

F-225

IONOSPHERIC DATA IN JAPAN

FOR SEPTEMBER 1967

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THE RADIO RESEARCH LABORATORIES
MINISTRY OF POSTS AND TELECOMMUNICATIONS
KOKUBUNJI, TOKYO, JAPAN

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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_oF2 f_oF1 f_oE	}	The ordinary wave critical frequency for the $F2$, $F1$ and E layers, respectively.
f_oE_s		The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.
f_sE_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.
hF		The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by hF . Thus hF 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_oE_s .
h_pF2		The virtual height of the $F2$ layer measured on the ordinary

$ypF2$ wave branch at a frequency equal to $0.834f_0F2$.

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 $0.969f_0F2$).

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 height: 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_oE . 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_oE . 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 greatly 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_oE_s and $W E_s$. The slant trace is sometimes observed to start at f_oE without echoes clearly identifiable as E_s echoes being seen.

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

d. Multiple Reflections from E_s

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

B. SOLAR RADIO EMISSION

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

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

Observations are feasible almost from sunrise to sunset.

a. Time and Unit

The time is expressed as U.T.

The unit is $10^{-22} \text{ W} \cdot \text{m}^{-2} \cdot (\text{c/s})^{-1}$ 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 Hiraio 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 atmospheric.
- (): Inaccurate measurement influenced by interferences, atmospheric, 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 Hiraio 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

COWWV 20, 15 and 10 Mc/s (Fort Collins, Colorado)
 SFVarious frequencies of commercial circuit (San Francisco)
 HAWWVH 15 and 10 Mc/s (Hawaii)
 TOJJY 15 and 10 Mc/s (Tokyo)
 SHBPV 15 and 10 Mc/s (Shanghai)
 HBVarious 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

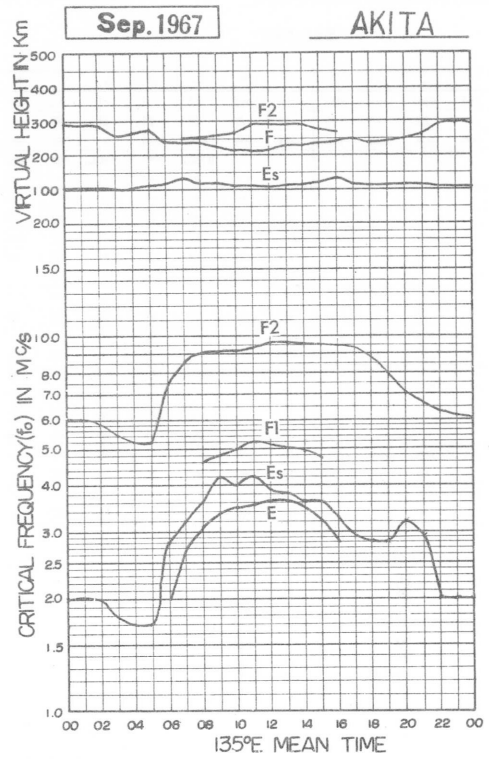
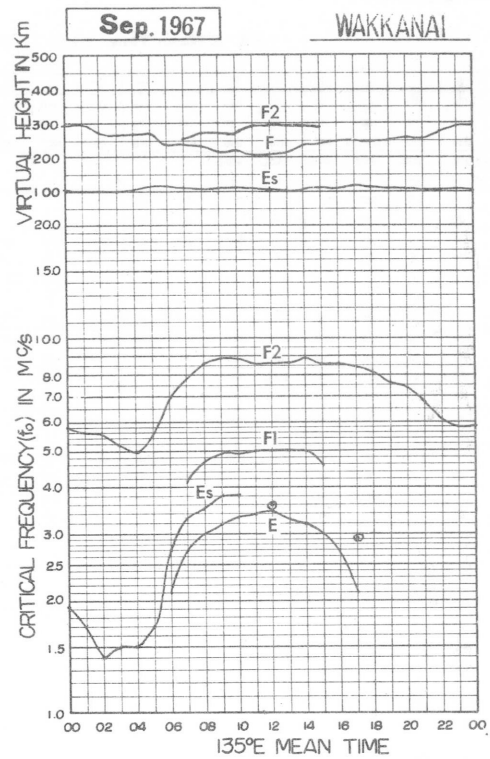
Importances

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

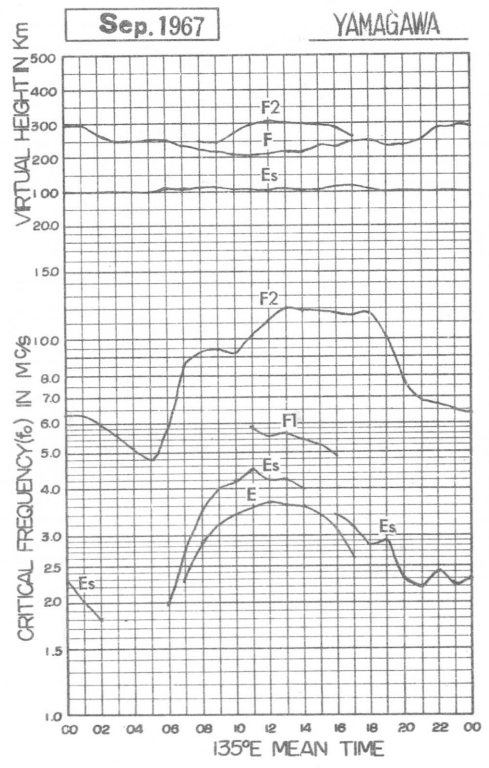
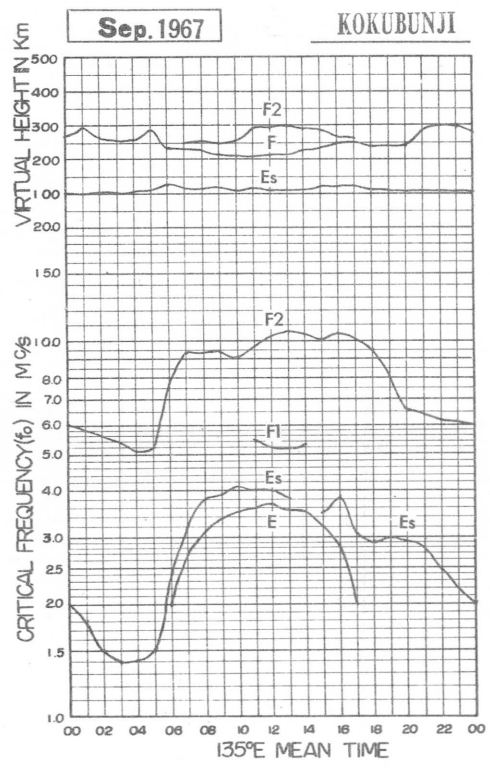
1-	1	1+
2-	2	2+
3-	3	3+

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



Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

0.1Mc 135° E Mean Time (G.M.T. +9h)

f_oF₂

Sep. 1967

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	060F	058F	SF	056F	056F	059F	067	080	074	077	071	077	080	074H	073	076	080	083	088	073	068	065	060	054
2	053	050	056	054	048F	044F	053	068	066	067	062	065	068	073	073	072	075	073	076	076	076	073	061	055
3	056	055	050	048F	053	057	076	074	068	060	066	071	071	074	074	070	069	069	073A	073	075	072	066	054F
4	054F	051F	048	047	048	055	083	085	085R	073	071	075	076	073	072	072	074	075	082	081	075	070	063	056F
5	SF	F	056F	050F	049	051	068	086	100	094	088	080	079	075	077	073	074	081	086	080	077	077	062	058
6	056	056	056	056	056	051	088	087	085	090	092	086	086	089	088	083	081	084	086	087	087	086	077	064
7	063F	057F	057F	053F	053F	062	079	094	088	083	086	083	085	086	088	089	086	086	086	083	076	070	066	066F
8	063	057F	F	F	056F	058	074	076	087	095	084	088	086	087	091	087	086	079	082	075	075	068	057	058
9	060	062	058	053	049	053	079	074	080	087	093H	090	085	090	093	088	087	083	074	070	071	069S	065	063
10	063	066	063	059	051	054	065	078	095	100	100	094H	092	086	090	090	088	089	081	074	073	070	060	059
11	059	058	057	054	050	056	070	081	080	085	091	096	103	095	093	083	083	088	087	080	071	068	066	067
12	067	065	063	058	057	064	077	077	086	090	088	094	093	090	091	086	085	084	084	086	078	070F	070	067
13	062	063	060	057	056	058	076	086	100	104	095	090	101	093	084	086	091H	104	111	096	083	070	079	069
14	065	065	060	057	055	055	063	061	063H	076	076	076	087	090	090	090	088	084	078	069	071	066	063	060
15	056	056	053	048	043	043	058	067	074	077	080	083	086	085	083	079	084	088	082	080	073	067	057	053
16	053	051	052	051	051	055	065	080	094	101	093	083	080	084	084	083	092	091	095	077	070	062	057	058
17	057	058	056	054	055	058	076	091	093	088	088H	090	088	087	086	089	090	093	088	071	062	058	058	058
18	057	055	050	047	047	050	066	077	079	085	087	083	085	081	081	086	088	092	094	083	076	062	062	062F
19	064	063	063	G	G	G	G	G	G	G	G	G	G	G	G	G	078	083	086	083	080	073F	F	F
20	F	F	F	F	F	F	086F	092F	113	G	G	G	G	G	G	G	093	087	077	076	072	073	070	065
21	066	051	050	040	041	038	047	053	1056G	063	062	070	074	076	076	076	070	072	069	070	066	063	059	057
22	053	051	044	042	040	040	053	056	077	079F	073	087	090	090	095	094	G	G	G	G	G	G	051	049
23	046	045	043	042	036	040	056	071	097	102	090	093	094	101	103	094	083	076	080	076	073	061	057	053
24	050	050	050	046	043	043	067	079	095	100	098	096	103	103	108	099	094	088	078	073	065	061	058	057
25	058	054	053	051	050	052	069	078	091	102	099	101	096	096	096	093	093	087	078	073	068	063	065F	065F
26	F	F	F	F	F	F	068	086	096	102	101	109	103	104	I099C	095	098	088	083	077	078	SF	066F	066F
27	064F	F	058F	058F	056F	C	C	C	C	105	I100C	098	098	099	101	094	094	093	088	083	074	070	059	056
28	058	059	056	056	057	061	083	098	103	109	104	098	095	097	099	100	104	104	102	083	073	069	067	065
29	068	053	056	052	048	047	055	063	068	063	063	071	070	074	078	078	074	069	075	066	064	056	055	044
30	041	040	040	041	040	043	048	064	058	I063A	062	058	063	068	I063A	068	066	063	058	056	053	050	047	
31																								
Count	27	26	26	26	27	27	28	28	28	28	28	28	28	29	30	30	29	29	29	29	28	29	29	29
Median	058	056	056	052	050	055	068	078	086	088	088	086	086	087	088	086	086	084	082	076	073	068	062	058
U. Q.	063	059	058	056	056	058	078	086	095	100	094	094	094	093	093	093	092	088	088	083	076	070	066	065
L. Q.	054	051	050	047	043	044	060	070	074	076	072	076	080	076	078	078	076	078	078	073	069	062	058	054
Q. R.	069	068	068	069	013	014	018	016	021	024	022	018	014	017	015	015	016	010	010	010	007	008	008	011

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

f_oF₂

The Radio Research Laboratories, Japan

W 1

Sep. 1967

f_oF₁

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	A	530	540H	550	540		520	520	I460L	400L						
2							410	A	A	A	U480L	520	530	540H	500	U460L	470L							
3								420	490L	I490A	530	510	560H	U500L	I490A	460	420							
4							U360L	400L	I470A	500L	L	U560L	510	510	L	490L								
5								410L	480	A	510	490	500	L	L	L								
6								I420A	440L	530H	500	500L	560L	520H	450	L								
7								U420L	440	480	470	500L	520L	500	500	470L								
8									470L	A	I480A	A	500	500	500L	U470L								
9								400	U470L	470L		480	500L	540	500L	U480L								
10								410L	500H	500H	460	490	510	500L	U500L									
11								A	420	470L	500	520L	520	510L	500	440L								
12									L	U480L	500L	I500A	I510A	U500L	L									
13										500L	500	500L	520	510L	L	460H								
14									480L	500	A	A	L	500L										
15									410	490	500H	480L	490L	470	U480L									
16										U500L	450	490	480L	480L	500L	I500L								
17								U380L	U460L	U470L		L	480L	500L	L									
18										450	460L	500L	440	500L	440L	440L								
19										C	C	C	500	500	U470L	430L								
20										450	C	C	C	500L	U490L	L								
21										410	I430C	460H	500	510	500	U500L	I490A							
22										470L	500L	L	480L	450L	L									
23										L	U480L	U480L	470L	L	L									
24										L	L	480L	L	L	L									
25										L	L	L	L	L	L									
26											U490L	490L		L	C									
27											C	480L	440	440L										
28											A	440	450	440										
29											440L	490	490	U510L										
30											I430A	U500L	A	480	510L	470	460	A						
31																								
Count							2	11	18	19	21	22	24	24	15	12	4	1						
Median							U380L	410	470L	490	490	500L	500	500L	500L	460L	440L	400L						
U. Q.																								
L. Q.																								
Q. R.																								

f_oF₁

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

The Radio Research Laboratories, Japan

W2

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

0.01Mc 135° E Mean Time (G.M.T. +9h)

f_oE

Sep. 1967

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						I145A	235	300	300	340	375	350	365	I350A	345	335	300	250	A	E					
2						140	240	290	305	325	320	320	350	330	330	330	295	230	S						
3						155	235	290	315	325	335	360	I360A	375	330	305	A	A	A	E					
4						130	215	275	300	I310A	325	315	360	350	335	A	A	A	A	E					
5						A	225	285	300	320	300	370	I370A	355	365	325	290	225	S						
6						125	215	290	305	300	I320A	340	360	340	345	320	285	210	S						
7						S	210	270	I285A	305	I335A	350	380	350	340	320	290	225	A						
8						E	210	270	295	300	305	A	A	A	A	A	A	A	A						
9						A	A	255	280	I310A	335	355	350	345	335	310	290	220	E						
10						E	225	290	310	335	345	365	365	350	335	310	280	225	S						
11						E	205	260	290	310	330	365	365	365	340	315	280	230	S						
12						E	A	275	310	335	350	365	345	350	310	285	210	S	E						
13						E	215	I285A	305	335	350	355	I345A	I335A	325	305	270	215	S						
14						E	S	215	280	300	330	345	350	330	I310A	I290A	I270A	200	E						
15						E	I175S	240	285	330	335	340	340	345	315	295	275	200	A						
16						S	I210A	280	300	315	330	335	335	330	325	305	265	200	A						
17						S	205	270	I300A	300	315	310	330	330	325	300	265	A	A						
18						S	200	270	300	325	335	335	345	340	I320A	300	270	205	A						
19						C	C	C	C	C	C	C	R	320	315	300	265	200	A						
20						E	200	265	300	C	C	C	C	320	320	305	270	200	E						
21						E	200	260	I295C	310	330	325	330	320	I290A	I245A	220	A	E						
22						E	205	260	300	315	310	330	330	330	305	280	C	C	C	C					
23						S	205	265	300	315	315	325	300	330	310	295	240	170	S						
24						E	200	260	295	310	330	330	325	310	300	290	255	S	A						
25						E	210	270	300	320	330	335	330	330	310	285	I255R	210	S						
26						E	200	250	310	325	335	335	330	335	C	A	A	A	S						
27						E	C	C	C	C	320	340	I340A	I330A	325	300	255	A	E						
28						E	A	A	I290A	I315A	330	335	330	325	315	A	A	A	E						
29						E	A	245	290	300	305	305	I305A	I305A	305	290	250	150	E						
30						E	E	200	295	310	325	325	320	300	305	285	235	150	E						
31																									
Count					2	21	24	27	28	27	28	27	27	29	28	26	24	19	9	3					
Median					E	E	210	270	300	315	330	335	345	330	320	300	270	210	E	E					
U. Q.																									
L. Q.																									
Q. R.																									

f_oE

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

The Radio Research Laboratories, Japan

W 3

IONOSPHERIC DATA

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

0.1Mc 135° E Mean Time (G.M.T. +9h)

foEs

Sep. 1967

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	J064	J053	J025	J037	020	023	037	063	J054	g	g	041	g	042	g	g	024G	033	043	J073	J034	J023	J024	J035
2	J023	J026	E	E	E	018	029	J055	J054	J070	J063	042	045	044	049	037	035	054	028	020	016	J025	J153	J123
3	J040	J042	J081	J053	036	040	J058	042	044	055	041	g	038	g	J071	040	038	J033	J083	J071	J030	J025	J025	J025
4	J027	J043	015	015	015	020	027	033	J055	035	038	g	g	g	g	042	J071	050	025	027	J043	J023	040	J040
5	J043	J023	021	J021	021	016	g	035	J051	J056	J044	033G	044	029G	030G	022G	018G	033	025	020	J043	J035	026	E015S
6	E015S	E	E	E	016	020	030	J054	J068	043	J064	040	g	g	032G	040	043	J084	J061	J050	J053	J065	E017S	E017S
7	J043	J033	J023	J020	023	039	051	105	J040	052	J060	030G	026G	026G	033G	025G	024G	029	J023	E015S	J033	J073	J073	J058
8	J030	J025	018	E	J023	J035	035	J045	J058	J070	J058	J055	060	054	057	J050	042	031	025	063	043	J030	J053	035
9	J034	J024	J023	J023	019	J038	033	031	035	034	032G	g	g	g	g	g	g	027	020	J030	J042	J024	E015S	E015S
10	E016S	E	E	E	E	018	g	034	038	040	030G	g	g	g	g	g	g	025	J048	J023	019	E	E	J025
11	J033	E	J030	E	J018	015	039	041	034	035	043	g	g	g	g	g	g	g	E015S	E011S	019	023	J038	J044
12	J023	J021	J033	J030	J040	J035	032H	021G	023G	032G	043	J053	J071	046	043	043	J045	J041	063	E012S	J066	043	J032	E016S
13	021	J075	033	J031	E	015	027	051	037	J045	g	g	039	045	g	028G	g	g	E015S	J021	E015S	E	E012S	E015S
14	020	016	018	013	E	E013S	g	031	037	040	053	J064	038	040	033	043	040	030	023	J031	J030	J038	E018S	E
15	E016S	E	E	E	J030	J023	020	025	033	g	J058	g	g	g	025G	026G	g	g	025	E016S	E017S	E016S	E	E016S
16	E016S	021	J025	015	020	E013S	035	g	g	035	g	g	g	g	g	g	032	026	033	J025	051	E013S	021	018
17	E016S	J028	E012S	015	E	E013S	g	g	033	028G	g	024G	033G	g	g	021G	030	026	J027	J023	J024	J024	020	E016S
18	E016S	E	E	E	E	E013S	025	025G	028G	036	g	039	039	031G	035	034	038	028	024	J025	E	E015S	E	E
19	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	022	E015S	J035	J043	E015S	E015S
20	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	030	E	018	E	E	E
21	E	013	015	020	020	017	g	030	C	035	038	040	038	040	J061	J048	027	022	018	J023	E	015	E017S	J023
22	018	E	E	E	E	E	E	E	033	038	036	g	g	g	g	g	g	g	C	C	C	C	E	E016S
23	E	E	E	E	E	E015S	030	g	g	g	038	g	036	027G	030G	g	g	g	E013S	E	E	E	J023	E015S
24	E	E	E	E	E	E	E	E	033	022G	020G	020G	023G	020G	017G	g	g	021	021	E012S	E017S	015	020	J021
25	E011S	E	E	E	E	E	E	024	g	036	J068	038	037	038	034	032	g	018G	E012S	J028	J048	J023	E012S	E
26	E	E	E	E	E	E	E	030	040	041	040	043	038	030G	C	031	027	029	025	E015S	J023	J068	J033	J030
27	023	021	J026	J023	J014	J024	C	C	C	033	g	030G	036	035	027G	g	g	028	J023	020	E015S	E	E015S	E015S
28	021	E	014	016	J028	E	054	J030	034	J046	g	g	g	028G	g	033	033	J035	E	J025	J024	E	J030	J053
29	J035	J033	J023	018	E	J024	022	035	g	038	038	037	039	039	033	g	033	031	023	J030	J031	J021	E	E
30	E017S	018	E	E	E	E	019	J038	J046	J075	050	064	J071	045	J063	g	030	031	J028	J024	E	E012S	018	E
31																								
Count	30	30	30	29	29	29	28	28	27	28	28	28	29	30	29	30	29	29	29	29	29	29	30	30
Median	019	017	014	015	015	017	027	033	035	038	038	g	036	g	g	g	g	028	024	J023	024	J023	020	E016
U. Q.	030	026	023	022	022	024	035	044	046	049	047	040	039	040	039	037	036	033	029	029	042	034	032	035
L. Q.	E015	E	E	E	E	E013	g	028	g	034	g	g	g	g	g	g	g	024	020	E016	E012	E012	E015	
Q. R.	D015					D011	016	015		015								009	009	D013	D022	D020	D020	

The Radio Research Laboratories, Japan

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

foEs

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

0.1Mc 135° E Mean Time (G.M.T. +9h)

fbEs

Sep. 1967

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	035	019	020	035	016	018	g	051	050			g		038			023g	018	030	057	028	020	019	018	
2	020	020				g	g	054	052	062	g	g	g	g	048	g	g	044	022	015	016	020	017	016	
3	033	024	027	020	028	034	048	040	g	052	g		038		068	g	032	026	A	040	018	017	021	020	
4	017	0015S	014	014	014	g	g	050	050	035	g					036	030	037	021	025	022	018	024	034	
5	025	014	016	018	020	016	g	g	g	050	g	032g	043	029g	028g	021g	018g	g	020	019	020	030	0016S	S	
6	S				g	g	g	047	g	g	033	028			024g	g	038	027	036	020	028	025	042	043	
7	030	020	017	E	017	034	043	040	034	g	040	030g	023g	024g	027g	021g	020g	019	020	017	S	026	051	016	
8	017	016	017		E	022	g	040	043	050	051	051	037	037	045	043	039	023	024	031	030	020	020	024	
9	031	020	017	018	015	025	027	g	g	034	031g							g	018	020	016	018	S	S	
10	S					016		020g	g	g	030g							g	047	020	015			017	
11	020		E		E	014	035	039	g	g	g							S	S	S	014	020	027	030	
12	016	016	020	020	030	024	025	019g	021g	024g	g	051	062	044	040	040	040	039	056	S	041	030	019	S	
13	019	017	017	023		g	g	032	g	g		038	038	043		027g		S	018	S			S	S	
14	016	014	E	E		S	S	g	g	g	049	062	g	g	033	032	028	027	019	020	026	E	S	S	
15	S			016	011	017	g	g	g	g				025g	025g			018	020	S	S	S		S	
16	S	018	013	012	012	S	023		g	g							020g	018g	025	016	022	S	017	016	
17	S	018	S	012		S			032	027g		024g	023g			020g	020g	025	023	018	019	0015S	016	S	
18	S					S	018g	025g	027g	026g		g	g	030g	035	028	038	g	020	020		S			
19					C	C	C	C	C	C	C	C						g	015	S	018	018	S	S	
20							g	g	g	C	C	C	C			029g		020			016				
21		E	E	015	018	017		g	C	g	g	g	g	g	061	043	g	022	016	021		015	S	020	
22	016				E			g	g	g	g						C	C	C	C	C	C		S	
23						S	016				g			027g	029g			S					020	S	
24							g		020g	022g	020g	020g	022g	020g	017g			g	017	S	S	015	018	016	
25	S						018g	017g	g	g	g	g	024g	022g	020g	g		018g	S	028	022	019	S		
26								023g	g	g	g	g	g	030g	C	031	027		023	021	S	016	020	022	
27	016	016	012	019	012	019	C	C	C	g	g	030g	036	035	027g			023	E	016	S		S	S	
28	020		E	E	E		020	026	032	045			028g		030	027	021	021	015				018	050	
29	020	030	015	014		020	021	g	g	g	g	g	035	037	028	g	g	g	021	020	025	017			
30	S	012				g	030	050	g	A	043	045	040	g	A	g	g	g	026	017		S	016		
31																									
Count																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

IONOSPHERIC DATA

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

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

Sep. 1967

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	E	E	E	E	E	E	016	018	018	020	020	020	020	020	018	011	E	E	E	E	E	E	E
2	E	E	E	E	E	E	015	013	016	017	019	019	020	020	011	016	017	016	E012S	E	E	E	E	E015S
3	E	E	E	E	E	E	011	012	012	020	020	019	018	020	019	016	016	E	E	E	E	E	E	E
4	E	E	E	E	E	E	012	016	016	017	020	022	020	020	017	019	012	012	E	E	E	E	E	E
5	E	E	E	E	E	E	012	013	013	016	017	018	020	019	019	011	011	011	E012S	E	E015S	E	E016S	E015S
6	E015S	E	E	E	E	E	012	012	016	018	017	019	019	020	012	013	017	012	E012S	E	E015S	E	E	E
7	E	E	E	E	E	E012S	013	012	012	018	019	019	017	016	018	016	012	012	E	E015S	E	E	E	E012S
8	E	E	E	E	E	E	012	012	017	019	020	018	020	020	020	017	017	011	E	E	E	E015S	E	E015S
9	E	E	E	E	E	E	E	014	017	017	017	017	023	020	020	020	013	011	E	E	E	E	E	E015S
10	E016S	E	E	E	E	E	012	016	013	020	020	016	017	012	017	017	012	011	E011S	E	E	E	E	E
11	E	E	E	E	E	E	011	012	016	018	016	023	019	019	019	018	012	012	E015S	E011S	E	E	E	E
12	E	E	E	E	E	E	E	E	015	018	020	021	017	020	020	018	015	E012S	E	E012S	E013S	E	E015S	E016S
13	E015S	E	E	E	E	E	015	014	017	020	020	021	022	020	017	017	015	013	E015S	E	E015S	E	E012S	E015S
14	E015S	E	E	E	E	E013S	012	012	015	019	016	018	016	017	016	017	012	012	E	E012S	E	E	E018S	E
15	E016S	E	E	E	E	E	E017S	012	017	017	017	017	017	016	013	012	012	E	E	E016S	E017S	E016S	E	E016S
16	E016S	E	E	E	E	E013S	016	016	016	020	017	018	020	016	018	017	012	E	E	E	E	E013S	E	E
17	E016S	E	E	E	E	E013S	011	013	016	017	018	016	017	020	016	012	E	E	E	E	E	E015S	E	E016S
18	E016S	E	E	E	E	E013S	E	011	018	016	016	018	017	019	017	017	011	012	E	E	E	E015S	E	E
19	E	E	E	E	C	C	C	C	C	C	C	C	020	016	016	016	011	011	E	E015S	E	E	E015S	E015S
20	E	E	E	E	E	E	015	015	017	C	C	C	C	017	017	017	017	017	E	E	E	E	E	E
21	E	E	E	E	E	E	016	016	C	020	021	020	018	018	017	017	015	015	E	E	E	E	E017S	E
22	E	E	E	E	E	E	011	011	018	017	017	018	018	018	013	016	C	C	C	C	C	C	E	E016S
23	E	E	E	E	E	E015S	E	013	013	018	017	017	018	017	017	013	011	E	E013S	E	E	E	E	E015S
24	E	E	E	E	E	E	015	017	018	015	011	012	E	011	E	018	012	E018S	E	E012S	E017S	E	E	E015S
25	E011S	E	E	E	E	E	E	011	016	017	017	017	017	016	015	016	017	013	E012S	E	E	E	E012S	E
26	E	E	E	E	E	E	012	016	020	020	021	020	017	020	C	016	013	017	E014S	E015S	E	E	E	E
27	E	E	E	E	E	E	C	C	C	016	017	020	020	018	017	016	012	E	E	E	E015S	E	E015S	E015S
28	E	E	E	E	E	E	E	012	017	016	017	019	016	017	016	016	012	E	E	E	E	E	E	E
29	E	E	E	E	E	E	E	016	016	017	017	017	017	017	018	012	012	012	011	E	E	E	E	E
30	E017S	E	E	E	E	E	014	012	016	018	017	018	018	015	016	011	012	011	E	E	E	E	E012S	E
31																								
Count	30	30	30	29	29	29	28	28	27	28	28	28	29	30	29	30	29	29	29	29	29	29	30	30
Median	E	E	E	E	E	E	012	013	016	018	017	018	018	018	017	016	012	011	E	E	E	E	E	E
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

f-min

WG

IONOSPHERIC DATA

Sep. 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	250F	250F	SF	270F	260F	290F	285	285	320	285	270	270	295	275E	290	275	290	285	300	310	270	275	265	255
2	235	240	250	305	250F	275F	295	290	275	300	270	265	260	280	300	295	295	300	300	270	270	290	290	280
3	260	265	250	260F	260	260	305	335	285	310	275	290	275	280	295	295	295	295	I295A	280	285	285	300	280F
4	260F	265F	260	255	270	275	300	320	I325R	310	295	290	300	300	290	290	300	300	295	300	285	275	280	255F
5	SF	F	285F	270F	280	275	310	315	310	315	320	300	310	295	300	300	295	300	295	290	285	310	270	270
6	275	265	270	275	270	285	325	300	320	305	315	305	300	300	295	300	295	300	300	285	285	300	315	285
7	270F	270F	265F	285F	275F	290	305	320	330	325	290	300	310	300	300	310	295	315	310	300	290	285	285	275F
8	275	265F	F	F	260F	260	290	305	320	315	325	305	295	285	300	310	310	315	310	280	295	295	265	255
9	250	265	280	265	265	275	315	300	315	320	280H	300	295	290	295	310	315	325	300	285	270	I275S	260	295
10	255	275	285	290	280	295	310	320	305	295	295	310H	300	290	305	305	300	310	305	290	280	285	265	260
11	265	265	265	280	280	290	320	325	315	340	310	300	315	305	310	310	310	310	315	300	280	265	265	270
12	275	270	285	270	270	290	340	325	320	305	310	320	305	300	300	305	305	320	300	300	300	270F	275	285
13	270	270	280	265	270	290	330	320	310	315	340	300	305	305	305	295	290H	290	315	295	275	270	250	265
14	260	270	255	255	255	260	330	340	300H	310	305	295	300	305	305	305	320	310	310	285	285	275	255	250
15	250	255	285	275	265	295	280	330	310	320	310	315	310	315	315	305	315	310	305	305	290	285	275	270
16	260	265	260	280	285	305	325	315	315	315	325	320	300	305	300	310	310	305	315	310	300	290	265	270
17	270	265	270	265	265	275	325	325	330	320	315H	310	320	300	305	315	310	310	315	310	285	270	270	275
18	275	275	270	265	270	280	325	340	330	335	315	300	320	310	300	315	310	305	310	315	305	290	260	255F
19	265	255	270	G	G	G	G	G	G	G	G	G	G	300	295	315	310	290	300	295	290	280F	F	F
20	F	F	F	F	F	F	320F	300F	325	G	G	G	G	300	290	295	300	310	290	270	245	260	255	260
21	270	255	250	265	245	265	300	270	I270G	285	260	270	275	295	285	315	285	290	285	265	270	255	245	265
22	265	300	265	260	260	260	305	270	290	300F	290	310	310	305	315	310	G	G	G	G	G	G	260	265
23	265	275	270	295	260	285	320	315	320	325	310	305	305	305	310	315	315	315	300	290	310	290	265	275
24	265	280	280	290	300	295	345	315	315	320	310	300	300	295	305	305	315	320	310	295	290	285	265	265
25	260	265	265	280	280	275	345	335	325	320	315	310	315	300	315	300	310	315	310	285	285	280	265F	275F
26	F	F	F	F	F	F	315	320	315	320	305	310	300	310	I300G	300	310	320	295	280	300	SF	275F	275F
27	265F	F	260F	270F	275F	275F	G	G	G	315	I310G	295	300	295	295	295	300	295	295	295	295	285	275	265
28	245	260	265	260	265	280	310	320	295	295	310	295	280	285	280	280	280	285	290	285	280	255	255	260
29	280	245	260	255	250	255	275	280	295	290	240	270	280	280	310	285	310	295	280	265	260	270	280	270
30	245	245	240	270	260	275	290	300	275	I265A	260	240	275	285	I285A	295	315	305	295	270	270	265	260	255
31																								
Count	27	26	26	26	27	27	28	28	28	28	28	28	29	30	30	30	29	29	29	29	29	28	29	29
Median	265	265	265	270	265	275	310	320	315	315	310	300	300	300	300	305	305	305	300	290	285	280	265	265
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan

M(3000) F2

W7

IONOSPHERIC DATA

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

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

Sep. 1967

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	360	345H	325	335		345	335	I355L	350L						
2						295	A	A	A	A	U375L	345	345	345H	I360A	U370L	340L							
3							A	A	345L	I340A	360	375	350H	U370L	I355A	350	355							
4						U360L	375L	I365A	365L	L	U340L	365	355	L	L	345L								
5							390L	355	A	360	405	370	L	L	L	L								
6							I405A	395L	360H	380	380L	380L	345L	345H	375	L								
7							I380A	390	415	405	380L	370	365L	360	350	350L								
8							A	A	A	I390A	A	370	360	360	I360A	I360A								
9						380	U380L	385L				375	360L	345	340L	U375L								
10						370L	365H	380H	415	410	370	360L	360L											
11						A	385	380L	380	385L	380	385L	365	375L	365	385L								
12							L	U375L	380L	A	A	A	A	A	L									
13								380L	390	390L	380	375L	L	370H	L									
14								355L	345	A	A	L	360L											
15								390	375	380H	370L	365L	375	U355L										
16							U390L	U370L	400	390	395L	380L	360L	I365L										
17								U390L	U405L		L	375L	380L	L										
18								395	390L	385L	405	380L	385L	340L										
19						C	C	C	C	C	C	360	370	U365L	370L									
20								380	C	C	C	C	C	380L	U350L	L								
21							325	I330C	325H	340	335	340	U340L	I345A	A									
22								340L	360L		L	375L	395L	L										
23								L	U395L	U395L	385L	L	L	L										
24									L	L	L	395L	L	L	L									
25									L	L	L	L	L	L										
26										U405L	390L		L	C										
27						C	C	C	C	C	395L	395	410	410L										
28									A	410	400	390												
29							325	335L	325	330	345	345	U340L											
30							I310A	U335L	A	I340A	I345A	340	350	A	U355L									
31																								
Count						2	10	17	19	21	21	21	23	23	15	12	4	1						
Median						U330L	380	365L	375	380	380	380	365	360L	360	360L	355L	350L						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

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

M(3000) F1

WS

IONOSPHERIC DATA

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

km 135° E Mean Time (G.M.T. +9h)

h'F2

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							320	270	345	350	395	335		350	350	320	300							
2							440	370	1745A	U335L	415	405	360	325	300	300								
3							255	345	325	415	350	370	305L	I320A	300	290								
4							260	I270A	290	305	350	315	300	310L	335									
5							245	270	260	270	275	295	320	305	300									
6							250	250	300	285	280	310	310	290	285									
7							250	250	285	260	285	300	300	300	285									
8								250	285	265	300	290	360	300	290									
9							240	270	265		285	300	335	290	275									
10							295	300	240	285	270H	300	290	290										
11							240	250	260	270	300	275	275	275	275									
12								260	260	270	275	I265A	270	290										
13									250	250	265	290	265	L	290		250	285						
14									310	315	290	I295A	310	285										
15								260	275	300	290	280	285	275										
16							250	290	265	250	260	270	300	L		260								
17								245	250		275	260	285	275										
18								250	260	250	260	260	270	260	270									
19							C	C	C	C	C	C	275	290	265	260								
20							C	C	C	C	C	C	C	290	300	265								
21							400	I390C	360	395	365	360	300	I310A	275									
22								310	285		285	260	260	275										
23								260	260	250	250	250	275L	275										
24									245	250	250	275	260		250									
25									250		250	260	260											
26										260	270		295	I265C										
27							C	C	C	C	250	250	250	270										
28									250	250	250	250	260											
29							345	305	340	450	350	320	U335L											
30							310	350L	I355A	420	520L	390	310	I310A	300									
31																								
Count							2	14	22	26	24	27	28	28	22	17	5	2						
Median							350	260	270	270	270	285	290	290	290	285	290	290	290					
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

h'F2

W9

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

135° E Mean Time (G.M.T. +9h)

km $f'F$

Sep. 1967

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	300	315	1270A	260	260	250	1245A	1240A	220	210E	255	245	225E	235	240	250	270	1265A	1255A	285A	275	265	300
2	360	360	310	245	240	275	275	A	A	A	225	215	250	240E	1245A	225	260	1260A	260	275	270	260	260	295
3	1315A	300	360A	315	390A	315A	A	A	250	1230A	210	240	200E	200	A	250	240	260	1270A	1275A	275	270	250	250
4	300	300	310	310	300	280	240	235	1245A	210	210	215	210	245	225	240	255A	1265A	260	250	260	260	250	1310A
5	350	290	360	265	285	245	250	230	250	1255A	235	210	250	215	225E	220	255	260	260	245	270	250A	225	270
6	275	275	275	265	270	260	240	1225A	220	200E	235	210	215	200E	240	245	260A	250	1255A	260	275A	260	1290A	1285A
7	300A	295	275	290	290	1270A	1240A	1245A	215	200	200	200	240	225	245	235	235	250	250	240	250	260	1280A	290
8	275	300	305	300	290	295	240	255A	1255A	1250A	1230A	1230A	210	225	1265A	1260A	260A	250	245	265A	270A	260	295	345
9	1345A	300	270	295	265	300	250	235	210E	225	225E	210	215	250	225	240	250	250	245	250	275	275	300	290
10	310	275	250	250	240	255	240	235	225E	240	200	210	225	210	210E	235E	250	260	1245A	245	270	250	250	310
11	305	285	275	260	245	260	245A	1210A	210	200	210	200	200	235	230	215	250	260	240	235	250	270	310	325A
12	290	285	275	270	305A	265	225	235	210	220	240	A	A	A	240	250A	1255A	1250A	1250A	240	1255A	295A	250	265
13	295	295	260	265	265	265	225	240	235	215E	215	210	195	250	225	210E	225E	260	230	250	260	225	310	265
14	270	275	290	295	275	305	225	250	235	240	1245A	1230A	210	250	240	240	235	245	230	250	275	260	285	300
15	305	300	250	250	260	275	250	250	220	220	200E	200	200	220	210	240	245	250	245	240	250	260	240	285
16	300	315	300	270	250	250	220	240	225	215	235	210	210	220	240	240	250	250	245	230	250	240	275	290
17	290	300	275	290	280	280	240	225	220	210	200E	200	205	215	240	245	240	250	235	220	250	260	270	280
18	275	260	270	260	295	265	225	235	210	210	200	200	200	200	240	210	245	250A	260	240	240	240	265	300
19	270	300	270	G	G	G	G	G	G	G	G	G	210	220	220	225	245	250	245	250	260	275	245	280
20	260	300	295	270	265	290	250	240	230	C	C	C	C	210E	240	245	240	250	245	275	310	295	285	270
21	280	250	305	275	305	320	265	250	1240C	225E	230	240	225	250	1250A	1255A	250	250	250	290	285	275	300	300
22	265	240	290	305	275	305	255	250	240	225	225	225	225	205	215	245	C	C	C	C	C	C	290	300
23	295	280	285	250	260	270	225	210	215E	225	215	210	210	205	235	240	240	245	245	250	240	240	290	270
24	295	280	260	250	240	260	225	225	230	220	210	205	200	200E	205E	240	240	235	225	230	245	265	285	295
25	300	280	275	260	235	270	225	220	240	220	205	210	210	220	230	240	245	240	240	220	270	265	275	275
26	270	270	275	260	260	245	225	245	240	235	210	215	225	220	1245C	220	250	235	240	250	250	250	275	295
27	270	300	290	285	245	290	G	G	G	225	220	210	205	200	260	245	240	245	245	250	245	245	250	300
28	325	300	270	295	285	275	250	240	230	1215A	215	210	200	200	240	250	250	260	245	240	245	280	300	1310A
29	270	280	290	280	310	350	290	260	295	250	225	225	225	250	245E	245	260	250	270	270	295	250	260	245
30	325	345	350	300	310	295	275	1295A	290	A	1245A	1255A	265A	250	1260A	250	250	250	270	270	270	290	300	335
31																								
Count	29	30	30	29	29	29	27	26	27	26	28	27	28	29	29	30	29	29	29	29	29	29	30	30
Median	295	295	275	270	270	270	240	240	230	220	210	210	210	220	235	240	250	250	245	250	260	260	275	290
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

Sweep 1.0 Mc to 30.0 Mc in 20 sec in automatic operation

$f'F$

W 10

IONOSPHERIC DATA

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

135° E Mean Time (G.M.T. +9h)

km *h'*ES

Sep. 1967

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

The Radio Research Laboratories, Japan

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

*h'*ES

W11

Lat. 45° 23.6'N
Long. 141° 41.1'E

Wakkanai

IONOSPHERIC DATA

135° E Mean Time (G.M. T. +9h)

Types of Es

Sep. 1967

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	f2	f4	f5	f2	1	c	1 c4	e2			c	1				1	c 1	c2 1	c6	f2	f	f2	f2	
2	f3	f5			h	h	h	e2	e3	e3	c	c	c	c	c2	c	c	c4	c	f	f	f2	f2	f2	
3	f4	f f	f2	f2	f f	e2	c4	e2	e2	e3	c	c	c 1		e2	c	h 1	12	14	13	f2	f2	f	f2	
4	f	f	f	f	f	c	c	c	e2	1	c					12	12	13	12	12	f2	f	f3	f4	
5	f2	f2	f	f2	f2	1		c	e2	e2	1	1	1	1	1	1	1	e2	c	f	f2	f4	f		
6					h	h	e2	e2	c	c	12	c 1					e2	e3	e3	f2	f2	f4	f4	f2	
7	f2	f	f	f	f	e2	e4	e2	1	c	1	1	1	1	1	1	1	c 1	1	f		f3	f4	f2	
8	f2	f2	f	f	f	e3	e2	e2	e2	e3	e2	12	1	12	12	12	13	12	1	f f	f2	f2	f	f2	
9	f3	f2	f2	f	f	12	12	c	c	1	1						c	c	c	f2	f	f2			
10					c	c	h 1	h 1	h	c	1						h	c4	f2	f	f			f2	
11	f2		f		f	c	e2	e3	c	c	c									f	f	f4	f4		
12	f	f2	f3	f2	f4	13	12	1	1	1	c	e2	e3	c	c	e2	e3	e3			f2	f2	f4	f	
13	f	f2	f2	f7		c	h	12	c	1			1	12	1	1			f						
14	f	f	f	f		h	h	h	c	c	e2	e3	c	c	1	1	12	e2	c	f2	f2				
15				f2	f2	1	c	c		1			1	1	1		1	h	c 1						
16		f	f	f	f		c 1			c							h 1	c 1	c 1	f2	f3	f		f	
17		f2		f		h 1	1	1	1	1		1	1	1	1	1	h 1	c 1	1	f	f			f	
18														1	12	h 1	h 1	c	12	f2					
19																	h	1	1		f2	f2			
20						h	h	c	c						1				e3		f				
21		f	1	f	f2	c		c	c	c	c	c	c	c	12	12	c	1	c	f2	f			f2	
22	f				f		h	h	h	c	c														
23						1				c			c	1	1								f2		
24						h	h			c 1	1	1	1	1	1		h	1	1		f2	f2	f		
25						h 1	1	1		c	1	c	c 1	c 1	c 1	c	1	1	f		f2	f2			
26								c 1	c	c	c	c	1	1	1	1	1	1	c 1		f	f2	f2	f2	
27	f2	f2	f	f2	f	1			c	c	1	1	1	1	1	1	1	1	1	f2	f				
28	f		f	f	f		12	12	1	12			1	1	1	1	12	12	12	f2	f		f5	f7	
29	f3	f2	f	f2		12	1	c	c	c	c	1	12	1	1	h	c2	c2	c2	f3	f4	f			
30		f			h	e2	e3		e2	e2	c	c2	c2	c2	h3	h	c2	c2	c2	f2			f		
31																									
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

W 12

IONOSPHERIC DATA

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

0.1Mc
1 35° E Mean Time (G.M.T. +9h)

foF2

Sep. 1967

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	063	064	064	066	057	062	077	077	085	090	084	087	092	090	087	089	091	IC94R	IC92R	084	065	064R	IC61A	054S
2	FS	FS	052	053	044	046	059	077	069	073	081	081	I084A	088	086	081	081	084	086	IC78R	FS	059	FS	
3	060	060	052	054	053S	059	087	085	074H	075	072	078	077	078	075	074	076	075	078	081	076	070	065	056R
4	057	056	053	051	051	056	086	087	077H	081	073	073	081	080	073	076	079	082	086	086	077	FS	0623S	0623S
5	FS	063	063	056	047	051	072	089	I092R	103	097	078	078	081	080	086	081	083	089	082	076	072	066	062
6	055	056	056	054	051	053	083	091R	087	088	081	091	088	090	092	088	086	088	I091R	088	086	076	071	066
7	062	061	060	058	059	063	083	IC94R	092	085	084	094	096	092	096	100	096	095	091	085	074	070	064	064
8	065	064	061	059	059	060	082	I096R	100	101	088	092	098	I096C	099	102	096	090	081	072	069	066	064	FS
9	FS	FS	065	054	052	051	075	I089R	I089R	099	096	096	097	093	097	099	087	091	079	072	069	070	066	066
10	063	065	067	061	053	054	068	086	098	103	101	100	102	097	094	094	090	093	I091R	078	068	066	063	063
11	062	063	061	060	057	057	071	084	082	085	091R	096	108	106	093	093	082	085	092	079	064	061	063	066
12	063	061	061	056	057	057	075	078	085	091	095	089	096	091	090	097	092	095	I094R	091	077	070	067	060
13	061	C	C	C	C	C	C	C	C	C	C	095	094	100	100	094	097	104	I116R	089	074	C	C	C
14	067	063	058	058	055	051	088	073	086	101	101	091	099	I102R	I105C	I099A	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	I059C	I078C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	090	092	088	092	096	094	I100R	097	079	062	057	055	056
17	058	056	056	054	054	056	083	094	098	091	097	099	107	093	091	097	099	094	092R	076	061	057	060	061
18	060	058	054	048	048	051	076	092	I098C	088	085	086	096	094	095	089	097	099	I102R	086	069	059	054	056
19	055	053	054	052	051	052	068	075	088	087	087	094	099	098	097	088	088	089	096	083	077	070	063	063
20	062	FS	FS	063S	FS	FS	086	I101R	109	092	081	092	103	103	099	107	106	097	087	074	072	075	073	069
21	062	062	054	052	047	045	054	057	070	075	076	079	085	097	093	086	076	079	077	069	066	066	065	062
22	064	057	048	046	046	045	071	072	096	113	089	093	111	099	103	094	101	093	076	061	062	062	061	063
23	061	058	059	053	043S	047S	059	080	108	115	103	098	100	106	112	106	099	089	082	077	072	059	060	056
24	052	054	051	046	042	041	066	086	102	106	107	107	112	112	113	I109C	102	096	088	070	064	063	063	062
25	059	058	059	060	053	052	077	093	087	098	107	104	101	102	098	099	102	I100R	I086R	070	064	061	061	I062R
26	061	061	058	056	056	056	071	089	J111R	106	102	106	114	107	103	106	104	096	082	077	074	069	066	066
27	063	062	062	062	058	059	081	088	113	107	101	094	098	104	102	105	103	099	091	084	073	062	059	058
28	057	059	060	055	057	060	078	I097R	113	111	103	102	097	098	103	106	105	104	I105R	086	073	066	068	066
29	069	057	056	053	049	052	C	C	C	089	094	096	I100C	I099C	096	091	088	083	079	079	069	066	057	056
30	048	046	044	046	043	042	068	062	064H	060	073	074	081	087	077	C	C	C	075	066	061	056	059	053
31																								
Count	25	24	26	27	26	26	27	27	26	27	27	29	29	29	29	28	27	28	28	28	28	26	28	26
Median	061	060	058	054	052	052	075	086	090	091	091	093	097	097	096	095	094	093	088	079	070	066	063	062
U. Q.	063	062	061	059	057	057	083	092	100	103	101	097	102	102	101	101	101	096	092	086	075	070	066	066
L. Q.	058	056	054	052	047	051	068	077	085	085	081	086	090	090	090	088	086	084	082	073	064	062	060	056
Q. R.	005	006	007	007	010	006	015	015	015	018	020	011	012	012	011	013	015	012	010	013	011	008	006	010

foF2

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

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

foF1

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	A	L	490	520	540	530	540H	550	530L	460	400L						
2							400L	450	I480A	I540A	A	A	A	A	A	A	A	A						
3							L	A	I460A	490	530	I540A	540	520	510	510	460	L						
4							L	420	460	480	550	560	540	520	510	530	460L	L						
5								450	470	480	500	480	600	600	530	570	510H	L						
6							L	L	L	510H	500H	500	520	550H	470	500	L							
7								A	L	I490A	500	530	540	520	510	470L	I4H	L						
8								L	470	480	500	560	480	I520C	480	470	L							
9								L	I500A	480	510	530H	520	I530A	480	L	L	L						
10								L	450	480	520H	540	520	500	490	460	I4H	L						
11								L	L	470	550	480	490	500H	L	450L	L							
12								L	L	480L	500	500	I500A	I490A	L	480L	L	A						
13								C	C	C	510	500	500	500	480	450	400	L						
14									L	490	490	490	500	L	C	A	C							
15								C	C	C	C	C	C	C	C	C	C							
16								C	C	C	C	500H	550H	480	510L	460H	I430A							
17								L	430	480	500	530	470	480	500	480	420							
18								L	C	480	490	480	560H	L	480	L	L							
19								L	460	480	480	510	500	480	460	L	A							
20								400	460	460	480	530	510	500	470	L	L							
21								330L	470	500	510	560	530	530L	500	L	L							
22								L	L	L	L	500	500	500	450	L								
23								L	460L	470L	480	500	500	500	440	430L								
24									460L	460L	500	500	510	510	L	C								
25									L	L	490	520	550	A	A	A								
26									460L	L	500	510	510	500L	L	470L	L							
27									450	490	510	520H	630H	470	560H	L	L							
28									480	480	490	480L	450	500L	L	L								
29								C	C	I470A	I490A	500	C	C	L	L								
30								L	520	520	490	520	480	490	L	C								
31																								
Count							2	5	17	24	25	27	27	24	19	15	6	1						
Median							360L	440	460	480	500	520	510	500	490	470	440	400L						
U. Q.																								
L. Q.																								
G. R.																								

