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IONOSPHERIC DATA IN JAPAN

FOR MAY 1969

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RADIO RESEARCH LABORATORIES

NUKUI-KITAMACHI, KOGANEI-SHI, TOKYO, JAPAN

CONTENTS

SITE OF THE RADIO WAVE OBSERVATORIES AND HIRAISO BRANCH

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.	Nukui-Kitamachi, 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 component 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 *Es*.

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. **Definitions of the CNT, MED, UQ and LQ**

Median count (CNT) is the number of values from which a median has been computed. In addition to numerical values, the count may include certain descriptive letters.

Median (MED) of a set of numbers is the middle value when the numbers are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

Upper quartile (UQ) is the median value of the upper half of the values when they are ranked according to magnitude; the *lower quartile* (LQ) is the median value of the lower half.

d. **Description of Standard Types of *Es***

The eight standard types of *Es* are identified by corresponding capital letters: *F*, *L*, *C*, *H*, *Q*, *R*, *A*, *S*. These letters suggest the names flat, low, cusp, high, equatorial, retardation, auroral and slant, respectively. The letter '*N*' is used to designate any *Es* trace that does not correspond to any of the eight types.

F An *Es* 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 *Es* traces observed in the daytime are classified according to their virtual hight: *H* or *L*.

L A flat *Es* 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 *Es* 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 *Es* 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 *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)

Q An *Es* 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 *Es* 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 *Es* 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 *Es* trace which rises steadily with frequency and usually emerges from another type *Es* 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 *Es* trace such as *Es-L* or *Es-F*, at frequencies which greatly exceed the *E* layer critical frequency, whereas at low latitudes it usually rises from *Es-Q* *Es-C* or *Es-H* at frequencies near the regular *E* critical frequency. Type *S* is never used to determine f_0Es and $h'Es$. The slant trace is sometimes observed to start at f_0E without echoes clearly identifiable as *Es* echoes being seen.

N The designation '*N*' is used to denote an *Es* 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.

e. **Multiple Reflections from *Es***

When the ionogram shows the presence of multiple reflections from *Es* 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 MHz at Hiraiso Branch.
Antennas are two parabolic reflectors : 10 meter for 200 MHz and
5 meter for 500 MHz, each having the total power receiver.
Observations are feasible almost from sunrise to sunset.

a. **Time and Unit**

The time is expressed as U.T.

The unit is 10^{-22} W·m^{-2}Hz^{-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 MHz 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.

Bracket means that observation time does not exceed one third of the period.

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 Strengths of WWV and WWVH

Field Strengths 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 Hz is picked up by the use of a narrow band pass filter with ±40 Hz bandwidth.

The *tabulated field strength* 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	λ/2 vertical	λ/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	±40Hz 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.

U: Inaccurate measurement influenced by interferences, atmospherics, or non-propagational reasons.

E: 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 MHz frequencies broadcast from Fort Collins, Colorado), Lima (commercial circuit) and WWVH (10 and 15MHz frequencies broadcast from Hawaii), which are received at Hiraiso Branch.

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 Lima.

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

c. Sudden Ionospheric Disturbances (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 MHz are indicated by (′), (none), and (″), respectively. Characteristics of the phenomenon are classified as follows.

Circuits and Drop-out intensities

CO.....WWV 20, 15 and 10 MHz (Fort Collins, Colorado)
LM .....Various frequencies of commercial circuit (Lima)
HA.....WWVH 15 and 10 MHz (Hawaii)
TO.....JJY 15 and 10 MHz (Tokyo)
SH.....BPV 15 and 10 MHz (Shanghai)
HB.....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

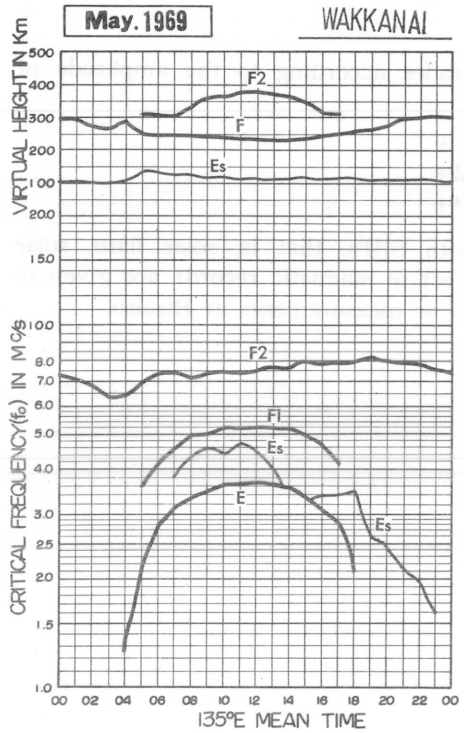
Importances

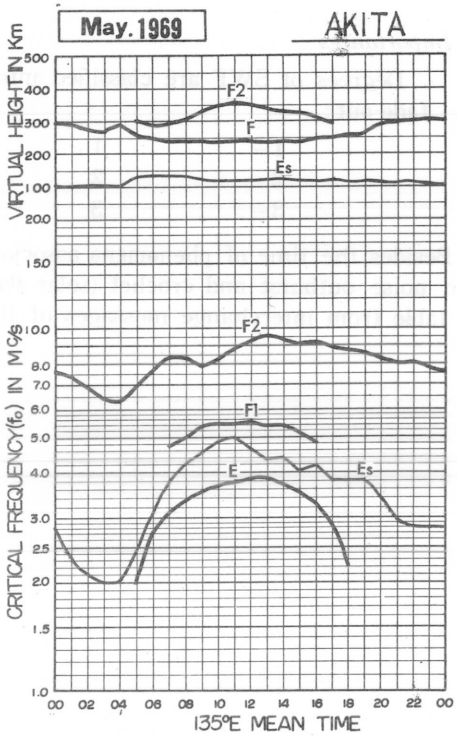
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out ;

1−	1	1+
2−	2	2+
3−	3	3+

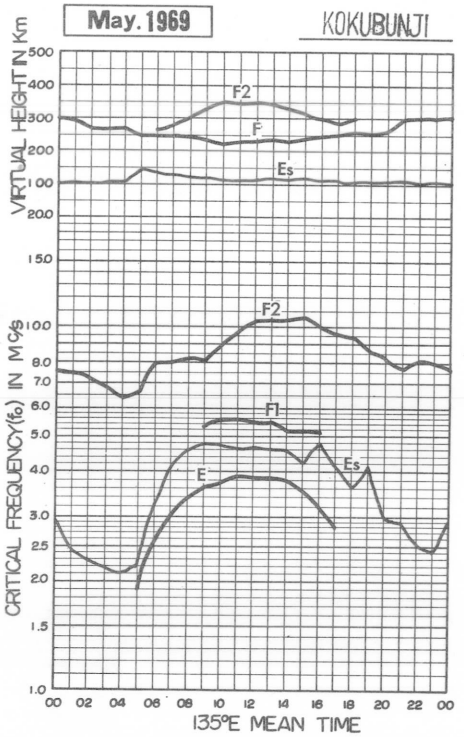
Besides, the time of phenomena associated with SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record), are given in this table from interchange messages of IUWDS or measurements at Hiraiso.

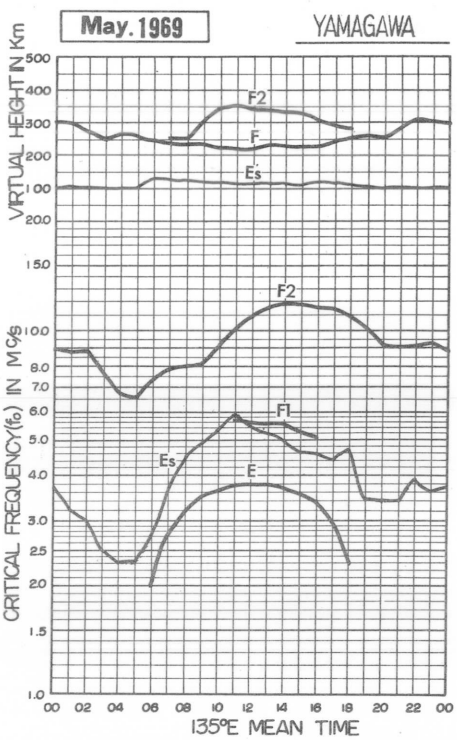
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: WAKKANAI

May 1969

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	073	071	068	063	063	070	074	074	072	074	075	074	075	077	077	080	078	079	080	082	080	080	077	075
	CNT	29	29	30	30	29	30	30	29	28	26	26	25	25	27	27	27	27	29	29	29	30	29	29	29
	Q R	006	008	007	008	007	010	018	019	013	011	014	015	017	013	014	012	008	013	012	010	006	005	006	008
foF1	MED					290	360	410	460	500	500	520	520	520	520	520	500	470	415L						
	CNT					1	5	11	14	19	23	22	21	20	23	22	19	15	6						
foE	MED					125	210	280	308	330	350	365	365	365	365	355	335	305	285	210	E				
	CNT					23	30	30	30	30	30	28	26	22	26	25	25	25	27	25	16				
foEs	MED	E	E013E	E	E	G	G	G	038	043	046	044	047	045	040	G	G	034	034	035	026	J025X	J021X	020	016
	CNT	30	30	30	30	30	30	30	30	30	30	29	27	27	27	27	27	28	29	30	29	30	30	30	30
	Q R								009	013	021	013	015	D020						028	037		023		
f-min	MED	E	E	E	E	E	012	012	017	020	020	021	022	022	021	020	020	016	012	012	E	E	E	E	E
	CNT	30	30	30	30	30	30	30	30	30	30	29	27	27	27	27	27	28	29	30	30	30	30	30	30
M (3000) F2	MED	265	265	270	268	270	280	290	290	285	280	278	270	275	280	280	285	285	290	290	285	275	270	265	265
	CNT	29	29	30	30	29	30	30	30	28	27	26	25	25	27	27	27	27	29	29	29	30	29	29	29
M (3000) F1	MED					315	328	350	355	345	350	345	345	345	345	340	340	350	342L						
	CNT					1	4	10	13	17	20	20	18	19	22	22	18	12	6						
h'F2	MED					325	310	305	300	330	360	360	375	378	372	365	350	320	310						
	CNT					1	5	12	16	25	26	25	24	24	26	24	24	16	11						
h'F	MED	300	295	275	272	292	260	250	250	245	245	238	240	240	235	235	245	245	255	260	260	275	295	300	300
	CNT	30	30	30	30	30	29	27	24	22	21	22	19	20	23	25	22	19	21	19	23	29	28	29	30
h'Es	MED	105	105	105	105	110	130	138	125	125	120	120	115	115	110	110	120	115	115	115	115	110	110	110	110
	CNT	10	14	12	10	10	12	12	23	28	28	27	24	20	14	9	13	16	18	23	25	22	24	17	16
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: AKITA

May 1969

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	076	074	069	064	063	069	077	083	083	079	082	088	092	095	093	091	092	088	087	085	082	080	081	078
	CNT	29	29	27	28	30	31	31	31	30	30	30	31	31	31	31	31	30	30	29	29	28	28	26	27
	Q R	007	009	008	007	010	010	014	017	016	011	013	015	016	012	016	012	013	014	011	008	007	006	006	007
foF1	MED						320	490H	475	500	535	545	540	550	540	540	510	480L	440						
	CNT						1	1	8	20	24	26	26	28	29	27	25	19	4						
foE	MED					E	202	275	310	335	355	365	375	385	385	370	350	325	280	220	E				
	CNT					20	22	30	31	30	30	27	18	15	17	17	20	20	14	6	2				
foEs	MED	J028X	J023X	J021X	J020X	J020X	024	031	038	042	J046X	J049X	J050X	J046X	043	044	040	J042X	J038X	J038X	J038X	J034X	J029X	J028X	J028X
	CNT	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30	31	31	31	31	31
	Q R	019	010	011				D008	009	012	011	021	025	028	008	011	018	D017	026	027	019	034	031	023	020
f-min	MED	E013S	E	E	E	E	014	014	015	016	017	017	017	018	017	015	015	014	014	014	E013S	E013S	E013S	E013S	E013S
	CNT	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30	31	31	31	31	31
M (3000) F2	MED	265	270	275	272	275	290	295	295	288	275	270	275	275	275	285	285	290	290	295	290	275	270	268	270
	CNT	29	29	27	28	30	31	31	31	30	30	30	31	31	31	31	31	30	30	29	29	28	28	26	27
M (3000) F1	MED						315	300H	338	345	342	335	340	340	340	335	335	335L	U335						
	CNT						1	1	8	20	24	26	26	28	29	27	25	19	3						
h'F2	MED						302	282	290	300	335	352	360	350	340	335	325	308	295	290					
	CNT						6	28	29	27	27	30	31	31	31	31	31	30	28	4					
h'F	MED	295	290	275	270	285	255	250	242	240	240	240	240	230	230	240	240	245	250	262	260	280	290	295	295
	CNT	31	31	31	31	31	31	29	28	26	27	25	26	27	29	27	26	25	25	28	30	30	29	30	30
h'Es	MED	105	105	105	105	105	135	140	135	130	125	120	120	118	120	120	120	120	120	115	115	110	110	110	105
	CNT	26	24	26	21	20	21	23	27	31	30	28	29	28	26	25	25	23	26	25	29	28	28	27	27
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: KOKUBUNJI

May 1969

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	077R	075	073	068	064	067	080	080	082	081	090	098	104	104	105	106	100	096	095	087	084R	077	081R	080R
	CNT	25	25	28	30	30	29	29	30	28	29	29	28	29	30	31	29	28	29	29	28	25	25	21	25
	Q R	010	008	010	011	013	008	010	018	013	012	013	015	016	015	018	019	018	015	015	013	009	012	010	012
foF1	MED						U510L	U395L	U510L	505	530L	560L	560L	550L	550L	520L	520L	U510L	390L						
	CNT						1	2	4	4	9	13	13	9	11	13	15	7	1						
foE	MED						192	260	305	340	365	375	388	U385	390	380	355	325	275	180					
	CNT						14	28	25	23	16	10	6	8	9	10	11	13	10	3					
foEs	MED	J029X	024	023	022	021	022	032	041	046	048	047	046	047	046	046	042	J048X	J042X	J036X	J041X	J030X	J029X	025	J024X
	CNT	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	29	29	30	31	31	31	31	31	30
	Q R	019	015	011	D014	007	008	006	006	026	022	017	021	016	012	010	015	030	019	025	025	020	026	028	020
f-min	MED	E016S	E016S	E016S	E015S	E015S	016	016	016	026	026	026	029	028	026	026	026	019	016	015	E016S	E016S	E016S	E016S	E016S
	CNT	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	29	29	30	31	31	31	31	31	30
M (3000) F2	MED	270R	280	288	280	275	300	305	305	300	280	270	270	275	280	285	285	290	285	295	290	275R	275	270R	270R
	CNT	25	25	28	30	30	28	29	29	28	29	29	28	29	30	31	28	28	29	29	28	24	25	21	24
M (3000) F1	MED						U315L	U400L	U338L	340	350L	340L	340L	342L	345L	348L	345L	U335L	360L						
	CNT						1	2	4	4	9	13	11	8	11	12	15	7	1						
h'F2	MED						340	265	275	298	324	350	345	350	340	328	310	300	290	300					
	CNT						2	11	22	26	28	29	27	29	30	31	28	28	26	5					
h'F	MED	300	295	272	265	275	250	250	248	245	240	221	225	230	240	235	240	250	250	260	255	260	300	300	300
	CNT	31	31	31	31	31	31	30	26	23	22	22	19	15	17	23	23	22	24	25	28	30	30	30	31
h'Es	MED	105	105	105	105	105	148	140	130	125	120	115	115	115	115	115	118	115	115	110	110	110	110	105	108
	CNT	28	28	24	22	23	22	28	28	29	29	28	29	24	30	28	24	27	27	28	29	29	26	25	24
hpF2	MED	390R	370	352	365	378	308	300	305	310	350	385	388	375	360	358	350	350	345	340	340	362R	385	390R	395R
	CNT	25	25	28	30	30	28	29	29	26	29	28	28	29	30	30	28	27	28	27	28	24	24	21	24
ypF2	MED	100R	095	090	098	090	090	095	090	100	105	105	100	100	100	100	100	100	100	100	100	090R	090	085R	082R
	CNT	25	25	28	30	30	28	29	29	26	29	28	28	29	30	30	28	27	28	27	28	24	25	21	24

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: YAMAGAWA

May 1969

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	088S	087S	088S	076	067	066	074	078	079	081	090	101	108	115	118	117	116	114	108	101	090S	090S	090S	092S
	CNT	24	23	25	22	24	24	29	29	29	29	28	28	27	26	26	26	26	26	27	28	27	27	26	23
	Q R	014	015	016	011	011	012	008	011	011	010	012	017	016	022	025	023	019	020	018	020	015	013	016	014
foF1	MED									480L	555	540	570	560L	555	550	520	505	U480L						
	CNT									1	2	4	10	13	14	10	9	6	2						
foE	MED							200	275	320	350	365	375	380	380	370	358	340	300	230					
	CNT							22	26	27	26	23	21	13	14	18	18	19	22	16					
foEs	MED	J037X	J032X	J030X	J025X	J023X	J023X	027	037	J045X	050	054	060	054	052	050	046	J046X	J044X	047	J034X	J034X	J034X	J039X	J036X
	CNT	28	28	28	28	29	29	29	29	29	30	29	28	27	25	26	26	26	26	27	28	28	28	28	28
	Q R	030	024	028	030	016	D014	005	008	011	030	016	030	022	019	019	025	021	019	030	032	034	040	020	042
f-min	MED	E015S	E013S	012	011	011	011	E015S	014	015	016	018	021	021	020	020	018	016	015	014	012	E015S	E015S	E014S	E014S
	CNT	28	28	28	28	29	29	29	29	29	30	29	28	27	25	26	26	26	26	27	28	28	28	28	28
M (3000) F2	MED	265S	270S	290S	285	275	272	310	315	305	290	270	265	270	275	275	280	285	285	290	290	275S	265S	260S	265S
	CNT	24	23	25	22	24	24	29	29	29	28	27	27	26	25	26	26	26	26	27	28	27	27	26	23
M (3000) F1	MED									385L	342	352	340L	340L	340	335	340	340	U335L						
	CNT									1	2	2	7	12	9	8	9	4	2						
h'F2	MED							290	252	256	300	345	348	342	340	335	325	305	290	278					
	CNT							1	10	28	27	27	27	26	24	26	26	25	26	25					
h'F	MED	298	298	268	250	270	262	245	240	240	U238	U218H	218	218	230	229	234	235	247	255	258	252	288	306	298
	CNT	28	28	28	27	29	29	29	28	21	15	11	12	14	13	14	18	15	16	15	27	28	28	28	27
h'Es	MED	105	102	100	100	100	105	132	125	120	118	115	110	110	110	108	110	120	115	110	105	105	105	105	102
	CNT	27	26	24	26	24	21	28	29	29	30	29	28	27	24	22	23	26	25	27	27	25	28	26	26
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA

MAY 1969 | foF2 (0.1) | 135° E Mean Time (G. M. T. +9 h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	63	60	58	58	54	56	53	56	55	I A 56	59	I C 68	75	78	81	81	78	79	76	80	80	79	70	69
2	F 62	64	64	62	65	72	78	79	78	73	79	87	90	93	96	88	88	93	83	82	83	80	77	73
3	70	67	67	62	F 59	63	64	83	73	77	85	90	93	93	91	88	88	91	93	89	83	82	80	73
4	70	73	64	57	55	59	62	55	60	61	66	66	70	76	76	74	80	76	71	75	75	76	74	74
5	71	72	65	58	58	60	63	65	66	70	77	83	86	87	86	83	83	74	66	70	74	78	75	71
6	70	71	64	F 60	F 60	F 63	63	69	75	77	86	83	90	84	H 83	87	91	87	91	82	73	73	70	68
7	66	68	69	F 60	58	75	84	71	70	70	71	65	66	66	68	70	73	70	70	73	70	71	71	71
8	68	68	68	63	63	70	73	76	83	83	86	92	94	93	87	85	86	83	78	80	78	77	78	F 76
9	F 77	72	69	70	69	75	87	91	90	85	84	91	104	105	97	94	94	96	93	86	77	75	77	75
10	73	76	71	68	63	71	81	84	84	84	88	84	80	80	78	80	83	87	86	89	82	80	74	75
11	75	74	75	70	66	73	78	83	83	90	C	C	C	C	C	C	C	91	87	88	92	90	80	77
12	74	73	70	66	67	74	75	67	66	64	63	68	67	I A 70	73	73	77	79	80	82	82	80	75	74
13	71	71	69	63	63	76	86	77	71	68	74	78	76	77	79	77	82	73	74	77	77	80	69	67
14	63	63	62	61	61	62	65	64	57	I A 66	63	74	74	76	79	76	74	78	80	84	84	81	79	75
15	74	69	66	63	66	69	57	62	F 70	69	67	75	86	85	75	80	78	74	F 73	F 73	83	85	94	75
16	74	59	55	46	52	48	43	W	A	A	60	74	84	83	87	92	87	88	96	91	81	77	76	69
17	70	61	51	45	42	48	55	54	50	W	A	62	65	66	71	76	78	77	70	67	72	70	73	69
18	66	63	59	53	48	53	58	56	62	74	78	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	90	I C 87	87	88	79	82	83	86
20	81	80	77	66	63	690	78	80	H 75	I A 70	67	68	70	68	70	70	70	70	74	78	80	81	U S 75	78
21	81	75	73	71	71	83	91	87	78	79	79	81	83	78	75	73	77	81	81	83	82	87	82	84
22	80	80	73	63	66	73	78	74	69	67	62	65	69	68	I A 67	66	I A 71	74	78	84	85	F	F 78	U F 77
23	F 76	70	67	68	F 65	70	64	54	A	A	A	A	57	56	57	61	A	59	I A 62	66	69	74	71	70
24	69	66	63	60	60	70	77	78	76	75	76	74	80	81	83	80	83	83	83	I C 82	82	87	83	83
25	79	75	75	66	67	66	67	73	70	73	H 61	61	67	73	70	72	68	65	67	72	73	74	F 74	F
26	76	76	71	62	63	71	83	89	84	78	82	81	C	C	C	C	C	81	85	86	82	81	80	79
27	78	76	74	70	68	70	81	81	77	77	I R 78	I A 68	U R 68	72	77	80	78	A	A	I A 77	80	82	84	82
28	75	74	74	70	70	72	81	87	80	81	80	79	73	74	77	80	78	80	85	90	86	90	A	S 82
29	F	F	U F 71	F 71	F	F 70	70	59	58	62	66	A	A	70	68	67	67	67	70	76	78	79	79	72
30	71	68	66	65	64	73	81	83	82	85	74	I A 70	73	82	84	84	80	77	81	A	S 93	85	83	82
31	80	77	68	67	67	75	73	68	66	A	A	A	A	73	70	70	73	76	I A 80	90	86	S 86	I S 86	87
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	30	29	30	30	29	28	26	26	25	25	27	27	27	27	29	29	29	30	29	29	29
MED	73	71	68	63	63	70	74	74	72	74	75	74	75	77	77	80	78	79	80	82	80	80	77	75
UQ	76	75	71	68	66	73	81	83	79	79	80	83	86	84	84	84	84	87	85	86	83	82	80	79
LQ	70	67	64	60	59	63	63	64	66	68	66	68	69	71	70	72	76	74	73	76	77	77	74	71

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969 | foF1 (0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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								430	A	A	500	I C 510	520	510	500	A								
2								440	480	U L 500	L	500	L 500	510										
3									480	U L 500	510	I A 500	L 530	L 500	U L 500	U L 460								
4							400		460	500	510	490	520	510	L 500	500								
5									L 480	510	520	520	H 510	520	500	U L 480	U L 450							
6								L 460	500	L 500	520	520	520	500		U L 500	L 480							
7								470	480	500	500	500	510	500	500	490	460	U L 400						
8									A	500	530	500	L 500	490	U L 510		L 470							
9									U L 500	L 520	530	A	A	A	530	520	A	A						
10										520	520	520	520	520	L 530	500								
11									L 500	530	C	C	C	C	C	C	C							
12							430	470	520	510	510	530	550	I A 540	510	500	U L 500							
13							430	480	510	530	530	530	540	530	500	500	460							
14							U L 410	A	A	A	530	530	530	540	520	500	A	A						
15									A	540	580	540	550	550	530	L 520	480							
16						330	400	430	A	I A 480	510	U L 530												
17						360	400	430	470	490	I A 510	530	530	550	520	510	490	A						
18							400	L 440		A	U L 540	C	C	C	C	C	C	C						
19						C	C	C	C	C	C	C	C	C	C	C		C						
20									500	I A 500	510	520	530	I A 520	520	500	490							
21									510	510	540	530	530	530	530	500								
22								460	500	A	530	500	520	500	A	A	A							
23							A	A	A	A	A	A	A	A	A	A	A	L 410						
24								480	U L 500	510	530	530	530	530	520	500	470	420						
25								A	490	490		530	510	510	500	A	A	A						
26							450	460	500	L 520	A	540	C	C	C	C	C	A						
27								470	510	A	R	A	A	520	520	490	A	A						
28							430		500	500	530	A	A	530	520	500	500	A						
29						350	A	A	480	490	490	A	A	A	540	490	460	410						
30						L 380	U L 410	470	A	480	A	A	530	500	500	A	460	L 430						
31					290	U L 360	400	A	A	A	A	A	A	500	530	I A 500	I A 460	L 420						

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	5	11	14	19	23	22	21	20	23	22	19	15	6						
MED					290	360	410	460	500	500	520	520	520	520	520	500	470	L 415						
UQ						L 360	430	470	500	515	530	530	530	530	530	500	485	L 420						
LQ						350	400	440	480	495	510	510	510	505	500	500	460	L 410						

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969 | foE (0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	180	250	300	315	350	370	I C 370	370	365	345	325	295	I A 250	I A 200	E				
2					E	205	250	300	325	340	360	360	A	R	350	330	300	255	200	E				
3					E	165	265	305	320	340	355	350	I A 320	I A 330	340	335	305	250	200	E				
4					E	180	265	295	320	345	355	360	360	375	345	320	300	265	200	E				
5					E	175	250	305	325	345	355	365	350	360	355	325	300	280	190	E				
6					E	205	250	305	325	350	360	365	I B 365	355	330	340	305	275	195	E				
7					E	205	260	300	330	350	365	370	365	365	340	320	295	230	200	E				
8					E	200	270	305	320	345	365	370	375	365	345	330	300	265	A	A				
9					S	200	265	300	335	360	375	380	375	365	340	340	300	260	A	A				
10					A	205	280	305	330	355	365	365	365	340	355	340	300	270	210	S				
11					E	215	290	310	335	355	C	C	C	C	C	C	C	A	A	E				
12					A	210	280	310	330	360	370	360	350	340	A	R	A	290	A	A				
13					A	210	280	310	330	350	R	R	R	380	375	340	305	285	205	S				
14					115	210	290	305	335	350	370	390	370	380	360	330	310	285	205	E				
15					130	215	280	305	330	350	380	380	380	370	360	340	310	285	205	160				
16					A	200	275	300	330	335	340	350	350	I R 350	360	325	I A 300	280	210	E				
17					140	215	280	305	325	350	350	I B 350	365	375	355	330	315	285	210	E				
18					130	225	290	310	330	350	350	C	C	C	C	C	C	C	C	C				
19					C	C	C	C	C	C	C	C	C	C	C	C	A	C	230	S				
20					125	230	295	320	350	365	370	360	370	400	380	355	325	290	215	120				
21					155	230	295	310	330	355	375	I B 380	365	R 370	370	350	315	290	210	S				
22					155	240	295	310	330	335	350	B	B	340	A	A	A	A	A	S				
23					150	220	290	320	340	365	I B U R 375	380	375	350	350	320	285	300	220	S				
24					A	225	280	310	335	350	360	I B 365	365	355	350	350	315	295	215	C				
25					125	200	290	320	340	360	I B 370	380	370	I A 370	380	345	320	290	205	S				
26					150	220	300	325	365	380	390	395	C	C	C	C	C	285	210	S				
27					130	210	290	315	335	355	I B 355	I R 370	I B 375	370	370	350	310	280	210	E				
28					E	210	280	305	340	350	365	345	A	390	370	350	310	280	205	S				
29					A	215	285	310	320	360	375	360	355	I A 345	335	310	315	290	220	S				
30					130	230	290	315	330	335	350	335	A	385	370	345	320	295	215	E				
31					130	230	290	310	335	345	360	355	350	370	340	335	300	290	215	E				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					23	30	30	30	30	30	28	26	22	26	25	25	25	27	25	16				
MED					125	210	280	308	330	350	365	365	365	365	355	335	305	285	210	E				
UQ					130	220	290	310	335	355	370	380	370	375	370	345	315	290	215	E				
LQ					E	200	265	305	325	345	355	360	355	350	345	325	300	268	200	E				

IONOSPHERIC DATA

MAY 1969

foEs (0.1)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 C 20	E	E	E	21	G	44	47	J X 63	J X 56	C	40	43	42	J X 63	J X 45	30	23	25	J X 40	J X 30	20	E
2	E	E	E	E	E	G	31	G	38	40	42	47	40	G	G	G	G	G	G	15	E	J X 35	20	20
3	E	E	E	E	E	G	G	38	40	42	43	J X 48	J X 64	41	G 33	G	G	G	G	E	E	E	E	E
4	E	E	E	E	E	G	G	35	39	41	47	50	G	G	G 32	G	37	G	27	18	J X 28	J X 34	20	E
5	E	E	E	E	E	G	G	G	39	G	40	40	40	G	G	G	G	37	25	18	E	E	E	J X 23
6	E	13	E	E	E	G	G	35	40	40	40	43	E B 45	40	G	G	33	G	G	14	E	E	E	E
7	E	J X 25	J X 31	E	15	G	34	38	42	41	45	43	44	40	G	G	G	30	G	15	20	18	E	E
8	E S 15	E	E	E	E	G	G	G	J X 58	J X 63	J X 55	43	G	40	G	G	G	G	J X 46	18	E	J X 48	J X 26	E
9	J X 24	J X 23	J X 20	E	E S 13	21	G 20	G	G	42	43	J X 63	J X 63	51	G	43	J X 64	J X 65	J X 33	71	J X 23	21	E	E
10	J X 31	J X 33	J X 24	15	J X 24	G 19	G	G	G	43	44	42	40	G	G	41	G	G	G	E S 13	E	E	E	E
11	E	E	E	E	E	G	G	35	40	J X 50	C	C	C	C	C	C	C	J X 43	J X 34	24	J X 61	18	E	E S 16
12	E	J X 26	16	J X 23	16	G	G	37	37	G	42	J X 53	J X 59	J X 94	39	G	J X 45	50	36	33	20	E	E	E
13	E	13	E	E	15	G 15	G	40	40	43	G	G	G	G	G	G	G	43	38	J X 39	J X 41	J X 25	J X 23	26
14	19	17	E	E	34	33	40	J X 61	J X 56	J X 94	J X 51	G	41	G	G	J X 64	J X 73	J X 51	J X 40	J X 33	J X 33	18	J X 30	J X 21
15	E	E	E	E	G	G	38	47	56	50	43	G	G	G	G	G	G	G	G	G	14	15	E	E
16	E	E	E	18	J X 45	29	38	34	49	48	40	40	G	G	G	G	J X 33	G	24	26	E	16	J X 20	19
17	E	J X 38	15	J X 23	20	30	35	40	43	44	J X 73	43	45	G	G	38	44	48	J X 46	J X 29	20	18	J X 63	J X 21
18	J X 23	E	E	E	G	G	G	36	J X 54	J X 73	42	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	36	C	28	E S 16	J X 25	E	15	J X 26
20	J X 21	J X 23	18	E	G	G 20	G	40	43	J X 74	J X 66	J X 55	J X 53	J X 63	J X 66	G	G	G	G	J X 60	16	J X 38	J X 66	J X 38
21	J X 63	J X 24	J X 26	J X 23	G	30	34	43	43	48	44	J X 55	G	G	G	G	G	J X 45	J X 63	J X 43	E	J X 21	E	16
22	E	E	E	E	G	G	G	36	41	50	43	44	J X 48	46	J X 73	J X 65	J X 81	J X 63	J X 51	J X 74	J X 73	J X 74	J X 66	J X 24
23	15	J X 23	J X 38	J X 21	27	28	43	49	J X 60	J X 79	J X 63	J X 60	53	51	J X 54	J X 55	J X 114	G	J X 63	J X 55	J X 66	J X 56	28	17
24	E S 16	16	E	E	20	G 15	G	38	43	51	44	45	41	40	G	G	G	G 28	31	C	J X 25	15	E	E
25	E	E	E	E	G	G	32	50	J X 60	42	40	43	46	40	G	J X 64	M 67	J X 60	J X 40	21	J X 64	J X 63	J X 44	18
26	J X 24	J X 36	J X 23	14	G	G	G	36	53	J X 70	J X 66	J X 53	C	C	C	C	C	J X 63	J X 173	26	J X 35	J X 21	E	15
27	J X 21	E	E	E	G	G	G	G	43	57	48	M 73	J X 60	G	G	40	J X 75	J X 88	J X 81	J X 85	J X 53	J X 24	J X 63	J X 24
28	15	J X 44	20	J X 23	G	G	G	G	41	45	J X 58	J X 63	J X 85	46	44	J X 54	50	J X 73	J X 49	76	113	J X 73	J X 113	19
29	E S 15	E	J X 45	28	21	35	J X 59	55	44	44	G	J X 101	J X 71	J X 74	52	45	G	34	J X 54	J X 43	J X 33	J X 28	J X 40	E
30	E	E	18	15	G	G	35	41	51	41	54	J X 108	J X 63	G	G	J X 69	41	G	J X 88	J X 100	J X 73	J X 40	E	E
31	E	E	E	E	G	G	G	J X 58	M 56	J X 88	J X 94	J X 122	J X 160	G	G	101	J X 93	50	J X 90	J X 79	J X 25	J X 40	40	J X 50
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	29	27	27	27	27	27	28	29	30	29	30	30	30	30
MED	E	E E 13	E	E	G	G	G	38	43	46	44	47	45	40	G	G	34	34	35	26	J X 25	J X 21	20	16
UQ	19	J X 23	20	15	16	21	34	43	53	J X 63	J X 55	J X 58	J X 60	44	36	54	J X 57	J X 50	J X 51	J X 55	J X 41	J X 38	J X 40	J X 21
LQ	E	E	E	E	E	G	G	34	40	42	42	43	E G 40	G	G	G	G	G	23	18	E	15	E	E

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IONOSPHERIC DATA

MAY 1969 | f_bEs (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45°23.6'N, Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 C 20	E	E	E	G	G	40	46	A	48	C	G	G	G	51	45	27	21	24	38	28	18	E
2	E	E	E	E	E	G	G	G	G	G	G	G	39	G	G	G	G	G	G	15	E	35	18	12
3	E	E	E	E	E	G	G	G	G	G	G	G	53	40	G 32	G	G	G	G	E	E	E	E	E
4	E	E	E	E	E	G	G	G	G	G	45	G	G	G	G 31	G	G	G	G	G	28	20	18	E
5	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	14	E	E	E	20
6	E	E	E	E	E	G	G	G	G	G	G	G	E B 45	G	G	G	G	G	G	G	E	E	E	E
7	E	20	18	E	12	G	G	G	G	G	45	E R 43	G	G	G	G	G	G	G	15	18	17	E	E
8	E S 15	E	E	E	E	G	G	G	58	G	G	G	G	G	G	G	G	G	44	17	E	30	24	E
9	20	19	12	E	E S 13	18	G 20	G	G	G	G	53	55	51	G	G	60	58	24	65	20	20	E	E
10	19	30	20	11	20	G 16	G	G	G	G	G	G	G	G	G	G	G	G	G	E S 13	E	E	E	E
11	E	E	E	E	E	G	G	G	G	49	C	C	C	C	C	C	C	30	27	24	30	18	E	E S 16
12	E	20	13	19	13	G	G	G	G	G	G	49	48	A	37	G	42	50	34	27	15	E	E	E
13	E	12	E	E	15	G 15	G	G	G	G	G	G	G	G	G	G	G	38	37	34	40	20	12	20
14	16	15	E	E	25	G	40	60	55	A	48	G	G	G	G	G	71	50	37	30	30	15	22	20
15	E	E	E	E	G	G	38	42	53	49	G	G	G	G	G	G	G	G	G	G	E	E	E	E
16	E	E	E	E	40	G	G	G	A	A	G	G	G	G	G	G	32	G	G	G	E	14	18	15
17	E	38	12	15	G	G	G	G	G	G	A	G	G	G	G	G	43	47	45	24	20	15	50	20
18	20	E	E	E	G	G	G	G	48	52	G	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	35	C	G	E S 16	24	E	12	24
20	15	20	12	E	G	G 17	G	G	G	A	45	G	G	53	50	G	G	G	G	45	15	30	28	28
21	36	19	21	22	G	G	G	G	G	48	G	47	G	G	G	G	G	G	38	28	E	17	E	15
22	E	E	E	E	G	G	G	G	G	50	G	G	48	45	A	58	A	40	44	60	20	37	42	20
23	15	19	18	12	G	G	41	48	A	A	A	A	53	51	50	50	A	G	A	52	43	30	19	15
24	E S 16	15	E	E	18	G 15	G	G	G	50	G	G	G	G	G	G	G	G 21	G 20	C	18	14	E	E
25	E	E	E	E	G	G	G	44	48	G	G	G	G	40	G	51	64	50	39	20	25	30	21	16
26	18	30	15	11	G	G	G	G	49	48	60	48	C	C	C	C	C	56	42	26	27	19	E	15
27	18	E	E	E	G	G	G	G	40	54	E R 48	A	50	G	G	G	64	A	A	A	30	21	50	21
28	14	16	17	16	G	G	G	G	G	45	47	54	54	G	G	44	42	70	48	65	25	43	A	18
29	E S 15	E	20	20	18	30	59	52	G	44	G	A	A	51	45	45	G	G	51	41	30	26	19	E
30	E	E	15	13	G	G	G	G	50	G	52	A	40	G	G	53	G	G	60	A	18	22	E	E
31	E	E	E	E	G	G	G	52	50	A	A	A	A	G	G	52	66	G	A	73	21	33	34	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	29	27	27	27	27	27	28	29	30	29	30	30	30	30
MED	E	E	E	E	G	G	G	G	G	44	G	G	G	G	G	G	G	G	30	24	20	20	15	14
UQ	16	19	15	11	13	G	G	G	49	52	48	51	49	40	E G 31	44	52	47	44	45	28	30	22	20
LQ	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	14	E	14	E	E

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IONOSPHERIC DATA

MAY 1969 | f-min (0.1) | 135° E Mean Time (G. M. T. + 9h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 C 20	E	E	E	14	E	16	19	29	20	C	20	20	20	16	12	12	E	E	E	E	E	E
2	E	E	E	E	E	12	12	17	17	20	21	22	20	20	23	18	18	11	E	E	E	E	E	E
3	E	E	E	E	E	E	11	12	15	17	24	20	20	20	20	20	18	16	12	E	E	E	E	E
4	E	E	E	E	E	12	12	12	18	22	20	20	28	22	19	E	16	17	16	E	E	E	E	E
5	E	E	E	E	E	E	11	12	20	20	20	20	20	23	20	20	16	15	16	E	E	E	E	E
6	E	E	E	E	E	E	15	18	19	20	20	20	45	20	20	20	20	15	12	E	E	E	E	E
7	E	E	E	E	E	12	12	13	22	20	20	32	25	20	20	17	17	15	16	E	E	E	E	E
8	E S 15	E	E	E	E	13	12	12	12	16	17	20	30	24	28	20	15	13	E	E	E	E	E	E
9	E	E	E	E	E S 13	E	14	13	20	23	20	23	27	21	24	16	13	12	12	E	E	E	E	E
10	E	E	E	E	E	11	12	14	17	20	20	27	22	21	22	20	16	12	12	E S 13	E	E	E	E
11	E	E	E	E	E	E	12	17	17	21	C	C	C	C	C	C	C	E	E	E	E	E	E	E S 16
12	E	E	E	E	E	E	E	17	17	18	20	20	20	25	24	23	16	12	E	E	E	E	E	E
13	E	E	E	E	E	E	11	19	22	20	21	23	20	28	20	20	18	16	16	E S 12	E	E	E	E
14	E	E	E	E	E	12	18	17	20	20	20	22	30	23	24	20	15	12	13	E	E	E	E	E
15	E	E	E	E	E	12	18	17	20	20	20	20	25	20	20	20	16	12	11	E	E	E	E	E
16	E	E	E	E	E	14	11	17	11	18	20	20	20	20	23	20	17	14	15	E	E	E	E	E
17	E	E	E	E	E	17	17	23	21	25	28	35	27	27	23	18	17	17	15	E	E	E	E	E
18	E	E	E	E	E	16	15	16	17	20	28	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	13	C	15	E S 16	E	E	E	E
20	E	E	E	E	E	E	17	21	26	20	22	22	22	30	24	20	15	12	11	E	E	E	E	E
21	E S 15	E	E	E	E	13	16	18	21	21	24	40	20	20	17	18	16	12	11	E S 12	E	E	E	E
22	E	E	E	E	E	13	11	18	17	20	22	34	35	26	30	22	17	12	11	E S 12	E	E	E	E
23	E	E	E	E	E	13	16	20	20	26	40	30	21	27	20	24	20	17	12	E S 13	E	E	E	E
24	E S 16	E	E	E	E	E	12	12	20	20	20	40	23	20	22	21	18	12	E	E	E	E	E	E
25	E	E	E	E	E	E	17	18	20	21	38	23	22	21	23	20	17	17	12	E S 12	E	E	E	E
26	E	E	E	E	E	E	16	20	20	20	22	23	C	C	C	C	C	18	13	E S 13	E	E	E	E
27	E	E	E	E	E	12	15	17	15	21	43	27	38	21	20	17	13	13	17	E	E	E	E	E
28	E	E	E	E	E	12	18	16	23	20	21	20	27	21	20	20	17	12	12	E S 12	E	E	E	E
29	E S 15	E	E	E	E	11	14	18	19	25	23	20	20	24	22	20	20	11	11	E S 12	E	E	E	E
30	E	E	E	E	E	E	11	12	22	20	22	20	25	20	20	20	20	12	E	E	E	E	E	E
31	E	E	E	E	E	E	11	20	20	18	18	20	20	20	20	19	16	12	E	E	E	E	E	E
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	29	27	27	27	27	27	28	29	30	30	30	30	30	30
MED	E	E	E	E	E	12	12	17	20	20	21	22	22	21	20	20	16	12	12	E	E	E	E	E
UQ	E	E	E	E	E	13	16	18	20	21	23	27	27	24	23	20	18	15	15	E S 12	E	E	E	E
LQ	E	E	E	E	E	E	11	13	17	20	20	20	20	20	20	18	16	12	E	E	E	E	E	E

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IONOSPHERIC DATA

MAY 1969

M(3000)F2(0.01)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	250	255	260	260	285	270	265	260	I A 260	250	I C 280	295	305	310	310	295	305	300	290	285	290	270	270
2	F 260	265	270	270	280	280	290	315	310	285	290	295	290	290	290	295	285	300	315	295	290	285	275	265
3	255	255	270	270	F 280	295	295	335	325	295	285	290	290	285	295	295	295	295	300	295	285	275	285	270
4	255	275	280	265	255	280	300	290	280	285	275	275	270	295	290	310	310	330	300	295	275	275	280	265
5	270	280	280	275	260	285	295	300	290	280	285	275	295	285	290	290	315	325	290	275	260	275	280	270
6	270	280	275	F 265	F 265	F 300	290	320	295	290	300	290	300	310	H 300	295	295	300	305	305	300	270	265	265
7	260	265	295	F 275	275	295	310	310	285	275	295	270	275	275	275	270	280	285	285	290	265	260	260	270
8	280	270	270	285	285	315	290	305	295	300	290	290	300	290	285	290	300	300	295	285	280	270	270	F 265
9	F 275	265	255	265	275	285	285	295	295	295	275	270	270	285	280	285	285	300	310	285	280	255	260	265
10	260	285	285	285	275	275	295	275	285	275	285	290	275	300	280	300	285	290	295	290	275	280	260	265
11	265	260	280	285	275	280	290	295	290	290	C	C	C	C	C	C	C	305	290	285	285	290	285	275
12	270	260	270	265	280	280	305	285	275	270	260	270	270	I A 270	280	290	290	290	295	280	280	275	270	270
13	265	270	270	270	265	265	280	295	275	250	260	280	265	270	280	265	280	275	270	285	260	285	260	255
14	245	255	240	250	260	275	260	290	205	I A 260	235	270	255	255	290	305	I A 280	285	290	275	275	270	265	265
15	260	255	255	255	275	310	290	285	F 315	245	225	240	265	265	250	265	280	255	F 260	F 245	240	240	265	240
16	255	235	230	230	230	250	225	W	A	A	250	300	290	300	285	285	285	285	295	290	270	260	255	260
17	260	260	260	255	255	255	255	280	245	W	A	265	280	265	270	290	290	310	285	275	265	255	260	260
18	265	270	270	270	275	285	300	335	300	285	285	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	295	I C 285	300	295	265	265	255	265
20	265	275	285	270	265	275	270	285	H 255	I A 270	270	265	255	265	270	275	270	275	285	270	275	270	U S 280	255
21	275	270	250	255	260	265	285	285	280	280	265	270	275	280	280	275	275	290	290	270	270	265	260	260
22	265	275	270	255	275	290	280	275	290	275	240	260	265	270	I A 270	275	I A 285	295	285	285	270	F	F 255	U F 260
23	F 265	265	260	265	F 270	265	280	230	A	A	A	A	250	240	240	260	A	270	I A 265	275	250	250	255	255
24	255	265	265	270	265	275	305	295	305	265	270	260	275	270	270	280	275	290	295	I C 270	270	260	265	265
25	255	255	280	275	295	260	255	285	290	275	H 295	235	260	260	270	280	255	285	275	280	260	250	F 260	F
26	265	270	280	275	270	270	290	300	295	280	280	270	C	C	C	C	C	285	295	290	275	270	270	265
27	265	265	270	280	280	300	270	290	275	285	I R 290	I A 280	U R 280	270	275	290	295	A	A	I A 280	265	260	275	280
28	265	260	275	270	275	265	285	285	280	285	280	290	300	270	275	285	280	265	270	285	270	270	A	S 270
29	F	F	U F 260	F 255	F	F 305	290	I A 270	240	260	275	A	A	285	270	280	285	290	285	280	280	280	280	265
30	260	265	260	260	260	260	300	300	280	305	295	I A 270	270	280	290	300	300	295	280	A	S 290	270	270	270
31	275	285	270	265	260	295	305	315	275	A	A	A	A	300	270	285	280	290	I A 280	290	280	S 270	I S 270	265
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	30	29	30	30	30	28	27	26	25	25	27	27	27	27	29	29	29	30	29	29	29
MED	265	265	270	268	270	280	290	290	285	280	278	270	275	280	280	285	285	290	290	285	275	270	265	265
UQ	265	270	280	275	275	295	295	300	295	285	290	290	290	290	290	295	295	300	295	290	280	275	275	270
LQ	260	260	260	260	260	265	280	285	275	268	260	270	265	270	270	278	280	285	285	275	265	260	260	260

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969

M(3000)F1(0.01)

135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	A	C	345	345	350	A								
2								375	360	U L 360	L	360	L 365	350										
3										355	U L 360	350	I A 350	L 340	L 360	U L 360	U L 350							
4							350		365	325	I A 345	380	365	355	L 345	340								
5									L 355	345	345	350	H 355	345	345	U L 355	U L 365							
6								L 370	340	L 355	355	345	345	365		U L 360	L 355							
7								355	355	360	I A 345	I R 340	355	350	340	325	325	U L 350						
8									A	360	345	380	L 360	380	U L 355		L 355							
9									U L 345	L 345	360	A	A	A	335	340	A	A						
10										345	340	345	345	345	L 330	340								
11									L 355	A	C	C	C	C	C	C	C							
12							340	350	325	350	355	A	A	A	350	345	A							
13							L 350	335	335	340	340	345	335	345	360	345	350							
14							A	A	A	A	340	330	340	325	345	340	A	A						
15									A	I A 335	330	330	325	325	335	L 330	345							
16						295	325	335	A	I A 350	335	U L 340												
17						315	325	335	330	350	I A 355	340	340	325	330	330	A	A						
18							350	L 370		A	U L 335	C	C	C	C	C	C	C						
19						C	C	C	C	C	C	C	C	C	C	C	C							
20									335	I A 345	355	345	340	I A 345	I A 340	340	330							
21									340	I A 335	330	I A 335	330	340	325	340								
22								325	330	A	330	360	I A 340	I A 335	A	A	A							
23							A	A	A	A	A	A	A	A	A	A	A	L 340						
24								355	U L 360	I A 350	340	350	345	335	335	335	345	335						
25								A	A	365		345	355	340	350	A	A	A						
26							355	355	A	A	A	A	C	C	C	C	C	A						
27								365	340	A	R	A	A	350	340	345	A	A						
28							350		345	A	A	A	A	340	330	A	A	A						
29						A	A	A	360	I A 360	365	A	A	A	320	I A 350	350	365						
30						L 340	U L 365	355	A	365	A	A	330	360	345	A	350	L 345						
31					315	U L 390	345	A	A	A	A	A	A	360	330	I A 340	I A 335	L 335						

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	4	10	13	17	20	20	18	19	22	22	18	12	6						
MED					315	328	350	355	345	350	345	345	345	345	340	340	350	L 342						
UQ						L 365	350	365	355	360	355	350	355	350	350	345	L 352	L 350						
LQ						305	340	335	335	345	338	340	340	340	330	340	340	L 335						

IONOSPHERIC DATA

MAY 1969 | h'F2 (km) | 135° E Mean Time (G. M. T. + 9h)

Station WAKKANAI Lat. 45°23.6'N, Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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								405	425	IA 460	490	C	345	330	300	315								
2								275	290	L 285	UL 300	300	300	310										
3										290	L 300	300	310	320	300	310	300							
4							290		410	395	425	360	400	345	310	320								
5									300	360	350	360	320	335	300	310	290							
6								285	315	310	315	320	320	310		310	295							
7								300	365	365	360	420	415	415	380	370	345	300						
8									345	310	350	315	300	315	320		300							
9									300	310	340	350	350	320	320	330	300	300						
10										360	345	325	350	340	350	325								
11									290	320	C	C	C	C	C	C	C							
12							315	350	415	420	L 420	425	410	IA 405	375	360	345							
13							310	345	360	470	425	380	420	405	335	395	320							
14							UL 335	A	805	A	540	410	400	415	360	305	A	315						
15									310	500	575	450	385	400	425	375	315							
16						450	650	W	A	A	495	320												
17						440	445	400	580	W	A	450	380	450	400	360	325	295						
18							300	270		370	345	C	C	C	C	C	C	C						
19						C	C	C	C	C	C	C	C	C	C	C		C						
20									390	IA 400	405	415	450	435	390	375	365							
21									355	350	410	375	360	365	360	360								
22								340	330	390	515	450	410	395	IA 390	395	A							
23							320	A	A	A	A	A	500	550	525	445	A	L 330						
24								300	305	370	380	400	370	370	365	345	320	300						
25								345	315	355		545	425	400	365	360	A	335						
26							300	300	295	345	350	375	C	C	C	C	C	315						
27								300	320	320	325	IA 345	375	390	375	325	A	A						
28							300		300	320	360	340	375	390	370	345	340	A						
29						290	A	A	500	440	395	A	A	375	410	360	345	300						
30						310	270	295	310	300	315	IA 410	395	350	320	320	300	310						
31					325	285	300	300	350	A	A	A	A	320	375	355	IA 350	315						

