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IONOSPHERIC DATA IN JAPAN

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THE RADIO RESEARCH LABORATORIES
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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 two parabolic reflectors : 10 meter for 200 Mc/s and 5 meter for 500 Mc/s, each having the total power receiver.

Observations are feasible almost from sunrise to sunset.

a. Time and Unit

The time is expressed as U.T.

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

b. Daily Data

Flux density

The three-hourly and daily mean values are given.

Variability

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

Variability is expressed in the following four grades:

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

The number of bursts exceeding the flux level is counted.

c. Distinctive Events

The phenomena are picked up on the following criteria:

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

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

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

Descriptive type is denoted by the following symbols:

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

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

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

C. RADIO PROPAGATION CONDITIONS

a. Field Intensities of WWV and WWVH

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

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

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

Transmitter

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

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

Receiver

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

The meaning of *Descriptive symbols* is as follows:

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

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

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

<: Less than the following figure.

b. Radio Propagation Quality Figures

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

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

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

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

N=normal
U=unstable
W=disturbed

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

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

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

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

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

Circuits and Drop-out intensities

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

Start-time and Duration

Types

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

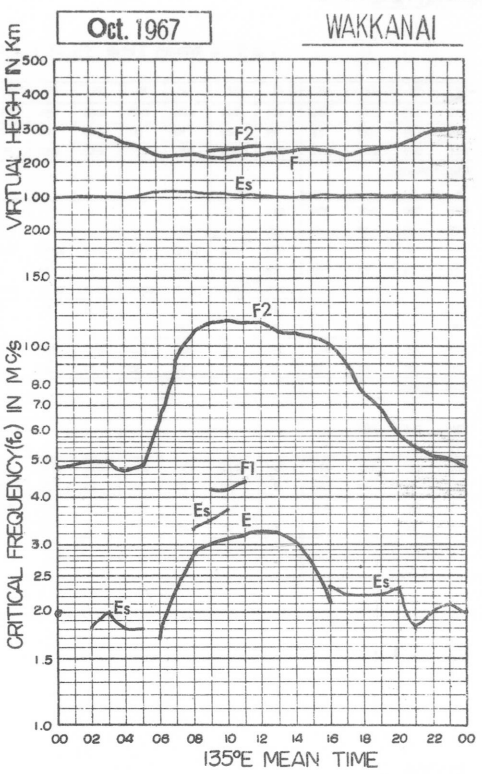
Importances

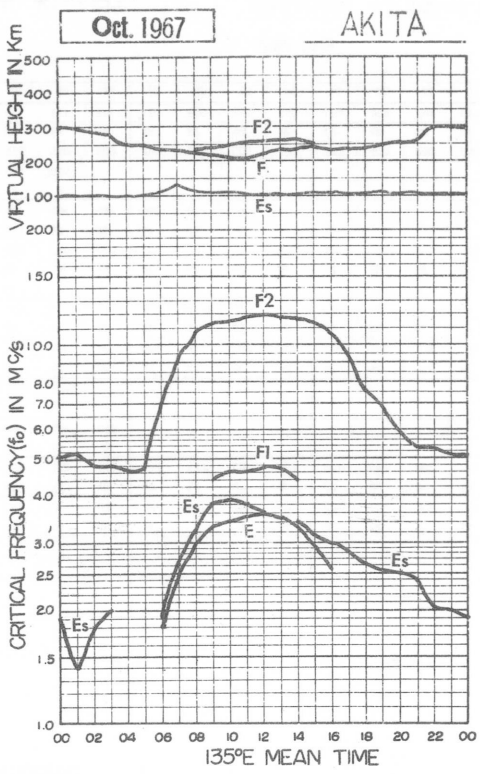
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1−	1	1+
2−	2	2+
3−	3	3+

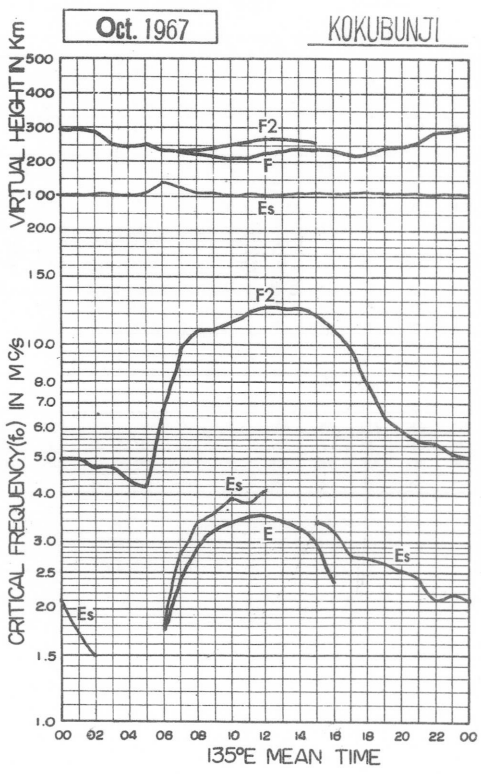
Besides, the time associated phenomena with SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record), are given in this table from interchange messages of IUWDS or measurements at Hiraiso.

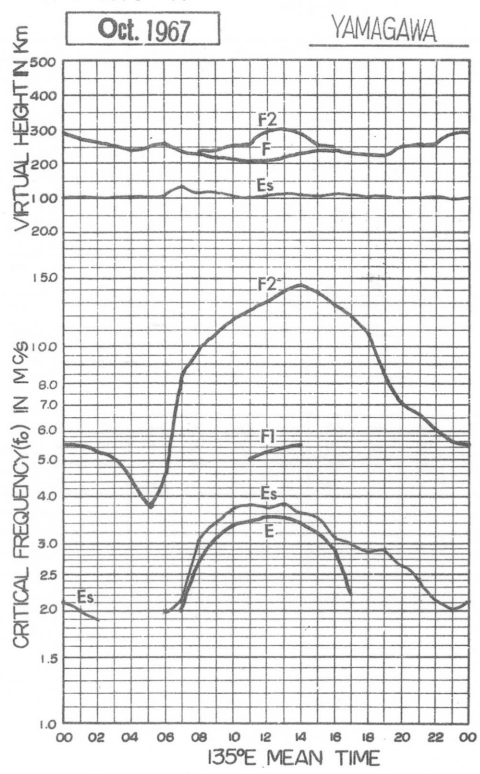
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: WAKKANAI

Oct. 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	048	049	050	050	047	048	064	091	107	113	115	115	114	109	108	106	101	090	076	068	058	054	051	050
	CNT	26	25	24	23	24	26	27	28	28	29	29	29	29	29	29	29	29	29	30	30	30	29	27	26
	Q R	007	008	007	007	007	007	009	012	009	015	011	014	011	013	014	011	012	009	010	011	010	010	007	008
foF1	MED										U420L	420	440L	U430L	U440L										
	CNT										8	8	6	4	1										
foE	MED						E	170	230	285	300	310	320	325	320	305	270	210	E	E					
	CNT						3	10	28	28	28	29	26	26	25	27	26	20	4	2					
foEs	MED	020	018	J020	018	018	E	G	G	033	035	037	G	G	G	G	G	023	022	J022	022	023	E017	J020	021
	CNT	29	28	28	28	28	27	28	28	28	29	29	28	29	29	29	29	29	29	30	30	30	30	30	29
	Q R											013				013		013	008	D015	D012	D017	D015	D012	D013
f-min	MED	E	E	E	E	E	E	E015S	012	012	017	017	017	017	017	013	012	011	E	E	E	E015S	E	E	E015S
	CNT	29	28	28	28	28	27	28	28	28	29	29	28	29	29	29	29	29	29	30	30	30	30	30	29
M (3000) F2	MED	260	265	265	275	285	285	315	320	320	320	310	305	305	300	305	305	310	315	300	300	290	280	270	270
	CNT	26	25	24	23	24	26	27	28	28	29	29	29	29	29	29	29	29	29	30	30	30	29	27	26
M (3000) F1	MED										U400L	405	400L	U400L	U385L										
	CNT										8	8	6	4	1										
h'F2	MED									250	235	240	245	250	255	260									
	CNT									4	16	18	13	13	4	2									
h'F	MED	300	300	295	275	260	250	225	225	225	220	215	220	220	235	240	240	240	220	230	245	250	270	290	295
	CNT	29	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29	30	30	30	29	30	29
h'Es	MED	100	100	100	100	100	100	120	120	120	110	110	105	105	100	100	100	105	105	105	105	105	105	105	105
	CNT	17	18	20	18	19	8	8	13	20	20	25	19	16	20	23	22	23	25	20	17	20	15	19	19
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: AKITA

Oct. 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	051	052	048	048	047	047	068	094	106	112	113	117	119	117	116	113	106	095	076	069	059	053	053	051
	CNT	31	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	Q R	007	008	010	008	008	010	011	017	011	012	014	009	008	011	011	012	010	010	013	011	011	012	011	010
foF1	MED									385	430	460	460	470	470	440									
	CNT									2	11	17	26	19	13	7									
foE	MED							180	245	295	330	340	350	355	350	330	295	255	170	E					
	CNT							10	23	20	16	16	21	25	26	25	25	15	2	7					
foEs	MED	J019	J014	J018	J020	E012	E012	E019B	026	032	038	039	J038	J036	G	J034	J031	J030	J028	J026	J025	J025	J024	J020	J020
	CNT	31	30	30	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	Q R	D012	D012								D009							017	016	D024	D015	D021	D016	D016	D010
f-min	MED	E014	E	E	E	E	E	018	018	018	019	019	020	019	018	018	014	013	012	E013	E014S	E013S	E013S	E014	E014
	CNT	31	30	30	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
M (3000) F2	MED	270	270	275	285	285	280	320	330	330	325	310	305	300	300	300	310	315	320	310	300	295	280	275	275
	CNT	31	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
M (3000) F1	MED									390	395	390	380	370	370	370									
	CNT									2	11	17	26	19	13	7									
h'F2	MED									235	240	250	255	255	265	260	250								
	CNT									23	30	31	31	31	31	31	18								
h'F	MED	295	290	280	275	250	250	230	230	225	220	210	205	225	230	230	240	235	230	230	240	250	265	285	290
	CNT	31	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
h'Es	MED	105	105	100	100	105	105	120	135	120	115	110	105	105	105	105	110	110	105	110	110	105	105	105	105
	CNT	17	16	18	19	12	9	8	21	19	22	24	24	21	20	23	22	28	28	25	24	26	21	19	18
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: KOKUBUNJI

Oct. 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	050	050	048	048	044	042	067	095	108	108	113	120	124	122	122	119	109	098	078	065	060	055	055	051
	CNT	31	30	30	30	30	30	30	30	30	31	30	30	30	30	29	29	30	29	28	30	29	28	29	29
	Q R	010	009	009	005	007	010	009	008	015	019	016	008	011	010	013	015	012	010	015	009	008	008	009	011
foF1	MED										420	450L	460	440L											
	CNT										1	1	1	1											
foE	MED							175	240	290	320	335	350	350	340	325	300	235	180						
	CNT							9	22	16	14	11	14	12	18	23	21	12	1						
foEs	MED	J021	017	J015	E014B	E014B	E014B	018	028	034	036	039	038	J041	G	G	034	032	J027	J027	J026	J025	J024	J021	J022
	CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	29	30	29	29	30	29	29	30	29
	Q R	007	D004	D006			D003	D005	005	003	004	006			010	014	009	007	006	013	012	D014	D019	012	D014
f-min	MED	014	012	012	010	010	012	015	014	014	016	016	017	018	016	016	015	014	013	E015S	012	E015S	014	012	014
	CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	30	29	29	30	29	29	30	29
M (3000) F2	MED	275	275	285	295	285	285	325	335	330	320	310	300	300	295	300	310	315	325	315	305	300	285	285	280
	CNT	31	30	30	30	30	30	30	30	30	31	30	30	30	30	29	29	30	29	28	30	29	28	29	29
M (3000) F1	MED										395	390L	400	405L											
	CNT										1	1	1	1											
h'F2	MED								230	230	240	250	260	265	270	265	260	245							
	CNT								9	21	29	30	30	30	30	26	19	3							
h'F	MED	295	285	280	255	240	260	235	230	225	215	210	210	225	230	240	240	235	225	225	240	245	260	280	280
	CNT	30	30	30	30	30	30	30	30	30	28	30	30	29	29	28	29	29	29	28	30	28	28	29	29
h'Es	MED	105	105	105	105	105	105	140	125	115	110	110	110	105	105	110	110	110	110	110	110	110	110	105	105
	CNT	27	22	20	13	13	9	17	23	25	27	27	27	27	26	25	28	30	28	27	28	19	22	23	22
hpF2	MED	375	370	350	340	345	350	285	270	280	290	310	325	325	335	325	310	300	290	290	320	330	350	355	355
	CNT	31	30	30	30	30	30	30	30	30	31	30	30	30	30	29	29	30	29	28	29	29	28	29	29
ypF2	MED	085	080	080	085	085	085	070	065	065	075	080	080	080	080	080	080	080	065	070	080	090	090	085	085
	CNT	31	30	30	30	30	30	30	30	30	31	30	30	30	30	29	29	30	29	28	29	29	28	29	29

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: YAMAGAWA

Oct. 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	055	054	052	050	045	038	046	081S	099	107	117	123	130	138	144	138	127	119	108	084S	071S	067S	061	056
	CNT	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
	Q R	008	013	014	007	007	010	009	011	015	018	018	012	015	013	010	015	013	010	016	019	018	015	009	008
foF1	MED								260L	U360L	400L	440L	500L	U520L	U610H	550L	U480	360L	270						
	CNT								1	1	3	3	8	6	1	10	2	2	1						
foE	MED								200	270	310	330	345	355	350	345	320	285	220						
	CNT								31	30	29	24	22	23	25	27	26	22	14						
foEs	MED	021	020	019	E015	E015	E014B	020	021	030	034	037	038	037	038	036	035	031	030	J028	J029	J026	024	J021	020
	CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	Q R	D006	D008	D007	D010			D007											014	014	022	014	011	005	D010
f-min	MED	E015S	013	014	011	E	014	E015S	012	012	015	015	017	017	017	017	015	015	013	E015S	E015S	E015S	E015S	E015S	E015S
	CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
M (3000) F2	MED	280	285	290	300	305	285	295	330S	340	320	305	300	295	290	295	300	305	315	320	300S	285S	290S	285	280
	CNT	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
M (3000) F1	MED								395L	U410L	410L	395L	380L	U370L	U360H	350L	U370	400L	400						
	CNT								1	1	3	3	8	6	1	10	2	2	1						
h'F2	MED								230	230	240	255	255	285	300	280	255	250	240						
	CNT								1	18	29	31	31	31	31	31	31	24	3						
h'F	MED	280	275	270	255	235	250	265	230	225	220	210	205H	205H	220H	230	235	240	235	225	220	250	250	255	280
	CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	29	30	31	31	31	31	31	31	31
h'Es	MED	100	100	100	100	100	100	100	135	115	115	105	105	105	110	110	110	110	110	105	105	100	100	100	100
	CNT	23	20	16	13	10	4	17	19	28	27	31	29	30	28	27	28	27	28	30	27	28	24	24	21
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA

Oct. 1967 | foF2 | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	048	049	046	041F	F	C	056	066	076	078	080	085	081	080	080	079	075	076	071	073	C	C	C	C
2	C	C	C	C	C	C	C	C	C	091	093	097	094	098	096	088	091	093	084	074	063	058	056	056
3	053	053	052	051	047	050	067	085	096	097	111	104	105	108	105	096	089	088	080	U073S	058	I053S	051	048
4	050	050	051	051	046	045	063	093	112	113	110	101	105	100	098	098	094	090	078	071	063	058	056	054
5	053	052	053	052	050	051	069	093S	106	106	108	104	108	110	100	097	093	101	078	072	066	060	055	052
6	052	053	053	051	049	049	071	081	109	106	103	116	120	120	110	108	100	090	072	062	063	060	058	057
7	056	056	058	056	043	044	066	091	107	113	114	I110C	113	108	104	108	103	087	077	067	064	063	060	061
8	062	061	060	053	051	050	073	101	119	118	113	114	112	104	098	097	094	092	078	070	058	054	055	052
9	052	053	053	050	047	049	064	091	112	126	117	114	112	103	102	103	096	091	080	070	064	062	060	061
10	061	056	058	053	048	050	065	093	112	112	109	114	123	129	120	106	100	092	076	067	059	061	055	050
11	047	049	048	044	045	045	063	088	088	113	118	127	128	106	104	102	102	091	074	065	055	045F	F	047F
12	045	042	042	043	043	036	059	083	105	118	121	129	127	116	113	107	109	093	083	078	053	055	056	054
13	053	056	054F	F	F	F	078	086	099	100	121	125	120	113	114	111	102	094	076	072	062	060	057	053F
14	SF	F	F	F	F	050F	067F	094	112	106	103	119	120	115	112	108	104	096	088	075	053	050	051F	050F
15	050F	045F	F	048F	048F	048F	064	084	108	125	132	126	123	116	114	114	110	095	078	074	053	054	053	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	043	044	046	044
17	046	048	051	047S	045	047	065	086	107	122	129	120	112	108	108	104	098	084	077	075	067	052	051	F
18	F	F	F	F	060	058	073	100	108	106	110H	115R	118	109	105	107	108	096	080	070	064	053	050	051
19	053	051	053	051	053	049	059	084	103	115	116	114	106	102	094	100	096	083	078	070	053	056	F	F
20	F	F	F	F	F	051F	F	083	103	118	112	110	110	109	099	103	107	086	073	065	058	F	045F	SF
21	049	051	051	051	053	050	069	099	108	117	113	113	113	102	094	099	101	080	062	057	053	053	050	046
22	047	048	050	F	053	053	066	098S	103	101	117	116	114	113	108	112	108	086	061	053	046	042	044	044
23	046	045	050	050	051	040	061	079	104	103	113	123	114	119	122	113	110	085	067	059	055	059	058	055
24	053	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	067	059	050	043	042	043
25	042	041	043	044	043	037	061	089	103	113	117	128	116	115	117	107	100	087	064	061	056	051	049	048
26	048	048	049	050	051	048	060	094	103	104	121	114	113	103	111	106	102	091	066	054	048	I046S	SF	044F
27	044	047	047	046	047	044	058	084	106R	115	126	123	120	103	111	106	098	073	063	058	060	054	056	046
28	045	044	046	049	038	036	073	107	132	134	116	130H	132	116	111	111	100	083	069	069	050	043	041	043
29	042	041	038	039	039	037	057	091	129	131	115	115	116	105	119	118	114	087	070	063	060	056	050	047
30	046	045	041	041	040	039	054	102	123	U126R	142	133	134	120	120	111	114	096	076	056	052	051	051	049
31	046	047	046	044	044	043	061S	102	115	123	121	129	125	111	113	113	109	082	068	066	058	046	043	043
Count	26	25	24	23	24	26	27	28	28	29	29	29	29	29	29	29	29	29	30	30	30	29	27	26
Median	048	049	050	050	047	048	064	091	107	113	115	115	114	109	108	106	101	090	076	068	058	054	051	050
U.Q.	053	053	053	051	051	050	069	096	112	120	121	126	122	116	114	111	108	093	078	072	063	058	056	054
L.Q.	046	045	046	044	044	043	060	084	103	105	110	112	111	103	100	100	096	084	068	061	053	048	049	046
Q.R.	007	008	007	007	007	007	009	012	009	015	011	014	011	013	014	011	012	009	010	011	010	010	007	008

foF2

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

The Radio Research Laboratories, Japan

W1

IONOSPHERIC DATA

Oct. 1967 | foF1 | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	480L	430	480L	U480L											
2									C	440		U450L												
3											A	A	410L	L										
4										L		440L			L									
5										U450L	L		L	L										
6										L		U430L	L											
7										L		C												
8											L		L	L										
9												L	L											
10										L	U430L		U430L	U440L										
11											L		L											
12											L	L	U430L											
13										L														
14											I420A	410L			L									
15											L	A	L											
16										C	C	C	C	C										
17									L	L	L	L												
18											A													
19										U430L	L													
20									L	U420L			L											
21										U410L	400													
22										410L	410L													
23																								
24										C	C	C	C	C										
25										A		A	A											
26											400													
27											470L		L											
28										410L	L	420												
29									L															
30										B														
31											400													
Count										8	8	6	4	1										
Median										U420L	420	440L	U430L	U440L										
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

W2

IONOSPHERIC DATA

Oct. 1967 | foE | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						C	A	225	275	300	315	R	C	A	I300A	280	A	A	A					
2						C	C	C	C	305	I325A	330	325	320	310	285	250	A	S					
3						E	200	250	295	300	305	295	300	A	A	A	A	A	A					
4						E	170	245	285	I315A	I330R	330	I325R	I320A	I310A	280	235	A	A					
5						E	S	I240A	I260A	295	320	325	330	320	305	280	235	150	S					
6						S	150	230	285	I290A	300	320	325	325	310	290	240	A	E					
7						E	170	250	300	325	335	I340C	345	340	325	280	230	A	A					
8						E	170	230	265	I295A	I315A	315	325	I320A	305	270	225	A	S					
9						E	S	235	290	300	300	300	300	I305R	300	270	A	A	E					
10						E	S	235	290	300	I295A	I310A	320	320	300	I265A	210	A	A					
11						E	S	235	295	300	310	310	315	310	300	260	230	S						
12							S	225	270	290	285	320	325	320	300	270	210	A						
13							S	235	280	300	I310A	I320A	330	320	300	260	A	A						
14							S	240	280	290	I300A	320	325	315	300	260	205	S						
15							180	230	280	290	305	A	A	A	I310A	270	A	A						
16						C	C	C	C	C	C	C	C	C	C	C	C	C	C					
17							S	230	285	305	295	A	A	A	A	A	A	A						
18							S	245	285	300	300	325	I310R	I290A	275	265	210	S						
19							S	205	275	290	290	I280A	320	310	295	A	A	S						
20							S	240	255	295	I320A	I320A	320	310	300	270	205	A						
21							S	I220A	260	290	I305A	315	320	315	305	270	210	A						
22							S	230	300	I305A	I320A	325	325	320	300	250	200	A						
23							140	230	290	295	I290A	I300A	315	320	305	270	200	E						
24						C	C	C	C	C	C	C	C	C	C	C	C	C						
25							S	225	285	300	315	320	325	320	295	260	180	S						
26							S	I225A	280	310	325	325	320	325	305	265	A	E						
27							130	220	290	305	320	340	335	325	305	265	195	A						
28							190	240	290	I295A	I305A	330	330	320	305	275	205	A						
29							A	215	I250A	I295A	I320A	330	340	335	305	265	190	E						
30							S	215	290	B	300	I310A	I315A	315	295	250	200	S						
31						E	130	230	285	305	315	330	330	325	290	230	A	S						
Count						9	10	28	28	28	29	26	26	25	27	26	20	4	2					
Median						E	170	230	285	300	310	320	325	320	305	270	210	E	E					
U.Q.																								
L.Q.																								
Q.R.																								

foE

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

The Radio Research Laboratories, Japan

W 3

IONOSPHERIC DATA

Oct. 1967 | foEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	018	022	C	J044	030	J056	G	G	G	E035C	033	038M	033M	034M	040	J027	E016S	C	C	C	C
2	C	C	C	C	C	C	C	C	C	043	050	G	G	028G	024G	020G	016G	023	J028	E015S	J063	J063	J030	J030
3	E	016	016	J025	015	020	G	G	038	038	J062	061	037	J043	035	033	J038	033	J021	033	J033	J030	J035	J040
4	J023	E	J020	E	J020	J024	020	G	031	J036	G	G	G	033	032	046	030	020	J025	J031	J021	J023	J028	J021
5	022	E	020	J024	020	E	E020S	025	J035	024G	033	G	G	G	G	G	G	023	E015S	E017S	E015S	E	E015S	E016S
6	J021	J020	E	E	E	E012S	020	029	G	032	037	G	G	022G	024G	021G	020G	017	E	E	E	E012S	J026	E015S
7	J023	J023	J021	E	E	E	G	G	038	G	G	C	G	G	G	G	G	020	J025	J023	E043	015	020	J033
8	J030	J024	J025	J020	J021	015	015G	033	033	037	J038	G	025G	037	021G	033	J030	025	J033	J027	022	E015S	E	E017S
9	E017S	E	J021	015	018	E	E020S	G	G	G	036	034	038	G	028G	026G	040	021	E	E016S	J021	J021	J021	024
10	E	015	E	E	E	E	E018S	G	034	057	037	J061	023G	038	035	030	023	J023	022	022	022	E015S	E016S	E017S
11	J023	J025	015	J023	E	024	J040	033	038	038	050	037	040	G	G	018G	018G	E016S	E012S	E016S	E018S	E015S	E015S	E018S
12	018	024	J023	J023	E	E	020	031	035	034	035	030G	028G	G	020G	031	030	J030	J030	J023	J024	E017S	015	E017S
13	E	E	E	J043	J024	E	020	031	031	G	J062	J053	025G	023G	024G	023G	J031	J031	J021	J028	024	J033	E	020
14	J025	J026	J021	J023	015	E013S	E018S	G	040	J043	J063	028G	025G	028G	035	033	023	E015S	E016S	J021	J040	J023	E016S	018
15	E018S	J033	J043	J024	J025	021	G	G	G	034	J044	J073	J043	J035	035	026G	026	025	J023	J033	J024	J030	E020S	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E016S	E017S	J021	E015S
17	E017S	021	020	J025	018	E	E017S	G	G	G	039	038	041	J038	032	029	023	031	J028	J025	030	E015S	J030	J031
18	J053	J021	J040	J033	J035	020	E016S	G	J043	040	050	G	G	036	030	G	G	E012S	032	J040	J041	J034	J030	027
19	015	E	E	E	E	E	E016S	J035	039	037	040	033	030G	029G	023G	030	030	030	J030	J043	J048	J043	J024	J031
20	E	E	015	E	E	E	E015S	G	034	039	036	J045	033	033	G	023G	023	J022	J031	J030	J061	J040	J051	J051
21	J024	J030	J023	E	J024	E	E016S	025	031	033	037	037	031G	025G	020G	019G	028	020	J023	E017S	E015S	E016S	E017S	021
22	J025	J030	J030	020	J031	J030	E017S	030	031	062	033	028G	G	G	G	G	G	015	E	E015S	E016S	E014S	E017S	E015S
23	E015S	E015S	J025	018	016	E	G	G	G	036	034	036	G	021G	020G	020G	024	022	021	E	J033	E	018	026
24	J030	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J042	J025	J025	J050	J040	J043
25	J028	J030	J031	020	J023	E	E016S	G	033	056	040	143	084	046	035	040	J043	J050	J044	J043	J043	018	J030	J021
26	E	E	E	E	J021	E	E015S	025	034	G	043	G	027G	027G	030G	G	040	J025	J035	J028	J036	J063	J021	E013S
27	020	016	022	E	020	E	G	025	G	G	033	029G	024G	G	G	021G	022	J024	E012S	E018S	E015S	E012S	E017S	J041
28	J028	J023	J031	J028	J023	E013S	G	029	033	J043	034	045	030G	028G	022G	015G	020G	022	E017S	018	E015S	020	J020	J020
29	E016S	E	E	E	E	018	J023	G	035	033	J057	G	G	G	020G	G	G	020	E013S	E013S	E016S	E016S	J021	J024
30	J023	J022	J023	015	018	E	E014S	G	G	E058B	043	035	040	030G	027G	G	G	E014S	E015S	E013S	025	E	E	E
31	E	017	E	018	E	E	G	G	G	G	G	027G	G	G	018G	027	020	020	020	E	021	E011S	J021	018
Count	29	28	28	28	28	27	28	28	28	29	29	28	29	29	29	29	29	29	30	30	30	30	30	29
Median	020	018	J020	018	018	E	G	G	033	035	037	G	G	G	G	G	023	022	J022	022	023	E017	J020	021
U.Q.	024	024	024	024	022	016	020	030	036	042	047	042	036	034	032	030	030	028	030	028	033	030	028	030
L.Q.	E	E	E	E	E	E	E	G	G	G	034	G	G	G	019	G	017	020	E015	E016	E016	E015	E016	E017
Q.R.											013				013		013	008	D015	D012	D017	D015	D012	D013

foEs

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

The Radio Research Laboratories, Japan

W4

IONOSPHERIC DATA

Oct. 1967 | **f_bEs** | 0.1Mc | **135° E Mean Time** (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				015	015	C	027	G	055				C	032	032	025	026	023	019	S	C	C	C	C
2	C	C	C	C	C	C	C	C	C	G	032			026G	023G	020G	015G	020	024	S	053	017	E	016
3		012	E	E	E	015			G	G	051	048	G	034	032	028	030	023	020	027	020	017	027	035
4	E		E		015	018	G		G	033				033	031	020	020	018	020	020	017	018	018	017
5	015		016	013	012		S	025	030	020G	023							G	S	S	S		S	S
6	E	012				S	G	G		032	G			022G	023G	020G	020G	016				S	026	S
7	019	017	017						G			C						015	020	018	S	015	017	030
8	020	020	018	016	015	015	014G	G	G	033	033		024G	032	020G	020	020	020	018	020	017	S		S
9	S		017	012	014		S				G	G	G		028G	023G	027	018		S	017	018	020	E
10		015					S		G	G	035	035	023G	028	025	028	G	020	021	020	020	S	S	S
11	016	022	015	017		022	026	G	G	G	G	G	G			017G	018G	S	S	S	S	S	S	S
12	017	020	020	016			G	G	G	G	G	029G	027G		020G	020	016	018	020	021	018	S	015	S
13				022	018		G	G	G		046	036	026G	022G	024G	020G	023	020	E	018	E	E		015
14	018	016	012	013	012	S	S		G	040	050	028G	025G	027G	024	020	018	S	S	018	021	019	S	E
15	S	E	031	018	E	019				G	G	050	036	032	032	024G	023	020	019	020	020	020	S	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	S	017	S
17	S	E	016	020	013		S				G	038	040	035	031	028	023	014	023	022	024	S	023	023
18	024	017	023	030	033	016	S		G	G	049			036	G			S	017	035	030	030	022	016
19	015						S	G	G	G	G	033	028G	029G	022G	028	023	G	016	022	040	028	018	020
20			012				S		G	G	033	034	025	022		016G	018G	018	027	023	032	022	020	026
21	018	018	015		015		S	024	G	G	033	025	026	024G	020G	018G	017	019	016	S	S	S	S	016
22	020	028	018	017	016	020	S	G	G	032	033	025G						014		S	S	S	S	S
23	S	S	025	015	012					G	033	036		020G	019G	017G	015G	G	018		027		015	016
24	026	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	030	017	021	037	025	025
25	021	020	017	012	016		S		G	045	G	102	066	028	023G	G	030	022	036	028	019	012	020	018
26					E		S	025	025		030		023G	027G	028G		037	020	025	026	026	030	E	S
27	018	E	014		012			G			030G	029G	023G			020G	016	017	S	S	S	S	S	016
28	019	016	020	015	019	S		G	G	038	034	G	027G	023G	020G	015G	019G	015	S	015	S	017	016	E
29	S					E	017		028	031	036				020G			G	S	S	S	S	020	018
30	020	020	012	E	E		S			B	G	034	034	029G	025G			S	S	S	E			
31		017		011								026G			018G	019G	020	G	016		015	S	E	016
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

W 5

IONOSPHERIC DATA

Oct. 1967 | f-min | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	C	E015S	012	016	017	017	018	E035C	017	016	012	E	E	E	E016S	C	C	C	C
2	C	C	C	C	C	C	C	C	C	018	016	018	017	016	016	012	E	014	E014S	E015S	E012S	E	E012S	E015S
3	E	E	E	E	E	E	015	016	016	017	016	017	015	017	012	E	016	E	E	E	E016S	E015S	E	E015S
4	E015S	E	E	E	E	E	E	016	017	017	020	017	018	012	017	011	E	E	E	E	E015S	E	E	E
5	E	E	E	E	E	E	E020S	015	012	016	015	018	012	016	017	016	016	012	E015S	E017S	E015S	E	E015S	E016S
6	E015S	E	E	E	E	E012S	011	016	015	018	018	016	018	017	017	016	015	E	E	E	E	E012S	E	E015S
7	E	E	E	E	E	E	012	012	012	015	018	C	020	024	018	016	012	E	E	E	E014S	E	E	E
8	E016S	E	E	E	E	E	E	012	016	017	017	016	016	017	014	011	E	E	E015S	E	E015S	E015S	E	E017S
9	E017S	E	E	E	E	E	E020S	011	012	011	017	018	019	011	011	010	E014S	E	E	E016S	E	E	E	E016S
10	E	E	E	E	E	E	E018S	012	017	017	016	011	016	011	011	E	017	E	E	E	E015S	E015S	E016S	E017S
11	E	E	E	E	E	E	E013S	015	016	017	016	017	018	019	012	012	E	E016S	E012S	E016S	E018S	E015S	E015S	E018S
12	E	E	E	E	E	E	E013S	012	012	017	018	018	017	017	012	012	011	E015S	E	E	E	E017S	E	E017S
13	E	E	E	E	E	E	E016S	012	011	017	018	016	018	017	013	012	E	E	E018S	E	E016S	E016S	E	E
14	E	E	E	E	E	E013S	E018S	016	022	017	017	019	017	016	012	011	011	E015S	E016S	E	E015S	E	E016S	E017S
15	E018S	E	E	E	E	E	015	017	016	017	017	018	017	016	017	012	012	011	E	E	E014S	E	E020S	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E016S	E017S	E013S	E015S
17	E017S	E013S	E	E	E	E	E017S	012	018	017	018	022	027	020	018	016	015	E	E	E	E015S	E015S	E	E013S
18	E	E	E	E	E	E	E016S	012	012	018	021	026	028	027	018	015	012	E012S	E	E015S	E	E	E	E
19	E	E	E	E	E	E	E016S	011	016	017	018	018	018	018	012	017	016	E015S	E	E	E	E	E	E014S
20	E	E	E	E	E	E	E015S	016	012	017	016	017	017	017	018	011	011	E	E013S	E012S	E	E	E015S	E
21	E	E	E	E	E	E	E016S	012	012	017	018	012	015	017	012	011	011	E	E	E017S	E015S	E016S	E017S	E015S
22	E	E	E	E	E	E	E017S	011	011	011	017	017	017	017	013	012	011	E	E	E015S	E016S	E014S	E017S	E015S
23	E015S	E013S	E	E	E	E	E	012	012	012	017	017	018	013	011	E	E	E	E	E	E	E	E	E
24	E	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	E	E	E	E	E
25	E	E	E	E	E	E	E016S	011	012	012	015	017	018	016	011	011	011	E013S	E	E	E	E	E	E
26	E	E	E	E	E	E	E015S	012	011	017	017	016	016	017	017	016	016	E	E	E	E	E015S	E016S	E013S
27	E	E	E	E	E	E	E	012	012	017	011	019	017	015	016	011	E	E	E012S	E018S	E015S	E012S	E017S	E014S
28	E	E	E	E	E	E013S	011	011	016	017	018	017	017	016	012	011	E	E	E017S	E	E015S	E	E	E015S
29	E016S	E	E	E	E	E	E	012	012	011	015	016	020	024	017	017	015	E	E013S	E013S	E016S	E016S	E	E016S
30	E	E	E	E	E	E	E014S	012	012	058	020	017	017	015	012	015	015	E014S	E015S	E013S	E017S	E	E	E
31	E	E	E	E	E	E	E	012	012	017	017	017	018	013	011	012	E	E015S	E012S	E	E	E011S	E	E
Count	29	28	28	28	28	27	28	28	28	29	29	28	29	29	29	29	29	29	30	30	30	30	30	29
Median	E	E	E	E	E	E	E015S	012	012	017	017	017	017	017	013	012	011	E	E	E	E015S	E	E	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

W6

IONOSPHERIC DATA

Oct. 1967 | M(3000) F2 | 0.01 | 135° E Mean Time (G. M. T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	255	265	280	265F	F	C	310	300	330	280	305	310	310	300	315	315	320	320	285	290	C	C	C	C
2	C	C	C	C	C	C	C	C	C	330	315	300	295	295	305	305	310	310	310	320	285	275	270	270
3	270	265	260	275	275	280	315	320	315	305	295	290	285	285	295	310	310	310	300	U315S	295	I280S	275	275
4	265	260	275	290	285	290	310	315	295	295	295	295	290	300	300	305	310	305	295	295	285	280	270	270
5	265	265	265	275	280	285	320	310S	305	320	300	290	285	290	300	300	300	305	310	290	305	290	275	270
6	270	270	260	275	270	270	300	310	300	305	290	285	285	290	290	295	305	310	320	280	275	265	260	260
7	260	270	275	320	285	295	320	325	310	305	300	I295C	295	295	290	295	305	310	310	290	280	285	255	265
8	275	275	290	275	280	280	315	315	305	305	290	295	295	300	295	300	310	305	315	310	300	280	265	260
9	250	260	270	280	275	285	305	310	315	310	320	305	320	290	290	295	300	300	295	300	280	275	265	280
10	290	265	295	285	265	250	320	300	315	310	285	290	290	300	305	300	300	300	305	295	290	285	275	260
11	255	260	270	270	290	285	335	320	320	305	305	300	310	300	305	300	300	305	315	305	310	265F	F	265F
12	270	250	260	280	300	305	310	325	300	320	310	310	305	300	310	300	310	300	300	325	290	265	270	265
13	270	270	265F	F	F	F	335	325	315	300	315	310	305	290	305	315	300	315	300	290	290	290	300	270F
14	SF	F	F	F	F	285F	320F	320	340	320	300	310	305	315	310	315	315	315	310	320	280	280	280F	270F
15	260F	260F	F	270F	280F	275F	315	320	320	305	320	310	300	310	305	310	320	315	300	320	275	270	275	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	305	295	285	285
17	285	290	280	285S	295	300	325	335	335	330	325	320	305	305	305	315	315	320	300	305	305	310	265	F
18	F	F	F	F	275	290	315	320	335	320	280H	300R	305	305	295	300	305	315	305	300	300	285	260	255
19	265	255	265	270	290	305	330	330	330	330	320	315	310	315	310	310	325	320	320	325	300	275	F	F
20	F	F	F	F	F	310F	F	330	325	325	320	305	300	305	315	310	320	320	300	310	335	F	265F	SF
21	260	265	275	275	285	280	310	325	350	330	325	300	310	315	310	305	325	325	300	305	300	290	290	270
22	275	275	260	F	285	295	335	325S	330	320	310	315	305	310	295	305	325	315	295	285	305	275	265	270
23	260	260	280	280	300	300	325	325	325	310	310	310	290	305	305	310	310	320	300	275	265	270	280	265
24	255	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	315	290	295	265	250	265
25	255	260	260	285	310	280	315	320	320	320	315	315	310	300	310	320	320	315	295	285	290	280	280	285
26	270	265	265	280	295	285	315	340	335	320	320	305	300	300	300	310	315	325	305	280	300	I290S	SF	285F
27	275	275	275	280	295	315	300	325	310R	305	335	300	315	310	300	305	325	315	285	275	285	280	305	275
28	245	245	255	255	325	250	315	335	320	330	320	300H	300	300	305	295	320	315	280	305	285	240	250	240
29	260	270	250	255	280	255	290	320	325	325	310	290	295	295	290	305	315	315	280	285	265	255	240	230
30	245	245	225	240	245	255	265	315	295	U310R	315	310	305	300	310	300	310	305	290	275	275	280	275	285
31	260	270	260	275	275	280	290S	325	330	335	320	320	315	305	305	320	320	305	295	305	305	295	280	270
Count	26	25	24	23	24	26	27	28	28	29	29	29	29	29	29	29	29	29	30	30	30	29	27	26
Median	260	265	265	275	285	285	315	320	320	320	310	305	305	300	305	305	310	315	300	300	290	280	270	270
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

W7

IONOSPHERIC DATA

Oct. 1967 | M(3000) F1 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									A	365L	375	375L	U380L											
2										400		U400L												
3											A	A	415L	L										
4										L		400L			L									
5										U380L	L		L	L										
6										L		U395L	L											
7										L		C												
8											L		L	L										
9												L	L											
10										L	U395L		U370L	U385L										
11											L		L											
12											L	L	U420L											
13										L														
14											I410A	415L			L									
15											L	A	L											
16										C	C	C	C	C										
17									L	L	L	L												
18											A													
19										U395L	L													
20									L	U405L			L											
21										U415L	425													
22										415L	415L													
23																								
24										C	C	C	C	C										
25										A		A	A											
26											425													
27											385L		L											
28										415L	L	415												
29									L															
30										B														
31											400													
Count										8	8	6	4	1										
Median										U400L	405	400L	U400L	U385L										
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 | W 3

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									265	290	270	270	270											
2									C	245		245												
3											260	250	245	U275L										
4										225		250			260									
5										245	245		260	260										
6										240		245	260											
7										240		I240C												
8											245		250	250										
9												250	255											
10										240	240		255	250										
11											240		250											
12											250	250	250											
13										220														
14											245	240			260									
15											240	245	240											
16									C	C	C	C	C	C	C									
17									245	240	245	235												
18											220													
19										235	235													
20									235	235			250											
21										235	235													
22										225	235													
23																								
24									C	C	C	C	C	C	C									
25										225		I250A	245											
26											230													
27											260		235											
28										230	225	230H												
29									260															
30										225														
31											225													
Count									4	16	18	13	13	4	2									
Median									250	235	240	245	250	255	260									
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

W9

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	270	290	310	335	I305C	250	245	I240A	215	210	200	240	220	240	240	245	240	250	260	C	C	C	C
2	C	C	C	C	C	C	C	C	C	245	190H	200H	225	215	245	245	250	245	240	225	I245A	250	260	290
3	300	300	295	255	250	255	225	240	245	225	I240A	I225A	200	240	245	240	245	240	245	250	245	280	300	I300A
4	300	300	275	245	250	255	235	245	240	225	220	200	220	225	250	245	250	230	235	245	250	260	275	295
5	300	300	300	280	250	255	230	230	245	215	215	215	200	240	245	240	245	250	225	250	250	250	260	275
6	300	290	310	270	275	295	215	215	245	220	220	210	230	215	240	240	240	225	215	250	270	285	315	300
7	305	300	265	220	200	255	225	230	225	220	215	I215C	225	250	245	245	245	220	240	250	265	260	290	310
8	290	290	255	255	275	265	240	240	225	215	210	235	210	235	225	245	245	240	225	245	250	270	295	320
9	350	305	280	240	250	260	240	225	225	230	235	210	220	225	230	245	240	225	225	240	250	285	300	295
10	260	260	260	250	280	340	245	220	230	225	220	235	205	235	240	245	245	240	230	250	250	275	275	340
11	345	345	290	260	260	270	225	225	225	240	220	210	225	245	230	245	240	225	220	240	245	250	315	305
12	300	365	345	300	220	220	250	240	225	215	215	210	215	235	225	240	240	220	250	225	215	295	290	280
13	295	285	300	335	290	250	220	225	220	210	I240A	225	220	225	240	240	240	225	225	250	245	260	245	255
14	305	310	295	280	260	245	225	225	235	240	I205A	205	200	240	240	245	240	225	225	215	245	265	295	300
15	305	305	335A	300	260	250	225	225	220	220	210	I240A	210	225	240	240	240	220	245	240	230	295	280	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	220	280	290	295
17	300	275	270	275	250	250	220	215	210	210	225	220	235	225	235	240	230	220	250	245	245	225	295	290
18	325	300	310	315A	I285A	250	225	225	230	225	I235A	235	245	245	230	240	240	220	225	255A	260	275A	305	290
19	275	280	280	275	255	225	220	225	225	225	220	220	220	215	225	245	225	220	225	230	I260A	290A	270	295
20	250	290	300	280	240	205	220	220	220	200	210	210	210	235	240	240	240	215	250	240	250A	280	280	320
21	305	300	295	270	275	250	240	225	220	210	200	210	210	230	240	240	230	220	225	240	245	250	250	250
22	300	315	285	260	250	250	225	225	220	215	210	230	225	225	240	240	230	210	210	230	245	270	300	290
23	305	300	300	270	245	210	220	220	225	220	205	240	220	235	240	235	240	215	240	225	300	275	260	290
24	310	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	240A	240	260	I270A	335	330
25	350	340	305	270	235	245	245	220	210	I230A	220	I220A	I230A	230	250	240	235	225	I240A	275	250	260	290	280
26	275	270	285	280	250	215	225	230	220	220	200	225	225	235	245	240	235A	215	220	285	265	A	280	260
27	285	275	280	275	260	235	215	220	220	225	225	235	215	235	240	240	220	205	225	260	265	260	240	255
28	370	375	325	300	225	315	260	235	235	225	215	210	235	240	240	245	220	225	240	250	245	340	345	340
29	280	260	295	300	260	320	270	225	225	225	225	220	225	235	240	240	225	210	240	240	275	300	350	390
30	360	350	350	320	310	305	280	240	220	I225B	235	230	225	235	240	235	240	210	215	220	270	260	280	270
31	280	290	280	275	275	225	250	215	225	215	215	210	230	220	230	240	220	210	230	250	230	250	280	300
Count	29	28	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29	29	30	30	30	29	30	29
Median	300	300	295	275	260	250	225	225	225	220	215	220	220	235	240	240	240	220	230	245	250	270	290	295
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

