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IONOSPHERIC DATA IN JAPAN

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KOKUBUNJI, TOKYO, JAPAN

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THE RADIO RESEARCH LABORATORIES

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CONTENTS

SITE OF THE RADIO WAVE OBSERVATORIES

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

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

Solar radio emission and radio propagation conditions are observed at Hiraiso Branch.

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

SYMBOLS AND TERMINOLOGY

A. IONOSPHERE

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

Terminology

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

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

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

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

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

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

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

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

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

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

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

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

a. Descriptive Letters

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

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

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

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

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

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

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

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

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

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

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

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

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

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

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

V Forked trace which may influence the measurement.

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

X Measurement refers to the extraordinary component.

Y Intermittent trace.

Z Third magneto-ionic component present.

b. Qualifying Letters

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

value on the monthly tabulation sheets.

D	greater than.
E	less than.
I	Missing value has been replaced by an interpolated value.
J	Ordinary component characteristic deduced from the extraordinary component.
O	Extraordinary component characteristic deduced from the ordinary component. (Used for x- characteristics only.)
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
U	Uncertain or doubtful numerical value.
Z	Measurement deduced from the third magneto-ionic component.

c. Description of Standard Types of E_s

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

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

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

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

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

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

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

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

sometimes extend over several hundred kilometers of virtual height.

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

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

d. Multiple Reflections from E_s

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

B. SOLAR RADIO EMISSION

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

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

Observations are feasible almost from sunrise to sunset.

a. Time and Unit

The time is expressed as U.T.

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

b. Daily Data

Flux density

The three-hourly and daily mean values are given.

Variability

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

Variability is expressed in the following four grades:

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

The number of bursts exceeding the flux level is counted.

c. Distinctive Events

The phenomena are picked up on the following criteria:

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

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

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

Descriptive type is denoted by the following symbols:

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

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

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

C. RADIO PROPAGATION CONDITIONS

a. Field Intensities of WWV and WWVH

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

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

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

Transmitter

	WWV	WWVH
Location	Fort Collins, Colorado Long. 105°02′ W Lat. 40°41′ N	Maui, Hawaii Long. 156°28′ W Lat. 20°46′ N
Power	3 kW for the upper side-band	0.5 kW* for the upper side-band
Antenna	$\lambda/2$ vertical	$\lambda/2$ vertical
Distance	9150 km	6270 km

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

Receiver

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

The meaning of *Descriptive symbols* is as follows:

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

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

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

<: Less than the following figure.

b. Radio Propagation Quality Figures

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

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

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

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

N=normal
U=unstable
W=disturbed

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

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

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

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

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

Circuits and Drop-out intensities

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

Start-time and Duration

Types

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

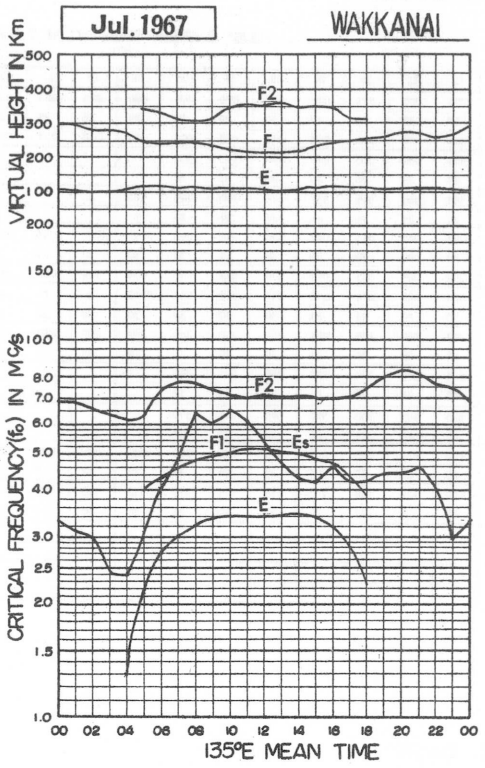
Importances

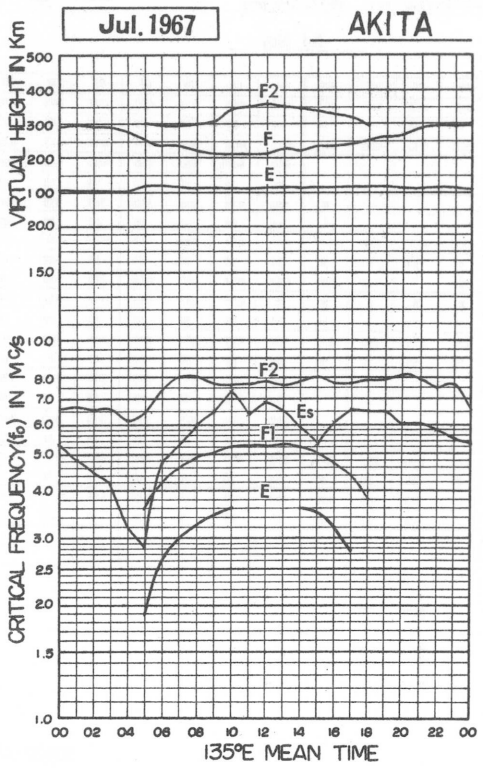
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1−	1	1+
2−	2	2+
3−	3	3+

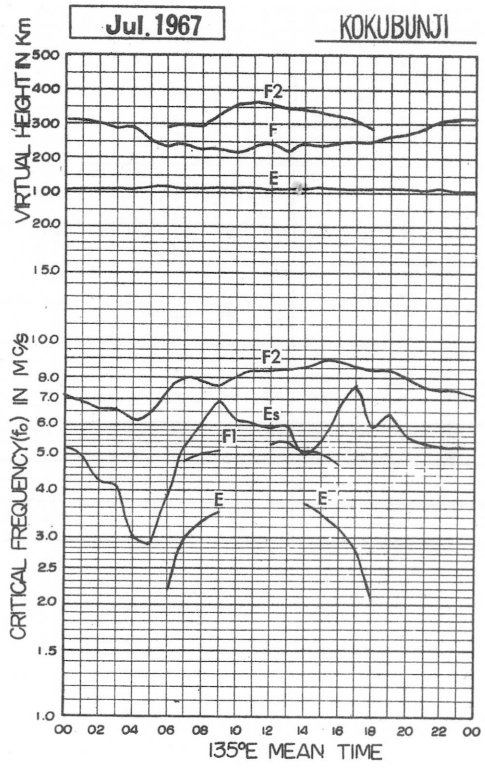
Besides, the time associated phenomena with SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record), are given in this table from interchange messages of IUWDS or measurements at Hiraiso.

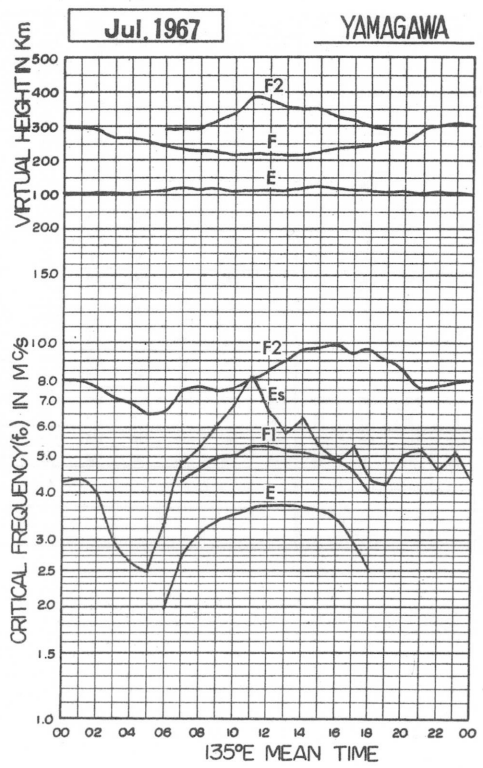
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: WAKKANAI

Jul. 1967

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	068	068	066	063	062	063	073	077	077	073	072	070	071	070	071	070	070	070	074	080	083	081	076	074
	CNT	18	18	17	19	22	27	30	29	27	25	26	27	27	28	29	29	30	29	29	29	28	25	20	20
	Q R	008	010	008	008	011	009	009	014	011	011	007	006	009	008	010	008	010	008	006	011	008	011	006	006
foF1	MED					260	400L	430	460	480	490	500	510	510	500	500	480	470	430	390					
	CNT					2	14	17	18	15	15	18	23	25	25	26	26	27	23	14					
foE	MED				E	130	215	270	300	325	335	340	340	335	340	345	335	315	280	225	130	E			
	CNT				4	11	27	30	30	29	29	29	28	29	25	24	24	26	26	24	5	3			
foEs	MED	J033	J031	J030	J024	024	031	040	048	J064	J061	J065	J061	051	047	043	042	046	042	042	J044	J044	J046	J041	J030
	CNT	31	31	31	31	31	30	30	30	30	29	28	27	30	29	29	29	30	30	30	30	30	30	29	29
	Q R	041		022	021	022	012	027	022	035	039	030	037	032	024	025	019	013	022	032	032	032	030	041	041
f-min	MED	E	E	E	E	E	011	012	015	017	017	018	020	020	020	019	018	017	015	011	E012	E	E	E	E
	CNT	31	31	31	31	31	30	30	30	30	29	28	27	30	29	29	29	30	30	30	30	30	30	29	29
M (3000) F2	MED	275	275	270	275	280	275	280	290	295	300	290	285	285	280	285	285	285	290	290	280	280	280	280	280
	CNT	18	18	17	19	22	27	30	29	27	25	26	27	27	29	29	29	30	29	29	29	28	25	20	20
M (3000) F1	MED					320	340	345	355	360	370	370	370	365	365	360	355	340	340	340					
	CNT					2	13	15	15	13	10	14	18	23	23	26	26	26	23	12					
h'F2	MED					335	340	325	315	310	310	340	355	360	365	350	350	345	315	310					
	CNT					2	16	28	27	25	22	23	24	24	27	29	29	28	25	22					
h'F	MED	290	290	275	275	275	250	240	240	240	U230A	220	215	210	210	220	235	240	250	260	265A	270A	270	260	270
	CNT	26	26	30	31	31	28	20	16	13	12	15	19	23	24	26	25	25	26	24	23	22	23	22	24
h'Es	MED	105	105	100	100	105	120	120	115	115	110	110	110	110	105	105	110	115	115	115	110	110	110	110	110
	CNT	24	23	29	26	24	25	28	29	30	29	27	26	25	27	23	26	28	29	29	30	30	28	27	24
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: AKITA

Jul. 1967

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	066	067	066	066	062	064	073	080	081	077	076	077	078	076	078	080	077	077	078	078	081	079	075	076
	CNT	4	9	13	13	18	27	28	29	30	29	30	28	28	29	31	31	31	29	29	29	28	19	12	8
	Q R	012	014	010	008	008	008	012	016	015	010	007	012	012	010	014	012	011	010	008	011	011	010	009	006
foF1	MED						360L	420	460	490	U500A	520	520	520	530	520	500	470	440	380					
	CNT						6	14	20	23	19	23	22	22	21	21	22	22	17	3					
foE	MED					E	190	260	300	325	345	360	375A	U380A	370	U360A	350	320	275	210	E				
	CNT					15	11	19	22	23	23	11	5	2	4	8	14	19	13	1	11				
foEs	MED	J053	J048	J044	J042	J032	J028	J048	J052	J060	J065	J073	J064	J068	J066	J059	J053	J061	J066	J065	J065	J060	J061	J058	J054
	CNT	30	30	29	30	30	30	30	30	30	30	31	30	30	31	30	31	31	31	30	31	29	30	30	30
	Q R	026	032	027	031	020	023	025	029	030	025	031	037	052	038	038	031	033	036	028	043	048	024	039	028
f-min	MED	E014S	E	E	E	E	012	013	017	018	018	018	020	020	020	018	018	017	014	013	E012	E013	E013S	E014S	E014
	CNT	30	30	29	30	30	30	30	30	30	30	31	30	30	31	30	31	31	31	30	31	29	30	30	30
M (3000) F2	MED	265	275	280	285	280	290	290	290	300	295	285	280	280	275	280	285	290	290	295	290	280	280	280	280
	CNT	4	9	13	13	18	27	28	29	30	29	30	28	28	29	31	31	31	29	29	29	28	19	12	8
M (3000) F1	MED						320L	350	360	355	U370	365	355	360	350	350	345	340	340	340L					
	CNT						6	12	16	19	15	19	21	21	20	20	19	20	15	2					
h'F2	MED						300	290	290	295	310	340	355	365	355	340	335	325	320	290					
	CNT						24	28	28	30	25	25	25	26	29	31	31	31	27	25					
h'F	MED	290	290	280	280	275	255	230	230	220	215	210	210	210	225	220	230	235	240	250	270	270	280	285	280
	CNT	25	27	29	30	30	26	17	14	14	11	15	18	18	15	16	18	16	12	12	25	29	27	28	24
h'Es	MED	105	105	105	105	105	120	120	120	115	115	115	115	115	110	115	115	115	115	115	115	110	110	110	110
	CNT	29	29	29	29	28	28	30	30	30	30	31	30	30	31	29	30	29	31	30	31	29	30	30	30
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT KOKUBUNJI

Jul. 1967

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	U072	U068S	U066	066	062	064	073	080	078	076	080	083	084	084	086	088	088	086	083	084	080	U075S	U074	U074
	CNT	15	19	24	28	26	28	28	26	26	24	22	23	25	28	28	28	26	28	27	25	26	24	18	14
	Q R	011	011	010	008	008	008	014	012	016	010	010	017	014	016	019	014	012	015	015	020	018	012	013	017
foF1	MED						310L	420L	480L	500L	510L	600L	540R	530L	540	510L	500L	470L	420L	360L					
	CNT						1	2	5	6	7	3	2	8	8	7	8	7	2	1					
foE	MED						180	240	300	330	350	I360R	380	I385R	380	370	345	320	280	205					
	CNT						2	13	12	12	10	2	2	2	2	5	13	12	11	5					
foEs	MED	J052	J050	J042	J041	J030	J029	J039	J052	J060	J069	J062	061	059	060	050	J054	J067	J076	J059	J064	J056	J053	J052	J052
	CNT	29	30	30	29	29	28	28	28	28	29	30	31	31	31	30	29	31	30	31	30	30	30	30	30
	Q R	023	024	026	031	020	019	020	029	025	054	037	066	038	048	029	042	065	038	047	082	040	031	048	026
f-min	MED	013	013	012	011	011	013	015	016	016	020	026	026	026	026	026	025	017	014	014	013	E014S	014	E015S	E015S
	CNT	29	30	30	29	29	28	28	28	28	29	30	31	31	31	30	30	31	30	31	30	30	30	30	30
M (3000) F2	MED	U285	U280S	U290	285	290	295	295	300	305	285	280	280	280	280	280	285	285	290	295	295	285	U280S	U280	U280
	CNT	15	19	24	28	26	28	28	26	26	24	22	23	25	28	28	28	26	27	27	25	25	23	18	14
M (3000) F1	MED						315L	335L	345L	355	360L	310L	345	350L	360	355L	350L	350L	340L	400L					
	CNT						1	2	5	6	7	3	1	8	5	7	8	7	2	1					
h'F2	MED						335	285	300	290	325	360	360	360	350	340	330	325	310	280					
	CNT						6	25	26	26	22	20	22	25	28	29	26	26	26	24					
h'F	MED	315	310	300	280	285	260	230	240	225	225	220A	230	245	220	240	230	245	250	250	270	270	280	310	315
	CNT	27	29	30	28	28	28	21	14	8	10	8	6	11	11	12	11	14	12	9	23	28	25	22	26
h'Es	MED	110	110	110	110	110	115	120	115	115	115	115	115	115	115	115	120	115	115	115	115	110	110	110	110
	CNT	29	30	29	29	27	27	27	28	28	29	30	31	31	31	27	26	31	30	31	29	30	30	30	30
hpF2	MED	U365	U370S	U350	355	350	330	330	325	325	345	375	365	375	370	365	365	350	340	335	330	355	U350S	U370	U375
	CNT	15	18	24	27	26	27	28	25	21	19	19	19	24	24	25	24	21	24	23	22	22	22	18	14
ypF2	MED	U070	U075S	U070	075	070	080	070	075	070	075	070	080	080	075	075	080	080	080	075	080	075	U075S	U075	U075
	CNT	15	18	24	27	26	27	28	25	21	19	19	19	24	24	25	24	21	24	23	22	22	22	18	14

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: YAMAGAWA

Jul. 1967

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	080S	079S	077S	072S	069	065	066S	075	077	075	076	080	085	090	096	097	098	094	096	089	086	076S	077S	078S
	CNT	15	15	13	14	18	17	26	28	29	29	29	30	29	29	30	30	31	31	30	30	30	28	27	19
	Q R	015	014	008	014	008	012	013	016	012	008	013	011	013	014	012	011	017	020	019	013	013	010	011	016
foF1	MED								430	460L	500L	500	530	530	520	510	500	490	460	400					
	CNT								2	7	15	14	18	22	16	21	28	28	20	7					
foE	MED						E	195	265	310	335	350	365	370	370	370	360	340	300	250	150				
	CNT						11	16	21	22	22	20	20	22	18	19	22	23	22	18	1				
foEs	MED	J043	J044	J040	J030	J026	J025	033	J048	J052	J061	J068	J081	066	J058	063	053	049	J053	044	J042	J050	J052	J046	J051
	CNT	30	30	30	30	30	30	29	29	29	29	29	30	30	30	31	31	31	31	30	30	30	30	30	30
	Q R	032	026	028	025	014	010	014	022	020	035	028	047	034	031	053	033	024	030	025	028	036	026	026	034
f-min	MED	E015S	014	011	E	E	011	013	014	015	015	021	024	023	023	023	022	018	015	015	014	014	E015S	E015S	E015S
	CNT	30	30	30	30	30	30	29	29	29	29	29	30	30	30	31	31	31	31	30	30	30	30	30	30
M (3000) F2	MED	265S	275S	280S	290S	285	285	310S	310	310	295	285	270	260	270	275	275	280	280	290	290	285	270S	270S	265S
	CNT	15	15	13	14	18	17	26	28	29	29	28	27	27	29	30	30	30	31	30	30	30	28	27	19
M (3000) F1	MED								355	355L	365L	360	360	370	365	365	355H	350	335	340					
	CNT								2	5	13	11	11	16	15	18	19	22	15	6					
h'F2	MED							280	280	290	320	330	380	375	360	350	350	325	320	295	280				
	CNT							15	28	29	27	24	26	29	27	30	30	31	31	27	12				
h'F	MED	300	290	290	270	270	260	245	235	225	225	210	220	220	215	215	225H	230	230	245	260	255	280	300	310
	CNT	29	29	30	30	30	30	26	21	20	19	11	17	19	20	16	19	22	19	22	25	27	30	29	29
h'Es	MED	105	105	105	105	105	110	120	120	115	115	110	110	115	115	120	125	120	115	115	110	110	105	110	105
	CNT	30	29	29	30	29	28	29	28	29	29	29	30	29	29	29	30	29	31	30	30	30	30	30	30
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA

Jul. 1967 | foF2 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	067	069	F	058F	053	050	050	050	A	059	I059A	059	I059A	061	I061A	I063A	064	066	076	084	083	092	070	063
2	061	057	057	053	048	053	055	051	A	A	A	051	A	W	054	055	I055A	058	056	A	A	061	F	F
3	064F	057F	F	F	F	F	073F	077F	068F	066	067	069	067H	068	064	070	071	073	072	073	077	078F	I072C	I066C
4	063	063F	060	056	055	061	074	071	065	066	I072C	I072C	071	069	072	066	066	072	077	080	083	076	081	074
5	072	067F	064F	061	066F	075	080	076	077	076	083	I080C	073	070	068	075	076	080	077	083	083	081	085	083
6	068F	F	066F	063F	066	066	073	079	087	073	070	I073A	072	074	070	070	071	072	074	083	087	073	A	F
7	SF	SF	F	F	050F	053F	I058A	061F	075	A	063	075	073	063	067	067	070	070	063	070	079	076	075	070
8	060F	056	F	F	F	063F	076	083	081	086	078	I068A	063	068	070	I065A	063	A	A	084	092	087	074	065
9	065	063	060	058	058	063	076	082	081	080	071	063	065	061	063	062	063	064	069	077	083	089	F	F
10	F	F	F	F	F	F	070	083	085	077	076	070	068	066	060	057	062	061	064	069	078	081	F	F
11	F	F	066F	053F	050F	055	065	079	088	083	074	I068A	063	069	080	072	063	063	I069A	078	086	SF	SF	F
12	F	F	F	F	F	063F	I067A	054	I051A	I054A	I069A	055	I056A	I057A	059	060	062	061	059	066	074	074	074	072F
13	F	066	063	063	066	060	049H	060	066	067	067	068	067	073	075	064	061	063	070	080	086	083	080	076
14	073	068	064	062	061	060	067	067	072	078	073	073	076	071	075	072	070	067	070	081	090	087	080	069
15	067	065	F	F	051	054	060	066	065	070	064	066	067	066	063	069	074	075	077	080	077	075	075	075
16	F	F	069F	060F	062F	058F	068F	083	072	083	067	063	067	063	067	076	083	083R	076	I072A	074	F	077F	076
17	068	060	058	057	058	066	073	079	081	080	078	074	073	072	074	076	070	067	073	076	083	081S	076	076
18	075	073	070	F	F	070	073	077	076	070	I070A	071	066H	072	074	073	064	069	075	078	083	080S	SF	F
19	076	073	070	064F	063	063	076	075	074	073	070	070	072	070	065	070	071	071	076	080	071	072	073	071F
20	F	F	F	064F	065F	067	081	083	078	070	A	A	A	069	072	070	064	067	074	086	083	SF	073F	F
21	F	F	F	F	F	073F	079	073	077	076	074	I081A	078	076	074	071	069	I072A	078	I082A	084	I083A	080F	073F
22	F	F	F	F	F	065F	I075A	083	081	A	A	A	A	I077A	078	075	I073A	070	070	070	I075A	083F	F	F
23	079F	A	F	F	F	F	075	086	I085A	078	074	078	076	073	074	073	074	079	083	091	093	090	080	074
24	073	070F	F	066F	070F	080F	091	103	090	082	083	078	I068A	067	069	070	072	075	075	073	A	F	F	F
25	F	076F	071F	066F	068F	067	070	078	078	077	071	070	074	076	078	078	075	071	070	075	081	081F	F	077F
26	F	F	F	070F	061F	067F	081	096	A	A	065	068	066	071	073	073	070	068	069	071	078	083	080	I079S
27	068	068	065	064	064	C	C	C	C	C	C	C	077	077	073	071	070	072	076	086	091	087	084	081
28	076	076	075	070	073	076	080	F	070F	069F	073F	076	075	082	087	076	074	066	070	082	085	I088S	I084S	077F
29	F	F	F	F	F	058F	070	073	070	063	073	073	078	080	071	075	074	075	074	070	076	079	074	073
30	073	073	069	066	063	073	087	097	081	C	C	C	C	C	C	C	083	088	I084A	084	078	F	F	F
31	F	F	066F	F	061F	066F	073F	073	I073A	I073A	073	074	078	C	C	C	C	C	C	C	C	C	C	C
Count	18	18	17	19	22	27	30	29	27	25	26	27	27	28	29	29	30	29	29	29	28	25	20	20
Median	068	068	066	063	062	063	073	077	077	073	072	070	071	070	071	070	070	070	074	080	083	081	076	074
U.Q.	073	073	070	066	066	067	076	083	081	079	074	074	075	074	074	074	074	074	076	083	086	087	080	076
L.Q.	065	063	062	058	055	058	067	069	070	068	067	068	066	066	064	066	064	066	070	072	078	076	074	070
Q.R.	008	010	008	008	011	009	009	014	011	011	007	006	009	008	010	008	010	008	006	011	008	011	006	006

The Radio Research Laboratories, Japan

foF2

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

W 1

IONOSPHERIC DATA

Jul. 1967 | foF1 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					260		410	430	A	A	A	500	I500A	500	A	A	460	430	A					
2					270	330	370	420	A	A	A	460	I460A	470	470	460	I440A	I410A	A					
3							430	460	460	A	A	A	500	500H	510	470	450	430	390					
4							430	460	480	500	I500C	I500C	500	510	490	U480L	I460A	430	A					
5							440	500	480	480	490	I510C	500	500	490	490	460	430	380					
6							A	A	A	510	A	A	A	510	510	470	460	420	390					
7							A	A	A	A	500	I500A	500H	I480A	470	470	460H	420	370					
8						400L	A	A	A	A	490	I490A	I500A	A	470	A	A	A	A					
9						400	430	450L	460	I480A	480	490	480	480	490	460	490H	I420A	I360A					
10							440	I440A	I450A	I470A	470	480	490H	490	510	480	450	A	A					
11						420L	A	A	A	A	A	I510A	500	470	480H	460	470	A	A					
12						A	A	A	I450A	A	A	A	A	A	470	460	440	420	A					
13								440	I460A	480	I490A	480	510	490	480	480	460	A	400					
14						350	430	440	I460A	I470A	I480A	500	500	500	I480A	480	470	420	U400L					
15							400	440	A	480	510	500	510H	510H	480	480	470	450						
16						440L	430	460	470	490	490	500H	500H	520	500	500H	460	I420A	380H					
17						400L	420	450L	480	I490A	510	520	520	500	500	470	460		400					
18							430	I460A	I480A	500	I510A	510	520	520	A	520	510	460	U400L					
19						400	430	460	500	500	500	510	530	500	500L	500	470	I440A	A					
20						U380L	A	A	A	A	A	A	A	500	530H	I500A	480H	460	380					
21							I480A		A	A	A	A	520	520	520H	I510A	480	I430A	A					
22						U350L	A	A	A	A	A	A	A	A	A	A	A	430						
23						U440L	A	A	A	A	I520A	550	530	530	520	U520L	I490A	460	A					
24						360	A	470H	A	A	A	540	A	A	I540A	520	500	430						
25							A	470	I490A	490	I520A	550	530	530H	530	500	500	460L						
26						400	A	A	A	A	A	540	570	530	530H	530	490	440L	U400L					
27						C	C	C	C	C	C	C	530H	530	540	500	500	460	U400L					
28							430	U500L	500	530	520	550	I540A	I530A	530	510	480		L					
29						390	U440L	460	500	530	520	540L	530	540	540	510	500L	I450A	U360L					
30						L	A	A	A	C	C	C	C	C	C	C	A	A	A					
31							430	A	A	A	530	I520A	530	C	C	C	C	C	C					
Count					2	14	17	18	15	15	18	23	25	25	26	26	27	23	14					
Median					260	400L	430	460	480	490	500	510	510	500	500	480	470	430	390					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1

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

W2

IONOSPHERIC DATA

Jul. 1967 | f_0E | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				E	A	A	270	300	315	330	335	330	325	320	315	300	I290A	280	230	165	E			
2				E	A	205	270	300	320	330	335	340	360	350	350	320	300	I265A	I220A	S	E			
3				E	A	215	275	305	330	335	340	350	370	370	A	A	A	A	A	A	E			
4					A	230	295	305	I330A	350	I355C	I350C	I340A	I335A	I335A	330	310	290	220	S				
5					A	210	280	300	320	330	325	I320C	I315A	325	330	330	315	280	235	S				
6					A	215	270	300	320	330	345	350	345	325	300	280	250	270	I230A	140				
7					120	205	250	300	320	340	340	345	340	330	I335A	330	310	280	230	A				
8					A	215	265	300	310	335	330	330	335	340	335	335	315	275	225	S				
9				E	120	210	255	295	310	330	330	340	345	I340A	I340A	335	305	270	215	S				
10					A	210	270	300	315	325	340	340	335	330	315	I300A	I300A	290	225	S				
11					A	205	265	300	315	335	330	320	315	I345A	340	I350A	310	280	210	S				
12					A	215	265	300	320	330	340	340	335	300	310	335	305	285	225	130				
13					145	215	270	300	315	330	330	335	325	I335A	350	330	315	280	215	S				
14					145	210	265	300	325	335	345	340	310	A	A	A	I295A	I285A	230	A				
15					A	215	260	300	320	335	330	335	360	I360A	355	350	315	280	230	S				
16					A	215	270	310	335	340	350	350	345	350	340	330	325	290	235	A				
17					130	215	285	305	330	I345B	380	370	335	I345A	360	I340A	315	I270A	215	A				
18					140	215	275	310	325	I335A	370	380	340	A	A	A	A	A	235	A				
19					115	200	270	300	325	330	330	335	I335A	I355A	370	345	315	290	220	S				
20					A	215	270	305	315	320	330	305	I325A	I350A	370	350	320	295	220	A				
21					A	A	240	300	335	350	365	360	380	I370A	I360A	350	320	295	235	E				
22					A	205	290	305	345	360	370	365	345	300	350	310	A	A	A	A				
23					A	215	290	310	330	340	355	360	335	A	A	A	305	295	230	E				
24					140	205	265	305	320	345	350	340	335	I335A	I350A	365	335	300	235	S				
25					130	205	300	310	335	355	365	A	A	A	A	A	345	I280A	I215A	S				
26					A	220	295	315	350	350	335	I365B	345	I365A	I360A	I365A	330	290	A	A				
27					130	C	C	C	C	C	C	C	345	370	365	345	325	290	A	A				
28					A	210	290	305	335	340	365	355	335	320	I320A	I335A	I330A	290	A	A				
29					115	220	290	320	350	360	365	360	360	340	370	350	325	I270A	I215A	S				
30					A	190	290	315	A	C	C	C	C	C	C	C	A	A	A	A				
31					A	A	270	305	330	335	I340A	345	335	C	C	C	C	C	C	C	C			
Count				4	11	27	30	30	29	29	29	28	29	25	24	24	26	26	24	5	3			
Median				E	130	215	270	300	325	335	340	340	335	340	345	335	315	280	225	130	E			
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

f_0E

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

W 3

IONOSPHERIC DATA

Jul. 1967 | foEs | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	019	J060	016	J024	J030	J030	036	043	J083	J101	J141	065	J100	050	J085	J083	J045	G	J049	J051	J030	J033	J023	E015S
2	J020	E	J018	014	021	033	032	038	059M	J092	J081	057	051	050	043	042	J063	J055	J041	J125	J110	J050	J063	J063
3	J043	J035	J024	E	038	G	033	038	043	J055	053	J053	G	G	038	035	040	033	J034	065	J044	090	C	C
4	J033	J037	J024	J025	J021	G	G	G	040	J060	C	C	J065	J063	J072	047	J127	041	J080	J031	J063	J025	J030	J021
5	J022	J023	J023	J021	J028	039	055	050	048	038	J050	C	039	038	G	G	030G	033	034	J033	J033	J033	J024	J030
6	J030	J023	J033	J030	J033	035	J063	J055	J066	J054	J065	J083	J071	J065	J063	041	040	033	032	035	J023	J060	J073	J080
7	J060	J073	J060	J053	J071	J070	D	054	J073	090	J083	J073	043	J073	J053	044	040	037	037	J040	J031	J043	J083	E
8	J103	J023	J053	J055	J033	029	J051	J068	J103	J065	J063	J103	J058	J055	040	J080	094	J096	J110	030	J058	J043	J054	J033
9	E	E	015	E	025	025	J043	040	041	J056	042	G	G	041	038	030G	043	J060	J076	J033	J033	J050	J053	E
10	J030	J053	J043	J043	J040	048	J063	J076	J063	J070	G	040	038	037	045	J053	046	J055	063	J041	J042	J070	J083	J045
11	J028	J053	J055	J031	J040	030	J048	J055	J067	J053	J055	J080	040	039	G	040	048	J054	J130	J110	J080	J120	J170	J110
12	J063	J053	J043	J025	J024	037	J070	J063	J083	J065	J065	J066	J113	100	038	050	046	043	J050	046	J035	J050	J051	J055
13	J060	E	J035	J023	G	031	036	041	060	045	J055	039	J055	J043	G	G	040	J070	037	038	J035	J051	J030	020
14	E015S	E	J021	015	016	028	032	044	J053	J065	J073	J078	051	J060	J073	048	043	031	030	J049	J063	J043	J030	J030
15	E014S	J025	J024	J031	020	G	033	037	J055	042	J048	055	G	044M	032G	031G	056	070	040	J033	J028	J041	020	015
16	J040	J031	J021	017	021	027	033	041	041	041	050	046	041	047	040	J054	043	J056	J053	J111	J063	J051	J043	J020
17	J023	E	J025	J023	G	G	G	043	045	053	049	J064	J051	040	G	041	039	042	033	J050	J031	J043	J021	015
18	E016S	E	E	J045	G	024	036	J063	J065	J055	J073	061	J054	J043	J084	J043	040	J040	G	081	J065	J040	J053	J023
19	E016S	E	E	E	025	J063	033	043	J055	044	043	040	036	040	J063	G	J051	J051	071	030	050M	J023	J041	J063
20	J031	J053	J044	J033	032	031	036	J054	J090	J103	J175	J175	J163	110	046	065	053	033	029	123	J085	J063	J041	J025
21	J063	J050	J041	J036	J039	J040	060	071	J115	J093	J093	121	J077	055	043	J070	J071	J114	J103	J180	J118	J156	J113	J065
22	101	J030	J043	J055	060	041	102	082	093	J111	138	J185	130	J088	J058	J074	103	J040	J058	J055	111	083	J030	J063
23	J111	J083	J031	J053	039	032	J060	J085	098	J075	J062	J053	J060	041	050	J053	053	040	J048	J081	J023	J024	018	J033
24	J033	J063	J023	J021	G	032	J056	041	J073	J061	J103	J130	J163	J065	J073	040	046	043	J065	J058	J110	J053	J056	J053
25	J036	J043	J043	J029	G	036	046	040	J063	050	J080	J060	071	060	050	038	053	041	J043	040	J043	J031	J078	J044
26	J043	J070	J053	013	J021	035	J073	098	J103	J114	J075	034	G	038	041	046	G	026G	033	034	J032	J063	J041	J023
27	E016S	E	017	E	G	C	C	C	C	C	C	C	G	G	G	032G	G	025G	031	J025	020	E	E	E
28	E	018	019	J023	018	025	033	045	044	061	J071	J061	J065	J073	043	040	J046	027G	026	030	J050	J035	J030	J031
29	J035	J023	J030	E	G	G	033	041	045	049	055	043	045	040	G	032G	031G	053M	030	040	021	E016S	E	E012S
30	J035	J041	J053	019	J023	025	045	J061	J066	C	C	C	C	C	C	C	061	084	110	065	J053	J108	J076	J074
31	J064	J035	J053	J036	065	068	028	072	J085	J165	165	085	045	C	C	C	C	C	C	C	C	C	C	C
Count	31	31	31	31	31	30	30	30	30	29	28	27	30	29	29	29	30	30	30	30	30	30	29	29
Median	J033	J031	J030	J024	024	031	040	048	J064	J061	J065	J061	051	047	043	042	046	042	042	J044	J044	J046	J041	J030
U.Q.	060	053	043	036	038	037	060	063	083	091	082	083	071	064	060	053	053	055	065	065	063	063	068	059
L.Q.	019	E	021	015	016	025	033	041	048	052	052	046	039	040	035	034	040	033	033	033	031	033	027	018
Q.R.	041		022	021	022	012	027	022	035	039	030	037	032	024	025	019	013	022	032	032	032	030	041	041

The Radio Research Laboratories, Japan

foEs

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

W 4

IONOSPHERIC DATA

Jul. 1967 | **f_bEs** | **135° E Mean Time** (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N, Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	017	017	E	013	016	025	018G	040	A	050	A	G	A	044	A	A	034		049	049	026	027	020	S
2	017		012	E	017	G	G	G	A	A	A	G	A	G	G	G	A	044	036	A	A	027	030	028
3	022	019	020		017		G	G	G	050	050	050			037	034	038	030	030	048	037	030	C	C
4	023	023	E	019	017				035	045	C	C	042	039	043	043	054	G	039	029	042	020	016	015
5	016	016	E	017	017	035	042	G	G	G	G	C	036	G			029G	G	G	027	030	031	018	016
6	014	015	016	020	026	033	062	053	063	049	059	A	068	047	044	G	G	026	030	035	020	040	A	045
7	043	046	040	020	042	030	A	045	060	A	046	060	G	060	040	G	G	035	034	034	027	034	052	
8	016	014	018	030	017	G	048	058	050	058	G	A	053	049	G	A	054	A	A	026	048	034	035	018
9			E		G	G	037	G	G	051	G			037	036	027G	G	042	040	025	016	021	E	
10	016	027	032	020	026	030	G	054	050	059		G	G	G	044	036	032	047	058	038	038	027	055	041
11	E	023	028	022	020	G	044	049	053	050	049	A	G	036		037	043	054	A	040	073	051	066	051
12	041	040	029	016	020	034	A	043	A	A	A	049	A	A	G	044	041	G	049	034	030	038	036	030
13	025		015	016		G	G	G	048	043	050	G	G	040			G	040	036	028	025	018	024	017
14	S		E	E	011	G	G	042	051	060	070	046	G	042	062	036	036	030	G	048	026	032	017	016
15	S	020	016	016	017		G	G	047	G	G	G		037	026G	028G	045	044	033	027	025	032	016	016
16	030	015	E	E	014	G	G	G	G	G	G	G	G	G	G	G	G	052	G	A	041	014	025	015
17	020		015	016				G	G	051	049	G	045	039		035	027G	037	G	020	024	030	020	013
18	S			033		018	024	056	061	040	A	G	G	042	050	040	033	030		053	022	019	020	016
19	S				022	030	G	039	G	G	G	G	E036R	040	G		G	050	040	020	050	016	018	020
20	021	032	020	019	020	G	044	045	065	060	A	A	A	042	G	058	G	G	G	075	039	050	030	030
21	050	031	021	020	026	022	058	041	067	055	053	A	044	044	040	054	045	A	045	A	067	A	042	040
22	042	021	020	030	030	G	A	060	066	A	A	A	A	A	053	057	A	033	023	045	A	060	022	026
23	040	A	020	020	019	016	051	075	A	070	058	G	045	040	037	040	053	G	042	075	015	022	015	018
24	017	026	016	013		G	045	G	054	055	067	050	A	055	061	G	045	G	G	057	A	045	045	047
25	022	022	021	013		033	045	G	055	048	058	047	050	040	040	037	046	032	032	026	042	021	040	030
26	030	032	E	E	016	033	062	086	A	A	060	G		E038R	040	040		025G	025	025	020	032	040	019
27	S		014			C	C	C	C	C	C	C				030G		025G	027	020	015			
28		013	014	014	015	G	G	042	G	050	048	052	065	070	041	037	034	026G	026	028	043	020	020	022
29	020	011	015				G	G	043	G	G	G	G	G		030G	030G	050	025	G	015	S		S
30	033	041	020	E	015	G	042	057	055	C	C	C	C	C	C	C	059	054	A	027	036	052	052	030
31	040	028	027	030	029	051	G	060	A	A	044	066	043	C	C	C	C	C	C	C	C	C	C	C
Count																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

W5

IONOSPHERIC DATA

Jul. 1967 | f-min | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	013	018	015	017	026	018	020	018	017	017	017	012	013	E	E	E	E015S
2	E	E	E	E	E	012	016	013	017	017	018	020	018	018	017	018	018	012	012	E015S	E	E	E	E015S
3	E	E	E	E	E	011	011	017	019	018	020	023	023	017	017	018	017	017	011	E	E	E	C	C
4	E	E	E	E	E	012	011	011	011	017	C	C	020	018	019	017	017	011	E	E013S	E	E	E015S	E
5	E	E	E	E	E	011	011	011	011	017	020	C	017	019	017	018	018	016	E	E014S	E	E	E	E
6	E	E	E	E	E	012	013	016	017	019	021	018	020	020	024	020	017	E	012	E	E	E	E	E
7	E	E	E	E	E	E	011	011	017	017	017	017	018	019	017	016	016	011	E	E	E	E	E	E
8	E	E	E	E	E	E	011	012	017	016	019	018	018	018	019	017	012	012	011	E012S	E	E012S	E012S	E
9	E	E	E	E	E	E	E	015	016	017	013	020	017	018	019	018	016	015	011	E012S	E	E	E	E
10	E	E	E	E	E	E	011	013	017	017	017	022	016	016	018	018	011	E	E	E013S	E	E	E	E
11	E	E	E	E	E	011	011	012	017	016	011	018	019	018	017	017	011	012	016	E012S	E	E	E	E
12	E	E	E	E	E	012	012	017	017	017	017	020	018	020	023	018	016	E	011	E	E	E	E015S	E
13	E015S	E	E	E	E	012	011	015	017	017	016	020	018	017	017	017	011	011	015	E015S	E015S	E015S	E014S	E
14	E015S	E	E	E	E	012	012	012	020	017	025	020	020	020	020	018	011	012	012	012	E	E	E	E
15	E014S	E	E	E	E	011	012	011	015	017	017	021	019	020	015	016	015	E	011	E012S	E	E012S	E	E
16	E	E	E	E	E	011	012	020	022	016	017	020	016	017	018	017	018	011	011	E	E	E	E	E
17	E	E	E	E	E	012	012	012	012	038	022	025	028	015	017	017	015	015	011	E	E012S	E	E	E
18	E016S	E	E	E	E	011	012	018	020	018	020	017	020	020	019	018	016	015	E	E	E	E	E	E
19	E016S	E	E	E	E	011	012	012	018	018	015	017	018	015	019	017	017	012	E	E013S	E	E	E	E
20	E	E	E	E	E	011	012	016	017	018	018	016	022	024	019	018	017	015	012	E012S	E	E	E014S	E
21	E	E	E	E	E	E	013	012	012	018	020	020	020	020	020	016	016	018	011	E	E	E	E	E
22	E	E	E	E	E	012	011	015	018	019	018	020	020	020	019	019	018	017	E	E	E	E	E	E
23	E012S	E	E	E	E	E	011	015	017	018	019	020	019	020	019	023	018	016	011	E	E	E	E	E015S
24	E015S	E	E	E	E	E	011	016	017	017	019	020	021	026	020	019	018	017	016	E012S	E	E	E	E015S
25	E	E	E	E	E	012	022	015	019	024	025	028	021	028	020	022	018	016	011	E014S	E	E	E	E
26	E	E	E	E	E	E	016	017	030	020	020	034	028	027	025	018	020	016	E	E	E014S	E	E016S	E015S
27	E016S	E	E	E	E	C	C	C	C	C	C	C	029	026	018	017	017	017	012	012	E	E	E	E
28	E	E	E	E	E	012	015	017	019	021	019	020	021	021	018	020	018	018	012	011	E	E	E	E
29	E	E	E	E	E	E	E	011	012	017	017	020	020	020	020	017	017	013	011	E014S	E	E016S	E	E012S
30	E	E	E	E	E	011	012	017	018	C	C	C	C	C	C	C	017	017	011	E	E	E	E	E014S
31	E015S	E	E	E	E	E	015	016	019	017	020	020	012	C	C	C	C	C	C	C	C	C	C	C
Count	31	31	31	31	31	30	30	30	30	29	28	27	30	29	29	29	30	30	30	30	30	30	29	29
Median	E	E	E	E	E	011	012	015	017	017	018	020	020	020	019	018	017	015	011	E012	E	E	E	E
U.Q.																								
L.Q.																								
Q.R.																								

f-min

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

The Radio Research Laboratories, Japan

W6

IONOSPHERIC DATA

Jul. 1967 | M(3000) F2 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	265	260	F	265F	285	265	280	290	A	290	I295A	285	I260A	280	I285A	I285A	280	275	270	285	280	295	260	275
2	270	275	265	250	270	245	255	265	A	A	A	250	A	W	270	270	I270A	295	285	A	A	270	F	F
3	275F	290F	F	F	F	F	320F	310F	320F	305	290	295	275H	280	265	285	295	300	295	275	275	280F	I290C	I275C
4	270	280F	275	270	275	280	320	315	295	275	I285C	I275C	295	280	285	280	290	295	295	280	300	285	290	285
5	280	275F	270F	280	295F	300	295	265	290	290	295	I290C	290	285	265	295	285	290	295	290	285	270	280	295
6	265F	F	255F	260F	265	265	280	290	315	305	285	I270A	305	285	285	295	285	295	290	295	310	300	A	F
7	SF	SF	F	F	300F	275F	I270A	260F	305	A	260	295	315	290	285	285	295	305	285	275	285	285	295	290
8	275F	280	F	F	F	265F	275	275	285	300	310	I305A	285	285	300	I300A	295	A	A	295	285	310	285	275
9	275	275	285	295	295	275	275	295	290	320	320	300	290	280	285	290	285	290	285	275	280	295	F	F
10	F	F	F	F	F	F	270	290	295	285	305	305	300	290	285	285	280	300	295	275	285	280	F	F
11	F	F	290F	300F	300F	280	270	280	315	325	300	I280A	265	275	295	315	280	285	I260A	260	280	SF	SF	F
12	F	F	F	F	F	300F	I305A	315	I295A	I275A	I270A	280	I260A	I260A	285	285	285	285	280	275	285	270	275	275F
13	F	280	270	285	310	335	300H	305	305	305	300	295	270	290	295	305	275	285	285	275	285	295	290	275
14	280	285	275	275	280	290	285	300	280	310	I280A	290	300	280	300	285	285	290	275	275	285	295	300	275
15	270	270	F	F	320	295	290	285	295	300	295	305	285	305	280	295	300	305	290	300	300	270	275	280
16	F	F	290F	290F	275F	260F	260F	275	300	300	300	315	295	265	270	275	295	315R	320	I285A	275	F	275F	290
17	295	290	275	280	295	300	300	280	285	285	285	285	280	280	290	295	295	285	295	280	295	290S	280	280
18	280	275	270	F	F	305	280	295	305	295	I280A	285	280H	270	285	280	265	280	290	290	290	290S	SF	F
19	275	265	270	280F	280	260	295	295	295	305	300	270	280	315	270	285	295	295	305	315	270	270	275	270F
20	F	F	F	280F	275F	285	300	300	300	290	A	A	A	275	285	285	270	275	290	290	295	SF	280F	F
21	F	F	F	F	F	260F	320	290	300	305	285	I285A	295	285	290	280	295	I280A	285	I280A	275	I300A	275F	285F
22	F	F	F	F	F	275F	I275A	280	310	A	A	A	A	I280A	290	295	I295A	305	300	285	I275A	275F	F	F
23	280F	A	F	F	F	F	280	290	I300A	310	270	280	280	275	285	275	285	290	280	285	280	290	275	270
24	275	255F	F	275F	265F	265F	275	295	290	290	275	310	I285A	270	270	270	275	285	285	285	A	F	F	F
25	F	265F	270F	275F	280F	280	275	280	290	305	275	265	270	280	285	295	290	280	290	265	265	270F	F	280F
26	F	F	F	265F	250F	255F	260	280	A	A	295	255	240	270	275	275	285	280	290	275	265	270	275	I275S
27	285	270	275	265	280	C	C	C	C	C	C	C	285	285	285	295	290	280	280	280	290	280	285	280
28	275	265	270	275	285	305	290	F	295F	285F	270F	280	265	270	285	300	295	280	275	270	270	I270S	I280S	290F
29	F	F	F	F	F	245F	270	300	280	255	285	265	275	285	260	285	280	290	295	270	265	270	270	265
30	265	275	275	260	270	260	280	295	270	C	C	C	C	C	C	C	265	290	I285A	290	280	F	F	F
31	F	F	245F	F	245F	275F	300F	315	I305A	I310A	310	285	285	C	C	C	C	C	C	C	C	C	C	C
Count	18	18	17	19	22	27	30	29	27	25	26	27	27	29	29	29	30	29	29	29	28	25	20	20
Median	275	275	270	275	280	275	280	290	295	300	290	285	285	280	285	285	285	290	290	280	280	280	280	280
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F2

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

The Radio Research Laboratories, Japan

W 7

IONOSPHERIC DATA

Jul. 1967 | M(3000) F1 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					345		350	A	A	A	A	360	A	A	A	A	350	345	A					
2					300	335	380	365	A	A	A	395	I355A	385	395	370	I345A	I355A	A					
3							350	350	380	A	A	A	390	360H	340	385	380	335	335					
4							350	370	375	A	C	C	380	375	350	I350A	I345A	345	A					
5							A	345	360	380	390	I370C	365	360	365	330	335	340	340					
6							A	A	A	A	A	A	A	A	335	365	355	350	360					
7							A	A	A	A	A	A	360H	I370A	365	360	325H	I350A	A					
8						340L	A	A	A	A	370	I370A	I365A	A	360	A	A	A	A					
9						325	335	355L	380	I385A	395	365	420	375	350	370	330H	I335A	A					
10							340	A	A	A	425	415	405H	400	340	335	335	A	A					
11						335L	A	A	A	A	A	I370A	385	385	360H	370	A	A	A					
12						A	A	A	I385A	A	A	A	A	A	365	I380A	I355A	335	A					
13								355	360A	I365A	I385A	395	365	365	370	335	340	A	I330A					
14						370	335	A	A	A	A	A	400	360	I355A	350	350	350	U335L					
15							360	370	A	380	370	385	375H	375H	375	380	I335A	I345A						
16						310L	335	350	355	375	410	400H	385H	345	345	335H	350	I355A	370H					
17						350L	355	380L	365	I360A	I370A	380	345	360	360	360	350		350					
18							350	I340A	I345A	360	I370A	375	380	365	A	380	335	320	U350L					
19						330	335	360	345	370	400	400	375	400	360L	355	340	I335A	A					
20						U340L	A	A	A	A	A	A	A	380	340H	I350A	340H	330	335					
21							A		A	A	A	A	365	370	335H	I325A	I350A	I340A	A					
22						U350L	A	A	A	A	A	A	A	A	A	A	A	350						
23						U340L	A	A	A	A	I360A	330	370	355	360	U325L	I335A	325	A					
24						355	A	355H	A	A	A	A	A	A	I335A	330	I350A	350						
25							A	345	I345A	A	A	A	A	360H	340	355	I350A	350L						
26						A	A	A	A	A	A	355	330	360	360H	325	335	340L	U320L					
27						C	C	C	C	C	C	C	365H	375	340	355	340	325	U345L					
28							345	U345L	355	I360A	I365A	I370A	I365A	I350A	360	355	355		L					
29						290	U340L	350	360	360	365	365L	365	340	340	335	320L	I325A	U360L					
30						L	A	A	A	C	C	C	C	C	C	C	A	A	A					
31							345	A	A	A	365	I360A	360	C	C	C	C	C	C					
Count					2	13	15	15	13	10	14	18	23	23	26	26	26	23	12					
Median					320	340	345	355	360	370	370	370	365	365	360	355	340	340	340					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

