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IONOSPHERIC DATA IN JAPAN

FOR APRIL 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 f_oEs.

$hpF2$ — The virtual height of the $F2$ layer measured on the ordinary wave component at a frequency equal to 0.834 f_oF2.

$ypF2$ — 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_oE. This is usually continuous with the normal *E* trace, although when the deviative absorption is large, part or all of the cusp may be missing. (Usually a daytime type.)

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

Q — An *Es* trace which is diffuse and non-blanketing over a wide frequency range. The spread is most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)

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

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

S — A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace. The rising trace alone is classified as 'S'; the horizontal trace is classified separately. At high latitudes the slant

trace usually starts to rise from a horizontal *Es* trace such as *Es-L*, or *Es-F*, at frequencies which greatly exceed the *E* layer critical frequency, whereas at low latitudes it usually rises from *Es-Q*, *Es C* or *Es-H* at frequencies near the regular *E* critical frequency. Type *S* is never used to determine $f_o Es$ 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_0, 1+, 2–, 2_0, 2+ 3–, 3_0, 3+, 4–, 4_0, 4+, 5–, 5_0 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

APR. 1973 | FOF2 (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	48	F	S 46	38	40	39	50	57	56	65	75	73	71	96	94	81	73	74	76	76	72	63	56	57
2	50	46	41	31	F 31	F 30	28	E G 35	E G 42	E G 42	E G 42	52	53	67	73	81	67	66	63	66	72	65	F 59	F 50
3	F 39	F 30	F	F 23	F 29	F 31	39	R	43	47	57	64	64	61	66	63	64	61	59	48	48	47	45	F
4	F 40	37	38	F 36	F 30	36	47	60	68	87	H 93	87	78	75	80	73	80	71	70	65	63	54	47	45
5	45	46	43	41	37	43	56	65	76	85	102	103	83	74	83	83	79	72	77	74	68	60	50	50
6	50	50	48	48	47	53	62	70	78	83	87	91	89	86	81	83	81	84	85	73	62	53	53	53
7	53	53	51	50	46	51	68	71	73	84	81	86	86	82	92	89	81	75	73	63	58	59	58	55
8	53	53	50	48	48	51	67	74	83	87	90	83	78	83	82	86	83	77	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	95	96	88	86	89	98	92	86	83	75	71	65	63	60	58
10	56	55	53	53	50	55	65	70	80	94	97	86	91	96	93	93	89	79	76	73	66	63	58	57
11	54	54	53	53	46	50	60	68	73	84	91	98	95	94	92	94	89	C	C	C	C	C	65	57
12	63	60	56	57	53	53	60	65	69	75	81	86	82	86	78	81	82	80	88	75	61	51	50	47
13	47	47	45	43	43	45	60	73	78	78	81	77	84	75	76	75	75	78	75	75	79	72	65	61
14	57	48	46	32	A	29	40	51	57	63	64	60	67	67	70	76	76	86	91	91	60	50	36	33
15	33	33	33	32	28	41	57	70	85	88	87	86	76	79	80	78	70	73	68	67	65	58	54	50
16	F	F	F 45	F 43	38	41	45	48	52	60	57	65	64	70	83	78	73	65	73	71	67	68	62	58
17	53	47	47	43	35	35	W	41	53	55	51	64	69	74	75	76	71	74	71	63	70	56	53	47
18	50	S	F	40	27	33	37	48	57	57	61	67	68	83	80	68	61	55	59	63	67	63	48	41
19	43	43	38	36	36	43	52	52	54	56	60	71	77	72	68	68	66	69	64	66	73	68	50	43
20	37	37	38	39	36	35	39	45	45	53	46	53	65	64	71	64	56	62	56	55	53	53	48	46
21	43	43	41	37	36	42	40	47	49	47	56	62	74	76	71	I A 62	59	61	67	73	68	67	60	58
22	56	53	47	38	35	38	43	43	A	A	A	A	55	60	57	60	60	59	61	66	72	55	46	45
23	43	38	40	40	41	44	42	A	A	A	47	48	I R 50	53	51	50	50	48	53	60	56	55	41	36
24	S	S 37	38	36	34	42	48	56	58	59	63	66	62	63	63	A	60	59	71	83	76	61	F	47
25	43	43	41	38	39	47	53	57	57	56	A	63	65	70	65	73	80	77	76	71	56	53	S 43	F 43
26	F	F	43	43	39	34	38	40	E G 41	E G 42	46	48	W	57	61	58	54	54	53	53	53	53	50	49
27	43	43	45	44	33	38	38	48	51	W	48	49	53	57	58	64	60	63	63	64	61	57	55	49
28	52	53	49	48	44	50	52	60	65	65	60	63	62	65	66	71	73	73	69	73	74	66	63	57
29	57	57	50	46	44	47	53	61	63	64	71	73	71	70	76	70	A	A	77	80	78	73	60	58
30	54	58	63	63	31	44	56	66	H 69	63	70	62	60	A	A	A	A	A	A	86	S 73	64	57	F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	25	27	29	28	29	28	27	27	27	28	29	29	29	29	28	28	27	27	28	28	28	28	27
MED	50	47	45	41	38	42	51	57	58	64	67	67	71	74	76	76	73	72	71	71	66	60	54	50
UQ	54	53	50	48	44	47	58	67	73	84	87	86	82	83	82	82	80	77	76	74	72	64	60	57
LQ	43	43	41	37	34	36	40	48	52	56	56	62	64	65	66	66	60	62	63	64	60	54	48	46

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APR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

