

IONOSPHERIC DATA IN JAPAN

FOR NOVEMBER 1973

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OBSERVATION STATIONS

Ionospheric observations are carried out by means of the ionospheric vertical sounding at the following five observatories in Japan.

	Latitude	Longitude	Site
Wakkanai	45°23.6'N	141°41.1'E	Midori, 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
Yamagawa	31°12.1'N	130°37.1'E	Yamagawa-machi, Ibusuki-gun, Kagoshima-ken
Okinawa	26°19.0'N	127°46.8'E	Chatan-son, Nakagami-gun, Okinawa-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	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.

a. Terminology

f_oF2 f_oF1 f_oE	The ordinary wave critical frequency for the $F2$, $F1$ and E layers, respectively.
f_oE_s	The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.
f_bE_s	The lowest ordinary wave frequency at which the E_s layer begins to become transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.
f -min	The frequency below which no echoes are observed.
$M(3000)F2$	The maximum usable frequency factor for a path of 3000 km for transmission by $F2$ layer.
$M(3000)F1$	The maximum usable frequency factor for a path of 3000 km for transmission by $F1$ layer.
$h'F2$	The minimum virtual height, $h'F2$, refers to the highest, most stable stratification observed in the F region and can only be scaled when such stratification is present.
$h'F$	The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by $h'F$. Thus $h'F$ is identical with the current $h'F2$ when F region stratification is present, e.g., at night, and with the current $h'F1$ when $F1$ stratification is present.
$h'Es$	The lowest virtual height of the trace used to give the f_oEs .
h_pF2	The virtual height of the $F2$ layer measured on the ordinary wave component at a frequency equal to $0.834 f_oF2$.
y_pF2	The semi-thickness of the $F2$ layer deduced from a parabolic fit to the

“nose” of the electron density distribution with height and based on the observed $h'f$ trace. (The difference between $hpF2$ and the virtual height at $0.969 foF2$).

b. 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 <i>Es</i> .
B	Measurement influenced by, or impossible because of, absorption in the vicinity of f -min.
C	Measurement influenced by, or impossible because of, any nonionospheric 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 atmospheric.
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.

c. 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.

d. 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.

e. 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 non-blanketing over part or all of its frequency range. This is distinguished from the usual group retardation (as in the case of an occulting thick *E* layer) by the lack of group retardation in the *F* layer traces at corresponding frequencies and the lack of complete blanketing.

A An *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 $h'Es$. 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.

f. 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 100, 200 and 500 MHz at Hiraiso. Observation equipments are: a 5 meter parabolic reflector with a total-power receiver for 500 MHz and a 10 meter parabolic reflector with two polarimeters for 100 and 200 MHz. Observations are feasible almost from sunrise to sunset.

Time is expressed in hours, minutes and tenths of minutes U.T. and the unit of flux density is $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$ for both components of polarization.

a. 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 mean flux level is counted.

Daily data with bracket mean that observation time does not exceed one third of the period.

b. 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 the nearest minute in general, but to nearest a tenth minute for short intense occurrences of clear commencements. *Date* indicates the day to which *starting time* of event belongs.

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

Type is denoted by the following descriptive 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 wavelength,
- e : sudden beginning of burst with steep rise of intensity,
- E : steep rise of intensity of continuum background,
- pi : post-burst increase,
- ns : noise storm.

Peak intensity is the flux density of each important peak of the occurrence, measured above the pre-burst level.

Mean intensity is the flux density averaged over the duration of burst, measured above the pre-burst level.

Polarization is expressed by polarization degree as follows:

- O : no apparent polarization,
- r or l : right- or left-handed polarization degree less than 0.5,
- R or L : right- or left-handed polarization degree equal to or less than 1,
- s : oscillatory change of polarization degree less than 0.5,
- S : oscillatory change of polarization degree equal to or less than 1.

The following letters may be attached to values in table, if necessary.

- D : greater than,
- E : less than,
- U : uncertain or doubtful, also including a case of partial interruption of observed phenomenon.

C. RADIO PROPAGATION

a. Measurement of H. F. Field Strength

Field strength observation of 15 MHz standard waves transmitted from WWV and WWVH stations which are located respectively at Fort Collins, Colorado and Kauai, Hawaii, is carried out at Hiraiso. In order to avoid interference among the same frequency waves, the upper side-band of WWV or WWVH with the audio tone 600 Hz is picked up by the use of a narrow band pass filter with 80 Hz band width. Particulars of the transmitters and the receiver are summarized in the following tables.

Characteristics	Transmitter		Receiver
	WWV	WWVH	
Station Call	WWV	WWVH	
Location	Fort Collins, Colorado	Kauai, Hawaii	Hiraiso, Ibaraki
latitude	40°41'N	22°00'N	36°22'N
longitude	105°02'W	159°46'W	140°38'E
Distance	9150 km	5910 km	—
Carrier Power	10 kW	10 kW	—
Modulation	50%	50%	—
Antenna	$\lambda/2$ vertical	$\lambda/2$ vertical	4.5 m vertical rod
Bandwidth	—	—	80 Hz for upper side-band
Calibration	—	—	every an hour

The tabulated *field strength* in dB above one microvolt per meter is the peak average of the incident upper side-band field intensity in 45 seconds after the universal time indicated on the

table. Abbreviated symbols are as follows.

CNT	: number of values from which a median has been computed,
MED	: median,
UD	: upper decile, median of the uppermost fifth of values when they are ranked according to magnitude,
LD	: lower decile, median of the lowest fifth of values when they are ranked according to magnitude,
U	: uncertain,
E	: less than,
C	: influenced by, or impossible because of, any non-propagational reasons,
S	: influenced by, or impossible because of, interferences or atmospheric.

b. Radio Propagation Quality Figures

The tabulated six-hourly quality figures are calculated for standard waves WWV transmitted from Fort Collins and standard waves WWVH transmitted from Kauai, respectively. *Quality figures* expressing radio propagation conditions are ranged over five grades as follows

1	: very poor (very disturbed),
2	: poor (disturbed),
3	: rather poor (unstable),
4	: normal,
5	: good.

Whole day quality figure ranged in grades of 1₀, 1+, 2-, 2₀, 2+ 3-, 3₀, 3+, 4-, 4₀, 4+, 5-, 5₀ stands for an average of six-hourly ones of the two circuits. Abbreviated symbols are as follows

C	: artificial accident,
S	: propagational accident,
U	: inaccurate.

Radio propagation conditions which can be described with a code in the following

N	: normal,
U	: unstable,
W	: disturbed

are forecast 12 hours in advance and broadcast twice per an hour from JJY Station.

Data on a *geomagnetic storm* correlated with a radio propagation disturbance are tabulated from observation at Kakioka Magnetic Observatory, Japan Meteorological Agency. *Time* is expressed in hours and minutes U.T. (or tenths of hour), and *range* in gammas. When they are uncertain quantitatively, /'s are replaced with them. Continuation of a geomagnetic storm is denoted by---

c. Sudden Ionospheric Disturbances

(i) SWF

The table of short wave fade-out (SWF) is prepared from the record of field intensities measured at Hiraiso. *Drop-out intensities* of the 10 MHz, the 20 MHz and the 25 MHz waves are distinguished by marks ', " and "' from these of the 15 MHz wave for WWV and WWVH, respectively. Values of *start*, *duration*, *type* and *importance* are obtained from data of the circuit whose drop-out intensity in dB is underlined as _____. When these quantities are not given correctly, they are accompanied by the following symbols.

D	: greater than,
E	: less than,
U	: uncertain or doubtful.

Types of fade-out are as follows

S	: sudden drop-out and gradual recovery,
---	---

SL : slow drop-out taking 5 to 15 minutes and gradual recovery,

G : gradual and irregular in both drop-out and recovery.

Importance of fade-out is scaled according to its amplitude into nine ascending grades as 1-, 1, 1+, 2-, 2, 2+, 3-, 3, 3+.

Correspondence of solar flare, solar radio burst or geomagnetic crochet to SWF is marked by X in accordance with interchange messages of IUWDS and observations at Hiraiso.

(ii) SPA

Data of sudden phase anomaly (SPA) are prepared from the records of phase measurement of VLF radio wave propagation received at Inubo. Characteristics of the VLF radio wave propagation circuits are given on the following table. In the last column, distance of circuit along the great circle is shown.

Name	Transmitter				Distance of circuit (km)
	Location (Geographic Coordinate)	Station Call	Frequency (kHz)	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	10	6100
Aldra	66°25'N 013°09'E	AL0 AL2 AL3	10.2 12.3 13.6	10	7820
North Dakota	46°22'N 098°20'W	ND0 ND2 ND3	10.2 12.85 13.6	10	9150

Phase advance is shown in unit of degree at its maximum stage. No transmission or no reception during the period is indicated by -, and indistinguishable record is spaced out, and multi-peak event is marked by *.

Out of more than two circuits on which the same SPA event is observed, the *phase advance* on the circuit on which the SPA is the most remarkable or distinct is underlined. As for the underlined *phase advance*, *start*, *end* and *maximum* times are obtained.

In the column *remarks*, the event with its corresponding solar X-ray data observed by satellites is shown by X.

In table (i) SWF and (ii) SPA, *date* indicates the day to which *start-time* of event belongs.

The following letters may be attached to the value, if necessary.

D : greater than,

E : less than,

U : uncertain or doubtful.

IONOSPHERIC DATA

NOV. 1973

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	38	35	36	33	33	33	40	61	64	78	87	82	81	78	73	73	68	42	37	35	35	U ₃₀ S	32	32					
2	33	33	34	28	29	30	35	57	77	70	81	81	85	70	69	71	69	50	39	35	39	36	39	37					
3	36	36	38	37	39	34	39	59	70	78	77	83	81	66	81	78	58	45	A	A	37	36	38	38					
4	A	39	40	40	37	35	38	60	71	64	76	90	80	66	65	65	63	37	29	33	31	33	33	34					
5	33	34	37	35	36	35	37	69	61	94	81	76	76	79	70	81	76	49	35	33	40	38	40	43					
6	42	43	36	35	35	35	39	57	67	75	76	91	77	81	76	78	66	50	33	33	31	33	35	37					
7	35	37	38	F	F ₄₀	33	33	54	57	76	83	99	89	57	65	69	56	35	29	31	34	27	33	I ₃₆ A					
8	33	34	34	34	35	32	30	56	68	72	71	78	75	64	62	60	63	36	27	A	28	30	28	30					
9	30	33	33	32	33	40	28	56	57	59	72	77	84	69	60	60	63	33	35	33	31	28	31	32					
10	33	33	33	34	F	F ₄₀	30	51	57	68	70	73	82	65	67	60	56	35	28	28	30	24	28	29					
11	30	32	I ₃₃ C	31	33	31	23	48	57	66	56	77	77	76	73	62	53	35	24	28	A	30	F ₃₀	F ₃₀					
12	F ₃₂	F ₃₃	31	31	31	43	26	45	56	65	61	76	72	62	65	57	51	35	A	33	33	30	29	32					
13	F ₃₃	F ₃₀	27	A	C	33	27	49	63	I ₇₀ C	75	79	A	58	56	A	51	31	A	31	33	33	31	30					
14	33	F ₃₅	F ₃₀	F	F	C	29	C	C	63	78	C	70	59	53	52	48	A	A	A	32	30	30	C					
15	C	33	34	36	40	F	F ₄₃	F ₅₄	58	71	C	C	C	C	C	60	55	42	35	43	40	41	F	F ₄₅					
16	S ₄₇	U ₄₇ S	47	U ₄₈ S	F	F ₄₁	F ₃₆	58	65	63	68	78	63	58	65	62	50	32	34	26	33	26	S ₂₈	S ₂₈					
17	27	31	30	29	30	27	28	53	56	71	76	73	82	65	59	67	54	33	33	31	30	28	31	33					
18	33	33	34	34	32	33	28	50	73	76	J ₈₅ R	100	65	74	78	73	53	33	38	36	36	I ₃₈ S	42	38					
19	38	38	F ₃₀	F ₃₄	33	31	29	53	65	63	74	76	72	61	53	63	46	30	30	33	34	S ₃₄ U ₃₀ F	31	F					
20	31	31	32	S ₃₂	F ₃₀	30	30	54	58	70	61	70	68	65	57	60	45	32	36	30	30	33	30	30					
21	33	33	32	31	33	30	30	53	57	68	62	H ₈₂	75	63	61	64	41	37	38	C	31	I ₃₁ S	32	S ₃₃					
22	34	U ₃₃ S	31	28	F ₂₉	31	33	U ₅₅ S	68	71	U ₉₀ R	73	93	68	78	78	65	48	47	S	F	S	F	F ₄₈					
23	50	48	49	49	50	S ₃₅	F	53	69	72	74	80	70	H ₆₇	60	64	58	32	32	30	34	F ₃₀	F	S					
24	S	F ₃₀	S ₃₆	42	F ₃₆	33	28	48	54	63	68	70	72	72	64	59	52	41	34	S ₃₆	40	40	40	S					
25	38	38	F	F ₃₈	F	S	U ₄₀ S	43	55	56	57	67	61	62	57	54	45	34	F ₃₆	F	A	F	F	F ₃₆					
26	S	F	F ₄₃	F ₄₃	U ₄₆ F	F	23	43	53	71	70	70	61	66	60	61	42	40	30	25	25	25	25	S					
27	S	30	29	32	33	33	37	48	57	62	73	75	73	59	55	58	43	30	31	30	S ₃₅	32	36	35					
28	41	35	33	31	30	26	24	50	60	62	76	66	68	67	57	55	48	32	31	31	S ₃₅	S	F ₃₀	31					
29	33	F ₂₈	30	30	30	S	31	44	58	66	63	79	68	64	64	53	39	30	37	26	A	30	I ₃₄ A	30					
30	S	F ₃₅	F ₃₉	F ₃₇	42	37	S ₃₆	57	60	60	63	72	74	63	59	50	44	33	A	24	32	29	S ₃₁	S					
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	23	29	29	27	25	25	29	29	29	30	29	28	28	29	29	29	30	29	25	24	26	27	26	25					
MED	33	33	34	34	33	33	30	53	60	69	74	77	74	65	64	62	53	35	34	31	33	30	31	33					
UQ	37	36	37	37	37	35	37	57	67	72	78	82	81	69	69	69	63	41	36	33	35	34	35	37					
LQ	33	33	31	31	31	31	28	49	57	63	68	73	69	62	59	59	46	32	30	29	31	30	30	30					

NOV. 1973

FOF2 (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

FOF1 (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											L			L										
2														L										
3														A										
4											L			390										
5											L		L											
6															L									
7											L													
8											A													
9												L	L											
10											L													
11																								
12																								
13																								
14																								
15																								
16																								
17												L												
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
CNT										1	1		4	4										
MED										330	330		385	400										
UQ													395	400										
LQ													375	400										

NOV. 1973

FOF1 (0.01 MHz)

IONOSPHERIC DATA

NOV. 1973

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	A	A	A	A	290	290	285	270	225	S							
2							S	190	230	260	280	A	A	A	A	230	A							
3							S	170	230	260	A	A	A	A	A	A	A							
4								195	230	245	260	R	A	275	250	215	S							
5							S	180	235	245	260	A	A	275	255	205	S							
6							S	190	A	255	270	A	A	A	A	A	A							
7							S	155	220	255	A	A	270	260	245	200	S							
8							E	170	225	A	A	A	280	270	245	200	S							
9							S	205	225	A	A	A	A	260	235	205	S							
10								A	220	250	A	A	290	265	235	200	S							
11								185	235	260	265	270	A	A	A	A	S							
12								S	230	260	245	A	285	A	A	A	S							
13								S	A	C	A	A	A	A	A	A	S							
14								C	C	245	285	260	A	A	A	A								
15								S	230	255	C	C	C	C	C	A	E							
16								S	215	250	250	A	270	260	A	200	S							
17								S	220	250	250	A	285	250	235	A	A							
18								S	225	A	A	A	A	265	250	A	S							
19								S	I A 215	255	290	290	280	270	240	205	S							
20								S	215	260	290	285	A	A	240	A	S							
21								S	215	235	A	A	285	270	240	170	S							
22								S	210	240	250	270	275	260	230	185								
23								S	215	240	250	280	285	R	240	A								
24								S	190	245	260	A	A	A	A	A	A							
25								S	A	A	A	A	A	260	A	S	S							
26								S	200	245	275	290	280	270	225	195	S							
27								S	A	240	260	285	280	265	S	S	S							
28								S	S	235	260	A	R	265	240	S	S							
29								S	190	235	265	285	285	270	245	S	S							
30								S	210	250	275	290	290	270	230	185	S							
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	9	23	24	19	11	15	19	18	14	1							
MED							E	185	220	250	265	285	285	265	240	200	E							
UQ								190	230	255	278	290	285	270	245	205								
LQ								170	215	242	255	280	280	260	235	195								

NOV. 1973

FOE (0.01 MHz)

IONOSPHERIC DATA

NOV. 1973

FOES (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 15	E 16	E	E	21	E 15	E 14	22	37	28	36	28	G	G	G	G	20	21	23	J X 21	E 15	31	E 17	E 15	J X 21																			
2	J X 41	J X 33	J X 23	28	J X 21	18	E 15	22	33	40	37	30	J X 46	J X 61	34	19	G	21	28	22	25	24	J X 53	32	E 14																			
3	E 16	E 13	28	23	E 14	E 13	E 14	G	28	38	43	54	J X 43	J X 40	J X 44	J X 43	J X 33	J X 51	J X 46	J X 53	J X 43	J X 53	J X 28	31																				
4	J X 75	J X 30	J X 23	J X 23	21	22	24	G	G	G	30	G	J X 30	G	G	G	19	E 15	E 15	E 15	E 15	E 15	E 15	E 15																				
5	E 14	E 15	J X 23	J X 21	J X 20	E	E 15	G	G	J X 40	30	36	28	G	G	G	E 16	E 12	E 15	E 13	J X 73	J X 33	E 16	J X 33																				
6	E 15	E	J X 23	J X 25	J X 20	E 15	E 15	G	32	31	34	36	J X 33	J X 40	31	33	J X 32	30	30	26	J X 33	27	28	28																				
7	J X 30	J X 26	31	J X 21	24	E 14	E 15	G	G	30	J X 43	J X 40	G	G	G	G	E 15	20	20	J X 71	J X 30	E 15	J X 21	J X 41																				
8	26	J X 28	17	J X 30	J X 25	22	E	21	G	J X 60	30	29	30	G	G	G	21	E 15	E 15	J X 53	E 16	E 15	J X 23	30																				
9	21	21	21	22	E	E 13	E 15	G	G	26	31	J X 60	J X 38	21	G	G	E 15	E 17	E 16	E 15	E 15	E 16	E 15	E 15																				
10	E 15	E 14	E 15	E	E 15	E 15	E 15	21	G	G	33	29	G	G	G	G	E 15	J X 31	J X 28	J X 25	24	J X 21	24	24																				
11	E 15	E 15	C	E 15	25	E	24	G	28	37	39	36	J X 50	41	51	25	J X 45	J X 43	J X 30	E 16	42	30	J X 23	E 15																				
12	J X 20	24	24	J X 25	E	E 15	E 14	23	G	32	33	J X 41	28	J X 30	31	28	30	E 15	J X 40	E 15	E 16	E 15	25	J X 43																				
13	J X 40	J X 60	J X 25	J X 53	C	26	E 15	E 17	30	C	J X 70	J X 41	J X 90	J X 50	J X 68	J X 83	J X 31	37	J X 37	31	E 16	E 16	E 15	E 15																				
14	E 16	J X 25	33	J X 35	30	C	25	C	C	32	32	G	30	31	27	J X 31	J X 50	J X 51	J X 43	40	E 16	E 16	E 15	C																				
15	C	E	21	20	E 15	E 16	E 15	20	30	40	C	C	C	C	C	J X 25	J X 40	J X 35	38	J X 25	22	18	E 14	E																				
16	E 16	E 14	E 13	E	E	E	E 14	G	G	21	38	31	32	G	G	G	27	23	E 16	24	E 15	E 15	E 16	E 20	E 13	E 16																		
17	E 16	J X 27	E 15	J X 25	28	E 15	E 15	G	26	38	34	J X 31	G	G	G	21	J X 23	E 14	E 16	E 15	21	E 16	E 13	E																				
18	E 15	E 15	E 14	E 15	E 14	E 15	E 15	E 17	G	31	28	41	J X 40	G	G	J X 24	E 14	E	E 15	E 14	E 14	E 16	28	E 15																				
19	25	E 15	28	28	J X 31	J X 30	E 14	23	32	G	G	G	G	G	G	J X 25	J X 33	33	30	J X 24	27	24	28																					
20	E 15	J X 20	J X 31	J X 23	24	26	E 15	E 17	G	G	34	G	35	J X 29	G	25	E 15	E 15	J X 25	E 15	E 15	E 13	25	23																				
21	E	E	20	21	E	E 15	E 16	G	G	33	J X 40	31	G	G	G	20	E 15	E 14	E 13	C	E 14	E 15	E 15	E 15																				
22	E	20	E 14	E 16	E 15	E 14	E 15	G	28	33	38	34	31	30	35	G	E 16	E 15	E 15	E 15	E 15	E 14	26	E 15																				
23	24	E 15	E 15	E 15	23	E 14	E 14	G	26	32	34	G	G	G	G	100	J X 34	J X 23	J X 25	E 15	23	E 16	E 15	E 15																				
24	E 16	29	24	23	E 14	E 15	E 16	G	G	27	37	J X 38	28	28	30	28	25	J X 25	J X 28	J X 24	30	J X 38	J X 28	38																				
25	27	J X 28	E 13	E	E 15	E 14	E 15	21	23	J X 31	28	28	32	G	26	E 20	E 17	E 16	E 18	J X 40	43	E 15	E 15	E 16																				
26	E 16	E 14	26	23	E 14	17	E 17	E 15	24	G	G	G	G	G	G	G	E 15	E 16	E 14	E 15	E 15	E 15	E 15	E 15	S																			
27	S	E	E	E 12	E 14	E 13	E 15	E 15	25	G	G	G	G	G	E 26	E 21	E 15	E 17	E 16	E 15	E 15	E 15	E 15	E 14																				
28	E 15	E 15	E 15	E 15	E	E 15	E 16	E 15	24	G	J X 53	33	G	G	G	E 21	E 15	E 15	E 15	E 14	E 17	E 16	E 15	E 15																				
29	E 15	E 14	E 14	24	E 14	E	E 20	E 17	G	30	G	G	G	G	G	E 21	E 17	E 18	E 17	24	J X 52	E 15	J X 61	E 15																				
30	E 16	30	E 13	J X 24	J X 21	E 14	E 15	E 17	G	G	G	G	G	G	G	G	23	E	J X 36	30	J X 43	E 15	E 15	E 15																				
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	28	30	29	30	29	29	30	29	29	29	29	29	29	29	29	30	30	30	30	29	30	30	30	28																				
MED	E 16	16	21	22	15	E 15	E 15	E 15	23	31	33	31	28	G	G	21	20	18	20	E 16	22	E 16	E 16	E 15																				
UQ	24	J X 27	24	J X 25	23	E 16	E 16	20	28	37	37	36	J X 33	30	30	25	J X 30	J X 30	J X 30	30	31	21	25	28																				
LQ	E 15	E 14	E 14	E 15	E 14	E 14	E 15	G	G	G	30	G	G	G	G	G	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15																				

NOV. 1973

FOES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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 ₁₅	E ₁₆	E	E	E	E ₁₅	E ₁₄	21	25	28	29	25	G	G	G	G	20	E	E	E ₁₅	20	E ₁₇	E ₁₅	E	
2	20	19	E	14	17	E	E ₁₅	G	G	G	G	30	31	37	27	18	18	17	E	E	19	20	E	E ₁₄	
3	E ₁₆	E ₁₃	17	E	E ₁₃	E ₁₃	E ₁₄	G	G	G	40	52	30	40	29	30	27	33	A	A	18	28	19	E	
4	A	17	15	E	E	E	E	G	G	G	G	G	28	G	G	G	G	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
5	E ₁₄	E ₁₅	E	15	12	E	E ₁₅	G	G	G	G	29	28	G	G	G	E ₁₆	E ₁₂	E ₁₅	E ₁₃	20	20	E ₁₆	20	
6	E ₁₅	E	E	17	16	E ₁₅	E ₁₅	G	27	G	G	34	30	30	26	24	24	20	18	E	17	E	19	E	
7	20	20	E	E	E	E ₁₄	E ₁₅	G	G	G	31	31	G	G	G	G	E ₁₅	E	E	20	E	E ₁₅	15	A	
8	19	E	E	14	17	E	E	G	G	50	27	29	22	G	G	G	17	E ₁₅	E ₁₅	A	E ₁₆	E ₁₅	E	18	
9	E	E	E	E	E	E ₁₃	E ₁₅	G	G	25	30	30	30	21	G	G	E ₁₅	E ₁₇	E ₁₆	E ₁₅	E ₁₅	E ₁₆	E ₁₅	E ₁₅	
10	E ₁₅	E ₁₄	E ₁₅	E	E ₁₅	E ₁₅	E ₁₅	19	G	G	30	28	G	G	G	G	E ₁₅	E	20	20	E	18	17	E	
11	E ₁₅	E ₁₅	C	E ₁₅	E	E	E	G	G	G	G	G	35	33	40	23	43	25	E	E ₁₆	A	E	E	E ₁₅	
12	E	E	E	E	E	E ₁₅	E ₁₄	G	G	G	G	34	22	28	28	23	G	E ₁₅	A	E ₁₅	E ₁₆	E ₁₅	E	20	
13	E	17	E	A	C	E	E ₁₅	E ₁₇	28	C	28	29	A	30	40	A	30	27	A	20	E ₁₆	E ₁₆	E ₁₅	E ₁₅	
14	E ₁₆	E	E	E	E	C	E	C	C	G	G	G	27	29	25	27	26	A	A	A	E ₁₆	E ₁₆	E ₁₅	C	
15	C	E	E	E	E ₁₅	E ₁₆	E ₁₅	G	G	G	C	C	C	C	C	C	22	20	34	28	19	E	E	E ₁₄	
16	E ₁₆	E ₁₄	E ₁₃	E	E	E	E ₁₄	G	G	G	G	30	G	G	G	G	E ₁₆	E	E ₁₅	E ₁₅	E ₁₆	E ₂₀	E ₁₃	E ₁₆	
17	E ₁₆	16	E ₁₅	E	17	E ₁₅	E ₁₅	G	G	38	G	28	G	G	G	G	20	17	E ₁₄	E ₁₆	E ₁₅	E	E ₁₆	E ₁₃	
18	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₄	E ₁₅	E ₁₅	E ₁₇	G	28	27	28	29	G	18	22	E ₁₄	E	E ₁₅	E ₁₄	E ₁₄	E ₁₆	E	E ₁₅	
19	E	E ₁₅	E	E	25	20	E ₁₄	17	23	G	G	G	G	G	G	G	22	20	20	20	16	17	E	E	
20	E ₁₅	E	20	E	E	E	E ₁₅	E ₁₇	G	G	G	G	29	22	G	20	E ₁₅	E ₁₅	25	E ₁₅	E ₁₅	E ₁₃	E	E	
21	E	E	E	E	E	E ₁₅	E ₁₆	G	G	G	27	30	G	G	G	G	E ₁₅	E ₁₄	E ₁₃	C	E ₁₄	E ₁₅	E ₁₅	E ₁₅	
22	E	E	E ₁₄	E ₁₆	E ₁₅	E ₁₄	E ₁₅	G	G	G	G	G	G	G	G	G	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E	E ₁₅	
23	E	E ₁₅	E ₁₅	E ₁₅	E	E ₁₄	E ₁₄	G	G	G	G	G	G	G	G	23	22	20	20	E ₁₅	E	E ₁₇	E ₁₅	E ₁₅	
24	E ₁₆	E	E	E	E ₁₄	E ₁₅	E ₁₆	G	G	G	G	28	27	27	28	27	20	24	28	20	20	26	E	E	
25	E	17	E ₁₃	E	E ₁₅	E ₁₄	E ₁₅	G	22	25	27	26	26	G	24	E ₂₀	E ₁₇	E ₁₆	E ₁₈	25	A	E ₁₅	E ₁₅	E ₁₆	
26	E ₁₆	E ₁₄	E	E	E ₁₄	E ₁₇	E ₁₅	G	G	G	G	G	G	G	G	G	E ₁₅	E ₁₆	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	S	
27	S	E	E	E ₁₂	E ₁₄	E ₁₃	E ₁₅	E ₁₅	25	G	21	G	G	G	E ₂₆	E ₂₁	E ₁₅	E ₁₇	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₄	
28	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E	E ₁₅	E ₁₆	E ₁₅	G	G	G	27	G	G	G	E ₂₁	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₇	E ₁₆	E ₁₅	E ₁₅	
29	E ₁₅	E ₁₄	E ₁₄	E	E ₁₄	E	E ₂₀	E ₁₇	G	G	G	G	G	G	G	E ₂₁	E ₁₇	E ₁₈	E ₁₇	E	A	E ₁₅	A	E ₁₅	
30	E ₁₆	E	E ₁₃	E	14	E ₁₄	E ₁₅	E ₁₇	G	G	G	G	G	G	G	G	G	E	A	E	E	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	28	30	29	30	29	29	30	29	29	29	29	29	29	29	29	30	30	30	30	29	30	30	30	28	
MED	E ₁₅	E ₁₄	E	E	E ₁₄	E ₁₄	E ₁₅	G	G	G	G	28	G	G	G	E ₂₀	E ₁₆	E ₁₆	E ₁₆	E ₁₅	E ₁₆	E ₁₆	E ₁₅	E ₁₅	
UQ	E ₁₆	E ₁₅	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₇	G	G	27	30	29	27	26	23	20	20	25	20	18	E ₁₇	E ₁₅	E ₁₅	
LQ	E	E	E	E	E	E	E ₁₄	G	G	G	G	G	G	G	G	G	E ₁₅	E ₁₄	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E	E	

NOV. 1973

FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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 ₁₅	E ₁₆	E	E	E ₁₅	E ₁₅	E ₁₄	15	11	11	15	12	15	15	11	11	E ₁₇	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₇	E ₁₅	
2		E ₁₅	E ₁₄	E ₁₄	E	E	E ₁₅	E ₁₅	15	15	17	13	15	14	12	11	11	13	E ₁₄	E ₁₆	E ₁₇	E ₁₅	E ₁₆	E ₁₄	E ₁₄	
3		E ₁₆	E ₁₃	E ₁₄	E ₁₄	E ₁₄	E ₁₃	E ₁₄	11	11	12	21	16	15	15	11	11	11	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
4		E ₁₅	E	E	E	E	E ₁₄	E ₁₅	15	14	11	12	15	11	12	15	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
5		E ₁₄	E ₁₅	E	E	E	E	E ₁₅	11	13	11	11	15	15	11	11	12	E ₁₆	E ₁₂	E ₁₅	E ₁₃	E ₁₅	E ₁₇	E ₁₆	E ₁₅	
6		E ₁₅	E	E	E	E	E ₁₅	E ₁₅	11	15	11	11	16	11	11	11	E	E	E ₁₅	E ₁₆	E ₁₅	E ₁₄	E ₁₃	E ₁₅	E ₁₃	
7		E	E	E ₁₅	E	E ₁₅	E ₁₄	E ₁₅	E	14	16	17	17	16	17	16	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E	E ₁₅	
8		E ₁₅	E ₁₅	E	E	E	E ₁₄	E	11	16	15	16	19	17	16	15	15	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₆	E ₁₅	E ₁₅	E ₁₅	
9		E ₁₅	E ₁₅	E ₁₅	E ₁₂	E	E ₁₃	E ₁₅	E ₁₅	16	15	16	16	16	17	16	15	E ₁₅	E ₁₇	E ₁₆	E ₁₅	E ₁₅	E ₁₆	E ₁₅	E ₁₅	
10		E ₁₅	E ₁₄	E ₁₅	E	E ₁₅	E ₁₅	E ₁₅	E ₁₅	16	17	18	19	17	17	16	15	E ₁₅	E ₁₆	E ₁₆	E ₁₅	E ₁₉	E ₁₆	E ₁₅	E ₁₅	
11		E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E	E ₁₅	E ₁₆	15	15	15	15	16	17	16	11	E ₁₅	E ₁₅	E ₁₅	E ₁₆	E ₁₆	E ₁₆	E ₁₅	E ₁₅	
12		E ₁₅	E ₁₅	E ₁₄	E ₁₅	E	E ₁₅	E ₁₄	E ₁₆	15	15	17	15	15	15	11	E	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₆	E ₁₅	E ₁₅	E ₁₆	
13		E ₁₅	E ₁₅	E ₁₃	E ₁₅	E	E ₁₅	E ₁₅	E ₁₇	16	C	15	15	14	14	11	11	E ₁₅	E ₁₆	E ₁₅	E ₁₅	E ₁₆	E ₁₆	E ₁₅	E ₁₅	
14		E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₆	E	E ₁₄	C	C	15	16	12	15	15	15	E ₁₅	E ₁₅	E ₁₅	E ₁₆	E ₁₅	E ₁₆	E ₁₆	E ₁₅	C	
15		C	E	E ₁₄	E	E ₁₅	E ₁₆	E ₁₅	E ₁₅	15	14	C	C	C	C	C	15	E	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₆	E	E ₁₄	
16		E ₁₆	E ₁₄	E ₁₃	E	E	E	E ₁₄	E ₁₃	15	14	20	16	16	15	16	16	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₆	E ₂₀	E ₁₃	E ₁₆	
17		E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15	14	16	15	17	15	16	12	E	E ₁₄	E	E ₁₆	E ₁₅	E ₁₆	E ₁₃	E	
18		E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₄	E ₁₅	E ₁₅	E ₁₇	15	15	16	15	15	15	E	E	E ₁₄	E	E ₁₅	E ₁₄	E ₁₄	E ₁₆	E ₁₅	E ₁₅	
19		E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₄	E ₁₅	11	14	17	16	16	14	12	15	E ₁₄	E ₁₃	E ₁₅	E ₁₅	E	E ₁₅	E ₁₅	E ₁₅	
20		E ₁₅	E	E	E ₁₄	E ₁₄	E ₁₆	E ₁₅	E ₁₇	15	11	11	14	14	12	E	E	E ₁₅	E ₁₅	E ₁₃	E ₁₅	E ₁₅	E ₁₅	E ₁₃	E ₁₅	
21		E	E	E	E ₁₄	E	E ₁₅	E ₁₆	E ₁₅	11	11	11	16	15	15	14	14	E ₁₅	E ₁₄	E ₁₃	C	E ₁₄	E ₁₅	E ₁₅	E ₁₅	
22		E	E ₁₄	E ₁₄	E ₁₆	E ₁₅	E ₁₄	E ₁₅	E ₁₅	14	14	15	16	16	17	16	15	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₅	
23		E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₅	14	15	15	15	15	16	15	15	E ₁₅	E	E	E ₁₅	E ₁₅	E ₁₆	E ₁₅	E ₁₅	
24		E ₁₆	E ₁₅	E ₁₅	E ₁₆	E ₁₄	E ₁₅	E ₁₆	E ₁₄	14	15	14	15	16	14	16	15	E	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₆	
25		E ₁₅	E	E ₁₃	E	E ₁₅	E ₁₄	E ₁₅	E ₁₅	14	14	15	17	15	14	12	E ₂₀	E ₁₇	E ₁₆	E ₁₈	E ₁₇	E ₁₄	E ₁₅	E ₁₅	E ₁₆	
26		E ₁₆	E ₁₄	E ₁₅	E	E ₁₄	E	E ₁₇	E ₁₅	14	15	11	11	15	15	15	15	E ₁₅	E ₁₆	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	S	
27		S	E	E	E ₁₂	E ₁₄	E ₁₃	E ₁₅	E ₁₅	15	11	12	18	20	18	E ₂₆	E ₂₁	E ₁₅	E ₁₇	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₄	
28		E ₁₅	E ₁₅	E ₁₅	E ₁₅	E	E ₁₅	E ₁₆	E ₁₅	E ₂₀	18	20	18	17	18	16	E ₂₁	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₇	E ₁₆	E ₁₅	E ₁₅	
29		E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E	E ₂₀	E ₁₇	16	18	17	17	20	19	19	E ₂₁	E ₁₇	E ₁₈	E ₁₇	E	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
30		E ₁₆	E ₁₄	E ₁₃	E ₁₄	E	E ₁₄	E ₁₅	E ₁₇	16	15	19	20	19	14	16	16	E ₁₂	E	E	E ₁₅	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		26	30	29	30	29	29	30	29	29	29	29	29	29	29	29	30	30	30	30	29	30	30	30	28	
MED		E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₅	E ₁₅	15	15	15	16	15	15	15	14	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
UQ		E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15	15	17	17	16	17	16	15	E ₁₅	E ₁₅	E ₁₆	E ₁₅	E ₁₆	E ₁₆	E ₁₅	E ₁₅	
LQ		E ₁₅	E	E	E	E	E ₁₃	E ₁₄	E ₁₅	14	12	13	15	15	14	11	11	E ₁₄	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	

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F-MIN (0.1 MHz)

IONOSPHERIC DATA

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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	290	285	305	295	310	335	325	360	330	345	335	355	340	360	355	335	345	350	330	320	320	U S 305	275	280
2	280	310	325	235	305	310	335	350	350	345	345	350	355	350	360	350	375	350	340	310	310	305	295	295
3	280	300	285	295	320	325	315	370	355	345	350	350	355	320	360	375	360	365	A	A	325	305	305	295
4		290	300	320	330	320	325	365	365	390	370	355	365	365	355	340	355	380	310	305	295	305	305	295
5	280	295	305	310	280	310	310	370	330	360	350	350	355	340	345	345	370	360	345	275	315	300	290	280
6	285	325	330	299	305	295	310	330	365	345	345	365	365	335	355	355	380	360	320	305	310	300	290	295
7	285	295	310	F	F 315	310	325	370	335	350	355	345	380	370	365	370	375	350	300	305	295	295	295	I A 310
8	310	299	295	295	330	355	325	355	345	385	365	370	375	360	370	330	370	360	295	A	325	320	320	280
9	300	295	300	300	305	375	340	385	370	355	360	360	380	375	375	375	350	335	315	320	325	280	295	290
10	305	290	310	295	F	F 375	335	385	350	380	370	340	365	355	375	365	375	345	320	310	335	315	295	285
11	285	295	I C 300	290	335	385	305	355	365	360	340	350	360	370	360	355	360	345	340	305	A	300	F 300	F 310
12	F 285	F 295	290	290	295	370	330	365	345	370	330	355	375	365	355	370	370	360	A	320	335	335	295	S 310
13	F 280	F 300	F 280	A	C	365	335	360	355	I C 350	345	340	A	360	375	A	370	355	A	330	330	310	320	300
14	295	F 285	F 300	F	F	C	345	C	C	335	335	C	375	390	360	365	335	A	A	A	325	325	305	C
15	C	310	295	310	300	F	F 320	F 365	380	375	C	C	C	C	C	365	355	310	315	325	315	315	F 290	F 300
16	S	U S 300	300	U S 315	F	F 315	F 305	380	360	345	360	370	370	335	340	365	360	345	340	340	335	325	295	S 300
17	300	295	300	310	300	345	320	350	355	365	365	365	355	370	370	375	350	325	340	325	315	310	290	295
18	280	290	295	295	295	350	325	350	350	370	J R 340	360	355	340	370	370	355	305	320	280	330	I S 295	300	290
19	315	290	F 300	F 290	305	315	310	365	370	365	350	380	345	375	360	380	365	330	315	335	295	S 325	U F 300	F 305
20	340	315	300	S 305	310	335	315	360	360	370	345	375	340	365	350	355	380	315	340	325	300	335	265	265
21	285	310	295	305	320	315	315	360	340	360	S H 305	360	350	380	325	375	340	340	320	C	305	I S 290	280	S 305
22	295	U S 305	290	285	275	355	305	U S 325	355	350	U R 355	325	365	330	355	360	350	340	315	F	S	F	F	F 270
23	280	300	290	305	330	S 310	F	340	360	335	335	340	380	340	H 350	360	380	345	315	335	325	F 300	F	S
24	S	F 265	S 280	295	F 305	335	285	365	350	335	370	345	345	345	360	360	350	335	335	S 335	315	300	290	S
25	265	280	F	F 270	F	S	U S 275	310	300	320	330	335	345	350	335	365	335	295	F 280	F	A	F	F	F 280
26	S	F	F 290	F 280	U F 305	F	305	330	360	355	355	355	345	355	355	370	345	325	340	345	290	310	280	S
27	S	300	310	290	305	310	320	305	370	355	340	360	385	375	350	330	350	385	320	305	S 295	340	290	285
28	275	285	285	285	315	345	355	360	370	355	360	350	360	390	340	320	360	355	330	355	S 315	S	F 300	290
29	290	F 285	300	300	300	S	350	380	365	380	350	360	375	330	375	360	340	300	345	315	A	310	I A 320	300
30	S	F 315	F 285	F 295	290	340	S 315	350	365	375	360	360	365	350	355	360	320	335	A	315	295	310	S 315	S
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	23	29	29	27	25	25	29	29	29	30	29	28	28	29	29	29	30	29	25	24	26	27	26	25
MED	285	295	300	295	305	335	320	360	355	355	350	355	362	360	355	360	358	345	320	320	315	310	295	295
UQ	298	300	300	305	315	355	330	365	365	370	360	360	375	370	365	370	370	355	340	332	325	318	305	300
LQ	280	290	290	290	300	315	310	350	350	345	340	348	352	340	350	355	350	330	315	305	300	300	290	285

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M(3000)F2 (0.01)

IONOSPHERIC DATA

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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										L			L											
2													L											
3												A												
4											L	390												
5											L	L												
6															L									
7										L			L											
8										A			L											
9											L	L												
10											L		U L											
11												U L												
12													L											
13													L	A										
14													L	L										
15													C	C										
16													L											
17											L													
18													L											
19																								
20													410											
21																								
22																								
23																								
24																								
25										335	395	L												
26																								
27													L											
28													405											
29																								
30																								
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	1		4	4											
MED									335	395		398	405											
UQ												408	410											
LQ												370	400											

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H·F2 (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										235			235											
2													235											
3												240												
4										225	230													
5										250	215													
6													245											
7									245			220												
8								220																
9										245	230 ^L													
10										245	230													
11											250													
12													220											
13												230	A											
14											245	225												
15												C	C											
16												225												
17										225														
18												230												
19																								
20												230												
21																								
22																								
23																								
24																								
25									300	250	260													
26																								
27												230												
28																								
29																								
30																								
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	4	6	11	6	1										
MED									300	240	245	230	228	245										
UQ									248	250	235	235												
LQ									228	225	230	220												

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H·F2 (KM)

IONOSPHERIC DATA

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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	250	255	250	255	250	230	230	210	210	205	220	210	200	210	230	215	210	200	235	250	250	U ^S 250	320	310	
2	320	265	245	250	265	250	225	215	220	225	225	200	215	235	200	225	215	205	225	250	260	300	280	270	
3	300	290	290	275	245	220	210	225	220	225	220	A	225	I ^A 220	235	225	220	235	A	A	255	300	265	300	
4	A	285	260	235	235	230	240	210	220	210	200	200	200	215	225	220	205	200	250	250	250	270	270	290	
5	295	275	250	250	275	250	250	210	215	240	200	210	205	200	230	225	215	200	205	290	260	280	285	295	
6	265	225	220	275	260	250	240	210	215	220	220	230	230	210	225	225	205	205	230	240	255	270	300	265	
7	300	300	250	275	240	230	250	215	210	215	235	245	220	215	200	220	210	210	265	285	300	260	290	I ^A 280	
8	260	290	275	275	240	205	220	210	215	I ^A 220	200	220	220	200	220	225	210	200	265	A	255	260	250	325	
9	290	275	285	260	260	210	225	215	210	200	200	230	225	235	220	215	210	200	250	230	250	250	300	300	
10	260	295	255	250	225	200	225	205	210	210	225	210	225	215	225	220	200	210	275	300	250	295	300	300	
11	300	285	I ^C 260	270	225	200	295	200	210	215	200	215	230	220	A	210	A	245	215	270	A	250	290	290	
12	270	260	270	275	270	200	225	200	210	210	220	240	215	210	225	210	200	210	A	245	230	235	300	295	
13	275	300	290	A	C	220	225	205	210	I ^C 210	215	210	A	225	A	A	205	A	255	A	260	245	250	240	275
14	265	280	290	285	310	C	210	C	C	220	225	215	210	210	220	210	225	A	A	A	250	240	270	C	
15	C	260	260	270	270	245	205	200	210	225	C	C	C	C	C	210	205	A	280	240	230	245	265	250	
16	275	250	260	230	225	215	230	215	220	220	220	220	200	200	235	215	215	205	225	230	220	300	300	300	
17	270	300	295	280	285	225	250	200	205	230	215	205	215	220	225	220	205	200	230	230	245	265	285	275	
18	295	305	265	275	275	215	240	200	220	210	220	200	205	205	225	215	200	220	235	270	220	260	260	270	
19	250	250	265	240	315	255	250	215	205	215	220	220	195	215	210	215	200	250	290	250	250	235	290	275	
20	245	275	300	260	275	245	240	205	210	215	200	200	200	225	215	210	200	230	250	245	260	215	300	310	
21	285	250	245	250	230	235	245	205	210	225	200	215	245	220	205	210	200	210	225	C	260	290	295	275	
22	250	240	265	305	305	200	245	205	210	220	220	240	235	210	230	215	215	200	225	220	240	275	285	275	
23	270	270	250	245	205	215	250	215	215	225	230	195	215	200	205	230	210	205	250	220	230	235	225	300	
24	275	300	305	260	240	230	285	200	205	220	225	200	205	225	215	210	200	225	I ^A 260	250	245	300	240	260	
25	295	300	325	295	275	250	275	245	255	215	230	215	210	250	240	225	225	245	230	250	A	225	245	245	
26	315	280	285	270	240	250	295	220	210	205	200	200	210	230	220	215	200	240	225	240	285	255	305	S	
27	S	260	260	250	250	250	245	220	210	220	210	210	220	210	220	215	200	240	250	250	250	225	275	270	
28	270	290	280	300	245	230	230	225	200	195	215	200	225	225	215	210	200	205	230	225	230	300	300	300	
29	260	275	285	275	275	225	225	200	205	210	220	240	220	220	220	215	205	260	235	250	A	265	I ^A 245	280	
30	280	245	260	275	260	210	220	210	200	210	220	205	230	215	220	200	200	210	A	280	260	255	250	220	
31																									
CNT	27	30	30	29	29	29	30	29	29	30	29	28	28	29	27	29	29	28	25	26	27	30	30	28	
MED	275	275	265	270	260	230	240	210	210	215	220	210	215	215	220	215	205	210	235	250	250	260	285	280	
UQ	295	290	285	275	275	245	250	215	215	220	220	220	225	225	225	220	210	238	250	260	258	280	300	300	
LQ	262	260	255	250	240	215	225	205	210	210	200	200	205	210	215	210	200	202	225	240	242	245	260	270	

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H*F (KM)

IONOSPHERIC DATA

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H^oES (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	S	S	E	E	100	S	S	105	105	105	105	105	100	G	G	100	100	100	100	S	100	S	S	110			
2	105	105	100	100	100	100	S	125	115	110	110	105	100	100	100	100	100	100	105	105	100	105	105	S			
3	S	S	100	100	S	S	S	G	125	110	105	105	100	100	100	100	100	100	105	105	100	105	105	105			
4	110	105	100	100	100	100	100	G	G	G	110	G	100	G	G	G	125	S	S	S	S	S	S	S			
5	S	S	100	100	100	E	S	G	G	115	115	105	105	G	G	G	S	S	S	S	110	105	S	105			
6		E	100	100	100	S	S	G	110	125	115	110	105	100	100	100	100	105	100	100	105	110	105	105			
7	105	100	100	100	100	S	S	G	G	115	105	105	G	G	G	G	S	100	115	105	100	S	105	100			
8	100	100	100	100	100	100	E	135	G	110	110	105	105	G	G	G	105	S	S	105	S	S	100	100			
9	100	100	100	100	E	S	S	G	G	110	110	105	100	100	G	G	S	S	S	S	S	S	S	S			
10	S	S	S	E	S	S	S	100	G	G	110	110	G	G	G	G	S	100	100	100	100	100	100	100			
11	S	S	C	S	105	E	105	G	150	125	110	110	105	105	105	110	105	105	105	S	105	105	105	S			
12	105	105	110	105	E	S	S	150	G	120	110	105	100	100	100	100	100	S	105	S	S	S	105	105			
13	105	105	105	105	C	105	S	S	110	C	105	105	100	100	100	100	100	100	100	100	S	S	S	S			
14	S	100	100	100	100	C	100	C	C	115	115	G	110	105	110	100	100	100	100	100	S	S	S	C			
15	C	E	100	100	S	S	S	145	120	120	C	C	C	C	C	105	100	100	100	100	100	100	S	E			
16	S	S	S	E	E	E	S	G	110	115	110	105	G	G	100	150	S	100	S	S	S	S	S	S			
17	S	100	S	100	100	S	S	G	145	115	110	105	G	G	G	100	100	S	S	S	100	S	S	E			
18	S	S	S	S	S	S	S	S	G	110	110	105	100	G	100	100	S	E	S	S	S	S	110	S			
19	100	S	100	100	100	100	S	100	110	G	G	G	G	G	G	G	100	100	100	100	100	100	100	100			
20	S	105	100	100	100	100	S	S	G	G	120	G	110	105	G	100	S	S	110	S	S	S	100	100			
21	E	E	100	100	E	S	S	G	G	115	105	105	G	G	G	125	S	S	S	C	S	S	S	S			
22	E	100	S	S	S	S	S	G	145	115	115	115	125	135	120	G	S	S	S	S	S	S	115	S			
23	100	S	S	S	110	S	S	G	150	115	110	G	G	G	G	23	105	100	100	S	100	S	S	S			
24	S	105	105	105	S	S	S	G	G	145	120	110	110	110	110	110	105	105	105	105	105	105	100	100			
25	105	100	S	E	S	S	S	150	110	110	105	110	105	G	105	S	S	S	S	100	100	S	S	S			
26	S	S	100	100	S	105	S	S	125	G	G	G	G	G	G	G	S	S	S	S	S	S	S	S			
27	S	E	E	S	S	S	S	S	100	G	100	G	G	G	S	S	S	S	S	S	S	S	S	S			
28	S	S	S	S	E	S	S	S	120	G	110	100	G	G	G	S	S	S	S	S	S	S	S	S			
29	S	S	S	100	S	E	S	S	G	160	G	G	G	G	G	S	S	S	S	105	110	S	100	S			
30	S	100	S	100	100	S	S	S	G	G	G	G	G	G	G	G	145	E	110	105	105	S	S	S			
31																											
CNT	10	14	17	20	14	7	3	8	16	21	25	20	17	11	12	16	16	14	16	14	16	9	14	11			
MED	105	100	100	100	100	100	100	130	118	115	110	105	105	100	100	100	100	100	100	102	100	100	105	100			
UQ	105	105	100	100	100	102	102	148	135	120	110	110	105	105	108	108	105	100	105	105	105	105	105	105			
LQ	100	100	100	100	100	100	100	102	110	110	105	105	100	100	100	100	100	100	100	100	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. + 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					F1			L1	L1	L1	L1	L1	L1			L1	L1	F1	F1		F1			F1		
2	F2	F3	F3	F2	F2	F1		C1	C2	C1	C2	L2	L2	L2	L1	L1	L1	F1	F1	F2	F1	F2	F1			
3			F2	F1					C1	C1	L1	L2	L2	L2	L1	L3	L3	F2	F3	F3	F2	F2	F2	F2		
4	F3	F2	F2	F2	F1	F1	F1				C1		L2				C1									
5			F1	F2	F2					C1	C1	L2	L1									F2	F2		F2	
6			F1	F2	F2				L1	C1	C1	C3	L2	L2	L2	L2	L3	F2	F2	F1	F2	F1	F2	F2		
7	F2	F3	F2	F1	F1					C1	L1	L2						F1	F1	F2	F1		F1	F6		
8	F1	F1	F1	F2	F1	F1		H1		L2	L1	L1	L1				L1			F2			F2	F1		
9	F1	F1	F1	F1						L1	L1	L1	L1	L1												
10								L1			L1	L1								F1	F1	F1	F1	F1		
11					F1		F1		H1	C1	C1	C1	L2	L2	L3	L2	L3	F3	F1		F2	F1	F1			
12	F1	F1	F1	F2				H1		C1	C1	L2	L1	L2	L1	L2	L1		F4				F1	F2		
13	F1	F2	F2	F3		F1			L2		L1	L2	L4	L2	L2	L3	L2	F3	F1	F1						
14		F1	F2	F2	F3		F1			C1	C1		L1	L2	L1	L2	F2	F2	F1	F1						
15			F1	F1				H1	C1	C1						L1	L1	F4	F4	F2	F1	F1				
16									L1	C2	C2	L1			L1	H1		F1								
17		F1		F2	F1				H1	C2	C2	L2					L1					F1				
18										L1	L1	L2	L1		L1	L3								F1		
19	F1		F2	F2	F4	F2		L1	L1								L3	F2	F2	F1	F2	F1	F1	F1		
20		F1	F2	F1	F1	F1					C1		L1	L2		L1			F4				F2	F1		
21			F1	F1						C2	L2	L1				C1										
22		F1							H1	C1	C2	C1	C1	H1	C1									F1		
23	F1				F1				H1	C1	C1					L1	F2	F2	F3		F1					
24		F2	F1	F1						H1	C1	L1	L1	L1	L1	L1	L2	F2	F3	F2	F2	F1	F2			
25	F1	F2						H1	L1	L1	L1	L1	L1		L1					F1	F1					
26			F1	F1		F2			C1																	
27									L1		L1															
28									C1		L1	L1														
29				F1						H1											F1	F1		F1		
30		F1		F2	F2												H1		F2	F1	F1					
31																										
CNT																										
MED																										
UQ																										
LQ																										

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TYPES OF ES

IONOSPHERIC DATA

NOV. 1973

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	40	38	37	33	38	33	42	77	71	94	88	94	92	91 ^H	88	85	72	52	34	36	38	33	33	34
2	33	37	31	31	27	30	40	67	72	91	79	80	92	87	82 ^H	77	79	52	35	36	38	40	39	I _A 40
3	36	35	39	38	39	35	43	60	82	I _R 84	84	96	89	82	73	72	69	48	33	36	39	38	39	38
4	38	38	39	42	40	33	42	69	83	85	74	69	81	84	69	64	64	52	I _A 34	32	35	32	35	35
5	34	35	37	36	32	33	37	71	64	94	101	83	86	76	84	84	92	49	I _A 31	I _A 32	38	37	37	37
6	40	42	39	35	37	33	39	77	68	65	91	89	91	81	89	89	78	47	33	34	36	31	33	35
7	34	35	35	33	34	33	39	59	68	65	94	92	106	78	61	73	64	42	31	32	36	34	30	I _A 36
8	34	36	37	36	44	32	32	65	76	77	69	78	82	80	69	68	63	46	26	I _A 31	32	29	31	32
9	32	33	34	34	36	42	29	49	62	66	66	76	82	81	68	66	61	48	32	35	34	30	30	32
10	34	34	36	36	37	32	32	54	61	63	64	72	91	79	78	71	58	38	31	27	31	30	28	31
11	31	30	32	34	32	23	28	54	59	71	69	72	75	82	78	69	60	38	A	A	32	29	F 30	F 30
12	F 34	32	32	32	34	37	28	47	55	71	68	71	86	71	68	69	59	36	A	A	31	28	27	30
13	F 30	30	31	32	32	31	32	57	67	82	82	78	68	62	64	58	55	41	28	31	31	32	33	31
14	32	33	33	31	32	34	33	52	61	65	72	87	82	68	58	58	48	48	34	32	31	33	I _A 29	32
15	32	33	35	35	34	34	36	58	65	65	80	82	86	68	67	76	49	37	34	35	36	33	32	34
16	35	38	36	36	36	29	33	58	72	74	71	66	67	65 ^H	68	68	58	42	28	33	33	30	29	30
17	33	30	33	32	32	30	33	59	66	67	89	88	69	85	78	63	59	I _A 45	I _A 38	37	39	29	31	33
18	33	31	36	33	35	35	31	65	64	Z 79	73	86	81	83	75	74	56	39	35	37	40	29	I _A 32	35
19	35	F 34	35	34	34	34	36	57	66	69	69	77	76	69	75	64	55	42	28	36	34	33	31	29
20	34	34	34	34	33	31	33	55	65	73	65	64	71	67	66	61	56	37	33	35	36	34	32	33
21	33	33	34	32	32	27	32	63	65	66	69	68	68	76	67	59	57	37	39	38	30	F 32	F 32	F
22	35	34	30	33	F 33	39	31	I _R 56	75	67	94	88	98	82	77	79	66	49	48	48	43	F	F	F
23	F 47	F 47	F	56	44	F	F	61	65	65	87	81	83	88	72	59	69	45	35	29	25	26	F 27	F
24	29	29	30	31	35	29	34	58	57	64	73	79	74	76	79	65	56	38	39	I _R 38	29	F	F	F
25	F	F 33	31	F 31	F	39	28	65	62	86	71	89	76	74	69	63	59	44	54	55	35	41	F	44
26	F	F	F	53	54	32	31	54	76	71	94	78	71	66	74	64	58	39	36	37	I _R 26	28	27	30
27	29	31	32	32	28	27	30	59	73	62 ^H	72	85	72	69	56 ^H	55	50 ^H	42	28	32	34	36	28	31
28	30	31	32	30	32	28	29	58	74	74	68	82	70	73 ^H	65	62 ^H	56	34	29	27	29	30	27	28
29	31	32	32	31	32	F	26	58	58	59	65	76	79	72	64	65	55	34	33	36	29	30	29	32
30	32	F 30	30	32	35	F 34	34	66	65	62	65	79	72	74	69	57	45 ^H	44	41	27	30	I _A 30	32	F
31																								
CNT	28	29	28	30	29	28	29	30	30	30	30	30	30	30	30	30	30	30	28	28	30	27	27	25
MED	34	33	34	33	34	33	33	58	66	70	72	80	81	76	69	66	58	42	34	35	34	31	31	32
UQ	35	35	36	36	37	34	36	65	72	79	87	87	86	82	78	73	64	48	36	36	36	34	32	35
LQ	32	31	32	32	32	30	31	56	62	65	69	76	72	69	67	62	56	38	31	32	31	30	29	31

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FOF2 (0.1 MHz)

IONOSPHERIC DATA

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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									L	L	U L 410	L	L	L										
2									U L 400	L	L	U L 410	L	L	L									
3										L	I A 390	L	L	L										
4									L	U L 400	U L 420	I A 400	L	L	L									
5									L	L	L	U L 420	U L 430	L	L									
6										L	L	A	390	410	L									
7										L	430	L	410	L	L									
8										L	370	420	L	L	L									
9										350	L	L	L	L	L									
10										L	L	380	L	L	L	L								
11										L	L	420	410	420	L	L								
12										L	L	450	L	U L 400	L									
13										U L 400	400	420	400	H	L	L								
14									L	L	U L 410	410	L	L	L									
15											L	410	L	L	L									
16										L	L	H 500	L	380	L									
17										L	A	L	U L 400	L	L									
18										L	L	L	370	400										
19										U L 360	L	L	400	L	L									
20											L	410	L	U L 370	L									
21											L	400	L	L	L									
22											U L 460	L	L	A	400									
23										L	L	L	U L 410	A	L									
24											L	L	U L 420	L	L									
25										L	H 470	410	390	L	350									
26									L	360	400	410	L	L	L									
27										L	360	L	L	L	L									
28									L	L	L	L	L	L	H 490									
29											L	L	L	L	L									
30										L	L	H 410	L	400										
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	6	11	17	11	9	2									
MED									U L 400	U L 380	U L 410	410	400	400	420									
UQ									U L 400	L	L	420	410	400										
LQ									360	395	410	395	400											

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FOF1 (0.01 MHz)

IONOSPHERIC DATA

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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	215	I A 260	I A 285	300	310	315	310	290	255	A	S						
2							S	A	255	A	A	A	310	305	A	A	A	S						
3							S	200	260	280	305	A	A	A	I A 290	250	A	S						
4							S	A	255	280	A	A	A	290	275	245	A	S						
5							S	A	255	290	300	310	A	A	A	A	A	S						
6							S	180	245	I A 280	295	A	A	A	A	A	A	S						
7							S	190	A	A	A	300	315	305	275	240	A	S						
8							S	200	A	A	A	A	A	A	A	A	A	S						
9							S	B	250	275	285	I A 295	300	A	A	A	A	S						
10							S	200	240	275	I A 285	A	A	I A 300	285	250	B	S						
11							S	A	245	275	285	I A 300	300	A	A	A	A	S						
12								200	240	275	285	I A 300	305	300	A	A	A							
13								I A 195	I A 245	I A 275	295	300	305	R 300	270	240	190							
14								200	245	275	I A 290	300	I A 310	300	275	235	175							
15								195	255	280	290	300	305	300	I A 270	A	A							
16								A	255	A	A	295	300	I A 300	275	245	A							
17								200	250	275	A	A	A	A	280	235	A							
18								A	A	I A 265	290	295	300	300	280	235	B							
19								180	A	A	290	I A 300	305	295	255	230	A							
20								A	245	280	A	A	A	300	280	245	B							
21								I A 190	250	275	I A 290	A	A	A	285	245	B							
22								170	235	275	285	295	I A 295	285	270	230	B							
23								180	240	275	280	A	A	A	A	A	A							
24								185	240	275	285	295	A	A	A	A	A							
25								195	240	A	A	I A 290	295	290	270	230	175							
26								B	235	280	290	300	R 300	290	275	230	B							
27								B	240	270	285	290	295	295	270	230	B							
28								B	240	I A 270	I A 290	I A 300	305	295	275	215	B							
29								A	225	275	280	290	300	I A 300	275	235	175							
30								B	225	275	285	295	300	300	285	I A 245	175							
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								17	26	24	22	20	19	20	21	20	5							
MED								195	245	275	290	300	300	300	275	238	175							
UQ								200	255	280	290	300	305	300	280	245	175							
LQ								185	240	275	285	295	300	295	270	230	175							

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FOE (0.01 MHz)

