

F-256

IONOSPHERIC DATA IN JAPAN

FOR APRIL 1970

VOL. 22 No. 4

Issued in July 1970

Prepared by

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

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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 Hiraiso Branch and Inubo Radio Wave Observatory.

	Latitude	Longitude	Site
Hiraiso	36°22.0'N.	140°37.5'E.	Isozaki-machi, Nakaminato-shi, Ibaraki-ken
Inubo	35°42.2'N.	140°51.5'E.	9912 Tennodai, Choshi-shi, Chiba-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_oEs		The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.
f_bEs		The lowest ordinary wave frequency at which the Es 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.
$hF2$		The minimum virtual height, $hF2$, refers to the highest, most stable stratification observed in the F region and can only be scaled when such stratification is present.
hF		The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by hF . Thus hF is identical with the current $hF2$ when F region stratification is absent, e.g., at night, and with the current $hF1$ when $F1$ stratification is present.
hEs		The lowest virtual height of the trace used to give the f_oEs .
$hpF2$		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 *Es*

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

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

L A flat *Es* trace at or below the normal *E* layer minimum virtual height in the day or below the night *E* layer minimum virtual height at night.

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

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

Q An *Es* trace which is diffuse and non-blanketing over a wide

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

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

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

S A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace. The rising trace alone is classified as 'S'; the horizontal trace is classified separately. At high latitudes the slant trace usually starts to rise from a horizontal *Es* trace such as *Es-L*, or *Es-F*, at frequencies which greatly exceed the *E* layer critical frequency, whereas at low latitudes it usually rises from *Es-Q* *Es-C* or *Es-H* at frequencies near the regular *E* critical frequency. Type *S* is never used to determine f_oEs and hEs . The slant trace is sometimes observed to start at f_oE without echoes clearly identifiable as *Es* echoes being seen.

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

e. Multiple Reflections from *Es*

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

B. SOLAR RADIO EMISSION

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

a. Time and Unit

The time is expressed as U.T.

The unit is $10^{-22} \text{W} \cdot \text{m}^{-2} \text{Hz}^{-1}$ 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. Bracket means that observation time does not exceed one third of the period.

c. Distinctive Events

The phenomena are picked up on the following criteria:

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

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

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

Descriptive type is denoted by the following symbols:

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

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

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

C. RADIO PROPAGATION CONDITIONS

a. Field Strengths of WWV and WWVH

Field Strengths observations of WWV and WWVH transmitted from Fort Collins, Colorado and Hawaii, respectively, are carried out at Hiraio 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)
- 2 = poor (disturbed)
- 3 = rather poor (unstable)
- 4 = normal
- 5 = good

The tabulated circuits contain Hamburg (commercial circuit), WWV (10, 15 and 20 MHz frequencies broadcast from Fort Collins, Colorado), Lima (commercial circuit) and WWVH (10 and 15 MHz 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's.)

(i) SWF

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.

(ii) SPA

The data of sudden phase anomaly (SPA) are prepared from the records of phase measurement of VLF radio wave propagation received at Inubo Radio Wave Observa-

tory. Characteristics of the VLF radio wave propagation are as the following table. In the last column, a spherical earth with a radius of 6371.2 km is assumed.

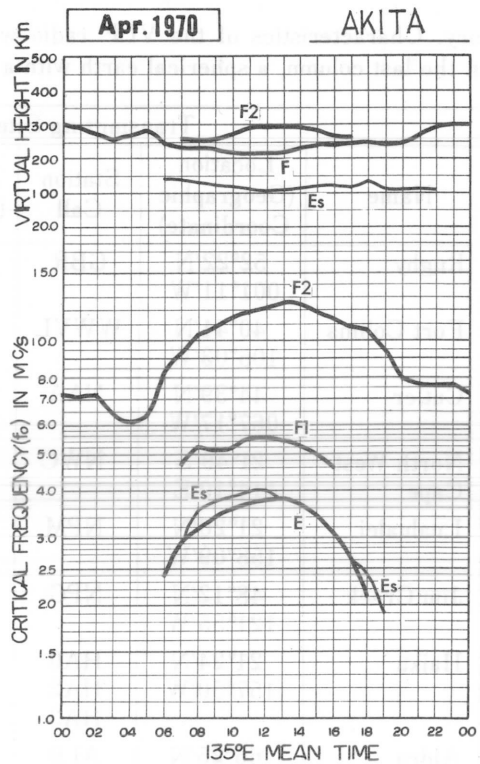
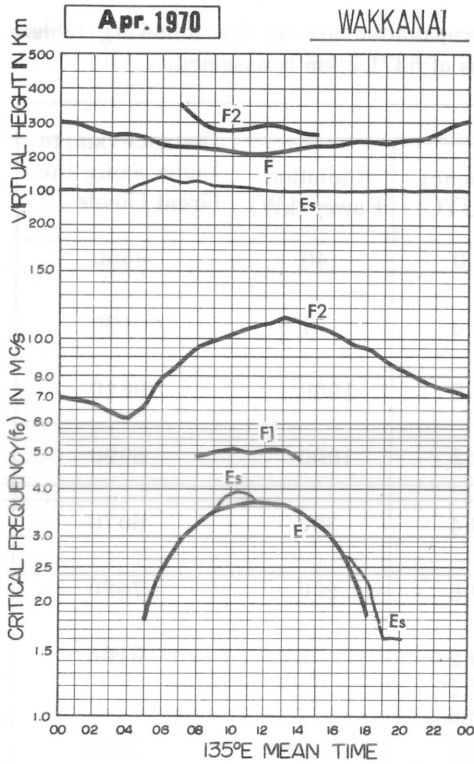
Transmitting Site					Distance (km) to Inubo along the Great Circle
Name	Location (Geographic Coordinate)	Station Call	Frequency (kHz-UTC)	Radiation Power (kW)	
Rugby	52°22'N 001°11'W	GBR	16.0	40	9550
Fort Collins	40°41'N 105°03'W	WWVL	20.0	1.8	9190
Cutler	44°39'N 067°17'W	NAA	17.8	1000	10640
North West Cape	21°49'S 114°10'E	NWC	22.3	1000	6990
Lualualei	21°26'N 158°09'W	NPM	23.4	300	6070
Jim Creek	48°12'N 121°55'W	NPG	18.6	250	7620
Haiku	21°24'N 157°50'W	HA0 HA2 HA3	10.2 12.2 13.6	2	6100
Aldra	66°25'N 013°09'E	AL0 AL2 AL3	10.2 12.2 13.6	4	7820

The phase advance is shown in its maximum stage. In the column 'Phase Advance', — means no transmission or no reception during the period, and blank means indistinguishable record.

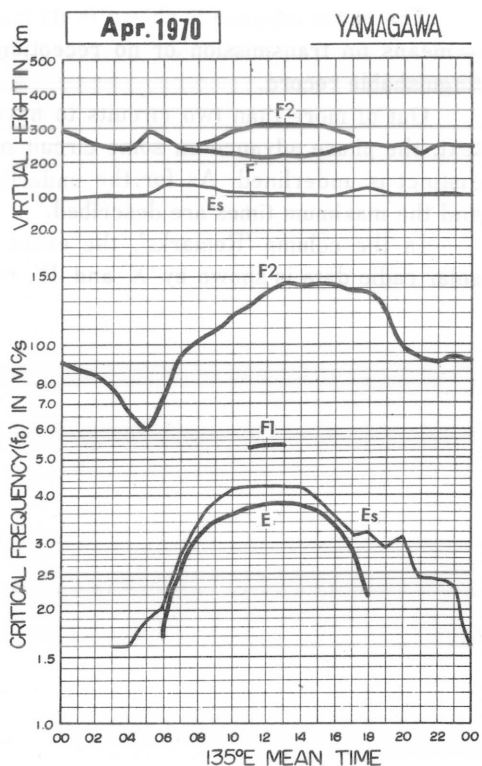
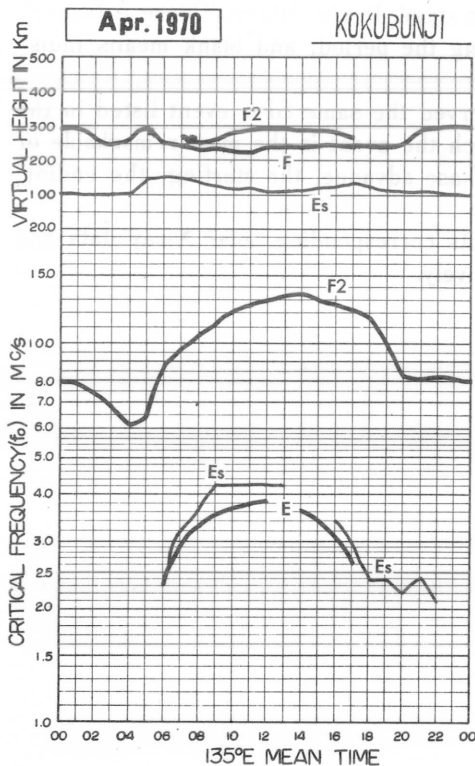
Out of more than two circuits to have observed the same SPA event listed in the text, the phase advance on some circuit on which the event is the most remarkable or distinct is underlined. As for the underlined phase advance, the starting, the ending, and the maximum times are described.

In the column 'Remarks', the event with its corresponding solar X-ray data and solar radio data is shown by 'X' and 'R', respectively.

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



IONOSPHERIC DATA

APR. 1970

FOF2 (0.1 MHz)

135° E Mean Time (G. M. T. + 9h)

Station	WAKKANAI				Lat.	45 23.6 N				Long	141 41.1 E				Sweep 1 MHz to 20 MHz 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	69	64	60	63	61	55	55	61	64	59	59	66	72	70	77	81	80	81	81	74	68	58	53	53	
2	51	52	50	51	50	53	67	77	86	96	99	100	105	104	106	103	96	96	95	86	83	74	68	65	
3	63	60	60	62	55	60	81	92	103	114	108	107	108	109	106	105	101	97	105	93	83	76	72	71	
4	71	73	71	65	64	70	88	100	117	119	123	122	124	124	123	118	107	103	94	88	85	78	68	70	
5	68	66	67	63	63	67	87	103	111	123	122	120	120	118	118	118	109	104	103	86	83	80	77	73	
6	76	72	74	67	IC	66	84	105	101	109	113	117	119	124	123	119	111	103	104	99	79	65	65	69	
7	71	65	64	61	62	62	77	92	103	109	116	126	119	116	117	110	98	93	95	89	84	73	73	69	
8	68	65	65	64	63	67	87	102	116	123	125	122	124	126	120	111	108	106	103	87	81	79	75	77	
9	71	71	71	69	66	71	91	109	118	120	120	121	118	114	109	107	106	105	99	94	88	86	77	F	
10	69	71	73	49	48	55	69	70	68	69	67	70	77	80	80	85	87	85	87	80	75	70	65	63	
11	61	61	63	61	60	66	80	87	94	96	100	104	108	113	116	112	104	102	95	88	81	77	77	75	
12	76	71	73	72	67	74	96	104	109	111	113	119	126	121	117	116	113	104	102	102	93	86	79	76	
13	76	73	71	67	68	74	84	83	86	98	101	105	105	108	110	104	97	93	88	84	84	77	73	70	
14	71	69	68	65	61	69	82	95	103	106	112	112	110	113	111	108	103	99	103	98	84	76	77	77	
15	77	78	76	73	63	70	90	103	110	112	109	109	115	115	114	116	112	104	100	94	90	83	77	76	
16	75	74	73	69	65	74	93	103	116	113	114	117	127	130	129	125	110	104	101	88	83	83	77	75	
17	73	73	73	70	68	77	90	101	121	116	121	122	124	128	126	122	114	107	104	89	84	83	76	76	
18	73	72	71	70	F	F	80	89	113	106	111	111	112	117	118	120	110	104	96	93	84	82	77	75	
19	73	71	63	56	53	55	67	76	87	93	93	103	112	108	105	103	102	90	91	82	90	83	79	76	
20	73	69	55	53	57	63	75	87	87	95	103	106	113	113	105	95	94	94	89	84	79	74	63	57	
21	60	58	54	43	42	43	55	55	57	59	69	80	81	79	82	79	80	76	78	77	72	69	66	59	
22	59	56	50	F	F	38	45	53	R	R	48	W	50	W	55	57	61	60	F	F	F	F	F	F	
23	F	F	55	48	43	46	53	58	60	IC	66	71	79	84	96	93	91	90	89	94	93	76	75	73	70
24	69	67	66	59	54	54	59	61	64	67	71	77	84	91	90	90	86	87	87	87	85	82	74	73	
25	68	68	64	57	55	56	53	57	58	67	80	87	94	95	99	C	C	C	C	84	81	F	74	70	
26	69	F	F	F	F	F	75	93	100	107	111	108	107	116	106	105	96	97	91	93	86	86	83	80	
27	78	77	78	71	65	69	82	84	86	96	101	95	97	117	113	110	103	103	104	95	85	78	76	77	
28	74	75	76	74	66	70	77	83	95	98	91	99	111	117	123	119	113	105	100	96	85	78	77	76	
29	77	78	74	71	64	63	67	69	73	78	84	93	97	103	104	104	97	89	85	83	78	76	73	73	
30	73	70	69	65	66	74	84	78	82	93	93	104	104	105	100	97	103	95	89	94	86	86	83	77	
31																									
CNT	29	28	29	29	30	29	30	30	29	29	30	29	30	29	30	29	29	29	29	29	29	29	29	29	29
MED	71	70	68	64	62	66	80	87	95	98	102	106	109	113	110	107	103	97	95	88	84	78	75	73	
UQ	74	73	73	69	66	70	87	101	110	112	113	117	119	117	118	116	109	104	102	94	85	83	77	76	
LQ	68	65	63	57	55	55	67	70	82	93	84	95	97	104	100	97	96	90	89	84	81	75	72	69	

The Radio Research Laboratories, Japan

APR. 1970

FOF2 (0.1 MHz)

IONOSPHERIC DATA

APR. 1970

FOF1 (0.01 MHZ)

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

Station **WAKKAYAI** Lat. 45 23.6 N Long. 141 41.1 E Sweep 1 MHz to 20 MHz 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						360	400	440	470	500	500	500												
2										L														
3										L	L	L												
4										L														
5																C								
6											L		L		L	L								
7									L	L		L	450	L										
8									L	L					L	L								
9											L	C	L	L										
10							410	500	530			560	560											
11										L														
12												U 470	L											
13												480												
14																								
15											L													
16																								
17																								
18									L		L	500	490				L							
19									L	L	L	L	L	L	460									
20								L	L	A	L	L	L	500	500									
21						380		480	490	530	530	530			L	460								
22					310	390	A	450	440	450	460	470	480	470				L						
23							450			C	520	510	520		L	L								
24								510	500					530	460									
25							440	460	500		500			L	L	C	C	C						
26									L	L	L			L	L									
27										L				510		500								
28								510	L	L			560	L	490	500								
29								500	510		580		540	530	500		L							
30									540	510	540		L	L										
31																								
CNT						1	3	4	8	8	5	11	8	5	6	4								
MED					310	380	425	490	500	510	500	510	510	480	500									
UQ						385	445	505	520	520	535	545	530	500	500									
LQ						370	405	455	480	500	490	480	500	460	480									

APR. 1970

FOF1 (0.01 MHZ)

IONOSPHERIC DATA

APR. 1970

FOE (0.01 MHz)

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

Station **WAKKANAI** Lat. **45 23.6 N** Long. **141 41.1 E** Sweep 1 MHz to 20 MHz 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	200	270	310	350	370	370	350	365	345	325	290	230		S					
2					S	210	285	315	330	350	355	365	370	360	330	300	235		A					
3					S	215	290	315	340	360	380	370	365	350	335	290	225		S					
4					S	225	290	330	345	345	370	380	360	350	325	290	230	150						
5					S	215	290	315	350	360	370	370	365	355	330	300	240		S					
6					110	210	290	310	340	345	355	355	365	350	320	285	245		S					
7					S	245	295	330	350	345	360	370	360	360	345	305	250		S					
8					S	235	295	335	355	355	360	350	370	355	330	295		A	A					
9					E	240	300	345	360	365	360	370	365	350	345	310	245	155						
10					S	235	295	330	360	370	370	365	355	350	320	300	250	155						
11					S	230	290	320	345	345	365	360	360	350	325	300	260		A					
12					S	245	295	320	345	355	370	375	360	355	320	300	260		A					
13					S	250	300	330	350	380		A	A	A	R	340	310		A	A	S			
14					S	250	300	325	350	375	380	380	370	360	325	305	250		A					
15					180	250	305	325	370	390	390	385	375		B	R	320	265		A				
16					180	260	300	330	355	365	380		A	A	A	A	305	260	185		E			
17					150	240	300	320	340	370	380	390	365	350	320	300	255	180						
18					S	250	300	320	350	350	365	380	370	360	325	295	250	200		E				
19					180	245	300	315	340	360	380	370	360	335	325	300		A	A	A				
20					E	165	245	300	320	340	350	370	365	370	360	325	300	245	180					
21					E	S	240	290	315	335	335	345		A	A	A	A	295	250		S			
22					E	170	230	285	310	330	345	335		A	A	350	315	290	240		S	E		
23					E	A	245	285	305	320	325	350	365	365	335	325	300	250		A	S			
24					E	150	245	295	320	335	335	345	330		A	A	315		A	260	190		E	
25					E	155	245	290	320	330	340		A	A	A	A	C	C	C	C				
26					E	190	265	300	325	350	360		A	A	A	A	330	300	260		A	A		
27					E	200	265	300	320	350	360	345	340		R	A	330	305	265	200		A		
28					E	200	265	305	325	350	360	355	350		A	A	330		A	A	A		E	
29					E	195	270	305	330	350	380	385	365	350	355	340	305	265	200			S		
30					E	205	280	305	330	350	355	370	385	365		A	A	300	280	205		A		
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					11	15	30	30	30	30	30	27	24	21	20	25	27	25	11	5				
MED					E	180	245	295	320	350	358	370	368	365	350	325	300	250	185		E			
UQ					E	192	250	300	330	350	365	375	378	370	358	330	305	260	200		E			
LQ					E	152	230	290	315	340	345	355	358	360	350	325	295	245	168		E			

APR. 1970

FOE (0.01 MHz)

IONOSPHERIC DATA

APR. 1970

FOES (0.1 MHz)

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

Station WAKKANAI Lat. 45 23.6 N Long. 141 41.1 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Station	WAKKANAI	Lat.	45 23.6 N	Long.	141 41.1 E	Sweep 1 MHz to 20 MHz in 20 sec in automatic operation																							
Hour/Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	20	E	E	E ₁₃	E	E ₁₅	24	G	G	G	G	G	43	27	G	G	G	G	E ₁₆	E	E	E	E ₁₅	E					
2	22	E	E	E	E	E ₁₅	G	G	G	G	G	G	G	G	G	G	G	G	J ₂₈	16	E	E	E	15					
3	E ₁₄	E	E	E	E	E ₁₄	G	G	G	39	39	G	G	G	G	G	G	G	E ₁₇	E	E	E	E ₁₄	E ₁₆					
4	E	E	E	E	E	E ₁₅	G	G	G	G	45	35	G	31	24	G	G	J ₃₃	G	15	16	E	E	E ₁₂					
5	E	E	17	J ₂₀	J ₂₀	E ₁₅	G	G	G	G	G	G	G	G	C	G	G	G	E ₁₆	E	E	E	E	E					
6	E	18	E	E	E	G	G	G	G	35	36	29	G	28	25	G	G	G	E ₁₈	E	E	E ₁₂	E ₁₂	E ₁₆					
7	E	E ₁₆	17	E	E	E ₁₆	25	G	G	38	J ₅₄	42	G	G	24	21	18	29	E ₁₉	18	E ₁₈	19	24	20					
8	E ₁₆	19	J ₂₀	J ₂₃	24	G	25	G	G	38	43	44	42	34	34	G	28	27	J ₂₆	J ₃₀	E ₁₂	E	21	23	20				
9	E ₁₆	E ₁₅	17	19	J ₂₀	24	27	24	35	38	40	C	G	33	26	24	G	26	G	E ₁₃	E ₁₅	E ₁₃	24	21					
10	23	22	20	E ₁₃	20	18	27	33	36	J ₄₃	44	39	38	34	29	J ₃₁	J ₃₁	28	21	22	21	E ₁₅	E ₁₅	E ₁₆					
11	24	E ₁₅	19	19	E	24	26	21	31	37	40	34	32	25	24	36	35	29	J ₂₆	24	21	E ₁₅	E ₁₆	E ₁₅					
12	20	19	E ₁₆	E	J ₂₂	G	G	16	G	28	21	G	G	31	25	29	33	40	34	30	30	E ₁₅	E ₁₃	E ₁₆	20				
13	20	E	E	E	E	E ₁₇	G	G	39	G	G	40	40	G	G	G	23	J ₃₁	J ₃₃	E ₁₃	J ₂₅	E ₁₅	E ₁₅	E ₁₄					
14	E ₁₅	E	15	E	E	G	G	G	G	G	G	G	G	30	29	25	G	20	20	J ₂₃	E ₁₅	E	E ₁₂	E ₁₆	E ₁₆				
15	E	E	E	E	E	G	26	G	G	G	G	G	G	29	G	E ₃₈	G	G	31	32	J ₂₅	J ₂₅	E	E	E ₁₆				
16	E ₁₆	E	E	E	E	G	G	G	40	41	G	G	39	42	43	35	G	G	G	E	E	E ₁₆	E	E ₁₅					
17	E	E ₁₅	E	E	E	G	G	G	G	45	G	43	G	G	G	G	G	G	G	E	J ₂₂	J ₂₄	16	E ₁₅					
18	E ₁₄	E	E	E	E	E ₁₇	G	34	40	G	G	41	41	G	G	27	G	G	G	15	20	E	E	E					
19	E	E	E	E	E	G	G	G	G	G	40	G	G	G	G	G	G	32	J ₂₅	J ₂₄	25	E	E ₁₅	E ₁₅					
20	E	E	E	E	E	20	29	33	45	J ₆₃	45	40	36	34	30	30	G	G	G	J ₂₃	E	22	J ₂₁	J ₂₈					
21	J ₂₈	E	E	E	18	E ₁₈	G	G	G	G	39	G	39	36	J ₃₄	J ₄₃	G	G	20	18	E ₁₆	E ₁₂	E ₁₅	J ₇₁					
22	J ₇₀	J ₃₃	29	23	15	29	31	43	45	41	G	41	38	37	41	G	G	37	34	J ₂₆	E	E	E	E					
23	E	E	E	E	18	21	G	G	G	C	G	G	G	40	39	25	35	31	23	E ₁₂	E ₁₆	E	E ₁₅	E					
24	E ₁₅	E	E	E	E	G	G	G	38	G	39	39	41	39	37	39	J ₃₅	32	25	22	18	E ₁₅	E	E					
25	19	E	J ₃₁	J ₃₃	18	21	G	G	34	38	43	44	J ₅₃	39	37	C	C	C	C	J ₂₃	E ₁₅	E	E ₁₃	E					
26	E ₁₆	J ₂₄	J ₂₃	16	18	G	20	34	34	G	40	40	38	43	43	29	G	J ₃₃	30	J ₂₁	26	E	E	E					
27	E	E	E	E	16	G	15	G	G	G	40	40	G	G	39	36	J ₃₃	30	23	20	E ₁₅	E	E ₁₅	E ₁₄					
28	E ₁₅	E	E	15	E	G	G	G	51	44	45	47	43	40	37	40	34	25	E	E	E ₁₅	E ₁₆	E						
29	E	E	E	E	E	G	G	G	36	G	41	40	40	43	G	40	G	G	28	E ₁₅	16	E	E	E ₁₅					
30	E ₁₅	E	20	15	E	G	G	G	G	40	42	41	G	G	42	40	29	20	G	17	20	E	E ₁₈	E					
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	30	30	30	30	30	30	30	30	30	29	30	29	30	30	29	29	29	29	29	29	30	30	30	30					
MED	E ₁₅	E	E	E	E	E ₁₄	G	G	G	21	39	39	32	28	29	25	G	G	26	23	16	16	E ₁₂	E ₁₅	E ₁₅				
UQ	20	E ₁₅	17	15	18	E ₁₈	25	16	36	39	42	41	40	37	38	35	29	31	28	22	20	E ₁₅	E ₁₆	E ₁₆					
LQ	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	E ₁₆	E ₁₂	E	E	E	E					

APR. 1970

FOES (0.1 MHz)

IONOSPHERIC DATA

APR. 1970

FBES (0.1 MHZ)

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

Station	WAKKANAI				Lat. 45° 23.6' N				Long. 141° 41.1' E				Sweep 1 MHz to 20 MHz 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 ₁₃	E	E ₁₅	G	G	G	G	G	G	G	G	G	G	G	E ₁₅	E	E	E	E ₁₅	E			
2	E	E	E	E	E	E ₁₅	G	G	G	G	G	G	G	G	G	G	G	G	E ₁₅	18	16	E	E	E	15	
3	E ₁₄	E	E	E	E	E ₁₄	G	G	G	G	37	G	G	G	G	G	G	E ₁₇	E	E	E	E ₁₄	E ₁₆			
4	E	E	E	E	E	E ₁₅	G	G	G	G	43	34	G	G	30	24	G	G	14	G	15	14	E	E	E ₁₂	
5	E	E	E	15	16	E ₁₅	G	G	G	G	G	G	G	G	C	G	G	20	E ₁₆	E	E	E	E	E		
6	E	16	E	E	E	G	G	G	G	G	36	29	G	28	25	G	G	14	19	E ₁₈	E	E	E ₁₂	E ₁₂	E ₁₆	
7	E	E ₁₆	16	E	E	E ₁₆	18	G	G	G	50	41	G	G	24	21	G	18	21	E ₁₉	16	E ₁₈	E	16	E	
8	E ₁₆	15	15	15	E	G	G	G	G	G	41	41	34	34	27	26	26	29	E ₁₂	E	E	E	E	E		
9	E ₁₆	E ₁₅	16	16	14	20	17	G	G	G	G	C	G	G	29	26	23	G	G	G	E ₁₃	E ₁₅	E ₁₃	E	16	
10	E	15	E	E ₁₅	E	G	G	G	G	G	G	G	E ₁₈	34	29	35	22	16	13	E	E	E ₁₅	E ₁₅	E ₁₆		
11	E	E ₁₅	E	E	E	18	21	G	G	G	36	E ₁₂	25	24	G	28	20	20	21	E	E	E ₁₅	E ₁₆	E ₁₅		
12	E	15	E ₁₆	E	15	G	G	G	G	G	G	G	31	G	29	G	24	30	20	22	19	E ₁₅	E ₁₃	E ₁₆	17	
13	18	E	E	E	E	E ₁₇	G	G	G	G	39	39	G	G	G	G	23	29	20	E ₁₃	18	E ₁₅	E ₁₅	E ₁₄		
14	E ₁₅	E	E	E	E	G	G	G	G	G	G	G	G	30	29	25	20	18	20	E ₁₅	E	E ₁₂	E ₁₅	E ₁₆		
15	E	E	E	E	E	G	20	G	G	G	G	G	27	G	E ₁₈	G	G	G	23	22	24	E	E	E ₁₆		
16	E ₁₆	E	E	E	E	G	G	G	G	G	G	G	37	36	36	33	G	G	G	E	E	E ₁₆	E	E ₁₅		
17	E	E ₁₅	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	E	21	23	12	E ₁₅		
18	E ₁₄	E	E	E	E	E ₁₇	G	G	G	G	G	G	G	G	G	G	G	G	G	G	18	E	E	E		
19	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	25	20	23	17	E	E ₁₅	E ₁₅		
20	E	E	E	E	E	G	G	G	G	60	43	38	36	33	28	30	G	G	G	17	E	E	19	19		
21	28	E	E	E	E	E ₁₈	G	G	G	G	G	G	37	36	34	37	G	G	G	15	E ₁₆	E ₁₂	E ₁₅	45		
22	49	32	26	16	E	27	29	41	40	G	G	G	36	36	G	G	G	G	30	18	E	E	E	E		
23	E	E	E	E	15	19	G	G	G	C	G	G	G	32	35	24	28	20	21	E ₁₂	E ₁₆	E	E ₁₅	E		
24	E ₁₅	E	E	E	E	G	G	G	G	G	G	G	G	37	35	28	30	20	G	21	17	E ₁₅	E	E		
25	E	E	21	19	12	G	G	G	G	G	G	40	43	37	35	C	C	C	C	18	E ₁₅	E	E ₁₃	E		
26	E ₁₈	E	17	16	E	G	G	G	G	G	G	38	38	37	36	G	G	20	22	18	18	E	E	E		
27	E	E	E	E	E	G	G	G	G	G	G	G	G	G	37	29	31	19	18	18	E ₁₅	E	E ₁₅	E ₁₄		
28	E ₁₅	E	E	E	E	G	G	G	G	48	G	G	45	41	36	26	32	30	22	E	E	E ₁₅	E ₁₆	E		
29	E	E	E	E	E	G	G	G	G	G	G	G	G	37	G	39	G	G	G	E ₁₅	E	E	E	E ₁₅		
30	E ₁₅	E	16	14	E	G	G	G	G	G	G	G	G	G	36	33	G	24	19	G	15	18	E	E ₁₆	E	
31																										
CNT	30	30	30	30	30	30	30	30	30	29	30	29	30	30	29	29	29	29	29	30	30	30	30	30	30	
MED	E	E	E	E	E	E	G	G	G	G	G	G	E ₂₇	G	G	G	G	G	18	E ₁₈	15	E ₁₄	E	E	E ₁₄	E ₁₄
UQ	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E	E ₁₅	G	G	G	G	G	G	34	36	36	35	28	23	20	21	18	17	E ₁₃	E ₁₅	E ₁₅	E ₁₆
LQ	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E	E

APR. 1970

FBES (0.1 MHZ)

IONOSPHERIC DATA

APR. 1970

F-MIN (0.1 MHZ)

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

Station WAKKANAI Lat. 45 23.6 N Long. 141 41.1 E Sweep 1 MHz to 20 MHz 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 ₁₃	E	E ₁₅	11	12	18	18	20	20	20	20	17	17	17	14	E ₁₆	E	E	E	E ₁₅	E
2	E ₁₅	E	E	E	E	E ₁₅	12	11	17	18	18	18	20	24	22	20	19	E	E	E	E	E	E	E
3	E ₁₄	E	E	E	E	E ₁₄	13	15	13	17	18	20	20	20	19	18	12	E	E ₁₇	E	E	E	E ₁₄	E ₁₆
4	E	E	E	E	E	E ₁₅	12	12	12	18	17	17	17	17	17	17	12	11	E	E	E	E	E	E ₁₂
5	E	E	E	E	E	E ₁₅	12	14	12	17	17	19	17	16	C	11	11	11	E ₁₆	E	E	E	E	E
6	E	E	E	E	E	E	11	11	11	16	17	16	18	17	17	15	E	11	E ₁₈	E	E	E ₁₂	E ₁₂	E ₁₆
7	E	E ₁₆	E	E	E	E ₁₆	11	16	17	20	20	25	20	22	20	16	11	11	E ₁₉	E	E ₁₆	E	E	E
8	E ₁₆	E	E	E	E	E ₁₂	15	16	16	17	17	21	16	19	18	16	16	11	11	E ₁₂	E	E ₁₃	E ₁₆	E ₁₆
9	E ₁₆	E ₁₅	E	E	E	E	14	11	15	20	19	C	25	21	19	17	17	12	12	E ₁₃	E ₁₅	E ₁₅	E ₁₅	E ₁₄
10	E ₁₆	E	E ₁₆	E ₁₅	E	E ₁₅	12	16	21	17	21	20	20	16	17	15	11	11	E	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₆
11	E ₁₆	E ₁₅	E	E	E	E ₁₅	E	12	12	19	19	22	22	22	17	11	E	11	E	E ₁₆	E ₁₆	E ₁₅	E ₁₆	E ₁₅
12	E ₁₅	E	E ₁₆	E	E	E ₁₆	12	11	12	16	22	22	19	17	16	15	15	11	11	E	E ₁₅	E ₁₃	E ₁₆	E ₁₅
13	E	E	E	E	E	E ₁₇	15	16	17	17	20	20	20	20	18	16	12	E	E	E ₁₃	E ₁₇	E ₁₅	E ₁₅	E ₁₄
14	E ₁₅	E	E	E	E	E ₁₄	12	12	16	17	20	20	20	20	17	17	12	E	E	E ₁₅	E	E ₁₅	E ₁₅	E ₁₆
15	E	E	E	E	E	E ₁₂	13	16	12	17	18	16	17	17	38	20	17	11	E	E ₁₅	E ₁₂	E	E	E ₁₆
16	E ₁₆	E	E	E	E	E	11	11	11	13	17	20	17	17	17	11	12	12	12	E	E	E ₁₆	E	E ₁₅
17	E	E ₁₅	E	E	E	12	11	11	13	17	17	17	17	16	16	12	11	E	E	E	E	E	E	E ₁₅
18	E ₁₅	E	E	E	E	E ₁₇	14	12	11	20	20	18	18	19	23	17	17	E	12	E	E	E	E	E
19	E	E	E	E	E	12	11	E	17	16	17	17	17	17	16	17	16	E	E	E	E ₁₅	E	E ₁₅	E ₁₅
20	E	E	E	E	E	E	12	12	12	18	17	17	20	19	17	13	11	11	13	E	E	E ₁₂	E	E
21	E	E	E	E	E	E ₁₈	E	11	11	11	16	19	17	17	16	17	11	11	E ₁₂	E	E ₁₆	E ₁₂	E ₁₅	E ₁₅
22	E	E	E	E	E	12	16	12	12	12	19	20	20	16	20	16	17	15	E ₁₇	E	E	E	E	E
23	E	E	E	E	E	E	17	11	13	C	17	18	17	13	11	11	11	E	E	E ₁₂	E ₁₆	E	E ₁₅	E
24	E ₁₅	E	E	E	E	E	12	11	12	17	16	20	17	17	17	12	11	13	12	E	E	E ₁₅	E	E
25	E	E	E	E	E	12	15	16	17	19	21	20	17	20	20	C	C	C	C	E ₁₅	E ₁₅	E	E ₁₃	E
26	E ₁₆	E	E	E	E	11	12	12	12	17	17	18	19	17	19	17	12	E	E	E	E	E	E	E
27	E	E	E	E	E	12	E	E	16	17	19	17	20	20	17	17	11	11	E	E	E ₁₅	E	E ₁₅	E ₁₄
28	E ₁₅	E	E	E	E	13	12	16	16	18	19	21	20	18	17	13	11	E	E	E	E	E ₁₅	E ₁₆	E
29	E	E	E	E	E	11	14	13	17	17	20	20	18	20	19	16	11	E	12	E ₁₅	E	E	E	E ₁₅
30	E ₁₅	E	E	E	E	13	11	11	11	17	17	17	20	17	18	17	12	11	12	E	E	E	E ₁₆	E
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	30	30	30	30	30	30	30	30	30	29	30	29	30	30	29	29	29	29	29	30	30	30	30	30
MED	E	E	E	E	E	E ₁₂	12	12	13	17	18	20	19	18	17	16	12	11	E ₁₁	E	E	E	E ₁₄	E ₁₄
UQ	E ₁₅	E	E	E	E	E ₁₅	14	15	17	18	20	20	20	20	19	17	16	11	12	E ₁₃	E ₁₅	E ₁₃	E ₁₅	E ₁₅
LQ	E	E	E	E	E	E ₁₁	11	11	12	17	17	17	17	17	17	13	11	E	E	E	E	E	E	E

The Radio Research Laboratories, Japan

APR. 1970

F-MIN (0.1 MHZ)

IONOSPHERIC DATA

APR, 1970

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 MHz to 20 MHz 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	235	225	235	240	240	245	250	270	260	255	280	290	310	300	305	315	300	305	295	280	275	255	250
2	260	260	260	265	260	280	315	305	295	300	295	300	315	305	300	310	300	315	305	300	300	295	280	275
3	260	250	260	285	275	285	325	325	310	315	295	300	290	290	290	290	290	295	305	300	290	280	260	260
4	260	265	275	270	265	270	310	305	310	305	295	295	290	295	295	305	300	305	305	295	295	285	275	265
5	270	270	280	275	270	285	310	315	295	315	305	300	300	290	295	300	295	310	310	295	290	285	275	275
6	270	255	285	275	270	275	290	295	295	290	285	295	295	290	295	300	295	295	295	310	290	260	235	250
7	265	260	265	260	265	275	285	295	290	295	285	300	300	295	300	310	305	300	305	300	290	275	280	270
8	270	270	265	270	270	270	305	305	310	310	300	290	290	295	300	290	290	300	300	300	295	280	265	285
9	270	260	270	275	265	270	310	310	305	315	300	295	290	290	280	280	290	295	295	285	285	265	295	240
10	250	260	290	285	255	265	305	275	280	275	270	255	285	290	275	290	305	305	300	310	295	285	270	270
11	270	260	265	270	275	280	315	305	300	285	280	280	270	275	285	285	290	295	300	295	280	260	260	270
12	270	260	275	280	275	275	310	310	295	290	285	270	290	280	290	290	290	290	285	295	295	290	285	290
13	265	260	255	255	260	245	290	275	285	285	265	290	290	280	285	300	300	305	305	290	285	285	275	265
14	270	265	275	275	270	275	305	300	300	295	295	285	280	285	290	295	300	305	300	305	290	275	275	275
15	285	285	290	300	285	270	310	300	310	305	295	285	285	280	280	295	295	300	310	300	290	285	275	280
16	270	270	275	270	250	255	310	300	310	290	275	270	285	290	285	305	295	305	300	285	275	275	285	280
17	265	270	275	275	280	300	320	275	305	275	285	280	280	290	285	295	300	300	310	295	275	275	265	275
18	250	250	260	260	260	F	F	305	300	310	290	290	295	300	295	310	310	310	310	300	275	280	265	255
19	250	270	260	255	265	260	285	300	290	300	285	290	305	295	305	310	315	300	295	270	280	285	260	280
20	265	305	265	265	275	280	270	305	290	265	265	285	295	305	305	310	300	320	315	305	290	295	275	245
21	250	255	280	245	240	240	275	275	285	240	260	280	300	305	300	305	295	300	295	285	265	255	245	240
22	250	255	270	220	240	235	245	240	R	R	210	W	210	W	235	280	270	295	290	F	F	F	F	F
23	F	F	275	295	275	295	305	300	300	295	295	300	300	295	300	310	310	305	305	310	305	280	260	255
24	260	265	270	280	270	265	290	290	290	285	280	300	300	300	300	295	300	305	300	300	285	280	270	260
25	250	255	265	280	265	290	300	300	310	305	300	305	300	300	305	C	C	C	C	305	275	275	275	255
26	260	F	F	F	270	295	300	310	310	300	305	295	290	300	290	305	305	305	305	290	290	280	270	265
27	270	275	285	280	275	290	300	310	305	315	295	295	280	300	290	290	295	310	305	305	290	280	265	260
28	255	265	290	310	290	300	330	300	315	310	295	285	290	285	295	305	305	305	300	300	300	270	270	265
29	275	280	280	300	280	300	285	290	300	295	285	290	290	300	305	310	310	310	305	295	280	275	260	260
30	260	270	275	275	275	285	310	300	280	300	290	295	295	290	290	280	295	305	290	280	280	265	275	275
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	29	28	29	29	30	29	30	30	29	29	30	30	30	30	30	29	29	29	29	29	29	29	29	29
MED	265	262	275	275	270	275	305	300	300	295	288	290	290	292	295	300	300	305	305	300	290	280	270	265
UQ	270	270	280	280	275	285	310	305	310	305	295	295	300	300	300	305	305	305	305	300	290	285	275	275
LQ	255	258	265	265	260	265	290	290	290	285	280	280	285	290	285	290	295	300	300	295	280	275	260	255

APR, 1970

M(3000)F2 (0,01)

IONOSPHERIC DATA

APR. 1970

M(3000)F1 (0,01)

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

Station **WAKKANAI** Lat. **45 23.6 N** Long. **141 41.1 E** Sweep 1 MHz to 20 MHz 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							290	325	325	360	340	350	360											
2										L														
3										L	L	L												
4										L														
5																C								
6											L		L		L	L								
7									L	L		L	410	L										
8									L	L					L	L								
9											L	C	L	L										
10								365	330	340		330	330											
11											L													
12												U L		L										
13													385											
14													380											
15											L													
16																								
17																								
18									L		L	395	390					L						
19									L	L	L	L	L	L	390		L							
20								L	L	A	L	L	L	380	380									
21							325		335	350	340	355	U 340		L	375								
22					A	290	A	A	375	375	360	355	355	350			L							
23								340		C	350	360	355	L	L									
24									335	355			340	380										
25							365	370	365		380		L	L	C	C	C							
26									L	L	L		L	L										
27									L				360		380									
28									360	L	L		355	L	365	360								
29									345	355	340		350	360	380		L							
30										345	375	U 350	L	L										
31																								
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							3	4	7	8	5	11	8	5	6	4								
MED							290	352	335	355	350	360	355	355	372	378								
UQ							308	365	352	362	375	380	375	360	380	380								
LQ							290	332	332	348	340	350	348	350	360	368								

APR. 1970

M(3000)F1 (0,01)

IONOSPHERIC DATA

APR. 1970

H^oF₂ (KM)

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

Station WAKKANAI Lat 45 23.6 N Long 141 41.1 E Sweep 1 MHz to 20 MHz 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						415	410		380	425	470	360	310												
2										275															
3										255	250	250													
4										250															
5																C									
6											250		250		260	270									
7									255	255		255	250	255											
8									245	255					250	250									
9											245	C	250	245											
10								285	365	390		455	355												
11									245																
12												255	260												
13												270													
14																									
15											250														
16																									
17																									
18									270		250	260	270			270									
19									U L 290	275	270	265	280	285	260	260									
20								290	310	310	285	280	280	275	260										
21							370		365	540	420	355	320		310	290									
22						500	450	570	R	R	725	W	725	W	550		375								
23								345			C	340	305	310	290	275									
24									345	360					310	290									
25								355	300	345		275		310	285		C	C	C						
26										260	265	275		280	275										
27											270			280		280									
28									280	270	270		310	295	280	270									
29									320	320		320		310	275	290	260								
30										290	300	295	310	305											
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	3	6	12	18	14	16	14	14	12	7	2								
MED						500	415	350	305	275	270	278	295	288	275	270	318								
UQ						432	410	355	345	340	338	310	310	288	285										
LQ						392	290	275	255	250	262	260	275	260	270										

APR. 1970

H^oF₂ (KM)

IONOSPHERIC DATA

APR. 1970

H'F (KM)

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

Station WAKKANAI Lat. 45 23.6 N Long. 141 41.1 E Sweep 1 MHz to 20 MHz 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	320	345	320	300	370	295	250	245	235	230	215	230	245	220	225	240	250	250	245	250	250	290	310
2	320	300	310	295	260	275	240	245	225	225	200	200	205	225	220	230	235	245	235	235	245	235	245	270
3	300	300	300	245	240	270	220	225	220	220	210	205	205	215	225	235	240	250	230	215	245	260	270	300
4	300	280	250	250	255	280	215	220	225	220	225	215	210	205	225	225	235	240	235	240	250	235	235	275
5	270	280	260	260	265	250	215	230	215	220	210	205	210	210	210	240	240	245	240	220	245	250	260	270
6	280	290	260	225	240	255	230	245	230	210	220	210	205	210	225	235	225	245	250	220	225	255	345	345
7	295	270	295	295	290	255	230	225	235	230	255	205	205	220	230	240	240	240	240	240	260	235	255	265
8	285	295	300	270	265	260	225	230	225	220	215	215	220	210	215	225	235	240	235	235	245	255	265	265
9	275	300	280	265	265	260	230	225	235	220	210	210	225	210	235	235	245	245	245	240	250	265	235	315
10	300	270	240	205	305	300	255	250	250	225	220	220	215	225	230	220	235	245	245	235	240	240	255	285
11	300	310	300	265	265	235	220	225	220	230	215	220	215	215	220	235	235	245	245	240	250	250	295	275
12	285	295	290	255	250	260	230	220	225	220	215	205	205	200	225	230	250	245	245	250	235	245	255	270
13	295	300	300	270	280	270	230	235	240	225	220	205	215	215	225	245	235	245	240	240	250	250	270	285
14	300	280	260	250	250	250	230	220	220	210	220	220	200	220	220	220	240	245	250	235	230	240	270	280
15	275	260	250	240	225	250	220	220	220	215	205	205	200	225	225	235	245	245	245	245	250	230	250	270
16	270	275	270	270	315	260	230	225	225	210	210	220	200	225	235	235	225	245	245	225	250	255	250	270
17	280	285	270	240	250	240	230	225	225	230	215	220	220	220	210	235	240	240	240	220	260	270	250	265
18	300	320	300	270	260	250	220	225	210	230	220	205	200	230	220	245	230	240	245	240	265	260	290	320
19	300	275	250	290	290	260	250	235	220	220	220	210	205	210	215	215	230	235	245	270	270	250	290	250
20	270	225	250	295	295	245	225	245	250	235	250	205	205	210	215	225	235	240	235	240	250	250	260	350
21	340	300	250	325	370	295	250	235	220	205	205	205	235	220	205	240	220	250	265	260	265	315	315	A
22	A	365	285	320	370	360	300	280	A	230	205	250	225	225	245	250	225	275	275	280	300	260	300	300
23	295	295	260	250	265	265	230	225	210	200	200	190	185	205	220	220	220	235	260	235	230	270	280	320
24	315	300	280	265	280	250	250	235	225	215	220	205	210	205	215	220	230	245	260	250	260	260	260	300
25	300	305	310	285	305	295	245	225	215	200	200	220	240	215	210	C	C	C	C	220	260	250	265	295
26	295	295	260	245	245	240	225	245	225	210	215	215	200	210	205	235	215	245	245	250	250	250	260	290
27	300	280	260	245	265	250	240	230	215	210	210	205	205	205	210	235	235	250	250	230	230	245	275	300
28	310	300	265	240	230	245	220	225	210	225	220	230	210	230	210	230	225	245	240	235	245	245	290	300
29	295	275	260	250	260	240	245	240	215	220	220	210	220	210	240	230	225	235	245	250	250	260	275	300
30	300	270	270	260	280	245	245	220	215	210	205	210	210	220	210	230	240	240	260	270	260	265	260	250
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	29	30	30	30	30	30	30	29	30	30	30	30	30	30	29	29	29	29	30	30	30	30	29	
MED	300	295	270	262	265	258	230	228	225	220	215	210	210	215	220	235	235	245	245	240	250	250	265	285
UQ	300	300	300	285	290	270	245	240	225	225	220	220	220	225	225	235	240	245	250	250	260	260	290	300
LQ	285	275	260	245	250	250	225	225	215	210	210	205	205	210	210	225	225	240	240	235	245	245	255	270