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	5	12	16	25	26	25	24	24	26	24	24	16	11						
MED					325	310	305	300	330	360	360	375	378	372	365	350	320	310						
UQ						440	328	348	390	400	425	418	410	405	385	365	345	315						
LQ						290	300	298	305	320	345	332	348	330	320	320	300	300						

IONOSPHERIC DATA

MAY 1969 | **h'F (km)** | 135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45°23.6'N, Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	320	320	300	300	295	275	270	A	A	A	A	C	215	260	245	I A 260	A 270	250	260	260	A 300	275	270	275
2	290	300	280	275	290	245	250	245	245	225	215	250	200	210	235	240	245	255	250	260	260	290	270	290
3	310	300	260	290	260	260	245	250	225	210	215	250	I A 235	240	210	245	250	265	260	250	260	285	260	280
4	300	285	250	265	325	270	250	255	245	265	I A 250	220	200	210	245	235	245	250	260	260	300	300	285	300
5	300	295	250	270	310	270	250	240	235	215	230	210	H 210	225	225	240	245	265	255	265	290	290	270	310
6	275	280	250	290	315	260	250	250	250	235	210	260	B 255	240	H 225	215	235	250	265	250	250	270	300	300
7	315	315	260	210	275	260	260	260	245	245	I A 265	I B 250	250	225	200	235	245	260	260	270	275	295	300	300
8	300	270	275	250	280	260	250	245	I A 215	245	250	210	220	215	220	225	245	245	A 270	260	255	310	305	305
9	300	300	300	260	275	255	250	235	235	250	215	I A 250	A	A	235	250	A	A	260	I A 255	250	300	300	300
10	310	A 300	275	250	270	250	250	225	225	225	260	250	240	230	240	260	235	260	260	260	260	260	275	300
11	300	300	280	250	265	245	240	245	240	A	C	C	C	C	C	C	C	255	265	260	A 285	260	250	280
12	290	310	280	300	300	260	255	250	235	235	210	A	A	A	225	245	I A 255	I A 265	A 290	270	260	265	280	285
13	300	295	275	270	300	265	250	260	245	240	210	225	250	250	240	245	240	A	A	A 275	I A 305	275	300	310
14	345	325	325	335	310	300	A	A	A	A	A 275	215	240	250	235	215	A	A	285	280	295	285	300	300
15	300	315	310	295	275	240	250	A 285	A	I A 255	235	245	250	235	250	245	240	260	285	315	325	350	315	350
16	305	340	350	390	I A 385	325	260	250	I A 250	I A 250	235	225	225	235	225	225	245	255	260	250	260	300	310	280
17	300	I A 300	300	340	355	300	265	250	285	250	I A 235	245	245	240	240	250	A	A	A	260	300	310	I A 310	305
18	300	290	270	270	295	260	235	250	270	A	225	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	250	I C 255	265	265	260	300	315	310
20	290	290	250	220	275	260	255	270	250	I A 250	240	225	280	I A 245	I A 250	250	245	255	250	I A 270	280	A 300	295	A 345
21	A 310	275	315	315	300	270	260	250	245	I A 255	245	I A 240	225	240	235	240	245	260	290	290	260	300	305	300
22	300	260	250	220	260	275	250	250	250	I A 250	250	235	I A 240	I A 225	A	A	A	A	A	A	300	I A 340	U A 360	315
23	300	300	305	305	310	260	A	A	A	A	A	A	A	A	A	A	A	260	A	A	A	A	305	310
24	300	270	275	275	275	245	240	245	250	I A 260	250	250	215	250	230	230	230	245	260	I C 270	260	290	285	300
25	300	285	260	230	270	245	240	A	A	215	H 250	240	240	240	240	A	A	A	A	275	300	A 320	315	285
26	295	300	250	245	295	245	245	220	A	A	A	A	C	C	C	C	C	A	A	255	265	275	275	295
27	300	275	265	250	250	260	220	215	250	A	A	A	A	225	210	250	A	A	A	A	300	300	I A 300	265
28	265	280	270	260	270	245	250	240	240	A	A	A	A	250	250	A	A	A	A	A	265	A	A	250
29	270	285	300	315	300	A	A	A	250	I A 230	250	A	A	A	I A 240	I A 260	245	270	A	A	290	295	285	265
30	290	295	310	300	300	275	255	250	A	215	A	A	240	235	245	I A 250	250	240	A	A	275	265	270	295
31	275	250	285	300	290	255	240	A	A	A	A	A	A	225	220	A	A	250	A	A	270	A 300	I A 300	305
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	27	24	22	21	22	19	20	23	25	22	19	21	19	23	29	28	29	30
MED	300	295	275	272	292	260	250	250	245	245	238	240	240	235	235	245	245	255	260	260	275	295	300	300
UQ	300	300	300	300	300	270	255	250	250	U A 250	250	250	248	242	240	250	248	260	268	270	300	300	305	305
LQ	290	280	260	250	275	250	245	242	235	225	215	225	218	225	225	235	242	250	260	260	260	275	275	285

IONOSPHERIC DATA

MAY 1969 | h'Es (km) | 135° E Mean Time (G. M. T. + 9h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	C	E	E	E	145	G	135	125	120	115	C	120	120	120	110	110	110	110	125	115	115	110	E
2	E	E	E	E	E	G	145	G	140	125	120	110	110	G	G	G	G	G	G	125	E	110	110	110
3	E	E	E	E	E	G	G	125	125	125	115	110	105	105	105	G	G	G	G	E	E	E	E	E
4	E	E	E	E	E	G	G	145	140	125	120	115	G	G	105	G	120	G	140	140	115	110	110	E
5	E	E	E	E	E	G	G	G	140	G	125	120	115	G	G	G	G	125	120	115	E	E	E	110
6	E	110	E	E	E	G	G	145	125	120	125	120	B	115	G	G	120	G	G	135	E	E	E	E
7	E	105	105	E	110	G	145	145	140	140	135	125	120	120	G	G	G	115	G	120	115	115	E	E
8	S	E	E	E	E	G	G	G	115	125	120	120	G	120	G	G	G	G	110	110	E	110	110	E
9	110	105	105	E	S	100	100	G	G	145	140	120	115	125	G	150	110	110	115	110	110	115	E	E
10	105	105	105	105	105	105	G	G	G	125	120	120	120	G	G	140	G	G	G	S	E	E	E	E
11	E	E	E	E	E	G	G	145	125	115	C	C	C	C	C	C	C	105	110	115	110	110	E	S
12	E	105	105	105	105	G	G	125	125	G	135	110	110	110	110	G	100	120	120	115	100	E	E	E
13	E	100	E	E	100	100	G	125	120	115	G	G	G	G	G	G	G	140	120	115	110	110	110	110
14	105	100	E	E	125	140	120	120	115	110	110	G	115	G	G	105	120	115	115	115	110	110	110	110
15	E	E	E	E	G	G	140	125	120	120	120	G	G	G	G	G	G	G	G	G	125	120	E	E
16	E	E	E	140	125	140	125	145	115	115	115	115	G	G	G	G	105	G	140	125	E	110	110	110
17	E	110	105	105	145	145	140	125	125	120	110	110	115	G	G	120	125	120	110	110	110	110	110	110
18	105	E	E	E	G	G	G	140	115	110	120	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	105	C	140	S	110	E	110	110
20	105	105	100	E	G	105	G	140	135	110	115	110	110	110	115	G	G	G	G	110	110	110	110	110
21	110	105	105	105	G	145	135	125	120	115	120	110	G	G	G	G	G	125	115	115	E	110	E	105
22	E	E	E	E	G	G	G	145	125	110	115	110	110	110	105	105	105	105	105	115	110	115	110	110
23	110	105	105	110	115	135	140	125	120	120	120	115	115	110	110	110	110	G	115	115	110	110	110	110
24	S	105	E	E	105	105	G	140	125	120	120	120	120	115	G	G	G	105	120	C	110	110	E	E
25	E	E	E	E	G	G	145	120	115	120	120	115	115	110	G	110	120	115	110	115	115	115	110	105
26	105	100	100	100	G	G	G	150	125	120	110	115	C	C	C	C	C	115	115	115	115	110	E	110
27	105	E	E	E	G	G	G	G	125	115	120	120	115	G	G	135	115	115	115	110	110	110	110	110
28	110	110	110	105	G	G	G	G	125	120	115	110	110	115	145	120	125	115	110	115	115	110	115	110
29	S	E	105	105	110	125	120	115	120	125	G	110	110	110	115	110	G	125	115	115	110	105	110	E
30	E	E	105	105	G	G	125	125	115	115	110	110	110	G	G	120	120	G	115	110	110	105	E	E
31	E	E	E	E	G	G	G	120	120	115	110	110	110	G	G	120	115	125	110	110	115	125	120	110
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	14	12	10	10	12	12	23	28	28	27	24	20	14	9	13	16	18	23	25	22	24	17	16
MED	105	105	105	105	110	130	138	125	125	120	120	115	115	110	110	120	115	115	115	115	110	110	110	110
UQ	110	105	105	105	125	142	142	145	125	122	120	120	115	115	115	120	120	125	120	118	115	115	110	110
LQ	105	105	105	105	105	105	122	125	120	115	115	110	110	110	105	110	108	110	110	112	110	110	110	110

IONOSPHERIC DATA

MAY 1969 | Types of Es | 135° E Mean Time (G. M. T. + 9 h)

Station WAKKANAI Lat. 45°23.6'N. Long. 141°41.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 1		H 1	C 1	C 1	C 2		C 1	C 1	C 1	C 2	C 2	L 1	L 1	C 3	F 3	F 4	F 1	
2							H 1		H 1	C 1	C 1	C 1	L 1							C 1		F 3	F 1	F 1
3								C 1	C 1	C 1	C 1	C 1	L 3	L 1	L 1									
4								H 1	H 1	C 1	C 2	C 1			L 1		C 1		H 1	H 1	F 1	F 2	F 1	
5									H 1		C 1	C 1	C 1					C 1	C 2	C 1				F 1
6		F 1						H 1	C 1	C 1	C 1	C 1		C 1			C 1			H 1				
7		F 3	F 4		C 1		H 1	H 1	H 1	H 1	H 1	C 1	C 1	C 1				C 1		C 1	F 1	F 1		
8									C 1	C 1	C 1	C 1		C 1					L 2	L 1		F 4	F 2	
9	F 2	F 2	F 2			L 1	L 1			H 1	H 1	C 1	C 1	C 1		H 1	C 2	C 4	L 2	L 3	F 2	F 1		
10	F 2	F 4	F 2	F 1	L 2	L 1				C 1	C 1	C 1	C 1			H 1								
11								H 1	C 1	C 2								L 1	L 2	C 1	F 2	F 1		
12		F 3	F 1	F 2	L 1			C 1	C 1		H 1	C 2	C 1	C 3	L 1		L 2	CL 21	CL 32	CL 21	F 1			
13		F 1			L 1	L 1		C 1	C 1	C 1								H 2	C 1	C 3	F 4	F 1	F 1	F 1
14	F 1	F 2			C 2	H 2	C 2	C 2	C 2	C 4	C 1		C 1			L 1	C 2	C 3	C 2	C 2	F 4	F 1	F 2	F 1
15							H 1	C 1	C 2	C 2	C 1										F 1	F 1		
16				F 2	CL 31	H 1	C 1	H 1	C 1	C 1	C 1	C 1					L 2		H 1	C 1		F 1	F 1	F 1
17		F 4	F 1	F 2	H 1	H 1	H 1	C 1	C 1	C 1	C 1	C 1	C 1			C 1	C 1	C 2	C 2	C 4	F 1	F 1	F 2	F 1
18	F 2							H 1	C 2	C 2	C 1													
19																	L 1		H 1		F 2		F 1	F 2
20	F 1	F 2	F 1			L 1		H 1	H 1	C 2	C 1	C 1	C 1	L 1	C 1					C 5	F 1	F 2	F 1	F 2
21	F 2	F 2	F 3	F 3		H 1	H 1	C 1	C 1	C 1	C 1	C 1						C 1	C 2	C 3		F 1		F 1
22								H 1	C 1	C 2	C 1	C 1	C 1	C 1	L 1	L 2	L 3	L 3	L 2	C 4	F 2	F 4	F 7	F 2
23	F 1	F 2	F 3	F 1	C 2	H 1	H 2	C 1	C 2	C 2	C 1	C 2	C 1	C 1	C 1	C 2	C 3		C 4	C 5	F 5	F 4	F 2	F 1
24		F 1			L 1	L 1		H 1	C 1	C 2	C 1	C 1	C 1	C 1				L 1	CL 11		F 2	F 1		
25							H 1	C 1	C 1	C 1	C 1	C 1	C 1	L 1		C 2	C 2	C 2	C 4	C 1	F 4	F 2	F 2	F 1
26	F 1	F 4	F 1	F 1				H 1	C 1	C 2	C 2	C 1						C 3	C 2	C 2	F 2	F 2		F 1
27	F 2								C 1	C 2	C 1	C 1	C 1			H 1	C 2	C 3	C 4	C 5	F 3	F 2	F 3	F 2
28	F 1	F 2	F 2	F 2					C 1	C 1	C 1	C 2	L 2	C 1	H 1	C 1	C 2	C 4	C 3	C 3	F 2	F 5	F 5	F 1
29			F 2	F 2	L 1	C 2	C 4	C 2	C 1	C 1		C 2	C 2	L 2	C 1	C 2		C 1	C 4	C 4	F 2	F 2	F 2	
30			F 2	F 1			C 1	C 1	C 1	C 1	C 2	C 3	L 1			C 1	C 1		C 3	C 5	F 2	F 1		
31								C 2	C 3	C 3	C 2	C 3	C 2			C 2	C 3	C 1	C 5	C 6	F 2	F 4	F 5	F 2

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

IONOSPHERIC DATA

MAY 1969 | foF2 (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N, Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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	63	61	62	61	56	58	57	56	56	63	68	80	92	96	103	96	92	88	86	89	IR 84	IR 77	71	69
2	66	63	65	62	62	75	92	97	93	91	93	103	104	108	111	IR 110	IR 102	IR 98	96	89	86	78	IR 78	74
3	69	68	IR 64	61	55	59	87	79	78	73	91	IC 96	102	100	102	104	99	106	95	88	84	77	82	75
4	78	78	74	64	64	69	76	63	63	72	79	91	93	101	102	92	96	81	82	85	74	74	74	73
5	73	73	68	61	61	70	76	76	70	73	77	88	96	101	101	105	87	76	73	71	74	76	79	70
6	71	69	71	61	61	64	77	81	85	87	92	99	99	102	96	101	105	97	IR 94	84	74	71	69	68
7	65	65	69	53	51	62	82	92	88	82	84	88	88	83	82	88	89	88	86	77	72	69	73	IR 74
8	73	71	68	62	61	71	79	75	84	83	92	96	104	103	104	96	99	87	87	84	78	IR 78	77	74
9	75	76	69	74	73	73	81	88	88	89	87	101	114	121	113	107	101	101	98	82	75	73	79	78
10	73	77	76	69	58	57	82	86	91	91	96	101	97	91	93	95	93	94	91	85	81	81	77	78
11	78	79	76	72	65	69	77	82	86	88	91	94	94	97	99	101	96	94	92	91	92	86	81	77
12	76	73	73	68	66	74	86	83	76	71	74	82	83	88	87	89	93	94	94	88	84	83	81	81
13	79	77	74	71	65	74	86	89	90	89	89	98	96	96	100	91	98	82	78	90	78	81	69	73
14	70	67	66	65	66	69	71	80	67	79	91	93	102	96	104	96	84	85	87	91	IR 82	84	83	79
15	77	72	67	67	69	74	67	72	84	69	81	85	99	96	93	89	96	78	81	69	85	IR 86	R	R
16	85	74	66	59	58	59	55	IA 52	IA 62	69	84	89	88	104	93	98	97	99	103	97	81	79	81	79
17	73	67	65	56	46	52	54	560	58	59	64	71	75	79	82	86	IA 88	88	A	A	73	IR 76	79	75
18	73	67	64	60	57	63	68	68	71	72	80	89	84	95	103	93	96	93	96	92	87	82	IR 84	86
19	79	77	74	68	72	80	76	86	98	99	99	96	97	105	104	103	102	96	86	84	78	81	85	86
20	IR 85	84	76	58	58	67	84	92	83	81	76	71	78	78	78	78	IA 74	74	77	82	79	82	83	81
21	81	82	81	79	77	82	95	98	84	82	87	99	99	93	88	86	83	88	90	85	85	IR 81	IR 81	81
22	82	85	76	70	69	67	86	93	94	74	85	88	96	IA 88	80	78	81	86	87	91	83	75	F	F
23	78	76	68	68	64	69	64	60	A	A	A	IA 61	IA 63	61	IA 62	63	64	65	66	65	A	A	73	IR 72
24	70	67	66	62	60	68	66	70	77	79	78	86	92	96	99	98	91	90	86	84	82	82	87	IR 84
25	IR 80	IR 77	75	64	61	67	75	83	86	82	78	72	80	88	87	83	79	74	72	74	77	IR 78	F	S 81
26	F	76	F	62	56	66	80	84	81	77	86	91	IA 92	93	93	90	A	A	89	83	IR 84	83	81	79
27	81	IR 82	79	73	64	63	77	88	83	82	81	IA 84	82	85	88	90	87	80	81	84	86	IR 87	83	F
28	84	F	F	F	S 74	79	86	92	79	76	80	85	87	88	86	87	86	88	91	98	87	R	F	F
29	R	F	F	F	75	S 79	74	68	IA 68	68	70	80	80	80	81	83	74	72	IC 76	IR 82	R	R	F	IR 78
30	75	74	F	F	68	75	90	83	84	82	76	76	81	94	91	89	86	79	A	A	A	80	86	84
31	IR 84	86	69	65	F	84	85	69	IA 66	IA 66	81	79	78	81	75	76	79	87	92	92	86	84	IR 88	86
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	27	28	30	31	31	31	30	30	30	31	31	31	31	31	30	30	29	29	28	28	26	27
MED	76	74	69	64	63	69	77	83	83	79	82	88	92	95	93	91	92	88	87	85	82	80	81	78
UQ	80	77	74	68	68	74	86	88	86	83	91	96	98	100	102	98	97	94	92	90	85	82	83	81
LQ	73	68	66	61	58	64	72	71	70	72	78	81	82	88	86	86	84	80	81	82	78	76	77	74

IONOSPHERIC DATA

MAY 1969 | foF1 (0.01) | 135° E Mean Time (G. M. T. + 9h)

Station AKITA Lat. 39°43.5'N. Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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	I A 450	I A 490	510	L 520	L	I A 550	L 510	L 500	L	L	L						
2							L	L	L	U L 490	510	550	520	560	L	L	L	L						
3								L	L	L	530	I C 520	L 590	520	L 560	510	L	L						
4							L	L	500	540	530	A	530	540	530	L 500	L 450	L						
5							L	L	L 500	510	540	550	550	530	510	500	L	L						
6							L	L	L	L 510	L	L 540	550	560	H 550	520	L 480	L						
7							L	L	U L 500	550	530	550	530	540	550	500	L 470	L						
8							L	L	L 500	510	500	520	540	520	540	L 520	L 470	L						
9							L	L	L	L	500	570	550	550	L 520	L 520	A	L						
10							L	L	L	550	550	540	570	540	540	500	L 480	L						
11							L	U L 500	U L 500	L	I A 580	590	I A 570	570	560	510	L	L						
12							L	U L 480	600	570	570	570	580	I A 540	550	560	A	A						
13							L	L 500	L 510	I A 560	I A 580	560	590	570	570	540	500	A						
14							L	A	L	I A 590	I A 580	610	580	570	L 580	L 520	U L 500	A						
15							L	480	L 560	A	600	540	L 590	590	560	510	450	L						
16						320	A	A	A	L	560	L	590	L	L	U L 540	L 470	L						
17						L	H 490	440	470	540	560	I A 570	L	530	550	A	A	440						
18							L	L	510	580	620	I A 560	600	590	560	U L 560	500	L						
19								L	H 520	530	550	500	570	570	570	L 550	L	L						
20							L	L	510	530	550	560	I A 550	540	530	550	I A 500	A						
21						L	L	L	L 500	610	I A 540	540	550	550	550	510	L 510	L						
22							L	L	L 500	L 510	A	A	A	A	L 570	490	L 490	A						
23						L	L	460	A	A	A	I A 500	I A 510	520	A	A	A	A						
24							L	L	L 510	I A 530	600	530	550	550	520	500	460	L						
25							L	L	520	510	540	540	540	I A 530	I A 510	480	480	U L 450	L					
26						L	L	L	A	590	A	A	A	550	530	A	A	A	A					
27							L	L 470	500	550	L	I A 580	570	550	I A 530	530	490	A	L					
28							L	L	L 500	570	560	540	530	I A 540	520	520	470	I A 440						
29							A	A	A	510	540	530	I A 520	530	500	490	L 580	A						
30						L	L	L	490	I A 510	I A 500	I A 530	I A 510	500	A	A	A	A						
31								A	A	A	I A 510	520	510	500	500	I A 480	L 460	430	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	1	8	20	24	26	26	28	29	27	25	19	4						
MED						320	H 490	475	500	535	545	540	550	540	540	510	L 480	440						
UQ								L 490	510	565	570	560	575	560	560	530	L 500	445						
LQ								455	L 500	510	530	530	530	530	520	500	L 470	435						

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IONOSPHERIC DATA

MAY 1969 | foE (0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N. Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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 165	245	290	325	345	355	A	A	A	355	A	A	A	190					
2						185	245	290	325	345	350	360	I A 370	I A 370	A	A	A	270	A					
3						185	245	300	330	345	I A 355	I C 360	A	A	A	I A 335	305	265	210					
4						175	250	300	325	340	355	365	A	A	A	335	320	A	A					
5						200	270	300	325	340	355	370	I A 375	375	360	I A 340	320	280	220	S				
6						205	I A 265	305	330	350	360	365	375	I A 380	A	A	A	A	A					
7						I A 190	255	300	325	345	365	375	385	375	350	330	I A 295	I A 250	A	S				
8						205	260	305	330	345	360	370	A	A	A	A	A	A	A	S				
9						200	275	305	I A 330	350	365	380	395	390	380	350	I A 320	A	A	E				
10						A	I A 265	305	335	360	370	A	A	A	A	350	315	275	220	S				
11					E	200	275	320	335	355	365	A	A	380	I A 370	I A 355	330	A	A	S				
12					E	195	275	305	330	355	365	I A 380	A	A	A	A	A	A	A	A				
13					E	200	275	300	I A 330	355	A	A	390	400	390	A	A	A	A	E				
14					E	A	275	305	335	355	370	I A 375	I A 385	I A 390	I A 385	370	325	275	A	S				
15					E	205	270	315	340	355	365	380	I A 385	I A 390	385	365	325	I A 280	225	S				
16					E	A	I A 270	I A 305	340	350	360	I A 370	I A 385	I A 385	365	340	315	285	A	A				
17					A	A	275	315	335	355	370	A	A	A	A	A	325	285	A	S				
18					E	A	I A 275	I A 305	335	350	365	A	A	A	A	A	340	A	A	S				
19					E	215	285	320	I A 335	355	365	I A 380	400	400	A	A	325	280	I A 220	S				
20					E	A	275	320	345	355	I A 365	I A 380	395	385	380	370	I A 340	285	A	A				
21					E	215	270	315	335	355	370	A	A	A	400	375	330	285	A	S				
22					E	A	275	310	330	I A 350	I A 360	A	A	A	A	355	325	A	A	A				
23					E	A	285	315	340	355	370	A	A	A	A	A	I A 335	A	A	A				
24					E	200	270	310	330	355	360	370	A	A	395	I A 370	A	A	A	A				
25					E	225	280	310	345	I A 360	A	A	A	A	A	A	A	A	A	A				
26					E	I A 205	275	315	I A 350	360	I A 370	385	I A 390	I A 395	I A 365	330	A	A	A	S				
27					E	220	275	310	340	355	I B 370	I A 380	I A 375	I A 370	I A 355	345	315	A	A	S				
28					125	220	280	I A 310	325	355	A	A	A	390	370	355	325	295	A	S				
29					E	225	I A 280	I A 320	345	355	370	A	A	A	A	I A 350	A	A	C	S				
30					E	215	280	310	I A 335	355	A	A	375	390	370	345	A	A	A	S				
31					E	A	A	315	A	A	365	I A 375	385	380	355	330	310	280	A	S				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					20	22	30	31	30	30	27	18	15	17	17	20	20	14	6	2				
MED					E	202	275	310	335	355	365	375	385	385	370	350	325	280	220	E				
UQ					E	215	275	315	340	355	370	U A 380	390	390	385	360	328	285	220					
LQ					E	195	265	305	330	350	360	370	U A 375	380	360	338	315	275	210					

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969 | foEs (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N. Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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	J X 24	J X 18	J X 14	E	E	20	30	J X 50	J X 63	J X 49	44	J X 56	J X 73	J X 43	44	J X 52	J X 39	J X 34	G	J X 28	J X 20	J X 53	J X 37	J X 60
2	J X 45	J X 21	J X 44	J X 29	J X 35	25	39	38	39	40	40	40	40	40	41	40	J X 46	G	24	J X 24	J X 20	J X 21	J X 25	J X 25
3	J X 20	J X 21	J X 13	E	E	G	30	38	38	G	J X 55	C	44	40	J X 39	36	G	G	G	J X 29	J X 28	J X 18	J X 18	J X 23
4	J X 19	E S 14	E S 14	E	E	22	29	39	39	J X 54	J X 49	J X 51	40	40	43	36	G	J X 38	J X 28	J X 34	J X 26	J X 42	J X 35	J X 28
5	J X 63	J X 23	J X 21	J X 18	E	G	28	34	39	43	44	41	41	39	38	37	G	G	G	J X 18	J X 23	J X 23	J X 18	E S 14
6	E S 14	J X 25	J X 19	J X 20	J X 18	J X 28	29	36	42	44	48	49	46	43	42	J X 53	J X 43	J X 31	26	J X 18	J X 36	J X 28	J X 36	J X 28
7	J X 18	J X 24	E	E	E	23	31	37	42	J X 46	44	46	46	48	43	J X 47	J X 40	J X 33	J X 25	J X 29	J X 33	J X 24	J X 19	J X 28
8	J X 28	J X 23	J X 36	J X 18	E	G	G	G	36	39	43	46	J X 48	J X 73	J X 51	J X 45	J X 43	J X 29	J X 44	J X 23	J X 21	J X 42	J X 23	J X 35
9	J X 28	J X 19	J X 25	J X 23	J X 25	G	G	G	39	42	G	G	G	G	G	40	J X 50	30	J X 55	J X 33	E S 14	J X 24	J X 22	J X 20
10	E S 14	E S 14	E	J X 50	J X 36	J X 24	J X 37	G	39	43	43	42	J X 48	41	44	40	G	G	G	E S 14	E S 13	E S 14	J X 18	J X 19
11	J X 17	E	E	E	E	G	G	G	43	45	J X 73	J X 67	J X 69	G	41	J X 49	G	J X 58	J X 43	J X 39	J X 25	J X 26	J X 29	J X 54
12	J X 19	J X 18	J X 19	E S 13	E	27	G	J X 43	42	45	G	41	44	J X 106	J X 84	J X 103	J X 88	J X 74	J X 40	J X 39	J X 35	E S 13	E S 14	E S 13
13	E S 13	E	M 20	J X 20	J X 20	G	34	35	J X 80	J X 59	J X 66	J X 58	G	G	G	J X 69	J X 52	J X 81	J X 53	J X 75	J X 64	J X 74	J X 48	J X 24
14	J X 21	J X 28	J X 24	J X 25	J X 28	J X 41	J X 47	J X 73	J X 48	J X 78	J X 67	J X 50	J X 45	J X 41	42	G	41	J X 53	J X 39	J X 54	J X 61	J X 53	J X 24	J X 19
15	J X 24	J X 18	J X 19	J X 24	J X 20	G	31	36	J X 51	J X 55	J X 48	J X 49	41	41	G	G	G	35	G	E S 14	E S 14	E S 13	E S 14	E S 14
16	E S 14	E S 14	E S 14	E	E	29	J X 45	J X 53	J X 55	J X 46	45	47	40	J X 40	G	G	G	G	29	J X 29	J X 23	J X 19	E S 14	J X 23
17	J X 21	E S 14	J X 24	E	J X 16	32	32	39	J X 49	43	J X 64	J X 74	J X 50	45	J X 50	J X 63	J X 87	J X 44	J X 123	J X 99	J X 44	J X 34	J X 24	J X 24
18	J X 30	J X 27	J X 30	J X 19	E	25	30	J X 50	39	42	49	J X 64	46	J X 48	41	39	G	34	J X 32	J X 42	J X 55	J X 79	J X 55	J X 28
19	J X 29	J X 17	J X 24	J X 20	J X 21	J X 23	G	36	40	43	43	43	G	G	J X 46	39	J X 38	38	J X 51	J X 36	J X 24	J X 19	E S 13	E S 14
20	E S 14	E	J X 21	J X 20	J X 20	27	34	48	44	47	J X 51	J X 52	J X 74	47	J X 51	G	J X 86	J X 58	31	J X 53	J X 66	J X 34	J X 43	J X 21
21	J X 43	J X 44	J X 44	J X 28	J X 26	26	33	43	41	J X 53	J X 75	J X 48	J X 44	42	G	G	36	35	J X 58	J X 38	J X 73	J X 53	J X 53	J X 20
22	J X 35	J X 38	J X 25	J X 26	J X 28	J X 24	J X 32	34	J X 88	J X 138	J X 73	J X 104	J X 78	J X 143	45	J X 48	J X 43	J X 49	J X 40	J X 39	J X 54	J X 84	J X 33	J X 36
23	J X 54	J X 53	J X 38	J X 29	20	25	43	45	J X 59	J X 79	J X 145	J X 88	J X 72	J X 48	J X 84	J X 94	J X 62	J X 59	J X 88	J X 44	J X 103	J X 74	J X 28	J X 51
24	J X 36	J X 24	J X 21	J X 23	J X 26	J G 16	G	39	44	J X 55	J X 57	45	J X 44	43	G	39	34	J X 36	J X 36	J X 29	J X 34	J X 26	J X 78	J X 44
25	J X 40	J X 36	J X 42	J X 35	J X 28	G	G	35	42	J X 49	J X 49	J X 70	J X 68	J X 54	J X 94	J X 42	39	J X 33	26	J X 46	J X 27	J X 19	J X 24	J X 28
26	J X 40	J X 24	J X 20	J X 25	J X 35	25	37	45	J X 50	50	J X 58	J X 84	J X 130	46	J X 48	J X 98	J X 130	J X 104	J X 54	J X 49	J X 54	J X 29	J X 20	J X 24
27	J X 25	J X 24	J X 19	E	J X 16	G	G	38	39	42	E B 46	J X 102	J X 48	46	J X 74	G	J X 94	J X 47	J X 33	J X 29	J X 54	J X 64	J X 88	J X 51
28	J X 31	J X 63	J X 29	E	G	25	33	36	39	J X 51	J X 51	J X 45	J X 77	J X 67	J X 60	J X 54	J X 43	J X 51	J X 44	J X 39	J X 79	J X 86	J X 53	J X 63
29	J X 54	J X 80	J X 100	J X 64	J X 34	J X 28	J X 54	J X 59	J X 76	J X 44	J X 55	J X 55	J X 90	50	J X 55	36	J X 42	J X 91	C	J X 65	J X 115	J X 53	J X 28	J X 28
30	J X 28	J X 21	J X 19	J X 24	J X 28	G	J X 29	39	J X 51	J X 60	J X 66	J X 110	J X 70	G	J X 99	J X 73	J X 93	J X 118	D	D	J X 145	J X 44	J X 54	J X 84
31	J X 49	J X 45	J X 36	J X 33	J X 34	J X 67	J X 43	J X 129	J X 110	J X 108	J X 88	J X 80	44	43	46	J X 67	J X 45	J X 81	J X 83	J X 83	J X 32	J X 26	J X 43	J X 51
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30	31	31	31	31	31
MED	J X 28	J X 23	J X 21	J X 20	J X 20	24	31	38	42	J X 46	J X 49	J X 50	J X 46	43	44	40	J X 42	J X 38	J X 38	J X 38	J X 34	J X 29	J X 28	J X 28
UQ	J X 38	J X 28	J X 30	J X 26	J X 28	26	36	45	J X 51	J X 54	J X 65	J X 70	J X 70	48	J X 51	J X 54	J X 51	J X 58	J X 53	J X 48	J X 58	J X 53	J X 43	J X 40
LQ	J X 19	J X 18	J X 19	E	E	G	E G 28	36	39	43	44	45	42	40	40	36	E G 34	32	26	J X 29	J X 24	J X 22	J X 20	J X 20

IONOSPHERIC DATA

MAY 1969 | f_bEs (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N. Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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	16	16	13	E	E	19	29	47	50	46	44	47	61	43	43	46	32	30	G	23	E	30	24	25
2	21	E	18	14	22	23	38	36	38	38	39	40	40	39	39	38	39	G	23	19	20	16	18	16
3	E	E	E	E	E	G	G	36	36	G	44	C	44	40	38	35	G	G	G	19	20	E	E	E
4	E	E S 14	E S 14	E	E	20	28	37	35	44	43	50	39	38	40	35	G	32	21	18	16	18	24	25
5	E	E	14	E	E	G	G	34	38	43	42	40	40	39	G	36	G	G	G	E	17	17	15	E S 14
6	E S 14	17	15	15	14	15	29	36	40	44	47	47	46	42	41	40	35	30	23	E	16	23	20	23
7	16	20	E	E	E	22	31	36	41	44	42	44	45	44	43	42	35	30	25	23	26	16	E	24
8	17	16	18	14	E	G	G	G	35	38	42	44	42	40	37	34	33	27	26	21	17	U R 42	E	16
9	E	15	17	15	16	G	G	G	39	42	G	G	G	G	G	40	49	30	51	26	E S 14	15	18	17
10	E S 14	E S 14	E	15	24	22	33	G	38	39	42	42	45	40	41	38	G	G	G	E S 14	E S 13	E S 14	16	17
11	E	E	E	E	E	G	G	G	40	45	64	47	64	G	41	39	G	39	28	25	15	20	22	E
12	15	E	15	E S 13	E	24	G	40	40	43	G	41	43	60	47	45	64	61	28	19	32	E S 13	E S 14	E S 13
13	E S 13	E	E	14	16	G	G	32	44	58	64	55	G	G	G	39	35	65	38	40	39	61	29	E
14	E	24	16	25	14	40	39	50	42	72	60	47	43	42	40	G	39	51	35	40	57	47	19	E
15	19	14	15	17	16	G	G	35	46	55	45	46	41	40	G	G	G	31	G	E S 14	E S 14	E S 13	E S 14	E S 14
16	E S 14	E S 14	E S 14	E	E	25	40	A	A	44	44	45	39	40	G	G	G	G	29	25	20	17	E S 14	19
17	E	E S 14	14	E	15	30	30	36	44	42	49	65	49	45	47	56	A	43	A	A	21	17	E	23
18	21	14	16	14	E	24	29	37	37	42	48	64	44	48	41	39	G	30	29	39	50	40	E R 55	16
19	24	E	E	14	15	15	G	34	39	42	42	42	G	G	42	39	27	35	36	24	16	E	E S 13	E S 14
20	E S 14	E	14	14	15	24	33	45	43	41	44	44	60	44	50	G	A	55	30	U R 53	40	24	25	19
21	24	31	25	22	17	25	32	42	40	48	60	45	42	40	G	G	35	33	34	26	28	E R 53	40	E
22	25	24	24	20	18	22	15	34	40	44	64	65	62	A	43	48	37	48	31	35	45	50	25	26
23	47	20	19	18	13	25	38	40	A	A	A	A	A	45	A	60	48	59	33	28	A	A	22	51
24	E	14	18	18	17	G 16	G	37	42	55	54	44	44	42	G	37	34	31	30	24	23	18	50	29
25	28	24	27	24	17	G	G	34	40	44	44	47	49	54	64	42	36	33	24	20	20	E	16	18
26	28	16	14	15	18	24	36	40	48	50	58	62	A	42	47	74	A	A	45	44	18	24	18	23
27	16	21	15	E	13	G	G	35	37	40	E B 46	A	44	44	74	G	40	44	30	21	E R 54	50	60	29
28	21	34	E	E	G	24	33	36	39	49	46	45	46	62	42	41	39	51	43	28	69	29	44	49
29	40	35	50	19	22	20	49	52	A	44	51	48	59	45	45	36	34	50	C	65	60	40	E	18
30	E	E	E	15	17	G	26	38	44	60	60	59	61	G	80	63	65	67	A	A	A	25	44	54
31	26	28	25	23	24	59	40	56	A	A	65	43	40	40	38	62	45	33	24	26	18	17	17	45
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30	31	31	31	31	31
MED	16	14	15	14	15	20	29	36	40	44	46	47	44	42	41	39	35	33	29	25	20	19	18	18
UQ	22	20	18	18	17	24	33	40	44	50	59	59	54	44	46	44	42	50	35	37	41	U 38	24	25
LQ	E	E	E E 13	E	E	G	G	34	38	42	42	44	40	40	38	35	E G 27	30	23	20	16	16	14	14

IONOSPHERIC DATA

MAY 1969 | f-min (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N. Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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	14	13	14	14	17	16	17	16	15	14	16	14	13	13	E S 13	E S 13	E S 13	E S 13	E
2	E S 12	E S 13	E	E	E	E	13	15	17	14	16	15	15	14	13	14	14	14	14	E S 13	E S 13	E	E	E
3	E	E	E	E	E	13	14	15	16	17	15	C	19	17	14	14	13	14	13	E	E	E S 13	E S 13	E S 13
4	E S 13	E S 14	E S 14	E	E	13	14	14	14	14	16	17	18	21	15	14	13	14	13	E S 13	E S 13	E	E S 13	E S 13
5	E	E	E	E	E	14	15	16	13	14	17	15	18	17	15	15	16	14	14	E S 14	E S 13	E S 13	E	E S 14
6	E S 14	E	E	E	E	15	15	15	15	19	20	16	35	16	15	15	16	17	13	E S 14	E S 14	E S 13	E S 13	E S 13
7	E S 13	E	E	E	E	14	13	15	16	13	14	20	18	17	17	14	14	14	13	E S 12	E S 14	E S 14	E S 12	E S 12
8	E S 13	E S 13	E	E	E	14	15	15	12	18	17	17	13	18	14	14	14	14	13	E S 13	E S 13	E S 13	E S 13	E
9	E S 13	E	E	E	E	14	14	16	16	18	17	17	15	17	16	15	14	15	14	E	E S 14	E	E S 13	E S 13
10	E S 14	E S 14	E	E	E	13	14	14	13	16	17	16	16	14	14	14	14	15	13	E S 14	E S 13	E S 14	E S 12	E S 12
11	E S 14	E	E	E	E	14	14	14	16	17	18	14	19	15	18	16	16	14	14	E S 13	E	E	E S 13	E S 13
12	E S 13	E S 13	E	E S 13	E	14	14	14	17	15	14	17	17	16	14	14	16	15	14	13	E S 13	E S 13	E S 14	E S 13
13	E S 13	E	E S 14	E	E	14	15	16	13	14	17	13	14	16	13	18	13	13	14	E	E S 13	E S 14	E S 13	E S 14
14	E S 13	E	E	E	E	14	15	15	16	17	17	14	23	19	17	17	14	13	14	E S 13	E S 12	E S 12	E	E
15	E S 12	E	E	E	E	15	17	13	13	17	17	16	17	17	17	14	13	15	14	E S 14	E S 14	E S 13	E S 14	E S 14
16	E S 14	E S 14	E S 14	E	E	13	14	14	16	16	15	14	14	15	16	15	15	14	14	E	E S 12	E S 12	E S 14	E
17	E S 12	E S 14	E	E	E	16	15	15	15	18	19	21	19	20	15	16	15	17	15	E S 14	E S 13	E S 13	E S 14	E S 14
18	E S 13	E	E	E	E	14	14	14	17	18	16	20	23	25	19	27	14	13	14	E S 13	E S 14	E S 14	E S 14	E S 13
19	E S 13	E	E	E	E	12	14	14	15	16	15	18	18	15	15	19	14	14	15	E S 14	E S 13	E S 13	E S 13	E S 14
20	E S 14	E	E	E	E	12	14	15	14	20	20	15	18	18	17	17	16	17	14	13	E S 14	E S 14	E S 13	E S 12
21	E S 13	E S 13	E S 13	E S 13	E	14	14	17	16	20	20	24	14	18	17	15	15	13	14	E S 14	E S 13	E S 12	E S 13	E S 13
22	E S 13	E S 13	E	E	E	E	14	15	14	14	14	18	15	23	24	14	16	15	13	13	E S 12	E S 13	E S 14	E S 12
23	E	E	E	E	E	14	15	15	17	17	18	18	19	19	15	15	15	14	14	E S 13	E S 13	E S 14	E S 14	E S 13
24	E S 14	E	E	E	E	E	14	14	16	14	15	14	18	18	17	17	14	14	13	13	E S 13	E S 13	E S 13	E S 13
25	E S 13	E	E	E S 13	E	13	15	15	15	18	18	19	18	18	14	19	16	14	13	13	E S 13	E S 14	E S 13	E
26	E S 14	E	E	E	E	13	15	17	18	17	18	23	18	15	15	17	17	13	13	E S 13	E	E S 13	E	E
27	E S 13	E	E	E	E	14	14	16	16	17	46	19	18	18	14	17	17	13	14	E S 13	E S 13	E S 13	E S 14	E
28	E S 14	E	E	E	E	14	15	16	16	16	18	18	22	17	18	15	14	13	14	E S 13	E S 13	E S 13	E S 13	E S 13
29	E S 13	E S 13	E	E	E	E	14	16	16	16	16	18	19	18	18	15	16	15	C	E S 14	E	E S 14	E S 14	E S 13
30	E S 14	E	E	E	E	14	14	14	18	17	16	19	15	23	19	16	14	14	13	E S 12	E S 14	E S 14	E S 14	E S 14
31	E S 13	E S 13	E S 13	E S 13	E	13	14	14	16	15	17	16	17	17	17	15	14	14	14	E S 12	E S 12	E	E S 13	E S 14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30	31	31	31	31	31
MED	E S 13	E	E	E	E	14	14	15	16	17	17	17	18	17	15	15	14	14	14	E S 13	E S 13	E S 13	E S 13	E S 13
UQ	E S 14	E S 13	E	E	E	14	15	16	16	18	18	19	19	18	17	17	16	15	14	E S 14	E S 13	E S 14	E S 14	E S 13
LQ	E S 13	E	E	E	E	13	14	14	14	15	16	15	16	16	14	14	14	14	13	E S 13	E S 12	E S 12	E S 13	E E 12

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IONOSPHERIC DATA

MAY 1969

M(3000)F2(0.01)

135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N. Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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	265	260	275	275	290	290	280	255	270	290	285	295	295	290	300	300	310	300	290	I R 300	I R 285	275	270
2	265	260	275	270	260	295	305	315	310	300	290	280	290	280	295	I R 290	I R 295	I R 300	305	295	290	280	I R 280	275
3	265	255	I R 270	265	275	275	320	315	310	285	285	I C 285	285	285	280	290	295	295	305	295	295	275	275	270
4	265	270	280	265	265	285	305	305	285	280	275	275	280	285	295	300	315	305	305	295	280	280	275	270
5	260	275	285	275	250	285	305	315	305	290	275	275	275	280	295	305	310	305	305	285	270	270	285	260
6	265	270	295	270	275	285	300	295	295	290	285	295	285	295	285	285	290	290	I R 300	295	280	275	275	270
7	260	275	285	285	275	285	300	305	295	270	265	280	285	280	280	285	290	290	295	280	280	275	270	I R 270
8	275	280	280	275	275	285	320	295	295	300	285	280	280	285	290	285	295	290	290	295	275	I R 275	280	275
9	260	275	275	280	290	300	295	305	280	285	270	260	275	275	285	285	290	300	295	290	270	260	265	270
10	265	280	290	300	280	300	295	285	290	290	280	280	280	275	285	290	290	290	295	290	275	275	265	265
11	270	265	280	285	275	295	315	295	290	285	285	270	275	275	285	290	290	290	300	300	300	285	275	265
12	270	270	270	265	275	285	305	310	270	285	265	275	270	275	270	275	285	290	295	295	280	265	265	265
13	265	265	275	275	265	275	280	280	270	275	265	275	265	260	275	270	285	280	265	285	275	275	250	255
14	255	255	255	260	275	295	275	285	305	265	275	250	265	265	290	285	285	295	285	295	I R 270	260	265	270
15	260	260	255	255	265	295	305	270	275	275	265	235	260	265	265	270	280	270	275	265	255	I R 250	R	R
16	255	250	255	250	255	255	265	I A 280	I A 260	305	295	300	280	300	285	290	290	285	295	295	275	260	260	270
17	260	275	265	260	255	290	270	280	275	265	255	285	275	285	280	290	I A 290	305	A	A	265	I R 260	260	270
18	265	280	265	280	285	290	320	305	305	275	270	290	260	275	295	285	290	290	295	295	285	260	I R 265	270
19	275	270	275	285	280	310	290	295	295	295	285	285	275	275	280	285	290	305	290	305	260	260	260	260
20	I R 270	285	280	285	265	295	285	285	265	275	265	250	265	265	275	280	I A 270	285	275	295	280	270	275	270
21	265	270	260	265	270	270	285	305	280	260	265	275	285	280	280	280	270	285	295	285	270	I R 265	I R 255	260
22	270	270	280	270	280	295	290	300	300	275	265	265	280	I A 290	270	280	285	295	295	300	305	255	F	F
23	265	270	265	270	265	285	275	260	A	A	A	I A 255	I A 260	240	I A 255	265	265	280	280	285	A	A	265	I R 270
24	275	275	275	275	280	315	310	300	285	290	255	270	270	285	285	285	290	285	285	285	275	270	270	I R 285
25	I R 275	I R 275	280	285	275	295	285	290	285	270	260	250	260	280	285	290	280	290	290	285	270	I R 270	F	S 265
26	F	280	F	270	280	290	305	295	275	265	265	270	I A 265	270	275	275	A	A	295	280	I R 270	275	275	265
27	265	I R 270	290	285	280	310	290	295	295	275	280	I A 270	265	275	285	290	290	290	275	275	270	I R 280	265	F
28	260	F	F	F	S 275	280	295	300	300	275	270	270	275	275	290	285	280	275	275	285	290	R	F	F
29	R	F	F	F	275	S 285	285	280	I A 275	265	255	265	265	270	275	295	295	285	I C 285	I R 280	R	R	F	I R 260
30	265	265	F	F	270	280	300	300	285	295	265	265	260	275	295	285	290	285	A	A	A	275	270	265
31	I R 275	280	280	260	F	310	320	310	I A 290	I A 270	285	285	285	300	285	270	275	285	295	290	285	265	I R 265	280
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	27	28	30	31	31	31	30	30	30	31	31	31	31	31	30	30	29	29	28	28	26	27
MED	265	270	275	272	275	290	295	295	288	275	270	275	275	275	285	285	290	290	295	290	275	270	268	270
UQ	270	275	280	282	280	295	305	305	295	290	285	282	280	285	290	290	290	295	295	295	285	275	275	270
LQ	260	265	265	265	265	285	285	285	275	270	265	265	265	275	278	280	285	285	285	285	270	260	265	265

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IONOSPHERIC DATA

MAY 1969

M(3000)F1(0.01)

135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N. Long. 140°8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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	I A 335	I A 335	335	L 345	L	I A 350	L 355	L 345	L	L	L						
2							L	L	L	U L 365	355	345	360	335	L	L	L	L						
3								L	L	L	335	I C 370	L 325	345	L 325	335	L	L						
4							L	L	325	315	335	A	360	340	345	L 340	L 355	L						
5							L	L	L 345	345	335	345	340	345	355	340	L	L						
6							L	L	L	L 355	L	L 335	335	340	H 330	330	L 335	L						
7							L	L	U L 340	335	345	340	360	350	330	340	L 325	L						
8							L	L	L 360	350	375	380	345	365	335	L 335	L 340	L						
9							L	L	L	L	380	350	345	340	L 360	L 335	A	L						
10							L	L	L	345	330	345	340	350	335	340	L 340	L						
11							L	U L 345	U L 345	L	I A 340	325	I A 335	335	340	355	L	L						
12							L	U L 340	315	325	330	330	325	I A 335	330	320	A	A						
13							L	L 330	L 350	I A 330	I A 320	I A 325	325	335	335	335	335	A						
14							L	A	L	I A 310	I A 330	325	330	335	L 330	L 345	U L 335	A						
15							L	335	L 335	A	320	315	L 310	305	325	335	350	L						
16						315	A	A	A	L	340	L	325	L	L	U L 335	L 345	L						
17						L	H 300	350	305	345	340	I A 335	L	360	325	A	A	A						
18							L	L	355	330	320	I A 350	335	325	340	U L 325	340	L						
19								L	H 360	360	345	400	345	345	335	L 325	L	L						
20							L	L	335	340	335	325	I A 350	325	I A 345	310	I A 325	A						
21						L	L	L	L 355	300	I A 330	335	345	330	340	335	L 325	L						
22							L	L	L 355	L 365	A	A	A	A	L 335	345	L 325	A						
23						L	L	330	A	A	A	I A 360	I A 355	345	A	A	A	A						
24							L	L	L 350	I A 345	300	360	340	330	350	340	345	L						
25							L	L	345	355	335	330	335	I A 335	I A 330	355	335	U L 335	L					
26						L	L	L	A	325	A	A	A	335	335	A	A	A	A					
27							L	L 345	345	340	L	I A 330	335	335	I A 340	320	325	A	L					
28							L	L	L 360	320	320	345	360	I A 330	315	330	335	I A 335						
29							A	A	A	355	330	340	I A 350	340	335	345	L 315	A						
30						L	L	L	355	I A 350	I A 350	I A 345	I A 335	360	A	A	A	A						
31								A	A	A	I A 370	340	360	370	360	I A 350	I A 330	340	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	1	8	20	24	26	26	28	29	27	25	19	3						
MED						315	30U	338	345	342	335	340	340	340	335	335	335 L	U 335						
UQ								345 L	355 L	352	345	350	350	345	342	340	340 L	338						
LQ								332	335	328	330	330	335	335	330	330	325	U 335						

IONOSPHERIC DATA

MAY 1969 | h'F2 (km) | 135° E Mean Time (G. M. T. + 9h)