The Radio Research Laboratories, Japan

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

foF1

A2

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

IONOSPHERIC DATA

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

Sep. 1967

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	A	A	A	A	A	345	305	A	A					
2						A	215	280	320	340	A	A	A	A	365	360	A	A	A					
3						E	A	A	A	A	A	A	375	1380A	370	A	A	A	S					
4						A	A	A	A	345	A	A	370	375	355	340	300	255	A					
5						S	235	1290A	A	A	A	A	A	370	350	330	305	A	S					
6						E	A	1270A	1315A	1340A	360	1370A	1360A	355	350	335	295	240	A					
7						S	A	275	310	1335A	360	370	1375A	375	355	335	A	A	S					
8						E	A	A	300A	A	A	A	1375A	1365C	355	325	285	A	E					
9						E	A	A	A	A	A	A	A	A	A	345	1305A	A	E					
10						A	1270A	310	1345A	355	365	370	375	370	360	335	290	230	B					
11						A	A	280	A	A	A	A	370	370	355	320	290	A	E					
12						E	225	275	310	345	355	360	A	A	A	340	290	240A	S					
13						C	C	C	C	C	C	A	375	370	350	315	A	A	E					
14						S	210	270	305	1340A	350	360	A	A	C	320	C	C	C					
15						C	C	C	C	C	C	C	C	C	C	C	C	C	C					
16						C	C	C	C	C	C	1355A	365	365	340	315	275	A	E					
17						220	1270A	1310A	1330A	1350A	340	355	365	365	350	1310A	1270A	A	E					
18						A	A	270	1310C	340	350	355	365	365	350	1320A	275	A	E					
19						E	1210A	265	1305A	345	350	1355A	360	1365A	345	325	275	A	E					
20						200	265	265	300	1330A	1350A	365	370	A	A	315	285	A	E					
21						A	A	A	A	1335A	1345A	A	A	A	A	310	265	A	S					
22						190	260	260	300	330	340	1350A	355	355	335	310	275	200	E					
23						185	255	255	295	335	345	350	1360R	1355A	340	310	A	A	E					
24						B	265	265	310	330	345	355	1350A	350	1340A	1320C	280	A	E					
25						200	275	275	315	335	345	350	A	A	A	A	A	B	E					
26						200	260	260	310	1335A	1350A	A	A	A	A	350	320	275	205	S				
27						A	A	265	320	1340A	355	365	1370A	360	350	320	1280A	A	E					
28						1195A	260	A	A	A	A	355	360	365	A	A	A	A	E					
29						C	C	C	C	C	A	A	C	C	340	1320A	275	A	E					
30						190	260	260	300	1330A	A	A	355	345	330	C	C	A	E					
31																								
Count					5	13	20	18	19	16	16	19	20	21	24	24	20	6	17					
Median					E	200	270	310	1335A	350	355	365	365	350	320	280	235	E						
U. Q.																								
L. Q.																								
Q. R.																								

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

IONOSPHERIC DATA

0.1Mc 135° E Mean Time (G.M.T. +9h)

foEs

Sep. 1967

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	J040	J045	J033	J039	J026	J024	J027	J044	J064	J047	J055	J046	040	040	J040	J043	036	040	J029	J025	J040	J080	J083	J024
2	J024	J020	J017	J023	J023	022	031	035	J055	J070	J065	J078	J087	J074	J066	J060	J061	J048	J056	J028	J080	J083	J074	
3	J054	J038	J030	J019	J021	019	J043	J077	J067	J058	J053	J059	036G	041	g	037	039	046	J043	J063	J063	J078	J029	
4	J029	J027	J020	J022	J015	J019	024	J039	J036	J039	J070	J045	035G	g	038	g	g	J017	J041	J061	J079	J042	J035	
5	J033	J023	J026	J023	J029	J029	J029	031	034	J060	J044	J045	J070	g	J055	J027G	g	J079	J043	J073	J080	J053	J044	J019
6	J021	J018	J016	J021	J015	J016	J028	J035	J034	036	032G	J043	J075	g	g	J079	036	J037	J038	J065	J055	J033	J029	J029
7	J034	J024	J022	E	E	E012S	J041	J070	J049	J081	038	g	043	042	045	042	J060	J029	026	J081	J053	J045	J030	025M
8	E016B	J020	J019	J017	J021	J025	029	J050	J046	J054	J050	J060	J039	C	g	g	033	J027	J018	J020	J043	J043	J040	J029
9	J020	J029	J025	J029	J024	J028	J042	J052	J084	J049	J045	J052	J066	J064	J044	g	034	028	J025	J020	J040	J033	J024	J021
10	J020	J020	J020	E	J035	J017	J033	031	033	036	g	J044	J040	g	039	036	g	E017B	J028	J030	J018	J020	E017B	
11	E016B	E012S	J021	J019	J020	J016	022	031	036	J059	J048	038	035G	g	g	g	030	024	020	E013S	E016B	E017B	J021	E017B
12	J024	J020	J045	J026	J025	J020	J026	J038	035	040	038	045	J054	J054	J042	040	033	J043	J035	J036	J074	J026	J025	J044
13	J040	C	C	C	C	C	C	C	C	C	C	040	036G	g	J032G	039	032	J026	J025	J020	J029	J029	J018	J020
14	J018	J024	J019	J021	J020	E013S	J029	J040	040	J054	035	045	J046	J080	C	J138	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	042	042	J040	g	033	J044	J036	J071	J018	022M	J029	J018	J021
17	J020	J020	E	E	J020	J019	J028	028	033	035	027B	J040	g	g	037	036	032	J028	J035	J024	J026	J019	E017B	
18	J020	E	E	E	E	J015	026	030	C	037	J040	041	g	g	J085	037	039	J041	J028	J025	J029	J023	E017B	E012S
19	E	E	J024	E	J014	J016	025	032	J044	041	041	037	g	037	g	038	044	J033	J025	E017B	J024	J028	E018B	J016
20	E018B	E	E	J012	J017	E	026	029	042	039	J040	g	g	J045	036	g	g	030	J029	J056	J030	E014S	E017B	E014S
21	E018B	E	J014	J018	J019	J020	028	033	J040	039	041	J041	J079	039	038	031G	024G	J027	J025	J028	J034	J033	E014S	J020
22	J023	J026	J021	J018	E	E	025	030	039	042	J054	036	033G	g	036	g	g	J021	J015	J015	E017B	E017B	E017B	E017B
23	E018B	J019	J021	E	E	E	022	032	035	036	036	g	035G	J038	031G	029G	J030	J027	J019	J021	J024	E014S	E013S	E017B
24	E013S	E	E	E	E	J018	026	034	034	036	037	g	038	036	036	C	030	026	J029	J052	J055	J020	J018	E017B
25	J025	J020	J030	E	E	E	026	030	035	J083	J044	044	J045	J060	J055	J084	J050	J057	J080	J054	J030	J035	J051	J078
26	J021	J016	J020	J019	J020	J018	g	g	034	041	040	J045	J040	038	J035G	J032G	023G	g	E013S	J023	J030	J020	E	E
27	E012S	J019	E	E	E	J018	J029	027	g	037	g	J035G	J039	g	g	034	035	023	J025	J030	J028	J038	E016B	E017B
28	E012S	E	E	E	E	E013S	J030	g	036	J045	036	038	039	040	J044	J049	033	J040	J063	J029	J024	J024	E017B	E017B
29	E014S	E	J018	J020	E	E	C	C	C	J064	J065	J037	C	C	036	035	035	J033	J040	J043	J034	J018	J020	J018
30	E	J014	J016	J013	E	E	022	030	038	042	037	043	g	g	g	C	C	029	J031	J054	J033	J036	J061	J036
31																								
Count	28	27	27	27	27	27	26	26	25	27	27	29	28	27	28	27	27	28	28	28	28	28	28	28
Median	J020	J020	J018	J017	J017	J017	J028	032	036	042	040	042	039	038	036	036	033	J029	J028	J028	J032	J029	J020	J020
U. Q.	024	024	024	021	021	020	029	039	045	058	050	045	046	042	043	042	039	040	039	053	054	040	041	029
L. Q.	E016	E	014	E	E	E012	025	030	034	037	036	037	g	g	g	g	g	026	022	020	024	020	E017	E017
Q. R.	D008		010			D008	004	009	011	021	014	008					014	017	033	030	020	D024	D012	

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

foEs

The Radio Research Laboratories, Japan

A 4

Lat. 39° 43.5'N
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Akita

IONOSPHERIC DATA

0.1Mc 135° E Mean Time (G.M.T. +9h)

fbEs

Sep. 1967

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	C27	C20	C24	C21	C17	C17	C24	C45	C42	C44	C44	C39	C40	C39	C37	C24	G	C28	C18	C18	C40	C48	A	C18	
2	C18	C16	C13	C12	C14	C17	C28	C30	C54	C62	C54	C75	A	C66	C64	C56	C52	C42	C47	C18	C65	C21	C17	C32	
3	C22	C28	C19	C16	C14	C17	C33	C57	C47	C42	C40	C56	C24G	C40		C37	C36	C26	C36	C34	C31	C25	C23	C20	
4	C25	C22	C18	C14	C12	C14	C23	C37	C33	C28	C43	C42	C34G		G	G			C17	C18	C21	C19	C29	C28	
5	E	E	C13	C14	C12	C24	C14	C29	C33	C37	C39	C41	C42		C37	C25G		C28	C19	C20	C20	C26	C21	C17	
6	E	C13	E	E	C13	C15	C23	C29	C33	C36	C31G	C39	C44			G	C31	C33	C33	C44	C20	C18	C18	C20	
7	C18	C14	C17		S	C34	C68	C38	C38	C55	C38	C39	C42	C41	C43	C39	C34	C24	C23	C58	C21	C20	C19	E	
8	B	E	C16	E	C12	C15	C26	C31	C44	C40	C43	C39	C39	C			G	C25	C18	E	C20	C18	C18	C18	
9	C17	C18	C17	C16	C14	C14	C22	C38	C78	C43	C41	C40	C49	C55	C40		C31	C25	C19	C16	C18	C18	C16	E	
10	C16	C13	E		E	C14	C22	C30	C33	C36		C32	C33		G	G		B	C16	C17	C17	C17	B	B	
11	B	S	C13	E	E	C14	C22	C30	C34	C38	C42	C38	C34G				C30	C24	C18	S	B	B	E	B	
12	C18	C13	C21	C21	C15	C12	C17	C23	C33	C39	C36	C43	C54	C54	C41	G	C33	C37	C34	C35	C25	C18	C17	C18	
13	C20	C	C	C	C	C	C	C	C	C	C	C	C34G	C30G	C33	C32	C32	C23	C17	E	C17	C16	C17	C17	
14	C17	C15	E	C15	C12	S	C13	C22	C38	C47	C42	C41	C43	C47	C	A	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	C	C36	G	C37		C33	C44	C27	C17	E	E	C17	E	C17	
17	E	C14			C14	C14	C17	C28	C33	C35	C27G	C29			C37	C33	C31	C24	C17	C23	C18	C17	E	B	
18	C16				C14	C14	C24	C29	C	C37	C21	C40			C26	C37	C39	C40	C24	C17	C18	C18	B	S	
19			E		E	C13	C25	G	C33	C38	C39	C37			C37	C38	C39	C31	C18	B	C18	E	B	C14	
20	B			E	C12		C23	C28	C34	C35	C37			C43	C36			C24	C24	C20	C28	S	B	S	
21	B		E	E	C15	C18	C25	C29	C38	C37	C40	C39	C38	C38	C36	C30G	C22G	C23	C20	C24	C22	C28	S	C20	
22	C19	C22	C18	C13			C24	C28	C37	C39	C49	C36	C35G		G			C18	C14	C14	B	B	B	B	
23	B	E	E				C22	C29	C33	C36	C36		C33G	C37	C30G	C28	C29	C23	C18	C18	C20	S	S	B	
24	S				E		C25	C32	C33	C36	C37		C37	C36	C	C	C29	C24	C25	C45	C35	C18	C18	B	
25	C18	E	E				C25	C30	C34	C21	C43	C43	C44	C54	C54	C83	C45	C57	C26	C49	C21	C29	C21	C38	
26	C18	E	C13	E	C14	C13			C33	C38	C39	C42	C39	C38	C32G	C28G	C22G		S	C20	C21	C18			
27	S	E			E		C17	C21		C35		C29G	C39		C34	C30	C30	C22	C21	C23	C18	C23	B	B	
28	S				S		C24		C34	C29	C36	C38	C38	C39	C39	C36	C29	C37	C20	C19	C18	C18	B	B	
29	S						C	C	C	C53	C58	C37	C	C	C35	C33	C32	C29	C27	C34	C21	C17	C17	E	
30		E					C21	G	C34	C38	C37	C42			C	C	C	C28	C26	C29	C27	C17	C21	C24	
31																									
Count																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

fbEs

A5

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

IONOSPHERIC DATA

0.1Mc 1 35° E Mean Time (G.M.T. +9h)

Sep. 1967

f-min

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	EC14S	E	E	E	E	E	E	017	018	018	018	018	018	018	018	017	012	012	012	EC13S	017	EC13S	016	016	
2	EC14S	E	E	E	E	E	E	018	018	018	019	017	018	018	017	014	013	014	013	EC14S	EC13S	EC13S	EC14S	EC14S	
3	EC14S	E	E	E	E	E	E	017	018	017	018	017	018	018	017	017	017	017	013	EC12S	EC12S	E	EC12S	EC13S	
4	016	E	E	E	E	E	E	017	018	017	018	018	019	019	018	018	016	017	012	EC13S	EC14S	EC13S	EC14S	EC14S	
5	EC13S	E	E	E	E	E	E	018	018	019	018	018	018	018	017	017	013	013	EC12S	E	EC13S	EC13S	EC14S	EC14S	
6	EC14S	E	E	E	E	E	E	018	018	018	019	018	018	017	017	016	013	013	E	016	EC14S	EC13S	017	EC13S	
7	EC13S	E	E	E	E	E	E	017	018	017	018	017	017	019	017	017	013	014	EC13S	EC13S	EC13S	EC13S	EC14S	017	
8	016	EC12S	E	E	E	E	E	013	018	018	018	018	019	C	018	017	018	012	E	017	EC14S	016	016	016	
9	EC13S	E	EC12S	E	E	E	E	018	018	017	019	018	022	017	017	018	012	012	E	E	E	EC13S	EC13S	016	
10	016	E	E	E	E	E	E	013	018	018	017	017	017	013	022	013	013	012	017	EC14S	EC13S	EC13S	017	017	
11	016	EC12S	E	E	E	E	E	018	018	018	019	019	019	018	018	017	012	012	E	EC13S	016	017	017	017	
12	017	E	E	E	E	E	E	012	013	014	018	030	018	018	018	014	017	012	EC12S	EC14S	EC13S	EC13S	EC13S	EC13S	
13	EC14S	C	C	C	C	C	C	C	C	C	C	C	020	017	017	017	013	012	E	EC12S	EC13S	EC13S	EC13S	016	
14	EC12S	E	E	E	E	EC13S	013	012	014	018	017	018	018	018	C	018	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	C	014	017	013	013	014	014	014	E	EC12S	EC13S	E	EC12S	016	
17	EC14S	E	E	E	E	E	013	012	018	018	019	018	019	018	018	013	012	E	E	EC12S	E	EC12S	016	017	
18	EC14S	E	E	E	E	E	012	013	C	014	013	019	019	018	018	016	012	012	E	EC13S	EC12S	017	EC12S	016	
19	E	E	E	E	E	E	017	012	018	023	018	021	019	021	018	015	014	012	E	EC13S	EC12S	017	EC12S	016	
20	018	E	E	E	E	E	014	018	018	018	019	019	018	018	019	018	018	013	E	E	017	EC14S	017	EC14S	
21	018	E	E	E	E	EC12S	017	018	019	019	021	022	019	020	021	019	018	013	EC12S	E	EC12S	017	EC14S	E	
22	E	E	E	E	E	E	018	019	018	019	020	020	021	018	019	013	012	E	E	E	017	017	017	017	
23	018	E	E	E	E	E	013	013	018	018	019	021	021	018	018	014	013	013	E	E	EC12S	EC14S	EC13S	017	
24	EC13S	E	E	E	E	E	020	019	020	018	018	017	014	017	013	C	014	E	E	EC14S	EC13S	EC13S	EC12S	017	
25	016	E	E	E	E	E	018	018	018	018	019	021	017	021	018	018	014	017	E	E	EC13S	EC13S	EC13S	017	
26	EC14S	E	E	E	E	E	018	018	019	018	021	021	021	020	018	014	013	013	EC13S	E	EC12S	E	E	E	
27	EC12S	E	E	E	E	E	012	018	018	018	021	021	020	018	018	018	014	013	E	EC13S	EC13S	EC12S	016	017	
28	EC12S	E	E	E	E	EC13S	012	014	018	019	018	020	019	018	018	013	013	012	E	017	018	EC13S	017	017	
29	EC14S	E	E	E	E	E	C	C	C	018	019	020	C	C	018	018	014	018	E	016	E	EC12S	EC12S	016	
30	E	E	E	E	E	E	017	013	019	018	019	019	018	017	014	C	C	013	E	EC13S	EC12S	017	EC12S	EC13S	
31																									
Count	28	27	27	27	27	27	26	26	25	27	27	29	28	27	28	27	27	28	28	28	28	28	28	28	28
Median	EC14S	E	E	E	E	E	014	017	018	018	018	019	019	018	018	017	013	013	E	EC13S	EC13S	EC13S	EC14S	016	
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

A 6

f-min

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

IONOSPHERIC DATA

M(3000)F2 0.01 1 35° E Mean Time (G. M. T. +9h)

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	255	265	260	275	265	295	315	315	295	290	290	280	285	290	285	285	285	I290R	I305R	300	270	270R	I275A	265S
2	FS	FS	250	295	265	285	275	295	290	265	285	265	I280A	285	305	290	295	305	300	290	I295R	FS	255	FS
3	255	270	265	250	255S	270	310	340	300H	305	295	285	290	290	300	300	300	305	300	295	295	285	280	280R
4	265	280	260	255	260	270	325	335	325	315	305	280	285	285	285	290	295	295	290	305	300	FS	270S	270S
5	FS	280	285	305	285	280	320	315	I315R	315	325	295	280	295	280	295	285	300	315	300	295	280	285	290
6	285	260	275	285	275	285	320	305R	325	325	300	300	285	285	295	300	305	300	I300R	290	305	305	290	280
7	275	280	275	280	280	285	315	I325R	325	310	295	300	295	295	295	300	300	305	315	305	290	290	280	270
8	275	280	265	270	270	265	305	I305R	315	320	300	280	290	I290C	290	295	305	315	305	300	275	275	275	FS
9	FS	FS	295	280	270	275	310	I310R	320	305	300	285	300	280	290	305	300	315	320	280	275	265	260	270
10	270	275	300	295	290	290	320	315	305	310	315	295	295	290	295	300	300	300	I310R	295	280	280	270	270
11	275	270	280	285	290	300	325	325	315	305	305R	285	295	305	295	310	305	305	315	305	285	265	260	265
12	275	280	280	285	285	285	335	325	325	310	315	295	305	295	285	300	300	305	I315R	310	310	285	295	280
13	265	C	C	C	C	C	C	C	C	C	C	305	300	300	305	295	290	290	I305R	290	275	275	255	260
14	285	285	275	260	265	270	335	330	315	310	315	305	295	I300R	I305C	I310A	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	I285C	I315C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	300	295	295	290	305	305	I320R	310	315	295	270	265	270
17	265	270	270	265	275	275	320	340	335	310	295	300	310	290	300	300	310	I320R	315	285	285	270	270	265
18	280	285	280	285	265	275	325	335	I335C	330	335	320	295	300	310	315	310	310	I315R	315	310	290	255	260
19	260	265	270	265	275	300	330	325	305	330	310	295	300	300	300	310	305	315	315	305	300	285	270	270
20	260	FS	FS	280S	FS	FS	315	I325R	325	335	285	300	290	295	295	290	305	320	310	275	255	265	265	265
21	265	290	240	285	275	280	305	285	275	295	295	285	280	285	295	305	305	305	295	265	265	255	255	260
22	290	280	260	265	265	260	320	295	300	345	310	290	300	300	310	305	310	325	315	295	265	265	270	265
23	270	275	280	285	260S	260S	325	315	315	330	325	305	295	295	305	305	320	320	305	305	300	280	280	275
24	270	280	290	295	290	290	325	325	325	320	315	300	295	295	300	I305C	315	310	320	295	280	280	280	270
25	275	260	265	285	285	280	325	335	340	315	310	305	290	305	295	305	305	I315R	I315R	300	290	280	265	I275R
26	270	280	280	270	285	295	325	335	J310R	330	315	300	300	300	285	300	310	315	305	290	295	275	275	280
27	285	275	275	275	290	290	320	330	320	330	315	300	295	300	290	295	300	320	315	305	295	285	270	275
28	260	270	275	275	275	285	310	I325R	320	325	305	305	305	290	290	295	290	290	I310R	310	290	255	255	265
29	285	275	265	275	245	265	C	C	C	295	310	285	I295C	I300C	300	320	310	315	280	300	275	300	265	280
30	265	245	245	265	250	265	310	295	250H	265	285	285	285	285	310	310	C	315	290	285	275	260	260	255
31																								
Count	25	24	26	27	26	26	27	27	26	27	27	29	29	29	29	28	27	28	28	28	28	26	28	26
Median	270	275	275	275	275	280	320	325	315	315	305	295	295	295	295	300	305	310	310	300	290	280	270	270
U. Q.																								
L. Q.																								
G. R.																								

IONOSPHERIC DATA

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

M(3000)F1 0.01 1 35° E Mean Time (G.M.T. +9h)

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	A	L	365	350	355	345	355H	340	340	355	350L						
2							345L	325	A	A	A	A	A	A	A	A	A	A	A					
3								A	I360A	365	360	I350A	355	365	350	325	350							
4							L	380	370	375	340	325	335	350	355	335	350L	L						
5								355	365	395	385	400	335	345	325	335H	L	L						
6							L	L	L	370H	380H	400	365	340H	355	345	L							
7								A	L	I380A	385	345	345	350	355	360L	IH	L						
8								L	375	385	385	340	380	I350C	355	355	L							
9								L	I350A	375	375	360H	365	I340A	375	L	L	L						
10								L	365	375	375H	355	360	360	365	370	IH	L						
11								L	L	375	360	405	380	360H	L	360L	L							
12								L	L	360L	360	365	I370A	I360A	L	340L	L	A						
13								C	C	C	C	360	365	360	355	355	375	L						
14									L	A	370	370	365	L	C	A	C							
15									C	C	C	C	C	C	C	C	C							
16									C	C	C	360H	345H	365	355L	355H	I360A							
17								L	385	375	360	340	380	365	355	355	360							
18								L	C	375	380	400	350H	L	355	L	L							
19								L	355	375	375	355	380	375	395	L	A							
20								375	355	365	375	345	355	360	360	L	L							
21							395L	320	335	335	345	325	340	340L	340	L	L							
22								L	L	L	L	L	355	365	370	L								
23								L	360L	370L	380	375	365	365	370	365L								
24									365L	375L	370	380	375	355	L	C								
25									L	L	375	365	365	A	A	A								
26									370L	L	380	375	365	360L	L	355L	L							
27									365	360	365	385H	350H	370	340H	L	L							
28									355	375	390	375L	410	365L	L	L								
29								C	C	I350A	I365A	360	C	C	L	L								
30								L	315	335	350	340	365	345	L	C								
31																								
Count							2	5	16	22	25	27	27	24	19	15	6	1						
Median							370L	355	360	375	375	360	365	360	355	355	360	350L						
U. Q.																								
L. Q.																								
Q. R.																								

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

M(3000)F1

The Radio Research Laboratories, Japan

A8

IONOSPHERIC DATA

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

km **h'F2** 1 35° E Mean Time (G. M. T. +9h)

Sep. 1967

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	315	250	265	295	315	335	315	315	350	305	305	285						
2						315	315	I305A	I350A	315	A	A	A	325	315	320	305	285						
3							250	260H	280	305	320	320	325	325	295	315	300	275						
4							255	255	285	315	340	340	330	315	315	335	305	280						
5							280	250	275	265	275	375	315	315	360	320	290	275						
6							260	225	250	260	250	290	290	325	290	300	280							
7							270	250	260	270	295	295	310	310	295	290	275	260						
8							255	255	260	270	265	325	290	I310C	300	280	265							
9							240	I275A	275	280	290	285	290	290	305	275	265	260						
10							250	275	250	270	310	310	300	290	290	275	280	265						
11							240	250	260	275	275	290	280	280	265	270	255							
12							245	250	265	270	280	280	295	285	280	290	270	270						
13							C	C	C	C	C	280	265	280	280	280	275	290						
14								255	270	255	270	285	285	290	I285C	I275A	C							
15								C	C	C	C	C	C	C	C	C	C							
16								C	C	C	C	270	315	290	300	275	270							
17								230	240	265	265	285	275	270	290	285	275							
18								230	I240C	250	245	270	305	285	275	275	270							
19								240	270	260	260	270	275	275	275	260	260							
20								250	250	245	250H	280	295	280	275	290	245							
21								290	350	365	330	300	345	325	315	290	260							
22								250	290	250	250	270	270	290	275	280								
23								255	265	245	250	265	265	285	275	270								
24									255	255	260	270	275	290	275	I260C								
25									230	250	250	265	275	275	270	I275A								
26									255	240	265	270	280	275	275	275	255							
27									245	245	245	245	290	270	290	275	265							
28									260	240	265	265	260	280	305	275	265							
29									C	290	280	280	I285C	I275C	265	255								
30									420L	400H	350	365	320	280	270	C								
31																								
Count							5	20	26	27	27	28	28	29	29	28	21	9						
Median							260	250	255	260	265	280	290	290	290	275	270	275						
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

IONOSPHERIC DATA

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

135° E Mean Time (G.M.T. +9h)

h'F km

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	320	330	330	290	245	275	240	I230A	A	A	A	200	230	230H	230	235	240	255	245	I230A	I260A	I260A	I260A	290
2	360	340	335	245	250	285	255	250	A	A	A	A	A	A	A	A	A	A	270	265	I255A	270	290	I310A
3	315	305	305	325	320	295	245	A	A	220	215	I220A	215	205	225	230	255	260	265	260	260	270	280	260
4	320	295	310	315	305	290	235	225	220	195	210	230	200H	230	220	240	240	255	265	240	245	250	I295A	310A
5	295	280	255	245	235	I260A	240	230	230	215	220	205	215	200	225	220	240	240	240	240	I255A	250	255	260
6	255	295	290	270	260	275	230	220	225	220H	190H	195	I220A	200H	210	230	240	250	245	I255A	245	235	255	260
7	270	270	270	250	260	270	240	I240A	230	I220A	205	195	220	210	I230A	240	230H	245	240	I240A	240	250	260	285
8	285	275	300	290	290	295	240	245	I240A	220	220	195	I2400	220	230	230	240	240	250	230	250	290	275	330
9	330	290	260	255	260	275	240	230A	A	A	220	200H	I220A	I245A	220	240	240	240	240	255	270	290	290	290
10	290	280	250	240	240	270	240	230	220	220	190H	190	240	230	230	220	225H	250	240	240	250	270	290	290
11	300	290	280	255	245	240	235	220	230	215	I205A	180	205	200H	230	230	235	250	240	230	230	270	295	290
12	290	270	285	270	280	270	225	215	230	235	220	230	A	A	A	240	245	I260A	250	245	240	240	250	270
13	320	C	C	C	C	C	C	C	C	C	C	230	205	215	225	230	225	260	240	230	250	240	305	305
14	275	250	270	325	250	310	230	235	230	I240A	240	230	240	A	C	A	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	I260C	I230C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	190H	200H	230	220	I215A	I245A	250	240	225	225	255	280	290
17	290	285	270	270	290	285	245	230	220	200	200	210	195	230	220	235	240	240	235	240	240	290	290	290
18	280	260	250	255	280	285	230	230	I2300	220	210	195	190H	240	230	245	250	260	240	220	240	240	280	290
19	290	290	280	260	280	245	230	240	220	240	215	200	200	220	195	250	I260A	255	250	240	245	255	250	280
20	320	295	290	250	270	285	240	230	230	225	210	200	215	I240A	225	240	240	250	235	270	I310A	290	280	265
21	290	250	300	255	275	300	260	240	245	220	225	215	215	225	240	230	240	240	255	290	290	300	295	280
22	270	290	290	290	275	290	240	225	240	240	I230A	230	220	215	220	230	245	240	225	240	270	285	290	290
23	290	270	270	230	250	290	230	230	230	225	215	220	215	215	205	230	245	245	230	245	245	240	260	255
24	285	275	240	230	230	255	240	225	230	225	220	215	210	210	220	I240C	250	240	230	I240A	I260A	275	280	290
25	285	290	290	270	230	255	230	230	220	225	225	225	230	A	A	A	260	250	240	I240A	255	I265A	300	I305A
26	290	280	255	270	265	240	220	235	225	230	220	205	215	235	230	230	240	240	230	255	255	255	260	260
27	260	270	270	265	240	255	230	235	225	230	215	195H	205H	195	200H	250	240	235	240	240	250	270	285	
28	315	290	270	275	280	275	240	235	220	230	205	205	190	215	240	250	250	260	235	230	235	300	330	280
29	255	240	280	265	320	300	C	C	C	I240A	I240A	235	I2200	I2300	240	240	240	240	260	265	260	250	270	270
30	280	300	340	290	265	290	280	270	250	240	220	230	215	235	235	C	C	240	255	255	280	290	320	
31																								
Count	28	27	27	27	27	27	27	26	22	24	25	28	27	25	25	25	26	27	28	28	28	28	28	28
Median	290	285	280	265	265	275	240	230	230	225	215	210	215	225	225	235	240	250	240	240	250	260	280	290
U. Q.																								
L. Q.																								
Q. R.																								

h'F

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

The Radio Research Laboratories, Japan

A 10

IONOSPHERIC DATA

Lat. 39° 43.5' N
Long. 140° 08.2' E

Akita

km
f'Es

135° E Mean Time (G.M.T. +9h)

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	105	105	100	100	100	100	120	120	115	115	110	110	115	110	110	105	140	125	105	100	115	110	105	110	
2	105	105	100	115	100	130	130	125	115	115	115	115	115	115	125	115	110	110	105	110	110	110	110	105	
3	115	100	100	100	100	130	120	115	115	115	115	105	110	115	G	120	145	130	125	105	105	105	100	105	
4	105	100	100	100	100	115	120	110	110	105	105	105	105	G	130	140	G	G	105	105	100	110	105	105	
5	110	105	100	105	105	105	105	140	120	110	110	105	105	G	100	105	G	125	115	115	105	105	105	105	
6	105	105	105	105	105	130	115	115	115	125	105	105	105	G	G	125	130	115	115	110	105	105	105	100	
7	100	100	100	E	E	S	120	115	115	115	145	G	120	125	115	115	130	100	120	105	105	105	105	110	
8	B	115	100	100	100	120	115	120	115	115	115	140	115	C	G	G	140	105	105	105	105	110	105	100	
9	100	105	105	105	105	105	110	115	115	110	110	105	105	100	105	G	140	125	100	105	110	110	105	105	
10	105	105	105	E	110	110	100	140	125	130	G	105	110	G	130	125	G	G	B	120	125	115	115	B	
11	B	S	105	105	105	105	125	120	120	120	110	110	110	G	G	G	155	140	115	S	B	B	115	B	
12	110	105	105	105	105	105	100	105	155	135	130	120	115	115	115	120	150	120	115	115	115	115	110	105	
13	105	C	C	C	C	C	C	C	C	C	C	110	105	G	105	130	C	C	C	C	C	C	C	C	
14	100	100	100	110	105	S	100	115	125	115	120	120	115	125	C	120	C	C	C	C	C	C	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	C	125	125	125	G	E170G	120	120	125	120	120	110	110	110	105
17	105	100	E	E	115	100	100	130	125	130	105	105	G	G	165	155	140	125	115	105	105	100	105	B	
18	105	E	E	E	E	100	170	150	C	140	100	130	G	G	110	155	135	125	115	110	110	105	B	S	
19	E	E	115	E	130	120	140	130	120	130	120	120	G	120	G	155	140	120	115	B	110	115	B	110	
20	B	E	E	105	105	E	120	140	125	120	120	G	G	115	120	G	G	125	115	110	115	S	B	S	
21	B	E	105	100	120	125	130	125	120	125	120	115	120	110	110	110	105	110	105	100	100	110	S	100	
22	110	110	105	105	E	E	130	140	130	125	115	115	110	G	130	G	G	105	105	105	B	B	B	B	
23	B	110	105	E	E	E	160	135	130	140	140	G	110	115	110	105	110	115	110	110	105	S	S	B	
24	S	E	E	E	E	110	140	135	140	140	140	G	120	140	130	C	150	130	120	115	115	110	110	B	
25	100	100	100	E	E	E	150	140	130	105	120	125	115	115	115	115	115	115	110	110	105	110	105	105	
26	105	105	105	100	100	105	G	G	140	120	125	105	105	115	105	105	110	G	S	110	105	110	E	E	
27	S	105	E	E	E	105	105	110	G	120	G	110	105	G	G	160	145	130	110	110	110	110	B	B	
28	S	E	E	E	E	S	105	G	125	105	130	130	135	130	115	115	115	110	105	110	110	105	B	B	
29	S	E	105	105	E	E	C	C	C	115	110	115	C	C	165	155	135	120	115	115	110	105	105	105	
30	E	100	100	100	E	E	155	140	125	120	120	115	G	G	G	C	C	120	115	110	110	110	105	105	
31																									
Count	17	19	21	17	17	18	25	24	24	27	25	25	23	16	20	22	22	25	26	26	26	24	19	17	
Median	105	105	105	105	105	110	120	130	120	120	115	115	110	115	115	120	135	120	115	110	110	110	105	105	
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

f'Es

IONOSPHERIC DATA

Lat. 39° 43.5'N
Long. 140° 08.2'E

Akita

1 35° E Mean Time (G.M.T. +9h)

Types of Es

Sep. 1967

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	f6	f3	f3	f2	f2	1	e2	e2	e3	e2	e3	c	e2	e2	e2	1 h	h	h31	1	f2	f4f2	f4	f3	f2	
2	f3	f3	f	f	f	c 1	h2	h	h5	e3	e2	e3	e6	c4	h21	c3	c6	c5	f3	f3	f5	f3	f6	f3	
3	f2f4	f3	f3	f	f	e2	e5	e2	e3	e3	e2	13	1	c	c	c2	h2e3	h 13	h213	f4	f4	f3	f2	f	
4	f3	f2	f2	f2	f	c	c	e3	e2	12	12	12	1	1	h	h			f2	f3	f3	f3	f3	f7	
5	f2	f	f2	f	f2	17	12	h	e2	e2	e2	12	12	12	1 h	12		e213	e2	f2	f3	f3	f3	f2	
6	f2	f2	f	f	f2	c	c	e2	c	e	12	12	12	12	h	h	h 12	e4	e7	f6	f4	f2	f3	f4	
7	f2	f	f	f	f	e3	e4	e2	e2	e2	h	h	c	h212	e212	e21	e212	1 h	e21	f4	f3	f3	f4	f	
8	f	f	f	f	f	e2	e4	e2	e3	e2	e2	h c	e2	c2	h	h	h	13	1	f	f2	f2	f3	f2	
9	f	f2	f	f2	f	1	1 e2	e4	e3	e3	e3	12	12	13	13	13	h	h312	1	f	f3	f2	f3	f	
10	f	f	f	f	f	1 h	h	h2	h	h2	h	12	1	h	h	h	h	h312	1	f	f	f	f	f	
11																		h2	e2					f2	
12	f2	f2	f3	f4	f2	1	1	12	h	h2	h	h2	c3	c3	c3	h	h 1	e4	e4	f6	f4	f3	f2	f3	
13	f4												12	12	12	h 13	h213	12	1	f	f2	f2	f2	f2	
14	f2	f2	f	f2	f	1 h	1 h2	h212	e3	h2	e2	e2	e2	h2e2	c3	c3									
15																									
16												h	h	h	h	h	e2	e3	c	f	f	f2	f	f2	
17	f	f2				f2	1	h2	h	h 1	12	13				h	h3	e312	c	f3	f2	f	f		
18	f					f	h	h	h	h	1 h2	h2				1 h	h3	h41	e5	f	f2	f			
19			f			f2	c	h2	e2	h	h	h				h2	h2	e2	e2	f2	f2	f		f	
20						f2	c	h	h3	e2	c					e3	e2	h2	e5	f3	f2				
21						f2	h3	h2	e3	h	e2	e2	e2	e2	e2	12	12	13	12	f2	f2	f3		f	
22	f3	f3	f4	f3		h2	h2	h2	h2	h2	e3	c	1		h		12	1	f						
23		f	f			h2	h2	h2	h	h	h		1	e3	12	12	13	e2	12	f2	f3				
24						h2	h3	h	h	h	h 1		e2	h	h 1	h21	h21	h21	e6	f3	f4	f2			
25	f2	f	f			h2	h2	h2	h2	1 h2	h2	h2	e2	e2	e2	e4	e31	e4	e6	f5	f3	f3	f3	f4	
26	f2	f	f3	f2	f2	f			h	e2	h 12	12	13h	e2	12	13	1		f5	f5	f3	f2			
27		f				f	1 h2	1		c		1	12	h	h3	h3	h	h	13	f7	f2	f4			
28							14		h212	13e	h 12	h	h2	h	e2	e3	e3	13	12	f	f	f			
29									e4	e3	e2			h	h	h	h3	e5	e3	f4	f3	f	f	f	
30		f	f	f			h	h 1	h2	e2	e2	e2					e3	e5	e5	f5	f3	f2	f3	f5	
31																									
Count																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