IONOSPHERIC DATA

NOV. 1973

FOES (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	JX 20	JX 18	ES 14	JX 19	ES 14	ES 14	ES 14	G	30	JX 44	JX 32	JX 30	G	G	G	G	23	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	
2	ES 14	JX 19	JX 20	ES 14	M 19	ES 14	ES 14	25	29	34	JX 39	JX 44	JG 26	JG 29	JX 36	JX 30	JX 29	JX 28	JX 25	JX 23	JX 22	JX 25	JX 20	JX 86	
3	ES 14	JX 51	JX 24	ES 14	ES 14	M 18	ES 14	G	29	39	44	JX 48	JX 32	JX 40	JX 34	JX 29	JX 34	JX 29	JX 20	JX 22	JX 29	JX 29	JX 32	JX 44	
4	JX 35	JX 39	JX 50	JX 31	JX 18	JX 28	JX 29	JX 30	JG 24	32	35	JX 54	JX 109	JG 29	35	63	JX 38	JX 31	JX 74	JX 34	JX 37	JX 25	JX 20	JX 19	
5	JX 18	JX 18	ES 14	ES 13	E	ES 14	ES 13	25	28	32	34	JX 35	JX 46	JX 44	JX 37	29	JX 29	JX 28	JX 44	JX 37	JX 26	JX 29	21	JX 27	
6	JX 38	JX 21	M 20	M 21	M 21	ES 14	ES 14	23	JX 44	JX 40	JX 44	JX 59	JX 54	JX 64	JX 43	JX 34	JX 25	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	
7	ES 14	JX 39	JX 29	JX 26	JX 20	ES 14	ES 14	G	29	45	JX 38	G	JX 39	JX 33	JG 26	JG 19	JX 19	JX 26	ES 14	ES 14	JX 21	JX 24	JX 26	JX 43	
8	JX 34	JX 27	JX 40	JX 30	JX 29	JX 18	JX 18	G	34	34	JX 35	JX 65	JX 39	JX 34	JX 34	JX 28	24	JX 40	JX 19	JX 38	JX 26	JX 24	JX 22	JX 29	
9	JX 23	JX 20	JX 24	M 20	ES 14	ES 14	ES 14	EB 23	G	G	JX 29	JX 39	JX 31	JX 46	JX 40	JX 64	JX 38	JX 29	JX 20	M 20	ES 14	JX 21	ES 14	JX 20	
10	JX 19	JX 20	ES 14	ES 14	ES 14	ES 14	ES 14	G	G	G	35	JX 38	JX 42	JX 54	G	G	EB 19	JX 18	ES 14	JX 20	JX 32	JX 24	ES 14	JX 18	
11	JX 24	JX 26	JX 20	JX 27	JX 19	JX 20	JX 18	23	26	G	37	JX 31	JG 29	JX 32	JX 29	JX 27	27	JX 36	JX 39	JX 65	JX 25	JX 20	ES 14	ES 14	
12	ES 14	ES 15	ES 14	M 20	ES 14	JX 26	JX 26	G	29	30	32	34	35	JX 34	32	JX 46	JX 46	JX 35	JX 76	JX 35	ES 15	EB 18	JX 26	JX 25	
13	ES 14	JX 26	JX 20	JX 27	JX 29	ES 14	ES 14	22	26	JX 29	G	G	G	G	G	G	G	21	M 18	JX 27	JX 19	22	ES 14	ES 14	
14	ES 14	ES 14	JX 28	JX 19	ES 14	ES 14	ES 14	G	G	30	32	G	JX 34	G	G	G	G	M 21	ES 14	M 22	ES 14	JX 18	JX 32	ES 14	
15	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	G	29	JX 38	34	G	G	G	JX 27	JX 21	JX 24	M 21	EB 20	ES 14	ES 14	ES 14	ES 14	ES 14	
16	ES 14	JX 20	M 20	ES 14	M 21	ES 14	ES 14	24	29	JX 38	JX 43	G	G	JX 38	G	JX 25	JX 23	JX 26	JX 25	JX 18	ES 14	ES 14	ES 14	ES 14	
17	ES 14	ES 14	ES 14	ES 14	JX 20	JX 18	ES 14	G	27	33	JX 65	JX 60	JX 58	JX 53	G	JX 36	JX 34	JX 47	JX 29	EB 17	ES 14	JX 47	JX 29	ES 14	
18	ES 14	ES 14	JX 18	JX 26	ES 14	ES 14	ES 14	20	32	JX 39	G	G	G	G	G	G	EB 19	ES 14	ES 14	EB 19	JX 41	JX 34	44	ES 14	
19	M 21	ES 14	ES 14	ES 14	E	ES 14	ES 14	G	28	32	JX 30	JX 42	G	G	G	33	JX 21	ES 14	ES 14	JX 19	ES 14	ES 14	ES 14	ES 14	
20	ES 14	ES 14	ES 14	JX 29	JX 21	JX 26	JX 27	JX 19	G	G	31	JX 40	JX 33	G	G	G	EB 19	ES 14	ES 14	ES 14	JX 18	JX 18	ES 14	EB 20	
21	JX 18	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	24	28	G	32	32	31	33	30	G	EB 19	ES 14	E	ES 14	EB 19	ES 14	ES 14	ES 14	
22	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	G	G	33	41	35	JX 57	33	30	G	EB 18	JX 19	JX 20	JX 24	ES 14	M 21	JX 21	ES 14	
23	ES 14	ES 18	ES 14	ES 14	ES 14	ES 14	ES 14	G	G	JX 30	JX 48	JX 49	JX 37	JX 68	JX 40	JX 38	JX 24	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	
24	ES 14	ES 14	ES 14	M 20	M 20	ES 14	ES 14	G	G	G	G	JX 47	JX 74	33	35	JX 54	JX 48	JX 38	JX 36	JX 34	JX 18	JX 19	JX 38	JX 31	
25	ES 14	ES 14	JX 20	ES 14	ES 14	ES 14	ES 14	G	JX 28	29	31	JX 35	JX 35	G	G	G	JX 20	ES 14	ES 14	ES 14	JX 22	ES 14	JX 20	JX 47	
26	JX 44	JX 48	JX 28	M 20	M 20	JX 18	ES 14	EB 19	G	G	G	G	G	G	G	G	EB 18	ES 14	ES 14	ES 14	M 23	JX 20	M 21	JX 18	
27	JX 20	JX 18	ES 14	ES 14	E	ES 14	ES 14	EB 21	G	G	G	G	33	G	G	G	EB 19	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	
28	JX 29	JX 29	JX 21	ES 14	ES 14	ES 14	ES 14	EB 19	G	JX 42	JX 30	JX 31	JX 45	G	G	G	EB 18	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	
29	ES 14	E	ES 14	ES 14	JX 20	ES 14	JX 19	21	G	G	35	35	G	33	31	G	G	ES 14	JX 24	JX 21	JX 25	ES 14	M 22	JX 46	
30	JX 24	ES 14	JX 19	JX 24	ES 14	ES 14	ES 14	EB 22	G	G	31	G	G	G	G	JX 27	JX 19	JX 20	ES 14	ES 14	JX 39	JX 55	JX 29	JX 30	
31																									
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	ES 14	JX 18	18	16	14	ES 14	ES 14	ES 19	26	31	33	JX 35	JX 33	32	28	26	21	JX 20	18	20	18	JX 20	20	ES 16	
UQ	JX 23	JX 26	JX 21	JX 24	JX 20	18	ES 14	23	29	38	38	44	42	38	35	33	JX 29	JX 29	JX 25	JX 24	JX 25	JX 24	JX 26	JX 29	
LQ	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	G	G	G	30	G	G	G	G	G	EB 19	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	ES 14	

NOV. 1973

FOES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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	E	E S ₁₄	E	E S ₁₄	E S ₁₄	E S ₁₄	G	28	31	27	G ₂₈	G	G	G	G	22	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	
2	E S ₁₄	E	16	E S ₁₄	E	E S ₁₄	E S ₁₄	24	28	31	33	36	G ₂₅	G ₂₇	31	28	26	25	20	20	18	20	E	A	
3	E S ₁₄	26	E	E S ₁₄	E S ₁₄	E	E S ₁₄	G	29	34	43	38	32	33	30	20	24	18	E	20	20	18	29	E	
4	21	24	31	27	18	19	25	26	G ₂₀	30	33	52	35	G ₂₅	32	31	28	E	A	23	30	18	E	E	
5	E	E	E S ₁₄	E S ₁₃	E	E S ₁₄	E S ₁₃	24	28	30	33	26	34	36	29	28	25	27	A	A	23	19	E	E	
6	24	E	E	E	E	E S ₁₄	E S ₁₄	23	28	34	42	54	33	31	30	25	20	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	
7	E S ₁₄	19	18	E	E	E S ₁₄	E S ₁₄	G	28	32	31	G	28	26	G ₂₁	G ₁₈	18	E	E S ₁₄	E S ₁₄	18	21	18	A	
8	E	20	23	19	18	E	E	G	31	29	33	31	36	32	31	28	23	28	17	A	22	17	19	18	
9	20	18	18	E	E S ₁₄	E S ₁₄	E S ₁₄	E H ₂₃	G	G	26	31	26	31	29	30	28	18	18	E	E S ₁₄	E	E S ₁₄	E	
10	E	E	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	G	G	G	34	37	34	33	G	G	E B ₁₉	E	E S ₁₄	E	24	19	E S ₁₄	E	
11	E	22	17	18	16	E	E	23	26	G	32	31	G ₂₉	32	29	24	24	20	A	A	17	E	E S ₁₄	E S ₁₄	
12	E S ₁₄	E S ₁₅	E S ₁₄	E	E S ₁₄	21	E	G	29	30	32	32	32	31	32	37	20	30	A	A	E S ₁₅	E B ₁₈	18	16	
13	E S ₁₄	E	E	E	17	E S ₁₄	E S ₁₄	20	26	29	G	25	G	G	G	G	G	E	E	24	E	20	E S ₁₄	E S ₁₄	
14	E S ₁₄	E S ₁₄	E	E	E S ₁₄	E S ₁₄	E S ₁₄	G	G	29	31	G	32	G	G	G	G	E	E S ₁₄	E	E S ₁₄	18	A	E S ₁₄	
15	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	G	28	36	33	G	G	G ₂₃	32	27	20	19	E	E B ₂₀	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	
16	E S ₁₄	18	E	E S ₁₄	E	E S ₁₄	E S ₁₄	24	28	32	32	G	G	34	G	22	20	23	23	E	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	
17	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	17	16	E S ₁₄	G	27	32	55	38	31	38	G	25	25	A	A	E B ₁₇	E S ₁₄	18	E	E S ₁₄	
18	E S ₁₄	E S ₁₄	E	E	E S ₁₄	E S ₁₄	E S ₁₄	20	31	33	G	G	G	G	G	G	E B ₁₉	E S ₁₄	E S ₁₄	E B ₁₉	20	24	A	E S ₁₄	
19	E	E S ₁₄	E S ₁₄	E S ₁₄	E	E S ₁₄	E S ₁₄	G	27	28	28	35	G	G	G	27	20	E S ₁₄	E S ₁₄	18	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	
20	E S ₁₄	E S ₁₄	E S ₁₄	E	16	18	24	19	G	G	31	34	32	G	G	G	E B ₁₉	E S ₁₄	E S ₁₄	E S ₁₄	E	E	E S ₁₄	E B ₂₀	
21	E	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	22	28	G	31	32	31	33	30	G	E B ₁₉	E S ₁₄	E	E S ₁₄	E B ₁₉	E S ₁₄	E S ₁₄	E S ₁₄	
22	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	G	G	32	36	33	56	32	30	G	E B ₁₈	18	20	21	E S ₁₄	E	E	E S ₁₄	
23	E S ₁₄	E	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	G	G	G	37	39	35	57	37	31	21	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	
24	E S ₁₄	E S ₁₄	E S ₁₄	E	E	E S ₁₄	E S ₁₄	G	G	G	G	40	32	31	33	36	32	18	28	30	E	E	18	24	
25	E S ₁₄	E S ₁₄	E	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	G	21	29	29	34	25	G	G	G	15	E S ₁₄	E S ₁₄	E S ₁₄	22	E S ₁₄	18	32	
26	32	18	18	E	E	E S ₁₄	E B ₁₉	G	G	G	G	G	G	G	G	G	E B ₁₈	E S ₁₄	E S ₁₄	E S ₁₄	18	18	E	E	
27	E	E	E S ₁₄	E S ₁₄	E	E S ₁₄	E S ₁₄	E B ₂₁	G	G	G	G	33	G	G	G	E B ₁₉	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	
28	E	18	E	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E B ₁₉	G	29	30	30	35	G	G	G	E B ₁₈	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E B ₁₈	E S ₁₄	
29	E S ₁₄	E	E S ₁₄	E S ₁₄	E	E S ₁₄	E	21	G	G	34	34	G	33	29	G	G	E S ₁₄	20	E	E	E S ₁₄	E	E	
30	E	E S ₁₄	E	E	E S ₁₄	E S ₁₄	E S ₁₄	E B ₂₂	G	G	31	G	G	G	G	26	26	G	E	E	E S ₁₄	E	A	18	17
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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E S ₁₄	E S ₁₄	14	14	14	E S ₁₄	E S ₁₄	E G ₁₉	26	29	32	32	31	29	28	21	20	14	14	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	
UQ	E S ₁₄	18	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	22	28	32	33	36	33	33	30	28	24	19	20	21	19	18	18	E S ₁₆	
LQ	E	E	E	E	E	E S ₁₄	E S ₁₄	G	G	G	28	G	G	G	G	G	E B ₁₈	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	E S ₁₄	

The Radio Research Laboratories, Japan

NOV. 1973

FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	15	15	18	15	15	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
2	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	14	16	16	17	15	16	14	14	14	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₃																									
3	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	14	21	17	16	13	15	15	14	E ₁₄	E ₁₄	E ₁₃	E ₁₃	E ₁₄	E ₁₄	E ₁₄																									
4	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₃	E ₁₃	15	14	15	15	15	14	14	15	15	15	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
5	E ₁₄	E ₁₄	E ₁₄	E ₁₃	E ₁₄	E ₁₄	E ₁₃	14	14	14	16	15	15	16	14	14	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
6	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	14	15	18	15	18	15	15	E	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
7	E ₁₄	E ₁₃	E ₁₄	E ₁₃	E ₁₄	E ₁₄	E ₁₄	15	16	15	17	17	17	17	14	15	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
8	E ₁₄	E ₁₃	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	17	18	17	17	16	14	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₃	E ₁₄																									
9	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	23	15	16	17	15	15	15	15	14	13	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
10	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	15	18	17	15	15	15	19	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
11	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	16	17	15	15	15	13	13	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
12	E ₁₄	E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	14	14	15	15	15	15	14	15	13	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₅	18	E ₁₄																									
13	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	14	14	17	16	14	15	15	15	15	17	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E	19	E ₁₄																									
14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	18	18	18	16	15	16	15	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
15	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	14	17	17	16	15	14	14	14	E ₁₄	E ₁₄	E ₁₄	20	E ₁₄	E ₁₄	E ₁₄																									
16	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	16	15	16	17	15	18	17	15	14	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
17	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	16	16	16	15	17	15	14	19	14	14	E ₁₄	E ₁₄	E ₁₄	17	E ₁₄	E ₁₄	E ₁₄																									
18	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	14	16	17	18	18	15	17	15	15	19	E ₁₄	E ₁₄	E ₁₄	19	E ₁₄	E ₁₄	E ₁₄																									
19	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	14	16	15	17	17	15	14	15	15	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
20	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	16	15	15	17	15	15	19	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	20																									
21	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	14	17	17	19	14	14	15	19	E ₁₄	E ₁₄	E ₁₄	E ₁₄	19	E ₁₄	E ₁₄																									
22	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	14	18	17	17	15	15	15	16	15	18	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
23	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	17	17	18	17	15	15	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
24	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	16	17	18	18	19	18	15	15	16	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
25	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	16	18	15	17	16	15	15	15	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
26	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	19	16	15	16	18	18	17	18	17	18	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
27	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	21	17	16	16	15	17	15	15	18	19	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
28	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	19	15	16	18	15	16	16	15	15	18	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	18	E ₁₄																									
29	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	17	20	17	19	17	17	16	15	15	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
30	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	22	16	16	18	15	16	16	15	15	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30																									
MED	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	17	16	16	16	15	15	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
UQ	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	16	16	18	17	17	17	15	15	18	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									
LQ	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	15	15	15	16	15	15	15	15	14	14	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄																									

NOV. 1973

F-MIN (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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	295	300	310	295	300	300	320	340	325	345	320	330	335	310 ^H	330	350	350	345	300	310	310	305	290	270
2	285	320	310	300	295	305	330	335	335	365	335	345	330	335	320 ^H	330	345	340	315	305	290	300	285	290 ^{I A}
3	290	285	290	290	300	295	325	335	345	340 ^{I R}	345	340	330	335	325	340	350	330	320	300	310	310	280	280
4	290	290	290	310	325	285	320	335	340	345	340	350	330	330	340	340	340	350	300 ^{I A}	295	295	280	290	
5	285	285	300	315	295	295	315	330	335	330	345	315	335	330	335	335	350	370	305 ^{I A}	295 ^{I A}	285	300	285	290
6	295	320	335	305	310	290	300	350	345	350	350	330	340	320	330	345	350	355	305	305	305	290	295	305
7	295	295	300	295	305	305	315	335	340	320	325	330	340	345	345	350	350	335	315	305	290	330	285	290 ^{I A}
8	305	290	300	305	315	335	315	340	340	355	360	325	330	330	335	355	350	330	305	315 ^{I A}	305	310	295	295
9	295	295	295	310	305	335	335	355	345	340	325	320	325	345	350	350	350	335	315	310	330	300	280	290
10	300	290	305	300	320	330	320	345	350	335	335	340	335	345	350	360	350	345	315	295	305	310	285	285
11	270	290	295	325	335	295	300	350	350	350	350	340	340	330	335	335	350	325	A	A	325	310	325 ^F	300 ^F
12	295 ^F	290	295	290	310	340	305	340	345	340	340	310	335	330	340	355	355	330	A	A	330	280	280	290
13	295 ^F	300	310	310	315	340	330	350	345	345	350	335	350	355	345	345	350	350	295	305	305	330	295	290
14	295	295	295	290	285	310	320	345	345	335	315	325	350	340	345	345	350	335	315	320	325	310	310 ^{I A}	290
15	295	305	305	295	300	320	320	350	350	330	350	330	330	330	330	340	345	325	320	315	315	295	320	300
16	285	300	290	315	320	285	320	345	350	345	350	320	335	320 ^H	340	330	345	335	330	320	305	315	280	285
17	295	285	290	300	305	305	310	350	350	360	335	360	335	335	340	345	345	330 ^{I A}	315 ^{I A}	305	335	310	290	295
18	305	280	305	295	295	330	295	350	340	330 ^K	335	320	330	335	340	345	345	300	305	310	330	280	310 ^{I A}	325
19	300	305 ^F	305	300	300	305	315	340	350	360	340	350	345	355	355	345	335	350	285	315	340	315	305	280
20	295	295	295	310	320	305	330	340	360	345	350	340	350	345	350	360	340	340	305	325	315	305	295	285
21	285	295	320	310	315	305	310	350	355	360	335	355	340	340	345	350	340	325	305	320	280	F	285 ^F	F
22	305	325	295	295	305 ^F	315	285	345 ^{I R}	350	310	330	340	330	330	320	345	325	325	300	335	300	F	F	F
23	285 ^F	295 ^F	F	320	340	F	F	350	360	340	340	340	345	350	320	350	340	350	320	335	295	290	290 ^F	F
24	280	280	275	285	330	310	325	350	350	340	350	340	340	335	330	355	340	325	320	330 ^{I R}	310	F	F	F
25	F	285 ^F	265	280 ^F	F	280	265 ^F	335	290	350	295	320	335	335	345	350	345	320	315	315	345	290	F	275
26	F	F	F	290	315	320	315	335	345	330	340	345	340	330	350	345	345	325	310	330	300 ^{I R}	300	295	275
27	280	295	305	300	300	280	305	335	350	335 ^H	350	340	340	350	340 ^H	335	320 ^H	325	305	310	305	320	305	305
28	305	305	305	295	325	300	315	345	345	360	350	340	345	340 ^H	315	335 ^H	330	320	315	295	315	335	275	285
29	295	295	285	295	295	F	305	350	360	355	340	335	340	340	345	345	345	325	305	330	300	325	305	310
30	310	280 ^F	305	305	315	325 ^F	320	335	355	350	345	340	345	340	350	350	330 ^H	330	335	305	300	305 ^{I A}	300	F
31																								
CNT	28	29	28	30	29	28	29	30	30	30	30	30	30	30	30	30	30	30	28	28	30	27	27	25
MED	295	295	300	300	310	305	315	345	345	345	340	340	338	335	340	345	345	330	312	310	305	305	290	290
UQ	295	300	305	310	320	322	320	350	350	350	350	340	340	345	345	350	350	345	315	320	325	312	302	295
LQ	285	290	292	295	300	295	305	335	340	335	335	325	330	330	330	340	340	325	305	305	300	298	285	285

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M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1973

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									L	L	U L	L	L	L										
2									U	L	L	L	L	L										
3										L	I A	I A	L	385	L									
4									L	U L	U L	I A	L	L	L									
5									L	L	L	U L	U L	L	L									
6										L	L	A	385	365	L									
7										L	370	L	375	L	L									
8										L	405	375	L	L	L									
9										400	L	L	L	L	L									
10										L	L	I A	L	L	L	L								
11										L	L	380	380	360	L	L								
12										L	L	355	L	U	L	L								
13										U	L	390	380	385	L	L								
14									L	L	U L	365	L	L	L									
15											L	375	L	L	L									
16										L	L	365	L	390	L									
17										L	A	L	U	L	L	L								
18										L	L	L	380	375										
19										U	L	L	L	375	L	L								
20											L	390	L	U	L	L								
21											L	390	L	L	L									
22										U	L	L	L	A	L									
23										L	L	L	U	L	A	L								
24											L	L	U	L	L	L								
25										L	H	L	L	L	L	375								
26									L	410	375	385	L	L	L									
27										L	405	L	L	L	L									
28									L	L	L	L	L	L	355									
29											L	L	L	L	L									
30										L	L	H	L	L	375									
31												385	L	375										
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	6	11	17	11	9	2									
MED									U	L	U	L	380	375	365									
UQ									400	402	385	385	385											
LQ									U	L	372	370	375	370										

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H⁺F₂ (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									230	235	235	230	225	250	235									
2									250	240	245	255	255	255	235									
3										235	230	260	245	240	230									
4									230	245	230	230	230	245	230									
5									235	265	245	240	245	250	250									
6										225	240	250	230	255	245									
7										235	260	240	240	235	230									
8										220	230	265	250	245	235									
9										235	250	260	250	235	235									
10										240	245	245	250	250	235	225								
11										240	230	260	255	270	235	235								
12										255	245	275	250	240	230									
13										235	235	255	230	240	240									
14									240	245	255	255	235	250	230									
15											235	250	250	240	235									
16										240	235	290	235	255	240									
17										230	255	230	250	245	240									
18										245	235	240	235	255										
19										230	235	225	245	225	235									
20											235	235	235	235	225									
21											235	230	220	250	235									
22											290	245	250	275	250									
23											230	250	230	235	240	270								
24												235	240	250	240	250								
25												225	295	275	250	245	240							
26									230	230	245	235	235	230	235									
27										220	225	250	240	235	215									
28									240	225	220	250	245	240	300									
29											250	255	245	235	235									
30										240	230	250	245	250										
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									7	25	30	30	30	30	27	2								
MED									235	235	235	250	245	245	235	230								
UQ									240	240	245	255	250	250	240									
LQ									230	230	235	235	235	240	232									

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H⁺F₂ (KM)

IONOSPHERIC DATA

NOV. 1973

H·F (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	245	255	255	275	245	240	220	235	220	235	200	210	190 ^H	240	240	235	220	195	235	250	245	235	275	325													
2	320	245	225	245	255	260	220	220	205	220	205	205	180 ^H	230	220	235	230	205	245	260	260	260	280	285 ^{I A}													
3	270	310 ^{I A}	275	280	245	260	225	215	230	220	215	215	235	210	215	220	215	200	240	275	270	260	280 ^{I A}	300													
4	305	290	305 ^{I A}	265	240	270	260	230	230	210	205	205	210	190 ^H	240 ^{I A}	225	220	195	A	315	290 ^{I A}	285	295	290													
5	285	295	265	240	255	280	235	225	220	230 ^H	245	210	225	210 ^{I A}	240	240	220	200	A	A	300	270	285	295													
6	295	245	230	250	245	275	255	225	225	225 ^{I A}	A	A	A	200	235	230	215	195	240	240	230	260	285	255													
7	265	300	295	275	270	250	225	220	230	220	200	180 ^H	195	220	220	230	210	200	245	265	285	235	290	280 ^{I A}													
8	290	300	285	280	245	195	245	235	225	220	205	205	220	220 ^{I A}	220 ^{I A}	235	235	215	220	245	255 ^{I A}	265	250	295	295												
9	295	295	290	245	255	220	195	200	215	185	190 ^H	180 ^H	180 ^H	235	235	225	215	205	235	260	220	255	295	295													
10	285	295	275	250	230	210	230	220	215	195 ^H	225 ^{I A}	225 ^{I A}	240	235 ^{I A}	235	210	205 ^H	210	240	250	270 ^{I A}	250	290	295													
11	310	310 ^{I A}	280	240	230	255	245	215	230	235	230	210	210	235	230	230	210	210	A	A	250	255	265	300													
12	290	290	280	275	255	230	205	205	220	240	225	230	235	220	230	235	210	A	A	A	230	290	325 ^{I A}	300													
13	300	295	290	265	265	230	230	210	220	215	220	195	190 ^H	230	200	225	205	195	250	255 ^{I A}	250	255	290	290													
14	290	275	290	295	295	245	225	215	215	225	220	195	235	235	210	225	210	220	240	230	245	250	260 ^{I A}	295													
15	275	260	270	275	260	245	230	205	225	235	235	200	185 ^H	230	230	240	210	225	245	250	230	250	260	275													
16	295	290	275	240	240	225	235	250	230	240	235	205 ^H	230	225 ^{I A}	235	220	225	220	235 ^{I A}	240	245	245	300	300													
17	290	300	285	270	265	255	235	215	220	225	A	A	205	230 ^{I A}	235	235	215	240 ^{I A}	255 ^{I A}	270	235	245	300	285													
18	270	310	280	260	270	220	270	210	215	230	215	215	200	205	235	220	215	215	270	240	240	255 ^{I A}	255 ^{I A}	235													
19	290	245	280	270	260	255	235	215	220	195	225	220 ^{I A}	215	190	240	215	205	210	250	255	215	225	250	295													
20	280	280	290	265	250	255	250	210	210	235	210	200	230	205	225	215	215	200	245	230	235	255	265	305 ^B													
21	295	280	240	245	235	230	245	225	210	225	210	205	215	235	230	215	220	215	245	215	290	295	310	295													
22	270	225	280	255	265	240	290	205	215	230	225 ^{I A}	230	235 ^{I A}	210	245	225	205	215	240	230	245	245	290	295													
23	280	265	250	230	200	265	245	220	220	210	245	A	A	A	255	215	230	200	220	215	260	240	295	315													
24	315	300	300	295	240	240	235	200	200 ^H	230	235	235 ^{I A}	230	230	240	215	220	215	250	230 ^{I A}	230	275	340	320 ^{I A}													
25	295	325	330	300	260	280	370	240	245	235	200 ^H	250	220	235	210	230	215	215	250	235	230	265	295	285 ^{I A}													
26	310 ^{I A}	290	305	275	230	205	240	220	220	195	220	210	225	210	235	230	215	215	245	230	245	290	300	315													
27	290	285	280	250	245	295	255	240	225	210	210	180 ^H	235	225	210	230	205	220	245	245	250	245	240	290													
28	250	300	275	295	240	240	255	225	220	225	200	185 ^H	230 ^H	230	190 ^H	225	220	210	245	250	250	235	290	330													
29	290	265	290	290	275	215	240	215	210	220	235	235	240	235	245	225	210	215	270	225	250	230	270	250													
30	245	280	290	300	250	235	230	215	205	180 ^H	210	180 ^H	220	215	235	220	200	245	215	230	290	290 ^{I A}	290	300													
31																																					
CNT	30	30	30	30	30	30	30	30	30	30	28	27	28	29	30	30	30	29	26	27	30	30	30	30													
MED	290	290	280	268	250	242	235	218	220	225	218	205	220	225	235	225	215	210	245	245	248	255	290	295													
UQ	295	300	290	280	260	260	250	225	225	230	228	218	232	235	235	230	220	215	250	255	265	265	295	300													
LQ	275	265	275	250	240	230	230	210	215	210	205	198	202	210	220	220	210	200	240	230	235	245	270	285													

NOV. 1973

H·F (KM)

IONOSPHERIC DATA

NOV. 1973

H⁺ES (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	100	100	S	100	S	S	S	G	115	115	105	110	G	G	G	G	130	S	S	S	S	S	S	S
2	S	100	100	S	105	S	S	140	120	120	115	105	100	100	100	100	100	100	100	100	105	105	105	105
3	S	105	100	S	S	100	S	G	140	125	120	110	105	105	100	100	100	100	105	110	110	110	110	110
4	110	105	105	105	105	100	100	100	105	120	115	110	110	110	135	125	125	115	115	110	105	110	110	110
5	105	105	S	S	E	S	S	150	160	125	115	110	110	105	100	115	110	100	110	110	115	110	110	110
6	105	105	105	100	100	S	S	125	120	120	125	115	115	115	115	115	110	S	S	S	S	S	S	S
7	S	105	100	100	100	S	S	G	120	115	115	G	110	110	110	110	110	105	S	S	105	105	105	105
8	100	105	100	100	100	105	110	G	120	120	115	115	110	110	115	115	115	110	110	110	105	110	105	100
9	100	100	100	100	S	S	S	B	G	G	110	105	105	105	115	105	100	100	100	100	S	120	S	110
10	105	105	S	S	S	S	S	G	G	G	125	115	115	115	G	G	B	100	S	160	100	100	S	100
11	100	100	100	105	110	110	110	155	155	G	120	110	110	110	110	105	125	110	110	105	105	105	S	S
12	S	S	S	110	S	110	110	G	165	160	150	120	145	120	150	100	110	110	110	110	S	B	100	100
13	S	115	110	115	110	S	S	120	115	115	G	110	G	G	G	G	G	100	100	100	100	100	S	S
14	S	S	105	105	S	S	S	G	G	120	115	G	115	G	G	G	G	100	S	100	S	105	105	S
15	S	S	S	S	S	S	S	G	140	120	120	G	G	100	100	100	100	100	100	B	S	S	S	S
16	S	105	100	S	100	S	S	150	145	110	110	G	G	105	G	100	100	100	100	100	S	S	S	S
17	S	S	S	S	100	100	S	G	145	125	115	110	105	105	G	105	100	100	100	B	S	115	110	S
18	S	S	110	110	S	S	S	140	120	115	G	G	G	G	G	G	B	S	S	B	110	105	105	S
19	110	S	S	S	E	S	S	G	120	115	110	105	G	G	G	125	115	S	S	100	S	S	S	S
20	S	S	S	110	110	105	105	105	G	G	125	115	115	G	G	G	B	S	S	S	105	105	S	B
21	105	S	S	S	S	S	S	150	150	G	125	115	115	115	155	G	B	S	E	S	B	S	S	S
22	S	S	S	S	S	S	S	G	G	140	125	125	120	145	150	G	B	110	155	115	S	115	105	S
23	S	100	S	S	S	S	S	G	G	120	120	115	115	110	110	110	110	S	S	S	S	S	S	S
24	S	S	S	105	110	S	S	G	G	G	G	125	115	120	115	110	110	110	110	105	105	100	110	105
25	S	S	100	S	S	S	S	G	110	115	110	105	105	G	G	G	100	S	S	S	100	S	100	105
26	100	100	105	105	110	110	S	B	G	G	G	G	G	G	G	G	B	S	S	S	100	100	100	110
27	105	105	S	S	E	S	S	B	G	G	G	G	155	G	G	G	B	S	S	S	S	S	S	S
28	105	100	110	S	S	S	S	B	G	120	115	105	105	G	G	G	B	S	S	S	S	S	B	S
29	S	E	S	S	110	S	110	155	G	G	160	155	G	145	140	G	G	S	140	120	110	S	110	105
30	110	S	105	105	S	S	S	B	G	G	140	G	G	G	110	110	G	100	140	S	110	105	100	105
31																								
CNT	14	17	16	15	13	8	6	11	18	20	25	22	21	19	17	17	18	18	16	16	16	18	16	14
MED	105	105	102	105	105	105	110	140	120	120	115	110	110	110	115	110	110	100	110	108	105	105	105	105
UQ	105	105	105	108	110	110	110	150	145	122	125	115	115	115	135	115	115	110	112	110	110	110	110	110
LQ	100	100	100	100	100	100	105	122	120	115	115	110	105	105	110	100	100	100	100	100	102	105	102	105

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H⁺ES (KM)

IONOSPHERIC DATA

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TYPES OF ES

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	F ₁	F ₁		F ₁					C ₂	C ₁	L ₁	L ₁					H ₁								
2		F ₁	F ₁		F ₁			H ₁	C ₁	C ₂	C ₁	L ₂	L ₁	L ₂	L ₃	L ₂	L ₃	L ₂	F ₁	F ₁	F ₁	F ₂	F ₁	F ₂	
3		F ₃	F ₁			F ₁			H ₁	H ₁	C ₂	L ₂	L ₂	L ₂	L ₂	L ₂	L ₂	L ₁	F ₁	F ₂	F ₃	F ₃	F ₃	F ₂	
4	F ₂	F ₄	F ₃	F ₄	F ₂	F ₂	L ₂	L ₄	L ₁	H ₂	C ₂	L ₄	L ₂	L ₂	H ₁	H ₂	H ₃	C ₁	F ₄	F ₂	F ₃	F ₂	F ₁	F ₂	
5	F ₁	F ₁						H ₁	H ₁	H ₁	C ₂	L ₁	L ₂	L ₂	L ₂	C ₂	L ₁₂	L ₃	FF ₂₂	FF ₃₁	FF ₃₁	FF ₂₁	F ₁	F ₂	
6	F ₂	F ₁	F ₁	F ₁	F ₁			H ₂	C ₂	H ₂	H ₂	C ₂	C ₁	C ₁	C ₂	C ₂	L ₁								
7		F ₂	F ₂	F ₂	F ₂				C ₁	C ₂	C ₂		L ₁	L ₁	L ₁	L ₁	L ₁	L ₁				F ₁	F ₂	F ₂	F ₃
8	F ₂	F ₂	F ₂	F ₃	F ₂	F ₁	L ₁		C ₂	H ₂	C ₂	C ₂	L ₂	L ₂	C ₂	C ₂	C ₂	L ₂	F ₁	F ₃	F ₂	F ₁	F ₂	F ₂	
9	F ₂	F ₂	F ₂	F ₁							L ₁	L ₂	L ₁	LH ₁₁	CL ₁₁	L ₂	L ₃	L ₁	F ₁	F ₁			F ₁	F ₁	
10	F ₁	F ₁									H ₁	C ₂	C ₂	C ₂				L ₁		F ₁	F ₂	F ₂		F ₁	
11	F ₂	F ₃	F ₁	F ₂	F ₁	F ₁	L ₁	H ₂	H ₁		H ₁	L ₁	L ₁	L ₁	L ₂	LH ₂₁	H ₄	LL ₁₂	F ₂	F ₃	F ₂	F ₂			
12				F ₁	F ₂	F ₁			H ₁	H ₁	H ₁	HL ₁₂	HL ₁₁	HL ₁₂	HL ₁₂	L ₃	L ₂	F ₃	F ₃	F ₂			F ₁	F ₁	
13		F ₁	F ₁	F ₂	F ₂			C ₂	C ₂	C ₂		L ₁						F ₁	F ₁	F ₂	F ₁	F ₁			
14			F ₁	F ₁							H ₁	C ₁	C ₁					F ₁		F ₁		F ₁	F ₂		
15									H ₁	H ₂	H ₂			L ₁	L ₂	L ₂	L ₁	F ₁	F ₁						
16		F ₁	F ₁		F ₁			H ₂	H ₁	L ₂	L ₂			L ₃		L ₂	L ₂	F ₂	F ₂	F ₁					
17					F ₁	F ₁			H ₁	H ₁	C ₂	L ₂	L ₁	L ₂		LH ₁₁	L ₂	F ₂	F ₂			F ₁	F ₁		
18			F ₁	F ₁				H ₁	C ₂	C ₂												F ₁	F ₂	F ₂	
19	F ₁								C ₂	C ₂	L ₁	L ₂				H ₁	C ₁			F ₁					
20				F ₂	F ₁	F ₂	F ₃	L ₁			H ₁	C ₁	C ₂								F ₁	F ₁			
21	F ₁							H ₂	H ₁		H ₁	C ₁	C ₁	C ₁	H ₁										
22											H ₁	H ₂	H ₁	H ₂	H ₂	H ₁		F ₁	FF ₁₁	F ₂		F ₁	F ₂		
23		F ₁									C ₁	C ₂	C ₂	C ₂	L ₄	L ₂	L ₂	L ₂							
24				F ₁	F ₁						H ₂	C ₁	C ₁	C ₁	L ₃		L ₂	F ₁	F ₃	F ₂	F ₁	F ₁	F ₂	F ₂	
25			F ₁						L ₁	C ₁	L ₁	L ₂	L ₁				L ₁				F ₁	F ₁	F ₂		
26	F ₂	F ₂	F ₂	F ₁	F ₁																	F ₁	F ₁	F ₁	F ₁
27	F ₁	F ₁																							
28	F ₂	F ₁	F ₁								C ₁	C ₁	L ₁	L ₂											
29					F ₁		F ₁	H ₁			H ₁	H ₁			H ₁	H ₁			F ₁	F ₁	F ₁		F ₁	F ₁	
30	F ₁		F ₁	F ₂							H ₁								F ₁	F ₁		F ₂	F ₃	F ₂	F ₁
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																									
MED																									
UQ																									
LQ																									

NOV. 1973

TYPES OF ES

IONOSPHERIC DATA

NOV. 1973

FOF2 (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	41	41	R	35	36	32	48	69	83	94	101	94	J ^R 102	R	J ^R 100	R ⁸⁴	73	54	34	36	37	39	34	35
2	35	37	33	32	27	26	42	62	80	79	R ⁸⁹	75	82	J ^R 103	R ⁸⁷	83	76	59	34	36	35	40	39	38
3	37	37	38	37	39	35	44	65	87	91	84	75	94	88	74	72	72	59	34	36	36	39	36	38
4	39	39	37	38	39	A	39U	74	86	86	91	62	R	J ^R 95	R	A	61	49	R	A	A	A	35	37
5	R ³⁸	R ³⁵	39	40	30	28	R ³⁵	I ^R 64	J ^R 76	81	J ^R 105	92	J ^R 88	79	86	93	84	49	31	31	34	39	38	39
6	38	44	35	F ³⁴	36	32	39	61	73	76	78	86	96	I ^A 83	93	96	76	51	34	38	37	30	30	32
7	31	32	34	34	34	31	40	61	61	75	80	J ^R 105	I ^R 96	J ^R 107	66	66	63	43	32	30	35	37	27	31
8	33	35	35	36	41	25	35	R ⁶⁶	J ^R 86	R	J ^R 72	65	88	J ^R 100	R ⁹³	71	61	41	31	31	33	27	29	31
9	31	31	33	35	35	36	31	51	58	68	71	77	77	94	71	65	57	44	32	31	31	28	27	29
10	31	31	32	34	40	22	33	50	64	60	70	J ^R 75	78	J ^R 88	84	J ^R 76	H ⁵¹	H ⁴⁴	I ^R 31	27	30	30	S ²⁹	I ^A 30
11	A	30	34	39	26	21	31	53	64	61	67	74	R ⁷⁴	70	92	70	61	38	A	A	I ^A 30	31	34	F ³¹
12	32	F ³⁴	F ³³	34	38	31	31	47	55	60	J ^R 77	75	J ^R 75	86	62	64	64	40	31	26	28	R ²⁸	27	29
13	30	30	30	30	31	29	36	56	65	J ^R 77	81	83	67	64	65	69	55	40	26	29	30	31	31	30
14	32	32	31	30	32	34	35	50	62	66	75	74	J ^R 75	65	69	58	54	40	39	40	30	29	29	29
15	31	31	33	34	34	31	39	56	60	71	79	78	80	86	65	69	55	45	29	34	37	F ³⁰	30	32
16	31	35	34	35	35	28	34	59	66	R ⁷⁵	R ⁸⁵	70	79	J ^R 78	74	H ⁶⁷	56	42	34	31	31	30	30	31
17	35	34	32	33	S ³¹	31	34	56	62	70	71	J ^R 90	R	J ^R 85	J ^R 77	64	61	J ^R 40	I ^A 32	40	40	31	31	31
18	31	31	35	36	37	30	31	R ⁶⁸	58	71	J ^R 80	83	J ^R 90	91	R ⁷⁵	70	55	40	36	41	J ^R 42	26	30	33
19	R ³⁴	36	35	35	35	31	37	58	R ⁷⁵	R ⁷⁵	J ^R 77	81	67	R	J ^R 67	I ^R 66	56	39	29	35	I ^R 37	30	28	27
20	30	31	31	33	33	30	33	J ^R 55	61	I ^R 63	J ^R 70	71	66	67	60	65	55	46	H ²⁹	36	38	26	30	31
21	31	34	32	35	28	26	31	61	75	64	69	J ^R 73	67	68	78	R ⁶⁵	53	39	34	37	27	31	J ^S 34	U ^S 34
22	F ³⁵	37	F ²⁸	J ^F 32	F ³¹	34	31	81	59	61	101	67	83	91	75	79	74	50	40	44	37	36	F ³⁸	F ³⁸
23	F ⁴⁰	F ⁴¹	J ^S 42	51	31	30	35	69	70	65	J ^R 78	91	80	92	78	R ⁷⁵	61	58	42	30	24	26	26	27
24	28	30	29	30	31	30	32	64	59	62	J ^R 74	79	J ^R 78	J ^R 80	J ^R 74	70	59	40	39	32	28	29	30	F ²⁸
25	31	F ³⁰	F ³⁰	30	30	29	J ^S 31	70	66	84	J ^R 79	97	99	79	70	67	60	45	F ⁴⁰	F ⁴⁶	42	28	S ²⁹	32
26	34	F ⁴⁰	J ^F 41	F ⁴²	49	F ³⁸	F ⁴⁴	R ⁶⁹	80	76	80	J ^R 89	71	71	67	68	58	46	38	I ^R 36	28	26	27	26
27	30	30	31	30	J ^R 27	26	30	J ^R 56	78	R	R	R	75	J ^R 71	66	58	56	46	30	32	31	31	29	31
28	31	31	33	30	31	31	29	57	67	J ^R 80	R ⁶⁶	81	J ^R 72	J ^R 80	64	66	66	43	28	30	26	28	29	29
29	31	31	35	33	35	35	26	50	65	59	66	78	R ⁷³	78	J ^R 68	62	60	38	28	36	30	28	26	31
30	26	26	26	29	31	35	34	61	77	58	66	J ^R 70	70	J ^R 73	68	61	46	37	42	C	28	31	31	31
31																								
CNT	29	30	29	30	30	29	30	30	30	28	29	29	28	28	29	29	30	30	28	27	29	29	30	30
MED	31	33	33	34	34	31	34	61	66	71	78	78	78	82	74	68	60	44	33	35	31	30	30	31
UQ	35	37	35	36	36	32	39	66	77	78	81	86	88	91	78	72	64	49	37	36	37	31	34	33
LQ	31	31	31	32	31	28	31	56	61	62	71	74	72	72	67	65	55	40	30	31	30	28	29	29

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FOF2 (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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									
2									L	L	L	L	L	L	L	L								
3									L	L	L	L	400	L	L	L								
4									L	L	L	L	510	A	A	A								
5									L	L	L	L	L	L	L	L								
6									L	A	A	A	A	A	L	L								
7									A	L	A	A	L	L	A	L								
8								L	A	L	L	L	L	L	A	L								
9								L	L	L	L	L	L	390	L	L								
10								L	L	L	L	L	L	410	L	L								
11								L	L	L	L	L	L	L	U L 400	L								
12								L		410	420	H	L	L	L									
13								L	L	L	L	L	400	L	L	L								
14								L	L	420	L	L	410	L	390	L								
15								L	L	L	L	L	L	L	L	L								
16								L	400	A	A	L	L	410	L	L								
17								A	L	L	L	A	L	370	L	L								
18								L	L	L	L	L	L	L	L	L								
19								L	L	L	L	L	L	L	L	L								
20								L	L	L	L	L	L	L	L	L								
21								L	L	L	L	L	L	L	A	L								
22								L	L	L	L	L	L	L	L	L								
23								L	L	L	L	L	L	L	L	L								
24									350	L	L	L	L	A	L	L								
25								L	L	L	L	L	L	L	L	L								
26								L	390	L	L	L	L	L	L	L								
27								L	L	L	L	L	L	L	L	L								
28								L	L	L	L	L	L	310	L	L								
29								L	L	L	L	L	L	L	L	L								
30								L	370	L	L	L	L	L	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	3	1	4	5	2									
MED										370	410	420	405	390	395									
UQ										380	415		460	410										
LQ										360	405		400	370										

NOV. 1973

FOF1 (0.01 MHz)

IONOSPHERIC DATA

NOV. 1973

FCE (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							b	A	A	A	315	I A 320	325	310	290	265	190		B					
2							b	240	A	290	330	335	325	325	A	A	175	B						
3							b	200	270	305	A	A	325	310	280	260	A	B						
4							b	A	260	280	290	295	295	305	295	250	A	A						
5								220	260	300	315	A	A	310	275	260	A							
6							b	I A 195	260	I A 285	300	300	305	A	A	A	180							
7							b	210	255	A	A	A	A	A	A	A	A	A						
8							b	200	R 255	265	A	A	A	A	A	A	A	B						
9							b	195	R	280	I R 305	310	I A 310	300	A	A	A							
10							b	220	255	280	305	315	A	A	A	250	180	B						
11								H 220	260	270	A	A	A	A	I A 280	240	A							
12							b	180	250	280	305	320	R 320	A	280	255	A							
13							b	I A 190	I A 255	280	310	315	310	R 290	275	260	190							
14							b	180	270	A	A	K	320	310	I A 270	240	180							
15							b	200	265	280	U A 295	A	A	300	270	225	200							
16							b	180	260	275	A	A	I A 310	300	A	A	A							
17							b	200	265	280	A	A	A	R	K	A	A	A						
18								190	255	270	R	R	A	280	I R 265	250	B							
19								155	260	275	305	I A 305	I A 300	A	260	235	A	A						
20								A	R 240	I R 260	285	A	A	270	265	A	A							
21							b	220	240	270	I A 310	I A 310	310	R	A	255	180							
22							b	170	250	290	300	310	305	295	A	A	175							
23							b	205	250	270	295	A	A	R	A	A	175							
24							b	175	255	280	310	I A 315	310	A	A	A	A							
25							b	190	260	A	280	320	315	305	I R 260	A	A							
26							b	A	260	I R 275	210	300	310	I A 290	260	250	B							
27								180	R 250	I R 270	300	300	300	300	I A 275	240	A							
28								160	250	I R 280	I R 300	I A 300	A	A	K	A	170							
29								B	B	R	B	R	310	R 350	A	R	B							
30								150	R	R	300	R 320	I A 320	305	290	255	180							
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								25	25	24	21	17	19	18	16	16	12							
MED								195	255	280	300	310	310	302	275	250	180							
UQ								205	260	280	310	320	320	310	280	258	185							
LQ								180	250	270	295	300	308	295	265	240	175							

The Radio Research Laboratories, Japan

NOV. 1973

FCE (0.01 MHz)

IONOSPHERIC DATA

NOV. 1973

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	J X 29	J X 26	30	J X 25	J X 20	21	E S 15	26	J X 35	J X 31	G	J X 40	G	G	G	30	29	30	28	J X 25	E S 15	J X 19	E S 15	J X 23	E S 15	E S 15
2	M 20	E B 13	E S 15	M 20	M 20	E S 15	J B 15	25	31	34	G	G 23	G 25	G 20	36	27	24	J X 23	E S 15	E S 15	E 12	J X 25	J X 28	J X 19		
3	J X 26	J X 19	J X 27	J X 27	M 20	E S 15	18	G	30	G	35	37	G 30	J G 25	31	31	J X 37	J X 30	M 22	J X 18	E S 15	E S 15	E S 15	E S 15	E S 15	
4	J X 19	J X 54	J X 36	J X 46	J X 42	J X 48	J X 25	J X 36	29	35	36	G	G	J X 58	J X 51	J X 91	J X 46	J X 35	J X 36	60	55	J X 54	J X 40	J X 26		
5	J X 30	J X 44	E S 15	J X 22	20	20	20	G	31	40	43	J X 41	J X 50	32	31	G	J X 30	M 21	J X 19	J X 25	J X 41	J X 45	M 25	M 30		
6	J X 43	J X 51	J X 21	J X 28	J X 26	J X 18	17	23	29	J X 58	J X 44	J X 52	J X 52	J X 91	J X 43	J X 29	19	M 19	E S 15	E S 15	E B 14	J X 24	J X 29	M 20		
7	J X 19	J X 30	E S 15	J X 30	M 20	19	J X 24	G	G	J X 48	J X 83	J X 75	J X 54	J X 45	J X 49	J X 31	J X 25	J X 25	E B 13	E S 15	E S 15	E S 15	20	E S 15	20	
8	J X 26	21	21	J X 23	21	J X 20	21	G	G	J X 41	J X 41	36	35	32	J X 45	J X 31	31	E B 13	E B 13	J X 24	J X 23	E S 15	E S 15	E S 15	E S 15	
9	E S 15	J X 16	J X 26	E S 15	J X 20	J X 25	J X 20	G	G	31	28	J X 36	37	J G 30	J X 41	J X 31	J X 41	J X 27	J X 25	J X 24	J X 19	J X 19	J X 19	M 21		
10	J X 19	E B 12	E B 14	E S 15	E B 12	M 20	J X 19	G 19	G	32	G	G	41	42	30	G	G	19	27	M 20	J X 26	J X 25	25	J X 39		
11	J X 39	J X 30	J X 35	J X 29	J X 30	J X 25	J X 29	G 17	G	31	J X 40	32	J X 39	J X 36	J X 28	22	J X 28	J X 42	J X 49	J X 54	J X 42	J X 54	J X 36	J X 19		
12	J X 19	E B 14	17	E B 12	J X 25	M 20	E B 14	G	G	G	J G 25	G	34	34	30	G	J X 30	E S 15	E S 15	J X 25	J X 30	J X 30	E S 15	E S 15		
13	E S 15	E S 15	E S 15	18	E S 15	E B 14	16	22	J X 26	32	25	G	G	24	19	33	29	23	E S 15	J X 19	M 20	J X 18	M 22	M 18	E S 15	
14	E B 14	M 19	E B 12	E S 15	M 20	M 21	E B 14	G	30	J X 42	32	31	G	G	J X 28	G	G	J X 19	J X 22	J X 19	E S 15	E S 15	E S 15	M 20		
15	E S 15	E S 15	E B 13	E S 15	M 19	E B 12	E B 12	G	G	34	J X 41	34	36	21	G 20	25	J G 18	M 20	E S 15	19	19	E S 15	E B 12	E S 15		
16	E S 15	E B 12	E B 13	E S 15	E B 12	E B 14	E B 12	G	31	30	J X 32	J X 44	J X 42	31	J X 31	J X 36	J X 30	J X 42	J X 42	M 21	J X 31	J X 26	M 19	M 20		
17	M 19	E S 15	E S 15	M 23	M 20	E S 15	E B 12	G		34	J X 44	J X 40	J X 85	G	G	J X 26	J X 43	47	46	31	J X 20	18	E S 15	J X 26		
18	J X 25	E S 15	E S 15	J X 20	21	20	E S 15	G	29	34	G	G	J X 46	G	G	22	G 18	21	20	20	E S 16	E S 15	E B 13	E S 15	J R 26	
19	J X 25	E S 15	E S 15	E S 15	E B 13	E S 15	E S 15	G	G	32	38	36	35	32	21	G	J X 28	J X 30	J X 25	J X 25	E S 15	E S 15	E S 15	E S 15		
20	E S 15	E S 15	E S 15	E S 15	J X 30	J X 27	J X 19	31	18	G 20	33	35	35	19	G	31	25	E B 14	E B 14	E B 14	E B 12	E S 15	E S 15	J X 25		
21	M 20	18	E B 12	E B 12	E B 14	E S 15	E B 12	G	G	G	31	31	37	31	J X 31	G	G	E S 15	E S 15	E S 15	E S 15	E S 15	19	E S 15		
22	E S 15	M 17	E B 12	E B 14	E B 12	E B 14	E B 14	G	G	34	40	40	36	36	30	26	21	18	E S 15	J X 54	J X 25	J X 25	J X 25	J X 19		
23	E S 15	E S 15	M 20	M 19	E B 12	J X 21	E S 15	G	G	30	36	J X 42	J X 48	30	31	J X 30	G	E B 14	E B 13	E S 15	E B 14	E S 15	E S 15	E S 15		
24	E B 12	E S 15	E B 13	E B 12	E B 12	M 20	E B 14	G	31	33	G	35	J X 42	J X 55	35	37	J X 30	J X 31	J X 26	J X 24	M 20	E S 15	E S 15	J X 19		
25	J X 21	J X 24	J X 23	J X 23	M 20	E S 15	E B 14	21	G	30	27	G	G	22	G 19	G	J X 25	J X 19	J X 15	M 21	E S 15	E S 15	19	18		
26	E S 15	E S 15	19	J X 18	E B 12	E B 14	E B 14	19	G	J G 22	G	G	J G 28	35	J G 21	G	21	J X 25	J X 19	J X 25	J X 19	E S 15	E S 15	E S 15		
27	20	E S 15	19	E S 15	E S 15	E S 15	E S 15	G	G	G	G	G	37	33	30	G	J X 25	J X 26	J X 20	26	E S 15	E S 15	E S 15	E S 15		
28	E S 15	E S 15	26	J X 26	E S 15	E S 15	E S 15	G	G	G	G	34	35	33	G	32	G	E S 15	E S 15	E S 15	E S 15	E S 15	20	E S 15		
29	E S 15	E S 15	E B 13	E S 15	E B 13	E S 15	E S 15	E B 15	E B 27	G	E B 33	35	36	34	32	G	E B 15	E S 15	J X 23	20	E S 15	E S 15	E S 15	J X 23		
30	J X 20	J X 35	E B 13	23	21	J X 21	20	G	G	G	33	G	32	G	33	30	21	19	J X 24	C	J X 25	M 21	E S 15	E S 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	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	
MED	19	E 15	E 15	18	20	18	E 15	G	G	32	32	34	36	32	30	26	25	20	19	20	16	16	E 15	19		
UQ	J X 25	J X 24	21	J X 23	21	21	19	19	29	34	40	J X 40	J X 42	35	33	31	J X 30	J X 27	J X 25	J X 25	J X 25	J X 25	20	J X 21		
LQ	E S 15	E S 15	E B 13	E S 15	E B 13	E S 15	E B 14	G	G	G	G	G	G 30	G 20	G 22	G	19	E 15	E S 15	E 16	E S 15	E S 15	E S 15	E S 15		

NOV. 1973

FOES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

FBES (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	20	22	26	19	17	E	E ₁₅ ^B	24	28	31	G	33	G	G	G	30	25	16	E ₁₅ ^S	E	E ₁₅ ^S	18	E ₁₅ ^S	E ₁₅ ^S
2	E	E ₁₃ ^B	E ₁₅ ^S	E	E	E ₁₅ ^S	G	G	28	34	G	E ₂₃ ^K	G ₂₅	G ₂₀	32	27	23	23	E ₁₅ ^S	E ₁₅ ^S	E ₁₂ ^B	17	22	16
3	25	E	17	E	E	E ₁₅ ^S	G	G	29	G	E ₃₅ ^K	36	G ₂₇	G ₂₅	31	30	32	23	17	16	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S
4	16	30	17	31	17	A	20	27	29	32	34	G	G	55	50	A	33	28	34	A	A	A	20	20
5	28	16	E ₁₅ ^S	19	E	E	16	G	31	40	40	39	33	28	31	G	22	E	E	18	27	17	E	25
6	21	19	17	15	23	E	G	22	29	32	42	46	49	A	35	27	16	E	E ₁₅ ^S	E ₁₅ ^S	E ₁₄ ^B	16	26	E
7	E	20	E ₁₅ ^S	19	E	17	17	G	G	43	39	55	38	35	38	28	21	16	E ₁₃ ^B	E ₁₅ ^S	E ₁₅ ^S	E	E ₁₅ ^S	E
8	18	E	E	E	E	E	G	G	G	41	32	31	31	32	43	27	25	E ₁₃ ^B	E _{13^B}	19	18	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S
9	E ₁₅ ^S	E	E	E ₁₅ ^S	E	17	18	G	G	31	27	27	33	27	31	28	22	20	17	19	18	17	E	E
10	E	E ₁₂ ^B	E ₁₄ ^B	E ₁₅ ^S	E ₁₂ ^B	E	G	G ₁₆	G	32	G	G	39	36	30	G	G	G	27	E	17	24	24	A
11	A	28	25	E	E	17	16	G ₁₆	G	30	34	32	35	33	28	G ₂₂	27	30	A	A	A	24	16	E
12	E	E ₁₄ ^B	E	E ₁₂ ^B	E	E	E ₁₄ ^B	G	G	G	G ₂₅	G	34	32	29	G	25	E ₁₅ ^S	E ₁₅ ^S	E	24	20	E ₁₅ ^S	E ₁₅ ^S
13	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E	E ₁₅ ^S	E ₁₄ ^B	15	22	26	32	G ₂₅	G	G ₂₄	E ₁₉ ^R	32	29	22	E ₁₅ ^S	17	E	E	E	E ₁₅ ^S	
14	E ₁₄ ^B	E	E ₁₂ ^B	E ₁₅ ^S	E	E	E ₁₄ ^B	G	28	35	E ₃₂ ^K	E ₃₁ ^K	G	G	28	G	G	15	18	E	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E
15	E ₁₅ ^S	E ₁₅ ^S	E ₁₃ ^B	E ₁₅ ^S	E	E ₁₂ ^B	E ₁₂ ^B	G	G	34	40	33	34	G ₂₁	G ₂₀	25	G ₁₇	E	E ₁₅ ^S	E	E	E ₁₅ ^S	E ₁₂ ^B	E ₁₅ ^S
16	E ₁₅ ^S	E ₁₂ ^B	E ₁₃ ^B	E ₁₅ ^S	E ₁₂ ^B	E ₁₄ ^B	E ₁₂ ^B	G	28	E ₃₀ ^R	32	43	39	32	31	33	26	34	29	17	16	24	E	E
17	E	E ₁₅ ^S	E ₁₅ ^S	E	E	E ₁₅ ^S	E ₁₂ ^B	G	G	34	32	38	45	G	G	24	33	34	A	25	E	E	E ₁₅ ^S	19
18	20	E ₁₅ ^S	E ₁₅ ^S	E	E	E	E ₁₅ ^S	G	28	33	G	G	36	G	E ₂₂ ^K	G ₁₇	20	E	E	E ₁₆ ^S	E ₁₅ ^S	E ₁₃ ^B	E ₁₅ ^S	18
19	E	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₃ ^B	E ₁₅ ^S	E ₁₅ ^S	G	G	30	33	33	34	31	G ₁₉	G	25	23	E	16	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S
20	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	16	20	E	28	G ₁₆	G ₁₉	32	31	32	G ₁₉	G	28	22	E ₁₄ ^B	E _{14^B}	E _{14^B}	E ₁₂ ^B	E ₁₅ ^S	E ₁₅ ^S	E
21	E	E	E ₁₂ ^B	E ₁₂ ^B	E ₁₄ ^B	E ₁₅ ^S	E ₁₂ ^B	G	G	G	31	E ₃₁ ^K	34	E ₃₁ ^R	40	G	G	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E	E ₁₅ ^S
22	E ₁₅ ^S	E	E ₁₂ ^B	E ₁₄ ^B	E ₁₂ ^B	E ₁₄ ^B	E _{14^B}	G	G	34	36	37	36	36	30	26	21	16	E ₁₅ ^S	26	E	19	18	E
23	E ₁₅ ^S	E ₁₅ ^S	E	E	E ₁₂ ^B	17	E ₁₅ ^S	G	G	30	35	42	40	E _{30^R}	31	27	G	E ₁₄ ^B	E ₁₃ ^B	E ₁₅ ^S	E ₁₄ ^B	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S
24	E ₁₂ ^B	E ₁₅ ^S	E ₁₃ ^B	E ₁₂ ^B	E ₁₂ ^B	E	E ₁₄ ^B	G	31	32	G	34	41	55	32	30	24	26	15	16	E	E ₁₅ ^S	E ₁₅ ^S	E
25	E	16	16	E	E	E ₁₅ ^S	E ₁₄ ^B	20	G	27	G ₂₇	G	G ₂₂	G ₁₉	G	24	25	E	E	E	E ₁₅ ^S	E ₁₅ ^S	E	E
26	E ₁₅ ^S	E ₁₅ ^S	E	E	E ₁₂ ^B	E ₁₄ ^B	E _{14^B}	E ₁₉ ^R	G	G ₂₂	G	G	G	G ₂₆	31	G ₂₀	G	20	22	18	19	16	E ₁₅ ^S	E ₁₅ ^S
27	E	E ₁₅ ^S	E	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	G	G	G	G	G	36	31	30	G	25	16	E	E	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S
28	E ₁₅ ^S	E ₁₅ ^S	E	16	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	G	G	G	G	34	33	30	G	26	G	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E	E ₁₅ ^S
29	E ₁₅ ^S	E ₁₅ ^S	E ₁₃ ^B	E ₁₅ ^S	E ₁₃ ^B	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^B	E ₂₇ ^B	G	E ₃₃ ^B	35	35	32	30	G	E ₁₅ ^B	E ₁₅ ^S	18	E	E ₁₅ ^S	E ₁₅ ^S	E ₁₅ ^S	E
30	E	19	E ₁₃ ^B	E	E	E	E	G	G	G	32	G	32	G	32	29	21	19	23	C	E	E	E ₁₅ ^S	E ₁₅ ^S
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	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30
MED	15	E ₁₅	E ₁₄	E ₁₄	E ₁₂	E ₁₄	E ₁₄	G	G	31	30	32	34	30	30	26	22	16	15	E ₁₅	15	15	E ₁₅	15
UQ	16	16	E ₁₅	E ₁₅	E ₁₄	E ₁₅	E ₁₅	16	28	34	34	36	36	32	32	28	25	23	18	18	16	17	E ₁₅	E ₁₅
LQ	E	E ₁₂	E ₁₂	E	E	E	E ₁₂	G	G	E ₁₉	G	G	G	G ₂₇	G ₂₀	G	17	E ₁₄	E ₁₃	E	E ₁₂	E ₁₅	E ₁₂	E

NOV. 1973

FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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	S 12	S 13	E 15	E 15	E 15	S 15	S 15	S 15	S 14	S 14	S 15	S 16	S 15	S 15	S 14	S 15	S 12	E 15	E 15	E 15	S 12	S 12	E 15
2	E 15	S 13	E 15	E 15	S 14	E 15	S 15	S 15	S 12	S 15	S 15	S 15	S 15	S 15	S 19	S 15	S 14	S 13	E 15	E 15	S 12	S 13	E 15	S 12
3	S 12	S 12	S 12	E 15	E 15	E 15	S 15	S 12	S 14	S 14	S 31	S 22	S 18	S 15	S 15	S 13	S 12	S 13	S 12	S 14	E 15	E 15	E 15	E 15
4	S 13	S 14	S 14	S 13	S 14	S 14	S 14	S 12	S 12	S 15	S 15	S 15	S 15	S 15	S 15	S 12	S 15	S 14	E 15	E 15	E 15	S 13	E 15	E 15
5	E 15	E 15	E 15	S 12	E 15	E 15	E 15	S 16	S 15	S 15	S 15	S 15	S 15	S 14	S 15	S 12	S 12	S 14	E 15	S 14	E 15	E 15	E 15	S 12
6	E 15	S 14	S 12	S 12	S 14	S 12	S 14	S 14	S 12	S 14	S 18	S 16	S 15	S 15	S 15	S 14	S 13	S 13	E 15	E 15	S 14	S 14	E 15	E 15
7	S 14	S 14	E 15	S 14	E 15	E 15	S 14	S 14	S 14	S 14	S 15	S 19	S 25	S 15	S 15	S 15	S 15	S 13	S 13	E 15	E 15	E 15	E 15	E 15
8	E 15	E 15	E 15	E 15	E 15	E 15	S 15	S 13	S 15	S 15	S 18	S 25	S 23	S 22	S 15	S 15	S 15	S 13	S 13	E 15	E 15	E 15	E 15	E 15
9	S 15	S 13	E 15	E 15	E 15	S 13	S 15	S 15	S 15	S 15	S 16	S 15	S 19	S 14	S 14	S 14	S 14	S 13	S 12	S 14	E 15	E 15	E 15	E 15
10	E 15	S 12	S 14	E 15	S 12	E 15	S 16	S 12	S 14	S 15	S 14	S 16	S 18	S 19	S 15	S 16	S 15	S 14	E 15	E 15	E 15	S 14	E 15	E 15
11	E 15	S 13	S 14	S 13	S 13	S 12	S 12	S 12	S 14	S 15	S 15	S 15	S 15	S 16	S 14	S 15	S 14	E 15	S 14	E 15	E 15	E 15	S 13	S 14
12	S 14	S 14	S 12	S 12	S 12	S 14	S 14	S 13	S 14	S 15	S 15	S 16	S 15	S 15	S 14	S 14	S 14	E 15	E 15	S 14	E 15	E 15	E 15	E 15
13	E 15	E 15	E 15	E 15	E 15	S 14	S 12	S 12	S 15	S 15	S 15	S 16	S 14	S 13	S 14	S 14	S 14	E 15	E 15	E 15	E 15	S 14	E 15	E 15
14	S 14	S 13	S 12	E 15	E 15	S 12	S 14	S 13	S 12	S 14	S 16	S 15	S 15	S 15	S 15	S 15	S 15	S 12	S 14	S 12	E 15	E 15	E 15	E 15
15	E 15	E 15	S 13	E 15	E 15	S 12	S 12	S 14	S 14	S 14	S 16	S 15	S 16	S 14	S 16	S 14	S 14	E 15	E 15	E 15	E 15	E 15	S 12	E 15
16	E 15	S 12	S 13	E 15	S 12	S 14	S 12	S 14	S 12	S 15	S 15	S 14	S 16	S 15	S 14	S 14	S 12	E 15	E 15	E 15	E 15	E 15	E 15	E 15
17	E 15	E 15	E 15	E 15	E 15	E 15	S 12	S 14	S 14	S 15	S 15	S 15	S 16	S 15	S 16	S 15	S 15	S 14	S 15	E 15	E 15	E 15	E 15	E 15
18	S 13	E 15	E 15	E 15	E 15	E 15	E 15	E 15	S 15	S 15	S 15	S 16	S 16	S 16	S 15	S 13	S 15	E 15	E 15	E 15	E 15	S 13	E 15	E 15
19	E 15	E 15	E 15	E 15	E 15	S 13	E 15	E 15	S 12	S 12	S 15	S 15	S 15	S 15	S 16	S 16	S 15	S 14	E 15	E 15	E 15	E 15	E 15	E 15
20	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15	S 13	S 13	S 14	S 16	S 15	S 15	S 15	S 16	S 15	S 14	S 14	S 14	S 12	E 15	E 15	E 15
21	E 15	S 12	S 12	S 12	S 14	E 15	S 12	S 15	S 14	S 15	S 14	S 15	S 15	S 20	S 12	S 14	S 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15
22	E 15	E 15	S 12	S 14	S 12	S 14	S 14	S 15	S 14	S 14	S 14	S 15	S 14	S 14	S 15	S 14	S 15	S 14	E 15	S 14	E 15	E 15	S 12	E 15
23	E 15	E 15	E 15	E 15	S 12	S 12	E 15	S 14	S 15	S 14	S 15	S 15	S 16	S 16	S 16	S 15	S 14	S 14	S 13	E 15	S 14	E 15	E 15	E 15
24	S 12	E 15	S 13	S 12	S 12	E 15	S 14	S 16	S 15	S 15	S 16	S 16	S 15	S 15	S 19	S 14	S 14	S 12	S 12	E 15	E 15	E 15	E 15	E 15
25	S 12	S 12	S 12	E 15	E 15	E 15	S 14	S 14	S 14	S 14	S 15	S 16	S 15	S 14	S 15	S 14	S 14	S 12	S 14	S 14	E 15	E 15	E 15	E 15
26	E 15	E 15	S 14	S 14	S 12	S 14	S 14	S 15	S 14	S 15	S 15	S 16	S 15	S 15	S 16	S 16	S 15	S 15	S 13	E 15	E 15	E 15	E 15	E 15
27	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15	S 15	S 15	S 15	S 15	S 16	S 16	S 14	S 16	S 15	S 13	S 13	E 15	E 15	E 15	E 15	E 15
28	E 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15	S 13	S 15	S 13	S 15	S 22	S 16	S 15	S 15	S 15	S 16	E 15	E 15	E 15	E 15	E 15	E 15
29	E 15	E 15	S 13	E 15	S 13	E 15	E 15	S 15	S 27	S 16	S 33	S 26	S 19	S 22	S 19	S 16	S 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15
30	E 15	S 13	S 13	E 15	E 15	E 15	E 15	S 12	S 15	S 24	S 25	S 26	S 15	S 16	S 15	S 14	S 15	S 13	S 13	C	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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30
MED	E 15	S 13	S 13	E 15	E 15	E 15	S 14	S 14	S 14	S 15	S 15	S 15	S 15	S 15	S 15	S 14	S 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15
UQ	E 15	E 15	E 15	E 15	E 15	E 15	E 15	S 15	S 15	S 15	S 16	S 16	S 16	S 16	S 16	S 15	S 15	E 15	E 15	E 15	E 15	E 15	E 15	E 15
LQ	S 13	S 13	S 13	S 13	S 12	S 13	S 14	S 13	S 14	S 14	S 15	S 15	S 15	S 15	S 15	S 14	S 14	S 13	S 13	S 13	E 15	E 15	E 15	E 15