Station AKITA Lat. 39°43.5'N, Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							310	I A 340	A	395	320	330	340	305	305	290	295	275						
2							275	250	280	270	300	320	305	335	305	300	290	270						
3								260	255	270	340	I C 310	320	305	330	310	295	280						
4							280	280	350	370	360	305	335	325	305	300	280	260						
5							280	265	300	330	345	370	350	330	310	295	270	260						
6							270	305	295	305	315	315	315	310	330	315	300	300						
7							275	290	300	370	370	350	340	335	355	325	315	290						
8							260	260	290	305	330	330	330	305	320	305	295	270						
9							255	255	300	325	290	380	340	315	300	315	305	280						
10							280	290	300	335	340	325	340	340	335	320	305	295						
11							250	300	290	305	325	365	350	350	340	315	305	295						
12							270	300	390	350	395	360	370	355	355	345	330	310						
13							285	325	300	345	370	355	370	370	335	370	325	I A 300						
14							315	290	290	A	355	390	355	370	320	320	305	290						
15							290	350	315	A	350	470	395	375	355	350	305	320						
16						365	365	A	A	320	340	290	350	290	330	310	300	280						
17						310	430 L	380	410	450	405	I A 390	355	350	355	340	I A 305	I A 280						
18							285	250	295	370	355	320	390	340	315	320	310	300						
19								265	305	300	310	295	325	330	340	320	300	280						
20							290	325	340	350	400	470	390	390	390	350	I A 330	325						
21						295	270	270	270	370	380	355	340	335	345	330	350	320						
22							300	290	300	305	370	380	330	I A 335	345	325	330	305						
23						290	350	440	A	A	A	I A 475	I A 455	540	I A 475	450	390	A						
24							250	290	310	325	430	370	370	345	330	325	310	305						
25							290	300	315	345	365	410	410	350	330	325	320	305	290					
26						305	275	290	290	300	370	355	I A 350	350	345	340	A	A	250					
27							295	275	300	370	325	I A 360	390	360	370	315	320	290	290					
28							290	270	290	365	340	360	345	355	345	335	325	325						
29							300	325	I A 330	400	440	390	370	370	345	325	340	320						
30						300	275	290	300	295	390	400	380	345	I A 330	325	330	A						
31								A	A	A	350	340	340	340	350	I A 340	350	320	300					

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						6	28	29	27	27	30	31	31	31	31	31	30	28	4					
MED						302	282	290	300	335	352	360	350	340	335	325	308	295	290					
UQ						310	298	305	312	370	370	385	370	355	348	338	330	308	295					
LQ						295	272	270	290	305	330	328	340	330	325	315	300	280	270					

IONOSPHERIC DATA

MAY 1969 | h'F (km) | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N, Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / 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	315	300	295	285	285	290	255	I A 250	I A 260	I A 250	265	A 260	I A 260	250	235	I A 240	245	255	255	250	245	A 260	300	290
2	295	295	290	275	295	245	260	245	240	230	215	215	215	210	240	240	260	255	255	245	260	280	265	260
3	295	300	255	290	245	260	245	240	230	230	255	I C 220	230	230	230	225	250	255	255	250	250	280	280	290
4	295	290	255	250	300	275	260	A 245	235	250	240	I A 250	220	215	240	240	235	245	255	255	255	280	290	310
5	315	280	240	240	315	260	250	240	230	245	235	215	230	215	230	240	230	240	265	265	290	295	260	295
6	290	290	255	290	290	250	250	245	250	240	A 245	I A 230	250	215	H 220	240	245	250	255	245	245	290	300	310
7	315	305	240	215	275	245	245	245	250	250	240	240	240	225	240	255	245	255	265	255	270	290	290	290
8	280	280	260	250	280	240	235	230	220	220	225	215	225	205	215	240	230	240	255	240	270	I A 290	285	290
9	325	290	305	285	255	235	240	230	240	230	230	200	230	200	240	255	I A 255	265	260	240	255	310	315	290
10	290	280	250	240	270	245	250	240	235	210	225	230	240	230	235	230	225	245	250	250	250	260	290	300
11	295	290	255	240	275	250	240	230	230	I A 255	I A 245	255	A	235	245	245	240	I A 250	270	265	245	245	265	290
12	295	295	280	260	290	270	250	240	240	220	230	220	230	I A 235	A 240	255	A	A	270	250	280	270	290	280
13	295	285	270	260	270	255	245	245	A 260	I A 250	I A 240	I A 230	210	230	240	245	245	I A 275	305	290	290	I A 295	285	305
14	315	340	325	315	290	270	I A 285	I A 255	240	I A 255	I A 250	I A 245	230	240	245	240	255	I A 280	290	280	I A 290	I A 305	290	290
15	295	310	305	305	295	230	230	245	I A 240	I A 250	250	I A 240	240	230	245	235	240	265	275	295	325	340	320	265
16	320	315	325	340	360	320	A	A	A	240	230	240	210	225	230	230	230	240	265	250	240	295	295	295
17	310	250	290	290	350	A 265	H 250	230	I A 245	225	230	A	A	240	250	A	A	A	A	A	290	330	300	280
18	290	280	280	270	250	255	235	230	210	235	I A 235	I A 260	240	I A 220	240	240	240	245	265	270	290	325	I A 305	300
19	300	290	285	255	255	240	235	230	H 220	230	215	205	230	220	245	240	240	245	255	245	280	290	315	305
20	280	245	230	220	290	255	250	A 280	245	255	240	260	I A 240	270	I A 235	240	I A 250	I A 250	255	280	285	300	295	295
21	315	310	320	310	305	255	245	I A 250	235	I A 250	I A 245	260	240	230	240	230	240	255	275	275	300	I A 300	I A 305	305
22	315	300	260	265	255	245	250	250	240	235	A	A	A	A	255	255	250	I A 255	280	275	245	A	340	350
23	I A 320	295	290	295	255	280	290	265	A	A	A	I A 240	I A 240	A 240	A	A	A	A	290	285	A	A	295	I A 295
24	280	265	275	280	270	240	240	240	250	I A 245	I A 235	220	230	245	225	230	225	235	255	250	280	280	I A 300	295
25	295	295	290	250	285	255	250	250	230	245	245	I A 255	265	A	A	240	245	255	255	275	285	280	310	305
26	300	270	245	245	280	260	245	255	A	A	A	A	A	230	A	A	A	A	A	265	285	270	270	290
27	290	285	250	240	250	235	250	230	210	220	I B 235	I A 235	220	240	I A 230	210	250	I A 240	240	250	I A 290	I A 285	I A 285	300
28	290	305	260	240	270	250	240	240	230	280	255	240	235	I A 260	A 265	255	250	I A 255	290	255	I A 255	255	A	A
29	300	300	I A 325	305	285	260	A	A	A	240	A	A	I A 215	240	I A 240	230	245	A	I C 310	I A 295	I A 290	I A 290	270	295
30	295	290	280	290	290	250	240	240	A 240	A	A	A	I A 215	230	A	A	A	A	A	I A 290	I A 280	265	I A 300	I A 300
31	300	275	275	315	325	A 270	255	A	A	A	A	245	240	235	235	A	A	250	255	280	255	290	295	I A 300
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	29	28	26	27	25	26	27	29	27	26	25	25	28	30	30	29	30	30
MED	295	290	275	270	285	255	250	242	240	240	240	240	230	230	240	240	245	250	262	260	280	290	295	295
UQ	315	300	290	290	292	262	250	250	245	250	245	A 250	240	240	242	245	250	255	275	280	290	295	300	300
LQ	292	280	255	248	270	245	240	235	230	230	230	220	222	220	232	230	240	245	255	250	255	280	285	290

IONOSPHERIC DATA

MAY 1969

h'Es (km)

135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 8.2' E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	110	105	105	E	E	145	150	130	125	125	125	115	115	120	125	110	120	115	G	120	110	110	110	105
2	105	110	105	115	110	150	140	135	140	140	130	130	140	130	130	120	115	G	140	120	115	110	110	110
3	105	105	105	E	E	G	150	140	140	G	120	C	115	115	110	130	G	G	G	115	115	110	100	105
4	100	S	S	E	E	150	150	140	140	130	130	125	135	130	125	150	G	120	120	115	115	110	110	110
5	110	105	110	105	E	G	155	145	130	135	130	130	130	140	140	140	G	G	G	125	110	110	110	S
6	S	105	110	110	105	105	155	140	130	130	125	120	125	120	120	115	115	115	115	110	115	115	115	110
7	105	105	E	E	E	150	140	140	140	130	130	130	125	130	125	120	115	115	115	110	110	110	110	110
8	110	105	105	105	E	G	G	G	150	145	140	130	125	115	120	120	115	120	115	115	115	105	110	105
9	105	110	105	105	105	G	G	G	150	140	G	G	G	G	G	165	140	130	115	115	S	110	110	105
10	S	S	E	110	105	105	105	G	140	125	125	125	115	120	150	150	G	G	G	S	S	S	110	105
11	110	E	E	E	E	G	G	G	130	125	115	115	115	G	115	110	G	110	110	105	105	100	105	110
12	105	100	105	S	E	140	G	120	120	120	G	135	120	110	105	105	105	110	105	100	110	S	S	S
13	S	E	100	100	100	G	150	140	115	115	115	115	G	G	G	120	120	130	105	105	105	105	110	110
14	105	105	120	130	110	125	130	120	120	120	115	120	120	120	120	G	130	120	120	115	115	110	105	105
15	105	105	100	100	105	G	140	140	120	120	125	120	125	130	G	G	G	130	G	S	S	S	S	S
16	S	S	S	E	E	140	125	120	120	120	115	115	120	110	G	G	G	G	125	120	115	115	S	100
17	105	S	105	E	150	135	140	140	125	125	120	115	115	150	115	140	115	125	115	110	105	115	110	110
18	105	105	105	105	E	130	140	100	130	130	115	115	120	115	130	140	G	130	115	115	110	105	105	105
19	105	100	100	100	100	100	G	125	140	140	130	120	G	G	110	110	110	120	115	110	110	110	S	S
20	S	E	100	100	100	140	145	130	140	125	120	125	125	130	130	G	125	120	120	115	110	110	105	110
21	105	105	105	105	105	150	140	130	130	125	120	120	115	125	G	G	140	130	120	115	115	110	110	105
22	105	105	100	100	100	100	100	140	120	115	115	110	110	110	130	130	130	120	115	115	110	110	110	105
23	105	105	105	105	140	155	140	140	130	120	115	115	110	115	110	110	120	120	115	110	105	105	110	110
24	115	110	105	100	100	100	G	135	130	125	120	120	115	110	G	115	115	110	110	110	105	110	110	105
25	105	100	100	100	100	G	G	140	140	120	120	110	110	110	105	110	120	105	115	110	105	105	110	115
26	110	105	105	105	105	120	140	135	125	125	120	115	110	140	135	120	115	110	110	110	115	105	100	100
27	105	100	100	E	105	G	G	145	130	135	B	115	115	130	110	G	125	120	120	115	110	110	105	105
28	105	105	115	E	G	155	140	120	120	115	110	110	110	130	130	125	125	115	110	110	110	105	105	110
29	105	105	100	100	105	105	125	125	125	120	120	115	110	110	110	110	110	115	C	115	110	110	105	105
30	105	105	105	100	105	G	110	120	120	120	110	110	120	G	120	120	115	115	110	110	110	105	105	105
31	100	105	100	105	105	105	140	125	115	110	115	120	145	145	145	130	130	125	115	110	115	120	120	115
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	24	26	21	20	21	23	27	31	30	28	29	28	26	25	25	23	26	25	29	28	28	27	27
MED	105	105	105	105	105	135	140	135	130	125	120	120	118	120	120	120	120	120	115	115	110	110	110	105
UQ	105	105	105	105	105	150	148	140	140	130	125	125	125	130	130	130	125	125	120	115	115	110	110	110
LQ	105	105	100	100	100	105	135	125	120	120	115	115	115	115	110	110	115	115	110	110	110	105	105	105

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969 | **Types of Es** | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39°43.5'N. Long. 140° 8.2'E Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F2	F2	F2			H2	H1	H3	H3	H2	H1	C3	C2	C1	H1	C2	C1	C3		F5	F1	F3	F4	F4
2	F3	F2	F3	F2	F6	H2	H3	H2	H1	H1	H1	H1	H1	H1	H1	H1	C2		H2	F2	F2	F3	F3	F3
3	F2	F1	F1				H1	H2	H1		H1		C1	C1	C1	H1				F3	F3	F1	F2	F2
4	F2					H2	H2	H2	H1	H2	H2	H2	H1	H1	H2	H1		C2	C3	F3	F1	F3	F3	F3
5	F3	F3	F1	F1			H1	H2	H1	H1	H1	H1	H1	H1	H1	H1				C1	F3	F3	F2	
6		F3	F2	F2	F1	L1	H1	H2	H2	H2	H2	H1	H1	H1	H2	C2	C2	C2	C3	F1	F3	F4	F5	F5
7	F2	F3				H2	H2	H2	H2	H2	H1	H1	H1	H1	H2	C2	C2	C2	C2	L3	F6	F3	F2	F3
8	F2	F3	F4	F2					H2	H1	H1	H1	H1	C1	H1	H2	C2	C2	C3	C3	F3	F4	F2	F3
9	F2	F2	F2	F3	F4				H1	H2						H1	H2	H1	C3	C2		F2	F2	F2
10				F2	F6	L2	L2		H1	H1	H1	H2	H2	H1	H1	H1							F2	F2
11	F2								H1	H1	C2	C2	C1		C1	L1		L3	L3	L4	F2	F3	F3	F2
12	F2	F2	F2			H2		H2	C2	H2		H1	H2	C2	L2	L2	L3	L4	L2	L2	F5			
13			F1	F2	L1		H1	H1	C2	C2	C2	C2				H1	H1	H2	L3	L4	F5	F3	F4	F2
14	F2	F4	F3	F4	L3	H3	H3	H3	H2	H3	H2	H2	H1	H1	H1		H2	H3	C4	C3	F4	F4	F5	F2
15	F3	F1	F1	F2	L2		H1	H1	H3	H2	H2	H2	H1	H1				H1						
16						H1	H4	H3	H2	H2	H2	H2	H1	L1					H2	C5	F3	F2		F4
17	F3		F2		H1	H2	H1	H2	H2	H2	H1	C2	C2	H1	C2	H4	C3	H3	C3	C3	F2	F3	F2	F3
18	F4	F3	F3	F2		H2	H2	LH12	H1	H1	H2	H2	H1	C2	H1	H1		H1	C2	C4	F4	F3	F3	F3
19	F4	F1	F1	F2	L2	L1		H1	H1	H1	H1	C1			L2	L1	L1	H2	C3	C3	F3	F2		
20			F2	F1	L2	HL22	H2	H2	H1	H1	H1	H1	H2	H1	H2		H2	C2	C3	C4	F3	F3	F4	F3
21	F4	F5	F4	F4	L2	H2	H2	H2	H1	H2	H2	H1	C1	H1			H1	H1	C2	C4	F3	F3	F2	F2
22	F4	F6	F6	F3	L2	L2	L1	H1	H1	C1	C2	C3	C2	C2	H1	H2	H2	C2	C3	C6	F4	F3	F6	F4
23	F6	F5	F6	F4	H1	H1	H2	H2	H2	C2	C3	C2	C3	C1	C3	C3	C2	C3	C3	C3	F5	F6	F3	F4
24	F2	F2	F3	F3	L2	L1		H2	H2	H3	H2	H1	C1	C1		C1	C1	L2	L3	L3	F4	F3	F4	F2
25	F3	F3	F4	F3	L2			H1	H1	H1	H2	C2	C2	L2	L2	L2	H2	L2	C1	L3	F3	F2	F4	F3
26	F5	F3	F2	F3	L3	C1	H2	H2	H2	H1	H2	H2	C3	H1	H1	H2	C4	C4	C3	C3	F4	F3	F3	F6
27	F2	F6	F3		L1			H2	H1	H1		C3	C1	H1	C2		H2	C2	C2	C4	F4	F3	F4	F4
28	F4	F4	F1			H1	H1	C2	C2	H2	L2	L2	C2	H1	H2	H2	H2	C2	C4	C4	F4	F5	F6	F4
29	F4	F5	F3	F3	L4	L2	H4	H3	H3	H2	H3	C2	C2	C2	C2	C2	L3	C4		L6	F5	F4	F3	F4
30	F3	F2	F1	F2	L3		L2	H2	H2	H2	C2	C2	H2		H3	H3	C2	C3	L2	L3	F3	F3	F3	F3
31	F4	F3	F3	F3	L4	L7	H2	H3	C3	C3	C2	H1	H1	H1	H1	H3	H3	H2	C2	C2	F4	F3	F4	F5
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

IONOSPHERIC DATA

MAY 1969 | foF2 (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	68	68	67	61	62	66	65	58	62	71	82	98	104	107	116	118	109	102	101	J R 101	R	R	R	R 71
2	I R 70	I R 68	R 64	60	61	I R 75	83	92	89	88	98	108	115	120	128	126	118	111	110	J R 104	I R 87	I R 86	R	R
3	R 74	R 73	67	60	55	63	86	R 71	78	71	90	106	112	110	113	115	116	113	98	88	R	72	R	R
4	R	R	R	J R 68	67	R	J R 79	72	68	81	91	113	117	116	120	112	99	90	91	87	R 75	73	U R 71	J R 74
5	I R 72	74	71	58	58	J R 74	82	74	72	75	75	89	100	109	116	113	95	84	78	S 73	74	J R 70	R 74	R 70
6	J R 70	69	68	61	59	65	80	91	87	88	96	101	106	114	113	120	112	111	J R 107	93	R	R	74	I C 71
7	R 70	71	68	58	50	61	R 77	100	95	95	102	110	110	100	101	C	C	96	91	I R 82	I R 73	R 73	R	R
8	R	R 74	71	R 64	61	70	80	73	82	82	95	99	110	117	115	114	106	96	95	89	80	78	R 79	I R 75
9	J R 74	R 77	70	72	71	R 70	72	78	84	86	96	111	127	132	123	112	111	106	100	80	75	72	S	80
10	J S 75	75	U S 76	61	54	55	77	86	96	91	95	104	105	104	J R 104	106	103	98	97	81	S 74	I R 78	U R 70	S 76
11	U R 82	I R 82	U R 79	71	69	71	81	82	85	90	91	99	104	107	109	109	108	104	J R 104	J R 104	I R 98	I R 88	86	I R 83
12	77	I R 75	75	J R 72	72	73	R 91	94	81	81	84	90	94	97	96	C	C	C	105	91	84	86	86	R 88
13	R 78	84	R	75	67	R 67	81	90	95	95	96	101	J R 104	105	113	106	107	97	A	A	R 84	I R 74	71	R 73
14	R 71	71	70	70	71	I R 74	74	86	85	94	108	110	116	114	121	112	99	89	94	94	J R 86	86	R 83	86
15	I R 82	I R 75	R 73	71	R 68	R	R	70	81	78	87	R	110	108	R 105	99	105	85	R 82	81	R 91	R	R	J R 105
16	R 91	R	R 81	R 72	R 73	67	62	56	A	91	91	100	90	116	105	110	106	110	J R 106	106	R 86	R	R	R
17	R 74	I R 76	R 73	65	57	47	R	60	61	66	69	78	84	88	93	94	94	A	85	J R 80	79	84	81	80
18	J R 76	73	J R 64	59	55	62	73	72	75	70	83	92	95	102	111	108	106	104	105	92	86	R 84	J R 83	J R 88
19	R	80	75	74	75	J R 70	69	93	J R 105	105	96	101	J R 105	113	116	111	110	107	A	A	R 79	R	R	R 90
20	R	R	R 78	R 62	58	R 64	86	94	92	85	84	81	J R 88	89	85	84	79	75	85	I A 83	A	74	J R 84	81
21	I R 82	86	78	J R 77	J R 80	R 65	93	92	83	80	91	105	105	103	98	93	91	97	95	85	R 86	R 71	R 84	R 87
22	R 77	I R 81	J R 82	R 73	J R 74	R 71	R 80	90	87	77	90	I A 96	I A 102	100	90	90	86	91	95	94	R 79	68	R 70	R 70
23	82	80	77	J R 69	R 70	67	70	63	A	A	A	A	A	A	66	I A 67	I A 69	71	71	69	R 72	R 74	I R 73	68
24	70	70	69	60	60	62	62	69	73	79	82	94	104	108	110	108	100	96	94	87	J R 86	I R 83	J R 84	U R 86
25	84	J R 81	78	70	61	64	79	85	84	83	83	82	91	98	100	89	84	81	79	79	J R 78	74	U R 79	81
26	82	84	R 72	63	J R 55	65	81	73	R 70	77	81	90	95	96	95	96	90	91	86	74	R 77	85	A	R
27	80	R	R 80	R 73	R 61	62	J R 74	81	82	76	I R 80	89	89	96	96	93	I R 88	81	86	81	I S 90	93	I R 89	80
28	J R 88	91	85	77	73	76	88	89	78	70	74	R 84	95	98	94	91	92	92	99	99	86	I A 77	U S 79	74
29	82	S 73	U F 65	U S 71	J F 74	R 72	R 70	A	A	A	A	84	88	90	90	90	I R 79	78	80	I A 82	R	R	R	I R 83
30	R	R	R 76	R 68	68	R 72	84	80	81	81	73	78	88	100	100	94	I A 90	89	93	90	R 86	I R 89	R 91	R
31	R	A	R	R	S	J R 80	R 93	77	66	71	83	C	C	86	86	81	A	101	105	S	S	I R 76	J R 83	88
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	28	30	30	29	29	30	28	29	29	28	29	30	31	29	28	29	29	28	25	25	21	25
MED	R 77	75	73	68	64	67	80	80	82	81	90	98	104	104	105	106	100	96	95	87	R 84	77	R 81	R 80
UQ	R 82	81	78	72	71	R 72	83	90	87	88	95	104	110	113	114	112	108	104	101	94	R 86	85	R 84	R 86
LQ	R 72	73	68	61	58	64	73	72	74	76	82	89	94	98	96	93	90	89	86	81	R 77	73	R 74	74

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IONOSPHERIC DATA

MAY 1969 | foF1 (0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	A	L	L	L	L	L	L						
2									A	A	L	UL 500	UL 530	L	UR 520	A	A							
3									L		L	L	L	L	L	L	L	L						
4										L	L	L 570	A	A	UL 520	UL 500	A							
5									L	L	A	L 530	UL 550	L 560	520	UL 500	L	L						
6								L	L	UL 500	L	A	B	L 530	L 500	A	L	L						
7								L	L	L	L 600	R	A	L	L	C	C	L						
8								UL 600	UL 500	L 500	550	L 550	UR 560	L	L 550	UL 520	L	L						
9									L	UL 550	560	550	540	550	UL 560	L 500	L	A						
10								L	L	L	L 540	L	L 550	L 560	A	L 540	L	L						
11							L	L	L	L	L	560	L	560	L	L	L	L						
12								L	L	L 510	L 580	I R 540	R	A	A	C	C	C						
13								UL 510	A	L 540	I R 560	R	A	R	R	R	L 510	L	A					
14									A	A	A	L 580	R	L	A	UL 530	A	A						
15							L	L 510	R	A	R	R	R	R	R	UL 530	UL 510	L						
16							UL 410	A	A	A	L	A	L 630	UL 550	L 510	UL 510	L	L 390						
17							A	A	520	L	570	560	B	L 560	L	L 540	A	A						
18								L	L	A	L	L	R	L	A	A	L	A	A					
19								L	L	L	R	R	R	A	L 510	R	L	L						
20							L	L	L 510	L 560	UL 570	A	A	A	A	A	UL 500	L	A					
21								A	A	A	A	A	A	R	R	L 530	UL 510	A						
22								L	L	A	UL 560	A	A	A	B	500	L	L						
23						UL 510	UL 380	UL 510	A	A	A	A	A	A	A	A	A	L						
24								L	A	L	A	550	530	540	L 530	L 520	A	L						
25								L	L	550	L 560	UL 600	A	530	550	L	A	A						
26							A	A	A	A	A	UL 700	L 550	UL 510	UL 480	510	UL 450	A						
27							L	L	A	A	A	570	UL 550	A	L 550	510	L	L	L					
28							L	L	L	L 530	530	A	A	550	L 530	L 520	L 520	L	A					
29							L	A	A	A	A	A	A	A	R	A	500	A	A					
30						L	L	L	500	A	L 510	A	R	A	A	A	A	L						
31								L	A	UL 510	550	C	C	A	L	A	A	A	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	2	4	4	9	13	13	9	11	13	15	7	1						
MED						UL 510	UL 395	UL 510	505	530	L 560	L 560	550	550	520	L 520	UL 510	L 390						
UQ								UL 555	515	L 550	L 570	L 570	L 550	L 560	L 550	L 530	L 510							
LQ								L 510	500	L 510	L 550	550	L 540	535	L 510	L 505	UL 500							

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IONOSPHERIC DATA

MAY 1969 | foE (0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	240	300	340	A	A	A	A	A	A	A	A	A	B					
2						170	I R 240	290	I A 310	R	R	A	I A 370	A	A	A	A	A	A					
3						B	R 245	I A 300	A	A	A	A	B	A	A	A	A	A	A					
4						B	250	A	A	A	I A 365	I A 375	I A 375	370	I A 360	340	310	265	170					
5						B	260	300	340	365	370	390	385	380	325	340	310	270	200					
6						185	250	305	330	A	A	A	B	R 370	A	A	A	A	A					
7						B	R 250	305	335	350	A	A	A	A	A	C	C	A	B					
8						175	255	300	330	360	380	385	I R 390	A	A	A	A	A	A					
9						B	R 250	A	345	R 365	I A 380	I R 390	I B 385	400	390	355	310	260	A					
10						B	250	305	340	370	380	380	A	A	A	A	A	A	A					
11						B	260	305	340	355	U A 370	R	A	A	A	A	320	250	180					
12						B	255	310	I A 340	R 360	A	A	I A 380	A	A	C	C	C	B					
13						B	250	A	I A 345	A	R	A	A	A	A	A	A	A	A					
14						200	A	300	335	A	A	A	A	A	A	355	A	270	A					
15						B	R 255	A	A	A	R	B	B	B	A	A	A	A	A					
16						200	260	A	I A 340	A	R 360	A	A	A	R	R	R	A	A					
17						200	R 265	305	I A 340	365	B	B	B	400	390	I R 370	340	280	A					
18						B	255	300	340	360	R	A	B	B	I A 380	I A 360	340	A	A					
19						B	270	330	360	370	R	A	A	A	A	A	A	A	A					
20						B	270	R 320	I A 355	365	395	400	410	I R 390	385	365	340	290	A					
21						195	270	320	355	A	A	B	B	B	A	A	A	A	A					
22						B	260	315	A	360	A	B	B	A	B	R	325	A	A					
23						210	275	320	A	370	A	B	B	A	A	B	A	285	A					
24						B	270	310	340	A	I A 380	A	B	B	A	R	A	A	A					
25						190	270	320	I R 345	370	A	A	A	A	A	A	A	A	A					
26						185	290	325	370	B	B	B	A	A	R	R	A	A	A					
27						210	A	320	I A 345	365	B	B	R 390	390	I R 370	350	320	280	A					
28						180	270	320	A	A	370	A	A	A	385	355	325	285	A					
29						195	270	320	350	370	A	B	B	A	A	A	340	A	A					
30						180	A	A	A	A	A	A	A	390	I A 380	I A 350	325	A	A					
31						B	R 270	305	A	A	A	C	C	390	370	355	320	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						14	28	25	23	16	10	6	8	9	10	11	13	10	3					
MED						192	260	305	340	365	375	388	U 385	390	380	355	325	275	180					
UQ						200	270	320	345	370	380	390	390	390	385	358	340	285	190					
LQ						180	250	300	340	360	370	380	U A 378	380	U 370	350	320	265	175					

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IONOSPHERIC DATA

MAY 1969 | foEs (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	28	JX 30	24	22	ES 15	EB 15	30	JX 41	48	47	45	JX 53	42	44	43	JX 39	JX 38	35	EB 20	48	JX 21	JX 36	JX 25	JX 64
2	JX 36	31	JX 33	22	ES 15	23	36	JX 42	JX 61	JX 57	42	44	44	47	46	JX 56	56	JX 41	JX 51	48	68	JX 51	22	JX 25
3	JX 25	JX 23	JX 23	22	ES 15	23	30	36	42	48	42	46	EB 53	44	42	JX 41	42	JX 33	JX 36	35	JX 51	JX 26	JX 25	JX 22
4	JX 40	21	18	ES 16	EB 13	21	34	JX 41	JX 41	44	48	45	JX 60	JX 83	46	41	JX 54	JX 36	JX 36	JX 42	JX 30	ES 15	ES 16	43
5	JX 50	JX 29	JX 22	24	23	22	32	37	JX 43	47	58	46	48	45	43	39	36	G	G	ES 15	JX 22	23	M 36	JX 23
6	19	M 20	23	JX 36	20	G	30	38	43	45	50	JX 54	EB 81	42	43	54	44	JX 41	JX 31	ES 15	JX 22	ES 16	ES 16	C
7	21	22	JX 41	JX 27	JX 21	21	29	36	JX 42	45	49	44	49	46	45	C	C	JX 33	JX 28	JX 23	20	JX 22	22	JX 22
8	29	21	21	21	JX 24	21	29	G	35	G	G	42	43	JX 52	42	38	JX 49	JX 30	23	22	23	21	JX 23	JX 36
9	22	27	21	EB 12	EB 14	EB 14	G	33	G	40	39	44	EB 40	43	42	G	39	JX 55	20	22	23	ES 16	28	22
10	JX 36	ES 15	EB 11	EB 11	20	22	30	35	44	47	49	58	46	JX 45	JX 61	47	JX 54	JX 42	JX 28	M 20	ES 15	ES 15	ES 16	M 24
11	M 29	22	ES 15	ES 15	EB 12	EB 16	33	36	JX 42	48	44	44	48	40	55	43	G	G	G	JX 26	JX 40	JX 41	JX 23	JX 24
12	JX 24	JX 26	JX 28	JX 21	M 20	JX 24	31	JX 41	46	44	JX 61	46	47	JX 53	JX 85	C	C	C	JX 84	JX 36	JX 21	JX 25	ES 16	ES 16
13	ES 16	20	ES 16	21	21	JX 29	35	JX 41	JX 61	JX 73	G 35	41	71	44	43	44	JX 71	JX 54	JX 71	M 95	JX 26	JX 49	JX 53	JX 84
14	JX 51	JX 25	JX 25	JX 30	JX 25	23	JX 54	JX 69	JX 75	JX 71	JX 71	44	44	48	48	G	76	JX 51	58	35	JX 41	JX 53	JX 29	JX 24
15	18	ES 16	20	ES 16	ES 16	22	30	38	46	66	46	42	42	44	48	46	43	35	JX 37	JX 41	ES 16	ES 16	ES 16	ES 16
16	ES 16	ES 16	ES 16	ES 16	19	24	36	66	JX 88	JX 61	JX 53	55	53	42	G	G	G 34	34	JX 29	JX 25	JX 33	JX 29	20	20
17	22	21	ES 15	ES 16	ES 16	25	JX 41	JX 51	JX 47	43	EB 45	EB 53	EB 55	45	48	39	JX 72	JX 128	JX 39	JX 31	23	JX 38	JX 78	ES 16
18	ES 16	22	JX 23	JX 29	21	21	JX 41	39	45	JX 51	43	JX 51	44	JX 51	JX 56	JX 56	G	JX 85	91	JX 41	24	JX 28	JX 52	21
19	JX 41	22	21	JX 23	JX 25	JX 26	31	G	41	42	G	43	44	57	JX 55	42	42	36	JX 145	JX 88	JX 21	26	ES 17	ES 16
20	20	JX 23	ES 16	ES 15	24	23	34	42	JX 90	42	55	68	JX 90	80	63	JX 60	JX 74	G	58	JX 74	JX 129	Y 35	M 47	31
21	31	JX 41	48	JX 54	JX 24	G	38	JX 58	JX 74	JX 73	60	71	JX 84	47	44	40	JX 51	JX 59	JX 78	JX 56	JX 51	JX 85	JX 37	JX 61
22	JX 41	43	JX 30	38	JX 25	JX 25	34	JX 41	JX 106	JX 85	46	JX 110	JX 120	JX 74	EB 55	G	41	42	30	49	JX 35	JX 38	JX 75	JX 41
23	JX 43	JX 41	JX 29	JX 41	30	G	32	JX 53	77	68	JX 97	JX 109	JX 124	JX 148	JX 80	71	JX 84	JX 41	JX 40	43	JX 36	JX 54	JX 29	JX 121
24	46	JX 75	ES 16	22	22	EB 16	31	JX 41	57	JX 58	JX 65	48	EB 41	EB 42	40	G	JX 73	JX 54	JX 36	JX 51	JX 29	JX 29	22	23
25	JX 23	JX 29	JX 27	JX 24	JX 18	21	32	38	G	G	42	JX 43	JX 74	43	46	JX 50	58	54	JX 43	JX 31	30	JX 25	21	JX 27
26	JX 35	JX 51	M 31	23	JX 28	23	58	JX 54	69	JX 65	JX 67	JX 65	42	41	G	G 35	JX 37	47	JX 36	55	JX 55	69	JX 106	JX 25
27	JX 29	JX 24	JX 24	ES 16	21	G 19	34	34	46	49	64	44	G	70	JX 52	42	JX 43	JX 42	30	JX 29	M 44	JX 41	JX 25	ES 16
28	JX 41	54	60	JX 43	JX 30	G	G	G	JX 38	42	42	JX 83	JX 59	42	46	JX 42	JX 48	39	47	JX 72	51	JX 87	JX 33	JX 43
29	58	JX 59	JX 53	JX 30	32	29	36	90	JX 104	79	JX 114	JX 71	JX 51	JX 54	48	JX 63	JX 41	JX 71	72	61	JX 29	JX 98	61	ES 16
30	JX 26	21	JX 25	28	21	G	JX 29	36	43	JX 63	42	JX 126	48	66	48	JX 55	79	JX 52	48	JX 36	JX 51	JX 54	JX 55	JX 41
31	JX 63	JX 88	JX 88	JX 38	JX 36	JX 33	G	JX 41	JX 68	JX 119	47	C	C	68	JX 52	M 95	JX 154	JX 86	JX 29	56	33	26	M 69	JX 29
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	29	29	30	31	31	31	31	31	30
MED	JX 29	24	23	22	21	22	32	41	46	48	47	46	47	46	46	42	JX 48	JX 42	JX 36	JX 41	JX 30	JX 29	25	JX 24
UQ	JX 41	JX 36	JX 30	JX 30	JX 24	24	36	JX 42	JX 68	JX 66	59	JX 65	JX 60	56	53	54	JX 71	JX 54	JX 54	53	JX 42	JX 50	JX 50	JX 41
LQ	22	21	19	E 16	17	16	30	36	42	44	42	44	44	44	43	39	41	35	JX 29	JX 28	22	24	22	21

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969 | f_bEs (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	20	26	E	14	E S 15	E B 15	28	38	40	E R 47	44	52	42	41	42	39	33	28	E B 20	46	E	29	20	26
2	26	26	26	17	E S 15	18	28	35	61	55	42	43	44	46	E R 46	52	53	40	50	44	68	40	E	25
3	18	18	20	E	E S 15	21	26	32	40	45	41	46	E B 53	E R 44	40	40	38	G	26	32	30	17	19	E
4	19	E	E	E S 16	E B 13	18	26	32	40	40	46	40	55	59	45	40	52	34	32	40	E	E S 15	E S 16	27
5	25	25	18	16	E	20	30	37	40	46	54	45	48	45	41	39	33	G	G	E S 15	18	19	25	E
6	E	E	18	16	E	G	30	37	41	45	50	54	E B 81	41	42	51	37	30	28	E S 15	20	E S 16	E S 16	E
7	E	E	41	E	18	17	28	E R 36	40	40	49	E R 44	E R 49	E R 46	44	C	C	30	25	20	E	19	E	19
8	25	E	E	E	20	19	28	G	35	G	G	41	41	46	40	37	39	27	21	E	E	E	20	32
9	16	18	16	E B 12	E B 14	E B 14	G	33	G	40	E R 39	E R 44	E B 40	43	42	G	38	55	20	E	19	E S 16	20	E
10	35	E S 15	E B 11	E B 11	17	21	29	34	41	45	46	53	42	45	59	45	41	28	25	E	E S 15	E S 15	E S 16	E
11	22	E	E S 15	E S 15	E B 12	E B 16	28	36	41	46	41	41	48	40	53	40	G	G	G	E	19	25	20	20
12	18	E	24	21	14	18	28	41	40	44	50	E R 46	E R 47	52	65	C	C	C	75	31	19	E	E S 16	E S 16
13	E S 16	E	E S 16	E	E	26	28	32	59	41	E R 35	E R 41	E R 71	E R 44	41	E R 44	40	54	A	A	20	45	40	53
14	26	25	25	26	25	23	53	63	66	62	66	43	E R 44	E R 48	E R 48	G	76	51	55	35	29	26	E	19
15	E	E S 16	E	E S 16	E S 16	21	29	34	E R 46	53	E R 46	E R 42	E R 42	E R 44	E R 48	41	38	32	32	28	E S 16	E S 16	E S 16	E S 16
16	E S 16	E S 16	E S 16	E S 16	E	24	35	52	A	57	51	54	52	40	G	G	E R 34	28	27	25	32	25	E	E
17	E	E	E S 15	E S 16	E S 16	22	40	51	46	40	E B 45	E B 53	E B 55	44	47	39	66	A	37	17	E	25	25	E S 16
18	E S 16	E	E	20	19	21	41	38	45	51	43	45	E R 44	51	52	54	G	84	90	40	18	25	27	E
19	E R 41	E	E	16	25	24	30	G	40	40	G	E R 43	E R 44	57	40	E R 42	35	33	A	A	18	26	E S 17	E S 16
20	E	E	E S 16	E S 15	E	E R 23	32	35	44	41	47	66	54	55	59	56	42	G	55	A	A	28	41	20
21	29	30	45	16	E	G	37	58	62	66	58	71	75	E R 47	E R 44	38	40	59	75	52	40	65	26	41
22	26	40	28	34	24	25	27	38	40	60	45	A	105	56	E B 55	G	38	37	30	46	34	34	40	26
23	39	40	28	41	25	G	30	40	A	A	A	A	A	A	59	A	A	40	40	38	30	54	26	27
24	46	30	E S 16	E	E	E B 16	30	40	52	46	64	46	E B 41	E B 42	40	G	53	41	31	26	19	27	20	16
25	E	E	19	19	14	16	31	38	G	G	41	42	63	42	45	45	52	47	41	26	24	20	E	21
26	32	45	E	15	16	E R 23	53	51	64	63	62	60	41	40	G	E R 35	37	45	29	52	55	65	A	E
27	20	20	19	E S 16	E	G 17	30	33	43	49	59	44	G	70	45	40	41	37	26	28	E S 44	41	25	E S 16
28	41	29	55	27	15	G	G	G	37	40	41	62	59	42	46	41	41	38	47	70	19	A	30	40
29	40	40	37	25	17	25	32	A	A	A	A	71	G	54	E R 48	58	40	70	70	A	26	54	50	E S 16
30	19	E	E	26	E	G	29	36	41	62	41	50	E R 48	60	E R 48	55	A	37	45	30	40	31	44	33
31	54	A	52	26	E	27	G	32	55	41	44	C	C	63	46	77	A	65	25	55	27	20	55	19
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	29	29	30	31	31	31	31	31	30
MED	20	16	16	16	E E 15	18	29	36	41	46	46	46	U G 44	45	44	40	40	37	32	32	20	25	20	19
UQ	29	28	26	20	17	23	32	40	57	56	52	54	54	54	47	51	52	51	52	49	30	37	28	26
LQ	16	E	E E 11	E E 14	E	16	28	32	40	40	41	42	E E 42	41	42	38	37	28	26	22	18	18	E E 16	16

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IONOSPHERIC DATA

MAY 1969 | f-min (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 S 16	10	E S 15	12	E S 15	15	16	16	19	28	29	26	27	26	26	26	16	15	20	E S 16	E S 16	E S 16	E S 16	E S 16
2	E S 16	E S 16	E S 16	E S 15	E S 15	15	16	18	25	27	25	29	26	26	26	28	25	16	25	E S 18	E S 16	E S 16	E S 16	E S 16
3	12	E S 15	E S 16	E S 15	E S 15	16	15	16	16	26	27	26	53	26	26	25	17	16	16	E S 16	E S 16	E S 16	E S 16	E S 16
4	E S 16	E S 16	E S 16	E S 16	13	16	15	16	26	19	23	26	26	26	27	19	16	16	15	E S 16	E S 16	E S 15	E S 16	E S 15
5	E S 16	E S 16	12	10	E S 15	16	15	14	16	26	27	29	27	26	22	26	18	16	15	E S 15	E S 16	E S 16	E S 15	E S 16
6	E S 16	12	12	13	10	15	15	17	18	26	26	26	81	27	26	26	26	16	16	E S 15	E S 16	E S 16	E S 16	C
7	E S 16	E S 16	E S 16	E S 15	10	16	16	17	17	27	26	29	30	26	26	C	C	16	16	E S 16	E S 16	E S 16	E S 16	E S 16
8	E S 16	E S 16	E S 16	E S 15	14	15	16	16	16	18	26	28	28	27	25	26	16	15	15	E S 16	E S 15	E S 16	E S 16	E S 16
9	E S 15	13	13	12	14	14	16	16	25	19	29	26	40	25	25	22	20	15	15	13	E S 16	E S 16	E S 16	E S 16
10	E S 16	E S 15	11	11	12	16	15	16	18	16	26	26	26	26	26	18	16	15	12	E S 15	E S 15	E S 15	E S 16	E S 15
11	E S 15	E S 15	E S 15	E S 15	12	16	15	15	16	19	26	26	34	31	28	25	16	16	16	E S 15	E S 15	E S 15	E S 15	E S 15
12	E S 15	E S 15	E S 15	14	10	15	15	16	26	27	26	28	26	26	28	C	C	C	13	E S 16	E S 16	E S 16	E S 16	E S 16
13	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	18	26	25	25	28	26	26	29	25	16	16	16	E S 16	E S 16	E S 16	E S 16	E S 16
14	E S 16	E S 15	E S 16	E S 15	E S 15	16	17	18	26	26	26	29	29	26	26	27	28	16	16	E S 16	E S 16	E S 16	E S 16	E S 16
15	E S 16	E S 16	E S 16	E S 16	E S 16	16	15	17	26	26	25	40	38	35	26	25	26	16	16	E S 15	E S 16	E S 16	E S 16	E S 16
16	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	16	26	27	25	25	20	26	25	25	25	16	16	E S 16	E S 16	E S 16	E S 16	E S 17
17	E S 18	E S 15	E S 15	E S 16	E S 16	16	15	16	16	26	45	53	55	26	27	20	17	16	15	E S 15	E S 15	E S 16	E S 16	E S 16
18	E S 16	E S 16	12	E S 15	E S 16	17	16	16	26	25	27	37	40	40	28	31	25	16	15	E S 15	14	E S 15	E S 15	E S 16
19	E S 16	E S 15	12	11	12	13	17	16	26	28	26	26	26	30	30	30	28	17	16	E S 16	E S 16	E S 16	E S 17	E S 16
20	E S 16	E S 16	E S 16	E S 15	E S 16	16	16	16	26	26	25	27	38	26	21	21	16	14	15	E S 16	E S 16	E S 15	E S 16	E S 16
21	14	E S 15	12	13	E S 15	16	16	16	17	30	27	40	38	38	26	20	16	16	15	12	E S 16	E S 16	E S 16	E S 16
22	E S 16	E S 15	E S 16	E S 15	E S 16	16	16	19	27	23	27	40	40	34	55	26	27	17	16	E S 16	E S 16	E S 16	E S 16	E S 16
23	E S 16	E S 16	E S 16	11	11	16	17	19	26	26	29	38	40	32	26	35	26	16	15	E S 16	E S 16	E S 16	E S 16	E S 16
24	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	17	26	26	25	38	41	42	29	27	18	16	14	12	13	12	13	13
25	E S 15	E S 15	12	12	12	11	16	28	26	26	30	32	28	28	26	26	19	15	13	11	13	E S 15	E S 15	E S 15
26	E S 16	E S 16	E S 16	10	10	16	16	19	19	40	40	40	28	26	30	26	16	17	16	E S 16	E S 16	E S 16	E S 16	E S 16
27	E S 16	E S 16	E S 16	E S 16	E S 15	14	16	18	26	26	46	40	26	29	26	18	20	16	15	E S 16	E S 16	E S 15	E S 16	E S 16
28	E S 16	E S 16	E S 16	12	10	14	16	16	19	26	26	32	27	22	28	26	18	16	14	13	E S 16	E S 16	E S 15	12
29	E S 16	E S 16	12	12	12	12	15	18	26	26	27	39	40	28	28	19	26	18	16	E S 16	E S 16	E S 16	E S 16	E S 16
30	E S 16	E S 16	12	12	E S 16	16	16	16	19	26	26	26	28	28	29	26	26	16	13	16	E S 16	E S 16	E S 16	E S 16
31	E S 16	11	E S 16	E S 16	E S 16	16	16	18	26	26	26	C	C	26	26	26	19	16	16	E S 16	E S 15	E S 16	E S 16	E S 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	29	29	30	31	31	31	31	31	30
MED	E S 16	E S 16	E S 16	E S 15	E S 15	16	16	16	26	26	26	29	28	26	26	26	19	16	15	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	18	26	26	27	38	40	30	28	26	26	16	16	E S 16	E S 16	E S 16	E S 16	E S 16
LQ	E S 16	E S 15	12	12	12	15	15	16	18	26	26	26	26	26	26	22	16	16	15	E S 15	E S 16	E S 16	E S 16	E S 16

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969

M(3000)F2(0.01)

135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	265	265	270	280	290	305	305	310	300	280	285	290	290	285	290	290	305	295	290	J R 300	R	R	R	R 270
2	I R 265	I R 280	R 270	285	275	R	315	305	305	295	275	270	285	280	280	285	290	295	300	J R 310	R	I R 285	R	R
3	R 265	R 290	285	270	285	290	325	R 315	320	315	265	295	285	280	280	285	295	305	300	285	R	270	R	R
4	R	R	R	J R 270	275	R	J R 315	320	315	275	275	285	290	285	295	310	305	300	295	300	R 295	290	U R 285	J R 265
5	I R 280	280	310	275	270	J R 295	315	310	320	315	265	270	275	275	290	305	295	300	300	S 295	280	J R 270	R 290	R 285
6	J R 270	275	295	285	270	290	315	310	300	280	290	285	280	290	285	290	290	295	J R 290	295	R	R	260	I C 265
7	R 255	280	300	280	270	295	R 305	295	310	275	265	285	285	270	275	C	C	290	295	I R 285	I R 280	R 275	R	R
8	R	R 280	295	R 285	280	305	315	290	295	280	280	270	275	280	285	290	290	290	295	290	275	280	R 275	I R 280
9	J R 270	R 275	275	275	310	R 315	325	310	285	280	260	260	275	290	285	280	280	290	300	290	260	265	S	285
10	J S 265	285	U S 315	310	275	295	300	290	300	285	270	270	280	280	J R 280	280	285	295	300	285	S 290	I R 275	U R 275	S 275
11	U R 270	I R 280	U R 305	295	275	305	320	300	305	275	270	275	260	280	275	285	285	285	J R 285	J R 290	I R 290	I R 285	270	I R 270
12	280	I R 275	290	J R 280	270	300	R 310	310	310	290	275	265	275	280	275	C	C	C	295	295	280	265	265	R 260
13	R 275	275	R	290	280	R 285	265	260	275	275	260	265	J R 275	265	270	275	290	280	A	A	R 285	I R 285	260	R 260
14	R 270	255	270	275	270	I R 320	285	295	295	260	270	265	270	270	285	290	295	280	280	285	J R 255	275	R 270	265
15	I R 270	I R 275	R 265	275	R 265	R	R	270	295	275	275	R	265	270	R 275	275	295	295	R 270	260	R 255	R	R	J R 285
16	R 235	R	265	R 255	R 260	250	270	A	A	300	290	310	280	300	285	285	285	285	J R 285	305	R 275	R	R	R
17	R 260	I R 280	R 275	275	260	325	R	315	280	290	275	295	290	285	290	285	290	A	295	J R 290	255	250	265	290
18	J R 275	280	J R 290	290	275	305	325	325	310	315	275	285	280	275	280	285	285	285	295	285	280	R 275	J R 280	J R 260
19	R	270	270	270	300	J R 300	290	300	J R 295	290	275	290	J R 275	275	285	290	290	310	A	A	R 270	R	R	R 260
20	R	R	R 300	R 280	270	R 280	300	285	285	270	260	260	J R 265	270	270	280	290	280	295	I A 290	A	270	J R 260	270
21	I R 270	270	255	J R 260	J R 270	R 305	295	295	290	270	255	275	280	275	290	270	275	280	280	275	R 275	R 275	R 265	R 255
22	R 290	I R 290	J R 285	R 290	J R 285	R 295	R 290	300	300	275	250	I A 275	I A 285	290	285	290	290	290	285	300	R 265	270	R 255	R 265
23	295	290	275	J R 275	R 290	250	285	270	A	A	A	A	A	A	270	I A 280	I A 270	285	295	270	R 280	R 260	I R 260	270
24	270	285	290	285	285	325	325	305	290	290	265	255	270	275	275	285	270	275	280	300	J R 270	I R 275	J R 280	U R 280
25	280	J R 275	280	305	270	290	290	300	290	270	265	260	260	275	290	295	285	285	290	280	J R 275	285	U R 265	270
26	275	275	R 295	300	J R 285	305	320	315	R 290	275	260	265	265	275	275	300	280	295	300	290	R 275	275	A	R
27	265	R	R 305	R 305	R 280	305	J R 305	310	325	280	I R 260	260	260	280	290	290	I R 290	270	280	285	I S 275	280	I R 285	260
28	J R 255	300	280	295	285	295	305	320	305	300	270	R 265	270	280	280	275	270	275	275	300	290	I A 265	U S 280	270
29	275	S 285	U F 350	U S 300	J F 300	R 345	R 300	A	A	A	A	275	275	280	285	300	I R 285	280	290	I A 300	R	R	R	R
30	R	R	R 290	R 280	280	R 290	310	290	310	295	275	270	270	280	290	285	I A 290	280	280	290	R 275	I R 270	R 280	R
31	R	A	R	R	S	J R 315	R 325	350	305	280	280	C	C	285	280	A	A	285	295	S	S	I R 280	J R 265	285
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	28	30	30	28	29	29	28	29	29	28	29	30	31	28	28	29	29	28	24	25	21	24
MED	R 270	280	288	280	275	300	305	305	300	280	270	270	275	280	285	285	290	285	295	290	R 275	275	R 270	R 270
UQ	R 275	285	298	290	285	305	315	310	310	290	275	285	280	285	288	290	290	295	295	300	280	R 280	R 280	280
LQ	R 265	275	272	275	270	290	295	295	290	275	265	265	270	275	275	280	285	280	285	285	R 270	270	R 265	R 262