The Radio Research Laboratories, Japan

APR. 1970

H'F (KM)

IONOSPHERIC DATA

APR. 1970

H^oES (<M)

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

Station	WAKKANAI				Lat.	45 23 6 N				Long.	141 41 1 E				Sweep	MHz to 20				MHz 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	100	E	E	S	E	S	150	G	G	G	G	G	115	100	G	G	G	G	S	E	E	E	S	E			
2	100	E	E	E	E	S	G	G	G	G	G	G	G	G	G	G	100	100	100	100	E	E	E	100			
3	S	E	E	E	E	S	G	G	G	115	105	G	G	G	G	G	G	S	E	E	E	S	S				
4	E	E	E	E	E	S	G	G	G	G	110	105	G	100	100	G	G	100	G	100	100	E	E	S			
5	E	E	100	100	100	S	G	G	G	G	G	G	G	G	C	G	G	105	S	E	E	E	E	E			
6	E	100	E	E	E	G	G	G	G	110	105	105	105	100	G	G	100	105	S	E	E	S	S	S			
7	E	S	100	E	E	S	105	G	G	110	105	105	G	G	100	100	100	100	S	115	S	110	105	105			
8	S	100	105	100	105	G	180	G	G	115	110	110	105	105	105	105	100	100	100	S	E	100	105	100			
9	S	S	100	100	100	100	150	105	125	115	105	C	G	105	105	100	G	150	G	S	S	S	105	105			
10	105	105	105	S	100	150	150	150	140	120	115	110	105	105	105	105	105	140	120	100	100	S	S	S			
11	100	S	100	100	E	100	165	100	100	110	110	105	105	105	100	100	100	100	100	100	100	S	S	S			
12	105	105	S	E	100	G	G	100	105	100	G	G	105	100	100	100	100	100	100	100	S	S	S	105			
13	100	E	E	E	E	S	G	G	135	G	G	100	105	G	G	G	100	100	100	S	100	S	S	S			
14	S	E	100	E	E	G	G	G	G	G	G	G	G	100	100	105	100	100	100	S	E	S	S	S			
15	E	E	E	E	E	G	105	G	G	G	G	G	100	G	B	G	G	140	105	120	115	E	E	S			
16	S	E	E	E	E	G	G	G	120	115	G	G	105	100	100	105	G	G	G	E	E	S	E	S			
17	E	S	E	E	E	G	G	G	G	115	G	110	G	G	G	G	G	G	G	E	115	110	105	S			
18	S	E	E	E	E	S	G	125	115	G	G	120	115	G	G	100	G	G	G	125	110	E	E	E			
19	E	E	E	E	E	G	G	G	G	G	120	G	G	G	G	G	100	100	100	100	E	S	S	S			
20	E	E	E	E	E	150	145	135	115	110	115	105	105	105	100	105	G	G	G	100	E	100	105	105			
21	100	E	E	E	105	S	G	G	G	G	110	G	105	105	105	105	G	G	145	135	S	S	S	115			
22	110	130	135	125	145	125	120	115	115	110	G	105	105	105	115	G	G	125	125	120	E	E	E	E			
23	E	E	E	E	100	100	G	G	G	C	G	G	G	100	100	100	100	100	100	S	S	E	S	E			
24	S	E	E	E	E	G	G	G	125	G	110	110	105	105	100	105	100	105	135	115	110	S	E	E			
25	105	E	100	100	100	140	G	G	125	120	115	105	100	105	105	C	C	C	C	100	S	E	S	E			
26	S	105	100	100	100	G	100	145	140	G	115	110	105	105	105	100	G	100	100	100	100	E	E	E			
27	E	E	E	E	100	G	100	G	G	G	115	110	G	G	110	100	100	100	135	100	S	E	S	S			
28	S	E	E	100	E	G	G	G	G	115	115	110	110	105	100	100	100	100	100	E	E	S	S	E			
29	E	E	E	E	E	G	G	G	125	G	115	115	110	105	G	105	G	G	125	S	110	E	E	S			
30	S	E	100	100	E	G	G	G	G	120	115	120	G	G	105	105	105	100	G	100	110	E	S	E			
31																											
CNT	9	6	11	9	11	7	11	8	13	15	18	18	18	19	19	18	13	21	17	17	12	4	5	7			
MED	100	105	100	100	100	125	145	120	125	115	112	110	105	105	100	102	100	100	100	105	105	105	105	105			
UQ	105	105	102	100	102	145	150	140	125	115	115	110	105	105	105	105	100	105	125	115	110	110	105	105			
LQ	100	100	100	100	100	100	105	102	115	110	110	105	105	100	100	100	100	100	100	100	100	100	105	102			

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H^oES (<M)

IONOSPHERIC DATA

APR. 1970

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 MHz to 20 MHz in 20 sec in automatic operation

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

APR. 1970

TYPES OF ES

IONOSPHERIC DATA

APR. 1970

FOF2 (0.1 MHz)

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

Station AKITA Lat. 39 43.5 N Long. 140 08.2 E Sweep 1 MHz to 20 MHz 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	71	68	60	61	I ₆₂ ^R	57	61	67	68	66	67	85	89	94	86	91	96	94	96	79	63	59	59	59	
2	54	56	56	55	53	52	71	82	92	102	106	118	118	123	121	119	116	109	107	91	81	79	74	65	
3	62	58	I ₆₀ ^R	64	54	51	80	94	104	109	106	107	112	114	109	105	110	107	I ₁₀₈ ^R	95	65	72	I ₇₀ ^R	67	
4	68	68	73	64	61	61	87	96	110	116	119	122	124	127	129	128	119	111	103	88	77	73	I ₇₀ ^R	66	
5	66	I ₆₄ ^R	64	63	56	61	86	100	104	116	119	119	119	122	123	124	124	114	104	95	76	81	78	76	
6	I ₇₆ ^R	74	72	66	63	63	84	I ₁₁₂ ^R	120	119	124	I ₁₂₈ ^R	131	129	130	124	121	109	119	I ₁₁₀ ^R	68	66	62	I ₆₅ ^R	
7	70	66	64	62	63	64	85	102	117	117	122	129	132	127	126	124	114	108	114	I ₉₈ ^R	79	74	I ₇₂ ^R	71	
8	68	67	64	64	60	64	89	110	123	123	I ₁₂₃ ^R	124	126	130	129	121	112	111	114	95	81	76	80	82	
9	76	69	76	69	64	69	94	114	121	123	119	126	122	119	114	116	112	115	115	96	86	81	83	69	
10	69	71	74	62	46	52	89	S ₉₄	86	87	91	89	105	107	103	102	107	103	99	94	83	70	67	64	
11	66	65	66	64	59	64	84	91	99	104	108	114	123	127	129	128	119	115	113	94	86	84	81	83	
12	81	76	77	76	70	73	89	106	110	117	114	123	132	130	130	124	123	116	113	R	R	82	80	I ₈₀ ^R	
13	I ₇₇ ^R	I ₇₄ ^R	70	69	67	71	89	94	104	109	I ₁₁₈ ^R	I ₁₂₂ ^R	129	127	126	124	116	108	105	89	I ₈₂ ^R	76	I ₇₅ ^R	I ₇₄ ^R	
14	70	74	74	65	56	59	79	94	108	111	I ₁₁₃ ^R	119	118	121	118	117	116	111	110	101	79	76	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	112	111	123	126	129	126	119	113	110	96	82	78	79	78
16	78	78	76	66	63	64	91	102	117	112	119	122	131	137	134	132	118	108	106	93	81	79	80	78	
17	77	77	75	75	65	75	93	94	118	107	118	123	125	135	133	129	126	116	I ₁₁₂ ^R	90	83	82	72	I ₇₆ ^R	
18	72	71	I ₇₁ ^R	73	66	71	82	90	I ₁₀₉ ^R	108	116	131	124	127	132	133	126	119	110	96	86	89	86	83	
19	88	81	90	54	54	57	78	94	106	116	120	131	134	126	123	114	112	104	101	87	91	89	82	87	
20	73	81	62	52	56	61	91 ^R	97	109	117	126	127	131	131	121	114	105	107	97	84	71	68	66	I ₆₁ ^R	
21	I ₆₃ ^R	I ₆₃ ^R	60	46	46	46	68	65	63	70	84	99	109	108	98	93	94	89	87	78	74	I ₇₀ ^R	66	I ₆₆ ^R	
22	67	65	I ₅₀ ^R	34	36	43	53	I ₆₀ ^R	A	A	A	A	A	G	55	60	63	63	62	I ₆₁ ^R	62	61	I ₆₀ ^R	64	
23	I ₆₃ ^R	67	60	55	52	57	58	64	68	76	89	96	108	114	118	113	109	102	101	99	77	72	75	67	
24	69	67	72	63	52	54	63	68	72	74	83	94	105	102	98	103	99	100	97	94	I ₈₄ ^R	79	I ₇₈ ^R	I ₇₈ ^R	
25	I ₇₆ ^R	75	69	62	66	61	63	65	68	73	S ₉₂	104	108	106	108	I ₁₁₄ ^R	108	103	I ₁₀₄ ^R	93	73	76	76	I ₇₇ ^R	
26	75	77	I ₇₃ ^R	68	62	66	80	99	113	I ₁₁₂ ^R	124	118	117	126	121	118	109	101	101	97	81	81	I ₈₀ ^R	77	
27	I ₇₈ ^R	78	81	69	64	71	84	I ₉₆ ^R	99	105	108	114	109	124	128	118	116	111	107	I ₁₀₇ ^R	77	76	71	78	
28	R	R	I ₈₂ ^R	72	I ₆₀ ^R	63	81	93	102	96	I ₁₀₀ ^R	117	124	131	132	136	I ₁₂₈ ^R	116	112	I ₁₀₈ ^R	79	75	I ₇₅ ^R	I ₇₆ ^R	
29	I ₇₈ ^R	I ₈₁ ^R	I ₈₀ ^R	78	62	64	73	78	83	88	105	109	117	124	127	121	108	I ₉₈ ^R	93	87	77	79	I ₈₀ ^R	I ₇₉ ^R	
30	I ₇₉ ^R	76	74	68	68	76	91	89	94	106	102	114	120	119	114	114	114	107	96	86	88	I ₈₄ ^R	I ₈₂ ^R	82	
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	28	28	29	29	29	29	29	29	28	28	29	29	29	30	30	30	30	30	30	29	29	30	29	29	
MED	72	71	72	64	61	63	84	94	104	108	113	118	122	125	123	118	114	108	106	94	79	76	75	76	
UQ	77	76	75	69	64	66	89	99	112	116	119	123	126	127	129	124	119	113	112	96	83	81	80	78	
LQ	68	66	64	62	54	57	73	82	89	92	102	109	112	114	114	114	108	103	99	88	76	72	70	66	

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FOF2 (0.1 MHz)

IONOSPHERIC DATA

APR. 1970

FOF1 (0.01 MHZ)

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

Station AKITA Lat. 39 43.5 N Long. 140 08.2 E Sweep 1 MHz to 20 MHz 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							360	420	460	500	520	510	A	500	L	L	L								
2									L	L	L	520	590	L	L	L	L								
3									L	470	560	650	550	580	510	L	L								
4									L	L	510	L	520	580	560	L	L								
5									L	500	520	530	L	L	480	L	L								
6									L	L	510	550	550	510	540	L									
7							L	L	L	470	490	L	L	L	500	L									
8							L	L	L	500	600	600	490	L	A										
9									L	L	470	610	510	L	L	L	L								
10							L	L	520	540	610	520	650	L	510	L	L								
11									L	L	520	550	610	540	550	L	L								
12									L	L	L	L	650	540	540	L	A								
13									L	L	540	580	540	550	L	L	L								
14									L	L	520	550	L	560	550	L	L								
15								C	C	510	510	580	560	590	L	L									
16									L	L	580	600	620	L	L	L	L								
17									L	500	520	640	590	L	500	510	L								
18							L	L	L	L	540	L	560	510	520	L									
19							L	L	L	520	550	560	550	520	L	L									
20							L	L	U	510	500	550	550	530	470	460	L								
21					340	420	470	L	540	540	560	540	500	490	470	420	L								
22					320	400	500	A	A	A	A	A	490	470	480	460	L								
23							480	500	520	560	550	530	540	510	L	L	L								
24						L	U	460	560	520	520	560	550	530	520	L	460	L							
25						U	420	470	480	530	540	550	520	540	540	500	470	L							
26							L	L	L	520	540	520	520	510	500	L	L								
27							L	L	L	L	590	540	540	520	L	L	L								
28							L	L	L	570	580	570	580	540	510	L	L								
29							L	540	530	540	540	560	530	540	500	A	A								
30							L	540	510	540	570	600	540	L	520	460	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						2	4	6	7	13	25	26	24	23	23	10	5								
MED						330	410	470	520	510	520	550	555	540	520	500	460								
UQ						420	480	540	530	540	580	595	555	540	510	460									
LQ						380	460	490	500	510	540	540	525	505	480	460									

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FOF1 (0.01 MHZ)

IONOSPHERIC DATA

APR. 1970

FOE (0.01 MHZ)

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

Station AKITA Lat. 39 43.5 N. Long. 140 08.2 E Sweep 1 MHz to 20 MHz 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	230	290	310	330	345	360	375	380	365	345	310	245		A				
2						S	215	290	320	330	350	355	375	385	370	355	315	270	195	B				
3						S	215	285	315	335	350	365	380	375	360	345	310	260		A				
4						S	215	280	315	335		A	A	A	385	365	340	305	255		B			
5						S	220	285	320	340	350	360	375	385	370	350	305	260		B				
6						B	225	280	310	335	350	365	385	380	365	345	305	255		B				
7						S	220	285	315	335	350	365	375	385	370	350	325	265	185					
8						S	225	285	320	340	360		A	A	385	A	A	A	270	210				
9						B	230	295	325	345	360	375	385	385	365	345	310	275		A				
10						B	245	300	330	350	360		A	A	385	380	345	310	260		A			
11						B	235	295	320	345	360	370	380	380	370		A	A	A	A				
12						B	230	290	320	340	360	375	385	390	375	350	310		A	A				
13						B	240	300	325	345	360	370	385	390	375	340	315	275		B	S			
14						B	235	295	325	350	360	370	380	380	360	335	315	265	195		S			
15						C	C	C	C	C	370	385	395	390	375	355	315	265		A	S			
16						B	235	295	320	350	365	380	390	390	375	340	305	260		A	S			
17						B	235	290	320	340	360	380		A	A	A	340	305	260	210		S		
18						B	240	290	320	340	360		A	A	380	370	345	310	270		A	S		
19						S	240	295	320	345	360	375	385	385	370	340	300	250		B	S			
20						B	255	300	330	350		A	A	A	A	A	325	305	270		A	S		
21						B	245	295	320	345		A	A	A	380	365	340	305	255		A	S		
22						A	A	A	A	A	A	A	A	A		365	345	310	265		A	S		
23						B	240	295	320	345	365	370	380	380	360	340	310	270		A	S			
24						B	245	290	320	345		A	A	A	A	A		305	265		A	S		
25						B	245	300		A	A	A	A	A	A	A		285	210		S			
26						A	260	300	325		A	A	A	A	A	365	350	325	280		A	S		
27						B	255	295		A	A	A	380	385	390	375	340	310	275		A	S		
28							190	250	300	325		A	A	A	380	375	360	330	285	230		B		
29						B	250	300	330	350	365		A	A	A	A	A	A	A	A		S		
30						A	250	300	325	345	365		A	A	A	375	340	320	275		A	A		
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	28	28	26	24	21	17	16	22	24	25	26	27	7					
MED						190	238	295	320	345	360	370	382	385	370	345	310	265	210					
UQ						245	300	325	345	360	375	385	385	375	350	315	272	210						
LQ						228	290	320	338	350	365	378	380	365	340	305	260	195						

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FOE (0.01 MHZ)

IONOSPHERIC DATA

APR. 1970

FOES (0.1 MHZ)

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

Station	AKITA							Lat.	39 43 '5 N							Long.	140 08 '2 E							Sweep	1 MHz to 20 MHz 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 ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	G	31	36	41	39	42	J ₄₉	G	G	G	G	J ₄₁	J ₂₈	J ₂₆	E ₁₄	E ₁₄	E ₁₄	E ₁₄						
2	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	G	G	G	G	G	G	G	G	G	G	G	G	J ₁₈	E ₁₄	E ₁₄	E ₁₄	E ₁₄							
3	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	G	G	G	G	G	G	G	G	G	G	G	J ₂₄	E ₁₄	E ₁₄	J ₁₈	E ₁₄	E ₁₄							
4	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	G	G	G	38	41	40	38	G	G	G	G	G	E ₁₉	E ₁₄	E ₁₄	E ₁₄	E ₁₄							
5	E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₆	G	G	G	G	G	G	G	G	G	G	G	E ₁₈	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄							
6	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₈	G	G	G	G	38	G	G	G	G	G	G	E ₂₀	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄							
7	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	G	G	G	E ₃₈	40	E ₄₂	41	G	42	39	G	E ₂₈	G	E ₁₄	J ₁₈	E ₁₄	E ₁₄							
8	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₈	E ₂₃	G	G	37	42	41	42	J ₄₃	G	J ₄₁	J ₆₃	G	G	E ₁₄	E ₁₄	E ₁₄	E ₁₄							
9	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₈	G	G	G	37	40	G	J ₄₁	G	39	G	G	G	22	J ₂₀	E ₁₄	E ₁₄	E ₁₄							
10	E ₁₄	E ₁₄	E ₁₄	J ₁₇	J ₂₀	E ₁₅	E ₁₅	G	G	42	42	42	45	43	G	G	G	G	G	J ₁₈	E ₁₄	E ₁₄	E ₁₄	E ₁₄							
11	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₆	E ₁₆	E ₁₆	G	G	G	G	41	G	G	44	38	40	J ₅₀	35	J ₄₅	J ₃₆	J ₁₈	E ₁₄	E ₁₄							
12	E ₁₄	E ₁₄	E ₁₄	J ₁₄	E ₁₇	E ₁₇	E ₁₇	G	G	G	G	G	G	G	40	G	G	G	J ₅₅	J ₅₈	J ₆₄	J ₄₃	E ₁₄	E ₁₄							
13	E ₁₄	J ₁₈	J ₂₀	J ₂₀	J ₁₈	E ₁₉	E ₁₉	G	33	39	43	46	40	40	G	G	G	G	G	E ₂₃	J ₂₀	E ₁₄	E ₁₄	E ₁₄							
14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	J ₂₈	J ₂₈	G	G	G	37	38	G	G	G	G	G	G	G	E ₁₄	E ₁₄	E ₁₄	C	C							
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	G	40	40	G	G	J ₃₆	J ₃₄	J ₂₀	J ₃₃							
16	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₆	E ₁₆	26	33	37	38	42	41	G	G	G	G	G	G	G	28	E ₁₄	E ₁₇	J ₂₀							
17	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₈	E ₁₈	27	G	36	G	39	G	43	J ₄₅	J ₄₃	42	J ₅₇	J ₅₃	26	E ₁₄	E ₁₄	J ₂₀								
18	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₉	E ₁₉	G	36	42	42	45	45	J ₄₈	G	G	G	G	G	J ₃₆	J ₂₄	J ₂₄	J ₂₀								
19	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	J ₁₈	J ₁₈	27	35	39	39	39	40	G	J ₃₇	G	G	G	G	E ₂₂	E ₁₄	E ₁₄	E ₁₄								
20	E ₁₄	E ₁₄	E ₁₄	E ₁₄	J ₁₈	E ₁₈	E ₁₈	G	G	G	G	37	J ₄₇	J ₄₄	J ₄₃	39	G	J ₃₅	34	J ₂₆	J ₂₀	E ₁₄	E ₁₄								
21	E ₁₄	J ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₉	E ₁₉	G	34	35	G	38	39	42	G	G	G	G	G	20	E ₁₄	E ₁₄	J ₁₈								
22	E ₁₄	E ₁₄	J ₂₆	E ₁₄	J ₂₀	22	32	J ₄₃	J ₆₇	J ₆₄	J ₈₂	J ₇₉	J ₅₄	40	G	G	35	29	J ₄₆	J ₆₀	J ₄₅	J ₅₀	E ₁₄								
23	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₉	E ₁₉	E ₁₉	G	G	35	G	G	41	J ₃₉	40	40	G	G	G	24	J ₂₃	J ₃₅	E ₁₄	E ₁₄							
24	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₂₀	E ₂₀	G	32	40	41	39	39	39	J ₄₃	J ₃₇	G	G	J ₂₉	J ₂₆	J ₃₇	J ₃₁	J ₃₄								
25	E ₁₄	J ₂₄	J ₃₄	J ₃₄	J ₂₃	E ₁₇	E ₁₇	G	35	39	41	39	40	42	J ₆₃	J ₄₃	J ₄₅	J ₄₈	G	G	J ₃₉	E ₁₄	E ₁₄	E ₁₄							
26	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	21	31	34	39	41	39	42	45	J ₃₉	G	37	G	J ₂₅	24	J ₂₇	E ₁₄	J ₁₉	E ₁₄	E ₁₄							
27	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₉	E ₁₉	31	G	38	44	42	G	G	G	G	38	G	G	32	27	E ₁₄	E ₁₄	E ₁₄							
28	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	G	G	G	G	42	40	J ₄₉	J ₆₃	G	J ₆₃	42	G	G	E ₁₇	J ₂₀	J ₂₄	J ₂₀							
29	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₉	E ₁₉	G	G	42	42	44	43	J ₄₄	J ₅₀	J ₄₈	J ₅₄	J ₇₆	J ₈₄	J ₂₈	J ₂₈	J ₂₆	J ₂₀								
30	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	22	29	38	44	39	42	43	43	39	G	G	G	J ₂₄	23	J ₂₉	J ₂₉	J ₂₉	J ₂₀	E ₁₄							
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	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	29	29							
MED	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₈	E ₁₈	G	G	36	38	39	40	40	G	G	G	G	G	24	J ₁₉	E ₁₄	E ₁₄	E ₁₄							
UQ	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₉	E ₁₉	23	33	39	42	42	42	J ₄₃	39	40	39	34	32	J ₂₈	J ₂₇	J ₂₀	J ₂₀	E ₁₄							
LQ	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₅	E ₁₅	G	G	G	G	38	G	G	G	G	G	G	G	E ₁₉	E ₁₄	E ₁₄	E ₁₄	E ₁₄							

The Radio Research Laboratories, Japan

APR. 1970

FOES (0.1 MHZ)

IONOSPHERIC DATA

APR. 1970

FBES (0.1 MHz)

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

Station AKITA Lat. 39 43.5 N Long. 140 08.2 E Sweep 1 MHz to 20 MHz 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 ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	G	30	35	40	39	40	49	G	G	G	G	41	26	23	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
2	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	G	G	G	G	G	G	G	G	G	G	G	G	G	18	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
3	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	G	G	G	G	G	G	G	G	G	G	G	G	20	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
4	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	G	G	G	38	39	38	38	G	G	G	G	G	E ₁₉ B ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₅ S ₁₄	E ₁₄ S ₁₄		
5	E ₁₅ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₆ S ₁₄	G	G	G	G	37	G	G	G	G	G	G	G	E ₁₈ B ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
6	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₈ B ₁₄	G	G	G	G	38	G	G	G	G	G	G	G	E ₂₀ B ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
7	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	G	G	G	E ₃₈ B ₁₄	40	E ₄₂ B ₁₄	41	G	40	39	G	E ₂₈ B ₁₄	G	E ₁₄ S ₁₄	17	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
8	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₂₃ B ₁₄	G	G	37	40	40	40	42	G	38	54	33	G	G	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
9	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₈ B ₁₄	G	G	G	37	40	G	40	G	39	G	G	G	21	18	E ₁₃ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
10	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	14	17	E ₁₅ B ₁₄	G	G	40	40	40	43	42	G	G	G	G	G	20	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
11	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E ₁₆ B ₁₄	G	G	G	G	41	G	G	40	37	36	36	32	42	28	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
12	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E	E ₁₇ B ₁₄	G	G	G	G	G	G	40	G	G	G	55	58	55	38	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
13	E ₁₄ S ₁₄	E	E	E	E	E ₁₉ B ₁₄	G	33	38	42	44	40	40	G	G	G	G	G	E ₂₃ B ₁₄	19	E ₁₄ S ₁₄	E ₂₀ B ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	17	G	G	G	37	38	G	G	G	G	G	G	G	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	40	40	G	32	33	24	E	29	19	E ₁₄ S ₁₄
16	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₆ B ₁₄	26	G	37	38	40	41	G	G	G	G	G	G	26	E ₁₄ S ₁₄	E ₁₇ S ₁₄	E	E	E ₁₄ S ₁₄	
17	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₈ B ₁₄	27	G	36	G	39	G	42	41	37	G	41	44	26	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
18	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₉ B ₁₄	G	33	42	42	44	42	46	G	G	G	G	G	36	20	21	19	E ₁₂ S ₁₄	E ₁₄ S ₁₄	
19	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	27	33	38	38	38	39	G	35	G	G	G	G	E ₂₂ B ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
20	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E ₁₈ B ₁₄	G	G	G	G	37	45	41	40	37	G	34	34	24	E	E ₁₂ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₉ B ₁₄	
21	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₉ B ₁₄	G	G	35	G	38	39	40	G	G	G	G	G	20	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	
22	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	E ₁₄ S ₁₄	18	21	26	38	A	A	A	A	A	40	G	G	G	30	46	A	41	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
23	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E ₁₉ B ₁₄	G	G	35	G	G	39	39	38	38	G	G	G	24	20	20	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
24	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₂₀ B ₁₄	G	32	36	37	37	39	39	39	37	35	G	G	29	24	26	23	26	20	
25	E ₁₄ S ₁₄	18	30	24	17	E ₁₇ B ₁₄	G	34	38	39	39	40	42	41	40	39	36	G	G	E	E ₁₂ S ₁₄	E ₁₄ S ₁₄	18	E ₁₄ S ₁₄	
26	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	21	29	34	39	40	39	42	43	39	G	37	G	23	24	20	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
27	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₉ B ₁₄	31	G	37	40	41	G	G	G	G	36	G	G	26	E ₁₄ S ₁₄	E ₁₄ S ₁₄	21	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
28	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	G	G	G	G	41	39	44	61	G	43	G	G	G	E ₁₇ B ₁₄	18	20	18	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
29	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₉ B ₁₄	G	G	39	40	42	42	41	41	42	42	49	80	24	26	23	19	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
30	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	21	29	38	39	39	42	42	42	39	G	G	G	23	23	22	23	20	E	E ₁₄ S ₁₄	
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	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	29	29	
MED	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₈ B ₁₄	G	G	35	38	39	39	40	G	G	G	G	G	23	E ₁₈ B ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
UQ	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₉ B ₁₄	23	32	38	40	40	42	42	39	38	36	G	30	26	22	17	E ₁₉ B ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
LQ	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₅ S ₁₄	G	G	G	G	37	G	G	G	G	G	G	G	E ₁₉ B ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	

The Radio Research Laboratories, Japan

APR. 1970

FBES (0.1 MHz)

IONOSPHERIC DATA

APR. 1970

F-MIN (0.1 MHZ)

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

Station AKITA Lat. 39 43.5 N. Long. 140 08.2 E Sweep 1 MHz to 20 MHz 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 ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	17	19	20	21	29	23	21	20	18	16	15	15	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
2	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	15	17	16	19	20	18	24	22	22	20	14	18	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
3	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	16	14	18	21	23	24	21	20	20	20	18	18	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
4	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	18	20	21	20	21	24	25	20	20	16	15	19	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₃ S ₁₃		
5	E ₁₅ S ₁₅	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₆ S ₁₆	16	16	19	19	20	19	21	21	20	19	19	16	18	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
6	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	15	18	18	20	20	21	24	20	23	20	20	18	20	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
7	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	17	19	21	38	29	42	28	34	26	25	16	28	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
8	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	23	19	20	20	22	26	24	23	19	23	18	16	16	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
9	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	19	19	20	22	21	26	24	29	23	21	20	16	14	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
10	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E	E	15	15	18	20	21	19	24	21	23	22	19	14	16	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
11	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E	16	18	18	19	22	23	24	22	24	15	20	17	14	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
12	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E	E	17	15	18	19	20	24	24	23	24	27	21	20	19	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
13	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₄ S ₁₄	19	18	18	21	24	21	24	26	26	18	28	16	18	23	E ₁₄ S ₁₄	E ₁₄ S ₁₄	20	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	17	17	18	20	19	22	22	21	21	19	18	14	18	13	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	24	20	24	24	29	21	18	14	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
16	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	16	15	14	18	20	21	21	19	17	15	18	14	16	13	E ₁₄ S ₁₄	E ₁₇ S ₁₇	E ₁₀ S ₁₀	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
17	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	16	15	14	19	19	21	20	21	20	19	15	15	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
18	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₄ S ₁₄	19	16	18	18	22	24	21	20	24	26	21	18	18	13	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
19	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	19	15	14	20	21	22	21	21	18	15	15	16	22	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄		
20	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E	E	18	19	14	18	20	20	21	25	21	18	19	18	16	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	19	
21	E ₁₄ S ₁₄	E	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₄ S ₁₄	19	16	19	19	22	21	20	21	20	19	16	15	15	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₂ S ₁₂	
22	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E	14	19	18	18	19	22	20	24	20	19	19	18	18	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
23	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E	E	19	16	15	19	20	20	19	25	20	20	18	20	17	14	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
24	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	20	18	15	19	22	22	24	15	18	18	18	14	18	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
25	E ₁₂ S ₁₂	E	E	E	E	E	17	16	18	15	19	19	24	21	19	20	14	18	15	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
26	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	14	16	15	19	19	19	20	18	19	23	19	18	14	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
27	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	19	16	15	20	20	19	25	21	24	20	21	19	14	16	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
28	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	16	16	19	19	20	21	24	22	23	20	20	19	16	15	17	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	
29	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	19	16	17	20	20	20	20	20	20	20	19	18	18	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₃ S ₁₃	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
30	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₄ S ₁₄	14	16	19	19	19	20	26	22	22	19	18	18	14	17	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄
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	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	29	29		
MED	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	16	16	18	19	20	21	22	22	21	20	19	18	16	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
UQ	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	18	18	18	20	21	22	24	24	24	22	21	18	18	16	E ₁₂ S ₁₂	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	
LQ	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	16	15	18	19	20	20	21	20	19	18	15	15	14	14	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	E ₁₄ S ₁₄	

APR. 1970

F-MIN (0.1 MHZ)

IONOSPHERIC DATA

APR. 1970

M(3000)F2 (0,01)

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

Station	AKITA				Lat. 39 43.5 N				Long. 140 08.2 E				Sweep 1 MHz to 20 MHz 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	270	255	245	250	250	250	260	265	275	285	285	290	315	295	310	305	310	310	305	275	270	265	270		
2	275	275	270	280	280	280	310	315	310	315	300	305	300	290	290	295	300	305	310	310	285	290	300	295	
3	275	270	275	300	285	290	320	325	325	315	305	295	285	290	285	285	290	295	300	300	275	280	280		
4	270	270	290	285	260	270	315	310	310	305	295	290	290	290	285	290	300	300	310	300	285	285	285	290	
5	285	280	280	280	275	280	320	320	320	300	300	300	295	285	285	290	295	300	310	300	285	275	275	280	
6	280	270	285	295	285	275	300	310	310	305	290	290	290	285	290	290	290	280	300	310	315	260	255	255	
7	270	290	260	260	260	275	295	305	310	310	285	285	290	285	290	290	285	285	300	290	280	285	280	280	
8	275	270	265	270	265	260	315	310	310	300	290	290	290	285	285	285	290	290	305	300	270	275	270	280	
9	280	270	270	285	260	265	305	310	305	300	300	295	285	285	280	275	275	300	300	300	280	270	285	250	
10	255	270	290	290	260	265	310	300	280	280	270	270	285	280	280	285	300	300	295	300	290	295	270	255	
11	260	265	260	270	270	285	300	300	305	290	285	275	275	275	280	280	285	290	300	290	270	265	265	280	
12	270	270	275	280	270	275	320	310	300	300	290	285	280	275	280	285	290	295	295	R	R	285	275	280	
13	280	270	260	250	255	260	305	300	300	290	280	280	285	285	285	285	295	295	300	290	280	280	270	270	
14	270	270	285	295	285	285	290	310	305	300	290	295	285	285	290	290	295	300	300	310	280	270	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	290	280	280	285	285	290	295	295	305	305	285	280	280	280
16	280	280	290	290	255	265	305	305	310	285	290	280	280	285	285	285	295	290	300	295	275	275	275	280	
17	275	270	280	295	295	295	320	310	300	300	290	280	280	280	285	290	305	300	290	265	270	285	270		
18	265	255	260	275	290	290	320	285	300	310	295	300	285	285	285	295	300	300	300	300	280	280	260	260	
19	270	265	315	285	270	265	310	310	305	295	290	290	290	295	290	290	285	295	295	280	275	270	270	285	
20	260	295	280	270	260	260	310	290	300	290	295	285	290	290	285	300	300	300	305	300	285	280	280	260	
21	255	255	270	245	245	245	255	270	270	260	270	280	290	295	300	290	300	305	290	290	270	270	260	245	
22	255	265	300	265	250	245	250	275	A	A	A	A	A	G	240	250	270	290	290	275	260	260	260	260	
23	260	270	285	280	265	300	300	310	300	295	295	295	285	290	300	290	300	305	300	305	305	280	280	270	
24	265	270	285	275	275	260	290	300	290	290	290	290	295	295	290	300	300	300	300	300	290	270	270	270	
25	270	270	275	275	280	275	290	300	310	290	300	300	300	290	280	295	300	300	310	290	280	275	270	270	
26	280	275	285	285	280	305	300	300	310	290	300	290	290	285	285	295	295	290	305	295	290	275	275	265	
27	270	270	300	295	265	290	290	310	310	305	300	295	270	290	290	295	300	295	300	290	305	270	295	265	
28	R	R	290	305	285	290	300	310	305	295	290	290	280	280	285	285	300	300	305	300	290	270	270	265	
29	275	280	290	300	280	300	305	310	290	290	285	280	290	290	295	300	300	300	290	290	285	270	265	270	
30	270	275	275	280	280	290	310	310	285	300	285	275	280	285	270	280	280	290	300	280	275	270	265	270	
31																									
CNT	28	28	29	29	29	29	29	29	28	28	29	29	29	30	30	30	30	30	30	29	29	30	29	29	
MED	270	270	280	280	270	275	305	310	305	298	290	290	285	285	285	290	295	300	300	300	280	275	270	270	
UQ	275	275	290	290	280	290	315	310	310	302	295	295	290	290	290	295	300	300	305	300	290	280	280	280	
LQ	265	270	270	270	260	265	295	300	300	290	285	280	280	285	280	285	290	290	300	290	275	270	265	265	

APR. 1970

M(3000)F2 (0,01)

IONOSPHERIC DATA

APR. 1970

M(3000)F1 (0.01)

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

Station AKITA Lat. 39 43.5 N. Long. 140 08.2 E Sweep 1 MHz to 20 MHz 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						290	310	335	335	345	360		A	380	L	L	L								
2									L	L	L	370	345	L	L	L	L								
3									L	370	345	340	355	345	355	L	L								
4									L	L	370	L	380	350	360	L	L								
5									L	U	365	370	370	L	L	375	L	L							
6									L	L	375	365	350	360	345	L									
7								L	L	370	380	L	L	L	360	L									
8								L	L	L	380	350	345	370	L	A									
9									L	L	385	350	375	L	L	L	L								
10								L	350	350	330	375	330	L	365	L	L								
11									L	L	370	360	340	355	360	L	L								
12									L	L	L	L	340	370	350	L	A								
13									L	L	370	350	355	355	L	L	L								
14									L	L	370	365	L	345	350	L	L								
15									C	C	380	375	350	345	345	L	L								
16									L	L	350	335	325	L	L	L	L								
17									L	365	365	330	340	L	360	360	L								
18								L	L	L	L	350	L	360	360	350	L								
19								L	L	L	365	365	360	350	350	L	L								
20								L	L	U	360	380	365	360	360	370	370	L							
21					260	320	340	L	335	340	340	355	360	370	360	360	L								
22					260	275	280	A	A	A	A	A	350	365	335	325	L								
23							340	340	355	340	350	360	335	355	L	L	L								
24						L	U	350	340	355	355	340	345	360	345	L	350	L							
25					U	355	340	355	360	350	355	365	355	350	350	345	L								
26						L	L	L	370	360	370	365	355	350	L	L									
27						L	L	L	L	340	370	360	350	L	L	L									
28						L	L	L	335	350	340	335	340	340	L	L									
29						L	355	360	355	355	345	360	360	355	A	A									
30						L	355	355	360	340	335	355	L	345	350	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					2	4	6	7	13	25	26	24	23	23	10	5									
MED					260	305	340	350	360	365	352	350	355	355	350	350									
UQ					338	340	355	365	370	365	360	360	360	360	350										
LQ					282	310	340	355	350	340	340	350	350	345	345										

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M(3000)F1 (0.01)

IONOSPHERIC DATA

APR. 1970

H^oF₂ (KM)

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

Station AKITA Lat. 39 43.5 N. Long. 140 08.2 E Sweep 1 MHz to 20 MHz 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						410	380		390	365	370	320	265	270	250	260	265								
2									250	250	265	260	280	270	265	260	255								
3									255	255	260	290	270	300	270	270	280								
4									260	250	265	260	270	300	300	270	255								
5									250	260	265	265	275	270	260	290	265								
6									250	260	255	265	285	270	295	280									
7								260	255	255	255	260	270	260	275	255									
8								250	250	250	260	290	290	265	270	265									
9									250	255	250	290	265	285	290	300	270								
10								285	295	300	320	275	315	290	275	255	280								
11									250	270	265	280	300	290	300	290	260								
12									250	260	260	295	315	280	300	270	275								
13									270	290	270	300	290	290	290	280	255								
14									260	255	260	280	275	295	280	270	265								
15									C	C	260	260	315	305	315	280	275								
16									260	255	280	305	320	290	300	265	255								
17									255	255	265	320	315	290	290	285	280								
18								245	270	255	270	290	265	290	300	290	250								
19								245	255	270	270	290	280	285	290	260	250								
20								245	255	265	265	265	290	275	265	270	260								
21						460	370	300	315	410	350	340	305	280	280	280	270	260							
22						440	460	400	A	A	A	A	A	G	550	455	355	290							
23								300	300	305	320	315	300	300	295	285	255	260							
24								295	300	320	300	290	310	300	300	300	280	275	260						
25								300	315	265	295	290	300	290	300	305	290	275	260						
26								275	255	260	280	275	290	300	285	260	250	270							
27								250	265	270	270	310	290	305	280	250	270	255							
28								250	260	250	315	305	310	320	300	290	270	255							
29								260	300	290	300	290	305	300	290	290	265	280							
30								255	300	290	295	290	330	310	300	310	290	250							
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						2	5	17	28	28	29	29	29	30	30	30	27	10							
MED						450	370	260	260	260	270	290	290	290	290	280	265	260							
UQ						410	300	282	290	290	305	305	300	300	290	275	270								
LQ						300	250	252	255	260	275	275	280	275	265	255	255								

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H^oF₂ (KM)

IONOSPHERIC DATA

APR. 1970

H'F (KM)

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

Station **AKITA** Lat. **39° 43.5' N** Long. **140° 08.2' E** Sweep **1 MHz to 20 MHz** 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	310	345	340	305	355	305	270	255	250	220	215	220	215	240	240	245	255	250	235	240	270	300	310
2	315	315	310	295	270	280	240	240	230	230	205 ^H	205	205	225	240	235	245	245	240	235	245	250	245	255
3	295	310	300	250	230	275	245	235	230	210	215	215	215	205	220	235	250	255	245	220	220	290	290	305
4	300	295	260	240	290	300	230	230	230	230	210	220	220	215	220	240	245	245	240	240	245	250	270	290
5	270	285	280	255	255	290	240	230	230	215	220	220	230	230	230	240	245	245	240	235	245	290	285	295
6	290	290	265	245	265	280	240	240	240	235	220	220	205	230	220	240	240	245	260	230	200	305	350	350
7	315	270	295	290	305	290	240	245	245	225	210	245	240	240	240	240	240	250	250	235	255	250	280	275
8	290	295	300	275	265	310	240	240	240	235	215	215	225	210	230	240	245	250	250	225	245	280	290	270
9	270	300	280	265	250	300	240	235	230	230	210	215	215	205 ^H	240	245	250	260	250	230	245	260	255	310
10	315	295	235	230	320	325	245	250	250	250	235	235	230	250	240	230	235	250	245	240	240	245	255	295
11	310	300	290	255	245	260	235	235	230	230	215	225	225	215	220 ^H	240	245	250	255	245	245	260	295	290
12	295	290	280	245	255	280	230	235	230	240	235	235	240	205	205	245	260 ^{I A}	270	265	260	235	230	270	270
13	280	285	305	300	310	300	245	235	235	240	210	210	245	230	230	255	245	255	250	245	255	265	270	295
14	295	280	255	245	255	275	240	235	230	230	215	200	230	215	230	240	245	250	245	235	220	265	C	C
15	C	C	C	C	C	C	C	C	C	C	220	210	215	215	245	250	240	250	245	235	240	260	275	270
16	280	280	255	270	340	270	240	235	230	230	220	205	230	250	245	230	250	235	250	230	250	260	280	285
17	290	290	270	245	245	245	230	230	230	220	215	220	230	240	210	215	250	250	240	230	260	290	265	290
18	295	320	315	290	250	280	230	230	240	245	230 ^H	215	240	230	240	240	240	250	240	240	260	290	295	320
19	295	275	230	235	305	295	250	230	230	230	230	220	210	210	230	240	230	240	255	250	290	270	300	265
20	270	250	230	290	320	270	250	230	230	215	210	230	215	230	240	220	230	255	240	240	250	265	260	350
21	350	295	270	280	370	300	255	245	240	215	210	200	215	215	230	230	235	240	260	245	260	305	315	365
22	340	280	250	300	430	340	245	A	A	A	A	A	A	A	240	235	230	240	260	305	295 ^{I A}	330 ^{I A}	300	310
23	305	295	270	245	255	255	250	225	210	195	210	205 ^H	200	195	220	240	240	245	250	240	220	280	280	320
24	320	305	275	250	270	295	250	230	240 ^H	250	215	210	205	200 ^H	215	240	230	245	260	250	260	285	305	320
25	315	300	310	300	295	255	250	240	230	210	210	200	245	230	230	250	210	255	255	230	260	265	310	300
26	300	285	265	220	240	240	235	240	235	230	220	235	230	210	230	245	240	245	255	250	240	270	275	315
27	305	290	265	220	275	255	240	235	230	220	230	215	210	205	240	230	240	255	255	230	220	265	300	305
28	320	295	265	230	220	230	240	230	230	230	220	200	225 ^{I A}	225	230 ^{I A}	250	245	245	250	240	230	275	310	315
29	315	275	260	245	225	245	250	240	230	230	215	230	215	230	230	245	A	A	255	250	265	300	300	305
30	300	280	275	260	280	265	230	230	240	230	225	215	215	215	230	230	240	245	255	260	280	290	270	280
31																								
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	29	29	29	29	29	29	28	28	28	29	29	29	30	30	30	29	29	30	30	30	30	29	29
MED	300	290	270	255	270	280	240	235	230	230	215	215	215	220	230	240	240	250	250	240	245	270	285	300
UQ	315	300	295	290	305	300	250	240	240	235	220	220	230	230	240	245	245	255	255	245	260	290	300	315
LQ	290	280	260	245	250	260	240	230	230	220	210	210	210	210	220	230	240	245	245	230	240	260	270	285

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H'F (KM)

IONOSPHERIC DATA

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H¹ES (KM)

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

Station	AKITA				Lat. 39 43.5 N				Long. 140 08.2 E				Sweep 1 MHz to 20 MHz 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	S	S	S	S	S	G	140	140	130	140	115	115	G	G	G	G	120	115	115	S	S	S	S	
2	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	G	G	G	G	100	S	S	S	S	
3	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	G	G	G	105	S	S	100	S	S	
4	S	S	S	S	S	S	G	G	G	130	115	115	110	G	G	G	G	G	B	S	S	S	S	S	
5	S	S	S	S	S	S	G	G	G	G	120	G	G	G	G	G	G	G	B	S	S	S	S	S	
6	S	S	S	S	S	B	G	G	G	G	115	G	G	G	G	G	G	B	S	S	S	S	S	S	
7	S	S	S	S	S	S	G	G	G	B	140	B	120	G	130	130	G	B	G	S	110	S	S	S	
8	S	S	S	S	S	S	B	G	140	120	115	115	110	G	110	110	120	G	G	S	S	S	S	S	
9	S	S	S	S	S	B	G	G	G	125	115	G	105	G	120	G	G	G	130	115	S	S	S	S	
10	S	S	S	100	100	B	G	G	130	120	115	110	110	G	G	G	G	G	130	115	S	S	S	S	
11	S	E	S	S	E	B	G	G	G	G	120	G	G	120	140	130	110	140	110	100	100	S	S	S	
12	S	S	S	100	E	B	G	G	G	G	G	G	115	G	G	G	115	115	110	105	S	S	S	S	
13	S	100	100	100	100	B	G	150	140	130	120	115	115	G	G	G	G	G	B	115	S	B	S	S	
14	S	S	S	S	S	105	G	G	G	120	115	G	G	G	G	G	G	G	G	S	S	S	C	C	
15	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	115	150	G	145	130	115	110	110	105	S
16	S	S	S	E	S	B	155	140	130	130	115	115	G	G	G	G	G	G	120	S	S	100	100	S	
17	S	E	S	S	S	B	140	G	140	G	130	G	115	110	110	140	120	120	150	S	S	110	S	S	
18	S	S	S	S	S	B	G	140	130	130	115	115	115	G	G	G	G	G	130	120	115	110	S	S	
19	S	S	S	S	S	100	145	140	130	130	130	120	G	105	G	G	G	G	B	S	S	S	S	S	
20	S	S	S	S	105	B	G	G	G	G	120	105	105	110	120	G	105	140	105	100	S	S	S	B	
21	S	100	S	S	S	B	G	140	140	G	130	130	120	G	G	G	G	G	140	S	S	S	115	S	
22	S	S	150	S	100	140	130	125	115	115	115	110	110	115	G	G	125	150	120	115	110	115	S	S	
23	S	S	S	S	E	B	G	G	140	G	G	110	140	140	140	G	G	G	120	100	105	S	S	S	
24	S	S	S	S	S	B	G	145	130	130	120	115	115	110	110	115	G	G	130	110	110	105	105	105	
25	S	100	100	100	100	B	G	150	130	115	115	115	110	105	105	110	100	G	G	110	S	S	110	S	
26	S	S	S	S	S	155	150	145	130	115	130	125	110	10	G	120	G	100	140	115	S	100	S	S	
27	S	S	S	S	S	B	150	G	130	120	110	G	G	G	G	115	G	140	130	S	S	100	S	S	
28	S	S	S	S	S	G	G	G	G	120	130	115	110	G	105	160	G	G	G	B	110	110	110	S	
29	S	S	S	S	S	B	G	G	130	120	120	115	110	105	115	115	130	115	160	115	105	105	S	S	
30	S	S	S	S	S	150	145	130	130	140	130	120	120	115	G	G	G	100	105	115	110	110	110	S	
31																									
CNT		3	3	4	5	5	7	11	17	18	25	18	20	11	12	11	8	11	19	17	10	12	7	1	
MED		100	100	100	100	140	145	140	130	122	120	115	110	110	115	120	118	120	130	115	110	108	110	105	
UQ		100	125	100	100	150	150	145	140	130	130	115	115	115	125	135	122	140	130	115	110	110	110		
LQ		100	100	100	100	105	142	140	130	120	115	115	110	105	110	115	108	115	112	105	105	100	105		