APR. 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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								380	410	430	L 460	L		470	L									
2								350	420	420	420	430	470	500		U L 430								
3							300	380	390	430	460	460	460	L 470	450									
4									480	460		L 470	L	L										
5										L 460	U L 470	U L 490	480		U L 480									
6										L 460	L 470	U L 480	L 470			L 440								
7										L 470	L 470	U L 500	U L 490	L 470										
8										A	A	470			L 490	L								
9									C			L 500	L 500	L	L									
10											L 470	480	L 500	L		L								
11										L	480	L 480	480	L 480										
12											L 480			L 480	L 460									
13										430	450	460	L		L									
14							350	380	410	440	450	450	460	L	450									
15									A	A	460	460	450	470	L 450									
16									420	430	430	450	460	460	450	410	390							
17							340	370	400	420	430	450	460	440	430									
18							350	370	410	430	430	440	440	430	420	400								
19									L 410	430	440	450	450	440	430	410								
20							350	380	400	430	430	430	430	440	430	400								
21								390			430	450	450	A	430	A								
22								380	A	A	A	A	A	430	440	420	390	330						
23								A	A	A	430	430	440	430	430	430	400							
24								400	430	460	450	470	470	470	A	A	400							
25								410	430	A	A	460	A	450	460	440	430							
26							330	380	410	420	430	450	450	440	450	440	400							
27								400	410	430	430	450	450	460	440	440	400							
28								A	450	430	460	490	490	470	470	450	U L 430							
29								430	440	480	480	480	490	480	470	450	A							
30								430		A	470	480	480	A	A	A	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							6	15	16	19	25	27	23	20	19	13	8	1						
MED							345	380	410	430	450	460	460	465	450	430	400	330						
UQ							350	400	430	460	470	480	480	470	460	440	415							
LQ							330	380	410	430	430	450	450	440	430	410	395							

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APR. 1973 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						S	200	250	290	310	325	340	330	325	310	300	265	210	E					
2				E	130	190	190	240	280	290	300	310	300	325	315	300	265	210	S					
3		E	E	E		150	200	260	290	310	310	310	300	A	320	300	265	A	S					
4						E	200	265	295	310	A	325	325	325	A	A	270	210	A					
5						E	A	260	295	310	315	315	A	A	320	300	275	215	A					
6						S	210	265	300	320	A	330	330	335	330	305	275	215	A					
7						S	205	270	300	320	325	330	335	325	315	305	280	220	A					
8						S	205	270	300	320	340	350	355	340	330	305	280	230	C					
9						C	C	C	C	320	330	350	345	340	I A 330	315	290	235	S					
10						S	220	270	300	325	B	360	335	335	330	310	275	235	A					
11						S	215	280	300	320	330	335	340	340	325	300	265	C	C					
12						S	230	280	305	320	320	330	340	335	330	300	280	220	130					
13						S	210	270	295	310	335	350	345	335	320	310	290	230	E			E		
14			E	E	E	E	205	270	300	315	A	A	A	330	315	300	270	230	S					
15			E	E	E	S	210	265	295	305	320	325	330	A	A	300	270	220	S					
16						S	215	270	295	310	320	A	A	A	315	300	270	215	S					
17						175	220	260	295	305	320	330	335	320	310	295	265	220	140	E				
18		E	E	E	E	140	230	265	300	300	A	A	A	A	300	290	265	225	S					
19						S	220	265	295	310	315	A	325	315	300	295	255	210	S					
20						145	210	250	290	300	315	310	320	315	300	290	255	215	160					
21						170	215	255	285	300	305	295	A	A	A	300	275	235	S					
22						S	210	270	290	300	A	A	A	A	A	310	285	215	S					S
23	S	E	E			S	220	275	295	310	320	325	335	335	325	310	275	230	150					
24						150	235	275	300	325	320	A	A	A	335	310	290	220	120					
25						A	230	290	305	320	325	325	315	A	325	300	A	A	A					
26					E	170	225	290	300	320	340	340	A	A	A	310	300	235	170					
27					E	185	240	280	305	325	335	350	I A 350	330	325	305	290	240	180	S				
28						190	240	280	305	325	335	345	335	325	325	300	270	A	A	S				
29					E	185	245	290	310	325	335	350	350	335	330	325	300	250	190	E				
30				E	E	150	B	B	330	330	I A 320	330	365	350	340	B	300	250	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		3	5	6	8	15	27	28	29	30	24	24	22	20	25	28	29	26	10	2		1		
MED		E	E	E	E	150	215	270	300	312	320	330	335	332	325	300	275	220	145	E		E		
UQ		E	E	E	E	180	228	278	300	320	332	348	345	335	330	310	285	235	170					
LQ		E	E	E	E	142	208	262	295	310	318	325	325	325	315	300	265	215	120					