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

The Radio Research Laboratories, Japan

Types of Es

A12

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

0.1Mc 135° E Mean Time (G. M. T. +9h)

foF2

Sep. 1967

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	064	I065R	062	065	058	060	079	079	085	094	087	091	102	099	100	100	102	I095S	107	093	067	063	061	057
2	052	053	050F	052	049	049	071	084	079	083	094	095	100R	112	107	095	088	090	101R	098S	075	060	060	062
3	060	060	056	052	058	058	081	089	080	075	081	084	087	081	079	077	079	080	086	089R	074	066	056	056
4	056	055	053	050	050	053	086	087	076	080V	078	077	089	084	080	080	083	084	088	093	074R	062	060	059F
5	058F	059F	060	052	044	045	066	095S	096	089V	084	079	081	083	086	093	093	087	094	092	071	069	072	065
6	055	055	054	054	049	050	I077R	096S	095S	086	077	086	094	I094C	096	096	c	c	096	092	085	073	067	066
7	062	058	058	053	053	056	077	095S	100	095	085	100	099	096S	101	105	105	098S	095	088	071	068	067	066
8	068	063	056	056	058	060Z	088	J108R	100	091	091	097	106	109	112	115	105	098	081	074	065	065	063	060
9	060	061	062	052	050	049	071	096S	084	090	098S	103	109	J101R	098	102	095	094	082	071	069	064	065	068
10	064	063	068	060	051	052	071	090	098	099	090V	095	104	105	103	097	092	094	097	082	062	063	063	063
11	061	063	061	059	055	055	068	076	090	091	087	I102R	110	115	107	099	091	089	095	085	065	061	064	065
12	066	061	058	055	054	055	075	081	082	095	091	092	093	096	097	I100R	105	106	108	097	075	069	J067R	060
13	058	058Z	060	053	050	051	077	090	I101R	096	097	104	100	104	109	106	110	109	127	085	068	072	063	067
14	070	065	055	052	055	048	093S	078	087	I098R	106	095	J105R	110	108	111	110	103	093	072	066	070S	066	065
15	061	056	061	059	041	044	067	092	084	091	094	098	101	104	112	098	105	098	103	085	059	058	057	056
16	057	054	054	054	054	053	074	089	091	094	093	096	100	100	102	106	104	112	094	077	056	053	053	053
17	054	053	054	049	051	052	084	098	088	092H	112	117	115	111	106	110	113	108	097	078	064	059	060	063
18	061	062	055	049	047	050	071	J104R	094	092	084	085	095H	103	102	098	098S	106	105	087	065	056	054	053
19	053	052	051	049	048	050	077R	094S	087	091	092	100	110	110	098	098	096	103	101R	082	072	061	060	058
20	056	056	057	061	055	055F	086	097	100	095	090	097	117	123	110	111	118	107	099R	I072R	I074R	075R	075	069
21	060	065	053	056	050	044	054	067	074	082	090	090	102	116	113	100	087	086	083	068	064	067	067	068
22	065	055	050	049	046	044	079	096	099	116	094	099	117	113	100	098	105	106	085	060	055	058	060	059
23	057	058	056	050	F	053F	073R	095	111	115	108	J105R	106	115	113	116	119	106	093	075S	063	061	059	059
24	056	055	052	045	042	042	065	095	093	109	105	117	120	117	115	117	109	106	095	I066A	062	064	065	062
25	058	056	056	056	054	051	078S	094	095	096	110	J110R	105	106	102	104	107	105	J099R	071	063	064	062	062
26	062	062R	056	056	054	054	077R	093	108	109	100	106	114	113	108	116	105	100	087	074	069	064	064	062
27	062	059	059	056	057	057	088	092	J105R	103	101	095	104R	106	104	112	110	107	099	080	065	058	058	057
28	055	057	058	056	053	055	076S	098S	122	114	096	104	097	104	106	111	112	113	111	091	067	067	066	066
29	070	060	055	056	048	054	065	107R	106	110	118	115	112	110	110	102	092	090	081	085	070	064R	057	060
30	055	051	048	049	047	046	067	062R	J068V	067	077	088	092	097	088	084	090	090	070	061	058	I058C	058	053
31																								
Count	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	29	29	30	30	30	30	30	30
Median	060	058	056	054	051	052	076	094	094	094	092	097	103	106	104	101	105	100	095	082	066	064	062	062
U. Q.	062	062	059	056	054	055	079	096	100	099	100	104	110	112	109	111	110	106	101	089	071	067	066	065
L. Q.	056	055	054	050	048	049	071	087	084	090	087	091	097	099	098	098	092	090	087	072	063	060	059	058
Q. R.	006	007	005	006	006	006	008	009	016	009	013	013	013	013	011	013	018	016	014	017	008	007	007	007

The Radio Research Laboratories, Japan

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

foF2

K1

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

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

foF1

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	L	L	L	L	L	L	500	560	520	L	L						
2							L	A	A	A	A	A	A	U570L	A	A	L	A	A					
3							A	A	A	A	540	550	550	560	560	500	L	L						
4							L	L	L	510	L	L	530	540	550	L	L	L						
5							L	L	L	L	L	L	560	L	510	L	L	L						
6							L	L	L	L	490	510	530	C	530	L	C	C	A					
7							A	L	L	L	500	U560L	510	L	510	L	L							
8							L	L	L	L	470	560	490	490	L	L	L	L						
9							L	L	L	460L	520	A	520L	L	L	L								
10							L	L	L	480L	L	L	L	L	490L	L								
11							L	L	L	L	A	580	520	450	490	450	L							
12							L	L	L	470	L	L	500	480	L	L	L	A	A					
13							L	L	L	450	L	L	A	560	560	L	A	A						
14							L	L	L	A	A	L	L	A	A	A	A	A						
15							L	L	L	490L	L	L	L	L	L	L	A							
16							L	L	L	460L	L	U590L	L	U570L	L	L	A	A						
17							L	L	L	L	L	U500L	540L	L	L	L	L							
18							L	L	L	L	470	470	460	500	L	L								
19							L	L	L	L	470	L	L	L	L	L								
20							L	L	L	L	L	490	550	L	L	L	L	A	A					
21							L	L	L	L	L	L	L	L	L	L	L							
22							L	L	L	L	L	L	L	L	L	L	L							
23							L	L	L	L	L	L	L	L	L	L	L							
24							L	L	L	L	L	L	L	L	L	L	L							
25							L	L	L	L	A	A	A	A	A	A								
26							L	L	L	L	L	L	L	L	L	L	L							
27							L	L	L	L	L	L	L	L	L	L	L							
28							L	L	L	L	L	L	L	L	L	L								
29							L	L	L	L	L	L	L	L	L	L								
30							L	L	L	L	L	L	L	L	L	L	A							
31							L	L	L	L	L	U520L	L	L	L	L								
Count										7	7	10	12	10	9	3								
Median									470L	490	540	520	520	520	530	500								
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

foF1

K 2

IONOSPHERIC DATA

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

Sep. 1967

foE

0.01Mc 135° E Mean Time (G. M. T. +9h)

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	A	A	A	A	A	A	A	A	A	A	A	310	A	A					
2	A	200	280	320	I335R	365	370	375	I375R	365	330						A	A	B					
3	B	A	I265R	315	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B					
4	B	A	A	A	A	A	A	A	A	A	A	A	A	I370R	360	340	300	240	A					
5	B	A	A	A	A	A	A	A	A	A	A	A	A	R	R	R	295	R	B					
6	B	A	A	I310A	A	A	A	A	A	A	A	A	380R	I365C	350	325	C	C	B					
7	B	215	I260R	310	R	355	370	380	360	360	330	305					305	A	A					
8	B	R	R	A	A	A	A	A	A	A	A	A	I370R	360	345	320	I290R	245	B					
9	B	A	A	A	A	A	A	A	A	A	A	R	A	A	370	330	300	220	S					
10	B	205	285	A	340	365	I370A	375	370	350	A	290	230	160										
11	B	205	A	A	A	A	A	A	I380R	370	350	330	290	225	B									
12	A	A	A	A	340	A	A	A	A	A	A	A	A	A	A	350	325	290	225	B				
13	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A					
14	A	180	270	310	330	350	360	A	A	A	A	A	360	325	290	A	A	B						
15	A	A	A	255	R	320	350	360	360	350	340	315	285	200	S									
16	B	205	280	305	335	A	A	A	A	A	A	A	340	310	A	A	A	A						
17	B	200	A	290	315	325	360	370	355	345	320	285	A	B										
18	E	170	270	320	340	A	I380R	385R	355	360	320	270	200	B										
19	B	A	A	265	310	345	350	A	A	A	A	A	355	340	320	265	195	B						
20	B	A	A	A	A	A	A	A	A	A	A	A	R	A	A	340	320	280	A					
21	A	A	A	A	310	A	A	A	A	A	A	A	A	A	A	320	A	A	B					
22	B	200	260	305	330	A	A	A	A	A	A	I340R	315	I265R	A	B								
23	B	A	260	I300A	320	R	R	360	A	A	A	A	A	A	A	A	A	A	B					
24	B	185	255	305	325	340	345	A	A	A	335	315	A	200	B									
25	B	205	270	320	340	350	360	370	A	A	A	A	A	A	A	200	A							
26	B	190	250	315	335	A	A	A	A	A	A	A	320	I280A	A	B								
27	B	175	270	R	335	350	I360R	I365A	R	340	320	275	185	B										
28	E	A	A	A	315	330	360	380	370	360	340	A	260	A	B									
29	E	170	A	A	A	A	A	A	R	R	350	I310R	I260R	B	B									
30	E	R	R	A	A	A	A	A	360	I365R	R	325	310	170	E									
31																								
Count	1	4	14	17	17	17	11	12	14	12	22	22	21	13	2									
Median	E	E	200	270	310	335	350	360	370	360	350	320	285	200	E									
U. Q.																								
L. Q.																								
Q. R.																								

foE

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

The Radio Research Laboratories, Japan

K 3

IONOSPHERIC DATA

Lat. 35° 42.4'N
Long. 139° 28.3'E

Kokubunji Tokyo

foEs 0.1Mc 1 35° E Mean Time (G.M.T. +9h)

Sep. 1967

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	J038	J037	J026	J026	J028	J022	J026	031	J051	J070	J050	J041	J051	J041	042	043	038	J038	J025	J036	J053	J036	J062	J077
2	J026	J052	J042	J030	J026	J047	028	J037	J053	J066	J060	J059	J078	J055	J065	J053	J050	J065	J105	J051	J029	J018	J015	B013B
3	J014	J024	J020	J017	J025	J016	J028	J084	J064	J071	J041	043	044	042	J039	J041	J043	J037	J033	J029	J041	J041	J024	J030
4	J029	J028	J016	J025	013	B013B	025	J041	049	J042	J050	J072	041	032G	G	G	033	G	018	B013B	B014B	031	J052	J051
5	J062	J028	J029	J025	J030	J028	J032	J037	037	038	039	044	042	035G	029G	035	J038	J030	J029	J023	J044	J054	J029	J029
6	J025	J026	J024	J015	B012B	J016	024	J030	J036	J036	041	039	032G	C	G	040	C	C	J069	J042	J015	J015	J020	J015
7	021	B011B	B011B	J014	E	J015	025	J049	039	043	044	040	041	039	041	040	030G	J026	J025	J036	J074	J075	J042	J024
8	J018	J015	J017	020	021	020	026	J056	J041	J040	041	043	G	G	029G	G	032	G	J025	J025	J015	J055	J035	J025
9	J021	J025	021	B014B	B011B	B014B	030	033	J042	J038	038	067M	035G	042	039	J029G	J038	J038	J028	031	020	J029	J035	024
10	021	J016	J022	020	J015	B014B	024	G	035	037	038	038	G	022G	G	035	G	G	J024	B012B	J069	J023	J024	J024
11	B012B	021M	J015	J017	015	J015	G	J029	033	044	J053	047	036G	031G	032G	G	037	029	020	020	B014B	B015S	B016S	B016S
12	B015S	B011B	E	B011B	J042	J025	J024	033	J061	038	041	040	048	044	G	039	037	J041	J048	J037	J053	J028	J025	020
13	J025	J023	J019	J016	J017	J018	J028	J030	036	J035	J041	J051	J055	044	047	J041	J044	J044	J030	J028	021	021	J015	019
14	J015	B014B	J015	B013B	B011B	J018	023	J041	039	048	J071	044	049	J125	J094	J070	J065	J109	J085	J108	J054	J052	J041	J028
15	020	E	J015	E	E	J016	J028	044	J040	036	042	042	042	G	021G	037	J056	J033	J042	J042	J054	J030	J030	J022
16	022M	026M	J025	023	021	019	023	030	035	035	038	037	J043	038	030G	J027G	J050	J079	J108	J052	J038	J025	J027	J025
17	022	021	E	E	E	B012B	021	J029	J028G	J036	037	G	029G	040	J026G	G	035	J034	J042	J030	J029	028	021	020M
18	020M	E	E	J014	E	E	E	G	032	038	042	041	G	041	042	039	039	033	J030	J019	J020	J025	J017	B015S
19	B014B	B014B	E	E	J014	B011B	J025	032	038	041	042	J051	J041	041	043	045	J042	J040	J075	J032	J026	J024	B013B	J025
20	B015S	B012B	B011B	B013B	B012B	B013B	023	J033	J038	036	J041	J040	J044	035G	G	G	030	024	J052	J030	J051	J030	J015	021
21	J023	J024	020	J015	018	J018	027	J038	039	J044	J041	038	038	036	J040	G	J038	J041	J035	J036	J029	J025	J018	J016
22	J030	J024	J019	J051	J016	J015	023	033	038	J041	J042	J038	040	038	026G	G	021G	021	J026	J024	023	B015S	B014B	B013B
23	B015S	B014B	B012B	E	J025	B013B	021	030	036	038	G	G	G	036	034	J034	034	J028	J029	J029	J029	J026	J029	B013B
24	B014B	E	E	E	E	E	026	031	036	041	G	043	038	J041	035	035	J028	024	J024	J085	J088	J042	J053	J017
25	020	B014B	E	E	J014	B013B	G	033	J041	044	J055	J117	J064	J089	J071	J053	J039	024	J033	J061	J039	J038	J030	J030
26	J029	J029	J024	J020	J018	J017	J025	G	G	037	042	041	J048	J041	039	J028G	J041	025	J023	B015S	J026	J021	J025	J023
27	J016	J024	B011B	E	B012B	B014B	022	029	030G	G	G	G	J040	031G	J043	034	032	023	B013B	B013B	J043	J043	B016S	B016S
28	020	J016	B012B	E	E	E	020	034	G	026G	G	G	G	G	030G	035	032	031	J028	022	J025	J026	J026	024
29	B013B	E	B015B	B011B	E	013	024	J027	044	J042	J044	039	G	G	036	J043	J033	J029	J043	J053	J018	J016	B014B	B014B
30	B014B	J014B	B011B	E	E	E	022	030	036	J034	036	G	G	G	G	G	032	J029	J029	025	J052	C	023	J029
31																								
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	29	29	30	30	30	29	30	30
Median	020	J018	J015	014	014	J015	024	032	038	039	041	040	040	038	G	035	033	J031	J029	J030	J029	J028	J025	J022
U. Q.	025	025	021	020	021	018	026	037	041	043	044	044		042	042	040	042	039	042	042	052	040	035	025
L. Q.	B015	B014	B011	E	E	B013	022	030	036	036	038	038	G	G	032	G	032	024	025	024	020	021	017	015
Q. R.	B010	B011	B010			D005	004	007	005	007	006	006		010	010	G	010	014	017	018	032	019	013	010

The Radio Research Laboratories, Japan

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

foEs

K 4

IONOSPHERIC DATA

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

0.1Mc 135° E Mean Time (G.M.T. +9h)

fbEs

Sep. 1967

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	029	026	025	023	021	019	025	031	048	065	046	040	046	040	038	040	036	028	022	031	030	022	041	053	
2	017	039	029	025	017	022	026	037	051	065	056	057	078	048	064	052	041	064	054	027	026	016	015	B	
3	E	015	013	016	018	016	025	071	063	068	040	039	040	041	038	038	042	030	032	020	019	020	016	027	
4	025	025	015	015	012	B	025	030	040	039	044	049	040	028G		G			017	B	B	022	025	039	
5	030	016	016	E	018	019	029	033	036	038	038	040	042	E035R	027G	034	034	027	017	014	026	025	021	025	
6	020	016	015	014	B	B	024	030	034	034	039	037	032G	C		039	C	C	065	025	013	E	016	E	
7	016	B	B	E		G	024	047	039	039	041	040	040	039	039	038	025G	025	018	029	043	040	028	015	
8	017	015	016	016	E	G	025	033	040	038	039	040		028G		030	030	017	016	E	E	027	031	016	
9	016	019	017	B	B	B	026	030	040	034	037	065	E035R	040	039	025G	037	034	026	015	E	E	017	025	E
10	E	E	E	E	E	E	023		034	036	038	038		E022R		033				017	B	046	019	E	
11	B	E	E	E	E	G		029	033	038	051	043	E036R	030G	025G		036	028	020	015	B	B	S	S	
12	S	B		B	021	018	024	031	034	037	040	040	044	040		038	036	037	045	033	025	E	021	E	
13	021	017	017	015	016	016	025	030	033	034	040	050	054	039	043	040	043	040	025	016	016	E	E	016	
14	E	B	011	B	B	013	022	031	037	044	070	043	040	058	070	053	051	053	040	042	025	014	027	E	
15	016		014			014	025	040	036	036	039	040	040		E021R	034	044	030	033	038	030	018	018	015	
16	016	019	016	015	014	E	023	029	033	035	036	036	037	037	030G	027G	040	045	041	029	025	017	020	016	
17	E	E				B	019	027	026G	035	036		029G	039	026G		035	025	028	025	019	017	E	E	
18	E	B	B	E		B	022	028	036	040	040	041	041	039	041	044	039	032	026	015	015	017	015	S	
19	B	B	B	B	B	B	021	029	033	035	040	040	041	039	041	044	040	036	063	026	014	018	B	015	
20	S	B	B	B	B	B	020	030	033	035	036	038	040	036	037		030	024	019	020	040	025	E	016	
21	017	015	E	E	E	016	026	033	038	043	040	038	038	036	037		028	029	026	026	025	016	016	E	
22	027	016	016	037	014	G	022	029	037	040	040	038	040	036	025G		021G	021	025	019	S	B	B	B	
23	S	B	B		E	B	020	030	033	036				036	034	032	029	026	027	027	017	023	023	B	
24	B					G	024	030	035	040		040	037	040	035	033	028	022	020	A	052	026	040	015	
25	E	B			E	B	029	029	040	044	053	085	056	087	053	039	039	022	028	031	021	019	025	025	
26	016	025	015	017	016	014	017		036	040	040	040	042	040	037	026G	030	025	016	S	017	016	018	019	
27	016	015	B		B	B	021	028	029G				038	E031R	039	033	030	022	B	B	B	018	S		
28	E	E	B	B			020	029		026G					025G	032	030	025	017	016	016	019	017	016	
29	B	B	B	B		013	019	027	033	041	041	039				032	043	028	025	040	041	015	015	B	
30	B	B	B				021	027	033	034	036						029	027	028	017	040	C	E	020	
31																									
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

K 5

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

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

Sep. 1967

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	012	010	012	010	011	010	010	016	016	016	018	025	018	020	017	015	013	013	012	013	013	014	015	015	
2	012	011	010	011	011	010	015	015	016	018	026	025	025	026	021	011	017	014	015	014	013	013	014	013	
3	012	013	010	012	010	011	015	016	015	025	025	026	026	029	019	017	015	015	013	011	011	014	012	014	
4	E015S	011	013	010	010	013	014	015	017	019	020	025	026	026	019	018	015	015	014	013	014	013	E015S	E015S	
5	E015S	E015S	011	012	013	014	013	013	016	018	017	016	019	018	017	015	013	015	012	012	E015S	012	012	013	
6	014	012	014	010	012	014	014	011	012	013	020	026	016	C	026	018	C	C	014	011	010	013	013	014	
7	E015S	011	011	010	010	013	015	013	016	016	016	016	019	017	018	016	015	015	012	014	013	014	E015S	013	
8	E015S	014	013	E015S	014	014	012	015	016	016	017	025	025	026	019	016	013	014	011	012	014	014	013	014	
9	012	014	013	014	011	014	014	012	015	017	024	018	025	025	019	015	011	011	E015S	010	E015S	E015S	E015S	011	
10	012	012	010	010	010	014	013	012	014	016	015	015	015	015	025	015	015	015	012	013	012	013	010	013	
11	012	012	010	010	010	013	013	015	012	015	025	024	025	016	016	015	017	014	014	013	014	014	E015S	E016S	
12	E015S	011	010	011	E	014	010	010	015	016	018	025	026	026	015	012	012	013	014	014	E015S	014	013	014	
13	013	010	011	E	E	010	016	015	014	016	025	025	019	025	016	013	013	011	013	014	E015S	E015S	014	E015S	
14	013	014	E	013	011	010	013	013	012	015	017	019	017	025	016	026	013	025	015	013	014	012	011	E016S	
15	E015S	010	010	010	010	010	015	013	015	016	015	015	025	020	015	015	017	014	E015S	E015S	012	013	014	012	
16	011	010	012	E	010	014	014	013	015	019	025	018	025	016	016	015	014	016	011	013	E015S	E015S	E015S	013	
17	014	013	010	010	010	012	015	010	015	016	015	025	018	025	016	016	015	011	014	E015S	E015S	E015S	E015S	013	
18	E015S	010	E	E	010	010	013	013	014	013	012	025	019	026	017	016	014	013	011	013	011	010	014	E015S	
19	014	014	010	E	012	011	015	012	016	030	026	026	016	018	017	016	013	013	012	011	011	010	013	010	
20	E015S	012	011	013	012	013	014	014	012	023	017	026	028	017	018	016	016	016	014	010	014	013	011	013	E015S
21	E015S	010	014	010	014	011	014	016	028	025	026	027	026	027	020	019	015	013	014	012	014	014	010	014	
22	E015S	011	010	E	010	012	015	015	016	018	017	025	025	025	014	026	014	010	014	014	E015S	014	010	014	
23	E015S	014	012	010	010	013	017	014	016	025	018	026	026	019	016	012	013	015	015	014	014	E016S	E015S	013	
24	014	010	010	010	010	014	015	016	014	016	018	025	015	017	018	017	015	015	015	E015S	013	E015S	014	013	
25	014	014	010	E	E	013	016	015	014	017	022	026	016	026	019	014	019	014	011	014	014	013	014	014	
26	013	012	012	010	011	011	012	012	016	016	017	022	018	025	022	016	014	015	014	E015S	012	013	013	014	
27	E015S	010	011	010	012	014	013	014	015	016	018	026	021	025	017	016	014	014	013	014	012	013	012	E016S	
28	E015S	014	012	010	010	010	011	012	016	018	017	026	018	018	016	014	012	011	012	012	E015S	E015S	E015S	013	
29	013	010	015	011	010	010	014	014	014	016	019	026	025	029	016	014	015	015	012	013	014	012	012	014	
30	014	014	011	010	010	010	015	011	015	018	015	024	025	025	015	016	014	011	010	013	013	C	013	013	
31																									
Count	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	29	29	30	30	30	29	30	30	
Median	013	012	011	010	010	012	014	014	015	016	018	025	023	025	017	016	014	014	012	013	013	014	013	014	
U. Q.																									
L. Q.																									
Q. R.																									

The Radio Research Laboratories, Japan

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

f-min

K 6

IONOSPHERIC DATA

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

M(3000)F2 0.01 1 35° E Mean Time (G. M. T. +9h)

Sep. 1967

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	U270R	265	280	295	295	320	310	305	290	285	270	280	280	285	290	290	U300S	310	310	280	270	280	R
2	240	250	255F	285	280	280	290	310	300	265	280	275	270R	295	295	300	295	295	305R	315S	320	255	265	270
3	270	285	280	265	270	285	310	325	310	315	290	290	290	295	295	305	300	305	300	305R	305	300	285	265
4	270	275	275	260	275	285	325	345	315	310	320	295	300	300	295	300	300	305	300	310	325R	285	285	280F
5	265F	280F	300	305	275	280	305	340S	320	305V	315	295	290	285	290	295	300	305	305	310	305	285	290	305
6	290	275	285	290	300	290	U310R	320S	315S	335	310	285	285	1280C	290	295	C	C	300	305	305	295	285	285
7	290	290	290	295	285	290	320	320S	325	330	285	300	290	290S	290	295	310	305S	310	305	300	295	280	275
8	290	290	280	270	265	275F	305	J325R	310	315	290	285	290	285	290	295	305	315	305	305	285	285	280	260
9	260	275	315	285	290	275	320	325S	305	320	305S	300	305	J295R	295	305	310	320	320	295	290	275	270	270
10	270	285	305	315	280	285	310	330	325	320	290V	285	290	295	290	300	305	305	320	315	310	265	270	280
11	275	280	295	295	300	310	340	315	320	325	290	U290R	300	305	305	305	300	300	310	310	305	270	270	285
12	300	290	295	285	290	285	330	340	325	315	315	300	300	290	290	U290R	300	305	315	315	305	290	J285R	295
13	280	270Z	290	300	295	290	320	U325R	330	330	295	300	285	285	295	290	300	290	320	330	260	280	265	265
14	285	290	270	255	280	265	330S	340	305	U315R	310	295	J295R	305	295	305	315	320	320	300	275	275S	280	270
15	270	265	285	325	260	265	320	315	310	320	295	305	305	295	315	305	325	315	330	330	295	280	280	270
16	280	280	280	295	295	300	340	360	340	310	300	290	305	290	295	300	310	300	330	315	280	280	275	280
17	280	285	290	280	275	290	345	340	315	290H	300	305	295	305	290	305	320	325	320	320	300	285	275	285
18	295	305	300	290	270	290	340	J335R	350	340	315	280	285H	295	305	305	305S	315	325	330	305	290	270	270
19	275	275	275	280	275	300	330R	340S	310	315	300	300	295	300	295	305	300	315	315R	310	300	285	280	280
20	255	265	275	305	280	275F	315	335	315	320	300	295	290	300	290	295	310	315	310R	U290R	1265R	275R	280	285
21	265	290	250	290	270	285	310	300	295	290	310	290	275	290	290	295	305	300	290	290	265	265	265	280
22	290	275	285	270	260	265	310	325	290	310	315	285	300	315	305	305	310	330	335	310	260	290	275	285
23	280	290	295	290	F	275F	315R	320	325	320	320	J305R	300	295	300	300	305	330	325	310S	290	285	285	285
24	280	285	315	290	290	275	330	330	310	325	305	300	300	300	305	310	325	330	325	1315A	285	280	280	285
25	290	265	275	300	295	300	335S	330	345	320	305	J310R	295	305	290	300	305	315	J325R	330	285	290	275	280
26	290	285R	285	275	275	290	325R	320	315	325	310	300	295	300	290	305	310	315	310	295	290	290	275	285
27	280	290	285	285	290	295	335	325	J335R	320	330	300	300R	295	300	305	310	320	320	315	285	265	285	280
28	265	270	285	290	275	280	330S	325S	320	335	305	305	290	290	285	295	295	310	315	320	285	260	265	280
29	285	300	275	300	250	260	280	315R	310	290	305	295	295	300	310	315	310	310	285	300	295	295R	265	290
30	275	265	250	260	285	265	310	300R	J280V	295	285	305	295	300	310	310	310	330	305	295	280	1270C	290	265
31																								
Count	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	29	29	30	30	30	30	30	29
Median	280	280	285	290	280	285	320	325	315	320	305	295	295	295	295	300	305	305	315	310	290	280	280	280
U. Q.																								
L. Q.																								
Q. R.																								

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

The Radio Research Laboratories, Japan
K 7

M(3000)F2

IONOSPHERIC DATA

Lat. 35° 42.4'N
Long. 139° 28.3'E

Kokubunji Tokyo

M(3000)F1^{0.01} 135° E Mean Time (G.M.T. +9h)

Sep. 1967

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	365	335	340	L	L						
2								L	A	A	A	A	A	A	A	A	L	A	A					
3								A	A	A	350	340	350	345	335	350	L	L						
4							L	L	L	370	L	L	340	345	335	L	L	L						
5								L	L	L	L	L	355	L	350	L	L	L						
6							L	L	L	L	385	390	375	C	335	L	C	C	A					
7								A	L	L	395	U355L	365	L	345	L	L	L						
8								L	L	L	400	340	385	375	L	L	L	L						
9								L	L	L	390L	380	350L	L	L	L		L						
10								L	L	L	395L	L	L	L	375L	L								
11								L	L	L	A	345	360	390	360	370	L							
12								L	L	L	L	L	385	390	L	L	L	A	A					
13								L	L	L	L	L	A	340	350	L	A	A						
14								L	L	L	A	L	L	A	A	A	A	A						
15								A	L	L	L	L	L	L	L	L	A	A						
16								L	L	L	L	U355L	L	U355L	L	L	A	A						
17								L	L	L	L	U380L	350L	L	L	L	L							
18								L	L	L	400	405	410	365	L	L								
19								L	L	L	390	L	L	L	L	L								
20								L	L	L	L	380	340	L	L	L	L							
21								L	L	L	L	L	L	L	L	L	L							
22								L	L	L	L	L	L	L	L	L	L							
23								L	L	L	L	L	L	L	L	L	L							
24								L	L	L	L	L	L	L	L	L	L							
25								L	L	L	A	A	A	A	A	A								
26								L	L	L	L	L	L	L	L	L	L							
27								L	L	L	L	L	L	L	L	L	L							
28								L	L	L	L	L	L	L	L	L	L							
29								L	L	L	L	L	L	L	L	L	A							
30								L	L	L	L	L	L	L	L	L								
31								L	L	L	L	U350L	L	L	L	L								
Count									7	7	10	12	9	9	9	3								
Median									390L	390	355	360	365	345	350									
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

M(3000)F1

K8

IONOSPHERIC DATA

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

135° E Mean Time (G. M. T. +9h)

km

h'F2

Sep. 1967

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								235	260	310	300	350	330	305	320	305	300	275						
2								275	290	355	325	315	375	315	305	285	300	300	275					
3								270	285	280	330	325	330	330	330	310	305	280						
4							255	230	265	285	280	335	315	310	335	310	300	275						
5								275	250	265	260	260	310	290	310	325	280	260						
6							240	250	260	250	260	295	310	I310C	320	310	C	C	250					
7								230	260	250	260	300	300	310	310	295	270							
8								240	250	250	270	310	325	300	315	285	270	260						
9								250	260	250	285	320	300	290	310	275								
10								250	250	260	250	310	305	300	290	275								
11									260	275	260	330	305	280	280	270	260							
12									255	275	265	270	290	295	305	300	275	265	255					
13									250	250	295	295	275	315	310	300	295	280						
14									235	255	275	280	300	295	305	280	270	255	240					
15								250	260	250	260III	275	295	295	275	290	260							
16									240	250	260	325	275	305	290	260	250	250						
17								240	240		300	270	290	280	290	285	255							
18									230	245	240	255	275H	290	290	280								
19								230	250	250	285	285	270	275	280			255	B275A					
20								235	260	235	275	280	320	275	260	280	270							
21								285	320	290	280	300	310	305	285	250	260							
22									255	260	240	310	275	265	275	260	260							
23								250	245	250	255	260	290	295	265	260	260							
24								245	240	250	260	275	275	275	280	260	250							
25									235	250	260	I270A	260	315	275	265								
26								250	255	250	250	265	285	275	285	270	255							
27									250	240	250	250	285	275	290	295	260							
28								250	255	240	240	255	250H	255	300	250								
29								250	250	275	265	260	275	275	260		245							
30											300	310	275	260	260									
31																								
Count							2	20	29	28	30	30	30	30	30	27	22	11	5					
Median							250	250	255	250	260	290	290	295	290	280	265	265	250					
U. Q.																								
L. Q.																								
G. R.																								

The Radio Research Laboratories, Japan

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

h'F2

K 9

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

135° E Mean Time (G.M.T. +9h)

Km

h'F

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	345	325	310	270	250	260	230	225	255	A	205	195H	205	225	240	240	240	250	250	235	250	295	325	A
2	360	425	375	310	280	305	255	255	A	A	A	A	A	255	A	A	265	A	A	250	230	270	305	305
3	265	280	270	310	330	300	240	A	A	A	215	215	200H	225	210	225	260	255	265	250	235	250	250	325
4	340	315	300	310	310	290	240	230	230	210	255	290	215	225	215	220	230H	255	260	240	215	275	290	350
5	350	305	255	220	325	290	250	240	225	220	210	205	225	215H	210H	230	255	255	265	240	235	300	270	255
6	265	305	290	260	260	280	215	230	215	200H	200	190H	180	I200C	220	240	C	C	A	250	240	225	245	250
7	265	265	265	245	260	275	235	A	230	220	205	195	200	215	230	230	230	250	235	245	275	290	300	290
8	285	260	305	300	320	285	250	240	230	210	205	205H	190	215	220	225	230	245	230	230	235	280	325	310
9	310	285	250	260	255	265	250	220	225	200	180H	A	230	225	220	230	250	250	240	250	250	280	300	295
10	275	280	250	225	250	290	250	230	230	200	205	200H	185	230	240	230	245	250	245	230	220	I300A	310	290
11	295	290	260	250	250	250	230	225	210	220	A	215	205H	190	225	220	245	255	240	230	215	295	305	280
12	260	255	265	270	275	295	230	225	220	215	220	210	215	195	250	240	255	A	A	235	230	240	260	260
13	295	315	260	230	260	275	230	235	220	200	210	A	A	210H	250	240	A	A	245	210	250	275	295	310
14	260	250	255	340	275	310	225	225	220	A	A	240	235	A	A	A	A	A	A	270	295	300	285	290
15	290	300	270	215	230	305	260	A	225	210	205	195H	205	195H	210	240	A	245	240	240	250	280	290	295
16	290	300	300	260	250	250	230	230	220	205	195	180H	190H	220	220	225	A	A	240	240	240	260	300	305
17	300	290	260	255	290	290	240	225	210	205H	195	200	205	225	220	225	250	240	240	220	240	270	290	270
18	260	255	E240E	E255E	290	280	220	240	225	225	205	200	200	215	240	250	255	260	240	215	225	245	285	290
19	300	300	280	E260E	275	255	230	230	220	225	215	200H	240	230	250	270	270	A	A	230	250	255	280	285
20	325	315	295	240	255	300	250	230	220	220	210	200	230	210	225	225	245	250	235	250	250	350A	325	260
21	275	270	350	260	275	280	265	250	240	245	230	220	215	220	240	235	230	250	260	260	300	290	310	260
22	270	260	255	365	280	305	255	250	230	235	225	210	230	210	225	210H	250	245	225	235	310	300	285	275
23	275	265	235	220	245	305	230	230	225	210	210	215	210	210	205	220H	235	235	230	240	240	275	295	260
24	275	260	225	205	240	260	230	230	220	225	230	210	210	220	205H	230	240	235	225	A	A	295	330	270
25	260	295	295	E250E	E240E	245	225	225	235	240	I220A	A	A	A	I240A	260	240	240	240	240	260	265	305	305
26	270	295	255	285	260	250	230	230	230	230	225	225	210	210	230	240	235	240	225	240	240	260	295	270
27	275	270	275	255	255	260	230	230	230	210	210	205	195	200H	235	240H	240	250	225	225	230	230	295	280
28	320	300	260	255	270	230	230	230	225H	205	205	200	205	200	210	205	250	255	240	230	210	310	330	270
29	260	240	300	255	305	320	245	240	240	235	225	225	225	225	230	235	A	250	255	275	280	250	240	270
30	265	325	330	300	265	295	255	260	230H	240	225	220	230	225	240	250	250	240	240	250	250	E340A	275	305
31																								
Count	30	30	30	30	30	30	30	27	28	26	27	26	27	28	27	28	24	23	25	29	29	30	30	29
Median	275	290	270	260	260	280	230	230	225	220	210	205	210	215	225	230	250	250	240	240	240	280	295	285
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan
K 10

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

h'F

IONOSPHERIC DATA

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

1 35° E Mean Time (G.M.T. +9h)

km f'Es

Sep. 1967

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

The Radio Research Laboratories, Japan

K 11

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

f'Es

IONOSPHERIC DATA

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

135° E Mean Time (G.M.T. +9h)

Types of Es

Sep. 1967

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	f3	f3	f3	f2	l3	l2h	c	e3	l3	l2	l	l2	l	l2	l	hl2	l2	l3	f4	f2	f2f2	f3	f4	
2	f4	f4	f3	f3	f2	l	h	e2	e3	e2	e2	c	c	c2	c2	c2	l3	l5	l3	f2	f5	f2	f		
3	f	f	f	f	ff	l	h	e3	e2	l2	l	l	l	l	l	h	h	l4	l4	f2	f4	f3	f2	f3	
4	f2	f2	f	f	f	l2	l2	l2	l2	l2	l2	l2	l	l	l	h	h	l	l	f2	f2	f2	f3	f3	
5	f3	f2	f2	f	f2	l4	l3	l3	hl2	h	h	hl	hl	l	l	hl	hl2	c	l2	f	f3	f4	f4	f4	
6	f3	f2	f2	f	h	h	l2	l	l	l	l	l	l	l	h	h	h	l3	f3	f	f	f	f		
7	f	f	f	f	h	h2	e3	e2	e2	e1	e1	hl	hl	hl	hl	c2	l	l	l2	f3	f3	f5	f3	f2	
8	f2	f	f	f	f	l	h2	e2	l2	l2	l	l	l	l	l	c	c	l	l	f	f	f2	f5	f2	
9	f2	f2	f	f	f	l2	l2	e2	l2	l	l2	l3	l	l	hl	l	hl2	h3	l2	f2	f	f2	f4	f	
10	f2	f	f	f	f	h	h	h	l2	h	h	h	l	l	l	l	h3	h2	l2	f	f4	f3	f2	f2	
11		f2	f2	f	f2	l	l3	h2	l2	h	c	l2	l	l	h	h	h2	c4	l6	f4	f3	f	f3	f	
12					f2	l5	l3	h2	lh	h	c	c	l2	l	l2	l3	l4	l6	l4	f	f	f	f	f	
13	f2	f2	f2	f2	f2	l	h2	l	l	l2	l2	l3	l2	l	l2	l3	l4	l6	l4	f	f	f	f	f	
14	f	f	f	f		l2	h2	lb2	h2	h2	e2	c	hl	h3	h2	c3	l3	l3	f3	f3	f3	f2	f5	f	
15	f	f	f	f		l2	l	e3	e2	c	e1	e1	c	l	hl	c3	c3	l3	l3	f4	f3	f2	f3	f2	
16	f2	f4	f3	f2	f3	l	h	h	h	h	c	c	c	l	l	l3	l3	l3	l3	f4	f4	f2	f2	f	
17	f	f2				l2	l2	l2	l	hl	hl2	l	h	h	l	h3	l3	l5	f6	f4	f2	f2	f	f2	
18	f			f			h2	h2	h	h	c		h	h	h2	h2	h3	l4	f	f2	f2	f			
19					f		h2	h	e2	c	c	c	h	h	h2	h2	h4	l	f6	f2	f2	f2	f2	f2	
20						h	h	c	c	c	c	c	l	l	h	h	c	l3	f6	f4	f5	f	f	f	
21	f	f2	f2	f	f	c	c	c	c	c2	c	c	l	l2	l2	l2	l3	l2	f	f2	f2	f2	f	f	
22	f4	f2	f2	f4	f2	h	h2	h	h2	e2	c	l	c	l	l	l	l2	l6	f3	f2	f2				
23					f	h	h	h2	h	c			l	l	l2	h	l	l2	l3	f2	f2	f3	f2	f2	
24						h	h	h2	h	h	c2	c	l2	h	h	l	h	l2	f5	f3	f2	f2	f5	f2	
25	f				f		hl	hl	h2	c	e2	c	e2	e2	c2	c2	h	l2	f3	f3	f2	f2	f5	f4	
26	f2	f3	f2	f3	f2	l2	l	h1	l2	l	l2	l	l2	l	l2	l2	c	l2	l	f3	f3	f	f2	f3	
27	f2	f				h2	h	h	l	l	l	l	l	l	hl	h	h	h				f3			
28	f					hl	hl	hl	l	l	l	l	l	l	l	hl	hl	l2	l	f	f	f2	f2	f2	
29						l	h	c	e2	c	c	l	h	h2	h2	h	h2	h2	l6	f4	f3	f	f	f	
30						h2	h	h	c	l	l	l	h2	h2	h2	h2	h2	c2	l5	f2	f4	f	f	f3	
31																									
Count																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

The Radio Research Laboratories, Japan

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

Types of Es

K 12

IONOSPHERIC DATA

Kokubunji Tokyo

Lat. 35° 42.4'N
Long. 139° 29.3'E

km **f_oF₂** 1 3 5° E Mean Time (G. M. T. +9h)