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H¹ES (KM)

IONOSPHERIC DATA

APR. 1970

TYPES OF ES

135° E Mean Time (G. M. T. + 9^h)

Station AKITA Lat. 39° 43' 5" N Long. 140° 08' 2" E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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

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TYPES OF ES

IONOSPHERIC DATA

APR. 1970

FOF2 (0.1 MHz)

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

Station	KOKUBUNJI TOKYO																							Lat.	35 42.4 N.		Long.	139 29.3 E		Sweep 1 MHz to 20 MHz 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	80	73	6 ^R	69	65	62	J ^B	69	70	7 ^F	81	109	117	104	99	98	104	109	10 ^R	81	63	63	63	62																												
2	61	60	59	58	54	53	68	86	100	112	120	125	129	136	135	135	134	128	126	Y ^O	91	93	J ^R	7 ^B																												
3	71	70	71	70	48	54	R	101	108	Y ^O	109	116	120	120	117	120	123	120	117	98	71	72	J ^R	74																												
4	72	73	J ^B	64	59	61	91	Y ^O	111	116	120	129	135	139	143	142	136	128	119	97	7 ^B	79	79	72																												
5	U ^B	71	71	66	58	63	9 ⁿ	Y ^O	107	112	121	127	129	130	132	133	133	128	119	98	82	89	89	86																												
6	83	81	74	69	64	65	87	113	120	116	126	134	135	139	136	130	129	124	130	Y ^O	J ^B	73	70	71																												
7	73	76	J ^B	6 ^R	65	J ^B	90	112	120	124	125	135	141	137	135	131	126	126	126	Y ^O	79	I ^R	J ^R	J ^R																												
8	74	72	70	66	61	65	90	113	126	126	126	129	134	136	134	129	123	120	121	Y ^O	78	81	86	8 ^R																												
9	R	7 ^B	77	71	66	70	96	113	120	120	126	128	132	130	124	123	124	128	128	106	85	84	86	71																												
10	72	71	J ^R	58	48	51	96	113	111	116	118	120	124	126	125	117	111	115	111	106	78	71	72	72																												
11	71	71	70	69	61	66	86	94	101	110	119	125	132	133	136	135	131	127	124	103	90	91	89	90																												
12	85	84	80	J ^R	68	J ^B	95	106	113	114	123	134	134	135	135	132	128	128	122	109	94	88	I ^R	J ^B																												
13	83	79	69	68	69	73	96	110	111	116	126	132	140	140	136	134	133	122	116	96	J ^R	R	82	80																												
14	80	C	C	C	C	C	C	C	C	113	122	126	128	129	128	126	124	122	121	98	80	81	J ^B	I ^B																												
15	85	88	85	62	56	57	86	97	101	107	115	118	126	134	139	138	128	123	118	Y ^O	J ^B	81	83	J ^R																												
16	83	I ^B	80	66	63	61	90	Y ^O	110	113	124	129	136	Y ^A	138	134	128	116	112	100	84	84	84	84																												
17	81	J ^B	J ^B	J ^B	69	72	94	94	110	110	120	122	131	148	140	134	134	130	116	96	83	83	J ^B	J ^R																												
18	J ^R	71	71	J ^R	66	69	91	100	Y ^O	108	124	136	136	137	145	145	138	131	124	110	98	99	104	Y ^O																												
19	110	Y ^O	115	68	64	64	89	109	107	117	131	146	145	135	129	124	123	114	108	93	90	90	88	89																												
20	76	83	71	55	57	60	96	96	110	115	128	136	136	132	134	127	117	115	116	93	76	70	69	66																												
21	61	66	63	49	49	49	65	72	70	87	105	121	126	126	116	103	10 ^R	96	92	86	86	I ^B	J ^B	I ^R																												
22	71	J ^R	J ^R	J ^R	39	46	58	70	60	57	60	64	61	62	61	66	69	71	62	62	61	J ^R	61	65																												
23	66	66	62	56	54	56	69	71	76	84	100	111	120	128	136	136	128	125	116	104	85	8 ^B	82	8 ^B																												
24	80	80	81	66	56	56	67	72	80	90	96	112	123	108	107	116	113	110	104	101	83	80	J ^B	81																												
25	81	79	J ^R	70	61	66	70	70	76	80	101	111	117	119	123	124	120	116	116	10 ^R	77	J ^B	R	8 ^B																												
26	I ^B	84	R	71	6 ^R	64	79	96	112	116	129	126	126	131	134	130	122	111	117	Y ^O	81	82	84	J ^R																												
27	81	J ^R	84	71	60	69	85	97	100	107	110	120	120	130	140	130	126	117	120	110	J ^B	81	81	I ^B																												
28	80	82	J ^B	71	55	60	80	92	100	96	109	128	134	139	Y ^B	150	Y ^B	137	125	Y ^O	83	83	J ^R	J ^R																												
29	85	90	94	J ^R	63	67	80	83	88	104	113	125	129	137	144	128	119	107	104	J ^R	R	R	J ^B	91																												
30	87	I ^B	78	69	68	74	90	94	96	105	107	119	129	129	127	127	126	120	108	91	90	85	84	84																												
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	29	29	28	29	29	29	28	29	29	30	30	30	30	30	30	30	30	30	30	30	29	28	29	30																												
MED	80	79	74	68	61	64	88	97	107	111	120	126	129	132	134	130	126	121	117	100	82	81	82	81																												
UQ	83	82	80	71	65	69	91	106	111	116	125	129	135	137	138	134	131	128	122	106	85	84	85	8 ^B																												
LQ	72	71	70	64	56	57	74	86	96	104	109	119	124	128	125	124	120	115	111	96	78	78	77	72																												

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APR. 1970

FOF2 (0.1 MHz)

IONOSPHERIC DATA

APR. 1970

FOF1 (0.01 MHZ)

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

Station KOKUBUNJI TOKYO Lat. 35 42.4 N Long. 139 29.3 E Sweep 1 MHz to 20 MHz 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	L	L	L									
2									L	L	L	L	L	L	L	L	L								
3									L	L	L	L	L	L	L	L	L								
4									L	L	L	L	L	L	L	L	L								
5									L	L	L	L	L	L	L	L	L								
6									L	L	L	L	L	L	L	L	L								
7									L	L	L	U 510	L	L											
8									L	L	L	L	L	L	L	L	L								
9									L	L	L	L	B	L	L	L									
10									L	A	R	L	L	L	L	L	L								
11									L	L	L	L	L	L	L	L									
12									L	L	L	L	L	L	L	A	L			A					
13									L		L	L	L	510	R	L	L								
14							C	C	C	L	L	L	L	B	L	L	L	L							
15									L	L	L	L	L	A	B	L	L	A							
16									L	L	L	L	L	L	L	L	L								
17									L	L	L	L	L	L	L	L	L								
18								L	L	L	L	L	A	L	L	L	L								
19									L	L	L	L	L	L	L	L	L								
20									L	L	L	L	L	R	A	L	L	L							
21								L		L	590	L	L	510	U 510	L	L								
22							L	U 420	A	A	490	500	500	500	470	450	L	L							
23								L	L	L	L	L	L	L	L	L	A								
24									L	L	L	L	L	L	L	L	L								
25							L		A	L	L	L	A	L	L	U 480	L	L							
26									L	L	L	R	L	500	L	L	L	L							
27									L	L	L	L	L	L	L	L	L								
28								L	L	L	L	L	570	L	L	L	500	L	L						
29									L	L	L	L	A	L	A	A	A	A	A						
30								L	L	L	L	L	U 570	L	L	U 530	L	L							
31																									
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			2	3	2	4	2	4									
MED								U 420			540	510	535	505	490	490									
UQ											540		510		515										
LQ											505		500		465										

APR. 1970

FOF1 (0.01 MHZ)

IONOSPHERIC DATA

APR. 1970

FOE (0.01 MHZ)

135° E Mean Time (G. M. T. + 9h)

Station **KOKUBUNJI TOKYO** Lat. **35 42.4 N** · Long. **139 29.3 E** Sweep **1** MHz to **20** MHz 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							230	285	325 ^B	A	A	A	390	375 ^B	380 ^B	350	300	240	B					
2							190	280	320	R	R	R	R	R	375	350	310	255 ^B	B					
3							220	285	R	340	R	A	R	R	R	R	310	R	B					
4							220 ^B	290	R	360	A	A	A	A	350	345	300	245	B					
5							220	280	325	335	370	380	390 ^B	390	370	335	310 ^B	255	B					
6							200	295	320	335	R	A	A	A	A	350	320	R	B					
7							I ^R 225	R	R	B	350	R	R	B	A	A	320	R	B					
8							235	290	R	A	A	R	A	R	R	350	R	R	B					
9							250	300	I ^R 335	350	A	R	B	R	R	A	A	A	B					
10							210	290	I ^A 340	R	A	A	A	A	R	R	R	R	B					
11							220	305	340	365	370	A	A	A	A	340	320	285	B					
12							220	290	330	360	370	I ^B 385	I ^R 380	385	380	350	315	A	B					
13							210	300	325	350	A	R	R	R	R	A	A	A	B					
14							C	C	C	R	A	R	R	B	R	340	A	A	B					
15							I ^B 230	300	I ^B 335	350	R	R	385	365	B	A	325	260	B					
16							A	290	330	350	365	R	R	R	360	310	310	260	A					
17							230	290	325	340 ^B	350	360	R	R	R	340	300	A	B					
18							230	305	I ^A 330	360 ^B	370	R	R	R	R	350	310	270	155					
19							225	285	320	350	350	A	R	R	365	350	310	240	170					
20							150	240	285	325	I ^R 340	A	A	A	A	A	A	A	A					
21							180	R	290	A	345	350	R	R	R	350	I ^B 330	300	260	B				
22							B	A	A	A	A	A	A	A	350	I ^R 325	I ^R 315	R	R					
23							B	235	I ^A 290	I ^A 315	350	R	R	R	A	A	R	300	A	A				
24							B	250	290	325	340	A	B	A	A	350	I ^R 340	310	I ^R 275	B				
25							B	I ^R 230	A	A	A	A	A	A	A	R	R	310	265	B				
26							B	A	A	A	A	A	A	A	A	A	R	I ^R 275	A					
27							B	250	I ^A 300	345	A	A	A	A	A	A	A	A	A					
28							B	260	310	330	355	I ^A 365	375	A	A	I ^R 370	345	330	240	185				
29							170	250	300	I ^A 330	360	A	A	A	A	355	320	230	B					
30							180	255	300	340	355	370	375	385	A	A	I ^B 360	320	280	A				
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	25	25	21	20	11	5	5	4	11	19	22	16	3					
MED						175	230	290	330	350	365	375	385	380	365	345	310	260	170					
UQ						180	240	300	335	358	370	380	390	388	372	350	320	272	178					
LQ						160	220	290	325	340	350	375	385	370	350	340	310	242	162					

APR. 1970

FOE (0.01 MHZ)

IONOSPHERIC DATA

APR. 1970

FOES (0.1 MHZ)

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

Station KOKUBUNJI TOKYO Lat. 35 42.4 N Long. 139 29.3 E Sweep 1 MHz to 20 MHz 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	21	20	E ₁₅	20	E ₁₂	31	30	36	J ₅₆	J ₄₃	43	G	35	43	21	39	39	J ₃₀	J ₂₂	M	J ₄₃	J ₂₅	J ₂₄	
2	J ₂₄	22	M	J ₂₁	21	M	G	G	35	G	G	G	G	G	G	G	G	G	23	23	18	E ₁₅	E ₁₅	E ₁₅	
3	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E	E ₁₅	G	G	G	G	G	42	G	G	G	G	G	E ₁₅	21	E ₁₅	E ₁₅	E ₁₅	E ₁₅		
4	E ₁₅	E ₁₅	E ₁₅	E	E ₁₂	E ₁₅	G	G	G	G	39	42	42	42	33	29	21	G	18	J ₁₆	M	E ₁₅	E ₁₅	E ₁₅	
5	E ₁₂	E ₁₃	E ₁₃	E ₁₁	E	E ₁₂	G	30	J ₂₉	G	39	G	G	G	G	19	19	30	23	M	20	M	E ₁₅	E ₁₅	
6	18	18	18	M	E	E ₁₂	G	G	G	G	G	40	42	J ₄₂	J ₃₉	G	G	G	23	21	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
7	E	E ₁₂	E ₁₅	E	E	E ₁₅	G	G	G	E ₄₀	G	G	G	E ₄₀	47	47	37	G	30	22	J ₂₁	J ₂₅	21	E ₁₅	
8	E ₁₅	E ₁₅	E ₁₅	E	E	E ₁₂	G	G	G	46	43	G	41	G	G	G	G	E ₁₇	E ₁₅	E ₁₅	E ₁₅	E ₁₂	E ₁₅	E ₁₅	
9	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E	E ₁₅	G	35	G	G	42	G	E ₅₀	G	G	J ₄₁	35	32	J ₂₄	J ₂₇	20	E ₁₅	E ₁₂	E ₁₅	
10	E ₁₅	E ₁₅	E	E	E ₁₅	E ₁₅	25	35	39	G	J ₅₀	47	42	46	35	G	G	G	22	J ₂₃	21	20	E ₁₅	E ₁₅	
11	E ₁₅	E ₁₅	E ₁₅	E	E	E ₁₅	G	G	G	39	43	42	43	45	39	59	36	J ₃₉	48	M	J ₂₄	J ₃₇	J ₂₄	21	
12	20	E ₁₄	E	E	20	E ₁₅	27	32	38	42	43	58	45	43	J ₅₉	J ₆₆	J ₄₃	J ₅₁	111	J ₂₈	E ₁₂	J ₆₁	E ₁₂	J ₁₈	
13	E ₁₅	E ₁₅	E ₁₂	E	M	J ₂₅	23	32	39	44	47	G	G	G	G	42	36	J ₃₆	J ₂₉	21	J ₂₄	J ₅₄	J ₂₅	22	
14	E ₁₅	C	C	C	C	C	C	C	C	G	41	G	G	E ₅₁	G	G	35	30	17	21	20	E ₁₅	E ₁₅	E ₁₅	
15	E ₁₅	E	E ₁₅	E	E ₁₂	E ₁₅	G	34	G	G	G	G	G	J ₅₄	E ₅₀	J ₄₂	36	J ₈₈	109	J ₈₂	J ₅₄	J ₂₄	J ₂₄	J ₂₇	
16	21	E ₁₅	E ₁₅	E	E ₁₅	E ₁₅	26	35	36	42	J ₄₂	G	G	G	42	G	36	J ₄₂	J ₄₂	J ₅₅	20	E ₁₅	E ₁₅	E ₁₅	
17	E ₁₅	E ₁₅	E ₁₂	E	E	20	G	34	38	J ₄₂	42	G	G	G	G	G	35	34	J ₂₅	J ₂₅	J ₂₅	J ₆₂	J ₂₄	21	
18	20	20	21	20	E ₁₅	E ₁₅	G	G	42	46	J ₆₁	J ₆₆	72	G	G	G	G	30	J ₄₁	J ₂₄	J ₃₂	J ₂₄	23	J ₂₁	
19	20	J ₁₈	E ₁₂	E	E	E ₁₄	30	33	35	37	39	J ₄₂	G	34	G	37	G	17	15	G	M	J ₂₅	J ₂₄	21	E ₁₅
20	23	20	J ₁₈	J ₁₈	J ₁₆	G	J ₂₈	31	35	G	37	42	43	44	J ₆₂	J ₃₉	35	35	J ₂₄	J ₃₇	28	20	21	E ₁₅	
21	E ₁₅	20	21	E ₁₅	E ₁₅	23	G	G	36	J ₄₃	G	G	G	G	G	G	34	30	J ₂₄	21	21	21	E ₁₅	E ₁₅	
22	E ₁₅	E ₁₅	20	E ₁₅	22	22	J ₂₉	J ₄₃	J ₆₂	65	J ₄₂	46	46	J ₄₂	G	G	G	G	G	22	J ₂₄	J ₃₀	J ₅₂	J ₂₄	
23	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₂	21	G	33	36	G	G	G	G	43	42	G	61	J ₃₅	J ₅₅	J ₈₅	J ₂₉	J ₂₄	21	20	
24	E ₁₅	22	J ₂₂	24	22	E ₁₅	G	35	39	J ₄₆	46	42	43	42	G	G	G	G	24	60	109	J ₆₁	J ₈₄	J ₄₁	
25	J ₅₃	J ₂₇	J ₂₄	20	20	E ₁₅	G	J ₄₂	J ₅₄	J ₄₂	49	J ₅₃	J ₆₁	J ₁₀₆	G	G	G	G	J ₂₈	J ₂₄	22	J ₂₄	J ₃₆	E ₁₅	
26	J ₆₁	E ₁₅	E ₁₅	E ₁₂	E ₁₅	18	J ₃₈	J ₃₉	J ₄₁	46	J ₄₈	47	44	49	49	J ₄₂	G	G	25	J ₄₂	J ₂₄	23	20	20	
27	22	21	20	20	22	21	29	35	38	43	43	J ₄₂	J ₄₂	50	J ₄₁	J ₄₂	35	55	J ₄₂	J ₃₂	21	J ₂₉	21	21	
28	20	E ₁₅	E ₁₂	E	21	21	28	G	39	43	J ₅₅	J ₅₁	57	45	39	G	G	G	G	J ₃₆	J ₄₇	J ₃₂	J ₂₇	23	
29	21	E ₁₂	E	E	J ₂₃	J ₁₇	40	37	J ₄₁	J ₅₁	J ₅₁	J ₅₀	J ₆₀	J ₇₀	J ₅₂	J ₅₇	J ₈₇	J ₁₀₂	J ₆₂	J ₈₈	J ₂₉	J ₅₂	J ₅₄	E ₁₅	
30	E ₁₅	E ₁₅	E ₁₂	J ₂₂	E ₁₂	G	J ₄₂	40	J ₄₁	47	43	43	47	J ₅₃	J ₄₁	44	J ₄₂	22	21	J ₅₄	J ₃₃	J ₃₇	J ₃₆	34	
31																									
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	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E ₁₅	E ₁₅	E ₁₅	E ₁₂	E ₁₃	E ₁₅	G	32	36	42	42	42	42	42	E ₃₃	E ₁₉	34	30	24	J ₂₄	22	J ₂₄	21	E ₁₅	
UQ	20	20	20	16	20	20	28	35	39	46	46	46	44	46	42	42	36	36	J ₄₁	J ₃₇	J ₂₈	J ₃₇	J ₂₅	21	
LQ	E ₁₅	E ₁₄	E ₁₂	E	E	E ₁₃	G	G	G	G	37	G	G	G	G	G	G	G	21	21	20	E ₁₅	E ₁₅	E ₁₅	

The Radio Research Laboratories, Japan

APR. 1970

FOES (0.1 MHZ)

IONOSPHERIC DATA

APR. 1970

FBES (0.1 MHz)

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

Station KOKUBUNJI TOKYO Lat. 35 42.4 N Long. 139 29.3 E Sweep 1 MHz to 20 MHz 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	E	E ₁₅	18	E ₁₂	25	29	35	45	41	41	G	32	41	E ₂₁	37	24	29	21	E	15	20	E	
2	19	14	E	15	15	E	G	G	34	G	G	G	G	G	G	G	G	G	18	E	E	E ₁₅	E ₁₅	E ₁₅	
3	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E	E ₁₂	G	G	G	G	G	40	G	G	G	G	G	G	E ₁₅	E	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
4	E ₁₅	E ₁₅	E ₁₅	E	E ₁₂	E ₁₃	G	G	G	G	39	41	40	40	33	27	21	G	18	E	E	E ₁₃	E ₁₅	E ₁₅	
5	E ₁₂	E ₁₃	E ₁₃	E ₁₁	E	E ₁₂	G	30	G	29	G	38	G	G	G	18	G	18	29	20	17	E	E	E ₁₅	E ₁₅
6	E	E	E	E	E	E ₁₂	G	G	G	G	G	40	40	42	38	G	G	G	20	E	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
7	E	E ₁₂	E ₁₅	E	E	E ₁₃	G	G	G	E ₄₀	G	G	G	E ₄₀	E ₄₇	46	36	G	26	E	19	E	E	E ₁₅	
8	E ₁₅	E ₁₅	E ₁₅	E	E	E ₁₂	G	G	G	41	41	G	40	G	G	G	G	G	E ₁₇	E ₁₅	E ₁₅	E ₁₅	E ₁₂	E ₁₅	
9	E ₁₂	E ₁₂	E ₁₅	E ₁₅	E	E ₁₅	G	32	G	G	40	G	E ₅₆	G	G	40	35	30	24	E	E	E ₁₅	E ₁₂	E ₁₅	
10	E ₁₅	E ₁₅	E	E	E ₁₅	E ₁₅	24	34	38	G	50	E ₄₇	42	44	E ₃₅	G	G	G	18	20	E	E	E ₁₃	E ₁₅	
11	E ₁₅	E ₁₅	E ₁₅	E	E	E ₁₅	G	G	G	39	39	42	E ₄₃	45	E ₃₉	54	36	37	43	E	19	35	22	E	
12	E	E ₁₄	E	E	E	E ₁₃	26	31	38	42	40	53	45	41	44	63	41	38	10	9	28	E ₁₂	20	E ₁₂	E
13	E ₁₅	E ₁₅	E ₁₅	E	E	E	E ₂₃	32	39	44	46	G	G	G	G	40	34	33	26	E	E	35	19	E	
14	E ₁₅	C	C	C	C	C	C	C	C	C	G	41	G	E ₅₁	G	G	32	28	17	E	E	E ₁₅	E ₁₅	E ₁₅	
15	E ₁₅	E	E ₁₅	E	E ₁₂	E ₁₅	G	31	G	G	G	G	G	52	E ₅₀	41	33	82	80	70	38	24	23	E	
16	E	E ₁₅	E ₁₅	E	E ₁₃	E ₁₅	24	33	35	40	41	G	G	G	42	G	35	35	26	53	E	E ₁₅	E ₁₅	E ₁₅	
17	E ₁₅	E ₁₅	E ₁₅	E	E	E	G	31	38	41	40	G	G	G	G	G	33	30	25	15	21	60	19	E	
18	E	E	E	E	E ₁₅	E ₁₅	G	G	41	45	55	58	71	G	G	G	G	30	40	22	32	19	E	E	
19	E	17	E ₁₂	E	E	E ₁₄	26	33	35	E ₃₇	39	40	G	E ₃₄	G	37	G	G	15	G	E	21	19	E	E ₁₅
20	E	E	E	E	E	G	27	30	34	G	37	40	42	E ₄₄	55	37	33	28	24	35	E	E	E	E ₁₅	
21	E ₁₅	E	E	E ₁₅	E ₁₅	16	G	G	35	40	G	G	G	G	G	G	32	28	22	E	E	E	E ₁₅	E ₁₅	
22	E ₁₅	E ₁₅	E	E ₁₅	E	18	28	36	52	52	41	45	45	40	G	G	G	G	G	E	24	29	23	E	
23	E ₁₅	E ₁₂	E ₁₅	E ₁₂	E ₁₂	20	G	31	33	G	G	G	G	40	42	G	60	34	55	35	29	E	E	E	
24	E ₁₅	E	18	E	E	E ₁₅	G	32	39	45	43	41	41	41	G	G	G	G	22	56	56	30	53	30	
25	41	25	24	E	E	E ₁₅	G	35	53	41	45	42	55	40	G	G	G	G	22	E	E	19	30	E ₁₅	
26	50	E ₁₅	E ₁₅	E ₁₂	E ₁₃	17	34	36	40	45	45	E ₄₇	42	42	45	39	G	G	23	40	29	E	E	E	
27	E	E	E	E	E	20	29	33	37	40	43	40	40	42	41	40	32	49	42	26	E	E	E	E	
28	E	E ₁₅	E ₁₂	E	E	19	27	G	38	40	54	51	55	44	33	G	G	G	G	28	46	30	25	E	
29	E	E ₁₂	E	E	15	G	40	37	41	47	51	50	57	55	52	56	83	97	62	75	22	17	E	E ₁₃	
30	E ₁₃	E ₁₃	E ₁₂	E	E ₁₂	G	20	40	41	46	43	43	45	50	40	38	42	21	G	20	53	30	19	19	E
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	30	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E ₁₅	E ₁₄	E ₁₂	E	E	E ₁₅	G	31	35	40	40	40	E ₄₀	G	U ₃₈	E ₃₃	E ₁₈	32	26	22	16	15	15	15	E ₁₅
UQ	E ₁₅	E ₁₅	E ₁₅	E ₁₂	E ₁₃	E ₁₅	26	33	39	44	43	42	44	43	42	40	35	33	29	35	24	20	19	E ₁₅	
LQ	E	E	E	E	E	E ₁₂	G	G	G	G	37	G	G	G	G	G	G	G	18	E	E	E	E	E	

APR. 1970

FBES (0.1 MHz)

IONOSPHERIC DATA

APR. 1970

F-MIN (0.1 MHz)

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

Station **KOKUBUNJI TOKYO** Lat. **35 42.4 N** Long. **139 29.3 E** Sweep 1 MHz to 20 MHz 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	E ₁₅	E ₁₅	E ₁₅	12	15	13	15	17	E ₂₉	25	26	25	26	15	14	11	15	14	E ₁₅	14	E ₁₅	E ₁₅
2	E ₁₅	12	13	10	10	12	15	14	16	25	26	26	25	26	26	26	17	23	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
3	E ₁₅	E ₁₅	E ₁₅	E ₁₅	10	E ₁₅	14	15	15	25	26	26	25	26	26	25	18	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
4	E ₁₅	E ₁₅	E ₁₅	10	12	13	15	15	15	16	25	26	26	25	26	19	15	15	14	E ₁₅	E ₁₅	13	E ₁₅	E ₁₅
5	12	13	13	11	10	12	14	14	11	17	16	22	26	18	16	15	14	10	15	E ₁₅	E ₁₅	13	E ₁₅	E ₁₅
6	E ₁₅	11	11	10	10	12	16	15	14	15	25	25	25	26	19	19	15	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
7	10	12	E ₁₅	10	10	13	15	15	26	40	26	28	28	40	28	26	20	16	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
8	E ₁₅	E ₁₅	12	10	10	12	15	16	16	18	25	26	26	26	25	18	15	15	17	E ₁₅	E ₁₅	E ₁₅	12	E ₁₅
9	12	12	E ₁₅	E ₁₅	10	E ₁₅	15	14	17	25	28	28	56	27	26	25	11	13	15	E ₁₅	E ₁₅	E ₁₅	12	E ₁₅
10	E ₁₅	E ₁₅	10	10	E ₁₅	E ₁₅	15	15	25	18	25	28	25	28	19	19	15	15	15	E ₁₅	E ₁₅	E ₁₅	13	E ₁₅
11	E ₁₅	E ₁₅	E ₁₅	10	10	E ₁₅	15	15	15	19	26	25	28	26	26	25	15	14	14	13	E ₁₅	E ₁₆	E ₁₅	E ₁₅
12	E ₁₅	14	10	10	10	13	15	14	16	16	18	41	29	27	19	16	16	15	16	14	12	E ₁₅	12	14
13	E ₁₅	E ₁₅	12	10	13	E ₁₅	16	17	15	25	25	25	29	28	29	26	15	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
14	E ₁₅	C	C	C	C	C	C	C	C	19	25	25	29	51	25	25	15	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
15	E ₁₅	10	E ₁₅	10	12	E ₁₅	15	15	16	26	25	27	28	25	50	18	18	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
16	E ₁₅	E ₁₅	E ₁₅	10	13	E ₁₅	15	13	15	15	25	26	28	26	25	19	15	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
17	E ₁₅	E ₁₅	12	10	10	E ₁₅	15	15	15	15	18	25	25	26	25	15	15	15	15	12	E ₁₅	E ₁₅	E ₁₅	E ₁₅
18	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15	15	15	25	26	25	26	28	26	16	16	14	14	10	14	E ₁₅	E ₁₅	E ₁₅
19	E ₁₅	E ₁₅	12	10	10	14	15	15	16	26	25	25	25	26	16	15	14	11	16	12	E ₁₅	E ₁₅	E ₁₅	E ₁₅
20	E ₁₅	14	11	12	10	14	15	16	15	19	19	25	26	27	25	15	15	15	15	13	E ₁₅	E ₁₅	E ₁₅	E ₁₅
21	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15	15	12	13	15	25	26	25	20	17	15	15	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
22	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15	15	15	15	17	16	26	29	27	19	26	15	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
23	E ₁₅	12	E ₁₅	12	12	15	15	15	15	19	18	18	25	25	26	26	18	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
24	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15	15	15	19	26	25	38	27	28	19	15	15	15	16	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
25	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15	15	15	17	19	27	25	25	25	25	26	19	14	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
26	E ₁₅	E ₁₅	E ₁₅	12	13	15	15	15	15	25	26	25	26	28	25	25	10	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
27	E ₁₅	E ₁₅	E ₁₅	12	12	15	15	15	25	26	19	26	28	26	26	19	15	15	14	E ₁₅	13	E ₁₅	E ₁₅	E ₁₅
28	E ₁₅	E ₁₅	12	10	13	15	16	15	15	16	26	26	27	25	27	25	15	14	14	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅
29	E ₁₅	12	10	10	10	15	15	16	16	19	28	26	26	26	26	15	16	15	16	E ₁₅	E ₁₅	E ₁₅	E ₁₅	13
30	13	13	12	10	12	14	14	15	19	16	26	26	26	26	26	25	16	14	13	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅
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	30	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E ₁₅	E ₁₅	E ₁₅	10	11	15	15	15	15	19	25	26	26	26	26	19	15	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
UQ	E ₁₅	E ₁₅	E ₁₅	E ₁₅	12	15	15	15	16	25	26	26	28	27	26	25	16	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅
LQ	E ₁₅	12	12	10	10	12	15	15	15	16	25	25	25	25	19	15	15	14	15	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅

The Radio Research Laboratories, Japan

APR. 1970

F-MIN (0.1 MHz)

IONOSPHERIC DATA

APR. 1970

M(3000)F2 (0.01)

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

Station KOKUBUNJI TOKYO Lat. 35 42.4 N Long. 139 29.3 E Sweep 1 MHz to 20 MHz 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	270	275	25 ^B	245	255	265	26 ^B	265	270	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	305	290	290	285	280	285	290	290	295	300	30 ^B	275	290	30 ^B	27 ^B	
3	270	265	270	315	320	285	R	320	315	30 ^B	290	290	285	285	275	275	285	290	310	310	275	265	27 ^B	275	
4	265	270	29 ^B	285	270	280	310	30 ^B	305	300	285	280	280	280	280	290	295	290	305	300	27 ^B	270	280	275	
5	29 ^B	280	285	305	280	280	310	31 ^B	310	290	290	290	285	285	280	285	285	295	300	305	270	260	270	270	
6	270	285	280	290	275	275	285	300	300	285	280	255	280	285	280	265	280	285	305	31 ^B	26 ^B	250	250	245	
7	275	275	26 ^B	27 ^B	260	25 ^B	290	280	300	290	280	280	285	275	275	285	285	295	300	31 ^B	28 ^B	28 ^B	27 ^B	28 ^B	
8	270	265	275	265	275	260	300	300	300	295	280	270	280	280	280	280	285	290	305	30 ^B	270	260	280	30 ^B	
9	R	27 ^B	275	285	265	260	290	310	310	290	285	280	295	275	275	270	275	290	295	300	280	260	280	270	
10	255	270	30 ^B	290	255	260	30 ^B	315	305	290	280	275	275	285	290	290	290	295	295	285	295	280	265	265	
11	270	270	275	280	285	285	315	300	295	290	285	275	280	280	275	280	285	290	300	290	270	275	265	280	
12	280	275	275	28 ^B	275	26 ^B	300	300	300	290	275	280	280	275	275	275	275	290	285	295	295	275	270	27 ^B	
13	280	275	275	260	260	250	290	300	300	275	280	280	270	285	280	285	285	285	295	290	28 ^B	R	265	265	
14	265	C	C	C	C	C	C	C	C	290	285	280	280	275	275	285	290	295	305	310	265	260	26 ^B	27 ^B	
15	275	305	320	325	275	285	315	325	310	290	285	280	275	275	285	290	290	295	305	30 ^B	27 ^B	270	26 ^B	28 ^B	
16	275	28 ^B	305	275	255	265	300	30 ^B	290	280	280	275	280	28 ^B	285	285	290	290	305	300	280	260	265	28 ^B	
17	270	26 ^B	29 ^B	29 ^B	290	295	325	310	290	290	280	265	265	295	280	275	285	290	305	285	270	255	27 ^B	26 ^B	
18	26 ^B	270	255	27 ^B	290	260	310	310	29 ^B	280	275	280	290	280	285	290	305	300	305	300	285	265	260	25 ^B	
19	270	26 ^B	315	280	260	260	305	315	290	280	290	300	295	295	285	290	285	305	295	285	265	265	260	270	
20	275	290	310	260	250	270	315	305	285	280	280	265	290	290	290	285	300	305	320	325	345	270	275	255	
21	265	260	285	275	245	245	280	305	260	275	265	280	290	290	310	300	30 ^B	305	295	290	270	25 ^B	25 ^B	25 ^B	
22	240	28 ^B	30 ^B	25 ^B	230	240	260	275	250	230	240	265	265	260	250	260	290	320	310	275	265	25 ^B	265	265	
23	265	290	275	285	290	285	33 ^B	325	305	290	290	290	285	290	295	295	295	295	300	310	280	26 ^B	270	25 ^B	
24	255	265	295	290	270	270	310	335	315	315	290	285	300	280	290	295	290	305	300	295	290	265	25 ^B	260	
25	260	265	27 ^B	275	280	290	315	315	305	290	295	280	290	290	285	290	295	295	310	31 ^B	275	26 ^B	R	27 ^B	
26	27 ^B	285	R	280	28 ^B	280	305	300	300	295	285	295	280	285	295	290	295	290	310	33 ^B	315	265	265	26 ^B	
27	265	27 ^B	31 ^B	300	270	275	320	310	300	295	285	285	285	280	295	290	285	290	300	290	26 ^B	265	265	26 ^B	
28	265	270	27 ^B	325	280	290	315	305	310	270	275	285	290	285	29 ^B	295	29 ^B	300	295	29 ^B	270	260	25 ^B	26 ^B	
29	270	290	300	31 ^B	285	295	30 ^B	305	295	290	280	285	285	285	300	295	295	300	300	29 ^B	R	R	26 ^B	270	
30	265	27 ^B	285	280	275	290	305	320	295	290	270	270	275	285	275	280	285	300	295	285	275	260	260	270	
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	28	28	27	28	28	28	27	28	28	29	29	29	29	29	29	29	29	29	29	29	29	28	27	28	29
MED	270	272	285	282	275	272	305	305	300	290	280	280	285	285	285	285	290	295	300	300	275	265	265	27 ^B	
UQ	272	285	300	292	282	285	315	315	305	290	285	285	290	285	290	290	295	300	305	310	282	270	275	27 ^B	
LQ	265	268	275	275	260	260	295	300	290	280	280	275	280	280	275	280	285	290	295	290	270	260	260	260	

The Radio Research Laboratories, Japan

APR. 1970

M(3000)F2 (0.01)

IONOSPHERIC DATA

APR. 1970

M(3000)F1 (0.01)

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

Station **KOKUBUNJI TOKYO** Lat. **35 42.4 N** Long. **139 29.3 E** Sweep 1 MHz to 20 MHz 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	L	L									
2									L	L	L	L	L	L	L	L								
3									L	L	L	L	L	L	L	L								
4									L	L	L	L	L	L	L	L								
5									L	L	L	L	L	L	L	L								
6									L	L	L	L	L	L	L	L								
7									L	L	L	L	L	L										
8									L	L	L	L	L	L	L	L								
9									L	L	L	L	L	L	L	L								
10									L	A	R	L	L	L	L	L								
11									L	L	L	L	L	L	L									
12									L	L	L	L	L	L	L	A	L			A				
13									L		L	L	L	L	R	L	L							
14							C	C	C	L	L	L	L	B	L	L	L	L						
15									L	L	L	L	L	A	B	L	L	A						
16									L	L	L	L	L	L	L	L	L							
17									L	L	L	L	L	L	L	L	L							
18								L	L	L	L	L	A	L	L	L	L							
19									L	L	L	L	L	L	L	L	L							
20									L	L	L	L	L	R	A	L	L	L						
21								L		L	340	L	L	370	375	L	L							
22							L	U 315	A	A	345	360	340	340	340	355	L	L						
23								L	L	L	L	L	L	L	L	L	A							
24									L	L	L	L	L	L	L	L	L	L						
25							L		A	L	L	L	A	L	L	U 400	L	L						
26									L	L	L	R	L	400	L	L	L	L						
27									L	L	L	L	L	L	L	L	L							
28								L	L	L	L	A	L	L	L	365	L	L						
29									L	L	L	A	L	A	A	A	A	A	A					
30								L	L	L	L	L	U 340	L	L	U 340	L	L						
31																								
CNT								1			2	2	2	4	2	4								
MED								U 315			342	375	340	375	358	360								
UQ														390		382								
LQ														355		348								

APR. 1970

M(3000)F1 (0.01)

IONOSPHERIC DATA

APR. 1970

H^oF₂ (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** MHz to **20** MHz 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						380	385		370	330	295	280	265	255	255	260								
2									250	270	255	255	250	280	290	280	285							
3									255	250	250	280	265	285	290	295	285							
4									250	250	250	290	290	300	300	280	270							
5									245	280	280	300	280	280	280	290	275							
6									245	250	250	265	285	290	265	290	255							
7									250	250	250	290	290	260										
8									250	250	250	270	270	290	255	275	270							
9									250	250	250	260	265	260	290	310								
10									270	260	260	280	280	270	280	280	260							
11									250	260	280	290	300	270	300									
12									260	250	300	310	300	320	300	290	270			A				
13									270	265	290	280	295	290	295	290	290							
14						C	C	C	265	265	285	295	290	295	290	265	265							
15									250	250	280	290	290	290	295	290	270	290						
16									250	270	265	295	300	300	280	270	265							
17									250	250	260	260	285	295	275	280	280							
18							250		250	255	300	300	300	300	300	280	270							
19									250	260	300	280	270	300	275	270	285							
20									250	270	270	290	290	285	290	290	270	270						
21								280		320	340	310	295	300	290	270	270							
22						380	360	490	A	E	A	490	440	465	450	E	A	425	325	280				
23							250		260	295	290	295	300	300	300	290	280							
24									250	280	295	300	295	290	300	295	285	260						
25						260			275	270	295	290	295	300	310	300	290	260						
26									260	280	295	290	290	300	295	290	260	260						
27									250	255	290	300	295	340	300	290	290							
28							250		250	240	325	310	310	310	300	300	270	270						
29										300	300	310	310	310	290	275	300	A	A	270				
30								270	275	300	280	310	330	310	310	310	300	255						
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							3	7	26	29	30	30	30	30	29	28	26	9	1					
MED							380	270	250	262	280	290	290	295	290	290	272	265	270					
UQ							380	320	260	280	295	300	300	300	300	295	285	270						
LQ							320	250	250	250	260	280	280	285	280	280	270	260						

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APR. 1970

H^oF₂ (KM)

IONOSPHERIC DATA

APR. 1970

H^oF (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 MHz to 20 MHz 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	295	300	345	350	310	310	300	270	250	I ₂₅₀ ^A	250	220	230	210	245	240	250	250	245	230	245	295	320	310	
2	320	310	305	275	260	270	250	230	220	210	240	230	230	240	240	240	250	250	250	240	245	250	250	250	
3	290	300	295	240	200	295	250	250	240	240	220	220	220	230	240	240	250	250	250	230	200	300	295	300	
4	295	295	245	240	300	305	250	250	240	225	205	220	210	225	230	230	245	245	240	225	240	250	260	290	
5	280	275	260	245	245	290	245	240	230	220	210	225	210	220	220	225	245	255	245	240	245	300	290	290	
6	295	275	275	240	260	290	245	245	225	240	220	220	210	230	240	230	240	250	250	240	200	300	345	350	
7	300	280	295	280	310	310	250	250	240	240	240	230	250	230	265	250	250	250	250	230	250	295	265	290	
8	295	295	285	250	255	315	250	250	245	240	230	220	220	230	240	245	250	250	250	240	240	300	295	245	
9	250	295	290	250	250	300	250	250	245	240	230	210	I ₂₄₀ ^B	240	250	245	250	265	250	250	245	290	270	295	
10	310	300	230	210	310	330	250	250	250	240	I ₂₄₅ ^A	I ₂₄₅ ^B	220	240	240	240	240	250	250	250	240	245	265	295	
11	295	295	290	250	250	290	250	240	240	225	210	225	240	225	200	270	245	255	250	220	250	300	300	290	
12	280	290	280	290	250	290	220	245	225	230	225	I ₂₅₀ ^B	240	200	250	A	250	270	I ₂₅₀ ^A	250	230	260	290	275	
13	280	280	290	300	310	325	245	245	240	250	250	210	240	230	I ₂₄₀ ^B	240	245	250	250	245	245	300	295	300	
14	295	C	C	C	C	C	C	C	C	240	210	220	220	I ₂₄₅ ^B	240	245	250	250	250	240	240	290	300	295	
15	295	255	240	200	265	295	240	250	240	230	210	210	230	I ₂₄₅ ^A	I ₂₅₀ ^B	250	240	I ₂₅₀ ^A	290	290	270	295	300	295	
16	290	285	250	250	320	300	240	250	240	230	240	240	210	230	250	245	250	250	250	275	250	290	290	290	
17	290	295	270	240	250	250	250	250	240	230	200	240	220	240	240	240	240	250	240	240	255	360	290	295	
18	305	310	310	290	270	295	240	240	240	240	A	A	A	210	250	255	230	H	245	245	240	250	300	315	
19	280	290	225	195	300	300	240	240	220	210	210	225	220	220	220	225	220	245	250	245	300	290	300	280	
20	245	255	210	275	345	300	255	235	225	230	210	210	240	I ₂₄₀ ^A	I ₂₄₀ ^A	240	245	245	240	250	260	290	290	340	
21	350	310	290	265	390	300	250	240	240	240	230	210	240	210	240	220	240	245	255	250	290	300	340	360	
22	350	275	230	250	430	350	300	280	A	A	260	260	I ₂₄₀ ^A	240	260	240	250	250	260	260	300	340	350	315	
23	260	280	265	250	285	250	245	240	215	210	200	210	200	200	245	215	I ₂₇₀ ^A	250	260	250	240	295	295	310	
24	315	295	260	240	290	290	240	240	240	255	240	210	240	240	205	240	240	245	250	290	350	295	380	340	
25	360	330	295	290	260	290	250	250	I ₂₄₀ ^A	240	215	240	A	210	200	200	240	245	250	240	240	295	340	295	
26	E ₃₅₀ ^A	290	245	210	240	250	250	250	240	240	250	I ₂₄₀ ^A	240	210	250	245	245	245	260	250	240	295	295	305	
27	305	295	250	210	255	260	240	240	230	220	240	240	230	220	230	245	240	270	260	240	215	305	310	320	
28	310	295	250	200	240	250	250	240	240	225	A	A	I ₂₄₀ ^A	255	190	200	245	230	245	240	270	315	340	310	
29	300	275	250	225	240	245	230	225	230	270	I ₂₄₅ ^A	E ₂₅₅ ^A	A	A	A	A	A	A	A	A	I ₂₅₀ ^A	270	310	300	290
30	295	290	260	250	260	270	250	240	245	260	210	220	220	I ₂₅₀ ^A	225	240	I ₂₅₀ ^A	245	255	290	300	310	290	290	
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	30	29	29	29	29	29	29	29	28	29	28	28	27	29	29	28	29	29	29	30	30	30	30	30	
MED	295	295	265	250	260	295	250	245	240	240	228	221	230	230	240	240	245	250	250	242	245	295	295	295	
UQ	308	295	290	275	310	300	250	250	240	240	240	240	240	240	250	245	250	250	255	250	265	300	310	310	
LQ	290	280	250	240	250	270	240	240	230	225	210	215	220	220	230	230	240	245	250	240	240	290	290	290	

APR. 1970

H^oF (KM)

