F – 291

IONOSPHERIC DATA IN JAPAN

FOR MARCH 1973

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CONTENTS

RADIO RESEARCH LABORATORIES
MINISTRY OF POSTS AND TELECOMMUNICATIONS
TOKYO, JAPAN

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_bEs — The lowest ordinary wave frequency at which the Es layer begins to become transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.

f-min — The frequency below which no echoes are observed.

M(3000)$F2$ — The maximum usable frequency factor for a path of 3000 km for transmission by $F2$ layer.

M(3000)$F1$ — The maximum usable frequency factor for a path of 3000 km for transmission by $F1$ *layer.*

$h'F2$ — The minimum virtual height, $h'F2$, refers to the highest, most stable stratification observed in the F region and can only be scaled when such stratification is present.

$h'F$ — The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by $h'F$. Thus $h'F$ is identical with the current $h'F2$ when F region stratification is absent, e.g., at night, and with the current $h'F1$ when $F1$ stratification is present.

$h'Es$ — The lowest virtual height of the trace used to give the $foEs$.

$hpF2$ — The virtual height of the $F2$ layer measured on the ordinary wave component at a frequency equal to 0.834 $foF2$.

$ypF2$ — The semi-thickness of the $F2$ layer deduced from a parabolic fit to the

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

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 *Es*.
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 atmospherics.
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
V	Forked trace which may influence the measurement.
W	Measurement influenced or impossible because the echo lies outside the height range recorded.
X	Measurement refers to the extraordinary component.
Y	Intermittent trace.
Z	Third magneto-ionic component present.

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 hight: *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 $f_o E$. 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 $f_o E$. 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 $f_o Es$ and *h'Es*. The slant trace is sometimes observed to start at $f_o E$ 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 MH_2 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} W m^{-2} 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 at Fort Collins, Colorado and Kauai, Hawaii, are carried respectively 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
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	λ/2 vertical	λ/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 upper tenth of values when they are ranked according to magnitude,
LD : lower decile, median of the lower tenth 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 atmospherics.

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 1_o, 1+, 2–, 2_o, 2+ 3–, 3_o, 3+, 4–, 4_o, 4+, 5–, 5_o stands for an average of six-hourly ones of the two circuits. Abbreviated symbols are as follows: 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 : distrubed,

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 ---.

Daily conditions characterized by COSMIC EVENT, FLARE, MAGSTORM, PROTON FLARE of GEOALERT are modified by letters C, F, M, P, respectively.

c. Sudden Ionospheric Disturbances (SID)

(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____.

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 coloumn, distance of circuit along the great circle is shown.

Transmitter					Distance of circuit (km)
Name	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

MAR. 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	33	35	C	34	C	C	C	C	C	68	72	93	95	81	73	71	73	67	67	56	C	37	36	37
2	36	S	C	C	30	C	C	65	76	81	83	75	101	100	93	90	76	76	62	48	40	S	S	43
3	S 43	C	39	38	38	C	C	65	C	71	81	94	86	98	83	76	73	68	53	43	40	37	38	38
4	S	37	34	32	33	33	43	55	58	59	66	76	82	73	66	71	67	62	50	43	45	47	S	44
5	44	43	43	C	C	C	C	C	C	66	85	85	88	85	71	72	67	60	48	46	50	48	S	S
6	S 43	42	41	40	S	S	51	63	71	73	73	90	89	77	C	83	72	80	80	67	46	34	41	S
7	S	C	S	C	S	C	S	76	94	96	103	104	87	86	75	71	74	68	61	54	40	40	S 38	S
8	C	C	C	38	38	34	C	66	75	72	90	93	84	90	88	72	66	65	55	50	45	44	S	43
9	43	C	S	42	S	34	S	S 65	67	77	83	89	88	84	85	77	75	81	56	48	48	47	43	43
10	41	C	C	43	43	36	48	67	66	76	93	85	84	96	79	73	73	81	69	47	50	48	46	47
11	43	S	43	43	43	43	54	63	68	77	81	96	87	86	89	80	77	70	63	57	55	S	50	S
12	S 43	S	C	43	S	S 43	52	R	78	83	83	85	100	94	81	73	73	73	62	57	53	48	50	45
13	S 42	I C 42	43	43	42	S	58	64	78	85	92	87	86	95	94	83	78	70	64	53	48	48	46	I S 46
14	46	S	S	S	43	42	51	67	83	88	83	91	86	79	77	75	72	76	71	59	52	47	I S 46	43
15	43	I S 43	S 43	43	41	38	53	U S 63	70	76	93	83	83	89	83	77	73	77	68	56	53	45	43	S
16	S	C	43	C	S	S 40	53	C	72	75	96	85	89	86	79	76	73	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	93	93	81	75	72	75	63	56	52	52	51	51
18	51	C	C	C	C	C	C	C	C	80	86	93	85	78	85	78	68	73	68	53	50	52	49	48
19	50	52	48	43	35	35	55	66	73	93	90	81	95	91	86	70	66	73	73	73	74	61	57	63
20	F 47	F	43	34	33	33	46	65	63	83	83	96	83	79	90	83	73	72	69	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	63	F 58	F	F 43	F	F	47
22	43	41	37	32	31	30	38	45	44	53	69	66	73	78	77	68	64	67	57	43	43	F	F	F
23	F	F	F	29	30	30	43	50	51	51	56	63	67	65	65	59	56	60	60	50	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	62	60	51	48	45	F	F
26	F 40	F	F 41	42	F 40	31	42	47	52	57	66	68	73	73	71	71	63	61	63	46	43	S 43	S	S
27	S	S 37	F	38	27	S 33	43	57	54	75	70	71	73	71	72	68	62	56	54	50	47	50	47	S 43
28	S	S	S	S 38	35	36	43	60	67	75	90	83	75	C	C	C	C	61	57	55	51	48	I S 46	44
29	42	43	38	35	35	I C 38	46	54	C	C	67	89	83	70	67	67	68	73	75	67	59	44	37	38
30	43	42	F 43	F 43	F 43	F	60	61	63	67	68	83	78	86	75	68	67	66	60	57	60	53	53	48
31	46	45	43	44	36	36	50	59	71	88	84	89	73	84	76	78	73	71	63	60	59	57	53	53
	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	20	12	15	21	19	18	19	22	22	26	27	27	28	27	26	27	27	29	29	27	26	23	19	19
MED	43	42	43	40	36	36	50	63	69	76	83	85	86	85	79	73	72	70	62	53	49	47	46	44
UQ	45	43	43	43	42	38	53	65	75	83	90	92	88	90	85	78	73	73	68	57	53	49	50	48
LQ	42	39	40	35	33	33	43	57	63	68	71	82	80	78	73	71	67	63	57	48	45	44	42	43

The Radio Research Laboratories, Japan

MAR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3											L	450		L	420									
4											A		L 440											
5													L	L 440	L 410									
6												L	L		C									
7																								
8										L				L										
9											L		L	L										
10											L	L												
11												U L 440		L										
12											L	L												
13											L													
14										L	L 430				L									
15											L 480		L											
16											420		470											
17									C	C	C	C	L 450	L										
18									C	L 430	440	L 460	450	L 440										
19										L 430	L	L 450	L		L									
20										410	450	L			L									
21									C	C	C	C	C	C	C	C								
22										430	L 420	L 440	L 440	430	L									
23									380	410	420	410	H 430	H 410	L 420	L 390								
24									C	C	C	C	C	C	C	C								
25									C	C	C	C	C	C	C	C								
26									400		430	440	440	430	L 410	L 400								
27									400	430	440	460	440	430	430									
28										420	430	440	440	C	C	C								
29									C		430	430		430										
30										U L 440	U L 440		L 470	L 450	L 420									
31										L	L 450	490	A	450										
	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	8	13	11	10	9	6	2								
MED									400	430	430	440	440	430	L 420	L 395								
UQ									400	L 430	L 440	455	L 450	L 440	420									
LQ									390	415	430	440	440	430	L 410									

MAR. 1973 FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 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 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								C	C	270	295	305	305	305	300	285	230	S						
2								195	C	295	A	A	310	315	300	285	230	A						
3							C	C	C	285	A	300	305	300	300	270	210	140						
4							S	C	C	A	A	A	305	300	300	280	225	A						
5							C	C	C	285	295	B	310	B	300	280	245	A						
6							S	B	260	290	B	B	A	305	C	285	B	A						
7							S	215	C	A	300	305	325	315	305	285	235	160						
8							C	C	255	295	A	320	330	320	300	290	230	185						
9							S	C	280	300	310	325	325	320	305	285	240	180						
10							S	205	270	295	300	315	325	320	315	290	240	170						
11							S	215	270	295	300	R	A	315	300	290	240	175						
12							S	C	280	295	300	325	325	325	315	290	250	A						
13							S	215	270	295	I A 295	300	320	320	310	290	240	190						
14							S	230	285	300	315	325	325	320	300	290	250	185	S					
15							S	220	290	300	300	320	330	330	310	300	250	185	S					
16							S	C	290	300	315	330	325	325	320	295	250	C	C					
17							C	C	C	C	C	C	330	330	310	290	245	200						
18							C	C	C	305	320	320	320	320	305	290	225	S	S					
19							S	230	280	300	300	A	320	310	295	280	240	200	S					
20							180	235	255	285	300	300	320	310	300	285	235	195	S					
21							C	C	C	C	C	C	C	C	C	C	C	200	S					
22						E	S	205	260	280	300	300	305	300	300	290	245	185	S					
23						E	190	235	265	295	300	300	305	A	C	275	250	185	E					
24						C	C	C	C	C	C	C	C	C	C	C	C	C	C					
25						C	C	C	C	C	C	C	C	C	C	C	C	180	A					
26						E	S	225	265	290	300	300	A	A	300	290	245	A	S					
27						E	170	225	275	290	300	300	A	A	A	275	C	A	A					
28						E	180	240	265	290	295	A	320	C	C	280	C	190	S					
29						C	190	235	C	295	300	325	320	320	305	290	265	200	A					
30						E	170	245	290	305	315	A	A	315	315	300	265	A	A					
31						E	185	250	295	305	315	315	305	325	310	A	265	210	S					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						7	7	17	19	25	22	19	23	23	24	27	25	19	1					
MED						E	180	225	270	295	300	315	320	320	302	290	240	185	E					
UQ						E	188	235	282	300	310	322	325	320	310	290	250	198						
LQ						E	175	215	265	290	300	300	308	310	300	282	235	180						

The Radio Research Laboratories, Japan

MAR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 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

Day \ Hour	00	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 C 23	E C 21	C	E C 26	C	E C 15	E S 17	E C 27	E C 38	G	G	G	G	31	G	G 17	G 20	E S 19	F S 14	E S 14	E C 30	E	E S 15	E S 16
2	22	E S 16	C	21	E C 24	C	E C 16	G	E C 50	G	J X 43	J X 43	G	G	G	G 21	G 20	J X 23	19	19	24	21	J X 25	22
3	J X 23	C	E C 15	20	E	C	C	E C 23	C	34	J X 34	G	G	G	G 20	G 16	G	G	23	E S 15	22	E S 17	E S 16	E S 14
4	E S 17	E S 15	E	E	E	E S 15	E S 15	E C 27	G	35	J X 51	36	G 25	G	G 20	G 25	G	J X 21	20	E S 15	E	E S 16	E S 16	E
5	E S 16	E S 13	E	C	C	C	C	C	C	G	G	E B 39	G	E B 36	G	G	G	23	E S 15	E	E S 14	E S 16	E S 15	E S 14
6	E	E	E	E	E	E	E S 15	E B 24	G	G	40	E B 34	34	G	C	G	F B 24	17	20	E	E S 15	E S 16	E	E S 15
7	E S 16	E C 19	E S 14	E S 13	E	C	E S 13	G 18	E C 41	33	G	G	G	G	G	G	G	20	15	J X 26	21	25	J X 23	31
8	C	C	C	E	22	E S 21	C	E C 23	30	33	J X 39	G	G	G	G	34	G	G	E S 12	E	E S 15	E S 15	E S 15	28
9	J X 23	C	23	E	15	E S 15	E S 16	E C 46	G	G	G	G	G	G	G	G	G 15	G	E	E	E S 15	E S 18	E S 15	E S 15
10	E S 14	C	C	E S 15	E S 17	E S 13	E S 16	G	G	G	G	G	G 24	G	G	G	G	G	26	22	22	E	E S 15	E
11	E S 15	J X 24	E	E	18	E S 15	E S 17	G	G	35	34	G	J X 42	G	G 27	G	G	G	20	25	21	E S 16	E S 15	E S 16
12	E S 15	E	C	21	E	E S 15	G	E C 32	G	32	G	G 31	G 26	G	G	G 15	G 16	16	18	24	E S 15	E	E S 16	E
13	J X 23	C	J X 23	21	15	E	G	G	G	32	34	G	G	G	G 22	G	G	G 15	E S 15	20	E S 15	E S 15	E S 16	E
14	E S 15	E S 13	E	E S 14	E	E S 14	E S 17	G	G	38	33	39	G	G	G	G	G	G	E S 13	E	E S 13	E S 15	E S 15	E S 15
15	E S 15	E S 15	E	E	E	E S 13	G	G	G	33	G	G	G	G	G	G	G 13	G	E S 13	E	E	E S 15	E S 15	E S 15
16	E S 15	E C 19	E S 14	C	E	E S 15	E S 19	E C 25	G	G	G	G	34	G	G	G	G 15	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	19	J X 23	E S 16	E S 16	E S 15	E S 15
18	E S 14	C	C	C	C	C	C	C	C	G	36	G	G	G	G	G	G	21	19	E S 15	E S 15	E S 16	E S 15	E S 16
19	E S 15	E S 13	E S 13	E	E	E	19	G	G	36	39	40	G	G	G	G	G	G	E S 13	E S 15	E	E	E	E S 15
20	E	E	E	E	E	E S 13	G	G	33	32	G	G	G	G 26	G 24	G	G	G	21	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	E S 13	E	E	E	21	21
22	J X 21	E	E	16	E	E	G	29	34	G	G	G	32	G	G	G 20	G	G	E S 14	E	E	E	E	E
23	22	E	23	J X 21	J X 21	E	G	30	33	33	G	36	G	30	E C 40	G	G	G	18	18	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J X 23	17	26	22	E	20	E
26	E S 15	E	E	E	E	E	G	G	33	32	34	38	31	31	G 29	G 24	G 22	20	E S 15	E S 15	E	E S 15	25	E
27	26	18	J X 25	15	E	26	G	G	G	35	34	35	J X 39	38	36	G 20	G 18	22	27	27	E S 16	E S 15	E	E S 15
28	25	E	18	E	J X 20	20	G	30	32	41	50	35	G 28	E C 45	C	G 22	F C 25	G	E S 15	E S 14	E S 15	E S 12	E	E S 15
29	E S 15	E	E	E	E	C	G	G	C	33	35	G	G	G	G	G 17	G 19	G	22	E	E S 15	E S 15	E S 20	J X 31
30	J X 31	J X 25	E	E	E	E	G	G	G	42	G	34	33	G 28	G 25	G 21	G 25	J X 28	J X 25	28	E S 15	E	E	E
31	E S 15	E	E	E	E	E	G	G	34	J X 44	34	37	J X 55	G	J X 53	39	G	G 20	E S 17	J X 23	J X 28	J X 30	20	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	21	21	24	24	21	23	25	23	27	27	27	28	28	26	28	28	29	29	28	27	27	27	27
MED	E S 16	E E 13	E	E	E	E E 13	G	G	G	33	34	G	G	G	G	G	G	G	17	15	E E 15	E S 15	E S 15	E S 15
UQ	23	E E 18	15	17	16	E S 15	E S 16	E C 27	32	35	36	36	32	E G 27	G 23	G 20	G 17	20	20	23	21	E S 16	E S 18	E S 16
LQ	E S 15	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E S 14	E	E S 14	E	E S 15	E

MAR. 1973 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 C 23	E C 21	C	E C 26	C	E C 15	E S 17	E C 27	E C 38	G	G	G	G	25	G	G 17	G 19	E S 19	E S 14	E S 14	E C 30	E	E S 15	E S 16
2	E	E S 16	C	E	E C 24	C	E C 16	G	E C 50	G	32	35	G	G	G	G 20	G 19	19	17	18	E	E	E	E
3	E	C	E C 15	E	E	C	C	E C 23	C	G	32	G	G	G	G 20	G 16	G	G	E	E S 15	E	E S 17	E S 16	E S 14
4	E S 17	E S 15	E	E	E	E S 15	E S 15	E C 27	G	35	42	33	G 25	G	G 19	G 21	G	20	E	E S 15	E	E S 16	E S 16	E
5	E S 16	E S 13	E	C	C	C	C	C	C	G	G	E B 39	G	E B 36	G	G	G	22	E S 15	E	E S 14	E S 16	E S 15	E S 14
6	E	E	E	E	E	E	E S 15	E B 24	G	G	38	E B 34	34	G	C	G	F B 24	17	17	E	E S 15	E S 16	E	E S 15
7	E S 16	E C 19	E S 14	E S 13	E	C	E S 13	G 18	E C 41	31	G	G	G	G	G	G	G	G	E	20	17	E	20	20
8	C	C	C	E	E	E S 21	C	E C 23	G	G	34	G	G	G	G	20	G	G	E S 12	E	E S 15	E S 15	E S 15	E
9	16	C	E	E	15	E S 15	E S 16	E C 46	G	G	G	G	G	G	G	G	G 15	G	E	E	E S 15	E S 18	E S 15	E S 15
10	E S 14	C	C	E S 15	E S 17	E S 13	E S 16	G	G	G	G	G	G 23	G	G	G	G	G	E	E	E	E	E S 15	E
11	E S 15	19	E	E	E	E S 15	E S 17	G	G	G	G	G	37	G	G 25	G	G	G	E	E	E	E S 16	E S 15	E S 16
12	E S 15	E	C	E	E	E S 15	G	E C 32	G	G	G	G 28	G 26	G	G	G 15	G 15	16	14	E	E S 15	E	E S 16	E
13	15	C	E	E	E	E	G	G	G	G	33	G	G	G	G 21	G	G	G 14	E S 15	E	E S 15	E S 15	E S 16	E
14	E S 15	E S 13	E	E S 14	E	E S 14	E S 17	G	G	G	30	27	G	G	G	G	G	G	E S 13	E	E S 13	E S 15	E S 15	E S 15
15	E S 15	E S 15	E	E	E	E S 13	G	G	G	G	G	G	G	G	G	G	G 13	G	E S 13	E	E	E S 15	E S 15	E S 15
16	E S 15	E C 19	E S 14	C	E	E S 15	E S 19	E C 25	G	G	G	G	28	G	G	G	G 15	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	E	E	E S 16	E S 16	E S 15	E S 15
18	E S 14	C	C	C	C	C	C	C	C	G	G	G	G	G	G	G	G	G	G	E S 15	E S 15	E S 16	E S 15	E S 16
19	E S 15	E S 13	E S 13	E	E	E	G	G	G	G	G	34	G	G	G	G	G	G	E S 13	E S 15	E	E	E	E S 15
20	E	E	E	E	E	E S 13	G	G	G	G	G	G	G	G 25	G 24	G	G	G	E	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	E S 13	E	E	E	E	E
22	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G 20	G	G	E S 14	E	E	E	E	E
23	E	E	E	18	15	E	G	G	G	G	G	G	G	30	F C 40	G	G	G	G	E	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	16	E	E	E	E	E
26	E S 15	E	E	E	E	E	G	G	G	G	G	G	32	31	G 28	G 24	G 19	20	E S 15	E S 15	E	E S 15	E	E
27	17	13	18	E	E	E	G	G	G	G	G	G	38	32	30	G 19	G 18	21	25	E	E S 16	E S 15	E	E S 15
28	20	E	14	E	E	17	G	G	G	G	G	35	G 27	F C 45	C	G 22	F C 25	G	E S 15	E S 14	E S 15	E S 12	E	E S 15
29	E S 15	E	E	E	E	C	G	G	C	G	G	G	G	G	G	G 17	G 18	G	14	E	E S 15	E S 15	E S 20	E
30	26	14	E	E	E	E	G	G	G	G	G	34	33	G 27	G 24	G 20	G 24	26	22	20	E S 15	E	E	E
31	E S 15	E	E	E	E	E	G	G	G	40	G	G	47	G	38	27	G	G 15	E S 17	17	20	25	E	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	21	21	24	24	21	23	25	23	27	27	27	28	28	26	28	28	29	29	28	27	27	27	27
MED	E S 15	E E 13	E	E	E	E E 13	G	G	G	G	G	G	G	G	G	G	G	G	E E 13	E	E E 15	E S 15	E S 15	E S 14
UQ	E S 16	E E 15	E E 13	E	E	E S 15	E S 16	E C 23	G	G	E G 30	28	28	F G 25	G 22	G 20	G 16	16	E S 15	15	E S 15	E S 16	E S 15	E S 15
LQ	E S 14	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E	E

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MAR. 1973 | FBES (0.1 MHZ)

Changes of Transmission Particulars 1965–1973

1965 '66 '67 '68 '69 '70 '71 '72 '73

Dec.1 Jul.1

WWV	Carrier Power	9kW → 10kW →
	Upper Sideband Power (kW) or Modulation (%)	3kW* → 75% → 50% →
	Modulation Frequency	440Hz 600Hz → 500Hz 600Hz →
	Station	Greenbelt, Maryland → Fort Collins, Colorado →
WWVH	Carrier Power	2kW → 10kW →
	Modulation	75% → 50% →
	Modulation Frequency	440Hz 600Hz → 500Hz 600Hz →
	Station	Maui, Hawaii → Kauai, Hawaii →

* Power delivered by single upper sideband transmitter.

IONOSPHERIC DATA

MAR. 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 C 23	E C 21	C	E C 26	C	E C 15	E S 17	E C 27	E C 38	18	17	17	20	17	16	12	11	E S 19	E S 14	E S 14	E C 30	E	E S 15	E S 16
2	E S 16	E S 16	C	E C 13	E C 24	C	E C 16	E C 15	12	15	13	17	16	15	16	11	11	E	E S 13	E	E	E S 15	E S 15	E S 15
3	E S 16	C	E C 15	E S 15	E	C	C	E C 23	C	11	11	15	16	17	16	11	12	E	E	E S 15	E S 13	E S 17	E S 16	E S 14
4	E S 17	E S 15	E	E	E	E S 15	E S 15	E C 27	12	17	20	14	12	17	11	11	11	E	E S 15	E S 15	E	E S 16	E S 16	E
5	E S 16	E S 13	E	C	C	C	C	C	C	20	24	39	24	36	23	22	20	15	E S 15	E	E S 14	E S 16	E S 15	E S 14
6	E	E	E	E	E	E	E S 15	24	20	24	29	34	24	26	C	20	24	E	E	E	E S 15	E S 16	E	E S 15
7	E S 16	E C 19	E S 14	E S 13	E	C	E S 13	11	E C 41	18	17	20	16	20	17	12	12	E	E	E	E S 15	E	E S 13	E S 15
8	C	C	C	E	E S 15	E S 21	C	E C 23	16	12	17	17	15	14	12	11	11	12	E S 12	E	E S 15	E S 15	E S 15	E S 15
9	E	C	E S 14	E	E	E S 15	E S 16	E C 46	11	11	15	19	18	17	17	11	11	12	E	E	E S 15	E S 18	E S 15	E S 15
10	E S 14	C	C	E S 15	E S 17	E S 13	E S 16	16	16	16	14	18	16	13	17	15	11	E	E S 14	E S 16	E S 15	E	E S 15	E
11	E S 15	E	E	E	E	E S 15	E S 17	11	11	12	13	20	19	17	16	17	13	E	E	E S 15	E S 15	E S 16	E S 15	E S 16
12	E S 15	E	C	E	E	E S 15	E S 15	E C 32	13	16	18	20	16	16	11	E	E	E	E	E	E S 15	E	E S 16	E
13	E	C	E	E S 14	E	E	E S 15	20	11	11	14	20	11	15	12	18	11	E	E S 15	E S 11	E S 15	E S 15	E S 16	E
14	E S 15	E S 13	E	E S 14	E	E S 14	E S 17	11	15	17	14	18	16	16	11	16	E	11	E S 13	E	E S 13	E S 15	E S 15	E S 15
15	E S 15	E S 15	E	E	E	E S 13	E S 15	15	13	14	16	20	16	18	17	16	E	11	E S 13	E	E	E S 15	E S 15	E S 15
16	E S 15	E C 19	E S 14	C	E	E S 15	E S 19	13	11	14	13	18	16	17	15	12	11	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	19	17	17	17	11	17	E S 13	E S 15	E S 16	E S 16	E S 15	E S 15
18	E S 14	C	C	C	C	C	C	C	C	16	19	19	17	20	19	16	14	F S 15	E S 15	E S 15	E S 15	E S 16	E S 15	E S 16
19	E S 15	E S 13	E S 13	E	E	E	E S 14	12	11	16	17	17	17	17	12	11	11	12	E S 13	E S 15	E	E	E	E S 15
20	E	E	E	E	E	E S 13	E	12	12	12	15	16	17	12	12	12	11	12	E S 13	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	12	E S 13	E	E	E	E S 14	E S 16
22	E	E	E	E	E	E	E S 12	11	11	11	11	12	16	12	15	12	13	11	E S 14	E	E	E	E	E
23	E S 14	E	E	E	E	E	E S 14	E	11	13	16	16	15	16	E C 40	17	12	11	E	E S 14	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	E	E S 15	E S 14	E	E	E
26	E S 15	E	E	E	E	E	E S 14	E	11	17	17	15	18	18	15	15	11	12	E S 15	E S 15	E	E S 15	E S 15	E
27	E S 15	E	E	E	E	E	12	E	E	12	13	20	16	17	16	12	11	E	E	E S 14	E S 16	E S 15	E	E S 15
28	E	E	E	E	E	E	E S 16	15	12	16	18	17	17	E C 45	C	13	E C 25	12	E S 15	E S 14	E S 15	E S 12	E	E S 15
29	E S 15	E	E	E	E	C	13	12	C	16	16	20	16	17	11	11	E	E	E	E	E S 15	E S 15	E S 20	E
30	E S 13	E	E	E	E	E	12	E	15	16	20	20	17	17	15	12	13	E	E	E S 13	E S 15	E	E	E
31	E S 15	E	E	E	E	E	E	13	11	16	17	18	20	19	16	17	16	11	E S 17	E	E	E S 15	E	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	21	21	24	24	21	23	25	23	27	27	27	28	28	26	28	28	29	29	28	27	27	27	27
MED	E S 15	E	E	E	E	E E 13	E S 15	12	12	16	16	18	16	17	16	12	11	E E 11	E S 13	E S 12	E S 15	E S 15	E S 15	E S 15
UQ	E S 15	E S 15	E	E E 13	E	E S 15	E S 16	E C 23	14	16	18	20	18	18	17	16	12	12	E S 14	E S 15	E S 15	E S 16	E S 15	E S 15
LQ	E S 13	E	E	E	E	E	E S 13	11	11	12	14	17	16	16	12	11	11	E	E	E	E	E	E	E

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MAR. 1973 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1973 | M(3000)F2 (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 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	290	285	C	295	C	C	C	C	C	360	320	335	330	330	335	350	340	345	335	325	C	310	305	295
2	290	S	C	C	265	C	C	370	360	340	335	325	325	330	330	335	340	340	340	315	310	S	S	280
3	S 285	C	290	285	280	C	C	340	C	340	340	340	350	345	350	330	340	355	335	310	310	295	290	290
4	S	300	300	285	290	280	330	335	360	345	340	335	345	345	350	350	350	340	340	300	295	310	S	310
5	295	300	300	C	C	C	C	C	C	350	355	330	340	345	340	345	360	335	335	305	305	315	S	S
6	S 295	285	295	285	S	S	345	365	355	340	330	310	335	340	C	335	335	325	325	345	325	300	290	S
7	S	C	S	C	S	C	S	335	320	315	340	330	320	345	355	340	355	345	320	325	300	295	S 315	S
8	C	C	C	305	310	325	C	365	355	340	335	325	320	335	365	345	350	330	340	295	310	295	S	300
9	280	C	S	295	S	305	S	S 380	360	345	335	335	330	335	325	350	325	345	330	300	295	305	290	300
10	275	C	C	285	300	305	340	360	350	340	345	340	310	345	335	320	335	335	360	295	290	305	305	300
11	300	S	290	295	295	300	335	360	350	350	320	355	335	335	335	340	340	345	330	300	310	S	300	S
12	S 280	S	C	285	S	S 300	340	R	345	325	350	330	340	330	340	335	330	340	310	310	315	295	300	310
13	S 295	I C 290	290	290	285	S	315	345	345	310	345	335	325	325	340	335	345	350	340	325	315	290	305	I S 290
14	295	S	S	S	300	290	340	345	335	340	335	340	335	340	365	320	335	340	340	325	325	305	I S 300	295
15	295	I S 280	S 300	300	315	315	335	U S 345	350	340	335	325	320	335	350	325	355	340	355	315	320	305	285	S
16	S	C	280	C	S	S 310	340	C	345	335	355	340	315	325	320	345	330	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	315	330	335	335	330	330	335	305	290	290	285	290
18	275	C	C	C	C	C	C	C	C	330	330	330	325	340	330	335	335	330	330	310	285	280	285	280
19	275	290	315	305	285	285	320	330	305	315	335	300	315	300	350	345	325	320	310	275	295	280	280	300
20	F 270	F	270	280	285	280	310	325	310	360	325	355	335	330	335	335	330	335	335	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	340	F 330	F	F 285	F	F	275
22	280	295	290	270	270	285	320	320	320	280	335	325	330	345	345	345	345	345	320	300	300	F	F	F
23	F	F	F	295	300	305	350	320	330	315	310	310	330	315	355	355	340	310	335	290	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	330	325	315	295	280	F	F
26	F 295	F	F 295	290	F 305	325	320	315	330	290	310	320	330	340	340	350	335	330	350	310	290	S 300	S	S
27	S	S 290	F	315	315	S 295	350	345	335	325	325	325	330	325	325	330	350	330	330	295	300	290	275	285
28	S	S	S	S 310	315	300	325	325	315	320	310	325	335	C	C	C	C	345	325	310	285	300	I S 285	280
29	260	295	295	285	295	I C 310	350	340	C	C	320	325	350	335	335	330	340	330	335	330	320	325	290	270
30	285	280	F 275	F 300	F 300	F	350	350	315	350	325	325	335	335	345	355	345	340	335	305	300	280	285	285
31	280	275	295	330	335	330	340	330	325	335	320	335	330	330	325	335	340	330	315	305	300	295	290	300
	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	20	12	15	21	19	18	19	22	22	26	27	27	28	27	26	27	27	29	29	27	26	23	19	19
MED	285	290	295	295	300	302	340	342	340	340	335	330	330	335	340	335	340	340	335	310	300	295	290	290
UQ	295	295	298	300	308	310	342	360	350	345	340	335	335	340	350	345	345	345	340	315	310	305	300	300
LQ	278	282	290	285	285	290	322	330	320	320	322	325	322	330	335	335	335	330	325	300	295	290	285	282

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MAR. 1973 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 1973 | 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																								
2																								
3											L	370		L	400									
4											A		L 295											
5													L	L 385	L 410									
6												L	L		C									
7																								
8										L				L										
9											L		L	L										
10											L	L												
11												U L 375		L										
12											L	L												
13											L													
14										L	L 415				L									
15											L 360		L											
16											380		380											
17									C	C	C	C	L 380	L										
18									C	L 380	385	L 390	380	L 380										
19										L 370	L	L 375	L		L									
20										390	370	L			L									
21									C	C	C	C	C	C	C	C								
22										350	L 385	L 380	L 370	380	L									
23									370	365	380	415	H 385	H 395	C	L 385								
24									C	C	C	C	C	C	C	C								
25									C	C	C	C	C	C	C	C								
26									350		375	370	370	375	L 365	L 375								
27									375	350	375	350	375	360	345									
28										385	375	370	375	C	C	C								
29									C		390	395		395										
30										U L 385	U L 385		L 380	L 370	L 380									
31										L	L 380	350	A	375										
	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	8	13	11	10	9	5	2								
MED									370	375	380	375	378	380	L 380	L 380								
UQ									372	385	385	L 385	380	385	L 400									
LQ									360	358	375	370	370	375	L 365									

The Radio Research Laboratories, Japan

MAR. 1973 | M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1973 | 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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3											250	275		250	245									
4											265		250											
5													255	265	245									
6												265	260		C									
7																								
8										225				255										
9											245		250	250										
10											250	245												
11												250		250										
12											245	270												
13											260													
14										240	250				245									
15											275		265 L											
16											260		290											
17									C	C	C	C	260	265										
18									C	255	275	265	265	260										
19										260	260	280	270		260									
20										245	280	245			260									
21									C	C	C	C	C	C	C	C								
22										390	290	280	280	260	255									
23									315	350	320	300	280	285	270	255								
24									C	C	C	C	C	C	C	C								
25									C	C	C	C	C	C	C	C								
26									300		295	295	275	270	265	250								
27									280	300	275	295	280	275	290									
28										270	275	265	270	280	C	C								
29									C		290	275		270										
30										250	285		275	265	255									
31										245	250	275	270	270										
	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	11	20	15	16	15	10	2								
MED									300	255	270	275	270	265	258	252								
UQ									308	285	282	280	278	270	265									
LQ									290	245	250	265	260	258	245									

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MAR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1973 | 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	E C 320	C 300	C	C	C	225	225	215	220	210	210	200	200	225	225	245	235	225	220	220	C 235	245	265	270
2	300	270	C	290	I C 340	C	225	210	C	220	220	220	215	225	220	225	225	225	205	245	240	300	320	285
3	285	C	295	300	300	C	C	245	C	215	215	200	205	220	210	215	205	220	205	245	230	270	290	260
4	290	260	250	300	275	295	240	240	215	215	A	180	200	210	205	215	235	220	215	255	265	250	250	250
5	250	260	260	C	C	C	C	C	C	205	200	240	215	225	210	215	230	215	210	240	255	245	270	280
6	285	290	275	300	275	245	220	225	225	220	240	215	220	230	C	250	245	250	225	200	220	265	300	310
7	305	C 315	270	280	220	C	225	250	C	215	195	195	200	235	230	200	245	230	220	240	250	275	285	305
8	C	C	C	240	260	290	C	230	225	205	255	225	220	200	225	220	220	225	210	235	245	260	285	280
9	300	C	260	250	225	250	225	C	220	200	200	200	220	225	250	230	210	225	210	240	250	260	250	250
10	300	C	C	270	250	235	225	220	220	210	225	220	200	240	220	210	240	235	210	230	265	245	265	260
11	255	300	265	265	255	255	220	215	225	210	200	205	225	220	205	230	240	225	215	245	240	250	250	245
12	275	290	C	270	250	250	210	210	235	210	225	200	205	205	200	225	240	225	215	235	245	250	250	245
13	265	C	260	280	275	260	230	225	225	210	215	200	225	200	250	220	240	220	220	220	245	275	270	295
14	260	265	270	260	250	250	210	225	215	220	200	200	200	225	225	225	245	240	220	220	230	245	250	270
15	285	295	275	260	230	245	220	220	225	200	205	220	200	235	240	225	245	245	215	225	230	245	280	290
16	280	300	300	C	250	235	215	215	220	215	225	205	200	205	230	245	235	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	205	205	230	215	240	245	215	230	250	275	270	265
18	280	C	C	C	C	C	C	C	C	205	205	200	210	200	210	220	240	245	215	235	265	295	295	300
19	300	275	240	225	250	300	245	225	240	225	250	210	195	200	225	240	250	245	245	300	270	245	275	260
20	285	305	300	250	285	295	275	250	220	210	220	210	220	210	215	230	230	245	215	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	230	225	250	260	250	280	300
22	305	275	270	295	305	295	260	255	250	210	200	215	210	205	225	225	215	245	230	220	250	265	310	375
23	305	265	235	275	295	260	220	250	225	215	230	200	H 200	H 200	C	235	250	260	240	250	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	240	220	230	255	270	300	295
26	275	275	280	260	230	220	250	250	240	230	220	240	210	210	215	230	230	245	225	215	250	260	255	275
27	250	280	290	245	240	270	240	245	225	230	220	200	225	205	210	225	245	240	245	250	285	285	295	300
28	325	280	270	245	250	265	240	250	225	215	240	240	215	C	C	220	250	245	230	230	280	260	265	300
29	300	260	260	270	260	I C 250	240	225	C	230	205	205	200	200	200	230	260	255	230	220	220	220	300	300
30	300	300	300	260	225	250	225	220	210	240	200	205	205	200	220	220	245	245	230	245	250	265	275	280
31	300	300	295	240	215	245	225	230	240	A	225	205	A	205	250	225	225	240	230	245	255	275	265	260
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	21	21	23	24	22	23	24	21	26	26	27	27	27	25	28	28	29	29	28	27	27	27	27
MED	286	280	270	265	250	250	225	225	225	215	218	205	205	210	220	225	240	240	220	235	250	260	275	280
UQ	300	300	290	280	275	270	240	248	225	220	225	218	218	225	230	230	245	245	230	245	258	272	292	300
LQ	275	270	260	250	235	245	220	220	220	210	200	200	200	202	210	220	230	225	215	222	240	248	265	260

MAR. 1973 | H'F (KM)

IONOSPHERIC DATA

MAR. 1973 | H'ES (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 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	C	C	C	C	C	C	S	C	C	G	G	G	G	100	G	100	100	S	S	S	C	E	S	S
2	100	S	C	100	C	C	C	G	C	G	110	110	G	G	G	105	100	100	100	100	115	110	105	100
3	105	C	C	100	E	C	C	C	C	125	110	G	G	G	105	100	G	G	100	S	100	S	S	S
4	S	S	E	E	E	S	S	C	G	105	100	100	100	G	100	100	G	100	100	S	E	S	S	E
5	S	S	E	C	C	C	C	C	C	G	G	B	G	B	G	G	G	105	S	E	S	S	S	S
6	E	E	E	E	E	E	S	B	G	G	110	B	105	G	C	G	B	100	100	E	S	S	E	S
7	S	C	S	S	E	C	S	110	C	110	G	G	G	G	G	G	G	120	110	110	105	110	105	105
8	C	C	C	E	105	S	C	C	145	125	105	G	G	G	G	100	G	G	S	E	S	S	S	105
9	105	C	100	E	100	S	S	C	G	G	G	G	G	G	G	G	100	G	E	E	S	S	S	S
10	S	C	C	S	S	S	S	G	G	G	G	G	100	G	G	G	G	G	100	100	100	E	S	E
11	S	100	E	E	100	S	S	G	G	120	115	G	105	G	100	G	G	G	100	100	100	S	S	S
12	S	E	C	100	E	S	G	C	G	115	G	105	105	G	G	100	100	100	100	100	S	E	S	E
13	105	C	105	100	105	E	G	G	G	115	110	G	G	G	100	G	G	100	S	100	S	S	S	E
14	S	S	E	S	E	S	S	G	G	115	105	105	G	G	G	G	G	G	S	E	S	S	S	S
15	S	S	E	E	E	S	G	G	G	120	G	G	G	G	G	G	100	G	S	E	E	S	S	S
16	S	C	S	C	E	S	S	C	G	G	G	G	105	G	G	G	100	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	105	105	S	S	S	S
18	S	C	C	C	C	C	C	C	C	G	120	G	G	G	G	G	G	125	115	S	S	S	S	S
19	S	S	S	E	E	E	150	G	G	120	115	110	G	G	G	G	G	G	S	S	E	E	E	S
20	E	E	E	E	E	S	G	G	115	120	G	G	G	105	105	G	G	G	100	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	S	E	E	E	105	110
22	105	E	E	110	E	E	G	125	120	G	G	G	115	G	G	105	G	G	S	E	E	E	E	E
23	110	E	105	105	105	E	G	125	125	125	G	110	G	105	C	G	G	G	120	115	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	100	100	100	100	E	115	E
26	S	E	E	E	E	E	G	G	135	135	120	110	110	105	110	105	105	110	S	S	E	S	105	E
27	105	105	100	100	E	105	G	G	G	115	115	115	105	100	100	100	100	100	100	100	S	S	E	S
28	105	E	110	E	105	105	G	140	120	115	110	110	110	C	C	100	C	G	S	S	S	S	E	S
29	S	E	E	E	E	C	G	G	C	120	120	G	G	G	G	100	100	G	100	E	S	S	S	110
30	105	105	E	E	E	E	G	G	G	120	G	110	110	105	105	100	100	100	100	100	S	E	E	E
31	S	E	E	E	E	E	G	G	140	120	120	115	110	G	115	115	G	105	S	100	100	115	110	S
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	3	5	7	6	2	1	4	7	18	15	11	12	6	9	13	10	13	16	12	7	3	6	5
MED	105	105	105	100	105	105	150	125	125	120	110	110	105	105	105	100	100	100	100	100	100	110	105	105
UQ	105	105	105	102	105			132	138	120	118	110	110	105	105	105	100	105	102	102	102	112	110	110
LQ	105	102	100	100	100			118	120	115	110	108	105	100	100	100	100	100	100	100	100	110	105	105

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MAR. 1973 | H'ES (KM)

IONOSPHERIC DATA

MAR. 1973 | 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														L 1		L 1	L 1							
2	F 1			F 1							L 1	L 1				L 1	L 1	L 1	F 1	F 2	F 1	F 1	F 2	F 1
3	F 2			F 1						C 1	L 2				L 1	L 1			F 1		F 1			
4										L 2	L 2	L 1	L 1		L 1	L 1		L 1	F 1					
5																		L 1						
6											C 1		L 1					L 1	F 1					
7								L 1		L 1								C 1	F 1	F 3	F 2	F 2	F 3	F 2
8					F 1				H 1	C 1	L 2					L 1								F 2
9	F 2		F 1		F 1												L 1							
10													L 1						F 1	F 1	F 1			
11		F 2			F 1					C 1	C 1		L 1		L 1				F 1	F 1	F 1			
12				F 1						C 1		L 1	L 1			L 1	L 1	L 1	F 1	F 1				
13	F 2		F 1	F 1	F 2					C 1	L 1				L 1			L 1		F 1				
14										C 1	L 1	L 1												
15										C 1							L 1							
16													L 1				L 1							
17																			F 1	F 1				
18											C 1							C 1	C 1					
19							H 1			C 1	C 1	L 1												
20									C 1	C 1				L 1	L 1				L 1					
21																						F 1	F 1	
22	F 1			F 1				C 1	C 1				C 1			L 1								
23	F 1		F 1	F 2	F 2			C 1	C 1	C 1		C 1		L 1					C 1	F 1				
24																								
25																		L 1	L 1	F 1	F 1	F 1		
26									H 1	H 1	C 1	C 1	L 1	L 1	L 1	L 1	L 1	L 1				F 1		
27	F 2	F 1	F 3	F 1		L 1				C 1	C 1	C 1	L 3	L 2	L 1	L 1	L 1	L 1	L 1	F 1				
28	F 2		F 1		F 1	L 2		H 1	C 1	C 1	C 1	L 1	L 1			L 1								
29										C 1	C 1					L 1	L 1		L 1				F 2	
30	F 4	F 2								C 1		L 1	L 1	L 1	L 1	L 1	L 1	L 3	L 3	F 1				
31									H 1	C 2	C 1	C 1	C 2		C 2	CL 12		L 1		F 2	F 2	F 3	F 2	
	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																								

MAR. 1973 | TYPES OF ES

IONOSPHERIC DATA

MAR. 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 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	32	35	F 33	34	35	33	39	68	76	82	78	86	96	105	87	76	76	79	67	55	45	40	37	37
2	37	39	40	37	36	37	49	60	77	83	99	102	95	111	96	101	85	72	61	46	43	42	42	45
3	43	44	39	38	38	39	52	65	96	96	77	92	106	102	98	80	77	67	55	45	48	43	41	42
4	39	40	36	36	36	36	47	63	69	64	69	76	102	92	72	74	73	75	58	44	46	48	47	45
5	45	46	F	F 46	40	36	45	61	80	78	76	96	90	100	81	72	74	65	51	46	48	50	46	43
6	I S 42	42	43	42	I R 42	45	55	71	74	71	82	94	92	100	88	94	I C 87	77	83	74	43	41	41	44
7	43	42	44	41	40	37	38	68	105	115	100	111	104	101	94	75	76	76	62	49	46	44	43	43
8	45	42	I R 42	42	40	35	50	70	81	77	84	107	114	103	94	84	70	71	60	47	48	48	45	46
9	46	43	44	42	41	34	45	76	89	74	77	92	99	99	90	87	75	72	73	64	44	47	42	42
10	40	39	40	42	41	35	48	64	78	86	93	103	88	86	91	86	74	86	79	49	47	51	48	48
11	48	46	48	49	48	46	61	71	76	80	76	99	107	101	98	85	80	81	69	56	59	R 59	47	46
12	46	45	44	46	46	42	58	65	79	94	102	95	112	104	91	84	78	75	73	59	54	49	49	51
13	42	41	41	41	37	40	55	73	77	84	91	96	98	106	97	96	80	75	64	51	46	47	49	48
14	49	47	48	50	46	46	55	71	88	92	86	86	105	91	82	71	84	82	84	65	53	46	46	46
15	46	45	46	48	46	38	54	75	76	76	82	102	93	90	92	89	81	80	79	59	51	I R 48	47	46
16	47	46	45	44	44	42	52	74	68	65	86	108	92	96	89	88	84	75	74	54	49	48	48	48
17	47	51	52	44	36	36	55	76	72	75	92	104	99	95	87	81	77	82	75	55	51	48	50	51
18	49	51	49	48	46	42	59	68	72	80	84	92	102	92	90	86	79	78	76	64	50	48	51	49
19	47	52	55	46	34	35	52	70	78	92	102	90	94	98	84	79	71	82	78	75	80	79	64	64
20	55	55	54	52	F	32	56	88	95	74	79	99	94	89	86	92	87	76	75	60	56	56	51	50
21	49	55	32	30	27	28	45	58	68	84	76	89	82	96	88	84	74	65	60	56	54	59	52	52
22	50	48	42	36	35	38	47	60	65	59	82	102	97	97	91	78	73	72	64	59	47	44	F 42	41
23	42	44	45	32	30	30	45	62	63	72	70	82	81	81	75	68	65	68	79	68	50	47	I A 45	46
24	46	45	48	37	29	32	51	59	60	68	82	89	102	102	89	70	78	88	76	56	44	43	42	42
25	41	45	39	42	30	26	48	56	69	73	95	100	I R 90	76	73	76	85	76	68	51	44	44	43	42
26	42	40	38	39	32	26	46	62	78	70	89	92	99	90	82	82	74	69	68	59	43	47	48	F
27	45	44	43	F	F	40	52	61	68	68	86	86	87	85	79	79	68	63	56	52	46	48	46	F 42
28	F 40	38	36	36	I R 32	F 35	50	59	74	92	74	88	84	89	85	72	68	74	70	54	49	49	48	46
29	46	F 46	46	36	36	37	56	61	66	74	66	92	88	86	71	65	76	82	94	82	51	38	36	37
30	39	42	41	44	42	44	66	72	66	68	74	82	94	88	89	72	72	75	69	63	57	58	55	51
31	51	51	48	55	35	35	54	59	72	96	97	87	95	84	94	83	83	82	71	63	59	55	55	54
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	30	30	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
MED	45	45	44	42	37	36	52	65	76	77	82	92	95	96	89	81	76	75	70	56	48	48	47	46
UQ	47	46	48	46	42	40	55	71	78	85	92	101	102	101	92	86	80	80	76	63	52	50	49	49
LQ	42	42	40	37	35	34	47	61	68	72	76	88	91	89	83	74	74	72	63	51	46	44	42	42

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MAR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1973 | 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 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									L	L	U L 450	L 460	L 460	L 460	L 430	L								
2									L	L	L	L 460	L	L	L	350								
3										L	L	L	L	L	L	L	L							
4									L 370	L 410	L 450	H 510	I A 460	L 460	L	L	L							
5									L	L 430	H 510	460	480	470	L 440	L	L							
6									L	L	L 450	L 460	L	L	U L 480	L 450								
7									L	L	L 460	L 480	L	500	440	L 400	L							
8									L	L	H 450	430	480	460	L 430	L								
9									L	L	L 460	490	480	440	L	L	L							
10									L	L	H 450	L	L	L	L	L	L							
11									L	L	L 480	L	L 460	L	L 450	L	L							
12									L	L	U L 470	L 480	480	L 470	L 450	L								
13										U L 440	460	U L 480	490	U L 490	L	L	L							
14									L	L	L 450	L 550	L	L	L	L	L							
15									L	L	L 460	L	L	500	L 460	L	L							
16									L	L	L 450	H 460	U L 480	450	H 480	L	L							
17									L	L	L	L	L 480	L 470	L 460	L	L							
18									L	U L 460	L 460	L	470	H 480	L 460	L	L							
19									L	L	L 460	L 480	L	L 470	L	L	L	L						
20									L	L	440	L	L 470	L 460	L	L	L							
21								L	L 410	L 430	L 460	460	480	470	450	L	L							
22								L	L	L	460	H 470	H 470	460	L 430	L	L							
23								L	L	L	460	450	460	440	430	L	L	L						
24									L	L	L 460	460	470	450	L	L	L	L						
25									U L 410	420	450	H 470	460	430	U L 420	U L 400	L							
26										L 440	460	480	470	460	430	L	L							
27								L	U L 360	430	460	460	460	H 460	450	L 420	L							
28								L	U L 410	440	470	480	I A 460	470	450	L	L							
29									L	L 450	L 460	470	470	470	L 460	L	L	L						
30									L	430	I A 470	I A 480	490	L	A	A	L							
31									L	L	A	480	470	L 480	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									5	11	27	24	23	24	19	5								
MED									U L 410	L 430	L 460	470	470	465	L 450	L 400								
UQ									U L 410	L 440	L 460	480	480	470	L 460	L 420								
LQ									U L 370	430	450	460	460	460	430	L 400								

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MAR. 1973 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1973 | FOE (0.01 MHZ) | 135 E Mean Time (G. M. T. + 9 h)

Station AKITA | Lat. 39 43.5 N. Long. 140 08.2 E | Sweep 1 MHz to 20 MHz in 20 sec in 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	205	260	290	310	325	335	330	315	300	A	A						
2							S	225	270	290	310	I A 320	I A 325	I A 330	I A 315	290	255	A						
3							S	200	255	300	315	320	325	320	305	285	245	B						
4							S	210	255	290	305	325	I A 335	335	320	300	260	B						
5							S	220	270	295	315	330	R 335	I B 330	325	305	270	200						
6							S	A	B	B	A	A	A	A	B	A	I C 260	I A 210	S					
7							S	225	A	A	315	I A 325	335	335	325	310	270	A	S					
8							S	I A 235	285	305	315	330	340	340	330	315	270	205	S					
9							S	235	I A 280	300	315	335	345	345	335	310	265	215	S					
10							S	230	275	305	320	335	I A 345	345	330	310	275	215	S					
11							B	240	275	305	320	I A 330	345	345	335	I A 310	275	215	S					
12							B	240	285	305	320	335	350	345	335	315	275	220	S					
13							B	245	285	305	I A 325	340	350	345	335	310	270	215	S					
14							S	I A 230	280	I A 300	320	I A 335	350	345	335	310	270	230	S					
15							B	255	290	310	330	345	I A 350	350	340	320	I A 280	A	S					
16							B	245	295	310	330	350	360	I A 350	I A 335	305	I A 265	210	S					
17							S	235	285	310	I A 330	350	360	345	325	305	275	225	S					
18							B	245	285	310	I A 325	340	I A 350	345	330	A	A	A	S					
19							S	220	285	I A 310	I A 330	345	350	350	330	315	270	235	S					
20							A	240	285	305	325	I A 335	I A 345	345	325	305	265	215	S					
21							A	A	270	305	A	A	350	340	315	295	270	A	B					
22							A	215	265	300	315	325	A	A	330	A	A	A	S					
23							185	260	290	I A 305	I A 320	335	345	I A 330	310	295	I A 265	I A 220	S					
24							B	255	290	310	I A 335	340	350	340	325	305	280	R 230	B					
25							B	240	280	A	A	A	A	A	A	295	255	A	B					
26							185	240	280	305	A	A	A	A	325	305	265	B	B					
27							B	240	280	A	A	A	A	A	315	295	260	A	S					
28							B	250	285	A	A	A	A	A	320	300	270	A	A					
29							B	245	285	315	325	A	A	A	A	305	280	235	S					
30							A	250	290	310	325	A	A	A	A	A	A	A	A					
31							A	250	290	310	325	I A 335	I A 350	350	I A 340	320	285	240	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	29	29	26	25	23	23	23	27	27	27	17						
MED							185	240	285	305	320	335	345	345	325	305	270	215						
UQ								245	285	310	325	340	350	345	335	310	275	230						
LQ								225	275	300	315	328	338	335	320	300	265	215						

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MAR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1973 | FOES (0.1 MHZ) | 135 E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39 43.5 N. Long. 140 08.2 E Sweep 1 MHz to 20 MHz in 20 sec in 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	E S 14	E S 14	E S 14	M 21	M 20	E S 14	E S 14	G	G	G	G	G	36	36	34	J X 40	J X 42	J X 30	J X 26	J X 31	J X 19	J X 27	E S 14	E S 14
2	J X 23	J X 29	E S 14	E S 14	E S 14	E S 14	E S 14	G	29	G	G	J X 39	J X 37	35	32	G	G	J X 29	E S 14	M 20	J X 18	J X 18	J X 29	E S 14
3	J X 29	J X 17	J X 28	J X 19	J X 17	E S 14	E S 14	G	G	32	32	G	G	G	G	G	G	E B 18	E S 14	E S 14	J X 26	J X 35	J X 29	J X 27
4	J X 27	E S 14	J X 37	E S 14	E S 14	E S 14	E S 14	G	G	G	G	G	J X 67	J G 27	J G 29	G	G	E B 22	E S 14	E S 14	E S 14	E S 14	J X 19	E S 14
5	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	G	G	33	G	G	G	E B 35	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
6	E S 14	E S 13	E S 14	E S 13	E S 14	E S 14	E S 14	27	E B 31	32	36	39	J X 49	J X 38	E B 34	33	C	J X 24	J X 18	J X 27	J X 54	J X 18	J X 20	E S 14
7	E S 14	J X 21	E S 14	E S 14	E S 14	E S 14	E S 14	28	J X 38	J X 38	J X 32	J X 48	J G 29	G	G	G	28	J X 32	J X 24	J X 20	E S 14	J X 20	J X 30	M 20
8	J X 28	J X 30	J X 39	J X 31	E S 14	E S 14	E S 14	26	G	G	32	J X 34	J X 41	J G 34	J X 38	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
9	E S 14	E S 14	J X 28	J X 20	J X 20	E S 14	E S 14	26	J X 36	G	G	G 30	J X 36	G	G	G	29	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
10	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 17	G	G	G	33	G	J X 45	J G 29	J G 26	J G 25	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
11	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 19	J X 27	G	36	37	J X 45	G	G	G	J X 45	G	G	E S 14	E S 14	J X 27	E S 14	E S 14	E S 14
12	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 19	G	G	32	G	G 30	G 29	G	G 25	G	G 20	J G 20	J X 20	J X 21	J X 17	E S 14	E S 14	E S 14
13	E S 14	E S 14	J X 24	M 20	E S 14	E S 14	E B 18	G	G	36	35	G	G	G	G	G	G	G	J X 19	E S 14	E S 14	E S 14	E S 14	E S 14
14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 16	27	31	38	J X 44	35	J G 31	J G 28	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 19	G	G	32	32	42	J X 36	38	36	G	30	J X 29	J X 27	J X 40	J X 31	J X 30	E S 14	E S 14
16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 19	G	G	G	G	G	G	37	34	32	30	18	J X 20	J X 20	J X 44	J X 29	J X 20	E S 14
17	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	28	34	39	39	G	G	G	G	J G 30	J X 29	J X 26	E S 14	J X 40	J X 20	E S 14	E S 14	E S 14
18	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 20	G	G	33	36	G 33	J X 40	G 30	J G 32	34	30	24	J X 24	J X 22	J X 21	J X 29	J X 25	E S 14
19	E S 14	E S 14	E S 14	E S 14	E	E S 14	23	G	32	34	39	G 34	G	G	G	G	G	G	20	E S 14	E S 14	E S 14	E S 14	E S 14
20	E S 14	J X 21	J X 18	M 20	E S 14	E S 14	21	28	32	33	40	36	R 37	G	G	G	G	G	E S 15	E S 14	E S 14	E S 14	E S 14	E S 14
21	E S 14	E S 14	E S 14	E S 14	M 20	E S 14	22	28	32	35	35	J X 41	G	G	G	G	G	25	E B 19	E S 14	J X 19	E S 14	J X 19	J X 19
22	J X 29	J X 19	J X 30	E S 14	E S 14	E S 14	21	28	32	35	39	38	35	J X 40	J X 42	35	32	23	E S 14	E S 14	E S 14	E S 14	E S 14	J X 19
23	J X 20	J X 29	J X 20	J X 19	E S 14	E S 14	G	29	33	J X 46	38	G	G	J X 39	J X 35	G	29	24	E S 14	E S 14	E S 13	J X 44	J X 46	E S 14
24	J X 20	J X 19	M 20	E S 13	M 18	E S 14	E B 21	31	32	43	40	G	G	G	G	G	G	G	E B 18	E S 14	E B 24	E S 14	E S 14	E S 14
25	J X 24	J X 25	M 20	M 20	E S 14	E S 14	E B 19	G	31	J X 42	38	38	36	44	R 33	G	G	J X 27	E B 18	E S 14	E S 14	E S 14	E S 14	E S 14
26	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	30	32	40	39	36	34	34	G 27	G	E B 24	E B 18	E S 14	E S 14	E S 14	E S 14	E S 14
27	E S 14	J X 19	J X 29	J X 37	J X 20	E S 14	E B 20	G	32	37	35	38	J X 40	34	G 25	G	G 26	J X 24	E S 15	E S 14	E B 20	E B 19	J X 26	J X 30
28	J X 30	J X 46	J X 24	J X 23	J X 36	E S 14	E B 21	26	G	J X 47	J X 64	J X 50	J X 48	J X 46	G	G	J X 30	J X 27	J X 24	J X 24	E S 14	E B 18	E B 20	E S 14
29	E S 14	E S 14	E S 14	E S 14	M 20	E S 14	E B 20	G	G	33	37	38	35	35	38	G	G 23	G	J X 22	J X 24	J X 19	E S 14	E S 14	E S 14
30	E S 14	J X 29	J X 47	J X 30	J X 24	E S 14	J X 20	G	32	37	J X 48	J X 80	J X 62	J X 66	J X 71	J X 67	J X 39	J X 30	J X 36	J X 26	E S 14	E S 14	E S 14	E S 14
31	E S 14	E S 14	E S 14	E S 14	M 20	E S 14	23	31	39	45	J X 47	J X 49	38	G	J X 60	33	G	G	J X 20	M 20	M 20	J X 33	J X 37	J X 34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31
MED	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E E 19	G	30	33	36	35	36	G 30	G 26	G	G	U 20	E E 18	E S 14	E S 14	E S 14	E S 14	E S 14
UQ	J X 20	J X 20	J X 24	20	19	E S 14	E B 20	28	32	38	39	39	J X 39	36	34	31	29	J X 26	J X 20	J X 22	J X 20	J X 20	J X 20	E S 14
LQ	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	32	32	G	G	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAR. 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 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	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	G	G	G	G	G	36	36	34	22	31	25	22	21	17	E	E S 14	E S 14
2	E	E	E S 14	E S 14	E S 14	E S 14	E S 14	G	29	G	G	34	34	34	32	G	G	21	E S 14	E	E	E	22	E S 14
3	E	E	25	E	E	E S 14	E S 14	G	G	31	G	G	G	G	G	G	G	E B 18	E S 14	E S 14	21	25	23	E
4	21	E S 14	20	E S 14	E S 14	E S 14	E S 14	G	G	G	G	G	62	G 24	G 24	G	G	E B 22	E S 14	E S 14	E S 14	E S 14	E	E S 14
5	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	G	G	33	G	G	G	E B 35	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
6	E S 14	E S 13	E S 14	E S 13	E S 14	E S 14	E S 14	27	E B 31	32	36	38	41	38	E B 34	32	C	23	E	18	21	E	E	E S 14
7	E S 14	E	E S 14	E S 14	E S 14	E S 14	E S 14	24	31	33	29	36	G 29	G	G	G	G	32	21	E	E S 14	E	20	E
8	20	E	32	20	E S 14	E S 14	E S 14	25	G	G	30	31	31	G 25	24	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
9	E S 14	E S 14	20	17	17	E S 14	E S 14	G	35	G	G	G 28	30	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
10	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 17	G	G	G	33	G	42	G 26	G 23	G 24	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
11	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 19	20	G	33	35	37	G	G	G	32	G	G	E S 14	E S 14	E	E S 14	E S 14	E S 14
12	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 19	G	G	32	G	G 29	G 29	G	G 24	G	G 19	G 19	18	19	E	E S 14	E S 14	E S 14
13	E S 14	E S 14	E	E	E S 14	E S 14	E B 18	G	G	35	35	G	G	G	G	G	G	G	19	E S 14	E S 14	E S 14	E S 14	E S 14
14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 16	25	31	32	30	35	G 27	G 27	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 19	G	G	32	35	42	36	G	G	G	29	24	20	24	22	26	E S 14	E S 14
16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 19	G	G	G	G	G	G	36	34	32	29	G 16	20	E	E	E	E	E S 14
17	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	27	34	35	37	G	G	G	G	G 27	25	18	E S 14	25	E	E S 14	E S 14	E S 14
18	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E B 20	G	G	33	35	G 32	36	G 30	G 29	33	28	24	20	22	20	22	19	E S 14
19	E S 14	E S 14	E S 14	E S 14	E	E S 14	22	G	32	34	35	G 33	G	G	G	G	G	G	20	E S 14	E S 14	E S 14	E S 14	E S 14
20	E S 14	18	E	E	E S 14	E S 14	20	27	32	33	38	36	36	G	G	G	G	G	E S 15	E S 14	E S 14	E S 14	E S 14	E S 14
21	E S 14	E S 14	E S 14	E S 14	E	E S 14	20	27	31	34	34	36	G	G	G	G	G	25	E B 19	E S 14	E	E S 14	E	E
22	23	E	20	E S 14	E S 14	E S 14	21	27	32	34	37	36	34	39	29	32	28	23	E S 14	E S 14	E S 14	E S 14	E S 14	E
23	E	E	17	E	E S 14	E S 14	G	28	31	40	35	G	G	36	28	G	28	24	E S 14	E S 14	E S 13	39	A	E S 14
24	E	E	E	E S 13	E	E S 14	E B 21	30	32	42	35	G	G	G	G	G	G	G	E B 18	E S 14	E B 24	E S 14	E S 14	E S 14
25	24	24	E	E	E S 14	E S 14	E B 19	G	30	34	38	37	36	41	U R 33	G	G	25	E B 18	E S 14	E S 14	E S 14	E S 14	E S 14
26	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	30	U R 32	39	38	35	34	30	G 27	G	E B 24	E B 18	E S 14	E S 14	E S 14	E S 14	E S 14
27	E S 14	E	17	21	E	E S 14	E B 20	G	31	34	34	37	38	34	G 25	G	G 24	24	E S 15	E S 14	E B 20	E B 19	20	19
28	25	18	E	18	22	E S 14	E B 21	U R 26	G	43	42	40	48	37	G	G	24	24	23	E	E S 14	E B 18	E B 20	E S 14
29	E S 14	E S 14	E S 14	E S 14	E	E S 14	E B 20	G	G	33	37	38	35	35	35	G	G 23	G	22	20	19	E S 14	E S 14	E S 14
30	E S 14	E	35	20	20	E S 14	20	G	32	37	48	49	40	38	55	58	28	28	U R 36	26	E S 14	E S 14	E S 14	E S 14
31	E S 14	E S 14	E S 14	E S 14	E	E S 14	23	31	37	44	47	38	38	G	44	33	G	G	19	E	E	30	30	22
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31
MED	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E E 19	G	30	33	35	34	34	G 26	G 24	G	G	18	E E 18	E S 14	E S 14	E S 14	E S 14	E S 14
UQ	E S 14	E S 14	16	E S 14	E S 14	E S 14	E B 20	26	32	34	37	37	36	36	30	27	25	24	20	16	E E 16	E S 14	E E 16	E S 14
LQ	E S 14	E	E S 14	E S 13	E	E S 14	E S 14	G	G	32	E G 29	G	G	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14