M(3000) F1 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation | W8

IONOSPHERIC DATA

Jul. 1967 | h'F2 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					310		395	375	A	370	I390A	400	I480A	415	I395A	I390A	375	350	325					
2					360	425	410	455	A	A	A	535	A	W	460	460	A	350	320					
3							280	305	290	310	360	310	370H	360	385	345	315	300	295					
4							290	280	300	380	I340C	I350C	325	365	350	330L	A	315	290					
5							300	315	320	300	320	I335C	345	350	410	325	340	295	295					
6							I325A	300	I300A	295	A	A	A	360	350	320	320	310	280					
7							I390A	365	310	A	430	I335A	310	I375A	350	360	315	300	300					
8						340L	315	315	320	300	285	A	385	365	325	I335A	360	A	A					
9						340	325	325	300	270	295	335	360	380	375	345	375	315	310					
10							350	310	305	340	320	325	320	350	370	350	345	320	A					
11						350	380	315	290	275	305	A	405	365	315	305	370	A	A					
12						305	I305A	320	I375A	A	A	400	A	A	380	370	340	335	350					
13								325	315	300	325	335	400	345	320	320	370	340	325					
14						285	330	295	345	I305A	I315A	335	325	355	I335A	345	360	305	305					
15							340	340	310	325	350	325	340	350	335	350	315	300						
16						400	360	305	315	300	315	335	370	440	400	350	315	285	270					
17						300	275	300	320	310	340	370	360	360	340	325	305		310					
18							395	310	315	320	I360A	360	360H	405	345	340	405	350	315					
19						370	310	295	310	300	345	370	370	325	335L	360	325	300	280					
20						300L	285	270	I300A	A	A	A	A	375	370	I355A	360	350	305					
21							I280A		I340A	350	360	I330A	330	360	350	360	360	A	310					
22						305	I335A	I320A	A	A	A	A	A	A	345	I355A	I345A	310						
23						440	320	I315A	I310A	I305A	400	365	350	390	360	350	300	315	310					
24						310	325	295	310A	325A	I320A	320	A	420	410	375	360	315						
25							350	350	310	315	365	415	390	360	340	325	340	300						
26						350	A	A	A	A	A	460	525	410	375	370	350	325	300					
27						C	C	C	C	C	C	C	345	320	340	340	340	340	310					
28							310	335L	315	370	375	375	I385A	I365A	340	345	310		310					
29						410	345	310	335	415	370	370	370	350	420	350	350	310	270					
30						325	270	290	365	C	C	C	C	C	C	C	360	310	A					
31							300	A	A	A	300	I360A	335	C	C	C	C	C	C					
Count					2	16	28	27	25	22	23	24	24	27	29	29	28	25	22					
Median					335	340	325	315	310	310	340	355	360	365	350	350	345	315	310					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F2 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation | W 9

IONOSPHERIC DATA

Jul. 1967 | h'F | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	290	315	290	290	260	245	250	A	A	A	A	250	A	A	A	A	230	260	I250A	I255A	275A	260	250	275
2	290	290	300	320	300	275	235	230	I230A	I230A	I225A	225	I235A	240	215	230	I225A	I240A	A	A	A	305A	A	330A
3	295	275	270	260	275	245	225	225	235	I220A	I225A	I240A	215	205H	220	220	220	225	250	I275A	I285A	295A	I260C	I275C
4	305	280	260	250	250	240	200	215	215	A	C	C	210	200	265	A	A	260	I265A	275	I255A	260	255	245
5	265	280	260	280	275	250	I250A	225	230	210	225	I200C	210	215	205	210	240	230	275	260	I260A	310A	285	245
6	260	295	300	310	310	290	A	A	A	A	A	A	A	A	270A	245	240	225	260	I270A	240	A	A	A
7	A	A	A	260	I260A	265	I245A	A	A	A	A	A	225H	I245A	250	250	275H	I245A	I245A	I260A	270	I265A	I255A	235
8	260	260	295	320A	270	250	A	A	A	A	245	I235A	I230A	I235A	245	A	A	A	A	270A	I265A	I245A	I230A	250
9	275	265	265	250	260	240	260	210	225	I225A	200	210	200	200	215	225	235H	I255A	I255A	260	260	260	230	225
10	230	300	300A	260	265	270	250	A	A	A	200	210	185H	200	260	225	220	A	A	A	A	275	A	A
11	245	260	275	275	270	240	A	A	A	A	A	I220A	200	200	200H	240	A	A	A	A	I270A	I270A	A	A
12	A	A	260A	310	315	A	A	A	I225A	A	A	A	A	A	225	I240A	I240A	260	I265A	I265A	A	A	A	A
13	290	270	275	265	250	240	240H	240	I255A	I245A	I220A	210	200	210	215	245	260	I265A	I270A	290	270A	250	250	265
14	250	255	270	275	270	245	235	A	A	A	A	A	200	225	I230A	235	235	240	245	I265A	275	265A	240	260
15	290	300	265	250	220	240	210	220	I255A	230	210	200	200H	200H	200	220	I265A	I270A	280A	250	250	I275A	270	270
16	305A	290	260	260	275	250	240	260	250	220	220	200H	200H	250	250	250H	240	I250A	220H	I250A	I260A	275	300	260
17	250	245	275	270	260	220	235	250	240	I245A	I240A	210	250	205	210	220	240	265	260	250	270	I265A	260	275
18	270	250	255	300A	245	240	225	I245A	I250A	220	I215A	235	200	205	A	220	220	235	240	I280A	290	270	270	285
19	290	245	265	250	275	260	225	250	245	205	200	200	200	210	200	215	250	I250A	I255A	260	I250A	260	275	270
20	300	I320A	300	290	300	240	A	A	A	A	A	A	A	220	240H	I260A	210H	245	240	A	A	A	290A	320A
21	A	A	300	270	255	260	A	245	A	A	A	A	240	225	200H	I250A	I245A	I260A	A	A	A	A	A	A
22	I300A	290	300	300A	295	275	A	A	A	A	A	A	A	A	A	A	A	245	250	A	A	A	295	300A
23	A	A	260	305	270	230	A	A	A	A	A	230	220	225	210	250	I260A	260	I265A	I265A	250	250	250	260
24	290	305	290	270	280	260	I260A	220H	A	A	A	A	A	A	I265A	220	I250A	250	260	A	A	A	A	A
25	250	290	275	275	260	270A	I265A	240	I250A	A	A	A	A	200H	225	225	I235A	245	260A	275A	I280A	270	I295A	295A
26	310	A	285	250	285	310A	A	A	A	A	A	215	240	235	210H	250	235	240	260	275	290	I295A	I280A	270
27	250	295	275	275	275	C	C	C	C	C	C	C	220H	210	215	215	240	235	260	290	260	250	250	250
28	260	290	290	260	280	260	240	265	240	I230A	I215A	I230A	I240A	I245A	220	240	240	240	260	290A	I300A	275	260	260
29	300	300	330	275	320	270	250	250	250A	245	225	205	205	215	240	245	240	I265A	250	260	270	270	260	290
30	I300A	I290A	285	285	300	260	A	A	A	C	C	C	C	C	C	C	A	A	A	275	A	A	A	315A
31	A	300	310	325A	350A	A	250	A	A	A	250	I225A	225	C	C	C	C	C	C	C	C	C	C	C
Count	26	26	30	31	31	28	20	16	15	12	15	19	23	24	26	25	25	26	24	23	22	23	22	24
Median	290	290	275	275	275	250	240	240	240	U230A	220	215	210	210	220	235	240	250	260	265A	270A	270	260	270
U.Q.																								
L.Q.																								
Q.R.																								

h'F

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

The Radio Research Laboratories, Japan

W 10

IONOSPHERIC DATA

Jul. 1967 | h'Es | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	110	105	105	105	105	125	120	115	115	110	110	110	110	110	110	110	G	120	125	120	110	110	S
2	110	E	110	110	125	125	135	125	115	115	110	125	120	120	120	120	115	110	110	120	120	115	115	110
3	105	105	105	E	105	G	145	140	125	110	110	110	G	G	105	105	105	105	100	120	100	110	C	C
4	105	105	105	100	100	G	G	G	105	115	C	C	110	105	105	115	110	130	110	110	110	105	125	110
5	100	100	100	100	100	120	115	115	115	115	110	C	105	105	G	G	105	145	125	115	110	110	110	110
6	110	110	100	105	105	120	115	110	110	110	110	110	110	110	110	110	110	125	115	115	110	110	110	110
7	110	110	105	105	120	115	110	115	115	110	110	110	110	110	105	135	145	125	125	115	105	110	105	E
8	110	105	105	100	100	125	115	110	110	110	110	110	110	110	170	120	120	115	110	110	110	110	110	110
9	E	E	105	E	105	135	115	115	110	110	125	G	G	100	100	100	125	115	110	110	110	110	115	E
10	110	105	100	100	115	120	120	115	110	110	G	115	115	115	110	110	110	120	120	110	110	110	110	110
11	105	100	100	100	105	135	120	115	110	110	110	110	105	100	G	105	140	120	110	110	110	110	110	110
12	100	100	100	100	100	120	115	115	110	110	110	110	110	110	125	120	115	120	115	115	115	110	110	110
13	105	E	100	105	G	140	130	125	115	115	110	115	110	105	G	G	135	110	115	110	110	110	105	105
14	S	E	100	105	105	135	125	120	115	110	110	110	105	100	100	105	110	110	140	120	110	110	110	110
15	S	105	105	100	105	G	140	125	115	115	110	110	G	105	105	105	115	115	115	110	110	110	110	110
16	105	105	105	105	105	135	135	130	125	115	115	110	110	110	115	110	120	115	115	110	110	110	105	105
17	100	E	100	100	G	G	G	125	120	110	110	110	110	105	G	105	120	120	115	110	110	110	105	110
18	S	E	E	100	G	110	125	120	115	115	115	115	110	110	105	105	105	105	G	115	115	110	110	105
19	S	E	E	E	125	115	125	115	115	110	115	110	105	100	120	G	120	115	110	110	110	110	110	110
20	105	100	100	100	115	125	120	115	110	110	110	110	105	105	125	125	125	120	115	110	110	110	110	110
21	110	105	100	100	105	110	110	115	115	110	110	110	110	110	110	110	115	110	110	110	110	110	110	110
22	110	105	105	105	110	120	115	125	115	110	110	110	110	105	110	110	105	105	105	100	110	115	110	105
23	105	105	100	100	105	125	115	110	110	110	110	110	110	105	105	105	110	115	115	110	110	110	110	105
24	105	100	100	100	G	115	115	120	110	110	110	110	105	105	105	150	125	120	115	115	110	110	110	110
25	105	105	100	100	G	125	120	120	115	115	110	110	105	105	105	125	115	115	110	110	110	110	110	110
26	105	100	105	105	105	125	115	110	110	110	110	110	G	105	105	145	G	105	105	105	105	105	115	105
27	S	E	105	E	G	C	C	C	C	C	C	C	G	G	G	105	G	105	100	105	110	E	E	E
28	E	105	105	100	100	140	145	115	115	110	110	110	110	105	105	105	105	105	105	115	110	110	110	105
29	105	105	100	E	G	G	145	125	120	115	110	110	110	110	G	105	105	100	125	115	115	S	E	S
30	105	105	100	105	105	110	120	115	105	C	C	C	C	C	C	C	135	115	115	115	110	110	110	110
31	110	100	100	100	115	110	120	110	110	110	115	110	105	C	C	C	C	C	C	C	C	C	C	C
Count	24	23	29	26	24	25	28	29	30	29	27	26	25	27	23	26	28	29	29	30	30	28	27	24
Median	105	105	100	100	105	120	120	115	115	110	110	110	110	105	105	110	115	115	115	110	110	110	110	110
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

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

The Radio Research Laboratories, Japan

W 11

IONOSPHERIC DATA

Jul. 1967 | Types of Es | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f	f2	f	1	1	12	c 1	c	c2	c2	c2	c	c3	c2	c3	c3	1		c3	c2	c3	f3	f2	
2	f		f	1	1	c	h	c	c2	c3	c2	c	c	c	c	c	c4	12	12	c4	c4	f3	f3	f3
3	f2	f3	f2		1		h	h	c	c2	c	c2			1	1	13	1	12	c 1	13	f2 f		
4	f2	f4	f2	f3	1				1	c2			1	1	12	c2	c2	h	c3	c4	f4	f2	f	f2
5	f	f2	f	f	1	c3	c2	c	c	c	c2		1	1			1	h	c	c2	f6	f3	f2	f2
6	f2	f	f2	f3	12	c3	c5	c3	c3	c2	c2	c3	c2	c2	c2	c2	c2	c 1	c 1	c2	f3	f4	f4	f3
7	f6	f6	f4	f2	c2	c2	c3	c2	c2	c3	c2	c2	c	c2	12	h	h	c	c3	14	f4	f3	f6	
8	f2	f2	f2	f3	12	c	c3	c4	c2	c2	c	c3	c2	c2	h	c2	c3	c4	c4	c3	f6	f5	f4	f2
9			f		1	h	c4	c	c	c2	c			12	1	1	c	c2	c2	c3	f2	f2	f2	
10	f2	f2	f3	f2	c 1	1 c	c2	c2	c2	c2		c	c	c	c2	1	1	c3 1	c4 1	c5	f7	f2	f7	f6
11	f	f2	f3	f3	12	h	c3	c2	c2	c2	c2	c3	c	1		1	h2	c2	c3	c2	f4	f4	f3	f3
12	f	f4	f3	f2	13	c2	c3	c2	c2	c3	c2	c2	c4	c4	c	c2	c2	c2	c4	c5	f4	f4	f4	f6
13	f2		f2	f2		h	h	c	c2	c2	c2	c	c2	1			h	c2	c2	c2	h2	f2	f2	f2
14			f	f	1	h	c	c3	c2	c2	c3	c2	c2	12	13	12	12	1	h	c5	f2	f2	f2	f2
15		f2	f2	f2	1		h	c	c2	c	c	c		1	1	1	c2	c2 1	c 1	c2	f3	f3	f2	f
16	f2	f2	f	f	1	h	h	h	c	c	c	c	c	c	c	c2	c	c3	c	14	f3	f2	f4	f
17	f2		f2	f2				c	c	c	c	c	c2	1		1	c 1	c 1	c	12	f2	f3	f	f
18				f2		1	c 1	c3	c2	1	c3	c	c	1	12	12	1	12		14	f2	f2	f2	f
19					c2	c2	c	c2	c2	c	c	c	1	1	c		c	c2	c3	c2	f3	f	f	f2
20	f2	f2	f2	f2	c 1	c	c2	c3	c2	c3	c2	c3	13	12	c	c 1	c	c	c	13	f4	f5	f4	f5
21	f4	f2	f2	f2	12	12	c2	c2	c3	c2	c2	c3	c2	1	1	c2	c2	c4	c2	c5	f4	f2	f2	f4
22	f3	f2	f2	f6	12	c2	c3	1 c3	c3	c2	c3	c2	c2	c3	c2	c2	13	12	1	14	f4 f2	f f4	f2	f6
23	f5	f4	f2	f2	1	c 1	c2	c4	c6	c2	c2	c	c2	1	12	1	c2	c	c2	c3	f	f2	f	f2
24	f2	f2	f2	f		c	c2	c	c3	c2	c3	c2	c2	1	13	h	c	c2	c2	c3	f4	f4	f6	f7
25	f2	f2	f2	f		c2	c	c	c2	c	c2	1	12	1	1	c 1	c	c 1	12	c3	f4	f3	f4	f2
26	f2	f2	f2	f	1	c3	c3	c3	c2	c3	c3	c		1	1	h 1		1	12	13	f2	f3	f4	f
27			f													1		1	12	12	f			
28		f	f2	f2	1	h	h	c	c	c2	c2	c	c2	c2	12	1	12	1	12	c2 1	f4	f2	f3	f4
29	f2	f2	f2				h	c	c	c	c	c	c	c		1	1	13	c 1	c2	f			
30	f4	f7	f2	f	12	c	c	c2	12								h 1	c 1	c4 13	c2 13	f3	f3	f6	f2
31	f3	f4	f2	f4	c 12	c2 1	c	c3	c4	c4	c 1	c2	c											
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Jul. 1967 | foF2 | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	FS	FS	FS	FS	FS	054	055	058	064	A	A	A	A	066	067	I069A	072	070	I077A	I083A	086	084	RS	FS
2	059S	FS	064S	FS	052	052	I057A	056	049	I054A	I054A	A	A	A	I058A	057	057	063	061	061	055	057	F[illegible]	FS
3	FS	056S	I054C	052	054	062	073	077	071	067	072	071	072	071	073	I074A	076	076	069	073	I081C	079	FS	FS
4	FS	FS	066S	FS	FS	FS	073	FS	071	076	066	071	076	076	I080C	086	080	A	A	RS	084	076	FS	FS
5	FS	FS	FS	FS	FS	068	069	078	I088A	083	077	083	083	080	078	092	089	091	081	079	082	081	083	081
6	FS	071S	071S	068	064	073	079	092	086	084	I080A	081	084	078	I078A	I080A	083	074	081	I086R	083	064	062	RF
7	FS	R	FS	059	051	054	056	I068A	083	071	I063A	072	I074A	075	070	I071A	I072R	076	075	077	082	076	069	FS
8	I062R	FS	052	FS	050	058	079	082	088	082	067	066	069	073	077	072	068	066	074	092	R	A	R	A
9	FS	I065R	062S	FS	FS	059	FS	083	I090R	077	073	069	066	068	071	069	I069A	068	I074R	076	081S	FS	RS	FS
10	FS	FS	FS	FS	FS	FS	071S	083	077	073	079	077	069	072	I067A	067	065	068	061	066	076	A	FS	FS
11	FS	FS	FS	FS	FS	055S	065S	083	091	074R	I075A	078	081	078	089	084	063	064	I069A	078	092	I090R	R	A
12	FS	FS	FS	FS	058	074S	068	I066A	I056A	053	062	060	065	070	066	066	062	I063R	I062A	068	075	FS	FS	FS
13	FS	066S	068S	067S	071	063	057	066	074	069	068	069	073	075	079	072	065	A	A	A	I088R	084	074	FS
14	FS	FS	068	066	FS	064	065H	078	081	077	079	084	083	081	086	084	077	073	078	086	089R	083	FS	FS
15	FS	074	071	069S	059	059Z	066	073	076	076	076	073	074	075	068	071	082	085	084	078	074	FS	FS	FS
16	FS	FS	FS	FS	FS	059	072	089	I097R	091	076H	064	061	074	076	082	091	I092R	081	069	070	FS	FS	079S
17	FS	056	058	060	056	066	068	073	081	077	076	078	080	077	081	081	073	077	078	078	081	FS	FS	FS
18	FS	FS	FS	FS	FS	073	083	072	073	I081A	076	074	072	076	081	083	080	079	078	081	080R	FS	FS	FS
19	FS	FS	072S	070S	067S	066S	I073A	083	086	081	078	078	079	068	I070A	077	081	086	090	077	I071A	072	071	FS
20	FS	RS	FS	FS	061	066	083	084	071	067	073	070	075	073	075	073	074	077	082	083	075	070S	071	076
21	F	F	F	F	067F	074F	FH	080H	074	080	088	088	086	086	I085R	082	I078R	079	088	I089R	086	081	077	FS
22	FS	FS	FS	FS	FS	FS	080H	I087A	078	072H	074	082	079	092	091	085	I078A	077	071	070	074	072	FS	FS
23	FS	FS	RS	FS	FS	067	079	093	088	I079A	075	084	086	088	086	086	088	091	095	I096R	R	FS	FS	FS
24	FS	078	FS	082	FS	069	089	I092R	082	080	079	086	077	073	072	078	083	082	076	073	071	RS	FS	FS
25	RS	FS	FS	071	066	066	073S	080	088	082	083	082	086	095	095	089	I080A	078	074	I079A	I084R	FS	078S	072S
26	FS	FS	FS	FS	063	066	078	I096R	095	I080A	I068A	070	I073A	077	077	078	076	076	073	076	079	080	076	073F
27	F	F	F	066	064	062	076	088	090	082	077	075	079	081	079	074	074	078	I082C	089	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	076	084	091	096	099	094	084	I078A	081	091	086	079	I084R	086
29	071	067	066	066	061	I060R	074	079	073	074	075	077	084	088	081	082	086	083	078	078	075	I076R	073	074
30	073	073	069	063	063	066	091	099	101	I098R	080	C	C	A	102	098	092	I097R	097	084	I072A	074	FS	FS
31	FS	FS	FS	FS	063	064	072	072	074	077	080	081	086	085	084	082	076	I074R	I077R	083	089	082	081	076
Count	4	9	13	13	18	27	28	29	30	29	30	28	28	29	31	31	31	29	29	29	28	19	12	8
Median	066	067	066	066	062	064	073	080	081	077	076	077	078	076	078	080	077	077	078	078	081	079	075	076
U.Q.	072	074	070	070	064	067	079	088	088	082	079	082	084	083	085	084	083	082	082	085	085	082	080	080
L.Q.	060	060	060	062	056	059	067	072	073	072	072	070	072	073	071	072	072	072	074	074	074	072	071	074
Q.R.	012	014	010	008	008	008	012	016	015	010	007	012	012	010	014	012	011	010	008	011	011	010	009	006

foF2

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

The Radio Research Laboratories, Japan

A 1

IONOSPHERIC DATA

Jul. 1967 | foF1 | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						370L	410	450	A	A	A	A	A	A	A	A	A	A	A					
2						320	I380A	I420A	I440A	I450A	I460A	A	A	A	I480A	470	I450A	430	L					
3						L	LH	440	480H	480	500A	I510A	510	I540A	A	A	A	A	A					
4						L	L	560H	490	I480A	I500A	540	530H	A	C	480A	450	A	A					
5						L	L	470	I480A	500	I500A	500	I520A	510	510	490	450	420	L					
6						350	I400A	I460A	I480A	A	A	A	A	A	A	A	460A	L	A					
7						L	A	A	A	A	A	A	A	A	A	A	A	A	A					
8						400L	410L	I440A	I460A	I480A	I500A	I520A	560	I490A	490	470	I460A	440	L					
9						A	L	A	A	480	500	520	500	500	480	470	A	A	A					
10						L	A	A	A	A	480H	500	540R	A	A	A	440	I420A	L					
11						400L	I420A	I440A	460	A	A	480A	480	500	I480A	470	460L	A	A					
12						L	A	A	A	A	470R	480	I480A	480	470	A	A	A	A					
13							A	A	A	I490A	500	I500A	500	480H	I490A	470	A	A	A					
14						LH	L	430A	I460A	470	500	510	510H	A	A	A	A	440	A					
15						L	410	L	460	500	I520A	540	520R	510	550L	500	I460A	420A	A					
16						L	470L	A	A	A	I500A	520	520	500	490	520H	I460A	420	L					
17							L	460	500	I500A	530	530	520	I520A	520	490	500L	430	A					
18						L	A	A	540H	A	A	A	A	550	520H	I490A	470	440	A					
19						L	A	460	480	510	520	540	510	560H	I510A	500H	470	460A	A					
20						L	410	450	500	I520A	520	550H	520A	560H	500	530	430	440	380					
21								460	470L	A	A	A	A	A	A	A	500	460	400					
22						A	450L	I480A	500	550H	560A	A	A	530R	I540A	A	A	A	A					
23							A	A	500	A	A	550H	540	550	530	520R	480	A	L					
24						L	420	470	I500A	I550A	530	560H	540	560H	550H	520H	500H	450	A					
25							L	470	500	I530A	520	560A	I550A	530	530	510	A	A	L					
26						L	440	480	I490A	A	A	A	A	A	A	510	480	460	A					
27							430	470	500L	I530A	600	520	560R	550	550	530	500	450	C					
28						C	C	C	C	C	550	I540A	550	530	530	500	500	A	A					
29						360L	440	470	500	530	540	580	540	530	520	540	500	460						
30						L	450	480	I500A	I520A	I540A	C	C	A	A	540	510	A	A					
31						A	A	L	510	510	530	550	530	I540A	I530A	520	I480A	470L	370L					
Count						6	14	20	23	19	23	22	22	21	21	22	22	17	3					
Median						360L	420	460	490	U500A	520	520	520	530	520	500	470	440	380					
U.Q.																								
L.Q.																								
Q.R.																								

IONOSPHERIC DATA

Jul. 1967 | foE | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5′N Long. 140° 08.2′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	265	305	325	I345A	A	A	A	A	A	A	A	A	A	E				
2						A	A	A	A	345	355	I370A	I375A	I370A	I360A	I340A	I320A	A	A	E				
3						190	260	305	I330A	345	A	A	A	A	A	A	A	A	A	E				
4						A	260	A	A	350	A	A	A	A	C	345	320	275	A	S				
5						190	I255A	I300A	320	A	A	A	A	A	A	A	305	270	A	E				
6						A	255	295	320	I340A	355	I360A	A	A	A	A	A	A	A	E				
7						A	I245A	I285A	320	345	A	A	A	A	355	340	310	275	A	S				
8					E	A	I260A	295	320	340	A	A	A	A	A	I335A	315	A	A	S				
9					E	195	I240A	I285A	315	340	A	A	A	370	I355A	I335A	315	275	A	E				
10					E	A	A	I295A	I320A	A	A	A	A	A	A	A	A	A	A	E				
11					E	A	255	I300A	I320A	I340A	A	A	A	A	A	350	330	A	A	S				
12					E	A	A	295	315	340	I350A	A	A	A	A	I350A	I320A	I270A	210	S				
13					E	I190A	270	300	I325A	I345A	A	A	A	A	A	A	310	275	A	S				
14					E	185	240	I290A	320	I340A	I360A	A	A	A	A	A	A	A	A	S				
15					E	I180A	255	295	I325A	345	A	A	A	A	A	360	I320A	275	A	A				
16					E	A	A	305	335	350	A	A	A	A	365	365	335	A	A	E				
17					E	A	A	305	I330A	A	A	A	A	A	A	A	320	A	A	S				
18					E	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E				
19					E	A	A	A	A	A	A	A	A	A	I375A	350	325	285	A	S				
20						A	A	A	A	330	I350A	380	385	375	I355A	340	I315A	280	A	A				
21						A	240	310	345	I350A	360	A	A	A	A	A	335	A	A	S				
22						A	A	A	A	A	A	A	A	A	A	A	A	A	A	S				
23						A	A	310	330	I345A	350	A	A	A	A	A	A	A	A	A				
24						A	265	A	A	A	A	A	A	380	I375A	365	340	300	A	S				
25					E	I190A	285	315	330	I350A	A	A	A	A	A	A	A	A	A	E				
26						I180A	I260A	305	340	360	375	380A	A	A	A	A	A	A	A					
27					E	200	265	310	345	350	360	A	A	A	375	I370A	330	300	C	A				
28					C	C	C	C	C	C	A	A	A	A	A	A	A	A	A	E				
29					E	I180A	I250A	305	I330A	355	I365A	A	A	A	A	A	I330A	295	A	S				
30						190	I270A	315	I335A	360	A	C	C	A	A	A	A	A	A	S				
31						A	A	A	I345A	360	370A	375	A	A	A	365	325	275	A					
Count					15	11	19	22	23	23	11	5	2	4	8	14	19	13	1	11				
Median					E	190	260	300	325	345	360	375A	U380A	370	U360A	350	320	275	210	E				
U.Q.																								
L.Q.																								
Q.R.																								

foE

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

The Radio Research Laboratories, Japan

A3

IONOSPHERIC DATA

Jul. 1967 | foEs | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J065	J066	J074	J043	J040	025	J068	047	J060	J079	J084	J114	J117	J079	J059	J079	J069	J056	J115	J167	J085	J119	J083	J025
2	J037	J029	J077	J078	J064	J037	J083	J084	J056	J071	J076	J087	J160	J098	J055	044	J066	J038	J044	019	022M	J070	J054	J052
3	J048	J046	C	J040	J031	023	030	035	038	041	J073	J142	J136	J062	J078	J109	J144	J169	J083	J064	C	J050	J083	J034
4	J074C	J057	J022	J030	J035	J028	030	J040	045	J088	J056	043	J048	J076	C	J065	J048	J098	J138	J089	J044	J050	J074	J043
5	J054	J044	J054	J026	J025	J029	J053	J045	J123	J052	J059	J058	J084	043	J043	J041	J032	034	J042	J045	J039	J058	J080	J052
6	J050	J035	J034	J031	J032	J032	J060	J061	J084	J083	J135	J085	J075	J086	J118	J081	J083	J078	J051	J084	J083	J065	J057	J071
7	J063	J077	J055	J063	J036	J050	J084	J084	J085	J069	J093	J077	J100	J122	J098	J079	J075	J066	J063	J040	J033	J063	J084	J080
8	J029	J029	J082	J060	J020	024	035	J065	J081	J076	J116	J059	J066	J067	J068	J050	J065	J070	J066	J089	J084	J088	J084	J088
9	J061	J063	J061	J080	J045	J072	J055	J084	J060	J055	J049	J053	J043	J036G	J043	046	J081	J132	J078	J114	J079	J080	J130	J065
10	J052	J043	J032	J079	J078	J054	J077	J074	J079	J084	J046	047	J080	J064	J078	J073	J053	J048	J062	J053	J078	J085	J069	J071
11	J081	J063	J059	J065	J043	024	J045	J065	J042	J082	J143	J126	J170	J084	J084	J129	039	J082	J078	J065	J082	J083	J143	J083
12	J066	J035	J020	E	J025	J046	J053	J077	J087	J054	J053	J044	J084	043	042	J066	J079	J074	J079	J069	J053	J053	J079	J034
13	J040	J045	J044	J049	J035	J035	J059	J056	J053	J064	J055	J058	J062	044	J085	J049	J068	J098	J105	J114	J053	J053	J040	J053
14	E013S	J019	J029	J029	J021	G	035	J050	J071	J049	J051	039	045	J074	J083	J078	J053	J039	J066	J054	J024	J033	J027	J029
15	J020	J029	J029	J053	J043	027	J051	J045	J081	J054	J080	J109	J071	J074	044	J047	J059	J054	J043	J088	J114	J061	J040	J043
16	J031	J062	J044	J043	J026	029	J045	J053	J072	J053	J058	J083	J054	J051	J045	J060	J066	J145	J074	J053	J086	J040	J044	J065
17	J035	J020	J040	J013	J018	025	031	036	040	J054	J053	J048	J046	J066	J049	J046	042	J048	J066	J045	J051	J060	J053	J038
18	J054	J073	J073	J079	J050	J049	J078	J079	J059	J083	J073	J088	J125	J145	J055	J075	J057	J052	J039	J032	J029	J054	J053	J044
19	J028	J030	J025	J023	J021	026	J051	J050	J050	J048	J078	054	049	046	J104	J055	J047	J055	J054	J046	J088	J081	J110	J074
20	J055	J056	J040	J029	J060	J048	J040	J044	J037	J073	J040	050	J063	J070	J043	041	J034	J083	J051	J083	J032	J049	J032	J078
21	J053	J044	J041	J060	J028	028	036	J052	J053	J066	J084	J154	J166	J176	J123	J062	J113	J084	J088	J080	J070	J054	J050	J029
22	J040	J062	J059	J044	J083	J074	J074	J117	J082	J055	J084	J145	J081	J140	J079	J080	J111	J077	J075	J058	J060	J085	J046	J054
23	J073	J059	J084	J054	J037	J029	J066	J079	J064	J153	J123	042	J059	J073	J074	042	040	J056	J064	J089	J084	J063	J080	J054
24	J050	J060	J055	J044	J064	J054	031	J055	J075	J066	J061	J067	045	042	042	G	G	038	J032	J053	J025	J074	J044	J067
25	J074	J054	J054	J030	J025	027	J041	J054	J047	J074	045	J062	J083	J064	J065	J053	J085	J178	J080	J108	J080	J073	J074	J026
26	J061	J081	J077	J041	E	026	037	J051	J084	J085	J078	J070	J113	J058	J054	J045	J047	J043	J058	J140	J051	J028	J058	J060
27	J070	E	J030	J024	015	G	033	045	J051	J055	046	040	040	040	G	038	G	J030	C	J024	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	J084	J078	J048	J050	J049	J044	J061	J088	J084	J076	J062	J061	J039	J064
29	J033	J030	J034	J030	J023	023	036	039	J061	J051	J058	J067	045	040	J056	J050	034	J054	028	J029	J025	J023	J041	J050
30	J061	J056	J058	J030	E	J024	030	038	J062	J063	J123	C	C	J118	J083	J053	J073	J051	J063	J078	J110	J074	J086	J080
31	J053	J051	J036	J020	J029	J050	J055	J044	J051	043	J054	J053	J041	J066	J059	J040	J069	J083	J064	J063	J051	J033	J026	J083
Count	30	30	29	30	30	30	30	30	30	30	31	30	30	31	30	31	31	31	30	31	29	30	30	30
Median	J053	J048	J044	J042	J032	J028	J048	J052	J060	J065	J073	J064	J068	J066	J059	J053	J061	J066	J065	J065	J060	J061	J058	J054
U.Q.	063	062	060	060	043	048	060	074	081	079	084	087	100	084	083	075	075	084	079	089	084	074	083	071
L.Q.	037	030	033	029	023	025	035	045	051	054	053	050	048	046	045	044	042	048	051	046	036	050	044	043
Q.R.	026	032	027	031	020	023	025	029	030	025	031	037	052	038	038	031	033	036	028	043	048	024	039	028

foEs

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

The Radio Research Laboratories, Japan

A 4

IONOSPHERIC DATA

Jul. 1967 | fbEs | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5′N | Long. 140° 08.2′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	039	019	026	020	018	022	019	038	058	A	A	A	A	059	055	A	069	051	050	A	064	055	040	E
2	017	017	021	018	028	025	A	054	045	A	A	A	A	A	A	043	047	033	024	019	E	017	021	027
3	021	022	C	026	021	023	029	034	035	039	050	064	045	053	053	A	058	062	039	059	C	027	042	016
4	016	016	013	018	022	018	028	032	040	072	054	041	043	069	C	048	043	A	A	070	020	031	045	018
5	018	026	031	019	020	013	031	034	A	043	053	039	057	040	037	035	027	031	038	040	032	016	017	034
6	045	023	027	018	021	024	045	049	053	065	A	073	063	059	A	A	046	042	043	029	028	021	028	040
7	047	058	024	025	027	027	050	A	066	055	A	062	A	061	062	A	068	066	062	038	024	024	018	018
8	024	021	014	018	017	022	034	050	054	059	059	058	049	059	043	046	055	038	040	064	054	A	044	A
9	053	058	024	028	018	043	034	073	052	044	044	048	042	035G	039	044	A	060	051	064	026	025	066	053
10	044	028	024	018	016	027	054	058	051	064	038	046	041	061	A	055	036	044	028	049	056	A	039	036
11	057	038	014	E	028	020	042	056	037	068	A	048	046	043	062	034	G	059	A	036	053	042	065	A
12	042	022	015		E	025	044	A	A	048	040	038	057	041	041	057	058	044	A	040	020	040	049	018
13	023	018	031	029	023	029	054	055	050	054	047	054	040	039	062	037	C55	A	A	A	023	023	022	019
14	S	014	014	021	017		034	043	057	045	038	039	043	067	078	062	048	036	039	038	021	017	018	017
15	016	018	014	039	016	022	040	040	038	041	059	042	043	044	041	039	057	042	041	049	058	022	016	018
16	024	018	024	028	024	019	040	053	068	052	058	045	047	049	041	038	064	034	033	021	027	024	034	016
17	017	014	E	E	013	023	026	032	039	054	052	045	042	062	047	040	041	040	047	043	018	040	021	016
18	027	044	018	031	023	027	051	057	037	A	061	060	057	046	042	075	043	040	039	019	016	038	025	024
19	E	014	013	016	013	023	050	044	042	040	044	044	042	040	A	043	046	046	052	038	A	046	060	018
20	021	034	016	016	031	022	028	034	036	062	038	046	052	030	040	040	034	043	032	031	020	040	025	042
21	026	023	025	032	016	022	031	041	041	058	059	066	078	059	070	056	044	035	031	063	027	030	028	017
22	018	020	020	014	016	044	029	A	040	039	056	061	058	045	063	058	A	068	049	038	039	017	046	052
23	044	042	056	034	022	021	056	056	046	A	065	041	052	044	042	042	037	048	040	025	063	044	048	016
24	017	019	023	028	024	024	030	039	058	056	042	042	041	040	040			033	U032R	030	019	031	024	045
25	057	018	023	022	020	023	038	043	044	054	043	056	078	048	052	039	A	048	025	A	021	026	034	018
26	018	021	015	021		023	033	046	063	A	A	062	A	058	U054R	043	043	040	048	047	040	021	033	041
27	040		016	011	011		031	039	047	055	043	040	040	040		038		028G	C	020	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	041	061	047	048	042	039	039	A	078	072	050	038	028	029
29	018	026	022	016	E	020	034	036	037	049	053	041	043	040	044	040	034	035	027	023	017	019	032	039
30	055	043	036	018		E	028	036	061	061	059	C	C	A	070	050	044	048	050	056	A	032	034	040
31	021	017	017	012	014	036	052	G	043	041	043	049	040	066	058	038	049	045	029	020	022	020	018	028
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

fbEs

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

The Radio Research Laboratories, Japan

A 5

IONOSPHERIC DATA

Jul. 1967 | f-min | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5′N Long. 140° 08.2′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E012S	E	E	E	E	E	013	014	018	019	018	018	020	019	017	017	017	017	012	E	E	E012S	017	016
2	E	E	E	E	E	012	018	018	018	017	021	020	020	018	018	016	014	014	013	E	016	E013S	016	016
3	E013S	E	C	E	E	014	017	018	018	018	022	020	020	021	020	018	012	017	014	E	C	E	E012S	E012S
4	016	E	E	E	E	E	012	018	017	018	018	021	022	019	C	018	018	012	012	E012S	E012S	E014S	E013S	016
5	E013S	E	E	E	E	E	E013S	018	018	018	018	017	018	018	018	016	012	013	012	E	E014S	E012S	E012S	E013S
6	E014S	E	E013S	E	E	E	012	018	020	019	021	022	021	018	017	017	017	014	012	E	E	E012S	017	E
7	E014S	E	E	E	E	E	013	012	018	018	018	021	019	020	019	017	017	014	013	E013S	E	016	016	016
8	017	E	E	E	E	011	014	018	017	019	019	020	021	020	017	017	017	013	013	E013S	E012S	E014S	017	018
9	017	E	E	E	E	012	014	018	020	014	019	023	021	018	017	016	014	012	E	E	E013S	E013S	E014S	E013S
10	E014S	E	E	E	E	E	014	012	017	018	017	017	018	018	017	018	013	013	E	E	E013S	E013S	E	E013S
11	E	E	E	E	E	012	012	012	018	017	018	013	013	018	017	017	013	017	014	E013S	016	E013S	E012S	E012S
12	E013S	E	E	E	E	012	013	019	018	017	017	017	018	017	018	016	017	013	014	E012S	E	E014S	E013S	E014S
13	E014S	E	E	E	E	E	012	014	017	017	017	017	018	019	018	014	012	012	012	E013S	E	E	E014S	E012S
14	E013S	E	E	E	E	017	017	017	013	019	018	018	021	018	018	017	014	012	013	E013S	E	E012S	E013S	E014S
15	E013S	017	E	E	E	012	012	016	013	018	018	018	018	018	018	018	013	017	017	E014S	017	E	E013S	016
16	E012S	E	E	E	E	012	013	018	019	018	018	021	018	020	018	021	017	013	013	E	016	E	E013S	016
17	E014S	E	E	E	E	E	013	012	012	024	019	021	023	023	018	019	017	014	012	E012S	E012S	016	016	E013S
18	E013S	E	E	E	E	012	016	017	018	019	021	020	022	018	020	017	017	013	012	E	016	E014S	E013S	E013S
19	E014S	E	E	E	E	012	012	012	013	017	017	017	018	018	017	018	014	012	014	E014S	016	E014S	016	E
20	E014S	E	E	E	E	E	013	013	018	017	019	018	021	021	020	023	016	016	012	016	016	013	E	E
21	016	E	E	E	E	013	E	017	015	018	017	021	020	020	020	018	017	016	012	E013S	016	E013S	E012S	E
22	E	E	E	E	E	014	013	014	019	020	022	020	026	023	023	018	019	013	017	E012S	E	E013S	E014S	E014S
23	E014S	E	E	E	E	021	013	013	018	019	017	018	019	021	022	022	017	017	012	012	016	E014S	E012S	E014S
24	E014S	E	E	E	E	012	016	017	017	021	020	019	022	021	025	021	017	017	012	E012S	016	016	E014S	016
25	016	E	E	E	E	013	022	017	018	025	020	028	021	023	021	019	017	017	014	E	E	E	016	E013S
26	E013S	E	E	E	E	E	017	017	026	025	027	032	033	027	023	020	024	013	013	E	E	014	016	016
27	016	E	E	E	E	E	017	016	017	023	017	021	035	025	020	018	017	016	C	E	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	018	021	021	025	018	017	018	016	013	E	016	E012S	E012S	016
29	016	E	E	E	E	013	012	013	018	018	019	021	025	020	021	020	021	017	014	E013S	017	E013S	017	017
30	017	E	E	E	E	E	018	019	018	023	020	C	C	021	021	018	020	017	013	E012S	E	016	016	016
31	E013S	E	E	E	E	014	017	019	018	018	020	020	020	020	021	018	017	017	014	E	E	E015S	E015S	011
Count	30	30	29	30	30	30	30	30	30	30	31	30	30	31	30	31	31	31	30	31	29	30	30	30
Median	E014S	E	E	E	E	012	013	017	018	018	018	020	020	020	018	018	017	014	013	E012	E013	E013S	E014S	E014
U.Q.																								
L.Q.																								
Q.R.																								

f-min

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

The Radio Research Laboratories, Japan

A 6

IONOSPHERIC DATA

Jul. 1967 | M(3000) F2 | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5′N Long. 140° 08.2′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	FS	FS	FS	FS	FS	260	290	290	290	A	A	A	A	285	285	I275A	285	270	I260R	I280A	280	290	RS	FS
2	265S	FS	270S	FS	255	265	I270A	I250A	230	I250A	I240A	A	A	A	I270A	275	275	290	295	295	255	255	FS	FS
3	FS	285S	I270C	280	285	310	310	300	310	310	295	270	280	280	290	I280A	280	295	290	265	I280C	280	FS	FS
4	FS	FS	280S	FS	FS	FS	315	FS	295	295	295	260	275	275	I275C	275	280	A	A	RS	280	280	FS	FS
5	FS	FS	FS	FS	FS	310	295	280	I300A	295	275	280	270	275	255	285	295	305	295	280	270	270	280	285
6	FS	255S	260S	260	260	270	275	290	300	305	I300A	275	285	285	I280A	I285A	300	285	295	I295R	315	275	265	RF
7	FS	R	FS	290	290	295	265	I290A	310	315	I285A	275	I285A	295	285	I275A	I285R	300	305	285	290	290	290	FS
8	I280R	FS	270	FS	275	275	285	285	305	320	295	280	265	280	295	300	315	275	275	295	R	A	R	A
9	FS	I290R	285S	FS	FS	295	FS	290	I300R	300	290	280	285	285	290	305	I305A	305	I295R	290	285S	FS	RS	FS
10	FS	FS	FS	FS	FS	FS	285S	300	305	285	295	300	290	285	I295A	300	295	310	305	290	280	A	FS	FS
11	FS	FS	FS	FS	FS	285S	275S	290	305	300R	I280A	275	275	270	295	300	295	275	I255A	255	285	I300R	R	A
12	FS	FS	FS	FS	265	300S	320	I330A	I300A	230	285	270	265	295	275	305	285	I295R	I285A	280	295	FS	FS	FS
13	FS	275S	295S	295S	325	340	I300A	290	310	295	300	285	285	275	280	295	290	A	A	A	I290R	295	275	FS
14	FS	FS	280	275	FS	310	280H	295	290	285	285	285	290	280	285	285	290	285	280	295	305R	280	FS	FS
15	FS	275	285	295S	295	290Z	290	290	290	300	310	295	305	295	270	280	295	300	305	305	285	FS	FS	FS
16	FS	FS	FS	FS	FS	290	260	275	I295R	315	290H	300	260	285	290	275	295	I310R	310	290	260	FS	FS	295S
17	FS	275	285	285	300	315	300	305	290	300	275	280	285	275	285	290	285	300	300	290	275	FS	FS	FS
18	FS	FS	FS	FS	FS	290	320	335	290	I295A	290	285	270	265	280	285	290	285	295	290	300R	FS	FS	FS
19	FS	FS	280S	285S	285S	280S	I285R	300	305	290	290	280	300	265	I280A	285	295	295	310	310	I280A	270	275	FS
20	FS	RS	FS	FS	275	295	300	325	315	270	305	270	280	255	280	280	290	300	295	315	280	270S	280	280
21	F	F	F	F	285F	300F	FH	305H	305	285	300	300	290	275	I285R	280	I280R	285	290	I295R	285	295	275	FS
22	FS	FS	FS	FS	FS	FS	280H	I305A	285	280H	265	280	255	275	285	285	I290A	300	300	285	285	280	FS	FS
23	FS	FS	RS	FS	FS	290	295	295	305	I295A	285	280	275	285	280	275	285	285	295	I290R	R	FS	FS	FS
24	FS	275	FS	295	FS	275	285	I290R	275	280	270	280	285	275	270	280	280	295	295	290	265	RS	FS	FS
25	RS	FS	FS	285	290	305	290S	275	285	275	285	275	275	275	285	295	I290A	295	290	I280A	I290R	FS	295S	270S
26	FS	FS	FS	FS	275	275	265	I290R	305	I335A	I260A	260	I260A	265	265	285	285	290	295	300	265	280	280	295F
27	F	F	F	275	290	290	290	300	315	305	280	280	270	270	280	290	280	275	I280C	290	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	255	265	270	265	275	290	285	I280A	270	285	285	265	I275R	285
29	265	265	245	260	255	I250R	285	305	310	285	285	265	275	280	270	270	295	290	285	285	270	I275R	265	265
30	265	275	275	270	275	265	280	285	305	I300R	275	C	C	A	265	265	265	I280R	295	305	I270A	255	FS	FS
31	FS	FS	FS	FS	270	280	305	310	300	295	305	285	295	285	295	290	285	I290R	I285R	275	285	285	280	275
Count	4	9	13	13	18	27	28	29	30	29	30	28	28	29	31	31	31	29	29	29	28	19	12	8
Median	265	275	280	285	280	290	290	290	300	295	285	280	280	275	280	285	290	290	295	290	280	280	280	280
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

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IONOSPHERIC DATA

Jul. 1967 | M(3000) F1 | 135° E Mean Time (G.M.T.+9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						320L	345	335	A	A	A	A	A	A	A	A	A	A	A					
2						350	I360A	I365A	I355A	I335A	I350A	A	A	A	I340A	360	I350A	325	L					
3						L	LH	360	355H	370	I365A	I375A	375	A	A	A	A	A	A					
4						L	L	325H	350	I380A	I380A	355	345H	A	C	A	I355A	A	A					
5						L	L	340	I350A	I370A	I360A	380	I365A	350	350	340	340	335	L					
6						315	A	A	A	A	A	A	A	A	A	A	A	L	A					
7						L	A	A	A	A	A	A	A	A	A	A	A	A	A					
8						315L	355L	I360A	I350A	A	A	I340A	320	I355A	335	A	A	340	L					
9						A	L	A	A	375	360	350	375	370	360	A	A	A	A					
10						L	A	A	A	A	420H	I365A	370R	A	A	A	360	I350A	L					
11						345L	A	A	370	A	A	A	A	360	I365A	360	350L	A	A					
12						L	A	A	A	A	405R	375	I360A	395	370	A	A	A	A					
13							A	A	A	A	A	I370A	365	370A	I350A	355	A	A	A					
14						LH	L	A	A	A	365	380	360H	A	A	A	A	345	A					
15						L	I350A	L	370	375	I360A	355	365R	340	330L	355	I345A	A	A					
16						L	355L	A	A	A	I375A	370	345	I360A	370	335H	I335A	335	L					
17							L	360	350	I375A	I360A	360	365	I355A	I370A	355	340L	I350A	A					
18						L	A	A	340H	A	A	A	A	350	360H	I365A	335	345	A					
19						L	A	A	365	370	410	355	390	355H	I365A	340H	I340A	A	A					
20						L	370	365	380	I370A	365	355H	I355A	315H	360	340	380	I345A	A					
21								355	355L	A	A	A	A	A	A	A	340	335	345					
22						A	335L	I365A	380	350H	A	A	A	340R	A	A	A	A	A					
23							A	A	360	A	A	380H	335	345	345	350R	355	A	L					
24						L	355	360	I350A	I330A	365	355H	370	325H	345H	345H	340H	350	A					
25							L	370	360	I355A	380	I340A	I340A	345	I345A	350	A	A	L					
26						L	335	I350A	A	A	A	A	A	A	A	330	340	330	A					
27							365	355	I360L	I370A	320	365	345R	345	335	330	340	340	C					
28						C	C	C	C	C	365	I345A	330	340	340	360	345	A	A					
29						305L	330	345	360	330	I340A	325	360	360	350	330	335	340						
30						L	335	355	A	A	A	C	C	A	A	320	320	A	A					
31						A	A	L	355	385	360	I350A	355	I365A	I345A	340	I350A	I350A	335L					
Count						6	12	16	19	15	19	21	21	20	20	19	20	15	2					
Median						320L	350	360	355	U370	365	355	360	350	350	345	340	340	340L					
U.Q.																								
L.Q.																								
Q.R.																								

