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IONOSPHERIC DATA IN JAPAN

FOR OCTOBER 1968

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RADIO RESEARCH LABORATORIES

NUKUI-KITAMACHI, KOGANEI-SHI, TOKYO, JAPAN

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SITE OF THE RADIO WAVE OBSERVATORIES AND HIRAIISO BRANCH

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

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

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

	Latitude	Longitude	Site
Hiraíso	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_oE_s		The lowest ordinary wave frequency at which the E_s layer begins to become transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.
f -min		The frequency below which no echoes are observed.
$M(3000)F2$		The maximum usable frequency factor for a path of 3000 km for transmission by $F2$ layer.
$M(3000)F1$		The maximum usable frequency factor for a path of 3000 km for transmission by $F1$ layer.
$h'F2$		The minimum virtual height, $h'F2$, refers to the highest, most stable stratification observed in the F region and can only be scaled when such stratification is present.
$h'F$		The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by $h'F$. Thus $h'F$ is identical with the current $h'F2$ when F region stratification is absent, e.g., at night, and with the current $h'F1$ when $F1$ stratification is present.
hE_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 component 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. Definitions of the CNT, MED, UQ and LQ

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

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

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

d. Description of Standard Types of E_s

The eight standard types of E_s are identified by corresponding capital letters: *F, L, C, H, Q, R, A, S*. These letters suggest the names flat, low, cusp, high, equatorial, retardation, auroral and slant, respectively. The letter 'N' is used to designate any 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_0E . This is usually continuous with the normal E trace, although when the deviative absorption is large, part or all of the cusp may be missing. (Usually a daytime type.)
- H* An E_s trace showing a discontinuity in height with the normal E layer trace at or above f_0E . The cusp is not symmetrical, the low frequency end of the E_s trace lying clearly above the high frequency end of the normal E trace. (Usually a daytime type.)
- Q* An E_s trace which is diffuse and non-blanketing over a wide

frequency range. The spread is most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)

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

A An E_s having a well defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. These sometimes extend over several hundred kilometers of virtual height.

S A diffuse E_s trace which rises steadily with frequency and usually emerges from another type E_s trace. The rising trace alone is classified as 'S'; the horizontal trace is classified separately. At high latitudes the slant trace usually starts to rise from a horizontal E_s trace such as E_s-L or E_s-F , at frequencies which greatly exceed the E layer critical frequency, whereas at low latitudes it usually rises from E_s-Q , E_s-C or E_s-Hat frequencies near the regular E critical frequency. Type S is never used to determine f_oE_s and $h'E_s$. 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.

e. 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 500MHz at Hiraiso Branch. Antennas are two parabolic reflectors : 10 meter for 200 MHz and 5 meter for 500 MHz, each having the total power receiver. Observations are feasible almost from sunrise to sunset.

a. Time and Unit

The time is expressed as U.T.

The unit is $10^{-22} \text{ W} \cdot \text{m}^{-2} \text{ Hz}^{-1}$ for both components of polarization.

b. Daily Data

Flux density

The three-hourly and daily mean values are given.

Variability

The three-hourly and daily mean values are given at 200 MHz only.

Variability is expressed in the following four grades:

0=Quiet or no burst,

1=A few bursts,

2=Many bursts,

3=Very many bursts.

The number of bursts exceeding the flux level is counted.

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

c. Distinctive Events

The phenomena are picked up on the following criteria:

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

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

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

Descriptive type is denoted by the following symbols:

S = Simple rise and fall of intensity;

C = Complex variation of intensity,

C + = Prolonged broad-band enhancement of radiation, generally of spectral type IV;

F = Group of bursts: multiple peaks probably belonging to the same event, but separated by relatively short period of quietness;

RF = More or less irregular rise and fall of intensity, at metric or decimetric wavelengths;

e = Sudden beginning of burst with steep rise of intensity;

E = Steep rise of intensity of continuum background;

p.i. = post-burst increase;

onset storm = clear-cut beginning of a noise storm.

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

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

C. RADIO PROPAGATION CONDITIONS

a. Field Strengths of WWV and WWVH

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

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

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

Transmitter		
	WWV	WWVH
Location	Fort Collins, Colorado Long. 105°02' W Lat. 40°41' N	Maui, Hawaii Long. 156°28' W Lat. 20°46' N
Power	3 kW for the upper side-band	0.5 kW* for the upper side-band
Antenna	$\lambda/2$ 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 Hz 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.
- U: Inaccurate measurement influenced by interferences, atmospheric, or non-propagational reasons.
- E: Less than the following figure.

b. Radio Propagation Quality Figures

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

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

The tabulated circuits contain Hamburg (commercial circuit), WWV (10, 15 and 20 MHz frequencies broadcast from Fort Collins, Colorado), Lima (commercial circuit) and WWVH (10 and 15MHz frequencies broadcast from Hawaii), which are received at Hiraiso Branch.

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

N=normal
U=unstable
W=disturbed

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

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

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

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

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

Circuits and Drop-out intensities

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

Start-time and Duration

Types

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

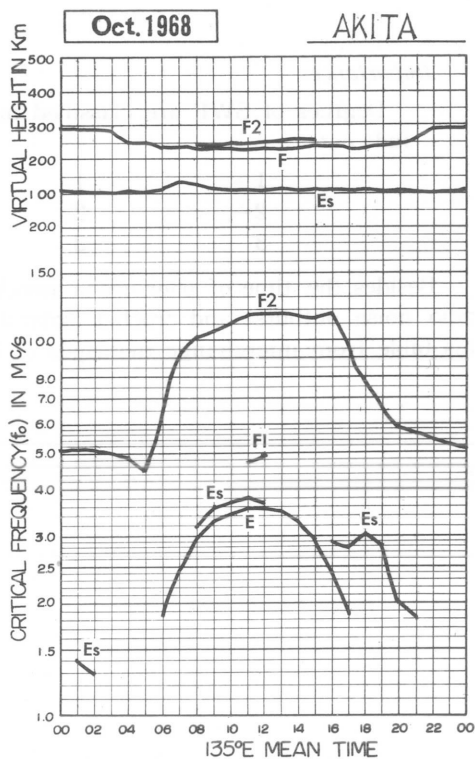
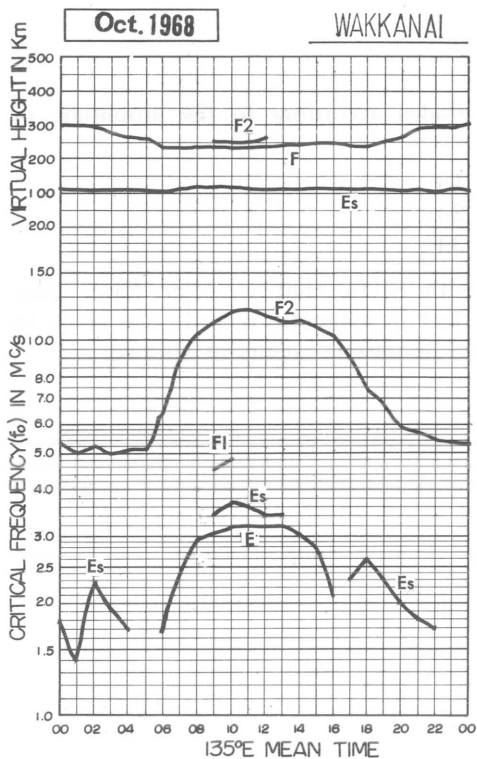
Importances

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

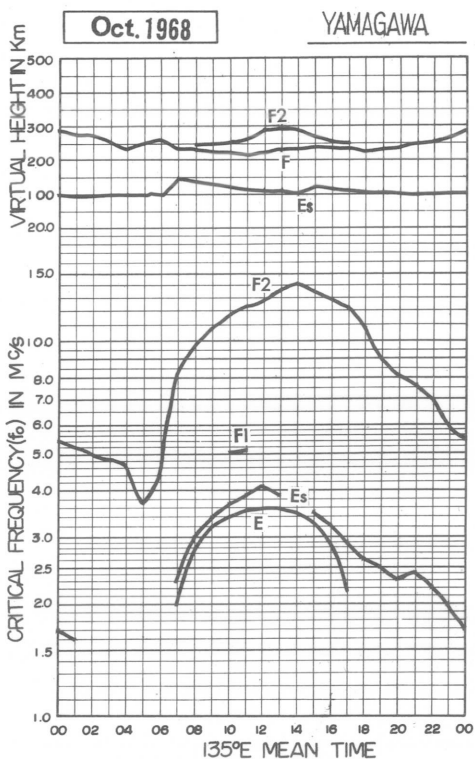
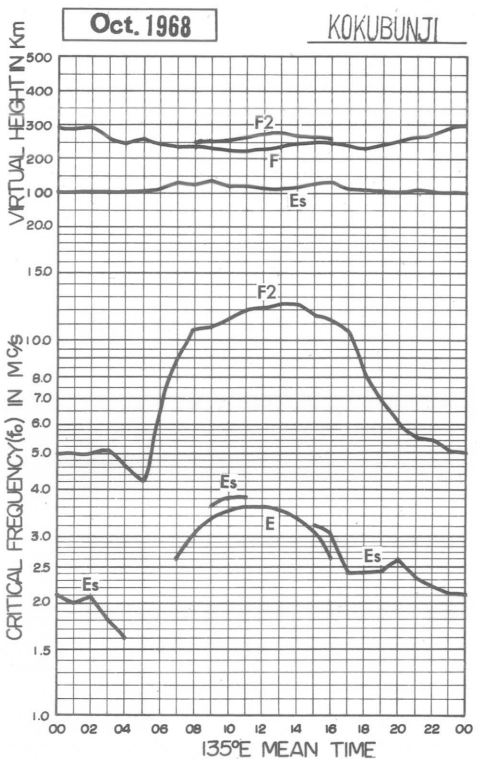
1-	1	1+
2-	2	2+
3-	3	3+

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

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA

OCT. 1968

foF2 (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	65	67	64	61	63	63	79	86	100	111	109	104	106	104	109	108	104	95	83	73	78	73	69	65	
2	63	63	64	63	60	64	74	87	104	118	116	116	105	122	125	114	110	118	117	87	53	47	43	48	
3	49	43	45	41	31	33	59	83	96	107	109	119	114	114	113	105	97	103	91	74	58	53	57	55	
4	45	48	46	45	46	45	74	84	98	106	114	120	I _C 114	107	104	106	105	98	83	80	63	53	52	51	
5	50	50	48	49	47	48	I _C 66	90	113	108	109	H 110	104	103	101	97	98	93	78	74	66	59	56	51	
6	50	50	52	52	50	51	75	98	106	111	107	109	104	103	94	96	92	85	66	67	69	66	64	57	
7	F ₅₆	F ₅₆	F ₅₄	F ₅₄	F ₅₄	F ₅₅	70	92	105	102	101	101	105	103	94	105	98	86	78	76	73	70	64	60	
8	57	57	54	55	50	53	75	96	108	S 113	102	98	103	113	111	105	103	101	78	73	59	56	57	57	
9	56	56	55	56	53	50	66	89	93	105	110	113	113	110	112	112	114	89	73	72	71	62	55	55	
10	53	50	51	50	50	52	73	87	96	111	110	109	112	112	107	104	101	92	73	68	64	59	54	53	
11	52	53	54	F ₅₆	F ₅₃	43	60	82	93	112	115	111	118	104	96	101	105	90	74	69	63	59	53	55	
12	55	54	54	54	I _C 51	49	70	86	96	105	106	118	113	114	114	118	113	104	82	63	62	63	65	63	
13	60	56	50	46	40	I _C 39	40	C	C	C	C	C	C	C	C	78	76	61	I _C 56	53	43	43	40	40	
14	40	C	C	C	C	C	C	C	C	C	C	C	I _C 111	104	97	94	93	89	64	F ₅₈	F ₅₀	F	F	F	
15	U ₅₂	U ₅₁	F	F	F	F	U ₆₇	80	94	107	125	116	106	101	104	101	103	89	73	67	60	57	U ₅₆	U ₄₉	
16	F	U ₄₈	U ₄₈	F	U ₅₅	53	61	83	87	100	118	121	I _C 106	104	101	97	91	83	74	70	54	46	47	47	
17	47	45	46	50	53	53	60	83	101	116	123	131	121	115	114	109	100	83	69	59	53	55	54	52	
18	48	50	51	50	50	48	64	93	103	109	121	124	121	123	116	113	109	93	70	70	65	67	60	58	
19	F ₅₆	F	F	F	U ₅₇	F ₅₆	75	91	102	111	130	138	125	123	112	116	107	89	77	71	65	59	53	U ₅₀	
20	U ₅₀	F ₄₉	F ₄₉	F ₅₀	U ₆₀	43	57	86	117	122	124	124	117	H 123	107	120	106	86	73	66	55	50	53	51	
21	58	60	60	54	52	52	64	100	113	115	123	123	114	105	100	97	103	78	67	62	56	58	S ₅₆	58	
22	F ₅₇	63	60	F ₆₀	F ₅₇	F ₆₀	63	88	109	107	115	116	113	105	103	110	113	78	61	56	52	51	51	53	
23	54	55	54	53	55	53	60	83	98	110	118	113	114	103	96	93	88	72	67	63	51	48	46	U ₄₆	
24	50	51	50	U ₄₉	U ₅₀	50	65	93	109	114	121	131	130	119	123	118	110	89	73	65	58	F ₅₈	F ₆₀	F ₅₇	
25	F ₅₇	F ₅₈	F ₆₀	F	F ₅₅	F ₆₀	U ₇₀	108	128	127	120	123	133	130	127	118	103	89	F ₇₅	U ₆₀	U ₅₀	F	F	F ₅₈	
26	U ₆₀	F ₅₀	U ₅₄	F ₅₃	F ₅₁	F ₅₂	66	104	123	140	131	131	126	113	118	109	102	83	63	58	F ₄₆	U ₄₈	U ₅₀	F	
27	F ₄₉	U ₄₈	U ₄₈	U ₄₇	F	U ₅₁	61	94	107	118	H 113	121	106	110	113	118	103	88	68	66	63	55	53	F ₅₀	
28	F	U ₄₈	F	F	F ₅₀	49	62	94	124	123	124	123	127	113	113	105	94	83	67	65	54	49	46	44	
29	44	45	F ₄₅	F ₄₄	46	43	61	82	106	120	118	131	139	132	114	111	108	96	78	73	58	50	48	43	
30	45	47	47	41	37	37	64	93	104	104	120	151	143	139	131	126	123	82	F ₇₃	F ₅₄	F	F	F	F ₅₇	
31	U ₅₇	F	F	F	F	F	43	56	96	108	130	148	143	141	139	125	118	114	88	73	58	44	36	34	35
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	28	26	25	27	29	30	29	29	29	29	29	30	30	30	31	31	31	31	31	30	28	28	29	
MED	53	50	52	50	51	51	64	89	104	111	118	120	114	112	112	108	103	89	73	67	58	56	54	53	
UQ	57	56	54	54	55	53	70	94	109	118	123	124	125	122	114	115	108	93	78	72	64	59	57	57	
LQ	49	48	48	49	50	45	61	84	98	107	110	113	106	104	101	101	98	83	68	61	53	50	49	49	

IONOSPHERIC DATA

OCT. 1968

foF1 (0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1												A	L											
2										L	UL 500	L		A										
3										UL 470	L	L	UL 490											
4									L	UL 460		L												
5										L	L													
6											UL 480													
7										UL 450	UL 460	UL 460	L											
8											UL 470	UL 450												
9										410														
10											UL 480		UL 440											
11												L												
12											L	L												
13										C	C	C	C	C	C	C								
14										C	C	C	C	C										
15											L	L	L											
16											L	L												
17										L	L													
18																								
19																								
20											A													
21																								
22																								
23																								
24												A												
25												400												
26											L													
27																								
28												A												
29																								
30													L											
31																								
CNT										4	5	3	2											
MED										UL 455	UL 480	UL 450	UL 465											
UQ										UL 465	UL 480	UL 455												
LQ										430	UL 470	425												

IONOSPHERIC DATA

OCT. 1968

foE (0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	250	305	320	350	320	310	300	A	A	A	A						
2							165	245	300	310	320	320	300	320	320	300	245	A						
3							185	A	295	300	300	I A 320	345	A	A	300	235	135						
4							A	260	300	330	330	I A 315	I C 300	300	320	A	A	A						
5							C	255	295	305	325	335	350	335	320	300	250	A						
6							190	260	300	310	340	340	350	340	320	290	230	C						
7							175	260	295	310	335	335	330	325	305	285	230	S						
8							155	245	300	300	315	I A 310	335	I A 335	315	295	220	E						
9							170	250	300	305	300	300	I A 325	325	315	290	210	A						
10							155	250	300	305	I A 315	330	320	325	305	290	215	A						
11							185	260	300	305	I A 320	325	335	325	310	290	230	S						
12							S	240	300	320	320	325	320	320	305	I A 265	210	A						
13						C	C	C	C	C	C	C	C	C	C	270	205	A						
14							C	C	C	C	C	C	C	310	305	280	A	A						
15							A	230	290	300	305	300	I A 310	315	295	A	A	A						
16							E	230	285	305	325	320	I C 325	320	300	I A 250	205	S						
17							S	230	290	300	320	320	305	290	270	265	200	S						
18							S	225	295	305	315	310	300	290	310	A	205	A						
19							S	240	290	310	325	335	320	310	290	250	A	S						
20							A	235	290	305	320	320	A	A	A	A	A	A						
21							A	240	295	305	325	320	320	315	300	290	210	E						
22							A	A	A	A	310	310	315	300	300	I A 260	205	S						
23							S	230	295	305	I A 305	310	310	I B 315	300	260	200	E						
24							E	210	290	305	335	325	305	280	A	260	A	A						
25							E	200	285	300	305	320	A	A	A	290	205							
26							S	200	265	300	300	A	A	A	A	A	A							
27							A	225	275	305	330	A	325	325	310	270	190							
28							S	200	285	290	285	A	305	A	A	A	A							
29							S	200	245	265	325	335	330	330	300	260	190							
30							S	220	290	300	305	330	I A 310	320	I A 295	260	190							
31							A	A	A	330	350	340	335	310	295	255	185							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							11	26	27	28	29	26	26	25	23	24	22	4						
MED							165	238	295	305	320	320	320	320	305	275	208	E						
UQ							180	250	300	310	325	330	330	325	312	290	230	E 135						
LQ							E 155	E 225	290	300	305	315	310	310	300	260	200	E						

IONOSPHERIC DATA

OCT. 1968

foEs (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E	E	E	15	16	J X 24	J X 24	G	G	G	G	49	37	40	J X 43	J X 35	J X 33	20	J X 30	J X 25	J X 21	22	E 17	E 15	
2	E	E	E S 13	E	17	17	E	G	G	32	37	38	40	40	J X 56	40	34	23	J X 34	J X 53	J X 23	E 15	E 18	E 15	E
3	E	E	J X 23	J X 25	J X 21	E	G	25	G	34	37	J X 53	33	J X 43	J X 53	35	34	24	J X 23	J X 64	J X 63	J X 53	J X 21	18	
4	18	J X 25	J X 29	J X 24	J X 26	J X 30	J X 23	G	G	G	G	38	39	C	36	G	J X 38	J X 36	24	J X 28	E 16	E 15	E	E	E
5	E S 12	15	J X 24	18	J X 23	E	C	J X 33	G	G	G	G	G	G	G	G	G	23	J X 26	J X 30	J X 23	E 16	E 16	E 15	E 15
6	E S 16	E	E	E	E	E	G	G	33	G	G	G	G	G	G	G	G	E C 15	E C 49	J X 24	E 15	20	E 16	E 15	E
7	E	E	E	E	E	E	22	G	G	G	G	G	G	G	G	G	G	E S 16	E	E	J X 24	E	E	E S 15	E S 15
8	E	E	E	E	E	E	20	G	G	G	G	M 38	43	G	35	G	32	G	30	E	J X 35	20	E 15	E 15	E
9	E	E	E	E	E	E	G	G	G	36	35	G	36	J X 34	34	27	G	24	J X 24	E	E 15	E 15	E 17	E	E
10	20	J X 23	E	J X 20	E	E	20	G	G	40	J X 40	G	G	G	G	G	G	20	E 15	E	E	15	J X 24	J X 38	E
11	J X 65	J X 66	J X 53	J X 25	J X 36	J X 23	31	30	G	44	39	G	G	G	G	G	G	E S 15	E S 15	E S 17	E	E S 17	E S 16	E	E
12	J X 30	J X 33	J X 33	J X 24	C	J X 25	G	G	G	G	36	G	G	G	G	G	G	20	20	21	E 15	E 16	E 14	E	J X 30
13	J X 63	J X 43	J X 28	J X 23	E	C	E C 22	C	C	C	C	C	C	C	C	C	G	J X 25	G	J X 23	D C 33	20	E 15	E	E
14	E S 15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	J X 25	19	E 16	E	E 15	E 15	22	E S 14
15	E	E	J X 25	J X 21	18	J X 23	20	G	G	23	35	36	34	G	G	J X 40	J X 33	J X 26	J X 28	J X 23	20	19	E	E	E
16	E S 15	E	E	J X 23	J X 22	E	J X 61	G	G	33	G	37	C	G	G	J X 62	G	E S 15	22	J X 25	E 14	E	E S 14	E	E
17	18	E	E	E	E	E	G	G	G	G	36	35	43	41	34	G	G	E S 15	E	J X 33	J X 26	J X 24	J X 25	J X 21	J X 21
18	E S 15	E	E	E	E	E	E S 17	G	G	35	37	36	34	32	30	29	G	17	20	J X 30	20	E	E	J X 20	20
19	24	E	J X 34	E	E	E	E S 17	G	G	G	G	47	45	J X 50	J X 51	J X 61	23	J X 23	J X 30	E 15	E 15	E 15	E 15	20	20
20	E S 17	E	E	17	E	E	17	G	G	36	J X 55	40	J X 44	39	J X 52	J X 36	J X 33	J X 23	J X 53	J X 103	J X 51	J X 25	J X 63	E	E
21	J X 24	E	E	J X 21	E	E	18	28	G	37	39	40	42	35	35	G	G	18	18	E	J X 31	J X 23	J X 23	J X 103	J X 103
22	J X 26	J X 43	J X 25	15	J X 53	J X 34	J X 35	J X 43	J X 36	J X 34	39	44	40	38	33	33	J X 30	E S 12	E S 12	J X 24	J X 28	J X 20	E 15	E 17	E 17
23	J X 21	19	J X 23	E	16	E	G	G	G	44	40	40	G	E B 35	G	G	G	J X 23	J X 23	J X 25	J X 30	J X 24	J X 20	J X 63	E
24	J X 58	J X 23	J X 28	J X 23	J X 23	E	G	G	36	39	41	71	39	44	31	J X 41	22	J X 43	18	20	19	J X 30	J X 31	25	25
25	15	14	J X 23	J X 53	J X 30	E	G	30	38	39	37	G	J X 52	J X 63	J X 61	G	G	J X 48	J X 40	J X 23	20	J X 35	J X 81	J X 25	J X 25
26	18	J X 30	J X 24	15	J X 21	J X 21	E S 15	28	34	J X 44	J X 40	38	J X 54	J X 56	J X 43	J X 34	J X 25	J X 83	J X 53	J X 43	J X 33	J X 28	J X 30	J X 23	J X 23
27	J X 35	15	J X 23	J X 23	J X 23	J X 21	21	31	30	G	32	33	33	25	G	G	23	J X 33	J X 40	J X 31	E S 17	J X 35	J X 53	J X 28	J X 28
28	J X 33	J X 43	J X 28	J X 25	J X 24	J X 23	E S 16	25	31	J X 41	40	J X 61	35	40	35	J X 33	J X 40	J X 23	J X 34	J X 33	J X 33	J X 21	J X 21	E 15	E 15
29	J X 51	J X 61	J X 53	J X 20	J X 25	15	E S 15	G	31	31	G	G	G	G	G	G	20	G	J X 25	J X 33	J X 33	J X 30	J X 21	J X 24	E
30	J X 21	E	E	E	E	E	E S 15	33	33	J X 50	J X 71	G	J X 110	G	33	40	26	J X 53	J X 65	J X 63	J X 31	J X 31	J X 24	J X 24	J X 24
31	J X 34	J X 53	J X 23	J X 23	J X 25	J X 31	J X 53	J X 40	J X 34	G	G	G	G	G	34	32	G	E S 15	E S 63	J X 43	18	E	E S 15	E S 16	E
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	30	30	30	29	29	29	29	29	29	29	29	29	27	30	30	31	31	31	31	31	31	31	31	31
MED	18	14	J X 23	19	17	E	E G 17	G	G	34	37	36	34	34	30	32	G	20	23	J X 26	J X 23	20	18	17	E 15
UQ	J X 28	J X 30	J X 28	J X 23	J X 23	J X 23	22	28	32	39	39	40	41	40	35	J X 36	26	J X 27	J X 36	J X 33	J X 29	J X 24	J X 24	J X 24	J X 24
LQ	E E 14	E	E	E	E	E	G	G	G	G	G	G	G	G	G	E G 16	G	20	18	E	E	E 15	E 15	E 15	E

IONOSPHERIC DATA

OCT. 1968

fbEs (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	E	E	E	15	12	16	21	G	G	G	G	48	G	G	40	33	25	19	20	17	18	16	E	E						
2	L	E	E	11	13	E	G	G	G	G	G	G	G	52	G	G	G	21	22	20	14	E	E	E	E					
3	E	E	19	20	13	E	G	G	G	G	G	G	G	31	35	34	G	G	18	60	33	36	18	17						
4	15	16	20	20	18	20	21	G	G	G	G	38	C	G	G	36	25	22	19	E	E	E	E	E						
5	E	14	E	17	12	E	C	23	G	G	G	G	G	G	G	G	G	18	15	23	20	E	E	E	E					
6	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	E	C	15	E	16	E	E	E					
7	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	E	S	16	E	E	E	E	E					
8	E	E	E	E	E	E	G	G	G	G	G	G	36	G	34	G	G	G	23	E	16	17	E	E	E					
9	E	E	E	E	E	E	G	G	G	G	G	G	G	33	29	26	G	24	G	20	20	E	E	E	E	E				
10	18	E	E	E	E	E	G	G	G	G	G	35	G	G	G	G	G	18	G	16	E	E	E	15	20	20				
11	20	37	15	16	16	17	16	G	G	G	G	35	G	G	G	G	G	E	S	15	E	E	E	E	E	E				
12	18	25	28	20	C	18	G	G	G	G	G	G	G	G	29	28	28	17	18	18	E	E	E	E	18					
13	22	20	18	14	E	C	E	C	C	C	C	C	C	C	C	C	C	G	18	16	15	E	E	E	E	E				
14	E	C	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	18	25	18	E	E	E	E	16	E				
15	E	E	17	E	E	17	15	18	19	G	G	G	G	G	34	G	G	25	35	30	26	19	16	18	18	E	E			
16	E	E	E	12	E	E	12	G	G	G	G	G	G	C	G	G	24	G	E	S	15	E	18	E	E	E	E			
17	17	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E	S	15	E	16	17	20	E	17			
18	E	E	E	E	E	E	E	S	17	G	G	G	G	G	G	G	G	29	28	17	15	15	18	E	E	17	16			
19	E	S	15	E	16	E	E	E	S	17	G	G	G	G	45	43	43	41	59	22	E	S	15	20	E	E	E	E	S	15
20	E	E	E	E	E	E	15	G	G	G	45	G	36	37	47	29	22	17	43	26	21	E	S	16	17	E	E			
21	16	E	E	E	E	E	13	G	G	G	G	G	G	G	G	G	G	G	G	15	E	15	18	16	17	E	E			
22	16	30	16	12	17	20	29	38	30	33	G	G	G	G	G	17	28	16	E	S	12	E	20	23	16	E	E			
23	18	15	E	E	E	E	G	G	G	G	35	G	G	E	B	35	G	G	G	15	16	23	20	20	E	S	15	17		
24	20	E	26	20	E	E	G	G	G	G	G	58	G	41	30	21	20	17	16	15	15	E	S	14	27	E	S	17		
25	15	14	17	12	16	E	G	G	G	G	G	G	G	36	34	47	G	G	37	16	18	15	28	30	E	E				
26	15	18	17	E	E	14	E	S	15	G	G	G	G	35	38	32	30	27	20	40	26	17	16	17	18	17	E	E		
27	18	E	15	E	13	16	15	G	G	G	29	33	29	24	G	G	G	G	21	40	20	E	29	24	22	E	E			
28	30	20	17	E	20	14	E	S	16	G	G	G	G	52	G	29	32	28	21	14	32	30	22	15	E	S	14	E	E	
29	18	23	32	E	15	15	E	S	15	G	G	G	G	G	G	G	G	19	G	17	22	15	20	18	18	E	E			
30	E	E	E	E	E	E	E	S	15	G	G	45	G	G	33	G	31	22	G	47	44	15	18	17	15	17	E	E		
31	30	20	E	13	12	16	20	27	28	G	G	G	G	G	G	G	G	G	E	30	25	E	E	E	E	E	E	E	E	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	31	30	30	30	29	29	29	29	29	29	29	29	29	27	30	30	31	31	31	31	31	31	31	31	31					
MED	15	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	17	16	16	15	E	E	E	E	E			
UQ	18	18	17	14	13	16	16	G	G	G	G	35	32	33	30	20	20	21	20	19	18	18	17	17						
LQ	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	E	G	E	G	E	E	E	E	E	E	E		

IONOSPHERIC DATA

OCT. 1968

f-min (0.1)

135 E Mean Time (G. M. T. +9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	E	16	17	28	18	18	17	17	16	E	E	E	E ₁₅	E	E ₁₅	E ₁₇	E ₁₅
2	E	E ₁₃	E	E	E	E	E	15	11	13	16	16	18	17	16	12	12	E ₁₃	E	E ₁₅	E ₁₈	E ₁₅	E	E
3	E	E	E	E	E	E	15	13	17	17	17	17	17	17	17	12	16	11	E	E ₁₅	E	E	E	E
4	E	E	E	E	E	E	E	13	12	20	25	20	C	17	16	12	11	E	E	E ₁₆	E ₁₅	E	E	E
5	E ₁₂	E	E	E	E	E	C	12	12	17	20	17	20	17	17	12	12	E	E	E	E	E ₁₆	E ₁₆	E ₁₅
6	E ₁₆	E	E	E	E	E	11	12	15	17	17	19	20	18	18	11	E	E ₄₉	E	E ₁₅	E ₁₅	E ₁₆	E ₁₅	E
7	E	E	E	E	E	E	E	E	17	17	16	19	18	18	17	13	12	E ₁₆	E	E	E	E	E	E ₁₅
8	E	E	E	E	E	E	11	16	16	17	16	17	16	17	17	17	12	E	E	E	E ₁₅	E ₁₅	E	E
9	E	E	E	E	E	E	E	12	12	17	16	20	18	17	12	12	11	E	E	E	E ₁₅	E ₁₅	E ₁₇	E
10	E	E	E	E	E	E	E	17	11	15	18	20	17	17	12	11	11	E	E ₁₅	E	E	E	E	E
11	E	E	E	E	E	E	E	13	17	17	15	17	17	12	12	12	12	E ₁₅	E ₁₅	E ₁₇	E	E ₁₇	E ₁₆	E
12	E	E	E	E	C	E	E ₁₄	15	16	18	16	17	17	17	13	12	E	E	E	E ₁₅	E ₁₆	E ₁₄	E	E
13	E	E	E	E	E	C	E ₂₂	C	C	C	C	C	C	C	C	C	15	11	E	E ₁₂	E	E	E ₁₅	E
14	E ₁₅	C	C	C	C	C	C	C	C	C	C	C	C	C	17	16	11	E	E	E ₁₆	E	E ₁₅	E ₁₅	E ₁₄
15	E	E	E	E	E	E	E	E	E	16	17	12	11	12	14	E	E	E	E	E	E	E	E	E
16	E ₁₅	E	E	E	E	E	E	12	14	16	16	16	C	17	17	E	E	E ₁₉	E ₁₂	E	E ₁₄	E	E ₁₄	E
17	E	E	E	E	E	E	E ₁₂	12	17	17	17	18	20	17	17	12	12	E ₁₅	E	E	E	E	E ₁₅	E
18	E ₁₆	E	E	E	E	E	E ₁₇	15	12	17	18	17	19	23	19	11	11	E	E	E	E	E	E	E
19	E ₁₅	E	E	E	E	E	E ₁₇	12	12	15	17	20	11	E	18	16	14	E ₁₅	E	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
20	E ₁₇	E	E	E	E	E	E	12	17	13	16	17	17	17	15	15	E	E	E ₁₄	E	E	E ₁₆	E ₁₂	E
21	E ₁₅	E	E	E	E	E	E	12	12	12	17	17	20	18	17	12	15	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	E	16	15	15	12	16	11	12	11	E ₁₂	E ₁₂	E	E	E	E	E ₁₅	E ₁₇
23	E	E	E	E	E	E	E ₁₂	12	12	18	16	17	17	35	19	16	14	E	E	E	E	E	E ₁₅	E ₁₅
24	E	E	E	E	E	E	E	15	12	18	28	19	17	16	18	15	11	E	E	E	E	E ₁₄	E	E ₁₇
25	E	E	E	E	E	E	E	12	18	17	17	17	17	17	15	15	13	E	E	E	E	E	E	E
26	E	E	E	E	E	E	E ₁₅	13	15	18	17	18	17	16	11	E	E	E	E	E	E	E	E	E
27	E	E	E	E	E	E	E	15	16	17	17	E ₂₃	20	17	17	12	12	E	E	E ₁₂	E ₁₇	E ₁₅	E	E
28	E	E	E	E	E	E	E ₁₆	16	13	12	17	12	17	18	17	17	E	E	E	E	E	E	E ₁₄	E ₁₅
29	E	E	E	E	E	E	E ₁₅	15	15	16	18	17	18	18	12	11	11	E	E ₁₄	E ₁₂	E	E	E	E
30	E	E	E	E	E	E	E ₁₅	12	15	12	15	17	16	17	12	12	14	E	E ₁₅	E	E	E	E	E
31	E	E	E	E	E	E	E	16	26	27	23	20	20	11	11	E ₁₅	E ₁₅	E	E	E	E	E	E ₁₅	E ₁₆
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	30	30	29	29	29	29	29	29	29	29	27	30	30	31	31	31	31	31	31	31	31	31
MED	E	E	E	E	E	E	E	12	15	17	17	17	17	17	16	12	11	E	E	E	E	E	E ₁₂	E
UQ	E ₁₂	E	E	E	E	E	E ₁₅	15	16	17	18	19	18	18	17	15	12	E ₁₅	E ₁₂	E ₁₂	E ₁₄	E ₁₅	E ₁₅	E ₁₅
LQ	E	E	E	E	E	E	E	12	12	16	16	17	17	17	12	11	E	E	E	E	E	E	E	E

IONOSPHERIC DATA

OCT. 1968

M(3000)F2(0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	260	280	275	270	285	290	330	315	305	315	315	290	290	290	285	290	310	310	305	265	280	275	270	280	
2	265	260	275	275	275	285	320	315	315	310	310	295	270	280	295	300	290	295	325	320	285	245	230	235	
3	245	250	260	315	270	255	305	315	310	320	310	310	305	300	300	305	300	310	320	305	255	265	265	295	
4	275	270	265	275	280	290	340	330	330	320	305	305	300	300	295	310	315	315	315	315	305	270	280	275	
5	280	260	260	270	275	290	I ^C ₃₂₅	335	320	335	315	310	310	300	300	315	305	325	295	310	300	290	295	280	
6	270	265	270	285	285	290	325	330	325	325	320	310	310	310	310	320	325	320	290	280	275	280	285	265	
7	270	270	260	265	270	280	315	335	325	335	320	305	310	310	295	320	310	300	295	300	300	305	290	280	
8	265	265	270	275	260	265	315	335	320	320	315	310	290	290	300	305	305	315	310	315	275	255	265	255	
9	255	255	260	265	300	300	335	335	315	310	315	305	290	290	295	305	320	315	300	290	310	290	275	275	
10	270	260	275	260	260	280	325	335	320	330	310	310	300	295	300	310	320	320	300	295	290	295	295	280	
11	270	265	275	275	F ³⁰⁰	300	320	330	325	315	315	315	305	315	310	305	325	315	305	305	290	295	275	265	
12	270	280	280	295	I ^C ₂₉₅	280	320	335	335	325	300	315	290	305	290	305	300	310	300	275	245	260	260	265	
13	275	270	255	270	245	I ^C ₂₅₀	265	C	C	C	C	C	C	C	C	320	325	300	I ^C ₂₉₀	310	255	265	250	260	
14	250	C	C	C	C	C	C	C	C	C	C	C	I ^C ₃₀₅	315	320	315	315	315	300	290	F ²⁸⁰	F ²⁸⁰	F ²⁸⁰	F ²⁸⁰	
15	U ^F ₂₆₀	U ^F ₂₃₀	F ²⁶⁵	F ²⁶⁵	F ²⁷⁰	F ²⁸⁵	U ^F ₃₁₅	330	340	300	320	310	305	305	310	305	310	325	300	300	285	295	U ^F ₂₉₅	U ^F ₂₆₅	
16	F ²⁶⁵	U ^F ₂₆₅	U ^F ₂₅₅	U ^F ₂₆₅	U ^F ₂₇₀	U ^F ₂₈₅	325	335	335	320	320	325	I ^C ₃₁₅	310	305	310	320	320	310	315	315	285	275	275	
17	270	260	260	265	285	305	315	335	320	315	310	320	310	315	305	310	340	300	305	295	280	275	295	285	
18	270	260	260	265	285	290	315	345	340	305	315	310	305	300	310	315	320	325	285	290	280	295	290	275	
19	F ²⁶⁵	F ²⁶⁵	F ²⁶⁵	F ²⁸⁰	U ^F ₂₈₀	U ^F ₂₇₀	320	350	330	295	320	305	300	305	305	315	325	305	315	305	305	305	275	U ^F ₂₆₀	
20	U ^F ₂₇₅	U ^F ₂₆₅	U ^F ₂₆₅	U ^F ₂₈₀	U ^F ₃₀₀	U ^F ₂₈₀	300	310	320	320	310	310	310	310	310	300	325	330	305	300	305	290	280	275	275
21	275	280	285	260	270	280	305	330	320	320	320	310	315	315	300	310	320	320	295	295	285	280	285	275	
22	285	285	285	285	285	300	300	340	330	330	305	310	310	305	305	305	335	320	305	295	285	280	280	270	
23	270	275	280	280	300	280	305	325	325	325	320	310	315	310	315	325	320	305	300	300	295	290	265	U ^F ₂₇₅	
24	270	275	290	U ^F ₂₆₅	U ^F ₂₆₀	U ^F ₂₉₅	335	330	330	315	310	310	310	310	300	310	320	305	300	285	280	275	275	U ^F ₂₆₀	
25	245	U ^F ₂₆₀	U ^F ₂₆₅	F ²⁶⁵	U ^F ₂₆₅	U ^F ₂₆₅	U ^F ₃₀₅	325	330	325	320	300	295	300	310	315	305	305	320	U ^F ₂₈₀	U ^F ₂₈₀	U ^F ₂₈₀	F ²⁷⁵	F ²⁷⁵	
26	U ^F ₂₉₅	U ^F ₂₆₀	U ^F ₂₇₅	U ^F ₂₇₀	U ^F ₂₉₅	U ^F ₂₇₅	290	325	310	325	315	320	315	315	315	310	335	320	300	315	285	U ^F ₂₇₀	U ^F ₂₇₀	F ²⁷⁵	
27	F ²⁸⁵	U ^F ₂₆₅	U ^F ₂₈₅	U ^F ₂₅₅	F ²⁷⁵	U ^F ₂₇₅	305	340	325	325	285	300	305	305	295	315	310	310	280	290	290	290	285	275	
28	F ²⁶⁵	U ^F ₂₆₅	F ²⁶⁵	F ²⁶⁵	285	285	300	320	330	315	300	300	305	310	320	325	310	315	295	310	295	290	285	280	
29	260	265	U ^F ₂₆₅	U ^F ₂₇₅	300	285	310	330	310	320	315	305	300	310	305	290	305	300	295	300	305	260	255	235	
30	240	250	280	245	245	245	295	315	310	310	290	305	300	300	305	310	320	295	310	U ^F ₂₈₀	U ^F ₂₈₀	F ²⁸⁰	F ²⁸⁰	U ^F ₂₃₅	
31	U ^F ₂₄₀	F ²⁶⁵	F ²⁶⁵	F ²⁶⁵	F ²⁶⁵	F ²⁶⁵	285	320	320	300	320	310	300	300	295	305	315	300	305	300	260	240	235	235	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	28	26	25	27	29	30	29	29	29	29	29	30	30	30	31	31	31	31	31	30	28	28	29	
MED	270	265	270	270	280	280	315	330	325	320	315	310	305	305	302	310	320	310	300	300	285	280	275	275	
UQ	275	270	280	280	290	290	325	335	330	325	320	310	310	310	310	315	322	320	308	308	295	290	285	275	
LQ	260	260	260	265	270	275	305	325	320	315	310	305	300	300	295	305	310	305	295	290	280	268	265	260	

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M(3000)F1(0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1												A	L											
2										L	U L 370	L		A										
3										U L 385	L	L	U L 365											
4									L	U L 390		L												
5										L	L													
6											U L 375													
7										U L 400	U L 375	U L 390	L											
8											U L 385	U L 385												
9										390														
10											U L 375		U L 390											
11												L												
12											L	L												
13									C	C	C	C	C	C	C	C								
14									C	C	C	C	C											
15											L	L	L											
16											L	L												
17										L	L													
18																								
19																								
20											A													
21																								
22																								
23																								
24												A												
25											410													
26											L													
27																								
28												A												
29																								
30													L											
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										4	5	3	2											
MED										U L 390	U L 375	U L 390	U L 378											
UQ										U L 395	U L 375	400												
LQ										388	U L 375	U L 388												

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OCT. 1968

h'F2 (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1												260	260											
2										260	260	250		285										
3										260	260	260	275											
4									240	250		270												
5										240	250													
6											245													
7										245	245	250	255											
8											250	245												
9										245														
10											250		260											
11												250												
12											250	265												
13										C	C	C	C	C	C	C								
14										C	C	C	C	C										
15											255	245	245											
16											255	260												
17										260	250													
18																								
19																								
20											245													
21																								
22																								
23																								
24													275 ^A											
25												245												
26											245													
27																								
28												240												
29																								
30													260											
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	7	13	13	6	1										
MED									240	250	250	250	260	285										
UQ									260	255	260	260												
LQ									245	245	245	255												

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***k'*F** (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	275	270	275	260	245	225	230	235	210	240	235	225	230	260	250	250	245	245	260	285	265	260	260
2	290	295	270	280	275	260	215	225	245	240	225	215	215	260	245	245	260	270	240	205	215	350	370	370
3	340	315	335	245	270	340	265	250	245	240	225	235	220	240	250	240	250	250	235	260	310	360	305	250
4	280	300	315	300	295	295	235	225	235	220	250	240	245	230	220	260	250	240	235	245	225	265	275	295
5	295	295	305	295	265	245	220	240	245	215	215	200	240	240	235	245	250	235	245	250	250	250	260	270
6	285	285	280	270	260	260	245	245	245	235	230	210	235	245	240	245	245	250	220	265	265	265	250	250
7	275	290	300	290	260	245	225	230	240	225	210	200	220	225	245	260	245	225	250	250	260	250	265	260
8	290	300	280	270	275	315	245	230	225	230	225	210	200	230	250	245	250	245	220	245	240	295	305	300
9	305	300	290	260	225	225	220	230	225	220	210	205	215	235	240	250	250	220	250	250	250	250	270	280
10	300	325	285	300	275	270	225	220	225	250	215	210	200	245	240	245	245	230	235	250	250	255	270	300
11	300	375	300	270	245	245	220	225	240	240	240	210	210	240	240	250	250	230	240	250	245	250	265	290
12	300	310	300	260	250	260	230	230	240	240	225	220	250	240	250	260	245	235	235	245	300	315	300	280
13	290	300	295	260	325	310	290	C	C	C	C	C	C	C	C	245	245	220	250	250	295	305	325	320
14	340	C	C	C	C	C	C	C	C	C	C	C	C	240	245	240	240	245	225	215	250	260	280	285
15	275	310	345	295	250	265	230	225	240	235	230	240	220	225	245	250	245	225	245	245	250	270	265	270
16	280	295	305	300	285	240	225	240	225	230	225	225	225	235	240	250	240	235	240	240	225	250	275	285
17	300	330	310	295	260	240	220	225	240	240	230	240	245	250	245	245	235	220	235	250	270	300	280	275
18	280	315	305	300	265	240	235	225	230	220	240	235	225	245	245	245	235	215	225	260	260	250	250	260
19	300	300	310	275	265	235	245	220	215	230	230	250	240	250	250	255	225	220	230	245	245	250	260	310
20	260	300	280	270	245	220	250	235	235	240	240	235	235	230	250	250	230	215	265	250	260	255	295	290
21	300	275	265	295	270	250	245	240	235	240	240	235	235	235	240	240	240	210	245	245	250	295	275	290
22	290	275	250	250	275	250	240	220	245	240	230	240	235	240	245	250	240	210	220	260	275	290	290	300
23	300	295	260	265	260	230	225	225	240	245	230	240	235	235	240	245	220	220	250	250	260	270	300	315
24	305	285	300	290	305	265	215	225	235	245	240	245	245	245	245	245	240	215	225	250	250	280	305	300
25	310	310	300	275	295	275	215	220	240	235	225	210	245	250	255	245	225	245	220	250	270	370	370	275
26	265	250	285	260	250	260	250	245	245	245	225	220	245	230	245	240	230	250	250	240	260	295	325	300
27	275	275	280	265	300	295	250	235	240	225	220	245	240	240	255	250	230	235	260	270	250	300	295	290
28	335	345	305	285	290	260	245	235	240	220	230	240	240	225	235	240	235	225	250	265	250	260	275	285
29	325	350	375	265	255	250	245	215	220	240	240	220	255	240	240	240	240	240	250	245	250	290	310	350
30	395	340	250	360	345	395	220	250	245	240	240	260	240	240	250	250	245	240	260	230	295	295	335	335
31	350	365	295	300	295	300	275	245	225	240	250	245	240	240	245	245	235	240	250	250	310	360	435	420
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	30	30	30	30	30	29	29	29	29	29	30	30	30	31	31	31	31	31	31	31	31	31
MED	300	300	298	275	268	260	232	230	240	240	230	235	235	240	245	245	245	230	240	250	260	280	290	290
UQ	305	315	305	295	290	275	245	240	240	240	240	240	240	245	250	250	248	240	250	250	270	298	305	300
LQ	282	290	280	265	260	245	220	225	230	225	225	210	220	230	240	245	235	220	232	245	250	255	268	275

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***K'*E_s** (km)

135° E Mean Time (G. M. T. + 9^h)

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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	18	15	17	21	17	11	13	13	12	18	21	18	18	19	21	23	18	24	24	21	19	16	15	13	
MED	110	105	105	105	105	105	105	115	120	118	115	110	110	110	110	110	108	110	110	110	105	108	105	110	
UQ	110	110	105	105	105	105	150	135	138	120	120	115	110	110	110	110	110	115	110	110	110	110	110	110	
LQ	105	105	105	105	105	100	105	105	110	115	110	110	110	105	105	105	105	105	105	105	105	102	102	102	105

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Types of Es

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1			F1	F2	F2	L1			L1		C2	C1	C2	L2	L3	L2	LH1	F2	F1	F2	F1				
2			F1	F2				H1	C1	C1	C1	C1	C1	C2	H1	H1	L1	L3	F3	F1					
3			F2	F3	F2			L1		C1	C1	L2	L1	L2	L2	H1	C1	H2	F1	F3	F2	F3	F2	F1	
4	F1	F1	F2	F2	F2	F2	L1				C1	L1		C1		L2	L2	L2	F2						
5		F1	F1	F2	F2			L1										L1	F1	F3	F2				
6									H1								L1		F1		F1				
7							H1														F1				
8							H1				C1	L1		L1		C1		C2		F1	F1				
9										C1	C1		L1	L1	L1	L1	L1	L1	F3						
10	F1	F1		F1			H1			C1	L1				L1	L1		L1				F1	F2	F4	
11	F3	F3	F2	F1	F2	F1	LH1	H1		C1	L1			L1	L1	L1								F2	
12	F2	F2	F4	F2		F1					C1			L1	L1	L2	L1	L1	F1					F2	
13	F2	F2	F2	F2												L1		L1	F1	F1					
14																L1	L2	L1					F1		
15			F2	F1	F1	F2	L1	L1	L1		C1	C1	L1		L1	L2	L2	L4	F2	F1	F1	F1			
16				F2	F2		L1			H1		H1			L1	L3			F1	F1					
17	F1										H1	C1	C1	C2	C1					F1	F2	F3	F1	F1	
18									C1	C1	C1	C1	C1	C1	L1	L2	L1	L1	F1	F1			F1	F1	
19	F1		F2					L1				C2	CL21	CL21	C2	C3	L1	L1	F2					F1	
20				F1			L1			H1	C2	C1	L2	L2	L2	L2	L1	L1	F3	F2	F2	F1	F1		
21	F1			F1			L1	H1		C1	C1	C1	C1	C1	C1			H1	F1		F1	F1	F1	F2	
22	F2	F2	F2	F1	F3	F3	L4	L3	L2	L1	C1	C1	C1	C1	CL1	L2	L1			F2	F3	F1			
23	F2	F1	F1		F1					C2	L1	C1						C1	F2	F4	F4	F3	F1	F2	
24	F2	F1	F3	F3	F1			H1	C1	C1	CL31		C2	C2	L2	L2	L1	L1	F1	F1	F1	F1	F3	F1	
25	F1	F2	F2	F2	F2			H1	C2	C1	C1		L2	L2	L3			F4	F1	F1	F2	F3	F3	F1	
26	F1	F2	F2	F2	F1	F1		H1	C1	C1	C1	L1	L2	L2	L2	L2	L1	F3	F2	F1	F1	F2	F2	F1	
27	F2	F1	F2	F1	F2	F2	L1	L1	H1		L1	L1	L1	L1			H1	F6	F4	F2		F4	F2	F3	
28	F3	F3	F2	F1	F2	F1		C1	C1	C2	C1	L2	C1	L1	L2	L2	L1	F1	F3	F4	F2	F1	F1		
29	F2	F4	F4	F1	F2	F1			C1	C1			L1					F1	F3	F2	F2	F1	F2		
30	F1							H1	C1	C2	C2		L1		L1	L1	H1	F4	F2	F1	F2	F1	F2	F2	
31	F5	F7	F2	F2	F2	F2	L3	L3	L2						H1	H1			F2	F2	F2				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