W10

IONOSPHERIC DATA

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

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

h'Es

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

The Radio Research Laboratories, Japan

W11

IONOSPHERIC DATA

Oct. 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				f2	f2		12	c	c3					1	1	1	12	12	1					
2										c	1			1	1	1	1	1	e2		f3	f2	f	f
3		f	f	f	f	1			c	c	c2	c2	c	12	1	1	12	c 1	1	f f	f	f	f2	f3
4	f		f		f	1	h		c	1				1	1	1	1	1	1	f	f	f	f	f
5	f		f	f	f			1	12	1	1							h						
6	f	f					c	c		1	c			1	1	1	1	1					f2	
7	f	f	f						c									1	12	f2		f	f	f2
8	f2	f4	f2	f2	f2	1	1	c	c	1	1		1	1	1	1	1	12	1	f	f			
9			f2	f	f						c	c	c		1	1 1	12	1			f	f	f	f
10		f							c	c	1	12	1	1	1	12	h	1	1	f f	f			
11	f2	f3	f	f2		c	c3	c	c	c	c	c	c			1	1							
12	f	f2	f3	f			c	c	c	c	c	1	1		1	1	1	1	f2	f	f		f	
13				f3	f		h	c	c		13	13	1	1	1	1	1	12	f	f	f	f		f
14	f	f	f	f2	f				e	e2	13	1	1	1	1	1	h 1			f	f	f		f2
15		f	f4	f2	f2	f2				c	c	13	12	12	12	1	1	1	f	f	f	f		
16																							f	
17		f	f	f4	f						c	1	12	12	1	1	1	1	f2	f	f		f	f
18	f2	f	f2	f4	f2	f			c	c	e2			1	c				f	f4	f2	f3	f2	f
19	f							c	c	c	c	1	1	1	1	12	1	c	f	f2	f3	f4	f2	f2
20			f						c	c	1	1	1	1		1	h 1	1	f2	f2	f2	f2	f2	f2
21	f	f	f		f			1	c	c	1	1	1	1	1	1	1	1	f					f
22	f2	f3	f2	f2	f2	f3		1	1	12	1	1						1						
23			f5	f	f					c	1	1		1	1	1	h 1	c	f		f2		f	f2
24	f3																		f3	f2	f2	f2	f2	f4
25	f3	f3	f2	f2	f2				h	e2	c	c2 1	c 1	h 1	h 1	h	c3	c3	f4	f3	f2	f	f2	f
26					f			1	1 c		1		1	1	12		12	1	f2	f2	f3	f2	f	
27	f	f	f2		f			h			1	1	1			1	1	1						f2
28	f2	f3	f3	f2	f2			c	c	12	1	c	1	1	1	1	1	1		f		f2	f2	f
29						f	1		1	12	12				1			c					f2	f3
30	f2	f4	f	f	f						c	1	12	1	1						f			
31		f		f2								1			1	c 1	c 1	c	f		f		f	f
Count																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

Types of Es

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

The Radio Research Laboratories, Japan

W12

IONOSPHERIC DATA

Oct. 1967 | foF2 | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	052	053	048	046	044	048	066	081	087	081	083	096	099	091	086	088	084	084	081	074	070	061	052	052
2	049	046	043	046	046	048	073	086	088	092	094	097	107	107	101	096	098	096	086	069	059	056	056	055
3	056	055	054	054	051	053	074	098	091	104	107	116	118	118	120	114	102	095	086	074	063	052	053	051
4	050	047	048	049	040	041	068	088	113	116	101	103	105	108	106	101	097	I096R	078	070	061	059	059	055
5	053	054	056	056	055	054	072	104	116	103	103	107	115	112	110	103	101	096	092	069	062	061	058	056
6	055	057	054	056	051	052	073	086	097	119	115	122	125	116	114	116	108	097	074	059	058	059	057	059
7	058	059	060	056	040	038	066	I100R	112	114	107	116	113	110	110	113	106R	085	074	070	065	066	064	064
8	061	059	060	055	051	049	074	103	104	111	114	123	121	113	107	103	099	094	077	063	056	057	056	054
9	051	053	053	049	046	045	068	096	112	112	124	111	113	110	105	106	104	094	078	071	066	063	061	066
10	061	061	061	060	052	051	081	083	I112R	112	107	118	127	127	126	114	099	096	087	069	065	061	061	056
11	056	053	055	048	049	047	076	098	106	111	128	134	132	125	116	112	103	101	081	070	060	047	047	046
12	048	046	046	045	045	035	059	086	107	114	132	137	128	119	123	118	112	107	084	083	058	053	055	055
13	052	052	051	048	050	052	073	094	102	116	116	128	119	118	121	122	104	098	078	068	061	056	056	056
14	052	053	057	054	054	055	074	I096R	114	096	109	129	126	122	111	117	111	100	083	073	051	049	052	050
15	051	052	056	055	054	051	067	083	108	122	133	132	118	119	119	123	112	I096R	076	071	054	052	056	052
16	052	055	056	049	042	042	064	091	103	106	121	120	121	122	121	116	113	I096R	071	I060A	047	045	045	044
17	046	046	046	045	043	040	066	083	I098R	108	120	115	112	111	111	114	105	091	076	072	066	045	043	042
18	041	041	047	048	048	047	070	I100R	113	113	101	117	121	123	117	117	119	105	087	I071A	I068A	I053A	I051A	050
19	052	C	C	C	C	C	C	C	C	C	109	116	121	114	099	102	107	084	071	067	049	042	048	049
20	051	053	054	056	060	059	071	095	102	103	105	114	116	114	113	106	106	104	071	067	049	037	039	041
21	041	043	044	045	046	046	069	103	106	108	113	114	119	108	099	097	099	091	062	055	047	047	049	044
22	042	045	047	048	050	049	073	089	097	106	108	123	114	118	121	116	109	089	055	051	046	038	039	041
23	041	043	044	047	049	035	057	092	103	096	103	111	119	122	125	122	101	084	062	061	057	060	062	054
24	055	056	056	054	055	056	073	104	122	104	113	126	121	121	123	123	116	088	066	058	056	049	045	045
25	042	I042A	045	049	046	038	058	087	101	116	120	123	119	117	116	112	098	087	070	059	059	050	047	046
26	045	044	044	044	043	042	062	086	102	097	111	121	119	113	107	113	106	087	062	053	053	048	046	046
27	046	047	047	046	045	038	056	086	106	112	114	116	112	111	116	109	105	078	062	058	060	057	059	039
28	042	041	041	041	041	031	055	104	124	132	132	116	121	119	113	113	106	083	070	068	070	046	046	046
29	048	046	041	043	043	042	061	106	116	131	123	115	110	115	120	119	113	093	070	071	065	059	054	052
30	051	052	046	048	048	048	061	110	I131C	136	126	135	133	135	128	119	108	098	086	071	054	053	055	053
31	047	051	046	045	042	042	062	106	124	118	114	121	133	122	119	121	118	082	068	064	066	048	043	042
Count	31	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	051	052	048	048	047	047	068	094	106	112	113	117	119	117	116	113	106	095	076	069	059	053	053	051
U.Q.	053	054	056	054	051	051	073	103	113	116	121	123	121	122	121	118	111	097	083	071	065	059	057	055
L.Q.	046	046	046	046	043	041	062	086	102	104	107	114	113	111	110	106	101	087	070	060	054	047	046	045
Q.R.	007	008	010	008	008	010	011	017	011	012	014	009	008	011	011	012	010	010	013	011	011	012	011	010

The Radio Research Laboratories, Japan

foF2 | Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation | A1

IONOSPHERIC DATA

Oct. 1967 | foF1 | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	470	480	550H	520H	LH	460L	L								
2									L	L	LH	420	420	500H	L	L								
3									L	460L	L	500L	490	480L	440	L								
4									L	A	460	500	500	470	L	L								
5									L	450	460H	L	500	L	450L	L								
6									LH	420	470	550	480L	450	L	L								
7									L	L	460	470	L	L	L	L								
8									L	L	460L	450	480	L	L	L								
9									L	L	440	480	I490A	500	L	L								
10									LH	460	L	510H	L	L	430	L								
11									A	L	L	460L	460L	470L	L	L								
12									L	A	480	L	470	L	L	L								
13									L	420	L	500	L	460	L	L								
14									L	L	L	500H	L	420	L	L								
15									400	420	440	460H	L	L	460L	A								
16									L	L	L	440	L	500	L	L								
17									L	430	L	L	L	L	A									
18									L	430	440	540H	480L	I480A	L									
19									C	C	L	440	460L	L	L									
20									L	L	LH	460	440	L	L									
21									L	L	450L	450L	440	L	L									
22									370	L	L	460	LH	L	L									
23										L	420	L	460L	460L	420									
24										L	LH	480L	470	480	L	L								
25									L	470	LH	I460A	I470A	L	A									
26									L	390	450L	440	500L	L	L									
27										L	510	LH	L	LH	L									
28										L	480	460L	L	L	L									
29										L	440	400	L	L	L									
30										B	L	450	420	L	L									
31										L	450	400	L	450L	410	L								
Count									2	11	17	26	19	13	7									
Median									385	430	460	460	470	470	440									
U.Q.																								
L.Q.																								
Q.R.																								

foF1 | Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

IONOSPHERIC DATA

Oct. 1967 | foE | 0.01MC | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	A	A	350	350	340	330	305	A	A	E					
2							185	I250A	310	335	345	350	355	345	330	290	235	A	E					
3							180A	250	300	A	A	355	360	355	335	305	255	A	S					
4							A	A	A	A	A	A	350	355	340	305	I260C	A	B					
5							B	A	A	335	345	355	355	350	335	305	270	A	S					
6							I190A	255	A	A	345	350	355	350	335	315	255	B						
7							195	260	315	330	345	350	360	355	345	310	260	175	E					
8							175	255	315	I330A	345	350	360	350	320	295	255	170	E					
9							185	255	295	330	335	A	A	A	I330A	A	A	S						
10							B	I250A	310	I330A	I345A	350	I355A	350	330	295	A	A	E					
11							B	A	A	A	A	350	I360A	340	325	295	A	B	E					
12							A	250	295	A	A	A	A	350	330	295	A	A	E					
13							B	I240A	300	335	I345A	355	355	355	I330A	I290A	I255A	A						
14							B	250	A	A	A	345	355	I340A	A	A	A	A						
15							185	250	300	325	330	340	345	A	A	A	A	A	S					
16							B	255	A	A	A	345	355	345	330	315	A	A						
17							B	245	295	A	A	A	A	A	A	A	A	A						
18							B	A	A	A	A	A	A	A	A	I310A	I255A	S						
19							C	C	C	C	A	A	I340A	340	325	295	250	A						
20							B	A	A	330	335	340	345	345	330	310	230	B						
21							B	245	I295A	330	335	345	345	340	325	290	245	A						
22							B	230	I280A	325	340	340	345	345	325	I270A	225	B						
23							B	245	305	I325A	A	A	355	350	335	A	A	B						
24							S	230	I290A	I320A	335	345	350	355	A	A	A	A						
25							B	225	290	325	340	340	345	350	330A	280	A	S						
26							B	235	300	I330A	340	345	350	350	325	290	A	A						
27							175	245	295	A	A	355	I355A	355	335	295	A	A						
28							165	230	A	A	A	A	A	A	A	295	A	A						
29							165	235	290	A	A	A	A	355	345	290	225	A						
30							B	A	I290C	B	A	A	350	350	325	285	A	A						
31							B	245	295	330	340	345	355	I345A	325	275	I210A	B						
Count							10	23	20	16	16	21	25	26	25	25	15	2	7					
Median							180	245	295	330	340	350	355	350	330	295	255	170	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

A 3

IONOSPHERIC DATA

Oct. 1967 | foEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J025	J030	J029	J022	E	J022	J024	J036	040	J038	J040	J034G	G	J044	J029G	025G	J063	J087	J054	J028	J043	J019	E020B	E018B
2	E012S	E	J020	E	E	E	020	028	G	G	G	G	G	G	G	032	J038	J033	J021	J023	J024	J038	J068	J031
3	J083	J040	J028	J022	J019	J020	J025	028	036	041	J043	G	G	J029G	J030G	J020G	J030	J028	J026	J029	J041	J030	J020	J019
4	E018B	J026	J024	J028	J011	E	022	029	035	J067	J043	J052	G	J025G	G	G	E043C	J060	J027	J035	J043	E017B	J019	J019
5	E018B	E014S	E	E013S	E013S	E	E019B	027	033	G	G	J044	G	J108	J063	G	J024G	J020	020	J038	J029	E013S	E018B	E018B
6	E018B	E	E	E	E012S	E	023	028	032	038	G	J081	G	G	G	G	028	024M	E018B	J020	E012S	J014	J015	J016
7	E013S	J023	E	E	E	E	G	028	G	G	038	039	G	G	G	G	G	G	J020	J020	J025	J021	J024	E018B
8	E018B	E	J020	J020	E	E	G	G	G	J043	J033G	J035G	G	G	J035	J035	J025G	021	J024	J020	J021	J024	E018B	J020
9	E019B	E014S	J023	J038	J028	E	J024	G	G	G	G	036	J065	J044	036	J035	J045	J030	J030	J029	E017B	E013S	E018B	E012S
10	E013S	J014	J014	J013	E	E	E021B	029	G	037	037	G	J040	G	J044	J026G	J029	J030	J030	J025	J023	J029	E018B	E013S
11	J019	E013S	J012	E	E014S	E013S	E020B	032	J055	038	039	038	J038	G	J066	G	026	E022B	E	E018B	J024	J028	J027	J025
12	E018B	E	J018	J023	J019	E014S	022	G	G	J059	J046	J074	J062	J063	J033G	J023G	J030	J025	J033	J029	J020	E014S	E018B	E018B
13	E017B	E014S	E	J030	E	E	E021B	028	032	J040	J064	G	J043	J036	J044	J042	J040	J030	E018B	E017B	J018	E013S	E013S	E016B
14	E018B	J024	J019	J020	J032	E	E018B	026	035	033	039	036	J040	J044	J034	J045	J061	J053	J040	J032	J030	J025	E018B	E020B
15	J020	E013S	E	E	E	J024	G	028	G	J050	G	G	J039	J059	J048	J050	J060	J068	J045	J033	J024	J024	E018B	E018B
16	E018B	E	E	E	E	E013S	E018B	G	037	J043	J050	J049	J034G	J034G	028G	G	J058	J078	J074	J097	J056	J030	J029	J035
17	J027	J019	J019	J023	J022	J024	E018B	G	031	035	J045	J044	J073	J050	J045	J049	J028	J020	J033	J019	J019	J020	E019B	J022
18	J025	J019	J023	J025	J018	E012S	E019B	028	036	J045	039	040	J041	J065	036	036	034	J033	J069	J083	J154	J109	J079	J043
19	J071	C	C	C	C	C	C	C	C	C	J044	036	J040	J034G	J027G	J024G	G	J037	J076	J034	J048	J049	J063	J044
20	J033	J019	J030	J028	J021	J019	E019B	026	034	G	J029G	J044	J041	J034G	J025G	G	026	021	E018B	J021	J031	J043	J034	J035
21	J038	J024	J025	J025	J020	E018B	E018B	G	J044	G	J035	J029G	G	025G	J034	031	J029	J020	J017	J020	E016B	E014S	J020	J021
22	J020	E	E	J030	E	E	E018B	026	033	033	G	J035	J025G	G	G	032	039	J030	J044	J029	E018B	E013S	E014S	E018B
23	E018B	J020	E012S	E	E	J022	E019B	027	033	036	042	J054	J036	J043	G	J055	025	J030	J036	J036	J049	E018B	J043	E018B
24	J018	J015	E	J020	J027	J026	J029	G	034	043	040	G	G	G	J036	J060	J029	J021	E014S	E014S	J029	J029	J023	J021
25	J033	J052	J027	J015	J016	J017	E019B	029	G	040	G	J050	J056	G	J069	J060	J084	J043	J049	J072	J043	J049	J064	J051
26	J039	J030	J028	J012	E	E	E018B	027	022G	035	J036	J033G	J034G	G	036	034	J046	J058	J051	J061	J035	J036	J038	J073
27	J025	E014S	E013S	E	E013S	E013S	G	026	J029G	J037	J069	J042	J043	J039	J026G	031	J033	J020	E019B	E019B	J024	J022	J027	J021
28	E019B	E	E	E012S	E012S	E012S	G	026	032	J038	J040	J073	J065	J063	J046	J028G	J036	J025	J020	E014S	E013S	J023	J043	J028
29	J027	J032	J027	J026	J023	E014S	G	G	G	038	J056	J040	J045	G	J038	037	028	J024	J025	J024	J021	E018B	J016	J020
30	J024	E012S	J025	E	E	J028	E019B	026	C	E062B	041	J074	J034G	030G	G	G	023	J022	025M	E018B	025M	E014S	E016B	E018B
31	J028	J018	E012S	J020	E014S	E	E018B	G	G	G	031G	G	J028G	036	G	G	022	E018B	J020	E018B	J026	J029	J018	E018B
Count	31	30	30	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	J019	J014	J018	J020	E012	E012	E019B	026	032	038	039	J038	J036	G	J034	031	J030	J028	J026	J025	J025	J024	J020	J020
U.Q.	027	024	025	025	019	019	E021	028	035	042	043	049	043	044	044	037	043	037	044	034	041	030	034	028
L.Q.	E015	E012	E	E	E	E	E018	G	G	E033	G	G	G	G	G	G	026	021	E020	E019	E020	E014	E018	E018
Q.R.	D012	D012								D009							017	016	D024	D015	D021	D016	D016	D010

foEs

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

Oct. 1967 | f_bEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

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

f_bEs

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

The Radio Research Laboratories, Japan

A 5

IONOSPHERIC DATA

Oct. 1967 | f-min | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39°43.5'N Long. 140°08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	012	017	017	018	018	021	018	014	018	012	013	012	E	E013S	E012S	018	020	018
2	E012S	E	E	E	E	E	014	018	019	019	021	020	018	018	018	013	013	013	E	E	018	018	E014S	018
3	E014S	E	E	E	E	E	012	013	019	018	021	021	019	018	018	012	012	E	E013S	E013S	E	E	E013S	E
4	018	E	E	E	E	E	018	018	020	019	021	021	020	018	013	013	E043C	E	017	016	E013S	017	018	E013S
5	018	E014S	E	E013S	E013S	E	019	019	020	018	019	013	021	013	012	012	E	E	E014S	017	018	E013S	018	018
6	018	E	E	E	E012S	E	016	018	018	018	018	018	021	018	021	018	E	019	018	E	E012S	E	E	E
7	E013S	E	E	E	E	E	019	014	018	020	019	018	020	028	020	018	013	013	E	E012S	E	018	017	018
8	018	E	E	E	E	E	014	014	018	020	020	021	021	020	017	013	013	012	E	E014S	E	E012S	018	018
9	019	E014S	E	E	E	E	012	014	019	019	021	018	021	019	018	018	014	E014S	E013S	017	017	E013S	018	E012S
10	E013S	E	E	E	E	E	021	018	019	018	021	021	018	021	014	012	012	012	E	E	E013S	E012S	018	E013S
11	E012S	E013S	E	E	E014S	E013S	020	019	014	019	021	021	018	019	018	013	012	022	E	018	E013S	E	E012S	E
12	018	E	E	E	E	E014S	018	018	019	018	018	018	018	018	013	014	012	E	E	016	E012S	E014S	018	018
13	017	E014S	E	E013S	E	E	021	012	018	018	018	022	018	019	014	012	013	012	018	017	017	E013S	E013S	016
14	018	E	E	E	E	E	018	014	019	018	018	020	020	018	018	018	018	012	E013S	E013S	016	017	018	020
15	017	E013S	E	E	E	E	018	018	018	018	018	019	020	018	018	018	012	014	E012S	E014S	E012S	E012S	018	018
16	018	E	E	E	E	E013S	018	018	018	019	022	021	022	021	021	018	013	014	E	E014S	E013S	E014S	E	E014S
17	E014S	E	E	E	E	E	018	018	E012S	018	019	021	020	020	020	013	018	012	E013S	E012S	E013S	E013S	019	E
18	018	E	E	E	E	E012S	019	018	018	021	020	021	020	018	021	018	014	E013S	E012S	018	E012S	018	E014S	E013S
19	E012S	C	C	C	C	C	C	C	C	C	021	019	018	018	018	019	018	E014S	018	E013S	E	E014S	E	E012S
20	E014S	E012S	E012S	E	E	E012S	019	019	019	019	019	018	018	018	014	012	018	018	018	017	E014S	E	E014S	E014S
21	E012S	E014S	E	E	E013S	018	018	018	018	018	018	019	018	018	018	014	E	012	E013S	018	016	E014S	016	E013S
22	019	E	E	E	E	E	018	012	014	019	020	021	018	018	018	018	014	018	E013S	E012S	018	E013S	E014S	018
23	018	E	E012S	E	E	E014S	019	019	019	018	018	018	019	018	018	014	013	018	E	E013S	E013S	018	E014S	018
24	E013S	E013S	E	E	E	E012S	E013S	018	014	019	020	021	019	019	018	014	013	013	E014S	E014S	E015S	E012S	E013S	018
25	E	E	E	E	E	E	019	012	014	018	019	020	020	018	019	014	013	E012S	E014S	E012S	E013S	E013S	018	E012S
26	E013S	E012S	E012S	E	E	E	018	019	018	019	020	019	021	020	020	018	014	E	E012S	E012S	E012S	E013S	018	E013S
27	E013S	E014S	E013S	E	E013S	E013S	014	014	013	019	019	019	019	018	019	013	018	014	019	019	018	E013S	E012S	E
28	019	E	E	E012S	E012S	E012S	014	012	015	020	018	019	018	017	014	012	E	012	E013S	E014S	E013S	E012S	E012S	E012S
29	E014S	E	E	E	E	E014S	015	014	014	019	021	022	021	023	019	018	018	014	E013S	E013S	E012S	018	E	E
30	E013S	E012S	E	E	E	E014S	019	015	C	062	022	020	019	018	020	013	018	013	019	018	E014S	E014S	016	018
31	E013S	E	E012S	E	E014S	E	018	012	018	020	019	019	018	018	020	018	018	018	E	018	E	E013S	E	018
Count	31	30	30	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	E014	E	E	E	E	E	018	018	018	019	019	020	019	018	018	014	013	012	E013	E014S	E013S	E013S	E014	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

Oct. 1967 | M(3000) F2 0.01 | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	250	275	270	270	255	260	315	310	325	320	300	300	305	310	315	325	320	320	310	300	310	285	285	280
2	285	265	265	260	265	290	330	345	340	325	330	300	300	300	295	315	320	325	345	310	305	275	280	285
3	270	270	275	280	275	290	325	340	330	320	320	300	300	300	305	315	315	315	315	305	310	285	280	275
4	270	260	280	310	295	295	330	320	335	325	315	305	295	295	305	310	315	I320R	310	305	280	280	275	275
5	270	280	275	285	290	280	315	330	340	330	305	305	305	295	300	310	310	315	320	310	285	275	285	275
6	275	275	265	285	270	270	315	335	330	320	305	305	305	295	300	305	315	315	320	285	275	260	265	275
7	265	270	285	315	295	280	315	I330R	330	325	310	315	300	300	300	310	320R	320	295	285	275	280	280	280
8	285	275	285	295	285	285	325	330	325	305	305	305	315	300	300	305	315	320	320	300	280	280	270	275
9	250	265	285	285	270	265	320	330	310	315	315	295	295	300	295	305	315	320	310	300	295	275	270	280
10	285	290	290	305	265	250	345	330	I320R	315	290	290	285	290	300	310	310	315	315	290	280	265	270	265
11	260	260	275	265	270	265	330	325	310	310	305	305	300	305	305	315	310	320	310	305	315	285	265	265
12	275	260	260	270	300	300	325	325	325	300	310	305	305	295	300	305	310	310	300	325	290	260	275	280
13	270	270	275	270	265	290	330	350	325	330	315	305	305	300	305	315	320	315	325	300	290	285	285	275
14	270	260	275	285	280	290	325	I335R	335	315	305	300	310	305	295	315	320	320	305	315	275	270	280	275
15	275	265	270	280	295	285	330	315	315	305	315	315	300	305	300	310	315	I315R	305	305	300	270	275	270
16	270	285	300	305	290	275	315	340	315	325	305	300	295	305	305	310	310	I325R	315	I305A	300	285	270	275
17	270	285	300	290	305	270	335	335	I335R	325	325	305	310	300	305	305	315	320	310	305	320	305	265	275
18	260	270	280	280	290	300	320	I335R	320	335	315	290	290	295	300	300	320	320	325	I315A	I310A	I280A	I280A	275
19	280	C	C	C	C	C	C	C	C	C	305	305	310	300	305	305	325	325	310	330	315	280	275	285
20	280	275	270	285	300	300	325	350	345	330	305	305	295	300	305	320	305	320	315	320	305	290	275	265
21	260	260	270	280	285	280	320	335	330	335	310	305	305	305	315	305	320	325	325	310	300	300	295	290
22	280	270	280	300	300	300	335	335	340	330	305	310	300	295	305	310	320	335	310	295	290	290	280	265
23	270	265	275	300	325	275	305	340	340	310	300	295	295	295	305	315	315	320	290	280	280	270	290	280
24	265	270	285	270	275	270	315	325	330	325	310	305	290	295	295	315	325	320	305	290	290	290	265	265
25	255	I260A	265	290	310	305	315	340	330	325	330	300	315	305	310	315	325	320	305	290	295	295	280	275
26	265	275	275	275	285	280	310	355	345	320	315	315	305	300	300	310	320	330	315	295	295	305	285	275
27	275	270	300	300	315	295	320	335	335	330	315	320	295	300	305	305	315	320	290	295	285	295	310	295
28	245	245	260	260	315	255	280	315	320	325	320	300	295	305	300	310	310	300	285	285	315	255	255	255
29	265	275	260	260	265	255	295	325	310	320	315	305	290	290	290	300	310	300	280	280	285	275	265	245
30	255	260	240	250	250	250	280	310	I325C	315	300	300	300	295	295	310	315	305	300	310	285	290	285	285
31	275	285	285	295	265	265	295	320	340	330	315	310	310	295	300	305	320	305	295	295	310	305	275	260
Count	31	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	270	270	275	285	285	280	320	330	330	325	310	305	300	300	300	310	315	320	310	300	295	280	275	275
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Oct. 1967 | M(3000) F1 0.01 | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	385	390	355H	360H	LH	370L	L								
2									L	L	LH	405	415	365H	L	L								
3									L	380L	L	370L	370	375L	370	L								
4									L	A	390	375	360	365	L	L								
5									L	400	395H	L	360	L	365L	L								
6									LH	395	375	345	370L	375	L	L								
7									L	L	395	385	L	L	L	L								
8									L	L	375L	380	375	L	L	L								
9									L	L	410	375	I370A	360	L	L								
10									LH	375	L	360H	L	L	380	L								
11									A	L	L	375L	390L	385L	L	L								
12									L	A	375	L	385	L	L	L								
13									L	400	L	375	L	375	L	L								
14									L	L	L	360H	L	385	L	L								
15									380	405	410	390H	L	L	370L	A								
16									L	L	L	385	L	365	L	L								
17									L	395	L	L	L	L	A									
18									L	I390A	390	355H	370L	I360A	L									
19									C	C	L	390	370L	L	L									
20									L	L	LH	395	385	L	L									
21									L	L	380L	400L	380	L	L									
22									405	L	L	370	LH	L	L									
23										L	405	L	355L	370L	365									
24										L	LH	375L	375	370	L	L								
25									L	365	LH	I380A	I370A	L	A									
26									L	405	385L	390	365L	L	L									
27										L	375	LH	L	LH	L									
28										L	370	390L	L	L	L									
29										L	390	400	L	L	L									
30										B	L	390	390	L	L									
31										L	405	425	L	380L	390	L								
Count									2	11	17	26	19	13	7									
Median									390	395	390	380	370	370	370									
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

A 8

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									260	245	265	290	280	265	265	255								
2									235	230	240	240	250	275	245	255								
3									230	240	250	270	265	275	270	260								
4									235	245	240	280	275	270	270	255								
5									240	245	240	255	265	265	260	255								
6									245	255	250	280	265	265	275	265								
7									235	230	230	255	265	275	270	255								
8									230	250	255	275	260	260	275	270								
9									225	230	255	255	270	270	260	245								
10									240	240	240	280	265	250	255	245								
11									240	245	255	255	255	260	265	250								
12									235	240	265	245	255	250	255	250								
13									230	230	240	265	240	245	265	250								
14									225	220	240	275	245	250	250	255								
15									235	240	240	240	250	255	265	250								
16									245	235	260	245	275	275	265	250								
17									235	230	245	240	250	270	255									
18									230	220	225	280	255	270	255									
19									C	C	250	245	255	255	245									
20									225	225	250	250	245	255	255									
21									220	225	240	245	250	255	250									
22									225	240	250	255	250	265	270									
23										225	250	265	265	265	260									
24										225	240	260	250	270	275	240								
25									220	255	250	240	255	260	255									
26									225	225	240	245	265	250	245									
27										240	265	235	240	270	275									
28										240	265	240	255	255	255									
29										230	250	240	250	265	255									
30										250	235	240	250	270	255									
31										225	210	240	250	235	230	240								
Count									23	30	31	31	31	31	31	18								
Median									235	240	250	255	255	265	260	250								
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

A 9

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	340	295	280	285	290	320	255	240	I230A	215	195	190H	190H	205H	225	230	250A	I255A	255	250	255	255	260	270
2	255	255	280	290	290	270	230	235	230	215	195H	200	180	190H	230	240	240	240	225	230	230	270	290	270
3	290	300	290	290	240	275	230	235	225	215	230	200	205	225	225	240	240	240	230	240	240	265	280	280
4	295	305	285	230	240	240	230	230	235	I230A	210	210	215	220	240	240	245	240	225	240	250	255	275	275
5	290	290	275	265	245	260	225	235	230	200	195H	210	195	230	225	230	240	240	230	235	255	255	260	280
6	295	280	280	270	255	290	220	225	210H	205	220	220	220	220	235	235	240	225	225	245	275	295	305	300
7	290	285	250	205	230	245	245	235	225	220	205	205	220	235	240	240	230	225	230	245	255	280	285	275
8	270	250	255	235	255	240	230	230	220	I225A	220	195	230	230	225	235	245	240	225	230	255	285	285	290
9	345	300	270	290	230	280	240	230	225	230	195	215	I230A	I225A	230	230	240	225	240	250	245	270	290	270
10	260	250	255	240	280	330	230	215	205H	215	220	205H	240	235	230	235	240	240	240	240	250	265	290	305
11	320	315	280	240	280	235	230	230	I230A	235	225	230	230	220	230	240	230	230	220	235	230	260	300	315
12	290	300	300	280	210	250	230	225H	230	I225A	225	235	215	220	230	240	240	240	240	235	210H	290	285	285
13	280	280	285	300	290	250	225	230	230	220	225	215	225	225	235	240	230	235	225	230	230	250	270	280
14	290	290	270	245	250	245	225	225	I225A	220	220	195H	230	I230A	225	240	230A	230	235	240	270	270	280	290
15	295	290	280	265	240	245	230	225	215	200	200	195H	225	I230A	230A	I240A	230	240A	240	245	220	290	295	290
16	300	275	240	220	215	270	240	225	225	I225A	I225A	195	225	225	230	230	235	I230A	240	I250A	240	280	295	300
17	295	275	270	280	250	255	225	220	225	205	225	230	230	230	I230A	250	230	225	240	240	225	230	300	290
18	320	300	310	295	260	235	230	220	220	I215A	195	190H	230	I245A	240	245	240	230	230	I245A	I250A	I275A	I300A	295
19	290	C	C	C	C	C	C	C	C	C	230	200	210	230	230	245	235	230	235	235	250A	I255A	I280A	I310A
20	290	295	310A	290	235	230	230	220	220	220	190H	195	220	230	240	240	240	230	215	235	230	255	290	310
21	350	320	310	285	275	280	245	225	230	215	205	195	205	230	240	240	240	225	220	230	240	255	260	250
22	295	290	270	245	240	240	235	215	210	225	210	200	205H	230	230	245	230	220	250	260	245	250	305	315
23	315	300	285	255	230	240	240	230	225	220	200	240	215	235	230	240	230	220	240	I250A	I270A	290	255	270
24	285	290	265	280	285	300	235	230	235	220	210H	215	205	230	245	240	235	215	215	240	260	270	280	300
25	330	I340A	320	270	230	240	240	220	230	195	220H	I230A	I230A	230	I240A	245	240	230	240	I255A	250	255	I270A	I290A
26	300	290	290	280	255	240	230	220	225	220	220	205	225	245	230	240	235	225	225	255	255	255	305	330
27	290	280	270	250	235	240	230	225	225	230	220	205H	230	210H	240	240	235	215	240	260	280	270	255	235
28	340	350	300	290	230	250	270	230	240	230	210	215	230	230	240	240	235	225	240	240	235	290	300	320
29	300	290	300	305	290	300	270	240	240	230	205	230	240	240	235	240	235	220	230	260	255	270	305	325
30	330	305	300	295	320	310	280	240	I335C	I230B	225	210	225	230	230	230	225	230	225	225	235	255	270	255
31	280	275	245	250	255	280	255	235	230	220	205	195	240	225	230	240	235	205	235	240	235	245	260	290
Count	31	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	295	290	280	275	250	250	230	230	225	220	210	205	225	230	230	240	235	230	230	240	250	265	285	290
U. Q.																								
L. Q.																								
Q. R.																								

h'F

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

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

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

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

h'Es

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

The Radio Research Laboratories, Japan

A11

IONOSPHERIC DATA

Oct. 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	f3	f5	f3	f2		f3	c2	c3	c3	c2	12	1		1	12	12	15	13	13	f3	f3	f		
2			f				c	h2								h 12	h212	12c2	12	f	f	f2	f3	f2
3	f2	f2	f2	f2	f2	f2	1	h2	h	c2	c2			12	12	12	13h2	12	c 1	f2	f2	f3	f2	f2
4		f2	f2	f	f		h2	c2	c2	c3	c	12		1				c2	c	f2	f2		f2	f
5								h2	h2			1		1	1		1	1	c	f2	f			
6							c	h	h2	c2		c					h 1	1		f		f	f	f2
7		f						h			h	h							12	f2	f	f2	f2	
8			f	f2						c2	12	12			1	12	1	h2	1	f	f	f		f
9			f2	f4	f2		c					c2	c2	13	h 12	14	13	13	f2	f2				
10		f2	f2	f				h2		c2	c2		12		12	12	12	12	13	f3	f2	f2		
11	f		f					h3	c3	h2	c2	h	c2		12		h				f	f3	f2	f2
12			f2	f2	f		h			c2	12	12	h 12	12	12	12	13	12	12	f3	f			
13				f				c2	h2	12	h 12		12	12	12	12	12	12			f2			
14		f	f	f	f			h2	c2	c	c2	12	12	13	12	13	15	16	f4	f3	f2	f		
15	f					f		h		1			12	13	13	13	15	14	13	f2	f	f		
16									c2	c3	c2	1	1	12	12		h3	c3	f6	f3	f3	f2	f2	f2
17	f2	f2	f2	f2	f3	f			h2	c 12	c2	12	13	12	12	13	12	c	f	f	f	f		f
18	f2	f2	f2	f3	f2			c2	c2	c2	c2	c2	c2	c3	c2	h2	h2	c4	f3	f4	f3	f4	f4	f2
19	f2										12	c2	1	12	12	12		c2	f2	f3	f4	f3	f4	f3
20	f2	f	f2	f2	f2	f		h2	c		1	12	12	12	1		h	c		f	f3	f2	f2	f2
21	f2	f	f2	f	f2				c2		1	12		12	1	h	1 h	1	f	f			f	f
22	f			f				h	c2	12		12	1			h2	h3	c3	f5	f3				
23		f				f		h2	h2	c2	c2	12	13	12		c4	h21	c3	f2	f3	f6		f2	
24	f2	f		f2	f3	f3	13		h	h2c2	h 12				c	c2	12	1			f3	f3	f2	f
25	f2f2	f3f2	f2	f	f	f2		h2		h		h2	h3		h2	h312	c3	c2	f3	f3	f3	f3	f3	f4
26	f3	f2	f2	f				h2	1	c2	12	1	1		h	h2	c4	h c2	f3	f4	f3	f3	f3	f3
27	f2							h	12	12	12	12	12	12	12	h 1	12	1			f2	f2	f2	f
28								h2	h2	c2	c3	12	12	13	12c	12	12	14	f2			f2	f3	f3
29	f2	f3	f3	f2	f					c2	12	12	1		12h	h 1	h2	h	f	f2	f2		f	f2
30	f2		f2			f		h			c	h 12	12	12			h	12	f		f			
31	f3	f		f							1		1	c			h		f		f2	f2	f	
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es | Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Oct. 1967 | foF2 | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	050	053	049	048	045	047	070	090	090	084	088	099	110	112	099	094	089	091	089	080	070	058	052	051
2	048	044	042	041	042	045	074	088	095	095	098	100	114	116	108	104	J100R	098	084	068	056	052	055	057
3	054	U052F	052	052F	049	053	074	096	J104R	097	111	118	130	126	126	125	119	J107R	085	069	061	057	057	055
4	052	052	051	048	040	040	070	088	109	113	104R	110	113	118	114	103	098	101	080	064	060	059	057	053
5	052	053	054	050	047	048	070	J105R	110	094	100	117	124	115	115	111	106R	U101R	094	065	057	056	057	054
6	053	056	054	053	046	047	072	091	094S	111	129	131	127	117	122	114	120	J104R	075	056	055	056	056	057
7	057	057	057	051	038	035	062	U103R	122	108	113	125	115	110	112	115	U103R	084	072	070	J066R	U066S	U066R	066
8	062	057	058	054	046	046	U075R	095	U098S	102	116	125	131	121	115	110	102	098S	073	058	060	059	056	055
9	049	052	053	045	041	039	067	097S	107	106	110	118	119	115	115	110	107	C	C	068	C	C	061	C
10	063	C	C	C	C	C	C	C	C	J101R	108	119	132	133	130	117	100	098	093	068	060	058	058	056
11	056	054	055	050	047H	045	072	099	112	122	129	140	133	124	128	120	109	J104R	090	068	058	051	050	048
12	I050C	048	045	046	042	035	061	084	108	120	130	140	129	121	128	122	114	J106R	091	073	062	053	057	057
13	057	055	052	048	049	052	070	095	109	I116C	121	119	125	125	132	127	109	095	084	061	059	053	056	055
14	051	051	054	050	048	048	074	098	101	108	120	126	132	128	123	122	124	105R	077	062	050	050	048	048
15	048	048	048	050	049	046	067	092	109	117	126	129	118	119	123	127	113	096	078	067	060	054	054	051
16	050	052	052	044	036	035	060	093	097	106	119	125	128	129	130	127	113	U105R	073	057	055	A	A	045
17	046	U047R	044	047	041	036	061	091	097R	104R	117	119	119	116	120	119	116	U099R	076	067	060	044	042	042
18	041	040	041	042	041	040	067	097	115	098R	101	116	124	123	128	127	121	117	096R	065	049F	051	049	050
19	048	050	050	052V	053	043	061	095	108	108	107	125	133	130	115	105R	111	093	065	059	045	036	042	044
20	046	046	046	049	047	043	067	098	103	092	108	121	122	119	120	116	J106R	110	080	060	048	041	039	U039R
21	038	040	042	042	039	042	066	U098R	112	112	110	118	121	119	C	C	098S	094	070	055	046	046	047	043
22	043	042	044	047	042	042	068	093	090	098	109	119	125	130	136	128	116	095	062	048	047	041	038	U039R
23	040	041	043	047	048	026	054	086	096	095	100	117	123	131	129	124	098R	084	A	060	060	057	063	052
24	051	051	053	050	050	051	U072S	092	111	118	116	128	127	131	131	130	118	097	066	060	062	051	047	046
25	043	042	044	047	044	037	058	089	097R	109R	123	123	125	118	119	111	U101R	088	078R	068	060	057	052	042
26	I039A	042	042	042	037	038	059	087	098	J106R	104	120	117	121	117	118	114	082	063	055	049	048	042	043
27	042	044	045	046	043	034	052	085	101R	113	113	116	117	122	121	123	109	089	063	058	059	059	057	037
28	035	037	037	038	039	033	054	J104R	123	129	126	120	119	123	118	119	U105R	095	072	078S	082S	057	052	051
29	051	049	046	046	044	045	065	097	117	140	126	113	114	123	128	122	112	094	075	072	U073R	062	057	054
30	054	053	048	049	050	050	064	113	130	130	133	134	137	135	140	128	113	103R	094	U077R	060	057	055	055
31	051	049	054	043	037	038	058	J107R	120	119	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Count	31	30	30	30	30	30	30	30	30	31	30	30	30	30	29	29	30	29	28	30	29	28	29	29
Median	050	050	048	048	044	042	067	095	108	108	113	120	124	122	122	119	109	098	078	065	060	055	055	051
U.Q.	053	053	053	050	048	047	070	098	112	117	123	125	129	128	128	126	114	104	087	068	060	058	057	055
L.Q.	043	044	044	045	041	037	061	090	097	098	107	117	118	118	115	111	102	094	072	059	052	050	048	044
Q.R.	010	009	009	005	007	010	009	008	015	019	016	008	011	010	013	015	012	010	015	009	008	008	009	011

The Radio Research Laboratories, Japan

foF2 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation | K1

IONOSPHERIC DATA

Oct. 1967 | foF1 | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	A	L	L	L	L										
2								L	L	L	L	L	L	L	L	L								
3									L	L	L	L	L	L	L	L	L							
4									L	L	L	L	L	L	L	L								
5									L	L	L	L	L	L	L	L								
6								L	L	L	L	L	L	L	C	L	L							
7									L	L	L	L	L	L	L	L								
8									L	L	L	L	L	L	L	L								
9									L	L	L	L	L	L	L	L								
10							C	C	C		L	L	L	L		L								
11										A	L	L	L	L	L									
12										L	L	L	L	L	L	L								
13									L	C	L	L	L	L	L	L								
14								L	L	L	L	L	L	L	A		A							
15								L	L	420	L	L	L	L	L	L								
16									L	L	L	L	L	A	L	L								
17									L	L	450L	L	L	L	L	L								
18								L	L	L	L	L	L	L	L	L								
19								L	L	L	L	L	L	L	L	L								
20									L	L	L	L	L	L	L									
21									L	L	L	460	L	L	C	C	C							
22									L	L	L	L	L	L	L									
23									L		L	L	L	L	L									
24								L		L	L	L	440L	L	L	L								
25									L	L	L	L	L	L	L									
26								L		L	L	L	A	L		L								
27										L	L	L	L	L	L									
28										L	L	L	L	L	L	L								
29										L	L	L	A	L	L									
30										B	L	L	L	L	L									
31										L	C	C	C	C	C	C	C							
Count										1	1	1	1											
Median										420	450L	460	440L											
U.Q.																								
L.Q.																								
Q.R.																								

foF1

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

The Radio Research Laboratories, Japan

K2

IONOSPHERIC DATA

Oct. 1967 | foE | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							180	A	A	A	A	350	A	350	320	300	A	A						
2							A	A	310	325	350	355	360	350	330	300	A	A						
3							180	260	A	325	A	A	350	I345A	330	310	270	180						
4							170	260	A	A	A	A	A	350	330	300	255	A						
5							160	255	300	340	350	350	360	340	325	300	A	A						
6							A	265	I290A	A	A	345	345	340	I330C	310	260	A						
7							195	240	A	A	A	360	350	345	340	A	A	A						
8							185	255	A	A	A	A	A	350	320	295	A	A						
9							A	245	A	315	325	330	345	A	A	A	A	C						
10							C	C	C	A	340R	A	350R	I350A	320	280	R	A						
11							A	A	A	A	A	A	A	335R	325	290	235	A						
12							B	260	300	325	A	340	A	335	325	290	A	A						
13							B	A	270	C	I330A	340	A	I340R	320	285	R	A						
14							B	A	A	A	A	A	A	A	A	A	A	A						
15							B	R	R	310	330	R	340	335	325	305	R	A						
16							B	240	290	320	A	A	A	A	A	U290A	R	A						
17							175	A	A	315	A	A	A	A	325	A	A	A						
18							B	215	A	A	A	A	A	R	320	315	A	A						
19							A	I230A	270	A	A	A	A	R	325	300	240	B						
20							B	240	300	320	A	A	I340A	325	325	310	235	B						
21							B	240	A	A	335	I345R	350	R	C	C	235	B						
22							B	230	I270A	A	I335A	R	A	340	330	285	230	A						
23							170	230	295	315	325	335	A	A	A	A	225	A						
24							170	225	270	A	345	A	360	A	A	A	A	A						
25							B	230	285	325	R	345	355	340	325	285	215	B						
26							B	220	280	320	A	355	A	A	A	A	A	A						
27							B	A	310	325	340	350	I355A	I345A	335	300	A	B						
28							B	235	A	A	A	355	I360A	355	335	A	220	B						
29							B	230	295	A	A	A	A	R	340	300	A	B						
30							B	230	A	B	A	A	A	335	325	280	215	S						
31							B	250R	310	305	C	C	C	C	C	C	C	C						
Count							9	22	16	14	11	14	12	18	23	21	12	1						
Median							175	240	290	320	335	350	350	340	325	300	235	180						
U.Q.																								
L.Q.																								
Q.R.																								