MAR. 1973 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	17	18	18	18	19	24	18	15	14	13	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
2	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	19	18	19	19	20	20	20	20	18	16	15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
3	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	17	17	E C 28	18	19	20	20	20	19	18	18	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
4	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	19	17	16	19	19	18	18	18	18	18	22	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
5	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	16	16	19	17	25	27	35	22	16	16	15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
6	E S 14	E S 13	E S 14	E S 13	E S 14	E S 14	E S 14	19	31	30	28	28	28	28	34	18	C	17	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
7	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	18	15	21	20	21	20	18	17	14	17	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
8	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	15	15	18	18	18	16	15	16	16	16	18	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
9	E S 14	E S 14	E	E	E	E S 14	E S 14	16	15	16	18	18	19	19	20	18	16	15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
10	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 17	15	18	17	19	19	18	18	17	14	15	18	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
11	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	19	15	17	15	19	17	19	19	19	15	15	15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
12	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	19	15	18	18	22	18	18	18	15	15	14	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
13	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	18	15	17	18	19	20	18	19	19	18	14	16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 16	15	18	15	19	18	15	18	17	16	16	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	19	18	17	18	17	16	16	18	15	14	14	13	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	19	16	19	18	18	20	18	18	15	17	14	14	E S 14	E S 14	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	E S 14	E S 14	E S 14	17	15	16	18	15	19	15	18	17	14	15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
18	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	20	16	15	17	20	19	21	20	16	18	15	15	E S 13	E S 14	E S 14	E S 14	E S 14	E S 14
19	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	18	15	18	20	19	20	18	18	15	14	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
20	E S 14	E	E S 14	E S 14	E S 14	E S 14	15	16	17	18	22	19	19	17	19	15	15	16	E S 15	E S 14	E S 14	E S 14	E S 14	E S 14
21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	14	16	18	18	18	18	21	19	18	18	17	14	19	E S 14	E S 14	E S 14	E S 14	E S 14
22	E S 14	E S 14	E	E S 14	E S 14	E S 14	17	18	15	15	20	18	19	19	19	18	17	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
23	E S 14	E S 14	E	E S 14	E S 14	E S 14	15	16	18	18	14	14	18	18	19	16	17	16	E S 14	E S 14	E S 13	E S 18	E S 14	E S 14
24	E S 14	E S 14	E S 14	E S 13	E	E S 14	21	18	18	18	18	18	18	21	18	18	15	14	18	E S 14	24	E S 14	E S 14	E S 14
25	E S 14	E	E S 14	E S 14	E S 14	E S 14	19	16	18	20	24	21	32	21	24	18	16	15	18	E S 14	E S 14	E S 14	E S 14	E S 14
26	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	16	18	18	19	20	24	23	24	18	18	14	24	18	E S 14	E S 14	E S 14	E S 14	E S 14
27	E S 14	E S 14	E	E S 14	E S 14	E S 14	20	17	18	19	19	19	19	19	14	17	15	16	E S 15	E S 14	20	19	E S 14	E S 14
28	E S 13	E S 14	E S 14	E	E	E S 14	21	18	20	22	22	23	24	20	20	18	17	15	14	E S 14	E S 14	18	20	E S 14
29	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	20	18	18	15	21	32	21	21	21	16	16	16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
30	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	15	16	19	20	20	20	20	21	19	16	16	14	14	E S 14	E S 14	E S 14	E S 14	E S 14
31	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	17	16	19	19	19	16	19	15	15	15	15	15	14	E S 14	E S 14	E S 14	E S 14	E S 14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31
MED	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	16	16	18	18	19	19	19	19	18	17	16	15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
UQ	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	19	18	18	19	20	20	21	20	20	18	16	16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
LQ	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	16	16	17	18	18	18	18	16	15	14	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14

IONOSPHERIC DATA

MAR. 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

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	310	290	F 290	300	305	335	350	365	335	345	345	315	325	330	335	335	325	340	330	330	315	300	290	300
2	280	285	315	285	275	300	345	340	345	340	335	325	325	325	325	340	345	340	340	295	310	275	285	290
3	290	300	285	275	275	285	335	330	355	365	360	335	330	325	345	350	360	340	335	300	310	315	310	300
4	300	310	305	290	305	305	340	360	335	335	325	305	335	340	335	335	335	335	330	295	295	310	300	295
5	295	295	F	F 310	330	300	315	335	335	340	320	335	320	330	335	335	335	330	320	295	300	310	300	285
6	I S 295	280	300	285	I R 290	295	315	345	340	325	325	315	315	330	300	315	I C 325	315	320	330	300	290	270	280
7	280	270	280	285	285	315	300	315	325	335	320	305	320	320	335	320	330	330	325	310	305	285	290	280
8	290	300	I R 300	290	295	285	320	345	340	330	315	320	315	330	325	340	330	340	330	300	295	295	295	290
9	300	280	295	300	315	290	305	340	340	340	330	325	315	325	320	320	335	310	330	265	295	310	300	300
10	290	280	280	290	300	290	325	335	330	335	325	330	320	315	315	320	320	335	330	340	275	300	300	300
11	290	295	290	290	305	285	330	350	340	335	305	305	310	310	325	315	320	325	320	300	300	R 310	300	290
12	280	280	280	285	300	295	340	325	315	325	325	325	315	320	320	310	320	320	315	315	290	300	300	305
13	295	280	280	285	290	280	315	335	335	330	325	315	305	320	315	325	325	335	325	315	300	295	290	285
14	300	290	290	300	285	305	320	320	330	330	330	300	325	310	320	310	325	330	320	325	300	300	285	285
15	285	290	295	295	300	305	320	335	340	320	315	310	320	310	315	330	320	320	325	320	290	I R 290	295	285
16	285	285	280	295	295	305	320	340	340	340	330	320	310	310	315	320	325	320	325	320	285	290	275	270
17	280	295	325	310	335	260	330	340	345	315	305	320	315	310	315	320	320	330	325	310	295	285	280	290
18	280	290	285	305	305	280	335	340	340	320	310	310	325	315	320	320	325	325	320	325	285	290	280	275
19	275	285	310	310	275	275	305	330	320	320	335	310	310	315	320	325	310	315	320	270	270	305	275	275
20	275	275	280	325	F	270	310	330	350	305	315	330	315	320	305	310	320	320	320	300	275	290	270	280
21	280	320	280	315	275	290	300	330	315	330	315	340	310	320	330	325	330	330	315	300	295	295	275	270
22	280	285	290	270	270	280	335	315	345	340	310	325	325	325	330	330	335	330	325	310	300	300	F 290	265
23	285	295	335	335	280	295	340	315	330	310	290	315	310	335	325	325	330	305	320	315	305	285	I A 280	280
24	285	290	305	325	285	280	310	305	310	295	315	305	315	325	330	315	320	330	335	315	270	290	280	280
25	280	290	285	305	305	280	325	330	325	310	330	330	I R 330	320	315	320	330	340	330	305	280	280	280	275
26	285	275	280	275	310	290	335	330	320	315	315	315	325	320	325	335	330	325	325	325	285	300	290	F
27	290	295	295	F	F	295	335	315	315	310	315	315	310	310	310	325	330	335	325	310	285	290	285	F 285
28	F 280	280	310	315	I R 310	F 295	335	315	320	300	300	320	310	320	325	330	330	325	335	315	285	290	285	270
29	280	F 290	320	305	285	305	335	345	350	335	290	315	310	325	315	305	315	310	330	335	320	290	290	280
30	290	285	285	315	300	315	340	345	340	330	320	300	310	310	325	315	320	350	335	300	290	295	285	290
31	275	280	290	315	340	315	320	335	305	335	335	315	325	305	320	325	320	320	330	305	305	295	300	285
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	30	30	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
MED	285	290	290	300	300	295	325	335	335	330	320	315	315	320	320	325	325	330	325	310	295	295	290	285
UQ	290	295	305	310	305	305	335	340	340	335	330	325	325	325	328	330	330	335	330	320	300	300	298	290
LQ	280	280	280	285	285	282	315	328	322	318	315	310	310	312	315	318	320	320	320	300	285	290	280	280

The Radio Research Laboratories. Japan

MAR. 1973 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 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 380	L 370	L 370	L 370	L 370	L								
2									L	L	L	L 380	L	L	L	410								
3										L	L	L	L	L	L	L	L							
4									L 405	L 385	L 380	H 365	I A 360	L 355	L	L	L							
5									L	L 365	H 360	375	365	365	L 370	L	L							
6									L	L	L 380	L 355	L	L	U L 350	L 340								
7									L	L	L 370	L 365	L	360	365	L 375	L							
8									L	L	H 370	420	355	375	L 370	L								
9									L	L	L 370	360	355	375	L	L	L							
10									L	L	H 390	L	L	L	L	L	L							
11									L	L	L 375	L	L 375	L	L 360	L	L							
12									L	L	U L 360	L 375	365	L 370	L 380	L								
13										U L 375	355	U L 365	365	U L 355	L	L	L							
14									L	L	L 380	L 350	L	L	L	L	L							
15									L	L	L 370	L	L	360	L 355	L	L							
16									L	L	L 380	H 415	U L 375	405	H 365	L	L							
17									L	L	L	L	L 355	L 375	L 355	L	L							
18									L	U L 355	L 375	L	370	H 375	L 365	L	L							
19									L	L	L 365	L 355	L	L 360	L	L	L	L						
20									L	L	365	L	L 375	L 365	L	L	L							
21								L	L 370	L 360	L 370	370	375	345	345	L	L							
22								L	L	L	370	H 365	H 360	365	L 375	L	L							
23								L	L	L	350	380	390	365	370	L	L	L						
24									L	L	L 355	355	360	370	L	L	L	L						
25									U L 365	375	370	H 360	365	I A 370	U L 375	U L 375	L							
26									L	355	350	355	360	365	370	L	L							
27								L	U L 390	360	355	370	370	H 365	340	L 355	L							
28								L	U L 355	I A 370	370	365	I A 370	350	350	L	L							
29									L	L 360	L 370	350	360	365	L 350	L	L	L						
30									L	400	I A 375	I A 375	355	L	A	A	L							
31									L	L	A	375	375	L 360	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									5	11	27	24	23	24	19	5								
MED									U L 370	L 365	L 370	365	365	365	L 365	L 375								
UQ									L 390	375	L 375	375	372	370	L 370	L 375								
LQ									U L 365	L 360	362	358	360	360	L 352	L 355								

MAR. 1973 M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1973 | 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	230	245	255	255	260	245	235								
2									230	250	250	270	250	250	250	245								
3										240	230	270	275	265	250	235	235							
4									240	235	255	290	255	250	245	235	235							
5									230	245	290	255	275	260	240	250	245							
6									230	230	255	280	255	265	280	260								
7									255	235	250	255	250	275	250	250	245							
8									230	240	260	270	255	260	250	245								
9									240	230	250	275	280	255	255	250	235							
10									250	250	260	250	245	265	260	250	240							
11									235	235	260	280	255	255	260	255	250							
12									250	250	260	250	280	260	255	240								
13										255	260	260	275	265	260	255	240							
14									245	240	250	300	270	255	250	245	255							
15									230	240	255	265	250	290	265	250	245							
16									230	225	250	275	265	285	275	260	250							
17									230	255	300	260	265	275	260	250	250							
18									240	265	260	285	260	270	265	260	250							
19									255	265	250	290	255	270	250	265	255	255						
20									230	235	275	250	265	265	270	265	245							
21								255	280	255	290	245	290	270	255	250	235							
22								285	245	250	290	265	260	265	255	245	245							
23								255	255	290	320	275	300	255	255	250	245	255						
24									240	255	290	280	275	260	250	250	265	245						
25									255	285	255	260	255	255	255	255	250							
26									245	270	285	280	260	260	255	250	255							
27								250	250	285	280	280	290	285	290	255	250							
28								265	280	250	305	280	275	275	260	255	255							
29									235	260	280	290	280	275	275	270	280	260						
30									230	260	280	300	280	270	265	I A 260	255							
31									255	275	255	280	265	280	275	255	255	250						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								5	29	31	31	31	31	31	31	31	26	5						
MED								255	240	250	260	275	265	265	255	250	250	255						
UQ								265	250	260	282	280	275	272	265	255	255	255						
LQ								255	230	238	252	260	255	260	250	248	245	250						

The Radio Research Laboratories, Japan

MAR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1973 | H'F (KM) | 135 E Mean Time (G. M. T.+ 9h)

Station AKITA Lat. 39 43.5 N. Long. 140 08.2 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	235	280	295	270	255	230	220	215	210	200	205	200	215	215	220	220	230	235	215	215	215	240	250	270
2	300	270	240	290	305	290	200	205	210	H 220	225	225	230	220	230	210	235	230	215	235	240	290	305	290
3	260	270	I A 270	295	305	275	225	225	240	240	220	210	210	230	220	220	220	220	215	240	245	250	280	270
4	295	245	245	270	260	250	240	235	205	200	200	H 190	I A 200	210	215	235	230	235	205	235	260	250	250	250
5	250	245	250	225	210	255	220	220	230	200	H 195	220	200	205	205	230	235	225	205	225	245	245	250	295
6	290	280	270	290	265	250	210	225	220	215	230	230	I A 240	I A 230	225	215	I C 240	245	225	205	240	255	300	310
7	240	230	230	200	205	205	210	205	230	230	215	215	245	250	290	290	290	260	I A 270	270	245	290	215	220
8	290	260	I A 270	270	245	290	215	220	225	225	H 205	195	230	210	230	235	230	230	210	210	260	250	260	280
9	260	280	265	250	240	250	235	235	I A 225	210	200	200	200	200	230	235	235	240	210	205	255	245	250	270
10	260	295	290	265	240	245	230	225	H 200	235	H 195	235	I A 210	205	H 205	240	230	235	215	200	290	255	250	255
11	255	260	255	255	240	265	230	215	230	230	200	H 200	230	225	205	H 205	230	235	215	230	250	230	240	255
12	280	285	275	280	250	240	215	220	230	240	230	210	200	210	205	210	240	230	230	230	250	240	260	245
13	250	275	240	275	260	290	240	230	230	215	220	230	205	220	215	230	240	235	210	205	250	275	280	290
14	260	275	270	255	240	245	225	240	240	210	200	195	H 190	235	235	220	250	240	230	205	240	245	275	290
15	290	280	260	250	225	240	230	225	220	210	195	250	H 180	200	205	240	230	235	230	215	245	250	270	295
16	285	290	280	270	240	240	225	230	225	215	205	H 180	230	200	H 180	240	240	230	220	215	250	290	290	300
17	300	275	215	235	220	300	225	235	230	230	H 200	240	225	210	205	210	240	240	230	235	250	265	285	280
18	290	265	255	250	225	275	225	225	210	230	210	H 190	200	H 200	200	225	235	240	225	215	250	300	295	310
19	310	280	230	235	210	295	245	230	240	240	220	195	220	220	240	235	240	250	235	290	290	230	255	280
20	270	300	255	220	300	290	250	240	240	230	225	240	205	200	240	230	235	230	225	240	295	320	300	300
21	290	225	310	250	340	300	255	240	230	230	220	215	200	200	210	235	230	235	235	245	260	255	290	290
22	305	290	290	290	310	280	225	250	230	220	205	H 190	H 190	I A 210	210	230	230	235	230	225	240	245	295	330
23	300	280	225	230	290	290	225	245	230	I A 230	230	205	195	205	220	230	220	245	235	225	235	I A 250	I A 290	300
24	290	280	250	225	265	305	250	230	225	I A 225	215	225	205	205	240	240	240	245	220	215	E B 290	270	310	290
25	320	290	290	240	230	290	230	230	220	205	I A 225	H 200	225	I A 225	215	220	H 230	230	220	220	255	290	305	300
26	290	290	285	245	220	250	225	240	230	205	I A 230	220	225	230	225	230	230	240	220	215	235	250	250	290
27	270	260	260	255	250	250	225	220	215	230	205	205	225	H 205	205	230	240	245	230	230	250	280	300	310
28	I A 300	300	255	245	I A 280	270	240	240	240	I A 220	I A 210	I A 200	I A 205	230	230	235	235	245	230	215	270	275	290	315
29	305	275	240	240	260	255	230	230	220	215	225	225	215	210	220	235	250	245	235	215	220	250	275	290
30	290	290	I A 300	260	245	250	225	225	215	260	280	300	280	270	265	I A 260	255	245	240	250	255	250	260	285
31	300	290	280	225	200	235	230	235	240	A	A	215	220	215	I A 235	240	230	240	230	240	235	270	280	290
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	290	280	260	250	245	255	225	230	230	222	212	210	210	210	220	230	235	235	225	225	250	250	280	290
UQ	300	290	280	270	265	290	232	235	230	230	225	225	225	225	230	235	240	245	230	235	256	275	292	300
LQ	260	268	248	238	228	248	225	222	220	210	200	200	200	205	205	220	230	232	215	215	240	248	252	275

The Radio Research Laboratories, Japan

MAR. 1973 | H'F (KM)

IONOSPHERIC DATA

MAR. 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	S	S	S	110	110	S	S	G	G	G	G	G	160	165	155	100	100	100	100	110	110	110	S	S
2	100	100	S	S	S	S	S	G	150	G	G	110	110	110	110	G	G	110	S	110	110	110	110	S
3	110	105	100	100	105	S	S	G	G	145	125	G	G	G	G	G	G	B	S	S	110	105	105	105
4	100	S	120	S	S	S	S	G	G	G	G	G	100	100	100	G	G	B	S	S	S	S	105	S
5	S	S	S	E	E	S	S	G	G	150	G	G	G	B	G	G	G	G	S	S	S	S	S	S
6	S	S	S	S	S	S	S	135	B	125	120	115	105	105	B	100	C	105	100	110	105	100	100	S
7	S	105	S	S	S	S	S	130	115	110	110	105	100	G	G	G	140	115	110	110	S	110	110	105
8	105	105	105	100	S	S	S	155	G	G	105	110	100	100	100	G	G	G	S	S	S	S	S	S
9	S	S	100	100	100	S	S	155	105	G	G	110	105	G	G	G	130	G	S	S	S	S	S	S
10	S	S	S	S	S	S	S	G	G	G	140	G	100	100	100	100	G	G	S	S	S	S	S	S
11	S	S	S	S	S	S	B	110	G	130	130	110	G	G	G	100	G	G	S	S	120	S	S	S
12	S	S	S	S	S	S	B	G	G	135	G	110	110	G	105	G	100	100	100	100	100	S	S	S
13	S	S	100	105	S	S	B	G	G	120	115	G	G	G	G	G	G	G	100	S	S	S	S	S
14	S	S	S	S	S	S	S	130	130	115	105	115	100	100	G	G	G	G	S	S	S	S	S	S
15	S	S	S	S	S	S	B	G	G	135	125	165	110	130	145	G	115	100	100	105	110	110	S	S
16	S	S	S	S	S	S	B	G	G	G	G	G	G	115	110	140	125	100	100	100	110	110	105	S
17	S	S	S	S	S	S	G	150	135	130	125	G	G	G	G	110	110	105	S	100	100	S	S	S
18	S	S	S	S	S	S	B	G	G	130	120	110	110	105	100	115	115	115	110	110	110	115	110	S
19	S	S	S	S	E	S	150	G	140	125	120	110	G	G	G	G	G	G	110	S	S	S	S	S
20	S	110	105	105	S	S	140	130	130	130	125	115	115	G	G	G	G	G	S	S	S	S	S	S
21	S	S	S	S	105	S	140	140	130	130	120	110	G	G	G	G	G	130	B	S	105	S	100	105
22	105	105	105	S	S	S	145	140	130	130	125	120	120	110	110	130	125	115	S	S	S	S	S	110
23	105	105	105	105	S	S	G	140	130	125	120	G	G	110	105	G	125	130	S	S	S	110	110	S
24	100	105	105	S	105	S	B	130	125	115	120	G	G	G	G	G	G	G	B	S	B	S	S	S
25	105	105	105	105	S	S	B	G	130	115	115	115	115	110	105	G	G	100	B	S	S	S	S	S
26	S	S	S	S	S	S	G	G	150	140	125	115	115	115	110	110	G	B	B	S	S	S	S	S
27	S	105	100	100	100	S	B	G	130	125	115	110	105	110	100	G	100	100	S	S	B	B	110	105
28	105	110	105	105	100	S	B	160	G	115	115	110	105	100	G	G	100	100	100	110	S	B	B	S
29	S	S	S	S	105	S	B	G	G	130	120	120	115	115	110	G	100	G	100	100	100	S	S	S
30	S	100	100	100	100	S	100	G	120	120	115	110	110	105	100	100	100	100	100	100	S	S	S	S
31	S	S	S	S	105	S	140	135	130	125	115	115	120	G	120	135	G	G	100	100	100	115	115	110
	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	9	12	13	11	10		6	14	16	24	24	21	21	18	17	11	14	16	13	13	13	10	11	6
MED	105	105	105	105	105		140	138	130	128	120	110	110	110	105	110	112	102	100	105	110	110	110	105
UQ	105	105	105	105	105		145	150	132	130	125	115	115	115	110	122	125	115	100	110	110	110	110	110
LQ	100	105	100	100	100		140	130	128	120	115	110	105	100	100	100	100	100	100	100	100	110	105	105

MAR. 1973 | H'ES (KM)

IONOSPHERIC DATA

MAR. 1973 | 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								H 1	H 1	H 1	LC 21	L 3	L 2	F 1	F 2	F 1	F 1		
2	F 2	F 1							H 1			L 1	C 1	C 2	L 2			L 1		F 1	F 2	F 1	F 2	
3	F 2	F 1	F 3	F 1	F 1					H 1	H 1										F 2	F 2	F 2	F 1
4	F 1		F 1										L 2	L 1	L 1								F 1	
5										H 1														
6								H 1		H 1	C 1	C 1	L 1	L 1		L 1		L 1	L 1	F 1	F 2	F 2	F 1	
7		F 1						H 1	C 2	L 1	L 1	L 2	L 1				H 1	C 3	L 2	F 2		F 2	F 2	F 1
8	F 2	F 2	F 3	F 2				H 2			L 1	L 1	L 1	L 1	L 1									
9			F 2	F 2	F 2			H 1	L 2			L 1	L 1				H 1							
10											H 1		L 3	L 2	L 1	L 1								
11								L 1		H 1	H 1	L 1				L 2					F 1			
12										H 1		L 2	L 1		L 2		L 2	L 1	L 1	F 2	F 1			
13			F 1	F 1						H 1	C 1								L 1					
14								H 1	H 1	C 1	L 1	C 1	L 1	L 2										
15										H 1	H 1	H 1	L 2	H 1	H 1		C 2	L 2	L 1	F 2	F 3	F 2		
16														C 2	L 2	H 1	H 2	L 1	L 2	F 1	F 1	F 1	F 2	
17								H 2	H 2	H 1	H 1					L 1	L 1	L 1		F 2	F 1			
18										H 1	C 1	L 1	L 1	L 1	L 2	C 2	C 2	C 1	L 1	F 1	F 2	F 2	F 2	
19							H 1		H 1	H 1	C 1	L 1							L 1					
20		F 2	F 1	F 1			H 1	H 2	H 1	H 1	H 1	C 1	C 1											
21					F 1		H 1	H 1	H 1	H 1	C 1	L 1						H 1			F 1		F 1	F 1
22	F 2	F 2	F 2				H 1	H 2	H 1	H 1	H 1	H 1	H 1	L 2	L 1	H 1	H 1	C 2						F 1
23	F 2	F 2	F 1	F 1				H 2	H 1	H 2	C 1			L 2	L 1		H 2	H 1				F 3	F 4	
24	F 2	F 1	F 1		F 1			H 1	H 1	C 1	H 1													
25	F 2	F 2	F 1	F 1					H 1	C 1	C 1	C 1	C 1	L 2	L 1			L 1						
26									H 1	H 1	H 2	C 1	C 1	C 1	L 1	L 1								
27		F 1	F 2	F 2	F 1				H 1	H 1	H 1	L 2	L 1	L 2	L 1		L 1	L 1					F 1	F 1
28	F 2	F 2	F 1	F 2	F 2			H 1		C 2	C 2	L 2	L 2	L 2			L 2	L 1	L 1	F 1				
29					F 1					H 1	H 1	H 1	C 1	C 1	L 2		L 1		L 2	F 1	F 1			
30		F 2	F 4	F 2	F 2		L 1		H 1	H 1	C 2	L 2	L 2	L 2	L 2	L 3	L 2	L 1	L 2	F 1				
31					F 1		H 1	H 1	H 1	H 2	C 2	C 1	H 1		H 2	H 1			L 1	F 1	F 1	F 3	F 2	F 2
	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																								

The Radio Research Laboratories, Japan

MAR. 1973 | TYPES OF ES

IONOSPHERIC DATA

MAR. 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 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	41	36	R 36	38	36	35	38	R 65	J R 75	J R 90	I R 81	82	95	R 107	J R 101	R 80	C	R 77	C	51	C	C	C	C
2	C	C	C	C	C	C	45	C	C	C	C	C	110	112	110	100	92	J R 78	65	50	49	45	44	45
3	44	44	43	39	39	41	49	65	85	106	J R 104	86	J R 110	116	106	90	76	71	60	47	53	46	39	39
4	38	40	35	35	34	35	44	65	R 71	R 80	R 72	83	100	100	81	I R 78	75	66	R 69	45	43	47	46	44
5	41	39	40	40	39	34	43	60	69	81	80	J R 91	106	95	90	70	R 71	67	54	44	43	45	44	J R 39
6	J R 42	41	41	40	39	39	R	R 67	R	79	R 81	J R 85	I R 96	I R 94	R 96	J R 101	95	R 75	R 80	R 65	43	36	40	R 44
7	R	R	I R 43	45	38	35	41	R	R 98	115	J R 105	I R 109	I R 114	110	96	J R 85	71	J R 78	65	45	48	45	44	44
8	45	41	40	41	36	35	52	J R 64	R	80	85	J R 101	J R 129	111	J R 105	J R 89	J R 77	72	58	49	49	50	45	45
9	45	41	43	41	38	31	41	R	R	84	80	86	100	J R 106	100	940	81	65	77	56	43	44	41	41
10	40	38	39	40	38	37	42	61	S 80	92	97	99	93	85	88	95	87	72	80	51	41	49	45	47
11	48	44	45	45	41	40	56	R	J R 80	U S 79	J R 74	90	119	118	105	90	82	86	70	59	60	63	40	44
12	42	41	41	44	43	37	55	65	74	94	J R 105	110	110	117	J R 105	92	87	83	81	64	I S 51	52	I S 48	50
13	44	39	40	40	38	38	50	75	R 76	J R 75	I R 84	J R 105	108	115	J R 103	95	91	79	61	50	41	41	45	45
14	47	45	44	45	41	36	48	R	R	96	I R 78	J R 86	R 105	J R 105	91	J R 75	81	81	84	R 64	45	40	41	J R 41
15	43	43	43	45	40	36	51	R	80	J R 76	I R 79	92	J R 118	85	89	91	J R 86	84	J R 74	J R 65	47	I R 48	I R 45	46
16	R 46	45	44	44	41	39	51	J R 65	R	67	82	91	110	95	97	J R 90	88	80	75	55	44	45	44	I S 45
17	S 45	46	56	35	31	31	49	77	S 72	68	85	119	110	97	86	90	80	80	75	58	48	47	U S 46	49
18	48	48	42	46	42	J S 38	55	65	75	J R 80	88	J R 102	108	J R 103	85	86	83	83	75	65	49	49	49	46
19	49	49	51	44	32	34	49	U S 75	R 81	R 86	98	89	J R 107	93	83	76	79	85	88	J R 79	R 85	R	R	R
20	61	58	60	51	39	36	57	91	R 95	75	I S 75	J R 103	J R 100	90	90	95	100	79	74	65	58	58	55	60
21	55	59	32	30	27	J S 28	50	S 75	84	91	80	101	94	100	99	92	82	64	60	54	50	55	49	50
22	49	49	42	38	39	39	53	60	90	66	73	J R 103	109	114	94	J S 80	78	65	68	64	44	40	I S 40	39
23	F 41	43	41	25	24	26	49	65	69	R 69	86	R 96	86	86	82	J R 79	66	66	83	76	50	40	39	I A 41
24	F 40	43	43	37	A	31	50	S 74	61	66	82	96	J R 105	J R 102	R 92	I R 78	86	100	86	56	38	J S 40	S 39	40
25	38	42	38	S 40	26	S 28	47	64	71	I R 73	94	98	96	82	79	75	89	85	66	48	40	43	40	F
26	43	F 40	40	41	H 26	26	44	65	80	81	81	96	117	J R 105	92	84	80	J R 74	71	60	42	R 40	I R 41	J R 40
27	F	R 45	I R 46	47	I R 34	31	51	55	70	66	J R 87	95	J R 100	J R 103	94	J R 90	72	66	59	I R 53	40	J R 41	R 42	J R 41
28	R	J R 40	41	35	27	26	45	59	R	83	A	91	91	J R 102	98	83	69	80	I R 77	52	44	45	R 45	44
29	44	J R 44	46	36	34	35	53	R 64	65	70	67	90	95	94	J R 77	66	80	95	J R 102	R	41	I R 36	36	36
30	36	40	39	40	36	J R 39	R 63	65	I R 68	63	75	R 71	J R 103	96	88	83	75	80	74	61	51	52	51	51
31	48	49	49	50	31	30	54	62	74	95	100	93	J R 105	95	97	91	86	86	81	66	60	55	54	50
	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	27	29	30	30	29	30	30	25	24	30	29	30	31	31	31	31	30	31	30	30	30	29	29	28
MED	44	43	42	40	38	35	50	65	75	80	82	94	105	102	94	89	81	79	74	56	46	45	44	44
UQ	48	45	44	45	39	38	53	67	80	90	88	101	110	108	100	92	87	83	80	64	50	49	46	46
LQ	41	40	40	38	32	31	45	64	70	70	79	89	98	94	88	80	76	72	65	50	43	41	40	41

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MAR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 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									L	L	L	L	L	L	L	L	L							
2									C	C	C	C	L	L	L	L								
3									L	L	L	L	L	L	L	L	L							
4									L	L	L	L	B	L	A		L							
5										L	L 430	L 480	L	B	L 450		L							
6									L	R	B	L 490	L	L 410	L 450	L	L							
7									L	L	L	L	L	L	L	L	L							
8									L	L	L	L	L 460	L	L	L	L							
9									L	L	L 450	L	U L 490	L	L	L	L							
10									L	L	L	500	L	L 460	U L 500	L	L							
11									L	L	L	L	L	L 480	L	L	L							
12									L	L	U L 490	U L 500	U L 490	U L 500	L	L	L							
13									L	L	L	L 480	L 490	L	L	L	L							
14									L	L	L	L	L 500		L	L	L							
15									L	L	L	L 510	A	L	L	L								
16									L	L	L	500	L	L	L	L	L							
17									L	L	L 450	L	L	L	L	L	L							
18									L	L	L	U L 460	L 490	L	L	L	L							
19									L	L	L	L	L	L 460	L	L	L							
20										L	L	L	A	L	L	L	L							
21								L	L	L	L	L		L	L	L	L							
22									L	L	L	L	L	A	L	L								
23									L	L 460	440	460	L 460	L	L	L	L							
24									L	L	L	L 460	U L 480	L	L	L	L	L						
25										L	480	L	L	L	L	L	L							
26									L	L	L	A	L	L 460	L	L	A							
27									L	L	L 450	L 460	L 480	L 460	L 440	A								
28								L	L	L 410	A	L 480	L	L 460	L	L								
29									L	L	L	L 450	L 480	L 460	L 450	L								
30								L	L	440	L 480	L	L	L	L	L	L							
31									L	L	L	A	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	8	13	10	9	5									
MED										L 440	L 450	L 480	L 485	L 460	L 450									
UQ										450	L 480	L 500	L 490	L 460	L 450									
LQ										425	L 445	L 460	L 480	L 460	L 450									

The Radio Research Laboratories, Japan

MAR. 1973 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1973 | FOE (0.01 MHZ) | 135 E Mean Time (G. M. T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35 42.4 N. Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 20 sec in 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								180	R 265	290	R	R	B	I R 315	315	I R 295	A	B						
2								C	C	C	C	C	A	A	A	A	A	200						
3							B	230	I R 270	I R 310	A	A	A	A	I A 330	R	A	A						
4							B	190	I R 290	I R 300	305	B	B	R	A	I A 310	I A 260	200						
5							B	240	A	R	B	B	R	B	R	R	A	A						
6							B	R 250	B	A	B	B	B	R	B	300	I R 260	A						
7								225	I R 260	I A 290	315	R	A	A	I B 320	I B 290	R 240	A						
8								240	I A 265	I R 300	I R 315	335	I R 350	335	R	B	250	R						
9								220	A	R	A	R	365	I A 350	340	300	265	190						
10							B	220	I R 275	I R 320	R	R	B	I R 335	I A 330	I R 310	260	A						
11							B	250	285	I R 320	I R 340	B	A	R	340	325	275	215						
12							160	210	270	315	340	R	R	A	340	A	A	A						
13							175	250	R	I R 300	R	R	B	B	R	R	I R 260	R	B					
14								R	I R 270	R	B	B	B	B	R	I B 305	270	220	B					
15							180	I R 235	B	R	B	B	A	A	A	B	280	A	B					
16							B	245	I R 285	R 320	R 350	365	R 380	360	345	R	265	A						
17							185	R 230	R	I B 320	I R 330	B	A	A	A	A	280	A						
18							185	I R 225	R	S	S	R	B	R	A	310	A	A						
19							B	I R 235	I R 295	300	R	A	350	R	A	A	R	A						
20							B	200	A	310	S	B	A	A	325	300	240	A						
21							170	240	R	300	A	A	A	I A 345	R	R	A	A						
22							190	245	280	300	315	B	A	A	A	I A 300	265	215						
23							150	I R 240	260	305	315	R	R	I R 335	R 330	305	270	A						
24							170	225	270	300	I A 310	A	R	R	I B 335	I R 310	280	220						
25							180	230	260	A	A	A	A	A	A	A	I A 265	A						
26							200	R 240	275	B	A	A	R	A	A	A	A	A						
27							B	245	I R 265	300	A	A	A	A	A	A	A	A	B					
28							B	R	I R 290	I R 310	A	A	A	R	A	I R 295	280	A	B					
29							B	R	270	I R 310	R	B	B	R	R	A	A	A	B					
30							165	250	285	310	R	A	A	A	A	A	I A 290	A	B					
31							165	250	295	330	A	A	A	R	I A 350	315	I R 260	I A 230	B					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							13	27	21	22	10	2	4	7	12	15	20	8						
MED							175	235	270	308	315	350	358	I 335	332	I 305	265	215						
UQ							185	245	I R 285	I R 315	R 340		372	348	340	310	278	220						
LQ							165	225	265	300	315		350	I R 335	328	300	260	200						

The Radio Research Laboratories, Japan

MAR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 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

Day \ Hour	00	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 15	E S 15	E B 13	E B 13	E S 15	E S 15	E S 15	G	G	G	G	G	E B 38	39	35	G	34	20	C	E B 12	C	C	C	C
2	C	C	C	C	C	C	E S 15	C	C	C	C	C	36	36	J X 37	36	J X 40	G	J X 19	21	M 21	M 21	E S 15	E S 15
3	21	E B 12	J X 29	M 24	M 20	M 21	E B 14	G	G 21	G	35	J X 46	36	J X 40	J X 40	G 21	J X 28	J X 25	J X 25	J X 21	E S 15	E B 14	J X 30	J X 30
4	J X 34	21	19	20	E B 12	E B 12	E B 16	G	G 20	G 21	G	E B 39	E B 49	G 20	J X 50	35	21	G 19	16	20	E S 15	E B 12	20	J X 26
5	E B 12	E S 15	E B 14	E B 12	E B 11	E B 12	E B 12	G	29	G	E B 36	E B 40	E R 27	E B 45	G	E R 23	27	30	E S 15	E	E S 16	E S 15	E S 16	E
6	23	M 20	E S 15	E S 15	E S 15	E S 15	E S 15	G	E B 33	G 38	E B 58	E B 42	E B 40	G 31	E B 40	G	G	38	J X 24	23	E B 13	E S 15	J X 25	J X 23
7	E S 15	E B 13	E S 15	E S 15	E S 15	E S 15	E S 15	G	G	34	35	G	35	42	E B 39	E B 32	G	26	M 20	E B 13	E S 15	21	E S 15	J X 24
8	J X 24	21	M 20	22	M 20	M 21	20	G	J X 34	G	G	G	G	G	G	G	31	G 20	E S 15	J X 24	21	M 21	E S 15	E S 15
9	E S 15	E B 13	E B 13	E S 15	E B 13	E B 13	E S 15	G	34	G	35	G 21	G	40	G 31	G 20	G	G	E B 14	E B 11	E S 15	M 20	E B 14	17
10	E S 15	E S 15	E B 12	E B 12	E S 15	E S 15	E B 14	G	G 20	G	G	G	E B 38	G	J X 40	G 20	G 17	J X 26	E S 15	21	24	E S 15	E S 15	E S 15
11	E B 12	E B 14	E B 14	E S 15	E S 15	E S 15	E B 15	G	G	G 24	J G 25	E B 39	45	G 35	37	G	G 16	G 18	J X 20	24	18	J X 29	J X 41	21
12	E S 15	E B 14	E B 12	M 21	M 20	M 20	G	G	30	33	G	G 35	G 35	35	G 29	35	31	23	J X 20	J X 21	21	E S 15	E S 15	E B 12
13	E B 12	E B 12	E B 12	E B 12	M 20	E B 12	G	G	G	G	G	G	E B 40	E B 38	G 23	G 19	G	G	E B 15	E B 13	E S 15	E S 15	E S 15	E S 15
14	E S 15	E S 15	E B 13	E S 15	E S 15	E S 15	E S 16	G	G	G	E B 40	E B 39	E B 42	E B 40	G	E B 33	G	G	E B 15	E B 12	E S 15	E S 15	E B 12	E S 15
15	E S 15	E B 13	E B 13	E B 13	E B 12	E S 15	G	G	E B 30	G	E B 38	E B 44	46	48	J X 41	E B 40	J X 41	J X 34	J X 35	J X 25	E S 15	E S 15	J X 42	E B 13
16	E S 15	E S 16	E S 15	E S 15	E B 13	E S 15	E B 15	G	G	G	J G 29	G	G	40	36	37	J X 38	J X 32	J X 26	J X 22	16	21	J X 25	E S 15
17	M 21	E B 12	E B 12	E B 12	E B 14	E B 14	G	G	G	E B 35	G	46	38	J X 54	J X 44	35	J X 30	J X 43	J X 40	M 31	M 21	E S 15	E B 12	M 20
18	E B 12	17	19	E B 14	E B 14	E S 15	G	G	G	E S 39	G	G	E B 40	J G 32	36	G 20	30	J X 30	E B 14	M 21	J X 18	J X 35	J X 42	J X 25
19	M 20	M 20	E B 13	E B 12	E B 14	E B 12	E B 12	G	G	33	G	37	G 30	G	36	35	G	25	20	E S 15	E S 16	E S 15	E B 23	E S 15
20	E S 15	M 20	40	J X 26	J X 24	E S 15	24	29	J X 41	36	42	E B 40	J X 85	J X 46	G 26	G 27	J X 26	J X 25	J X 18	20	M 21	E S 15	E S 15	E S 15
21	M 23	M 20	21	E B 12	E B 12	M 18	20	27	G	33	36	J X 43	39	J X 36	G 20	G 20	J X 54	J X 30	J X 30	J X 22	E S 15	J X 18	24	E S 15
22	J X 18	J X 42	J X 24	J X 24	E S 15	M 18	G	G	30	36	40	42	41	J X 56	46	32	G	G	E B 14	M 21	22	M 24	E S 15	J X 19
23	E B 14	16	E B 12	22	M 20	E S 15	G	G	32	33	36	G	G	G	G	G	G	22	E B 14	J X 19	M 22	M 19	J X 20	J X 49
24	J X 24	M 20	J X 37	J X 25	J X 40	J X 24	G	G	30	37	J X 49	J X 40	G	G	E B 35	G	G	G	J X 21	J X 25	M 20	M 21	E S 15	E S 15
25	M 20	J X 20	M 21	M 21	18	17	G	G	32	35	39	J X 53	S 39	36	43	J X 40	J X 28	J X 40	J X 39	J X 25	E S 15	E S 15	E S 15	E S 15
26	E S 15	M 19	E B 12	E S 15	E B 12	E B 14	G	G	G	E B 36	39	J X 55	G	46	42	J X 40	J X 53	J X 28	20	E B 13	E S 15	E S 15	E S 15	E S 15
27	E S 15	E S 15	E S 15	E S 15	E B 13	19	E B 15	G	G	J X 41	J X 40	J X 45	41	J X 48	J X 45	J X 46	J X 40	J X 30	J X 39	J X 31	M 21	E S 15	E S 15	J X 30
28	J X 21	J X 40	J X 24	J X 28	J X 29	M 21	24	G	G	35	J X 83	J X 40	J X 45	G 29	36	G	G 20	J X 25	J X 24	J X 24	E S 15	E S 15	E S 15	E S 15
29	E S 15	E B 13	E S 15	E S 15	21	M 21	E B 15	G	G	G	G	E B 40	E B 40	G	G	J X 40	J X 60	J X 54	J X 54	J X 44	E S 15	J X 21	M 20	E S 15
30	E S 15	E S 15	E B 13	E S 15	21	21	G	G	G	35	G	J X 41	J X 41	42	J X 40	J X 38	J X 34	30	J X 64	J X 23	M 20	J X 24	E S 15	20
31	21	21	E B 12	E S 15	E B 14	21	G	27	33	37	42	J X 56	J X 41	G	42	37	36	J X 25	J X 29	J X 19	22	J X 24	J X 43	J X 39
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	31	30	30	30	30	30	31	31	31	31	31	31	30	31	30	30	30	30
MED	E 15	E 16	E E 14	E 15	E 15	E 15	E G 14	G	E G 20	U 28	U 30	E G 40	U 34	36	36	U 26	28	25	J X 20	21	16	E 15	E E 15	E 15
UQ	21	20	20	21	20	20	E E 15	G	30	36	40	J X 42	40	42	40	36	J X 35	J X 30	J X 29	J X 24	21	21	J X 24	J X 23
LQ	E S 15	E B 14	E B 13	E B 13	E B 13	E S 15	G	G	G	G	G	G	E G 32	G 24	U G 26	E G 20	G	G 20	E 15	17	E S 15	E S 15	E S 15	E S 15

MAR. 1973 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 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	E S 15	E S 15	E B 13	E B 13	E S 15	E S 15	E S 15	G	G	G	G	G	E B 38	38	34	G	27	20	C	E B 12	C	C	C	C
2	C	C	C	C	C	C	E S 15	C	C	C	C	C	E R 36	36	32	33	28	G	16	F	E	E	E S 15	E S 15
3	E	E B 12	E	E	E	E	E B 14	G	E R 21	G	35	40	E R 36	40	40	E R 21	25	22	21	E	E S 15	E B 14	E	26
4	26	E	E	E	E B 12	E B 12	E B 16	G	E R 20	E R 21	G	E B 39	E B 49	E R 20	50	35	F R 21	G 19	16	E	E S 15	E B 12	E	E
5	E B 12	E S 15	E B 14	E B 12	E B 11	E B 12	E B 12	G	29	G	E R 36	E B 40	E R 27	E B 45	G	E R 23	27	30	E S 15	E	E S 16	E S 15	E S 16	E
6	19	E	E S 15	E S 15	E S 15	E S 15	E B 15	G	E B 33	E R 38	E B 58	E B 42	E B 40	F R 31	E B 40	G	G	38	E	E	E B 13	E S 15	E	E
7	E S 15	E B 13	E S 15	E S 15	E S 15	E S 15	E S 15	G	G	34	35	G	35	32	E B 39	E B 32	G	25	E	E B 13	E S 15	E	E S 15	24
8	E	E	E	E	E	E	E	G	34	G	G	G	G	G	G	G	26	E R 20	E S 15	19	E	E	E S 15	E S 15
9	E S 15	E B 13	E B 13	E S 15	E B 13	E B 13	E S 15	G	30	G	35	E R 21	G	38	G 29	E R 20	G	G	E B 14	E B 11	E S 15	E	E B 14	E
10	E S 15	E S 15	E B 12	E B 12	E S 15	E S 15	E B 14	G	E R 20	G	G	G	E B 38	G	35	E R 20	G 17	26	E S 15	E	24	E S 15	E S 15	E S 15
11	E B 12	E B 14	E B 14	E S 15	E S 15	E S 15	E B 15	G	G	G 24	E R 25	E B 39	45	E R 35	37	G	G 16	G 18	20	24	E	19	16	17
12	E S 15	E B 14	E B 12	E	E	E	G	G	30	32	G	E R 35	E R 35	E R 35	G 28	32	30	23	20	20	E S 21	E S 15	E S 15	E B 12
13	E B 12	E B 12	E B 12	E B 12	E	E B 12	G	G	G	G	G	G	E B 40	F B 38	E R 23	E R 19	G	G	E B 15	E B 13	E S 15	E S 15	E S 15	E S 15
14	E S 15	E S 15	E B 13	E S 15	E S 15	E S 15	E S 16	G	G	G	E B 40	E B 39	E B 42	E B 40	G	E B 33	G	G	E B 15	E B 12	E S 15	E S 15	E B 12	E S 15
15	E S 15	E B 13	E B 13	E B 13	E B 12	E S 15	G	G	E B 30	G	E B 38	E B 44	42	42	32	E B 40	38	25	30	25	E S 15	E S 15	25	E B 13
16	E S 15	E S 16	E S 15	E S 15	E B 13	E S 15	E B 15	G	G	G	G 29	G	G	40	36	E R 37	38	32	25	17	16	E	E	E S 15
17	E	E B 12	E B 12	E B 12	E B 14	E B 14	G	G	G	E B 35	G	45	38	39	40	35	25	25	31	30	E	E S 15	E B 12	E
18	E B 12	E	E	E B 14	E B 14	E S 15	G	G	G	E S 39	G	G	E B 40	E R 32	E R 36	G 20	30	29	E B 14	E	16	27	32	19
19	E	E	E B 13	E B 12	E B 14	E B 12	E B 12	G	G	32	G	35	G 29	G	33	34	G	24	E	E S 15	E S 16	E S 15	E B 23	E S 15
20	E S 15	E	35	22	18	E S 15	23	23	35	35	40	E B 40	71	42	G 26	G 26	22	25	E	E	E	E S 15	E S 15	E S 15
21	17	E	E	E B 12	E B 12	E	19	26	G	33	36	40	E S 39	36	E R 20	E R 20	32	25	26	20	E S 15	E	E	E S 15
22	E	16	E	E	E S 15	E	G	G	29	36	38	40	41	51	41	32	G	G	E B 14	E	E	16	E S 15	16
23	E B 14	E	E B 12	20	E	E S 15	G	G	31	33	34	G	G	G	G	G	G	22	E B 14	17	16	E	19	A
24	E	E	25	22	A	18	G	G	30	37	40	40	G	G	E B 35	G	G	G	20	19	E	E	E S 15	E S 15
25	E	18	E	E	E	E	G	G	32	34	39	42	E S 39	36	36	38	25	38	26	E	E S 15	E S 15	E S 15	E S 15
26	E S 15	E	E B 12	E S 15	E B 12	E B 14	G	G	G	E B 36	39	54	G	35	39	33	530	25	19	E B 13	E S 15	E S 15	E S 15	E S 15
27	E S 15	E S 15	E S 15	E S 15	E B 13	E	E B 15	G	G	40	36	38	39	38	33	40	40	27	35	26	E	E S 15	E S 15	16
28	E	30	22	25	19	E	23	G	G	33	A	40	38	E R 29	35	G	E R 19	23	24	22	E S 15	E S 15	E S 15	E S 15
29	E S 15	E B 13	E S 15	E S 15	E	E	E B 15	G	G	G	G	E B 40	E B 40	G	G	35	35	40	50	22	E S 15	20	E	E S 15
30	E S 15	E S 15	E B 13	E S 15	E	E	G	G	G	34	G	41	41	40	40	34	31	27	35	18	E	16	E S 15	E
31	E	20	E B 12	E S 15	E B 14	E	G	27	33	37	42	56	41	G	42	35	35	24	25	E	17	E	16	22
.	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	31	30	30	30	30	30	31	31	31	31	31	31	30	31	30	30	30	30
MED	E 15	E E 13	E E 13	E E 14	E E 13	E E 12	E E 14	G	E G 20	E G 32	E G 35	E G 40	E G 38	E G 36	34	E G 32	25	24	18	E E 13	E E 15	E 15	E E 15	E 15
UQ	E S 15	E E 15	E 15	E S 15	E 15	E S 15	E E 15	G	30	34	38	40	39	39	38	34	30	26	25	20	E S 16	E S 15	E S 15	16
LQ	E	E	E B 12	F B 12	E	E	G	G	G	G	G	G	E G 32	E G 24	26	E G 20	G	20	E E 14	E	E	E	E E 12	E E 13

MAR. 1973 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 S 15	E S 15	13	13	E S 15	E S 15	E S 15	14	15	18	18	15	38	15	15	16	15	12	C	12	C	C	C	C
2	C	C	C	C	C	C	E S 15	C	C	C	C	C	25	15	19	16	15	14	13	E S 15	14	E S 15	E S 15	E S 15
3	14	12	14	E S 15	14	14	14	15	15	15	14	18	25	25	18	15	12	12	14	E S 15	E S 15	14	E S 15	14
4	E S 15	E S 15	12	E S 15	12	12	16	12	15	15	15	39	49	15	14	14	14	14	14	E S 15	E S 15	12	E S 15	12
5	12	E S 15	14	12	11	12	12	14	15	18	36	40	22	45	17	15	15	15	E S 15	E S 15	E S 16	E S 15	E S 16	E S 15
6	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	15	15	33	25	58	42	40	25	40	23	15	15	14	E S 15	13	E S 15	E S 15	E S 15
7	E S 15	13	E S 15	E S 15	E S 15	E S 15	E S 15	13	15	15	15	15	29	25	39	32	19	15	E S 15	13	15	12	E S 15	12
8	E S 15	12	E S 15	12	13	E S 15	E S 15	13	12	15	15	15	25	25	27	35	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
9	E S 15	13	13	E S 15	13	13	E S 15	13	15	15	15	15	25	25	19	15	15	15	14	11	E S 15	E S 15	14	14
10	E S 15	E S 15	12	12	E S 15	E S 15	14	14	14	15	15	25	38	24	15	15	14	12	E S 15	E S 15	12	E S 15	E S 15	E S 15
11	12	14	14	E S 15	E S 15	E S 15	15	15	14	15	16	39	31	28	20	15	14	12	11	12	E S 15	14	E S 15	12
12	E S 15	14	12	12	13	14	14	12	15	15	15	25	21	26	16	15	14	12	14	12	E S 15	E S 15	E S 15	12
13	12	12	12	12	E S 15	12	12	15	14	15	25	25	40	38	15	15	15	15	15	13	E S 15	E S 15	E S 15	E S 15
14	E S 15	E S 15	13	E S 15	E S 15	E S 15	E S 16	15	15	25	40	39	42	40	15	33	15	15	15	12	E S 15	E S 15	12	E S 15
15	E S 15	13	13	13	12	E S 15	13	15	30	25	38	44	25	22	19	40	15	14	15	E S 15	E S 15	E S 15	13	13
16	E S 15	E S 16	E S 15	E S 15	13	E S 15	15	12	15	16	17	25	26	25	32	19	15	15	16	12	12	14	E S 15	E S 15
17	E S 15	12	12	12	14	14	14	12	15	35	25	35	25	28	19	25	15	12	14	14	12	E S 15	12	E S 15
18	12	14	E S 15	14	14	E S 15	13	12	12	E S 39	E S 26	31	40	26	15	15	15	14	14	E S 15	12	14	E S 15	E S 15
19	E S 15	14	13	12	14	12	12	14	15	15	32	25	25	25	18	15	14	15	E S 15	E S 15	E S 16	E S 15	23	E S 15
20	E S 15	E S 15	13	13	12	E S 15	15	13	15	15	E S 39	40	31	26	22	15	12	11	12	E S 16	E S 15	E S 15	E S 15	E S 15
21	12	12	E S 15	12	12	E S 15	12	14	15	15	31	31	19	15	16	15	12	14	12	14	E S 15	14	E S 15	E S 15
22	14	14	12	12	E S 15	12	14	14	15	15	16	32	31	26	15	15	15	15	14	E S 15	11	14	E S 15	12
23	14	E S 15	12	14	12	E S 15	14	14	15	23	16	26	25	24	25	15	15	14	14	12	14	E S 15	14	14
24	14	14	14	12	14	14	14	15	15	21	25	25	26	25	35	25	15	15	12	14	E S 15	E S 15	E S 15	E S 15
25	E S 15	12	14	E S 15	14	14	14	14	14	15	25	19	32	25	26	19	12	12	12	E S 15	E S 15	E S 15	E S 15	E S 15
26	E S 15	E S 15	12	E S 15	12	14	15	15	15	36	23	30	28	25	25	19	15	13	12	13	E S 15	E S 15	E S 15	E S 15
27	E S 15	E S 15	E S 15	E S 15	13	E S 15	15	15	15	15	25	25	25	16	18	14	15	15	15	12	E S 15	E S 15	E S 15	12
28	13	E S 15	12	12	13	E S 15	15	15	14	23	22	25	25	25	22	15	15	13	15	12	E S 15	E S 15	E S 15	E S 15
29	E S 15	13	E S 15	E S 15	E S 15	13	15	15	15	15	22	40	40	25	26	15	15	13	13	14	E S 15	E S 15	E S 15	E S 15
30	E S 15	E S 15	13	E S 15	13	E S 15	14	15	15	22	25	25	25	25	15	14	14	12	14	E S 15	E S 15	E S 15	E S 15	E S 15
31	E S 15	E S 15	12	E S 15	14	14	14	15	15	15	25	25	24	26	25	19	15	14	12	E S 15	E S 15	E S 16	E S 15	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	31	30	30	30	30	30	31	31	31	31	31	31	30	31	30	30	30	30
MED	E S 15	13	12	13	13	E S 15	14	14	15	15	23	25	26	25	19	15	15	14	14	12	E S 15	E S 15	E S 15	E S 15
UQ	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	15	15	15	22	26	39	35	26	25	19	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15
LQ	13	13	12	12	13	14	14	13	15	15	16	25	25	24	16	15	14	12	13	12	12	13	E S 15	13

MAR. 1973 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	310	295	R 290	295	315	315	345	R 355	R 325	J R 340	I R 320	305	330	R 330	J R 340	R 340	C	R 340	C	320	C	C	C	C
2	C	C	C	C	C	C	335	C	C	C	C	C	320	320	325	320	335	J R 330	335	310	305	280	280	275
3	295	295	310	270	265	295	325	330	325	340	J R 345	290	J R 330	335	330	345	340	340	330	315	315	325	280	270
4	285	310	305	285	275	295	315	340	R 340	R 325	R 315	330	330	350	345	I R 330	330	355	R 335	310	295	290	300	305
5	305	305	290	310	320	260	320	350	330	320	315	J R 310	305	315	335	315	R 330	345	335	340	300	305	290	J R 290
6	J R 290	295	295	295	305	285	R	R 345	R	320	R 335	J R 305	I R 315	I R 320	R 315	J R 320	335	R 320	R 315	R 325	305	315	270	R 270
7	R	R	I R 280	260	305	315	295	R	R 315	325	J R 305	I R 320	I R 315	320	325	J R 330	325	J R 335	320	315	310	315	295	290
8	290	295	305	325	315	290	350	J R 345	R	340	320	J R 315	J R 335	325	J R 325	J R 330	J R 340	350	345	310	305	300	295	290
9	290	295	305	300	320	295	320	R	R	345	325	315	320	J R 300	330	330	340	330	335	325	300	295	295	295
10	290	275	280	300	315	315	325	335	S 320	330	350	325	335	320	305	325	345	330	335	340	285	285	300	290
11	295	295	290	290	315	290	340	R	J R 350	U S 330	J R 325	285	320	325	325	320	315	325	325	305	300	340	290	290
12	290	280	290	285	315	285	345	345	325	320	J R 325	320	300	325	J R 315	315	330	325	320	315	I S 300	305	I S 290	310
13	300	285	275	290	300	280	330	330	R 340	J R 320	I R 315	J R 305	320	315	J R 315	315	330	345	350	320	300	295	290	300
14	305	290	280	290	325	310	340	R	R	340	I R 325	J R 305	R 295	J R 305	330	J R 320	335	335	345	R 345	315	305	285	J R 295
15	280	300	300	315	330	285	335	R	340	J R 345	I R 320	285	J R 330	320	325	335	J R 325	330	J R 315	J R 340	300	I R 290	I R 295	285
16	R 300	285	280	300	320	330	350	J R 340	R	345	315	290	320	305	330	J R 320	330	325	345	340	285	275	285	I S 270
17	S 280	305	350	325	320	270	335	330	S 345	330	290	320	320	330	310	320	335	330	335	315	295	280	U S 300	285
18	290	290	310	295	335	J S 295	325	345	335	J R 325	295	J R 310	315	J R 330	320	320	325	335	320	330	295	290	270	270
19	275	290	325	325	280	275	310	U S 315	R 345	R 325	310	295	J R 320	325	315	315	320	315	330	J R 340	R 275	R	R	R
20	280	275	285	295	275	310	320	330	R 345	335	I S 325	J R 310	J R 320	320	310	305	330	330	310	310	260	255	265	300
21	295	330	270	300	260	J S 270	330	S 335	325	345	330	315	330	320	325	335	340	335	320	295	290	290	290	280
22	275	280	275	265	265	290	345	315	345	315	290	J R 320	330	325	350	J S 335	340	335	325	330	320	275	I S 275	265
23	F 270	305	345	315	270	270	325	340	330	R 305	305	R 345	325	320	330	J R 330	340	335	325	265	300	290	275	I A 270
24	F 285	295	330	350	A	260	335	S 345	360	320	310	310	J R 315	J R 325	R 325	I R 310	305	350	340	355	265	J S 290	S 270	280
25	280	295	290	S 315	345	S 285	340	350	315	I R 325	325	330	330	340	325	315	335	340	345	315	290	280	275	F
26	285	F 265	275	330	H 290	290	335	320	325	310	300	315	310	J R 330	340	350	350	J R 365	325	335	310	R 280	I R 290	J R 300
27	F	R 290	I R 310	320	I R 325	295	335	335	315	305	J R 300	315	J R 320	J R 310	320	J R 320	345	350	335	I R 330	305	J R 285	R 280	J R 275
28	R	J R 305	300	315	285	310	335	325	R	340	A	310	320	J R 325	330	340	325	340	I R 330	340	300	290	R 280	275
29	280	J R 285	330	335	290	295	360	R 345	355	330	315	300	315	330	J R 325	335	315	330	J R 345	R	310	I R 285	310	285
30	290	280	285	310	310	J R 315	R 335	355	I R 350	345	315	R 320	J R 330	325	315	335	325	340	330	320	295	290	285	275
31	270	270	295	340	335	275	350	330	310	315	310	310	J R 315	315	320	320	320	325	320	310	320	290	295	300
	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	27	29	30	30	29	30	30	25	24	30	29	30	31	31	31	31	30	31	30	30	30	29	29	28
MED	290	295	292	300	315	290	335	340	332	328	315	310	320	325	325	320	330	335	330	320	300	290	290	285
UQ	295	295	310	320	320	310	340	345	345	340	R 325	320	330	328	330	335	340	340	335	340	305	300	295	295
LQ	280	285	280	290	285	280	325	330	325	320	310	305	315	320	318	320	325	330	320	310	295	285	280	275

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MAR. 1973 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 1973 | 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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	L	L	L	L							
2									C	C	C	C	L	L	L	L								
3									L	L	L	L	L	L	L	L	L							
4									L	L	L	L	B	L	A		L							
5										L	L 380	L 360	L	B	L 400		L							
6									L	R	B	L 380	L	L 440	L 360	L	L							
7									L	L	L	L	L	L	L	L	L							
8									L	L	L	L	L 390	L	L	L	L							
9									L	L	L 420	L	U L 360	L	L	L	L							
10									L	L	L	360	L	L 390	U L 360	L	L							
11									L	L	L	L	L	L 380	L	L	L							
12									L	L	L 360	U L 380	U L 380	U L 360	L	L	L							
13									L	L	L	L 390	L 360	L	L	L	L							
14									L	L	L	L	L 360		L	L	L							
15									L	L	L	L 350	A	L	L	L								
16									L	L	L	380	L	L	L	L	L							
17									L	L	L 390	L	L	L	L	L	L							
18									L	L	L	U L 345	L 380	L	L	L	L							
19									L	L	L	L	L	L 370	L	L	L							
20										L	L	L	A	L	L	L	L							
21								L	L	L	L	L		L	L	L	L							
22									L	L	L	L	L	A	L	L								
23									L	L 335	380	385	L 375	L	L	L	L							
24									L	L	L	L 390	U L 365	L	L	L	L	L						
25										L	390	L	L	L	L	L	L							
26									L	L	L	A	L	L 370	L	L	A							
27									L	L	L 375	L 370	L 370	L 355	L 365	A								
28								L	L	L 390	A	L 350	L	L 360	L	L								
29									L	L	L	L 380	L 360	L 375	L 380	L								
30								L	L	410	L 370	L	L	L	L	L	L							
31									L	L	L	A	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	8	13	10	9	5									
MED										L 390	L 380	L 380	L 368	L 370	L 365									
UQ										400	L 390	L 380	L 380	L 380	L 380									
LQ										L 362	L 372	L 360	L 360	L 360	L 360									

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MAR. 1973 | M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1973 | 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									220	245	250	270	270	270	250	240	250							
2									C	C	C	C	270	250	250	250								
3									250	250	240	250	260	250	255	230	230							
4									230	240	250	270	270	245	245		240							
5										255	250	250	250	260	260	270	240							
6									250	240	250	300	290	280	285	260	250							
7									255	250	250	255	260	260	250	250	240							
8									240	250	270	285	265	250	250	250	240							
9									240	240	260	270	280	260	250	260	230							
10									240	255	250	280	245	270	300	255	230							
11									230	230	260	290	260	260	255	250	255							
12									250	260	270	260	260	260	260	250	240							
13									230	245	260	290	265	275	255	250	250							
14									250	250	240	270	300		250	250	260							
15									245	245	270	300	250	250	285	275								
16									240	240	280	305	270	290	260	260	250							
17									230	250	295	275	260	250	270	260	250							
18									250	270	280	280	270	250	260	260	245							
19									245	250	285	285	250	250	250	250	270							
20										230	270	270	250	260	270	270	235							
21								240	260	250	260	260		260	260	245	230							
22									230	250	260	275	260	260	230	250								
23									255	295	260	255	255	275	255	250	245							
24									230	255	290	280	270	250	250	255	280	230						
25										260	270	250	260	250	270	270	250							
26									255	260	300	280	250	250	250	250	250							
27									260	270	300	290	270	295	275	250								
28								250	285	250	A	300	290	270	255	260								
29									230	270	290	290	270	250	265	270								
30								230	240	255	285	280	270	250	260	260	250							
31									270	270	260	270	270	270	270	255	250							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	27	30	29	30	30	30	31	30	25	1						
MED								240	245	250	260	278	265	260	255	252	250	230						
UQ								245	252	260	280	290	270	270	268	260	250							
LQ								235	230	245	250	270	260	250	250	250	240							

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MAR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1973 | 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