The Radio Research Laboratories, Japan

APR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

APR. 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	J X 33	E	E	E	E	E S 15	24	29	33	43	39	39	38	G	35	G	G	29	18	J X 25	E S 14	E	E	E
2	E S 15	E	E	E	G	G	27	31	31	34	G	G	G	G	G	G	G	G	23	E S 14	E S 14	E S 15	E	E S 15
3	E S 15	18	15	17	E	G	25	G	32	35	38	44	35	35	G 28	35	G	J X 33	25	18	20	E S 15	18	E S 13
4	E	20	E	E	15	J X 25	25	G 21	G	G	35	G	G	G	33	J X 33	30	G 20	20	E S 15	J X 23	J X 31	J X 35	J X 35
5	E	E	E	J X 15	13	J X 19	23	G	G	G	G	36	J X 43	J X 43	38	G	G	G 20	J X 43	30	E S 15	E S 16	E	E S 15
6	E S 16	E	E	E	E	E S 14	G	G	G	G	40	G	G	G	G	G	G	30	18	E	22	E S 14	E S 16	J X 23
7	J X 24	18	E	J X 23	J X 24	E S 14	G	G	G	35	G	G	G	G	G	G	G	26	18	22	E	E S 15	E S 15	E
8	E S 16	E	E	22	E	21	G	33	36	J X 54	J X 60	G	G	G 23	G 21	G 20	G 20	31	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	48	G	G	G	G	33	G 22	G 15	G	21	E S 16	E S 13	E	E S 14	E
10	E S 14	13	E	E	E	G	G	G	G	G	E B 36	G	G	G	G	G	G	G	18	E S 15	E	E	E	E S 14
11	E S 12	E S 13	15	E	22	G	G	G	G	G	G	G	G	G	G	G	G	C	C	C	C	C	E	E S 13
12	E S 15	E	E	E	E	E S 16	G	G	G	38	J X 56	G 27	G	G	G	G 27	G	G	G	E S 13	E S 15	E S 15	23	E S 15
13	20	E S 14	E	E	E	E S 15	G	30	G	G	G	G	G	G	G	G	G	G	G	E S 14	E	E	E S 15	E S 12
14	E S 13	E	15	E	34	15	28	G	G	G	35	35	35	G	G	G	G	G	E S 16	E S 15	E S 15	E S 15	E S 14	17
15	E	16	22	15	15	30	J X 51	31	45	48	G	G	G	J X 38	36	42	38	J X 63	J X 40	J X 31	J X 25	J X 30	J X 51	28
16	E S 15	J X 31	J X 28	E	E	E S 17	G	G	G	G	G	44	J X 35	J X 44	G 23	G	G	G	E S 16	19	E S 16	E S 15	E S 16	E
17	E	E	14	14	E	G	G	G	G	37	38	J X 45	G	G	G	38	35	J X 35	26	J X 32	J X 33	28	J X 30	J X 20
18	E	J X 23	22	J X 20	E	G	G	31	38	43	35	34	33	38	G	G	G	G 13	E S 18	E	20	E S 13	E S 15	E S 14
19	E S 15	E	E	E	E	18	G	G	34	G	37	34	G	G 26	G 23	G	G	G 15	E S 16	E S 13	E S 15	E S 15	E	E
20	E	E	E S 13	E	E	19	27	38	G	G	G	G	G	G	G	G	G 19	G	G	E	E	E	E S 15	E S 15
21	E	E	E	E	E	G	G	G	33	35	39	G	J X 51	J X 53	38	J X 70	37	38	E S 17	E S 16	E S 14	E	E S 13	E
22	E S 15	J X 30	15	J X 23	17	J X 30	24	33	J X 51	53	J X 63	J X 60	J X 56	40	38	G 23	G	G	E S 18	E S 14	22	E S 15	E S 14	23
23	18	J X 28	J X 25	J X 20	15	25	28	47	J X 64	J X 70	57	G	G	40	G	G	G	34	J X 33	J X 29	J X 30	J X 43	J X 23	J X 26
24	E	E	J X 24	J X 23	15	20	G	32	35	36	G	36	37	35	48	J X 73	J X 65	J X 45	J X 53	J X 33	J X 65	J X 33	J X 30	15
25	J X 23	J X 23	J X 21	J X 28	J X 25	21	G 21	34	J X 52	48	J X 74	38	48	36	38	33	J X 40	J X 41	J X 40	J X 35	J X 25	J X 28	20	E S 14
26	E	E	E	E	E	G	28	G	G	45	38	G	37	38	39	G 23	35	28	J X 58	J X 21	20	E	E S 15	E
27	E S 14	E	E	E	E	G	G 15	G	G	34	G	G	38	G	39	G 22	G	G	G	E S 14	E	30	J X 33	J X 62
28	E S 14	18	21	J X 40	J X 26	23	29	44	37	G	G	G	G	G	38	35	34	40	33	J X 32	J X 33	J X 41	E S 15	E
29	E S 15	E	E	E S 15	E	21	G	33	41	47	45	41	48	44	G	G	J X 83	J X 76	J X 43	18	E	E S 14	E S 15	E S 14
30	E S 14	E	E	17	18	22	E B 44	E B 40	41	J X 63	J X 53	J X 55	G	D	J X 73	J X 90	J X 133	D	J X 155	J X 103	J X 83	J X 64	J X 31	E S 14
31																								

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	29	28	28	28	28	29	29
MED	E S 14	E	E	E	E	F G 16	E G 15	E G 21	31	35	36	G	G	E G 23	G 23	E G 20	G	26	19	17	16	E E 15	E E 15	E E 14
UQ	E S 15	18	15	J X 20	15	21	26	32	37	47	40	38	37	38	38	33	35	35	J X 36	J X 30	J X 24	29	23	17
LQ	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	E G 16	E S 14	E S 14	E E 13	E S 14	E

APR. 1973 | FOES (0.1 MHZ)