NOV. 1973

F-MIN (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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	295	320	R	290	310	325	330	335	350	320	345	320	J ₃₁₅	R	J ₃₄₀	R ₃₂₅	370	345	295	305	315	295	295	285	
2	275	300	300	330	355	295	335	355	350	340	350	330	330	J ₃₄₀	R ₃₄₅	360	355	345	295	295	300	300	305	290	
3	285	280	290	285	300	300	320	350	350	350	335	310	330	350	340	335	335	345	320	305	290	295	275	280	
4	265	285	305	290	310	A	310	340	350	350	350	340	R	J ₃₁₅	R	A	345	345	R	A	A	A	290	275	
5	290 ^R	270 ^K	305	335	325	275	290 ^K	I ^H ₃₃₅	J ₃₄₅	320	J ₃₅₀	340	J ₃₃₀	330	320	345	360	345	295	290	295	295	290	280	
6	305	315	320	270 ^F	310	280	310	345	355	355	305	335	330	I ^A ₃₂₀	340	345	340	355	290	305	325	295	280	295	
7	295	295	290	280	295	310	325	345	350	335	325	J ₃₂₀	I ^R ₃₁₅	355	350	335	360	330	285	270	290	325	300	260	
8	285	290	295	285	345	335	315	335 ^R	J ₃₅₀	R	J ₃₄₀	340	295	J ₃₃₀	R ₃₄₅	355	360	345	325	295	295	300	280	295	
9	295	270	285	295	315	365	355	355	345	350	340	350	335	360	360	340	355	345	315	305	330	305	295	280	
10	290	305	300	295	350	305	335	360	345	355	330	J ₃₄₀	330	J ₃₄₀	345	J ₃₇₅	H ₃₇₅	H ₃₄₅	I ^R ₃₃₅	295	285	300	265 ^S	I ^A ₂₈₀	
11	A	A	295	345	340	290	325	345	355	345	345	330	R	330	320	350	345	345	355	A	A	I ^A ₂₉₀	290	285	275 ^F
12	280	270 ^F	290 ^F	300	330	355	325	360	360	335	J ₃₃₅	335	J ₃₂₅	R ₃₅₅	355	360	355	335	325	300	290	285 ^R	295	280	
13	285	280	285	305	320	315	330	355	340	J ₃₄₀	345	365	325	320	325	365	370	350	330	305	295	310	290	300	
14	275	300	295	295	290	325	330	360	355	350	330	340	J ₃₆₀	345	365	345	355	340	335	340	305	310	290	270	
15	295	305	300	295	295	295	335	375	350	355	340	320	325	355	330	350	360	370	305	295	295	285 ^F	295	300	
16	290	285	280	310	330	320	325	360	340	345	R ₃₄₀	355	330	J ₃₃₀	340	H ₃₁₅	370	335	240	310	305	300	270	260	
17	285	270	295	305	320 ^S	320	310	375	355	330	310	J ₃₄₅	R	J ₃₃₀	J ₃₅₀	345	345	J ₃₃₀	I ^A ₃₁₀	305	320	280	285	295	
18	305	280	255	335	290	310	305	355 ^R	345	330	J ₃₃₀	340	J ₃₃₅	335	335 ^R	345	365	330	290	320	J ₃₃₅	310	270	305	
19	300 ^R	310	290	290	310	320	325	345	335 ^R	350 ^K	J ₃₅₀	335	345	R	J ₃₄₅	I ^R ₃₅₀	360	360	315	290	I ^R ₃₂₅	320	315	300	
20	305	305	295	305	335	300	355	J ₃₆₅	345	I ^R ₃₅₀	J ₃₄₅	255	335	345	370	340	365	365	280 ^H	320	305	310	300	285	
21	295	295	315	330	285	290	310	360	350	345	325	J ₃₅₅	310	330	330	350 ^K	355	335	305	340	290	295	J ₃₀₅	U ^S ₂₉₀	
22	300 ^F	320	280 ^F	300 ^F	285 ^F	320	320	380	340	350	R	345	325	350	345	340	345	340	305	305	305	290	280 ^F	280 ^F	
23	285 ^F	295 ^F	J ₃₀₅	355	355	300	305	350	355 ^R	345	J ₂₉₅	340	350	340	355	345	325	345	340	300	315	285	270	260	
24	270	265	275	265	325	315	310	350	380	355	J ₃₄₀	330	J ₃₃₀	J ₃₂₀	J ₃₅₀	355	355	330	330	345	285	270	300	250 ^F	
25	275	265 ^F	285 ^F	280	295	260	J ₂₉₅	325	325	325	J ₂₉₀	325	345	315	340	350	355	330	265 ^F	300 ^F	335	315	260 ^S	280	
26	275	270 ^F	270 ^F	295 ^F	325	290	310	330 ^R	350	330	340	J ₃₅₀	325	325	345	340	350	305	320	I ^R ₂₉₀	345	275	300	270	
27	265	265	290	320	J ₂₉₅	275	305	J ₃₂₅	345	R	R	R	335	J ₃₅₀	350	360	345	335	315	315	295	325	305	295	
28	295	295	305	280	295	295	315	355	335	J ₃₄₀	335	345	J ₃₂₀	J ₃₂₅	330	340	350	350	325	335	275	290	275	270	
29	270	295	255	305	315	345	330	360	355	340	350	335 ^R	330	345	J ₃₄₀	355	350	320	295	335	335	290	310	325	
30	345	290	290	290	295	345	325	360	340	350	345	345	330	J ₃₄₀	345	360	360	315	345	C	285	305	290	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	29	29	29	30	30	29	30	30	30	28	28	29	28	28	29	29	30	30	28	27	29	29	30	30	
MED	290	290	290	295	312	310	322	355	350	345	340	340	330	338	345	345	355	345	312	305	300	295	290	280	
UQ	295	300	300	310	330	320	330	360	355	350	345	345	335	348	350	355	360	345	325	318	320	310	300	295	
LQ	275	270	285	290	295	295	310	345	345	335	330	330	325	325	340	340	345	330	295	295	290	290	280	275	

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M(3000)F2 (0.01)

IONOSPHERIC DATA

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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									
2										L	L	L	L	L	L	L								
3										L	L	L	L	410	L	L	L							
4										L	L	L	L	370	A	A	A							
5										L	L	L	L	L	L	L								
6										L	A	A	A	A	L	L								
7										A	L	A	L	L	A	L								
8										L	A	L	L	L	L	A	L							
9										L	L	L	L	L	275	L	L							
10										L	L	L	L	L	365	L	L							
11										L	L	L	L	L	L	U L 330	L							
12										L		365 380	H	L	L	L								
13										L	L	L	L	400	L	L	L							
14										L	L	375	L	385	L	395	L							
15										L	L	L	L	L	L	L	L							
16										L	395	A	L	L	365	L								
17										A	L	L	A	L	400	L								
18										L	L	L	L	L	L	L								
19										L	L	L	L	L	L	L								
20										L	L	L	L	L	L	L								
21										L	L	L	L	L	L	A	L							
22											L	L	L	L	L	L								
23										L	L	L	L	L	L	L	L							
24											410	L	L	L	A	L								
25										L	L	L	L	L	L	L								
26										L	L	L	L	L	L	L	L							
27										L	L	L	L	L	L									
28										L	L	L	L	L	460	L								
29										L	L	L	L	L	L	L								
30										L	L	L	L	L	L	L								
31										430	L	L	L	L	L	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										3	3	1	4	5	2									
MED										410	375	380	392	365	362									
UQ										420	385		405	400										
LQ										410	370		378	365										

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H*F2 (KM)

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										250	245	230	270	220	270									
2									230	240	230	240	255	255	240	230								
3									230	240	240	240	260	230	230	230								
4									240	240	230	230	300	260	240	A								
5									250	250	240	260	255	260	235									
6									230	250	250	255	I A 250	245	240									
7									240	255	250	260	240	240	230									
8									240	240	240	240	290	250	250	230								
9									240	245	260	240	260	250	240	225								
10									235	250	255	250	255	240	215									
11									240	240	250	260	260	250	230									
12									230		250	250	270	240	230									
13									250	230	230	240	240	240	225									
14									240	250	260	250	240	240	240	240								
15									230	245	250	260	240	250	225									
16									230	245	230	275	260	240										
17									235	260	240	250	250	240										
18									230	250	240	240	250	260	240									
19									240	240	250	240	250	240										
20									230	250	240	250	250	250										
21									230	250	240	240	250	250	230									
22										260	220	260	240	240	240									
23									220	220	250	250	240	240	250	230								
24									230	250	260	255	E A 260	240										
25									260	260	260	240	250	230										
26									230	250	250	250	250	250	240	240								
27									240	240	220	250	230	240										
28									220	235	240	260	250	260	250									
29									230	240	240	250	250	240	230									
30									210	250	240	260	250	240										
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									13	28	30	30	30	30	29	16								
MED									230	240	250	245	255	250	240	230								
UQ									240	248	250	250	260	255	250	238								
LQ									230	230	240	240	250	240	240	228								

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H*F2 (KM)

IONOSPHERIC DATA

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H*F (KM)

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	250	E A 350	290	270	240	240	230	240	220	200	205	H 195	230	220	225	210	210	220	260	260	270	255	290
2	310	250	250	230	210	300	245	210	210	215	220	230	195	245	230	205	220	205	240	250	240	260	280	290
3	A 310	300	290	280	260	250	220	240	240	220	R 220	200	200	230	220	220	230	210	220	250	270	250	250	305
4	300	I A 280	250	E A 310	230	I A 270	270	230	225	220	230	200	H 190	I A 245	A	A	210	210	260	A	A	A	300	320
5	320	310	260	240	240	300	220	230	240	I A 250	I A 230	230	205	210	230	230	220	190	155	300	350	270	290	320
6	300	240	220	290	250	270	250	220	220	220	A	A	A	I A 215	240	240	205	200	220	250	220	250	A	290
7	280	300	275	310	255	270	245	230	220	I A 240	I A 240	I A 250	240	250	I A 230	210	220	200	220	250	290	230	255	305
8	300	300	250	250	240	220	250	230	240	I A 230	210	210	210	240	I A 240	230	220	200	230	290	250	260	300	300
9	300	300	290	260	240	230	200	205	235	230	230	225	220	240	230	225	210	210	220	260	240	270	280	310
10	290	275	260	255	210	245	225	220	230	230	205	200	I A 245	245	220	210	H 190	H 170	A 280	250	300	300	A	A
11	A	A	310	210	205	A 340	240	230	230	220	230	205	220	220	210	210	210	240	A	A	A	A 330	270	310
12	320	300	275	260	230	200	200	210	220	200	H 220	190	H 220	240	225	220	220	200	220	240	310	A 290	290	300
13	290	290	290	275	240	240	220	220	220	230	220	200	200	200	240	230	205	210	220	250	260	255	275	290
14	280	270	280	300	290	220	230	210	230	245	210	205	190	220	205	200	220	210	205	220	240	230	275	310
15	290	270	280	280	250	270	220	205	220	230	I A 210	200	H 190	245	205	230	200	200	260	270	240	255	275	275
16	270	280	280	250	210	245	230	220	230	220	I A 200	205	I A 235	220	I A 230	H 230	220	A 250	A 250	A 250	250	A 300	295	330
17	290	300	290	270	245	250	220	200	220	I A 200	205	240	I A 210	200	230	230	230	250	I A 280	280	230	290	300	300
18	300	310	300	240	250	230	280	220	205	210	220	240	205	240	240	230	200	210	290	245	220	230	290	270
19	285	260	275	280	250	260	240	205	240	230	240	235	230	200	240	230	210	220	240	280	235	240	260	275
20	290	290	280	280	250	A 300	250	220	230	230	210	230	200	210	200	230	205	200	H 260	245	230	220	280	310
21	300	260	245	230	220	270	250	220	230	220	210	220	200	200	I A 230	220	210	200	245	220	220	270	260	300
22	270	220	280	255	310	240	255	210	205	H 230	260	I A 235	220	245	220	225	220	205	220	250	A 240	290	290	310
23	290	255	260	220	195	270	255	220	205	205	200	I A 200	I A 210	205	H 210	230	220	210	210	220	220	260	310	320
24	315	300	300	295	250	245	245	200	H 220	210	220	225	A	A	240	240	205	245	220	205	260	280	245	310
25	320	350	310	320	290	310	250	250	220	210	200	245	240	200	220	230	220	200	240	250	200	220	310	305
26	290	310	310	260	220	220	240	240	230	210	200	200	240	230	240	240	215	230	240	230	240	300	280	320
27	300	300	290	240	250	300	290	240	240	230	220	200	240	230	240	240	230	205	240	240	260	250	250	300
28	290	300	290	300	250	250	250	230	220	235	205	240	220	200	220	240	210	200	240	220	280	270	310	330
29	310	290	300	290	250	230	200	220	210	230	230	240	240	240	230	240	230	200	300	240	210	260	260	260
30	250	300	310	300	280	240	230	210	230	210	210	200	H 200	190	H 230	230	205	240	230	I C 220	260	250	280	280
31																								
CNT	29	29	30	30	30	30	30	30	30	30	28	29	28	29	29	29	30	30	29	28	28	29	28	29
MED	290	290	280	268	250	250	240	220	228	220	215	220	210	230	230	230	212	208	240	250	240	260	280	305
UQ	300	300	295	290	250	270	250	230	230	230	230	235	232	240	240	230	220	210	250	255	260	280	292	310
LQ	290	270	260	250	230	240	220	210	220	210	205	200	200	205	220	220	205	200	220	235	230	250	260	290

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H^oES (KM)

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	100	100	100	100	100	100	B	110	110	110	G	105	G	100	100	145	125	115	S	110	S	105	B	S
2	105	B	S	100	100	S	b	130	115	110	G	100	100	100	110	110	140	110	S	S	B	105	100	100
3	100	100	100	100	100	S	100	G	150	G	110	110	105	105	160	140	125	100	100	100	S	S	S	S
4	105	105	100	100	100	100	100	100	150	120	110	G	G	140	130	110	110	110	110	105	105	105	130	100
5	100	100	S	100	100	100	100	G	155	150	130	110	110	105	130	G	100	100	100	120	110	110	110	105
6	105	100	100	100	100	100	100	120	130	110	110	110	110	110	110	110	110	100	S	S	B	100	100	100
7	100	100	S	100	100	100	100	G	G	110	110	105	105	105	105	105	100	100	B	S	S	110	S	100
8	100	100	100	100	100	100	100	G	G	110	110	110	110	110	110	110	100	B	B	100	100	S	S	S
9	S	100	100	S	100	100	100	G	G	170	105	100	105	100	100	100	100	100	100	100	100	100	100	100
10	100	B	B	S	B	100	100	100	G	180	G	G	140	130	120	G	G	100	100	170	150	100	100	120
11	115	115	110	115	105	105	105	115	G	130	115	110	105	105	105	100	105	105	100	100	100	100	100	100
12	105	B	115	B	105	100	B	G	G	G	105	G	170	120	175	G	115	S	S	105	100	120	S	S
13	S	S	S	100	S	B	105	120	120	170	105	G	100	100	175	155	160	S	100	100	140	130	105	S
14	B	100	B	S	100	100	B	G	160	110	110	110	G	G	110	G	G	100	100	100	S	S	S	105
15	S	S	B	S	100	B	b	G	G	120	110	110	105	100	100	150	100	100	S	100	100	S	B	S
16	S	B	B	S	B	B	B	G	150	155	110	100	100	170	100	100	100	100	115	90	105	100	100	100
17	100	S	S	100	100	S	B	G	G	130	110	105	100	G	G	100	100	100	100	100	100	100	S	100
18	100	S	S	100	100	100	S	G	140	130	G	G	100	G	100	100	150	100	100	S	S	B	S	100
19	100	S	S	S	B	S	S	G	G	120	160	100	140	100	100	G	100	100	100	100	S	S	S	S
20	S	S	S	S	100	100	100	100	100	100	130	120	115	100	G	110	100	B	B	B	B	S	S	100
21	100	100	B	B	B	S	B	G	G	G	110	110	130	110	105	G	G	S	S	S	S	S	100	S
22	S	100	B	B	B	B	B	G	G	170	130	125	120	120	115	120	140	115	S	110	110	100	100	100
23	S	S	100	100	B	105	S	G	G	140	120	110	110	110	105	110	G	B	B	S	B	S	S	S
24	B	S	B	B	B	105	B	G	170	160	G	130	115	110	110	115	110	110	105	105	100	S	S	105
25	105	100	100	100	100	S	B	140	G	110	110	G	105	100	G	110	110	110	105	150	S	S	100	100
26	S	S	100	100	B	B	B	150	G	110	G	G	100	100	100	100	150	110	100	100	100	S	S	S
27	100	S	100	S	S	S	S	G	G	G	G	G	145	140	100	G	115	100	100	100	S	S	S	S
28	S	S	100	100	S	S	S	G	G	G	G	120	110	110	G	110	G	S	S	S	S	S	100	S
29	S	S	B	S	B	S	S	B	B	G	B	150	150	150	110	G	B	S	100	150	S	S	S	100
30	100	100	B	100	100	100	100	G	G	G	140	G	110	G	155	160	160	150	140	C	100	100	S	S
31																								
CNT	18	14	13	17	18	16	12	10	12	23	21	21	27	26	26	22	24	22	18	21	15	15	13	17
MED	100	100	100	100	100	100	100	118	145	120	110	110	110	108	110	110	110	100	100	100	100	100	100	100
UQ	105	100	100	100	100	100	100	130	152	152	120	110	118	120	120	120	132	110	105	110	108	108	100	100
LQ	100	100	100	100	100	100	100	100	118	110	110	105	105	100	100	100	100	100	100	100	100	100	100	100

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TYPES OF ES

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	F3	F3	F1	F3	F2	F1		C1	C1	C2	L1		L1	L1	HL11	HL11	C3		F1		F2				
2	F1			F1	F1		H1	H1	C1	C1	L1		L1	L1	C1	C2	H1	C3				F2	F2	F2	
3	F4	F2	F2	F2	F1		L1		H1		C1	C2	L1	L1	HL11	HL21	HL22	LH21	FF13	F1					
4	F2	F3	F4	F3	F3	F5	F3	L3	HL22	H1	C2			H1	H2	C2	C2	L2	F3	F3	F5	F4	FF21	F3	
5	F4	F2		F3	F1	F1	F1		H1	H1	HC11	C2	L1	L1	HL11		L3	F1	F1	FF11	FF12	F2	F1	F3	
6	F4	F4	F4	F3	F2	F2	L1	C2	H1	C1	C2	C2	C2	C2	C2	C1	L1	F1				F2	F1	F1	
7	F1	F2		F2	F1	F2	L3			C2	C1	C2	C2	C2	C1	L1	L1	L1				F1		F1	
8	F1	F1	F1	F1	F1	F1	L1			C2	C1	C2	C1	C1	C2	C1	C2			F3	F2				
9		F1	F1		F2	F2	L2			HL11	L1	L2	L1	L2	L2	L2	L2	F2	F3	F2	F2	F1	F1	F1	
10	F1				F1	L1	L1			H1			HC11	HC21	C1			L1	F3	F1	FF11	F3	F1	FF23	
11	F4	FF51	F3	F1	F2	F3	F3	L1		H2	C2	C1	L2	L2	L1	L1	L2	F3	F3	F4	F3	F3	F3	F3	
12	F1		F1		F2	F1					L1		HL11	HL11	HL12		C2			F2	F3	FF22			
13				F1			L1	C2	C1	H1	L1		L1	L1	HL11	H1	H1		F2	F1	F1	F1	F1		
14		F1			F1	F1			H1	C2	C1	C1			L1			F1	F3	F2				F1	
15					F1					H1	C2	C1	L2	L2	L1	HL11	L1	F1		F1	F1	F1			
16									H2	H1	L2	L2	L2	HL12	L2	L2	L2	F3	FF12	F2	FF21	F2	F1	F1	
17	F1			F1	F1						C1	C2	C2			L1	L3	L2	F1	F2	F1	F2		F1	
18	F1			F1	F1	F1			H1	H1			C1		L1	L1	H1	F1	F1					F2	
19	F2									H1	HL11	L1	HL11	L1	L1		L2	L2	F1	F1					
20					F2	F3	F2	L3	L1	L1	HL11	HL11	CL11	C1		L1	L1							F2	
21	F1	F1									L1	L1	HL11	L1	L2	L2								F1	
22		F1								H1	H1	HL21	HL12	HL21	C1	CL11	H1	F1		F3	FF21	F4	F2	F2	
23			F2	F1		F3				H1	C2	C2	C1	L1	L2	L2									
24					F1				H1	H1		H1	C2	C2	C1	C3	C2	F2	F3	F3	F2			F1	
25	F2	F3	F3	F3	F1			H2		C1	L1		L1	L1		L1	L2	F1	F1	F1				F1	
26			F1	F1				H1		L1			L1	L2	L2	L2	H1	F3	F1	F1	F3				
27	F1		F1										H1	HL11	L1		C2	F1	F1	F1					
28			F1	F2							H1		C1	C1		C1								F1	
29											H1		H1	H1	C1					F1	F1			F1	
30	F1	F2		F1	F1	F1					H1		C1		H1	H2	H1	F2	F2		F2	F1			
31																									
CNT																									
MED																									
UQ																									
LQ																									

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TYPES OF ES

IONOSPHERIC DATA

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HPF2 (KM)

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	300	300	R	310	300	290	260	270	260	290	270	280	J ₃₀₀ R	R	J ₂₈₀ H	280	220	250	300	300	310	310	310	310
2	350	300	305	260	250	340	260	240	250	250	240	250	280	J ₂₇₀ R	260	250	240	250	300	300	300	310	300	330
3	310	350	340	340	300	300	270	250	250	250	260	300	290	250	260	260	260	240	290	300	340	300	340	360
4	380	340	310	A	280	A	310	260	260	260	250	260	R	J ₃₀₀ R	R	A	250	250	R	A	A	A	350	380
5	360 ^R	380 ^R	300	260	270	360	290 ^K	I ₂₇₀ ^K	J ₂₆₀ R	280	J ₂₆₀ R	260	J ₃₀₀ R	275	290	250	230	240	310	330	350	310	340	350
6	310	290	270	340 ^F	280	350	300	250	230	250	300	270	280	I ₂₇₀ A	260	260	240	240	320	300	280	300	A	330
7	320	310	310	350	310	300	290	260	240	260	280	J ₂₈₀ R	I ₃₀₀ R	260	260	260	255	260	260	300	350	260	300	360
8	350	350	300	300	270	260	260	270 ^R	J ₂₆₀ R	R	J ₂₆₀ R	260	310	J ₂₉₀ R	260 ^K	255	260	270	280	310	290	300	360	360
9	360	360	300	300	280	260	250	250	260	250	260	250	270	250	250	260	240	250	290	290	250	300	320	350
10	320	310	310	300	240	280	260	240	250	250	270	J ₂₇₀ R	270	J ₂₆₀ R	260	J ₂₂₀ H	215 ^H	230 ^H	I ₂₆₀ R	320	330	310	370 ^S	I ₃₇₀ A
11	A	A	320	220	230	320	280	250	250	250	260	290 ^R	290 ^R	300	250	260	250	240	A	A	I ₃₂₀ A	350	310	350 ^F
12	350	350 ^F	315 ^F	300	280	230	260	230	250	260	J ₂₆₀ R	260	J ₂₈₀ R	250	250	230	240	260	260	290	310	330 ^R	340	330
13	320	330	340	305	280	300	250	220	250	J ₂₆₀ R	250	240	260	290	280	240	230	240	280	300	320	300	330	320
14	330	310	315	330	320	280	290	230	250	260	270	260	J ₂₅₀ R	260	230	260	250	250	240	250	300	290	320	350
15	310	310	310	340	300	310	250	220	250	250	260	280	285	250	290	250	230	220	300	310	300	320 ^F	340	310
16	320	320	320	290	250	300	280	240	260	250 ^R	250 ^R	240	280	J ₂₇₀ R	250	300 ^H	240	250	A	290	295	310	350	380
17	340	350	320	310	290 ^S	300	280	220	240	260	300	J ₂₅₅ R	R	J ₂₇₀ R	J ₂₅₀ R	250	260	J ₂₆₀ R	I ₃₃₀ A	300	280	360	360	360
18	340	360	360	260	280	280	360	250 ^K	250	280	J ₂₆₀ R	260	J ₂₉₀ R	300	260 ^K	260	250	280	315	280	J ₂₆₀ R	290	350	300
19	300 ^R	300	310	310	290	300	260	250	260 ^R	260 ^R	J ₂₆₀ R	260	260	R	J ₂₆₀ R	I ₂₆₀ R	250	260	280	300	I ₂₇₀ R	260	300	300
20	340	320	310	300	280	340	290	J ₂₃₀ R	260	I ₂₆₀ R	J ₂₆₀ R	260	260	280	260	260	240	240	310 ^H	300	280	280	310	340
21	310	300	290	260	280	290	295	240	250	250	290	J ₂₅₀ R	270	280	280	250 ^R	250	250	290	250	290	290	J ₃₀₀ S	340 ^S
22	310 ^F	280	340 ^F	J ₃₀₀ F	360 ^F	290	300	220	250	250	R	240	290	250	250	260	250	250	295	290	300	340	340 ^F	350 ^F
23	350 ^F	315 ^F	J ₃₁₀ S	250	210	300	300	250	240 ^R	250	J ₃₂₀ R	260	250	260	260	250 ^K	290	250	250	260	260	300	340	370
24	360	350	340	340	290	280	300	250	220	250	J ₂₆₀ R	280	J ₂₈₀ R	J ₂₈₀ R	J ₂₅₀ R	260	230	270	270	240	340	340	300	290 ^F
25	360	395 ^F	360 ^F	360	350	350	J ₃₀₀ S	290	280	300	J ₃₃₀ R	290	260	280	260	250	240	250	340 ^F	300 ^F	250	300	350 ^S	350
26	350	380 ^F	J ₃₆₀ F	310 ^F	260	300 ^F	300 ^F	280 ^R	250	290	260	J ₂₆₀ R	290	260	260	260	280	290	280	I ₂₉₀ R	260	350	300	350
27	360	350	350	260	J ₂₈₀ R	350	300	J ₂₈₀ R	260	R	R	R	260	J ₂₄₀ R	260	250	260	260	280	270	300	300	300	360
28	300	360	300	360	300	300	300	260	260	J ₂₇₀ R	260 ^R	280	J ₃₀₀ R	J ₂₉₀ R	290	260	260	260	290	260	310	310	350	370
29	360	310	350	300	290	260	260	260	250	260	260	240 ^R	300	260	J ₂₅₅ R	260	260	260	350	290	260	300	300	300
30	260	350	360	360	300	250	260	260	250	250	260	250	280	J ₂₆₀ R	260	240	230	310	250	C	340	300	340	310
31																								
CNT	29	29	29	29	30	29	30	30	30	28	28	29	28	28	29	29	30	30	27	27	29	29	29	30
MED	340	330	315	300	280	300	285	250	250	260	260	260	280	270	260	260	250	250	290	300	300	300	340	350
UQ	350	350	340	340	300	310	300	260	260	260	270	280	290	280	260	260	260	260	305	300	320	310	350	360
LQ	310	310	310	290	270	280	260	240	250	250	260 ^R	250	265	260	250	250	240	240	275	285	280	300	300	320

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HPF2 (KM)

IONOSPHERIC DATA

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YPF2 (KM)

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	90	90	R	80	90	90	100	90	100	60	40	70	JR 60	R	JR 50	R 80	60	50	150	100	90	90	90	90
2	90	100	105	90	60	100	50	60	50	50	60	70	50	JR 50	80	40	60	50	110	100	90	90	100	110
3	85	100	100	70	100	100	80	50	50	50	60	80	50	60	60	70	50	60	110	100	100	100	110	100
4	110	100	90	A	80	A	90	50	40	100	80	100	R	JR 90	R	A	100	80	R	A	A	A	110	100
5	100	R 100	R 100	100	110	100	K 90	I 110	JR 100	80	JR 40	50	JR 60	45	50	50	70	60	130	80	90	90	100	110
6	90	60	90	F 100	80	90	60	50	60	50	100	50	40	I 70	A	50	50	60	60	130	100	70	100	A 110
7	80	90	90	100	90	60	70	50	60	60	60	JR 100	I 90	JR 100	100	100	95	100	100	90	110	100	90	100
8	90	110	90	90	90	100	100	R 90	JR 100	R	JR 100	100	100	JR 100	R	105	100	50	90	80	90	90	100	100
9	100	100	90	90	100	100	90	90	100	50	50	50	50	30	40	120	60	50	80	80	60	100	120	90
10	83	85	85	90	60	140	60	60	50	50	60	JR 50	40	JR 50	60	JR 40	H 80	H 70	I 90	80	110	90	S 80	I 100
11	A	A	80	80	70	80	70	50	50	70	50	R 60	R 60	60	45	40	60	60	A	A	I 110	90	130	F 90
12	90	F 100	F 85	90	80	70	100	70	50	60	JR 50	60	JR 60	50	50	70	60	100	110	110	90	R 110	100	110
13	120	120	100	90	60	70	70	80	60	JR 50	60	50	100	60	80	60	40	60	120	100	130	95	110	80
14	110	50	80	70	80	80	70	70	50	40	50	50	JR 50	60	40	50	50	70	70	60	100	80	90	90
15	90	85	70	100	100	85	60	50	50	45	50	60	50	50	40	50	60	80	100	90	100	F 90	100	90
16	80	125	70	70	70	90	70	40	50	R 50	R 50	60	40	JR 50	60	H 60	50	50	A	70	100	90	100	80
17	100	90	80	80	S 60	50	80	55	60	100	90	JR 95	R	JR 100	JR 90	90	100	JR 100	I 95	A	90	100	100	100
18	100	100	100	100	100	90	100	R 90	80	100	JR 100	100	JR 90	90	100	R 100	110	100	100	100	JR 100	100	110	90
19	R 90	90	100	100	90	90	100	90	100	R 80	JR 100	100	100	R	JR 100	I 100	90	100	100	90	I 100	100	90	90
20	90	100	80	90	100	100	90	JR 100	100	I 100	JR 100	100	100	100	100	100	100	60	H 90	100	90	80	85	100
21	85	100	60	50	70	70	50	40	50	60	60	JR 50	90	40	40	R 50	50	100	80	50	110	100	J 100	S 60
22	F 90	70	F 110	J 85	F 80	70	80	60	95	50	R	60	60	50	50	50	50	60	100	80	100	100	F 110	F 100
23	F 100	F 85	J 80	S 50	85	100	70	50	R 60	50	JR 90	50	50	50	50	R 50	50	50	50	100	120	100	110	100
24	90	100	100	110	50	80	80	50	50	50	JR 60	40	JR 60	JR 50	JR 50	60	50	60	70	60	100	130	100	105 F
25	90	F 100	F 80	90	90	120	J 100	S 60	65	60	JR 110	70	50	80	90	50	60	80	F 110	F 95	60	100	S 100	90
26	90	F 110	J 100	F 90	F 60	F 60	F 40	50	90	100	JR 90	100	100	100	100	100	90	100	100	I 105	100	110	90	110
27	100	90	110	100	JR 100	110	90	JR 100	100	R	R	R	100	JR 100	100	110	100	100	100	90	90	90	80	100
28	90	100	90	100	90	90	90	100	100	JR 90	100	R 80	JR 90	JR 90	100	100	100	100	90	100	100	100	110	90
29	100	120	110	90	90	100	100	100	110	100	100	100	R 90	100	JR 105	100	100	100	110	90	100	90	90	90
30	100	110	100	100	90	110	100	100	110	90	50	UR 50	60	JR 40	50	40	60	90	60	C	100	95	100	85
31																								
CNT	29	29	29	29	30	29	30	30	30	28	28	29	28	28	29	29	30	30	27	27	29	29	29	30
MED	90	100	90	90	88	90	80	60	60	60	60	60	60	60	60	60	60	70	100	90	100	100	100	100
UQ	100	100	100	100	90	100	100	90	100	90	100	R 95	90	95	100	100	100	100	110	100	100	100	110	100
LQ	90	90	80	80	70	80	70	50	50	50	50	50	50	50	50	50	50	60	90	80	90	90	90	90

NOV. 1973

YPF2 (KM)

IONOSPHERIC DATA

NOV. 1973

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 automatio		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	I S 30	30	33	28	28	J S 64	C 83	C	C	J C 122	96	C	132	124	79	66	52	31	34	C 36	34	33	
2	33	33	C 32	32	36	26	28	57	I C 78	77	78	C 88	95	99	C	C	77	72	53	S 35	43	43	38	30	
3	32	32	32	32	33	29	32	54	S 82	C 99	92	C 84	79	C 97	80	83	72	70	61	33	35	38	33	C 29	
4	S 32	S 38	J S 41	32	38	33	28	57	79	J C 90	V 79	72	76	I C 89	C	C	78	54	49	37	S 38	I S 46	S 46	S 38	
5	J S 40	S 38	S 42	I S 42	32	25	26	56	74	66	87	I C 96	I C 94	85	I C 104	I C 114	86	56	39	33	38	39	30	J C 33	
6	J S 33	S 36	S 35	F 34	37	25	28	55	J S 74	67	78	I C 86	C 96	92	I C 107	J C 125	J C 88	76	57	36	42	38	C 28	28	
7	31	32	30	30	34	25	24	53	J S 63	65	74	I C 89	J C 105	I C 98	92	72	66	57	47	S 30	37	46	33	27	
8	30	32	35	C 38	36	25	23	51	66	71	71	62	92	119	J C 122	J C 103	69	61	47	S 38	38	30	28	28	
9	30	31	32	36	43	23	23	43	55	59	72	76	76	C	72	64	69	58	46	30	32	33	28	29	
10	30	S 35	32	34	32	20	20	43	60	57	C	C	C	C	C	C	I C 59	I C 54	42	25	26	S 32	S 35	I A 33	
11	S 32	32	33	41	J S 43	26	22	47	S 62	61	65	72	72	64	C 89	C 98	62	61	39	I C 30	I A 32	33	I S 34	I S 32	
12	I A 34	S 34	C 33	F 33	41	33	21	44	52	55	73	81	76	U C 86	C 93	71	66	66	47	I A 32	I A 28	I A 27	25	27	
13	29	29	29	29	35	22	24	52	S 60	74	71	75	66	80	C 86	U C 84	65	53	37	31	35	33	28	28	
14	30	29	31	29	30	33	37	S 51	60	59	69	79	69	76	C 86	C 77	64	51	H 68	37	I C 42	35	H 27	26	
15	S 27	S 32	30	31	34	29	29	52	52	67	76	83	69	83	J C 92	90	58	H 60	34	S 32	44	33	26	28	
16	S 32	29	S 31	32	38	25	26	49	S 66	S 76	67	78	67	82	S 81	77	66	55	43	30	33	38	S 37	S 33	
17	33	32	31	30	31	29	28	49	60	65	70	94	91	68	I C 84	77	62	60	42	37	J C 46	38	34	33	
18	33	34	33	36	36	28	27	J S 54	56	66	80	I C 90	102	I C 97	C	97	67	57	43	46	49	33	26	29	
19	29	31	32	32	33	H 26	27	51	S 68	66	78	61	73	76	C 89	71	65	52	46	32	37	U S 44	28	26	
20	26	28	31	31	34	29	28	52	57	63	72	70	66	71	V 70	70	58	51	34	31	37	J S 36	37	28	
21	28	31	S 36	33	30	28	29	45	U S 73	76	72	72	70	H 75	84	C 94	71	54	44	S 44	J S 45	42	32	C 33	34
22	36	34	32	33	34	40	23	59	55	66	81	J C 102	80	J C 91	86	82	85	60	46	41	44	33	F	F	
23	S 35	37	S 36	S 47	39	22	22	48	68	64	74	I C 92	92	C	C	I C 98	J C 90	I C 78	57	43	33	27	23	25	
24	S 28	I S 29	30	29	34	28	26	51	S 62	62	64	82	80	J C 89	99	71	83	58	45	S 35	30	28	27	27	
25	28	29	29	32	30	31	34	49	59	78	92	C	101	C	C	91	79	87	65	47	45	C	33	25	25
26	C 28	C 29	31	36	C	26	26	46	73	S 86	S 83	U C 88	85	83	U C 86	U C 86	76	56	53	42	40	28	26	24	
27	25	26	28	31	31	21	23	45	U C 77	79	71	68	74	80	68	H 60	62	J S 61	39	37	34	32	33	28	
28	27	28	31	32	28	31	25	43	J C 75	74	69	77	85	90	77	73	79	56	49	S 33	33	31	S 32	S 30	
29	S 30	32	32	S 33	41	S 28	23	39	61	63	64	92	72	I C 100	81	68	71	55	39	A	I C 44	36	30	26	
30	29	28	27	28	28	J S 37	25	J C 43	65	68	73	H 73	76	H	C	C 82	C 78	71	45	40	C	C	28	27	25
31																									
CNT	29	29	30	30	29	30	30	30	30	29	28	28	29	24	25	27	30	30	30	28	28	30	29	29	
MED	30	32	32	32	34	28	26	51	64	66	73	82	79	86	86	79	70	58	46	34	37	33	30	28	
UQ	33	34	33	34	37	29	28	54	74	76	78	90	92	94	92	96	79	61	49	38	42	38	34	32	
LQ	28	29	31	31	32	25	23	45	60	63	70	72	72	78	81	72	65	54	40	31	33	32	27	27	

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FOF2 (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

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									
2										L	L	L	L	L	L	A								
3										L	L	L	L	L	L	A	A							
4									L	L	L	R	L	L	L	A								
5										A	A	A	A	A	L	L	L							
6										A	L	A	A	L	L	L	L							
7										L	L	L	L	L	L	L	L							
8										L	L	A	L	L	A	A	A							
9										L	L	L	L	L	L	L	L							
10										L	C	C	C	L	C	C	C							
11										L	L	L	L	L	L	L	A							
12										L	L	L	L	L	L	L								
13										L	L	L	L	L	L	L	L							
14										L	L	L	L	L	L	L	L							
15										L	L	L	L	L	L	L	L							
16										L	L	L	L	L	L	L	L							
17										L	L	L	L	L	L	L	L							
18										L	L	L	L	L	L	L	L							
19										L	L	L	L	L	L	L	L							
20										L	L	L	L	L	L	L	L							
21										L	L	L	L	L	L	L	L							
22										L	L	L	L	L	L	L	L							
23										L	L	L	L	L	L	L	L							
24										L	L	L	L	L	L	L	L							
25										L	L	L	L	L	L	L	L							
26										L	L	L	L	L	L	L	L							
27										L	L	L	L	L	L	L	L							
28										L	L	L	L	L	L	L	L							
29										L	L	L	L	L	L	L	L							
30										L	L	L	L	L	L	L	L							
31										L	L	L	L	L	L	L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									4	5	2	6	5	6	3	1								
MED									285	320	410	440	430	445	400	360								
UQ									290	330		450	430	450	400									
LQ									275	310		420	420	430	385									

NOV. 1973

FOF1 (0.01 MHz)

IONOSPHERIC DATA

NOV. 1973

FOE (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								160	I A 235	280	300	I A 315	320	320	295	285	245	A						
2								165	245	280	300	310	320	A	A	290	250	A						
3								150	240	290	I B 315	310	I R 320	320	I A 305	280	A	A						
4								S	240	H 280	I A 300	I A 310	310	320	300	275	H 240	S						
5								S	220	265	295	310	315	310	290	A	A	A						
6								160	250	270	290	300	305	A	A	A	A	S						
7								S	H 240	270	280	300	300	A	A	A	230	A						
8								A	240	260	285	300	300	A	A	A	A	A						
9								S	220	I R 270	280	300	A	A	290	275	A	A						
10								S	215	265	C	C	I C 310	300	I C 275	I C 255	C	C						
11								A	230	270	I A 285	I R 300	I A 300	R	A	280	A	A						
12								S	220	270	290	305	310	310	290	265	A	A						
13								S	I A 220	I A 260	285	290	310	310	300	280	235	S						
14								S	240	H 270	A	A	320	I A 320	295	270	I A 230	A						
15								S	220	275	I A 290	300	R 300	300	290	250	230	150						
16								S	230	I A 265	I A 295	300	R 305	I A 300	295	270	240	S						
17								S	220	270	290	A	A	310	300	I A 275	240	A						
18								S	200	270	290	310	320	310	H 300	270	A	S						
19								S	220	275	285	300	310	310	295	270	230	S						
20								S	A	255	280	290	300	295	280	255	235	A						
21								S	H 210	H 270	290	300	310	300	H 300	280	H 240	S						
22								S	H 230	270	300	H 300	310	305	290	270	200	S						
23								S	220	280	295	315	A	A	A	A	A	S						
24								S	H 220	280	I A 295	310	I A 320	I A 320	A	A	A	S						
25								S	220	260	270	280	280	I A 295	300	I A 270	I A 230	S						
26								S	230	270	295	310	315	310	I A 295	I A 270	A	A						
27								S	210	260	285	300	320	305	300	275	I A 220	S						
28								S	230	270	H 295	310	310	320	300	I A 265	240	S						
29								S	210	255	H 280	310	315	310	300	280	230	A						
30								S	220	270	285	300	A	A	A	275	235	S						
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	29	30	28	27	26	22	22	24	18	1						
MED								160	220	270	290	300	310	310	295	272	235	150						
UQ								162	235	275	295	310	320	320	300	280	240							
LQ								155	220	265	285	300	305	300	290	270	230							

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FOE (0.01 MHz)

IONOSPHERIC DATA

NOV. 1973

FOES (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	J X 21	E S 14	E S 14	E C 14	E C 15	E S 15	E S 15	21	24	G	G	28	32	G	G	36	G	J X 28	J X 31	J X 20	E S 15	E S 14	E S 14	E C 17	E S 14
2	E S 14	J X 21	19	18	E C 14	25	22	G	27	31	38	36	37	38	40	G	J X 51	J X 26	J X 26	E S 15	J X 33	E S 14	18	E S 15	
3	E S 15	E S 14	E S 14	E C 14	E C 14	E S 14	20	G	28	31	41	J X 50	35	34	38	J X 46	J X 42	27	J X 21	E C 16	J X 29	24	22	E C 23	
4	20	E S 15	E S 13	J X 27	J X 34	J X 27	E S 14	E S 13	G	31	38	39	J X 49	42	42	45	J X 59	J X 34	20	E S 14	22	E S 14	J X 33	J X 31	
5	J X 51	J X 30	J X 21	J X 21	J X 20	J X 20	E S 15	25	30	35	J X 65	J X 55	J X 71	60	J X 49	J X 43	J X 32	25	24	E C 17	E C 16	E S 15	E C 14	E C 15	
6	J X 31	J X 25	J X 26	J X 32	25	E S 14	E S 14	G	28	J X 51	J X 44	J X 76	J X 65	J X 50	J X 53	J X 49	J X 27	J X 22	J X 33	E S 14	J X 25	32	22	E C 17	
7	E C 15	E C 15	E B 14	20	E B 14	E C 20	E S 14	E S 14	G	32	36	36	38	J X 41	J X 35	J X 36	J X 28	26	J X 44	E C 17	E S 15	E S 15	E S 15	E S 15	
8	J X 34	E S 16	E C 17	E C 17	J X 24	21	22	J X 26	26	32	35	40	41	40	J X 44	J X 49	J X 50	J X 38	J X 33	J X 31	J X 19	20	E C 20	22	
9	20	21	19	23	20	E S 14	E S 14	21	25	G	26	38	37	35	J X 42	32	29	J X 26	26	J X 30	J X 26	J X 20	J X 25	27	E C 15
10	E S 14	E C 14	E C 15	E S 14	E S 14	21	J X 19	24	J X 26	31	C	C	C	35	C	C	C	C	J X 20	19	J X 27	J X 37	J X 29	J X 35	
11	J X 23	23	J X 26	J X 26	E S 14	22	19	J X 48	J X 33	J X 33	J X 45	32	J X 43	30	J X 39	G	J X 28	J X 37	J X 34	J X 31	41	J X 40	J X 20	J X 27	J X 34
12	J X 67	32	E C 17	E B 13	E B 12	E S 15	J X 26	20	G	J X 36	35	34	35	37	33	32	J X 33	J X 38	J X 64	J X 62	J X 33	J X 34	J X 31	E S 14	
13	19	26	J X 27	E B 14	E B 15	E S 14	22	23	J X 26	27	G	G	G	20	G	23	35	31	16	J X 29	J X 23	23	E S 15	23	E S 14
14	E S 15	E S 14	E S 14	E B 13	E B 15	E B 15	E C 17	22	G	30	31	31	30	G	37	35	31	J X 31	J X 26	24	E S 15	E C 17	J X 22	23	E S 15
15	E S 14	E S 14	E S 14	E C 14	E C 14	E S 14	E S 14	E S 13	28	31	30	G	21	G	18	G	J X 23	27	20	20	E S 15	E S 14	E S 13	E S 15	E S 14
16	E S 15	E S 15	E S 14	E B 13	E C 14	E S 14	J X 22	16	G	22	31	34	40	38	38	32	29	G	18	17	E C 23	21	E S 15	E S 14	20
17	E S 15	E S 14	E C 15	E C 15	E C 15	E S 15	E S 15	E S 15	G	33	35	35	J X 32	34	J X 32	J X 34	J X 34	22	J X 27	J X 27	E S 14	E S 15	E S 14	E S 14	
18	E S 14	J X 33	J X 20	J X 21	E C 14	E S 14	E S 15	E S 13	G	32	32	G	G	G	G	16	J X 27	J X 27	J X 26	20	E S 14	E S 14	E S 15	E S 15	
19	J X 24	J X 21	E C 14	E C 15	E C 13	E B 13	E S 15	E S 13	25	G	G	G	35	36	G	18	G	G	22	16	23	J X 21	E C 15	E S 13	E S 14
20	E S 15	23	E S 14	E S 14	E B 14	E B 14	E S 15	J X 26	J X 26	G	25	31	35	33	32	30	28	25	J X 30	J X 31	23	E C 14	E C 17	E C 14	E C 15
21	E S 15	E S 14	22	E S 13	E B 14	E B 14	E S 14	E S 15	G	G	G	34	J X 56	37	G	G	J X 27	J X 26	J X 19	E C 16	E S 14	E S 15	E C 15	E S 15	
22	E S 15	E S 14	E C 15	E C 14	E C 15	E C 14	E S 15	J X 21	G	32	33	39	41	41	35	32	25	J X 21	J X 19	20	J X 27	20	J X 22	J X 29	
23	J X 34	J X 33	J X 29	23	E S 14	E S 14	E S 14	E S 14	26	G	24	33	G	29	47	J X 53	J X 72	J X 52	J X 41	21	18	22	19	E S 15	E S 14
24	E S 15	E S 15	E S 14	E C 14	E C 14	E C 16	E S 15	E S 14	G	31	34	33	40	J X 34	J X 52	J X 34	J X 33	J X 29	J X 31	J X 27	J X 19	E C 17	E S 15	E S 15	
25	J X 25	J X 19	20	J X 22	26	E C 15	E S 15	E S 15	G	G	29	32	34	36	J X 29	29	J X 27	E S 15	E S 13	E S 14	E S 14	E S 14	E C 18	E C 14	
26	E C 16	E C 15	E C 17	E C 14	E C 15	E C 15	23	20	G	J X 31	30	33	J X 33	G	J X 37	J X 32	J X 31	J X 21	E S 14	22	E S 15	E S 14	E S 14	E S 13	
27	E S 15	E S 14	E B 15	E B 14	E B 15	E S 12	E S 14	J X 21	23	G	25	G	34	J X 60	39	34	G	24	E S 14	23	E S 14	E S 15	E S 13	E S 14	E S 14
28	E S 13	E S 14	E S 14	E S 14	E B 15	E B 15	22	18	G	G	G	G	G	G	G	G	30	26	E S 14	E S 15	E S 15	E S 15	E S 15	E S 14	E S 15
29	E S 15	E S 15	E S 15	E C 15	J X 20	E S 14	E S 14	E S 14	G	G	34	37	41	G	34	32	25	J X 24	J X 32	J X 37	J X 20	J X 49	18	J X 26	
30	J X 18	E S 14	E S 14	E S 14	E C 17	E S 14	E S 14	E S 14	G	G	33	34	36	34	33	33	27	24	24	J X 24	J X 25	E S 15	E S 14	E C 15	
31																									
CNT	30	30	30	30	30	30	30	30	30	30	29	29	29	30	29	29	29	29	29	30	30	30	30	30	30
MED	E S 15	E S 15	E S 15	E C 14	E S 15	E S 14	E S 15	16	22	31	33	34	36	36	34	31	J X 27	J X 26	J X 24	19	19	E S 15	E S 15	E S 15	E S 15
UQ	J X 23	23	20	21	E S 17	E S 16	20	21	26	32	36	37	41	40	38	J X 34	J X 33	J X 29	J X 31	24	J X 25	22	22	E S 20	
LQ	E S 15	E S 14	E S 14	E C 14	E C 14	E S 14	E S 14	E S 14	G	G	24	30	32	33	G	30	32	G	26	22	20	E S 15	E S 15	E S 14	E S 14

NOV. 1973

FOES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

FBES (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 automatio		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	19	E ₁₄	E ₁₄	E ₁₄	E ₁₅	E ₁₅	E ₁₅	15	E ₂₄	G	G ₂₈	E ₃₂	G	G	G	G	23	29	E	E ₁₅	E ₁₄	E ₁₄	E ₁₇	E ₁₄	
2	E ₁₄	19	E	17	E ₁₄	E	E	G	G	G	36	E ₃₆	36	38	38	G	30	22	E	E ₁₅	E	E ₁₄	17	E ₁₅	
3	E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E	G	G	G	41	34	E ₃₅	34	37	46	38	24	E	E ₁₆	20	E	E	E ₂₃	
4	E	E ₁₅	E ₁₃	18	18	23	E ₁₄	E ₁₃	G	G	34	E ₃₉	44	E ₄₂	42	44	56	32	17	E ₁₄	18	E ₁₄	17	27	
5	22	18	E	16	E	E	E ₁₅	23	29	34	52	54	71	48	45	33	27	18	E	E ₁₇	E ₁₆	E ₁₅	E ₁₄	E ₁₅	
6	20	22	20	E	E	E ₁₄	E ₁₄	G	G	44	44	66	64	37	43	30	24	15	27	E ₁₄	25	30	E ₂₂	E ₁₇	
7	E ₁₅	E ₁₅	E ₁₄	E	E ₁₄	E ₂₀	E ₁₄	E ₁₄	G	30	35	34	36	33	32	29	21	23	34	E ₁₇	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
8	17	E ₁₆	E ₁₇	E ₁₇	18	16	E	18	G	31	34	39	E ₄₁	35	42	43	48	35	27	17	E	E	E ₂₀	E	
9	E	E	E	E	E	E ₁₄	E ₁₄	19	G	E ₂₆	37	36	34	36	31	29	24	18	17	23	18	22	19	E ₁₅	
10	E ₁₄	E ₁₄	E ₁₅	E ₁₄	E ₁₄	18	16	G	19	G	C	C	C	34	C	C	C	C	E	19	19	20	20	A	
11	20	E	24	23	E ₁₄	E	E	25	19	25	32	32	36	E ₃₀	36	27	35	30	25	26	A	19	E ₂₇	E ₃₄	
12	A	18	E ₁₇	E ₁₃	E ₁₂	E ₁₅	E	G	G	22	33	G	34	36	32	32	26	34	26	A	A	A	19	E ₁₄	
13	E	18	25	E ₁₄	E ₁₅	E ₁₄	17	G	24	27	G	G	18	G	35	31	16	17	18	17	E ₁₅	17	E ₁₄	E ₁₄	
14	E ₁₅	E ₁₄	E ₁₄	E ₁₃	E ₁₅	E ₁₅	E ₁₇	21	G	G	31	30	G	29	35	35	G	28	19	23	E ₁₅	E ₁₇	18	E	E ₁₅
15	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₃	G	30	30	G	21	18	G	21	27	G	17	E ₁₅	E ₁₄	E ₁₃	E ₁₅	E ₁₄	
16	E ₁₅	E ₁₅	E ₁₄	E ₁₃	E ₁₄	E ₁₄	18	G	G	21	30	32	40	36	37	32	G	G	17	15	E ₂₃	E	E ₁₅	E ₁₄	18
17	E ₁₅	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	G	30	G	31	32	33	26	29	20	20	25	25	E ₁₄	E ₁₅	E ₁₄	E ₁₄	
18	E ₁₄	E	15	14	E ₁₄	E ₁₄	E ₁₅	E ₁₃	G	29	31	G	G	G	G	16	27	26	23	E	E ₁₄	E ₁₄	E ₁₅	E ₁₅	
19	E	17	E ₁₄	E ₁₅	E ₁₃	E ₁₃	E ₁₅	E ₁₃	G	G	G	G	35	35	22	17	G	21	E	E	E	E ₁₅	E ₁₃	E ₁₄	
20	E ₁₅	E	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₅	26	22	G	25	G	G	32	30	G	G	29	27	22	E ₁₄	E ₁₇	E ₁₄	E ₁₅	
21	E ₁₅	E ₁₄	E	E ₁₃	E ₁₄	E ₁₄	E ₁₄	E ₁₅	G	G	G	G	39	35	G	26	20	17	E	E ₁₆	E ₁₄	E ₁₅	E ₁₅	E ₁₅	
22	E ₁₅	E ₁₄	E ₁₅	E ₁₄	E ₁₅	E ₁₄	E ₁₅	G	G	G	33	39	40	E ₄₁	33	31	24	18	E	18	E	E	E	E	
23	26	23	25	E	E ₁₄	E ₁₄	E ₁₄	E ₁₄	20	G	G	G	29	47	43	30	43	27	31	19	18	E	E	E ₁₅	E ₁₄
24	E ₁₅	E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₆	E ₁₅	E ₁₄	G	G	33	33	38	33	36	30	30	17	26	18	E	E ₁₇	E ₁₅	E ₁₅	
25	17	E	E	17	E	E ₁₅	E ₁₅	E ₁₅	G	G	G	G	32	32	27	27	23	E ₁₅	E ₁₃	E ₁₄	E ₁₄	E ₁₄	E ₁₈	E ₁₄	
26	E ₁₆	E ₁₅	E ₁₇	E ₁₄	E ₁₅	E ₁₅	E	G	G	26	29	30	30	G	35	29	26	19	E ₁₄	E	E ₁₅	E ₁₄	E ₁₄	E ₁₃	
27	E ₁₅	E ₁₄	E ₁₅	E ₁₄	E ₁₅	E ₁₂	E ₁₄	15	19	G	G	G	G	34	32	G	22	E ₁₄	17	E ₁₄	E ₁₅	E ₁₃	E ₁₄	E ₁₄	
28	E ₁₃	E ₁₄	E ₁₄	E ₁₄	E ₁₅	E ₁₅	E	G	G	G	G	G	G	G	G	29	22	E ₁₄	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₄	E ₁₅	
29	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E	E ₁₄	E ₁₄	E ₁₄	G	G	33	35	38	G	33	31	25	19	31	A	20	29	E	15	
30	E	E ₁₄	E ₁₄	E ₁₄	E ₁₇	E ₁₄	E ₁₄	E ₁₄	G	G	33	34	36	34	33	32	G	23	19	20	23	E ₁₅	E ₁₄	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	30	30	30	30	30	30	30	30	30	29	29	29	30	29	29	29	29	30	30	30	30	30	30	
MED	E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	E ₁₄	G	G	32	31	34	34	32	29	24	19	17	E ₁₇	E ₁₅	E ₁₅	E ₁₅	E ₁₅	
UQ	17	E ₁₆	E ₁₅	E ₁₅	E ₁₅	E ₁₅	E ₁₅	15	19	29	34	35	38	36	36	31	27	26	25	20	18	17	E ₁₇	E ₁₅	
LQ	E ₁₄	E ₁₄	E ₁₄	E ₁₃	E ₁₄	E ₁₄	E ₁₄	G	G	G	27	G	U ₂₅	30	29	17	21	17	E	E ₁₅	E ₁₄	E ₁₄	E ₁₄	E ₁₄	

NOV. 1973

FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

F-MIN (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	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ C	E ₁₅ C	E ₁₅ S	E ₁₅ S	E ₁₃ S	14	15	18	17	19	19	16	14	14	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₇ C	E ₁₄ S
2	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ C	E ₁₄ C	E ₁₃ S	E ₁₄ S	E ₁₃ S	13	13	17	20	18	19	15	15	14	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₃ S	E ₁₅ S
3	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₄ C	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₄ S	13	14	35	24	19	17	14	13	14	E ₁₃ S	E ₁₅ S	E ₁₆ C	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₂₃ C
4	E ₁₅ S	E ₁₅ S	E ₁₃ S	E ₁₄ C	E ₁₄ C	E ₁₅ S	E ₁₄ S	E ₁₃ S	13	13	14	15	17	15	14	15	14	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₃ S
5	E ₁₃ S	E ₁₃ S	E ₁₃ S	12	12	E ₁₃ S	E ₁₅ S	E ₁₄ S	14	14	14	15	17	16	14	16	15	E ₁₅ S	E ₁₅ S	E ₁₇ C	E ₁₆ C	E ₁₅ S	E ₁₄ S	E ₁₅ C
6	E ₁₅ S	15	14	15	15	E ₁₄ S	E ₁₄ S	E ₁₄ S	14	15	15	15	17	17	16	18	15	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₈ C	E ₁₅ S	E ₁₇ C
7	E ₁₅ C	E ₁₅ S	14	13	14	E ₂₀ C	E ₁₄ S	E ₁₄ S	14	13	16	16	17	17	15	15	14	E ₁₄ S	E ₁₅ S	E ₁₇ C	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₅ S
8	E ₁₄ S	E ₁₆ S	E ₁₇ C	E ₁₇ C	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₄ S	14	14	15	15	18	17	15	13	14	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₂₀ C	E ₁₄ S
9	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₄ C	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₅ S	14	15	17	17	17	19	17	16	14	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₅ C
10	E ₁₄ S	E ₁₄ C	E ₁₅ S	E ₁₄ S	E ₁₄ C	E ₁₅ S	E ₁₅ S	E ₁₄ S	13	14	C	C	C	14	C	C	C	C	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₄ S
11	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₃ S	E ₁₃ S	15	14	14	14	18	16	16	14	13	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₄ S
12	E ₁₄ S	E ₁₅ S	E ₁₇ S	13	12	E ₁₅ S	E ₁₅ S	E ₁₅ S	15	14	14	17	15	15	16	17	15	15	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₄ S
13	E ₁₄ S	E ₁₃ S	E ₁₄ S	14	15	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₁₄ S	13	14	14	14	14	17	15	13	E ₁₅ S	E ₁₅ S	E ₁₃ S	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₄ S
14	E ₁₅ S	E ₁₄ S	E ₁₄ S	13	15	15	E ₁₇ C	E ₁₄ S	13	13	15	15	14	15	14	15	15	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₁₇ C	E ₁₃ S	E ₁₅ S	E ₁₅ S
15	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ C	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₃ S	13	15	14	14	15	15	14	14	14	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₃ S	E ₁₅ S	E ₁₄ S
16	E ₁₅ S	E ₁₅ S	E ₁₄ S	13	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₅ S	13	13	14	14	16	15	14	14	14	E ₁₄ S	E ₁₄ S	E ₂₃ C	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₇ C
17	E ₁₅ S	E ₁₄ S	E ₁₅ C	E ₁₅ C	E ₁₅ C	E ₁₅ S	E ₁₅ S	E ₁₅ S	13	14	14	17	15	16	15	15	15	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₄ S
18	E ₁₄ S	E ₁₃ S	E ₁₃ S	E ₁₃ S	E ₁₄ C	E ₁₄ S	E ₁₅ S	E ₁₃ S	14	14	14	14	15	15	15	14	13	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₅ S
19	E ₁₅ S	E ₁₅ C	E ₁₄ C	E ₁₅ C	E ₁₃ C	13	E ₁₅ S	E ₁₃ S	14	14	14	14	14	14	14	15	13	E ₁₄ S	E ₁₄ S	E ₁₆ C	E ₁₄ S	E ₁₅ C	E ₁₃ S	E ₁₄ S
20	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	14	14	E ₁₅ S	E ₁₄ S	11	13	14	14	14	14	13	15	14	E ₁₃ S	E ₁₄ S	E ₁₇ C	E ₁₄ C	E ₁₇ C	E ₁₄ S	E ₁₅ C
21	E ₁₅ S	E ₁₄ S	E ₁₃ S	E ₁₃ S	14	14	E ₁₄ S	E ₁₅ S	13	14	14	16	15	14	14	15	14	E ₁₅ S	E ₁₅ S	E ₁₆ C	E ₁₄ S	E ₁₅ S	E ₁₅ C	E ₁₅ S
22	E ₁₅ S	E ₁₄ S	E ₁₅ C	E ₁₄ C	E ₁₅ C	E ₁₄ S	E ₁₅ S	E ₁₅ S	13	13	14	14	15	15	15	15	15	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₅ S
23	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₅ S	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₄ S	14	15	15	19	17	15	14	15	15	E ₁₄ S	E ₁₃ S	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₄ S
24	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₄ C	E ₁₄ C	E ₁₆ C	E ₁₅ S	E ₁₄ S	13	14	15	15	17	17	17	14	15	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₅ S	E ₁₇ C	E ₁₅ S	E ₁₅ S
25	E ₁₃ S	E ₁₅ S	E ₁₅ S	12	E ₁₄ C	E ₁₅ S	E ₁₅ S	E ₁₅ S	13	14	13	15	15	15	15	14	14	E ₁₅ S	E ₁₃ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₈ C	E ₁₄ S
26	E ₁₆ C	E ₁₅ C	E ₁₇ C	E ₁₄ C	E ₁₅ C	E ₁₅ S	E ₁₅ S	E ₁₅ S	13	15	14	16	16	14	15	15	11	14	E ₁₄ S	E ₁₅ C	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₃ S
27	E ₁₅ S	E ₁₄ S	15	14	15	E ₁₂ S	E ₁₄ S	E ₁₄ S	14	15	13	14	15	16	17	15	14	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₃ S	E ₁₄ S	E ₁₄ S
28	E ₁₃ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	15	15	E ₁₅ S	E ₁₄ S	13	14	14	15	15	15	15	15	14	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₄ S	E ₁₅ S
29	E ₁₅ S	E ₁₅ S	E ₁₅ C	E ₁₅ C	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₄ S	13	14	14	16	18	18	17	17	15	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S
30	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₇ C	E ₁₄ S	E ₁₄ S	E ₁₄ S	14	15	16	18	17	17	17	15	15	E ₁₄ S	E ₁₅ S	E ₁₅ S	E ₁₅ C	E ₁₅ S	E ₁₄ S	E ₁₅ C
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	30	29	29	29	30	29	29	29	29	30	30	30	30	30	30
MED	E ₁₅ S	E ₁₄ S	E ₁₄ S	E ₁₄ C	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₄ S	13	14	14	15	16	15	15	15	14	E ₁₄ S	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₅ S	E ₁₄ S	E ₁₄ S
UQ	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₄ C	14	E ₁₅ S	E ₁₅ S	E ₁₅ S	14	15	15	17	17	17	16	15	15	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₅ S	E ₁₅ S
LQ	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₃ C	E ₁₄ C	E ₁₄ S	E ₁₄ S	E ₁₄ S	13	13	14	14	15	15	14	14	14	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S	E ₁₄ S