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

IONOSPHERIC DATA

Jul. 1967 | h'F2 | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						340	345	375	I360A	A	A	A	A	360A	380	I350A	I345A	355	350					
2						395	I285A	A	590	I525A	I555A	A	A	A	I450A	425	430	350	300					
3						270	275	285	295	290	340	I345A	350	370	340	I350A	340	330A	275					
4						275	255	330	325	I320A	340	410	390	I360A	I355C	325	325	A	A					
5						270	250	345	I300A	305	350	340	370	350	385	330	295	295	290					
6						345	320	290	290	290	A	A	335	335	I340A	I330A	310	295	290					
7						315	430A	I360A	305	310	A	A	A	340	I340A	I350A	I330A	330A	310					
8						345	300	290	280	280	A	I370A	415	365	330	320	310	350	325					
9						305	330	I295A	285	290	345	365	370	370	340	325	I320A	I310A	300					
10						290	330	290	285	I325A	330	315	365	350	I350A	340	340	310	270					
11						340	290	295	285	A	I350A	370	335	375	320	290	300	A	A					
12						285	280	A	I310A	590	370	420	410	340	390	340	I350A	330	A					
13							A	350	275	315	330	370	360	350	340	325	330A	A	A					
14						275	265L	290	310	305	325	340	330	340A	I325A	325	300	325	315					
15						275	295	290	310	310	290	320	320	330	360L	360	320	290	255					
16						300	350	335	290	255	320	335	470	360	355	365	315	300	270					
17							245	285	315	305	360	350	335	360	350	330	340	295	300					
18						280	260	255	330	I320A	330	340	I370A	410	340	I335A	325	320	270					
19						300	320	290	290	310	330	365	320	405	I380A	355	320	310	270					
20						285	270	240	270	A	345	425	380	420	375	330	345	320	300					
21								295	280	350	320	320	I330A	350	I340A	340	340	325	290					
22						300	320	I290A	320	325	410	355	410	340	320	330	I325A	310	280					
23							290	290	265	A	A	355	355	345	335	365	325	305	280					
24						290	280	270	300	340	330	340	365	385	400	370	330	305	265					
25							280	310	290	300	335	370	I365A	340	335	310	I315A	320	275					
26						320	360	295	285	A	A	A	A	395	380	350	340	330	295					
27							300	300	295	310	375	340	380	355	345	335	360	320	I305C					
28						C	C	C	C	C	420	380	355	360	325	310	320	A	A					
29						390	330	295	295	345	350	385	365	335	355	380	325	300						
30						300	310	280	280	280	340	C	C	A	340	350	350	325	275					
31						320	280	260	305	330	330	355	330	345	330	325	330	320	310					
Count						24	28	28	30	25	25	25	26	29	31	31	31	27	25					
Median						300	290	290	295	310	340	355	365	355	340	335	325	320	290					
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Jul. 1967 | h'F | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	320	320	330	280	290	275	220	240A	A	A	A	A	A	A	A	A	A	A	A	A	330	290	I255A	280
2	290	310	305	310	350	280	I250A	I230A	A	A	A	A	A	A	A	240	I240A	240	245	255	230	290	330	340A
3	290	280	I310C	320	270	240	225H	240	205H	220	I210A	I215A	205	A	A	A	A	A	A	A	I300C	285	305	255
4	290	290	245	280	290	240	225	200H	240	A	A	205	215H	A	C	A	I255A	A	A	A	235	270	300A	250
5	290	290	290	280	265	240	235	220	I215A	230	I235A	195	I205A	230	215	225	225	235	I270A	280	305	290	270	280
6	I320A	340	340	315	300	275	A	A	A	A	A	A	A	A	A	A	A	I245A	I270A	255	245	245	325	A
7	A	A	260	260	290	A	A	A	A	A	A	A	A	A	A	A	A	A	A	285	245	250	250	270
8	270	270	260	270A	315	265	245	A	A	A	A	A	A	A	I240A	A	A	A	A	290A	270	I250A	A	A
9	A	I285A	280	270	255	A	A	A	A	240A	I225A	I225A	210	205	225	A	A	A	A	I270A	275	280	A	A
10	A	285A	270	250	275	I250A	A	A	A	A	190H	I200A	195H	A	A	A	220	A	A	300A	I300A	I280A	I260A	A
11	A	A	255	250	290A	240	A	A	215	A	A	A	A	A	A	220	230	A	A	A	310	270A	I275A	A
12	350A	355	280	310	310	A	A	A	A	A	195	200	I225A	195	240	A	A	A	A	290	250	I260A	I270A	260
13	275	275	280	270	250	240	A	A	A	A	A	I225A	220	215H	I220A	240	A	A	A	A	270	230	250	290
14	250	250	255	290	260	205H	230	A	A	A	220	205	200H	A	A	A	A	I235A	A	270	245	240	290	230
15	275	280	255	240	240	220	A	A	230	205	I215A	210	220	I225A	215	235	I220A	I245A	I255A	I250A	I260A	290	290	275
16	290	290	290	290	260	245	A	A	A	A	A	230	I215A	I220A	215	240H	A	A	A	240	I250A	290	I280A	245
17	245	240	270	265	255	235	225	220	220	I210A	I220A	210	210	I225A	I220A	225	A	A	A	260	270	280A	270	270
18	280A	I290A	280	290A	260	A	A	A	215H	A	A	A	A	220	200H	I225A	I240A	I240A	I240A	255	240	I300A	310A	310
19	280	260	270	265	270	255	A	A	230	215	195H	230	210	200H	I215A	I235A	I250A	A	A	235	I260A	I290A	I275A	270
20	290	270	265	280	300A	255	210	230	195	I190A	195	220	I215A	I230A	220	240	235	I240A	I250A	245	250	A	330	300A
21	310	320	280	285	275	290	230	I225A	A	A	A	A	A	A	A	A	I235A	240	I210A	280	260	250	290A	270
22	290	300	270	240	285	I270A	230	I210A	190	190H	A	A	A	A	A	A	A	A	A	275	I280A	275	I290A	A
23	A	A	A	290	255	240	A	A	A	A	A	180H	I230A	250	230	225	230	A	A	265	I270A	I280A	280A	265
24	260	265	290A	270	290A	255	225	230A	I220A	I240A	215	190H	195	200	230	230	230H	250	I255A	255	265	A	I335A	I315A
25	I295A	265	270	260	275	245	A	A	230	I215A	210	A	A	A	A	225	A	A	250	I265A	265	280	265	270
26	300	295	280	290	270	270	250	A	A	A	A	A	A	A	A	I240A	A	A	A	310A	320A	275	280	300A
27	I340A	275	290	285	260	255	245	245	A	A	225	210	225	240	225	225	230	230	I250C	275	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	205	A	A	I230A	I220A	230	240	A	A	A	285	290	290	280
29	280	305	335	290	305	290	270	240	225	A	A	205	205	225	250	225	240	240	260	260	270	265	290A	I300A
30	I300A	310	290	290	290	255	240	240	A	A	A	C	C	A	A	A	A	A	A	270	A	A	330	I330A
31	330	300	295	290	285	I280A	I250A	230	230	210	210	I215A	230	A	A	230	I235A	I250A	265	270	280	255	265	285
Count	25	27	29	30	30	26	17	14	14	11	15	18	18	15	16	18	16	12	12	25	29	27	28	24
Median	290	290	280	280	275	255	230	230	220	215	210	210	210	225	220	230	235	240	250	270	270	280	285	280
U.Q.																								
L.C.																								
Q.R.																								

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

IONOSPHERIC DATA

Jul. 1967 | h'Es | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N, Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	105	105	105	100	140	100	125	115	115	115	105	110	110	110	105	105	130	120	120	110	105	110	110
2	110	110	110	105	105	115	115	110	125	125	125	125	115	115	115	130	120	120	115	130	120	110	120	115
3	110	105	C	105	105	160	170	140	130	125	115	110	115	110	110	105	105	105	105	105	C	120	105	105
4	105	100	100	105	105	105	130	110	130	120	120	115	115	110	C	155	125	115	115	105	110	115	110	105
5	105	105	100	100	120	100	120	125	115	115	115	140	105	110	115	105	105	135	125	120	110	115	115	110
6	105	110	105	105	105	130	125	120	115	115	115	115	115	115	115	110	110	130	125	115	115	110	105	115
7	110	110	110	110	110	110	125	120	115	115	115	105	110	115	115	130	125	125	120	120	115	115	110	110
8	105	105	105	105	105	130	120	120	115	115	115	115	115	115	125	135	130	120	115	115	110	115	110	110
9	105	130	125	115	125	125	120	115	115	115	115	110	110	105	110	140	125	120	115	115	115	125	125	115
10	105	105	105	130	115	105	115	120	120	115	115	140	110	105	105	105	105	130	135	115	115	120	110	110
11	110	110	105	105	105	130	125	120	125	115	110	110	110	110	115	120	140	120	115	115	115	110	110	110
12	110	105	105	E	110	105	125	120	120	115	120	120	130	120	130	120	115	115	120	115	140	115	115	110
13	110	105	105	105	105	130	125	120	115	115	110	110	110	110	115	100	130	115	115	110	115	110	110	110
14	S	100	100	100	105	G	125	125	120	115	115	105	115	110	110	110	110	115	120	115	110	110	110	110
15	110	115	105	105	110	140	125	120	125	115	115	110	110	110	120	125	120	120	120	115	140	110	115	135
16	105	125	100	100	110	120	120	130	115	115	115	140	120	115	120	140	115	115	110	115	110	110	110	105
17	105	100	105	105	100	140	125	140	120	115	110	110	110	110	105	105	130	120	105	110	110	110	105	110
18	105	105	105	110	110	115	115	110	115	115	115	115	110	110	115	115	115	115	115	115	115	120	110	110
19	130	105	105	105	105	125	115	115	115	115	110	130	140	140	130	130	120	115	115	110	110	110	105	105
20	105	100	105	105	110	105	105	110	115	110	110	125	125	110	100	145	110	120	120	110	100	100	110	110
21	110	105	105	105	110	120	120	130	135	115	115	115	115	115	115	115	115	115	115	115	110	105	110	110
22	115	105	105	115	115	120	115	115	115	115	105	105	105	120	105	105	105	105	105	105	105	110	110	105
23	105	105	105	105	105	105	120	115	115	110	110	120	110	110	115	115	140	115	115	110	105	105	105	110
24	105	100	105	100	105	105	130	115	110	110	115	110	120	145	150	G	G	135	120	115	115	110	110	105
25	105	105	100	105	105	130	120	115	115	115	120	110	110	130	110	115	115	115	115	105	110	105	105	105
26	105	105	105	100	E	130	125	115	115	115	115	115	110	115	135	110	110	105	105	120	105	105	110	115
27	110	E	105	110	110	G	130	125	125	115	120	120	115	115	G	115	G	105	C	115	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	115	110	115	115	110	110	105	105	105	105	105	105	115	110
29	105	105	105	105	100	140	130	130	120	120	115	120	115	115	105	105	110	120	130	115	115	115	105	105
30	100	100	100	100	E	105	150	130	120	120	115	C	C	110	115	110	130	105	105	105	125	115	110	110
31	105	120	110	115	115	115	115	115	115	120	120	120	120	110	110	135	130	120	110	110	105	105	105	105
Count	29	29	29	29	28	28	30	30	30	30	31	30	30	31	29	30	29	31	30	31	29	30	30	30
Median	105	105	105	105	105	120	120	120	115	115	115	115	115	110	115	115	115	115	115	115	110	110	110	110
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

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

The Radio Research Laboratories, Japan

A 11

IONOSPHERIC DATA

Jul. 1967 | Types of Es | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5′N | Long. 140° 08.2′E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f7	f3	f4	f4	f2	h 12	1 h	h3	h41	c5	c4	c4	c4	c3	c3	c5	15	h314	h314	c214	f4	f3	f4	f2
2	f2	f2	f4	f2	f4	c3	c4	c3	h212	h3	h2h	h3	c4	c4	c2	h2	h3	h2	c	c2	f	f2	f4	f5
3	f3	f5		f7	f3	h2	h 12	h2	h 12	h 1	c2	c3	h21	c2	c3	c4	c4	14	13	15		f2f6	f3	f2
4	f2	f2	f	f3	f2	13h2	h2	c2	h213	h3	h3	h2	c2	c4		h h2	h2	c5	c4	14	f6	f6	f4	f2
5	f4	f4	f5	f3f	f2f	1 h	h3	h2	h4	h3	h3	h2c	13	c2	c	12	12	h21	h3	c6	f5	f3	f3	f6
6	f5	f4	f7	f2	f2	h213	h3	h4	h2	c4	c4	c5	c4	c2	c5	c4	c3	h214	c214	c215	f3f4	f2f2	f3	f4f2
7	f5	f6	f4	f4	f6	12c2	h5	c4	c4	c4	c3	c3	c4	c2	c3	h2	h3	h4	c4	c6	f6	f3	f3	f2
8	f2	f7	f2	f2	1	h2	h2	h5	c3	c3	c2	c3	c2	c3	h2	h2	h3	c4	c3	c6	f4	f6	f4	f5
9	f5	f2f3	f2f3	f2f4	c212	h3	c4	c6	c4	h3	c3	c2	c2	12	c2	h212	h3	c413	c512	f4f	f5	f3	f3	f5
10	f5	f3	f2	f f2	c2	13	c4	h5	h3	c3	c	h2	1 h	13h	14	13	13h2	h312	h213	c314	f6f4	f3f	f3	f6
11	f6	f5	f3	f2	12	h2	h3	h4	h2	c4	c4	c2	c4	c2	c2	c2	h2	c5	c5	c4	f5	f3	f3	f5
12	f6	f4	f		1	1 c2	h3	h4	h4	c3	h	h	h c2	h	h2	h3	c3	c3	c4	c6	f f4	f3	f6	f2
13	f4	f3	f2	f5	14	h3	h3	h5	h3	c3	c3	c2	c2	c2	c312	12h	h313	c31	c31	14	f4	f3f	f3	f4
14		f	f	f2	12		h3	h3	h312	c2	c	12	c 12	c4	c4	c2	c3	c4	c3	c3	f4	f3	f2	f2
15	f2	f2	f2	f4	c3	h2	h2	h2	h3	h2	h4	c	c2	c2	h2	h2	h3	h3	c3	c4	f2f4	f4	f3	f2f3
16	f4	f f4	f2	f2	12	h	h2	h3	h3	c2	c2	h c2	c3	c2	c2	h	h3	c3	c3	13	f3	f6	f6	f3
17	f4	f2	f2	f2	1	h21	h	h2	h2	c	c2	c2	c2	c2	12	13	h212	c313	13	15	f3	f4	f3	f4
18	f3	f3	f2	f4	14	c3	c3	c3	c2	c4	c3	c2	c2	c2	c2	c3	c3	c3	c2	13	f2	f4	f3	f5
19	f2f2	f2	f	f	1	c3	c41	c4	c2	c2	c2	h c2	h c	h	h2	h3	h3	h5	c5	16	f5	f5	f3	f3
20	f3	f4	f3	f2	f4	12	12	c2	c21	c3	c	h2	h2	1 h2	12h	h	1	c312	c312	c613	f2	f4	f6	f4
21	f3	f2	f2	f3	f2	c3	h3	h3	h2	c3	h2	c3	c3	c3	c2	c2	c2	c2	c2	13	f4	f4	f4	f4
22	f3	f2	f3	f	f3	c5	c2	c5	c2	c	12	12	1	h2	12	12	14	16	13	13	f5	f2	f6	f6
23	f3	f5	f5	f5	f3	14	c4	c5	c2	c4	c3	h	c2	c2	c2	c2	h c2	c313	c4	c3	f5	f3	f4	f2
24	f2	f2	f2	f2	f3	12	h31	c3	c3	c2	c2	c2	h	h	h			h212	c2	c3	f3	f5	f6	f5
25	f6	f2	f3	f3	13	h2	h2	c4	c2	c2	h2	c2	c3	h212	c2	c2	c4	c3	c3	14	f3	f4	f4	f4
26	f2	f2	f2	f2		h2	h2	h3	c2	c3	c3	c2	c3	c2	h c2	c2	12	13	12h	f2f4	f6	f3	f3	f6
27	f5		f2	f	c		h3	h3	h3	c2	h2	h	c	c2		c		12		c				
28											c2	c2	c2	c2	c2	c2	12	15	16	14	f4	f5	f6	f4
29	f4	f4	f3	f2	1	h2	h4	h3	h	h2	h2	h	c	c	12	12	c	h2	h2	c3	f2	f3	f4	f5
30	f3	f6	f5	f2		1	h	h2	h2	h3	c2			c4	c3	c2	h 13	13	15	15	f5f3	f3	f4	f5
31	f3	f2f	f4	f2	f2	14	c3	c2	c2	h	h	h2	h	c2	c2	h	h2	c2	c2	f2	f3	f4	f2	f3
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

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

IONOSPHERIC DATA

Jul. 1967 | foF2 | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	U070S	I069S	073S	073	065	060	063R	067R	064	A	A	A	A	I073A	073R	070R	I072A	I074A	090S	083S	I083R	A	S
2	U063S	066S	U066S	U069S	056S	054	059	057	059R	059	A	060	A	062	059R	I060A	058	063	062	060	056	058	057	U058F
3	F	U059S	U055S	C	C	C	C	C	C	070R	U072R	A	A	072	079	U079R	A	J076R	071	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	R	U066R	I076A	084	086	094	088	082	I083R	091	U087S	U075S	S	I072F
5	I072F	U071S	U070F	U067S	062S	062S	068	074R	U098S	079	076	083	089	092	I091C	106	097	I095C	083	U071S	S	U084S	U080S	U077S
6	C	U064S	F	068	065S	068S	075S	091	A	A	A	A	A	A	A	I091A	092	093	094S	094	076	I066A	U065S	U062S
7	S	063S	059	J051R	049R	049	058	C	U083S	A	C	077	079	085	075	078	082	I081A	I082A	A	090	A	U065S	F
8	F	059F	057	047	U045S	I052C	I071C	088	C	075	C	A	J080R	083	A	A	A	A	A	A	S	058	054	U056F
9	I057F	U059S	I059F	I058A	U055S	050	A	A	A	A	073R	071	070	I073A	076	A	A	A	A	A	A	U076S	A	A
10	F	F	U068S	065F	066S	060F	076	078	075	072R	076	A	074	076	076	077	073	069	067	J071R	080S	067	065	A
11	A	F	U065S	F	F	048R	063	U079S	097	074	078	A	A	A	J101S	092	065	062	A	A	093	U105S	070	U058F
12	F	U058F	U059F	U060F	U059S	070	071R	I065A	056	A	063	I063A	068	077	071	067	065	063	068	069	073	071	A	F
13	F	F	064F	J073R	057F	056	060	A	074	068R	A	070R	074	077	086	085	073	073R	082R	I088A	090S	S	U074R	F
14	A	U065F	U061F	067F	058F	057F	065	078	080	077	081	088	085	091	095	095	090	087	091	097S	U092S	I082A	R	F
15	S	S	F	066S	060F	061	072S	082	077R	077	I080A	080	084	076	076R	081	087	093R	A	A	A	A	A	F
16	F	F	F	U064S	059F	058	067	083	112	U102R	U073R	I066A	U067R	I080R	085	091	100	094	081	065	U074R	U075S	F	R
17	U056F	060F	058	057F	053	059	061	070	076	073	080	087	088	086	086	080	I088R	091	081	I080A	J080R	F	A	F
18	F	S	F	068	F	F	084	J066R	J073R	081	082	074R	077	U079R	J088R	096	101R	096	108R	091	070	U067R	U070R	F
19	U066R	I068S	069F	U063F	U065S	066	071	J082R	088	083	084	089	082R	075	078	081	090	098S	093	073	U072R	077S	U078S	A
20	U065S	F	U070S	U069S	063	066	082	080R	065H	065	073	076	080R	083	087	093	096	092	093S	U082R	071R	U070R	074R	I079R
21	072S	F	J074F	076R	074R	066	I080R	077R	072	084	090	I089A	090	094	097	097S	089R	U086R	091	U093S	U084S	U080S	U076S	U079S
22	U080S	U078S	077S	U071S	U066S	U064R	082S	U098R	070	073	078	085	089	102R	105R	I092C	090	084	077	078R	I073R	U070S	A	F
23	U072R	F	U071R	063F	063F	U067R	079	092	089	A	A	A	098R	103	102R	101	A	A	U106R	J107R	092R	F	F	U086F
24	F	F	F	I087A	A	U074R	092	096	085	082	084	092	087	083	080	087	089	087	U078R	071	072R	U073S	072	F
25	F	090R	086	081	070	069R	074	082	088	085	084	092	098R	107	111	A	A	084	084	089	092F	086R	U076R	A
26	U071R	U071R	U066R	065	U062R	065	075	093	100R	A	A	A	A	085	A	085	087	083	082	080	079R	082	083	U073R
27	U076R	071R	U064F	061F	061F	066	075R	088	091	I080C	083	080R	082R	087	086	079	084	086	085	091	089	092	092	082R
28	081	U081S	U078S	074S	072	077S	081	080	077	076	I080A	087	100R	108	111	104	091R	097R	095R	102S	J083S	U072S	U077S	F
29	U082S	U083S	065S	065S	068	063S	076R	081	076	074	073R	083	091	094	091	089	095	092	089	084	071S	I072S	A	076S
30	073S	071S	065	062	063	065	084	097S	100	090	081	090	I104A	115	113	110	106	111	106	080	062S	A	A	I070S
31	U066F	A	F	U063F	U064R	062	072	076R	078	075	083	087	092	087	089	085	080	080	085	092	092	086S	U083S	U084S
Count	15	19	24	28	26	28	28	26	26	24	22	23	25	28	28	28	26	28	27	25	26	24	18	14
Median	U072	U068S	U066	066	062	064	073	080	078	076	080	083	084	084	086	088	088	086	083	084	080	U075S	U074	U074
U.Q.	076	071	070	070	066	066	080	088	089	082	083	088	090	093	096	094	092	093	093	092	090	082	078	079
L.Q.	065	060	060	062	058	058	066	076	073	072	073	071	076	077	077	080	080	078	078	072	072	070	065	062
Q.R.	011	011	010	008	008	008	014	012	016	010	010	017	014	016	019	014	012	015	015	020	018	012	013	017

The Radio Research Laboratories, Japan

foF2

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

K 1

IONOSPHERIC DATA

Jul. 1967 | foF1 | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							420L	440	A	A	A	A	A	A	A	A	A	A	A					
2						310L	L	430L	450	460R	A	A	A	A	A	A	460L	420L	A					
3						C	C	C	C	510	A	A	A	510	A	A	A	A	A					
4						C	C	C	C	C	R	A	A	L	500L	490L	L	A	A					
5							L	A	A	A	A	A	530L	510	C	C	L	C	L					
6							A	A	A	A	A	A	A	A	A	A	A	A	A					
7							L	C	C	A	C	A	L	S	L	A	A	A	A					
8						C	C	A	C	A	C	A	A	A	A	A	A	A	A					
9							A	A	A	A	A	A	500L	A	A	A	A	A	A					
10							430L	A	A	A	A	A	A	A	A	A	430L	L	A					
11							A	A	A	520L	A	A	A	A	490L	460	420L	A	A					
12						A	A	A	A	A	A	A	510R	540L	500L	U530L	A	L	A					
13								A	A	A	A	A	A	A	A	A	470	A	A					
14							L	500L	A	A	A	A	A	A	A	A	A	L	360L					
15						L	L	A	A	L	A	A	A	A	L	L	A	A	A					
16							A	A	L	A	L	A	A	A	A	A	A	430L						
17								480	480	A	540	A	530	530R	520	470	L	A	A					
18							L	A	520	490L	A	A	A	A	A	A	A	A	A					
19							A	A	A	L	A	A	530L	U520L	510L	480L	A	A	L					
20							L	L	450L	540	A	520R	A	U540R	R	R	470	A	A					
21							L	L	530	A	A	A	A	A	A	A	A	A	A					
22							L	L	A	A	R	L	R	A	R	C	A	L	L					
23							A	A	A	A	A	A	A	A	L	L	A	A	A					
24						L	L	L	L	L	600L	560	R	S	R	500	480L	L	L					
25							L	L	A	A	670L	A	550	A	A	A	A	L	A					
26						L	L	A	A	A	A	A	A	A	A	A	A	A	A					
27							L	L	A	C	A	R	610L	U540R	530L	520	500	L	L					
28							L	480L	A	L	A	A	R	A	A	A	A	A	A					
29						L	L	A	A	510L	L	A	A	550	L	S	L	L	L					
30							L	L	L	A	A	L	A	A	A	A	L	A	A					
31							A	L	510	U510L	A	A	I530S	L	530L	510L	L	L	L					
Count						1	2	5	6	7	3	2	8	8	7	8	7	2	1					
Median						310L	420L	480L	500	510L	600L	540R	530L	540	510L	500L	470L	420L	360L					
U.Q.																								
L.Q.																								
Q.R.																								

foF1

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

The Radio Research Laboratories, Japan

K 2

IONOSPHERIC DATA

Jul. 1967 | foE | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	240	310	A	A	A	A	A	A	A	A	A	A	A					
2						A	A	A	A	I360R	R	A	R	370	R	340	315	285	215					
3						C	C	C	C	345	A	A	A	A	355	A	A	A	A					
4						C	C	C	C	C	R	A	R	R	I360R	345	315	A	A					
5						A	R	A	A	A	A	A	A	A	C	C	A	C	A					
6						A	R	285	315	A	A	A	A	A	A	A	A	A	A					
7						B	240	C	C	I330C	R	A	R	R	R	330	315	280	205					
8						C	C	A	C	C	C	R	A	A	A	340	R	A	A					
9						A	A	A	A	A	A	A	A	A	A	340	315	270	A					
10						A	R	A	A	A	A	A	A	A	A	A	A	A	A					
11						A	240	A	A	335	A	A	A	B	R	345	315	275	A					
12						A	240	A	A	A	A	A	A	A	A	350	320	270	A					
13						185	240	300	330	A	A	A	A	A	A	A	325	270	A					
14						A	245	295	I320R	A	A	A	A	A	A	A	A	A	A					
15						170	240	295	R	R	R	A	R	A	R	355	320	R	A					
16						A	R	305	330	R	355	A	R	R	A	355	A	A	A					
17						A	R	280	315	A	A	A	A	A	A	A	S	A	A					
18						B	A	A	A	A	A	380	A	B	R	355	R	A	A					
19						A	R	A	315	355	A	A	A	R	R	355	325	A	A					
20						A	A	A	A	A	A	A	R	A	A	R	A	A	A					
21						A	275	310	330	365	I370R	R	I380R	A	I380R	345	335	295	A					
22						A	R	A	R	350	R	R	R	R	R	C	A	A	A					
23						A	R	A	R	A	R	A	A	A	A	A	A	R	205					
24						A	A	A	A	A	A	A	B	390	A	A	330	300	A					
25						A	270	305	340	A	R	A	A	A	A	A	A	A	A					
26						B	R	A	B	A	A	B	B	A	A	A	A	A	A					
27						A	240	A	335	C	R	B	A	A	A	A	A	280	205					
28						A	250	305	345	A	A	B	B	A	A	A	A	A	B					
29						A	225	295	R	340	R	R	R	B	B	A	R	280	215					
30						A	250	I305R	350	360	R	385	390	R	370	A	A	A	A					
31						B	A	A	320	355	A	A	A	R	375	350	330	275	A					
Count						2	13	12	12	10	2	2	2	2	5	13	12	11	5					
Median						180	240	300	330	350	I360R	380	I385R	380	370	345	320	280	205					
U.Q.																								
L.Q.																								
Q.R.																								

foE

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

The Radio Research Laboratories, Japan

K 3

IONOSPHERIC DATA

Jul. 1967 | foEs | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J029	J054	J053	J029	J041	J024	029	038	J063	J068	J079	094M	J139	J092	J075	J070	J119	J137	J085	J051	J061	J053	J094	J084
2	J061	J084	J035	J028	J039	J029	J029	J038	042	039	060	055	059	060	056	J084	J074	034	J038	033	J021	J022	J025	J051
3	J037	J040	J043	C	C	C	C	C	C	J041	J092	J128	077M	041	060	J063	J120	J080	J066	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	048	048	J122	048	045	G	J070	J096	J062	068	J071	J061	J051	J029
5	J052	J029	J027	J025	J043	J041	032	J055	J051	J069	060	056	042	J041	C	C	034	C	031	022	043	J054	J053	J053
6	C	J054	J039	J041	J030	050	J055	070	097	J109	J145	J144	J182	J142	J145	127	J109	J089	J051	J050	J029	J089	J041	032
7	J056	J053	J025	J042	J061	J030	J043	C	J102	J108	048C	059	047	044	G	J060	057	J089	J107	J125	J107	J088	J071	J053
8	J063	J064	J025	J016	J017	C	C	048	C	J067	C	121M	J062	J122	J132	125M	J137	J140	D	J119	J030	J026	J036	J029
9	J041	J051	J052	J085	J042	J053	J094	J178	D	J138	054	047	J054	J138	J053	J103	D	J177	J177	J142	J105	J088	J131Y	J085
10	J051	J029	J053	J055	J042	J029	J036	J060	J060	049	J074	093M	J062	060	J055	J054	J041	036	J054	J070	J054	034	J038	J078
11	J086	J050	J054	J065	J030	J041	J051	J054	J088	J112	J091	J142	J120	J094	046	G	034	J051	J138	J116	J037	J028	J084	J052
12	J084	J025	J071	J042	J029	J054	057	076	J056	072M	049	J089	047	J068	J042	048	059	J071	J054	J068	J089	059M	069M	J094
13	J053	J050	J053	J037	J022	J033	J039	J091	J068	J114	J081	J061	J060	J057	J060	069	036	J064	077	J137	J084	J056	J029	J051
14	J074	J053	J028	J035	J029	021	030	039	J066	J071	J071	J075	J063	073	072	J053	J058	J042	032	J026	J061	J088	J061	J061
15	J041	J017	E014B	021	E011B	022	J036	J082	J077	J064	095M	J065	058	D	043	J042	J083	096M	J131	J139	J108	J127	J087	J054
16	J043	J036	J043	J054	J057	J052	J055	053	047	J082	J088	D	J071	J055	J059	067	J103	J084	J041	J055	J061	J053	J069	022
17	J025	J041	J027	J021	026	J021	J038	042	J053	071	057M	057	045	043	046	J041	048	J071	059	J115	J061	J065	J084	J035
18	058	J063	J042	J041	J042	J043	J068	J059	043	044	057	060	J085	073	J092	J053	J055	J051	J058	J061	032	J021	J029	J055
19	J082	J061	J041	021	E016S	026	J053	J070	J061	J078	J063	J055	047	043	043	044	067	J070	J051	J108	J062	J036	J041	J107
20	031	J065	J108	J086	J056	J053	J043	J041	J070	J041	J055	046	058	047	044	042	047	057	059	J025	J051	032	035	J041
21	J054	J055	J028	J029	J029	J041	J029	039	J041	J055	J110	J142	J122	J119	J084	J120	J119	J088	J060	J084	J053	J036	J041	032
22	J026	J024	J064	J052	J042	022	J041	J052	J061	J036	043	047	047	J055	G	C	067	J053	J040	J037	J029	J050	J109	J038
23	J054	J051	J029	J041	J028	J029	J063	J083	094M	107M	J118	J145	J071	J094	045	J053	J119	J128	J088	J120	J108	J144	J141	J060
24	J062	J088	J123	J108	J104	J041	J036	036	042	056	J054	043	045	044	038	J039	038	J038	J028	J025	J032	J053	J039	J053
25	J066	J054	J055	J042	J052	J025	J039	J041	055	069	J054	J076	041	J071	J056	133M	J114	J088	J142	081	J088	J052	J057	J085
26	J025	J029	J025	J025	020	024	032	062	J106	131M	094M	J121	119M	077	J145	083	J067	J084	J043	035	031	J055	J024	J077
27	J052	J043	J036	J056	J042	J029	J041	J041	J067	C	J089	045	045	041	043	043	040	032	J032	J024	021	022	J029	J029
28	J051	J031	J028	J025	J028	021	G	J042	J055	J117	J119	061	043	059	045	J085	J089	J102	J068	J058	J057	032	J036	046
29	J045	J035	J058	J069	J015	020	J033	J051	J055	J053	J051	059	059	046	048	046	044	J038	J029	J029	J024	J036	J071	J036
30	022	J018	J028	J016	J015	021	029	J034	044	061	J056	J055	117M	076	080	J070	047	J081	054	J086	058	J063	J084	J054
31	J042	J128	J061	J070	J021	E018B	J046	J083	039	J043	061	076	046	044	G	G	043	J053	J108	E014B	021	020	021	021
Count	29	30	30	29	29	28	28	28	28	29	30	31	31	31	30	29	31	30	31	30	30	30	30	30
Median	J052	J050	J042	J041	J030	J029	J039	J052	J060	J069	J062	061	059	060	050	J054	J067	J076	J059	J064	J056	J053	J052	J052
U.Q.	062	055	054	056	042	041	052	070	074	108	091	121	085	092	072	084	109	089	088	115	071	063	084	061
L.Q.	039	031	028	025	022	022	032	041	049	054	054	055	047	044	043	042	044	051	041	033	031	032	036	035
Q.R.	023	024	026	031	020	019	020	029	025	054	037	066	038	048	029	042	065	038	047	082	040	031	048	026

The Radio Research Laboratories, Japan

foEs

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

K4

IONOSPHERIC DATA

Jul. 1967 | foEs | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	025	046	043	017	025	020	028	036	061	056	A	A	A	A	A	066	056	A	A	050	018	051	A	016
2	028	041	016	025	028	026	026	033	037	039	A	052	A	055	055	A	041	031	034	026	019	016	016	027
3	029	025	038	C	C	C	C	C	C	040	053	A	A	039	057	057	A	053	062	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	045	046	A	047	040		043	066	053	065	067	034	041	017
5	051	025	025	018	022	026	029	052	050	065	060	051	040	039	C	C	032	C	025	022	038	026	041	041
6	C	040	034	039	028	049	054	070	A	A	A	A	A	A	A	A	052	070	045	039	025	A	040	026
7	040	030	016	026	037	027	038	C	058	A	A	055	046	042		058	055	A	A	A	086	A	028	027
8	019	054	013	015	015	C	C	046	C	064	C	A	056	065	064	A	A	A	A	A	029	016	E	016
9	031	027	023	A	018	041	A	A	A	A	052	045	041	A	050	A	A	A	A	A	A	067	A	A
10	041	023	039	033	028	018	027	041	056	048	058	A	057	058	055	049	038	034	043	062	026	031	025	A
11	A	038	051	037	025	040	041	053	068	044	071	A	A	A	044		033	040	A	A	018	018	016	041
12	046	016	014	015	016	042	051	A	046	A	048	A	045	046	042	047	058	040	040	035	065	054	A	054
13	020	025	031	025	E	025	039	A	055	055	A	056	055	055	055	068	035	062	073	A	072	053	016	026
14	A	025	026	026	017	018	028	038	065	064	055	064	052	070	066	052	056	040	026	020	056	A	016	051
15	026	016	B	016	B	020	028	046	066	046	A	063	055	056	041	041	079	084	A	A	A	A	A	038
16	042	027	026	040	027	028	043	052	045	081	045	A	052	055	058	063	087	035	028	037	040	016	053	016
17	025	025	020	017	020	018	033	038	040	065	047	055	043	043	045	041	045	071	052	A	016	052	A	017
18	054	044	025	025	016	036	030	040	038	040	052	054	063	069	084	052	050	044	046	023	026	016	019	040
19	053	046	024	E	S	025	046	054	053	045	059	053	046	041	040	041	062	050	032	056	052	027	025	A
20	025	037	045	036	040	023	031	040	040	040	054	046	056	041	E044R	E042R	045	050	055	020	026	027	030	025
21	041	040	025	019	016	026	020	039	040	054	078	A	079	085	071	075	045	065	040	079	028	028	032	029
22	022	020	025	017	019	019	026	040	055	054	041	043	046	044		C	E067R	038	023	036	024	016	A	026
23	029	017	026	027	017	024	055	075	079	A	A	A	070	079	044	042	A	A	066	066	054	077	024	052
24	046	052	052	A	A	020	024	032	037	056	042	E043R	044	043	E038R	038	037	033	025	022	026	033	026	047
25	055	E	038	026	024	021	037	041	051	068	050	066	041	065	055	A	A	033	041	076	079	040	053	A
26	022	016	017	017	E	021	032	056	068	A	A	A	A	071	A	079	066	063	040	029	027	026	017	053
27	029	042	011	016	015	021	037	041	063	C	065	E045R	E045R	E041R	042	039	037	032	030	019	E	E	020	023
28	040	027	018	016	016	019		040	053	055	A	058	E043R	057	E045R	058	083	079	067	053	046	028	025	041
29	028	025	024	027	015	019	032	045	052	043	050	055	055	046	045	E046S	040	033	027	018	016	E	A	019
30	E	016	015	015	014	020	028	033	042	060	053	054	A	074	075	065	045	065	051	067	053	A	A	027
31	020	A	052	027	016	B	044	033	038	041	055	070	E046S	044			043	037	026	B	E	E	016	E
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

foEs

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

The Radio Research Laboratories, Japan

K5

IONOSPHERIC DATA

Jul. 1967 | f-min | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	014	E015S	014	011	011	011	013	015	014	026	019	025	028	027	026	026	019	014	013	E015S	E015S	E016S	E015S	E015S
2	E015S	012	013	014	E015S	013	015	017	016	016	026	026	026	026	025	021	016	015	016	014	E015S	014	014	E015S
3	014	014	011	C	C	C	C	C	C	019	026	018	020	015	018	024	017	018	013	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	025	026	026	019	026	016	015	012	013	E019S	E017S	E015S	E015S	014
5	014	014	011	010	010	011	015	015	015	027	017	027	026	025	C	E075C	016	C	012	013	E016S	014	014	E016C
6	C	014	011	011	011	014	016	015	018	018	026	026	026	025	026	027	017	014	014	011	E015S	E015S	E015S	E015S
7	E015S	014	014	011	011	015	E019C	C	E051C	022	024	017	017	026	018	017	016	013	013	E015S	011	E015S	E015S	014
8	014	E029C	012	011	010	C	C	013	C	017	C	E026C	018	027	017	016	014	014	013	013	013	013	013	013
9	013	011	011	011	010	014	014	017	015	015	019	029	026	028	024	025	015	013	015	E015S	014	E015S	E015S	013
10	012	013	013	010	011	013	013	015	015	020	016	017	027	018	027	025	013	014	013	013	E015S	014	E015S	E015S
11	E015S	014	012	013	013	012	014	016	016	013	017	018	015	039	025	018	014	013	013	013	E015S	013	014	E015S
12	014	013	011	E	011	013	013	016	016	025	025	021	025	026	019	018	016	016	014	013	013	E015S	E016S	E016S
13	E016S	015	010	E	010	012	012	012	012	017	017	019	017	025	026	017	013	013	014	013	013	E015S	014	E015S
14	E015S	013	011	010	011	013	015	014	016	025	025	025	026	027	027	025	017	013	014	014	014	013	013	013
15	E015S	014	014	010	011	015	014	014	016	019	026	021	027	013	026	025	017	014	013	014	E015S	E015S	E015S	E015S
16	E015S	012	012	011	012	013	015	017	025	026	026	014	026	026	026	019	025	013	013	013	014	014	E015S	E015S
17	014	012	013	010	011	013	016	016	013	034	026	026	E032S	026	025	025	025	015	012	E015S	E015S	013	E016S	011
18	E015S	E015S	011	E	E	012	013	016	019	025	026	027	026	041	026	023	018	017	014	013	012	013	013	E015S
19	E015S	014	E015S	014	E016S	011	015	012	013	016	020	026	026	026	026	025	016	013	016	013	014	E015S	013	E015S
20	013	014	013	012	013	013	013	016	017	017	026	020	024	025	026	025	018	017	016	E015S	E016S	E015S	E016S	014
21	E015S	013	013	011	014	013	016	016	018	017	027	025	026	026	027	026	025	014	014	011	E016S	014	E015S	E015S
22	014	013	E015S	010	011	014	014	016	018	018	026	026	026	026	027	C	016	014	013	014	E015S	014	014	014
23	014	012	011	010	011	013	015	016	015	019	026	028	025	028	027	026	020	017	014	014	014	E015S	014	014
24	014	013	011	011	011	013	015	015	015	026	026	026	040	023	026	027	025	017	013	013	E015S	E015S	012	E015S
25	013	014	E015S	011	010	014	019	016	016	026	027	027	026	030	027	026	026	018	014	014	014	014	013	013
26	E015S	011	012	012	011	015	015	016	035	027	026	038	039	026	027	025	026	017	013	013	E015S	014	E015S	E015S
27	E015S	014	010	011	013	011	014	015	015	C	026	038	038	026	027	025	019	016	014	012	014	014	E015S	013
28	E015S	013	013	010	011	013	016	026	018	026	027	038	040	033	026	026	020	016	014	E016S	013	014	014	014
29	E015S	013	013	011	011	015	016	016	017	019	025	027	027	040	038	030	020	018	014	013	013	014	E015S	E015S
30	014	013	011	011	011	015	015	025	025	025	027	030	028	029	025	026	019	017	015	013	E015S	013	E015S	014
31	014	011	013	011	010	018	015	017	019	025	026	034	027	027	026	020	025	016	017	014	014	014	011	013
Count	29	30	30	29	29	28	28	28	28	29	30	31	31	31	30	30	31	30	31	30	30	30	30	30
Median	013	013	012	011	011	013	015	016	016	020	026	026	026	026	026	025	017	014	014	013	E014S	014	E015S	E015S
U.Q.																								
L.Q.																								
Q.R.																								

f-min | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K6

IONOSPHERIC DATA

Jul. 1967 | M(3000) F2 | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	U280S	I285S	275S	275	290	285	285R	305R	300	A	A	A	A	I295A	295R	295R	I280A	I285A	290S	285S	R	A	S
2	U285S	265S	U275S	U285S	275S	255	285	260	245R	235	A	270	A	280	290R	I290A	275	305	305	310	275	265	270	U270F
3	F	U295S	U280S	C	C	C	C	C	C	295R	U280R	A	A	295	295	U290R	A	R	285	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	R	U270R	I280A	275	285	295	285	300	I290R	290	U300S	U300S	S	I285F
5	I290F	U285S	U290F	U305S	300S	305S	275	295R	U315S	315	270	265	265	265	I265C	305	295	I300C	310	U285S	S	U290S	U290S	U300S
6	C	U265S	F	285	280S	295S	280S	300	A	A	A	A	A	A	A	I290A	305	300	305S	315	300	I295A	U280S	U275S
7	S	285S	300	J345R	280R	295	280	C	U300S	A	C	280	285	285	290	305	300	I290A	I295A	A	R	A	U295S	F
8	F	305F	300	295	U280S	I290C	I310C	315	C	305	C	A	J300R	290	A	A	A	A	A	A	S	350	270	U285F
9	I290F	U290S	I315F	I290A	U290S	340	A	A	A	A	305R	285	280	I290A	295	A	A	A	A	A	A	U315S	A	A
10	F	F	U280S	285F	320S	300F	295	305	310	280R	290	A	285	290	290	300	300	305	300	J295R	305S	300	275	A
11	A	F	U310S	F	F	290R	295	U295S	325	310	275	A	A	A	J290S	295	295	275	A	A	280	U330S	310	U285F
12	F	U270F	U290F	U280F	U290S	310	340R	I325A	335	A	270	I265A	270	295	295	285	285	285	295	305	285	295	A	F
13	F	F	305F	J315R	295F	305	345	A	325	305R	A	290R	280	275	280	295	315	295R	295R	I290A	290S	S	U310R	F
14	A	U320F	U290F	290F	285F	300F	320	290	320	280	285	280	280	270	275	285	275	275	270	300S	U285S	I290A	R	F
15	S	S	F	285S	290F	275	300S	320	325R	280	I300A	295	300	290	295R	290	295	300R	A	A	A	A	A	F
16	F	F	F	U290S	300F	285	280	260	305	U340R	U320R	I285A	U260R	I285R	280	270	295	305	325	285	U290R	U265S	F	R
17	U285F	275F	295	300F	300	330	270	290	310	280	280	280	285	290	280	265	I285R	295	310	I300A	J290R	F	A	F
18	F	S	F	290	F	F	320	J330R	J275R	315	300	290R	280	U275R	J285R	270	285R	290	300R	320	290	U265R	U285R	F
19	U285R	I285S	285F	U285F	U290S	305	315	J300R	290	290	280	280	295R	275	290	285	280	305S	310	295	U275R	275S	U290S	A
20	U285S	F	U305S	U300S	300	310	320	325R	280H	275	280	285	290R	300	275	265	280	290	300S	U305R	275R	U280R	265R	I280R
21	280S	F	J290F	285R	295R	305	I310R	310R	285	285	285	I280A	265	275	270	280S	290R	U285R	290	U295S	U300S	U280S	U265S	U270S
22	U280S	U275S	280S	U295S	U280S	U295R	300S	U325R	285	285	270	265	260	280R	295R	I290C	290	300	290	305R	I295R	U295S	A	F
23	U295R	F	U285R	295F	285F	U300R	285	290	290	A	A	A	270R	270	270R	265	A	A	U300R	J300R	280R	F	F	U280F
24	F	F	F	I285A	A	U285R	290	325	280	275	255	280	280	280	280	275	285	295	U295R	295	275R	U270S	270	F
25	F	280R	280	275	295	315R	295	285	290	270	255	265	260R	270	285	A	A	285	285	280	290F	280R	U290R	A
26	U280R	U280R	U285R	280	U280R	270	265	270	325R	A	A	A	A	275	A	275	280	295	280	290	285R	265	270	U280R
27	U285R	280R	U290F	285F	280F	290	305R	295	310	I285C	285	280R	270R	280	280	280	280	280	290	275	275	270	285	275R
28	265	U280S	U285S	290S	290	300S	305	305	300	285	I270A	255	260R	270	280	280	270R	270R	280R	275S	J310S	U280S	U270S	F
29	U285S	U255S	260S	265S	260	255S	290R	305	305	295	275R	270	270	275	275	270	280	285	285	300	270S	I270S	A	265S
30	275S	275S	285	275	270	285	290	295S	295	285	255	250	I260A	275	270	270	260	280	320	305	270S	A	A	I275S
31	U270F	A	F	U265F	U280R	285	300	305R	310	295	295	280	290	285	280	280	290	285	280	275	285	285S	U270S	U275S
Count	15	19	24	28	26	28	28	26	26	24	22	23	25	28	28	28	26	27	27	25	25	23	18	14
Median	U285	U280S	U290	285	290	295	295	300	305	285	280	280	280	280	280	285	285	290	295	295	285	U280S	U280	U280
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

K 7

IONOSPHERIC DATA

Jul. 1967 | M(3000) F1 | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							330L	355	A	A	A	A	A	A	A	A	A	A	A					
2						315L	L	345L	360	340R	A	A	A	A	A	A	360L	330L	A					
3						C	C	C	C	365	A	A	A	370	A	A	A	A	A					
4						C	C	C	C	C	R	A	A	L	370L	345L	L	A	A					
5							L	A	A	A	A	A	340L	355	C	C	L	C	L					
6							A	A	A	A	A	A	A	A	A	A	A	A	A					
7							L	C	C	A	C	A	L	S	L	A	A	A	A					
8						C	C	A	C	A	C	A	A	A	A	A	A	A	A					
9							A	A	A	A	A	A	350L	A	A	A	A	A	A					
10							340L	A	A	A	A	A	A	A	A	A	365L	L	A					
11							A	A	A	380L	A	A	A	A	355L	365	375L	A	A					
12						A	A	A	A	A	A	A	370R	350L	340L	U360L	A	L	A					
13								A	A	A	A	A	A	A	A	A	340	A	A					
14							L	340L	A	A	A	A	A	A	A	A	A	L	400L					
15						L	L	A	A	L	A	A	A	A	L	L	A	A	A					
16							A	A	L	A	L	A	A	A	A	A	A	350L						
17								345	350	A	315	A	355	360R	365	380	L	A	A					
18							L	A	365	360L	A	A	A	A	A	A	A	A	A					
19							A	A	A	L	A	A	375L	U380L	370L	350L	A	A	L					
20							L	L	400L	335	A	R	A	R	R	R	345	A	A					
21							L	L	345	A	A	A	A	A	A	A	A	A	A					
22							L	L	A	A	R	L	R	A	R	C	A	L	L					
23							A	A	A	A	A	A	A	A	L	L	A	A	A					
24						L	L	L	L	L	310L	345	R	S	R	355	350L	L	L					
25							L	L	A	A	305L	A	345	A	A	A	A	L	A					
26						L	L	A	A	A	A	A	A	A	A	A	A	A	A					
27							L	L	A	C	A	R	315L	R	345L	340	335	L	L					
28							L	350L	A	L	A	A	R	A	A	A	A	A	A					
29						L	L	A	A	345L	L	A	A	R	L	S	L	L	L					
30							L	L	L	A	A	L	A	A	A	A	L	A	A					
31							A	L	345	U370L	A	A	I355S	L	335L	340L	L	L	L					
Count						1	2	5	6	7	3	1	8	5	7	8	7	2	1					
Median						315L	335L	345L	355	360L	310L	345	350L	360	355L	350L	350L	340L	400L					
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

K 8

IONOSPHERIC DATA

Jul 1967 | h'F2 | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							350	365	355	355	A	A	A	A	I370A	375	350	A	I335A					
2						380	350	460	500	575	A	430	A	400	430	A	375	320	275					
3						C	C	C	C	365	365	A	A	360	340	325	A	280	375					
4						C	C	C	C	C	R	415	I370A	370	340	310	350	325	280					
5							355	325	280	275	380	375	360	360	I360C	315	300	I290C	260					
6							350	305	A	A	A	A	A	A	A	A	310	315	270					
7							405	C	305	A	C	360	355	325	350	330	330	A	A					
8						C	C	270	C	315	C	A	345	330	350	A	A	A	A					
9							A	A	A	A	325	330	360	I350A	355	A	A	A	A					
10							310	270	300	325	350	A	350	350	340	325	310	290	310					
11							305	310	275	280	I360A	A	A	A	325	275	305	355	A					
12						275	255	I315A	285	A	410	I440A	400	340	340	370	E400A	350	310					
13								A	275	325	A	375	360	380	335	330	325	360	A					
14							275	335	280	375	335	330	355	350	335	315	330	330	310					
15						355	275	275	285	325	A	335	315	320	330	325	I330A	E355A	A					
16							315	365	295	265	285	I340A	450	365	360	345	345	275						
17								335	305	A	375	355	340	350	340	310	325	320	290					
18							260	250	395	280	325	355	375	405	E425A	355	310	280	280					
19							270	285	310	285	360	340	320	380	360	330	330	295	260					
20							245	275	240H	425	375	360	340	310	360	365	310	305	280					
21							280	265	360	355	360	A	E420A	E400A	355	350	320	335	280					
22							295	275	365	370	375	380	400	345	320	I325C	E375R	280	285					
23							305	325	E355A	A	A	A	360	360	340	355	A	A	295					
24						315	280	260	275	360	400	350	335	365	375	360	310	300	275					
25							270	310	275	380	430	355	370	350	320	A	A	300	300					
26						300	330	325	270	A	A	A	A	380	A	E430A	345	325	280					
27							265	280	275	C	345	355	390	350	345	345	340	315	300					
28							275	300	295	370	A	415	365	350	325	325	E425A	360	330					
29						395	320	275	285	325	380	380	365	350	350	360	320	310	280					
30							280	290	280	305	320	410	I380A	330	340	350	350	320	265					
31							285	310	325	290	340	355	325	355	340	330	305	310	285					
Count						6	25	26	26	22	20	22	25	28	29	26	26	26	24					
Median						335	285	300	290	325	360	360	360	350	340	330	325	310	280					
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