IONOSPHERIC DATA

APR. 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 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	E S 15	E	E	E	E	E S 15	G	G	G	G	G	G	G	G	G	G	G	G	G	23	E S 14	E	E	E
2	E S 15	E	E	E	G	G	25	G	G	G	G	G	G	G	G	G	G	G	G	E S 14	E S 14	E S 15	E	E S 15
3	E S 15	G	G	G	E	G	G	G	G	G	G	43	G	35	G 27	25	G	26	17	E	E	E S 15	15	E S 13
4	E	13	E	E	E	17	15	G 17	G	G	34	G	G	G	33	31	G	G 15	15	E S 15	20	22	23	27
5	E	E	E	E	E	18	22	G	G	G	G	G	36	35	25	G	G	G 18	25	20	E S 15	E S 16	E	E S 15
6	E S 16	E	E	E	E	E S 14	G	G	G	G	35	G	G	G	G	G	G	18	15	E	E	E S 14	E S 16	20
7	20	E	E	E	16	E S 14	G	G	G	G	G	G	G	G	G	G	G	G	17	E	E	E S 15	E S 15	E
8	E S 16	E	E	E	E	E	G	G	G	52	48	G	G	G 22	G 20	G 20	G 20	G 20	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	45	G	G	G	G	33	G 21	G 15	G	G	E S 16	E S 13	E	E S 14	E
10	E S 14	E	E	E	E	G	G	G	G	G	E B 36	G	G	G	G	G	G	G	16	E S 15	E	E	E	E S 14
11	E S 12	E S 13	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	C	C	C	C	C	E	E S 13
12	E S 15	E	E	E	E	E S 16	G	G	G	G	G	G 27	G	G	G	G 27	G	G	G	E S 13	E S 15	E S 15	E	E S 15
13	E	E S 14	E	E	E	E S 15	G	G	G	G	G	G	G	G	G	G	G	G	G	E S 14	E	E	E S 15	E S 12
14	E S 13	E	G	E	A	G	27	G	G	G	35	35	34	G	G	G	G	G	E S 16	E S 15	E S 15	E S 15	E S 14	E
15	E	15	G	G	G	26	49	G	41	47	G	G	G	36	33	G	34	65	35	28	23	22	22	E
16	E S 15	21	17	E	E	E S 17	G	G	G	G	G	37	36	37	G 22	G	G	G	E S 16	E	E S 16	E S 15	E S 16	E
17	E	E	G	G	E	G	G	G	G	G	G	42	G	G	G	G	G	G	G	30	30	E	23	E
18	E	E	G	G	E	G	G	G	G	40	32	34	32	31	G	G	G	G 13	E S 18	E	E	E S 13	E S 15	E S 14
19	E S 15	E	E	E	E	G	G	G	G	G	G	34	G	G 26	G 23	G	G	G 15	E S 16	E S 13	E S 15	E S 15	E	E
20	E	E	E S 13	E	E	G	G	36	G	G	G	G	G	G	G	G	G 19	G	G	E	E	E	E S 15	E S 15
21	E	E	E	E	E	G	G	G	G	G	G	G	40	50	36	A	G	G	E S 17	E S 16	E S 14	E	E S 13	E
22	E S 15	25	E	19	16	23	G	G	A	A	A	A	51	34	35	G 22	G	G	E S 18	E S 14	E	E S 15	E S 14	20
23	16	25	21	15	E	G	G	A	A	A	G	G	G	G	G	G	G	G	31	22	25	28	20	20
24	E	E	17	15	E	G	G	G	G	G	G	37	36	34	47	A	36	32	42	29	52	26	20	E
25	18	20	14	20	20	21	G 20	G	41	47	A	G	48	35	G 27	G 23	34	37	36	36	24	18	16	E S 14
26	E	E	E	E	E	G	G	G	G	G	G	G	36	36	34	G 22	G	G	15	15	E	E	E S 15	E
27	E S 14	E	E	E	E	G	G 15	G	G	G	G	G	37	G	G	G 21	G	G	G	E S 14	E	E	20	25
28	E S 14	14	E	26	20	G	G	43	G	G	G	G	G	G	G	G	G	35	30	28	33	21	E S 15	E
29	E S 15	E	E	E S 15	E	G	G	G	40	46	44	G	47	G	G	G	A	A	25	G	E	E S 14	E S 15	E S 14
30	E S 14	E	E	G	15	G	E B 44	E B 40	40	53	39	G	G	A	A	A	A	A	A	20	21	20	20	E S 14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	29	28	28	28	28	29	29
MED	E S 14	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	16	E E 15	E E 14	E E 15	E E 15	E E 13
UQ	E S 15	E G 13	G	G	G	E G 15	E G 15	G	G	45	34	34	36	35	33	G 22	G 15	20	25	21	20	17	16	E S 15
LQ	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	E E 13	E	E	E S 13	E