The Radio Research Laboratories, Japan

NOV. 1973

F-MIN (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

M(3000)F2 (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	S	S	I ^S ₃₂₅	300	310	320	295	J ^S ₃₄₅	C ^S ₃₅₀	C	C	J ^C ₃₆₀	345	C	330	C ^S ₃₆₅	355	365	335	315	305	C ^S ₃₂₅	C ^S ₃₂₅	305	
2	285	305	C ^S ₃₁₅	300	340	285	310	350	I ^C ₃₈₀	335	345	C ^S ₃₆₅	335	330	C	C	365	360	340	S ^S ₃₁₀	300	305	340	300	
3	290	290	295	295	310	280	315	345	340	C ^S ₃₆₅	345	335	330	340	C ^S ₃₃₅	350	345	355	360	305	315	300	335	310	
4	I ^S ₃₁₅	S ^S ₃₀₀	J ^S ₃₁₅	295	315	345	285	335	345	J ^C ₃₅₅	345	C ^S ₃₆₅	315	I ^C ₃₄₀	C	C	385	370	345	275	I ^S ₃₁₅	I ^S ₂₉₀	C ^S ₃₀₅	I ^S ₂₉₀	
5	J ^S ₂₇₅	S ^S ₂₉₀	295	I ^S ₃₃₅	375	260	275	330	C ^S ₃₆₅	335	315	I ^C ₃₄₅	I ^C ₃₄₀	330	I ^C ₃₃₀	I ^S ₃₅₀	380	370	340	320	305	345	315	J ^C ₃₀₅	
6	U ^S ₃₀₅	C ^S ₃₄₅	330	F ^S ₃₃₀	350	335	320	345	J ^S ₃₈₀	375	345	I ^C ₃₃₅	C ^S ₃₄₅	335	C	C	J ^C ₃₈₅	365	360	320	350	335	C ^S ₃₄₅	295	
7	310	325	325	305	355	C ^S ₃₆₅	315	360	J ^S ₃₈₀	355	335	I ^C ₃₄₅	J ^C ₃₆₀	I ^C ₃₆₀	370	350	355	350	340	S ^S ₂₈₀	280	315	340	280	
8	275	295	300	I ^C ₃₁₅	335	335	285	340	350	360	355	305	295	320	J ^C ₃₄₅	J ^C ₃₁₀	360	360	330	S ^S ₃₁₅	300	300	285	295	
9	295	290	305	335	350	330	305	345	310	H	340	350	330	355	C	365	365	375	360	350	335	320	335	295	285
10	300	I ^S ₃₁₀	345	325	375	345	295	355	365	355	C	C	C	C	C	C	I ^C ₃₇₀	I ^C ₃₆₀	360	340	290	265	S ^S ₂₈₅	I ^S ₂₉₀	
11	I ^S ₂₈₀	280	305	305	J ^S ₃₅₀	355	315	340	370	S ^S ₃₅₀	375	360	345	315	C ^S ₃₃₀	C ^S ₃₆₅	370	375	385	I ^C ₃₃₀	I ^A ₃₀₅	I ^A ₃₀₅	I ^S ₃₁₀	I ^S ₂₉₀	
12	I ^A ₂₉₀	295	280	I ^F ₃₁₅	340	365	285	340	365	S ^S ₃₆₀	350	345	330	330	C ^S ₃₃₅	360	365	365	385	I ^A ₃₄₀	I ^A ₃₁₅	I ^A ₃₂₅	310	295	
13	315	305	310	315	355	355	315	275	S ^S ₃₆₅	375	330	355	345	330	345	U ^C ₃₇₀	390	370	345	285	330	310	325	295	
14	300	325	315	285	295	335	320	J ^S ₃₇₅	370	340	360	345	335	330	C ^S ₃₅₅	C ^S ₃₇₅	375	305	H	365	305	I ^C ₃₂₀	315	325	305
15	295	S ^S ₂₈₀	300	295	315	315	310	365	S ^S ₃₆₅	330	345	350	335	335	J ^C ₃₄₅	365	330	H	350	325	305	305	335	300	
16	S ^S ₂₈₅	295	S ^S ₂₉₅	315	330	325	315	345	340	370	350	365	345	330	330	S ^S ₃₇₀	370	365	365	335	335	305	315	305	S ^S ₂₇₅
17	280	310	290	295	290	325	305	335	S ^S ₃₆₅	295	335	345	350	340	I ^C ₃₃₀	365	355	350	335	295	J ^C ₃₀₅	I ^C ₃₂₀	300	290	
18	275	C ^S ₂₇₅	275	305	320	335	275	J ^S ₃₅₅	375	335	335	I ^C ₃₂₀	330	I ^C ₃₃₀	C	350	355	355	300	S ^S ₂₉₅	315	345	270	290	
19	290	295	295	285	325	H	305	295	S ^S ₃₅₅	355	355	375	365	345	340	C ^S ₃₈₅	370	360	340	365	315	310	U ^S ₃₃₅	335	325
20	295	300	310	320	335	340	340	375	S ^S ₃₇₅	355	370	360	360	345	335	V	385	380	365	360	300	310	J ^S ₃₄₅	345	315
21	305	315	I ^S ₃₂₀	340	335	320	325	335	U ^S ₃₇₅	355	355	365	330	360	H	340	360	365	380	320	J ^S ₃₀₅	325	315	305	310
22	290	325	280	305	295	355	345	340	S ^S ₃₆₅	350	335	365	325	340	335	390	375	355	330	300	320	305	F	F	
23	285	285	305	305	385	280	285	325	365	375	335	I ^C ₃₅₅	345	C	C	I ^C ₃₁₀	J ^C ₃₄₅	I ^C ₃₆₅	345	325	335	335	300	285	
24	295	I ^S ₂₈₀	300	310	355	360	305	355	370	370	375	340	325	J ^C ₃₃₀	365	325	360	380	335	345	300	320	335	295	
25	280	285	280	280	275	275	325	325	355	320	305	C	I ^C ₃₃₅	C	330	350	355	370	320	305	C	335	290	275	
26	C ^S ₂₈₀	C ^S ₂₆₀	265	300	C	340	280	325	360	S ^S ₃₅₅	S ^S ₃₅₅	U ^C ₃₆₀	335	C ^S ₃₅₅	U ^C ₃₃₅	U ^C ₃₅₀	350	355	345	315	345	370	310	305	
27	280	290	300	320	355	315	295	340	U ^C ₃₆₅	365	375	360	355	345	355	335	340	J ^S ₃₅₅	350	340	330	325	335	310	
28	295	295	315	360	315	320	310	335	J ^C ₃₆₀	350	375	345	340	355	380	335	365	375	365	S ^S ₃₂₅	340	325	315	305	
29	285	295	295	I ^S ₃₁₅	330	375	305	335	360	350	330	335	350	I ^C ₃₄₀	360	340	380	365	335	A	I ^C ₃₄₀	335	340	305	
30	310	300	295	285	305	J ^S ₃₇₀	350	J ^C ₃₅₀	370	340	360	300	305	C	355	C ^S ₃₄₅	375	370	305	C	C	310	325	305	
31																									
CNT	29	29	30	30	29	30	30	30	30	29	28	28	29	24	24	26	30	30	30	28	28	30	29	29	
MED	290	295	300	305	335	335	308	340	365	355	348	348	340	338	342	355	365	365	342	315	315	322	315	295	
UQ	300	305	315	320	350	355	315	350	370	360	360	360	345	342	358	365	375	370	360	328	328	335	335	305	
LQ	280	290	295	295	315	315	295	335	355	340	335	338	330	330	332	345	355	355	335	302	305	310	305	290	

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M(3000)F2 (0.01)

IONOSPHERIC DATA

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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	390								
2										L	L	U L 385	L	L	L	L	A							
3										L	L	L	L	L	L	A	A							
4									L	L	L	R	L	L	L	A								
5										A	A	A	A	A	L	L	L							
6										A	L	A	A	L	L	L	L							
7										L	L	L	L	L	L	L	L							
8										L	L	A	L	L	A	A	A							
9									L	L	L	L	L	L	L	L	L							
10									L	C	C	C	C	L	C	C	C							
11										L	L	L	L	L	L	L	A							
12										L	L	L	L	L	L	L								
13									L	L	L	L	L	L	L	L								
14									L	L	L	L	L	L	L	L								
15									L	L	L	L	L	L	L	L								
16									L	L	L	L	L	L	L	L								
17									L	L	L	L	L	L	L	L								
18									L	L	L	L	L	L	L	L								
19									L	L	L	L	L	L	L	L								
20									L	L	L	L	L	L	L	L								
21									L	L	L	L	L	L	L	L								
22									L	L	L	L	L	L	L	L								
23									L	L	L	L	L	L	L	L								
24									L	L	L	L	L	L	L	L								
25									L	L	L	L	L	L	L	L								
26									L	L	L	L	L	L	L	L								
27									L	L	L	L	L	L	L	L								
28									L	L	L	L	L	L	L	L								
29									L	L	L	L	L	L	L	L								
30									L	L	L	L	L	L	L	L								
31									L	L	L	L	L	L	L	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									4	5	2	6	5	6	3	1								
MED									430	435	418	375	395	372	385	390								
UQ									435	440		385	395	385	400									
LQ									420	430		365	380	370	380									

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H*F2 (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									250	250	230	235	285	250	235									
2									225	250	255	255	280	245	235	215								
3									240	240	240	245	245	225	245	225								
4								245	225	230	235	255	270	220	230									
5									240	275	240	240	250	280	230	205								
6									220	255	E A 270	250	240	255	230	200								
7									230	240	260	215	235	230	240	225								
8									230	245	240	300	255	240	235	225								
9								225	250	250	285	250	245	230	235	225								
10									230	C	C	C	255	I C 235	C	C								
11										235	245	250	280	265	235	220								
12										260	250	250	260	250	240									
13								220	230	235	235	240	260	245	250	210								
14									260	240	250	245	255	250	225									
15									255	250	245	250	275	240	240									
16									235	240	230	275	260	240	230	225								
17								215	220	260	245	230	245	240	240	220								
18									240	275	275	245	245	255	225									
19								225	220	235	230	255	250	230	215	215								
20								210	225	240	240	240	270	230	220									
21									240	235	240	280	230	250	235	225								
22										265	230	250	245	250		230								
23								210	215	245	235	240	240	235	225									
24									230	230	265	265	255	230	235									
25								240	245	275	255	240	255	240	240	225								
26								240	240	225	240	260	235	250	240	220								
27								235	230	235	245	250	265	235	230									
28									225	225	250	250	240	230	275									
29										285	250	235	260	230	225									
30								220	220	245	230	295	H 270	240	240									
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	26	29	29	29	30	30	28	16							
MED									225	230	245	242	250	255	240	235	222							
UQ									238	240	255	250	255	265	250	240	225							
LQ									218	225	235	235	240	245	230	230	215							

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H*F2 (KM)

IONOSPHERIC DATA

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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	275	225	225	250	245	250	270	240 ^H	225	200 ^H	200	215	195	180 ^H	240	225	220	210	200	230	290	250	250	260
2	305	280	240	295	225	285 ^{E S}	275	225	210	220	205	200	220	215	240	210 ^H	A	220	200	220	250	225	220	250
3	290	290	270	270	250	225	260	205	240	240	I 220 ^A	200	240	205 ^H	220	A	A	220	200	250	250	270	220	E 300 ^C
4	230	250	225	270	245	205	285	240	215	220	205	I 230 ^A	I 215 ^A	255	A	A	215	210	200	245	260	265	245	E 300 ^A
5	300	300	260	205	200	370	300	240	225	A	A	A	A	A	I 220 ^A	I 220 ^A	205	200	200	250	275	220	260	250
6	340	230	250	235	225	205	275	225	215	A	E 250 ^A	A	A	E 220 ^A	E 255 ^A	220	210	205	210	220	230	E 250 ^A	E 300 ^C	305
7	285	255	225	260	225	200	260	230	205	195 ^H	220	200	E 220 ^A	180 ^H	230	220	215	205	E 230 ^A	280	285	245	210	E 300 ^S
8	330	300	270	235	245	200	E 250 ^S	225	230 ^H	205	240	I 230 ^A	I 210 ^A	230	A	A	A	220	210	225	250	260	E 300 ^C	300
9	295	300	270	245	210	200	250	215	200	225	E 240 ^A	210	180	245	230	210	200 ^H	200	210	240	250	260	E 270 ^A	325
10	310	260	230	245	200	E 280 ^A	E 300 ^A	210	230	220	C	C	C	220	I 225 ^C	I 230 ^C	I 215 ^C	I 210 ^C	200	E 245 ^A	E 310 ^A	E 350 ^A	E 290 ^A	I 310 ^A
11	310	300	E 300 ^A	250	205	205	250	225	225	225	230	200	210	210	E 250 ^A	240	I 215 ^A	220	220	E 300 ^A	A	260	A	S
12	A	290	300	250	225	200	E 300 ^S	210	215	235	240	210	200 ^H	245	240	E 240 ^A	225	E 225 ^A	205	A	A	A	E 300 ^A	305
13	290	290	E 350 ^A	270	230	200	295	220	200	205	200 ^H	210	180 ^H	180 ^H	245	240	220	205	220	250	250	240	250	305
14	300	270	270	310	300	230	245	215	215	215	200 ^H	170 ^H	200	240	E 245 ^A	230	225	200 ^H	225	230	250	220	225	270
15	295	290	290	295	250	200	250	215	220	225	200	200 ^H	190 ^H	190 ^H	175 ^H	250	205	220	225	260	245	215	250	295
16	290	300	300	275	235	230	E 265 ^A	225	230 ^H	230	210	I 220 ^A	200	230 ^H	235	210 ^H	210	210	200	E 225 ^A	245	235	245	280
17	300	260	290	E 300 ^C	275	250	250	205	200	225	180 ^H	200 ^H	180 ^H	245	230	205	225	210	220	E 300 ^A	230	225	245	250
18	295	300	300	250	240	230	E 295 ^S	230	205 ^H	225	185 ^H	210	200 ^H	230	210	230	225	215	250	250	220	210	E 325 ^S	E 300 ^S
19	300	295	275	300	260	200	275	230	200	200	215 ^H	195 ^H	215	220	190 ^H	190 ^H	210	210	210	245	260	270	230	240
20	290	295	270	255	250	225	250	210	200	215	205 ^H	215	210	200	200 ^H	230	210	210	E 240 ^A	E 300 ^A	260	245	220	255
21	300	275	260	235	240	250	255	230	220	220	200 ^H	210	220	225	195 ^H	215 ^H	220	205	230	210	225	240	260	250
22	245	245	270	280	295	200	230	235	200 ^H	230	230	250	240	250	210	230	215	200	210	230	235	230	260	325
23	E 350 ^A	E 310 ^A	E 300 ^A	240	190	E 310 ^S	E 300 ^S	245	210	200 ^H	200 ^H	200 ^H	I 195 ^A	I 185 ^A	225	I 225 ^A	225	210	190	210	200	230	E 280 ^S	300
24	300	300	290	290	240	225	290	220	210	225	220	210	205	220	250	200	225	200	225	200	255	260	250	300
25	325	350	350	310	300	300	240	210	190 ^H	200	190 ^H	230 ^H	220	220 ^H	210 ^H	220	240	205	225	225	220	230	E 300 ^C	E 345 ^C
26	315	350	330	265	245	250	E 300 ^S	250	205 ^H	200 ^H	200 ^H	195 ^H	205	205 ^H	E 240 ^A	235	225	205	210	230	235	205	255	250
27	320	315	300	260	225	E 300 ^S	E 300 ^S	240	220	225	185 ^H	235	215	205 ^H	210	225	225	210	205	240	240	225	235	250
28	310	315	275	225	270	250	265	245	245	225	220	200	180 ^H	200	200 ^H	205 ^H	210	200	190	230	205	250	225	265
29	305	300	285	250	225	200	E 250 ^S	225	210 ^H	225	225	250	220	200	235	210	210	200	E 250 ^A	A	210	E 280 ^A	230	290
30	280	275	305	320	300	230	225	225	205	190	230	200	205	230	230	240	220	200	250	225	245	250	250	270
31																								
CNT	29	30	30	30	30	30	30	30	30	28	28	27	27	29	28	27	27	30	30	28	28	29	29	29
MED	300	291	272	259	240	U 216	258	225	212	220	206	210	205	220	225	222	215	209	210	232	246	240	240	U 280
UQ	310	300	295	285	250	240	262	235	225	225	224	218	216	230	236	230	225	210	222	248	255	255	E 270 ^E	300
LQ	290	270	260	245	225	200	250	215	205	202	200 ^H	200	198	200 ^H	210	210	210	200	200	225	230	225	230	255

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H·F (KM)

IONOSPHERIC DATA

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H⁺ES (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	S	S	C	C	S	S	110	105	G	100	100	G	G	150	G	100	100	100	S	S	S	C	S
2	S	100	100	100	C	100	100	G	150	120	110	110	110	105	105	G	120	100	105	S	100	S	100	S
3	S	S	S	C	C	S	100	G	160	140	125	110	115	150	140	120	120	120	100	C	105	100	100	C
4	100	S	S	100	100	100	S	S	G	145	140	135	130	150	140	125	115	110	110	S	120	S	100	100
5	110	105	105	100	100	100	S	150	145	140	120	120	110	110	110	105	100	100	100	C	C	C	C	C
6	100	100	100	100	100	S	S	G	120	105	105	105	100	100	100	100	100	100	100	S	90	90	90	C
7	C	C	B	90	B	C	S	S	G	105	105	105	105	105	105	105	105	105	100	C	S	S	S	S
8	100	S	C	C	100	100	100	100	130	125	120	110	110	110	110	105	105	105	100	100	100	100	C	100
9	100	100	100	100	100	S	S	175	150	100	125	125	125	100	125	140	105	100	100	100	100	100	95	C
10	S	C	C	S	S	100	100	100	100	155	C	C	C	145	C	C	C	C	95	100	140	100	130	120
11	100	100	100	100	S	100	100	105	105	105	100	135	100	100	105	105	100	100	100	100	100	100	100	95
12	100	105	C	B	B	S	105	100	G	100	150	140	130	165	120	120	115	105	105	100	100	100	100	S
13	100	100	100	B	B	S	105	105	105	105	G	G	100	100	165	150	100	100	100	100	S	105	S	S
14	S	S	S	B	B	B	C	140	G	150	105	105	105	170	150	160	100	100	140	S	C	100	100	S
15	S	S	S	C	C	S	S	S	150	145	110	G	100	100	G	100	135	125	100	S	S	S	S	S
16	S	S	S	B	C	S	105	150	110	155	150	130	135	140	150	140	G	100	100	C	100	S	S	100
17	S	S	C	C	C	S	S	S	G	130	125	105	100	150	100	100	100	100	100	100	S	S	S	S
18	S	100	100	100	C	S	S	S	G	125	125	G	G	G	G	100	100	95	95	95	S	S	S	S
19	100	100	C	C	C	B	S	S	150	G	105	G	165	145	100	100	G	175	145	100	125	C	S	S
20	S	115	S	S	B	B	S	100	100	100	155	125	125	130	120	120	130	125	120	95	C	C	C	C
21	S	S	100	S	B	B	S	S	G	G	100	145	120	120	115	100	100	100	100	C	S	S	C	S
22	S	S	C	C	C	C	S	100	G	175	160	125	115	115	120	115	110	100	95	100	100	100	100	100
23	100	95	95	100	S	S	S	S	105	100	170	100	110	105	100	95	95	90	95	95	95	90	S	S
24	S	S	S	C	C	C	S	S	G	150	145	130	105	100	100	100	100	100	100	95	100	C	S	S
25	100	100	100	100	100	C	S	S	G	G	110	115	110	105	105	100	100	S	S	S	S	S	C	C
26	C	C	C	C	C	C	100	100	G	110	105	110	105	100	95	95	95	95	S	120	S	S	S	S
27	S	S	B	B	B	S	S	105	105	105	105	155	125	120	125	G	110	S	105	S	S	S	S	S
28	S	S	S	S	B	B	100	100	G	G	G	G	G	G	G	105	100	S	S	S	S	S	S	S
29	S	S	C	C	100	S	S	S	G	G	160	145	125	G	150	150	120	105	105	120	110	105	100	105
30	105	S	S	S	C	S	S	S	G	G	160	140	150	160	150	160	160	170	105	110	100	C	S	C
31																								
CNT	13	12	10	10	7	6	10	15	16	23	27	24	26	26	26	26	27	26	27	16	16	12	11	7
MED	100	100	100	100	100	100	100	105	115	125	120	122	110	112	118	105	100	100	100	100	100	100	100	100
UQ	100	102	100	100	100	100	105	125	150	145	148	135	125	145	140	125	115	105	105	100	108	100	100	102
LQ	100	100	100	100	100	100	100	100	105	105	105	108	105	100	105	100	100	100	100	98	100	100	100	100

The Radio Research Laboratories, Japan

NOV. 1973

H⁺ES (KM)

IONOSPHERIC DATA

NOV. 1973

TYPES OF ES

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	F ₂						L ₁	L ₂		L ₁	L ₁			H ₁		LH ₁₁	L ₃	F ₁							
2		F ₂	F ₁	F ₁		F ₁	F ₁		H ₁	C ₁	C ₂	C ₁	C ₁	C ₂	C ₂		CL ₃₂	L ₂	F ₁		F ₁		F ₁		
3							F ₁		H ₂	H ₁	H ₁	C ₁	C ₁	HL ₁₁	HL ₁₂	CL ₁₂	CL ₂₃	CL ₃₂	FF ₁₁		F ₂	F ₁	F ₁		
4	F ₁			F ₃	F ₃	F ₂				HL ₁₁	HL ₁₁	HL ₁₃	H ₁	HL ₁₁	HL ₁₁	H ₃	C ₃	C ₄	FF ₂₁		F ₂		F ₃	F ₄	
5	FF ₂₁	F ₃	FF ₂₁	F ₁	F ₁	F ₁		H ₃	H ₂	H ₂	C ₁	C ₂	C ₂	C ₁	C ₂	C ₂	L ₂	L ₁	F ₁						
6	F ₂	F ₃	F ₃	F ₂	F ₁				C ₂	C ₂	C ₁	C ₂	C ₄	C ₁	C ₂	L ₂	L ₂	L ₁	F ₃		F ₂	F ₁	F ₁		
7				F ₁						CL ₂₁	CL ₂₁	CL ₁₁	CL ₂₁	CL ₁₁	LL ₂₁	L ₂	L ₂	L ₃	F ₄						
8	F ₁				F ₁	F ₁	F ₁	L ₃	HL ₂₂	H ₂	CL ₁₁	CL ₁₁	C ₂	C ₂	C ₂	C ₃	C ₄	L ₃	F ₅	F ₁	F ₁	F ₁	F ₁		
9	F ₁	F ₁	F ₁	F ₁	F ₁			H ₁	HL ₁₂	L ₂	CL ₁₁	CL ₁₂	CL ₁₁	L ₂	CL ₁₁	H ₁	C ₁	L ₁	F ₂	F ₂	F ₂	F ₂	F ₂	F ₂	
10					F ₁	F ₁	L ₁	L ₃	HL ₂₃					HL ₁₁					F ₁	F ₂	FF ₂₁	F ₃	F ₂	F ₃	
11	F ₃	F ₂	F ₃	F ₁	F ₁	F ₁	L ₅	HL ₃₂	HL ₂₁	L ₂	HL ₁₂	L ₂	L ₁	L ₂	L ₂	L ₄	LL ₄₂	F ₄	F ₃	F ₂	F ₁	FF ₁₂	F ₂		
12	F ₁	FF ₁₁			F ₁	L ₁		HL ₃₂	HL ₁₂	H ₁	HL ₁₁	HL ₁₁	C ₁	C ₁	CL ₁₁	CL ₂₁	FF ₁₃	FF ₂		F ₁	F ₂	F ₁			
13	F ₁	F ₁	F ₂		F ₁	L ₁	L ₃	L ₃					L ₁	L ₁	H ₁	HL ₁₂	L ₁	L ₂	F ₄	F ₂		F ₁			
14							H ₂		H ₁	C ₂	C ₁		L ₁	HL ₁₂	HL ₁₁	HL ₁₁	L ₃	L ₂	F ₁			F ₁	F ₁		
15								HL ₁₃	H ₂	C ₁		L ₁	L ₁		L ₁	H ₂	C ₁	F ₁							
16					F ₄	H ₁	L ₂	HL ₁₂	HL ₁₂	HL ₂₁	HL ₁₁	HL ₁₂	HL ₁₂	HL ₁₂	HL ₁₁		L ₁	F ₁			F ₁			F ₁	
17									H ₁	H ₁	L ₁	L ₁	L ₁	HL ₁₁	L ₁	L ₂	HL ₂₁	L ₁	F ₄	F ₁					
18		F ₂	F ₂	F ₂					HL ₂₂	HL ₁₁						L ₁	L ₂	L ₄	F ₃	F ₁					
19	F ₁	F ₁							H ₁		L ₁		HL ₁₁	HL ₁₁	L ₁	L ₁		H ₁	F ₁	F ₁	F ₁				
20		F ₁					L ₇	L ₃	L ₃	H ₁	HL ₁₁	H ₁	H ₁	CL ₁₂	C ₁	H ₁	HL ₂₂	FF ₁₃	F ₁						
21			F ₁								L ₁	H ₁	C ₁	C ₂	C ₁	L ₂	F ₂	L ₄	F ₂						
22							L ₁		HL ₁₂	HL ₁₁	H ₂	C ₂	C ₂	C ₁	C ₂	C ₂	L ₁	F ₁	F ₁	F ₁	F ₁	F ₁	F ₁	F ₂	
23	F ₃	F ₄	F ₂	F ₂					HL ₁₁	L ₁	HL ₁₂	L ₁	CL ₂₂	CL ₁₂	L ₂	L ₃	L ₂	L ₃	F ₃	F ₁	F ₁	F ₁	F ₁		
24										H ₁	HL ₁₁	H ₁	C ₂	L ₁	L ₂	L ₁	L ₂	L ₁	F ₄	F ₂	F ₁				
25	F ₁	F ₁	F ₁	F ₂	F ₂					C ₁	C ₁	C ₁	C ₁	C ₁	L ₁	L ₁	L ₁								
26						F ₁	L ₁		L ₂	L ₁	L ₁	L ₁	L ₂	L ₁	L ₂	L ₃	L ₂		F ₁						
27							L ₂		L ₃	L ₃	L ₁	HL ₁₁	H ₁	C ₁	H ₁		L ₁		F ₁						
28						F ₁	L ₁									C ₁	L ₂								
29											H ₁	H ₂	H ₂		H ₁	H ₁	C ₁	L ₂	F ₈	FF ₂₂	F ₃	F ₃	F ₁	F ₁	
30	F ₁									HC ₁₁	HL ₁₁	HC ₁₁	HL ₁₁	HL ₁₁	HL ₁₁	H ₁	HL ₂₂	HL ₃₁	FF ₁₁	F ₁	F ₂				
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																									

NOV. 1973

TYPES OF ES

IONOSPHERIC DATA

NOV. 1973

FOF2 (0.1 MHz)

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

Station OKINAWA Lat. 26 19.0 N. Long. 127 46.8 E Sweep 1 MHz to 25 MHz in 30 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 ^S ₅₃	S ₆₂	56	38	36	25	22	54	87	113	110	126	R ₁₂₈	U ₁₃₁	R ₁₇₀	172	J ₁₃₉	U ₁₀₄	R ₈₀	63	44	S ₄₉	51	S ₄₆	
2	38	36	S ₃₃	33	34	23	25	57	72	80	H ₇₀	91	105	105	120	131	104	76	S ₈₇	70	62	57	51	S ₄₃	
3	S ₃₄	33	30	33	33	27	28	60	75	89	91	88	87	98	100	110	92	79	86	73	60	51	48	47	
4	40	42	44	29	27	C	26	50	82	110	75	85	74	100	120	R ₁₃₀	94	78	R ₇₁	81	72	64	58	S ₅₃	
5	45	U ₄₅	40	43	30	21	24	S ₅₂	74	65	88	113	112	111	114	J ₁₃₀	116	73	S ₅₄	46	47	51	32	31	
6	35	35	I ₂₉ ^A	29	29	20	23	49	76	75	68	88	97	114	128	144	150	S ₁₃₈	S ₁₄₀	R	97	95	61	48	
7	48	39	35	33	34	29	20	44	71	64	74	99	113	106	130	R ₁₁₄	R ₁₀₄	85	69	44	48	S ₅₇	50	33	
8	30	31	34	43	31	24	18	44	74	75	72	79	100	140	148	136	112	114	R ₁₁₂	63	52	54	44	37	
9	36	34	43	51	49	S	21	45	55	70	74	88	80	91	86	95	75	70	57	45	41	44	45	34	
10	31	37	42	30	31	S ₁₈	A	44	57	68	67	81	83	87	105	94	68	65	59	34	32	31	34	R ₃₇	
11	39	39	40	47	51	23	I ₂₃ ^A	45	62	67	69	73	80	88	91	101	99	73	62	43	40	45	43	37	
12	30	30	32	35	52	26	19	39	57	70	68	109	111	128	156	147	R ₁₂₆	105	81	57	47	43	43	37	
13	37	S ₃₆	38	40	41	26	20	49	72	S ₆₄	72	92	108	130	155	132	124	74	61	S ₅₃	S ₅₂	54	S ₄₁	35	
14	34	S ₃₃	34	33	38	44	40	S ₅₉	81	75	74	83	82	96	R ₁₀₇	R ₁₂₇	J ₁₀₉	82	65	80	46	56	C	C	
15	C	C	C	C	C	C	C	C	C	59	80	100	97	114	131	114	111	80	72	58	R ₅₄	57	S ₄₂	40	
16	J ₃₄	S ₃₁	34	35	37	27	20	44	S ₆₃	71	80	75	72	92	106	88	77	69	60	46	52	54	47	41	
17	S ₃₃	34	32	31	S ₃₄	F	S ₂₄	44	66	62	70	94	116	94	96	112	110	94	85	R ₆₁	51	53	43	38	
18	33	34	34	38	44	32	33	49	67	60	75	102	120	126	128	140	122	94	77	69	77	54	37	33	
19	33	34	34	35	38	27	25	46	72	68	70	77	69	102	91	88	76	70	64	53	49	56	S ₅₂	34	
20	25	26	28	32	31	26	23	47	64	63	71	74	74	72	74	79	69	55	50	42	45	50	47	35	
21	27	28	32	31	27	F	26	43	68	67	74	86	92	80	87	108	116	74	56	58	56	51	S ₄₄	38	
22	36	30	28	31	33	S ₄₂	17	44	73	68	80	116	86	93	110	94	92	66	S ₆₂	53	52	46	30	30	
23	32	32	34	42	25	18	19	41	75	79	73	102	123	144	153	156	137	R ₁₁₀	R ₁₀₀	64	55	43	S ₃₆	32	
24	S ₂₉	32	U ₃₇	S ₄₀	J ₄₂	S ₂₈	23	50	S ₅₈	70	72	74	93	109	110	113	102	84	50	43	49	45	S ₃₃	29	
25	31	31	31	39	S ₄₉	29	S ₃₇	46	55	59	100	106	I ₁₀₂	C	110	114	99	110	92	74	75	55	I ₅₅	I ₄₉	39
26	37	I ₃₅	34	41	39	19	R ₁₉	40	76	94	104	95	114	128	132	140	120	86	74	63	59	59	S ₄₅	32	
27	32	29	32	39	33	23	24	46	83	72	86	77	90	85	98	H ₈₇	73	71	62	49	R ₅₂	58	42	37	
28	28	30	30	41	25	24	20	39	68	95	80	78	104	108	116	100	106	94	83	57	46	49	50	43	
29	S ₃₈	37	43	50	46	17	18	39	62	71	75	87	108	100	120	108	106	91	R ₈₄	64	58	56	51	41	
30	35	31	30	28	34	37	S ₂₈	41	62	75	86	88	91	112	S ₁₁₇	119	S ₁₂₀	S ₈₉	U ₆₇	S ₅₇	61	J ₃₈	30	25	
31																									
CNT	29	29	29	29	29	25	28	29	29	30	30	30	30	30	30	30	30	30	30	29	30	30	29	29	
MED	34	34	34	35	34	26	23	45	71	70	74	88	97	106	115	114	108	81	70	57	52	54	44	37	
UQ	37	36	38	41	41	28	26	49	75	75	80	100	111	114	130	132	120	94	83	64	58	56	50	41	
LQ	31	31	32	32	31	23	20	44	62	65	71	79	83	93	100	99	92	73	61	46	47	46	41	33	

NOV. 1973

FOF2 (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

FOF1 (0.1 MHz)

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

Station **OKINAWA** Lat. **26 19.0 N**, Long. **127 46.8 E** Sweep **1 MHz** to **25 MHz** in **30 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								
3									L	L	L	L ⁴⁵⁰	L	L	L	L	L	A						
4									L	L	L	L	L ⁴²⁰	L	L	L	L	L						
5										L	A	A	A	A	A	L	L	L						
6									L	L	A	L	L	A	A	A	L	A						
7									L	L	L	L ⁴³⁰	L ⁴⁵⁰	L	L	L	L							
8									L	L	L	L	L ⁴⁸⁰	A	L	L	A	A						
9										L	L	L	L ⁴³⁰	L ⁴¹⁰	L	L	A							
10									L	L	L	L	L ⁴⁴⁰	L	L ⁴²⁰	L	L	L						
11										L	L	L ⁴⁵⁰	L ⁴²⁰	L	L	A	A							
12										L	L ⁴⁴⁰	L ⁴⁵⁰	L ⁴⁷⁰	L ⁴⁵⁰	L	L	L							
13									L	L ³⁷⁰	L	L ⁴⁴⁰	L ⁴⁵⁰	L ⁴²⁰	A	L	L	L						
14									L	L	L ⁴²⁰	L	L ⁴⁴⁰	L ⁴⁴⁰	L	L	L							
15									C	L	L	L ⁴⁰⁰	L	L	L	L	L	L						
16									L	L	L	L ⁴⁵⁰	L	L ⁴⁵⁰	L	L ³⁸⁰	L							
17									L	L	L	L	L	L	L ⁴³⁰	L	L							
18										L	L	L	L	L	L	L	L							
19										L	L	L	L	L	L	L	L							
20									L	L	L	L	L	L	L	L	A							
21									L	L	L	L	L ⁴⁶⁰	L ⁴⁹⁰	L	L	L							
22										L	L	L	A	A	A	L	L							
23									L	L	L ³⁷⁰	L ⁴⁵⁰	L	L ⁴⁷⁰	L	L ⁴³⁰	L							
24										L	L	L ⁴⁴⁰	L ⁴⁵⁰	L	L	L	L							
25											L	L	C	L	L	L	L							
26									L	L	L	L	L	L	L	L	L							
27									L	L	L	L	L	L	L	L								
28										L	L	L	L ⁴⁵⁰	L	L	L	L							
29										L	L	L	L	L	L	L								
30									L	L	L ⁴⁵⁰	L ⁴⁴⁰	L	L ⁴⁶⁰	L	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	4	10	12	8	2	2								
MED										L ³⁷⁰	L ⁴³⁰	L ⁴⁴⁵	L ⁴⁵⁰	L ⁴⁵⁰	L ⁴²⁵	L ⁴⁰⁵								
UQ										L ⁴⁴⁵	L ⁴⁵⁰	L ⁴⁵⁵	L ⁴⁶⁵											
LQ										L ³⁹⁵	L ⁴⁴⁰	L ⁴³⁵	L ⁴³⁰											

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FOF1 (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

FOE (0.01 MHZ)

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

Station OKINAWA Lat. 26 19.0 N. Long. 127 46.8 E Sweep 1 MHz to 25 MHz in 30 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							160	230		A	S	A	A	A	A	300	270	220	S					
2							285	220	280	315	325	330	335	325	320		A	A	S					
3							200	250	275		B	B	B	330	315	285	260	I A	B					
4							180	225	285	300	320	I A	335	330	320	R	A	U R	S					
5							A	230	280	295	315	325	325		A	305	255	A	S					
6							175	235	270	300	310	320	320	300		A	A	A						
7							180	220	260		A	310	A	A	A	A	A	A						
8							A	250	275	300	305	315	315	300		A	A	A						
9							170	215	270		A	A	315		A	A	A	A	A					
10							S	215	260	295	300	I A	315	310	305	280	220	180						
11							A	230		A	A	A	A	A	A	A	A	A						
12							S	235	I A	275	300	320	325	I A	315	310	290	A	A					
13							180	245	280	300	I A	310	A	A	A	295	I A	270	220	S				
14							A	225		A	A	A	330	325	305	I A	290	250	S	S				
15							C	C	A	A	A	A	A	320	295	270	235	200						
16							S	210		A	A	A	A	320	305	I A	290	A	A					
17							S	235	270	295	310	I A	310	315	I A	305	290	250	A					
18							B	180	270		A	290	I A	315	310	310	285	230	185					
19							170	205	265	300	I A	310	325	310	305	290	250	S						
20							165	220	270	I A	280	300	320	320	280	255	250	180						
21							S	185	245	300	320	I A	340		A	A	A	A	A					
22							190	220	270	280	310	300	300	300		I A	260	A	A					
23							S	205	250	285	U S	300	330	330	I A	320	I A	290	A	A				
24							S	B	275	310	I A	320		A	A	A	A	260	A					
25							S	200	270	295	R	310	I C	305	300		A	A	245	170				
26							S	220	245	285		A	A	A	I A	320	300	240	180					
27							S	245	270	300	305	320	330		A	A	A	175						
28							S	220	265	300	315	320	315	315		A	255	180						
29							165	205	250	300	300	330	I A	300	I A	320	A	260	170					
30							S	270	280	310	320	325	I A	320	310		A	A	190	S				
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	28	25	22	22	21	22	20	18	16	14						
MED								178	220	270	300	310	320	320	308	290	250	182						
UQ								185	235	275	300	320	330	325	318	295	260	200						
LQ								168	212	265	295	305	315	310	302	280	242	180						

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NOV. 1973

FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1973

FOES (0.1 MHz)

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

Station	OKINAWA																							Lat. 26° 19.0' N.	Long. 127° 46.8' E	Sweep 1 MHz to 25 MHz in 30 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	JX26	JX20	JX20	ES15	ES15	ES14	ES15	20	25	30	G	31	34	JX38	31	33	JG24	G	ES16	ES15	EB21	ES16	ES16	JX19					
2	M18	ES15	ES15	ES15	M18	EB14	ES16	G20	G	32	35	37	36	G	38	39	30	JX55	JX39	JX39	ES15	EB13	ES16	ES16					
3	ES16	ES16	ES16	ES15	ES15	EB13	ES16	G	G	40	EB37	EB37	EB36	39	36	35	29	JX64	24	JX37	ES16	ES16	ES16	M20					
4	ES16	ES16	ES16	JX29	EB13	C	EB12	G	27	32	39	35	JX33	45	41	JX36	31	G	16	ES16	ES15	ES15	ES16	ES15					
5	ES16	ES16	ES15	EB11	EB12	ES14	JX19	23	29	34	JX53	JX51	JX68	JX71	JX52	JX44	JX26	21	JX60	ES16	M	EB19	M	EB21					
6	ES16	JX27	JX42	JX30	JX28	JX21	M22	G	27	36	44	44	48	JX50	JX54	JX72	JX47	JX84	JX36	JX46	17	EB21	ES15	JX30					
7	M30	JX24	JX20	M22	M21	ES15	ES16	G	21	30	37	35	JX41	37	34	JX48	JX45	JX38	JX60	JX37	JX27	JX19	M21	ES16					
8	ES16	ES16	ES15	ES15	EB14	JX19	M20	19	G	JX35	41	45	41	45	44	JX42	JX47	JX60	JX44	JX35	JX21	JX22	JX18	M21					
9	M22	M23	ES16	M20	ES16	S	M23	M22	25	28	39	34	40	JX40	36	JX40	JX64	JX85	JX54	JX40	ES16	ES16	17	M22					
10	M22	M22	JX18	M17	JX19	JX24	M22	M22	17	33	40	49	JX37	38	34	30	26	20	JX33	JX26	JX30	JX26	JX26	JX33					
11	JX21	M22	JX34	ES15	ES16	JX21	JX26	JX24	JG23	37	33	JX50	JX49	JX51	31	JX58	JX42	JX53	JX49	JX29	JX29	JX18	ES16	ES16					
12	ES16	ES16	JX19	JX21	JX21	ES15	ES16	G20	JG24	31	34	27	G	JX37	36	JG28	JX35	JX39	JX31	JX29	JX34	JX30	JX22	M21					
13	JX26	JX24	25	M24	ES15	ES16	ES16	G	JX25	G	39	37	JX49	JX40	JX46	JG26	JX40	JX24	JX36	JX27	JX24	ES16	ES16	M18					
14	M17	M18	ES15	ES15	ES15	ES15	JX24	29	33	32	JX40	JG31	G	25	G	JX35	G	23	ES16	ES16	JX25	ES16	C	C					
15	C	C	C	C	C	C	C	C	29	36	G35	34	G25	G	G21	17	G21	G25	ES16	18	ES15	M	ES16						
16	ES16	ES16	JX25	ES15	M21	18	ES15	ES16	JG20	JX40	38	41	42	36	34	JX37	JX42	JX28	JX26	JX17	M20	M22	JX44	JX27					
17	JX30	ES16	ES16	ES15	EB12	ES16	ES16	ES16	JX36	JX34	JX70	36	JX52	35	32	JX29	JX35	JX35	20	ES16	ES16	ES16	M18	JX20					
18	ES16	ES16	ES16	JX21	ES14	ES16	ES15	EB16	G	JX36	JX39	34	35	G25	G	G26	G22	G	EB14	EB14	M20	M21	JX20	ES16					
19	ES16	ES16	ES16	M18	JX21	M18	ES16	G	G	G24	34	38	JG26	35	G	JX30	JX29	25	JX20	ES16	ES16	ES16	ES16	ES16					
20	ES16	ES16	JX24	M18	M17	EB12	ES16	G	G20	31	JX37	36	36	36	44	40	33	26	JX27	ES16	ES16	ES16	ES16	ES16					
21	ES16	ES16	ES16	ES15	ES15	ES15	ES16	ES16	G	G	34	37	40	JX50	JX48	JX40	JX54	JX40	JX27	JX18	EB14	M23	ES16	ES16					
22	ES16	ES16	ES16	ES16	EB11	JX18	M17	ES16	G18	JX30	35	36	JX58	JX45	JX46	JX39	JX30	JX29	JX25	JX19	JX18	M20	M19	ES16					
23	ES16	ES16	ES16	ES16	ES16	ES16	M20	ES16	G22	27	G	G	G	G	32	JX39	JX37	JX31	JX20	JX23	JX26	JX22	ES16	M22					
24	ES16	ES16	ES16	ES15	M21	JX18	ES16	G	G	32	35	35	39	39	JX37	JX51	JX28	JX35	JX29	JX30	JX31	ES15	ES16	ES16					
25	ES16	JX18	JX21	JX26	JX21	JX20	JX25	ES16	G	31	G26	37	C	46	JX45	28	JX34	G	17	ES16	ES16	C	C	ES16					
26	ES16	C	ES16	EB12	EB13	ES16	ES16	ES16	G	29	34	JX40	JX40	39	32	G27	28	G	JX18	ES16	JX24	M18	ES16	ES16					
27	M20	ES16	ES16	ES16	JX17	EB14	M21	M20	JG24	G	G24	G	37	37	JX36	30	27	16	EB14	EB14	ES16	EB14	ES16	ES16					
28	EB14	ES16	ES16	ES16	ES16	ES16	ES16	ES16	G	G	G	33	39	34	36	JX54	G24	G16	JX36	EB13	M18	ES16	ES16	ES15					
29	ES16	ES16	ES16	ES16	EB12	EB12	ES16	G	G	30	G34	36	36	JX40	38	34	G	G	ES14	JX20	ES16	ES16	ES16	ES16					
30	ES16	ES16	M23	JX19	M22	ES16	ES16	ES16	G	G	G28	G	35	39	33	31	JX30	20	ES15	ES15	JX20	M24	ES15	ES16					
31																													
CNT	29	28	29	29	29	27	29	29	29	30	30	30	29	30	30	30	30	30	30	30	30	29	28	29					
MED	ES16	ES16	ES16	ES16	ES16	ES16	ES16	16	G20	31	35	36	37	38	36	JX36	JX30	26	JX26	JX18	18	ES16	ES16	ES16					
UQ	20	19	JX20	20	21	18	20	20	25	34	39	40	JX41	JX45	44	JX40	JX40	JX39	JX36	JX29	JX24	21	19	21					
LQ	ES16	ES16	ES16	ES15	ES14	ES14	ES16	G	G	28	33	34	34	35	32	30	26	G16	G17	ES16	ES16	ES16	ES16	ES16					

The Radio Research Laboratories, Japan

NOV. 1973

FOES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

FBES (0.1 MHz)

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

Station OKINAWA Lat. 26 19.0 N. Long. 127 46.8 E Sweep 1 MHz to 25 MHz in 30 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 S ₁₅	E S ₁₅	E S ₁₄	E S ₁₅	20	E S ₂₅	30	G	E S ₃₁	34	37	31	32	G	G	E S ₁₆	E S ₁₅	E B ₂₁	E S ₁₆	E S ₁₆	E		
2	E	E S ₁₅	E S ₁₅	E S ₁₅	E	E B ₁₄	E S ₁₆	G	19	G	32	35	36	36	G	37	34	30	31	U A ₂₉	29	E S ₁₅	E B ₁₃	E S ₁₆	E S ₁₆	
3	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₅	E S ₁₅	E B ₁₃	E S ₁₆	G	G	40	E B ₃₇	E B ₃₇	E B ₃₆	38	36	34	28	60	22	30	E S ₁₆	E S ₁₆	E S ₁₆	E		
4	E S ₁₆	E S ₁₆	E S ₁₆	20	E B ₁₃	C	E B ₁₂	G	26	31	38	35	33	45	40	32	31	G	16	E S ₁₆	E S ₁₅	E S ₁₅	E S ₁₆	E S ₁₅		
5	E S ₁₆	E S ₁₆	E S ₁₅	E B ₁₁	E B ₁₂	E S ₁₄	18	23	28	33	51	50	67	60	47	26	23	20	30	E S ₁₆	19	E B ₁₉	20	E B ₂₁		
6	E S ₁₆	20	A	22	15	15	E	G	26	35	40	43	45	47	47	65	33	60	E	20	17	E B ₂₁	E S ₁₅	21		
7	26	20	E	15	17	E S ₁₅	E S ₁₆	G	21	30	36	34	36	35	34	32	27	25	40	34	23	19	E	E S ₁₆		
8	E S ₁₆	E S ₁₆	E S ₁₅	E S ₁₅	E B ₁₄	17	E	19	G	22	40	43	40	43	40	35	40	U A ₄₃	E	20	E	18	17	E		
9	18	E	E S ₁₆	E	E S ₁₆	S	E	G	25	28	34	34	38	36	34	37	55	U A ₄₀	46	25	E S ₁₆	E S ₁₆	E	E		
10	E	E	E	E	14	16	A	G	17	32	38	36	32	34	32	30	25	20	E	U A ₂₂	28	19	E	20		
11	19	22	16	E S ₁₅	E S ₁₆	16	A	21	G	20	30	33	33	37	41	31	56	36	53	36	24	E	E S ₁₆	E S ₁₆		
12	E S ₁₆	E S ₁₆	E	20	20	E S ₁₅	E S ₁₆	G	22	30	34	27	G	21	34	36	25	28	22	U A ₂₅	E	34	E	E		
13	18	22	25	20	E S ₁₅	E S ₁₆	E S ₁₆	G	23	18	39	37	37	40	40	25	G	30	19	G	24	23	E S ₁₆	E S ₁₆	E	
14	E	E	E S ₁₅	E S ₁₅	E S ₁₅	E S ₁₅	E S ₁₆	20	28	29	32	40	G	25	G	26	28	G	23	E S ₁₆	E S ₁₆	E S ₁₆	C	C		
15	C	C	C	C	C	C	C	C	C	29	32	32	32	G	25	G	G	17	16	20	E S ₁₆	E S ₁₅	E S ₁₆	E S ₁₆		
16	E S ₁₆	E S ₁₆	22	E S ₁₅	E	E S ₁₅	E S ₁₆	G	20	28	35	36	40	35	33	28	20	22	U A ₂₀	16	E	E	33	19		
17	19	E S ₁₆	E S ₁₆	E S ₁₅	E B ₁₂	E S ₁₆	E S ₁₆	E S ₁₆	24	25	27	33	G	34	32	23	20	20	18	E S ₁₆	E S ₁₆	E S ₁₆	E	E		
18	E S ₁₆	E S ₁₆	E S ₁₆	15	E S ₁₄	E S ₁₆	E S ₁₅	E B ₁₄	G	16	23	30	34	35	25	G	21	G	E B ₁₄	E B ₁₄	E	E	18	E S ₁₆		
19	E S ₁₆	E S ₁₆	E S ₁₆	E	15	E	E S ₁₆	G	G	G	23	33	35	20	35	G	23	23	17	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆		
20	E S ₁₆	E S ₁₆	E	E	E	E B ₁₂	E S ₁₆	G	G	16	30	30	35	35	36	43	38	32	21	19	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆		
21	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₅	E S ₁₅	E S ₁₆	E S ₁₆	E S ₁₆	G	G	33	36	37	41	41	32	33	21	18	E	E B ₁₄	E S ₁₆	E S ₁₆	E S ₁₆		
22	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E B ₁₁	E	E	E S ₁₆	G	18	25	35	35	53	44	46	34	27	22	20	18	E	E	E S ₁₆	E S ₁₆	
23	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	G	21	27	G	G	G	G	31	26	29	28	U A ₁₈	22	25	21	E S ₁₆	E	
24	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₅	E	E	E S ₁₆	G	G	32	34	34	36	39	32	31	20	23	21	26	28	E S ₁₅	E S ₁₆	E S ₁₆		
25	E S ₁₆	E	E	13	18	16	19	E S ₁₆	G	31	G	26	37	C	40	35	28	22	G	16	E S ₁₆	E S ₁₆	C	C	E S ₁₆	
26	E S ₁₆	C	E S ₁₆	E B ₁₂	E B ₁₃	E S ₁₆	E S ₁₆	E S ₁₆	G	28	32	33	32	33	32	26	G	27	G	E S ₁₆	E S ₁₆	E	E S ₁₆	E S ₁₆		
27	E	E S ₁₆	E S ₁₆	E S ₁₆	E	E B ₁₄	E	G	G	22	G	G	G	37	36	32	30	25	15	E B ₁₄	E B ₁₄	E S ₁₆	E B ₁₄	E S ₁₆	E S ₁₆	
28	E B ₁₄	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	G	G	G	33	36	34	35	36	G	21	G	16	20	E B ₁₃	E	E S ₁₆	E S ₁₆	E S ₁₅
29	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E B ₁₂	E B ₁₂	E S ₁₆	G	G	30	G	36	34	33	34	32	G	G	E S ₁₄	15	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	
30	E S ₁₆	E S ₁₆	E	E	E	E S ₁₆	E S ₁₆	E S ₁₆	G	G	G	G	34	39	34	31	26	17	E S ₁₅	E S ₁₅	17	19	E S ₁₅	E S ₁₆		
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	29	27	29	29	29	30	30	30	29	30	30	30	30	30	30	30	30	30	29	28	29	
MED	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₅	E S ₁₄	E S ₁₅	E S ₁₆	16	18	G	29	34	34	36	36	34	31	26	21	18	16	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	
UQ	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₅	E S ₁₆	E S ₁₆	E S ₁₆	22	31	36	36	37	40	40	34	30	25	21	22	18	E S ₁₆	E S ₁₆	E S ₁₆	E S ₁₆	
LQ	E S ₁₆	E S ₁₆	E S ₁₅	E S ₁₃	E S ₁₂	E S ₁₄	E S ₁₅	G	G	23	30	33	32	34	32	26	21	16	G	E S ₁₄	E S ₁₅	E	E S ₁₃	E S ₁₅	E	

NOV. 1973

FBES (0.1 MHz)

IONOSPHERIC DATA

NOV. 1973

F-MIN (0.1 MHZ)

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

Station	OKINAWA				Lat. 26 19.0 N.	Long. 127 46.8 E	Sweep 1 MHz to 25 MHz in 30 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 S 16	E S 16	E S 15	E S 15	E S 15	E S 14	E S 15	14	16	18	21	E S 17	E S 28	E S 27	23	20	16	14	E S 16	E S 15	21	E S 16	E S 16	14
2	E S 16	E S 15	E S 15	E S 15	11	14	E S 16	14	15	16	19	20	22	21	21	21	15	16	E S 15	E S 16	E S 15	13	E S 16	E S 16
3	E S 16	E S 16	E S 16	E S 15	E S 15	13	E S 16	E S 16	14	15	37	37	36	26	23	18	18	19	19	E S 16	E S 16	E S 16	E S 16	E S 16
4	E S 16	E S 16	E S 16	E S 15	13		12	13	14	16	16	17	18	21	20	21	20	18	E S 14	E S 16	E S 15	E S 15	E S 16	E S 15
5	E S 16	E S 16	E S 15	11	12	E S 14	E S 15	15	14	15	18	18	18	16	19	16	15	15	E S 15	E S 16	E S 15	19	E S 15	21
6	E S 16	E S 15	E S 15	E S 16	13	13	E S 15	14	14	15	18	21	17	19	18	20	18	15	E S 16	14	E S 16	21	E S 15	E S 16
7	E S 16	E S 16	E S 16	13	E S 15	E S 15	E S 16	E S 16	14	16	18	20	16	18	17	15	15	14	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16
8	E S 16	E S 16	E S 15	E S 15	14	E S 16	E S 16	13	14	14	14	15	20	20	18	20	17	14	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
9	E S 16	E S 16	E S 16	E S 16	E S 16		E S 16	E S 16	15	16	18	15	15	20	18	17	16	14	E S 15	E S 15	E S 16	E S 16	E S 16	E S 16
10	E S 16	E S 16	E S 15	12	E S 15	E S 16	E S 15		14	11	16	16	14	16	14	18	14	17	E S 16	14	14	E S 16	E S 16	E S 16
11	E S 16	E S 16	E S 15	E S 15	E S 16	12	E S 16	13	14	14	16	17	17	16	15	15	15	14	E S 15	E S 15	E S 16	E S 15	E S 16	E S 16
12	E S 16	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15	15	17	16	18	14	20	15	15	14	15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
13	E S 16	E S 16	E S 15	E S 16	E S 15	E S 16	E S 16	14	15	15	16	15	17	17	17	17	15	15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
14	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16	16	14	14	14	18	20	19	18	17	16	E S 18	E S 16	E S 16	E S 15	E S 16	C	C
15	C	C	C	C	C	C	C	C	C	18	15	18	18	15	18	15	14	14	E S 15	E S 16	E S 16	E S 15	E S 15	E S 16
16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 15	E S 15	E S 16	14	15	14	19	17	20	16	14	14	14	12	12	E S 16	E S 16	E S 16	E S 16
17	E S 16	E S 16	E S 16	E S 15	12	E S 16	E S 16	E S 16	14	14	15	18	18	15	16	20	16	15	14	E S 16	E S 16	E S 16	E S 16	E S 16
18	E S 16	E S 16	E S 16	12	E S 14	E S 16	E S 15	14	14	14	15	20	19	20	20	18	16	15	14	14	E S 16	E S 16	E S 16	E S 16
19	E S 16	E S 16	E S 16	E S 16	13	E S 16	E S 16	E S 16	14	14	20	19	14	21	20	16	17	E S 18	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
20	E S 16	E S 16	12	E S 16	12	12	E S 16	14	15	14	15	17	18	18	18	19	14	14	14	E S 16	E S 16	E S 16	E S 16	E S 16
21	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 16	14	15	15	18	20	18	17	15	14	14	E S 15	E S 16	14	E S 16	E S 16	E S 16
22	E S 16	E S 16	E S 16	E S 16	11	E S 16	E S 16	E S 16	14	14	15	16	18	19	17	15	15	14	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16
23	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	12	16	17	17	20	20	18	15	15	14	13	E S 16	E S 16	13	E S 16	E S 16
24	E S 16	E S 16	E S 16	E S 15	13	E S 16	E S 16	E S 16	24	14	16	20	15	17	18	15	15	14	E S 15	E S 15	E S 16	E S 15	E S 16	E S 16
25	E S 16	E S 16	E S 16	11	11	11	12	E S 16	14	14	15	20	C	20	16	15	14	14	12	E S 16	E S 16	C	C	E S 16
26	E S 16	C	E S 16	12	13	E S 16	E S 16	E S 16	14	14	19	20	20	20	20	20	14	15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
27	E S 16	E S 16	E S 16	E S 16	13	14	E S 16	E S 16	14	14	14	20	18	20	19	15	14	14	14	14	E S 16	14	E S 16	E S 16
28	14	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	15	14	15	20	16	18	16	16	15	14	E S 16	13	E S 16	E S 16	E S 15	E S 16
29	E S 16	E S 16	E S 16	E S 16	12	12	E S 16	15	14	14	15	18	18	17	17	18	16	14	E S 14	12	E S 16	E S 16	E S 16	E S 16
30	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	15	17	16	22	19	16	20	16	15	E S 15	E S 15	E S 15	E S 16	E S 15	E S 16
31																								
CNT	29	28	29	29	29	27	29	29	29	30	30	30	29	30	30	30	30	30	30	30	30	29	28	29
MED	E S 16	E S 16	E S 16	E S 15	E S 14	E S 15	E S 16	E S 16	14	14	16	18	18	19	18	17	15	14	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16
UQ	E S 16	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16	15	16	18	20	20	20	19	20	16	15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
LQ	E S 16	E S 16	E S 15	E S 15	12	13	E S 16	14	14	14	15	17	17	17	16	15	14	14	E S 14	E S 15	E S 16	E S 16	E S 16	E S 16

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F-MIN (0.1 MHZ)

IONOSPHERIC DATA

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M(3000)F2 (0.01)

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

Station OKINAWA Lat. 26 19.0 N. Long. 127 46.8 E Sweep 1 MHz to 25 MHz in 30 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 S	S	370	340	360	340	280	330	335	355	340	340	R	U R	330	340	J R	U R	R	350	290	S	330	S									
2	310	320	S	300	370	280	300	360	360	390	310	H	320	320	370	370	360	S	360	310	320	330	300										
3	310	S	330	300	310	330	300	350	365	360	350	355	335	330	315	345	350	340	340	325	290	300	320	320									
4	290	300	370	315	310	C	305	340	350	380	370	350	300	320	340	370	R	370	370	R	330	290	320	340	S								
5	300	U S	S	370	380	270	280	S	370	350	300	350	330	330	330	J R	330	370	370	S	330	310	320	310	300								
6	330	350	I A	320	350	330	280	330	360	365	330	310	315	315	310	330	340	S	S	R	325	360	340	280									
7	255	300	310	315	340	370	290	330	365	350	330	330	350	330	355	330	R	R	340	350	310	300	S	370	310								
8	280	280	310	330	340	350	250	335	360	360	340	290	290	310	330	330	350	325	S	345	280	310	330	280									
9	275	280	300	340	400	S	305	350	350	360	330	360	330	330	350	350	370	360	360	350	295	310	320	280									
10	290	320	380	360	360	S	A	370	370	360	350	350	340	320	345	365	360	360	380	305	300	300	300	R	275								
11	280	280	300	370	390	330	I A	315	350	350	380	360	330	335	330	330	340	340	360	380	380	290	310	310	280								
12	300	280	300	300	370	380	300	340	380	370	310	340	320	320	340	340	R	360	370	350	350	300	300	320	290								
13	310	310	S	300	360	390	300	350	370	S	340	330	350	330	340	340	360	350	370	R	S	340	S	300									
14	300	310	S	280	290	340	310	S	360	380	330	330	320	320	R	R	J R	340	310	360	330	390	290	360	C	C							
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	350	320	340	320	320	330	330	360	350	340	310	320	R	350	290	S	300
16	J S	J S	S	320	360	370	290	350	370	S	340	350	335	350	330	345	340	365	375	365	320	310	330	320	320								
17	S	305	315	310	S	F	S	335	370	340	330	335	340	335	315	335	335	330	330	330	R	290	310	340	320	340							
18	300	275	275	290	330	300	290	330	380	330	310	325	320	330	335	335	370	350	370	310	335	360	340	285									
19	290	285	295	295	310	330	310	320	360	370	375	360	310	345	350	340	340	370	320	330	290	325	S	360									
20	275	295	295	330	360	360	300	355	355	360	350	360	350	335	340	350	370	370	355	310	305	330	310	310									
21	300	290	320	350	290	F	340	320	355	340	340	360	350	300	305	335	360	350	330	320	320	320	S	310									
22	335	330	300	300	330	S	370	290	370	320	320	365	330	305	335	345	355	355	S	S	345	310	325	315	285								
23	290	290	315	370	400	300	300	320	365	350	320	330	320	320	330	340	350	S	S	R	320	370	310	S	270								
24	S	280	U S	S	J S	360	290	350	370	S	350	350	310	300	340	340	350	350	370	360	310	320	330	S	300								
25	280	265	270	305	370	S	300	320	365	285	315	325	I C	S	315	345	315	355	350	300	350	305	I C	I C	260								
26	270	I C	270	330	360	400	280	R	310	335	350	335	335	330	330	310	335	345	360	345	340	315	345	S	310								
27	315	275	280	335	360	280	295	340	365	360	355	335	355	315	320	S	H	330	350	310	340	R	330	330	325	325							
28	300	280	310	370	305	310	310	310	325	360	350	330	335	330	350	320	350	350	330	345	300	310	320	305									
29	S	280	290	310	390	400	275	310	350	360	355	310	350	310	340	310	335	350	S	R	360	320	330	345	330								
30	310	295	285	290	290	310	S	355	360	350	350	350	290	340	S	340	370	S	S	U S	S	340	J S	320	340								
31																																	
CNT	29	29	29	29	29	25	28	29	29	30	30	30	30	30	30	30	30	30	30	30	29	30	30	29	29								
MED	300	290	300	315	360	330	300	335	360	358	340	335	330	325	332	340	355	350	340	330	308	325	320	300									
UQ	310	305	315	340	370	370	308	350	370	360	350	350	340	330	340	345	365	360	355	350	320	340	340	320									
LQ	280	280	295	300	330	310	290	320	355	350	320	330	320	315	320	330	340	340	330	320	295	310	310	285									

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M(3000)F2 (0.01)

IONOSPHERIC DATA

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M(3000)F1 (0.01)

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

Station		OKINAWA							Lat. 26 19.0 N. Long. 127 46.8 E		Sweep 1 MHz to 25 MHz in 30 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									
3									L	L	L	L	L	L	L	L	L	A							
4									L	L	L	L	L	L	L	L	L	L							
5										L	A	A	A	A	A	L	L	L							
6									L	L	A	L	L	A	A	A	L	A							
7									L	L	L	L	L	L	L	L	L								
8									L	L	L	L	L	L	A	L	L	A	A						
9										L	L	L	L	L	L	L	L	A							
10									L	L	L	L	L	L	L	L	L	L							
11										L	L	L	L	L	L	L	A	A							
12										L	L	L	L	L	L	L	L	L							
13									L	L	L	L	L	L	L	L	L	L							
14									L	L	L	L	L	L	L	L	L	L							
15									C	L	L	L	L	L	L	L	L	L							
16									L	L	L	L	L	L	L	L	L	L							
17									L	L	L	L	L	L	L	L	L	L							
18										L	L	L	L	L	L	L	L	L							
19										L	L	L	L	L	L	L	L	L							
20									L	L	L	L	L	L	L	L	L	L	A						
21									L	L	L	L	L	L	L	L	L	L							
22										L	L	L	L	L	L	L	L	L							
23									L	L	L	L	L	L	L	L	L	L							
24										L	L	L	L	L	L	L	L	L							
25											L	L	L	L	L	L	L	L							
26									L	L	L	L	L	L	L	L	L	L							
27									L	L	L	L	L	L	L	L	L	L							
28										L	L	L	L	L	L	L	L	L							
29										L	L	L	L	L	L	L	L	L							
30									L	L	L	L	L	L	L	L	L	L							
31										L	L	L	L	L	L	L	L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT										1	4	10	12	8	2	2									
MED										410	385	380	385	370	375	385									
UQ											410	390	400	395											
LQ											380	370	380	360											

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M(3000)F1 (0.01)

IONOSPHERIC DATA

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H^oF₂ (KM)

135° E Mean Time (G. M. T. + 9h)