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

The Radio Research Laboratories, Japan

K 9

IONOSPHERIC DATA

Jul. 1967 | h'F | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	310	350	300	280	300	260	225	235	A	A	A	A	A	A	A	A	A	A	A	290	270	E350A	A	300
2	300	355	305	300	340	300	225	225	230	230	A	A	A	A	A	A	290	240	A	250	275	295	325	340
3	285	300	330	C	C	C	C	C	C	215	A	A	A	200	A	A	A	A	A	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	245	E290A	A	E300A	225	210H	310	A	A	315	310	260	320	310
5	355	315	280	255	275	255	220	I250A	A	A	A	A	250	215	C	C	230	I240C	245	255	290	285	305	275
6	C	375	325	320	315	330	A	A	A	A	A	A	A	A	A	A	A	A	A	245	235	A	330	315
7	325	310	265	235	300	265	315	C	C	A	C	A	320	240	200H	A	A	A	A	A	E365A	A	275	335
8	310	285	260	260	315	I260C	C	A	C	A	C	A	A	A	A	A	A	A	A	A	230	210	330	305
9	340	305	270	I315A	290	270	A	A	A	A	I220A	A	285	A	A	A	A	A	A	A	I280A	305	A	A
10	320	290	305	280	260	280	230	A	A	A	A	A	A	A	A	I235A	235	250	A	355	260	275	330	A
11	A	310	310	290	310	275	I260A	A	A	220	A	A	A	A	270	215	215	A	A	A	280	235	215	335
12	405	330	300	325	280	A	A	A	A	A	A	A	245	250	245	250	A	E320A	A	280A	A	E340A	A	E350A
13	300	290	275	260	240	250	250	A	A	A	A	A	A	A	A	A	245	A	A	A	E360A	275	260	360
14	A	245	305	285	255	225	250	230	A	A	A	A	A	A	A	A	A	330	255	260	275	A	290	330
15	275	255	255	260	230	230	225	A	A	250	A	A	A	A	210H	230	A	A	A	A	A	A	A	320
16	330	325	310	315	315	275	A	A	A	A	225	A	A	A	A	A	A	250	240	265	315	290	385	225
17	265	320	275	260	255	230	230	230	235	A	E300A	A	225	210	245	225	250	A	A	A	260	E360A	A	250
18	E340A	E350A	300	305	290	260	240	A	220	210	I215A	A	A	A	A	A	A	A	A	235	230	305	305	325
19	360	335	260	275	275	265	A	A	A	255	A	A	230	210	215	230	A	A	E270A	E305A	365	285	275	A
20	315	335	325	325	290	260	240	250	210	200H	A	200	A	210	R	R	300	A	A	235	275	310	345	295
21	325	350	295	280	255	230	230	235	220	A	A	A	A	A	A	A	E315A	A	A	325	260	270	325	325
22	300	285	295	275	290	265	225	250	A	A	205	230	250	215	R	C	A	270	235	280	270	265	A	330
23	300	340	285	310	285	265	A	A	A	A	A	A	A	A	245	255	A	A	A	280	310	E440A	325	E375A
24	340	320	330	A	A	250	220	220	230	A	215	225	220	220	240	230	220H	230	250	260	295	310	300	360
25	355	260	310	275	265	240	260	255	A	A	A	A	220	A	A	A	A	230	A	E355A	E350A	305	330	A
26	320	290	280	275	280	275	210	A	A	A	A	A	A	A	A	A	A	A	A	270	285	310	280	325
27	315	325	275	285	295	255	255	260	A	C	A	R	285	R	240	225	230H	260	280	270	265	275	260	260
28	340	305	275	265	260	230	230	240	A	300	A	A	R	A	A	A	A	A	A	280	255	280	360	330
29	275	315	325	320	320	300	260	A	A	240	A	A	A	R	260	S	250	235	255	255	275	275	A	300
30	270	280	275	310	285	270	230	240	230	A	A	400	A	A	A	A	230	A	A	310	E400A	A	A	310
31	305	A	E395A	310	280	280	A	230	210	210	I230A	I240A	I210S	220	225	230H	275	260	265	270	255	250	270	270
Count	27	29	30	28	28	28	21	14	8	10	8	6	11	11	12	11	14	12	9	23	28	25	22	26
Median	315	310	300	280	285	260	230	240	225	225	220A	230	245	220	240	230	245	250	250	270	270	280	310	315
U.Q.																								
L.Q.																								
Q.R.																								

h'F

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

The Radio Research Laboratories, Japan

K 10

IONOSPHERIC DATA

Jul. 1967 | h'Es | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	110	110	110	105	105	110	160	125	115	115	110	110	110	110	110	110	110	110	110	110	115	115	115	115
2	110	110	110	110	110	115	115	115	115	150	125	110	125	120	125	120	120	130	120	115	115	115	110	115
3	115	110	105	C	C	C	C	C	C	120	115	115	115	115	115	110	115	110	110	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	120	115	120	125	125	G	120	115	115	115	110	110	110	115
5	110	105	105	105	120	120	120	120	115	115	110	110	115	110	C	C	110	C	105	110	115	115	115	110
6	C	110	110	110	110	110	115	115	115	115	115	115	115	115	110	110	110	110	110	105	105	110	105	105
7	105	115	120	115	115	125	120	C	115	115	115	110	120	135	G	125	130	125	120	115	115	115	110	110
8	110	110	110	105	115	C	C	110	C	115	C	110	110	115	115	125	120	115	115	115	110	110	115	115
9	105	120	125	125	120	120	115	115	110	110	115	115	110	110	110	125	115	115	115	115	110	110	115	115
10	110	105	105	105	105	110	120	115	115	110	115	110	110	110	110	110	110	105	110	105	110	105	110	110
11	110	110	110	110	110	110	120	115	110	125	115	115	115	115	130	G	140	125	115	115	115	110	115	115
12	110	115	115	115	125	120	120	115	115	115	115	110	110	110	105	125	115	115	115	115	110	115	115	110
13	110	105	105	100	115	135	125	115	110	115	115	110	110	110	110	130	160	120	115	115	115	115	110	110
14	110	110	105	105	105	115	140	130	120	115	115	110	115	115	115	115	115	115	115	115	110	115	115	115
15	110	110	B	105	B	150	125	120	120	120	115	115	120	120	125	120	120	120	115	115	115	115	115	115
16	110	110	110	110	110	110	120	120	120	115	115	115	115	115	115	125	115	115	115	115	110	110	110	110
17	105	105	105	105	105	105	115	120	115	110	110	110	110	110	105	105	125	120	115	110	110	110	110	105
18	110	110	100	100	105	110	110	110	110	115	115	120	115	120	120	120	120	115	115	115	110	110	115	115
19	110	110	110	115	S	125	115	115	115	115	110	115	110	120	140	130	120	115	115	115	110	105	110	105
20	110	110	115	110	110	110	110	115	115	110	115	110	120	130	110	135	130	120	115	110	110	115	110	110
21	110	110	110	110	110	110	115	130	125	120	120	115	115	115	120	120	120	120	115	115	115	110	110	110
22	120	120	120	115	115	115	115	115	115	115	150	130	130	130	G	C	115	110	110	110	110	110	110	115
23	110	110	110	105	105	130	120	115	115	110	110	110	115	110	110	135	115	120	115	110	110	110	110	110
24	110	110	110	110	110	110	110	110	115	115	110	145	130	135	115	115	140	125	110	115	115	115	110	110
25	110	110	110	110	110	120	130	125	120	115	115	115	115	115	115	115	120	120	115	110	110	110	110	110
26	105	105	105	110	110	125	125	115	115	110	115	115	115	110	110	110	110	110	110	105	105	115	110	110
27	110	110	110	110	110	110	130	115	120	C	115	115	115	115	115	115	115	150	120	110	110	115	110	110
28	110	105	105	105	105	105	G	125	115	115	115	115	120	115	115	115	110	110	110	110	105	105	110	110
29	110	110	110	110	115	145	125	120	115	115	120	120	115	115	115	115	115	120	120	115	110	110	110	105
30	110	105	105	105	105	120	165	125	125	125	125	120	115	115	115	115	110	110	110	110	110	120	115	115
31	115	115	115	115	105	E	115	115	120	115	115	115	120	120	G	G	130	125	110	B	110	115	110	110
Count	29	30	29	29	27	27	27	28	28	29	30	31	31	31	27	26	31	30	31	29	30	30	30	30
Median	110	110	110	110	110	115	120	115	115	115	115	115	115	115	115	120	115	115	115	115	110	110	110	110
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

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

The Radio Research Laboratories, Japan

K11

IONOSPHERIC DATA

Jul. 1967 | Types of Es | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f3	f4	f5	f3	f2	1h	h	h	12	12	12	12	12	12	12	13	12	12	14	f3	f2	f2	f2	f2
2	f2	f4	f2	f2	f5	14	1	12	1	h	h	1	h	c	h	c2	c2	h	c2	f4	f2	f	f2	f2
3	f3	f3	f2							c	1	13	12	1	c	12	12	12	13					
4											c	1	c2	h	h		c	c3	12	f4	f5	f3	f5	f2
5	f5	f3	f2	f2	f2f2	12	c	12	13	12	12	12	1	1			12		1	f2	f3	f2	f3	f3
6		f4	f2	f3	f4	14	c2	c3	c2	12	13	14	14	13	13	12	12	12	14	f5	f2	f3	f3	f
7	f2	f2	f2	f3	f3	h2	c2		12	12	c	1	c	h		h2	h2	h3	c4	f2	f6	f6	f3	f3
8	f2	f3	f3	f	f			1		12		c2	1	1	1	h3	c3	14	13	f3	f2	f	f2	f2
9	f4	f f5	f2f2	f5	f4	13	13	12	12	13	12	1	12	12	1	h2	c2	c2	12	f3	f4	f2	f2	f2
10	f3	f5	f2	f2	f2	12	c	12	12	12	12	12	12	12	12	12	12	12	13	f3	f5	f4	f2	f3
11	f2	f3	f4	f4	f3	12	c3	12	13	h	12	13	12	12	h		h	h2	12	f2	f2	f2	f	f3
12	f4	f2	f2	f2	f2	14	c3	13	1	c2	c	c2	c2	12	12	h2	c2	c3	c3	f5	f3	f4	f5	f4
13	f3	f4	f4	f3	f	h2	h2	c3	c3	12	13	12	1	1	1	h1	h1	c212	1313	f3	f4	f2	f3	f3
14	f2	f2	f2	f2	f	1	h1	h2	c2	12	12	12	12	12	12	12	12	12	12	f2	f4	f5	f2	f5
15	f4	f2		f2		h2	h	c2	c2	c2	c2	12	c	1	h	c2	c2	c3	14	f5	f3	f3	f3	f3
16	f5	f5	f2	f4	f3	12	c2	c2	c2	c	c	12	c	c	12	h	1	12	12	f3	f3	f2	f4	f2
17	f2	f4	f2	f3	f2	12	c3	c2	c2	1	1	1	1	1	12	12	h	h2	c2	f4	f2	f4	f3	f3
18	f3	f3	f3	f3	f4	12	12	12	1	1	1	c	1	1	c	c	c3	13	12	f3	f2	f2	f2	f3
19	f4	f3	f2	f		h2	c3	13	c2	c2	12	1	12	c	h	h	c2	13	14	f3	f3	f2	f3	f3
20	f2	f2	f3	f2	f3	12	12	13	12	1	12	1	c2	h1	1	h	h212	1312	1212	f2	f2	f3	f4	f4
21	f3	f3	f4	f7	f2	13	12	h	h	c2	c2	c2	c2	c	c2	c2	c2	c2	12	f3	f3	f3	f4	f5
22	f4	f4	f3	f2	f2	1	c	12	c2	c2	h	h	h	h			1	12	12	f4	f4	f3	f3	f3
23	f3	f2	f4	f3	f2	h2	c3	13	c3	12	13	13	12	12	1	h1	12	c4	c2	f4	f3	f2	f2	f3
24	f3	f3	f2	f4	f3	13	1	12	1	1	1	h1	h	h	1	1	h	h	12	f2	f6	f5	f5	f3
25	f4	f2	f2	f3	f5	1	h	h2	c2	c2	c	1	1	1	1	1	1	1	13	f3	f4	f4	f3	f5
26	f6	f2	f3	f3	f	h	h2	1	1	12	12	13	13	1	13	12	12	12	13	f6	f2	f2	f2	f3
27	f2	f5	f	f2	f2	12	h2	1	c2		c	1	1	1	1	1	1	h2	c	f3	f	f	f3	f6
28	f3	f3	f	f	f	1		h	c2	1	12	1	1	1	1	12	12	12	13	f4	f3	f3	f3	f7
29	f4	f5	f4	f3	f	h	h2	c2	c2	c	c	c	c	1	1	1	c	c	c2	f2	f3	f2	f3	f2
30	f	f2	f2	f2	f	1	h	h	h	h	h	c	c2	c	c2	12	12	12	13	f2	f3	f5	f3	f3
31	f2	f3	f4	f2	f2		12	1	c	c	c	1	1	c			h2	h2	1		f	f	f2	f
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

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

The Radio Research Laboratories, Japan

K12

IONOSPHERIC DATA

Jul. 1967 | hpF2 | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	U375S	I360S	375S	375	355	365	365R	A	A	A	A	A	A	A	A	360R	I360A	I370A	340S	350S	R	A	S
2	U365S	405S	U375S	U370S	390S	430	360	460	500R	R	A	A	A	A	A	A	385	330	325	305	380	400	400	U400F
3	F	U350S	U365S	C	C	C	C	C	C	365R	U375R	A	A	360	350	U345R	A	R	A	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	R	U415R	I375A	375	360	330	A	325	I345R	335	U320S	U325S	S	I370F
5	I365F	U370S	U350F	U320S	335S	310S	375	340R	U315S	300	415	410	390	395	I390C	335	340	I320C	310	U350S	S	U345S	U360S	U320S
6	C	U410S	F	370	370S	350S	375S	305	A	A	A	A	A	A	A	I355A	325	330	315S	290	315	I330A	U365S	U380S
7	S	365S	335	J265R	365R	315	405	C	U330S	A	C	365	365	350	365	335	330	A	A	A	R	A	U340S	F
8	F	A	325	330	U370S	I340C	I310C	305	C	A	C	A	J350R	350	A	A	A	A	A	A	S	250	390	U375F
9	I360F	U345S	I320F	I360A	U340S	275	A	A	A	A	325R	350	375	I360A	360	A	A	A	A	A	A	A	A	A
10	F	F	U350S	355F	305S	320F	330	325	325	365R	355	A	360	365	350	335	330	320	335	A	315S	325	375	A
11	A	F	U315S	F	F	A	335	U335S	280	310	A	A	A	A	J350S	315	335	355	A	A	365	U285S	310	U375F
12	F	U415F	U355F	U380F	U350S	315	280R	A	A	A	A	A	400	350	350	375	A	350	340	310	A	350	A	F
13	F	F	315F	J300R	325F	310	260	A	300	330R	A	375R	365	395	365	R	335	A	A	I340A	365S	S	U325R	F
14	A	U280F	U360F	355F	345F	315F	310	360	285	375	360	355	375	370	370	350	365	375	385	320S	U350S	I350A	R	F
15	S	S	F	350S	340F	385	325S	305	A	350	I320A	335	325	335	340R	345	I345A	A	A	A	A	A	A	F
16	F	F	F	U350S	325F	345	365	420	315	U275R	U310R	A	U460R	I380R	365	375	A	310	280	340	U365R	U405S	F	R
17	U360F	385F	345	330F	320	280	340	345	320	I330A	375	360	350	360	360	400	I360R	330	305	I325A	J355R	F	A	F
18	F	S	F	355	F	F	290	J265R	J400R	305	330	360R	380	A	A	385	355R	340	325R	285	330	U410R	U370R	F
19	U365R	I360S	350F	U370F	U355S	325	295	J325R	330	345	375	360	335R	385	365	365	370	320S	305	330	U380R	375S	U345S	A
20	U370S	F	U340S	U340S	325	320	280	295R	G	G	375	360	360R	320	375	395	345	330	315S	U305R	355R	U380R	410R	I365R
21	365S	F	J360F	365R	335R	310	I305R	300R	365	365	A	A	A	A	380	370S	350R	U355R	335	U325S	U330S	U355S	U410S	U405S
22	U380S	U370S	375S	U340S	U370S	U330R	330S	U295R	375	375	395	400	425	375R	345R	I365C	R	320	330	330R	I345R	U335S	A	F
23	U330R	F	U345R	350F	355F	U330R	345	325	A	A	A	A	385R	380	375R	385	A	A	U335R	J315R	370R	F	F	U380F
24	F	F	F	A	A	U365R	340	285	335	365	425	365	350	370	380	370	345	325	U325R	330	380R	U375S	380	F
25	F	355R	360	375	330	290R	325	355	325	390	435	405	410R	390	360	A	A	360	A	A	A	350R	U365R	A
26	U385R	U385R	U365R	365	U370R	370	390	380	285R	A	A	A	A	A	A	A	360	340	350	350	355R	400	365	U365R
27	U370R	360R	U350F	370F	375F	330	325R	330	310	C	360	370R	400R	360	365	360	360	345	340	360	375	375	350	360R
28	405	U370S	U340S	340S	330	325S	310	325	320	375	I395A	430	405R	385	360	370	A	365R	360R	330S	J295S	U360S	U415S	F
29	U355S	U410S	420S	390S	415	435S	350R	315	315	335	395R	405	395	370	365	395	365	335	335	310	370S	I390S	A	390S
30	370S	370S	370	385	380	350	350	330S	340	340	420	445	I425A	375	380	390	405	370	310	A	A	A	A	I375S
31	U375F	A	F	U390F	U370R	355	330	335R	330	335	350	365	345	370	360	360	345	360	360	355	345	330S	U405S	U370S
Count	15	18	24	27	26	27	28	25	21	19	19	19	24	24	25	24	21	24	23	22	22	22	18	14
Median	U365	U370S	U350	355	350	330	330	325	325	345	375	365	375	370	365	365	350	340	335	330	355	U350S	U370	U375
U. Q.																								
L. Q.																								
Q. R.																								

hpF2 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K13

IONOSPHERIC DATA

Jul. 1967 | ypF2 | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	U060S	I060S	075S	065	075	065	065R	A	A	A	A	A	A	A	A	060R	I060A	I060A	075S	075S	R	A	S
2	U065S	075S	U070S	U080S	075S	090	070	070	060R	R	A	A	A	A	A	A	060	065	075	070	070	080	075	U075F
3	F	U075S	U060S	C	C	C	C	C	C	055R	U065R	A	A	055	060	U060R	A	R	A	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	R	U065R	I070A	070	070	085	A	075	I085R	085	U100S	U085S	S	I060F
5	I055F	U060S	U080F	U075S	070S	080S	075	070R	U060S	105	065	095	105	105	I100C	075	075	I080C	075	U075S	S	U075S	U085S	U085S
6	C	U075S	F	065	065S	080S	070S	095	A	A	A	A	A	A	A	I080A	065	080	065S	075	070	I100A	U085S	U075S
7	S	070S	070	J085R	085R	085	060	C	U070S	A	C	065	060	085	065	065	085	A	A	A	R	A	U075S	F
8	F	A	070	085	U060S	I080C	I070C	065	C	A	C	A	J060R	075	A	A	A	A	A	A	S	060	070	U070F
9	I075F	U080S	I065F	I065A	U065S	065	A	A	A	A	055R	065	080	I065A	060	A	A	A	A	A	A	A	A	A
10	F	F	U080S	085F	055S	065F	070	055	070	065R	065	A	065	050	060	070	070	060	065	A	070S	070	080	A
11	A	F	U060S	F	F	A	085	U070S	075	070	A	A	A	A	J070S	085	070	095	A	A	065	U070S	060	U070F
12	F	U065F	U075F	U060F	U090S	055	050R	A	A	A	A	A	050	060	055	065	A	070	060	085	A	070	A	F
13	F	F	085F	J050R	080F	080	075	A	050	060R	A	065R	075	070	090	R	065	A	A	I080A	065S	S	U070R	F
14	A	U085F	U070F	065F	080F	085F	065	055	080	075	085	095	085	105	090	085	095	080	085	075S	U085S	I080A	R	F
15	S	S	F	075S	085F	090	070S	055	A	095	I080A	070	070	095	065R	075	I065A	A	A	A	A	A	A	F
16	F	F	F	U080S	090F	090	085	085	080	U065R	U065R	A	U055R	I070R	070	085	A	075	085	100	U065R	U065S	F	R
17	U095F	065F	070	075F	055	065	085	095	070	I090A	075	090	100	090	105	115	I090R	095	090	I080A	J060R	F	A	F
18	F	S	F	090	F	F	060	J085R	J070R	070	080	065R	065	A	A	075	095R	085	075R	080	085	U075R	U065R	F
19	U065R	I070S	075F	U055F	U055S	070	065	J075R	080	095	070	080	080R	065	070	065	075	070S	080	080	U085R	080S	U080S	A
20	U060S	F	U065S	U065S	070	065	075	055R	G	G	065	065	080R	070	085	105	085	080	080S	U085R	090R	U065R	060R	I060R
21	065S	F	J065F	065R	060R	090	I070R	080R	070	075	A	A	A	A	085	080S	080R	U075R	075	U085S	U060S	U090S	U080S	U060S
22	U070S	U060S	085S	U070S	U070S	U080R	075S	U065R	070	070	065	075	105	075R	075R	I090C	R	075	095	080R	I075R	U065S	A	F
23	U125R	F	U080R	075F	075F	U075R	110	105	A	A	A	A	070R	105	100R	095	A	A	U070R	J090R	060R	F	F	U060F
24	F	F	F	A	A	U055R	075	085	105	110	120	090	080	080	075	095	095	120	U070R	095	080R	U075S	080	F
25	F	095R	085	090	075	075R	085	100	095	080	095	100	085R	100	085	A	A	070	A	A	A	115R	U065R	A
26	U065R	U065R	U075R	065	U060R	080	090	085	065R	A	A	A	A	A	A	A	100	085	100	080	060R	075	110	U075R
27	U055R	090R	U070F	055F	085F	085	070R	080	065	C	080	105R	095R	070	070	075	090	100	085	115	080	085	090	100R
28	090	U095S	U105S	075S	080	080S	070	060	065	065	I080A	085	095R	095	095	090	A	095R	075R	085S	J080S	U075S	U060S	F
29	U100S	U075S	085S	095S	070	080S	060R	085	075	075	070R	070	085	080	105	105	080	085	090	080	090S	I080S	A	085S
30	080S	080S	070	080	085	080	080	075S	065	105	110	110	I080A	100	100	090	080	095	055	A	A	A	A	I100S
31	U100F	A	F	U085F	U075R	075	065	065R	055	105	070	095	070	065	090	080	100	070	105	100	095	095S	U070S	U090S
Count	15	18	24	27	26	27	28	25	21	19	19	19	24	24	25	24	21	24	23	22	22	22	18	14
Median	U070	U075S	U070	075	070	080	070	075	070	075	070	080	080	075	075	080	080	080	075	080	075	U075S	U075	U075
U.Q.																								
L.Q.																								
Q.R.																								

ypF2 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K14

IONOSPHERIC DATA

Jul. 1967 | foF2 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	I095S	I088S	I082S	S	S	S	I072S	081F	J074S	065	I068A	075	J089R	I092A	091	I083A	080	083	088R	088S	086S	075S	079S	S
2	S	S	087S	FS	FS	069	F	049F	054	057	060	061	058R	059	066	067	059	I063A	I066A	062	J061S	064	066F	067S
3	063F	F	F	056	F	F	055	061	065	072	068	I067A	I076A	U089R	096	092	083	I087R	097S	094	086F	083S	U082S	I082S
4	080S	J077S	J073S	069	U069R	061F	062S	067	081	I074A	I064A	I068A	080	088	101	I100A	087	089	I092R	J098S	103S	S	U071S	F
5	S	081	F	F	I064S	063	063S	084S	080S	072S	073	080	088R	099	107	104	099S	094	086S	085R	J089R	U085S	081	085
6	087	079S	J077S	076S	073S	U070S	J076S	085	080	080	086R	071	077	087	095S	092S	104	114	107	086	U070S	U073S	070S	068
7	U066S	S	S	S	069S	064Z	068S	085	079S	I078A	077	083	090	097	J097S	092	084	089R	J096S	J100R	099	I074S	069S	S
8	A	S	A	S	F	056F	U070S	J076S	071	073	I070A	J079S	A	A	086	085	091R	I095A	103	108R	085	057	057S	059S
9	060S	063	068S	064F	056	058	063S	083	086	076	075	070	I083A	088	090	092	094S	U088S	085	I089S	086V	I077S	J078S	F
10	F	F	S	F	I071S	068S	065	074S	084	076	074R	074	077	079	085	087	083	080	078R	081	J080S	J072S	U064S	J062S
11	S	S	U067S	F	F	F	J061S	068	J074S	070	I076S	I081A	088	I097A	I099S	096	087	074S	076S	I081S	I095S	104	FS	A
12	S	S	S	S	FS	FS	054F	060	063	060	063	I073A	082	086	084	085	087R	089	085	086	I074S	U062S	U063S	063S
13	F	F	F	055S	F	F	A	A	068	I070A	I070A	067	072S	079	093	098	093	092	092	089S	081	S	S	S
14	S	S	F	F	069	F	058	073	077	084	087	082	092	101	104	106	104	103	104R	J096S	I087S	J077S	S	S
15	S	S	S	S	S	FS	I074S	088S	090	078	082	084	089	083	089	094	088	088	J098S	103	102	I080S	J073S	S
16	S	S	S	S	054	052F	051	076	098	I079S	065	060	073	092	096	092S	098	093	085H	085	088	085S	080S	084S
17	S	S	S	F	F	F	C	C	C	C	C	087	089	089	091	093	100	095	087R	083	083S	081	I086S	I090S
18	FS	I078S	S	FS	080	I072S	066S	066	079F	081	076	072	073	083	087	101	112	109	113	092S	I069A	069	072S	I074S
19	J075S	U069S	I076S	J078S	I069S	053F	056	I074S	076	079	090	082	085	090	085	094	104	099S	I078A	I076A	U080S	084S	077	I076S
20	J082S	FS	FS	FS	S	S	J076S	066	062	067	074	083	075	082	090	103	104	101	096	084	J073S	074	I075S	U074S
21	S	078S	J078S	083F	060F	F	065	064	069	091	084	079	090	103	113	114	115	110	104	098	084	I083S	I080S	FS
22	S	S	S	079S	071S	I073S	086	083H	064	073	081	089	096	104	106	103	095	089	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	087	102	I106C	106	108	110	112	118	108	093	091S	090S	I091S
24	090	I100S	I099S	091S	I087S	084	082	076	077	075H	083	090	095	086	090	100	095	090	080	078	082	I074S	I076S	081
25	069S	I070S	J074S	I068S	I062S	FS	061S	J071S	089	087	089	095	106	108	114	115	115	108	102	105	103	J076S	I083S	I082S
26	I083S	087S	FS	063S	063F	I059S	065	094	082	067	066	078	084	A	A	R	098	J095S	098	J096S	U086S	I075S	I078S	S
27	S	S	S	F	FS	FS	I085S	092S	085	082	078	076	085	094	099	102	099	088	087	092	093	092S	086	080
28	079	082	082	076	072	069	I071S	073	077	074	077	C	C	104	102	103	110	116	119	098	081	I075S	075	078S
29	I084S	087	S	S	S	S	FS	105	082	073	077	083	087	099	096	100	106	108	102	086S	078	I081S	I087S	084S
30	081	J079S	J075S	069	066	070	083	092	079	076	075	I080A	097	101	105	111	117	123	113	086	071S	072S	J071S	I073S
31	074	073S	I078S	J074S	071	065	066F	072S	074	077	088	090	083	090	096	093S	098S	106	105R	106	095S	I091S	091S	S
Count	15	15	13	14	18	17	26	28	29	29	29	30	29	29	30	30	31	31	30	30	30	28	27	19
Median	080S	079S	077S	072S	069	065	066S	075	077	075	076	080	085	090	096	097	098	094	096	089	086	076S	077S	078S
U.Q.	084	087	082	078	071	070	074	084	082	079	082	083	090	100	102	103	104	108	104	098	093	084	082	084
L.Q.	069	073	074	064	063	058	061	068	070	071	069	072	077	086	090	092	087	088	085	085	080	074	071	068
Q.R.	015	014	008	014	008	012	013	016	012	008	013	011	013	014	012	011	017	020	019	013	013	010	011	016

The Radio Research Laboratories, Japan

foF2

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

Y 1

IONOSPHERIC DATA

Jul. 1967 | foF1 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	420	A	A	A	A	A	A	A	A	510H	460H	410	L				
2							L	LH	440H	460	470	U480R	490R	490H	I490A	480	480	I450A	A					
3								L	L	480	A	A	A	520H	I500A	A	L	A	400L					
4								L	460L	I480A	A	I530A	520R	I510A	500H	I490A	L	450	LH					
5							L	A	440L	L	500	540	530H	A	A	500	470	U430L	L	A				
6							L	L	LH	500H	490	500H	510H	520H	470H	490	490H	430	L	L				
7							L	L	L	A	500L	510	500	500H	520L	I500A	510L	A	A					
8							L	L	L	A	A	A	A	A	A	510	470H	I460A	A	L				
9							L	LH	460L	LH	530H	LH	A	490	490H	480	460R	450H	L	A				
10							L	440	L	470	A	A	510	490R	490	I480A	470H	LH	U400L	L				
11							L	L	490H	490	LH	A	A	A	A	480	450	430	I420A	A				
12							A	A	L	500L	I480A	I490A	490	500H	A	490H	I460A	I440A	L	L				
13								A	L	A	A	LH	500	A	I480A	I470A	490	I450A	L	A				
14								L	L	520L	490	530R	500	L	I510A	I490A	480	A	L					
15								L	L	L	510R	520	I500A	L	I500A	480	480	LH	L	L				
16							L	A	A	L	L	LH	530R	500R	520	500H	460	L						
17							C	C	C	C	C	A	540	A	A	490	I490A	460H	420					
18								A	480L	I470A	A	510H	590H	LH	530	I500A	I480A	L	400H					
19								A	A	530L	510	U560L	540	520	I510A	490H	I470A	450L	A					
20							L	L	L	520L	520	530	550	510	500	500H	480	460	400					
21								L	L	A	A	A	A	530	I520A	510	A	A	A	A				
22							L	A	LH	470L	500	520	520R	A	A	520H	500	480	C	C				
23							C	C	C	C	C	A	A	C	530R	510H	500	470H	A					
24								L	540L	500L	520L	570H	540H	LH	520	530H	510L	490L	L					
25								L	A	520L	A	A	A	A	A	560	510H	490H	L					
26								L	L	L	570L	530	530	A	A	A	I510A	A	A					
27							L	A	A	A	A	580	560	I550A	530	530	510	L	L	L				
28								L	L	L	A	C	C	A	A	530H	520	I480A	L					
29							L	A	A	L	L	550	580	530	540	520H	I510A	A	A					
30								L	L	LH	L	I570A	530	540	550H	530H	510	480	L					
31								L	LH	550L	I530A	530	560L	550	550H	580H	520	I480A	L					
Count								2	7	15	14	18	22	16	21	28	28	20	7					
Median								430	460L	500L	500	530	530	520	510	500	490	460	400					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1

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

Y2

IONOSPHERIC DATA

Jul. 1967 | foE | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	210	260	300	330	340	360	350	A	A	A	A	A	250	B				
2						E	A	270	310	330	350	I370A	I365A	360	360	350R	325	295	240	B				
3						B	A	270H	I310A	345	345	350	370	A	A	350R	330	310	235	B				
4						B	S	250	310	325	A	A	A	365	370	350	335	A	A	B				
5						B	190	255	300	320	A	A	A	A	A	A	A	295	A	B				
6						E	195	A	A	330	350	355H	360R	350	360R	340R	320	290	250	A				
7						B	180	260	305	325	340	355	360	I350A	350	340H	320	290	240	B				
8						E	195	265	300	325	330	340	I345A	350	I355A	360H	330	A	A	A				
9						E	195	270	305	A	A	A	375	370	360	345	325	300	235	B				
10						E	A	A	A	A	A	A	A	A	A	A	325	290	250H	B				
11						B	185	260	295	325	340	350	350	360	350	345	320	295	250	B				
12						B	200H	260	290	A	A	A	A	A	A	340	320	290	245	B				
13						E	155	270	I295A	310	320	360R	I370A	A	A	A	A	305	250	B				
14						B	190	250H	300	A	A	A	A	A	A	A	A	A	A	B				
15						B	210	260	310	340	350	I365A	370	370	360	340H	325	295	250	B				
16						B	A	255	295	I320A	340	I350A	370	370	I355A	360	340	300	A	B				
17						B	C	C	C	C	C	C	A	A	A	A	350H	310H	250	B				
18						B	A	250	A	A	A	A	A	A	390R	360	345	300	250	B				
19						E	210H	270	A	A	A	I355A	360	I360A	370	365	A	A	A	B				
20						B	S	A	A	A	A	A	370	A	A	A	340	310	250	150				
21						E	205	275	320	345	360	380	390	390	380	370	350	310	250	B				
22						B	A	A	A	330	350	370	I390R	400	390	370	350	310	C	C				
23						C	C	C	C	C	C	A	A	C	400	390	355	320	255H	B				
24						E	A	A	A	345	I370A	385	390R	A	A	370	345	320	270	B				
25						B	215	270	320	360	370	390	390	390	370	I365A	360	320	A	B				
26						B	A	A	330	365	380	390R	390	A	A	A	A	A	A	A				
27						E	A	275	330	360	370	370	I380B	I380A	I380A	370	I345A	A	A	B				
28						B	A	A	I320A	350	365	C	C	375	A	A	A	A	A	B				
29						B	I195A	275	320	350	360	365R	390	385	390	380	A	A	A	B				
30						B	210	270	310	345	365	390	400	390	380	365	345R	315	A	B				
31						E	A	A	310	345	370	370	385	400	390	370	345	305	255	B				
Count						11	16	21	22	22	20	20	22	18	19	22	23	22	18	1				
Median						E	195	265	310	335	350	365	370	370	370	360	340	300	250	150				
U.Q.																								
L.Q.																								
Q.R.																								

foE

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

The Radio Research Laboratories, Japan

Y 3

IONOSPHERIC DATA

Jul. 1967 | foEs | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J051	J046	J040	J029	J020	026	J036	J041	J056	J061	083	J108	176	144	145	130	072	J037	033	J034	J079	J109	J043	J038
2	J121	J063	109	J065	J062	J061	J054	032	035	040	J056	080M	J066	054	J055	049	046	J136	075	J062	J035	J051	J041	J025
3	J060	J030	J083	061	J057	J028	024	G	J052	043	068	J093	104M	J059	J065	J050	051	J121	066M	J078	J052	J028	J049	019
4	J027	J042	024	021	J024	017	024	032	J042	J091	J066	J097	056	J062	J057	J157	067	108	044	J062	J036	J061	J074	J051
5	J061	060	J058	021	023	J028	J052	J056	J046	J052	J053	J054	043	J052	059	J053	J044	J034	J042	J035	J025	J025	J028	052
6	J031	021	J029	J050	J024	J026	020	J038	032	J048	J052	037	040	044	G	044	040	043	019G	J029	J062	J044	J052	J057
7	036	J054	039	J060	J022	J023	030	J048	J060	J138	050	J051	J054	038	046	J087	048	J058	J053	047	J062	J061	052	J060
8	J083	J090	J082	J062	J051	J024	022	034	054	J057	J089	J098	156	J119	106	070	J080	J138	J119	J041	J057	035M	024	J023
9	020	E014B	E013B	017	017	013	025	J034	J076	052	086	J084	J106	G	J078	043	053	032	J038	J028	067M	J061	J079	J044
10	J042	028	J032	027	J029	J025	025	030	J074	J084	122M	082	J096	J071	J057	J084	037	038	J049	J052	J065	J095	J031	J032
11	J041	J039	J043	J043	J032	J024	049	052	J048	J061	J090	J155	J074	J124	J154	046	G	033	J051	J064	135	J056	J060	J122
12	J061	J052	J067	J028	020	J034	J039	J056	J057	088	J098	J120	065M	J053	J073	038	086	116	037	026	J024	J036	J042	J026
13	J026	038	051	J043	J026	J059	065M	092M	J120	J121	191	112	086	J066	J112	J124	J054	053	047	J043	J078	J062	J063	J088
14	J040	J031	J036	J030	E016B	E016B	031	J046	J065	J051	J044	J079	J052	J053	J063	J061	J061	J053	J045	J050	J038	J027	J042	J083
15	J059	J062	J100	J068	J064	J018	039	J052	047	J054	J080	J178	J104	J058	J169	J079	047	J054	042	J035	J026	J031	J036	J051
16	J054	J051	J036	J021	J025	J027	J034	J084	127	J105	J065	J058	042	051	048	J054	J065	067	060	J061	J054	J044	J041	J028
17	031	J054	J028	J052	J042	J028	C	C	C	C	C	J074	J066	J080	J099	J060	J069	053	064M	J084	049	023	J051	J083
18	J084	J048	J038	J027	036	J047	J032	176	J058	J078	064	046	054	060	046	J076	072	J058	035	J036	J092	J061	023	J024
19	J044	J030	J021	J024	020	021	033	J072	J062	J077	047	J057	J086	049	J073	046	096M	J042	083	J084	J079	J061	J037	J029
20	J042	J030	J043	J025	J029	J028	052	J064	J052	J075	068	J055	J053	049	J045	038	046	034	034	028	J044	J055	J057	J026
21	J046	J029	J026	J026	023	E	023	034	050	J081	J070	102	J074	084	J095	042	049	087	J108	J040	J059	061	J061	J068
22	J060	J058	J037	J035	J024	015	J031	J106	J044	037	073	044	055	J067	073	060	047	J046	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	J104	J092	C	046	046	J064	036	J048	045	J061	J060	J053	J044
24	J024	J024	J026	J027	J022	021	J036	J038	040	039	042	041	G	046	051	051	043	034	036	J031	024	J053	J084	J053
25	022	J045	J043	J035	J033	J018	035	J056	J076	J081	J078	J121	J078	J092	106	057	039	J043	040	J060	J021	J044	J026	067
26	J085	J027	J079	J054	J030	J028	J036	033	037	045	052	051	050	J094	J126	J079	J070	J058	056	J064	J041	J061	J053	J056
27	J053	J083	J043	J044	J054	047	J033	J051	J070	062	J061	J078	047	J065	039	042	J040	039	031	J026	J025	J039	J029	021
28	J020	J028	J020	J021	021	J025	J029	031	J045	045	J073	C	C	J109	065	043	043	J060	J034	035	J031	J022	J020	J074
29	J088	J055	J056	J046	J027	J018	J029	J055	J052	J054	J075	J088	052	050	053	J060	J066	J101	J089	099	146	J123	J053	J053
30	J028	021	J024	J024	J021	020	024	029	041	J068	055	J095	J069	049	041	G	G	026G	028	034	J029	J052	J061	J056
31	J028	J056	J053	J028	J038	J048	J053	J054	J048	J045	J060	J080	045	042	G	040	049	J051	035	015	J016	024	J023	017
Count	30	30	30	30	30	30	29	29	29	29	29	30	30	30	31	31	31	31	30	30	30	30	30	30
Median	J043	J044	J040	J030	J026	J025	033	J048	J052	J061	J068	J081	066	J058	063	053	049	J053	044	J042	J050	J052	J046	J051
U.Q.	060	055	056	050	036	028	039	056	064	081	082	102	086	080	099	076	067	067	060	062	065	061	057	060
L.Q.	028	029	028	025	022	018	025	034	044	046	054	055	052	049	046	043	043	037	035	034	029	035	031	026
Q.R.	032	026	028	025	014	010	014	022	020	035	028	047	034	031	053	033	024	030	025	028	036	026	026	034

The Radio Research Laboratories, Japan

foEs

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

Y 4

IONOSPHERIC DATA

Jul. 1967 | f_bEs | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	041	029	032	015	014	018	015	035	047	051	A	054	074	A	061	A	041	035	032	027	040	026	024	023
2	025	043	018	035	043	027	024	026	032	036	044	043	046	044	055	047	037	A	A	041	028	032	024	025
3	020	026	022	014	026	016	022		044	041	061	A	A	042	057	049	049	050	034	047	028	021	031	016
4	017	018	019	016	017	015	023	030	035	A	A	A	048	058	042	A	043	041	027	061	036	038	025	035
5	026	034	033	021	015	018	030	045	041	043	045	051	042	E052R	051	048	038	026	027	023	025	025	022	028
6	025	014	015	018	015	014	018	032	031	036	048	G	G	043		042	037	041	019G	025	037	042	044	044
7	025	025	025	024	015	022	030	040	041	A	049	049	047	E038R	043	075	044	058	047	046	046	055	043	045
8	A	040	A	025	040	018	G	032	044	053	A	076	A	A	077	050	041	A	045	025	053	018	018	018
9	E	B	B	E	E	E013R	024	029	040	037	038	048	A		042	041	035	G	030	028	025	043	048	023
10	025	022	023	014	023	023	G	G	040	039	060	064	045	045	042	062	G	034	031	027	065	044	018	016
11	031	025	025	025	021	E	030	033	037	045	037	A	063	A	054	043		G	050	041	076	032	044	A
12	042	034	039	016	E	015	036	053	040	043	055	A	043	042	048	038	083	074	033	026	022	030	022	021
13	023	031	029	033	022	018	A	A	041	A	A	040	046	049	073	050	041	048	038	029	066	029	E063S	E088S
14	025	017	029	023	B	B	025	G	045	037	038	046	040	046	053	055	042	044	036	025	025	021	E	034
15	017	E062S	031	E068S	044	012	031	037	041	037	045	045	057	049	083	046	040	034	033	025	024	022	019	040
16	033	031	023	016	015	017	022	056	074	044	044	046	E042R	044	041	038	042	035	044	022	040	040	027	023
17	021	027	020	017	017	017	C	C	C	C	C	055	051	070	054	043	066	G	035	051	034	E	032	038
18	031	023	028	022	023	024	022	048	042	062	057	044	050	044	043	076	050	043	029	030	A	041	E	022
19	016	022	017	019	E	011	025	063	051	050	045	043	044	043	060	040	064	039	A	A	029	041	031	023
20	030	E	021	018	022	E	026	034	033	042	050	042	047	046	040	037	041	G	031	023	027	023	023	E
21	033	017	022	019	021		G	032	049	080	060	075	066	044	074	040	049	061	096	035	035	024	E061S	042
22	035	035	026	024	016	013	027	055	038	G	041	042	047	057	061	042	046	034	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	069	061	C	046	041	044	G	046	038	031	041	039	027
24	E	E	022	016	016	014	025	028	039	G	041	G		046	050	046	040	G	029	026	016	023	028	023
25	015	031	029	021	018	012	034	044	070	043	063	074	072	090	090	049	038	G	037	056	018	021	E	040
26	E	017	021	022	E	019	031	030	G	041	051	051	045	A	A	052	058	053	043	E064S	E041S	026	053	053
27	053	042	022	027	032	030	022	048	063	054	056	057	045	063	E039R	039	036	036	030	024	016	023	015	E
28	018	E	014	015	014	017	021	030	037	043	069	C	C	097	055	042	041	057	033	030	028	015	E	022
29	025	022	031	015	024	015	022	043	046	045	043	050	047	045	052	041	066	075	047	072	073	042	041	028
30	E	E	020	015	015	E	G	G	G	043	051	A	044	046	G			025G	027	033	020	E	E	041
31	015	E	030	018	021	031	027	041	043	042	057	042	044	G		040	048	049	034	E015R	015	018	021	E
Count																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

f_bEs

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Jul. 1967 | f-min | 135° E Mean Time (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	015	014	014	E	E	015	011	013	012	014	017	022	023	023	022	023	015	015	015	014	015	E015S	E051S	E015S
2	E014S	E014S	014	E	E	E	012	015	014	017	017	024	023	023	023	022	022	017	016	015	015	014	E015S	E015S
3	017	016	012	E	E	013	013	015	016	019	021	025	025	025	022	022	016	023	017	012	013	E014S	E015S	E015S
4	E015S	014	015	E	E	011	E014S	012	015	022	024	024	022	023	023	018	018	015	013	015	E015S	E015S	E015S	E015S
5	E015S	014	014	E	E	015	013	013	015	015	021	017	019	024	022	017	017	015	015	014	014	011	E015S	E014S
6	E015S	E	011	E	E	E	013	015	015	019	017	023	022	023	023	015	015	015	015	011	E015S	E015S	013	014
7	014	013	011	E	E	015	E015S	013	014	014	018	023	025	022	018	016	017	014	014	015	E015S	E015S	014	013
8	E015S	015	E	E	E	E	012	012	015	015	019	018	023	022	024	023	016	015	015	014	014	014	E015S	014
9	E015S	014	013	E	E	E	013	012	014	015	017	025	023	018	022	018	015	015	015	014	013	014	E015S	014
10	E015S	013	014	E	E	013	E015S	017	015	015	022	023	018	023	017	018	016	016	014	014	E015S	E015S	E015S	E015S
11	E015S	014	E	E	E	015	014	012	015	015	016	016	022	022	017	023	017	014	015	014	015	015	014	E015S
12	E014S	014	E	015	014	011	011	013	014	015	019	023	023	023	017	022	019	017	015	014	013	E015S	E014S	E015S
13	E015S	014	013	011	E	E	012	014	012	014	015	015	022	022	017	021	015	014	013	014	014	014	015	E015S
14	E014S	014	015	E	016	016	015	013	014	014	021	023	022	022	023	022	015	015	012	013	E014S	015	E015S	E
15	E015S	014	E	E	E	011	013	013	014	015	015	022	022	025	024	015	015	015	014	015	012	E014S	E014S	E014S
16	014	013	013	014	012	011	013	015	017	016	023	024	023	025	022	023	018	014	017	014	014	E015S	E015S	E015S
17	E015S	E	014	E	015	012	C	C	C	C	C	E038C	E035C	E033C	025	018	018	015	017	015	015	E015S	E015S	E015S
18	014	011	011	E	016	014	013	014	015	016	021	024	022	021	022	024	018	014	015	014	014	015	014	015
19	014	015	014	E	014	E	E015S	014	014	017	018	024	025	025	022	023	016	015	017	013	E015S	E015S	E015S	E015S
20	E015S	015	014	011	E	014	E015S	014	016	015	015	020	021	021	021	022	015	015	011	014	E015S	E014S	E015S	E015S
21	011	011	E	E	E	E	015	013	016	015	017	022	022	023	022	022	018	015	015	014	014	E014S	E015S	014
22	014	011	E	E	E	011	011	014	015	015	021	023	027	022	023	022	022	017	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	025	025	C	024	026	022	015	014	014	E015S	E014S	E014S	E015S
24	E015S	E015S	E	E	E	E	E014S	014	017	018	022	024	026	024	023	025	019	018	017	015	E015S	E015S	E015S	014
25	013	014	E	E	E	011	014	014	016	018	024	025	024	032	025	024	022	017	017	014	011	E015S	E014S	E015S
26	E015S	E	E	014	E	011	014	015	028	022	025	031	029	025	027	023	029	016	015	015	E015S	011	E015S	E015S
27	012	014	011	E	E	E	014	015	015	017	018	024	040	024	024	023	023	015	015	013	E015S	E015S	E013S	E014S
28	E014S	E015S	E	E	E	014	E014S	014	016	017	022	C	C	027	022	023	017	015	015	015	015	E	E015S	E015S
29	E014S	011	E	E	E	011	E015S	015	015	015	023	022	024	024	025	024	022	015	015	014	E015S	E014S	E015S	E015S
30	E015S	E015S	E	E	E	014	E015S	015	016	023	024	025	025	025	025	022	022	015	016	015	011	E014S	E015S	E014S
31	E014S	E015S	E	E	013	E	E015S	015	014	018	024	024	025	027	025	025	022	017	023	014	E	E015S	011	E015S
Count	30	30	30	30	30	30	29	29	29	29	29	30	30	30	31	31	31	31	30	30	30	30	30	30
Median	E015S	014	011	E	E	011	013	014	015	015	021	024	023	023	023	022	018	015	015	014	014	E015S	E015S	E015S
U. Q.																								
L. Q.																								
Q. R.																								

f-min

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Jul. 1967 | M(3000) F2 | **135° E Mean Time** (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	I285S	I275S	I280S	S	S	S	I275S	290F	J325S	335	A	270	J275R	I285A	280	I265A	270	270	280R	275S	285S	255S	255S	S
2	S	S	285S	FS	FS	275	F	245F	255	255	265	285	250R	260	285	295	275	I280A	I295A	280	J280S	265	270F	280S
3	260F	F	F	320	F	F	315	320	305	310	305	A	A	U270R	290	290	275	I265R	290S	290	290F	270S	U270S	I270S
4	280S	J275S	J290S	270	U290R	315F	315S	305	310	I340A	I275A	I260A	265	265	280	I290A	280	280	I290R	J290S	325S	S	U255S	F
5	S	320	F	F	I295S	300	285S	310S	325S	275S	295	250	250R	270	290	285	300S	290	285S	290R	J285R	U275S	260	270
6	280	255S	J275S	275S	275S	U285S	J275S	310	290	275	315R	290	270	285	300S	280S	280	310	320	335	U280S	U270S	280S	265
7	U260S	S	S	S	300S	265Z	285S	315	330S	I305A	285	270	260	285	J280S	285	270	280R	J295S	J300R	320	I300S	270S	S
8	A	S	A	S	F	285F	U335S	J330S	300	290	I275A	A	A	A	290	275	285R	I290A	290	310R	365	265	265S	270S
9	275S	285	310S	300F	285	295	285S	300	305	305	290	255	A	290	285	285	295S	U305S	295	I305S	305V	I280S	J275S	F
10	F	F	S	F	I300S	305S	310	300S	325	325	290R	285	265	270	280	290	295	290	295R	295	J290S	J280S	U280S	J290S
11	S	S	U310S	F	F	F	J330S	325	J310S	295	I275S	I260A	260	I270A	I270S	275	290	260S	250S	I255S	I285S	330	FS	A
12	S	S	S	S	FS	FS	350F	315	315	305	280	I285A	285	280	285	275	A	290	290	305	I305S	U270S	U270S	260S
13	F	F	F	365S	F	F	A	A	320	I295A	I280A	270	260S	255	270	275	280	295	285	295S	270	S	S	S
14	S	S	F	F	305	F	295	290	300	275	290	250	260	270	270	280	280	270	290R	J290S	I280S	J280S	S	S
15	S	S	S	S	S	FS	I295S	295S	290	285	285	290	285	265	290	300	295	270	J275S	300	315	I315S	J275S	S
16	S	S	S	S	265	275F	255	290	345	I330S	315	275	260	285	280	275S	285	280	280H	280	285	285S	270S	285S
17	S	S	S	F	F	F	C	C	C	C	C	265	265	265	270	270	285	305	310R	280	285S	265	I270S	I285S
18	FS	I290S	S	FS	300	I320S	350S	305	315F	295	305	280	260	240	245	265	285	275	310	315S	I270A	260	265S	I255S
19	J270S	U260S	I275S	J310S	I310S	300F	305	I310S	315	290	305	270	265	285	275	270	300	310S	I285A	I250A	U290S	270S	280	I260S
20	J265S	FS	FS	FS	S	S	J330S	365	325	285	285	290	260	245	255	275	280	285	300	295	J275S	270	I270S	U255S
21	S	255S	J280S	325F	270F	F	310	315	285	305	290	A	245	260	265	270	285	275	300	315	285	I270S	I260S	FS
22	S	S	S	285S	280S	I285S	325	290H	300	290	270	260	260	270	275	280	275	280	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	240	255	I265C	265	270	270	275	295	300	270	255S	260S	I265S
24	255	I280S	I275S	280S	I285S	310	315	330	300	295H	265	270	290	275	270	290	290	295	290	275	285	I280S	I280S	285
25	280S	I270S	J295S	I295S	I310S	FS	315S	J305S	290	275	250	235	260	270	270	275	280	270	280	285	310	J255S	I260S	I265S
26	I265S	300S	FS	270S	275F	I280S	275	320	345	305	255	280	270	A	A	R	285	J285S	285	J295S	U300S	I270S	I265S	S
27	S	S	S	F	FS	FS	I290S	335S	335	305	285	250	255	265	270	275	285	280	275	270	280	270S	270	265
28	260	270	280	290	280	290	I320S	305	300	285	255	C	C	260	265	255	265	275	295	305	280	I260S	250	255S
29	I265S	280	S	S	S	S	FS	315	330	290	285	265	265	270	270	260	275	295	300	290S	260	I250S	I270S	270S
30	260	J265S	J265S	260	275	275	310	315	315	290	280	I250A	270	265	260	260	265	285	300	285	255S	250S	J255S	I255S
31	255	245S	I265S	J285S	270	280	290F	295S	295	290	290	320	280	275	280	270S	265S	280	290R	295	290S	I280S	255S	S
Count	15	15	13	14	18	17	26	28	29	29	28	27	27	29	30	30	30	31	30	30	30	28	27	19
Median	265S	275S	280S	290S	285	285	310S	310	310	295	285	270	260	270	275	275	280	280	290	290	285	270S	270S	265S
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Jul. 1967 | M(3000) F1 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	355	A	A	A	A	A	A	A	A	335H	340H	315	L				
2							L	LH	320H	365	360	U385R	A	305H	I350A	A	350	A	A					
3								L	L	375	A	A	A	335H	I385A	A	L	A	340L					
4								L	360L	I370A	A	A	A	A	335H	I345A	L	A	LH					
5							L	A	A	L	355	A	335H	A	A	A	345	U335L	L	A				
6							L	L	LH	370H	A	390H	380H	340H	365H	355	320H	A	L	L				
7							L	L	L	A	A	A	A	330H	320L	A	325L	A	A					
8							L	L	L	A	A	A	A	A	A	A	320H	I330A	A	L				
9							L	LH	380L	LH	360H	LH	A	385	370H	370	360R	355H	L	A				
10							L	355	L	360	A	A	370	395R	385	A	355H	LH	U330L	L				
11							L	L	355H	A	LH	A	A	A	A	355	375	330	A	A				
12							A	A	L	330L	I370A	I380A	380	340H	A	355H	I350A	I335A	L	L				
13								A	L	A	A	LH	365	A	I375A	I365A	330	I330A	L	A				
14								L	L	325L	370	350R	400	L	A	A	335	A	L					
15								L	L	L	355R	345	A	L	A	A	355	LH	L	L				
16							L	A	A	L	L	LH	360R	380R	365	360H	370	L						
17							C	C	C	C	C	A	A	A	A	345	A	350H	355					
18								A	A	I380A	A	395H	AH	LH	375	A	I340A	L	350H					
19								A	A	A	370	U355L	360	375	I390A	365H	A	340L	A					
20							L	L	L	350L	A	360	365	370	395	360H	355	350	345					
21								L	L	A	A	A	A	375	I360A	350	A	A	A	A				
22							L	A	LH	385L	380	370	370R	A	A	365H	A	335	C	C				
23							C	C	C	C	C	A	A	C	360R	360H	360	340H	A					
24								L	340L	370L	385L	340H	345H	LH	365	340H	345L	340L	L					
25								L	A	350L	A	A	A	A	A	A	345H	330H	L					
26								L	L	L	320L	A	375	A	A	A	A	A	A					
27							L	A	A	A	A	A	375	I360A	360	345	350	L	L	L				
28								L	L	L	A	C	C	A	A	345H	335	A	L					
29							L	A	A	L	L	A	335	380	A	355H	A	A	A					
30								L	L	LH	L	A	385	350	345H	340H	350	315	L					
31								L	LH	335L	I350A	345	360L	365	320H	320H	A	A	L					
Count								2	5	13	11	11	16	15	18	19	22	15	6					
Median								355	355L	365L	360	360	370	365	365	355H	350	335	340					
U.Q.																								
L.Q.																								
Q.R.																								