IONOSPHERIC DATA

OCT. 1968

foF2 (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	64	66	62	60	59	62	72	89	I ₉₅ ^R	99	I ₁₀₀ ^R	106	102	107	108	114	110	102	88	74	74	71	72	71	
2	61	60	63	63	61	57	77	90	95	118	I ₁₁₂ ^R	122	117	119	135	126	113	116	I ₁₁₈ ^R	87	51	45	47	46	
3	51	50	46	50	31	31	67	92	108	114	124	126	123	123	116	119	106	103	96	68	60	54	53	59	
4	50	50	49	49	47	43	70	96	104	106	111	120	117	119	116	113	I ₁₁₆ ^R	111	91	71	60	55	54	54	
5	53	52	51	50	48	51	67	93	I ₁₀₉ ^R	112	106	111	106	97	106	102	97	98	86	73	62	56	50	50	
6	49	47	48	C	C	C	C	C	C	C	C	C	C	C	C	C	C	84	75	61	65	62	I ₅₉ ^C	53	
7	53	54	54	53	51	54	78	92	I ₉₄ ^R	96	95	96	99	100	C	C	C	96	78	75	72	68	65	59	
8	59	58	58	61	55	55	86	I ₉₅ ^R	97	96	98	100	109	115	119	112	107	105	86	65	56	56	57	59	
9	56	56	54	55	52	44	67	85	94	99	I ₁₀₄ ^R	104	108	115	117	116	112	100	79	71	67	60	57	56	
10	54	51	52	50	48	52	78	87	96	96	I ₉₈ ^R	110	I ₁₀₆ ^R	121	111	106	98	104	77	65	62	59	55	51	
11	49	48	49	49	48	36	58	80	94	I ₉₆ ^R	I ₁₀₈ ^R	116	111	111	104	106	104	98	77	67	63	56	51	52	
12	52	54	52	53	47	42	65	91	97	93	111	I ₁₁₃ ^R	111	118	117	I ₁₁₄ ^R	I ₁₁₅ ^R	110	78	61	59	61	62	63	
13	60	53	50	45	41	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	104	102	95	97	92	64	48	48	50	47	48
15	47	47	47	47	47	43	61	95	97	98	105	113	117	105	101	108	112	102	67	65	59	62	54	50	
16	49	52	51	52	52	47	66	87	100	91	I ₁₀₆ ^R	117	110	105	101	99	101	96	70	61	58	48	42	45	
17	45	44	44	46	51	45	63	78	89	I ₁₁₂ ^R	I ₁₂₂ ^R	121	120	118	123	122	107	82	71	67	56	60	57	57	
18	50	52	54	55	54	52	73	96	I ₁₀₇ ^R	I ₁₀₅ ^R	114	124	126	118	124	121	I ₁₀₂ ^R	94	75	69	65	70	59	54	
19	55	56	57	57	57	61	73	92	I ₁₁₄ ^R	106	114	130	129	121	125	111	113	98	78	71	66	54	48	47	
20	49	48	51	54	49	42	58	87	I ₁₁₅ ^R	121	I ₁₁₉ ^R	113	115	124	115	113	I ₁₁₂ ^R	85	66	68	57	56	55	54	
21	55	57	58	55	51	48	66	92	I ₁₁₆ ^R	I ₁₂₀ ^R	116	117	109	109	107	100	92	83	64	61	53	50	51	51	
22	49	48	46	47	45	37	56	87	97	I ₁₀₄ ^R	I ₁₀₇ ^R	112	112	108	112	106	106	88	56	52	49	47	46	46	
23	46	46	46	45	48	42	54	84	97	101	I ₁₀₈ ^R	114	116	111	111	88	87	74	62	60	51	45	44	43	
24	43	46	43	43	42	41	61	87	I ₁₀₂ ^R	104	102	128	128	122	121	121	105	92	73	63	57	56	58	54	
25	55	57	58	59	56	54	77	I ₉₇ ^R	127	116	I ₁₁₃ ^R	124	129	133	133	123	107	96	88	67	56	56	62	63	
26	59	61	53	58	58	49	67	I ₁₀₄ ^R	I ₁₂₈ ^R	133	133	138	123	118	122	124	108	90	73	57	44	46	47	48	
27	51	46	46	46	44	42	59	96	I ₁₀₃ ^R	110	108	116	121	111	111	I ₁₁₅ ^R	115	91	72	67	66	51	51	49	
28	46	48	48	49	50	45	64	96	I ₁₀₄ ^R	I ₁₁₄ ^R	I ₁₁₄ ^R	124	122	121	111	104	98	86	79	68	56	50	51	47	
29	46	46	46	46	46	39	58	I ₉₆ ^R	I ₁₀₂ ^R	111	I ₁₁₆ ^R	127	125	126	115	111	111	96	88	77	56	49	48	45	
30	43	46	49	37	36	35	61	84	I ₁₁₁ ^R	135	I ₁₃₂ ^R	134	147	141	129	125	111	96	74	67	54	55	56	56	
31	55	51	56	49	53	49	63	I ₁₀₀ ^R	I ₁₂₄ ^R	123	142	144	139	141	128	127	124	92	77	64	44	37	36	35	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	29	28	28	28	28	28	28	28	28	28	29	28	28	28	30	30	30	30	30	30	30
MED	51	51	51	50	49	45	66	92	102	106	111	117	117	118	116	113	107	96	77	67	58	56	54	52	
UQ	55	56	54	55	53	52	72	96	I ₁₁₀ ^R	115	116	125	124	121	122	121	112	102	86	71	63	60	57	56	
LQ	49	47	47	47	47	42	61	87	96	98	106	112	110	109	110	106	102	90	71	61	54	50	48	47	

IONOSPHERIC DATA

OCT. 1968

foF1 (0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	U L	L	L	L	L	A								
2										L	L	L	L	L	L	L								
3										430	L	L	L	500	550	L								
4										L	L	L	L	L	L	L								
5										L	U L	L	L	U L	L	L	L							
6										C	C	C	C	C	C	C	C							
7										L	L	L	U L	L	L	C								
8										L	C	U L	L	490	430	L								
9										L	L	L	L	460	L	L	L							
10										L	L	430	L	450	L	U L	440							
11										A	L	L	L	L	L									
12										L	U L	L	L	L	L									
13										C	C	C	C	C	C	C	C							
14										C	C	C	C	L	L									
15										L	L	L	L	L	L									
16										L	L	450	430	L	L									
17										L	L	L	L	L	L	L								
18										L	L	L	L	L	L									
19										L	U L	L	L	L	L									
20										L	L	A	A	L	L									
21										L	L	L	L	L	L									
22										L	L	L	L	L	L									
23										L	L	L	U L	L	L									
24										L	L	L	A	A	L									
25										L	A	U L	L	L	L									
26										L	L	L	L	L	L									
27										L	L	L	L	L	L									
28										L	L	L	L	L	L									
29										L	L	L	L	L	L									
30										L	L	L	L	L	L									
31										L	L	L	L	L										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										3	3	7	8	3		1								
MED										U L	U L	470	495	450		U L								
UQ										440	U L	485	500	500										
LQ										415	440	460	465	440										

IONOSPHERIC DATA

OCT. 1968

foE (0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1						E	B	265	310	335	350	355	A	A	A	A	A	A	S						
2						S	I B	185	250	305	340	A	A	I A	350	355	335	A	A	A	S				
3						S	I E	190	250	300	335	340	350	355	345	325	310	265	A	B					
4						S	A	A	300	340	355	370	365	355	340	310	R	260	A	S					
5						A	265	305	340	350	355	365	355	I A	340	315	I A	265	185	S					
6						C	C	C	C	C	C	C	C	C	C	C	C	C	210	S					
7						225	270	300	I A	330	345	355	I A	355	345	C	C	C	C						
8						C	C	C	C	C	355	355	350	I A	340	315	265	A							
9						A	245	300	335	340	350	355	355	A	A	A	B								
10						I B	175	250	300	I A	330	340	350	355	355	345	305	260	B						
11						B	245	305	I A	330	A	A	A	A	A	310	270	A							
12						S	250	305	335	A	A	355	340	320	I A	295	A	A							
13						C	C	C	C	C	C	C	C	C	C	C	C	C							
14						C	C	C	C	C	C	C	C	355	335	285	240	A							
15						B	235	300	I A	330	345	I A	350	R	350	315	290	A	B						
16						155	235	295	325	335	340	345	335	I R	320	280	220	B							
17						B	220	290	I A	315	I C	340	A	A	A	340	300	240	A						
18						B	245	275	A	A	A	A	A	A	S	345	310	240	A						
19						A	255	295	335	345	B	A	A	A	A	A	A	A							
20						B	I A	240	295	330	340	A	A	A	335	285	235	S							
21						B	235	295	I A	330	R	I A	350	A	A	A	295	R	245	B					
22						B	245	300	330	340	345	A	A	A	A	A	A	S							
23						E	245	300	R	335	I R	345	355	355	I B	340	315	285	240	155					
24						B	230	295	335	350	A	A	A	A	A	A	A	A							
25						200	260	295	A	A	A	A	A	355	325	A	A	A							
26						B	B	A	A	A	A	A	I A	355	350	345	305	B	A						
27						170	245	290	330	345	355	360	350	325	285	A	A	A							
28						S	220	A	A	A	A	A	360	A	A	A	A	A							
29						B	235	A	A	A	A	A	A	I A	350	I A	320	285	A	A					
30						185	245	295	I A	330	350	355	I A	355	350	I A	315	270	220	B					
31						S	225	A	B	B	A	A	A	I A	340	I A	320	285	B	S					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						1	8	25	23	21	18	15	16	19	20	20	14	3							
MED						E	185	245	300	330	345	355	355	350	330	295	242	185							
UQ						195	250	300	335	350	355	358	355	340	310	265	198								
LQ						172	235	295	U A	330	340	350	355	345	320	285	240	170							

IONOSPHERIC DATA

OCT. 1968

foEs (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	J X 18	J X 15	J X 20	J X 23	E	E	22	G	J X 38	38	45	J X 50	39	J X 45	J X 45	J X 50	J X 43	J X 60	J X 35	J X 33	J X 20	J X 17	E S 13	E S 13	
2	E S 13	J X 14	J X 15	J X 21	J X 20	J X 20	E B 20	G	33	41	46	J X 75	37	G	G	34	J X 36	J X 49	J X 53	J X 43	E S 13	E S 14	E S 13	E S 13	
3	E S 13	E	E S 13	E	E	E S 14	E B 20	G	G	G	G	G	G	G	G	G	36	J X 41	J X 23	J X 34	E S 14	J X 56	J X 53	J X 78	
4	J X 63	J X 20	E	E	E	J X 23	J X 40	J X 30	G	G	G	G	G	G	G	G	G	J X 26	J X 23	J X 19	J X 30	J X 25	J X 20	E S 13	
5	E S 13	E	E	J X 16	J X 30	E S 13	J X 22	G	G	G	G	G	G	G	G	36	G	G	E S 13	E S 13	E S 13	J X 20	E S 13	E S 13	
6	E S 13	E	E	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	J X 29	J X 19	J X 19	E B 28	C	E B 17	
7	E B 17	E S 12	E S 12	E	E	E S 12	G	30	33	36	37	G	J X 42	G	C	C	C	E C 19	E C 19	E C 18	E C 15	E C 17	E C 14	E C 15	
8	E C 17	E C 13	E	E	E C 15	E C 14	E C 21	E C 28	E C 35	E C 37	E C 63	G	G	G	36	G	G	20	E S 13	E S 13	J X 22	J X 29	J X 17	E S 13	
9	E B 19	E	E S 13	E S 12	E S 13	E S 14	19	G	G	G	G	G	G	J G 29	J X 36	J X 48	J X 49	E B 18	E S 14	J X 16	E B 19	E S 13	E S 13	E S 13	
10	E S 13	E	E	E	E S 13	E	E B 19	G	G	36	G	G	G	G	G	G	G	E B 19	E S 14	E S 13	E S 14	E B 18	E C 20	E B 18	
11	E C 22	J X 37	J X 25	E S 13	E S 13	E S 14	E B 17	G	J G 29	J X 48	37	37	39	37	36	G	G	J X 29	J X 20	E B 19	E B 19	E B 18	E S 13	E B 19	
12	E S 12	E	E	E	E S 13	E S 13	E S 16	30	33	G	38	39	G	G	G	J X 33	J X 29	J X 29	J X 28	E B 18	E B 19	E S 13	J X 23	J X 19	
13	E S 13	E S 14	E S 13	J X 36	J X 43	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G 33	G 29	J G 25	J G 24	J X 36	J X 28	E S 13	E S 13	J X 18	E S 13
15	E S 13	J X 14	E S 13	E S 13	E S 13	E S 13	E B 19	27	J X 35	34	G	36	G	G	G	G	E B 24	E B 21	J X 22	J X 18	J X 28	J X 18	J X 18	E S 17	
16	E S 14	E S 13	E S 13	E S 13	E S 13	E S 13	G	27	32	36	38	36	40	36	G	G	G	E B 18	J X 39	E S 14	E S 14	E S 12	E S 13	E B 19	
17	J X 26	J X 25	E	E	J X 20	E B 13	E B 14	G	G	38	C	39	39	J X 37	G	G	J X 29	J X 29	J X 39	J X 20	J X 20	E S 14	E B 18	J X 30	
18	J X 66	J X 55	J X 63	J X 53	J X 54	J X 33	E B 21	29	35	J X 45	40	41	38	37	37	33	29	J X 38	J X 48	J X 29	J X 28	J X 28	E S 14	J X 23	
19	E B 18	E S 13	E S 13	E	E S 13	J X 20	J X 29	G	32	35	37	38	37	36	36	32	J X 29	J X 53	J X 73	J X 48	J X 28	J X 28	E B 22	J X 18	
20	E B 18	J X 20	E S 13	E S 14	E S 13	E S 13	E B 19	26	32	G	37	J X 50	J X 50	43	G	J X 50	J X 40	J X 49	J X 65	J X 32	J X 25	J X 28	J X 26	J X 23	
21	J X 16	J X 15	J X 14	E	E	E B 18	E B 19	G	G	41	G	39	42	44	J X 43	G	G	E B 19	J X 20	J X 30	J X 18	E S 13	E B 19	E S 13	
22	E S 13	E S 13	E S 12	E S 13	E S 12	E S 13	E B 20	G	G	G	38	J X 55	J X 45	J X 48	J X 43	J X 50	J X 53	J X 50	J X 25	J X 27	J X 20	J X 20	J X 16	J X 26	
23	E S 14	E	E	J X 39	J X 29	J X 29	E B 20	G	G	G	36	G	G	E B 41	G	34	G	G	J X 44	J X 28	J X 31	J X 35	J X 32	J X 20	
24	J X 18	J X 20	J X 21	J X 18	J X 21	E S 13	E B 18	G	G	40	J X 50	J X 47	J X 48	J X 70	J X 43	J X 43	J X 41	J X 42	J X 44	J X 48	J X 43	J X 29	J X 23	J X 16	
25	E S 13	J X 13	E S 13	E	J X 13	E S 13	G	G	39	J X 45	J X 54	40	J X 46	J X 39	37	J X 34	J X 36	J X 35	J X 78	J X 41	J X 29	E S 13	E B 18	J X 30	
26	J X 30	J X 19	J X 29	J X 20	E S 13	E S 13	E B 20	E B 26	31	43	48	39	J X 52	G	J X 40	G	J X 26	J X 45	J X 63	J X 34	J X 23	E S 14	J X 23	J X 25	
27	J X 24	J X 21	J X 23	J X 23	J X 24	E S 14	G	J X 33	G	G	G	G	G	G	G	31	29	J X 28	J X 33	J X 34	J X 43	E S 14	J X 39	J X 41	
28	J X 32	J X 33	J X 25	J X 25	J X 31	J X 53	J X 32	G	J X 47	J X 48	J X 49	J X 48	G	39	35	J X 36	J X 38	J X 28	J X 39	J X 20	E B 18	J X 28	E B 18	E B 18	
29	E B 18	E S 13	J X 14	J X 19	E	E S 14	E B 18	G	31	J X 41	37	J X 42	36	J X 40	J X 40	G	28	J X 24	J X 33	J X 33	J X 22	J X 19	J X 22	J X 26	
30	J X 23	J X 25	J X 20	E S 13	E S 13	E S 13	G	28	33	37	G	G	37	G	J X 41	G	G	E B 17	J X 39	J X 53	J X 35	E S 13	J X 27	J X 49	
31	J X 28	J X 35	J X 53	J X 60	J X 43	J X 19	J X 20	G	36	J X 46	45	38	J X 39	J X 40	34	G	E B 26	E S 14	J X 18	J X 33	J X 23	M 21	J X 27	E B 19	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	29	28	28	28	28	28	27	28	28	29	28	28	28	28	30	30	30	30	30	29	30
MED	E B 18	J X 14	13	E S 13	E S 13	E S 14	E B 19	G	32	36	37	38	37	34	36	27	29	J X 28	J X 31	J X 28	J X 20	18	E B 18	E B 18	
UQ	J X 23	J X 20	J X 20	J X 21	J X 21	18	E B 20	28	34	41	44	J X 42	41	40	J X 38	J X 34	J X 36	J X 41	J X 44	J X 34	J X 28	J X 28	J X 23	J X 25	
LQ	E S 13	E S 12	E	E	E S 13	E S 13	E B 16	G	G	G	G	G	G	G	G	G	G	E B 19	J X 20	E B 18	E B 18	E S 14	E S 14	E S 13	

IONOSPHERIC DATA

OCT. 1968

fbEs (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	16	12	17	15	E	E	21	G	28	37	43	42	38	39	38	46	39	44	25	24	18	17	E ₁₃	E ₁₃		
2	E ₁₃	14	E	17	E	15	E ₂₀	G	G	39	45	43	37	G	G	33	34	40	28	39	E ₁₃	E ₁₄	E ₁₃	E ₁₃		
3	E ₁₃	E	E ₁₃	E	E	E ₁₄	E ₂₀	G	G	G	G	G	G	G	G	G	35	28	16	26	E ₁₄	24	30	22		
4	35	16	E	E	E	16	22	27	G	G	G	G	G	G	G	G	G	21	16	16	23	20	16	E ₁₃		
5	E ₁₃	E	E	14	E	E ₁₃	20	G	G	G	G	G	G	G	36	G	29	G	E ₁₃	E ₁₃	E ₁₃	E	E ₁₃	E ₁₃		
6	E ₁₃	E	E	G	C	C	C	C	C	C	C	C	C	C	C	C	C	G	19	18	19	E ₂₈	C	E ₁₇		
7	E ₁₇	E ₁₂	E ₁₂	E	E	E ₁₂	G	30	32	36	37	G	41	G	C	C	C	E ₁₉	E ₁₉	E ₁₈	E ₁₅	E ₁₇	E ₁₄	E ₁₅		
8	E ₁₇	E ₁₃	E	E	E ₁₅	E ₁₄	E ₂₁	E ₂₈	E ₃₅	E ₃₇	E ₆₃	G	G	G	36	G	G	20	E ₁₃	E ₁₃	18	20	U ₁₇	E ₁₃		
9	E ₁₉	E	E ₁₃	E ₁₂	E ₁₃	E ₁₄	19	G	G	G	G	G	G	G	29	35	34	37	E ₁₈	E ₁₄	E	E ₁₉	E ₁₃	E ₁₃		
10	E ₁₃	E	E	E	E ₁₃	E	E ₁₉	G	G	35	G	G	G	G	G	G	G	E ₁₉	E ₁₄	E ₁₃	E ₁₄	E ₁₈	E ₂₀	E ₁₆		
11	E ₂₂	14	20	E ₁₃	E ₁₃	E ₁₄	E ₁₇	G	G	26	48	37	37	38	37	36	G	G	22	19	E ₁₉	E ₁₉	E ₁₈	E ₁₃	E ₁₉	
12	E ₁₂	E	E	E	E ₁₃	E ₁₃	E ₁₆	29	32	G	38	39	G	G	G	30	26	25	22	E ₁₈	E ₁₉	E ₁₃	20	E		
13	E ₁₃	E ₁₄	E ₁₃	E	18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	31	28	23	21	33	27	E ₁₃	E ₁₃	17	E ₁₃	E ₁₃
15	E ₁₃	13	E ₁₃	E ₁₃	E ₁₃	E ₁₃	E ₁₉	27	24	34	G	36	G	G	G	G	E ₂₄	E ₂₁	19	18	25	17	16	E ₁₂		
16	E ₁₄	E ₁₃	E ₁₃	E ₁₃	E ₁₃	E ₁₃	G	27	31	35	37	35	39	36	G	G	G	E ₁₈	E ₁₈	29	E ₁₄	E ₁₄	E ₁₂	E ₁₃	E ₁₉	
17	28	23	E	E	12	E ₁₃	E ₁₄	G	G	37	C	37	38	37	G	G	27	21	30	29	19	20	E ₁₄	E ₁₈	22	
18	39	24	34	22	19	18	E ₂₁	28	34	44	39	39	38	37	G	32	28	35	45	25	22	21	E ₁₄	E ₁₉		
19	E ₁₈	E ₁₃	E ₁₃	E	E ₁₃	19	19	G	32	35	37	38	37	36	36	31	27	45	46	24	21	19	E ₂₂	18		
20	E ₁₈	18	E ₁₃	E ₁₄	E ₁₃	E ₁₃	E ₁₉	26	32	G	37	50	49	42	G	37	G	45	29	23	22	22	24	22		
21	16	15	E	E	E	E ₁₈	E ₁₉	G	G	40	G	38	41	39	43	G	G	E ₁₉	18	21	18	E ₁₃	E ₁₉	E ₁₃		
22	E ₁₃	E ₁₃	E ₁₂	E ₁₃	E ₁₂	E ₁₃	E ₂₀	G	G	G	37	40	39	45	41	38	26	23	17	23	E	E	U ₁₆	24		
23	E ₁₄	E	E	28	18	18	E ₂₀	G	G	G	36	G	G	E ₄₁	G	G	G	G	18	21	26	26	23	18		
24	17	17	19	14	19	E ₁₃	E ₁₈	G	G	39	40	42	46	55	39	35	29	19	27	23	25	18	20	U ₁₆		
25	E ₁₃	U ₁₃	E ₁₃	E	13	E ₁₃	G	G	39	44	54	37	44	30	G	32	30	25	35	24	24	E ₁₃	E ₁₈	25		
26	23	14	19	17	E ₁₃	E ₁₃	E ₂₀	E ₂₆	30	39	45	37	37	37	G	24	G	25	22	25	22	E	E ₁₄	21	19	
27	19	E	20	17	16	E ₁₄	G	22	G	G	G	G	G	G	G	31	28	18	24	21	18	E ₁₄	22	23		
28	23	21	18	19	23	39	24	G	43	40	45	40	G	39	35	32	25	22	30	19	E ₁₈	23	E ₁₈	E ₁₈		
29	E ₁₈	E ₁₃	E	13	E	E ₁₄	E ₁₈	G	31	38	37	37	36	37	38	G	28	22	23	25	21	19	19	22		
30	19	15	18	E ₁₃	E ₁₃	E ₁₃	G	G	G	36	G	G	37	G	33	G	G	E ₁₇	39	25	32	E ₁₃	18	25		
31	23	25	15	18	14	16	19	G	34	46	45	38	37	36	33	G	E ₂₆	E ₁₄	18	23	E	E	19	E ₁₉		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	29	29	28	28	28	28	28	27	28	28	29	28	28	28	30	30	30	30	30	30	29	30	
MED	E ₁₇	E ₁₂	13	E ₁₃	E ₁₃	E ₁₄	E ₁₉	G	26	36	37	37	37	30	26	E ₂₃	26	22	22	21	18	E ₁₇	E ₁₈	E ₁₈		
UQ	19	15	17	15	14	E ₁₆	E ₂₀	25	32	39	41	39	38	37	36	32	28	28	29	24	22	20	20	22		
LQ	E ₁₃	E	E	E	E	E ₁₃	E ₁₆	G	G	G	G	G	G	G	G	G	G	E ₁₈	18	E ₁₈	E ₁₄	E ₁₃	E ₁₄	E ₁₃		

IONOSPHERIC DATA

OCT. 1968

f-min (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E ₁₄ S ₁₃	E	E	E	E	E	17	16	15	18	28	20	19	21	17	16	13	13	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
2	E ₁₃	E	E	E	E	E ₁₃	20	17	18	17	20	19	19	17	16	18	17	17	E ₁₃ S ₁₃	E ₁₂ S ₁₃	E ₁₃ S ₁₃	E ₁₄ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
3	E ₁₃	E	E ₁₃	E	E	E ₁₄	20	18	18	22	21	27	21	20	17	18	17	14	14	E ₁₄ S ₁₃	E ₁₄ S ₁₃	E ₁₂ S ₁₃	E ₁₅ S ₁₃	E ₁₅ S ₁₃	
4	E ₁₄	E	E	E	E	E ₁₃	15	16	17	25	26	23	23	19	17	18	14	14	E ₁₃ S ₁₃	E	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
5	E ₁₃	E	E	E	E	E ₁₃	14	18	17	17	23	18	24	20	18	17	14	14	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
6	E ₁₃	E	E	E	C	C	C	C	C	C	C	C	C	C	C	C	C	15	E ₁₃ S ₁₃	E ₁₄ S ₁₃	E ₁₃ S ₁₃	28	C	17	
7	17	E ₁₂ S ₁₂	E ₁₂ S ₁₂	E	E	E ₁₂ S ₁₂	14	18	19	24	24	26	23	25	C	C	C	E ₁₉ S ₁₉	E ₁₉ S ₁₉	E ₁₈ S ₁₈	E ₁₅ S ₁₅	E ₁₇ S ₁₇	E ₁₄ S ₁₄	E ₁₅ S ₁₅	
8	E ₁₇ S ₁₇	E ₁₃ S ₁₃	E	E	E ₁₅ S ₁₅	E ₁₄ S ₁₄	E ₂₁ S ₂₁	E ₂₈ S ₂₈	E ₃₅ S ₃₅	E ₃₇ S ₃₇	E ₆₃ S ₆₃	20	19	23	22	18	18	17	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₂ S ₁₂	E ₁₃ S ₁₃	
9	19	E	E ₁₃ S ₁₃	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₄ S ₁₄	14	16	16	21	25	24	23	24	19	17	18	18	E ₁₄ S ₁₄	E ₁₃ S ₁₃	19	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
10	E ₁₃	E	E	E	E ₁₃	E	19	19	18	21	24	21	23	26	19	19	19	19	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	18	E ₂₀ S ₂₀	18	
11	E ₂₂ S ₂₂	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₄ S ₁₄	17	19	18	23	24	20	26	19	18	18	18	14	E ₁₃ S ₁₃	19	19	18	E ₁₃ S ₁₃	19	
12	E ₁₂	E	E	E	E ₁₃	E ₁₃	E ₁₆	18	19	25	21	22	20	20	20	18	14	14	E ₁₄ S ₁₄	18	19	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
13	E ₁₃	E ₁₄	E ₁₃	E ₁₃	E ₁₃	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	18	18	17	13	14	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
15	E ₁₃	E	E ₁₃	E ₁₃	E ₁₃	E ₁₃	19	13	14	19	22	24	18	21	21	14	24	21	E ₁₃ S ₁₃	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₂ S ₁₂	
16	E ₁₄	E ₁₃	E ₁₃	E ₁₃	E ₁₃	E ₁₃	14	14	18	24	24	23	25	24	29	21	19	18	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₉ S ₁₉	
17	E ₁₃	E	E	E	E	E ₁₃	E ₁₄	16	20	22	C	24	24	25	23	18	18	14	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	18	E ₁₃ S ₁₃	
18	E ₁₄	E ₁₃	E	E ₁₂	E	E ₁₃	21	19	20	22	23	22	24	34	25	22	19	14	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₃ S ₁₃	
19	16	E ₁₃	E ₁₃	E	E ₁₃	E	E ₁₄	19	22	20	25	36	25	24	22	21	20	14	18	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₃ S ₁₃	22	E ₁₃ S ₁₃	
20	16	E	E ₁₃	E ₁₄	E ₁₃	E ₁₃	19	14	21	25	25	22	22	23	22	21	14	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
21	E ₁₃	E	E ₁₃	E	E	18	19	20	22	24	25	25	34	24	24	23	19	19	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	19	E ₁₃ S ₁₃	
22	E ₁₃	E ₁₃	E ₁₂	E ₁₃	E ₁₂	E ₁₃	20	14	14	19	20	21	18	20	18	15	18	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
23	E ₁₄	E	E	E	E	E ₁₄	20	20	21	22	22	23	22	41	20	21	17	14	E ₁₃ S ₁₃	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
24	E ₁₃	E	E	E	E	E ₁₃	18	19	20	24	31	24	24	23	21	20	14	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
25	E ₁₃	E	E ₁₃	E	E	E ₁₃	14	22	18	21	25	24	24	20	20	23	18	14	18	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₃ S ₁₃	18	18	
26	17	E	E	E	E ₁₃	E ₁₃	20	26	21	23	27	25	22	19	22	22	24	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	
27	E ₁₄	E ₁₃	E	E	E	E ₁₄	E ₁₃	19	17	23	23	24	23	22	18	17	17	14	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₃	
28	E ₁₄	E	E	E	E	14	E ₁₄	18	21	17	21	22	19	23	23	22	16	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	E ₁₃ S ₁₃	18	18	
29	18	E ₁₃	E	E	E	E ₁₄	18	18	18	23	24	23	22	24	18	22	18	14	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
30	E ₁₃	E ₁₃	E	E ₁₃	E ₁₃	E ₁₃	13	14	18	21	22	22	22	22	18	15	17	17	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₄ S ₁₄	
31	E ₁₄	E ₁₃	E	E	E	E ₁₂	E ₁₄	14	19	36	37	30	24	22	22	20	26	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	17	E ₁₃ S ₁₃	19	
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	29	28	28	28	28	28	27	28	28	29	28	28	28	30	30	30	30	30	29	30	
MED	E ₁₄ S ₁₄	E	E	E	E	E ₁₃ S ₁₃	16	18	18	22	24	23	23	22	20	18	18	14	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	
UQ	E ₁₇ S ₁₇	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₂ S ₁₂	E ₁₃ S ₁₃	E ₁₄ S ₁₄	20	19	20	24	25	24	24	24	22	21	19	17	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₅ S ₁₅	
LQ	E ₁₃	E	E	E	E	E ₁₃	14	16	18	20	22	22	20	20	18	17	15	14	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	E ₁₃ S ₁₃	

IONOSPHERIC DATA

OCT. 1968

M(3000)F₂(0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	275	285	285	275	280	315	325	320	I ^R 320	305	I ^R 310	300	285	285	280	295	300	300	300	290	275	270	280	290	
2	290	270	285	245	295	295	340	335	320	325	I ^R 300	295	285	280	290	295	290	295	I ^R 310	320	275	250	250	245	
3	250	270	255	265	325	260	320	320	320	305	305	300	300	300	295	305	300	315	320	295	285	270	265	290	
4	280	270	270	275	290	295	325	335	315	325	310	295	295	295	300	295	I ^R 310	315	325	315	285	285	285	280	
5	275	275	275	290	290	300	335	330	I ^R 330	320	310	305	300	300	300	305	310	310	320	315	310	290	285	265	
6	275	280	275	C	C	C	C	C	C	C	C	C	C	C	C	C	C	310	315	290	295	290	I ^R 285	285	
7	275	280	280	285	285	285	325	340	I ^R 340	335	325	315	315	310	C	C	C	325	300	300	295	295	285	290	
8	275	290	275	285	290	265	330	I ^R 330	335	325	315	295	295	295	300	300	310	315	335	290	280	265	270	275	
9	270	270	275	290	325	295	350	345	325	325	I ^R 315	300	295	295	300	305	305	325	310	300	305	285	275	265	
10	275	265	275	280	275	275	335	340	330	315	I ^R 310	310	I ^R 290	295	305	310	320	310	310	295	300	295	245	285	
11	280	275	285	285	325	300	335	335	335	I ^R 320	I ^R 320	320	295	305	300	315	310	325	315	315	305	305	280	275	
12	275	285	290	305	310	270	325	340	330	305	295	I ^R 310	325	300	285	295	I ^R 305	310	320	280	255	265	270	295	
13	285	275	265	265	255	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	305	300	305	320	325	325	280	285	280	275	270
15	275	265	255	275	300	275	325	335	330	325	315	305	315	305	295	310	315	325	310	295	290	300	305	260	
16	280	270	275	285	300	285	335	345	320	325	I ^R 310	320	310	315	310	305	315	330	340	310	305	305	265	275	
17	280	255	255	270	315	305	350	345	320	I ^R 315	I ^R 320	305	300	305	310	310	320	330	310	315	280	295	245	300	
18	280	270	280	275	285	290	330	335	I ^R 335	I ^R 320	305	305	310	305	300	305	I ^R 315	325	320	300	295	310	305	275	
19	275	270	275	275	295	295	320	325	I ^R 330	295	300	300	305	305	305	305	320	325	310	295	305	310	275	270	
20	275	270	275	285	300	280	310	315	I ^R 315	315	I ^R 315	300	295	300	305	300	I ^R 320	320	290	300	295	280	275	275	
21	275	285	295	280	275	275	305	315	I ^R 320	330	300	315	295	305	310	310	320	315	305	295	300	280	280	290	
22	285	295	285	300	315	280	320	335	330	I ^R 315	I ^R 310	300	305	305	295	310	310	330	295	290	290	285	265	270	
23	280	285	285	290	300	310	315	335	325	325	I ^R 315	310	310	310	305	315	310	325	305	300	300	285	275	265	
24	270	285	280	280	280	275	330	340	I ^R 330	315	315	300	300	295	300	305	305	315	300	295	285	275	275	270	
25	255	265	275	280	285	275	315	I ^R 325	I ^R 330	310	I ^R 305	300	280	295	305	315	315	315	310	305	285	275	280	265	
26	290	300	285	285	300	285	300	I ^R 315	I ^R 320	315	315	315	300	300	305	305	315	315	315	300	280	285	275	275	
27	290	285	285	285	275	280	310	335	I ^R 325	320	315	320	305	295	290	I ^R 305	305	305	300	300	305	290	285	285	
28	255	255	260	280	290	280	315	325	I ^R 320	I ^R 315	I ^R 305	305	295	300	295	305	320	305	310	315	305	280	245	285	
29	265	270	270	285	295	260	295	I ^R 335	I ^R 325	315	I ^R 315	300	295	285	295	300	290	305	305	310	285	270	265	255	
30	240	245	290	245	240	235	295	305	I ^R 300	315	I ^R 300	295	305	300	295	300	300	315	295	305	285	285	270	270	
31	260	265	270	265	265	270	290	I ^R 325	I ^R 335	320	300	305	295	290	290	295	305	295	310	305	255	255	235	230	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	29	28	28	28	28	28	28	28	28	28	29	28	28	28	30	30	30	30	30	30	
MED	275	270	275	285	290	280	325	335	325	318	310	305	300	300	300	305	310	315	310	300	290	285	280	278	
UQ	280	285	285	285	300	295	332	338	330	325	315	310	305	305	305	310	318	325	320	310	300	295	285	285	
LQ	270	270	270	275	280	275	312	325	I ^R 320	315	305	300	295	295	295	300	305	310	305	295	285	275	275	270	

IONOSPHERIC DATA

OCT. 1968

M(3000)F1(0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	U L	L	L	L	L	L	A							
2										L	L	L	L	L	L	L								
3											400	L	L	L	L	L								
4										L	L	L	L	L	L	L								
5										L	U L	L	U L	L	L	L								
6										C	C	C	C	C	C	C								
7										L	L	L	U L	L	L	C								
8										L	C	U L	L	L	400	L								
9										L	L	L	L	L	L	L								
10										L	L	L	L	L	L	L								
11										A	L	L	L	L	L	L								
12										L	U L	L	L	L	L	L								
13										C	C	C	C	C	C	C								
14										C	C	C	C	L	L									
15										L	L	L	L	L	L									
16										L	L	L	L	L	L	L								
17										L	L	L	L	L	L	L								
18										L	L	L	L	L	L	L								
19										L	U L	L	L	L	L	L								
20										L	L	A	A	L	L	L								
21										L	L	L	L	L	L	L								
22										L	L	L	L	L	L	L								
23										L	L	L	U L	L	L	L								
24										L	L	L	A	A	L	L								
25										L	A	U L	L	L	L	L								
26										L	L	L	L	L	L	L								
27										L	L	L	L	L	L	L								
28										L	L	L	L	L	L	L								
29										L	L	L	L	L	L	L								
30										L	L	L	L	L	L	L								
31										L	L	L	L	L	L	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										3	3	7	8	3		1								
MED										U	U L	L	L	L		U L								
UQ										405	385	385	388	390										
LQ										392	U L	U L	L	L										

IONOSPHERIC DATA

OCT. 1968

h'F2 (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									250	240	275	255	310	300	280	265								
2									250	255	255	255	290	300	270	265								
3										240	265	250	260	285	270									
4									240	230	255	255	265	275	275	270								
5									230	240	255	260	265	265	280	260								
6									C	C	C	C	C	C	C	C								
7									230	230	245	255	265	265		C								
8										230	245	245	270	255	270									
9										245	260	245	250	285	270	260								
10										245	260	245	250	265	270	255								
11										255	255	245	255	255	255									
12										250	275	230	275	270	280									
13										C	C	C	C	C	C	C								
14										C	C	C	C		245	260								
15										235	250	250	250	250	260									
16										235	245	250	250	255	270									
17										250	I 240	C 250	260	255	255	245								
18										240	265	255	255	255	260									
19										230	240	250	250	260	270									
20										240	235	240	240	270	245									
21										240	245	245	240	260	255									
22										255	245	265	255	270	275									
23										245	265	250	255	280	255									
24										230	245	265	240	265	255									
25										230	230	265	250	265	255									
26										245	245	245	230	250	255									
27										225	255	265	270	245	250									
28										235	265	260	255	255	240									
29										240	255	255	250	245	240									
30										255	255	260	275	255	250									
31										230	240	250	250	250										
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										5	28	28	28	28	29	27	7							
MED										240	240	255	250	255	260	260	260							
UQ										250	245	260	258	265	270	270	265							
LQ										230	230	245	245	250	255	255	258							

IONOSPHERIC DATA

OCT. 1968

f^oF (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	300	275	265	260	245	245	230	245	240	215	230	210	230	240	240	I ^A ₂₄₅	245	245	230	240	260	270	260	250	
2	240	290	280	255	250	255	215	215	220	230	I ^A ₂₂₀	I ^A ₂₀₀	230	240	240	250	250	255	230	215	200	325	345	360	
3	320	275	290	240	195	330	250	230	230	220	200	230	240	245	235	245	245	240	235	235	240	305	I ^A ₃₁₅	280	
4	A ₃₁₀	310	280	275	250	245	235	240	235	220	230	235	230	230	240	245	250	230	225	220	240	260	280	285	
5	285	285	290	260	265	250	215	230	220	205	225	210	210	240	230	250	240	230	225	230	230	240	245	265	
6	270	275	285	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	235	230	240	265	280	I ^A ₂₅₀	265
7	295	290	285	270	245	255	230	230	230	230	220	205	210	215	C	C	C	230	235	235	250	250	250	250	
8	295	270	280	265	245	305	240	230	215	215	I ^A ₂₁₅	200	205	205	245	230	240	230	220	230	240	300	305	285	
9	300	290	290	255	220	240	220	225	225	210	230	220	195	230	240	245	245	230	230	245	250	245	280	285	
10	290	290	290	255	275	280	230	225	240	220	230	200	230	210	235	230	250	230	215	230	240	245	250	270	
11	290	295	295	250	230	235	220	225	230	I ^A ₂₃₀	230	225	215	235	230	235	240	225	225	240	240	245	260	295	
12	295	270	245	235	230	255	240	230	230	225	210	230	210	205	245	240	240	230	215	265	270	300	295	245	
13	270	270	260	245	320	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	235	230	240	235	230	220	240	265	280	280	280
15	285	300	310	290	250	230	230	235	225	225	210	215	230	230	220	240	240	220	210	255	270	260	235	260	
16	275	285	285	290	235	250	225	220	215	235	225	210	220	245	240	240	250	235	220	240	240	240	245	290	B ₂₉₀
17	A ₃₆₀	A ₃₆₀	315	295	240	240	230	230	225	230	I ^A ₂₃₀	215	225	235	240	230	225	225	240	230	245	270	250	265	
18	I ^A ₂₈₅	315	I ^A ₃₂₀	290	265	255	230	225	225	230	215	230	230	235	235	240	230	225	245	260	270	255	230	275	
19	290	280	280	270	265	265	225	225	230	230	205	230	230	230	240	230	230	235	255 ^A	250	240	235	265	300	
20	280	300	280	265	230	215	240	230	230	220	225	I ^A ₂₂₀	I ^A ₂₃₀	230	230	240	230	240	245	250	245	275	290	290	
21	290	270	255	260	270	280	240	230	230	240	230	230	230	230	I ^A ₂₄₀	240	230	225	225	245	240	260	285	260	
22	270	255	245	255	230	240	225	225	230	230	230	235	235	240	250	240	240	220	220	255	255	260	290	305	
23	295	280	270	I ^A ₂₇₅	275	240	230	230	235	230	230	240	225	230	240	230	230	225	245	240	270	280	290	310	
24	300	295	280	280	290	280	225	230	240	230	230	240	I ^A ₂₅₀	I ^A ₂₃₅	I ^A ₂₄₀	240	230	220	240	245	275	290	290	290	
25	310	300	290	260	255	290	240	225	230	I ^A ₂₂₅	I ^A ₂₃₀	210	I ^A ₂₁₅	240	230	240	230	230	240	230	265	300	290	290	
26	280	240	280	280	245	250	265	240	235	230	I ^A ₂₂₅	225	220	230	230	240	230	225	230	240	235	280	305	300	
27	275	260	290	270	265	290	265	230	230	225	225	225	230	230	235	240	240	220	250	270	245	240	290	275	
28	310	355	310	295	275	I ^A ₂₉₅	240	230	230	235	235	230	240	230	235	240	230	230	250	230	230	265	270	270	
29	290	305	290	265	240	240	255	230	225	230	230	230	230	230	230	240	240	225	240	230	225	260	305	350 ^A	
30	400	340	245	325	320	300 ^H	250	240	240	235	240	230	230	230	230	230	230	215	250	240	I ^A ₂₅₅	270	290	340 ^A	
31	315	330	280	270	300	290	285	230	230	I ^A ₂₃₀	I ^A ₂₃₀	230	235	230	230	240	230	215	240	240	290	320	I ^A ₃₈₀	I ^A ₄₃₀	B ₄₃₀
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	30	30	29	29	28	28	28	28	28	28	28	28	28	29	28	28	28	30	30	30	30	30	30	30
MED	290	290	282	270	250	255	230	230	230	230	230	225	230	230	235	240	240	230	230	240	245	268	282	285	
UQ	300	300	290	280	270	285	240	230	232	230	230	230	230	235	240	240	242	230	240	245	265	280	290	300	
LQ	280	275	280	255	240	240	225	225	225	220	220	210	218	230	230	238	230	225	225	230	240	250	250	265	

IONOSPHERIC DATA

OCT. 1968

***h'*E_s** (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	110	110	105	105	E	E	150	G	105	130	130	120	115	115	110	105	105	100	100	100	100	100	S	S
2	S	110	110	105	105	105	B	G	140	120	115	115	140	G	G	130	110	110	105	105	S	S	S	S
3	S	E	S	E	E	S	B	G	110	G	G	G	G	G	G	G	135	125	120	120	S	115	110	110
4	110	110	E	E	E	110	110	110	G	G	G	G	G	G	G	G	G	120	110	105	105	100	100	S
5	S	E	E	105	105	S	105	G	G	G	G	G	G	G	150	G	130	G	S	S	S	105	S	S
6	S	E	E	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	115	100	100	B	C	B
7	B	S	S	E	E	S	G	170	150	130	130	G	115	G	C	C	C	C	C	C	C	C	C	C
8	C	C	E	E	C	C	C	C	C	C	C	C	G	G	G	140	G	G	150	S	S	110	110	105
9	B	E	S	S	S	S	150	G	G	G	G	G	G	115	115	115	115	B	S	105	B	S	S	S
10	S	E	E	E	S	E	B	G	G	120	G	G	G	G	G	G	G	B	S	S	S	B	C	B
11	C	105	105	S	S	S	B	G	105	120	125	120	120	120	125	G	G	105	100	B	B	B	S	B
12	S	E	E	E	S	S	S	150	150	G	120	115	G	G	G	105	105	100	100	B	B	S	105	105
13	S	S	S	110	110	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	105	105	105	100	100	100	S	S	110	S
15	S	100	S	S	S	S	B	E	100	120	G	115	G	G	G	G	B	B	105	105	100	105	100	S
16	S	S	S	S	S	S	G	E	165	E	165	140	130	E	160	135	140	G	G	G	B	125	S	S
17	125	110	E	E	120	B	B	G	G	130	C	115	115	110	G	105	110	110	105	100	105	S	B	110
18	110	105	105	105	105	110	B	150	130	120	120	115	115	130	140	155	140	120	110	105	105	105	S	100
19	B	S	S	E	S	105	115	G	140	130	125	125	125	125	130	125	115	110	110	110	105	110	B	105
20	B	100	S	S	S	S	B	130	130	G	130	115	110	115	G	125	130	130	115	105	105	105	105	105
21	105	105	105	E	E	B	B	G	G	130	G	130	120	115	115	G	G	B	140	120	110	S	B	S
22	S	S	S	S	S	S	B	G	G	G	125	100	100	115	115	110	110	110	110	105	105	105	105	105
23	S	E	E	110	110	110	B	G	G	G	130	G	G	B	G	140	G	G	110	110	105	105	105	105
24	105	100	105	105	100	S	B	G	G	130	115	115	115	110	115	110	115	110	105	105	105	105	105	105
25	S	100	S	E	105	S	G	G	130	120	115	115	120	110	140	125	115	115	115	110	110	S	B	110
26	110	105	100	100	S	S	B	B	125	115	115	115	110	G	105	G	110	115	110	110	110	S	110	105
27	105	115	105	100	105	S	G	110	G	G	G	G	G	G	G	140	130	115	115	110	110	S	105	105
28	105	105	110	105	110	105	105	G	115	115	110	105	G	115	140	110	110	110	105	100	B	105	B	B
29	B	S	105	105	E	S	B	G	120	115	115	110	115	130	115	G	130	115	110	110	110	105	105	105
30	105	105	105	S	S	S	G	140	130	120	G	G	110	G	110	G	G	B	115	115	110	S	115	110
31	110	110	110	105	105	105	105	G	120	115	115	115	115	115	120	G	B	S	110	110	115	115	105	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	16	12	12	11	7	7	9	17	18	17	18	17	16	17	15	18	19	25	22	19	16	14	14
MED	110	105	105	105	105	105	110	U	140	128	120	120	115	115	115	115	115	110	110	105	105	105	105	105
UQ	110	110	108	105	110	110	132	U	158	135	130	130	118	120	122	140	128	130	118	115	110	110	105	110
LQ	105	102	105	105	105	105	105	130	115	120	115	115	115	115	112	115	108	110	110	105	105	105	105	105

IONOSPHERIC DATA

OCT. 1968

Types of Es

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F ₂	F ₂	F ₂	F ₂			H ₁		L ₁	HL ₁₂	H ₁	H ₂	C ₁	C ₂	C ₂	L ₃	L ₆	L ₄	L ₃	F ₃	F ₁	F ₁			
2		F ₁	F ₁	F ₂	F ₂	L ₁			H ₁	C ₂	C ₂	C ₂	H ₁			C ₁	C ₃	L ₃	L ₃	F ₃					
3									L ₁								H ₃	C ₄	C ₁	F ₄		F ₃	F ₄	F ₄	
4	F ₂	F ₃				L ₂	L ₂	L ₂										C ₂	L ₁	F ₁	F ₂	F ₂	F ₁		
5				F ₁	F ₁		L ₁								H ₂		C ₂					F ₁			
6																			C ₁	F ₁	F ₁				
7								H ₁	H ₁	H ₁	H ₁		C ₂												
8															H ₁			H ₁			F ₁	F ₂	F ₁		
9							H ₁							L ₁	C ₂	C ₂	C ₃			F ₁					
10										C ₁															
11		F ₁	F ₁						L ₂	C ₁	H ₁	C ₁	C ₁	C ₁	C ₂				L ₁	F ₁					
12								H ₂	H ₁		C ₁	C ₁				L ₂	L ₂	L ₃	F ₁			F ₂	F ₂		
13				F ₂	F ₁										L ₂	L ₂	L ₂	L ₃	L ₄	F ₂			F ₁		
14																									
15		F ₁						H ₁	L ₁	C ₁		C ₂								F ₁	F ₁	F ₂	F ₂	F ₁	
16								H ₂	H ₁	H ₁	H ₁	H ₁	H ₂	H ₁						F ₂					
17	F ₂	F ₅			F ₁					H ₂		C ₁	C ₂	C ₂		L ₂	L ₁	L ₂	F ₃	F ₁	F ₁		F ₂		
18	F ₂	F ₂	F ₄	F ₂	F ₂	F ₂		H ₁	H ₂	H ₂	H ₂	C ₂	C ₂	C ₁	H ₁	H ₁	H ₂	C ₃	F ₃	F ₂	F ₁	F ₂	F ₁		
19						F ₂	C ₁		H ₁	H ₁	H ₁	H ₁	H ₂	H ₁	H ₁	C ₂	C ₂	C ₃	F ₄	F ₂	F ₁	F ₁	F ₂		
20		F ₁						H ₁	H ₁		H ₁	C ₂	C ₃	C ₂		H ₂	H ₁	H ₂	F ₃	F ₂	F ₂	F ₂	F ₂	F ₂	
21	F ₁	F ₁	F ₁							H ₁		C ₁	C ₁	C ₂	C ₁				F ₁	F ₁	F ₁				
22											H ₁	HL ₁₂	L ₂	CL ₂₂	CL ₂₂	C ₂	C ₂	C ₂	F ₁	F ₃	F ₁	F ₁	F ₁	F ₂	
23				F ₄	F ₂	F ₂					H ₁						H ₁			F ₂	F ₂	F ₂	F ₂	F ₂	
24	F ₁	F ₂	F ₂	F ₂	F ₂				H ₁	C ₁	C ₁	C ₂	C ₂	C ₂	C ₂	C ₂	C ₂	L ₁	F ₄	F ₃	F ₃	F ₂	F ₂	F ₁	
25		F ₁			F ₁				H ₂	C ₂	C ₂	C ₁	C ₂	L ₂	H ₁	H ₂	C ₃	C ₃	F ₃	F ₂	F ₃			F ₂	
26	F ₂	F ₁	F ₂	F ₂					H ₂	C ₂	C ₁	C ₁	L ₁		L ₁		L ₁	C ₁	F ₂	F ₁	F ₁		F ₂	F ₁	
27	F ₂	F ₁	F ₃	F ₂	F ₂				L ₁								H ₂	H ₂	C ₁	F ₂	F ₂	F ₂		F ₂	
28	F ₂	F ₂	F ₂	F ₂	F ₄	F ₅	L ₃		C ₂	C ₂	C ₃	L ₂		C ₂	H ₁	L ₂	L ₁	L ₁	F ₂	F ₁		F ₂			
29			F ₁	F ₂					C ₂	C ₁	C ₁	C ₂	C ₁	H ₁	C ₂		H ₂	C ₁	F ₂	F ₂	F ₁	F ₁	F ₂	F ₂	
30	F ₁	F ₂	F ₁					H ₁	H ₁	C ₁			L ₁		L ₁					F ₃	F ₂	F ₃	F ₃	F ₃	
31	F ₂	F ₅	F ₂	F ₂	F ₂	F ₂	L ₂		C ₂	C ₁	C ₁	C ₁	C ₁	C ₁	C ₁					F ₁	F ₂	F ₂	F ₁	F ₁	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