foE

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

The Radio Research Laboratories, Japan

K 3

IONOSPHERIC DATA

Oct. 1967 | foEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J025	020M	018	E	E	E013B	024	J033	J033	J052	J039	031G	044	029G	G	025G	J051	J028	J027	J024	E015S	J022	J025	J029
2	022	020M	E011B	E	E013B	E	019	J029	J038	G	G	G	G	025G	G	034	033	027	J025	022M	E013B	E015S	J033	J029
3	J033	J055	J032	E	020	J022	024	030	035	038	040	037	J025G	J039	023G	019G	032	027	J056	J029	024	J025	J028	023
4	022	E013B	E	E	J019	020	023	029	033	035	J036	J038	J038	022G	J025G	039	J042	J043	J039	J026	J051	J029	020M	E013B
5	E015S	J015	E012B	E	J018	E012B	025	029	J026G	032G	G	G	025G	032G	020G	032	031	J024	J025	E016S	E012B	E014B	E015S	020
6	019	J014	J015	J014	J055	J014	021	029	J039	J036	037	030G	G	G	C	G	031	J028	J025	J025	J016	J026	J021	J023
7	J022	E	E011B	E	E	E	G	030	035	036	040	039	031G	G	G	035	026	024	J025	J025	J025	J024	J018	J018
8	J025	J013	J016	J015	E011B	E013B	G	J056	034	035	J041	J084	044	025G	035	J030	032	J029	J028	J024	J017	J016	020	E015S
9	E015S	E014B	J015	E	E	J014	023	028	031	036	035	035	038	036	J037	032	033	C	C	J044	C	C	E015S	C
10	E015S	C	C	C	C	C	C	C	C	036	033G	J048	J030G	J036	021G	J036	J024G	J036	J038	J030	029M	J025	J017	E015S
11	021M	020M	J023	J019	E	J015	021	J031	J041	J074	J052	J044	J042	032G	J026G	020G	022G	023	J026	J025	J028	023M	J025	021M
12	C	E013B	E	J016	021	E015S	020	J026	G	J029G	J042	038	J041	J028G	024G	026G	J032	J026	J026	J036	J026	024	J024	022M
13	018	020M	J018	E013B	E	E012B	019	J029	032	C	039	029G	J041	031G	027G	020G	020G	J029	J038	J026	E014B	E013B	E013B	E014B
14	J016	E016S	E014B	E013B	E014B	E014B	E017B	J030	J036	J039	042	J041	042	J041	J087	J040	J055	J029	J053	J028	J029	J029	J037	J025
15	J019	020	E015S	E014B	E013B	E015S	021	029	G	025G	026G	J034G	029G	025G	021G	021G	021G	020	024	J025	J025	020	E016S	E015S
16	J018	J016	J017	E	J021	J017	018	G	035	J042	J043	J054	J113	J066	J043	035	J029	022	E016S	E015S	J025	J089	J074	J033
17	J033	E013B	J014	021	J015	E012B	G	J030	035	J036	044	046	J041	J043	041	J039	J030	J029	J024	044	J026	J016	J028	J023
18	J015	J016	J024	J022	019	E014B	E015B	027	034	036	J044	045	J040	029G	034	036	032	J025	J030	J108	J047	J054	J029	J018
19	J025	J052	J030	J042	J016	J017	021	025	033	036	036	J037	038	024G	023G	032	J043	J033	E017S	018	J029	J027	J037	J036
20	J026	J025	J025	021	E014B	E011B	E016B	G	G	027G	036	037	042	030G	030G	032	027	E016B	J026	J026	J015	J021	J018	J026
21	J026	J030	J024	J016	J017	E014B	017	G	J036	J034	G	G	J042	031G	C	C	028	023	J028	J024	E015S	E014B	E014B	E014B
22	020	020	020	E016S	E	E	028	027	034	035	036	033G	J041	G	045	J051	041	J038	J037	J070	E014B	E013B	E016S	J016
23	J027	J015	J015	E012B	E	E012B	020	027	032	J042	J051	J042	J042	J050	J055	J051	035	025	069	J053	J029	J053	J025	J042
24	021	019	J015	E	E	E014B	020	G	032	036	041	043	G	043	J038	J038	J035	J038	J026	J029	E016S	J039	J023	021
25	J017	J014	E015S	J017	J016	E011B	E016B	G	033	038	040	044	042	039	044	J042	030	J030	J042	J036	J029	J054	J054	J043
26	J055	J038	020	E015S	E015S	E011B	E017B	028	032	036	J038	040	J053	J051	J064	034	J038	J025	J036	J028	J029	J033	E014B	E015S
27	J030	J024	J029	J016	J015	J015	E014B	030	034	036	J029G	J030G	J041	039	031G	J029G	J030	020	021	018	E015S	J036	J025	J025
28	021	E016S	E014B	E012B	E012B	E015S	E016B	029	034	J041	042	030G	J041	030G	038	035	033	J030	J029	J042	E015S	E014B	J018	J036
29	J023	020	J015	E	E	E014B	E016B	G	G	J041	J044	044	J070	G	038	035	J041	J029	J051	J036	J051	J038	J021	J017
30	J017	J018	J018	J015	J013	021	E014B	026	036	E084B	038	J038	J039	027G	J028G	025G	022G	J025	J026	021	E016S	E012B	J016	J030
31	J019	E	E012B	J016	E	E013B	E016B	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	29	30	29	29	30	29	29	30	29
Median	J021	017	J015	E014B	E014B	E014B	018	028	034	036	039	038	J041	G	G	034	032	J027	J027	J026	J025	J024	J021	J022
U.Q.	025	020	020	016	017	015	021	030	035	039	042	044	042	039	040	037	035	030	038	036	029	034	028	029
L.Q.	018	E016	E014	E	E	E012	E016	025	032	035	036	G	G	029	026	028	028	024	025	024	E015	E015	016	E015
Q.R.	007	D004	D006			D003	D005	005	003	004	006			010	014	009	007	006	013	012	D014	D019	012	D014

foEs

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

IONOSPHERIC DATA

Oct. 1967 | fbEs 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	017	E	E			B	017	030	033	050	036	027G	037	026G		025G	038	026	019	E	S	E	019	E
2	E	E	B		B		015	025	020					025G		033	030	024	020	E	B	S	025	017
3	025	029	015		E	017	021	G	032	036	039	037	025G	037	E023R	018G	030	024	035	025	016	019	E	E
4	E	B			E	E	020	028	033	033	036	038	037	E022R	025G	033	040	034	028	021	020	E	E	B
5	S	E	B		E	B	023	028	024G	026G			025G	026G	019G	020	026	020	016	S	B	B	S	E
6	E	E	012	E	E	E	020	027	033	033	035	030G			C		027	025	015	016	015	014	015	E
7	016		B					027	032	034	035	038	030G			031	026	020	023	021	016	023	017	017
8	016	E	E	E	B	B		027	031	033	038	042	040	025G	026	021G	029	024	024	018	017	E	E	S
9	S	B	E			E	020	027	031	035	035	035	038	036	036	030	028	C	C	023	C	C	S	C
10	S	C	C	C	C	C	C	C	C	032	032G	045	030G	034	021G	025	E024R	025	025	022	017	017	016	S
11	E	E	019	016		E	018	026	033	053	045	044	040	032G	026G	020G	019G	018	022	022	026	016	019	E
12	C	B		013	015	S	020	G		028G	037	038	036	026G	024G	026G	030	025	020	019	020	020	015	017
13	E	E	014	B		B	017	025	032	C	034	027G	039	028G	027G	020G	020G	017	029	016	B	B	B	B
14	013	S	B	B	B	B	B	027	031	033	037	038	040	040	086	039	050	018	016	025	023	026	033	019
15	016	016	S	B	B	S	019	029		025G	026G	034G	028G	E025R	021G	019G	020G	019	019	017	017	016	S	S
16	016	015	E		012	014	018		033	040	041	040	041	065	037	032	027	021	S	S	021	A	A	025
17	017	B	E	E	E	B		029	033	034	040	040	040	040	040	037	028	027	015	040	017	014	027	017
18	E	E	017	015	E	B	B	025	032	036	044	040	029	029G	033	033	027	018	026	052	037	027	018	016
19	019	040	027	033	016	015	017	025	032	034	036	035	035	024G	023G	031	040	030	S	015	026	020	019	017
20	017	020	023	017	B	B	B			026G	034	E037R	040	026G	026G	032	026	B	025	019	E	016	016	019
21	018	025	017	015	016	B	016		033	033			026	026G	C	C	027	022	025	022	S	B	B	B
22	E	016	E	S			017	026	032	033	035	033G	040		040	040	037	027	018	040	B	B	S	E
23	015	015	014	B		B	020	026	032	037	046	040	040	047	040	040	031	015	A	040	027	019	021	027
24	016	016	E			B	G		032	035	040	038		039	038	037	029	037	025	020	S	018	016	016
25	E	E	S	013	E	B	B		031	037	040	040	040	038	043	040	025	025	033	026	026	040	041	026
26	A	025	016	S	S	B	B	026	031	036	037	040	053	046	052	032	033	017	030	020	019	025	B	S
27	E	019	017	011	E	E	B	026	033	035	028G	026G	040	038	027G	027G	026	019	017	016	S	025	016	015
28	016	S	B	B	B	S	B	028	033	040	038	027G	040	026G	036	031	033	026	016	018	S	B	016	016
29	016	E	E			B	B			033	035	040	064		038	032	040	027	025	025	025	027	018	016
30	016	015	014	012	012	016	B	025	031	B	037	037	038	026G	027G	024G	018G	017	018	015	S	B	015	021
31	E		B	E		B	B				C	C	C	C	C	C	C	C	C	C	C	C	C	C
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

fbEs

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

The Radio Research Laboratories, Japan

K5

IONOSPHERIC DATA

Oct. 1967 | f-min | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E015S	013	010	010	010	013	014	013	015	016	018	025	015	018	018	015	011	010	010	013	E015S	E015S	011	E015S
2	E015S	012	011	010	013	010	011	014	014	017	016	019	020	019	018	014	014	015	E015S	E015S	013	E015S	014	E015S
3	011	012	010	010	013	010	011	014	015	017	016	017	016	015	015	012	016	011	E015S	E015S	E015S	E015S	E015S	013
4	013	013	010	010	013	013	014	014	015	017	016	019	017	016	013	014	011	011	E015S	E015S	013	E015S	014	013
5	E015S	013	012	010	011	012	010	011	015	014	017	016	017	013	012	013	011	012	E015S	E016S	012	014	E015S	014
6	014	011	010	010	010	010	015	014	016	016	026	025	025	017	E085C	016	013	014	011	011	011	013	011	014
7	011	010	011	010	E	010	016	014	013	017	016	017	026	027	026	015	014	012	013	014	010	014	E015S	E015S
8	013	011	011	010	011	013	014	013	013	013	016	017	018	016	014	014	013	013	E015S	E015S	E015S	014	014	E015S
9	E015S	014	012	010	010	013	013	016	014	015	016	016	018	015	015	016	016	C	C	E020C	C	C	E015S	C
10	E015S	C	C	C	C	C	C	C	C	017	015	025	019	018	016	013	014	011	E015S	012	E015S	011	013	E015S
11	013	014	013	011	010	011	014	013	015	016	015	025	017	017	014	012	011	010	E015S	E015S	013	013	013	E015S
12	C	013	010	012	010	E015S	015	012	015	013	012	014	020	016	016	016	010	011	E015S	E015S	E015S	E015S	014	014
13	E015S	E015S	011	013	010	012	015	016	016	C	017	017	015	013	013	015	013	010	012	011	014	013	013	014
14	011	E016S	014	013	014	014	017	013	013	015	013	016	015	016	014	014	015	011	E015S	014	E015S	E015S	013	E015S
15	E015S	014	E015S	014	013	E015S	015	014	014	016	018	019	016	016	015	016	016	014	E015S	E015S	E016S	015	E016S	E015S
16	013	010	014	010	010	010	015	015	015	016	018	018	025	016	018	015	015	014	E016S	E015S	E015S	E015S	E015S	013
17	013	013	012	E015S	010	012	015	015	013	016	016	026	018	026	016	016	016	014	010	011	E015S	010	E015S	012
18	014	010	012	010	014	014	015	014	014	018	026	017	018	025	019	016	015	014	014	014	014	014	E015S	015
19	014	014	014	E	010	010	010	016	016	015	018	018	017	017	018	017	016	017	E017S	014	012	013	014	014
20	012	014	012	013	014	011	016	016	017	017	017	017	017	013	014	013	015	016	014	014	014	014	013	013
21	013	E015S	014	014	010	014	015	013	014	015	015	016	016	014	C	C	016	016	013	014	E015S	014	014	014
22	014	014	014	E016S	010	010	014	012	012	014	016	013	019	016	016	017	016	015	E015S	014	014	013	E016S	014
23	014	010	010	012	010	012	014	014	014	016	015	016	025	025	015	016	014	011	012	012	E016S	E016S	E015S	E015S
24	014	E015S	014	010	E	014	016	014	013	016	017	016	016	016	016	015	013	013	014	014	E016S	E015S	012	E015S
25	014	013	E015S	010	010	011	016	013	013	013	016	016	017	016	016	015	015	012	E015S	E015S	E015S	E015S	E015S	014
26	E016S	013	014	E015S	E015S	011	017	014	015	018	017	016	026	025	019	015	013	011	E015S	013	014	014	014	E015S
27	013	011	012	010	012	012	014	016	013	015	016	016	016	017	015	017	011	015	E015S	015	E015S	012	E015S	014
28	E015S	E016S	014	012	012	E015S	016	014	013	015	017	016	018	016	013	012	012	016	E015S	E015S	E015S	014	012	014
29	014	014	010	010	010	014	016	015	014	013	016	018	027	030	026	018	015	014	013	E015S	014	013	E015S	011
30	013	013	012	010	E	E015S	014	015	014	084	025	025	025	017	015	014	012	E015S	E015S	013	E016S	012	011	012
31	013	010	012	011	010	013	016	016	014	015	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	30	29	29	30	29	29	30	29
Median	014	012	012	010	010	012	015	014	014	016	016	017	018	016	016	015	014	013	E015S	012	E015S	014	012	014
U.Q.																								
L.Q.																								
Q.R.																								

f-min

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

The Radio Research Laboratories, Japan

K6

IONOSPHERIC DATA

Oct. 1967 | M(3000) F2 | 0.01 | 135° E Mean Time (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	260	275	290	270	265	265	330	325	335	325	320	295	300	315	315	320	315	325	315	315	310	290	290	290
2	290	275	275	270	275	290	350	350	340	340	315	300	305	310	315	315	J320R	335	320	325	305	275	280	295
3	295	U280F	270	290F	275	285	325	345	J325R	320	315	295	305	295	295	310	320	J330R	330	315	320	295	290	285
4	275	275	295	305	300	300	345	330	340	345	315R	300	295	290	315	310	320	325	320	310	300	300	290	290
5	285	285	295	300	280	280	325	J345R	355	315	295	300	305	295	295	305	305R	U320R	315	325	285	290	285	280
6	275	280	295	290	265	270	325	325	320S	310	310	310	300	285	300	305	310	J330R	315	290	275	275	270	275
7	275	285	300	325	310	275	315	U330R	335	325	310	300	300	295	295	310	U325R	320	295	295	J290R	U280S	U285R	290
8	290	285	290	300	285	285	U335R	335	U340S	315	295	295	300	295	300	315	315	325S	315	290	285	285	280	280
9	250	275	315	285	275	260	320	325S	330	340	300	305	305	295	310	310	310	C	C	295	C	C	280	C
10	290	C	C	C	C	C	C	C	C	J305R	300	295	305	300	305	315	310	315	310	310	295	285	285	265
11	265	260	280	290	265H	290	320	335	320	320	295	315	310	300	305	310	315	J320R	320	325	305	285	275	270
12	I280C	260	275	295	275	295	330	320	325	315	310	320	300	295	305	305	315	J330R	320	305	305	265	290	295
13	290	290	290	270	265	310	345	345	330	I320C	310	290	295	295	305	315	330	315	325	300	300	300	290	290
14	275	275	290	295	290	300	330	340	330	320	310	300	305	295	305	310	320	330R	320	305	270	285	290	280
15	280	275	280	295	275	280	325	310	315	315	305	310	300	295	300	315	320	320	310	290	290	270	285	285
16	280	295	320	310	290	265	315	335	325	325	305	300	295	290	300	310	315	U330R	335	295	310	A	A	275
17	270	U295R	285	305	310	285	330	345	325R	325R	315	310	305	295	300	305	315	U330R	315	305	295	285	270	275
18	270	275	275	280	290	300	325	340	335	330R	290	295	295	290	295	305	305	315	325R	320	305F	290	270	280
19	275	280	290	310V	330	325	340	340	345	335	305	295	295	295	305	310R	325	335	330	320	325	280	265	280
20	270	275	265	295	315	300	345	340	355	295	315	300	300	300	300	310	J330R	335	335	305	300	285	290	U275R
21	275	265	280	300	295	295	325	U345R	340	335	310	305	295	300	C	C	325S	325	335	305	285	290	300	295
22	285	280	290	315	325	300	330	360	340	310	335	300	295	290	305	310	320	325	315	285	310	285	280	U265R
23	270	275	270	315	355	275	315	335	340	320	290	300	290	300	300	310	315R	325	A	290	290	280	310	305
24	275	275	290	285	280	280	U330S	335	315	320	310	295	295	290	300	305	320	325	315	285	290	300	285	275
25	270	260	270	290	320	340	330	330	320R	305R	315	305	310	305	305	315	U320R	315	305R	305	315	300	310	325
26	I260A	270	280	280	285	295	340	340	340	J330R	305	310	305	300	310	315	320	330	305	300	290	305	285	270
27	265	265	285	300	340	285	315	325	325R	315	325	310	300	295	295	305	315	320	295	290	285	305	310	300
28	255	250	260	260	285	280	290	J310R	330	325	310	310	280	290	295	310	U305R	320	290	305S	305S	280	265	255
29	275	285	275	275	270	265	290	330	310	315	305	300	290	290	295	305	305	310	290	290	U295R	285	265	255
30	265	265	260	255	255	260	280	320	325	300	315	300	300	290	305	305	310	300R	310	U310R	315	290	290	300
31	305	300	315	300	300	275	315	J345R	340	335	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Count	31	30	30	30	30	30	30	30	30	31	30	30	30	30	29	29	30	29	28	30	29	28	29	29
Median	275	275	285	295	285	285	325	335	330	320	310	300	300	295	300	310	315	325	315	305	300	285	285	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

K7

IONOSPHERIC DATA

Oct. 1967 | M(3000) F1 0.01 | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	A	L	L	L	L										
2								L	L	L	L	L	L	L	L	L								
3									L	L	L	L	L	L	L	L	L							
4									L	L	L	L	L	L	L	L								
5									L	L	L	L	L	L	L	L								
6								L	L	L	L	L	L	L	C	L	L							
7									L	L	L	L	L	L	L	L								
8									L	L	L	L	L	L	L	L								
9									L	L	L	L	L	L	L	L								
10							C	C	C		L	L	L	L		L								
11										A	L	L	L	L	L									
12										L	L	L	L	L	L	L								
13									L	C	L	L	L	L	L	L								
14								L	L	L	L	L	L	L	A		A							
15								L	L	395	L	L	L	L	L	L								
16									L	L	L	L	L	A	L	L								
17									L	L	390L	L	L	L	L	L								
18								L	L	L	L	L	L	L	L	L								
19								L	L	L	L	L	L	L	L	L								
20									L	L	L	L	L	L	L									
21									L	L	L	400	L	L	C	C	C							
22									L	L	L	L	L	L	L									
23									L		L	L	L	L	L									
24								L		L	L	L	405L	L	L	L								
25									L	L	L	L	L	L	L									
26								L		L	L	L	A	L		L								
27										L	L	L	L	L	L									
28										L	L	L	L	L	L	L								
29										L	L	L	A	L	L									
30										B	L	L	L	L	L									
31										L	C	C	C	C	C	C	C							
Count										1	1	1	1											
Median										395	390L	400	405L											
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

K8

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								255	250	250	250	280	290	260										
2								230	230	245	255	250	250	260	255	260								
3									230	240	250	250	260	260	270	255	250							
4									240	235	245	260	260	280	275	250								
5									240	225	240	280	275	285	265	260								
6								235	235	250	265	260	265	265	E280C	255	245							
7									235	235	255	280	255	290	275	260								
8									230	260	275	275	260	265	275	260								
9									245	240	250	270	275	260	270	250								
10							C	C	C		270	270	275	260		250								
11										260	250	260	255	250	260									
12										245	260	255	250	255	250	250								
13									250	I240C	250	265	265	275	265	250								
14								230	225	235	270	255	260	275	E280A		245							
15								240	235	235	255	265	265	280	265	255								
16									230	255	255	275	280	295	265	250								
17									225	250	255	255	275	285	275	260								
18								225	235	220	280	260	265	270	265	260								
19								230	230	230	245	275	270	260	260	260								
20									225	220	275	255	260	255	265									
21									230	245	235	245	275	270	C	C	C							
22									225	245	250	285	275	280	265									
23									230		325	280	290	285	260									
24								220		250	245	295	260	275	260	260								
25									230	230	255	250	265	260	260									
26								230		235	230	255	255	275		270								
27										255	230	280	275	255	270									
28										245	230	250	270	260	260	260								
29										250	250	250	275	290	260									
30										E250B	240	250	255	255	250									
31										230	C	C	C	C	C	C	C							
Count								9	21	29	30	30	30	30	26	19	3							
Median								230	230	240	250	260	265	270	265	260	245							
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

K9

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	325	280	250	275	260	310	240	240	240	A	200	205	200	200	240	240	250	245	240	230	240	240	255	275
2	255	255	290	290	290	275	230	225	225	205	200	195	200	185H	240	240	245	240	225	210	225	275	305	260
3	290	350	295	250	240	260	225	240	225	205	205	200	195H	210	230	240	240	225	230	240	230	255	260	260
4	280	275	255	220	250	255	240	225	220	205	200	210	210	220	230	245	245	240	220	240	255	260	270	255
5	280	290	255	240	250	275	230	240	205	210	205	205	200H	205H	230	230	250	235	230	220	250	260	260	265
6	295	280	255	255	245	300	230	220	220	210	195H	230	215	225	I230C	240	240	225	210	230	270	295	315	300
7	295	270	235	215	E225E	275	240	230	230	220	210	215	225	225	230	250	235	220	250	255	275	290	280	270
8	260	275	250	220	245	260	230	230	220	205	220	220	225	220	230	235	245	230	230	245	260	270	280	280
9	335	305	235	220	230	305	255	225	230H	225	220	200	210	225	230	230	250	C	C	270	C	C	290	C
10	275	C	C	C	C	C	C	C	C	225H	200H	E250A	205	230	240	230	240	240	245	225	240	275	290	300
11	305	320	290	250	225H	270	240	230	240	A	240	E250A	220	210	225	240	240	230	225	230	250	250	300	300
12	I295C	285	300	260	210	245	240	225	220	200	205	230	225	205	240	240	240	225	230	220	250	310	295	275
13	260	270	270	295	295	245	220	230	220	I215C	210	210	220	230	225	240	230	225	230	225	245	230	270	270
14	295	305	275	240	255	255	230	220	220	215	200H	195	235	230	A	210	A	225	205	245	260	295	315	295
15	290	285	285	255	230	250	225	230	220H	210	205H	215	230	230	230	230	230	225	225	230	255	260	290	275
16	290	270	230	215	240	300	235	230	225	230	220	240	240	A	240	230	235	225	210	230	245	A	A	325
17	305	265	250	255	230	255	230	225	210	210	210	235	225	230	250	245	235	230	225A	275	225	225	335A	280
18	290	300	300	300	250	250	235	230	230	210	230	240	225	235	225	250	235	230	220	E290A	A	295	300	280
19	295	E355A	315	300	230	225	230	225	225	220	210	205H	195H	235	235	235	250	220	220	230	215	270	305	290
20	305	330	330	280	225	230	235	225	225	210	205	230	225	230	230	250	235	235	215	230	215	255	280	305
21	310	355	300	265	245	275	250	225	225	210	210	200	240	235	C	C	235	225	220	240	230	255	260	250
22	265	275	270	250	220	255	230	215	215	215	200	210H	235	235	265	250	230	215	205	I255A	235	260	280	310
23	310	300	295	255	215	230	250	225	220	230	240	225H	230	275	250	245	225	230	A	305	290	295	260	275
24	290	295	270	255	E260E	285	235	215	230	235	230	210	200	230	245	250	230	210	210	260	235	255	275	295
25	310	330	305	275	225	220	235	225	220	230	245	230	230	235	250	245	230	220	250	245	245	E285A	E290A	255A
26	A	E330A	290	270	250	255	230	230	225	220	220	200H	I250A	255	265	225	235	210	255	250	260	275	265	295
27	315	310	280	260	220	275	230	230	230	230	235	200H	230	230	250	255	230	210	215	250	280	265	230	230
28	360	360	315	300	255	255	265	240	240	230	230	220	230	230	250	240	230	230	235	260	235	250	290	295
29	280	265	250	265	280	300	265	230	235	230	225	235	A	240	250	245	235	230	235	260	250	275	300	335
30	305	280	290	305	325	330	275	240	230	B	210	220	220	240	240	240	225	225	225	225	240	255	270	275
31	250	250	250	220	220	295	255	240	230	225	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Count	30	30	30	30	30	30	30	30	30	28	30	30	29	29	28	29	29	29	28	30	28	28	29	29
Median	295	285	280	255	240	260	235	230	225	215	210	210	225	230	240	240	235	225	225	240	245	260	280	280
U.Q.																								
L.Q.																								
Q.R.																								

h'F

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

The Radio Research Laboratories, Japan

K10

IONOSPHERIC DATA

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

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

h'Es

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

The Radio Research Laboratories, Japan

K11

IONOSPHERIC DATA

Oct. 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	f2	f	f				1	13	12	12	12	1	12	1		1	13	12	f3	f2		f	f2	f2
2	f	f					1	c	1					1		h1	h212	h212	f3	f2			f3	f2
3	f4	f4	f2		f2	f2	h2	h	1	c1	1	1	1	12	1	1	h2	c21	f3	f4	f2	f3	f2	f
4	f				f	f	h	c	c2	1	12	12	12	1	1	h2	h21	c3	f3	f4	f4	f2	f	
5		f			f		h21	h12	1	1			1	1	1	1	1	12	f2					f
6	f	f	f	f	f	f	h2	h2	c	c	1	1					h	h2	f	f2	f	f2	f2	f2
7	f2							h	c	1	1	1	1			1	1	14	f3	f4	f2	f3	f2	f2
8	f2	f	f	f				1h	1	12	12	12	12	1	1	1	1h	12	f2	f	f	f2	f	
9			f			f	1h	h2	c	h	h	h	h1	c	12	12	12			f2				
10										c	1	12	12	12	1	1	1	13	f3	f3	f3	f2	f	
11	f	f	f3	f		f	h2	c2	c2	c3	c2	c2	c2	1	1	1	12	12	f2	f3	f3	f2	f3	f2
12				f	f		h	c		1	1	h	12	1	1	1	13	13	f2	f2	f2	f2	f	f
13	f2	f	f				h	c	c2		12	1	12	1	1	1	12	1	f3	f				
14	f							c	c2	c	1	12	1	1	12	13	12	12	f	f3	f2	f2	f4	f2
15	f	f					h2	h		1	1	12	1	1	1	1	1	12	f2	f	f	f		
16	f	f	f		f2	f2	h		c2	c2	12	12	1	12	12	1h	h	h2			f3	f3	f3	f3
17	f2		f	f	f			12	13	c	12	1	12	1	c2	c2	12	12	f3	f5	f	f	f2	f2
18	f	f	f2	f2	f			h	c2	12	12	1	1	1	h	h	1	12	f	f4	f2	f	f2	f
19	f3	f3	f3	f3	f	f	1	h	c2	1	12	1	1	1	1	h1	h2	12		f	f	f3	f2	f2
20	f2	f2	f	f						1	1	1	12	1	1	h1	h1		f3	f2	f	f2	f2	f2
21	f	f2	f	f	f		h		1	12			1	12			h21	h2	f2	f3				
22	f	f	f				h2	h	c	c	1	1	12		h	h	c3	h213	ff	f3				f
23	f2	f	f				h	h	h	c1	c2	c	1	h212	h1	12	h2	h212	f6	f7	f6	f2	f2	f2
24	f	f	f				1		h1	h1	h1	12		1	12	13	15	14	f4	f3		f3	f2	f2
25	f	f		f2	f				h	h	h	h	h	h1	h12	h2	h	c212	f3	f2	f2	f4	f4	f5
26	f6	f3	f					h	h	h	c1	h1	c	12	c3	h1	13	c1	f4	f2	f2	f3		
27	f2	f2	f2	f	f	f		1	1	h12	1	1	12	1	1	1	12	1	f	f		f3	f	f
28	f2							h2	c2	12	1	1	1	1	h1	1	h41	12	f2	f3			f2	f2
29	f2	f	f							1	1	12	12		h	h	13	12	f3	f4	f3	f5	f2	f2
30	f2	f2	f	f	f	f		h	c2		1	1	12	1	1	12	12	12	f2	f2			f	f2
31	f			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

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	090	100	080	110	090	085	055	085	090	065	060	070	095	070	080	050	060	060	075	090	105	095	095
2	100	115	085	070	090	095	045	055	050	070	055	085	090	090-	065	065	J080R	070	080	070	095	080	085	075
3	065	U090F	120	085F	095	090	090	045	J065R	060	095	100	090	080	080	060	060	J080R	090	080	060	105	095	100
4	085	110	065	110	085	085	050	080	080	080	085R	085	065	095	090	085	055	065	080	085	070	065	065	090
5	080	075	100	095	095	090	065	J060R	045	090	080	095	080	085	100	075	085R	U085R	070	065	100	095	090	090
6	080	085	085	090	085	065	080	070	060S	080	065	065	080	080	065	100	085	J070R	065	080	100	070	080	080
7	085	095	070	065	085	100	065	U060R	060	085	100	085	090	080	090	095	U085R	060	080	085	J065R	U085S	U080R	085
8	075	100	090	125	090	080	U065R	075	U080S	075	080	075	090	080	095	075	085	080S	080	085	095	095	085	090
9	095	080	075	095	100	075	065	065S	065	085	090	080	090	110	090	085	070	C	C	070	C	C	095	C
10	090	C	C	C	C	C	C	C	C	J095R	075	090	090	080	095	090	095	055	080	095	100	100	085	105
11	105	095	085	095	100H	075	060	080	070	075	090	090	080	080	080	095	065	J055R	060	060	095	095	110	105
12	I090C	100	080	105	140	130	075	090	060	090	080	090	095	115	080	085	080	J055R	060	090	085	100	075	060
13	090	095	095	100	085	085	060	050	050	I080C	075	100	075	085	075	070	070	060	060	075	090	085	095	090
14	090	075	080	055	065	070	065	060	055	070	080	075	085	070	090	080	075	070R	075	090	105	095	080	080
15	090	080	090	065	100	085	060	065	065	075	070	065	080	085	085	060	090	065	070	085	090	105	075	085
16	080	070	080	065	095	095	080	060	065	055	085	075	075	070	075	075	090	U055R	055	085	080	A	A	080
17	095	U080R	065	075	065	065	065	055	055R	060R	070	090	085	095	080	095	085	U065R	060	070	080	075	095	095
18	080	060	075	075	060	065	065	070	060	090R	085	100	090	080	070	065	070	065	065R	080	090F	080	090	080
19	080	080	065	060V	065	085	060	045	065	070	070	080	070	075	090	060R	060	065	060	070	070	080	095	080
20	100	065	080	065	080	075	060	065	060	110	065	080	080	065	080	100	J070R	065	070	090	095	085	070	U095R
21	070	085	075	065	085	065	065	U060R	050	070	070	090	095	080	C	C	065S	065	060	075	085	080	065	065
22	080	085	080	080	065	065	070	065	075	065	075	065	080	075	085	080	085	060	125	A	085	090	095	U070R
23	060	080	080	070	055	100	075	075	065	065	085	075	070	075	070	070	080R	065	A	085	090	090	065	090
24	080	080	075	085	080	070	U065S	070	080	075	085	070	070	065	075	060	075	070	065	095	100	070	090	080
25	065	080	085	085	055	080	070	070	060R	120R	070	075	070	075	080	060	U070R	085	070R	080	075	095	090	080
26	I075A	080	085	080	085	060	055	065	085	J060R	110	065	080	070	080	065	070	080	080	080	095	075	080	095
27	075	080	085	085	065	090	080	070	095R	080	095	080	095	075	095	085	075	090	095	095	085	065	080	090
28	070	055	080	085	085	100	100	J075R	065	070	100	085	075	085	095	085	U080R	070	075	070S	080S	110	100	095
29	085	085	090	085	080	085	095	065	075	075	075	090	095	075	075	090	085	080	090	080	U085R	090	085	080
30	090	105	075	090	075	085	095	095	075	085	090	090	075	075	090	090	090	080R	090	U070R	095	100	095	065
31	090	080	055	095	090	085	055	J050R	060	065	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Count	31	30	30	30	30	30	30	30	30	31	30	30	30	30	29	29	30	29	28	29	29	28	29	29
Median	085	080	080	085	085	085	070	065	065	075	080	080	080	080	080	080	080	065	070	080	090	090	085	085
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

K13

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	410	360	345	380	390	410	260	290	255	260	290	340	330	300	300	300	300	290	290	290	300	345	350	350
2	340	350	380	380	375	350	250	245	250	260	300	315	310	305	300	300	J290R	255	270	280	305	370	355	340
3	340	U370F	375	355F	360	350	255	260	J255R	290	300	315	305	320	325	300	295	J270R	260	295	295	340	360	355
4	380	380	340	300	315	315	255	260	260	255	305R	315	335	350	305	305	300	290	270	305	340	335	350	350
5	365	375	345	310	350	365	290	J260R	255	285	325	330	320	335	335	325	310R	U290R	290	285	350	345	345	360
6	380	360	340	340	395	395	280	275	290S	320	315	315	335	360	350	315	305	J270R	295	350	360	380	395	390
7	395	350	325	290	295	365	295	U285R	275	285	305	325	325	335	335	300	U290R	290	335	340	J360R	U360S	U365R	340
8	340	345	350	320	350	350	U275R	270	U265S	305	350	335	325	335	325	310	300	285S	285	345	350	355	365	360
9	445	385	300	335	350	385	295	275S	285	260	315	320	310	340	310	305	300	C	C	330	C	C	350	C
10	350	C	C	C	C	C	C	C	C	J305R	325	345	310	310	305	305	300	300	305	300	345	350	365	390
11	395	405	365	350	400H	340	285	260	295	300	315	305	310	320	315	300	300	J300R	285	290	300	350	380	390
12	I370C	400	370	340	355	310	275	260	295	300	305	300	305	330	310	315	300	J290R	290	305	310	395	370	350
13	340	350	350	395	390	315	260	260	290	I280C	305	320	335	335	325	305	285	295	285	335	345	340	350	350
14	380	390	350	345	350	335	275	275	280	290	315	325	315	335	310	315	285	275R	290	305	380	350	345	360
15	355	365	360	335	360	355	285	285	300	300	320	310	325	335	330	315	285	295	305	345	345	385	360	345
16	365	340	295	295	330	375	295	280	280	300	315	330	330	345	325	305	295	U280R	270	340	300	A	A	375
17	375	U335R	340	310	300	340	285	255	290R	290R	310	305	315	330	330	310	295	U280R	295	325	300	340	385	350
18	370	390	370	365	340	325	290	260	275	260R	335	330	325	340	330	315	305	285	275R	295	315F	345	370	365
19	370	365	360	325V	280	290	275	275	265	275	320	335	335	335	320	320R	290	270	280	295	275	350	375	360
20	390	395	420	340	300	325	265	260	250	300	330	325	325	335	325	320	J280R	280	270	300	310	350	345	U355R
21	375	400	350	330	310	335	290	U260R	280	280	320	325	330	325	C	C	285S	275	275	325	345	345	330	335
22	350	360	345	315	280	330	280	245	260	305	285	335	330	340	310	305	300	290	295	A	310	345	355	U385R
23	385	365	375	310	245	355	295	270	270	290	340	330	355	330	325	310	290R	285	A	345	355	360	310	325
24	370	380	350	350	360	375	U285S	270	300	280	310	335	335	345	330	320	290	285	290	355	340	340	355	375
25	395	400	395	340	295	265	290	275	290R	300R	305	310	305	325	310	300	U290R	295	315R	315	305	330	300	290
26	I395A	380	365	345	340	330	275	265	260	J290R	310	315	320	330	320	305	295	265	320	325	345	315	350	380
27	400	395	350	330	265	350	295	275	290R	300	270	315	330	350	340	310	300	295	335	350	360	330	300	300
28	435	445	405	400	340	350	345	J310R	280	280	300	310	375	340	320	315	U300R	290	350	330S	305S	370	400	410
29	380	355	360	370	380	400	340	285	310	290	315	325	335	360	330	315	315	295	335	340	U340R	350	395	440
30	405	390	405	410	440	405	350	285	280	310	300	305	320	350	310	305	305	320R	305	U300R	300	350	350	335
31	310	315	300	300	295	365	300	J260R	260	275	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Count	31	30	30	30	30	30	30	30	30	31	30	30	30	30	29	29	30	29	28	29	29	28	29	29
Median	375	370	350	340	345	350	285	270	280	290	310	325	325	335	325	310	300	290	290	320	330	350	355	355
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

K14

IONOSPHERIC DATA

Oct. 1967 | foF2 | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	062	060	060	051	045	044	055	088S	085	087	099	104	123	137	136	128	J123S	116	110	094S	067S	066	062S	055
2	052	043	039	038	038	039	050	086	094S	095S	092	107	126	128	132	125	112	101S	095	U072S	J051S	051S	053	054
3	054S	050	051S	047	043	043	J051S	079S	099S	101	110	118	141R	142R	144R	145R	137S	125	J096S	071S	068	065	059	058
4	059	058S	054S	048	041	039	049S	087	112	116	107	116	129S	132	140S	128S	122	115	104	J072S	I070S	U072S	I065S	J061S
5	060S	057	054S	050	043	042	050S	102S	102	090S	098	119	125	127	130	128	123	122	104	068	059	061	058	057
6	055	057	064	048	042	042	047	089S	U093S	111	125	136S	129R	142R	U149R	145	J140S	127S	J098S	U074S	062	061S	U060S	057
7	055	057	059	052	034	027	I040S	U092S	115	118S	111	129	U152R	156R	I157R	U156S	J136S	117	J098S	095S	I083S	070S	063S	060
8	056	052	052	053	034	033	046	081	108	103	111	138	150R	156	165R	I155R	132	113	097S	084S	071S	I070S	065	062S
9	055	055	058	046	038	038	046	081	108	113	103	111	132	138S	U148S	140R	126	122S	113	U090S	080	I075S	067S	068S
10	064S	058	056	055	038	U038S	I048S	084	087S	097	108	129	137S	135	141	123	120	119	112	088	J071S	062S	058	U054S
11	053	055	054	U055R	049	044	047	085S	102S	112	U132R	146R	155S	144R	150R	144R	J136S	129S	U125R	091S	I080S	U070S	056	054S
12	057	062S	054	056	045H	026	036S	U072S	J099S	123	121	130	141	142	141	137S	124	115	112	084	067S	059	059	062
13	062S	065	058	051	048	053	049	J076S	099S	121	132	123	131	146	143	129	117	111	J098S	073	U066S	065S	058	060
14	058	053	052	053	049	047	050S	079S	J095S	107	118	134	133	133	134	135	135	123	102	063S	063	064	061	060
15	058	049	045	048	045	036	043	074S	J097S	111	124	119	120	127	140	138	128	111	110	087	081	J078S	064S	060
16	057	060	055	047	043	032	040	J074S	090	102	124	130	140R	145R	150	141R	128S	119	104	080S	070S	067	052	052S
17	053S	054	050	053S	054	035	040	083	093S	102	121	131	130	132	147R	146R	147R	142	121	U089S	088R	068S	054S	051S
18	051S	045	045	048	045	037	042	083	106	095S	100	117	124	136S	147S	144R	129	131R	125	075	J063S	J064S	057	058
19	058	058	057R	059S	056	033	037S	079S	100	106	117	138	154S	I164R	I163S	147S	129	115	095S	065	052	048	043	045
20	047	045	043	F	048F	035F	044	092S	094S	094	106	120	137	143	148S	138	128	120	114	087	069S	U067S	046	042
21	040	039	040	043	046	042	046	080	101	110	112	124	126	136	145	130	109	105	101	064	055	058	054	050
22	044	042	043	046	047	038	043	081	088	088	116	118	130	154S	I156R	I157S	U148R	U132S	U114R	U077S	072S	066S	053	048
23	048	045S	043	051	057	024H	033	I073S	086	093S	104R	118	125	136S	141R	131	114	101	098S	069S	065S	J063S	065	J053S
24	050	050	049	052	050	046	051	J076S	I095S	110	119S	126	131	140	144	150	141	131	107R	I085S	U090S	086S	U067S	049
25	044	042	041	044	046	038	034	J075S	I093S	I112C	125	125	126	132	136S	130S	123	120S	115	J104S	J101S	I100S	J082S	U053S
26	049	043	041S	039S	I039A	039	U041S	J073S	J094S	102	120	119	115	131	136	142S	125	118	104	087	I079A	064	061	056S
27	051	051	044V	045	048	031	035S	072S	U094S	096	112	122	116	131	142	135	127	119	109	U084S	083	088	062	039
28	035	035	038	039	038	036	039S	080S	118	127	134	120	127	130	139	133	123	117	108	J097S	108	087S	I076S	S
29	S	062	062	057	047	045	048S	096S	110	136	134	111	119	138	146	136	115	116	109	I094S	U090S	085	I076S	I069S
30	064	065	052	054S	050	052	056	I098S	126	121	130	137S	141	148	158S	141	124	119S	114	J097S	085	081S	I074S	069S
31	061S	058	057	051	043	031	U037S	080S	109	114	125	125	125	145S	155	153S	U148S	144S	131R	I123S	U116R	J099S	U064S	J054S
Count	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
Median	055	054	052	050	045	038	046	081S	099	107	117	123	130	138	144	138	127	119	108	084S	071S	067S	061	056
U.Q.	058	058	057	053	048	043	049	087	108	114	125	130	140	145	150	145	136	125	114	091	083	078	065	060
L.Q.	050	045	043	046	041	033	040	076	093	096	107	118	125	132	140	130	123	115	098	072	065	063	056	052
Q.R.	008	013	014	007	007	010	009	011	015	018	018	012	015	013	010	015	013	010	016	019	018	015	009	008

foF2

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

The Radio Research Laboratories, Japan

Y1

IONOSPHERIC DATA

Oct. 1967 | foF1 | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	A	500L	LH	LH	LH	L	L	L						
2									L	L	LH	460L	LH	L	530L	L	L							
3									L	L	L	U520H	LH	LH	U580H	U520H	L							
4									L	L	LH	LH	U540H	U610H	U570H	L	L							
5									L	LH	LH	LH	LH	L	LH	L	L							
6									L	LH	LH	L	U550L	LH	550L	L	L	L						
7									L	L	LH	LH	L	L	540L	L	L							
8										L	LH	580H	LH	LH	550H	L	L							
9									L	L	430L	LH	580L	LH	L	L	L							
10									U360L	400L	LH	550H	LH	LH	490	L	L							
11										L	A	L	U510L	C	550H	L	L							
12										L	L	LH	L	L	L	L								
13									LH	L	L	LH	LH	LH	L	L	L							
14										LH	L	LH	L	LH	LH	LH	L							
15										L	440H	LH	LH	LH	LH	L								
16										L	U500L	LH	LH	L	U520L	U450L	L							
17									L	U450L	L	LH	480H	LH	U057L	L	L							
18									L	350	LH	U500L	LH	LH	L	L	410L							
19								260L	LH	L	LH	L	LH	LH	LH	L								
20									L	L	LH	LH	L	L	L	L	320L							
21										C	LH	L	LH	LH	L	L								
22									L	L	L	L	LH	L	L	L	L							
23									L	LH	LH	LH	L	L	A	A	A							
24									LH	L	L	L	L	L	L	LH	L							
25									L	C	L	L	500L	L	LH	L	L	270						
26										L	L	480L	L	L	L	L	L							
27											L	490L	LH	LH	LH	L								
28										L	L	LH	LH	LH	L	L								
29										L	L	L	LH	LH	L	L								
30										B	A	L	LH	L	L	L	L							
31										LH	L	L	L	LH	L	L	L							
Count								1	1	3	3	8	6	1	10	2	2	1						
Median								260L	U360L	400L	440L	500L	U520L	U610H	550L	U480	360L	270						
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