Sep. 1967

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	415	U395R	400	340	330	335	285	290	305	335	335	380	370	355	360	350	335	U325S	315	300	350	380	370	A
2	450	440	420F	355	365	365	305	330	325	375	365	380	395R	345	335	330	335	335	325R	300S	280	420	405	400
3	390	370	360	400	400	360	300	270	305	A	350	355	350	355	345	340	330	325	325	320R	330	330	350	400
4	400	375	385	400	390	355	290	260	300	325	305	355	335	335	345	345	320	325	330	315	280R	345	370	375F
5	420F	385F	325	310	390	350	315	265S	305	315V	300	310	345	360	350	345	330	310	325	300	310	370	335	325
6	345	385	360	345	335	355	U300R	285S	310S	280	295	355	340	I360C	350	340	C	C	315	305	310	325	360	345
7	350	350	345	340	345	345	285	295S	295	280	345	315	330	350S	350	335	315	315S	305	300	320	330	370	375
8	365	335	380	395	410	395S	305	J290R	300	290	335	355	365	355	365	335	320	300	305	300	355	350	375	410
9	410	360	310	350	340	360	295	280S	325	280	325S	335	320	J330R	345	320	305	290	290	315	340	340	400	380
10	380	370	315	300	360	370	300	280	280	300	350V	350	350	325	340	325	320	310	300	290	300	405	390	380
11	390	380	350	335	330	305	260	285	290	295	315	U355R	340	320	320	315	320	315	300	295	315	390	390	370
12	330	345	350	355	340	355	275	260	300	305	295	310	335	340	345	U345R	315	310	305	290	325	340	J340R	340
13	380	405Z	350	335	345	340	285	280	U285R	275	330	330	340	365	340	350	330	340	290	270	445	370	415	380
14	350	340	380	435	370	400	275S	265	310	U310R	315	340	J345R	335	345	310	305	295	295	320	375	375S	375	390
15	385	395	345	290	390	385	295	320	325	290	320	320	315	340	300	310	295	300	285	275	315	355	375	390
16	370	380	375	350	340	320	250	245	260	300	310	350	300	340	340	320	315	290	275	290	360	365	380	380
17	375	375	345	380	380	360	260	265	290	345H	320	310	320	315	340	315	300	280	300	290	315	365	390	355
18	345	315	305	350	390	350	250	J255R	250	275	305	340	365H	555	325	320	320S	310	285	285	310	345	395	385
19	385	390	375	360	370	335	275R	270S	300	300	315	330	335	320	335	325	330	305	305R	295	325	350	380	370
20	425	405	390	325	360	375F	290	275	295	280	310	335	360	325	350	345	310	305	300R	U340R	385R	350	365	365
21	400	340	450	340	385	345	315	325	345	335	305	340	375	350	350	325	320	315	335	345	395	405	355	355
22	335	375	350	385	400	400	305	285	335	330	290	355	325	300	315	310	305	280	275	305	420	395	375	355
23	365	345	340	340	F	395F	300R	290	290	290	290	J325R	335	335	335	320	310	285	280	300S	340	350	350	350
24	360	345	295	340	340	350	280	280	295	280	320	325	330	335	330	305	290	290	295	A	A	365	375	350
25	350	405	380	330	335	330	275S	280	265	300	315	J325R	325	330	345	330	315	300	J285R	285	345	335	375	370
26	350	350R	350	355	355	340	285R	295	305	285	300	340	350	325	355	310	315	290	290	330	340	345	370	355
27	365	365	370	350	345	335	265	280	J280R	285	280	320	335R	335	345	320	310	305	290	290	350	395	365	375
28	405	400	355	355	380	350	280S	295S	290	280	315	310	340	340	350	350	340	305	300	295	350	420	425	355
29	350	310	400	340	450	410	350	305R	300	345	315	325	325	330	310	305	300	300	340	335	340	360R	400	345
30	360	410	445	400	350	395	310	335R	J340V	305	350	340	330	330	300	300	300	270	275	315	360	I390C	345	400
31																								
Count	30	30	30	30	29	30	30	30	30	29	30	30	30	30	30	30	29	29	30	29	29	30	30	29
Median	370	375	360	350	360	355	290	280	300	300	315	340	340	340	345	325	315	305	300	300	340	365	375	370
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

f_oF₂

K13

Lat. 35° 42.4'N
Long. 139° 29.3'E

Kokubunji Tokyo

IONOSPHERIC DATA

km 1 35° E Mean Time (G.M.T. +9h)

ypF2

Sep. 1967

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	080	1075R	100	100	080	075	070	135	080	090	105	095	080	085	090	080	085	1070S	075	080	095	085	085	A
2	105	105	095F	075	080	075	090	065	075	115	095	030	080R	075	095	070	080	085	075R	055S	070	100	095	090
3	100	080	075	095	095	085	070	085	075	A	075	075	065	065	070	060	065	070	060	070R	055	065	085	090
4	085	100	085	095	060	075	060	060	065	065	095	065	065	065	070	065	050	065	075	065	065R	095	080	075F
5	060F	070F	075	085	070	075	075	070S	050	140V	075	105	085	080	080	075	065	075	060	075	065	075	090	075
6	080	075	075	090	065	075	1080R	070S	065S	085	100	080	090	1095C	075	075	C	C	075	070	065	075	075	075
7	075	075	085	075	085	080	065	070S	055	060	095	085	095	070S	070	080	075	065S	065	090	075	085	065	070
8	060	075	075	075	085	095Z	090	1060R	075	095	135	085	075	095	075	085	070	075	085	075	085	080	080	090
9	090	095	065	075	085	085	065	065S	065	095	070S	065	080	1070R	060	080	095	065	070	085	085	060	090	075
10	090	100	075	100	090	080	070	070	070	050	100V	100	065	075	070	075	080	090	060	060	100	095	100	070
11	065	075	060	075	070	085	060	085	060	060	100	1065R	070	100	085	075	085	075	085	070	075	095	075	070
12	070	060	095	080	090	085	075	075	050	075	070	105	065	070	080	1070R	090	075	070	060	070	070	1080R	065
13	085	080Z	090	075	075	085	075	075	1065R	075	090	070	105	070	070	065	075	080	070	070	060	080	085	105
14	085	065	100	090	085	095	070S	055	090	1075R	080	070	1075R	070	080	090	070	075	075	075	085	075S	075S	080
15	080	080	080	065	105	090	070	060	060	065	080	075	085	070	095	080	055	065	075	075	090	100	110	100
16	080	070	080	100	070	090	070	045	085	095	085	065	100	100	080	080	065	060	080	060	130	100	095	075
17	080	080	095	070	085	095	055	055	050	105H	075	090	085	100	100	080	095	060	090	060	090	080	080	090
18	060	080	090	095	095	100	065	1065R	050	065	060	095	060H	050	065	065	075S	065	060	060	085	095	095	095
19	075	090	085	090	085	065	065R	060S	070	075	080	070	090	080	065	065	065	070	070R	070	060	090	075	080
20	075	080	065	080	080	080F	070	065	060	080	100	090	090	090	085	085	075	080	075R	1080R	1080R	085R	080	065
21	095	090	100	090	115	080	080	075	065	095	070	120	100	095	100	085	070	075	090	090	085	090	070	095
22	090	090	100	085	115	075	090	065	095	070	085	090	075	080	070	070	075	065	060	085	105	085	100	085
23	080	090	075	090	F	090F	080R	070	055	085	075	1075R	065	090	080	090	080	065	065	080S	075	095	090	080
24	095	090	085	090	085	095	065	060	075	070	075	080	080	080	085	090	080	080	055	A	A	065	075	075
25	090	090	095	070	075	070	070S	065	055	070	080	1075R	080	070	075	070	075	065	1075R	060	090	035	085	080
26	075	085R	095	095	095	085	065R	055	055	070	080	065	080	095	080	085	065	075	080	070	065	065	075	080
27	070	075	080	090	095	085	080	070	1060R	090	070	070	070R	070	065	080	080	070	060	080	095	105	080	070
28	080	080	090	080	100	095	075S	055S	065	070	080	095	100	100	100	070	075	095	070	085	110	090	075	100
29	100	080	090	060	115	100	100	065R	100	080	085	110	100	085	075	075	075	070	095	065	065	085R	100	095
30	105	080	090	100	090	100	065	085R	1070V	095	095	060	115	070	095	095	070	080	070	085	100	1065C	090	095
31																								
Count	30	30	30	30	29	30	30	30	30	29	30	30	30	30	30	30	29	29	30	29	29	30	30	29
Median	080	080	085	090	085	085	070	065	065	075	080	080	080	080	080	080	075	070	070	070	085	085	080	080
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

ypF2

K14

IONOSPHERIC DATA

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

0.1Mc **135° E Mean Time** (G.M.T. +9h)

foF2

Sep. 1967

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	080	U073S	070S	065	064.S	060	U073S	085H	081	088	088	093	112	120	1168S	114	112	110	117	114.S	1076S	061S	066S	064.S
2	J056S	I058S	F	060F	055	046	062	077S	080	083	088	101	111	125	128	117	110	112	118	114	069	061	061S	J063S
3	066S	065S	069S	060S	061	066S	069	082	087	092S	103	110	117	114	103	099S	097	102	099	107	I103S	072S	064	064.S
4	062S	J063S	I070S	066S	061	063	I073S	081	078	086	079	084	090	096	092	092S	092	I099C	105	099	081	068S	066	065S
5	056	J059S	063	050	I045C	I044C	U056S	082S	087	075H	085	086	091	098	I105C	111	110	099S	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	084	098	I06R	I08	I11R	110	109	U106R	I04	J085S	078S	I075S	S
7	S	U070S	068S	062	051S	047	057	J096S	092S	083	083	092	100	108	114	116	114	109	I113R	114	090S	J075S	072S	068S
8	063S	063S	054	051	053S	055S	U070S	097S	090	092	089	103	116	130	143	147S	I139S	133S	118	J101S	I092S	085S	070S	064
9	062S	063S	062	056	050	045	J062S	086	077	085V	087	103	110	107	103	115	114	108	104	U088S	081	075S	073S	070S
10	068S	066	068S	064	048	047	J053S	094.S	085	087	082	086	108	122	118	112	104	097S	102S	095S	078S	063S	064.S	065S
11	J064.S	064	068S	063S	061	056	055S	U072S	094.S	083	091	108	121	121	120S	121	C	C	122	116	093S	086S	082S	087S
12	I092S	080S	061S	061	060	059S	068S	I077S	083	090S	085	089	090	095S	103	107	117S	122	U123S	111	U089S	070S	J062S	059S
13	059S	059S	061	I065S	052S	045S	060S	080	090	088	086	096S	100	111	115	117	120	123	132	J096S	073S	I071S	067S	067S
14	U068S	U069S	056	048	054	049	060	U071S	089	096S	092S	104	111	118	117	121	125	114	115	098S	071S	068S	I074S	077S
15	S	S	068S	S	036H	038	051	085	I092S	094.S	106	108	116	122	132	126	115	113	117	I02S	057	J052S	052S	J053S
16	054.S	J054.S	051	050S	049S	043	055S	090S	J094.S	095S	081	096	105	117	119	125	129	125S	123	J101S	072S	059S	057	056
17	056	056	055	050	048	048	056	090S	095S	092S	111	132	134	138	134	136	136	133	131	121	106S	084.S	080	U081S
18	080	I076S	U073S	057	051	054	I073S	088	087	082	086	102S	114	124	119	111	112	123	125	J099S	078	060S	055	053S
19	052	052S	049	048	045	045	057	091S	U094.S	097	096	100	120	119	120	C	C	C	C	C	C	C	C	C
20	050	051	052	053	047	051F	058	J090S	093S	096S	097	J100R	U131R	145	137S	125	130S	J137S	U137S	113	U094.S	U093S	088S	I077S
21	U072S	U070S	057	061S	062	058S	058	U071S	086	112	105	110	136S	152S	156S	143	125	112	I07S	U090S	066S	J061S	064.S	066S
22	061S	051	051S	047	045	045S	054S	087S	094.S	104	107	102	132	122	C	C	106	I116C	107	069	056S	059	062S	065S
23	065S	053S	049	043	036	037	048	I094.S	106	098	099	108	117S	124	128	135S	147S	U147S	134.S	U115S	S	S	I086S	I083S
24	I075S	064	065	052	039	032	042	084	106	098	095	114	125	132	122	123	130R	126	114	U083C	I066S	U068C	067S	066S
25	063S	058S	055	052	051	U047C	057S	081	094.S	096	103	116	110	114	118	119	120	128	123	J097S	I078S	070S	067	063
26	J064.S	061S	060	055	053	052	058	084	106	099	100C	114	120C	124	125	123	117C	118C	112	I097S	I077S	067	064	061S
27	060	059S	056	057	056	052	058S	084	099S	103	088	100	108	117	114C	114C	119C	131C	115C	091C	U070S	068C	068C	070S
28	U070S	065C	067S	066C	051C	048C	054C	089C	121C	115	094	094	105	114	116	119	127	123	125	106	092S	087S	I081S	082
29	079S	065	055S	054	047	049	055S	100S	105	109	123	126	130	123	126	124	100	J101S	098	103	076	063	065	058
30	056	053	051	051S	055	049	059	J075S	085	106	102	101	106	115	112	104	104	112	J100S	078	063	062	070	068S
31																								
Count	27	28	28	28	29	29	29	29	29	29	29	30	30	30	29	28	28	28	28	28	27	27	28	27
Median	063S	063S	060	056	051	048	058S	085S	092	094	092	102	112	120	118	118	116	115	116	101	078S	068S	067S	065S
U. Q.	070	066	068	052	056	054	062	090	094	098	102	108	120	124	127	124	126	126	123	112	090	075	074	070
L. Q.	056	057	054	050	047	045	055	080	086	086	086	094	105	114	113	112	110	109	106	096	070	061	064	063
Q. R.	014	019	014	012	009	009	007	010	008	012	016	014	015	010	014	012	016	017	017	016	020	014	010	007

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

foF2

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

0.01Mc **foF1** 135° E Mean Time (G. M. T. +9h)

foF1

Sep. 1937

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	LH	A	L	L	L	590L	560	510	A	A	A					
2								L	L	L	L	U600L	A	A	550L	550H	L	L	L	L					
3								A	A	U600L	L	LH	U580H	U590H	U550L	L	510L	L	A	A					
4								L	L	510L	LH	LH	570	560L	L	550L	510L	C	L	L					
5								L	L	L	A	LH	LH	550H	I540C	520	480L	L	C	C					
6								C	C	C	C	630H	550L	550L	L	490L	LH	A	A	A					
7								L	L	L	470	LH	L	550L	580L	530	L	LH	L	L					
8								L	L	L	480L	LH	570L	LH	510	U550H	LH	L	L	L					
9								L	L	L	LH	LH	540	530	L	LH	560L	L	L	L					
10								L	L	L	480	LH	L	520H	540L	LH	LH	L	L	L					
11								L	L	A	530L	LH	510H	560H	520L	LH	C	C	C						
12								L	L	L	470L	L	540L	LH	570H	LH	500H	490H	440H	L					
13								L	L	L	L	580H	LH	570L	LH	450	500L	L	L	L					
14								L	L	L	L	LH	L	L	LH	520	LH	LH	L	L					
15								L	L	L	L	LH	LH	LH	LH	LH	LH	460L	A	A					
16								L	L	L	L	580L	LH	550H	540H	520H	490	L	A	A					
17								L	L	LH	LH	LH	LH	570L	510	510	490L	L	L	L					
18								L	L	L	U500L	580H	530L	U550L	U570H	L	L	L	L						
19								L	L	L	L	480L	LH	580H	LH	LH	C	C	C	C					
20								L	L	L	L	L	640L	U530L	570L	LH	LH	L	L	L					
21								L	L	L	L	L	LH	LH	U540L	L	LH	L	L	L					
22								L	L	L	L	LH	570H	500	C	C	LH	C	C						
23								L	L	L	L	L	LH	LH	L	LH	LH	L	L	L					
24								L	L	L	L	LH	580H	500L	LH	LH	L	L	L	L					
25								L	L	L	L	510H	LH	A	L	LH	L	L	L	L					
26								L	L	L	L	L	U530L	LH	LH	L	L	L	A	A					
27								L	LH	LH	LH	LH	LH	LH	L	L	L	L	L	L					
28								L	L	L	LH	LH	LH	L	LH	LH	L	L	L	L					
29								L	L	L	L	L	L	L	550	L	L	L	L	L					
30								L	L	L	LH	LH	LH	LH	L	L	L	L	L	L					
31																									
Count								6	4	10	13	16	15	10	8	1									
Median							480L	520L	580H	550	560L	540	520	490	440H										
U. Q.																									
L. Q.																									
Q. R.																									

foF1

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

The Radio Research Laboratories, Japan

Y2

IONOSPHERIC DATA

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

Sep. 1967

foE

0.01Mc 1.35° E Mean Time (G.M.T. +9h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	220	270	A	A	A	A	A	A	A	A	A	B					
2							S	250	300	330	355	370	375	380	375	350	320	270	S					
3							S	220	1275A	A	A	1370A	A	A	A	A	A	A	B					
4							S	1235A	A	A	A	1370A	A	A	A	A	A	A	C					
5							B	235	295	335	1355A	1375A	380	385	1370C	360	325	280	C					
6							C	C	C	C	C	A	A	A	A	A	330	270	160					
7							S	245	295	320	340	355	360	360	360	1340A	1300A	A	B					
8							B	230H	280H	310H	1345A	365R	1375A	380R	1360A	350	310	260	190					
9							B	240H	1285A	1320A	1345A	370	390R	390	375	350	320	280	A					
10							B	235	290	320	350	1360A	370R	380	370	340	310	265	200					
11							S	230H	280	320	340	1355A	370	360	360	345	C	C	A					
12							S	255H	295	325	345	350	350	1350A	350	345	315	265	175					
13							B	210	1280A	A	A	A	A	365	A	340	310	260	A					
14							B	235H	290	320	330	350	360	1370R	360	345	310	260H	A					
15							S	220	280	320	335	350	360	360	350H	335	310	260	B					
16							S	210	285	310	315	A	A	A	360	340	300	250	A					
17							B	A	A	A	335	350	350	350	340	335	300	255	S					
18							B	220	280	310	340	340	350	350	360	335	300	250	B					
19							S	220	295	345	345	350	360	360	350	C	C	C	C					
20							S	A	A	A	A	A	A	A	370	360	335	1300R	A	A				
21							B	225	290	325H	345	350	370H	370	A	340	300	250	C					
22							S	220	280	320	330	340	360	365	C	C	A	C	S					
23							S	220	285	320	340H	A	A	R	350	330	300	250H	B					
24							S	230	280	325	335	350	A	A	A	A	310	1270A	B					
25							B	245	295	325	350	370	370	A	A	A	310	A	B					
26							S	240	300	325	A	A	A	A	A	340	305C	240C	A					
27							S	230	300	325	350	360	370R	360R	1360R	345C	315C	250C	B					
28							S	A	285C	320	360	360	370	380	370R	340	300	240	S					
29							S	210H	280	1315A	335	A	A	A	355	330	295	250	C					
30							S	A	A	320	340	1355A	1370R	360	345	325	290	230H	S					
31																								
Count								25	25	23	23	22	19	21	20	22	24	21	4					
Median								230	285	320	340	355	370	365	360	340	310	260	180					
U. Q.																								
L. Q.																								
G. R.																								

foE

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

The Radio Research Laboratories, Japan

Y 3

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

IONOSPHERIC DATA

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

Sep. 1967

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	J027	J025	E015B	J021	E015B	E021	E021	E028	E028	E028	E028	E028	E028	E028	E028	E028	E028	E028	E028	E028	E028	E028	E028	E028
2	J062	J040	J039	J029	J027	J024	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020	E020
3	J025	J021	J023	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021	E021
4	J026	J024	E018B	E017	E014B	E018	E015S	E026	E034	E047	E042	E064	E040	E047	E070	E054	E052	E023	E029	E020	E015S	E014S	E015S	E015S
5	E015S	J044	J041	J035	E020	E019	E019	E030	E043	E057	E059	E041	E044	E044	E044	E031G	E034	E044	E029	E020	E015S	E014S	E015S	E015S
6	E028	E019	E019	E019	E012B	E021	E021	E028	E035	E045	E040	E045	E044	E044	E046	E046	E046	E046	E046	E046	E046	E046	E046	E046
7	J024	E020	E020	E015B	E018B	J019	J023	E032	E036	E043	E039	E030G	E063	E029G	E044	E025G	E019G	E023G	E017G	E022	E019	E015S	E015S	E022
8	J045	J030	J027	E014B	E013B	E014B	E021	E029	E035	E034	E058	E047	E042	E047	E045	E044	E039	E032	E030	E011B	E014S	E022	E041	E026
9	J033	J030	E021	J024	E020	E025	J029	J044	E032	E037	E059	E027G	E044	E044	E025G	E025G	E025G	E025G	E034	E014S	E022	E015S	E014S	E014B
10	E014S	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E014B
11	J027	E013B	E012B	E012B	E014B	E011B	E019	J030	E039	E078	E042	E052	E044	E043	E061	E024G	E026G	E031	E021	E021	E020	E015S	E015S	E024
12	J028	J029	J016	E015B	E011B	E020	E026	E026	J041	J043	J049	J048	E038	E036G	E035	E031G	E035	E034	J040	J030	E021	E020	E015S	E015S
13	J028	E017	E020	E019	E021	E020	E020	E030	E036	E045	E058	E069	E042	E041	E047	E040	E037	E029	E027	E036	E024	E024	E038	E084
14	E020	J043	J029	E021	E018	E021	E022	E027	E035	E040	E041	E044	E042	E038	E020G	E020G	E036	E043	E043	E029	E018	E028	E029	E026
15	J023	J020	J022	J021	E014B	E020	E014S	E026	E032	E037	J049	E045	E040	E036G	E036G	E032G	E042	E052	E079	E090	E032	E024	E021	E027
16	J027	J024	E020	E020	E021	E014B	J026	J051	E033	J043	G	E024G	E038	E041	E039	E041	E041	E031	E031	E042	E034	E024	E029	E024
17	E018	E016S	E015B	E015B	E011B	E011B	E017	E025	E033	E038	G	E039	E042	E037	E043	E045	E041	E035	E027	E023	E020	E025	E021	E022
18	E022	E015B	E012B	E014B	E014B	E014B	E014B	E014B	E037	E040	E041	E045	E052	E047	E060	E040	E041	E035	E027	E023	E020	E025	E021	E022
19	J031	J031	J019	E014B	E014B	E014B	E021	J027	J043	J056	J047	J058	J057	E034G	E030G	E039G	E030G	E030G	E030G	E030G	E030G	E030G	E030G	E030G
20	J031	J018	E021	E021	E021	E020	E020	E031	E040	E047	E053	E047	G	E036	E036	E036	E052	E027	E038G	E028	E022	E022	E023	E019
21	E020	J026	J018	E019	E014B	E014B	E015S	E026	E033	E037	E047	G	E028G	E032G	E036	E036	E087	E027	E038G	E028	E022	E022	E023	E019
22	E015S	E020	E015B	E015B	E013B	E013B	E019	E024	E030	E039	E040	E039	E040	E035G	E033G	E020G	G	E029	E033	E029	E023	E021	E015S	E014S
23	E021	E014B	E014B	E011B	E011B	E011B	E017	E019	E031	E038	E041	J044	J045	E045	E036	E061	E027G	E033	E016	E050	E028	E021	E053	J045
24	E015B	J018	J022	E021	E020	E020	E021	E020G	E033	E038	J053	E047	J061	J062	J051	E040	E033	E028	E017	E022	E043	E046	J026	E015B
25	E014B	E015B	E015B	E011B	E013B	E013B	E020	G	E037	E039	E040G	J051	J058G	J042G	E038	E035	E039G	E029G	E054G	E029G	E029G	E020	E021	E021
26	E014B	E014B	E014B	E020	E020	E015B	E015S	G	E031	E034	E032G	E033G	E034G	E034G	E034G	E034G	E034G	E034G	E034G	E034G	E034G	E034G	E034G	E034G
27	E014B	E015B	E015B	E014B	E011B	E015B	E020G	J025G	E033G	E035	G	E029G	E035G	E028G	E028G	E028G	E038	E028	E020	E021	E020	E015S	E019	E021
28	E015B	E015B	E015B	E014B	E014B	E014B	E014B	E014B	E036	J044	E044	E041	E043	E038	E028G	E038	E034	E033	E027	E015S	E023	E021	E030	E020
29	E015B	E014B	E014B	E014B	E014B	E014B	E014B	E014B	E034	E031G	E036	E036	E031G	E046	E040	E022G	E020G	E029	E026	E022	E020	E031	E039	J022
30	E021	E020	E014B	E014B	E014B	E014B	E014B	E014B	E035	E040	E042	J045	E042	E042	E040	E040	E034	E032	E028	E028	E028	E028	E028	E028
31																								
Count	29	29	29	29	28	28	29	29	29	29	29	30	30	30	28	28	28	26	28	28	28	28	28	28
Median	J023	J020	018	E015	E014	E014	E020	E027	E035	E040	E042	J045	E042	E042	E040	G	E034	E032	E028	J029	E023	E022	J024	J022
U. Q.	028	028	022	021	020	020	021	032	040	045	054	052	048	047	048	044	044	043	040	046	033	030	035	026
L. Q.	019	E015	E014	E012	E011	E011	E016	025	033	038	040	039	038	G	G	G	G	030	020	021	020	020	020	017
G. R.	009	D013	D008	D009		D009	D005	007	007	008	014	013	010				013	020	025	013	010	015	009	

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

foEs

The Radio Research Laboratories, Japan

Y4

IONOSPHERIC DATA

Sep. 1967

$f_b E_s$

0.1Mc 135° E Mean Time (G. M. T. +9h)

Yamagawa

Lat. 31° 12.1' N
Long. 130° 37.1' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E 021	E B 033	E B 021	E 014	E 021	B 020	B 015	G 030	G 040	G 035	G 050	G 056	G 052	G 042	G 043	G 044	G 064	G 059	G 038	G 050	G 025	G 026	G 054	G 022
2	E 024	E 019	E 021	E 015	E 021	E 020	E 021	G 037	G 032	G 036	G 044	G 039	G 044	G 042	G 045	G 050	G 042	G 043	G 030	G 044	G 040	G 022	G 018	G 018
3	E 024	E 021	E 021	E 016	E 021	E 020	E 021	G 025	G 032	G 044	G 039	G 039	E 040R	G 043	G 054	G 046	G 039	G 023	G 027	G 027	G 016	G 025	G 030	G 027
4	S 022	E 022	E 016	E 024	G 024	G 017	G 017	G 025	G 032	G 038	G 055	G 040	G 045	G 040	G 040	G 030G	G 036	G 036	G 027	G 027	G 016	G 025	G 030	G 027
5	S 022	E 022	E 016	E 024	G 024	G 017	G 017	G 025	G 032	G 038	G 055	G 040	G 045	G 040	G 040	G 030G	G 036	G 036	G 027	G 027	G 016	G 025	G 030	G 027
6	C 022	E 022	E 016	E 024	G 024	G 017	G 017	G 025	G 032	G 038	G 055	G 040	G 045	G 040	G 040	G 030G	G 036	G 036	G 027	G 027	G 016	G 025	G 030	G 027
7	E 020	E 021	E 021	E 021	B 021	B 016	B 021	G 030	G 035	G 038	G 035	G 030G	G 040	G 029G	G 039	G 024G	G 032	E 020R	E 017	E 036	E 022	E 022	E 023	E 023
8	E 017	E 025	E 021	E 021	B 021	B 016	B 021	G 030	G 035	G 038	G 035	G 030G	G 040	G 029G	G 039	G 024G	G 032	E 020R	E 017	E 036	E 022	E 022	E 023	E 016
9	E 032	E 025	E 021	E 021	B 021	B 016	B 021	G 030	G 035	G 038	G 035	G 030G	G 040	G 029G	G 039	G 024G	G 032	E 020R	E 017	E 036	E 022	E 022	E 023	E 016
10	E 021	E 019	E 012	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
11	S 028	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
12	E 021	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
13	E 018	E 025	E 014	E 021	B 021	B 016	B 021	G 030	G 035	G 038	G 035	G 030G	G 040	G 029G	G 039	G 024G	G 032	E 020R	E 017	E 036	E 022	E 022	E 023	E 023
14	E 021	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
15	E 028	E 015	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
16	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
17	E 022	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
18	E 021	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
19	E 017	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
20	E 025	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
21	E 022	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
22	E 018	E 017	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
23	S 021	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
24	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
25	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
26	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
27	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
28	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
29	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
30	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
31	E 018	E 018	E 015	E 017	E 021	E 015	E 015	G 025	G 032	G 038	G 049	G 042	G 027G	G 043	G 025G	G 025G	G 024G	G 032	G 025	G 025	G 025	G 019	G 025	G 015
Count																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

$f_b E_s$

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

The Radio Research Laboratories, Japan

Y 5

IONOSPHERIC DATA

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

0.1Mc 135° E Mean Time (G.M.T. +9h)

Sep. 1967

f-min

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	E014S	E014S	O15	O12	O15	O15	O13	O14	O15	O16	O22	O23	O22	O22	O23	O19	O15	O15	O14	E015S	E015S	E015S	E015S	E015S
2	E015S	E014S	O15	E	E	E	E015S	O12	O14	O14	O14	O16	O18	O15	O14	O14	O15	O12	E015S	E014S	E015S	E015S	E015S	E015S
3	E015S	O14S	O14	E	O14	O14	E015S	E015S	O15	O15	O17	O25	O22	O25	O23	O17	O15	O15	O14	E014S	E015S	E014S	E014S	E015S
4	E015S	O15	O18	O14	O14	E014S	E015S	O15	O16	O19	O24	O23	O22	O19	O17	O15	O15	O	O12	O12	E015S	E014S	E014S	E015S
5	E015S	O15	O15	E	O	O	O11	O13	O13	O15	O19	O17	O22	O18	O	O16	O15	O15	O	O	O	O	O	O
6	O	O	O	O	O	O	O	O	O	O	O	O25	O26	O18	O17	O15	O15	O12	O14	O15	E015S	E015S	E015S	E015S
7	O14	O14	O12	E	O12	E	E015S	O12	O12	O15	O17	O25	O25	O17	O22	O22	O16	O14	O15	O15	E015S	E015S	E015S	E015S
8	E014S	E	O14	O15	O18	E	O11	O15	O15	O15	O16	O22	O22	O22	O17	O16	O15	O12	O12	O11	E015S	E015S	E015S	E015S
9	E014S	O14	O11	O14	O13	O14	O12	O11	O14	O16	O16	O16	O25	O17	O15	O16	O17	O11	O15	O11	E014S	E014S	O11	O11
10	E014S	O11	E	E	O14	E014S	O12	O14	O13	O16	O17	O22	O17	O17	O15	O14	O13	O11	O15	E014S	E014S	E014S	O14	O14
11	E014S	O14	E	E	E	E	E015S	O11	O14	O14	O15	O19	O22	O17	O16	O17	O	O	O12	E015S	O12	E015S	E015S	O15
12	O15	O13	O12	E	O14	O11	E015S	O13	O15	O15	O18	O16	O18	O16	O16	O17	O12	O14	O14	E015S	O14	E015S	E015S	O15
13	O14	O12	O12	O15	E	O11	O12	O12	O12	O15	O17	O18	O23	O18	O17	O15	O15	O11	O11	O11	E015S	E015S	E015S	O14
14	O15	O15	E	O14	E	O14	O12	O13	O12	O15	O15	O18	O22	O23	O22	O16	O14	O15	O12	E014S	E015S	O12	E015S	E015S
15	E015S	E014S	O11	E	O14	O15	E015S	O15	O14	O14	O15	O16	O17	O16	O16	O17	O15	O15	O14	O11	E014S	O11	E015S	E012S
16	E015S	E015S	E	E	O14	E	E014S	O15	O15	O15	O19	O24	O23	O22	O23	O17	O15	O13	O14	E014S	E014S	E015S	E015S	E014S
17	E014S	O11	E	E	O15	O14	O11	E015S	O15	O16	O22	O17	O16	O28	O22	O17	O15	O14	E015S	E014S	E015S	E015S	O11	O11
18	E014S	E016S	O15	O15	O11	E	O12	O15	O11	O12	O15	O17	O22	O18	O18	O18	O15	O12	O15	O12	O11	E015S	E015S	E015S
19	E015S	O15	O12	O14	E	E	E015S	O15	O14	O24	O18	O18	O15	O25	O22	O	O	O	O	O	O	O	O	O
20	O11	O15	O11	O14	E	O14	E015S	O12	O15	O15	O15	O18	O27	O24	O23	O17	O15	O11	O14	O11	E015S	E015S	E015S	E015S
21	O12	O15	O11	E	E	O14	O12	O15	O15	O17	O22	O24	O25	O25	O23	O22	O17	O15	E0380	E014S	E015S	E014S	E014S	E015S
22	E017S	E015S	O15	O14	O14	O14	E015S	O15	O13	O17	O17	O23	O23	O19	O	O	O15	O	E015S	E015S	O12	E015S	E015S	E015S
23	E015S	E015S	O15	E	E	O13	E013S	E014S	O13	O17	O23	O17	O22	O22	O18	O16	O15	O14	O14	E014S	E015S	E015S	E015S	E014S
24	E015S	O14	E	O11	E	E	E014S	O12	O13	O15	O18	O22	O23	O25	O22	O18	O15	O15	O14	O15	O12	E015S	E015S	O12
25	O15	E	E	E	E	E	E	O12	O14	O17	O18	O25	O27	O25	O23	O23	O17	O15	O14	O11	E015S	E014S	E015S	O15
26	O14	O15	O15	O11	O13	E	E014S	E014S	O15	O17	O170	O18	O240	O230	O25	O23	O170	O140	O15	O14	E015S	E015S	O14	E015S
27	O14	O14	O14	E	E	O15	E015S	O14	O15	O15	O18	O26	O25	O25	O24	O180	O150	O140	O130	O140	O150	O150	O150	O160
28	O140	O150	E	O140	O110	O150	O120	O140	O16	O22	O22	O22	O24	O22	O18	O17	O14	O11	E014S	E014S	E015S	E015S	E015S	E015S
29	E015S	O15	E	O14	O14	O14	E015S	E015S	O14	O16	O15	O23	O23	O24	O22	O17	O15	O12	E0160	E015S	E015S	E015S	E015S	E015S
30	E015S	E014S	O14	E	E	E	E013S	O13	O14	O15	O16	O23	O23	O22	O18	O16	O14	O14	E014S	E014S	E015S	E014S	E014S	E015S
31																								
Count	29	29	29	29	28	28	29	29	29	29	29	30	30	30	28	28	28	26	28	28	28	28	28	28
Median	E015S	O14	O12	E	O12	O12	E014S	O14	O14	O15	O17	O22	O22	O22	O20	O17	O15	O14	O14	E014S	E015S	E015S	E015S	E015S
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

f-min

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

IONOSPHERIC DATA

M(3000)F2 0.01 1 35° E Mean Time (G.M.T. +9h)

Sep. 1967

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	U260S	270S	280	280S	300	U305S	355H	315	305	285	260	275	285	I285S	285	285	290	290	325S	I295S	250S	265S	265S
2	J250S	I265S	F	285F	275	260	295	325S	315	300	280	270	270	290	295	300	290	285	305	325	290	240	255S	J255S
3	260S	260S	290S	250S	260	290S	320	330	315	285S	280	280	280	285	270	285S	295	305	305	310	I325S	305S	265	265S
4	260S	J270S	I280S	275S	265	285	I330S	340	320	305	290	290	290	295	290	290S	295	I295C	305	325	310	295S	285	290S
5	270	J270S	305	300	I290C	I280C	U305S	355S	360	340H	315	290	285	285	I290C	290	300	300S	C	C	C	C	C	C
6	G	G	G	G	G	G	G	G	G	G	G	G	285	280	275R	275	285R	285	300	U300R	315	J320S	285S	I275S
7	S	U275S	295S	320	310S	285	310	J340S	345S	335	300	285	290	280	290	290	300	295	1300R	315	320S	J270S	280S	275S
8	285S	275S	270	265	255S	275S	U305S	350S	335	325	295	270	275	285	280	285S	I295S	295S	315	J295S	I300S	280S	275S	265
9	260S	275S	305	285	280	280	J315S	360	330	310V	300	290	300	290	280	290	300	305	315	U295S	290	255S	275S	265S
10	275S	275	295S	315	275	280	J285S	340S	340	325	305	280	280	290	295	290	300	300S	315S	305S	310S	255S	265S	270S
11	J265S	270	295S	295S	310	305	310S	U320S	340S	325	295	290	300	295	295S	290	C	C	310	320	315S	260S	260S	275S
12	I310S	325S	290S	295	290	295S	335S	I330S	345	335S	325	310	295	280S	285	285	295S	305	U315S	310	U320S	295S	J290S	275S
13	280S	270S	290	I315S	315S	290S	305S	340	335	340	295	300S	280	290	285	285	290	305	320	J330S	265S	I270S	285S	260S
14	U295S	U305S	315	260	280	325	295	U345S	325	320S	295S	290	290	290	300	300	310	315	320	325S	280S	270S	I255S	275S
15	S	S	295S	S	290H	265	305	340	I330S	310S	305	290	285	295	305	310	310	310	325	345S	315	J250S	260S	J265S
16	270S	J280S	280	290S	305S	325	310S	345S	J350S	340S	310	280	275	285	285	295	305	320S	330	J340S	290S	270S	265	270
17	270	270	295	280	275	285	295	335S	340S	285S	280	295	300	290	295	300	305	315	320	305	300S	265S	275	U285S
18	290	I290S	U300S	285	275	295	I325S	350	355	345	295	285S	290	300	295	295	300	315	330	J325S	315	285S	270	275S
19	265	285S	280	300	280	295	305	350S	U340S	345	320	290	295	290	290	C	C	C	C	C	C	C	C	C
20	260	260	285	320	275	240F	295	J350S	335S	325S	300	J275R	U285R	295	295S	285	295S	J305S	U305S	310	U285S	U280S	315S	I275S
21	U280S	U275S	250	275S	305	305S	310	U330S	310	320	305	275	280S	285S	280S	290	290	305	310S	U310S	275S	J255S	260S	290S
22	305S	295	285S	255	265	265S	280S	320S	330S	300	C	280	305	305	C	C	300	1320C	335	305	250S	255	275S	290S
23	300S	325S	305	300	255	255	280	I340S	340	335	320	305	300S	300	290	290S	300S	U315S	335S	U305S	S	S	I295S	I285S
24	I290S	265	295	310	320	280	275	335	350	340	305	300	300	305	295	290	305R	325	335	U325C	I290S	U285C	290S	290S
25	285S	275S	275S	310	300	U320C	325S	335	340S	335	305	315	290	290	290	285	300	310	325	J335S	I300S	280S	285	270
26	J280S	295S	285	280	285	310	300	340	330	325	310C	295	300C	290	295	300	300C	310C	325	I310S	I305S	290	290	285S
27	290	290S	275	295	305	320	305S	345	340S	350	320	300	295	295	265C	280C	300C	320C	325C	320C	U300S	270C	280C	280S
28	U280S	265C	290S	330C	305G	275C	300C	330C	340C	355	330	300	285	290	290	285	290	300	310	300	295S	245S	I255S	280
29	290S	300	265S	295	255	255	260S	330S	310	295	295	295	290	290	295	310	310	J295S	300	305	315	260	280	275
30	270	250	245	260S	300	265	290	J320S	305	315	310	285	285	290	305	305	310	320	J320S	310	280	260	270	270S
31																								
Count	27	28	28	28	29	29	29	29	29	29	28	30	30	30	29	28	28	28	28	28	27	27	28	27
Median	280S	275S	290	290	280	285	305S	340S	335	325	305	290	290	290	290	290	300	305	315	310	300S	270S	275S	275S
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

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

M(3000)F2

Y7

IONOSPHERIC DATA

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

M(3000)F1_{0.01} 135° E Mean Time (G.M.T. +9h)

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							L	L	L	LH	A	L	L	340L	340	355	A	A	A						
2								A	L	L	L	A	A	A	345L	345H	L	L	L	L					
3							A	A	U310L	L	L	335H	U340H	U340H	U345L	L	335L	L	A	A					
4							L	L	370L	LH	LH	LH	340L	340L	L	325L	345L	C	L	L					
5							L	L	L	A	LH	LH	350H	350H	U350G	345	370L	L	C	C					
6							C	C	C	C	C	320H	360L	355L	L	365L	LH	A	A	A					
7							L	L	L	380	LH	L	345L	330L	350	L	LH	L	L	L					
8							L	L	L	375L	LH	350L	LH	370	U335H	LH	L	L	L	L					
9							L	L	L	LH	LH	350	345	L	LH	320L	L	L	L	L					
10							L	L	L	390	LH	L	385H	355H	340L	LH	LH	L	L	L					
11							L	L	L	A	370L	LH	365H	330H	360L	LH	C	C	C						
12							L	L	L	380L	L	360L	LH	345H	LH	350H	340H	330H	L	L					
13							L	L	L	L	335H	LH	LH	330L	LH	375	340L	L	L	L					
14							L	L	L	L	LH	L	L	LH	350	LH	LH	L	L	L					
15							L	L	L	L	LH	LH	LH	LH	LH	LH	350L	A	A	A					
16							L	L	L	L	L	345L	LH	345H	340H	345H	350	L	A	A					
17							L	L	L	LH	LH	LH	LH	335L	355	350	345L	L	L	L					
18							L	L	L	L	U370L	345H	360L	U335L	U325H	L	L	L	L	L					
19							L	L	L	L	395L	LH	360H	LH	LH	C	C	C	C	C					
20							L	L	L	L	L	LH	330L	U355L	350L	LH	LH	L	L	L					
21							L	L	L	L	L	L	LH	LH	U335L	L	LH	L	L	L					
22							L	L	L	L	L	LH	350H	380	C	C	LH	C	L	L					
23							L	L	L	L	L	L	LH	LH	L	LH	LH	L	L	L					
24							L	L	L	L	LH	355H	390L	LH	LH	LH	L	L	L	L					
25							L	L	L	L	L	370H	LH	A	L	LH	L	L	L	L					
26							L	L	L	L	L	L	U375L	LH	LH	L	L	A	A	A					
27							L	L	LH	LH	LH	LH	LH	LH	L	L	L	L	L	L					
28							L	L	L	L	LH	LH	LH	L	LH	LH	L	L	L	L					
29							L	L	L	L	L	L	L	L	350	L	L	L	L	L					
30							L	L	L	L	LH	LH	LH	LH	L	L	L	L	L	L					
31																									
Count							6	4	9	13	16	15	10	8	1										
Median							380L	370L	350H	360	340L	345	350	345L	330H										
U. Q.																									
L. Q.																									
Q. R.																									

The Radio Research Laboratories, Japan

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

M(3000)F1

Y8

Sep. 1967

h'F2

km

135° E Mean Time (G.M.T. +9h)

Yamagawa

Lat. 31° 12.1'N
Long. 130° 37.1'E

IONOSPHERIC DATA

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							225	240	290	250	350	325	325	310	305	300	290	280						
2								250	275	300	340	340	320	300	305	300	280	255						
3							235	255	300	285	325	315	325	310	325	305	290	270						
4							240	245	280	305	330	325	325	330	325	300	29000	260						
5							240	240	245	290	340	340	330	330	320	275	280	0						
6							0	0	0	0	340	330	335	300	305	305	275	255						
7							250	240	250	300	295	315	325	310	305	280	265							
8							240	245	250	300	330	320	320	320	280	280	250							
9								250	240	300	320	300	290	315	315	275	270							
10							240	245	255	275L	305	340	295	290	295	280	270							
11								250	250	290	300	290	305	290	300	0	0							
12								240	255	255	305	300	325	300	305	300	265	250						
13								250	245	300	285	330	315	315	290	300	285							
14								255	250	260	300	305	300	290	300	275	255							
15								255	250	275	300	305	305	300	290	275	270	250						
16								240	245	240	335	300	310	305	295	285	255	250						
17								240	300	300	300	280	305	295	295	270	255							
18								230	240	250	295	305	290	290	290	280	265							
19								245	230	245	300	300	300	300	0	0	0	0						
20							230	250	245	240	355	330	280	280	300	280	265							
21								270	270	255	270	330	300	285	275	275	240							
22								250	245	U2550	325	290	265	0	0	280	0							
23								240	245	250	255	280	285	260	305	265	245							
24								225	240	280	295	270	280	270	255	265	250							
25									245	270	255	300	275	300	280	265	260							
26								250	230	245	255	265	295	300	270	260	250							
27								225	225	285	300	300	280	280	270	280	260							
28								250	225	245	275	300	300	290	305	290								
29								250	245	275	280	275	300	265	250									
30								250	250	280	270	305	300	275	275	255								
31--																								
Count							8	28	29	29	30	30	30	29	28	28	24	8						
Median							240	250	245	275	300	305	300	300	300	280	265	255						
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

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

135° E Mean Time (G. M. T. +9h)

km
f_oF

Sep. 1967

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	300	285	280	235	250	250	235	220	200H	I205A	I240A	I245A	225	230	250	A	A	A	250	230	E275A	A	295
2	350	350	330	280	280	295	270	230	I235A	245	A	A	A	A	230	230H	275	250	255	250	250	290	330	340
3	300	300	270	305	300	250	240	I245A	I235A	210	250	205H	220H	210H	230	I255A	265	A	A	250	240	E315A	300	
4	310	315	280	275	295	265	240	230	220	E245A	185H	190H	205	225	A	E265A	E250A	I235C	255	240	225	225	265	250
5	300	340	260	230	I265C	I290C	260	230	230	220	I220A	210H	220H	185H	I210C	230	245	255	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	205H	205	205H	205	245	230	225H	A	I260A	245	235	215	255	260
7	260	265	265	225	250	255	250	240	230	225	200H	200	200	205	215	240	230H	240	250	240	230	255	275	300
8	275	275	285	310	330	295	255	245	225	215	200H	200	260H	240	205H	245H	230	230	250	230	225	230	245	300
9	355	300	250	250	250	280	260	230	225	210H	210H	225	240	250	210H	250	250	245	240	235	240	245	300	295
10	295	295	260	235	250	295	270	245	225	215	200H	205	195H	AH	240	235H	225H	255	255	235	230	240	300	300
11	300	300	265	240	240	230	250	230	250	I220A	E250A	205H	195H	200H	225	210H	C	C	250	235	215	250	300	285
12	255	225	260	255	265	250	225	220	220	220	215	E250A	200H	200H	195H	195H	230H	225H	250	230	215	220	250	280
13	300	320	270	240	220	250	250	225	240	225	200H	215H	205H	240	210H	205	240	250	205	205	260	265	300	320
14	275	240	255	340	290	220	250	215	225	240	225H	250	225	215H	E250A	225H	235H	250	255	240	230	250	330	350
15	295	325	280	220	200H	300	260	240	225	225	205H	200H	220H	205H	210H	230H	225	I240A	I230A	215	200	300	325	325
16	310	290	295	260	250	240	250	240	225	215	A	210	200H	225H	205H	225H	E250A	A	A	225	200	265	295	300
17	315	300	260	250	295	280	270	240	220	200H	195H	195H	210H	225	225	240	230	240	245	230	225	230	300	280
18	270	260	250	245	285	275	250	220	225	215	200	200H	205	220	245H	255	255	260	245	225	215	240	275	310
19	315	300	290	250	250H	255	225	225	225	225	210	215H	215H	AH	210H	C	C	C	C	C	C	C	C	C
20	E355A	345	295	240	235	310	275	230	220	220	210	I240H	245	215	215	205H	210H	250	240	245	260	300	245	255
21	270	280	290	295	240	250	240	225	240	A	A	215	210H	225H	220	225	225H	245	250	245	250	295	315	280
22	250	250	250	280	300	295	285	240	235	220	U240C	220H	180H	220	C	C	245H	I235C	230	215	E345A	330	305	275
23	250	235	245	220	250	340	275	235	230	220	210	210	205H	200H	200	220H	220H	245	225	205	205	240	245	250
24	250	250	230	200	210	270	275	230	225	220	205H	200H	200	E215H	205H	E230A	225	250	230	220	250	270	270	285
25	255	290	290	250	250	230	245	220	225	220	230	200H	215H	A	250	230H	240	250	235	220	235	275	260	285
26	275	265	255	250	250	240	255	225	230	220	210	I200A	220	215H	195H	235	220	I225A	230	245	240	260	255	270
27	275	270	270	270	255	225	260	220	225	215H	205H	205H	190H	180H	245	220	240	250	225	215	220	285	265	280
28	280	295	270	230	225	255	265	230	245	225	220H	205H	195H	220	200H	195H	250	250	250	225	215	295	315	270
29	255	230	250	255	300	350	295	245	225	225	220	220	220	225	245	240	240	250	250	250	225	250	270	255
30	295	315	345	320	250	255	250	240	230	220	215H	215H	225H	AH	235	230	240	250	235	220	240	315	300	290
31																								
Count	29	29	29	29	29	29	29	29	29	28	26	29	29	25	28	28	27	24	25	28	28	28	27	28
Median	290	295	270	250	250	255	230	225	220	210H	205H	210H	210H	220	220	230	235	250	250	230	230	255	285	285
U. O.																								
L. O.																								
G. R.																								