Station OKINAWA Lat. 26° 19.0' N. Long. 127° 46.8' E Sweep 1 MHz to 25 MHz in 30 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									240	250	250	255	250	270	265	230	225							
2									220	240 ^H	255	260	270	260	240	225								
3									235	240	240	240	285	260	270	240	230	250						
4									245	230	220	245	250	290	250	240	220	205						
5									245	305	255	270	255	265	255	210	205							
6									225	230	260	285	280	270	270	250	230	225						
7									230	235	280	260	240	250	250	230	225							
8									240	235	260	295	345	275	250	230	225	220						
9									250	275	240	240	275	250	240	240								
10									225	240	255	260	270	285	250	230	220	225						
11									225	235	280	280	270	255	250	230								
12									245	305	260	260	265	255	220	220								
13									220	215	275	275	250	265	240	240	220	200						
14									250	220	260	260	275	290	270	240	210							
15									C	250	255	255	265	275	240	230	215	210						
16									220	250	240	280	250	270	250	250	230							
17									225	220	270	260	240	245	290	240	240							
18									230	290	280	280	270	250	240	220								
19									230	240	250	300	260	250	250	220								
20									220	240 ^L	250	245	260	250	260	250	225							
21									240 ^L	240	265	240	250	320	260	260	230							
22									270 ^L	270	235	270	280	260	250	240								
23									245	240	240	260	260	260	255	250	225							
24									245	250	255	280	265	265	240	225								
25									240	290	250	270 ^L	290	245	260	235								
26									260 ^L	255	250	240	260	260	250	250	220							
27									230	235	235	245	260	270	270	240 ^H								
28									245	245	280	265	270	240	260	230								
29									245	250	270 ^L	245	240	260	230	240								
30									230	235	250	250	270	275	255	240	220							
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									17	30	30	30	30	30	30	30	29	8						
MED									230	240	252	255	262	270	255	240	225	215						
UQ									240	245	270	270	275	275	265	250	230	225						
LQ									225	230	240	245	250	260	250	240	220	205						

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H^oF₂ (KM)

IONOSPHERIC DATA

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H^oF (KM)

135° E Mean Time (G. M. T. + 9h)

Station OKINAWA Lat. 26° 19.0' N. Long. 127° 46.8' E Sweep 1 MHz to 25 MHz in 30 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	240	215	230	210	220	285	235	225	220	205	E ₂₀₀ S	H ₁₉₅	200	H ₁₈₀	240	220	210	195	205	265	250	240	230	
2	240	250	240	250	205	270	290	225	215	215	205	H ₂₀₅	220	H ₁₉₀	235	220	225	215	210	220	205	215	230	240	
3	250	245	270	300	260	240	290	240	230	250	240	220	200	240	225	230	225	A	215	220	225	220	250	240	
4	280	260	220	220	250	C	255	230	235	215	220	200	H ₂₀₀	A	255	230	225	220	205	200	225	230	220	220	
5	255	260	250	205	200	375	340	230	230	235	A	A	A	A	A	H ₂₀₀	220	215	250	215	250	225	250	300	
6	250	230	A	300	220	E ₂₇₅ A	315	240	225	230	A	A ₂₇₀	A	A	A	A	240	A	200	200	205	200	200	290	
7	300	270	250	260	230	210	320	240	230	220	220	205	205	205	245	225	235	210	220	E ₂₈₀ A	270	250	210	230	
8	315	305	275	220	205	230	E ₄₅₀ S	220	H ₂₁₅	230	A	A	230	A	A	230	A	A	200	200	210	240	230	270	
9	300	300	260	220	200	S	280	230	225	H ₂₂₀	215	210	205	205	240	250	A	220	245	215	245	240	220	300	
10	325	260	210	220	215	E ₃₅₀ S	A	225	230	240	245	H ₂₃₀	220	210	200	H ₂₁₅	H ₂₂₀	H ₂₀₀	200	220	A ₂₃₀	280	260	340	
11	305	305	255	215	205	250	A	230	225	215	220	205	205	A	H ₂₀₀	A	A	215	210	205	E ₂₇₀ S	230	240	245	
12	275	305	275	260	210	195	E ₃₃₀ S	230	225	235	215	210	200	195	250	210	245	205	205	205	E ₃₁₀ A	210	215	300	
13	270	300	310	250	215	200	E ₃₂₀ S	240	210	H ₁₉₅	250	225	220	220	I ₂₅₀ A	220	240	210	200	220	245	220	215	250	
14	275	270	270	295	300	220	265	250	245	210	215	H ₂₅₀	195	195	H ₂₀₀	220	230	205	225	205	250	215	C	C	
15	C	C	C	C	C	C	C	C	C	H ₁₉₅	220	200	195	H ₁₈₀	195	H ₁₉₅	225	225	230	205	200	245	220	220	250
16	255	285	295	250	215	205	325	240	225	H ₂₀₀	230	220	250	205	240	200	220	230	200	200	240	235	260	270	
17	330	270	260	270	230	220	275	245	200	220	H ₂₀₀	H ₂₀₀	H ₁₇₀	H ₂₂₀	H ₂₀₀	220	230	225	200	200	240	230	230	230	
18	280	300	305	260	220	260	250	H ₁₈₀	H ₂₀₀	H ₂₀₀	H ₁₈₀	220	220	H ₁₉₀	H ₂₀₀	230	225	200	200	230	205	200	230	270	
19	295	300	270	280	240	240	270	240	H ₂₂₀	H ₂₂₀	200	220	H ₁₈₀	H ₂₁₅	H ₂₀₀	H ₂₁₅	H ₂₀₀	220	210	200	240	240	200	220	
20	300	310	300	250	220	220	280	240	220	230	230	H ₂₀₀	215	230	A	A	A	220	220	215	260	240	250	250	
21	280	300	250	220	290	260	230	240	220	H ₂₀₀	215	220	220	220	A	A	240	240	220	200	210	220	220	250	240
22	240	230	290	290	240	200	180	270	H ₂₀₀	240	250	230	A	A	A	230	230	215	220	220	240	220	240	290	
23	300	290	260	220	200	310	340	250	H ₂₂₀	H ₂₀₀	200	H ₁₉₀	H ₁₈₀	H ₁₉₀	H ₁₈₀	215	225	205	200	200	205	230	225	305 _S	
24	305	305	275	255	215	205	305	240	210	230	225	H ₂₀₅	200	255	220	230	220	215	200	235	260	210	220	300	
25	305	345	340	275	205	230	300	220	H ₂₂₅	I ₂₃₅ A	H ₂₀₀	240	I ₂₅₀ C	260	230	225	230	220	200	200	225	I ₂₂₀ C	I ₂₂₀ C	300	
26	325	I ₃₂₅ C	320	250	220	200	E ₃₅₀ S	260	H ₂₂₀	220	H ₂₀₀	200	H ₁₈₅	H ₂₀₀	H ₁₉₀	H ₂₀₀	235	205	200	200	230	215	210	240	
27	250	300	300	240	230	280	280	250	240	220	H ₂₀₀	H ₂₀₀	240	220	210	200	H ₂₀₀	230	200	200	240	230	220	240	
28	240	330	290	210	250	280	E ₂₆₀ S	260	240	235	220	215	210	220	200	230	235	215	200	200	240	230	240	250	
29	270	300	275	240	200	190	A ₃₅₀	250	235	230	230	220	230	200	200	230	205	210	200	200	220	240	225	230	
30	260	270	300	330	280	250	230	225	225	H ₂₂₀	220	H ₂₀₀	H ₁₉₅	250	220	215	240	H ₂₀₅	200	205	205	220	215	230	
31																									
CNT	29	29	28	29	29	27	27	29	29	30	27	28	27	24	24	27	26	27	30	30	30	30	29	29	
MED	280	300	272	250	220	225	285	240	225	220	220	210	205	208	205	225	225	215	200	205	238	228	225	250	
UQ	300	305	298	270	240	260	312	245	230	230	228	220	220	220	238	230	235	220	210	218	248	240	240	290	
LQ	255	260	252	220	205	208	268	230	220	215	H ₂₀₂	200	H ₁₉₅	H ₁₉₈	H ₂₀₀	215	220	208	200	200	220	220	220	240	

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H^oF (KM)

IONOSPHERIC DATA

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H⁺ES (KM)

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

Station OKINAWA Lat. 26 19.0' N. Long. 127 46.8 E Sweep 1 MHz to 25 MHz in 30 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	100	S	S	S	S	145	135	120	G	110	110	110	110	165	165	G	S	S	B	S	S	100
2	100	S	S	S	100	B	S	160	G	150	140	120	130	G	160	150	165	110	105	105	S	B	S	S
3	S	S	S	S	S	B	S	G	G	130	B	B	B	150	150	130	150	120	170	120	S	S	S	100
4	S	S	S	100	B	C	B	G	145	160	140	150	100	165	140	120	120	G	110	S	S	S	S	S
5	S	S	S	B	B	S	105	150	145	135	125	115	120	115	115	110	110	115	105	S	95	B	95	B
6	S	105	100	105	105	100	105	G	130	120	120	120	115	110	110	110	110	100	105	100	100	B	S	100
7	100	100	100	100	100	S	S	G	120	135	120	120	115	110	110	110	105	105	100	100	100	95	95	S
8	S	S	S	S	B	95	105	130	G	100	120	120	120	120	115	110	110	110	100	100	105	100	100	100
9	100	100	S	100	S	S	100	100	150	155	120	125	120	120	120	120	115	105	105	105	S	S	105	105
10	100	105	105	105	100	100	100	105	100	170	140	130	100	140	115	180	150	145	110	110	100	110	130	130
11	100	100	110	S	S	100	100	100	100	110	140	105	105	105	110	110	105	100	105	100	105	100	S	S
12	S	S	105	105	100	S	S	100	110	160	160	110	100	120	180	100	120	110	105	150	140	110	100	100
13	100	105	95	100	S	S	S	G	110	105	175	190	100	100	100	100	100	100	100	145	130	S	S	125
14	125	120	S	S	S	S	S	130	150	140	110	105	105	105	105	105	G	160	S	S	100	S	C	C
15	C	C	C	C	C	C	C	C	C	155	145	110	105	100	G	100	100	100	100	S	100	S	100	S
16	S	S	105	S	105	105	S	S	110	110	150	140	140	140	170	100	110	100	100	100	100	110	100	100
17	100	S	S	S	B	S	S	S	130	120	120	130	150	150	130	105	110	110	110	S	S	S	110	110
18	S	S	S	110	S	S	S	B	110	110	110	130	180	110	G	110	100	G	B	B	105	100	100	S
19	S	S	S	100	100	100	S	G	G	110	160	180	100	175	G	100	100	170	100	S	S	S	S	S
20	S	S	110	100	110	B	S	G	110	180	100	145	140	160	120	120	130	160	100	S	S	S	S	S
21	S	S	S	S	S	S	S	S	G	G	180	140	140	120	110	110	100	100	100	100	B	100	S	S
22	S	S	S	S	B	110	110	S	110	110	170	160	115	115	110	110	110	100	100	100	100	100	100	S
23	S	S	S	S	S	S	100	S	130	120	G	G	G	G	105	100	100	100	100	135	135	125	S	100
24	S	S	S	S	100	100	S	G	G	175	150	120	120	115	115	105	105	100	100	100	95	S	S	S
25	S	110	100	100	100	100	100	S	G	170	110	125	C	115	110	110	100	G	100	S	S	C	C	S
26	S	C	S	B	B	S	S	S	G	120	120	110	110	115	110	110	180	G	100	S	120	125	S	S
27	130	S	S	S	120	B	115	120	120	G	105	G	140	130	120	110	110	110	B	B	S	B	S	S
28	B	S	S	S	S	S	S	S	G	G	G	145	120	170	130	115	110	110	100	B	100	S	S	S
29	S	S	S	S	B	B	S	G	G	190	175	170	160	120	125	120	G	G	S	100	S	S	S	S
30	S	S	110	105	105	S	S	S	G	G	110	G	135	175	U G 175	110	110	110	S	S	110	100	S	S
31																								
CNT	10	9	11	12	12	9	10	10	18	26	26	26	27	28	27	30	28	24	24	16	18	12	11	11
MED	100	105	105	100	100	100	102	125	120	132	132	125	120	120	115	110	110	110	100	100	100	100	100	100
UQ	100	105	108	105	105	100	105	145	135	160	150	145	138	145	130	120	120	112	105	115	110	110	102	108
LQ	100	100	100	100	100	100	100	100	110	110	120	115	105	110	110	105	102	100	100	100	100	100	100	100

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NOV. 1973

H⁺ES (KM)

IONOSPHERIC DATA

NOV. 1973

TYPES OF ES

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

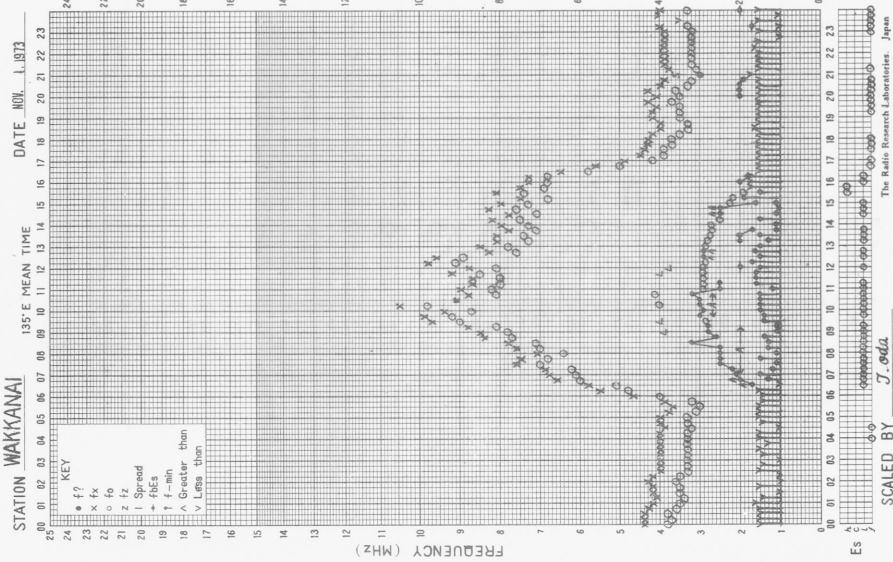
Station **OKINAWA** Lat. **26 19.0 N.** Long. **127 46.8 E** Sweep **1 MHz** to **25 MHz** in **30 sec** in automatic operation

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	F1	F1					H2	H1	C1		C1	C1	C1	C1	HL11	L1							F1	
2	F1				F1			H1		H1	H1	C1	C1		H2	H1	HC11	L4	L3	F2					
3										C2				H1	C1	C1	C1	C3	H1	F2				F1	
4				F1					H1	H1	H1	HL11	L2	H1	H2	C1	C1		L1						
5							F3	C2	H1	HC11	CC31	CC31	C3	C3	C3	C1	C1	L1	L4		F1		F2		
6		F2	F3	F3	F2	F2	F1		C2	CL21	CL21	C2	C2	CL21	C4	C3	C3	L5	F3	F1	F1			F2	
7	F2	F1	F1	F1	F1				L1	H1	C2	C1	C2	C1	C2	CL21	LL21	L3	F4	F2	F1	F2	F2		
8					F1	F1	CL11			LC21	CL22	CL32	C1	C3	C2	C2	C3	L5	F3	F1	F1	F1	F2	F1	
9	F1	F1		F1			F1	L1	HL11	HL12	CL12	CLL22	CL21	C2	C1	C2	C3	L4	F4	F3			F2	F2	
10	F2	F1	F1	F1	F2	F2	F2	L1	L2	HL11	CL21	C1	LH11	CL11	C1	HLL	HL11	H1	F1	F2	F3	F1	FF11	F2	
11	F2	F2	FF22			F2	F6	L3	L2	L2	HL11	CH21	L2	L2	C1	C3	C6	L6	F2	F3	F1	F1			
12			F1	F1	F3			L1	LL11	HHL11	HL11	L1	L1	C1	HCL11	L2	CHL11	LHL11	F2	FF11	FF32	F2	F2	F1	
13	F1	F2	F2	F1					C1	L1	HL11	HHL11	L3	L2	L4	L1	L3	L3	L3	FF22	FF42			F1	
14	F1	F1						L2	H2	HC22	C1	C3	L1	L1	L1	LH11		H1			F2				
15										HL11	HC11	C1	C1	L2		L1	L1	L1	F2		F2		F1		
16			F4		F2	F1			L1	LH21	HL11	CL12	CL22	CL12	HL12	LC31	LC12	L2	F5	F1	F1	F1	F3	F3	
17	F3								C1	LH11	LC12	CL11	HC11	HL11	CL11	L1	L1	L2	F1				F1	F1	
18				F1					L1	L2	L1	CL11	HL11	L1		L1	L1				F1	F1	F1		
19				F1	F1	F1			L1	H1	HHL11	L1	H1		L1	L1	HL11	F1							
20			F2	F1	F1				L1	HL11	LH21	HL12	HL11	HL11	CL21	C2	C2	HL11	F2						
21										H1	H1	C1	C2	C3	C2	L4	L4	F3	F1			F1			
22					F1	F1			L1	LH11	H1	H1	CL31	C1	CL31	C2	CL21	L2	F3	F2	F2	F2	F1		
23							F1		C1	C1					C1	LH21	L4	L2	F2	F1	FF51	F3		F1	
24					F1	F1				H1	H1	C1	C2	C2	CH21	L3	L2	L3	F2	F4	F3				
25		F1	F1	F2	F3	F3	F3			H1	L1	C1		C2	C1	L1	L2		F1						
26										C1	C1	C1	C1	CC11	C1	L1	H1		F1		F1	F1			
27	F1				F1		F1	L1	C1		L1		C1	C2	C1	C2	C2	L1							
28												C1	C1	H1	C1	C2	L1	L1	F2		F1				
29										HL11	H1	H1	HL11	C1	C2	C1				F1					
30			F1	F2	F1						C2		HC11	HCL11	HCL11	C1	C2	L1					F2		
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																									

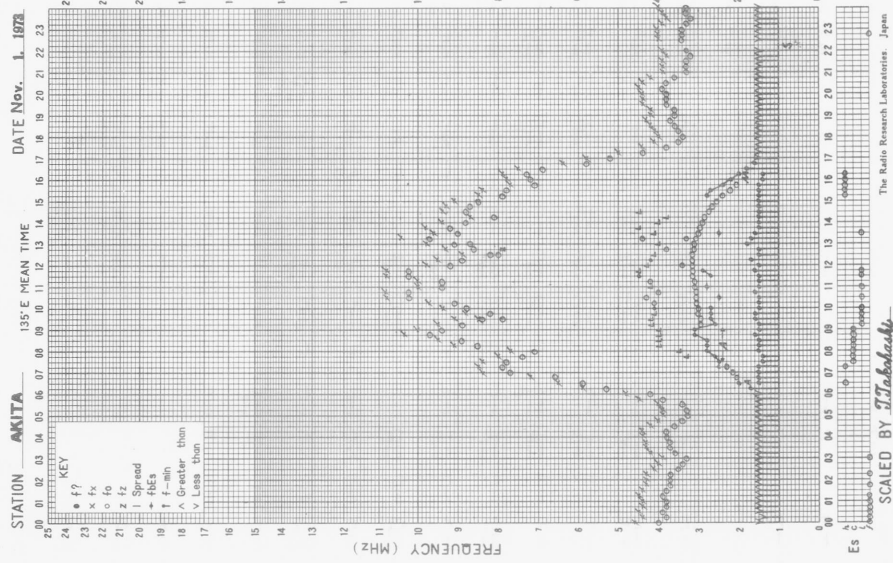
NOV. 1973

TYPES OF ES

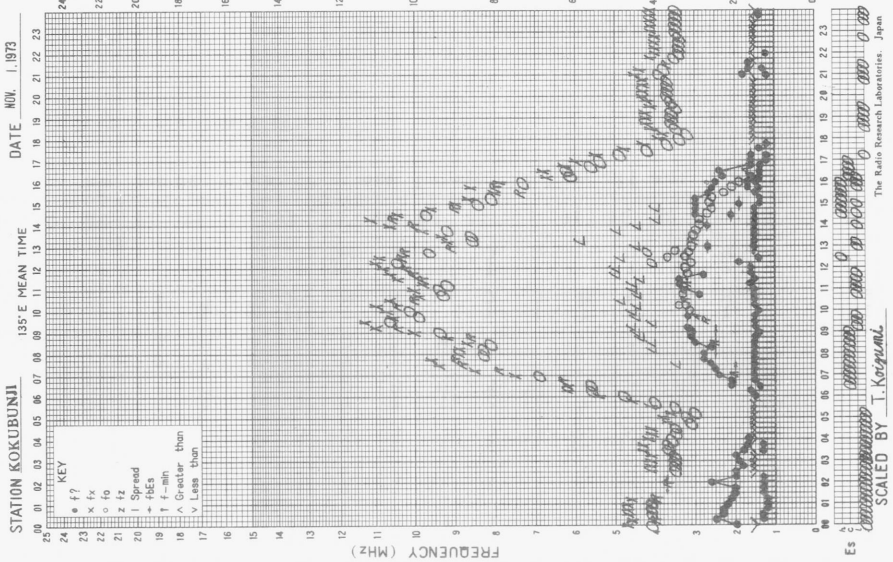
f- PLOT OF IONOSPHERIC DATA



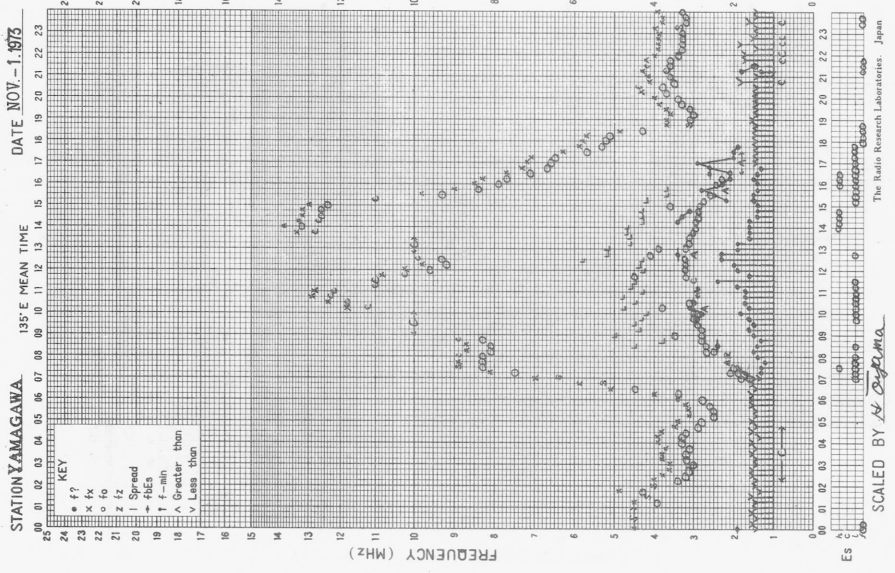
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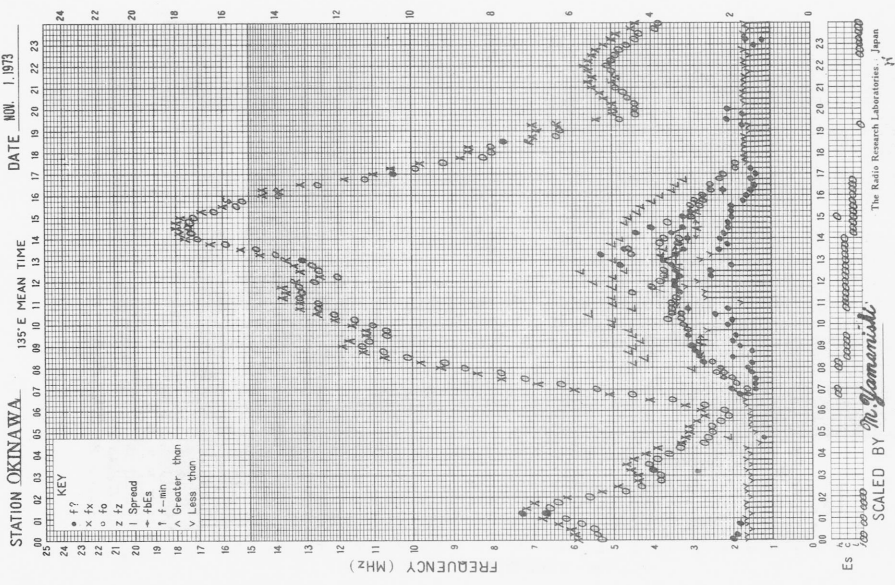
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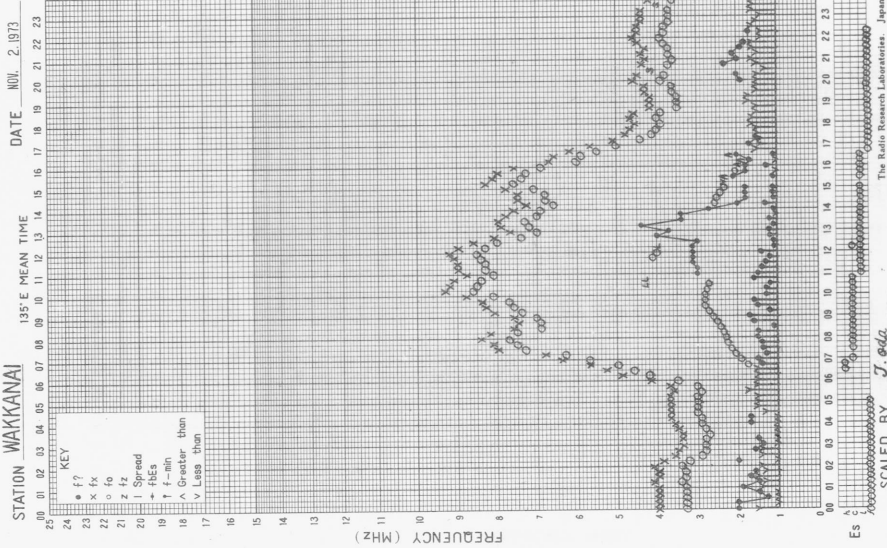
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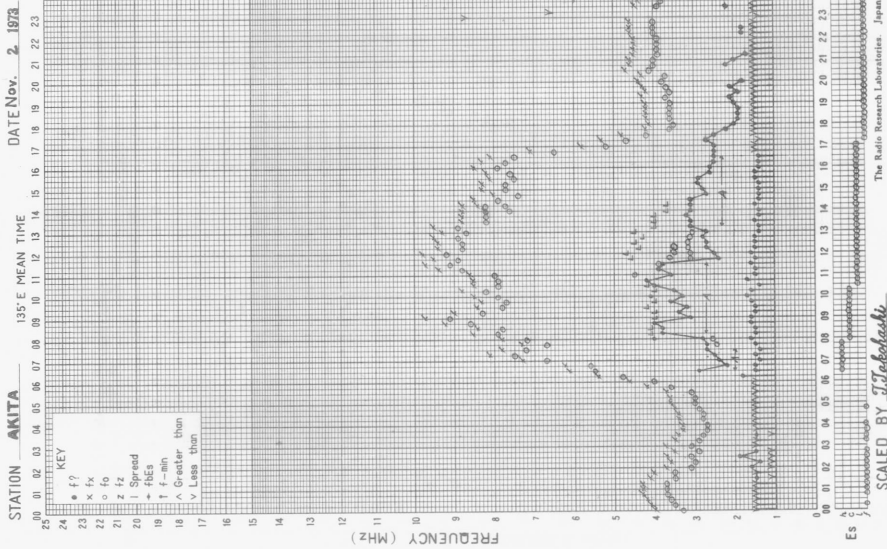
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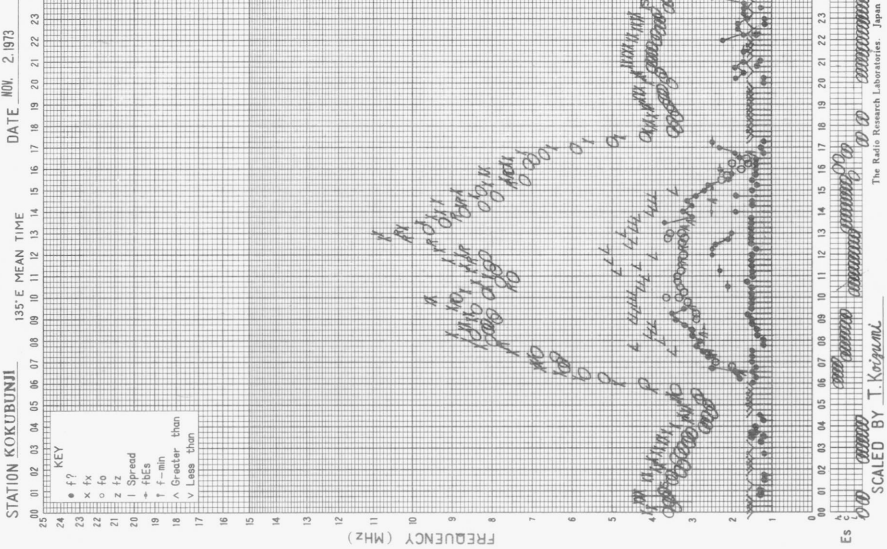
f- PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA

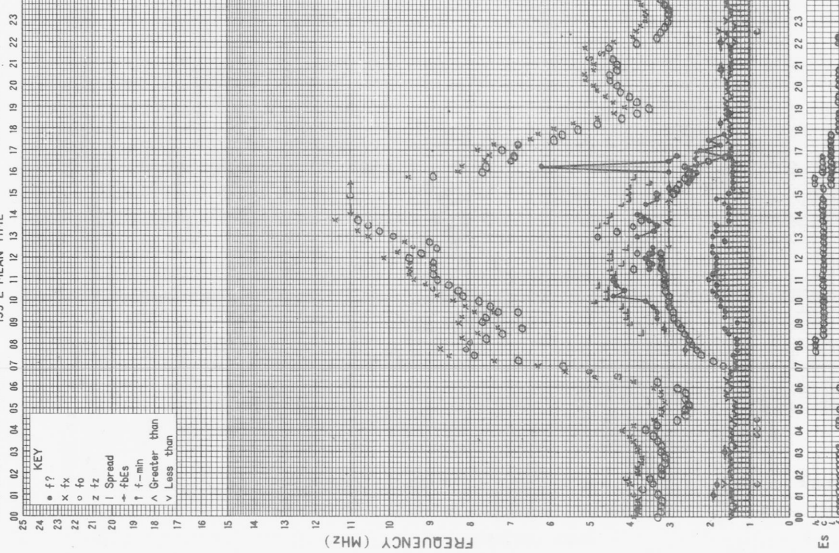


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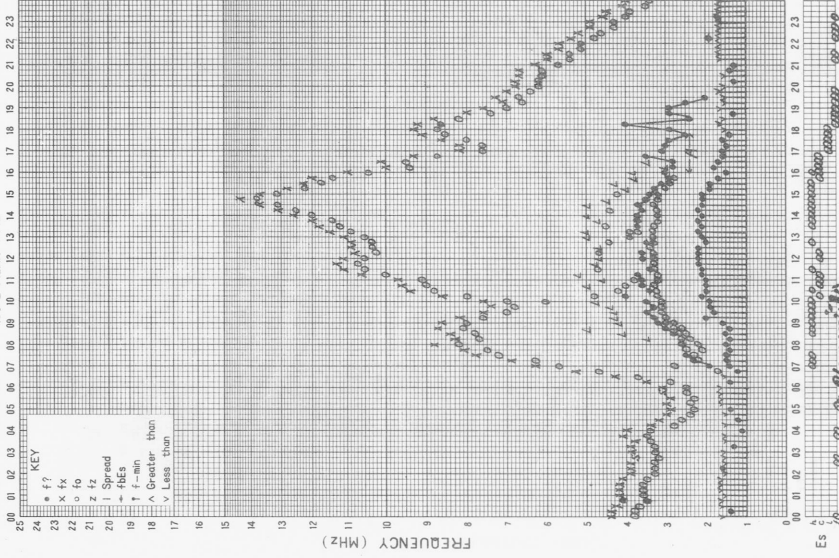
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA DATE NOV-2-1973

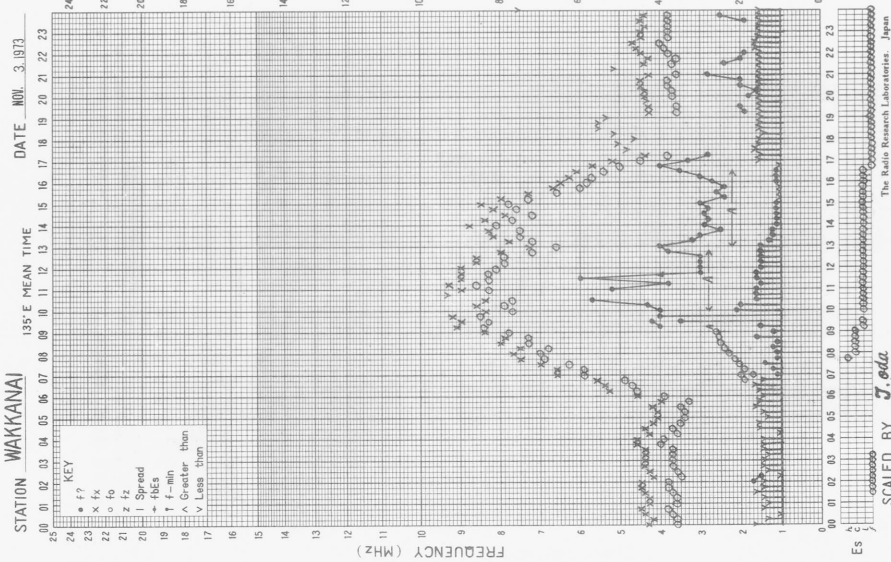


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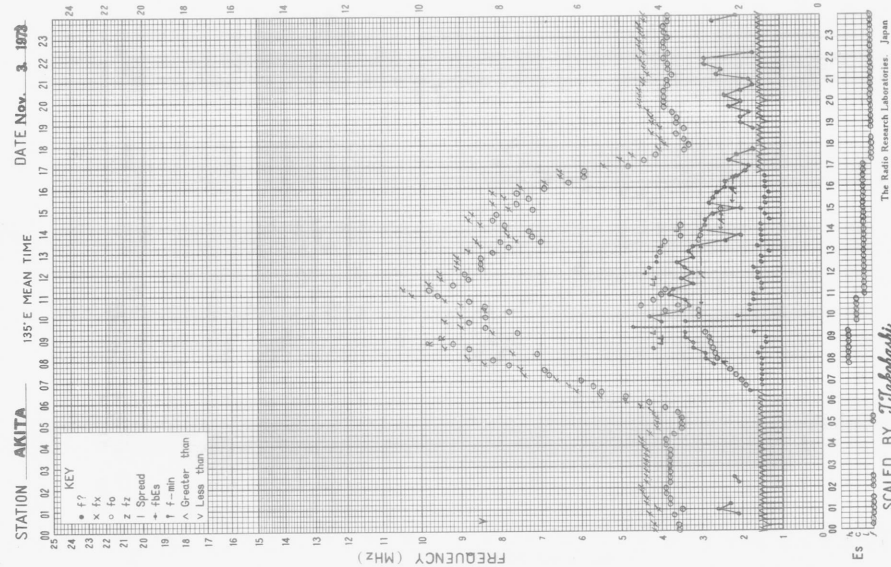
STATION OKINAWA DATE NOV-2-1973



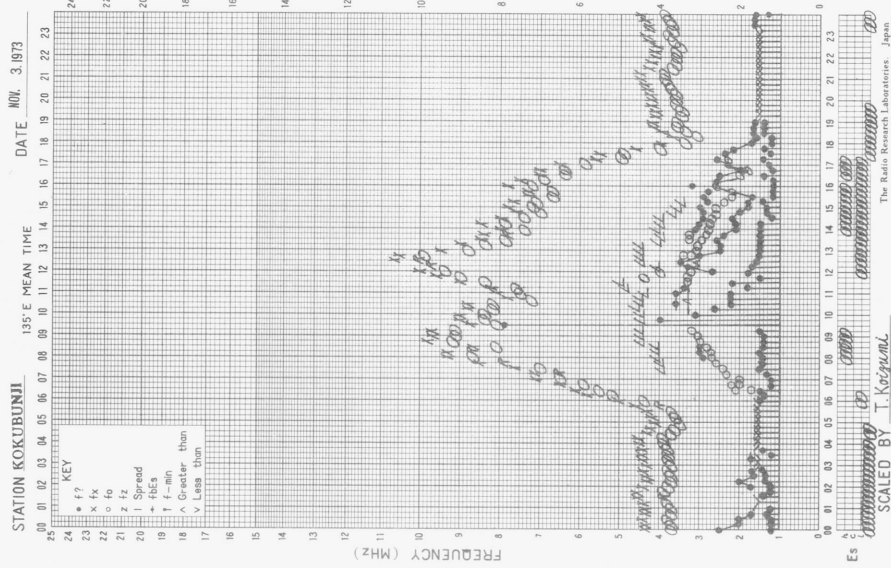
f--PLOT OF IONOSPHERIC DATA



f--PLOT OF IONOSPHERIC DATA

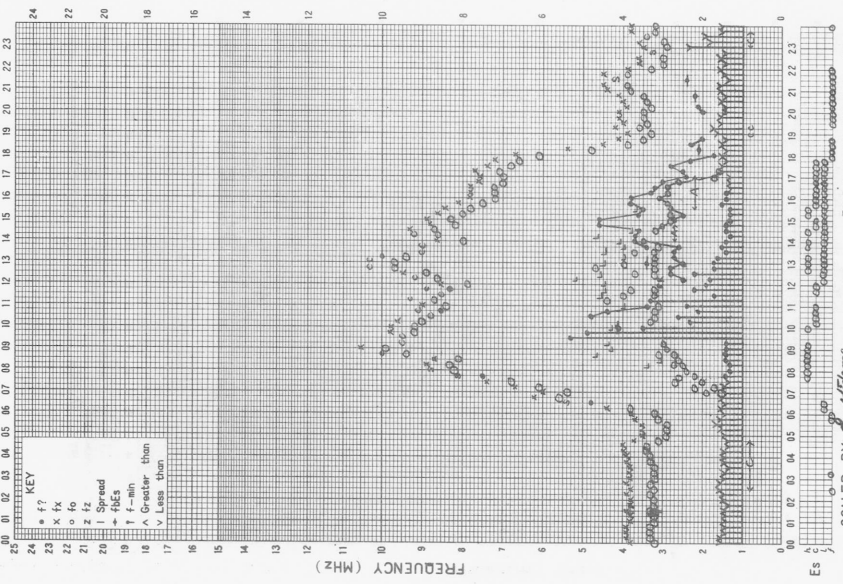


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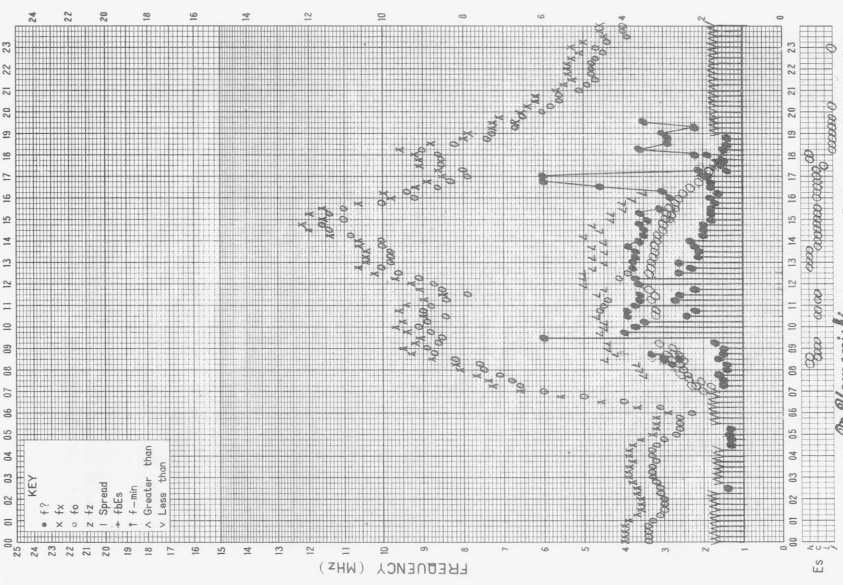
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STATION YAMAGAWA 135°E MEAN TIME DATE NOV.-3-1973

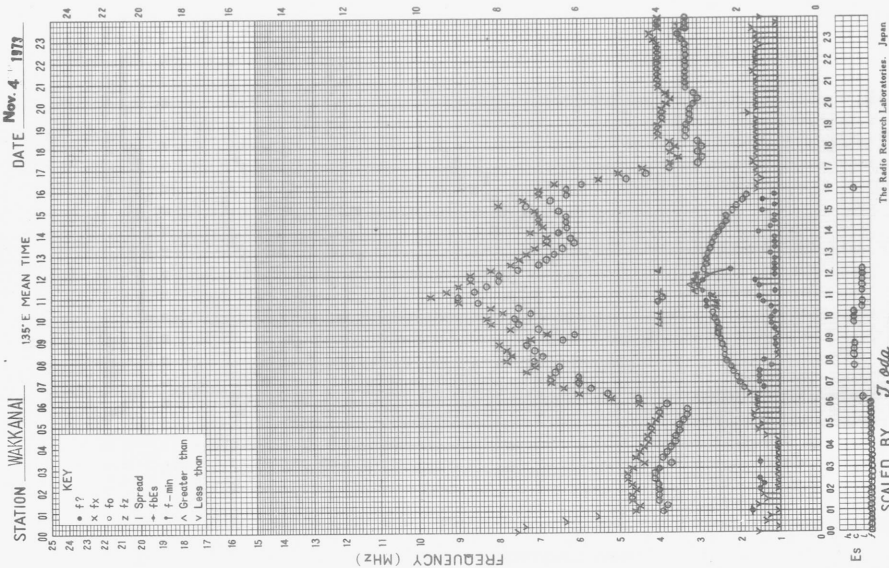


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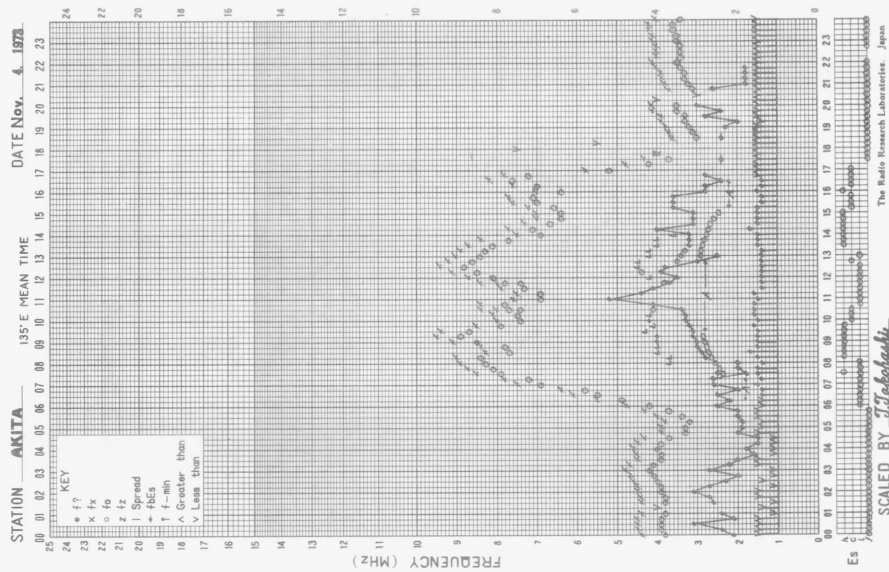
STATION OKINAWA 135°E MEAN TIME DATE NOV.-3-1973



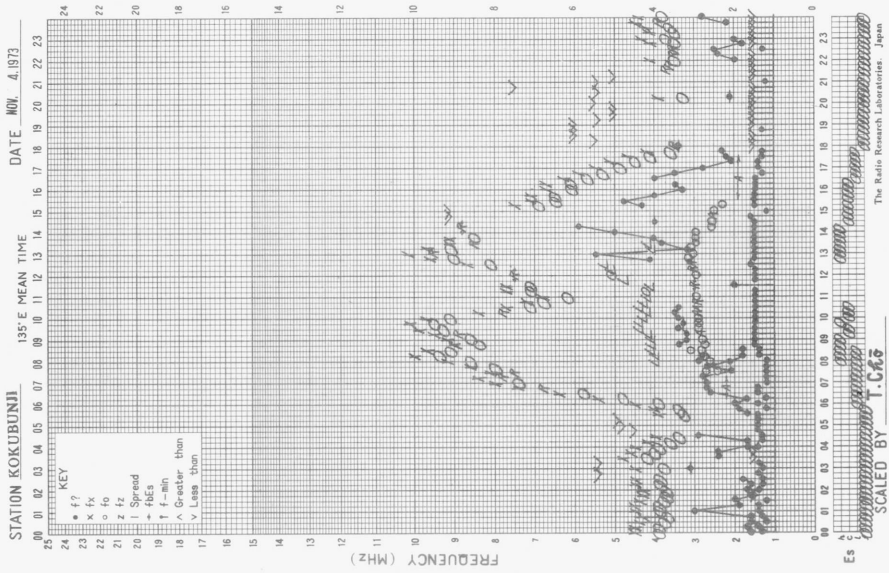
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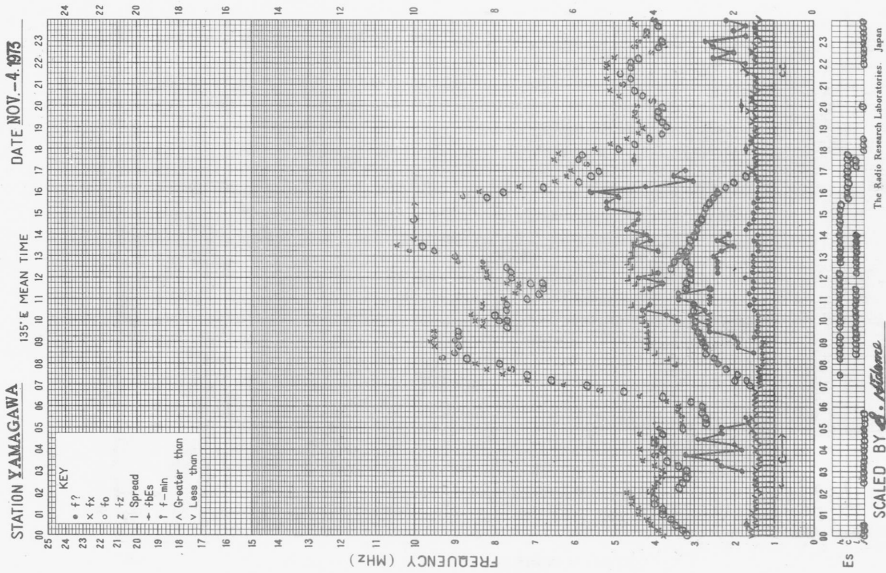
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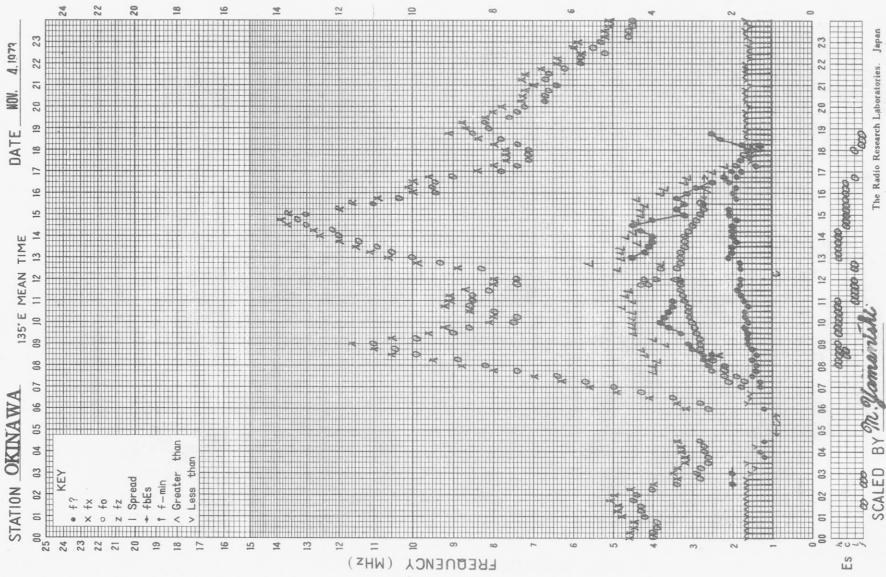
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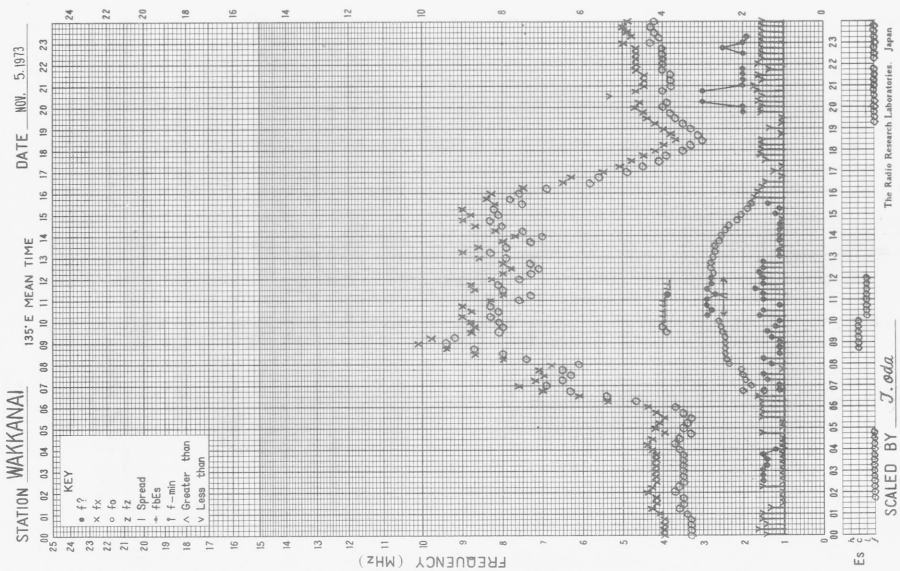
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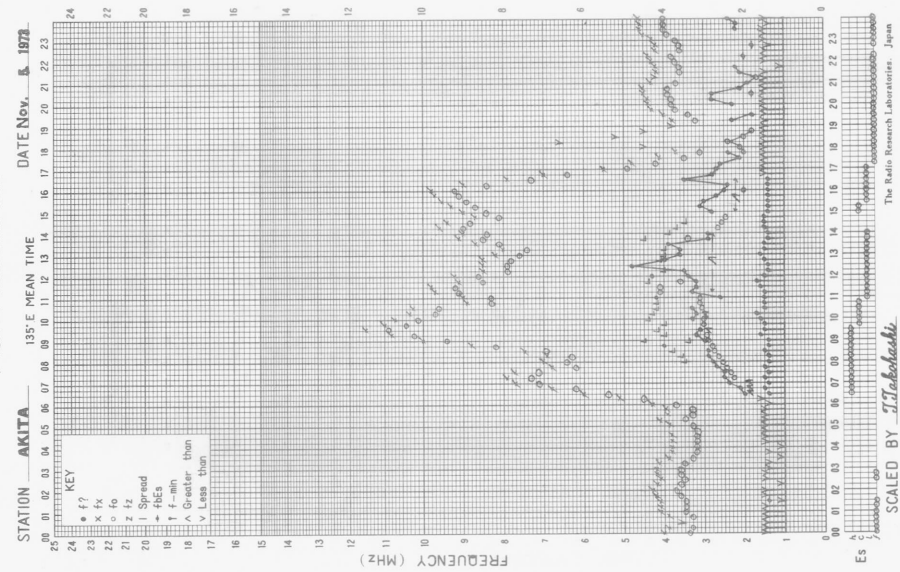
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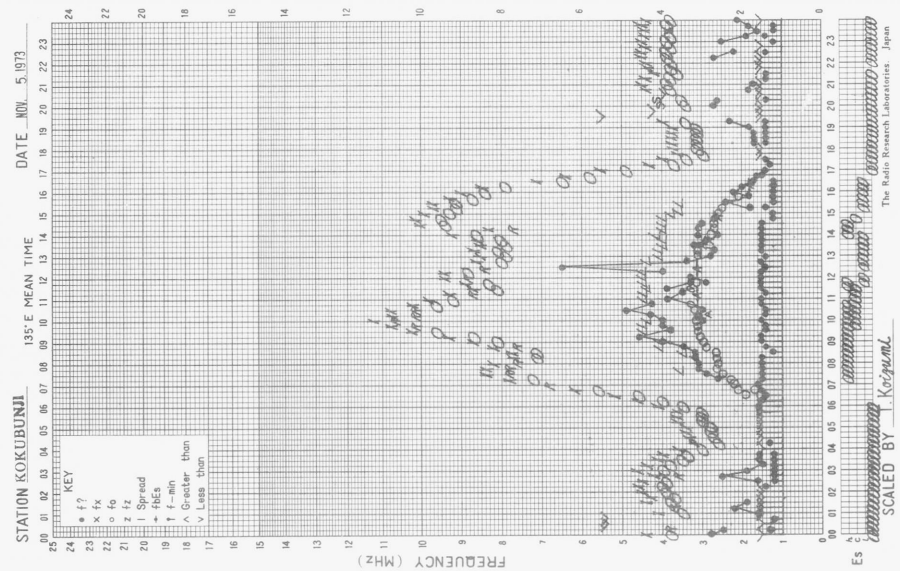
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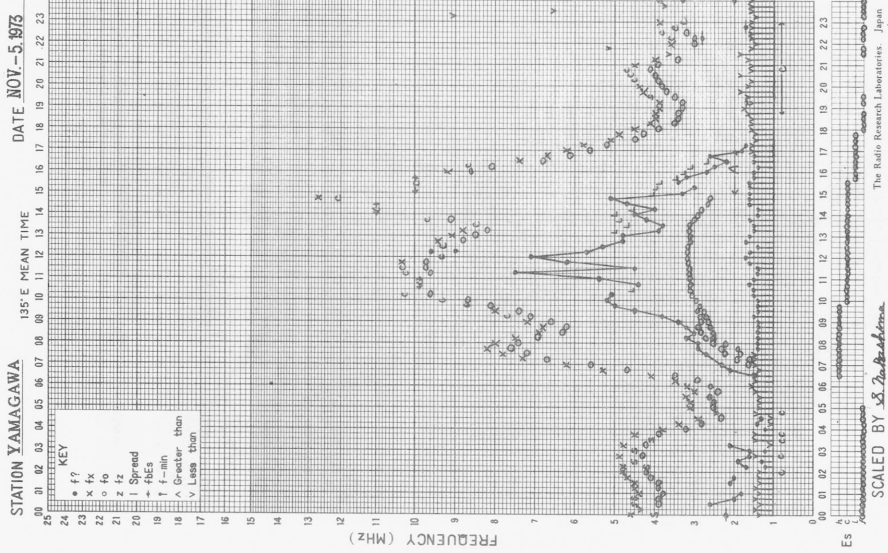
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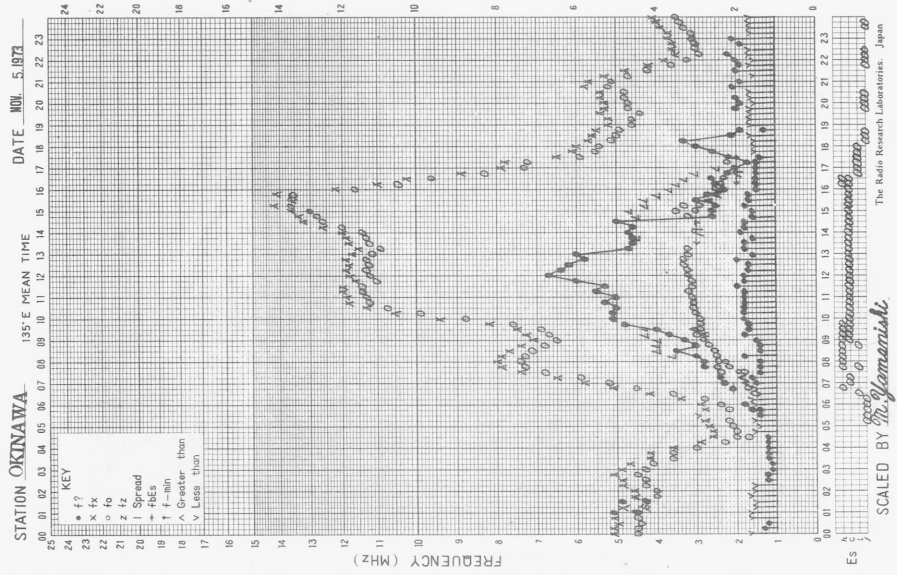
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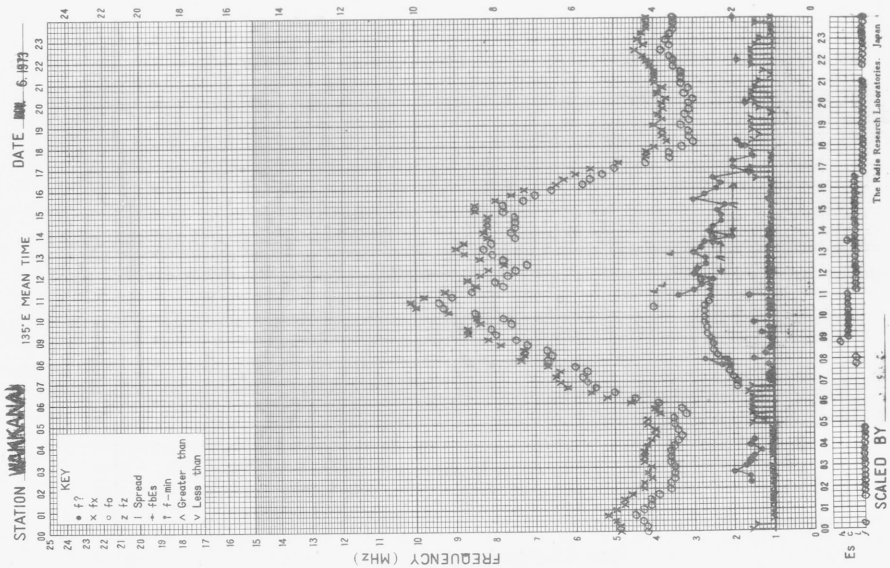
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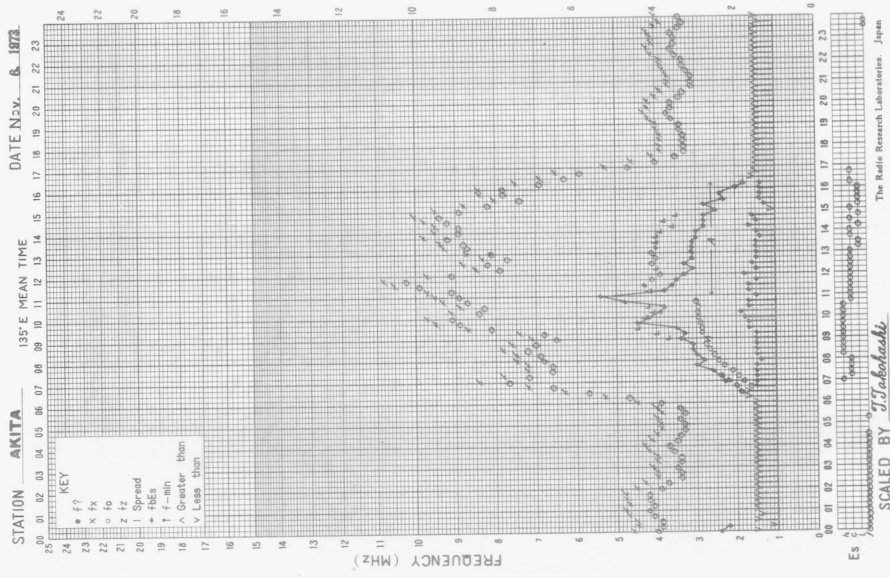
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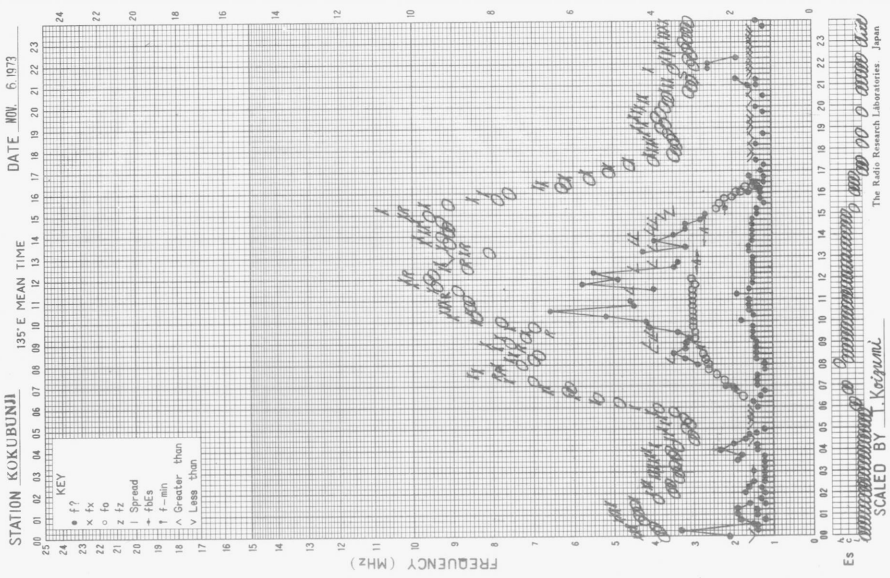
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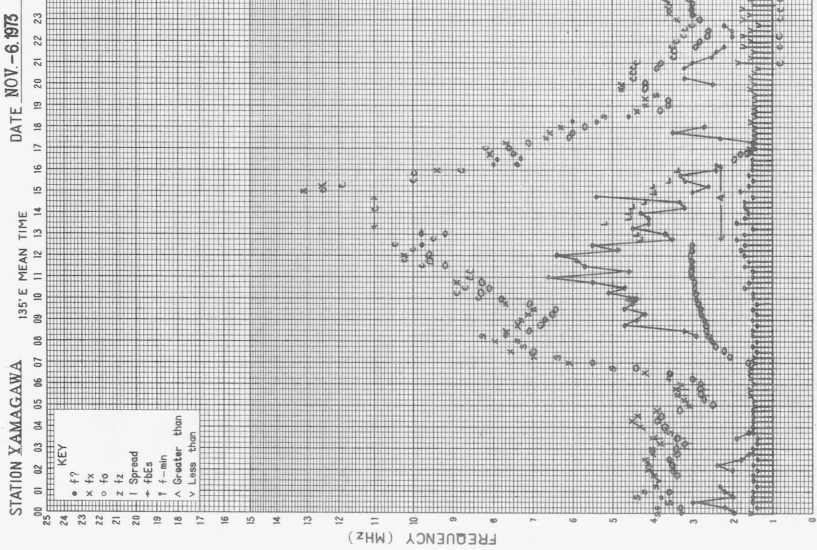
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA



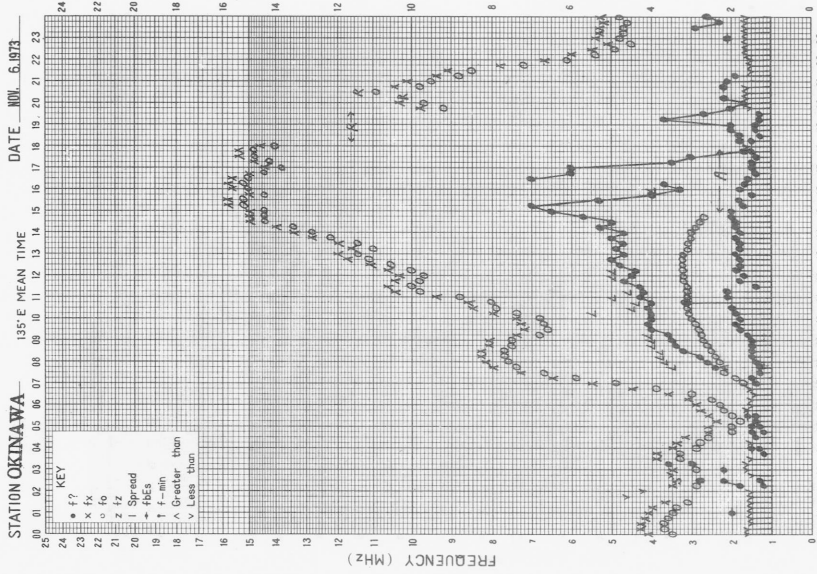
f-plot of IONOSPHERIC DATA



SCALED BY St. Nakashima

The Radio Research Laboratories, Japan

f-plot of IONOSPHERIC DATA



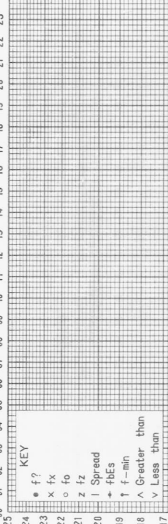
SCALED BY M. Koutaki

The Radio Research Laboratories, Japan

f- PLOT OF IONOSPHERIC DATA

STATION WAKKANAI DATE NOV. 7, 1973

135°E MEAN TIME



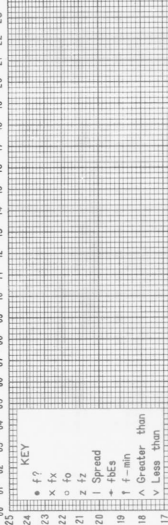
SCALED BY J. oda

The Radio Research Laboratories, Japan

f- PLOT OF IONOSPHERIC DATA

STATION AKITA DATE Nov. 7, 1973

135°E MEAN TIME



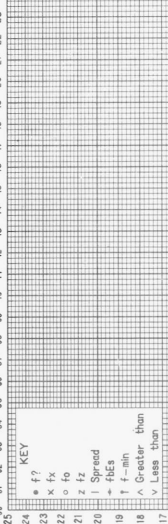
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The Radio Research Laboratories, Japan

f- PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI DATE NOV. 7, 1973

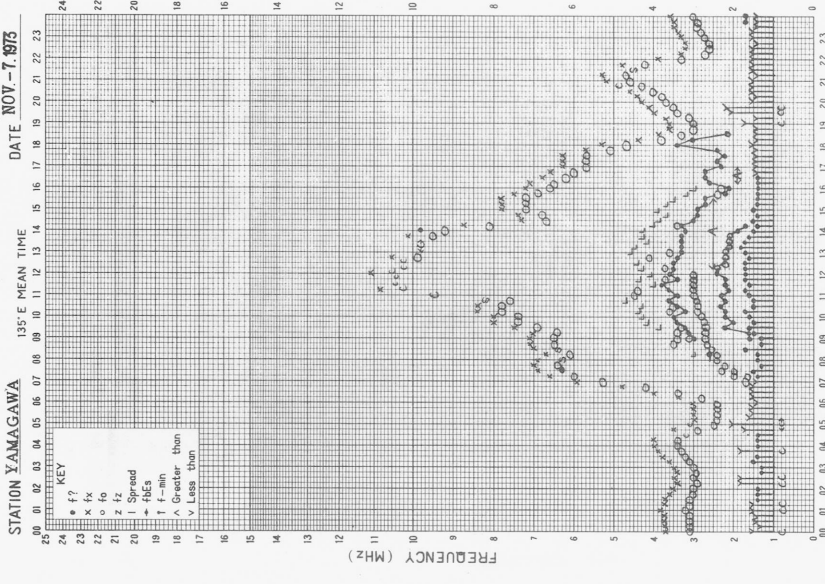
135°E MEAN TIME



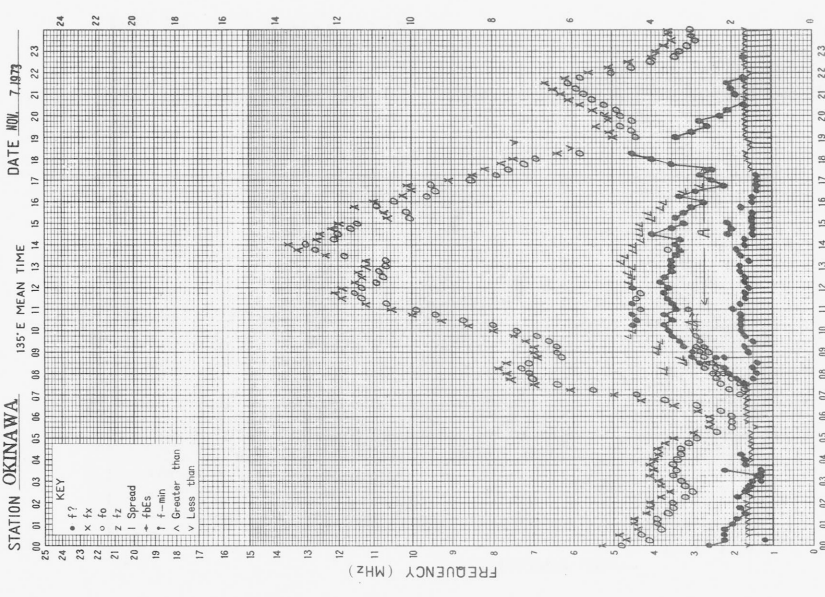
SCALED BY I. C. K.