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IONOSPHERIC DATA

MAY 1969 | M(3000)F1(0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N, Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	A	L	L	L	L	L	L						
2									A	A	L	UL 380	UL 355	L	R	A	A							
3									L		L	L	L	L	L	L	L	L						
4										L	L	L 335	A	A	UL 365	UL 345	A							
5									L	L	A	L 360	UL 325	L 325	350	UL 360	L	L						
6								L	L	UL 345	L	A	B	L 360	L 360	A	L	L						
7								L	L	L	L 335	R	A	L	L	C	C	L						
8								UL 340	UL 340	L 375	335	L 345	UR 330	L	L 345	UL 345	L	L						
9									L	UL 345	360	R	350	355	UL 330	L 360	L	A						
10								L	L	L	L 350	L	L 340	L 345	A	L 305	L	L						
11							L	L	L	L	L	340	L	345	L	L	L	L						
12								L	L	L 375	L 340	IR 360	R	A	A	C	C	C						
13								UL 350	A	L 350	IR 340	R	A	R	R	R	L 330	L	A					
14									A	A	A	L 335	R	L	A	UL 345	A	A						
15							L	L 320	R	A	R	R	R	R	R	UL 345	UL 330	L						
16							UL 440	A	A	A	L	A	L 320	UL 350	L 370	UL 355	L	L 360						
17							A	A	340	L	335	B	B	L 340	L	L 320	A	A						
18								L	L	A	L	L	R	L	A	A	L	A	A					
19								L	L	L	R	R	R	A	L 370	R	L	L						
20							L	L	L 335	L 325	UL 325	A	A	A	A	A	UL 340	L	A					
21								A	A	A	A	A	A	R	R	L 340	UL 335	A						
22								L	L	A	UL 380	A	A	A	B	355	L	L						
23						UL 315	UL 360	UL 335	A	A	A	A	A	A	A	A	A	L						
24								L	A	L	A	345	360	335	L 340	L 335	A	L						
25								L	L	330	L 340	UL 315	A	350	325	L	A	A						
26							A	A	A	A	A	UL 330	L 345	UL 370	UL 375	355	UL 380	A						
27							L	L	A	A	A	335	R	A	L 345	335	L	L	L					
28							L	L	L	L 360	375	A	A	325	L 340	L 330	L 310	L	A					
29							L	A	A	A	A	A	A	A	R	A	340	A	A					
30						L	L	L	355	A	L 355	A	R	A	A	A	A	L						
31								L	A	UL 350	320	C	C	A	L	A	A	A	L					

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	2	4	4	9	13	11	8	11	12	15	7	1						
MED						UL 315	UL 400	UL 338	340	L 350	L 340	L 340	L 342	L 345	L 348	L 345	UL 335	L 360						
UQ								UL 345	348	L 360	L 355	352	352	L 352	L 368	UL 355	UL 340							
LQ								L 328	338	UL 345	335	L 335	L 328	338	L 340	L 335	L 330							

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IONOSPHERIC DATA

MAY 1969 | h'F2 (km) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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										350	325	300	300	300	300	300	270	260						
2									300	300	300	300	310	330	310	300	275							
3									260		350	300	330	305	335	300	300	260						
4										340	310	320	300	310	300	290	255							
5									270	305	320	340	340	350	305	280	260	270						
6								270	260	300	320	310	I B 340	310	340	310	300	285						
7								275	260	310	350	300	300	320	310	C	C	260						
8								340	300	305	350	325	345	320	310	305	290	270						
9									270	310	355	355	330	310	305	300	305	270						
10								270	285	325	305	320	310	340	330	310	305	270						
11							250	270	290	325	320	350	340	340	325	320	290	310						
12								260	300	330	350	350	350	350	350	C	C	C						
13								320	320	340	360	R	360	370	350	340	310	300	A					
14									300	360	350	355	350	350	340	310	320	300						
15							250	390	300	E A 310	370	R	370	360	350	345	300	270						
16							350	A	A	285	315	290	365	310	300	310	285	285						
17							350	310	450	300	420	340	340	340	325	310	A 300	A						
18								250	270	270	340	345	E R 350	360	A 300	310	310	A	A					
19								280	260	290	340	300	350	350	345	300	290	280						
20							265	280	315	340	375	A 410	395	355	360	350	310	310	300					
21								270	300	E A 400	400	370	350	350	330	340	345	330						
22								275	280	340	380	I A 345	I A 345	310	340	345	300	290						
23						390	350	410	A	A	A	A	A	A	E A 430	I A 395	I A 370	350						
24								300	310	320	A 380	370	350	340	335	305	310	300						
25								275	280	355	380	380	390	355	330	330	310	A 290						
26							260	260	I A 330	370	E A 410	390	360	350	345	325	290	300						
27							290	280	280	370	380	390	345	340	325	320	290	290	275					
28							255	255	300	290	350	360	355	340	330	325	330	305	300					
29							270	A	A	A	A	A 390	350	345	350	320	330	E A 390	A 350					
30						290	260	250	295	340	335	400	360	340	315	300	I A 310	300						
31								255	320	330	350	C	C	330	340	A	A	310	280					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	11	22	26	28	29	27	29	30	31	28	28	26	5					
MED						340	265	275	298	324	350	345	350	340	328	310	300	290	300					
UQ							320	300	300	340	372	370	355	350	340	328	310	302	300					
LQ							258	260	270	301	325	315	335	320	310	300	290	270	280					

IONOSPHERIC DATA

MAY 1969 | h'F (km) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N, Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	305	315	300	270	260	255	250	250A	250	I A 255	240	I A 245	230	230	235	245	245	245	260	275A	240	275	290	310
2	300	310	295	290	300	260	250	250	A	A	245	240	250	240	I R 250	I A 250	I A 265	260	260	250	I A 260	300	285	280
3	300	300	250	290	260	260	250	245	235	260	210	245A	I B 230	I R 245	240	240	260	250	250	260	250	275	300	310
4	310	290	265	260	300	255	245	245	250	240	E A 260	210	I A 250	I A 220	225	240	I A 250	250A	255	250A	260	265	290	320
5	300	290	250	240	340	255	250	240	250A	A	I A 235	240	E A 290	240	220	240	240	240	255	255	290	300	290	300
6	300	290	250	255	300	255	245	250	240	260	A	A	B	230	240	I A 250	250	250	260	245	250	260	290	I C 305
7	310	290	275	250	275	260	250	250	250	260	220	I R 220	A	R	250	C	C	250	255	250	265	295	300	295
8	295	290	250	250	280	250	250	230H	230	210	210	225	220	A	205	220	245	225	255	245	260	275	290	315
9	300	295	290	295	240	245	230	225	205	200	205	I R 200	200	240	235	220	260A	I A 235	250	225	290	320	300	290
10	340A	280	245	220	280	255	245	230	245	245	245	I A 255	240	245	I A 250	250A	265A	245	250	245	275	275	290	305
11	305	290	250	245	275	250	240	220	240	270A	210	210	I A 230	215	I A 230	240	245	250	260	255	250	250	290	290
12	295	290	290	270	290	250	250	255	225	230	250	I R 210	R	A	A	C	C	C	300	250	250	295	305	300
13	295	290	270	260	250	250	250	250	I A 250	240	I R 210	I R 225	I A 230	I R 245	I R 255	R	280	250	A	A	260	300	360	I A 360
14	350	350	320	300	300	245	300	300	I A 290	A	A	225	R	R	I A 270	250	A	A	300	260	310	310	300	295
15	295	300	305	295	295	245	235	250	A	A	R	R	R	R	R	220	245	250	290	310	340	340	320	260
16	350	300	305	310	345	300	290	A	A	A	A	A	270	220	235	240	250	245	255	250	260	300	295	295
17	300	285	290	295	300	250	A	A	270	210	200	B	B	225	A	230	A	A	260	255	275	310	345	270
18	280	255	250	260	260	255	240	225	250A	I A 260	220	I A 220	I R 220	A	I A 250	I A 250	250	A	A	A 250	260	305	310	305
19	E R 325	290	275	255	250	225	225	225	235	210H	I R 225	I R 220	R	A	215	I R 240	240	250	A	A	300	320	310	330
20	290	250	225	260	275	255	250	245	250	240	255A	I A 250	A	A	A	A	260A	240	A	A	A	310	E A 350	300
21	300	310	370A	305	305	250	255	A	A	A	A	A	A	R	I R 235	240	250	A	E A 340	305	310	I A 335	300	E A 360
22	300	315	310	290	240	250	250	250	245	I A 250	250	A	A	A	B	255	250	I A 255	280	260	250	310	390	360
23	350	310	295	325	250	230	250	250	A	A	A	A	A	A	A	A	A	I A 295	295	300	300	E A 390	300	315
24	355	310	265	265	275	240	235	250	I A 245	240	I A 245	250	210	240	210	225	A	270A	260	255	255	290	290	290
25	290	280	270	245	260	245	250	250	210	200	200	220	I A 250	225	260	A	A	A	270A	270	290	290	295	305
26	310	310	250	250	290	295	I A 250	A	A	I A 265	A	A	225	210	220	240	240	I A 280	265	300A	E A 350	E A 350	A	300
27	300	300	250	235	250	240	245	240	I A 250	A	A	245	R	I A 240	230	250	E A 290	270A	255A	285	I S 300	300	260	270
28	E A 340	255	310A	250	260	255	240	225	205	220	200	A	A	A 260	A 280	250	260	280A	A	A 290	240	A	310	A 350
29	320A	300A	E A 360	290	255	210	250A	A	A	A	A	A	A	A	R	I A 250	240H	A	A	I A 285	260	350A	390A	285
30	325	300	290	300	285	260	240	240	245	I A 225	210	A	A	A	A	A	A	250	290	255	300	300	310	295
31	340	I A 300	270	310	310	250	245	250	A	220	250	C	C	A	E A 300	A	A	I A 270	260	250A	260	290	A 350	280
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	26	23	22	22	19	15	17	23	23	22	24	25	28	30	30	30	31
MED	300	295	272	265	275	250	250	248	245	240	221	225	230	240	235	240	250	250	260	255	260	300	300	300
UQ	320	305	296	295	300	255	250	250	250	260	245	245	248	240	250	250	260A	265A	275	280	295	310	310	311
LQ	300	290	250	250	260	245	240	230	235	220	210	U 220	222	225	228	240	245	245	255	250	255	290	290	290

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IONOSPHERIC DATA

MAY 1969

h'Es (km)

135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	110	105	105	105	S	B	140	130	125	130	125	120	115	130	125	130	115	110	B	115	110	110	110	110
2	110	110	110	110	S	150	145	130	125	125	125	125	120	120	125	115	115	120	110	110	110	110	110	110
3	110	110	110	110	S	150	140	130	140	130	125	115	B	115	115	110	110	110	120	110	110	110	110	110
4	110	110	100	S	B	150	145	140	130	120	120	115	115	115	115	115	120	125	115	110	110	S	S	110
5	110	105	105	105	105	150	140	140	130	130	125	125	125	125	125	125	125	G	G	S	110	110	105	105
6	105	110	105	105	110	G	150	140	140	130	120	130	B	130	120	115	115	110	110	S	110	S	S	C
7	110	110	110	110	110	145	150	145	130	145	130	130	140	130	130	C	C	115	110	110	110	110	110	110
8	110	110	110	110	105	160	150	G	160	G	G	140	120	115	115	115	110	120	110	110	110	110	110	105
9	105	105	110	B	B	B	G	115	G	155	115	130	B	170	155	G	115	120	120	110	110	S	105	105
10	105	S	B	B	105	150	150	140	115	115	115	110	110	110	110	140	105	105	105	105	S	S	S	105
11	105	105	S	S	B	B	140	125	125	115	115	110	110	110	105	110	G	G	G	105	105	105	100	100
12	105	105	105	100	100	150	140	115	115	130	115	120	115	110	110	C	C	C	105	100	100	110	S	S
13	S	100	S	100	100	145	140	125	115	115	110	110	110	110	115	115	110	110	115	110	110	110	110	110
14	105	100	100	100	110	145	130	125	130	120	115	115	115	110	115	G	120	130	115	110	110	110	105	100
15	100	S	100	S	S	150	150	130	130	130	115	115	130	115	110	110	110	110	110	110	S	S	S	S
16	S	S	S	S	110	145	130	120	120	115	115	110	110	110	G	G	105	105	100	110	110	110	105	105
17	110	100	S	S	S	150	130	130	115	115	B	B	B	150	140	145	120	115	115	110	110	105	125	S
18	S	105	110	100	100	120	120	120	115	110	125	110	130	115	115	130	G	110	110	110	110	105	105	105
19	105	110	100	100	100	105	145	G	140	130	G	115	115	105	110	110	110	130	110	110	110	110	S	S
20	110	105	S	S	100	150	140	140	125	145	130	120	140	130	125	125	120	G	115	110	105	105	105	105
21	105	105	105	105	105	G	140	120	115	115	115	115	110	110	110	130	130	115	110	110	110	110	100	110
22	105	100	100	100	100	100	140	130	115	115	115	110	110	110	B	G	135	130	110	110	105	110	110	110
23	110	110	100	105	105	G	150	130	130	115	110	110	110	110	110	130	115	130	110	110	105	100	100	110
24	110	110	S	115	110	B	150	130	130	120	115	115	B	B	115	G	110	105	105	105	105	105	100	105
25	100	100	100	100	100	100	140	135	G	G	115	110	105	110	110	105	105	105	105	100	100	100	100	110
26	110	110	105	105	105	155	135	130	130	130	115	115	115	115	G	110	130	120	110	110	110	110	110	105
27	100	100	100	S	105	110	115	150	130	130	115	125	G	115	115	130	120	130	125	115	110	105	105	S
28	105	105	100	100	100	G	G	G	130	125	125	110	115	115	140	130	125	120	115	110	110	110	105	110
29	105	105	105	105	105	145	145	130	125	115	110	110	110	110	110	110	130	110	110	110	110	110	110	S
30	110	105	105	100	100	G	110	115	125	110	110	115	120	140	140	130	115	115	110	110	105	110	105	105
31	105	105	105	100	110	130	G	130	115	115	110	C	C	130	130	120	115	115	115	110	110	125	120	110
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	24	22	23	22	28	28	29	29	28	29	24	30	28	24	27	27	28	29	29	26	25	24
MED	105	105	105	105	105	148	140	130	125	120	115	115	115	115	115	118	115	115	110	110	110	110	105	108
UQ	110	110	108	105	108	150	148	138	130	130	125	120	120	130	125	130	120	120	115	110	110	110	110	110
LQ	105	105	100	100	100	130	138	125	115	115	115	110	110	110	110	110	110	110	110	110	105	105	105	105

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969

Types of Es

135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F4	F3	F2	F2			H2	H1	H1	H1	H1	H1	C1	H1	H1	H1	C1	C1		F2	F2	F3	F3	F2
2	F4	F5	F2	F2		H1	H1	H2	H3	H2	H1	H1	H1	H1	H1	C2	C2	H1	L3	F2	F3	F2	F1	F3
3	F2	F2	F2	F1		H1	H1	H1	H1	H1	H1	C1		C1	C1	L1	L2	LH21	HL11	F3	F2	F2	F2	F2
4	F2	F1	F1			H1	H1	H1	H1	H1	C1	C1	C1	C1	C1	C1	H3	H2	C3	F5	F2			F2
5	F4	F4	F2	F2	F1	H2	H2	H2	H1	H1	H2	H1	H1	H1	H1	H1	H1				F3	F3	F3	F2
6	F1	F1	F3	F2	F1		H1	H2	H1	H1	H1	H1		H1	H1	C1	C2	L2	L2		F2			
7	F1	F2	F3	F2	F2	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1			C1	L2	F3	F1	F3	F1	F2
8	F2	F1	F1	F1	F5	H1	H1		H1			H1	C1	C1	C1	C1	C2	C1	L2	F1	F1	F1	F1	F3
9	F2	F3	F1					C1		H1	C1	H1		H1	H1		C2	C3	C1	F1	F3		F3	F2
10	F3				F1	H2	H1	H1	C1	C1	C1	C1	C1	C1	C2	HL12	L2	L2	L2	F1				F2
11	F3	F1					H1	H1	H1	C1	C1	C1	C1	C1	L2	L2				F1	F2	F3	F2	F2
12	F2	F1	F1	F3	F1	H1	H1	C1	C1	H1	C2	H1	C1	C2	C1				L3	F2	F2	F3		
13		F1		F1	F1	H1	H1	H1	C2	C2	L1	L1	L1	L1	C1	C1	L1	L1	HL33	F3	F2	F3	F2	F3
14	F2	F2	F2	F3	F2	H1	H1	H2	H2	H2	C2	C1	C1	C1	C1		H2	H2	C2	F3	F3	F2	F2	F2
15	F1		F1			H1	H1	H1	H1	H1	C1	C1	H1	C1	L1	L1	L1	L2	L2	F3				
16					F1	H1	H2	H2	H2	C1	C1	C1	C1	C1			L2	L2	L2	FF22	F3	F2	F1	F1
17	F1	F2				H1	H2	H2	H2	C1				H1	H1	H1	C3	C2	C3	F3	F2	F2	FF23	
18		F1	F1	F2	F1	C1	C2	C2	C2	C2	H1	C1	H1	C1	C2	H1		C4	C3	F3	F3	F3	F2	F2
19	F3	F1	F1	F2	F2	F3	H1		H1	H1		C1	L1	L1	L1	L1	L1	H1	L3	F5	F2	F2		
20	F1	F1			F1	H1	H1	H1	H1	H1	H1	C1	H1	H2	H1	C1	C2		C4	F3	F4	F3	F3	F4
21	F3	F3	F4	F3	F2		H2	C2	C2	C2	C1	C1	C2	C1	C1	H1	H1	C2	F3	F3	F3	F3	F3	F3
22	F2	F3	F3	F3	F2	L2	H1	H1	C1	C2	C1	C1	C2	C1			H1	H2	L2	F3	F3	F2	F3	F3
23	F3	F3	F3	F3	F3		H1	H2	H2	C1	C2	C2	C2	C2	C1	HL11	C2	H2	L3	F3	F3	F3	F3	F3
24	F4	F3		F1	F1		H1	H1	H2	C1	C1	C1			C1		L2	L2	L3	F3	F3	F2	F2	F2
25	F2	F2	F2	F2	F1	L1	H1	H1			C1	C1	L1	L1	L2	L2	L2	L3	L5	F4	F3	F3	F2	F3
26	F3	F4	F3	F2	F2	H1	H2	H2	H1	H2	C1	C1	C1	C1		L1	H1	H2	L2	F2	F3	F5	F3	F2
27	F5	F3	F2		F1	L1	L1	H1	H2	H1	C1	H1		C1	C1	H1	H1	H2	H2	F2	F3	F3	F4	
28	F3	F2	F4	F2	F1				H1	H1	H1	C2	C1	C1	H1	H1	H2	H2	C3	F3	F2	F3	F4	F2
29	F3	F3	F3	F4	F2	H2	H2	H2	H2	C1	C2	C1	C1	C2	L1	L2	H1	L3	L3	F3	F2	F3	F2	
30	F3	F1	F2	F3	F1		L2	C1	H1	C1	C1	C2	H1	H1	H1	H2	C2	C2	C4	F2	F2	F3	F2	F3
31	F2	F2	F2	F2	F2	H2		H1	C2	C1	C1			H1	H2	C2	C2	C3	C2	F4	F4	F1	F3	F2

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

IONOSPHERIC DATA

MAY 1969 | hpF2 (km) | 135° E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	390	390	380	380	345	305	300	300	315	370	360	350	350	350	350	340	320	340	340	JR 320	R	R	R	R 400
2	IR 400	IR 380	R 380	370	400	R	300	300	310	340	390	400	350	360	365	350	330	320	330	JR 320	R	R	R	R
3	R 400	R 350	350	400	380	330	280	R 300	300	300	390	350	350	360	360	350	350	310	320	340	R	400	R	R
4	R	R	R	JR 360	380	R	JR 300	290	300	360	355	345	325	350	320	305	300	305	315	310	R 325	350	UR 360	JR 410
5	IR 350	355	305	370	420	JR 305	290	300	295	305	390	375	360	370	345	310	310	305	305	S 340	360	JR 380	R 350	R 380
6	JR 395	390	320	340	390	335	290	300	300	340	360	360	360	350	350	350	350	330	JR 345	320	R	R	400	JC 400
7	R 420	370	330	380	400	340	R 300	340	300	380	400	350	350	370	360	C	C	340	340	IR 340	IR 370	R 390	R	R
8	R	R 370	340	R 350	400	300	300	340	340	340	355	360	380	350	345	335	330	335	320	320	360	355	R 355	IR 365
9	JR 380	R 370	370	380	295	R 275	270	295	350	350	400	410	360	350	350	355	350	330	310	320	405	405	S	355
10	JS 395	370	US 295	290	380	310	310	320	310	360	360	390	350	360	JR 360	350	340	325	300	345	S 345	IR 360	UR 380	S 390
11	UR 380	IR 360	UR 320	320	360	305	280	305	300	390	360	360	395	360	350	350	350	355	JR 340	JR 330	IR 315	IR 345	360	IR 360
12	360	IR 350	345	JR 350	350	310	R 305	290	305	350	380	400	380	360	400	C	C	C	340	340	360	400	400	R 400
13	R 360	375	R	350	360	R 350	370	400	380	380	400	410	JR 400	400	400	380	350	350	A	A	R 350	IR 380	420	R 440
14	R 400	400	400	390	390	IR 290	360	340	350	410	400	400	390	400	350	340	350	360	360	350	JR 380	400	R 390	390
15	IR 390	IR 390	R 400	390	R 390	R	R	400	350	380	380	R	400	390	R 380	390	350	350	R 380	440	R 440	R	R	JR 370
16	R 460	R	R 400	R 420	R 410	440	380	A	A	320	350	320	390	340	350	360	350	350	JR 340	340	R 350	R	R	R
17	R 400	IR 390	R 400	390	430	290	R	310	G	320	G	345	350	350	350	340	320	A	310	JR 350	390	390	410	350
18	JR 360	350	JR 340	345	375	310	265	280	300	300	360	355	360	380	355	350	350	350	A	340	360	R 385	JR 390	JR 400
19	R	380	375	360	310	JR 300	320	310	JR 325	350	380	350	JR 360	380	360	340	350	300	A	A	R 380	R	R	R 420
20	R	R	R 325	R 360	400	R 370	340	340	355	360	400	415	JR 405	370	370	360	340	350	305	IA 325	A	385	JR 400	385
21	IR 370	370	405	JR 395	JR 400	R 305	310	305	315	400	440	400	360	380	320	380	380	360	360	370	R 370	IA 395	R 390	R 440
22	R 360	IR 360	JR 360	R 370	JR 360	R 320	R 340	320	310	390	420	IA 380	IA 380	350	360	360	340	340	355	330	R 390	400	R 440	R 410
23	360	370	365	JR 400	R 350	450	380	395	A	A	A	A	A	A	A	IA 400	IA 390	360	340	390	R 380	R 410	IR 400	400
24	400	380	350	380	380	290	260	310	350	340	395	400	375	370	360	345	360	360	340	335	JR 360	IR 365	JR 360	UR 360
25	355	JR 360	340	300	350	330	320	300	320	360	400	395	400	370	350	350	330	330	320	355	JR 360	360	UR 390	390
26	380	355	R 325	300	JR 360	305	290	280	A	380	420	400	400	370	380	330	370	340	300	345	R 380	360	A	R
27	400	R	R 310	R 310	R 370	300	JR 305	305	290	370	IR 370	405	380	360	350	350	IR 330	350	340	350	IS 365	350	IR 350	400
28	JR 400	310	355	320	340	310	305	290	310	300	355	R 385	390	360	360	360	355	350	355	310	320	IA 385	US 380	405
29	370	S 340	UF 390	US 325	JF 315	R 250	R 300	A	A	A	A	390	360	360	360	340	R	A	A	IA 325	R	R	R	R
30	R	R	R 360	R 395	375	R 340	300	320	300	340	390	400	390	390	350	345	IA 345	365	350	345	R 385	IR 395	R 360	R
31	R	A	R	R	S	JR 300	R 280	260	330	350	355	C	C	350	360	A	A	355	330	S	S	IR 370	JR 380	355
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	28	30	30	28	29	29	26	29	28	28	29	30	30	28	27	28	27	28	24	24	21	24
MED	R 390	370	352	365	378	308	300	305	310	350	385	388	375	360	358	350	350	345	340	340	R 362	385	R 390	R 395
UQ	R 400	380	380	390	400	332	320	320	340	380	400	400	390	370	360	360	350	352	342	348	R 380	398	R 400	R 402
LQ	R 360	355	328	340	350	300	290	300	300	340	360	352	360	350	350	340	330	330	318	322	355	360	R 360	368

IONOSPHERIC DATA

MAY 1969 | YpF2 (km) | 135° E Mean Time (G. M. T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N. Long. 139°29.3'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	90	100	80	65	65	65	95	95	95	80	100	100	100	100	90	110	120	80	110	J R 90	R	R	R	R 100
2	I R 100	I R 100	R 100	110	100	R	100	100	90	120	110	100	100	100	95	100	120	90	90	J R 130	R	I R 95	R	R
3	R 100	R 90	90	100	120	110	80	R 100	100	100	110	100	100	100	100	100	90	100	80	100	R	100	R	R
4	R	R	R	J R 100	100	R	J R 100	70	120	95	115	95	115	95	100	75	110	95	85	85	R 75	75	U R 65	J R 80
5	I R 80	90	55	100	80	J R 90	60	80	50	70	105	125	90	100	80	85	135	95	90	S 80	85	J R 95	R 60	R 45
6	J R 75	70	80	85	85	65	80	75	95	110	100	100	120	100	100	110	90	90	J R 115	120	R	R	100	I C 100
7	R 130	120	110	120	90	100	R 100	90	100	110	140	100	100	130	100	C	C	100	100	I R 100	I R 80	R 100	R	R
8	R	R 110	70	R 90	90	100	100	100	100	120	100	100	100	95	100	90	95	110	85	125	90	85	R 95	I R 80
9	J R 90	R 75	80	80	65	R 85	75	80	110	110	100	110	100	70	95	90	95	115	85	120	95	85	S	75
10	J S 95	75	U S 60	65	80	100	90	90	95	100	140	100	105	100	J R 100	95	105	85	100	95	S 65	I R 90	U R 70	S 80
11	U R 80	I R 75	U R 80	80	95	75	80	95	95	105	120	90	105	100	140	95	95	90	J R 105	J R 85	I R 90	I R 105	100	I R 95
12	110	I R 95	55	J R 75	100	85	R 55	65	100	110	120	100	120	100	100	C	C	C	110	110	100	130	100	R 100
13	R 120	85	R	90	90	R 100	130	140	110	120	130	130	J R 110	110	100	110	100	100	A	A	R 90	I R 85	80	R 70
14	R 100	100	100	110	100	I R 95	120	120	100	130	100	110	100	80	100	100	110	120	120	110	J R 140	100	R 100	100
15	I R 105	I R 105	R 100	100	R 110	R	R	100	110	100	120	R	130	110	R 80	90	100	110	R 110	120	R 80	R	R	J R 90
16	R 140	R	R 90	R 100	R 90	80	80	A	A	130	90	100	90	70	110	100	100	100	J R 100	100	R 110	R	R	R
17	R 100	I R 80	R 100	110	90	110	R	80	G	125	G	55	95	100	95	105	125	A	100	J R 95	110	110	70	75
18	J R 100	95	J R 70	100	75	80	85	70	95	145	110	105	95	90	105	95	100	100	A 105	85	R 75	J R 70	J R 100
19	R	100	75	110	85	J R 90	125	90	J R 120	100	100	100	J R 100	100	100	110	100	100	A	A	R 100	R	R	R 100
20	R	R	R 95	R 100	90	R 130	100	100	105	95	105	85	J R 105	130	100	90	100	100	105	I A 110	A	70	J R 85	65
21	I R 90	100	100	J R 100	J R 60	R 90	100	95	110	100	100	80	100	100	130	100	120	100	130	110	R 90	I A 105	R 110	R 70
22	R 90	I R 95	J R 100	R 90	J R 120	R 80	R 100	120	110	90	170	I A 110	I A 85	110	100	120	100	100	115	110	R 130	100	R 80	R 90
23	110	90	115	J R 100	R 140	150	60	85	A	A	A	A	A	A	A	I A 75	I A 85	80	70	100	R 70	R 90	I R 90	80
24	100	110	90	110	110	100	100	90	100	105	110	120	125	105	100	100	115	110	105	65	J R 90	I R 65	J R 95	U R 85
25	95	J R 85	105	80	90	85	90	105	95	100	95	100	110	85	95	95	95	115	100	90	J R 85	55	U R 95	80
26	75	115	R 75	95	J R 85	75	65	80	A	80	80	100	100	90	110	130	110	100	100	85	R 110	120	A	R
27	100	R	R 100	R 90	R 120	100	J R 95	95	110	80	I R 110	115	130	90	100	95	I R 120	120	120	75	I R 90	70	I R 80	95
28	J R 95	85	90	80	80	95	95	60	85	160	95	R 65	110	100	100	100	115	120	90	60	120	I A 85	U S 70	65
29	75	S 70	U F 65	U S 75	J F 70	R 60	R 95	A	A	A	A	90	100	130	100	100	R	A	A	I A 75	R	R	R	R
30	R	R	R 120	R 85	105	R 100	100	120	90	80	90	80	110	110	100	115	I A 100	125	110	115	R 75	I R 100	R 120	R
31	R	A	R	R	S	J R 90	R 70	80	70	105	95	C	C	95	100	A	A	90	90	S	S	I R 85	J R 80	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	28	30	30	28	29	29	26	29	28	28	29	30	30	28	27	28	27	28	24	25	21	24
MED	R 100	95	90	98	90	90	95	90	100	105	105	100	100	100	100	100	100	100	100	100	R 90	90	R 85	R 82
UQ	R 100	100	R 100	100	100	100	100	100	110	120	118	108	110	105	100	108	115	110	110	110	R 105	100	R 100	R 100
LQ	R 90	85	75	80	80	80	80	80	95	95	100	92	100	95	100	92	98	92	90	85	R 82	85	R 70	75

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969 | foF2 (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N. Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 79	77	77	72	67	57	I S 73	76	80	81	97	112	121	126	142	146	144	147	U R 150	146	S 111	S 95	F 89	I A 88
2	S 84	F 79	S 74	68	61	F	76	82	77	77	97	S 115	129	140	150	156	S 152	J S 138	142	R 136	I S 110	U S 94	J S 100	I S 102
3	I S 96	F	S 88	F	66	66	77	72	77	81	94	114	S 120	125	136	147	151	138	J R 122	I S 113	I S 98	S 76	76	79
4	S 80	78	80	72	72	S 70	79	76	75	91	105	120	132	135	143	134	120	S 125	R 128	S 110	J S 102	S 90	U S 92	I S 92
5	S 88	96	I S 84	S 76	67	62	S 74	S 77	73	73	81	97	105	S 118	130	114	108	J S 103	J S 99	94	U S 84	77	77	S 72
6	S 71	U S 72	82	61	50	50	73	81	77	84	93	96	112	I C 123	131	S 135	J S 138	J R 127	J R 125	I S 118	I S 107	J S 100	87	S 78
7	J S 76	78	U S 82	S 77	57	S 54	71	90	90	85	S 103	113	S 118	113	117	R 124	S 123	U S 117	106	95	J S 87	S 88	I S 88	J S 90
8	84	81	S 81	69	67	62	75	78	H 79	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	84	96	111	127	132	124	125	129	124	107	I S 92	S 84	I S 90	I S 95	98
10	S 96	S 91	U S 96	77	58	59	72	S 87	87	85	89	102	C	C	C	C	C	C	C	104	S 96	J S 102	I S 107	I S 107
11	I S 107	I S 106	I S 98	S 86	72	70	88	85	84	89	94	105	117	120	120	123	120	122	I S 124	122	S 112	S 99	J S 103	S 101
12	J S 102	S 105	S 95	I S 87	78	S 77	S 92	S 104	83	87	89	R 98	104	111	113	S 118	S 120	S 117	115	S 108	90	90	U S 93	S 93
13	S 95	94	I S 93	83	71	68	77	S 91	99	S 95	R 94	108	113	115	123	124	115	113	U S 105	I S 110	I S 110	S 76	J S 78	U S 74
14	77	73	S 73	68	63	66	71	77	84	R 88	105	110	114	125	128	129	122	111	109	R 113	J S 101	93	J S 97	J S 100
15	89	87	J S 74	S 71	68	68	59	65	77	86	83	84	I S 120	115	106	112	116	95	R 90	94	I S 98	S 101	112	S
16	S 98	I S 109	I S 97	S 90	90	84	82	H 71	H 79	90	S	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	64	62	70	64	60	68	89	90	97	114	122	115	113	S 115	106	92	J S 89	I S 86	I S 89	I S 90
18	84	S	S	F	F	F	F 68	68	72	I A 75	83	99	107	S 115	126	130	130	S 120	S 115	I S 102	S 91	S 84	J S 91	I S 96
19	S 97	U S 85	77	F 74	F 71	59	68	S 95	92	89	94	105	S 114	126	131	131	127	114	J R 98	90	U S 85	91	S 101	I S 104
20	J S 102	S 95	S 92	I S 84	S 78	U S 74	90	J S 101	U S 98	100	101	104	S 115	122	113	113	115	111	108	92	84	J S 85	I S 90	I S 91
21	J S 90	I S 93	I S 95	83	S 79	78	S 92	90	86	79	90	100	105	I A 108	105	114	S 115	117	I S 113	J S 103	J S 99	I S 100	F	S
22	S	U S 85	U Z 82	F 73	74	F 70	71	85	83	76	88	101	108	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	A	68	I A 74	I A 80	80	77	78	86	86	R 86	84	I S 87	J S 82	I S 83	S 84
24	78	I S 85	J S 99	F	F 50	F	F 61	69	69	78	C	C	C	C	C	C	C	C	U S 124	U S 114	S	S	J S 130	S
25	S	S	S 107	I S 96	84	81	75	85	81	78	84	94	104	110	107	103	99	94	97	S 92	S 90	S 89	I S 90	92
26	I S 87	I S 86	I S 96	S 76	I S 65	F 60	65	74	70	74	82	89	93	94	R 100	102	103	97	J R 88	81	S 83	S 83	F	S
27	S	I S 96	106	S 73	59	57	71	79	73	69	79	84	96	100	99	90	89	91	99	J S 101	J S 102	103	I S 102	J S 98
28	S 94	93	U S 99	F 77	F	F 73	85	83	74	73	76	87	96	101	102	104	105	105	103	S 100	J S 87	I S 80	F 83	I S 85
29	J S 88	S	F	F	F	I S 65	S 71	76	S 73	78	I A 91	101	105	99	107	S 116	112	106	105	S 101	88	S 64	82	S
30	F	S	S	F	F	F	F 78	F 77	80	78	76	86	99	103	105	103	100	S 104	111	99	S 87	U S 98	I S 103	100
31	97	I S 95	S 76	F	F	F	F 84	62	70	80	94	H 106	100	96	104	107	I A 115	125	S 116	87	I A 86	83	J S 85	S 85
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	23	25	22	24	24	29	29	29	29	28	28	27	26	26	26	26	26	27	28	27	27	26	23
MED	S 88	S 87	S 88	76	67	66	74	78	79	81	90	101	108	115	118	117	116	114	108	101	S 90	S 90	S 90	S 92
UQ	S 96	S 95	U S 96	S 83	73	72	79	85	84	87	95	109	118	125	130	130	127	124	119	S 112	S 102	S 96	S 101	S 99
LQ	S 82	80	S 80	72	62	60	71	74	73	77	83	92	102	103	105	107	108	104	101	92	S 87	S 83	S 85	S 85

IONOSPHERIC DATA

MAY 1969 | foF1 (0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	A	L	L	L	L	A	L	L					
2									A	A	L 530	L	L	A	A	A	A	A	A					
3									L	L	L	U L 550	H 490	L 580	L	L	L	L						
4									L	L	L	L	L	L	A	L	L	A	A					
5								L	A	A	A	A	A	U L 550	A	A	L	L	L					
6									L	L	A	L	L I C 550 570		A	L 540	L	L	L					
7									A	L	A	L 580	L 570	L 530	U L 570	A	L	L	A					
8								L	L	C	C	C	C	C	C	C	C	C	C					
9								C	C	L	520	H 560	550	L	H 520	L	L	L	A					
10									L	L	L	L	C	C	C	C	C	C	C					
11									L	L	L	L	L	L	580	A	L	L	L					
12								L	L	L 570	L	L 590	U L 620	560	L	H 520	L	A	A					
13								L	L	L	L	L 600	L 570	600	550	L	A	A	A					
14								L	L	L	A	A	L 580	570	A	L	L	A	A					
15									A	L	L	L	A	L	L 600	L	L	L	L					
16									A	A	A	C	C	C	C	C	C	C	C					
17							L	A	L	A	L	L	H 520	R	L	A	A	A	A					
18									A	A	A	L	L	L	L	L 540	L	A	A					
19								L	L	L	L	L 590	U L 600	L 560	560	540	L	L	L					
20										L	L	I A 580	550	I A 570	L	L	L	L	L					
21									A	A	A	A	A	A	A	540	500	U L 510	A					
22								A	A	A	A	A	L 570	C	C	C	C	C	C					
23								C	C	A	A	A	A	520	A	A	490	L	A					
24									L	540	C	C	C	C	C	C	C	C	L					
25								L	A	L	L	L	560	540	A	A	A	L	L					
26									L	L	I A 560	540	A	A	540	H 520	L 510	U L 450						
27									L 480	A	A	A	A	540	L	L	L 540	L	A					
28								L	L	A	550	550	L 540	530	550	520	520	A	A					
29									L	A	A	A	L	A	A	A	470	L	A					
30									L	A	L	530	A	520	510	520	L	L	A					
31									L	A	A	A	L	L	L 540	H 510	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	4	10	13	14	10	9	6	2						
MED									L 480	555	540	570	L 560	555	550	520	505	U L 480						
UQ											555	L 590	L 570	570	570	540	L 520							
LQ											525	550	550	530	540	H 520	490							

IONOSPHERIC DATA

MAY 1969 | foE (0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N. Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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							170	265	310	H 345	360	380	380	380	370	I A 350	I A 325	300	210					
2							170	270	310	340	350	370	370	380	360	345	320	290	220					
3							S	250	320	350	380	380	380	R 380	H 380	A	A	300	230					
4							S	250	310	330	355	R 370	380	I R 375	370	350	330	290	220					
5							160	260	310	345	360	R 360	370	370	365	345	320	290	A					
6							180	265	310	340	360	370	I B 380	I C 370	360	345	325	275	180					
7							165	260	305	335	355	360	360	H 380	R 365	H 330	315	285	225					
8							190	270	315	C	C	C	C	C	C	C	C	C	C					
9							C	C	C	350	360	H 380	R 390	R 390	370	360	330	295	225					
10							200	280	320	350	365	380	C	C	C	C	C	C	C					
11							200	280	310	350	365	380	A	A	A	A	340	I A 300	A					
12							180	H 280	320	345	360	365	I A 370	H 380	I A 370	355	I A 340	305	A					
13							200	270	320	H 355	360	A	A	A	A	A	A	300	A					
14							205	270	320	345	A	A	A	A	A	A	A	300	235					
15							200	280	315	350	I A 365	I A 375	A	A	A	A	340	A	A					
16							H 200	280	330	350	365	C	C	C	C	C	C	C	C					
17							H 200	270	310	340	365	370	I A 380	R 400	400	380	350	310	A					
18							A	A	320	H 350	370	380	A	R	400	I R 380	355	310	A					
19							H 220	285	330	A	A	A	A	A	355	A	A	A	A					
20							240	300	335	360	375	R 385	A	R 390	R 375	370	340	305	235					
21							H 215	280	325	355	370	I R 375	380	I A 370	370	365	A	A	A					
22							A	290	315	350	370	385	A	C	C	C	C	C	C					
23							C	C	C	350	365	380	R 380	370	R 390	370	350	310	250	A				
24							A	290	330	350	C	C	C	C	C	C	C	C	230	A				
25							170	270	320	350	380	A	A	A	A	A	A	A	H 240	A				
26							H 220	280	320	355	A	A	A	A	A	355	340	300	A	S				
27							230	290	325	345	I B 370	R 370	380	I A 365	350	340	340	300	A	S				
28							A	A	A	A	A	360	A	A	R	365	345	310	250	B				
29							180	270	320	350	360	R 380	A	A	385	360	340	310	230	S				
30							A	A	A	A	A	A	A	A	A	A	A	300	240	A				
31							220	280	325	A	A	A	A	A	380	360	330	295	240	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							22	26	27	26	23	21	13	14	18	18	19	22	16					
MED							200	275	320	350	365	375	380	380	370	358	340	300	230					
UQ							215	280	322	350	370	380	380	R 380	380	365	340	305	240					
LQ							180	270	310	345	360	370	370	U 370	365	345	328	295	222					

IONOSPHERIC DATA

MAY 1969 | foEs (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N. Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	J X 36	J X 88	J X 51	J X 72	J X 38	23	24	37	43	45	50	J X 66	69	J X 59	J X 63	J X 64	J X 75	G	28	21	J X 63	J X 36	J X 62	J X 103
2	J X 103	90	J X 54	J X 65	27	E B 11	28	32	43	51	44	50	43	54	J X 82	J X 95	J X 88	J X 81	J X 46	J X 35	J X 39	J X 66	J X 63	J X 52
3	J X 54	J X 29	J X 19	E B 14	E	E B 14	24	32	35	45	46	44	40	45	G	38	J X 41	34	34	J X 34	J X 40	J X 39	J X 44	J X 34
4	J X 26	17	E	J X 22	15	E B 12	24	36	44	49	J X 51	43	52	52	58	45	38	46	35	16	J X 30	23	J X 32	J X 26
5	J X 22	J X 38	J X 28	J X 25	J X 20	J X 29	24	33	46	J X 62	J X 68	J X 77	M 63	44	53	52	J X 49	33	24	E S 15	E S 15	22	20	20
6	J X 51	J X 36	J X 20	J X 20	19	22	25	37	41	47	53	45	49	C	J X 60	41	38	J X 40	29	21	21	24	E S 15	E S 14
7	20	22	J X 26	J X 25	E	E B 11	27	36	J X 51	45	51	57	51	G	44	J X 64	J X 46	J X 50	J X 47	J X 45	J X 53	J X 35	J X 43	J X 24
8	22	J X 26	J X 34	J X 28	J X 20	J X 20	23	30	38	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	38	47	41	42	G 33	39	G	41	38	J X 54	J X 64	30	24	J X 28	J X 34
10	J X 51	J X 52	J X 28	J X 25	J X 24	20	J X 27	34	39	45	50	52	C	C	C	C	C	C	C	J X 37	J X 29	20	E S 15	J X 51
11	J X 23	J X 25	E B 11	20	19	E B 13	24	33	34	38	39	44	40	43	J X 51	72	J X 43	J X 38	J X 40	J X 31	J X 38	J X 29	J X 38	J X 36
12	J X 39	J X 32	J X 29	J X 29	E B 11	E S 14	G	33	38	45	49	43	41	41	48	47	J X 78	J X 59	J X 85	J X 72	J X 38	J X 32	J X 61	J X 54
13	J X 21	J X 21	E B 14	J X 22	J X 26	J X 29	28	J X 41	J X 45	J X 49	J X 61	J X 68	J X 48	J X 67	J X 49	J X 53	J X 65	J X 169	J X 126	J X 99	J X 33	J X 34	J X 48	J X 51
14	J X 26	J X 26	J X 30	J X 25	J X 27	J X 21	J X 32	J X 52	J X 46	57	74	J X 64	J X 86	J X 67	J X 75	J X 69	42	J X 57	M 49	27	J X 61	J X 78	J X 51	J X 33
15	J X 26	J X 32	J X 26	J X 24	18	J X 28	28	32	44	52	51	J X 63	J X 93	59	J X 51	J X 54	43	42	31	20	J X 34	J X 64	35	E S 13
16	E S 15	E S 13	E B 15	E B 12	J X 18	23	25	36	J X 77	J X 86	115	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	E B 12	15	24	J X 49	J X 50	50	41	54	48	56	G	J X 62	133	J X 64	J X 61	J X 34	E S 13	J X 30	J X 18	J X 124
18	J X 90	J X 64	129	J X 87	J X 41	J X 50	J X 44	J X 39	J X 60	J X 80	J X 64	56	J X 54	42	49	46	40	J X 55	75	J X 88	80	J X 64	J X 40	J X 52
19	J X 39	J X 26	J X 29	J X 21	23	20	27	38	35	48	J X 52	J X 46	54	46	J X 50	40	J X 50	J X 43	29	J X 50	J X 23	J X 62	J X 33	J X 25
20	J X 21	E B 13	20	22	E B 15	E B 12	29	38	J X 50	50	54	J X 86	J X 64	J X 99	G	G	J X 51	42	31	J X 27	E S 15	24	J X 21	26
21	21	J X 37	J X 37	J X 24	J X 22	J X 28	29	J X 43	J X 67	J X 135	J X 66	74	J X 64	J X 126	J X 101	38	J X 52	J X 44	J X 94	J X 54	J X 92	J X 101	J X 35	J X 88
22	23	17	23	J X 24	25	J X 24	J X 30	J X 43	J X 56	76	111	76	J X 72	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	90	66	104	106	80	J X 67	52	46	J X 88	J X 54	J X 35	J X 53	J X 44	J X 37	J X 31
24	J X 77	J X 114	178	J X 84	J X 52	J X 27	J X 50	36	J X 52	J X 54	C	C	C	C	C	C	C	C	27	19	22	J X 17	J X 29	J X 31
25	J X 38	J X 33	J X 30	J X 25	J X 24	J X 23	25	34	J X 73	45	41	J X 54	43	J X 52	99	J X 78	J X 62	J X 36	G 20	18	J X 21	24	J X 34	29
26	J X 20	J X 49	80	J X 53	J X 34	E B 11	26	30	36	47	J X 66	J X 70	J X 75	J X 102	J X 52	G	36	39	30	20	23	J X 33	J X 52	J X 71
27	J X 51	J X 45	J X 30	15	22	J X 24	29	40	45	J X 62	J X 65	J X 78	72	60	J X 46	42	38	J X 44	J X 59	J X 83	J X 92	J X 61	J X 41	J X 82
28	J X 59	J X 31	J X 82	J X 85	J X 59	J X 39	J X 39	J X 46	J X 45	J X 75	M 92	40	J X 48	43	G 35	38	39	J X 50	J X 49	J X 28	J X 27	J X 125	J X 138	J X 161
29	J X 43	J X 64	J X 50	J X 36	J X 63	J X 71	27	J X 70	J X 57	J X 102	J X 97	80	J X 69	J X 63	82	J X 134	J X 60	35	J X 54	35	24	J X 90	67	J X 85
30	J X 86	J X 38	J X 43	J X 52	J X 36	J X 34	J X 49	J X 41	J X 52	J X 63	J X 54	81	J X 59	50	44	44	44	50	J X 70	J X 60	J X 118	J X 34	J X 46	J X 64
31	J X 60	85	J X 84	75	J X 40	J X 32	J X 40	J X 69	J X 66	190	78	110	114	47	G	39	J X 124	104	61	J X 52	J X 172	111	J X 46	J X 37
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	29	29	29	29	29	30	29	28	27	25	26	26	26	26	27	28	28	28	28	28
MED	J X 37	J X 32	J X 30	J X 25	J X 23	J X 23	27	37	J X 45	50	54	60	54	52	50	46	J X 46	J X 44	47	J X 34	J X 34	J X 34	J X 39	J X 36
UQ	J X 52	J X 50	J X 50	J X 52	J X 34	J X 28	J X 29	J X 41	J X 52	J X 75	J X 66	J X 76	J X 70	J X 63	J X 63	J X 64	J X 62	J X 57	J X 60	J X 53	J X 57	J X 64	J X 50	J X 68
LQ	J X 22	J X 26	J X 22	J X 22	18	E 14	24	33	41	45	50	46	48	44	44	39	41	38	30	21	23	24	J X 30	J X 26

IONOSPHERIC DATA

MAY 1969 | f_bEs (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N. Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	16	27	36	49	32	13	G	36	43	43	48	63	50	56	50	47	59	G	26	21	62	33	53	A
2	16	E	E	50	17	E B 11	26	31	42	49	40	50	42	53	82	71	81	79	44	33	37	27	27	18
3	22	16	14	E B 14	E	E B 14	G	30	G	43	44	42	40	44	G	38	35	G	33	34	40	27	E	E
4	16	E	E	12	13	E B 12	G	G	41	47	44	42	50	51	56	44	37	45	33	16	28	E	E	E
5	15	18	17	14	15	17	G	32	45	53	64	74	55	43	51	51	46	31	23	E S 15	E S 15	E	E	E
6	17	22	15	14	12	12	24	36	40	46	51	43	48	C	58	40	37	39	29	20	E	15	E S 15	E S 14
7	E	E	21	16	E	E B 11	25	35	50	44	50	56	50	G	44	61	43	39	46	42	44	27	30	21
8	E	E	14	15	15	16	G	G	36	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	G	45	41	G	G 33	E R 39	G	40	36	53	47	E	E	16	19
10	21	19	17	17	11	14	16	35	36	42	48	50	C	C	C	C	C	C	C	22	E	E	E S 15	27
11	E	16	E B 11	E	E	E B 13	G	G	G	G	39	43	40	E R 43	43	62	33	36	26	22	21	E	27	28
12	27	22	E	15	E B 11	E S 14	G	G	36	43	43	42	E R 41	41	47	44	48	47	71	51	22	31	19	18
13	15	15	E B 14	E	15	18	G	39	40	41	49	44	47	52	48	49	55	53	88	99	20	27	48	27
14	20	20	20	17	E	15	29	46	43	49	62	54	43	54	67	53	41	52	45	24	29	53	50	20
15	22	27	18	19	14	25	27	31	43	50	50	61	75	45	47	42	40	39	30	17	E S 34	26	28	E S 13
16	E S 15	E S 13	E B 15	E B 12	E	E	G	32	63	67	77	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	E B 12	15	G	42	43	45	41	52	45	E R 56	G	59	67	61	56	22	E S 13	18	E	54
18	16	25	27	47	30	35	36	33	53	A	61	53	46	42	47	46	G	54	63	E S 88	29	43	27	37
19	18	16	21	E	E	13	G	G	G	46	48	43	42	E R 46	49	E R 40	42	41	28	34	15	23	E	15
20	E	E B 13	E	E	E B 15	E B 12	26	32	44	49	54	62	50	79	G	G	47	40	30	25	E S 15	22	17	E
21	E	18	35	20	15	24	28	41	63	77	65	67	57	A	84	E R 38	44	43	72	43	76	66	30	63
22	E	E	15	E	17	19	20	40	52	63	81	61	48	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	A	57	A	A	44	59	51	G	42	51	27	36	E S 44	36	23
24	34	19	51	47	29	17	27	34	42	48	C	C	C	C	C	C	C	C	27	17	E	E	19	E
25	27	31	19	15	E	17	G	G	52	41	40	52	42	50	88	63	59	34	G 20	17	17	E	15	E
26	E	E	28	40	16	E B 11	G	G	G	46	59	49	62	60	47	G	G	33	29	19	E	19	19	17
27	28	34	19	E	13	17	26	39	42	54	E R 65	66	59	52	46	42	37	40	51	83	76	32	36	53
28	29	26	52	50	45	28	38	32	42	63	52	E R 40	42	42	G 35	G	39	48	47	26	24	48	48	53
29	28	50	20	19	40	50	G	66	42	69	A	62	52	55	64	60	44	33	53	31	E	27	50	E S 85
30	E	16	32	28	28	25	37	37	45	55	50	51	57	48	40	42	41	43	61	55	43	25	24	25
31	51	45	41	48	26	19	32	47	43	52	53	87	51	44	G	G	A	63	52	51	A	25	39	26
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	29	29	29	29	29	30	29	28	27	25	26	26	26	26	27	28	28	28	28	28
MED	16	18	18	16	15	15	16	32	42	48	50	52	48	46	47	44	42	40	45	26	22	26	26	20
UQ	24	26	28	34	17	19	27	39	45	55	60	62	54	54	58	53	48	48	53	44	36	30	36	U 30
LQ	E	13	E E 14	E E 12	E E 11	E E 13	G	30	40	43	45	43	42	42	40	E G 38	37	36	29	20	E E 14	E E 15	15	14