IONOSPHERIC DATA

OCT. 1968

foF2 (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	65	65	66	60	59	58	74	90	108	96	101	111	105	113	117	I ^C ₁₁₉	115	102	92	73	71	72	72	74
2	66	59	63	66	61	52	76	81	97	108	120	130	128	128	142	135	123	122	125	79	56	53	54	51
3	58	63	49	52	37	31	66	99	101	104	129	135	132	129	126	131	117	111	96	73	69	58	56	61
4	57	51	52	53	52	43	70	91	113	110	114	117	125	128	130	123	123	123	97	65	60	57	55	56
5	53	52	51	51	48	48	R	96	107	105	110	120	112	109	106	109	Y ^R ₁₀₅	104	92	69	59	54	49	49
6	47	47	47	47	45	47	J ^R ₇₆	94	94	100	119	120	111	101	101	95	90	86	J ^R ₈₃	64	64	59	59	54
7	52	54	53	50	46	49	78	95	104	94	97	110	110	107	108	108	108	105	90	72	70	70	67	59
8	60	58	57	56	54	49	R	98	107	92	93	109	120	120	129	120	114	107	82	59	59	59	60	U ^S ₆₁
9	J ^R ₅₆	55	56	57	50	42	71	80	95	104	Y ^R ₁₀₄	113	115	124	128	120	111	109	89	68	65	61	60	59
10	58	54	52	55	49	51	74	91	101	98	107	114	117	127	126	113	108	109	88	63	64	60	56	51
11	51	48	49	J ^R ₅₂	43	37	64	83	100	C	116	122	111	115	120	113	109	100	82	69	63	58	50	50
12	49	50	48	46	40	35	63	90	100	98	113	126	122	128	129	122	123	119	74	60	59	63	64	69
13	57	51	49	46	40	42	52	74	91	95	103	108	123	114	101	J ^R ₁₀₆	87	84	56	53	54	I ^R ₅₀	50	48
14	49	44	44	44	43	38	R	85	J ^R ₁₀₇	107	112	116	121	119	111	111	111	93	68	46	51	51	46	46
15	48	46	43	45	44	39	63	86	109	110	102	112	121	112	102	115	115	Y ^R ₁₀₅	76	62	63	63	56	47
16	48	47	46	48	46	42	70	84	100	104	100	108	112	105	109	108	108	108	74	56	58	52	42	43
17	46	43	45	45	49	44	67	90	96	110	126	120	121	125	129	128	115	96	69	68	60	59	60	52
18	48	49	50	54	48	48	R	100	108	115	115	124	123	128	126	123	114	102	76	68	64	69	54	50
19	52	52	51	56	J ^R ₅₄	56	R	94	115	114	118	128	132	129	127	121	114	106	82	69	66	54	52	48
20	50	46	49	51	41	40	58	88	119	121	128	109 ^H	117	126	125	112	109	97	65	63	58	53	51	51
21	50	52	53	55	44	44	60	95	111	127	125	122	114	119	119	106	93	88	S ₆₀	58	57	53	52	56
22	47	49	48	52	51	31	57	76	100	Y ^K ₁₀₆	112	113	118	116	114	115	101	93	59	54	54	J ^S ₅₁	49	49
23	48	46	45	46	49	30	54	85	101	107	105	121	119	126	123	111	87	87	63	59	57	50	47	46
24	47	47	44	44	43	38	57	81	100	108	114	129	134	134	128	127	118	97	73	63	59	55	55	50
25	50	51	50	56	49	47	78	103	121	104	122	133	134	136	136	126	113	98	J ^R ₉₇	74	55	J ^R ₅₀	60	60
26	I ^R ₆₂	R ₅₁	J ^R ₅₄	50	45	66	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	108	116	131	127	120	113	113	108	80	70	69	55	49	47
28	43	42	42	46	45	40	52	I ^C ₉₄	114	115	115	123	125	125	119	106	J ^R ₁₀₃	89	81	73	60	52	50	46
29	46	43	42	46	37	31	57	95	106	113	117	134	127	123	125	115	111	Y ^R ₁₀₇	92	R	58	51	50	48
30	I ^R ₄₄	46	52	33	37	37	52	88	115	141	140	138	142	147	136	125	115	108	R	78	63	60	55	51
31	51	50	54	47	47	48	60	111	128	131	142	141	144	150	148	131	127	Y ^R ₁₀₈	80	69	50	I ^R ₄₇	41	39
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	26	29	29	28	30	30	30	30	30	30	30	30	29	29	30	30	30	30
MED	50	50	50	51	46	42	65	90	106	107	114	120	121	125	125	115	112	104	81	68	60	55	54	50
UQ	57	54	52	55	50	48	71	95	111	114	120	128	128	128	129	123	115	108	90	70	64	60	59	56
LQ	48	46	46	46	43	38	57	85	100	102	105	113	115	115	114	111	108	96	73	60	57	52	50	48

IONOSPHERIC DATA

OCT. 1968

foF1 (0.01)

135° E Mean Time (G. M. T. +9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	L	L	C								
2										L	L	L	L	L	L	L	L							
3										L	L	L	L	L	L	L								
4								L	L	L	L	L	L	L	L	L	L							
5									L	L	L	L	L	L		L								
6								L	L	L	L	L	L	L	L									
7										L	L	L	L	L	L		L							
8									L	L	L	L	L	L	L									
9									L	L	L	L	L	L	L									
10										L	L	L	L	L	L									
11									L	C	L	L	L	L	L	L								
12										L	L	L	L	L	L	L								
13									L	L	L	L	L	L	L									
14									L	L	L	L	L		L									
15											L	L	L	L		L								
16											L	L	L	L										
17									L	L	L	A	L	L	A	A								
18										L	A	L		L	L	L								
19									L	L	L	L	L	L										
20									L		L	L	L	L		L								
21										L	L	L	L	L										
22										L	L	L	L	L	L	A								
23										L	L	L		B										
24											L	A	L	A	A	L								
25											L	L	L	L	L									
26										C	C	C	C	C	C	C	C	C	C					
27										C	C	C	L	L	L									
28											L	L	L		L				L					
29										L	L	L	L	L	L	L	L							
30										L	L	L	L	L	L									
31											B	L	L	L	L									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1														
MED										L														
UQ										430														
LQ																								

IONOSPHERIC DATA

OCT. 1968

foE (0.01)

135° E Mean Time (G. M. T. + 9^h)

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

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		I R		B	I A	R	R	R	C	A	A						
2							A		265 320	350	R	365	375	370	I R	330	315	A	A					
3							B		I R	I R		R	R	R			320	275	A					
4							180	280	320	355	B	B	370	I R	365	350	I R	320	280	B				
5							A		270	315	R	340	375	I R	370	360	340	325	270	A				
6							B		265	A	345	A	A	A	A	A	320	270	A					
7							B		255	310	330	I R	340	R	R	A	R	305	250	B				
8							B		250	305	330	355	I R	360	365	350	345	320	270	R				
9							B		260	305	330	355	I R	365	370	R	360	340	305	255	A			
10							B		260	310	330	350	I R	360	360	350	335	300	260	A				
11								200	270	300	I C	335	345	I B	I R	I R	335	310	R	B				
12								190	255	295	340	A	A	A	355	I A	340	310	A	A				
13							B		270	I A	I A	320	330	A	R	R	325	300	260	165				
14							A		240	300	320	335	I R	340	I A	355	340	300	250	B				
15							B		250	300	I A	320	A	A	A	R	I A	335	300	A	A			
16								185	230	300	330	335	I R	340	I R	350	340	I R	335	310	260	B		
17							B		I R	I R	300	330	340	A	A	A	A	A	A	A				
18							B		280	300	325	A	A	R	B	B	315	A	B					
19							B		260	300	340	350	I A	350	I A	350	350	330	A	A	A			
20							B		260	I A	320	I A	340	350	A	365	340	300	260	A				
21							B		I R	R	305	330	350	355	B	A	B	310	250	B				
22							B		265	305	340	355	365	I A	360	345	325	A	A	A				
23							B		I A	300	I A	330	I A	345	A	R	B	340	290	R	B			
24							B		I R	A	R	R	R	R	A	A	A	A	A	B				
25							B		270	300	A	A	A	R	A	A	A	A	A	B				
26							B		C	C	C	C	C	C	C	C	C	C	C	C				
27							C		C	C	C	C	355	R	R	I R	355	330	295	A	B			
28							C		A	300	A	345	R	R	340	A	A	A	A	B				
29							B		R	A	R	R	355	A	A	R	I R	300	260	B				
30							B		250	305	A	A	A	A	R	R	R	225	B					
31							E		R	R	B	B	A	A	A	R	A	R	B					
									285															
CNT							4	27	26	23	18	14	11	15	17	21	15	1						
MED							188	260	300	330	348	358	U	360	355	335	310	260	165					
UQ							195	268	305	340	355	U R	365	370	360	340	315	270						
LQ							182	250	300	328	340	U	350	U	352	350	330	300	252					

IONOSPHERIC DATA

OCT. 1968

foEs (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	22	22	J X 22	21	21	E S 16	21	29	G	G	E B 55	43	G	G	G	C	J X 29	22	J X 23	22	J X 41	35	J X 26	M 21		
2	18	E S 16	E B 12	21	J X 29	J X 23	23	G	35	39	G	G	G	G	G	G	J X 43	J X 41	J X 41	J X 28	J X 29	J X 23	E S 16	E S 16		
3	E S 16	E S 15	E S 15	21	E	E S 15	J X 24	G	G	29	36	39	G	G	G	G	36	J X 29	J X 24	M 22	22	J X 29	J X 25	21		
4	E S 16	E S 16	E B 12	E S 16	E B 12	E B 11	22	J X 29	G	G	E B 41	E B 40	G	G	G	G	22	29	24	J X 24	E S 15	21	E S 16	E S 16		
5	E S 16	E S 15	E S 15	E B 12	E	22	J X 23	39	G	G	G	G	G	G	G	G	36	35	24	J X 17	M 23	22	M 21	21	E S 15	
6	E S 15	E B 13	E B 12	E	E B 11	E B 14	24	J X 29	31	G	38	37	39	37	J X 40	G	30	23	J X 42	E B 14	22	J X 22	M 20	E S 15		
7	E S 15	E S 15	E B 12	E B 13	E	E B 13	21	31	36	36	G	G	G	M 43	G	G	29	27	E B 19	23	20	J X 23	M 20	E S 16	E S 15	
8	E S 15	E S 15	E S 15	E B 12	E B 12	E S 16	E B 16	29	G	36	G	G	G	G	G	G	31	G	21	E S 16	E S 15	19	24	21		
9	J X 25	24	21	21	E	E B 13	E B 16	G	G	36	G	G	G	G	G	G	22	32	G	19	23	J X 43	J X 29	M 22	J X 15	J X 17
10	E S 15	E S 15	E B 14	E	E	E B 11	E B 14	29	G	36	G	G	G	G	G	G	G	G	18	M 23	M 23	21	E S 15	E S 15	E S 15	
11	E S 16	21	E B 12	E	E B 12	21	G	G	G	C	50	42	42	39	43	G	18	G	J X 29	J X 41	M 30	E S 16	E S 16	E B 14	E S 16	
12	E S 15	E S 15	E S 15	E B 12	21	E S 16	22	28	M 33	39	39	39	J X 37	G	39	21	J X 34	M 31	J X 23	J X 24	M 20	22	E S 15	E S 15		
13	E S 15	M 20	M 21	E B 14	E S 15	E B 13	23	30	J G 29	42	J X 41	J X 43	G	34	J G 28	35	30	23	M 21	E S 15	J X 26	J X 25	30	24		
14	21	J X 33	M 32	E S 15	M 20	J X 24	23	G	23	32	36	42	M 42	42	36	G	42	31	E B 25	E S 15	E S 16	E S 16	17	21	M 23	
15	23	M 21	J X 25	E B 12	E S 15	E S 15	E B 15	G	21	35	35	36	M 43	G	31	37	35	J X 36	36	J X 36	J X 36	18	23	M 23	21	
16	21	21	E S 16	E B 12	E S 15	21	G	G	35	41	40	M 42	G	39	42	G	29	M 35	M 31	E S 16	28	J X 29	21	21		
17	M 27	E S 16	E	21	E S 15	21	E B 15	G	G	36	43	58	48	M 43	57	57	J X 51	31	J X 35	J X 27	J X 25	28	21	22		
18	E S 15	E S 16	J X 28	E S 16	J X 50	J X 51	23	J X 29	36	42	50	39	G	E B 39	E B 38	39	38	E B 16	J X 23	J X 20	J X 29	J X 25	J X 23	J X 23		
19	E S 16	18	E B 14	E S 15	E S 15	E S 16	E B 16	G	35	J X 37	39	48	J X 43	41	40	33	J X 33	J X 61	M 35	J X 29	29	36	M 26	24		
20	E S 16	18	18	M 22	21	22	21	J G 26	30	J X 39	J X 37	G	38	G	G	36	J X 41	21	M 35	J X 29	23	21	E S 15	E S 15		
21	M 21	22	21	M 20	M 21	J X 23	E B 16	G	G	36	G	39	E B 40	38	E B 40	G	G	E B 17	E S 15	M 30	35	J X 29	23	23		
22	J X 22	21	21	E B 13	J X 16	E S 15	21	G	34	43	43	42	43	39	47	J X 63	J X 42	J X 74	J X 52	J X 26	J X 41	J X 28	J X 29	24		
23	22	E S 15	M 22	M 20	J X 16	E	J X 25	J X 30	32	35	42	J X 41	G	E B 61	39	32	J X 58	28	J X 25	J X 25	21	J X 21	J X 28	J X 25		
24	26	J X 25	J X 23	22	E S 15	E S 16	E B 16	J X 30	J X 30	G	41	95	39	J X 91	J X 60	34	M 40	J X 51	M 35	J X 41	J X 30	J X 42	J X 29	23		
25	J X 24	M 21	M 21	21	18	21	E B 16	28	35	J X 41	J X 60	42	G	46	J X 41	J X 41	J X 29	J X 40	J X 36	J X 51	J X 36	J X 29	J X 22	M 22		
26	J X 29	49	23	J X 23	M 21	J X 30	22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
27	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	39	41	35	J X 37	J X 24	J X 36	J X 28	M 22	E S 16	M 21	
28	21	J X 28	J X 28	J X 27	J X 23	J X 24	E S 30	34	G	29	36	G	G	G	G	45	J X 50	34	21	E S 16	E S 16	E S 16	E S 16	E S 17		
29	21	M 21	J X 24	M 22	21	E S 15	21	G	J X 51	G	G	G	42	42	G	G	29	E B 16	J X 61	J X 54	J X 29	J X 29	31	J X 25		
30	J X 25	J X 23	J X 25	22	20	E S 16	E B 16	G	35	36	42	35	M 42	G	G	G	G	E B 16	E S 16	E S 16	J X 29	J X 50	J X 41	J X 51		
31	J X 52	23	J X 25	23	J X 28	J X 36	21	J G 24	36	E B 40	E S 56	J X 55	M 47	J X 51	G	35	30	E B 16	23	26	30	J X 25	J X 29	J X 29		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	29	29	28	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	
MED	21	20	21	18	16	E 16	21	26	30	36	38	38	E 34	U 32	U 32	32	31	24	J X 24	24	24	26	23	22	21	
UQ	23	22	J X 23	21	21	22	23	29	35	39	42	42	42	40	40	36	J X 36	J X 35	J X 35	J X 30	J X 29	J X 29	J X 28	23		
LQ	E S 16	E S 15	E B 14	E B 12	E B 12	E S 15	E B 16	G	G	35	G	G	G	G	G	G	29	19	23	E 16	21	21	E S 16	E S 16		

IONOSPHERIC DATA

OCT. 1968

fbEs (0.1)

135 E Mean Time (G. M. T. + 9^h)

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

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	16	E	16	E	E	E ₁₆	20	29	G	G	E ₅₅	40	G	G	E ₃₁	C	29	20	17	E	37	33	25	E	
2	E	E ₁₆	E ₁₂	E	18	17	23	G	33	38	G	G	G	G	G	G	29	41	40	25	20	E	E ₁₆	E ₁₆	
3	E ₁₆	E ₁₅	E ₁₅	E	E	E ₁₅	17	G	E ₂₉	35	38	G	G	G	G	G	33	26	20	E	E	26	20	E	
4	E ₁₆	E ₁₆	E ₁₂	E ₁₆	E ₁₂	E ₁₁	17	25	G	E ₄₁	E ₄₀	G	G	G	E ₂₂	29	20	16	E ₁₅	E	E ₁₆	E ₁₆	E ₁₆		
5	E ₁₆	E ₁₅	E ₁₅	E ₁₂	E	E	18	28	G	G	G	G	G	G	G	34	34	20	16	E	17	E	17	E ₁₅	
6	E ₁₅	E ₁₃	E ₁₂	E	E ₁₁	E ₁₄	22	28	E ₃₁	G	38	E ₃₇	E ₃₉	E ₃₇	38	G	29	23	26	E ₁₄	E	E	E	E ₁₅	
7	E ₁₅	E ₁₅	E ₁₂	E ₁₃	E	E ₁₃	G	30	35	E ₃₆	G	G	E ₃₄	37	E ₃₁	G	26	E ₁₉	16	E	17	E	E ₁₆	E ₁₅	
8	E ₁₅	E ₁₅	E ₁₅	E ₁₂	E ₁₂	E ₁₆	E ₁₆	26	G	35	G	G	G	G	G	G	G	G	17	E ₁₆	E ₁₅	E	E	E	
9	22	17	E	E	E	E ₁₃	E ₁₆	G	G	36	G	G	G	G	E ₂₂	32	G	19	17	38	20	E	E	E	
10	E ₁₅	E ₁₅	E ₁₄	E	E	E ₁₁	E ₁₄	27	G	35	G	G	G	G	G	G	G	18	E	E	E	E ₁₅	E ₁₅	E ₁₅	
11	E ₁₆	E	E ₁₂	E	E ₁₂	E	G	G	G	C	50	E ₄₀	40	E ₃₉	40	G	18	G	19	19	E	E ₁₆	E ₁₆	E ₁₄	E ₁₆
12	E ₁₅	E ₁₅	E ₁₅	E ₁₂	E	E ₁₆	20	28	33	38	38	38	37	28	37	21	G	25	22	19	E	E	E	E ₁₅	E ₁₅
13	E ₁₅	E	E	E ₁₄	E ₁₅	E ₁₃	22	G	E ₂₉	40	40	41	E ₃₅	E ₃₄	G	24	33	29	19	E	E ₁₅	21	E	25	15
14	E	18	25	E ₁₅	E	E	16	22	G	32	36	41	40	E ₄₂	E ₃₆	G	36	26	E ₂₅	E ₁₅	E ₁₆	E ₁₆	E	E	E
15	19	E	E	E ₁₂	E ₁₅	E ₁₅	E ₁₅	G	E ₂₁	33	34	E ₃₆	40	E ₃₁	E ₃₇	33	33	34	30	36	E	E	17	E	
16	E	E	E ₁₆	E ₁₂	E ₁₅	E	G	G	34	40	40	41	G	39	40	G	29	30	29	E ₁₆	19	20	E	E	
17	19	E ₁₆	E	E	E ₁₅	E	E ₁₅	G	G	G	41	53	E ₄₈	42	55	40	38	26	34	25	25	20	18	E	
18	E ₁₅	E ₁₆	E	E ₁₆	E	30	18	27	32	40	50	39	G	E ₃₉	E ₃₈	39	38	E ₁₆	16	E	E	24	25	E	
19	E ₁₆	E	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₆	G	32	28	38	47	40	40	40	33	31	30	30	E	18	25	22	16	
20	E ₁₆	E	E	E	E	E	18	23	G	30	39	37	G	38	G	G	32	40	18	32	20	17	E	E ₁₅	E ₁₅
21	E	18	E	E	E	15	E ₁₆	G	G	35	G	38	E ₄₀	E ₃₈	E ₄₀	G	G	E ₁₇	E ₁₅	23	30	20	E	E	
22	E	E	E	E ₁₃	E	E ₁₅	G	G	33	40	40	40	40	39	46	62	40	52	35	E	26	17	21	E	
23	E	E ₁₅	16	E	E	E	G	27	32	35	38	40	G	E ₆₁	39	31	25	18	E	E	E	E	28	25	
24	E	E	E	E	E ₁₅	E ₁₆	E ₁₆	G	30	G	41	60	E ₃₉	87	56	31	26	41	26	40	25	41	26	E	
25	24	E	E	E	E	E	E ₁₆	28	33	40	45	41	G	45	41	40	25	26	25	21	26	28	20	E	
26	25	A	17	16	16	E	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	39	40	26	35	24	17	27	E	E ₁₆	E
28	E	E	25	26	18	18	E ₃₀	25	28	36	G	G	G	G	40	34	29	G	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₅	E ₁₇	
29	E	E	E	16	E	E ₁₅	G	G	40	G	G	G	40	40	G	G	29	E ₁₆	33	30	23	17	30	25	
30	16	E	E	E	E	E ₁₆	E ₁₆	G	32	E ₃₆	40	E ₃₅	38	G	G	G	G	E ₁₆	E ₁₆	E ₁₆	21	50	40	18	
31	23	E	16	E	E	21	G	E ₂₄	30	E ₄₀	E ₅₆	53	44	41	G	33	25	E ₁₆	19	20	26	25	27	26	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	29	29	28	30	30	30	30	30	29	30	30	30	30	30	30	30	30	
MED	E ₁₅	E ₁₄	E ₁₂	E ₁₂	E	E ₁₄	E ₁₆	E ₂₂	30	36	38	E ₃₈	E ₃₄	E ₃₅	E ₃₄	31	29	20	19	16	18	16	16	E ₁₅	
UQ	16	E ₁₆	E ₁₅	E ₁₄	E ₁₅	E ₁₆	18	27	32	38	40	40	39	39	40	34	31	26	29	21	25	24	25	E ₁₆	
LQ	E	E	E	E	E	E	G	G	G	E ₂₈	G	G	G	G	G	G	25	E ₁₈	16	E	E	E	E	E	

IONOSPHERIC DATA

OCT. 1968

f-min (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E ₁₅	E ₁₅	14	E ₁₅	E ₁₆	E ₁₆	16	17	17	17	55	20	20	26	19	C	16	11	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
2	E ₁₆	E ₁₆	12	12	E ₁₅	E ₁₆	16	16	16	17	18	16	26	19	18	16	16	16	E ₁₅	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
3	E ₁₆	E ₁₅	E ₁₅	E ₁₅	10	E ₁₅	16	16	16	18	26	27	25	28	26	16	16	15	12	E ₁₆	E ₁₆	E ₁₅	E ₁₆	E ₁₆	
4	E ₁₆	E ₁₆	12	E ₁₆	12	11	16	16	16	26	41	40	25	25	18	16	16	16	13	E ₁₅	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
5	E ₁₆	E ₁₅	E ₁₅	12	10	14	14	18	16	16	16	18	26	17	16	16	15	12	14	E ₁₅	E ₁₅	E ₁₅	14	E ₁₅	
6	E ₁₅	13	12	10	11	14	16	15	16	25	20	25	25	25	18	15	25	14	E ₁₅	14	14	E ₁₅	E ₁₅	E ₁₅	
7	E ₁₅	E ₁₅	12	13	10	13	15	16	15	26	18	26	20	27	25	16	16	19	13	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₅	
8	E ₁₅	E ₁₅	E ₁₅	12	12	E ₁₆	16	16	16	16	16	27	19	25	25	19	15	15	E ₁₆	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
9	E ₁₅	E ₁₅	E ₁₅	E ₁₅	10	13	16	14	16	16	17	26	26	25	16	16	14	12	13	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
10	E ₁₅	E ₁₅	14	10	10	11	14	15	16	16	18	25	18	19	15	16	16	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
11	E ₁₆	E ₁₅	12	10	12	14	15	15	16	C	25	40	27	19	17	16	16	16	E ₁₆	E ₁₆	E ₁₆	E ₁₆	14	E ₁₆	
12	E ₁₅	E ₁₅	E ₁₅	12	E ₁₅	E ₁₆	16	16	15	18	22	26	16	16	18	15	14	11	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
13	E ₁₅	12	14	14	E ₁₅	13	16	16	15	17	16	18	26	25	14	15	15	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₆	12	
14	E ₁₅	12	11	E ₁₅	12	E ₁₅	13	16	15	18	26	25	17	26	26	18	16	25	E ₁₅	E ₁₆	E ₁₆	E ₁₅	E ₁₆	E ₁₆	
15	E ₁₆	E ₁₆	E ₁₆	12	E ₁₅	E ₁₅	15	16	15	19	16	16	16	18	16	16	16	16	E ₁₇	E ₁₇	E ₁₇	E ₁₆	E ₁₅	E ₁₅	
16	E ₁₅	E ₁₅	E ₁₆	12	E ₁₅	E ₁₅	16	16	17	19	26	26	26	17	26	20	16	16	E ₁₆	E ₁₆	E ₁₅	E ₁₆	E ₁₆	E ₁₆	
17	E ₁₆	E ₁₆	10	E ₁₆	E ₁₅	E ₁₅	15	16	26	18	18	28	25	27	26	16	15	15	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
18	E ₁₅	E ₁₆	E ₁₅	E ₁₆	E ₁₅	E ₁₆	16	16	16	19	16	26	26	39	38	18	16	16	E ₁₅	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
19	E ₁₆	E ₁₆	14	E ₁₅	E ₁₅	E ₁₅	16	16	16	15	16	33	17	16	16	16	12	12	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₆	E ₁₅	
20	E ₁₆	12	E ₁₅	10	11	13	16	16	16	16	18	26	25	26	19	15	16	14	E ₁₆	E ₁₅	13	E ₁₅	E ₁₅	E ₁₅	
21	E ₁₅	12	E ₁₅	E ₁₅	13	14	16	16	16	15	26	17	40	26	40	17	16	17	E ₁₅	12	E ₁₅	14	E ₁₅	E ₁₅	
22	14	14	14	13	10	E ₁₅	16	15	16	16	26	18	14	15	15	16	14	12	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₆	
23	E ₁₆	E ₁₅	11	14	10	10	15	16	14	25	26	25	26	61	16	16	14	16	E ₁₆	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₆	
24	E ₁₆	E ₁₅	E ₁₅	14	E ₁₅	E ₁₆	16	16	18	26	30	27	26	26	17	17	16	16	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
25	E ₁₆	E ₁₆	E ₁₅	E ₁₆	E ₁₅	E ₁₆	16	16	16	16	19	26	26	25	18	16	16	16	E ₁₅	E ₁₆	E ₁₇	E ₁₅	E ₁₅	E ₁₆	
26	12	13	E ₁₆	10	10	E ₁₆	16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
27	C	C	C	C	C	C	C	C	C	C	C	26	26	28	27	18	26	16	14	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆
28	E ₁₅	E ₁₆	E ₁₅	10	13	E ₁₅	E ₁₆	E ₁₆	16	16	16	15	27	18	16	16	16	16	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₅	E ₁₇	
29	E ₁₆	E ₁₅	E ₁₇	10	E ₁₆	E ₁₅	18	15	15	16	26	28	26	19	16	26	16	16	E ₁₅	E ₁₅	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
30	E ₁₅	E ₁₆	E ₁₅	12	E ₁₆	E ₁₆	16	15	17	15	16	25	19	18	16	15	16	16	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
31	E ₁₆	E ₁₅	14	10	E ₁₅	E ₁₆	16	16	19	40	56	28	27	26	18	17	16	16	E ₁₆	14	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	29	29	28	30	30	30	30	30	29	30	30	30	30	30	30	30	30	
MED	E ₁₅	E ₁₅	E ₁₅	11	12	E ₁₅	16	16	16	17	20	26	25	25	18	16	16	16	E ₁₅	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
UQ	E ₁₆	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₆	16	16	16	19	26	27	26	26	25	17	16	16	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	E ₁₆	
LQ	E ₁₅	E ₁₅	12	10	10	14	15	16	16	16	16	25	19	18	16	16	15	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	

IONOSPHERIC DATA

OCT. 1968

M(3000)F₂(0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	280	290	290	285	290	300	320	320	325	315	295	290	280	275	290	290	305	310	295	315	270	265	280	290			
2	290	270	285	290	310	295	330	325	310	320	310	310	280	275	300	295	295	295	310	330	260	255	255	250			
3	260	305	280	300	325	260	310	320	315	280	295	295	295	285	295	305	310	315	315	305	290	275	270	290			
4	295	280	290	285	310	315	335	330	325	310	300	290	290	290	290	300	310	320	340	325	290	290	290	280			
5	285	285	280	300	290	300	R	325	325	315	310	310	295	295	295	305	JR	325	335	320	320	295	295	285			
6	280	290	285	300	285	295	JR	330	350	325	320	310	315	305	305	310	305	320	JR	325	295	295	290	300	R		
7	275	280	300	300	300	295	335	340	345	320	310	310	295	295	290	295	305	315	320	300	280	285	285	285			
8	270	295	280	300	315	270	R	345	345	330	310	295	300	285	295	310	310	320	315	300	280	270	280	290			
9	JR	280	280	300	340	310	335	325	325	315	JR	310	290	290	295	310	305	320	315	290	290	295	295	290			
10	290	280	285	300	285	295	365	340	330	335	310	305	290	290	295	295	305	315	330	290	290	310	265	285			
11	280	285	285	JR	345	300	330	335	340	C	310	310	295	290	295	300	310	325	315	290	300	295	285	270			
12	285	295	290	310	320	265	315	325	330	315	310	310	285	290	285	290	300	330	310	265	260	280	280	305			
13	280	275	280	265	280	255	285	295	310	305	320	290	300	300	305	JR	310	330	320	275	295	I	270	290	270		
14	295	270	255	275	295	270	R	330	JR	310	320	300	300	305	295	310	310	320	310	285	280	285	290	280			
15	255	250	265	270	300	275	335	330	340	340	310	320	295	305	295	305	315	JR	325	305	280	290	300	300	290		
16	275	290	290	285	315	290	330	335	335	330	325	305	315	295	305	305	305	335	340	290	300	310	290	270			
17	265	255	260	270	320	300	330	335	315	300	310	310	295	290	290	315	315	315	305	305	300	290	305	310			
18	290	280	280	300	315	290	R	330	335	330	295	300	295	300	295	300	315	310	325	285	285	305	300	280			
19	270	280	295	280	JR	300	R	320	320	335	315	295	295	285	300	315	325	320	320	305	305	295	285	285			
20	290	300	295	315	320	300	320	325	330	330	320	285	300	295	310	315	320	330	310	285	295	290	285	290			
21	280	280	300	305	275	265	315	335	325	325	325	310	300	295	310	320	315	320	305	S	295	295	285	290	295		
22	300	295	300	315	350	270	330	355	340	JR	330	315	320	305	310	300	315	320	335	305	285	295	JR	285	285		
23	285	290	290	300	340	315	315	355	345	S	335	305	305	290	295	300	315	310	315	315	305	300	305	265	265		
24	285	290	290	290	300	275	320	335	330	315	300	295	300	295	290	300	305	310	295	285	290	285	280	285			
25	265	280	280	300	285	280	310	340	330	305	305	290	295	295	305	295	305	315	JR	320	310	275	JR	285	295		
26	295	I	315	JR	290	265	305	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
27	C	C	C	C	C	C	C	C	C	C	315	295	300	295	300	290	305	305	310	290	310	310	285	290			
28	280	260	270	285	320	290	325	I	C	335	325	320	305	305	290	290	300	300	JR	310	305	300	330	295	300	300	300
29	285	280	265	315	300	275	305	340	335	315	310	320	290	295	300	295	295	JR	300	295	R	305	300	280	255		
30	I	240	235	315	255	260	250	295	305	295	305	305	295	295	305	290	295	305	310	R	295	300	295	275	270		
31	275	275	295	280	260	280	295	315	310	305	305	310	290	300	295	290	300	JR	295	295	290	280	I	265	230	230	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	30	30	30	30	26	29	29	28	30	30	30	30	30	30	30	30	29	29	30	30	30	30			
MED	280	280	285	300	300	290	320	330	325	318	310	305	295	295	295	302	310	315	315	295	292	290	285	285			
UQ	290	290	290	300	320	300	330	340	335	330	315	310	300	300	300	310	315	325	320	305	300	300	290	290			
LQ	275	275	280	285	290	270	310	325	320	310	305	295	290	290	295	295	305	310	305	285	280	280	280	270			

IONOSPHERIC DATA

OCT. 1968

M(3000)F1(0.01)

135° E Mean Time (G. M. T. +9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L	C								
2										L	L	L	L	L	L	L	L							
3										L	L	L	L	L	L	L								
4								L	L	L	L	L	L	L	L	L	L							
5									L	L	L	L	L	L		L								
6								L	L	L	L	L	L	L	L									
7										L	L	L	L	L	L		L							
8									L	L	L	L	L	L	L									
9									L	L	L	L	L	L	L									
10										L	L	L	L	L	L									
11									L	C	L	L	L	L	L	L								
12										L	L	L	L	L	L	L								
13									L	L	L	L	L	L	L									
14									L	L	L	L	L		L									
15											L	L	L	L		L								
16											L	L	L	L										
17									L	L	L	A	L	L	A	A								
18										L	A	L		L	L	L								
19									L	L	L	L	L	L										
20									L		L	L	L	L		L								
21										L	L	L	L	L										
22										L	L	L	L	L	L	A								
23										L	L	L		B										
24											L	A	L	A	A	L								
25											L	L	L	L	L									
26									C	C	C	C	C	C	C	C	C	C	C					
27								C	C	C	C	L	L	L	L									
28											L	L	L		L				L					
29										L	L	L	L	L	L	L	L							
30										L	L	L	L	L	L									
31											B	L	L	L	L									
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1														
MED										L														
UQ										410														
LQ																								

IONOSPHERIC DATA

OCT. 1968

h'F2 (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									260	250	300	300	300	320	295	I ^C 270								
2									250	250	265	265	300	285	290	275	260							
3										250	285	265	270	275	265	260								
4								250	250	250	265	270	290	300	285	260	255							
5									245	240	250	260	260	250		260								
6								225	245	240	255	255	250	250	260									
7										290	255	260	280	285	300		250							
8									245	225	250	290	260	275	280									
9									240	250	250	260	270	295	285									
10										240	245	260	280	290	260									
11									245	C	270	265	280	275	285	270								
12										245	265	255	260	295	295	260								
13									270	255	260	290	270	255	250									
14									250	265	250	260	270		270									
15										255	255	285	255		270									
16										250	250	260	255											
17									250	280	255	250	290	290	265	250								
18										245	240	285		265	265	265								
19									250	240	255	275	265	255										
20									245		255	240 ^H	255	270		250								
21										250	250	255	255	260										
22										250	255	255	270	255	255	255								
23										250	250	275		290										
24											280	265	275	I ^A 280	260	255								
25											275	275	275	285	260									
26											C	C	C	C	C	C	C	C	C					
27											C	C	C	C										
28												255	275	285	280									
29											250	270	255		260		245							
30										250	265	275	285	275	260	275	270							
31											265	260	250	285	275	275								
											250	275	270	270	260									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	13	21	30	30	28	28	22	14	4	1						
MED								238	250	250	255	265	270	275	265	260	258	245						
UQ									250	250	265	275	285	288	285	270	265							
LQ									245	245	250	255	260	258	260	255	252							

IONOSPHERIC DATA

OCT. 1968

h'F (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	235	265	260	285	250	280	235	240	230	220	250	200	230	235	230	I ₂₄₀ ^C	250	250	240	235	300	320	300	260
2	250	295	295	250	245	260	245	225	230	230	200	210	240	240	250	240	250	260	245	200	240	345	355	380
3	330	250	300	255	200	355	255	245	240	210	210	245	230	230	250	250	250	250	235	220	245	300	295	260
4	250	295	270	290	250	230	230	230	235	235	240	230	200	235	240	240	250	250	215	220	250	250	270	285
5	230	295	290	265	250	250	235	245	235	220	220	205	205	200	245	245	245	240	210	220	240	250	250	280
6	280	260	270	250	250	270	250	230	220	210	205	205	240	210	230	240	240	225	245	225	270	250	260	260
7	305	295	270	250	245	270	240	230	225	220	225	205	220	215	245	250	230	245	225	235	255	260	265	255
8	295	290	290	265	240	310	245	230	225	210	205	200	200	210	240	250	245	225	210	210	275	300	300	280
9	300	300	295	255	210	240	240	210	220	210	200	200	210	235	240	245	225	245	220	260	250	250	270	280
10	280	285	290	250	255	270	220	220	225	225	205	200	210	245	240	245	245	245	210	215	250	250	255	255
11	280	295	290	250	205	250	240	225		C	250	225	220	240	245	235	245	235	245	245	240	250	255	305
12	305	275	245	250	250	300	245	245	240	220	205	205	210	205	H ₂₅₀ ^A	250	245	250	225	205	295	300	295	240
13	250	270	270	260	300	350	255	255	240	240	240	210	240	200	H ₂₀₅ ^H	205	245	230	230	205	260	255	305	300
14	255	300	E ₃₅₀ ^A	300	245	300	245	220	240	220	235	230	245	250	240	250	250	235	210	250	280	265	260	300
15	305	300	310	290	250	250	240	240	250	245	210	225	240	240	240	245	250	240	230	E ₃₀₀ ^A	250	250	240	265
16	300	290	290	285	245	270	235	230	240	250	225	205	230	225	250	245	250	235	215	235	245	250	255	295
17	310	320	310	290	235	260	235	235	230	230	240	I ₂₄₀ ^E	E ₂₅₀ ^B	250	I ₂₅₀ ^A	I ₂₅₀ ^A	250	230	255	250	255	270	265	250
18	285	300	300	265	220	E ₃₀₀ ^A	245	235	240	230	A	220	210	235	250	250	235	235	210	245	260	255	240	290
19	300	285	270	280	250	260	240	240	230	225	205	I ₂₁₀ ^A	210	240	245	245	240	220	225	250	245	255	285	290
20	295	260	280	250	205	255	250	240	225	225	210	225	220	205	240	240	245	220	225	260	240	250	275	290
21	300	290	260	250	260	295	240	240	210	240	225	225	210	230	250	240	230	230	210	255	280	A ₂₇₀	270	255
22	250	250	255	250	220	295	245	210	245	220	240	225	245	230	245	I ₂₄₅ ^A	225	240	250	260	280	260	295	295
23	280	275	280	280	220	210	245	225	240	235	225	220	250	I ₂₃₀ ^B	250	250	245	240	225	260	250	250	300	340
24	295	290	285	275	260	295	220	220	235	240	240	I ₂₄₀ ^A	200	I ₂₄₅ ^A	I ₂₄₀ ^A	240	250	240	240	295	275	I ₂₉₅ ^A	300	265
25	350	300	295	265	245	305	235	230	235	240	250	210	240	250	250	250	245	230	245	230	275	330	290	270
26	290	I ₂₇₀ ^A	285	285	240	250	275		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	235	220	235	230	250	250	250	240	235	250	255	245	280	260
28	290	330	350	310	250	265	E ₂₆₀ ^C	230	235	240	225	235	220	250	240	240	240	230	240	225	235	260	260	275
29	295	300	290	265	230	300	275	245	235	230	240	240	230	245	250	240	250	240	250	240	240	275	E ₃₅₀ ^A	350
30	395	355	245	290	360	340	245	250	250	245	245	240	235	250	240	240	240	240	220	240	240	A	A	320
31	320	320	290	220	320	320	280	250	240	245	B	E ₂₅₀ ^A	250	250	240	245	225	220	225	240	265	340	470	455
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	29	29	28	28	30	30	30	30	30	30	30	30	30	30	29	29	30
MED	295	292	289	265	245	270	244	230	235	230	225	220	228	235	245	245	245	238	225	241	252	260	272	280
UQ	305	300	295	285	250	300	248	240	240	240	240	230	240	245	250	250	250	240	240	258	275	295	298	300
LQ	280	275	270	250	230	255	235	225	225	220	208	205	210	225	240	240	240	230	210	225	245	250	260	260

IONOSPHERIC DATA

OCT. 1968

***h'*Es** (km)

135 E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	100	110	100	100	S	160	180	G	G	B	130	G	G	110	C	105	100	100	100	100	100	100	100
2	100	S	B	100	105	110	110	G	135	130	G	G	G	G	G	G	115	110	110	105	105	110	S	S
3	S	S	S	115	E	S	105	G	110	150	130	G	G	G	G	G	135	110	110	110	110	100	100	100
4	S	S	B	S	B	B	110	110	G	G	B	B	G	G	G	110	130	115	110	S	110	S	S	S
5	S	S	S	B	E	105	105	190	G	G	G	G	G	G	G	150	130	110	110	100	100	100	100	S
6	S	B	B	E	B	B	145	130	125	G	115	115	115	115	115	G	150	125	110	B	100	100	100	S
7	S	S	B	B	E	B	105	155	145	140	G	G	110	110	110	110	140	B	100	100	100	100	S	S
8	S	S	S	B	B	S	E	130	G	145	G	G	G	G	G	G	155	G	120	S	S	110	100	105
9	100	100	100	100	E	B	B	G	G	140	G	G	G	G	100	170	G	105	105	100	100	100	105	100
10	S	S	B	E	E	B	E	155	G	140	G	G	G	G	G	G	G	115	100	100	100	100	S	S
11	S	100	B	E	B	100	G	G	G	C	130	115	125	130	155	100	G	140	115	120	S	S	B	S
12	S	S	S	B	110	S	175	160	125	115	115	115	115	105	100	105	100	100	100	100	100	100	105	S
13	S	105	100	B	S	B	160	170	110	115	110	110	105	105	100	155	155	140	130	S	110	105	105	105
14	105	110	105	S	105	110	115	110	140	140	130	125	125	105	G	130	135	B	S	S	S	110	100	105
15	105	100	110	B	S	S	B	G	105	130	135	115	110	100	150	140	105	105	105	105	100	100	100	100
16	100	100	S	B	S	105	G	G	145	130	145	130	G	140	175	G	160	125	120	S	105	105	105	100
17	110	S	E	100	S	100	B	G	G	150	120	110	110	110	110	105	105	105	105	100	100	100	100	100
18	S	S	110	S	105	105	110	130	150	125	120	115	G	B	B	145	130	B	105	105	100	100	100	100
19	S	100	B	S	S	S	B	G	100	100	125	120	120	115	125	115	110	105	105	105	105	105	105	105
20	S	105	100	100	100	100	100	115	115	115	115	G	115	G	G	145	130	120	110	105	105	105	S	S
21	100	100	100	100	100	105	B	G	G	140	G	130	B	120	B	G	G	B	S	110	105	105	105	105
22	105	105	105	B	105	S	105	G	155	125	115	115	100	125	120	110	105	105	105	105	105	105	105	105
23	105	S	105	105	110	E	110	110	175	140	130	115	G	B	160	150	130	110	110	105	100	100	100	100
24	100	100	100	100	S	S	E	105	115	G	130	115	130	115	115	115	110	110	105	105	100	100	100	100
25	100	100	100	100	100	100	E	190	150	125	120	130	G	145	140	130	130	100	110	105	105	105	105	100
26	105	100	100	100	100	110	100	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	145	130	130	115	110	110	110	105	100
28	100	105	100	100	105	100	C	110	110	130	G	G	G	G	110	110	110	100	S	S	S	S	S	S
29	100	105	100	100	100	S	100	G	115	G	G	G	115	115	G	G	190	B	110	110	110	100	105	100
30	100	100	100	100	100	S	E	G	140	145	110	110	110	G	G	G	G	B	S	S	105	105	105	110
31	110	105	100	100	100	100	100	100	125	B	B	110	110	110	G	110	110	B	110	100	100	105	100	100
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	18	17	15	15	13	17	17	20	21	17	18	15	16	17	20	25	22	26	22	26	26	21	20
MED	100	100	100	100	100	105	110	130	125	130	120	115	115	115	115	122	130	110	110	105	102	105	100	100
UQ	105	105	105	100	105	105	115	160	145	140	130	125	118	122	145	145	135	115	110	105	105	105	105	105
LQ	100	100	100	100	100	100	105	110	112	125	115	115	110	108	110	110	110	105	105	100	100	100	100	100

IONOSPHERIC DATA

OCT. 1968

Types of Es

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F2	F1	F2	F1	F1		H1	H1				H1			L1		L2	L2	F1	F2	F2	F2	F2	F1	
2	F1			F2	F2	F2	L1		H1	H1							C2	L4	F4	F4	F2	F1			
3				F1			L1		L1	H1	H1						H1	C1	F6	F3	F1	F3	F3	F1	
4							L1	L1								L1	H1	C1	F1		F1				
5						F2	L1	H1								H1	H2	L2	F1	F2	F1	F1	F1		
6							H2	H1	C1		C1	C1	C1	C1	C1	L1		H1	H1	F3		F1	F2	F1	
7							L1	H1	H2	H1			L1	L1	L1	L1	H1		F2	F1	F2	F1			
8								H1		H1							H1		F1			F1	F2	F1	
9	F3	F2	F1	F1						H1					L1	H1		L3	F2	F3	F2	F1	F1	F1	
10								H1		H1								C1	F1	F1	F1				
11		F1				F1				H1	H1	C1	H1	H1	HL11	L1		HL11	F3	F1					
12					F1		H1	H1	H1	C1	C1	C1	C1	L1	L1	L1	L2	L3	F2	F1	F1	F1			
13		F1	F1				H1	H1	L1	C1	C2	L1	L1	L1	L2	H1	H1	H2	F1		F2	F2	F4	F2	
14	F1	F3	F4		F1	F2	L2	L2	H1	HL11	H1	H1	HL11	L1		H1	H1					F1	F2	F2	
15	F2	F1	F1						L1	H1	H1	C1	C1	L1	HL11	HL11	L3	L2	F2	F3	F2	F1	F2	F1	
16	F2	F1				F1			HL11	HL11	HL11	H1		H1	H1		H1	H2	F2		F2	F3	F1	F1	
17	F2			F1		F1				H1	H1	C2	C2	C2	L2	L3	L3	L2	F4	F2	F2	F3	F2	F1	
18			F2		F1	F2	L1	L1	HL11	H1	H2	C1					H1	H1	F3	F1	F3	F5	F4	F2	
19		F1							L2	LH21	H1	H1	CL11	CL11	HL11	C1	CL21	LL22	F3	F2	F3	F4	F3	F2	
20		F1	F2	F1	F1	F2	L1	L1	C2	C2	C1		C1			H1	H1	C1	F5	F3	F2	F2			
21	F1	F2	F2	F1	F1	F2				H1		HL11		C1						F5	F5	F3	F1	F2	
22	F2	F1	F2		F1		L1		H1	H1	C1	CL11	L2	HL11	CL21	C3	L4	L3	F3	F2	F3	F2	F4	F2	
23	F2		F1	F2	F1		L1	L2	HL11	HL11	H1	C1			HL11	H1	H1	L1	F2	F3	F1	F2	F5	F5	
24	F2	F2	F2	F2				L1	L1		H1	C2	H1	C2	C2	C2	C2	C2	F2	F4	F3	F3	F3	F1	
25	F2	F2	F1	F1	F1	F1		HL11	HL11	HL11	HL11	HL11			HL11	HL11	HL11	L2	FF22	F2	F2	F2	F3	F2	
26	F2	F5	F2	F2	F1	F1	L1																		
27															H1	H1	HL11	L2	F2	F2	F2	F2		F1	
28	F1	F1	F3	F4	F2	F2		L1	L1	H1					L2	L2	L2	L1							
29	F1	F1	F1	F2	F1		L2		C2				C1	C1			H1		F5	F3	F2	F2	F3	F3	
30	F2	F2	F2	F1	F1				H1	H1	C1	L1	L1								F2	F2	F3	F2	
31	F3	F2	F3	F1	F2	F2	L1	L2	H1			C2	C2	C1		C1	L1		F1	F2	F2	F2	F2	F4	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
UQ																									
LQ																									

IONOSPHERIC DATA

OCT. 1968

hpF2 (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day \	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	370	340	335	385	365	330	270	280	290	290	345	335	355	375	340	340	310	310	335	300	400	400	355	355		
2	330	400	370	330	310	330	260	260	300	290	300	310	370	375	345	335	335	320	300	260	390	450	450	470		
3	420	310	395	340	270	440	300	280	290	355	335	335	345	350	335	320	300	300	300	300	340	400	405	355		
4	340	390	375	355	305	300	265	290	290	300	310	340	335	355	340	325	310	290	260	270	350	350	360	380		
5	380	375	370	305	350	335	R	290	280	290	305	300	320	335	335	300	JR	290	260	285	290	325	335	355		
6	360	345	355	340	355	340	JR	250	280	290	300	300	300	310	300	305	280	290	JR	320	345	340	315	355		
7	385	375	345	345	320	340	260	255	250	285	315	300	345	340	350	335	305	300	285	340	365	350	350	370		
8	385	360	380	340	300	405	R	255	260	260	300	345	315	350	340	305	300	290	290	310	365	385	380	355		
9	JR	380	360	370	320	260	300	260	255	290	300	JR	305	345	350	335	305	305	295	290	320	335	345	345	355	
10	365	370	365	310	350	345	250	260	265	270	305	310	345	335	330	310	300	290	270	320	340	305	350	350		
11	365	365	365	JR	255	300	270	255	265	C	310	305	340	340	325	330	305	295	280	330	310	355	355	400		
12	365	345	315	310	295	385	300	260	290	300	300	305	340	350	345	330	315	290	295	395	410	375	370	295		
13	345	375	370	385	400	420	350	305	300	300	300	340	315	315	300	JR	290	260	275	370	340	JR	355	395		
14	330	385	420	375	320	370	300	270	JR	300	290	320	330	310	335	305	305	285	300	375	390	350	355	385		
15	410	400	400	385	335	350	265	275	270	275	300	290	320	315	330	315	300	JR	310	365	335	320	335	365		
16	390	365	360	365	300	350	280	255	265	285	300	305	300	340	315	325	305	275	255	350	340	315	330	385		
17	390	410	425	365	290	315	265	250	290	340	300	300	335	350	340	305	290	290	320	325	340	355	335	310		
18	340	380	390	325	300	350	R	285	280	280	305	320	320	330	320	315	300	300	300	350	345	330	320	385		
19	390	385	365	355	JR	310	345	R	285	290	255	300	315	340	335	315	300	295	290	280	305	305	315	350	365	
20	350	335	350	300	280	320	295	275	290	265	295	345	310	340	305	295	295	270	290	350	320	345	350	355		
21	370	345	325	300	360	390	300	270	300	300	290	305	305	315	305	295	290	290	300	S	325	345	350	350	320	
22	340	345	330	305	255	360	290	250	270	JR	300	295	310	305	305	300	280	260	300	350	345	JR	355	360	360	
23	360	350	355	345	260	285	300	250	255	280	300	315	345	340	325	300	300	290	290	340	340	315	360	395		
24	365	360	370	350	325	365	295	265	290	300	325	325	330	330	325	320	310	300	340	350	355	375	365	380		
25	420	385	400	345	375	400	300	260	260	305	315	335	340	350	320	320	300	320	JR	310	360	JR	385	385	340	
26	365	JR	310	360	JR	335	350	395	310	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
27	C	C	C	C	C	C	C	C	C	C	C	300	320	325	330	310	335	300	310	310	355	310	300	365	350	
28	385	410	400	360	300	320	290	JR	265	275	280	310	315	340	345	315	325	JR	300	320	315	275	340	330	340	350
29	365	365	365	315	310	365	310	260	265	300	300	305	335	350	325	325	330	JR	320	330	R	340	350	390	420	
30	JR	475	450	300	420	420	410	340	320	335	315	310	320	340	310	350	340	315	305	R	340	340	350	400	410	
31	400	400	360	365	400	390	350	300	290	305	315	320	350	350	340	345	310	JR	320	330	340	390	JR	410	510	500
Hour Day \	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	26	29	29	28	30	30	30	30	30	30	30	30	29	29	30	30	30	30	30	
MED	368	368	365	342	310	350	292	265	290	290	300	315	335	340	328	318	300	290	300	330	340	350	355	362		
UQ	390	385	380	365	350	390	300	280	290	300	310	325	345	350	340	330	310	305	310	350	360	375	370	385		
LQ	360	345	355	315	295	330	265	255	265	280	300	305	320	330	315	305	300	290	285	310	340	330	345	355		

IONOSPHERIC DATA

OCT. 1968

ypF2 (km)

135° E Mean Time (G. M. T. + 9^h)