The Radio Research Laboratories, Japan

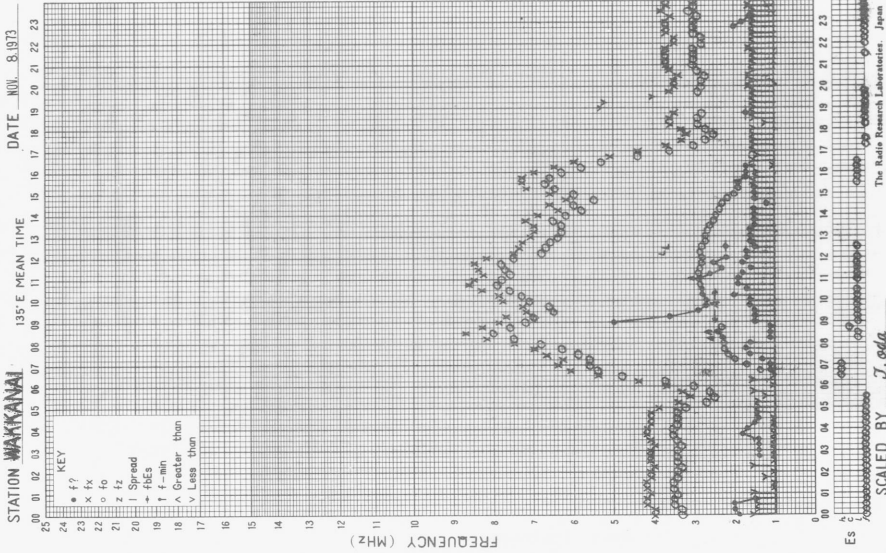
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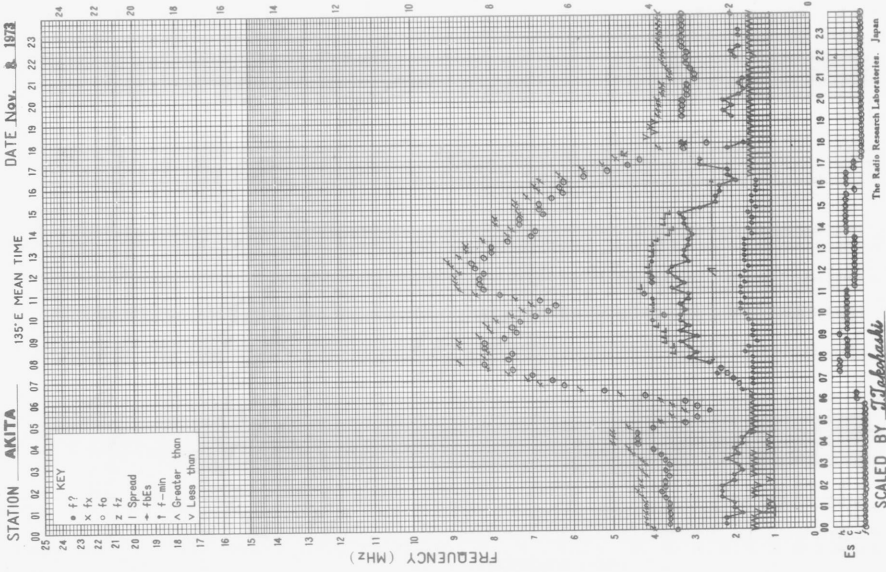
f-plot of IONOSPHERIC DATA



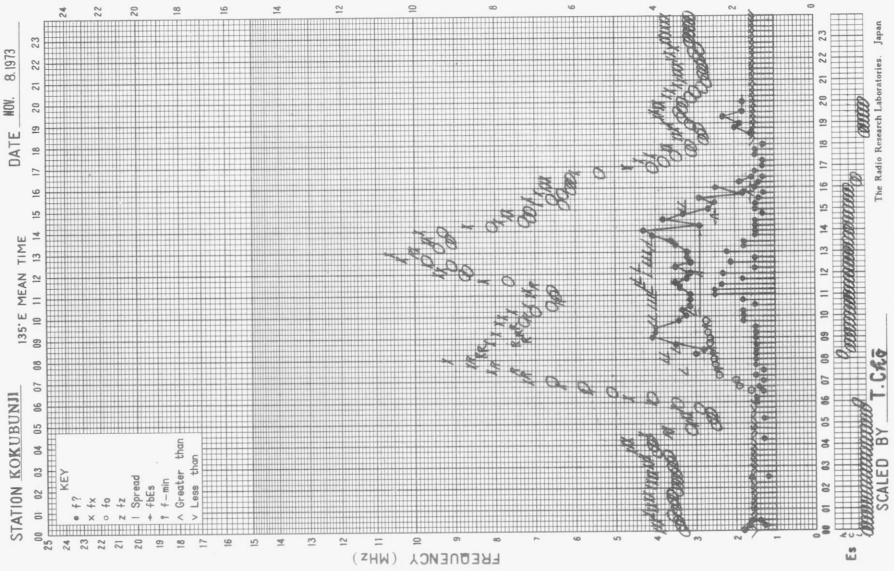
f--PLOT OF IONOSPHERIC DATA



f--PLOT OF IONOSPHERIC DATA



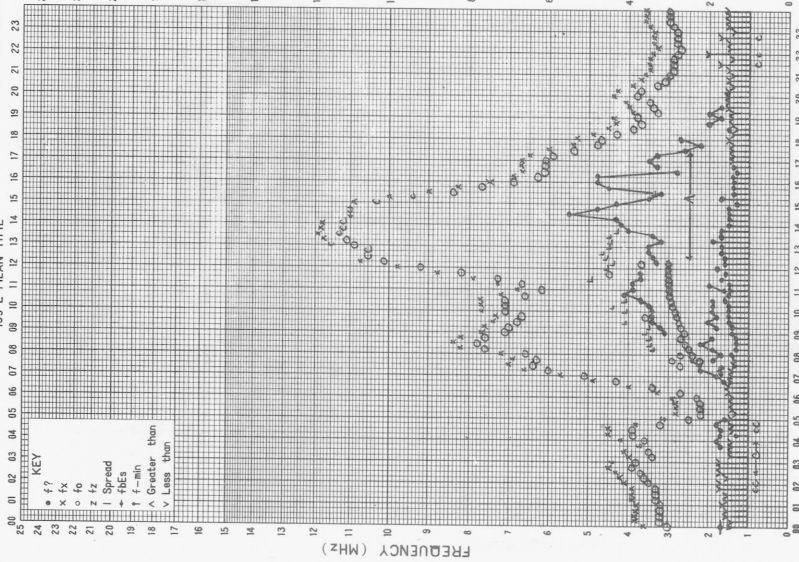
f--PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA DATE NOV.-8.1973

135°E MEAN TIME

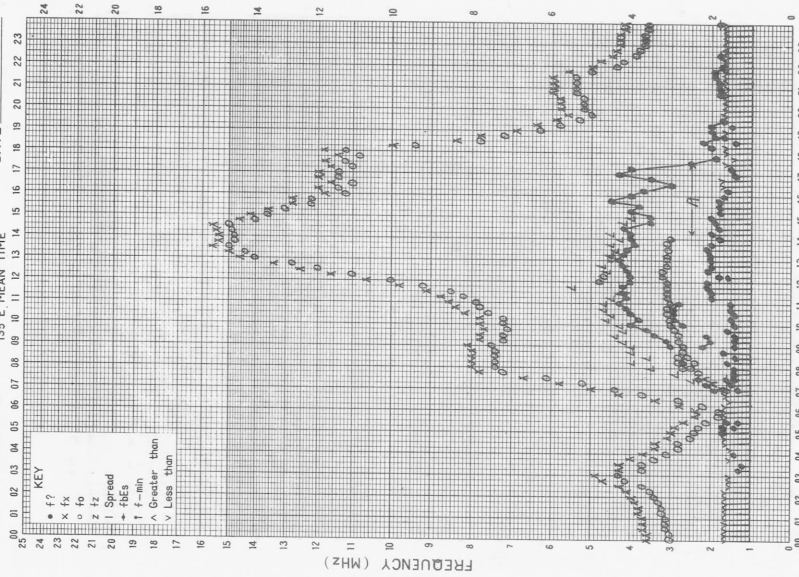


SCALED BY E. Akiyama The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

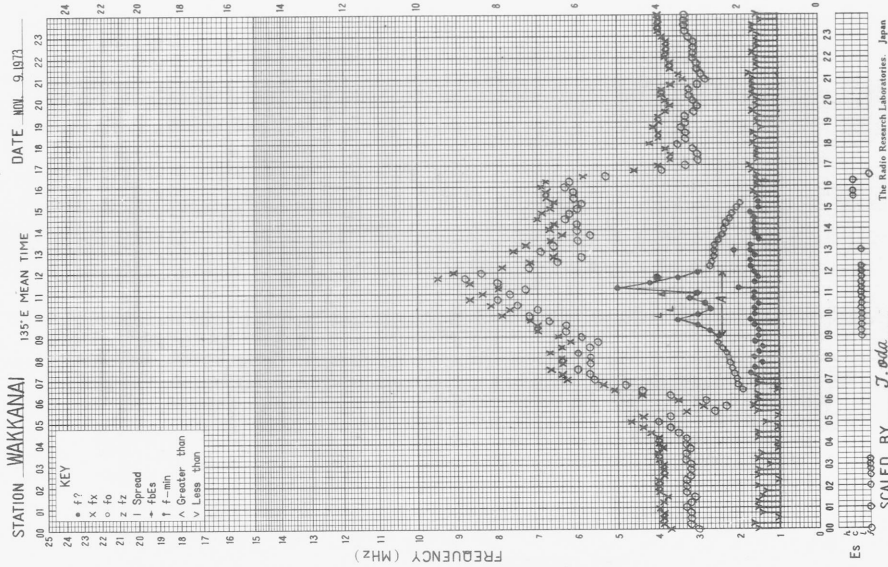
STATION OKINAWA DATE NOV. 8.1973

135°E MEAN TIME

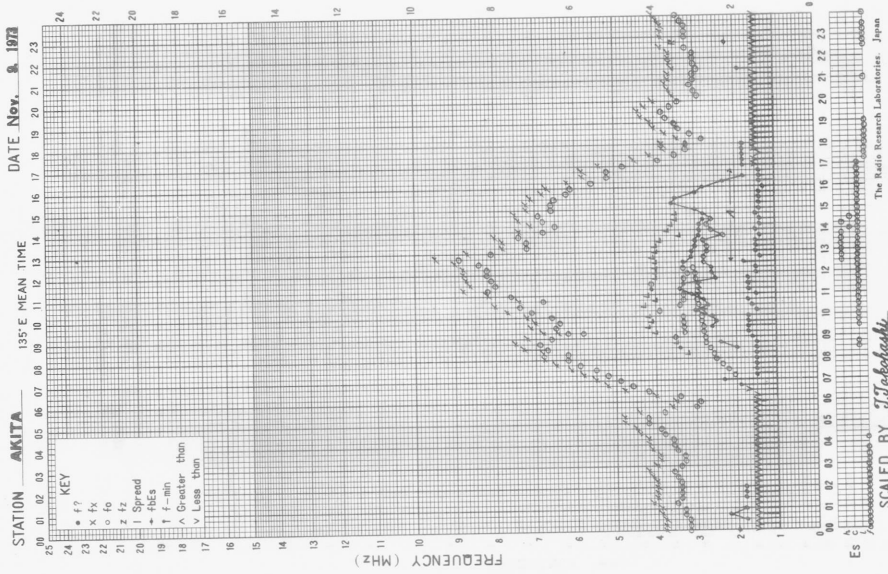


SCALED BY M. Kusaka The Radio Research Laboratories, Japan

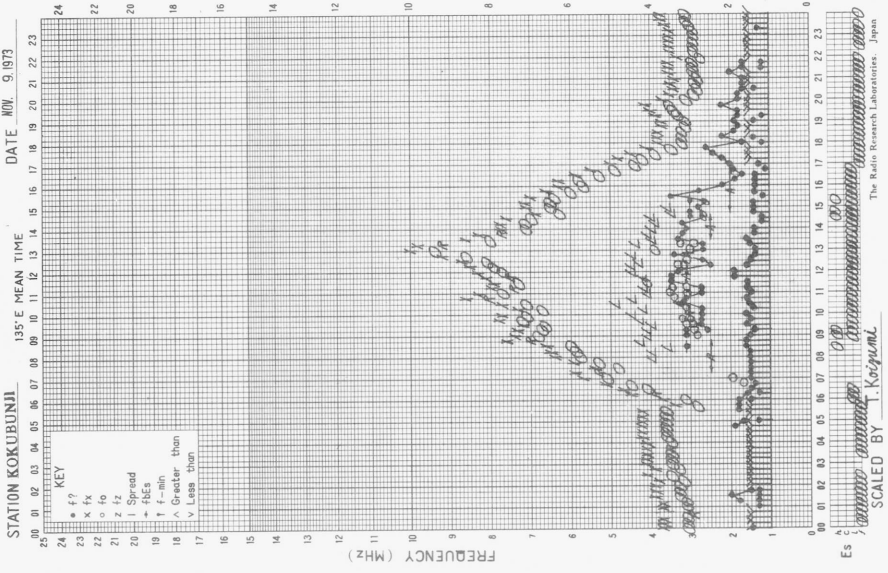
f-PLOT OF IONOSPHERIC DATA



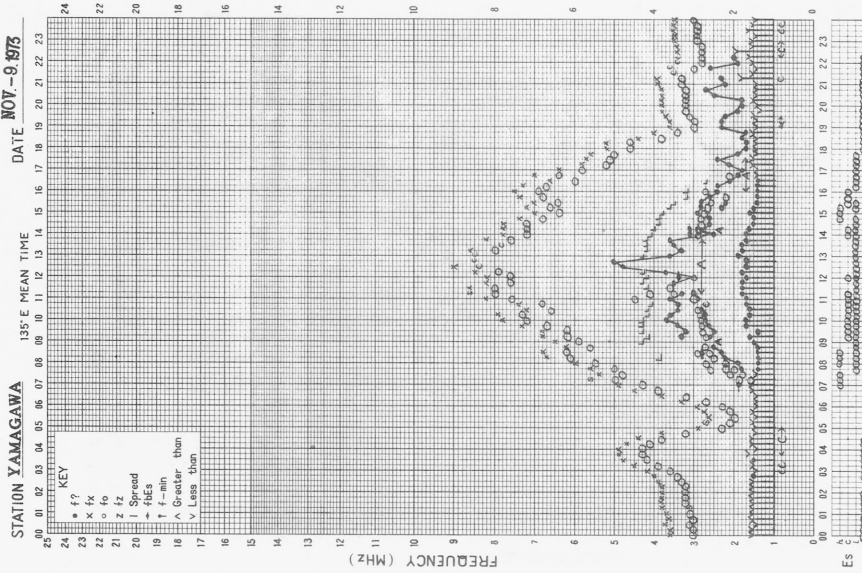
f-PLOT OF IONOSPHERIC DATA



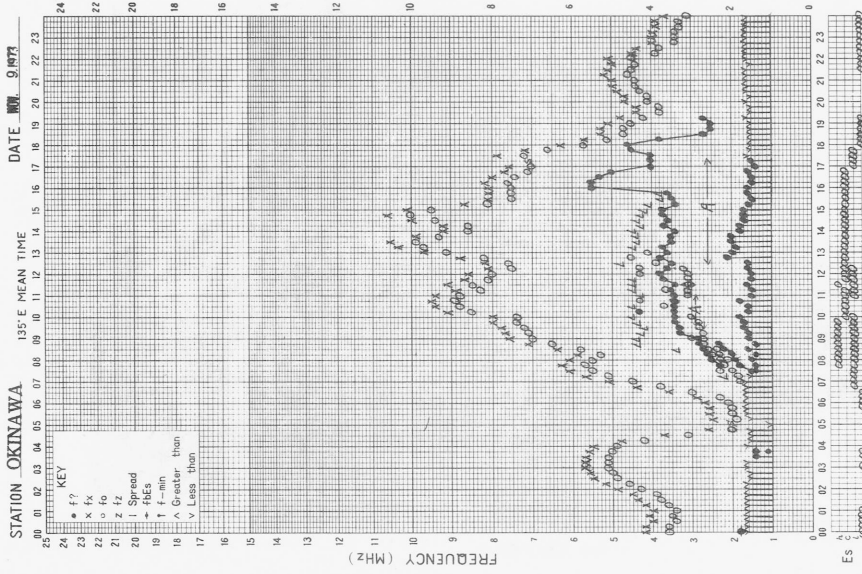
f-PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA

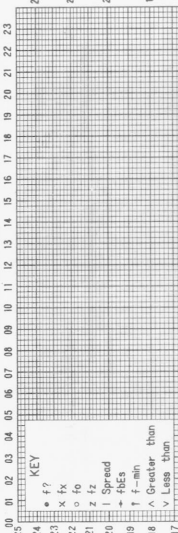


f- PLOT OF IONOSPHERIC DATA



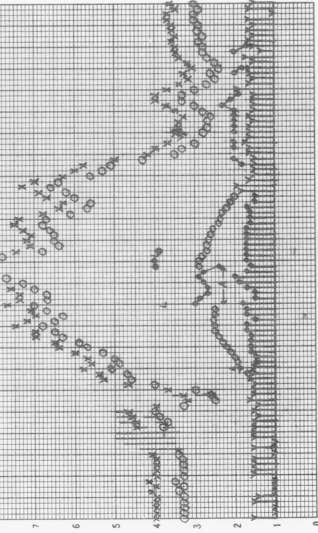
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI DATE MIL 10 1973



KEY
 * f_oF₂
 x F₁
 o F₁
 o F₂
 | Spread
 + f_{min}
 T f-min
 ^ Greater than
 v Less than

FREQUENCY (MHz)

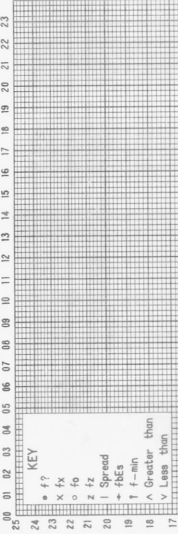


Es
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SCALED BY J. eda

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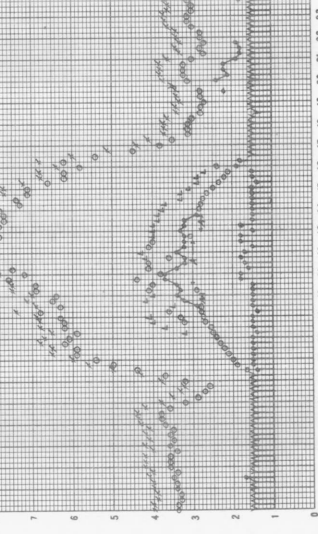
f-PLOT OF IONOSPHERIC DATA

STATION AKITA DATE Nov. 10 1973



KEY
 * f_oF₂
 x F₁
 o F₁
 o F₂
 | Spread
 + f_{min}
 T f-min
 ^ Greater than
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FREQUENCY (MHz)

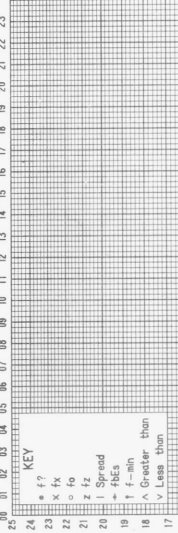


Es
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SCALED BY T. Takehashi

The Radio Research Laboratories, Japan

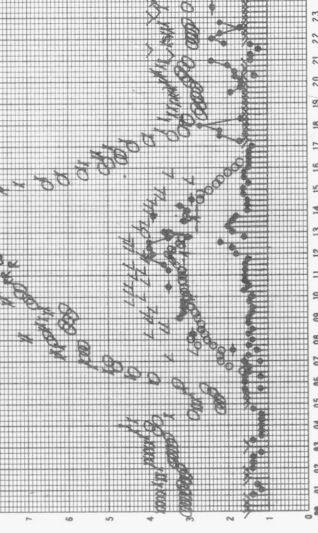
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI DATE NOV 10 1973



KEY
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 x F₁
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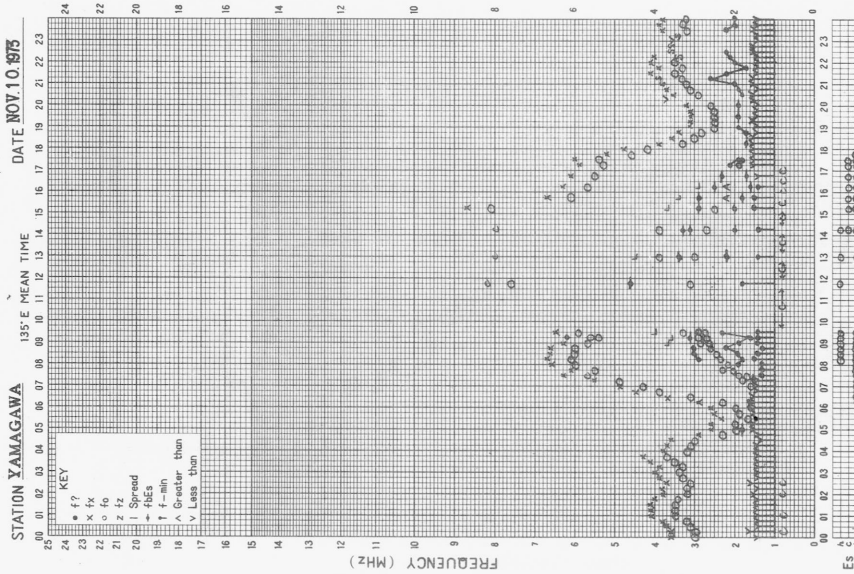
FREQUENCY (MHz)



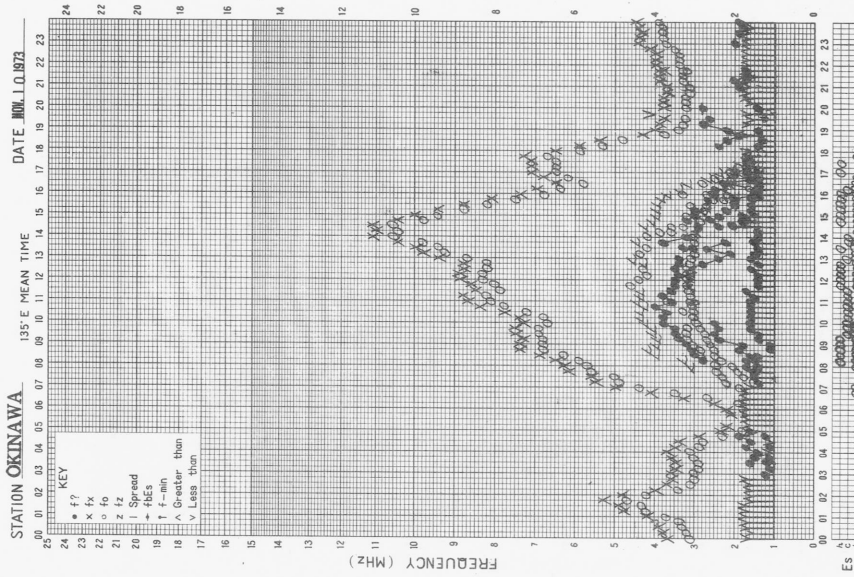
Es
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SCALED BY L. Kazumasa

The Radio Research Laboratories, Japan

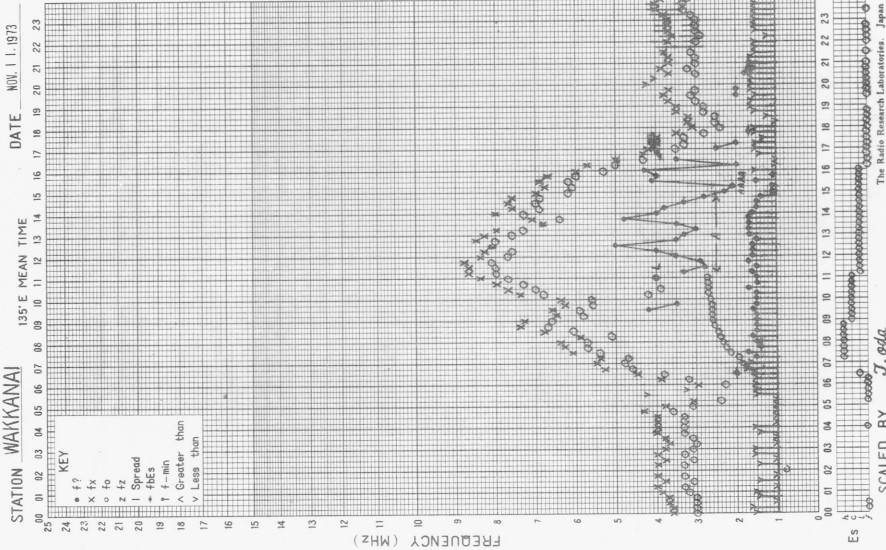
f-PLOT OF IONOSPHERIC DATA



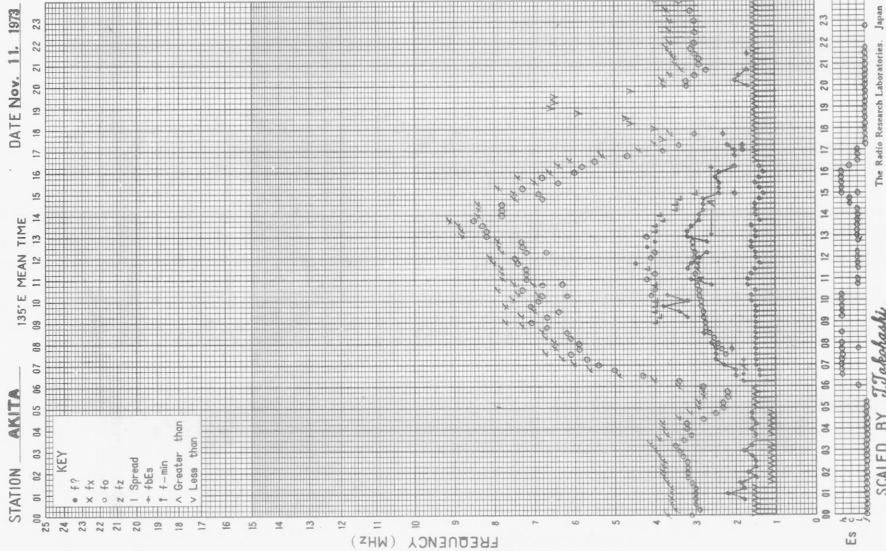
f-PLOT OF IONOSPHERIC DATA



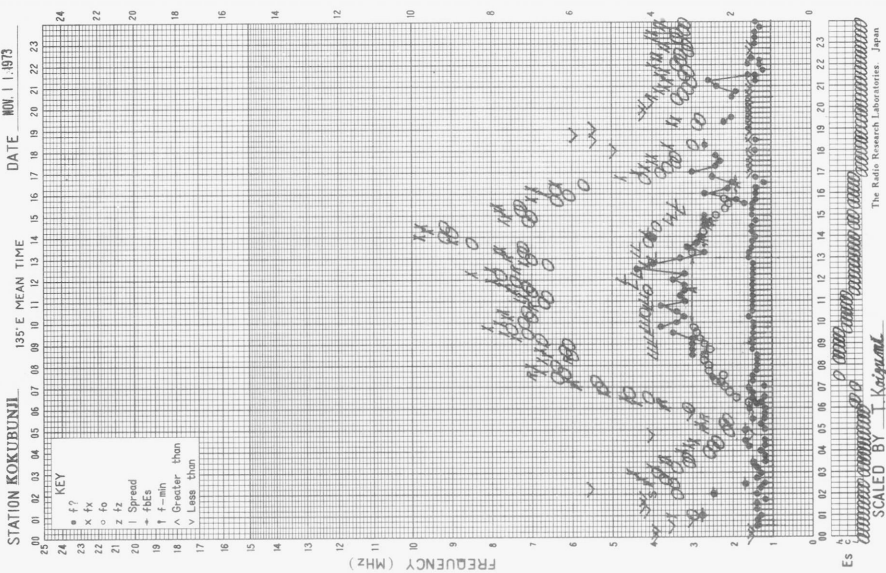
f--PLOT OF IONOSPHERIC DATA



f--PLOT OF IONOSPHERIC DATA



f--PLOT OF IONOSPHERIC DATA



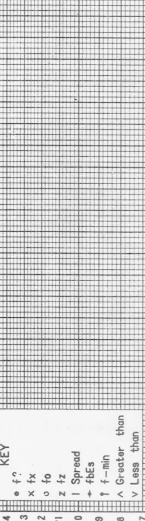
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA DATE NOV. 11. 1973

135° E MEAN TIME

25 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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FREQUENCY (MHz)

Es

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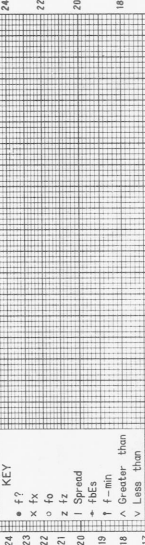
f-PLOT OF IONOSPHERIC DATA

STATION OKINAWA DATE NOV. 11. 1973

135° E MEAN TIME

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FREQUENCY (MHz)

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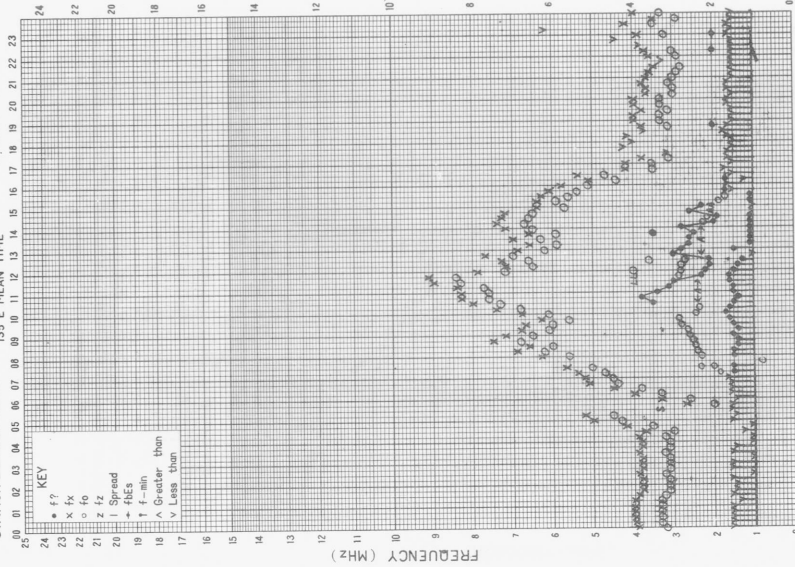
The Radio Research Laboratories, Japan

SCALED BY M. Yamamoto

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI DATE NOV. 12, 1973

135°E MEAN TIME

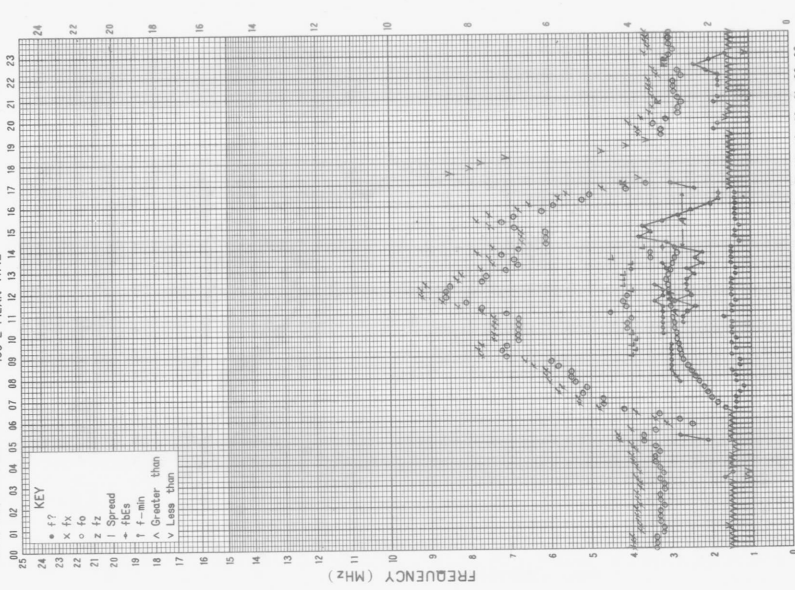


Es
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The Radio Research Laboratories, Japan
SCALED BY J. oga

f-PLOT OF IONOSPHERIC DATA

STATION AKITA DATE Nov. 12, 1973

135°E MEAN TIME

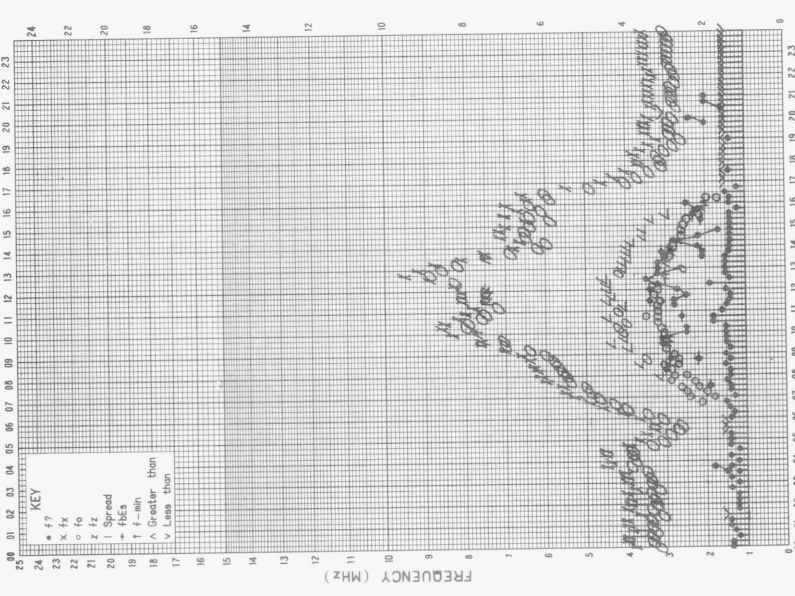


Es
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The Radio Research Laboratories, Japan
SCALED BY J. Tabuchi

f-PLOT OF IONOSPHERIC DATA

STATION KOCUBORI DATE NOV. 12, 1973

135°E MEAN TIME

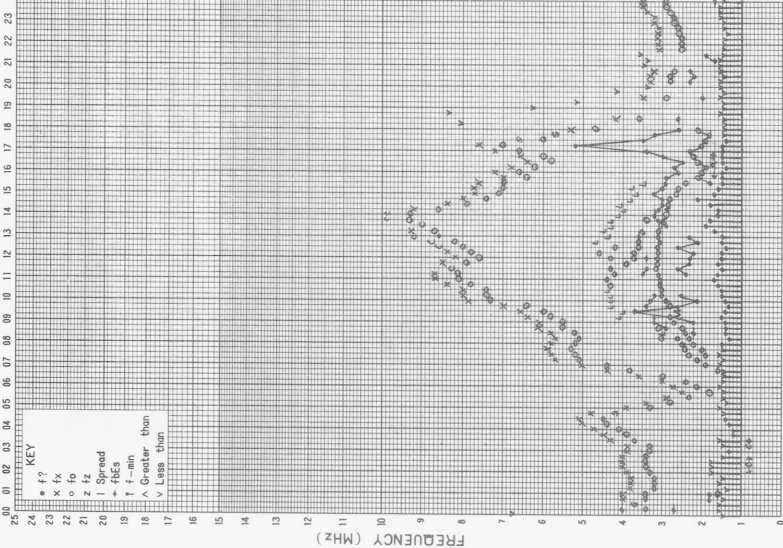


Es
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The Radio Research Laboratories, Japan
SCALED BY I. Kozumaki

f-PLOT OF IONOSPHERIC DATA

STATION **YAMAGAWA** DATE **NOV. 12, 1973**

135°E MEAN TIME

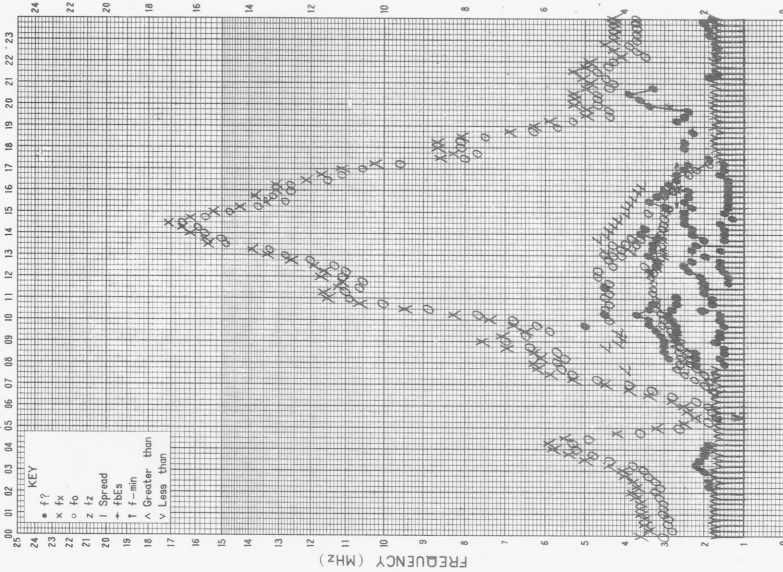


ES
The Radio Research Laboratories, Japan
SCALED BY *S. Nakashima*

f-PLOT OF IONOSPHERIC DATA

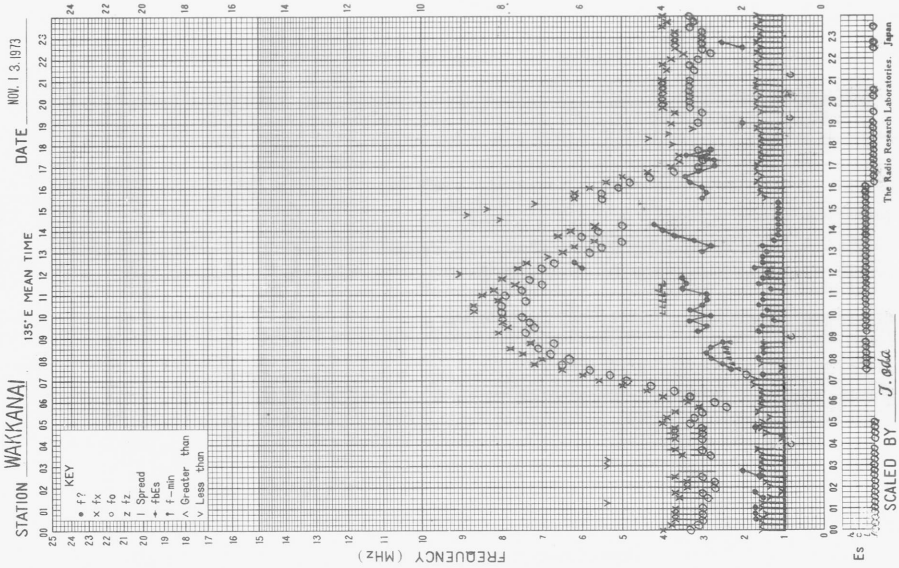
STATION **OKINAWA** DATE **NOV. 12, 1973**

135°E MEAN TIME

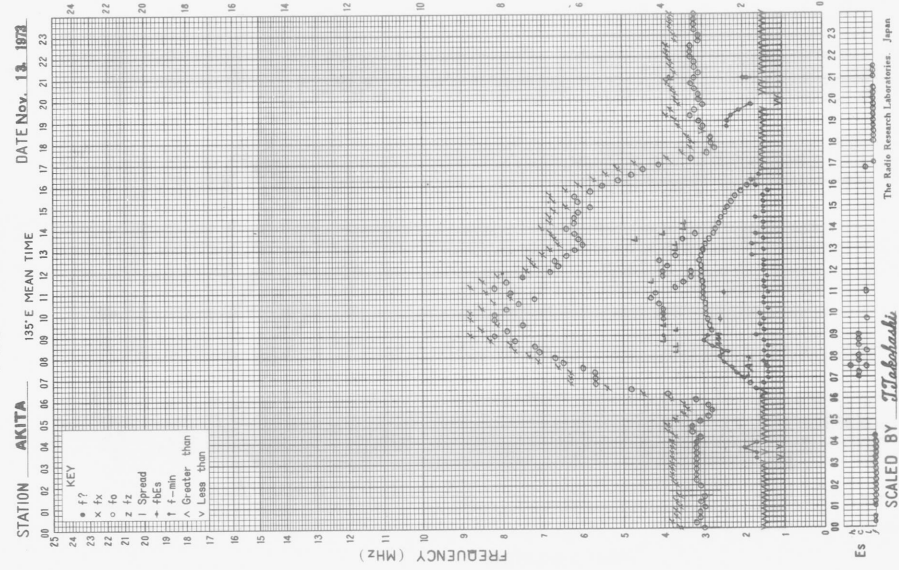


ES
The Radio Research Laboratories, Japan
SCALED BY *Dr. Yamazaki*

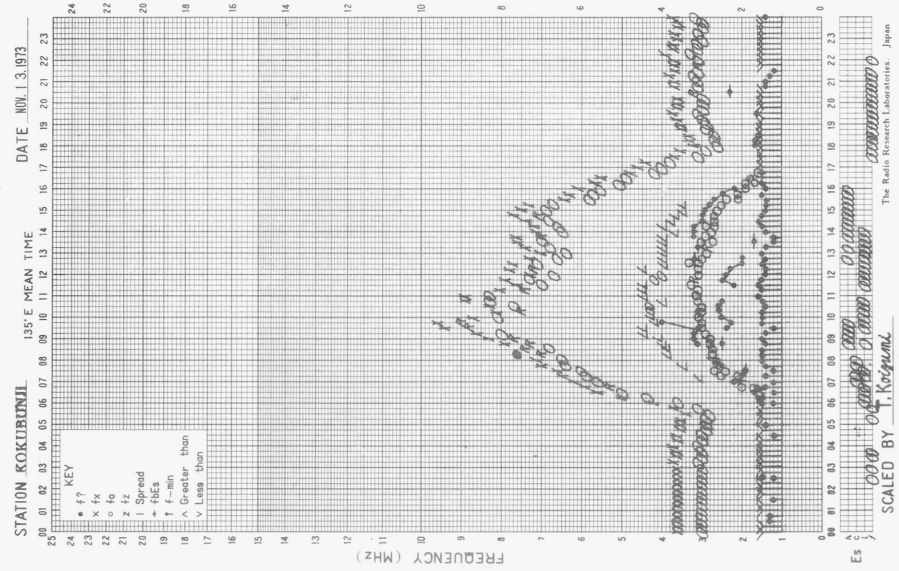
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

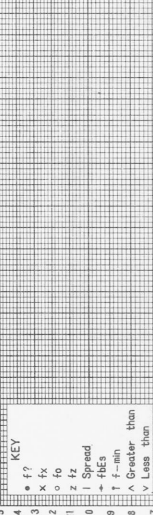
STATION YAMAGAWA DATE NOV 13 1973

135° E MEAN TIME

00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

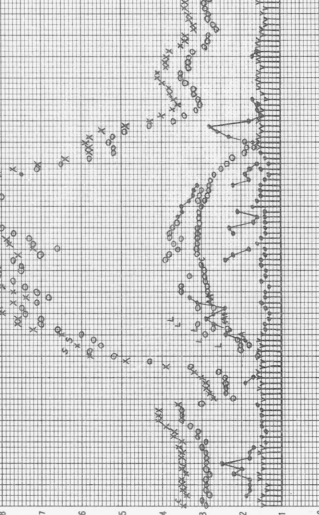
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KEY
 • f_oF₂
 x f_oF₁
 o f_oE
 z f_z
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 + h'Es
 T F-min
 Δ Greater than
 V Less than

FREQUENCY (MHz)



Es
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 The Radio Research Laboratories, Japan

SCALED BY S. Nakazima

f-PLOT OF IONOSPHERIC DATA

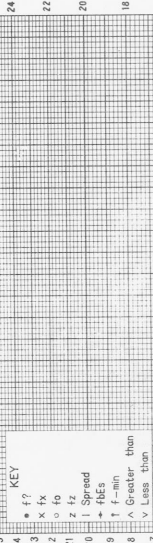
STATION OKINAWA DATE NOV 13 1973

135° E MEAN TIME

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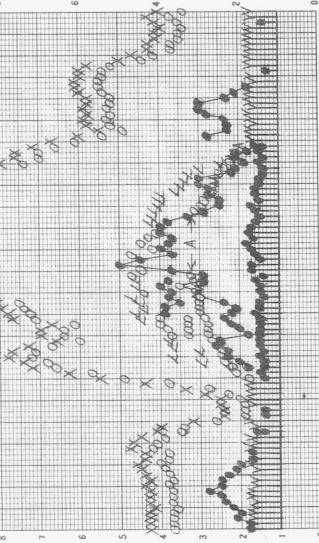
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KEY
 • f_oF₂
 x f_oF₁
 o f_oE
 z f_z
 l Spread
 + h'Es
 T F-min
 Δ Greater than
 V Less than

FREQUENCY (MHz)



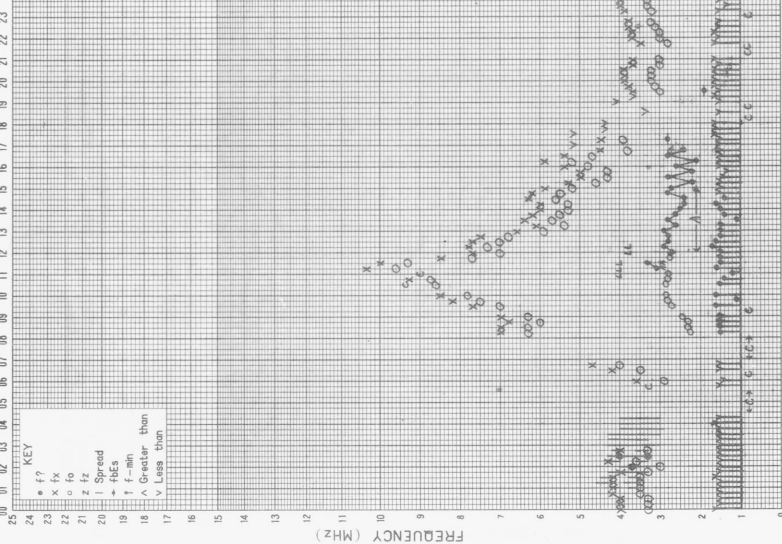
Es
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 The Radio Research Laboratories, Japan

SCALED BY M. Yamamoto

f- PLOT OF IONOSPHERIC DATA

STATION WAKKANAI NOV. 14, 1973

135°E MEAN TIME DATE NOV. 14, 1973

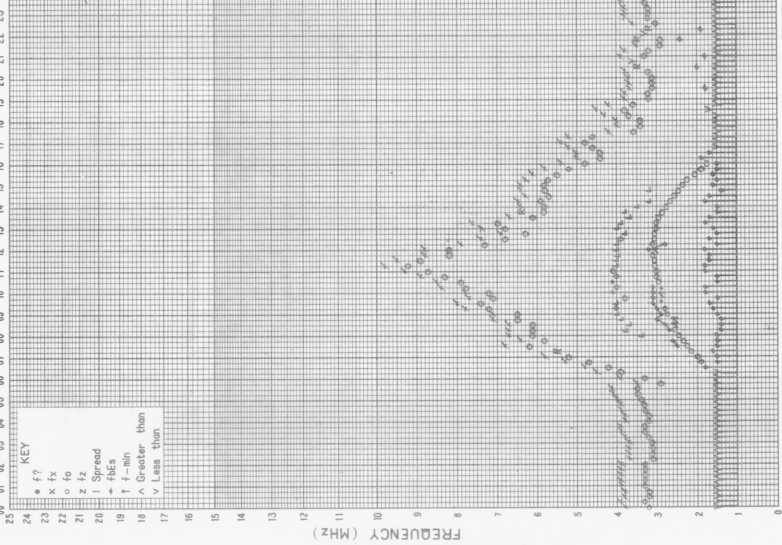


Es
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The Radio Research Laboratories, Japan
SCALED BY J. Oka

f- PLOT OF IONOSPHERIC DATA

STATION AKITA NOV. 14, 1973

135°E MEAN TIME DATE NOV. 14, 1973

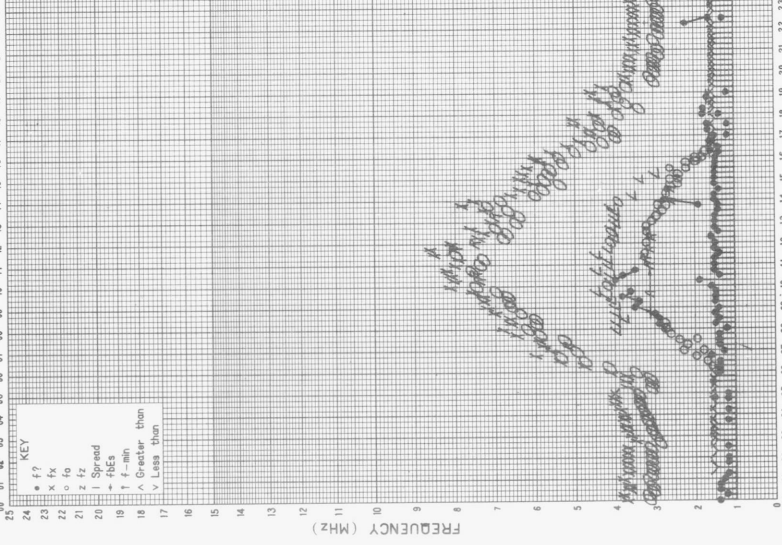


Es
A
The Radio Research Laboratories, Japan
SCALED BY T. Takahashi

f- PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI NOV. 14, 1973

135°E MEAN TIME DATE NOV. 14, 1973

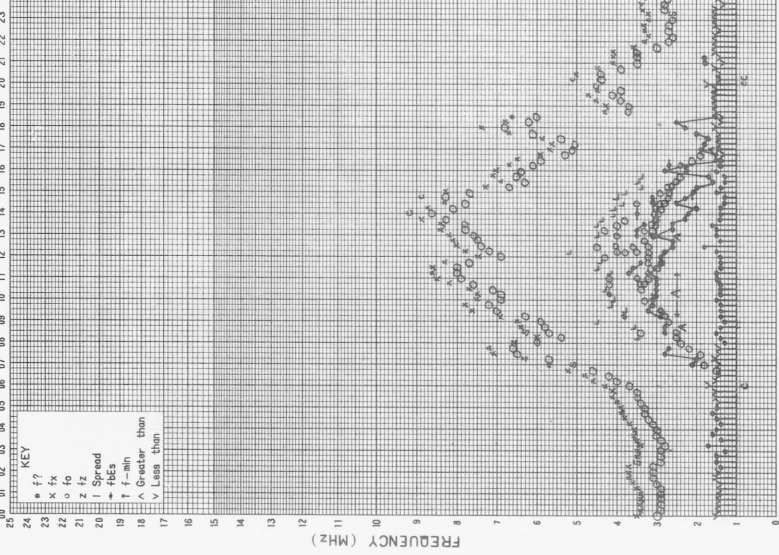


Es
A
The Radio Research Laboratories, Japan
SCALED BY T. Kaizumi

f-PLOT OF IONOSPHERIC DATA

STATION **YAMAGAWA** DATE **NOV. 14, 1973**

135°E MEAN TIME

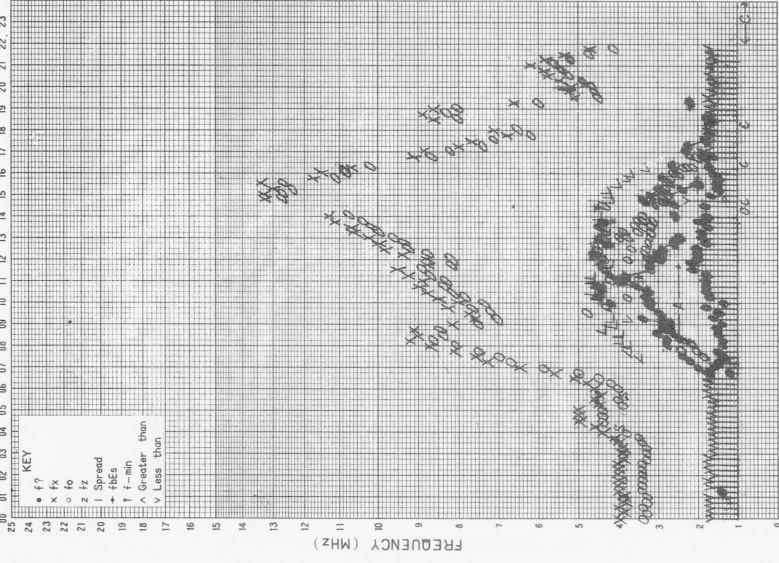


Es
The Radio Research Laboratories, Japan
SCALED BY **S. Nakamura**

f-PLOT OF IONOSPHERIC DATA

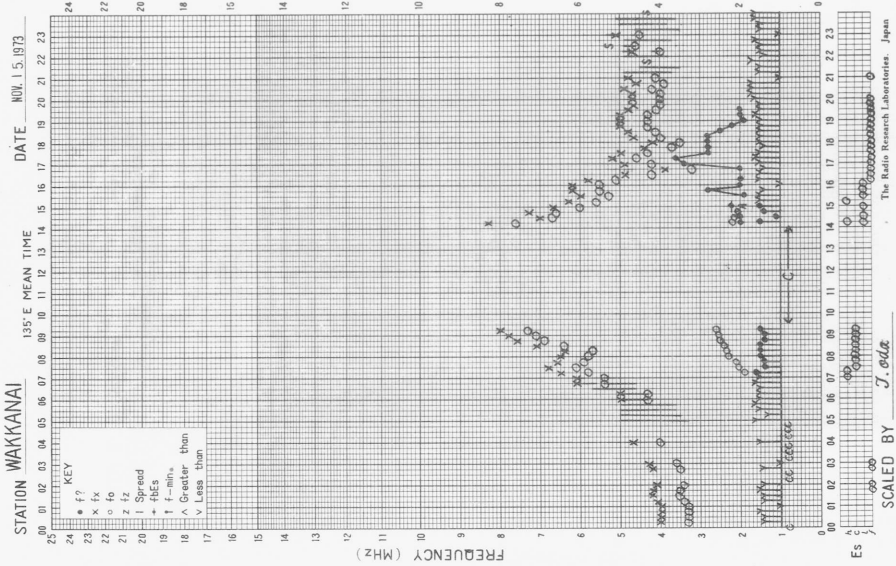
STATION **OKINAWA** DATE **NOV. 14, 1973**

135°E MEAN TIME

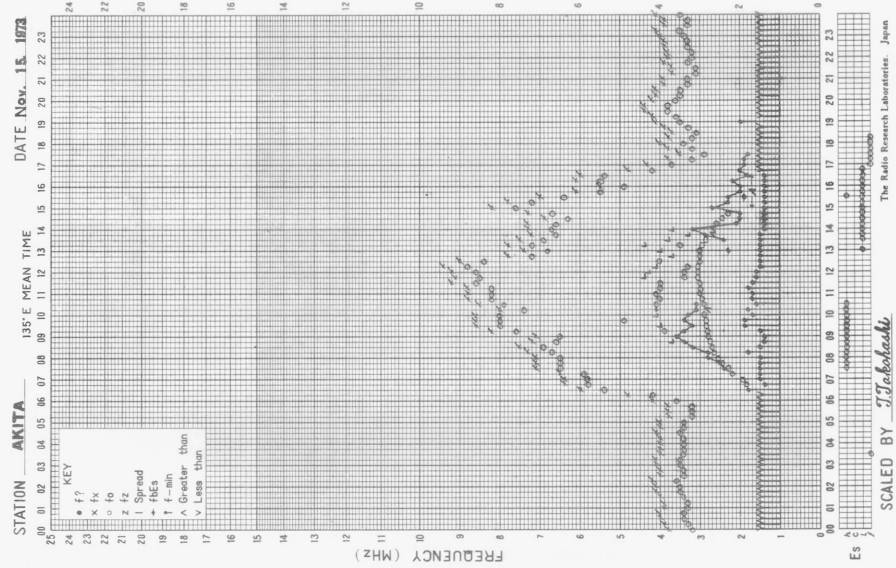


Es
The Radio Research Laboratories, Japan
SCALED BY **Dr. Yamamoto**

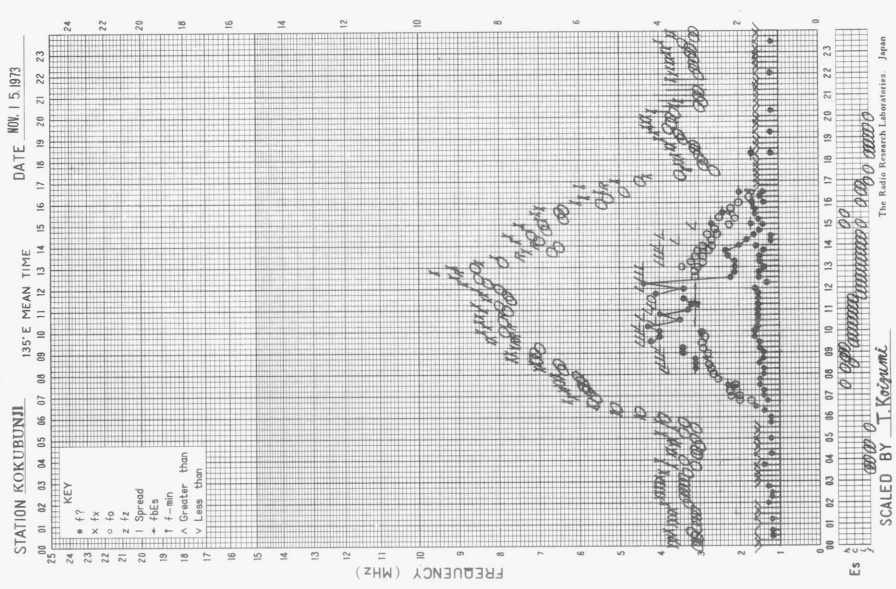
f-PLOT OF IONOSPHERIC DATA



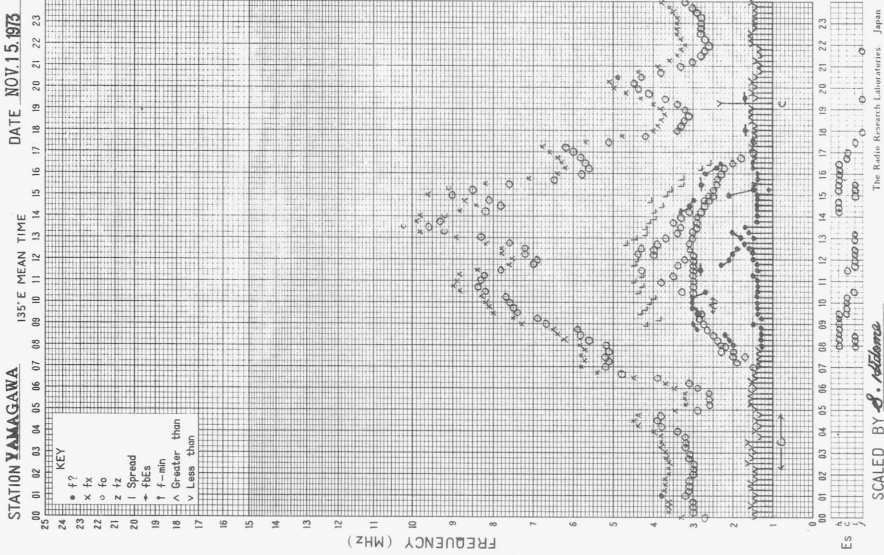
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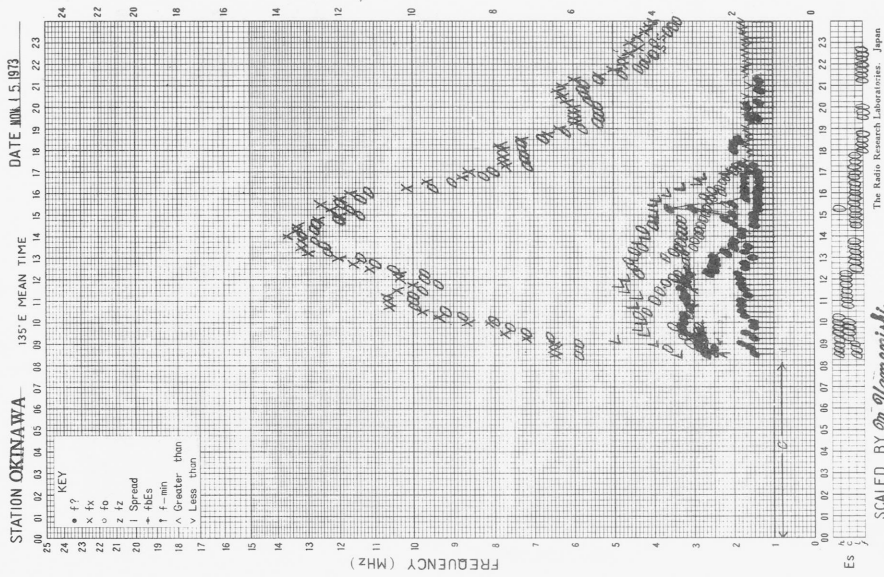
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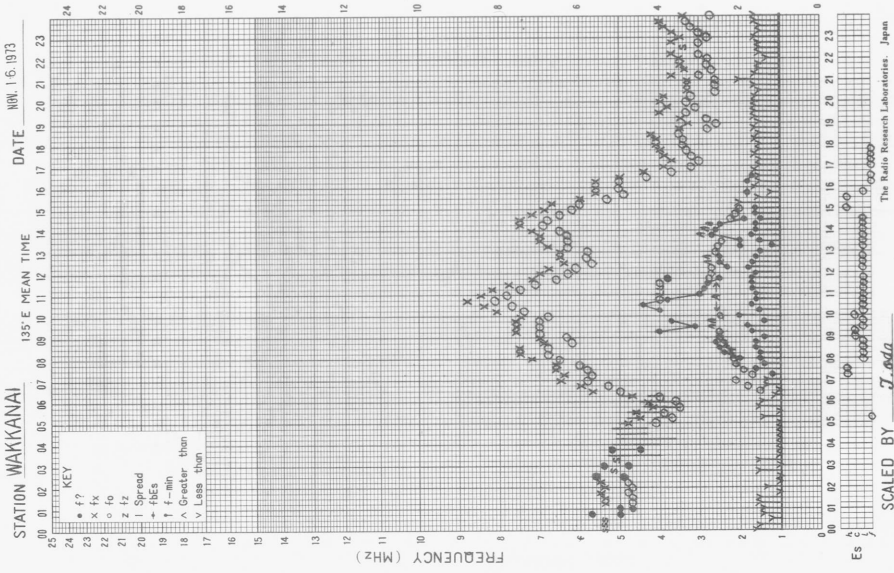
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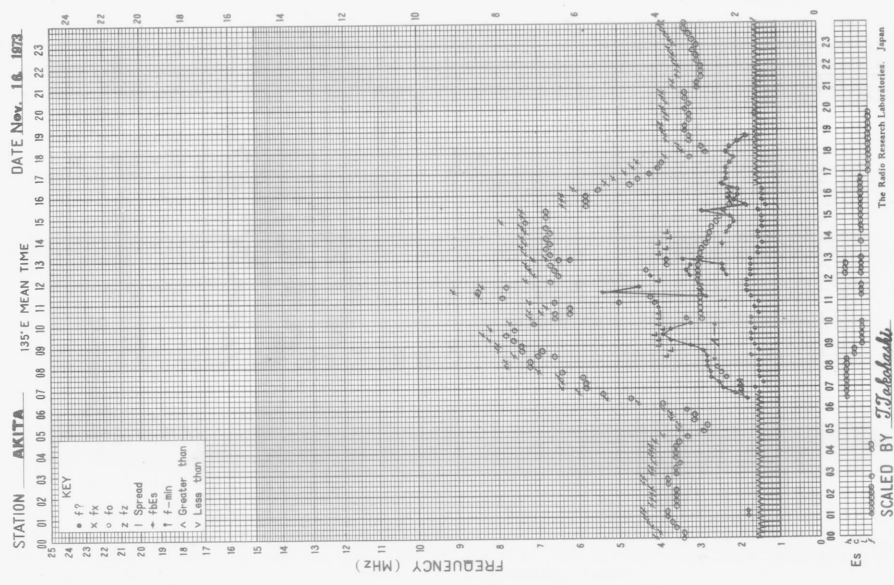
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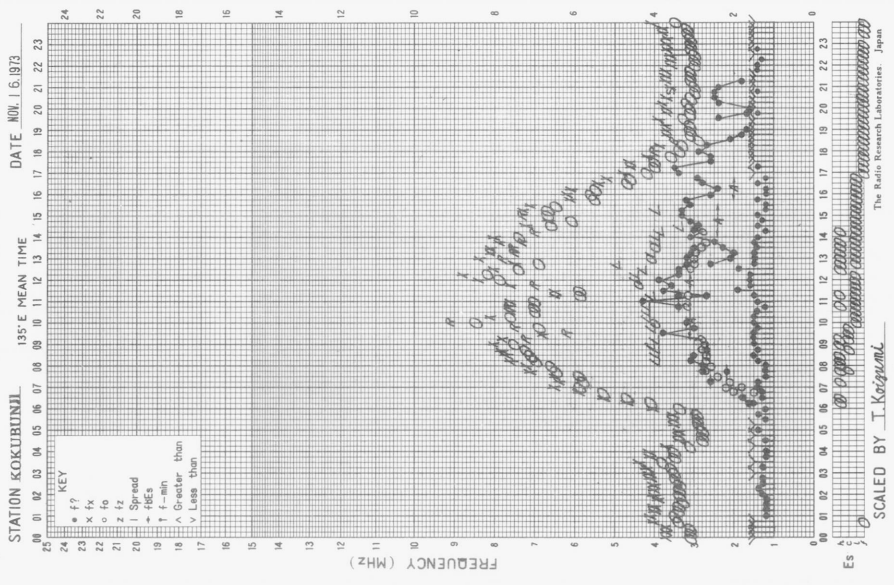
f-PLOT OF IONOSPHERIC DATA



f-PLOT OF IONOSPHERIC DATA

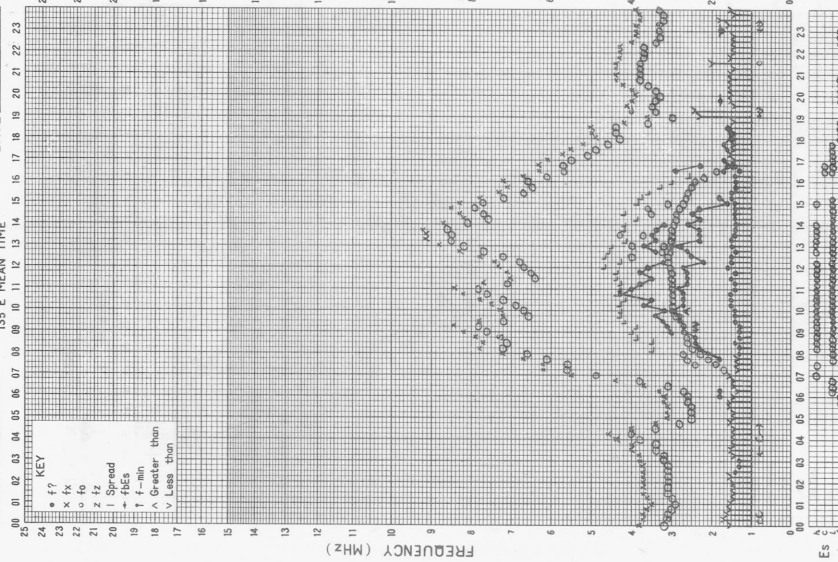


f-PLOT OF IONOSPHERIC DATA



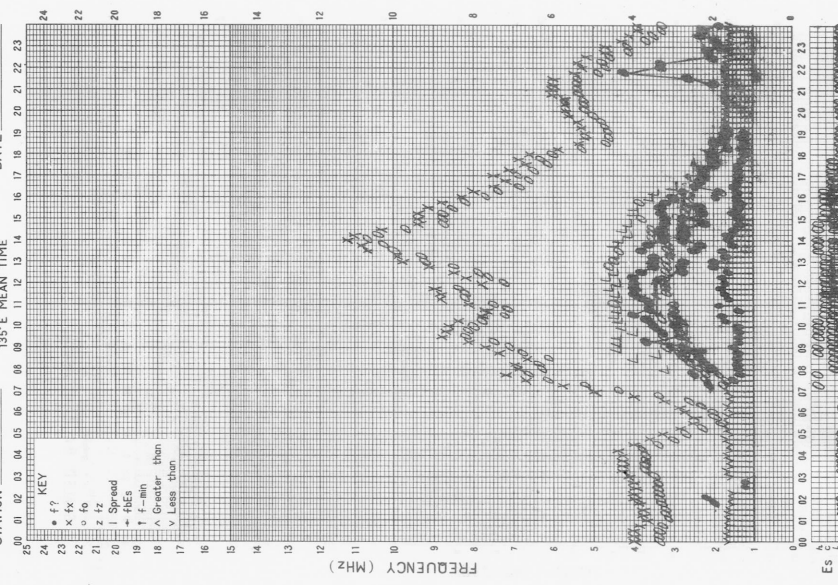
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA DATE NOV. 16, 1973