IONOSPHERIC DATA

MAY 1969 | f-min (0.1) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N, Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 S 15	15	13	11	E	11	E S 15	E S 15	14	16	21	18	19	23	19	17	15	16	15	11	E S 15	E S 14	E S 13	E S 14
2	E S 14	E S 14	13	E	12	11	E S 15	15	18	16	18	18	21	21	18	19	17	15	14	E S 14	E S 15	E S 15	E S 15	E S 15
3	E S 14	E S 14	13	14	E	14	E S 15	E S 14	15	17	20	22	21	24	21	17	14	15	16	E S 13	E S 15	E S 13	E S 14	E S 15
4	E S 15	14	E	E	E	12	E S 14	14	14	15	17	19	19	20	20	17	15	15	15	E S 12	E S 13	E S 15	E S 13	E S 14
5	E S 12	11	E S 14	E	E	E	E S 13	15	15	16	19	23	17	17	17	15	15	15	14	E S 15	E S 15	E S 15	E S 13	E S 14
6	E S 15	12	12	E	E	E	E S 15	14	15	15	18	19	43	C	15	16	19	15	15	13	E S 15	E S 13	E S 15	E S 14
7	E S 14	E S 14	11	11	E	11	E S 14	14	15	15	17	25	23	20	19	18	15	15	14	13	E S 15	E S 13	E S 15	E S 13
8	E S 14	12	12	E	E	E	E S 15	13	14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	15	15	22	17	18	17	17	16	14	14	E S 13	E S 13	E S 15	E S 13	13
10	E S 14	12	12	E	E	E	E S 14	14	15	15	16	17	C	C	C	C	C	C	C	E S 13	E S 14	E S 15	E S 15	E S 15
11	E S 14	E S 12	11	E	11	13	E S 14	14	15	15	17	19	22	25	21	19	15	15	11	E S 14	E S 15	E S 15	E S 15	E S 15
12	E S 15	E S 13	E S 15	E	11	E S 14	E S 14	13	16	17	22	21	20	19	20	21	16	14	15	13	E S 15	E S 15	E S 14	E S 14
13	E S 14	11	14	11	12	12	E S 14	14	16	17	20	20	23	21	20	20	15	15	15	12	E S 13	E S 15	E S 14	E S 15
14	E S 15	E S 13	13	12	11	11	13	15	14	15	16	22	25	25	23	19	18	14	11	E S 15	E S 15	E S 15	E S 15	E S 15
15	E S 15	E S 14	12	15	12	14	E S 15	14	15	16	17	20	21	20	17	17	15	15	13	E S 13	11	E S 15	E S 14	E S 13
16	E S 15	E S 13	15	12	11	12	E S 14	15	16	15	16	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	12	E S 11	14	14	14	15	19	24	25	20	27	16	21	14	14	14	E S 13	E S 15	E S 15	E S 15
18	E S 15	E S 14	12	11	E	12	E S 15	15	14	16	22	21	26	28	24	31	15	15	15	E S 13	E S 12	E S 15	E S 14	E S 14
19	E S 15	E S 12	12	12	15	12	14	14	15	15	16	18	17	21	22	31	15	15	15	12	E S 13	E S 15	E S 15	E S 13
20	E S 15	13	12	13	15	12	E S 15	15	15	18	24	22	23	25	20	17	18	15	14	14	E S 15	E S 15	E S 15	E S 15
21	E S 15	E S 15	14	13	12	11	15	15	15	20	20	30	21	23	20	22	16	15	15	11	E S 15	E S 15	E S 14	E S 15
22	E S 14	E S 15	13	15	14	12	E S 15	11	15	14	18	25	22	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	16	17	21	22	22	21	21	16	15	16	12	E S 13	E S 15	E S 14	E S 13
24	11	E S 13	E S 15	E	12	11	E S 14	15	15	15	C	C	C	C	C	C	C	C	15	11	E S 15	E S 14	E S 15	E S 15
25	E S 15	E S 14	12	11	15	15	E S 15	15	16	18	21	26	23	20	25	18	19	16	14	11	E S 12	E S 15	E S 14	E S 15
26	E S 15	13	11	11	E	11	15	14	15	19	20	21	19	20	19	20	17	15	11	E S 15	E S 15	E S 15	E S 13	E S 13
27	E S 15	E S 13	11	12	E	11	14	14	16	15	42	24	20	21	18	18	15	15	14	E S 15	E S 15	E S 15	E S 15	E S 15
28	E S 15	E S 14	13	13	13	14	15	14	15	17	17	20	21	19	20	17	16	15	14	13	11	E S 13	E S 15	E S 15
29	E S 14	E S 12	12	E	12	11	E S 15	15	15	16	23	18	22	18	18	19	15	16	14	E S 14	E S 15	E S 13	E S 13	E S 12
30	E S 15	E	12	13	E	E S 15	15	15	16	15	17	17	21	20	18	15	17	15	13	11	E	E S 15	E S 14	E S 13
31	E S 13	E	E	11	E	E	E S 14	15	15	15	24	18	19	19	19	16	16	15	14	11	E S 14	E S 14	E S 15	E S 14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	29	29	29	29	29	30	29	28	27	25	26	26	26	26	27	28	28	28	28	28
MED	E S 15	E S 13	12	11	11	11	E S 15	14	15	16	18	21	21	20	20	18	16	15	14	12	E S 15	E S 15	E S 14	E S 14
UQ	E S 15	E S 14	13	12	12	12	E S 15	15	15	17	21	22	23	23	21	20	17	15	15	E S 14	E S 15	E S 15	E S 15	E S 15
LQ	E S 14	E E 12	12	E	E	11	E S 14	14	15	15	17	18	20	20	18	17	15	15	14	12	E S 13	E S 14	E S 14	E S 13

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAY 1969

M(3000)F2(0.01)

135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N. Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 265	255	275	285	290	280	I S 295	320	310	295	280	285	280	275	280	285	285	285	U R 295	315	S 295	S 285	F 260	I A 250
2	S 260	F 270	S 270	280	265	F	310	330	310	275	265	S 265	280	280	275	285	S 285	J S 290	295	R 300	I S 290	U S 265	J S 265	I S 290
3	I S 260	F	S 295	F	275	295	325	320	325	295	275	285	S 275	275	275	280	295	290	J R 290	I S 295	I S 310	S 265	250	260
4	S 265	270	285	280	280	S 270	315	305	305	285	265	275	290	290	295	300	285	S 285	R 295	S 300	J S 295	S 270	U S 260	I S 265
5	S 270	270	I S 285	S 280	280	265	S 310	S 310	330	300	275	270	265	S 275	305	290	290	J S 285	J S 295	300	U S 295	275	275	S 270
6	S 265	U S 270	305	325	270	265	320	335	300	295	290	275	270	I C 280	290	S 290	J S 285	J R 290	J R 285	I S 290	I S 290	J S 285	265	S 26[illegible]
7	J S 260	265	U S 305	S 320	290	S 265	300	310	325	270	S 275	285	S 285	275	275	R 280	S 295	U S 290	290	280	J S 270	S 270	I S 275	J S 280
8	285	275	S 295	285	285	285	315	320	H 280	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	275	250	260	285	285	275	280	280	290	285	I S 270	S 255	I S 245	I S 255	270
10	S 270	S 275	U S 305	320	265	270	295	S 300	300	300	270	265	C	C	C	C	C	C	C	270	S 265	J S 255	I S 265	I S 265
11	I S 275	I S 280	I S 290	S 290	275	270	300	305	285	280	265	255	265	270	265	270	275	280	I S 280	280	S 285	S 265	J S 260	S 265
12	J S 275	S 270	S 275	I S 275	270	S 275	S 300	S 330	300	305	275	R 270	270	270	275	S 280	S 285	S 285	295	S 310	275	255	U S 255	S 260
13	S 265	275	I S 290	295	275	265	265	S 280	290	S 285	R 235	250	255	255	270	275	275	280	U S 275	I S 290	I S 300	S 265	J S 245	U S 255
14	260	255	S 270	285	270	290	290	280	285	R 250	250	255	255	270	270	285	280	270	280	R 290	J S 285	265	J S 260	J S 280
15	270	260	J S 255	S 260	265	305	335	280	270	290	260	215	I S 260	280	265	260	285	280	R 255	250	I S 250	S 240	255	S
16	S 240	I S 260	I S 265	S 245	245	255	255	H 275	H 265	300	S	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	260	260	300	295	285	265	260	300	270	280	280	285	285	S 285	300	275	J S 280	I S 250	I S 260	I S 260
18	260	S	S	F	F	F	F 320	310	315	I A 290	275	275	270	S 260	280	285	290	S 285	S 285	I S 290	S 265	S 245	J S 240	I S 265
19	S 280	U S 260	260	F 285	F 295	270	285	S 315	305	295	285	265	S 265	280	275	285	305	300	J R 295	275	U S 270	260	S 255	I S 260
20	J S 285	285	S 295	I S 290	S 280	U S 265	290	J S 315	U S 290	280	275	260	S 265	285	270	270	280	285	290	295	265	J S 265	I S 265	I S 260
21	J S 255	I S 280	I S 280	270	S 275	265	S 305	320	310	A	260	260	255	A	260	270	S 270	280	I S 290	J S 290	J S 270	I S 270	F	S
22	S	U S 295	U Z 260	F 265	285	F 300	315	325	325	280	A	270	270	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	A	255	A	A	275	275	270	280	285	280 R	265	I S 275	J S 255	I S 255	S 255
24	255	I S 290	J S 315	F	F 300	F	F 310	305	290	275	C	C	C	C	C	C	C	C	U S 265	U S 280	S	S	J S 260	S
25	S	S	S 290	I S 285	275	285	305	320	315	290	270	255	255	275	275	280	285	275	270	S 275	S 270	S 260	I S 260	275
26	I S 260	I S 260	I S 305	S 355	I S 285	F 300	325	320	305	290	280	265	265	260	R 265	280	290	300	J R 295	260	S 275	S 265	F	S
27	S	I S 275	325	S 330	290	300	315	335	310	305	275	260	270	280	285	280	265	265	275	J S 285	J S 285	275	I S 275	J S 285
28	S 270	285	U S 325	F 285	F	F 295	330	350	325	305	275	265	270	275	275	275	280	280	290	S 290	J S 280	I S 260	F 255	I S 280
29	J S 305	S	F	F	F	I S 280	S 315	325	S 305	270	I A 270	265	270	260	265	S 285	295	290	280	S 300	285	S 270	250	S
30	F	S	S	F	F	F	F 285	F 300	300	300	255	255	270	275	275	270	270	S 280	290	295	S 255	U S 255	I S 265	270
31	270	I S 290	S 330	F	F	F	F 335	305	315	290	290	H 275	290	260	265	270	I A 270	295	S 310	285	I A 270	265	J S 270	S 260
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	23	25	22	24	24	29	29	29	28	27	27	26	25	26	26	26	26	27	28	27	27	26	23
MED	S 265	S 270	S 290	285	275	272	310	315	305	290	270	265	270	275	275	280	285	285	290	290	S 275	S 265	S 260	S 265
UQ	S 272	S 280	S 305	295	285	292	315	320	315	298	275	275	275	280	280	285	290	290	295	S 295	S 288	S 270	S 265	S 272
LQ	S 260	262	275	S 280	270	265	295	305	290	278	260	260	265	270	270	270	280	280	280	275	S 270	S 255	S 255	S 260

IONOSPHERIC DATA

MAY 1969 | M(3000)F1(0.01) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N. Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	A	L	L	L	L	A	L	L					
2									A	A	L 350	L	L	A	A	A	A	A	A					
3									L	L	L	U L 345	H 390	L 335	L	L	L	L						
4									L	L	L	L	L	L	A	L	L	A	A					
5								L	A	A	A	A	A	U L 340	A	A	L	L	L					
6									L	L	A	L	L 340	C	A	L 335	L	L	L					
7									A	L	A	A	L 335	L 365	U L 335	A	L	L	A					
8								L	L	C	C	C	C	C	C	C	C	C	C					
9								C	C	L	355	H 340	350	L	H 375	L	L	L	A					
10									L	L	L	L	C	C	C	C	C	C	C					
11									L	L	L	L	L	L	330	A	L	L	L					
12								L	L	L 350	L	L 340	U L 325	360	L	H 340	L	A	A					
13								L	L	L	L	L 335	L 345	325	A	L	A	A	A					
14								L	L	L	A	A	L 340	A	A	L	L	A	A					
15									A	L	L	L	A	L	L 325	L	L	L	L					
16									A	A	A	C	C	C	C	C	C	C	C					
17							L	A	L	A	L	L	H 375	R	L	A	A	A	A					
18									A	A	A	L	L	L	L	L 335	L	A	A					
19								L	L	L	L	L 330	U L 335	L 320	A	360	L	L	L					
20										L	L	A	A	I A 330	L	L	L	L	L					
21									A	A	A	A	A	A	A	340	A	U L 315	A					
22								A	A	A	A	A	L 335	C	C	C	C	C	C					
23								C	C	A	A	A	A	350	A	A	345	L	A					
24									L	335	C	C	C	C	C	C	C	C	L					
25								L	A	L	L	L	340	A	A	A	A	L	L					
26									L	L	A	360	A	A	335	H 345	L 345	U L 355						
27									L 385	A	A	A	A	A	L	L	L 335	L	A					
28								L	L	A	A	355	L 365	360	340	340	325	A	A					
29									L	A	A	A	L	A	A	A	A	L	A					
30									L	A	L	A	A	A	355	345	L	L	A					
31									L	A	A	A	L	L	L 315	H 335	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	2	7	12	9	8	9	4	2						
MED									L 385	342	352	L 340	L 340	340	335	340	340	U L 335						
UQ												350	358	360	348	345	345							
LQ												L 338	L 335	L 330	328	335	330							

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IONOSPHERIC DATA

MAY 1969 | h'F2 (km) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N, Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	320	305	305	325	305	295	295	275	275					
2									250	260	320	350	325	320	325	305	300	290	260					
3									240	255	310	310	290	335	325	320	300	275						
4									250	320	295	345	300	300	300	280	275	280	260					
5								255	245	300	350	355	330	345	300	300	295	260	265					
6									280	300	290	300	340	C	310	305	300	270	275					
7									250	325	315	340	315	305	340	315	295	280	260					
8								250	250	C	C	C	C	C	C	C	C	C	C					
9								C	C	360	340	370	340	310	310	325	305	275	260					
10									250	280	285	340	C	C	C	C	C	C	C					
11									250	280	350	365	350	325	340	330	320	300	275					
12								235	255	300	340	340	355	350	335	315	320	285	295					
13								295	255	290	285	390	345	390	350	335	315	300	E A 375					
14								330	320	370	365	325	370	350	335	310	315	305	300					
15									250	280	355	555	375	320	360	350	290	305	300					
16									E A 350	305	E A 355	C	C	C	C	C	C	C	C					
17							290	305	460	255	350	320	350	330	325	325	305	300	255					
18									270	A	355	355	310	345	325	305	300	290	280					
19								255	250	305	290	325	325	340	320	320	290	280	240					
20										290	325	350	340	340	345	340	310	300	270					
21									290	I A 355	370	360	350	A	380	355	335	315	305					
22								250	260	E A 350	A	340	340	C	C	C	C	C	C					
23								C	C	A	430	A	A	370	390	380	360	325	310					
24									270	365	C	C	C	C	C	C	C	C	280					
25								250	275	300	365	355	380	350	365	325	325	280	300					
26									300	305	365	390	350	365	370	325	305	280						
27									260	380	390	E A 405	355	335	320	340	355	350	320					
28								240	255	E A 340	380	370	350	340	345	325	325	315	290					
29									305	A	A	340	345	350	360	325	290	280	295					
30									290	295	405	390	350	330	325	325	315	310	290					
31									280	315	325	E A 360	310	360	355	345	A	290	255					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	10	28	27	27	27	26	24	26	26	25	26	25					
MED							290	252	256	300	345	348	342	340	335	325	305	290	278					
UQ								295	282	345	365	365	350	350	355	335	320	305	298					
LQ								250	250	290	318	340	325	325	320	310	295	280	260					

IONOSPHERIC DATA

MAY 1969 | h'F (km) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N. Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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	310	310	315	275	260	240	240	250	250	E A 270	A	A	A	A	I A 225	A	245	255	240	250	260	330	A
2	310	285	250	I A 250	270	280	240	240	A	A	H 210	I A 235	220	A	A	A	A	A	A	245	250	280	315	250
3	295	300	270	245	270	245	225	230	230	240	H 230	220	H 200	220	210	240	245	245	255	255	250	250	320	305
4	295	285	270	240	270	250	225	220	245	A	245	210	A	A	A	E A 255	230	I A 255	I A 250	240	250	250	290	290
5	295	300	240	240	250	295	235	225	I A 240	A	A	A	A	230	A	A	A	240	250	255	250	270	275	295
6	330	320	255	205	280	310	250	250	240	E A 265	A	230	E A 280	C	A	220	240	255	255	250	250	245	250	310
7	310	300	255	225	270	295	255	240	A	250	A	A	A	H 225	220	A	E A 260	255	I A 260	270	310	300	310	280
8	255	275	255	250	255	270	240	225	240	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	H 205	E A 250	H 200	225	H 210	H 220	H 210	H 230	250	A	260	295	310	305	280
10	290	295	250	210	H 225	290	250	240	230	245	A	A	C	C	C	C	C	C	C	250	255	290	275	300
11	290	260	245	245	255	255	250	235	225	220	H 205	H 200	H 190	H 255	235	I A 230	H 230	245	245	265	250	235	300	300
12	300	290	270	260	255	265	245	235	210	240	H 220	205	H 240	240	E A 250	E A 250	A	A	A	260	250	310	310	325
13	305	275	265	245	250	290	255	255	250	235	E A 270	205	E A 250	A	A	A	A	A	A	E A 360	245	240	E A 400	350
14	325	335	300	275	270	255	250	E A 275	250	E A 280	A	A	220	A	A	A	E A 250	A	I A 270	270	270	315	350	280
15	275	315	305	325	275	225	215	230	A	A	A	A	A	230	250	E A 250	255	255	265	290	E S 350	355	340	275
16	320	300	275	295	320	290	275	250	A	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	295	320	265	I A 245	255	A	H 200	I A 240	H 200	I A 265	H 230	A	A	A	A	225	270	300	300	E A 340
18	295	320	305	310	285	275	245	240	A	A	A	A	230	H 225	I A 240	I A 265	H 240	A	A	A	280	E A 360	355	320
19	275	275	300	270	225	250	255	240	235	E A 250	A	225	225	A	A	245	260	E A 265	250	265	290	320	310	295
20	275	255	225	225	240	245	250	245	250	E A 260	A	A	A	A	H 230	H 215	A	E A 260	250	240	255	310	305	300
21	305	300	300	290	270	300	250	240	A	A	A	A	A	A	A	240	A	E A 300	A	275	E A 360	E A 340	300	E A 375
22	270	230	245	250	260	250	225	A	A	A	A	A	E A 255	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	A	A	A	A	250	I A 250	I A 260	225	A	A	290	300	E S 350	330	325
24	345	260	270	250	265	260	245	245	250	A	C	C	C	C	C	C	C	C	240	260	255	260	275	275
25	285	300	260	230	230	230	230	230	I A 220	H 225	H 205	A	230	A	A	A	A	240	H 240	270	260	280	295	280
26	280	305	260	225	275	245	230	240	225	E A 265	A	E A 275	A	A	A	H 230	H 215	240	255	250	260	280	335	310
27	300	320	250	205	250	270	250	235	240	I A 255	A	A	A	A	H 240	H 220	H 215	E A 260	A	E A 350	E A 345	285	290	320
28	305	295	270	290	305	270	250	235	E A 240	A	A	220	200	205	225	225	250	A	A	265	245	E A 380	E A 355	E A 400
29	265	320	305	290	280	E A 340	240	E A 300	250	A	A	A	A	A	A	A	A	H 225	I A 260	255	230	250	E A 390	I A 280
30	300	275	275	F 275	F 285	255	255	250	A	A	270	A	A	I A 245	220	240	I A 255	A	A	255	290	315	295	295
31	325	270	250	A	340	250	225	250	I A 230	A	A	A	A	H 240	H 205	H 240	A	A	A	260	A	310	330	305
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	27	29	29	29	28	21	15	11	12	14	13	14	18	15	16	15	27	27	28	28	27
MED	298	298	268	250	270	262	245	240	240	U 238	U H 218	218	218	230	229	234	235	247	255	258	252	288	306	298
UQ	308	308	288	282	280	290	250	246	250	E A 258	U E 245	230	232	245	240	A 245	250	E A 256	258	268	280	312	328	314
LQ	282	275	250	228	255	250	235	235	230	234	H 208	205	200	225	220	H 225	H 230	242	250	250	250	260	295	280

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IONOSPHERIC DATA

MAY 1969 | h'Es (km) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N, Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	105	100	100	100	105	145	125	130	130	120	110	110	110	105	105	105	G	115	125	105	105	105	110
2	105	105	105	100	100	B	130	130	125	120	120	110	110	115	110	110	110	110	110	110	105	105	105	105
3	105	105	105	B	E	B	170	150	150	115	110	110	120	115	G	110	105	150	125	115	110	110	110	105
4	105	105	E	105	105	B	150	130	125	120	120	125	125	120	120	130	135	115	110	110	105	105	105	100
5	100	100	100	100	100	105	155	145	125	115	115	115	115	135	120	115	115	120	115	S	S	105	105	105
6	105	105	105	100	100	105	140	125	125	125	120	120	120	C	110	115	120	105	105	105	105	105	S	S
7	105	105	105	105	E	B	140	125	125	120	125	125	130	G	120	105	110	115	110	105	105	105	105	105
8	105	105	105	105	105	105	105	150	140	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	150	125	145	145	105	145	G	150	135	115	110	105	105	100	100
10	100	100	100	100	100	100	100	140	130	125	115	115	C	C	C	C	C	C	C	95	100	115	S	100
11	100	100	B	100	100	B	140	140	130	125	120	110	110	105	105	100	100	100	110	95	105	100	105	100
12	100	105	100	100	B	S	G	130	125	120	115	110	120	115	150	150	130	125	100	100	100	100	100	100
13	100	100	B	105	105	100	125	115	115	120	105	105	105	105	105	105	120	115	110	105	100	100	105	100
14	100	100	100	100	105	105	125	120	120	115	110	105	115	100	100	105	140	120	115	115	110	105	100	100
15	100	100	95	100	100	105	130	135	120	120	115	110	110	120	100	100	110	110	110	115	105	105	105	S
16	S	S	B	B	100	100	140	125	115	110	105	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	B	145	135	115	110	115	125	110	140	150	G	130	125	115	110	120	S	105	100	105
18	105	100	110	105	105	105	100	100	120	115	115	110	120	130	120	120	150	120	110	105	115	105	100	100
19	100	100	95	95	95	130	130	125	140	115	110	105	135	105	105	105	105	105	105	115	110	105	105	105
20	105	B	100	100	B	B	145	140	120	120	115	110	110	110	G	G	120	120	115	105	S	160	105	105
21	105	105	100	95	100	105	125	120	115	110	110	105	105	105	105	120	130	125	105	100	100	100	100	105
22	100	100	100	95	95	105	95	120	110	115	110	105	105	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	115	115	110	110	110	125	130	130	130	115	105	100	100	95	95
24	105	100	105	105	100	110	105	130	125	125	C	C	C	C	C	C	C	C	115	135	100	120	100	95
25	95	95	95	95	95	95	140	130	120	125	125	110	105	105	100	100	100	105	100	100	100	100	105	100
26	100	110	105	100	100	B	160	155	150	120	105	105	105	105	105	G	150	115	110	110	100	105	105	105
27	105	105	100	100	100	105	150	125	120	110	115	110	110	105	110	110	130	115	110	105	105	105	100	100
28	100	95	100	100	100	100	105	100	105	110	105	105	105	105	105	150	135	120	115	110	110	105	105	105
29	105	105	105	105	100	100	150	120	120	110	110	110	110	110	110	110	115	125	110	105	110	115	110	115
30	120	100	100	100	100	100	100	100	105	110	105	105	105	125	105	130	125	115	110	105	105	105	105	105
31	105	105	105	100	105	115	125	115	110	105	105	105	105	110	G	155	115	115	110	105	105	105	100	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	26	24	26	24	21	28	29	29	30	29	28	27	24	22	23	26	25	27	27	25	28	26	26
MED	105	102	100	100	100	105	132	125	120	118	115	110	110	110	108	110	120	115	110	105	105	105	105	104
UQ	105	105	105	105	102	105	145	135	125	120	120	110	120	118	120	130	130	120	115	112	105	105	105	105
LQ	100	100	100	100	100	100	115	120	115	115	110	105	105	105	105	105	110	115	110	105	100	105	100	100

IONOSPHERIC DATA

MAY 1969 | Types of Es | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31°12.1'N. Long. 130°37.1'E Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Hour / 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 3	F 3	F 4	F 7	F 5	F 1	H 2	H 3	H 3	H 1	C 2	C 2	C 2	C 2	C 2	C 2	C 3		C 2	FF 21	F 5	F 7	F 6	F 4
2	F 3	F 2	F 2	F 5	F 4		H 3	H 2	H 2	C 2	C 1	C 1	C 1	C 2	C 3	C 3	C 3	C 4	C 2	F 6	F 5	F 3	F 3	F 2
3	F 3	F 3	F 1				HH 13	HH 21	H 1	C 1	C 1	C 1	C 1	C 1		C 1	LH 21	HL 22	H 3	F 6	F 6	F 4	F 2	F 2
4	F 2	F 2		F 2	F 1		H 3	H 2	H 2	C 3	C 1	H 1	H 1	HL 11	C 2	H 1	H 1	C 2	C 3	F 1	F 6	F 2	F 3	F 4
5	F 3	F 3	F 4	F 4	F 5	F 5	H 3	H 3	H 2	C 2	C 4	C 3	C 2	HL 11	CL 21	C 2	C 2	C 1	C 1			F 1	F 1	F 1
6	F 3	F 3	F 2	F 1	F 1	F 1	H 2	H 3	H 2	HL 11	CL 21	C 1	C 1		C 2	C 1	C 1	C 2	C 3	F 2	F 1	F 2		
7	F 1	F 1	F 4	F 3			H 3	H 3	H 2	H 1	H 1	HC 11	HC 11		C 1	C 3	C 2	C 2	C 3	F 3	F 4	F 4	F 5	F 4
8	F 1	F 2	F 3	F 2	F 3	F 3	L 1	HL 13	HL 22															
9										H 1	H 1	H 1	HL 11	L 1	H 1		H 1	H 3	C 5	F 3	F 2	F 1	F 2	F 4
10	F 4	F 3	F 3	F 3	F 2	F 2	LH 22	HL 22	H 2	H 1	C 1	C 1								F 4	F 2	F 1		F 3
11	F 2	F 4		F 1	F 1		H 2	H 2	H 1	H 1	C 1	C 1	C 1	L 1	L 1	L 4	L 3	LH 51	CHL 22	F 4	FF 22	F 2	FF 23	F 4
12	F 3	FF 12	F 3	F 1				H 2	H 1	C 2	C 1	C 1	C 1	C 1	HC 11	HC 11	HC 11	H 3	L 5	F 5	F 3	F 3	F 3	F 3
13	F 2	F 1		F 2	F 2	F 2	H 3	C 4	C 2	C 1	C 2	L 1	L 1	L 2	L 1	L 2	CL 32	CL 22	C 3	F 4	F 3	F 3	F 5	F 3
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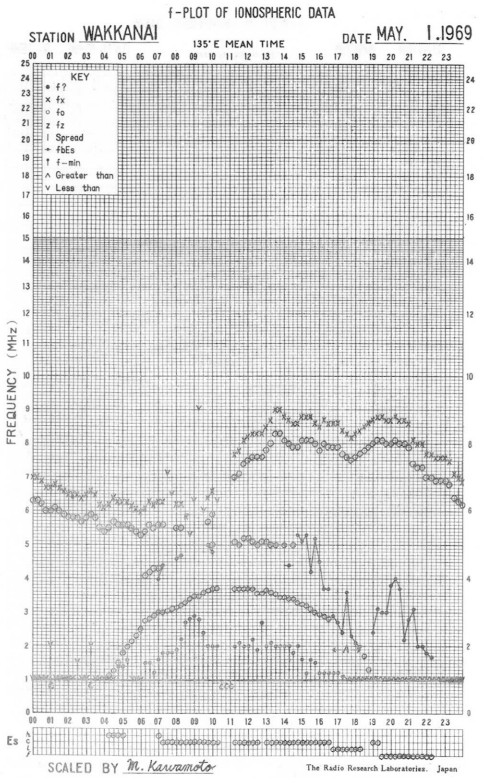
UQ																								
LQ																								

The Radio Research Laboratories, Japan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STATION WAKKANAI
135°E MEAN TIME
DATE MAY. 1.1969
KEY
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↑ f-min
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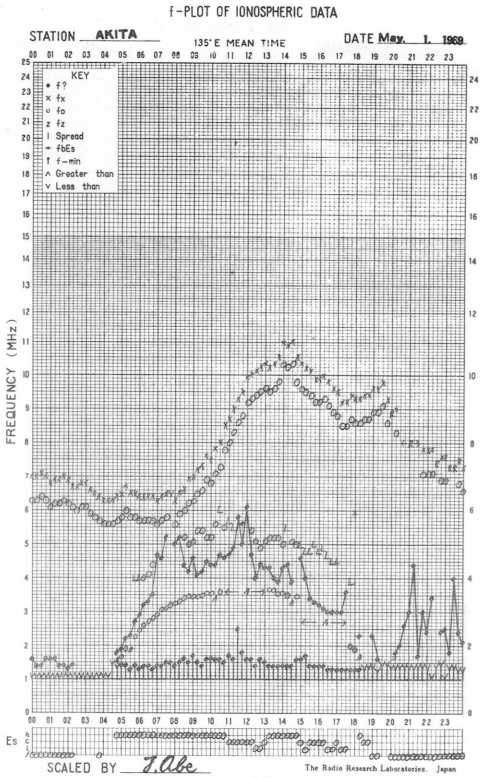
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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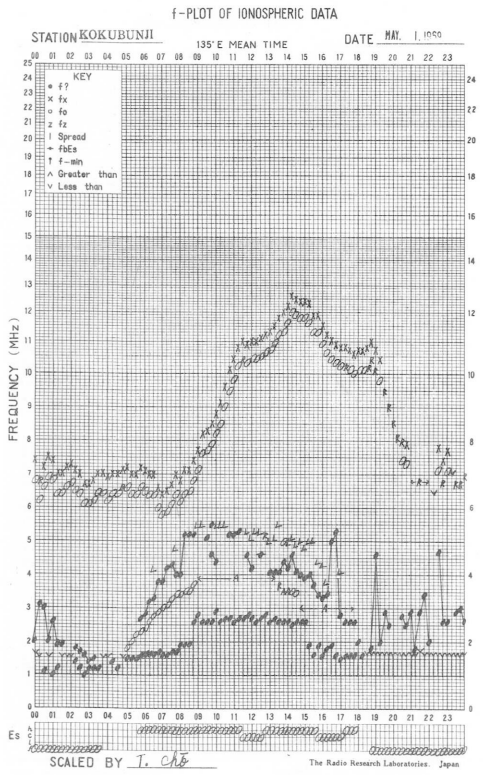
SCALED BY T. Abe
The Radio Research Laboratories. Japan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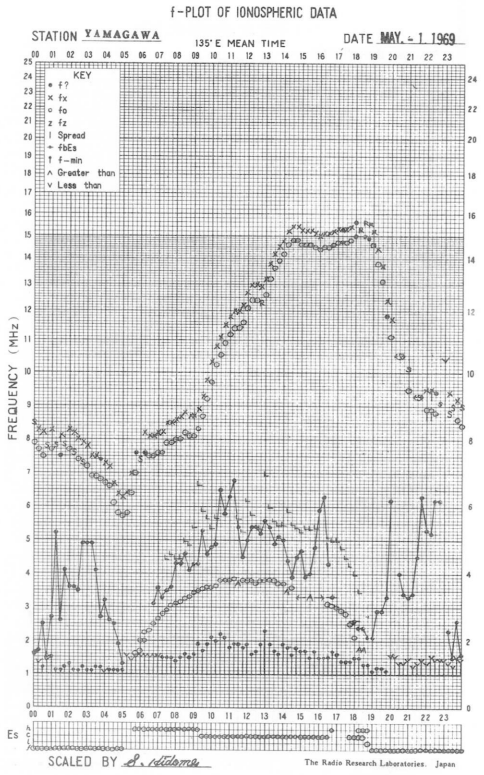
SCALED BY T. Chō
The Radio Research Laboratories. Japan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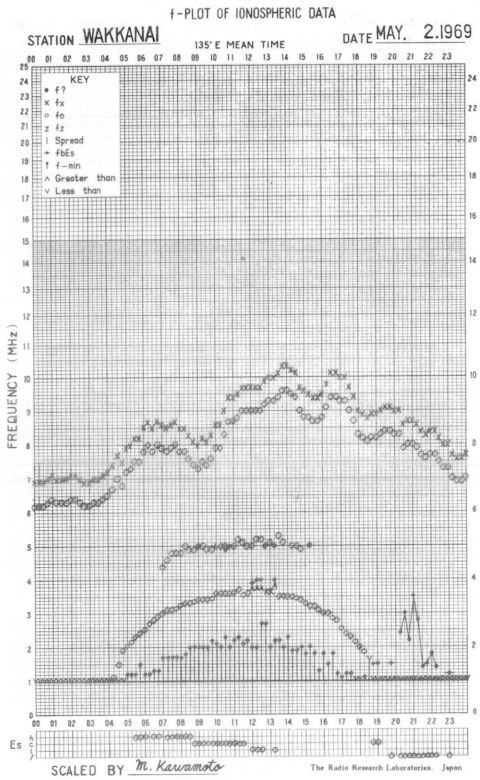
SCALED BY S. Kitamura
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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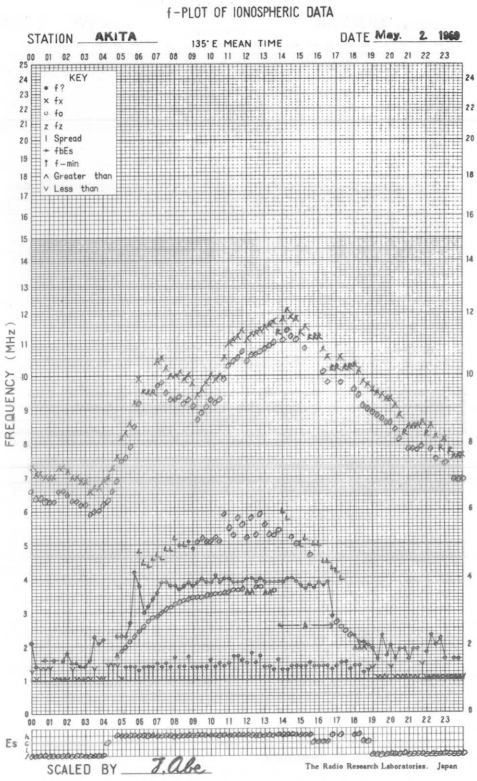
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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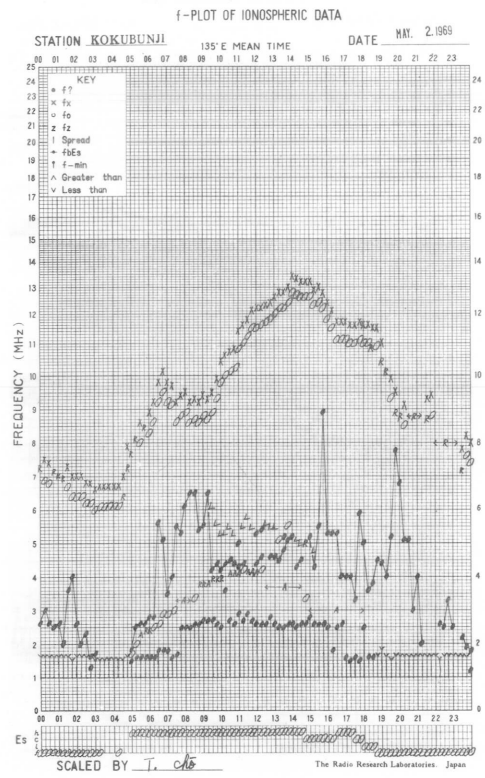
SCALED BY T. Abe
The Radio Research Laboratories. Japan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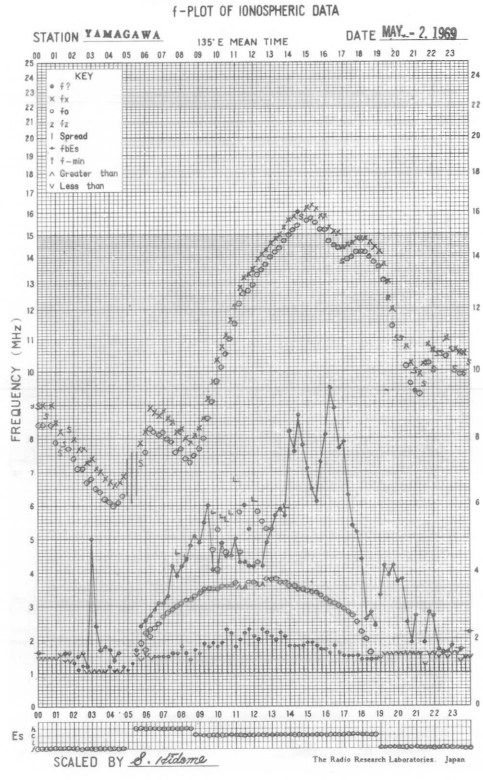
The Radio Research Laboratories. Japan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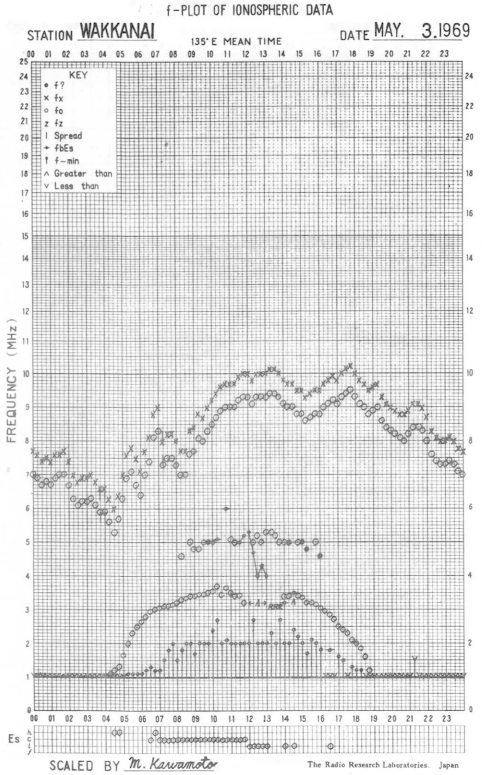
SCALED BY S. Ishioka
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 3.1969



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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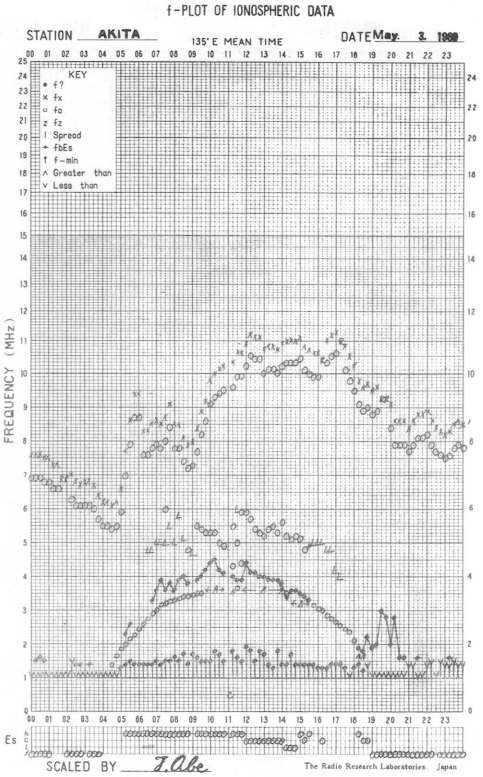
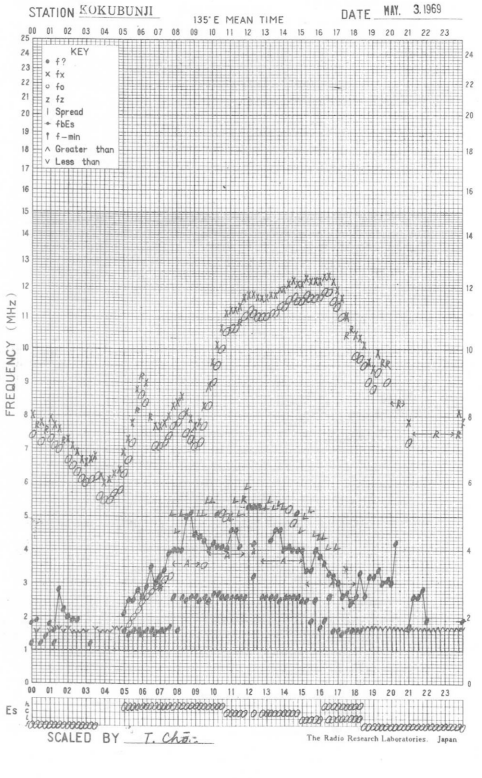


SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAY. 3.1969



SCALED BY T. Chiba The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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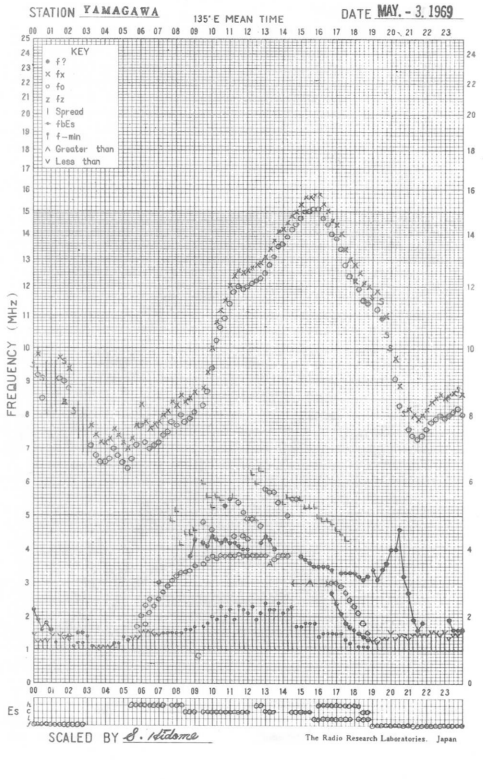
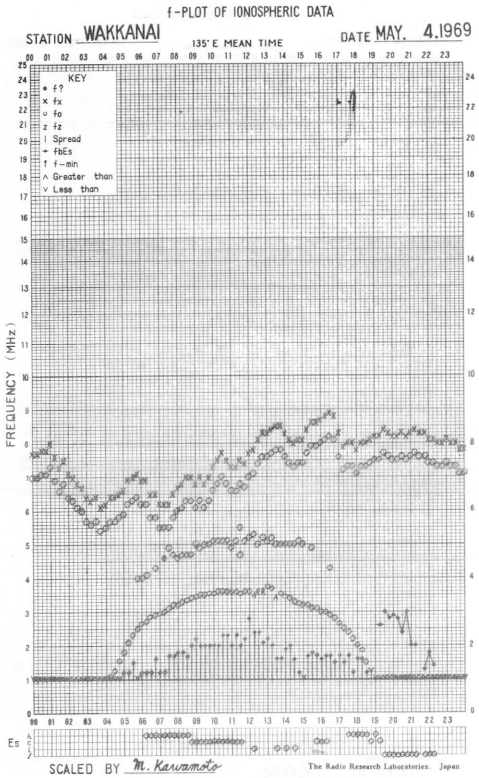