IONOSPHERIC DATA

APR. 1970

H^oES (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 MHz to 20 MHz		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	100	S	100	B	155	150	145	120	115	120	G	105	170	100	145	130	120	115	110	105	100	100
2	100	100	100	100	100	100	G	G	125	G	G	G	G	G	G	G	G	G	105	100	100	S	S	S
3	S	S	S	S	E	S	G	G	G	G	G	120	G	G	G	G	G	G	B	100	S	S	S	S
4	S	S	S	E	B	B	G	G	G	G	110	115	110	110	105	105	105	G	140	115	105	B	S	S
5	B	B	B	B	E	B	G	180	110	G	130	G	G	G	G	105	100	150	135	100	100	100	S	S
6	135	140	130	100	E	B	G	G	G	G	G	115	110	110	105	G	G	G	100	100	S	S	S	S
7	E	B	S	E	E	B	G	G	G	B	G	G	G	B	120	120	130	G	110	100	100	100	100	S
8	S	S	B	E	E	B	G	G	G	130	125	G	110	G	G	G	G	G	B	S	S	S	B	S
9	B	B	S	S	E	S	G	150	G	G	120	G	B	G	G	100	105	140	120	110	100	S	B	S
10	S	S	E	E	S	S	150	150	140	G	120	115	110	110	105	G	G	G	115	110	100	100	B	S
11	S	S	S	E	E	S	G	G	G	145	130	120	110	120	110	110	155	140	120	110	110	105	100	100
12	100	B	E	E	100	B	155	150	140	150	150	130	130	145	130	125	120	115	110	105	B	105	B	105
13	S	S	B	E	100	100	145	150	140	140	120	G	G	G	G	130	120	120	110	100	110	110	110	100
14	S	C	C	C	C	C	C	C	C	G	115	G	G	B	G	G	105	100	100	100	100	S	S	S
15	S	E	S	E	B	S	G	150	G	G	G	G	G	120	B	135	150	135	120	115	110	110	110	110
16	100	S	S	E	B	S	150	150	145	120	120	G	G	G	150	G	160	135	120	110	100	S	S	S
17	S	S	B	E	E	100	G	150	140	130	135	G	G	G	G	G	155	140	120	110	110	110	110	110
18	100	100	100	100	S	S	G	G	140	125	115	115	115	G	G	G	G	170	125	110	110	110	110	110
19	110	105	B	E	E	B	145	130	130	130	125	105	G	105	G	150	100	100	G	100	110	110	110	S
20	110	105	105	105	105	G	150	150	140	G	120	120	120	120	115	110	120	120	145	110	100	100	100	S
21	S	100	100	S	S	160	G	G	140	125	G	G	G	G	G	G	150	150	130	110	110	130	S	S
22	S	S	100	S	150	150	140	130	130	115	120	120	120	115	G	G	G	G	G	110	110	110	110	110
23	S	B	S	B	B	150	G	145	140	G	G	G	G	130	130	G	145	120	115	110	110	100	100	100
24	S	100	100	100	100	B	G	145	130	135	120	120	130	130	G	G	G	G	140	110	110	110	110	110
25	110	110	100	100	100	B	G	135	130	125	115	115	110	110	G	G	G	G	130	110	100	100	110	S
26	110	S	S	B	B	150	110	110	120	130	130	125	130	115	110	120	G	G	140	110	110	110	100	100
27	100	100	100	100	100	150	150	140	130	120	130	120	115	110	110	110	120	130	120	110	110	100	100	100
28	100	S	B	E	100	190	165	G	150	130	115	110	110	155	105	G	G	G	G	115	110	110	105	105
29	105	B	E	E	100	100	140	140	115	115	110	110	110	110	110	135	120	115	115	125	115	115	115	B
30	B	B	B	115	B	G	135	130	115	115	115	115	125	110	110	130	130	105	110	110	110	110	110	110
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	12	10	10	8	11	10	13	19	21	18	23	18	16	18	15	15	19	18	25	29	26	22	18	14
MED	102	100	100	100	100	150	150	150	140	128	120	118	112	112	110	120	120	130	120	110	110	110	110	105
UQ	110	105	100	102	100	150	150	150	140	130	128	120	122	120	125	130	148	140	130	110	110	110	110	110
LQ	100	100	100	100	100	100	140	138	130	120	115	115	110	110	108	108	112	115	110	100	100	100	100	100

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APR. 1970

H^oES (KM)

IONOSPHERIC DATA

APR. 1970

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 MHz to 20 MHz 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		F1		H1	H1	H1	F1	F1	F1		F1	H1	F1	H1	H1	F1	F1	F1	F1	F1	F1	
2	F3	F2	F1	F2	F2	F1			H1										F1	F1					
3												H1									F1				
4											F1	F1	F1	F1	F1	F1	F1		H1	F1	F1				
5								H1	H1		H1					F1	F1	H1	H1	F1	F1	F1			
6	F1	F1	F1	F1								F1	F1	F1	F1				F1	F1					
7															H1	H1	H1		H1	F1	F1	F1	F1	F1	
8									H1	H1		F1													
9								H1			H1					F1	H1	H1	H1	F1	F1				
10							H1	H1	H1		H1	F1	F1	F1	F1				H1	F1	F1	F1	F1		
11									H1	H1	F1	F1	F1	F1	F1	F1	H1	H1	F1	F1	F1	F1	F1	F1	
12	F2				F1		H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	F1	F1	F1	F1	F1	F1	F1	F1	
13					F1	FF	H1	H1	H1	H1	H1					H1	H1	H1	H1	F1	F1	F1	F1	F1	
14											F1								F1	F1	F1				
15								H1						H1		H1	H1	H1	F1	F1	F1	F1	F1	F1	
16	F1						H1	H1	H1	H1	H1				H1		H1	H1	H1	F1	F1				
17					F1		H1	H1	H1	H1							H1	H1	H1	F1	F1	F1	F1	F1	
18	F1	F2	F2	F2					H1	H1	F1	F1	F1					H1	H1	F1	F1	F1	F1	F1	
19	F3	F2					H1	H1	H1	H1	H1	F1		F1		H1	F1	F1	F1	F1	F1	F1	F1	F1	
20	F2	F1	F1	F1	F2		H1	H1	H1		H1	H1	H1	H1	F1	F1	H1	H1	H1	F1	F1	F1	F1	F1	
21		F1	F1				H1		H1	H1							H1	H1	H1	F1	F1	F1	F1	F1	
22			F1		F1	H1	H1	H1	H1	H1	H1	H1	H1	F1						F1	F1	F1	F1	F1	
23						H1		H1	H1					H1	H1			H1	H1	F1	F1	F1	F1	F1	
24		F2	F2	F2	F2			H1	H1	H1	H1	H1	H1	H1	H1				H1	F1	F1	F1	F1	F1	
25	F5	F4	F6	F1	F1			H1	H1	H1	F1	F1	F1	F1					H1	F1	F1	F1	F1	F1	
26	F4					H1	F1	H1	H1	H1	H1	H1	H1	F1	F1	H1			H1	F1	F1	F1	F1	F1	
27	F2	F2	F1	F1	F2	H1	H1	H1	H1	H1	H1	H1	F1	F1	F1	F1	H1	H1	H1	F1	F1	F1	F1	F1	
28	F1				F1	H1	H1		H1	H1	F1	F1	F1	H1	F1					F1	F1	F1	F1	F1	
29	F2				F2	F1	H1	H1	F1	F1	F1	F1	F1	F1	F1	F1	H1	H1	F1	F1	F1	F1	F1	F1	
30				F1			H1	H1	F1	F1	F1	F1	H1	F1	F1	H1	H1	H1	F1	F1	F1	F1	F1	F1	
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																									
MED																									
UQ																									
LQ																									

APR. 1970

TYPES OF ES

IONOSPHERIC DATA

APR. 1970

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 MHz to 20 MHz 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	400	390	480	470	400	400	408	390	390	345	360	350	325	325	320	345	325	315	290	280	345	390	400	405
2	360	390	395	380	365	370	320	310	300	310	340	340	350	350	350	350	340	300	300	310	350	350	310	350
3	390	400	390	300	310	380	R	300	300	300	340	350	350	350	350	380	350	340	310	300	350	395	390	400
4	395	400	340	340	400	395	300	310	310	305	350	355	360	360	360	350	340	330	305	310	350	360	355	375
5	350	360	350	310	375	370	305	290	300	340	350	350	355	355	360	355	350	315	310	310	355	405	380	380
6	380	355	370	345	380	380	350	305	310	350	360	350	360	350	365	370	390	340	300	300	390	410	450	450
7	395	390	400	390	430	410	320	330	320	340	380	350	370	350	360	350	350	330	310	300	350	370	390	380
8	390	390	390	365	395	390	310	310	310	340	355	390	355	350	360	360	350	350	310	310	390	400	390	350
9	R	400	390	350	400	400	340	300	300	350	340	370	310	370	380	400	370	370	340	300	350	400	380	410
10	410	400	300	340	420	440	310	300	300	350	350	350	350	360	350	340	350	320	310	340	310	360	390	400
11	400	400	400	350	370	380	300	310	340	340	350	365	370	370	370	355	350	350	315	350	390	380	405	370
12	370	370	370	350	370	370	320	305	320	350	370	360	365	370	370	370	355	320	330	320	320	355	380	360
13	360	360	390	410	410	430	340	305	315	350	350	350	365	365	360	350	350	350	320	350	350	R	390	390
14	390	C	C	C	C	C	C	C	C	340	350	350	350	350	390	350	350	330	310	300	390	400	400	390
15	390	310	290	300	390	390	300	300	300	350	340	370	395	350	350	340	350	340	340	320	340	390	390	390
16	365	350	310	350	410	410	330	310	340	350	350	380	380	360	350	350	350	350	310	330	360	390	390	360
17	360	390	350	320	340	310	300	310	340	340	380	390	390	350	350	370	360	330	310	340	390	390	390	410
18	400	400	410	380	350	390	300	310	350	350	370	355	350	360	360	340	310	310	305	320	350	400	400	440
19	350	390	300	350	415	410	300	290	320	350	355	330	340	345	350	340	350	305	320	345	405	400	405	370
20	360	340	300	405	440	405	300	300	355	350	390	350	350	350	330	350	340	340	300	300	250	400	390	440
21	420	400	350	390	480	490	320	320	440	380	380	350	350	350	300	340	300	310	310	370	390	450	450	450
22	440	380	340	450	540	460	420	390	450	G	500	450	G	G	500	425	350	300	300	370	400	450	420	400
23	400	370	390	390	390	390	300	300	310	340	350	350	360	350	340	340	340	320	340	310	350	400	390	400
24	440	400	315	340	400	400	315	290	300	300	350	350	340	350	350	350	340	310	310	340	350	400	440	400
25	410	400	390	390	380	350	300	300	300	350	350	350	390	350	380	350	350	350	325	300	390	400	R	400
26	400	390	R	380	350	350	310	340	310	350	350	340	380	340	350	350	325	350	320	310	320	390	400	400
27	400	390	310	315	400	390	300	310	320	340	380	380	380	390	350	350	360	350	350	310	380	400	395	400
28	400	390	340	290	380	350	300	300	300	370	370	355	355	350	350	350	340	310	310	310	350	410	410	400
29	380	350	310	290	345	310	300	300	310	340	350	350	350	345	330	320	330	340	315	310	R	R	410	390
30	385	390	350	360	370	345	300	300	315	340	370	370	370	355	360	360	350	310	330	350	380	410	400	380
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	29	29	28	29	29	29	28	29	29	29	30	30	29	29	30	30	30	30	30	30	29	28	29	30
MED	390	390	350	350	390	390	300	305	310	340	350	350	355	350	352	350	350	330	310	315	350	400	395	400
UQ	400	400	390	390	410	405	320	310	340	350	370	370	370	360	360	360	350	350	320	340	390	400	405	405
LQ	370	370	315	340	370	370	300	300	300	340	350	350	350	350	350	345	340	310	310	300	350	390	390	380

APR. 1970

HPF2 (KM)

IONOSPHERIC DATA

APR. 1970

YPF2 (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 MHz to 20 MHz 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	100	100	120 ^R	130	100	100	100 ^R	100	100	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	90	100	100	100	90	90	90	100	100	100	100 ^R	100	90	100 ^R	100 ^R	
3	90	100	90	100	110	100	R	90	100	100 ^R	100	90	100	90	90	100	100	100	90	100	100	85	100 ^R	100	
4	95	100	100 ^R	90	100	95	90	100 ^R	90	95	100	90	70	95	95	95	70	90	95	85	90 ^R	80	75	80	
5	100 ^R	85	95	100	95	100	70	100 ^R	85	70	90	90	85	85	85	70	80	85	90	70	115	90	90	80	
6	90	90	70	65	85	80	95	95	90	90	100	100	90	100	85	100	100	90	100	100 ^R	100 ^R	90	100	100	
7	95	100	100 ^R	100 ^R	110	100 ^R	80	90	120	100	100	100	80	90	90	100	100	110	90	100 ^R	90 ^R	100 ^R	100 ^R	100 ^R	
8	100	100	100	85	95	100	90	90	90	90	95	100	95	100	90	100	100	100	90	100 ^R	100	90	100	90 ^R	
9	R	90 ^R	100	90	90	100	90	100	100	90	100	90	90	90	80	80	100	80	90	100	100	100	100	90	
10	90	100	100 ^R	100	110	90	90	100	100	90	100	100	100	100	100	100	100	90	90	90	90	90	100	90	
11	90	90	90	100	90	100	90	100	100	80	100	110	85	85	100	90	95	75	100	95	100	80	95	85	
12	80	85	80	100 ^R	125	100 ^R	80	85	85	95	125	85	80	75	95	100	95	105	100 ^R	85	90	95	100 ^R	100 ^R	
13	90	80	60	90	85	115	130	90	85	100	100	100	85	65	100	100	90	90	90	90	100 ^R	R	100	100	
14	100	C	C	C	C	C	C	C	C	100	100	100	100	100	90	90	90	110	90	100	100	100	100 ^R	100 ^R	
15	100	100	100	100	100	100	100	90	100	90	100	90	95	100	100	100	100	90	100	110	100 ^R	90	90 ^R	100 ^R	
16	95	100 ^R	90	100	90	90	110	100 ^R	110	100	100	100	80	100 ^R	100	110	100	90	90	70	100	100	100	90 ^R	
17	90	100 ^R	100 ^R	100 ^R	100	90	100	90	110	100	100	100	100	110	80	80	90	110	90	100	100	100	100 ^R	100 ^R	
18	100 ^R	90	90	100 ^R	90	100	90	90	100 ^R	140	100	95	75	85	85	100	90	85	90	90	100	90	100	100 ^R	
19	150	100 ^R	70	120	85	90	95	70	100	90	75	70	80	75	80	85	80	85	90	95	85	90	95	85	
20	80	70	70	95	105	90	95	100	95	90	90	90	90	90	80	90	100	90	100	100	100	90	100	100	
21	80	100	90	100	120	110	90	80	100	100	70	100	100	90	100	100	100 ^R	90	100	110	100	100 ^R	100 ^R	100 ^R	
22	110	100 ^R	110	100 ^R	100	140	160	100	130	G	160	100	G	G	90	155	90	100	100	90	100	100 ^R	100	100	
23	100	110	100	100	100	100	100	100	110	100	100	90	90	90	100	90	90	100	100	90	90	100 ^R	100	100 ^R	
24	90	100	85	100	100	100	95	100	100	100	90	100	100	90	90	90	90	90	90	100	90	100	100 ^R	100	
25	90	100	100 ^R	100	80	100	100	100	110	90	90	90	90	90	100	90	90	90	115	100 ^R	100	100 ^R	R	100 ^R	
26	100 ^R	100	R	110	100 ^R	100	90	100	90	90	100	90	70	100	90	100	95	90	90	100 ^R	110	100	100	100 ^R	
27	100	100 ^R	85	85	100	100	90	90	90	100	100	110	110	100	100	100	100	100	90	90	100 ^R	100	95	100 ^R	
28	100	100	100 ^R	110	110	100	100	100	100	120	100	65	95	95	100 ^R	55	100 ^R	90	90	100 ^R	100	90	100 ^R	100 ^R	
29	70	60	100	100 ^R	100	135	125	75	135	100	100	90	80	70	100	85	115	100 ^R	90	100 ^R	R	R	100 ^R	100	
30	85	100 ^R	65	85	90	80	85	145	85	105	120	120	100	90	90	90	95	95	115	100	90	90	90	95	
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	28	28	27	28	28	28	27	28	28	28	29	29	28	28	29	29	29	29	29	29	29	28	27	28	29
MED	92	100	90	100	100	100	95	92	100	98	100	100	90	90	90	95	95	90	90	95	100	90	100	100 ^R	
UQ	100	100	100	100	102	100	100	100	105	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100 ^R	
LQ	90	90	85	90	90	90	90	90	90	90	100	90	80	88	90	90	90	90	90	90	90	90	90	90 ^R	

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APR. 1970

YPF2 (KM)

IONOSPHERIC DATA

APR. 1970

FOF2 (0.1 MHZ)

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

Station	YAMAGAWA							Lat	31 12.1 N			Long	130 37.1 E			Sweep	1 MHz to 20 MHz 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	84	85	71	72	70	68	68	79	94	100	108	117	135	125	121	119	121	125	118	99	78	72	70	67
2	64	61	62	62	56	50	58	84	105	115	122	128	137	148	154	159	163	171	181	S	S	S	178	175
3	140	110	92	89	75	39	49	92	109	110	114	122	129	130	131	134	133	137	131	122	85	78	85	81
4	79	79	84	72	57	59	65	97	115	119	114	133	146	157	169	173	178	181	172	152	S	S	114	98
5	96	93	83	77	65	59	68	102	106	108	122	123	133	139	139	141	145	152	141	130	118	113	112	S
6	S	95	84	77	71	66	174	98	111	110	120	131	138	144	139	137	145	149	134	108	98	87	80	77
7	82	82	70	69	67	72	83	108	115	119	120	133	143	143	141	140	141	143	140	122	109	105	87	84
8	83	78	76	68	61	61	72	105	117	115	122	131	140	145	147	143	138	137	133	121	S	S	S	S
9	S	85	78	79	68	66	178	104	109	117	118	124	131	137	132	132	139	142	137	118	98	92	95	81
10	79	80	85	62	55	56	65	103	105	113	122	126	131	140	143	130	127	133	132	120	108	84	85	89
11	84	81	79	81	73	62	75	93	103	118	117	126	138	137	137	142	145	144	136	113	105	102	104	97
12	108	97	91	87	70	63	77	104	109	100	116	131	136	138	140	143	141	140	135	121	109	94	88	92
13	94	90	78	69	75	76	88	110	107	118	125	133	145	160	165	169	168	166	149	138	134	138	S	S
14	S	131	118	98	62	58	70	98	104	109	122	125	131	137	138	135	134	135	128	105	95	95	105	107
15	101	105	108	69	56	51	63	93	107	102	C	C	129	142	148	149	144	142	142	122	100	95	S	S
16	97	95	92	74	63	60	69	105	102	112	125	132	137	148	141	134	134	132	125	118	94	102	95	108
17	87	84	85	85	67	60	78	97	93	108	118	119	126	150	149	147	143	136	130	118	98	85	85	85
18	88	84	79	85	78	59	79	92	89	105	124	136	157	164	170	167	163	154	148	148	S	S	S	S
19	S	S	S	93	80	77	87	108	111	121	133	146	152	148	137	141	142	133	120	110	98	98	92	92
20	93	85	85	59	60	62	75	88	103	109	123	137	144	152	152	151	145	138	135	124	82	70	73	71
21	66	72	67	53	51	52	57	76	86	117	123	137	145	147	141	131	121	115	106	105	101	98	99	100
22	90	85	66	55	51	55	66	78	72	90	111	106	115	120	102	104	113	102	90	87	74	72	75	75
23	77	76	72	65	58	54	73	78	82	94	108	116	136	151	163	165	165	162	144	125	108	102	114	S
24	S	S	S	S	78	68	79	86	94	94	108	130	134	128	120	134	135	126	117	107	87	83	87	92
25	102	101	93	89	63	53	62	70	79	96	118	119	134	147	150	148	142	137	136	122	89	83	88	93
26	102	91	108	78	63	55	70	91	110	119	122	119	130	132	137	129	130	131	122	114	93	108	S	S
27	92	93	100	93	66	63	73	91	93	101	105	118	134	141	142	147	145	143	140	128	S	S	S	S
28	107	105	S	98	67	69	71	97	100	97	112	130	148	149	162	168	166	152	141	123	107	104	105	104
29	102	108	104	91	75	68	79	94	98	103	108	120	132	151	150	142	131	126	114	105	88	102	88	92
30	95	87	92	108	67	70	81	101	103	97	109	126	140	141	144	148	144	138	123	108	108	92	95	92
31																								
CNT	25	28	27	29	30	30	30	30	30	30	29	29	30	30	30	30	30	30	30	29	25	25	24	22
MED	95	85	84	77	66	60	72	93	103	109	118	126	136	144	142	142	142	138	134	120	96	90	89	92
UQ	96	94	92	87	71	68	78	101	109	117	122	132	143	149	150	149	145	149	141	124	101	98	102	97
LQ	83	80	77	69	60	55	65	88	95	100	112	120	131	137	137	134	134	133	123	108	89	83	85	81

APR. 1970

FOF2 (0.1 MHZ)

IONOSPHERIC DATA

APR. 1970

FOF1 (0.01 MHz)

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

Station **YAMAGAWA** Lat. **31 12.1 N** Long. **130 37.1 E** Sweep 1 MHz to 20 MHz 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	L								
2										L	L	L	L	L	L	L	L	L						
3									L	L	450	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	L	L	L						
6										L	L	L	U 550	U 520	L	L	L	L						
7										L	L	L	L	L	L	L	L	L						
8									L	L	L	L	U 580	L	L	L	L	L						
9										L	L	C	L	L	L	U 640	L	L						
10										L	L	L	L	L	L	L	L	L						
11									L	L	L	490	L	U 550	U 550	L	L	A						
12										L	L	L	L	A	A	L	L	A						
13										A	L	L	L	L	L	L	L	L						
14									L	L	L	U 530	L	L	L	560	L	L						
15									L	L	C	C	L	610	L	L	L	L						
16										L	L	L	L	U 550	L	L	L	L						
17									L	L	L	L	L	L	L	L	L	A						
18									L	L	L	L	L	L	L	L	L	L						
19										L	L	L	L	U 530	L	L	A	L						
20									L	L	L	L	U 530	L	520	L	L	L						
21									L	L	L	560	L	L	L	L	L	L						
22								L		580	L	500	U 580	490	L	550	490	L						
23									L	L	L	L	L	L	L	L	L	L						
24									L	A	L	L	A	540	U 600	L	L	L						
25									L	L	L	A	L	L	L	L	L	L						
26									L	L	L	L	530	580	L	L	460	L						
27										L	L	570	C	A	L	A	L	L						
28									C	L	L	L	L	L	L	L	L	L						
29									L	L	L	L	L	A	L	L	A	U 410						
30									A	L	L	L	U 360	A	600	A	L	L						
31																								
CNT											1	1	5	6	8	4	3	2	1					
MED										580	450	530	540	545	575	560	475	410						
UQ											560	580	565	600	600									
LQ											500	530	525	535	555									

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APR. 1970

FOF1 (0.01 MHz)

IONOSPHERIC DATA

APR. 1970

FOE (0.01 MHZ)

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

Station YAMAGAWA Lat. 31 12' N Long. 130 37' E Sweep 1 MHz to 20 MHz 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	240 ^H	300 ^H	335 ^H	350 ^H	365	375	380	380 ^H	365	330	280	200					
2							S	230	310	330	350	A	A	A	380	370	335	290	A					
3							S	240	300	340	360	370	360	390 ^A	380	360	330	290	A					
4							S	240	310	340	360	380	A	A	A	365	330	290	200					
5							S	230	300	330	360	375 ^A	390	390	385	360	330	290	210					
6							S	230	300	340	A	A	380	375	370	350	320	290	210					
7							S	230	310	340	365	375	390	400	390	375	350	300	225 ^H					
8							S	255 ^H	310	355	370	370	A	A	A	370	330	A	A					
9							S	240	315	340 ^C	365 ^C	375 ^C	380	390	395	375	345	295	230					
10							S	250	315	350	370	390	400	A	A	A	335	295	230					
11							S	270	315	350	365	375	390	400	390	375	340	A	A					
12							S	255	315	350	370 ^B	380 ^H	400	400	395	370	340	305	205					
13							S	255	310	340	360	A	A	R	385	380	350	295	210					
14							S	255 ^H	310	345	360	370	A	A	A	A	330	290	220					
15							S	270 ^H	310	340	C	C	390	390	400	370	330	300	220					
16							S	250	300	330	360	360	380	380	360	360	320	280 ^H	210					
17							S	260	300	335	350	365	370	370	390	350	335	285	220					
18							S	260	305	340	370	370	375	380	375	360	330	290	210					
19							S	240	305	325	340	355	350	375	375	360	320	295	220					
20							150	240	300	335	355	A	A	A	A	A	315	A	A					
21							S	250	300	330	350	370	A	A	A	A	325	290	190					
22							S	260	295 ^H	325	345	365	A	A	365	350	325	280	210					
23							170	260	300	330	350	A	A	A	A	350 ^H	325	A	A					
24							190	265 ^H	310 ^H	335	350	360 ^B	365	380	370 ^H	350	325	290	220					
25							S	245	300	335	355	370	380	375	370	345	320	290	230					
26							S	A	A	A	A	A	A	A	A	360	335	300	235					
27							S	265	315	340	370	375	C	A	A	370	335	300	230					
28							170 ^C	270	310 ^C	335	350	370	A	A	R	370	330	290 ^H	230 ^H					
29							165	270	320	350	365	370	A	A	A	A	340 ^H	300 ^H	230					
30							C	260	320	340	370	380	A	A	A	A	A	A	A					
31																								
CNT								5	29	29	29	27	23	16	15	18	24	29	25	23				
MED								170	255	310	340	360	370	380	380	380	360	330	290	220				
UQ								170	260	310	340	365	375	390	390	390	370	335	295	230				
LQ								165	240	300	335	350	368	368	378	370	355	325	290	210				

APR. 1970

FOE (0.01 MHZ)

IONOSPHERIC DATA

APR. 1970

FOES (0.1 MHZ)

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

Station	YAMAGAWA							Lat.	31 12' 1" N			Long.	130 37' 1" E			Sweep	MHz to 20		MHz in 20		sec in automatic operation					
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	J ₃₀		20	23	15	15	J ₁₂	24	26	32	36	42	43	41	44	43	23	G	18	39	33	J ₃₄	J ₂₆	J ₂₈	18	23
2	E ₁₅	E ₁₅	E ₁₅	J ₂₆	J ₂₃	23	24	E ₁₅	G	35	36	41	44	40	45	35	34	J ₄₁	J ₃₁	J ₃₄	J ₁₉	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
3	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₄	E ₁₅	E ₁₅	G	G	G	G	G	39	40	G	37	36	G	G	20	J ₂₅	21	E ₁₅	E ₁₅	E ₁₅	
4	E ₁₁	E ₁₅	E ₁₅	E	E	E ₁₅	E ₁₅	G	G	G	38	42	45	43	J ₅₄	J ₃₉	J ₆₄	J ₃₄	24	18	19	E ₁₅	E ₁₅	E ₁₅		
5	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₃	E ₁₁	E ₁₅	G	G	G	38	40	34	G	36	32	29	G	21	33	29	25	23	E ₁₅	E ₁₅	E ₁₅
6	E ₁₅	E ₁₅	E ₁₅	E	E	E ₁₂	E ₁₅	G	G	39	38	43	37	39	J ₄₁	J ₈₆	J ₄₅	20	27	J ₂₈	21	19	E ₁₅	E ₁₅		
7	E ₁₅	E ₁₅	E ₁₄	E ₁₂	E	E ₁₃	21	22	G	30	37	39	40	G	43	G	G	G	40	33	J ₃₇	J ₃₉	J ₃₇	X ₂₅	J ₂₂	
8	23	E ₁₅	E ₁₅	E ₁₂	E ₁₂	J ₂₅	21	28	G	38	43	43	44	40	J ₄₄	J ₄₀	J ₃₈	J ₃₀	J ₃₉	24	J ₂₄	23	E ₁₅	J ₂₃		
9	21	E ₁₆	E ₁₆	E ₁₇	E ₁₈	E ₁₆	17	G	30	30	G	C	33	45	33	23	G	23	35	34	J ₃₆	J ₁₉	24	23	23	
10	E ₁₅	E ₁₅	E ₁₃	J ₂₃	E ₁₂	C	E ₁₅	28	38	38	40	G	G	42	J ₆₂	J ₄₈	J ₂₉	J ₃₇	31	87	J ₆₁	J ₆₂	J ₂₄	J ₂₁		
11	E ₁₅	E ₁₅	J ₃₇	J ₃₀	J ₂₉	23	21	21	G	33	42	43	42	G	G	46	J ₆₃	43	J ₆₈	J ₄₁	J ₃₆	J ₂₈	J ₂₂	J ₇₄	J ₃₄	
12	E ₁₅	E ₁₅	E ₁₅	E ₁₂	E	23	24	J ₂₇	36	39	33	G	51	J ₆₆	J ₇₅	J ₆₅	J ₇₁	J ₅₁	J ₇₁	J ₂₇	J ₃₄	E ₁₅	J ₅₁	J ₄₁		
13	J ₃₆	J ₂₆	J ₃₅	J ₂₆	J ₂₇	J ₂₆	J ₂₁	36	J ₄₈	55	44	40	45	44	48	G	J ₆₄	32	J ₂₅	24	J ₂₄	20	E ₁₅	E ₁₅		
14	21	E ₁₅	J ₂₃	J ₂₃	E ₁₃	E ₁₃	E ₁₅	28	33	37	38	42	44	39	45	39	33	J ₂₅	29	J ₃₄	J ₃₅	19	E ₁₅	E ₁₅		
15	E ₁₂	E ₁₄	E ₁₂	E ₁₁	E	19	20	29	34	G	C	C	G	36	35	32	53	53	38	38	19	J ₆₃	J ₅₂	E ₁₄	E ₁₅	
16	E ₁₅	J ₂₀	23	E ₁₁	E ₁₁	E ₁₅	20	28	34	38	40	41	41	G	G	29	G	39	33	32	J ₃₅	J ₄₂	J ₃₂	J ₃₀	25	
17	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₁	E ₁₅	20	31	40	42	49	41	50	39	G	G	G	36	40	29	J ₂₉	J ₃₈	J ₂₉	J ₄₄	J ₄₀	
18	J ₃₃	J ₆₃	J ₃₂	J ₃₆	J ₂₄	J ₂₅	22	33	37	40	44	44	45	42	G	G	J ₃₆	33	29	J ₃₂	J ₃₃	25	J ₄₂	23		
19	J ₃₆	25	21	J ₂₃	J ₄₁	25	20	G	34	40	43	44	42	39	38	50	J ₆₃	G	36	25	16	24	J ₂₂	J ₂₉		
20	J ₂₁	J ₃₄	J ₂₄	J ₂₃	E ₁₃	G	30	37	40	39	39	40	39	38	37	33	J ₃₀	J ₃₃	J ₅₀	J ₃₃	J ₂₅	22	E ₁₅			
21	E ₁₅	E ₁₅	E ₁₅	E	E ₁₁	E ₁₅	22	31	35	38	43	42	J ₄₇	43	45	39	34	32	23	20	J ₁₉	J ₁₉	J ₂₆	J ₃₂		
22	J ₁₈	E ₁₅	E ₁₁	20	J ₂₉	J ₂₀	J ₅₂	33	34	J ₆₀	42	41	45	J ₈₆	J ₃₇	G	34	29	J ₃₀	J ₅₁	J ₅₁	24	39	23		
23	J ₃₃	J ₃₃	25	21	23	J ₂₁	25	29	32	36	G	38	J ₇₄	J ₈₄	76	44	G	J ₅₄	J ₄₇	J ₅₈	J ₅₁	58	J ₆₁	J ₄₉		
24	J ₂₉	J ₂₅	E ₁₅	E ₁₄	E	23	33	43	49	43	J ₅₂	J ₆₂	43	42	41	18	G	41	31	J ₆₁	J ₂₉	J ₂₁	J ₄₂	J ₂₇		
25	J ₂₈	J ₂₉	J ₈₄	J ₅₂	J ₄₄	J ₄₂	24	32	38	41	47	J ₆₄	42	G	G	G	G	31	28	J ₂₉	J ₃₃	23	23	24		
26	20	E ₁₅	E ₁₁	J ₂₇	J ₂₂	J ₂₁	J ₂₅	J ₄₁	38	J ₆₁	J ₅₂	J ₅₂	J ₅₄	J ₄₁	J ₄₂	J ₃₄	G	G	J ₄₁	J ₅₁	J ₅₁	J ₃₆	J ₂₇	J ₂₆		
27	J ₂₅	J ₂₃	J ₂₆	J ₂₄	J ₃₃	J ₄₆	J ₃₂	39	J ₄₅	46	50	47	C	J ₉₉	61	J ₇₉	G	32	32	74	J ₂₂	J ₂₇	J ₃₆	J ₃₄		
28	J ₃₀	23	E ₁₄	E ₁₄	J ₃₁	C	G	32	C	J ₆₀	J ₆₂	J ₆₁	49	51	38	55	36	G	G	16	J ₂₉	J ₆₁	J ₆₁	J ₇₁		
29	E ₁₅	22	E ₁₃	E ₁₂	J ₂₇	E ₁₅	26	35	41	47	49	47	39	J ₆₁	92	50	50	G	G	25	49	J ₄₂	J ₃₈	J ₂₁		
30	E ₁₅	J ₆₄	J ₇₄	J ₉₈	J ₅₀	C	J ₃₀	40	J ₆₆	40	44	44	44	J ₁₁₀	J ₅₃	J ₇₄	J ₄₅	J ₅₀	J ₃₆	J ₂₅	J ₅₂	70	J ₆₃	J ₅₂		
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	30	30	30	30	30	27	30	30	29	30	29	28	29	30	30	30	30	30	30	30	30	30	30	30	30	
MED	16	E ₁₅	E ₁₅	16	16	19	20	28	34	39	42	42	42	42	42	39	35	32	32	J ₂₉	J ₃₁	24	24	23		
UQ	J ₂₈	J ₂₃	J ₂₆	J ₂₄	J ₂₇	J ₂₄	24	33	38	42	44	44	45	45	48	J ₅₀	J ₄₅	39	J ₃₆	J ₃₇	J ₄₂	J ₃₆	J ₄₂	J ₃₄		
LQ	E ₁₅	E ₁₅	E ₁₃	E ₁₂	E ₁₁	E ₁₄	15	21	32	36	38	40	39	39	33	23	18	29	28	25	J ₂₂	19	E ₁₅	E ₁₅		

The Radio Research Laboratories, Japan

APR. 1970

FOES (0.1 MHZ)

IONOSPHERIC DATA

APR. 1970

FBES (0.1 MHZ)

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

Station	YAMAGAWA							Lat.	31 12.1 N							Long.	130 37.1 E							Sweep	1 MHz to 20 MHz in 20 sec in automatic operation						
Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
1	20	E	E	13	12	S	5	G	G	G	40	41	40	43	42	29	18	38	32	27	E	23	E	E							
2	E ₁₅	E ₁₅	15	E	E	E	E ₁₅	G	G	G	G	43	E ₄₀	43	34	33	36	26	22	15	E ₁₄	E ₁₅	E ₁₅	E ₁₅							
3	E ₁₅	E ₁₅	E ₁₄	E ₁₄	E	E	E ₁₅	G	G	G	G	E ₃₉	40	34	35	G	G	E ₂₀	17	E	E ₁₃	E ₁₄	E ₁₅								
4	E ₁₅	E ₁₅	E ₁₅	E	E	E ₁₅	E ₁₅	G	G	G	G	41	41	41	40	30	45	32	G	15	E	E ₁₅	E ₁₅	E ₁₅							
5	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₃	E ₁₅	E ₁₅	G	G	G	G	39	34	34	31	29	20	32	28	24	E	E ₁₄	E ₁₅	E ₁₅							
6	E ₁₅	E ₁₅	E ₁₅	E	E	E ₁₄	E ₁₅	G	G	G	38	43	36	E ₃₈	35	40	44	18	27	28	E	E	E ₁₅	E ₁₅							
7	E ₁₅	E ₁₅	E ₁₄	E ₁₂	E	E ₁₃	S	G	30	37	E ₃₉	40	G	E ₄₃	G	G	G	36	32	28	24	29	19	10							
8	E	E ₁₅	E ₁₂	E ₁₂	E ₁₂	19	S	G	G	G	43	43	44	E ₄₀	42	40	38	30	31	18	24	E ₂₃	E ₁₅	18							
9	E	E ₁₆	E ₁₆	E ₁₇	E ₁₈	E ₁₆	17	G	29	30	G	C	33	44	33	23	22	G	33	33	17	E	E	E							
10	E ₁₅	E ₁₅	E ₁₃	E	E ₁₂	C	E ₁₅	G	36	G	G	G	G	42	50	39	27	32	29	76	45	20	15	E							
11	E ₁₅	E ₁₅	E	21	19	E	S	G	G	41	42	42	G	G	44	44	39	53	39	32	21	18	63	29							
12	E ₁₅	E ₁₅	E ₁₃	E ₁₂	E	E	S	G	35	37	33	G	48	62	67	53	48	49	56	E	E	E ₁₅	E	18							
13	17	20	26	17	18	18	16	35	45	53	43	E ₄₀	44	44	47	G	26	G	18	E	15	E	E ₁₅	E ₁₅							
14	E	E ₁₅	E	15	E ₁₃	E ₁₃	E ₁₅	G	G	G	G	41	42	E ₃₉	44	37	31	20	27	32	26	E	E ₁₅	E ₁₅							
15	E ₁₂	E ₁₄	E ₁₂	E ₁₁	E	E	19	G	G	G	C	C	35	33	32	45	52	33	37	15	45	48	E ₁₂	E ₁₅							
16	E ₁₅	E	14	E ₁₁	E ₁₁	E ₁₂	18	G	G	37	G	E ₄₁	E ₄₁	G	G	29	38	G	G	31	32	E	18	E							
17	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₁	E ₁₅	16	G	34	39	45	40	43	E ₃₉	G	G	G	35	G	19	32	26	27	40							
18	17	41	24	29	15	E	19	G	34	39	42	43	44	E ₄₂	G	G	26	G	27	30	26	E	E	E							
19	25	E	E	15	19	E	19	G	G	39	41	42	E ₄₂	E ₃₉	38	44	61	G	G	21	14	E	18	20							
20	E	14	18	E	E	E ₁₃	G	G	35	39	G	E ₃₉	E ₄₀	E ₃₉	E ₃₈	37	33	29	25	29	27	16	E	E ₁₅							
21	E ₁₅	E ₁₄	E ₁₃	E	E ₁₁	E ₁₅	20	29	33	38	42	40	43	43	42	39	G	G	G	18	16	17	22	31							
22	E	E ₁₅	E ₁₁	17	28	19	51	G	31	45	38	G	41	41	35	G	G	G	26	49	18	E	14	E							
23	29	25	E	E	E	15	G	G	G	G	G	38	54	51	67	43	G	36	39	51	30	E	24	20							
24	17	19	E ₁₃	E ₁₄	E	E	G	30	42	47	41	50	57	43	42	41	18	15	29	45	26	16	40	16							
25	E	17	20	27	31	42	22	31	34	39	46	64	42	G	G	G	G	G	27	19	29	E	20	19							
26	E	E ₁₅	E ₁₁	15	15	15	21	36	35	43	49	48	45	41	42	33	G	G	30	51	31	E	19	19							
27	16	15	20	20	22	40	24	37	43	42	48	46	C	95	47	75	G	G	30	65	17	18	E ₃₆	24							
28	E	E	E ₁₄	E ₁₄	E	C	G	G	C	54	53	58	47	50	E ₃₈	47	G	G	G	15	25	25	18	66							
29	E ₁₅	E	E ₁₃	E ₁₂	21	E ₁₅	24	31	35	42	48	44	E ₃₉	58	47	46	49	G	G	24	40	26	E	E							
30	E ₁₅	46	46	60	24	C	19	G	60	40	42	42	43	76	51	74	40	32	30	E	50	54	20	44							
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	30	30	30	30	30	26	25	30	29	30	29	28	29	30	30	30	30	30	30	30	30	30	30	30	30						
MED	15	E ₁₅	E ₁₄	E ₁₄	E ₁₂	E ₁₄	16	G	30	38	40	41	41	42	39	37	26	19	27	26	24	E ₁₅	E ₁₅	15							
UQ	E ₁₅	E ₁₅	14	17	18	15	19	G	35	41	43	43	44	44	44	44	39	32	31	32	30	23	20	20							
LQ	E	E ₁₃	E ₁₂	E ₁₁	E	E	E ₁₅	G	G	G	G	39	E ₃₉	E ₃₉	32	23	G	G	E ₁₈	17	14	E	E ₁₄	E ₁₅							

APR. 1970

FBES (0.1 MHZ)

IONOSPHERIC DATA

APR. 1970

F-MIN (0.1 MHZ)

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

Station YAMAGAWA Lat. 31 12' N Long. 130 37' E Sweep 1 MHz to 20 MHz 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 _{1.5}	E _{1.5}	E _{1.5}	11	E	E _{1.5}	E _{1.5}	E _{1.5}	13	15	17	16	18	18	17	17	15	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
2	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	15	15	15	18	20	20	20	18	15	14	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
3	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E	E _{1.5}	E _{1.5}	E _{1.5}	14	15	16	16	18	17	19	18	16	15	13	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
4	E _{1.5}	E _{1.5}	E _{1.5}	E	E	E _{1.5}	E _{1.5}	E _{1.5}	15	15	16	18	19	19	19	17	15	14	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
5	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	11	E _{1.5}	E _{1.5}	13	15	15	16	18	20	18	16	15	13	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
6	E _{1.5}	E _{1.5}	E _{1.5}	E	E	E _{1.5}	E _{1.5}	E _{1.5}	14	15	16	16	19	20	16	19	16	14	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
7	E _{1.5}	E _{1.5}	E _{1.5}	12	E	E _{1.5}	E _{1.5}	E _{1.5}	12	15	18	19	19	21	27	20	25	19	15	15	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
8	E _{1.5}	E _{1.5}	E _{1.5}	12	12	11	E _{1.5}	E _{1.5}	17	17	19	27	25	24	19	21	19	16	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	
9	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	
10	E _{1.5}	E _{1.5}	E _{1.5}	11	12	C	E _{1.5}	E _{1.5}	16	17	18	20	20	21	19	17	14	12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
11	E _{1.5}	E _{1.5}	11	E _{1.5}	E	E _{1.5}	E _{1.5}	E _{1.5}	11	16	17	17	16	18	18	18	15	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	16	19	18	19	19	18	18	18	15	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
13	E _{1.5}	E _{1.5}	E _{1.5}	15	12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	17	19	19	22	23	20	22	16	12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
14	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	13	15	E _{1.5}	E _{1.5}	15	15	16	19	19	18	19	17	15	14	12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
15	E _{1.5}	E _{1.5}	E _{1.5}	11	E	E _{1.5}	E _{1.5}	E _{1.5}	15	E _{1.5}	C	C	16	17	29	18	15	16	12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
16	E _{1.5}	E _{1.5}	E	11	11	E _{1.5}	E _{1.5}	E _{1.5}	13	15	15	18	19	18	17	16	16	12	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
17	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	11	E _{1.5}	E _{1.5}	E _{1.5}	13	15	16	18	20	16	18	17	15	14	14	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
18	E _{1.5}	E _{1.5}	E _{1.5}	12	11	E _{1.5}	E _{1.5}	E _{1.5}	14	17	19	18	19	26	26	18	15	14	14	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
19	E _{1.5}	E _{1.5}	E _{1.5}	E	E	E _{1.5}	E _{1.5}	E _{1.5}	15	15	16	17	18	18	18	17	16	15	14	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
20	E _{1.5}	E _{1.5}	E	E	E	E _{1.5}	E _{1.5}	E _{1.5}	15	17	17	19	18	20	18	16	15	12	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
21	E _{1.5}	E _{1.5}	E _{1.5}	E	11	E _{1.5}	E _{1.5}	E _{1.5}	15	15	16	16	17	18	15	16	16	12	15	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
22	E _{1.5}	E _{1.5}	11	E	E	E _{1.5}	E _{1.5}	E _{1.5}	15	15	15	17	16	19	20	16	16	12	12	E _{1.5}	E _{1.5}	E _{1.5}	11	E _{1.5}
23	11	E _{1.5}	E _{1.5}	11	14	E	E _{1.5}	E _{1.5}	15	15	16	18	16	19	22	18	15	14	15	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
24	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E	E _{1.5}	E _{1.5}	E _{1.5}	14	15	16	19	18	17	19	16	15	11	13	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
25	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E	E _{1.5}	E _{1.5}	E _{1.5}	14	16	19	20	19	19	18	16	16	14	14	E	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
26	E _{1.5}	E _{1.5}	11	E	E	13	E _{1.5}	E _{1.5}	15	16	18	18	19	19	20	17	17	15	15	12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
27	E _{1.5}	11	12	E	E	E _{1.5}	E _{1.5}	E _{1.5}	15	17	16	18	C	19	17	15	15	15	E _{1.5}	12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
28	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	15	C	E _{1.5}	E _{1.5}	C	15	17	21	19	20	18	18	17	15	15	12	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
29	E _{1.5}	E _{1.5}	13	12	E	E _{1.5}	E _{1.5}	E _{1.5}	16	16	18	19	20	22	18	22	16	15	15	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
30	E _{1.5}	E _{1.5}	E _{1.5}	13	E	C	E _{1.5}	E _{1.5}	15	15	19	20	22	19	17	17	16	15	15	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
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	30	30	30	30	30	27	30	30	29	30	29	28	29	30	30	30	30	30	30	30	30	30	30	30
MED	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E	E _{1.5}	E _{1.5}	E _{1.5}	15	15	16	18	19	19	18	17	16	14	13	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
UQ	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	12	E _{1.5}	E _{1.5}	E _{1.5}	15	16	18	19	20	20	20	18	16	15	15	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}
LQ	E _{1.5}	E _{1.5}	E _{1.5}	E	E	E _{1.5}	E _{1.5}	E _{1.5}	14	15	16	17	18	18	18	16	15	12	11	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}	E _{1.5}

APR. 1970

F-MIN (0.1 MHZ)

IONOSPHERIC DATA

APR. 1970

M(3000)F2 (0.01)