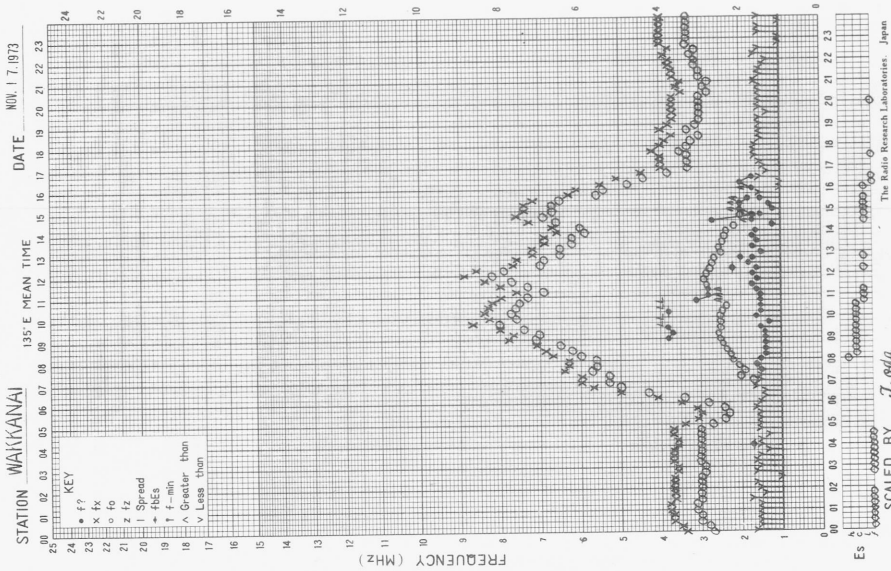


f-PLOT OF IONOSPHERIC DATA

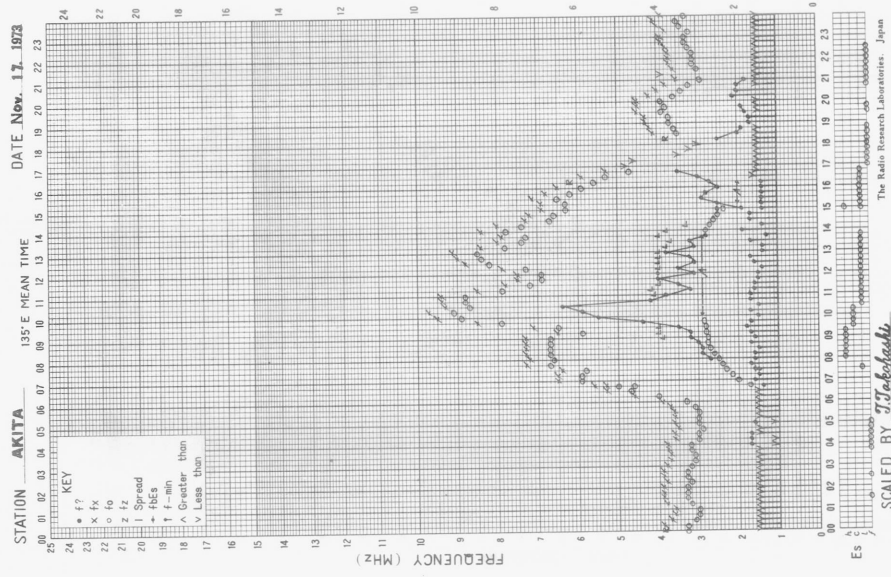
STATION OKINAWA DATE NOV. 16, 1973



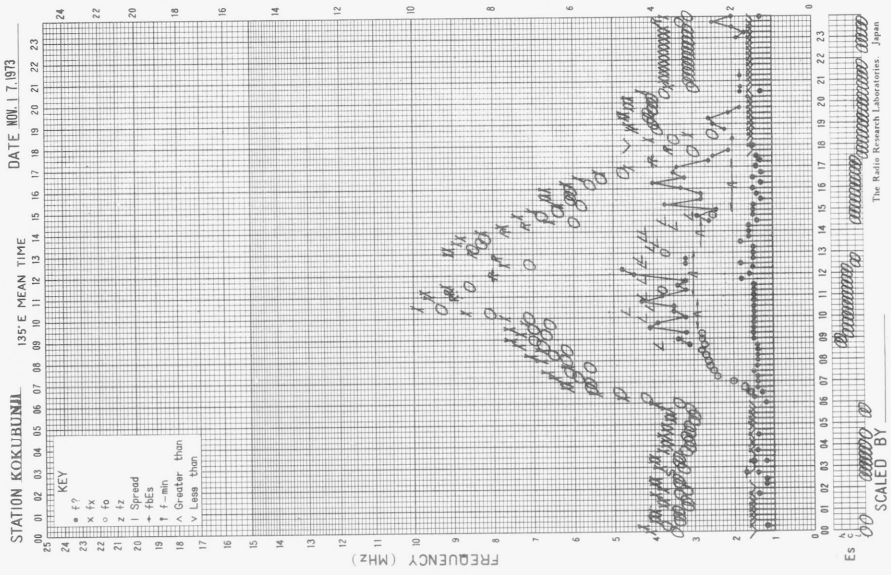
f- PLOT OF IONOSPHERIC DATA



f- PLOT OF IONOSPHERIC DATA

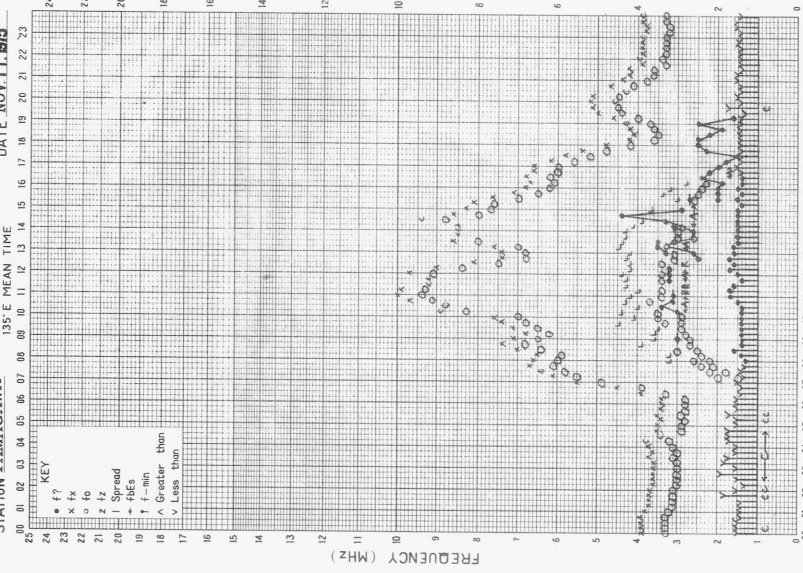


f- PLOT OF IONOSPHERIC DATA



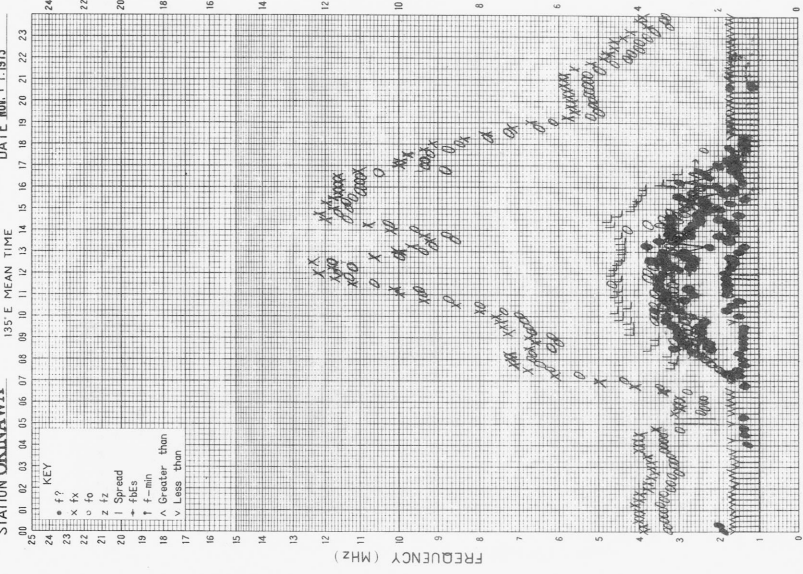
f-plot of IONOSPHERIC DATA

STATION YAMAGAWA DATE NOV. 17. 1973



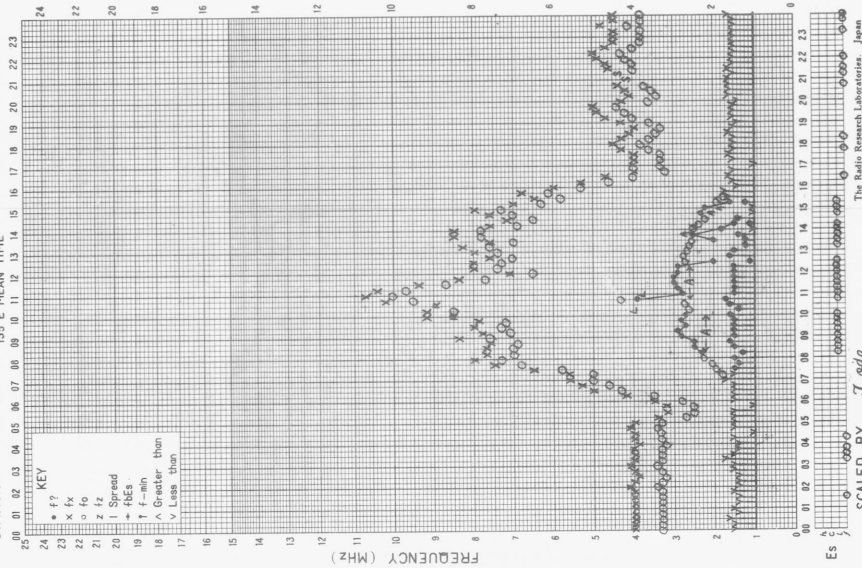
f-plot of IONOSPHERIC DATA

STATION OKINAWA DATE NOV. 17. 1973



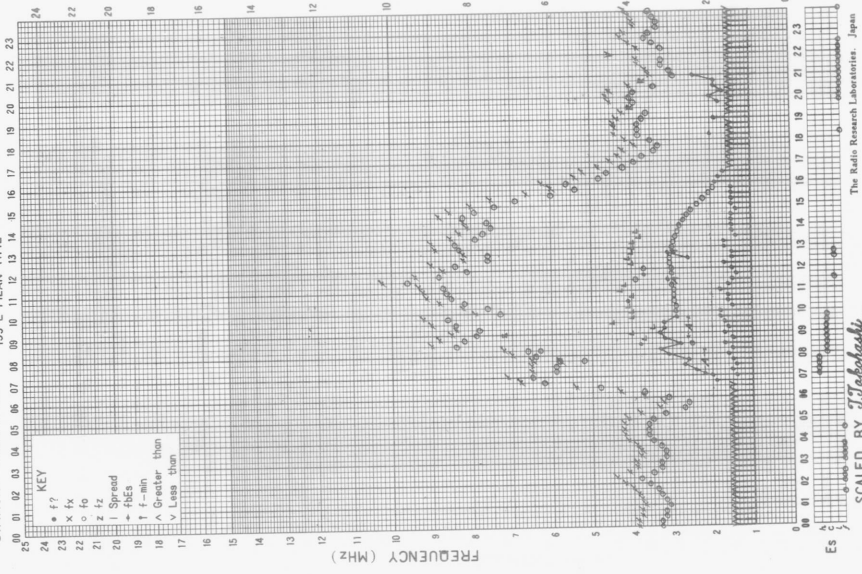
f--PLOT OF IONOSPHERIC DATA

STATION WAKKANAI DATE NOV. 18, 1973



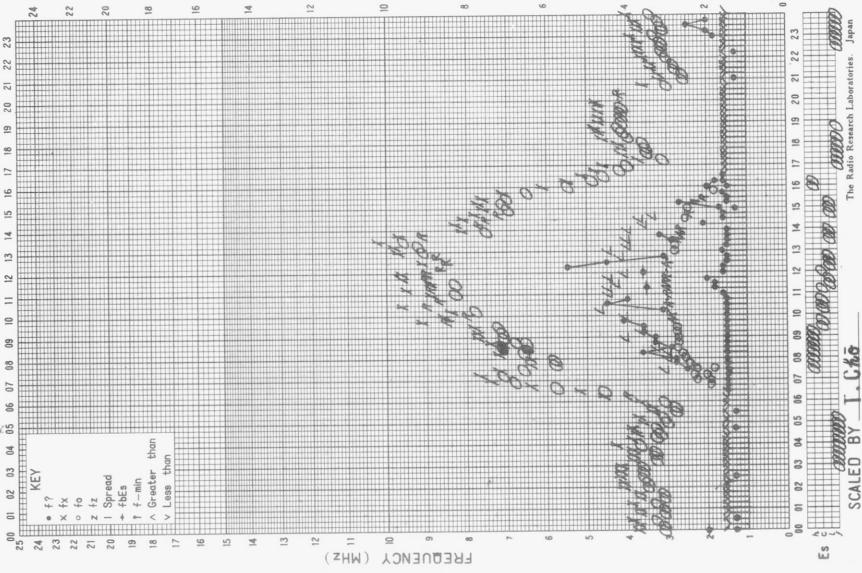
f--PLOT OF IONOSPHERIC DATA

STATION AKITA DATE Nov. 18, 1973



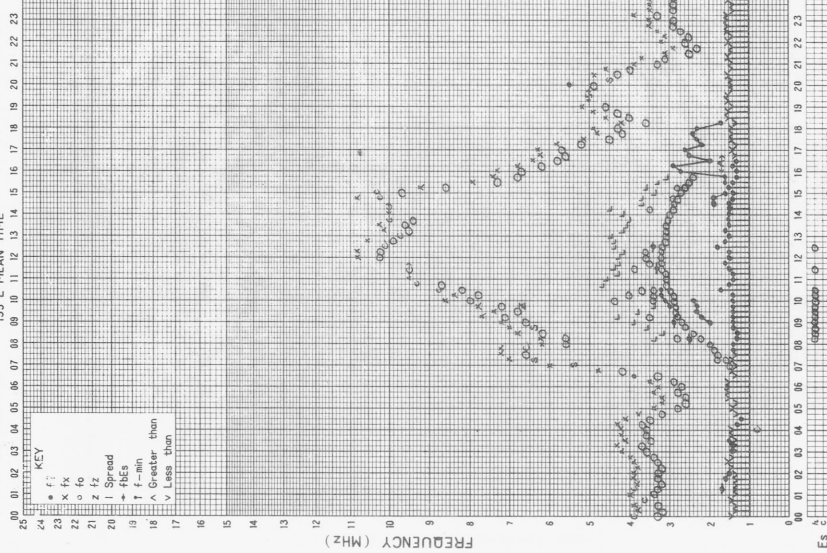
f--PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI DATE NOV. 18, 1973



f-plot of IONOSPHERIC DATA

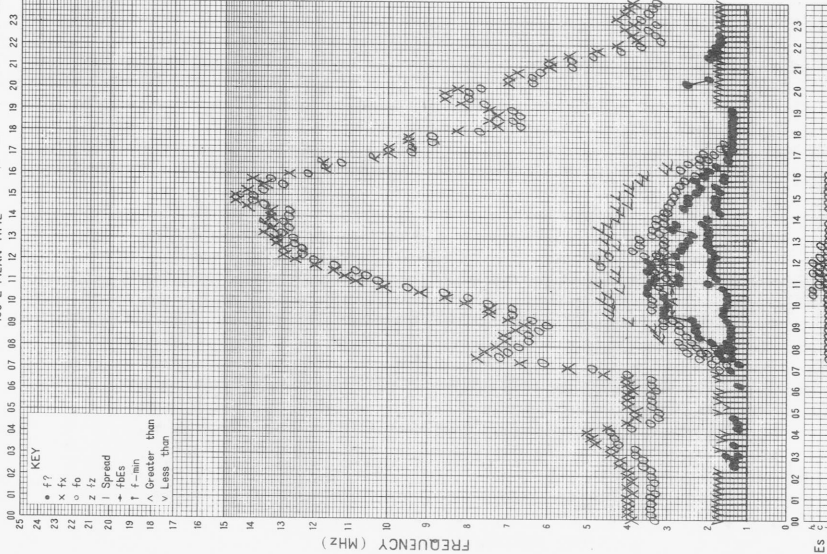
STATION YAMAGAWA DATE NOV 18 1973



Es
The Radio Research Laboratories, Japan
SCALED BY S. Aizawa

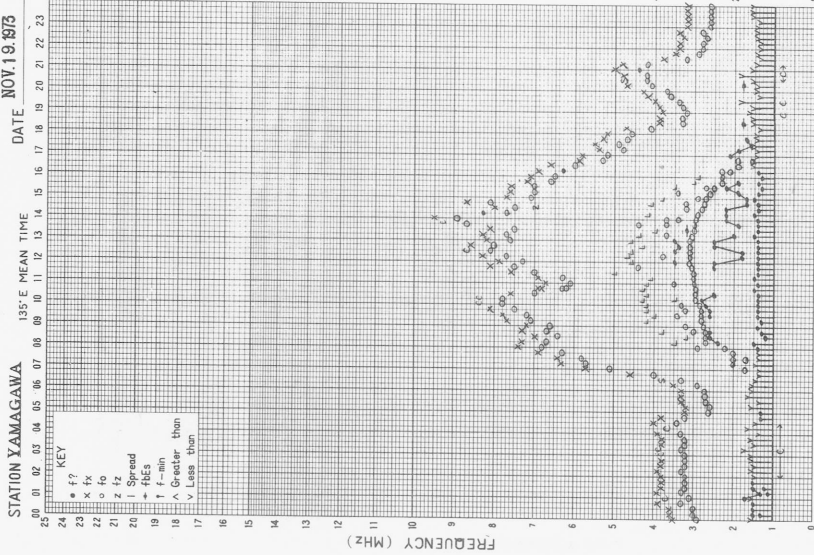
f-plot of IONOSPHERIC DATA

STATION OKINAWA DATE NOV 18 1973

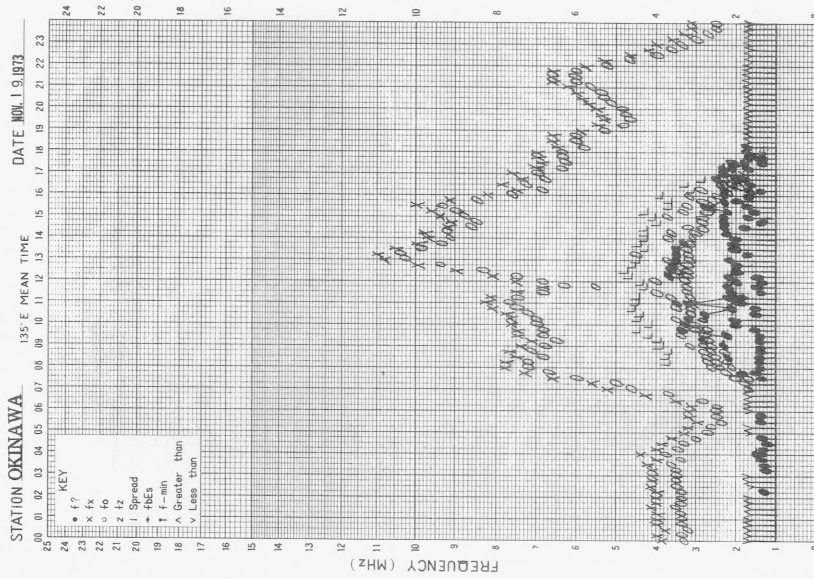


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The Radio Research Laboratories, Japan
SCALED BY M. Kawai

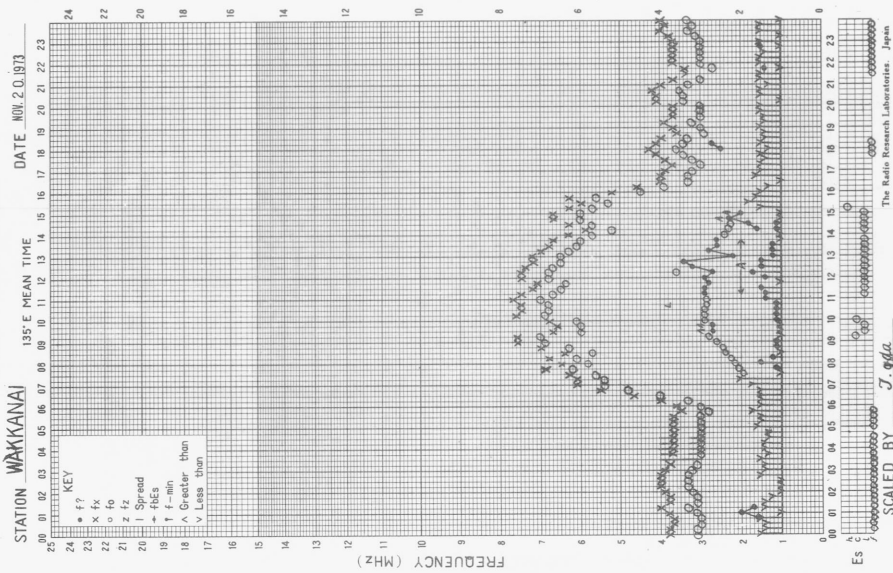
f-plot of IONOSPHERIC DATA



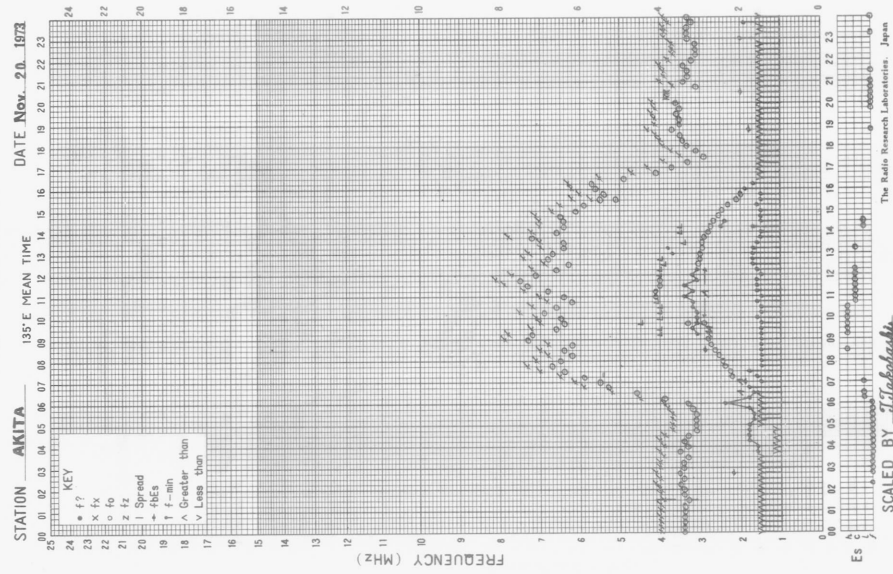
f-plot of IONOSPHERIC DATA



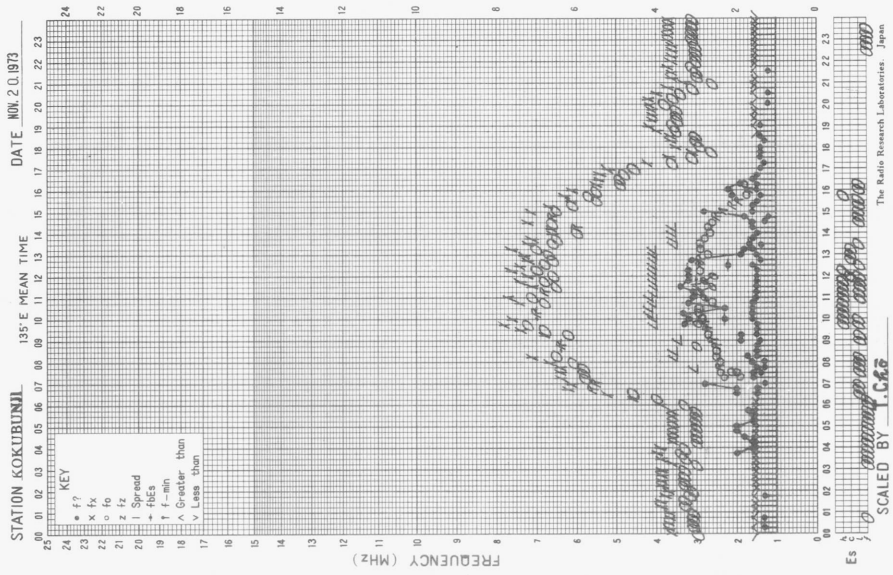
f--PLOT OF IONOSPHERIC DATA



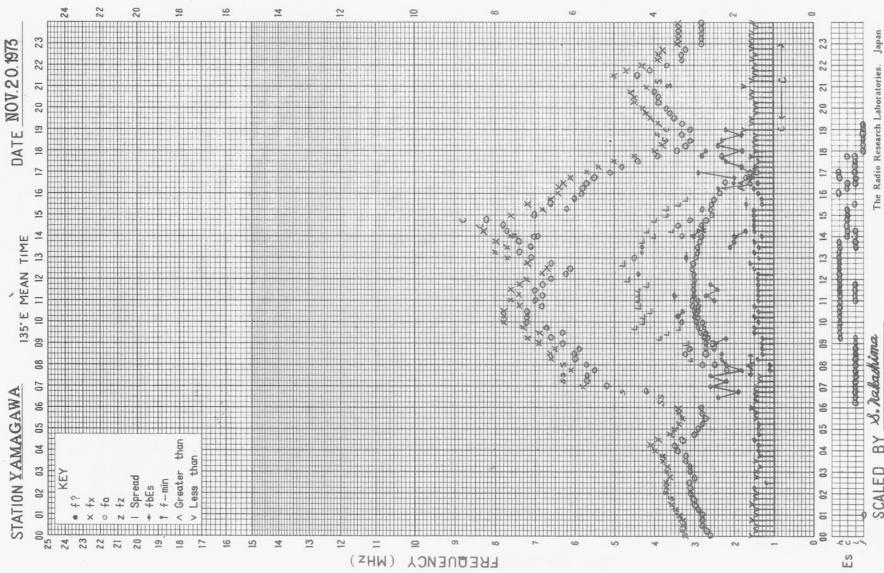
f--PLOT OF IONOSPHERIC DATA



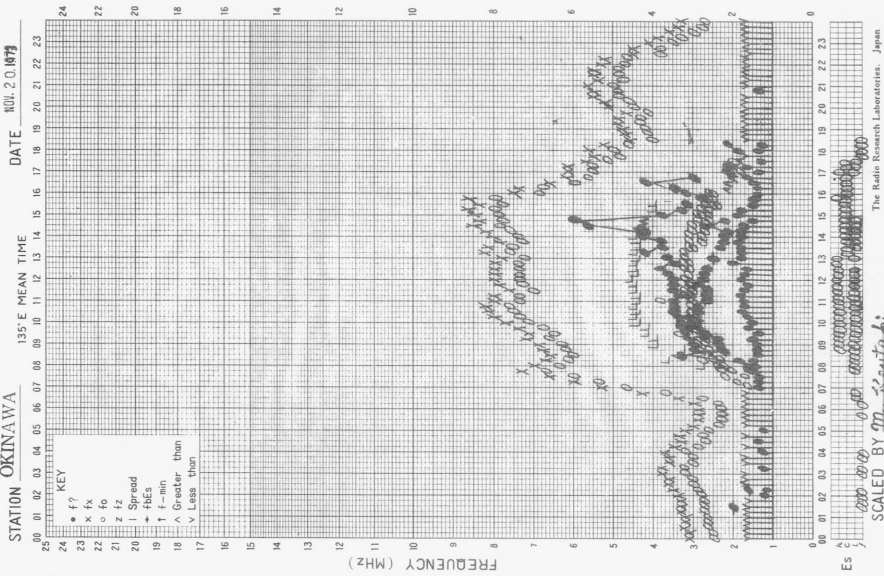
f--PLOT OF IONOSPHERIC DATA



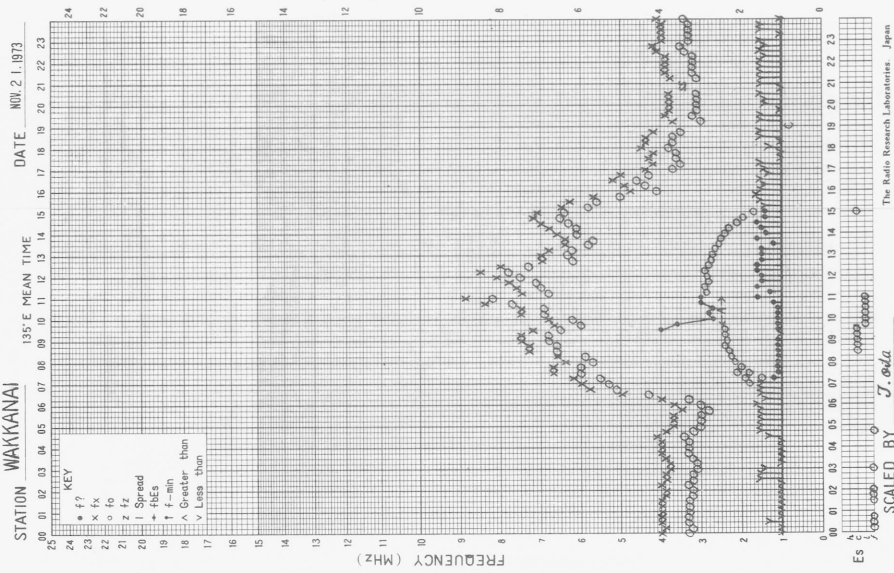
f-Plot of Ionospheric Data



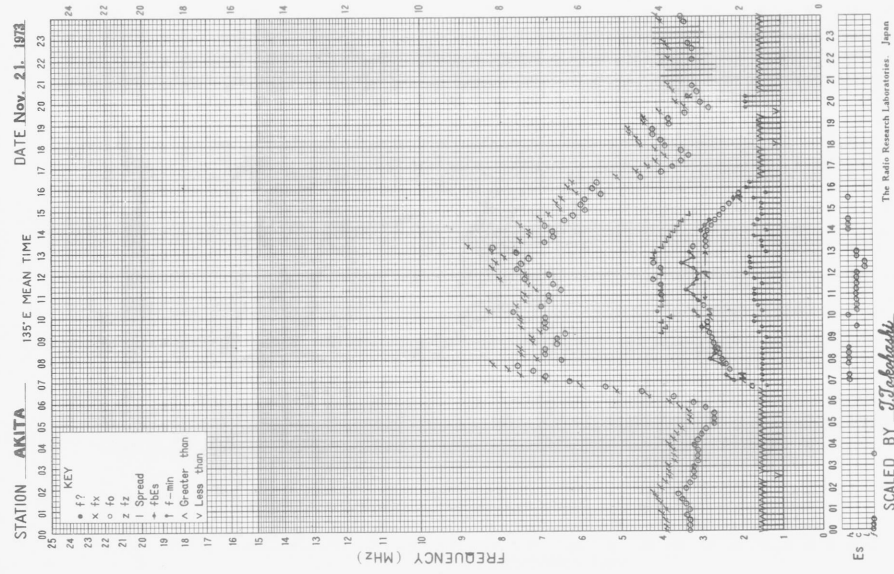
f-Plot of Ionospheric Data



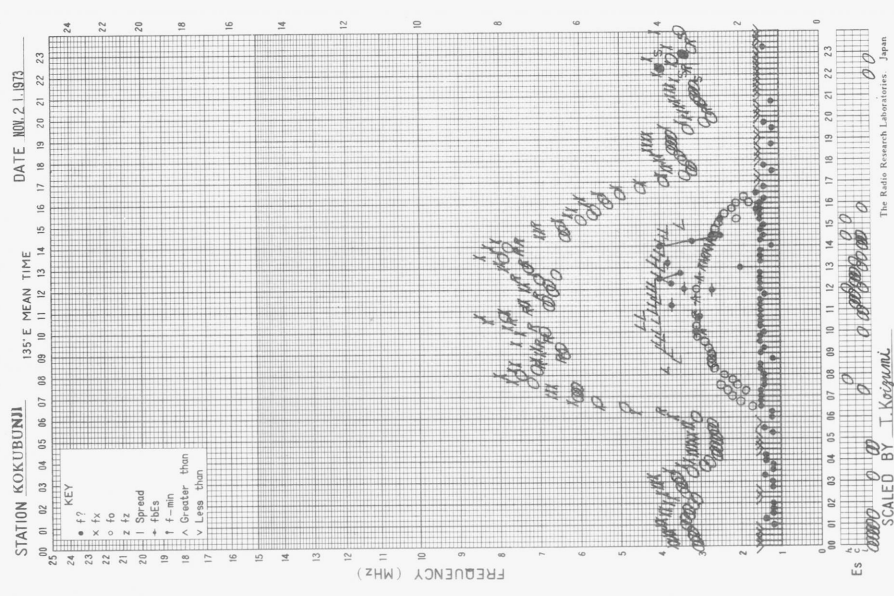
f--PLOT OF IONOSPHERIC DATA



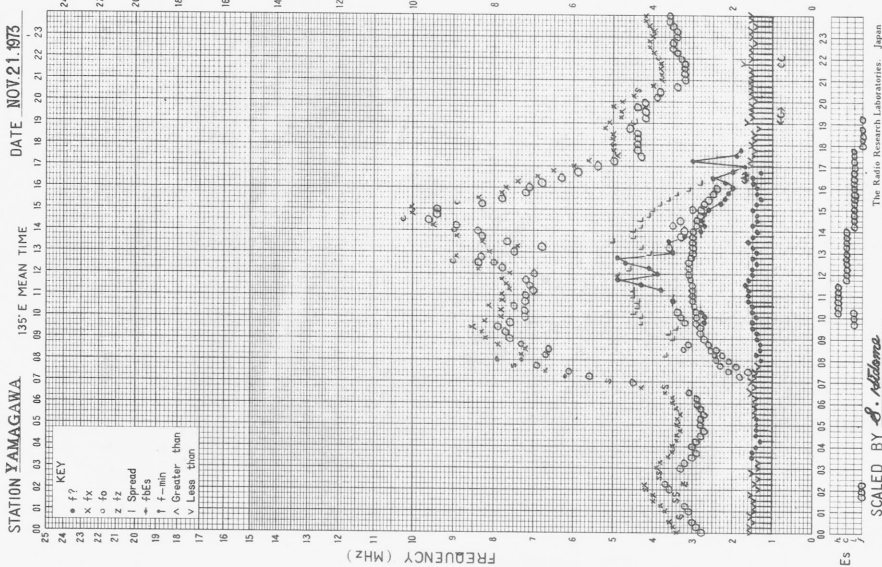
f--PLOT OF IONOSPHERIC DATA



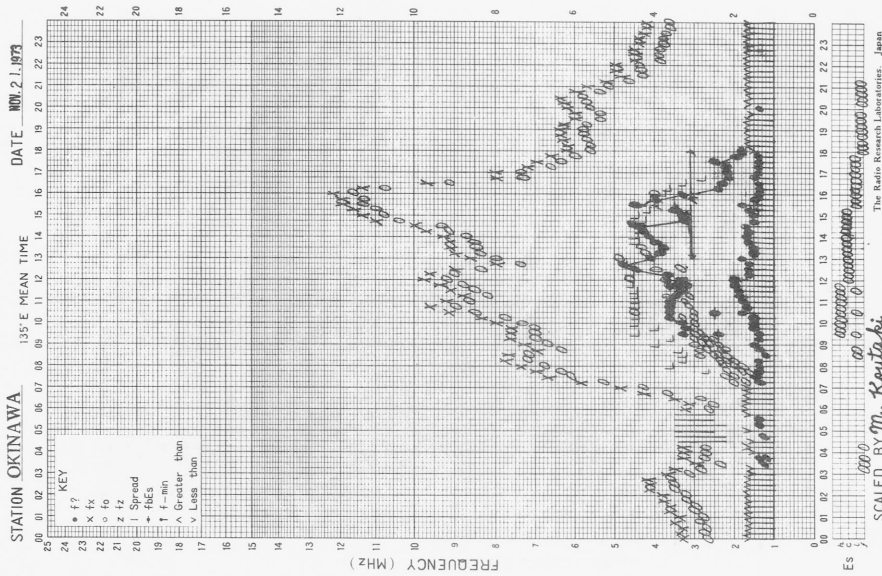
f--PLOT OF IONOSPHERIC DATA



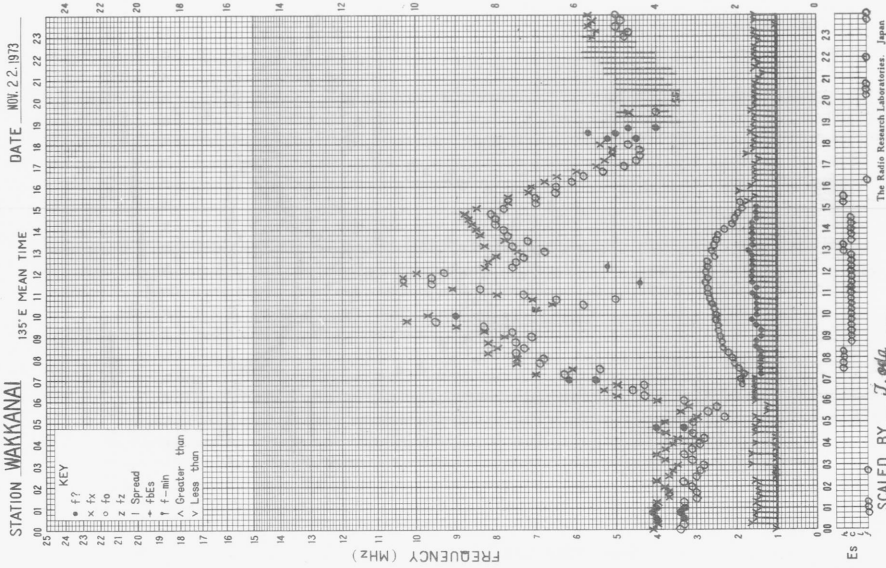
f-PLOT OF IONOSPHERIC DATA



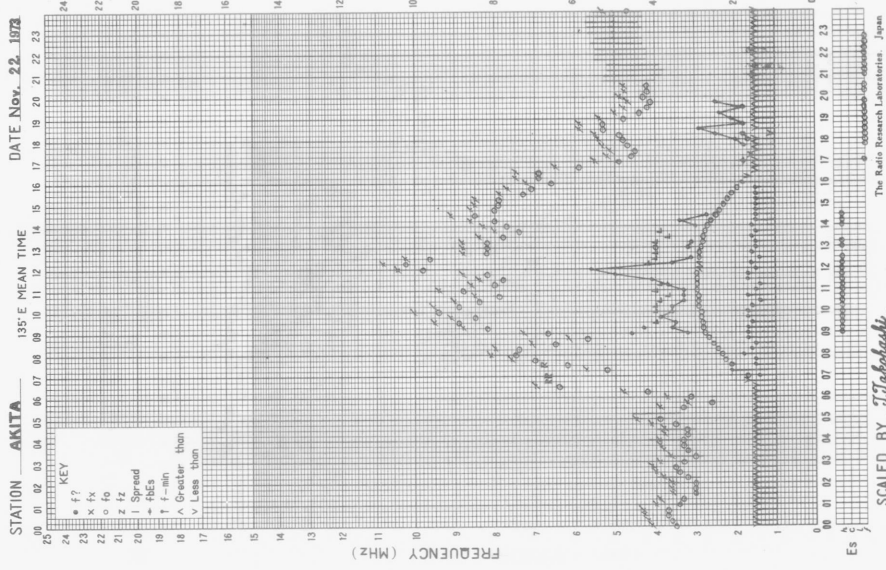
f-PLOT OF IONOSPHERIC DATA



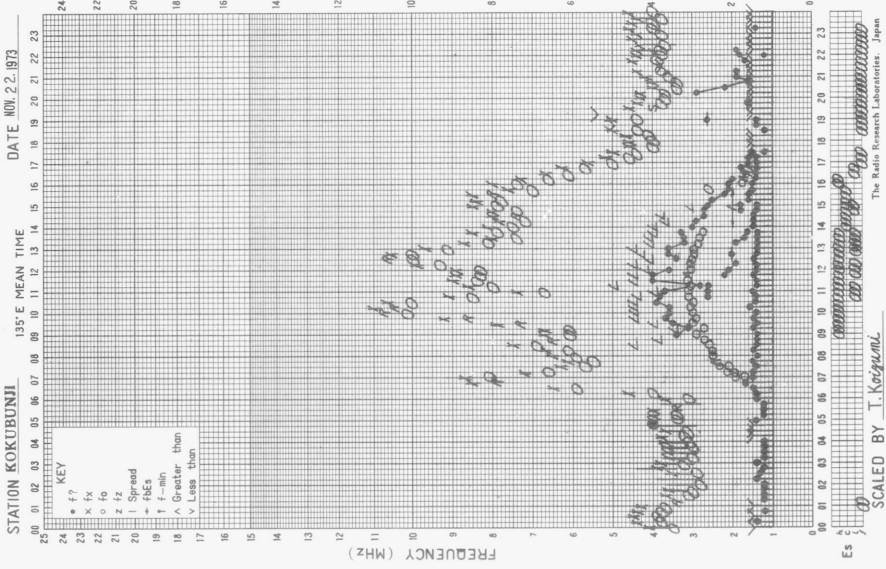
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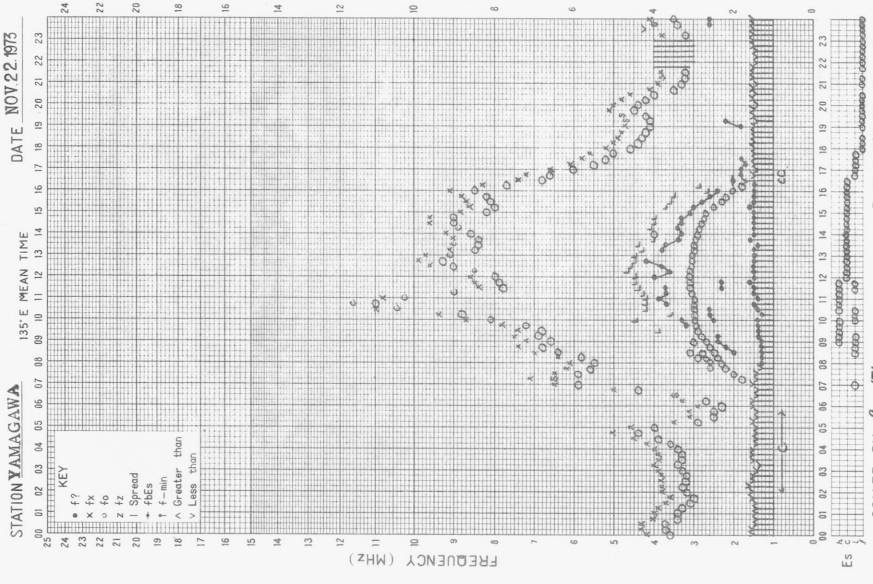
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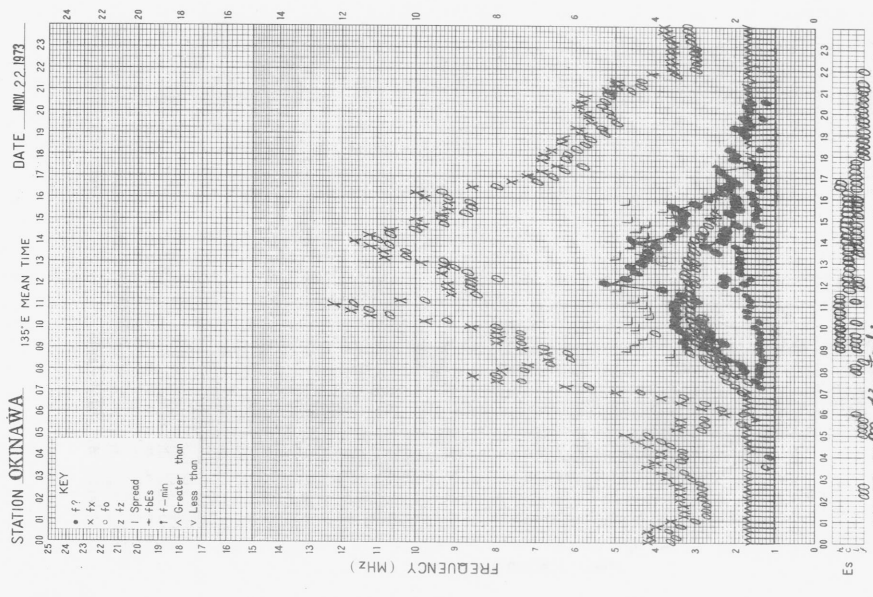
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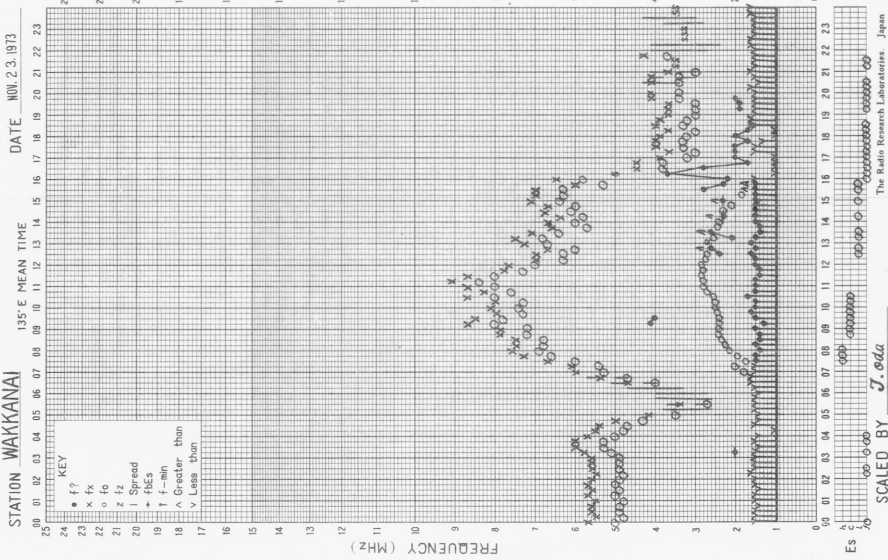
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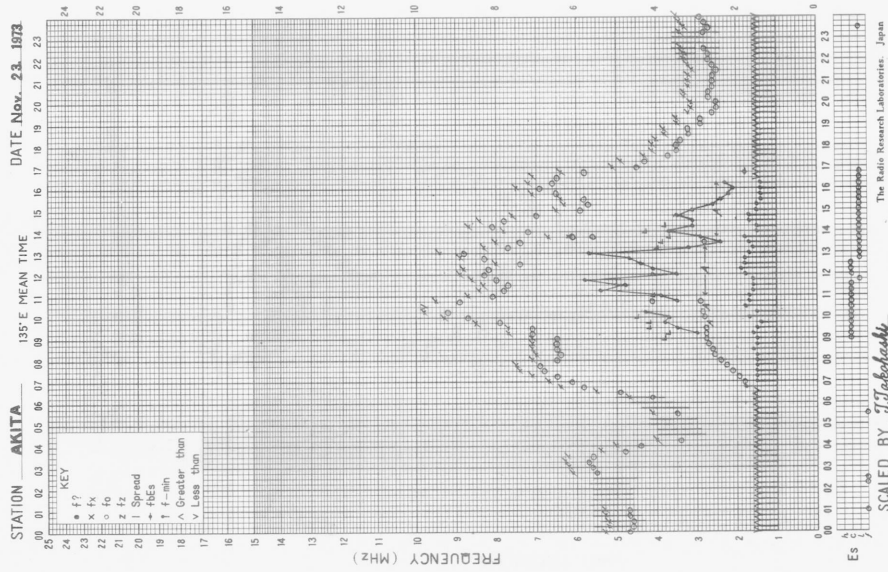
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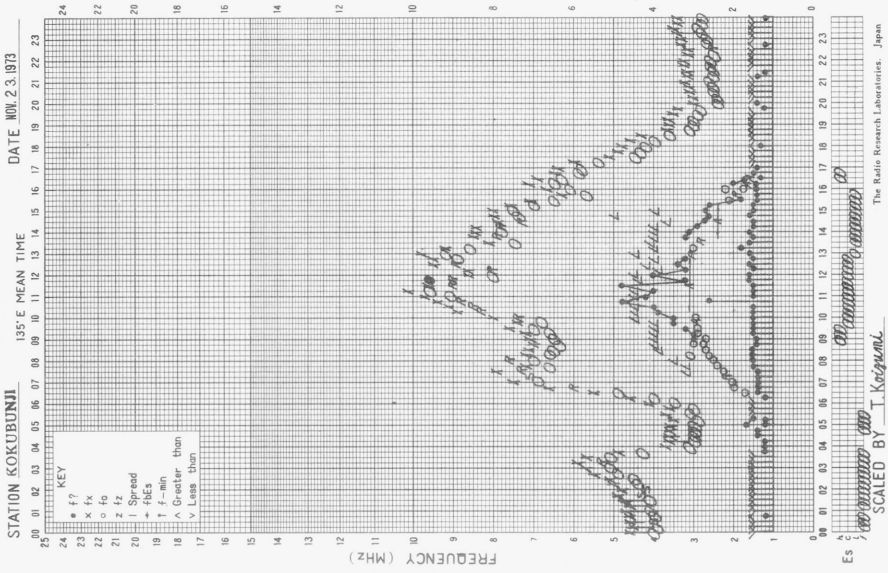
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f--PLOT OF IONOSPHERIC DATA

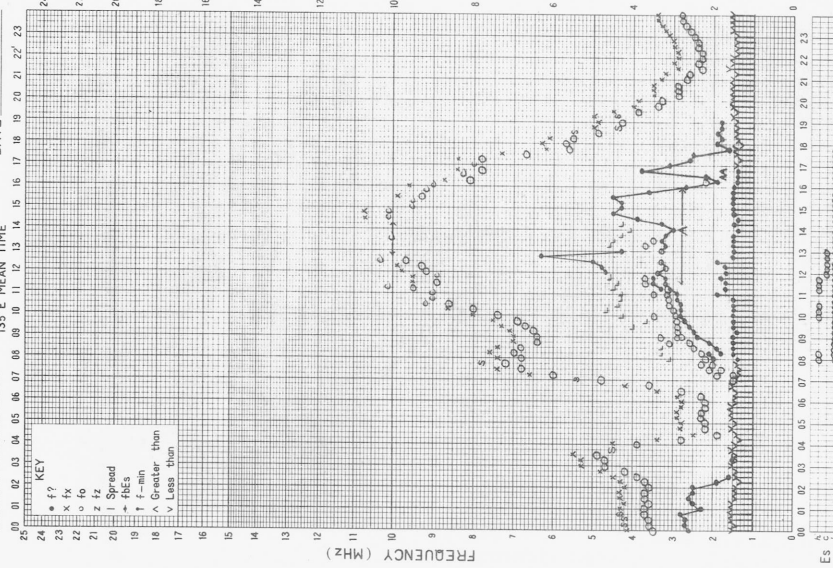


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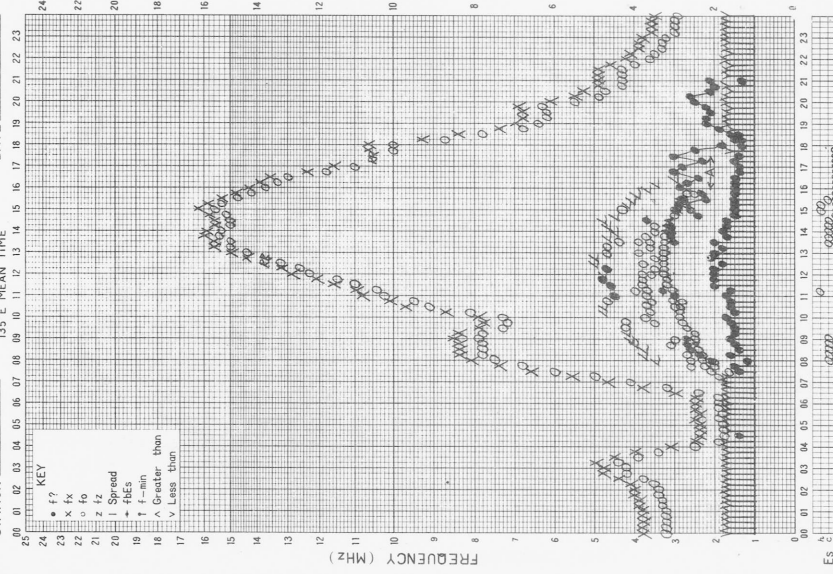
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STATION **YAMAGAWA** 135°E MEAN TIME DATE **NOV 23 1973**

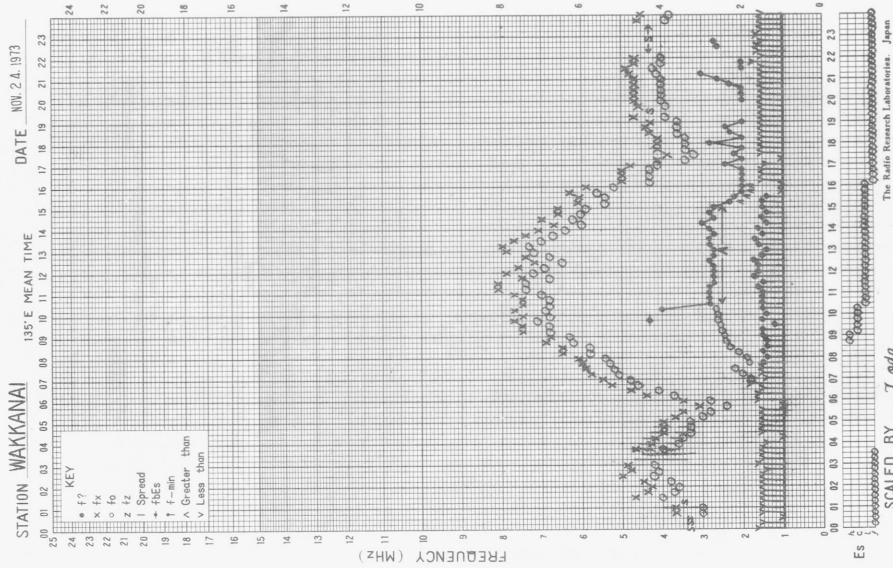


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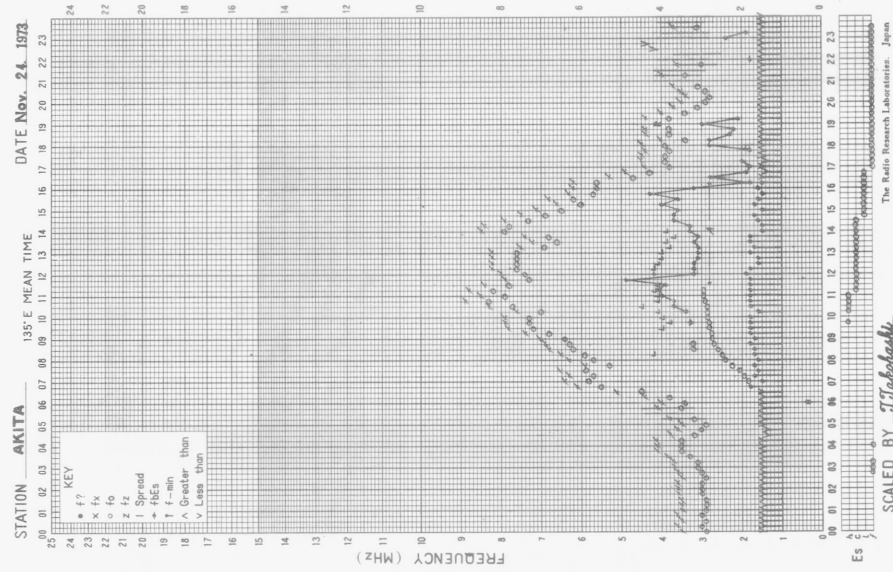
STATION **OKINAWA** 135°E MEAN TIME DATE **NOV 23 1973**