SCALED BY S. Kitsome The Radio Research Laboratories. Japan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DATE MAY. 4.1969
KEY
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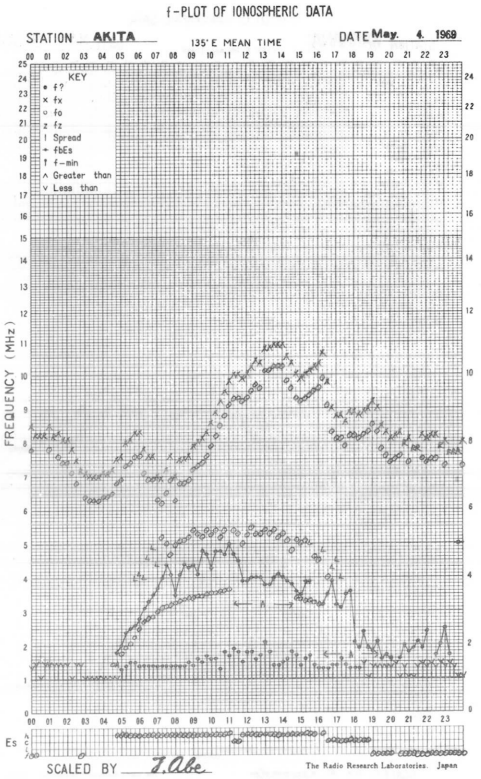
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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KEY
FREQUENCY (MHz)
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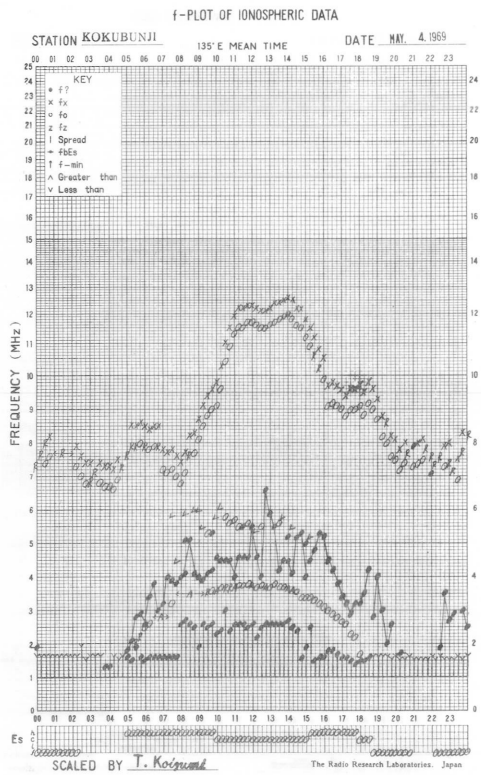
The Radio Research Laboratories. Japan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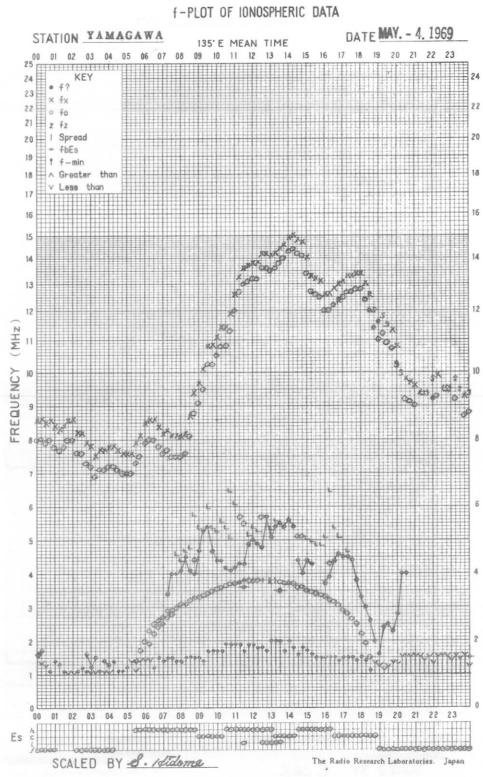
The Radio Research Laboratories. Japan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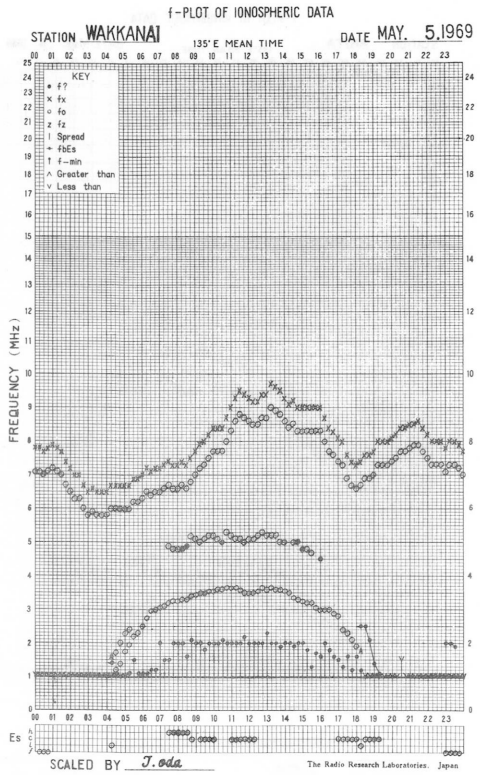
The Radio Research Laboratories. Japan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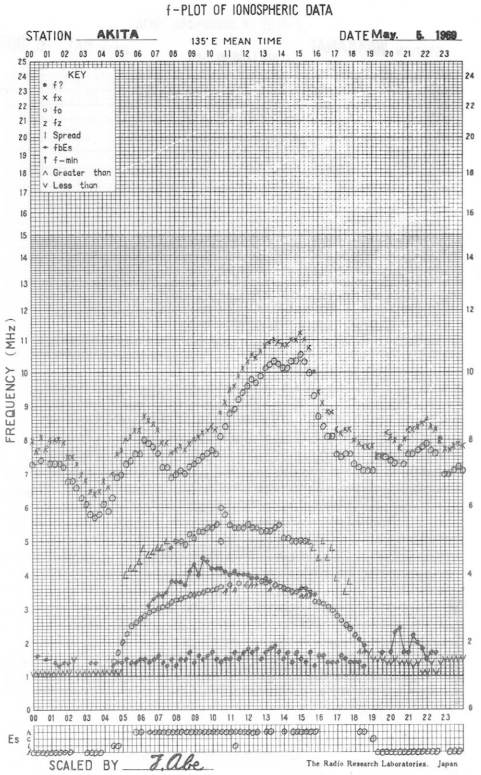
FREQUENCY (MHz)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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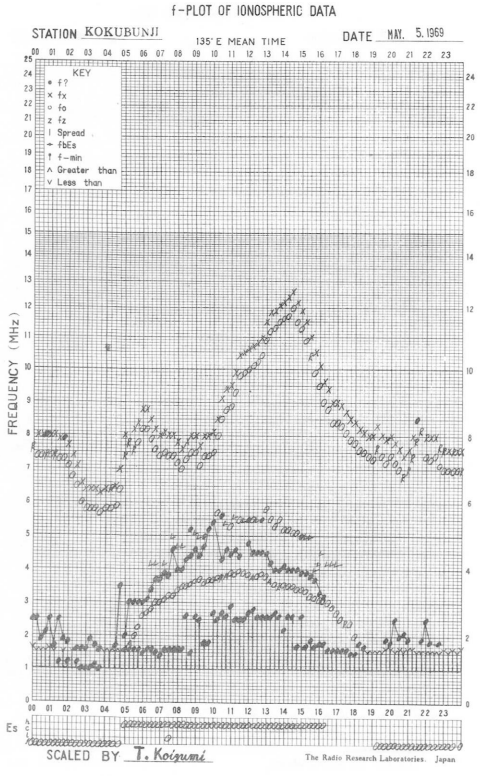
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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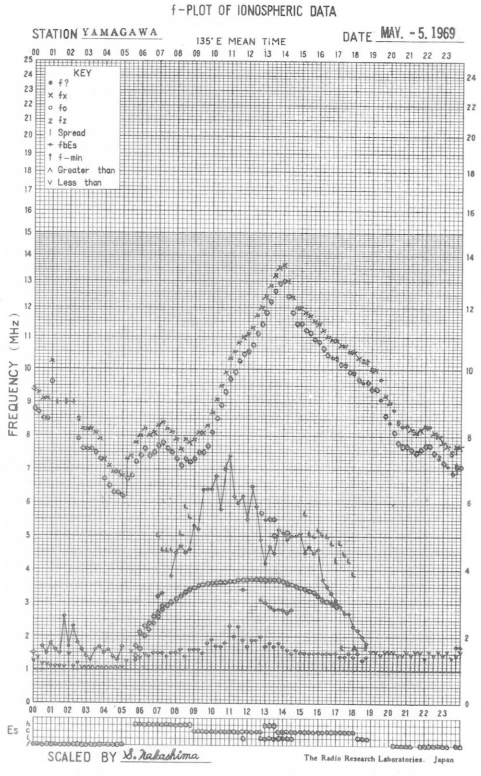
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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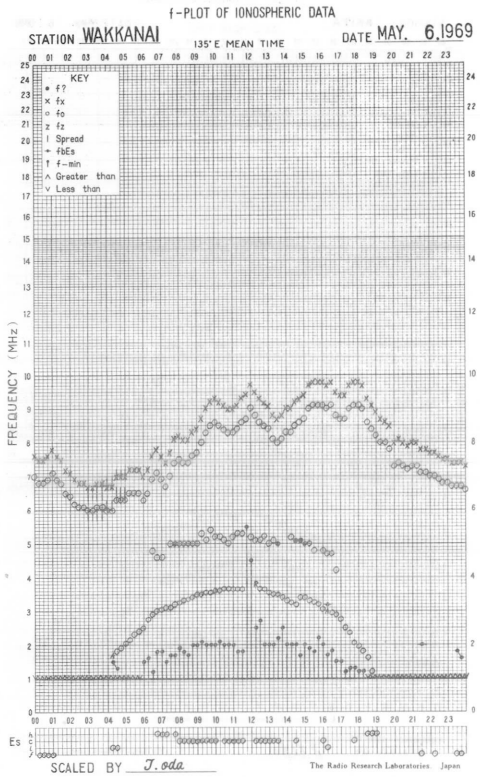
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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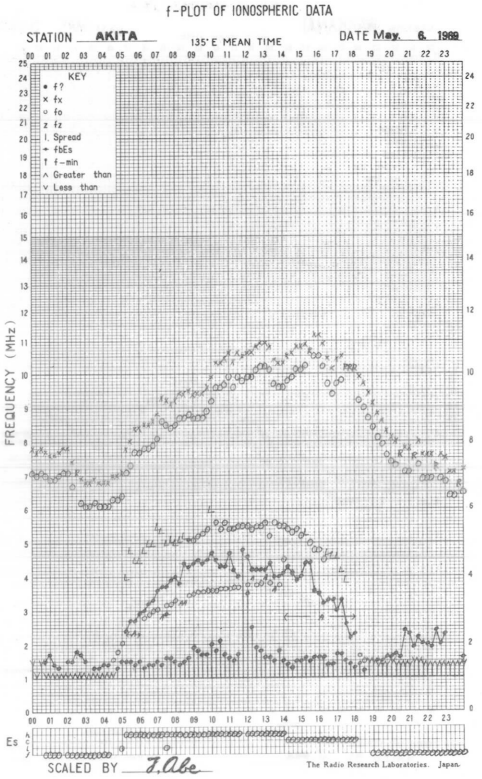
v Less than
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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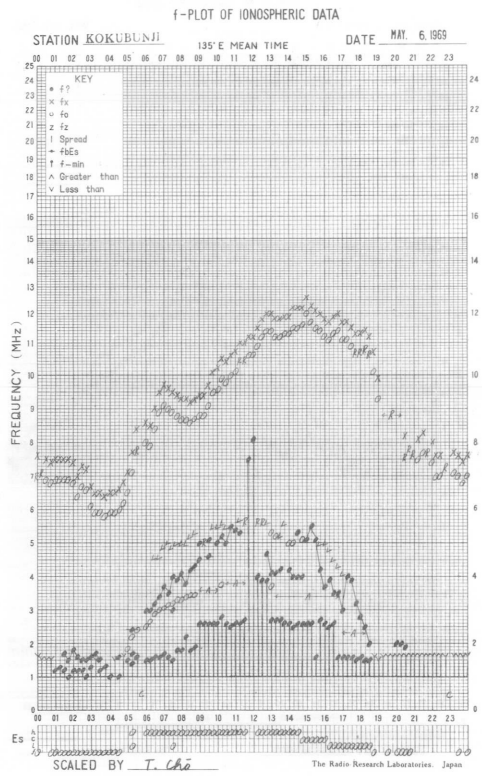
SCALED BY T. Abe
The Radio Research Laboratories. Japan.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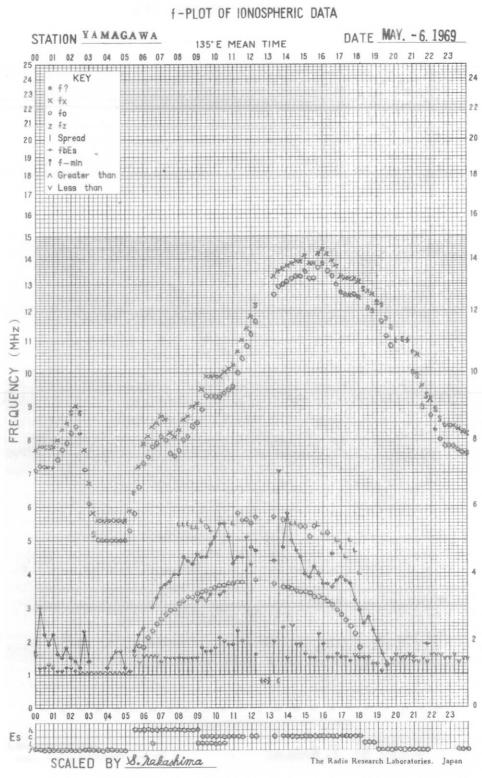
SCALED BY T. Chō
The Radio Research Laboratories. Japan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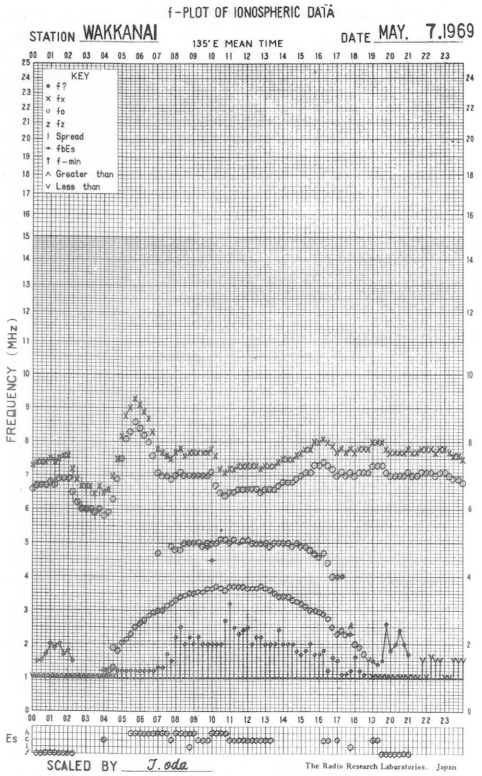
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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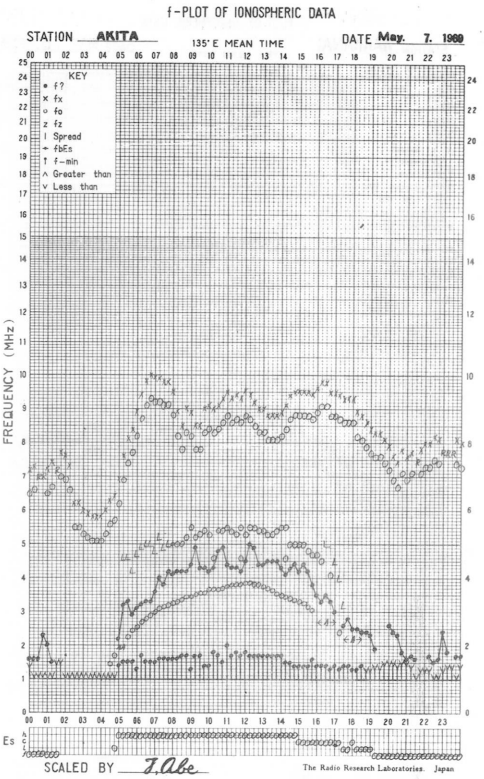
v Less than
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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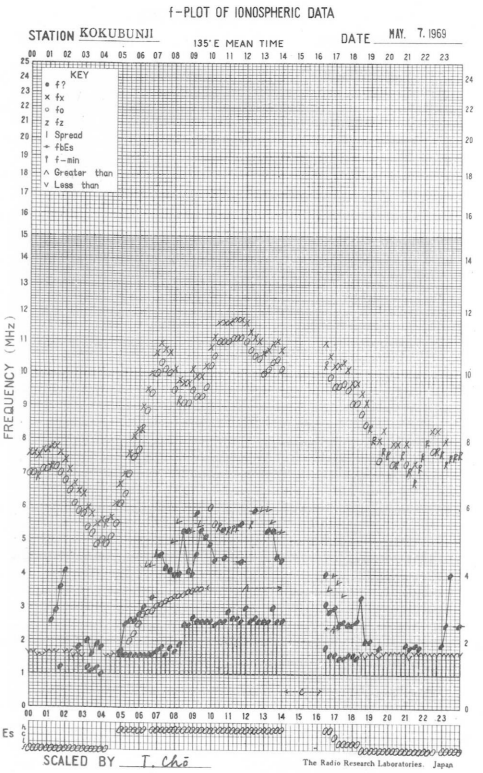
SCALED BY T. Abe
The Radio Research Laboratories. Japan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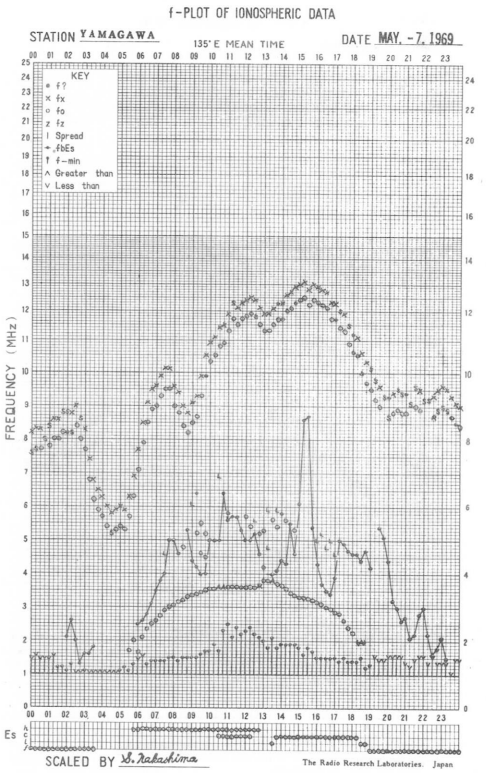
SCALED BY T. Chō
The Radio Research Laboratories. Japan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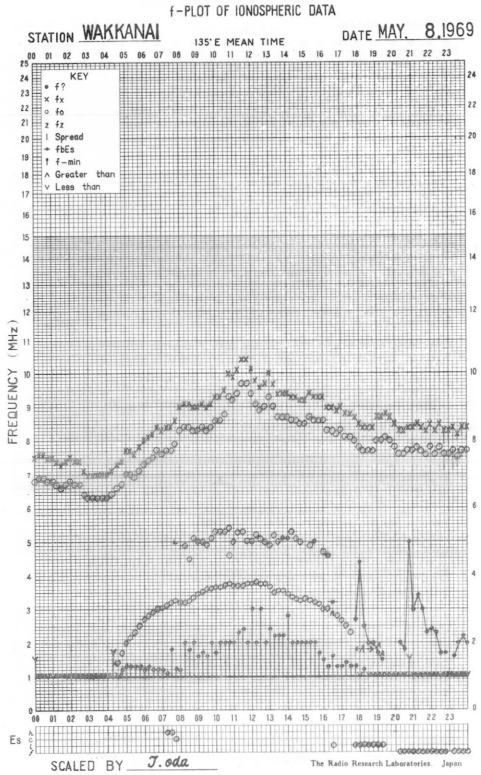
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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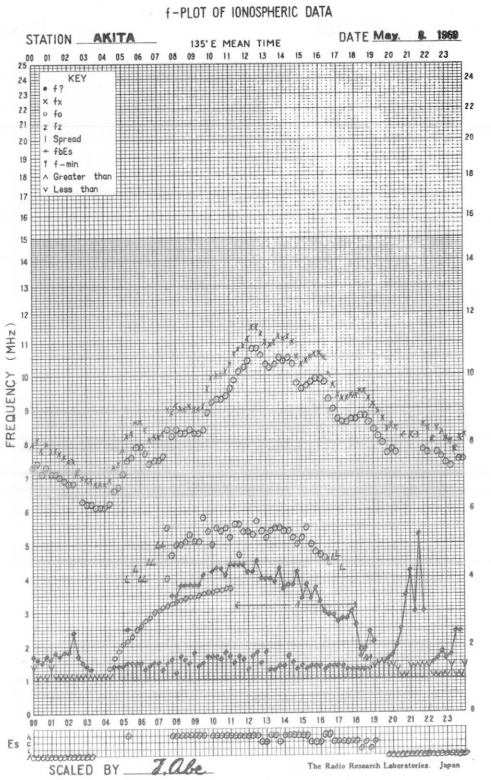
FREQUENCY (MHz)
Es
SCALED BY J. Oda
The Radio Research Laboratories. Japan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DATE May. 8. 1969
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○ fo
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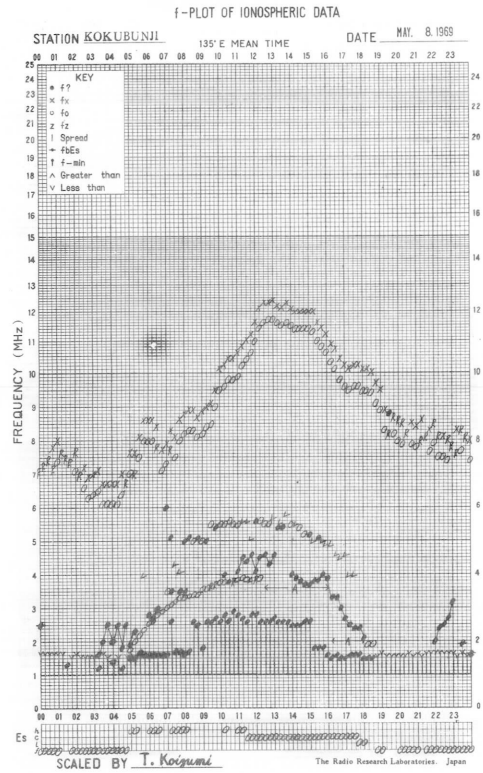
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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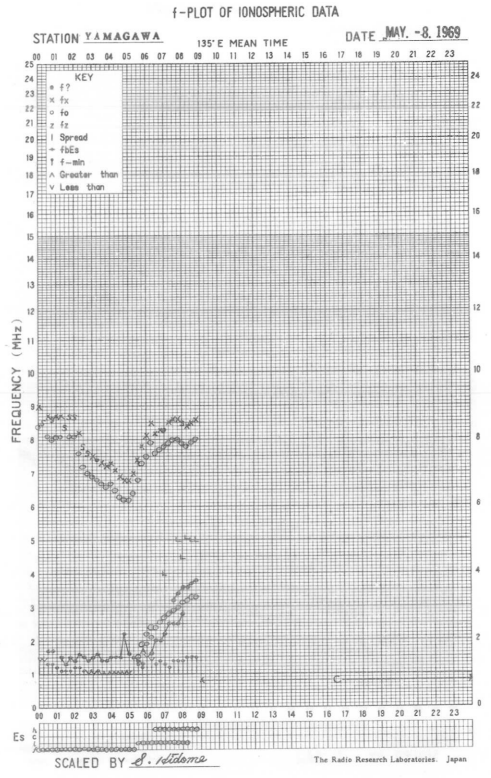
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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v Less than
FREQUENCY (MHz)
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The Radio Research Laboratories. Japan

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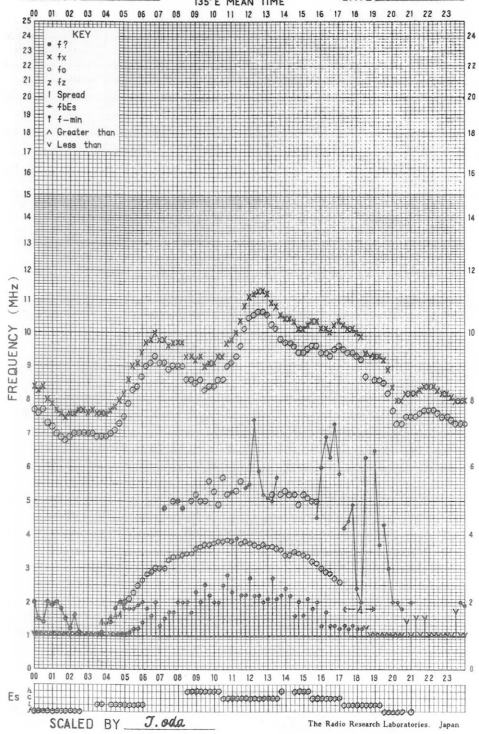
STATION WAKKANAI 135° E MEAN TIME DATE MAY. 9. 1969



SCALED BY T. Oda

The Radio Research Laboratories. Japan

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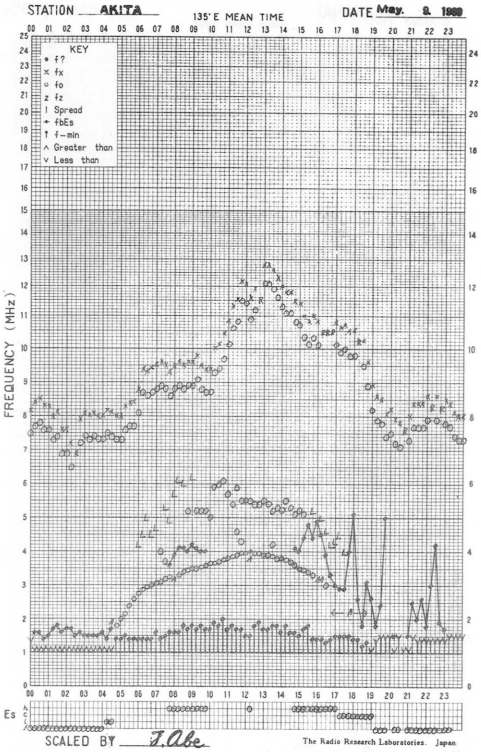

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The Radio Research Laboratories. Japan

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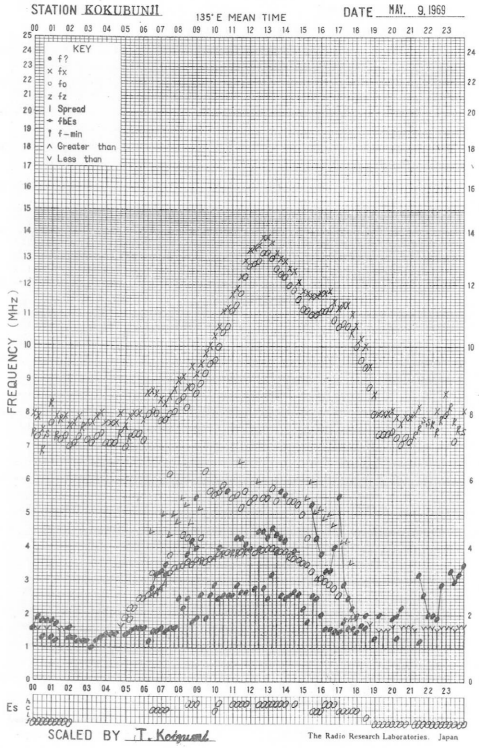

SCALED BY T. Kobayama

The Radio Research Laboratories. Japan

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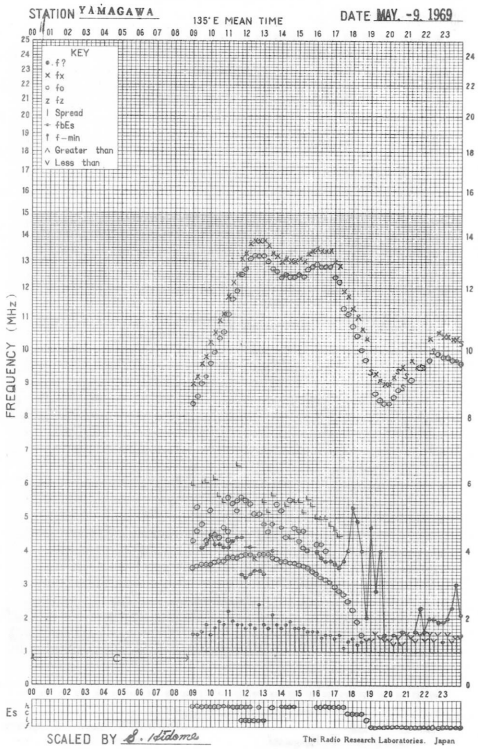
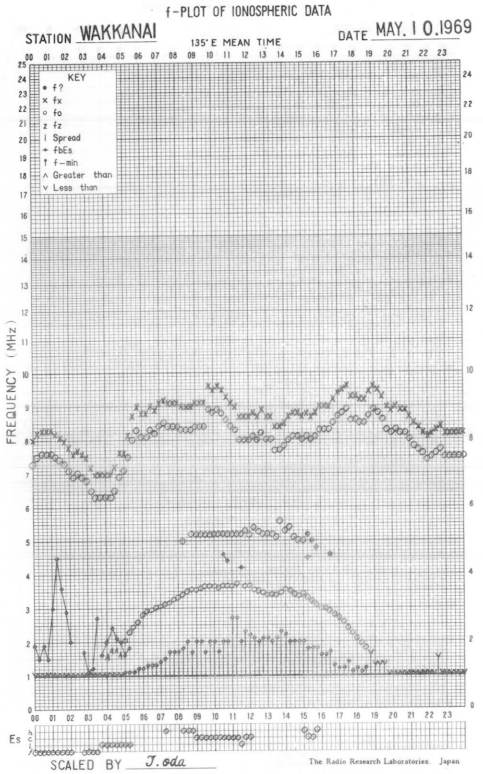