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

(Miles Dist.)	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	120	100	105	95	95	130	120	80	60	140	95	105	95	85	95	I ^C 100	90	95	125	85	90	90	75	85	
2	145	90	80	120	90	90	80	80	100	110	130	110	80	85	85	75	85	95	100	180	160	80	75	90	
3	130	80	85	60	80	60	90	120	90	120	80	80	70	90	95	80	100	80	115	110	100	100	95	135	
4	70	85	85	105	85	100	125	110	70	90	90	90	90	80	75	90	105	100	90	110	130	100	105	115	
5	85	65	90	95	100	95	R	70	110	75	90	100	85	100	110	95	J ^R 90	65	90	70	80	75	75	90	
6	95	100	100	60	100	60	J ^R 65	50	75	70	80	80	80	85	95	90	80	95	J ^R 60	90	55	60	80	I ^R 100	
7	70	80	65	75	80	60	60	65	55	115	100	100	95	110	95	110	95	140	130	100	125	100	100	90	
8	105	90	110	80	80	85	R	95	130	100	80	100	125	95	65	90	70	65	65	90	100	90	65	U ^S 60	
9	J ^R 85	95	85	75	85	95	55	110	60	70	J ^R 85	80	95	90	75	90	85	60	65	80	70	95	65	90	
10	90	85	90	85	105	70	35	85	80	70	75	90	85	80	90	135	95	65	80	90	105	75	100	95	
11	105	90	80	J ^R 75	90	95	85	70	80	C	100	95	75	90	105	90	95	105	120	120	90	95	115	100	
12	115	95	100	100	95	105	90	140	110	55	95	90	115	90	80	95	100	65	95	100	85	80	75	75	
13	100	80	100	115	100	80	70	85	95	95	70	115	90	85	90	J ^R 55	85	85	80	95	65	I ^R 95	90	95	
14	70	110	80	80	125	95	R	90	75	J ^R 65	100	95	95	80	100	105	95	95	115	140	105	100	90	105	105
15	130	115	90	105	115	110	85	105	70	80	80	85	95	85	85	85	90	J ^R 80	120	85	95	95	115	85	
16	100	85	125	125	90	65	90	105	85	115	105	110	85	100	95	75	95	75	105	100	130	105	80	105	
17	110	100	95	135	150	95	115	150	90	110	100	110	95	90	95	85	70	115	80	75	110	95	105	90	
18	80	100	90	75	110	110	R	115	120	60	95	95	95	90	95	95	90	110	90	100	95	110	90	105	
19	110	105	95	95	J ^R 100	95	R	105	70	90	95	90	75	70	90	95	60	65	75	85	80	85	95	100	
20	95	70	65	60	75	80	55	80	60	80	50	H	145	110	80	80	75	55	75	80	95	95	100	95	70
21	75	60	75	75	95	105	85	80	55	55	60	90	95	105	90	75	70	65	70	75	65	95	60	85	
22	75	100	85	55	45	95	55	55	45	J ^R 60	70	65	90	85	95	80	75	85	85	95	65	J ^S 90	95	85	
23	95	95	90	55	65	70	95	55	55	S	70	110	95	105	90	100	100	90	120	100	100	120	100	105	
24	95	130	120	90	95	115	105	125	120	90	85	85	85	85	105	95	95	100	150	100	120	115	100	110	
25	95	105	90	95	115	95	100	90	100	105	95	105	75	70	120	110	100	100	J ^R 100	140	100	J ^R 115	110	75	
26	95	I ^R 90	110	J ^R 90	140	95	105	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
27	C	C	C	C	C	C	C	C	C	C	100	85	75	105	100	105	100	125	100	95	100	100	95	115	
28	105	90	90	95	90	120	90	I ^C 80	65	100	105	90	100	95	105	115	J ^R 100	100	95	85	130	80	80	90	
29	95	85	85	85	90	85	90	80	185	95	100	85	95	100	105	90	105	J ^R 130	120	R	100	70	100	100	
30	I ^R 95	90	90	120	80	90	70	120	85	85	90	100	60	100	90	100	95	95	R	100	70	95	100	90	
31	100	90	100	125	105	100	100	90	100	95	85	80	90	100	100	95	100	J ^R 130	90	110	90	I ^R 90	90	100	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	26	29	29	28	30	30	30	30	30	30	30	30	29	29	30	30	30	30	
MED	95	90	90	90	95	95	90	85	80	90	92	92	90	90	95	92	92	95	95	95	98	95	95	94	
UQ	105	100	100	105	105	100	100	110	100	102	100	100	95	100	100	100	100	110	115	100	110	100	100	105	
LQ	85	85	85	75	85	80	70	80	65	70	80	85	80	85	90	85	85	75	80	85	80	85	80	85	

IONOSPHERIC DATA

OCT. 1968

foF2 (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	77	70	63	56	54	46	54	86	100	J 96	104	107	111	126	130	128	121	110	S 109	107	79	77	I 80	J 86
2	R 83	S 62	S 56	S 65	58	43	49	75	S 88	S 95	I 118	135	137	144	S 153	S 152	140	S 134	S 128	I 112	S	S	U 93	U 83
3	S	S 77	U 77	70	64	33	44	S 85	84	104	128	138	142	142	148	151	142	130	R 130	S 116	S 95	74	C	C
4	C	C	C	C	C	C	C	C	C	C	117	126	138	141	146	144	139	130	128	S 101	75	75	S 87	78
5	75	I 71	S 68	55	47	44	48	85	I 98	S 113	S 110	120	124	123	126	130	127	S 114	106	89	64	66	62	54
6	55	54	46	43	41	41	43	S 87	S 96	I 101	107	122	128	119	116	110	102	S 106	92	79	71	S 66	60	57
7	53	52	S 53	50	48	42	S 48	J 84	97	S 96	98	109	121	S 125	125	127	128	J 121	J 111	R 84	74	78	78	73
8	68	66	64	S 60	59	42	46	90	89	91	U 88	107	127	140	152	145	140	137	S 122	99	I 88	J 83	74	S 72
9	67	66	65	63	60	52	43	75	S 86	104	J 102	S 110	R 132	145	S 156	151	139	S 130	U 117	J 100	I 90	U 88	R	S
10	S	J 88	I 76	I 77	J 83	U 75	S 68	I 87	U 95	104	110	119	129	138	152	147	143	136	128	U 113	J 93	S 90	S 77	68
11	60	56	54	58	53	30	40	S 75	S 91	S 98	109	105	118	120	127	128	122	S 115	R 99	S 82	73	68	S 60	54
12	53	54	51	44	37	30	38	78	102	108	I 118	124	138	142	S 150	S 150	144	S 137	96	81	U 87	S 81	75	79
13	62	50	49	46	40	42	45	83	105	114	U 118	133	137	133	122	122	116	96	76	65	68	58	I 53	51
14	51	S 45	44	46	48	I 48	43	85	102	I 117	111	U 115	126	139	R 148	U 145	139	116	I 93	J 73	67	73	56	U 48
15	45	46	42	44	45	35	42	S 73	S 96	101	109	103	J 112	123	126	127	125	U 116	R 106	S 81	74	79	J 60	S 47
16	43	43	43	42	41	36	42	78	S 101	103	109	100	110	113	130	125	127	113	J 98	J 75	J 62	J 60	J 51	J 46
17	44	R 41	39	42	43	30	S 40	74	U 100	115	124	125	122	128	147	146	136	S 121	S 107	95	82	66	69	56
18	50	48	46	50	56	36	S 44	78	S 97	111	125	119	126	141	135	134	128	J 122	S 104	77	74	70	59	49
19	48	S 51	48	48	50	44	50	85	S 117	S 116	S 120	125	128	141	137	135	133	S 113	110	S 85	S 75	S 72	62	S 58
20	54	61	48	44	40	33	37	S 82	S 117	S 113	S 115	112	124	140	142	128	126	S 120	S 109	76	76	70	63	59
21	56	57	59	53	41	39	44	79	U 99	S 119	I 127	U 126	123	132	U 144	U 132	119	U 110	U 101	U 78	U 80	I 80	S 78	70
22	66	J 63	S 60	56	55	31	35	J 75	S 88	S 106	S 121	S 115	U 116	128	134	131	113	S 105	U 97	S 70	J 74	77	J 63	S 59
23	U 54	45	42	43	52	34	33	78	S 96	90	J 118	112	149	131	146	S 135	129	125	J 98	I 81	S 85	J 84	S 68	57
24	U 51	48	44	45	S 46	35	41	70	84	94	121	132	136	138	142	138	132	130	S 109	87	82	77	64	S 55
25	51	50	50	S 55	47	41	S 49	85	80	98	128	139	137	144	153	144	136	S 132	126	106	S 84	U 80	S 83	78
26	77	70	65	62	56	47	48	S 93	I 110	I 120	134	140	135	146	148	154	146	136	S 118	S 98	S 80	70	64	59
27	57	48	45	44	45	36	S 43	90	S 106	98	112	126	133	143	141	137	129	131	123	S 105	107	U 85	72	68
28	61	51	47	48	46	35	41	S 83	S 101	102	S 121	130	118	132	135	128	J 123	S 114	107	S 92	S 92	79	68	57
29	52	43	41	43	35	28	34	79	J 104	100	J 119	123	120	126	133	127	J 121	J 122	J 121	106	94	79	61	I 56
30	52	S 52	58	37	39	38	J 44	S 78	S 122	150	U 147	142	144	154	150	140	S 133	128	126	S 105	J 102	S 90	69	62
31	56	49	50	48	40	44	S 47	S 86	106	S 118	S 138	136	S 144	S 160	J 160	146	140	144	J 126	S 94	U 92	I 88	S 70	S 58
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	30	30	29	29
MED	54	52	50	48	47	37	44	82	S 98	104	118	123	127	138	142	135	129	S 122	S 109	S 89	S 80	77	68	58
UQ	64	62	60	56	55	43	48	S 85	S 104	114	122	131	136	142	149	146	139	130	122	S 103	S 90	S 81	75	70
LQ	51	48	45	44	41	33	41	78	S 91	98	110	112	120	127	132	128	124	S 114	S 100	80	74	70	61	55

IONOSPHERIC DATA

OCT. 1968

foF1 (0.01)

135° E Mean Time (G. M. T. +9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	UL 560	UL 620	L	L	L	L						
2									L	L	L	UL 510	L	L	L	L	L	L						
3									L	L	L	L	L	L	L	L	L	L	A					
4									C	C	L	510	L	L	L	L	L	L						
5									L	L	L	L	L	L	L	L	L	L						
6									L	C	L	L	L	L	L	L	L	L						
7										A	L	L	L	L	L	UL 540	L	L	A	A				
8									L	L	UL 680	L	L	L	520	L	L	L	L					
9										L	L	UL 460	L	UL 600	L	L	L	L	L					
10									L	L	L	L	L	L	L	L	L	L	L					
11									L	L	L	L	L	UL 610	L	L	L	L						
12									L	L	L	510	L	510	L	L	L	L						
13										L	L	L	L	R 430	L	L	L	L						
14									L	L	L	L	L	L	L	L	350	330	200					
15									L	L	A	L	A	L	A	A	L	L						
16										L	UL 480	L	460	A	A	A	L	L						
17										L	L	L	510	L	L	L	L	L						
18										L	L	L	L	L	L	A	A	L						
19									L	L	L	L	L	L	L	L	L	L						
20									L	L	L	L	L	L	L	L	L	L						
21									L	L	C	L	L	L	L	L	C	L						
22										L	L	L	L	L	L	L	A	A						
23										L	L	L	L	L	L	540	L	L						
24										L	L	L	L	L	L	L	450	L						
25										L	L	L	L	L	L	L	A	A						
26										L	L	L	L	L	L	L	L	L						
27										350	L	L	L	L	L	L	L	L						
28									L	L	UL 530	L	L	L	L	L	L	330						
29										L	L	L	L	L	L	L	L	L						
30										L	L	L	L	L	L	L	L	L						
31												L	L	L	L	L	A	L						
CNT											1	4	5	3	3	2	2	2	1	1				
MED										350	505	510	600	510	530	495	340	330	200					
UQ											UL 605	510	UL 610	560	L									
LQ											470	510	555	470										

IONOSPHERIC DATA

OCT. 1968

foE (0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	H																
2							S																	
3							S																	
4							C	C	C	C														
5							S																	
6							S																	
7							S																	
8							S																	
9							S																	
10							S																	
11							S																	
12							S																	
13							S																	
14							S																	
15							S																	
16							S																	
17							S																	
18							S																	
19							S																	
20							S																	
21							S																	
22							S																	
23							S																	
24							S																	
25							S																	
26							S																	
27							S																	
28							S																	
29							S																	
30							S																	
31							S																	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								30	30	30	30	30	30	30	29	28	29	22						
MED								200	280	320	340	355	360	360	350	330	285	220						
UQ								220	285	325	345	360	370	370	350	330	290	230						
LQ								190	275	315	340	350	350	355	345	320	280	205						

IONOSPHERIC DATA

OCT. 1968

foEs (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E 15	39	E 12	J 22	21	E 15	E 15	26	G	G	30	G	38	45	33	J 34	G	G	J 26	22	J 22	J 31	J 26	21		
2	19	E 15	E 13	E 12	E 12	E 15	E 15	28	J 34	36	G	31	G	36	G	G	G	36	28	J 36	J 29	J 36	J 25	22	23	
3	E 15	E 14	E 15	E 14	E 11	E 12	E 15	26	G	36	39	40	40	G	42	38	39	J 52	24	19	21	24	C	C		
4	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	G	34	29	23	E 15	J 17	E 14	J 27	22	
5	E 14	E 12	E	E 11	E	E 12	J 36	J 39	J 30	G	G	G	G	G	G	G	37	38	32	28	23	23	J 24	E 14	E 13	
6	E 15	E 13	E 11	E	E 11	E 15	E 15	25	31	C	37	37	37	38	38	G	G	32	28	21	17	J 17	E 13	E 14	E 14	
7	E 14	E 15	E 13	E	E 11	E 11	23	26	34	J 50	40	42	42	40	34	36	J 61	M 63	J 31	J 27	18	J 23	J 27	J 17		
8	E 15	E 13	E 12	E 12	E 13	E 13	E 15	26	34	34	43	42	42	44	G	41	39	J 43	J 51	25	22	20	18	E 15		
9	22	E 15	E 15	E 15	E 12	E 14	E 15	J 27	30	G	34	34	G	G	G	32	30	29	J 31	26	24	J 25	J 29	J 21	E 15	
10	E 15	E 15	E 14	E 15	E 11	E 15	E 15	G	G	34	G	G	G	G	G	G	25	25	17	27	J 22	J 21	23	22	E 15	E 15
11	E 14	E 12	E 12	E 13	E 12	E 15	E 15	G	31	G	39	39	41	38	37	33	30	28	J 42	J 62	J 37	J 25	E 15	E 15	E 15	
12	E 14	E 12	E 11	E	E	E 11	E 14	25	31	G	36	38	34	22	G	G	G	J 25	J 22	J 23	J 24	E 15	E 15	20	E 14	
13	E 14	18	E 12	E 13	22	J 15	E 14	G	30	34	45	22	38	28	G	G	G	23	24	J 20	J 25	J 37	J 74	J 28		
14	J 65	J 30	J 24	J 44	J 36	J 48	J 53	J 22	31	37	41	47	43	G	G	37	16	G	16	E 15	J 22	J 20	J 17	18	22	
15	J 22	J 23	E 13	E 13	E 15	E 14	E 14	26	30	48	J 54	J 51	J 66	39	J 50	J 44	31	G	20	J 36	28	J 24	E 15	E 15		
16	E 14	E 14	21	E 14	17	E 14	E 15	G	31	40	38	38	J 70	J 69	J 73	J 48	33	J 24	E 15	E 15	E 15	J 20	J 25	J 22		
17	J 18	J 22	J 18	E 13	18	18	24	25	33	45	36	J 57	40	39	J 51	35	J 35	25	J 34	J 36	J 24	J 22	E 18	22		
18	22	E 12	E 12	E 12	E	E 13	E 14	G	30	J 43	J 46	J 50	46	44	J 55	52	J 75	J 72	J 39	J 25	E 13	J 33	J 35	J 22		
19	J 17	18	J 17	E 15	E 11	E 15	J 25	G	G	34	41	40	39	42	41	36	31	G	19	15	J 17	J 24	J 36	J 52	J 53	
20	J 26	J 22	E 13	18	E 14	E 12	E 15	G	G	34	37	40	40	39	36	G	38	30	J 36	J 28	J 23	J 23	J 27	J 20		
21	J 16	J 18	21	J 23	19	19	19	G	G	37	C	45	48	46	42	37	G	G	21	J 37	J 32	J 23	23	M 31		
22	J 21	23	23	E 13	E 12	E 11	E 15	22	31	36	38	41	J 62	J 51	48	J 82	J 46	J 36	J 52	J 43	J 37	J 41	J 40	J 37		
23	J 32	J 23	J 21	E 13	E 12	E 12	E 15	G	G	26	36	G	G	37	E 47	G	35	32	J 80	J 61	J 108	J 41	J 37	J 25	J 27	
24	20	22	J 19	22	E 12	E 12	24	24	G	J 34	37	G	44	40	G	G	J 29	J 33	J 35	J 28	J 37	J 34	J 28	J 35		
25	J 38	24	J 23	17	E	E	E 15	G	J 29	36	37	42	43	J 52	46	52	J 46	J 43	J 39	J 31	J 23	J 40	J 25	18		
26	J 19	J 29	J 24	J 27	J 29	J 22	23	J 34	30	34	23	G	34	35	G	31	G	30	27	J 29	J 24	24	J 20	E 14	E 15	E 17
27	E 17	E 14	E 13	E 12	E 11	E 13	E 15	G	29	J 29	33	32	40	41	43	49	41	J 46	J 47	J 22	18	E 14	E 14	E 14		
28	E 15	E 12	E 11	E	E	E 11	E 14	G	28	34	37	49	42	J 31	J 30	G	G	J 26	18	E 15	E 15	E 14	J 22	E 13		
29	E 14	E 11	E 12	E	J 25	E 13	E 15	24	32	36	38	42	42	42	G	G	G	25	23	J 27	J 25	J 28	E 15	E 15		
30	22	19	22	17	E 15	E 14	E 15	G	30	G	44	J 60	J 66	J 49	J 40	J 34	30	J 23	J 18	E 15	23	J 26	67	J 39		
31	J 29	J 33	J 19	J 28	J 25	23	J 21	J 28	G	39	42	39	48	42	J 50	71	54	57	J 33	J 35	J 31	J 16	20	20		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	30	30	
MED	17	16	E 14	E 13	E 12	E 14	E 15	23	30	34	37	39	41	39	34	35	32	29	J 26	J 25	J 23	J 24	22	20		
UQ	J 22	J 23	J 21	17	18	E 15	21	26	31	37	41	42	44	42	42	40	38	J 38	J 36	J 33	J 26	J 30	J 27	J 23		
LQ	E 15	E 13	E 12	E 12	E 11	E 12	E 15	G	G	34	35	34	37	28	G	E 22	G	24	22	20	20	19	E 15	E 15		

IONOSPHERIC DATA

OCT. 1968

f_oE_s (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	E ₁₅ ^S	24	E ₁₂ ^B	18	E ₁₅ ^B	E ₁₅ ^S	G	G	G ₂₉	G	G ₃₁	41	33	G ₃₃	G	G	29	19	E	16	26	18	E						
2	E ₁₅ ^B	E ₁₅ ^B	E ₁₃ ^B	E ₁₂ ^B	E ₁₂ ^B	E ₁₅ ^B	E ₁₅ ^S	G	22	36	G ₃₁	G ₃₀	G ₃₃	G	G	G	35	27	19	16	23	17	E	E					
3	E ₁₅ ^S	E ₁₄ ^S	E ₁₅ ^B	E ₁₄ ^B	E ₁₁ ^B	E ₁₂ ^B	E ₁₅ ^S	26	G	G ₂₄	38	40	G ₂₁	G	G	G	38	40	20	17	E	14	C	C					
4	C	C	C	C	C	C	C	C	C	C	G	G ₃₃	G	G ₃₁	G ₂₆	G ₂₅	32	27	G ₁₅ ^S	E	E ₁₄ ^S	16	E						
5	E ₁₄ ^B	E ₁₂ ^B	E ₁₂ ^B	E ₁₁ ^B	E ₁₂ ^B	E ₁₂ ^B	25	18	26	G	G	G ₂₃	G	G ₂₄	G ₂₇	35	34	30	24	E	E	16	E ₁₄ ^S	E ₁₃ ^B					
6	E ₁₅ ^S	E ₁₃ ^B	E ₁₁ ^B	E ₁₁ ^B	E ₁₁ ^B	E ₁₅ ^S	E ₁₅ ^S	G	G	C	G	E ₃₇ ^R	E ₃₇ ^R	38	G	G	G	G	20	E	E	E ₁₃ ^B	E ₁₄ ^B	E ₁₄ ^S					
7	E ₁₄ ^B	E ₁₅ ^B	E ₁₃ ^B	E ₁₁ ^B	E ₁₁ ^B	E ₁₁ ^B	E	G	32	50	40	41	41	40	G ₃₄	36	51	54	29	17	E	16	24	17					
8	E ₁₅ ^S	E ₁₃ ^B	E ₁₂ ^B	E ₁₂ ^B	E ₁₃ ^B	E ₁₃ ^B	E ₁₅ ^S	G	32	G	40	40	41	42	G	40	39	43	50	20	E	E	16	E ₁₅ ^S					
9	E ₁₅ ^S	E ₁₅ ^B	E ₁₅ ^B	E ₁₅ ^B	E ₁₂ ^B	E ₁₄ ^B	E ₁₅ ^S	G	G	G	E ₃₄ ^R	G ₃₄	G	G	G ₃₂	G ₃₀	G ₂₅	27	20	17	19	26	E	E ₁₅ ^S					
10	E ₁₅ ^S	E ₁₅ ^B	E ₁₄ ^B	E ₁₅ ^B	E ₁₁ ^B	E ₁₅ ^B	E ₁₅ ^S	G	G	G	G	G	G	G ₃₀	G ₂₇	G ₂₅	G ₁₇	G	18	16	E	16	E ₁₅ ^S	E ₁₅ ^S					
11	E ₁₄ ^S	E ₁₂ ^B	E ₁₂ ^B	E ₁₃ ^B	E ₁₂ ^B	E ₁₅ ^B	E ₁₅ ^S	G	G	G	G	G	39	G	E ₃₇ ^R	G	G	24	32	46	18	E	E ₁₅ ^S	E ₁₅ ^B					
12	E ₁₄ ^S	E ₁₂ ^B	E ₁₁ ^B	E ₁₁ ^B	E ₁₁ ^B	E ₁₁ ^B	E ₁₄ ^S	G	G	G	E ₃₈ ^R	E ₃₄ ^R	G	G ₂₂	G ₂₆	G ₂₁	G ₁₈	G ₁₅	20	E	E ₁₅ ^S	E ₁₅ ^S	E	E ₁₄ ^S					
13	E ₁₄ ^S	E ₁₂ ^B	E ₁₃ ^B	E ₁₃ ^B	E ₁₃ ^B	E ₁₄ ^S	G	G	G	44	22	E ₃₈ ^R	G ₂₈	G ₂₀	G	G	G	23	19	20	21	A	18						
14	E	25	16	33	24	A	25	15	G ₂₃	36	41	46	43	G	G	37	G ₁₆	G ₁₅	E ₁₅ ^S	22	17	E	E	E					
15	20	20	E ₁₃ ^B	E ₁₃ ^B	E ₁₅ ^B	E ₁₄ ^B	E ₁₄ ^S	G	G	48	54	40	66	E ₃₉ ^R	49	44	31	G	G	34	18	19	E ₁₅ ^S	E ₁₅ ^S					
16	E ₁₅ ^S	E ₁₄ ^B	E ₁₄ ^B	E ₁₄ ^B	E ₁₄ ^B	E ₁₅ ^S	G	31	40	38	38	68	65	73	45	31	24	E ₁₅ ^B	E ₁₅ ^S	E ₁₅ ^S	18	18	17						
17	E	17	16	E ₁₃ ^B	E	E	G	G	32	39	G ₂₅	41	40	38	48	33	26	21	30	22	19	22	E ₁₈ ^B	E					
18	E	E ₁₂ ^B	E ₁₂ ^B	E ₁₂ ^B	E ₁₃ ^S	E ₁₄ ^S	G	G	38	44	40	45	44	46	50	43	29	36	22	E ₁₃ ^B	27	33	E						
19	E	17	15	E ₁₅ ^B	E ₁₁ ^B	E ₁₅ ^B	G	G	G	G	E ₄₀ ^R	39	41	E ₄₁ ^R	G ₂₀	G	G	18	14	E	16	28	26	30					
20	15	19	E ₁₃ ^B	E ₁₄ ^B	E ₁₂ ^B	E ₁₅ ^S	G	G	G	G	40	40	G	36	G	35	29	31	28	18	20	24	15						
21	E	16	E	18	E	E	G	G	G	37	C	E ₄₅ ^C	48	46	E ₄₂ ^C	E ₃₇ ^C	G	G	E ₂₁ ^C	37	E ₃₂ ^C	17	E	29					
22	16	E	E ₁₃ ^B	E ₁₂ ^B	E ₁₁ ^B	E ₁₅ ^S	G	29	36	37	41	48	48	41	46	33	22	26	23	25	41	40	36						
23	30	20	E ₁₃ ^B	E ₁₂ ^B	E ₁₂ ^B	E ₁₅ ^S	G	G	23	34	G	G	G	E ₄₇ ^B	G	G	G	77	51	52	21	36	22	25					
24	E	E	E	14	E ₁₂ ^B	E ₁₂ ^B	G	G	G	28	37	G	43	G	G	G	22	19	21	16	25	22	17	20					
25	29	14	E	E	E	E ₁₅ ^S	G	24	35	36	40	40	32	43	50	45	35	35	26	17	23	23	16						
26	17	22	20	22	23	16	G	G	G	G ₂₃	G ₃₃	G ₃₁	G	G	G ₃₀	G ₂₄	17	17	E	E	E ₁₄ ^S	E ₁₅ ^S	E ₁₇ ^B						
27	E ₁₇ ^B	E ₁₄ ^B	E ₁₃ ^B	E ₁₂ ^B	E ₁₁ ^B	E ₁₃ ^B	E ₁₅ ^S	G	24	28	G ₃₂	G ₃₂	G ₂₉	40	40	40	46	39	28	25	17	E	E ₁₄ ^S	E ₁₄ ^S					
28	E ₁₅ ^B	E ₁₂ ^B	E ₁₁ ^B	E	E ₁₁ ^B	E ₁₄ ^S	G	G	G ₂₉	37	47	41	G ₂₆	G ₂₃	G	G	G	G	E ₁₅ ^S	E ₁₅ ^S	E ₁₄ ^S	19	E ₁₃ ^S						
29	E ₁₄ ^S	E ₁₁ ^B	E ₁₂ ^B	E	15	E ₁₃ ^B	E ₁₅ ^S	15	31	G ₂₉	G ₃₁	42	40	41	G	G	G	G	16	24	19	17	E ₁₅ ^S	E ₁₅ ^S					
30	E	E	E	E	E ₁₅ ^B	E ₁₄ ^B	E ₁₅ ^S	G	G	G	42	43	42	37	35	24	28	16	G	E ₁₅ ^S	E	25	22	29					
31	18	24	E	14	15	E	G	G	E ₃₉ ^R	E ₄₂ ^R	E ₃₉ ^R	G	41	42	61	48	22	29	29	23	E	E	E						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	30	30	30	30	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	30	30				
MED	E ₁₄ ^S	E ₁₄ ^S	E ₁₂ ^B	E ₁₃ ^B	E ₁₁ ^B	E ₁₃ ^B	E ₁₅ ^S	G	G	G	28	32	U	36	40	32	U	G	G	26	22	20	17	16	17	E ₁₆ ^S	E ₁₅ ^S		
UQ	E ₁₅ ^S	17	E ₁₃ ^B	E ₁₄ ^B	E ₁₃ ^B	E ₁₅ ^B	E ₁₅ ^S	G	24	36	39	40	42	40	40	38	35	29	29	24	19	22	22	17					
LQ	E	E ₁₂ ^B	E	E	E	E ₁₁ ^B	E ₁₄ ^S	G	G	G	G	U	G	27	U	G	E	G	20	G	G	G	15	16	15	E	E ₁₄ ^S	E ₁₄ ^S	E ₁₅ ^S

IONOSPHERIC DATA

OCT. 1968

f-min (0.1)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E ₁₅	15	12	14	15	15	E ₁₅	E ₁₅	15	16	29	20	19	18	18	15	15	15	E ₁₃	E ₁₃	E ₁₃	E ₁₅	E ₁₅	16
2	E ₁₅	15	13	12	12	15	E ₁₅	E ₁₅	15	15	19	20	20	16	16	16	15	15	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
3	E ₁₅	E ₁₄	15	14	11	12	E ₁₅	E ₁₅	14	15	16	15	17	16	17	17	15	13	13	E ₁₃	E ₁₄	11	C	C
4	C	C	C	C	C	C	C	C	C	C	23	24	21	20	17	16	14	11	15	E ₁₅	E ₁₅	E ₁₄	E ₁₂	E ₁₄
5	14	12	E	11	E	12	E ₁₅	E ₁₄	15	15	17	16	20	16	17	16	13	15	E ₁₄	E ₁₄	E ₁₅	E ₁₄	E ₁₄	13
6	E ₁₅	13	11	E	11	E ₁₅	E ₁₅	E ₁₄	14	C	17	18	18	17	16	15	14	15	E ₁₃	E ₁₄	E ₁₅	13	14	E ₁₄
7	14	15	13	E	11	11	E ₁₅	15	11	16	16	15	19	20	17	17	15	12	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
8	E ₁₅	13	12	12	13	13	E ₁₅	E ₁₅	15	15	17	17	17	19	17	18	17	15	E ₁₃	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
9	15	15	15	15	12	14	E ₁₅	E ₁₄	15	16	18	20	28	18	17	16	15	15	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
10	E ₁₅	15	14	15	11	15	E ₁₅	E ₁₅	E ₁₅	15	16	17	19	16	18	15	15	14	E ₁₂	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
11	E ₁₄	12	12	13	12	15	E ₁₅	13	15	17	16	17	23	23	19	17	15	14	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15
12	E ₁₄	12	11	E	E	11	E ₁₄	E ₁₄	15	16	15	16	16	15	15	15	12	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	13	E ₁₄
13	E ₁₄	13	12	13	14	E	E ₁₄	11	15	14	17	16	15	23	18	16	15	14	E ₁₅	E ₁₁	E ₁₄	E ₁₅	E ₁₅	E ₁₅
14	E ₁₅	E ₁₄	13	E	E	13	E ₁₅	12	12	15	18	18	20	20	18	15	12	11	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
15	E ₁₅	15	13	13	15	14	E ₁₄	E ₁₅	12	15	17	17	18	18	18	16	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₅
16	E ₁₄	14	14	14	E	14	E ₁₅	E ₁₅	15	15	18	18	19	18	24	16	15	15	15	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₅
17	E ₁₅	14	13	13	13	15	E ₁₅	E ₁₅	12	13	16	18	17	20	15	15	12	E ₁₅	15	E ₁₅	E ₁₄	E ₁₄	18	E ₁₅
18	E ₁₅	12	12	12	E	E ₁₃	E ₁₄	13	14	15	15	15	15	30	25	14	15	15	E ₁₅	E ₁₂	13	E ₁₅	E ₁₁	E ₁₅
19	E ₁₅	13	E	15	11	15	E ₁₅	E ₁₄	15	15	17	26	18	22	16	16	16	15	11	E ₁₅	E ₁₄	E ₁₅	E ₁₅	E ₁₄
20	E ₁₃	12	13	14	14	12	E ₁₅	E ₁₄	15	16	18	17	23	23	15	15	17	15	E ₁₅	E ₁₃	E ₁₅	E ₁₂	E ₁₅	E ₁₃
21	E ₁₅	E ₁₅	15	E	14	14	E ₁₅	15	15	16	C	E ₂₄	E ₃₂	E ₂₁	E ₃₀	E ₂₀	E ₁₉	15	E ₁₂	E ₁₅	11	E ₁₅	E ₁₅	E ₁₅
22	E ₁₅	16	15	13	12	11	E ₁₅	E ₁₅	12	16	17	20	18	19	19	16	15	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₃
23	E ₁₅	12	15	13	12	12	E ₁₅	E ₁₅	15	15	15	17	18	47	17	17	15	15	E ₁₁	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
24	E ₁₅	E ₁₅	13	E	12	12	E ₁₄	E ₁₅	15	16	24	19	16	18	16	15	14	14	11	E ₁₁	E ₁₄	E ₁₁	E ₁₄	E ₁₅
25	E ₁₅	11	11	E	E	E	E ₁₅	E ₁₅	14	15	15	15	16	16	15	16	15	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₃	12
26	13	E ₁₅	14	E	12	12	E ₁₅	E ₁₅	14	13	17	20	19	20	16	17	15	E ₁₄	E ₁₃	11	E ₁₅	E ₁₄	E ₁₅	17
27	17	14	13	12	11	13	E ₁₅	13	14	15	18	23	19	17	15	15	15	15	13	E ₁₅	E ₁₃	E ₁₄	E ₁₄	E ₁₄
28	15	12	11	E	E	11	E ₁₄	E ₁₅	14	15	17	17	18	17	15	18	16	15	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₅
29	E ₁₄	11	12	E	E	13	E ₁₅	E ₁₃	14	15	15	19	18	23	20	19	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
30	E ₁₅	E ₁₄	12	E	15	14	E ₁₅	E ₁₄	15	15	16	15	16	15	15	15	15	15	E ₁₃	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
31	E ₁₅	11	E ₁₂	E	E	E ₁₄	E ₁₅	E ₁₅	15	28	31	24	23	19	18	15	E ₁₅	E ₁₅	E ₁₄	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	30	30
MED	E ₁₅	13	13	12	12	12	E ₁₅	E ₁₅	15	15	17	18	18	18	17	16	15	15	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
UQ	E ₁₅	15	14	13	13	14	E ₁₅	E ₁₅	15	16	18	20	20	20	18	16	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
LQ	E ₁₄	12	12	E	E	12	E ₁₅	E ₁₄	14	15	16	16	17	17	16	15	15	14	E ₁₃	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄

IONOSPHERIC DATA

OCT. 1968

M(3000)F₂(0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	300	300	315	280	300	305	310	340	330	305	320	300	270	280	290	295	295	305	305	305	290	275	290	285	
2	310	285	275	300	345	290	300	340	300	290	290	295	285	280	285	305	295	300	305	290	S	S	U ₂₅₅	U ₂₃₅	
3	S	S	U ₂₇₅	285	320	290	280	340	325	290	295	295	290	280	290	295	305	300	310	300	285	270	C	C	
4	C	C	C	C	C	C	C	C	C	C	300	290	285	285	290	300	300	315	315	325	270	270	255	275	
5	280	I ₂₇₅	270	290	305	295	315	340	I ₃₃₀	320	300	315	290	285	280	300	315	320	310	315	295	290	275	280	
6	280	295	295	285	315	295	295	335	S ₃₃₀	I ₃₂₀	300	300	305	285	295	300	300	315	320	300	295	290	285	280	
7	265	275	285	300	315	315	300	J ₃₄₅	340	335	315	300	290	295	285	290	295	J ₃₁₀	J ₃₁₅	310	280	280	285	275	
8	275	285	285	295	340	295	285	355	350	340	U ₂₉₅	C	285	290	285	300	295	300	305	310	310	I ₂₆₅	J ₂₆₀	270	270
9	275	280	285	295	335	345	305	340	325	330	J ₃₀₀	290	J ₂₈₅	285	295	295	295	310	320	J ₃₀₅	I ₃₀₀	U ₂₇₅	R	S	
10	S	J ₂₈₅	I ₂₇₅	I ₂₉₅	J ₂₈₅	U ₂₉₅	305	I ₃₄₀	U ₃₃₀	315	300	295	290	280	275	295	295	300	305	U ₃₁₀	J ₂₈₀	290	275	280	
11	265	275	280	310	325	285	300	335	S ₃₃₀	S ₃₂₀	310	300	290	285	290	295	305	315	310	305	290	290	300	280	
12	285	280	315	305	325	295	290	320	335	315	I ₃₁₀	300	295	290	285	285	290	290	290	260	U ₂₆₀	U ₂₆₀	265	295	
13	300	280	265	285	250	240	265	315	315	315	U ₂₉₅	295	300	300	285	295	300	325	310	285	295	295	I ₂₈₀	275	
14	280	300	275	285	335	I ₂₅₅	270	330	325	I ₃₂₀	330	U ₃₀₀	300	300	U ₂₉₅	U ₂₉₅	305	325	310	J ₂₈₅	280	300	320	U ₂₇₀	
15	275	285	275	280	310	315	315	350	S ₃₄₅	325	335	310	J ₃₁₅	300	300	305	310	U ₃₂₅	315	315	270	300	J ₃₀₀	285	
16	275	275	285	295	335	295	295	345	S ₃₅₀	340	335	325	305	285	305	305	315	335	J ₃₂₅	J ₃₄₅	J ₂₇₅	J ₂₉₅	J ₂₉₀	J ₂₈₅	
17	280	R ₂₇₅	265	295	345	290	295	335	J ₃₃₅	315	325	305	305	280	295	300	305	315	300	270	295	280	290	295	
18	270	265	265	290	340	280	270	325	340	315	320	295	285	300	295	300	300	J ₃₀₅	310	300	285	300	305	280	
19	265	275	280	275	300	290	275	320	325	335	310	310	290	290	290	295	310	310	320	295	280	280	275	275	
20	280	310	290	295	305	305	275	305	335	S ₃₃₅	315	295	285	290	295	295	300	315	315	275	280	285	285	275	
21	270	290	315	310	285	260	285	320	U ₃₁₅	J ₃₂₅	I ₃₂₀	U ₃₁₅	290	290	U ₂₉₅	U ₂₉₅	I ₂₉₅	U ₃₀₅	I ₃₂₀	U ₂₉₀	U ₂₇₅	I ₂₈₀	285	300	
22	300	J ₂₉₀	300	315	360	285	290	J ₃₄₀	315	320	320	320	U ₂₉₅	300	295	305	310	310	U ₃₁₅	285	J ₂₈₀	310	J ₃₀₀	290	
23	U ₂₇₀	295	290	295	335	345	285	345	350	325	J ₃₂₅	300	295	285	300	300	300	275	J ₃₂₅	I ₂₈₅	295	J ₂₈₅	300	260	
24	U ₂₇₅	285	290	320	315	260	300	350	340	315	295	305	300	285	285	295	290	305	300	275	285	285	280	280	
25	255	260	275	290	320	240	295	350	330	285	305	295	290	285	295	285	290	295	300	310	280	U ₂₆₅	290	270	
26	275	295	295	300	320	280	295	335	I ₃₃₀	I ₃₁₀	315	305	290	285	285	290	295	310	305	300	275	275	280	290	
27	300	315	270	270	310	275	275	335	S ₃₅₀	315	285	295	295	285	285	290	295	300	300	280	310	U ₃₁₀	275	280	
28	280	255	265	290	325	280	290	335	U ₃₄₅	330	315	305	280	285	290	290	J ₂₉₅	300	310	295	310	290	305	280	
29	265	265	275	315	345	255	275	315	J ₃₃₅	310	J ₃₀₀	300	285	285	295	290	J ₂₉₀	J ₂₈₅	J ₃₀₅	295	295	285	265	I ₂₆₀	
30	230	250	310	325	240	235	J ₂₉₅	280	S ₃₁₀	300	U ₃₀₀	290	285	285	290	285	285	290	300	285	J ₃₀₅	290	275	275	
31	285	270	265	290	260	250	260	320	S ₃₂₀	310	305	295	285	U ₂₉₀	J ₂₈₅	285	290	305	J ₂₉₀	285	U ₂₉₀	I ₂₈₀	205	230	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	29	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	30	30	29	29	
MED	275	280	280	295	320	290	292	335	330	318	310	300	290	285	290	295	300	305	310	295	285	285	285	280	
UQ	282	290	290	305	335	295	300	340	S ₃₄₀	S ₃₂₅	320	305	295	290	295	300	305	315	315	308	295	290	290	285	
LQ	270	275	275	285	305	260	275	320	325	310	300	295	285	285	285	290	295	300	305	285	280	275	275	275	

IONOSPHERIC DATA

OCT. 1968

M(3000)F1(0.01)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L 340	U L 300	L	L	L	L							
2									L	L	L	U L 370	L	L	L	L	L	L						
3									L	L	L	L	L	L	L	L	L	L	A					
4									C	C	L	L 380	L	L	L	L	L	L						
5									L	L	L	L	L	L	L	L	L	L						
6									L	C	L	L	L	L	L	L	L	L						
7										A	L	L	L	L	L	U L 340	A	A						
8									L	L	U L 335	L	L	L	L 345	L	L	L						
9										L	L 395	L	U L 340	L	L	L	L	L						
10									L	L	L	L	L	L	L	L	L	L						
11									L	L	L	L	L	U L 330	L	L	L	L						
12									L	L	L 370	L	L	L 355	L	L	L	L						
13										L	L	L	L	R 400	L	L	L	L						
14									L	L	L	L	L	L	L	L	L	420	405	400				
15									L	L	A	L	A	L	A	A	L	L						
16										L	U L 385	L 405	A	A	A	L	L	L						
17										L	L	L	L 370	L	L	L	L	L						
18										L	L	L	L	L	L	A	A	L						
19									L	L	L	L	L	L	L	L	L	L						
20									L	L	L	L	L	L	L	L	L	L						
21									L	L	C	L	L	L	L	L	C	L						
22										L	L	L	L	L	L	L	A	A						
23										L	L	L	L	L	L 340	L	L	L						
24										L	L	L	L	L	L	L 400	L	L						
25										L	L	L	L	L	L	L	A	A						
26										L	L	L	L	L	L	L	L	L						
27										400	L	L	L	L	L	L	L	L						
28									L	L	U L 355	L	L	L	L	L	L	410						
29										L	L	L	L	L	L	L	L	L						
30										L	L	L	L	L	L	L	L	L						
31												L	L	L	L	L	A	L						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	4	5	3	3	2	2	2	1	1					
MED										400	U L 370	370	U L 340	355	342	370	415	405	400					
UQ										390	380	355	378											
LQ										U L 345	370	L	U L 320	342										

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h'F2 (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									245	250	285	280	320	310	300	280	255								
2									250	230	290	270	310	320	300	275	270	260							
3									250	280	280	280	275	275	295	255	260	250							
4									C	C	255	265	310	290	285	275	260								
5									240	255	250	275	300	300	295	280	260								
6									220	C	275	280	275	290	270	290									
7									250	255	305	300	275	300	290	270	250								
8									215	230	310	290	290	305	295	265	270								
9									245	245	255	300	300	300	270	255									
10									235	250	250	260	300	290	300	280	270								
11									250	250	270	250	295	310	300	260	255								
12									245	260	260	255	295	275	315	280									
13									250	255	295	265	255	280	290	250									
14									250	250	245	285	255	275	290	275	255	230	215						
15									240	250	255	260	280	260	270	260	255								
16									245	250	245	285	305	300	270	255									
17									255	250	295	250	300	295	250	245									
18									250	255	255	300	280	255	260	255									
19									245	240	250	260	265	285	260	270	245								
20									235	240	250	255	290	300	260	275									
21									250	255	255	255	300	285	275	250	250								
22									255	260	250	300	290	280	250	240									
23									235	250	245	275	300	300	255										
24									250	255	270	275	285	295	255										
25									300	280	260	275	305	280	255	245									
26									250	255	255	280	295	290	270										
27									225	240	275	290	280												
28									235	240	255	260	250	295	255	250	245								
29									230	255	255	300	300	280	275	240									
30									260	260	255	290	300	260	250										
31												245	300	295		H 240	250								

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									15	28	30	31	31	31	29	30	23	4	1						
MED									245	250	255	260	290	295	290	270	255	250	215						
UQ									250	255	260	278	300	300	300	275	260	255							
LQ									235	240	250	255	275	282	275	255	248	240							

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f_oF (km)

135° E Mean Time (G. M. T. + 9^h),

Station	YAMAGAWA																				Lat.	31° 12.1' N.	Long.	130° 37.1' E	Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation																						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																							
1	265	250	230	280	260	220	250	235	230	220	205 ^H	205	220 ^H	240	215 ^H	240	235	245	245	230	205	300	275	250																							
2	245	250	275	250	225	250	245	225	220 ^H	225	205 ^H	215	205	215 ^H	250	240	240	255	235	205	230	290	310	350																							
3	275	230	250	255	205	235	300	215	220	200 ^H	200 ^H	215 ^H	225	200 ^H	230	245	250	245 ^{I A}	230	235	200	240	C	C																							
4	C	C	C	C	C	C	C	C	C	C	230	220	205 ^H	200 ^H	235	240	240	245	230	205	220	245	250	270																							
5	255	255	250	250	220	225	250	230	230	210 ^H	220 ^H	200	205 ^H	230	190 ^H	250	245	240	230	210	210	250	240	260																							
6	290	250	235	255	240	245	245	240	225	225 ^C	225 ^H	205	240 ^H	200 ^H	210	225 ^H	245	250	225	235	230	250	250	255																							
7	300	295	275	260	230	230	250	230	240	215 ^{I A}	205 ^H	205 ^H	200 ^H	245	230 ^H	225	230 ^{I A}	235 ^{I A}	235	220	230	265	275	275																							
8	285	275	265	250	225	265	290	220	220	210	210 ^H	200 ^H	205	225 ^H	240	250	255	250	240	220	220	280	295	295																							
9	285	280	265	255	220	205	240	225	220	225	205	200 ^H	260 ^{E R}	225 ^H	205 ^H	200 ^H	250	250	235	220	220	250	260	270																							
10	260	255	275	250	205	240	215	220	230	225	210	200	185 ^H	245	225	245	245	240	230	220	205	245	240	250																							
11	270	275	255	250	210	250	275	230	230	230 ^H	225	225	210 ^H	185 ^H	240	240	240	245	225	255	245	245	240	270																							
12	295	260	245	225	220	275	280	230	240	230	220	205	205 ^H	205	225 ^H	240	245	240	205	290	260	285	300	255																							
13	230	255	290	280	295	350	300	230	230	230	250	225	230	200 ^H	230 ^H	255	240	230	230	250	250	250 ^{I A}	270	295																							
14	265	290	300	325 ^{E A}	225	A	300	240	245	235	240	250 ^{E A}	235	235	215 ^H	250	210	225	200	240	265	250	225	280																							
15	325	300	300	300	250	230	255	225	235	235	A	225 ^H	A	250 ^{E A}	A	A	230	240	215 ^H	225	270	245	225	245																							
16	300	300	285	280	235	250	245	230	235	230	220	210 ^H	A	A	A	255 ^{E A}	245	225	220	215	255	245	255	280																							
17	300	320	340	280	225	270	270	220	235	235	230	225	220	205 ^H	230 ^{I A}	235	240	230	225	230	245	265	265	250																							
18	280	300	305	275	230	225	280	225	230	230	245	230	240 ^H	245	250 ^{I A}	250 ^{I A}	245 ^{I A}	230	225	215	250	250	250	255																							
19	300	295	280	295	255	245	250	230	235	240	215	215 ^{I A}	200 ^H	235	245	230 ^H	235	225	230	210	230	250	275	300																							
20	295	250	235	250	240	240	300	250	235	225	235 ^H	220	220 ^H	215 ^H	200 ^H	200 ^H	245	230	225	230	265	245	260	270																							
21	295	275	245	250	250	300	255	230	230	240	C	250 ^{E S}	250 ^{E S}	250 ^{E S}	255	C	235 ^H	235	220	255	220	250	245	260																							
22	255	250	240	250	225	205	275	240	215	225	220	240 ^{E A}	230 ^{I A}	230 ^{I A}	230	A	A	225	220	245	275	255	290	290																							
23	290	265	275	280	240	205	305	245	225	215	225	225	205 ^H	250 ^{E B}	215	235	245	260	250	230 ^{E A}	250	255	250	295																							
24	295	285	275	260	250	250	255	200 ^H	220	225 ^H	240	215 ^H	245	235	225 ^H	235	245	270	205	230	250	250	250	260																							
25	345 ^{E A}	300	295	250	225	320	255	215	205	215	200 ^H	240	225	230	250	A	A	240	240	220	230	270	260	250																							
26	255	270	255	255	240	260	245	245	225	225 ^H	225	220	220 ^H	205 ^H	225	240	235	230	210	205	225	255	250	265																							
27	260	250	275	275	240	280	290	230	225	215	225	230	235 ^H	235	245	255	250	250	225	235	240	205	215	255																							
28	245	270	300	270	225	250	270	230	230	220	220 ^H	240	210 ^H	235 ^H	240	230	230	240	225	225	225	230	245	255																							
29	260	295	290	245	220	270 ^{E B}	300	240	230	225	230	245	225 ^H	230 ^H	225 ^H	240 ^H	235 ^H	250	230	230	205	230	250	305																							
30	320	350	230	225	350	370	225	240	250	240	250	245	235 ^H	230	250	235	230	240	230	210	235	235	290	300																							
31	275	300	290	250	250	300	300	245	230	245	250	235	225	245 ^H	255	A	250 ^{E A}	245	205	250	250	240	250	375 ^{E S}																							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																							
CNT	30	30	30	30	30	29	30	30	30	30	29	31	29	30	29	26	29	31	31	31	31	31	30	30																							
MED	280	275	275	255	230	250	262	230	230	225	225	218	220 ^H	229	230	240	240	240	225	228	232	250	251	270																							
UQ	295	295	290	278	250	270	290	240	235	230	230	228	232	238	245	248	245	248	230	236	250	255	275	295																							
LQ	260	255	250	250	225	230	250	225	225	220	210 ^H	208	205 ^H	205 ^H	225 ^H	235	235	230	220	218	222	245	245	255																							

IONOSPHERIC DATA

OCT. 1968

***f*'Es** (km)

135° E Mean Time (G. M. T. + 9^h)

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

Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	S	100	B	100	100	B	S	165	G	105	G	150	135	105	105	G	G	125	115	110	105	100	100	100	
2	100	B	B	B	B	B	S	150	100	125	105	100	100	G	G	G	135	125	105	105	105	100	100	100	
3	S	S	B	B	B	B	S	150	G	145	130	145	150	G	150	150	120	110	105	105	100	100	C	C	
4	C	C	C	C	C	C	C	C	C	C	G	100	G	100	100	100	145	125	120	S	100	S	95	95	
5	B	B	E	B	E	B	100	100	100	G	G	100	G	100	100	150	140	125	115	100	100	100	S	B	
6	S	B	B	E	B	S	S	150	130	C	125	115	120	120	120	G	150	130	120	110	105	B	B	S	
7	B	B	B	E	B	B	100	155	150	125	125	120	115	120	105	105	105	100	100	100	100	100	100	95	
8	S	B	B	B	B	B	S	150	130	140	125	125	120	120	G	155	145	130	120	110	95	95	100	S	
9	100	B	B	B	B	B	S	105	130	G	105	105	G	G	105	105	105	100	150	100	100	95	95	S	
10	S	B	B	B	B	B	S	G	G	135	G	G	105	105	100	100	100	140	115	100	95	95	S	S	
11	S	B	B	B	B	B	S	G	150	G	125	125	120	125	125	130	135	110	105	105	100	100	S	B	
12	S	B	B	E	E	B	S	150	145	G	135	115	105	100	100	100	100	100	95	95	S	S	100	S	
13	S	100	B	B	100	100	S	G	150	140	120	100	150	105	100	G	G	145	120	115	105	105	110	100	
14	110	105	105	105	105	105	105	100	150	130	125	120	120	G	G	130	100	100	S	155	115	115	105	105	
15	100	100	B	B	B	B	S	150	150	125	120	145	130	120	105	105	150	G	100	110	105	105	S	S	
16	S	B	100	B	100	B	S	G	150	125	130	145	120	120	120	120	125	95	B	S	S	155	150	105	
17	100	100	95	B	100	100	100	165	145	125	125	110	115	105	105	110	105	110	105	100	100	100	B	100	
18	100	B	B	B	E	S	S	G	150	95	95	95	115	120	120	120	115	110	105	105	B	100	100	100	
19	100	100	100	B	B	B	105	G	G	130	120	125	120	120	115	125	110	110	110	105	100	100	100	100	
20	100	100	B	100	B	B	S	G	G	125	125	125	120	120	120	G	150	130	105	105	100	100	100	100	
21	100	100	100	100	100	100	100	G	G	140	C	130	120	120	125	125	G	G	150	105	100	105	105	100	
22	100	100	100	B	B	B	S	140	120	120	120	115	110	110	135	125	115	110	105	105	100	100	100	95	
23	95	95	95	B	B	B	S	G	105	150	G	G	150	B	G	165	160	110	105	105	100	100	100	100	
24	100	100	105	100	B	B	100	105	G	105	110	G	110	160	G	G	105	110	105	100	100	100	100	100	
25	100	100	100	100	E	E	S	G	105	145	150	140	135	100	130	120	115	110	105	105	105	100	100	100	
26	100	100	95	95	95	95	95	95	125	125	100	105	100	G	105	105	105	100	100	100	100	S	S	B	
27	B	B	B	B	B	B	S	G	105	100	105	100	150	170	150	130	125	120	110	105	105	100	S	S	
28	B	B	B	E	E	B	S	G	125	150	150	125	140	100	100	G	G	100	155	S	S	S	100	S	
29	S	B	B	E	95	B	S	150	155	150	150	140	135	130	G	G	G	E G 175	95	105	105	105	S	S	
30	100	100	100	100	B	B	S	G	150	G	105	105	100	100	100	100	120	100	110	S	105	100	105	100	
31	100	100	100	100	100	100	100	100	G	130	125	125	115	110	110	105	105	105	105	105	100	100	100	120	125
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	16	15	12	9	9	6	9	17	22	24	25	28	28	25	25	23	26	29	29	27	27	26	21	18	
MED	100	100	100	100	100	100	100	150	138	128	125	120	120	120	105	120	118	110	105	105	100	100	100	100	
UQ	100	100	100	100	100	100	100	150	150	140	125	128	135	120	120	130	140	125	115	105	105	100	105	100	
LQ	100	100	98	100	100	100	100	105	120	125	110	105	112	105	100	105	105	100	105	100	100	100	100	100	