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

Station	YAMAGAWA								Lat. 31 12' N		Long. 130 37' E		Sweep	MHz to 20		MHz in 20		sec in automatic		operation					
	Hour	00	01	02	03	04	05	06	07	08	09	10		11	12	13	14	15	16		17	18	19	20	21
1	275	280	250	250	255	255	260	290	285	290	290	290	280	300	290	295	295	305	305	290	265	250	260	270	
2	265	260	265	275	270	280	285	320	315	300	295	280	275	275	280	270	270	280	290	S	S	S	300	295	
3	270	255	250	290	335	265	275	305	320	300	300	285	280	270	270	275	275	285	290	300	295	250	255	265	
4	265	265	300	305	250	255	275	300	305	300	265	270	275	275	270	275	270	285	285	275	S	S	275	265	
5	270	290	290	285	290	270	280	310	320	290	270	270	280	275	275	270	275	285	290	290	265	255	255	S	
6	S	290	285	285	265	280	265	300	295	290	285	285	285	280	275	275	275	295	305	285	275	260	240	250	
7	270	285	270	265	245	260	285	300	310	300	275	275	280	275	275	275	280	285	300	300	280	265	280	280	
8	290	285	285	285	270	270	275	300	315	295	285	280	280	275	275	275	270	285	290	295	S	S	S	S	
9	S	260	265	275	275	270	290	320	310	300	295	280	275	275	270	265	270	285	295	300	275	270	275	265	
10	255	265	315	275	265	270	275	275	315	290	290	285	275	280	285	275	270	285	300	305	290	260	270	275	
11	280	270	275	290	295	280	305	315	315	295	280	270	275	275	265	270	275	275	290	285	260	265	270	265	
12	290	280	275	295	280	275	285	315	310	290	275	285	280	275	275	275	275	285	290	290	285	275	280	270	
13	285	290	275	255	260	265	265	320	300	290	280	265	270	265	270	275	265	275	280	285	255	260	S	S	
14	S	280	295	310	260	260	285	305	310	285	285	280	275	270	275	275	275	290	295	285	260	255	260	265	
15	280	295	310	305	275	265	285	310	310	295	C	C	270	265	270	275	275	280	290	285	270	255	S	S	
16	275	285	295	290	255	240	250	300	295	270	280	275	270	275	270	270	270	280	290	285	265	250	255	260	
17	265	260	280	300	290	280	305	320	305	290	280	260	255	265	275	270	280	280	285	280	275	255	250	255	
18	260	250	255	260	300	265	295	320	310	275	270	275	265	275	275	275	275	285	285	295	S	S	S	S	
19	S	S	S	300	260	255	270	305	280	265	275	280	280	285	270	270	280	290	285	280	265	265	255	255	
20	280	275	290	255	240	260	295	305	290	290	275	280	280	285	280	290	295	290	305	320	300	255	265	260	
21	240	265	285	265	240	245	275	300	280	285	280	285	295	295	290	290	290	295	285	285	270	260	245	245	
22	255	275	295	245	225	235	260	280	245	225	305	275	280	285	265	245	295	300	305	300	265	250	255	260	
23	255	280	280	275	265	275	315	315	305	285	285	265	270	280	280	285	285	285	300	280	280	265	255	S	
24	S	S	S	S	265	265	290	315	300	295	295	295	300	280	270	285	290	295	295	300	285	265	260	260	
25	265	275	295	275	295	280	305	315	300	290	285	280	285	285	280	285	290	290	300	305	300	255	255	260	
26	270	275	295	275	285	270	285	295	295	300	300	280	280	285	285	280	285	290	295	305	285	270	S	S	
27	260	275	280	325	280	270	305	310	305	295	265	265	285	290	280	285	285	280	285	305	S	S	S	S	
28	265	275	S	320	285	285	285	310	315	280	270	275	285	280	280	285	290	290	300	300	270	250	255	260	
29	275	295	310	310	285	280	305	310	300	285	270	275	280	290	295	290	290	300	300	295	280	265	250	260	
30	255	265	285	290	270	260	295	300	300	290	255	275	280	275	275	280	285	290	285	275	260	255	265	270	
31																									
CNT	25	28	27	29	30	30	30	30	30	30	29	29	30	30	30	30	30	30	30	29	25	25	24	22	
MED	270	275	285	285	270	268	285	308	305	290	280	280	280	275	275	275	278	285	290	290	275	255	258	262	
UQ	275	285	295	300	285	275	295	315	310	295	290	280	280	285	280	285	290	290	300	300	285	265	270	270	
LQ	260	265	275	275	260	260	275	300	295	285	275	275	275	275	275	270	270	275	285	285	285	265	255	255	260

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M(3000)F2 (0.01)

IONOSPHERIC DATA

APR. 1970

M(3000)F1 (0.01)

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

Station YAMAGAWA Lat. 31 12.1 N Long. 130 37.1 E Sweep 1 MHz to 20 MHz 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	L								
2										L	L	L	L	L	L	L	L							
3									L	L	425	L	L	L	L	L	L	L						
4									L	L	L	L	L	L	L	L	L							
5									L	L	L	L	L	L	L	L	L							
6									L	L	L	L	355	385	L	L	L	L						
7									L	L	L	L	L	L	L	L	L							
8									L	L	L	L	355	L	L	L	L	L						
9									L	L	C	L	L	L	320	L	L							
10									L	L	L	L	L	L	L	L	L							
11									L	L	L	400	L	365	360	L	L	A						
12									L	L	L	L	A	A	L	L	A							
13									A	L	L	L	L	L	L	L	L							
14									L	L	L	365	L	L	L	330	L	L						
15									L	L	C	C	L	330	L	L	L							
16									L	L	L	L	355	L	L	L	L							
17									L	L	L	L	L	L	L	L	L	A						
18									L	L	L	L	L	L	L	L	L							
19									L	L	L	L	L	360	L	L	A	L						
20									L	L	L	L	370	L	375	L	L	L						
21									L	L	L	345	L	L	L	L	L							
22							L		310	L	370	330	375	L	330	345	L							
23									L	L	L	L	L	L	L	L	L							
24									L	A	L	L	A	360	325	L	L	L						
25									L	L	L	A	L	L	L	L	L							
26									L	L	L	L	365	345	L	L	385	L						
27									L	L	335	C	A	L	A	L	L							
28									C	L	L	L	L	L	L	L	L							
29									L	L	L	L	L	A	L	L	A	390						
30									A	L	L	L	310	A	A	A	L	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									1	1	5	6	8	3	3	2	1							
MED									310	425	365	355	360	360	330	365	390							
UQ											370	365	370	368	330									
LQ											345	330	350	342	325									

APR. 1970

M(3000)F1 (0.01)

IONOSPHERIC DATA

APR. 1970

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 MHz to 20 MHz 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	275	260	275	275	255	285	280	280								
2										250	280	250	250	300	295	290	290	275							
3									240	255	245	275	280	310	300	305	290	280							
4									250	250	300	320	260	320	305	295	290	275							
5									245	275	300	300	305	280	300	305	295	275							
6									250	300	300	300	270	300	305	320	280								
7									250	250	320	300	300	315	300	305	285								
8									250	250	255	305	300	315	300	300	290	280							
9									250	285	300	300	310	290	315	340	325	300							
10									250	275	280	300	315	290	270	290	290								
11									250	300	255	270	310	285	305	330	310	290							
12									250	295	300	300	300	310	300	300	270								
13									270	265	255	330	325	315	290	280	275								
14									240	275	280	275	315	305	315	305	315	275							
15									250	260	C	C	310	340	310	300	295	275							
16									300	275	285	325	310	295	275	275	275								
17									255	275	300	300	360	330	300	305	275	250							
18									250	305	330	295	325	295	290	280	275	275							
19									300	310	295	295	285	300	315	285	260								
20									250	260	270	275	280	310	280	295	280	250							
21									300	300	285	310	290	290	280	290	270	265							
22								310		400	325	300	340	280	305	350	290	255							
23									245	290	275	290	310	320	305	300	290	275							
24									250	255	300	310	300	285	335	320	300	265							
25									250	290	295	300	325	325	310	305	290	295							
26									255	270	290	310	290	325	305	280	275	280							
27										255	325	325	315	300	295	300	295	275							
28								C	275	300	320	305	305	315	300	275	255								
29									250	260	280	300	325	310	290	290	275	270							
30									275	260	310	310	325	330	325	315	290	255							
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	18	30	29	29	30	30	30	30	30	29							
MED								310	250	265	285	300	305	305	302	300	290	275							
UQ									255	290	300	310	325	320	310	305	295	280							
LQ									250	250	275	280	295	290	295	290	280	265							

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H'F2 (KM)

IONOSPHERIC DATA

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H'F (KM)

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

Station YAMAGAWA Lat. 31 12.1 N Long. 130 37.1 E Sweep 1 MHz to 20 MHz 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	295	340	315	225 ^H	290	295	255	240	230	225	225 ^H	215 ^H	205 ^H	215 ^H	225 ^H	240	255	240	225	230	295	295	290
2	295	300	300	275	245	250	270	240	240	235 ^H	225 ^H	225 ^H	205 ^H	215 ^H	215 ^H	225 ^H	245 ^H	240	255	235	230	240	245	230
3	240	280	295	250	200	230	295	240	225	225 ^H	200	205 ^H	205 ^H	205 ^H	215 ^H	205 ^H	240	240	250	225	210	260	300	290
4	280	280	250	230	245 ^H	300	295	240	240	225	215 ^H	205 ^H	195 ^H	215 ^H	210	225 ^H	255	255	245	225	230	250	250	270
5	275	255	250	245	240	250	290	245	240	225 ^H	215 ^H	215 ^H	215 ^H	220	225 ^H	215 ^H	225 ^H	250	250	240	225	275	290	280
6	275 ^F	250	250	245	220	250	285	245	240	230	225 ^H	215 ^H	210	220	225 ^H	225	E ₆₀ ^H	250	250	235	220	265	350	340
7	290	260	260	295	300	300	270	240	245	230	220	205 ^H	225 ^H	255 ^H	235 ^H	225 ^H	205 ^H	255	255	240	250	300	290	270
8	275	270	260	250	250	290	280	235	240	230	220	215 ^H	210	225 ^H	225	225 ^H	240	250	250	230	230	300	300	270
9	250	275	290	265	255	295	275	240	230	220	225 ^H	215 ^H	215 ^H	225 ^H	225	225	250	255	260	240	245	250	245	295
10	320	295	230	205 ^H	250	I ₂₈₅ ^C	300	240	235	225	220	250	215 ^H	220	E ₇₀ ^H	225	225 ^H	250	260	E ₇₀ ^H	250	250	290	290
11	275	290	285	270	250	260	250	225	240	225	235	205	220	215 ^H	225	E ₅₀ ^H	245	A	255	240	255	275	E ₅₀ ^A	295
12	275	270	270	240	210	270	275	240	225	225	215 ^H	250	A	A	A	A	E ₇₅ ^A	I ₂₅₅ ^A	260	250	245	235	275	315
13	275	270	290	275	305	300	275	245	245	A	240	215	235 ^H	235 ^H	245 ^H	235 ^H	250	250	245	245	240	245	260	280
14	275	250	230	210	200	295	275	240	230	235 ^H	215 ^H	200	245 ^H	245	245 ^H	225 ^H	225 ^H	250	250	230	265	280	300	295
15	280	250	230	210	240	275	275	240	230	220	C	C	205 ^H	230	255 ^C	E ₆₅ ^C	I ₂₄₀ ^A	250	260	230	265	325	295	295
16	290	265	250	225	290	350	275	245	235	235 ^H	225 ^H	225	230	225	215 ^H	240	245	245	260	250	255	270	305	300
17	295	295	275	240	215	250	255	245	235	240	225	205 ^H	225 ^H	225 ^H	225 ^H	205 ^H	250	I ₂₅₀ ^H	250	240	260	270	320	330
18	310	350	340	300	225	250	245	230	225	225 ^H	225 ^H	205 ^H	215 ^H	260	250	235 ^H	225 ^H	240	260	250	250	290	325	305
19	300	255 ^F	225	220	260	265	265	235	230	225	235 ^H	225	230	220	225 ^H	245 ^H	I ₂₅₀ ^H	250	250	250	290	275	295	310
20	250	250	230	205 ^H	340	310	260	235	235	225	215	205 ^H	225	225	220	215	220	245	250	250	225	265	305	320
21	350	310	255	235	365	350	250	235	240	235	225	215	225	225 ^H	225 ^H	220	230	250	255	270	275	275	350	350
22	340	260	220	300	E ₆₀ ^A	390	E ₆₀ ^A	260	250	E ₉₀ ^A	235 ^H	225	225	220	230	230	240	245	250	E ₇₅ ^A	260	290	305	300
23	330	280	255	250	245	290	245	235	220	205 ^H	195 ^H	200	I ₂₁₅ ^A	I ₂₄₅ ^A	I ₂₄₅ ^A	250	235 ^H	245	250	250	260	265	305	300
24	310	290	250	225	205 ^H	270	250	240	240	A	225 ^H	A	A	220	215 ^H	245 ^H	250	250	260	265	250	265	E ₆₀ ^A	325
25	305	300	275	255	250	E ₄₀ ^H	250	235	235	225	255	I ₂₃₀ ^H	205	205	250	205 ^H	225 ^H	240	260	240	245	275 ^H	330	320
26	300	295 ^H	255	210	225 ^H	255	255	250	240	E ₅₀ ^H	E ₇₀ ^H	E ₅₀ ^H	235	210	220	240	230	225 ^H	255	E ₇₀ ^H	260	275	305	305
27	310	300	260	220	230	325	250	245	250	I ₂₄₅ ^A	250	240	C	A	A	I ₂₄₀ ^A	205 ^H	245	245	250	230	260	330	315
28	300	275	245	205	200	I ₂₂₀ ^C	I ₂₄₀ ^C	235	C	A	A	A	A	E ₆₅ ^A	205	A	225 ^H	235	245	230	250	300	300	E ₅₀ ^A
29	300	260	230	215	240	245	240	230	225	240	245 ^H	235 ^H	225 ^H	I ₂₃₀ ^H	250	A	A	230	240	245	290	290	330	305
30	300	E ₆₀ ^H	300	E ₅₀ ^H	260	C	260	250	I ₂₃₅ ^A	230	215	205 ^H	220	A	A	A	E ₅₀ ^H	240	250	245	E ₃₀ ^A	E ₄₀ ^A	285	E ₅₀ ^A
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	30	30	30	30	30	29	30	30	29	27	28	27	26	27	27	26	29	29	30	30	30	30	30	30
MED	295	276	255	241	241	280	269	240	235	228	224	215	212	220	222	225 ^H	235	250	250	241	250	271	300	299
UQ	305	295	285	268	258	300	278	245	240	231	229	225	225	229	239	235	248	250	260	250	260	290	315	312
LQ	275	260	245	220	220	250	250	235	230	225	215	205 ^H	215 ^H	218	218	225 ^H	225 ^H	240	250	235	230	260	290	290

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H'F (KM)

IONOSPHERIC DATA

APR. 1970

H^oES (KM)

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

Station **YAMAGAWA** Lat. **31 12.1 N** Long. **130 37.1 E** Sweep 1 MHz to 20 MHz 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	100	95	105	105	100	S	100	150	150	135	125	125	120	120	120	100	100	140	120	110	110	100	100	100
2	S	S	100	100	100	100	S	G	155	125	115	105	100	100	100	100	100	100	100	100	S	S	S	S
3	S	S	S	S	E	S	S	G	G	G	G	G	120	100	100	100	G	G	105	100	100	S	S	S
4	S	S	S	E	E	S	S	G	G	G	125	115	110	105	100	100	100	100	160	100	100	S	S	S
5	S	S	S	S	S	B	S	G	G	G	125	120	100	100	105	100	100	150	130	110	100	S	S	S
6	S	S	S	E	E	S	S	G	G	155	160	115	105	105	105	100	100	100	120	115	100	100	S	S
7	S	S	S	B	E	S	115	100	105	150	145	140	G	130	G	G	G	150	145	110	105	100	100	100
8	100	S	S	B	B	105	100	165	G	140	120	115	115	110	105	105	105	100	100	100	100	100	S	105
9	105	C	C	C	C	C	145	G	105	105	G	C	105	105	100	100	100	120	125	115	100	110	105	100
10	S	S	S	100	B	C	S	150	140	150	145	G	G	120	110	100	100	100	125	115	110	105	105	105
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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	15	13	13	15	15	14	20	23	24	26	26	25	26	27	25	24	24	26	28	30	29	24	20	20
MED	100	100	100	100	105	105	135	135	130	125	120	115	110	110	105	105	105	118	125	110	105	105	105	105
UQ	105	105	105	105	105	105	145	150	140	135	125	120	120	120	120	122	132	150	135	115	110	108	105	105
LQ	100	100	100	100	100	100	105	130	125	125	115	110	105	105	105	100	100	100	110	105	100	100	100	100

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H^oES (KM)

IONOSPHERIC DATA

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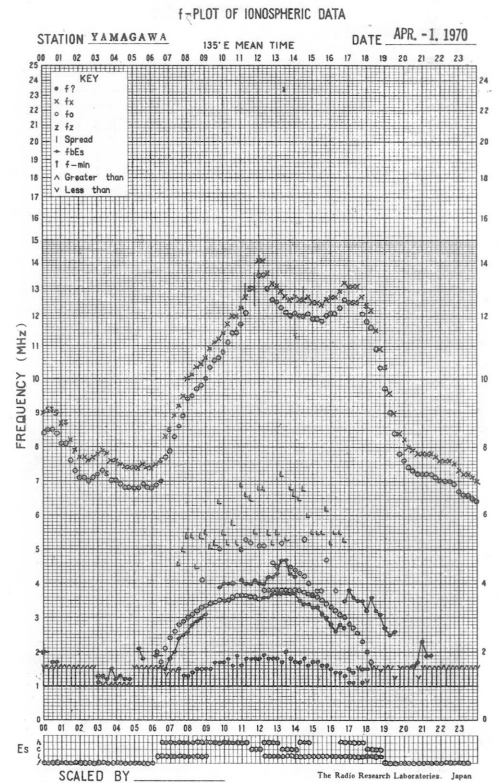
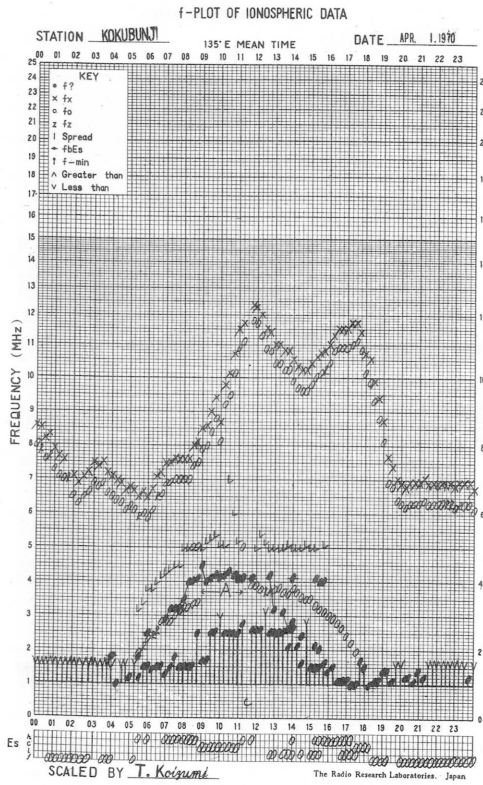
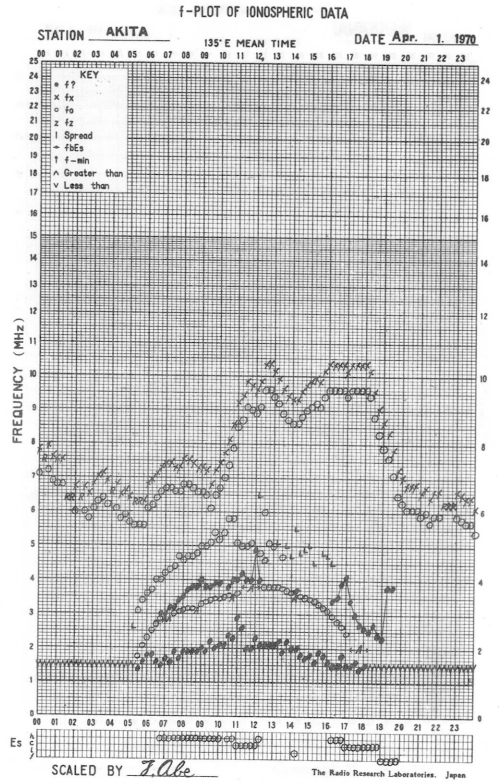
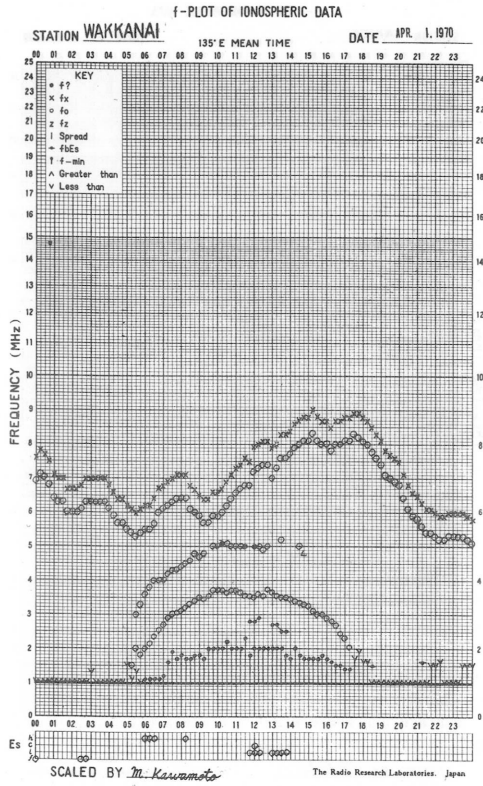
TYPES OF ES

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

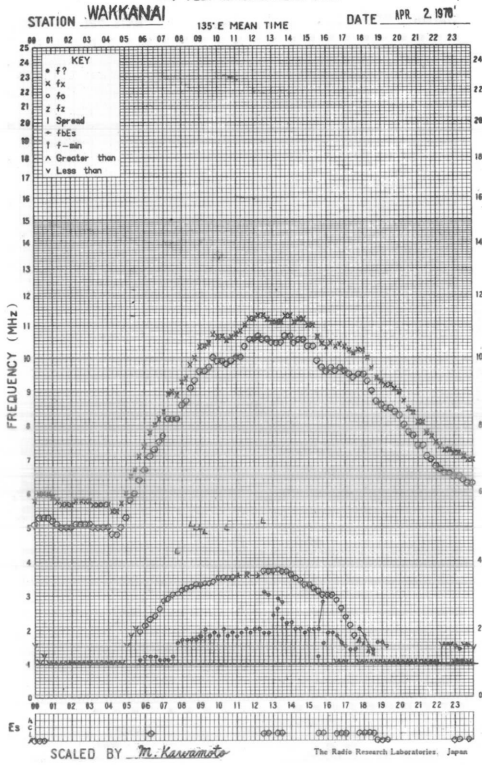
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Hour Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
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2			F2	F2	F2	F1			H2	H1	C2	F1	F1	F1	F1	F2	F3	F4	F4	F1										
3														C	F1	F1	F1			F1	F5	F1								
4											H1	C1	C1	F1	F2	F2	F3	F4	H13	F2	F1									
5											H1	C1	F1	F1	F1	F1	F1	H12	H11	F5	F1									
6										H1	H1	C1	F1	F2	F1	F2	F2	F1	C1	FF31	F1	F1								
7							F1	F1	F1	H11	H1	H1		H1			H2	H2	FF41	FF41	F3	F2	F2							
8	F1				F4	F1	H1		H1	C1	C1	C1	F1	F1	F2	F2	F3	F1	F1	F1	F2	F1		F1						
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14	F1		F1	F1				H2	H2	H1	H1	C1	C1	C1	H11	F2	F2	F2	H13	FF61	F4	F1								
15					F1	H3	H3	H1					F1	F1	F1	H2	H3	C1	FF11	F5	F7									
16		F2	F2			H2	H2	H3	H1	H1	C1	H1			F1	H11	H2	H11	FF62	FF61	FF31	F4	F2							
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29		F1			F3		H3	H3	H2	H1	C1	C1	C1	C2	F2	H12	H11		F5	F7	F4	F2	F2							
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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						
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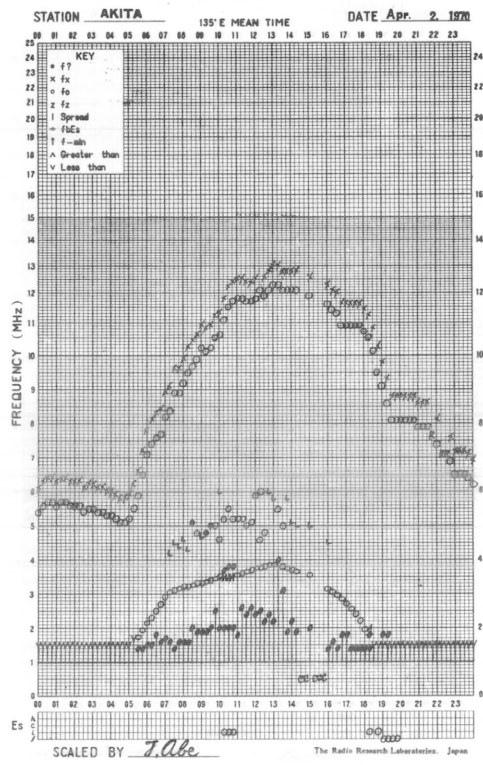
TYPES OF ES



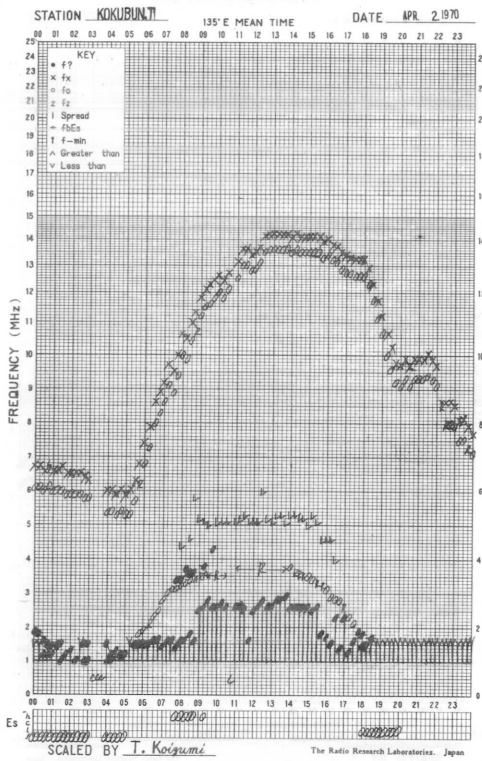
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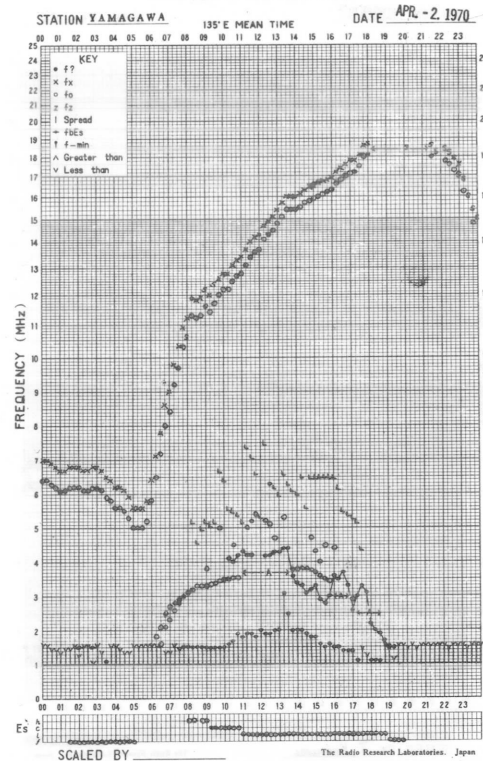
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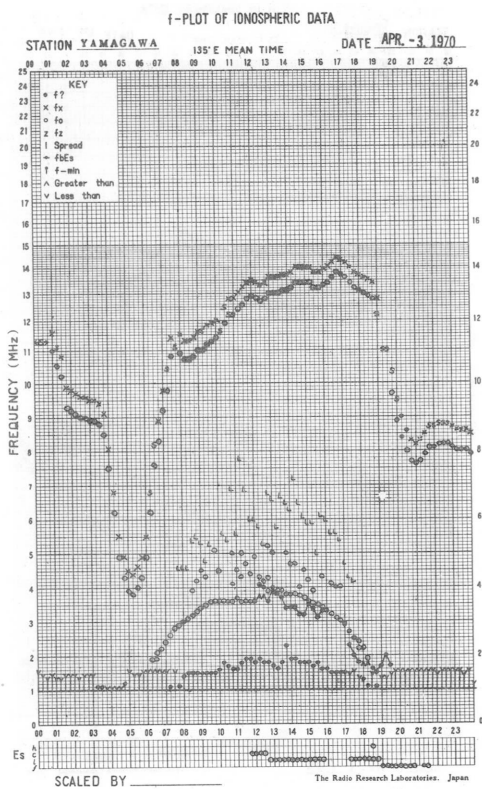
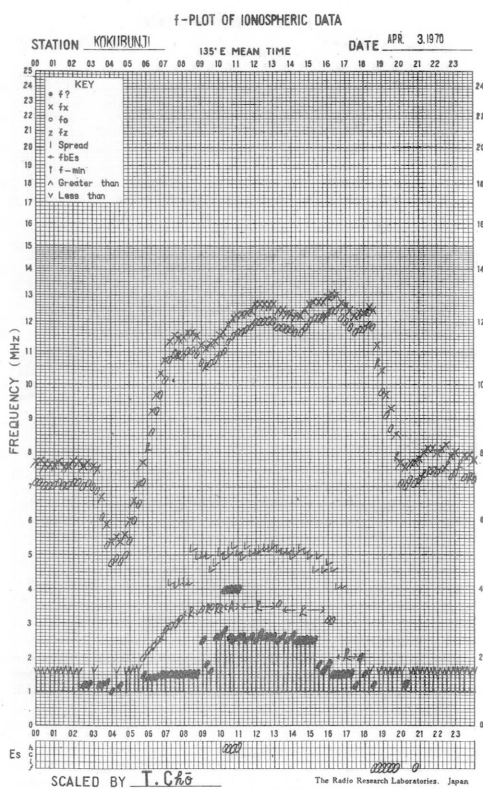
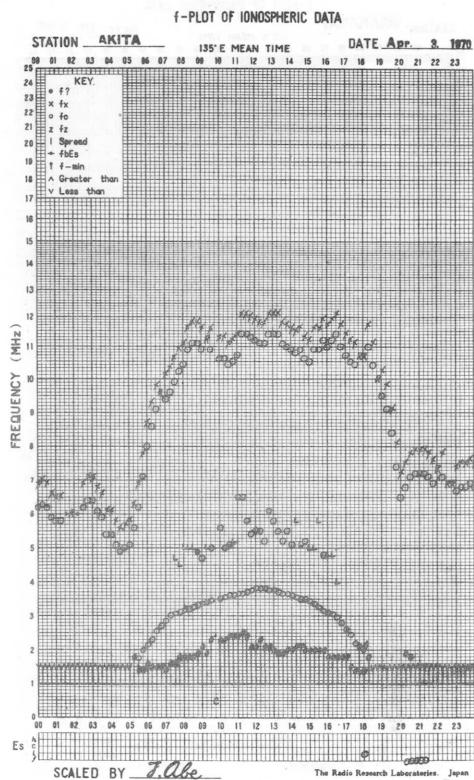
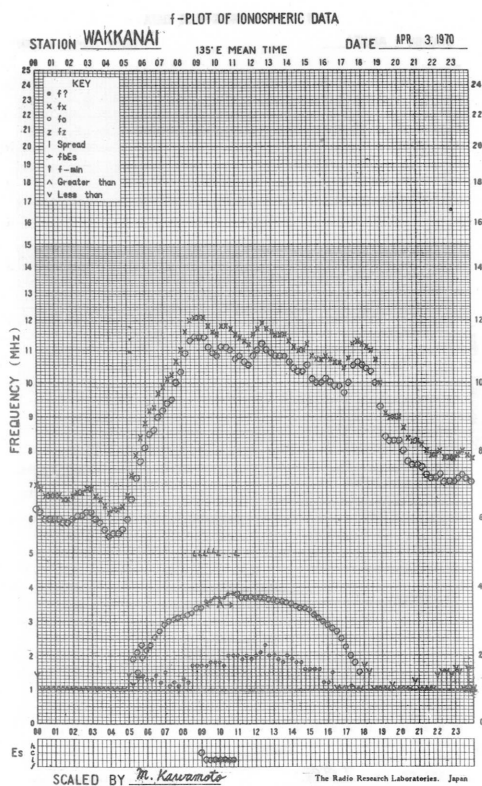


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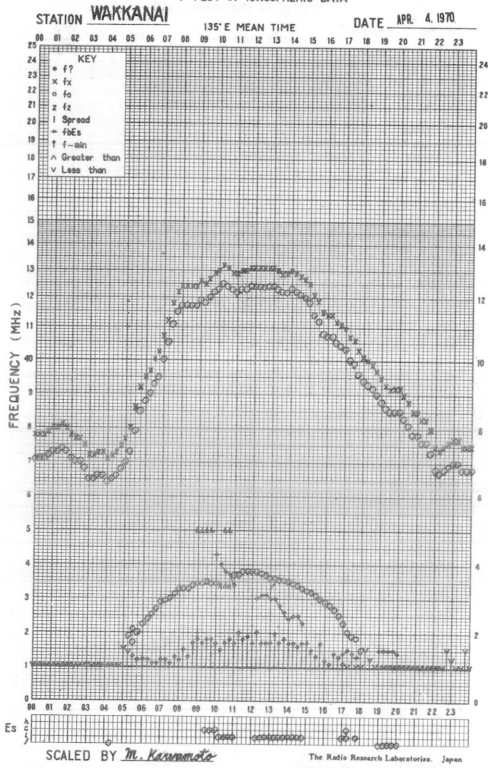


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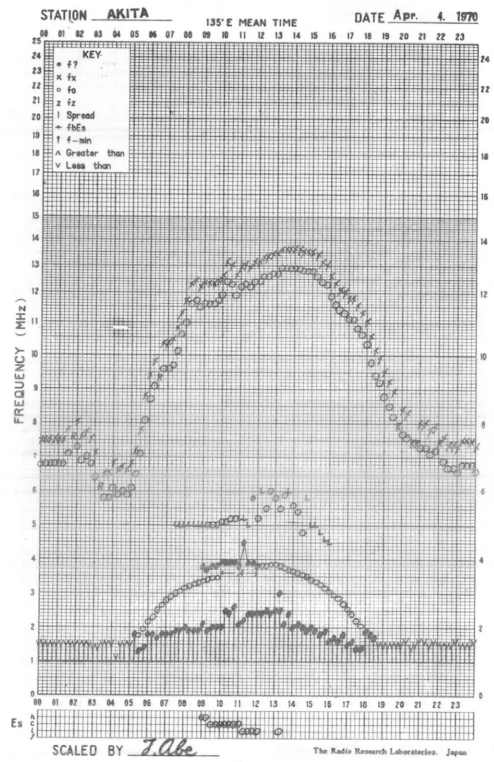




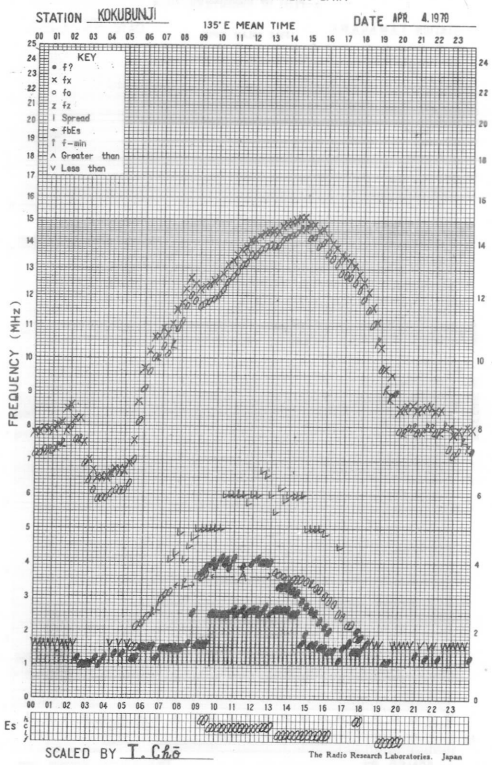
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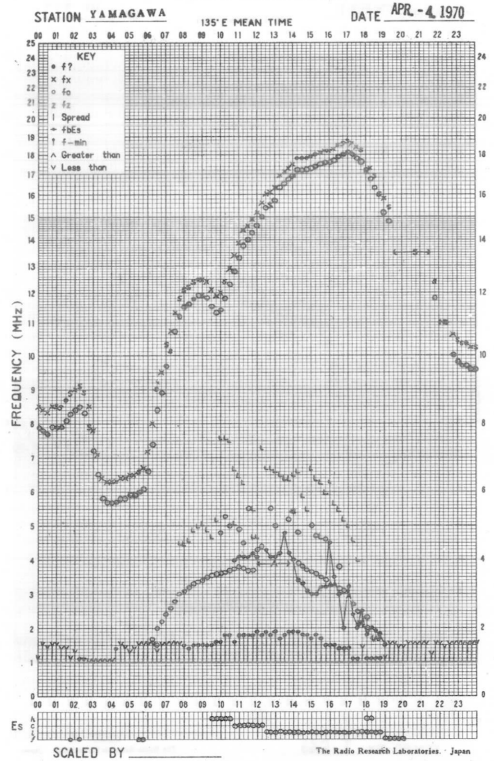
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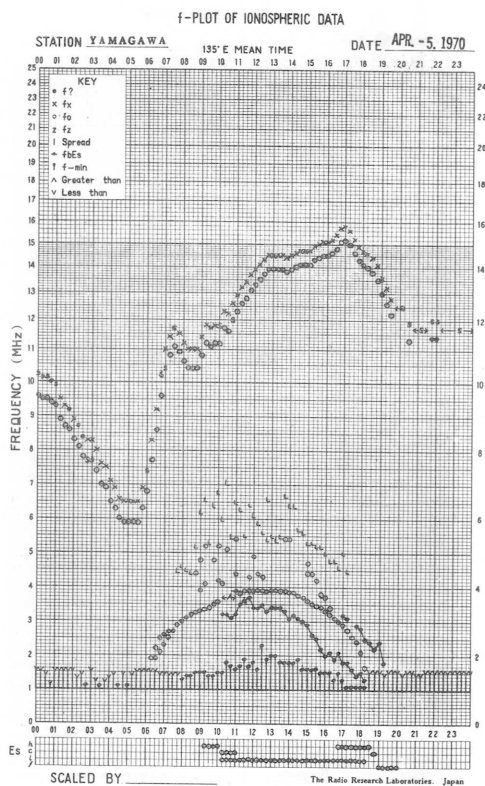
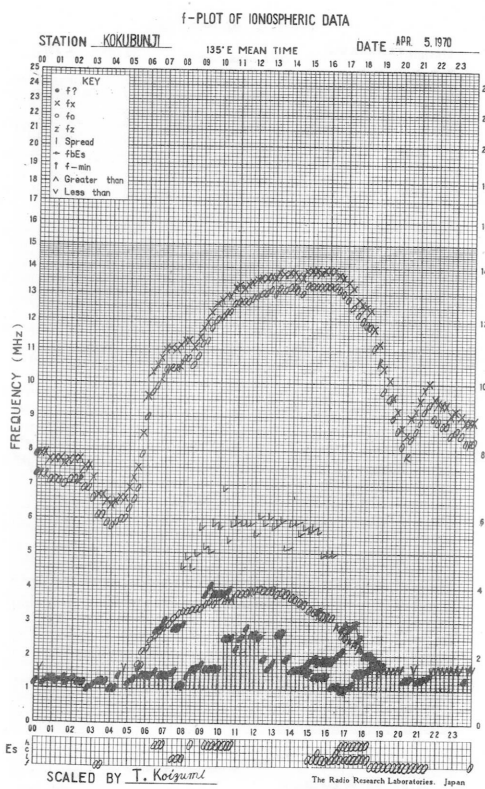
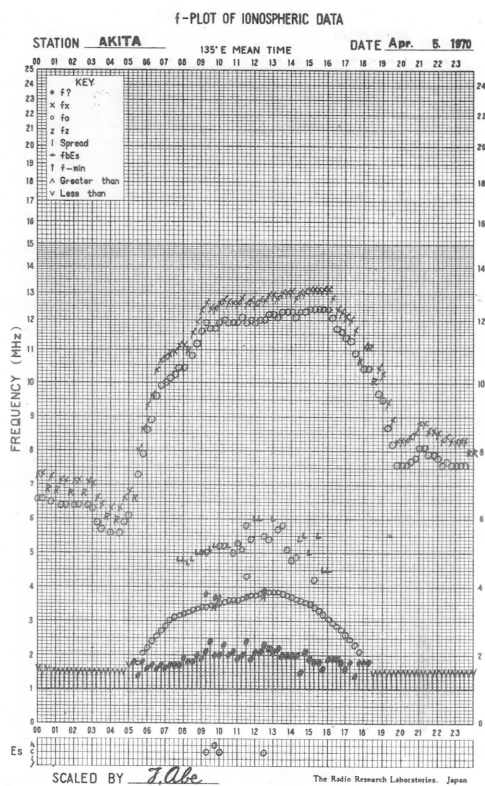
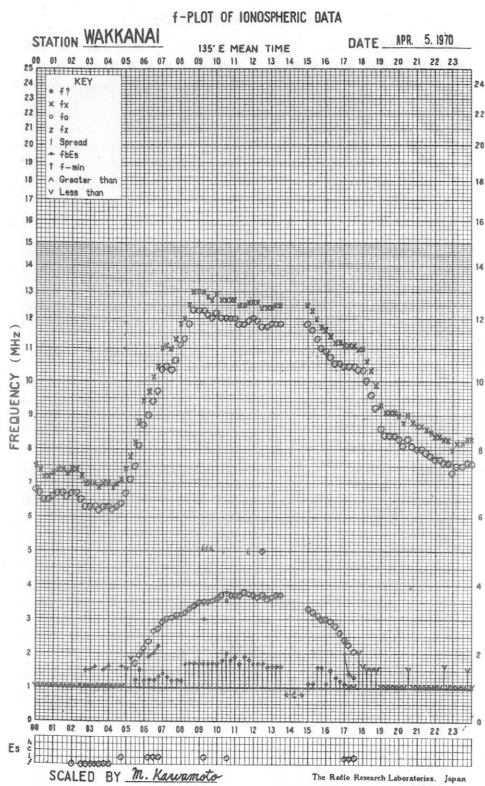


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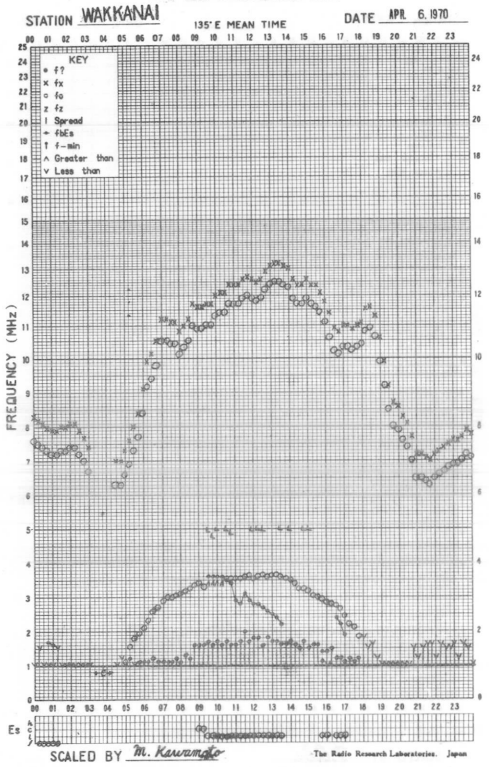


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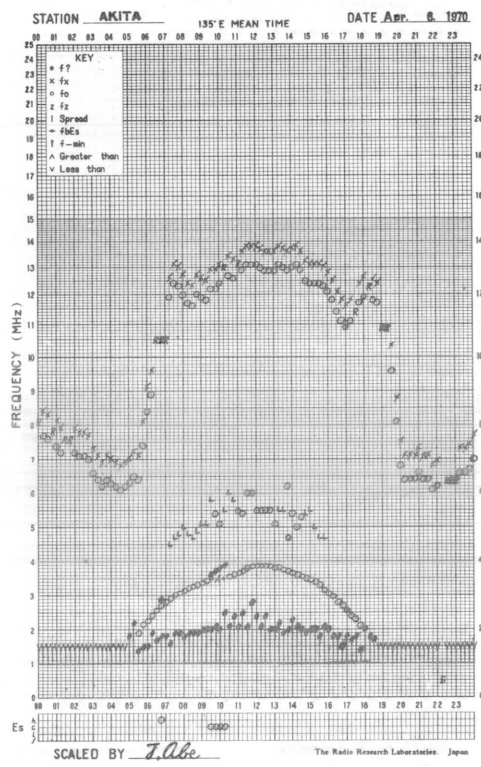