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

IONOSPHERIC DATA

Jul. 1967 | h'F2 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							340	290	280	250	A	390	375	I350A	350	I355A	370	350	325	285				
2							320	450	475	480	490	395	490	470	380	350	410	I375A	I310A					
3								250	310	310	E340A	I350A	I340A	360	330	300	330	355	300					
4								300	300	I265A	A	A	400	375	350	A	315	330	300					
5							270	280	250	320	325	405	390	360	320	325	295	290	290	280				
6							300	290	290	340	295	355	365	350	315	315	295	280	260	230				
7							300	250	270	A	320	360	375	350	340	E360A	355	340	295					
8							255	255	325	320	A	A	A	A	E390A	355	325	I310A	300	250				
9							290	275	260	270	310	380	I365A	325	335	330	310	300	275	270				
10							280	300	275	275	350	355	380	365	350	325	320	305	300	290				
11							290	270	310	340	390	A	400	A	330	330	300	375	400	370				
12							230	E365A	295	340	E390A	I375A	340	340	350	360	I350A	350	300	280				
13								A	300	I325A	A	450	420	395	400	335	330	320	300	275				
14								280	310	345	305	400	375	350	350	330	325	325	295					
15								300	290	280	325	340	330	320	I350A	300	320	330	310	265				
16							320L	340	250	275	300	430	425	340	340	330	315	295						
17							C	C	C	C	C	380	355	E390A	350	350	345	285	280					
18								315	285	330	300	345	450	400	430	390	315	315	270					
19								315	295	330	320	350	380	350	355	355	320	280	A					
20							250	230	290	355	355	340	425	410	390	345	305	295	280					
21								250	350	E330A	300	A	400	390	350	350	325	310	A	250				
22							245	250	520	330	350	375	395	350	345	340	330	325	C	C				
23							C	C	C	C	C	460	380	I360C	360	350	345	325	295					
24								250	300	280H	355	380	330	370	375	330	330	315	285					
25								320	320	295	400	E450A	365	E400A	380	345	325	320	300					
26								280	245	265	450	380	355	A	A	365	320	330	300					
27							280	250	270	305	300	455	400	380	350	345	325	340	305	290				
28								255	280	L	A	C	C	A	365	375	350	310	295					
29							280	260	255	345	340	350	375	365	365	375	330	305	280					
30								255	255	355	340	I435A	365	350	375	350	355	310	275					
31								280	320	275	340	330	355	355	340	350	355	330	295					
Count							15	28	29	27	24	26	29	27	30	30	31	31	27	12				
Median							280	280	290	320	330	380	375	360	350	350	325	320	295	280				
U.Q.																								
L.Q.																								
Q.R.																								

h'F2 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 9

IONOSPHERIC DATA

Jul. 1967 | h'F | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	295	290	300	245	275	275	255	250	A	A	A	A	A	A	A	A	230H	250H	270	280	230	300	300	350
2	325	315	290	295	E340A	300	240	240H	210H	255	E275A	230	I225A	200H	A	A	220	A	A	E300A	290	355	310	290
3	350	290	280	250	300	270	225	225	A	220	A	A	A	190H	A	A	A	A	E275A	270	260	280	295	255
4	280	290	265	280	270	225	255	240	215	A	A	A	A	A	240H	I235A	E270A	A	225H	300	245	240	350	360
5	270	255	275	235	250	260	E250A	A	A	E250A	E275A	I220A	195H	A	A	A	230	220	220	A	270	265	285	310
6	300	315	300	300	285	260	240	245	210H	210H	A	195H	205H	210H	200H	250	220H	A	230	I220A	300	330	330	360
7	340	305	305	295	255	300	E270A	A	A	A	A	I220A	A	195H	A	A	E300A	A	A	270	250	320	330	E380A
8	A	280	I290A	270	335	285	245	230	250	A	A	A	A	A	A	A	AH	A	A	250	220	260	310	310
9	305	280	240	235	230	265	230	220H	230	205H	205H	I220H	I200A	210	220H	240	220	220H	220	A	250	285	340	290
10	300	260	295	280	250	255	230	215	I205A	235	A	A	230	230	210	A	230H	220H	E250A	E275A	I290A	300	270	250
11	340	320	250	255	275	250	E250A	E255A	E245H	I205A	200H	A	A	A	A	E270A	220	240	I260A	A	A	235	E330A	A
12	E370A	E375A	E365A	290	250F	230F	A	A	E250A	E255A	A	A	230	220H	I225A	200H	A	A	E270A	E275A	240	290	300	350
13	300	310	260	220	265	235	A	A	270	A	A	200H	I225A	I220A	A	A	260	I245A	I255A	I265A	I270A	275	A	I305A
14	260	245	300	290	235	250	240	230	I255A	220	220	250	200	E250A	A	A	260	I225A	I250A	255	245	290	305	320
15	250	A	265	I295A	300	270	255	250	E250A	220	250	270	I225A	I235A	I250A	I250A	240	225H	255	I260A	240	210	280	320
16	325	350	280	250	230	300	250	I245A	I220A	A	270	250H	205	220	205	225H	240	250	260H	275	295	300	320	270
17	285	320	260	245	240	250	C	C	C	C	C	A	A	A	A	E270A	A	225H	E250A	300	275	280	280	310
18	250	260	290	280	260	230	225	A	E270A	A	A	200H	AH	225H	205	A	I220A	A	230H	240	A	E350A	300	325
19	280	330	280	265	245	230	245	A	A	A	230	210	220	220	I205A	200H	A	E260A	A	A	280	305	285	305
20	290	290	300	300	270	240	E245A	I220A	200	230	A	230	240	E250A	200	225H	220	230	225	255	245	300	300	300
21	315	300	300	245	250H	255	245	230	A	A	A	A	A	205	I220A	230	A	A	A	A	255	250	I330A	355
22	320	275	250	270	270	270	A	I225A	200H	195	200	220	240	A	A	200H	I240A	230	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	A	A	C	255	200H	E250A	245H	I235A	255	255	300	330	320
24	320	290	265	260	280	240	240	230	220	225	200	205H	230H	250H	A	E250H	230	230	250	270	260	280	340	285
25	260	E345A	290	265	250	230	260	A	A	240	A	A	A	A	A	A	210H	200H	A	290	250	250	290	E350A
26	305	270	255	290	280	280	270	245	230	225	A	A	210	A	A	A	A	A	A	E310A	260	275	E355A	E340A
27	E350A	305	290	310	335	290	255	A	A	A	A	A	200	I210A	225	225	230	240	245	270	265	280	250	280
28	310	300	275	255	255	255	225	230	230	230	A	C	C	A	A	215H	250	I250A	250	250	250	280	320	335
29	300	295	320	300	330	325	260	I240A	A	250	215	I210A	250	210	I250A	225H	A	A	A	E340A	A	355	330	300
30	290	295	300	300	300	275	255	240	225	230H	A	I210A	200	250	200H	210H	215	250	245	240	270	335H	300	E360A
31	300	335	325	275	285	305	270	I255A	250H	E230A	A	220	220	205	205H	240H	A	A	260	265	245	250	300	300
Count	29	29	30	30	30	30	26	21	20	19	11	17	19	20	16	19	22	19	22	25	27	30	29	29
Median	300	290	290	270	270	260	245	235	225	225	210	220	220	215	215	225H	230	230	245	260	255	280	300	310
U.Q.																								
L.Q.																								
Q.R.																								

h'F

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

The Radio Research Laboratories, Japan

Y 10

IONOSPHERIC DATA

Jul. 1967 | h'Es | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	100	100	100	100	105	100	120	115	110	110	125	105	105	100	100	105	105	125	115	110	105	110	110
2	110	105	105	105	105	105	105	115	145	135	120	115	115	115	120	130	125	115	110	110	105	105	115	100
3	115	120	105	120	105	110	110	G	115	120	110	110	110	105	130	130	120	115	115	110	110	105	105	100
4	100	110	105	100	105	110	145	135	125	115	115	115	115	110	125	110	125	110	110	110	105	100	105	110
5	105	100	100	100	095	110	115	110	115	105	105	105	105	105	100	100	100	100	125	100	100	095	110	110
6	110	110	110	105	105	105	110	110	110	115	110	130	150	110	G	130	125	120	105	120	100	100	110	105
7	115	110	105	105	110	130	125	120	115	110	110	110	110	110	165	125	135	120	120	115	110	115	115	110
8	110	105	105	105	105	105	145	125	115	115	110	105	110	115	130	130	125	110	110	105	105	100	100	100
9	100	B	B	130	130	125	120	125	110	105	115	120	120	G	120	145	130	135	120	115	110	110	110	105
10	105	105	100	100	100	100	140	110	110	110	105	105	105	105	105	120	135	150	130	120	115	115	115	110
11	110	110	105	105	105	140	125	125	125	125	120	120	120	120	120	130	G	175	120	115	115	115	110	110
12	110	105	110	110	110	110	125	120	120	110	105	105	110	115	130	150	120	120	120	115	120	115	110	105
13	110	105	100	105	110	130	125	120	120	115	110	110	120	115	100	115	100	125	120	110	110	105	105	105
14	100	100	095	095	B	B	130	125	120	115	110	105	105	105	100	100	100	100	100	100	100	100	120	120
15	115	115	105	100	105	165	130	125	120	120	115	105	120	120	115	115	130	125	120	120	110	110	110	105
16	105	100	100	100	105	110	110	115	110	110	115	115	130	120	115	120	120	110	105	105	100	100	100	100
17	100	100	100	100	125	120	C	C	C	C	C	105	100	100	100	130	130	125	115	110	110	100	115	110
18	105	105	105	100	105	105	110	110	110	105	115	130	130	130	150	125	120	115	120	115	110	110	105	105
19	105	100	100	100	100	105	140	120	110	110	115	115	110	115	120	115	110	105	105	100	105	115	100	100
20	115	110	110	115	115	110	105	105	105	105	105	110	110	105	105	105	100	130	120	115	110	110	110	110
21	110	105	100	100	100	E	145	125	120	115	115	120	120	120	120	140	125	115	110	110	105	105	100	100
22	100	105	100	105	115	115	105	105	110	115	110	110	125	130	125	125	120	115	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	105	105	C	150	165	130	150	120	110	105	100	100	100
24	100	110	105	105	110	105	100	105	105	135	150	155	G	150	130	125	130	155	140	120	120	110	105	105
25	105	110	105	110	110	130	130	120	120	115	110	110	115	110	110	110	120	115	105	110	100	100	100	110
26	110	100	110	110	115	110	110	110	145	130	130	130	115	105	105	105	105	100	105	100	115	115	120	110
27	110	105	105	105	105	105	105	125	115	115	115	110	120	105	110	125	110	105	105	105	105	100	105	100
28	095	100	100	105	095	105	100	110	120	120	110	C	C	110	105	105	105	100	100	100	100	100	110	105
29	105	100	100	100	100	100	130	120	120	115	115	110	120	115	120	125	125	120	115	100	110	105	100	115
30	100	100	100	100	100	100	170	160	120	110	110	110	120	115	130	G	G	100	100	130	120	115	120	115
31	100	115	115	110	110	110	110	110	110	115	115	115	115	125	G	125	130	120	120	110	105	100	100	100
Count	30	29	29	30	29	28	29	28	29	29	29	30	29	29	29	30	29	31	30	30	30	30	30	30
Median	105	105	105	105	105	110	120	120	115	115	110	110	115	115	120	125	120	115	115	110	110	105	110	105
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

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

The Radio Research Laboratories, Japan

Y 11

IONOSPHERIC DATA

Jul. 1967 | **Types of Es** | **135° E Mean Time** (G. M. T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f3	f6	f4	f2	f2	1	12h	c3	c5	c4	c3	h c3	c4	14	12	13	12	14	h2	c2	f3	f2f3	f2f2	f2f
2	f3	f3	f2	f3f2	f3f2	12	13	c3h	h	h	h2	c	c2	c	h2	h2	h	c2	c3	c2	f2f2	f3f2	f2f	f
3	f f	f f	f2f2	f f	f2	1	12		c3	c	c3	c3	c5	1	h c	h2	h2	c2	c2	c3	f3f	f4f2	f5f2	f
4	f2	f2f2	f2f	f	f3	1	h 1	h2	h2	c212	c21	c212	c2	c3	h	c2	c2	c2	c	c212	f3f2	f3	f3	f7
5	f5	f2	f2	f2	f2	121	h3	c4	c2	c2	12	13	1	12	13	14	13	13h	h 12	13	f2	f4	f2	f4
6	f3	f2	f2	f2	f2	12	1	14	1	c	c2	h	h c	c		h	h	h21	1	c212	f3	f3	f3f3	f3f4
7	f2f2	f2f	f3f	f5	f2	h	h5	h4	c2	c4	c2	c2	c2	c 1	h 1	h4	h	c3	c6	c4	f5f	f4f	f4	f5
8	f6	f3	f6	f3	f2	1	h	h3	c3	c3	c4	c3	c412	c3	h2c3	h2	h2	c3	13	13	f3	f3	f2	f3
9	f3			f	f	h	h3	c	c3	12	c 1	c21	h		h h	h	h2	h	c3	c	f3	f3	f4	f3
10	f3f2	f3	f2	f	f2	12	h 1	c h	12h	12	13	14	12	12	12	c212	h c	h212	h21	c31	f3f	f2f2	f2f2	f2
11	f3	f3	f2	f2	f2	h	h3	h3	h2	h2	c3	c4	c3	c3	c3	h2		h	c2	c4	f3	f2	f4	f4
12	f3	f4	f8	f2	f2	12h	h6	c5	c4	13	13	12	12	12	h 12	h	c2	c2	c2	c2	f2	f4	f3	f3
13	f f2	f3	f3	f4	f3	h2	h5	c6	c3	c3	c3	c	c21	c21	13	c212	13	h313	c41	c313	f5f2	f2	f2	f3
14	f2	f	f2	f2			h4	h2	c2	c2	c	12	1	12	13	13	13	15	14	13	f3	f2	f2f	f5
15	f3	f7	f4	f3	f7	h	h5	h4	c3	c2	c2	12	c2	c2	c3	c2	h	h2	c3	c3	f3	f4	f4	f4
16	f4	f3	f3	f	f3	12	12	c2	c4	c2	c2	c2	h	c	c	c	c2	c2	13	12	f4	f5	f3	f2
17	f3	f3	f3	f2	f f	c41						13	13	13	12	h2c2	h2	h	c4	c3	f4	f	f5	f3
18	f3	f3	f3	f2	f3	12	12	c3	c3	13	c212	h 12	h212	h 1	h 1	h2	c3	c2	c 1	c312	f3f3	f3f2	f	f2
19	f2	f	f	f3	f	1	h3	c5	14	13	c2	c2	c2	c2	h2c	c	13	12	13	13	f3	f2f4	f2	f2
20	f2f2	f2f	f2	f2	f f	1	12	13	12	13	13	12	c2	c2	12	1	12h	h 1	c212	c21	f5f2	f2f2	f2f2	f f
21	f3	f2	f2	f2	f5		h	h2	c4	c2	c3	c2	c2	c2	c3	h2	h2	c3	c2	c2	f4	f3	f4	f3
22	f4	f4f	f5	f3	f2	c	13	12	c2	c	c2	c	h c	h	h2	h2	c	c2						
23												c2	12		h	h	h2	h	c21	c6	f f5	f3	f5	f3
24	f2	f f	f5	f6	f3	13	15	12	13	h 1	h 1	h		h 1	h 1	h21	h	h	h	c2	f f	f3f	f	f3
25	f2	f f2	f2f2	f2f2	f2	h	h2	c5	c4	c2	c2	c2	c2	c4	c4	c2	c	c h	12	c21	f2	f3	f2	f3f2
26	f2f	f2	f2f	f2f2	f2f2	13	13	c3	h	h	h2	h	c	12	14	13	12	14	12	16	f f4	f f4	f4f5	f3
27	f4	f3	f2	f3	f5	14	12h2	h3	c4	c3	c3	c2	c	c3	1	c	c	14	12	12	f4	f3	f f4	f2
28	f4	f2	f2	f f	f4	1 12	1 c2	c3	c2	c2	c4			c3	c2	12	12	15	12	13c2	f4	f2	f f	f2
29	f3	f3	f4	f2	f3	1	h 1	c4	c4	c3	c2	c2	c	c	c	c	h2c2	h2c2	c4	12	f4f6	f4	f4	f f3
30	f2	f2	f6	f2	f2	1	h	h	c	c2	c2	c2	c	c	c			1	12	h3	f3f	f2f	f f	f3f3
31	f2	f2f	f2f	f f2	f3f	17	13	c4	c3	c2	c2	c	c	h		h	h2	h2	c	1	f2	f2	f4	f
Count																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

Types of Es

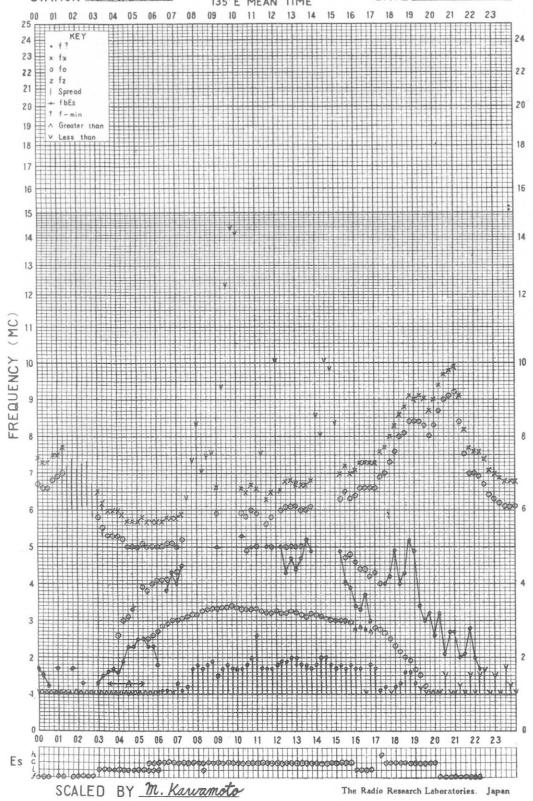
Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 12

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 1.1967

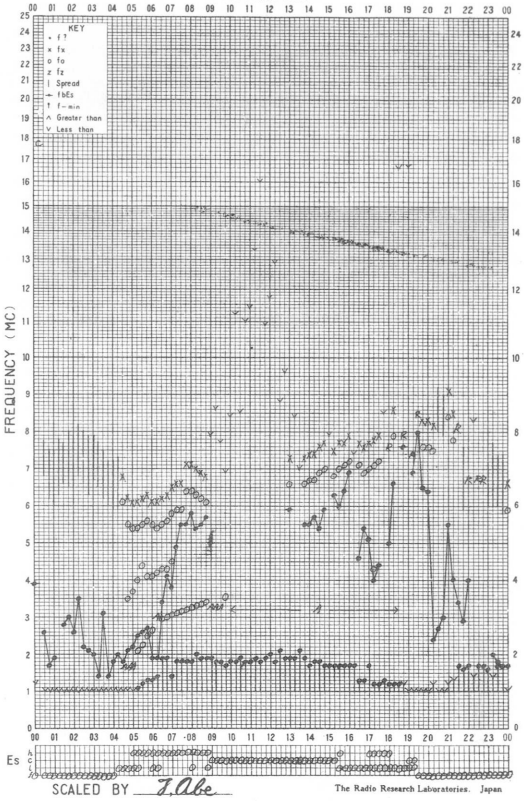


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 1. 1967

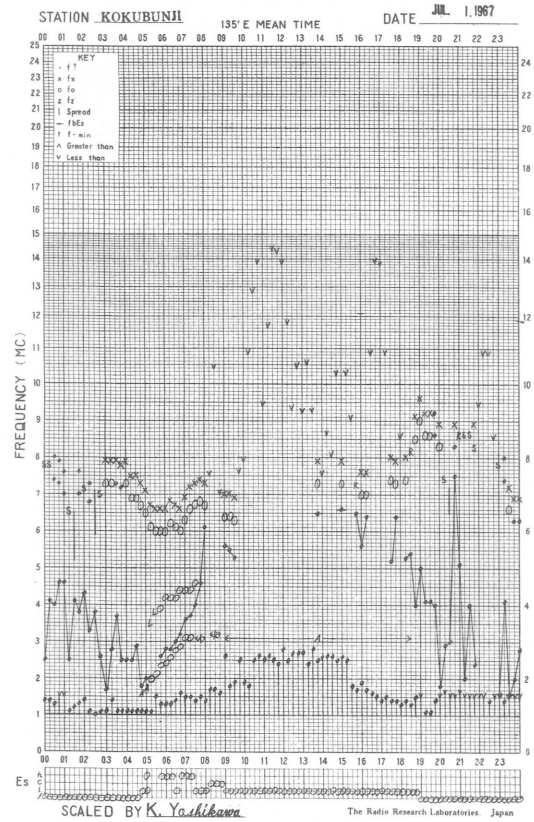


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 1.1967

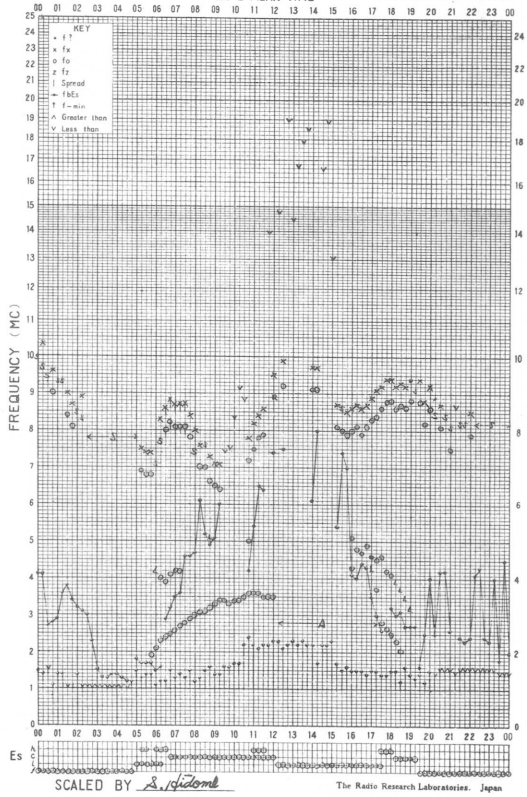


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. - 1. 1967

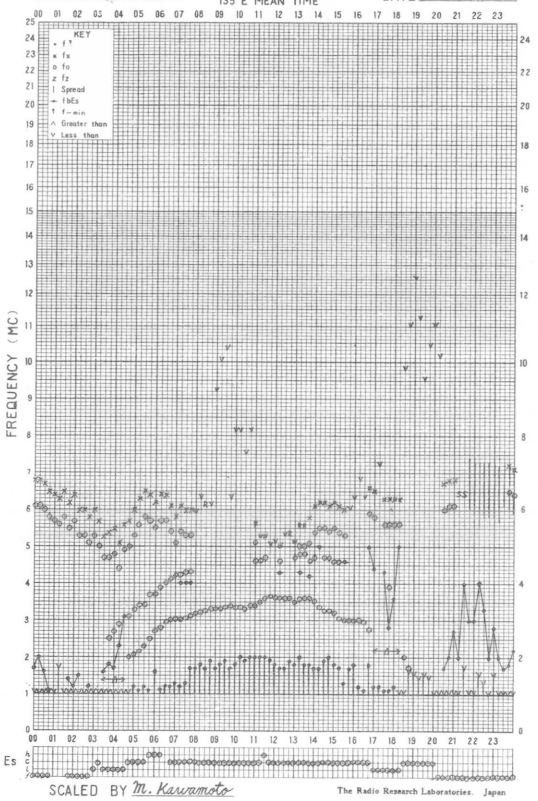


SCALED BY S. Shitomi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 2.1967

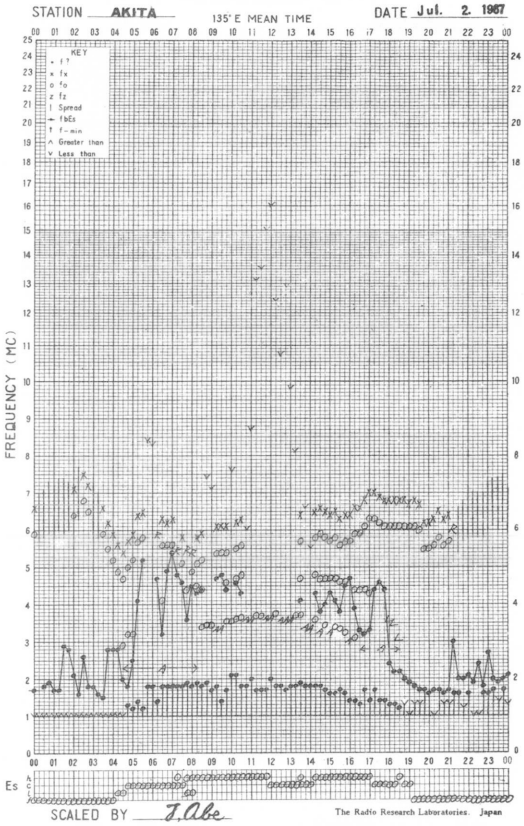


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 2. 1967

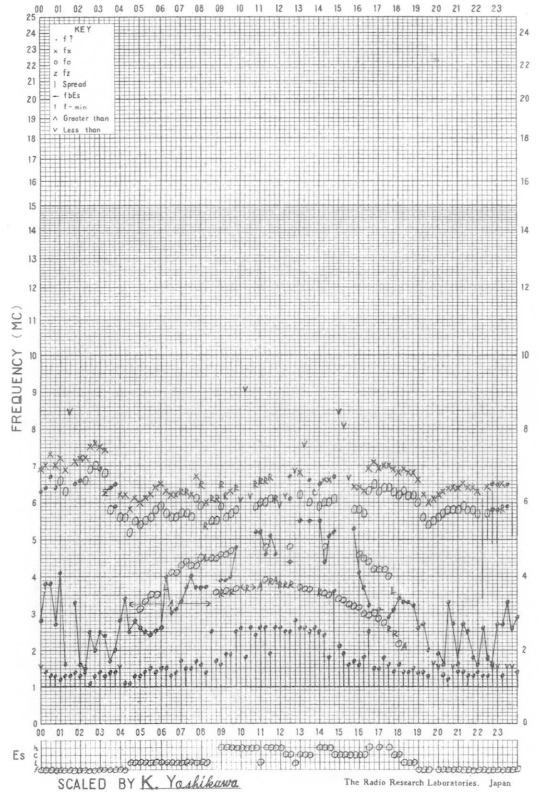


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 2.1967

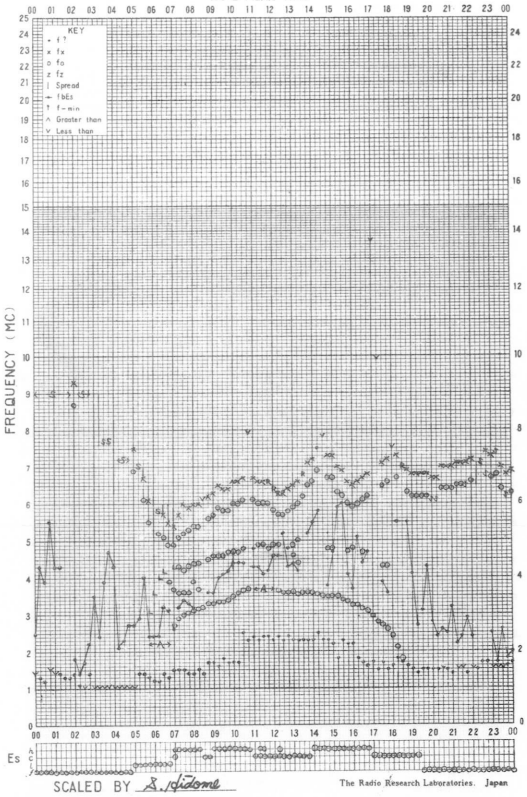


SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. -2.1967

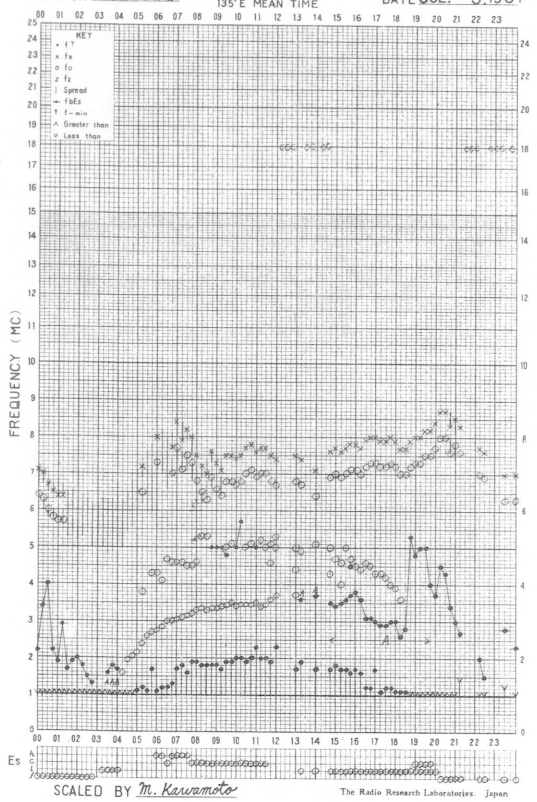


SCALED BY S. Fidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

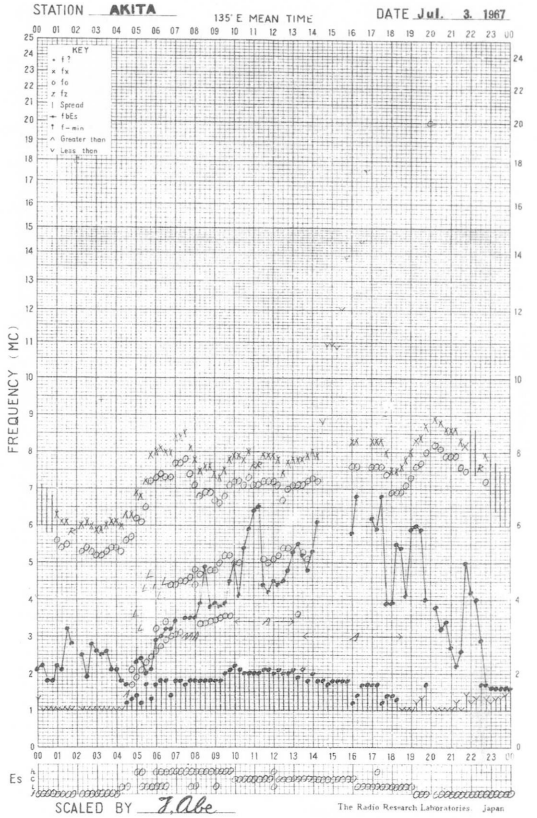
STATION WAKKANAI 135°E MEAN TIME DATE JUL. 3.1967



SCALED BY M. Kawamoto The Radio Research Laboratories Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 3. 1967



SCALED BY T. Abe The Radio Research Laboratories Japan

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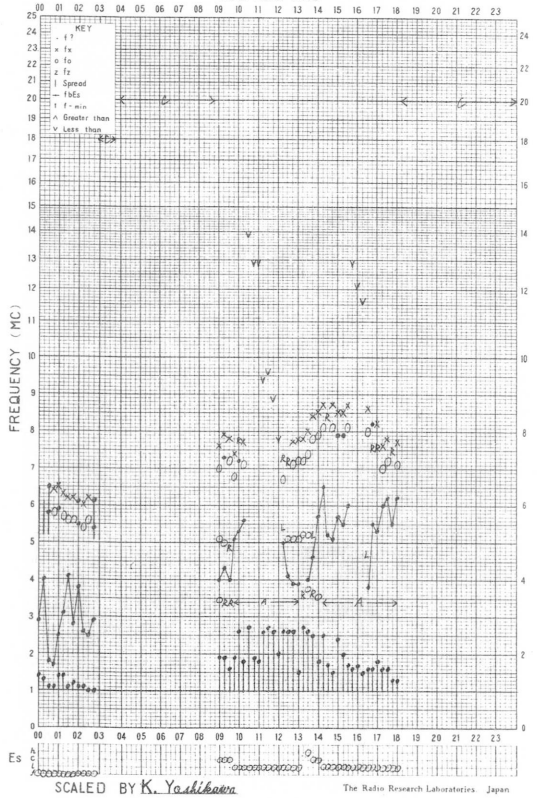

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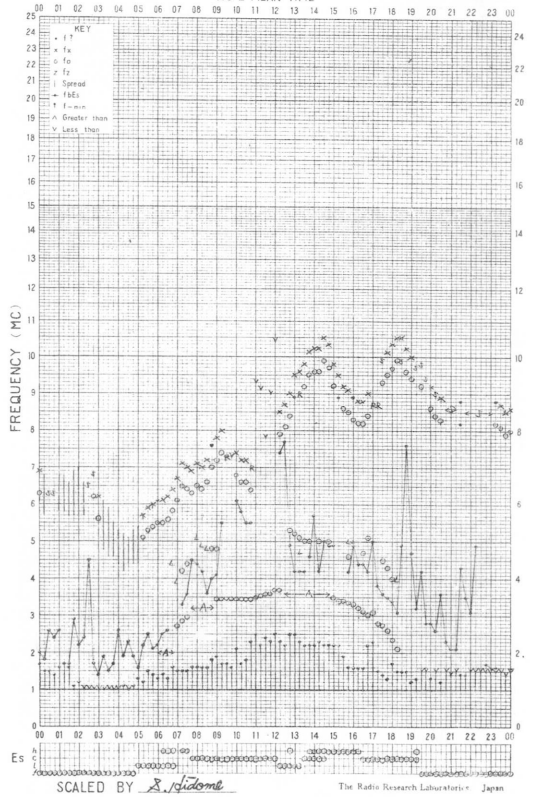

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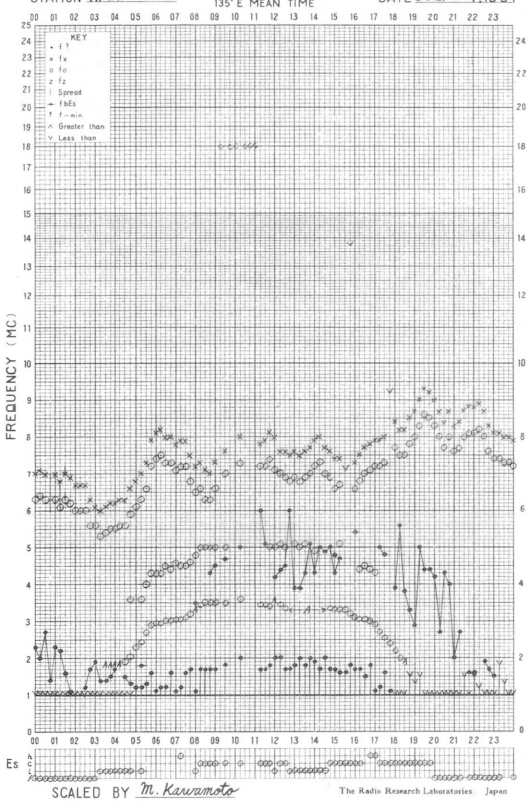

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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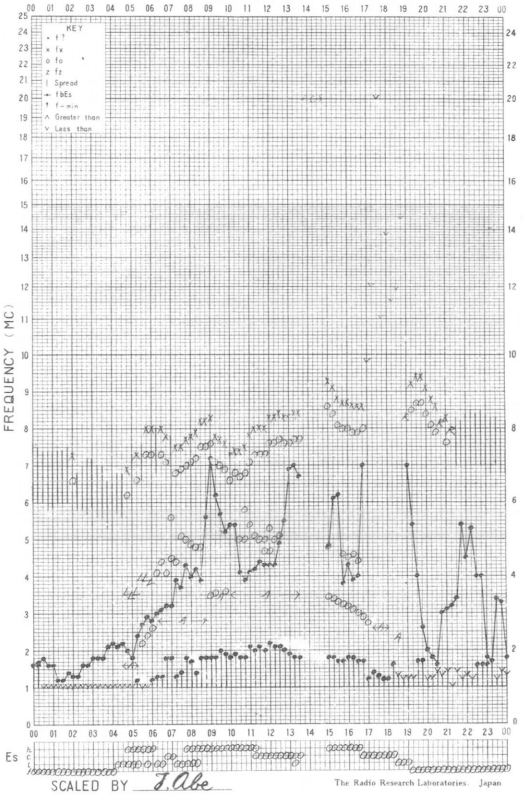

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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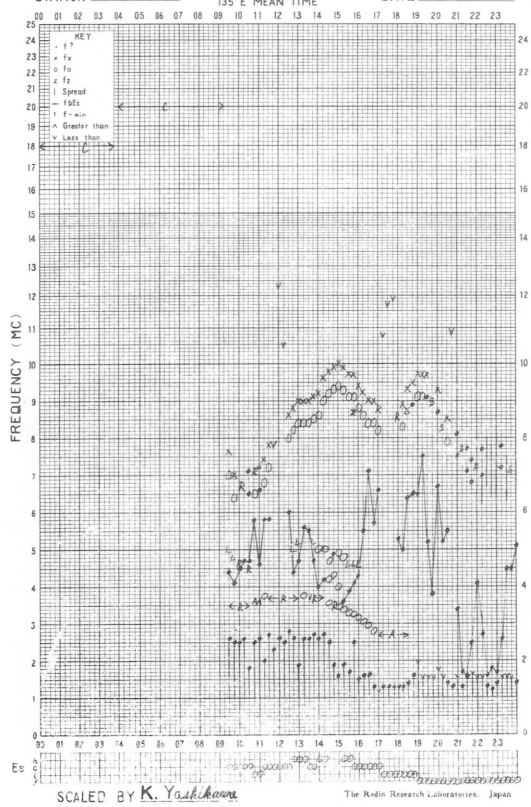

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The Radio Research Laboratories. Japan

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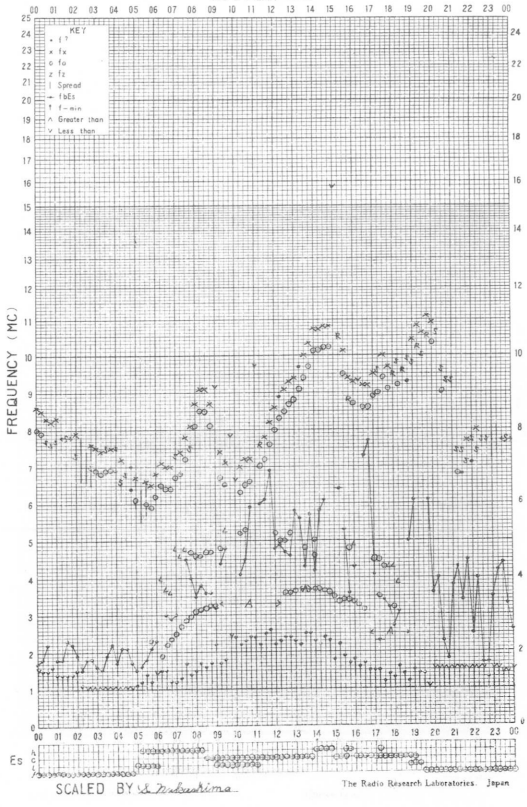

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The Radio Research Laboratories. Japan

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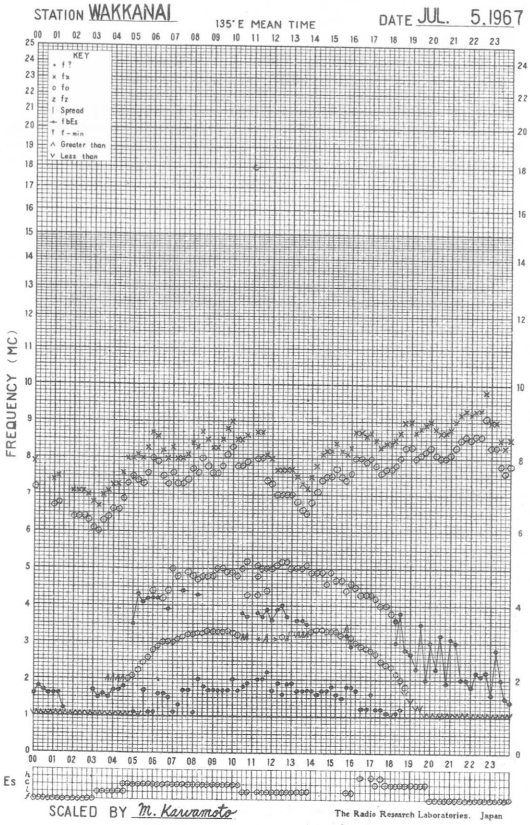

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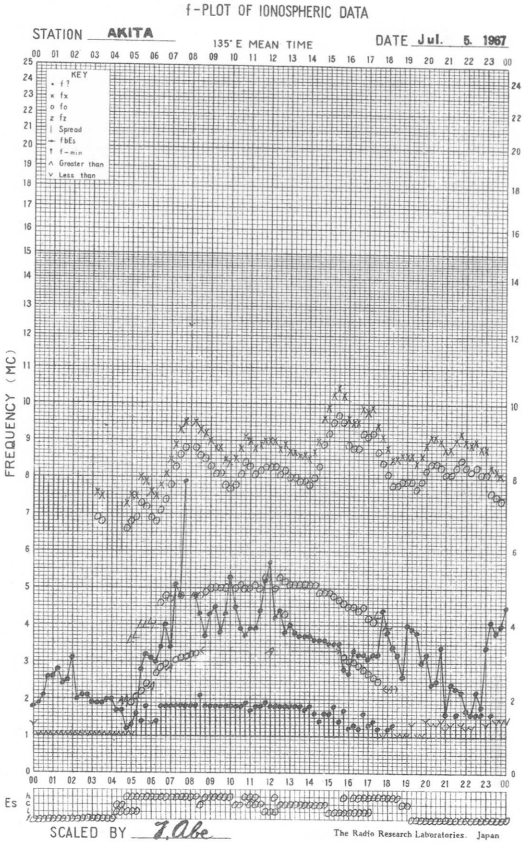

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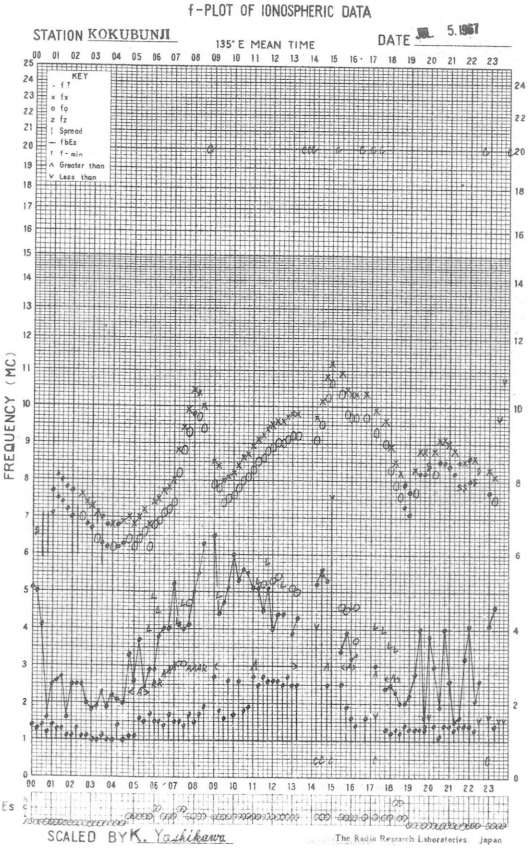

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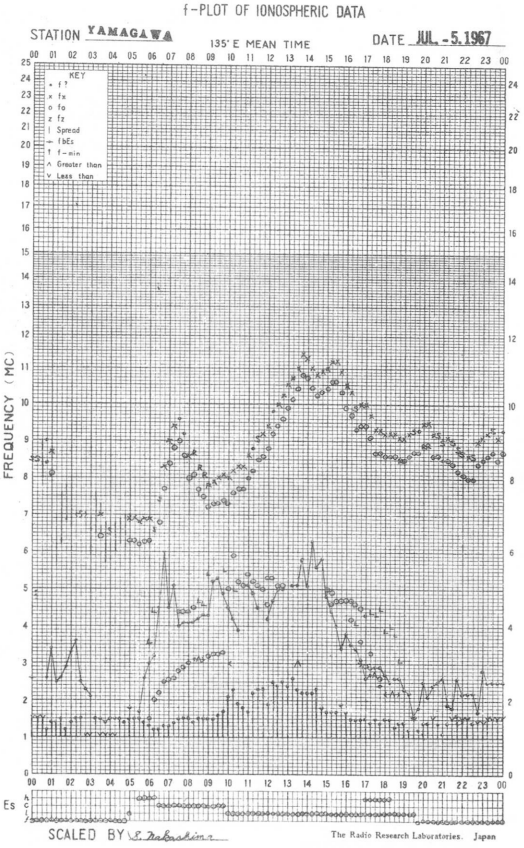

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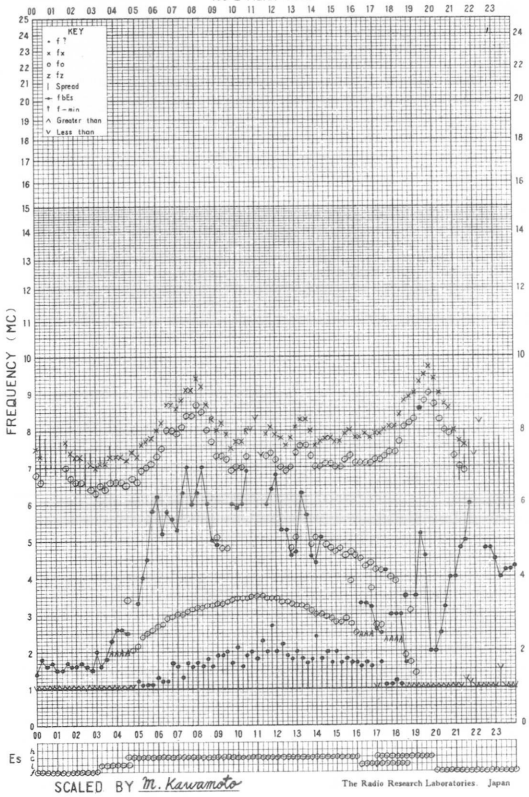

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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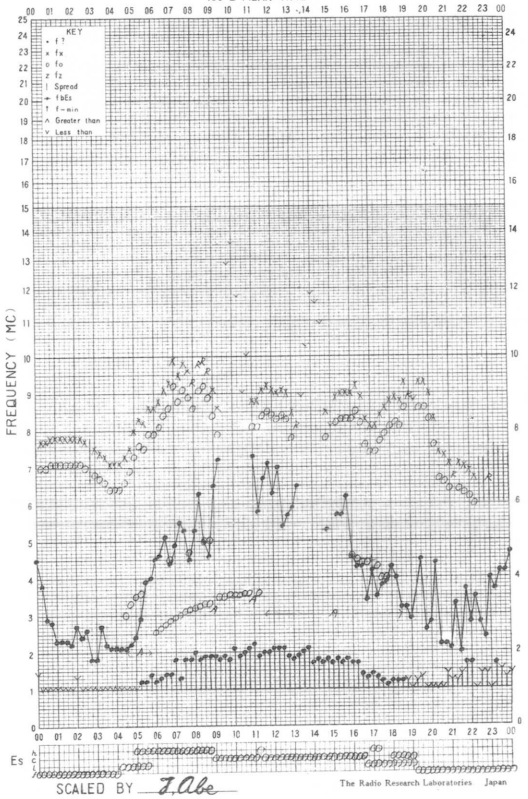

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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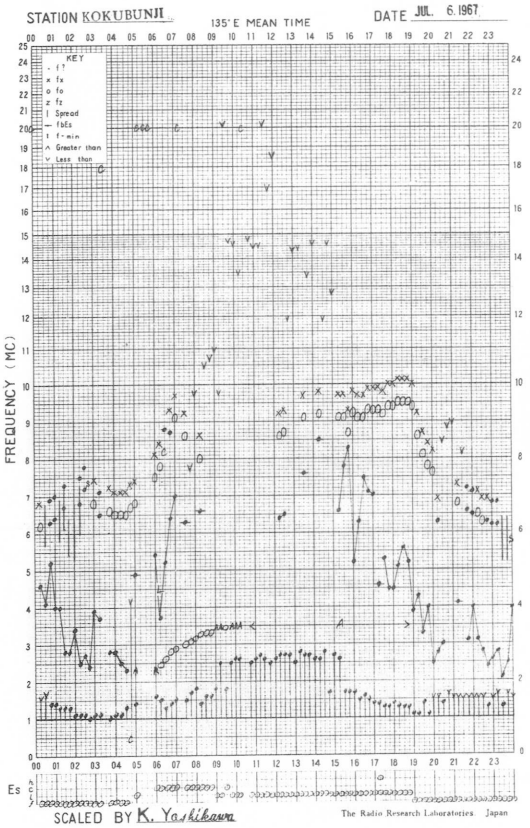

SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

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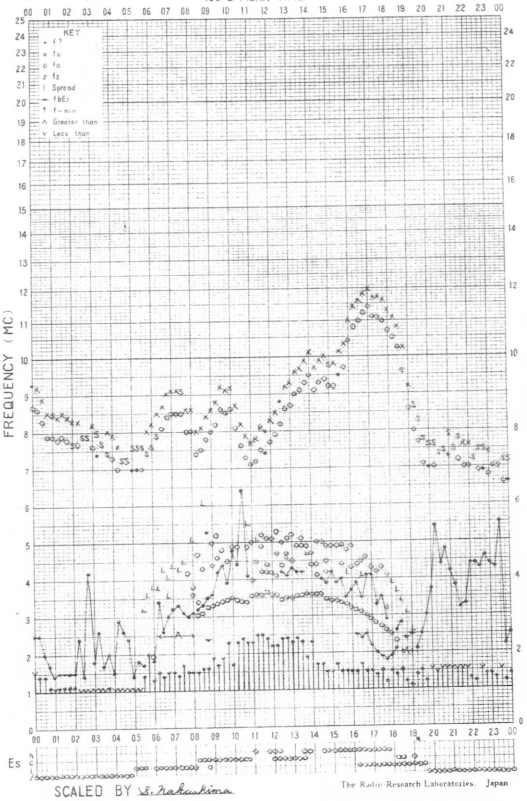

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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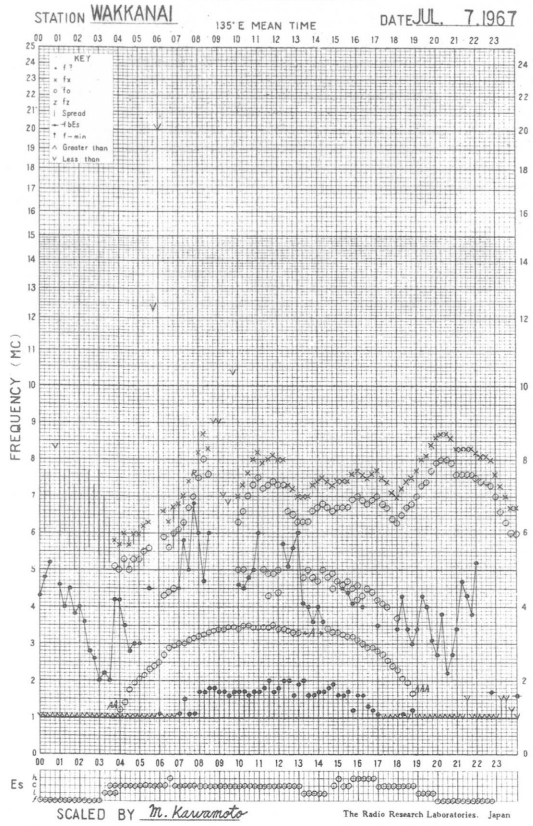

SCALED BY M. Kawamoto

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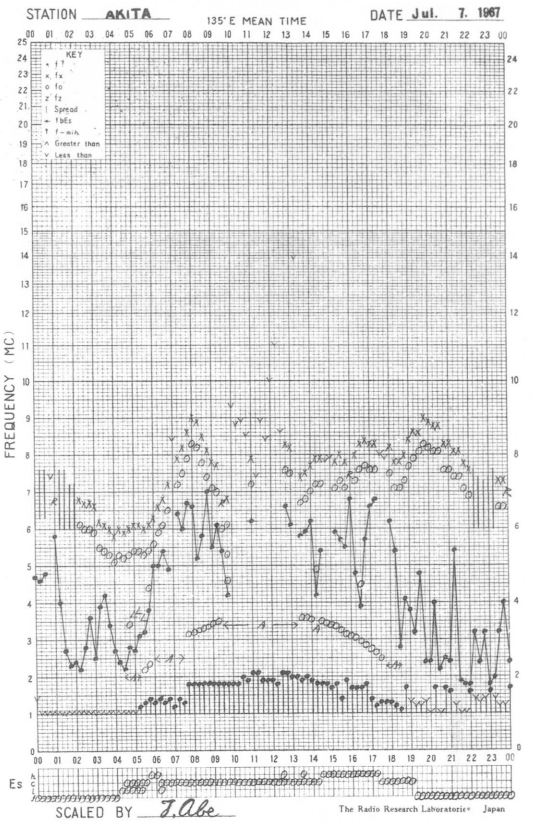

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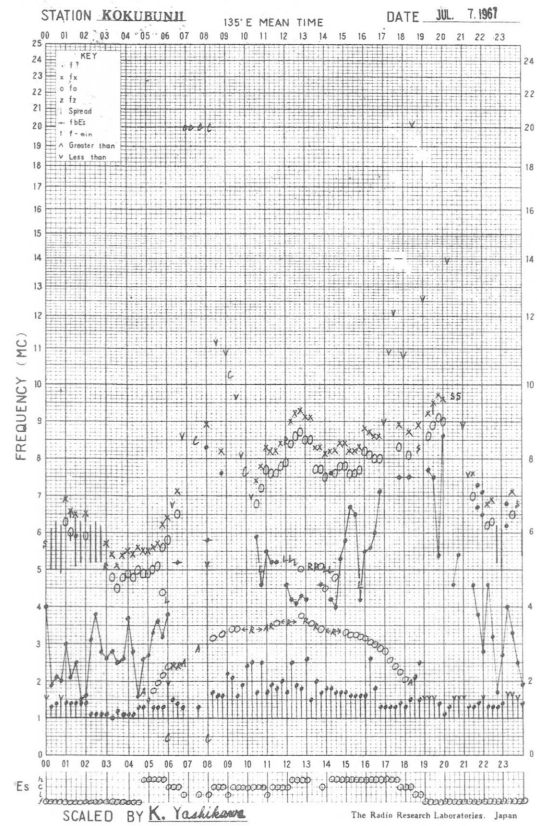

SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

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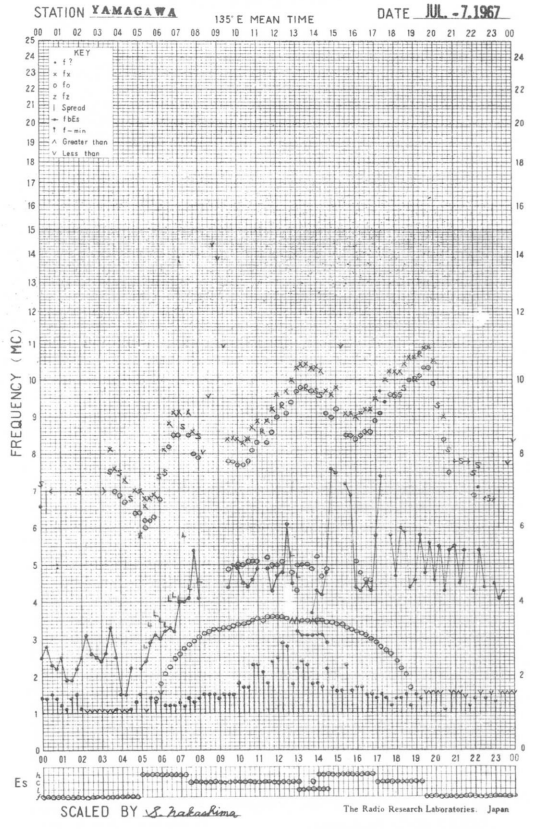

SCALED BY S. Takashima

The Radio Research Laboratories. Japan

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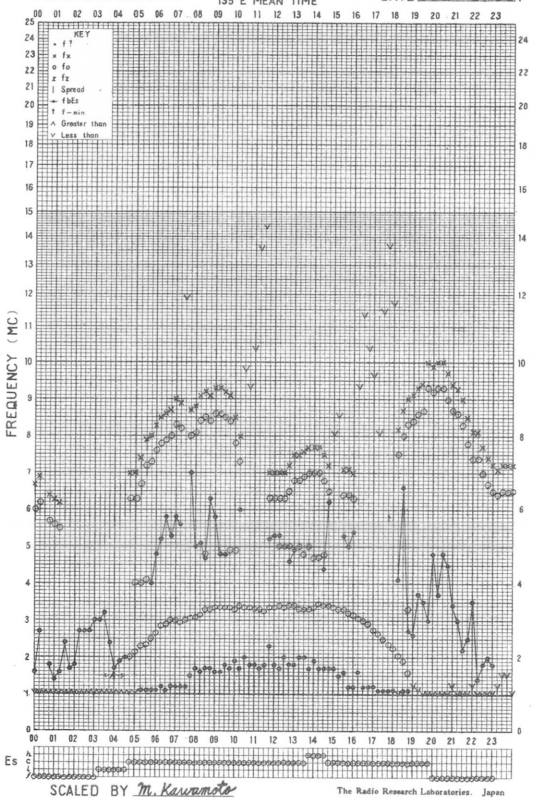

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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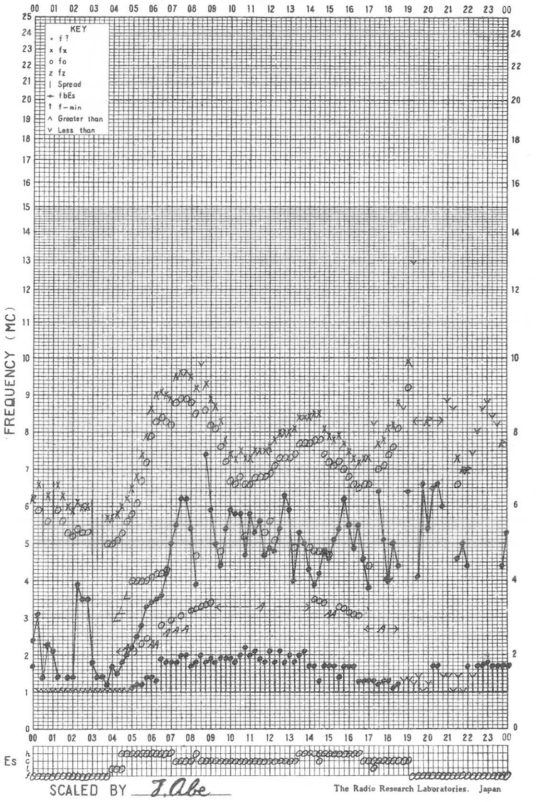

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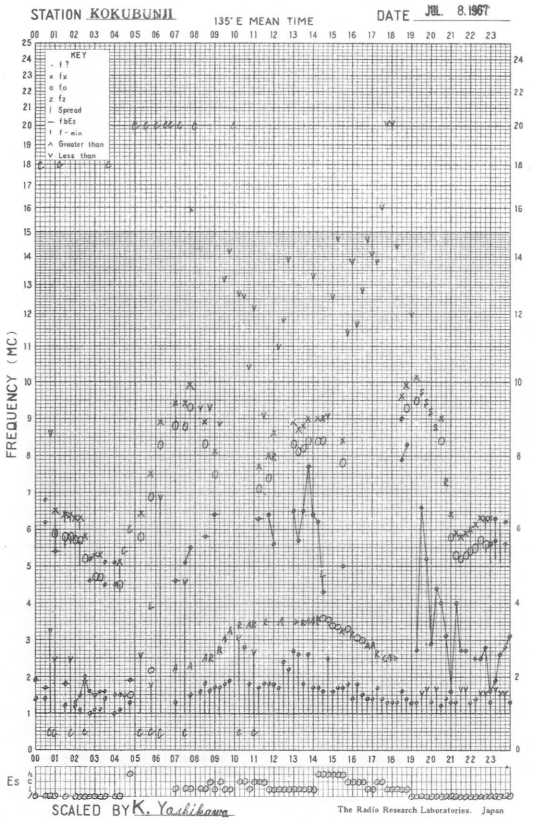

SCALED BY K. Yashikawa The Radio Research Laboratories. Japan

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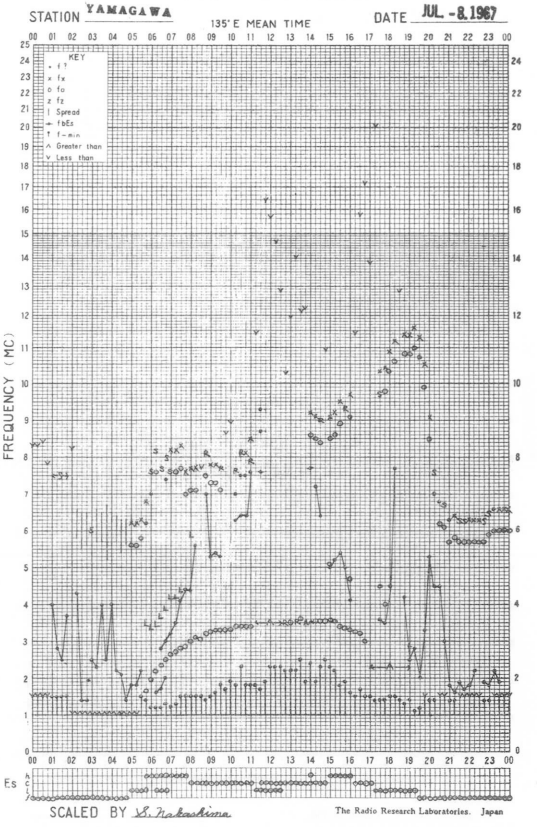

SCALED BY S. Nakashima The Radio Research Laboratories. Japan

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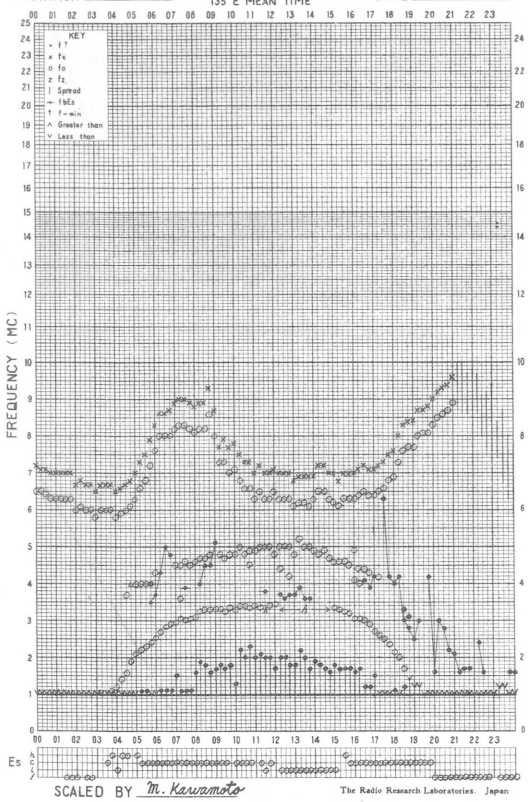

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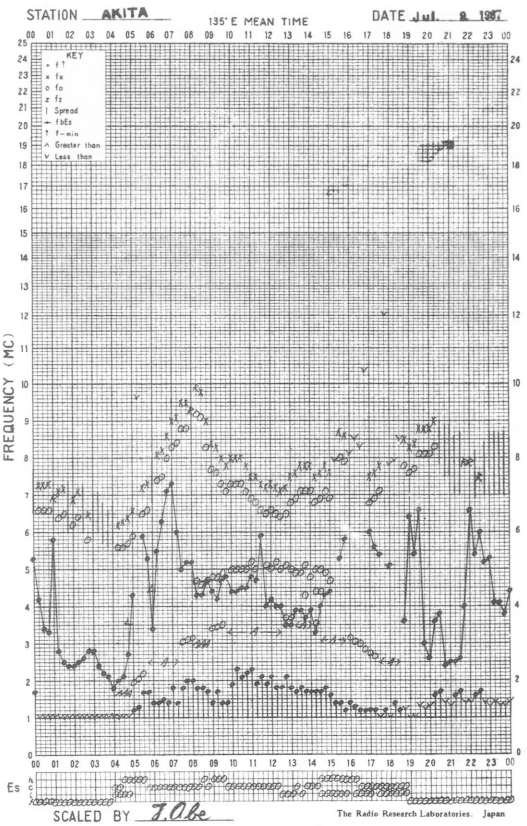

SCALED BY T. Obe The Radio Research Laboratories. Japan

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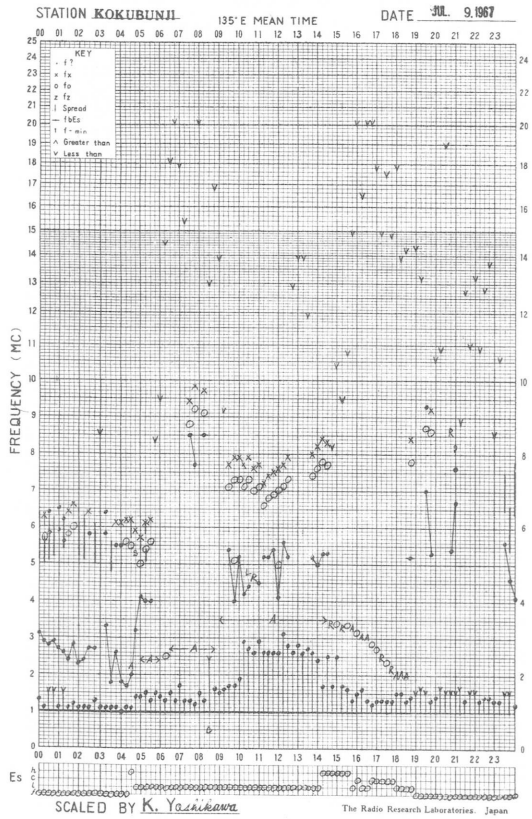

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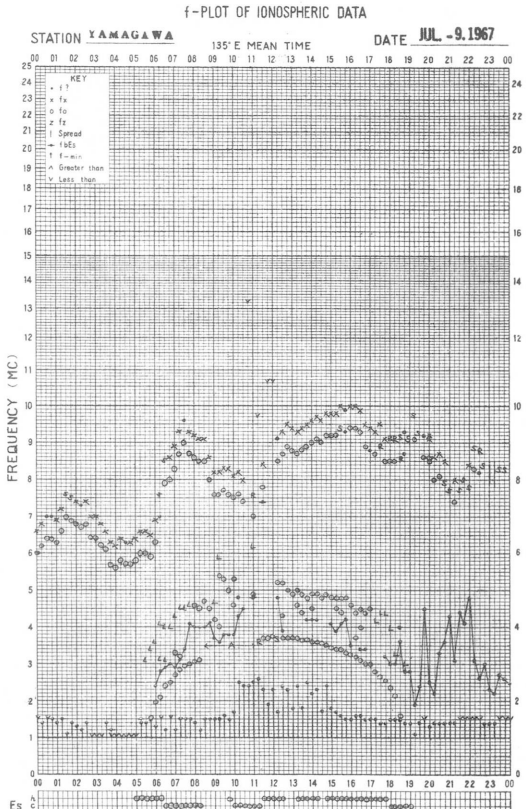

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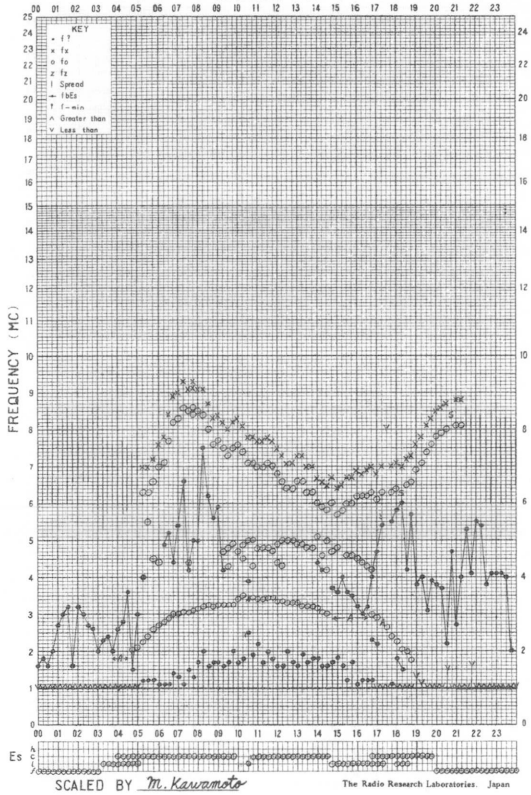

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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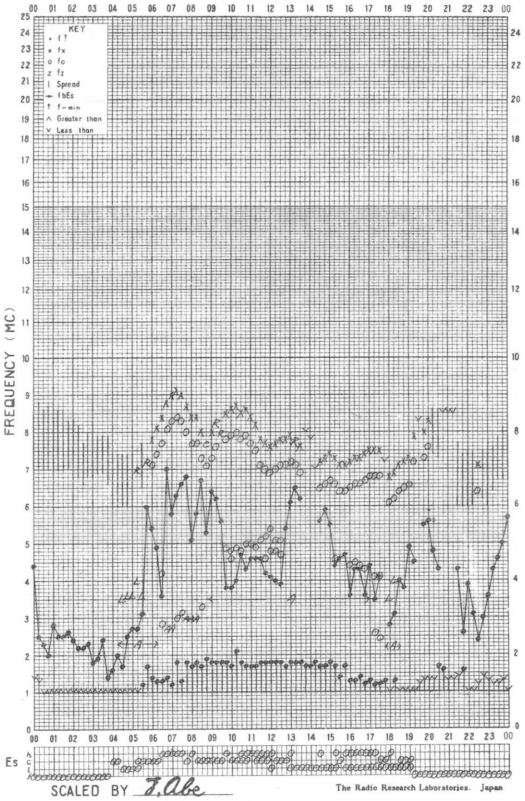

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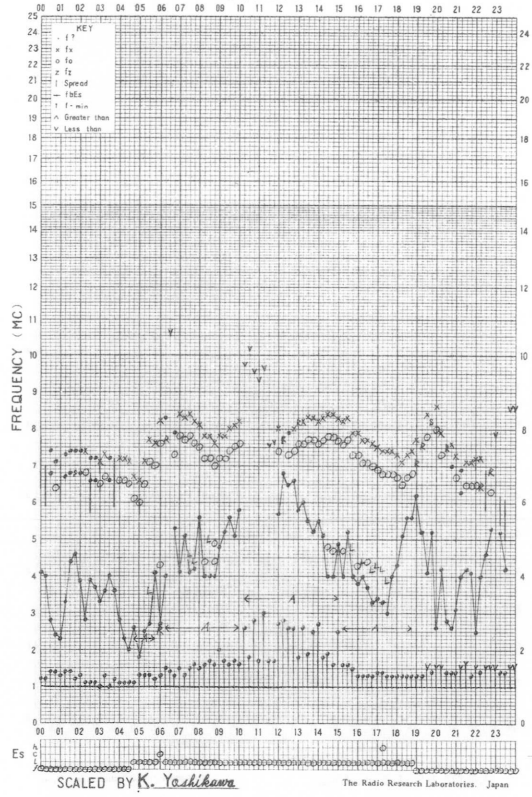

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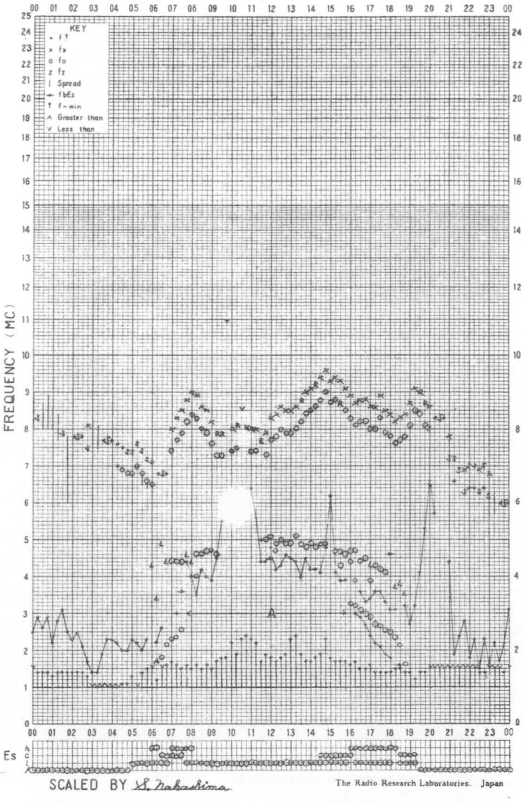

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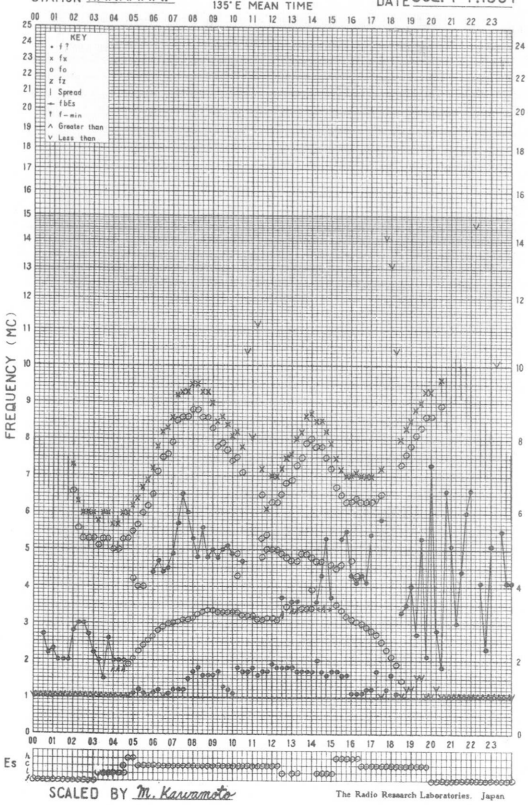

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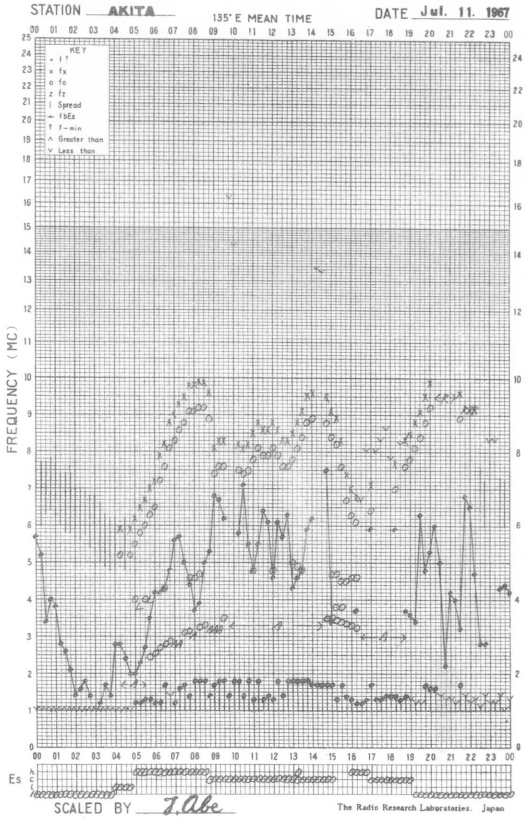

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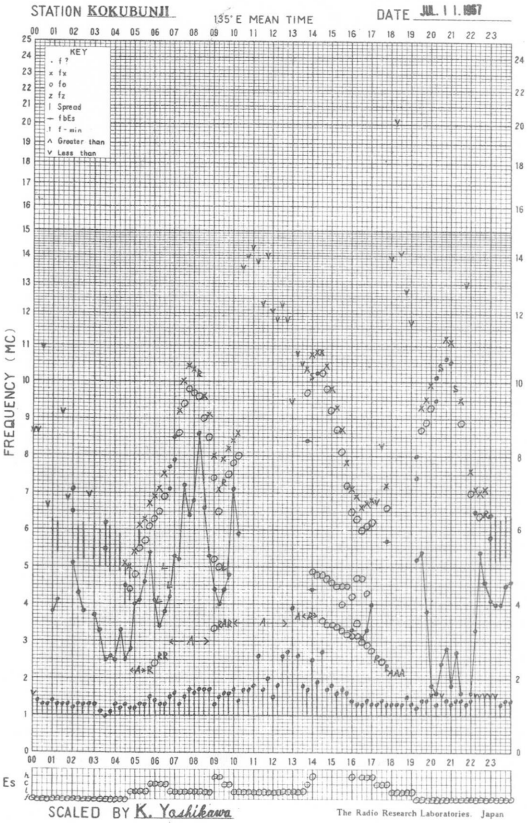

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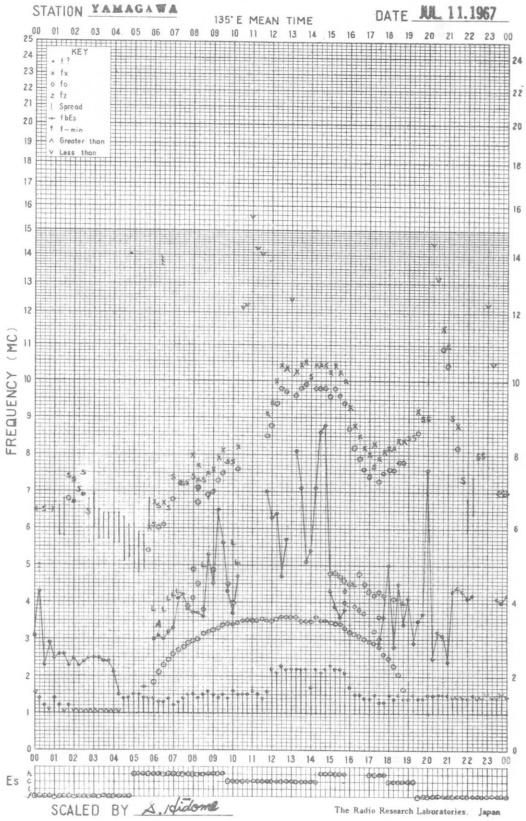

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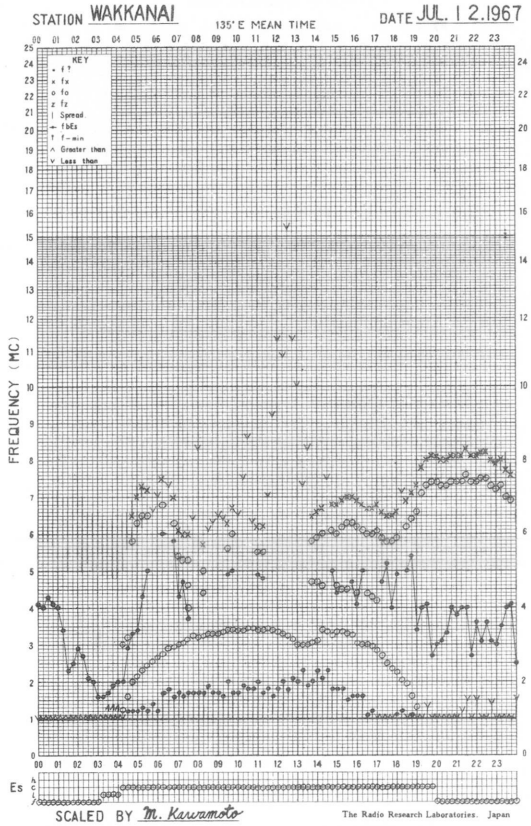

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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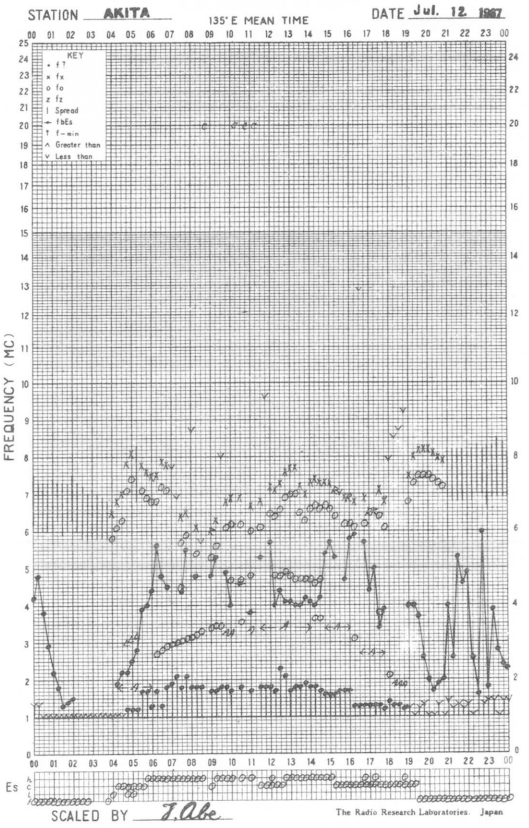

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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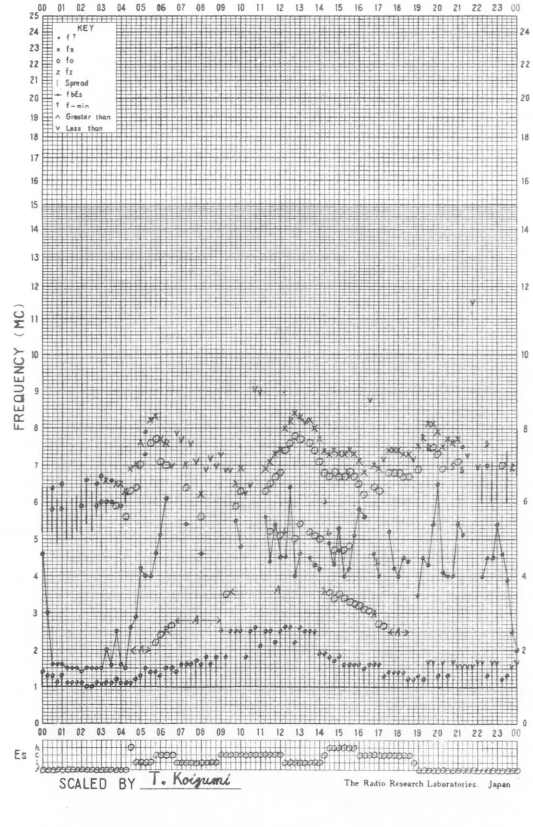

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The Radio Research Laboratories. Japan

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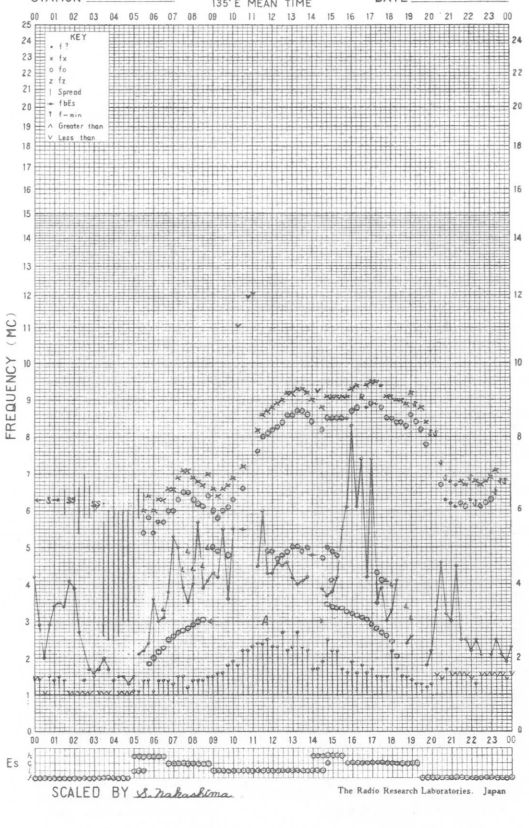

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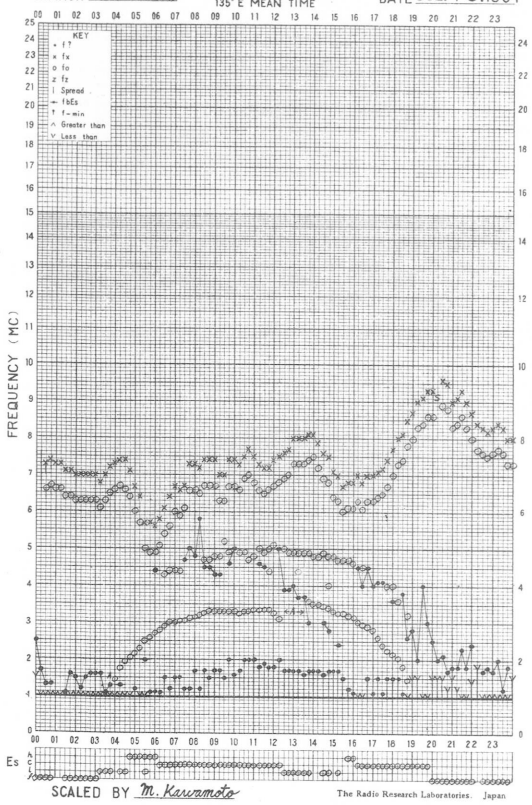

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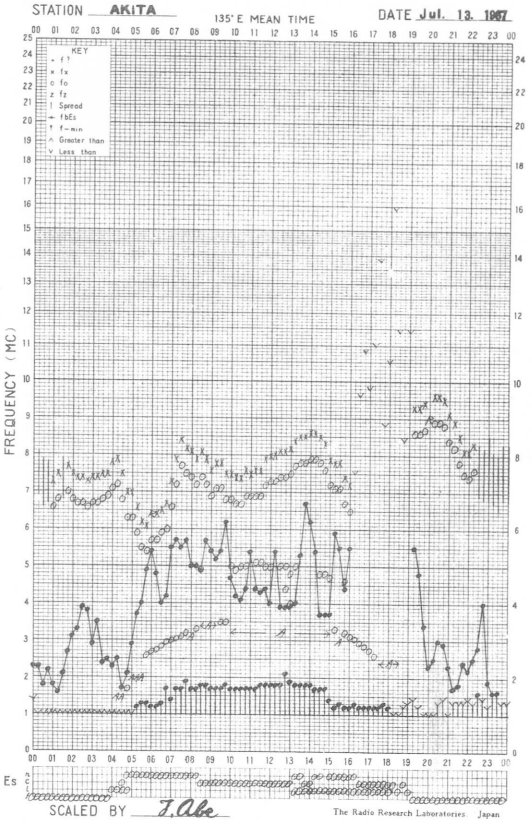

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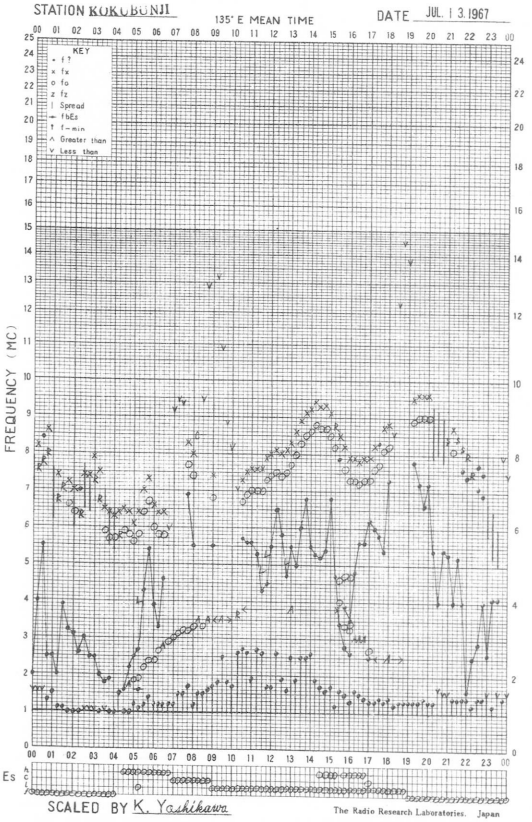

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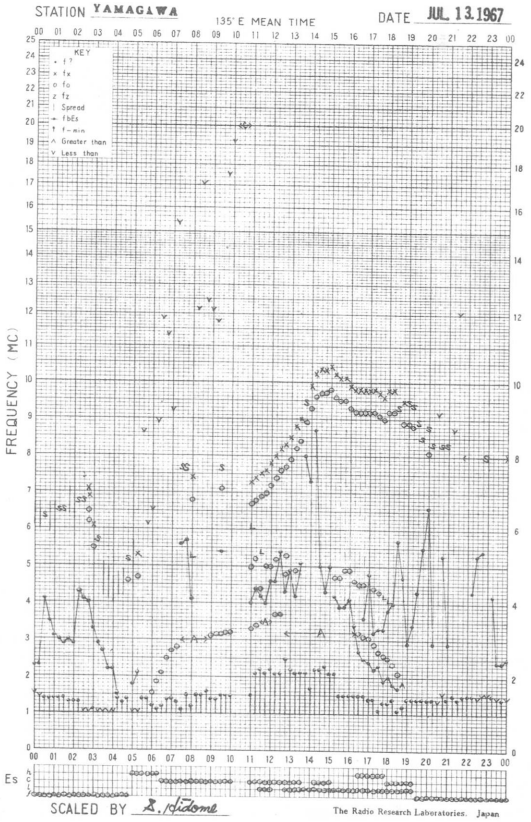

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The Radio Research Laboratories. Japan

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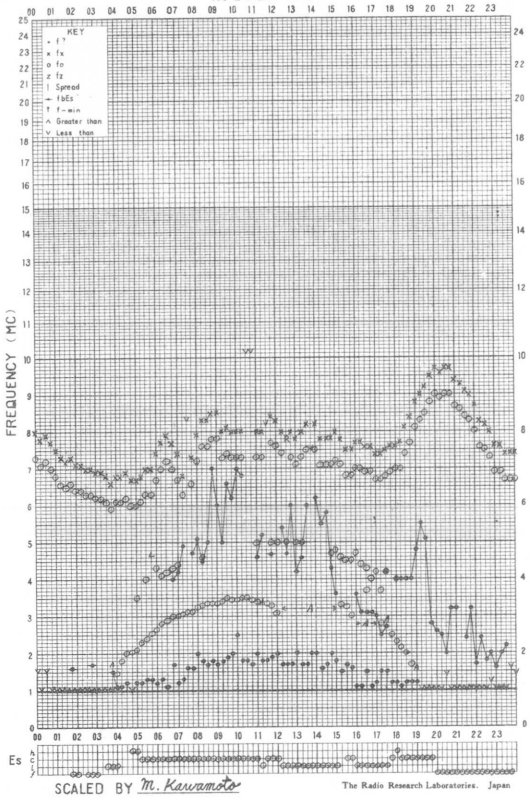

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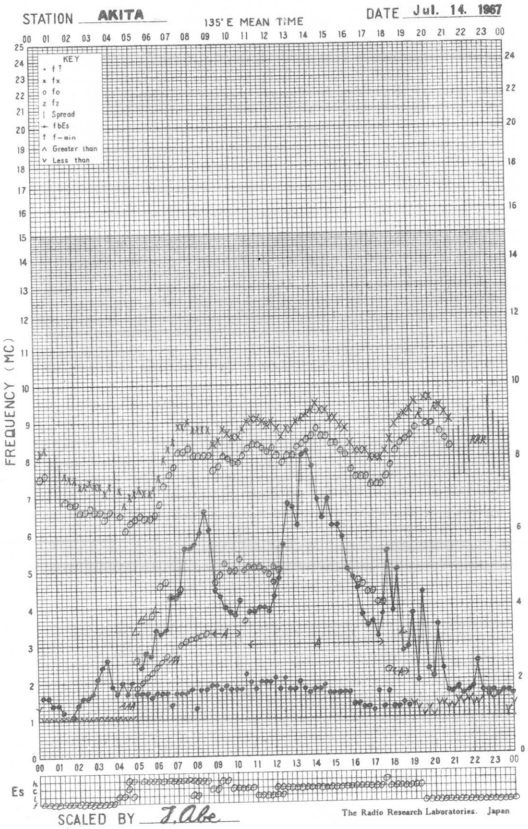

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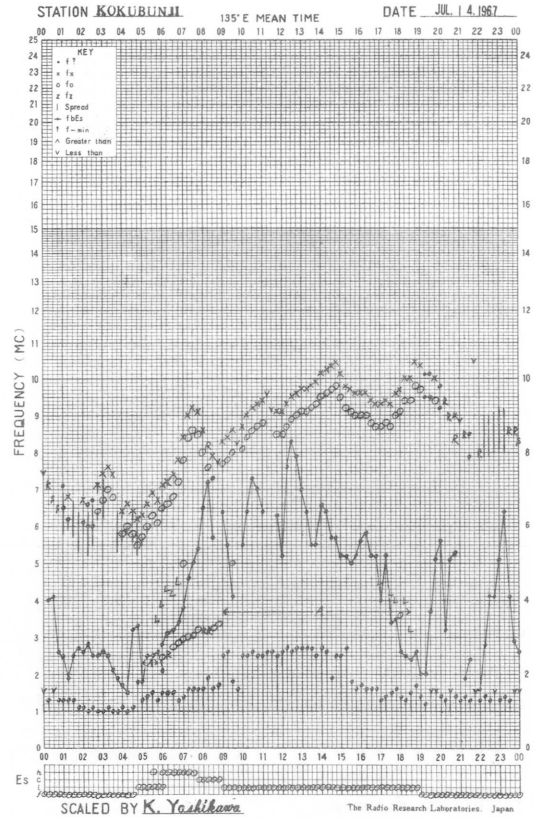
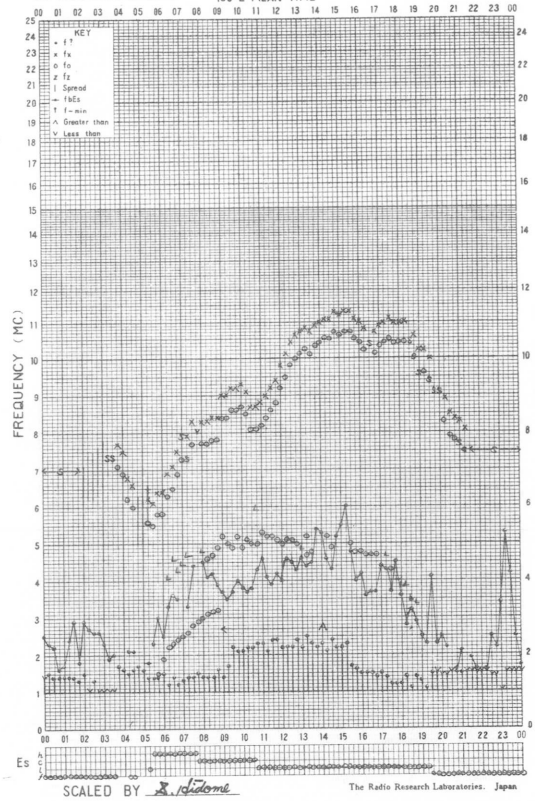


SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 14.1967



SCALED BY S. Tidomi The Radio Research Laboratories. Japan

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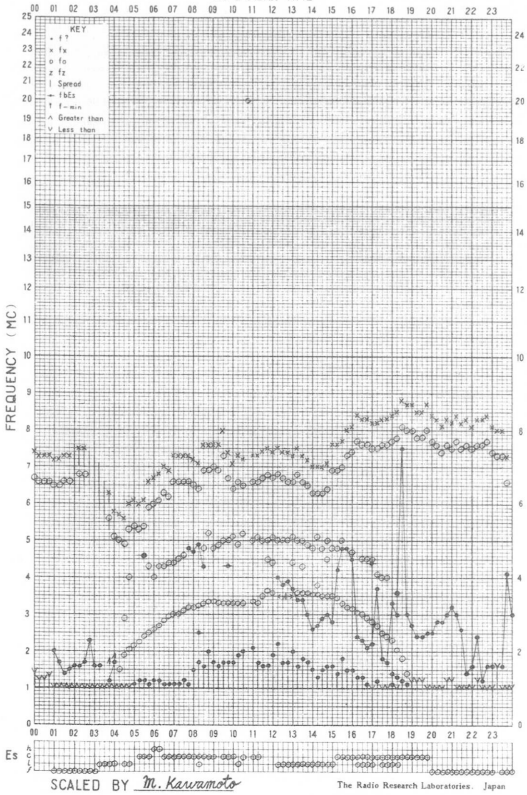

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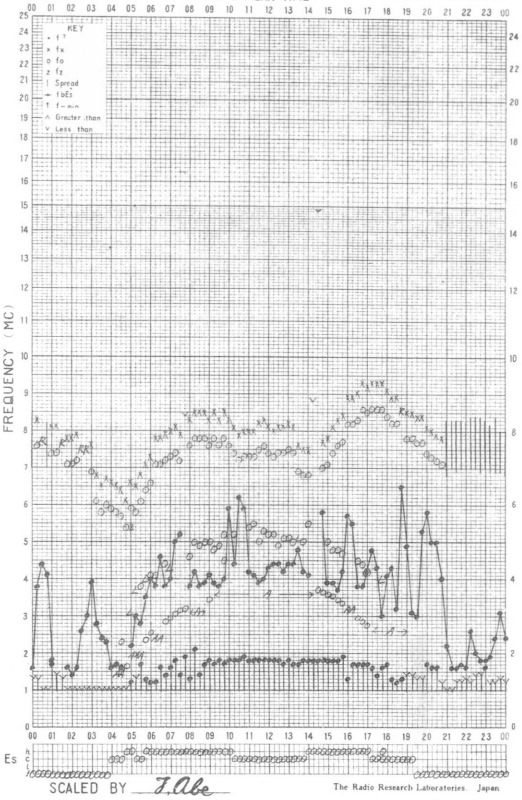

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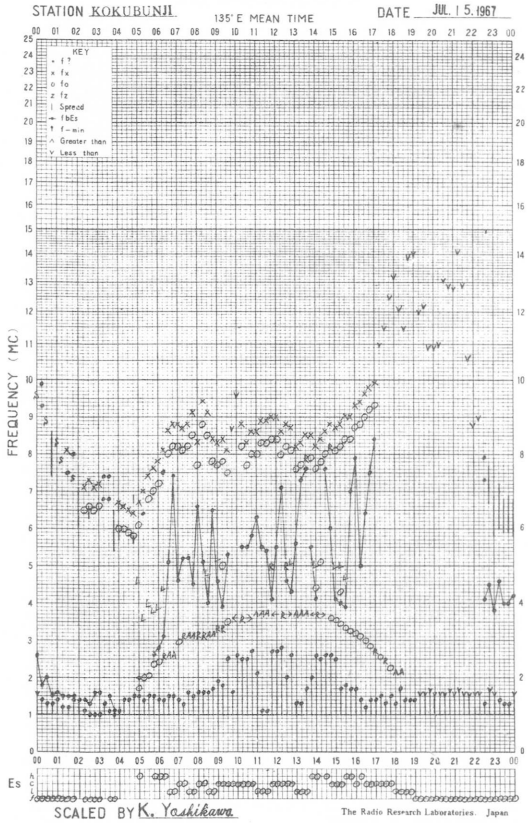