IONOSPHERIC DATA

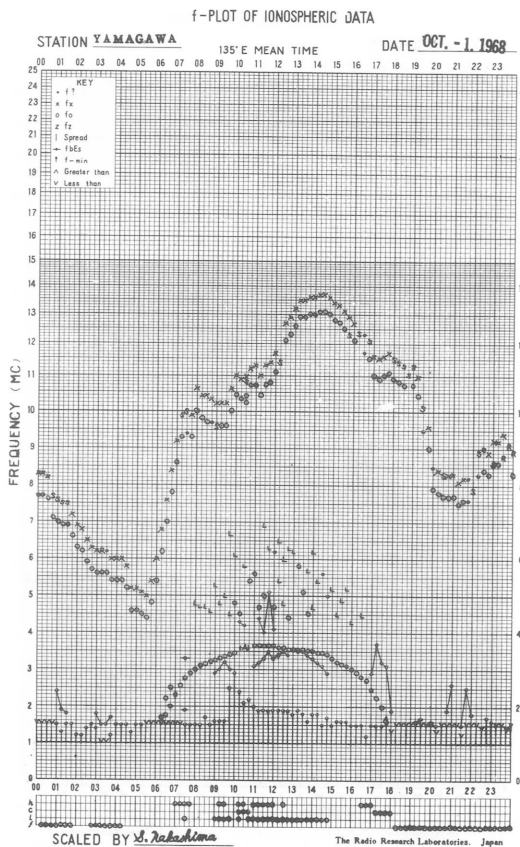
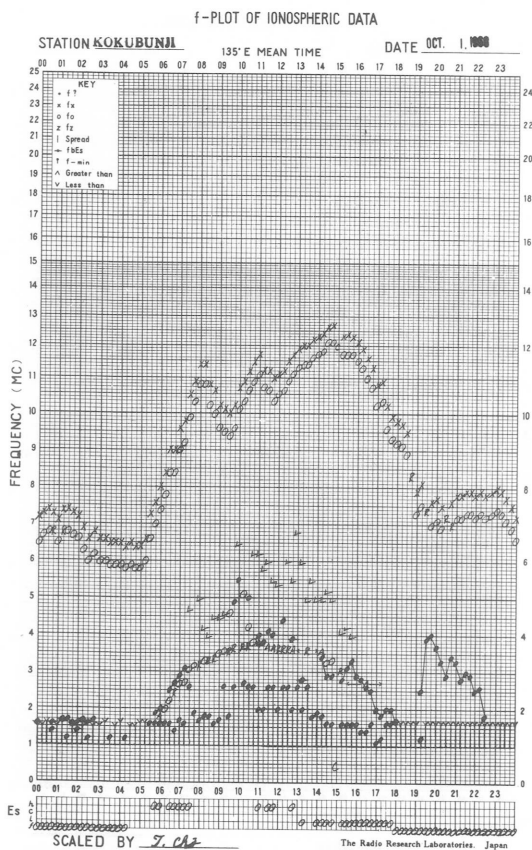
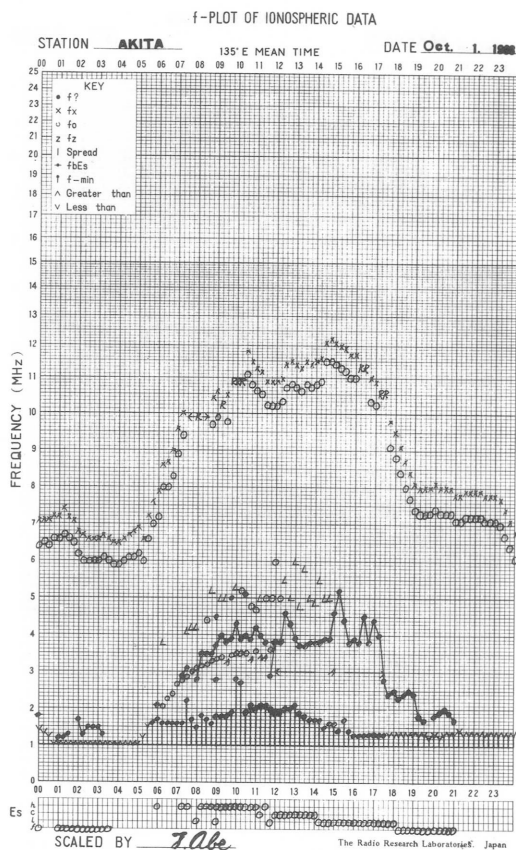
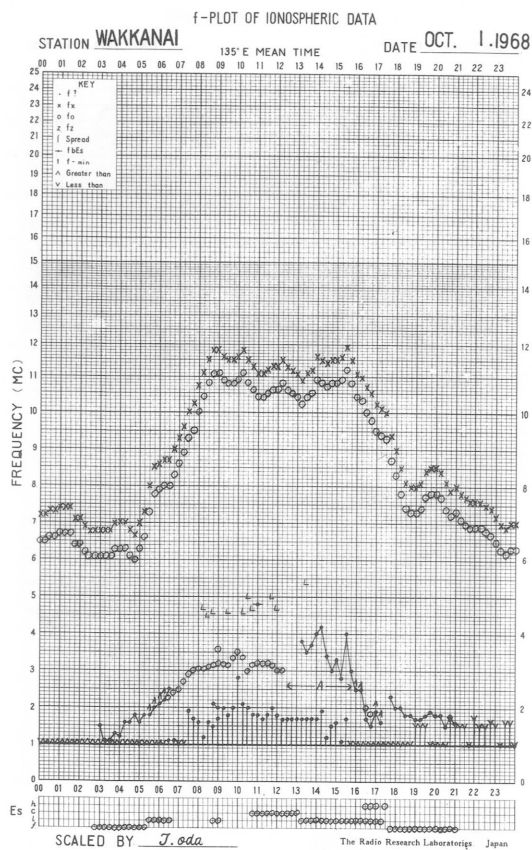
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Types of Es

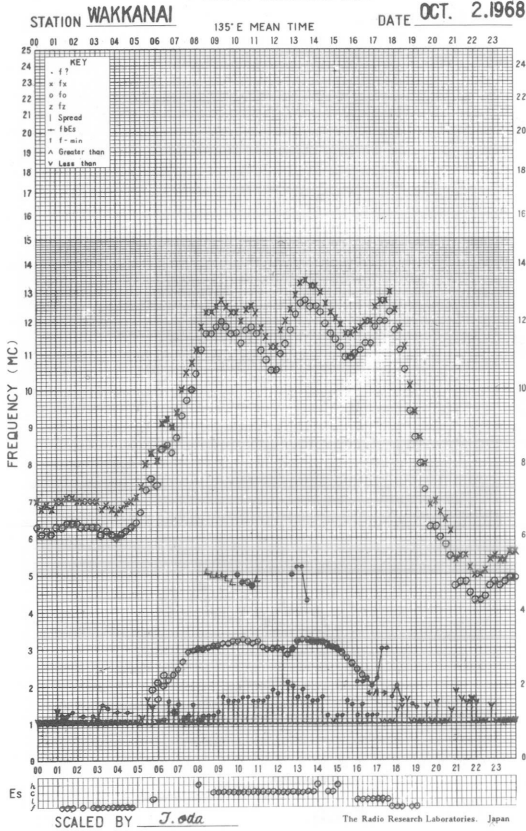
135° E Mean Time (G. M. T. + 9^h)

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

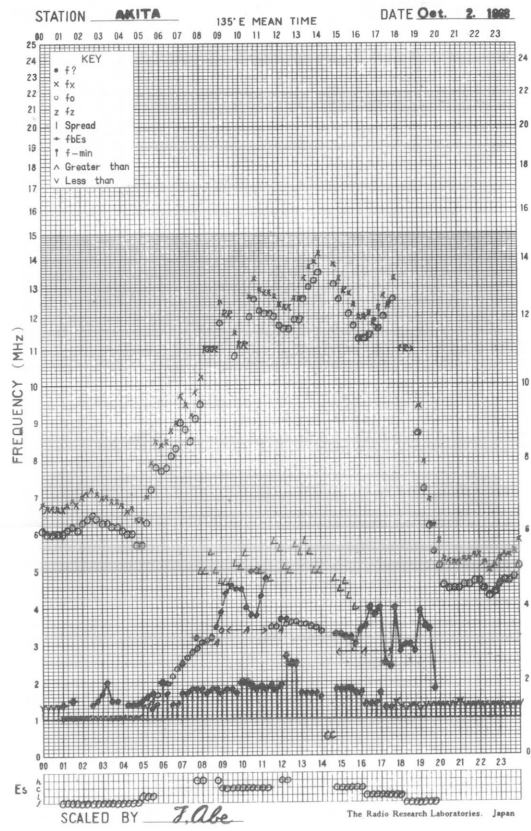
Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		F ₃		F ₁	F ₁			H ₁		L ₁		HL ₁₁	HL ₁₁	L ₁	L ₂			H ₃	C ₂	F ₁	F ₃	F ₃	F ₃	F ₁	
2	F ₁							H ₁	L ₂	HL ₁₁	L ₁	L ₂	L ₁				H ₂	HC ₂₂	L ₂	F ₁	F ₃	F ₂	F ₁	F ₁	
3								H ₁		HL ₁₁	HL ₁₁	HL ₁₁	HL ₁₁		H ₁	H ₁	C ₂	C ₅	L ₃	F ₃	F ₁	F ₁			
4												L ₁		L ₁	L ₁	L ₁	HL ₃₂	HL ₃₁	LC ₁₁		F ₁		F ₂	F ₁	
5							L ₇	LH ₂₂	L ₁			L ₁		L ₁	L ₁	HL ₁₁	H ₂	H ₄	C ₃	F ₁	F ₁	F ₁			
6								H ₂	H ₂		H ₁	C ₁	C ₁	C ₁	C ₁		H ₁	H ₂	C ₃	F ₁	F ₃				
7							L ₁	H ₁	H ₂	H ₂	H ₁	C ₁	C ₁	C ₁	L ₁	L ₂	L ₄	L ₄	L ₅	F ₂	F ₁	F ₂	F ₁	F ₁	
8								H ₁	H ₂	H ₁	H ₁	H ₁	C ₁	C ₁		H ₁	H ₁	H ₃	C ₄	FF ₃₂	F ₁	F ₁	F ₁		
9	F ₁							L ₁	H ₁		L ₁	L ₁			L ₁	L ₁	L ₂	L ₂	HL ₁₂	FF ₁₁	F ₂	F ₃	F ₁		
10									H ₁				L ₁	L ₁	L ₁	L ₁	L ₁	H ₁	CH ₂₁	F ₁	F ₁	F ₂			
11								H ₁		HL ₁₁	H ₁	C ₁	C ₁	H ₁	H ₁	H ₁	H ₁	C ₃	L ₃	F ₅	F ₃	F ₁			
12								H ₂	H ₂		H ₁	C ₁	L ₁	L ₁	L ₁	L ₁	L ₁	L ₁	L ₂	F ₁			F ₁		
13			F ₁		F ₂	F ₂		H ₁	H ₁	C ₁	L ₁	L ₁	HL ₁₁	L ₁	L ₁			H ₁	C ₁	F ₂	F ₃	F ₂	FF ₃₂	F ₁	
14	FF ₂₃	F ₅	F ₂	FF ₄₁	F ₃	F ₄	L ₄	L ₁	HL ₁₁	HL ₂₂	HL ₁₁	CL ₁₁	CL ₁₁			H ₁	L ₁	L ₁		F ₁	F ₂	F ₁	F ₁	F ₁	
15	F ₃	F ₂						H ₁	H ₁	H ₁	C ₁	HC ₁₁	HL ₁₁	CL ₁₁	C ₂	C ₂	H ₁		L ₁	FF ₃₁	F ₃	F ₂			
16			F ₂		F ₁				HL ₁₂	HL ₁₁	H ₁	HL ₁₁	CL ₃₁	CL ₄₁	CL ₂₁	CL ₁₁	HL ₁₂	L ₁				F ₁	FF ₂₂	F ₂	
17	F ₁	F ₁	F ₂		F ₁	F ₁	L ₁	H ₂	H ₂	H ₂	HL ₁₁	CL ₁₁	C ₁	L ₁	L ₂	CL ₂₁	CL ₂₁	C ₃	L ₆	F ₅	F ₃	F ₁	F ₁		
18	F ₁								H ₁	L ₃	L ₃	LH ₃₁	CL ₁₁	C ₁	C ₁	CL ₂₁	CL ₃₂	C ₃	L ₇	F ₃		F ₄	F ₅	F ₁	
19	F ₁	F ₁	F ₂				L ₁		H ₁	H ₁	H ₁	H ₁	H ₁	H ₁	CL ₁₁	CL ₁₁	C ₂	L ₁	C ₁	F ₁	F ₃	F ₄	F ₄	F ₃	
20	F ₂	F ₂		F ₁					H ₁	H ₁	H ₁	C ₁	C ₁	C ₁			H ₂	H ₆	L ₄	F ₄	F ₄	F ₄	F ₂	F ₁	
21	F ₁	F ₂	F ₁	F ₃	F ₁	F ₁	L ₁		H ₁		H ₁	H ₁	C ₁	C ₁	H ₁	H ₁			H ₁	F ₂	F ₅	F ₁	F ₁	F ₄	
22	F ₁	F ₁	F ₁					H ₁	C ₁	C ₂	C ₁	C ₁	C ₁	C ₂	H ₁	H ₂	C ₃	L ₃	L ₄	F ₃	F ₅	F ₇	F ₃	F ₄	
23	F ₄	F ₃	F ₂						L ₂	H ₁			H ₁			H ₁	H ₁	C ₃	L ₄	F ₄	F ₅	F ₄	F ₁	F ₄	
24	F ₁	F ₁	F ₁	F ₁			L ₁	L ₁		L ₁	L ₁		C ₁	H ₁			L ₁	L ₂	L ₅	F ₃	F ₄	F ₇	F ₃	F ₆	
25	F ₆	F ₂	F ₂	F ₁				L ₁	HL ₁₂	HL ₁₁	HL ₁₁	HL ₁₂	LH ₂₁	HL ₁₁	C ₃	C ₅	C ₃	L ₇	F ₅	F ₃	F ₄	F ₄	F ₄	F ₃	
26	F ₂	F ₂	F ₂	F ₄	F ₂	F ₁	L ₁	L ₁	H ₂	HL ₁₁	L ₁	L ₁	L ₁		L ₁	L ₁	L ₂	LH ₂₂	L ₃	F ₁	F ₁				
27									L ₂	L ₁	L ₁	L ₁	HL ₁₁	HL ₁₁	HL ₁₁	HL ₂₁	H ₃	C ₆	CL ₆₁	FF ₃₁	FF ₂₁	F ₁			
28									H ₂	HL ₁₂	H ₁	HL ₁₁	HL ₁₁	L ₂	L ₁			L ₁	H ₂					F ₂	
29					F ₂			HL ₃₁	HL ₁₃	HL ₂₂	HL ₁₂	HL ₁₁	HL ₁₁	H ₁				H ₂	L ₁	F ₃	F ₃	F ₄			
30	F ₂	F ₁	F ₁	F ₁					H ₂		L ₂	L ₂	L ₂	L ₂	L ₂	L ₂	CL ₂₂	L ₁	L ₁		F ₁	F ₅	FF ₂₃	F ₄	
31	F ₃	F ₅	F ₁	F ₂	F ₂	F ₂	L ₂	L ₁		C ₁	C ₁	H ₁	C ₁	C ₁	C ₁	L ₄	L ₃	L ₂	L ₅	F ₄	F ₃	F ₁	F ₂	F ₁	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
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LQ																									



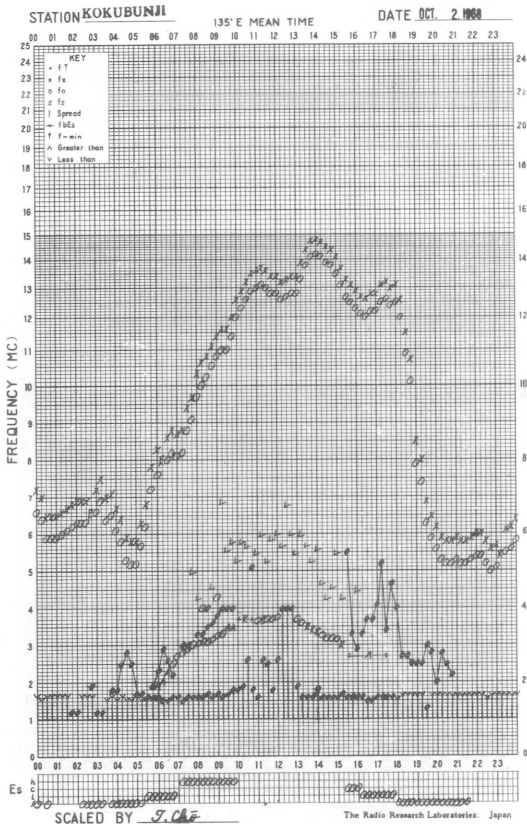
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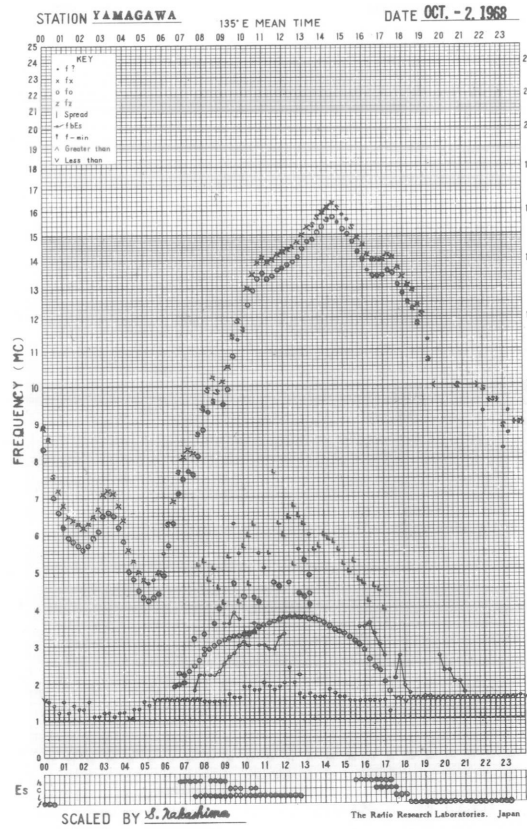
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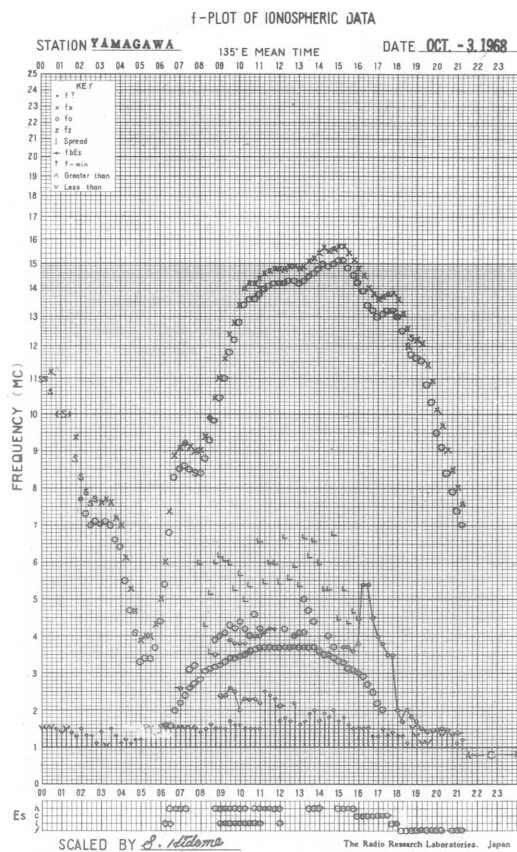
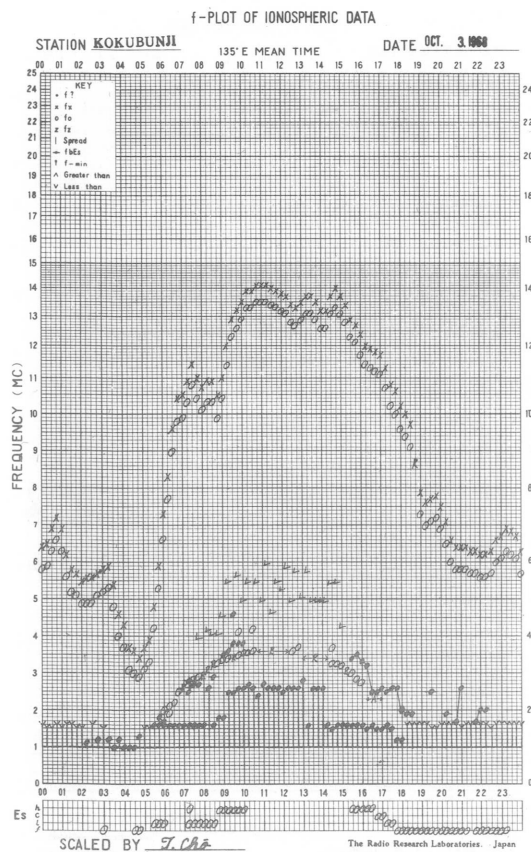
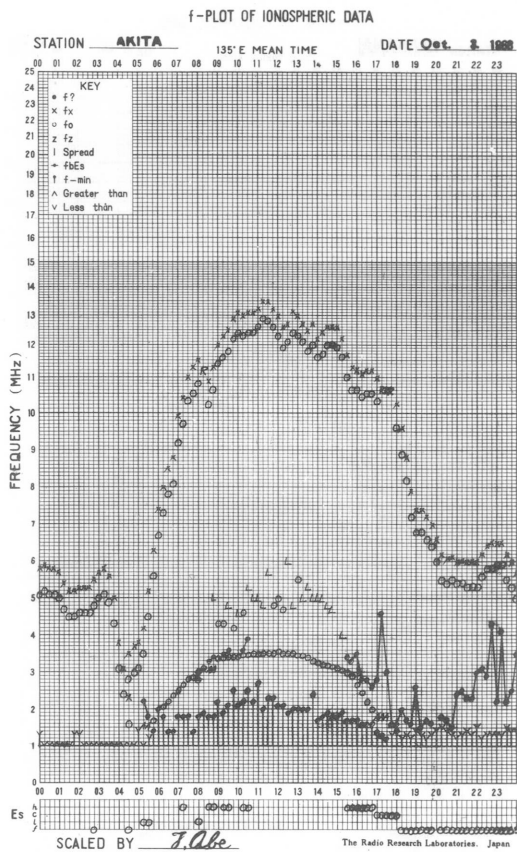
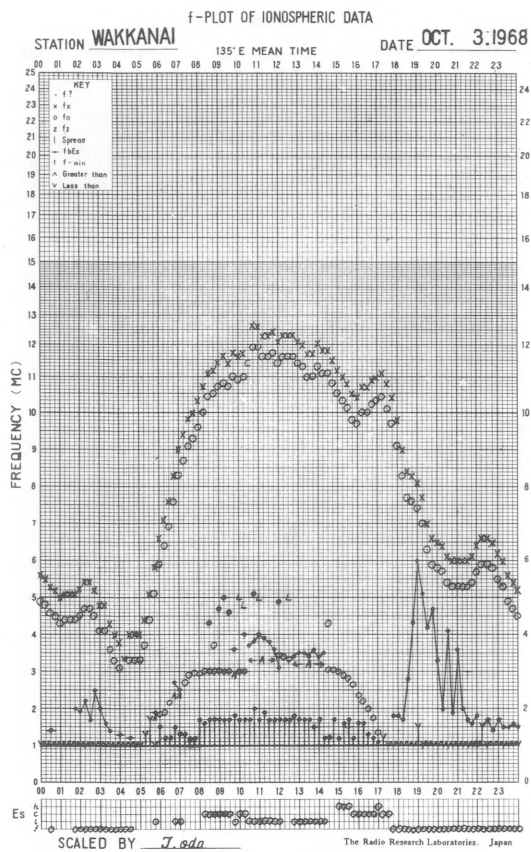


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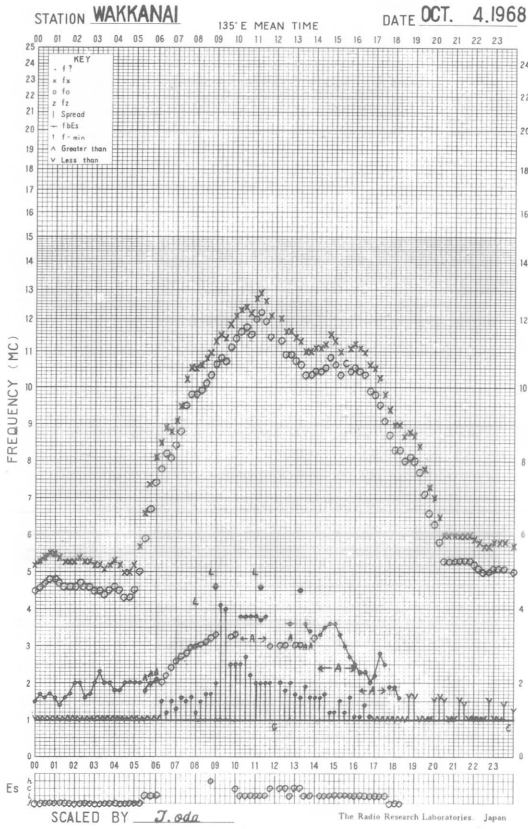


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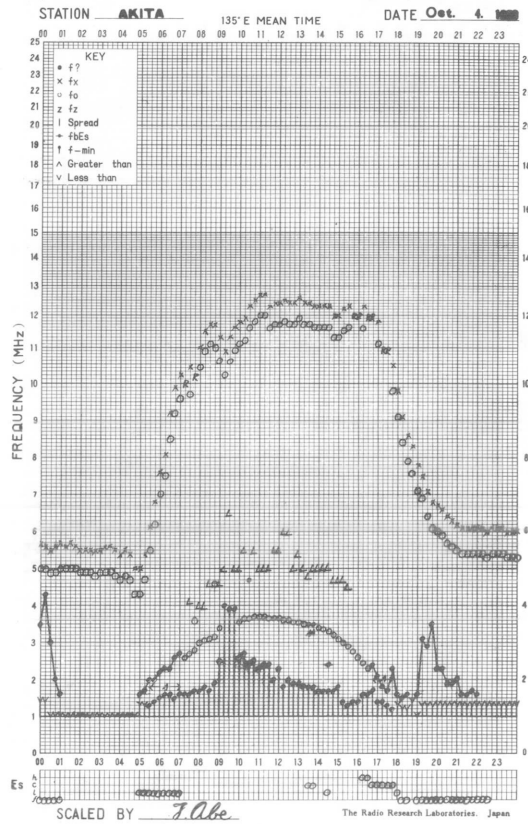




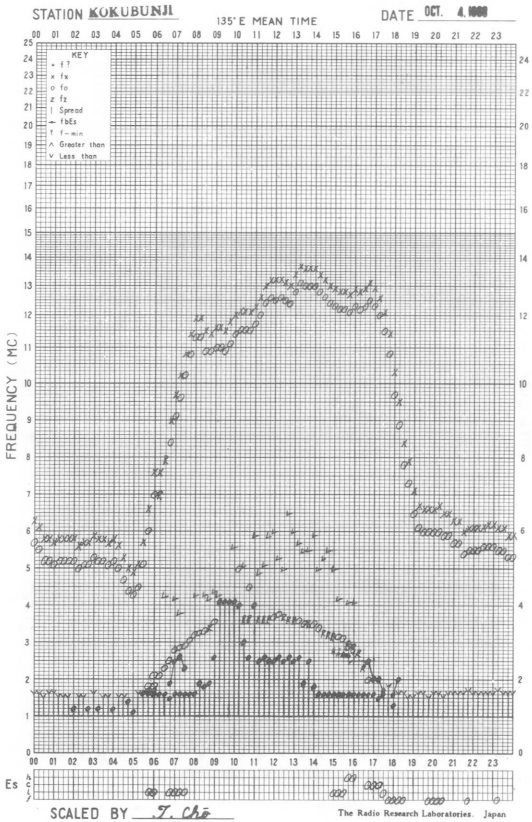
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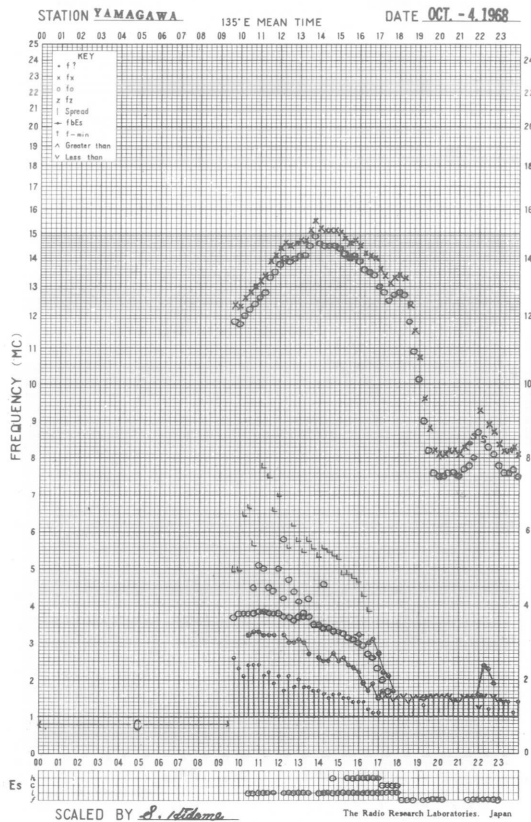
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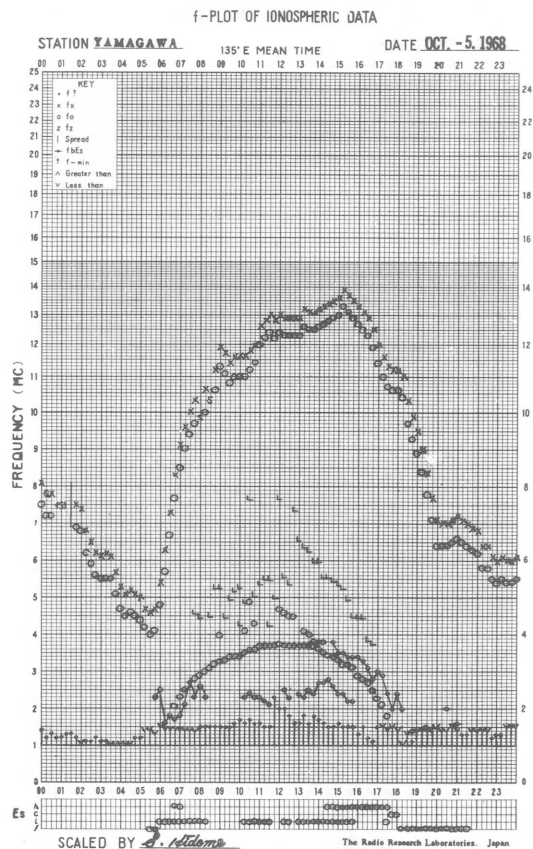
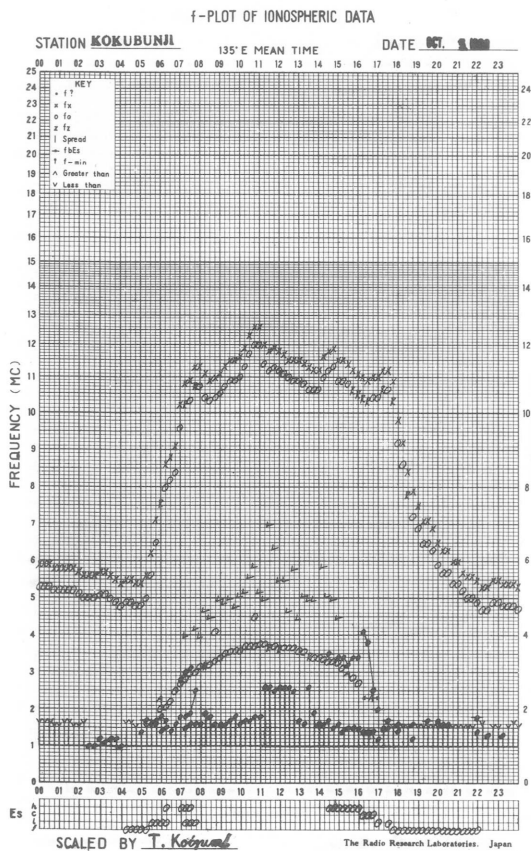
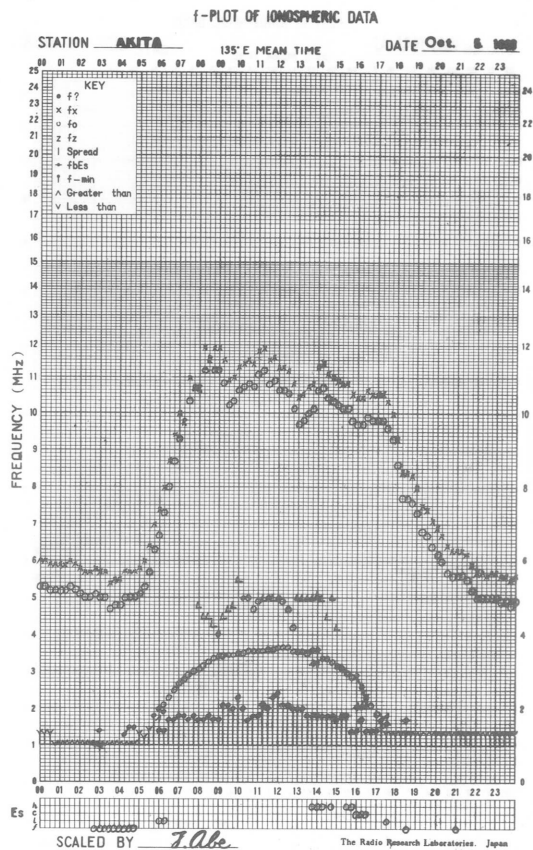
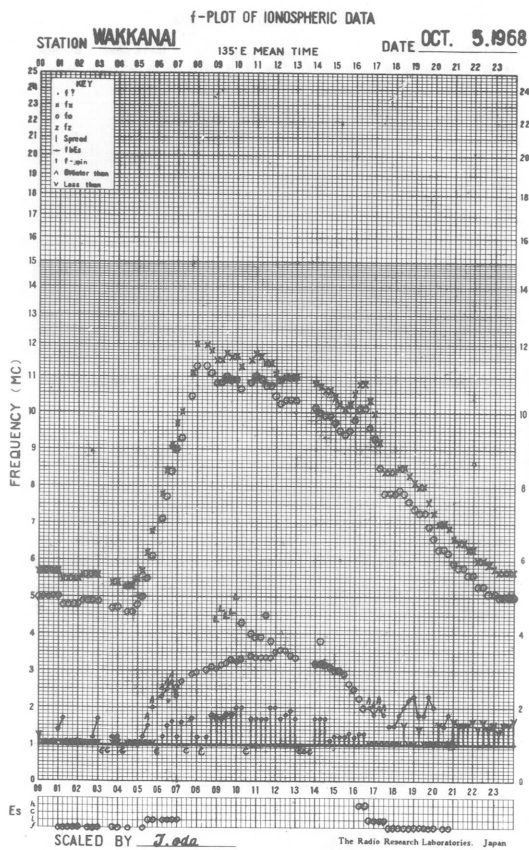


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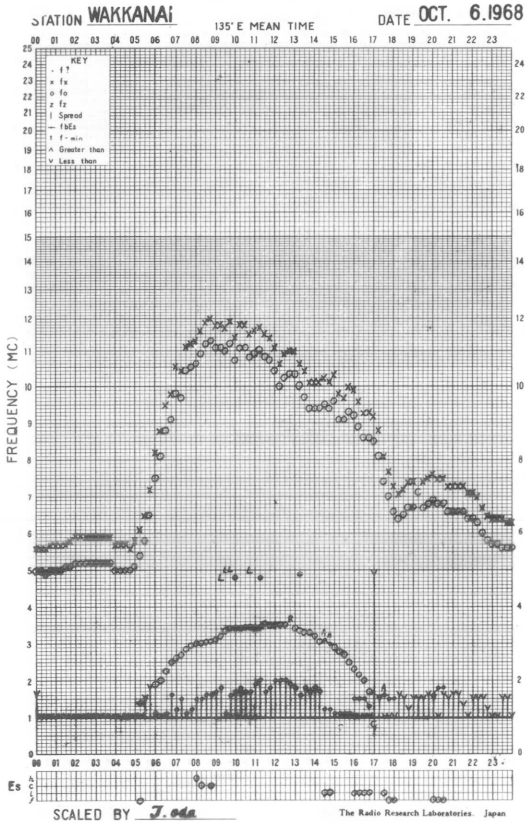


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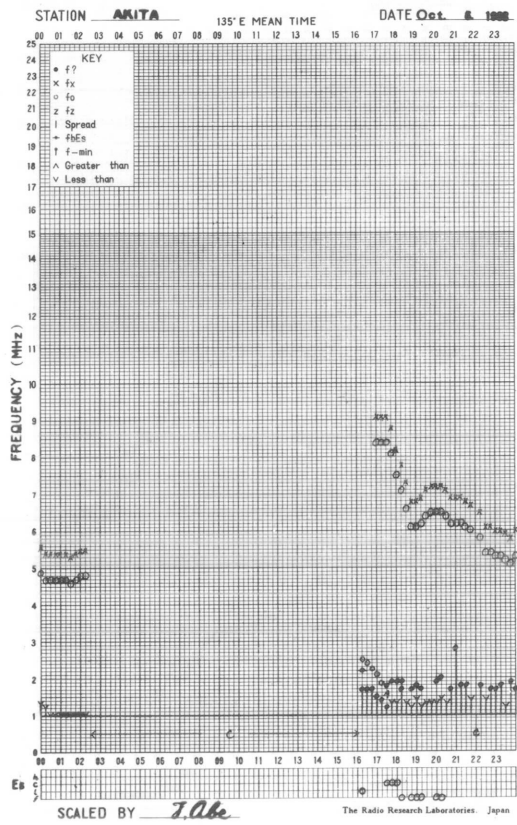