Day \ Hour	00	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	290	290	265	240	240	210	225	200	235	200	200	220	210	235	230	230	235	C	200	C	C	C	C
2	C	C	C	C	C	C	200	C	C	C	C	C	220	205	220	220	230	220	205	220	245	260	280	290
3	255	280	240	300	300	280	220	210	230	225	225	220	220	205	225	220	220	210	220	220	245	220	290	A 350
4	320	250	250	260	290	245	230	220	225	220	200	205	B	245	I A 230	230	210	210	220	220	250	255	250	250
5	250	245	255	240	210	220	230	215	215	200	200	240	235	B	200	250	230	240	210	230	260	260	270	290
6	300	285	290	290	250	260	220	230	210	I A 220	I B 200	200	250	240	250	240	240	240	225	200	240	250	300	320
7	305	330	290	250	250	230	250	240	250	200	200	200	240	230	240	240	210	250	205	240	250	240	300	300
8	270	250	280	270	220	280	240	210	200	220	200	220	210	235	235	230	210	235	210	240	250	250	250	290
9	255	285	250	240	230	250	250	240	200	H 200	200	230	220	220	245	210	230	220	225	210	210	250	260	260
10	260	290	290	260	240	245	220	220	225	200	210	220	245	205	205	220	H 200	225	215	200	310	275	250	260
11	250	245	255	260	240	300	225	210	215	210	225	220	I A 250	220	240	205	220	230	220	250	245	220	255	280
12	280	280	280	280	240	250	220	220	220	220	210	210	205	200	220	H 205	240	230	210	230	I S 250	250	255	240
13	240	260	290	270	240	280	245	220	210	210	210	220	200	240	240	220	200	240	210	220	250	250	285	290
14	255	285	270	260	230	240	240	245	240	235	230	240	235	260	230	210	240	240	235	200	230	250	300	290
15	290	275	270	240	220	280	240	235	210	220	200	240	I A 230	235	240	250	240	240	220	210	240	285	315	270
16	290	290	285	285	240	250	220	240	230	220	195	200	255	225	205	A	I A 235	240	210	210	240	280	300	300
17	300	260	220	210	210	310	240	220	225	210	220	I A 220	240	230	230	240	240	230	220	210	240	270	280	290
18	280	260	255	250	215	290	240	210	225	240	245	220	220	245	230	H 200	230	240	220	205	220	290	350	350
19	305	275	225	220	240	290	250	240	240	220	240	205	240	240	240	235	250	250	240	290	290	245	300	300
20	280	290	300	230	310	260	265	240	240	225	225	E B 255	I A 230	225	205	205	240	240	240	225	250	340	280	280
21	260	225	260	255	345	310	240	240	225	225	210	210	255	210	225	210	220	225	240	240	245	270	255	290
22	300	290	280	290	305	270	210	245	230	220	205	A 250	205	I A 220	I A 210	205	240	210	240	215	210	270	300	320
23	300	255	210	I A 245	310	300	230	240	240	210	210	210	215	220	225	230	220	245	245	210	210	280	300	I A 315
24	310	255	250	230	A	330	240	230	225	230	245	210	220	220	220	220	255	245	210	210	250	290	315	300
25	300	290	280	245	205	290	225	240	240	205	220	A	I S 215	200	225	245	240	230	220	230	240	300	300	290
26	280	280	270	230	H 200	260	230	240	220	240	230	I A 230	240	220	250	240	I A 245	230	240	210	210	250	260	280
27	300	290	260	240	260	260	230	240	240	260	210	230	220	230	200	A	240	240	240	240	230	300	310	320
28	290	300	260	260	310	290	240	240	240	210	I A 240	240	210	240	250	210	200	250	240	230	250	280	300	300
29	290	290	240	240	290	240	220	235	210	210	240	220	240	210	200	245	290	245	245	205	200	290	290	290
30	300	290	280	250	250	250	220	220	210	195	230	200	280	A 250	245	220	240	240	240	220	220	250	275	290
31	305	300	260	210	240	260	220	225	220	220	250	I A 230	240	220	250	240	240	240	220	230	230	260	250	270
	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	29	30	31	30	30	30	30	29	30	30	31	29	31	31	30	31	30	30	30	30
MED	290	282	265	250	240	260	230	232	225	220	210	220	230	222	230	220	235	240	220	220	242	260	288	290
UQ	300	290	280	265	290	290	240	240	240	225	230	230	240	240	240	240	240	240	240	230	250	280	300	300
LQ	260	260	250	240	230	250	220	220	210	210	200	210	220	210	220	210	220	230	210	210	230	250	260	280

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IONOSPHERIC DATA

MAR. 1973 | H'ES (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

Day \ Hour	00	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	B	B	S	S	S	G	G	G	G	G	B	140	150	G	115	110	C	B	C	C	C	C
2	C	C	C	C	C	C	S	C	C	C	C	C	110	110	110	110	105	G	105	105	105	105	S	S
3	105	B	100	100	100	105	B	G	100	G	130	110	105	105	100	100	100	100	100	100	S	B	100	100
4	100	100	100	100	B	B	B	G	105	100	G	B	B	100	100	100	100	105	110	105	S	B	105	105
5	B	S	B	B	B	B	B	G	115	G	B	B	100	B	G	100	110	105	S	100	S	S	S	100
6	100	100	S	S	S	S	B	G	B	110	B	B	B	105	B	G	G	100	100	100	B	S	120	100
7	S	B	S	S	S	S	S	G	G	110	120	G	105	100	B	B	G	110	100	B	S	100	S	100
8	100	100	100	100	100	100	100	G	115	G	G	G	G	G	G	G	110	110	S	100	110	100	S	S
9	S	B	B	S	B	B	S	G	110	G	110	100	G	100	100	100	G	G	B	B	S	100	B	130
10	S	S	B	B	S	S	B	G	100	G	G	G	B	G	100	100	100	100	S	110	105	S	S	S
11	B	B	B	S	S	S	B	G	G	100	100	B	105	105	150	G	100	100	100	100	110	105	105	105
12	S	B	B	100	105	100	G	G	140	125	G	105	105	105	105	110	110	115	100	120	110	S	S	B
13	B	B	B	B	100	B	G	G	G	G	G	G	B	B	100	100	G	G	B	B	S	S	S	S
14	S	S	B	S	S	S	S	G	G	G	B	B	B	B	G	B	G	G	B	B	S	S	B	S
15	S	B	B	B	B	S	G	G	B	G	B	B	100	100	100	B	100	105	100	100	S	S	100	B
16	S	S	S	S	B	S	B	G	G	G	100	G	G	150	130	125	110	110	105	105	105	105	105	S
17	100	B	B	B	B	B	G	G	G	B	G	110	110	105	105	105	100	100	100	100	100	S	B	100
18	B	100	100	B	B	S	G	G	G	S	G	G	B	100	120	100	115	110	B	110	110	105	110	105
19	105	100	B	B	B	B	B	G	G	130	G	105	100	G	105	105	G	135	100	S	S	S	B	S
20	S	100	100	100	100	S	150	150	120	130	120	B	110	105	105	100	100	100	100	100	100	S	S	S
21	100	105	105	B	B	160	140	145	G	130	110	105	105	105	100	100	100	100	100	100	S	105	105	S
22	105	105	105	100	S	160	G	G	140	115	115	110	110	110	110	115	G	G	B	105	105	105	S	105
23	B	105	B	100	100	S	G	G	130	130	120	G	G	G	G	G	G	115	B	110	105	105	105	105
24	120	105	100	100	100	100	G	G	145	110	110	110	G	G	B	G	G	G	100	100	100	100	S	S
25	100	105	105	105	105	105	G	G	120	110	110	110	110	105	100	100	100	100	100	100	S	S	S	S
26	S	105	B	S	B	B	G	G	G	B	110	105	G	105	100	100	100	100	100	B	S	S	S	S
27	S	S	S	S	B	105	B	G	G	110	110	110	105	100	100	100	100	100	100	100	100	S	S	100
28	105	100	100	100	100	100	150	G	G	140	105	105	105	100	100	G	100	100	100	100	S	S	S	S
29	S	B	S	S	100	100	B	G	G	G	G	B	B	G	G	100	100	100	100	100	S	100	100	S
30	S	S	B	S	100	100	G	G	G	115	G	105	105	100	100	100	100	120	110	95	95	110	S	110
31	100	100	B	S	B	105	G	150	140	130	125	110	110	G	120	110	110	110	100	100	100	110	105	105
	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	14	10	10	11	12	4	3	13	16	15	14	17	21	23	21	22	25	21	24	15	14	11	14
MED	100	100	100	100	100	102	145	150	120	115	110	108	105	105	100	100	100	105	100	100	105	105	105	105
UQ	105	105	105	100	100	105	150	150	140	130	120	110	110	105	110	105	110	110	100	105	108	105	105	105
LQ	100	100	100	100	100	100	120	148	110	110	110	105	105	100	100	100	100	100	100	100	100	100	102	100

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MAR. 1973 | H'ES (KM)

IONOSPHERIC DATA

MAR. 1973 | 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

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

The Radio Research Laboratories, Japan

MAR. 1973 | TYPES OF ES

IONOSPHERIC DATA

MAR. 1973 | 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 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	300	300	R 350	300	290	260	255	R 250	R 260	R 260	I R 280	300	250	R 290	J R 280	R 260	C	R 260	C	290	C	C	C	C
2	C	C	C	C	C	C	250	C	C	C	C	C	300	290	290	295	260	J R 250	290	300	305	345	340	350
3	305	340	300	360	360	320	290	260	300	280	J R 250	330	J R 290	280	290	250	260	250	280	300	305	290	340	390
4	360	300	305	340	350	305	290	250	R 250	R 260	R 290	290	300	260	250	I R 270	270	250	R 290	290	315	310	305	305
5	305	305	340	300	280	390	260	240	260	300	300	J R 300	300	300	290	300	R 260	260	280	260	300	300	300	J R 350
6	J R 350	300	360	360	300	360	R	R 250	R	280	R 260	R 350	I R 300	I R 300	R 300	J R 300	270	R 290	R 300	R 280	300	300	360	R 390
7	R	R	I R 330	300	350	260	300	R	R 300	300	J R 315	I R 300	I R 300	300	300	J R 260	290	J R 260	260	300	300	300	310	360
8	300	300	300	300	250	305	250	J R 250	R	260	300	J R 310	J R 290	300	J R 300	J R 290	J R 260	260	260	300	300	300	300	350
9	300	350	300	300	290	300	300	R	R	250	290	300	300	J R 310	290	285	250	280	250	280	290	305	300	320
10	310	350	350	310	300	290	265	260	S 290	280	260	295	260	305	310	290	255	270	250	250	355	325	310	305
11	310	305	320	320	300	340	250	R	J R 250	U S 260	J R 290	350	300	300	290	295	300	290	290	300	305	250	340	340
12	340	350	350	345	290	320	260	250	295	300	J R 295	300	305	295	J R 300	295	280	280	290	300	I S 310	310	I S 320	300
13	300	340	360	345	300	350	250	250	R 250	J R 300	I R 310	J R 320	300	300	J R 300	300	290	260	250	290	310	300	350	310
14	300	350	360	340	270	300	280	R	R	270	I R 285	J R 340	R 350	J R 310	290	J R 300	300	290	270	R 260	300	300	360	J R 360
15	360	310	350	300	280	350	260	R	260	J R 270	I R 300	350	J R 300	270	300	300	J R 300	270	J R 260	J R 260	300	I R 350	I R 300	350
16	R 350	360	360	310	300	300	270	J R 280	R	245	360	320	295	305	290	J R 300	280	260	250	250	320	360	350	I S 350
17	S 350	300	250	260	280	350	250	250	S 250	285	310	300	300	280	300	290	285	260	250	290	310	350	U S 320	350
18	340	340	300	305	260	J S 350	260	250	260	J R 300	310	J R 310	300	J R 260	295	290	290	260	270	260	310	350	380	405
19	380	330	280	260	350	360	300	U S 290	R 250	R 300	315	350	J R 300	290	300	300	300	300	290	J R 280	R 295	R	R	R
20	360	360	350	300	390	300	300	290	R 260	250	I S 290	J R 300	J R 290	300	305	310	280	265	290	300	390	410	380	350
21	340	280	350	305	370	J S 350	260	S 260	290	250	280	300	280	300	295	270	260	250	290	300	345	330	320	350
22	360	335	350	360	360	320	250	300	250	290	320	J R 300	290	300	250	J S 280	250	250	290	290	290	340	I S 350	400
23	F 360	310	250	300	350	350	260	250	290	R 310	300	R 270	275	295	280	J R 270	270	280	290	245	300	360	350	I A 390
24	F 380	320	270	250	A	395	270	S 250	245	290	305	305	J R 300	J R 290	R 295	I R 300	305	255	250	250	390	J S 350	S 380	350
25	360	330	340	S 300	250	S 320	250	250	290	I R 280	300	290	280	260	290	300	280	250	250	290	340	360	380	F
26	340	F 345	320	260	H 290	305	250	290	280	290	320	300	300	J R 300	290	290	280	J R 260	260	260	300	R 350	I R 320	J R 320
27	F	R 360	I R 290	265	I R 290	300	260	260	290	300	J R 330	300	J R 300	J R 300	300	J R 300	260	260	280	I R 260	290	J R 360	R 350	J R 395
28	R	J R 310	300	290	360	310	260	290	R	270	A	310	300	J R 300	280	270	290	280	I R 260	260	300	350	R 360	260
29	360	J R 360	260	260	340	300	250	R 260	250	290	300	310	300	285	J R 300	290	300	290	J R 260	R	290	I R 360	300	320
30	360	350	360	300	300	J R 300	R 250	250	I R 255	250	300	R 290	J R 290	290	290	265	295	265	260	290	310	320	345	360
31	390	370	325	250	260	340	250	290	300	300	295	300	J R 300	300	300	290	290	290	280	300	290	330	310	310
	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	27	29	30	30	29	30	30	25	24	30	29	30	31	31	31	31	30	31	30	30	30	29	29	28
MED	350	335	328	300	300	320	260	250	260	280	300	300	300	300	295	290	280	260	270	290	302	330	340	350
UQ	360	350	350	320	350	350	270	280	290	300	310	320	300	300	300	300	290	280	290	300	310	350	350	360
LQ	308	305	300	290	280	300	250	250	250	260	290	300	290	290	290	275	260	260	260	260	300	300	310	320

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MAR. 1973 | HPF2 (KM)

IONOSPHERIC DATA

MAR. 1973 | 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 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	90	90	R 100	90	100	100	105	R 100	R 90	R 100	I R 95	90	100	R 100	J R 100	R 100	C	R 100	C	100	C	C	C	C
2	C	C	C	C	C	C	100	C	C	C	C	C	60	65	55	55	60	J R 70	55	95	90	100	80	100
3	95	80	60	100	130	80	60	60	55	45	J R 55	120	J R 55	65	60	60	90	55	80	70	55	50	110	80
4	90	70	90	105	100	100	70	55	R 50	R 80	R 60	30	50	50	50	I R 82	90	50	R 60	70	100	90	55	65
5	90	95	105	95	70	110	55	60	50	90	90	J R 90	90	90	100	90	R 100	100	100	100	90	90	90	J R 110
6	J R 110	90	100	100	90	100	R	R 100	R	100	R 100	R 100	I R 90	I R 90	R 90	J R 90	90	R 100	R 90	R 100	90	90	100	R 90
7	R	R	I R 100	90	100	100	90	R	R 90	90	J R 105	I R 100	I R 90	90	90	J R 100	90	J R 100	100	90	90	90	100	100
8	90	90	90	90	100	95	100	J R 90	R	100	90	J R 100	J R 100	90	J R 90	J R 100	J R 100	100	100	90	90	90	90	110
9	90	100	90	90	100	90	90	R	R	50	65	75	60	J R 90	65	40	55	70	55	70	110	90	100	80
10	95	100	100	90	90	70	60	60	S 60	60	40	60	60	70	90	55	50	70	55	50	85	115	85	90
11	90	90	80	80	60	75	50	R	J R 50	U S 60	J R 60	90	55	60	60	80	55	60	80	95	90	70	100	75
12	65	90	90	100	75	80	60	50	50	60	J R 50	85	90	60	J R 95	85	65	70	70	95	I S 80	85	I S 105	70
13	95	100	110	100	95	110	65	60	R 60	J R 90	I R 90	J R 100	90	90	J R 90	90	100	100	100	90	80	90	90	120
14	90	70	100	100	90	90	100	R	R	90	I R 95	J R 100	R 100	J R 90	100	J R 90	90	90	90	R 100	90	90	100	J R 100
15	100	100	90	90	100	90	100	R	100	J R 110	I R 90	110	J R 90	90	90	90	J R 90	90	J R 100	J R 100	90	I R 90	I R 90	100
16	R 90	100	100	90	90	90	90	J R 90	R	55	60	90	60	75	55	J R 55	70	50	50	70	100	80	90	I S 95
17	S 90	60	50	85	80	100	60	55	S 50	60	90	50	60	50	80	60	60	60	50	70	90	95	U S 60	90
18	100	100	60	90	50	J S 90	60	50	50	J R 60	90	J R 70	60	J R 60	60	70	70	65	85	60	90	95	90	90
19	80	70	60	60	100	100	70	U S 65	R 50	R 90	95	90	J R 90	100	90	90	90	90	100	J R 100	R 95	R	R	R
20	100	100	90	90	90	90	90	100	R 100	55	I S 60	J R 70	J R 70	70	85	65	70	70	60	75	110	90	90	95
21	80	75	100	100	100	J S 95	60	S 50	60	50	40	60	40	60	50	50	50	65	90	100	100	70	85	100
22	100	90	95	100	130	90	60	90	55	110	90	J R 60	55	60	50	J S 40	55	60	50	60	55	100	I S 100	100
23	F 95	90	50	100	100	100	60	70	60	R 60	80	R 40	80	60	70	J R 60	50	55	70	65	100	90	100	I A 90
24	F 80	80	60	50	A	100	50	S 50	50	70	65	75	J R 70	J R 65	R 60	I R 90	90	50	70	50	110	J S 90	S 70	100
25	100	70	100	S 60	50	S 90	50	60	55	I R 70	50	55	40	60	60	60	40	50	50	70	110	90	60	F
26	100	F 105	90	60	H 110	95	60	60	45	100	90	90	90	J R 90	100	100	100	J R 100	100	100	90	R 90	I R 80	J R 90
27	F	R 100	I R 100	95	I R 100	90	100	100	100	100	J R 100	90	J R 90	J R 90	90	J R 90	105	100	100	I R 100	100	J R 100	R 100	J R 90
28	R	J R 90	90	100	100	100	100	100	R	90	A	90	90	J R 90	100	90	100	100	I R 100	100	90	100	R 100	100
29	100	J R 100	100	100	120	90	100	R 100	100	100	90	80	90	95	J R 90	100	90	90	J R 100	R	100	I R 100	100	90
30	100	100	100	90	90	J R 90	R 110	110	I R 100	50	70	R 55	J R 30	45	70	55	50	50	50	70	90	90	100	90
31	100	120	75	50	50	110	50	60	90	60	60	70	J R 55	60	60	70	70	70	65	75	70	90	90	90
	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	27	29	30	30	29	30	30	25	24	30	29	30	31	31	31	31	30	31	30	30	30	29	29	28
MED	95	90	90	90	100	92	68	60	58	75	90	88	70	70	85	82	80	70	80	90	90	90	90	90
UQ	100	100	100	100	100	100	100	100	90	100	90	90	90	90	90	90	90	100	100	100	100	95	100	100
LQ	90	80	80	90	90	90	60	60	50	60	60	60	58	60	60	60	55	60	55	70	90	90	85	90

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MAR. 1973 | YPF2 (KM)

IONOSPHERIC DATA

MAR. 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 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	39	I A 35	34	35	S 37	37	27	49	68	73	87	78	87	105	111	106	98	81	81	64	48	39	37	36
2	36	F 36	39	33	32	32	32	44	66	78	S	J S 108	J S 111	J S 110	S 110	S 111	J S 110	92	J S 84	66	S 51	S 50	47	J S 45
3	47	38	S 41	39	F 39	39	S 45	61	83	J S 111	S 104	S 96	J S 121	J S 122	121	118	89	82	J S 78	S 66	58	50	41	38
4	38	39	34	31	32	31	29	57	72	73	81	77	92	111	101	S 90	84	81	S 84	72	46	43	41	S 43
5	41	42	33	34	38	30	30	51	59	70	97	100	101	U S 95	91	91	88	J S 87	69	S 48	38	S 38	J S 42	S 40
6	S 39	S 39	S 37	S 38	S 39	31	I C 33	C	C	C	76	72	101	125	J S 123	136	116	81	S 84	76	48	37	38	36
7	38	S 37	S 39	41	35	37	S 37	55	S 85	S 104	113	S 107	129	131	S 122	S 106	S 87	U S 83	66	S 60	S 51	48	U S 43	43
8	43	42	39	39	39	33	33	U S 51	68	75	J S 99	J S 111	J S 119	130	126	J S 122	S 107	84	69	60	54	48	49	45
9	42	40	40	43	40	29	31	61	78	S 83	88	90	S 100	J S 124	134	J S 126	J S 112	98	81	71	J S 64	S 42	39	40
10	S 42	40	36	37	39	36	34	59	J S 78	77	89	89	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	70	H 81	90	S 113	124	119	S 106	J S 112	J S 104	S 93	S 90	J S 77	64	S 51	S 43
12	S 45	43	41	42	42	34	34	59	71	90	J S 112	J S 117	J S 121	142	S 142	S 138	J S 143	S 129	I S 125	S 101	U S 72	55	53	S 46
13	S 43	38	S 36	37	40	S 33	34	J S 65	S 72	78	S 84	103	117	124	S 117	104	S 97	93	80	55	46	43	U S 45	S 43
14	U S 44	45	43	45	44	31	32	58	85	S 98	86	84	J S 110	127	J S 116	93	85	S 94	S 90	S 72	46	S 37	38	J S 41
15	S 40	40	41	43	40	28	31	J S 60	70	82	80	88	S 113	S 115	103	103	J S 98	91	88	65	57	48	S 49	46
16	S 46	47	47	46	46	32	34	56	69	74	71	73	J S 104	S 116	J S 110	102	100	92	S 82	68	47	S 45	I S 46	S 45
17	I A 45	47	54	35	29	24	30	58	66	78	86	S 105	128	S 125	S 117	110	S 100	J S 85	81	S 73	47	43	43	44
18	J S 47	S 45	S 42	S 42	S 42	26	32	55	65	65	76	101	S 111	106	92	98	99	86	J S 85	J S 76	63	S 50	S 50	S 45
19	S 48	S 52	S	43	H 28	25	29	S 63	73	75	S 84	S 92	J S 112	J S 107	U S 93	87	91	96	J S 101	S 91	J S 104	U S 85	S 72	61
20	56	55	S 59	F	F	J S 37	47	S 75	S 91	78	75	90	S 109	102	98	S 98	S 97	92	80	S 85	68	55	64	S 60
21	U S 60	S 62	43	S 40	32	31	31	S 73	88	S 80	78	100	U S 116	S 123	S 128	J S 122	J S 117	J S 84	J S 73	73	55	47	S 48	46
22	S 43	43	42	S 40	39	42	45	48	S 86	S 83	65	95	112	124	138	I S 115	97	S 80	78	85	64	32	34	33
23	F	S	38	24	F 24	24	31	52	70	J S 87	J S 105	95	93	90	J S 110	93	75	71	S 93	S 92	55	H 34	38	37
24	I A 37	38	42	A	A	F	F	58	61	65	S 86	97	S 108	J S 110	106	J S 110	106	S 118	J S 104	S 68	43	41	43	S 47
25	J S 44	40	41	39	34	30	31	56	82	76	89	79	93	95	89	92	100	96	75	62	47	42	46	S 46
26	I S 44	S 45	S 46	S 52	F 21	22	31	56	80	88	75	91	104	J S 112	J S 107	S 100	S 101	J S 88	S 81	J S 92	65	H 30	S 33	S 35
27	S 37	S 37	S 34	J S 43	F	F	F	52	S 61	63	79	106	U S 118	J S 117	S 113	J S 108	J S 98	81	74	65	43	37	39	39
28	38	38	37	39	27	26	S 32	56	77	79	82	92	108	122	118	109	105	93	82	A	A	A	43	43
29	S 43	42	46	42	32	F	S 46	56	63	62	72	94	S 102	103	104	90	94	S 120	I A 100	I A 70	I S 48	36	37	36
30	39	43	S 42	41	39	28	S 38	64	71	70	74	82	S 101	J S 115	J S 112	126	S 121	S 110	J S 102	S 97	S 95	S	S 59	S 58
31	I S 55	S 50	52	S 56	39	22	33	59	77	88	94	87	S 106	122	118	109	104	J S 113	S 108	J S 92	65	55	S 53	46
	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	28	27	27	28	29	29	30	30	31	30	30	30	30	30	30	30	29	29	28	30	30
MED	S 43	42	41	40	39	31	32	57	72	78	84	92	S 110	116	112	106	100	92	S 82	S 72	54	43	43	43
UQ	S 45	45	43	43	40	34	34	60	80	83	89	100	S 116	124	S 121	S 115	S 107	96	S 93	S 85	64	50	S 49	S 46
LQ	39	38	37	37	32	27	31	55	68	73	76	88	101	S 107	104	98	94	83	78	65	47	38	39	39

MAR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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	L	L	L							
2									290	L	L	L	L	450	L	L	L							
3										L	L	L	L	L	L	L	L	L						
4									L	L	L	L	L 480	L	L	L	L	L						
5									L	L	L	L	L	L	L	L	L	L						
6									C	C	L	L	U L 490	L 450	U L 470	U L 460	L	L	L 190					
7									L	L	L	L	U L 500	U L 480	L	U L 450	L	L 310						
8									L	L	U L 500	L 490	L 480	L 480	L	L	L							
9										L	L	L 490	L	L	L	L	L	L						
10										L	L	L 480	C	C	C	C	C	C						
11									C	L	L	L	L 490	L	L	L	L	L	210					
12									300	L	L	L	L	L 500	L	L	L	L						
13										L	L	U L 510	U L 520	U L 500	L 490	L	L	L						
14									L	L	L	L	L	L	L	L	L	L						
15										L	L	U L 510	500	U L 500	L	L	L							
16									310	L	L	L	L 500	U L 490	490	L	A	A						
17										L	L	L 510	L 470	L	L	L	L	L						
18									L	L	L	L 480	L	L 490	L 510	L 470	L	L						
19									L	L	L	L	L	L	L	L	A	L						
20									L		L	L 440	U L 450	U L 500	L	L	L	L 270						
21									L	L	L	A	L	L	U L 480	L	L	L						
22									L	L		L 470	U L 480	L 480	L	L	A							
23									L	L	L	L	A	L	L	L	L	L						
24										L	L	L 470	L	L	A	L	L	L						
25									L	L	L	L 430	L	L	L 490	L 440	L	L						
26									L	L	L	L	A	U L 460	L	L	L	L	L 220					
27									L	L	L 470	L 470	L 470	L 470	U L 480	L	L	L						
28									L	L	L	L 500	L 470	L 470	L 510	A	A	A						
29										L	L 460	L 480	L 480	U L 480	L 470	L	U L 450	A						
30									L	L	L	L	L	L	L	L	L	L						
31									L	L	L	L	L 500	L	L 470	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	14	15	15	10	4	1	2	3					
MED									300		L 470	L 480	L 480	L 480	L 485	L 455	U L 450	L 290	L 210					
UQ									305		L 485	L 500	L 500	U L 495	L 490	L 465			215					
LQ									295		L 465	L 470	L 475	L 470	U L 470	L 445			200					

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MAR. 1973 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 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 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								170	245	H 280	310	320	330	335	330	315	280	255	S					
2								S	260	285	310	330	340	330	A	A	A	A	S					
3								A	H 245	280	300	310	A	A	A	A	A	A	S					
4								S	250	290	315	325	340	340	340	320	I A 295	A	S					
5								150	H 250	290	310	320	330	325	325	310	295	240	A					
6								C	C	C	A	A	A	A	I A 330	A	A	240	S					
7								S	235	290	315	330	335	335	325	315	290	250	A					
8								180	H 250	280	I A 310	330	340	350	340	320	300	A	S					
9								S	245	H 290	310	330	I A 340	I A 340	340	320	290	240	140					
10								150	260	300	315	330	C	C	C	C	C	C	C					
11								C	C	290	325	A	A	R	A	I A 325	300	I A 255	A					
12								170	270	290	A	A	A	A	330	320	290	255	170					
13								S	240	300	320	330	A	A	A	320	300	260	S					
14								190	270	290	R 320	I R 335	H 340	H 350	345	330	305	250	S					
15								S	240	305	320	325	A	A	345	335	I A 310	265	A					
16								H 220	265	H 300	325	R 340	350	350	350	335	305	255	S					
17								190	260	H 300	320	330	335	A	A	A	A	A	S					
18								170	H 250	295	315	330	330	I A 330	330	320	300	260	S					
19								150	250	290	310	I A 320	340	A	A	A	A	250	180					
20								H 210	R 255	300	305	I A 340	A	A	I A 330	315	I A 290	240	H 180					
21								160	255	285	305	315	I A 320	I A 330	R 325	I A 310	I A 285	I A 250	A					
22								170	250	290	310	325	315	A	A	A	A	A	S					
23								165	250	290	300	320	A	A	A	310	A	A	A					
24								A	245	285	I A 310	A	A	A	A	A	300	A	S					
25								180	260	290	A	A	A	A	A	A	285	250	160					
26								H 170	250	295	310	315	A	A	A	A	290	240	A					
27								190	245	A	A	315	I A 320	I A 325	I A 315	305	I A 285	250	A					
28								185	260	295	315	330	A	A	A	A	A	260	S					
29								190	260	295	320	A	A	330	I A 330	315	300	250	A					
30								H 180	250	300	320	330	335	H 330	340	A	A	A	A					
31								190	H 275	300	330	335	340	340	A	A	A	A	180					
	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								21	29	29	27	25	17	15	17	18	20	20	6					
MED								180	250	290	315	330	335	335	330	320	295	250	175					
UQ								190	260	300	320	330	340	340	340	320	300	255	180					
LQ								170	245	290	310	320	330	330	330	315	290	245	160					

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MAR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 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 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	J X 29	J X 36	J X 34	E S 15	E S 15	E S 14	E S 15	G	G 16	G	G	J G 32	38	39	36	39	33	30	18	E S 14	23	27	E S 15	J X 25
2	23	23	23	22	18	20	18	E S 14	G	33	40	35	37	38	J X 48	J X 50	J X 35	J X 33	J X 36	J X 23	J X 25	17	23	E S 13
3	E S 13	E S 14	J X 28	J X 28	J X 22	J X 15	J X 17	J X 18	G	30	32	42	J X 44	37	36	40	33	J X 33	J X 21	19	J X 22	E S 15	E S 15	E S 14
4	E S 14	F S 13	E S 14	F B 13	E	E B 11	E S 14	E S 15	G	G	G	G	G 24	G 22	G 32	G 32	J X 44	J X 28	J X 29	25	J X 33	E S 14	E S 14	E S 14
5	E S 15	E S 14	E	16	E	E S 14	E S 14	G	G	G 21	33	35	38	35	36	36	J X 33	26	25	42	25	J X 20	18	E S 14
6	E S 13	E S 14	E S 14	17	E S 14	E S 13	C	C	C	C	34	36	39	J X 46	37	48	34	27	J X 23	27	25	22	E S 14	18
7	23	E S 14	E S 14	E S 15	16	26	24	31	G	35	33	G	G	G	G 31	J X 32	J G 26	J X 39	32	23	E S 15	E S 14	32	31
8	J X 40	E S 14	22	30	26	20	E S 14	G	27	30	34	36	37	G 35	G	G	G 21	27	J X 21	23	J X 21	22	J X 20	20
9	E S 14	E S 14	E S 15	E B 14	E	E B 14	E S 15	E S 14	30	34	J X 36	J X 34	J X 38	J X 39	J G 32	G 25	J X 32	G 18	G	18	E S 13	E S 13	E S 13	E S 14
10	E S 13	E S 14	E S 13	E B 14	E B 13	E S 14	E S 14	G	G	G	37	36	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	J G 28	G 30	38	42	39	42	34	32	27	20	E S 14	J X 17	J S 14	18	17
12	J X 64	J X 35	E S 14	F B 13	E	E S 14	20	G	G	35	40	42	39	34	34	33	30	J X 27	J X 21	19	21	E S 14	E S 14	J X 18
13	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	29	32	36	36	37	35	37	33	32	G	20	E S 14	E S 14	E S 14	22	E S 14
14	32	26	21	19	E	E S 14	E	G	G	G	G	G 29	G 27	G 27	G 32	G 24	35	27	J X 27	24	23	24	J X 18	E S 15
15	E S 14	E S 14	E S 14	E S 15	E	E S 14	E S 14	E S 15	G	G 26	37	37	42	39	G	42	34	35	25	J X 20	E S 14	E S 14	E S 14	J X 32
16	22	24	E	E S 14	16	E S 14	E S 14	G	G 23	G	35	38	38	38	38	43	J X 71	J X 61	J X 27	23	J X 27	23	21	J X 40
17	58	E S 13	E S 14	E S 13	E S 13	E S 14	E S 14	23	28	32	35	37	38	J X 54	J X 49	J X 46	38	J X 43	20	J X 18	18	E S 13	E S 14	J X 20
18	E S 14	J X 25	J X 23	19	E B 11	E S 14	E S 15	G	J G 24	30	35	34	38	40	37	J X 48	33	G 13	25	J X 32	J X 21	J X 20	J X 22	J X 32
19	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 13	23	29	31	33	33	G 33	35	46	34	J X 46	28	J X 25	23	17	E S 15	E S 15	E S 14
20	E S 14	E S 14	19	18	J X 18	J X 30	23	G	30	38	43	41	35	39	J X 42	G 24	J X 38	J X 25	G 18	25	E S 14	E S 14	E S 14	E S 14
21	E S 15	21	21	20	32	E S 13	E S 14	26	28	36	41	J X 52	J X 66	J X 36	J X 57	J X 37	J X 39	J X 31	J X 31	J X 26	16	E S 14	E S 14	E S 14
22	E S 14	J X 26	J X 36	J X 31	J X 35	J X 25	J X 24	G	27	34	J X 45	43	J X 55	39	37	J X 48	J X 44	J X 34	17	17	E S 14	E S 15	21	21
23	E S 14	23	23	J X 20	21	E S 14	E S 15	G	27	30	33	42	J X 68	J X 55	J X 36	J X 32	J X 31	26	22	J X 15	22	E S 14	E S 14	E S 14
24	J X 39	J X 21	J X 37	J X 35	J X 27	J X 21	J X 31	J X 23	26	G 28	J X 34	39	J X 52	J X 46	J X 66	J X 51	J X 36	J X 36	J X 80	J X 34	J X 24	21	18	17
25	J X 31	E S 14	E B 12	26	19	21	22	25	29	31	33	38	37	36	34	36	J X 30	J X 26	J X 34	J X 32	J X 25	17	J X 26	E S 15
26	E S 15	E S 14	E	18	22	E S 14	E S 15	G	31	32	32	37	J X 55	55	43	J X 36	J X 30	J X 28	19	24	26	25	20	E S 15
27	E S 15	E S 14	E S 14	J X 28	J X 17	E S 14	E S 15	G	J X 32	35	36	40	36	34	J X 38	G 30	J X 39	J X 29	J X 41	J X 29	J X 19	E S 13	23	27
28	24	24	J X 36	J X 25	J X 23	J X 18	21	25	30	35	36	J G 33	37	38	J X 55	J X 104	J X 60	J X 58	J X 85	J X 101	J X 87	J X 73	J X 34	J X 37
29	E S 14	E S 15	14	E S 15	E S 15	E S 15	J X 21	G 18	29	38	34	38	41	41	40	38	35	85	J X 104	114	J X 55	20	E S 14	J X 24
30	J X 34	17	J X 25	E S 14	E	18	16	G 16	29	35	39	41	43	40	41	38	J X 40	J X 32	J X 51	J X 32	J X 35	J X 21	19	23
31	25	17	E S 14	E S 14	E S 14	E S 13	E S 14	G	30	34	37	42	42	48	J X 80	J X 56	J X 56	J X 32	20	21	19	J X 22	18	J X 32
	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	29	29	29	30	31	31	30	30	30	30	30	30	30	30	30	30	30	30
MED	E S 15	E S 14	E E 14	16	15	E S 14	E S 15	E G 14	27	32	35	37	38	38	37	36	J X 34	J X 28	J X 25	23	22	16	18	18
UQ	29	23	23	22	21	18	20	18	29	35	37	40	42	40	J X 43	J X 46	J X 39	J X 34	J X 32	J X 29	J X 25	22	21	J X 25
LQ	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	G	G	G 28	33	34	37	35	34	32	32	27	20	19	17	E S 14	E S 14	E S 14

MAR. 1973 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 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	21	A	22	E S 15	E S 15	E S 14	E S 15	G	G 16	G	G	G 28	38	39	36	36	33	30	17	E S 14	E	18	E S 15	15
2	E	E	E	E	E	E	E	E S 14	G	33	39	G	37	37	37	34	29	23	32	18	21	E	E	E S 13
3	E S 13	E S 14	18	14	15	E	E	15	G	G	G	40	38	34	34	35	31	30	15	E	16	E S 15	E S 15	E S 14
4	E S 14	E S 13	E S 14	E B 13	E	E B 11	E S 14	E S 15	G	G	G	G	G 24	G 22	G 31	G 30	32	25	17	17	27	E S 14	E S 14	E S 14
5	E S 15	E S 14	E	E	E	E S 14	E S 14	G	G	G 21	G	G	34	35	34	35	31	G	18	27	20	16	E	E S 14
6	E S 13	E S 14	E S 14	E	E S 14	E S 13	C	C	C	C	34	36	36	35	37	40	30	16	G	E	E	E	E S 14	E
7	E	E S 14	E S 14	E S 15	E	16	13	G	G	G	25	G	G	G	G 28	19	G 24	22	21	E	E S 15	E S 14	25	E
8	E	E S 14	E	E	E	E	E S 14	G	G	G	32	35	33	G 33	G	G	G 19	27	18	E	19	E	E	E
9	E S 14	E S 14	E S 15	E B 14	E	E B 14	E S 15	E S 14	28	G	30	32	35	35	G 29	G 25	26	G 17	G	E	E S 13	E S 13	E S 13	E S 14
10	E S 13	E S 14	E S 13	E B 14	E B 13	E S 14	E S 14	G	G	G	36	G	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	G 25	G 28	38	42	38	42	33	32	26	17	E S 14	E	S	E	E
12	14	17	E S 14	E B 13	E	E S 14	E	G	G	33	37	41	38	34	E R 34	G	G	23	16	E	E	E S 14	E S 14	16
13	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	29	32	35	36	37	35	36	31	G	G	20	E S 14	E S 14	E S 14	E	E S 14
14	15	E	E	E	E	E S 14	E	G	G	G	G	G 29	G 27	G 27	G 28	G 24	G	G	19	E	E	23	E	E S 15
15	E S 14	E S 14	E S 14	E S 15	E	E S 14	E S 14	E S 15	G	G 23	37	37	37	38	G	39	33	34	20	16	E S 14	E S 14	E S 14	29
16	E	E	E	E S 14	E	E S 14	E S 14	G	G 23	G	G	38	37	G	37	42	67	58	26	E	16	E	E	37
17	A	E S 13	E S 14	E S 13	E S 13	E S 14	E S 14	23	G	G	G	G	G	36	39	40	32	27	18	17	E	E S 13	E S 14	E
18	E S 14	E	13	E	E B 11	E S 14	E S 15	G	G 23	G	34	34	G	37	35	37	G	G 13	25	30	19	17	18	E
19	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 13	G	G	G	G	33	G 32	35	39	34	44	G	G	21	E	E S 15	E S 15	E S 14
20	E S 14	E S 14	14	E	14	23	E	G	29	38	40	40	E R 35	34	42	G 24	31	18	G 15	15	E S 14	E S 14	E S 14	E S 14
21	E S 15	E	E	E	E	E S 13	E S 14	24	G	36	39	47	39	34	31	32	30	25	21	20	15	E S 14	E S 14	E S 14
22	E S 14	19	E	30	19	19	19	G	G	33	43	40	41	36	35	40	39	30	15	E	E S 14	E S 15	E	E
23	E S 14	E	E	14	15	E S 14	E S 15	G	G	G	G	42	63	37	34	28	30	25	21	S	E	E S 14	E S 14	E S 14
24	A	E	14	A	A	14	18	23	G	G 27	32	35	41	34	48	36	26	25	25	22	17	E	E	E
25	16	E S 14	E B 12	E	E	E	18	G	G	G	32	37	34	34	34	34	24	20	14	17	21	E	E	E S 15
26	E S 15	E S 14	E	E	E	E S 14	E S 15	G	G	G	G	G	49	35	34	32	25	20	17	16	17	E	E	E S 15
27	E S 15	E S 14	E S 14	14	E	E S 14	E S 14	G	G	33	34	39	35	34	35	G 29	31	18	39	18	16	E S 13	E	19
28	E	E	25	21	17	E	E	25	30	34	35	G 30	35	36	40	55	48	52	63	A	A	A	17	19
29	E S 14	E S 15	14	E S 15	E S 15	E S 15	16	G 16	G	28	33	36	36	40	38	36	33	77	A	A	54	16	E S 14	16
30	23	E	15	E S 14	E	E	E	G 15	G	33	37	40	40	39	39	33	35	27	28	27	31	17	17	E
31	15	E	E S 14	E S 14	E S 14	E S 13	E S 14	G	G	34	36	41	41	46	38	46	46	26	15	E	E	20	E	17
	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	29	29	29	30	31	31	30	30	30	30	30	30	30	29	30	29	30	30
MED	E S 14	E S 14	E E 14	E E 14	E	E S 14	E S 14	G	G	E G 21	32	36	36	35	35	34	31	25	18	16	15	E E 14	E E 14	E E 14
UQ	15	E S 14	E S 14	E S 14	E E 14	E S 14	E S 15	15	G	33	36	40	39	37	38	37	33	27	25	20	19	16	E S 14	15
LQ	E S 13	E	E	E	E	E S 13	E E 13	G	G	G	G	G 28	34	34	34	29	25	18	15	E	E	E S 13	E	E

MAR. 1973 | FBES (0.1 MHZ)

IONOSPHERIC DATA

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

MAR. 1973 | F-MIN (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAR. 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	305	I A 290	295	290	S 310	340	335	355	365	335	320	300	305	325	345	345	345	355	355	350	350	305	310	285
2	285	F 285	320	325	275	295	355	355	335	310	S	J S 325	J S 325	J S 320	S 320	S 315	J S 320	340	J S 335	335	S 300	S 300	295	J S 280
3	305	285	S 290	280	F 270	280	S 335	360	320	J S 340	S 345	S 300	J S 315	J S 310	310	335	335	340	J S 345	S 325	325	320	295	270
4	290	305	325	305	300	310	285	335	345	355	335	335	315	325	315	S 320	345	345	S 345	345	310	290	295	S 290
5	290	295	275	295	315	305	305	355	355	330	335	330	320	U S 335	315	320	320	J S 345	375	S 340	300	S 290	J S 275	S 280
6	S 280	S 290	S 275	S 285	S 335	305	I C 320	C	C	C	355	305	290	320	J S 300	325	330	335	S 325	340	340	275	270	275
7	290	S 265	S 290	320	295	300	S 300	330	S 320	S 320	320	S 305	320	325	S 325	S 335	S 335	U S 350	335	S 345	S 325	315	U S 300	300
8	300	310	295	310	345	310	335	U S 365	340	320	J S 310	J S 315	J S 300	315	325	J S 320	S 335	305	340	320	310	325	320	295
9	305	290	300	310	335	295	285	355	360	S 335	335	315	S 295	J S 305	305	J S 315	J S 320	320	335	325	J S 340	S 325	290	280
10	S 295	300	285	295	310	305	295	340	J S 360	335	335	335	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	330	H 310	295	S 310	315	320	S 300	J S 310	J S 325	S 315	S 325	J S 325	320	S 315	S 260
12	S 270	270	270	275	320	295	295	340	325	370	J S 320	J S 325	J S 300	315	S 315	S 310	J S 300	S 315	I S 310	S 310	U S 300	295	315	S 305
13	S 310	300	S 280	275	325	S 290	280	J S 340	S 345	335	S 315	305	315	320	320	320	S 330	340	355	330	310	285	U S 300	S 300
14	U S 275	290	300	315	345	305	295	330	340	S 350	340	290	J S 300	325	J S 320	320	315	S 340	S 350	S 345	335	S 275	275	J S 275
15	S 270	290	290	330	360	275	295	J S 350	350	345	325	295	S 315	S 315	310	315	J S 330	335	340	330	320	285	S 295	295
16	S 280	295	300	305	355	305	300	350	340	345	335	305	J S 305	S 320	J S 320	315	330	350	S 345	345	300	S 275	I S 280	S 265
17	I A 275	300	350	345	320	275	300	360	350	305	305	S 280	315	S 305	S 305	310	S 320	J S 325	335	S 330	330	270	270	275
18	J S 275	S 280	S 290	S 290	S 355	275	280	355	340	340	290	305	S 315	325	305	295	325	325	J S 315	J S 330	325	S 280	S 280	S 265
19	S 265	S 290	S	305	H 355	280	275	S 350	340	325	S 310	S 300	J S 310	J S 310	U S 310	310	310	310	J S 320	305	J S 300	U S 275	S 290	315
20	285	275	S 300	F	F	J S 255	290	S 335	S 300	360	320	305	S 305	335	315	S 315	S 310	330	325	S 330	325	255	280	S 295
21	U S 285	S 310	305	S 310	270	280	280	S 340	345	S 350	320	320	U S 310	S 310	S 320	J S 310	J S 325	J S 320	J S 330	330	320	285	S 310	280
22	S 280	285	285	S 285	265	290	330	330	S 350	S 305	305	305	320	315	330	I S 320	325	S 330	315	335	355	265	280	275
23	F	S	380	335	F 275	280	315	340	330	J S 320	J S 335	315	330	290	J S 325	335	335	310	S 320	S 360	365	H 265	275	275
24	I A 280	290	310	A	A	F	F	375	360	320	S 315	310	S 310	J S 315	305	J S 315	310	S 325	J S 345	S 340	255	255	255	S 260
25	J S 275	275	295	295	300	285	295	340	345	340	335	330	315	315	315	310	325	345	345	325	300	250	265	S 265
26	I S 280	S 265	S 285	S 325	F 260	275	290	330	335	360	320	310	320	J S 325	J S 335	S 320	S 325	J S 320	J S 325	J S 350	370	H 255	S 280	S 270
27	S 280	S 285	S 280	J S 300	F	F	F	355	S 335	270	300	315	U S 320	J S 320	S 325	J S 325	J S 335	355	340	345	350	280	270	275
28	280	300	305	340	350	280	S 330	340	350	310	305	295	295	310	305	310	315	320	340	A	A	A	270	280
29	S 280	265	315	315	315	F	S 295	355	350	340	310	310	S 335	320	325	305	310	S 335	I A 330	I A 340	I S 330	260	270	265
30	240	270	S 290	295	320	305	S 290	350	350	340	315	295	S 310	J S 320	J S 310	315	S 320	S 325	J S 315	S 320	S 325	S	S 265	S 260
31	I S 260	S 265	300	S 330	385	300	305	340	335	320	320	305	S 305	320	320	315	310	J S 310	S 325	J S 320	310	300	S 295	285
	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	28	27	27	28	29	29	30	30	31	30	30	30	30	30	30	30	29	29	28	30	30
MED	S 280	290	295	305	320	295	295	350	345	335	320	305	S 312	320	318	315	325	330	S 335	S 330	325	282	280	278
UQ	290	295	305	322	345	305	318	355	350	345	335	315	320	325	S 325	S 320	330	340	345	345	335	300	S 295	290
LQ	S 275	275	S 285	292	298	280	290	340	335	320	310	300	S 305	315	310	310	S 315	S 320	S 325	S 325	310	268	270	S 270

The Radio Research Laboratories, Japan

MAR. 1973 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 1973 | M(3000)F1 (0.01) | 135 E Mean Time (G. M. T. + 9h)

Station YAMAGAWA Lat. 31 12.1 N. Long. 130 37.1 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	L	L	L	L							
2									430	L	L	L	L	400	L	L	L							
3										L	L	L	L	L	L	L	L	L						
4									L	L	L	L	L 375	L	L	L	L	L						
5									L	L	L	L	L	L	L	L	L	L						
6									C	C	L	L	U L 375	L 385	U L 370	U L 360	L	L	L 375					
7									L	L	L	L	U L 345	U L 365	L	U L 380	L	L 380						
8									L	L	U L 345	L 355	L 380	370	L	L	L							
9										L	L	L 375	L	L	L	L	L	L						
10										L	L	L 365	C	C	C	C	C	C						
11									C	L	L	L	L 365	L	L	L	L	L	405					
12									415	L	L	L	L	L 360	L	L	L	L						
13										L	L	U L 355	U L 335	U L 365	L 370	L	L	L						
14									L	L	L	L	L	L	L	L	L	L						
15										L	L	U L 365	360	U L 350	L	L	L							
16									420	L	L	L	L 360	U L 355	375	L	A	A						
17										L	L	L 355	L 385	L	L	L	L	L						
18									L	L	L	L 355	L	L 365	L 365	L 365	L	L						
19									L	L	L	L	L	L	L	L	A	L						
20									L		L	L 395	U L 400	U L 360	L	L	L	L 435						
21									L	L	L	A	L	L	U L 370	L	L	L						
22									L	L		L 370	U L 365	L 365	L	L	A							
23									L	L	L	L	A	L	L	L	L	L						
24										L	L	L 365	L	L	A	L	L	L						
25									L	L	L	L 415	L	L	L 345	L 375	L	L						
26									L	L	L	L	A	U L 380	L	L	L	L	L 385					
27									L	L	L 355	L 360	L 360	L 370	U L 350	L	L	L						
28									L	L	L	L 350	L 385	L 360	L 345	A	A	A						
29										L	L 370	L 360	L 360	U L 365	L 365	L	U L 360	A						
30									L	L	L	L	L	L	L	L	L	L						
31									L	L	L	L	L 350	L	L 360	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	14	15	15	10	4	1	2	3					
MED									420		L 355	L 362	L 365	L 365	L 365	L 370	U L 360	L 408	L 385					
UQ									425		L 362	L 370	L 378	L 370	L 370	L 378			395					
LQ									418		L 350	L 355	L 360	L 360	L 350	L 362			L 380					

MAR. 1973 | M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1973 | 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 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									220	235	300	260	275	270	255	230	240							
2									220	250	260	255	260	255	260	260	250							
3										250	230	260	275	255	255	240	230	235						
4									220	235	255	240	275	255	255	255	235	235						
5									210	280	265	265	260	245	260	280	270	235						
6									C	C	250	290	320	275	270	260	245	230	235					
7									250	270	260	255	285	255	255	255	250	240						
8									235	230	285	270	275	255	255	250	240							
9										230	250	260	280	280	270	250	245	245						
10										225	255	250	C	C	C	C	C	C						
11									C	225	255H	290	285	265	255	255	275	240	225					
12									225	260	270	250	270	265	260	250	255	240						
13										250	255	290	280	260	260	260	260	240						
14									240	245	245	315	310	275	255	255	250	250						
15										255	250	275	280	260	265	270	255							
16									235	235	260	295	310	270	280	280	270	245						
17										250	290	295	285	275	275	270	250	245						
18									235	240	330	285	275	250	290	290	255	240						
19									235	250	280	280	275	255	260	290	275	270						
20									245		260	285	250	255	285	270	250	235						
21									240	235	275	265	270	275	250	260	240	230						
22									250	225		290	265	275	240	250	250							
23									255	275	250	260	270	325	260	250	250	250						
24										245	275	275	265	255	270	275	275	245						
25									245	240	245	250	275	265	275	270	255	225						
26									255	250	280	285	265	275	250	260	250	245	230					
27									230	280	305	280	270	255	265	250	250	230						
28									250	245	270	295	285	275	255	260	255	240						
29										245	295	300	275	265	260	280	290	255						
30									230	250	280	300	290	260	280	270	250	250						
31									255	255	245	280	300	275	255	255	265	255						
	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									21	29	30	31	30	30	30	30	30	25	3					
MED									235	245	260	280	275	265	260	260	250	240	230					
UQ									250	250	280	290	285	275	270	270	260	245	232					
LQ									230	235	250	260	270	255	255	250	250	235	228					

The Radio Research Laboratories, Japan

MAR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1973 | H'F (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

Day \ Hour	00	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	A	310	285	255	220	225	210	215	205	H 195	H 185	220	235	235	225	220	225	220	200	210	250	250	270
2	300	305	250	250	315	300	200	200	200	230	245	205	210	200	225	230	210	235	230	210	240	255	250	275
3	250	255	290	295	305	300	225	205	230	H 205	205	E A 250	205	H 190	195	H 200	220	235	220	215	220	220	240	275
4	250	250	240	250	250	230	250	220	210	H 200	H 200	H 190	195	H 200	H 195	195	225	225	230	210	240	255	250	250
5	250	245	220	265	240	225	240	205	210	H 200	H 190	H 180	H 205	H 175	H 200	H 200	200	240	215	225	E A 250	280	275	280
6	295	275	300	295	230	E S 245	I C 225	C	C	C	H 200	H 200	H 195	235	230	A	220	225	225	205	205	280	310	320
7	300	340	290	240	205	250	255	240	220	H 200	H 190	H 200	195	H 195	210	205	210	240	210	205	235	245	290	285
8	280	245	250	255	210	255	230	200	210	220	H 200	220	200	190	H 190	H 190	220	225	220	220	240	220	250	260
9	270	270	265	245	220	265	290	225	225	205	H 195	H 190	190	190	H 200	H 195	220	H 225	220	220	205	220	250	280
10	260	250	280	280	250	230	260	225	230	225	H 240	215	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	215	H 195	215	225	220	E A 250	H 220	225	220	225	215	210	220	215	255
12	290	290	290	275	225	245	260	220	200	215	220	225	190	185	H 200	200	215	230	230	205	215	235	240	250
13	250	260	E S 300	E S 290	225	E S 270	E S 300	225	220	230	220	H 210	H 195	H 185	205	205	210	220	210	200	210	280	260	270
14	300	270	260	255	205	250	250	230	225	225	200	H 190	H 190	200	H 225	225	225	250	225	210	200	E A 300	E S 280	300
15	300	290	270	235	205	E S 250	E S 275	220	230	220	215	200	200	200	H 190	E A 240	220	250	225	205	220	250	270	E A 300
16	300	290	255	255	210	225	260	225	210	H 190	210	205	205	200	210	E A 250	A	A	220	210	210	280	290	A
17	A	270	225	200	250	340	290	210	220	220	220	H 200	H 215	210	H 225	E A 250	220	235	230	210	200	280	300	295
18	290	280	250	250	200	E S 290	290	210	200	H 190	H 200	H 190	H 185	225	H 205	220	240	235	225	225	220	245	270	320
19	305	250	220	230	H 200	E S 325	300	220	230	220	200	200	195	220	I A 215	210	I A 220	235	235	250	235	225	255	225
20	295	275	280	220	F 225	340	270	225	235	245	E A 245	E A 235	H 235	215	E A 245	210	225	215	235	235	225	335	290	270
21	280	250	200	250	E S 275	295	305	235	235	235	230	I A 200	H 200	H 180	H 190	210	230	210	245	225	225	250	250	290
22	300	300	250	E A 350	330	295	250	245	230	220	E A 250	225	E A 230	205	205	E A 250	A	225	250	220	200	H 250	305	340
23	325	240	205	230	340	320	245	220	H 205	230	H 200	E A 240	I A 200	200	190	220	215	205	250	205	200	E S 270	300	310
24	A	300	255	A	A	E A 345	280	215	225	H 190	H 190	215	E A 240	H 195	A	240	H 210	235	210	205	240	300	315	290
25	280	290	255	250	210	255	275	225	230	H 215	H 200	H 210	H 190	H 200	H 225	H 210	H 210	230	220	220	245	310	295	295
26	275	280	270	225	H 180	E S 310	270	235	H 180	220	H 210	H 200	I A 220	210	H 200	215	220	225	H 200	225	200	E S 290	305	300
27	290	275	280	260	205	E S 250	240	225	220	H 200	200	225	205	H 205	210	H 200	230	215	235	210	200	310	320	E A 320
28	300	255	E A 300	250	E A 245	315	260	240	240	225	H 225	H 200	210	200	A	A	A	A	E A 250	A	A	A	300	300
29	290	280	230	220	215	300	240	210	220	H 200	205	205	210	225	230	245	245	A	A	A	250	275	295	300
30	350	275	255	245	220	240	245	225	225	210	210	225	225	240	230	H 200	250	H 240	230	230	230	200	260	295
31	305	290	250	215	200	E S 260	255	230	235	225	220	225	220	A	225	225	220	H 225	230	205	215	245	245	250
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	30	29	29	30	30	29	29	30	31	31	30	29	28	28	27	27	29	28	29	29	30	29
MED	290	275	255	250	222	252	255	225	220	218	202	202	202	200	208	210	220	225	225	210	218	252	271	285
UQ	300	290	280	260	250	298	272	225	230	225	219	218	215	215	225	224	225	235	230	222	235	280	300	300
LQ	272	255	250	235	205	238	240	210	210	H 200	H 200	H 200	195	195	H 200	200	215	225	220	205	205	245	250	270

MAR. 1973 | H'F (KM)

IONOSPHERIC DATA

MAR. 1973 | 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 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	100	100	100	S	S	S	S	G	105	G	G	100	155	145	150	115	110	130	105	S	105	100	S	100
2	100	100	100	100	100	100	100	S	G	150	135	150	125	110	100	100	105	100	100	105	100	100	100	S
3	S	S	100	100	100	100	100	100	G	125	125	110	105	105	105	105	110	105	100	100	100	S	S	S
4	S	S	S	B	E	B	S	S	G	G	G	G	100	100	100	100	110	110	100	100	100	S	S	S
5	S	S	E	95	E	S	S	G	G	100	120	120	110	115	115	110	110	110	100	100	95	95	95	S
6	S	S	S	105	S	S	C	C	C	C	115	160	105	105	170	100	140	105	100	100	95	130	S	130
7	95	S	S	S	105	100	100	105	G	100	105	G	G	G	105	100	95	95	95	95	S	S	105	105
8	105	S	100	100	105	100	S	G	170	140	105	110	100	100	G	G	95	115	95	95	105	110	105	100
9	S	S	S	B	E	B	S	S	150	115	100	100	100	100	100	100	100	100	G	100	S	S	S	S
10	S	S	S	B	B	S	S	G	G	G	155	165	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	100	100	150	130	140	140	150	125	120	105	S	105	S	100	105
12	105	100	S	B	E	S	105	G	G	115	105	105	105	105	135	130	130	95	95	95	105	S	S	100
13	S	S	S	S	E	S	S	S	155	145	125	120	110	105	160	100	150	G	110	S	S	S	105	S
14	100	100	105	105	E	S	E	G	G	G	G	100	100	100	100	100	130	125	100	95	110	105	105	S
15	S	S	S	S	E	S	S	S	G	105	120	120	115	120	G	130	120	115	110	105	S	S	S	105
16	100	120	E	S	100	S	S	G	105	G	170	145	145	125	125	120	110	105	105	105	105	105	105	105
17	105	S	S	S	S	S	S	150	155	145	135	130	125	110	110	110	110	105	105	105	100	S	S	100
18	S	100	100	100	B	S	S	G	105	135	125	120	115	115	115	115	120	100	110	105	105	105	105	105
19	S	S	S	S	E	S	S	140	145	150	125	105	105	100	100	100	100	155	100	95	95	S	S	S
20	S	S	100	105	105	105	105	G	130	120	115	110	110	100	100	100	95	95	100	100	S	S	S	S
21	S	100	100	100	100	S	S	145	155	125	120	110	105	105	105	100	100	100	100	100	100	S	S	S
22	S	100	100	100	100	100	100	G	150	130	120	115	110	115	110	110	105	105	105	100	S	S	100	100
23	S	105	105	100	100	S	S	G	150	150	140	115	105	100	100	105	105	105	105	S	100	S	S	S
24	105	100	100	100	100	100	100	100	160	105	105	110	105	105	100	100	100	120	90	90	95	95	95	95
25	100	S	B	100	105	100	140	150	150	155	145	110	110	110	110	105	105	100	95	95	95	95	105	S
26	S	S	E	100	100	S	S	G	115	120	140	125	100	100	100	100	100	100	100	100	100	100	95	S
27	S	S	S	105	110	S	S	G	105	120	115	110	110	105	100	100	100	100	95	95	100	S	105	100
28	105	105	100	100	100	100	105	150	145	130	115	105	105	100	100	100	100	125	115	110	110	105	100	100
29	S	S	100	S	S	S	105	100	170	100	140	110	110	110	105	170	145	115	110	105	110	110	S	105
30	105	95	100	S	E	100	105	100	150	140	130	125	125	115	110	110	105	105	100	100	105	100	100	105
31	105	100	S	S	S	S	S	G	150	130	130	125	125	110	110	130	130	100	105	100	100	95	95	105
	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	13	14	16	14	10	11	10	20	25	28	29	29	29	28	29	30	29	29	26	24	15	17	17
MED	105	100	100	100	100	100	105	122	150	125	122	115	110	105	105	105	108	105	100	100	100	100	100	105
UQ	105	100	100	102	105	100	105	150	155	140	135	125	115	115	115	115	120	115	105	105	105	105	105	105
LQ	100	100	100	100	100	100	100	100	122	115	115	110	105	100	100	100	100	100	100	95	100	98	100	100

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MAR. 1973 | H'ES (KM)

IONOSPHERIC DATA

MAR. 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 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	F 3	F 5	F 4						L 1			L 1	H 1	H 2	HL 11	CL 22	CL 31	HL 22	L 1		F 1	F 2		F 2
2	F 2	F 1	F 1	F 2	F 1	F 1	F 1			H 2	H 2	H 1	H 1	C 1	L 2	L 2	L 2	L 3	L 7	F 2	F 7	F 1	F 1	
3			F 2	F 2	F 2	F 1	F 1	L 1		H 2	HL 22	C 2	C 2	C 1	C 2	CL 21	C 2	C 4	L 1	F 1	F 3			
4													L 1	L 1	L 1	L 2	CL 32	CL 31	L 2	FF 11	F 3			
5				F 1						L 2	C 1	C 1	C 1	C 1	C 1	C 2	CL 12	CL 12	L 3	F 5	F 3	F 2	F 2	
6				F 1							C 2	HC 11	C 2	CH 21	HL 12	L 3	HC 23	L 3	L 1	F 1	F 2	F 1		F 1
7	F 2				F 1	F 2	F 3	L 1		L 2	L 2				C 2	L 2	L 4	L 4	L 5	F 2			F 4	F 3
8	F 3		F 1	F 2	F 1	F 1			HL 22	H 1	C 1	C 1	L 1	L 1			L 3	LL 22	L 3	F 1	F 3	F 1	F 1	F 1
9									H 2	C 2	L 2	L 1	L 1	L 2	L 2	L 1	L 2	L 1		F 1				
10											HC 11	HC 11												
11										L 2	L 1	HH 11	HC 22	HC 11	HC 11	HCL 11	HL 11	C 2	L 1		F 1	F 1	F 1	F 1
12	F 2	F 5					F 1			C 2	C 2	C 2	C 2	C 1	HL 12	HL 11	HL 11	L 4	L 5	F 2	F 1			F 1
13									H 1	H 1	H 1	C 1	C 1	C 1	HC 13	L 3	HL 12		L 4				F 2	
14	F 2	F 1	F 1	F 1								L 1	L 1	L 1	L 2	L 2	HL 11	CL 22	LC 23	F 3	FF 11	F 5	F 2	
15										L 1	C 1	C 1	CL 11	CL 11		H 2	C 1	CL 32	C 3	F 2				F 4
16	F 1	F 1			F 1				L 2		HL 11	HL 11	HL 11	H 1	H 1	C 2	C 4	C 4	C 4	F 1	F 2	F 2	F 1	F 7
17	F 4							H 2	H 2	H 1	H 1	H 1	H 1	C 1	C 1	C 3	C 3	C 3	LH 11	F 7	F 1			F 1
18		F 3	F 2	F 1					L 2	HL 12	HL 11	CL 11	CL 11	CL 11	C 1	C 2	C 1	L 1	CL 51	FF 41	F 4	F 4	F 7	F 1
19								H 2	H 2	H 1	H 1	L 1	L 1	L 2	L 2	L 2	L 3	HL 13	LC 11	F 6	F 1			
20			F 2	F 1	F 2	F 7	F 2		H 2	C 2	C 2	C 1	C 1	CH 11	L 2	L 1	L 3	L 1	L 1	F 4				
21		F 3	F 1	F 2	F 2			H 3	H 1	H 2	C 2	C 2	C 1	C 1	LL 11	LL 21	L 2	L 2	L 2	F 4	F 1			
22		F 5	F 5	F 5	F 4	F 3	F 6		H 1	H 2	C 2	C 2	C 2	C 1	C 1	C 2	C 3	L 2	L 1	F 1			F 1	F 1
23		F 1	F 1	F 1	F 1				H 2	H 1	H 1	C 2	C 2	L 2	L 1	L 1	L 2	L 2	L 3	F 1	F 2			
24	F 5	F 2	F 2	F 4	F 4	F 1	F 3	L 1	H 1	L 2	C 1	C 1	C 2	C 1	L 3	L 3	L 3	CL 14	L 5	F 6	F 2	F 2	F 1	F 1
25	F 2			F 1	F 1	F 1	F 4	H 3	H 2	H 2	HL 11	C 2	C 1	C 1	C 1	CL 21	L 3	L 2	L 3	F 4	F 4	F 1	F 3	
26				F 1	F 1				C 1	HL 12	H 1	C 1	C 2	L 1	L 1	L 1	L 2	L 3	L 2	F 2	F 2	F 2	F 2	
27				F 3	F 1				L 1	C 2	C 1	C 2	C 1	L 1	L 2	L 2	L 3	L 2	L 5	F 5	FF 12		F 1	F 2
28	F 1	F 2	F 3	F 4	F 3	F 3	F 1	H 3	H 2	HL 22	C 2	C 1	CL 11	L 2	L 3	L 4	L 5	HL 34	CL 32	FF 53	FF 41	FF 51	F 2	F 3
29			F 2				F 2	L 2	HL 12	LH 21	HL 12	C 1	C 1	CL 11	CL 21	H 1	HL 11	CL 52	CL 53	FF 47	FF 34	FF 11		FF 21
30	FF 31	F 1	F 3			F 1	F 1	L 2	HL 12	H 2	H 1	H 1	H 1	C 1	C 1	C 1	L 2	L 1	L 4	F 2	FF 41	F 2	F 1	F 2
31	F 2	F 1							H 1	H 2	H 2	H 1	HL 11	CL 11	C 1	HC 11	HC 12	L 1	L 1	F 1	F 2	F 2	F 1	F 2
	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																								