IONOSPHERIC DATA

APR. 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 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	E	E	E	E S 15	14	11	12	15	17	19	20	20	20	17	11	12	E	E	E S 14	E	E	E
2	E S 15	E	E	E	E	E	12	11	13	16	20	18	19	15	12	17	16	15	E S 14	E S 14	E S 14	E S 15	E	E S 15
3	E S 15	E	E	E	E	E	11	16	16	16	17	22	20	16	17	12	12	E	E S 12	E S 15	E S 15	E S 15	E	E S 13
4	E	E	E	E	E	E	E	12	16	16	18	20	21	20	17	16	12	E	E	E S 15	E S 12	E	E S 13	E S 15
5	E	E	E	E	E	E	E	11	11	16	20	17	17	15	13	11	13	E	E	E S 13	E S 15	E S 16	E	E S 15
6	E S 16	E	E	E	E	E S 14	12	12	11	14	14	16	20	13	14	13	11	E	E	E	E S 15	E S 14	E S 16	E
7	E	E	E	E	E	E S 14	11	11	11	16	16	17	17	15	13	11	12	11	E	E S 15	E	E S 15	E S 15	E
8	E S 16	E	E	E	E	E S 15	15	E	15	12	16	12	17	17	16	12	E	E	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	16	20	16	18	16	17	12	E	12	E S 15	E S 16	E S 13	E	E S 14	E
10	E S 14	E	E	E	E	E S 13	12	12	17	15	36	34	20	17	20	16	16	11	E	E S 15	E	E	E	E S 14
11	E S 12	E S 13	E	E	E	E S 12	11	12	12	15	20	20	20	17	18	15	12	C	C	C	C	C	E	E S 13
12	E S 15	E	E	E	E	E S 16	11	12	16	17	19	17	22	20	17	16	E	11	E	E S 13	E S 15	E S 15	E S 15	E S 15
13	E S 16	E S 14	E	E	E	E S 15	11	E	12	18	15	15	16	20	16	15	11	11	E	E S 14	E	E	E S 15	E S 12
14	E S 13	E	E	E	F	E	12	11	11	15	20	16	17	16	17	12	E	E	E S 16	E S 15	E S 15	E S 15	E S 14	E
15	E	E	E	E	E	E S 15	11	11	11	11	16	17	16	16	11	12	11	12	E S 15	E	E	E	E S 15	E S 15
16	E S 15	E	E	E	E	E S 17	14	13	12	17	16	20	16	17	16	13	13	11	E S 16	E S 12	E S 16	E S 15	E S 16	E
17	E	E	E	E	E	E	12	11	12	16	15	18	19	16	16	13	11	11	E	E	E S 15	E S 15	E	E
18	E	E	E	E	E	E	E	11	11	16	17	18	18	16	11	15	11	E	E S 18	E	E S 15	E S 13	E S 15	E S 14
19	E S 15	E	E	E	E	E S 12	E	11	11	13	18	17	20	16	13	13	E	E	E S 16	E S 13	E S 15	E S 15	E	E
20	E	E	E S 13	E	E	E	14	12	16	18	16	20	19	19	16	16	12	11	E	E	E	E	E S 15	E S 15
21	E	E	E	E	E	E	11	12	12	15	16	20	18	17	16	11	15	12	E S 17	E S 16	E S 14	E	E S 13	E
22	E S 15	E	E	E	E	E S 13	15	13	16	22	22	18	19	20	17	14	12	11	E S 18	E S 14	E S 15	E S 15	E S 14	E S 12
23	E S 13	E	E	E	E	E S 13	15	20	15	15	20	21	20	11	15	17	17	12	E S 12	E S 14	E	E S 15	E S 13	E
24	E	E	E	E	E	E S 14	15	17	20	20	20	17	21	17	20	20	17	12	E	E	E S 15	E	E	E
25	E	E	E	E	E	E	11	14	15	16	20	17	19	20	20	16	12	12	E	E	E	E	E	E S 14
26	E	E	E	E	E	11	E	12	16	16	18	20	22	20	20	16	20	12	E	E	E S 15	E	E S 15	E
27	E S 14	E	E	E	E	11	E	E	11	16	16	16	17	19	16	15	11	11	12	E S 14	E	E	E	E
28	E S 14	E	E S 13	E	E	12	13	11	12	13	16	17	17	18	19	17	16	E	E	E S 15	E S 13	E	E S 15	E
29	E S 15	E	E	E S 15	E	13	14	16	17	16	20	23	20	20	17	17	19	12	E	E	E	E S 14	E S 15	E S 14
30	E S 14	E	E	E	C	12	44	40	25	27	25	21	20	25	20	36	18	12	E	E	E	E	E	E S 14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	29	28	28	28	28	29	29
MED	E S 14	E	E	E	E	F E 12	12	12	12	16	18	18	19	17	16	15	12	11	E	E S 13	E S 14	E S 13	E S 13	E S 12
UQ	E S 15	E	E	E	E	E S 14	14	13	16	16	20	20	20	20	18	16	16	12	E S 15	E S 15	E S 15	E S 15	E S 15	E S 14
LQ	E	E	E	E	E	E	11	11	11	15	16	17	17	16	15	12	11	E	E	E	E	E	E	E

APR. 1973 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

APR. 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

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	300	F	S 290	285	275	290	320	305	285	325	345	315	305	315	330	320	330	330	315	310	320	285	265	265
2	260	260	270	270	F 260	F 265	305	G	G	G	G	280	285	275	300	340	340	335	295	275	285	290	F 280	F 280
3	F 280	F 260	F	F 275	F 245	F 270	310	R	270	265	255	295	330	305	320	315	315	330	325	305	270	275	280	F
4	F 275	295	290	F 305	F 300	305	300	315	285	285	H 325	330	325	330	325	330	340	340	330	310	300	310	295	280
5	280	300	280	305	305	320	340	345	335	320	315	340	325	315	325	325	330	325	325	325	320	315	280	285
6	280	280	290	270	300	320	345	330	335	325	315	305	305	305	310	325	320	315	320	325	305	280	275	275
7	270	275	290	295	300	295	340	340	330	320	310	320	315	305	305	315	330	330	330	300	295	280	295	290
8	285	285	290	290	290	315	340	325	325	310	330	325	310	310	305	315	320	320	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	315	305	315	300	300	305	310	315	320	325	315	285	285	290	285
10	280	290	285	305	295	310	355	320	325	320	330	325	310	320	310	325	325	330	330	315	305	300	300	285
11	280	295	285	305	325	320	335	355	330	320	320	315	315	315	295	310	295	C	C	C	C	C	290	260
12	285	275	270	300	310	320	320	335	320	335	320	325	315	325	335	330	330	330	335	335	305	295	280	285
13	285	280	285	295	275	290	320	315	335	335	330	315	320	320	340	335	320	320	305	285	280	260	255	270
14	255	265	285	300	A	260	250	275	300	315	315	315	330	330	320	310	315	290	290	320	300	290	305	260
15	255	275	305	295	320	315	310	310	315	320	310	330	330	315	325	335	330	335	325	305	300	295	280	280
16	F	F	F 290	F 295	285	315	300	315	310	315	330	325	295	295	300	310	330	310	310	280	285	280	280	300
17	280	270	275	280	285	310	W	255	320	310	305	300	305	310	320	330	315	325	325	285	305	290	280	280
18	280	S	F	310	270	310	255	295	305	305	305	295	295	315	330	355	330	325	305	285	295	300	335	290
19	280	300	310	280	305	300	330	335	315	320	300	305	305	320	325	340	335	335	310	280	315	320	310	285
20	290	285	290	310	335	335	260	280	260	310	225	285	300	300	325	330	310	325	320	305	285	285	290	295
21	290	275	285	305	280	320	310	310	305	330	285	290	295	305	325	I A 325	310	310	305	290	280	300	280	290
22	285	275	275	275	265	305	335	290	A	A	A	A	A	290	300	315	315	305	305	290	335	300	280	290
23	290	270	270	280	285	340	335	A	A	A	245	265	I R 270	300	305	300	290	310	310	295	285	305	305	280
24	S	S 270	290	305	325	335	355	345	330	295	330	320	320	295	315	A	315	300	295	315	315	310	F	275
25	290	290	295	290	300	320	340	315	330	320	A	305	300	315	310	310	315	315	315	340	295	285	S 280	F 295
26	F	F	280	300	320	275	245	240	G	G	240	270	W	280	305	315	320	320	310	285	270	280	280	285
27	280	275	290	320	330	315	340	285	290	W	265	245	270	290	305	305	300	300	305	295	285	290	275	270
28	275	285	290	300	310	330	315	310	310	340	300	300	300	305	310	305	320	325	320	315	310	290	285	265
29	265	290	270	270	285	280	300	310	315	290	295	305	295	300	315	300	A	A	300	290	295	300	280	260
30	260	275	310	355	295	300	305	295	H 275	295	315	305	300	A	A	A	A	A	A	315	S 310	285	280	F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	25	27	29	28	29	29	27	27	28	28	29	29	29	29	28	28	27	27	28	28	28	28	27
MED	280	275	290	295	298	310	320	310	315	315	310	305	305	305	315	318	320	325	315	305	298	290	280	280
UQ	285	290	290	305	310	320	340	328	328	320	322	320	315	315	325	330	330	330	325	315	308	300	292	288
LQ	275	275	280	280	282	295	300	292	288	295	290	295	295	300	305	310	315	312	305	288	285	285	280	272