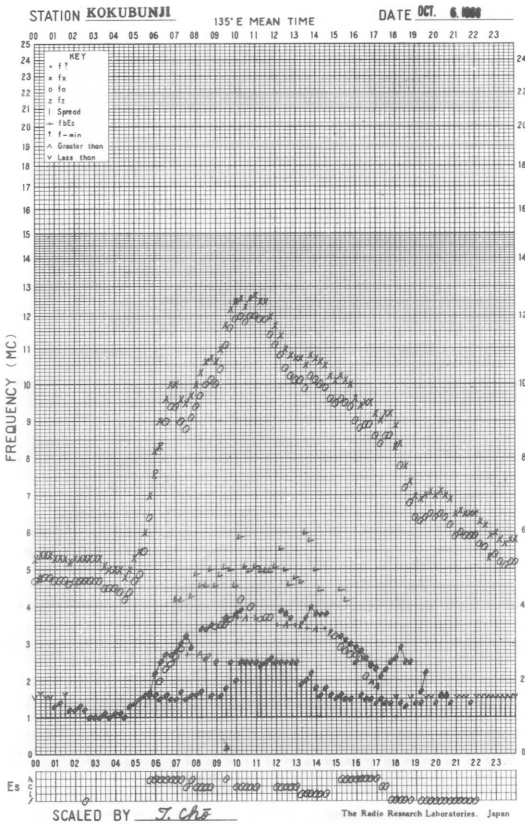
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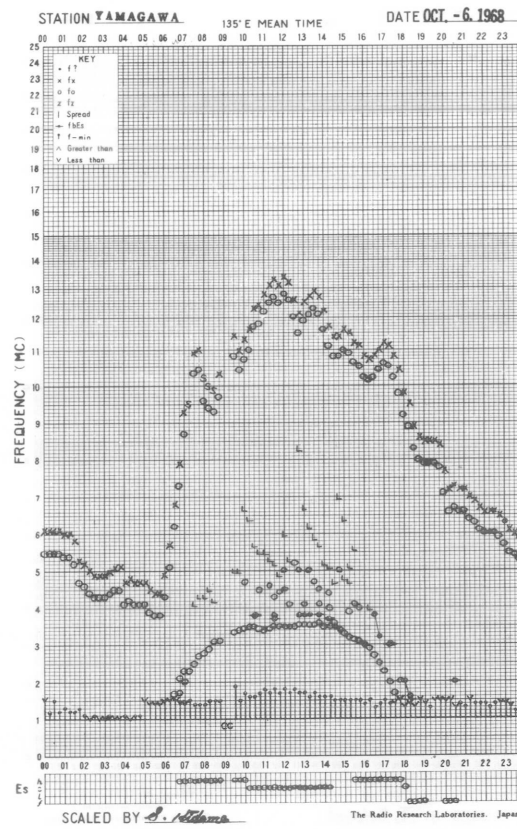
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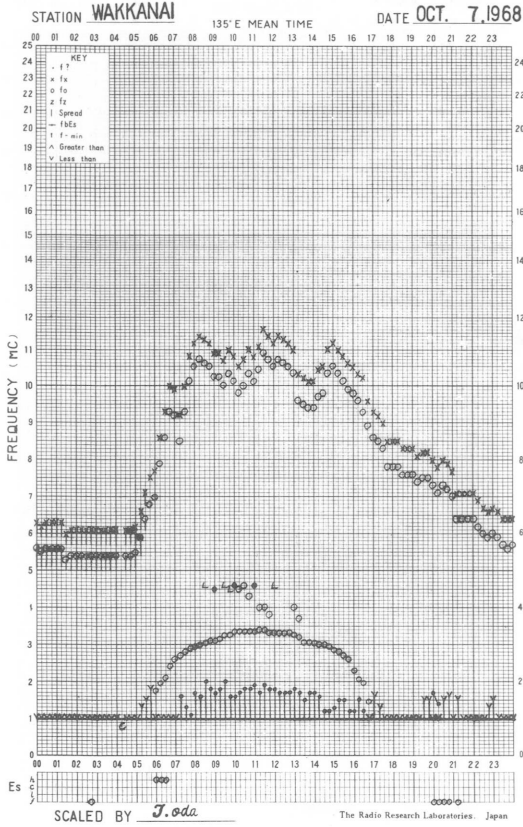
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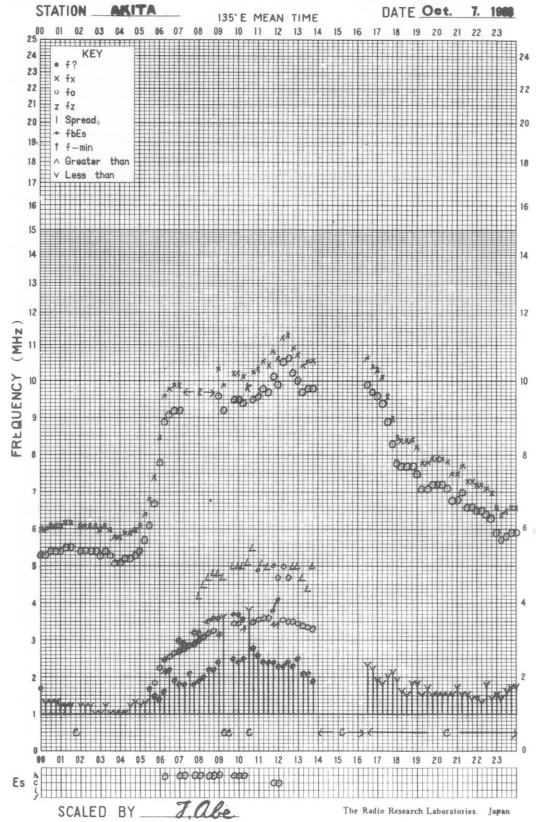
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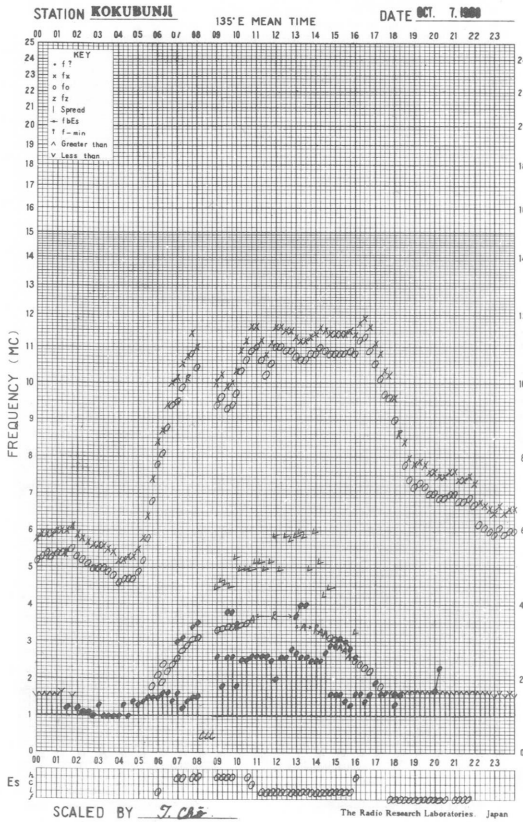
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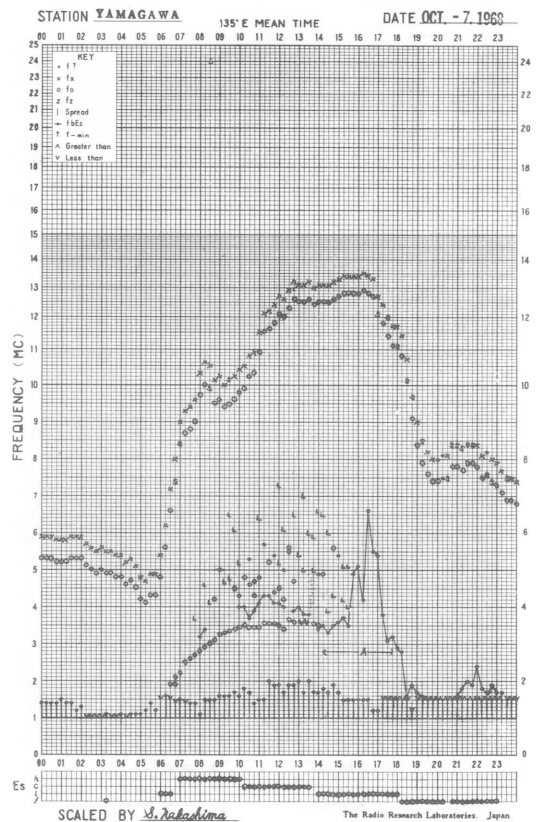
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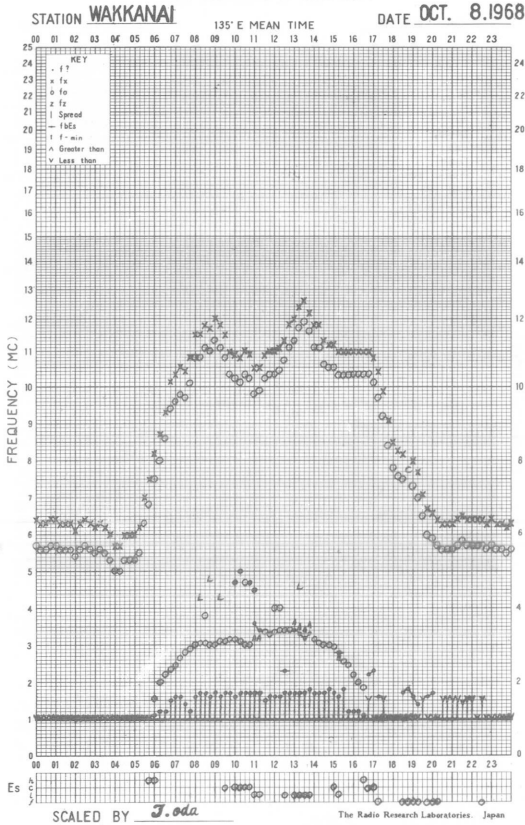
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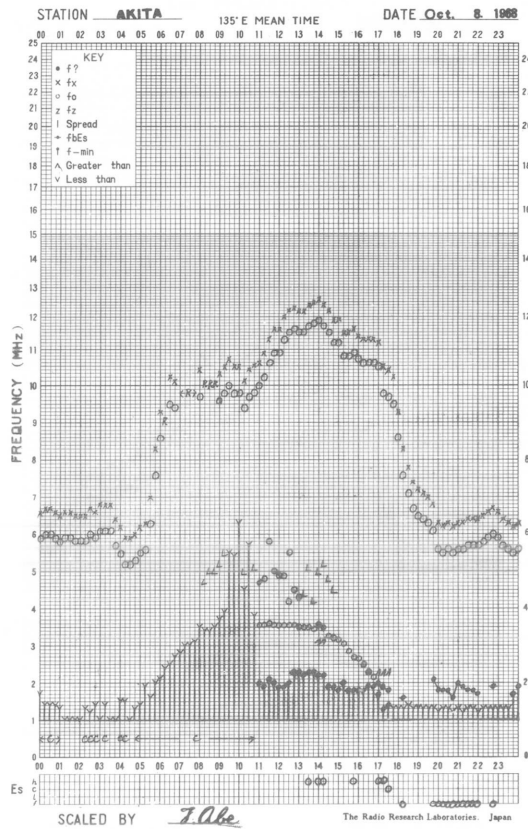
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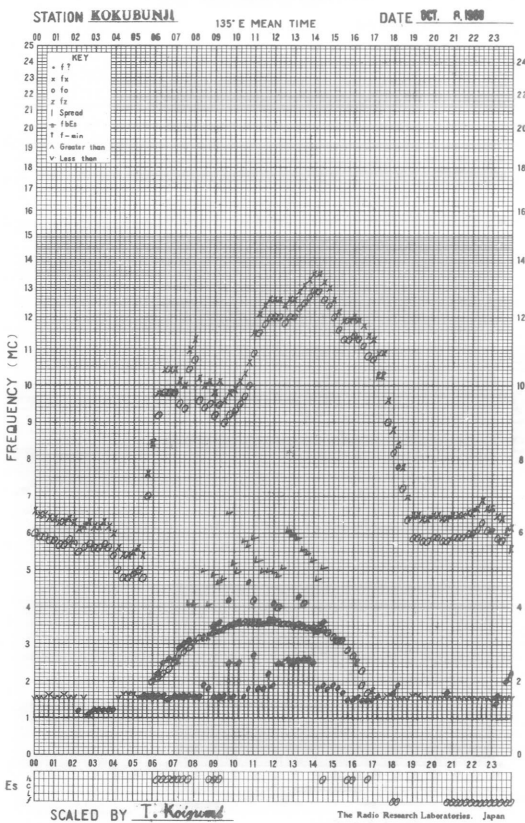
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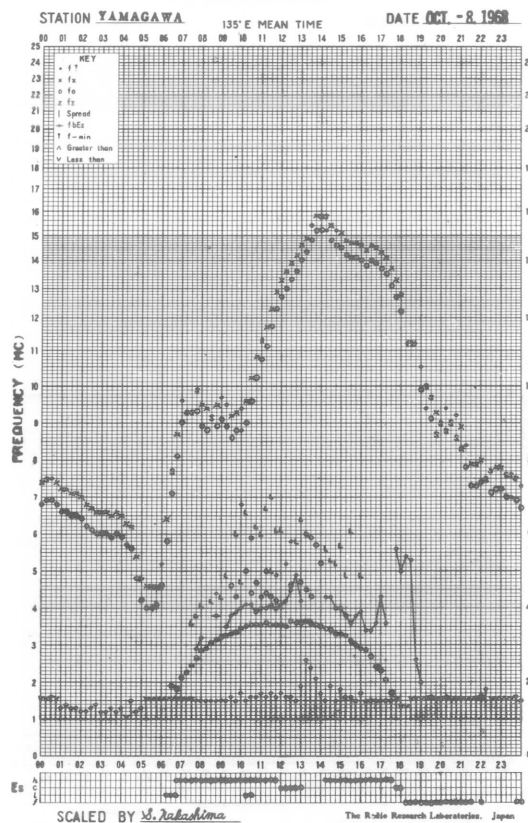
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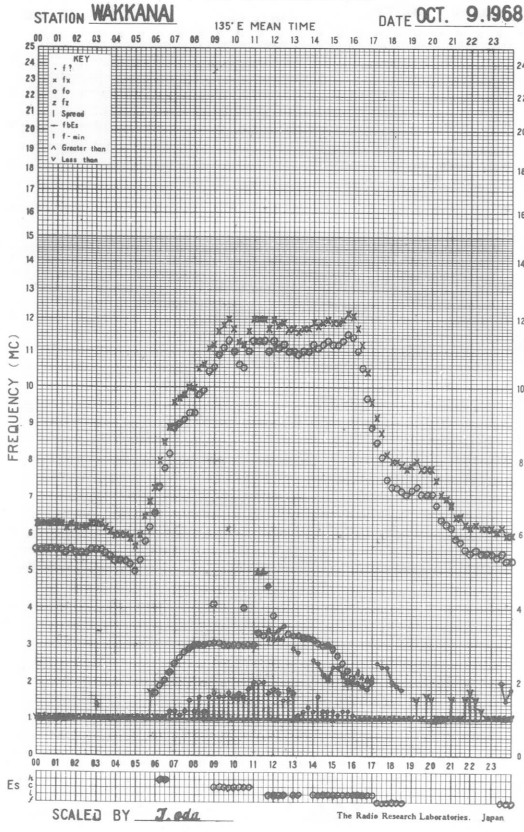
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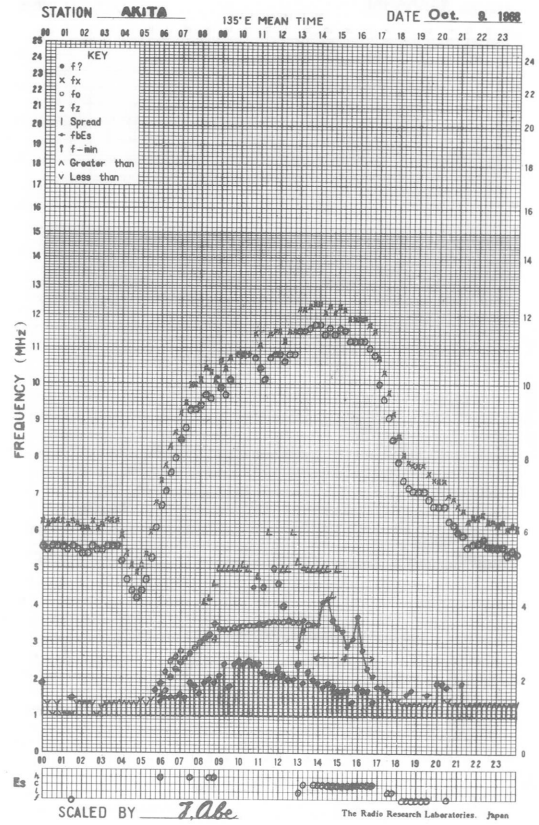
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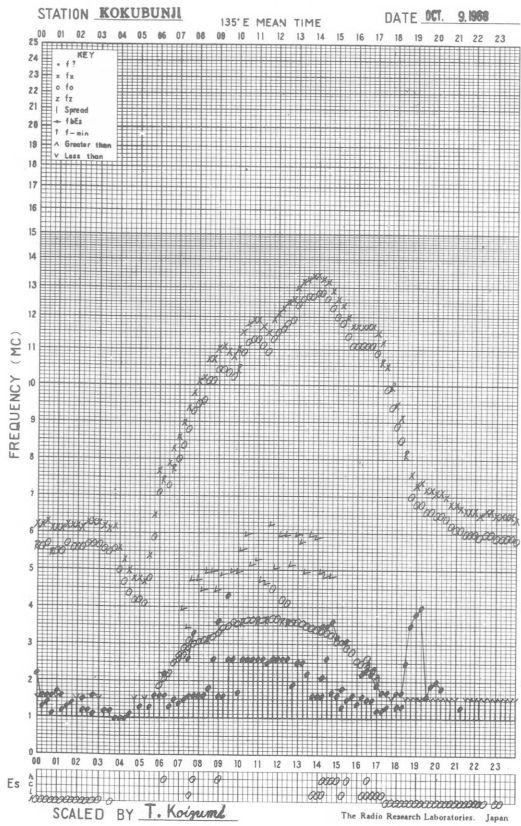
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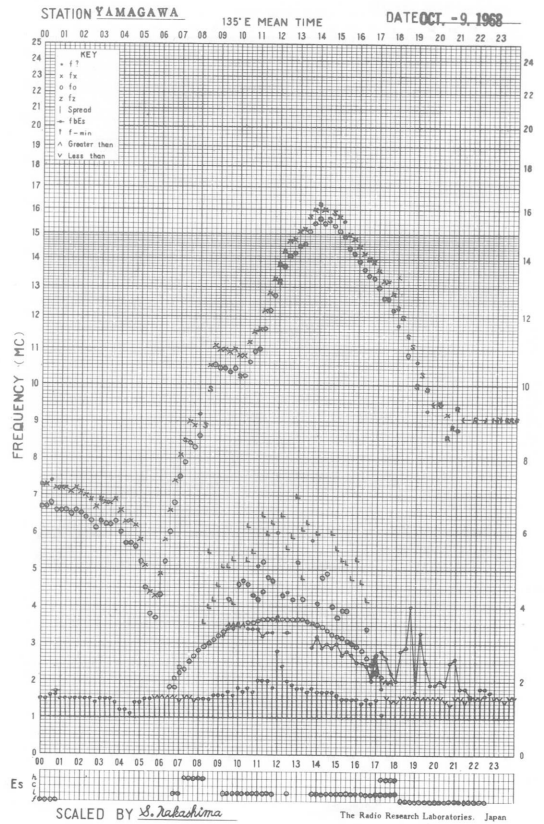
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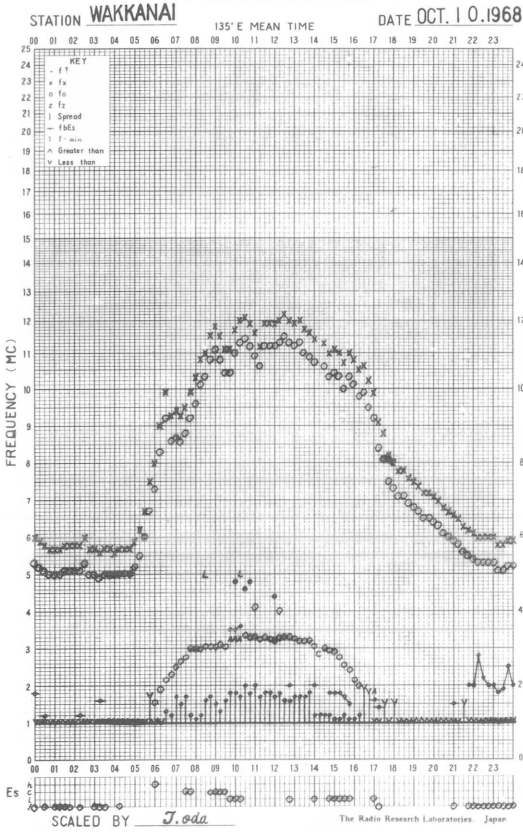
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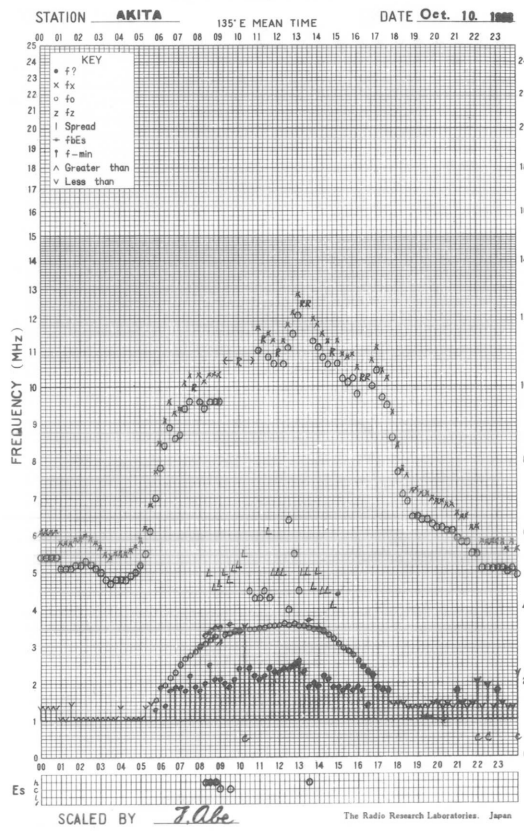
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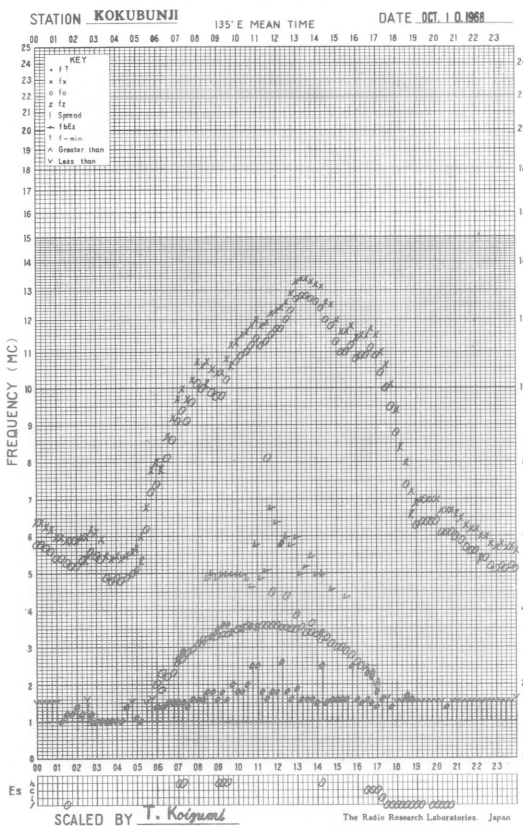
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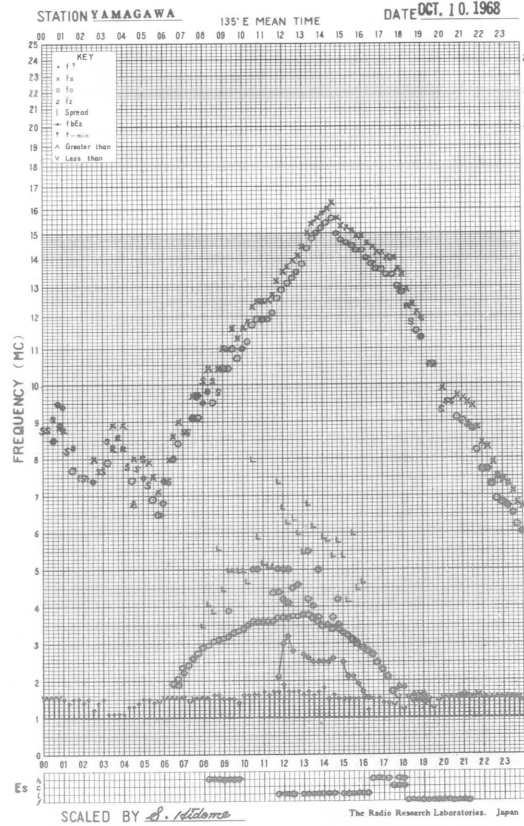
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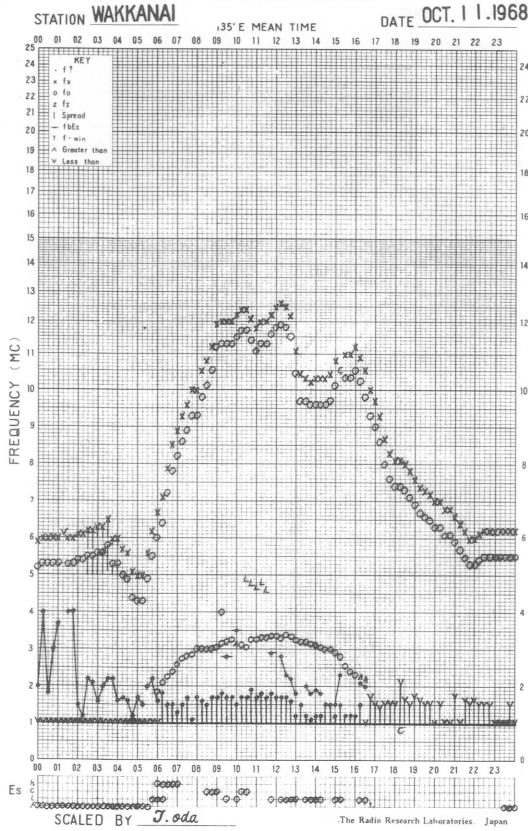
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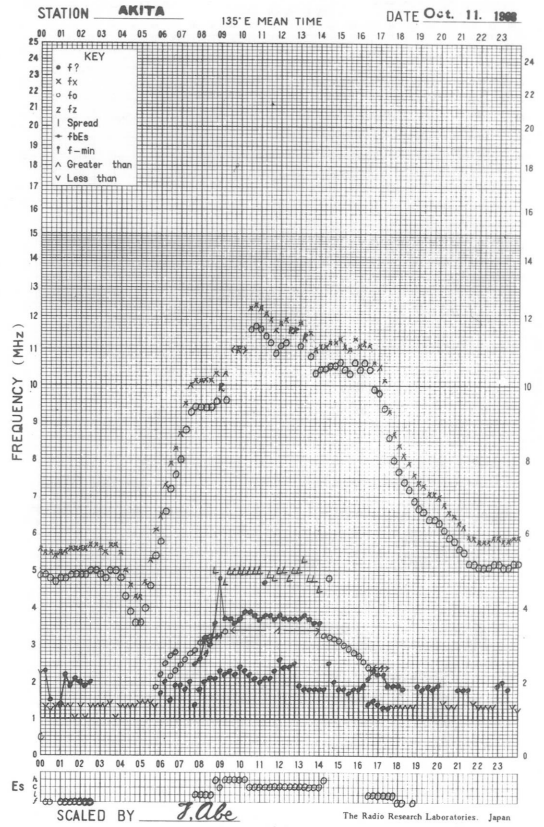
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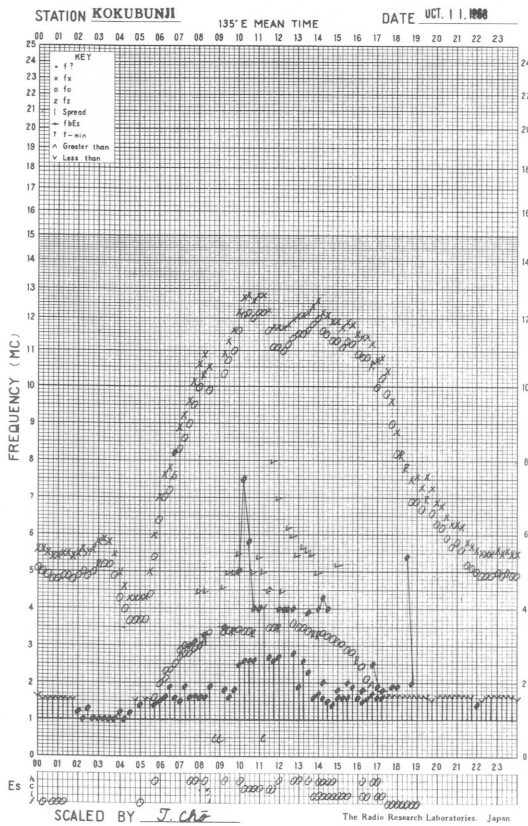
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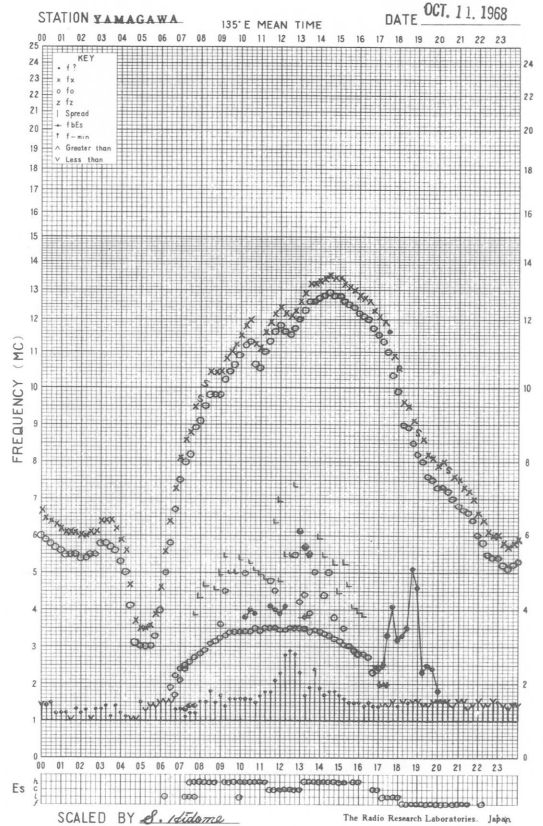
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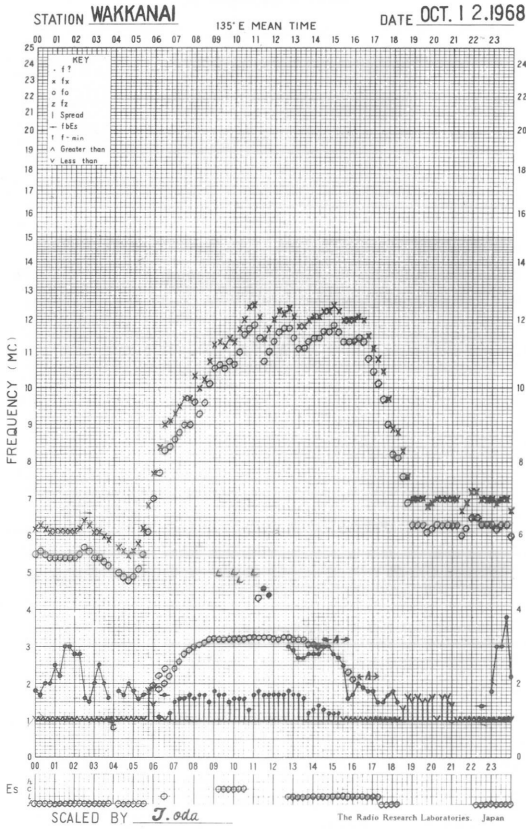
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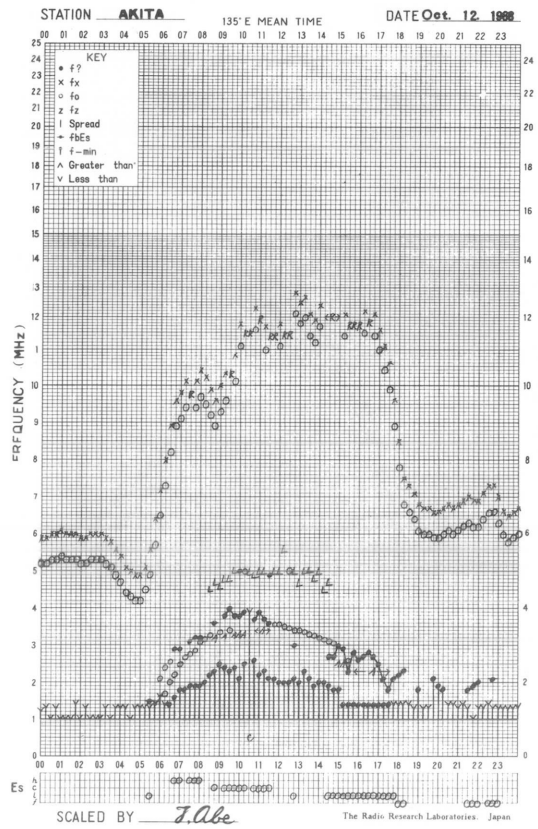
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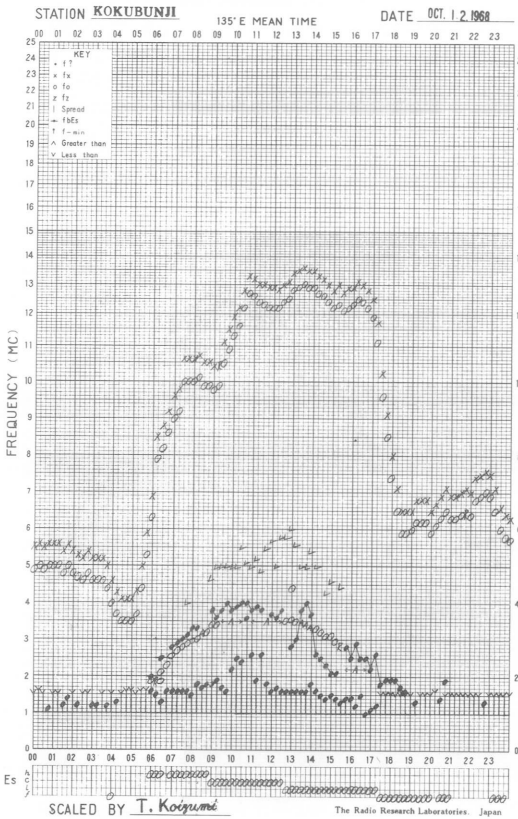
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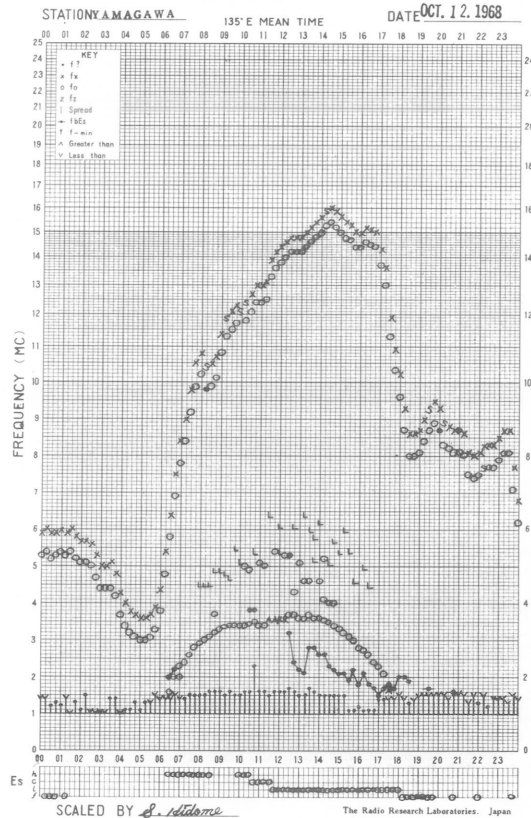
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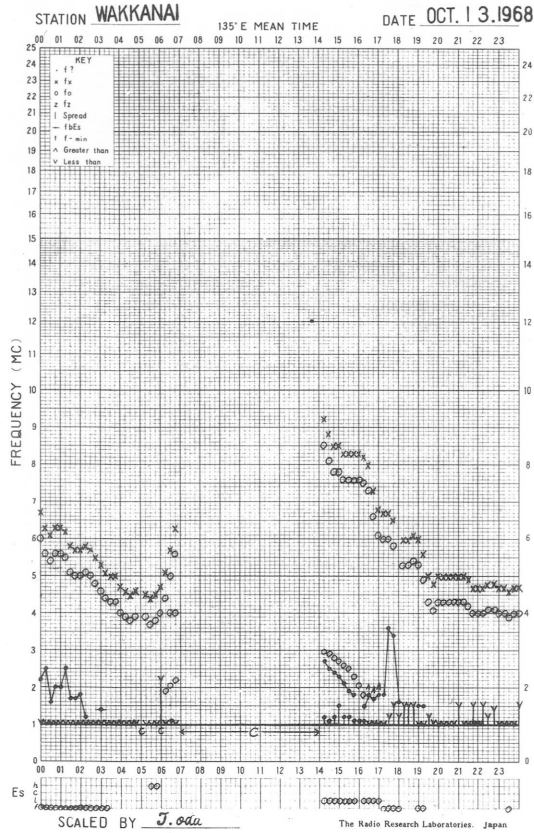
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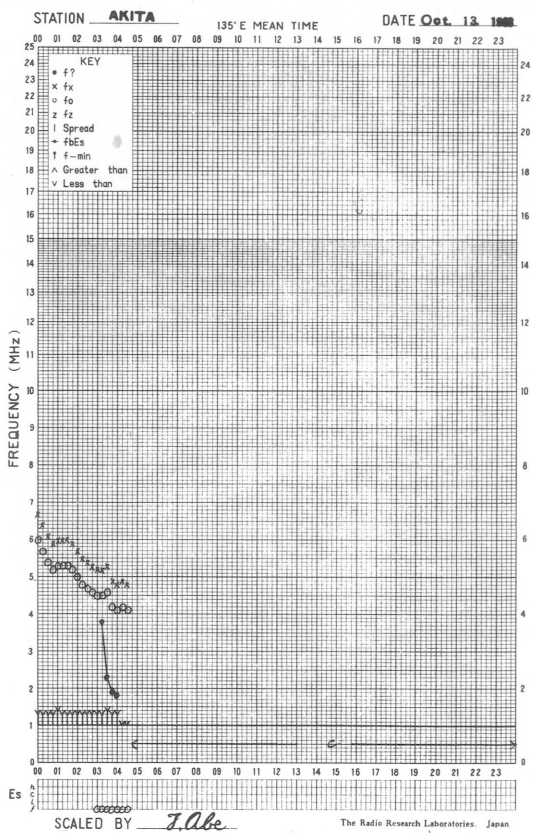
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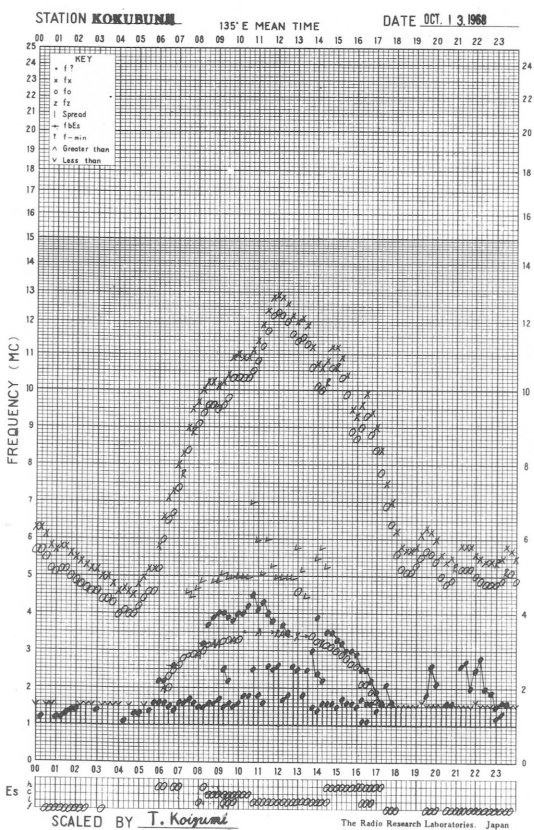
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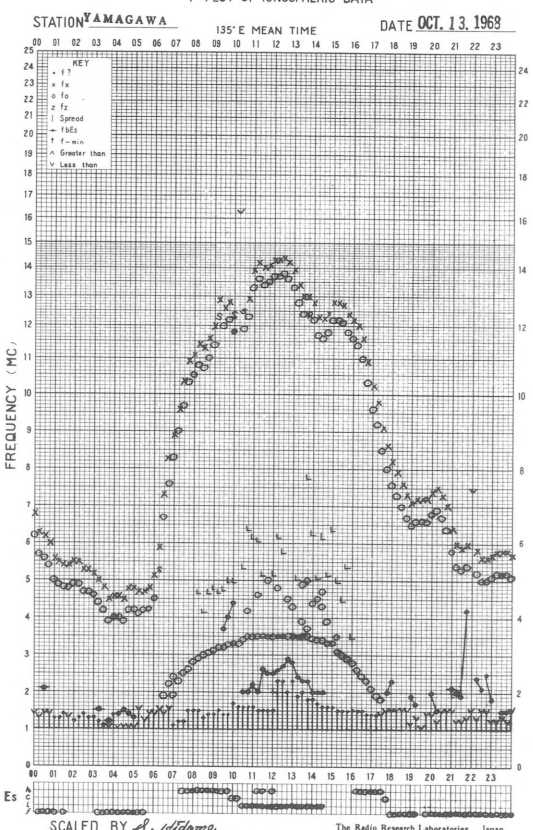
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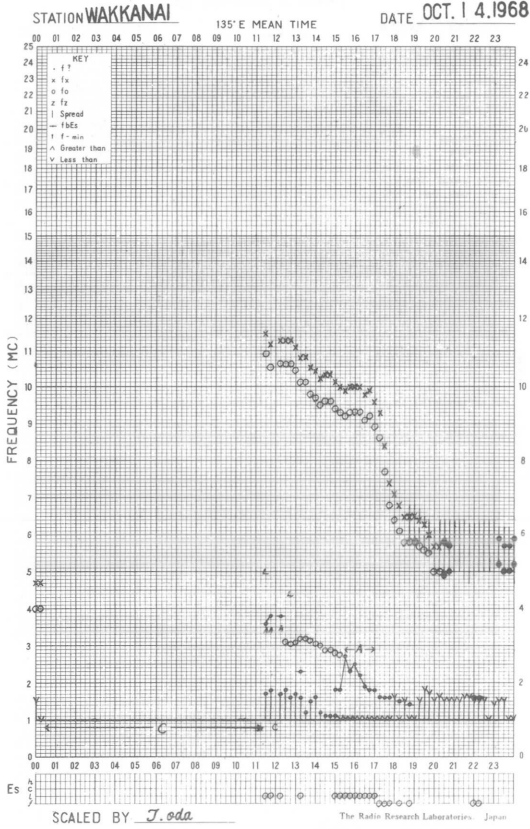
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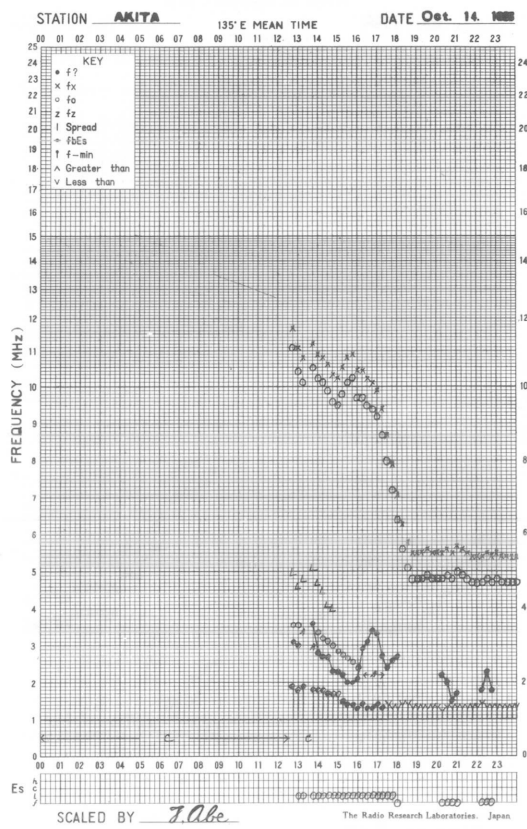
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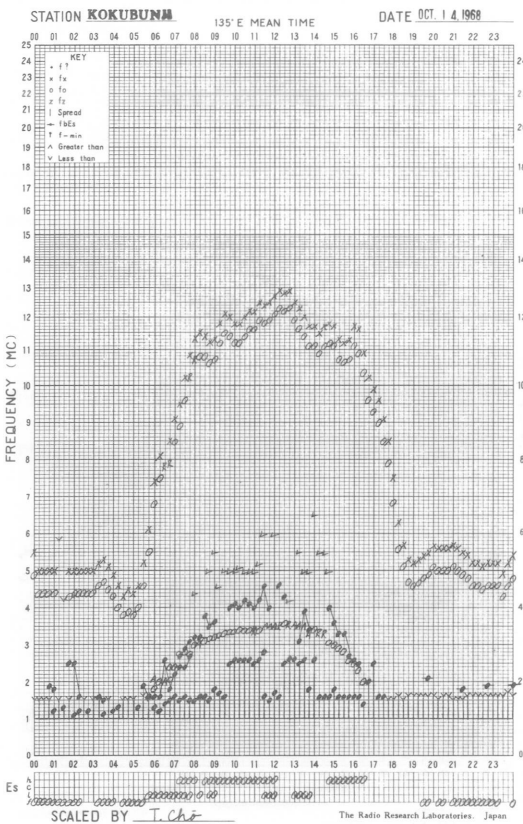
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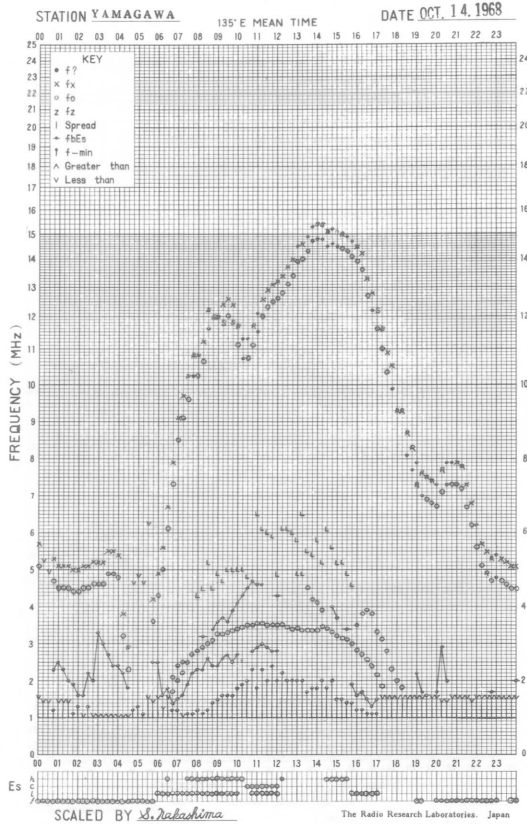
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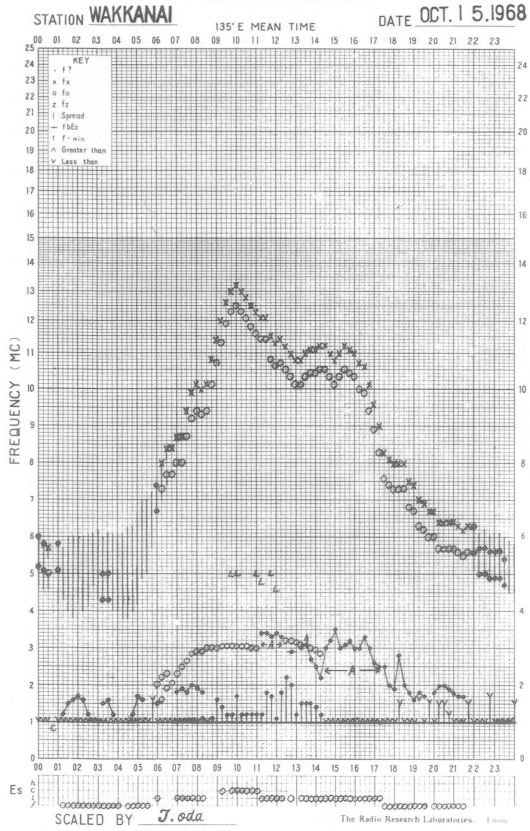
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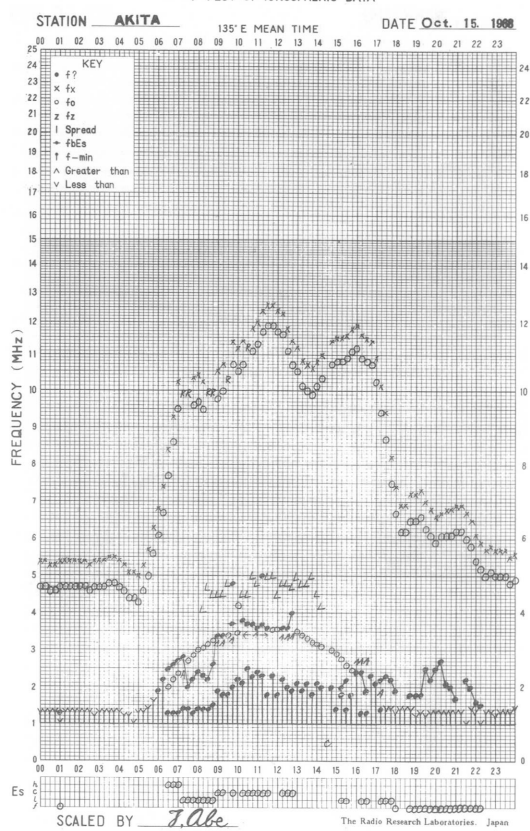
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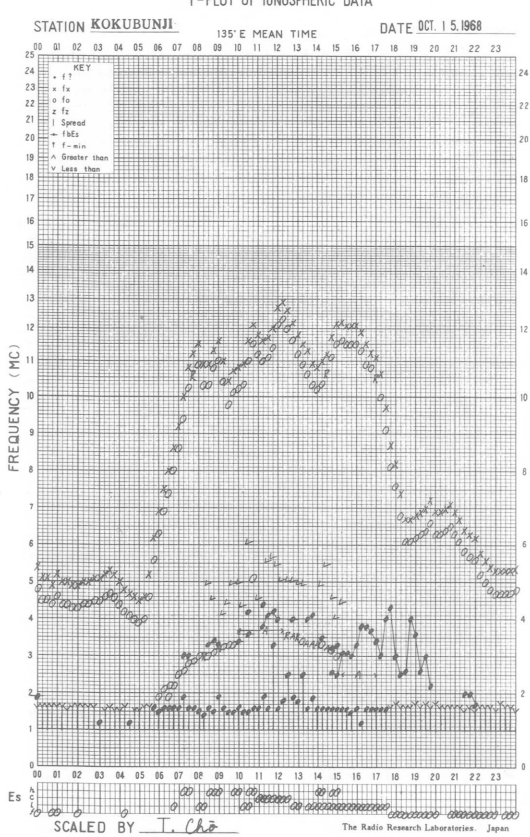
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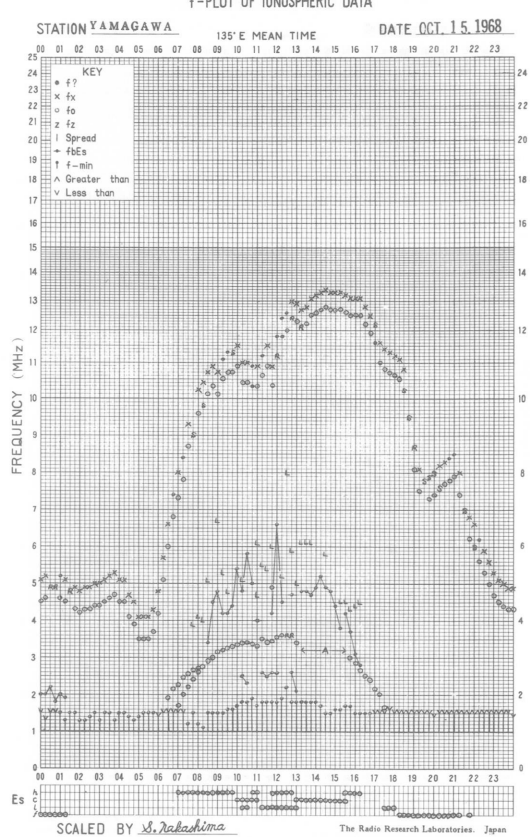
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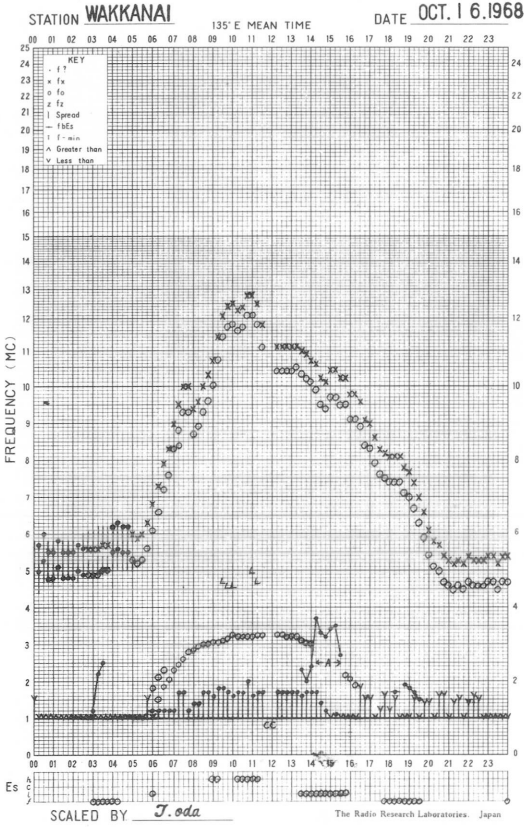
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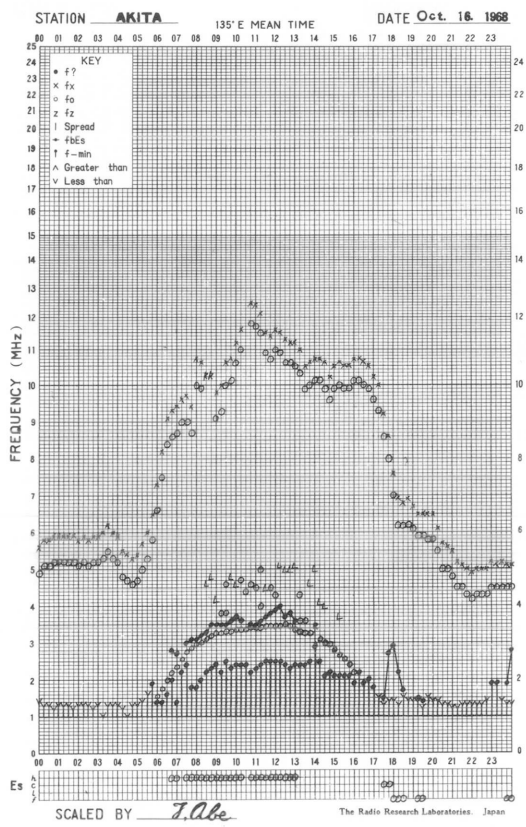
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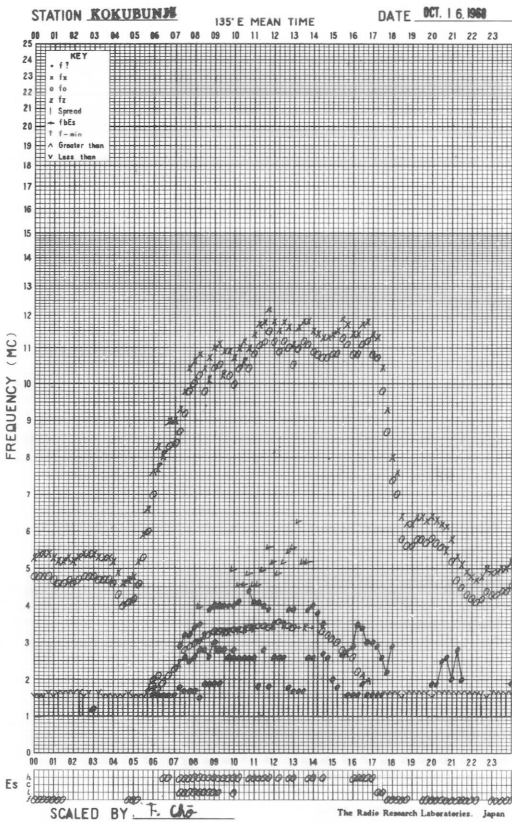
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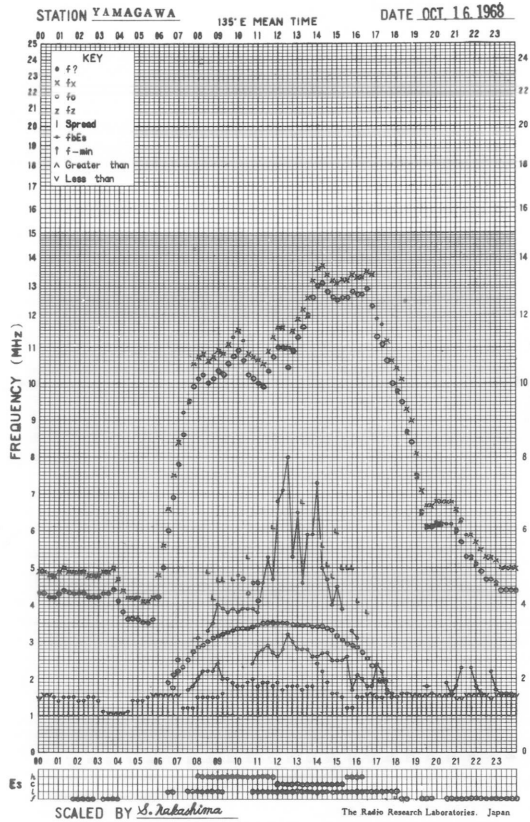
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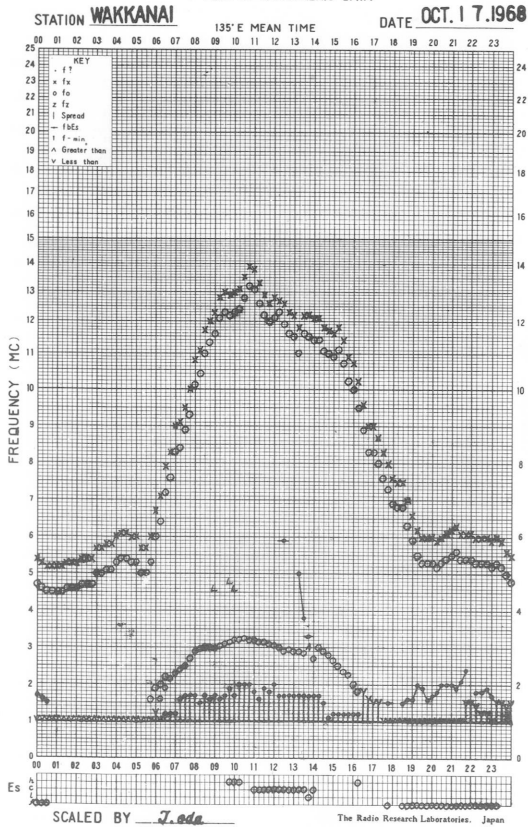
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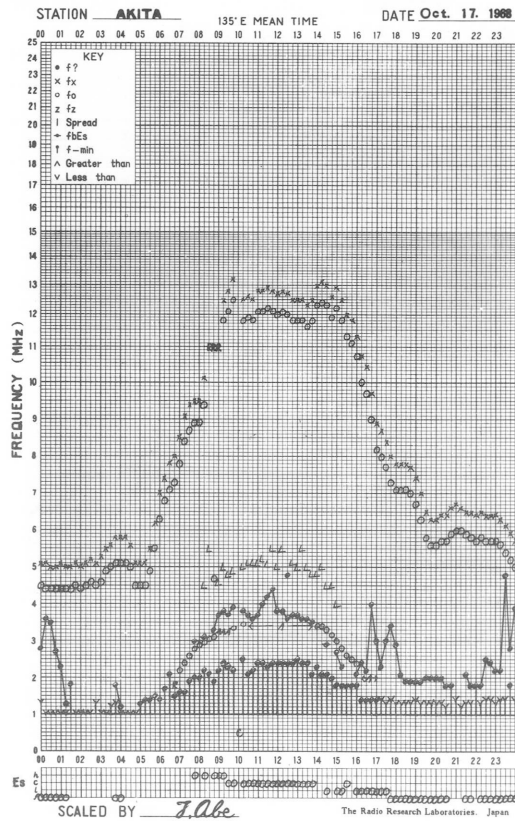
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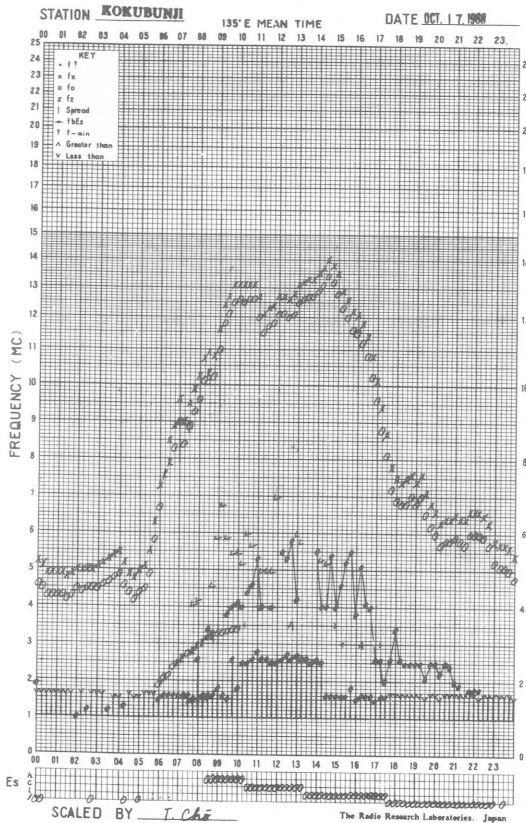
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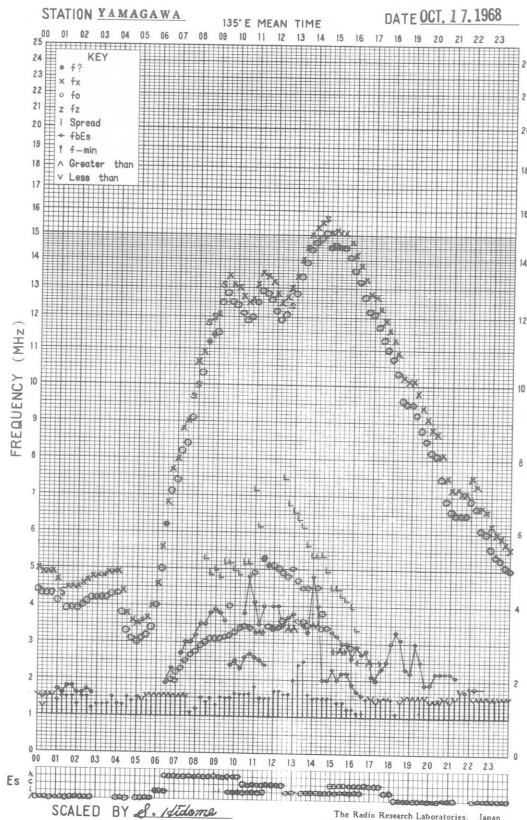
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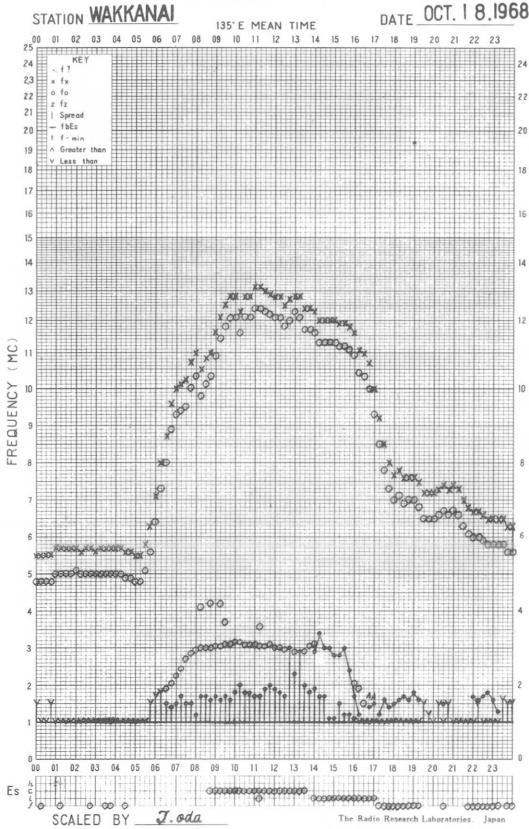
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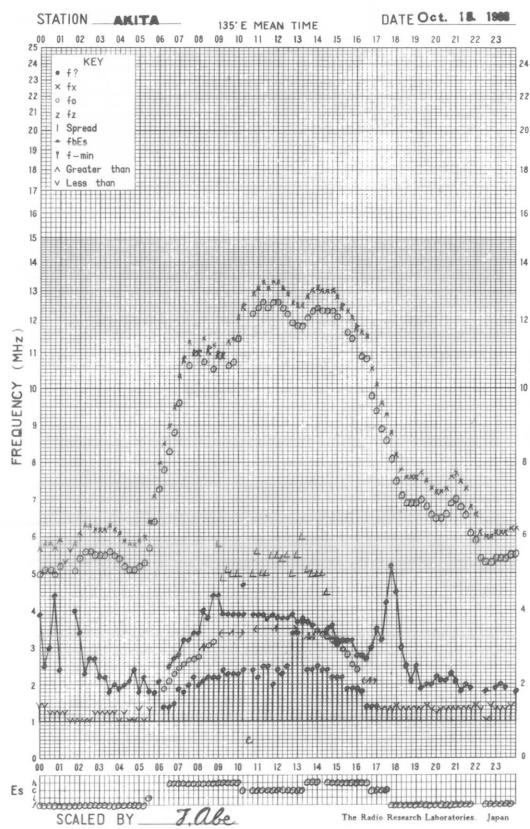
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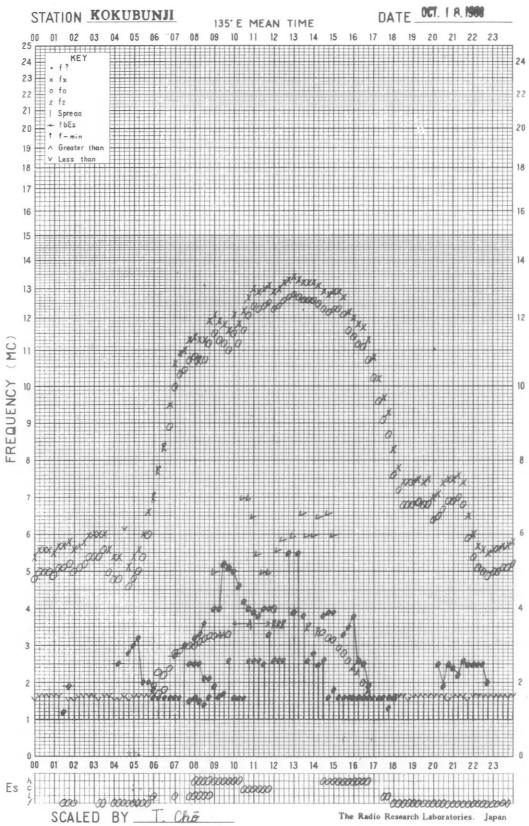
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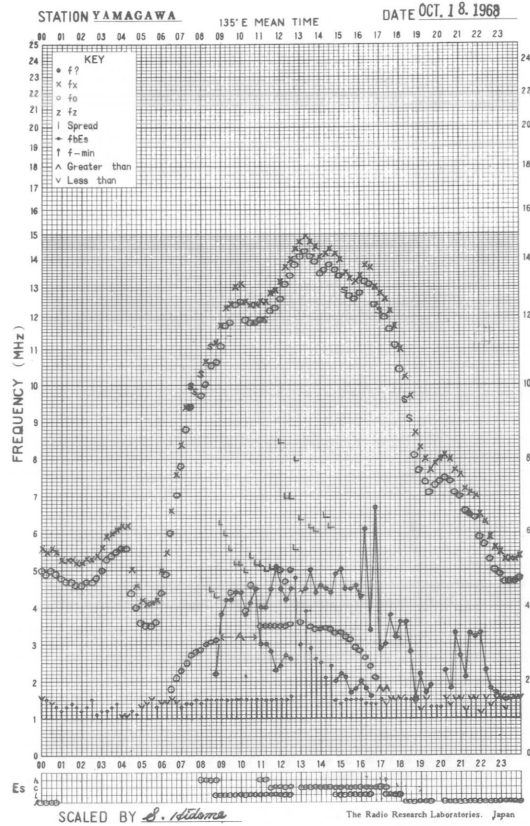
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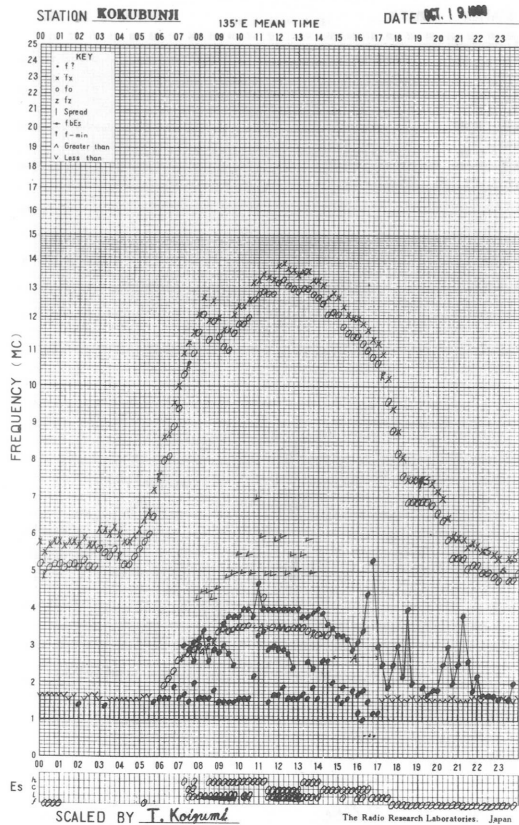
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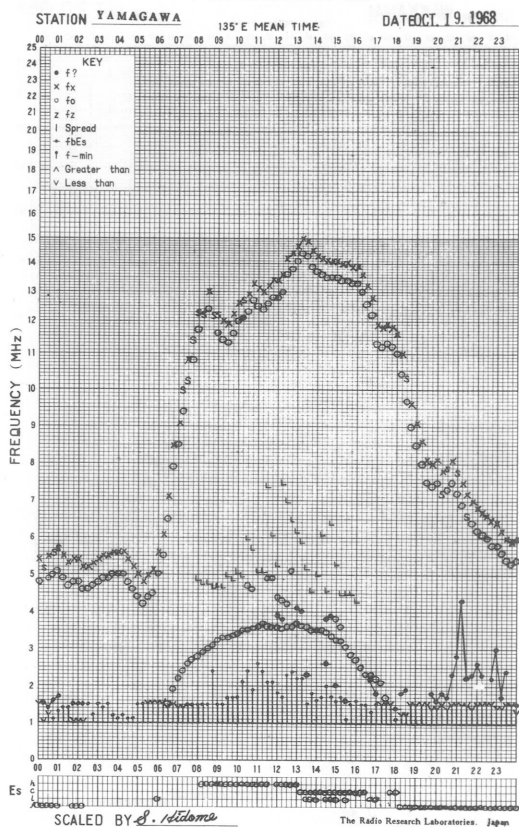
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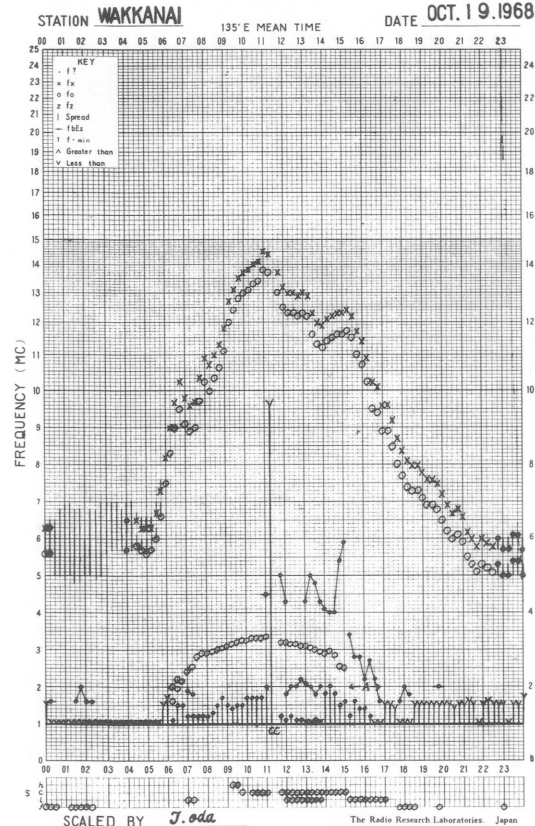
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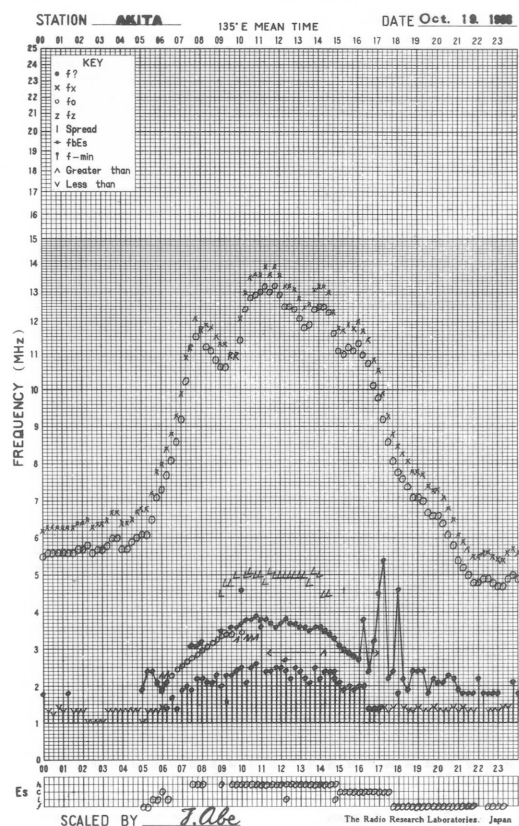
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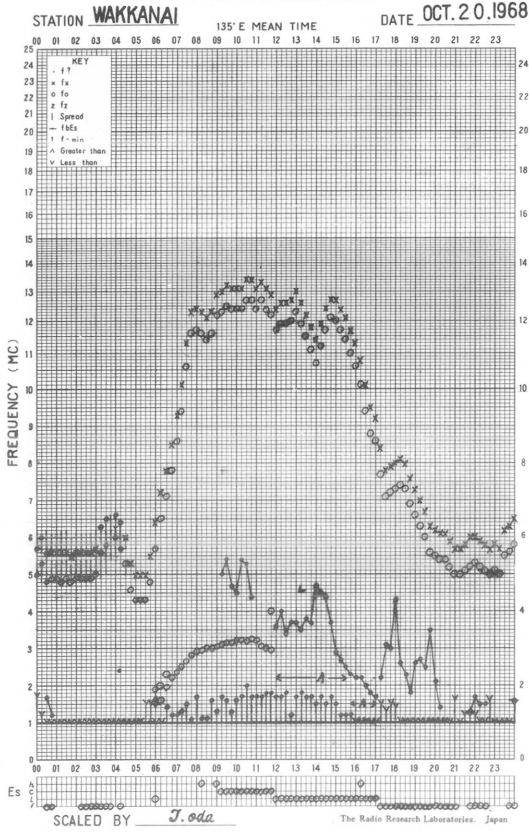
f-PLOT OF IONOSPHERIC DATA