MAR. 1973 | TYPES OF ES

IONOSPHERIC DATA

MAR. 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 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	54	50	45	45	48	30	23	45	64	72	84	95	104	113	120	126	114	111	104	86	U R 65	47	46	44
2	41	38	37	40	32	33	35	40	55	84	112	122	125	115	114	120	123	120	105	95	83	75	62	55
3	52	S 40	35	J S 38	36	36	38	50	S 61	97	117	105	126	134	150	163	150	122	116	119	110	94	R 92	F
4	F	F	47	49	35	29	20	46	69	75	88	100	101	123	140	129	120	121	U R 106	96	92	U R 77	85	78
5	70	59	54	43	40	32	29	43	57	67	90	115	113	103	110	114	118	110	A	54	S 52	J R 59	52	J S 46
6	S 46	42	J S 40	U S 40	42	37	24	50	S 61	85	85	86	112	160	177	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	R 93	108	122	132	144	R 154	147	135	R 112	R 107	85	67	R 54	S 53	49
8	50	47	40	41	S 37	27	23	45	63	80	100	120	137	142	151	159	160	144	115	96	86	84	68	S 53
9	45	44	42	47	38	27	28	54	71	84	96	106	117	145	167	168	156	143	130	107	R 116	85	S 63	46
10	46	43	32	35	35	32	32	56	71	67	85	104	96	113	123	125	115	109	97	84	76	S 73	59	A
11	S 52	56	S 48	44	39	35	33	61	66	71	84	94	114	129	127	150	157	151	150	153	142	R 100	C	C
12	C	C	C	C	C	C	C	C	C	87	111	124	135	165	J R 174	165	160	162	147	145	122	92	85	77
13	54	44	40	39	41	28	30	55	75	77	96	107	127	144	146	136	122	116	97	77	76	J R 61	53	S 53
14	49	48	44	45	37	24	27	53	80	91	107	100	111	136	137	123	119	111	106	74	R 64	J R 62	51	45
15	45	44	45	57	32	24	25	50	68	82	90	102	110	124	116	119	113	112	104	85	86	83	76	S 63
16	F	64	U S 70	S 63	46	28	28	51	74	77	80	84	103	127	121	120	126	114	104	79	76	R 98	F	F
17	64	F	F	43	25	26	26	53	67	78	96	112	130	C	C	C	C	C	C	C	C	C	C	C
18	64	66	71	66	53	27	30	57	65	63	84	101	107	110	104	108	110	102	101	94	84	70	62	59
19	R	F	73	45	35	F	F	56	70	67	83	104	108	128	114	120	130	138	132	128	156	116	R	R 106
20	R 72	56	60	65	31	32	F	F 60	76	93	80	91	121	118	118	114	127	118	100	112	108	R	79	86
21	67	62	66	35	32	31	31	61	84	80	90	108	123	159	170	169	175	165	146	R	R 97	62	60	50
22	39	39	41	36	33	35	39	55	86	90	69	99	118	130	169	156	145	154	J S 138	146	111	R 66	R	S 41
23	35	S 56	33	A	19	20	23	50	67	105	112	98	93	109	135	132	116	100	114	137	91	R 68	50	J R 53
24	48	66	77	A	23	F	26	60	61	65	90	110	118	115	129	145	148	146	144	97	R 70	R 57	54	54
25	63	47	45	40	38	30	29	55	77	97	83	74	91	112	127	118	128	121	99	64	56	U S 45	U S 44	45
26	46	45	45	V 48	21	F 19	F 23	57	73	89	76	86	110	114	120	110	119	129	R 124	116	55	31	30	33
27	33	35	36	43	26	23	28	50	60	74	73	99	122	136	144	140	130	127	105	95	68	J R 61	54	J R 54
28	48	F 59	S 49	J S 41	F 24	25	V 27	58	70	80	89	100	113	143	162	162	172	164	150	R 128	R 72	R 53	45	45
29	40	39	45	39	F 25	26	33	54	63	65	72	92	111	115	125	127	130	145	R 137	93	70	R 64	J R 54	S 52
30	S 56	J R 53	61	67	56	26	F 28	59	76	84	82	98	115	133	154	174	174	163	160	155	U R 138	90	R 84	85
31	84	82	89	S 95	42	27	32	R 58	72	94	95	98	113	141	149	147	146	154	160	U R 135	U R 115	96	J R 77	S 53
	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	26	28	27	29	27	27	29	29	31	31	31	31	30	30	29	29	29	28	28	29	28	25	25
MED	50	48	45	43	35	28	28	54	69	80	89	100	113	128	136	132	130	122	114	96	84	69	59	53
UQ	63	59	60	48	40	32	32	57	74	90	96	108	122	142	154	156	150	146	141	128	110	88	76	59
LQ	45	43	40	40	31	26	26	50	63	73	83	96	109	115	120	120	119	112	104	85	70	R 60	52	46

MAR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 automatio operation

Day \ Hour	00	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	U L 500	U L 500	L 470	L	L	L	L	L					
2										L	L 480	L	L 470	L 480	U L 500	L	L	L						
3									L	L	L	L	L	L 500	L	L	L	L	L					
4										L	L	L	L	430	L	L	L	A	L					
5									L	L	L	L	L 460	L 500	L 470	U L 470	L	L						
6									L	L	L	L 490	L 510	U L 480	L	C	C	C	C					
7									C	L	L 470	L 500	L 490	L 500	L	L	L	L						
8									300	L	L	L 490	L 490	U L 510	U L 520	L	L	L	L					
9									L	L	L	U L 490	L 490	U L 480	U L 480	L	L	L	A					
10									L	L	L	L 470	L 500	480	L	U L 480	A	L						
11										L	L	L	L	L 500	L	L	L	L	220					
12									C	L 430	L	L	L	L 480	L 500	L	L	L	L					
13									L	L	L	L 500	L 500	U L 500	L	L	L	L						
14									L	L	L	L 490	L 540	L	L	L	L	A						
15										L	L	L 500	L 500	L 500	L	L	L	L	L					
16										L	L	L 500	U L 500	L 500	L	L	L	L						
17										L	L	L 490	U L 510	C	C	C	C	C	C					
18										L	L 490	L 480	L	L 500	U L 470	L 470	L	L	L					
19									L	A	L	L	A	U L 480	L	L	L	L	L					
20									L	L	L	L 490	L	L	L	A	L	L						
21									L	L	L	L	L	U L 470	L	L	L	L	L					
22									L	L	L	L	A	L	L	L	430	L						
23									L	L	L	U L 470	L 470	L	L	L	L	L	L					
24											L	L 480	L 480	L	L	L	L	L						
25									L	L	L	L 450	L 470	L	L	L 440	L	L	L					
26									L	L	L	L	L 470	A	L 470	L	L	L	L					
27									L	L	L 470	U L 470	A	A	L 480	L	L	L	A					
28									L	L	L	L 470	L 480	L	L 480	L	L	L	A					
29										L	L 470	L 480	L 480	L 500	L	L	L	L	L					
30									L	L	L	L 490	L	L	U L 500	L 480	L	L	L					
31										L	L	L 500	U L 490	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	1	5	21	20	19	10	5	1		1					
MED									300	L 430	L 470	L 490	L 490	L 500	L 480	L 470	430		220					
UQ											L 480	L 500	L 500	L 500	U L 500	U L 480								
LQ											L 470	L 480	L 475	L 480	L 470	L 470								

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MAR. 1973 | FOF1 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 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	240	290	325	335	350	350	340	325	295	A	A					
2								S	220	290	320	340	355	350	345	A	A	A	A					
3								S	225	270	315	330	340	340	A	A	A	A	180					
4								S	250	295	325	340	350	350	330	330	A	A	A					
5								S	245	295	320	330	A	355	340	320	A	A	A					
6								170	230	280	305	335	340	340	335	C	C	C	C					
7								C	C	290	325	335	340	335	340	335	300	A	A					
8								S	230	280	305	330	335	355	I A 340	315	295	A	A					
9								S	240	300	A	A	A	A	A	335	305	270	A					
10								170	240	285	320	350	350	350	345	A	A	265	A					
11								S	215	300	330	350	370	340	335	340	315	A	A	B				
12								C	C	A	A	A	350	350	A	325	310	270	195					
13								185	240	300	325	350	335	340	A	335	310	270	190					
14								170	260	310	325	335	340	350	350	335	320	280	A					
15								200	270	310	330	340	350	350	335	335	315	A	A	B				
16								170	270	310	335	350	350	A	350	345	320	270	A					
17								180	250	290	325	335	350	C	C	C	C	C	C					
18								A	220	250	300	345	350	355	345	335	320	275	A					
19								S	A	285	A	A	A	A	R 340	325	305	R 270	A					
20								S	245	295	A	A	R 335	A	A	A	A	260	175					
21								S	240	285	310	320	330	R 325	325	310	305	260	200	S				
22								A	245	295	315	330	335	320	A	A	A	A	195					
23								S	235	290	315	325	A	R 330	R 325	A	A	A	A	A				
24								A	235	A	A	A	A	A	A	R 320	290	245	A	A				
25								150	245	A	A	A	A	A	R 330	325	300	265	190	S				
26								160	250	A	A	A	370	A	A	A	A	245	185					
27								160	240	295	320	R 340	335	R 335	R 340	335	320	270	A	S				
28								A	245	300	A	335	345	A	A	330	R 325	A	A	S				
29								180	250	300	325	340	350	350	345	335	310	270	A					
30								165	250	310	340	A	A	A	350	A	A	A	A					
31								210	270	305	335	350	355	355	340	320	A	A	A					
	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	27	23	23	24	21	21	21	18	15	8					
MED								170	242	295	325	335	350	350	340	330	310	270	190					
UQ								180	250	300	325	342	350	350	345	335	320	270	195					
LQ								165	235	288	315	332	338	340	335	325	300	262	182					

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MAR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 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

Day \ Hour	00	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 28	M 20	E S 15	J X 24	J X 19	E B 13	M 18	M 20	G	G	34	37	40	41	47	44	36	28	19	E S 15	E S 15	E S 15	M 21	M 20
2	M 21	E S 15	E S 16	E S 15	E S 16	E S 15	E S 15	G	28	34	38	39	44	37	G	J X 44	J X 39	J X 46	J X 47	J X 23	M 18	M 21	M 22	M 19
3	E S 16	E S 15	E S 16	J X 20	J X 25	J X 20	J X 19	E S 15	G	29	J G 25	G 29	J G 32	40	38	36	37	29	G	E S 15	J X 20	E S 15	E S 15	E S 16
4	E S 16	E S 15	E S 15	E B 11	E B 12	E B 13	E S 16	M 22	G	G	G	G	G	G	36	35	J X 58	J X 43	23	J X 18	M 17	M 18	J X 19	M 22
5	M 20	M 17	M 21	E B 11	E B 12	E B 13	E S 15	E S 16	G	G	34	39	40	39	40	41	J X 43	25	J X 87	J X 28	J X 24	J X 19	M 20	E S 16
6	E S 16	E S 15	E S 16	M 18	J X 19	J X 18	E S 15	G	G	31	35	37	G	39	40	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G 32	G 29	G 19	J X 38	J X 28	J X 21	M 22	E S 15	E S 15	E S 15
8	E S 15	J X 31	E S 16	E S 15	E B 13	E B 13	J X 21	M 22	G	31	34	36	36	G 25	G 30	39	32	27	20	J X 28	M 17	M 18	J X 21	J X 25
9	J X 19	J X 19	M 18	M 20	E	E S 15	M 17	G	G	J X 35	J X 35	J X 40	37	J X 48	J X 43	J X 35	J G 25	J G 25	J X 32	J X 25	J X 17	M 17	M 17	E S 15
10	E S 15	E B 13	E S 15	E S 16	E B 13	E S 15	E S 15	G	J G 25	J G 28	36	G	G	42	40	40	J X 48	28	J X 38	J X 18	J X 16	M 21	J X 38	J X 74
11	J X 35	J X 24	J X 19	E S 15	E S 15	E B 13	E S 15	G	G	33	34	40	46	44	38	G	34	36	21	J X 16	M 18	J X 20	C	C
12	C	C	C	C	C	C	C	C	C	32	35	J X 38	37	36	J X 36	J G 31	J G 30	J G 25	J X 20	J X 18	J X 44	J X 36	J X 18	E S 15
13	E S 15	E S 16	E S 16	E B 13	E B 11	E B 12	M 19	G	27	32	34	38	36	36	36	37	37	G 17	24	J X 17	M 17	M 20	M 21	E S 15
14	J X 18	E S 15	E S 15	J X 17	M 21	J X 17	E B 13	G	G	G	G	37	G 29	45	41	39	36	J X 45	J X 29	J X 22	J X 18	J X 18	M 22	E S 16
15	M 18	J X 24	E S 15	E B 13	E S 15	E B 13	E S 15	G	G	33	35	40	44	41	44	41	38	29	21	E B 12	E B 12	E S 15	E S 16	E S 16
16	J X 25	J X 20	J X 17	M 18	E B 11	E B 13	E S 15	G	G	33	36	37	37	41	46	38	42	J X 37	J X 32	J X 23	M 17	M 18	J X 19	J X 18
17	J X 54	E S 15	M 19	M 20	J X 20	M 18	E S 15	G	27	32	35	41	40	C	C	C	C	C	C	C	C	C	C	C
18	M 17	E S 16	E B 13	J X 20	J X 20	J X 17	J X 16	J X 24	G 19	G 25	G 29	G 32	40	37	37	40	38	32	25	17	M 20	E S 15	E S 15	19
19	M 18	J X 17	M 17	M 16	M 19	J X 16	J X 22	G	J X 40	37	38	J X 47	J X 88	33	G 33	G 27	36	J G 23	J X 38	J X 26	J X 33	J X 20	M 22	18
20	M 20	E S 15	J X 18	J X 16	J X 18	J X 15	J X 16	21	30	34	37	J X 36	39	35	J X 48	J X 57	J X 38	J X 43	J X 24	J X 21	J X 20	M 20	J X 24	M 21
21	E S 16	E S 16	M 21	J X 21	J X 23	J X 20	J X 27	J X 23	27	32	34	43	J X 50	44	38	35	G	G	J X 18	J X 19	M 22	J X 24	E S 15	M 22
22	E S 16	E S 15	E B 13	J X 38	J X 43	J X 44	J X 50	J X 28	27	32	34	41	J X 51	J X 71	J X 70	38	J X 38	29	J X 28	J X 25	J X 26	E S 15	M 23	M 22
23	E S 16	M 19	J X 23	J X 40	J X 31	J X 20	M 17	G	G	G	35	37	J X 41	J X 57	G 28	J X 35	J X 37	28	24	J X 23	E S 15	M 17	M 19	E S 16
24	M 20	J X 20	J X 51	J X 36	J X 36	J X 22	J X 15	J X 24	30	34	J X 60	J X 38	J X 38	37	J X 49	J X 48	J X 48	J X 43	J X 64	J X 43	J X 21	M 17	E S 16	J X 17
25	J X 18	J X 24	M 17	M 17	M 20	J X 18	M 18	G	29	33	36	39	41	39	41	35	42	G	G	E S 15	E S 15	J X 35	J X 17	J X 20
26	M 18	E S 15	J X 25	J X 19	E B 11	M 18	M 17	G	29	33	36	39	J G 35	J X 51	J X 74	J X 48	J X 64	J X 36	G 17	J X 21	J X 25	J X 18	M 21	E S 16
27	E S 16	E S 16	E S 15	E S 15	J X 19	M 22	E S 15	G	G	G	G	G 30	49	47	G 28	G	G	G	J X 36	27	J X 45	J X 48	J X 40	J X 26
28	J X 28	J X 35	J X 30	J X 19	M 21	J X 20	J X 24	25	29	31	34	37	38	34	J X 41	G 32	J X 36	J X 50	J X 49	J X 41	J X 31	M 22	E S 16	M 17
29	E S 16	E S 15	E S 15	E S 15	M 19	E S 16	M 22	G 17	G 20	32	35	35	38	40	41	38	32	29	23	M 20	M 18	M 17	E S 16	M 18
30	J X 17	J X 24	J X 41	M 18	J X 25	M 22	M 20	G	28	35	41	44	45	46	J X 54	J X 46	J X 41	J X 34	J X 21	19	J X 17	J X 19	J X 24	J X 64
31	J X 50	J X 36	J X 33	J X 24	J X 21	E B 13	E S 15	G	29	33	37	40	44	J X 48	J X 47	J X 57	J X 61	J X 60	J X 59	J X 41	J X 24	J X 18	J X 18	J X 21
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	31	31	31	31	30	30	29	29	29	29	29	29	29	28	28
MED	18	E 16	17	18	19	16	16	G	G 20	32	35	38	39	40	40	38	37	29	J X 24	J X 21	J X 18	18	19	18
UQ	J X 20	J X 20	J X 21	J X 20	J X 21	J X 20	M 19	21	28	33	36	40	44	45	J X 46	41	J X 42	J X 38	J X 36	J X 25	J X 24	J X 20	M 22	22
LQ	E S 16	E S 15	E S 15	E E 15	E E 13	E B 13	E S 15	G	G	G 26	34	36	36	36	36	35	34	25	21	J X 18	17	17	E S 16	E S 16

MAR. 1973 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	26	E	E S 15	16	16	E B 13	E	G	G	G	34	37	40	40	45	43	33	27	19	E S 15	E S 15	E S 15	14	E
2	E	E S 15	E S 16	E S 15	E S 16	E S 15	E S 15	G	27	34	37	38	43	37	G	40	31	35	45	21	E	16	E	E
3	E S 16	E S 15	E S 16	E	17	16	15	E S 15	G	29	G 25	G 29	G 30	38	36	34	36	28	G	E S 15	16	E S 15	E S 15	E S 16
4	E S 16	E S 15	E S 15	E B 11	E B 12	E B 13	E S 16	G	G	G	G	G	G	G	36	35	41	40	21	16	E	E	E	E
5	E	E	E	E B 11	E B 12	E B 13	E S 15	E S 16	G	G	33	39	38	39	38	35	35	25	A	E	E	E	E	E S 16
6	E S 16	E S 15	E S 16	E	15	E	E S 15	G	G	30	34	37	G	38	39	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G 32	G 28	G 19	G 32	23	20	E	E S 15	E S 15	E S 15
8	E S 15	E	E S 16	E S 15	E B 13	E B 13	16	G	G	30	34	36	36	G 23	G 30	36	36	27	19	27	E	E	E	24
9	17	16	E	E	E	E S 15	E	G	G	27	35	35	37	41	36	30	G 25	G 21	27	20	16	E	E	E S 15
10	E S 15	E B 13	E S 15	E S 16	E B 13	E S 15	E S 15	G	G 21	G 28	36	G	G	40	38	39	46	27	26	17	16	E	31	A
11	34	16	E	E S 15	E S 15	E B 13	E S 15	G	G	32	34	39	46	43	37	G	34	35	20	15	E	16	C	C
12	C	C	C	C	C	C	C	C	C	30	34	38	37	36	35	G 27	G 24	G 18	18	E	21	30	16	E S 15
13	E S 15	E S 16	E S 16	E B 13	E B 11	E B 12	E	G	27	37	34	37	36	36	36	36	37	G 17	23	E	E	E	22	E S 15
14	16	E S 15	E S 15	E	E	E	E B 13	G	G	G	G	37	G 29	44	40	37	36	45	28	21	U A 20	E	E	E S 16
15	E	16	E S 15	E B 13	E S 15	E B 13	E S 15	G	G	32	35	39	42	39	43	40	37	28	21	E B 12	E B 12	E S 15	E S 16	E S 16
16	16	17	E	E	E B 11	E B 13	E S 15	G	G	33	36	37	37	38	43	37	41	35	30	20	E	E	E	E
17	U A 22	E S 15	E	E	E	E	E S 15	G	27	32	34	41	39	C	C	C	C	C	C	C	C	C	C	C
18	E	E S 16	E B 13	E	E	E	E	17	G 19	G 23	G 28	G 30	38	37	36	37	37	31	24	E	E	E S 15	E S 15	18
19	E	15	E	E	E	E	E	G	30	37	36	42	85	E R 33	G 33	G 27	35	G 20	25	22	33	E	E	E
20	E	E S 15	15	15	16	15	E	20	29	33	37	35	39	E R 35	45	U A 55	32	23	22	19	E	E	21	E
21	E S 16	E S 16	E	E	15	17	16	16	27	31	34	42	38	40	35	34	G	G	G	G	E	17	E S 15	E
22	E S 16	E S 15	E B 13	22	22	28	22	18	27	31	33	40	50	38	35	35	31	28	18	21	23	E S 15	E	E
23	E S 16	E	23	A	15	15	E	G	G	G	34	36	36	37	G 28	33	30	27	21	21	E S 15	E	E	E S 16
24	E	E	40	A	16	19	E	18	28	33	40	36	38	36	35	40	39	31	33	33	20	E	E S 16	E
25	E	E	E	E	E	E	E	G	28	33	35	38	36	37	41	35	31	G	G	E S 15	E S 15	35	E	E
26	E	E S 15	16	E	E B 11	E	E	G	29	33	35	37	G 34	48	36	40	31	22	G	20	28	E	E	E S 16
27	E S 16	E S 16	E S 15	E S 15	U A 18	E	E S 15	G	G	G	G	G 30	48	47	G 28	G	G	G	30	28	45	40	20	25
28	U A 29	30	24	15	11	19	16	25	29	31	34	37	38	E R 34	39	G 30	30	36	40	30	26	19	E S 16	E
29	E S 16	E S 15	E S 15	E S 15	E	E S 16	E	G 16	G 20	32	35	35	38	39	40	36	37	29	22	E	E	E	E S 16	E
30	17	E	21	E	18	16	E	G	28	35	40	44	45	46	40	37	36	30	21	16	E	19	20	45
31	44	28	29	E	15	E B 13	E S 15	G	28	33	36	40	43	46	46	40	35	50	26	28	21	17	E	E
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	31	31	31	31	30	30	29	29	29	29	29	29	29	28	28
MED	16	E E 15	E E 15	E E 11	E E 13	E E 13	E E 15	G	G 20	31	34	37	38	38	36	36	35	28	22	19	15	15	E E 14	E E 15
UQ	16	E S 16	E S 16	E E 15	16	15	E S 15	16	28	33	36	39	41	40	40	39	37	32	27	21	20	16	E S 16	E S 16
LQ	E	E E 13	E	E	E E 11	E	E	G	G	G 25	34	35	36	36	35	33	31	22	19	15	E	E	E	E

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MAR. 1973 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 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 automatio operation

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

The Radio Research Laboratories, Japan

MAR. 1973 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1973 | 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 automatio operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	310	310	310	310	340	340	330	330	365	340	320	330	320	320	325	330	340	340	340	350	U R 340	330	300	310
2	300	335	300	345	270	290	360	330	315	310	320	340	330	320	300	310	320	335	330	350	310	275	305	300
3	320	S 325	290	J S 300	215	300	380	330	S 350	330	330	310	310	320	305	320	330	320	340	340	330	380	R 305	F
4	F	F	310	320	350	370	280	340	355	350	325	330	300	320	320	330	325	335	U R 340	330	320	U R 300	305	310
5	300	320	270	285	330	350	350	360	360	340	310	340	335	310	310	310	320	340	A	350	S 300	J R 270	280	J S 280
6	S 280	290	J S 270	U S 280	330	330	280	335	S 330	345	340	275	280	290	310	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	R 300	300	310	310	310	R 305	320	320	R 310	R 320	320	320	310	S 300	300
8	285	305	330	315	S 320	340	330	320	330	310	310	310	320	310	300	315	270	340	335	330	320	310	290	S 310
9	315	290	300	330	380	290	290	350	350	330	320	320	300	300	300	300	310	320	335	315	R 320	335	S 250	290
10	300	340	290	340	330	300	300	350	370	320	310	335	300	305	310	310	320	320	340	310	300	S 275	300	A
11	S 290	320	S 320	300	310	310	300	350	350	320	320	300	310	320	290	305	310	320	320	350	345	R 320	C	C
12	C	C	C	C	C	C	C	C	C	305	305	320	300	300	J R 305	300	310	305	315	320	335	300	305	320
13	300	300	275	300	350	280	270	340	360	330	310	300	300	300	300	300	325	330	340	300	270	J R 255	290	S 320
14	300	300	300	320	370	280	330	330	330	310	310	310	290	310	310	320	320	335	350	340	R 305	J R 255	280	280
15	290	280	300	340	375	280	280	350	340	340	315	320	300	315	310	315	315	330	340	335	300	285	275	S 280
16	F	280	U S 315	S 320	380	290	280	330	340	350	330	300	290	310	305	315	320	330	350	330	300	R 265	F	F
17	280	F	F	390	290	340	280	350	340	310	300	300	295	C	C	C	C	C	C	C	C	C	C	C
18	300	300	330	330	370	290	275	360	360	320	310	320	310	315	310	305	320	320	330	340	330	310	260	315
19	R	F	360	360	310	F	F	350	360	310	300	320	300	320	300	305	310	320	340	325	325	325	R	R 330
20	R 275	280	295	350	310	280	F	F 330	330	360	320	280	335	315	315	310	305	330	320	330	340	R	280	310
21	300	310	360	320	305	290	280	345	350	340	330	310	300	310	310	310	310	320	320	R	R 340	280	285	280
22	295	300	330	300	290	290	310	340	330	360	310	305	310	300	330	315	300	310	J S 310	345	345	R 300	R	S 280
23	280	S 360	380	A	260	300	310	340	320	335	350	335	295	295	320	330	330	310	310	365	355	R 280	280	J R 280
24	280	290	350	A	270	F	310	375	375	320	320	330	325	305	310	310	325	330	350	330	R 290	R 280	270	290
25	325	300	320	300	305	310	320	350	340	360	350	320	300	310	330	320	320	350	360	310	300	U S 270	U S 280	290
26	300	310	310	V 350	375	F 270	F 300	350	350	350	330	300	320	320	325	315	315	330	R 340	370	360	280	275	290
27	300	310	315	360	400	270	300	370	345	340	295	300	310	310	320	320	320	340	330	370	265	J R 250	260	J R 280
28	280	F 300	S 300	J S 320	F 280	290	V 300	350	340	320	310	300	310	310	315	300	320	330	350	R 355	R 330	R 270	280	280
29	290	300	330	380	F 310	310	300	380	350	330	305	290	310	310	320	305	320	340	R 350	340	345	R 260	J R 280	S 270
30	S 260	J R 295	300	340	370	330	F 310	340	350	350	295	300	305	305	300	315	310	320	330	350	U R 340	310	R 280	280
31	280	290	315	S 350	360	300	300	R 340	325	320	320	310	295	310	320	315	310	315	330	U R 340	U R 310	345	J R 325	S 290
	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	26	28	27	29	27	27	29	29	31	31	31	31	30	30	29	29	29	28	28	29	28	25	25
MED	298	300	310	320	330	300	300	345	350	330	315	310	305	310	310	315	320	330	338	340	320	282	280	290
UQ	300	310	330	348	370	320	315	350	355	342	322	320	310	315	320	320	320	335	340	350	340	310	300	310
LQ	280	290	300	305	305	290	280	335	330	320	310	300	300	305	305	305	310	320	325	328	300	R 270	280	280

MAR. 1973 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 1973 | 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 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									L	L	L	U L 370	U L 370	L 380	L	L	L	L	L					
2										L	L 370	L	L 385	L 370	U L 370	L	L	L						
3									L	L	L	L	L	L 380	L	L	L	L	L					
4										L	L	L	L	440	L	L	L	A	L					
5									L	L	L	L	L 380	L 370	L 380	U L 380	L	L						
6									L	L	L	L 360	L 350	U L 350	L	C	C	C	C					
7									C	L	L 370	L 400	L 370	L 360	L	L	L	L						
8									410	L	L	L 360	L 370	U L 370	U L 370	L	L	L	L					
9									L	L	L	U L 370	L 380	U L 380	U L 370	L	L	L	A					
10									L	L	L	L 370	L 360	370	L	U L 360	A	L						
11										L	L	L	L	L 380	L	L	L	L	340					
12									C	L 390	L	L	L	L 400	L 360	L	L	L	L					
13									L	L	L	L 370	L 360	U L 355	L	L	L	L						
14									L	L	L	L 380	L 350	L	L	L	L	A						
15										L	L	L 365	L 370	L 360	L	L	L	L	L					
16										L	L	L 360	U L 370	L 360	L	L	L	L						
17										L	L	L 360	U L 360	C	C	C	C	C	C					
18										L	L 350	L 370	L	L 355	U L 370	L 360	L	L	L					
19									L	A	L	L	A	U L 370	L	L	L	L	L					
20									L	L	L	L 360	L	L	L	A	L	L						
21									L	L	L	L	L	U L 375	L	L	L	L	L					
22									L	L	L	L	A	L	L	L	410	L						
23									L	L	L	U L 380	L 380	L	L	L	L	L	L					
24											L	L 370	L 375	L	L	L	L	L						
25									L	L	L	L 390	L 370	L	L	L 400	L	L	L					
26									L	L	L	L	L 370	A	L 370	L	L	L	L					
27									L	L	L 380	U L 370	A	A	L 370	L	L	L	A					
28									L	L	L	L 370	L 380	L	L 370	L	L	L	A					
29										L	L 380	L 360	L 360	L 370	L	L	L	L	L					
30									L	L	L	L 370	L	L	U L 360	L 360	L	L	L					
31										L	L	L 370	U L 370	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	1	5	21	20	19	10	5	1		1					
MED									410	L 390	L 370	L 370	L 370	L 370	L 370	L 360	410		340					
UQ											L 380	L 370	L 378	L 380	U L 370	U L 380								
LQ											L 370	L 360	L 360	L 360	L 370	L 360								

MAR. 1973 | M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1973 | H'F2 (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									225	245	275	275	290	290	290	260	250	250	220					
2										265	290	265	280	250	290	290	250	240						
3									240	275	275	290	300	270	295	250	250	240	225					
4										250	280	275	280	280	275	250	255	245	225					
5									275	255	300	270	255	285	295	275	260	250						
6									230	250	255	305	375	310	280	C	C	C	C					
7									C	270	285	285	280	275	275	260	250	245						
8									230	275	305	300	270	275	295	270	250	230	210					
9									240	250	280	270	295	290	295	275	250	245	225					
10									220	235	285	270	280	305	285	280	255	250						
11										250L	280	295	290	275	310	300	265	255	235					
12									C	260	300	280	295	300	290	295	265	255	230					
13									235	255	285	295	300	285	275	275	260	245						
14									250	275	280	275	240	300	275	270	270	250						
15										265	280	285	300	280	280	280	265	255	230					
16										255	280	300	330	295	285	290	260	250						
17										250L	290	300	315	C	C	C	C	C	C					
18										240L	315	280	290	295	280	300	270	260	240					
19									230	240L	280	280	330	265	270	310	290	270	250					
20									245	240	270	310	250	290	270	300	280	240						
21									240	255	275	290	295	280	270	290	270	230	250					
22									250	240	270	275	290	290	270	250	260	250						
23									250L	270	250	250	260	290	280	260	250	260	260					
24											280	280	270	280	280	290	265	260						
25									250	245	240	265	300	300	275	270	270	240	215					
26									250	255	280	295	280	280	275	280	295	250	230					
27									245	250	280L	300	300	280	260	255	260	240H	230					
28									250	270	270	305	295	300	280	280	260	240	235					
29										255L	290	275	295	290	280	295	280	250	225					
30									250	270	290	300	295	295	300	285	270	250	245					
31									260	280	260	295	310L	300	275	290	285	270						
	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									20	30	31	31	31	30	30	29	29	29	18					
MED									245	255	280	285	295	290	280	280	260	250	230					
UQ									250	270	288	298	300	295	290	290	270	255	240					
LQ									232	250	275	275	280	280	275	270	255	240	225					

The Radio Research Laboratories, Japan

MAR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1973 | H'F (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

Day \ Hour	00	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	245	245	255	240	200	235	240	230	225	220	225	215	215	A	A	230	220	240	210	195	250	250	250
2	265	290	270	225	320	300	200	215	230	235	225	245	235	210	205	250	220	250	235	210	205	240	245	250
3	245	220	280	265	300	280	205	235	230	H 230	H 205	210	200	220	205	215	230	225	195	220	210	200	225	F 250
4	235	235	240	220	220	200	330	230	235	H 205	200	215	205	190	215	215	A	A	245	205	200	200	245	225
5	230	210	235	245	235	205	230	210	200	H 195	H 180	H 200	H 200	220	215	210	230	235	A	205	210	230	250	260
6	260	270	295	275	245	210	305	235	230	H 190	H 200	225	205	210	250	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	205	200	H 200	H 195	H 195	H 200	205	210	240	230	205	215	270	250	265
8	265	250	225	250	210	220	245	225	215	H 225	A 200	H 210	A 200	200	200	200	H 195	235	H 245	210	225	210	230	250
9	240	280	260	250	200	250	300	240	230	210	205	210	205	200	200	220	200	230	A	215	225	200	235	210
10	270	225	250	285	220	255	250	230	235	H 205	H 205	205	195	205	235	210	A	230	230	205	235	205	280	A
11	300	240	240	235	225	250	275	220	220	210	200	230	A	225	H 200	H 220	220	245	215	215	205	200	C	C
12	C	C	C	C	C	C	C	C	C	200	H 195	205	H 200	190	H 185	200	205	H 190	245	220	215	240	240	215
13	225	250	280	265	220	245	295	245	H 240	225	H 205	H 200	H 195	200	H 180	215	245	235	220	205	205	235	295	235
14	275	265	255	250	205	250	280	240	H 235	215	215	200	H 200	275	240	230	225	I A 250	230	205	A 215	225	270	265
15	295	285	250	220	200	250	290	230	235	H 235	265	205	230	190	250	250	235	225	240	215	215	220	245	250
16	295	265	280	235	200	250	255	240	240	235	225	210	200	200	A	230	A	A	230	205	210	230	F 280	F 280
17	320	245	210	200	210	240	310	240	230	220	215	A 240	210	C	C	C	C	C	C	C	C	C	C	C
18	255	250	230	220	190	H 200	320	240	230	210	H 190	215	210	H 205	210	230	240	240	240	220	230	200	240	300
19	310	230	200	210	220	F 320	F 320	240	230	A	220	A	A	H 210	210	H 200	240	250	250	230	240	210	260	250
20	200	295	290	240	H 250	330	F 260	230	240	240	230	220	230	H 210	A	A	H 220	240	240	250	215	270	320	245
21	250	250	210	240	240	280	270	240	230	H 230	H 215	A 250	H 210	210	H 185	H 220	220	H 200	260	210	205	220	260	260
22	300	285	250	270	330	E A 350	270	235	230	220	210	230	A	220	210	220	230	H 190	240	230	200	210	300	320
23	340	230	220	A	A	310	F 270	230	235	H 220	230	220	210	190	H 190	205	H 210	H 220	240	220	195	200	300	270
24	320	270	220	A	340	F	270	220	220	230	A	215	220	H 200	205	A	A	250	220	210	230	280	310	290
25	250	270	250	230	235	230	250	230	235	235	225	205	200	H 195	I A 250	220	225	240	225	220	235	E A 360	310	300
26	270	250	270	225	185	E S 400	305	245	245	245	230	225	215	A	215	250	210	230	245	205	200	250	340	305
27	300	270	255	225	A 205	310	300	215	H 205	H 205	H 195	200	A	A	220	205	220	H 190	A	210	A	A 350	340	305
28	305	295	245	240	H 200	305	310	240	230	235	210	205	190	H 195	235	220	H 210	I A 240	I A 240	205	205	295	305	295
29	300	285	240	200	250	280	275	210	230	235	220	205	200	205	250	235	225	230	240	200	200	220	275	290
30	305	285	260	220	205	210	270	235	235	235	230	A 250	A	A	225	220	245	230	250	220	205	210	280	225
31	310	300	245	205	195	230	260	240	240	240	215	215	235	A	A	A 245	230	240	240	215	225	210	220	255
	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	27	28	28	29	29	29	30	30	30	26	26	26	26	25	27	26	29	28	29	28	27
MED	275	265	250	235	220	250	270	235	230	225	212	212	205	205	210	220	225	235	240	210	210	220	265	260
UQ	300	285	260	250	242	291	300	240	235	235	225	225	215	210	235	230	230	240	245	220	225	245	300	290
LQ	250	245	235	220	202	225	255	230	230	210	H 200	205	200	195	200	210	210	225	230	205	205	210	245	250

MAR. 1973 | H'F (KM)

IONOSPHERIC DATA

MAR. 1973 | 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	105	S	100	100	B	100	100	G	G	U G 180	175	160	155	145	120	115	110	110	S	S	S	100	100
2	100	S	S	S	S	S	S	G	175	155	145	140	135	130	G	105	105	105	105	100	100	100	100	100
3	S	S	S	125	100	100	105	S	G	145	105	105	105	115	120	115	105	105	G	S	100	S	S	S
4	S	S	S	B	B	B	S	100	G	G	G	G	G	G	110	120	105	105	105	100	100	100	105	100
5	100	100	100	B	B	B	S	S	G	G	120	145	165	160	120	110	105	105	100	105	105	100	100	S
6	S	S	S	110	105	105	S	G	G	115	115	115	G	175	120	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	G	G	G	G	G	105	105	100	100	100	100	100	S	S	S
8	S	100	S	S	B	B	100	100	G	U G 180	135	135	130	100	100	115	120	115	105	105	100	100	105	100
9	100	100	100	100	E	S	100	G	G	110	110	105	105	105	105	100	100	100	100	100	100	100	100	S
10	S	B	S	S	B	S	S	G	110	105	180	G	G	150	155	135	100	135	100	100	100	105	100	100
11	100	100	105	S	S	B	S	G	G	150	150	170	140	140	130	G	135	110	105	100	100	105	C	C
12	C	C	C	C	C	C	C	C	C	105	105	105	140	140	105	100	100	100	100	100	105	105	105	S
13	S	S	S	B	B	B	105	G	185	175	150	135	130	140	105	150	140	100	120	100	100	105	105	S
14	100	S	S	105	105	100	B	G	G	G	G	140	105	170	160	150	140	110	110	110	110	100	100	S
15	105	105	S	B	S	B	S	G	G	155	155	135	120	120	150	145	125	115	110	B	B	S	S	S
16	105	100	100	100	B	B	S	G	G	U G 180	155	155	150	115	150	150	120	115	110	110	110	115	110	110
17	110	S	100	110	105	100	S	G	160	150	160	130	130	C	C	C	C	C	C	C	C	C	C	C
18	105	S	B	105	105	105	105	105	105	105	105	110	170	170	130	120	120	120	115	115	100	S	S	110
19	110	100	110	105	150	170	150	G	130	120	115	110	100	105	105	110	170	100	100	100	110	110	105	110
20	105	S	105	105	105	105	110	170	150	160	150	110	140	105	100	100	100	100	100	95	95	110	100	105
21	S	S	105	100	100	100	100	105	160	150	140	120	120	120	125	120	G	G	100	110	105	100	S	100
22	S	S	B	105	100	100	100	105	U G 170	150	145	130	115	115	120	115	115	110	110	100	110	S	100	105
23	S	110	100	100	100	105	110	G	G	G	135	130	120	115	105	115	120	110	105	105	S	100	100	S
24	110	110	105	100	100	110	110	105	150	150	120	105	105	125	115	115	110	110	100	100	100	100	S	115
25	110	120	115	110	110	105	150	G	160	155	150	140	130	130	165	130	135	G	G	S	S	110	10	110
26	110	S	105	105	B	105	105	G	160	155	150	135	105	105	105	105	105	100	100	100	100	100	100	S
27	S	S	S	S	100	105	S	G	G	G	G	105	130	125	105	G	G	G	100	120	110	105	105	105
28	105	100	105	100	100	100	100	150	150	160	155	140	130	105	105	105	100	100	100	100	100	100	S	105
29	S	S	S	S	105	S	105	100	105	U G 170	150	160	100	135	180	155	U G 170	135	115	100	100	100	S	110
30	105	110	105	105	105	105	105	G	175	150	140	135	130	120	115	120	110	110	110	120	100	100	110	105
31	105	105	100	100	105	B	S	G	155	150	150	145	130	115	110	110	105	105	105	100	100	100	100	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	14	15	19	18	16	17	10	16	24	27	28	27	28	29	27	27	26	27	25	25	23	20	18
MED	105	102	105	105	105	105	105	105	158	150	145	135	130	122	115	115	110	108	105	100	100	100	100	105
UQ	110	110	105	105	105	105	110	105	165	158	150	140	138	140	130	125	122	110	110	105	105	105	105	110
LQ	100	100	100	100	100	100	100	100	140	132	120	110	110	115	105	108	105	100	100	100	100	100	100	100

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MAR. 1973 | H'ES (KM)

IONOSPHERIC DATA

MAR. 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 automatio operation

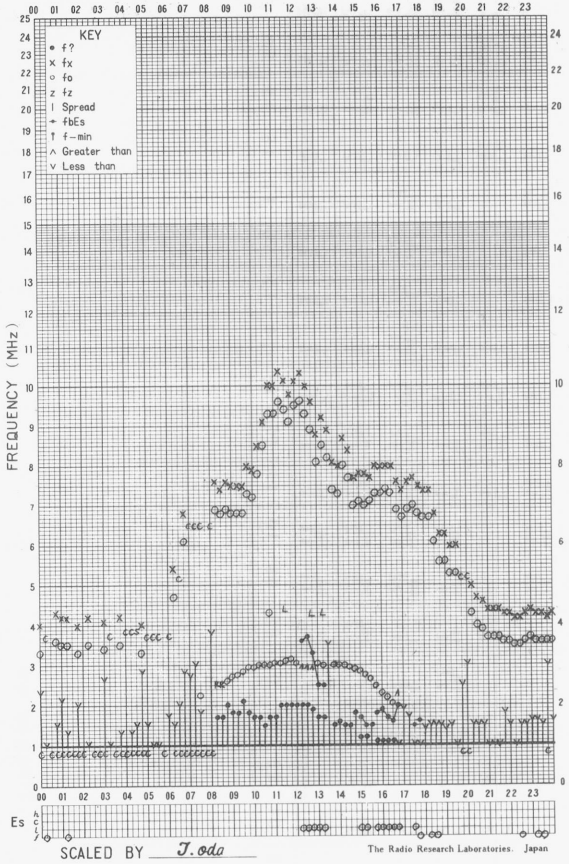
Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 5	F 1		F 2	F 3		F 1	L 1			H 1	H 1	H 1	H 1	HL 21	C 2	C 2	C 3	LL 11				F 1	F 1
2	F 1								H 1	H 2	H 2	H 2	H 2	C 1		C 2	L 2	L 5	L 4	F 2	F 1	F 2	F 2	F 1
3				F 1	F 2	F 2	F 2			HL 22	L 2	L 1	L 1	C 1	C 1	C 1	C 2	LL 22			F 3			
4								L 1							C 1	C 2	C 4	C 5	L 3	F 2	F 1	F 1	F 1	F 1
5	F 1	F 1	F 2								C 1	HC 11	HC 11	H 1	C 2	C 2	C 3	L 3	L 6	F 1	F 1	F 2	F 1	
6				F 1	F 3	F 1				C 2	C 1	C 1		HC 11	C 2									
7															L 1	L 1	L 1	L 5	L 5	F 1	F 2			
8		F 3					F 2	L 1		H 1	H 1	H 1	HL 11	L 1	L 1	CL 21	C 1	C 1	L 2	F 6	F 1	F 1	F 3	F 5
9	F 3	F 2	F 1	F 1			F 1			L 2	C 2	L 2	C 2	C 3	L 2	L 2	L 2	L 3	L 7	F 2	F 3	F 1	F 1	
10									L 2	L 1	HL 11			H 1	H 1	HL 12	L 4	HL 13	L 5	F 3	F 3	FF 11	F 6	F 6
11	F 6	F 4	F 1							HL 12	HL 12	HL 11	HL 11	HH 11	H 1		H 2	C 3	LL 21	LL 11	F 1	F 1		
12										C 2	C 2	C 2	HL 11	HL 11	L 1	L 2	L 1	L 2	L 4	F 2	FF 41	F 6	F 3	
13							F 1		H 1	H 1	H 1	H 1	C 1	H 1	C 2	HL 12	HL 21	L 1	C 4	FF 11	F 1	F 1	F 6	
14	F 1			F 1	F 1	F 1						H 1	L 1	HL 21	H 1	H 1	HL 12	CL 32	LL 45	FF 33	F 2	F 1	F 1	
15	F 1	F 2								H 1	HL 11	HL 11	CL 21	CL 11	HC 21	HC 21	C 2	C 2	C 3					
16	F 2	F 4	F 1	F 2						HL 11	HL 11	HL 11	HL 11	C 1	HC 21	H 1	C 2	C 4	C 6	F 3	F 1	F 1	F 2	F 2
17	F 5		F 1	F 1	F 1	F 1			H 1	H 1	H 1	H 1	H 1											
18	F 1			F 1	F 1	F 1	F 1	L 3	L 1	L 2	L 1	L 1	HL 11	HL 11	H 1	C 1	C 2	C 1	CL 21	FF 11	F 2			F 2
19	F 1	F 3	F 1	F 1	F 1	F 1	F 2		HL 32	CL 22	CL 21	L 2	L 6	L 1	L 1	L 1	H 1	L 1	L 6	FF 22	FF 61	F 1	F 1	F 2
20	F 1		F 2	F 4	F 3	F 2	F 1	H 3	H 3	H 1	HC 11	C 1	HL 11	L 1	L 3	L 5	L 4	L 3	LH 12	F 4	F 1	F 1	F 2	F 2
21			F 1	F 3	F 3	F 2	F 2	L 2	H 1	H 1	H 1	C 2	C 1	C 1	CL 11	CL 11			L 1	L 1	F 1	F 2		F 1
22				F 5	F 5	F 5	F 3	L 2	HL 11	HL 12	HL 11	HL 11	C 3	CL 21	CL 21	CL 21	C 1	CL 21	LHL 12	FF 11	F 3		F 1	F 1
23		F 1	F 5	F 5	F 4	F 2	F 1				H 1	H 1	C 1	CL 11	L 1	C 1	C 1	CL 31	L 3	L 3		F 1	F 1	
24	F 1	F 1	F 5	F 6	F 6	F 6	F 2	LH 22	HL 22	HL 12	CL 32	L 2	L 2	CL 11	CL 11	CL 21	CL 32	CL 43	L 5	L 5	F 2	F 1		F 4
25	F 2	F 1	F 1	F 1	F 1	F 1	FF 11		H 2	HL 12	HL 11	HL 11	HL 11	HL 11	HH 11	HL 21	HL 11					F 6	F 2	F 3
26	F 1		F 2	F 2		F 1	F 1		H 2	HL 11	HL 11	HL 11	L 1	C 2	C 1	C 3	L 2	LH 22	L 1	F 4	F 3	F 2	F 1	
27					F 3	F 2						L 1	HL 21	HL 11	L 1				LH 51	LL 23	FF 63	FF 41	F 3	F 6
28	F 6	F 6	F 5	F 3	F 3	F 4	F 3	HL 22	H 1	H 1	HL 11	H 1	H 1	C 1	C 2	L 1	L 3	L 4	L 6	L 5	F 4	FF 11		F 1
29					F 1		F 1	L 1	L 1	HL 22	HL 12	HL 11	HL 12	HL 11	HLL 11	HL 11	HL 12	HL 11	C 3	F 1	F 1	F 1		F 2
30	F 1	F 1	F 2	F 1	F 1	F 4	F 1		HL 12	HL 11	HL 12	HL 12	HL 12	CL 11	C 1	C 1	C 1	L 2	L 2	FF 12	F 2	F 2	FF 21	F 4
31	F 5	F 6	F 4	F 3	F 1				H 1	HL 11	HL 11	H 1	H 2	C 2	C 2	C 3	C 2	L 2	L 4	F 3	F 3	F 2	F 1	F 2
	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																								

The Radio Research Laboratories, Japan

MAR. 1973 | TYPES OF ES

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 1.1973



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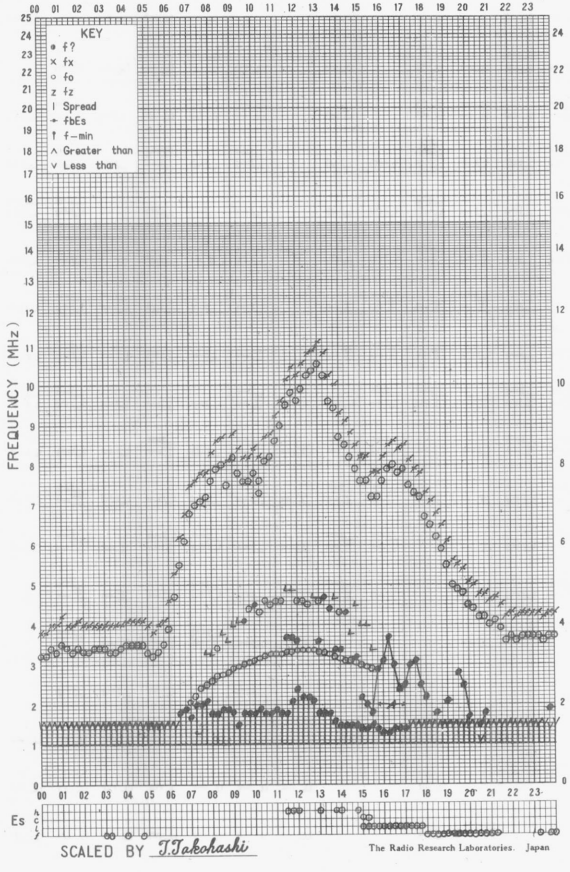
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Mar. 1. 1973



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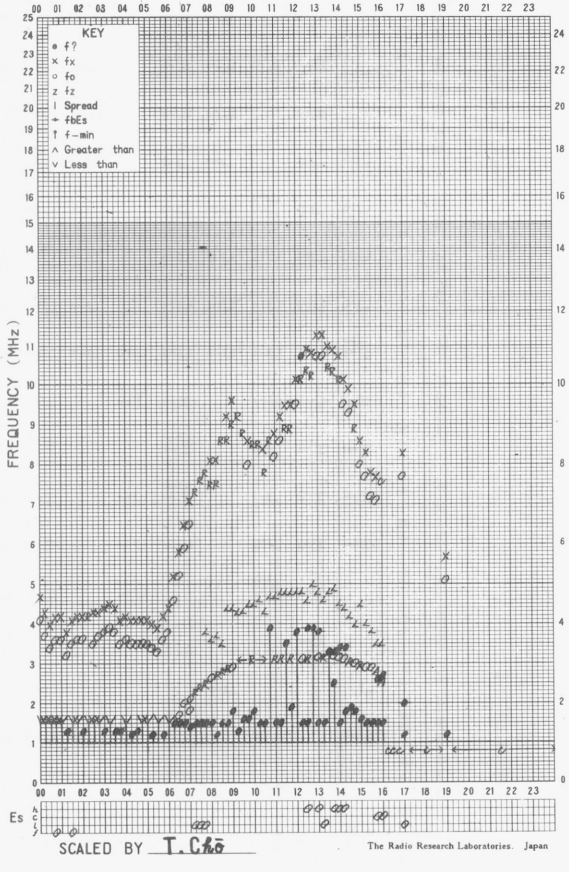
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAR. 1.1973



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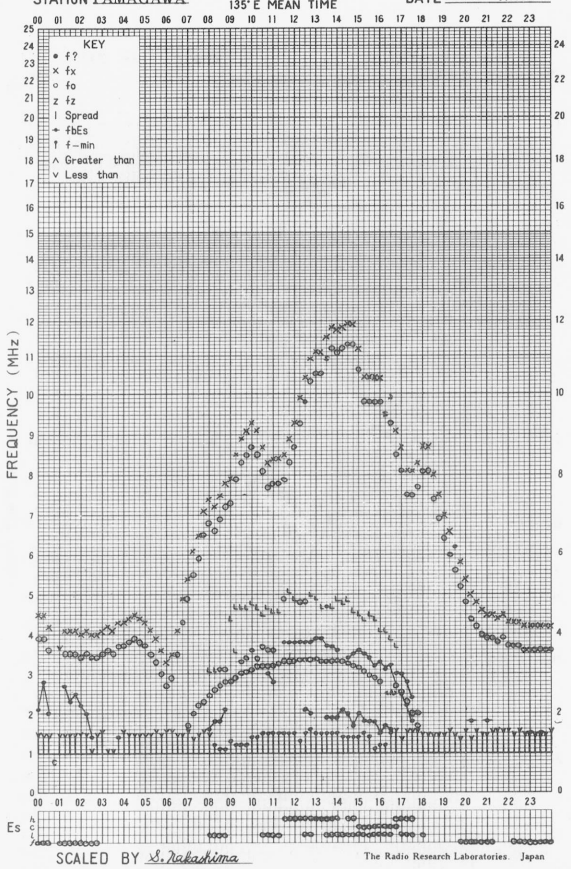
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE MAR. 1. 1973

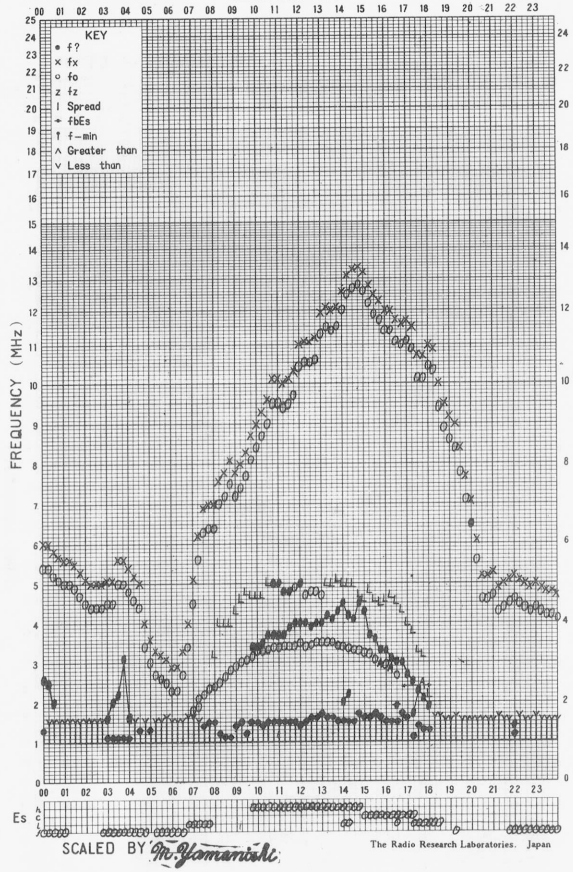


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION OKINAWA 135° E MEAN TIME DATE MAR. 1.[illegible]

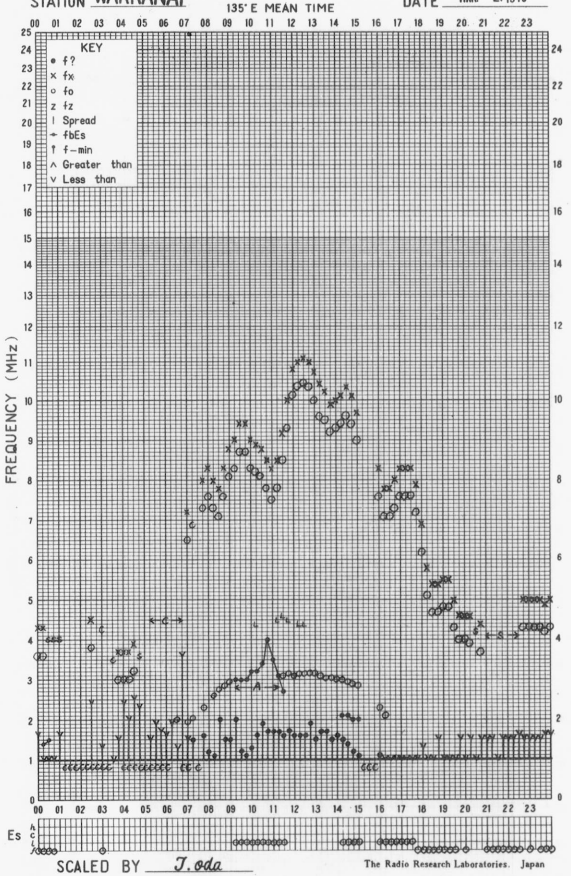


SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 2. 1973



SCALED BY T. Oda

The Radio Research Laboratories. Japan

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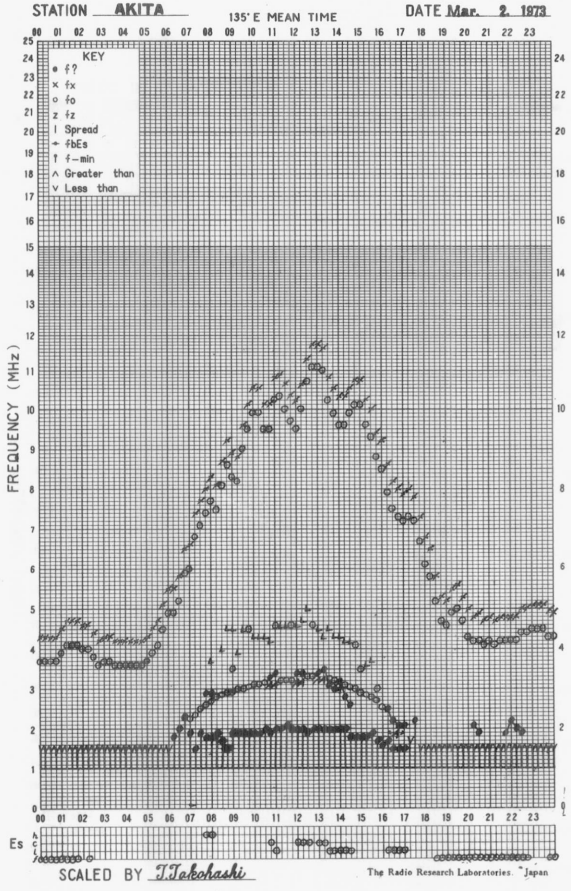

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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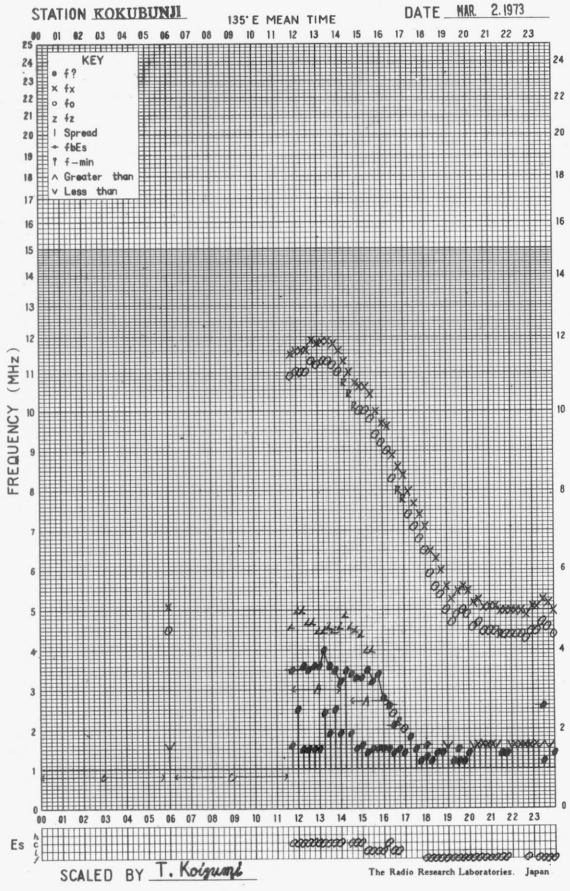

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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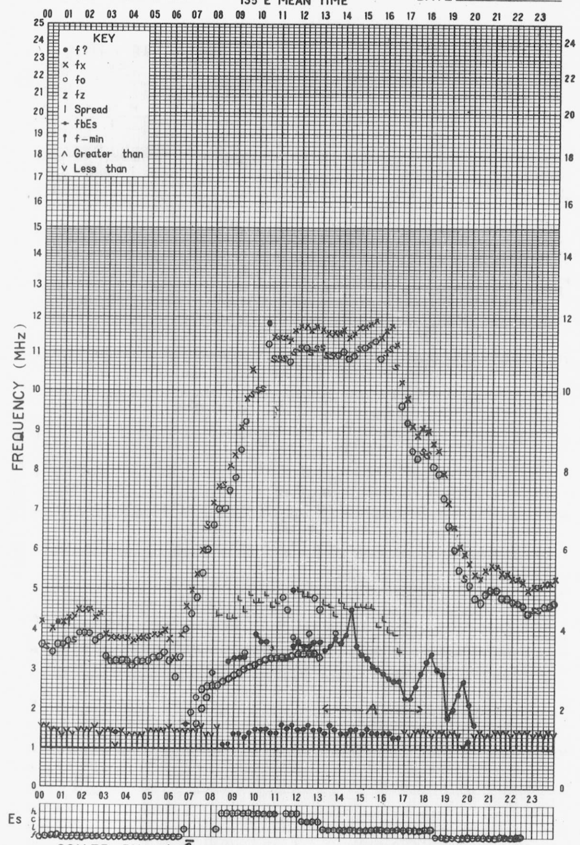

SCALED BY K. Ozyama The Radio Research Laboratories. Japan

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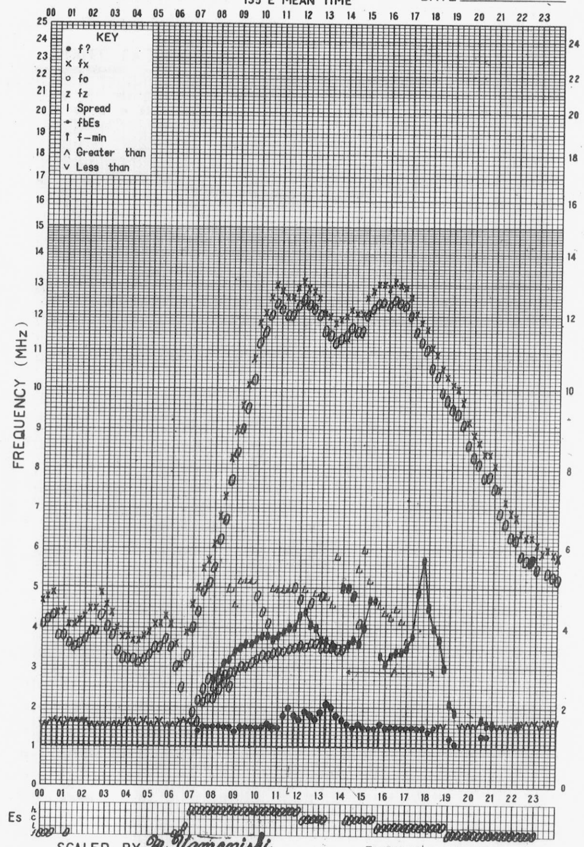

SCALED BY M. Yamanishi The Radio Research Laboratories. Japan

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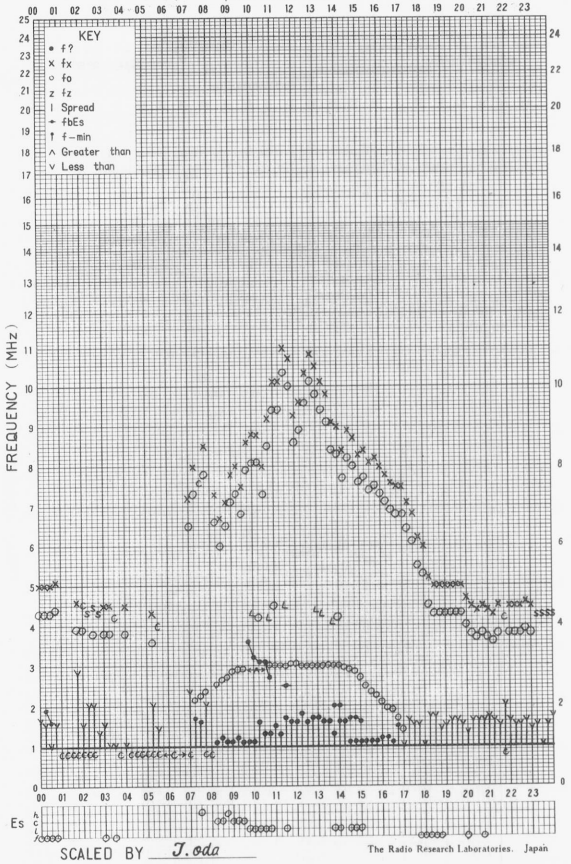