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

IONOSPHERIC DATA

APR. 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 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								330	355	375	L 370	L		360	L									
2								330	305	355	350	375	365	330		U L 370								
3							355	335	365	380	370	A	375	L 370	355									
4									350	380		L 370	L	L										
5										L 380	U L 375	U L 370	375		U L 360									
6										L 380	L 380	U L 365	L 365			L 370								
7										L 360	L 385	U L 355	U L 355	L 365										
8										A	A	385			L 345	L								
9									C			L 360	L 360	L	L									
10											L 375	375	L 355	L		L								
11										L	375	L 370	375	L 375										
12											L 365			L 365	L 370									
13										385	380	385	L		L									
14							325	370	355	365	365	385	375	L	370									
15									A	A	370	370	390	360	L 395									
16									355	380	375	395	375	350	355	365	360							
17							330	350	355	380	375	A	355	385	350									
18							310	340	365	A	375	375	365	350	370	375								
19									L 365	385	365	370	365	375	365	365								
20							310	A	355	350	380	375	375	375	340	375								
21								335			390	375	A	A	350	A								
22								365	A	A	A	A	A	385	375	360	360	380						
23								A	A	A	395	385	375	385	375	375	375							
24								375	375	355	360	375	365	365	A	A	A							
25								360	A	A	A	375	A	375	350	370	350							
26							350	340	365	355	380	375	380	385	360	360	375							
27								335	350	370	390	360	370	360	365	350	355							
28								A	360	395	370	350	355	360	355	365	U L 350							
29								350	A	A	A	355	A	355	340	355	A							
30								B		A	360	355	355	A	A	A	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							6	13	14	17	24	25	21	20	19	13	7	1						
MED							328	340	355	380	375	375	365	365	360	365	360	380						
UQ							350	360	365	380	380	375	375	375	370	370	368							
LQ							310	335	355	360	368	365	360	360	350	360	352							

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

IONOSPHERIC DATA

APR. 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

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								345	345	275	250	285		290	260									
2								G	G	G	G	400	420	370		255								
3							310	R	475	475	425	325	305	325	295									
4									345	280		260	290	275										
5										265	265	250	250		280									
6										265	275	280	270			270								
7										270	275	275	280	275										
8										270	265	275			300	275								
9									C			265	280	290	285									
10											260	260	290	280		265								
11										280	275	270	270	275										
12											290			280	265									
13										245	265	265	270		260									
14							500	390	350	285	300	280	300	275	315									
15									275	275	260	260	275	295	280									
16									330	315	285	320	325	325	300	280	260							
17								W	495	325	325	320	325	325	300	290								
18							500	360	300	320	305	325	325	290	275	255								
19									300	300	340	325	295	295	295	275								
20							470	370	480	340	645	400	325	340	295	270								
21								320			390	370	320	300	280	I A 290								
22								395	A	A	A	A	A	335	325	305	285	280						
23								A	A	A	575	475	I R 450	390	375	365	355							
24								275	315	370	305	320	310	350	300	A	295							
25								280	280	295	A	325	350	295	305	305	295							
26							545	580	G	G	575	450	W	405	315	315	305							
27								405	375	W	490	540	445	385	350	310	310							
28								310	305	295	345	345	350	340	315	320	295							
29								295	300	360	310	300	315	325	300	310	A							
30								330		350	315	320	325	A	A	A	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							6	15	17	24	26	28	26	25	23	16	8	1						
MED							500	360	330	298	305	320	312	300	295	285	295	280						
UQ							545	400	375	355	390	335	325	340	310	310	308							
LQ							470	315	300	275	275	272	280	290	280	270	290							

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APR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