52

IONOSPHERIC DATA

Oct. 1967 | foE | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	200	A	A	A	A	U360R	350R	340	320	290	240H	S					
2							S	220H	270	325	340	350	360	355R	340	320	285	230	B					
3							S	235	275	305	320	I330A	360R	360	355	320	285	235	S					
4							S	220H	270H	I300A	I315A	I340A	360	I365A	355	340	305	225	B					
5							S	220H	265	320	345	360	360	360	350H	330	290	240H	S					
6							S	220	270	305	320	I350R	360R	A	A	330	I285A	220	S					
7							S	230H	275	315	320	I330A	A	A	A	A	A	A	B					
8							S	220	280	310	I325A	345	350R	360	I350A	330	290	230	S					
9							S	210	260	310H	330	345	360	345	I335A	330	I285A	225	B					
10							S	200	265	315	340	345	345R	345R	335R	310	285	220	S					
11							S	180	255	A	A	A	R	I350R	340	R	A	A	B					
12							S	205	280	310	330	340	I345R	350	345	315	I280R	A	S					
13							S	200	I260A	I300A	I320R	340	360	360R	340	320	290H	220H	B					
14							S	210	I265A	310	330	340R	350	350	340	I325A	290	A	S					
15							S	215H	280	310	A	A	A	350	340	315	270	A	S					
16							S	205	260	300	A	A	A	A	A	A	A	A	S					
17							S	190H	260H	290	I310A	350	360R	I360A	A	A	A	A	S					
18							S	205	250	290	I325A	I335A	360	350	335	320	A	A	B					
19							S	I205A	255	I295A	330	I340A	I350A	360	I345A	325	A	A	S					
20							S	200	270H	310	330	330	I350R	350	345	320	280	220H	B					
21							B	195	260H	310	330	350	350	350	350	330	280	A	S					
22							S	180	260	315	A	A	A	360	345	325	280	205	B					
23							S	180	270H	310H	330	350	I350A	350	330	300	A	A	S					
24							S	190H	270H	300H	335H	360	355	355	330	A	A	A	S					
25							S	190	260	I305C	320	A	A	A	340	315	280	A	S					
26							S	200	285H	315	335	350	350	I350A	350	330	280	A	S					
27							B	205H	275	315	340	350	355	350	350	330	A	A	B					
28							S	190	280	300	A	A	360	365	350	320	290	215H	S					
29							S	200	I270A	I315R	A	A	B	B	360	330	300	A	B					
30							S	200	270	I310B	340	A	A	A	345	I315A	265	210H	S					
31							S	190	275	310	325	345	340	I345A	340	320	I275A	A	B					
Count								31	30	29	24	22	23	25	27	26	22	14						
Median								200	270	310	330	345	355	350	345	320	285	220						
U.Q.																								
L.Q.																								
Q.R.																								

foE

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

The Radio Research Laboratories, Japan

Y3

IONOSPHERIC DATA

Oct. 1967 | foEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J025	E015B	E016B	E014B	E015B	E014B	E014S	022	J035	J045	J060	044	032G	026G	029G	023G	G	026	J026	021	E014S	E015S	E015S	E015S
2	E014B	E015S	E	E013B	E015B	E014B	021	023	J026G	029G	027G	027G	G	030G	G	035	031	027	020	017	E014B	E012B	E015B	J030
3	J052	J024	J023	021	023	018	022	025	J030	033	037	035	032G	029G	030G	J029G	J026G	027	020	J021	J018	J026	J025	J025
4	021	020	020	021	021	E012B	020	J026	031	J040	039	035	030G	038	020G	G	G	031	J029	J043	J084	J028	J028	J021
5	021	021	021	020	019	E015B	020	025	031	035	025G	020G	020G	G	G	020G	G	G	022	E015S	J026	E015S	J024	J022
6	021	021	021	E	E	E011B	J013S	030	036	033	040	G	031G	039	036	036	J052	G	016	J032	J029	J038	J027	020
7	021	J022	E015B	E	E	E011B	J013S	024	031	040	040	041	040	039	037	035	030	J037	J029	020	022	020	J022	J020
8	020	020	E014B	E	E	E013B	020	G	G	J030G	034	035	031G	J033G	J047	J041	046	J051	J028	J030	J030	J024	J022	022
9	021	021	E	E	E	E	E014S	G	030	033	040	045	041	040	J084	G	029	023	020	J052	J025	J024	J026	J028
10	021	023	021	019	E	E015B	E015S	G	033	J034	029G	G	028G	025G	037	021G	020G	027	J029	J024	021	E015S	020	019
11	019	017	E012B	E011B	E014B	E011B	E012S	021	034	040	J077	J054	034G	030G	029G	031G	038	033	J035	J053	J044	J041	021	J029
12	J025	J018	021	E014B	019	E014B	021	024	J029	G	029G	J039	026G	G	G	020G	J027G	J039	J070	J090	J076	J031	J026	J026
13	021	E015S	E016B	E014B	E015B	E015B	J022	022	J042	J035	J033	027G	021G	020G	020G	019G	031	024	021	J024	020	E015S	020	E015S
14	E015S	021	021	E020B	E018B	E015B	021	G	028	G	031G	030G	026G	032G	031G	033	J067	J051	J054	J108	J063	J026	020	E015S
15	J024	E016S	E015B	021	020	E014B	021	024	G	J028G	J035	J036	J040	J042	036	036	034	023	020	E015S	020	E015S	E015S	E011B
16	021	J020	J021	J018	E	E012B	E015S	023	031	035	039	040	039	038	034	034	030	024	J018	J031	J042	J042	J023	021
17	021	022	019	021	E011B	020	021	G	029	035	037	029G	027G	038	036	J046	J043	J061	049	J043	J046	J029	J022	J028
18	020	J030	J029	J025	J019	E014B	E015S	014G	029	031	035	J049	038	039	041	040	J051	J030	J084	040	J026	J039	021	E015B
19	E015B	E	J028	J045	J022	E011B	020	021	029	033	J042	J052	J046	032G	035	032G	029	031	J047	J046	J030	J034	E014S	020
20	019	020	020	020	J030	E	J031	G	018G	021G	021G	036	025G	041	039	019G	020G	028	027	J033	J022	E014S	E015S	E015B
21	E014B	E014B	E014B	E	E014B	E	E012B	022	028	030G	026G	028G	J032G	J030G	040	037	041	035	J027	J029	E015B	020	021	E015B
22	E015S	J024	J026	J022	020	020	E012S	G	033	J041	J056	043	J041	J038	043	037	019G	020G	E017B	E014S	J026	021	J020	E015S
23	E012B	E014B	020	E014B	E015B	E011B	E014S	G	019G	035	037	039	J049	042	J050	J052	J051	J037	J033	J025	J026	J026	J021	021
24	J025	E	021	E013B	E014B	E	E012S	G	029	J046	043	047	047	J048	J049	046	J045	J044	J035	J029	J027	022	J033	020
25	022	J023	E017B	E015B	E	E014B	021	020	J030	C	J048	J053	J044	J054	037	J073	034	J042	J028	022	023	022	J021	J024
26	020	024	E015B	050	J044	J025	020	G	020G	036	043	042	043	J061	039	036	J083	J139	104	J067	J121	093	J043	J027
27	J019	024	E015B	E011B	E	E013B	E012B	025	031	034	J032G	021G	038	037	038	J055	J056	028	J029	J025	024	022	024	020
28	020	E015B	E014B	E017B	E014B	E	020	G	J026G	037	J049	038	044	044	046	036	G	030	J052	J058	J034	J025	020	E015S
29	E015S	E011B	E	E	E015B	E012B	E015S	G	J030	031G	038	J041	039	E043B	G	G	037	J038	022	021	021	J080	J054	J041
30	J026	J031	J030	020	E	E015B	021	023	031	E075B	047	J056	J042	J045	J034G	J034	020G	G	021	E015S	020	022	E015S	021
31	E015S	E012B	E012B	E011B	E	E018B	021	020	G	032	035	035	037	J041	035	036	031	020	J029	020	018	021	E015S	E015S
Count	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	021	020	019	E015	E015	E014B	020	021	030	034	037	038	037	038	036	035	031	030	J028	J029	J026	024	J021	020
U.Q.	021	023	021	021	019	E015	021	024	031	036	043	044	041	042	040	037	045	038	035	043	034	031	025	025
L.Q.	E015	E015	E014	E011	E	E011	E014	G	G	G	G	G	G	G	G	G	G	024	021	021	020	020	020	E015
Q.R.	D006	D008	D007	D010			D007											014	014	022	014	011	005	D010

foEs

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

The Radio Research Laboratories, Japan

Y4

IONOSPHERIC DATA

Oct. 1967 | f_bEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	022	B	B	B	B	B	S	G	032	041	047	038	032G	026G	027G	023G		G	S	E	S	S	S	S
2	B	S		B	B	B	G	G	024G	024G	026G	026G		030G		G	G	G	G	E	B	B	B	022
3	017	017	019	015	015	E	G	G	G	G	037	E035R	032G	029G	029G	025G	017G	G	G	021	015	015	018	016
4	E	E	E	013	014	B	G	G	G	034	039	E035R	029G	E038R	020G			030	028	042	037	022	026	E
5	E	E	015	014	014	B	G	G	G	G	025G	020G	020G			020G			G	S	E	S	019	E
6	E	E	E			B	S	G	G	G	038		031G	037	E036R	035	032		016	031	021	028	023	E
7	E	016	B			B	S	G	G	036	037	038	E040R	E039R	E037R	035	030	033	E029R	E	015	E	022	017
8	E	E	B			B	G			030G	034	032	030G	032G	036	029	037	041	027	023	016	021	018	E
9	E	E					S		G	G	038	038	040	039	044		029	022	020	044	024	E	022	017
10	E	E	015	012		B	S		032	029	029G		028G	025G	026	021G	019G	G	026	017	E	S	E	018
11	017	016	B	B	B	B	S	G	033	039	077	043	E034R	030G	029G	031G	037	032	033	037	040	029	E	028
12	025	015	014	B	E	B	S	E024R	024		029G	029	026G			020G	027G	027	054	043	020	030	017	017
13	017	S	B	B	B	B	G	G	029	033	E033R	026G	021G	020G	020G	019G	G	G	017	016	E	S	E	S
14	S	019	021	B	B	B	S		028		030G	029G	026G	027G	030G	E033R	038	036	045	042	043	018	E	S
15	018	S	B	E	014	B	S	G		028G	034	035	037	029	036	034	030	022	017	S	E	S	S	B
16	E	017	017	017		B	S	G	030	034	039	039	037	037	E034R	033	029	024	016	028	025	025	018	E
17	E	015	E	014	B	E	S		029	034	035	029G	027G	037	036	041	033	032	041	026	039	026	020	025
18	E	025	025	019	015	B	S	014G	G	G	035	041	038	037	040	036	037	025	041	025	024	026	014	B
19	B		018	024	017	B	S	020	028	032	028	042	037	024G	E035R	031G	028	028	032	036	018	025	S	017
20	E	018	016	016	018		019		016G	019G	019G	036	024G	041	038	019G	018G	026	020	E	E	S	S	B
21	B	B	B		B		B	G	G	029G	026G	026G	026G	029G	040	037	040	031	024	022	B	E	014	B
22	S	017	018	016	E	E	S		032	029	040	038	040	030	041	035	018G	016G	B	S	018	E	016	S
23	B	B	E	B	B	B	S		019G	035	037	039	049	041	049	049	041	036	030	023	E	E	015	E
24	017		014	B	B		S		G	025	040	041	044	044	041	037	034	042	028	028	017	E	020	E
25	E	022	B	B		B	S	S	G	C	044	043	039	045	G	055	030	022	017	E	E	E	E	018
26	016	E	B	027	A	E	S		020G	G	037	040	G	045	G	G	033	080	016	046	A	039	018	016
27	017	E	B	B		B	B	G	G	G	027G	021G	G	037	037	026	030	024	022	E	E	E	016	E
28	E	B	B	B	B		S		024G	036	035	037	042	042	041	G		026	023	038	023	019	E	S
29	S	B			B	B	S		028	E031R	037	038	E039R	B			032	035	020	E	E	014	043	025
30	017	025	024	E		B	G	G	G	B	046	044	038	041	032G	033	019G		S	S	E	E	S	E
31	S	B	B	B		B	S	G		G	G	G	G	036	033	030	029	020	026	E	017	E	S	S
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs

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

The Radio Research Laboratories, Japan

Y5

IONOSPHERIC DATA

Oct. 1967 | f-min | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E015S	015	016	014	015	014	E014S	011	E	015	018	018	022	018	018	015	015	E015S	E015S	E015S	E014S	E015S	E015S	E015S
2	014	E015S	E	013	015	014	E013S	012	012	016	017	022	018	018	017	016	012	011	015	E015S	014	012	015	013
3	E015S	012	E	E	E	014	E015S	E015S	012	015	017	022	027	024	017	014	014	012	E015S	E015S	014	012	014	015
4	015	014	014	E	E	012	E015S	011	012	014	016	018	018	017	018	017	015	015	012	E015S	E015S	E015S	012	015
5	014	012	011	E	E	015	E015S	012	011	015	015	016	017	024	018	018	015	015	E015S	E015S	E015S	E015S	E015S	E014S
6	E015S	E015S	014	E	E	011	E015S	E014S	013	015	017	024	024	023	029	023	015	014	E015S	012	012	E015S	E015S	E015S
7	E015S	E015S	015	E	E	011	E015S	012	012	016	017	019	026	033	022	017	015	E014S	012	E015S	E	E015S	E014S	E015S
8	E014S	E015S	014	E	E	013	E015S	E015S	012	015	017	016	020	022	017	015	015	012	E014S	012	E015S	E015S	E015S	E015S
9	E015S	E015S	E	E	E	E	E014S	012	014	015	015	018	017	017	018	015	014	012	014	013	014	E015S	011	012
10	E015S	015	E	E	E	015	E015S	012	012	012	017	016	017	022	015	015	014	012	E015S	E015S	E015S	E015S	E015S	E015S
11	015	014	012	011	014	011	E012S	012	015	016	017	025	028	017	016	017	015	015	014	014	E015S	E015S	E015S	E015S
12	E015S	014	011	014	014	014	E012S	012	014	015	015	016	017	025	022	015	014	E014S	E015S	E015S	E015S	E015S	E015S	E015S
13	E015S	E015S	016	014	015	015	E015S	012	015	015	015	018	017	017	017	016	015	E015S	011	E015S	E015S	E015S	E015S	E015S
14	E015S	017	017	020	018	015	E015S	015	012	015	015	015	016	016	015	015	013	012	E015S	E015S	E015S	E015S	E015S	E015S
15	E014S	E016S	015	014	E	014	E015S	012	014	014	017	016	022	019	018	015	012	E015S	E015S	E015S	E015S	E015S	E015S	011
16	E015S	E015S	E	015	E	012	E015S	012	012	012	017	015	017	019	018	014	013	011	E015S	E015S	E015S	E014S	E015S	E015S
17	015	011	012	E	011	015	E015S	014	011	013	015	015	017	018	016	018	016	015	E015S	014	E015S	E015S	012	012
18	013	011	E	E	E	014	E015S	012	012	015	018	018	015	017	021	018	015	014	014	013	016	E015S	011	015
19	015	E	015	015	014	011	E015S	012	012	015	015	017	016	015	022	022	015	014	E015S	012	E015S	E015S	E014S	E015S
20	E015S	E015S	014	E	E	E	E015S	E014S	015	014	015	015	016	017	014	014	015	015	014	015	E015S	E014S	E015S	015
21	014	014	014	E	014	E	012	012	015	015	015	015	015	015	015	015	012	012	E015S	013	015	E015S	011	015
22	E015S	E015S	E	E	015	015	E012S	E015S	012	014	014	016	018	016	016	014	014	012	017	E014S	E014S	E015S	E015S	E015S
23	012	014	014	014	015	011	E014S	012	012	015	015	019	017	017	015	015	015	011	E015S	E015S	E015S	E015S	012	E015S
24	E015S	E	E	013	014	E	E012S	012	012	015	015	016	016	015	018	017	012	E015S	E015S	E015S	E015S	E015S	E015S	E015S
25	E015S	015	017	015	E	014	E015S	E015S	012	C	015	018	019	017	017	015	014	E015S	E012S	E015S	E015S	E015S	E015S	E015S
26	E015S	E015S	015	015	015	016	E015S	014	012	016	017	022	021	022	016	016	014	012	E015S	E015S	E015S	012	E015S	E015S
27	013	E015S	015	011	E	013	012	012	012	015	015	015	018	016	017	015	015	012	015	012	E015S	E014S	E015S	E015S
28	014	015	014	017	014	E	E015S	E015S	012	015	017	017	016	016	015	015	016	015	E015S	E015S	012	E015S	E014S	E015S
29	E015S	011	E	E	015	012	E015S	012	015	015	015	017	035	043	023	022	017	E015S	012	E015S	E015S	E	E015S	E015S
30	E015S	012	E	011	E	015	E015S	E015S	015	075	023	022	018	022	023	018	014	E015S	E015S	E015S	E015S	016	E015S	E015S
31	E015S	012	012	011	E	018	E015S	E015S	013	015	015	017	017	017	018	012	012	012	015	E015S	E015S	E015S	E015S	E015S
Count	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	E015S	013	014	011	E	014	E015S	012	012	015	015	017	017	017	017	015	015	013	E015S	E015S	E015S	E015S	E015S	E015S
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

Y6

IONOSPHERIC DATA

Oct. 1967 | M(3000) F2 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	270	270	300	280	265	275	295	350S	345	315	315	295	285	295	305	305	J290S	320	335	320S	285S	290	280S	275
2	290	285	275	265	265	280	320	350	340S	350S	305	285	295	300	305	315	325	325S	330	U320S	J275S	280S	285	285
3	295S	285	305S	295	285	295	J300S	325S	340S	320	305	290	300R	300R	290R	300R	320S	340	J335S	300S	295	305	290	285
4	280	300S	300S	305	300	305	300S	335	340	340	315	300	300S	295	295S	305S	310	315	330	J290S	I280S	U295S	I290S	J285S
5	295S	290	305S	315	290	285	300S	360S	360	350S	300	305	295	285	285	295	300	310	325	305	270	280	280	280
6	265	280	330	285	265	250	280	340S	U340S	315	315	305S	295R	280R	U285R	295	J300S	320S	J325S	U295S	275	280S	U285S	280
7	275	290	315	345	360	265	I285S	U330S	340	330S	300	290	U295R	285R	I290R	U295S	J300S	300	J300S	295S	I290S	290S	285S	285
8	285	275	290	330	295	290	290	335	345	325	285	295	290R	290	295R	I295R	305	315	300S	300S	285S	I290S	295	280S
9	260	260	310	305	275	275	290	315	330	330	320	290	295	290S	U295S	300R	300	310S	320	U300S	290	I280S	280S	285S
10	310S	295	305	325	305	U265S	I280S	355	360S	325	295	300	305S	290	305	295	300	305	315	300	J305S	290S	285	U275S
11	260	270	275	U295R	280	295	300	335S	330S	295	U295R	300R	310S	285R	295R	300R	J300S	310S	U320R	320S	I300S	U305S	270	260S
12	280	290S	260	300	360H	290	280S	U325S	J315S	325	305	310	300	295	290	300S	305	305	325	310	285S	270	260	275
13	285S	295	300	275	270	300	320	J330S	325S	315	320	300	280	295	300	300	310	315	J325S	300	U280S	295S	285	285
14	280	285	290	300	310	300	300S	330S	J340S	315	305	315	300	300	295	305	320	335	335	295S	275	280	285	285
15	290	285	270	290	295	285	295	325S	J320S	320	325	310	290	290	300	300	315	305	320	300	270	J280S	270S	270
16	270	290	310	300	330	285	280	J325S	340	300	310	300	300R	295R	300	305R	310S	315	315	300S	290S	305	280	285S
17	285S	300	300	305S	345	310	300	345	340S	310	315	310	300	295	295R	300R	315R	325	320	U310S	305R	320S	270S	275S
18	285S	265	280	285	310	310	300	350	355	315S	300	300	285	290S	300S	310R	305	315R	335	325	J270S	J290S	295	280
19	290	285	290R	310S	355	305	300S	335S	340	325	300	290	290S	I295R	I300S	300S	315	330	325S	345	290	285	275	275
20	275	270	275	F	340F	300F	295	350S	360S	345	295	290	300	295	305S	305	300	315	325	315	285S	U315S	270	275
21	275	260	280	300	305	285	300	325	335	325	305	300	295	285	300	315	305	315	335	345	260	280	305	305
22	295	265	275	295	355	315	290	335	355	315	310	315	285	300S	I300R	I300S	U305R	U305S	U300R	U285S	255S	290S	275	255
23	280	285S	285	335	370	235H	280	I330S	350	320S	305R	295	295	290S	305R	315	305	305	315S	310S	280S	J285S	315	J300S
24	270	285	285	290	320	285	300	J330S	I325S	330	305	315	295	295	290	305	305	315	310R	I290S	U280S	315S	U310S	265
25	275	260	265	280	330	335	295	J335S	I340S	I320C	315	300	305	295	300S	300S	305	310S	310	J315S	J290S	I305S	J305S	U330S
26	290	280	280S	285S	I280A	305	U335S	J350S	J345S	345	315	310	295	290	295	305S	310	325	315	295	I290A	290	290	265S
27	275	275	280V	310	345	265	285S	325S	U330S	315	305	310	280	280	290	305	300	300	310	U265S	275	295	305	270
28	250	250	265	270	265	280	265S	300S	320	325	320	310	290	285	295	300	300	305	305	J280S	295	300S	I280S	S
29	S	275	290	300	295	265	270S	325S	315	310	305	295	275	280	305	295	285	300	300	I290S	U290S	295	I280S	I270S
30	275	285	280	270S	260	255	270	I310S	325	315	300	300S	285	285	295S	295	305	295S	300	J300S	295	285S	I310S	315S
31	305S	295	330	335	350	250	U275S	325S	345	330	320	310	290	295S	300	305S	U295S	305S	305R	I295S	U285R	J325S	U295S	J260S
Count	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
Median	280	285	290	300	305	285	295	330S	340	320	305	300	295	290	295	300	305	315	320	300S	285S	290S	285	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

Y7

IONOSPHERIC DATA

Oct. 1967 | M(3000) F1 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	A	380L	LH	LH	LH	L	L	L						
2									L	L	LH	415L	LH	L	350L	L	L							
3									L	L	L	U380H	LH	LH	U340H	U360H	L							
4									L	L	LH	LH	U365H	U360H	U350H	L	L							
5									L	LH	LH	LH	LH	L	LH	L	L							
6									L	LH	LH	L	U360L	LH	355L	L	L	L						
7									L	L	LH	LH	L	L	335L	L	L							
8										L	LH	340H	LH	LH	325H	L	L							
9									L	L	395L	LH	340L	LH	L	L	L							
10									U410L	410L	LH	355H	LH	LH	365	L	L							
11										L	A	L	U370L	C	365H	L	L							
12										L	L	LH	L	L	L	L								
13									LH	L	L	LH	LH	LH	L	L	L							
14										LH	L	LH	L	LH	LH	LH	L							
15										L	410H	LH	LH	LH	LH	L								
16										L	U360L	LH	LH	L	U345L	U385L	L							
17									L	U410L	L	LH	395H	LH	U350L	L	L							
18									L	430	LH	U380L	LH	LH	L	L	395L							
19								395L	LH	L	LH	L	LH	LH	LH	L								
20									L	L	LH	LH	L	L	L	L	405L							
21										C	LH	L	LH	LH	L	L								
22									L	L	L	L	LH	L	L	L	L							
23									L	LH	LH	LH	L	L	A	A	A							
24									LH	L	L	L	L	L	L	LH	L							
25									L	C	L	L	380L	L	LH	L	L	400						
26										L	L	385L	L	L	L	L	L							
27											L	375L	LH	LH	LH	L								
28										L	L	LH	LH	LH	L	L								
29										L	L	L	LH	LH	L	L								
30										B	A	L	LH	L	L	L	L							
31										LH	L	L	L	LH	L	L	L							
Count								1	1	3	3	8	6	1	10	2	2	1						
Median								395L	U410L	410L	395L	380L	U370L	U360H	350L	U370	400L	400						
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

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									230	230	250	255	300	290	270	270	250	250						
2									225	230	305	245	290	275	290	265	260							
3									240	230	270	255	280	270	300	280	255							
4									245	235	250	285	270	280	285	265	255							
5									230	225	275	275	265	275	290	260	255							
6									240	250	255	260	275	305	300	275	250	240						
7									235	245	250	300	290	300	300	280	245							
8										245	300	300	275	300	290	270	250							
9									245	235	240	300	295	300	285	255	240							
10									225	230	265	290	255	300	260	240	250							
11										260	290	250	270	I270C	290	265	250							
12										230	255	260	280	270	275	250								
13									250	245	250	250	305	280	250	245	245							
14										250	255	260	265	275	290	275	255							
15										250	250	250	285	290	280	250								
16										245	255	270	290	295	280	250	240							
17									225	235	245	260	250	300	295	270	260							
18									230	225	300	270	300	300	285	255	245							
19								230	235	230	250	270	290	280	275	255								
20									225	235	300	250	300	300	280	255	245							
21										C	275	270	250	300	275	255								
22									225	240	275	250	305	300	275	250	245							
23									230	270	270	280	275	290	265	255	235							
24									250	250	255	255	290	290	255	270	250							
25									250	I240C	270	250	255	280	280	270	240	240						
26										230	250	250	240	300	265	275	245							
27											245	250	340	310	290	275								
28										235	245	250	300	300	275	255								
29										250	240	240	325	300	275	250								
30										250	250	250	290	310	280	245	235							
31										245	240	245	245	300	280	250	235							
Count								1	18	29	31	31	31	31	31	31	24	3						
Median								230	230	240	255	255	285	300	280	255	250	240						
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

Y9

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	295	300	250	255	270	290	265	230	225	E225A	I210A	200	200H	200H	200H	230	240	250	230	220	205	250	230	250
2	255	235	270	300	300	280	250	220	225	215	210H	190	190H	225	220	240	230	230	225	210	210	280	280	300
3	270	285	270	255	255	260	255	220	220	215	210	205H	205H	200H	215H	225H	240	230	215	220	250	245	265	285
4	290	265	250	225	250	245	260	240	225	210	205H	205H	210H	220H	205H	235	240	250	220	255	300	270	270	270
5	270	265	250	245	250	290	280	235	220	210H	195H	180H	185H	200	205H	225	245	245	225	210	250	250	280	270
6	295	295	240	210	245	300	290	235	230	225H	200H	200	200	185H	230	235	235	250	220	245	255	300	295	280
7	300	285	250	215	205	300	295	240	230	230	215H	210H	225	230	245	240	245	230	240	240	230	250	280	280
8	270	275	260	220	275	250	250	225	230	225	195H	195H	190H	225H	200H	240	240	245	225	240	245	265	270	290
9	305	300	240	215	205	250	275	235	230	220	210	205H	220	225H	E250A	225	230	245	225	250	250	250	270	290
10	240	255	245	230	205	325	290	220	220	205	200H	200H	205H	230H	220	220	220	240	230	215	230	230	265	315
11	345	305	280	255	230H	220	240	230	230	225	I240A	240	225	230	210H	235	240	245	235	225	280	240	255	345
12	320	270	295	250	180	290	270	230	220	210	220	200H	220	210	235	225	230	235	245	225	240	290	305	295
13	290	255	250	285	280	250	215	225	220H	210	200	200H	200H	200H	225	240	225	235	225	215	250	250	250	275
14	280	290	300	250	245	250	225	220	225	205H	210	200H	240	220H	225H	230H	I230A	230	215	250	310	270	250	255
15	270	270	285	265	235	250	255	235	230	225	200H	200H	210H	205H	225H	235	245	230	230	220	245	250	250	275
16	280	270	245	225	220	250	275	225	230	220	220	E215H	200H	235	225	225	235	235	210	220	260	240	255	285
17	280	255	255	260	225	230	265	230	220	220	200	195H	205H	215H	230	A	240	240	220	210	250	220	275	300
18	260	335	320	285	220	240	245	230	225	200	205H	230	200H	195H	255	250	235	245	225	205	270	270	260	275
19	270	270	280	255	220	200H	245	230	220H	205	195H	225	205H	205H	225H	240	245	230	220	225	250	300	255	290
20	275	295	295	300	230	220	270	230	220	210	200H	190H	230	245	230	230	230	235	225	205	200H	225	250	295
21	300	300	280	250	245	245	255	225	220	220	205H	200	195H	200H	250	240	245	240	225	205	275	250	245	250
22	250	300	300	275	230	230	240	230	220	200	240	215	200H	240	250	230	240	220	205	200	265	240	255	300
23	295	275	295	245	220	210	300	225	205	215H	225H	220H	E255A	235	A	A	A	235	230	230	280	265	240	245
24	290	255	275	275	250	255	260	220	215H	225	230	220	220	E245A	235	220H	240	225	210	225	270	220	245	250
25	300	350	325	295	230	220	250	230	225	I220C	E240A	235	210	E250A	220H	I235A	235	250	225	220	220	220	220	215
26	270	275	290	325	I315A	270	220	215	225	225	205	205	225	E230A	250	230	I235A	250	205	250	I255A	285	245	280
27	280	275	250	250	225	260	280	230	240	230	225	210	200H	200H	230H	230	245	230	220	215	270	245	225	240
28	345	350	305	290	280	245	305	250	230	230	225	210H	215H	230H	250	240	240	245	230	250	250	245	250	250
29	250	250	270	250	245	255	300	245	230	230	230	240	225H	240H	250	240	230	250	225	225	245	250	E300A	300
30	290	260	270	275	255	320	300	255	230	I230B	I235A	235	220H	255	230	235	230	235	225	220	225	250	240	250
31	250	250	225	230	210	E330B	300	245	230	235H	220	215	205	195H	230	235	235	220	205	210	235	220	220	300
Count	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	29	30	31	31	31	31	31	31	31
Median	280	275	270	255	235	250	265	230	225	220	210	205H	205H	220H	230	235	240	235	225	220	250	250	255	280
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

Y10

IONOSPHERIC DATA

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	095	B	B	B	B	B	S	130	100	100	100	100	100	100	100	100	G	135	100	100	S	S	S	S
2	B	S	E	B	B	B	120	130	100	105	100	100	G	110	G	E160G	150	130	100	100	B	B	B	100
3	105	100	100	100	100	100	100	150	120	120	115	110	110	100	100	100	100	155	100	110	105	105	100	100
4	105	100	100	100	100	B	150	135	120	115	105	105	105	120	105	G	G	130	115	105	105	105	105	105
5	105	100	100	100	100	B	150	155	120	145	100	100	100	G	G	100	G	G	135	S	100	S	100	100
6	100	100	100	E	E	B	S	125	125	135	115	G	115	120	120	120	110	G	120	105	105	105	105	105
7	100	100	B	E	E	B	S	155	120	120	120	110	110	110	110	110	110	105	105	105	100	100	100	100
8	100	100	B	E	E	B	100	G	G	105	105	100	100	100	100	100	130	125	120	100	100	100	100	100
9	100	100	E	E	E	E	S	G	150	140	125	120	120	120	110	G	115	105	105	100	100	100	100	095
10	095	095	095	095	E	B	S	G	120	105	105	G	105	100	100	100	100	130	095	095	095	S	095	105
11	100	100	B	B	B	B	S	120	110	105	105	105	105	100	105	105	105	105	100	100	100	095	095	095
12	095	100	095	B	095	B	100	135	105	G	100	100	100	G	G	100	100	120	110	105	100	100	100	095
13	095	S	B	B	B	B	100	125	105	105	100	100	100	100	100	100	155	145	100	100	100	S	100	S
14	S	100	100	B	B	B	100	G	105	G	100	100	100	100	100	105	125	115	105	105	105	100	095	S
15	100	S	B	100	100	B	100	165	G	100	100	100	100	100	130	125	115	115	100	S	100	S	S	B
16	100	100	095	095	E	B	S	145	125	115	110	105	105	105	120	115	110	125	095	105	105	105	100	100
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19	B	E	100	100	100	B	095	120	115	120	100	105	105	100	120	120	115	105	105	100	100	100	S	100
20	100	100	095	100	100	E	095	G	100	100	100	120	100	160	150	100	100	145	120	100	100	S	S	B
21	B	B	B	E	B	E	B	150	150	100	100	100	100	100	170	150	140	140	125	105	B	100	100	B
22	S	100	100	100	100	100	S	G	110	100	100	100	100	100	145	145	100	100	B	S	100	100	100	S
23	B	B	095	B	B	B	S	G	100	120	120	120	115	115	110	110	110	110	105	105	105	105	105	100
24	100	E	100	B	B	E	S	G	E175G	100	125	120	120	115	110	110	105	105	105	100	100	100	100	095
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31	S	B	B	B	E	B	100	100	G	E170G	140	145	125	115	110	110	110	110	105	100	105	100	S	S
Count	23	20	16	13	10	4	17	19	28	27	31	29	30	28	27	28	27	28	30	27	28	24	24	21
Median	100	100	100	100	100	100	100	135	115	115	105	105	105	110	110	110	110	110	105	105	100	100	100	100
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

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

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Y11

IONOSPHERIC DATA

Oct. 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							h2	14	13	13	12	1	1	1	1		h	1	f				
2							c	h21	1	1	1	1		1		h	h 1	h 1	1	f				f3
3	f3	f2	f2	f2	f2	f	1 h	h	c	c21	c	1	1	1	1	1	1	h	1 c	f3	f	f3	f	f
4	f	f	f	f	f2		h	h2	c2	c	1	1	1	c	1			h3	c3	f4	f4	f3	f3	f2
5	f2	f2	f	f	f		h	h2	c	h 12	1	1	1			1			h		f		f2	f
6	f	f2	f				h	h2	h2	h c	c		1	c	c	c	12		c	f3	f3	f3	f4	f
7	f2	f2					h	h	c	c2	c	c	1	1	1	1	1	13	12	f	f2	f	f2	f2
8	f2	f					1			1	1	1	1	1	12	1 h	h21	h31	c4	f4	f2	f	f2	f
9	f2	f2							h	h	h	c	c	c	12		c2	12	13	f4	f3	f	f3	f2
10	f2	f2	f2	f					c3	1	1		1	1	1	1	1	h 13	14c2	f2	f		f	f
11	f	f						c	c2	1	14	12	1	1	1	1	13	14	13	f4	f4	f3	f	f3
12	f	f	f		f		1 h	h	12		1	1	1			1	12	c 12	c4	f3	f2	f3	f3	f
13	f2						1	h 12	12h	12	12	1	1	1	1	1	h	h	1	f	f		f	
14		f2	f				1		12		1	1	1	1	1	1	h21	c41	15	f4f	f4f2	f2f2	f	
15	f2			f	f		1	h		12	12	12	12	1 h	h 1	h 1	c21	c 1	1		f			
16	f	f	f2	f				h2	h2	c	12	1	1	1	c 1	c 1	c21	h c21	1	f4	f2	f2	f3	f
17	f	f	f	f		f	1		h 1	c2	c	1	1	c	c	12	12	13	13	f3	f3	f5	f3	f4
18	f	f3	f3	f2	f			1	c21	c 12	c 1	12	h 1	h	h c	c	13	13	13	f2	f	f f2	f	
19			f	f	f		1	c 1	c212	c212	1	c212	1 12	1	c	c	c 1	121	14	f6	f2	f2		f
20	f	f	f	f	f2		12		1	1	1	c 1	1	h 1	h 1	1	1	h2	c	f	f			
21								h2	h	1	1	1	1	1	h 1	h 12	h213	h212	h31	f2		f	f	
22		f	f2	f	f	f			c4	12	13	12	12	12	h212	h 13	1	12			f4	f	f2	
23			f						1	c 1	c 1	c 1	c2	c	c21	c2	c5	c51	1312	f4	f2	f3	f2	f
24	f2		f						h	1 h h	h2c 1	c 1	c21	c21	c2	12	131	14	14	f4	f2	f2	f2	f
25	f	f					1	1	1		c3	c2	c2	13	h 12	h3	h212	12	13	f	f	f f	f3	f2
26	f	f		f3	f3	f	1		1	h 1	c 1	c 1	c	13	h	h	h212	13	12	f5	f5	f3	f3	f2
27	f2	f						h	h	h	1	1	h 1	h 1	h 1	12h	c21	12	13	f f	f	f2	f2	f
28	f						1		1	h21	c 1	c 1	h 1	h 1	h h 1	h21		h2	c4	f6	f3	f3	f	
29									12	1	12	12	h				c2	c4	13	f	f	f3	f4	f5
30	f2	f3	f3	f			1	h21	h2		c2	c2	1	12	1	12	1		1		f	f		f2
31							1	1 h		h	h	h	h	c	1	121	121	1 1	121	f	f	f		
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

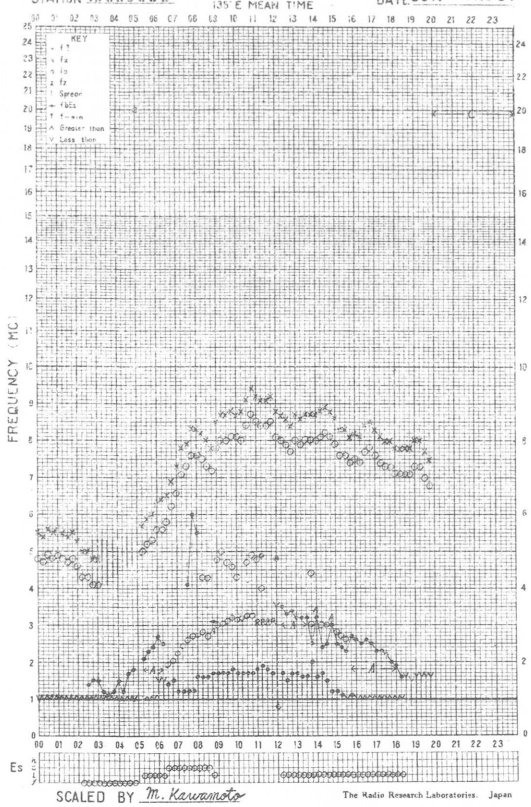
Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y12

f-PLOT OF IONOSPHERIC DATA

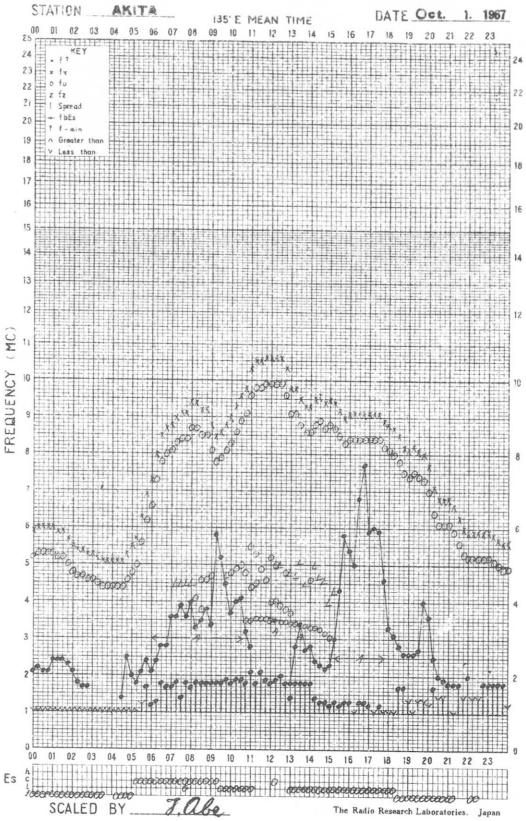
STATION WAKKANAI 135° E MEAN TIME DATE OCT. 1. 1967



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

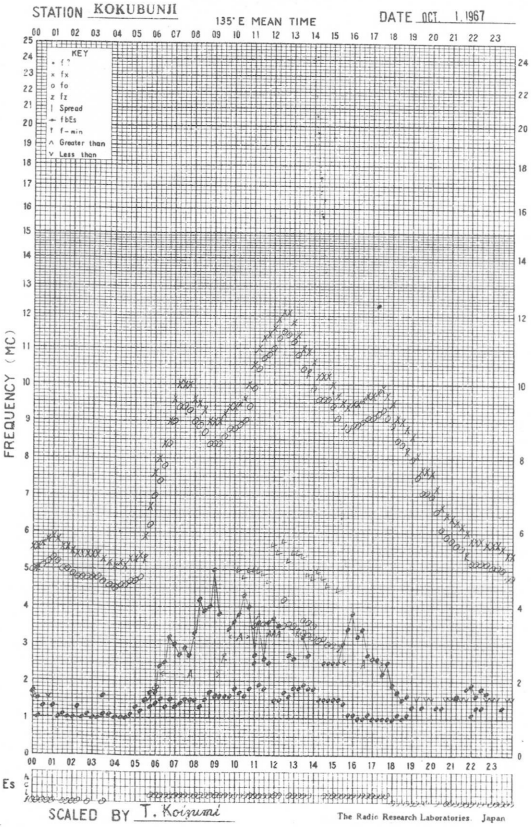
STATION AKITA 135° E MEAN TIME DATE Oct. 1. 1967



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

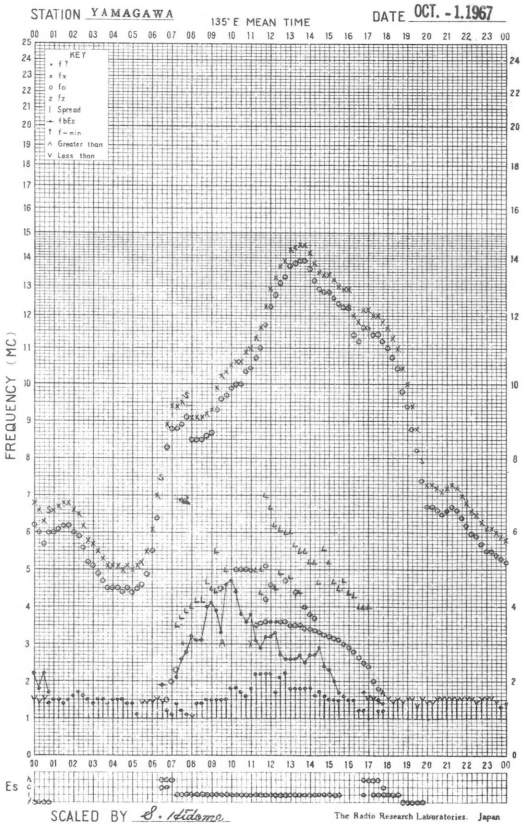
STATION KOKUBUNJI 135° E MEAN TIME DATE OCT. 1. 1967



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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



SCALED BY S. Hidamo The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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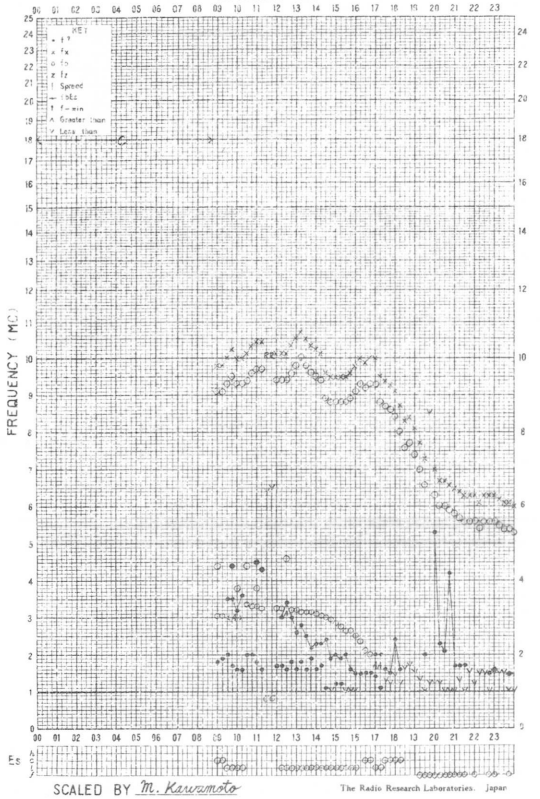

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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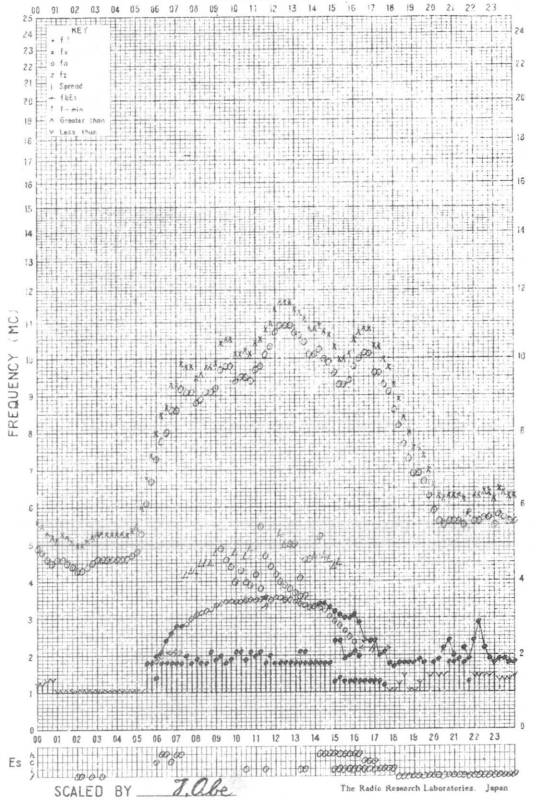
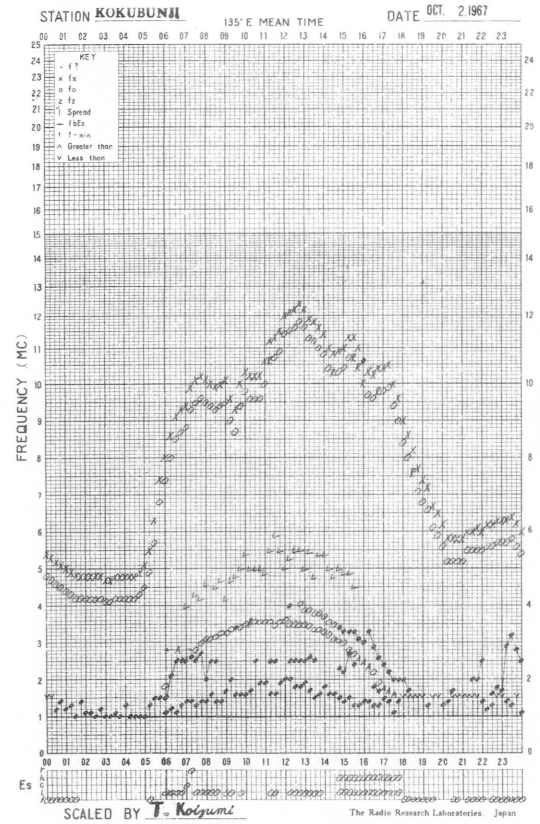


SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE OCT. 2.1967



SCALED BY T. Kotsumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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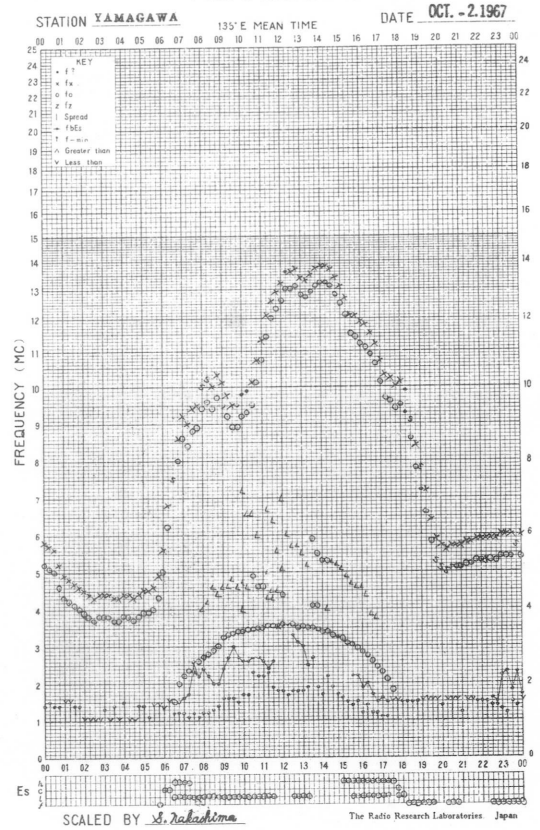
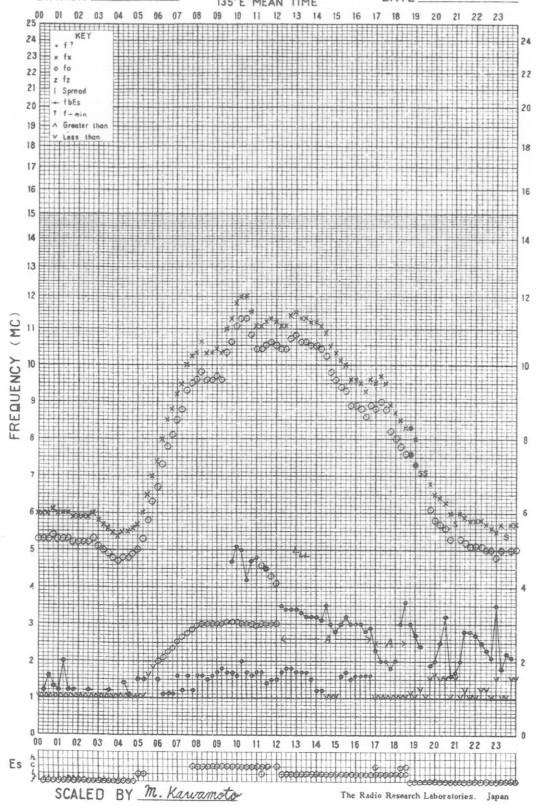


SCALED BY S. Takashima The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE OCT. 3.1967



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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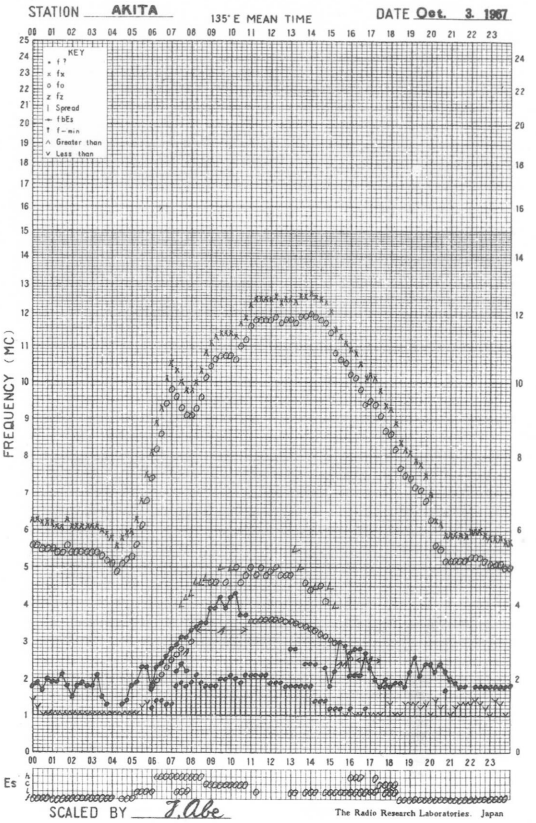
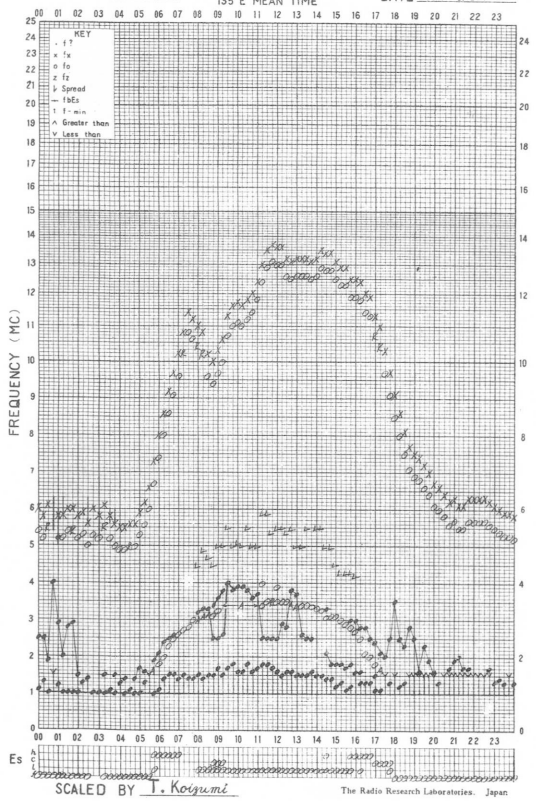


SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

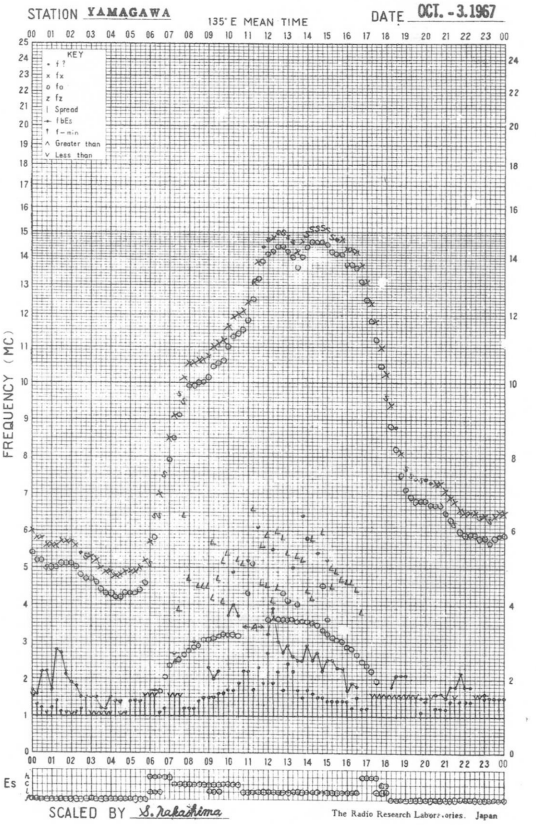
STATION KOKUBUNJI 135°E MEAN TIME DATE OCT. 3.1967



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

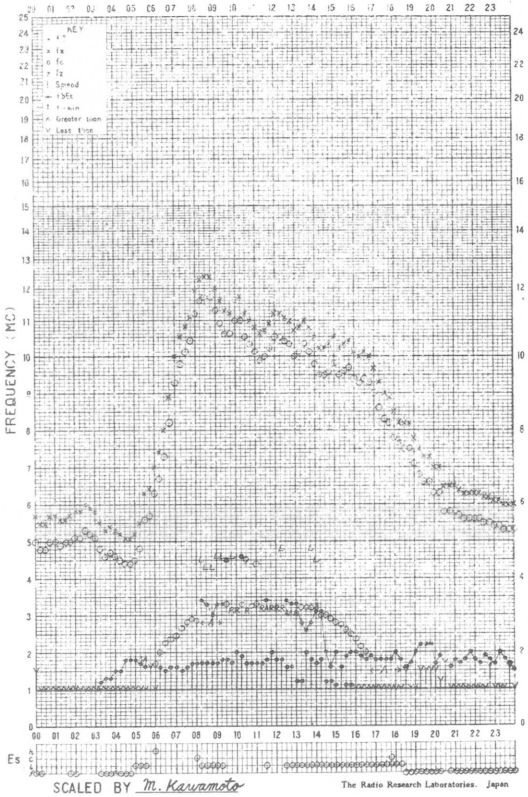
STATION YAMAGAWA 135°E MEAN TIME DATE OCT. - 3.1967



SCALED BY S. Takashima The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE OCT. 4,1967



SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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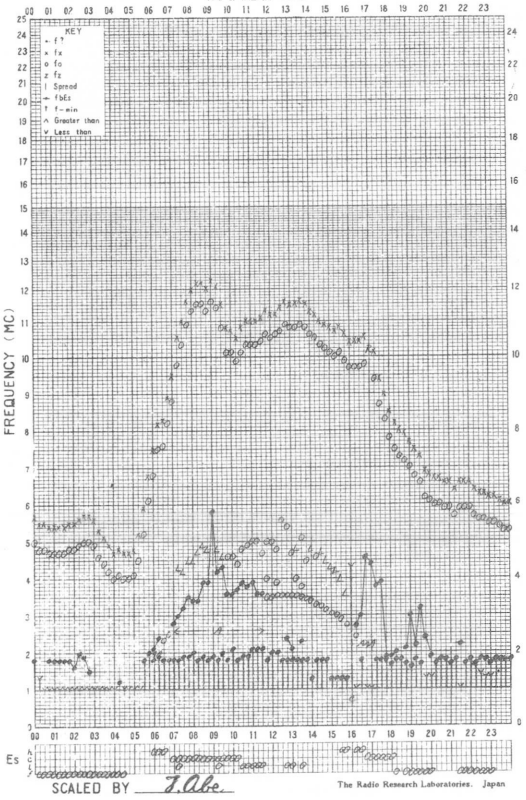
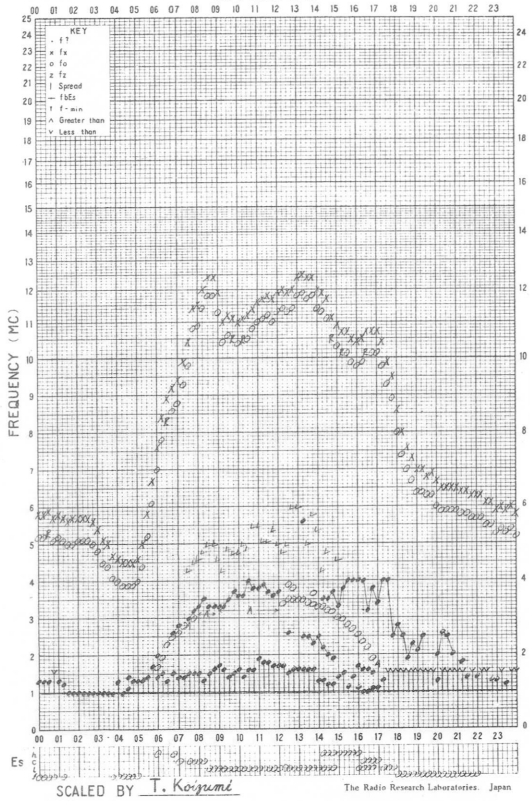


SCALED BY T. Abe.

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE OCT. 4.1967

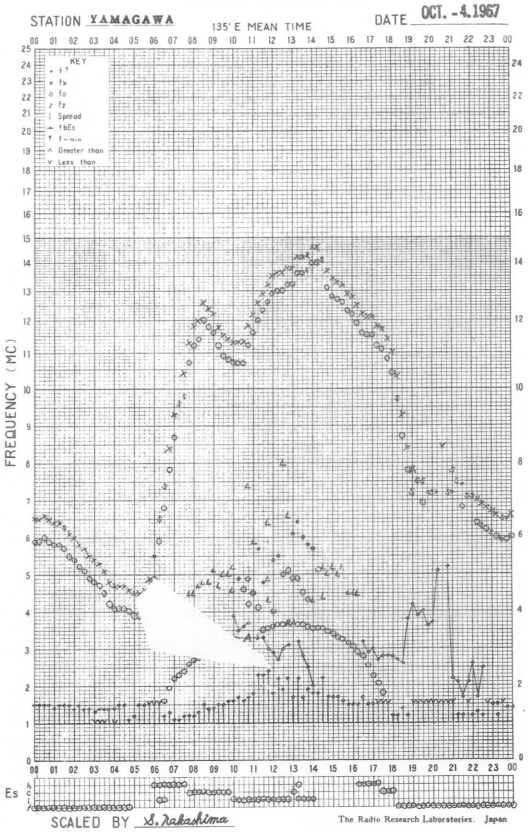


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE OCT. -4.1967

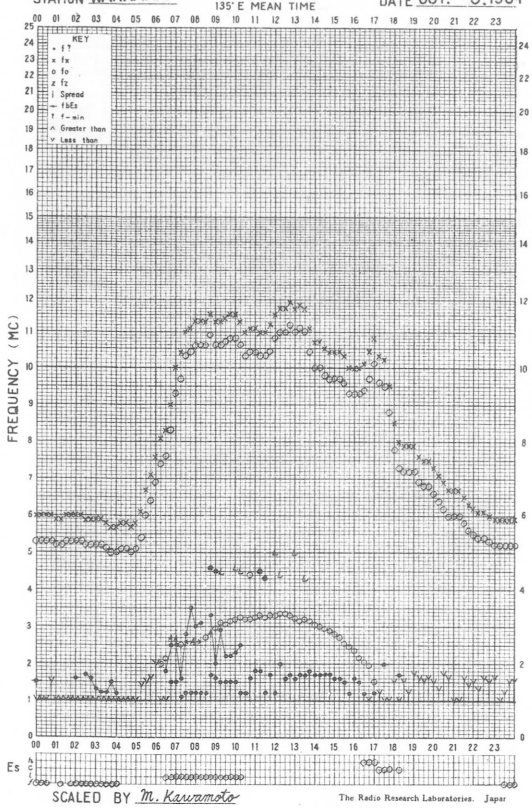


SCALED BY S. Takashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE OCT. 5, 1967



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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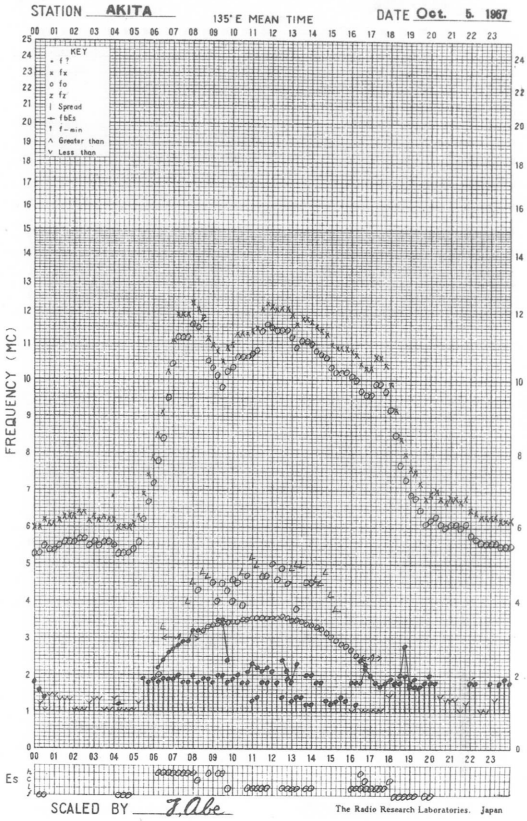
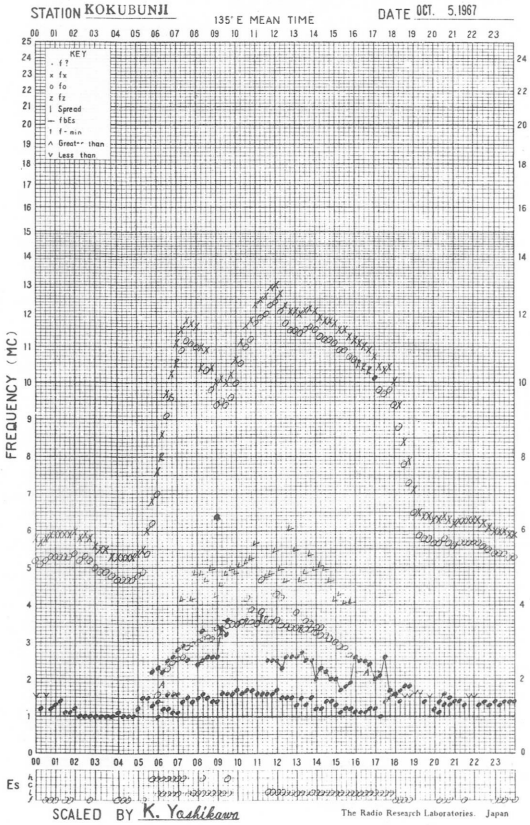


SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE OCT. 5, 1967



SCALED BY K. Yashikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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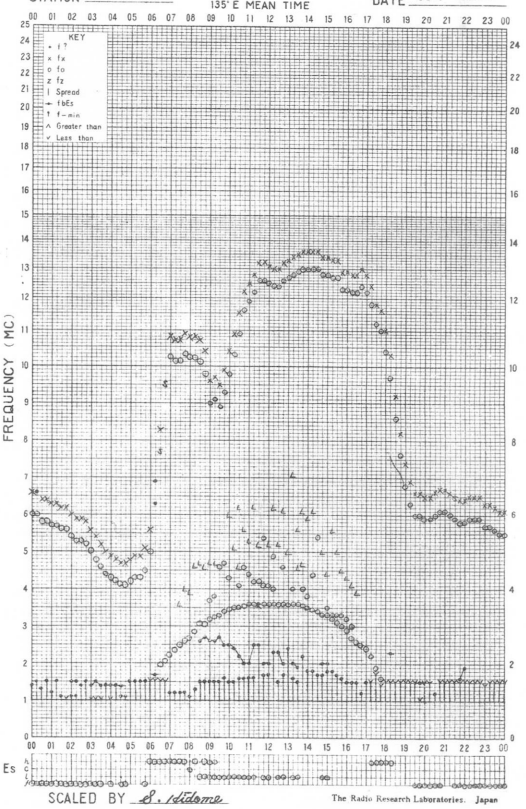

SCALED BY S. Iidaka The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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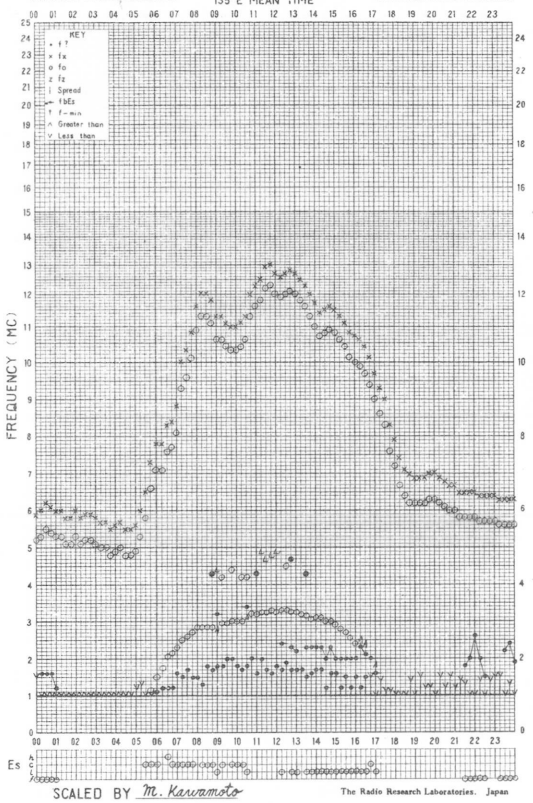

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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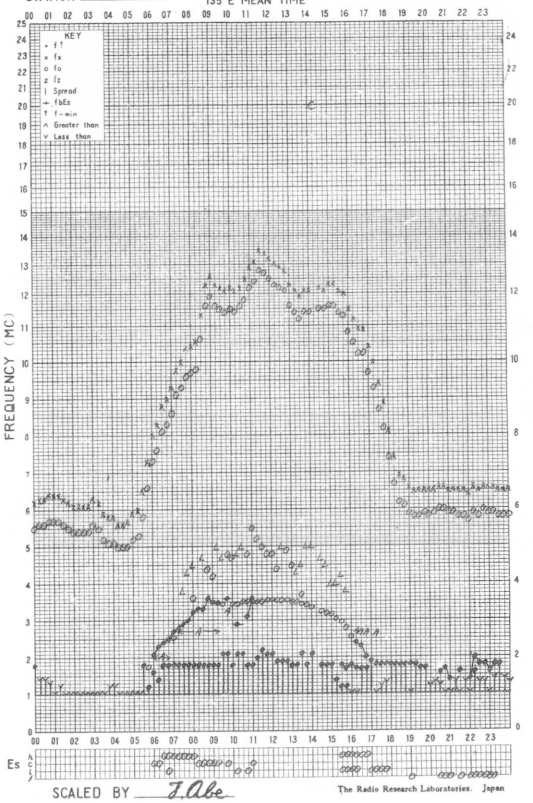

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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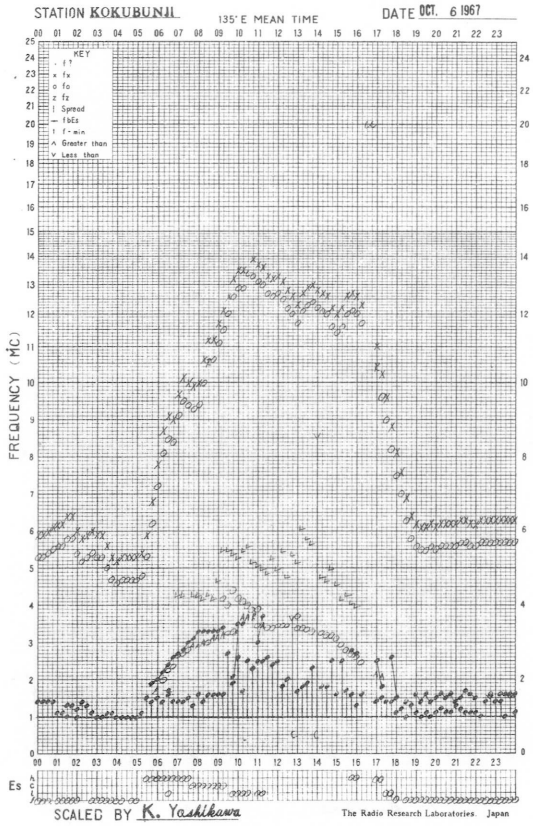

SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

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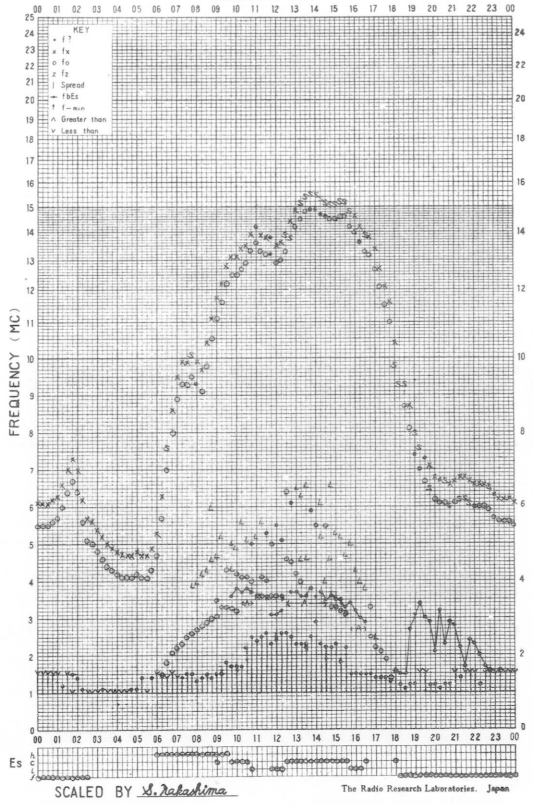

SCALED BY S. Takashima

The Radio Research Laboratories. Japan

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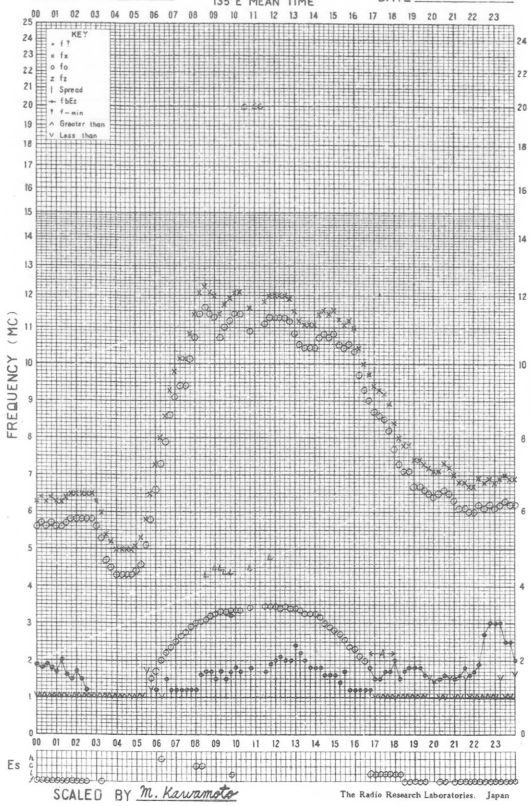

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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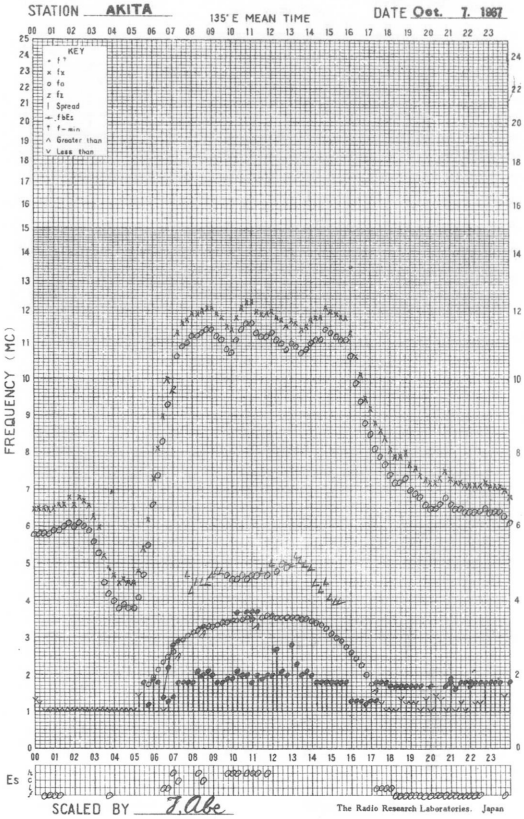

SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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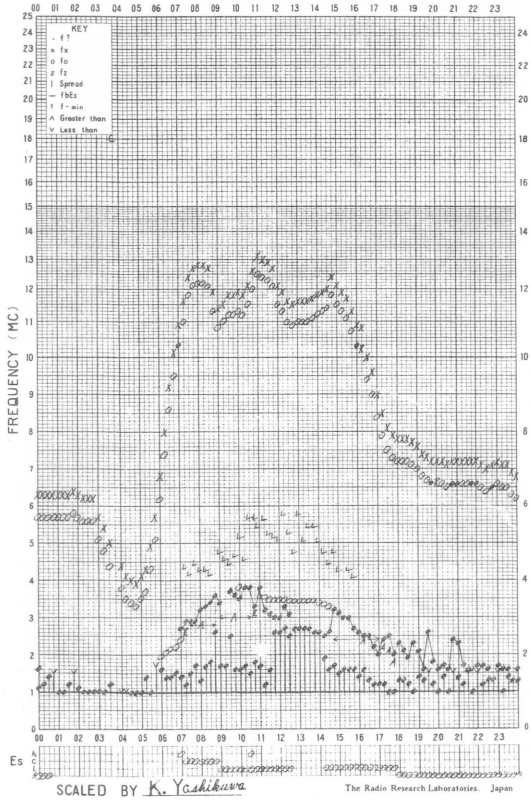
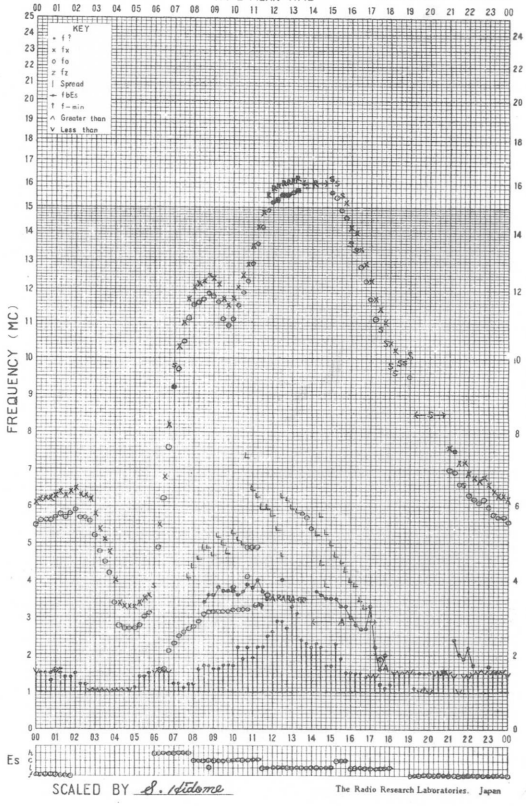


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE OCT. -7.1967



SCALED BY S. Aidome

The Radio Research Laboratories. Japan

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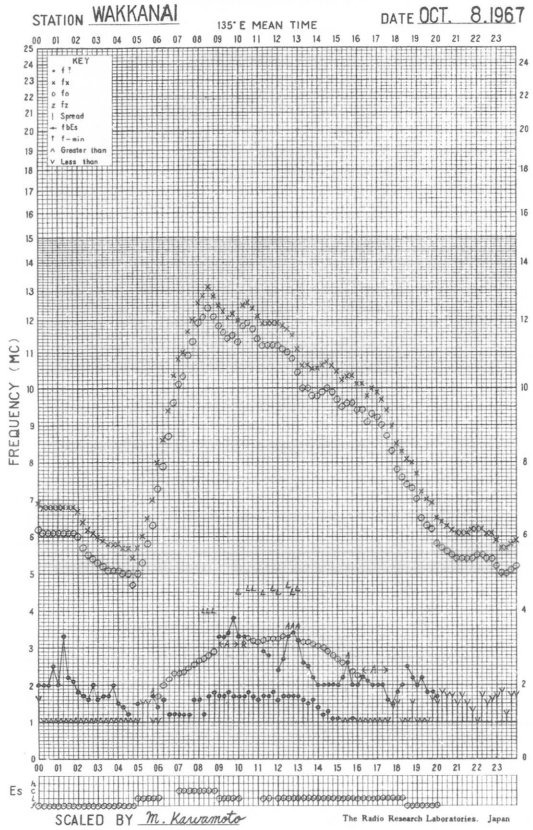
STATION WAKKANAI 135° E MEAN TIME DATE OCT. 8.1967



SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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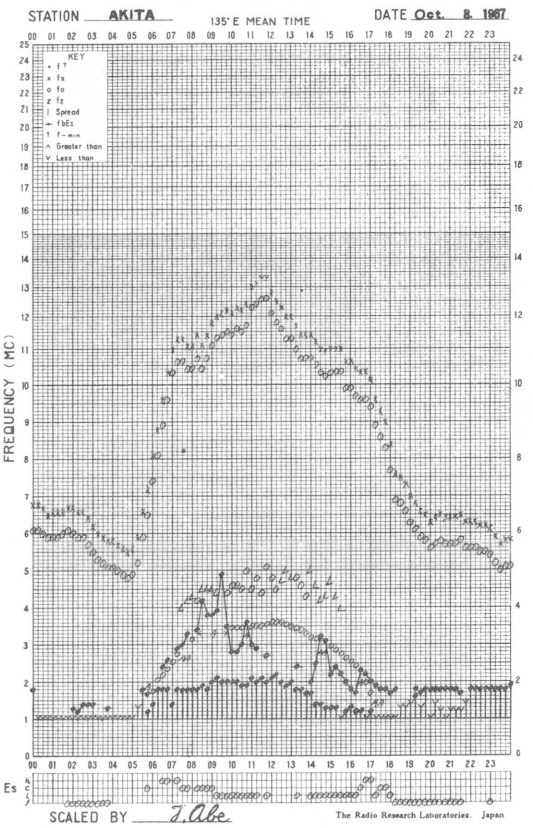

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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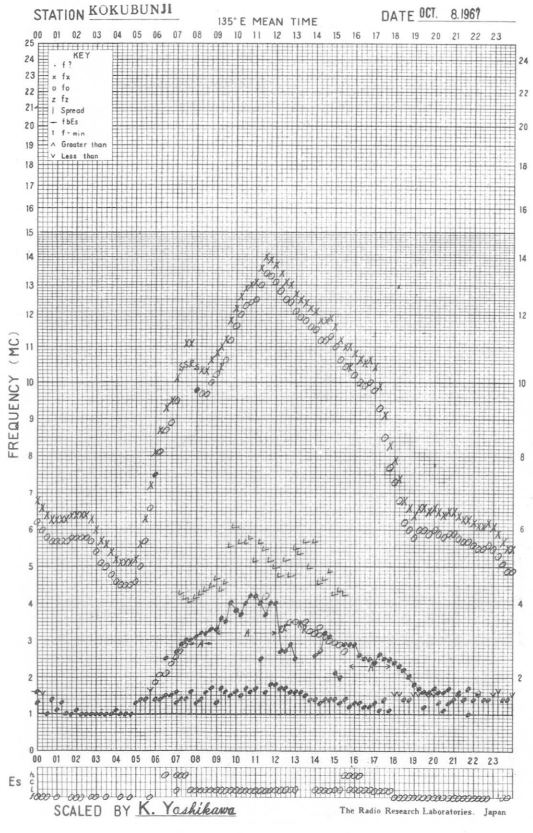

SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

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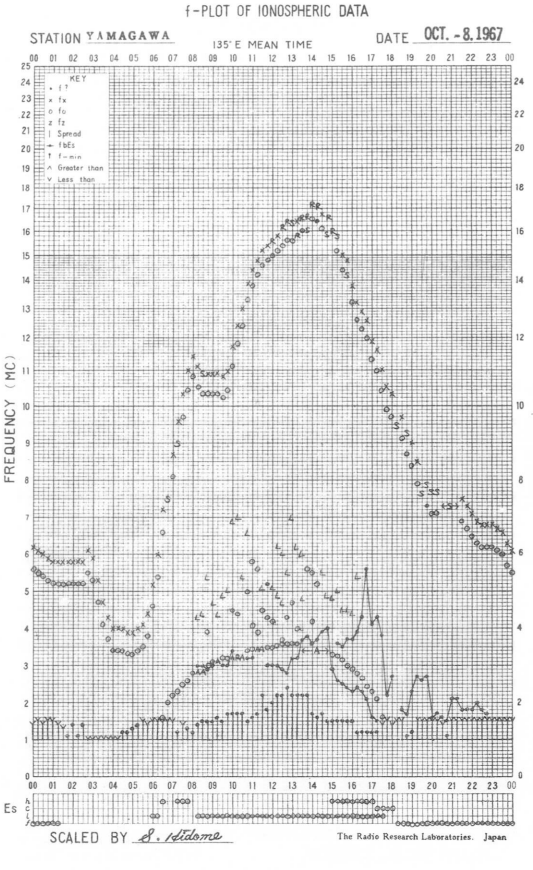

SCALED BY S. Iidaka

The Radio Research Laboratories. Japan

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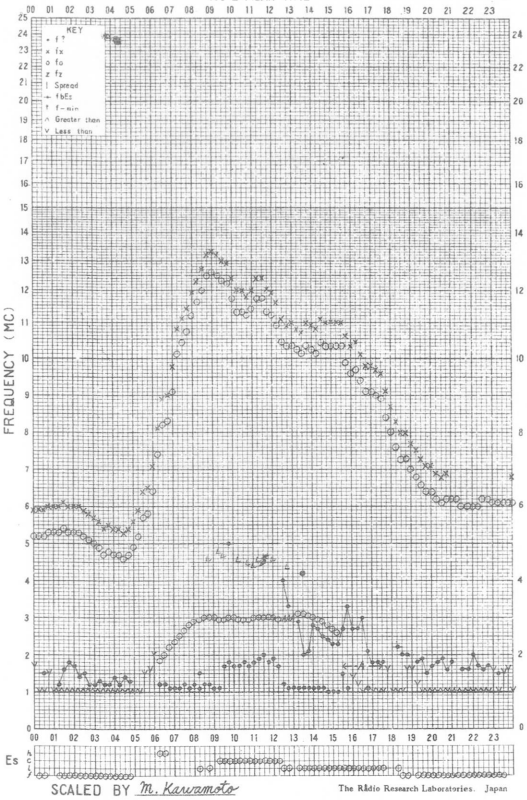

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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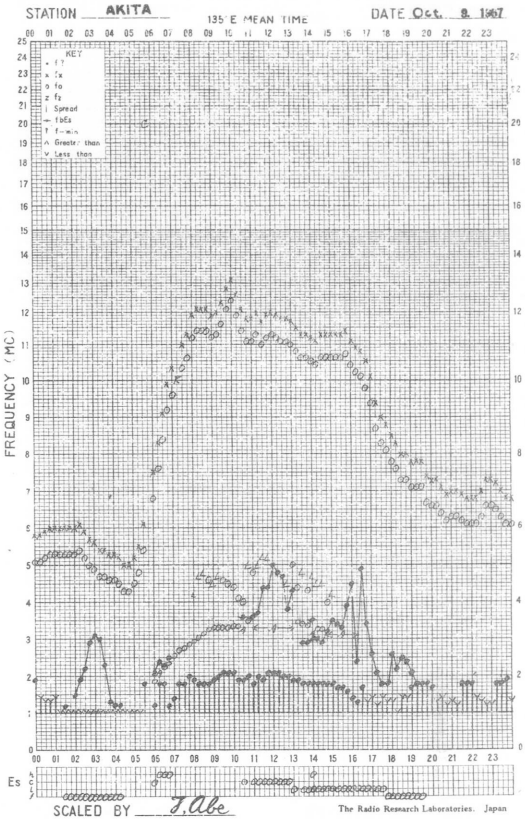

SCALED BY T. Abe The Radio Research Laboratories. Japan

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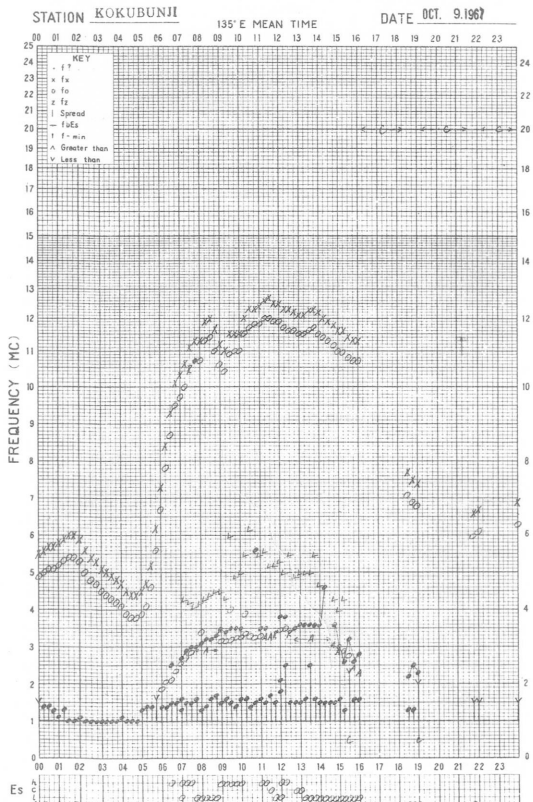

SCALED BY T. Koizumi The Radio Research Laboratories. Japan

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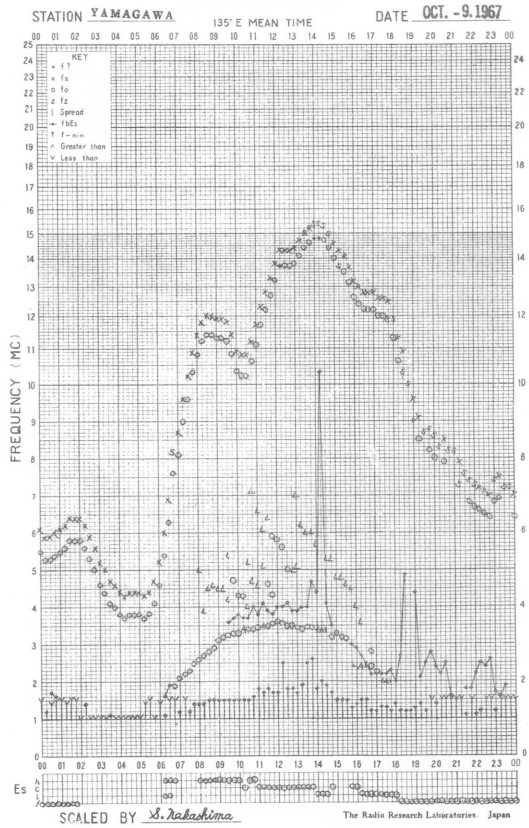

SCALED BY S. Nakashima The Radio Research Laboratories. Japan

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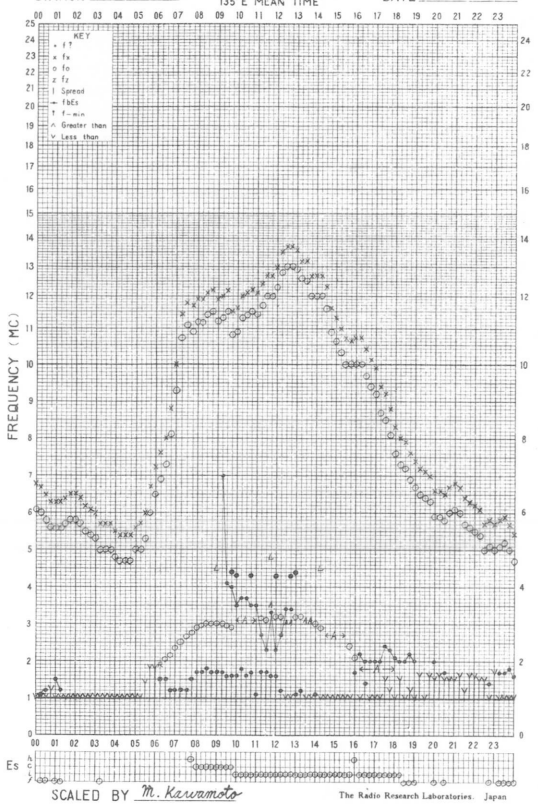

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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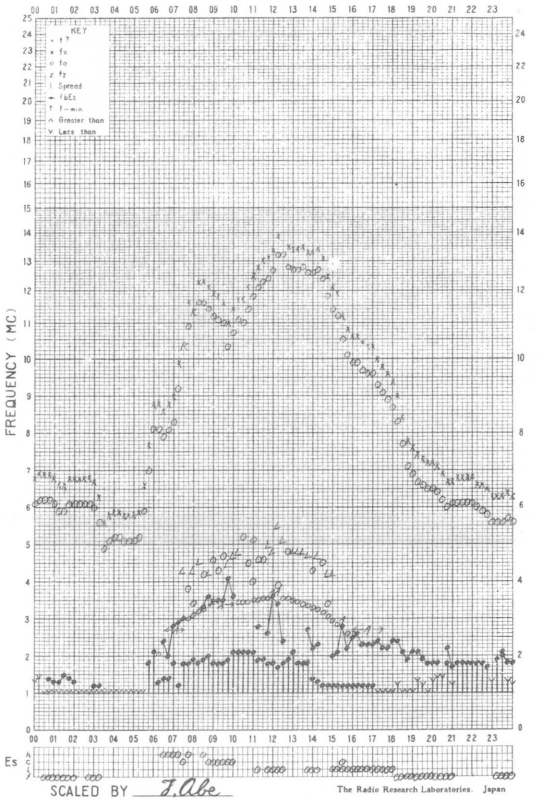