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

f_oF

Y 10

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

IONOSPHERIC DATA

135° E Mean Time (G.M.T. +9h)

km f_oF₂

Sep. 1967

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	100	B	100	100	B	100	120	110	115	100	100	100	100	100	100	100	100	100	100	110	110	105	105
2	105	100	100	100	100	100	125	130	120	120	115	115	110	110	145	150	125	120	105	100	100	100	100	100
3	100	095	100	100	100	125	120	115	110	120	105	105	100	100	105	100	100	100	105	100	095	100	100	100
4	100	100	B	100	B	100	S	105	105	105	100	105	100	100	100	100	100	100	100	100	100	S	S	S
5	S	110	105	105	C	G	150	140	125	120	110	100	125	140	G	100	150	120	G	G	G	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	105	110	105	105	110	G	110	115	110	110	095	100	S
7	105	110	105	E	B	E	135	135	125	120	120	120	120	120	115	115	115	110	110	110	105	105	100	100
8	100	E	100	B	B	100	100	120	120	115	110	100	100	100	100	100	100	100	100	100	100	S	S	100
9	100	100	100	B	B	B	150	150	145	100	100	100	170	135	140	130	130	145	125	B	S	105	100	100
10	100	100	100	100	100	100	100	100	140	120	G	125	100	170	100	100	100	100	140	S	110	S	S	B
11	S	B	E	E	E	E	155	135	125	125	115	105	150	100	100	100	G	G	125	115	095	100	100	B
12	130	B	B	E	B	B	100	100	130	120	120	115	115	110	120	G	100	150	100	095	095	S	S	145
13	100	095	100	B	E	B	120	120	110	105	105	105	105	105	105	100	140	125	110	110	100	105	110	105
14	105	110	105	105	105	105	100	130	125	125	125	125	135	140	130	130	140	170	135	110	110	110	105	105
15	105	100	100	100	125	100	100	120	120	120	120	120	125	140	100	105	150	120	110	105	105	100	100	100
16	100	100	100	100	B	100	S	125	120	120	110	105	105	110	110	105	130	115	110	105	100	100	100	100
17	100	100	100	100	100	B	110	110	110	110	G	100	125	115	115	115	G	130	115	105	100	100	100	095
18	095	S	B	B	B	E	155	150	130	120	G	120	120	125	155	150	130	125	120	110	110	100	100	095
19	095	B	B	B	E	E	S	120	120	120	120	120	115	115	115	C	G	G	G	G	C	C	C	G
20	105	105	100	B	E	B	115	130	110	110	110	105	105	105	105	105	105	110	105	100	100	100	100	100
21	100	100	100	100	100	125	125	120	120	120	115	115	G	G	110	G	105	105	G	100	100	100	100	100
22	100	100	100	100	B	B	S	130	125	120	110	G	100	100	G	C	105	G	100	100	100	095	105	095
23	S	095	B	E	E	B	100	140	130	115	120	110	110	115	110	100	G	130	105	100	100	100	S	S
24	100	B	E	B	E	100	100	150	135	120	110	110	105	105	105	105	105	100	120	105	105	105	120	105
25	B	100	100	100	100	100	100	100	135	125	115	120	110	105	105	110	145	125	135	100	105	105	100	B
26	B	B	B	B	B	E	100	G	130	120	115	105	105	105	105	120	140	120	105	105	105	105	120	100
27	100	B	B	B	090	B	S	G	145	125	100	105	105	105	100	105	105	135	120	100	100	100	095	095
28	B	B	E	B	B	B	125	110	115	120	G	G	100	100	100	100	145	125	100	100	100	S	095	100
29	100	B	E	B	B	B	S	130	115	115	115	110	105	110	105	170	150	130	120	S	105	100	100	100
30	100	100	B	E	E	E	S	110	110	105	105	105	100	125	130	100	100	140	110	100	100	100	100	100
31																								
Count	23	19	16	14	10	11	22	27	29	29	25	28	29	29	28	26	25	26	26	25	27	23	23	22
Median	100	100	100	100	100	100	110	120	120	120	110	105	105	110	105	105	115	120	110	100	100	100	100	100
U. Q.																								
L. Q.																								
G. R.																								

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Y11

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

f_oF₂

Lat. 31° 12.1'N
Long. 130° 37.1'E

Yamagawa

IONOSPHERIC DATA

1 35° E Mean Time (G.M.T. +9h)

Types of Es

Sep. 1967

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	f		f	f		1 c	e2h2	e3	12	13	12	12	12	12	12	14	16	15	f6	f3f2	f2f2	f3f	f2f	
2	f3f2	f4	f2	f	f3	f5	c	b41	c312	e21	e31	e21	e21	e21	h1	h1	h3	e3	e41	f5f	f4	f3	f2	f3	
3	f4	f3	f	f	f	f	e4	e4	e3	e2	13	1	12	1	12	13	13	13	14	f2	f4	f2	f2	f3	
4	f2	f	f2	f2	f	f		12	12	13	12	1	12	12	12	13	12	12	1	f4	f2	f2			
5	f2f	f3	f2	f2	f2		h21	h312	h213	e213	e2	1 h	h12	h12		1	h1	e3							
6												1	1	12	121	121		e2	e2	f2	f2f3	f2	f		
7	f3	f	f				h21	h2	h2	e2	e	e	e	e1	e	e2	e2	e4	1	f2f2	f5	f3	f3	f3	
8	f2		f			f	15	e3	e2	e2	c1	1	12	1	12	1	1	12	1	f2	f		f		
9	f3	f3	f3				h3	h2	h2c1	1	12	1 h	h1	h1	h1	h1	h	h12	c			f4	f3	f2	
10	f3	f3	f2	f4	f	f2	1 h	1 h2	h1	e2		h2c1	1	h1	1	12	1	h21			f				
11							h	h3	h3	h2	e2	12	h1	1	1	1		h1	f2f	f2	f				
12	f						1	1 h	h212	e2	e2	e2	e2	e2	c		12	h21	1	f2	f		f	f2	
13	f2	f4	f2				e3	e2	14	12	13	12	12	1	12	12	h213	h313	e512	f4f	f	f	f	f2	
14	f	f	f2f	f2	f2	f4	1	h3	h2	h21	e1	h1	h1	h1	h21	h21	h1	h	h2c	f4	f	f3	f3	f4	
15	f2	f4	f2	f	f	f2	12	e2	e212	e1	c1	e2	h1	h1	1	1	h	h3	e3	f4	f	f2	f3	f3	
16	f3	f2	f2	f2	f	f		h3	e2	e2	e2	e2	c	1	1	1	h3	e4	e4	f3	f	f2	f	f2	
17	f4	f4	f	f	f		13	14	e3	e2		1	c1	c	e2	e2	h2	e6	e5	f3	f	f2	f3	f3	
18	f						h	h	h3	e2	e	e	h	h	h	h2	h4	e3	e2	f	f2	f	f	f2	
19	f						e3	e2	e	e	e	e	e2	e2	e2										
20	f3	f2f	f				c1	h1	e3	12	12	12	12	12	1	12	12	13	15	f3	f3	f2	f2	f	
21	f2	f2	f2	f2	f2	f	h1	e3	e21	e2	e2	c		1			12	1		f2	f	f2	f2	f	
22	f	f2	f	f			h2	h2	h	c	e3		1	12			e21	1		f2	f	f2	f2	f	
23							1 h	h2	h1	e21	e	c1	c1	1	1	1		h2	13	f4	f2	f	f	f2	
24	f3						1	h	h	c	c	e2	1	12	1	12	1	14	c	f3	f4	f	f	f2	
25		f	f	f	f	f	1	1	h1	h21	c21	c	c	e3	e2	c	h	e21	h	f2	f3f	f	f2	f2	
26							1		h2	c	c1	12	1	1	1	c	h	e2	12	f3	f3	f4	f	f	
27	f								h	h	1	1	1	1	1	c	h	h1	c	f	f	f	f	f	
28							h	12	e2	c		1	1	1	1	1	h1	h21	1 c	f	f	f	f	f	
29	f						h	e3	e	e2	c	c	1	1	1	h1	h	h3	e2	f	f	f	f2	f	
30	f	f					e2	e2	e2	1	1	1	1	h1	h1	1	1	h2	e2	f3	f	f2	f2	f2	
31																									
Count																									
Median																									
U. Q.																									
L. Q.																									
Q. R.																									

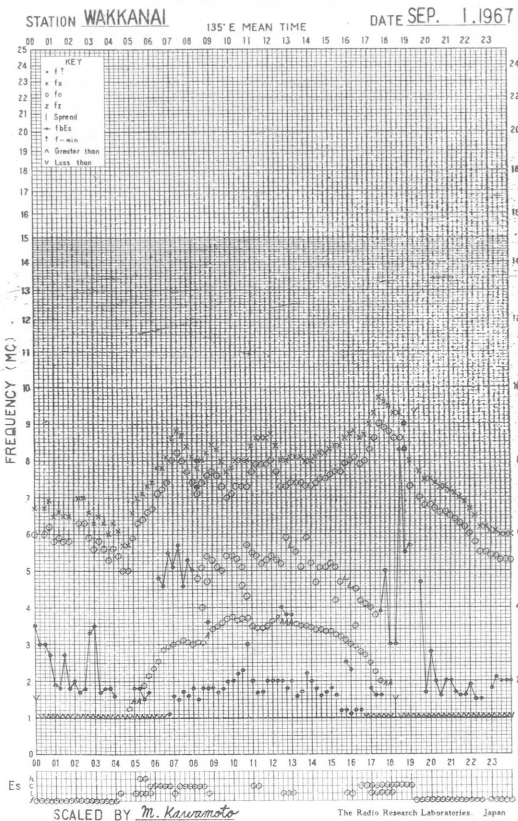
Types of Es

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

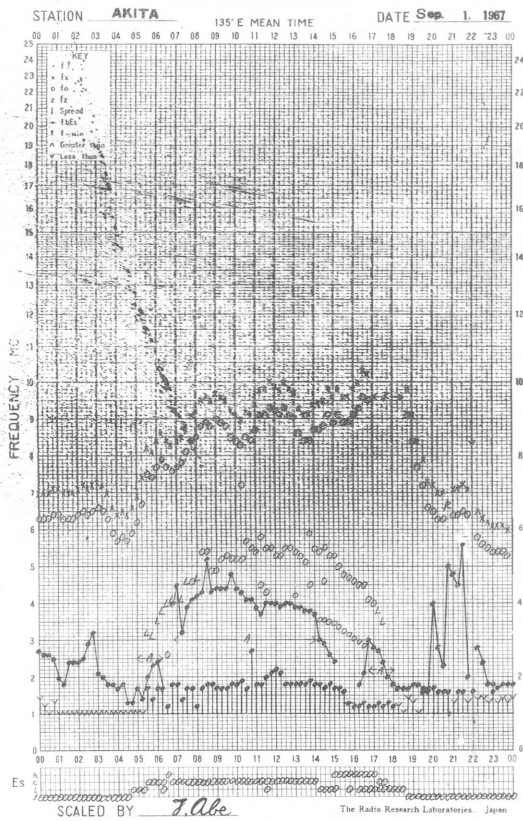
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Y12

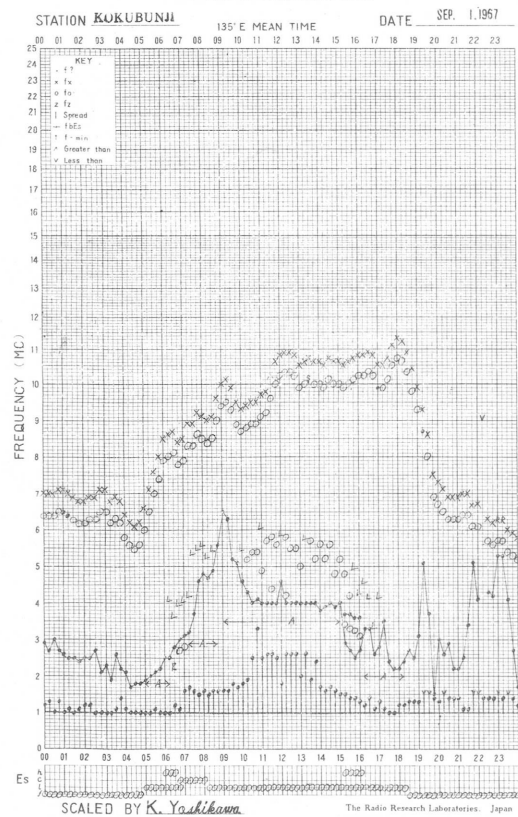
f- PLOT OF IONOSPHERIC DATA



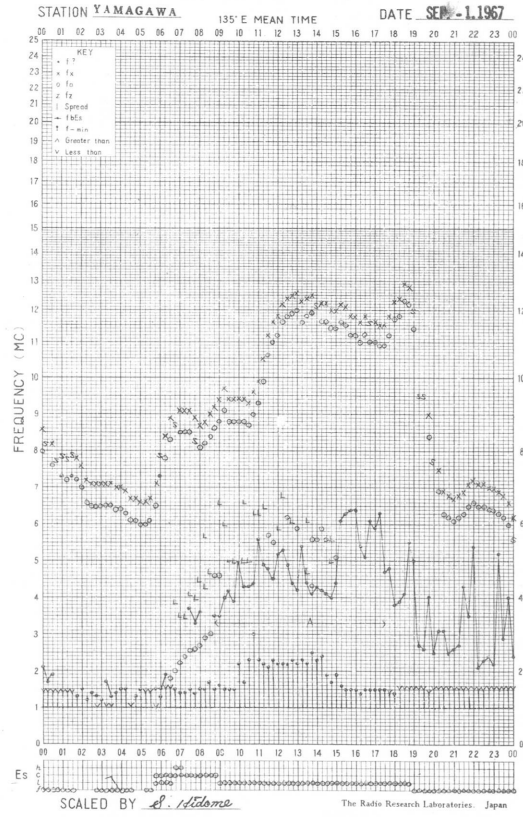
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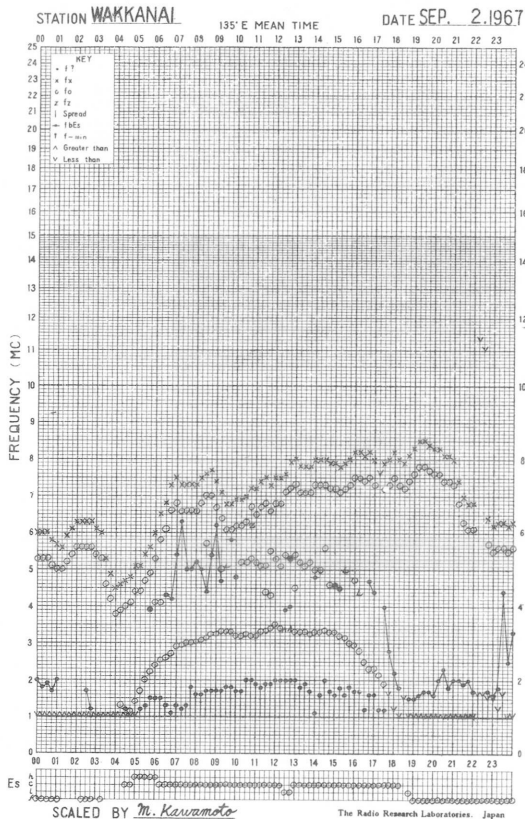
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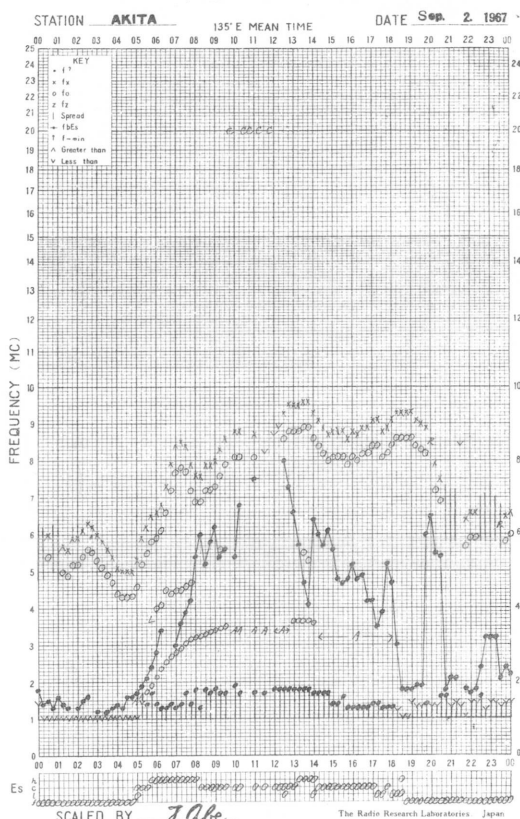
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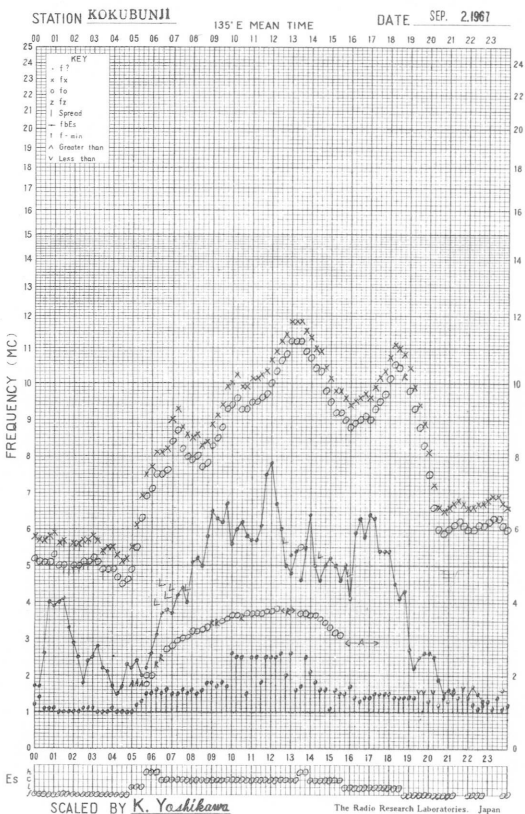
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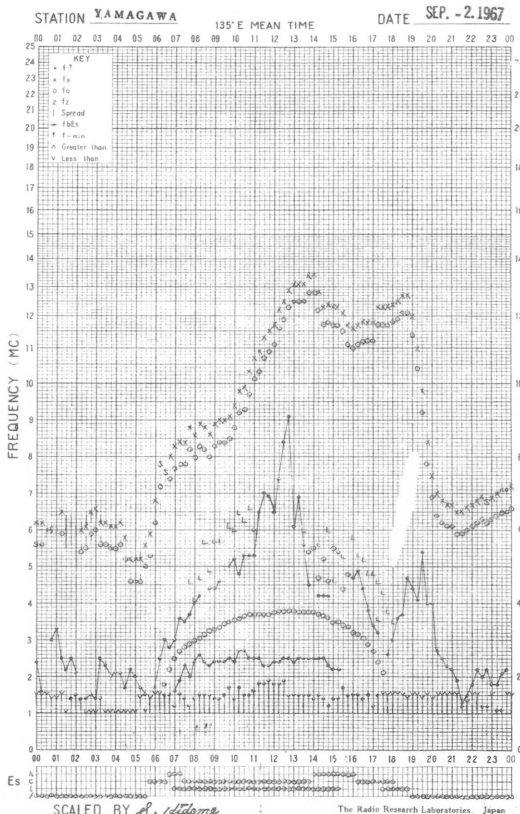
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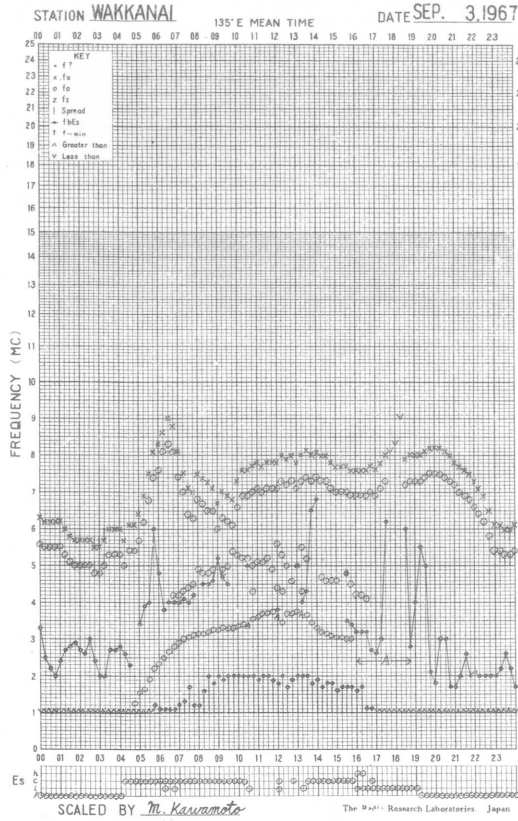
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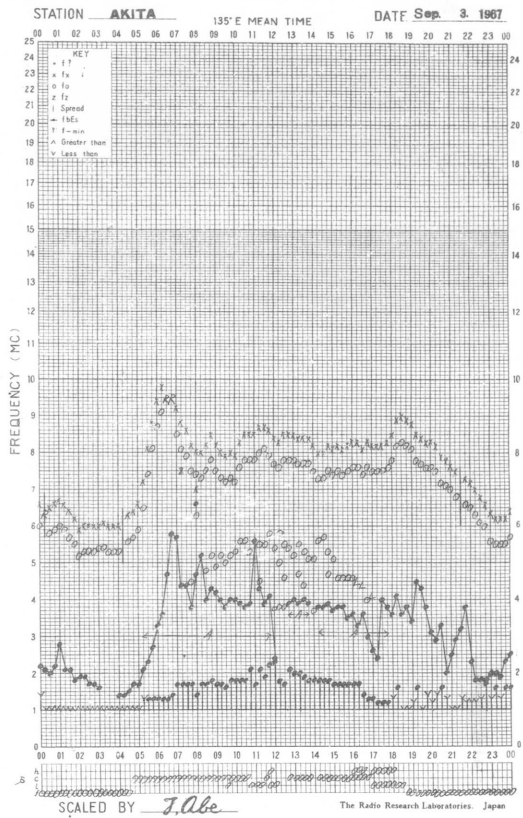
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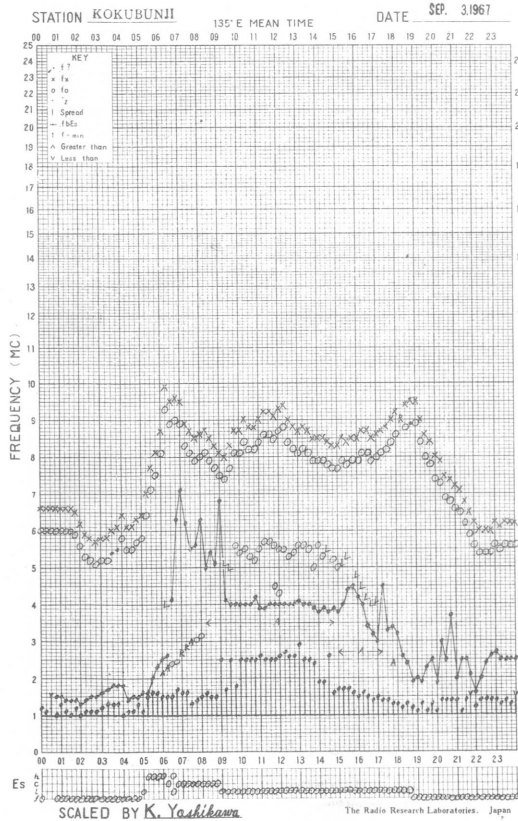
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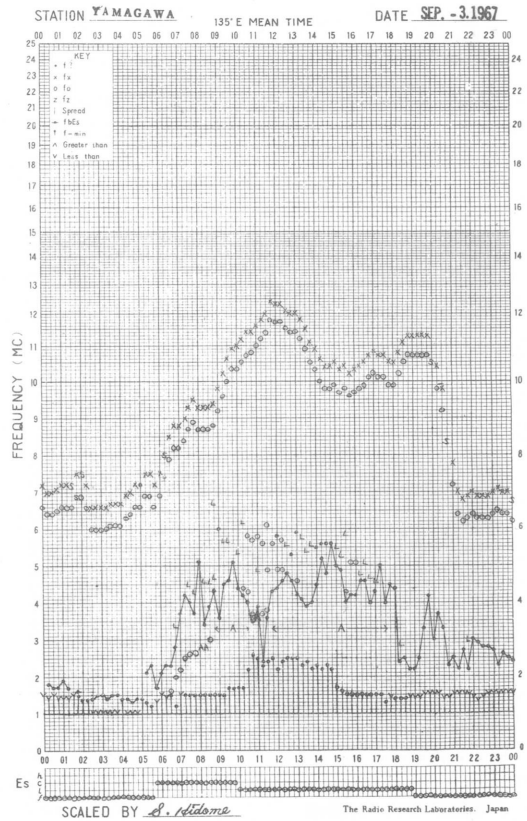
f- PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA

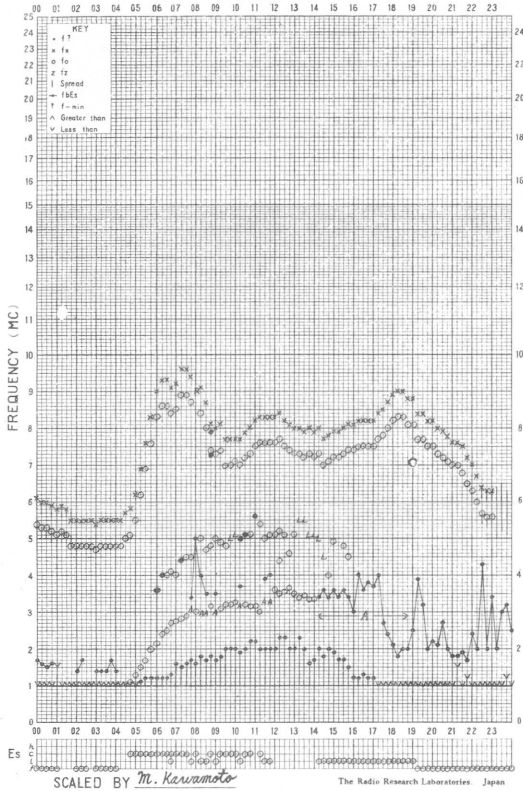


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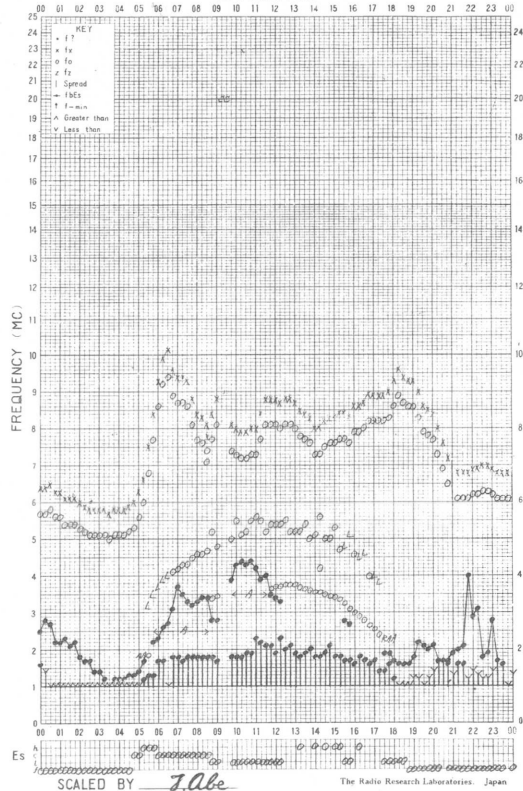
f- PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE SEP. 4 1967



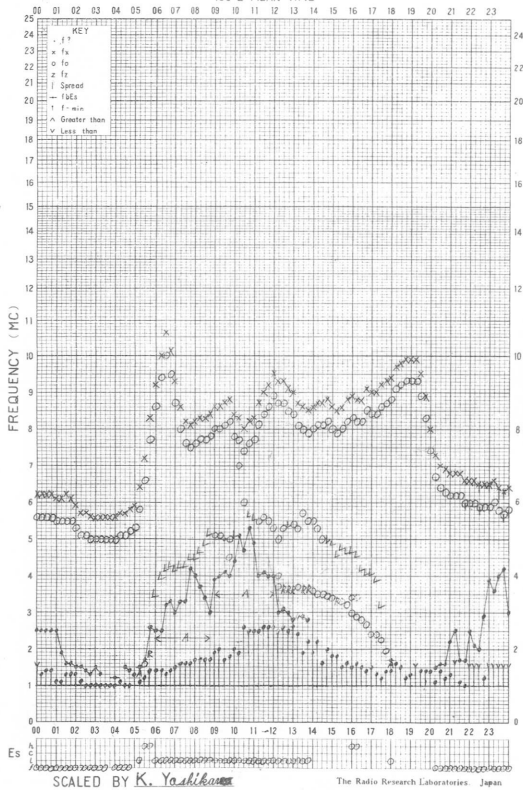
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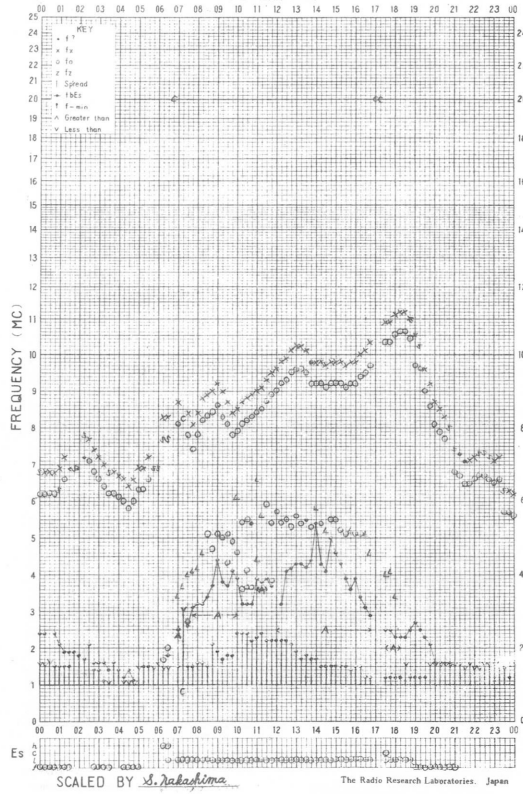
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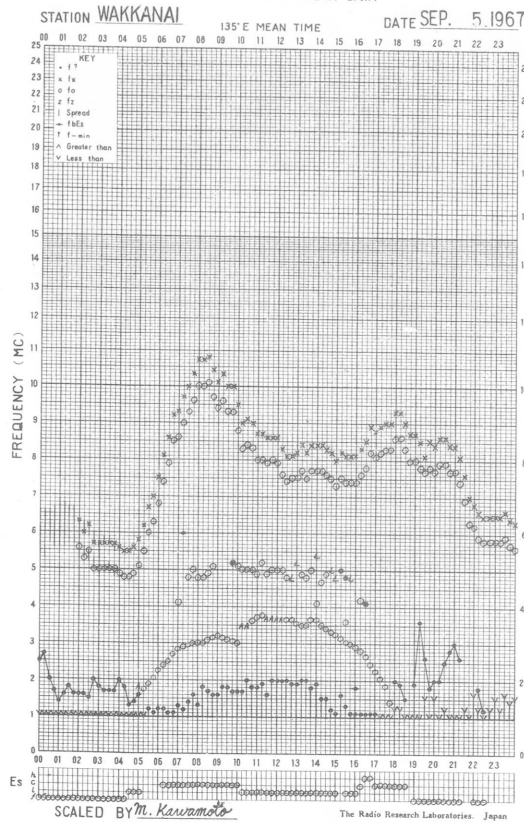


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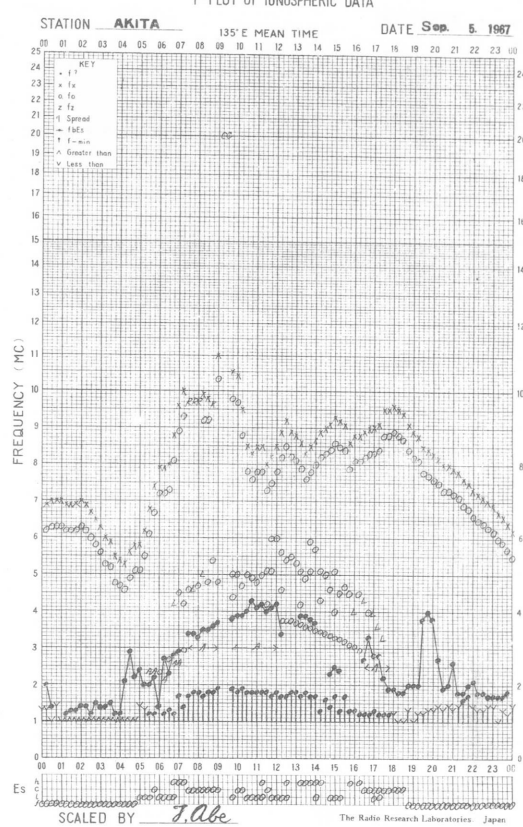
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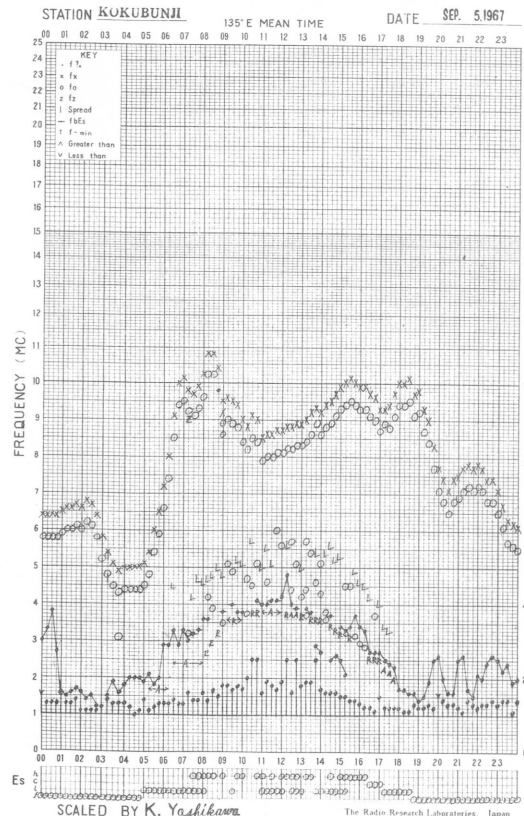
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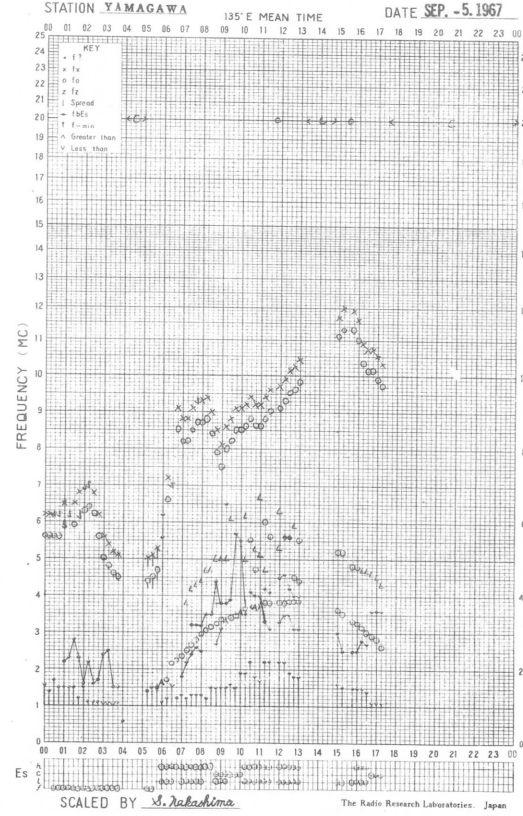
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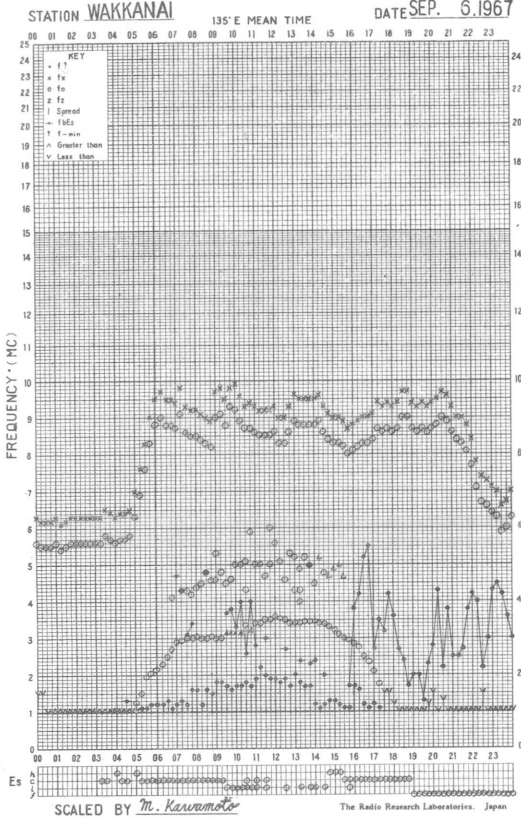
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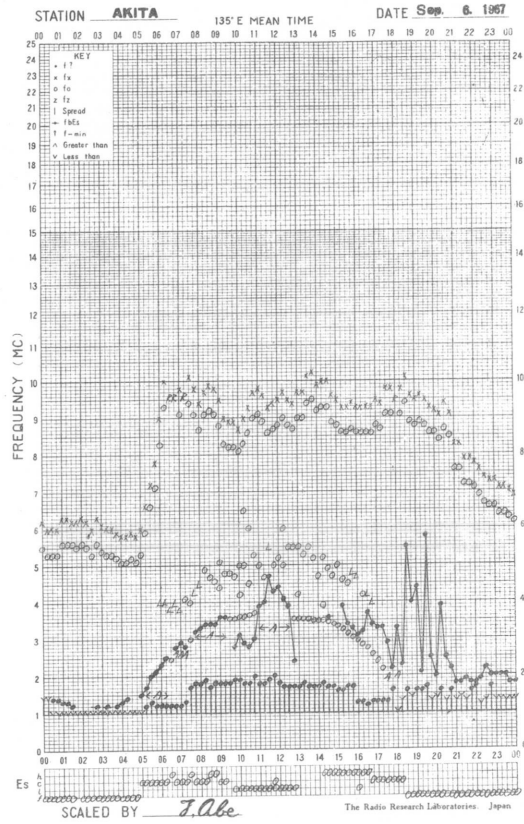
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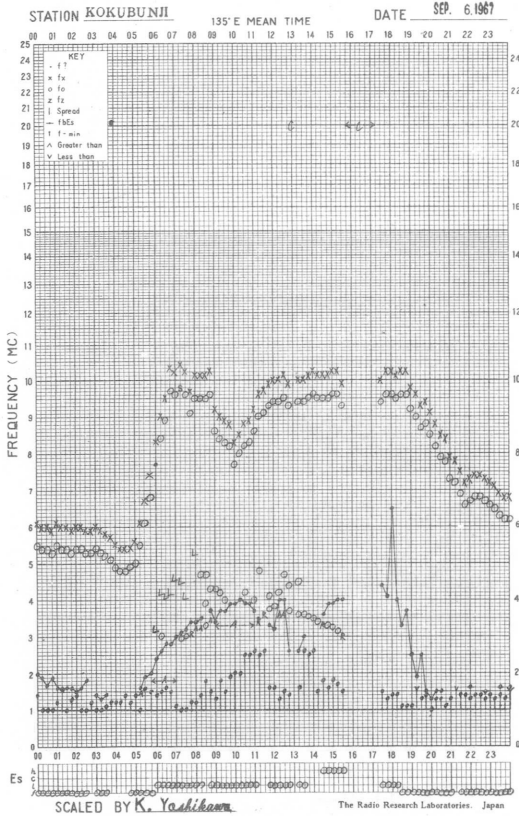
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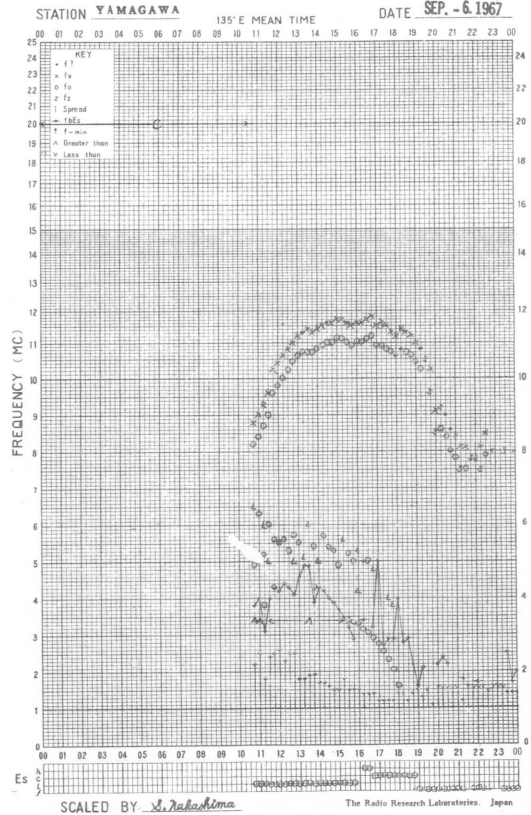
f-PLOT OF IONOSPHERIC DATA