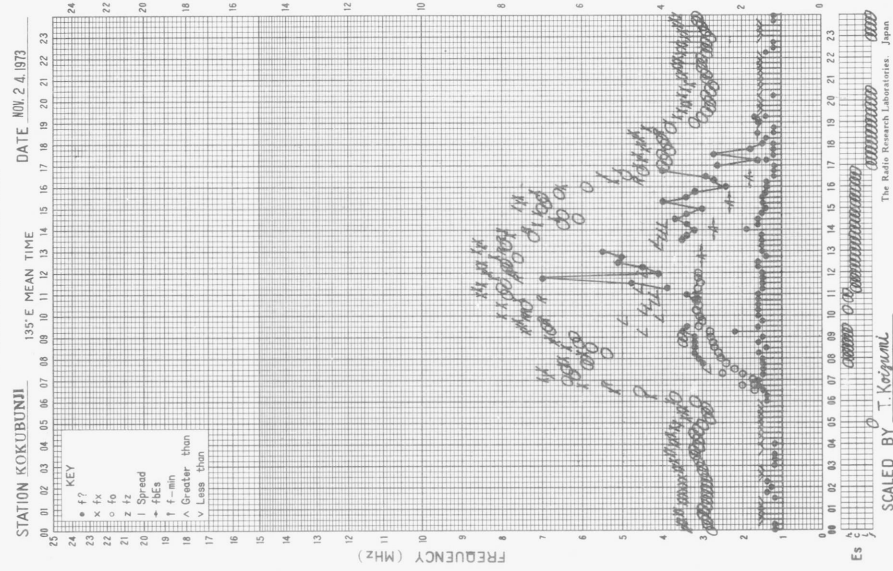
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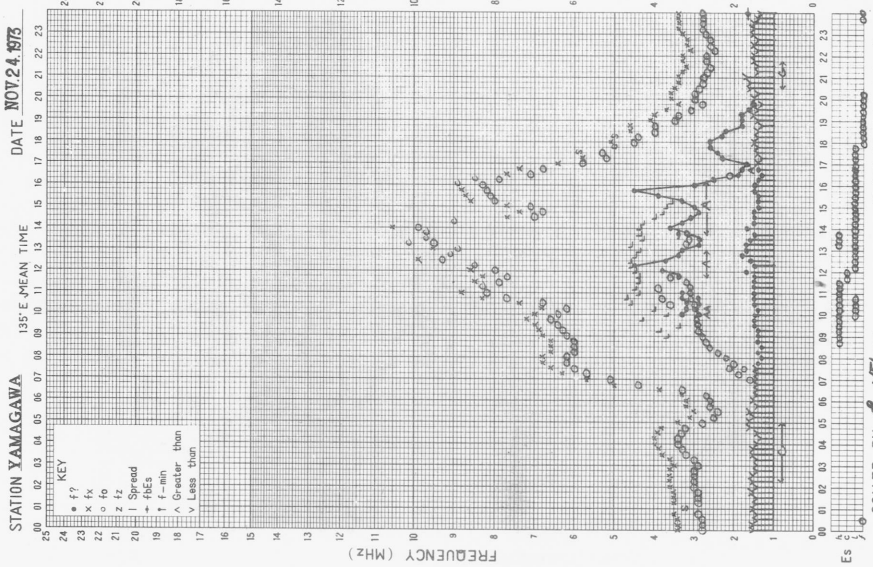
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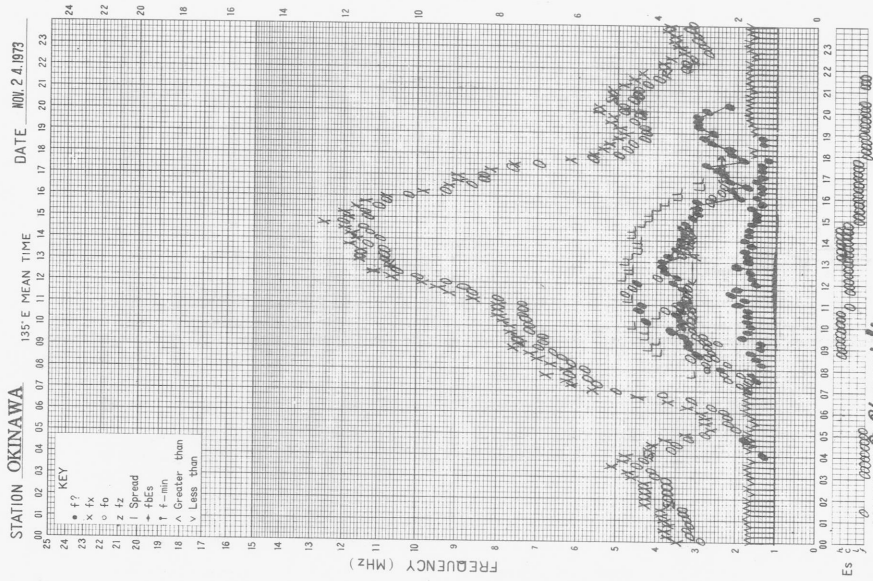
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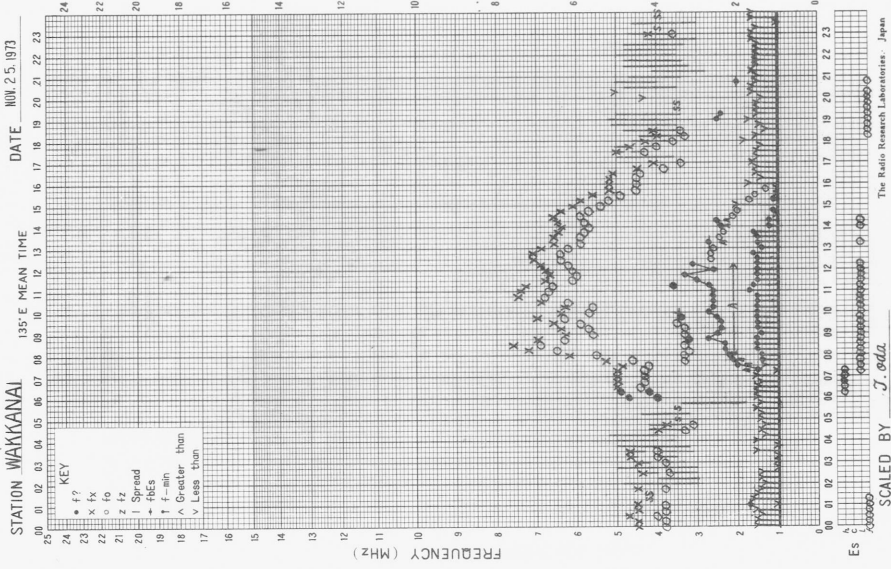
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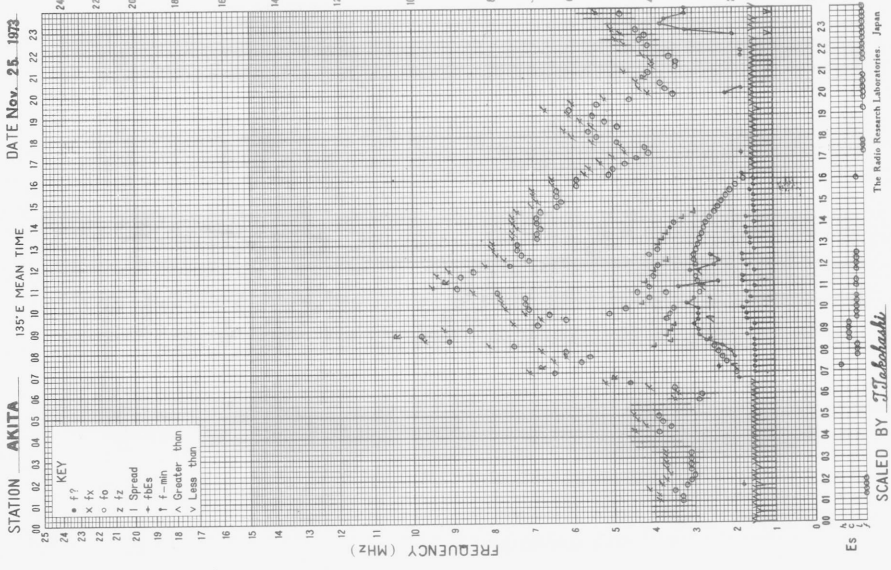
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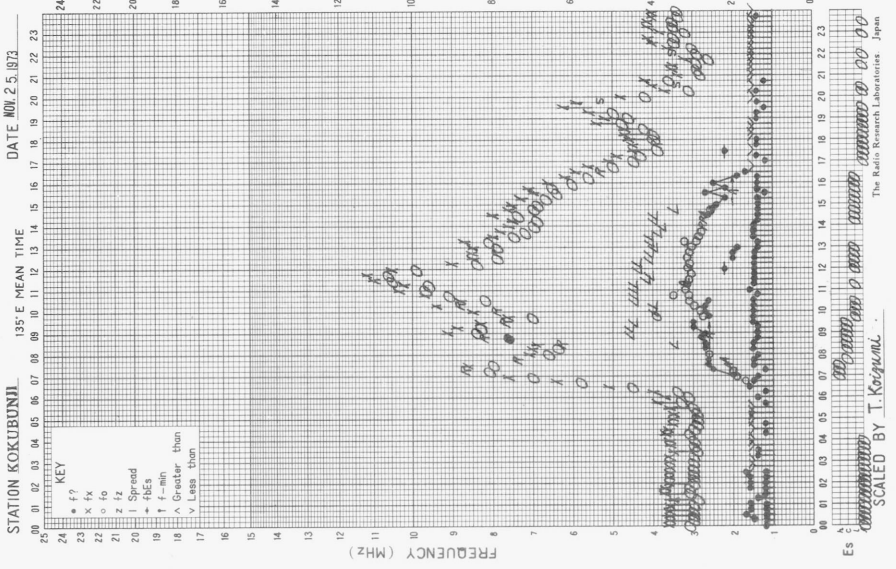
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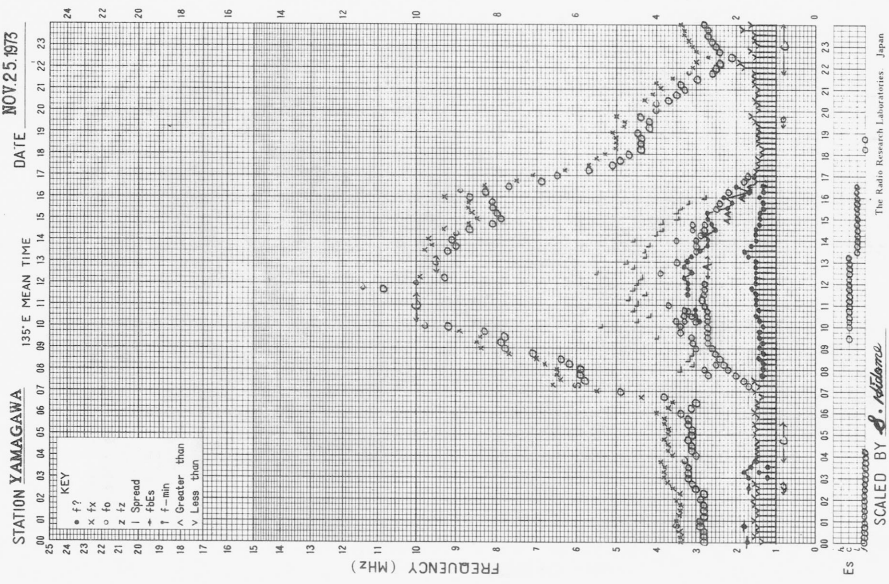
f- PLOT OF IONOSPHERIC DATA



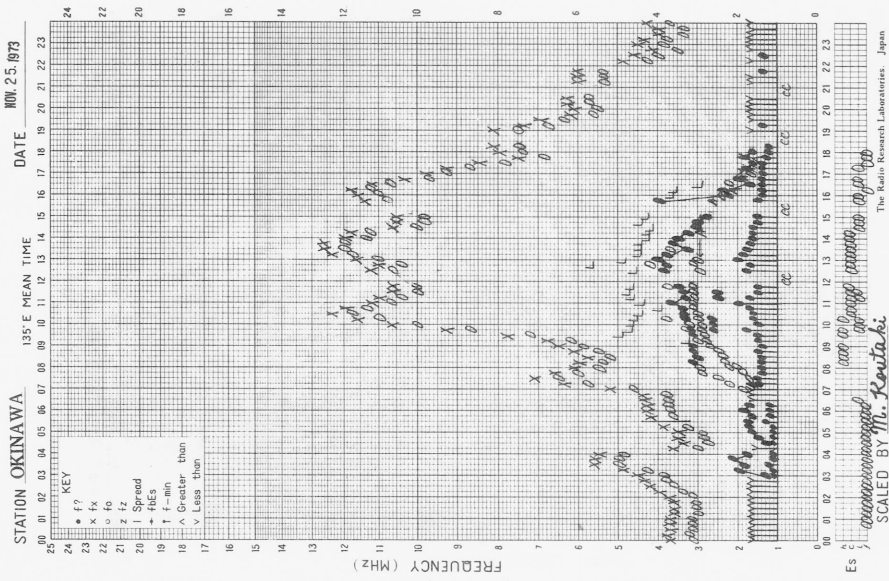
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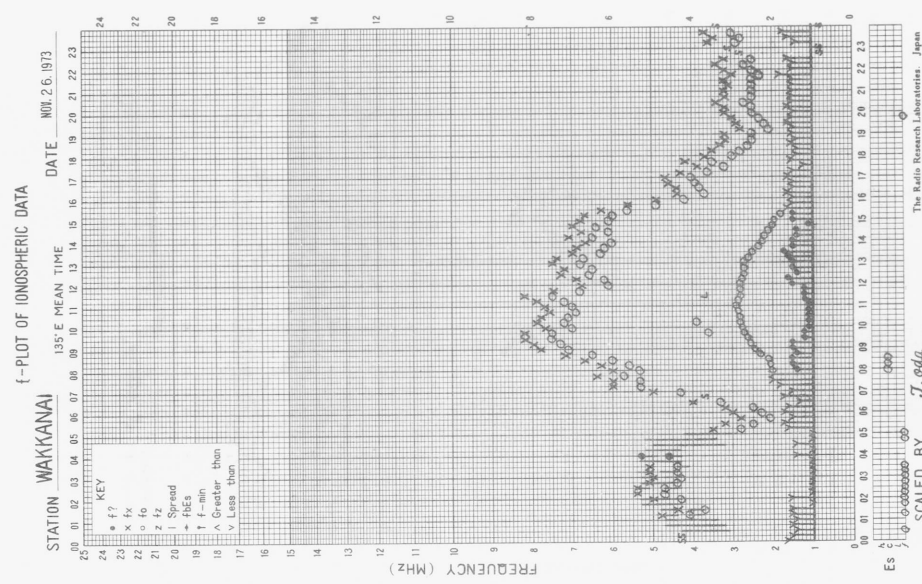
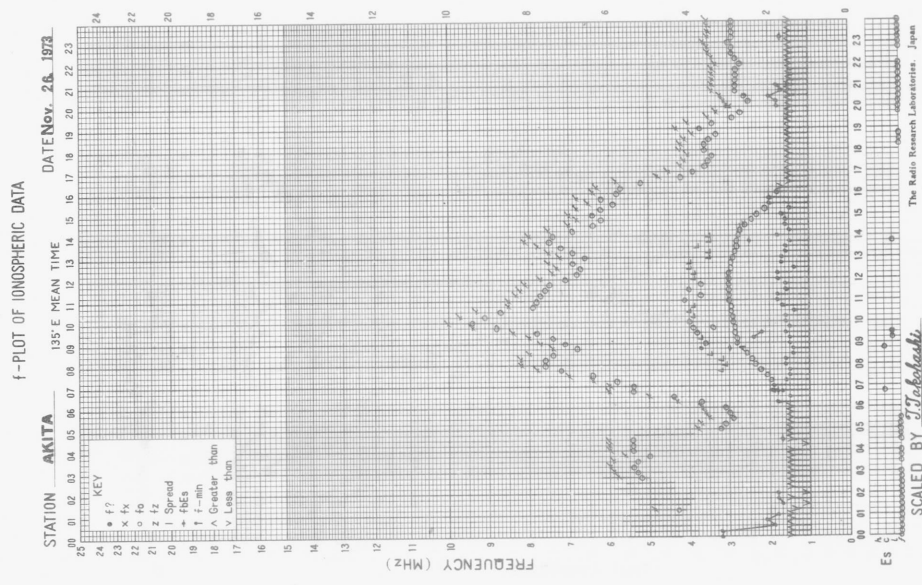
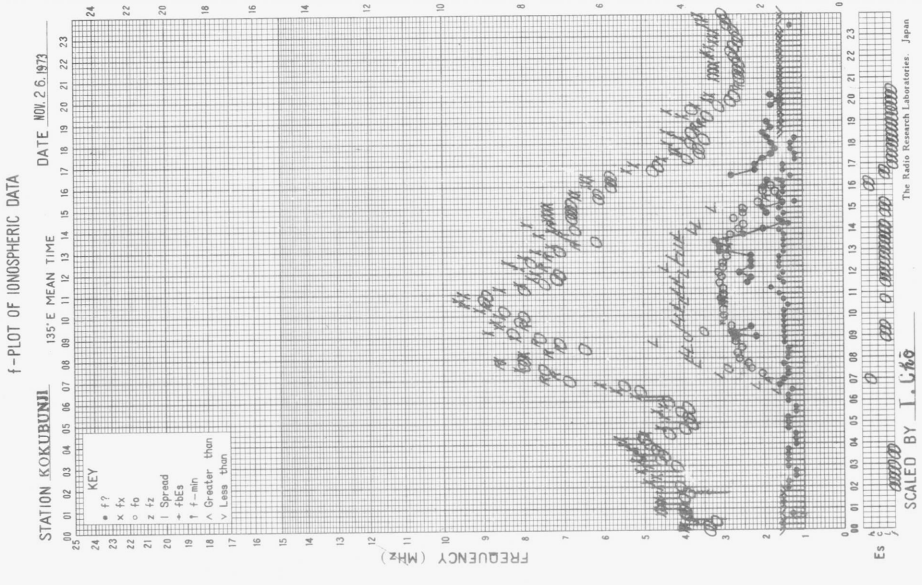


f-PLOT OF IONOSPHERIC DATA



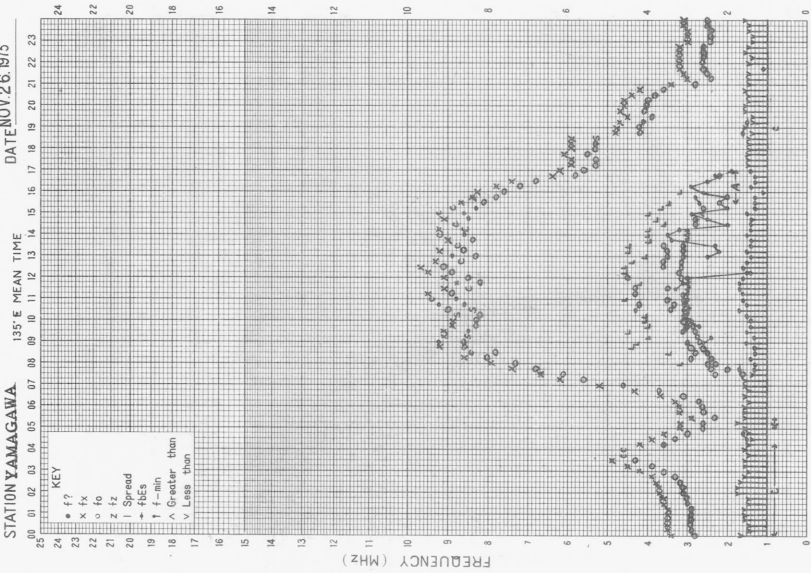
f-PLOT OF IONOSPHERIC DATA





f- PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA DATE NOV. 26, 1973

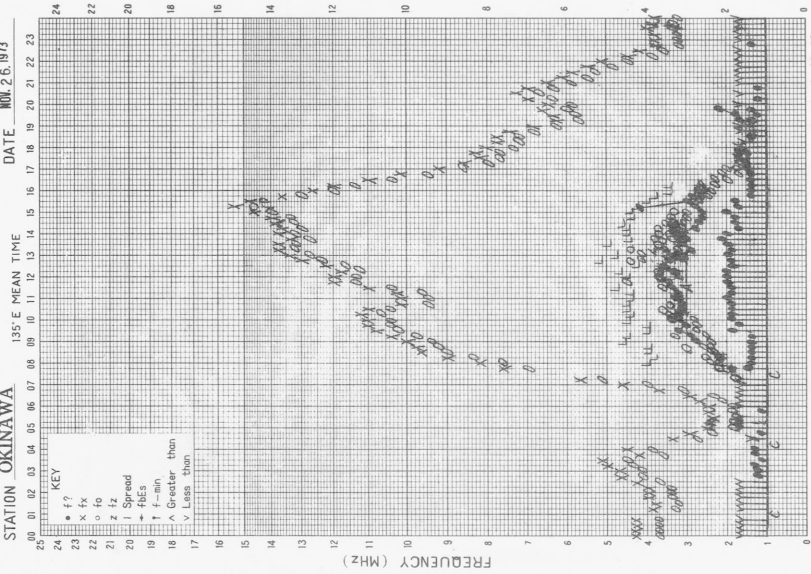


KEY
 • f_oF₂
 X f_oF₁
 O f_oF₂ virtual height
 F Spread
 + E_s
 † f-min
 △ Greater than
 V Less than

ES
 SCALED BY S. Takahama
 The Radio Research Laboratories, Japan

f- PLOT OF IONOSPHERIC DATA

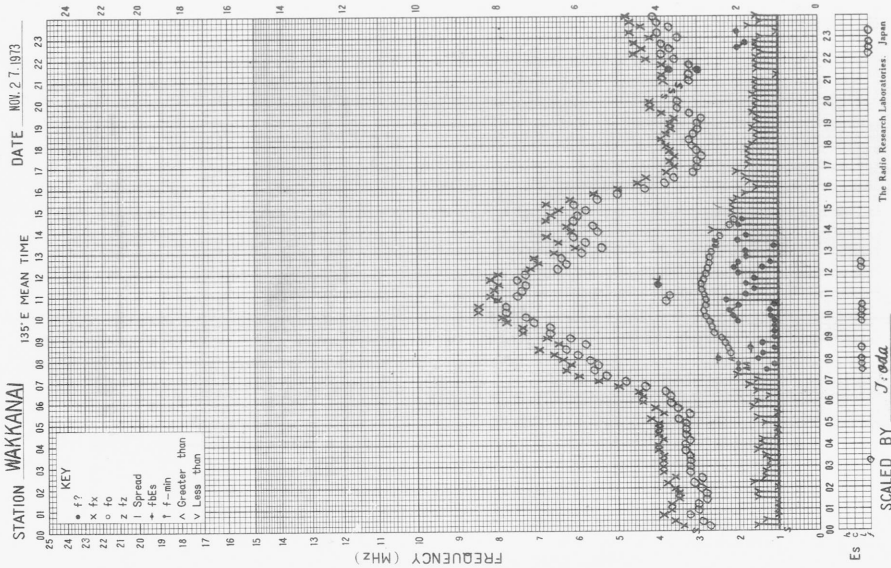
STATION OKINAWA DATE NOV. 26, 1973



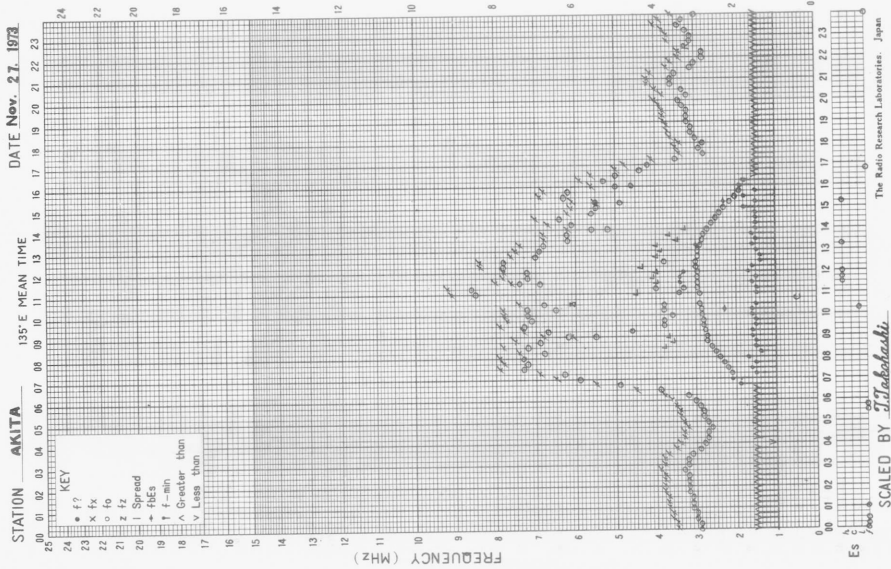
KEY
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 X f_oF₁
 O f_oF₂ virtual height
 F Spread
 + E_s
 † f-min
 △ Greater than
 V Less than

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 SCALED BY M. Kenzaki
 The Radio Research Laboratories, Japan

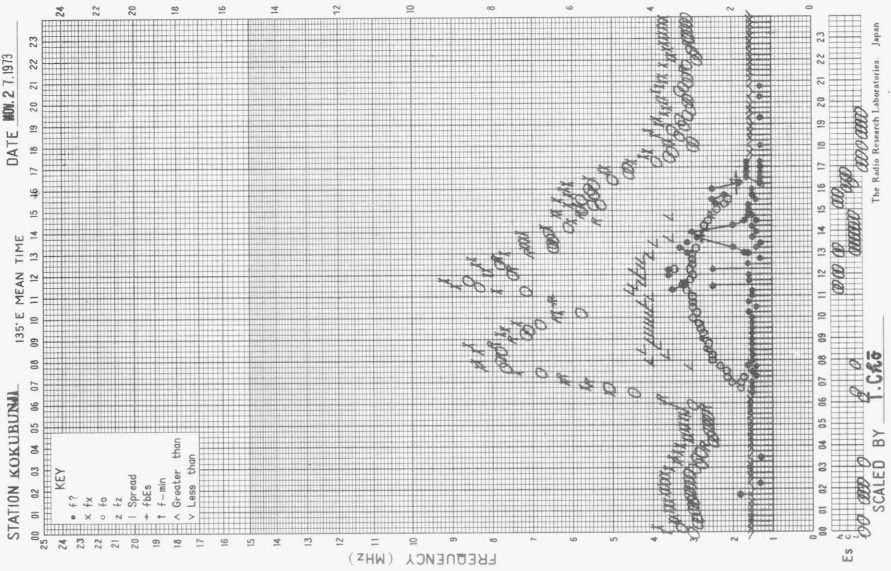
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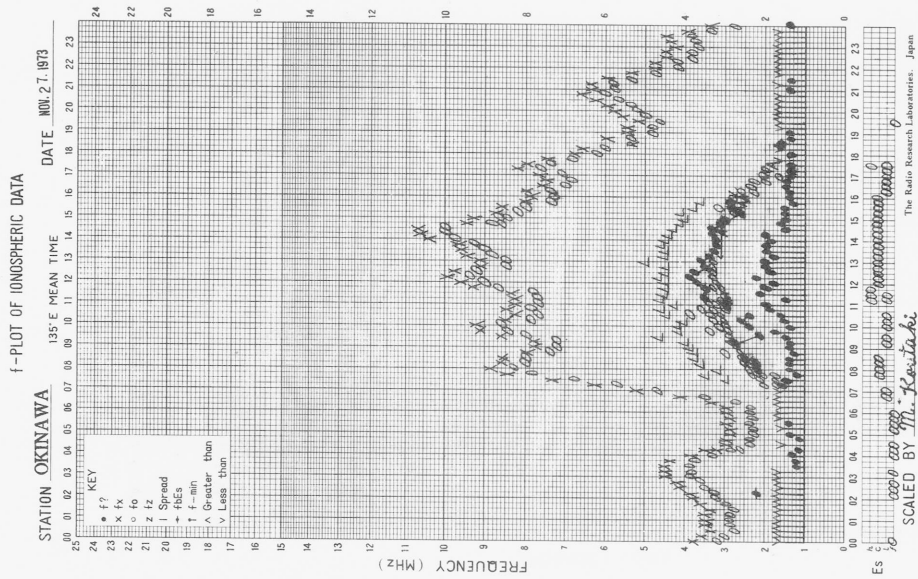
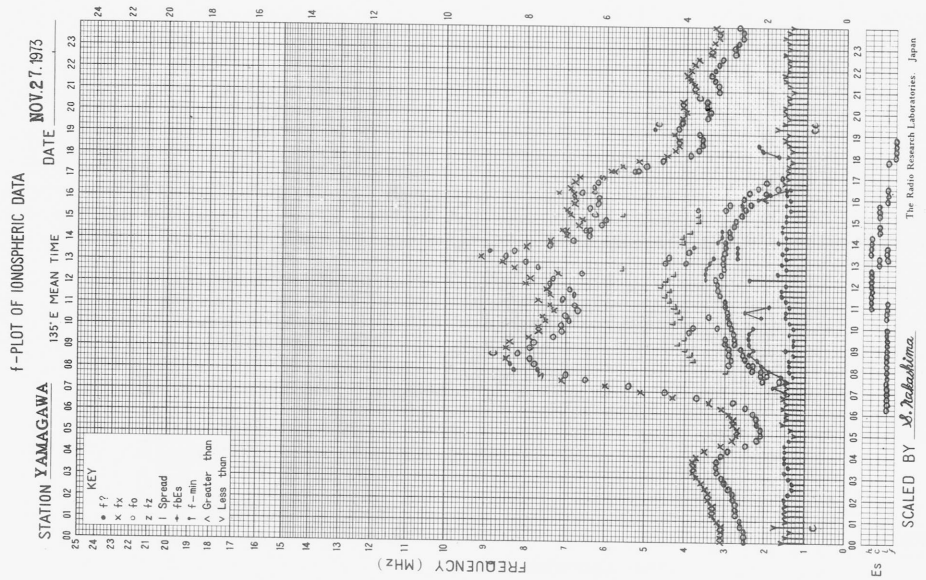


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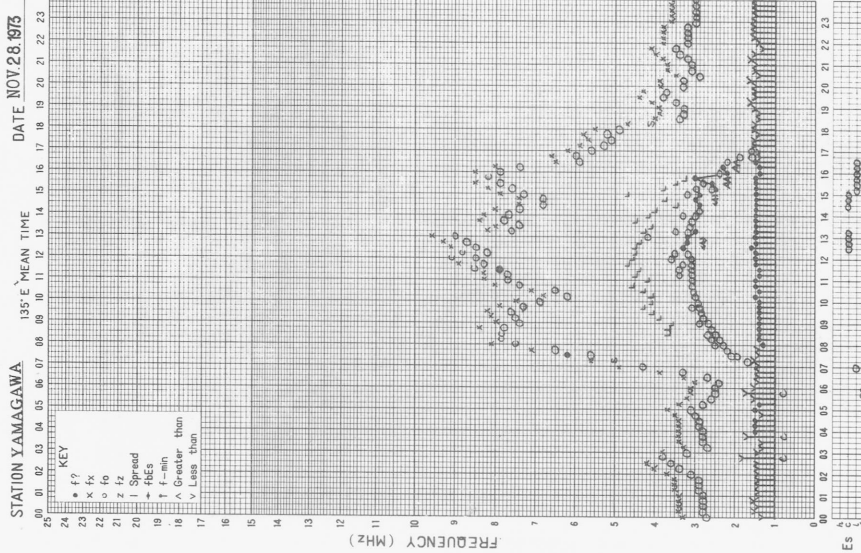


f-PLOT OF IONOSPHERIC DATA

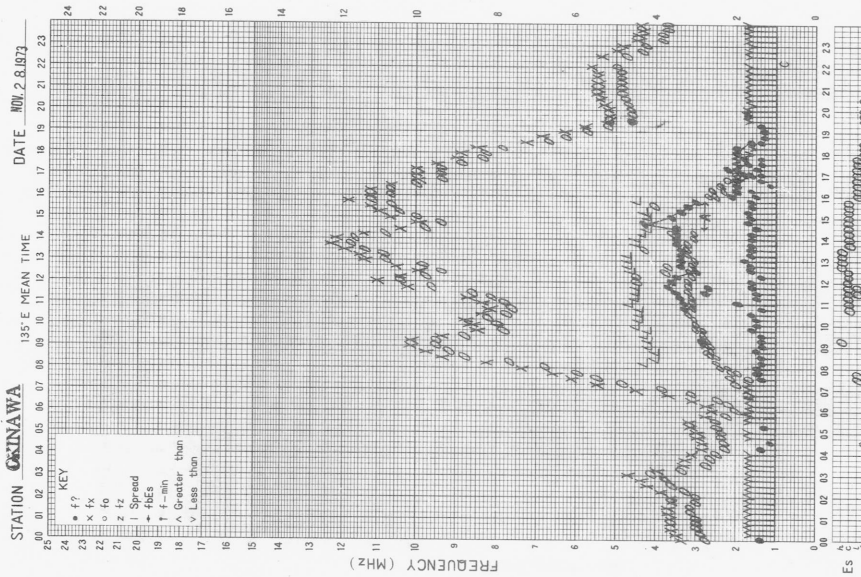




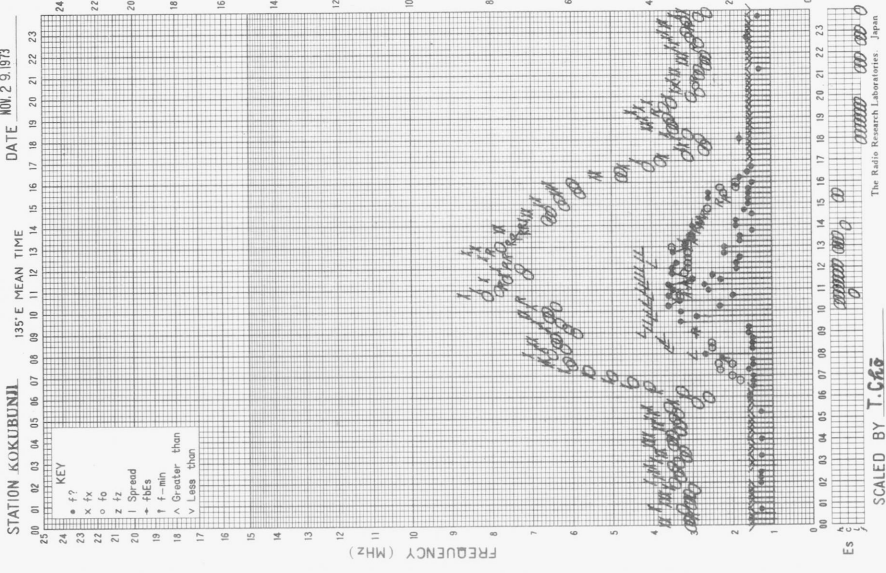
f-plot of IONOSPHERIC DATA



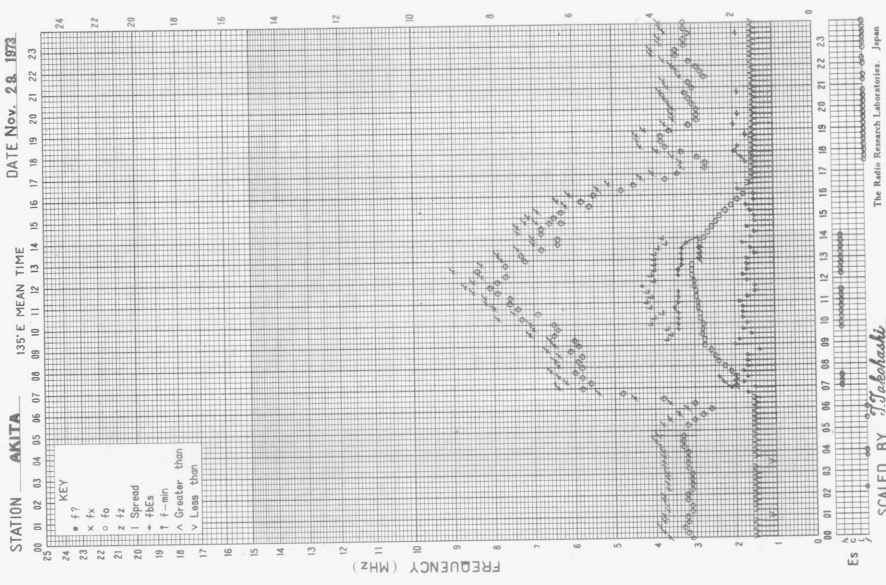
f-plot of IONOSPHERIC DATA



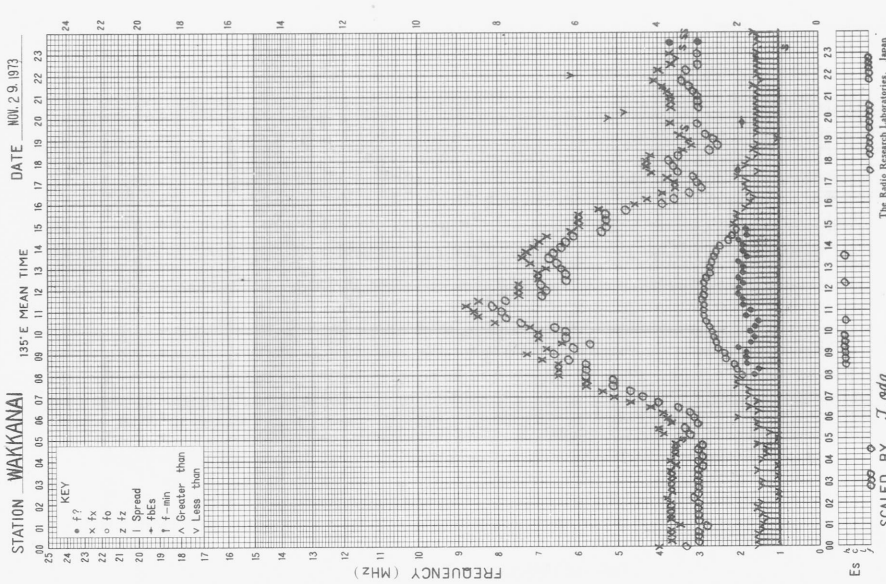
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f-PLOT OF IONOSPHERIC DATA

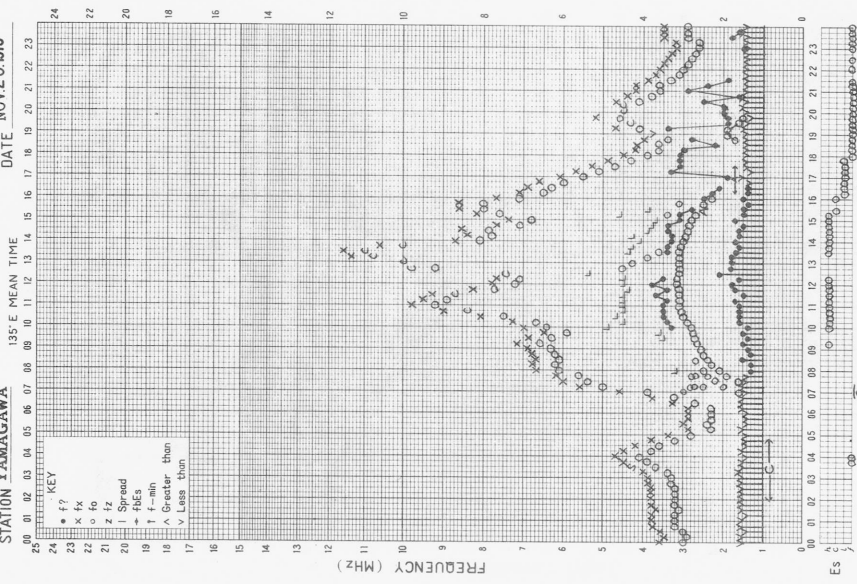


f-PLOT OF IONOSPHERIC DATA



f-plot of IONOSPHERIC DATA

STATION **YAMAGAWA** DATE **NOV 29 1973**

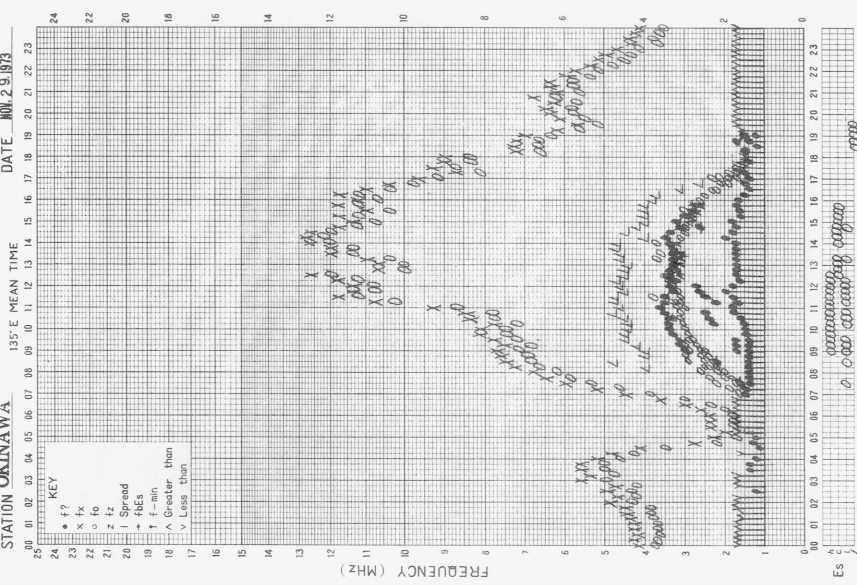


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C
The Radio Research Laboratories, Japan

SCALED BY *JK Byama*

f-plot of IONOSPHERIC DATA

STATION **OKINAWA** DATE **NOV 29 1973**



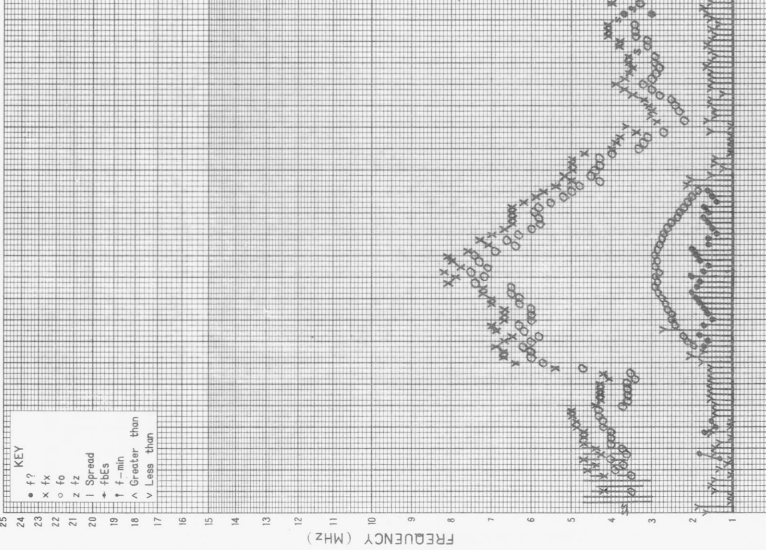
Es }
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C
The Radio Research Laboratories, Japan

SCALED BY *M. Koutaki*

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI DATE NOV. 30. 1973

135°E MEAN TIME

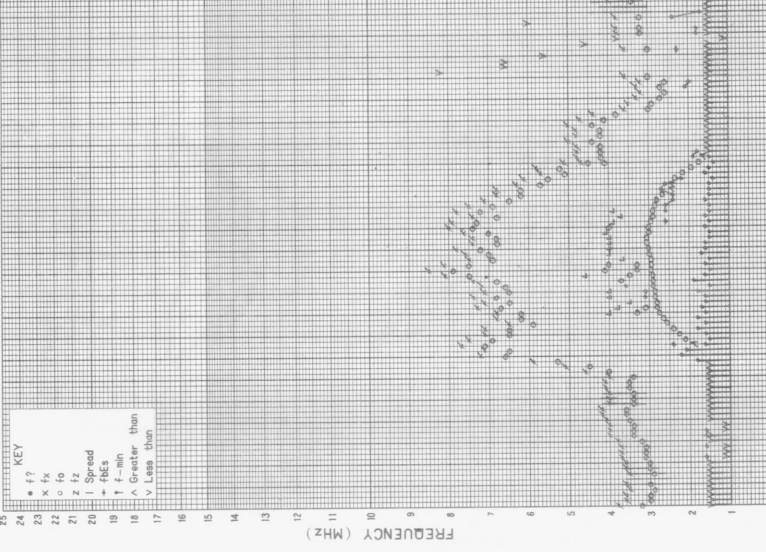


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The Radio Research Laboratories, Japan
SCALED BY J. oga

f-PLOT OF IONOSPHERIC DATA

STATION AKITA DATE Nov. 30. 1973

135°E MEAN TIME

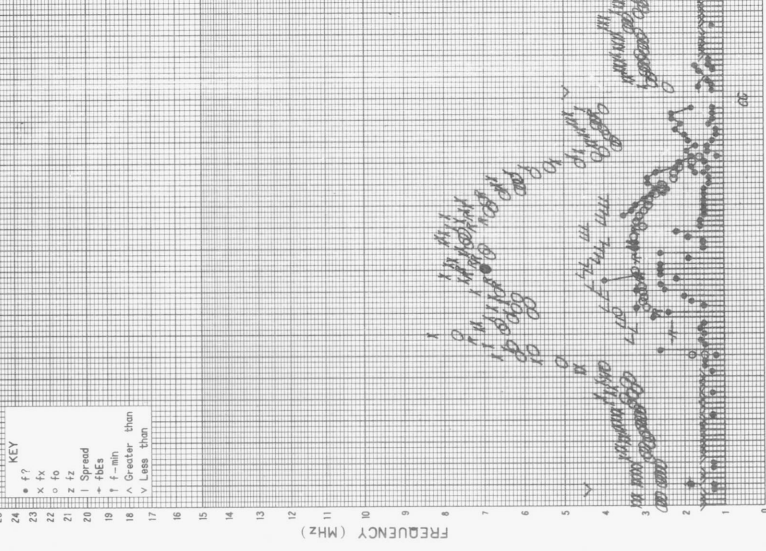


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The Radio Research Laboratories, Japan
SCALED BY J. Takahashi

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI DATE NOV. 30. 1973

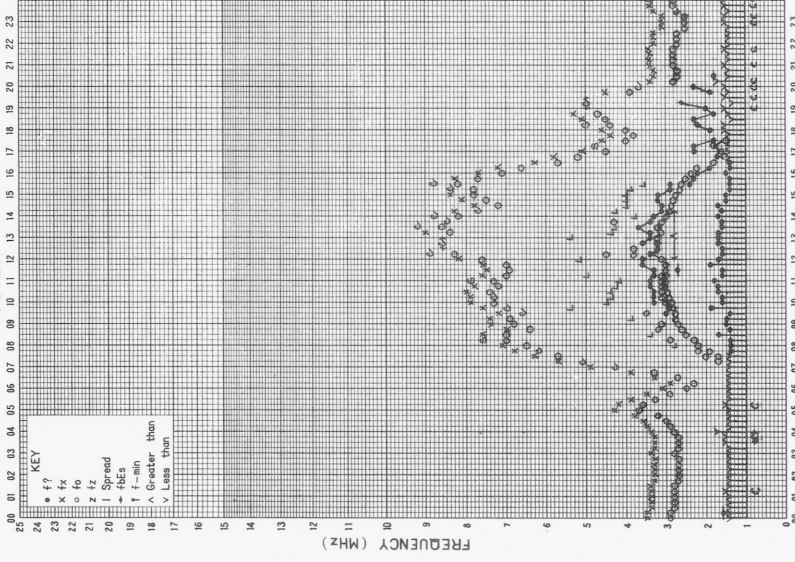
135°E MEAN TIME



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The Radio Research Laboratories, Japan
SCALED BY L. Kogawa

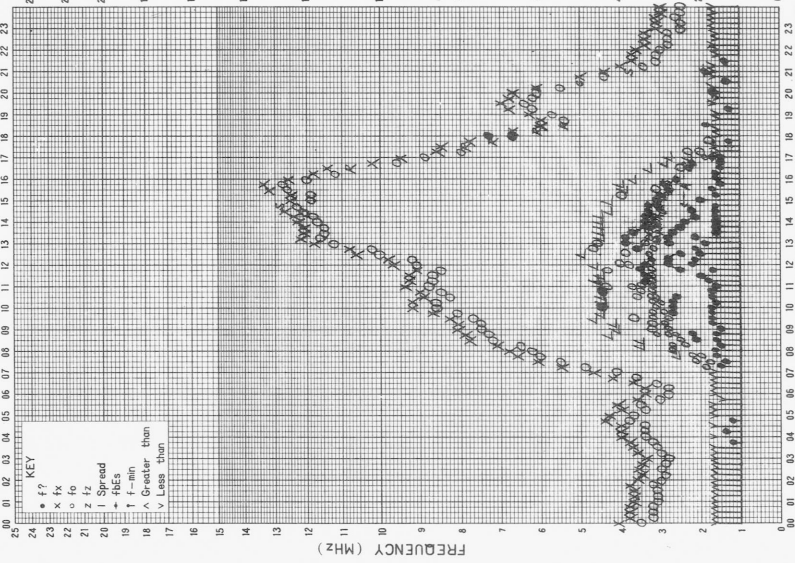
f- PLOT OF IONOSPHERIC DATA

STATION **YAMAGAWA** DATE **NOV.30.1973**



f- PLOT OF IONOSPHERIC DATA

STATION **OKINAWA** DATE **NOV.30.1973**



SOLAR RADIO EMISSION

<u>Flux Density and Variability</u>										
Month: November 1973					Frequency: 200 MHz					
Observing station: Hiraiso										
Flux density $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$						Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	9	9	(10)	18	10	0	0	(0)	1	0
2	22	10	(9)	11	16	1	0	(0)	1	1
3	9	9	(9)	8	10	0	0	(0)	0	0
4	9	9	(8)	9	9	0	0	(*)	1	0
5	9	-	-	-	(9)	0	-	-	-	(0)
6	8	8	(8)	8	8	0	*	(0)	0	0
7	9	9	(9)	8	9	0	0	(0)	0	0
8	9	9	(8)	8	8	0	0	(0)	0	0
9	8	-	(8)	8	8	0	-	(0)	0	0
10	8	8	(8)	8	8	0	0	(0)	0	0
11	8	8	(8)	8	8	0	0	(0)	0	0
12	9	9	(9)	8	9	0	0	(0)	0	0
13	9	9	(9)	8	9	0	0	(0)	0	0
14	9	9	(9)	8	9	0	0	(0)	0	0
15	9	9	(9)	8	9	0	0	(0)	0	0
16	9	9	(9)	8	9	0	0	(0)	0	0
17	9	9	(9)	8	9	0	0	(0)	0	0
18	9	9	(9)	8	9	0	0	(0)	0	0
19	9	9	(9)	8	9	0	0	(0)	0	0
20	9	9	(9)	9	9	0	0	(0)	0	0
21	9	9	(9)	9	9	0	0	(0)	0	0
22	9	10	(10)	13	9	0	0	(0)	1	0
23	14	14	(14)	18	14	1	0	(1)	1	1
24	22	31	(29)	20	25	1	1	(1)	1	1
25	19	20	(25)	38	20	1	1	(1)	1	1
26	28	28	(32)	15	31	1	1	(1)	1	1
27	14	13	(13)	14	14	1	1	(1)	1	1
28	19	23	(21)	14	19	1	1	(1)	0	1
29	13	14	(13)	11	13	0	0	(0)	0	0
30	13	13	(10)	10	12	0	0	(0)	0	0

Note No observations during the following periods:

5th 0135- 6th 0010 8th 0200- 0300
7th 0114- 0220 9th 0200- 0545

*: interference.

SOLAR RADIO EMISSION

<u>Flux Density</u>					
Month: November 1973					
Observing station: Hiraiso			Frequency: 500 MHz		
Flux density $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	29	28	(28)	28	29
2	28	26	(25)	26	27
3	27	27	(26)	24	27
4	23	22	(23)	26	23
5	26	24	(25)	26	25
6	26	25	(25)	23	25
7	24	23	(23)	24	24
8	25	23	(23)	23	24
9	23	23	(23)	23	23
10	22	22	(22)	22	22
11	22	21	(21)	23	22
12	24	24	(24)	24	24
13	25	25	(25)	26	25
14	26	24	(25)	24	25
15	24	25	(26)	-	25
16	26	25	(25)	25	25
17	26	26	(26)	27	26
18	27	27	(27)	26	27
19	28	27	(27)	27	27
20	27	24	(25)	26	26
21	28	27	(26)	28	27
22	28	28	(28)	27	28
23	28	27	(29)	28	28
24	28	28	(28)	25	28
25	27	28	(28)	32	27
26	31	29	(31)	(31)	31
27	31	30	(30)	(31)	30
28	31	30	(30)	(27)	31
29	27	27	(28)	(27)	27
30	26	26	(25)	(23)	26

Note No observations during the following periods:

6th	0435-	0550	15th	2120-	16th	0010
14th	0245-	0310	26th	0220-		0315
14th	0435-	0545	26th	0455-		0600
15th	0210-	0310	29th	0510-		0610
15th	0440-	0515				

Distinctive Events (single-frequency observations)									
Month: November 1973									
Observing station: Hiraiso									
Normal observing period: 2120 - 0730 (sunrise to sunset)									
Date	Freq.	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$		Polarization	Remarks
	MHz	UT	UT	minutes		peak	mean		
3	500	0011.5	0121.7	25.0	C	1700	340	L 01r0	
	100	0012.0	0016U	36.0	C	1000D	200D		
	200	0012.5	0023U	32.0	C	370D	240D		
23	500	2214.0	2215.1	1.5	C	390	80		
	200	2258.5	2258.8	1.5	C	170	80		
25	200	0055.0	0055.7	2.0	C	170	60		
	100	2350.5	2350.9	1.0	C	1000D	140D		
26	500	0027.3	0028.0	1.0	C	400	60		1st peak 2nd peak
		0107.0	0107.8	4.0	C	70	20		
	200	0107.0	0107.5U	2.0	C	170D	100D		
	100	0107.0	0107.7U	2.5	C	1000D	160D		
	200	0120.5	0120.9U	1.5	C	170D	60D		
	500	0150.0	0151U	1.5	C	170D	70D		
		0228.0	0229U	2.0	C	160D	70D		
	0433.0		3.5	C		10			
		0433.7				40			
		0434.6				37			
200	0550.0	0551.3U	7.5	C	170D	80D			
100	0550.5	0552.5	6.5	C	1000D	130D			
200	0703.5	0705.7U	4.0	C	100D	50D			
100	0705.0	0705.6	2.5	C	500D	100D			

No polarization measurement: 9th 0600 - 30th 0730.

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

NOV 1973	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	-3	10	ES 1	ES 0	ES 3	ES 2	ES 4	ES 6	ES -1	ES -8	ES -21	ES -1	ES -12	ES -12	ES -12	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	-9	-9	-9			
2	-6	ES -1	3	ES -4	ES 0	ES 3	ES 4	ES 6	ES 6	ES -2	ES -6	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	-1	-1	0			
3	-8	-3	0	ES 4	ES 0	ES 3	ES 4	ES 7	ES -1	ES -6	ES -3	ES -6	ES -21	ES -8	ES -21	ES -21	ES -21	-6	ES -21	ES -21	ES -21	ES -21	ES -21	4	8	4			
4	7	10	4	ES -12	ES -1	ES 0	ES -1	ES 1	ES 1	ES 1	ES 1	ES 4	ES -13	ES -13	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	5	1	4			
5	-2	4	9	ES -5	ES -3	ES -2	ES 4	ES 8	ES 2	ES -8	ES -6	ES -8	ES -22	ES -13	ES -7	ES -22	-7	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	1	4	5			
6	5	2	ES -8	ES -7	ES -1	ES 0	ES 1	ES 4	ES 2	ES -8	ES -22	ES -22	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	4	5	6			
7	5	ES -16	ES -9	ES -8	ES 4	ES 1	ES 0	ES 3	ES 5	ES -9	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	-18	-1	3	-1		
8	8	ES -13	ES -7	ES -4	ES 0	ES 1	ES 9	ES 2	ES 3	ES -1	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	4	2	0		
9	4	ES -16	ES -18	ES -7	ES 10	ES -5	ES 8	ES 4	ES -2	ES -18	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	2	3	1			
10	5	ES -6	ES -12	ES -6	ES 2	ES 2	ES 4	ES 2	ES 2	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	2	4	-1			
11	-2	ES -12	ES -13	ES -12	ES 3	ES 0	ES 4	ES 8	ES 1	ES 8	ES 2	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	1	2	8			
12	6	ES 1	ES -2	ES -2	ES -6	ES 0	ES 4	ES 2	ES 5	ES -2	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	4	7	4			
13	5	3	ES -7	ES -22	ES 1	ES -5	ES 4	ES -1	ES -3	ES -13	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	9	8	9			
14	6	3	ES -10	ES -22	ES -7	ES -8	ES -2	ES -4	ES 0	ES -13	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	6	7	9			
15	7	6	ES -8	ES -14	ES -7	ES -5	ES -1	ES 0	ES -5	ES -22	ES -22	ES -22	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	4	8	9			
16	4	ES -17	ES -9	ES -17	ES -4	ES -3	ES 1	ES -6	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	ES -21	4	7	12			
17	12	12	ES -9	ES -9	ES -9	ES 2	ES 0	ES 3	ES -7	ES -12	ES -21	ES -21	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	8	10	11			
18	7	ES -12	ES -14	ES -15	ES -14	ES -2	ES 2	ES 2	ES -14	ES -10	ES -10	ES -23	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	8	9	5			
19	0	ES -13	ES -22	ES -8	-5	ES 5	ES -2	ES 1	ES -13	ES -22	ES -22	ES -22	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	3	4	3			
20	7	ES -1	ES -5	9	ES -1	ES -1	ES -1	ES 2	ES -7	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	4	4	6			
21	2	-5	ES -6	ES -5	ES -11	ES -19	ES 2	ES 3	ES -14	ES -9	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-3	4	0			
22	3	3	-2	ES 2	ES -5	ES 3	ES 7	ES 4	ES 1	ES -7	ES 0	ES -13	ES -23	ES -23	ES -23	ES -23	-14	7	2	-2	ES -23	ES -23	ES -23	3	3	1			
23	6	-5	ES -1	ES -19	ES -5	ES 5	ES 1	ES 1	ES -14	ES -6	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	5	4	3			
24	4	0	ES -14	ES -14	ES -5	ES 0	ES 4	ES 1	ES -4	ES -1	ES -23	ES -23	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	-9	-5			
25	ES -17	-14	2	ES 12	ES -14	ES 2	ES 0	ES 5	ES -11	ES 9	ES -14	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-14	6	11	6		
26	11	10	ES -15	ES -14	ES -14	ES -12	ES -4	ES -4	ES -14	ES -5	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	2	-1	3			
27	-3	ES -5	ES -22	ES -16	C	ES -14	ES -1	ES 1	ES -16	ES -22	ES -22	ES -22	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-8	-12			
28	-8	ES -19	ES -12	ES -17	ES -23	ES 0	ES 2	ES 1	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-10	-6	-3		
29	-2	ES -14	ES -23	ES -19	ES -19	ES -5	ES 3	ES -2	ES -14	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	3	-1	3			
30	11	ES -23	ES -12	ES -14	ES -14	ES -6	ES 2	ES -5	ES -3	ES 2	ES -19	ES -19	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	2	10	5			
CNT	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MED	4	ES -4	ES -8	ES -10	ES -4	ES 0	ES 2	ES 2	ES -4	ES -10	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	ES -22	3	4	4			
UD	11	10	3	ES 0	ES 4	ES 3	ES 7	ES 7	ES 3	ES 1	ES 0	ES -6	ES -21	ES -13	ES -21	ES -21	ES -21	ES -21	ES -16	-2	ES -17	ES -16	ES -16	8	10	9			
LD	-8	ES -17	ES -22	ES -19	ES -14	ES -14	ES -2	ES -4	ES -16	ES -22	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	ES -23	-10	-8	-5		

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

NOV 1973		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	13	17	16	12	17	9	ES 6	ES 2	ES 3	ES 12	ES 12	ES 17	ES 12	ES 12	ES 12	ES 21	ES 21	ES 21	ES 21	-6	10	17	13	7	
2	6	14	19	15	18	ES 5	ES 3	ES 3	ES 2	ES 4	ES 6	ES 0	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	8	15	16	16	
3	ES 21	9	14	15	15	7	ES 1	ES 1	ES 6	ES 12	ES 2	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	-12	16	4	14	14	18	15	
4	13	16	15	17	10	9	ES 1	ES 1	ES 2	ES 1	ES 1	ES 9	ES 13	ES 13	ES 6	ES 21	ES 21	ES 21	ES 21	ES 21	8	16	12	14	
5	9	15	14	20	18	17	ES 10	ES 8	ES 8	ES 6	ES 3	ES 3	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	12	19	12	3	
6	7	14	14	15	14	10	ES 3	ES 2	ES 13	ES 22	ES 22	ES 22	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	14	15	20	18	
7	13	14	18	15	14	7	ES 1	ES 0	ES 2	ES 2	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	4	10	12	9	
8	10	8	19	12	18	4	ES 9	ES 2	ES 2	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	14	12	10	13	
9	13	13	15	14	6	ES 2	ES 3	ES 2	ES 10	ES 22	ES 9	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	11	15	15	12	
10	17	16	20	19	12	ES 1	ES 1	ES 1	ES 17	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	-12	ES 21	ES 21	9	12	15	13	
11	17	15	16	16	15	7	ES 3	ES 5	ES 4	ES 2	ES 9	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	-6	-4	4	9	15	14	10	
12	10	13	17	19	12	ES 3	ES 4	ES 1	ES 1	ES 6	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	10	14	14	15	
13	13	14	12	11	9	ES 7	ES 5	ES 3	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	4	4	12	14	
14	10	15	16	17	15	ES 5	ES 9	ES 4	ES 9	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	7	9	19	19	
15	12	11	15	14	8	8	ES 2	ES 7	ES 7	ES 22	ES 22	ES 22	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	9	13	14	12	
16	13	19	17	19	14	11	7	ES 7	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	ES 21	5	9	15	11	
17	20	19	16	19	10	7	5	1	ES 12	ES 21	ES 21	ES 21	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	17	11	7	11	
18	11	13	19	17	18	ES 2	ES 1	ES 8	ES 23	ES 23	ES 23	ES 23	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	12	12	10	8	
19	14	12	14	14	4	ES 0	ES 0	ES 2	ES 8	ES 8	ES 22	ES 22	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	-14	-14	7	18	15	13
20	7	12	19	12	9	ES 0	ES 3	ES 8	ES 1	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	7	12	13	6	
21	8	3	11	11	11	8	ES 2	ES 23	ES 11	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	-14	3	13	11	11	
22	10	15	14	19	15	10	ES 0	ES 3	ES 2	ES 4	ES 8	ES 18	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	11	13	11	13	
23	11	17	18	10	11	4	ES 3	ES 5	ES 10	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	12	12	10	7	
24	8	8	11	15	7	ES 0	ES 3	ES 4	ES 8	ES 23	ES 23	ES 23	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	1	18	13	12	
25	13	12	11	22	6	ES 4	ES 6	ES 9	ES 8	ES 15	ES 3	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	17	17	11	12	
26	11	12	14	13	18	ES 5	ES 4	ES 8	ES 11	ES 15	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	12	18	13	9	
27	12	19	11	20	13	ES 4	ES 3	ES 4	ES 7	ES 22	ES 22	ES 22	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	5	18	6	17	
28	10	14	18	11	10	6	ES 2	ES 3	ES 9	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	16	9	11	8	
29	5	12	16	10	9	5	ES 2	ES 8	ES 14	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	8	14	11	7	
30	14	12	12	3	15	ES 4	ES 2	ES 3	ES 6	ES 4	ES 19	ES 19	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	7	18	11	16	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	11	14	16	15	12	US 4	ES 1	ES 2	ES 8	ES 21	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	ES 22	9	14	12	12	
UD	17	19	19	20	18	10	ES 7	ES 3	ES 1	ES 1	ES 1	ES 9	ES 21	ES 21	ES 21	ES 21	ES 21	-12	-14	-6	16	18	18	17	
LD	6	8	11	10	6	ES 5	ES 5	ES 8	ES 22	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	ES 23	4	9	10	7	

RADIO PROPAGATION QUALITY FIGURES

HIRAI SO

Time in U.T.

Nov. 1973	Whole Day Figure	W W V				W W V H				Conditions				Principal Geomagnetic Storms		
		00	06	12	18	00	06	12	18	00	06	12	18	Start	End	Range
		06	12	18	24	06	12	18	24	06	12	18	24			
1	4-	4U	S	S	3	4	S	S	4	N	N	N	N			
2	3+	4U	S	S	3	4	S	S	3	N	N	N	N			
3	4o	4U	S	S	4	3	S	5U	4	N	N	N	N			
4	4+	5U	S	S	4	4	S	S	4	N	N	N	N			
5	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
6	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
7	4o	S	S	S	4	4	S	S	4	N	N	N	N			
8	4o	S	S	S	4	4	S	S	4	N	N	N	N			
9	4o	S	S	S	4	4	S	S	4	N	N	N	N			
10	4-	S	S	S	3	4	S	S	4	N	N	N	N			
11	4+	S	S	S	4	4	S	5U	4	N	N	N	N			
12	4o	S	S	S	4	4	S	S	4	N	N	N	N			
13	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
14	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
15	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
16	4o	S	S	S	4	4	S	S	4	N	N	N	N			
17	4o	4U	S	S	4	4	4U	S	4	N	N	N	N			
18	4o	S	S	S	4	4	S	S	4	N	N	N	N			
19	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
20	4o	4U	S	S	4	4	S	S	4	N	N	N	N			
21	4o	4U	S	S	4	4	S	S	4	N	N	N	N	03.2	---	75
22	4+	5U	S	5U	4	4	S	S	4	U	U	U	U	---	17.0	
23	4o	4U	S	S	4	4	S	S	4	U	U	U	U			
24	3+	4U	S	S	3U	3	S	S	4	N	N	N	N	10.7	---	81
25	4o	3U	S	S	5	4	S	S	4	U	U	U	U	---	---	
26	4o	5U	S	S	3	4	S	S	4	U	U	U	U	---	19.0	
27	3+	S	S	S	2U	4	S	S	4	U	U	U	U			
28	4o	S	S	S	4	4	S	S	4	U	U	U	U			
29	4o	S	S	S	4	4	S	S	4	U	N	N	N			
30	4o	S	S	S	4U	4	S	S	4	N	N	N	N			

SUDDEN IONOSPHERIC DISTURBANCES

HIRAISO

Time in U.T.

Nov. 1973	S W F				Correspondence						
	Drop-out Intensities (dB)				Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
CO	HA	1)	2)								
3	>15	>30	> <u>32</u>	>40	0012	78	G	3-	0014	×	

NOTES

CO: Colorado (WWV)
 HA: Hawaii (WWVH)
 1): Australia
 2): Teheran

I N U B O

Nov.	S P A									Remarks
1973	Phase Advance (degrees)					Time (U.T.)				
Date	GBR	NAA	NWC	NPG	ND3	Start	End	Maximum		
3	52	59	<u>153</u>	127	94	0014	0504	0028	X	
7			—	52		0326	0448	0340		
18				7		0020	0051	0023		
18				17		0214	0309	0224		
26			16			0436	0527	0449	X	
26			54			0552	0656	0558		
27				10		0201	0242	0206		
27		16	<u>46</u>	8	11	0311	0419	0316		

IONOSPHERIC DATA IN JAPAN FOR NOVEMBER 1973

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