SCALED BY J. oda

The Radio Research Laboratories. Japan

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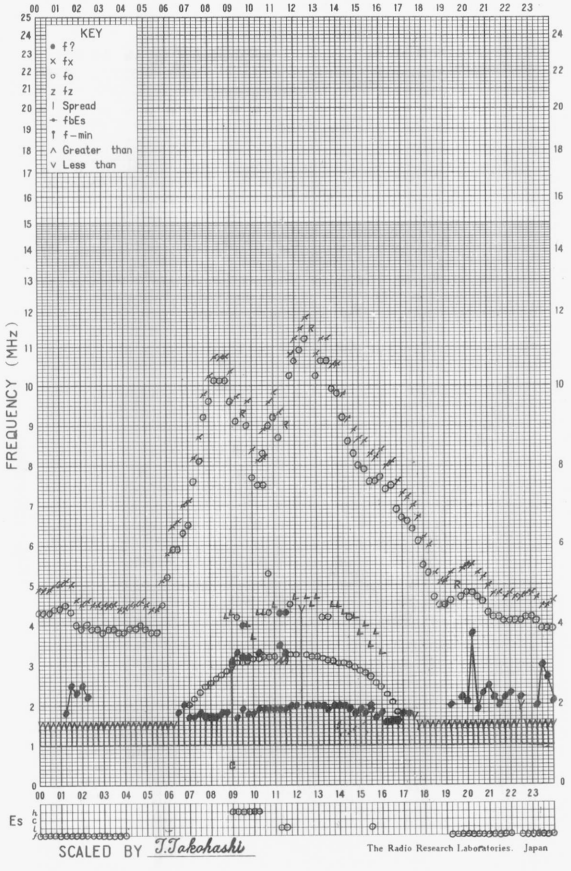

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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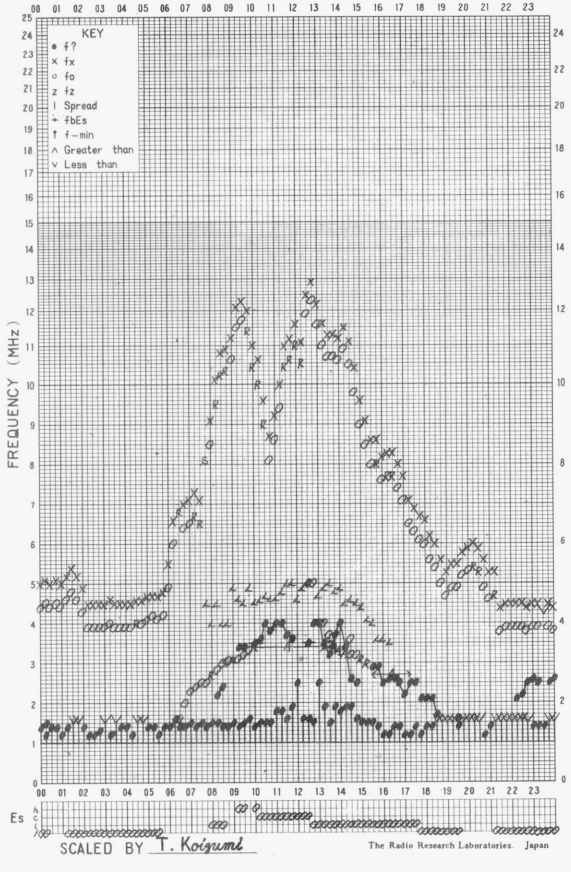
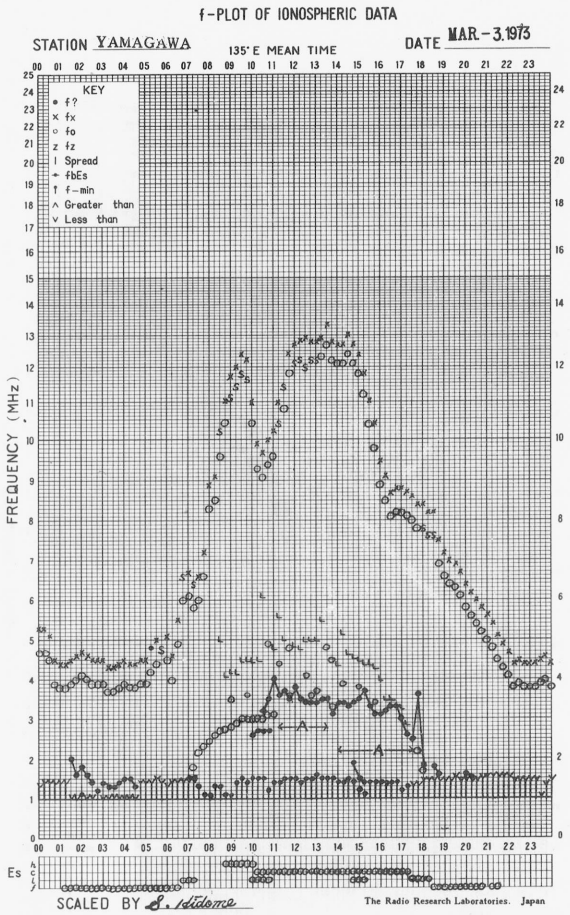


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE MAR.-3.1973
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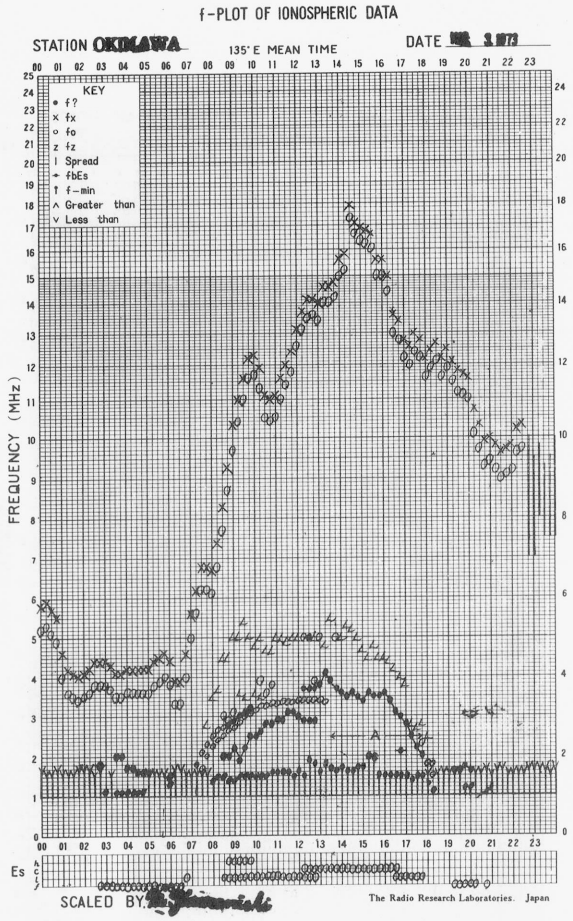
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Ishidome
The Radio Research Laboratories. Japan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↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
The Radio Research Laboratories. Japan

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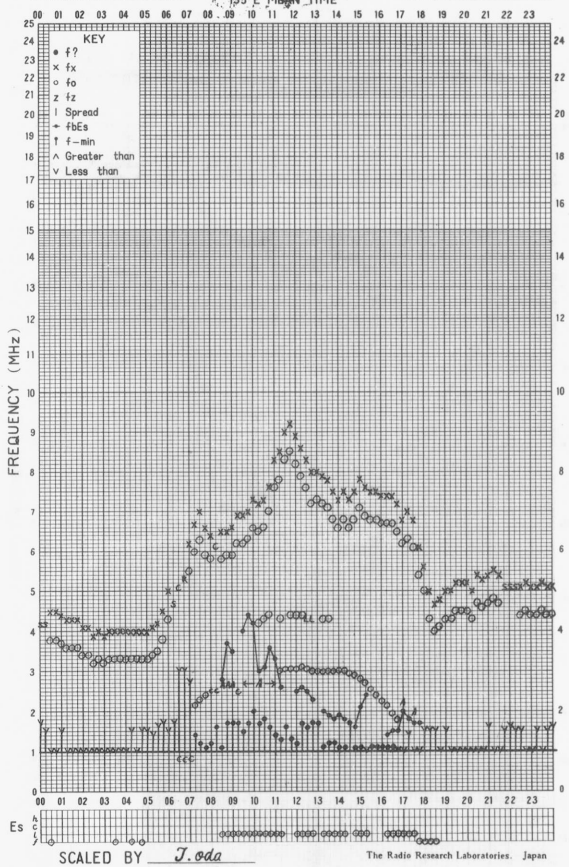

SCALED BY J. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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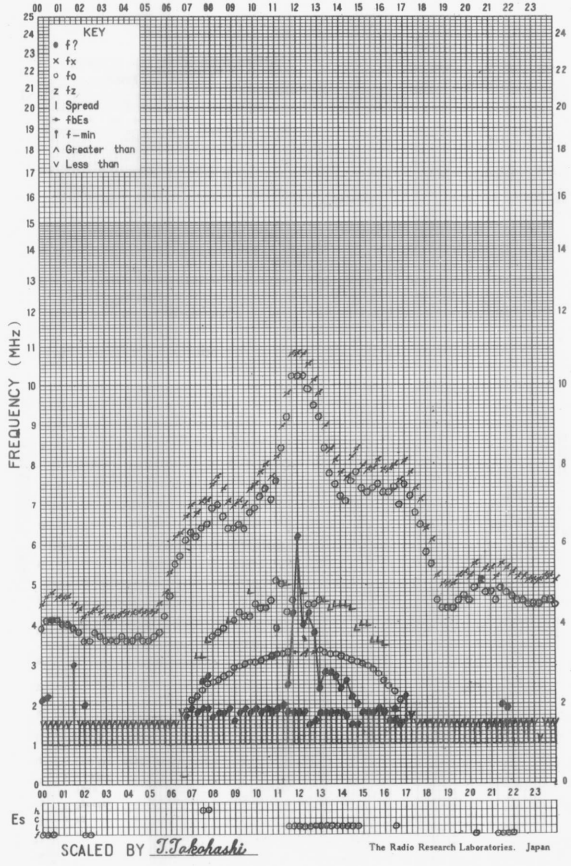

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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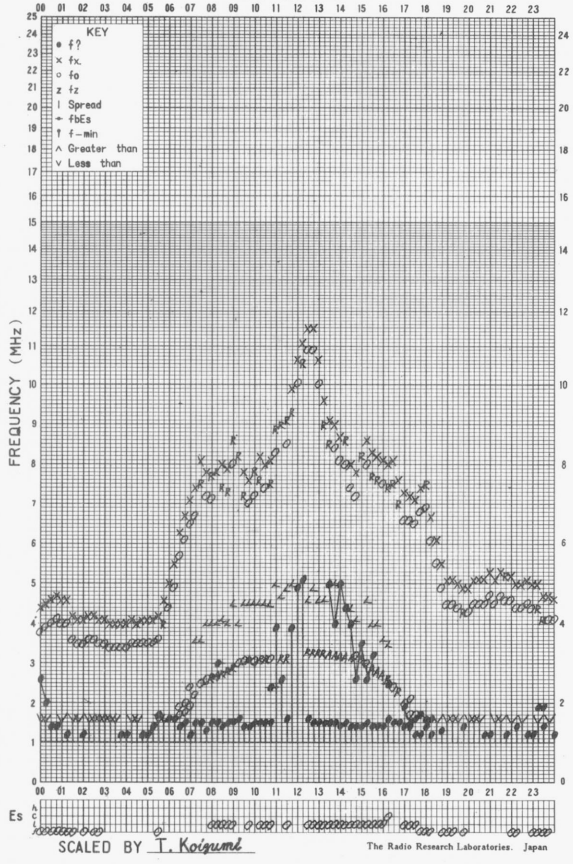

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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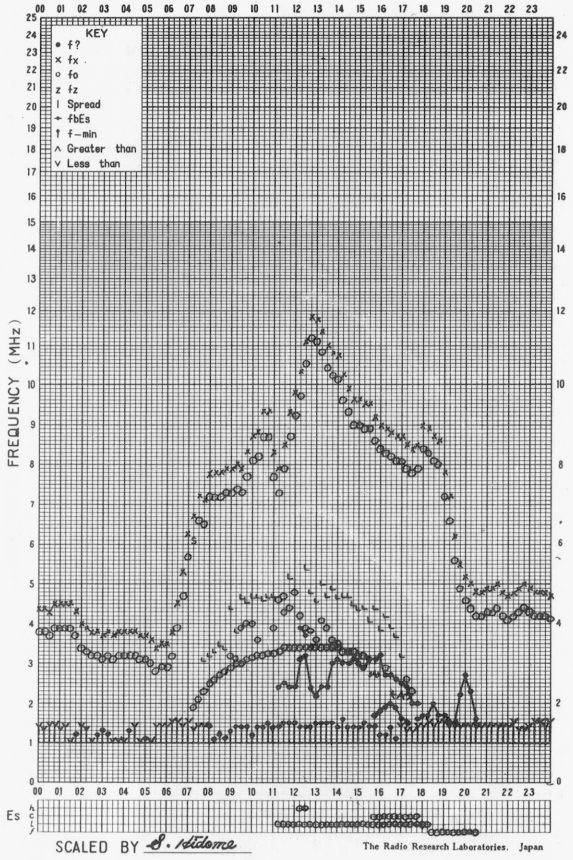

SCALED BY S. Kitsuma

The Radio Research Laboratories. Japan

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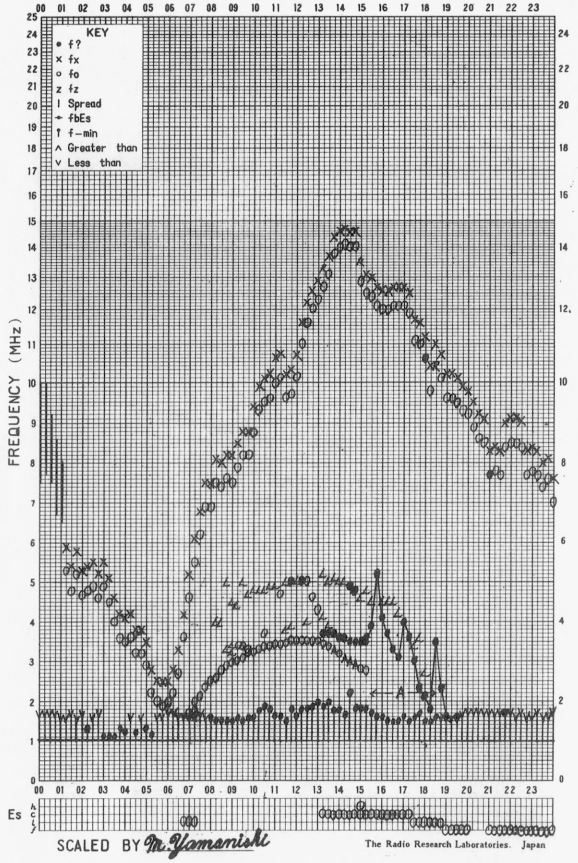

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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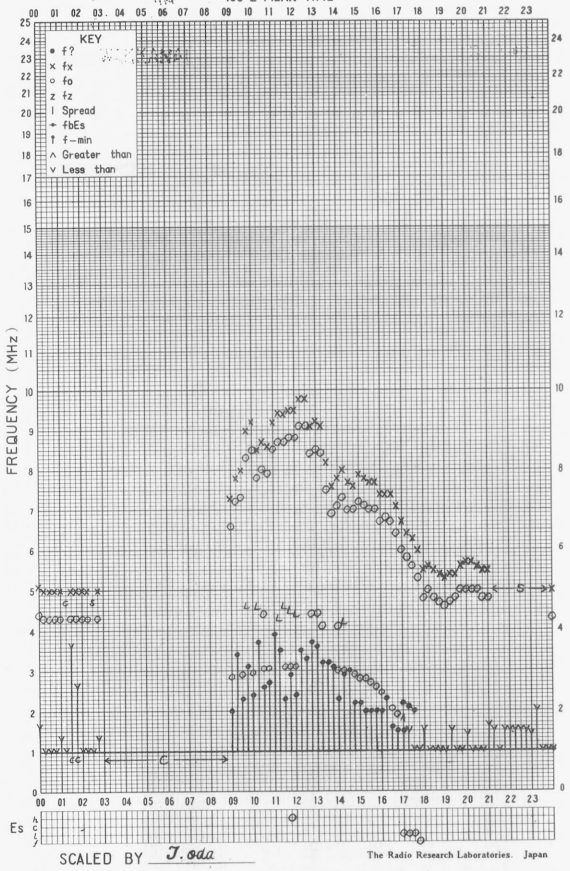

SCALED BY T. oda

The Radio Research Laboratories. Japan

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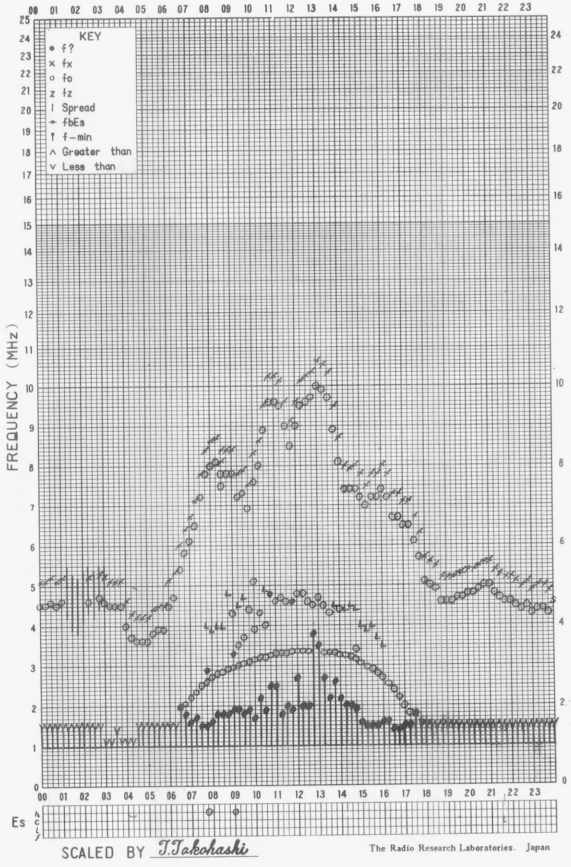

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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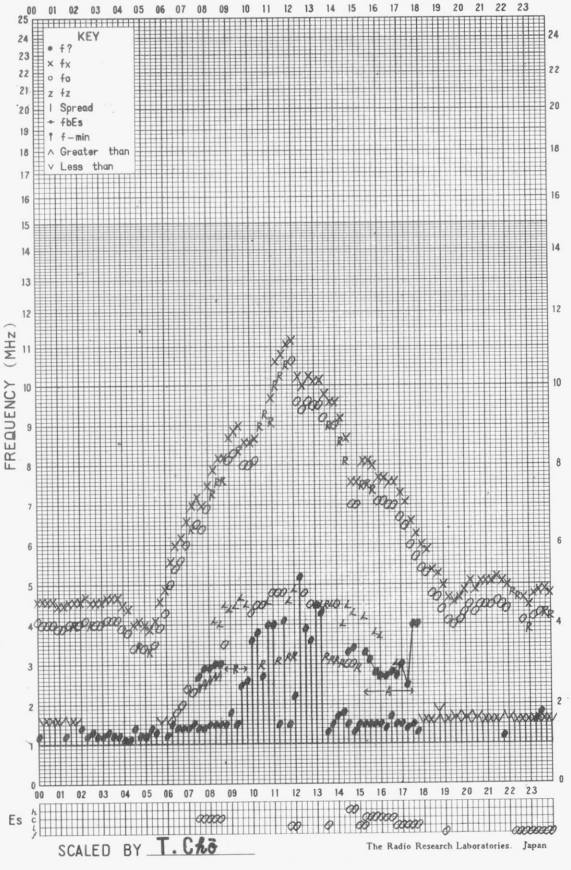

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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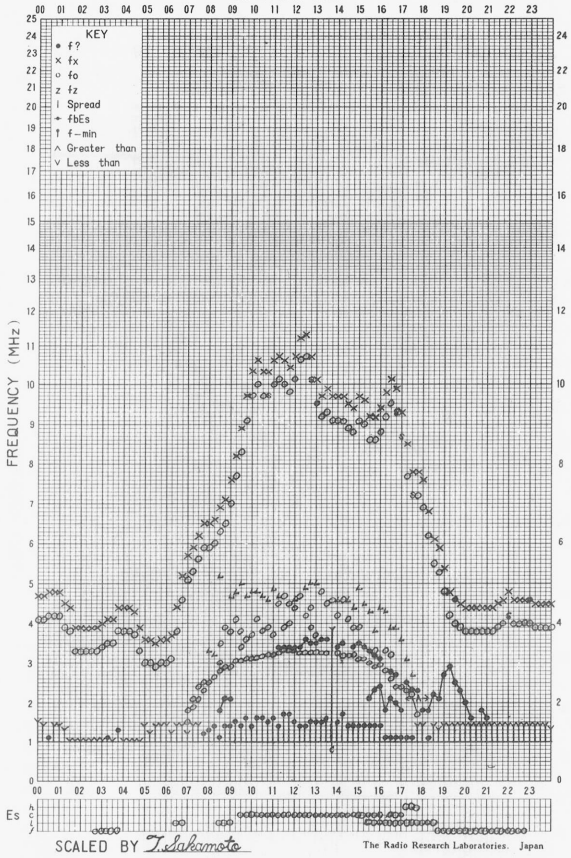
STATION YAMAGAWA 135°E MEAN TIME DATE MAR.-5.1973



SCALED BY T. Sakamoto

The Radio Research Laboratories. Japan

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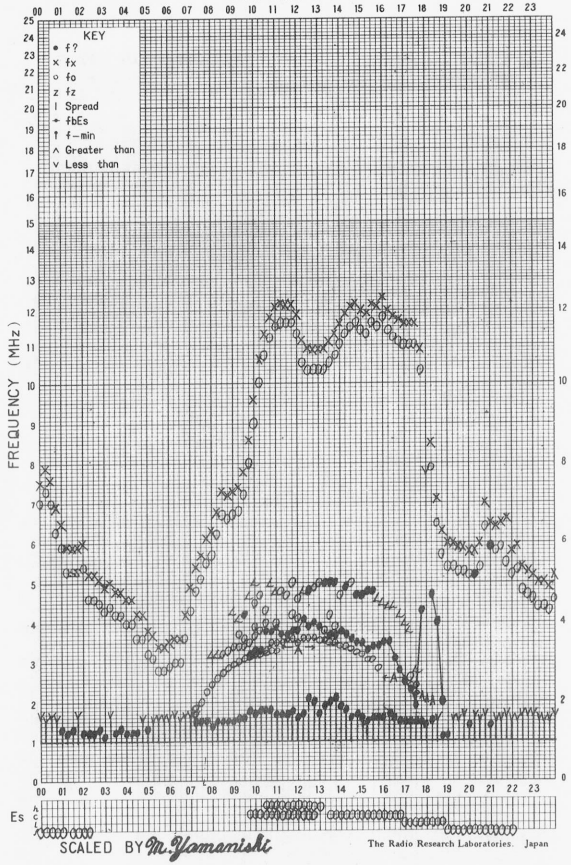

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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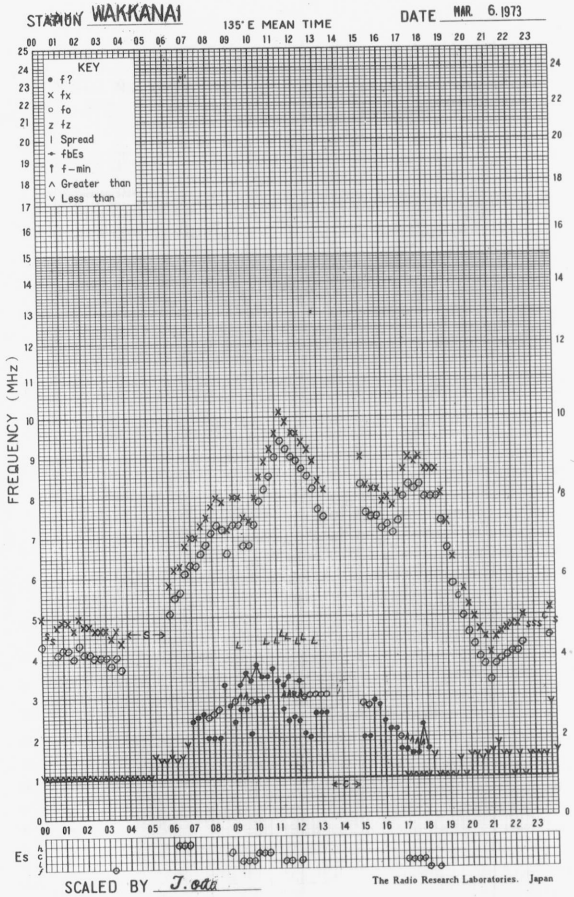

SCALED BY T. oda

The Radio Research Laboratories. Japan

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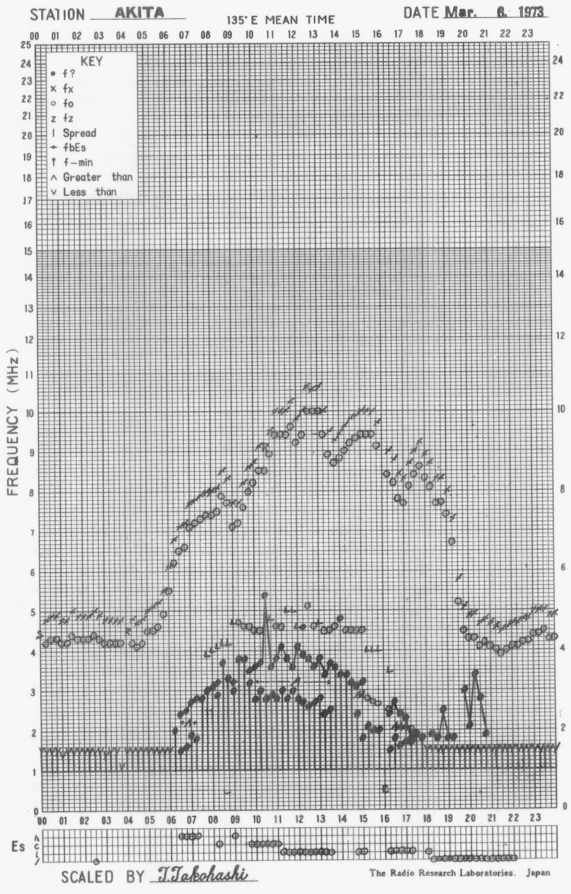

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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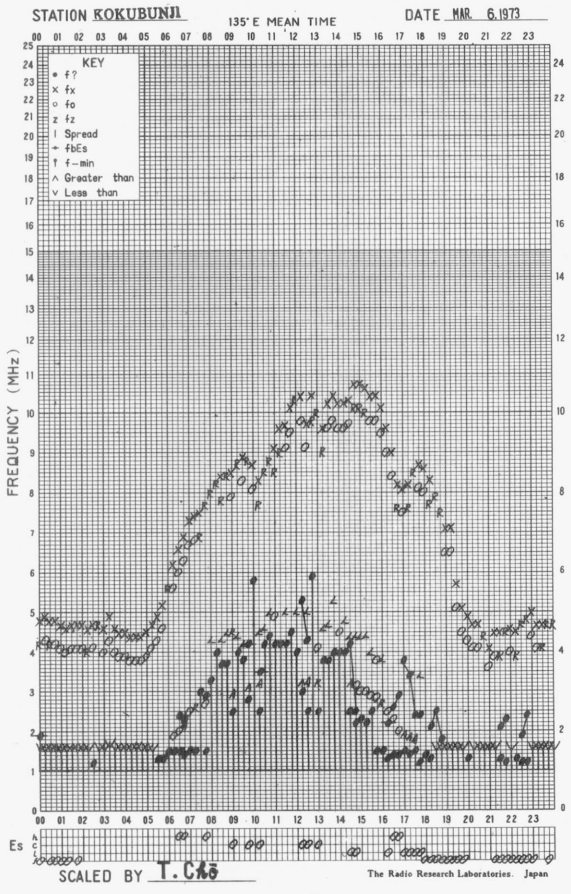

SCALED BY T. Ch5

The Radio Research Laboratories. Japan

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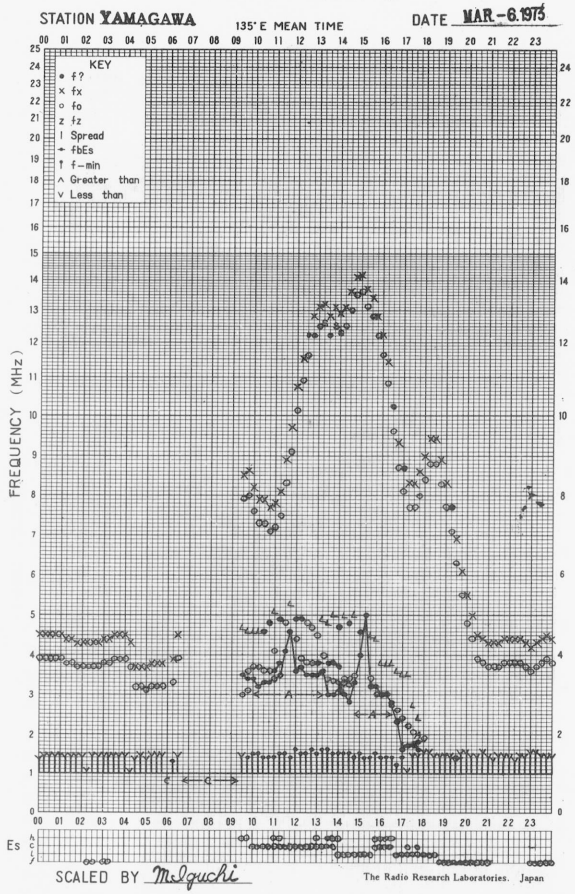

SCALED BY M. Iguchi

The Radio Research Laboratories. Japan

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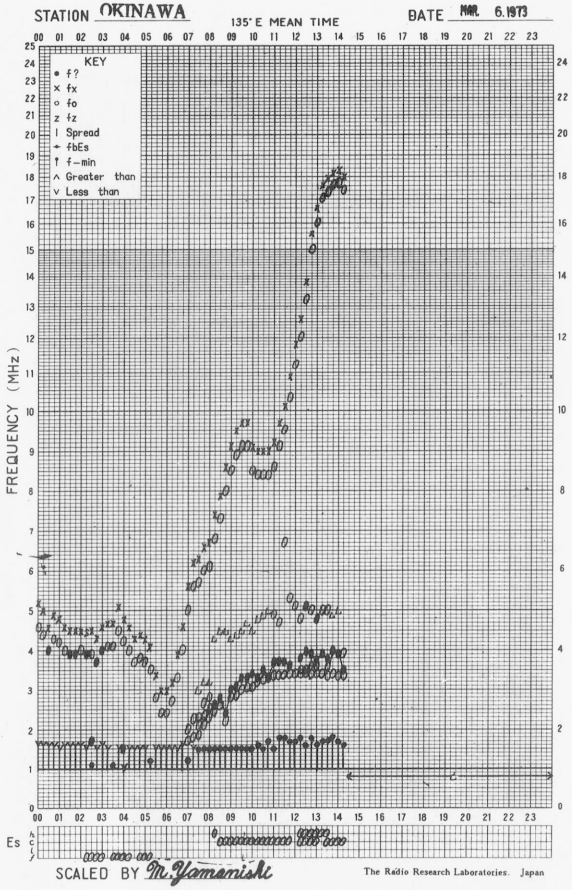

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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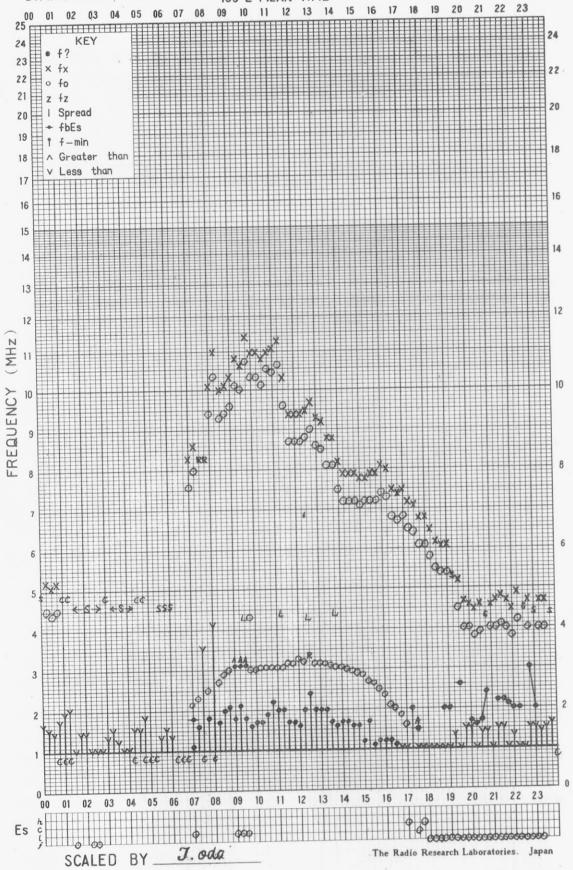

SCALED BY I. oda

The Radio Research Laboratories. Japan

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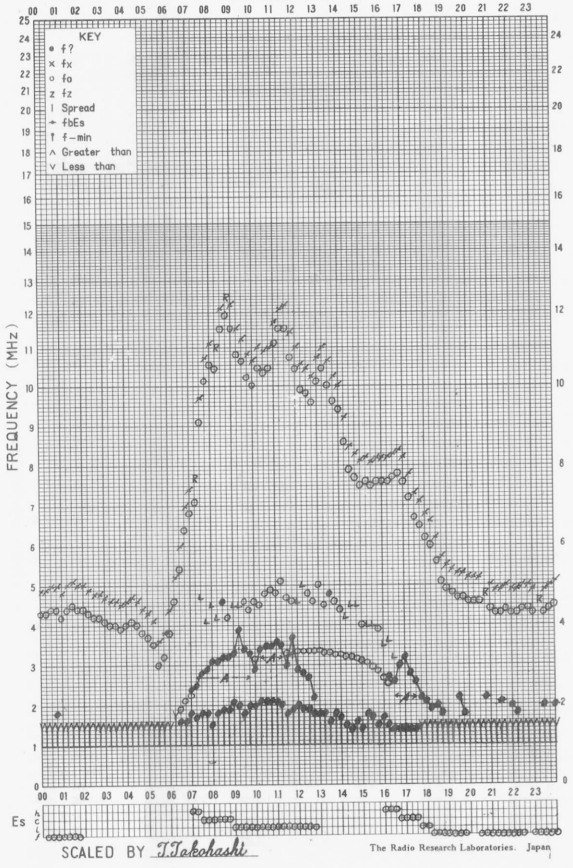

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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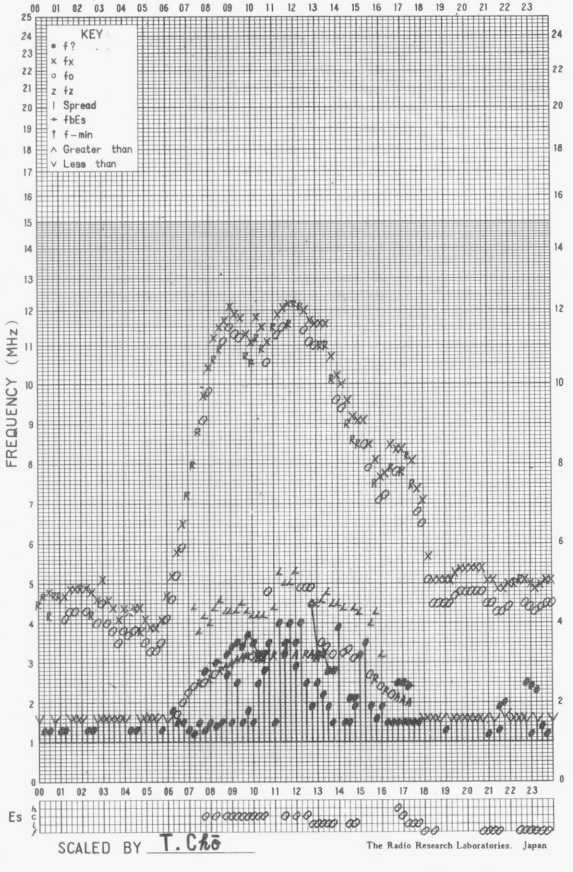
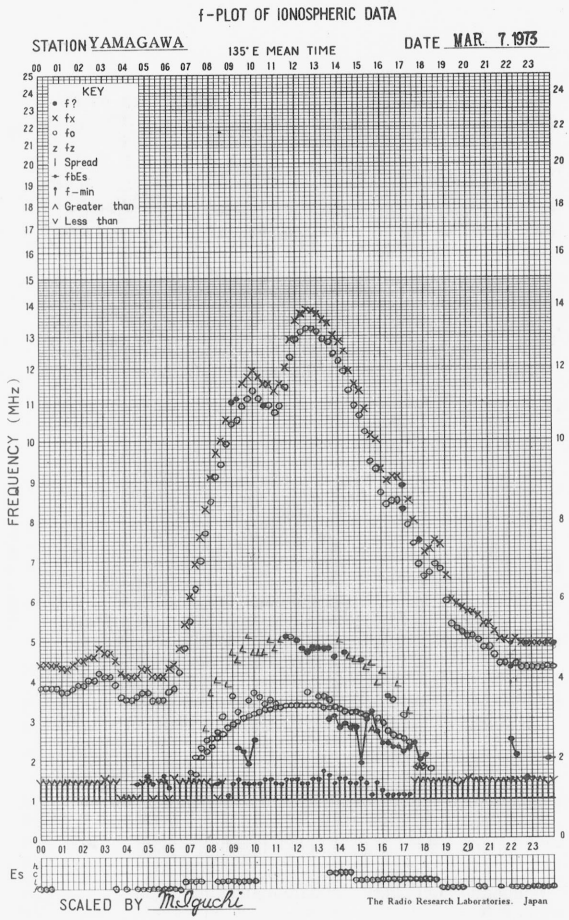


SCALED BY T. Chō

The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE MAR. 7. 1973
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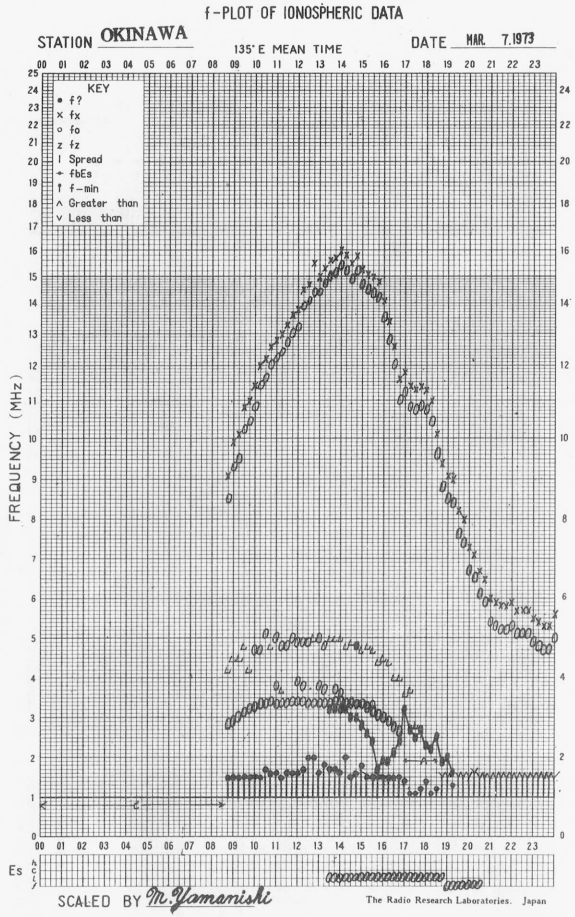
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Iguchi
The Radio Research Laboratories. Japan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∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

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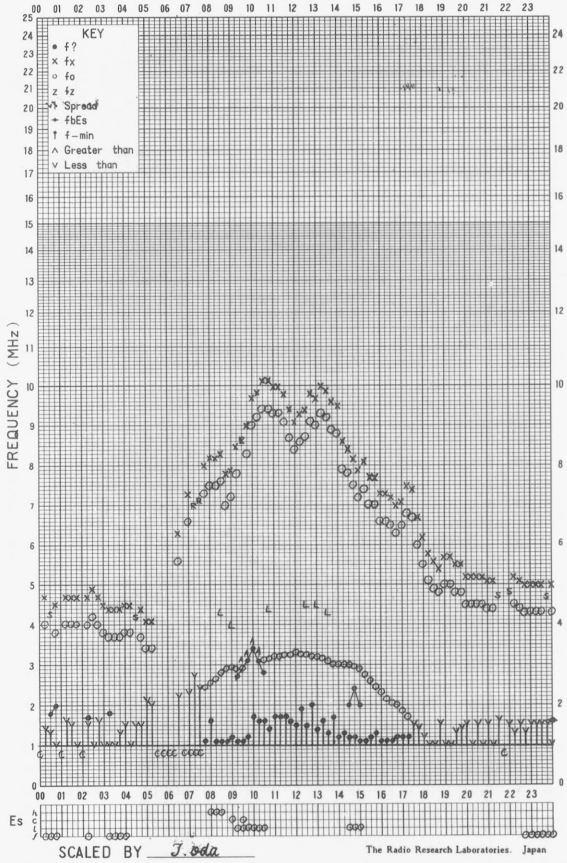

SCALED BY T. Oda The Radio Research Laboratories. Japan

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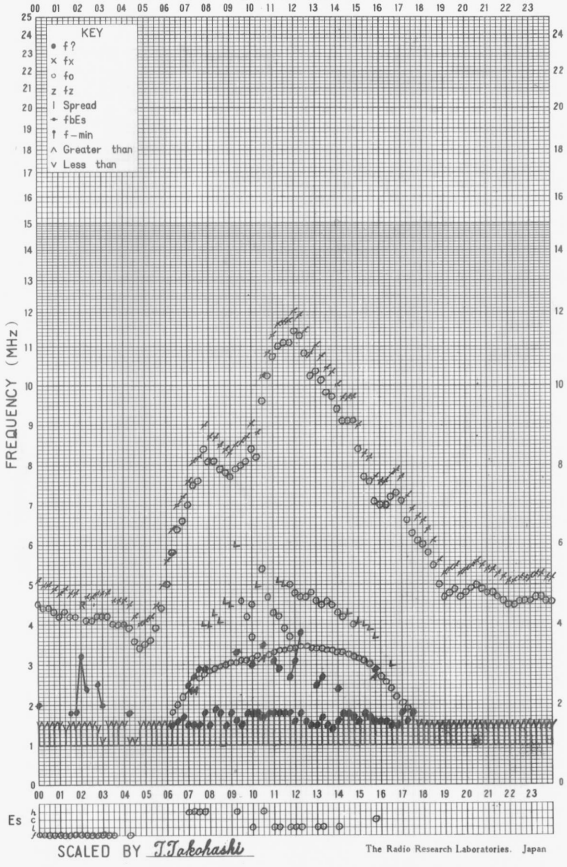

SCALED BY T. Takahashi The Radio Research Laboratories. Japan

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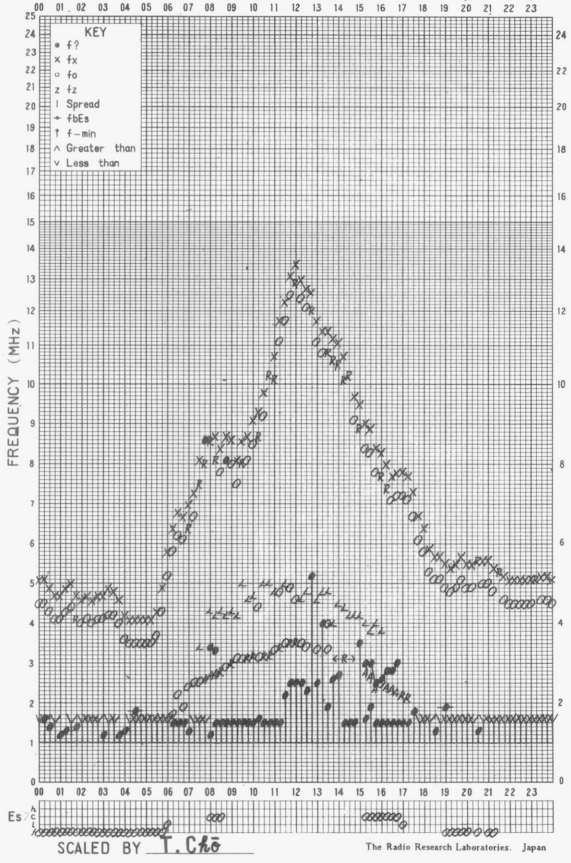
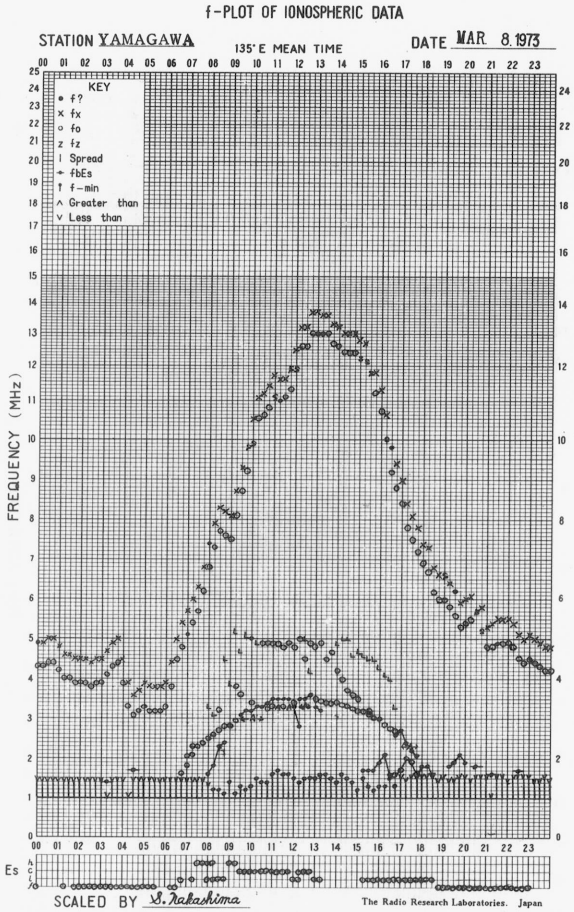


SCALED BY T. Cho The Radio Research Laboratories. Japan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STATION YAMAGAWA
135°E MEAN TIME
DATE MAR. 8.1973
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⌁ fbEs
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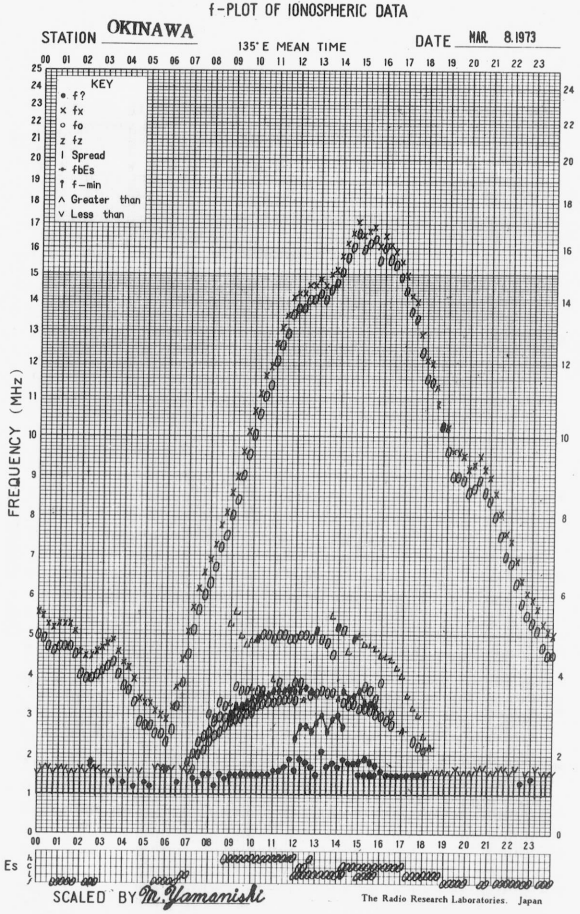
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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DATE MAR. 8.1973
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○ fo
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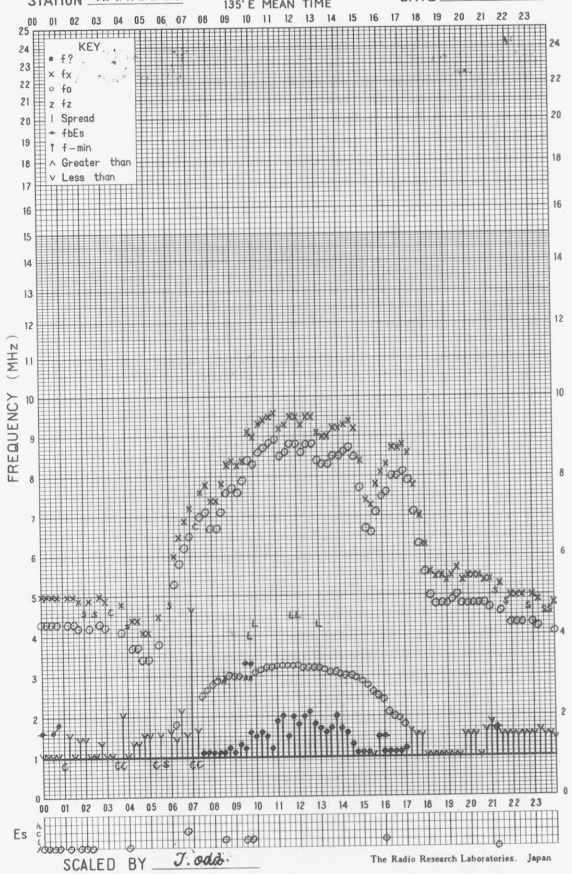
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 9. 1973



SCALED BY T. oda

The Radio Research Laboratories. Japan

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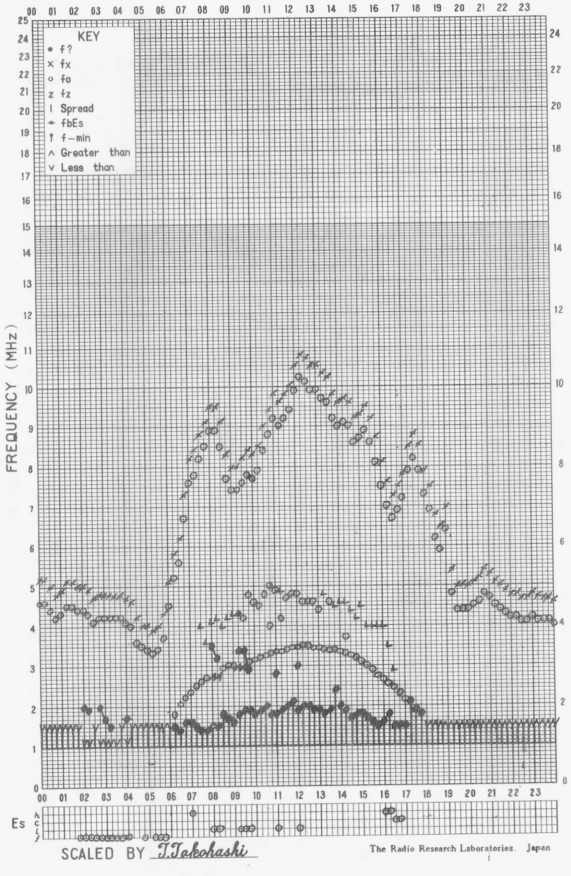

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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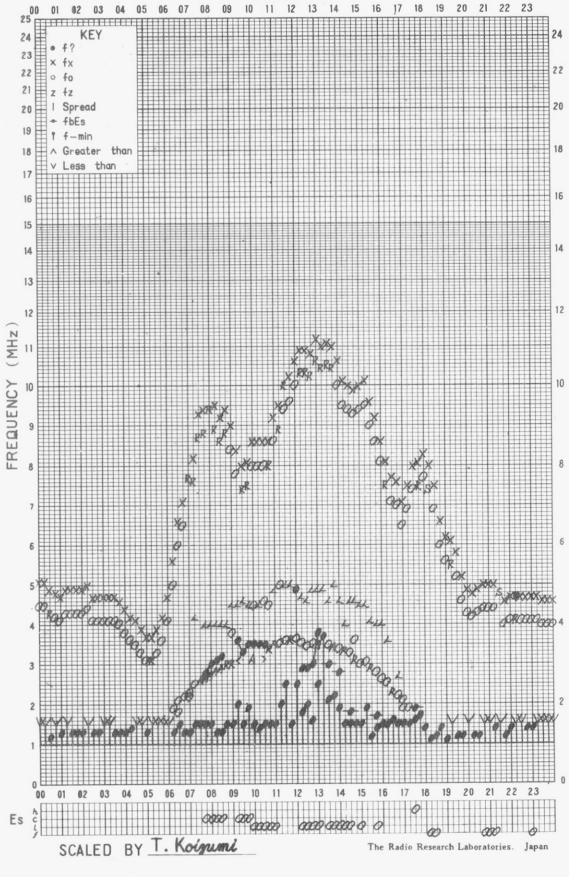
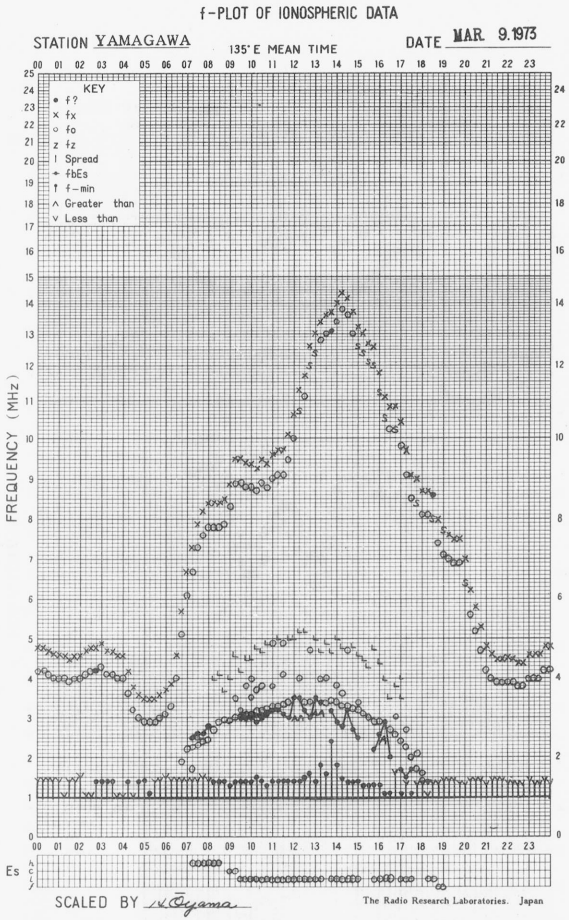


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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f-min
Greater than
Less than
FREQUENCY (MHz)
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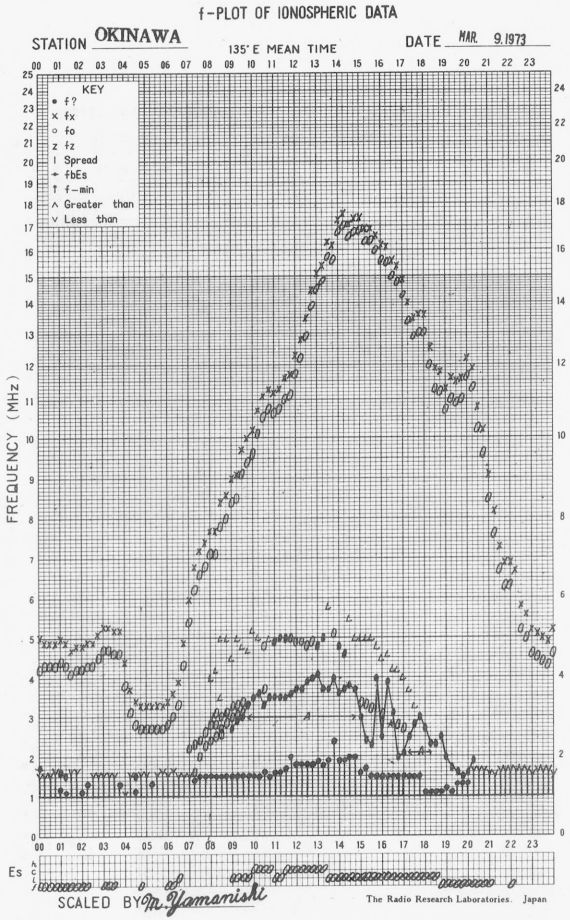
SCALED BY K. Tajima
The Radio Research Laboratories. Japan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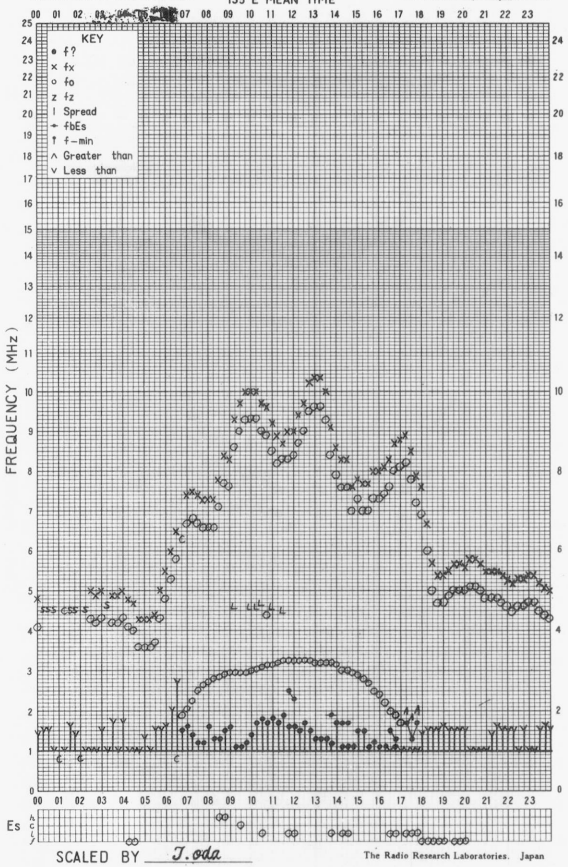
FREQUENCY (MHz)
Es
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 10, 1973

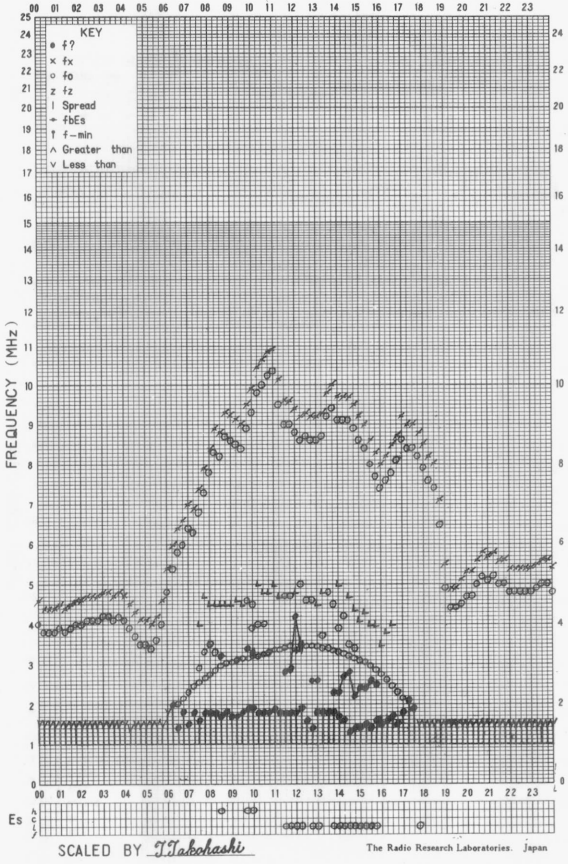


SCALED BY J. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Mar. 10, 1973

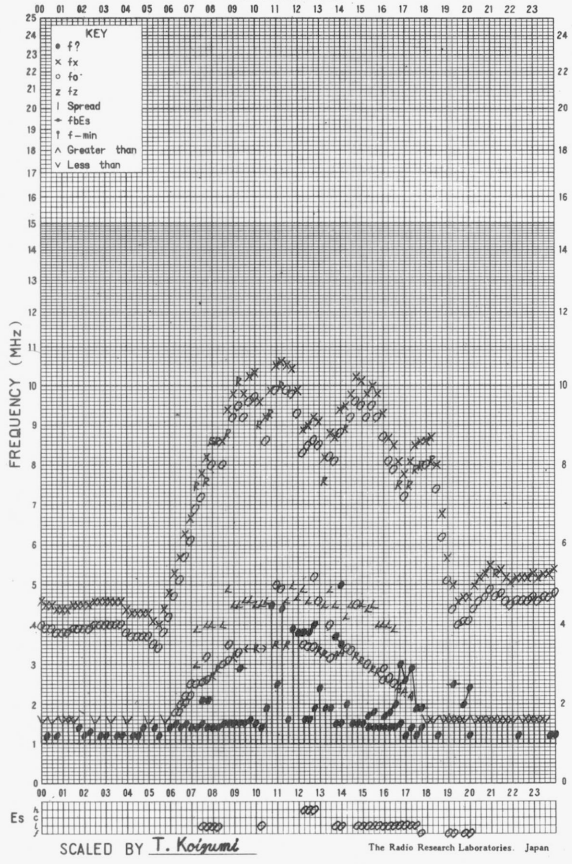


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

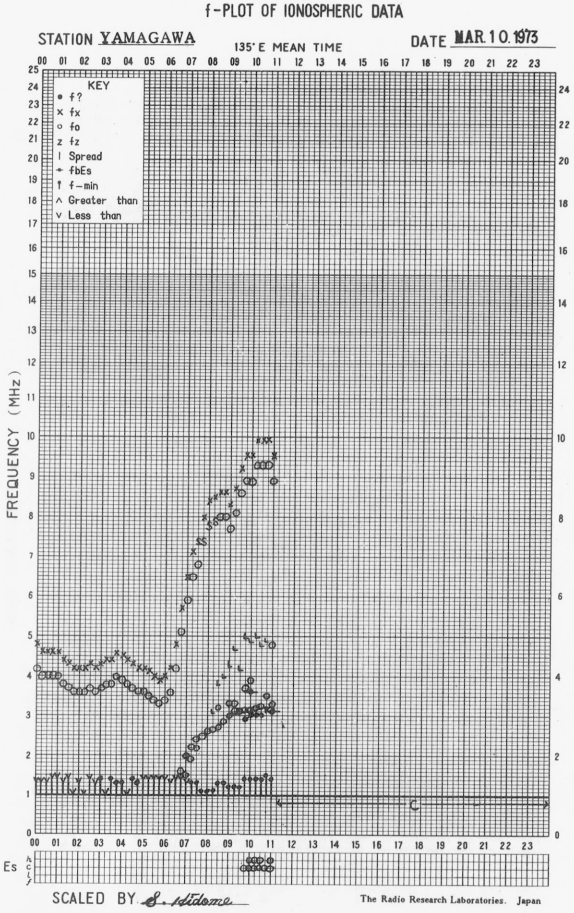
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAR. 10.1973



SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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STATION YAMAGAWA
135° E MEAN TIME
DATE MAR 10 1973
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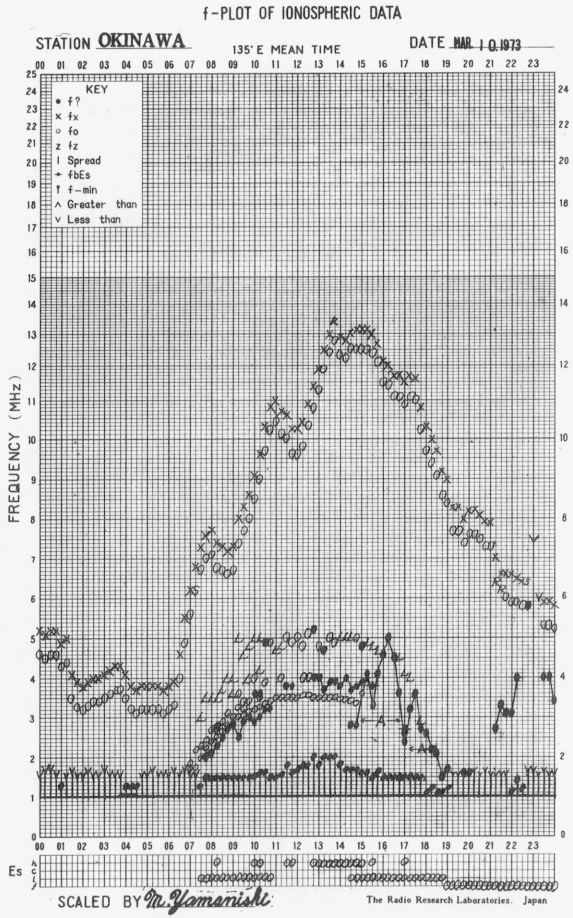
SCALED BY S. Ishidome
The Radio Research Laboratories. Japan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DATE MAR 10 1973
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FREQUENCY (MHz)
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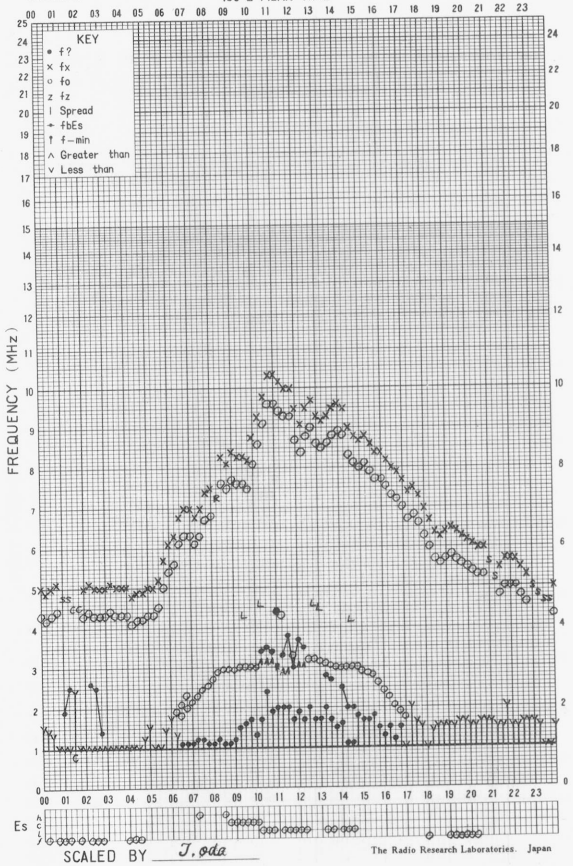
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE Mar 8-9, 1973



SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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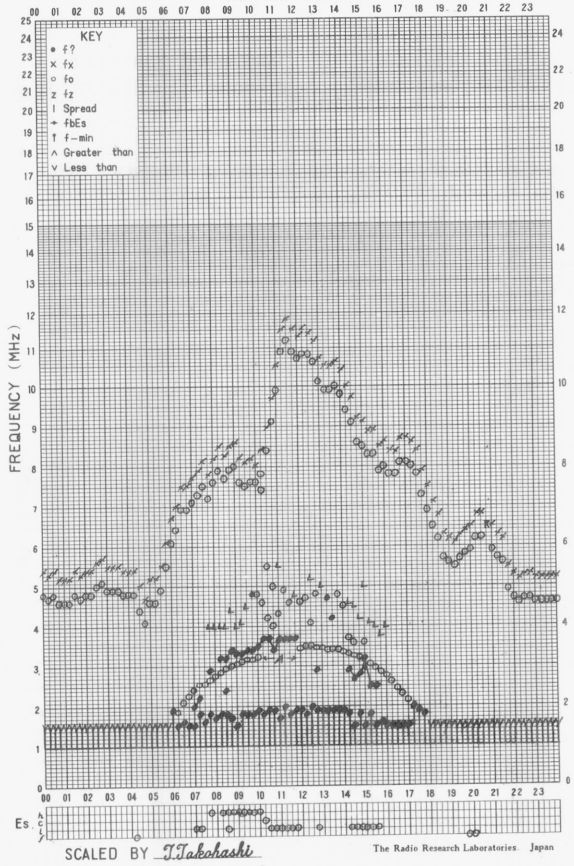

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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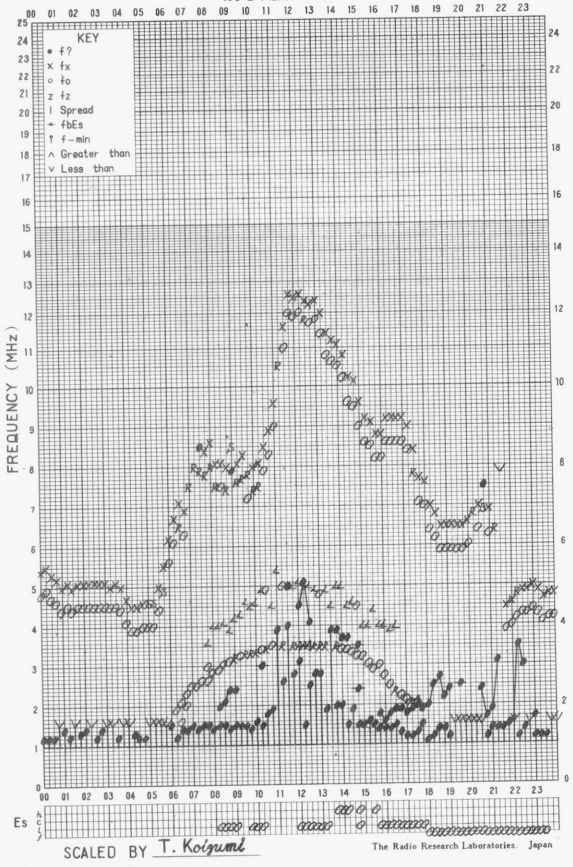
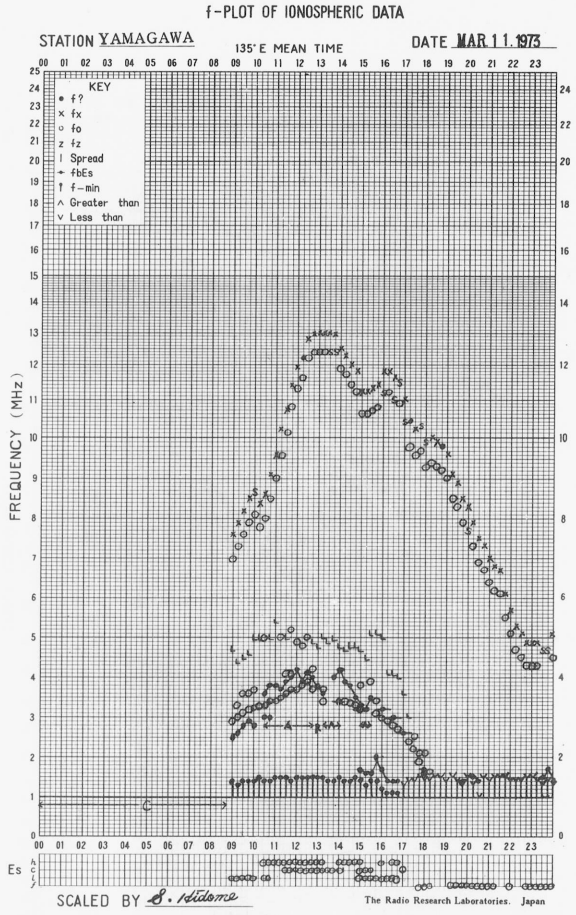


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE MAR 11. 1973
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FREQUENCY (MHz)
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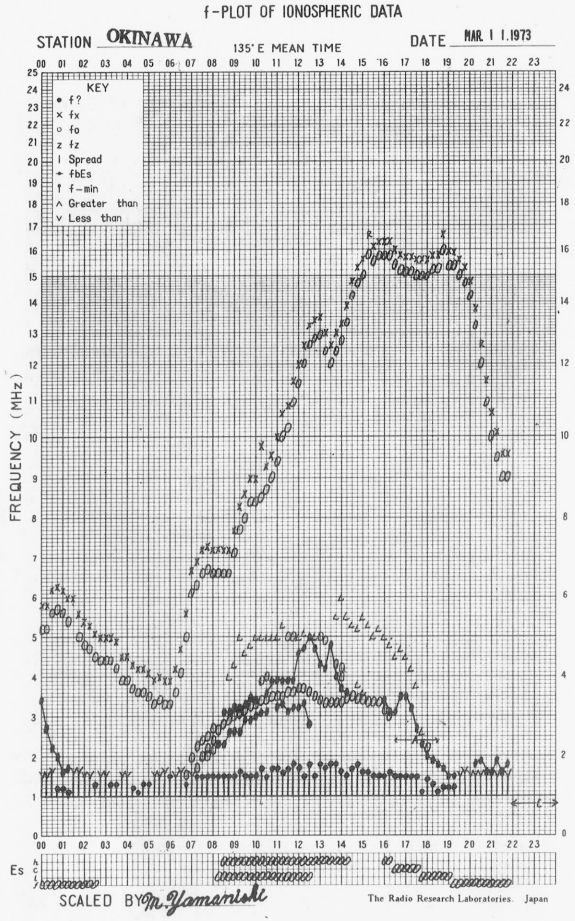
SCALED BY S. Hidoma
The Radio Research Laboratories. Japan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KEY
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FREQUENCY (MHz)
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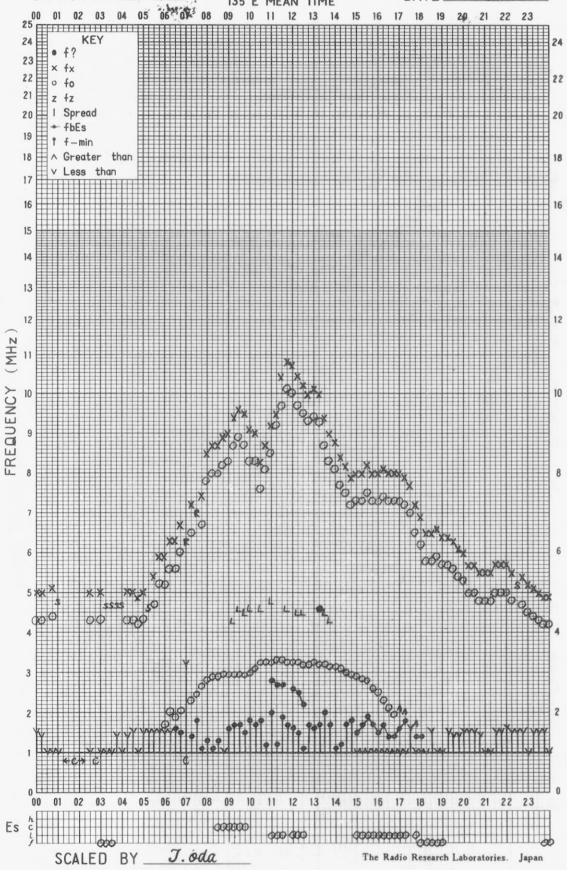
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 12 1973



SCALED BY J. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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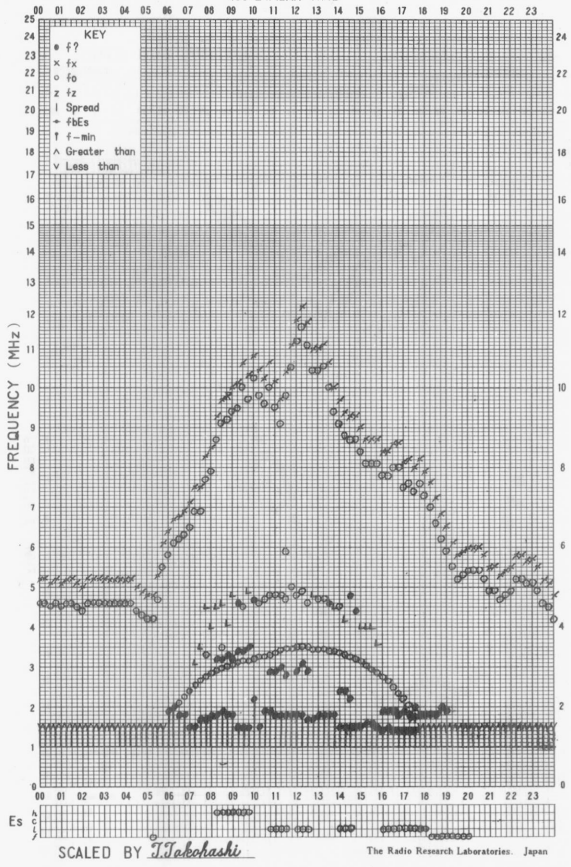

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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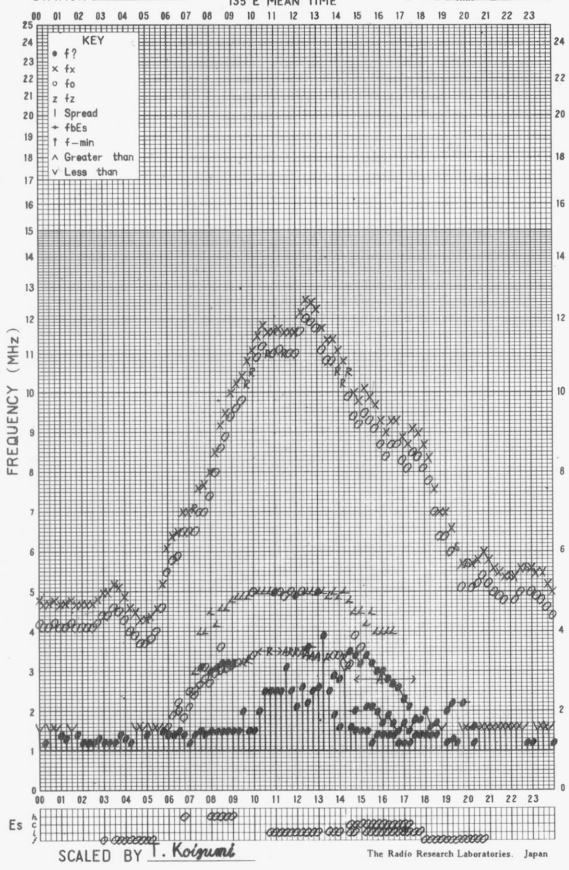
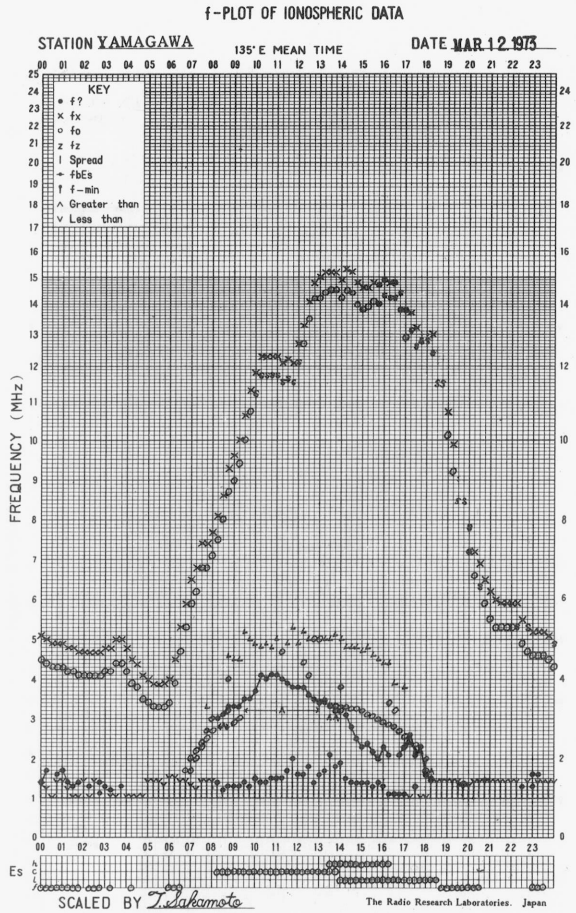


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE MAR. 12. 1973
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∨ Less than
FREQUENCY (MHz)
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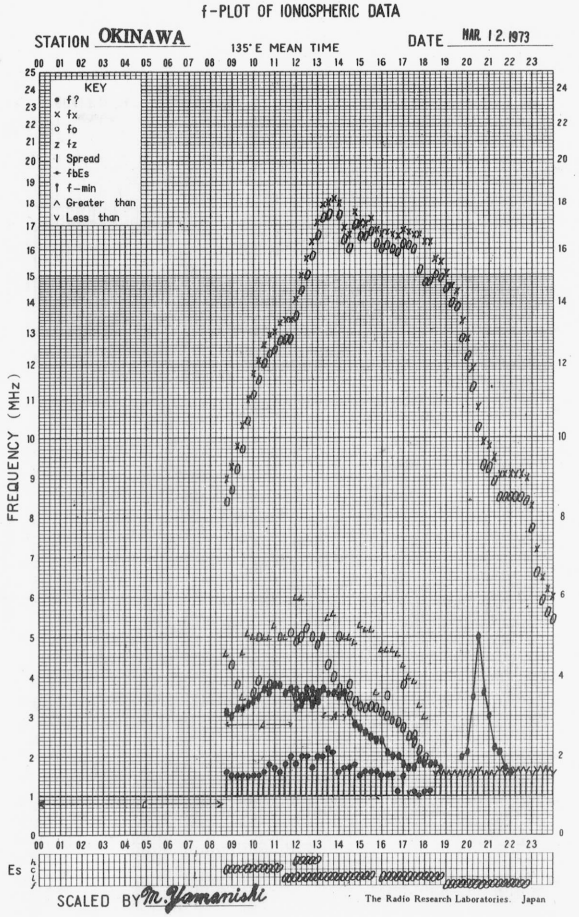
SCALED BY T. Sakamoto
The Radio Research Laboratories. Japan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∨ Less than
FREQUENCY (MHz)
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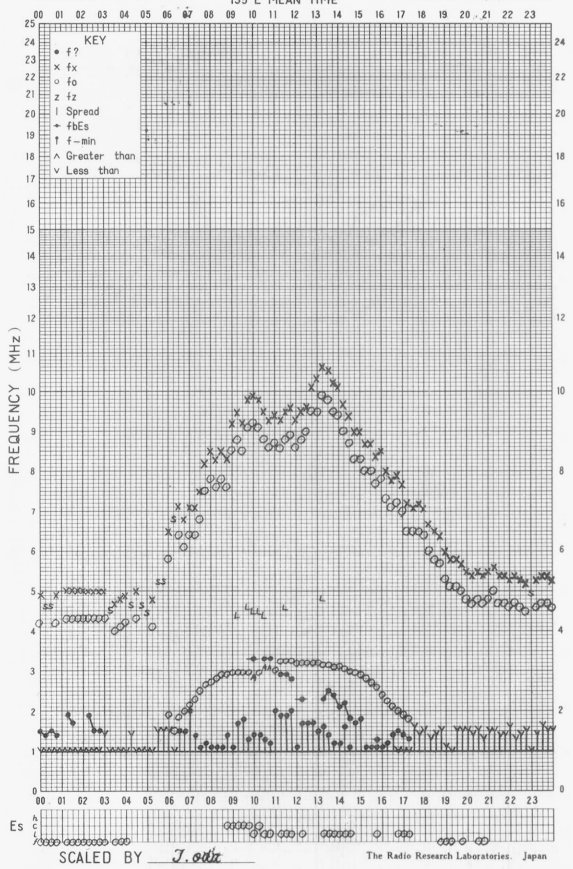
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR 13 1973



SCALED BY T. ozu

The Radio Research Laboratories. Japan

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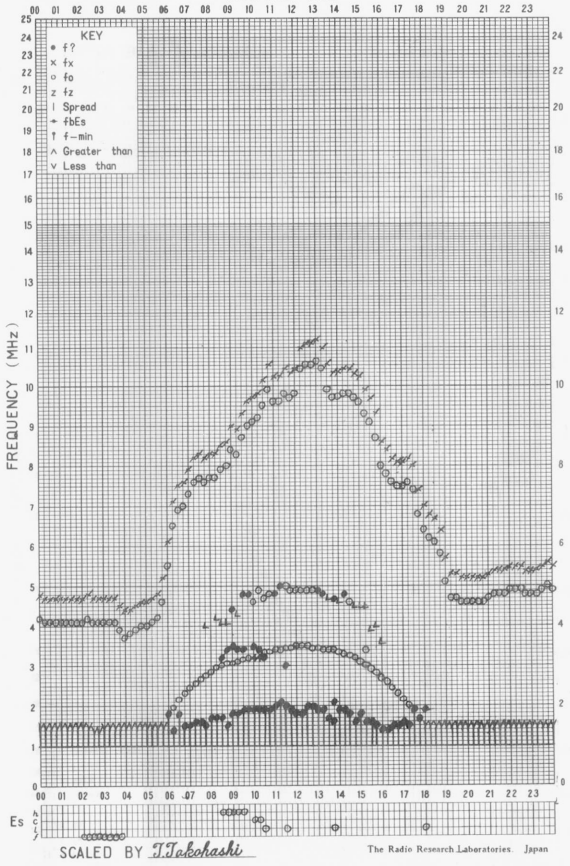

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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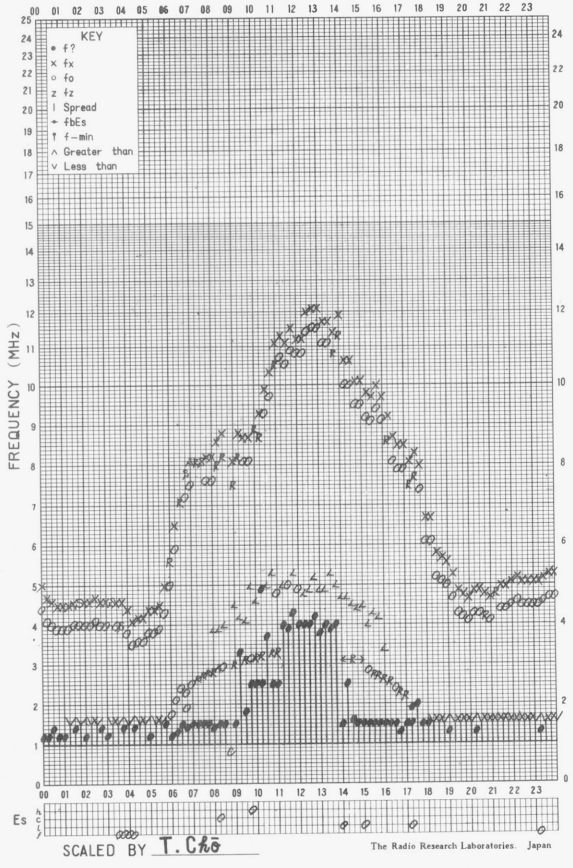

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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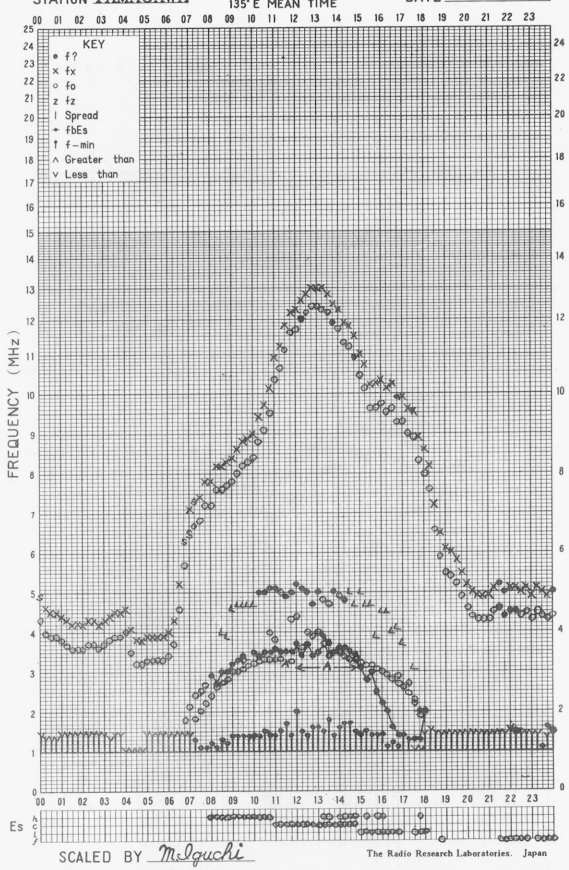

SCALED BY M.Iguchi

The Radio Research Laboratories. Japan

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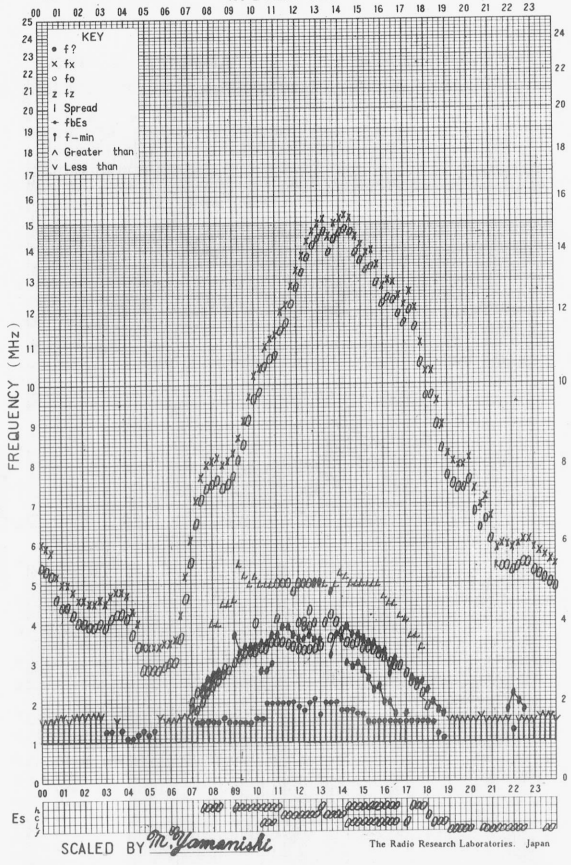

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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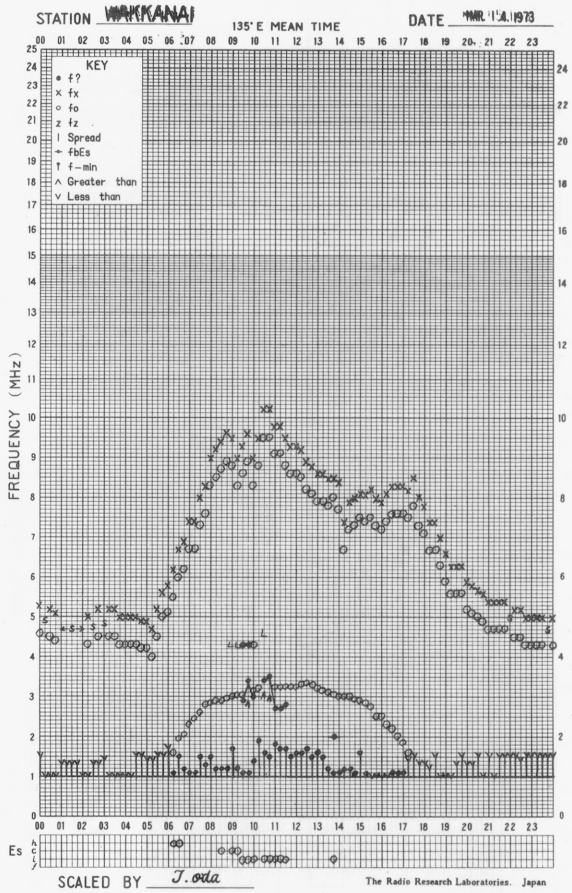

SCALED BY T. oda

The Radio Research Laboratories. Japan

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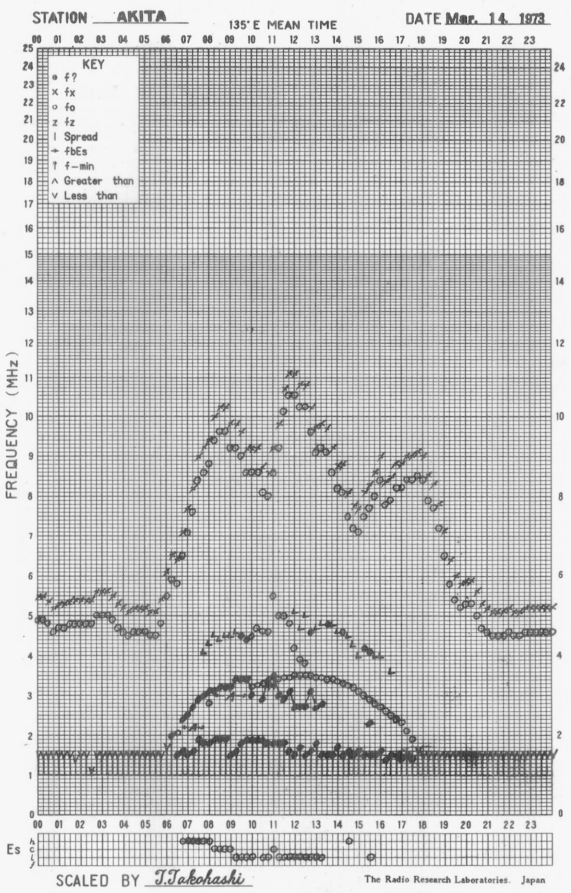

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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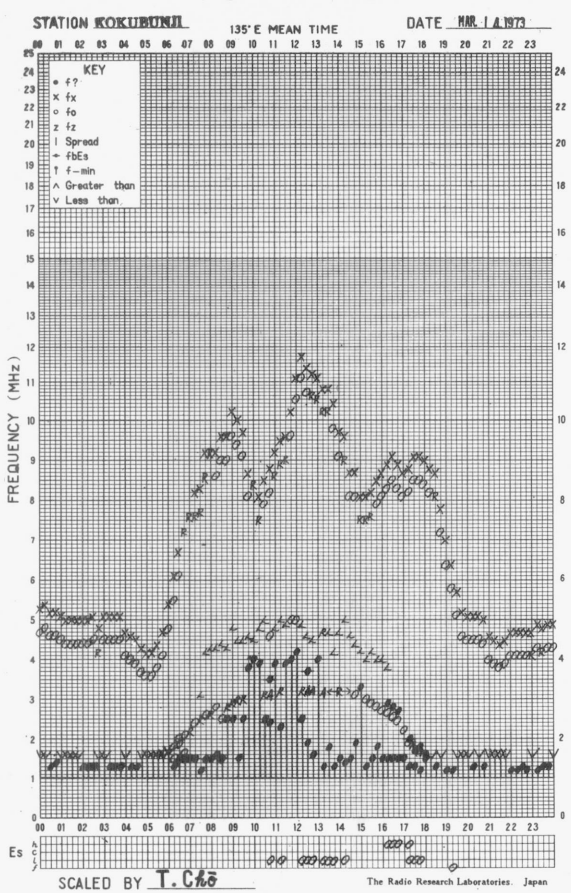

SCALED BY T. Ito

The Radio Research Laboratories. Japan

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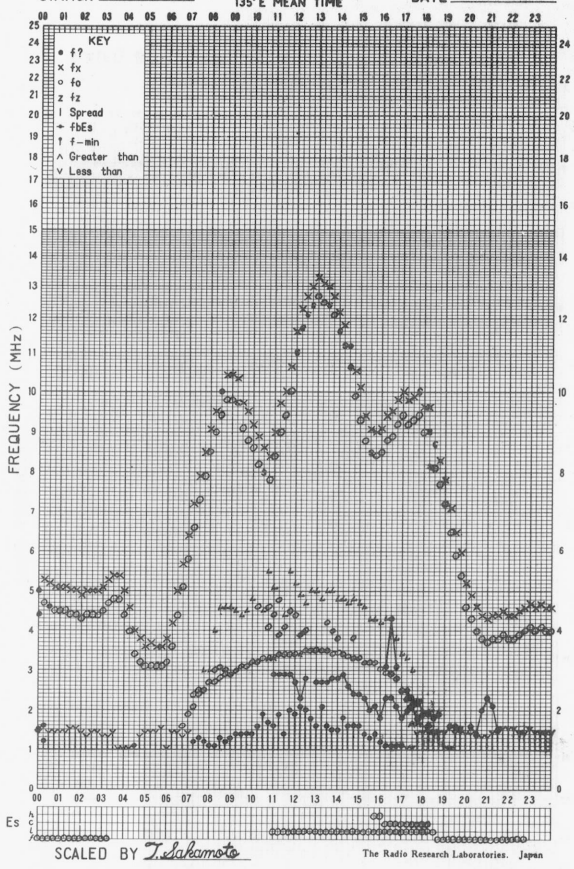

SCALED BY T. Sakamoto

The Radio Research Laboratories. Japan

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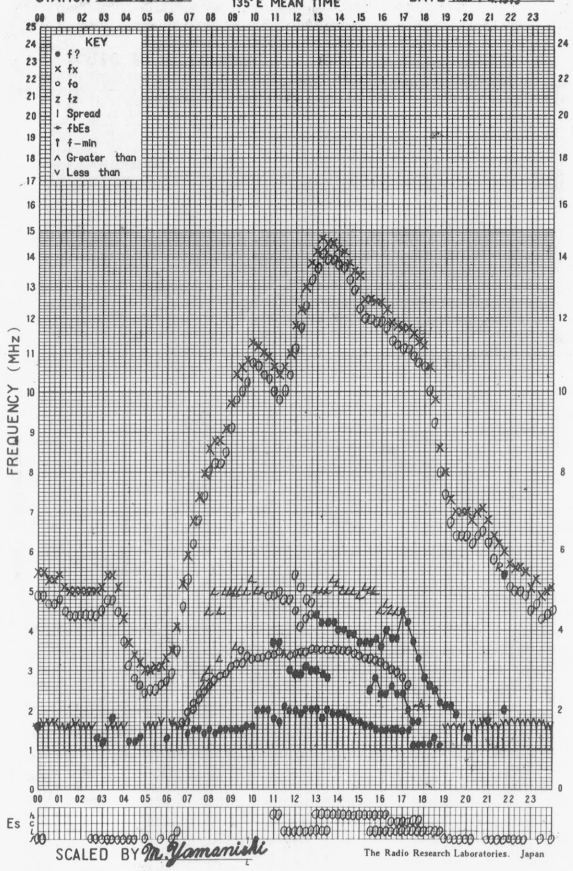
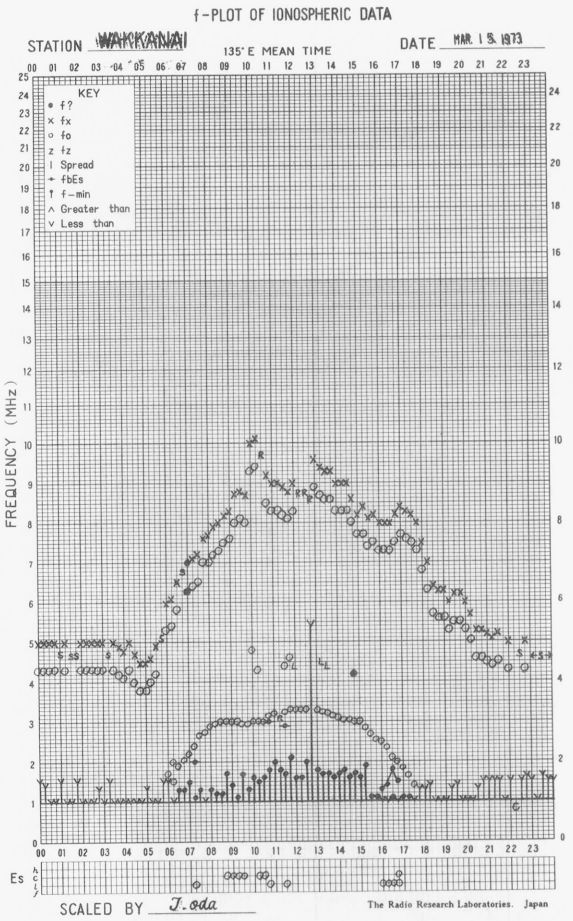


SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR. 15. 1973
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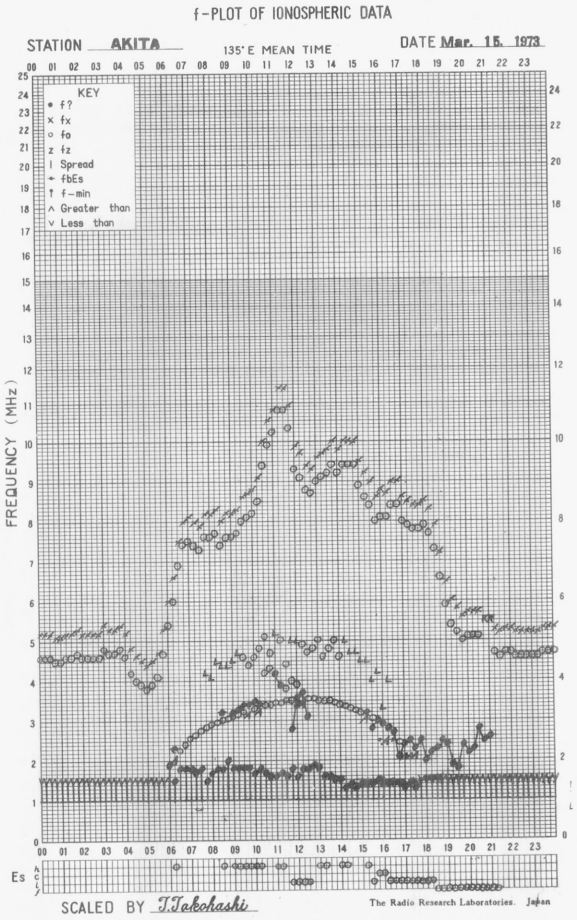
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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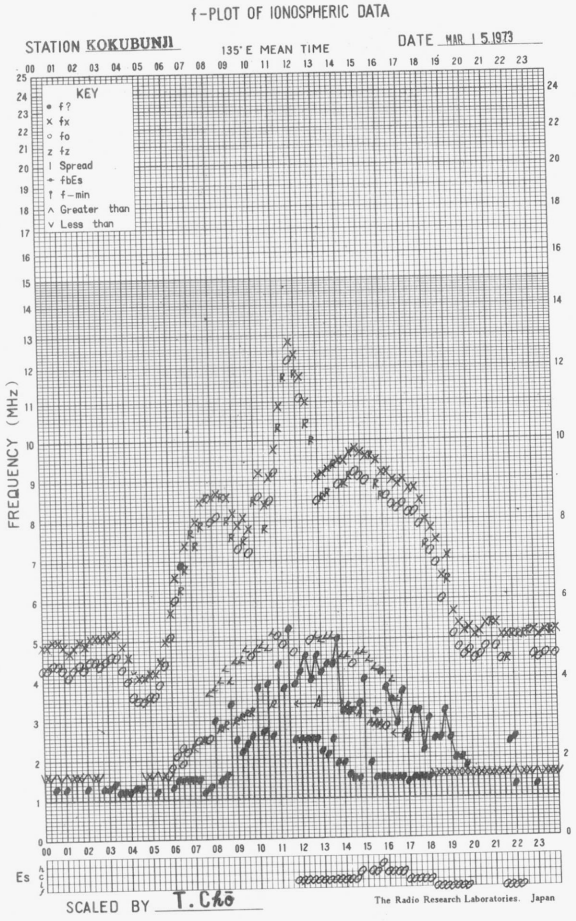
SCALED BY T.Takahashi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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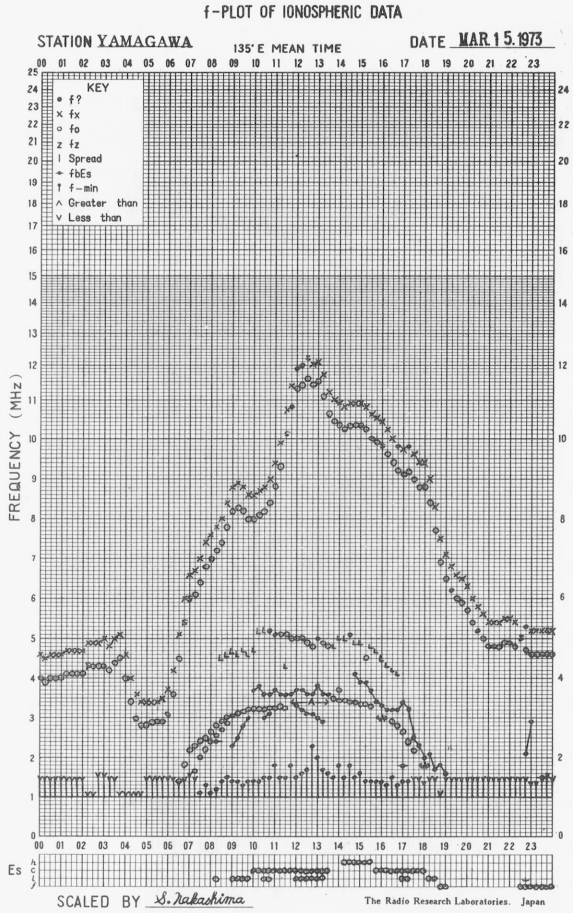
SCALED BY T. Chō
The Radio Research Laboratories. Japan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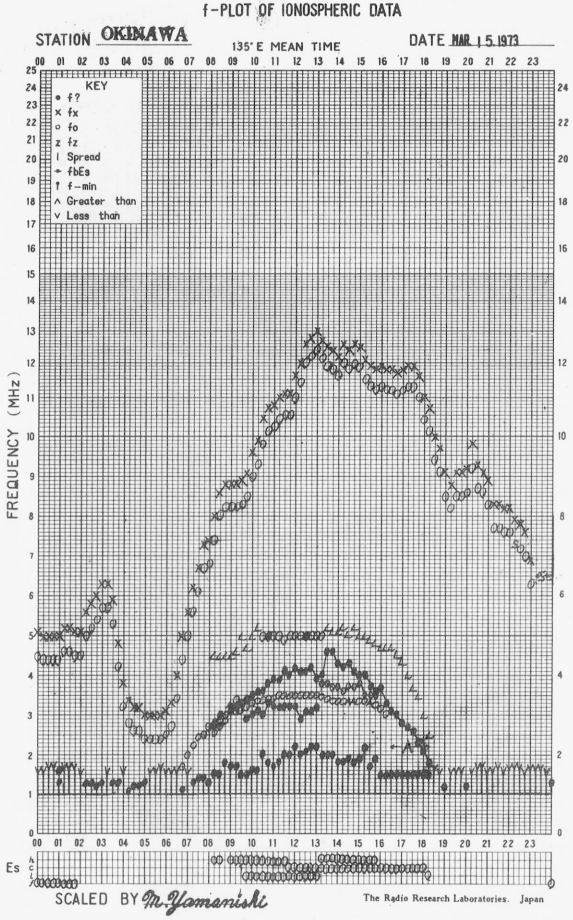
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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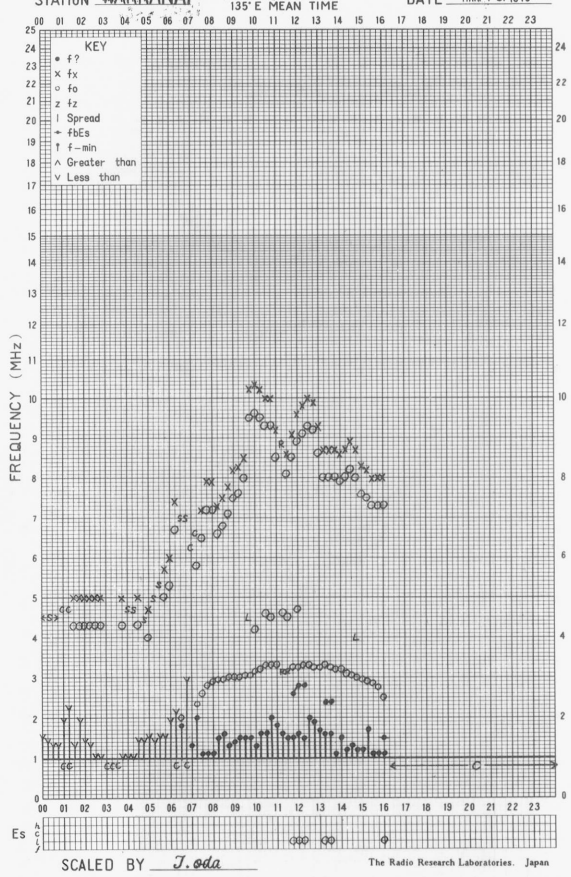

SCALED BY T. oda

The Radio Research Laboratories. Japan

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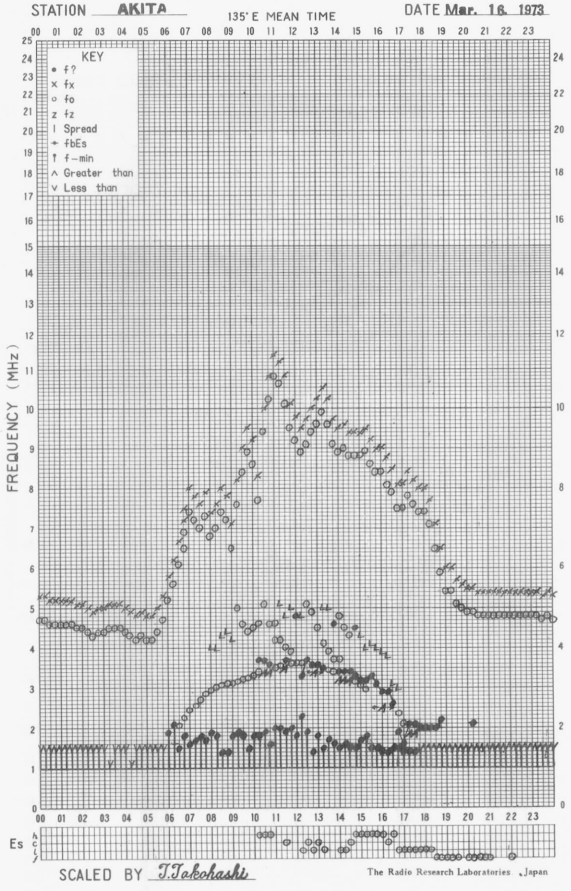

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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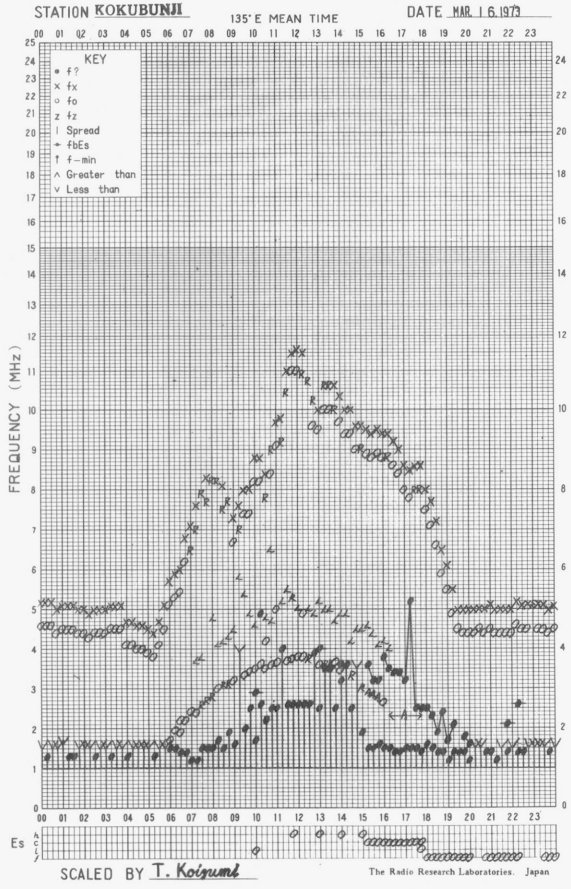
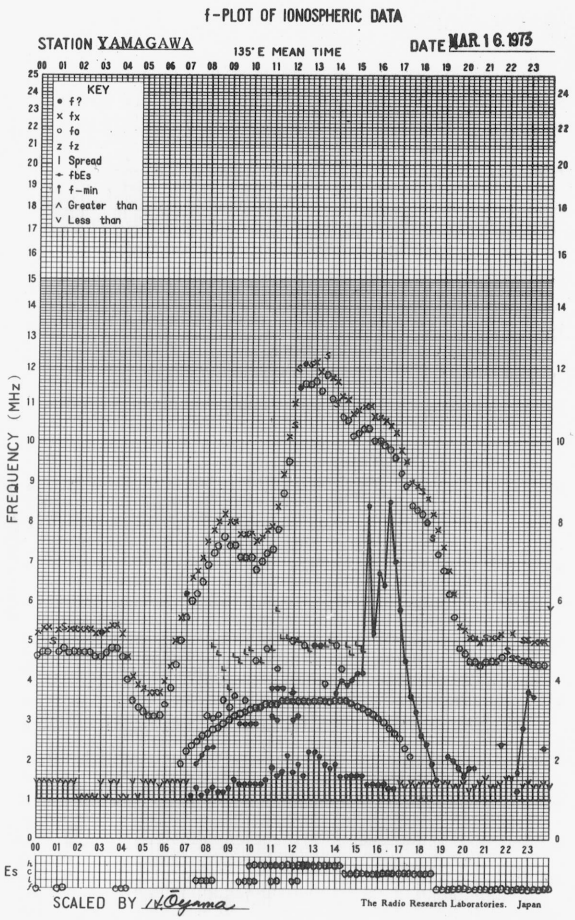


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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DATE MAR. 16. 1973
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FREQUENCY (MHz)
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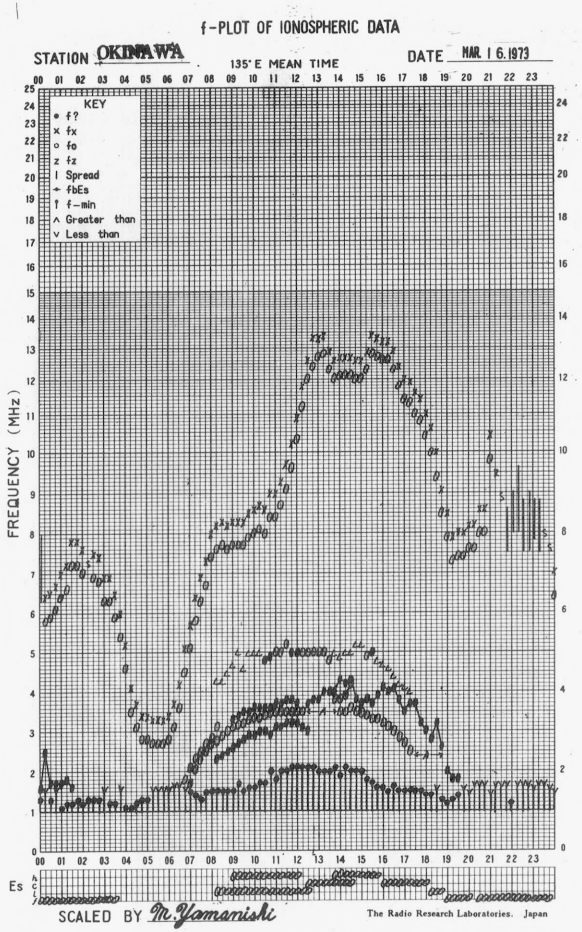
SCALED BY N. Oyama
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

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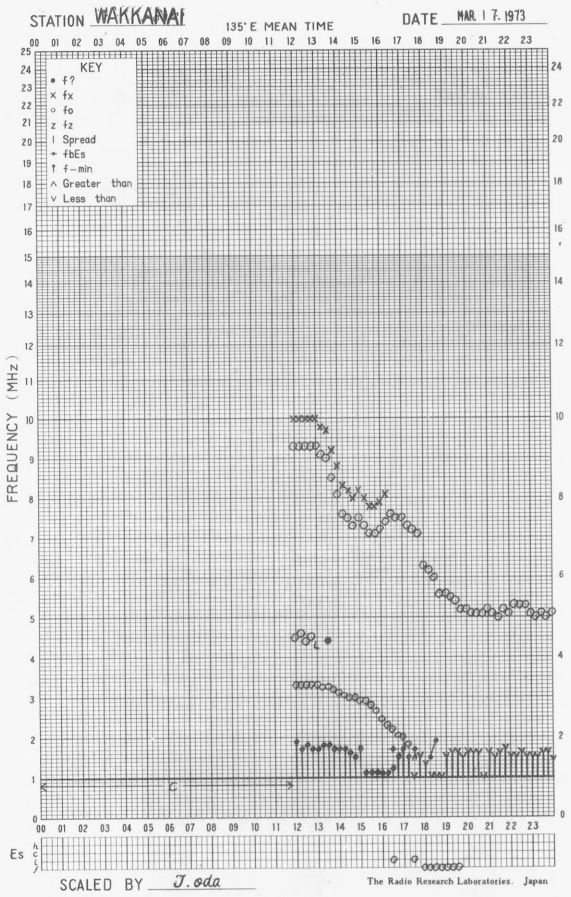

SCALED BY T. oda

The Radio Research Laboratories. Japan

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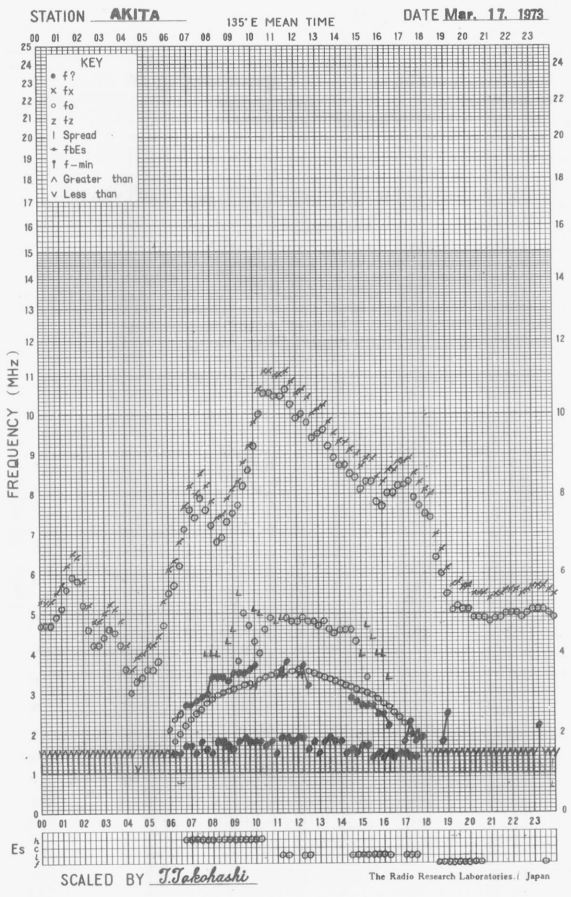

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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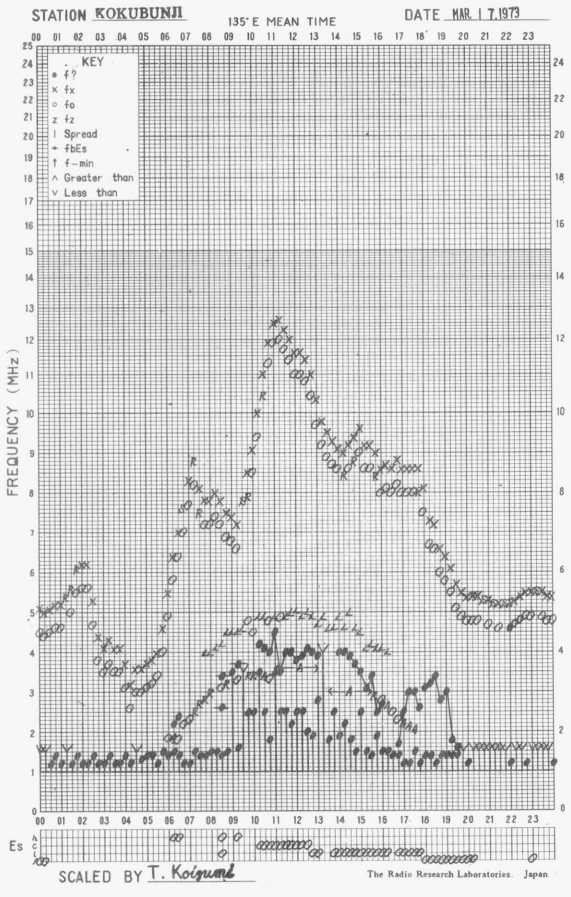

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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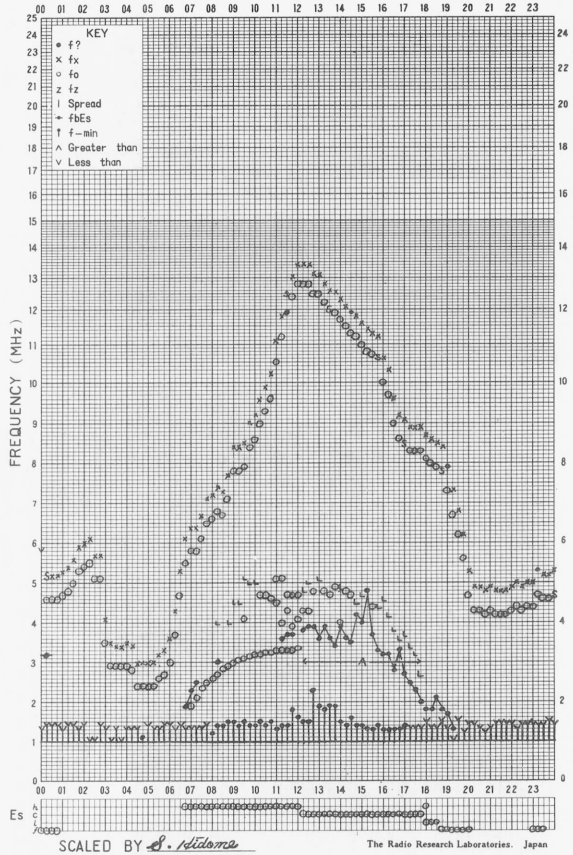

SCALED BY S. Iidaka

The Radio Research Laboratories. Japan

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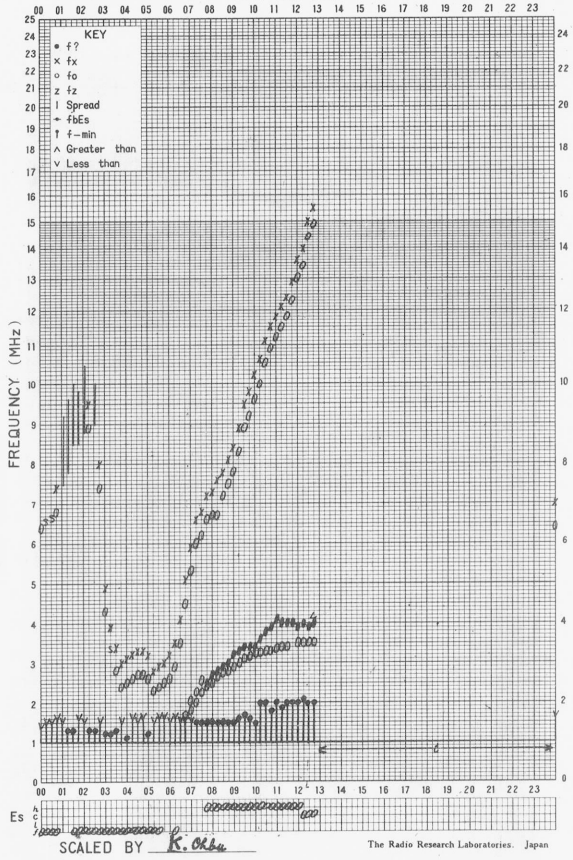
STATION OKINAWA 135°E MEAN TIME DATE MAR 17. 1973

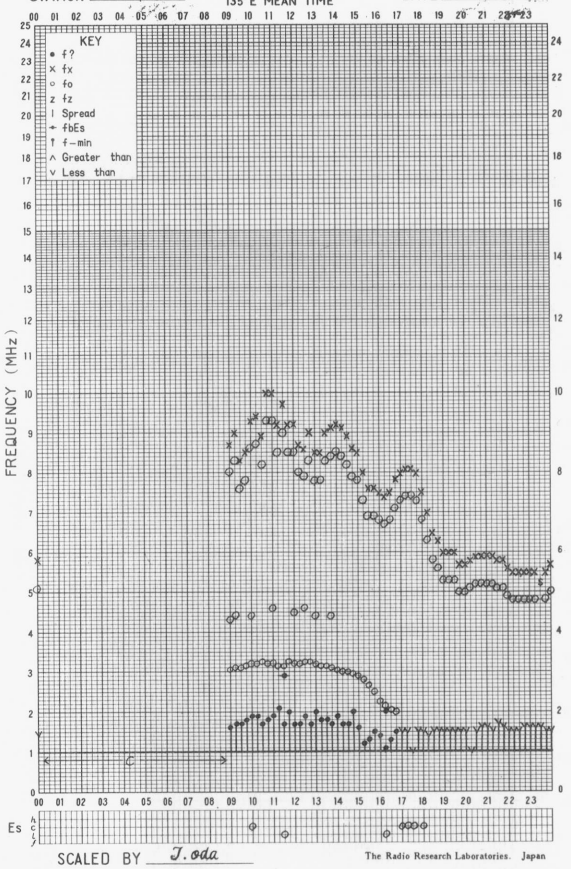


SCALED BY K. Ohba

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 18. 1973

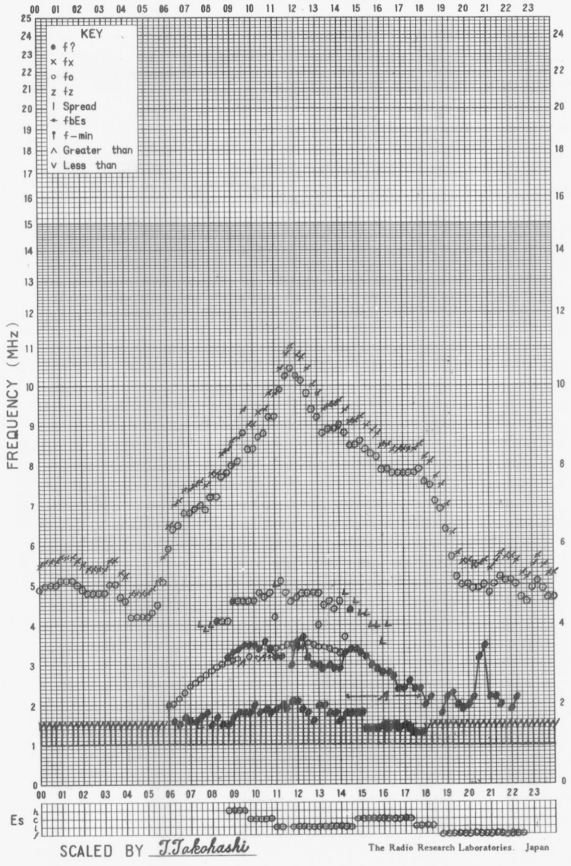


SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Mar. 18. 1973



SCALED BY J. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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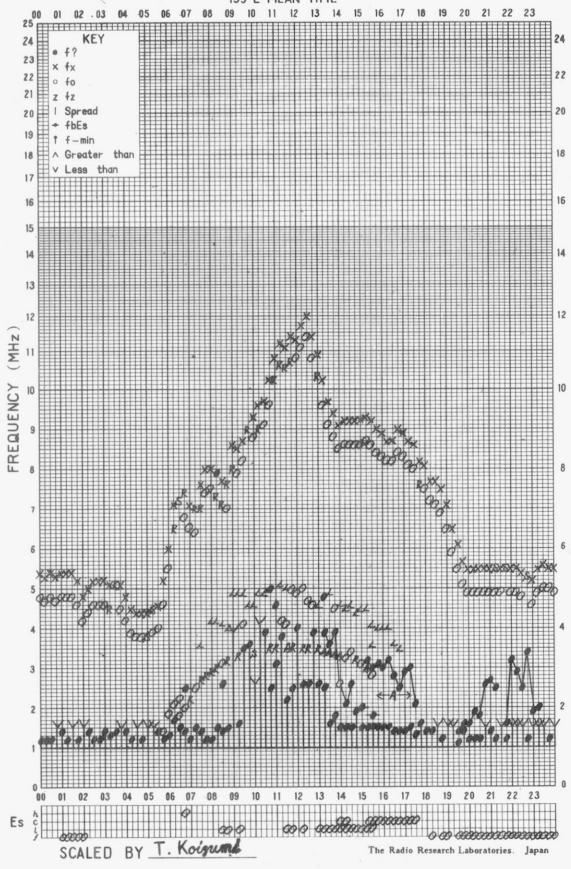
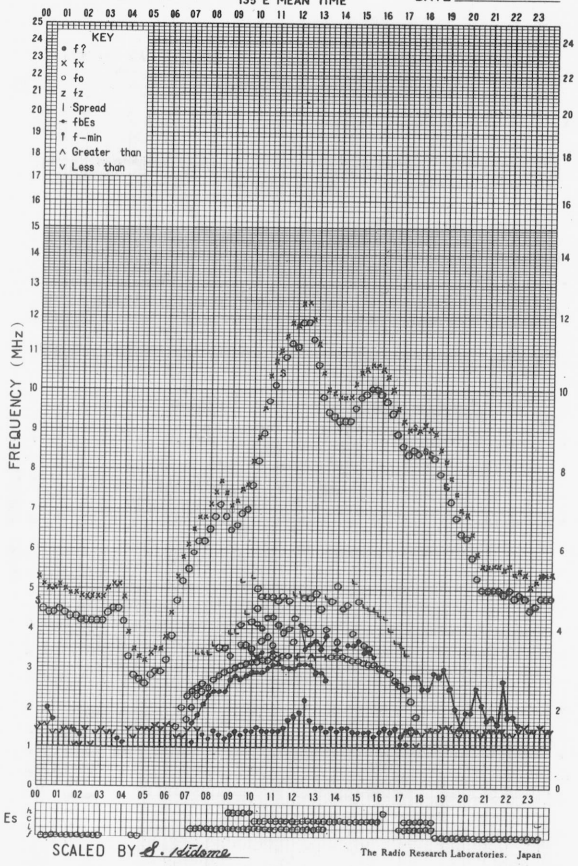