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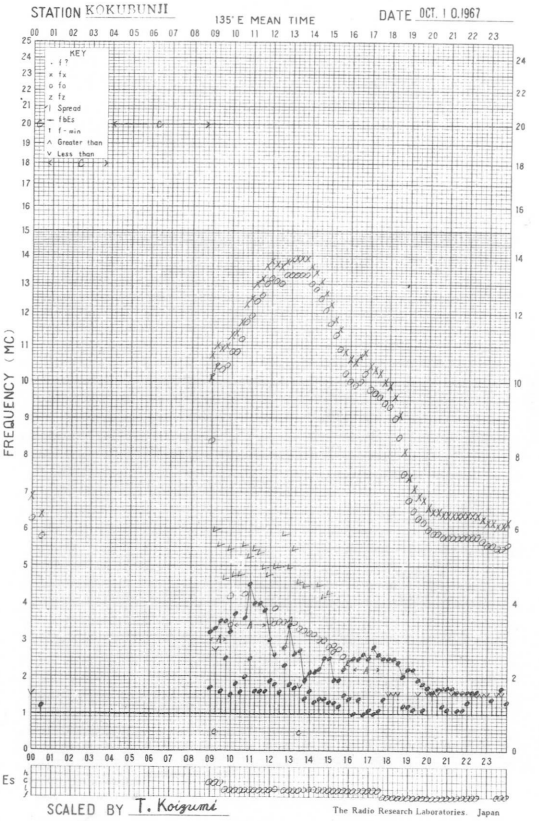

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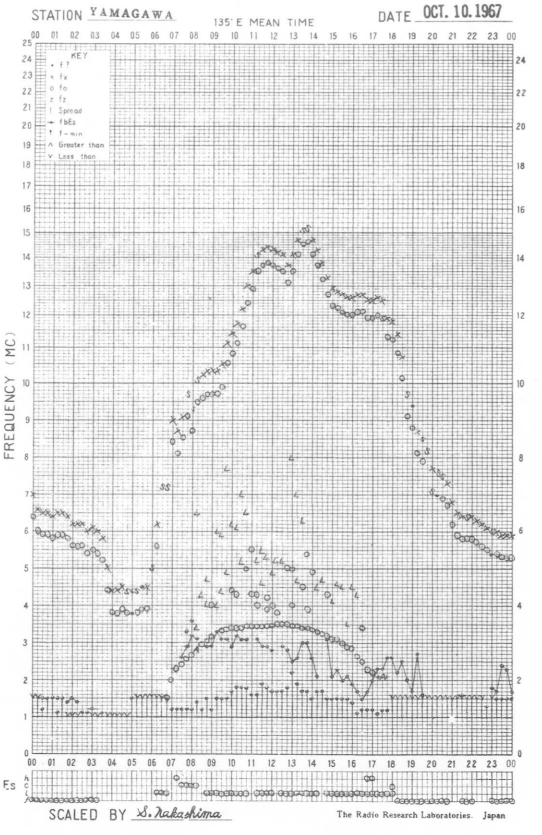

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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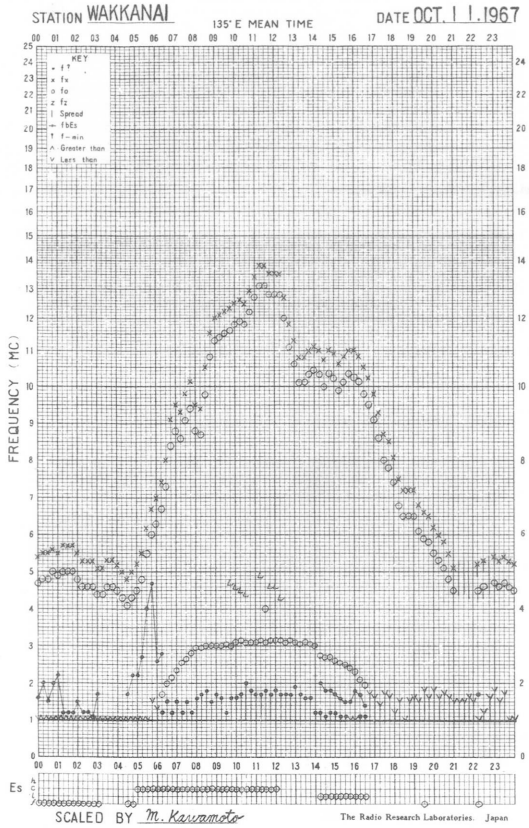

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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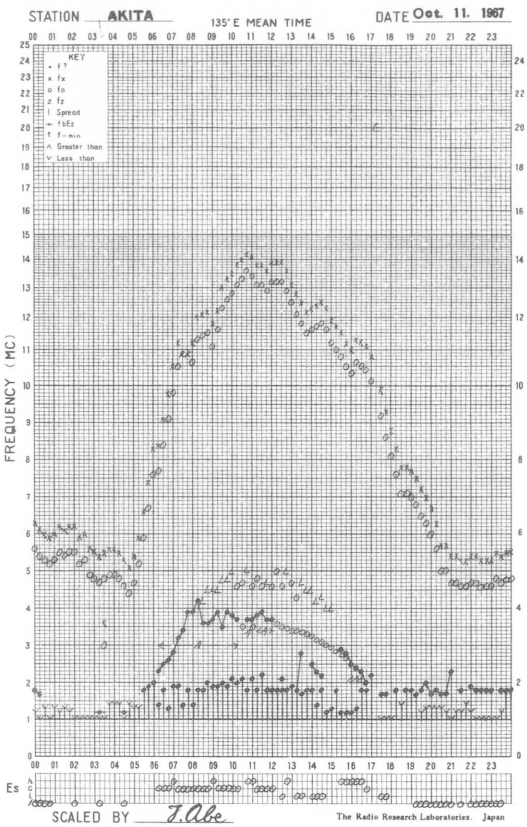

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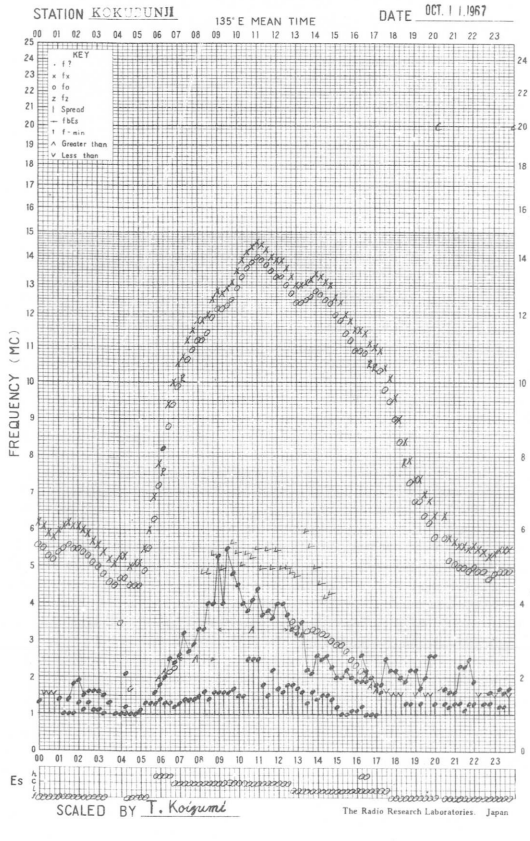

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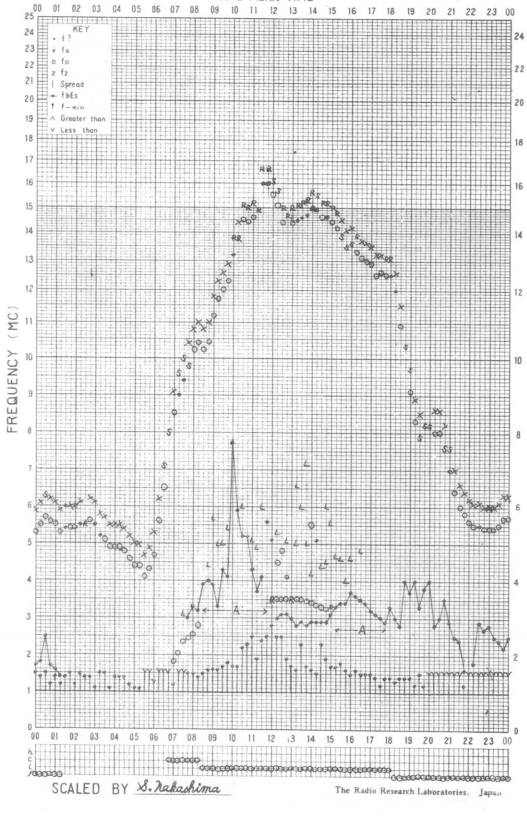

SCALED BY S. Nakashima The Radio Research Laboratories. Japan

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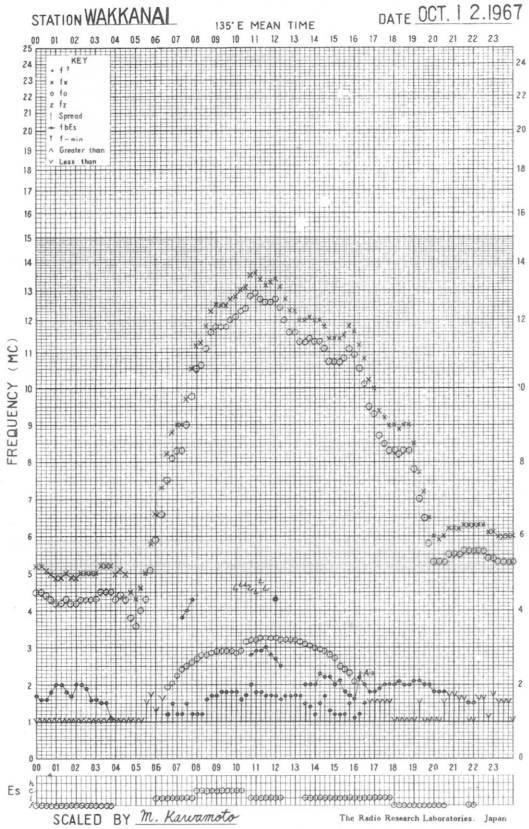

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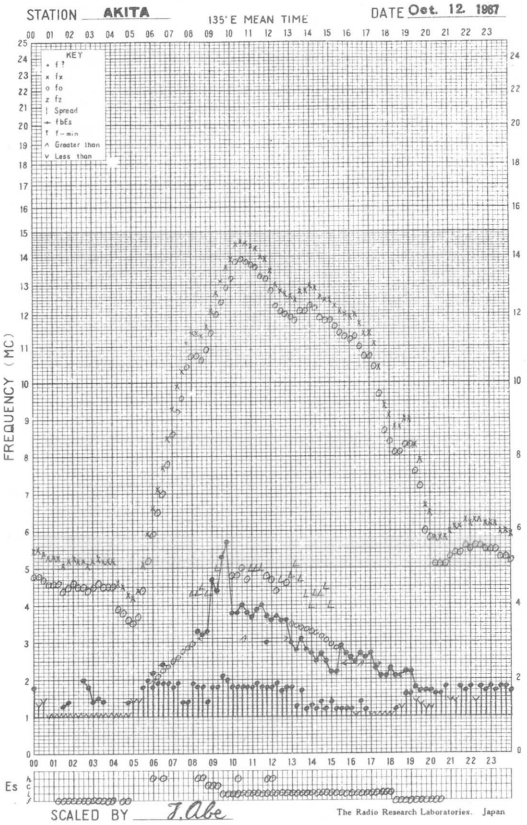

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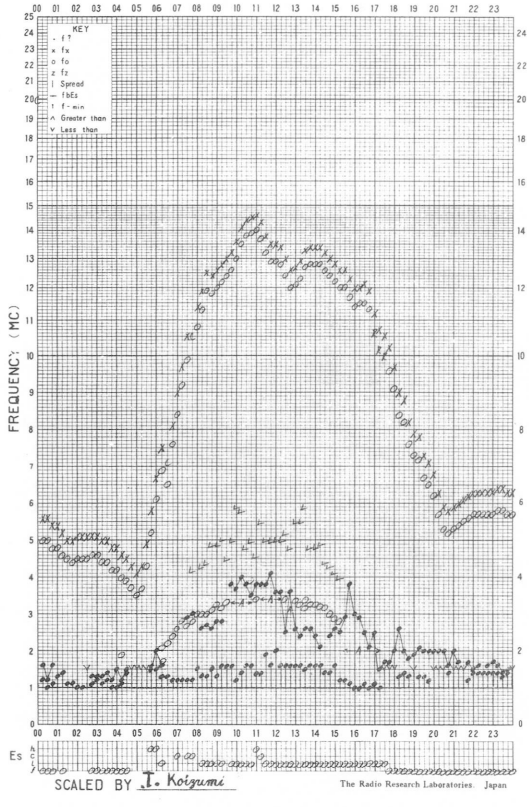

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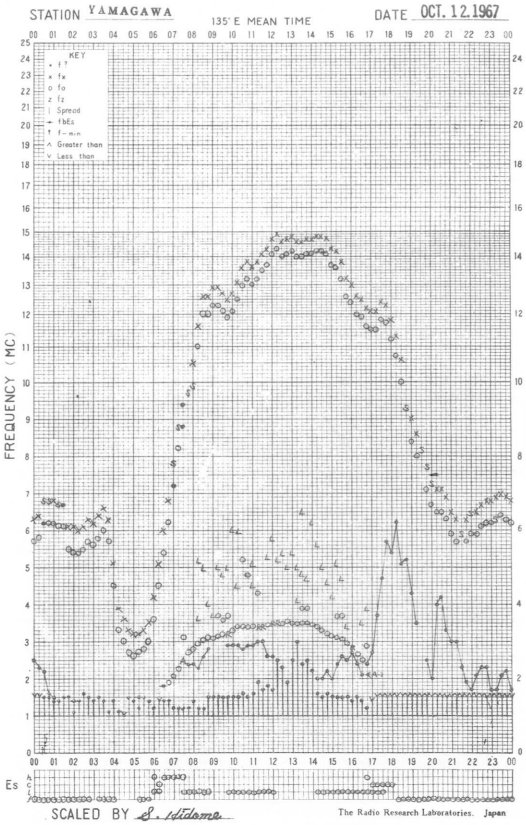

SCALED BY S. Hidaka The Radio Research Laboratories. Japan

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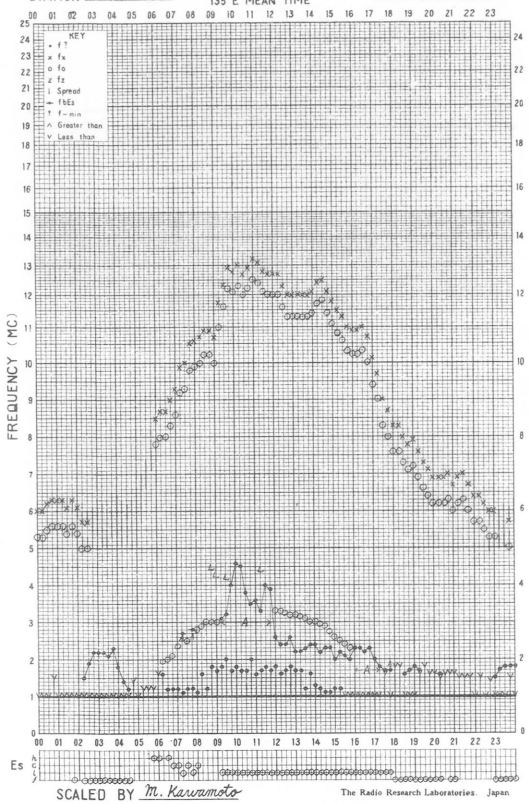

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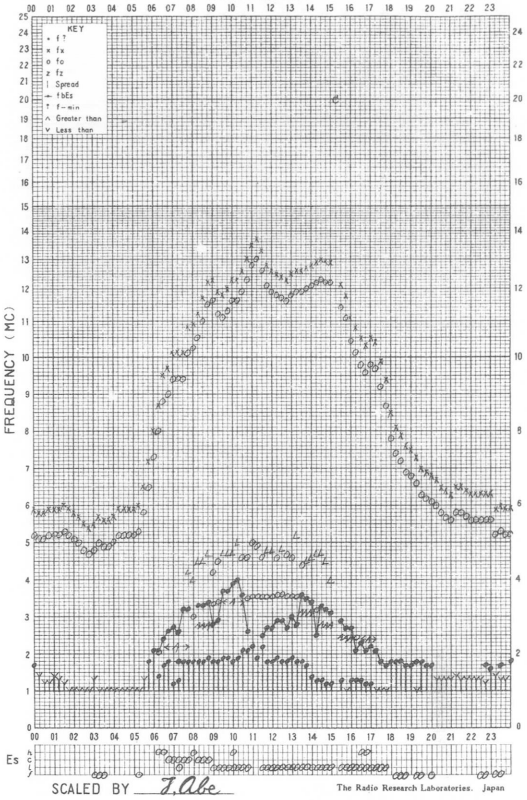

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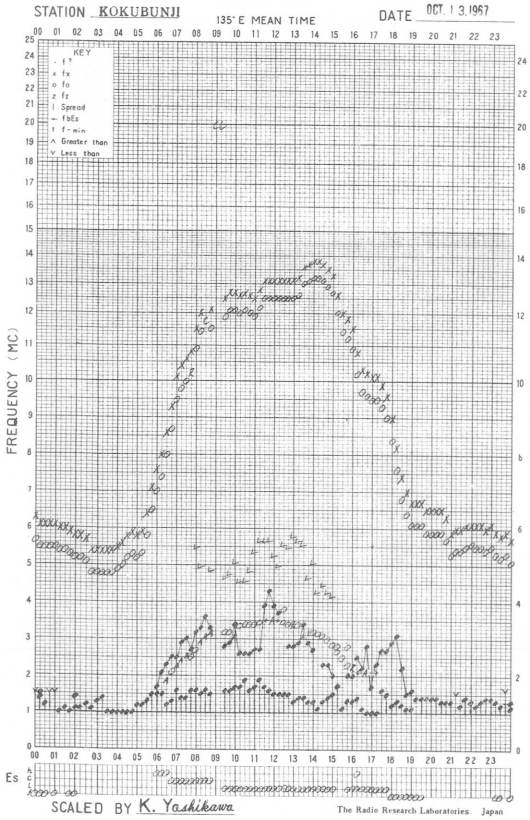

SCALED BY K. Yashikawa The Radio Research Laboratories. Japan

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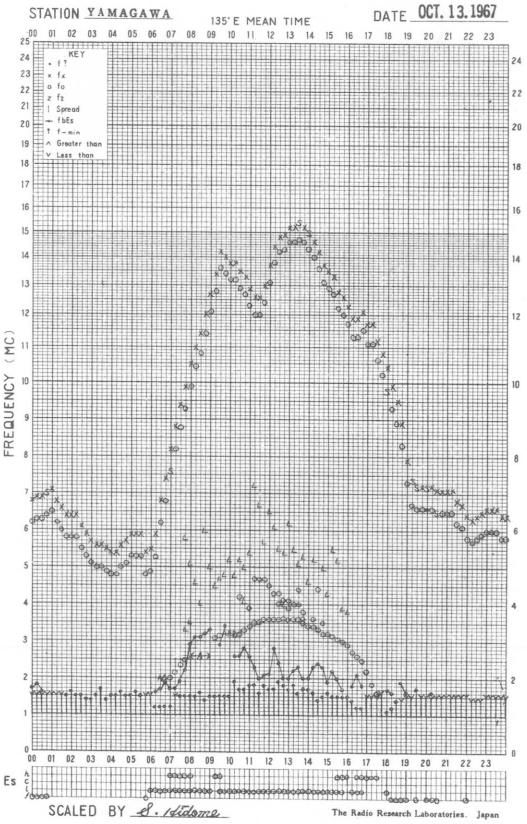

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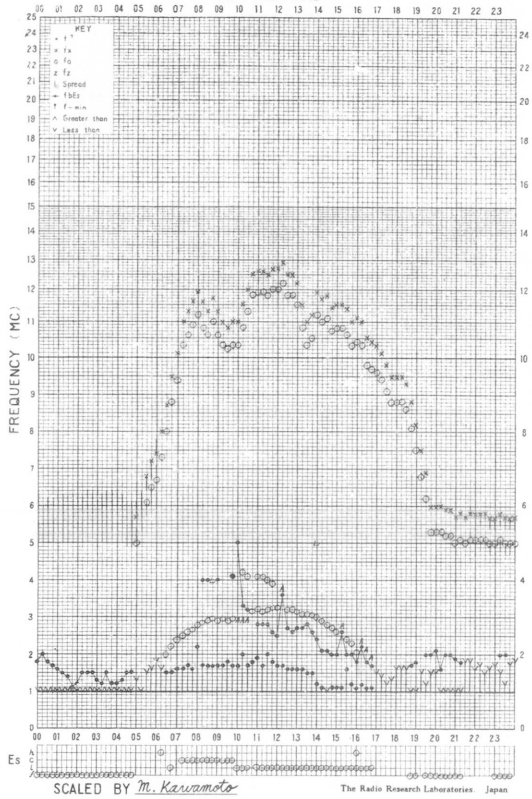

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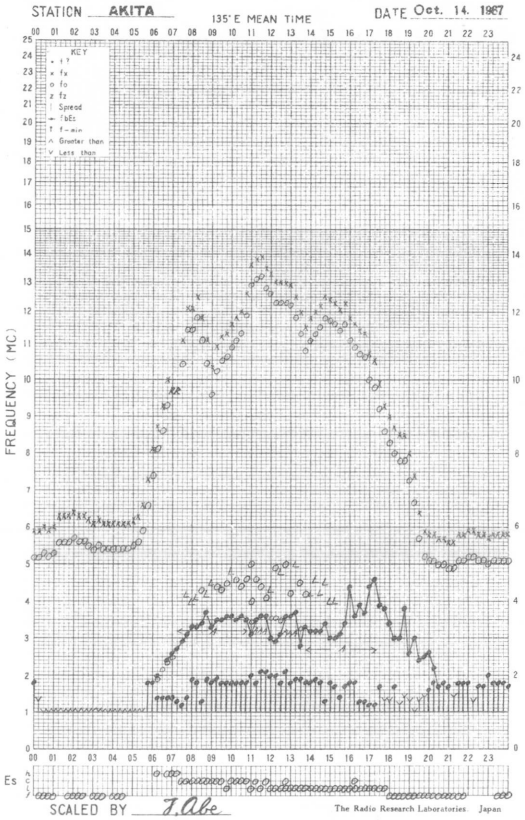

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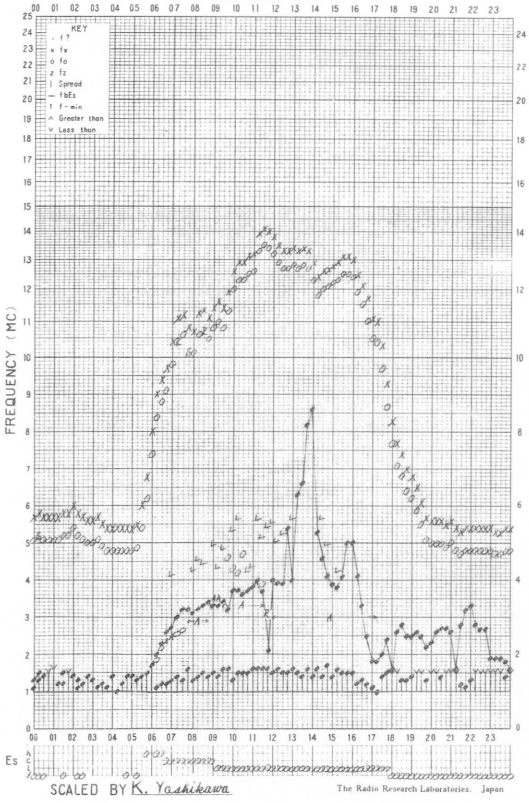

SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

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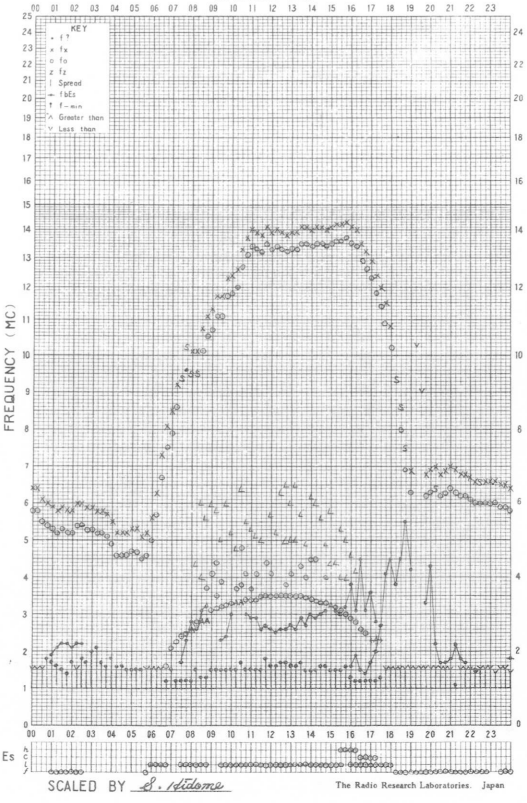

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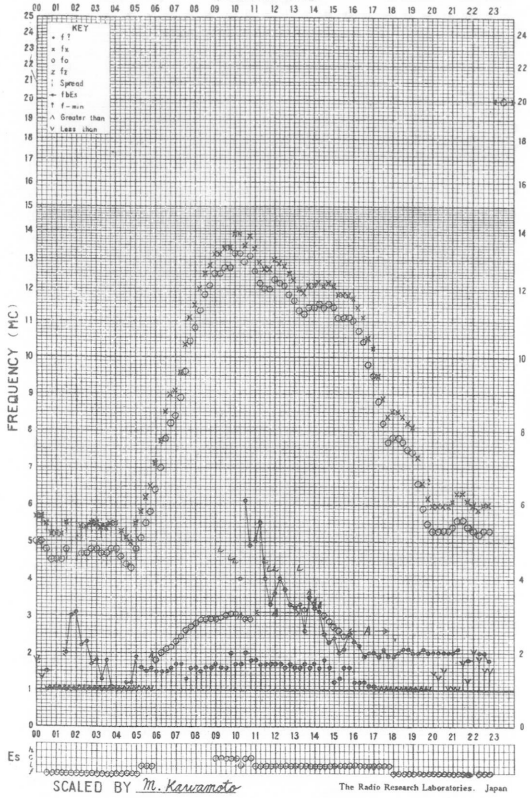

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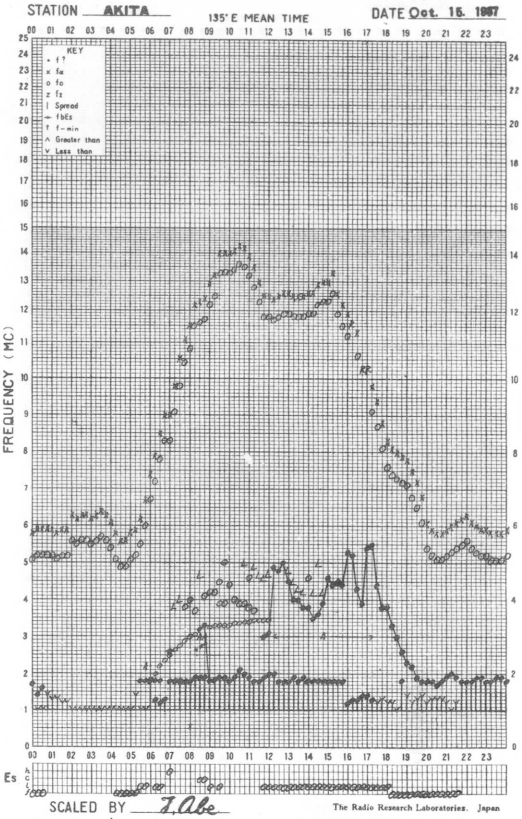

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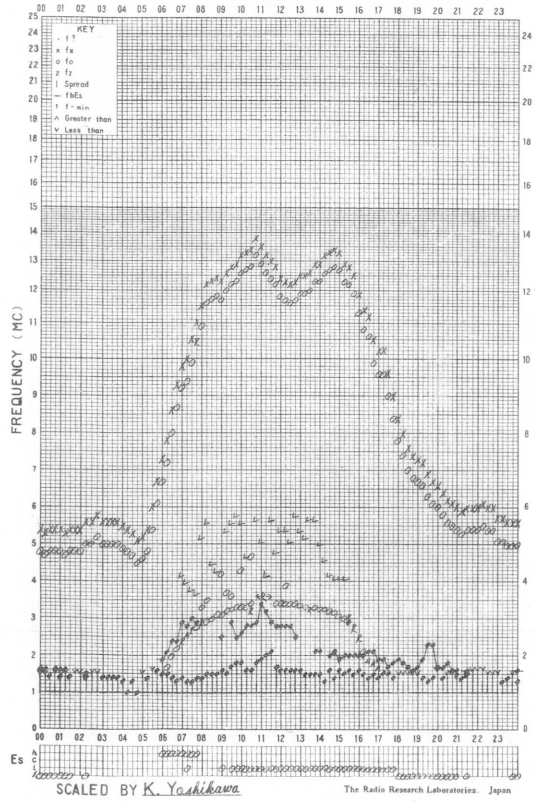

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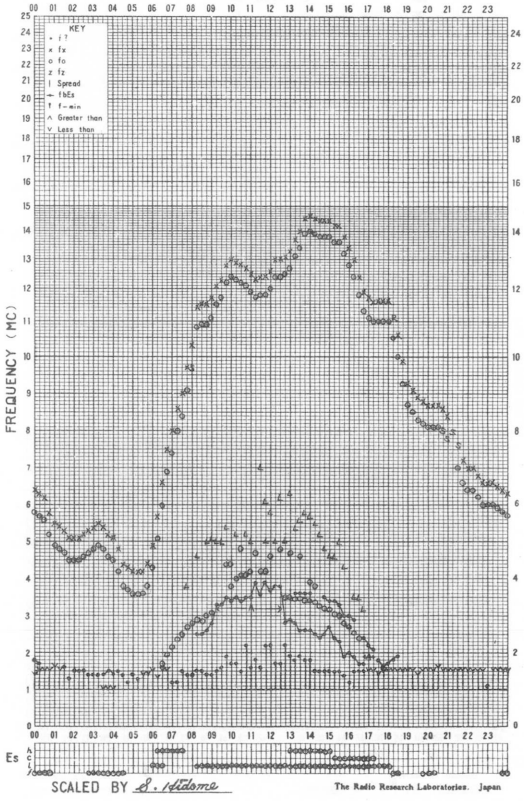

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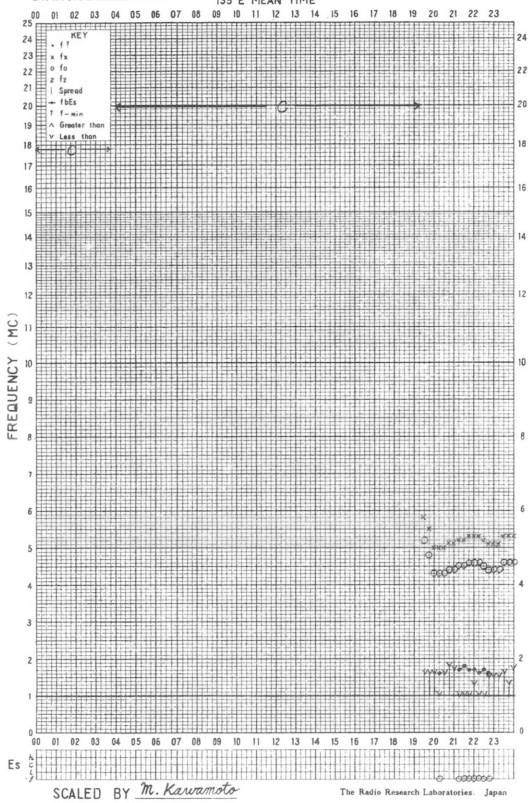

SCALED BY M. Kawamoto

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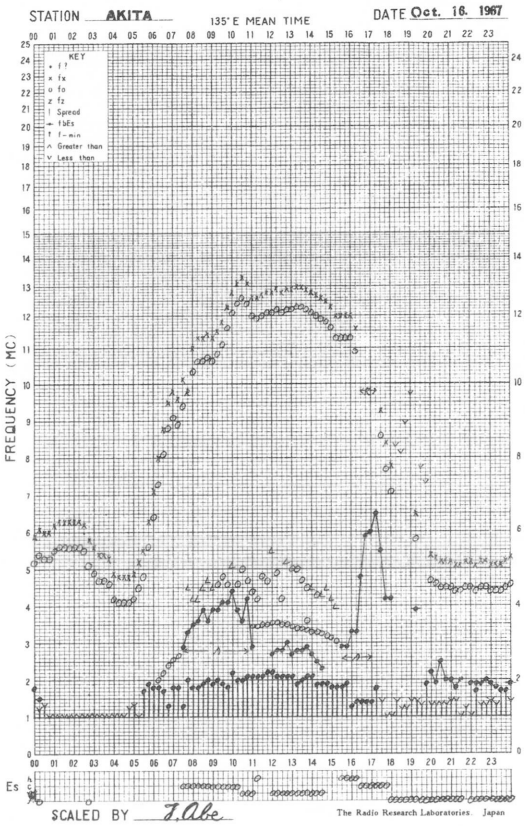

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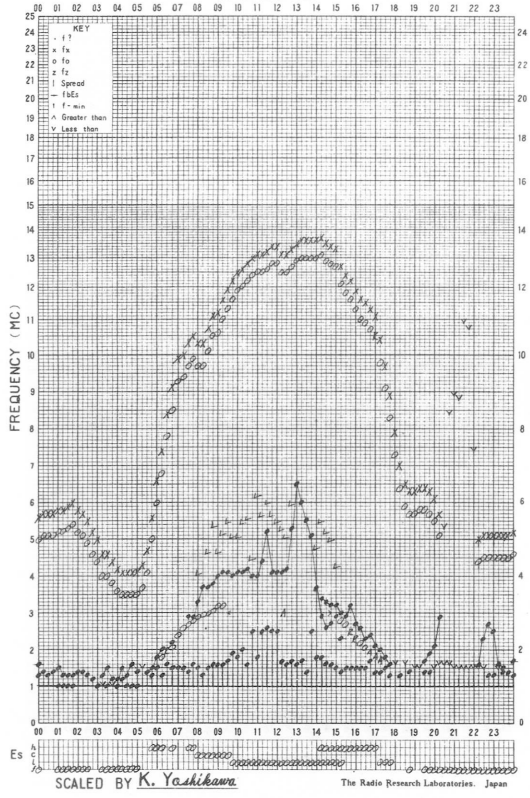

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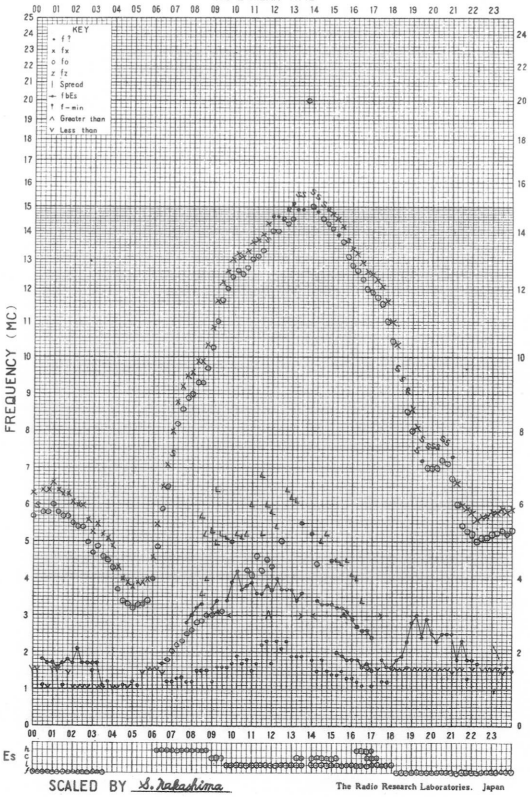

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The Radio Research Laboratories. Japan

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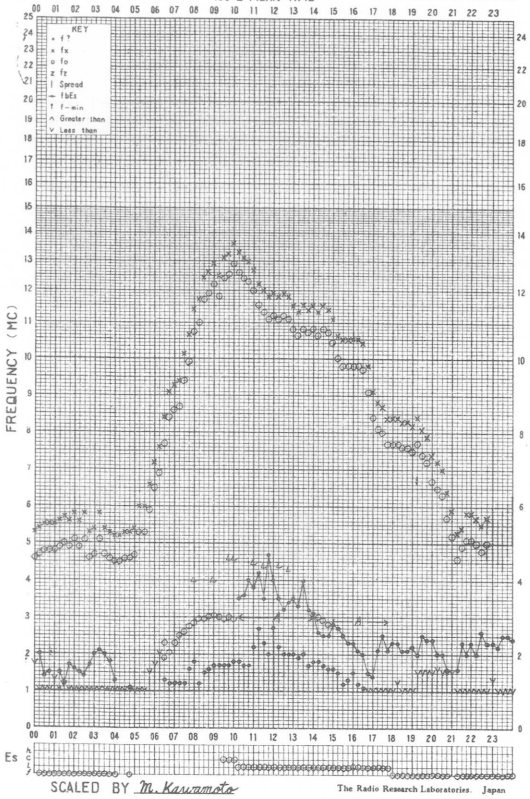

SCALED BY M. Kasuyamoto The Radio Research Laboratories. Japan

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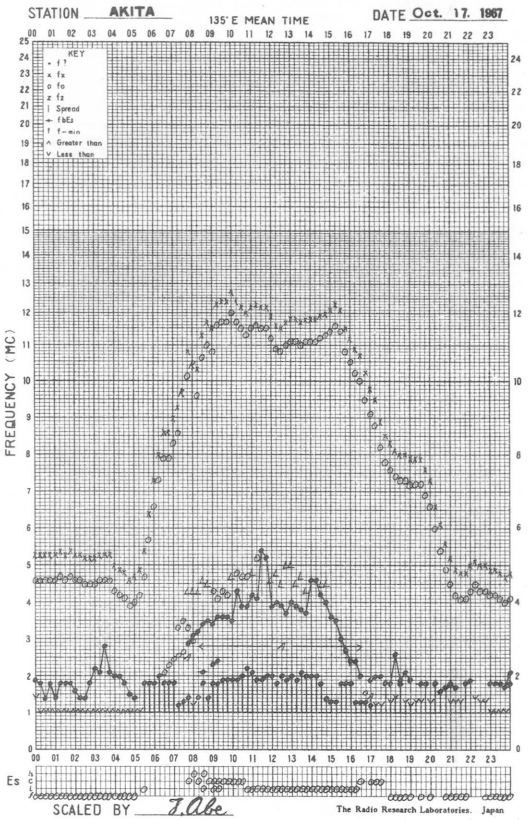

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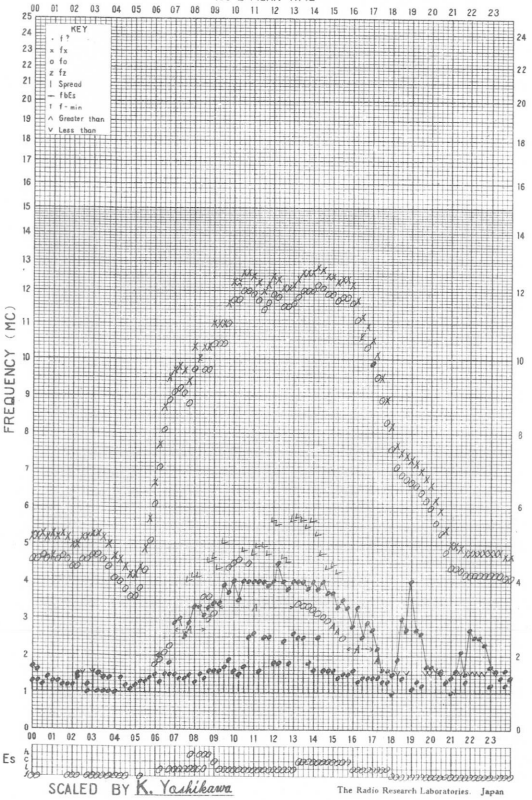

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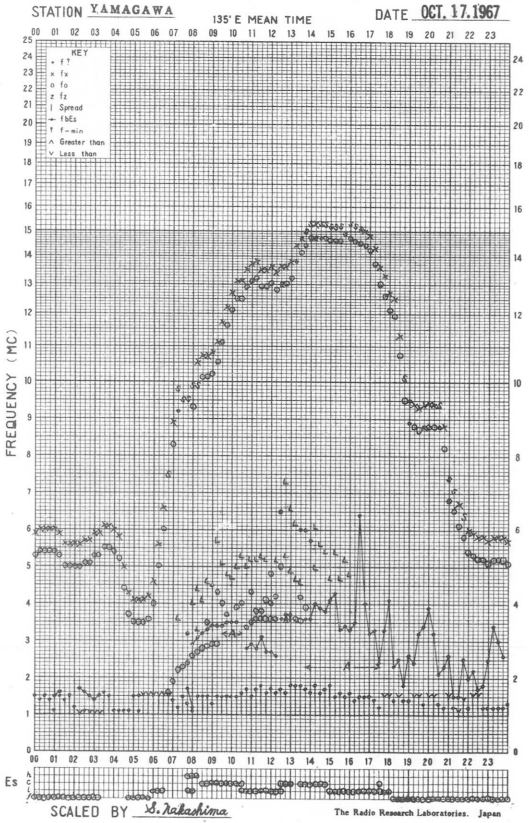

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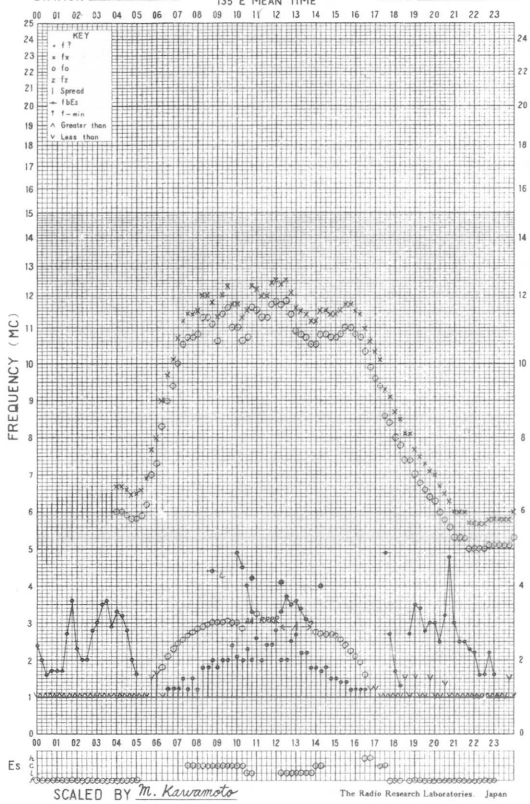

SCALED BY M. Kawamoto

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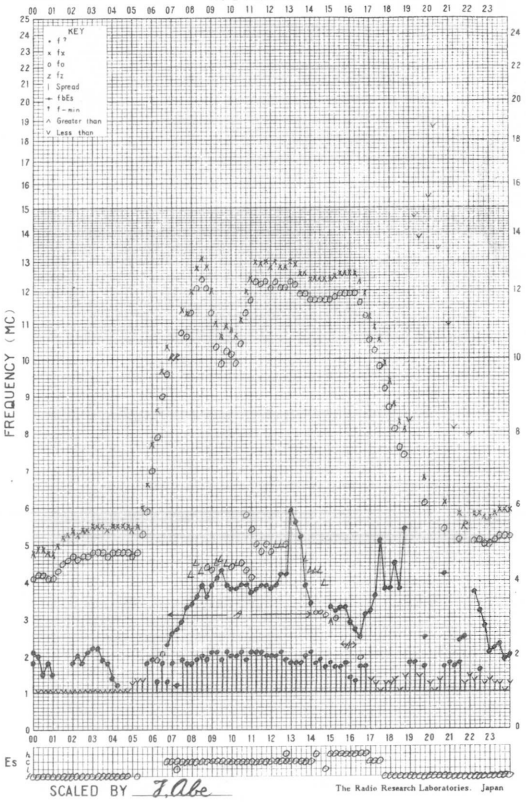