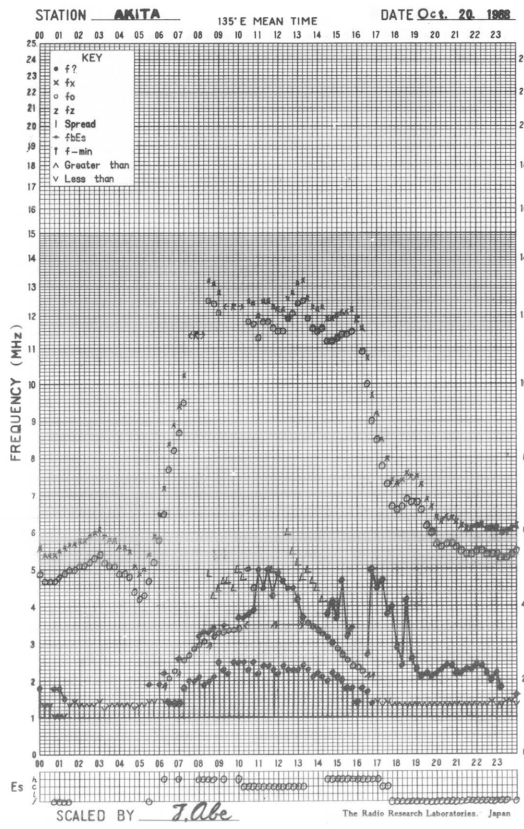
f-PLOT OF IONOSPHERIC DATA



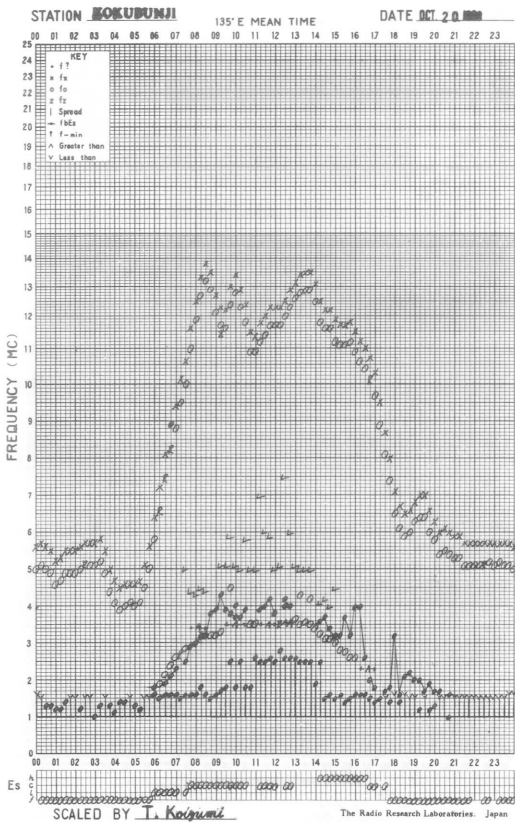
f-PLOT OF IONOSPHERIC DATA



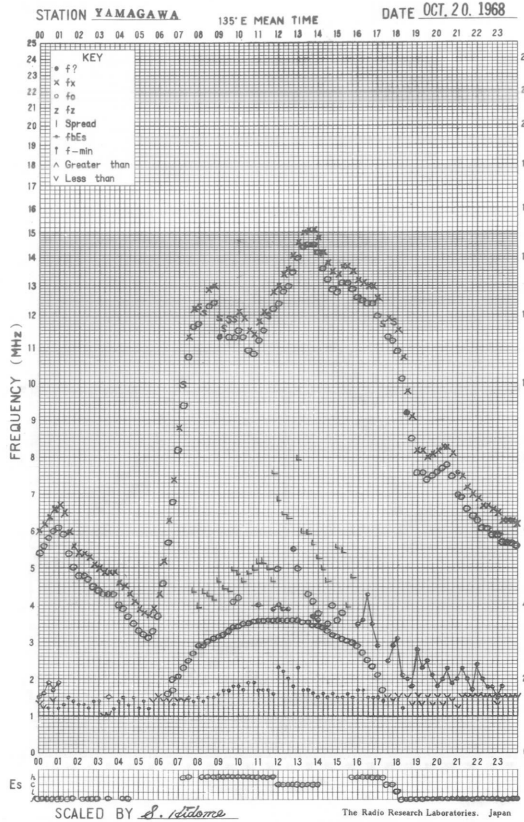
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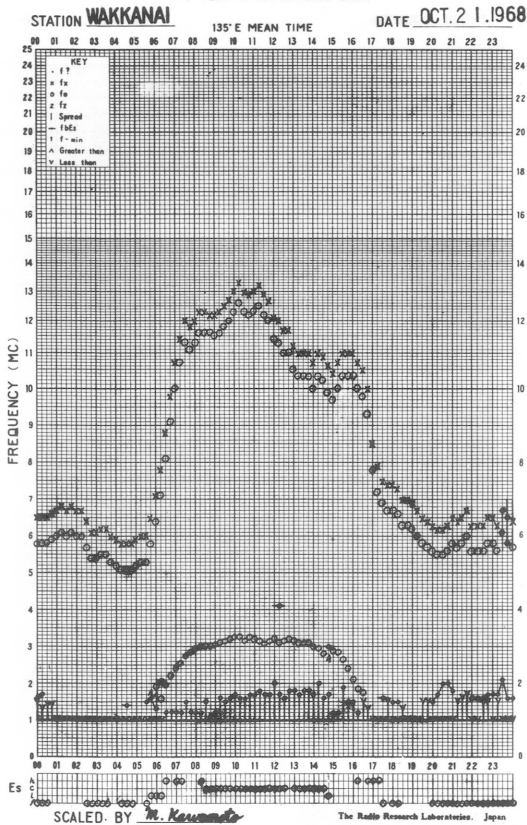
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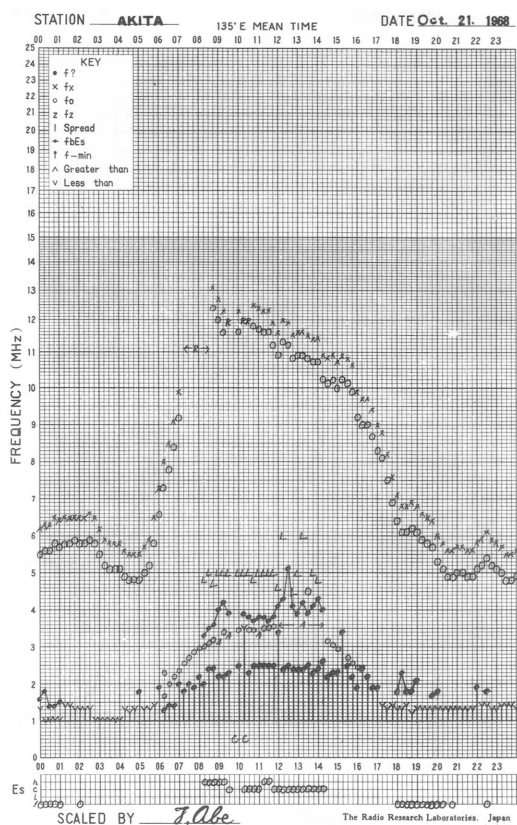
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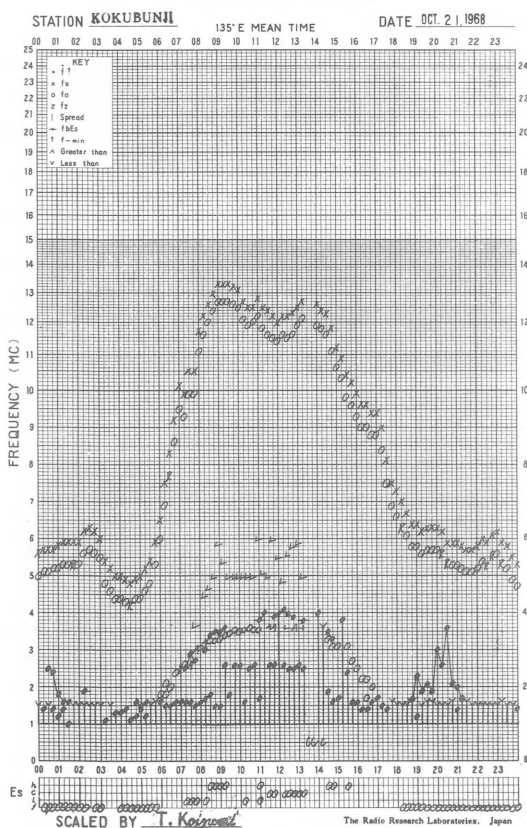
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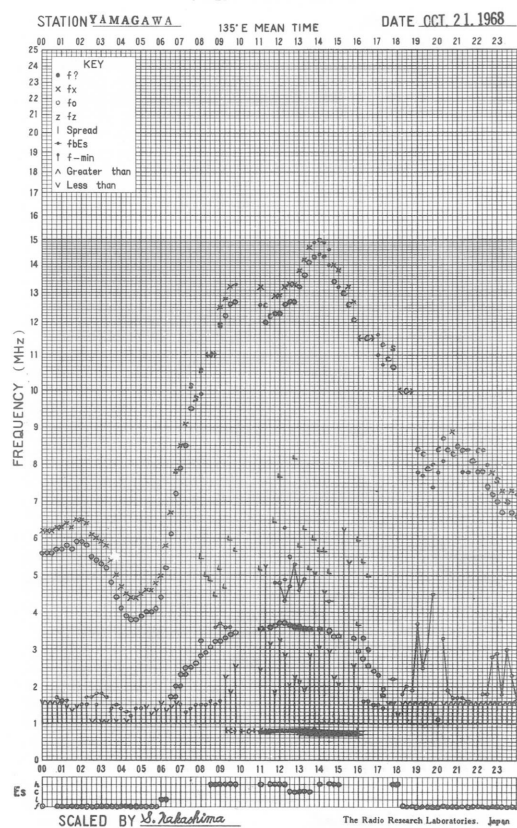
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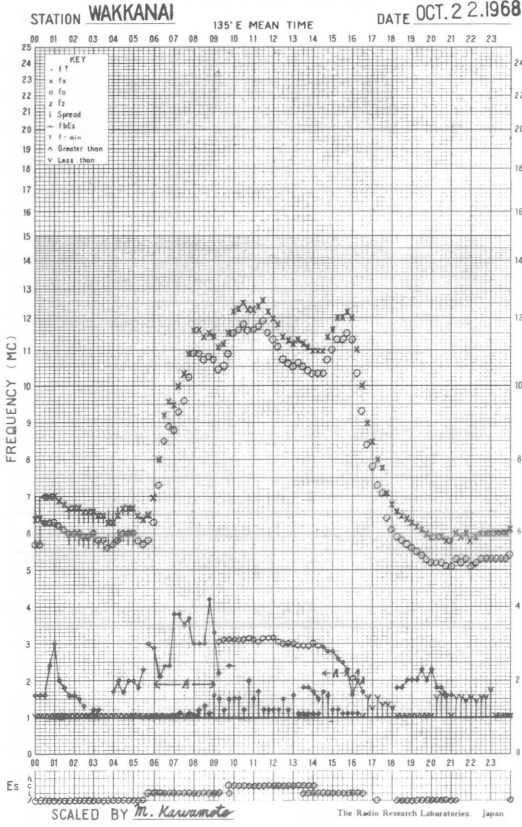
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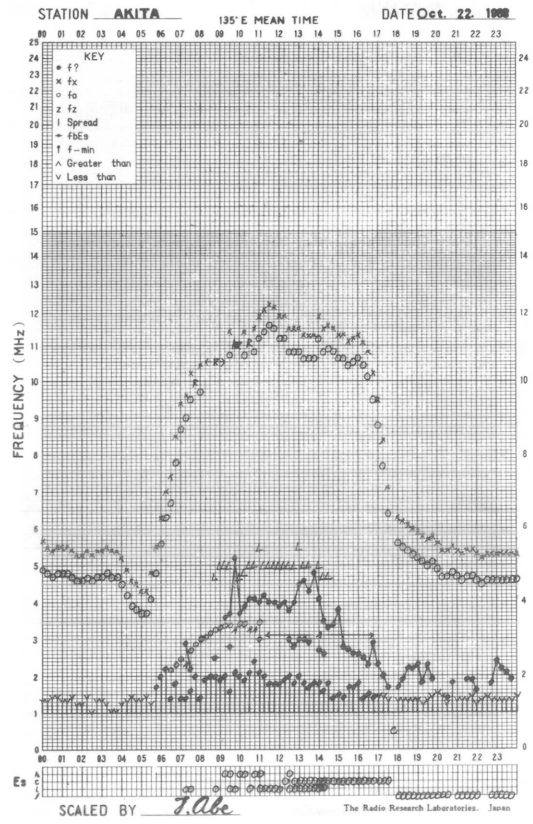
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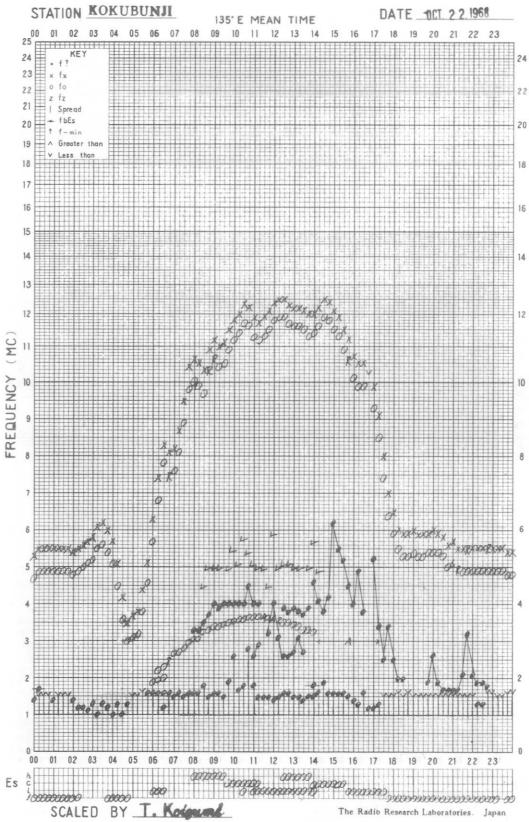
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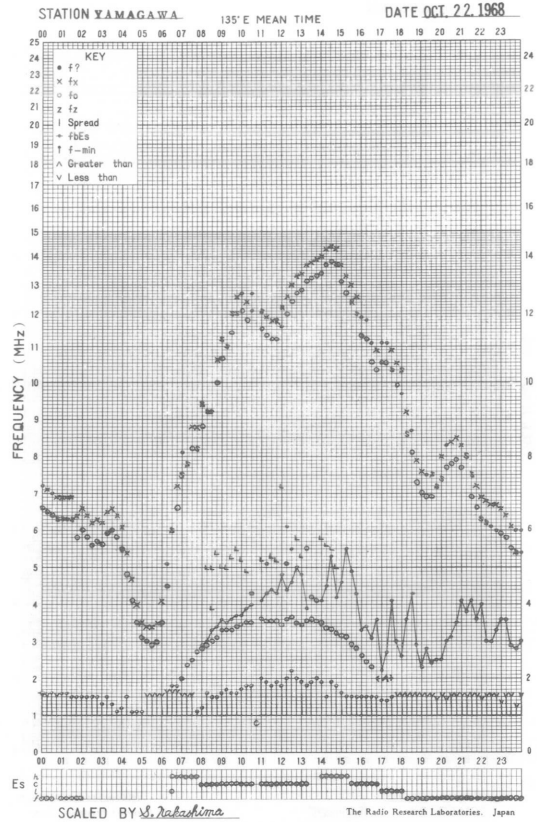
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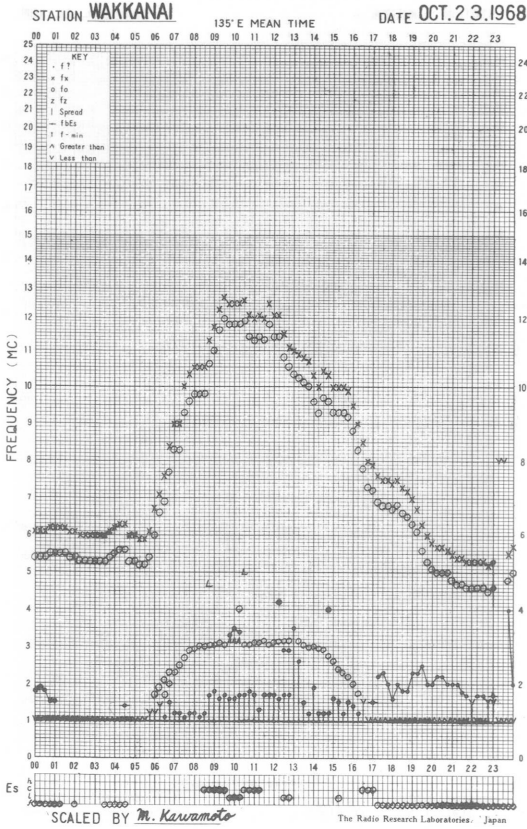
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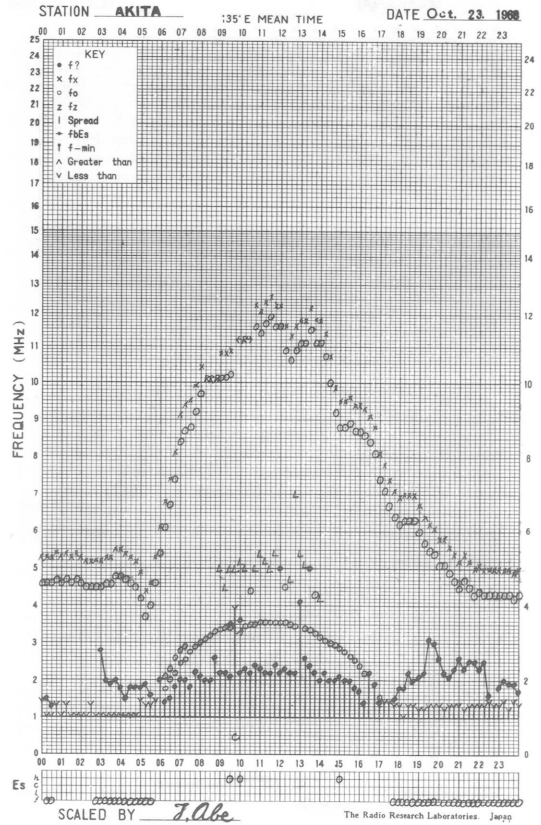
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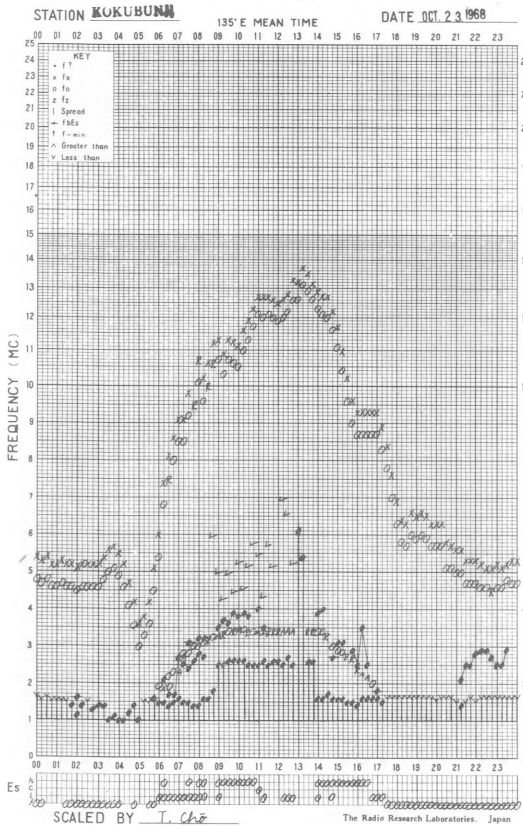
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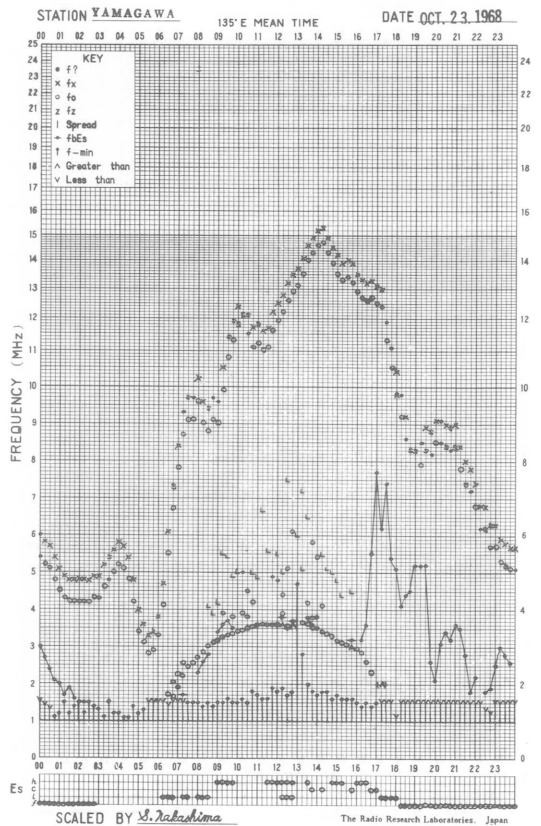
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

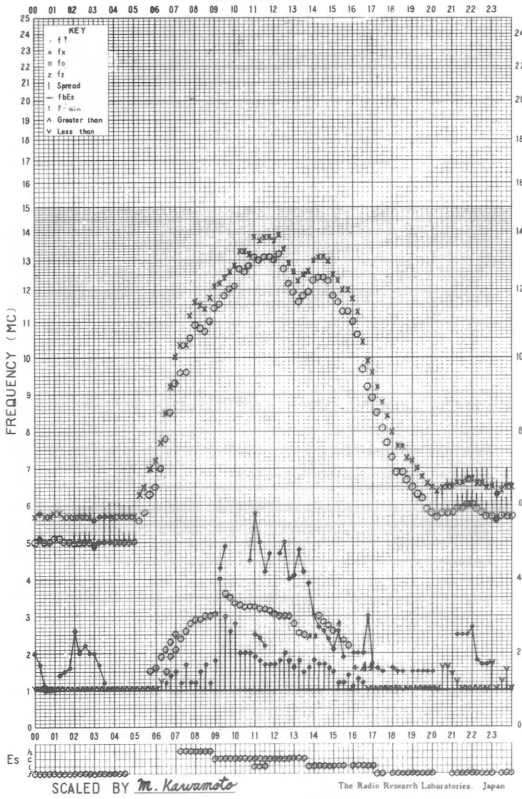


f-PLOT OF IONOSPHERIC DATA



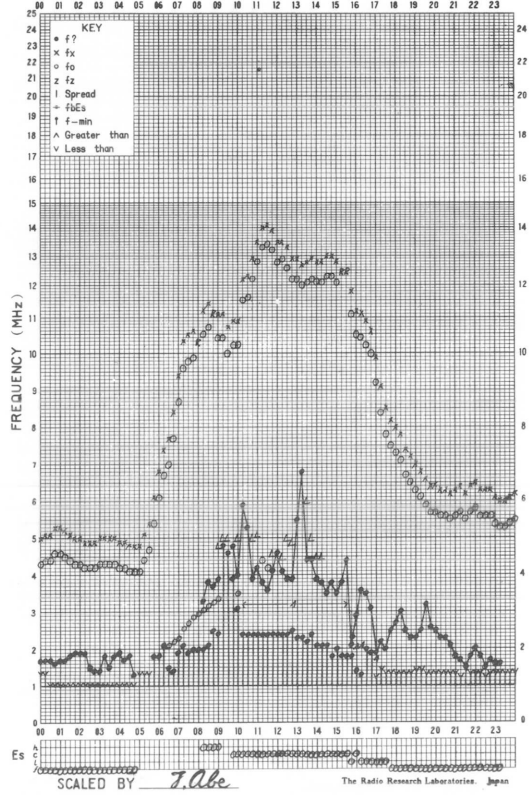
f-PLOT OF IONOSPHERIC DATA

STATION **WAKKANAI** 135°E MEAN TIME DATE **OCT. 24, 1968**



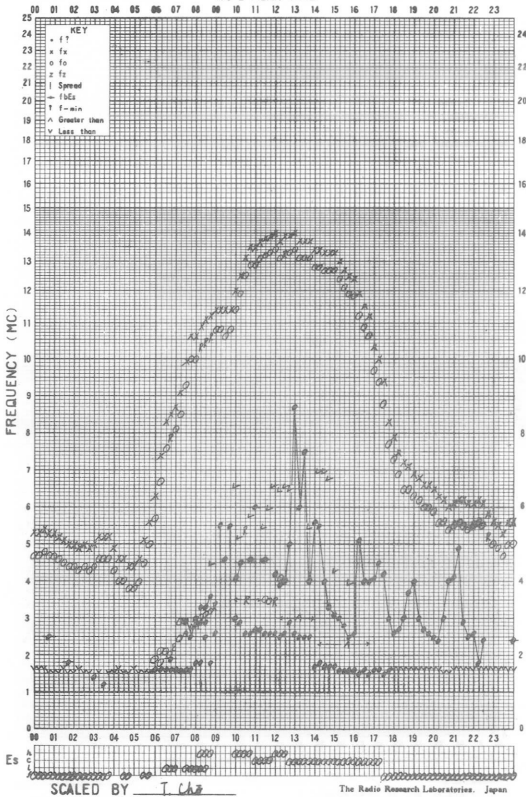
f-PLOT OF IONOSPHERIC DATA

STATION **AKITA** 135°E MEAN TIME DATE **Oct. 24, 1968**



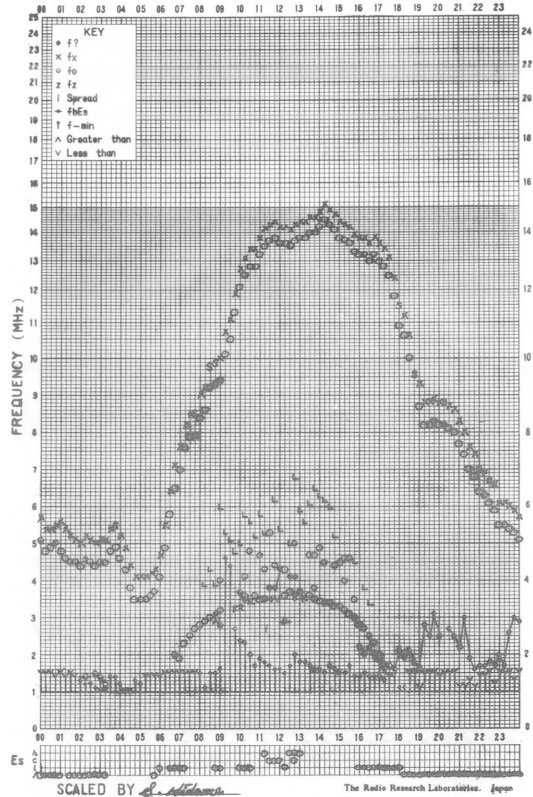
f-PLOT OF IONOSPHERIC DATA

STATION **KOKUBUNJI** 135°E MEAN TIME DATE **OCT. 24, 1968**

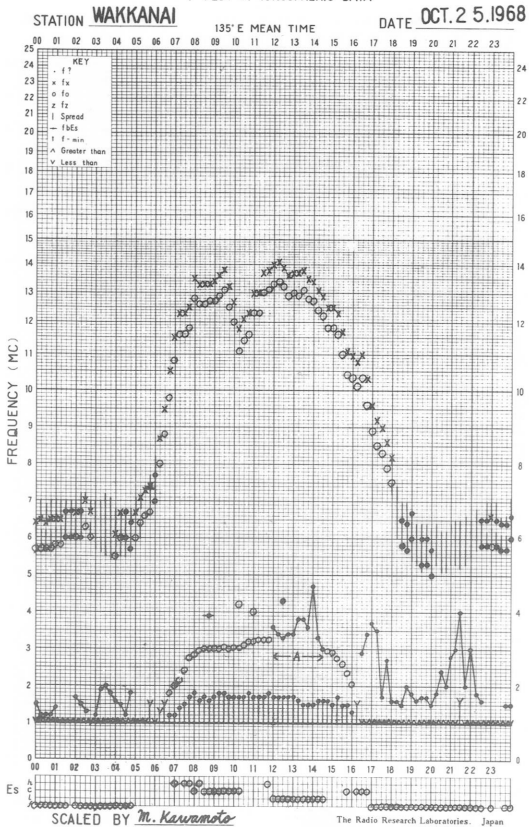


f-PLOT OF IONOSPHERIC DATA

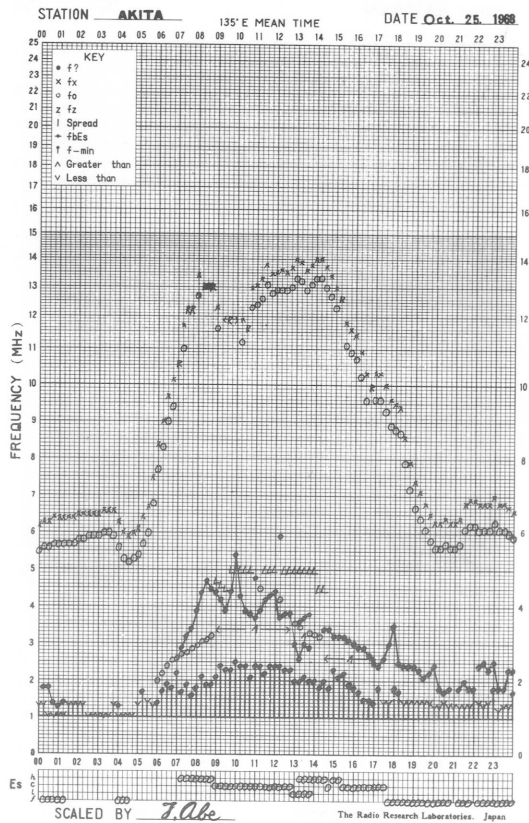
STATION **YAMAGAWA** 135°E MEAN TIME DATE **OCT. 24, 1968**