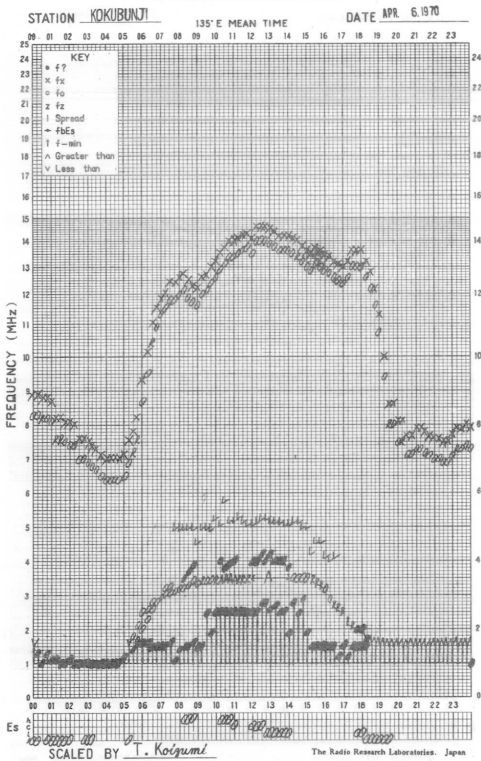
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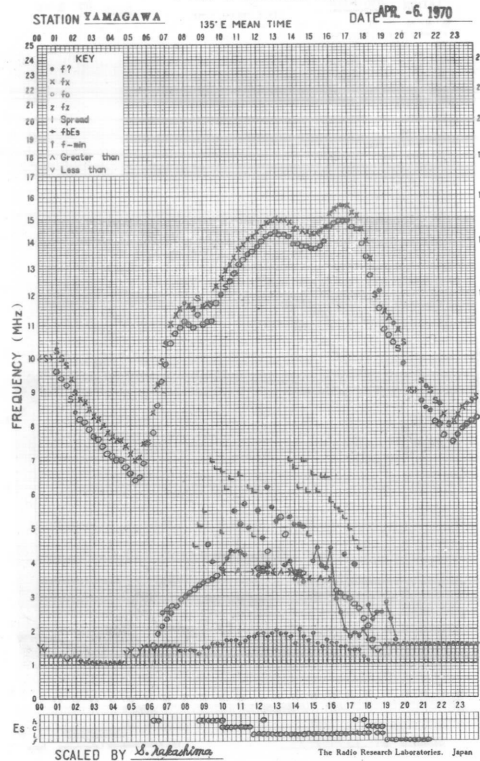
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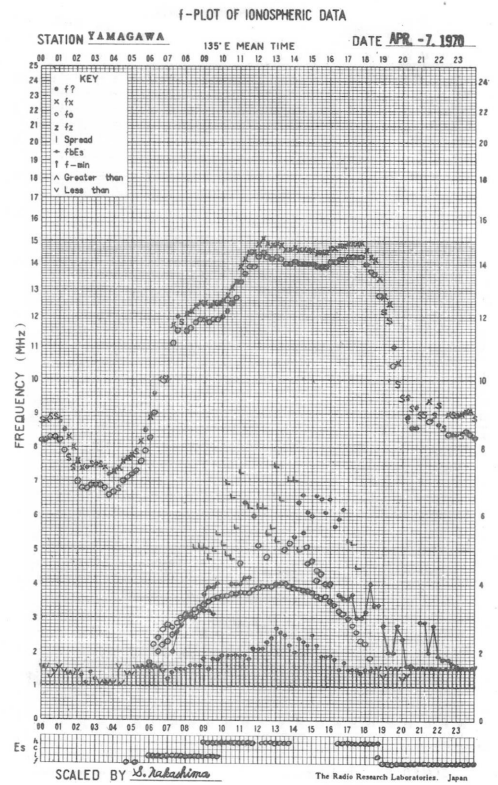
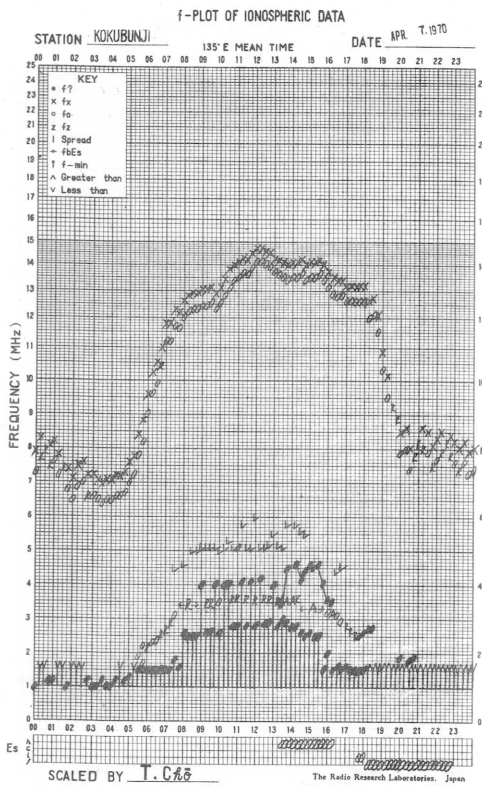
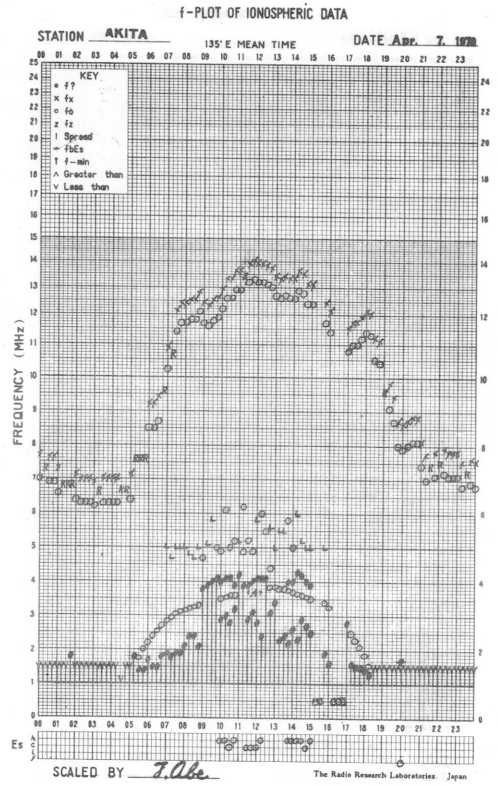
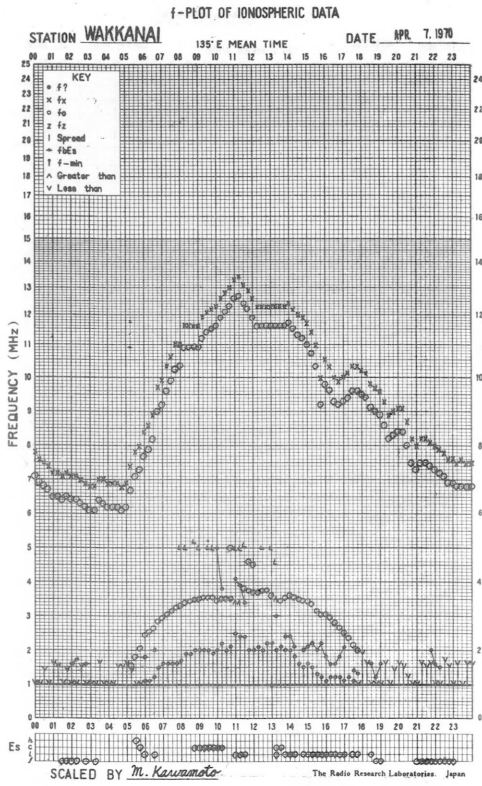


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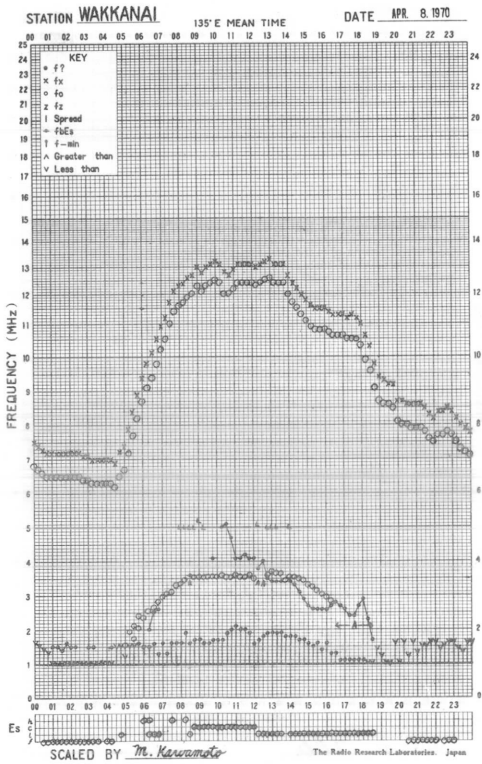


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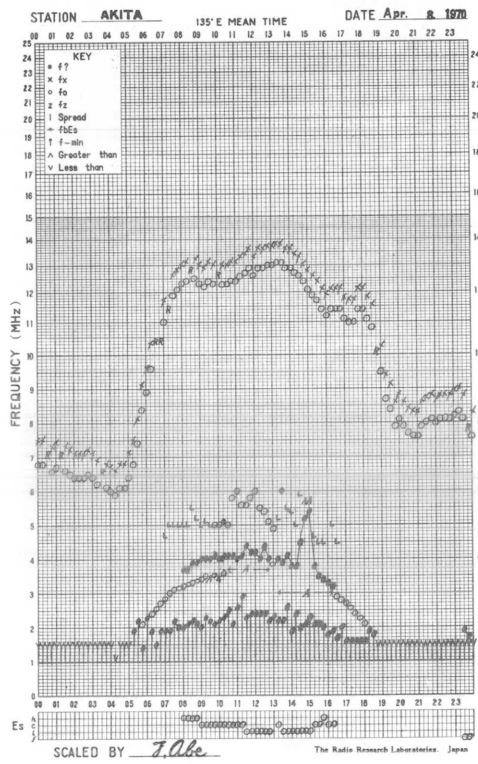




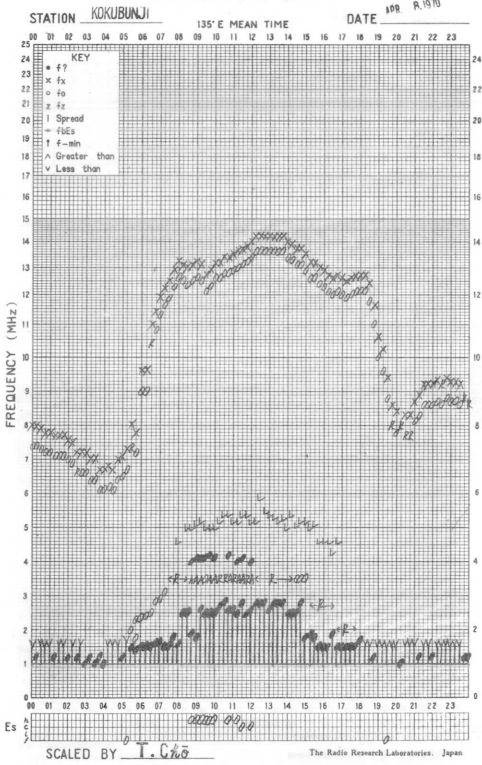
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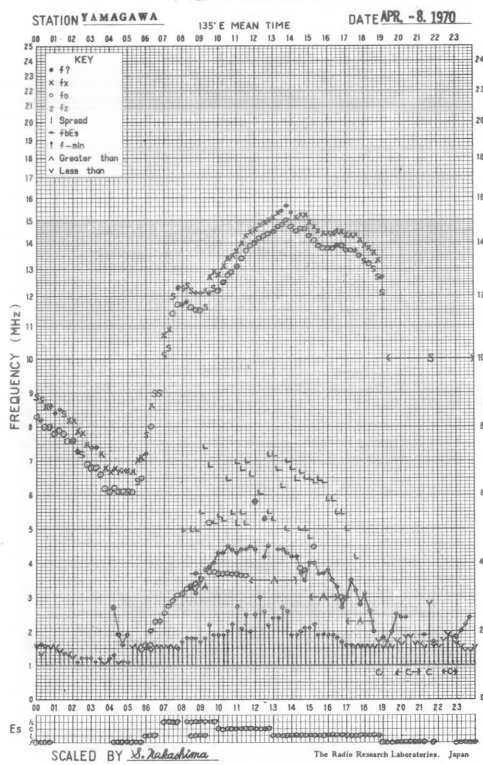
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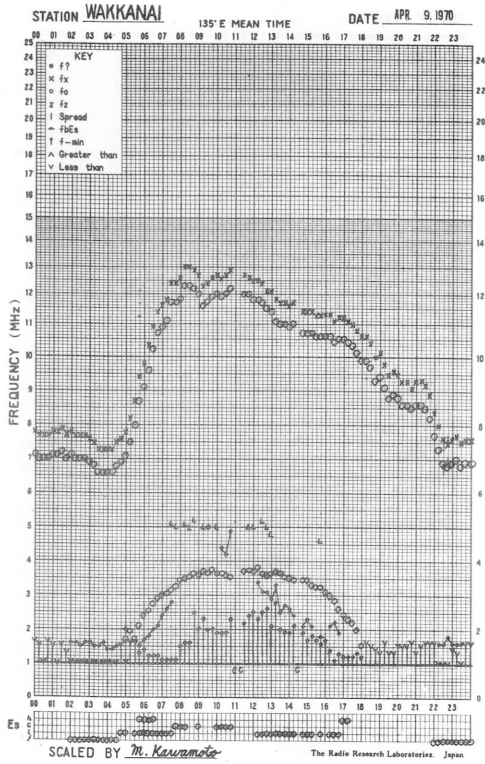
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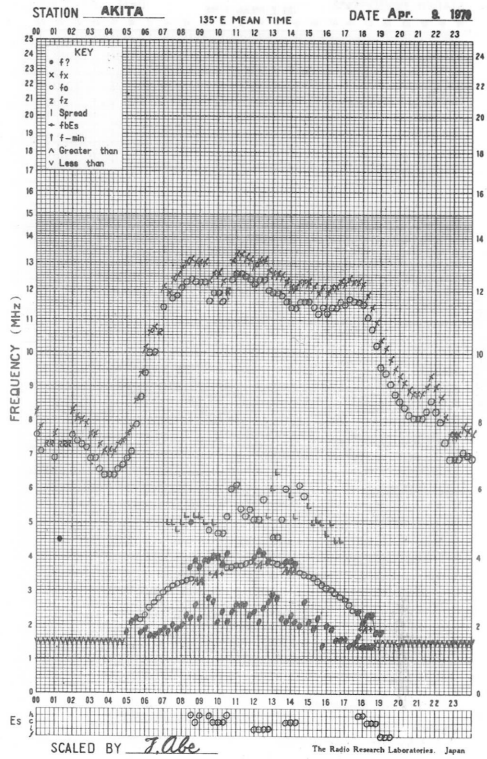
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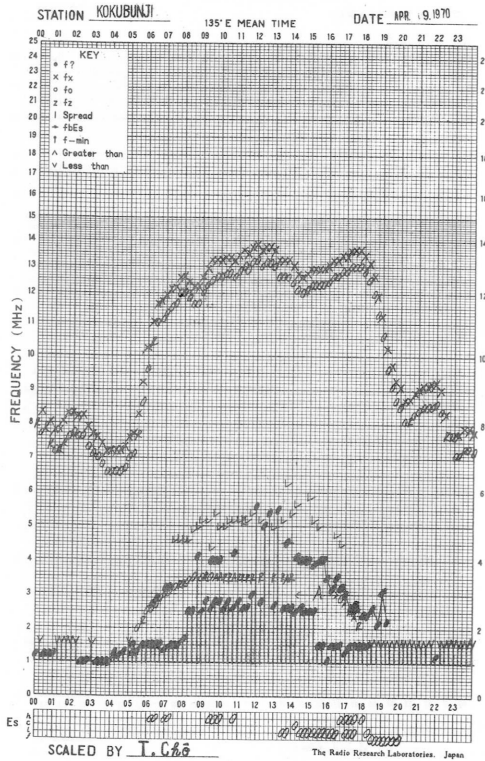
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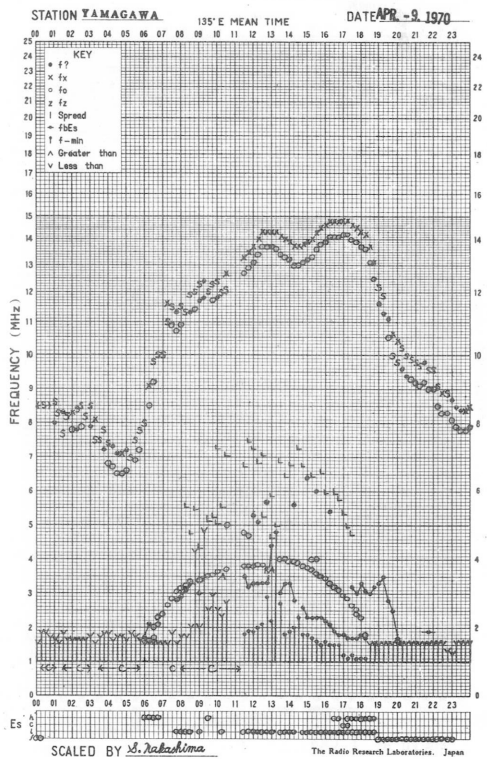
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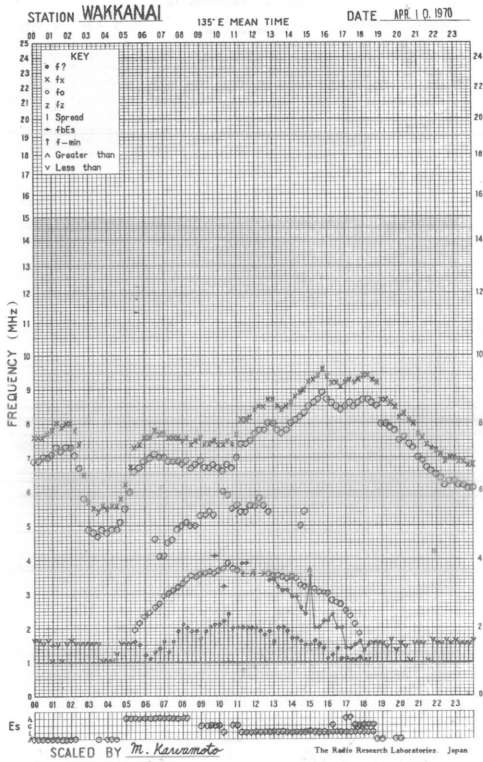
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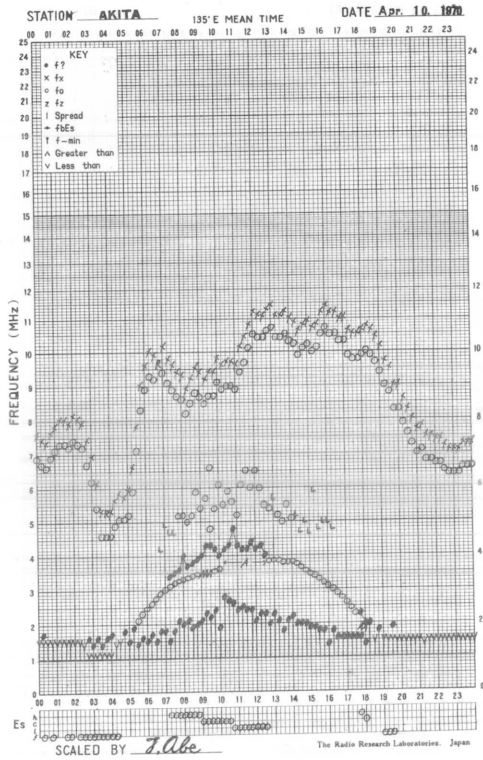
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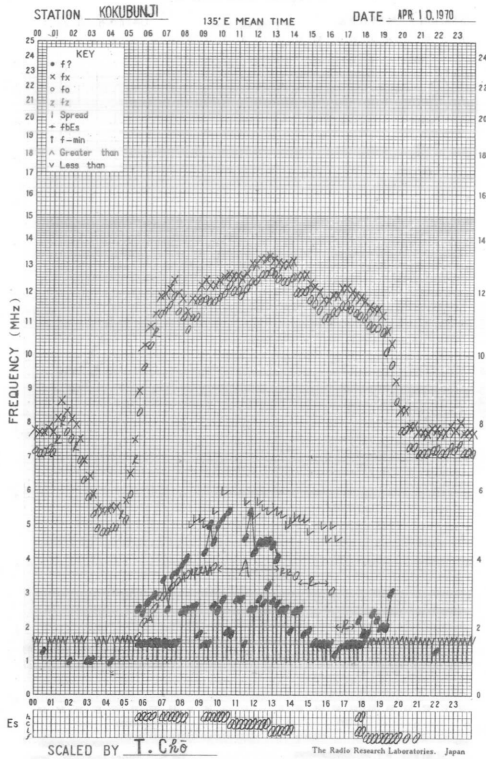
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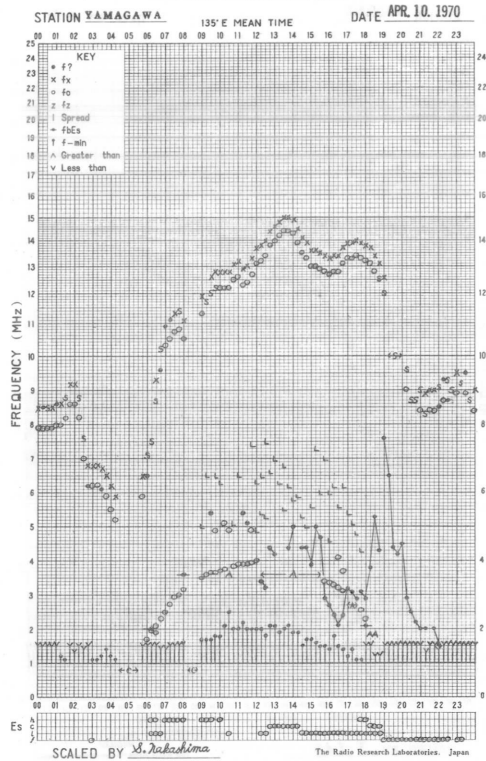
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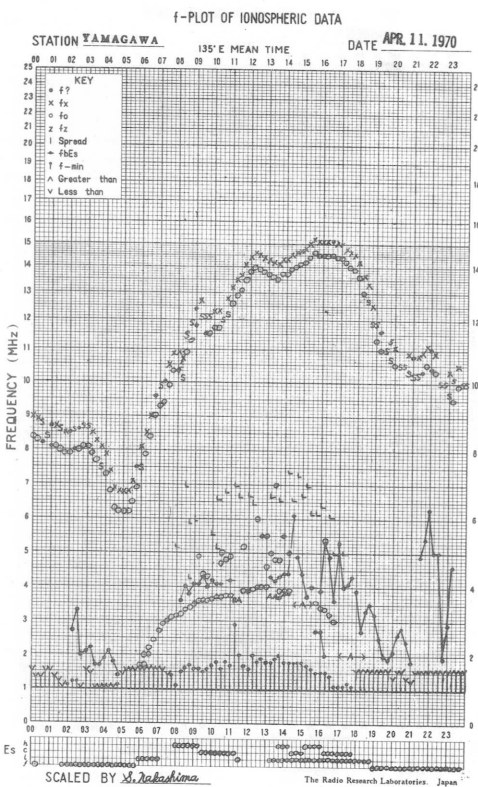
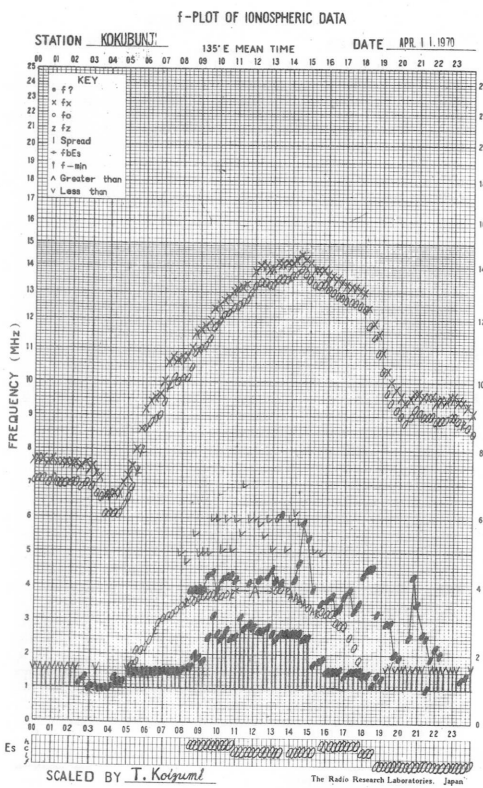
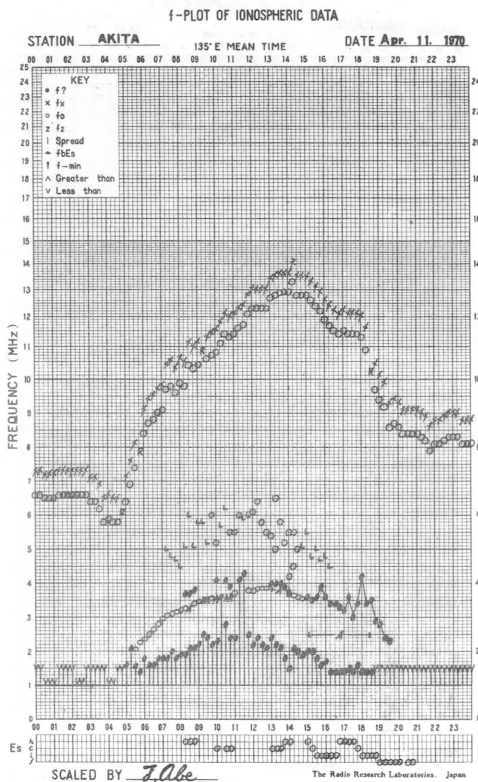
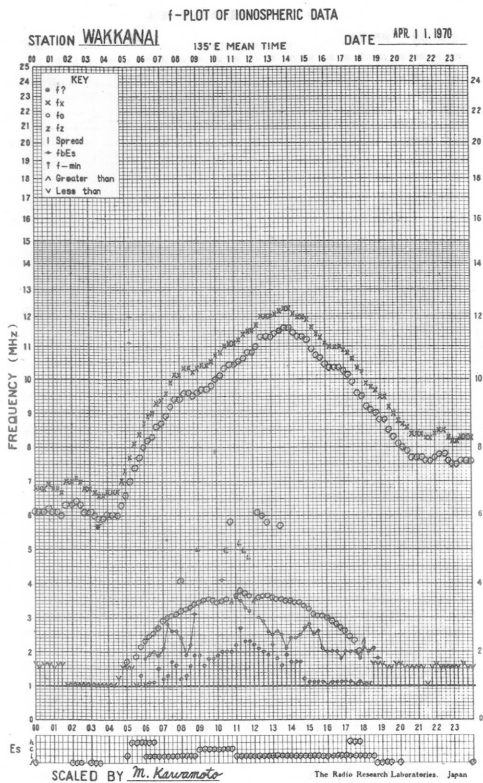


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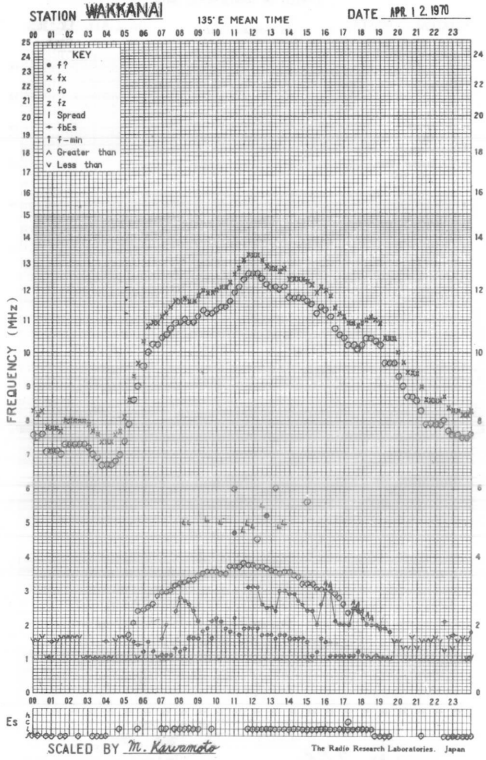


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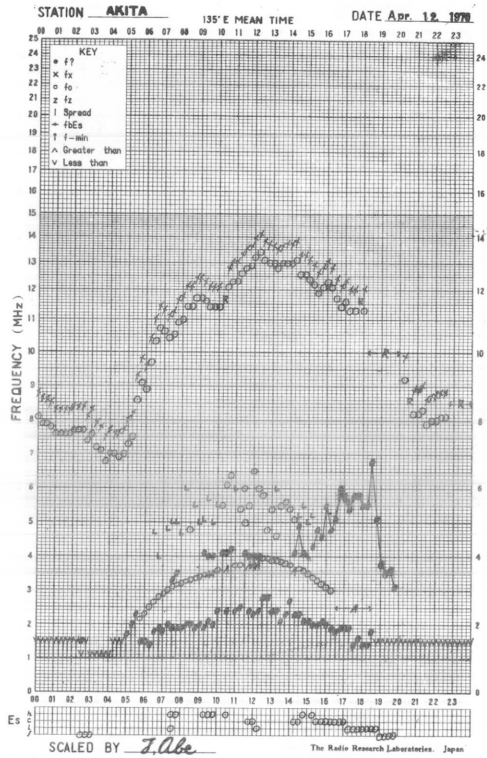




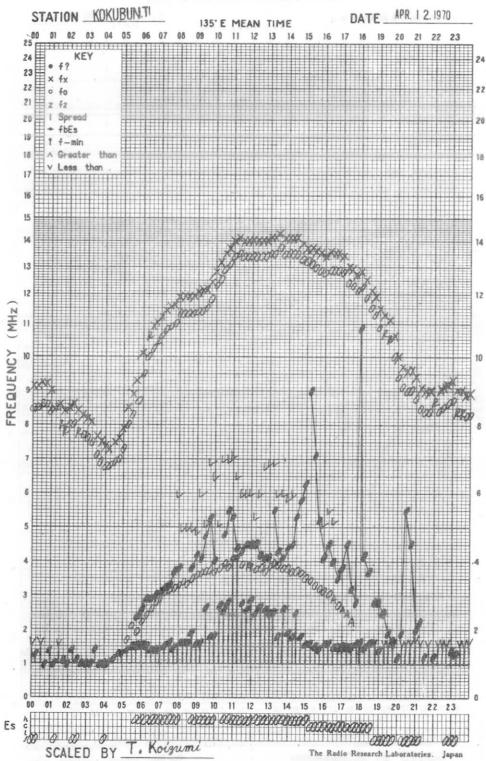
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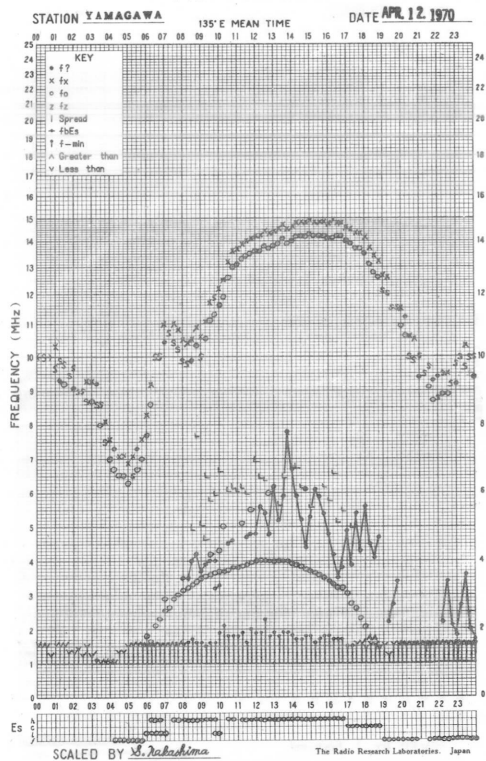
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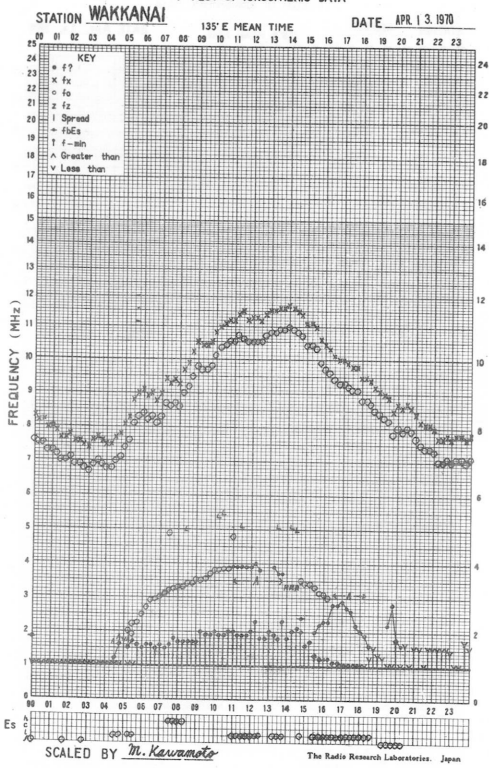
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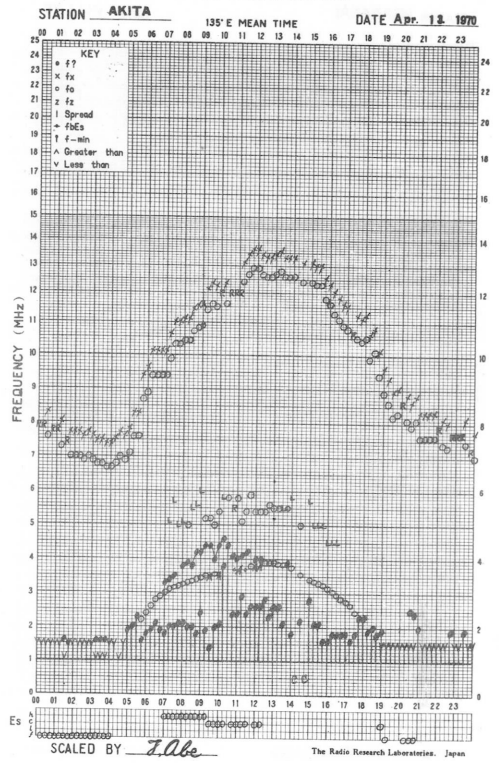
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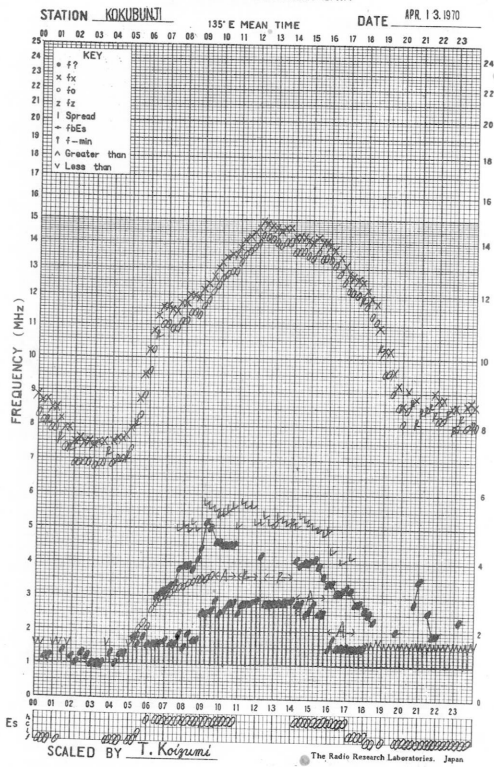
f-PLOT OF IONOSPHERIC DATA



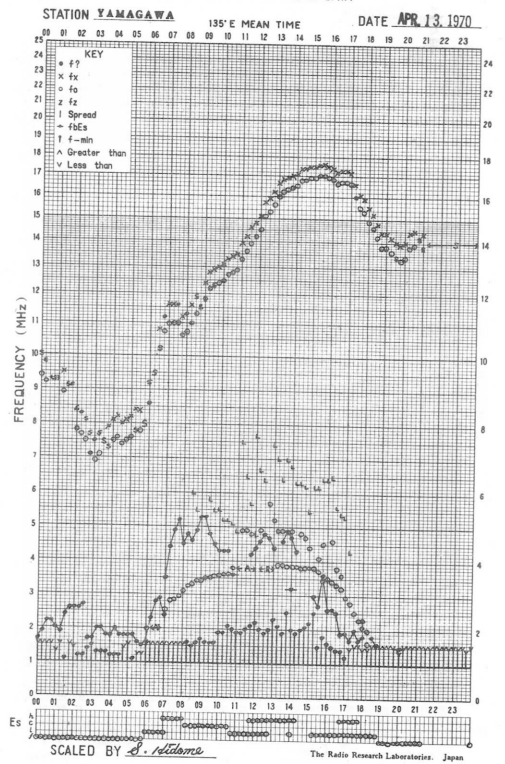
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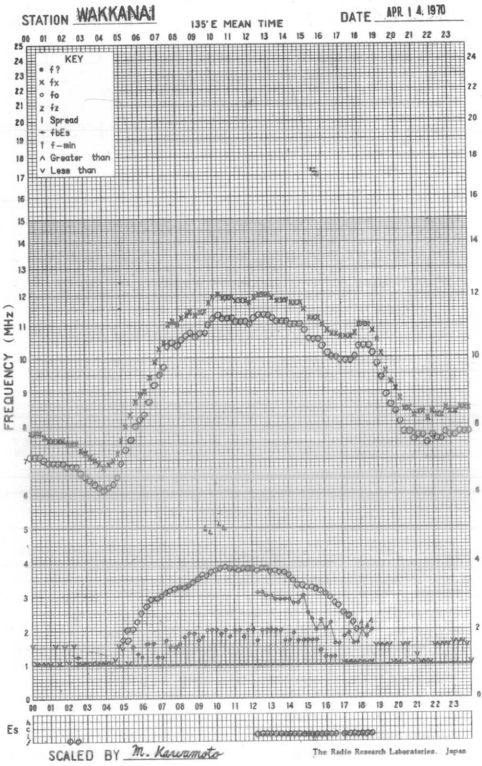
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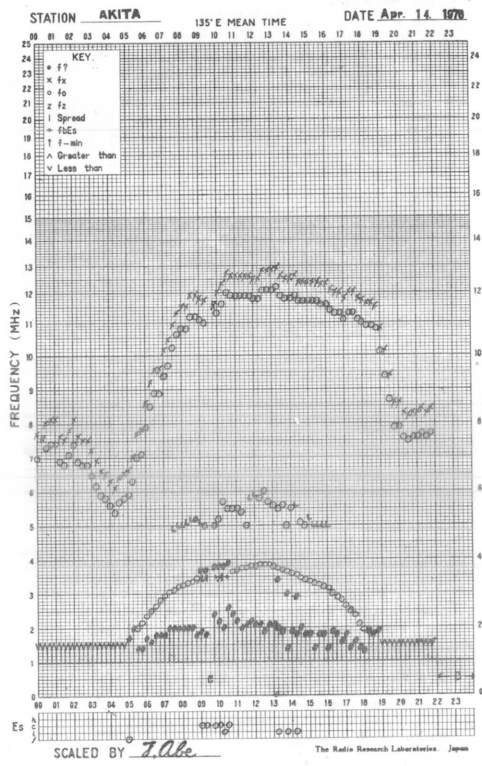
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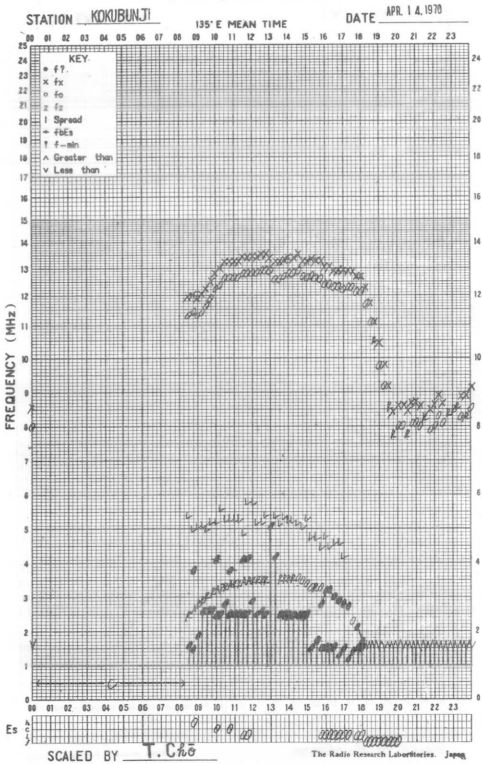
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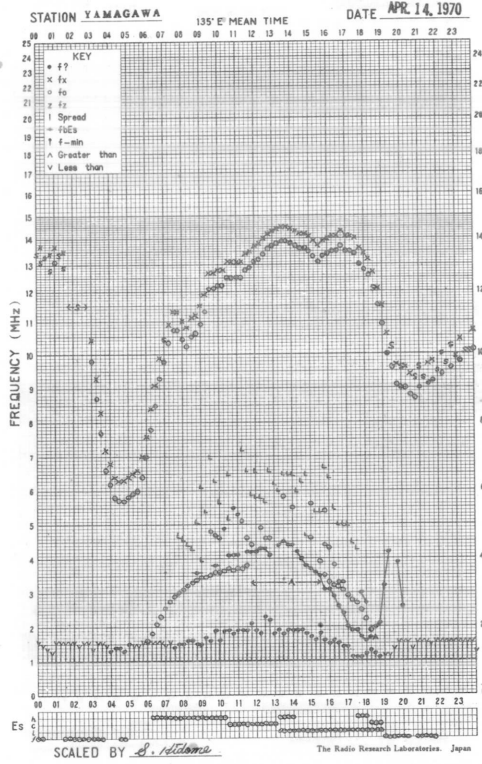
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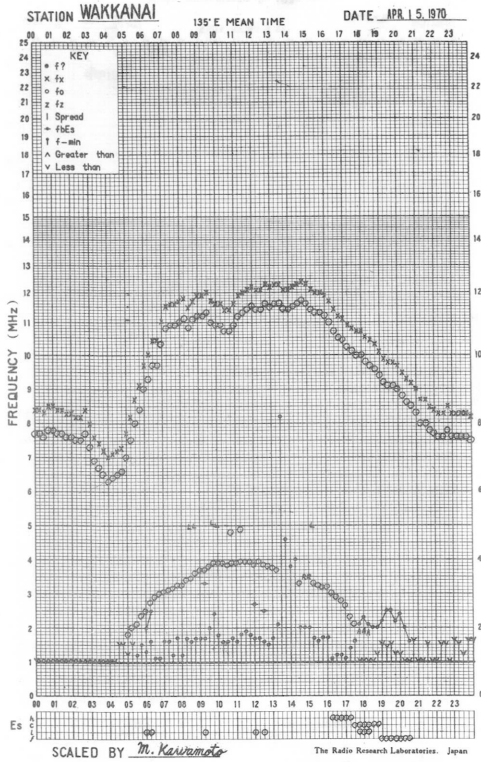
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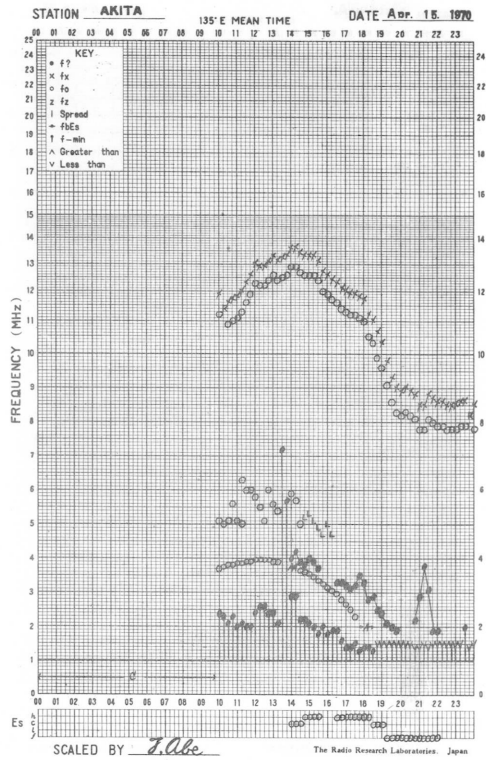
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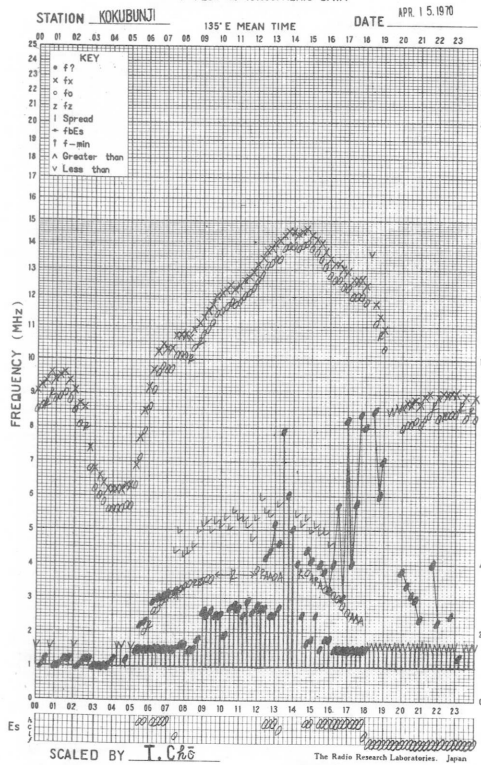
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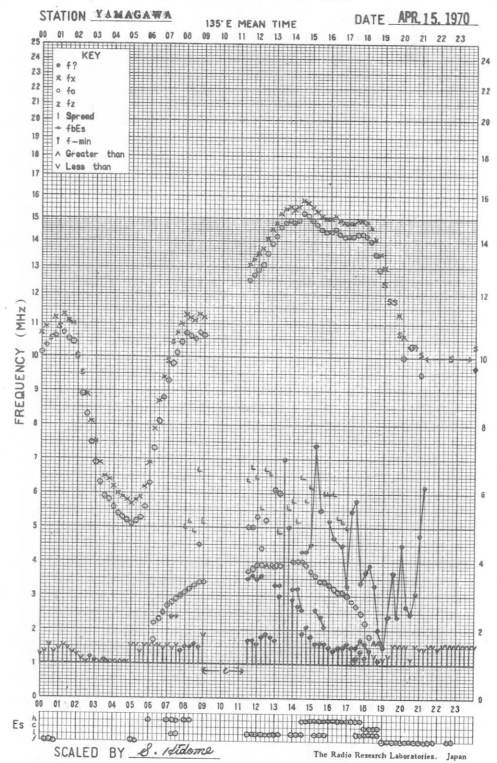
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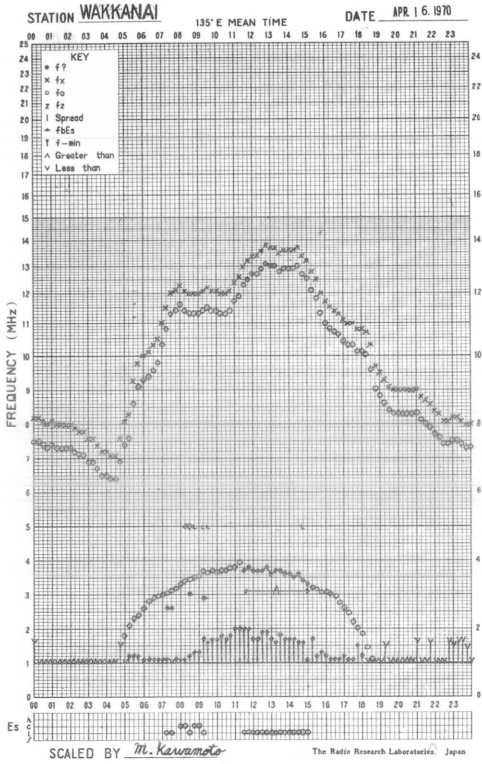
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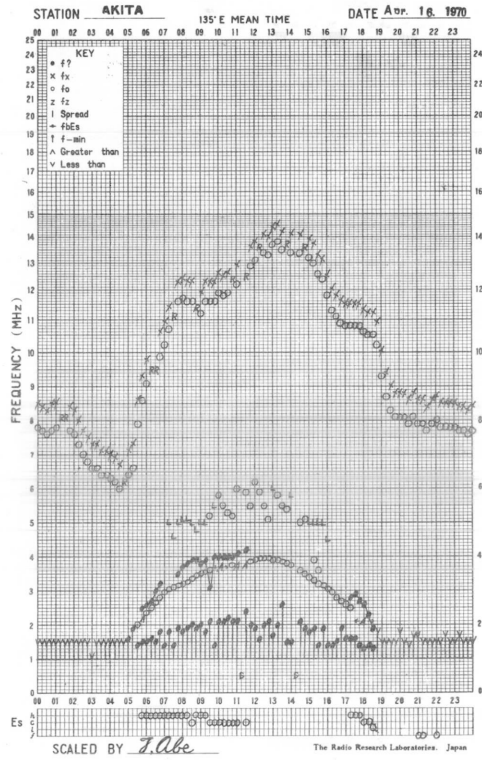
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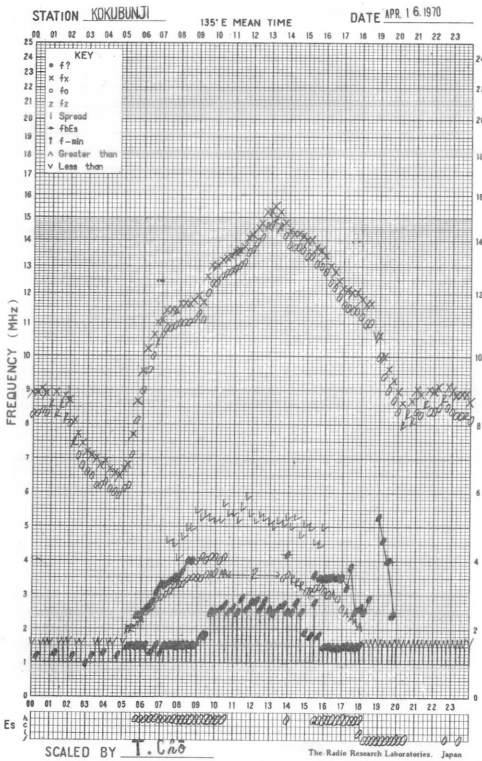
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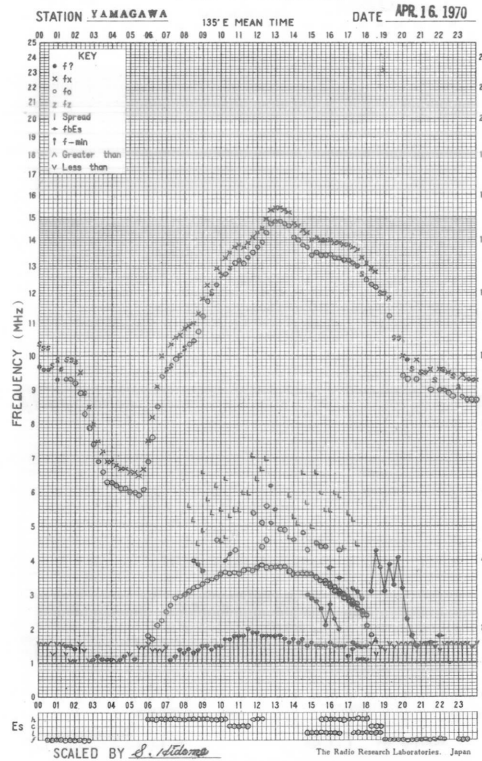
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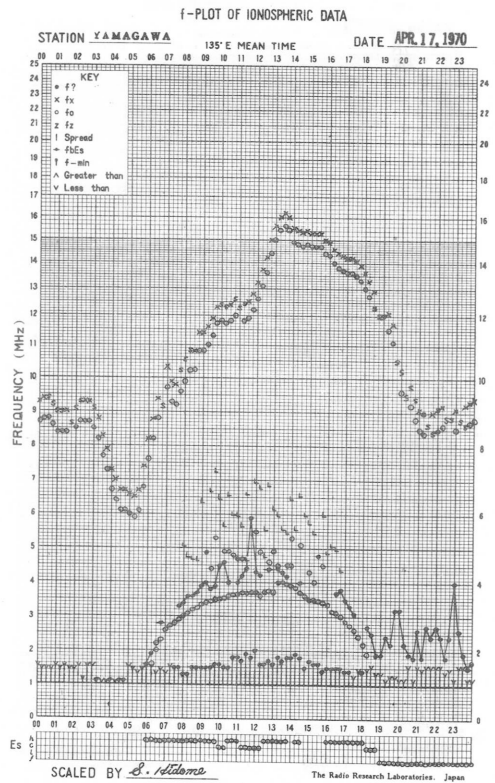
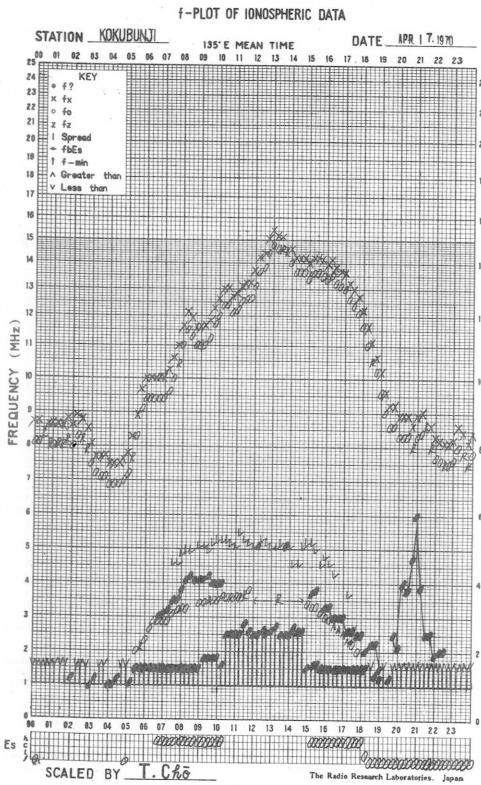
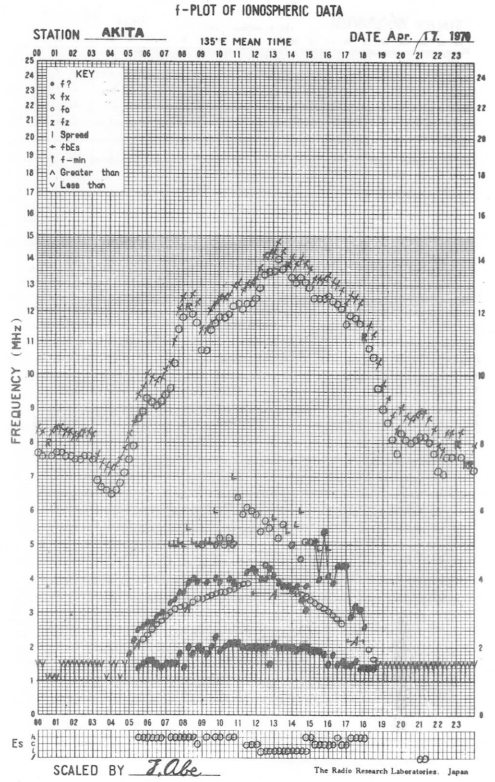
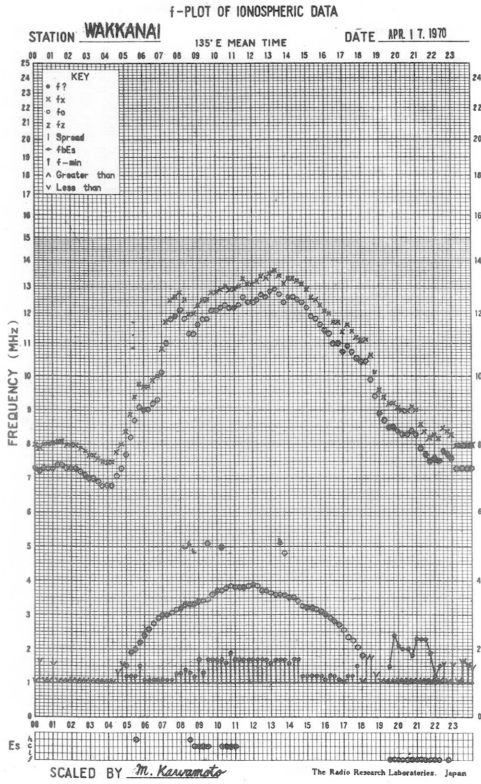