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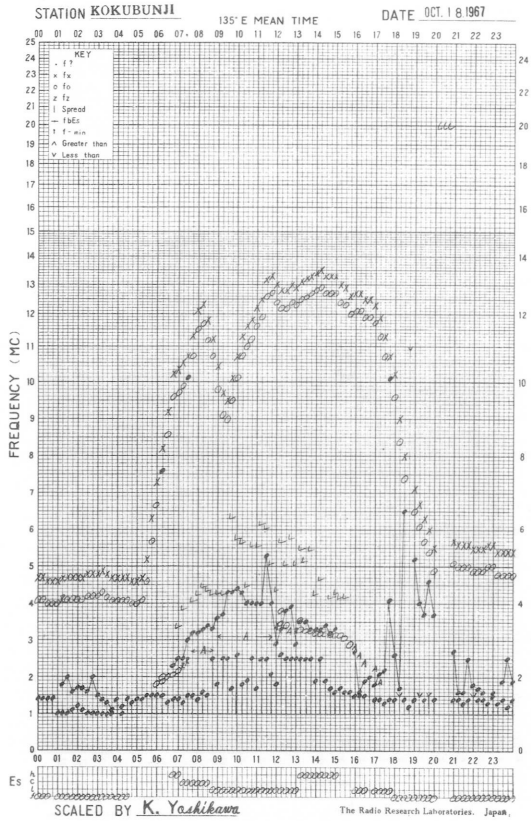

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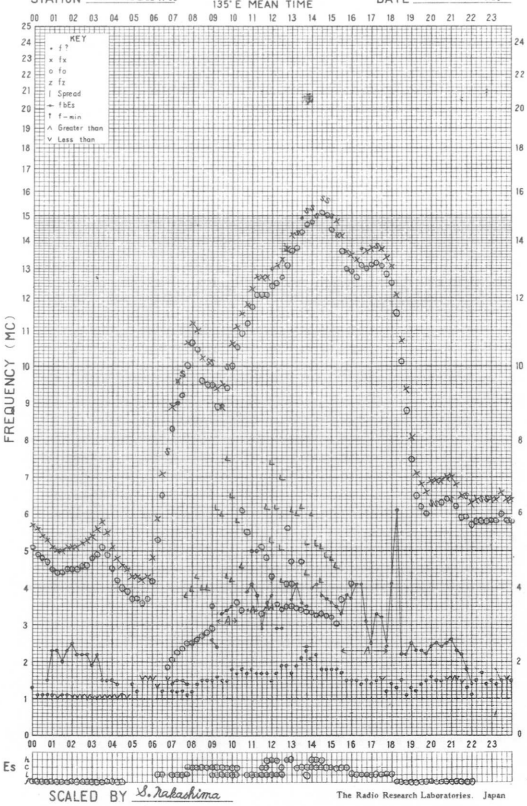

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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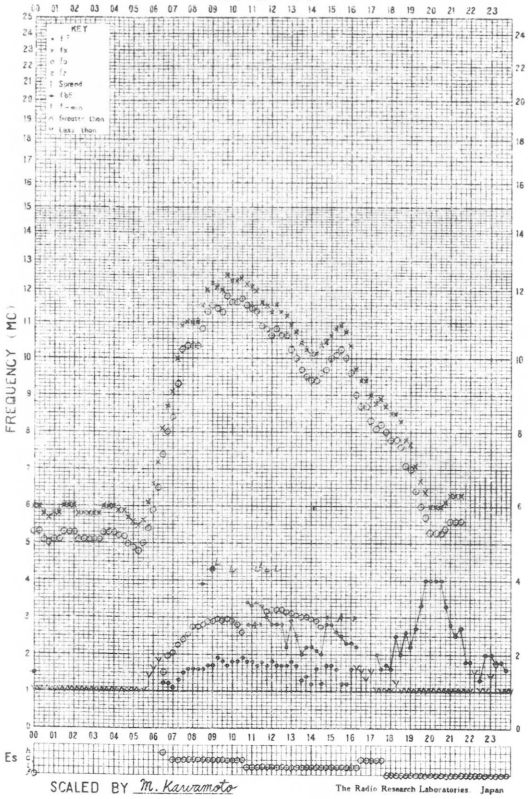
STATION WAKKANAI 135°E MEAN TIME DATE OCT. 19.1967



SCALED BY M. Kawamoto The Radio Research Laboratories Japan

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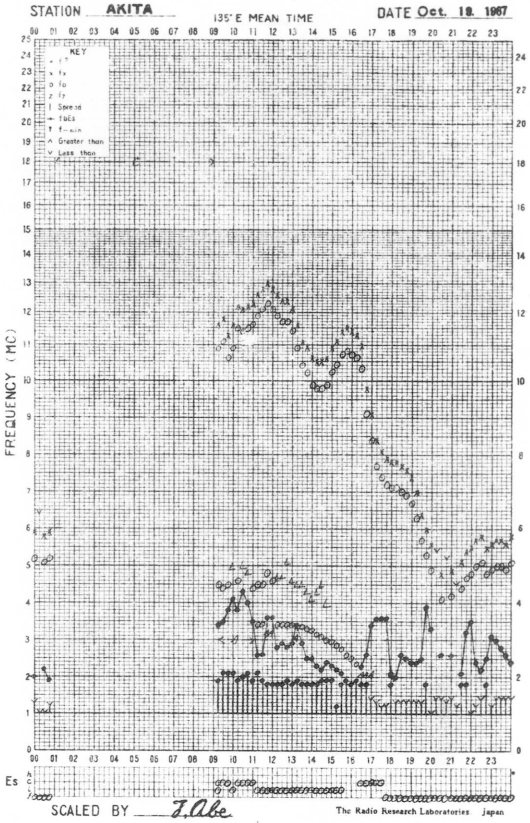

SCALED BY T. Abe The Radio Research Laboratories Japan

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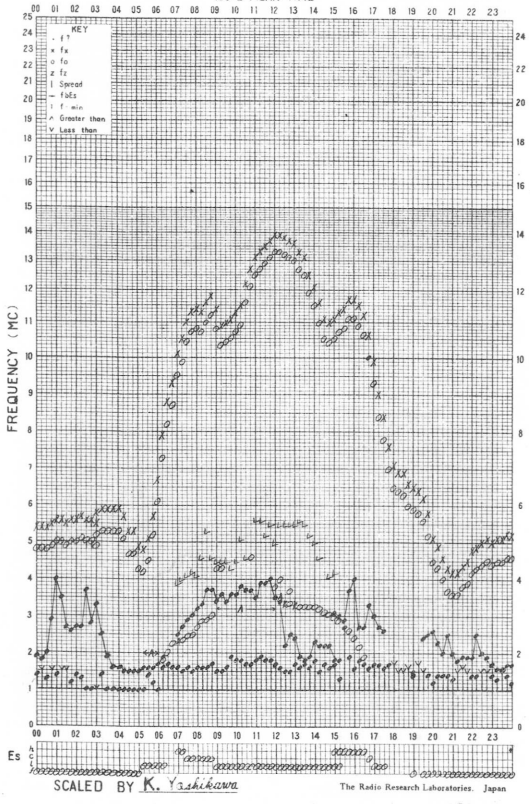

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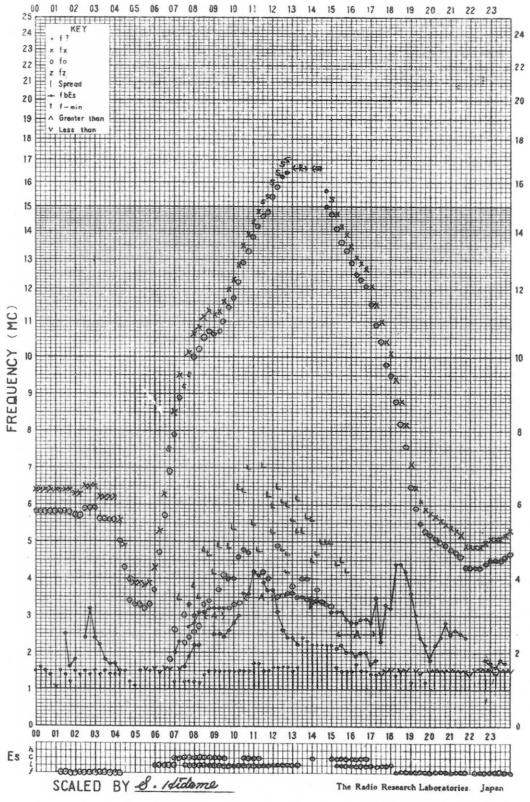

SCALED BY S. Ishioka The Radio Research Laboratories Japan

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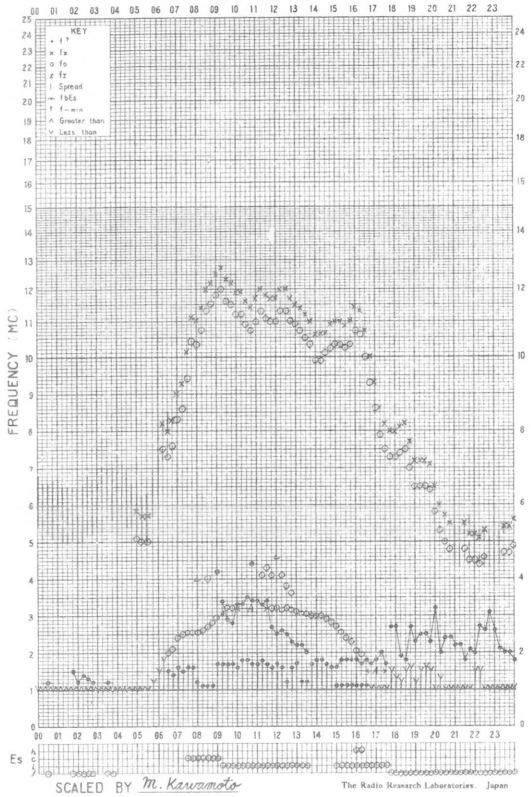

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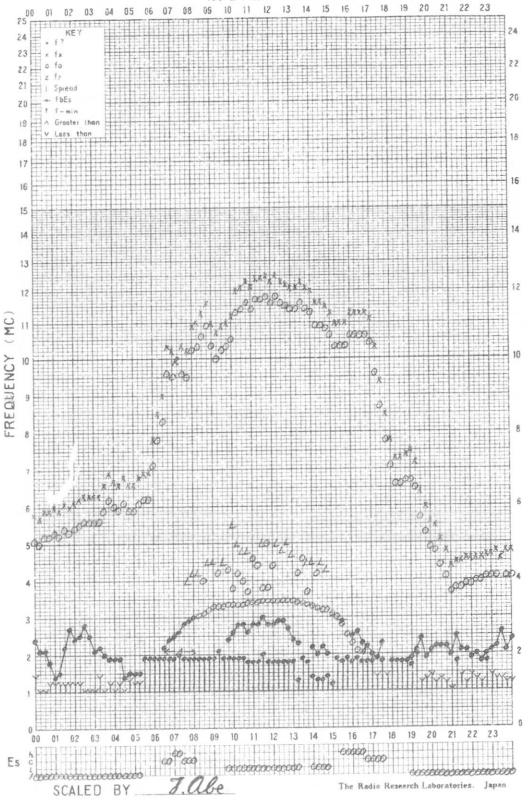

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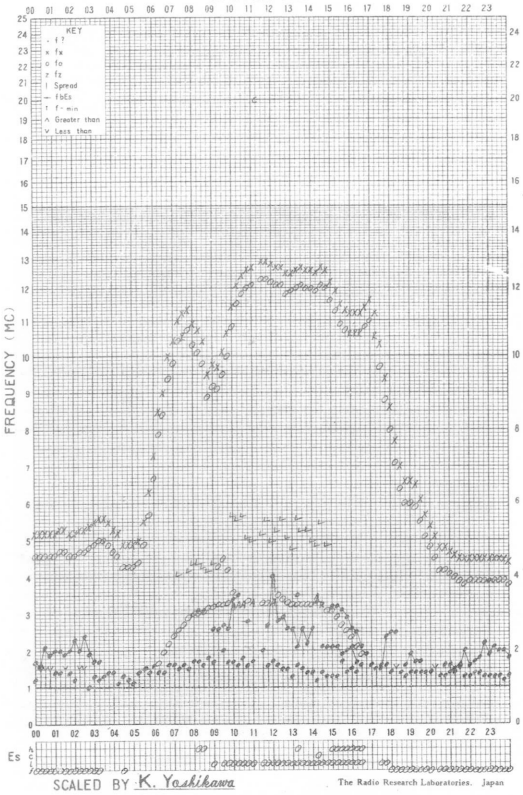

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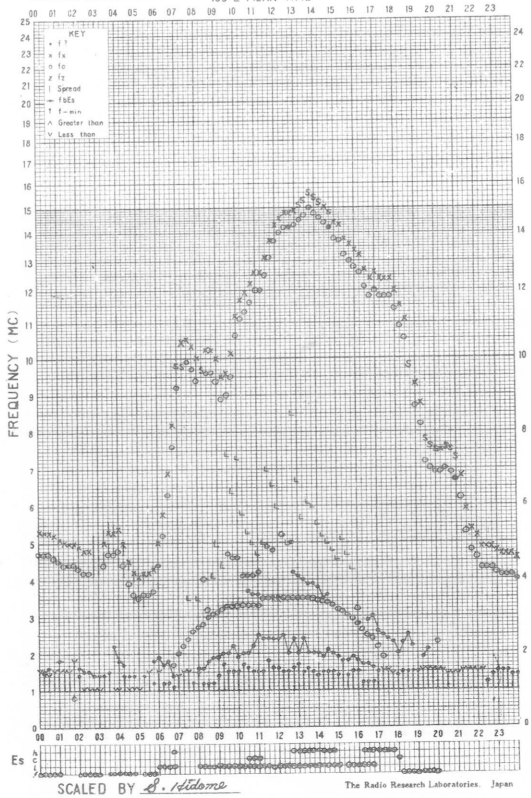

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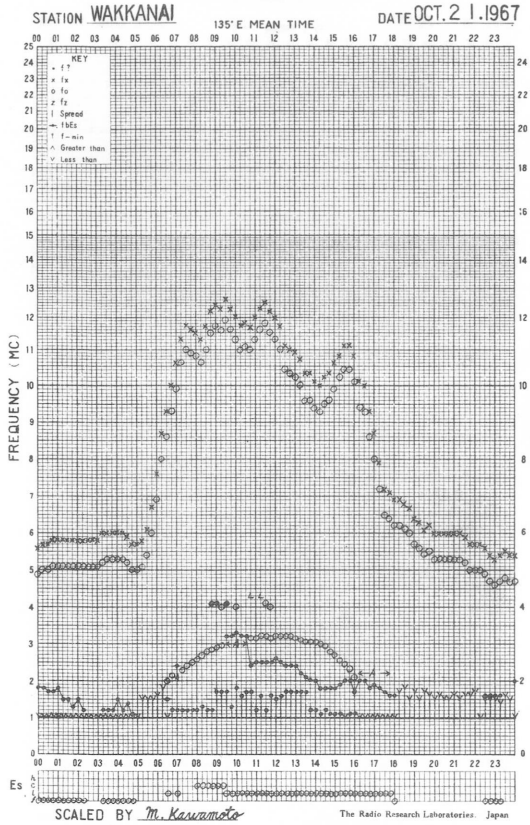

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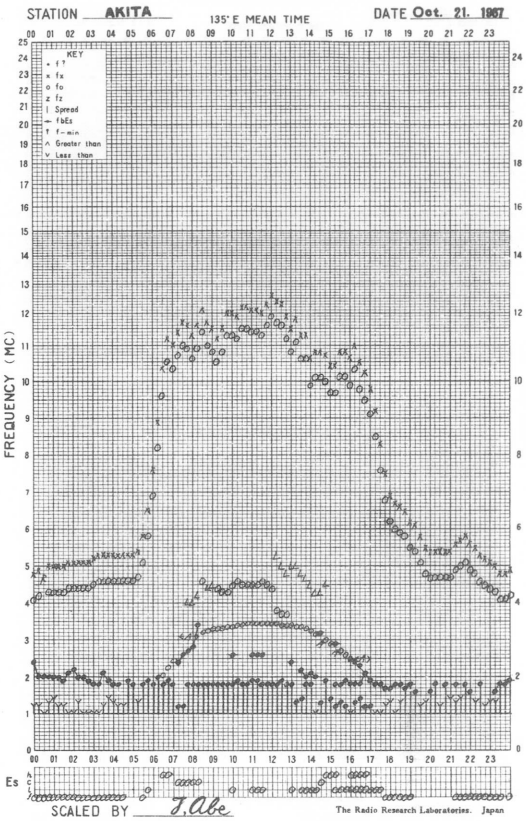

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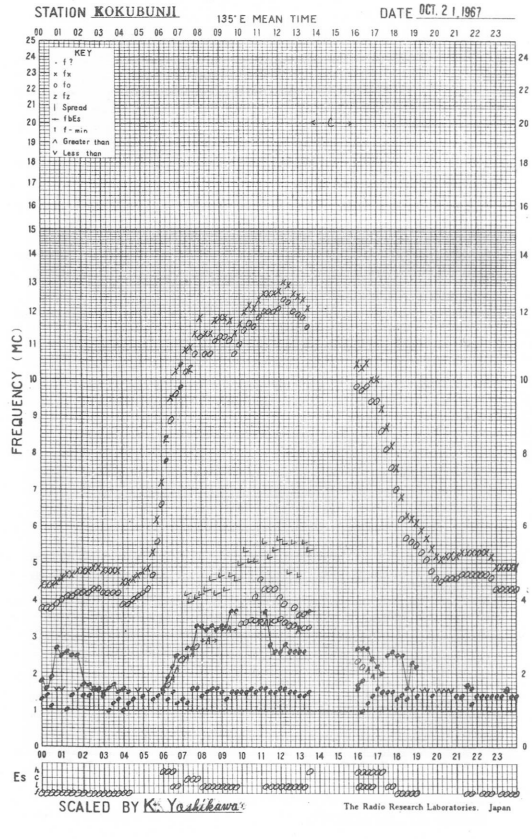

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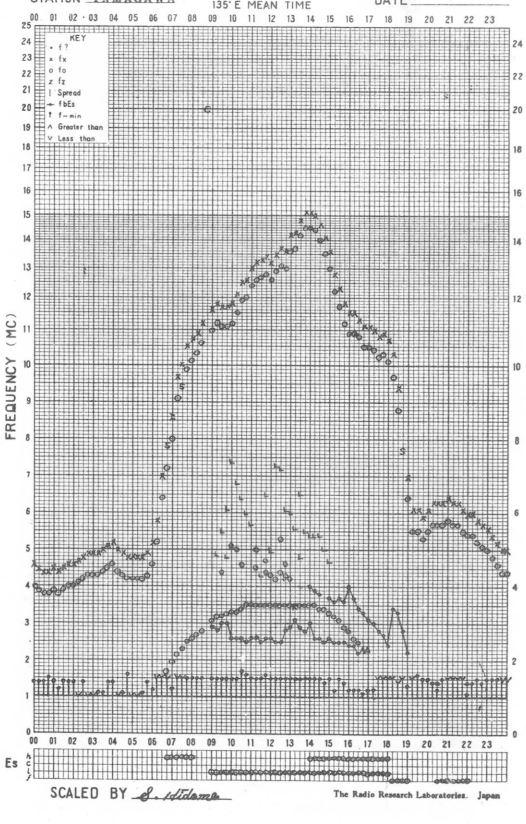

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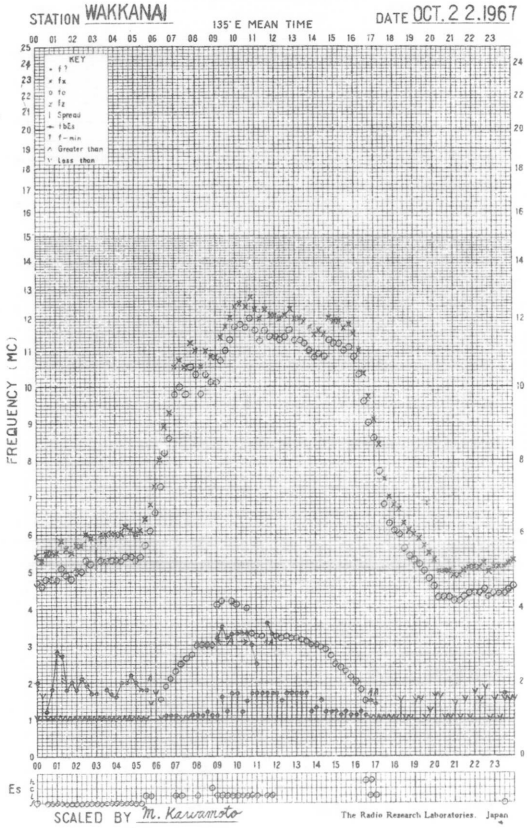

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The Radio Research Laboratories. Japan

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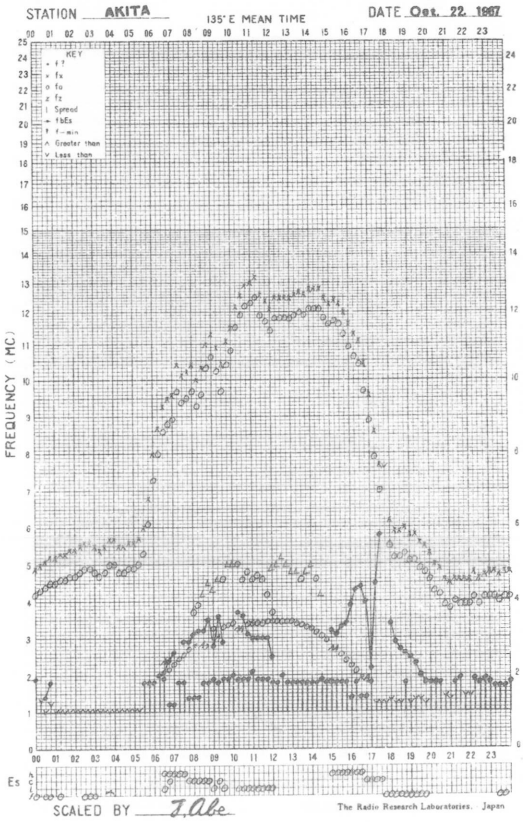

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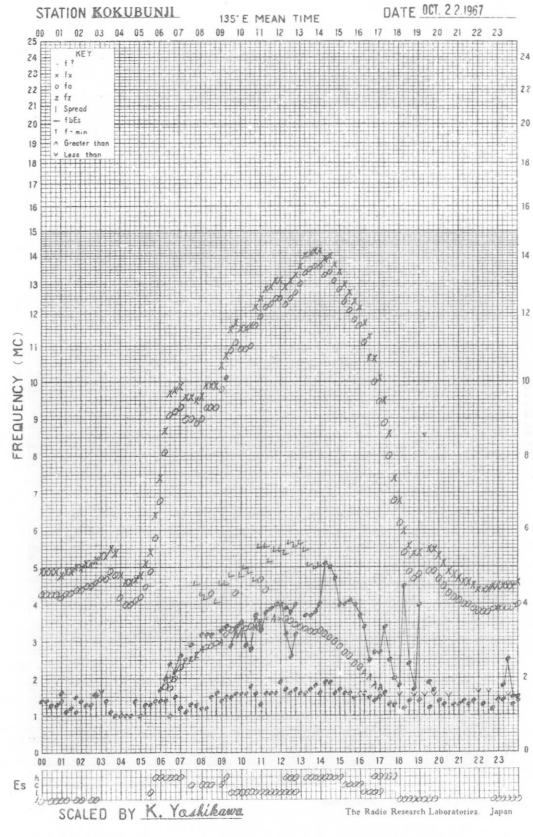

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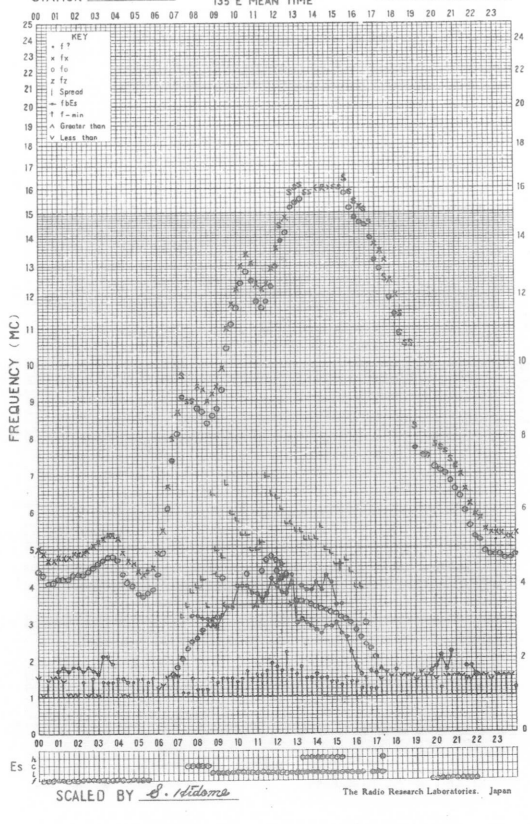

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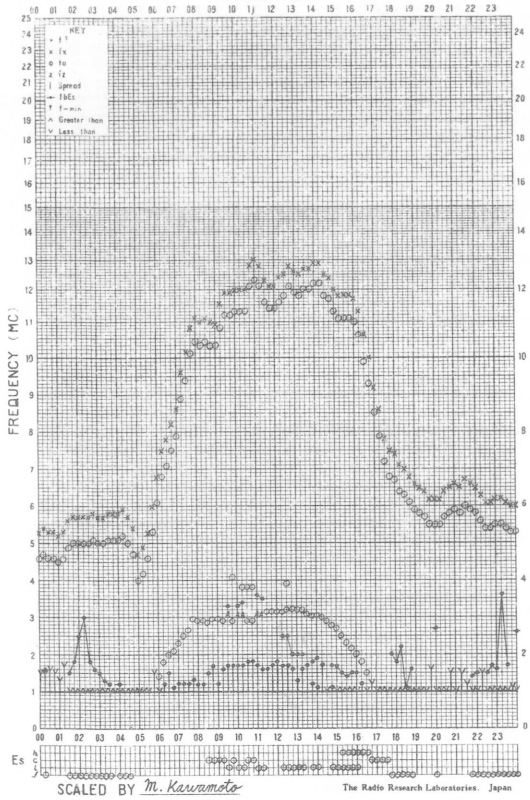

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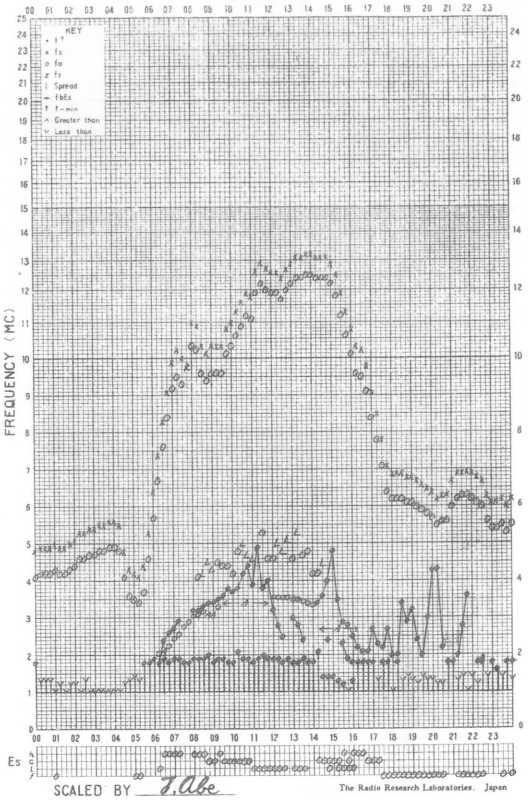

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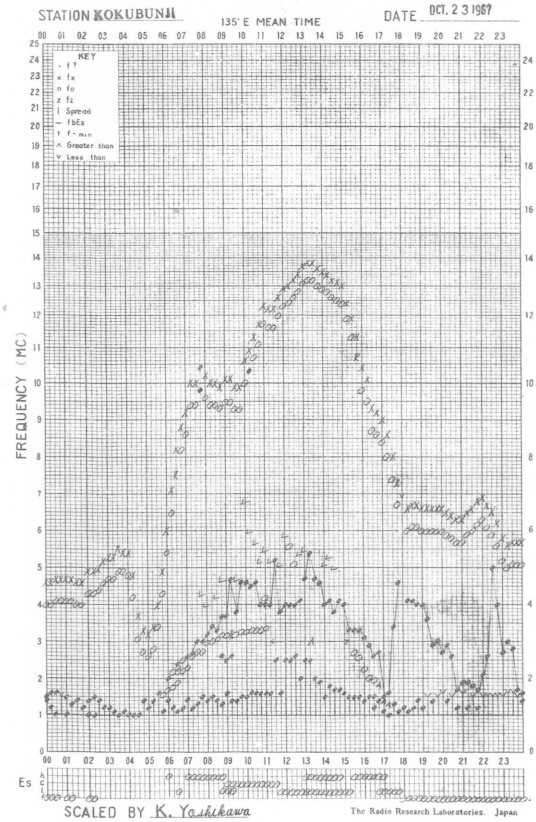

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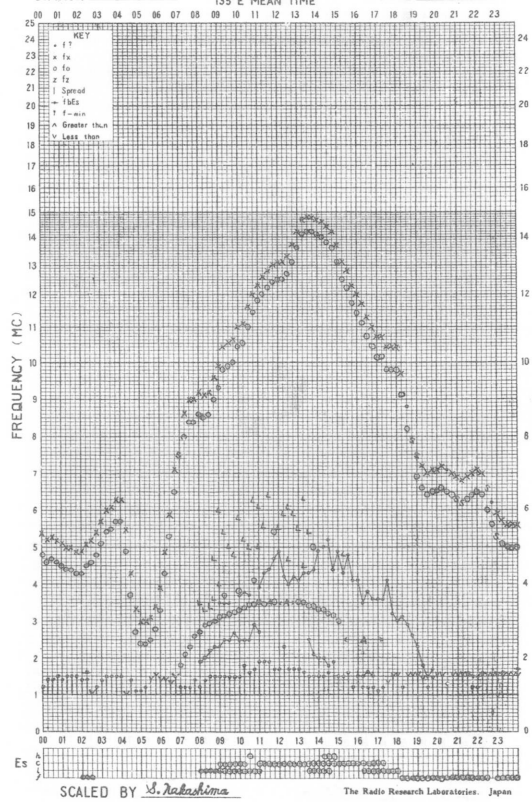

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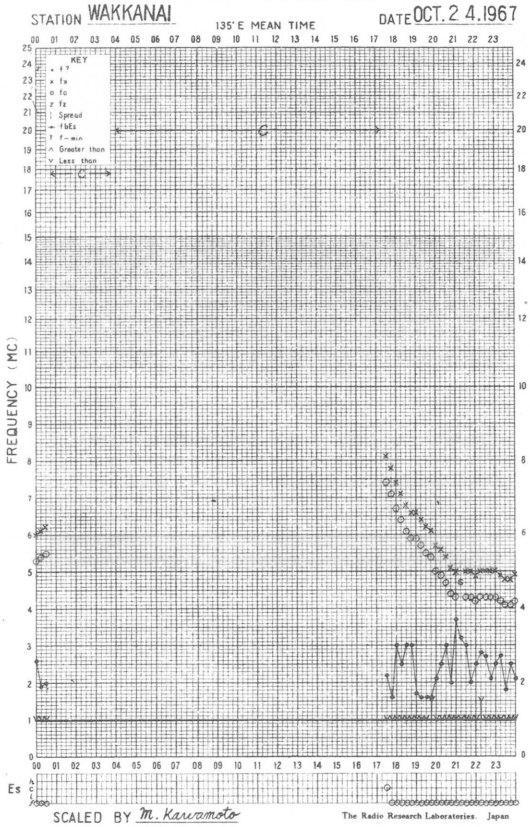

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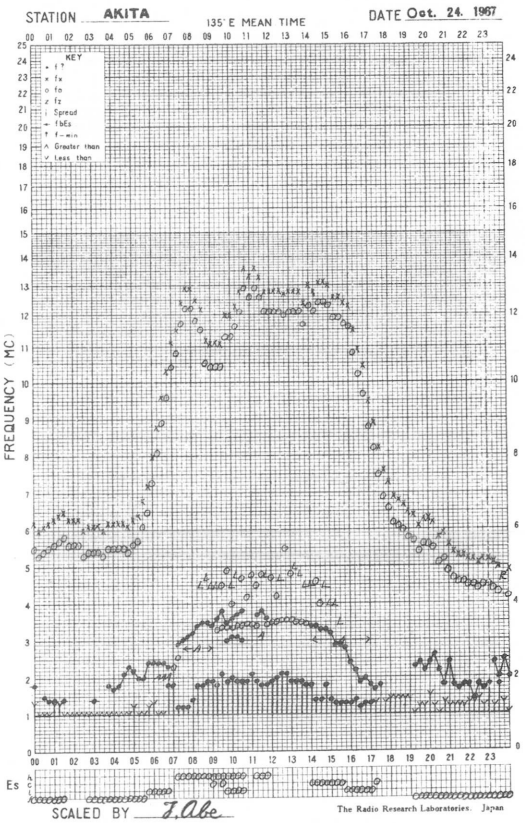

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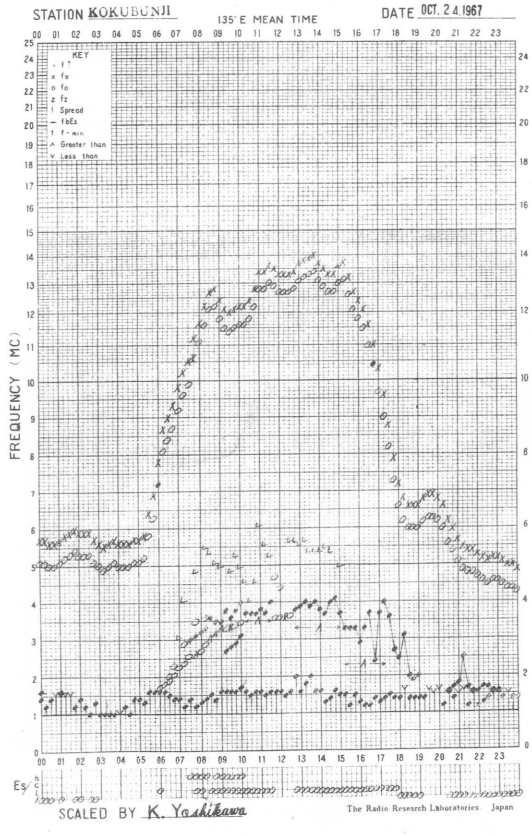

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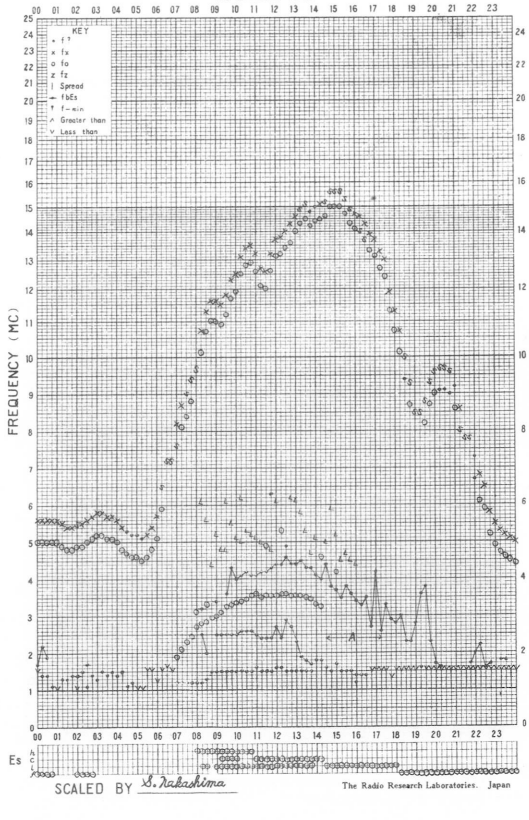

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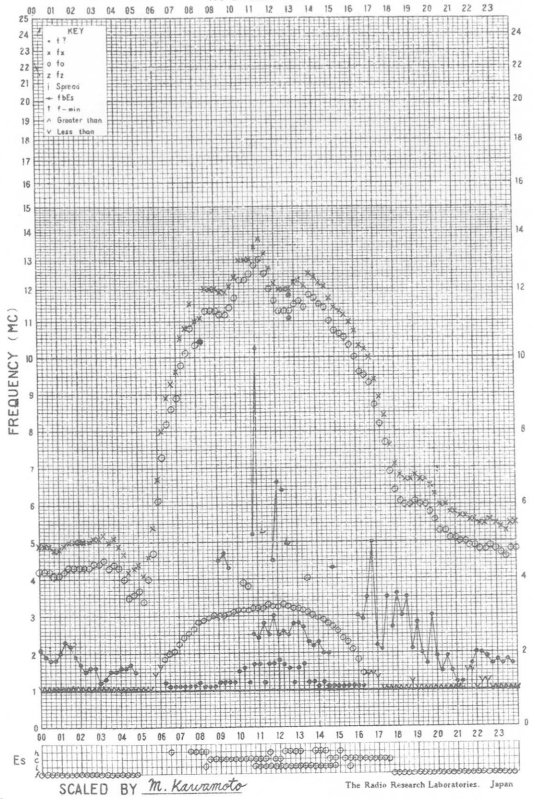

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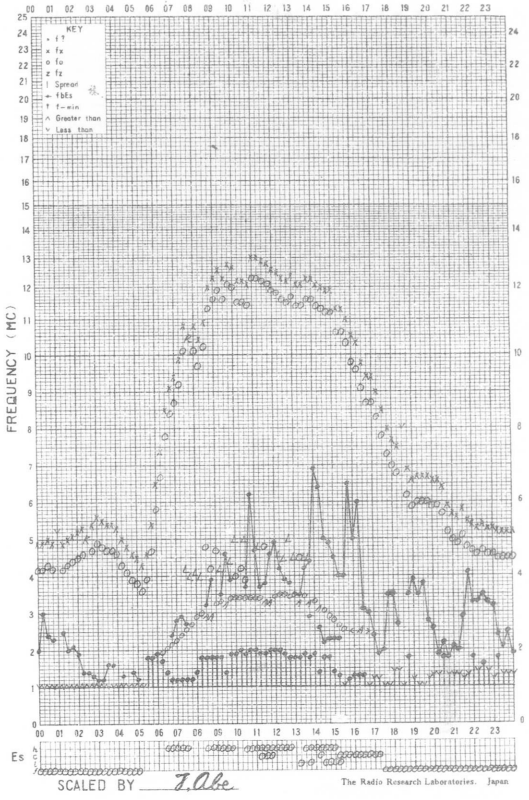

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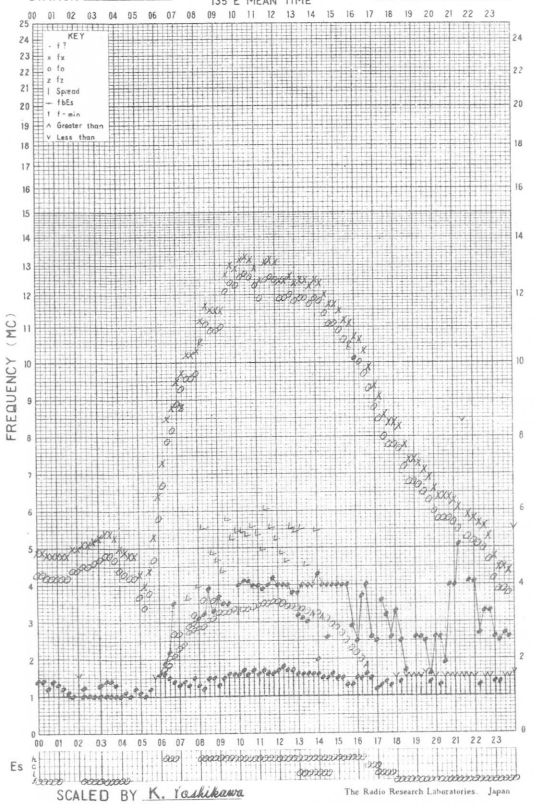

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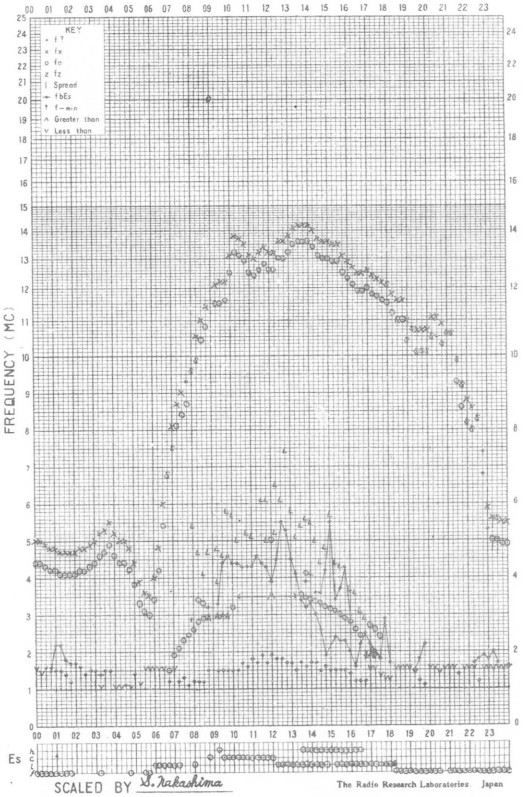

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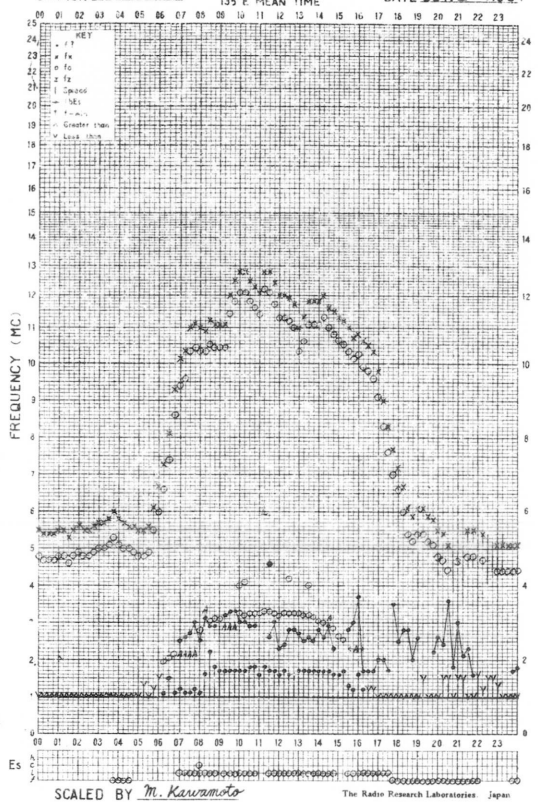

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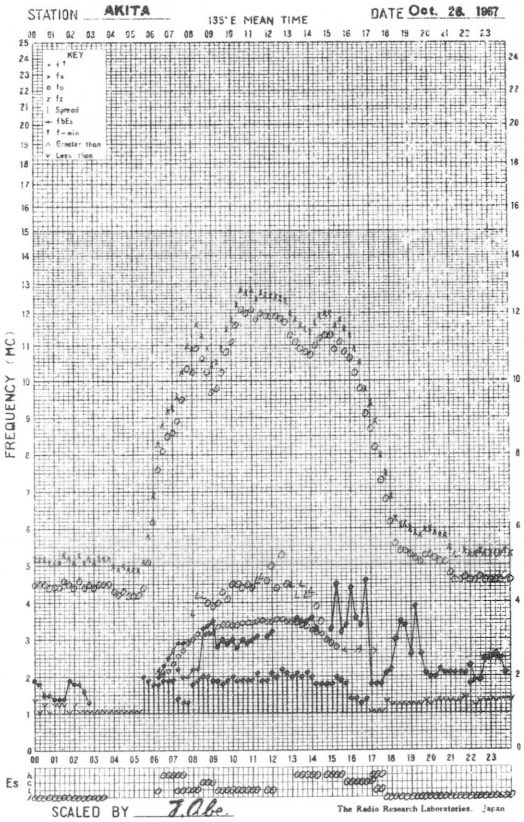

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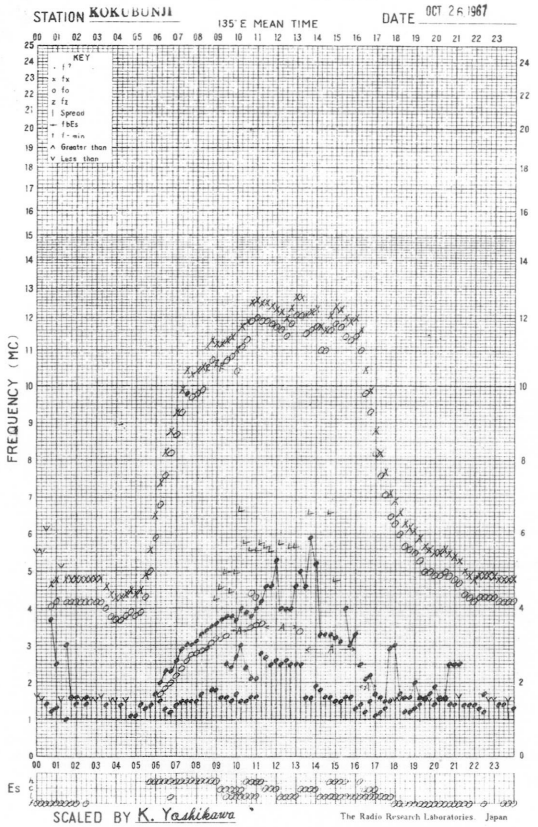