SCALED BY S. Ichidome

The Radio Research Laboratories. Japan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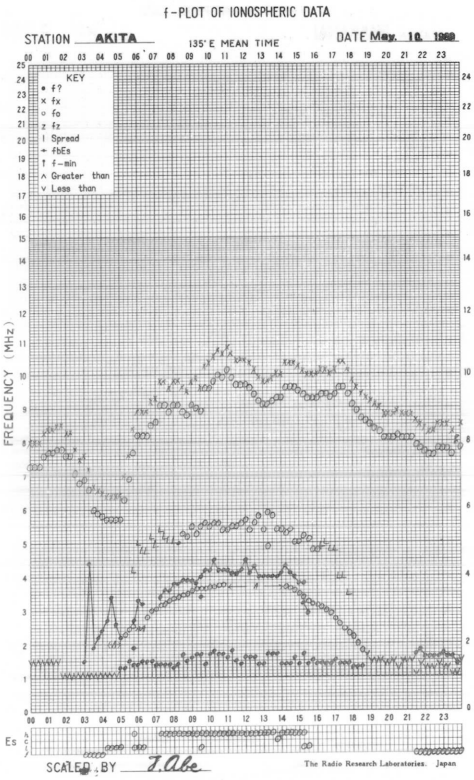
v Less than
FREQUENCY (MHz)
Es
SCALED BY J. Oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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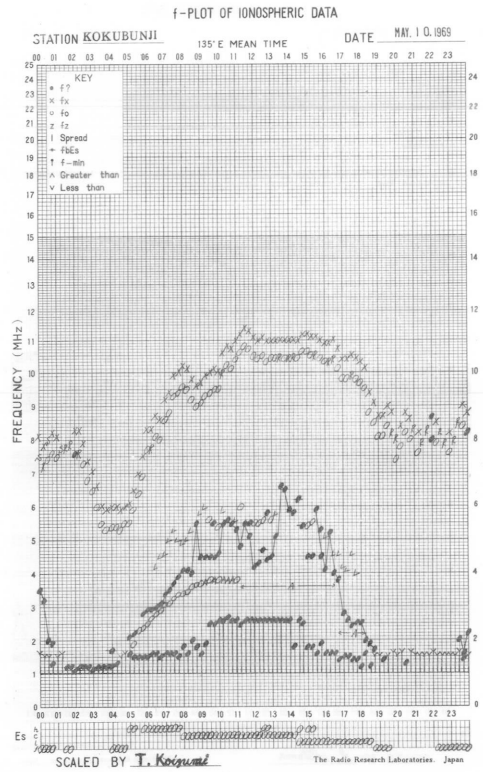
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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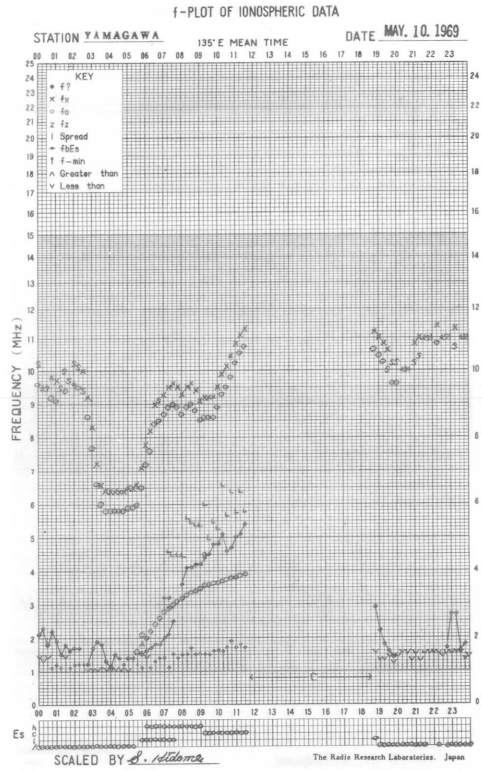
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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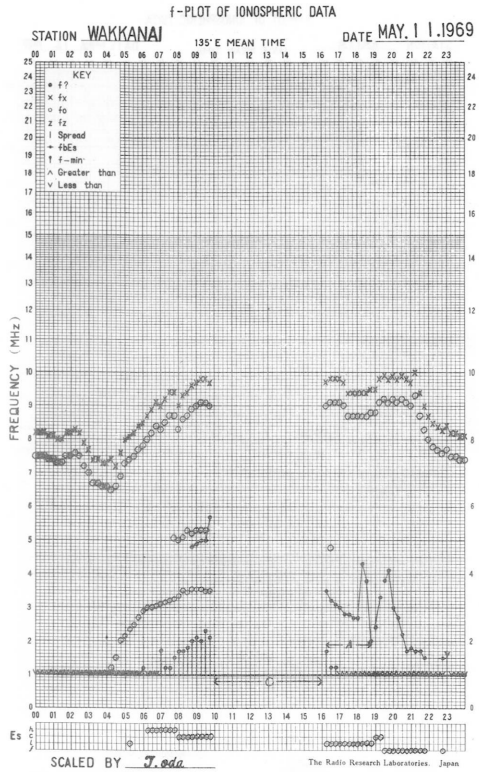
The Radio Research Laboratories. Japan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○ fo
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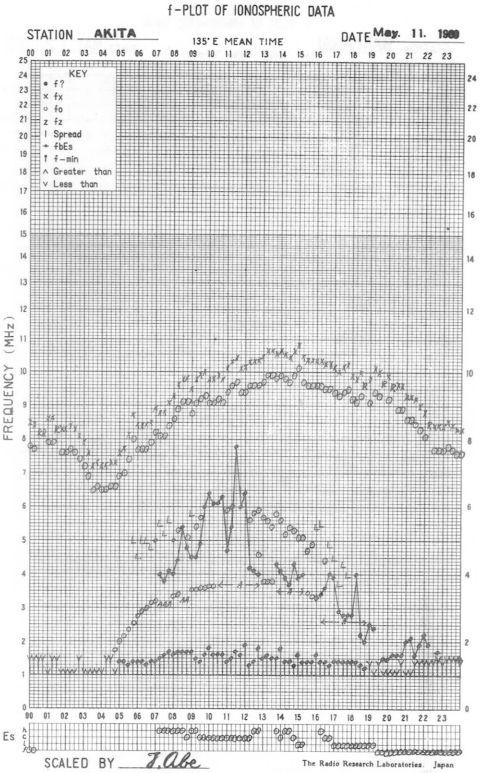
FREQUENCY (MHz)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan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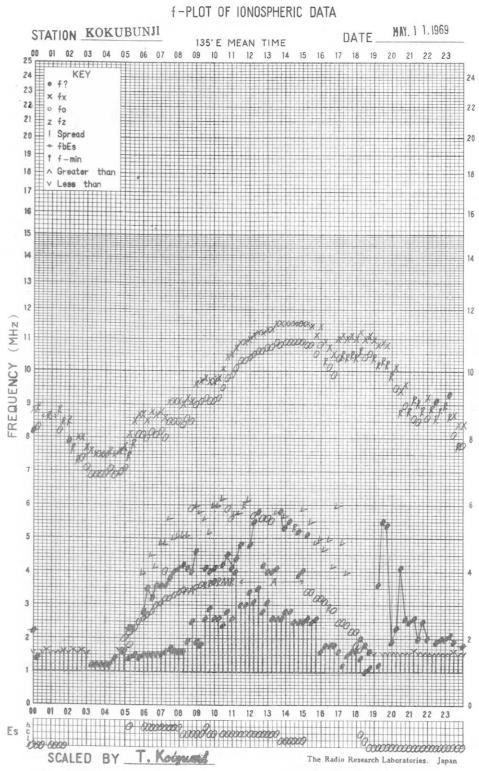
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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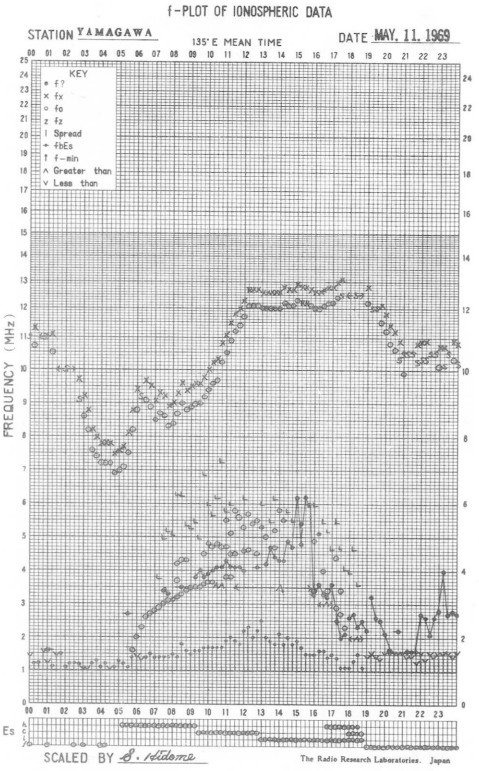
SCALED BY T. Kotsuma
The Radio Research Laboratories. Japan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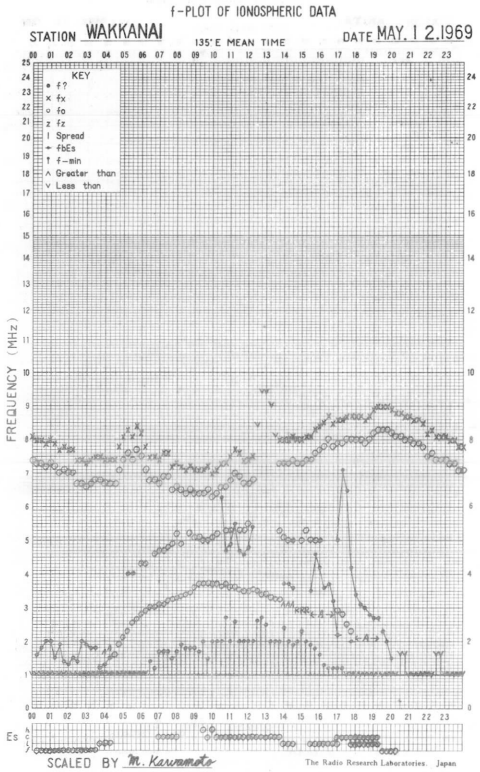
The Radio Research Laboratories. Japan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○ fo
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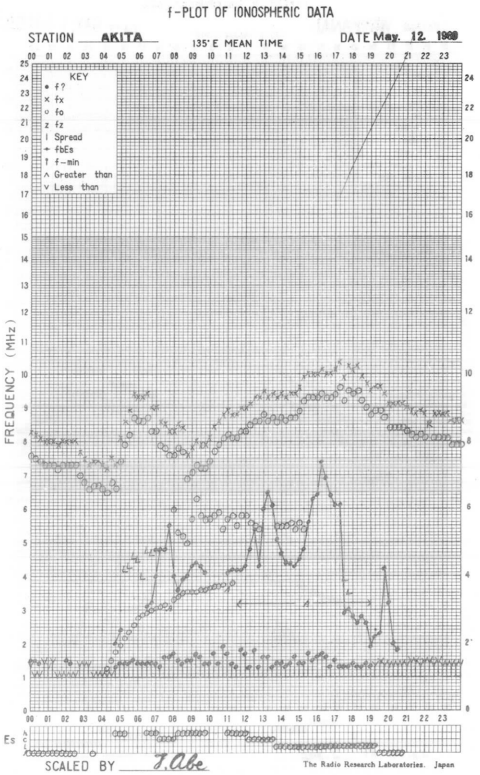
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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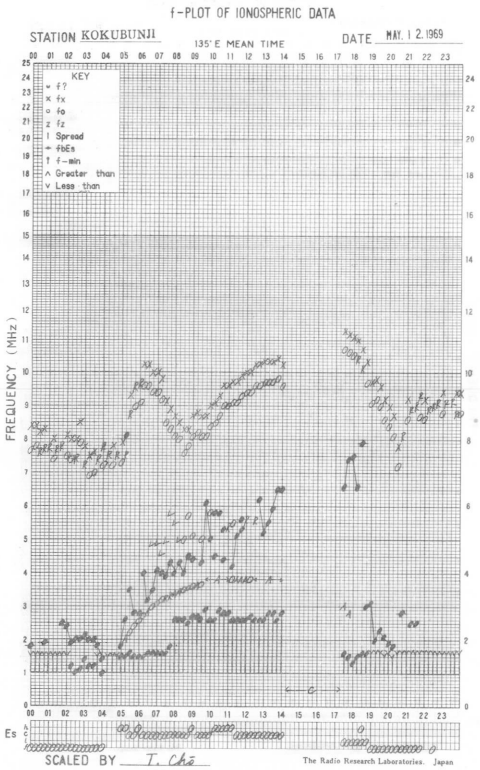
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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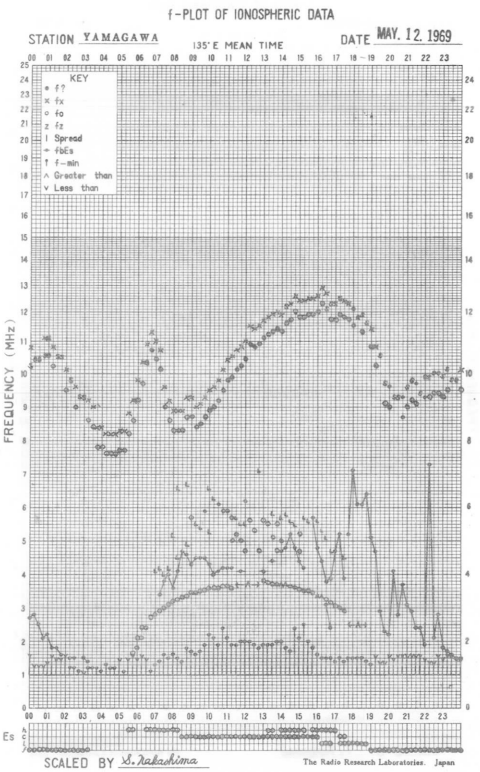
SCALED BY T. Chō
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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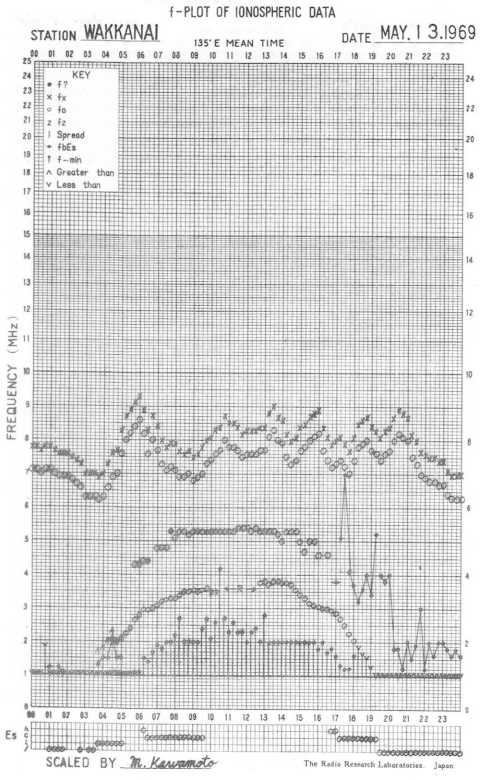
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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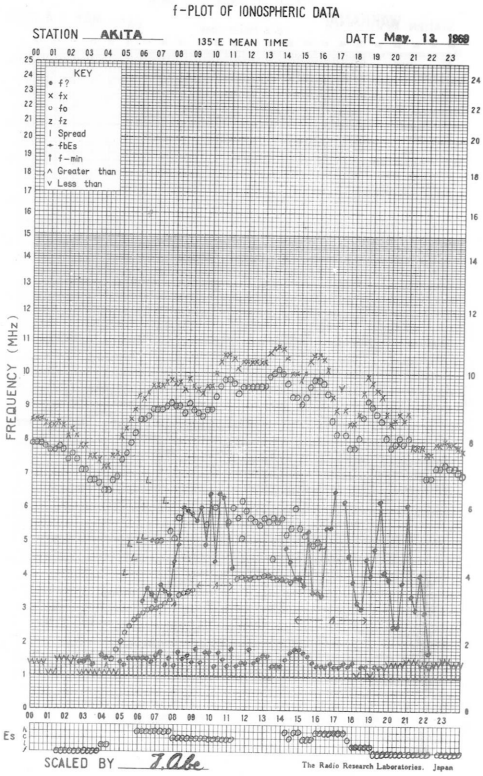
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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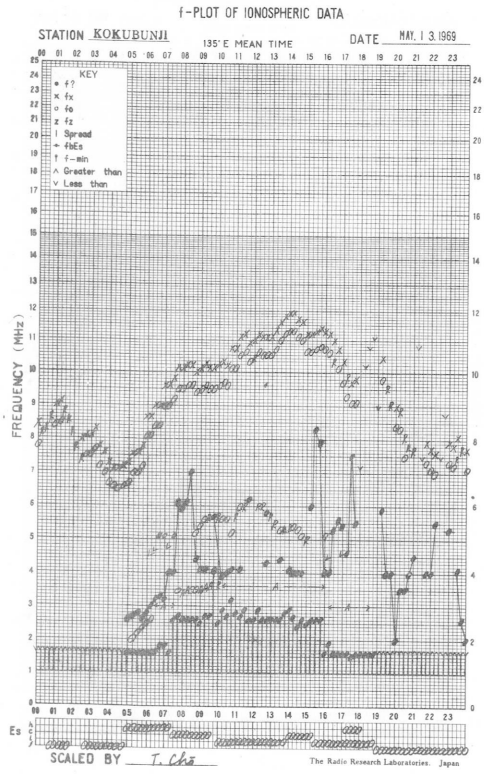
SCALED BY T. Abe
The Radio Research Laboratories. Japan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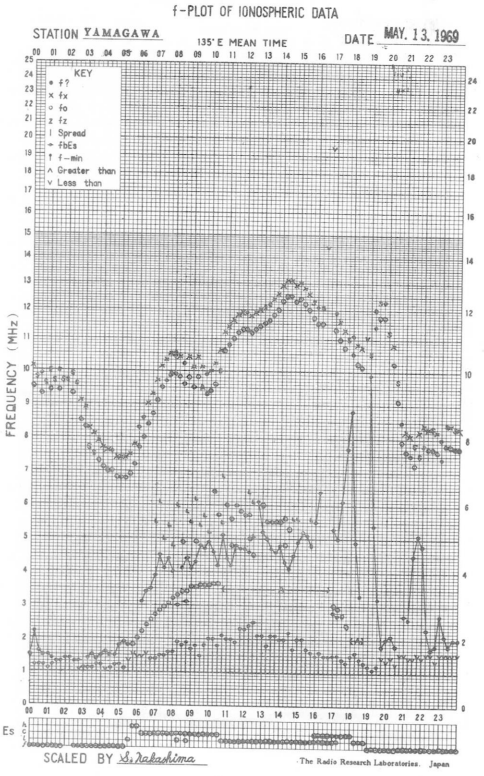
SCALED BY T. Chō
The Radio Research Laboratories. Japan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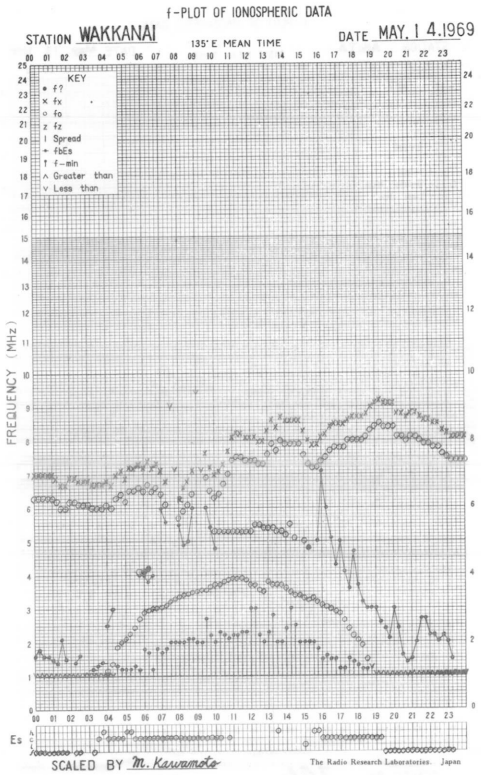
The Radio Research Laboratories. Japan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∨ Less than
FREQUENCY (MHz)
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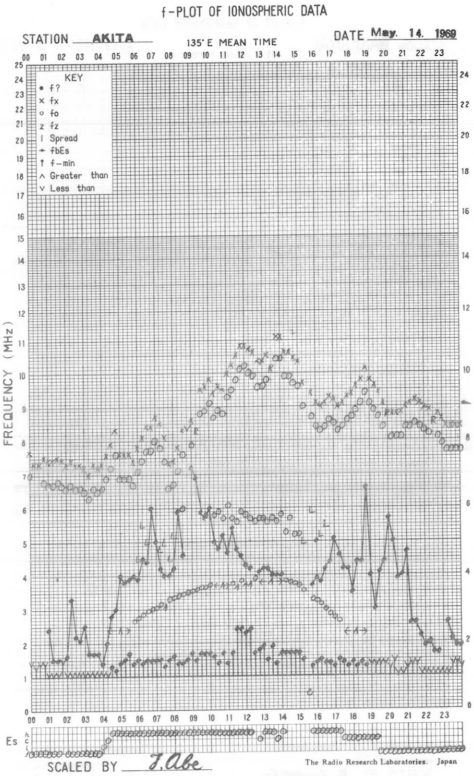
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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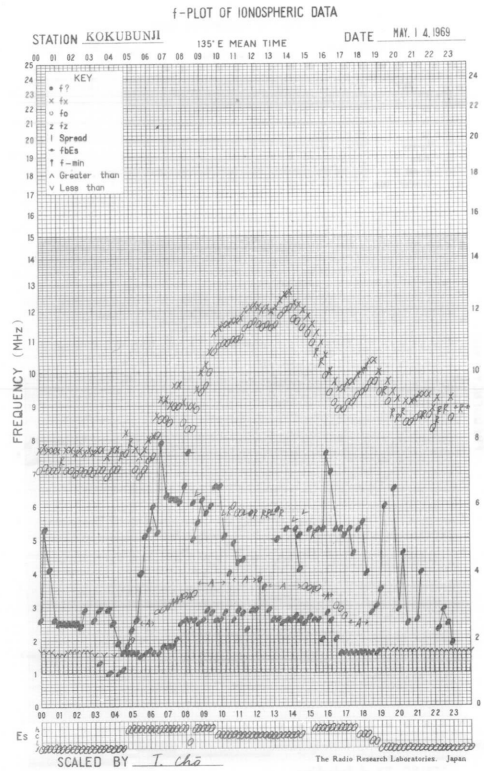
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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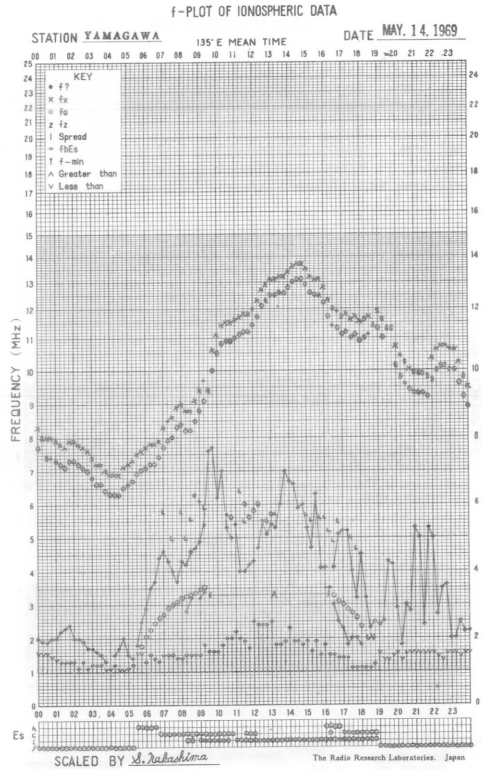
SCALED BY T. Chō
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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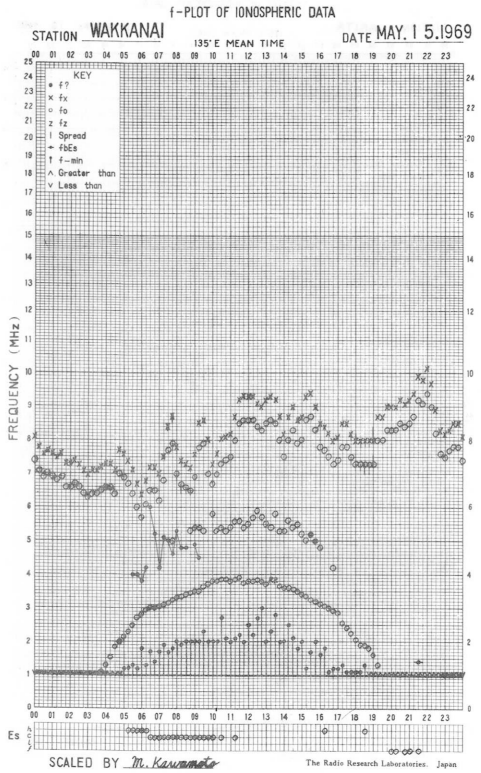
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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○ fo
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FREQUENCY (MHz)
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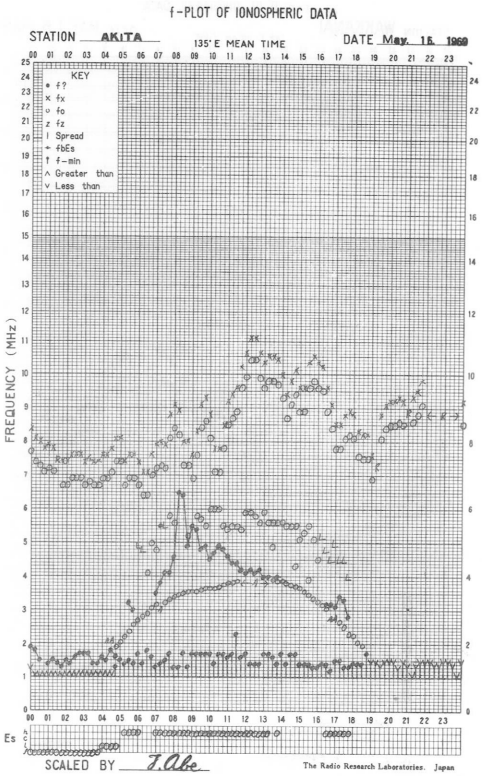
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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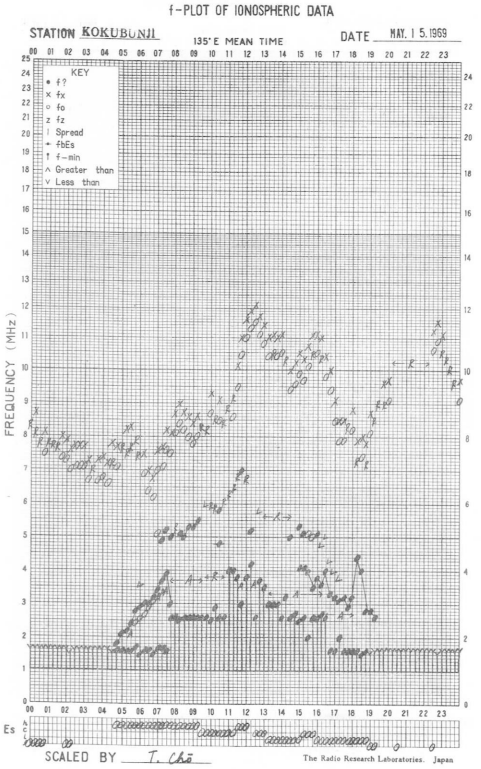
SCALED BY T. Abe
The Radio Research Laboratories. Japan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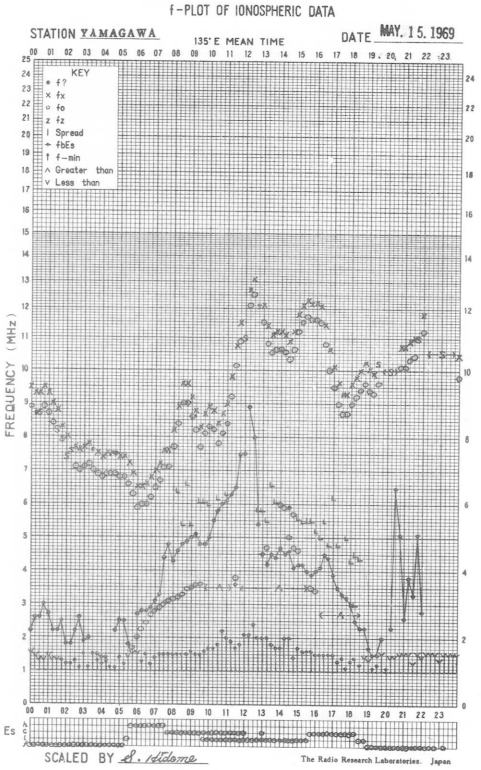
SCALED BY T. Chō
The Radio Research Laboratories. Japan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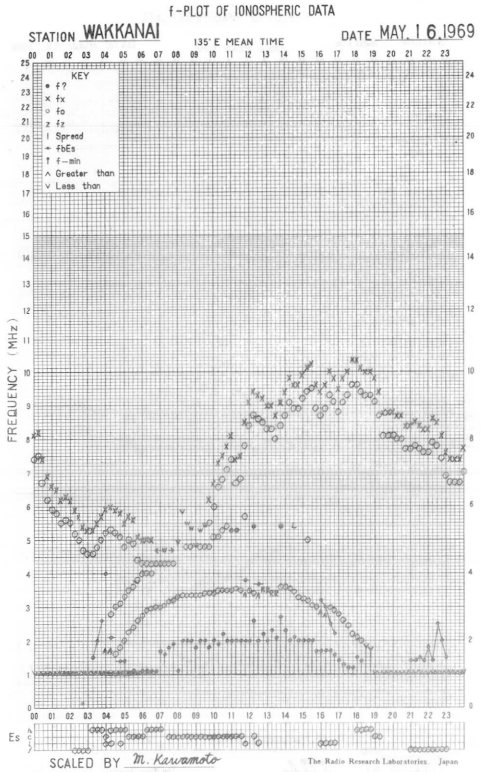
SCALED BY S. Ishiama
The Radio Research Laboratories. Japan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v Less than
FREQUENCY (MHz)
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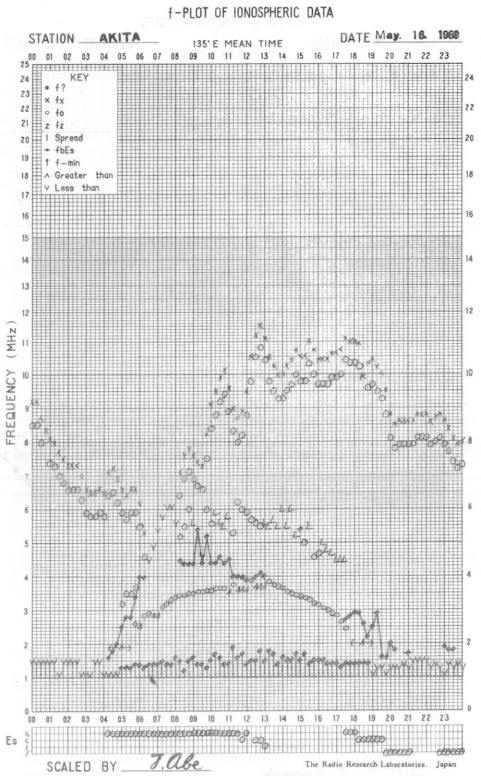
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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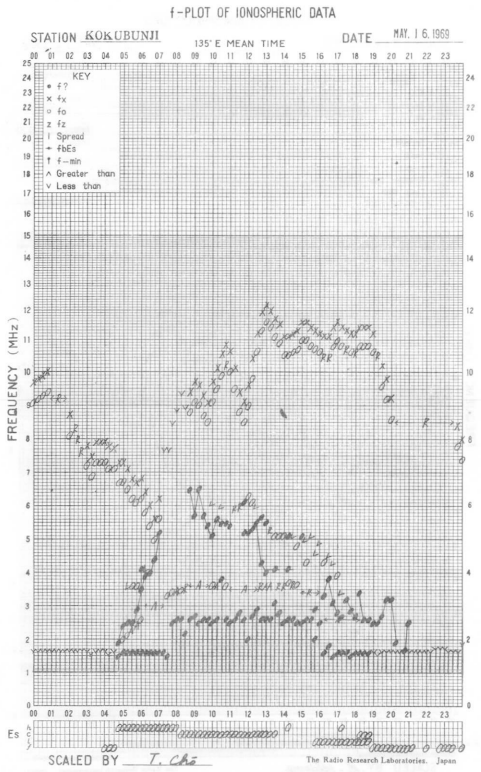
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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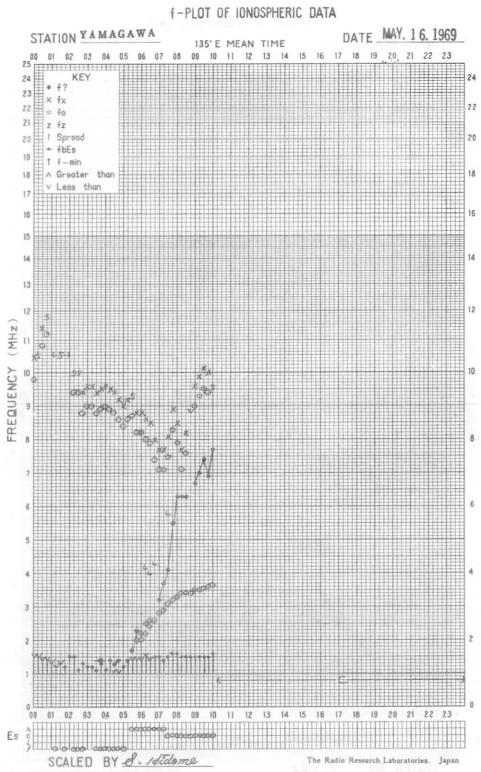
FREQUENCY (MHz)
Es
SCALED BY T. Chō
The Radio Research Laboratories. Japan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STATION YAMAGAWA
135°E MEAN TIME
DATE MAY. 16. 1969
KEY
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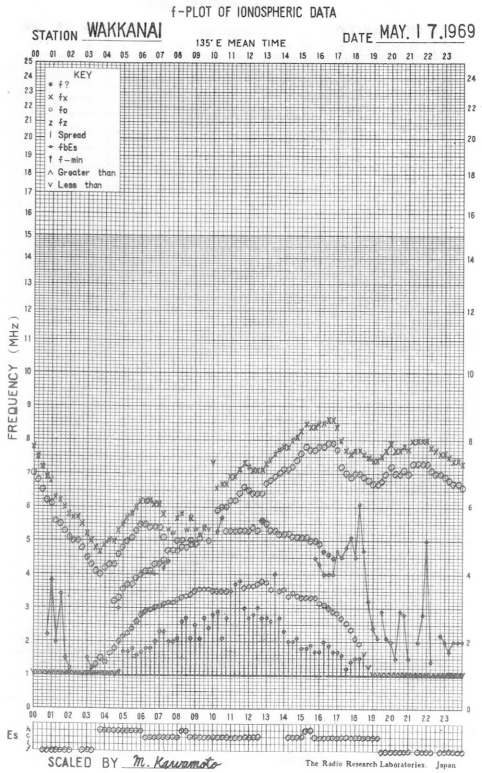
○ fo
z fz
! Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Ichitome
The Radio Research Laboratories. Japan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DATE MAY. 17.1969
KEY
FREQUENCY (MHz)
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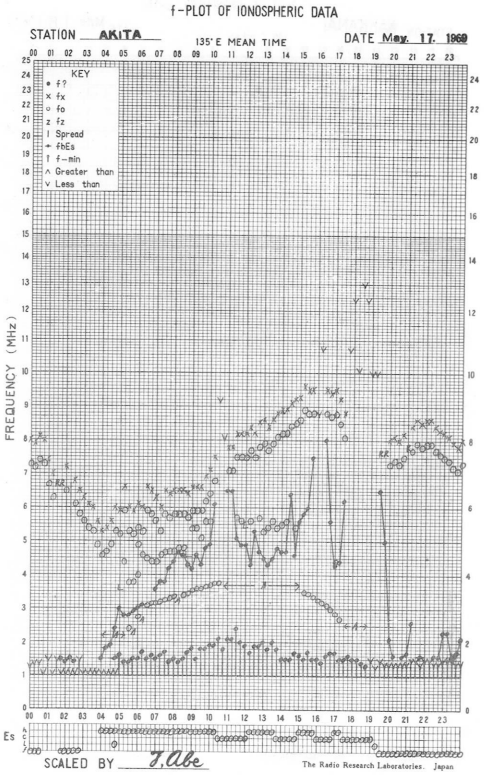
The Radio Research Laboratories. Japan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DATE May. 17. 1969
KEY
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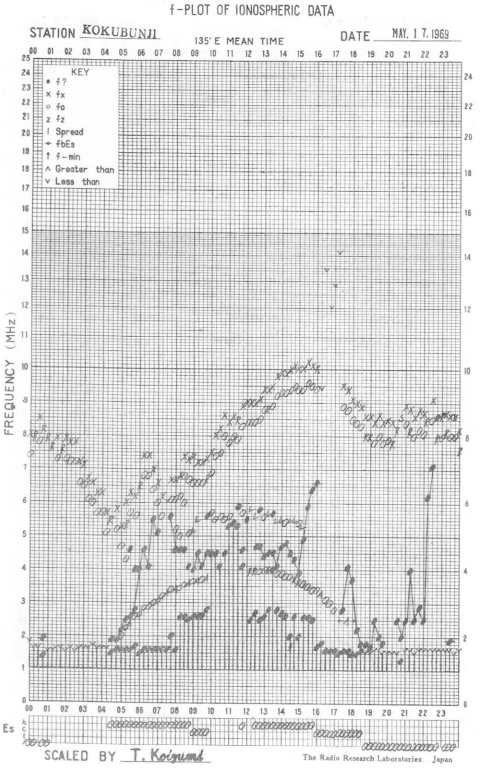
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAY. 17. 1969
KEY
FREQUENCY (MHz)
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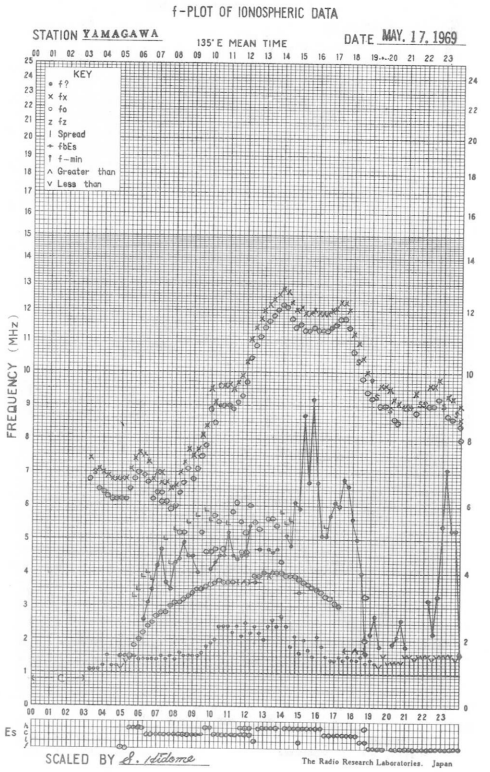
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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DATE MAY. 17, 1969
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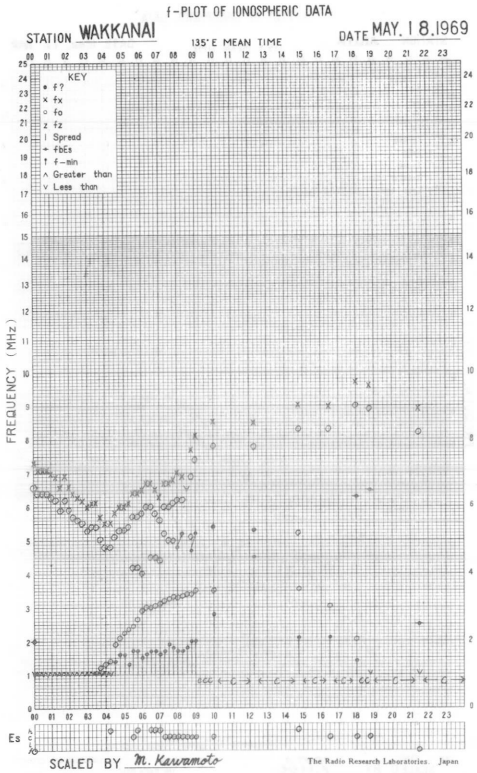
The Radio Research Laboratories. Japan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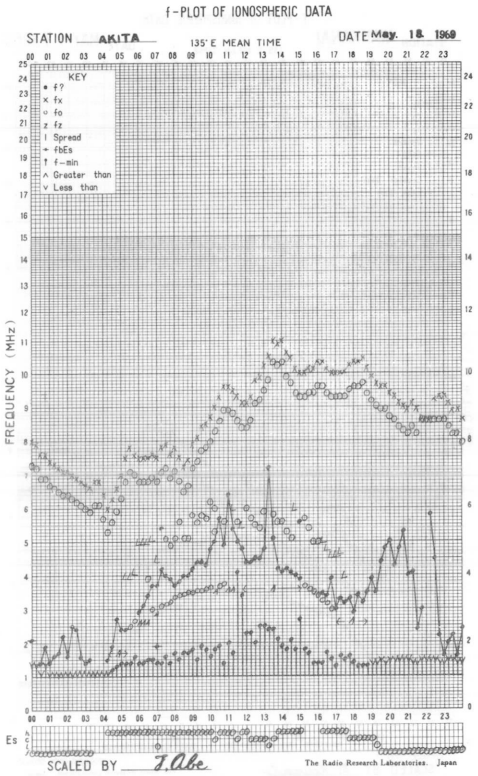
135°E MEAN TIME
DATE MAY. 18.1969
KEY
* f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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○ fo
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↑ f-min
^ Greater than
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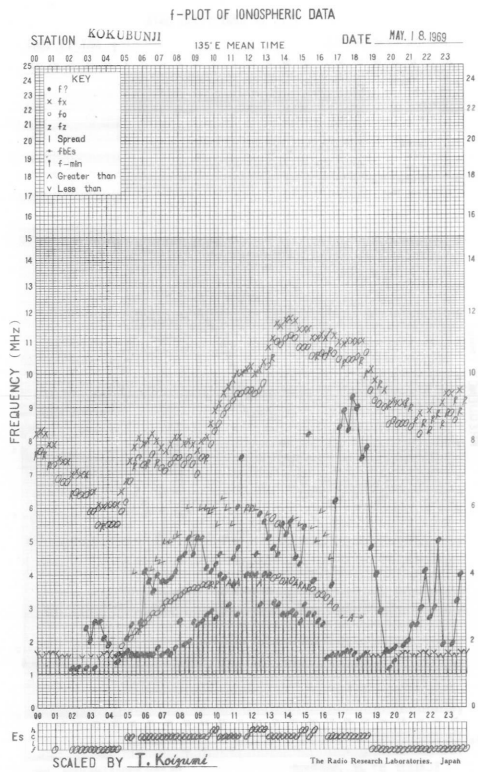
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAY. 18. 1969
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| Spread
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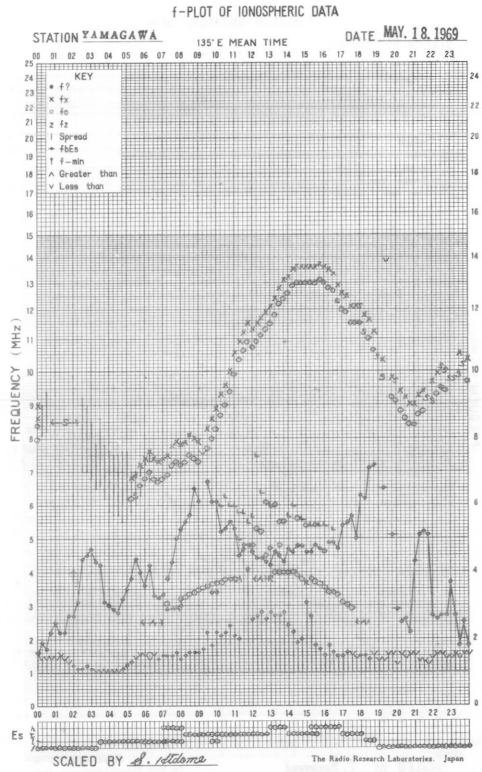
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAY. 18. 1969
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^ Greater than
v Less than
FREQUENCY (MHz)
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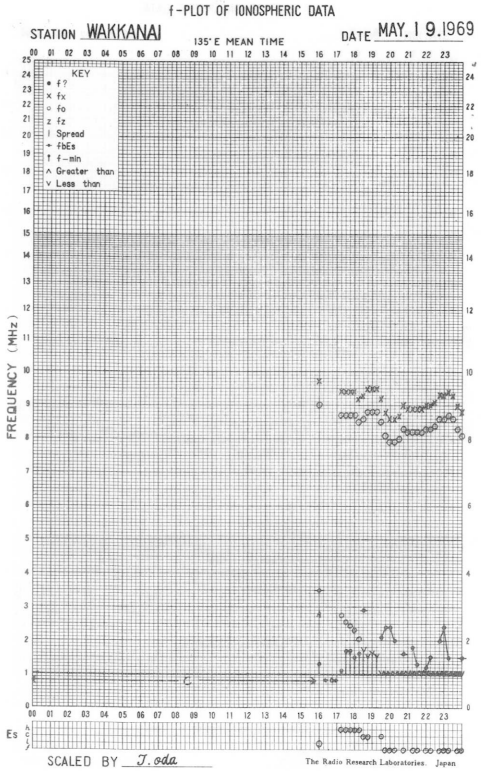
SCALED BY S. Kidoma
The Radio Research Laboratories. Japan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KEY
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○ fo
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| Spread
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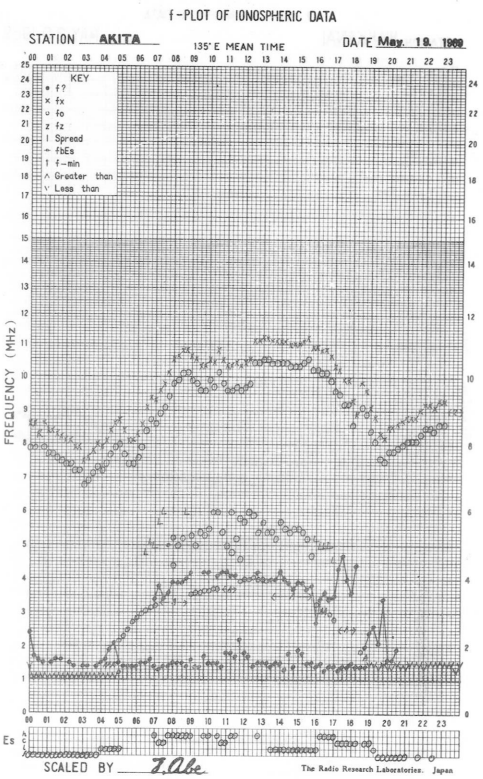
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE May. 19. 1969
KEY
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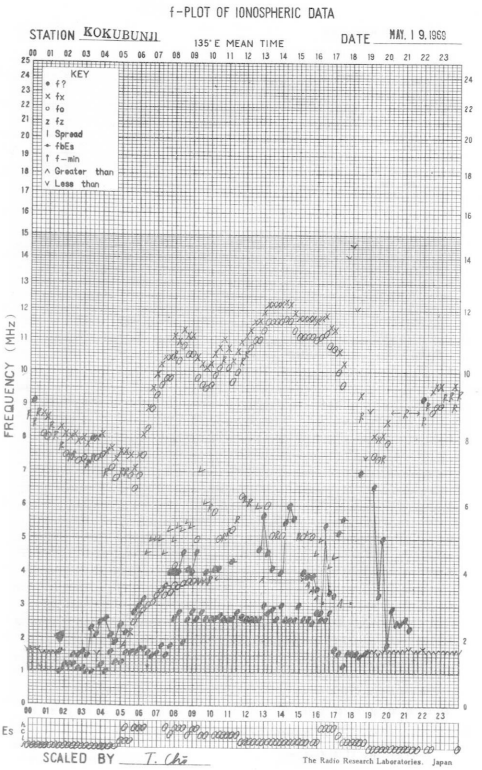
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAY. 19.1969
KEY
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○ fo
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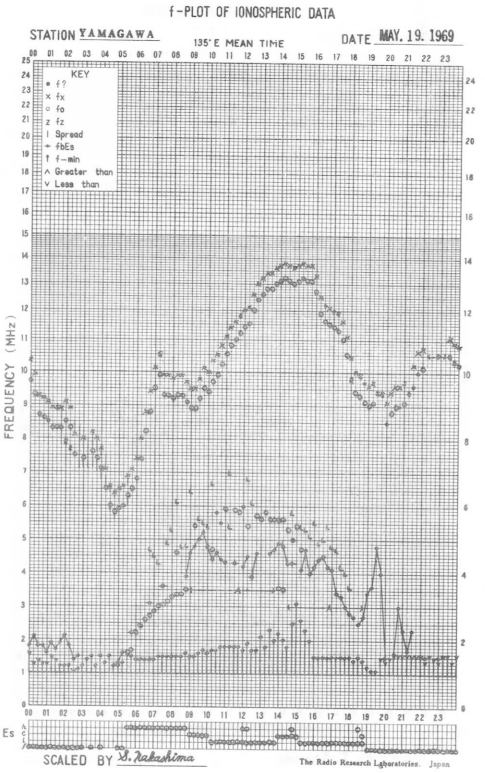
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Ito
The Radio Research Laboratories. Japan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^ Greater than
v Less than
FREQUENCY (MHz)
Es
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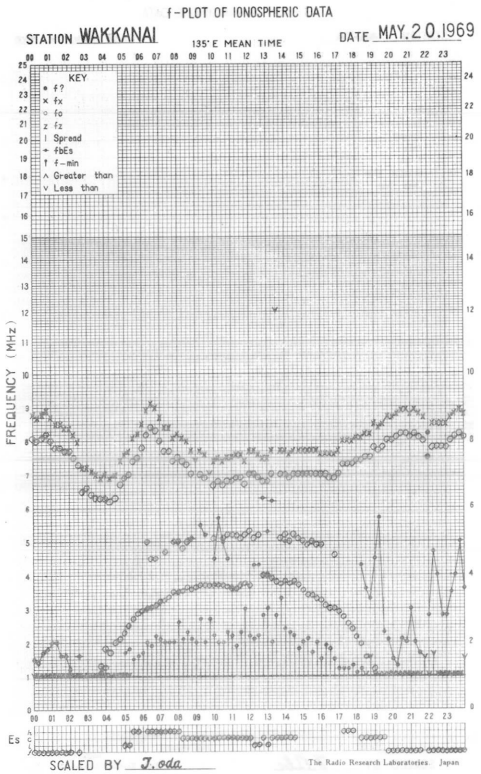
The Radio Research Laboratories. Japan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STATION WAKKANAI
135° E MEAN TIME
DATE MAY. 20. 1969
KEY
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× fx
○ fo
z fz
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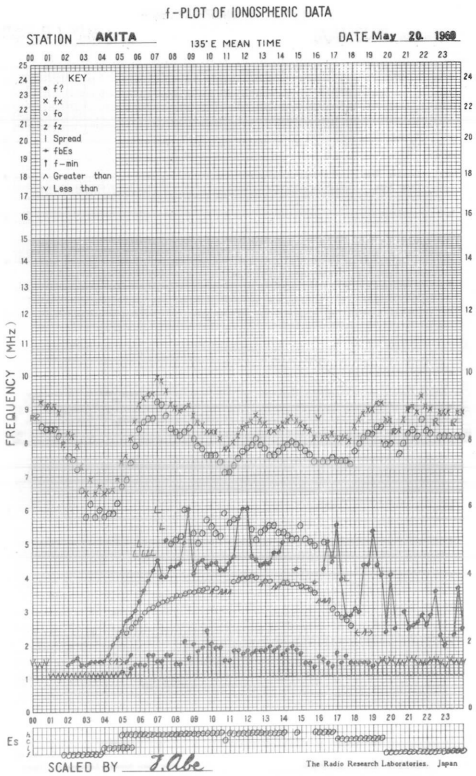
= fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan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STATION AKITA
135° E MEAN TIME
DATE May 20. 1969
KEY
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○ fo
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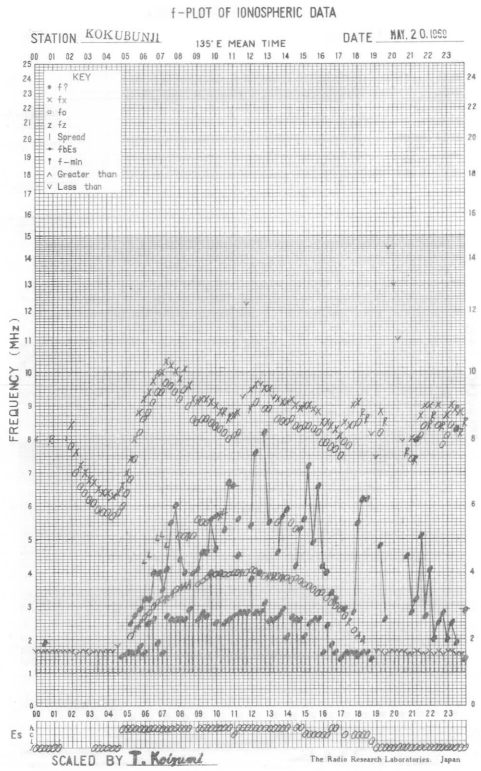
= fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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DATE MAY. 20. 1969
KEY
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○ fo
z fz
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∧ Greater than
∨ Less than
FREQUENCY (MHz)
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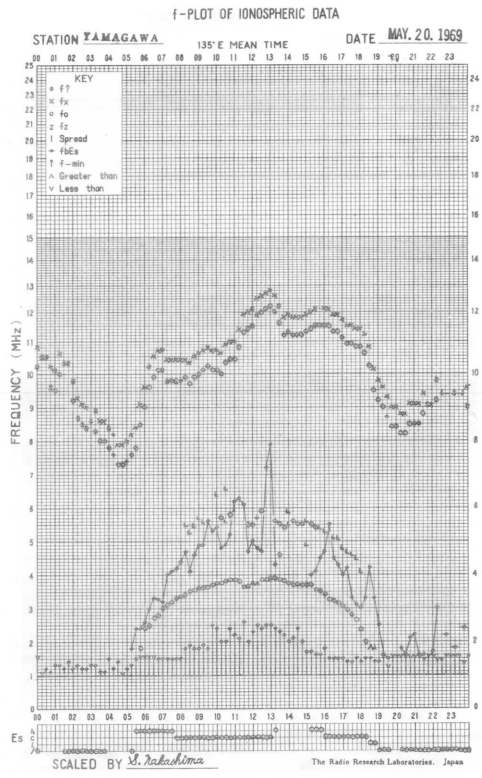
SCALED BY T. Koinumi
The Radio Research Laboratories. Japan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KEY
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FREQUENCY (MHz)
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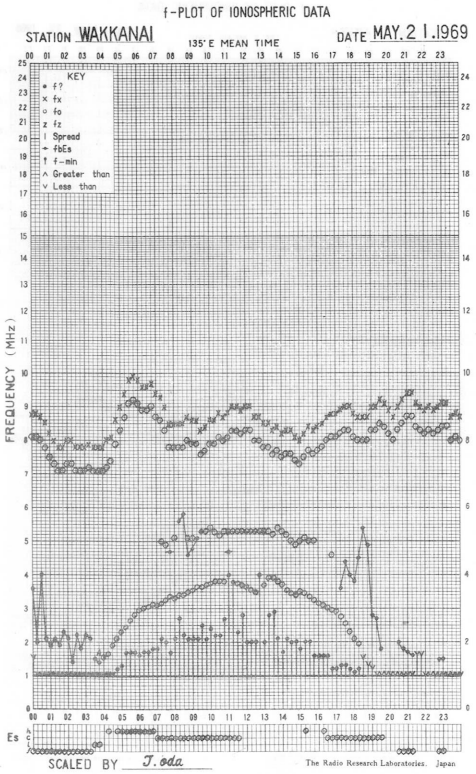
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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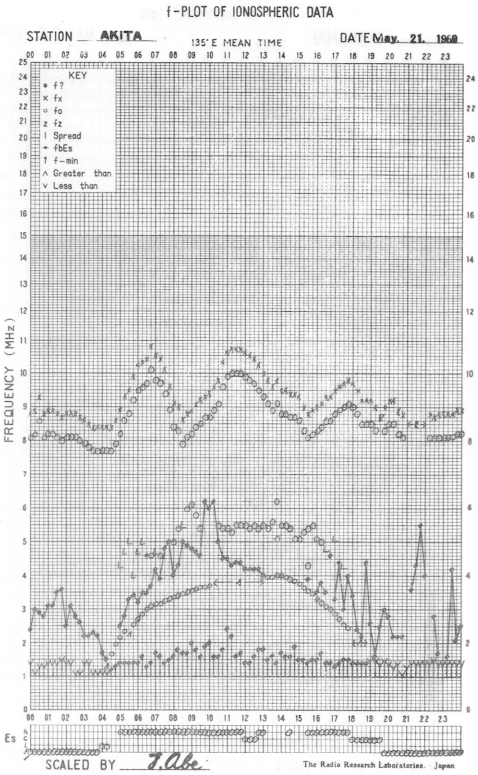
135°E MEAN TIME
DATE MAY. 21. 1969
KEY
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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DATE May. 21. 1969
KEY
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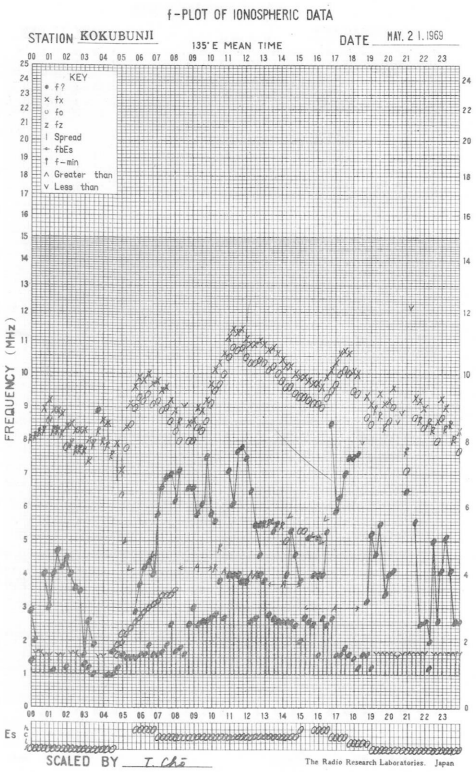
SCALED BY T. Abe
The Radio Research Laboratories. Japan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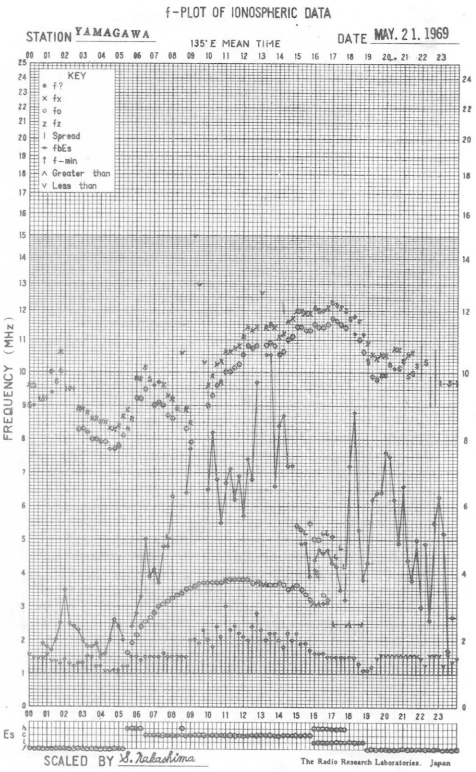
SCALED BY T. Ichi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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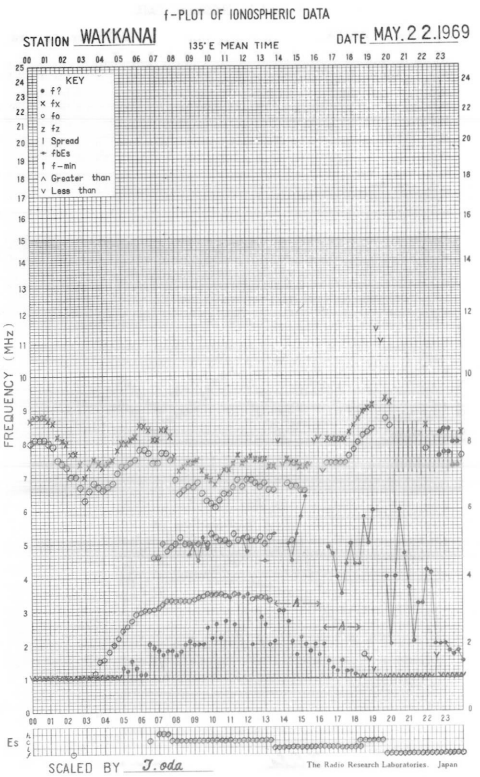
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAY. 22. 1969
KEY
* f?
× fx
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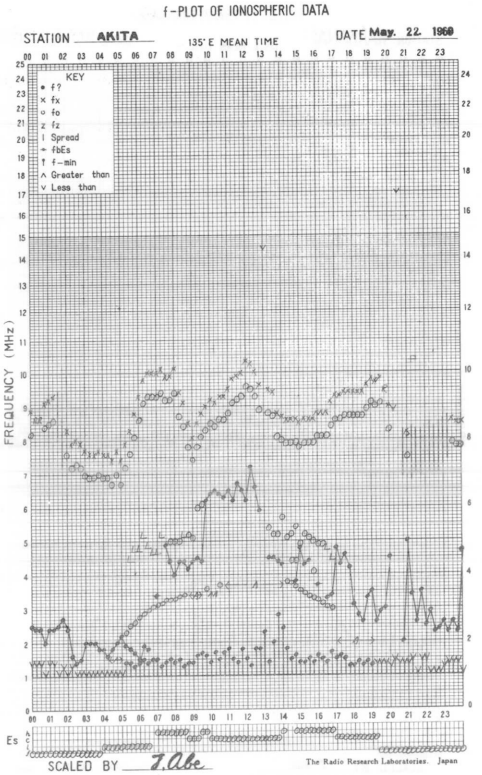
† f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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○ fo
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v Less than
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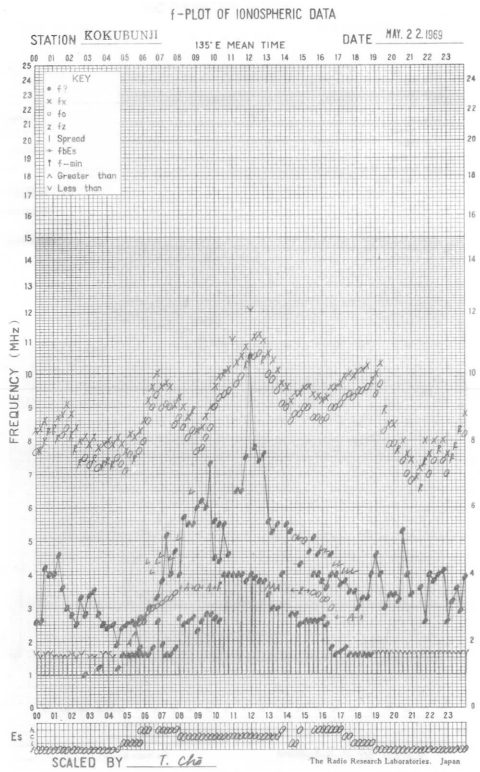
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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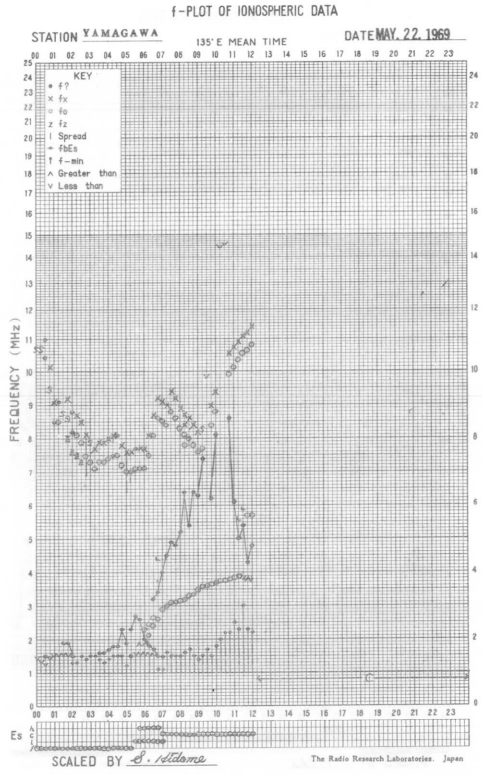
SCALED BY T. Cho
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAY. 22. 1969
KEY
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^ Greater than
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FREQUENCY (MHz)
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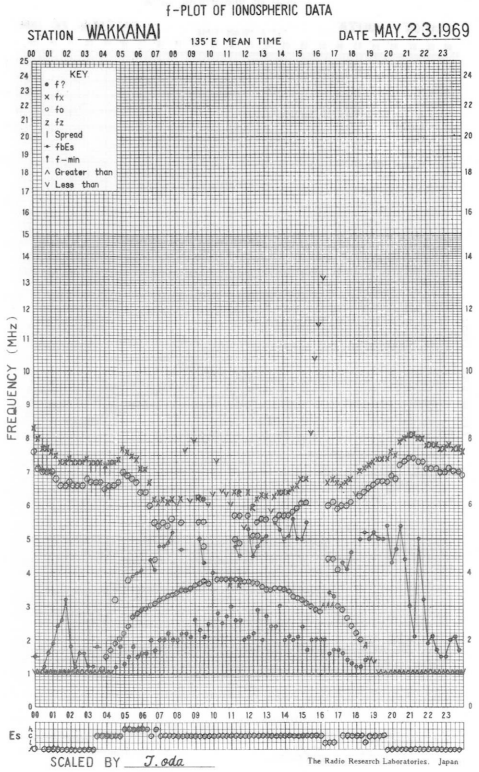
SCALED BY S. Kitamura
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 23.1969



SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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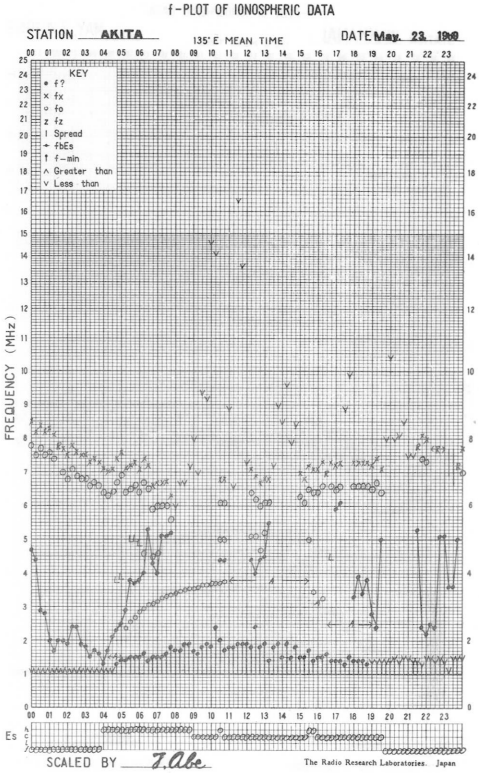

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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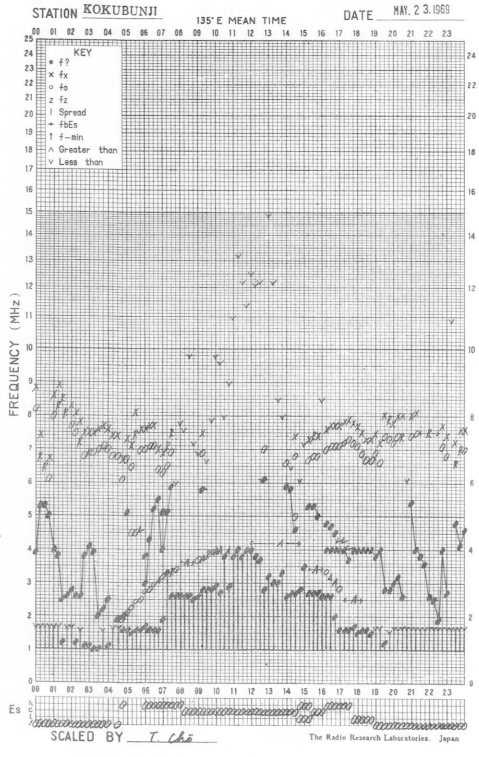

SCALED BY T. Ito

The Radio Research Laboratories. Japan

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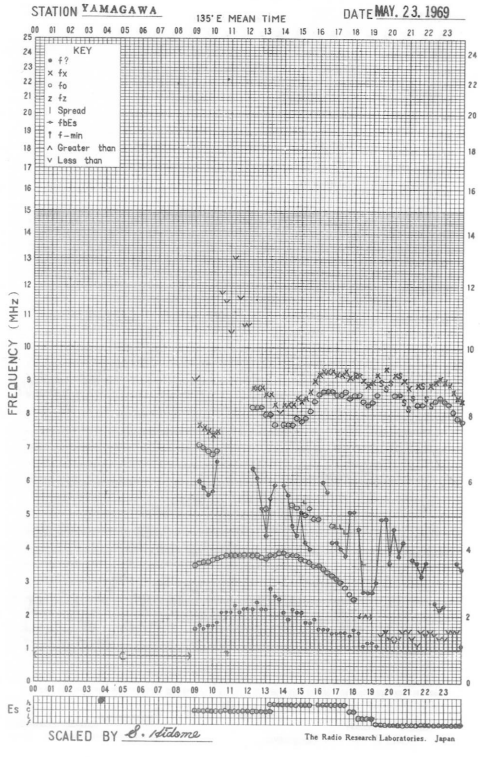
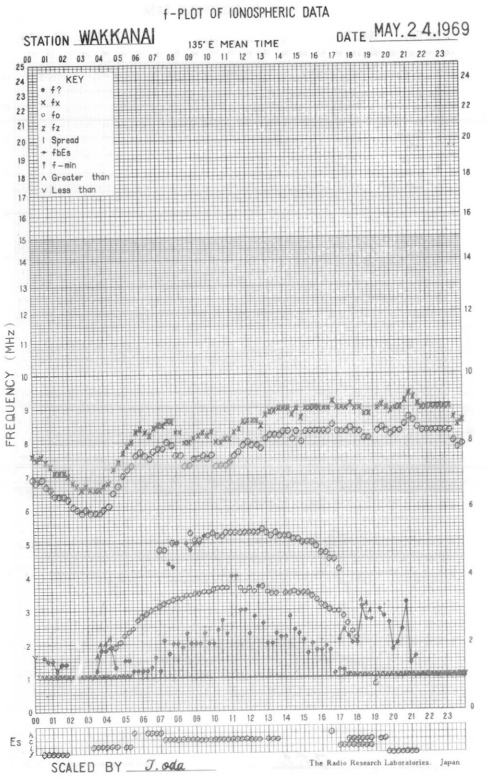


SCALED BY S. Kitsome

The Radio Research Laboratories. Japan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STATION WAKKANAI
135°E MEAN TIME
DATE MAY. 24. 1969
KEY
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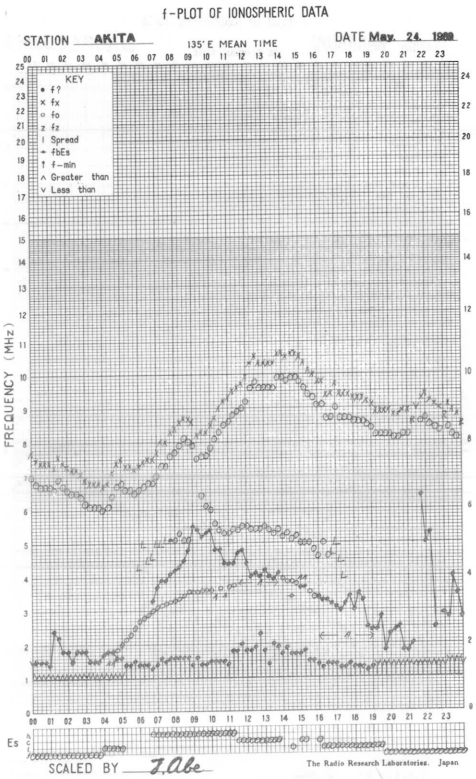
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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STATION AKITA
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DATE May. 24. 1969
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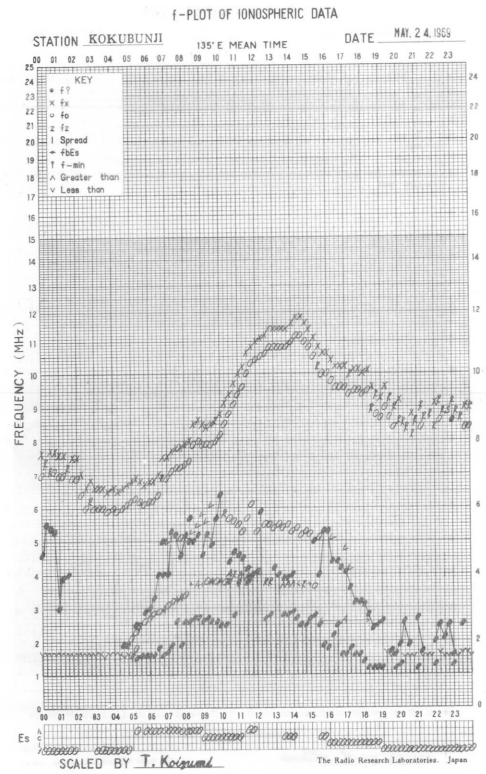
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAY. 24. 1969
KEY
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× fx
○ fo
z fz
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⊢ fbEs
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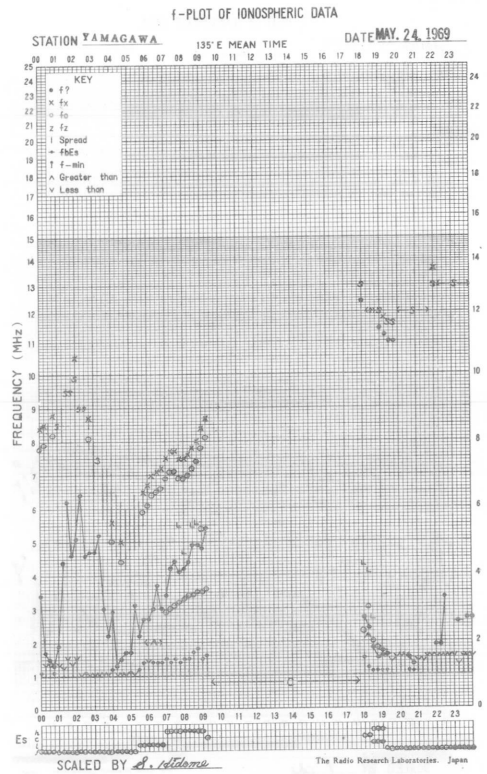
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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STATION YAMAGAWA
135°E MEAN TIME
DATE MAY. 24. 1969
KEY
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× fx
○ fo
z fz
I Spread
⊢ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
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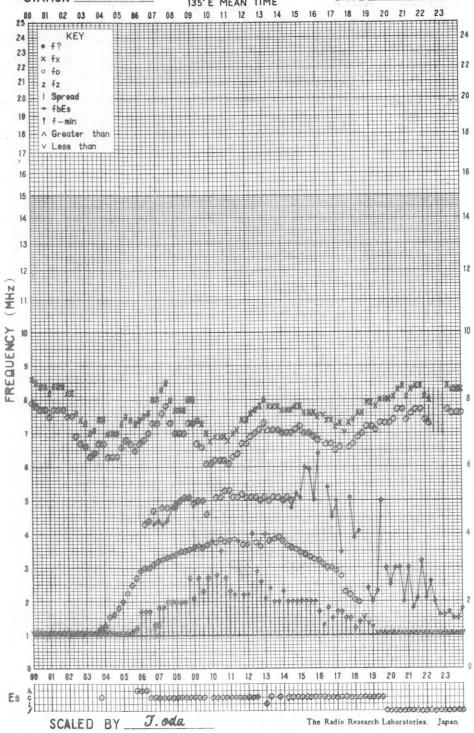
SCALED BY S. Ishitomo
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAY. 25. 1969



SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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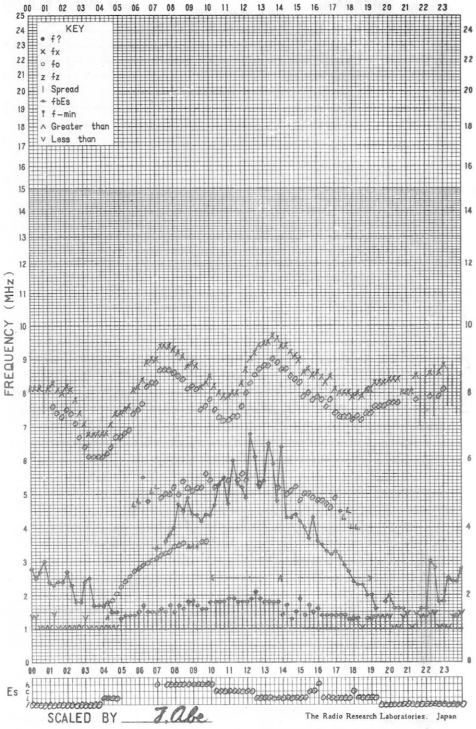