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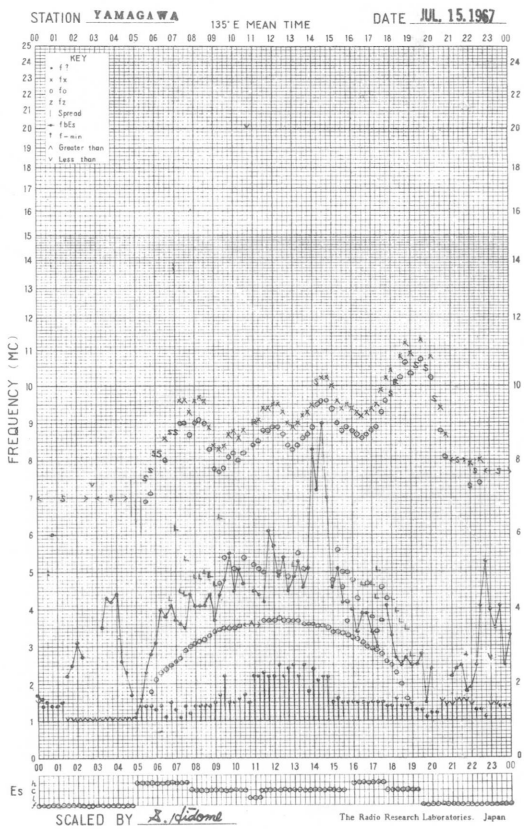

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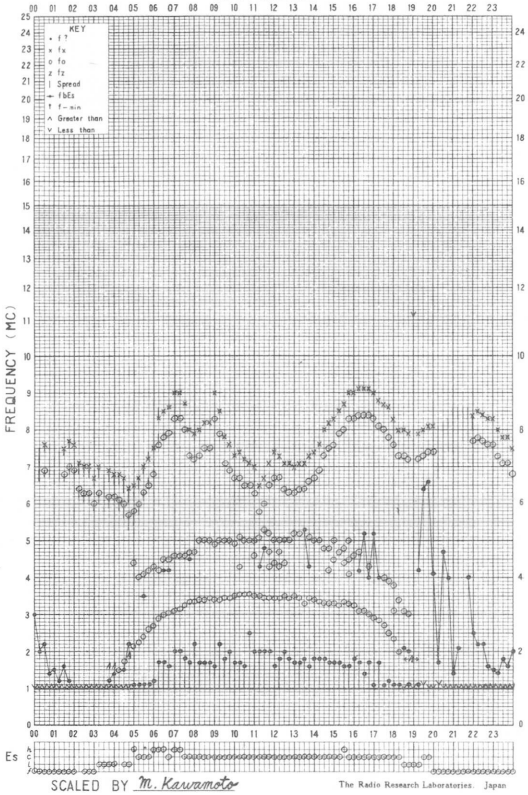

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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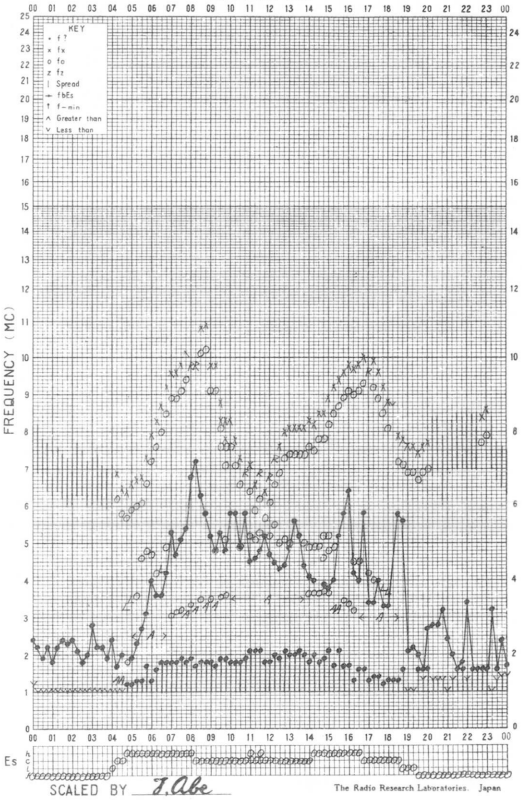

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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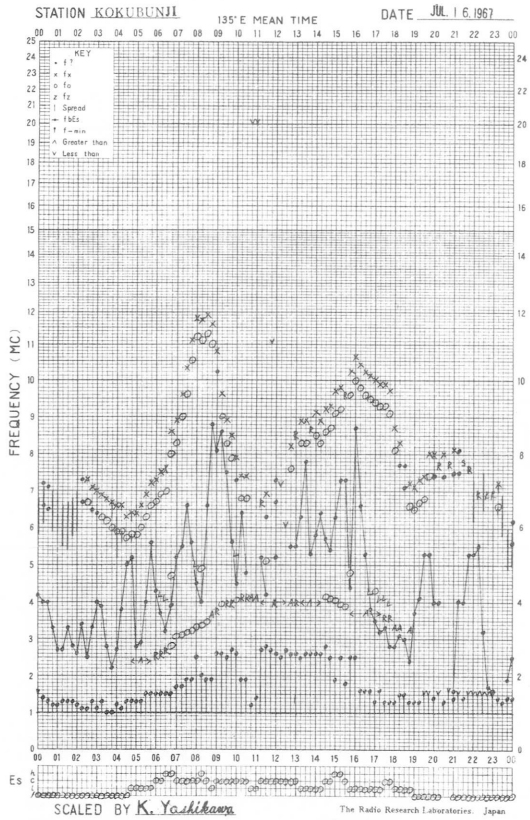
STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 16.1967



SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

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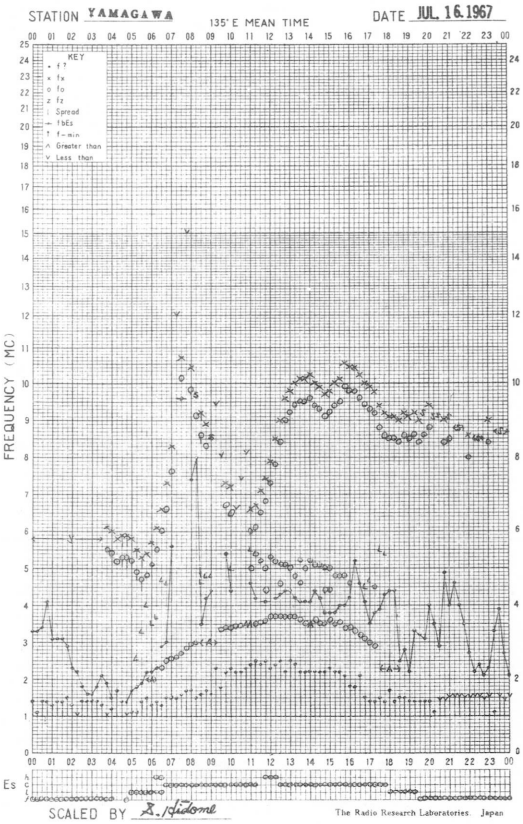

SCALED BY S. Fukami

The Radio Research Laboratories. Japan

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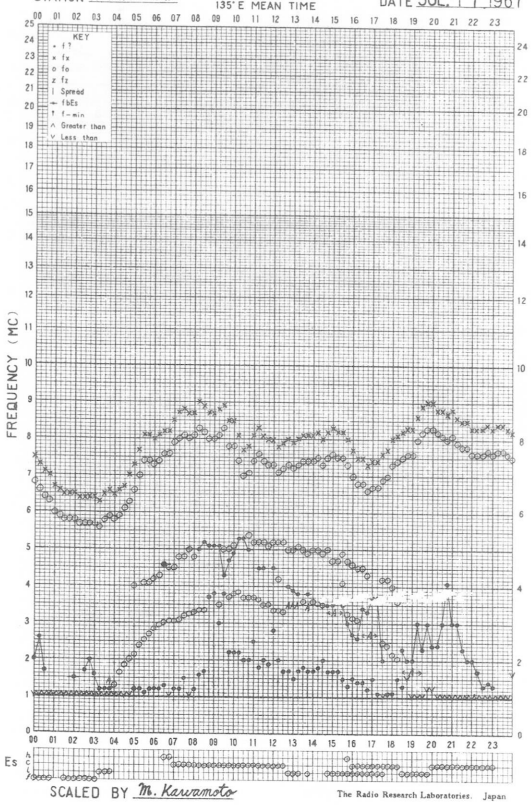

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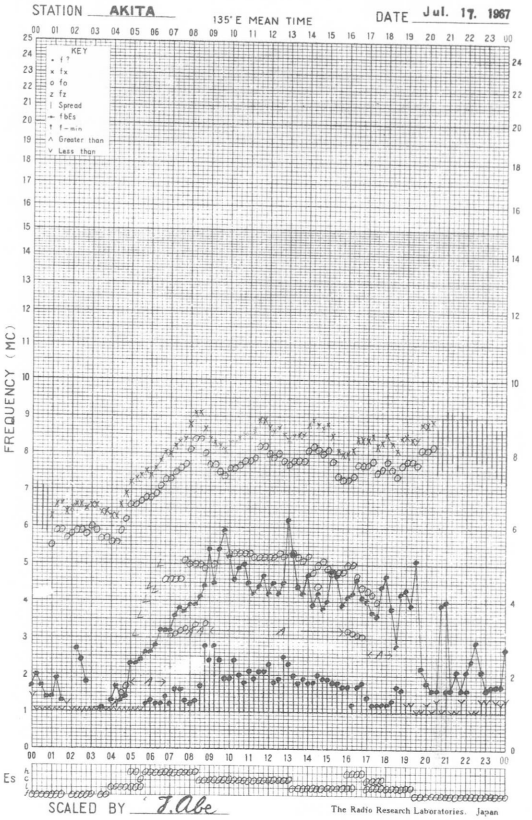

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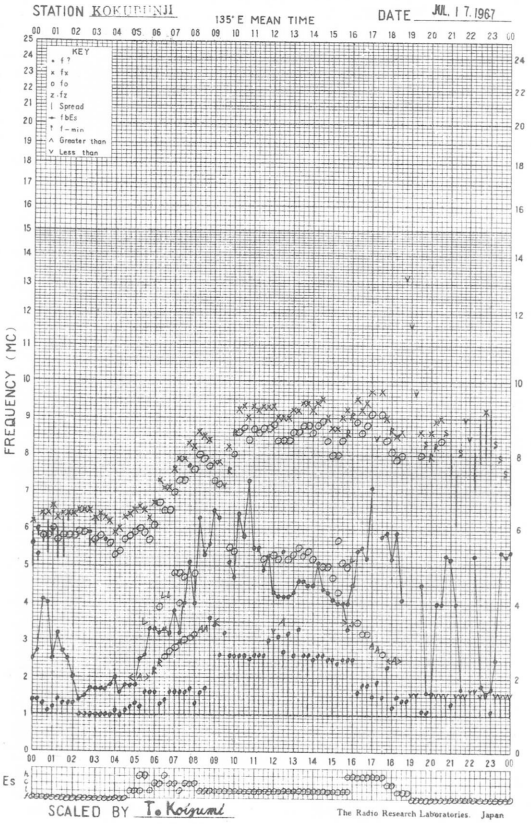

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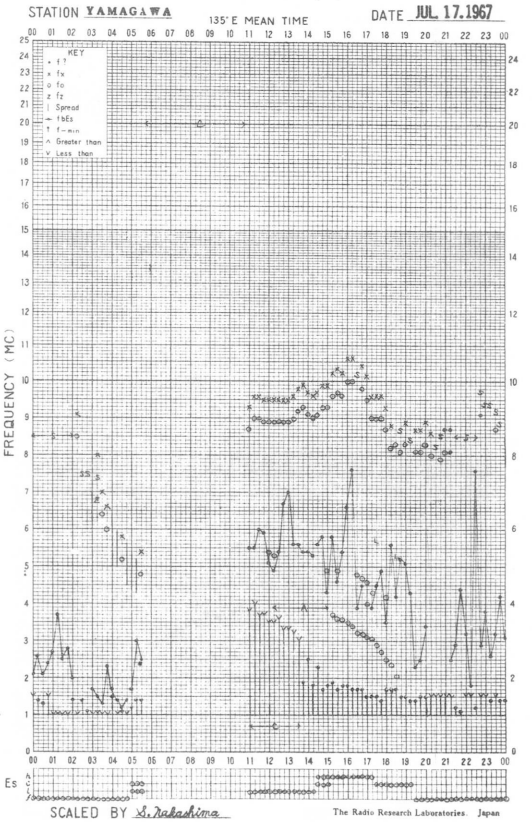

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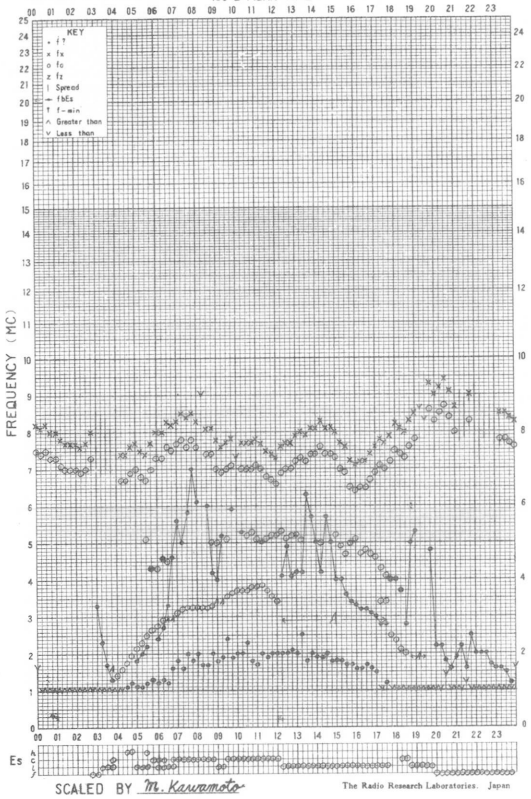

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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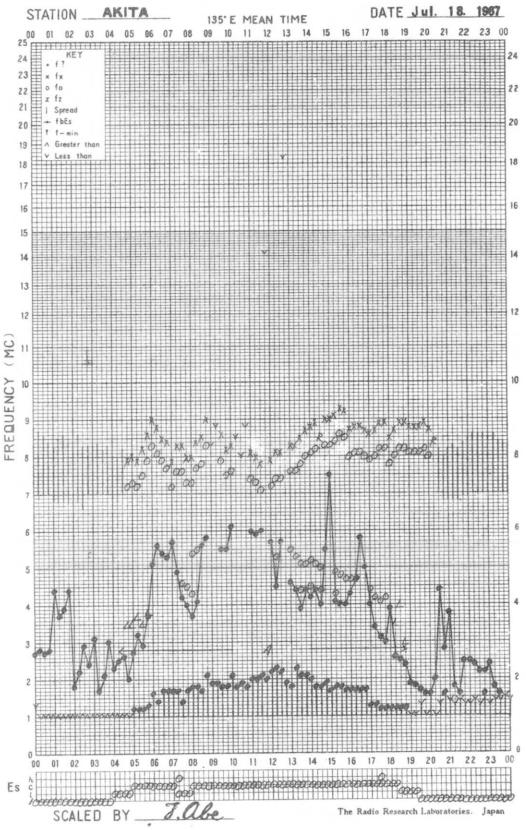

SCALED BY T. Abe The Radio Research Laboratories. Japan

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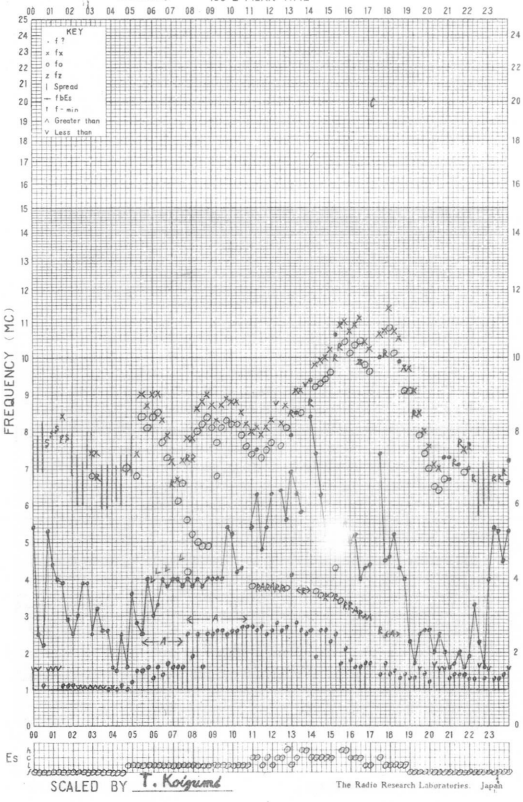

SCALED BY T. Koizumi The Radio Research Laboratories. Japan

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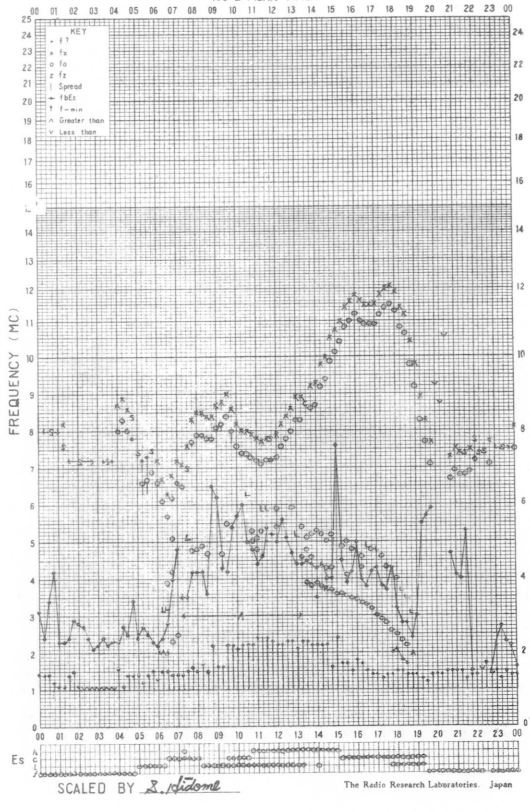

SCALED BY I. Tidome The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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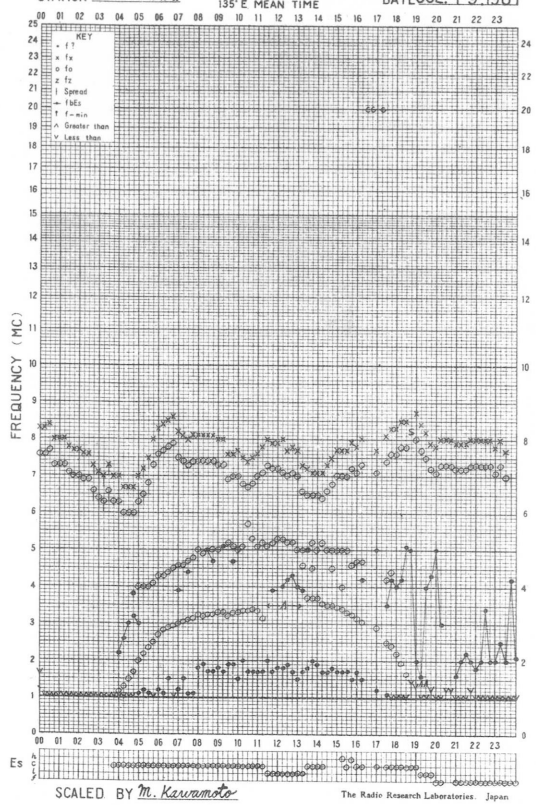

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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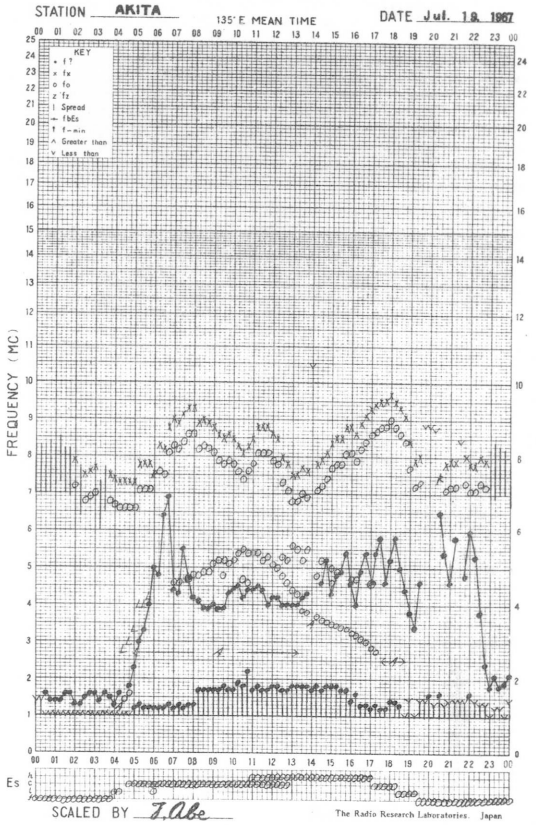

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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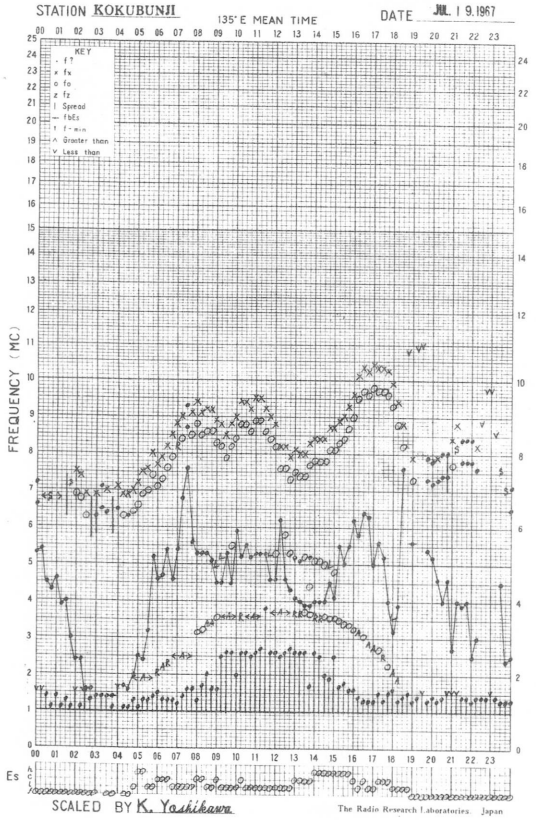

SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

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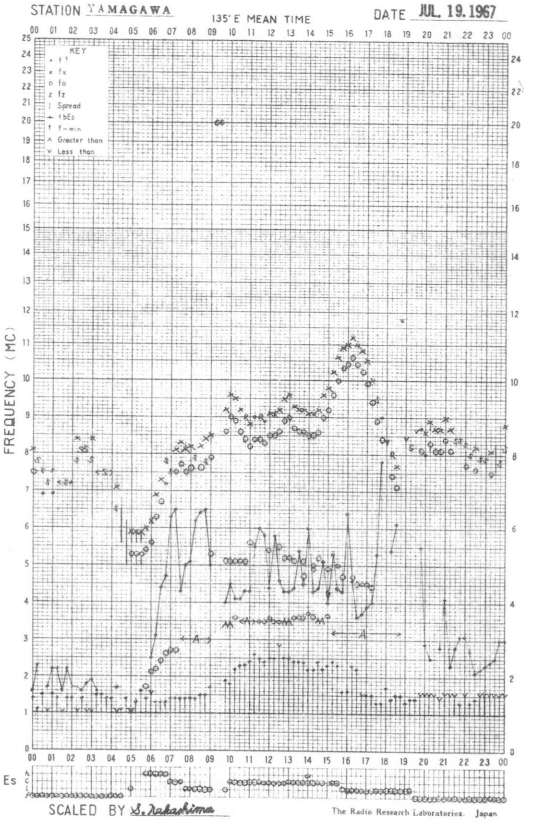

SCALED BY S. Takashima

The Radio Research Laboratories. Japan

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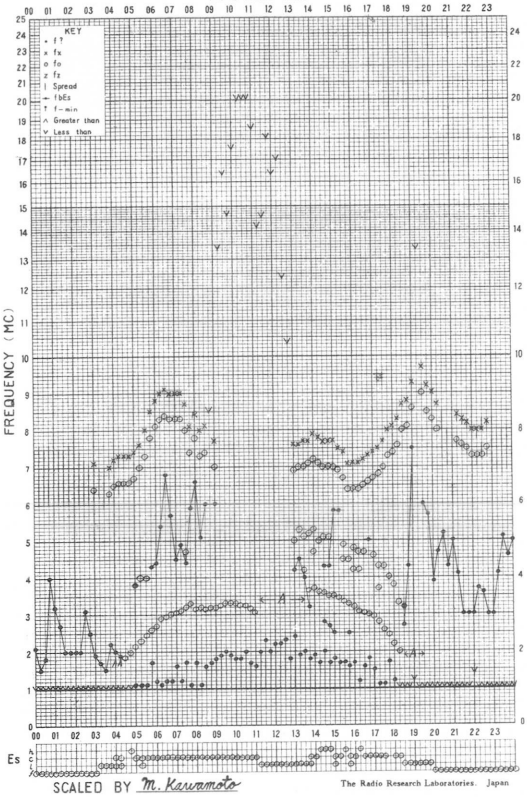

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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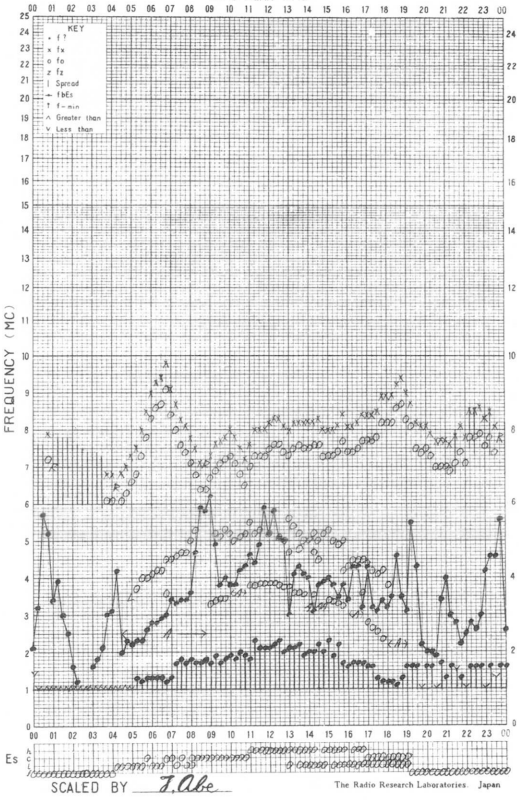

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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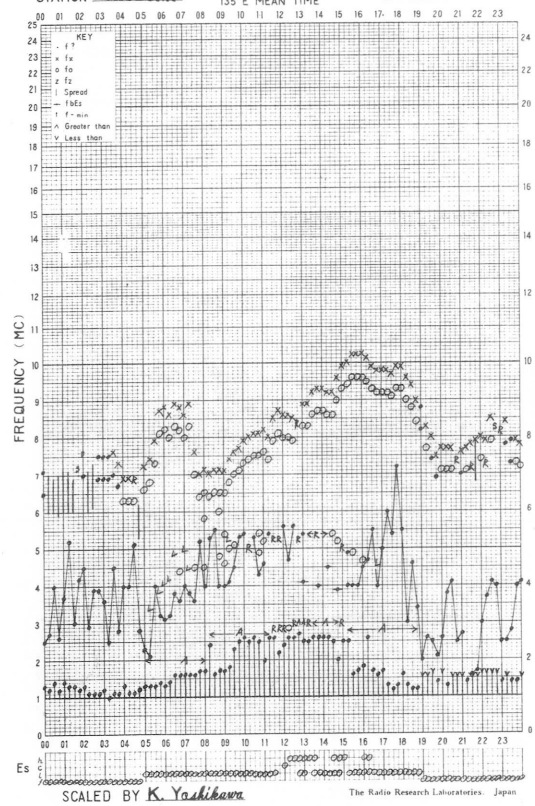

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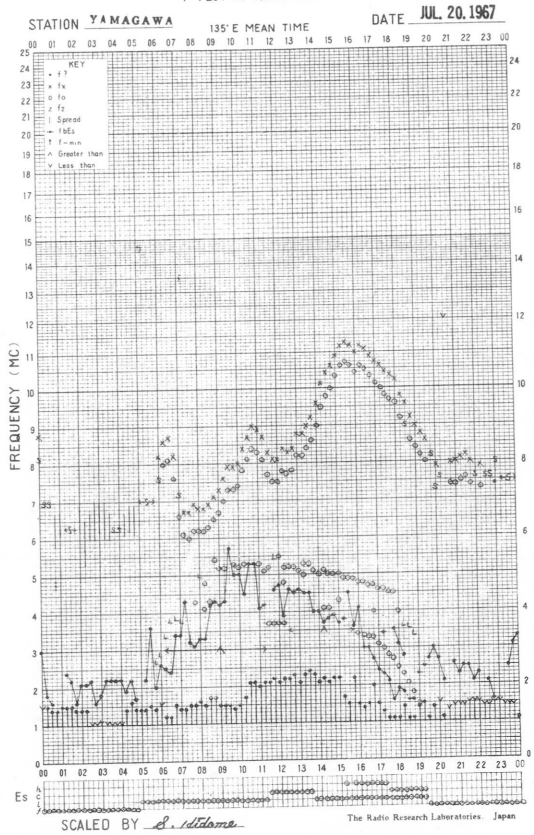

SCALED BY S. Ishitomo

The Radio Research Laboratories. Japan

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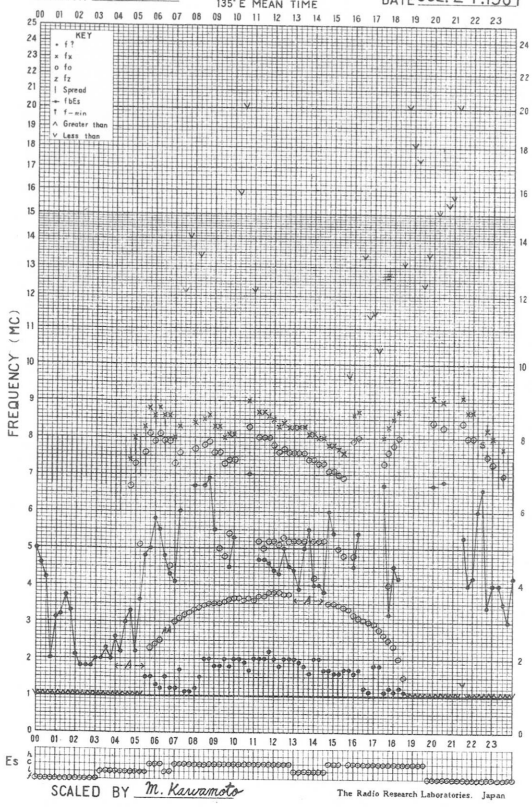

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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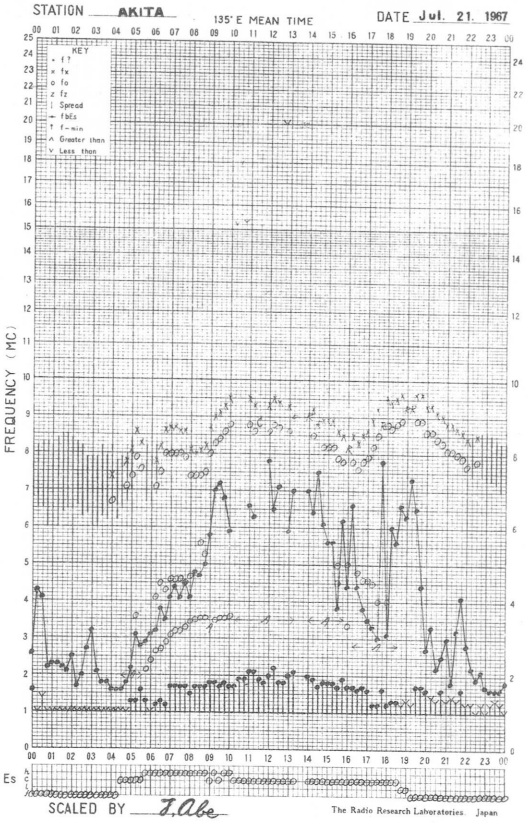

SCALED BY T. Abe The Radio Research Laboratories. Japan

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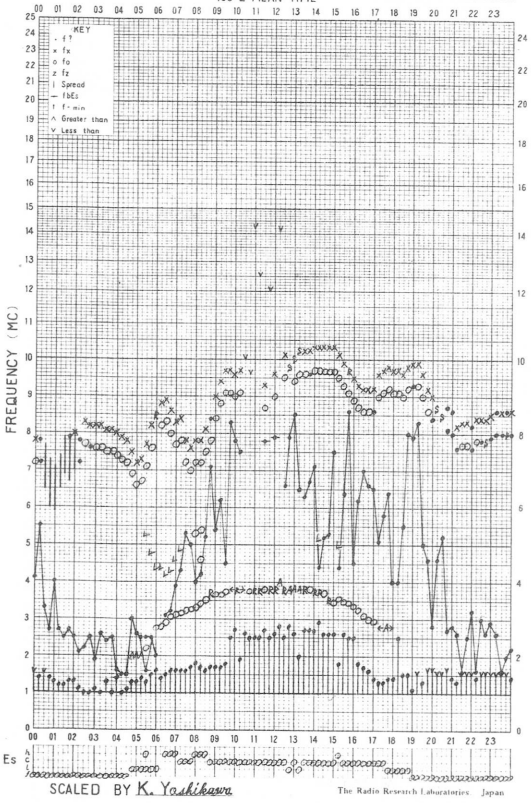

SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

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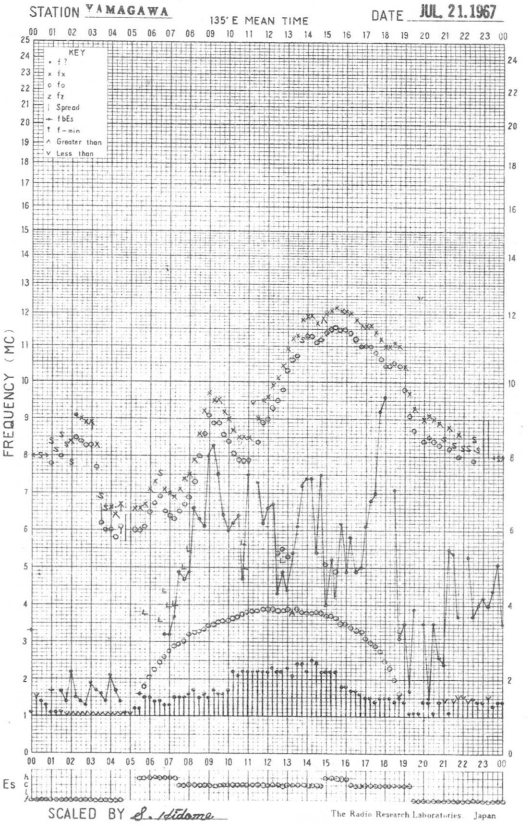

SCALED BY S. Ishitomo The Radio Research Laboratories. Japan

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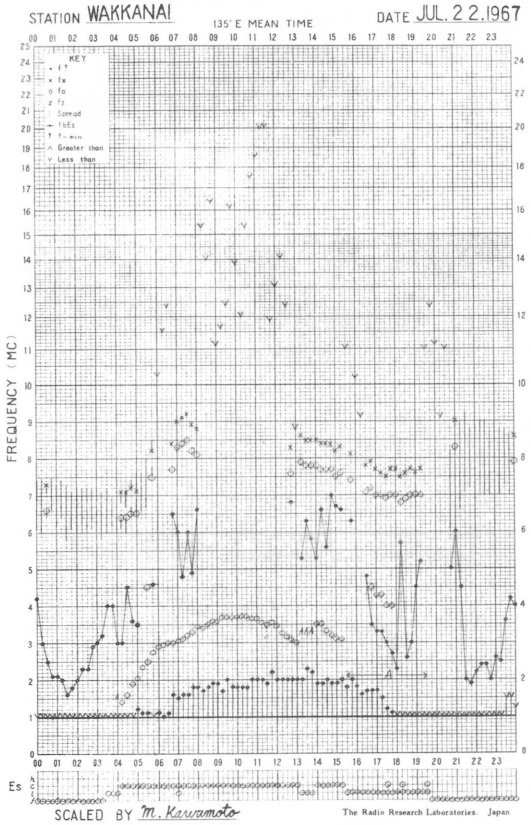

SCALED BY M. Kawamoto

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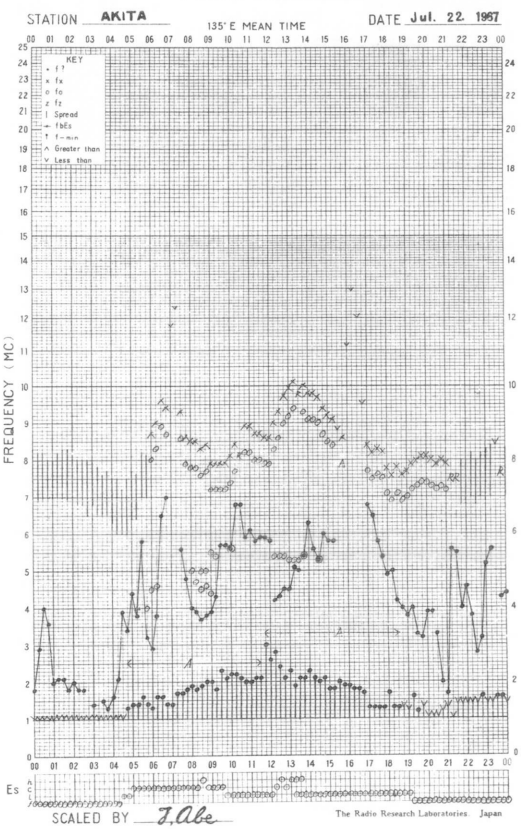

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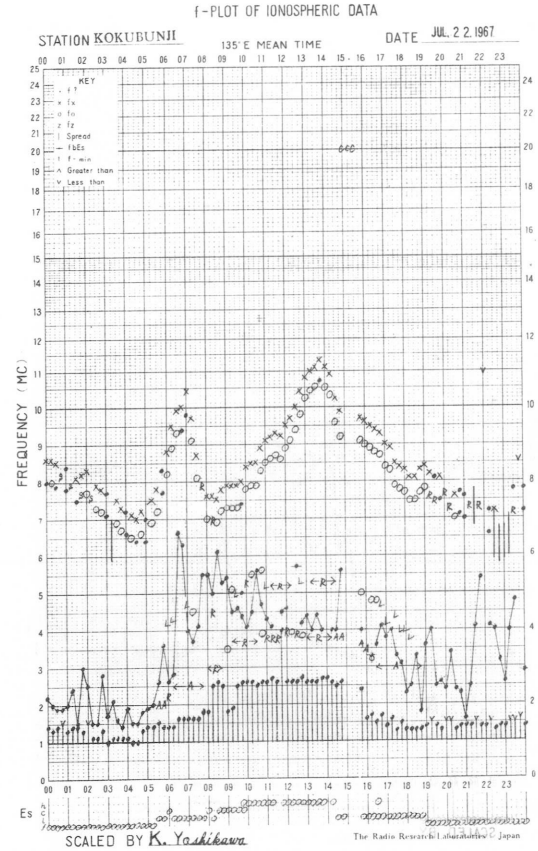

SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

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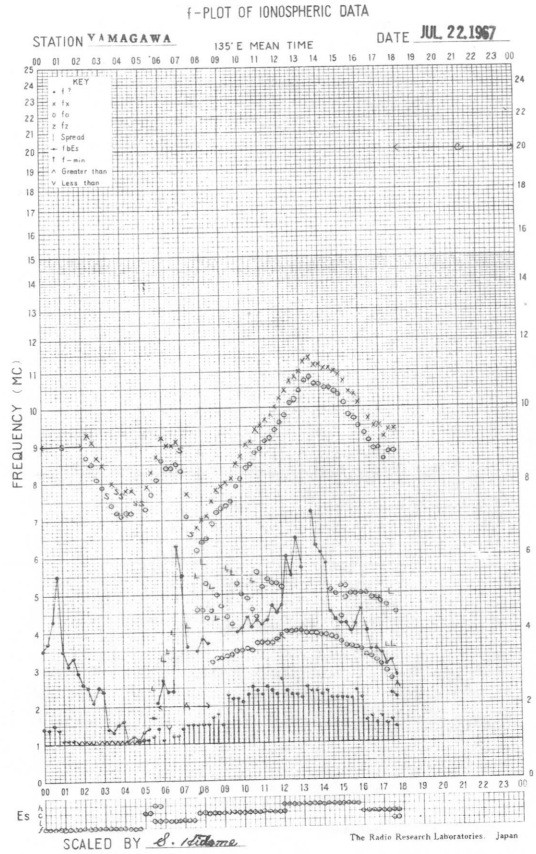

SCALED BY S. Fukume

The Radio Research Laboratories. Japan

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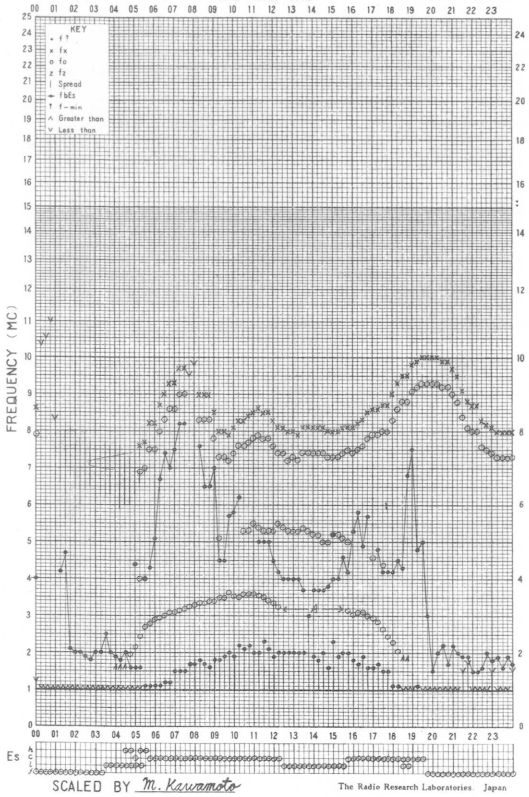

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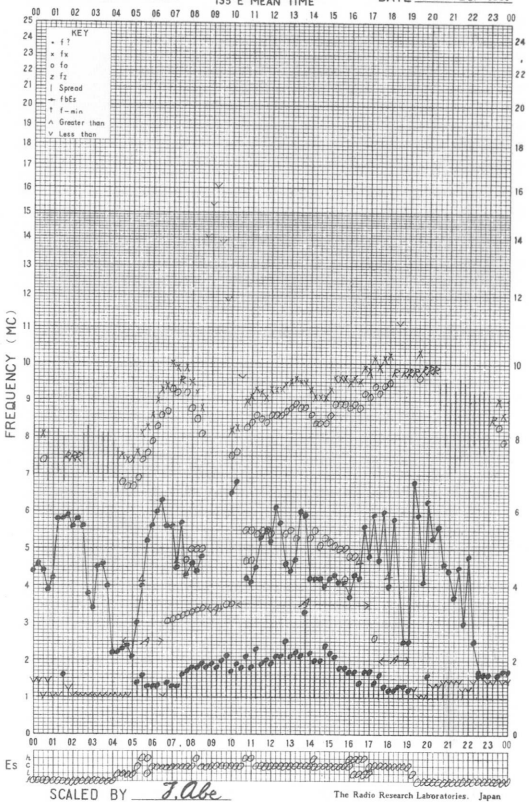

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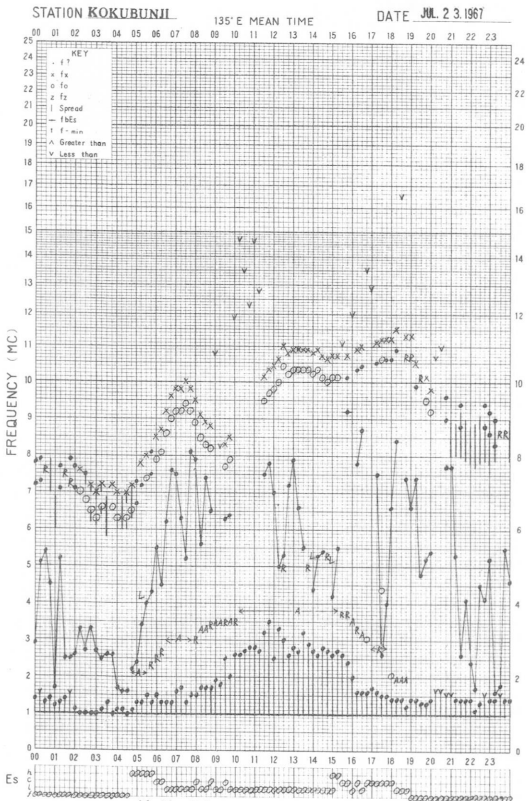

SCALED BY K. Yoshikawa

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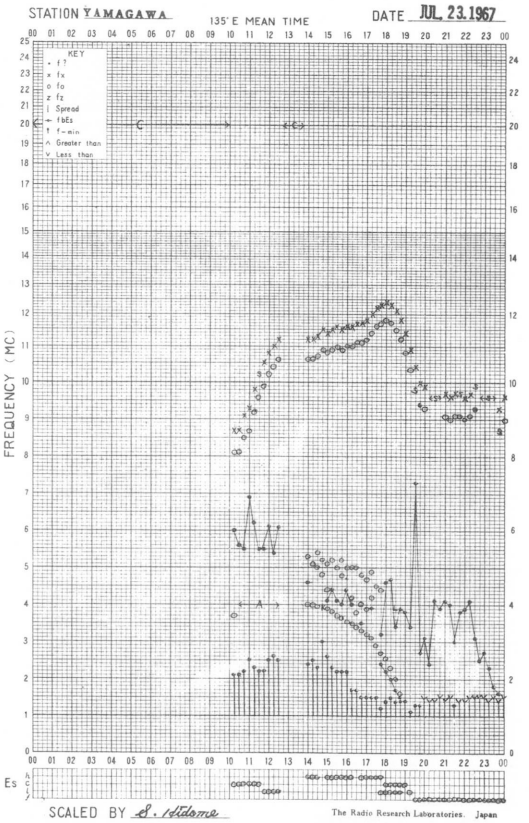

SCALED BY S. Kitamura

The Radio Research Laboratories. Japan

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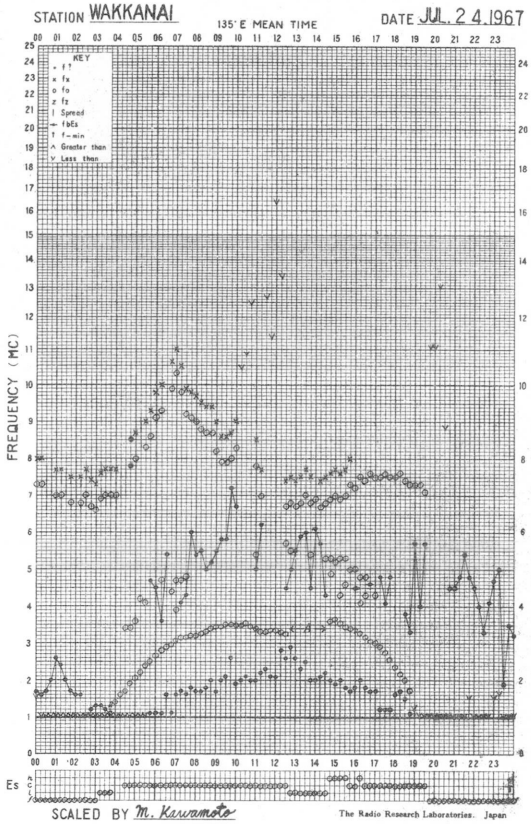

SCALED BY M. Kawamoto

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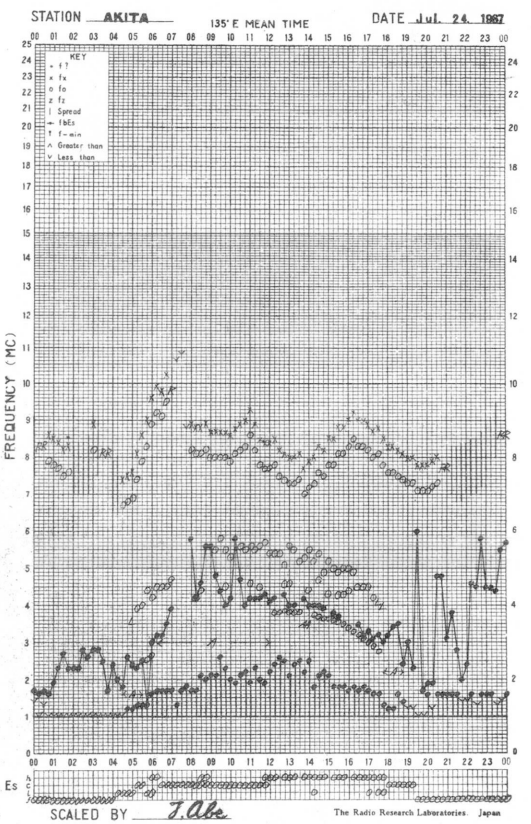

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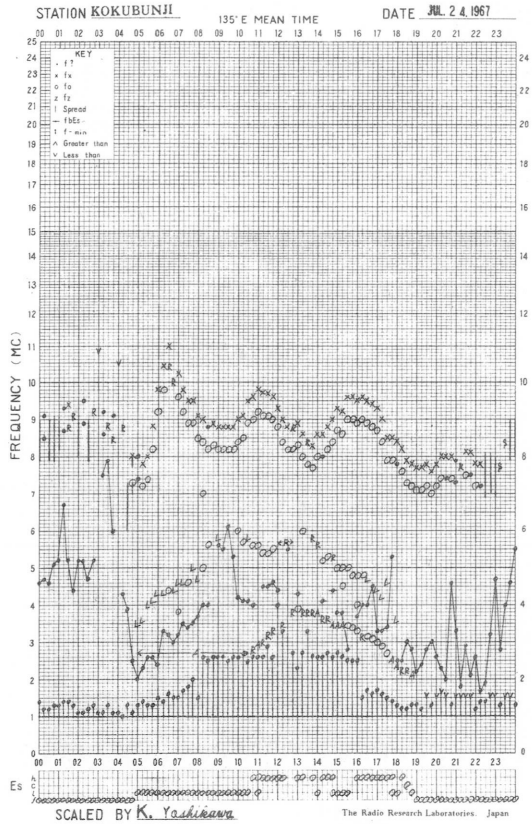

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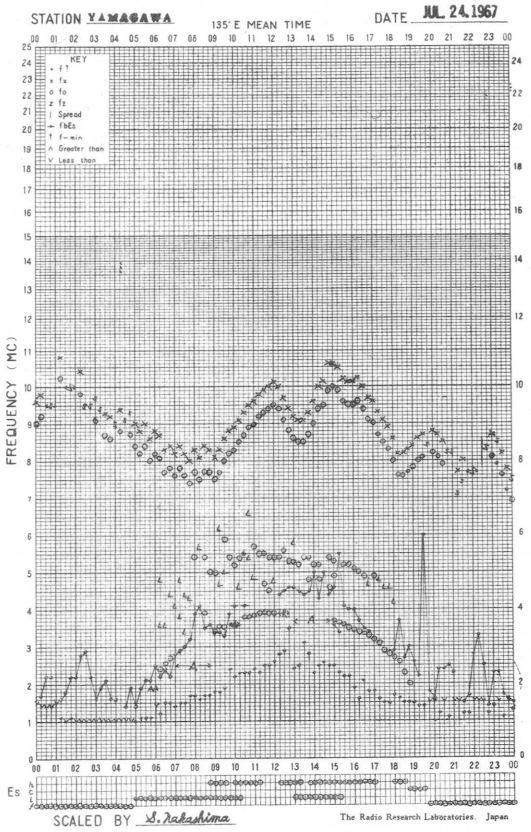