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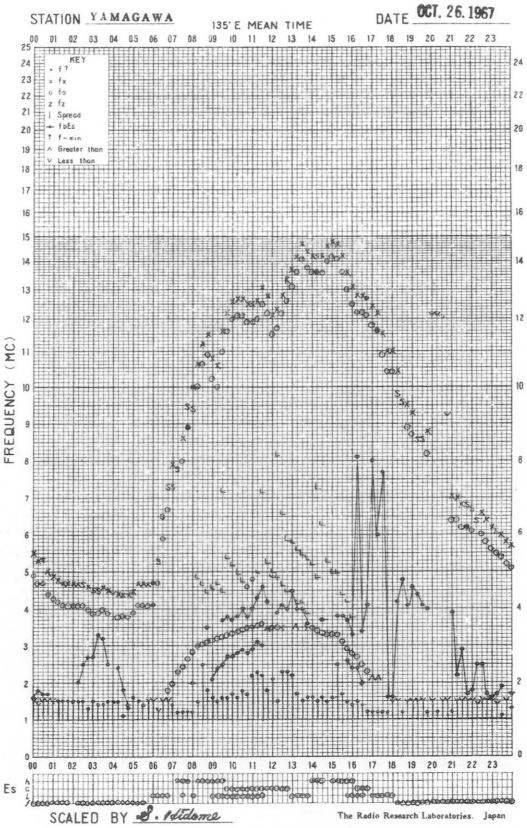

SCALED BY S. Ishioka The Radio Research Laboratories Japan

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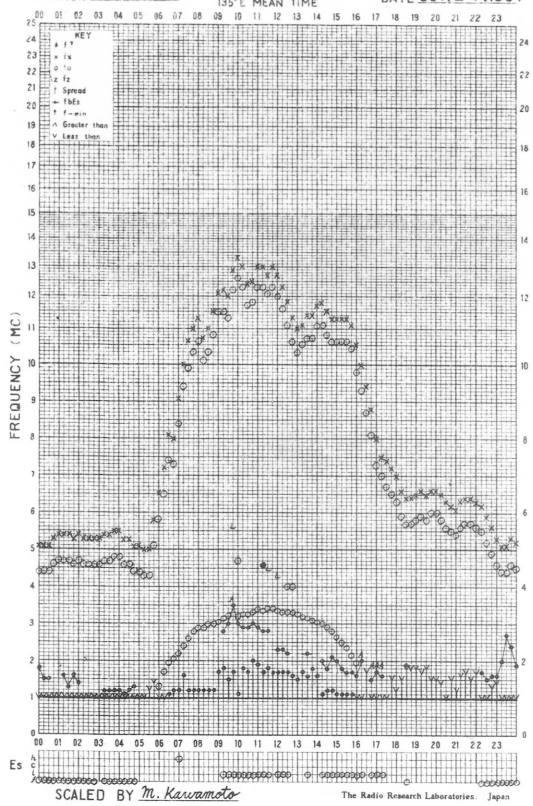

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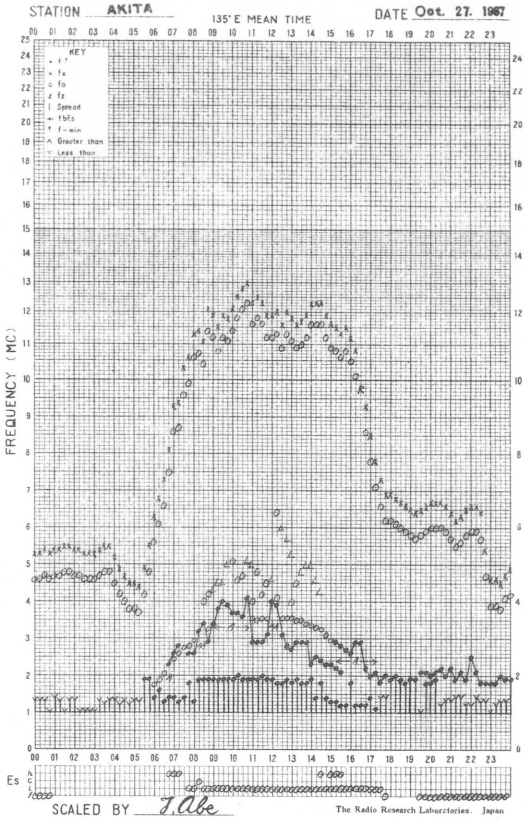

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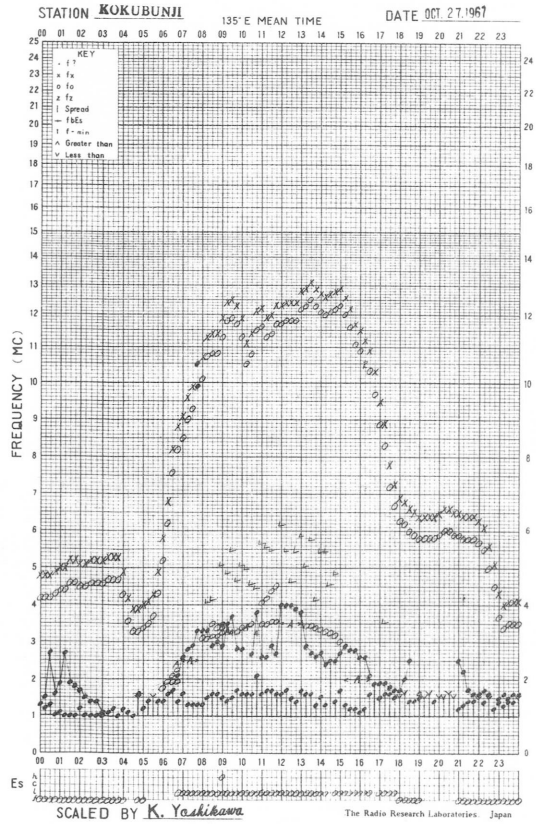

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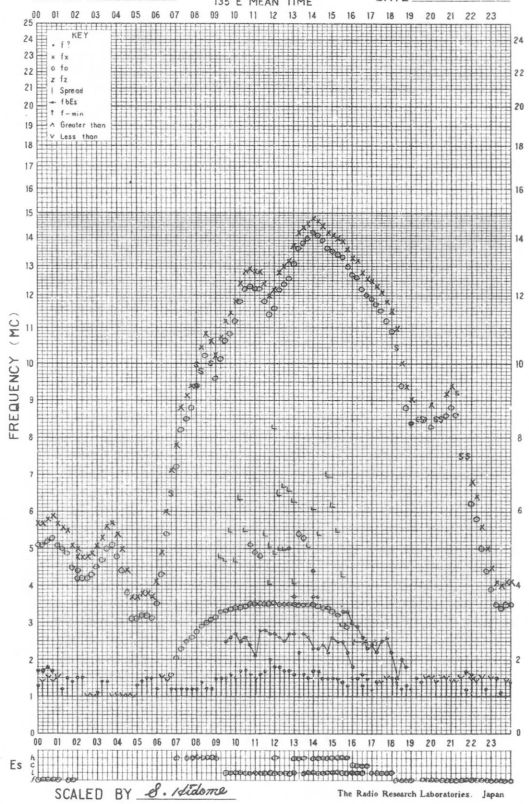

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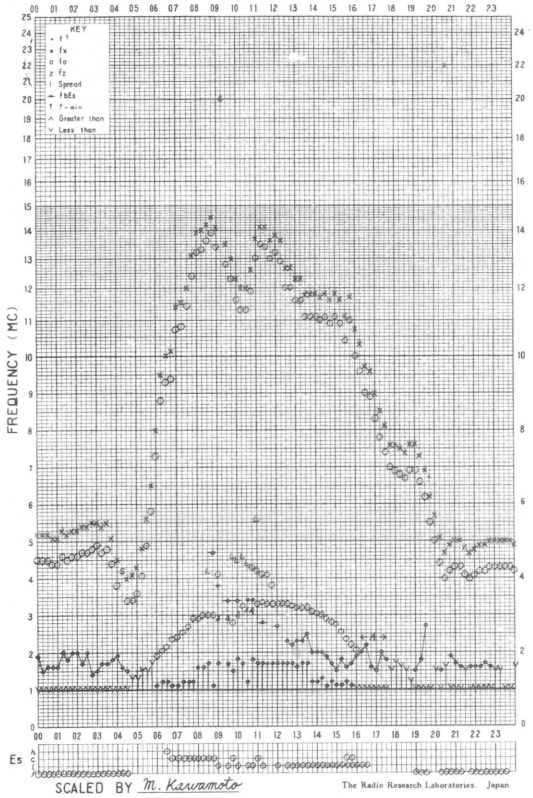

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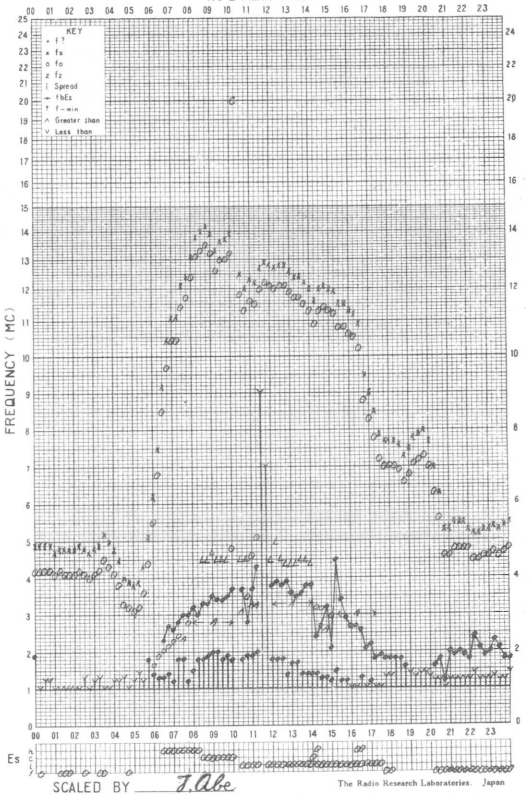

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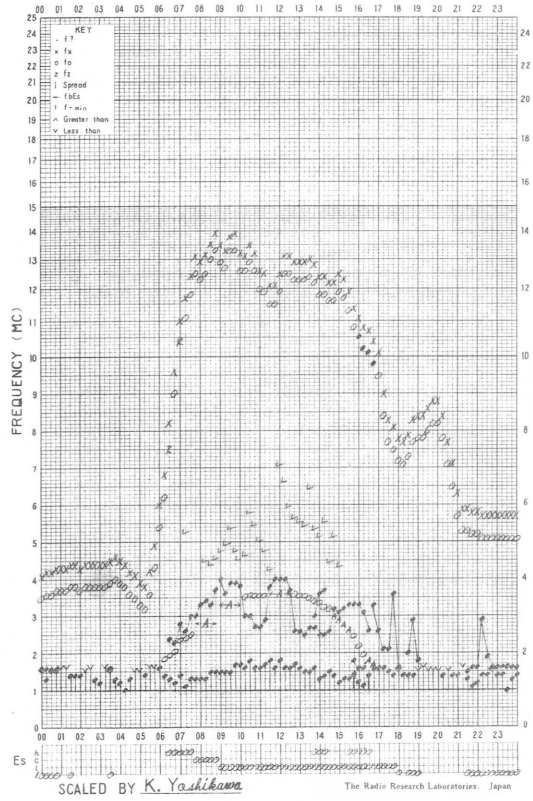

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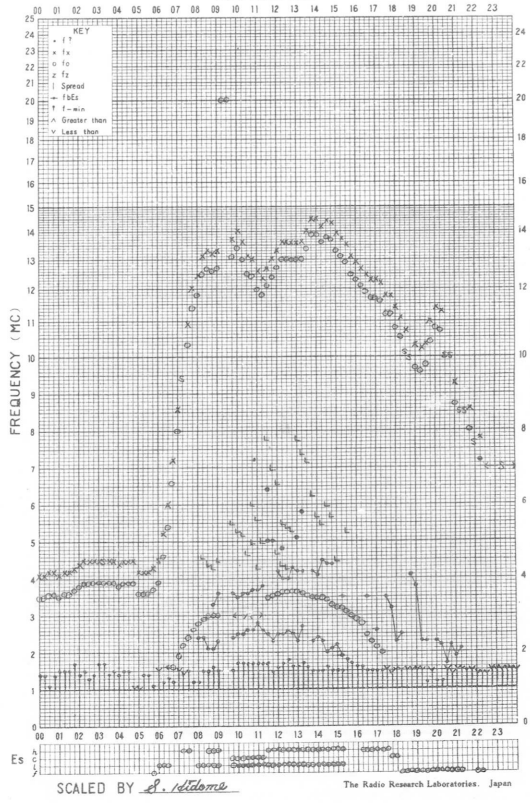

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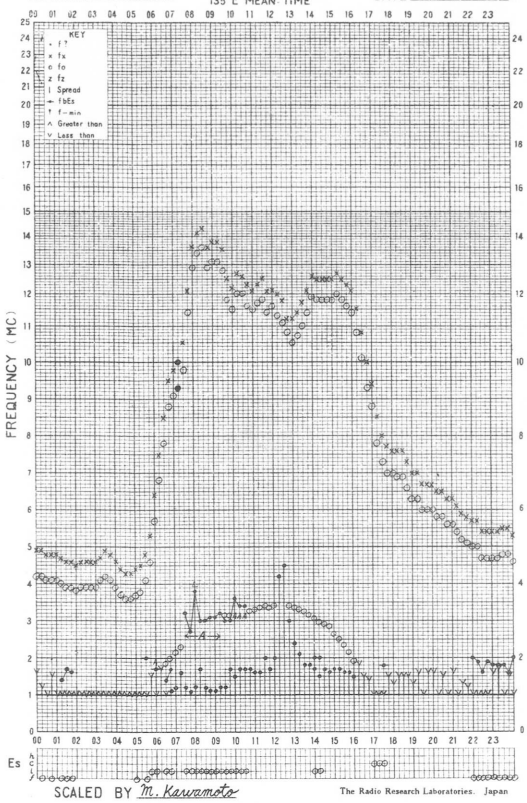

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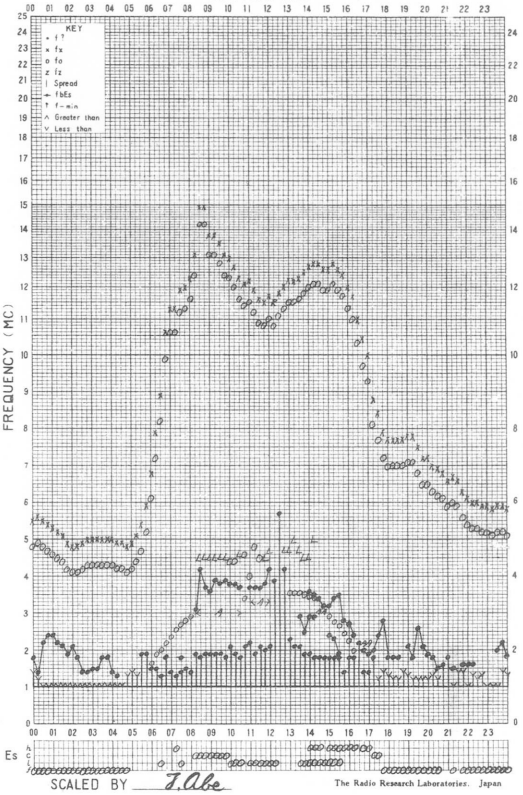

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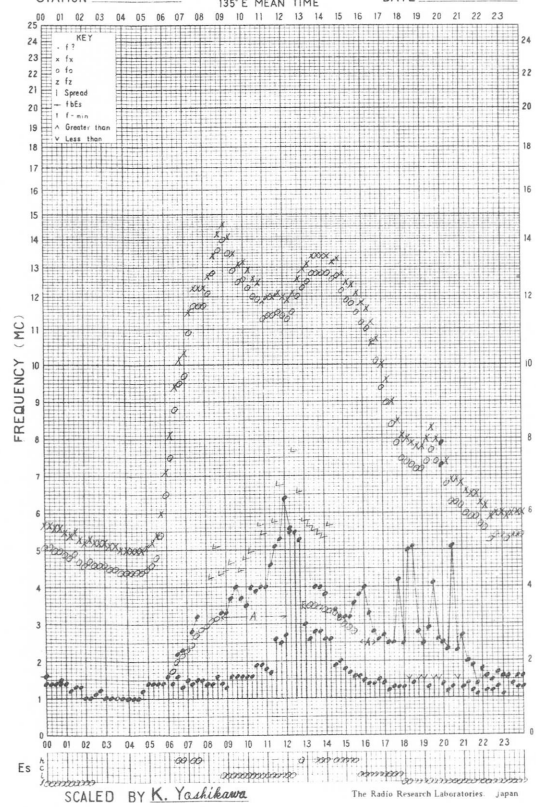

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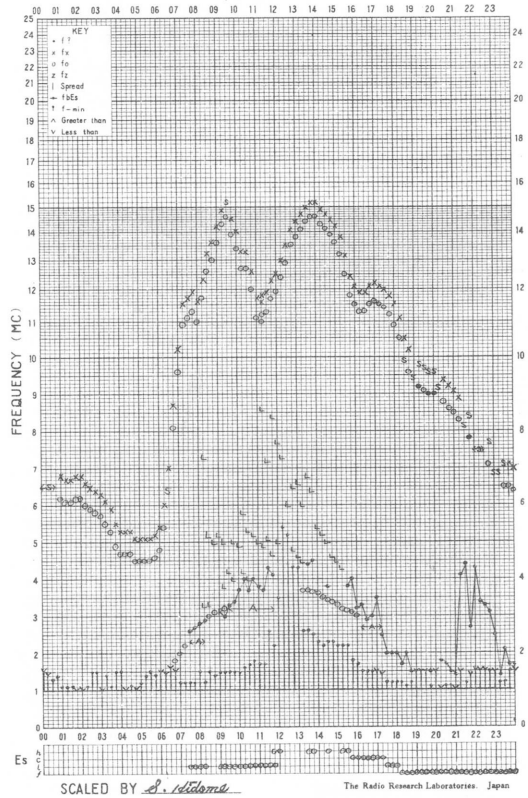
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE OCT. 29.1967

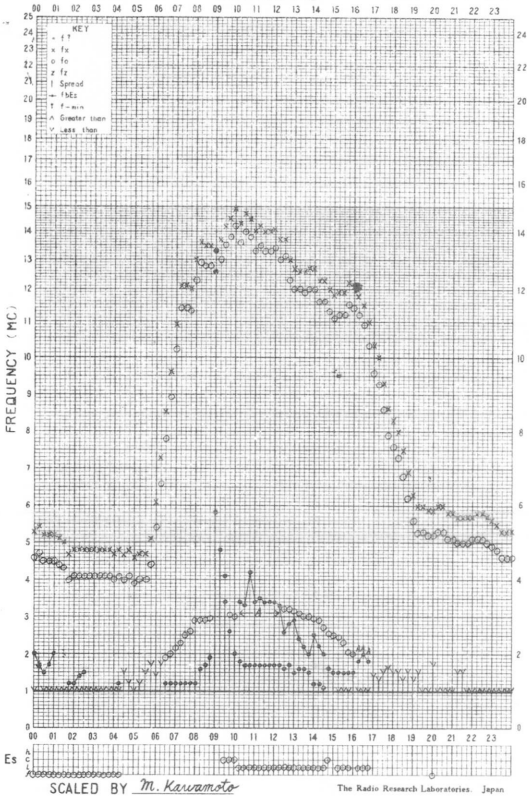


SCALED BY S. Ichijima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

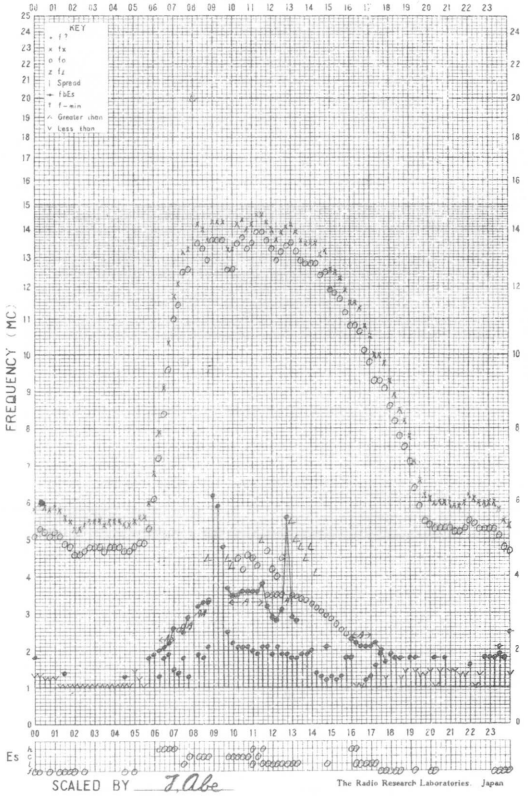
STATION WAKKANAI 135°E MEAN TIME DATE OCT. 30.1967



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

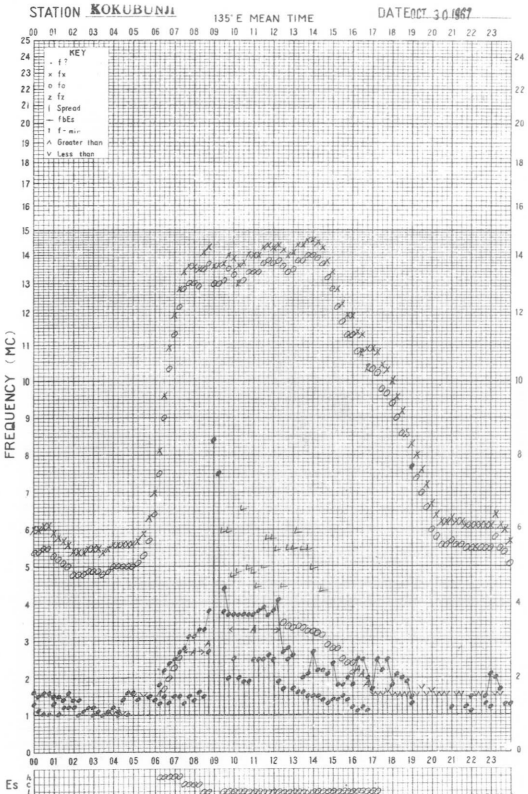
STATION AKITA 135°E MEAN TIME DATE Oct. 30. 1967



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

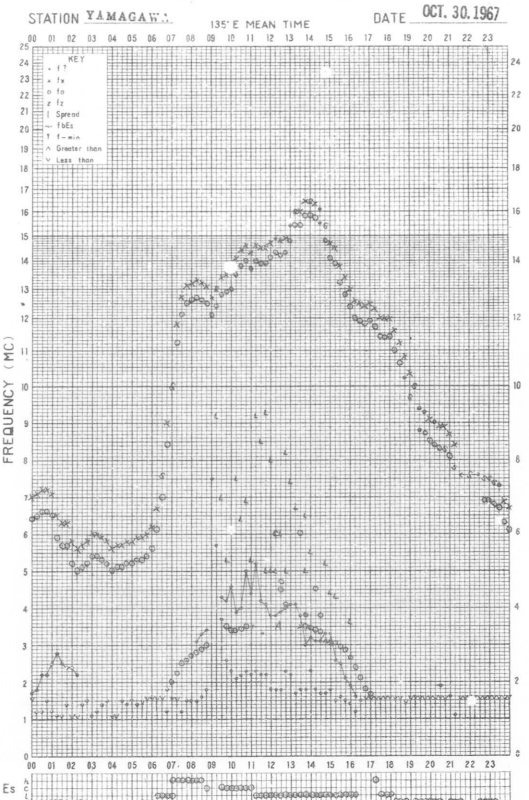
STATION KOKUBUNJI 135°E MEAN TIME DATE OCT 30 1967



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

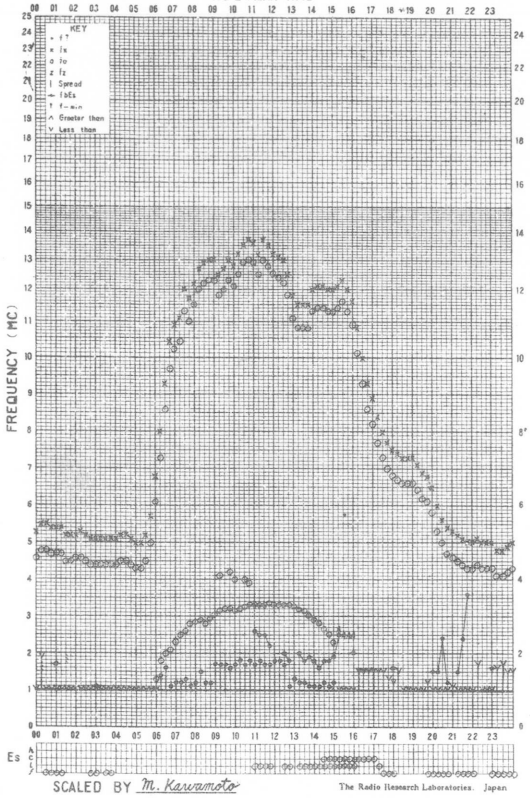
STATION YAMAGAWA 135°E MEAN TIME DATE OCT. 30.1967



SCALED BY S. Takashima The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

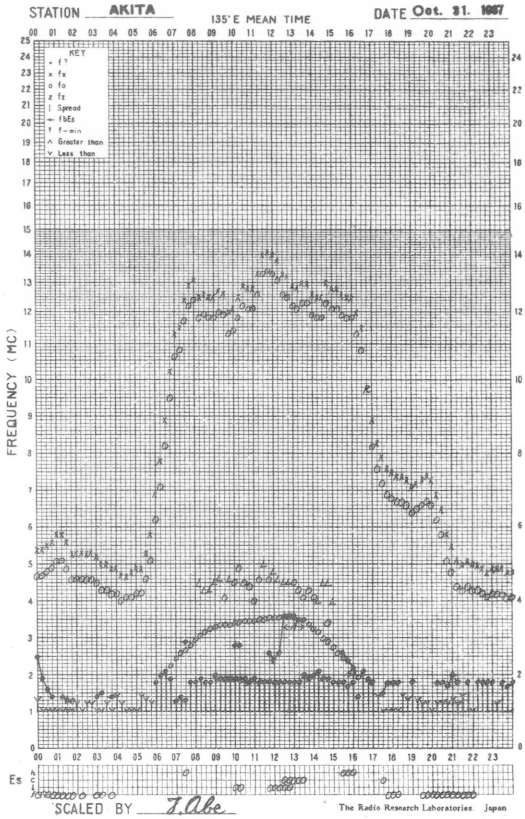
STATION WAKKANAI 135°E MEAN TIME DATE OCT. 31.1967



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

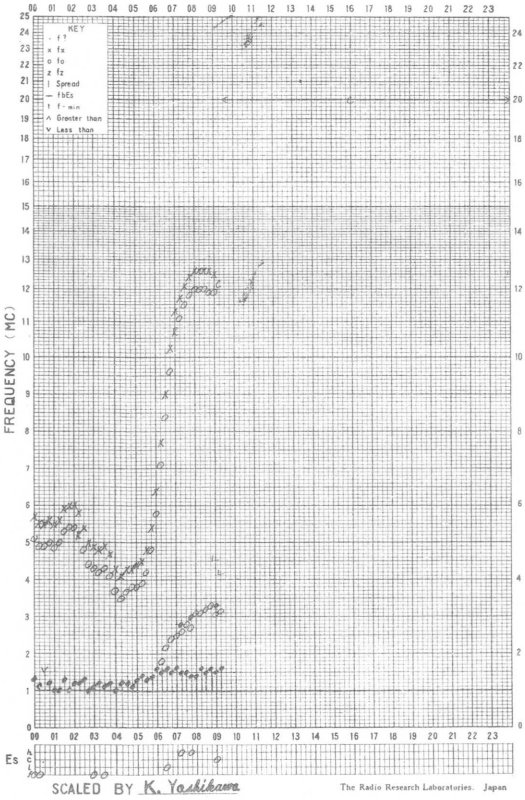
STATION AKITA 135°E MEAN TIME DATE Oct. 31. 1967



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

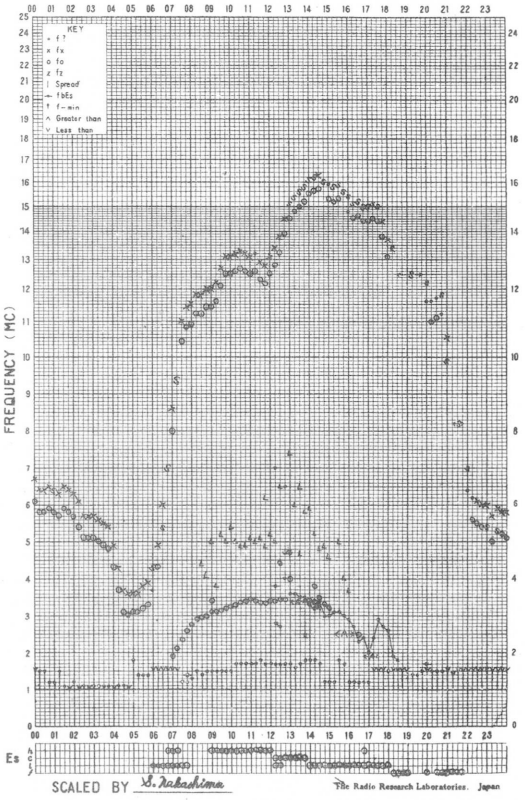
STATION KOKUBUNJI 135°E MEAN TIME DATE OCT. 31 1967



SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE OCT. 31.1967



SCALED BY S. Nakashima The Radio Research Laboratories. Japan

Flux Density and Variability

Month: October 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	9	8	-	-	8	1	0	-	-	0
2	(8)	8	-	9	(8)	(0)	0	-	0	(0)
3	9	9	7	6	9	1	1	1	0	1
4	10	(9)	7	8	8	1	(1)	0	1	1
5	9	(9)	12	9	9	1	(1)	2	0	1
6	9	7	9	6	8	0	0	0	0	0
7	10	9	9	8	8	1	1	2	0	1
8	7	9	6	7	8	1	1	1	0	1
9	7	7	6	-	7	1	0	0	-	0
10	13	12	9	31	12	1	1	1	2	1
11	21	20	(8)	15	21	1	1	(1)	1	1
12	54	36	(50)	73	39	2	2	(2)	1	2
13	55	52	(58)	34	58	1	2	(1)	1	1
14	21	21	(23)	-	25	1	1	(1)	-	1
15	10	10	-	-	(10)	0	0	-	-	(0)
16	-	-	-	(6)	-	-	-	-	(0)	-
17	7	6	(6)	-	6	0	0	(0)	-	0
18	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-
20	8	7	-	-	(7)	0	0	-	-	(0)
21	9	6	(7)	-	7	1	1	(1)	-	1
22	8	6	(5)	-	6	1	0	(0)	-	0
23	6	6	(5)	-	6	1	0	(0)	-	0
24	6	6	(5)	-	(6)	0	0	(0)	-	(0)
25	5	6	-	-	(5)	0	0	-	-	(0)
26	-	7	(8)	-	(7)	-	0	(1)	-	(0)
27	(8)	7	(8)	-	(8)	(0)	0	(0)	-	0
28	(8)	8	(7)	-	(8)	(1)	1	(0)	-	(1)
29	(10)	12	(9)	11	(11)	(1)	1	(1)	1	(1)
30	12	8	(10)	-	11	1	0	(1)	-	1
31	20	25	(20)	-	22	1	2	(2)	-	2

Note No observations during the following periods:

1st 0500- 2nd 0200
2nd 0600- 0810
4th 0300- 0500
5th 0400- 0600
9th 2050- 2400
12th 0500- 0600
14th 0300- 0400
14th 2050- 15th 0100
15th 0300- 0400
15th 0600- 16th 0810
16th 2300- 17th 0100
17th 0300- 0400
17th 2050- 20th 2400
20th 0600- 21st 0100
21st 2050 2400
22nd 0300- 0400
22nd 2050- 2400
23rd 0300- 0400
23rd 2050- 2400
24th 0300- 0400
24th 2050- 25th 0100
25th 0300- 0400
25th 0600- 26th 0300
26th 2050- 27th 0200
27th 0500- 0600
27th 2050- 28th 0200
28th 0400- 0500
28th 2050- 29th 0200
29th 0400- 0500
29th 2050- 2200
30th 2050- 2400
31st 2050- 2400

SOLAR RADIO EMISSION

Flux Density

Month: October 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	33	32	32	33	32
2	36	35	35	32	35
3	35	35	35	33	34
4	(31)	30	(33)	35	32
5	34	33	32	32	33
6	35	35	33	35	34
7	36	35	35	33	35
8	31	31	31	32	31
9	33	33	32	36	33
10	34	32	34	33	34
11	34	32	31	31	32
12	34	31	-	-	32
13	38	35	34	-	36
14	33	30	(41)	34	33
15	32	30	(31)	33	31
16	32	30	-	32	31
17	36	37	(38)	33	36
18	34	-	-	37	(34)
19	35	34	(35)	38	35
20	36	35	(36)	39	36
21	37	34	33	36	36
22	35	36	(38)	35	36
23	36	36	(35)	38	36
24	40	39	(40)	40	40
25	39	37	(39)	40	39
26	41	39	(43)	39	40
27	44	41	(45)	-	42
28	(43)	43	(40)	-	(43)
29	-	-	-	-	-
30	-	-	-	-	-
31	38	36	(37)	38	37

Note No observations during the following periods:

4th	0000-	0100	17th	0700-	0810
4th	0700-	0810	18th	0200-	0810
5th	0000-	0100	19th	0000-	0300
12th	0500-	2400	27th	2050- 28th	0215
13th	2050-	2400	28th	2050- 31st	0100
16th	0600-	0810			

Distinctive Events

(single-frequency observations)

Month: October 1967
Observing station: Hiraiso
Normal observing period: 2050 - 0810 (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	
5	200	0136.5	0137	1.0	C	60	15	
7	200	0043.5	0044	1.0	C	240	110	
10	200	2050 (SR) ~ 13th		0810 (SS)				noise storm
22	200	0202	0203	2.0	C	60	20	
23	200	0203	0203.4	1.0	C	65	10	
	200	0209.5	0209.8	1.0	C	40	10	
25	500	2318.0	2320.0	7.0	C	75	20	
26	500	0204.5	0205.2	1.5	C	100	10	
	500	0609.0	0609.6	2.0	C	410	100	
	200	0610.0	0610.0	2.0	C	300	30	
	200	0613.0	0613.5	2.0	C	360	50	1st peak
	200		0614.7			550		2nd peak
	200	0617.0	0618.8	>93.0	C	35	-	
29	200	0323.0	0334.2	14.0	C	210	35	
	200	2343.5	2357.8	47.0	C	260	50	
30	500	0046.0	0058.5	65.0	C	100	25	
	200	0044.0	0118.3	66.0	C	75	30	

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

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

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

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

Oct. 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	- 7	- 6	5	8	18	21	21	19	21	17	23	<- 2s	<- 7s	<-13s	<-17s	<-30s	<-31s	<-31s	<-31s	8	8	5	S	- 2
2	- 5	- 2	3	12	15	21	22	20	19	11	10	<- 5s	<- 4s	<- 9s	<-12s	<-33s	<-33s	-21	-14	0	4	0	S	0
3	- 5	- 1	5	11	19	23	24	24	21	21	23	16	- 7	<-12s	-16	<-17s	-21	-19	<-11s	0	10	0	S	- 1
4	- 1	2	4	0	19	27	21	4	15	18	- 1	<- 1s	- 5	-11	- 6	- 7	<-20s	4	6	1	6	1	S	- 4
5	- 3	- 3	4	11	19	19	20	22	21	21	- 4	- 3	<- 4s	<-11s	<-11s	-14	<-24s	S	S	- 3	10	3	S	- 2
6	- 4	0	1	13	16	19	21	16	22	<- 6s	<-11s	- 9	<- 9s	<-12s	<-24s	<-16s	-13	<- 5s	<-19s	1	3	4	S	- 8
7	- 6	- 1	0	7	14	19	13	24	17	2	< 3s	< 1s	- 4	<- 5s	<-13s	<-27s	-17	22	-12	1	5	3	S	- 1
8	- 2	3	4	11	17	20	18	12	20	3	<- 4s	<- 1s	<- 8s	<-11s	<-22s	<-30s	17	-12	<-24s	- 7	- 3	0	S	1
9	- 4	3	10	15	16	18	22	21	20	15	6	< 0s	8	9	14	<-22s	-17	12	<-24s	0	12	5	S	2
10	- 3	4	7	11	14	24	14	5	12	17	4	- 3	<- 4s	<-12s	<-29s	-22	-22	- 5	<-10s	-12	- 5	- 9	S	<-10s
11	1	- 2	3	11	15	19	19	15	10	<- 3s	<- 3s	<- 4s	<- 3s	- 9	-13	-20	<-32s	-14	-18	7	5	1	S	- 3
12	- 2	0	3	11	17	17	17	20	14	<- 1s	4	<- 1s	<- 6s	- 7	-17	<-13s	-23	-12	-17	5	6	3	S	- 1
13	- 2	1	5	8	14	19	15	- 3	- 2	- 2	19	13	- 6	<-27s	<-10s	<-18s	<-25s	4	- 1	- 1	4	4	0	- 2
14	0	1	4	7	16	21	13	11	27	5	- 2	12	- 9	-15	<-22s	<-25s	-24	<-14s	<-12s	2	8	1	0	- 1
15	- 4	0	6	13	10	20	21	15	24	0	<- 1s	<- 5s	- 4	- 7	-21	-24	S	- 1	<-29s	- 2	5	5	2	- 1
16	- 2	0	4	13	19	22	19	21	10	- 3	< 0s	< 2s	<- 7s	<-14s	-23	<-32s	<-32s	2	-23	- 5	9	3	S	2
17	1	1	7	16	19	23	25	25	21	11	2	<- 1s	- 7	-14	-16	<-32s	<-26s	-13	2	- 1	7	0	S	S
18	- 5	- 1	6	12	15	20	25	25	22	10	<- 3s	< 2s	< 5s	- 7	- 8	<-24s	<-16s	- 5	17	10	6	2	S	3
19	6	C	6	14	15	24	25	18	- 4	- 5	<- 3s	< 0s	<- 7s	<-19s	<-29s	<-29s	-26	-17	-18	4	15	3	12	1
20	- 3	- 4	3	14	23	23	20	25	13	- 3	< 1s	< 0s	<- 2s	-22	-29	<-33s	<-33s	-16	<- 4s	- 1	11	1	S	2
21	- 6	0	7	13	16	16	24	17	15	- 3	- 5	<- 5s	<- 6s	<-23s	-29	<-33s	<-34s	<-18s	<-34s	- 5	9	6	(10s	- 1
22	0	0	5	8	15	17	15	17	5	- 8	- 8	<- 4s	-14	-22	-26	<-34s	<-34s	-13	-18	1	- 3	- 6	1	- 1
23	1	2	12	14	18	23	20	24	22	- 2	<- 5s	<- 2s	20	-12	-24	<-28s	-20	- 6	3	2	10	2	< 7s	6
24	- 3	5	7	18	22	22	24	26	21	13	- 2	< 3s	- 9	-11	-14	-23	-15	- 8	<-13s	5	14	9	S	2
25	- 3	4	9	14	19	16	25	25	21	5	< 9s	6	< 5s	-12	-18	<-32s	-26	-10	-21	- 3	13	4	S	- 3
26	- 5	0	6	7	15	16	15	20	10	- 3	<- 2s	< 5s	<-14s	-18	<-24s	<-26s	<-24s	13	-14	- 3	3	5	3	3
27	- 4	- 2	5	10	23	32	23	27	13	0	- 5	< 3s	7	<- 8s	<-32s	<-33s	<-26s	<-17s	<-32s	- 1	- 1	- 1	- 1	1
28	- 1	- 1	3	14	13	18	21	26	26	18	4	0	<- 8s	<- 6s	- 5	-11	-10	S	-22	1	13	1	- 4	1
29	0	3	4	- 4	18	26	28	29	24	11	3	< 3s	<- 8s	- 8	-11	- 9	-21	-16	<-15s	-13	4	4	0	- 7
30	-15	- 4	1	7	15	18	19	24	23	- 3	<- 4s	- 2	<- 8s	<-11s	<-17s	-19	-16	-22	<-28s	- 1	C	1	- 5	1
31	- 3	- 1	8	8	12	18	35	25	19	12	<- 2s	< 0s	<- 7s	-11	(-24s	<-23s	<-24s	-24	-28	- 1	3	- 1	- 3	3
Median	- 3	0	5	11	16	20	21	21	20	2	<(2s	<(0s	<- 7s	(-12s	(-19s	<-24s	(-25s	(-12s	(-19s	0	6	2	S	- 1
Median Count	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	29	30	31	30	31	13	30
Upper decile	1	4	9	15	22	26	25	26	24	18	19	12	7	<- 6s	- 6	-11	-13	12	3	7	13	5	S	3
Lower decile	- 6	- 4	1	7	13	16	14	5	5	<- 5s	<- 5s	<- 5s	<- 9s	<-22s	<-29s	<-33s	<-33s	<-22s	<-31s	- 7	- 3	- 1	S	<- 7s

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Oct. 1967	Whole Day Index	H B 06 12 18 / 12 18 24	W W V 00 06 12 18 / 06 12 18 24	S F 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	ΔH
1	3+	3 (3) 3	3 3 3 4	4 4 4 4	4 4 - 4	N N N N			
2	4-	5 4 4	4 3 3 4	4 (3) C 4	4 4 - 4	N N N N			
3	4o	5 5 4	4 4 3 4	4 (4) C 4	4 4 - 4	N N N N			
4	4o	4 4 4	4 4 4 4	4 4 (4) 4	4 4 - 4	N N N N			
5	4o	3 4 5	4 4 3 4	4 (4) 4 4	4 4 - 4	N N N N			
6	4o	4 4 4	4 (4) 4 4	4 4 4 4	4 4 - 4	N N N N			
7	4o	(4) 4 5	4 4 4 4	4 4 4 4	4 4 - 4	N N N N			
8	4o	4 4 (4)	4 4 3 4	4 4 C 4	4 4 - 4	N N N N			
9	4+	5 4 3	5 4 4 (4)	5 5 4 (4)	4 5 - 4	N N N N			
10	4-	(3) 4 4	4 4 3 4	4 4 4 4	4 4 - 3	N N N N			
11	4-	4 (4) 3	4 3 4 4	4 4 4 4	4 4 - 4	N N N N			
(12)	4o	3 3 3	4 4 5 4	4 4 5 4	4 4 - 4	N N N N			
(13)	4o	4 4 4	4 4 4 4	4 4 4 4	4 3 - 4	N N N N			
(14)	4o	4 4 4	4 4 3 4	4 4 4 4	4 4 - 4	N N N N			
15	4+	4 (4) 4	4 4 5 4	4 5 4 4	4 4 - 4	N N N N			
16	4o	4 4 5	4 4 4 4	4 4 4 4	4 3 - 4	N N N N			
17	4+	4 4 (4)	4 4 5 5	4 5 5 5	4 4 - 4	N N N N			
18	5-	4 C C	(5) 5 5 5	5 4 (4 5)	4 4 - 5	N N N N			
19	4+	4 5 4	4 4 5 5	4 4 4 (5)	4 (3) - 4	N N N N			
20	4+	5 5 5	4 (4) 4 4	(4) 4 4 (4)	4 4 - 4	N N N N			
21	4o	4 4 5	5 3 3 4	C C C (4)	4 4 - 4	N N N N			
22	4o	(4 4 4)	4 4 4 4	(4) C C 4	4 4 - 4	N N N N			
23	5-	5 5 5	5 5 4 4	4 (4) C C	4 4 - 4	N N N N			
24	4o	4 4 5	4 4 4 4	(4) 4 (4) 4	4 4 - 4	N N N N			
25	4+	5 4 4	5 4 5 5	4 4 4 4	4 4 - 4	N N N N			
26	5-	5 4 4	4 5 5 5	4 5 5 4	4 4 - 4	N N N N			
27	4o	4 5 5	4 4 3 4	4 (4 4 4)	4 4 - 4	N N N N			
28	4o	3 4 4	4 4 4 4	4 C 4 (4)	4 4 - 4	N N N N	16.38	---	89γ
29	4-	4 3 (3)	4 4 3 4	4 3 (3 4)	(4) 4 - 3	N N U U	---	---	
30	4+	(4) 4 (4)	4 5 4 C	4 5 4 4	4 4 - C	N N N N	---	10xx	
31	4-	4 3 4	4 3 3 4	4 4 4 4	4 4 - 4	N N N N			

IQSY GEOALERT and ADALERT (Western pacific Region)

* = MAGSTORM
o = MAGCALME
△ = 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.

Oct 1967	S W F										Correspondence		
	Drop-out Intensities (db)						Start-time	Duration	Type	Imp.	Flare	Solar Noise	Mag.
	CO	SF	HA	TO	HB	SH							
25	-	22		-			23.14	32	Slow	1+	x	x	
29	22	-	-	-			03.00	60	S	1+		x	
29	30	50	-	-	-		23.43	67	Slow	3+	x	x	

IONOSPHERIC DATA IN JAPAN FOR COTOBER 1967

第19巻 第10号

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