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAR 18 1973



SCALED BY S. Ishidome

The Radio Research Laboratories. Japan

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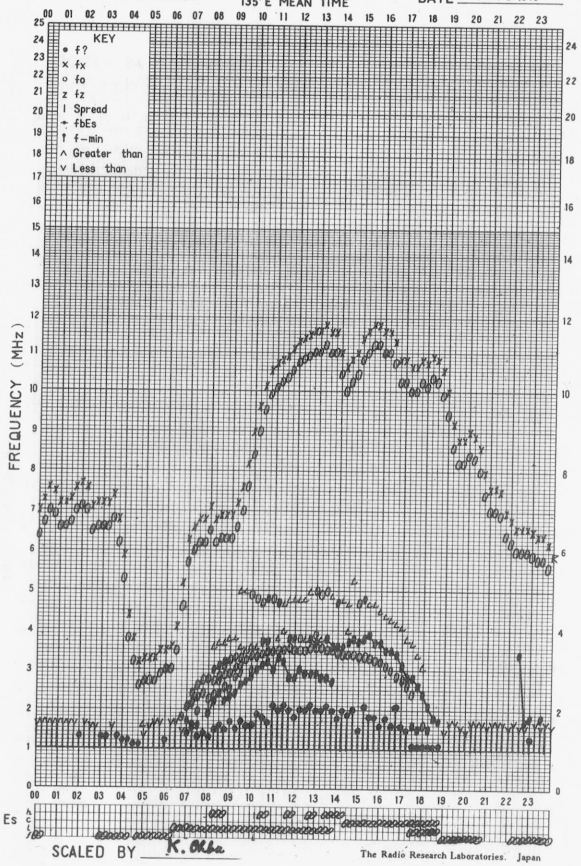
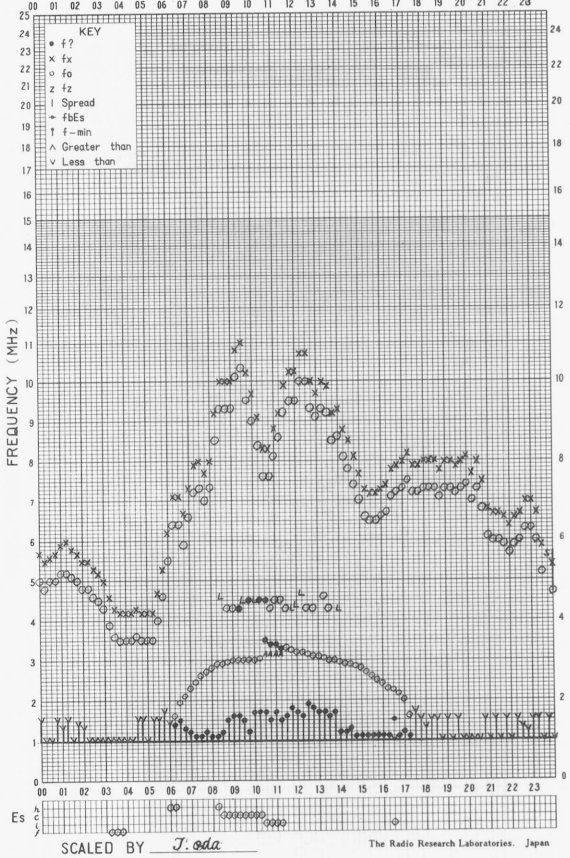


SCALED BY K. Oka

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 19. 1973



SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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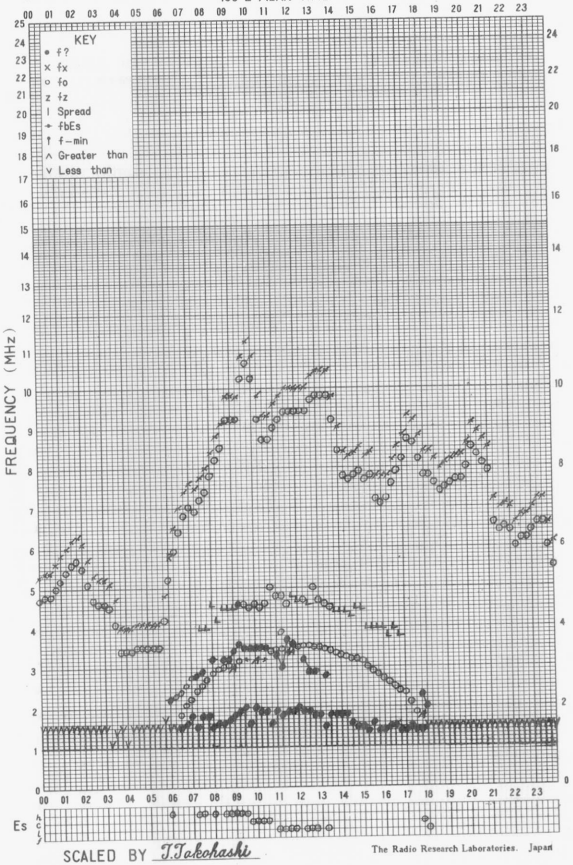

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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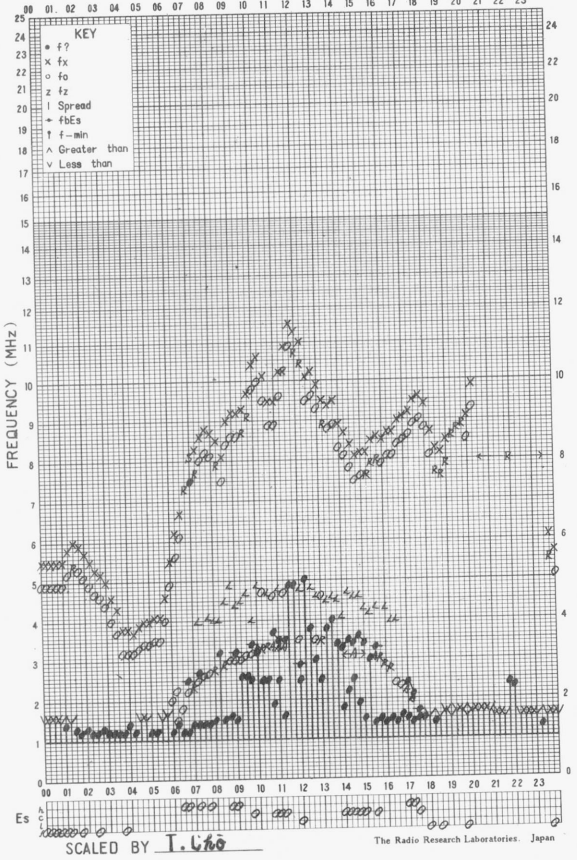

SCALED BY T. Ono

The Radio Research Laboratories. Japan

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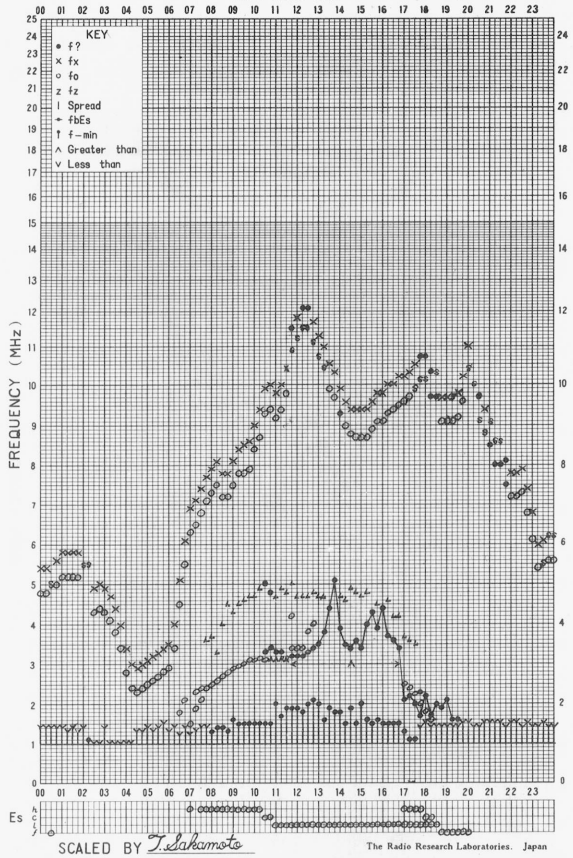

SCALED BY T. Sakamoto

The Radio Research Laboratories. Japan

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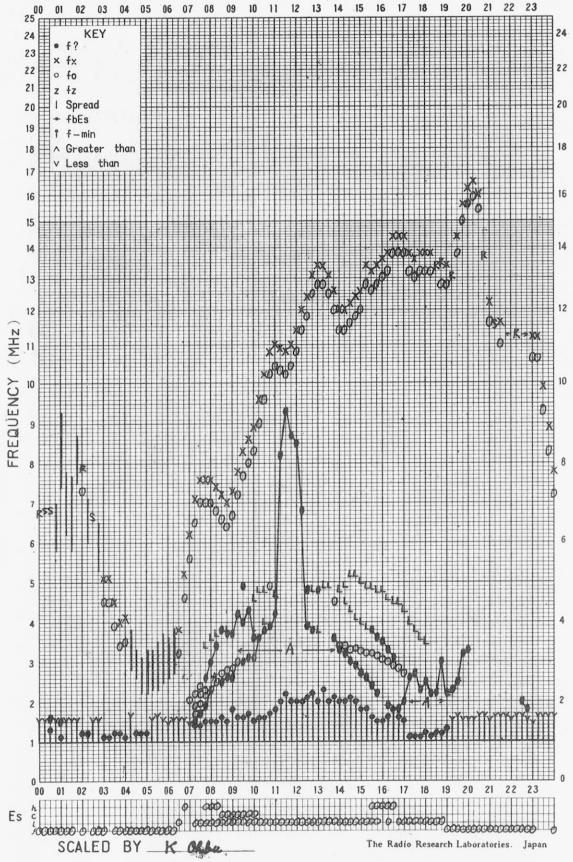

SCALED BY K. Ohba

The Radio Research Laboratories. Japan

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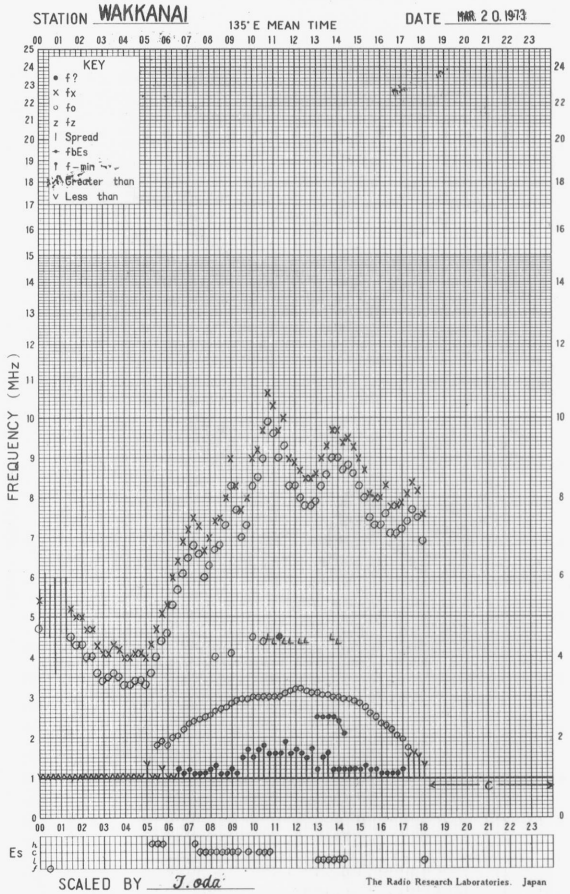

SCALED BY T. oda

The Radio Research Laboratories. Japan

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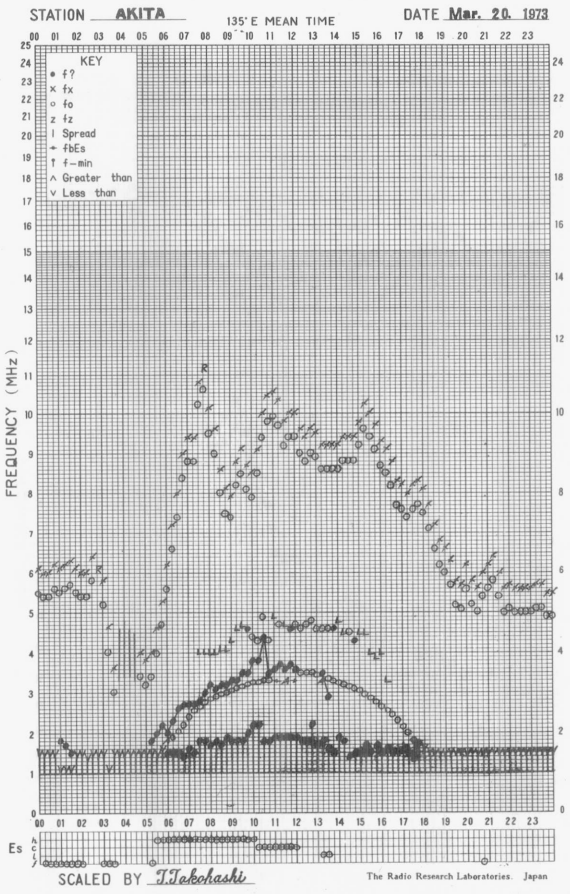

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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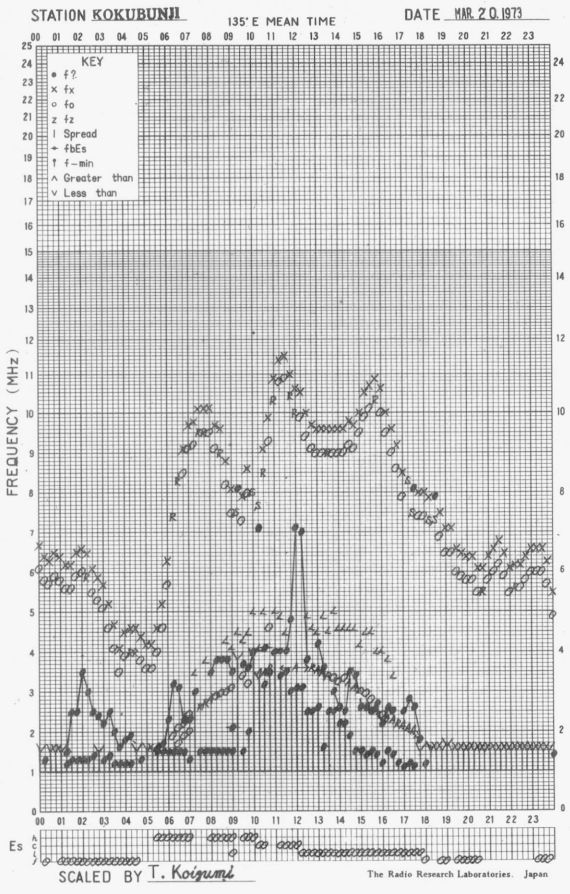
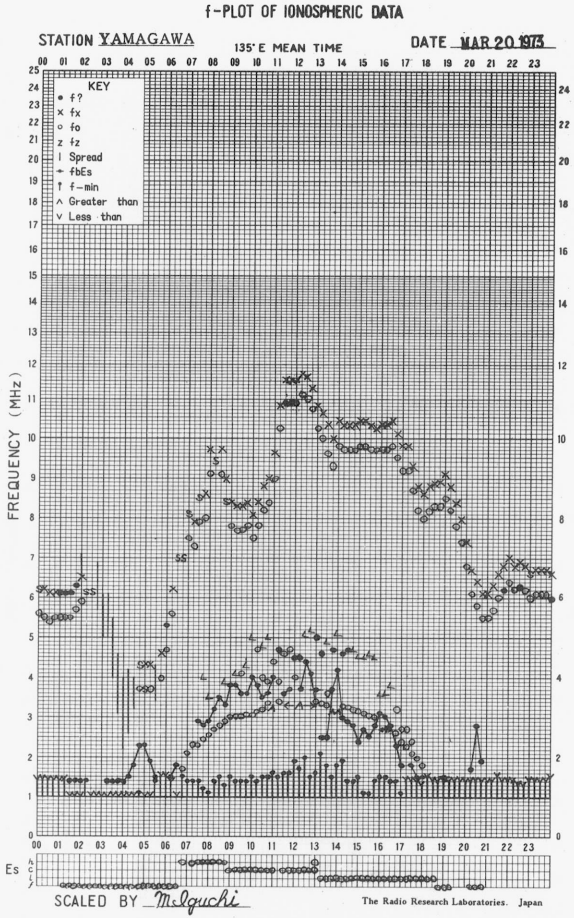


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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STATION YAMAGAWA
135° E MEAN TIME
DATE MAR 20 1973
KEY
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FREQUENCY (MHz)
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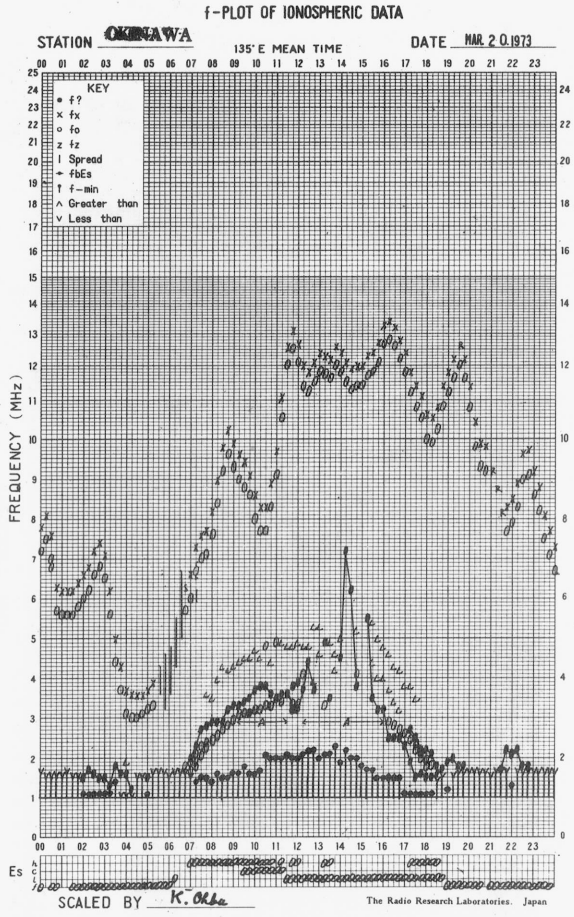
SCALED BY M. Iguchi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY K. Okba
The Radio Research Laboratories. Japan

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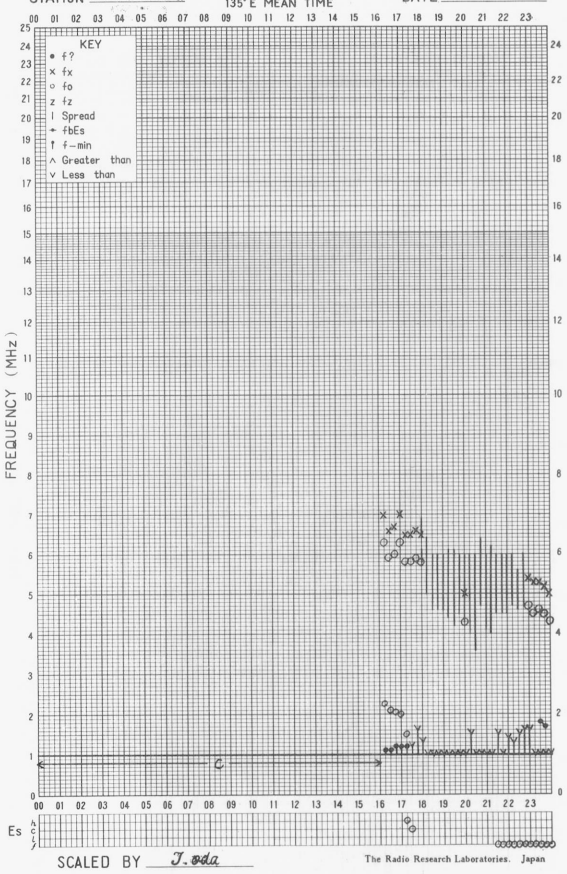

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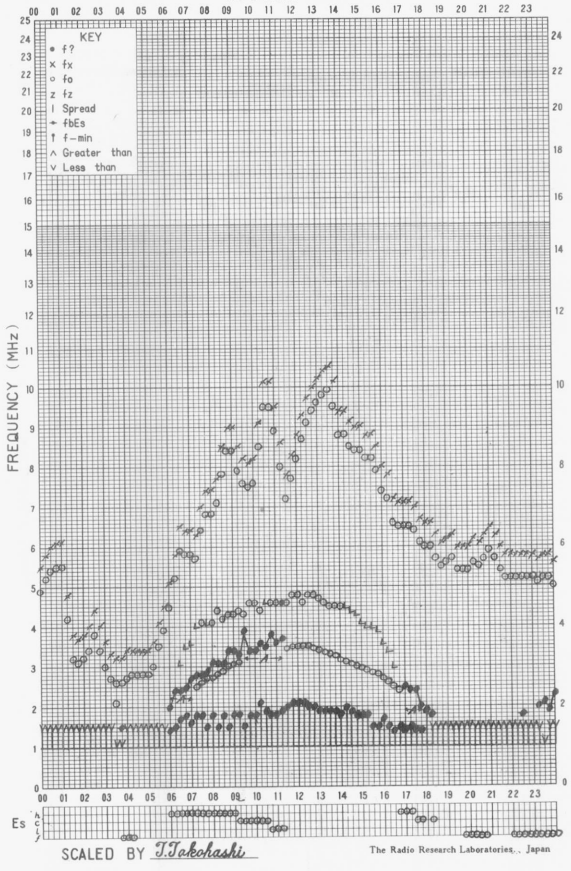

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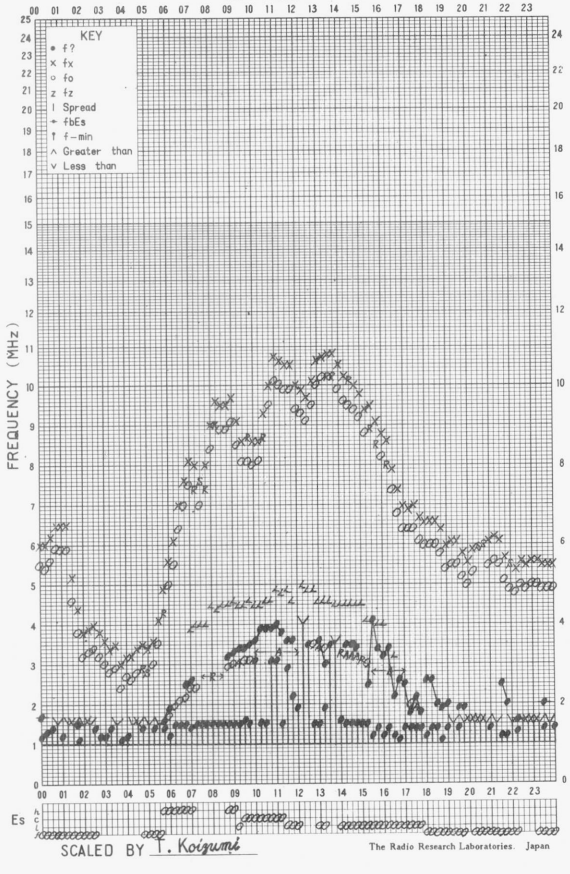

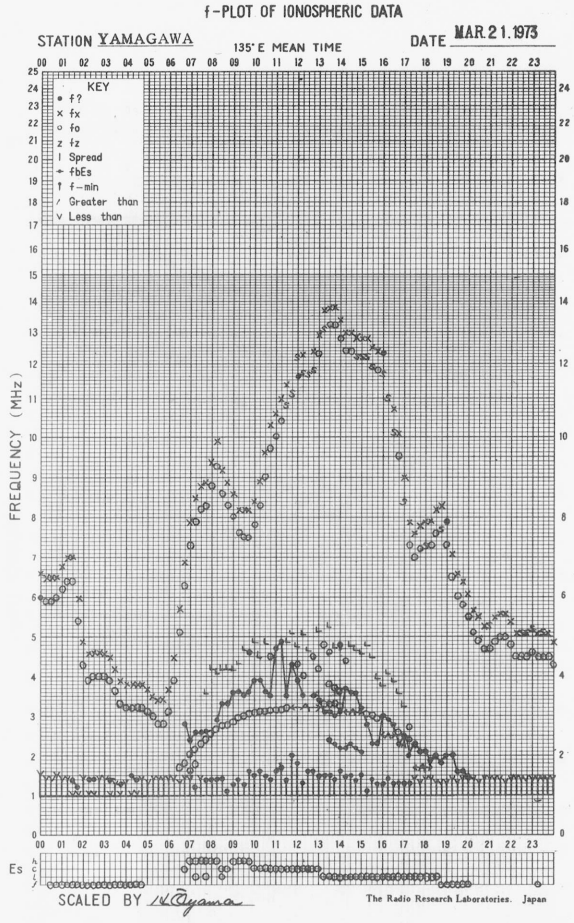
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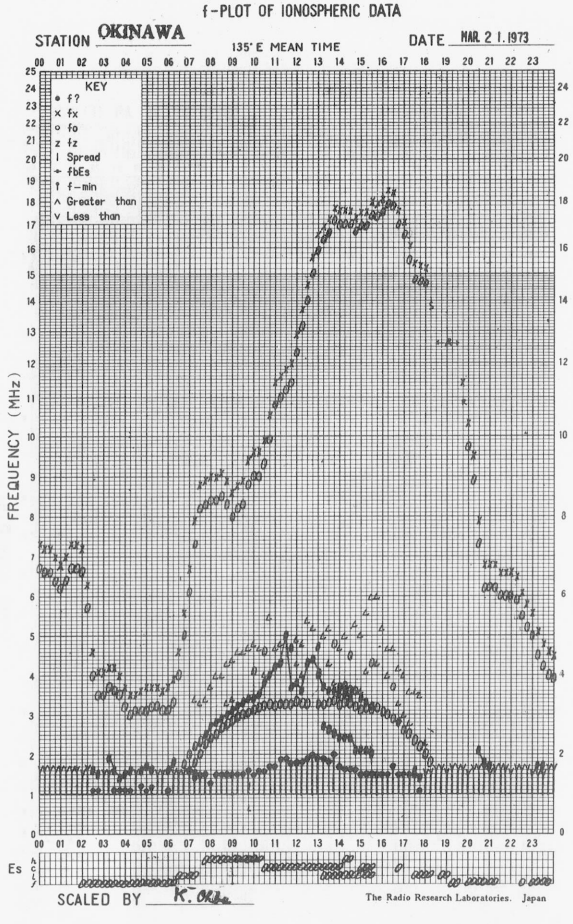
The Radio Research Laboratories. Japan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SCALED BY K. Okba
The Radio Research Laboratories. Japan

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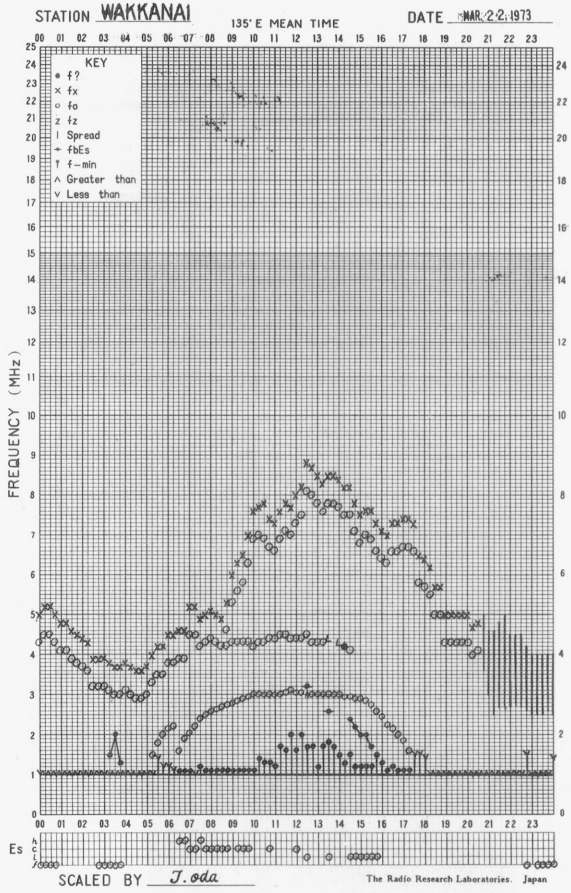

SCALED BY T. oda

The Radio Research Laboratories. Japan

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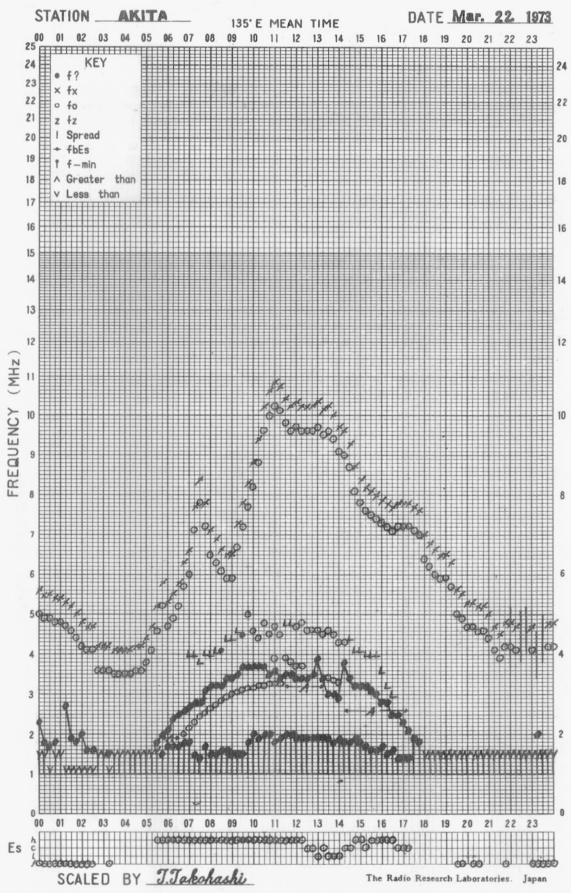

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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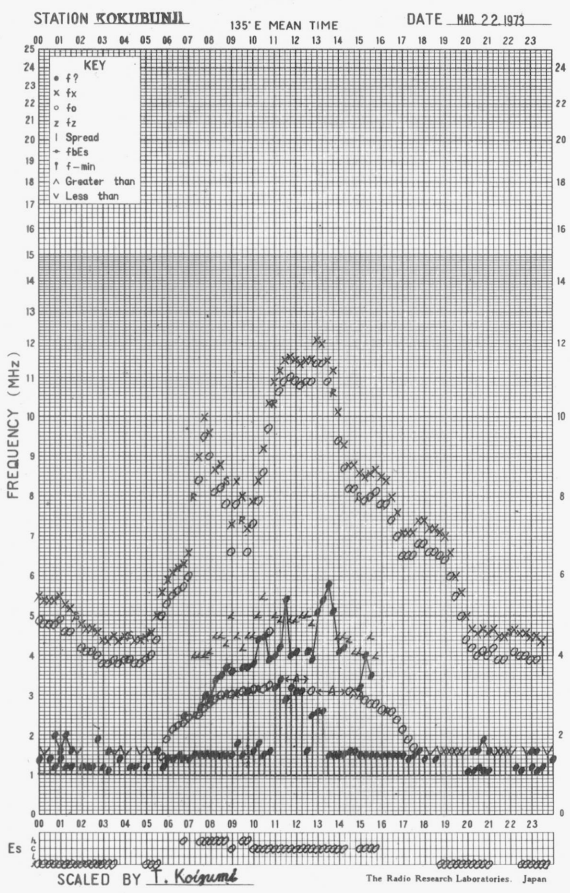
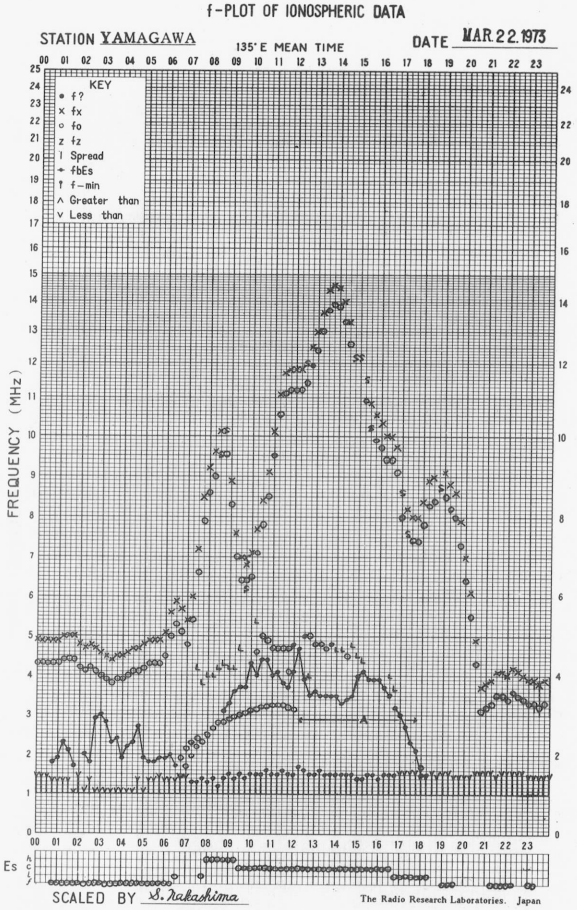


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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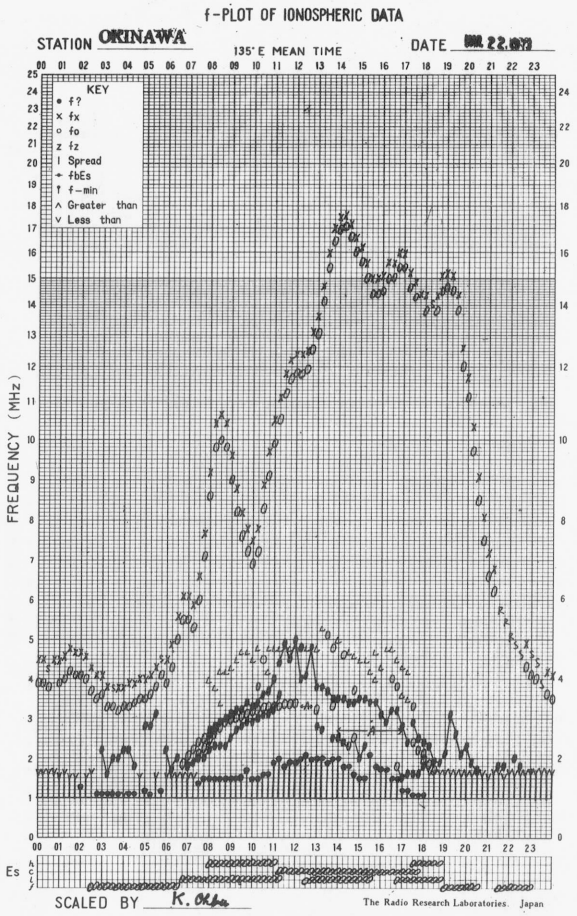
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY K. Okba
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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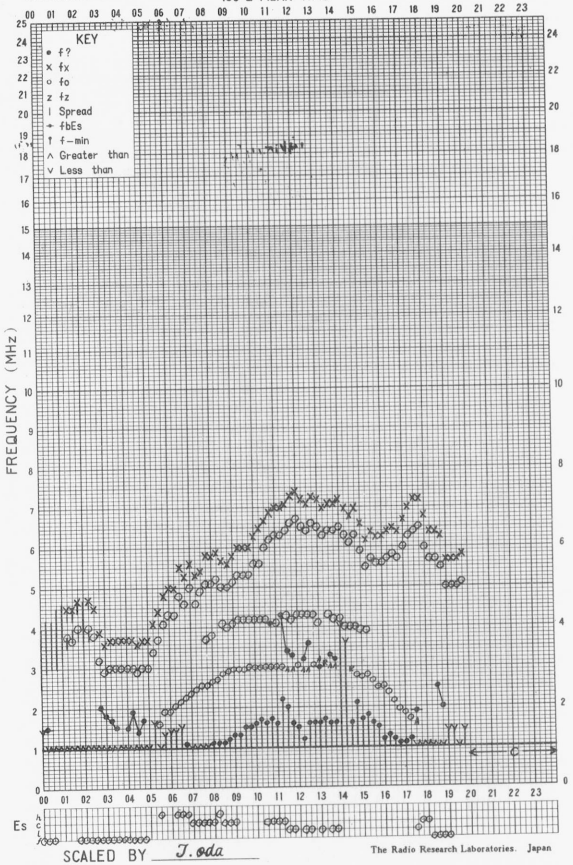

SCALED BY T. oda

The Radio Research Laboratories. Japan

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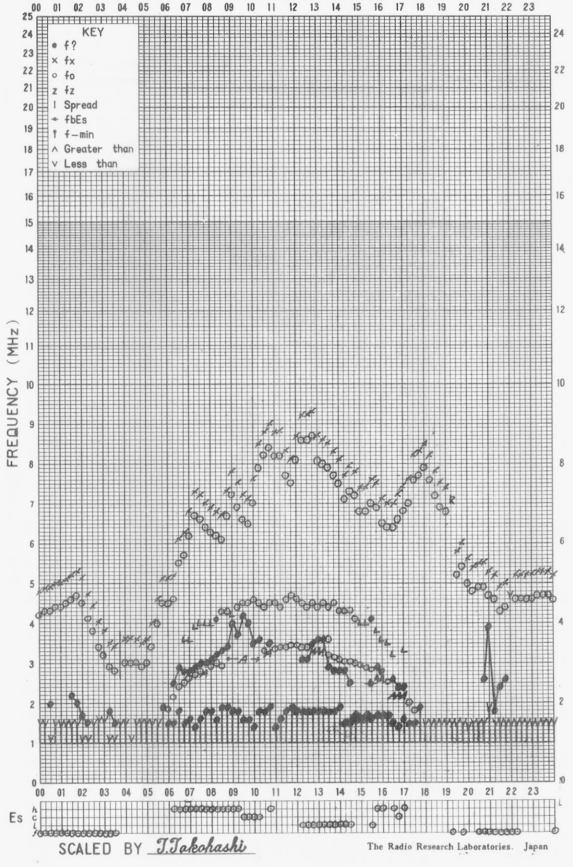

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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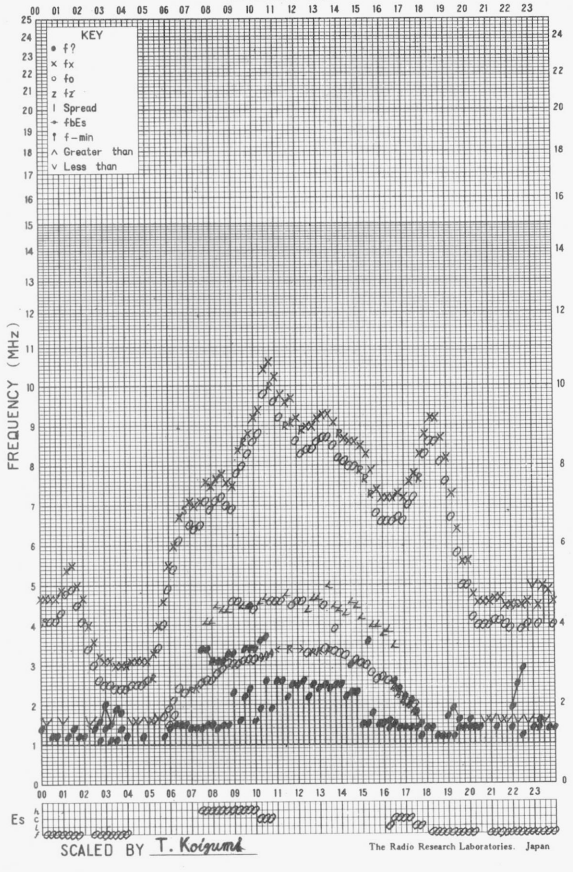
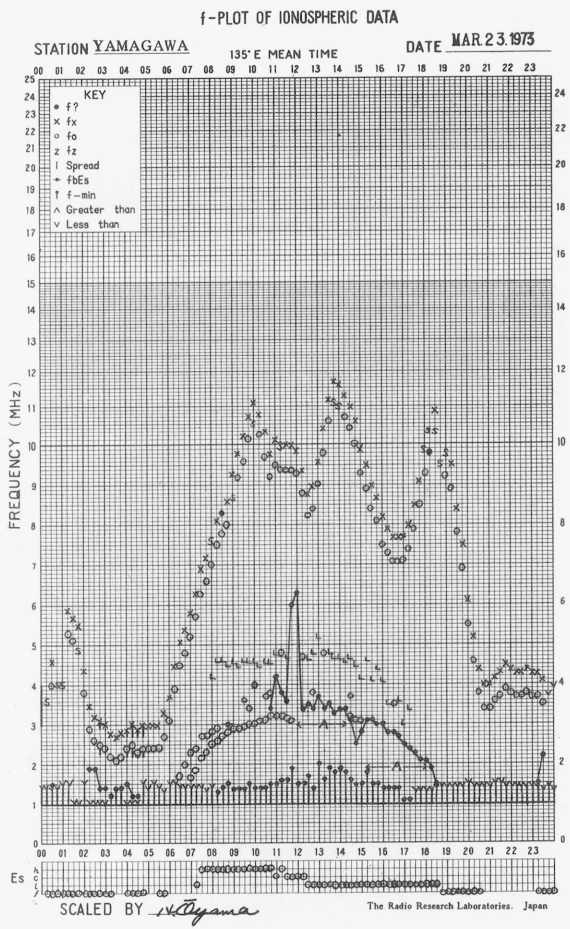


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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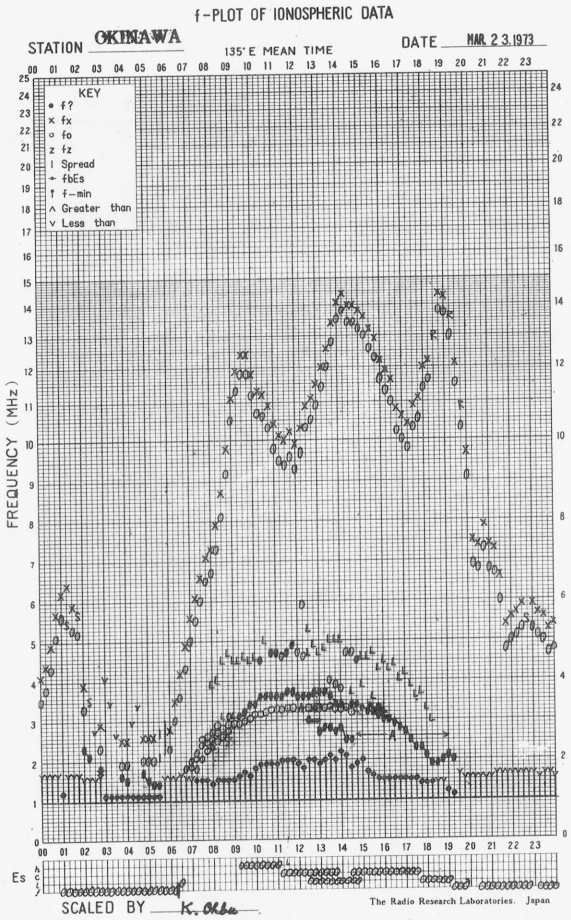
SCALED BY H. Oyama
The Radio Research Laboratories. Japan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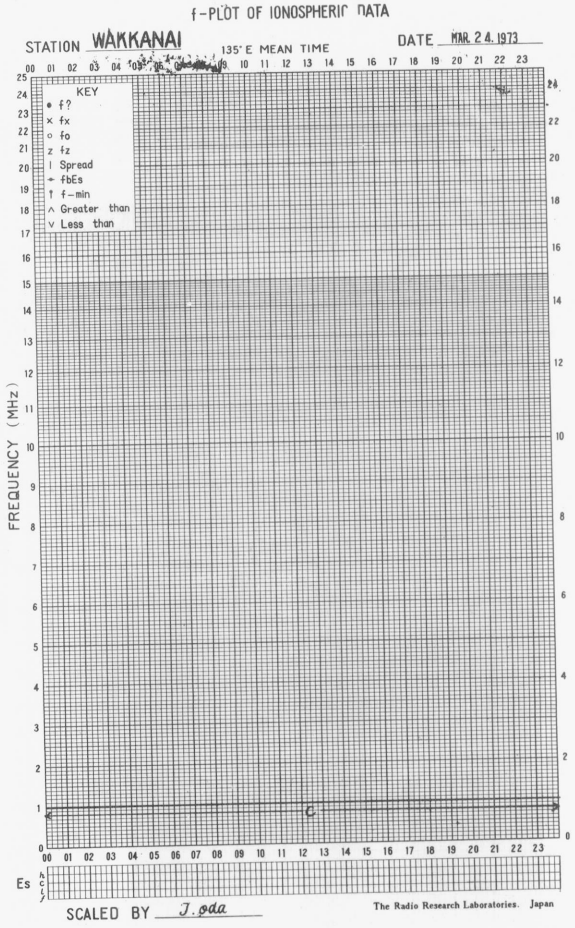
SCALED BY K. Ohba
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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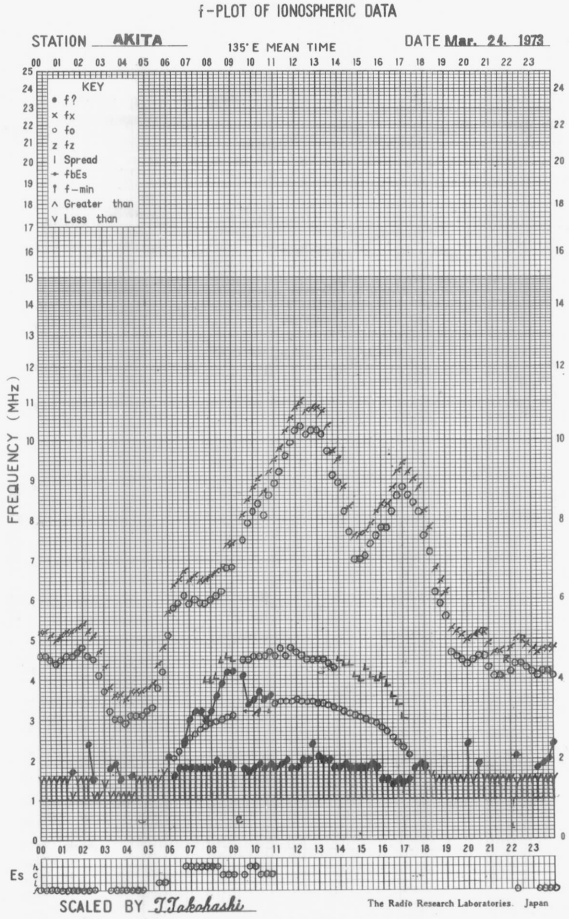
SCALED BY J. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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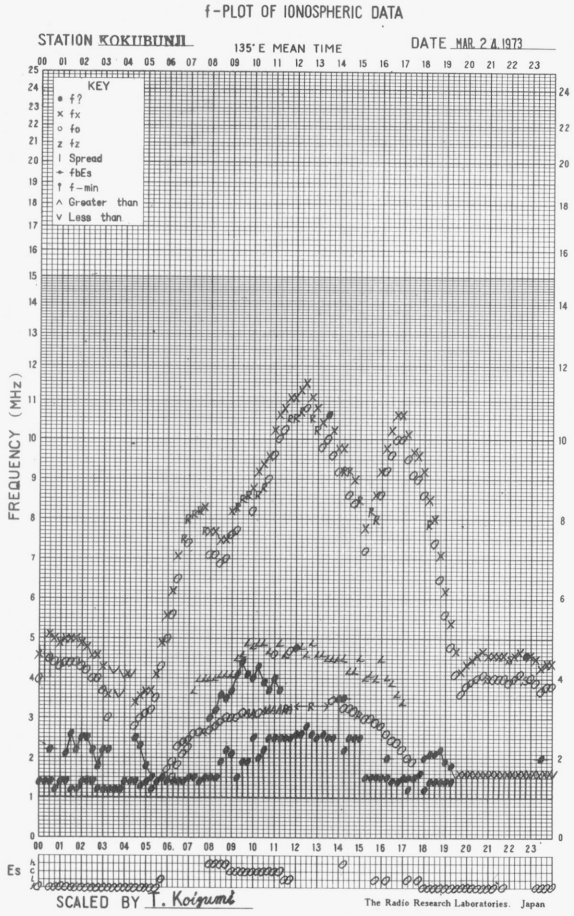
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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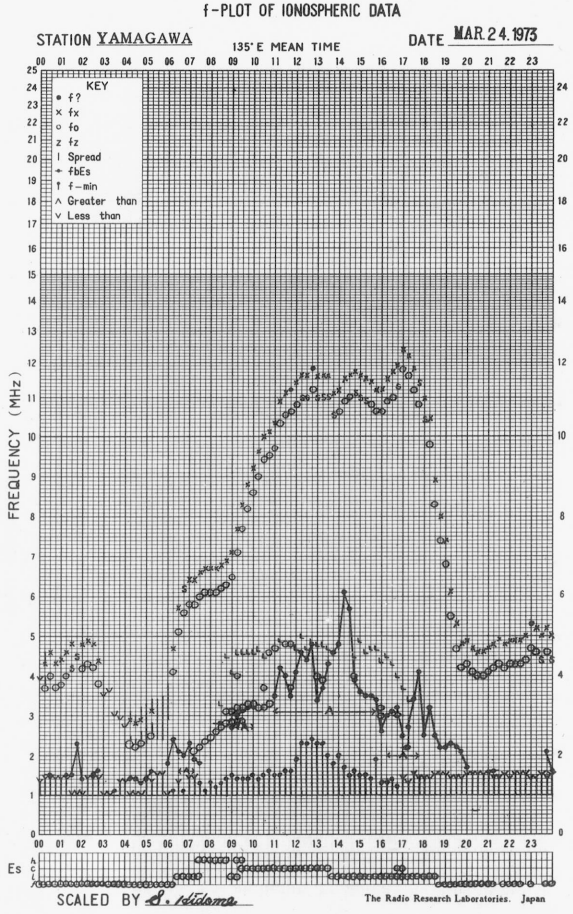
SCALED BY I. Koizumi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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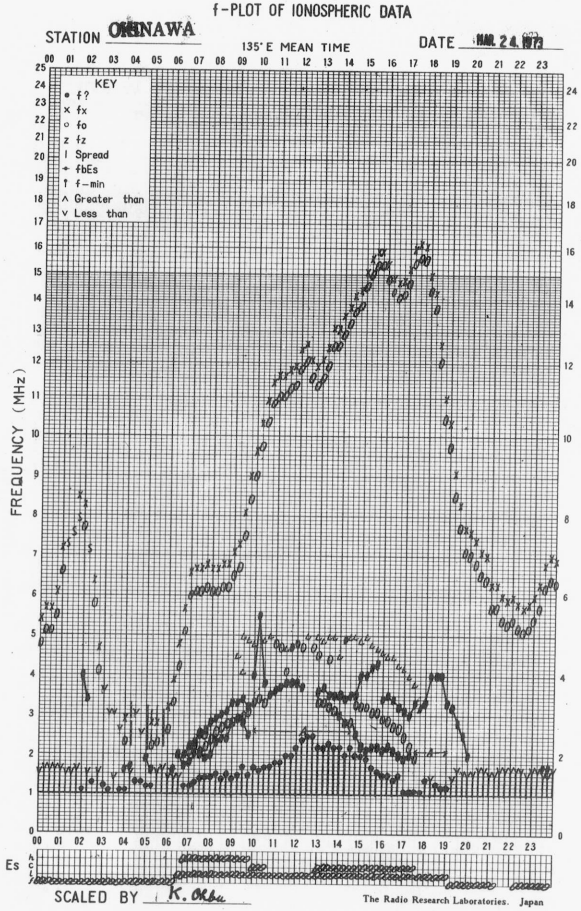
SCALED BY S. Ishidome
The Radio Research Laboratories. Japan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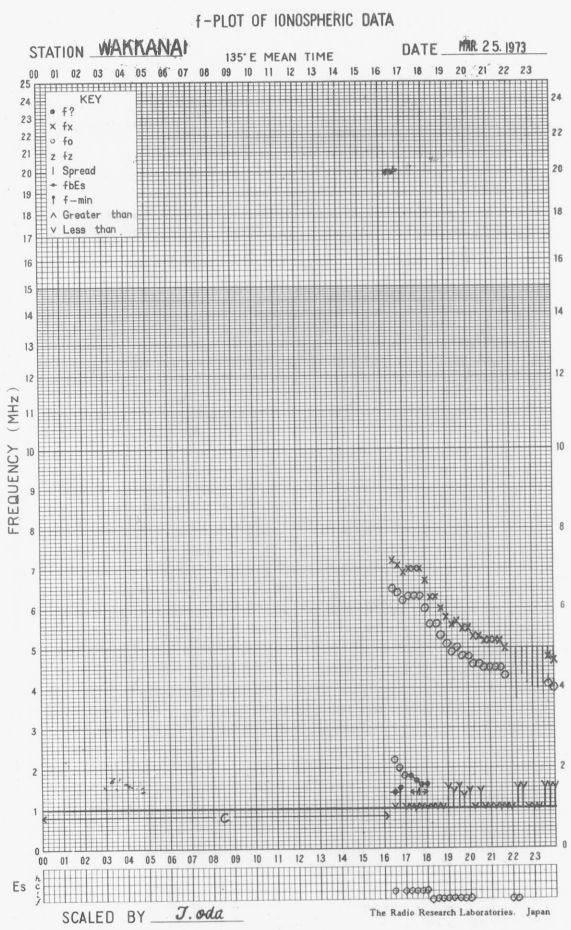
FREQUENCY (MHz)
Es
SCALED BY K. Okba
The Radio Research Laboratories. Japan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Less than
FREQUENCY (MHz)
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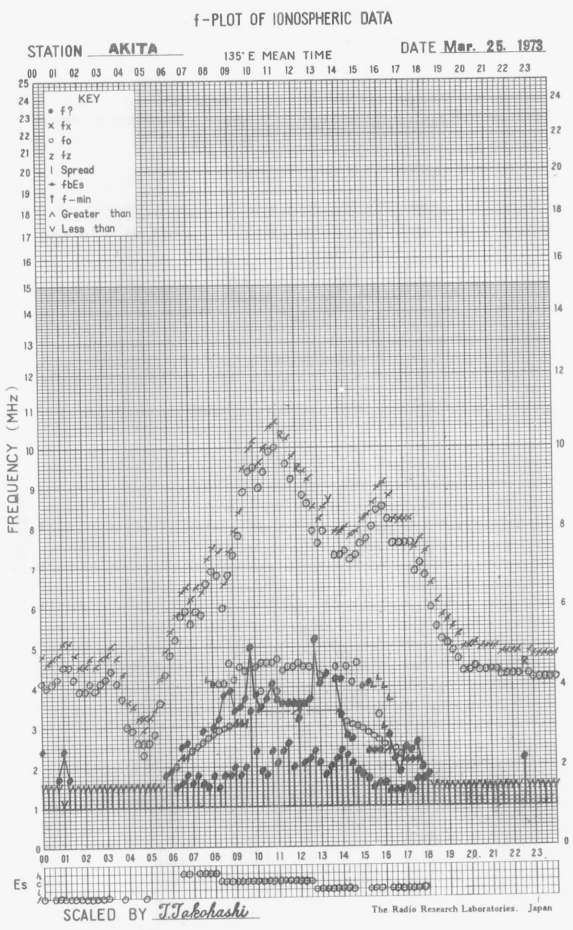
SCALED BY T. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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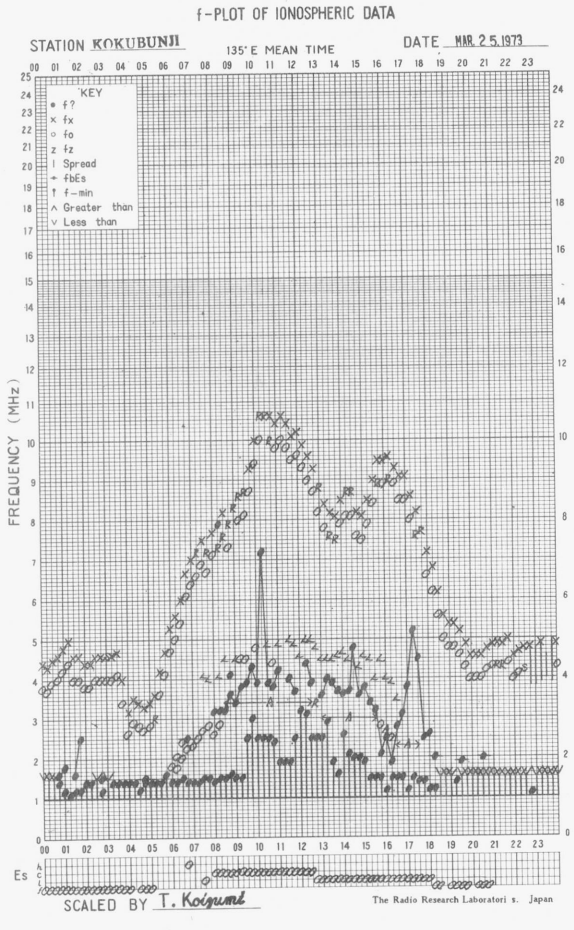
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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DATE MAR 25. 1973
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FREQUENCY (MHz)
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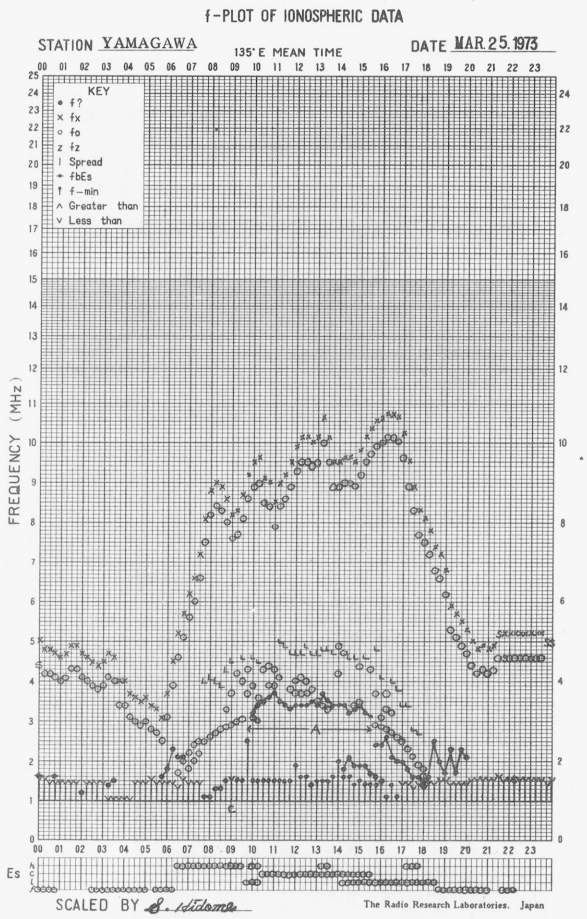
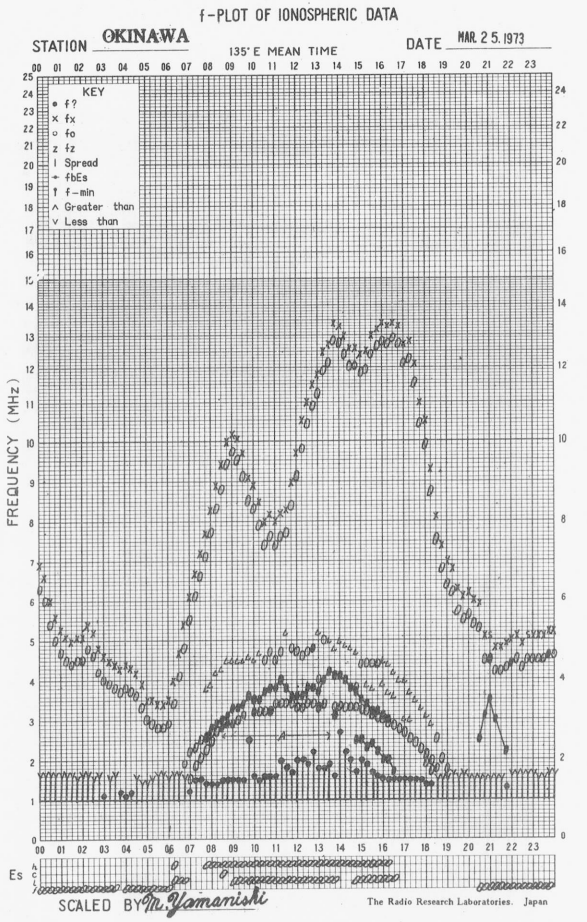
SCALED BY T. Koizumi
The Radio Research Laboratori s. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE MAR. 25. 1973
KEY
● f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Ichidama
The Radio Research Laboratories. Japan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STATION OKINAWA
135° E MEAN TIME
DATE MAR. 25. 1973
KEY
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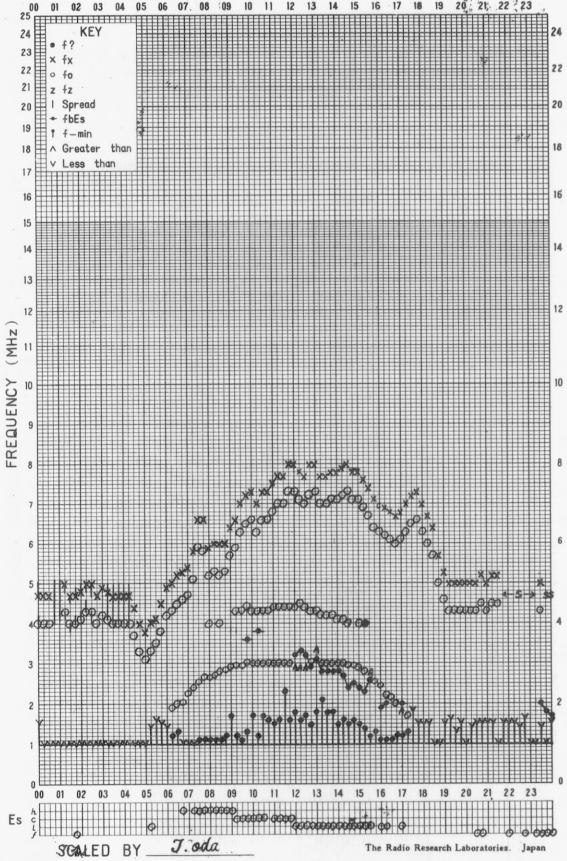
○ fo
z fz
| Spread
+ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR 26 1973

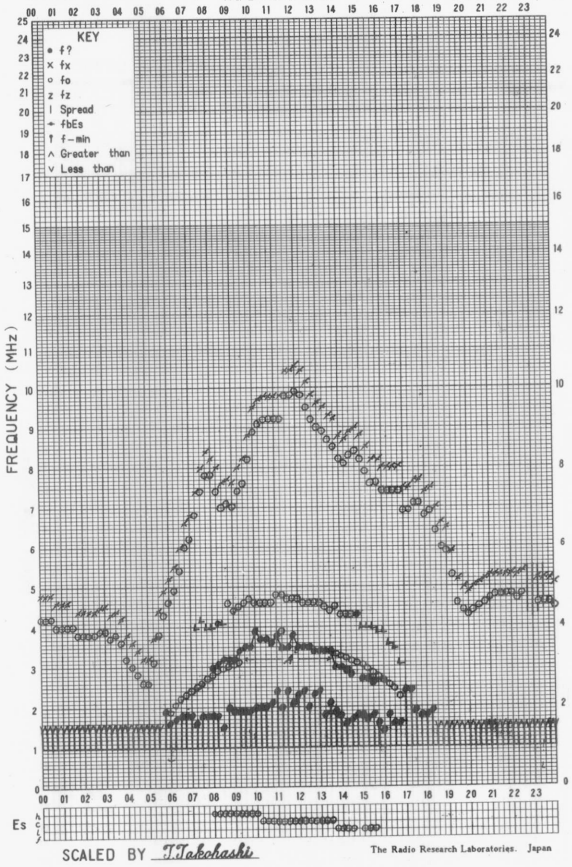


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Mar. 26. 1973

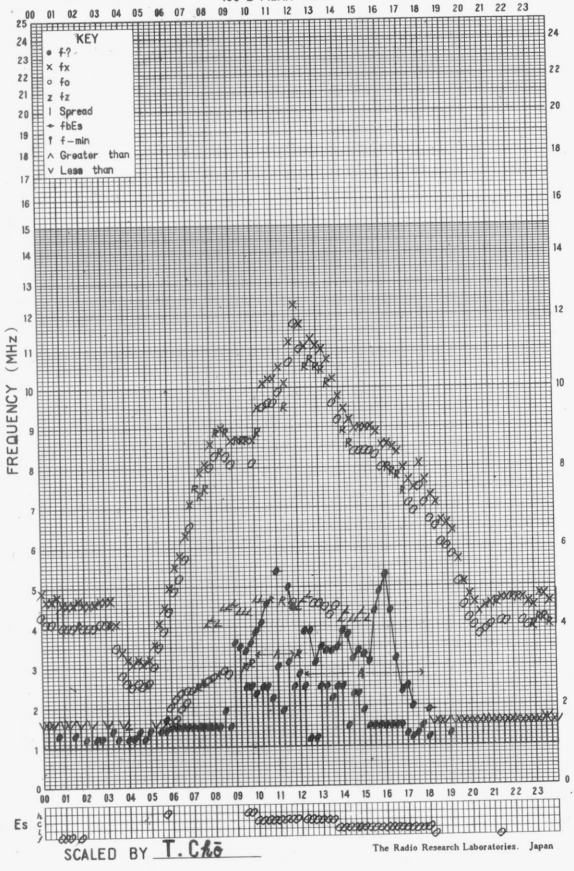


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

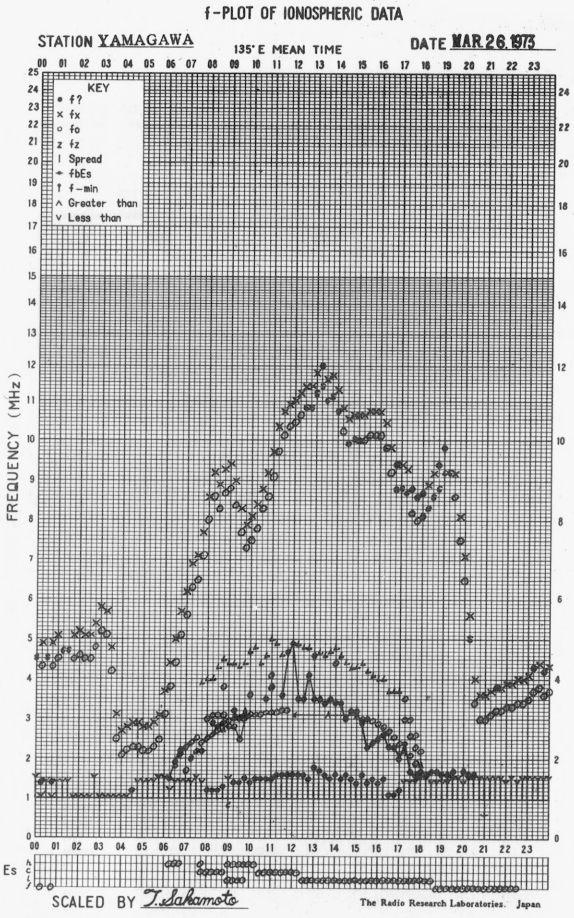
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAR 26 1973