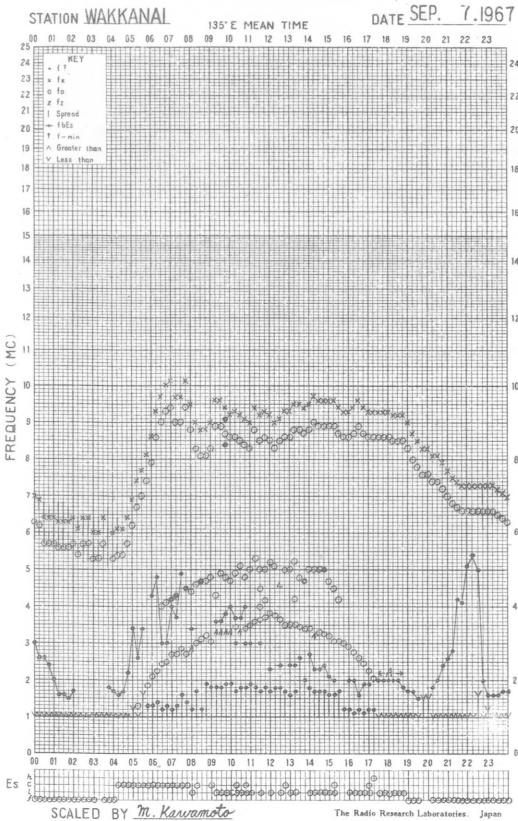
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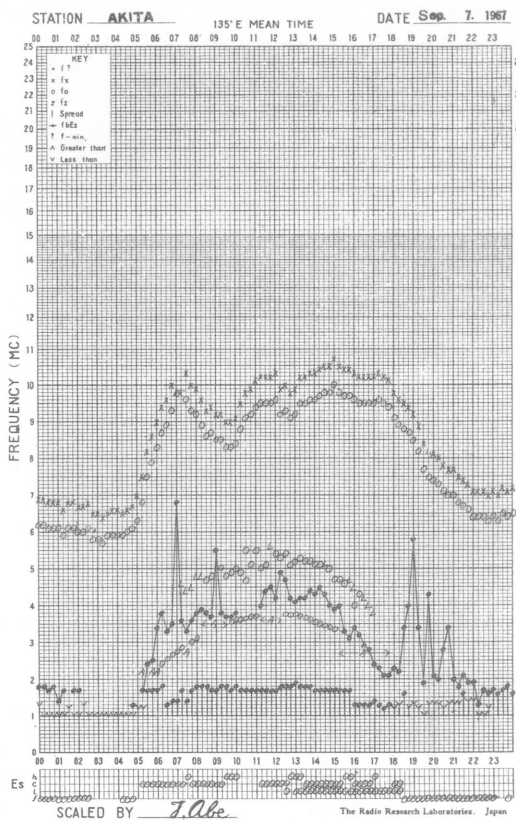
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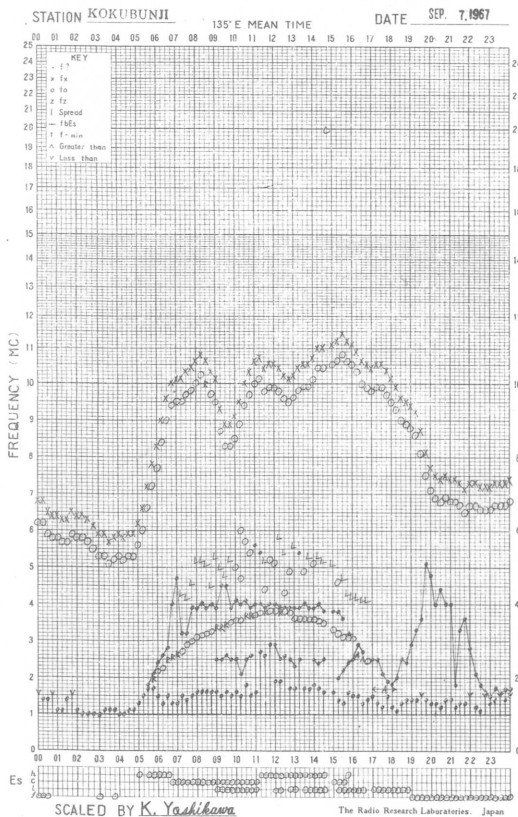
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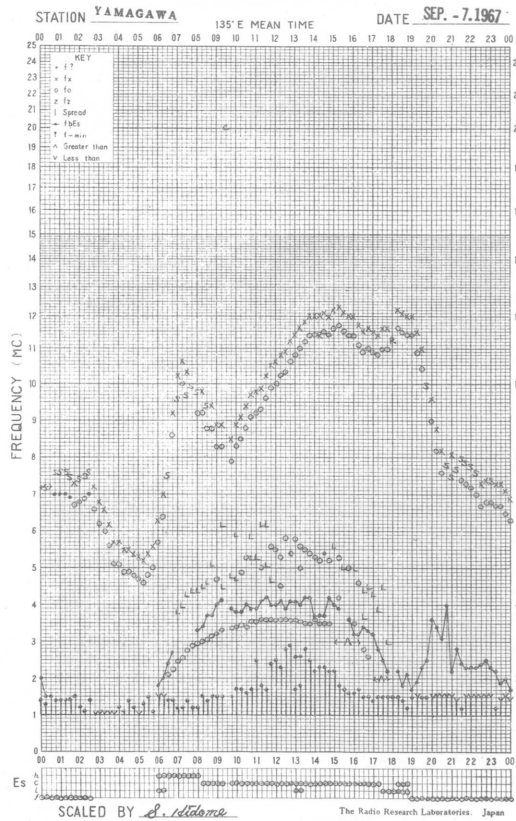
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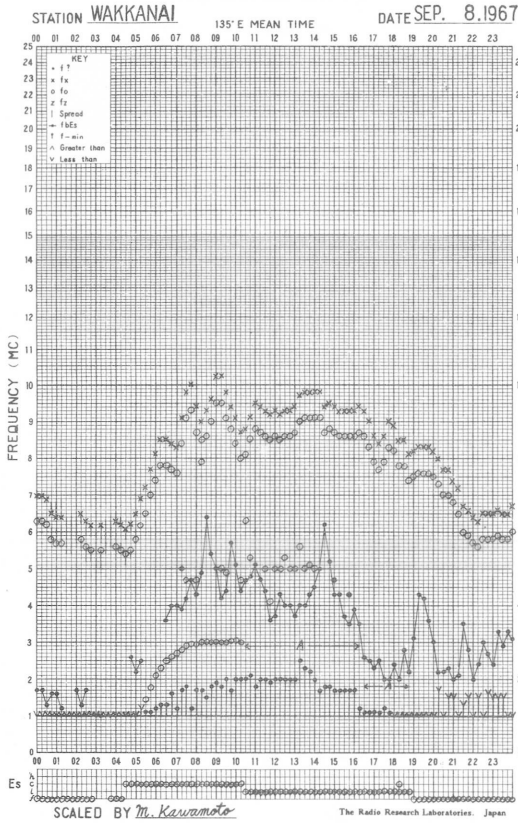
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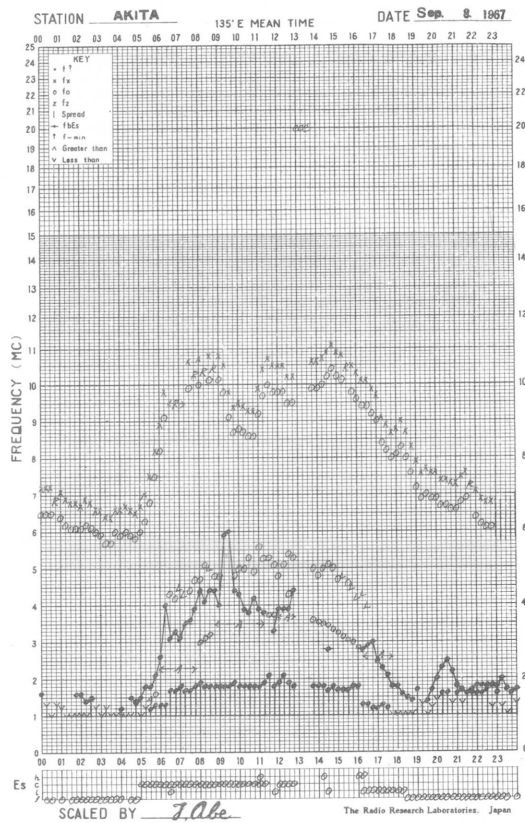
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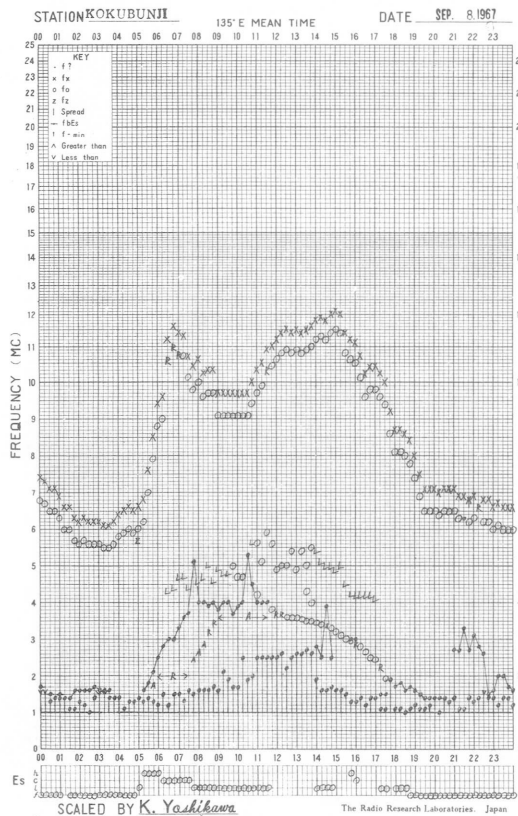
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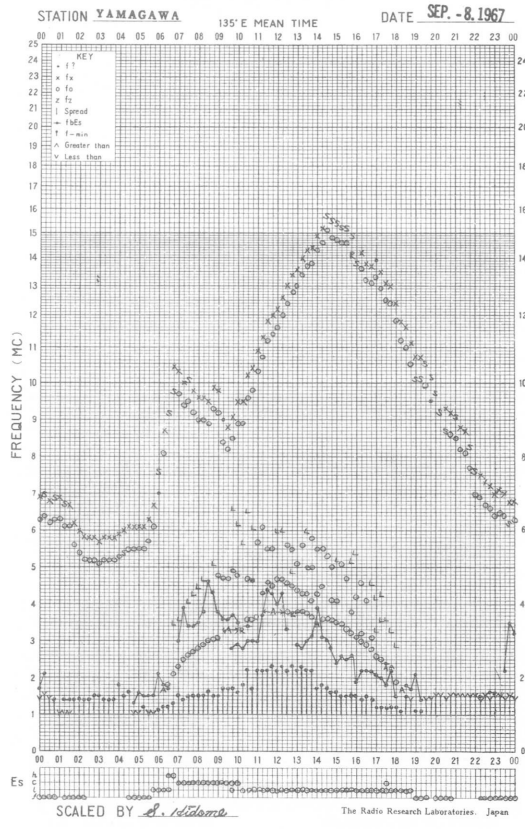
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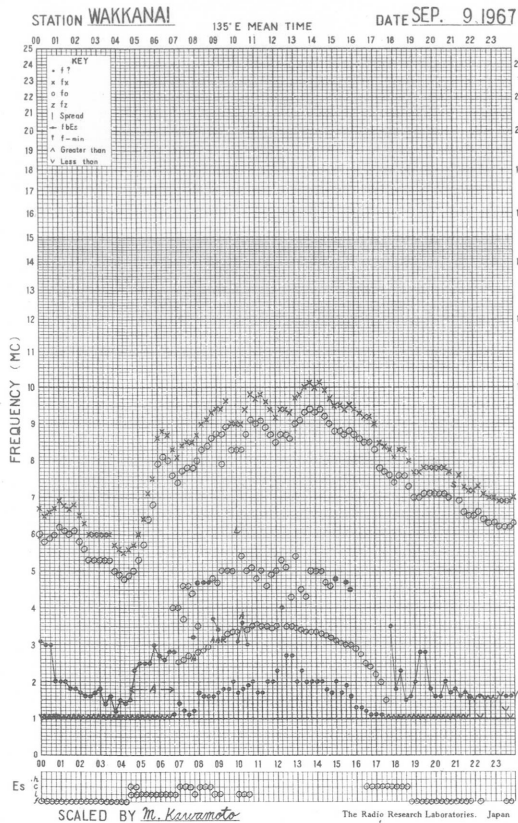
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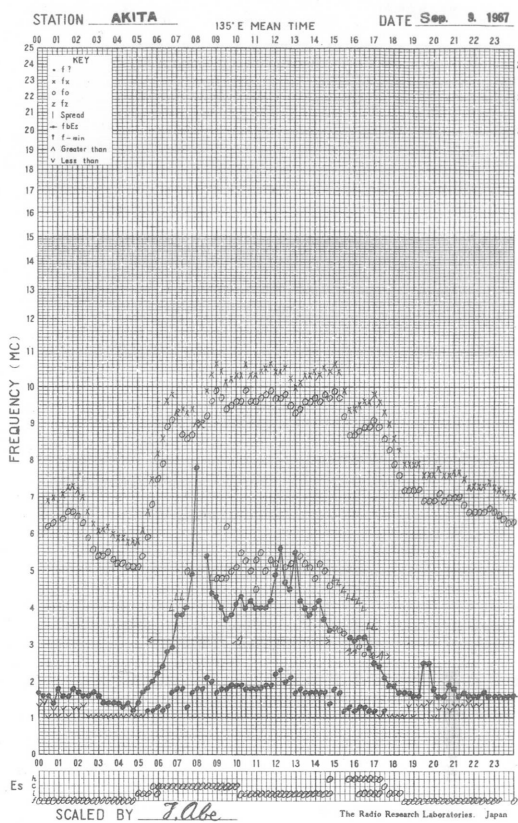
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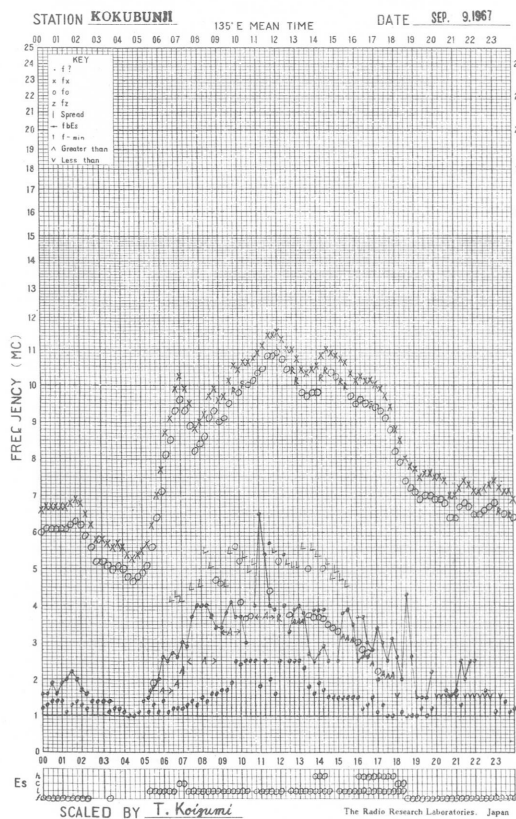
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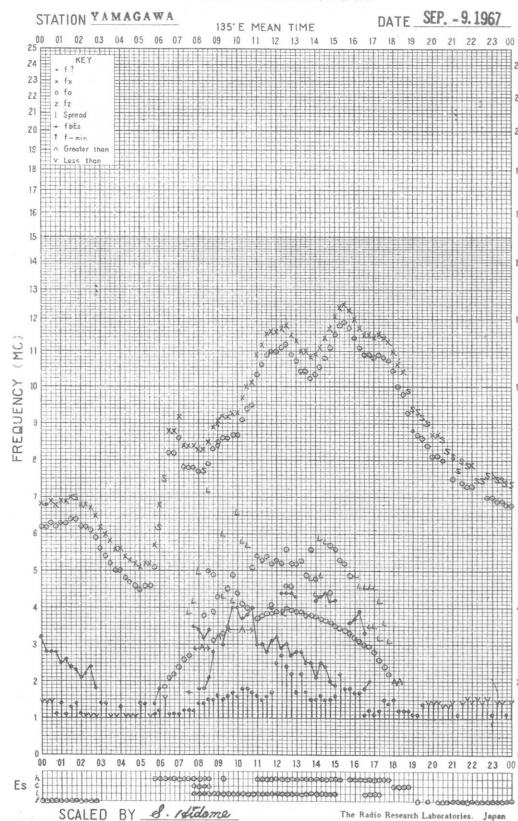
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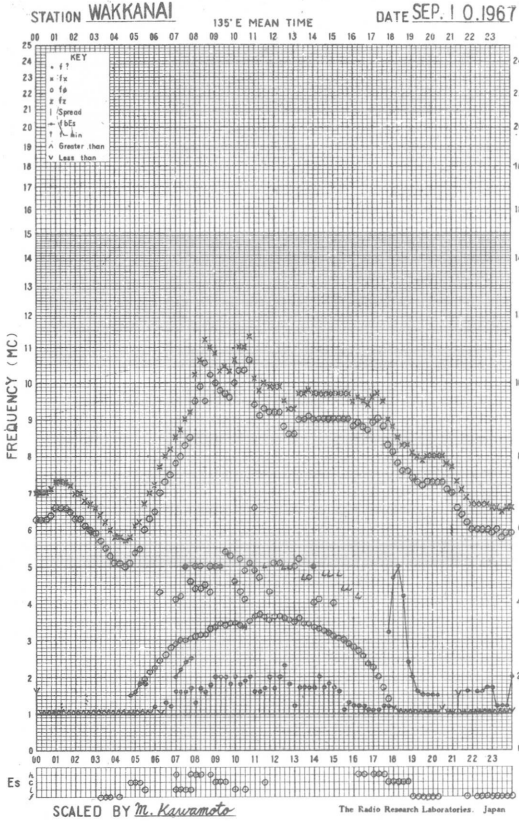
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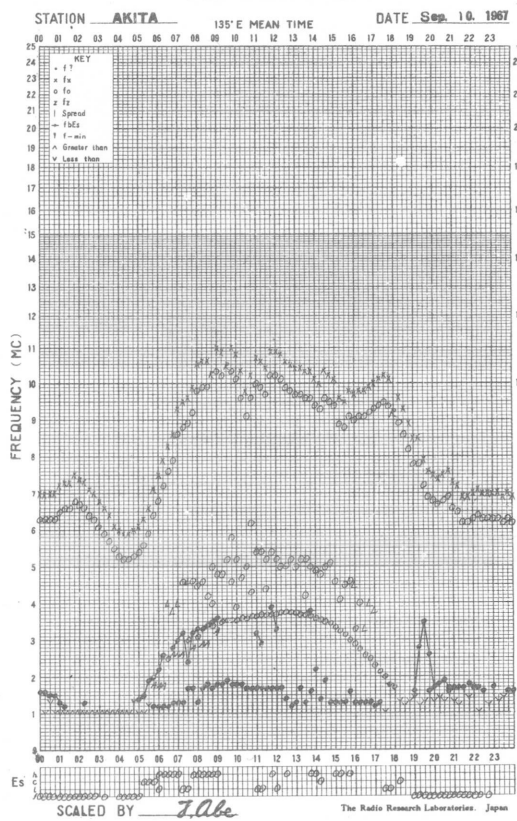
f-PLOT OF IONOSPHERIC DATA



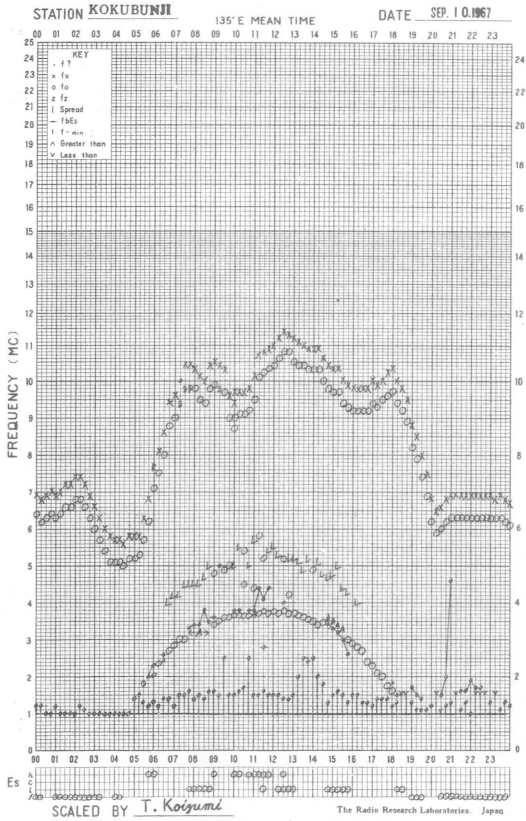
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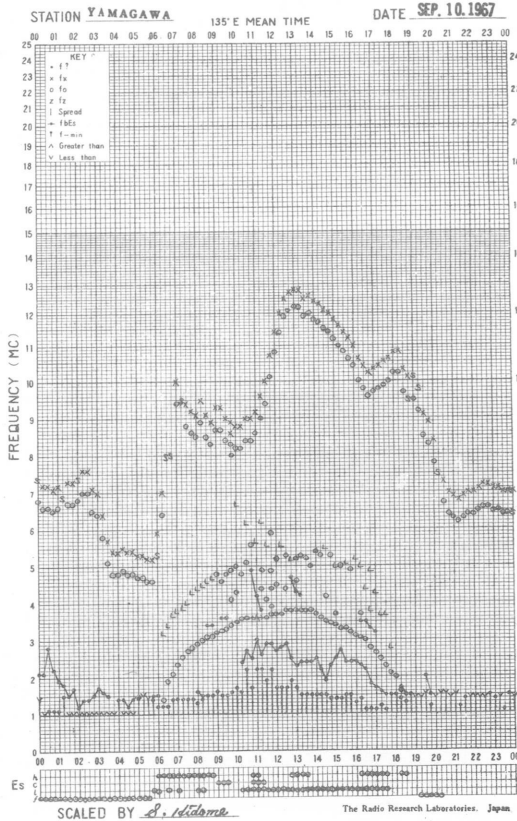
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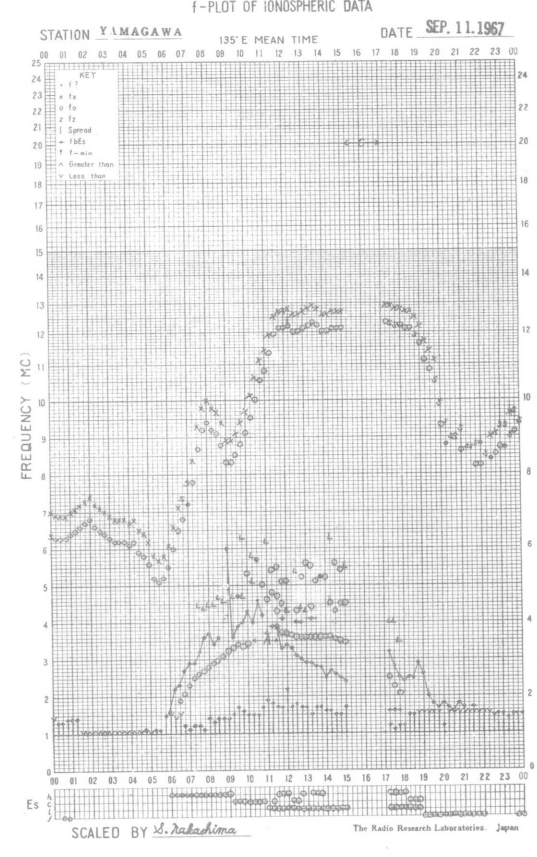
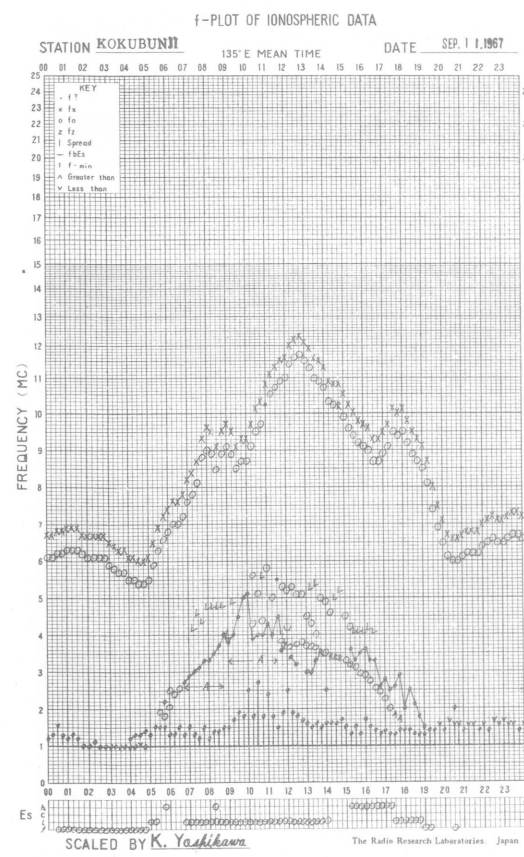
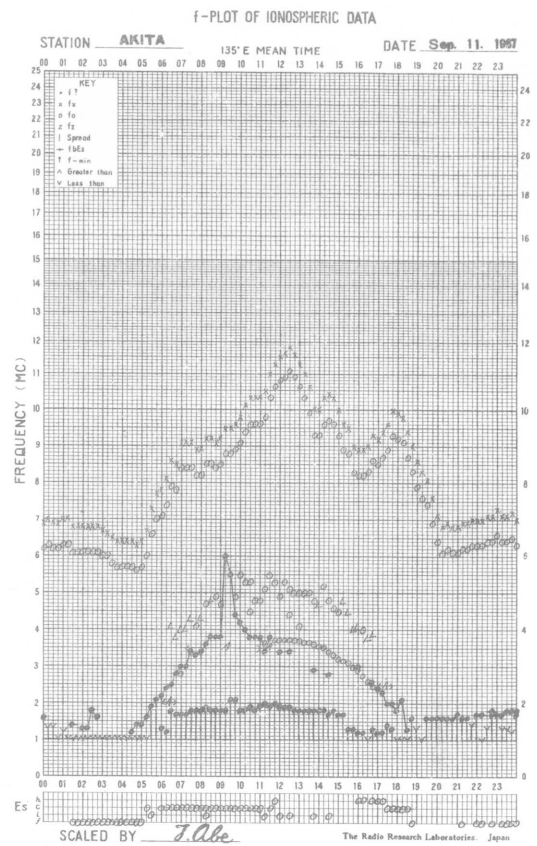
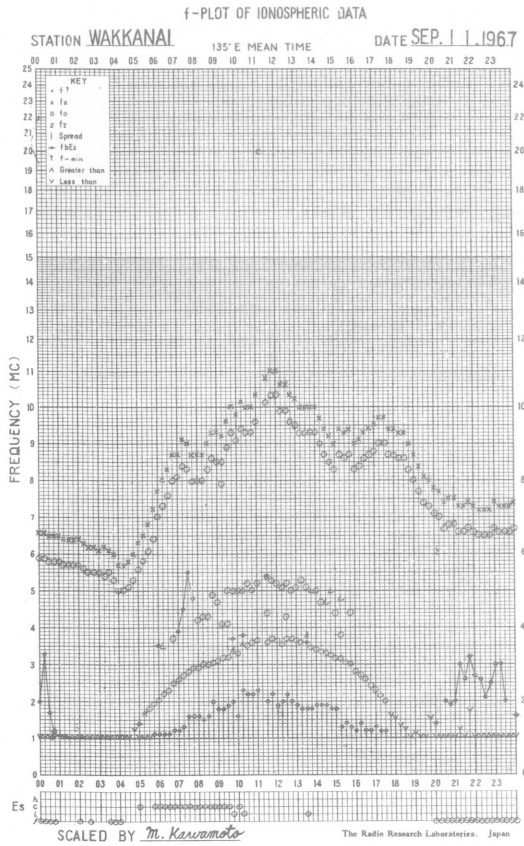


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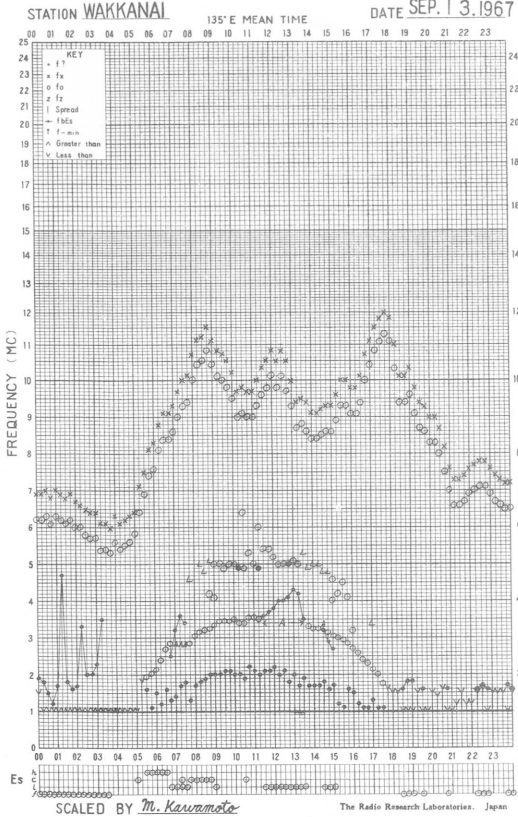


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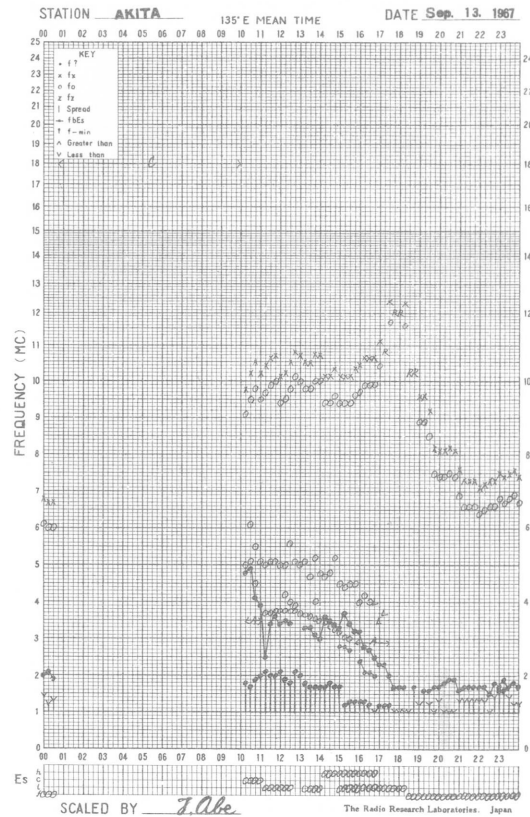