APR. 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	260	300	260	270	300	300	265	250	245	240	235	205	215	200	225	225	235	245	250	250	230	265	300	310
2	330	305	305	315	350	290	A	275	275	240	245	230	225	245	230	240	245	245	260	280	275	270	275	265
3	260	315	340	300	325	330	260	240	225	215	220	I A 230	200	215	220	225	240	245	235	245	300	300	270	290
4	305	285	270	250	255	255	245	225	205	215	H 200	225	210	215	220	210	250	230	230	230	245	250	300	340
5	290	260	265	250	235	245	220	225	225	220	205	200	210	200	200	245	240	240	240	245	230	225	245	285
6	280	275	260	255	245	245	225	210	225	225	200	210	205	210	225	225	250	245	240	220	230	260	295	300
7	300	285	270	255	240	250	225	235	225	215	210	200	210	215	220	240	245	245	235	225	250	280	260	270
8	290	270	255	255	255	250	225	225	235	A	A	215	205	200	205	230	250	245	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	A	215	230	220	205	215	240	240	250	235	230	250	260	250	265
10	295	280	250	250	250	240	215	225	215	225	220	245	210	200	250	225	245	240	225	230	240	250	245	270
11	285	275	250	250	210	235	210	240	215	220	230	215	215	200	215	225	235	C	C	C	C	C	260	270
12	290	280	295	250	235	220	230	240	240	210	250	210	220	225	240	220	240	240	230	220	225	245	275	290
13	295	295	275	265	295	260	250	225	245	200	220	215	195	215	200	225	250	250	255	265	280	305	325	300
14	320	295	285	245	A	305	275	235	245	250	200	220	210	200	215	250	230	260	275	240	210	225	275	350
15	350	315	275	245	265	270	A	245	A	A	225	210	200	205	180	260	255	A	250	240	250	270	260	275
16	300	325	280	245	250	260	245	210	225	210	225	205	225	255	245	220	245	250	265	275	265	295	260	270
17	275	305	300	295	300	290	250	230	225	245	215	A	235	215	265	290	260	260	245	270	260	250	300	265
18	300	300	275	250	290	275	250	245	240	A	215	210	210	215	230	225	235	245	255	270	260	260	210	275
19	295	250	265	275	260	250	245	235	235	205	225	225	230	210	220	215	240	245	250	260	245	245	220	265
20	290	300	280	250	240	250	250	I A 255	225	235	220	215	225	220	250	235	225	260	245	245	250	265	270	265
21	275	295	300	250	280	250	250	230	225	215	210	215	A	A	250	A	240	260	270	265	260	255	280	265
22	270	300	260	310	320	300	245	230	A	A	A	A	A	225	225	215	225	225	260	275	230	250	270	315
23	285	350	345	300	300	270	245	A	A	A	230	235	235	235	225	225	225	290	A 295	270	275	275	260	325
24	300	300	290	270	250	250	245	235	230	210	200	240	200	220	A	A	A	260	A	A 260	A	270	255	280
25	295	300	275	300	290	260	240	245	A	A	A	205	A	205	240	225	250	A 270	250	A 245	250	250	275	300
26	280	F 270	280	250	245	270	255	250	225	270	235	225	225	225	235	245	225	245	265	250	295	275	295	275
27	310	300	270	220	245	270	250	235	240	225	225	230	230	235	245	230	245	245	250	250	260	250	310	340
28	290	275	250	280	250	245	220	A	245	205	235	230	220	215	215	230	220	A 265	A 250	260	A 275	260	270	300
29	305	265	275	295	275	250	245	245	A	A	A	240	A	215	245	230	A	A	255	260	250	245	265	275
30	325	305	245	215	230	245	B	B	A 255	A	220	240	230	A	A	A	A	A	A	260	250	250	265	300
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	28	29	26	26	24	21	26	28	26	28	28	27	27	26	26	28	27	28	29	29
MED	295	295	275	255	255	255	245	235	228	220	220	218	215	215	225	225	240	245	250	250	250	260	270	280
UQ	300	300	285	280	292	270	250	245	242	235	230	230	225	222	242	240	248	260	260	265	262	270	280	300
LQ	285	275	260	250	245	250	225	225	225	210	210	210	210	205	215	225	235	245	240	240	242	250	260	270

APR. 1973 | H'F (KM)

IONOSPHERIC DATA

APR. 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 automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	E	E	E	E	S	145	150	145	120	125	120	115	G	115	G	G	110	120	110	S	E	E	E
2	S	E	E	E	G	G	125	120	120	115	G	G	G	G	G	G	G	G	120	S	S	S	E	S
3	S	145	140	140	E	G	135	G	130	130	120	110	115	100	100	100	G	100	115	115	110	S	105	S
4	E	105	E	E	100	100	120	105	G	G	110	G	G	G	105	105	105	105	100	S	105	110	105	110
5	E	E	E	105	100	100	100	G	G	G	G	110	105	100	100	G	G	105	100	100	S	S	E	S
6	S	E	E	E	E	S	G	G	G	G	105	G	G	G	G	G	G	100	100	E	100	S	S	105
7	105	105	E	105	105	S	G	G	G	125	G	G	G	G	G	G	G	145	100	100	E	S	S	E
8	S	E	E	100	E	100	G	140	125	115	115	G	G	100	100	100	100	125	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	120	G	G	G	G	115	100	100	G	115	S	S	E	S	E
10	S	105	E	E	E	G	G	G	G	G	B	G	G	G	G	G	G	G	100	S	E	E	E	S
11	S	S	100	E	100	G	G	G	G	G	G	G	G	G	G	G	G	C	C	C	C	C	E	S
12	S	E	E	E	E	S	G	G	G	125	110	105	G	G	G	100	G	G	G	S	S	S	100	S
13	100	S	E	E	E	S	G	165	G	G	G	G	G	G	G	G	G	G	G	S	E	E	S	S
14	S	E	125	E	120	125	125	G	G	G	110	105	105	G	G	G	G	G	S	S	S	S	S	105
15	E	100	125	130	125	140	125	135	120	115	G	G	G	100	100	145	135	120	120	120	115	110	115	110
16	S	100	100	E	E	S	G	G	G	G	G	105	100	105	100	G	G	G	S	115	S	S	S	E
17	E	E	125	125	E	G	G	G	G	120	120	110	G	G	G	150	130	125	135	125	115	110	115	115
18	E	125	140	125	E	G	G	140	120	110	105	105	105	105	G	G	G	100	S	E	115	S	S	S
19	S	E	E	E	E	140	G	G	115	G	115	105	G	100	100	G	G	100	S	S	S	S	E	E
20	E	E	S	E	E	140	125	120	G	G	G	G	G	G	G	G	105	G	G	E	E	E	S	S
21	E	E	E	E	E	G	G	G	120	120	110	G	105	100	110	115	150	180	S	S	S	E	S	E
22	S	105	125	125	100	120	125	125	110	110	105	105	105	100	100	100	G	G	S	S	115	S	S	150
23	150	125	120	115	120	115	140	125	120	115	125	G	G	130	G	G	G	145	120	115	110	110	110	110
24	E	E	115	110	110	120	G	125	125	145	G	110	105	110	125	115	115	110	110	110	105	115	115	105
25	100	100	105	100	105	100	100	125	115	115	110	115	110	110	120	115	100	100	100	100	100	100	100	S
26	E	E	E	E	E	G	145	G	G	120	125	G	105	110	110	100	150	150	120	100	115	E	S	E
27	S	E	E	E	E	G	100	G	G	145	G	G	110	G	140	100	G	G	G	S	E	115	115	105
28	S	100	100	100	105	130	125	120	125	G	G	G	G	G	125	115	115	130	120	115	115	110	S	E
29	S	E	E	S	E	145	G	125	115	115	115	115	110	115	G	G	115	115	125	125	E	S	S	S
30	S	E	E	120	115	115	B	B	115	110	110	115	G	115	115	120	115	115	110	110	110	110	105	S
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	11	12	13	12	14	14	14	15	19	17	14	13	15	17	15	13	19	18	14	13	9	10	9
MED	105	105	122	115	105	120	125	125	120	120	110	110	105	105	110	105	115	115	115	112	110	110	108	110
UQ	105	115	125	125	118	140	135	140	125	122	120	115	110	110	115	115	130	128	120	115	115	110	115	110
LQ	100	100	102	105	100	100	120	120	115	115	110	105	105	100	100	100	105	102	100	100	105	110	105	105