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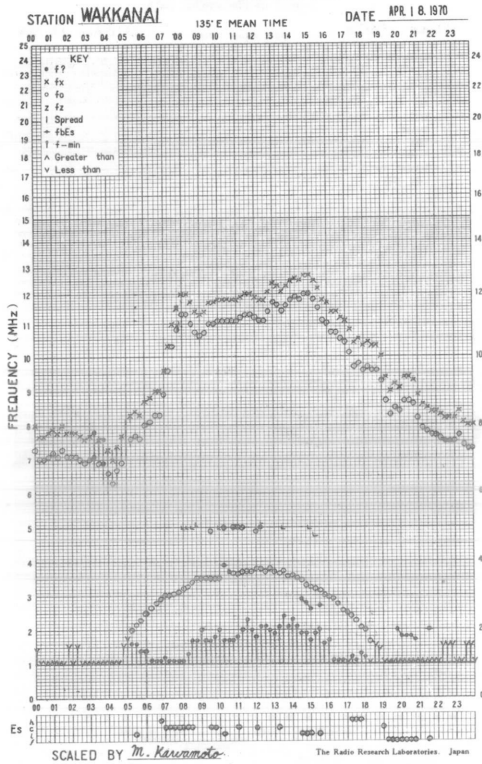


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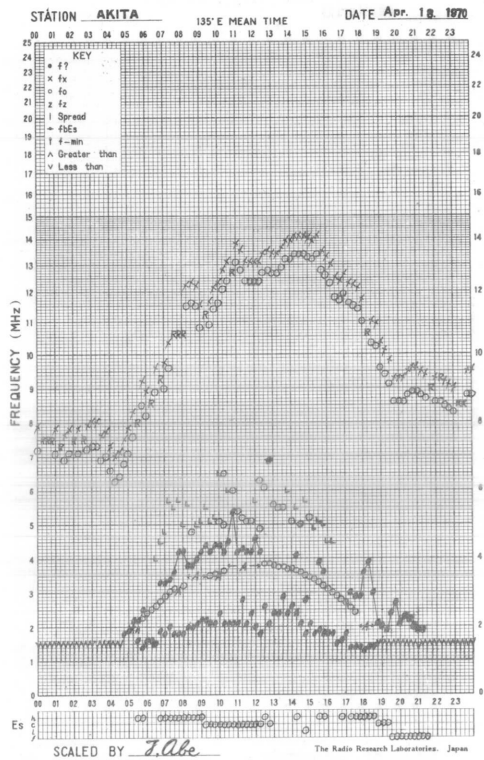




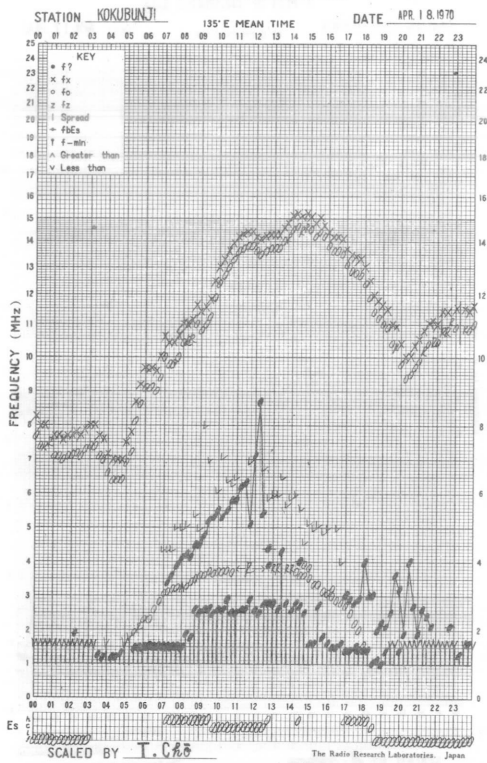
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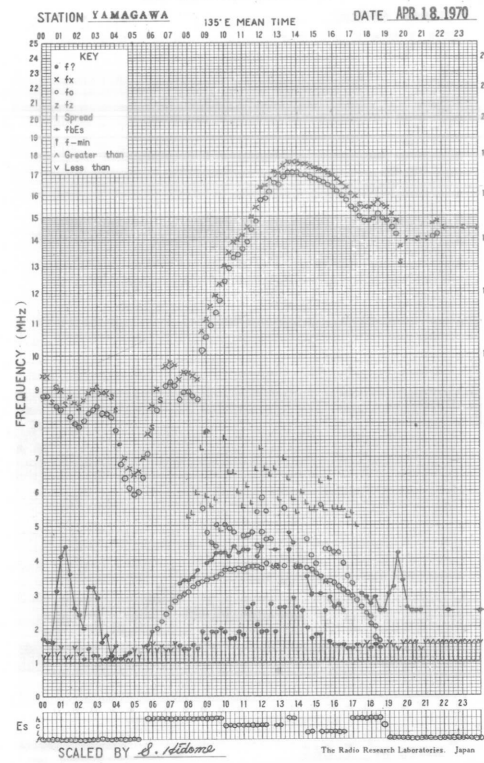
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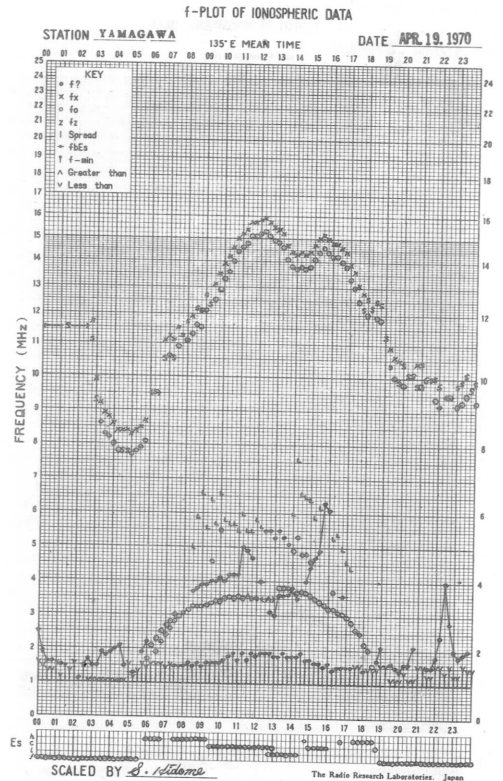
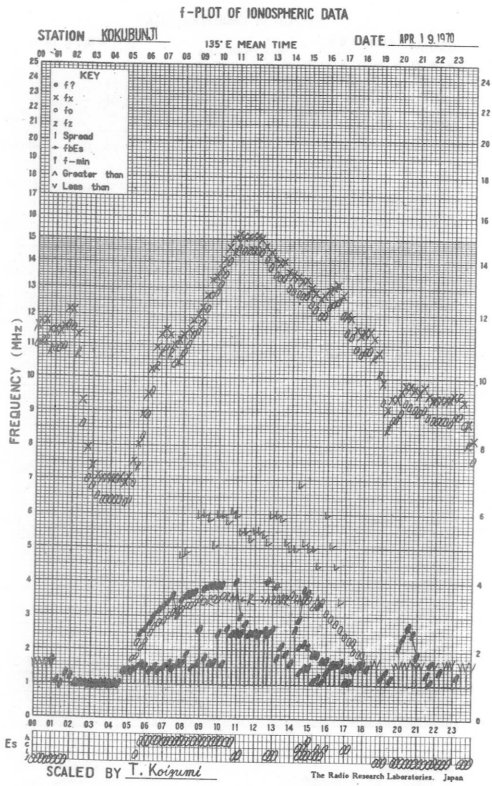
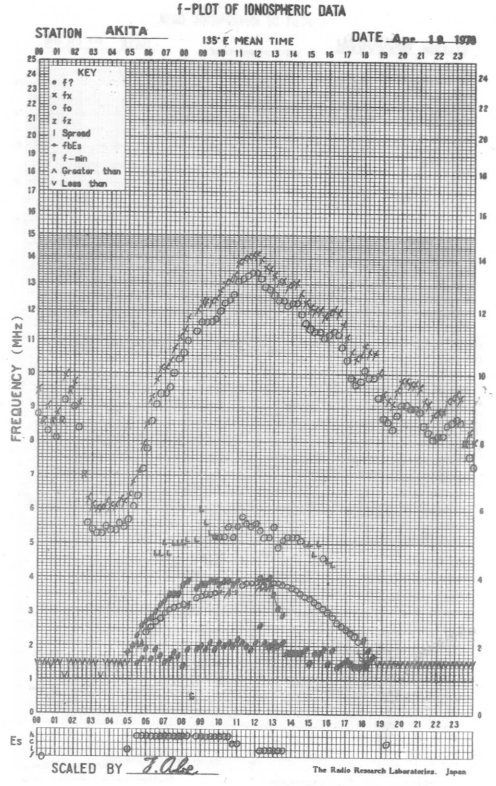
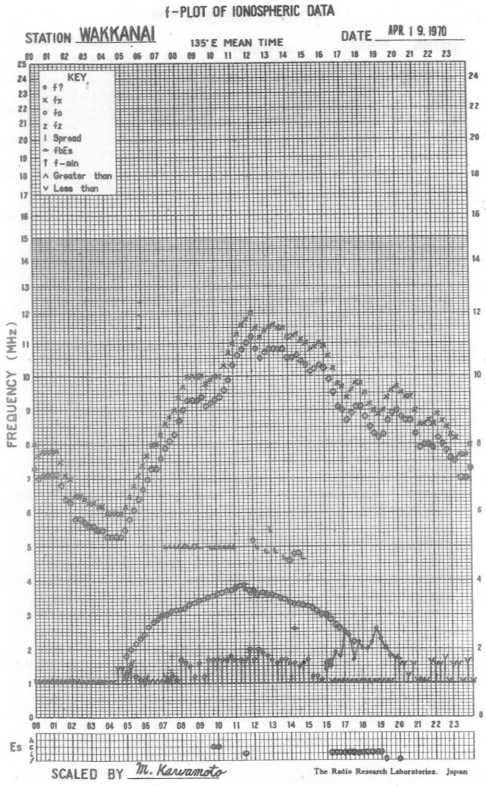


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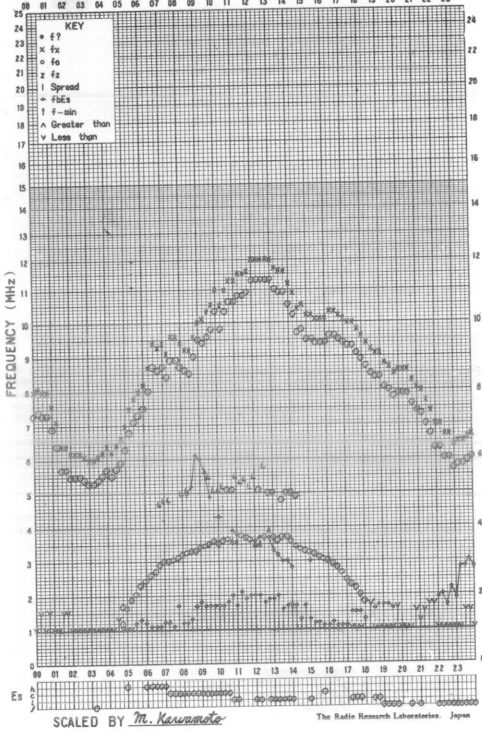
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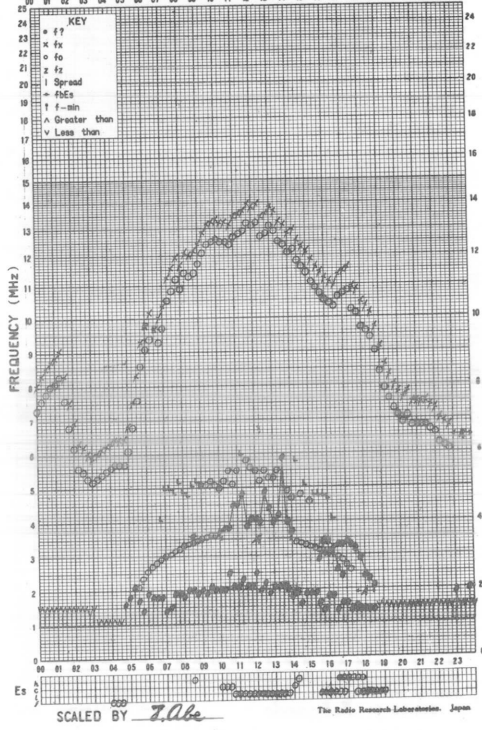
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STATION WAKKANAI 135°E MEAN TIME DATE APR. 20, 1970



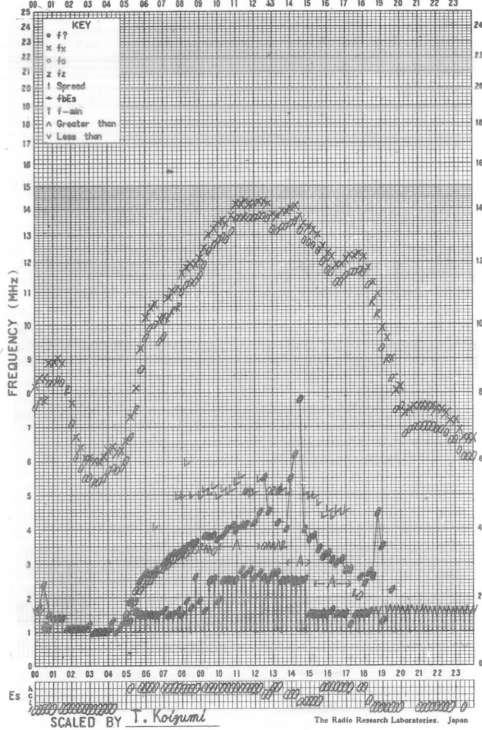
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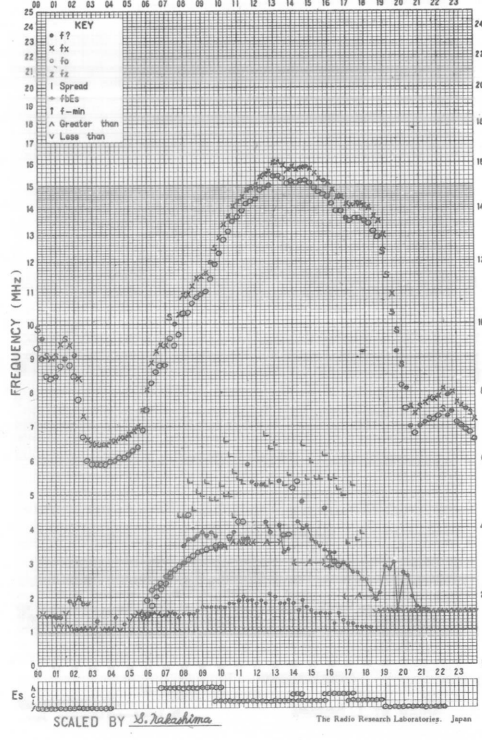
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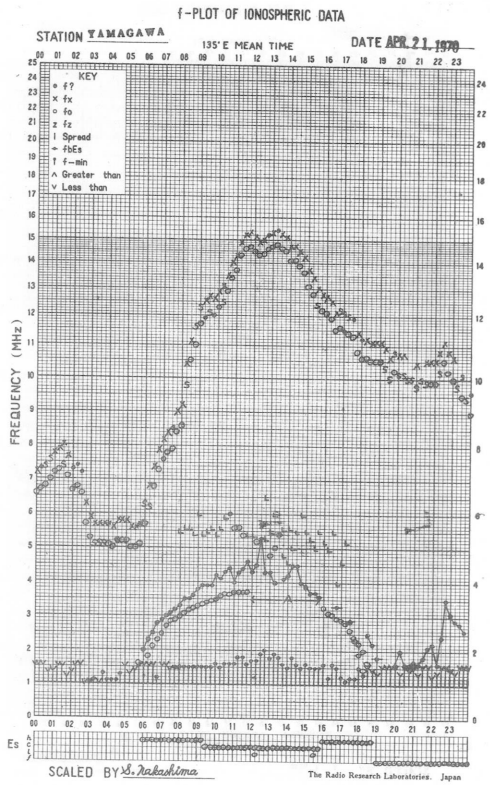
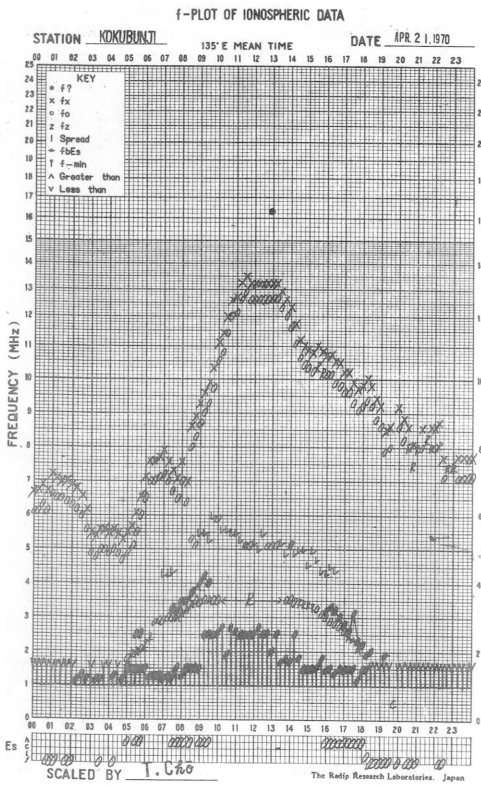
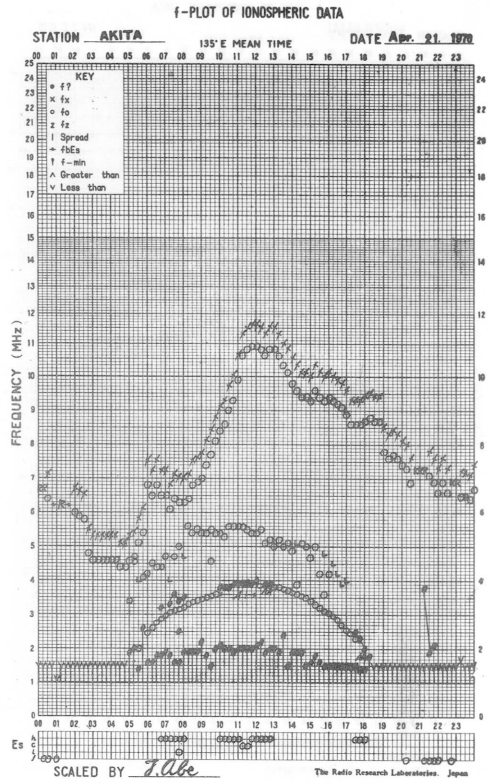
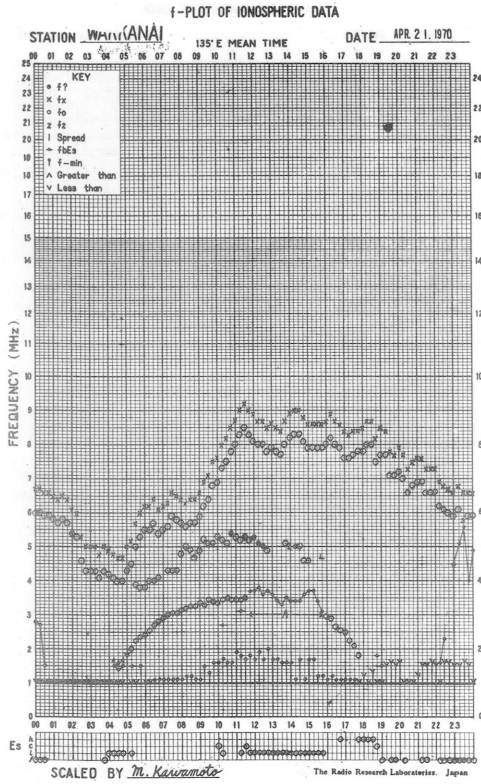
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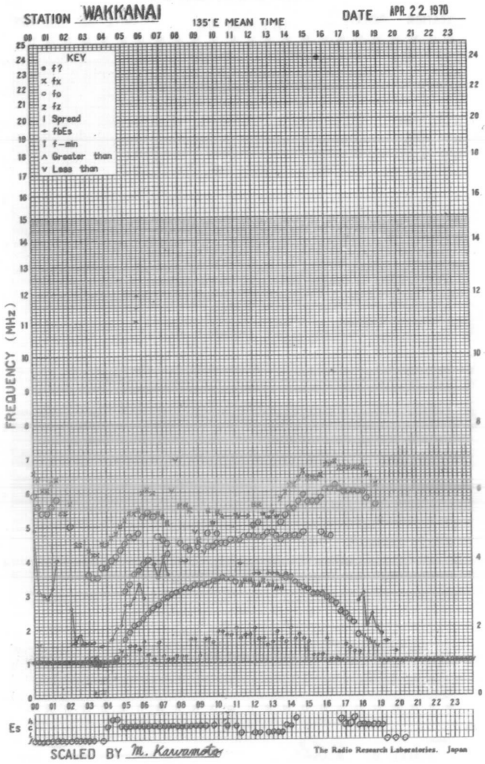
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STATION YAMAGAWA 135°E MEAN TIME DATE APR. 20, 1970

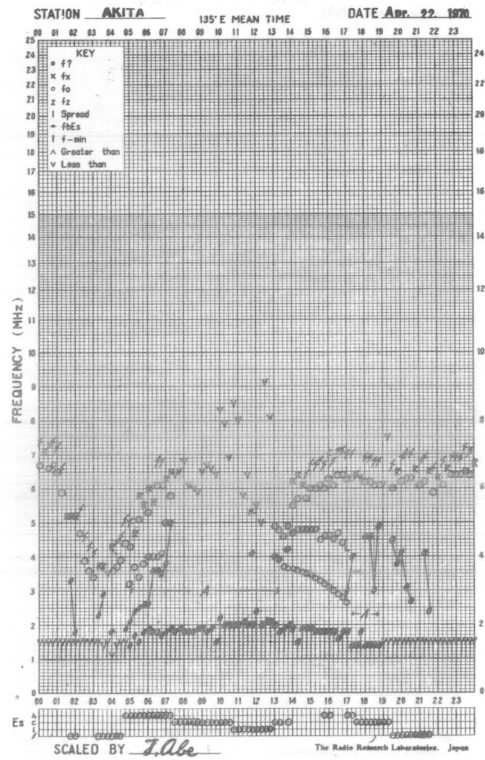




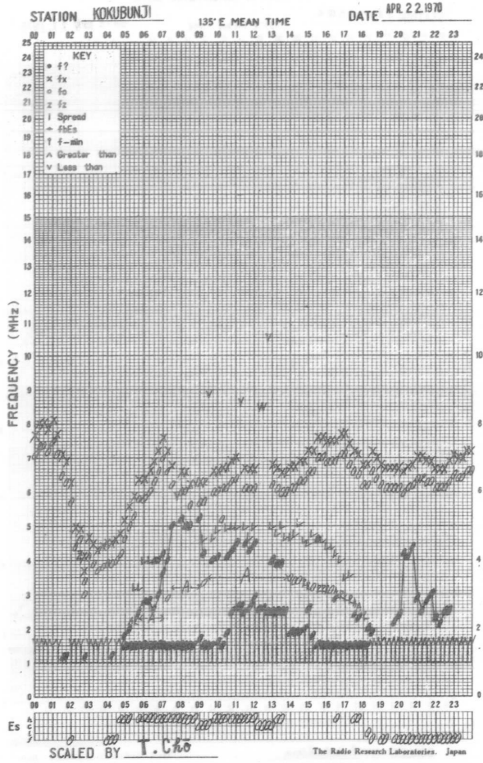
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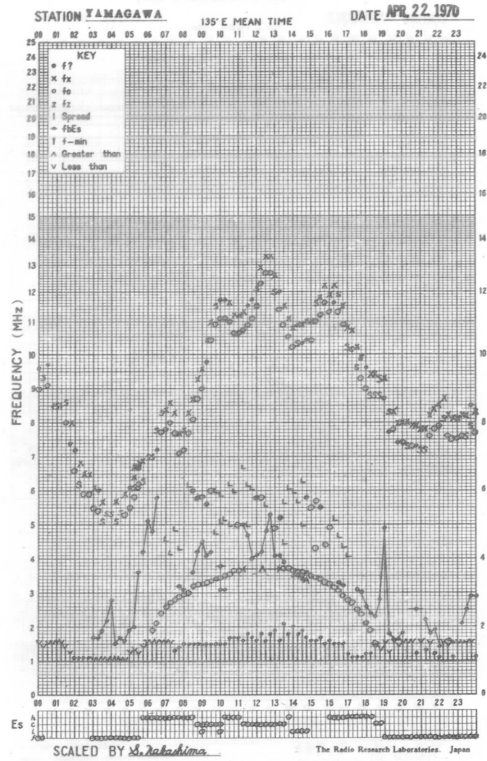
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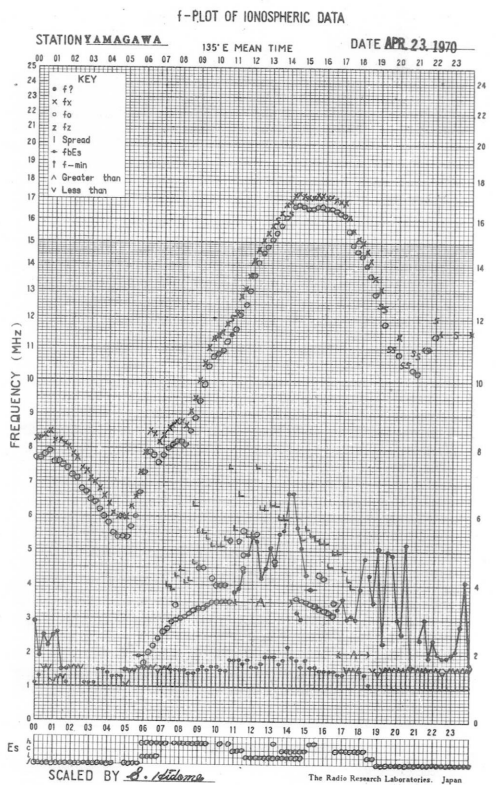
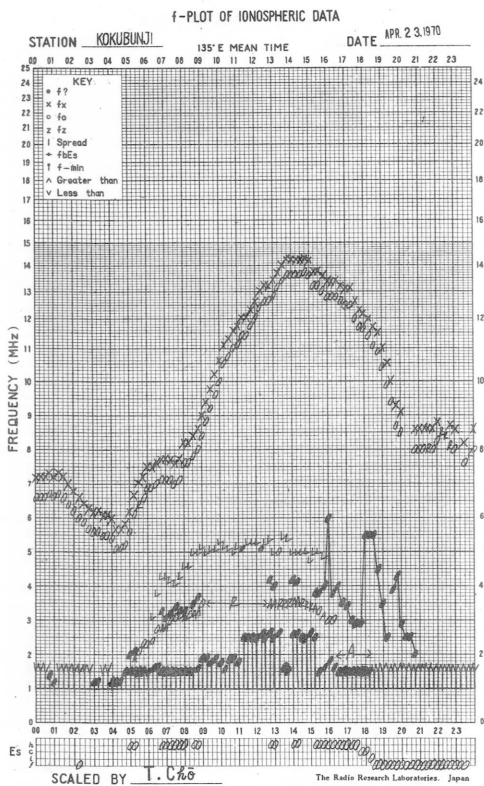
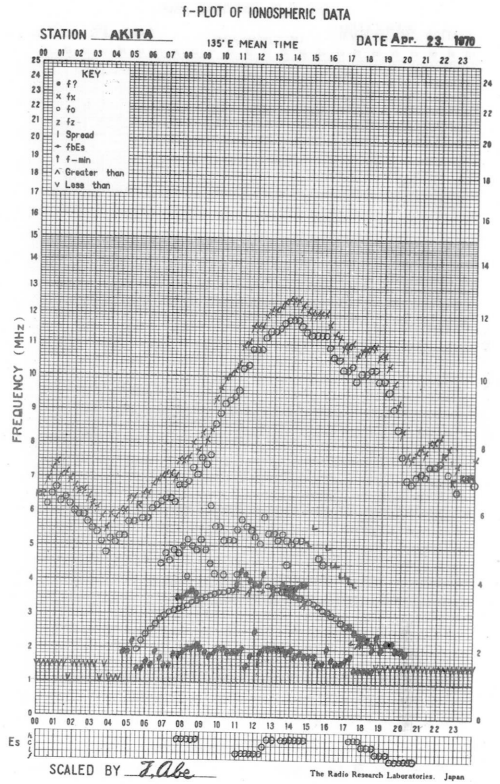
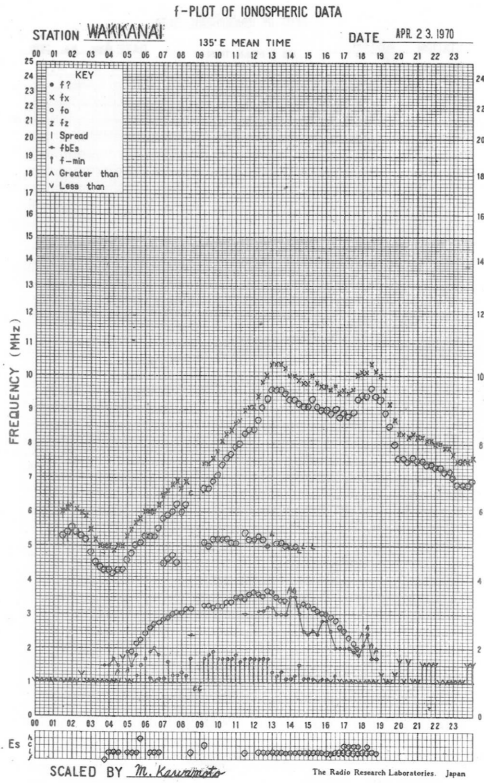


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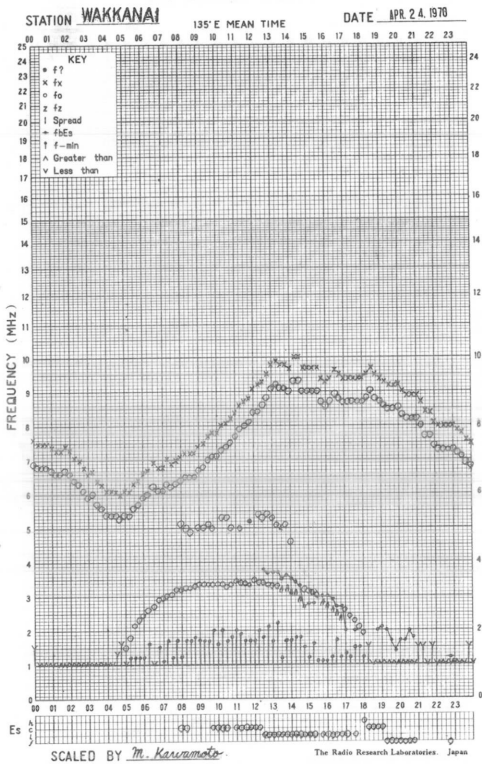


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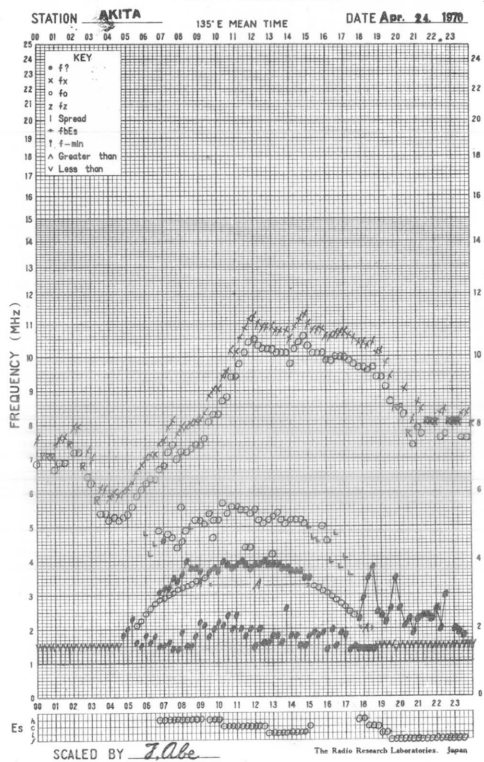