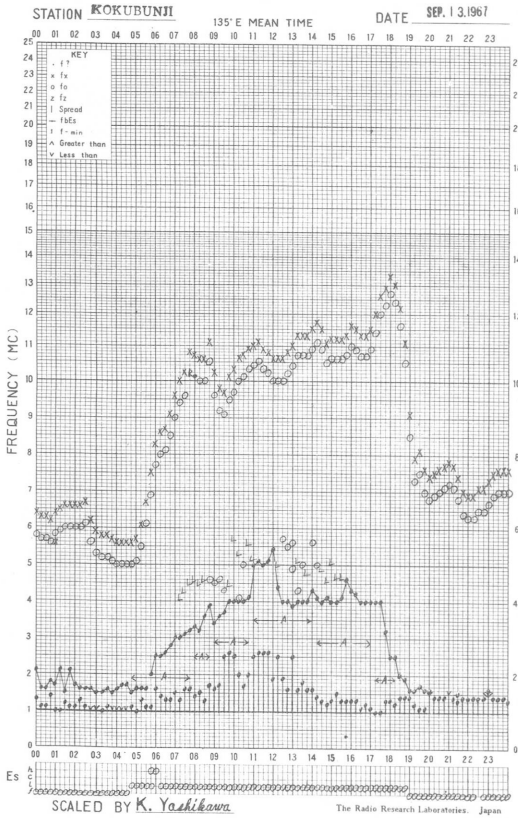
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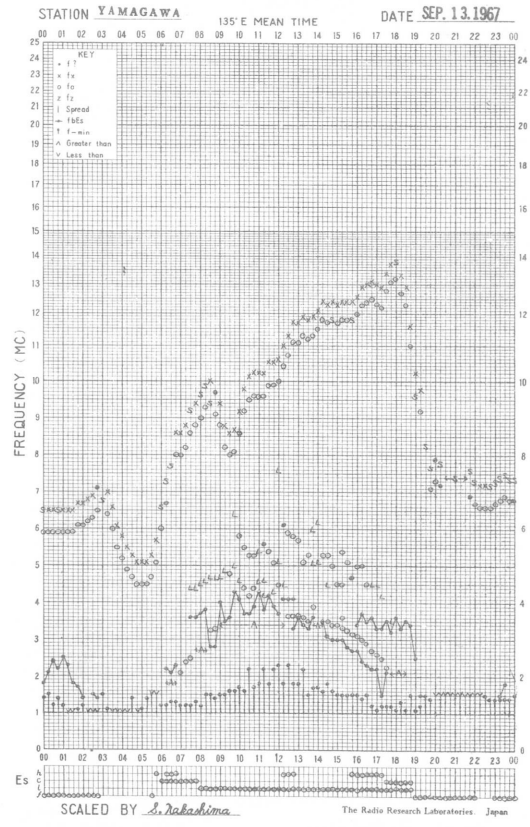
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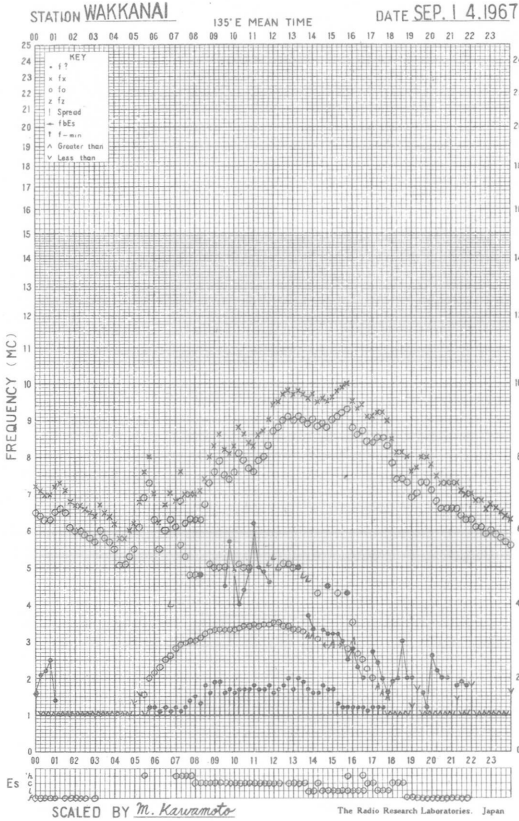
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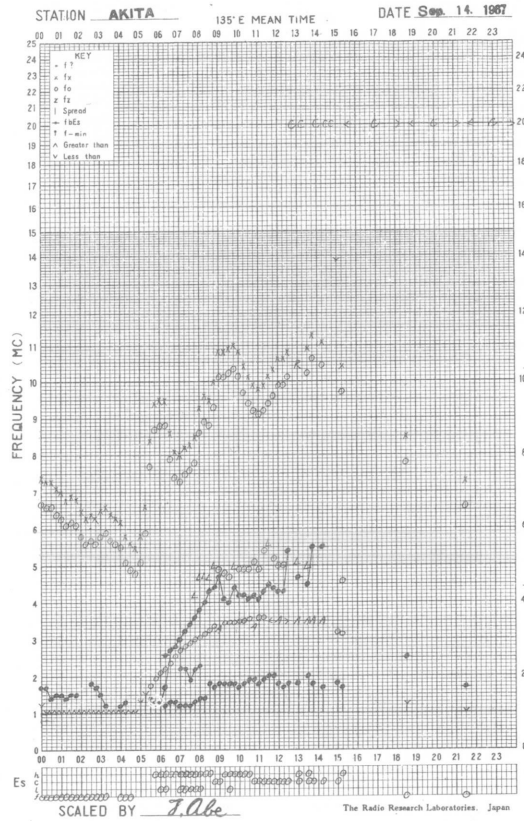
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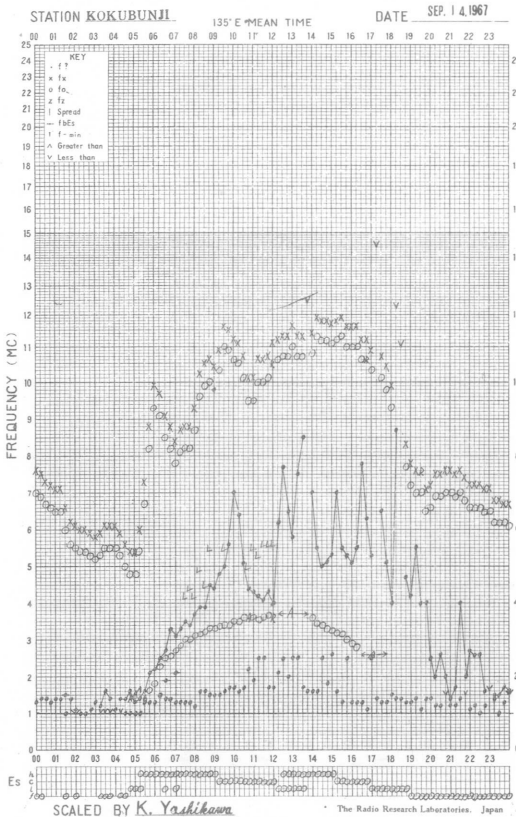
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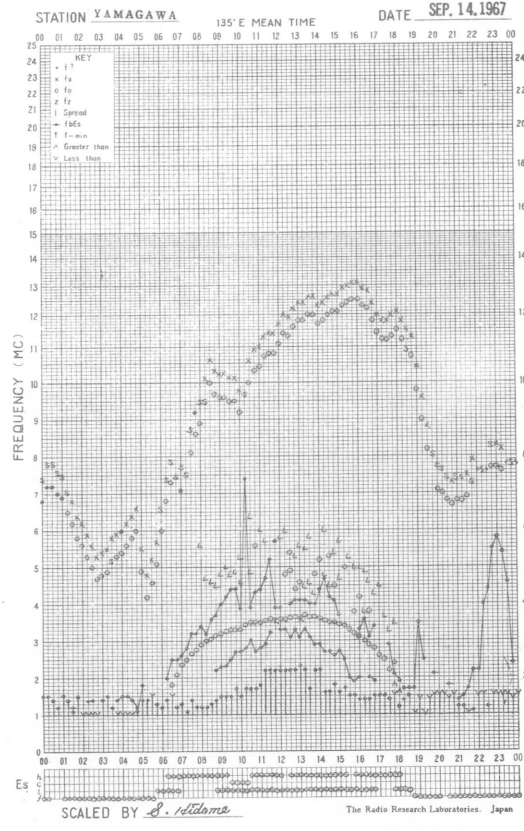
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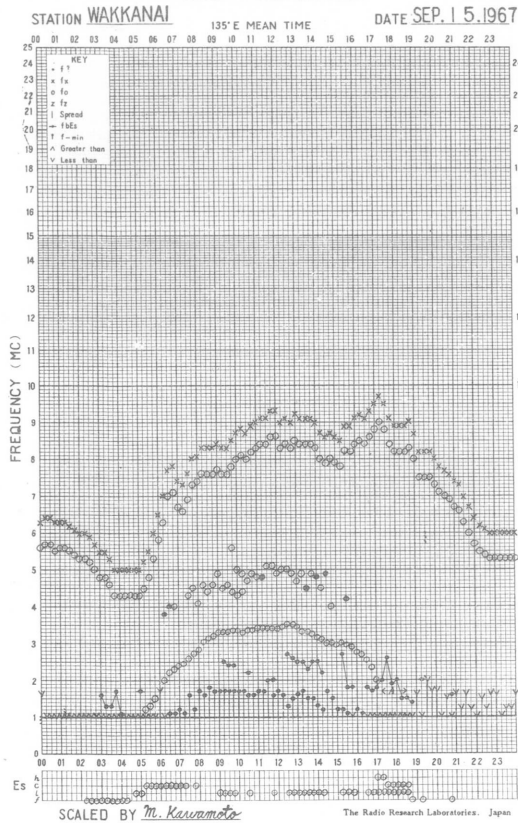
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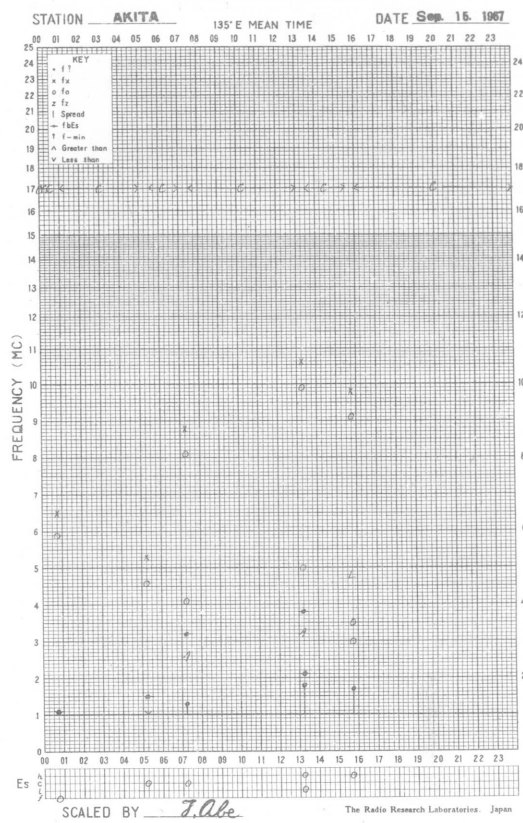
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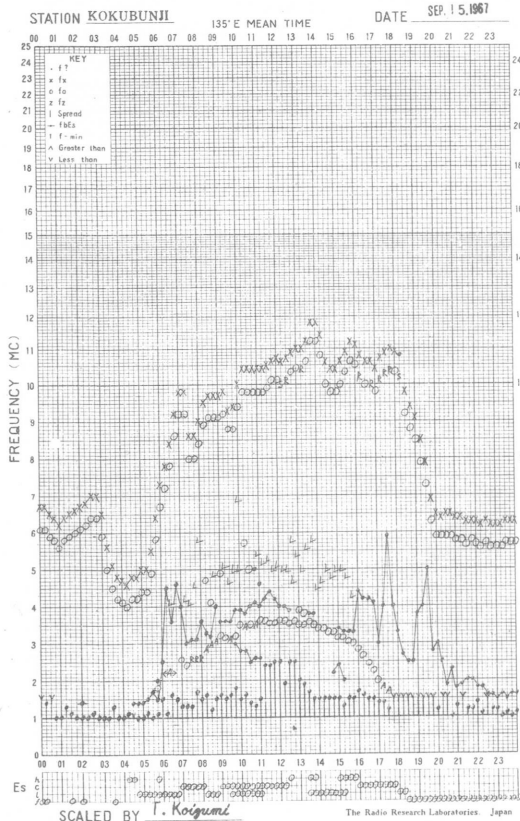
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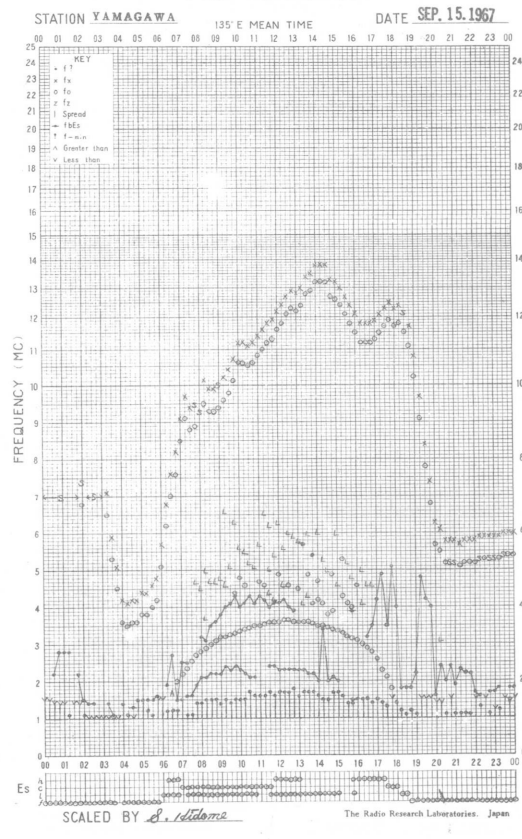
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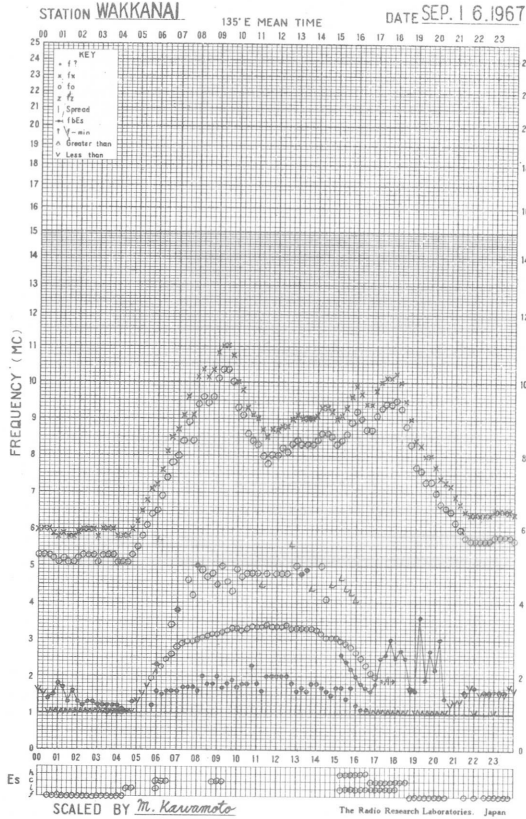
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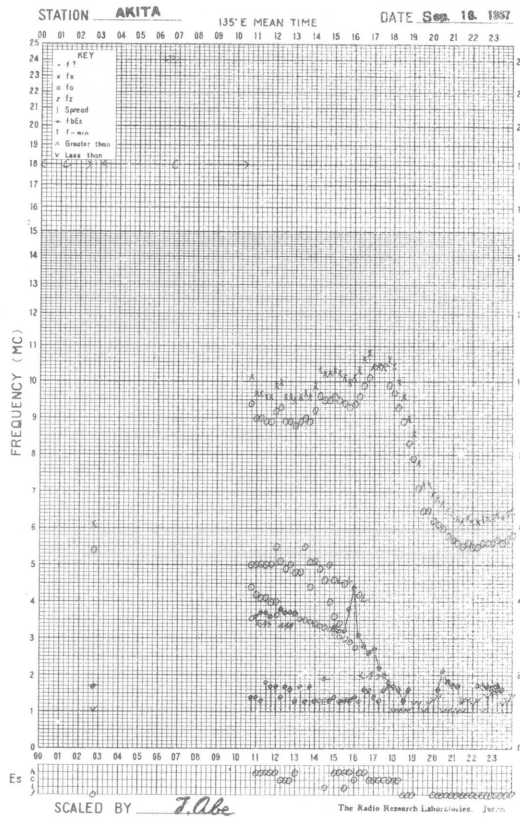
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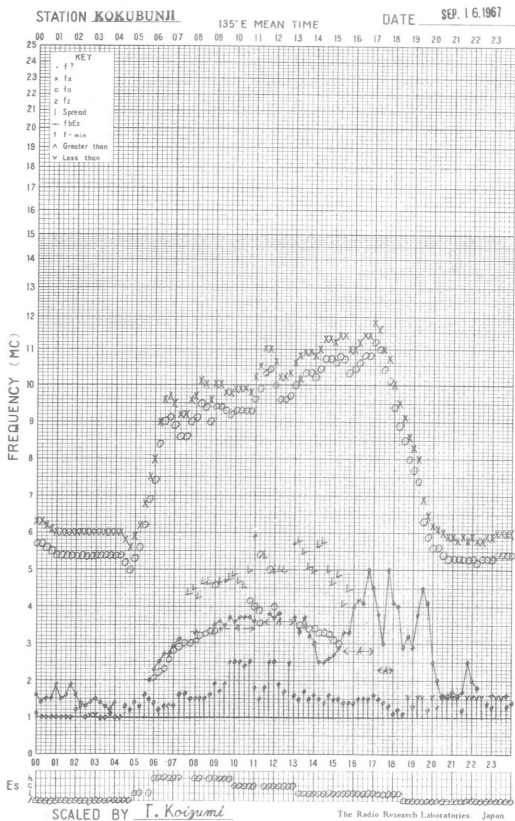
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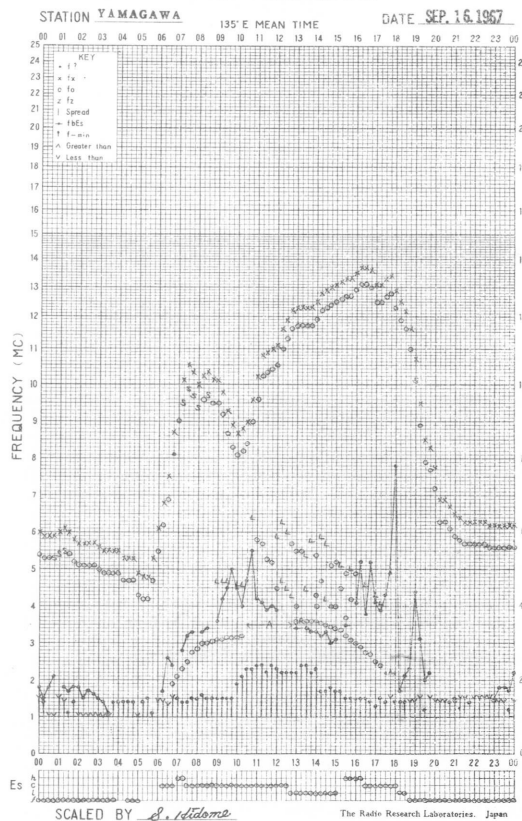
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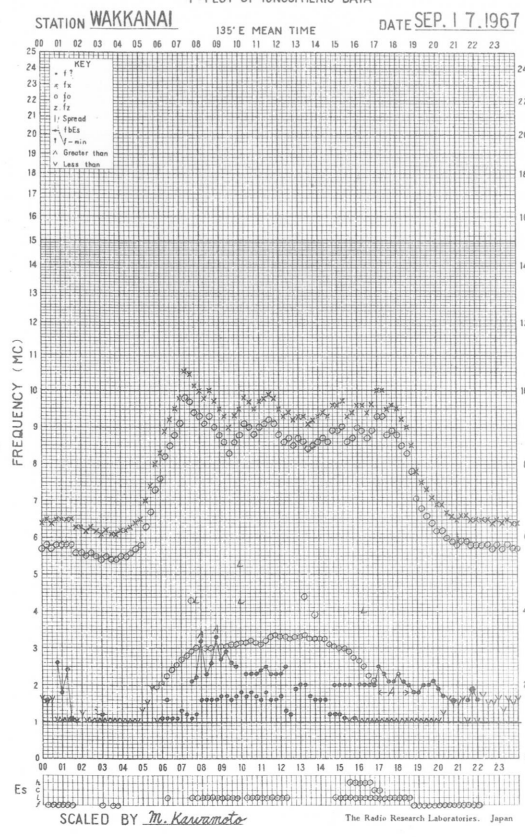
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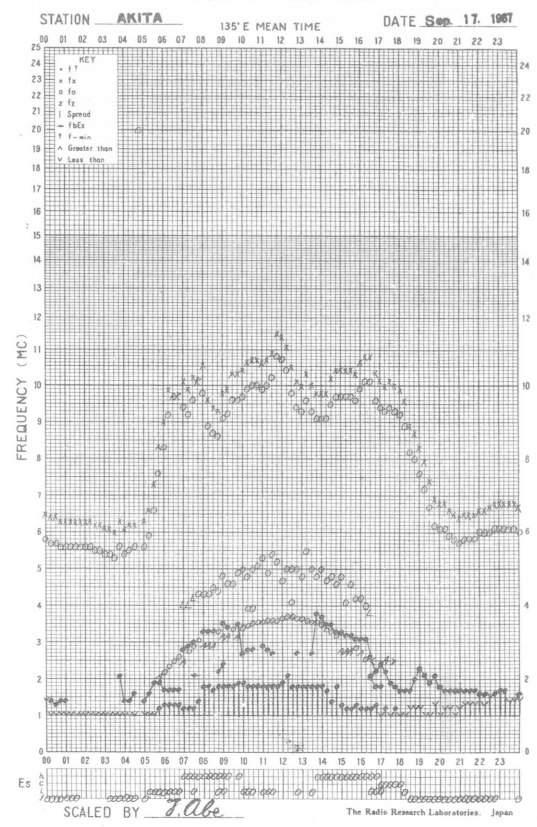
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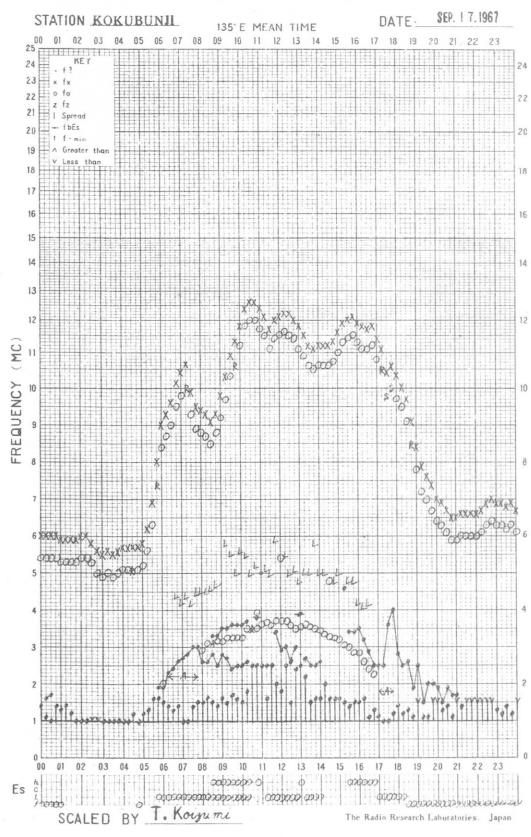
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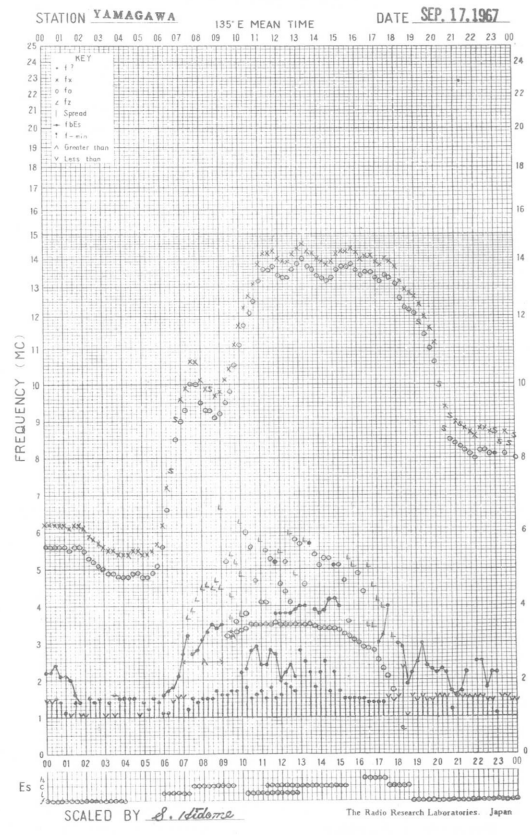
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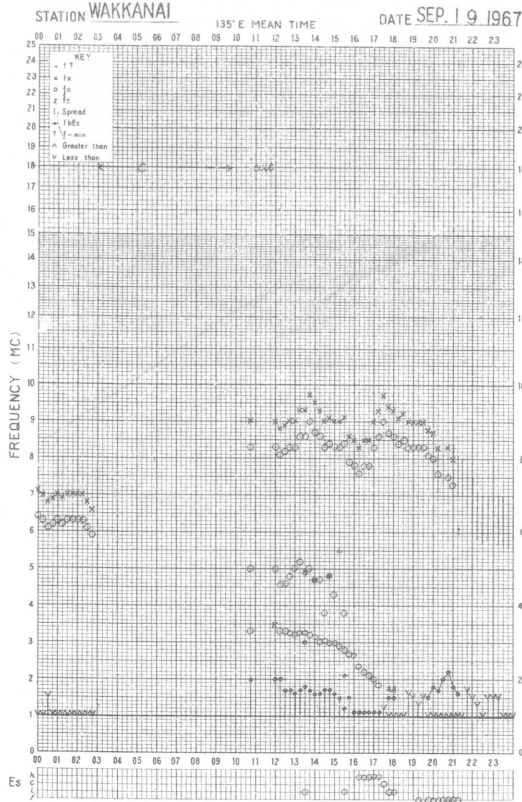
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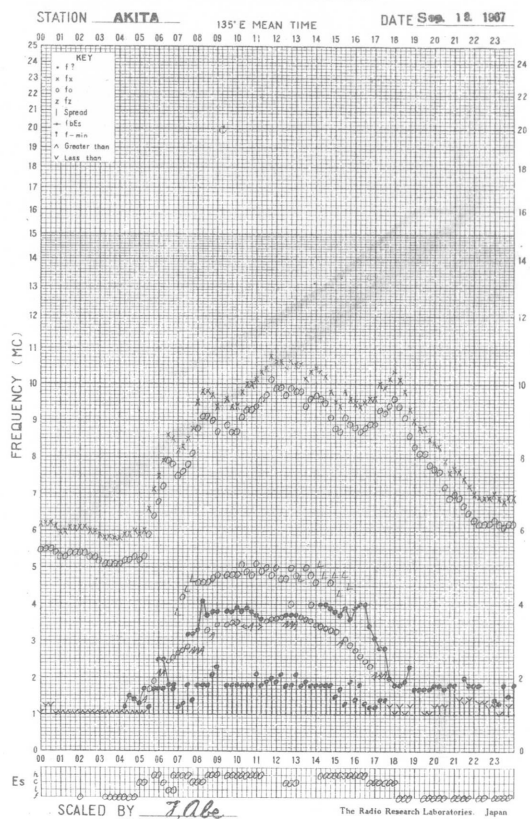
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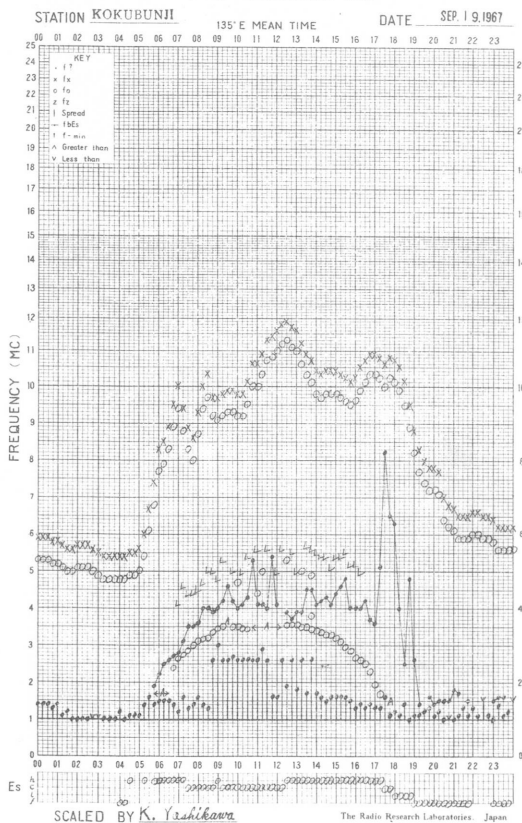
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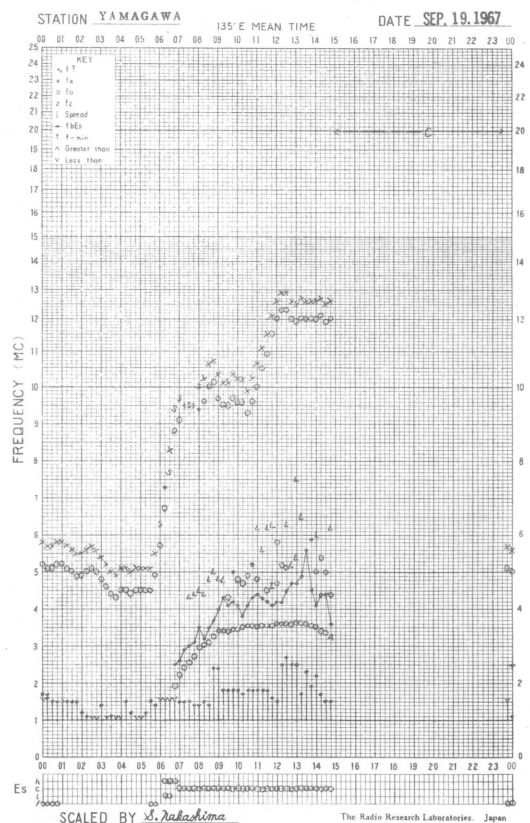
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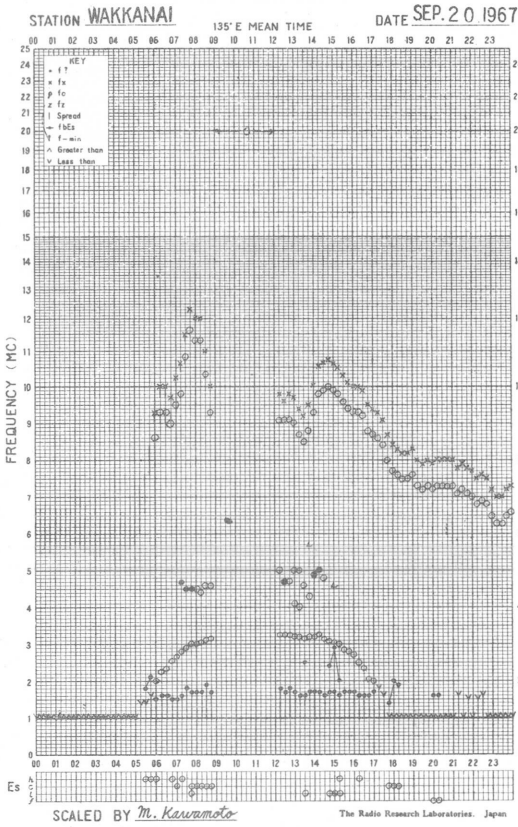
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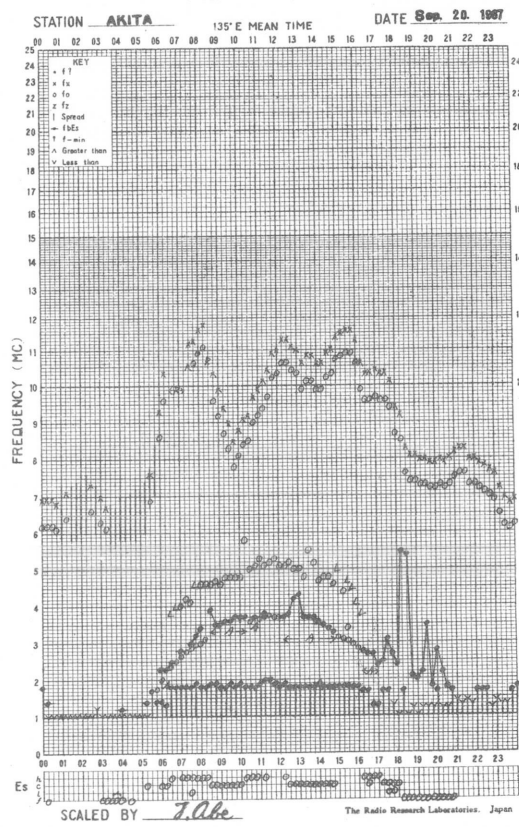
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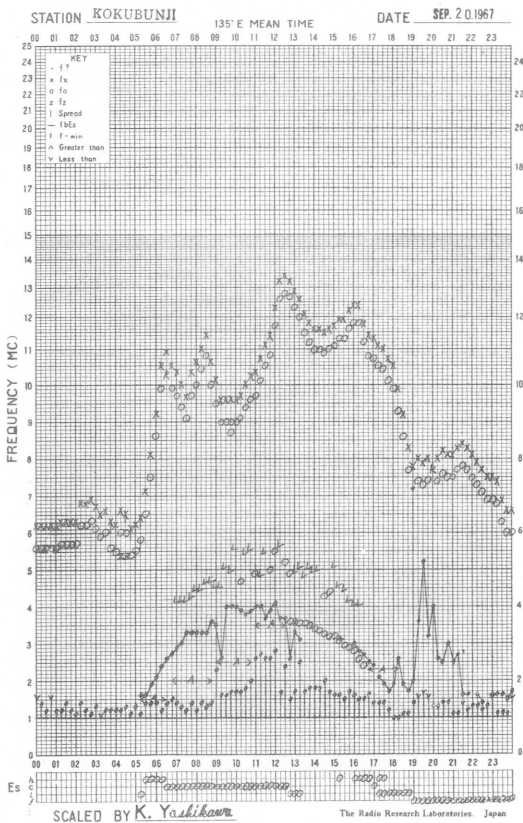
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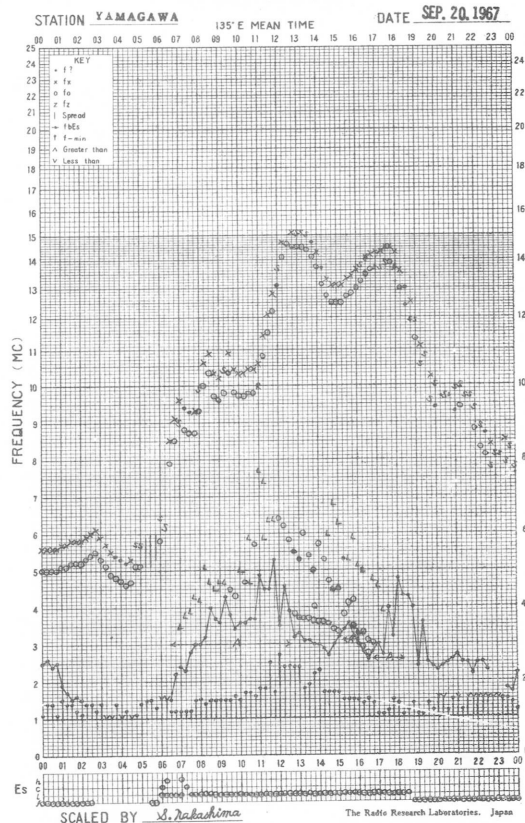
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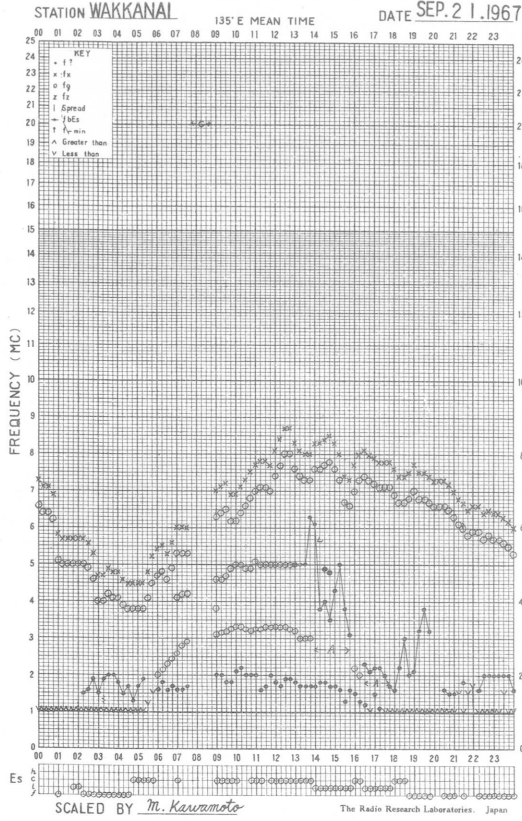
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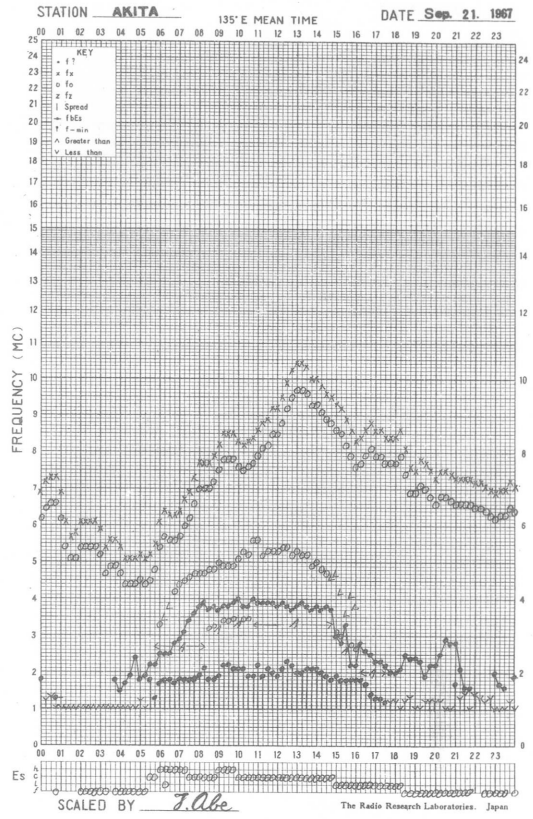
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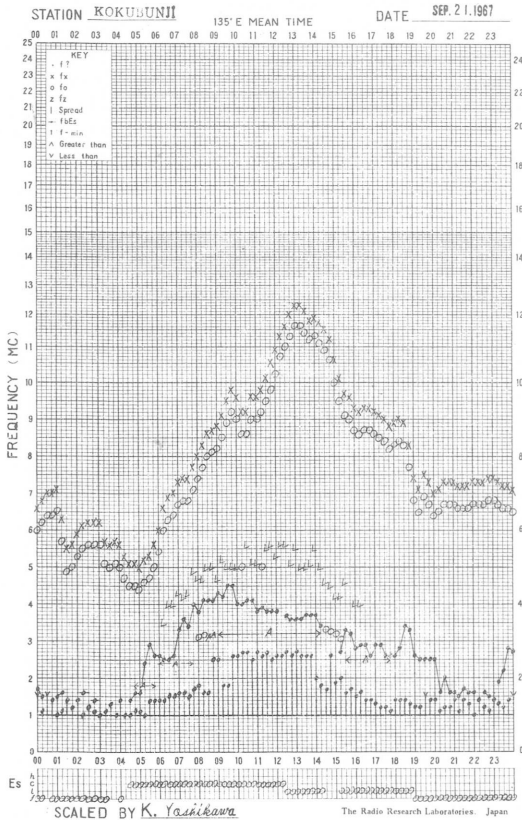
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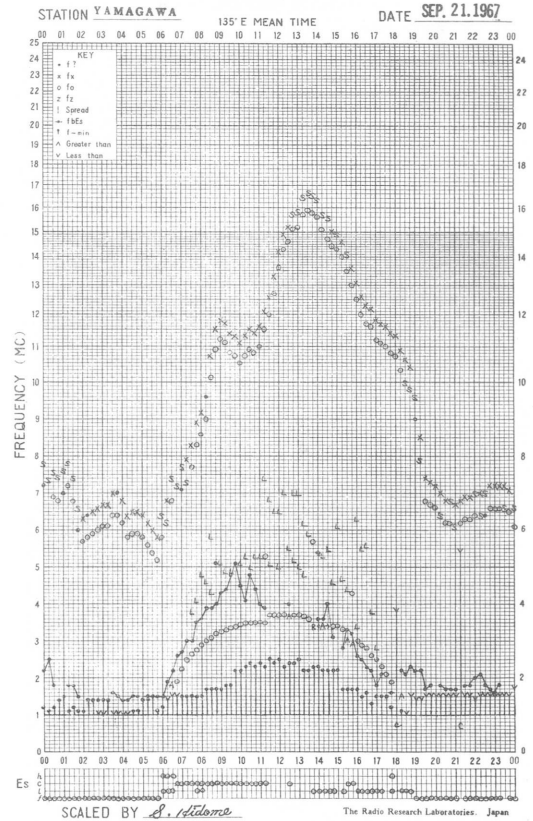
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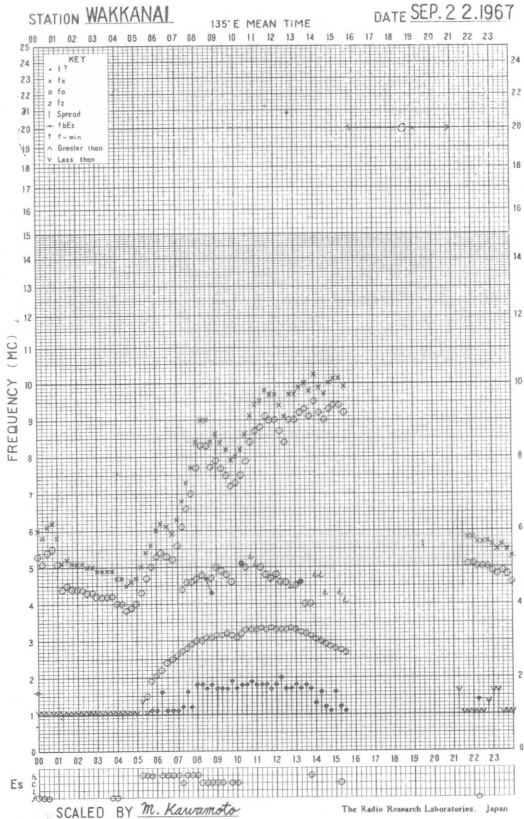
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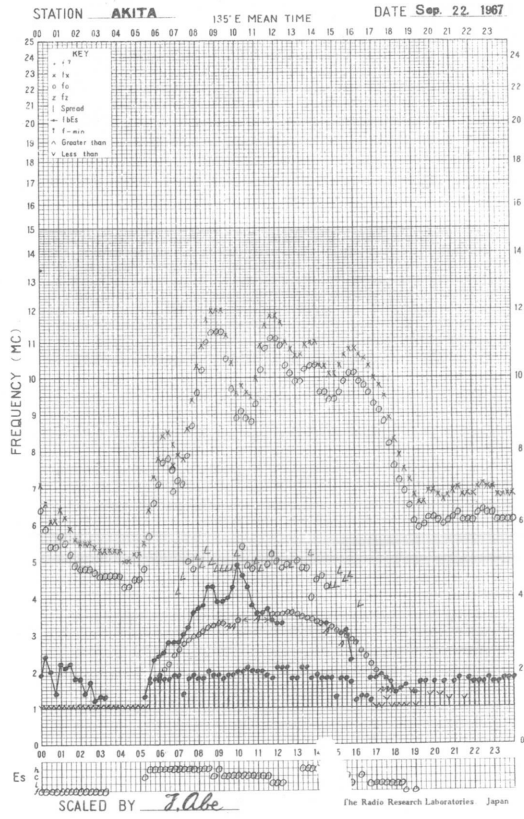
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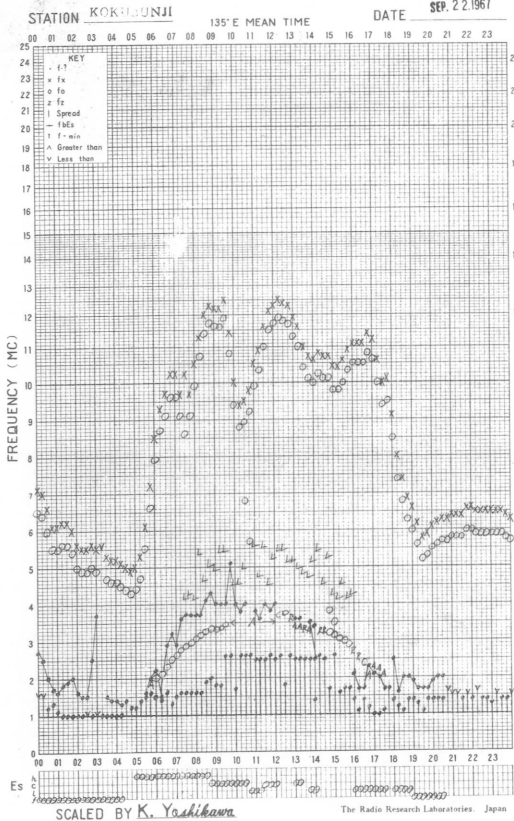
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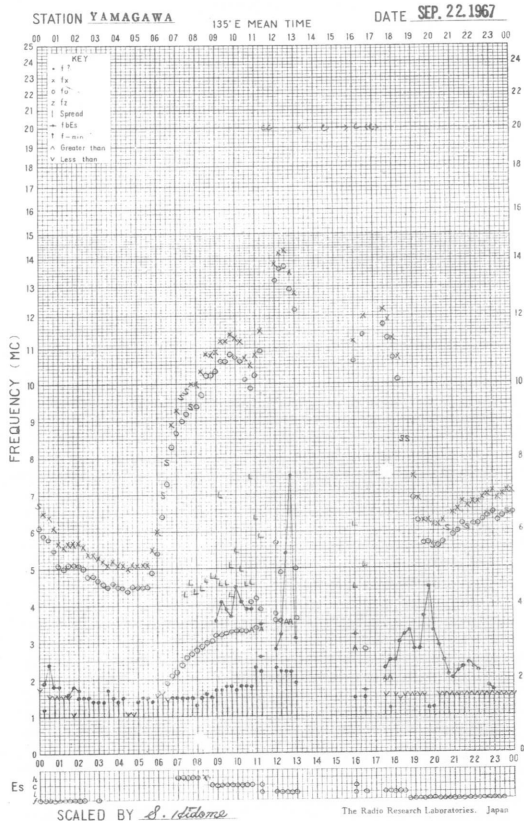
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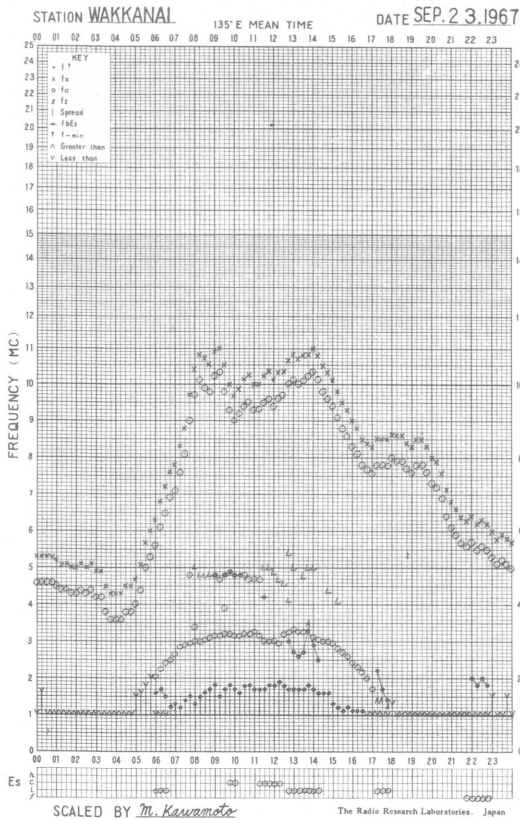
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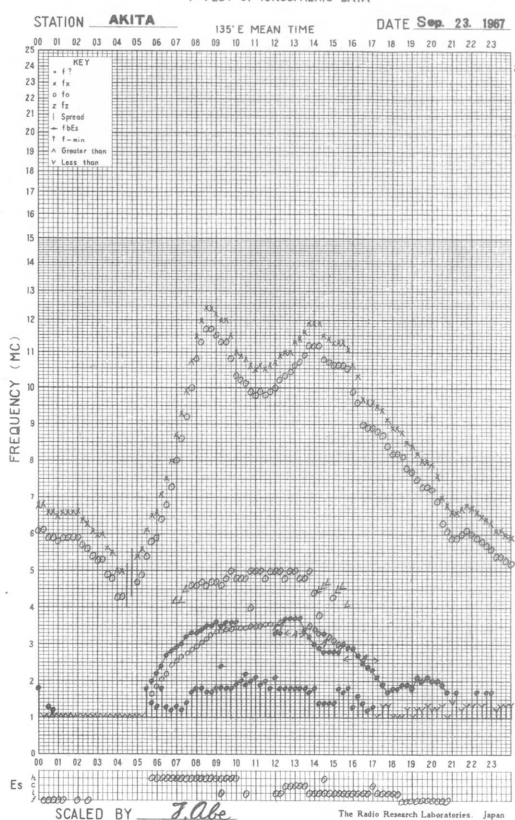
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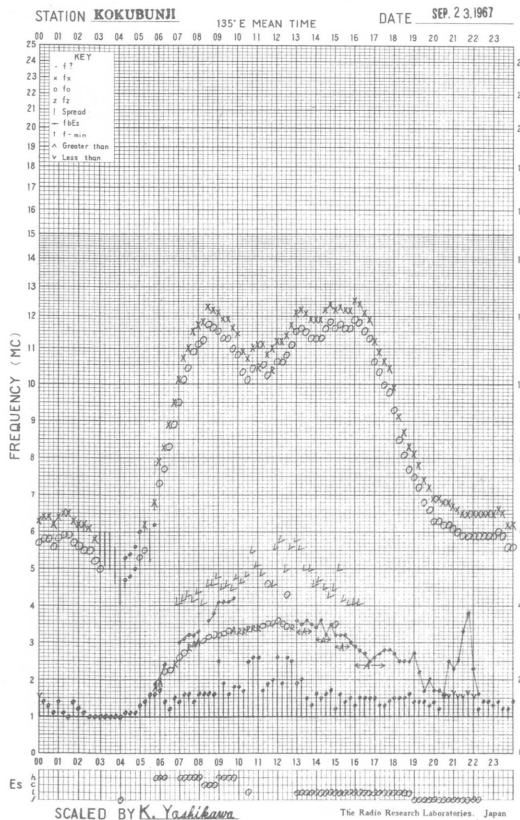
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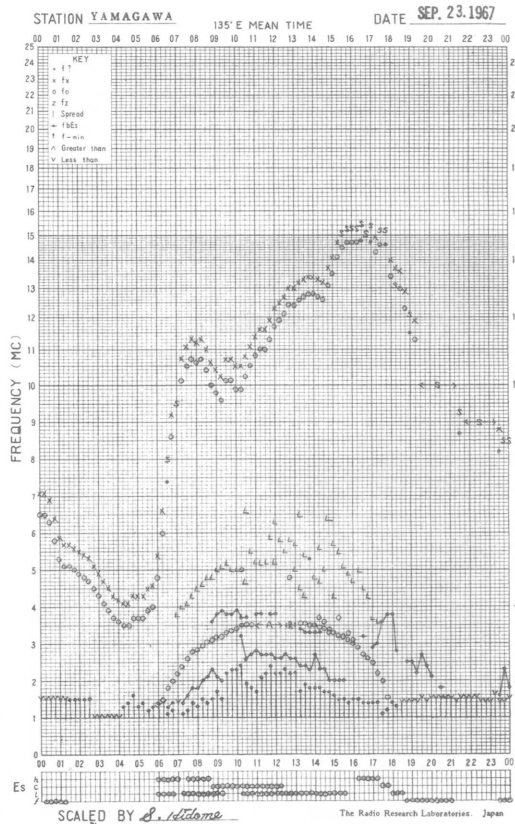
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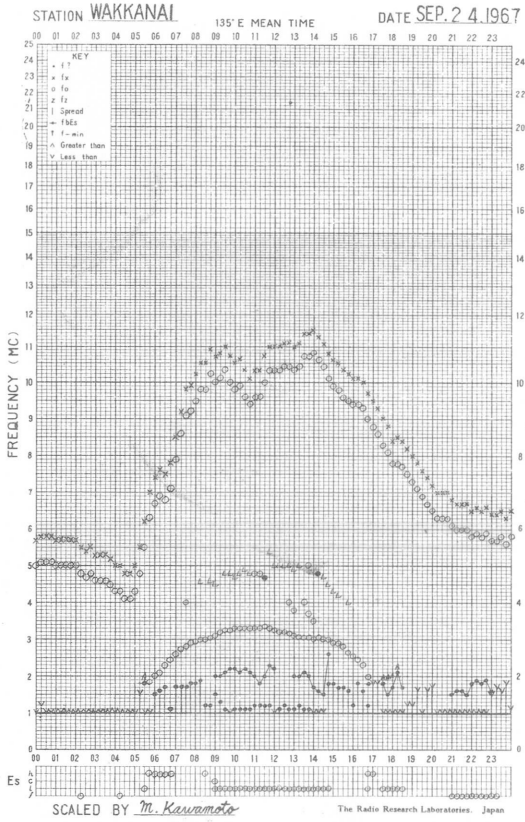
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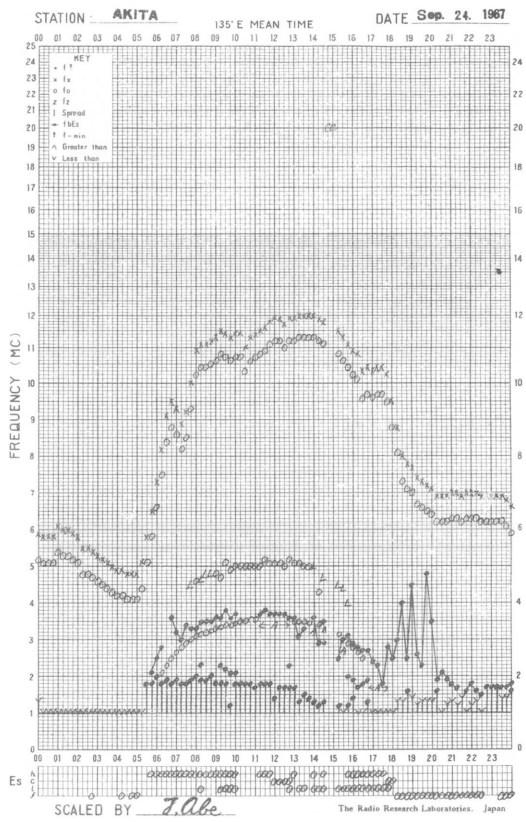
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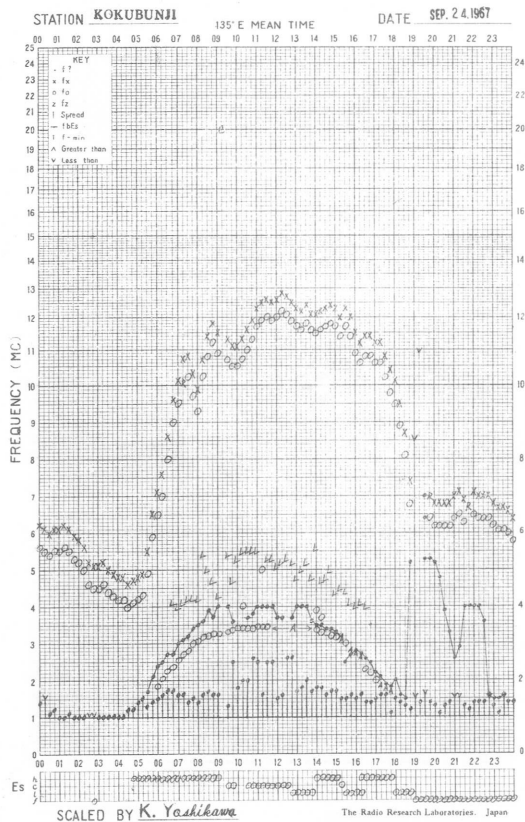
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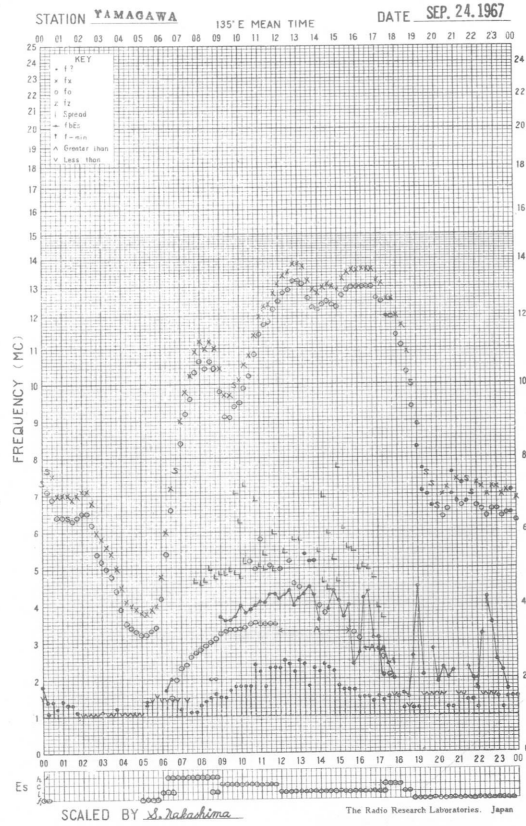
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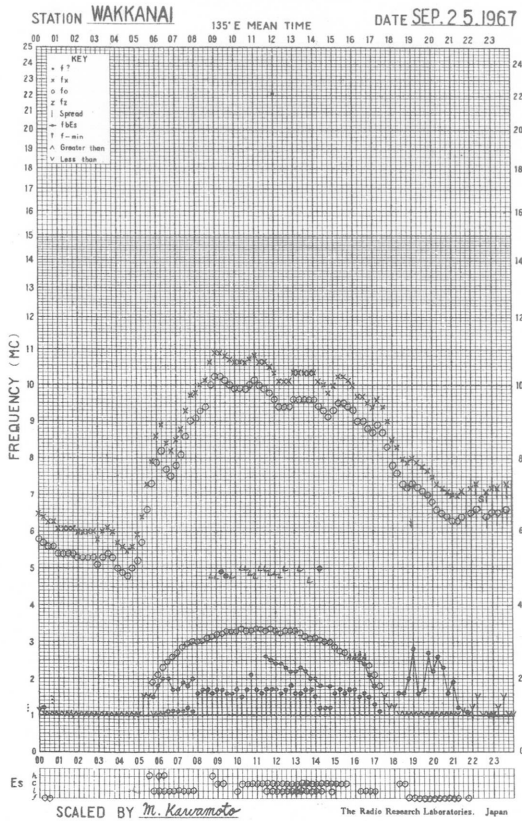
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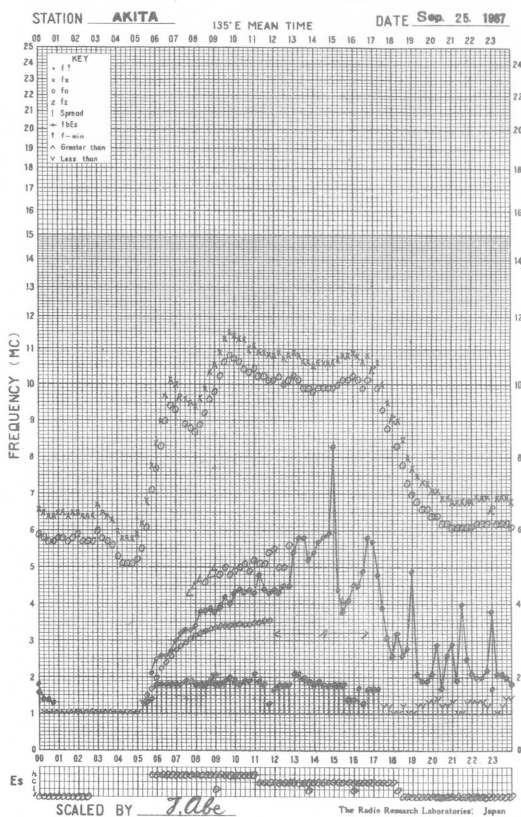
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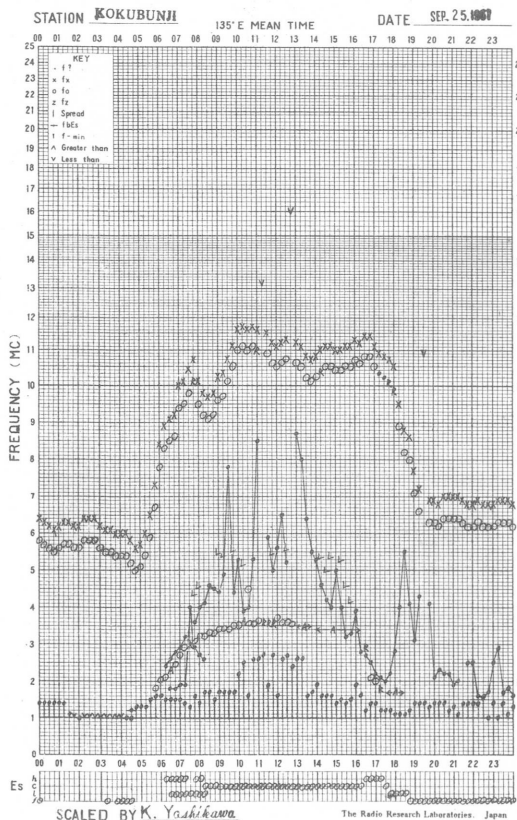
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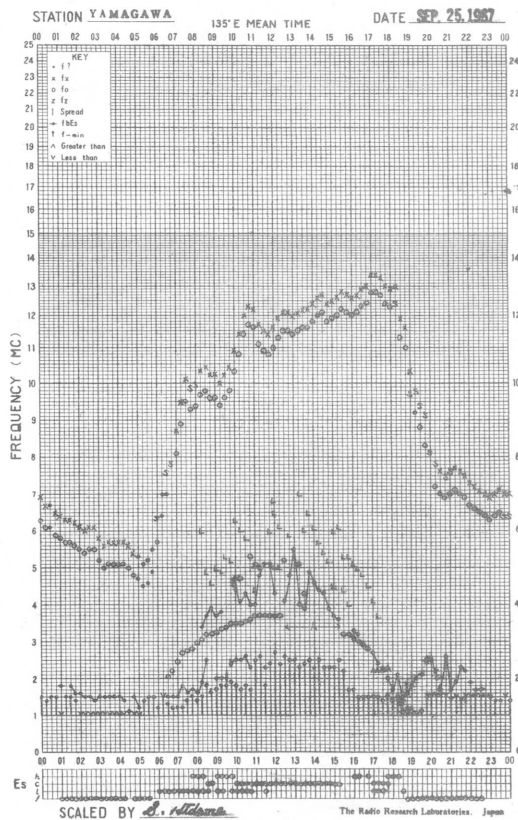
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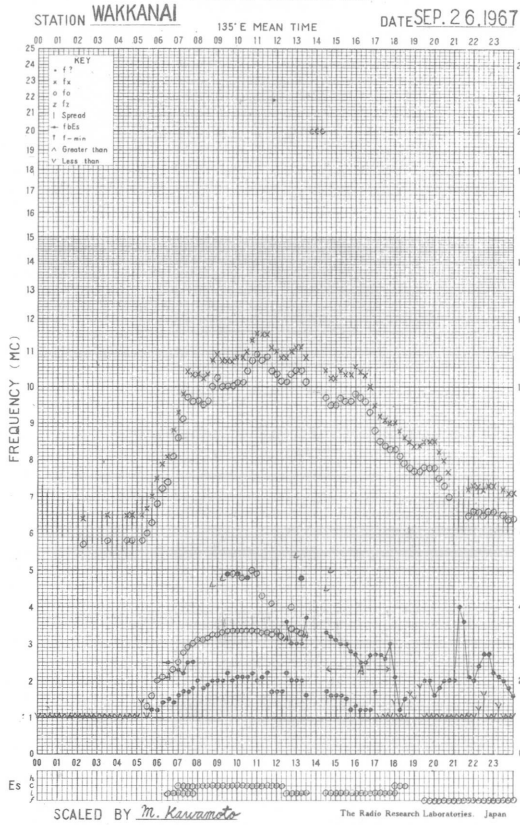
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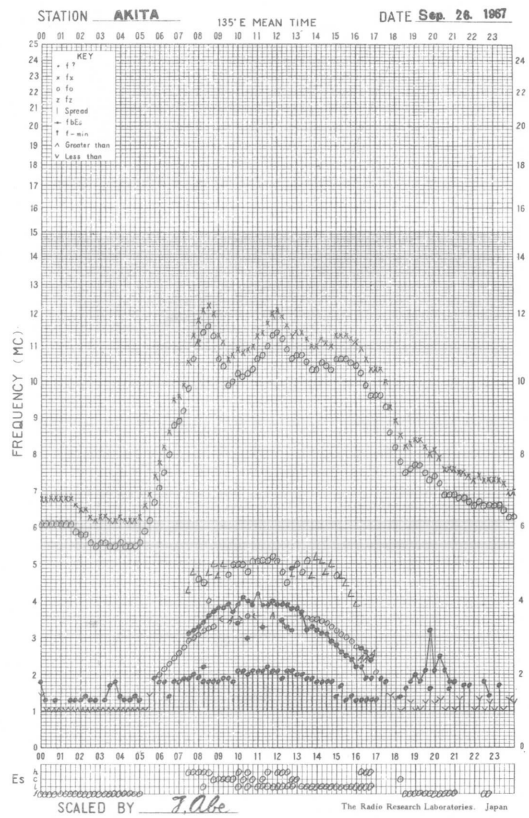
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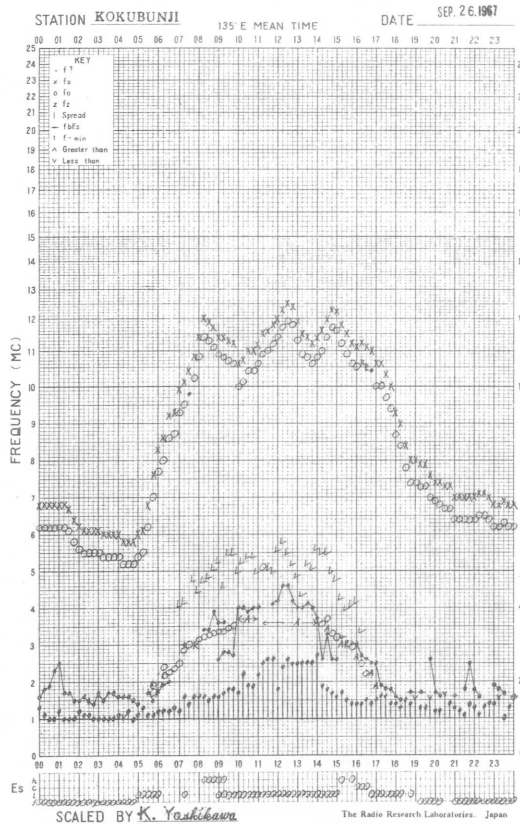
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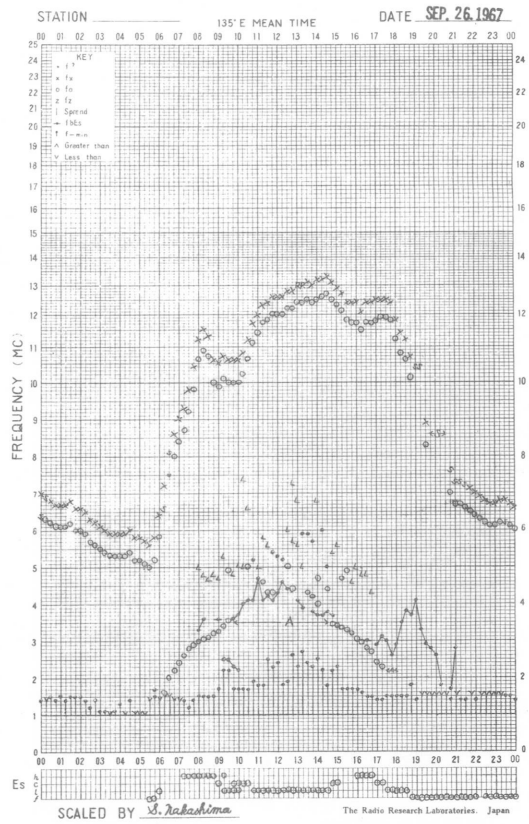
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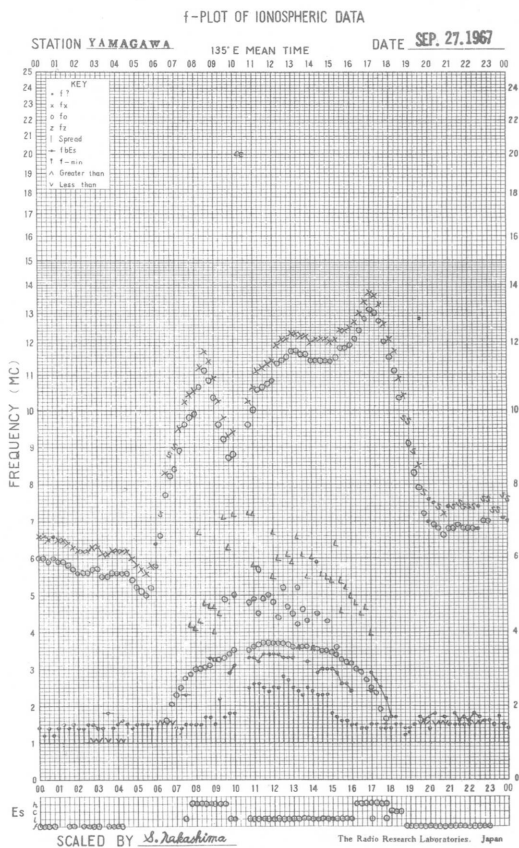
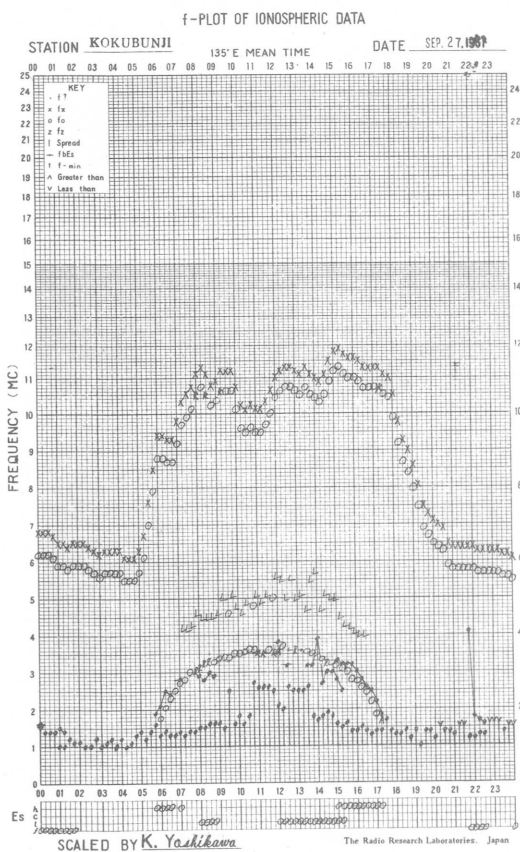
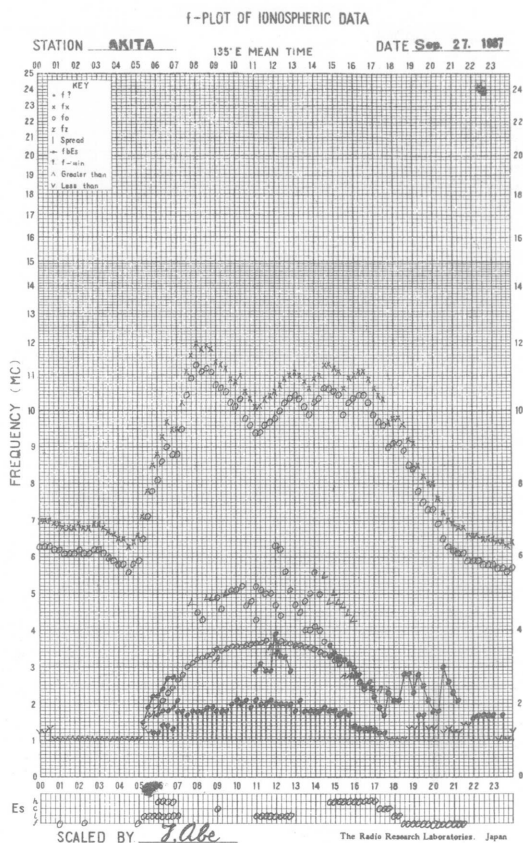
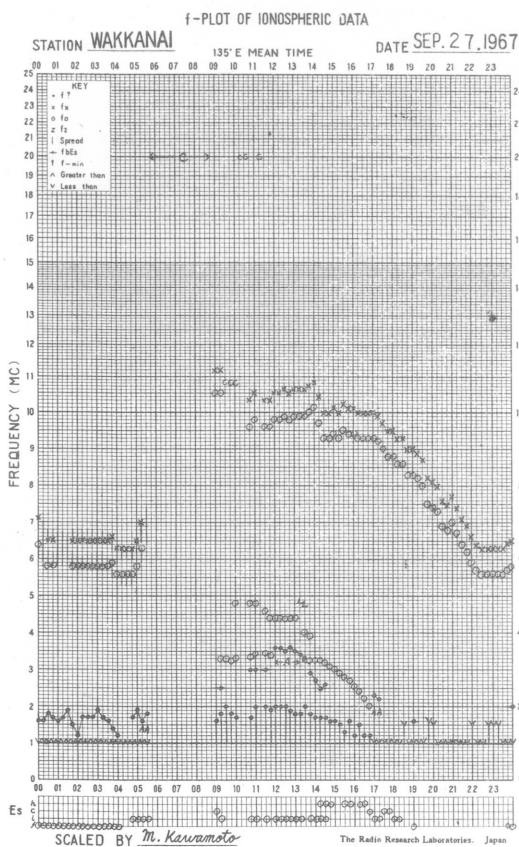