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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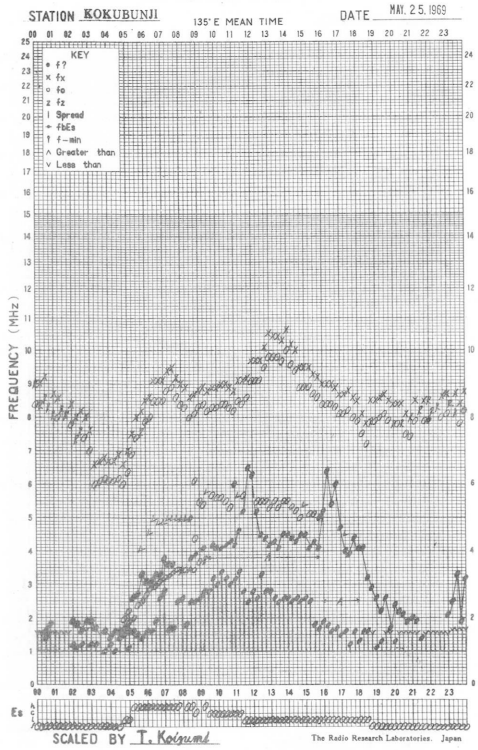
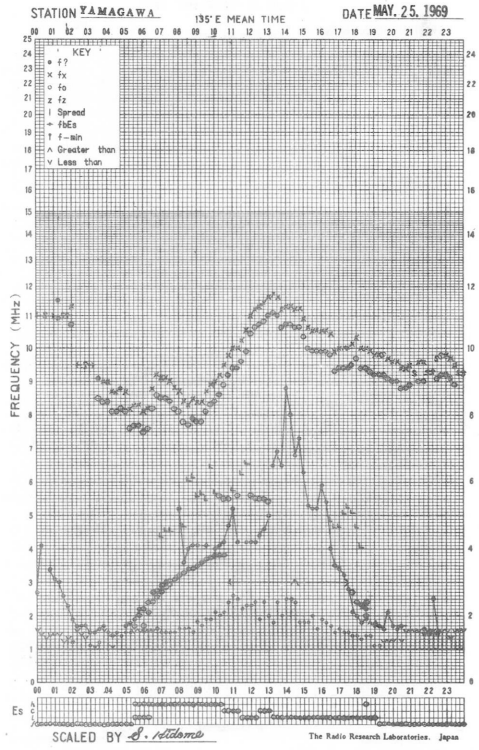


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

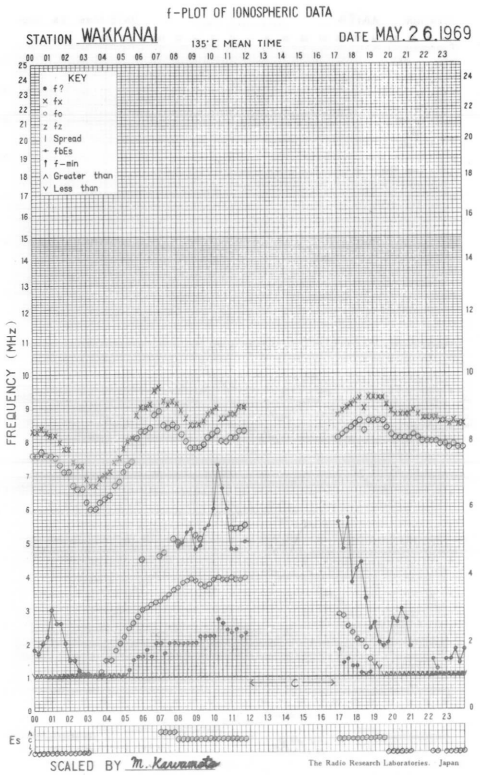
f-PLOT OF IONOSPHERIC DATA

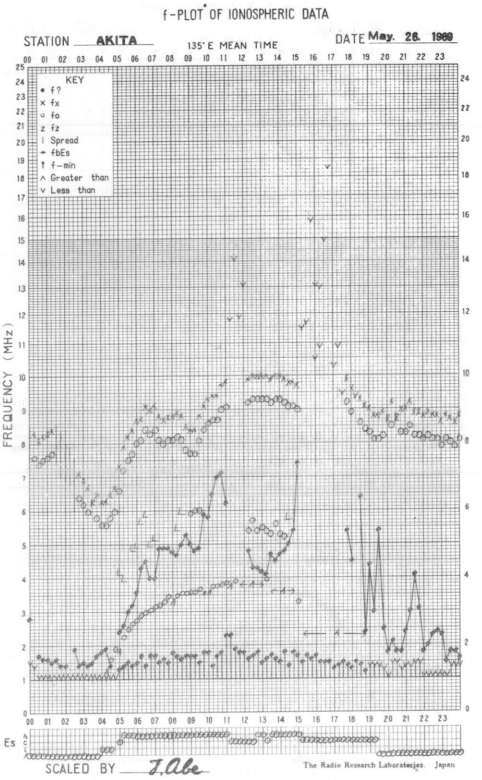
STATION YAMAGAWA 135°E MEAN TIME DATE MAY. 25. 1969

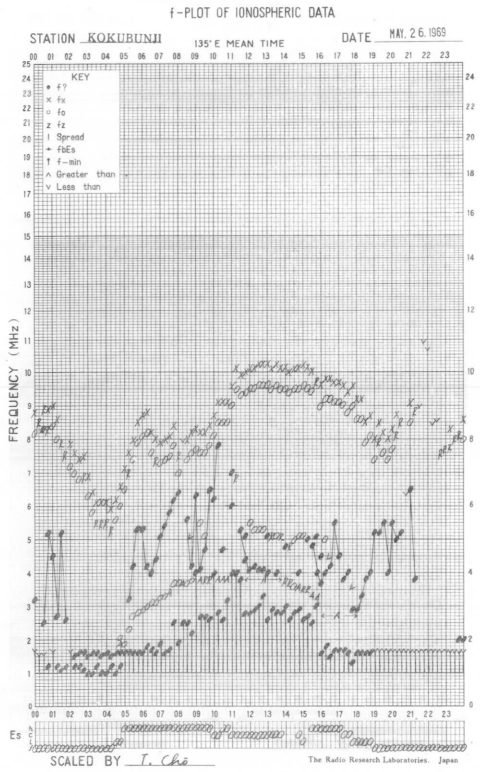


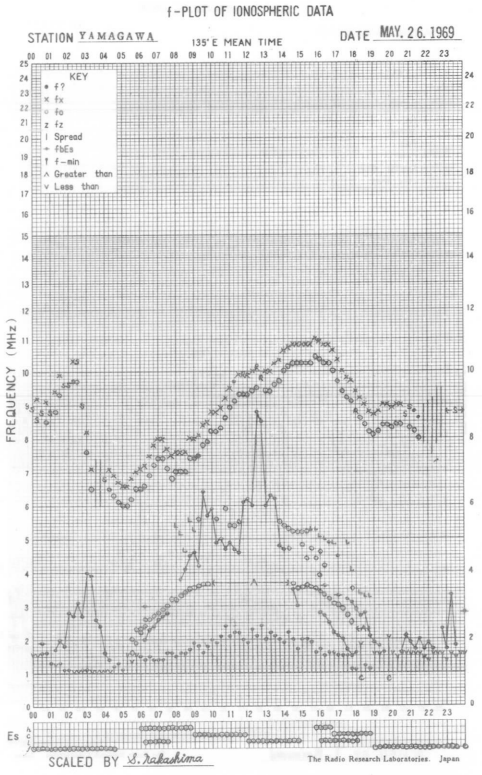
SCALED BY S. Ichidome

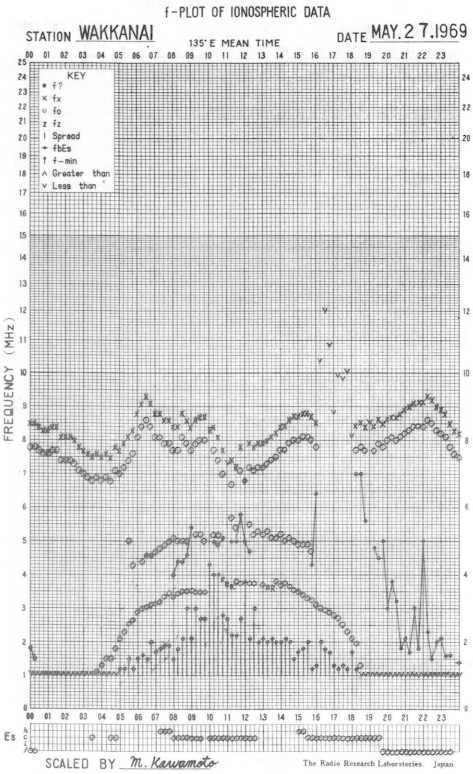
The Radio Research Laboratories. Japan

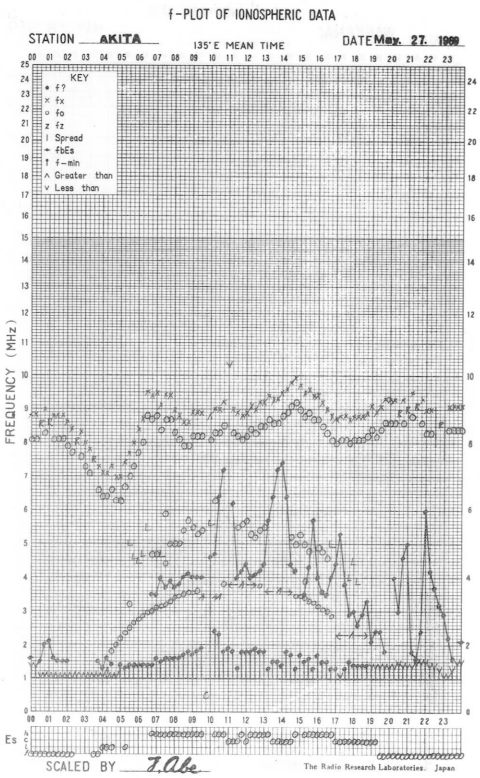

f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAY. 26. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan

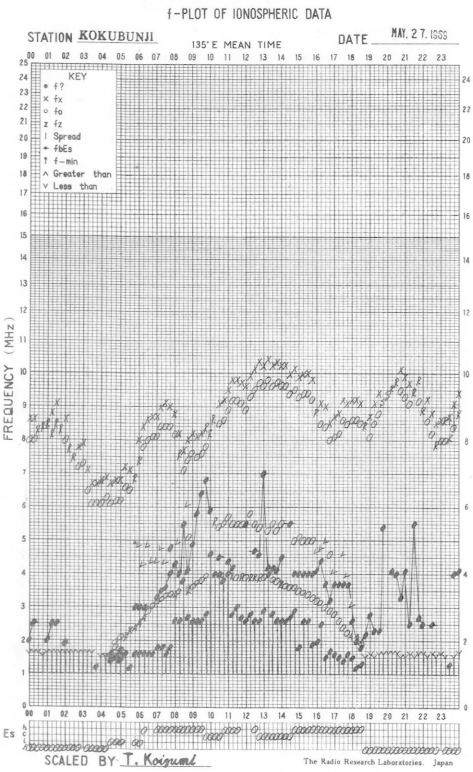

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE May. 26. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY I. Abe
The Radio Research Laboratories. Japan

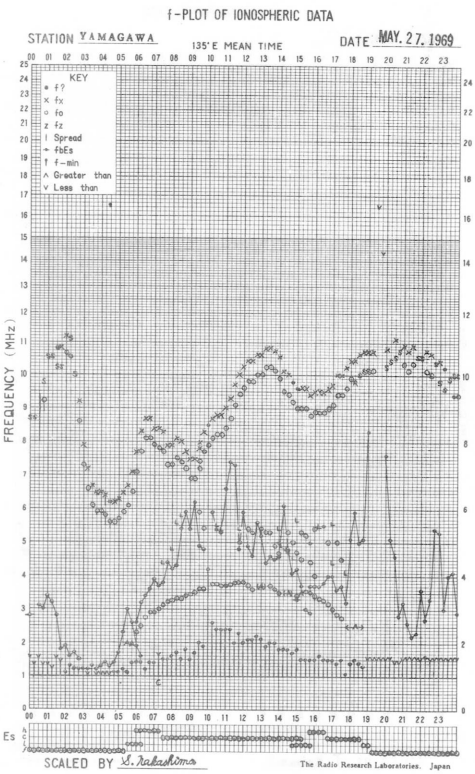

f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE MAY. 26. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Chō
The Radio Research Laboratories. Japan

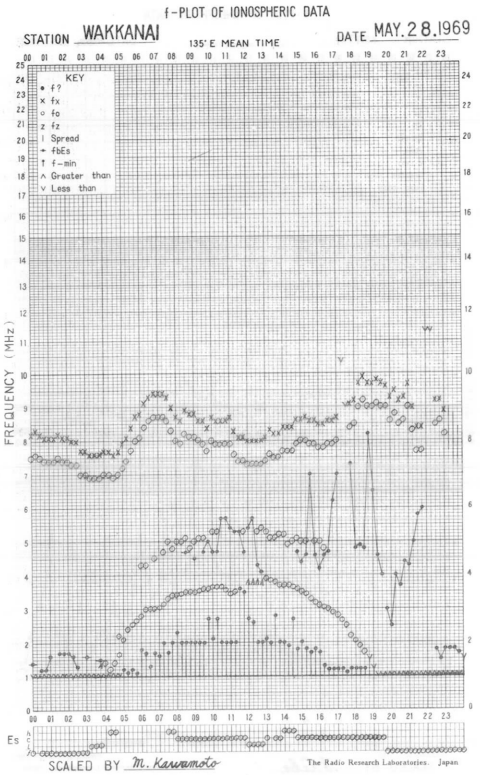

f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE MAY. 26. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan

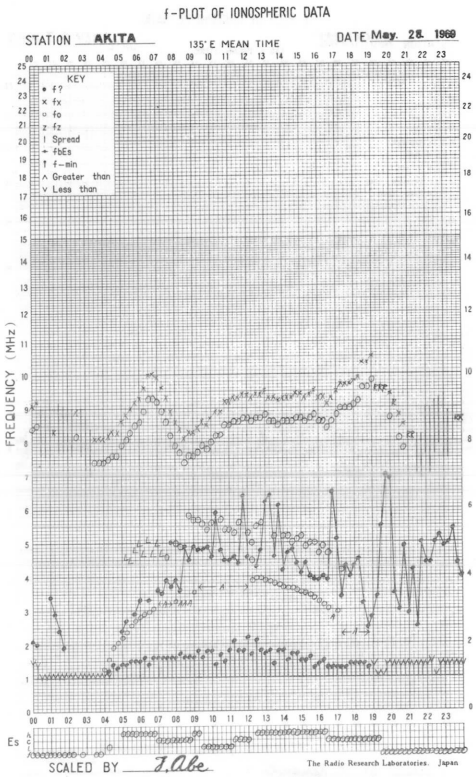

f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE MAY. 27. 1969
KEY
* f?
× fx
○ fo
z fz
| Spread
← fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan

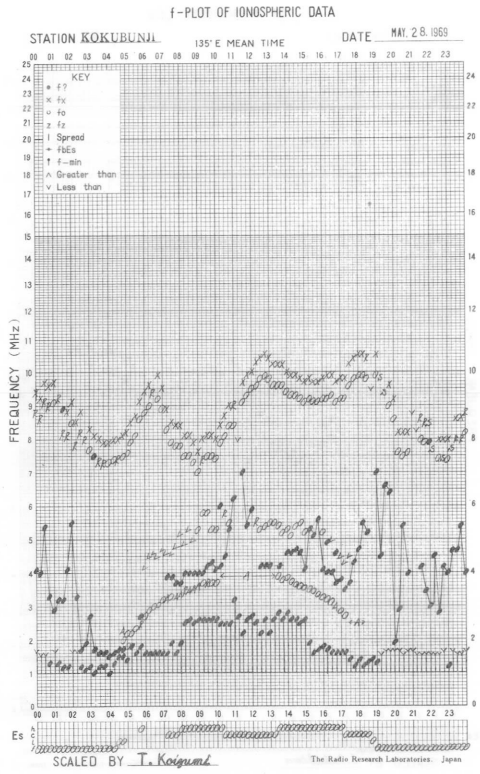

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE May. 27. 1969
KEY
* f?
× fx
○ fo
z fz
| Spread
← fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan

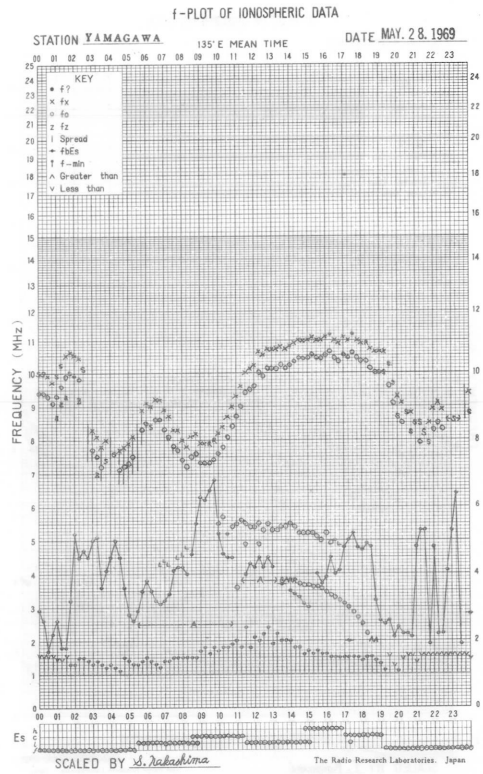

f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE MAY. 27. 1969
KEY
* f?
× fx
○ fo
z fz
| Spread
← fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan

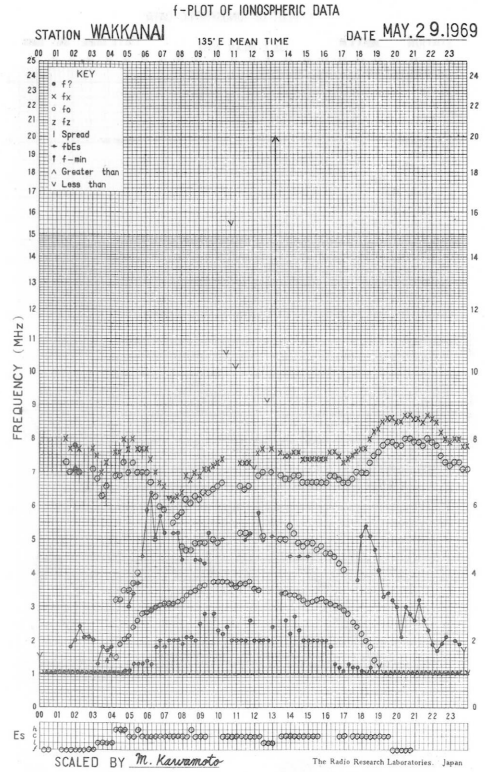

f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAY. 27. 1969
KEY
* f?
× fx
○ fo
z fz
| Spread
← fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Takashima
The Radio Research Laboratories. Japan

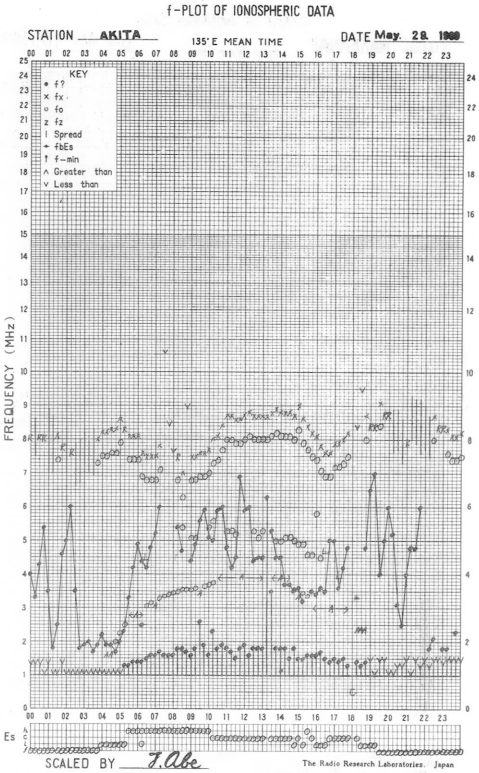

f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAY. 28. 1969
KEY
● f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan

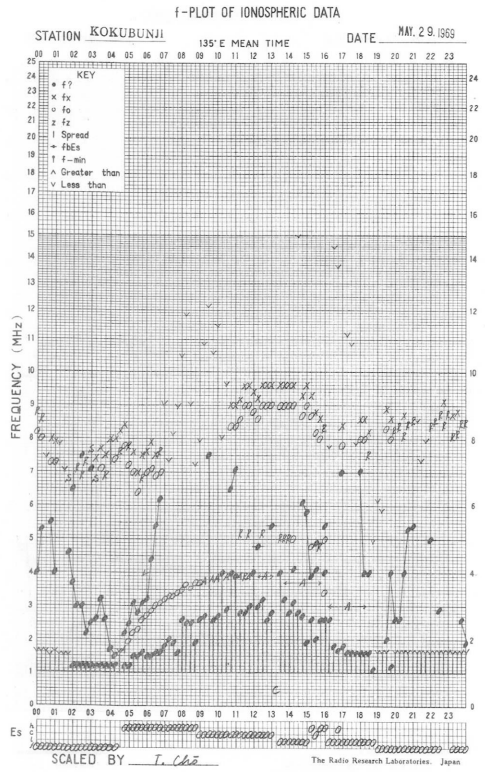

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE May. 28. 1969
KEY
● f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan

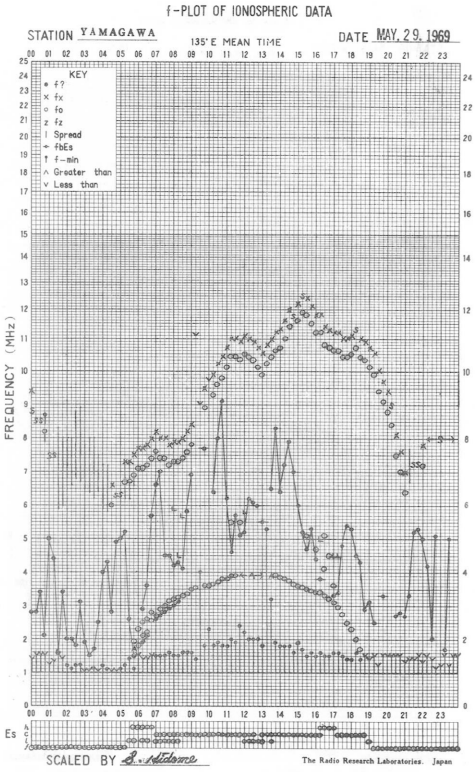

f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE MAY. 28. 1969
KEY
● f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koigumi
The Radio Research Laboratories. Japan

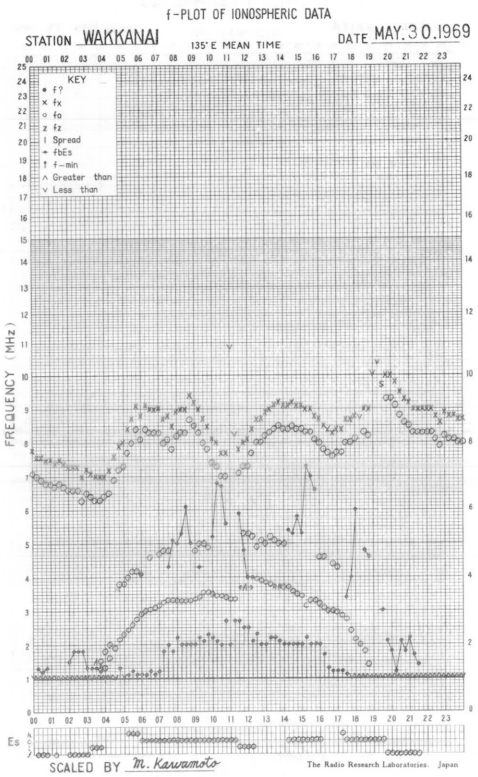

f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE MAY. 28. 1969
KEY
● f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan

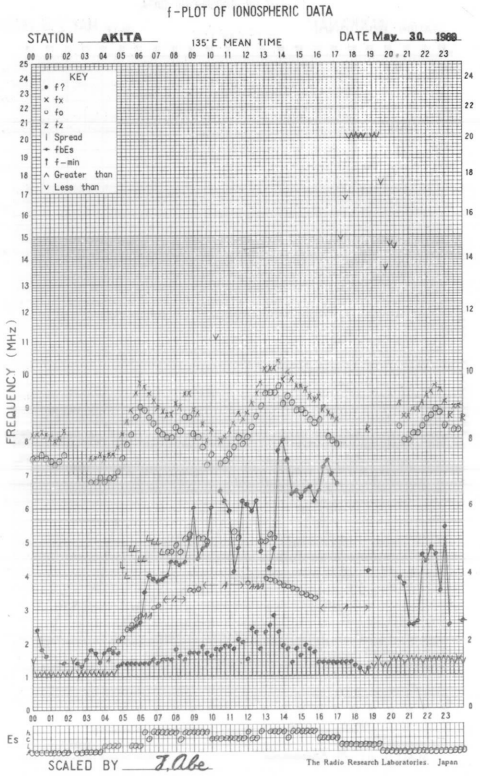

f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE MAY. 29. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan

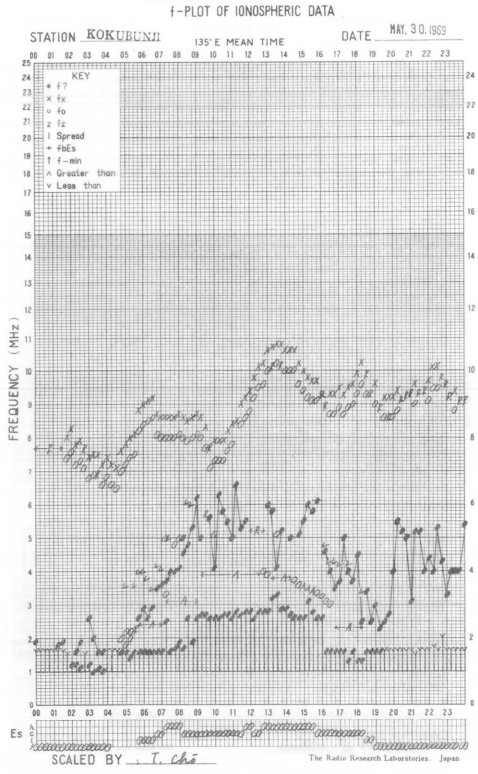

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE May. 28. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan

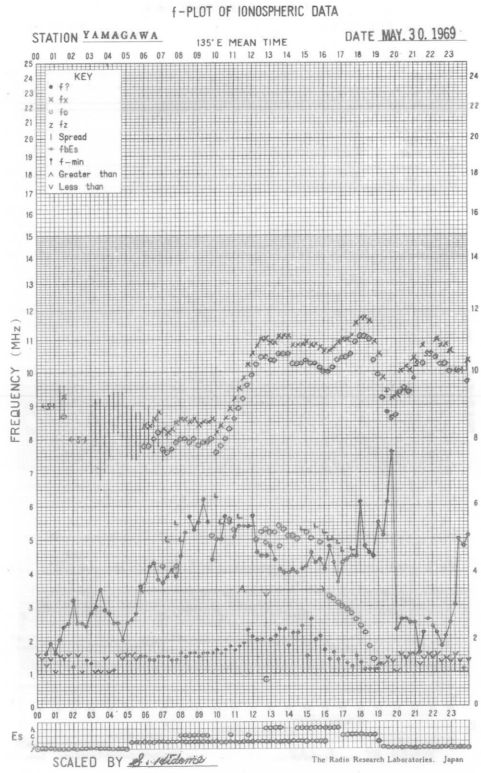

f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE MAY. 29. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY I. Chō
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAY. 29. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Ishikawa
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAY. 30. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE May. 30. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE MAY. 30. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Chō
The Radio Research Laboratories. Japan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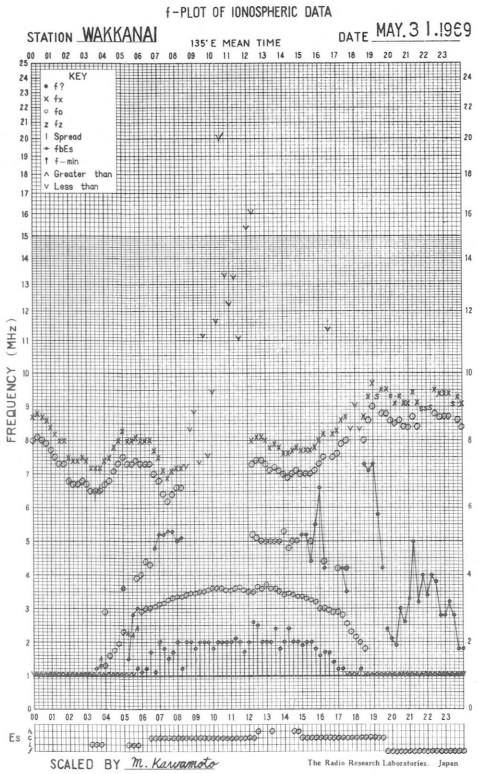
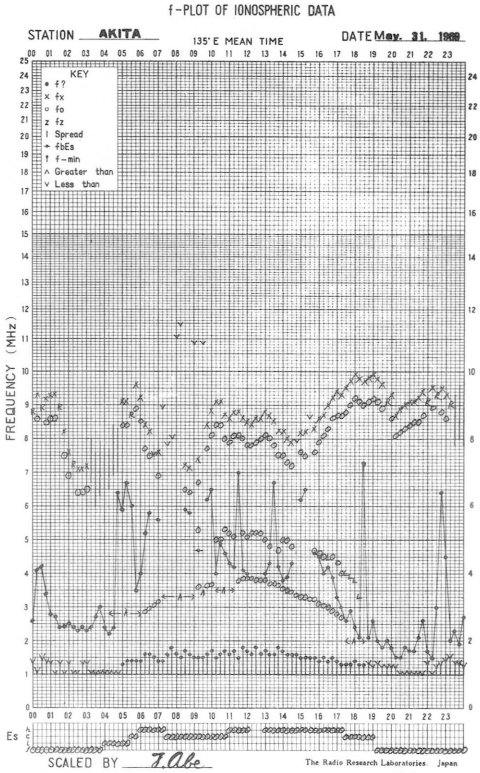
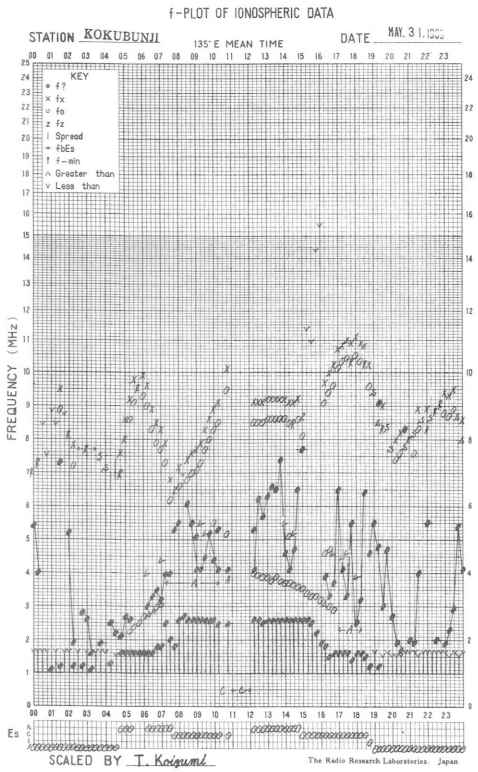
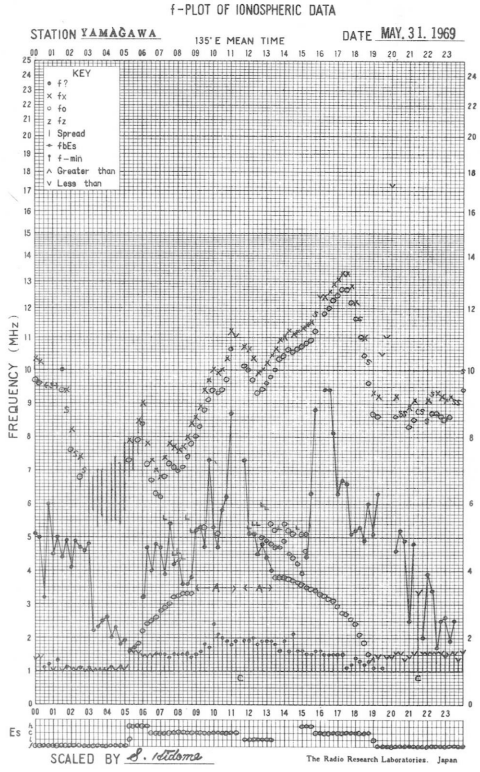
STATION YAMAGAWA
135° E MEAN TIME
DATE MAY. 30. 1969
KEY
• f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Matsumoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAY. 31. 1969
KEY
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE May. 31. 1969
KEY
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan


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


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE MAY. 31. 1969
KEY
FREQUENCY (MHz)
Es
SCALED BY S. Ichitomo
The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: May 1969
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	6	6	6	(8)	6	0	0	0	(0)	0
2	8	8	8	8	8	0	0	0	1	0
3	7	7	7	19	7	0	1	1	2	1
4	9	8	10	7	11	1	1	1	1	1
5	6	6	6	6	6	0	0	0	0	0
6	7	7	8	8	7	1	1	1	1	1
7	8	8	10	11	8	1	2	2	2	1
8	12	11	12	-	12	2	1	2	-	2
9	16	9	13	6	12	2	1	2	0	2
10	6	6	6	7	6	0	0	0	0	0
11	7	6	6	10	7	0	0	1	2	0
12	9	8	10	-	9	1	1	1	-	1
13	8	6	6	6	7	0	0	0	0	0
14	6	6	6	(6)	6	0	0	1	(1)	0
15	5	6	6	6	5	0	0	0	0	0
16	6	6	6	10	6	0	0	1	1	0
17	10	11	11	9	10	1	1	1	1	1
18	10	11	12	12	10	1	2	1	1	1
19	10	9	11	18	11	1	1	1	1	1
20	16	12	12	12	15	2	1	1	2	1
21	11	11	11	18	11	2	2	1	1	2
22	16	28	16	37	20	0	1	0	2	1
23	18	17	10	7	21	1	0	1	1	1
24	(8)	7	9	7	8	(1)	1	1	0	1
25	9	7	8	6	8	1	0	0	1	1
26	6	6	7	6	6	0	0	0	0	0
27	6	6	6	8	6	1	0	0	1	0
28	6	6	6	6	7	1	*	0	0	0
29	6	6	6	6	6	1	0	0	0	0
30	6	7	6	5	6	0	0	1	0	0
31	5	6	6	6	6	0	0	0	0	0

Note No observations during the following periods:

1st	2155-	2400	12th	2000-	13th 0100
6th	0000-	0100	14th	0750-	2300
8th	2000-	2400	24th	0100-	0300

* interference by atmospherics.

SOLAR RADIO EMISSION

Flux Density

Month: May 1969
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	29	28	29	30	29
2	31	30	28	31	30
3	30	q	q	28	30
4	28	29	30	27	29
5	29	29	30	28	29
6	29	29	29	33	29
7	32	30	30	34	31
8	32	29	29	34	31
9	33	32	33	30	33
10	29	31	31	29	30
11	30	30	32	32	30
12	32	32	32	34	32
13	34	34	34	31	34
14	34	34	33	33	33
15	33	31	33	33	32
16	33	33	33	32	33
17	34	34	34	32	34
18	33	35	38	33	34
19	37	34	36	36	35
20	37	38	38	35	37
21	36	37	36	33	36
22	37	38	39	40	37
23	37	35	35	32	37
24	(33)	34	34	33	34
25	35	37	36	35	35
26	37	35	40	34	37
27	34	33	32	32	33
28	32	32	30	30	31
29	33	27	27	30	29
30	29	30	31	28	30
31	29	27	26	28	27

Note No observations during the following periods:

6th	0045-	0150	15th	2000-	2125
10th	0200-	0300	18th	2000-	2130
13th	0700-	0800	24th	0100-	0300
14th	2000-	2125	26th	0445-	0510

"q" means quiet level, when radiometer is unstable.

Distinctive Events

(single-frequency observations)

Month: May 1969
Observing station: Hiraiso
Normal observing period: 2000 - 0840 (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	200	0720.0	0721.0	11.0	C	470	25	
6	500	0236.0	0240.5	29.0	C	280	20	
	200	0239.0	0249.0	32.0	C	150	40	
17	200	0126.0	0127.0	2.0	C	590	60	
	500	0535.0	0542.8	20.0	C	110	27	
	200	0538.0	0541.0	6.0	C	80	30	
24	500	0705.5	0723.0	69.0	C	675	62	
29	500	0019.5	0020.7	1.8	C	210	80	
	200	0018.0	0020.5	7.0	C	200	50	
30	200	0620.0	0620.8	2.5	C	1310	140	

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

MAY 1969 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	-12	-9	-9	0	6	12	-2	-8	2	-3	-1	ES 7	-4	22	12	2	3	11	4	1	8	3	9	-4
2	-5	-3	-1	10	12	12	12	19	5	-5	-2	-4	-1	1	-2	-2	-3	7	3	14	12	10	3	-12
3	-4	-2	-2	7	13	7	-6	-8	ES -3	3	-1	0	-1	-2	-7	3	2	6	-6	2	2	ES -8	-3	-3
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	-9	2	10	11	11	2	1	ES -2	ES -4	ES -1	ES 3	ES 5	3	3	16	13	2	6	3	7	7	2
6	-3	C	5	C	C	C	C	C	-5	3	0	-5	-2	11	-2	-3	3	8	-10	-4	5	3	-4	1
7	-6	-9	-6	-14	6	5	13	15	-2	-4	-4	-7	ES 4	16	8	4	12	19	-1	1	7	3	4	C
8	-2	-1	-6	3	-5	4	10	7	-7	-7	-7	-8	ES -6	-1	14	12	13	15	16	4	6	7	5	3
9	5	1	-2	2	2	15	C	7	0	-2	-2	-6	-6	4	-3	3	7	23	12	8	-2	1	3	6
10	3	-1	7	-3	9	4	5	-7	-4	-8	-4	-9	-7	7	22	23	9	20	7	8	7	7	-1	3
11	4	2	-2	3	9	10	11	5	8	3	-2	-2	-2	9	19	4	-1	7	4	4	3	0	-2	ES -14
12	3	9	5	8	19	15	18	18	11	9	2	-5	0	9	10	9	4	13	3	5	-2	5	-2	4
13	0	7	9	4	11	12	15	18	4	5	1	7	7	13	5	7	-2	-12	ES -16	ES -27	-14	-15	-5	-8
14	-7	12	16	5	11	6	2	8	10	-1	ES -8	-1	0	11	10	10	8	-1	-8	3	3	12	3	10
15	9	2	3	S	-3	-5	-5	-3	-2	ES 10	ES -17	ES -2	ES -11	ES 2	-4	ES -10	ES -4	ES -30	ES -30	ES -30	ES -24	ES -16	ES -30	ES -30
16	ES -11	ES -23	ES -17	ES -10	ES -4	ES -7	ES -14	-8	ES -5	ES -2	ES -11	ES -11	ES 3	ES -7	-8	-2	2	ES -1	ES -1	ES -31	ES -20	-10	ES -22	ES -22
17	0	-14	-15	ES -22	ES -17	ES -22	-7	0	2	3	-2	-6	-7	2	2	6	10	3	ES -32	-10	-14	0	-7	-7
18	-10	ES -8	ES -16	ES -6	-15	-8	ES -17	-10	6	3	8	-4	8	13	13	-3	14	1	5	-1	3	-9	0	-2
19	-5	-2	4	5	10	8	8	6	2	5	-1	-8	2	2	5	19	19	6	1	2	6	7	-4	-15
20	-10	-8	-10	-17	-10	0	10	-3	-2	-3	-2	1	-1	9	18	22	14	17	-10	8	4	-4	12	3
21	-6	-6	-4	6	3	10	16	3	0	0	-3	-5	2	7	11	8	13	8	ES -29	ES -29	ES -7	ES -7	ES -6	12
22	-7	-3	-2	-7	13	8	11	8	5	16	-1	ES -4	C	C	C	C	C	C	C	C	C	C	C	C
23	ES -23	-17	-12	1	-3	6	4	-1	-2	-2	6	-2	-1	6	5	7	-3	-6	5	7	3	7	-6	-3
24	-2	-4	-1	-6	-2	6	-3	-7	4	4	5	-2	8	26	6	18	8	10	0	-2	9	5	ES -10	1
25	ES -5	-1	3	-2	5	14	15	14	10	11	7	-3	11	15	13	14	8	7	-4	-8	-5	-3	-2	2
26	-3	3	-6	3	3	10	13	21	18	18	19	7	6	24	21	14	9	6	4	4	3	4	-4	-2
27	ES 5	-15	-1	6	10	13	18	22	15	15	15	13	25	22	13	11	8	11	6	6	2	1	4	3
28	ES 6	1	3	6	11	18	21	19	10	2	5	11	26	22	16	20	11	9	8	4	5	1	-4	-14
29	ES 3	-9	C	1	C	11	13	19	23	23	23	17	13	18	20	8	10	10	6	6	-6	5	-3	3
30	ES 7	-5	-2	5	9	13	7	7	2	-3	3	6	7	18	26	19	20	10	3	7	5	4	-2	3
31	4	-2	0	2	10	7	-8	-6	-4	-6	-6	4	12	26	21	20	8	13	8	5	0	ES -15	ES -22	-16
CNT	29	28	29	28	28	29	28	29	30	30	30	30	29	29	29	29	29	29	29	29	29	29	29	28
MED	ES -3	-2	-2	2	8	8	10	6	2	US 2	-1	ES -2	ES 2	9	10	8	8	8	3	4	3	3	-2	0
UD	ES 6	7	7	7	13	15	18	19	15	16	15	11	13	24	21	20	16	19	8	8	8	7	7	6
LD	ES -11	ES -15	-15	ES -14	ES -10	ES -7	-8	-8	ES -5	ES -6	ES -8	ES -8	ES -7	ES -1	-4	-3	-3	ES -6	ES -29	ES -29	ES -14	ES -15	ES -22	ES -16

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

MAY 1969 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	ES -24	-13	-11	-7	6	10	11	12	18	19	24	16	13	20	22	9	14	10	4	-7	-3	-3	-6	ES -9
2	ES -15	-15	-10	-4	3	10	12	21	22	22	23	13	8	13	-1	ES -23	13	8	3	0	-5	-12	ES -17	ES -10
3	-12	-13	-5	-4	4	9	19	13	18	19	18	23	10	4	10	10	17	13	3	6	-5	ES -7	ES -7	ES -9
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	-7	-2	7	11	16	28	16	ES -2	ES 11	20	12	-1	6	16	21	21	2	6	-8	2	-6	-6
6	ES -9	ES -8	C	C	C	C	C	C	18	17	23	19	16	16	11	10	6	5	-2	-7	-1	-7	-11	-8
7	-17	-15	-9	-9	0	5	16	20	23	12	18	13	12	13	9	2	15	10	-5	-3	-3	ES 2	-8	C
8	-2	ES -13	-6	-10	-7	UC -1	7	UC 12	9	12	13	11	11	15	16	-2	8	12	8	11	6	-5	ES -4	ES -4
9	ES -7	-7	-9	ES -13	-1	C	20	18	20	18	18	14	11	16	14	3	12	8	ES 5	7	-5	1	-3	ES -6
10	-9	-9	-2	-2	5	7	8	13	14	13	23	14	8	13	13	-3	15	3	-3	4	4	ES -5	ES -7	-12
11	-11	-11	-6	5	7	9	16	17	21	24	23	27	15	13	7	-1	11	8	-3	-2	2	-4	ES -10	ES -14
12	ES -6	ES -9	-2	3	12	9	15	15	15	18	18	20	12	12	10	10	12	13	18	3	-5	ES -4	-8	ES -16
13	ES -20	ES -10	-6	-2	7	13	12	21	24	21	20	20	14	13	5	4	22	13	-1	9	1	-1	-8	-11
14	ES -3	-5	-2	2	11	12	17	18	20	19	20	21	13	13	12	10	17	8	8	1	-7	-1	-11	-5
15	-3	-8	2	2	7	12	20	12	24	18	18	23	17	18	ES -12	8	5	17	-8	-9	ES -30	ES -30	ES -30	-13
16	-9	-7	-1	-7	3	3	10	13	15	13	12	15	15	-6	11	15	3	-7	ES -31	-9	5	ES -9	ES -22	ES -22
17	-22	ES -31	-14	-11	1	14	10	14	24	21	19	22	19	23	2	-9	12	9	4	0	4	-8	-8	ES -11
18	ES -22	ES -8	-16	-2	5	7	8	18	23	15	25	20	19	18	16	10	8	5	-2	-1	-7	-3	-9	ES -12
19	ES -10	-16	-12	-2	7	7	13	18	25	22	22	20	18	12	23	12	12	19	11	7	-8	3	-9	-15
20	ES -23	-10	-3	-3	9	13	8	20	16	19	25	-12	12	17	10	2	-3	9	0	-2	11	2	-5	-5
21	ES -8	-11	-3	-4	11	8	13	10	13	21	13	15	17	16	14	19	17	14	10	2	6	ES -6	-2	2
22	0	-2	3	1	C	8	16	17	20	20	20	18	C	C	C	C	C	C	C	C	C	C	C	C
23	ES -23	-11	-2	-3	7	14	19	22	19	19	18	18	17	13	17	7	7	7	3	7	1	-5	-6	-7
24	ES -2	-2	-4	-1	6	9	9	13	23	18	25	23	13	13	8	3	7	17	2	5	2	2	ES -2	ES -2
25	ES -2	-11	-3	5	10	10	13	16	16	18	18	19	24	18	13	14	13	8	-5	-5	-7	ES -11	ES -12	ES -11
26	ES 4	ES -16	-10	4	8	13	14	22	14	19	24	24	14	16	24	22	11	17	5	6	-2	-3	-7	-11
27	ES -1	-10	-5	-2	2	9	15	18	21	23	22	21	16	16	15	6	21	11	4	6	1	ES 1	-10	-2
28	ES 1	-5	1	-2	11	12	16	21	22	18	23	17	19	17	12	12	6	14	4	4	2	-9	-14	ES -13
29	ES 0	C	-13	-3	4	8	13	16	17	20	16	17	16	22	14	16	24	13	8	ES -32	4	-5	-12	-11
30	ES 5	-5	-5	5	6	7	8	15	18	22	22	18	21	18	23	15	21	10	8	6	4	-5	-2	ES -8
31	ES -2	ES -8	-2	2	6	10	18	22	19	21	19	21	17	14	14	22	14	19	9	ES 3	ES 0	ES -14	ES -22	-13
CNT	29	28	29	29	28	28	29	29	30	30	30	30	29	29	29	29	29	29	29	29	29	29	29	28
MED	ES -8	ES -10	-5	-2	6	9	13	17	19	19	20	19	15	15	12	10	12	10	US 3	US 3	US 0	ES -5	ES -8	ES -10
UD	ES 1	-5	1	5	11	13	19	22	24	22	25	23	19	20	23	19	21	19	10	7	6	2	ES -2	ES -2
LD	ES -23	ES -16	-13	-10	0	5	8	12	14	12	13	13	10	4	2	-3	5	5	ES -5	ES -9	ES -8	ES -12	ES -22	ES -15

RADIO PROPAGATION QUALITY FIGURES

HIRAISO — Time in U.T.

May 1969	Whole Day Index	H B 06 12 18 / 12 18 24	W W V 00 06 12 18 / 06 12 18 24	L M 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	ΔH
1	4-	4 (4)(4)	(3) 4 4 4	3 C - 4	(4) 4 4 -	N N N N			
2	4o	4 (4) C	(4) 4 3 3	5 (5) - 4	(4) 4 3 -	N N N N	13.22	---	84γ
3*	3+	C (4) C	3 4 3 3	(4) 3 - -	(4) 4 4 -	N N N N	---	24xx	
4	4o	(5)(5) C	(3) 4 4 (4)	(4) - - -	(3)(4)(3) -	N N N N			
5	4+	5 4 4	4 4 5 4	4 4 - C	4 3 4 -	N N N N			
6	4o	4 4 4	4 4 4 4	4 (4) - 3	4 4 4 -	N N N N			
7	4o	4 4 4	4 4 4 4	3 4 - 4	4 4 5 -	N N N N			
8	4o	4 4 4	4 4 4 4	4 4 - 4	4 4 4 -	N N N N			
9	4o	4 4 4	4 4 4 4	4 4 - 5	4 4 4 -	N N N N			
10	4+	4 4 5	4 4 5 5	5 4 - -	5 4 4 (4)	N N N N			
11	4+	5 5 5	4 4 4 4	(4) - - -	4 4 4 (4)	N N N N			
12	4+	5 5 4	4 5 4 4	4 (4) - 4	4 4 4 (4)	N N N N	17.8	---	99γ
(13*)	4-	4 3 3	4 5 3 3	4 4 - 3	4 4 4 4	N N N N	---	---	
(14*)	3+	3 4 3	3 4 3 3	3 4 - 4	4 4 4 4	N N N N	--- / 19:29	19.xx / ---	171γ
(15Δ)	3-	(2)(2) C	3 2 (2) 2	4 4 - (2)	4 4 3 3	U U W W	---	---	
16*Δ	2+	(2)(3) 3	2 3 (2)(2)	2 3 - 3	3 4 3 3	W W U U	---	24xx	
17Δ	3+	3 4 4	(2) 4 3 (3)	3 4 - -	C 4 4 3	U U N N			
18Δ	3o	3 3 4	(2) 4 4 3	(2) - - -	(3) 4 4 4	N N N N			
19Δ	4-	4 4 4	3 4 4 3	4 4 - 3	4 4 4 4	N N N N			
20Δ	4o	3 4 4	(3) 4 4 5	3 5 - 4	3 4 4 4	N N N N			
21Δ	4-	4 4 4	4 4 4 3	3 4 - 3	4 4 4 4	N N N N			
22Δ	4-	4 4 4	(3) 4 (4)(3)	4 4 - 3	(4) 4 3 3	N N N N			
23	3+	3 4 3	(3) 4 4 4	3 3 - 4	4 4 4 4	N N N N			
24	4o	4 5 4	(3) 4 5 4	4 4 - -	4 4 4 4	N N N N			
25	4o	4 5 (4)	5 4 4 4	(3) - - -	4 4 5 4	N N N N			
26	4+	4 4 (4)	5 5 4 5	4 4 - 4	4 4 5 4	N N N N			
27	5-	5 5 5	5 5 5 5	4 (4) - C	4 5 5 4	N N N N			
28	5-	4 4 5	5 5 5 5	(4) 5 - (4)	5 4 4 4	N N N N			
29Δ	5-	4 5 4	5 5 5 5	(4)(4) - 4	4 4 5 4	N N N N			
30	4+	(4)(4)(4)	5 4 5 5	4 4 - 5	4 4 5 4	N N N N			
31	4o	4 (5) 3	4 4 4 (3)	4 4 - -	4 4 5 3	N N N N			

IQSY GEOALERT and ADALERT (Western Pacific Region)

* = MAGSTORM

o = MAGCALME

Δ = COSMIC EVENT

[ ] = Regular World Day

C = artificial accident

\- = impossible to evaluate

--- = continuing magnetic storm

( ) = inaccurate

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

May 1969	S W F										Correspondence		
	Drop-out Intensities (db)						Start-time	Duration	Type	Imp.	Flare	Solar Noise	Mag.
	CO	LM	HA	TO	HB	SH							
6	- 12"	18					02.39	53	S	1+		x	
19		13	-				23.18	9	S	1			
20		-	18				00.36	12	S	2			
24					12		10.32	23	S	1			
27		12					00.54	23	S	1-			
28					7		12.54	22	S	1-	x		
29	12				15		00.22	17	Slow	1+		x	
29	18	24	20	-	27		04.06	30	Slow	2+			
29	12"						19.42	40	S	2-			
30				-	7		06.12	20	S	1-	x		

IONOSPHERIC DATA IN JAPAN FOR MAY 1969

第 21 巻 第 5 号

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