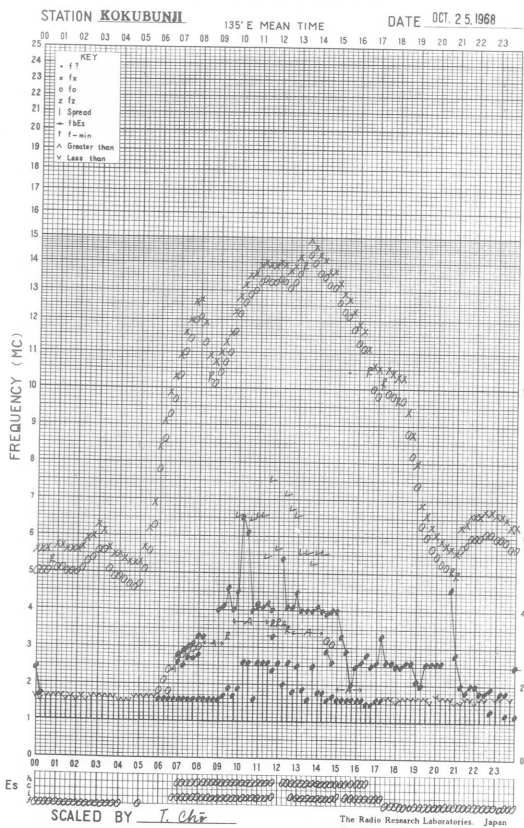
f-PLOT OF IONOSPHERIC DATA



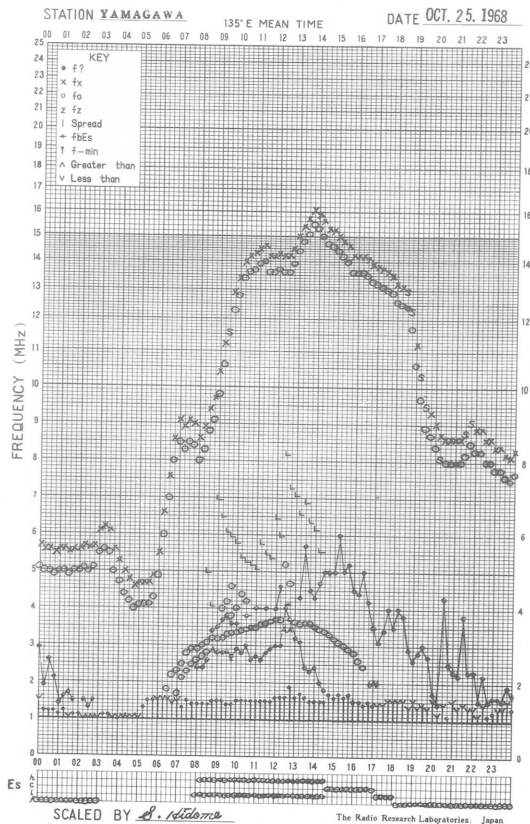
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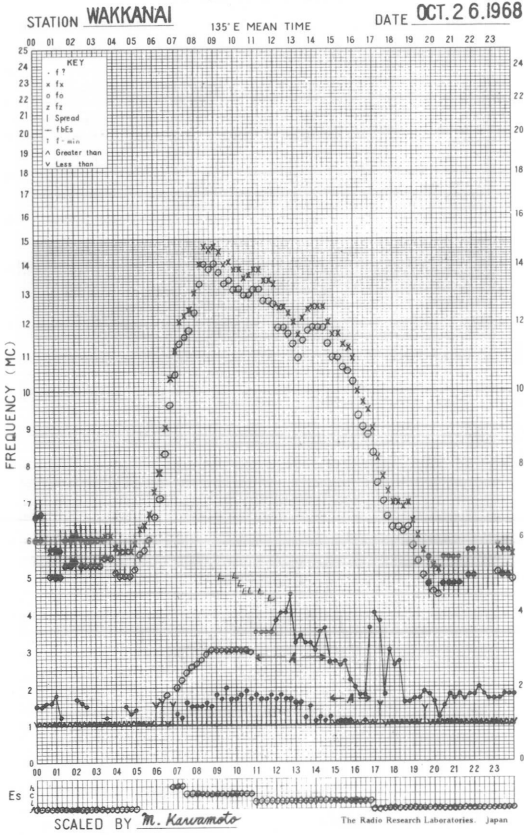
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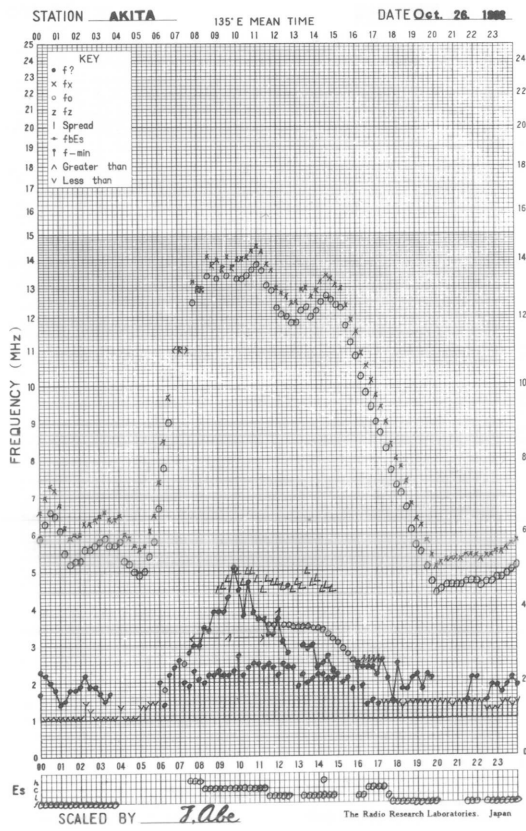
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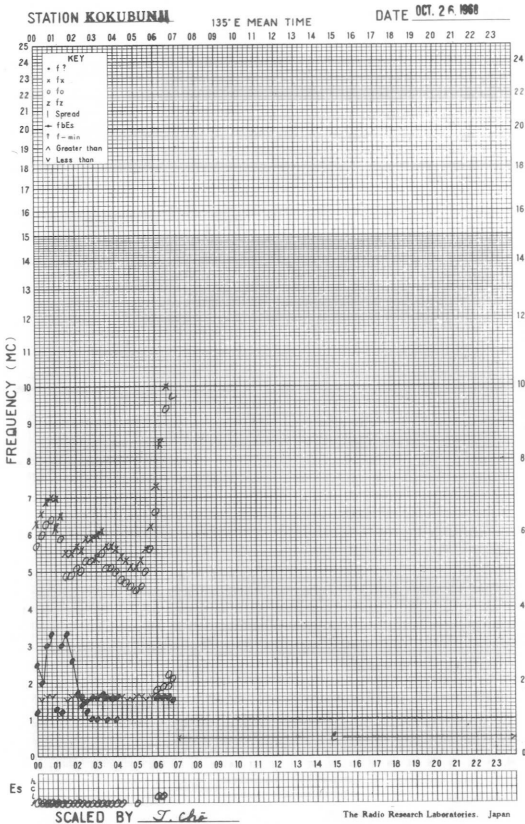
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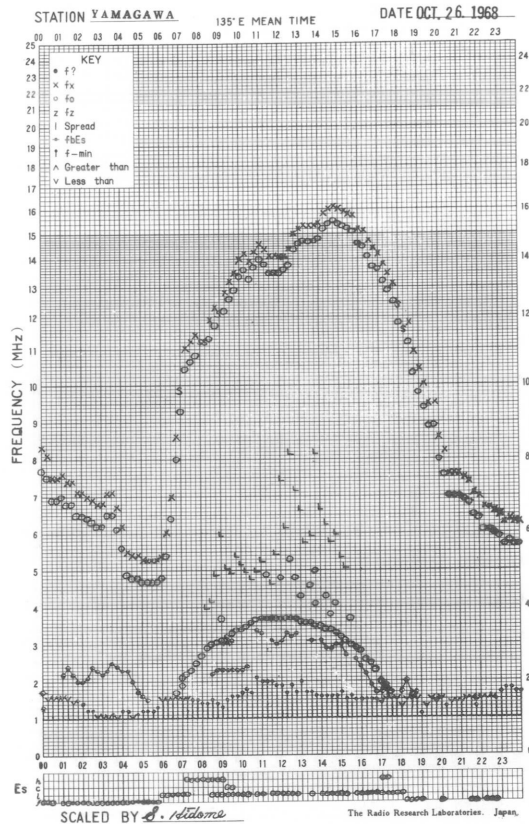
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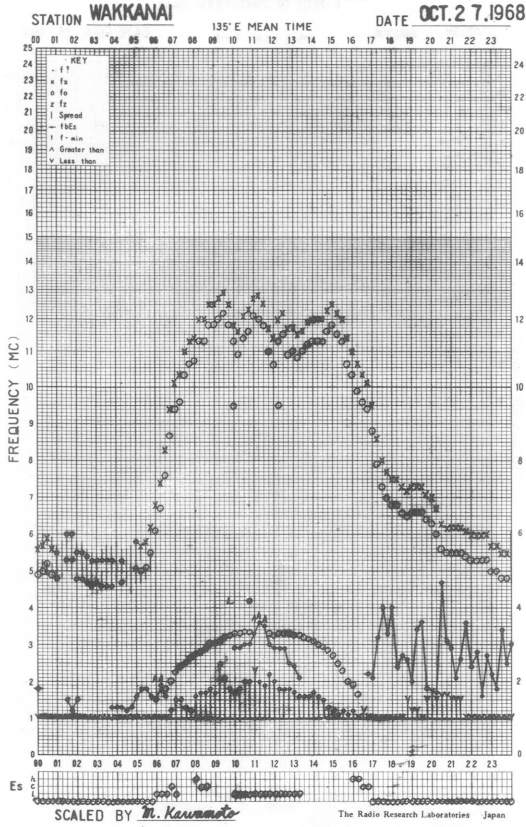
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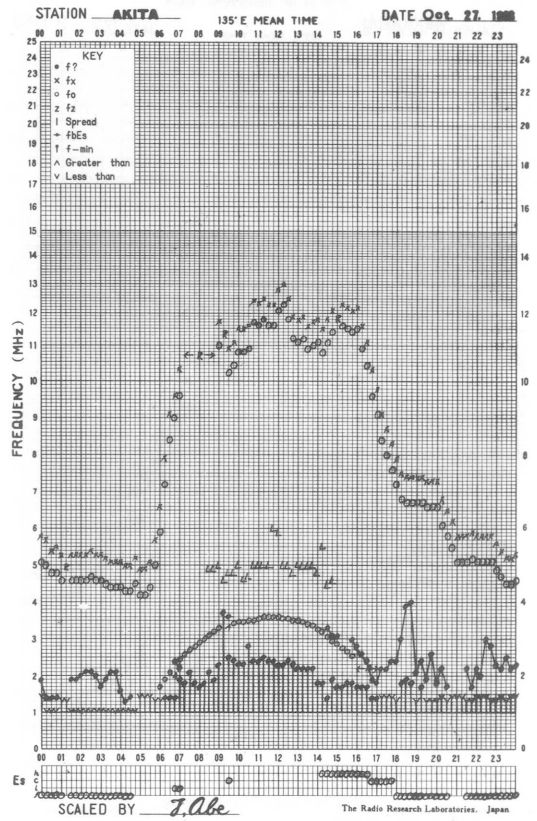
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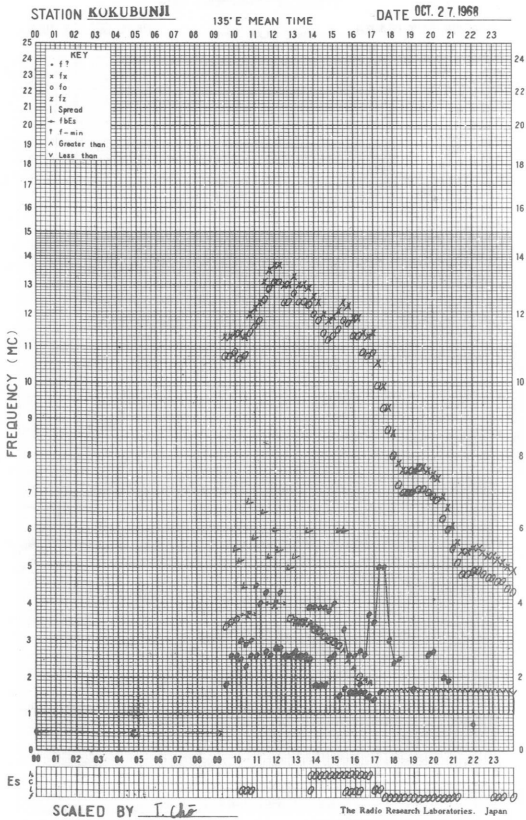
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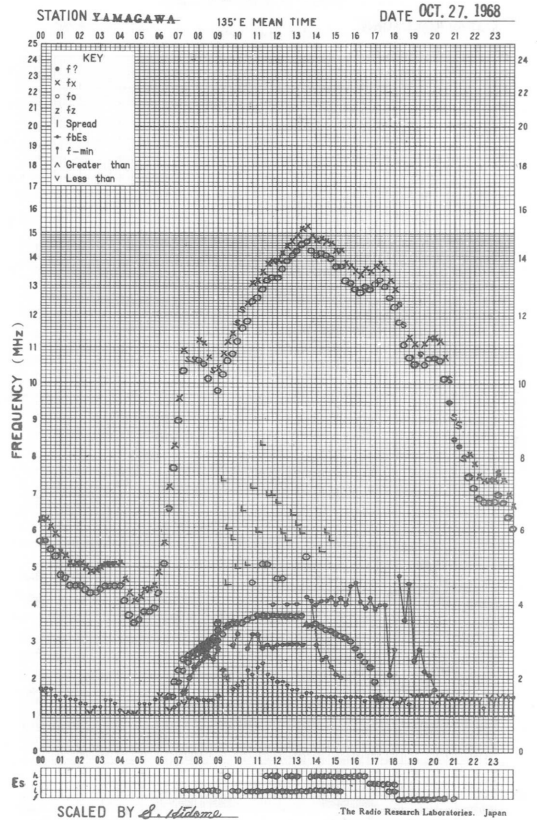
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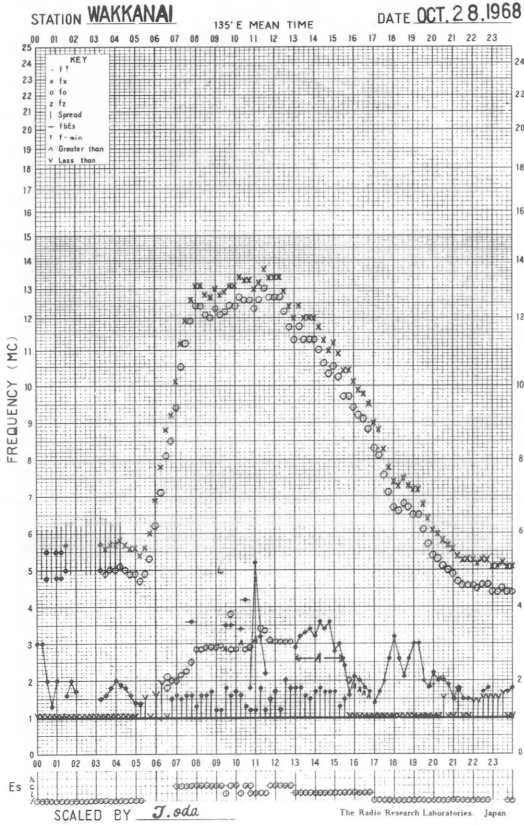
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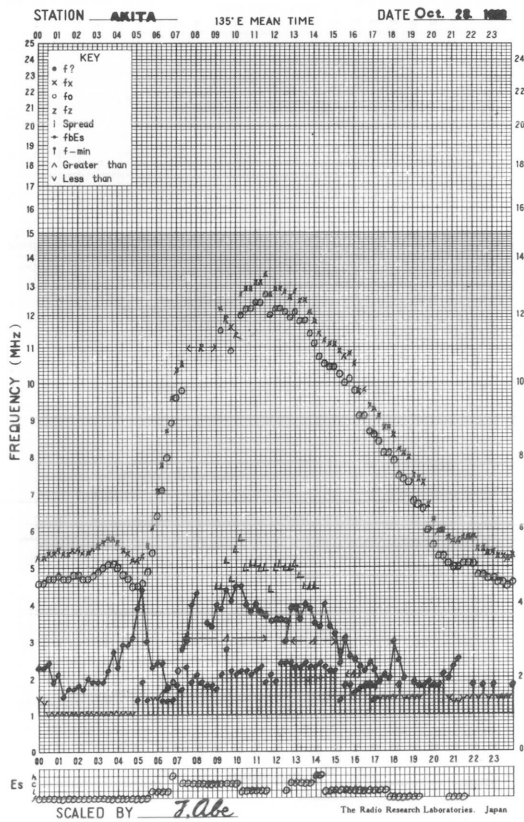
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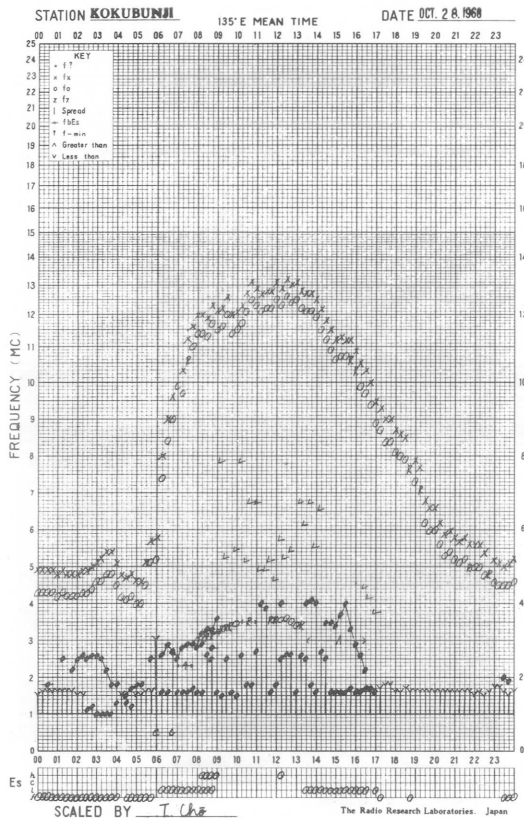
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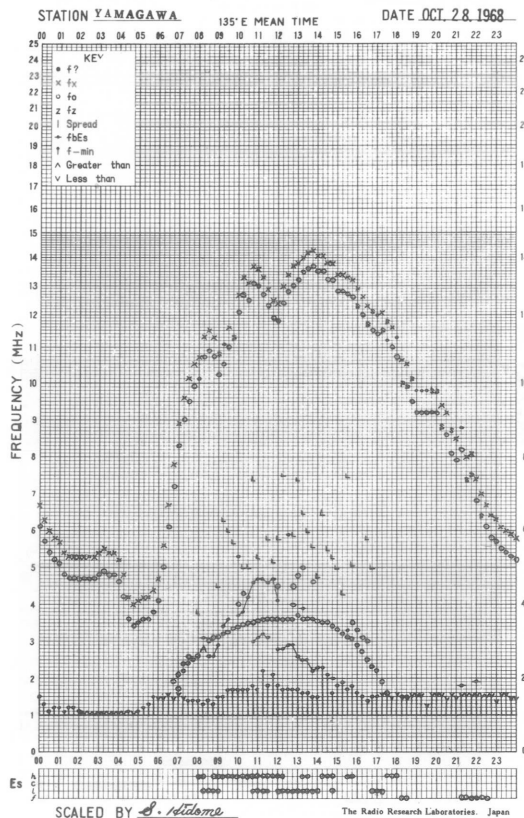
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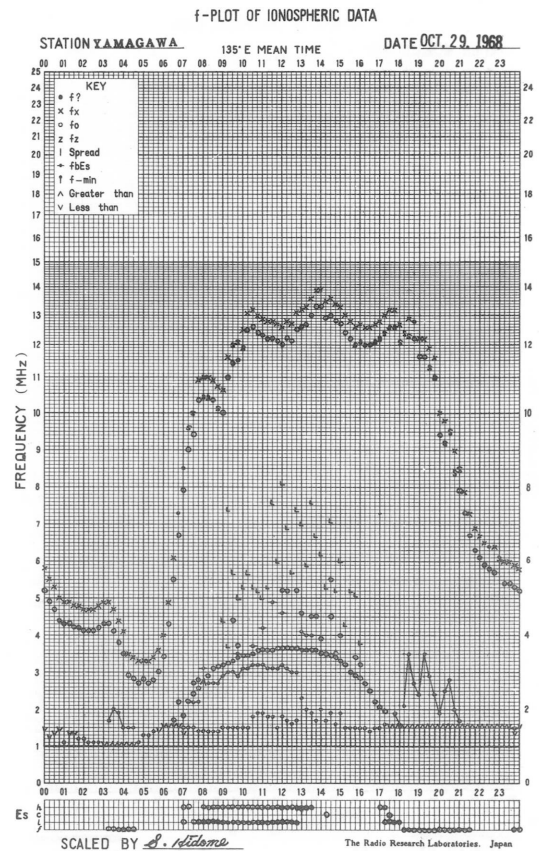
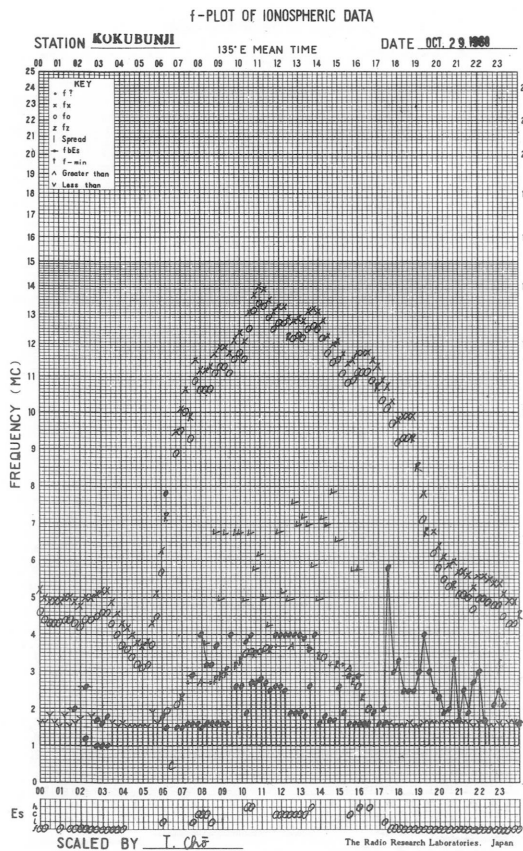
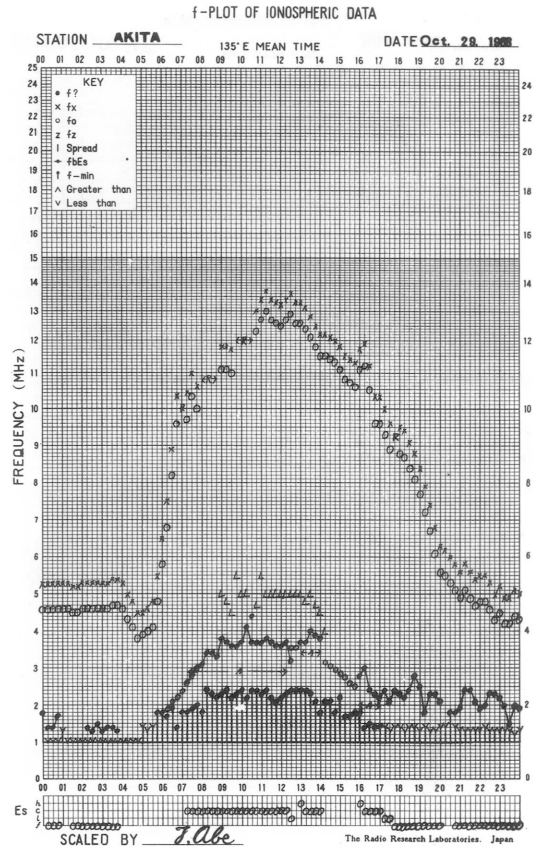
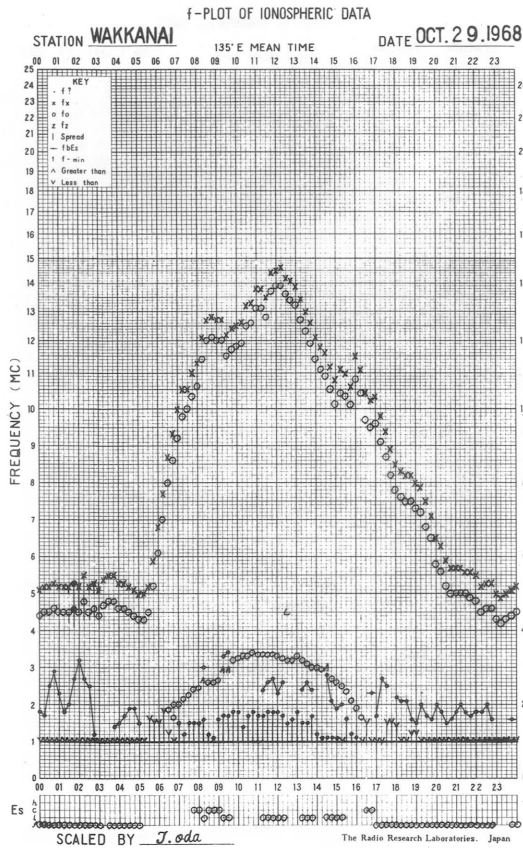


f-PLOT OF IONOSPHERIC DATA

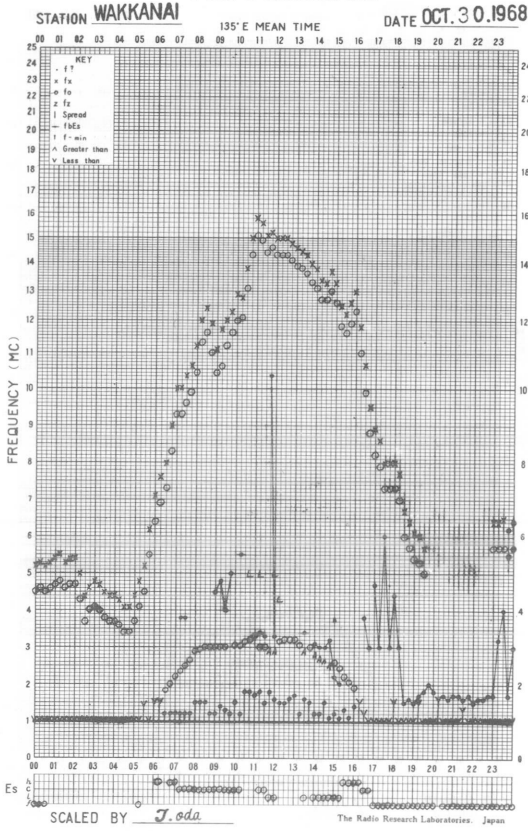


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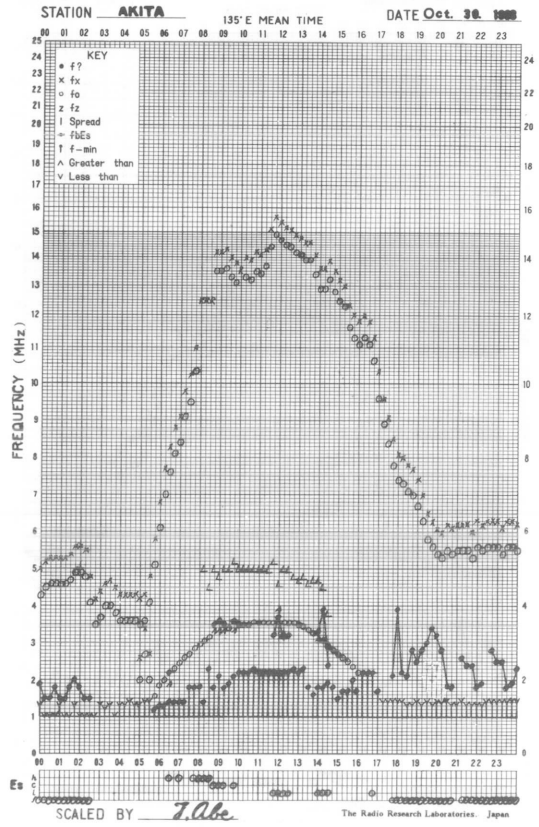




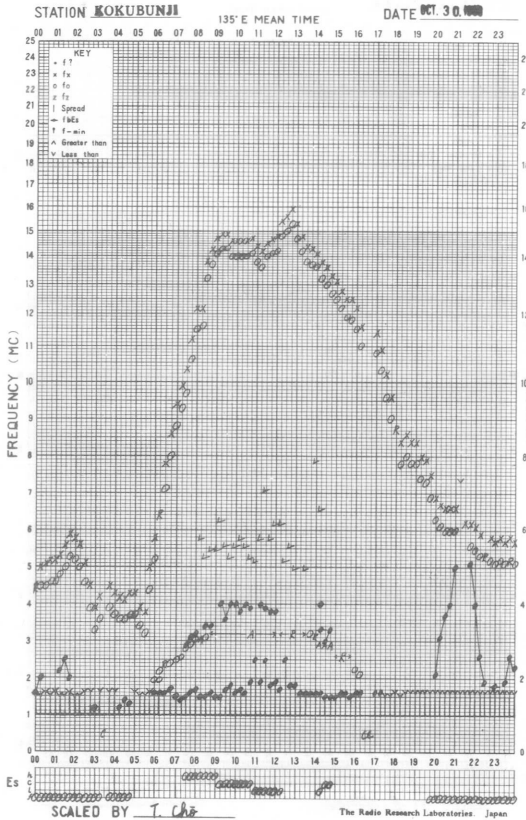
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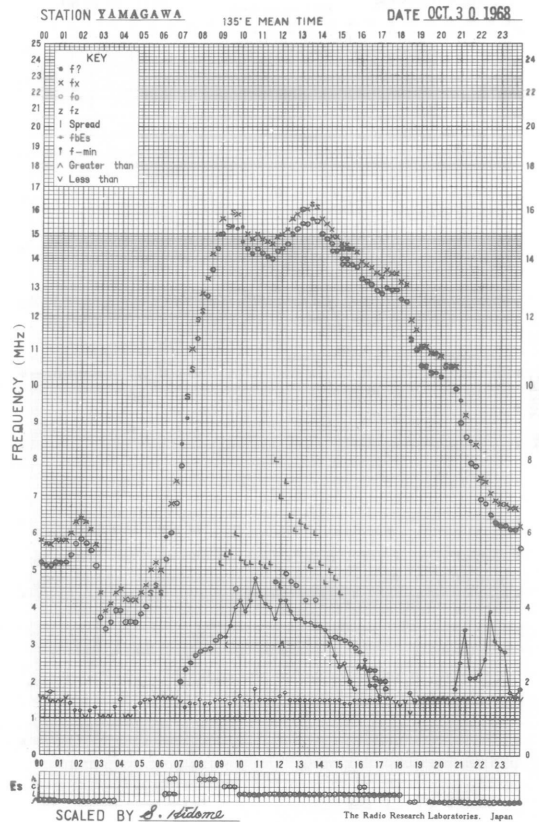
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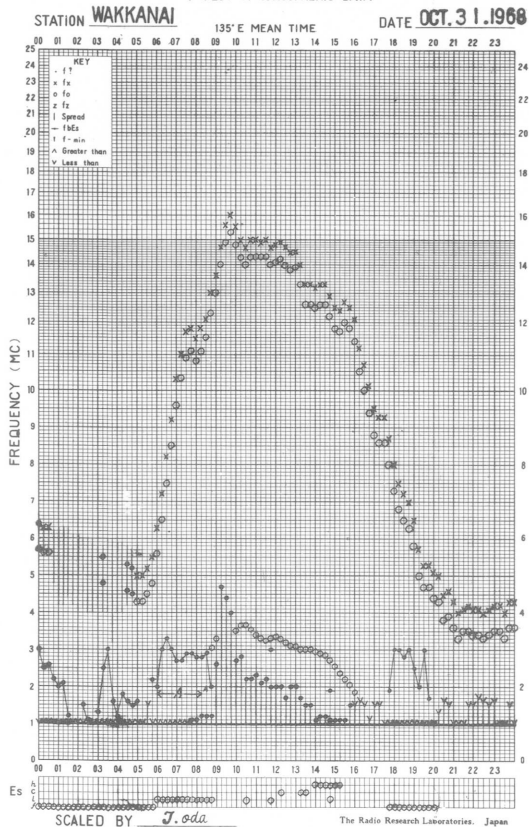
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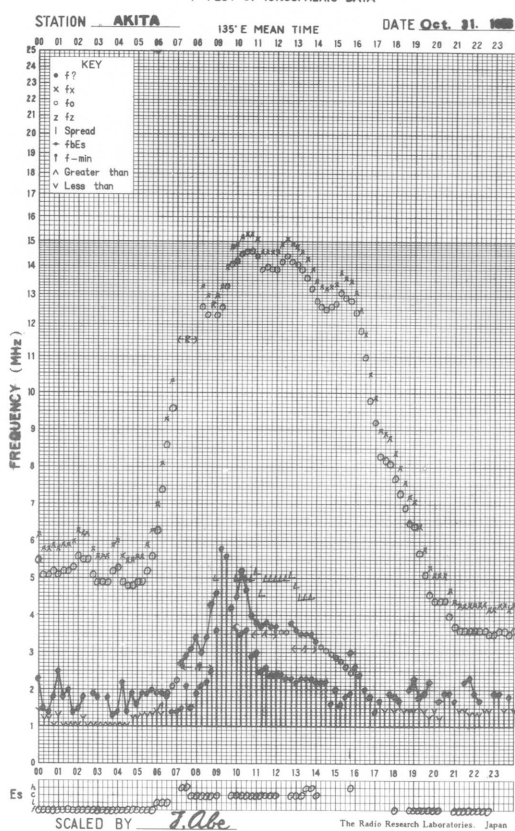
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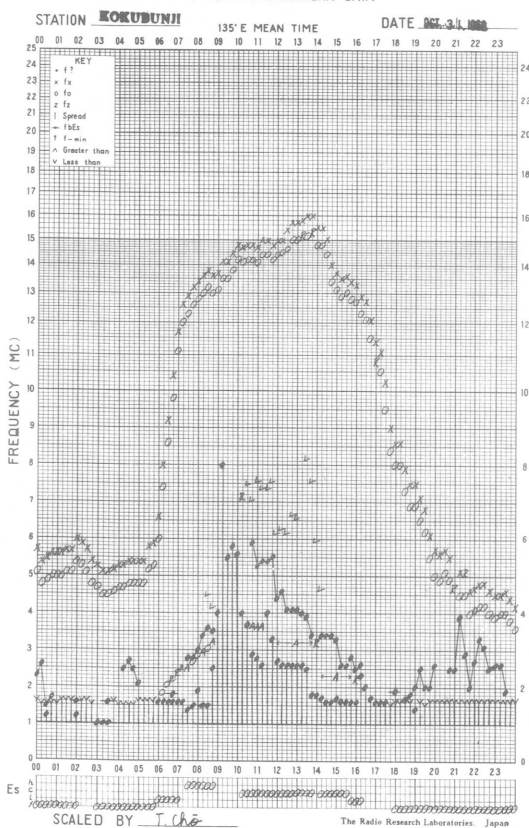
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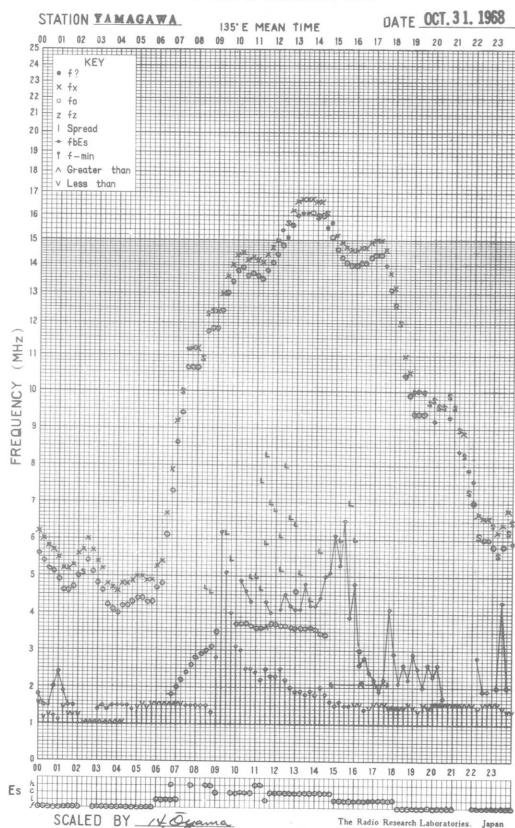
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA



SOLAR RADIO EMISSION

Flux Density and Variability										
Month: October 1968						Frequency: 200 MHz				
Observing station: Hiraiso										
Flux density $10^{-22} W_m^{-2} (Hz)^{-1}$						Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	8	7	(8)	7	7	1	1	(1)	1	1
2	6	7	(6)	7	7	1	1	(1)	0	1
3	6	6	(7)	8	6	0	0	(1)	1	0
4	8	7	(7)	6	8	1	0	(0)	0	1
5	6	6	(6)	7	6	0	1	(1)	0	1
6	6	7	(7)	6	7	1	1	(0)	1	1
7	7	6	(7)	6	6	1	1	(1)	1	1
8	6	6	(6)	6	6	0	0	(0)	0	0
9	6	6	(6)	6	6	0	0	(0)	1	0
10	6	6	(6)	6	6	0	0	(0)	0	0
11	7	7	(7)	7	7	0	1	(0)	1	0
12	7	7	(7)	8	7	0	0	(0)	0	0
13	8	9	(11)	8	9	1	1	(1)	0	1
14	9	9	(8)	7	9	0	1	(0)	1	0
15	6	6	(6)	-	6	0	0	(0)	-	0
16	8	8	(9)	11	8	1	1	(1)	1	1
17	12	18	(30)	-	16	1	1	(1)	-	1
18	14	13	(13)	10	13	1	1	(1)	1	1
19	13	16	(21)	20	14	1	1	(1)	1	1
20	19	17	(18)	11	19	1	1	(1)	0	1
21	11	9	(10)	8	10	0	0	(0)	1	0
22	9	8	(7)	10	8	1	1	(1)	1	1
23	10	12	(15)	-	11	1	1	(1)	-	1
24	-	-	-	-	-	-	-	-	-	-
25	19	16	(11)	10	17	1	1	(1)	1	1
26	10	(11)	(14)	10	11	1	(1)	(1)	1	1
27	105	(33)	(22)	43	58	2	(1)	(1)	0	1
28	16	14	(17)	39	21	0	0	(0)	1	0
29	32	42	(42)	72	38	1	1	(1)	1	1
30	-	(118)	(134)	31	(99)	-	(1)	(1)	1	(1)
31	67	58	(112)	19	61	1	1	(1)	1	1

Note No observations during the following periods:

15th	2050-	16th	0010	26th	0300-	0500
16th	0100-		0200	27th	0300-	0500
17th	2050-	18th	0005	30th	0000-	0520
23rd	2050-	25th	0010			

SOLAR RADIO EMISSION

<u>Flux Density</u>					
Month: October 1968					
Observing station: Hiraiso			Frequency: 500 MHz		
Flux density $10^{-22} W_m^{-2} (Hz)^{-1}$					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	34	33	(33)	35	33
2	32	30	(30)	34	32
3	34	33	(33)	35	34
4	34	34	(33)	34	34
5	33	32	(32)	34	33
6	34	32	(34)	36	34
7	35	34	(35)	-	35
8	34	34	(32)	36	34
9	36	35	(34)	37	35
10	36	34	(34)	39	35
11	36	35	(35)	35	36
12	35	34	(36)	37	36
13	37	36	(36)	36	36
14	34	33	(32)	34	34
15	33	31	(32)	35	32
16	34	34	(35)	34	34
17	35	35	(35)	34	35
18	31	29	(29)	30	31
19	31	30	(30)	31	31
20	33	33	(32)	34	33
21	32	32	(31)	35	32
22	36	34	(34)	35	35
23	38	(35)	(35)	-	36
24	-	-	-	-	-
25	38	37	(35)	33	37
26	34	34	(34)	33	34
27	35	38	(35)	37	36
28	35	34	(33)	34	35
29	33	34	(37)	34	34
30	37	35	(33)	39	35
31	37	38	(37)	33	38

Note No observations during the following periods:

7th 2050-	8th 0010	26th 2215-	2345
23rd 0400-	0545	29th 2315-	2350
23rd 2050-	25th 0100		

<u>Distinctive Events</u>								
(single-frequency observations)								
Month: October 1968								
Observing station: Hiraiso								
Normal observing period: 2050 - 0810 (sunrise to sunset)								
Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density		Remarks
	MHz	UT	UT	minutes		$10^{-22} W_m^{-2} (Hz)^{-1}$	peak		mean
1	500	0037.0	0043.0	19.0	C	80	20	
3	500	2343.0	0052.2	128.0	C	170	20	
	200	2347.0	0004.0	124.0	C	100	20	
4	500	2123.0	2125.5	10.0	C	18	8	1st peak
		2134.0	2134.5	12.5	C	280	55	2nd peak
	200	2124.0	2124.3	2.0	C	410	100	1st peak
		2126.0	2140.0	33.0	C	310	30	2nd peak
6	500	2238.0	2238.8	1.5	C	370	70	
13	200	0521.2	0521.8	2.2	C	510	80	
17	200	0408.0	0408.2	1.5	C	550	200	
26	200	0038.0	0038.0	1.0	C	250	100	
	500	0115.0	0153.0	60.0	C	1290	230	
	200	0100.0	0156.0	80.0	C	190	20	
27	500	0046.0	0109.5	183.0	C	37	12	
29	500	0012.7	0012.7	3.0	C	100	7	
	200	0014.0	0014.0	0.8	C	620	110	
30	500	0020.5	0113.8	156.5	C	270	10	
		2242.0	0006.5	118.0	C	5050	200	
	200	2339.0	0009.0	60.0	C	790	130	
31	500	0525.0	0712.0	135.0	C	330	40	
		2228.0	2252.0	48.0	C	190	25	
	200	2238.0	2355.5	40.0	C	470	160	
	500	2327.0	2328.4	17.0	C	50	10	

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

OCT	1968	FREQUENCY 15 MHZ																				BANDWIDTH	80 HZ	RECEIVING	ANTENNA	ROD	4.5 M	MEASURED AT HIRAISSO		
		00H 15M	01H 15M	02H 15M	03H 15M	04H 15M	05H 15M	06H 15M	07H 15M	08H 15M	09H 15M	10H 15M	11H 15M	12H 15M	13H 15M	14H 15M	15H 15M	16H 15M	17H 15M	18H 15M	19H 15M							20H 15M	21H 15M	22H 15M	23H 15M
1	2	4	8	14	22	21	21	-4	-2	ES -7	-1	ES 2	ES -8	-3	12	6	0	7	11	7	2	4	4	5						
2	5	9	10	10	15	0	ES 1	ES -2	ES 3	ES 6	ES 0	ES -2	ES -4	ES 3	ES -2	ES -6	ES -4	ES 5	5	-14	1	ES 18	5	3						
3	4	2	-1	ES -15	ES -3	ES -9	ES -9	ES 0	ES 1	ES 3	ES -6	ES 4	ES -7	ES -2	-5	ES -8	ES -27	ES -27	-15	-3	2	5	1	1						
4	ES -23	-3	5	15	ES -6	ES -1	ES -3	ES 1	ES 8	-2	ES -2	ES -6	ES -7	ES -2	ES 9	ES 8	ES -25	ES -25	ES -30	-18	-2	ES 3	-3	2						
5	0	3	8	9	2	5	-11	ES -11	ES -14	ES -2	ES -5	ES -1	ES -5	ES -2	ES -20	ES -30	ES -30	ES -30	-3	ES -30	-1	5	2	ES 3						
6	3	2	6	12	12	ES 3	ES 2	ES -4	ES -2	ES -7	ES 6	ES -4	ES -7	ES -7	11	1	8	13	ES -30	1	3	3	6	6						
7	1	4	10	10	13	ES -4	6	-1	ES 4	ES -2	ES -2	ES -8	ES -4	ES 1	0	-1	7	5	11	ES -26	5	6	3	6						
8	4	5	9	15	16	14	-5	-3	ES -4	ES 0	ES -4	ES -1	ES -1	ES -4	5	18	13	14	26	C	C	C	C	9						
9	8	10	12	18	16	9	ES -3	ES -4	ES 8	ES 2	ES 2	ES 6	ES -2	ES 5	6	-3	-5	2	-2	-10	7	4	7	8						
10	7	9	11	19	19	4	ES 1	ES 0	ES 6	ES -3	ES 0	ES 4	ES -1	ES 1	-3	5	0	11	8	6	3	9	9	8						
11	8	10	9	16	14	ES -4	-4	ES 7	ES 4	ES 2	ES 7	ES -1	ES 3	ES -6	-5	1	11	13	10	-3	4	8	12	8						
12	7	13	16	16	12	9	4	11	21	17	3	5	-6	ES -3	-5	15	-3	-6	-7	-16	-16	8	10	18						
13	11	9	14	2	-1	ES -4	2	ES -9	ES 2	ES -9	ES -4	1	ES -9	4	ES -27	ES -27	-3	C	C	C	C	C	C	C						
14	9	11	12	21	-6	-2	ES -1	ES -1	ES -2	-8	ES -19	ES -3	ES -9	ES -11	3	ES -21	-17	C	C	C	C	C	C	C						
15	11	13	16	15	13	10	-6	-5	ES 2	ES 3	ES -3	ES 7	ES 5	ES 0	-7	-22	ES -25	ES -25	ES -22	-13	5	6	-3	8						
16	-2	5	10	14	12	9	-1	ES -3	ES -2	ES 0	ES -13	ES -2	ES -12	ES -15	ES -27	ES -28	ES -26	ES -26	10	6	4	4	4	8						
17	7	6	15	15	19	12	10	6	ES 2	ES 5	ES 7	ES 1	ES 1	ES 1	6	-7	-9	5	2	-14	ES 6	4	1	5						
18	6	8	13	15	12	11	ES -2	ES 12	ES 2	ES 5	ES 11	ES 10	ES -23	ES 5	9	13	11	17	8	11	11	12	12	ES 16						
19	ES 14	ES 14	12	18	25	11	ES -17	ES -13	ES -7	ES 2	ES -4	ES 0	ES 1	ES -3	3	2	-9	14	14	7	7	9	11	11						
20	11	13	17	16	23	26	4	ES 1	0	ES 5	ES 4	ES 1	ES 1	ES 0	-6	-3	11	12	-16	ES 11	2	7	9	7						
21	8	8	12	16	18	0	ES -20	ES -5	ES 13	ES -1	ES -8	ES -6	ES -11	ES -3	8	9	9	11	13	-7	3	7	8	8						
22	5	5	11	12	-1	ES -3	ES -12	ES 0	ES 8	ES -1	ES -7	ES 5	ES 5	ES 8	4	14	18	8	5	-10	-2	9	11	7						
23	0	5	8	15	9	ES -4	ES -1	ES -3	ES -4	ES 14	ES 16	ES 11	C	C	C	C	C	C	C	C	C	C	C	C						
24	C	C	C	C	16	C	C	C	C	C	C	C	ES 2	-4	16	12	4	5	10	-3	2	-1	10	20						
25	8	20	12	C	C	C	C	ES 0	ES 4	ES 6	ES 0	-6	1	2	25	16	14	14	11	10	6	10	16	10						
26	11	10	16	22	22	ES -7	ES -11	ES -13	-6	ES 5	ES 4	ES 2	ES -4	ES 1	-4	1	-7	-14	-20	-17	5	11	15	16						
27	-4	7	15	22	21	0	-3	-6	3	11	ES 1	ES 15	ES -10	ES -4	ES -4	7	1	6	10	6	-6	11	11	15						
28	15	18	17	20	19	-5	ES -3	ES 5	ES 3	ES -1	ES 0	ES -1	ES 6	-5	2	-16	ES -7	-9	ES 8	ES -2	11	15	17	15						
29	12	16	18	20	22	24	1	ES 3	1	8	ES 4	ES -5	-3	ES -2	-12	ES -21	-20	ES -13	ES -22	ES -22	4	8	11	6						
30	13	18	22	21	26	26	24	-3	ES 4	ES -1	ES -3	ES -6	ES -1	ES -3	-7	2	4	1	ES 3	0	7	13	12	14						
31	ES -23	1	14	10	ES -11	-6	ES 0	ES -5	ES 0	-4	-3	ES -7	ES -15	ES -3	ES -4	ES -28	ES -28	ES -28	ES -28	ES -28	-20	-13	4	ES -8						
CNT	30	30	30	29	30	29	29	30	30	30	30	30	30	30	30	30	30	29	28	27	27	27	27	28						
MED	US 7	US 8	12	15	14	0	ES -1	ES -2	ES 1	ES -1	ES 0	ES -1	ES -4	ES -3	-2	0	-4	5	US 4	US -7	US 3	US 7	US 8							
UD	ES 13	18	17	21	23	24	10	ES 7	ES 13	ES 11	ES 7	ES 10	ES 1	ES 2	12	15	13	14	13	7	7	ES 13	15	16						
LD	ES -4	ES 2	6	9	ES -6	ES -6	ES -12	ES -11	ES -7	ES -7	ES -13	ES -7	ES -12	ES -9	ES -20	ES -27	ES -27	ES -27	ES -28	ES -26	ES -6	ES 3	1	ES 2						

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

OCT 1968 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M
 MEASURED AT HIRAI SO

UT DAY	00H 45M	01H 45M	02H 45M	03H 45M	04H 45M	05H 45M	06H 45M	07H 45M	08H 45M	09H 45M	10H 45M	11H 45M	12H 45M	13H 45M	14H 45M	15H 45M	16H 45M	17H 45M	18H 45M	19H 45M	20H 45M	21H 45M	22H 45M	23H 45M	
1	-4	ES -7	2	10	14	20	21	21	16	17	19	ES -1	ES -2	12	-10	ES -12	ES -3	14	12	7	4	-1	-2	ES -2	
2	ES -3	-3	2	7	16	23	15	6	7	25	0	ES 1	ES -9	ES -24	ES -5	ES -9	ES -6	ES -7	10	0	-2	3	0	3	
3	ES -5	1	2	8	14	ES 24	ES 28	21	16	14	14	-2	ES -1	ES -2	-6	ES -27	-11	-9	5	5	5	2	1	-2	
4	ES -25	-9	0	13	18	22	28	21	8	14	ES 1	ES -5	ES -5	ES -9	ES -9	ES -25	-18	-18	6	2	-1	ES -3	ES 3		
5	1	-1	6	11	17	23	21	27	-9	21	6	ES 4	6	ES 1	ES -20	ES -30	ES -30	ES -30	ES -30	6	7	2	ES -4	ES 3	
6	3	1	8	10	20	16	-2	0	11	3	ES -7	ES -4	ES -4	ES -5	ES -26	ES -26	-20	-5	1	2	6	1	1	0	
7	-1	1	8	8	18	25	25	28	22	1	ES 1	1	-1	ES -8	ES -7	-6	1	12	12	5	5	8	3	ES 2	
8	ES -4	3	4	8	21	19	24	13	26	11	-2	ES -1	-2	ES -4	ES -11	-4	ES -10	13	C	C	C	C	C	4	
9	4	2	3	10	16	18	ES 3	ES 2	11	ES 2	ES 1	ES -3	ES -5	-9	ES -13	ES -17	ES -17	16	-5	-2	8	-1	-3	0	
10	2	0	8	14	20	22	22	24	13	23	4	ES 1	ES 0	-7	ES -19	ES -27	-8	4	5	3	8	9	-2	2	
11	2	3	6	11	17	20	ES 22	28	36	15	11	ES -1	ES 2	ES -18	ES -16	ES -22	-13	-5	-16	3	13	2	2	0	
12	-1	-6	8	18	18	29	27	28	17	-4	-1	5	1	1	-9	ES -6	ES -4	-12	-3	1	4	4	4	3	
13	-2	1	6	11	21	26	26	13	23	1	-7	-1	-3	-9	ES -27	ES -27	ES -27	-17	C	C	C	C	C	4	
14	-2	2	8	11	17	22	13	27	12	ES -5	ES -7	ES 2	ES -6	ES -13	ES -24	ES -21	ES -21	C	C	C	C	C	C	2	
15	1	4	12	13	19	18	25	22	30	11	-1	ES 2	ES 1	-12	ES -17	ES -25	ES -25	-20	-6	2	3	-4	-3	ES 1	
16	-8	0	6	16	17	21	25	16	25	12	-11	ES 4	ES -12	ES -27	ES -27	ES -26	ES -26	-22	-20	8	8	-2	1	3	
17	0	6	8	16	19	25	27	29	26	ES 1	-2	ES 0	ES 3	-5	-13	ES -21	ES -21	7	6	7	ES 6	-2	2	1	
18	-5	6	13	1	13	23	23	26	23	ES 6	ES 3	ES 4	ES -23	-10	ES -23	ES -23	ES -23	18	14	9	12	0	13	ES 4	
19	ES 8	ES 4	8	11	18	24	23	23	31	20	ES 7	ES 0	ES 1	ES -12	ES -25	ES -6	-13	-1	3	9	4	11	5	0	
20	-1	4	8	16	24	25	26	27	30	18	ES 1	ES -1	ES 1	-13	ES -9	-19	-9	15	-19	-10	11	-7	1	1	
21	-2	1	5	11	16	24	24	25	28	18	-1	ES -2	ES -6	-8	ES -13	-20	-8	-12	-9	3	8	-3	-1	4	
22	5	-10	6	11	17	18	25	21	19	-1	ES -3	ES -2	ES -6	-13	ES -13	ES -16	-17	-7	-14	-5	7	4	-3	5	
23	-2	3	8	14	23	26	27	27	27	16	ES 2	ES -5	C	C	C	C	C	C	C	C	C	C	C	C	
24	C	C	C	13	25	C	C	C	C	C	C	C	C	ES 0	ES -9	ES -26	-20	-19	20	1	9	12	-5	-2	1
25	1	4	17	C	C	C	22	27	23	22	ES 0	ES 0	ES 1	-3	-4	-6	-4	24	10	4	7	2	0	ES 1	
26	ES 1	0	7	10	10	22	29	25	19	7	ES 4	ES 0	ES -5	ES -8	-12	-13	ES -20	ES -24	ES -22	3	3	0	-2	-1	
27	ES -6	ES -10	4	12	14	19	25	19	22	13	11	9	ES 4	ES -12	ES -10	ES -19	ES -30	-12	-7	-1	2	1	-1	1	
28	-1	5	9	10	18	22	20	25	18	22	10	ES -3	-4	ES -7	ES -17	ES -16	ES -13	-9	ES -7	0	8	16	8	6	
29	3	-4	8	16	21	24	22	22	25	19	4	ES -1	ES -8	ES -10	ES -21	-16	ES -6	-11	ES -22	6	1	-1	0	0	
30	4	C	13	14	15	23	28	26	22	14	14	ES -1	ES -4	ES -7	-11	-16	-13	8	3	-4	8	2	2	2	
31	ES -23	-6	6	16	18	20	26	24	25	10	10	ES -5	ES -10	ES -5	ES -28	ES -28	ES -28	ES -28	ES -28	3	6	4	ES -12	ES -2	
CNT	30	29	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	29	27	27	27	27	27	30	
MED	US -1	US 1	8	11	18	US 22	US 24	24	22	14	ES 1	ES -1	ES -4	ES -8	ES -13	ES -19	ES -15	-7	-5	3	6	1	0	ES 2	
UD	ES 4	5	13	16	23	26	28	28	30	22	14	ES 4	ES 2	ES 1	ES 6	-6	ES -4	18	12	9	12	9	5	5	
LD	ES -8	ES -9	2	8	14	ES 18	ES 13	6	8	ES -1	ES -7	ES -5	ES -10	ES -18	ES -27	ES -27	ES -28	ES -24	ES -22	-4	ES 2	-4	ES -3	ES -2	

RADIO PROPAGATION QUALITY FIGURES

HIRAI SO

Time in U.T.

Oct. 1968	Whole Day Index	H B			W W V				L M				W W V H				Warning				Principal magnetic storms						
		06	12	18	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18	Start	End	ΔH
		12	18	24	06	12	18	24	06	12	18	24	06	12	18	24	06	12	18	24	06	12	18	24			
1*	4+	5	5	4	5	4	4	5	4	4	-	4	4	4	(4)	5	N	N	N	N	---	---					
2*	3+	3	3	3	4	4	3	3	4	4	-	C	4	4	(3)	3	N	U	U	U	00.18	---	96 ^Y				
3*	3+	3	4	(4)	3	3	3	3	4	4	-	4	4	4	(4)	4	U	U	U	U	---	22xx					
4	3+	4	4	4	(3)	2	2	(4)	4	3	-	4	4	3	-	4	N	N	N	N							
5	4-	4	4	4	(4)	3	3	4	4	3	-	-	4	4	-	4	N	N	N	N							
6	4o	4	5	4	4	3	4	4	(4)	-	-	-	4	3	-	4	N	N	N	N	06.27	---	76 ^Y				
7	4o	4	4	3	4	5	4	4	4	(4)	-	4	4	4	(4)	4	N	N	N	N	---	---					
8	4o	4	4	3	4	4	4	4	4	4	-	4	4	4	(4)	C	N	N	N	N	---	05xx					
9	4+	5	4	4	4	4	4	4	4	4	-	5	(4)	4	(4)	4	N	N	N	N							
10	5-	5	5	4	4	4	5	(5)	C	(4)	-	5	4	4	(4)	5	N	N	N	N							
11	5-	5	5	5	4	4	5	5	5	5	-	5	5	4	(4)	4	N	N	N	N	22.0	---	98 ^Y				
12	4o	3	4	3	4	5	4	3	5	5	-	-	4	4	(4)	4	N	N	N	N	---	---					
13*	3+	3	3	3	3	3	3	4	(4)	-	-	-	4	3	-	4	N	U	U	U	---	---					
14	4-	3	4	4	4	3	3	(4)	4	4	-	4	4	4	-	C	N	N	N	N	---	24xx					
(15)	4-	4	4	4	4	3	3	4	4	4	-	4	4	4	-	4	N	N	N	N							
{16}	4-	4	3	4	4	4	3	4	4	(3)	-	4	4	4	-	4	N	N	N	N							
{17}	4o	4	4	4	5	3	4	4	4	(3)	-	4	4	4	-	4	N	N	N	N							
18	5-	4	5	(5)	4	5	5	5	4	(4)	-	4	4	4	(4)	5	N	N	N	N							
19	4-	5	4	(3)	4	2	4	5	4	(3)	-	-	(4)	4	-	4	N	N	N	N							
20	4+	5	4	(4)	5	4	4	4	(4)	-	-	-	4	4	-	3	N	N	N	N							
21	4+	4	5	5	4	3	5	5	4	(3)	-	(4)	4	4	-	4	N	N	N	N							
22	4+	4	5	5	4	4	5	4	(4)	(4)	-	(4)	4	4	-	4	N	N	N	N							
23	4o	5	4	4	4	4	C	C	(4)	(3)	-	C	4	4	C	C	N	N	N	N							
24	4+	4	5	4	4	C	5	4	C	C	-	(4)	(4)	C	(4)	4	N	N	N	N							
25	4+	4	5	4	(4)	5	(5)	(4)	(4)	(4)	-	(4)	(4)	5	(4)	C	N	N	N	N							
26	4-	3	4	3	4	4	4	4	(4)	(4)	-	-	4	4	-	4	N	N	N	N							
27	5-	4	5	5	4	5	5	5	(3)	-	-	-	4	5	-	4	N	N	N	N							
28	4-	4	4	4	4	(3)	3	4	(4)	(4)	-	4	4	4	-	(4)	N	N	N	N							
29*	4o	4	4	3	5	5	3	4	4	(4)	-	(4)	(4)	4	-	4	N	N	U	U	06.45	---	125 ^Y				
30*	4+	4	5	4	5	4	4	4	4	4	-	C	4	4	-	4	U	N	N	N	09.09	---					
31 ^Δ	2+	3	1	1	3	4	1	1	3	4	-	2	4	4	-	3	N	N	W	W	08.59	---	256 ^Y				

IQSY GEOALERT and ADALERT (Western Pacific Region)

- * = MAGSTORM
- o = MAGCALME
- Δ = COSMIC EVENT

- () = Regular World Day
- = impossible to evaluate
- () = inaccurate
- C = artificial accident
- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

Oct. 1968	S W F						Correspondence					
	Drop-out Intensities (db)						Start- time	Dura- tion	Type	Imp.	Flare	Solar Noise	Mag.
CO	LM	HA	TO	HB	SH							
1	15	-			-	00.38	xx	S	1+			
	-"											
4	>15		-	13	-	00.00	80	S	1+	x	x	
4		20	-			21.25	20	S	1+	x	x	
18				11		03.36	18	S	1	x		
21	-		-	28	<u>32</u>	06.05	40	S	3-	x	x	
21	6	<u>15</u>				21.28	16	S	1			
23	7		11'	<u>15</u>		03.59	22	S	1+			
23	20	<u>20</u>				23.57	xx	Slow	1+	x		
30	<u>37</u>	-		14		23.50	110	Slow	2+	x	x	
31	14	-				22.38	xx	Slow	1	x	x	

IONOSPHERIC DATA IN JAPAN FOR OCTOBER 1968

第 20 卷 第 10 号

1969年1月29日 印 刷
1969年1月30日 發 行 (不許複製非売品)

編 集 兼 越 智 文 雄
發 行 人

東京都小金井市貫井北町4丁目2-1

發 行 所 郵 政 省 電 波 研 究 所

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