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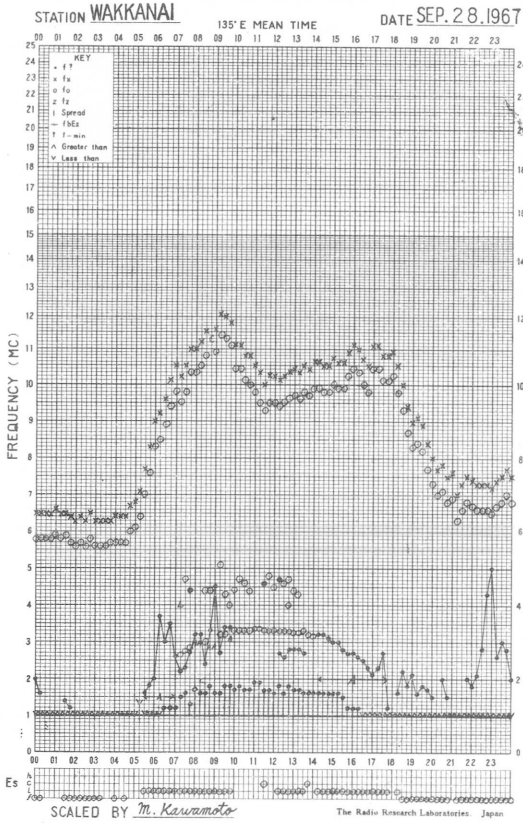


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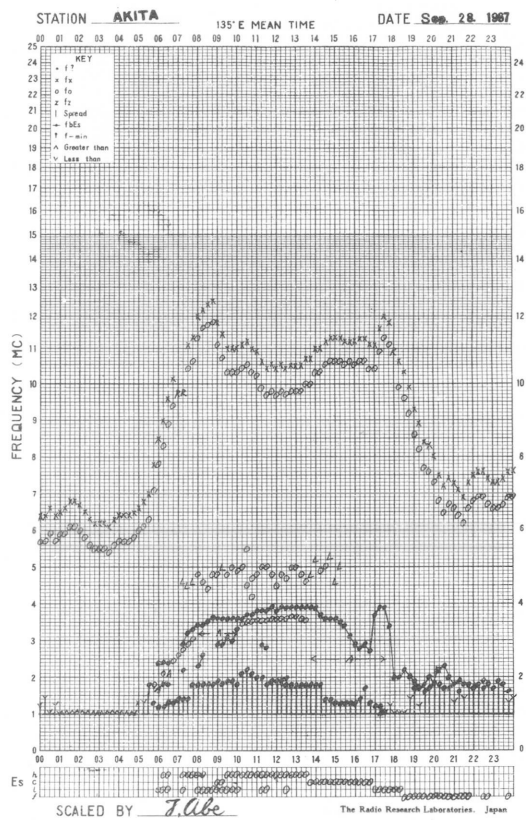




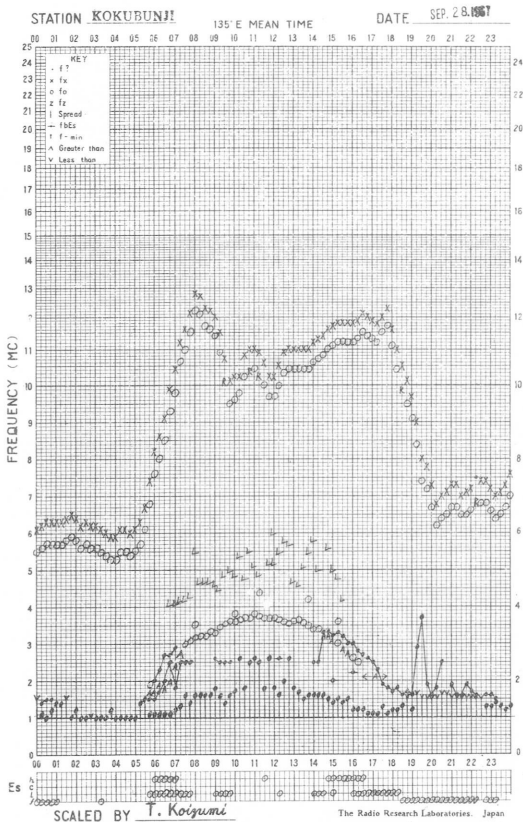
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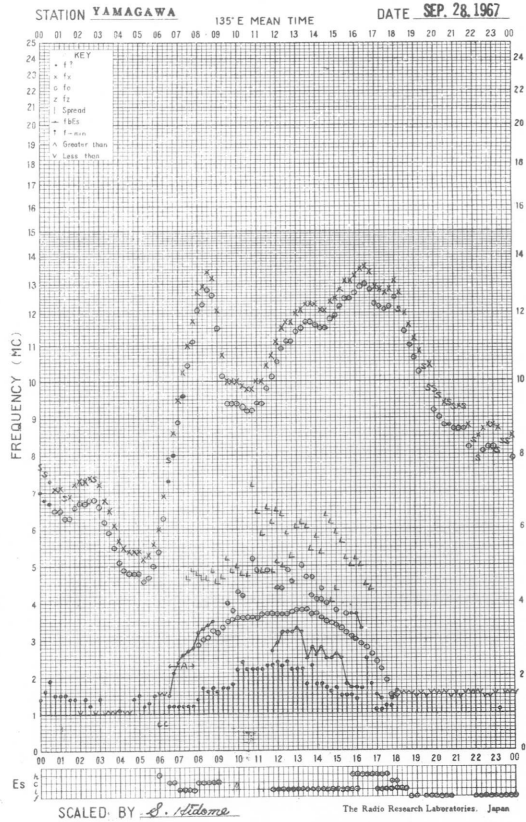
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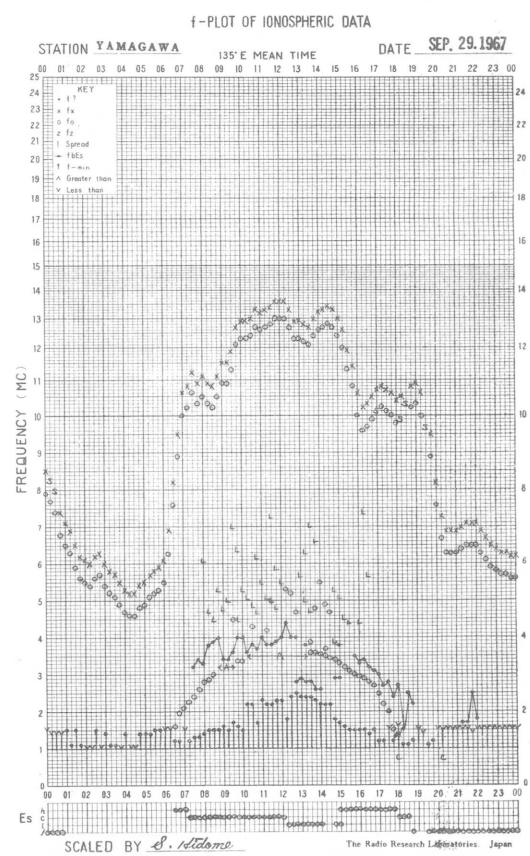
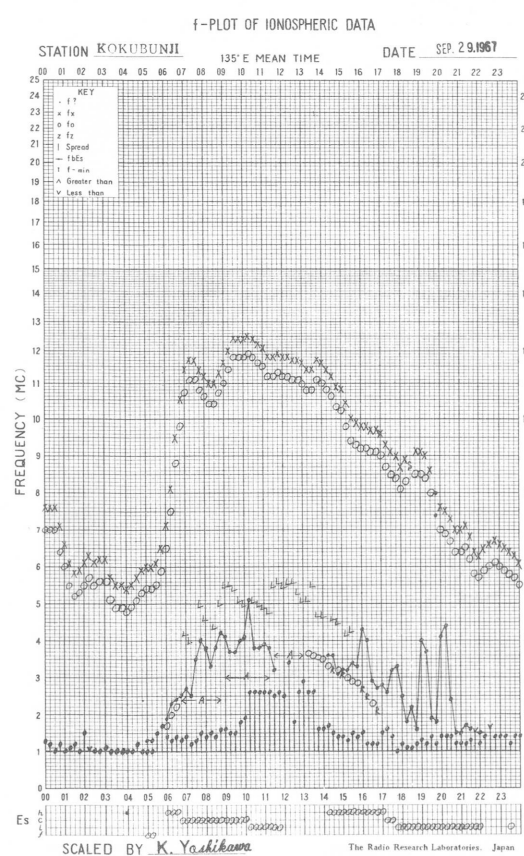
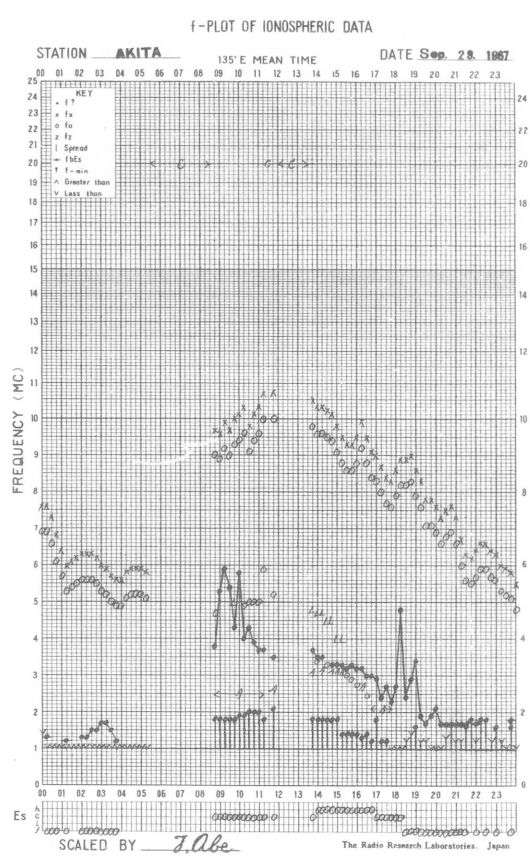
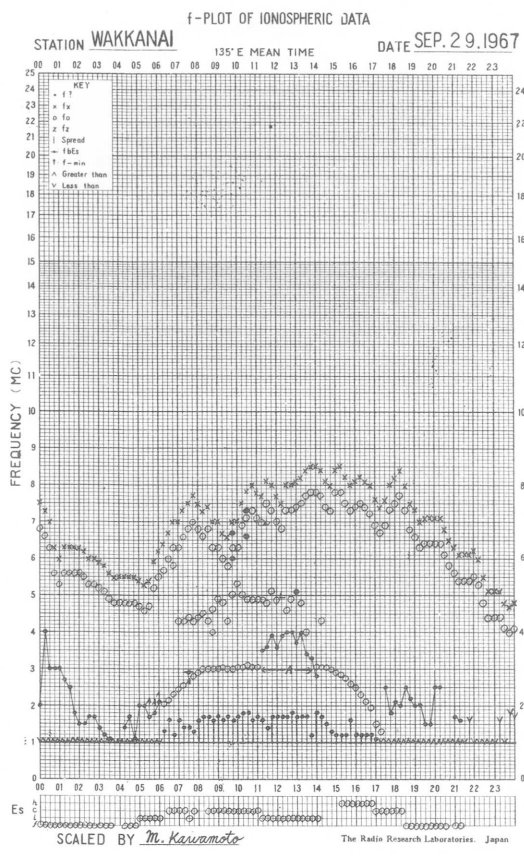


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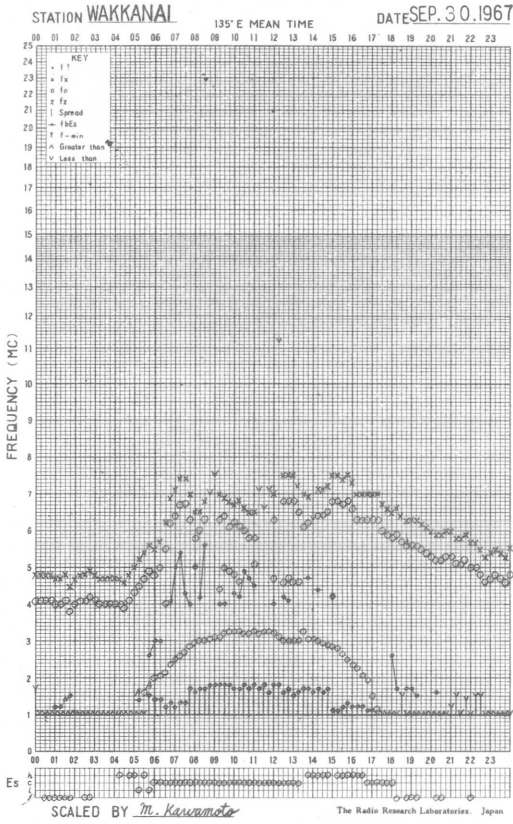


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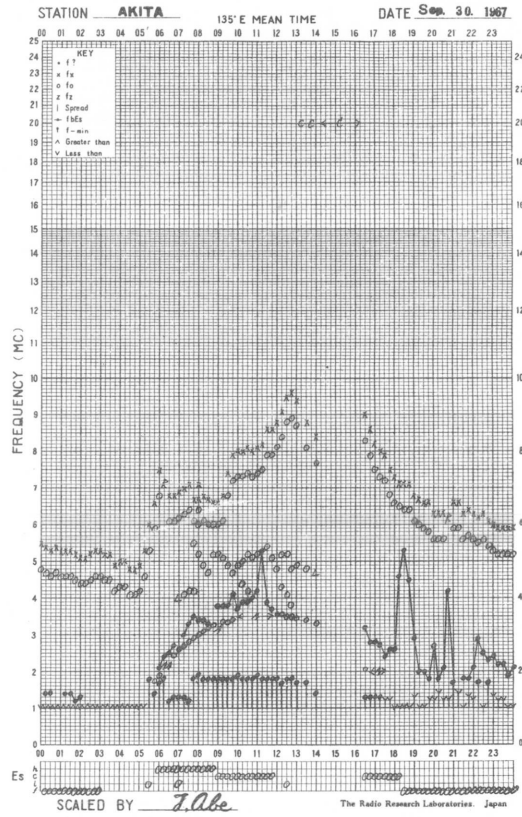




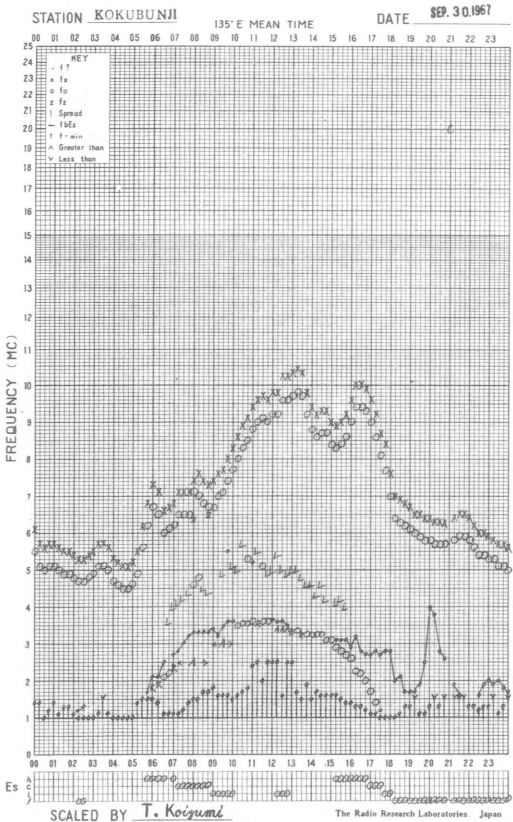
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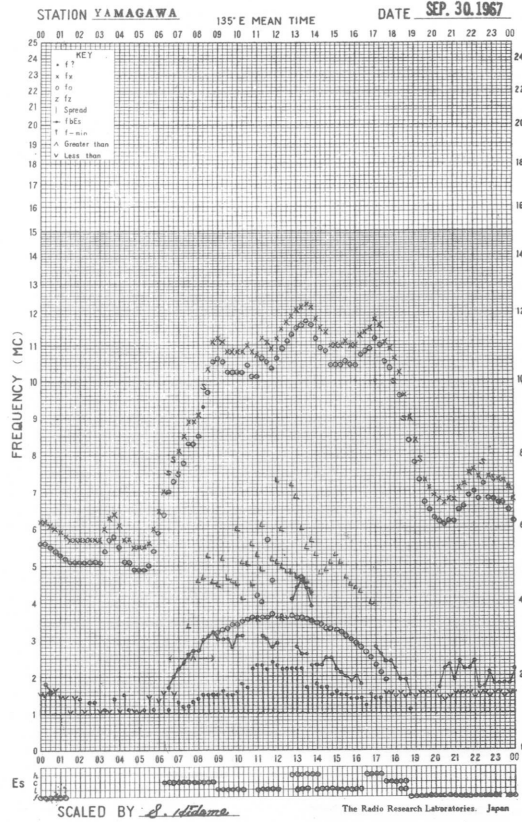
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA



SOLAR RADIO EMISSION

<u>Flux Density and Variability</u>										
Month: September 1967						Frequency: 200 MHz				
Observing station: Hiraiso										
Flux density $10^{-22} \text{Wm}^{-2} (\text{Hz})^{-1}$						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	10	9	-	-	10	0	0	-	-	0
2	9	8	10	(10)	9	0	0	0	(0)	0
3	10	11	9	(10)	10	0	1	0	(0)	0
4	10	(8)	-	8	(9)	0	(0)	-	0	(0)
5	10	10	11	10	9	0	0	0	0	0
6	9	9	10	(9)	9	0	0	0	(0)	0
7	9	9	11	7	9	0	0	0	0	0
8	8	8	9	-	8	0	0	0	-	0
9	8	7	(7)	-	7	-	0	(0)	-	0
10	-	-	-	-	-	-	-	-	-	-
11	6	(5)	-	-	(6)	0	(0)	-	-	(0)
12	(6)	(6)	7	-	(6)	(0)	(0)	0	-	(0)
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-
16	-	(6)	5	6	(5)	-	(0)	0	0	(0)
17	5	6	5	5	5	0	0	0	0	0
18	8	6	6	-	6	1	0	0	-	0
19	6	6	5	-	6	0	0	0	-	0
20	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-
25	-	6	(5)	6	(5)	-	0	(0)	0	(0)
26	7	6	4	6	6	0	0	0	0	0
27	6	6	5	6	6	0	0	0	0	0
28	6	5	6	6	6	0	0	0	0	0
29	7	7	(7)	7	7	0	0	(0)	1	0
30	7	9	8	8	8	0	0	1	1	0

Note No observations during the following periods:

1st	0500-	2400	9th	0700-	11th	0130
2nd	2020-	2300	11th	0400-	12th	0100
3rd	2020-	2300	12th	0200-	13th	0650
4th	0135-	0300	13th	0650-	16th	0500
4th	0400-	0850	18th	2020-		2400
6th	2020-	2300	19th	2020-	25th	0300
8th	2020-	2400	25th	0700-		0850

SOLAR RADIO EMISSION

<u>Flux Density</u>					
Month: September 1967					
Observing station: Hiraiso			Frequency: 500 MHz		
Flux density $10^{-22} \text{ W m}^{-2} (\text{Hz})^{-1}$					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	31	32	35	30	32
2	32	31	33	28	31
3	31	33	31	29	31
4	30	30	31	30	30
5	31	31	31	28	31
6	31	30	31	30	30
7	28	27	25	28	27
8	27	28	26	-	27
9	30	30	29	-	30
10	-	-	-	-	-
11	30	30	30	31	30
12	27	29	27	-	29
13	28	27	(27)	-	28
14	-	-	-	-	-
15	-	-	-	-	-
16	32	33	33	-	33
17	33	33	34	-	33
18	33	34	36	-	34
19	-	32	33	34	(32)
20	33	35	35	33	34
21	33	(35)	-	-	33
22	(28)	29	(34)	32	30
23	33	34	-	32	33
24	32	30	32	31	32
25	-	-	-	-	(31)
26	-	(34)	(36)	32	(35)
27	34	34	39	31	35
28	35	35	36	32	34
29	32	32	32	30	32
30	32	33	34	31	32

Note No observations during the following periods:

6th	2020-	2200	17th	0400-	0500
8th	2020-	9th 0100	17th	2020-	2400
9th	2020-	11th 0100	18th	2020-	19th 0300
12th	2020-	2400	21st	0400-	22nd 0200
13th	0700-	16th 0100	23rd	0600-	0850
16th	2020-	2400	25th	0000-	26th 0515

Distinctive Events

(single-frequency observations)

Month: September 1967

Observing station: Hiraiso

Normal observing period: 2020 - 0850 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density		Remarks
						$10^{-22} \text{ Wm}^{-2} (\text{Hz})^{-1}$		
	MHz	UT	UT	minutes		peak	mean	
3	200	0301.5	0301.8	1.5	C	310	150	
12	500	2205.5	2205.7	1.5	C	30	10	
	200	2205.0	2205.0	1.0	C	190	80	
18	200	0205.0	0205.5	1.0	C	190	90	
	500	2312.0	2348.1	46.0	C	160	30	

Measurement of H.F. Field Strength (Upper Side-band of WWV)
 Frequency: 15 MHz, Bandwidth: 140 Hz, Receiving Antenna: Rod (4.5 m)
 Measured at Hiralzo

Sept. 1967

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

*

Measurement of H.F. Field Strength
 Frequency: 15 MHz, Bandwidth: ±40 Hz,
 Receiving Antenna: Rod (4.5 m)
 Measured at Hiraíso

UT Date	Measurement of H.F. Field Strength															Measured at Hiraíso									
	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	<-10s	-18	-2	1	7	10	16	14	12	6	14	10	11	8	-2	<-23s	<-33s	0	-19	-7	2	-5	< 5s	-9	
2	-8	-16	-5	0	2	13	14	18	22	17	15	15	5	12	-4	<-20s	<-16s	<-14s	<20s	7	-11	0	< 3s	-7	
3	-10	-6	-5	2	5	10	13	19	17	21	6	8	10	2	<-24s	<-11s	-21	<54s	-5	1	2	< 3s	-12		
4	-13	-9	-7	-1	6	9	16	20	17	15	-1	25	11	-5	<-20s	<-20s	18	21	0	-2	-2	< 2s	-6		
5	-10	-9	-6	0	9	13	19	17	19	10	3	17	18	-5	-17	-5	11	0	<-13s	-3	-2	0	< 1s	-10	
6	-6	-3	-1	5	7	14	16	21	22	20	0	12	14	14	0	<-23s	23	8	-15	-1	2	-1	< 3s	-10	
7	-15	-6	-3	-4	5	11	16	13	19	22	11	-3	<-18s	-7	-10	<-16s	-10	10	-21	-1	-2	-1	< 1s	-4	
8	-11	-13	-7	-4	7	12	17	16	0	18	23	7	20	-7	-8	-11	20	10	-18	-1	2	-1	< 2s	-7	
9	-9	-7	-1	-4	8	11	19	19	12	12	20	4	10	-8	-3	-13	-1	6	-16	-2	-3	-1	3	-13	
10	-9	-7	1	-4	12	12	19	14	11	15	20	17	7	6	-7	<-18s	13	15	5	-1	-3	-3	0	<-17s	
11	-10	-3	1	4	9	11	21	11	4	9	11	-4	-10	-6	-6	<-23s	-11	14	10	-11	1	<-19s	18	-3	
12	-14	-5	5	9	11	23	24	16	19	25	20	17	19	7	<-11s	<-19s	7	15	13	3	0	2	0	8s	-5
13	-6	-5	-4	3	10	16	20	25	25	25	16	8	13	10	14	-5	-4	<33s	-2	1	0	2	<-5s	-3	
14	-7	-6	2	12	10	18	22	23	20	16	-5	<-5s	< 3s	-6	-13	<-18s	4	17	-1	1	<-11s	-1	<-1s	-6	
15	-6	-3	3	6	14	18	17	17	24	24	9	8	-2	<-18s	<-20s	<-24s	<-26s	-15	-3	4	3	0	< 2s	-4	
16	-2	-5	0	12	16	17	21	19	24	18	4	-1	<-11s	<-19s	-4s	-6	<-19s	<-25s	-11	-4	5	2	2	2	-5
17	-3	-2	0	9	14	19	20	26	21	20	14	-1	<-6s	<-13s	<-14s	<-17s	<-24s	<-27s	<-12s	-2	0	1	(2s	-5	
18	-6	-12	4	6	14	18	24	21	24	26	3	-2	<-5s	<-18s	<-26s	-18	10	-6	-11	0	11	< 5s	< 3s	<-18s	
19	-7	-6	2	6	11	16	25	24	23	17	20	21	21	-4	<-14s	<-13s	<-20s	18	-1	-1	6	(4s	< 2s	-8	
20	-3	-6	-1	17	15	17	22	24	22	12	2	10	21	17	-16	<-20s	<-22s	<-16s	-4	-9	4	-3	< 1s	-8	
21	-1	0	5	7	22	21	27	24	28	21	23	21	17	<-8s	<-15s	-7	<-21	<-33s	<-33s	-17	-9	0	< 10s	-7	
22	-7	-5	2	7	13	20	22	18	-1	-4	<-16s	<-10s	<-9s	<-12s	<-14s	<-14s	<-25s	12	<-23s	-5	1	4	< 10s	<-4s	
23	0	-6	5	9	17	21	25	21	17	23	2	2	<-4s	<-12s	<-10s	-12	12	9	-19	-3	2	1	< 4s	-5	
24	-3	-4	2	6	13	18	18	28	28	22	16	< 2s	< 0s	-11	<-13s	-8	(-14s	27	14	5	2	3	< 9s	-3	
25	-3	-5	2	6	12	22	< 22s	22	5	16	17	11	5	2	<-21s	<-19s	(-8s	4	-6	1	1	2	< 2s	<-11s	
26	-4	-6	0	5	12	20	21	26	28	17	13	21	1	-7	< 14s	<-16s	<-17s	7	7	1	6	3s	< 0s	-12	
27	-10	-3	-4	9	15	20	24	26	24	24	24	< 2s	-4s	-17	<-14s	<-17s	<-21s	19	<-6s	1	2	< 4s	8	-4	
28	-4	-6	-4	9	17	18	22	22	24	24	24	6	-3	-1	2	-1	5	25	<-18s	0	2	2	5	-3	
29	0	-3	-3	7	17	21	20	17	24	15	24	19	10	17	-7	-16	<-36s	<-3s	0	8	8	< 2s	5	-8	
30	-2	-3	1	13	19	19	15	8	11	15	3	<-5s	<-5s	-8	<-15s	<-23s	11	-18	<-12s	-1	5	3	5	-5	
Median Count	-7	-6	1	6	12	18	(20s	20	21	18	13	8	5	-6	<-12s	<-16s	-11	7	(-12s	-1	2	(0s	< 2s	-7s	
Upper decile	30	30	30	30	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30	25	30
Lower decile	-1	-2	5	12	17	21	25	26	28	25	23	21	20	14	< 4s	-5	18	21	10	5	6	< 4s	< 9s	-3	
	<-13s	-12	-7	-1	6	10	< 14s	13	5	9	-1	<-5s	<-9s	<-18s	<-21s	<-23s	<-26s	<-33s	<-25s	-9	-11	<-3s	<-3s	<-13s	

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

Sept. 1967	S W F							Correspondence					
	Drop-out Intensities (db)						Start- time	Dura- tion	Type	Imp.	Flare	Solar Noise	Mag.
CO	SF	HA	TO	HB	SH								
2	-	18					20.37	17	S	1+			
18	-	27	-				23.30	70	Slow	2-	x	x	

IONOSPHERIC DATA IN JAPAN FOR SEPTEMBER 1967

第 19 卷 第 9 号

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