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The Radio Research Laboratories. Japan

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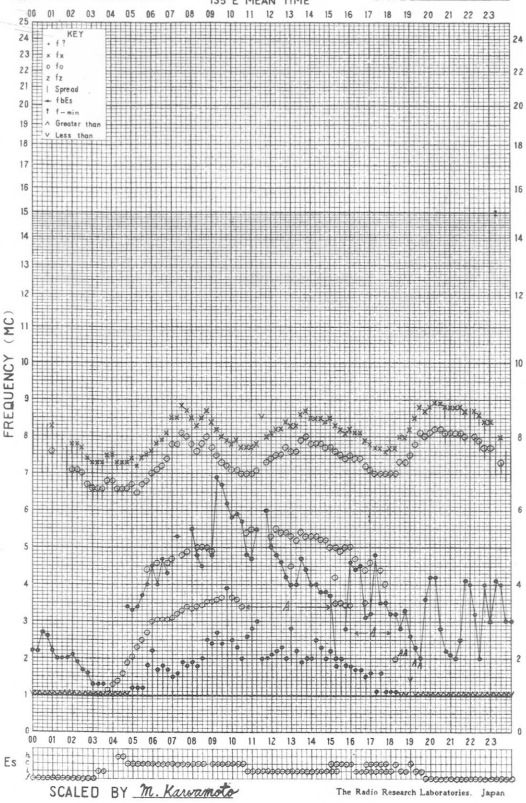

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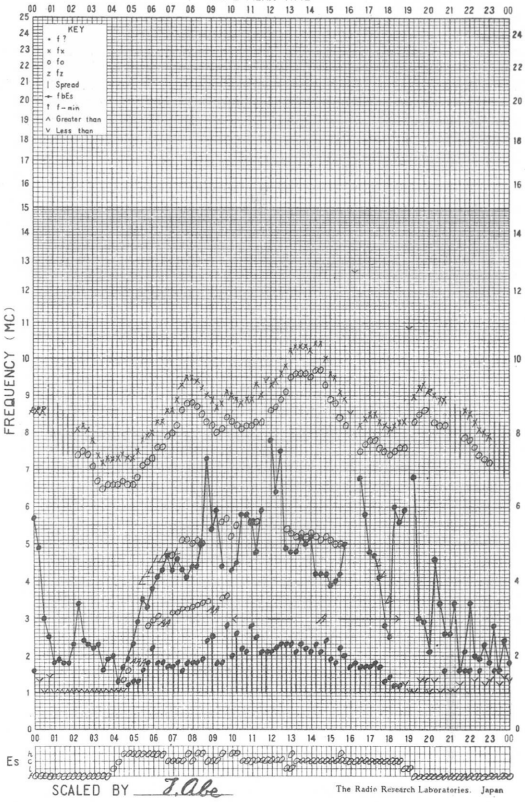

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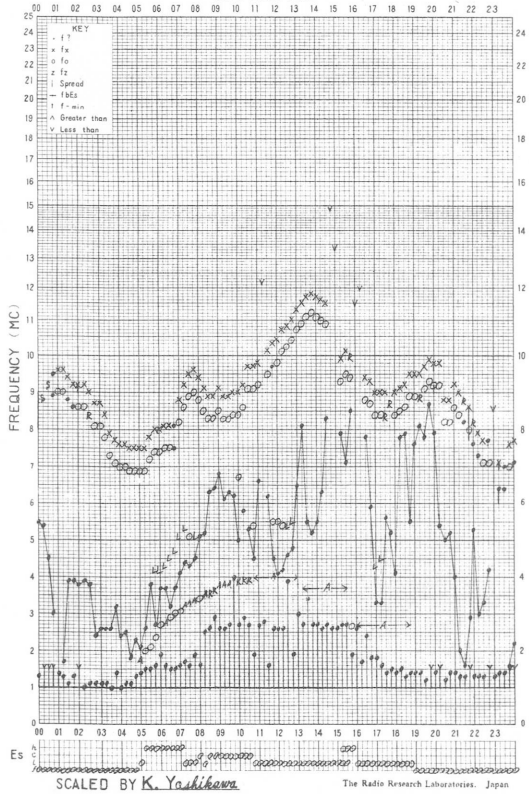

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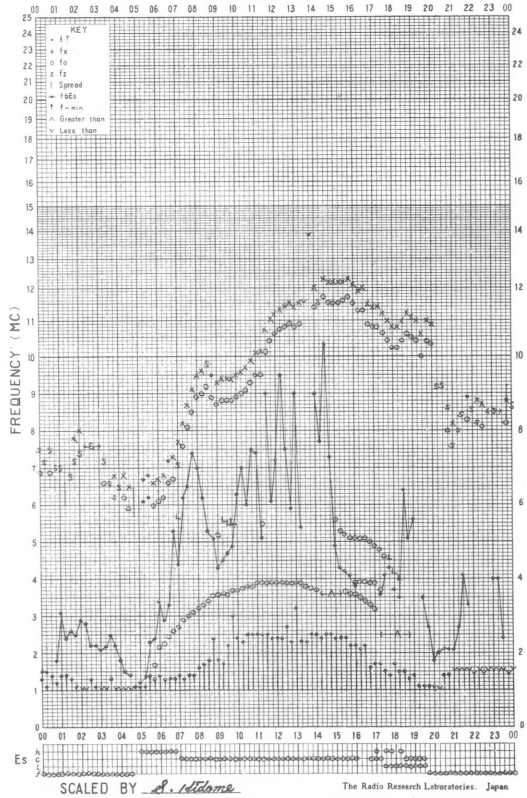
f-PLOT OF IONOSPHERIC DATA

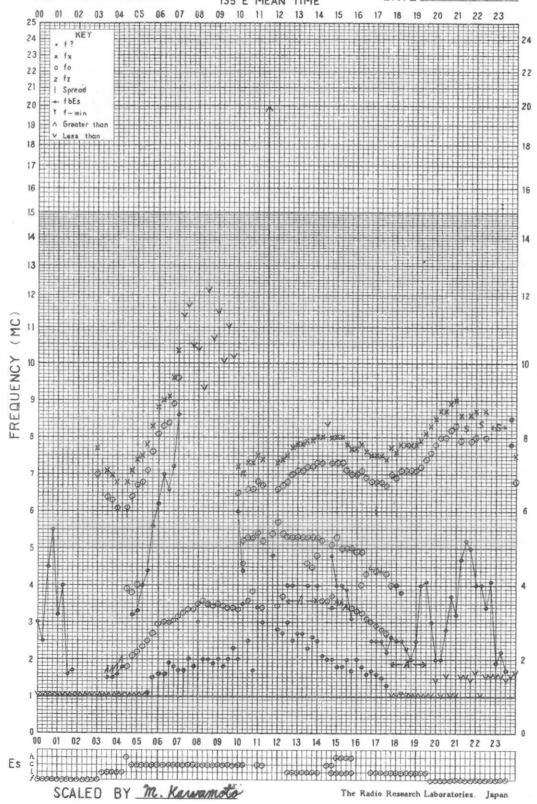
STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 25, 1967



SCALED BY S. Ishizume The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

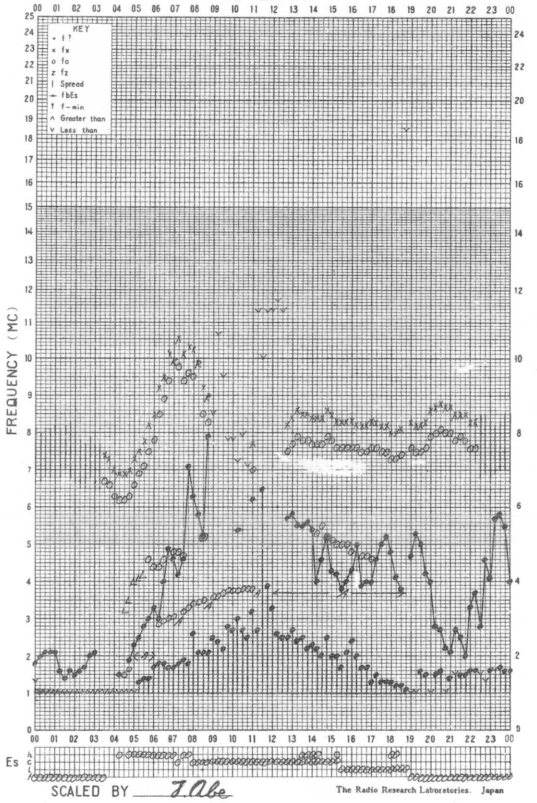
STATION WAKKANAI 135°E MEAN TIME DATE JUL. 26, 1967



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

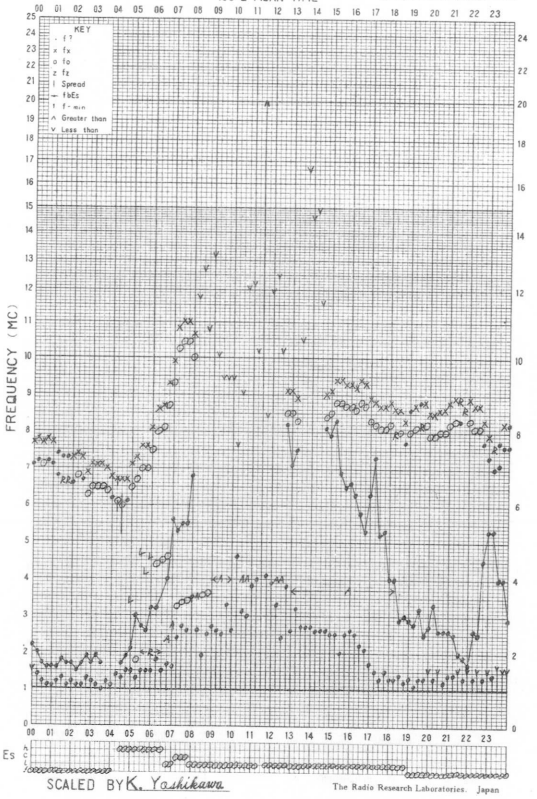
STATION AKITA 135°E MEAN TIME DATE Jul. 26. 1967



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

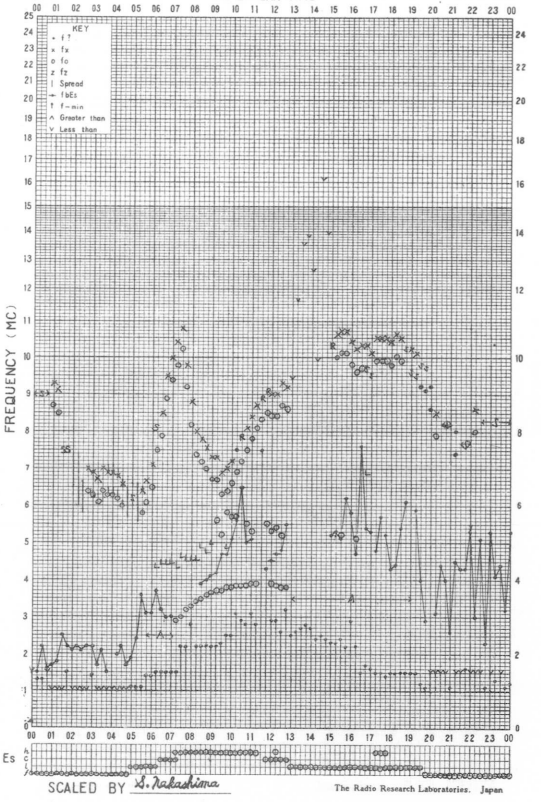
STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 26 1967



SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

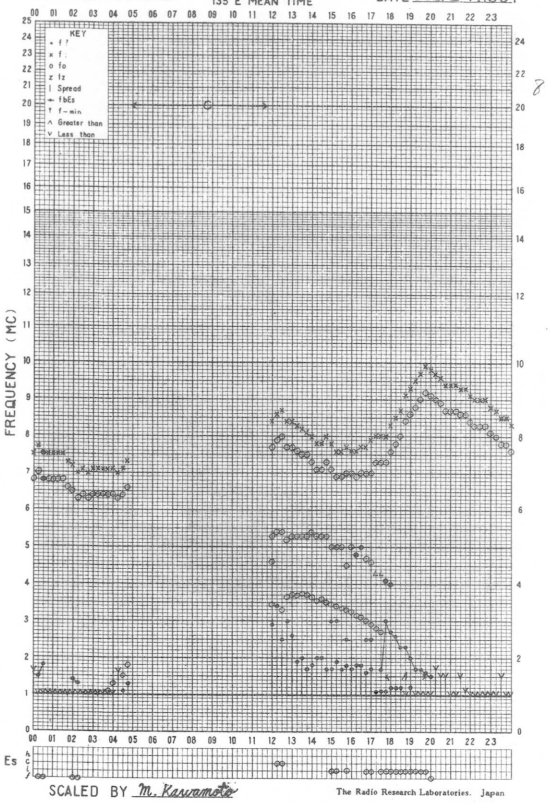
STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 26, 1967



SCALED BY S. Nakashima The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 27.1967



SCALED BY M. Kasamoto The Radio Research Laboratories. Japan

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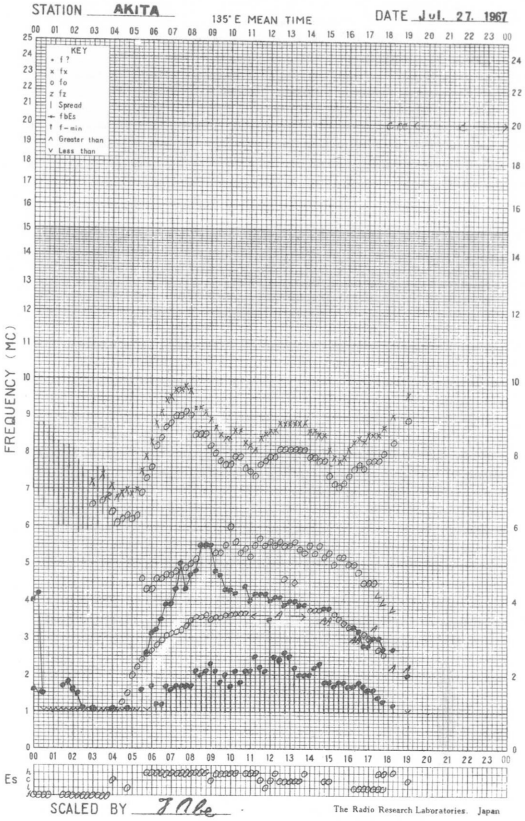
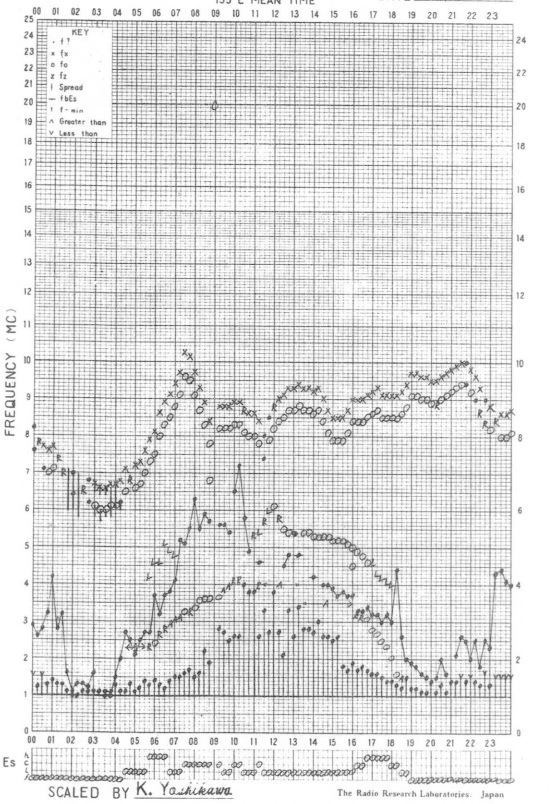


SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

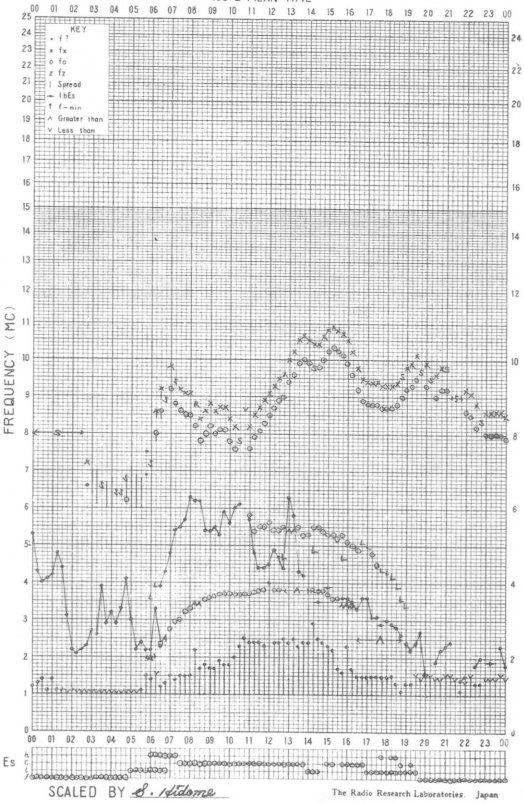
STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 27. 1967



SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

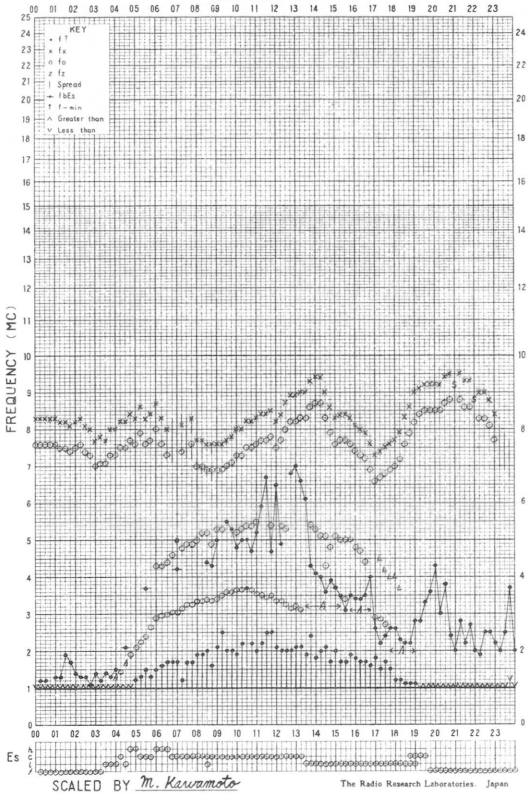
STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 27.1967



SCALED BY S. Hidama The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 28.1967

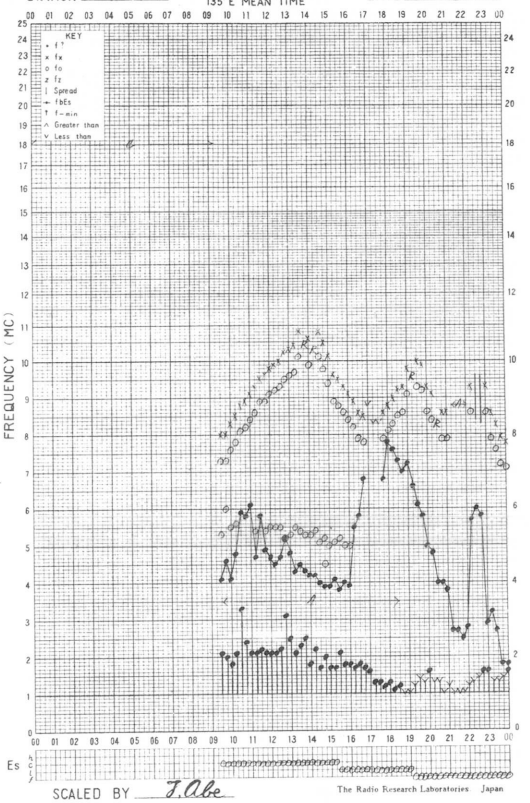


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 28. 1967

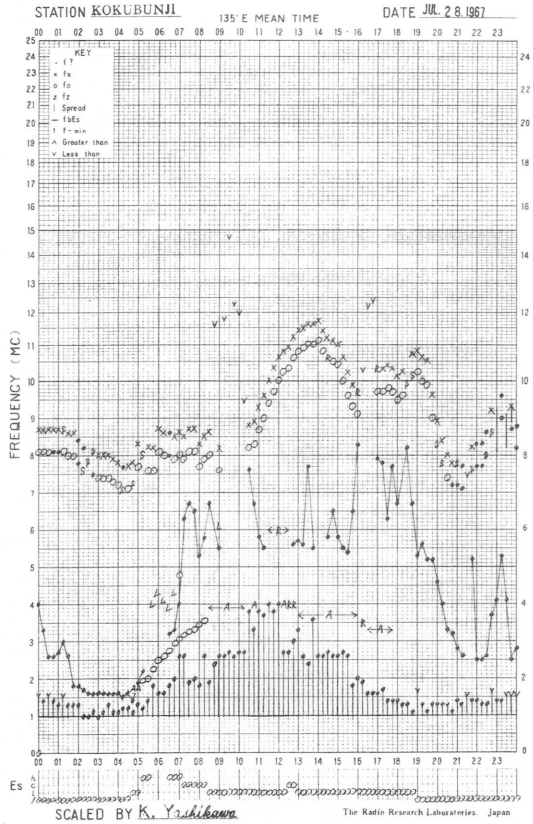


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 28. 1967

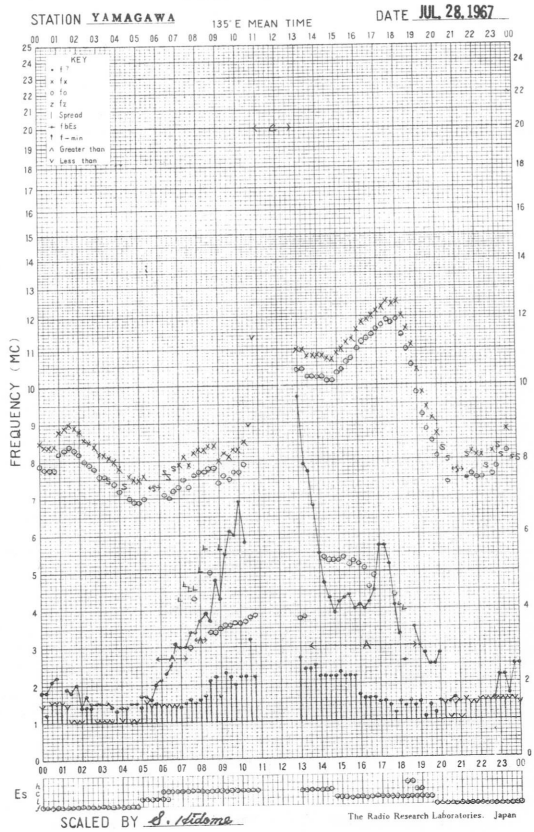


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 28. 1967

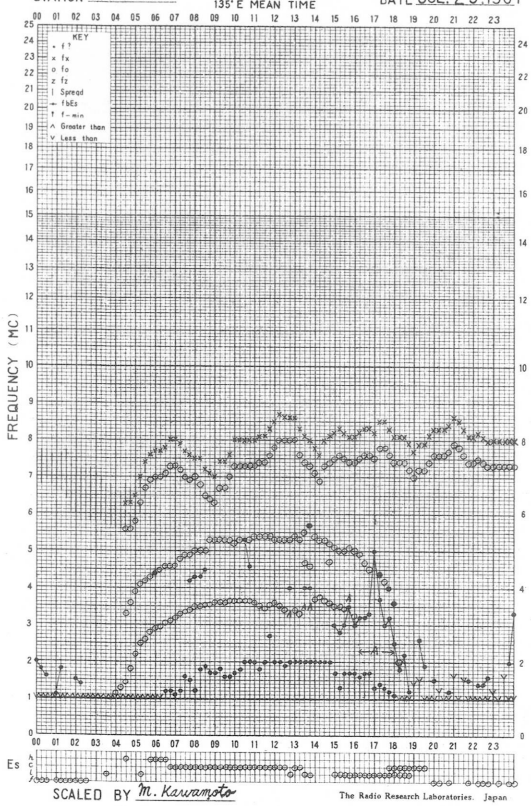


SCALED BY S. Uchida

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 29. 1967

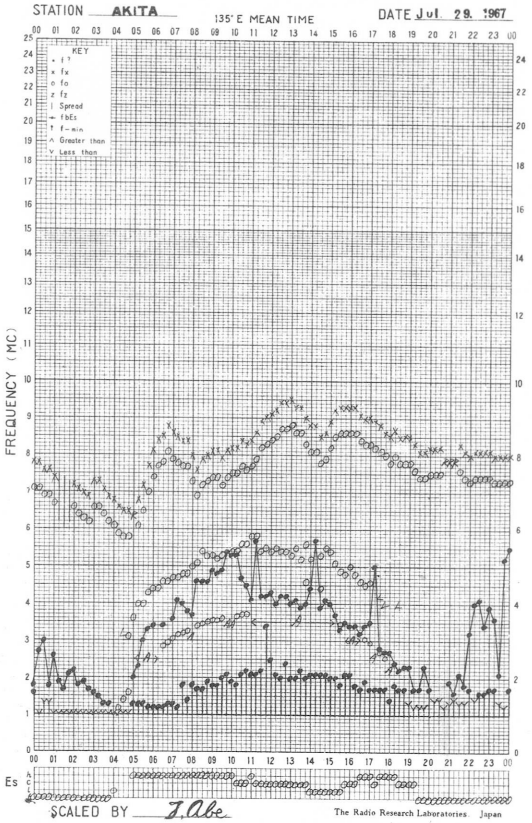


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul 29. 1967

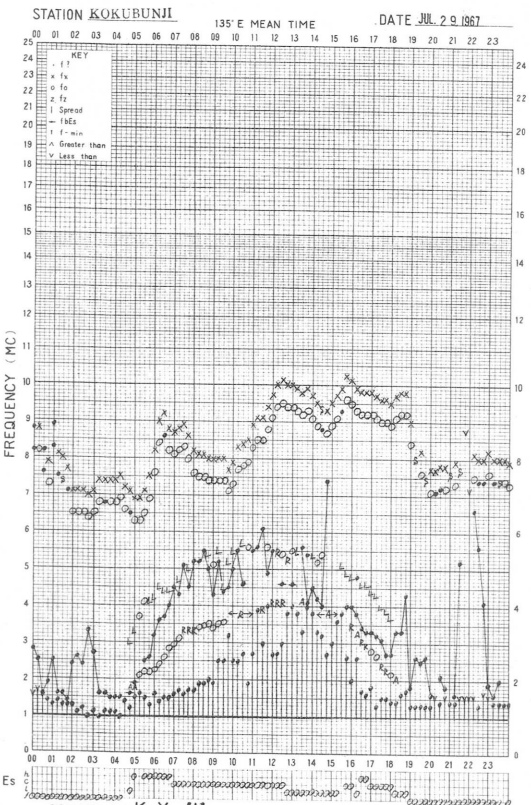


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL 29 1967

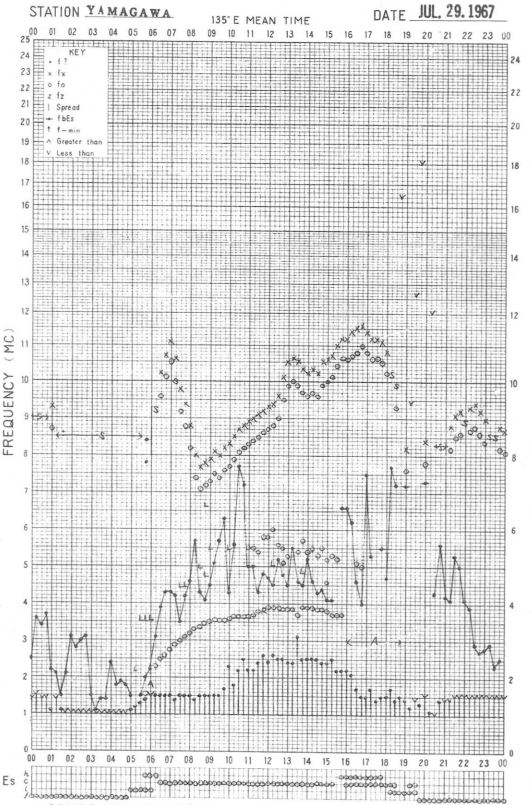


SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 29. 1967

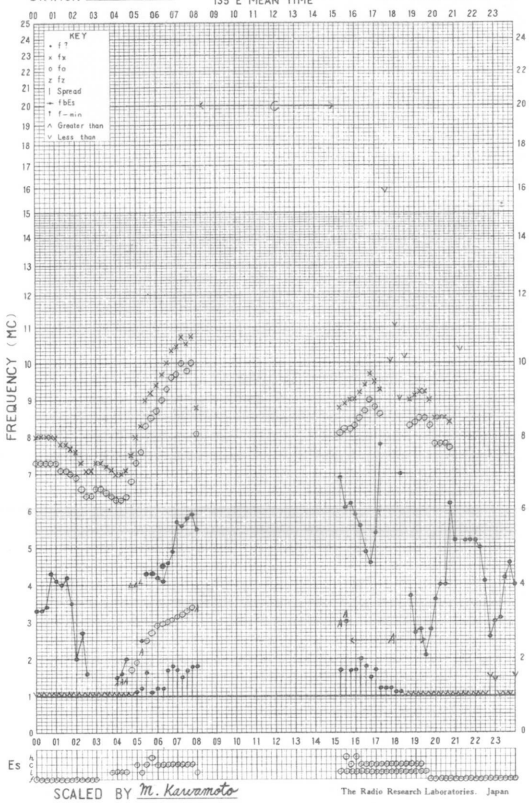


SCALED BY S. Iidaka

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 30. 1967



SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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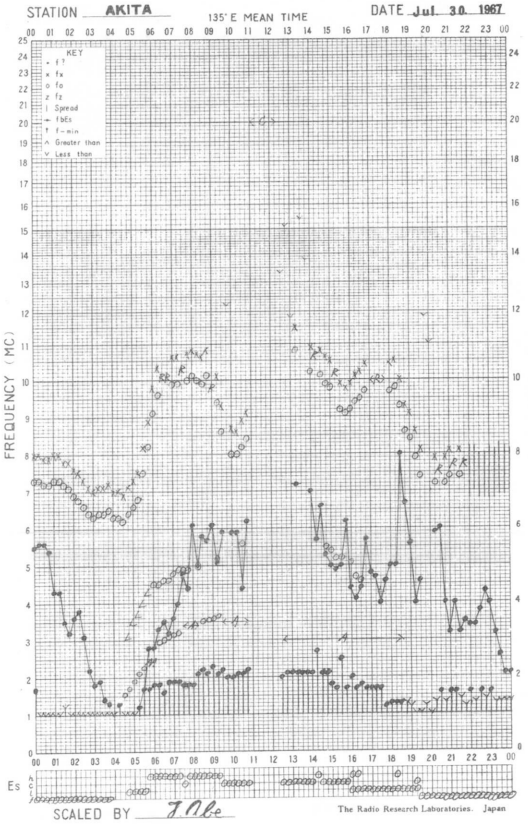
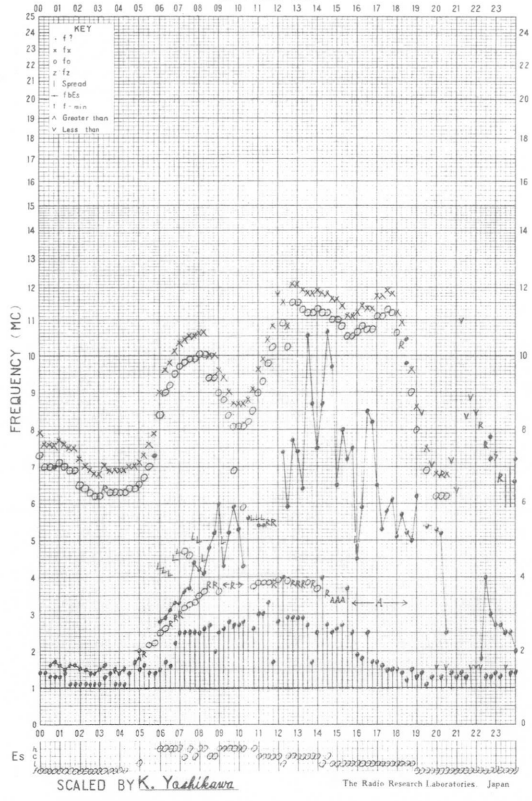


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL 30 1967

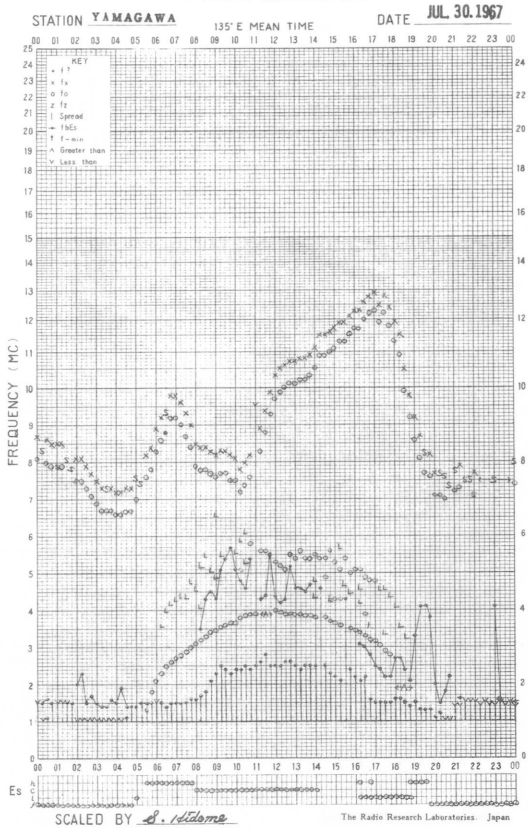


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE JUL. 30. 1967

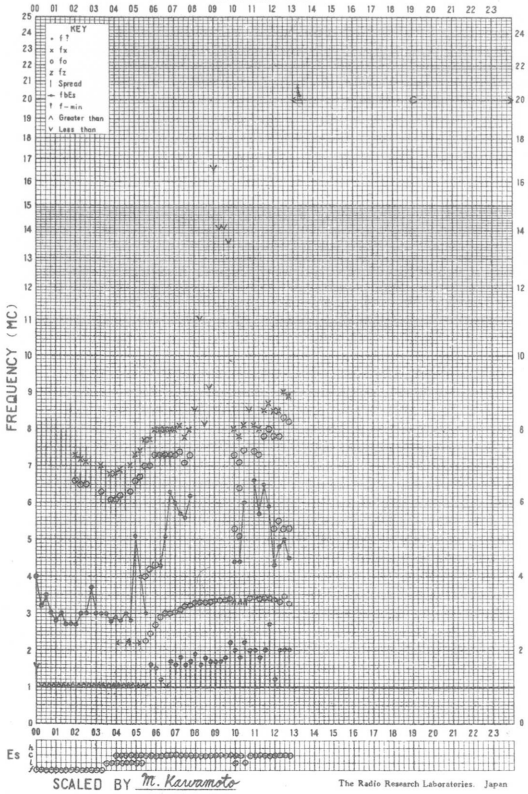


SCALED BY S. Iidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE JUL. 31, 1967

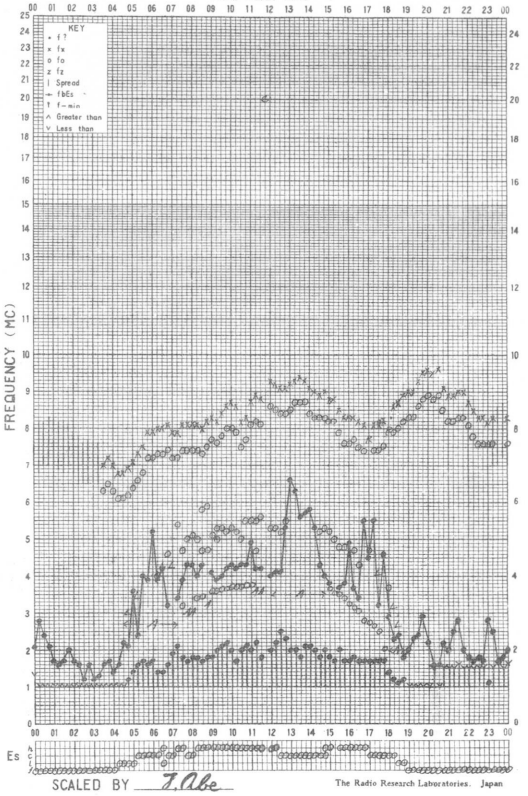


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Jul. 31. 1967

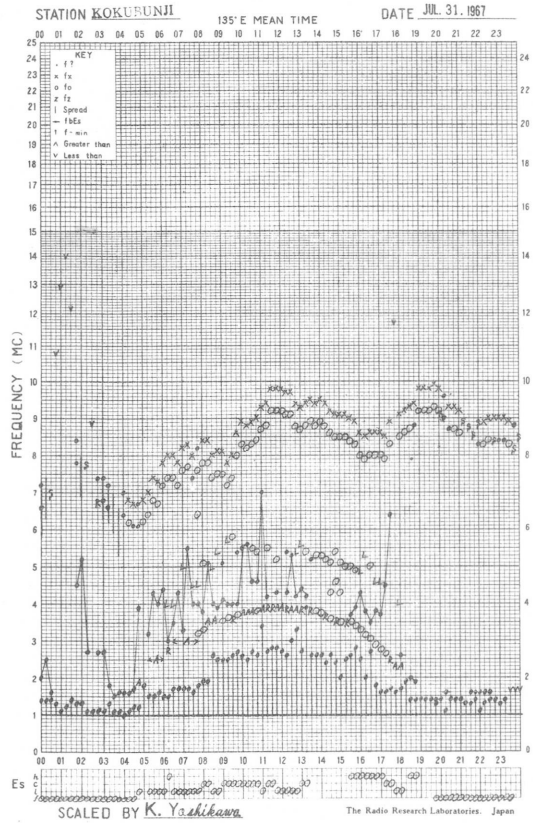


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE JUL. 31. 1967



SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

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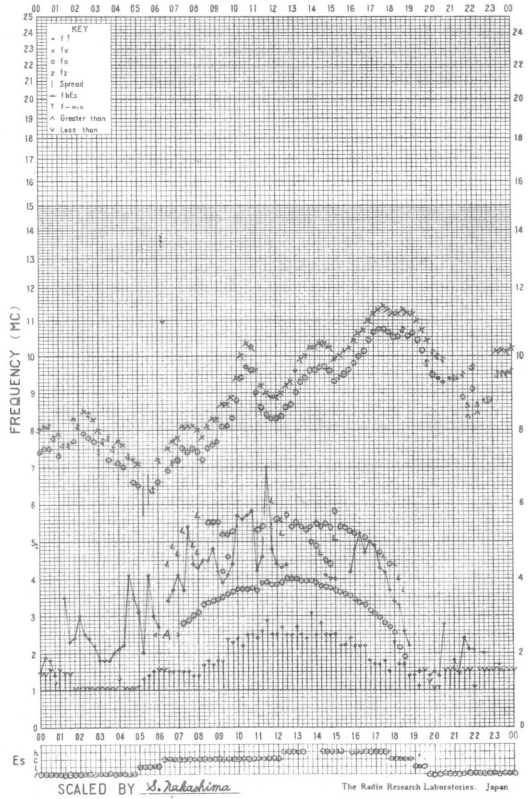

SCALED BY S. Takashima

The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: July 1967
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	16	11	14	-	14	0	0	0	-	0
2	13	13	14	(14)	13	0	1	0	(2)	0
3	11	11	12	8	11	0	1	0	0	1
4	12	10	10	6	10	0	1	1	1	1
5	8	10	13	10	9	0	0	1	0	1
6	(11)	9	10	7	10	(0)	0	0	0	0
7	8	9	9	-	8	0	0	0	-	0
8	11	11	14	13	12	0	0	1	0	0
9	14	(10)	13	(7)	13	0	(1)	1	(1)	1
10	10	8	11	-	9	0	0	0	-	0
11	7	7	9	-	8	0	0	0	-	0
12	9	7	9	-	8	0	0	0	-	0
13	-	8	10	(7)	(9)	-	0	0	(0)	(0)
14	8	7	9	10	8	0	0	0	0	0
15	9	7	8	7	8	0	0	0	0	0
16	8	8	(12)	7	8	0	0	(0)	0	0
17	10	7	(9)	7	8	0	0	(0)	0	0
18	8	-	8	7	8	0	-	0	0	0
19	8	-	-	6	8	0	-	-	0	0
20	8	8	8	9	8	0	0	0	0	0
21	8	8	10	93	9	0	0	0	2	0
22	55	25	34	16	53	2	1	2	1	2
23	31	25	14	43	23	1	1	1	2	1
24	29	36	32	43	35	2	2	2	3	2
25	66	55	51	41	54	3	2	2	1	3
26	49	43	29	63	39	1	1	1	2	1
27	66	103	142	375	89	1	1	1	1	1
28	268	(43)	75	74	236	1	(2)	1	1	1
29	73	53	51	35	64	1	1	1	1	1
30	40	32	(35)	13	35	1	1	(1)	1	1
31	14	19	21	11	16	1	1	1	1	1

Note No observations during the following periods:

1st	1930-		2400	13th	1930-		2300
2nd	1930-		2300	14th	0400-		0500
5th	0400-		0500	18th	0200-		0600
6th	0100-		0400	19th	0300-		0950
7th	1930-	8th	0100	22nd	1930-		2200
9th	0300-		0500	28th	0430-		0540
9th	1930-		2300	30th	0600-		0700
10th	1930-		2400	30th	0820-		0950
11th	1930-		2400	31st	0000-		0100
12th	1930-	13th	0300				

SOLAR RADIO EMISSION

Flux Density

Month: July 1967
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	32	31	30	35	31
2	32	33	31	34	32
3	30	31	27	29	31
4	31	29	28	28	29
5	29	30	29	29	29
6	30	29	27	31	29
7	30	28	24	30	28
8	29	28	26	30	28
9	28	26	25	29	27
10	27	24	23	27	26
11	25	24	25	28	26
12	25	24	27	28	26
13	29	27	27	30	28
14	29	27	25	30	28
15	28	27	27	30	28
16	30	30	28	30	30
17	33	33	30	31	31
18	32	31	31	31	31
19	30	29	28	31	30
20	30	32	29	31	31
21	34	30	29	34	31
22	34	34	30	35	33
23	33	34	33	35	34
24	34	36	34	37	35
25	37	38	32	40	36
26	43	39	36	43	40
27	41	41	43	52	42
28	34	(44)	41	40	48
29	42	39	35	36	40
30	37	36	35	36	36
31	39	37	39	39	38

Note No observations during the following periods:

1st 1930- 2200
13th 0100- 0200
28th 0430- 0610

Distinctive Events

(single-frequency observations)

Month: July 1967
Observing station: Hiraiso
Normal observing period: 1930 - 0950 (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	
3	500	0756	0756.4	1.5	C	210	80	
4	200	2318	2318	1.0	C	280	30	
	200	2321	2321	1.0	C	300	70	
5	200	0638	0638.6	6.0	F	280	-	
	500	0739	0739.5	3.0	C	40	2	
	200	0739	0740	7.0	C	1260	130	
10	500	0911.5	0918	10.0	C	420	35	
23	200	0442	0443.5	3.0	C	315	50	
	500	2114	2115	3.5	C	55	10	
24	500	0027	0027	1.0	C	360	25	
	500	0034	0034.5	2.0	C	545	70	
	200	0034	0034.3	4.0	C	310	35	
	200	0302.5	0303	2.0	C	310	70	
25	500	0406	0406	1.0	C	170	30	
	200	2255	2255	1.0	C	210	80	
	200	2315	2317.5	7.0	C	220	35	
26	500	2307.5	2307.9	0.5	C	200	33	
27	500	0005.3	0006.1	1.5	C	100	20	
	200	0006.5	0006.7	2.0	C	280	120	
	200	0010	0011.5	2.5	C	280	120	
	500	0010	0010.3	1.0	C	60	55	
	500	0556.8	0557.5	1.5	C	520	65	
	500	0712	0713.8	3.5	C	160	40	
	500	2011	2012	8.0	C	2600	360	
	200	2011	2012	8.0	C	3600	720	
28	500	0052	0053.2	4.5	C	700	30	
	500	0143.8	0147.5	5.7	C	230	20	
	500	2238	2303.8	38.0	C	100	20	
	500	2354.5	0005	18.0	C	50	15	
29	500	0206.5	0212	20.0	C	470	50	
	500	0826	0828.5	4.5	C	60	9	
	500	1947.5	1948	1.0	C	130	20	
30	500	0205	0206.5	2.5	C	38	15	
	200	0507	0508.8	2.5	C	3000	620	
	500	0509	0511	3.5	C	670	80	
	500	0622	0624	3.0	C	7	4	

ERRATA: Distinctive Events (Vol.19 No.5, May 1967, page•97)
the nineth line of 21st should be read as follows:

Freq.	Start.	Max.	Duration	Type	Peak flux	Mean flux
200	2050	-	70	RF	-	45

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

July 1967 — Frequency: 15 MHz, Bandwidth: ±40 Hz, Receiving Antenna: Rod (4.5 m) — Measured at Hiraiso

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

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

July 1967 Frequency: 15 MHz, Bandwidth: ±40 Hz, Receiving Antenna: Rod (4.5 m) Measured at Hiraiso

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

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

July 1967	Whole Day Index	H B 06 12 18 / 12 18 24	T H 00 06 12 18 / 06 12 18 24	W W V 00 06 12 18 / 06 12 18 24	S F 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	ΔH
1	3+	4 3 (4)	- (4) 4 (4)	3 3 4 (3)	4 3 (3) 3	3 4 4 (4)	N N N N			
2	4-	3 4 (4)	- (4) 4 5	3 4 4 4	3 3 (3) 4	4 4 3 3	N N N N			
3	4o	4 4 5	- 4 5 5	3 3 4 5	3 4 4 4	3 4 4 4	N N N N			
4	5-	5 5 5	(5 4) 5 5	4 4 4 4	4 5 5 5	4 4 4 4	N N N N			
5	4-	4 (3) 4	(4 4) 4 4	4 3 3 3	5 (3 4) 4	4 4 4 4	N N N N			
6	3+	3 4 3	- 4 4 3	3 2 3 4	4 3 4 4	4 4 3 4	N N N N			
7	4-	3 4 4	- (4) 5 4	2 2 4 (4)	(4 4) 4 4	4 4 4 4	N N N N			
8	4o	4 (4) 4	- (4) 5 5	3 4 4 4	4 (4 4) C	4 4 4 4	N N N N			
9	4+	4 4 4	- (4) 5 (4)	4 3 4 5	4 5 4 5	4 4 (4) 4	N N N N			
10	5-	4 5 5	- (3) C (2)	5 5 5 4	5 4 4 C	4 4 4 4	N N N N			
11	4-	3 4 3	- (3 2 2)	5 4 4 4	4 4 4 3	5 4 4 4	N N N N			
12	4o	(4) 4 4	- (3 2 2)	4 4 4 4	3 4 4 4	4 4 5 4	N N N N			
13	4-	4 4 4	- (3) 4 4	4 3 4 4	3 (4) 4 (4)	4 4 4 3	N N N N			
14	4o	4 4 4	- 3 4 3	5 4 4 4	4 4 4 4	4 4 4 4	N N N N			
(15)	4-	(3) 3 3	- (5) 4 3	4 (5) 4 4	4 4 (4) 3	4 4 4 4	N N N N			
(16)	4-	4 4 4	- 4 5 5	4 3 (4) 4	3 3 (3 4)	4 4 4 4	N N N N			
(17)	4o	4 4 4	- 5 5 4	4 3 5 5	4 4 4 4	4 4 4 4	N N N N			
18	4+	5 5 5	(4) 5 4 5	4 4 4 4	4 4 4 4	4 4 5 4	N N N N			
19	4+	5 5 5	- 4 5 (5)	4 4 5 5	4 4 4 4	4 4 4 4	N N N N			
20	5-	5 5 5	- 5 3 3	5 4 5 5	4 4 4 4	4 4 (4) C	N N N N			
21	4+	4 5 5	- 4 4 4	(5) 4 5 5	4 4 4 4	4 4 4 (4)	N N N N			
22	4+	4 4 4	- 4 4 4	5 4 5 5	4 5 5 4	4 4 4 4	N N N N			
23	4+	4 4 3	- 4 5 4	5 5 5 5	4 5 5 4	4 4 C C	N N N N			
24	4o	4 4 4	- 4 4 3	5 4 4 4	4 4 4 3	4 4 4 4	N N N N			
25	4o	4 4 4	- 4 4 3	4 4 4 4	4 4 4 3	4 4 C C	N N N N			
26	4-	4 4 4	- 4 4 4	3 4 4 4	3 4 4 4	3 4 4 3	N N N N			
27	5-	4 4 5	- (4) 4 3	5 4 5 5	4 5 (5) 4	3 4 (4) C	N N N N			
28	4o	(4 4) 4	- 4 4 4	4 4 4 4	4 4 4 4	4 4 4 (3)	N N N N			
29	4-	4 4 3	- 4 5 4	3 3 4 4	4 3 (4) 3	3 4 4 3	N N N N			
30	4-	3 4 4	- (3) C C	3 3 4 4	4 (4) 4 3	4 4 4 3	N N N N			
31	4+	4 4 3	(4 3) C C	4 5 5 5	4 4 (4) 4	3 4 C C	N N N N			

IQSY GEOALERT and ADALERT
(Western Pacific Region)

* = MAGSTORM

o = MAGCALME

Δ = COSMIC EVENT

( ) = Regular World Day

\- = impossible to evaluate

( ) = inaccurate

C = artificial accident

--- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

July 1967	S W F										Correspondence		
	Drop-out Intensities (db)						Start-time	Dura-tion	Type	Imp.	Flare	Solar Noise	Mag.
	CO	SF	HA	TO	HB	SH							
3					12		07.57	20	S	1	x	x	
16	17	21					23.37	24	Slow	1+		x	
24	16"	19				12'	00.34	8	S	1+		x	
24	25 13"	16	25				20.29	15	Slow	3-	x		
24	22"	16	14				20.51	25	S	1+			
25	10 13"	23		10	8		00.33	63	Slow	2-	x		
25					17		10.55	30	S	1+	x		
25					6		12.15	18	S	1-	x		
25					22		14.26	22	S	2-	x		
25					15		20.58	29	S	1+			
25		19			9		22.50	27	Slow	2-	x	x	
26	-	28	-' -		-		02.24	32	S	2	x		
26	-	8	-'		-		23.33	16	S	1-		x	
28	13 10"	16			-		22.29	55	S	1	x	x	
30	8						01.28	19	S	1-			
30	14		11 12'	-'	8		06.19	41	S	1+	x	x	

IONOSPHERIC DATA IN JAPAN FOR JULY 1967
第19巻 第7号

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