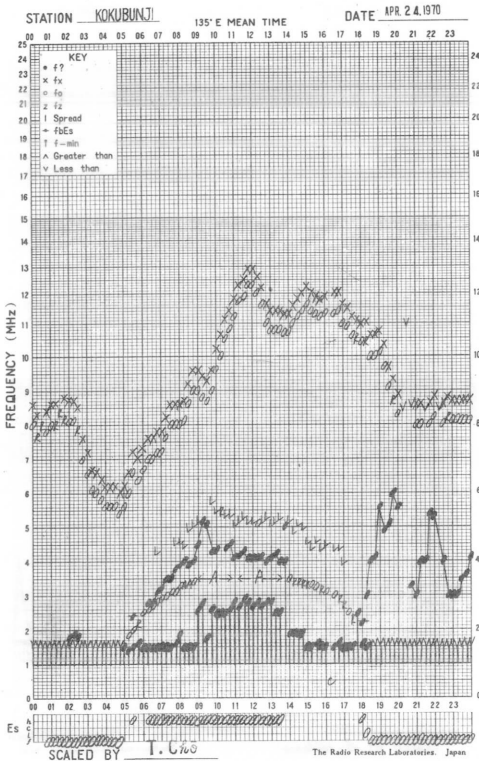
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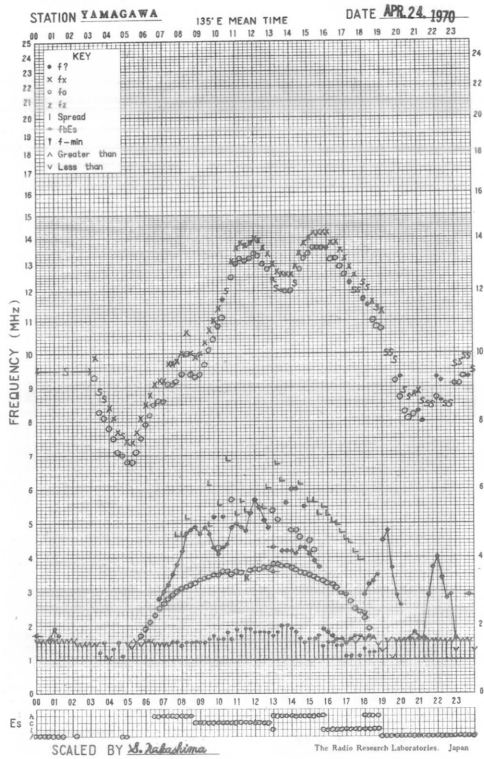
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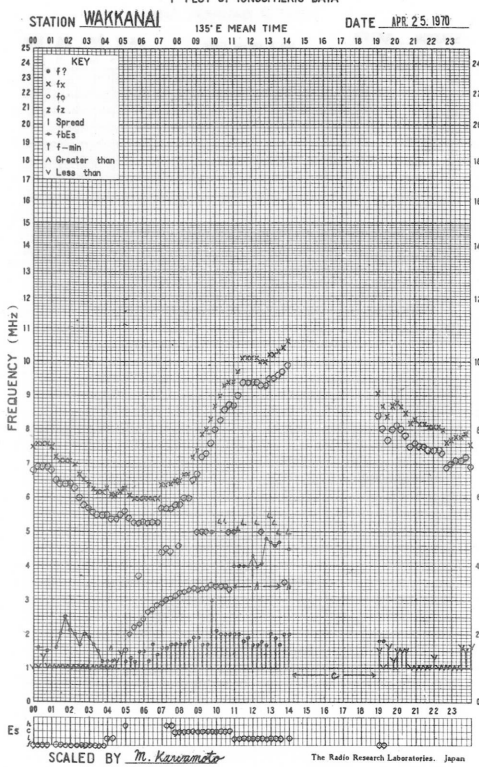
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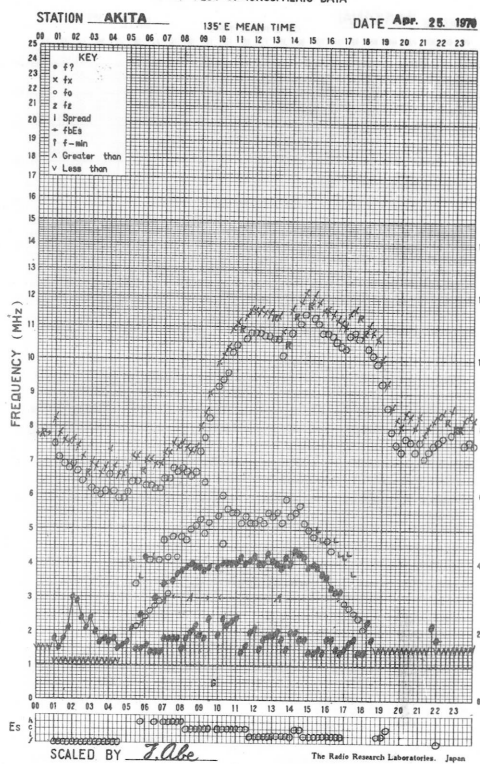
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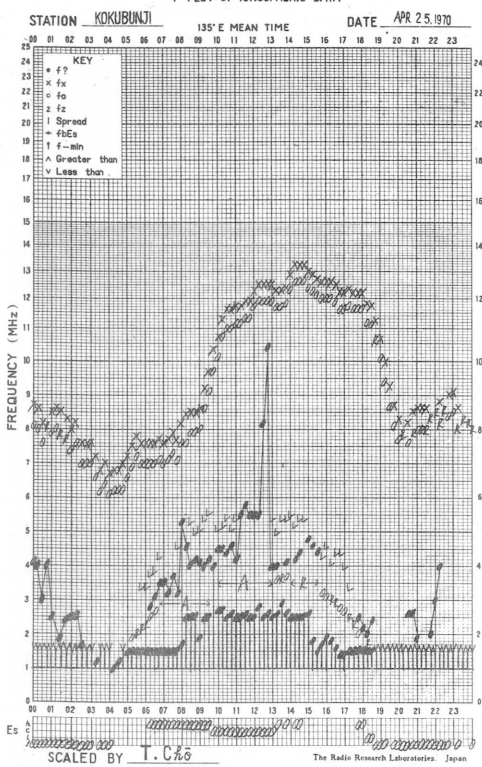
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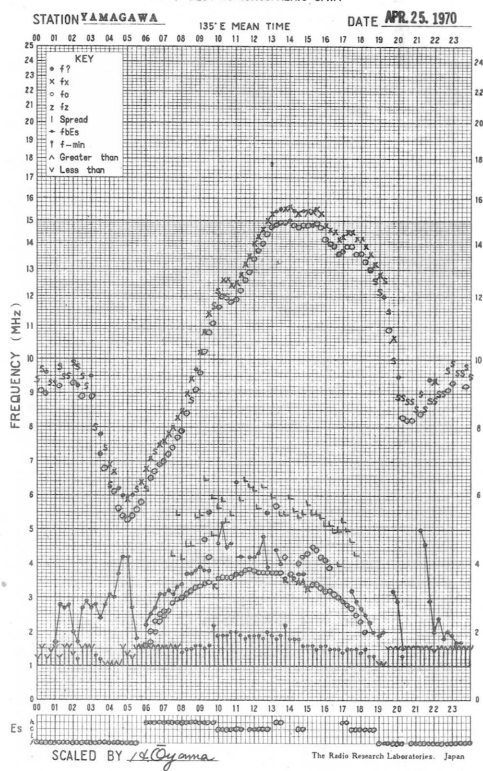
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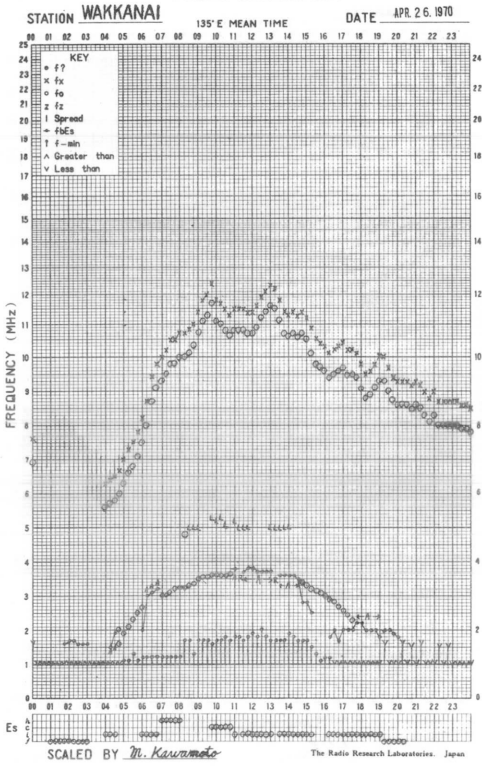
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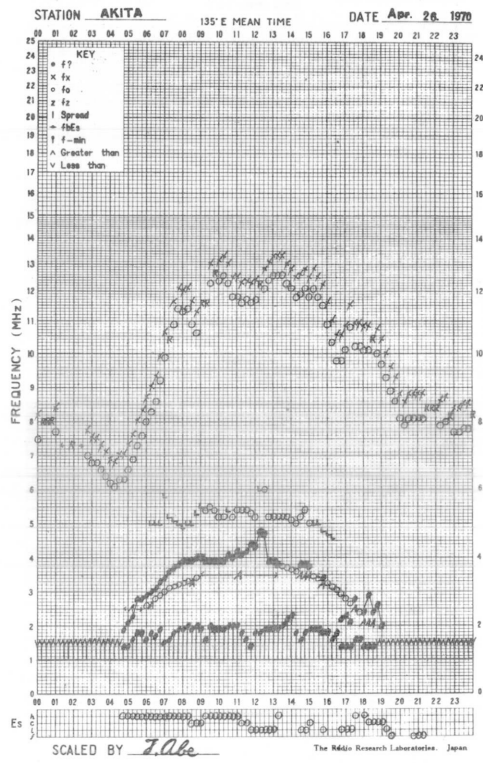
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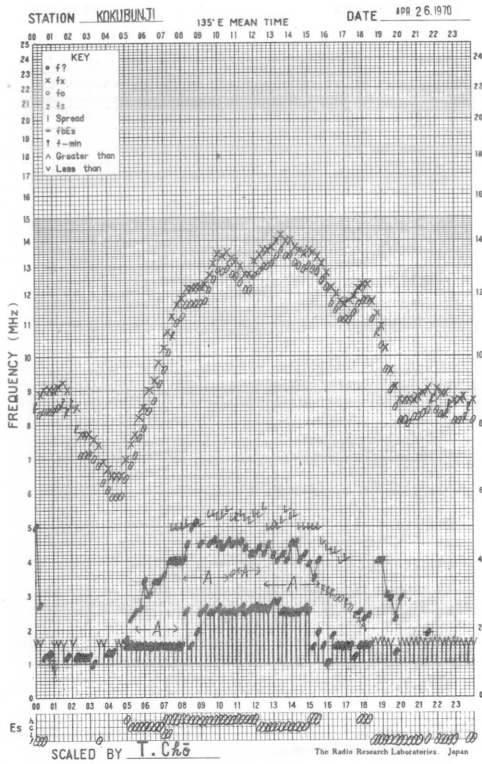
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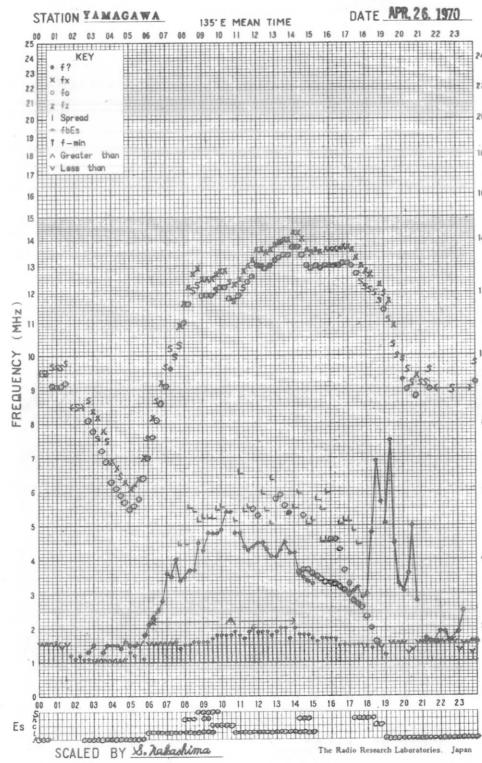
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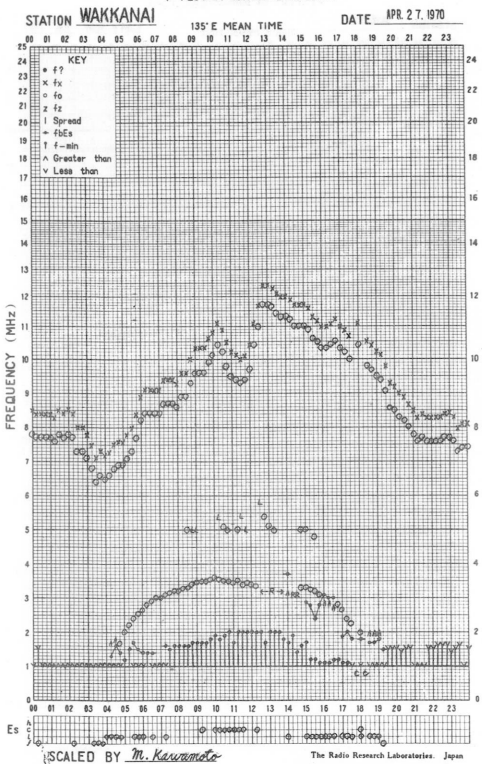
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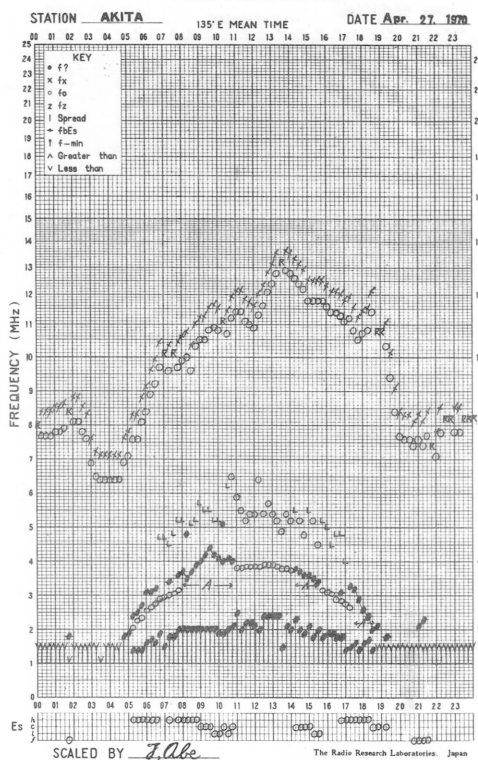
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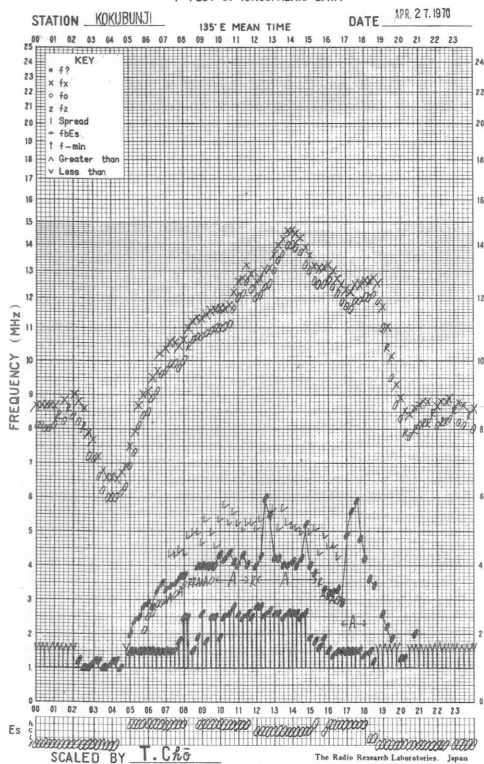
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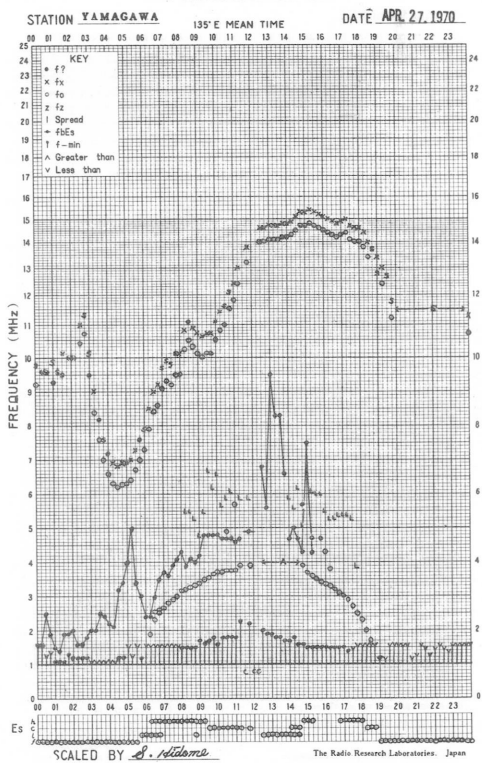
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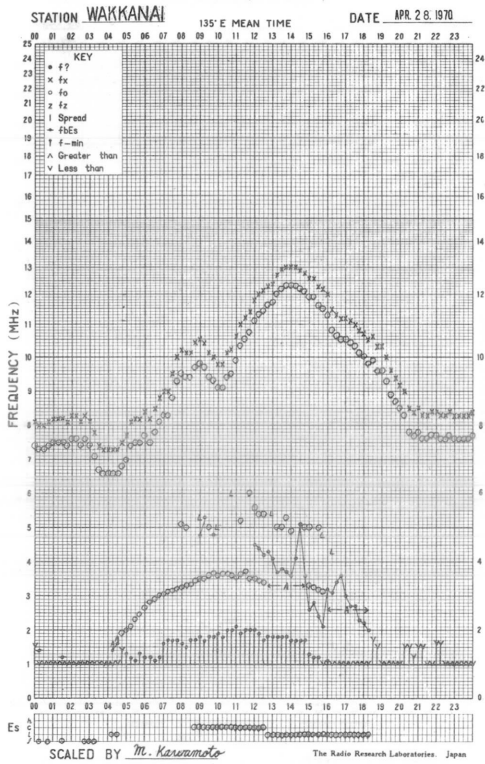
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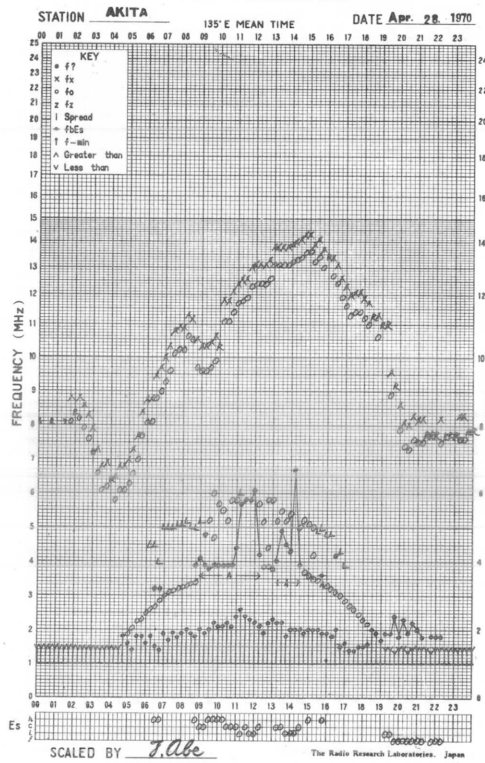
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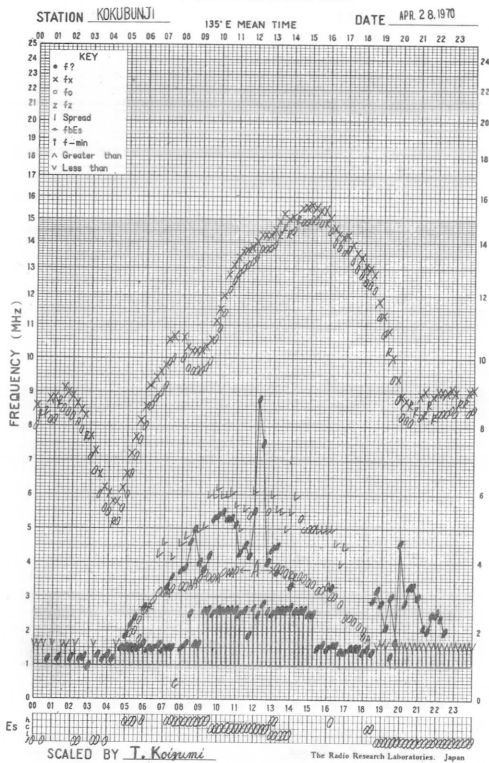
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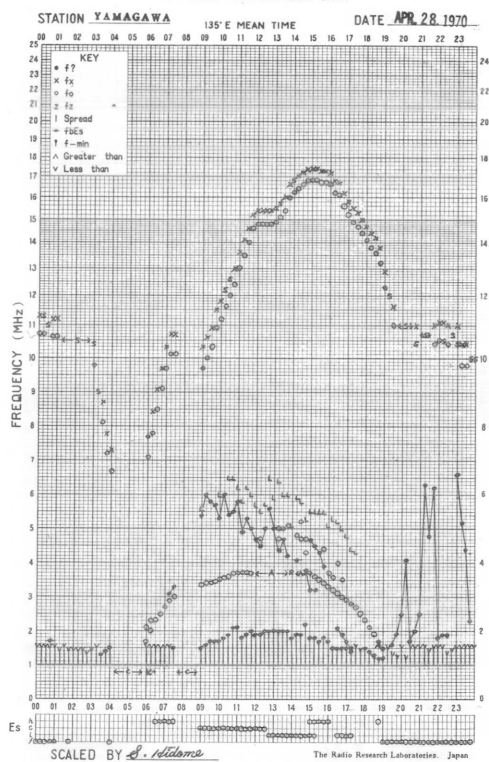
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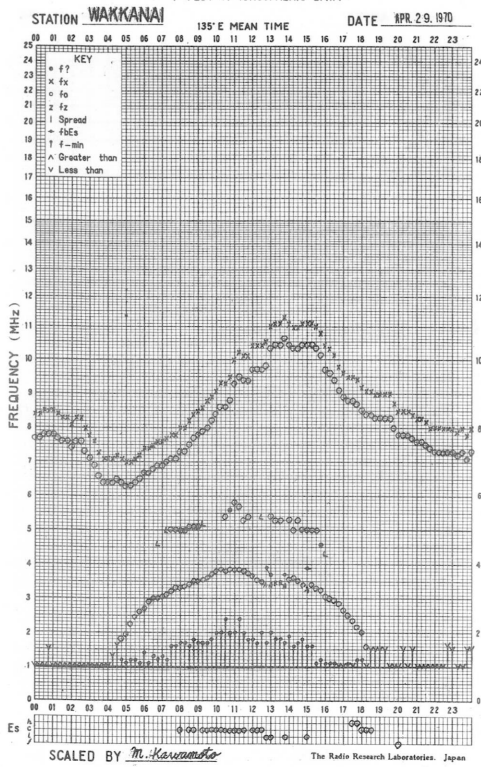
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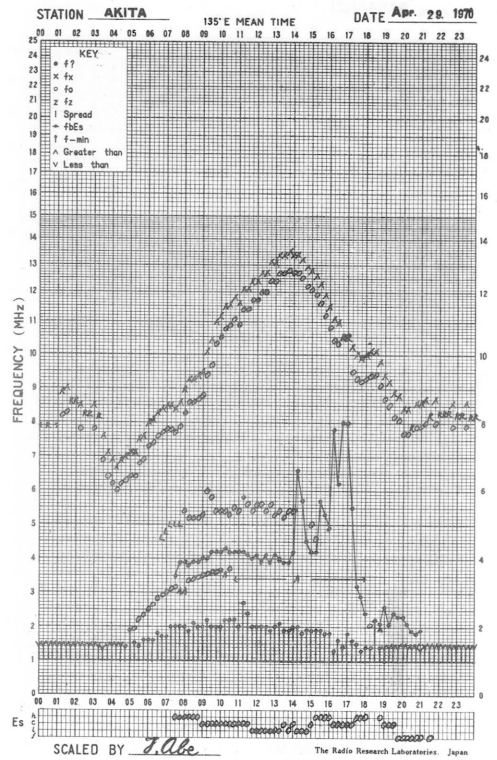
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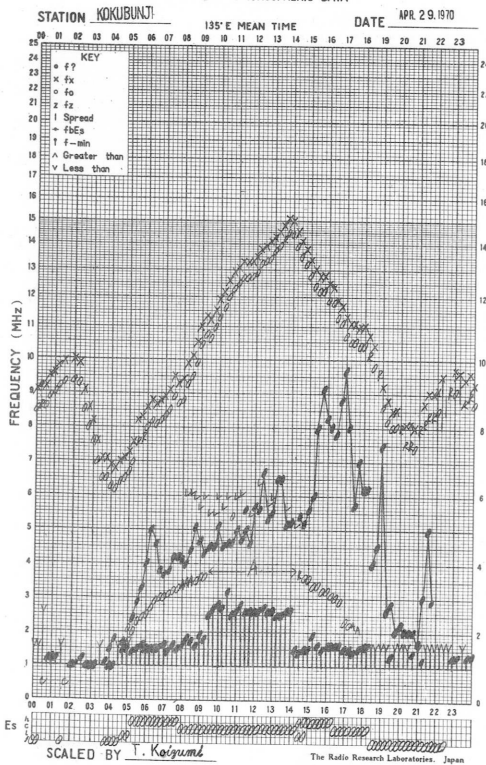
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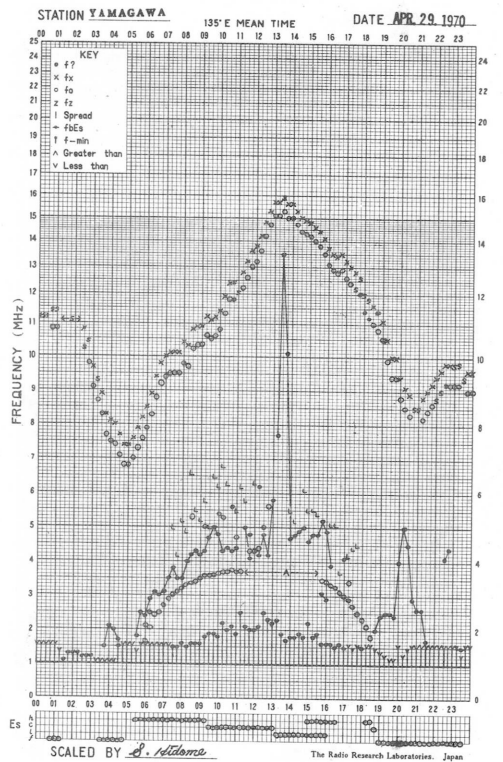
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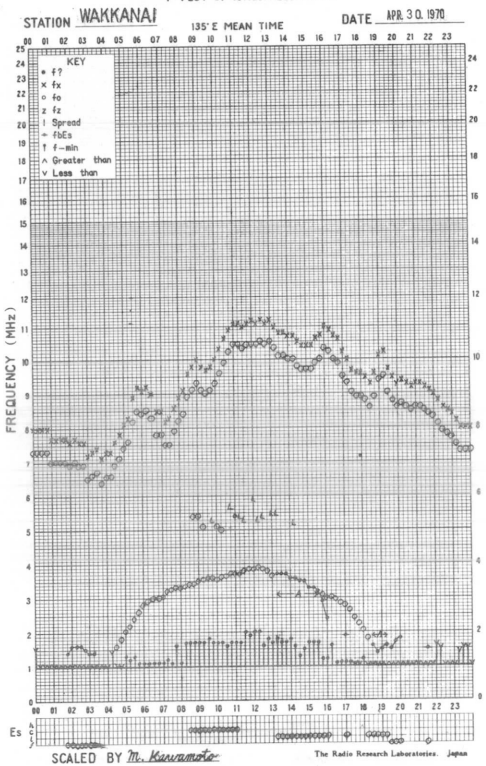
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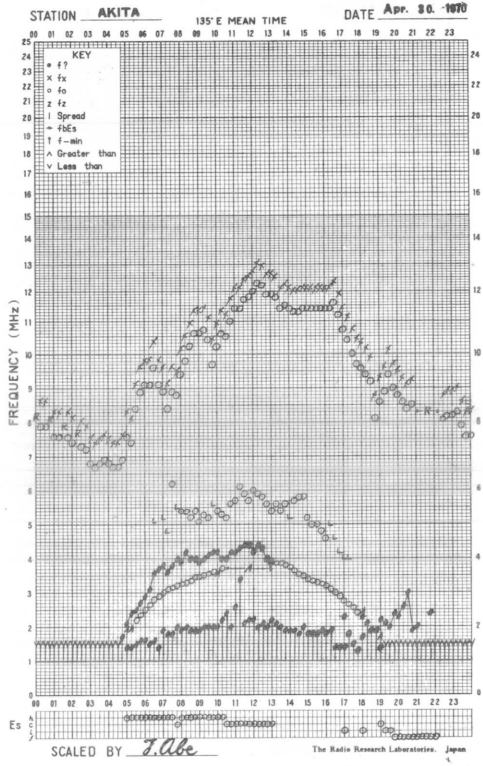
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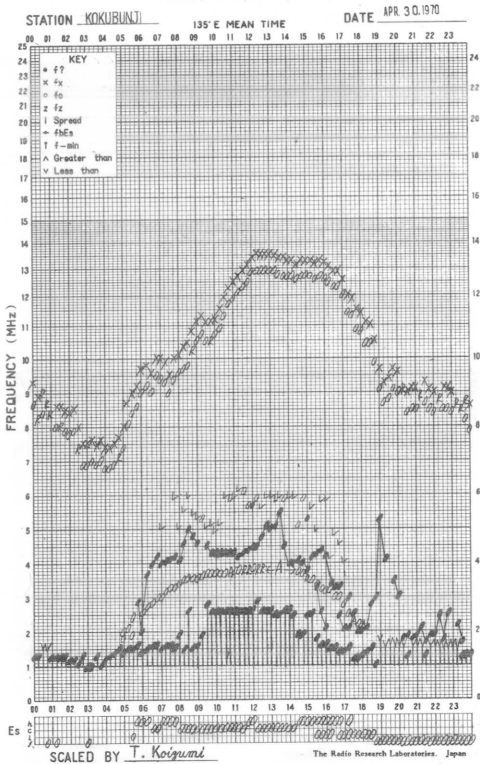
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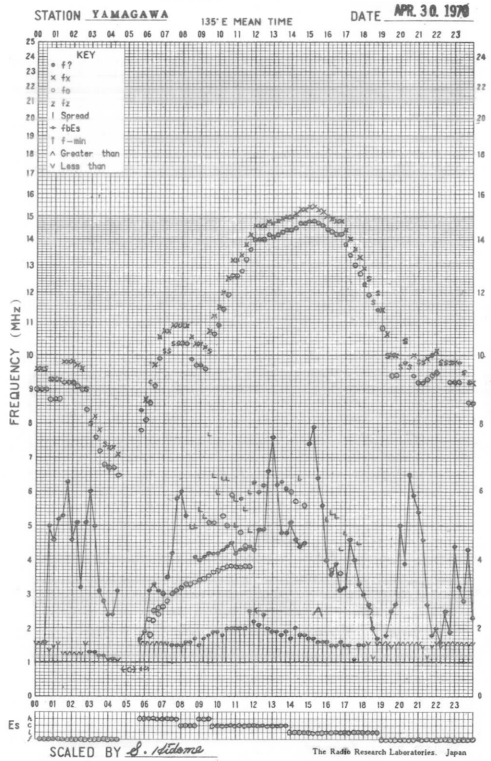
f- PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA



SOLAR RADIO EMISSION

<u>Flux Density and Variability</u>										
Month: April 1970						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	7	7	8	6	7	0	0	0	0	0
2	7	7	7	6	7	0	0	0	0	0
3	6	6	6	6	6	0	0	0	0	0
4	6	6	6	6	6	0	0	0	0	0
5	6	7	7	7	6	0	0	1	0	0
6	7	6	7	73	7	0	0	0	0	0
7	17	12	17	9	31	1	0	0	1	0
8	9	13	13	8	11	0	0	1	0	0
9	8	11	9	10	9	0	1	0	1	0
10	17	12	12	13	13	1	1	1	1	1
11	12	11	8	-	11	1	1	1	-	1
12	7	9	7	7	8	1	1	1	0	1
13	8	8	8	7	7	0	1	0	0	0
14	8	8	9	11	8	1	1	1	1	1
15	11	12	11	16	11	1	1	1	1	1
16	10	13	11	9	13	1	1	1	1	1
17	8	9	9	11	9	1	1	1	1	1
18	10	7	8	6	9	1	1	1	0	1
19	6	6	6	6	6	0	0	0	1	0
20	5	5	5	5	5	1	0	0	0	0
21	5	5	6	5	5	0	0	0	0	0
22	5	5	5	5	5	0	0	0	0	0
23	5	5	5	6	5	0	0	0	0	0
24	5	5	5	6	5	0	0	0	0	0
25	6	6	6	6	6	1	0	0	0	0
26	5	6	5	6	6	0	0	0	0	0
27	6	6	6	5	6	0	0	0	0	0
28	5	5	6	6	5	0	0	1	1	0
29	6	6	6	6	6	1	0	0	0	1
30	6	6	6	7	6	0	0	0	0	0

Note No observations during the following periods:

11th 2000- 12th 0015
13th 2300- 2400

SOLAR RADIO EMISSION

<u>Flux Density</u>					
Month: April 1970					
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	33	34	35	32	33
2	34	35	36	30	34
3	33	34	34	31	33
4	34	35	36	31	34
5	35	34	34	30	33
6	34	33	35	176	33
7	92	64	77	42	100
8	38	41	40	34	40
9	35	40	39	33	37
10	35	39	36	31	36
11	35	36	36	32	34
12	36	36	38	38	36
13	39	38	39	38	38
14	40	39	36	37	38
15	37	39	38	34	38
16	34	33	32	30	33
17	31	32	32	33	31
18	33	33	31	30	33
19	31	31	31	29	31
20	30	31	30	27	30
21	29	31	30	29	29
22	32	32	31	-	31
23	30	31	31	29	31
24	30	29	29	29	30
25	29	29	29	28	29
26	28	28	29	27	28
27	28	28	29	30	28
28	31	32	32	31	31
29	31	31	31	31	31
30	34	36	34	29	33

Note No observations during the following periods:

22nd 2000-

2400

<u>Distinctive Events</u> (single-frequency observations)									
Month: April 1970									
Observing station: Hiraiso									
Normal observing period: 2000 - 0910 (sunrise to sunset)									
Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22} W_m^{-2} (Hz)^{-1}$		Remarks	
	MHz	UT	UT	minutes		peak	mean		
2	100	0040.3	0040.8	1.7	C	> 300	> 130		
		2049.0	2051.0	2.5	C	> 340	> 100		
		2224.7	2225.0	5.0	C	> 340	> 30		
8	500	2329.5	2332.5	9.5	C	970	170		
		2349.0	2350.2	21.0	C	450	80		
		2332.0	2350.0	35.0	C	200	50		
	100	2334.0	2351.0	31.0	C	> 320	> 100		
12	100	0740.0	0740.0	1.5	C	> 210	> 60		
13	500	0418.5	0419.2	7.5	C	160	10		
		0418.0	0420.0	9.0	C	1650	30		
		0417.7	0428.0	15.5	C	> 240	> 120		
15	100	0034.5	0035.2	2.5	C	> 190	> 140		
		0414.5	0416.0	30.0	C	630	30		
		0416.0		28.0	C	> 2400	> 160		
		0416.0	0418.0	44.5	C	> 170	> 30		
		0827.7	0828.0	1.3	C	> 140	> 50		
		0853.7	0854.2	1.5	C	> 140	> 90		
16	100	2033.0	2033.5	1.0	C	> 200	> 50		
		2122.5	2123.0	0.8	C	> 200	> 80		
17	500	0130.3	0131.5	7.5	C	80	20		
		0130.0	0131.0	2.0	C	80	20		
		0129.5	0131.0	2.5	C	> 200	> 80		
		0733.2	0734.0	1.5	C	130	20		
		0733.3	0733.5	2.0	C	> 170	> 20		
18	100	0436.0	0438.0	3.0	C	> 210	> 30		
		0732.0	0733.5	3.0	C	> 210	> 80		
25	500	0036.0	0037.5	5.0	C	30	5		
		0036.5	0037.0	2.0	C	180	30		
		0036.7	0037.2	2.5	C	90	20		
26	200	0124.2	0124.5	1.5	C	90	30		
		100	0124.0	0125.0	3.0	C	> 250	> 140	
28	500	2114.2	2116.5	14.0	C	360	60		
		200	2113.0	2126.0	16.0	C	10	5	
		100	2113.5	2126.0	18.0	C	150	50	
29	500	0101.5	0109.3	14.0	C	170	20		
		200	0056.0	0107.0	15.0	C	20	5	
		100	0051.0	0107.0	37.0	C	> 300	20	

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

APR 1970 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M
MEASURED AT HIRAI SO

UT DAY	00H 15M	01H 15M	02H 15M	03H 15M	04H 15M	05H 15M	06H 15M	07H 15M	08H 15M	09H 15M	10H 15M	11H 15M	12H 15M	13H 15M	14H 15M	15H 15M	16H 15M	17H 15M	18H 15M	19H 15M	20H 15M	21H 15M	22H 15M	23H 15M
1	ES -4	7	7	10	11	2	-8	-3	ES -1	ES 2	ES 2	-8	-9	-4	4	9	6	4	2	-8	1	-2	-1	1
2	C	1	10	5	4	21	26	15	11	2	3	1	ES 2	ES 7	3	-1	10	3	12	-1	4	1	0	1
3	1	0	6	10	18	26	6	4	23	18	27	20	6	7	4	2	-2	5	7	1	4	6	5	3
4	4	4	11	12	15	22	27	25	2	ES 2	-2	7	ES 1	1	-2	2	10	6	10	10	5	5	2	2
5	3	6	10	10	18	24	26	27	20	2	ES 1	3	ES 2	5	12	ES 3	0	6	10	12	9	7	9	3
6	3	6	5	10	15	22	23	4	ES -1	9	7	ES 1	ES -1	ES -7	ES 3	5	10	7	-4	-7	-2	-1	3	-2
7	3	-2	3	5	5	-2	-8	-8	-1	-1	1	1	ES 2	6	1	ES 0	8	9	6	0	1	3	4	-6
8	0	5	5	19	4	24	17	15	5	5	ES 1	ES 1	ES 1	13	6	7	22	13	15	6	ES -3	6	2	0
9	ES -10	-1	1	8	2	15	0	1	4	11	13	9	0	ES 10	-1	8	3	5	7	8	14	8	7	2
10	17	2	13	-2	17	27	16	15	8	8	ES 7	6	ES 3	12	8	14	13	0	8	-4	0	-1	3	1
11	-3	3	0	12	16	19	26	27	31	20	12	5	7	12	17	2	8	8	23	5	13	3	2	6
12	8	12	7	8	17	19	17	C	2	4	7	7	7	ES 12	ES -1	6	12	10	-6	1	6	2	1	3
13	0	2	12	9	16	19	17	25	8	13	6	2	4	16	6	7	6	8	7	1	C	C	C	C
14	3	4	4	10	16	22	25	24	24	14	6	8	3	14	9	11	9	13	8	1	1	-1	-1	-2
15	1	3	7	9	7	17	27	29	26	9	28	32	21	18	12	9	8	8	9	2	5	2	3	1
16	6	4	8	16	22	26	29	24	7	8	3	-1	ES -2	6	3	1	20	10	16	10	16	8	14	6
17	6	2	6	5	19	0	ES -2	2	4	0	0	ES -3	ES 0	ES 2	10	8	4	13	9	9	8	7	7	4
18	-1	-1	6	9	11	10	15	13	11	10	ES 3	15	9	19	13	11	19	12	ES -15	1	8	6	0	-5
19	-2	-1	7	5	14	15	10	2	3	3	4	ES 1	ES -4	-4	6	9	11	6	-17	9	19	15	-5	15
20	3	3	9	3	11	0	-9	-5	1	3	ES -1	ES 0	ES 0	ES -5	-10	-3	5	4	ES -31	ES -31	13	-6	7	0
21	5	5	8	14	19	17	-7	ES -9	2	0	5	ES 1	ES -5	0	-5	ES -11	ES -10	16	ES -32	ES -32	-14	-9	ES -32	-9
22	ES -24	ES -18	ES -21	ES -18	ES -18	ES -13	ES -16	-8	ES -7	-4	ES -6	ES -10	-10	ES -7	ES -6	ES 0	ES -8	ES -24	ES -24	-11	-12	-12	-6	-8
23	-6	-3	1	5	8	11	15	ES 0	ES 6	0	3	3	-3	4	-1	3	5	16	10	-3	-1	-1	-9	ES -19
24	ES -7	-15	-11	4	0	-3	-2	9	10	8	5	-1	5	8	5	1	2	6	-3	-1	-1	-4	-9	-12
25	-1	-13	ES -17	5	6	1	ES -15	ES 1	3	-6	11	14	9	15	6	5	8	20	21	10	-2	-7	0	-4
26	-4	-9	-9	3	1	0	6	1	2	4	2	ES -2	ES 7	17	3	22	3	1	3	2	0	0	1	0
27	ES -3	ES -8	-9	-6	-2	10	ES -2	ES 3	4	6	12	2	4	19	5	16	22	10	5	5	5	0	-3	-4
28	-5	2	2	-3	8	10	17	16	16	3	7	ES 19	2	25	1	22	17	16	16	11	8	1	-3	-5
29	6	2	2	11	11	17	24	24	25	7	5	2	11	27	9	13	10	4	6	7	-2	0	1	-4
30	-7	0	5	6	22	21	11	6	11	12	-4	ES -4	3	26	22	7	4	8	3	2	10	13	15	7

CNT	29	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29
MED	0	2	6	8	11	17	15	6	US 6	4	US 5	US 2	ES 2	US 9	4	6	8	8	7	2	4	1	1	0
UD	6	6	11	14	19	26	27	27	25	14	13	ES 19	9	25	13	16	20	16	16	10	14	8	9	6
LD	ES -7	ES -13	-11	-3	0	-2	ES -9	ES -8	ES -1	ES -1	ES -2	ES -4	ES -9	ES -5	ES -5	ES -1	-2	1	ES -24	-11	ES -3	-7	-9	-9

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

APR 1970 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISSO

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

RADIO PROPAGATION QUALITY FIGURES

HIRAISO		Time in U.T.																									
Apr. 1970	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	06	12	18	24	Start	End	ΔH
1	3+	3	(4)	4	(2)	2	(3)	(4)	4	4	-	4	3	4	(4)	C	U	U	U	U							
2'	4+	5	5	4	4	4	4	4	4	4	-	4	3	5	4	4	N	N	N	N							
3	4+	4	4	4	4	5	4	4	4	5	-	4	4	4	4	4	N	N	N	N							
4	4o	4	4	4	4	4	4	4	4	4	-	-	4	4	4	4	N	N	N	N							
5	4o	(4)	4	(4)	4	4	4	4	(4)	-	-	-	4	5	5	5	N	N	N	N							
6	4-	3	4	4	4	4	4	3	4	5	-	3	4	4	3	3	N	N	N	N							
7	3+	3	3	4	(3)	3	4	4	3	4	-	4	4	4	4	4	U	N	N	N							
8	4-	3	4	4	4	4	4	4	4	3	-	4	4	4	4	4	N	N	N	N							
9	4-	4	4	4	3	4	4	3	3	4	-	3	4	4	4	4	N	N	N	N							
10	4o	4	4	4	(4)	4	4	5	3	4	-	4	4	4	4	4	N	N	N	N							
11	4+	4	4	4	5	5	4	(4)	5	5	-	-	(4)	4	4	4	N	N	N	N							
12	4-	4	4	4	(3)	(4)	4	4	(3)	-	-	-	4	4	4	4	N	N	N	N							
13	4+	5	4	4	4	4	4	5	5	5	-	4	4	4	4	C	N	N	N	N							
14	5-	5	4	4	5	5	(5)	5	4	4	-	4	4	4	4	4	N	N	N	N							
15	4+	5	4	4	5	5	(5)	5	4	3	-	4	4	4	4	4	N	N	N	N							
16	4+	4	4	4	5	4	4	4	5	4	-	4	4	4	4	4	N	N	N	N							
17	3+	3	4	3	3	3	3	(3)	4	4	-	4	4	4	4	4	N	N	U	U							
18	4-	4	4	3	(3)	4	4	3	5	3	-	-	3	4	4	3	U	N	N	N				08.23	---	98 ^y	
19	4-	4	4	3	4	4	3	3	(4)	-	-	-	4	4	4	3	N	N	U	U				---	19xx		
20*	3+	4	4	4	3	3	3	2	4	4	-	3	4	4	3	3	U	N	U	U				11.22	---	144 ^y	
21*	3-	3	2	(3)	4	3	2	1	5	4	-	1	4	4	3	3	N	N	U	U				---	---		
22*	2o	2	(2)	(3)	1	1	3	2	2	2	-	3	3	3	2	2	W	W	W	W				---	15xx		
23	3+	3	3	(3)	3	4	4	2	4	4	-	3	4	4	4	3	U	N	N	N							
24	3+	3	3	(3)	(2)	3	4	3	4	4	-	3	4	4	4	4	N	N	N	N							
25	3o	(3)	3	3	3	3	4	3	3	3	-	-	4	4	4	4	N	N	N	N							
26	4-	4	3	(4)	3	4	4	3	(4)	-	-	-	4	4	4	4	N	N	N	N							
27	4-	3	3	4	3	4	4	5	4	4	-	4	4	4	4	4	N	N	N	N							
28	4+	4	3	(4)	5	5	5	5	4	5	-	4	4	4	5	4	N	N	N	N							
29	4+	4	4	4	5	4	5	5	3	4	-	5	(4)	4	4	4	N	N	N	N							
30	4-	4	3	3	5	4	4	(3)	4	4	-	4	4	4	4	4	N	N	N	N							

GEOALERT

- " = PROTON FLARE
- * = MAGSTORM
- o = MAGCALME
- ' = COSMIC EVENT

- () = Regular World Day
- = impossible to evaluate
- () = inaccurate

- C = artificial accident
- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCER

(S.I.D.)

HIRAISO

Time in U.T.

Apr. 1970	S W F						Start- time	Dura- tion	Type	Imp.	Correspondence		
	Drop-out Intensities (db)										Flare	Solar Noise	Mag.
	CO	LM	HA	TO	HB	SH							
8		36			<u>35</u>		23.30	30	Slow	3		x	
9	x						03.33	14	S	x		x	
9	x						03.56	32	Slow	x		x	
15		19			<u>29</u>		04.13	59	S	2+		x	
18	x				<u>7</u>		04.15	18	Slow	1-			
18					<u>11</u>		06.23	15	S	1			
24					8		09.07	13	S	1-			
25	20''	x		x			00.36	20	S	2-	x	x	
28		8			x		21.19	20	S	1-		x	

I N U B O

1970	S P A								Remarks
Apr.	Phase Advance(degrees)					Time (U. T.)			
DATE	GBR	WWVL	NAA	NWC	HA2	Start	End	Maximum	
1					12	0406	0540	0425	
1					12	2240	2326	2248	X
2			15	<u>44</u>	37	0415	0550	0425	
2	15			<u>16</u>		0644	0740	0655	X
3				<u>16</u>	9	0040	0114	0052	X
3					16	0450	0533	0505	
4					9	2338	0015	2350	
6		<u>17</u>		4	7	2338	0116	2345	
7					12	0550	0622	0558	
7					28	0730	0824	0746	
7		25	19	16	<u>26</u>	2222	2305	2229	X
7		18	9	16	<u>28</u>	2312	0012	2318	X
8		<u>68</u>			57	1950	2053	2001	X
8	33	54*	73*	96*	<u>114*</u>	2329	0230	2338	X
9	30*	36*	29*	<u>72*</u>	83*	0317	0458	0412	X
9	18			<u>24</u>		0655	0741	0704	
10	18		19	<u>45</u>	40	0113	0227	0127	X
10		<u>22</u>		16	15	2334	2353	2341	
11	19	25	16	<u>56</u>	44	0206	0326	0218	X
11		11		4	<u>13</u>	2314	2355	2322	X
12					9	0055	0215	0113	
12	15			<u>16</u>		0743	0823	0750	X
13			6	<u>36</u>	24	0422	0515	0428	
13	27	-		<u>40</u>		0523	0700	0547	X
13					16	2008	2024	2017	
13	14	50	<u>62</u>	16	55	2209	2324	2217	
14	-	18	<u>24</u>	20	21	0033	0117	0042	X
14			4	<u>8</u>	4	0235	0258	0241	
14	21		21	<u>40</u>	18	0617	0712	0626	
15		11	<u>15</u>	12	13	0029	0111	0038	
15	110	114	126	<u>160</u>	154	0414	0704	0427	X
16	15	14	10	<u>20*</u>	15*	0218	0312	0231	X
17	30	38	28	<u>48</u>	40	0131	0225	0138	
17					11	2156	2230	2210	X
17	13	<u>81</u>	39	32	37	2340	0026	2350	X

1970	S			P			A			Remarks
Apr.	Phase Advance(degrees)						Time (U. T.)			
DATE	GBR	WWVL	NAA	NWC	HA2	Start	End	Maximum		
18		<u>31</u>	10	12	11	0032	0114	0045		
18	10		29	<u>36</u>	35*	0206	0303	0216		
18			13	<u>28</u>	31	0323	0400	0330	X	
18	20	<u>77</u>	29	40	46	0408	0526	0430	X	
18	45	<u>27</u>	31	<u>44</u>	22	0624	0720	0631	X	
18					7	2207	2226	2219		
18	12			4	<u>12</u>	2229	2248	2232	X	
18		<u>25</u>	15	4	13	2306	2337	2313	X	
19				<u>16</u>	7	0242	0313	0248		
21		-		<u>12</u>	6	0323	0412	0340		
24		-		<u>20</u>	14	0153	0233	0202	X	
24		-		6		0326	0352	0335		
24		-		<u>8</u>	5	0416	0430	0420		
24		-		<u>16</u>	13	0434	0521	0442		
24	<u>28</u>	-		16		0906	0936	0912		
25	40	-	58	96	<u>99</u>	0037	0300	0046	X	
25	15		30	<u>40</u>	22	0432	0553	0440	X	
27		-			7	0204	0236	0214		
27					7	2328	2350	2333		
28			26		<u>34</u>	2120	2230	2132		
29			<u>19</u>	12	12	0050	0200	0122	X	
29			19	24	<u>35</u>	0203	0300	0212	X	
29					6	0319	0345	0325		
29			-		18	1954	2038	2004	X	
30					5	0059	0115	0105		
30					9	0210	0237	0216		

- NOTES (1): The letter E or D attached to a time shows that the pertinent time is earlier or more delayed than the given time, respectively.
- (2): The mark * shows a multi-peak event.
- (3): The mark ** shows a time on the day before the pertinent day.

IONOSPHERIC DATA IN JAPAN FOR APRIL 1970

第 22 卷 第 4 号

1970年7月20日 印 刷
1970年7月25日 發 行

(不許複製非売品)

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