SCALED BY T. Chō

The Radio Research Laboratories. Japan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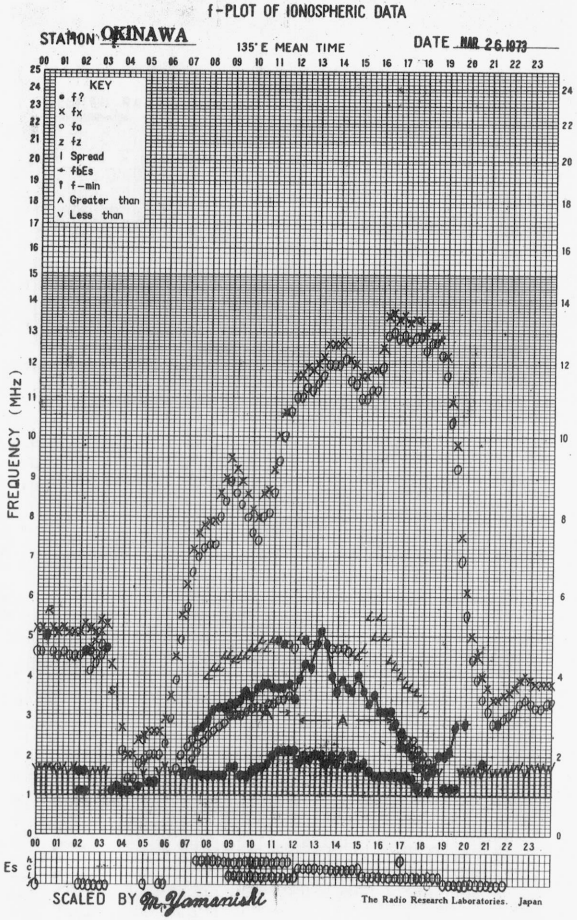
STATION YAMAGAWA
135°E MEAN TIME
DATE MAR 26 1973
KEY
• f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
† f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Sakamoto
The Radio Research Laboratories. Japan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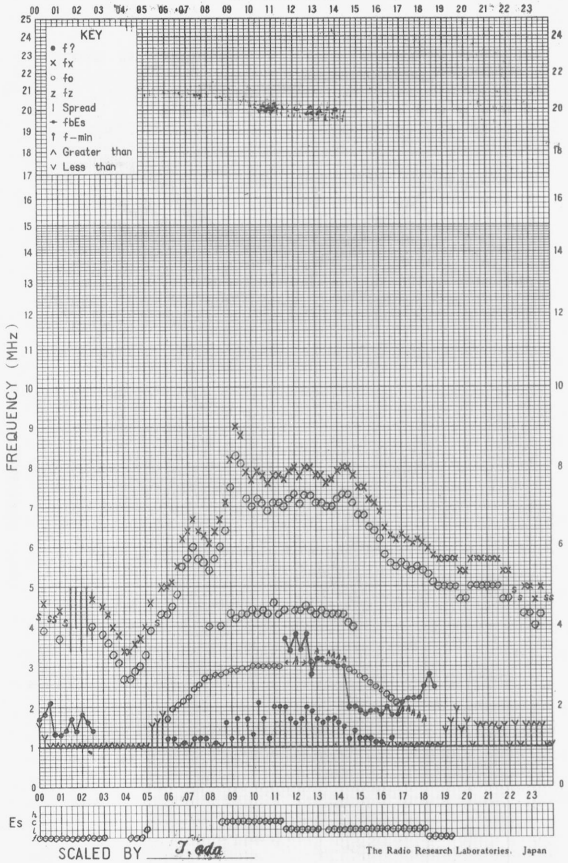
STATION OKINAWA
135°E MEAN TIME
DATE MAR 26 1973
KEY
• f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
† f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR 27 1973



SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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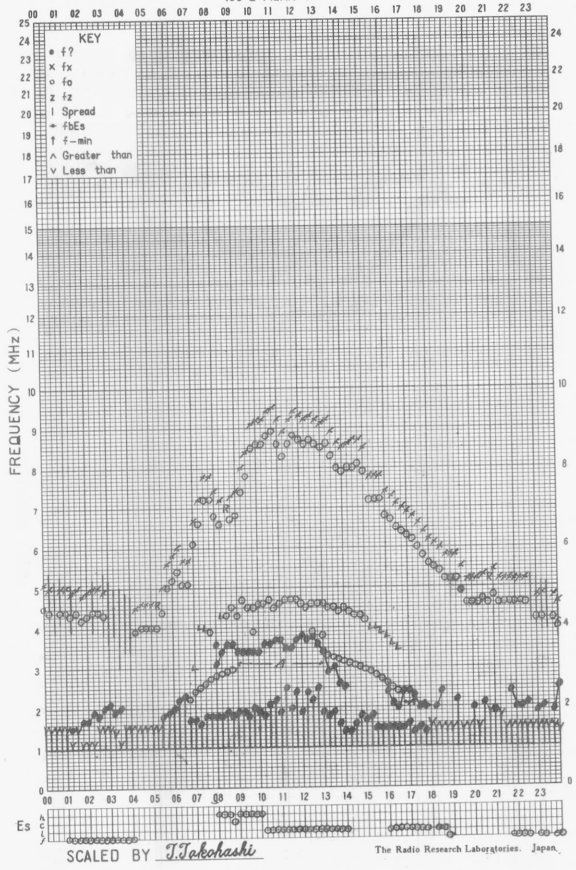
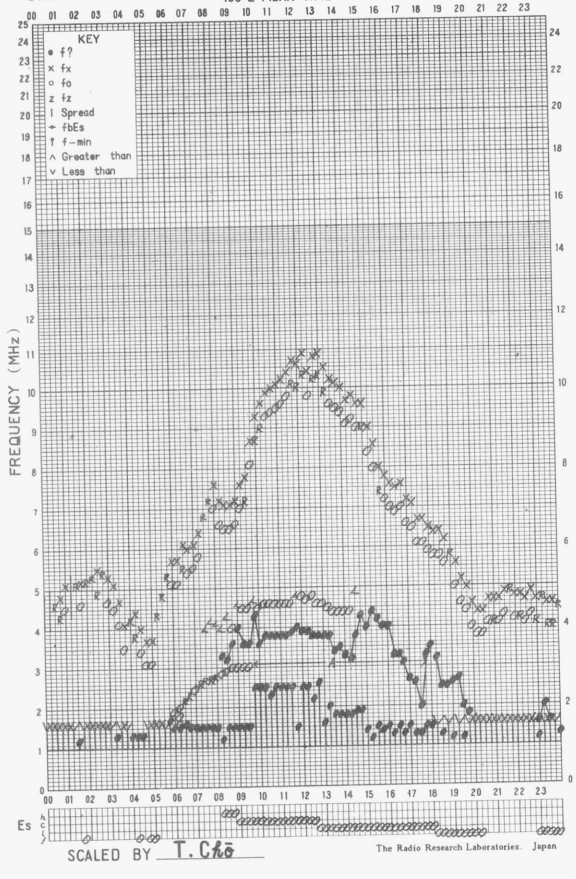


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

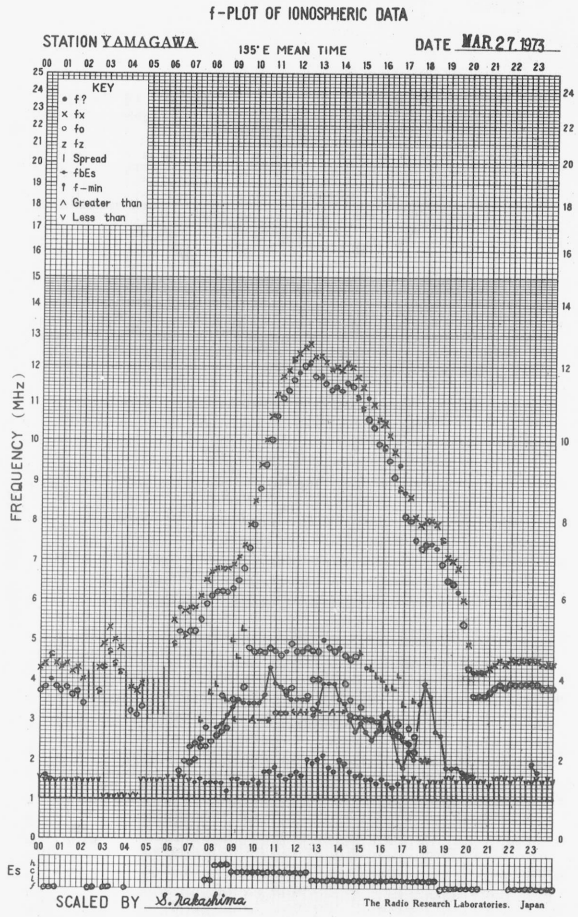
f-PLOT OF IONOSPHERIC DATA

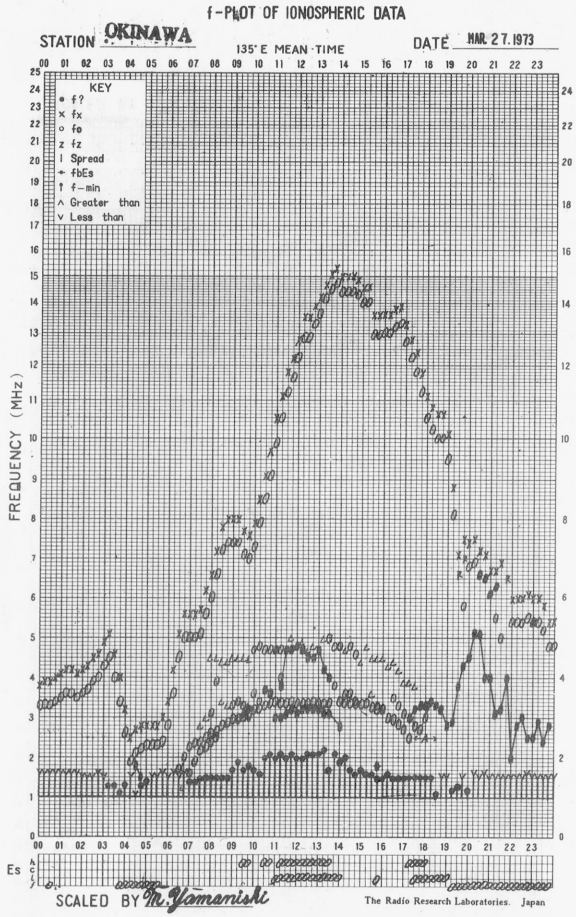
STATION KOKUBUNJI 135°E MEAN TIME DATE MAR. 27 1973

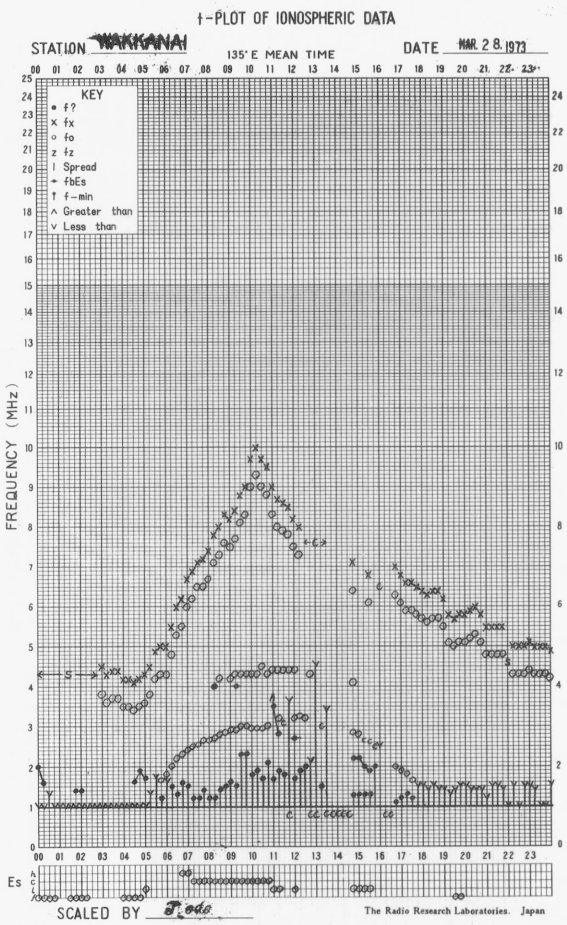


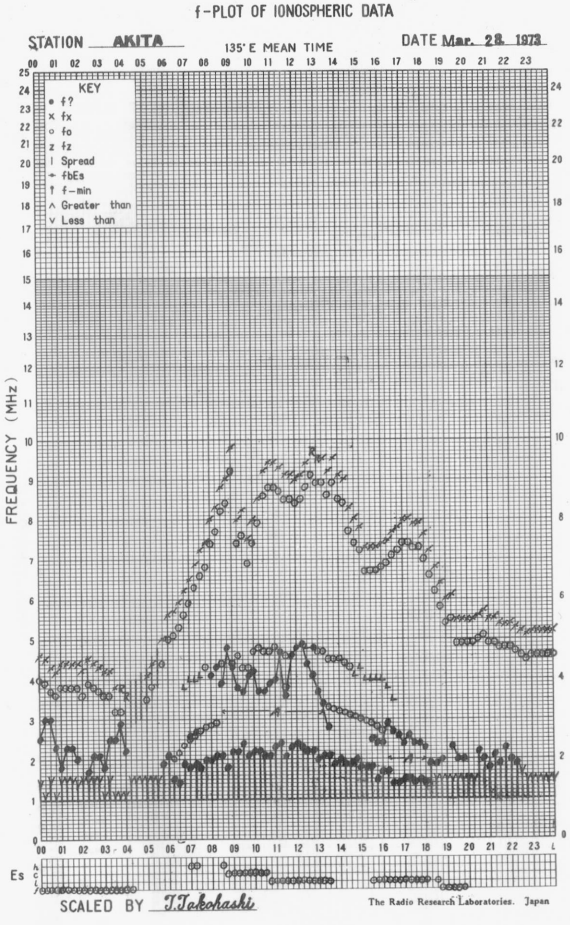
SCALED BY T. Chō

The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAR 27 1973
KEY
● f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135°E MEAN TIME
DATE MAR 27 1973
KEY
● f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAR 28 1973
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T.Ods
The Radio Research Laboratories. Japan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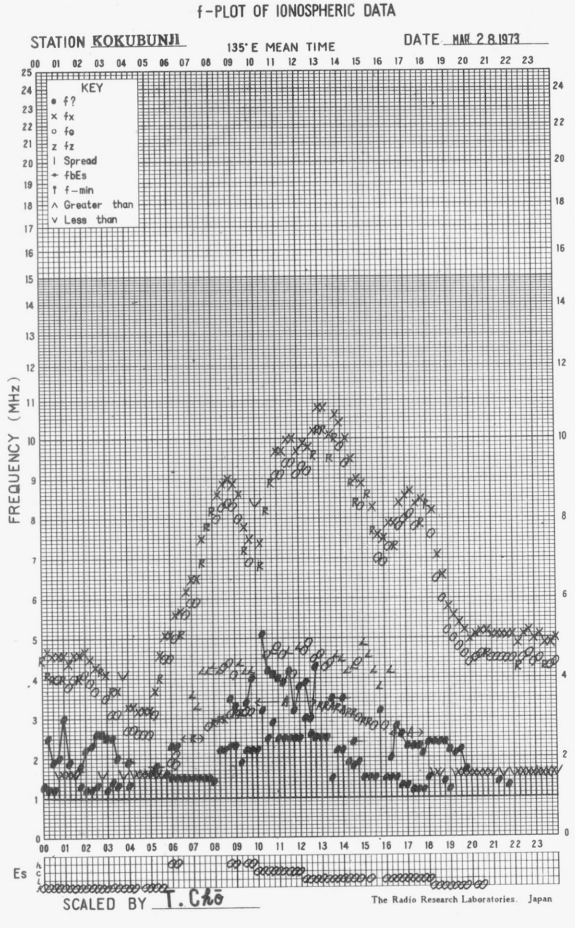
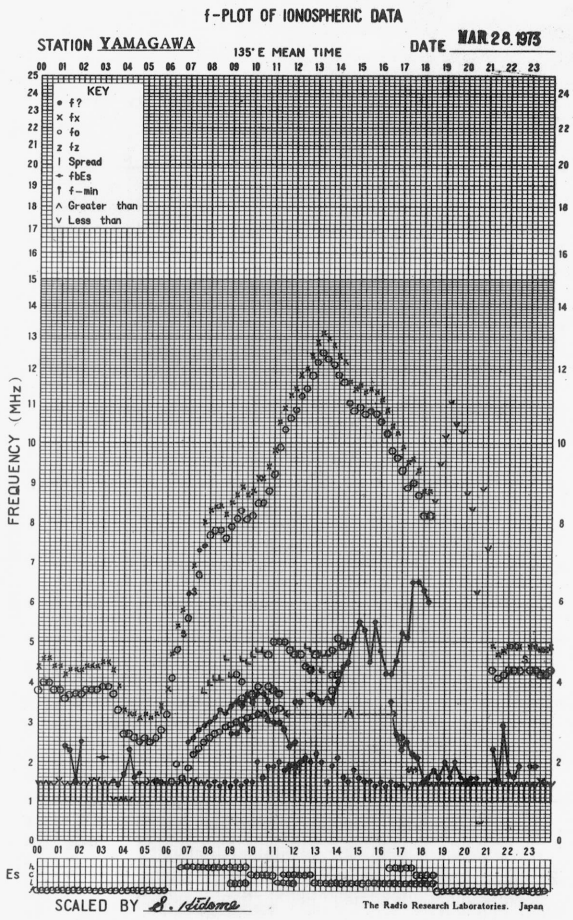
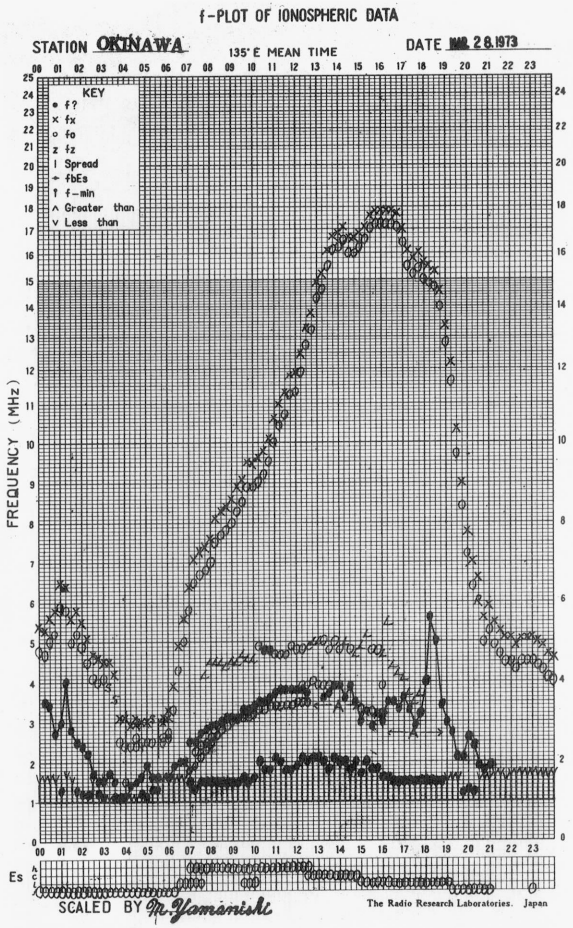
135° E MEAN TIME
DATE Mar. 28. 1973
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T.Takahashi
The Radio Research Laboratories. Japan

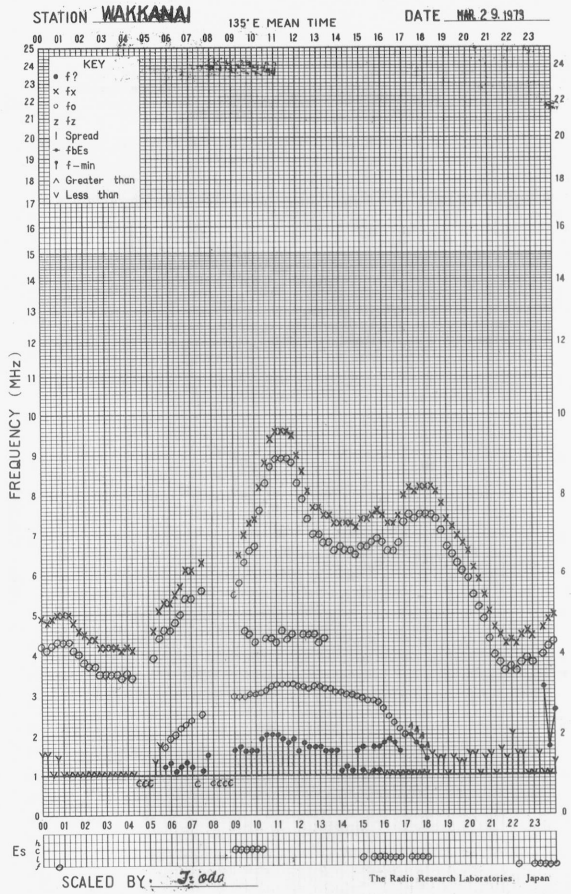

f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE MAR 28 1973
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAR 28 1973
KEY
● f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Hidema
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135°E MEAN TIME
DATE MAR 28 1973
KEY
● f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 29. 1973

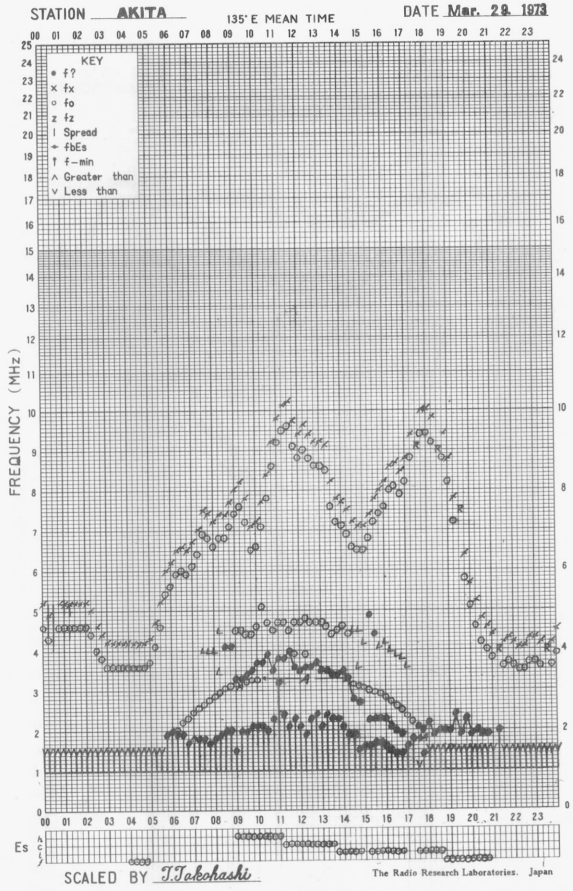


SCALED BY: I. Oda

The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Mar. 29. 1973

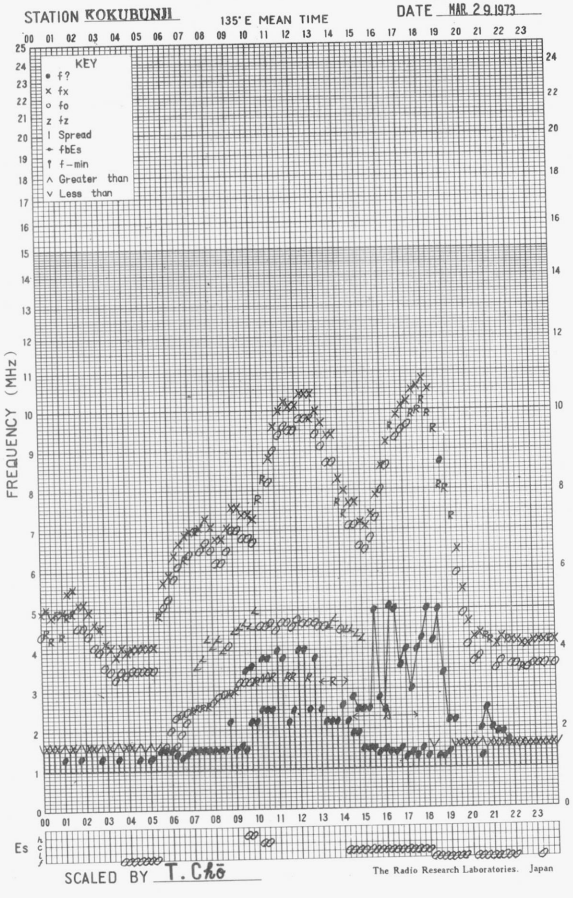


SCALED BY T. Takahashi

The Radio Research Laboratories, Japan

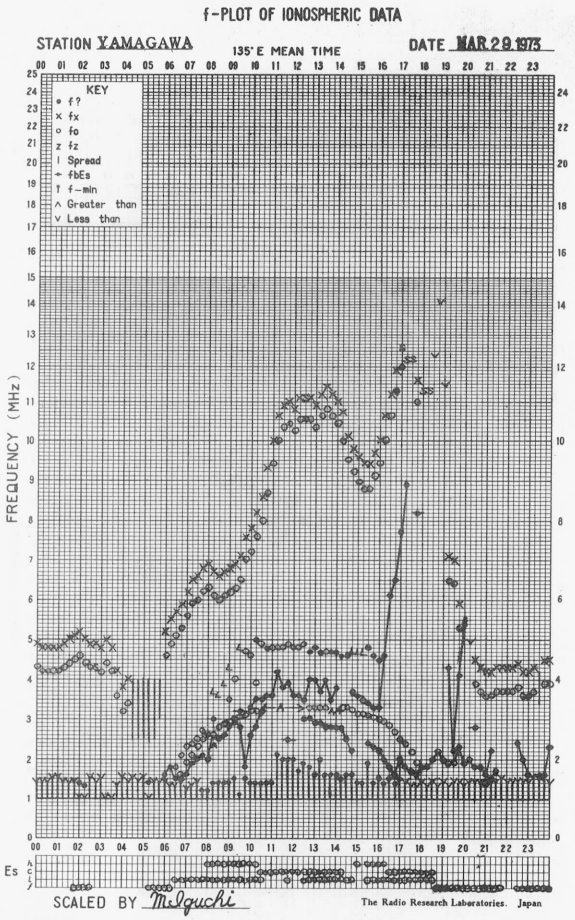
f-PLOT OF IONOSPHERIC DATA

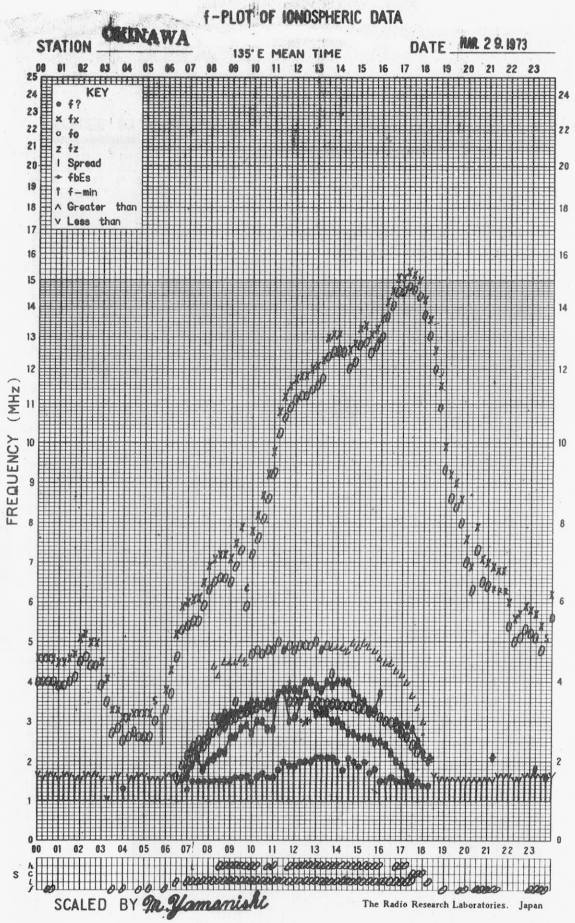
STATION KOKUBUNJI 135°E MEAN TIME DATE MAR 29 1973



SCALED BY T. Chō

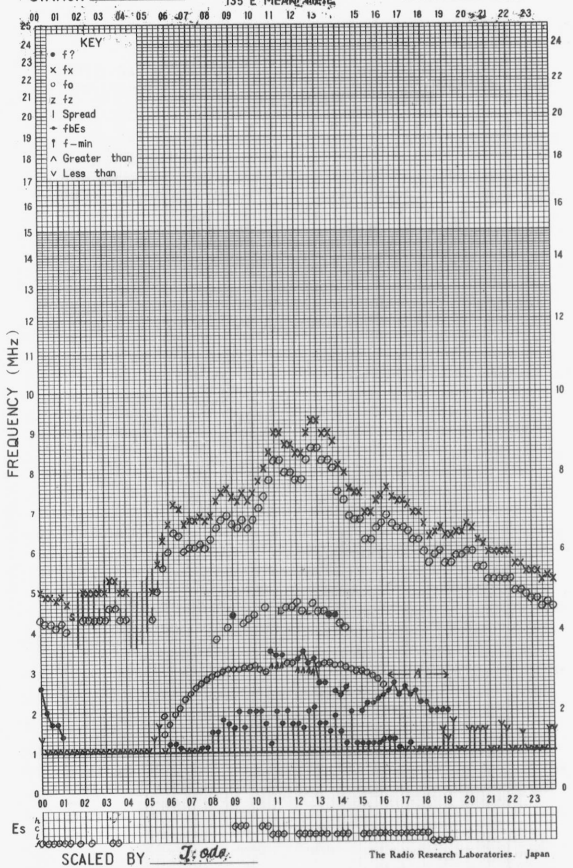
The Radio Research Laboratories, Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE MAR 29 1973
KEY
• f?
× fx
○ fo
z fz
! Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Iguchi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135° E MEAN TIME
DATE MAR 29 1973
KEY
• f?
× fx
○ fo
z fz
! Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
S
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 30. 1973

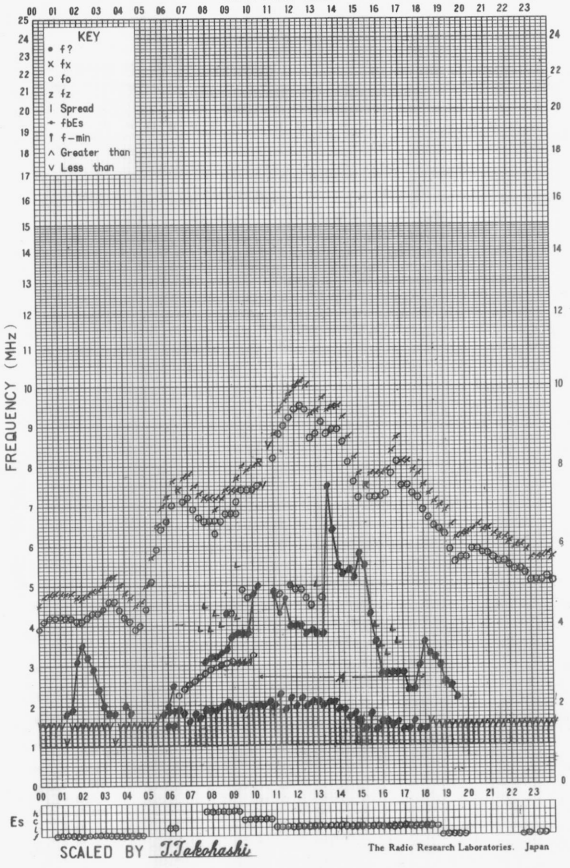


SCALED BY I. ODA

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Mar. 30. 1973

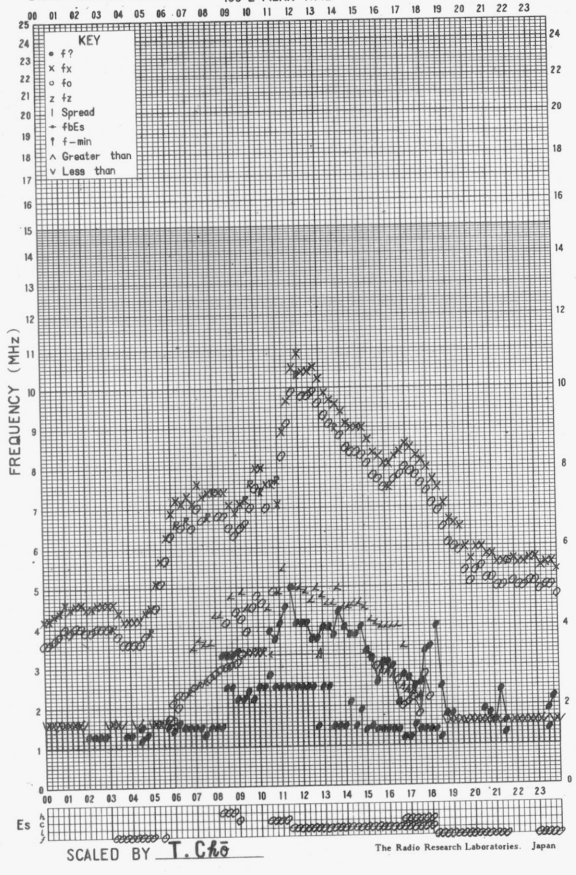


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

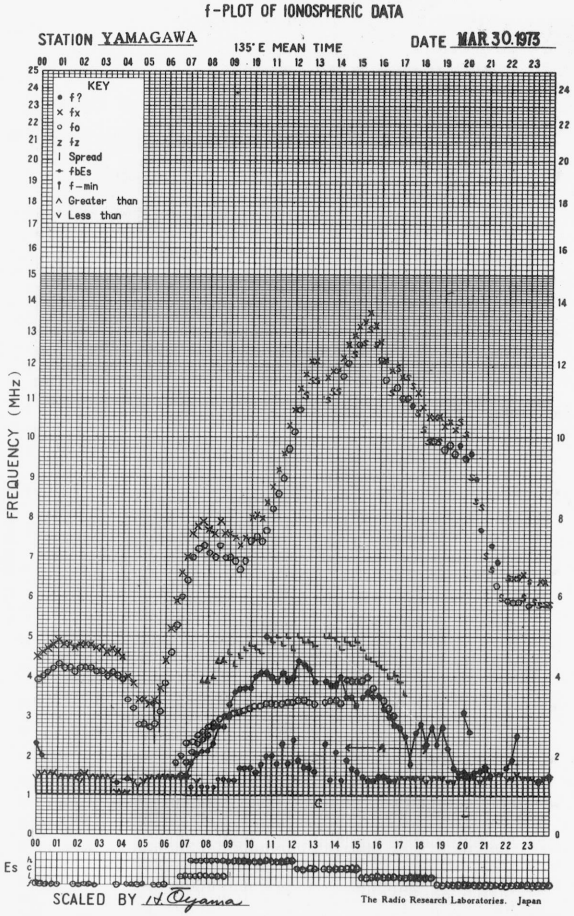
f-PLOT OF IONOSPHERIC DATA

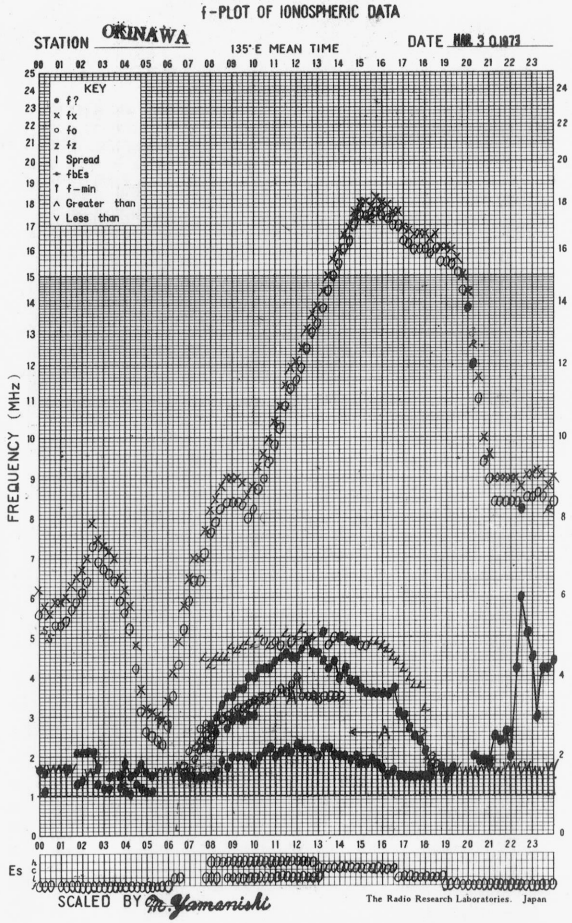
STATION KOKUBUNJI 135°E MEAN TIME DATE MAR. 30. 1973



SCALED BY T. Chō

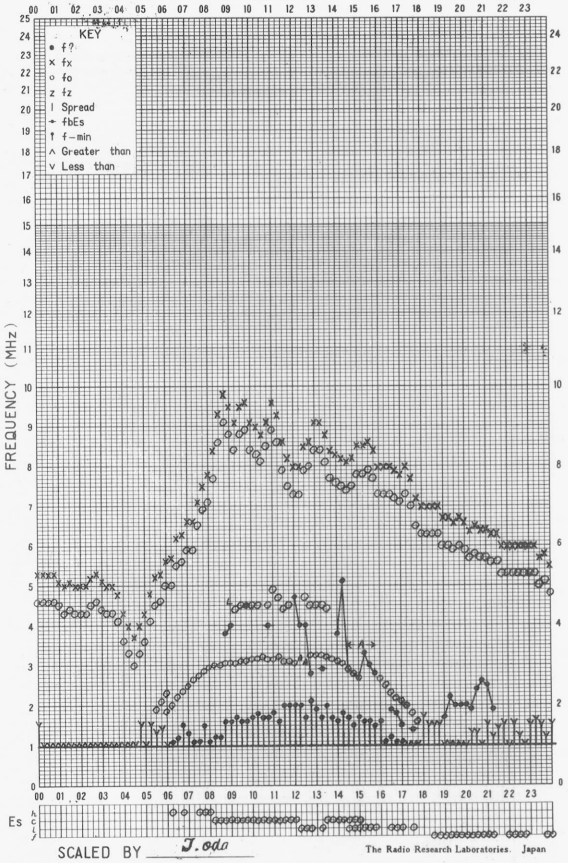
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAR 30 1973
KEY
• f?
× fx
○ fo
z fz
I Spread
← fbEs
T f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY H. Ogawa
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135°E MEAN TIME
DATE MAR 30 1973
KEY
• f?
× fx
○ fo
z fz
I Spread
← fbEs
T f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR 31, 1973

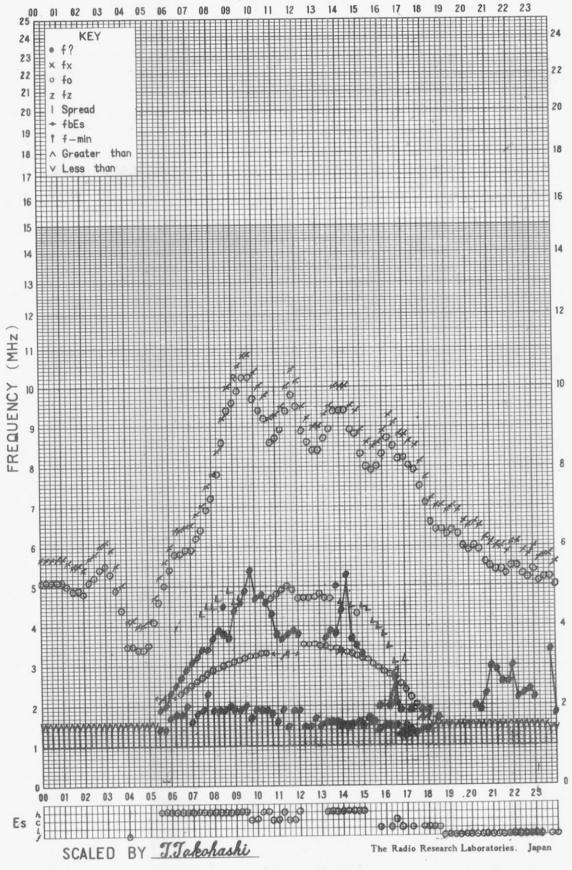


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Mar. 31. 1973

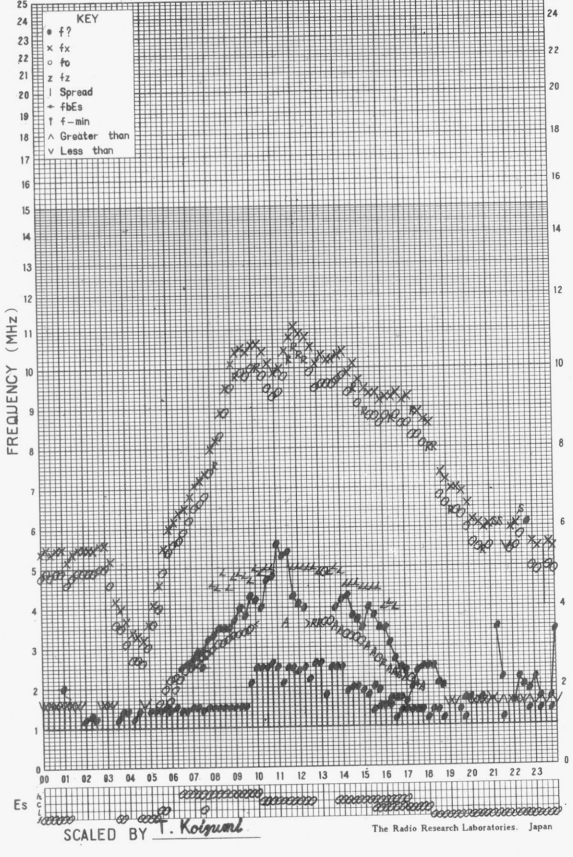


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

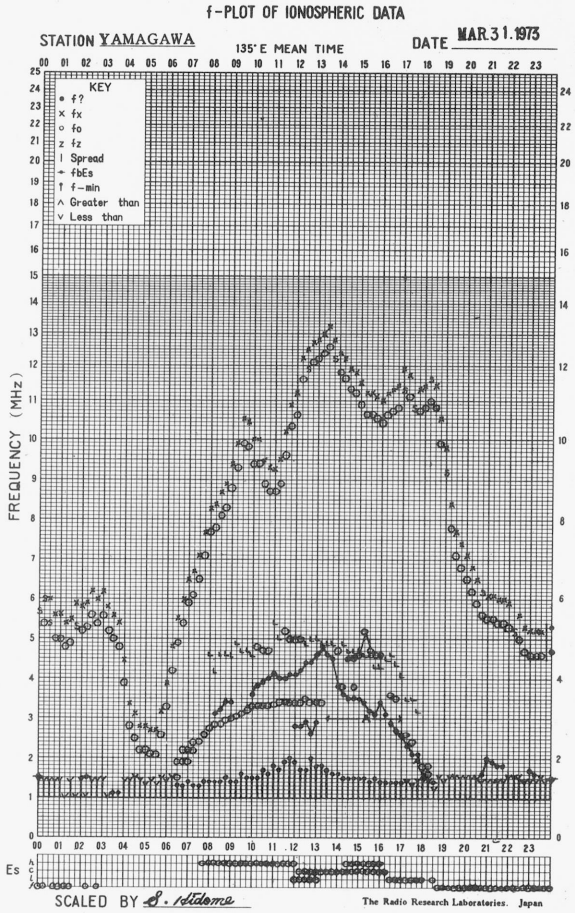
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAR 31 1973



SCALED BY T. Kotyuni

The Radio Research Laboratories. Japan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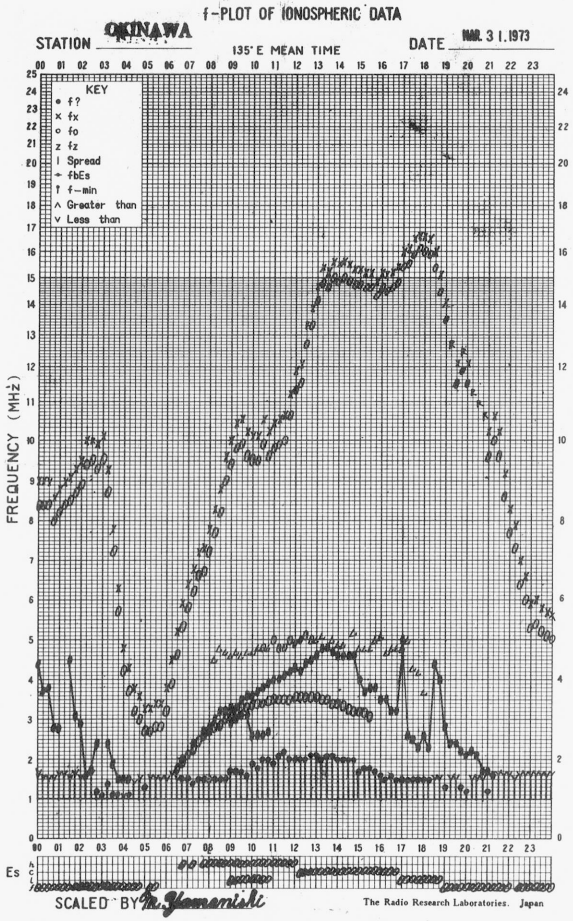
STATION YAMAGAWA
135°E MEAN TIME
DATE MAR.31.1973
KEY
• f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Ishikawa
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135°E MEAN TIME
DATE MAR. 31.1973
KEY
• f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY K. Yamanishi
The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: March 1973
Observing station: Hiraiso
Frequency: 200 MHz

	Flux density 10^{-22} Wm^{-2}Hz^{-1}					Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	8	7	5	9	7	0	0	0	0	0
2	9	9	12	8	10	0	0	1	1	0
3	7	7	7	8	7	0	0	0	0	0
4	7	8	7	7	7	0	0	0	0	0
5	8	7	7	12	7	1	0	0	0	0
6	9	7	9	8	9	0	0	1	0	0
7	(9)	8	7	8	8	(0)	0	0	0	0
8	8	7	6	7	7	0	0	0	0	0
9	6	q	q	6	7	0	0	0	0	0
10	6	5	q	5	6	0	0	0	1	0
11	6	6	6	6	6	0	0	1	0	0
12	6	8	13	6	8	0	1	1	1	1
13	6	6	5	6	6	0	0	0	0	0
14	6	6	6	9	6	0	0	0	0	0
15	7	7	7	8	7	0	0	0	1	0
16	7	10	13	6	8	1	1	1	0	1
17	5	q	q	q	6	0	0	0	0	0
18	q	q	q	q	q	0	0	0	0	0
19	q	q	q	5	q	0	0	0	0	0
20	6	6	5	q	6	1	0	0	1	0
21	q	q	q	q	q	0	0	0	0	0
22	q	q	q	q	q	0	0	0	0	0
23	q	q	q	q	q	0	0	0	0	0
24	q	q	q	q	q	0	0	0	0	0
25	q	q	q	q	q	0	0	0	0	0
26	q	q	q	q	q	0	0	0	0	0
27	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-

Note No observations during the following periods:

7th 0120- 0400
27th 0100- 31st 2400

q: quiet level, when radiometer is unstable.

SOLAR RADIO EMISSION

Flux Density

Month: March 1973
Observing station: Hiraiso Frequency: 500 MHz

Flux density 10^{-22} Wm^{-2} Hz^{-1}

UT	00-03	03-06	06-09	21-24	Day
Date					
1	28	29	28	27	28
2	27	30	30	24	28
3	26	26	26	23	25
4	23	24	25	24	24
5	24	24	25	26	24
6	26	25	(26)	24	26
7	25	26	27	27	26
8	27	28	27	26	27
9	25	26	27	25	26
10	25	26	29	23	26
11	25	25	26	24	25
12	24	29	31	26	27
13	27	27	29	27	27
14	27	27	27	26	27
15	27	28	26	29	27
16	(29)	(30)	30	26	30
17	27	26	25	25	26
18	25	26	25	25	25
19	26	26	25	26	26
20	26	26	24	24	25
21	24	24	22	23	24
22	26	25	24	24	24
23	24	25	25	26	25
24	25	26	26	25	26
25	26	27	26	25	26
26	25	25	25	22	25
27	24	24	25	24	24
28	26	26	26	24	25
29	26	27	28	25	26
30	28	29	26	23	27
31	25	26	27	26	25

Note No observations during the following periods:

3rd	0400-	0430	11th	0200-	0300
4th	0400-	0435	16th	0100-	0300
5th	0100-	0200	16th	0400-	0545
6th	0600-	0640			

Distinctive Events

(single-frequency observations)

Month: March 1973
Observing station: Hiraiso
Normal observing period: 2050 - 0830 (sunrise to sunset)

Date	Freq.	Starting time	Time of maximum	Duration	Type	Flux density 10^{-22} Wm^{-2}Hz^{-1}		Polarization	Remarks
	MHz	UT	UT	minutes		peak	mean		
6	200	0432.0	0432.3	1.0	C	190	40		
	100	0432.2	0432.2	0.5	eC	20	10	r	
10	200	2145.0	2145.2	5.5	C	790	50		
	100	2145.2	2145.4	1.0	C	80	30	rl	
	200	2220.0	2220.8	2.0	C	150	60		
	500	2220.5	2221.0	1.5	C	150	20		
	100	2220.8	2220.9	0.5	C	120	30	r	
	200	2223.0	2223.8	1.0	C	1000	200		
	100	2223.5	2223.8	0.6	C	75	20	r	
	200	2225.5	2225.8	4.0	C	110	30		
	100	2226.9	2227.0	1.0	eC	65	15	r	
11	200	0701.0	0702.6	2.0	C	170	50		
	100	0701.5	0703.0	2.0	C	110	15	lrl	
	500	0757.3	0757.4	0.5	C	160	60		
12	200	0204.0	0204.1	1.5	C	540	50		
	100	0204.2	0204.2	1.5	eC	120	20	rl	
		0418.2	0418.3	0.5	eC	65	20	r	
		0418.2	0421.2	6.5	C	40	10	0	
	200	0419.5	0421.0	4.0	C	15	5		
	100	0511.5	0513.2	2.0	C	130	40	rl	
	200	0511.5	0513.0	6.0	C	160	15		
	500	0512.7	0513.0	1.0	C	110	30		
	200	2202.0	2202.0	1.0	C	700	200		
	100	2301.6	2304.9	6.0	C	200	60	lrl	
13	100	0232.8	0232.9	0.5	C	90	30	lrl	
		0324.7	0324.8	0.5	C	60	15	l	
	500	0519.0	0519.0	0.5	C	95	40		
	100	0543.2	0544.9	3.0	C	170	60	l	
		0546.5	0548.3	2.6	C	220	80	l	
	200	0547.7	0548.0	0.8	C	1400	300		
	500	0548.0	0548.4	0.5	C	60	20		
15	200	2119.0	2140.0	71	C	380	60		
	100	2140	2228	170	RF	40	10	l	
20	200	0116.0	0116.8	1.0	C	300	100		
	100	0116.5	0117.0	0.6	C	40	15	r	
	200	0117.2	0117.5	0.8	C	360	60		
	100	0117.5	0117.6	0.5	eS	100	40	rl	
	200	0511.0	0511.5	1.0	C	250	40		
		2132.4	2133.5	2.5	C	460	60		
		2256.0	2256.5	1.0	C	200	70		
22	200	0115	0152	75	RF	20	10		
	100	0130	0207	65	RF	50	10	r	
		2119.5	2120.0	2.0	C	110	30	lr	
23	200	0108.0	0108.0	1.3	C	480	70		
	100	0108.0	0108.4	2.0	C	110	30	rl	
		0128.2	0128.5	1.0	C	190	80	rl	
24	100	0310	0329	150	RF	40	15	l	
28	100	0108.5	0111.4	6.5	C	130	60	r	
		0222.2	0505	285	RF	80	25	R	

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

MAR 1973 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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	-10	-7	-7	-10	ES -5	ES -5	ES -3	ES -2	ES 1	ES -1	ES 5	ES -3	ES -6	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-12	2	0	-3
2	-5	-3	0	0	ES -11	ES -5	ES -4	ES -5	ES -5	ES -4	ES -13	ES -25	ES -25	ES -16	ES -11	ES -10	ES -25	ES -25	ES -25	ES -25	ES -25	6	10	6
3	6	7	1	-1	ES -16	ES -9	ES -9	ES -8	ES -1	ES -7	ES -9	ES -1	ES 0	ES -5	ES -25	ES -10	ES -25	ES -25	ES -25	ES -25	-16	0	5	6
4	5	2	0	ES 11	ES -16	ES -10	ES -10	ES -8	ES -10	ES -7	ES -7	ES -7	ES -1	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	0	2	1
5	4	0	1	4	ES -14	ES -10	ES -8	ES -8	ES -4	ES -7	ES -10	ES -6	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-11	ES -13	ES -13
6	ES -16	-10	-8	3	-2	ES -10	ES -8	ES -2	ES -2	ES -2	ES 0	ES -7	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -16	-2	-5	-10
7	-10	-10	-1	ES -13	ES -5	ES -14	ES -10	ES -10	ES -7	ES -13	ES -16	ES -25	ES -25	ES -25	ES -5	ES -5	ES -14	ES -25	ES -25	ES -25	3	5	0	2
8	2	6	6	6	-1	ES -8	ES -7	ES -4	ES -1	ES -2	ES -7	ES -11	ES -3	ES -3	ES -8	ES 2	-6	ES -25	ES -25	ES -25	-10	4	4	2
9	0	4	11	5	ES -6	ES -7	ES -3	ES -2	ES -4	ES -2	ES -2	ES -5	ES -10	ES -25	ES -5	ES -25	ES -25	ES -25	ES -25	ES -25	-3	-1	0	5
10	1	0	13	4	ES -10	ES -7	ES -1	ES -5	ES -6	ES -4	ES -6	ES -21	ES -12	ES -5	ES -25	ES 1	ES -25	ES -25	ES -25	C	C	C	C	C
11	-2	6	10	7	4	ES -10	ES -5	ES -5	ES -5	ES -2	ES -1	ES 5	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	0	3	4	4
12	6	5	6	6	-2	ES -11	ES -8	ES -7	ES -7	ES -5	ES -5	ES -11	ES -4	ES -1	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	0	6	3	2
13	5	5	9	12	3	ES -13	ES -7	ES -10	ES -10	ES -7	ES -7	ES -10	ES -25	ES -1	ES -1	ES -10	ES -19	ES -25	ES -25	ES -25	0	3	3	2
14	2	0	7	7	-1	ES -13	ES -8	ES -8	ES -7	ES -6	ES -6	ES -10	ES -24	ES -1	ES -24	ES -4	ES -9	ES -24	ES -24	ES -24	-2	2	5	3
15	2	1	8	5	ES -7	ES -9	ES -9	ES -7	ES -6	ES -1	ES -6	ES -5	ES -11	ES -25	-6	ES -8	-11	1	4	-2	-7	1	0	1
16	2	5	6	5	ES -2	ES -8	ES -10	ES -6	ES -7	ES -5	ES -7	ES -4	ES 0	ES -13	ES -25	-14	-3	14	ES -25	ES -25	-4	10	5	4
17	6	5	5	0	-5	ES -18	ES -10	ES -7	ES -6	ES -1	ES -1	ES -8	ES -4	ES 0	ES -4	ES 1	ES 13	1	17	ES -24	-2	13	7	7
18	3	5	4	5	ES -10	ES -10	ES -6	ES -9	ES -9	ES -4	ES -3	ES -10	ES -9	ES 3	ES -14	ES -26	-20	-15	ES -26	ES -26	1	7	10	4
19	1	-2	-1	ES -13	ES -12	ES -10	ES -9	ES -7	ES -8	ES -3	ES -3	ES -7	ES -1	ES 1	ES -26	ES -26	ES -26	ES -26	ES -20	ES -26	ES -17	-2	4	9
20	-1	2	ES -17	ES -12	ES -11	ES -11	ES -3	ES -4	ES -3	ES -5	ES -4	ES -17	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-16	ES -25	ES -13	ES -14
21	-11	3	ES -13	ES -13	ES -17	ES -17	ES -9	ES -9	ES -13	ES -13	ES -13	ES -26	ES -20	ES -20	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-2	2
22	6	1	ES -16	ES -8	ES -5	ES -5	ES -5	ES -6	ES -5	ES -8	ES -5	ES -16	ES -24	ES -24	ES -24	ES -24	ES -24	ES -74	ES -24	ES -24	ES -24	-6	-1	1
23	-7	-11	ES -14	ES -11	ES -14	ES -10	ES -16	ES -14	ES -8	ES -10	ES -8	ES 4	ES 0	ES -11	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	-6	-7	ES -18
24	ES -19	ES -16	C	-10	-13	ES -25	ES -13	ES -13	ES -7	ES -7	ES -11	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-4	-2	-2
25	-11	-5	-14	ES -11	ES -9	ES -17	ES -9	ES -3	ES -9	ES -14	ES -5	ES -5	ES -25	ES -16	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	2	1	4	-1
26	1	ES -7	ES -8	ES -16	ES -25	ES -13	ES -11	ES -6	ES -7	ES -10	ES -7	ES -14	ES -16	ES -25	ES -25	ES -25	ES -25	ES -25	ES -13	ES -25	-5	-4	-3	-2
27	-5	0	-17	ES -12	ES -15	ES -15	ES -15	ES -15	ES -11	ES -14	ES -5	ES -3	ES -7	ES 0	ES -7	ES -25	ES -25	ES -25	ES -25	ES -25	-4	-5	5	-1
28	-1	-6	-6	ES -13	ES -2	ES -16	ES -16	ES -7	ES -7	ES -10	ES -7	ES -8	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	5	5	1	-2
29	-12	-7	-12	ES -9	ES -7	ES -9	ES -13	ES -9	ES -9	ES -5	ES -2	ES -13	ES -24	ES -24	ES -24	ES -13	ES -24	ES -24	ES -20	ES -24	2	1	2	0
30	ES -24	2	2	-9	ES -12	ES -15	ES -11	ES -12	ES -9	ES -7	ES -6	ES -9	ES -7	ES -15	C	C	C	C	C	C	C	C	C	C
31	2	-1	4	-3	-3	2	-1	ES -5	ES -9	ES -6	ES -5	ES -4	ES 1	ES -1	ES 1	ES -1	ES -24	ES -24	ES -24	ES -24	1	-9	-5	3
CNT	31	31	30	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	29	29	29	29	29
MED	1	0	0	US -1	ES -7	ES -10	ES -9	ES -7	ES -7	ES -6	ES -6	ES -8	ES -12	ES -16	ES -24	ES -24	ES -24	ES -25	ES -25	ES -25	-5	1	2	2
UD	6	6	10	ES 7	-1	ES -5	ES -3	ES -2	ES -1	ES -1	ES -1	ES -1	ES 0	ES 0	ES -4	ES 1	ES -6	1	-13	ES -24	2	7	7	6
LD	ES -16	ES -10	ES -16	ES -13	ES -16	ES -17	ES -15	ES -13	ES -10	ES -13	ES -13	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	ES -25	-11	-7	ES -13

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

MAR 1973 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Mar. 1973	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Conditions 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start	End	Range
1	3+	3U S S 3	4 S S 4	N N N N			
2	4o	4U S S 4	4 S S 4	N N N N			
3	4o	4U S S 4	4 4U S 4	N N N N			
4	4o	4U S S 4U	4 S S 4	N N N N			
5	3+	4U S S 2U	4 3U S 3	N N N N			
6	3+	3U S S 3	3 4U S 4	N N N N			
7	4-	3U S S 4	4 4U S 4	N N N N			
8	4+	5U S S 4U	4 S S 4	N N N N			
9	4o	4U S S 4	4 4U S 4	N N N N			
10	4+	4U S S 5U	4 4U S 4U	N N N N			
11	4+	5U S S 4U	4 5U S 4	N N N N			
12	4o	4U S S 4U	4 4U S 4	N N N N			
13	4+	5U S S 4U	4 4U S 4	N N N N			
14	4+	5U S S 4U	4 5U S 4	N N N N			
15	4+	4U S 5U 4U	4 5U S 4	N N N N			
16	4+	5U S 5U 4	4 4U S 4	N N N N	06.25	---	69
17	4o	4U S 5U 4	4 3U S 4	N N N N	---	14.0	
18	4o	4U S 4U 5	4 4U S 3	N N N N	07.6	---	135
19	4-	3U S S 4	4 4U S 4	N N N N	---	---	
20	3+	3U S S 2U	4 4U S 4	N U U U	---	---	
21	4-	3U S S 3U	4 5U 4U 4	U U U U	---	---	
22	4-	3U S S 3	4 4U 5U 4	U U U U	---	---	
23	4-	3U S S 2U	4 4U 5U 4	U U U U	---	---	
24	3+	2U S S 3	4 4U S 4	U U U U	---	---	
25	4o	3U S S 4	4 5U S 4	U U U U	---	---	
26	4-	3U S S 4	4 4U S 4	U U U U	---	12.0	
27	4-	3U S S 4	4 4U S 4	N N N N			
28	4-	3U S S 4	4 4U S 4	N N N N			
29	4-	3U S S 4	4 4U S 4	N N N N			
30	4-	3U S S C	4 4U C C	N N N N			
31	4+	4U S S 4	4 5U 5U 4	N N N N	13.6	---	

SUDDEN IONOSPHERIC DISTURBANCES

HIRAISO

Time in U.T.

Mar. 1973	S W F						Correspondence		
	Drop-out Intensities (dB)			Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crocht
	CO	HA	1) 2)							
25		22	13	0041	11	S	2+		X	
25			8	2358	20	SL	1-			

NOTES

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

I N U B O

Mar. 1973	S P A									Remarks
	Phase Advance (degrees)						Time (U.T.)			
Date	GBR	NAA	NWC	NPG	ND3	AL3	Start	End	Maximum	
1			14				0830	0857	0838	
9		18	64	27	20	30	0430	0536	0439	X
12				17			2202	2231	2204	
13			14		22	36	0516	0610	0524	
13		19	18	—	17		2228	2250	2234	X
14	11	15	—	22	23	—	0108	0150	0119	X
14			—	8		—	0208	0248	0230	
14	13	26	24	28	16	13	2324	0020	2348	
15		8	28*	7	11		0323	0425	0345	
18		—		15	17		2117	2133	2120	X
22			11	13			2306	2322	2307	
24			30	12			0304	0426	0345	X
24			24	10			0455	0540	0501	X
24			9				0610	0630	0616	
24	14		31	7			0639	0730	0642	X
25	35	32	82	48	47		0040	0205	0046	X
25			56	18	20		0456	0618	0502	
26			10		21		0532	0604	0535	
27		33		35			2124	2215	2129	
30			12				0459	0520	0502	

IONOSPHERIC DATA IN JAPAN FOR MARCH 1973
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