APR. 1973 | H'ES (KM)

IONOSPHERIC DATA

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

The Radio Research Laboratories, Japan

APR. 1973 | TYPES OF ES

IONOSPHERIC DATA

APR. 1973 | FOF2 (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	50	F	F	42	40	41	61	64	65	90	89	82	90	96	108	100	87	88	87	80	69	59	61	56
2	51	52	46	40	31	48	50	I R 50	64	60	54	84	78	76	101	99	79	76	69	I R 72	76	74	I R 65	F
3	70	55	52	46	36	43	42	41	46	56	55	I A 64	66	64	64	66	71	74	66	50	42	F	44	44
4	F	F 43	F 40	41	29	34	51	63	74	88	104	115	106	97	83	81	75	83	74	71	57	54	I A 52	50
5	48	51	47	45	39	40	60	65	77	94	101	110	98	88	88	92	91	80	84	79	64	56	49	49
6	49	49	48	47	44	46	66	70	79	90	96	96	102	100	94	95	91	96	95	79	53	48	50	51
7	51	52	50	49	41	43	71	76	76	84	89	90	100	96	94	102	91	80	74	65	59	54	54	56
8	55	54	52	49	46	48	71	82	83	91	96	92	87	90	96	96	94	88	81	I R 78	72	I A 66	64	I R 62
9	62	60	57	54	53	56	78	90	91	87	102	102	96	97	104	102	95	89	80	73	I R 63	61	61	58
10	57	55	56	54	48	50	62	70	81	93	104	97	98	105	112	106	100	100	84	71	66	61	61	56
11	55	54	53	52	40	45	61	67	74	92	105	114	107	101	103	106	104	96	96	92	84	62	64	59
12	66	66	61	61	57	57	70	H 77	82	92	86	94	101	90	88	95	94	88	87	74	56	54	53	54
13	52	52	52	48	46	46	58	84	92	84	77	84	91	94	82	83	80	82	82	80	75	70	68	69
14	64	I R 60	49	F 38	I A 28	I A 33	44	62	72	82	77	76	76	82	85	80	88	80	87	84	69	45	41	37
15	36	F 36	42	37	I A 28	35	61	78	89	102	108	92	79	85	89	89	80	74	74	I R 74	69	I A 54	57	F
16	F	F	F	F 48	46	48	53	60	71	73	75	80	84	92	104	108	96	78	76	69	76	65	64	62
17	64	58	54	54	49	46	46	59	71	72	64	75	86	92	86	76	78	82	89	72	69	58	I R 55	60
18	F	F	59	48	32	36	46	53	72	67	69	87	95	94	100	88	68	65	62	71	75	61	52	44
19	45	46	48	39	39	46	66	72	69	74	71	89	98	94	86	76	72	75	74	73	79	65	53	46
20	43	42	42	46	42	46	45	59	55	67	56	68	91	92	88	82	72	68	72	68	55	53	52	51
21	48	46	42	44	38	45	52	58	56	51	66	80	97	96	94	79	66	69	72	78	72	70	61	64
22	61	60	60	54	49	48	48	49	52	I A 59	61	72	64	77	79	76	75	69	72	72	72	54	54	52
23	52	46	48	45	46	52	Z 50	I R 49	I R 48	46	52	56	51	58	57	53	55	55	56	61	61	52	43	39
24	40	40	39	41	34	45	57	68	64	69	71	72	69	75	72	69	69	66	72	96	77	56	F	F
25	F	48	F 47	43	41	50	66	68	66	69	65	71	78	82	86	86	89	92	99	88	51	51	47	46
26	48	47	44	46	44	39	44	44	48	47	53	60	I R 56	60	74	66	62	59	61	60	57	57	57	56
27	51	52	53	56	34	42	46	44	E G 46	52	52	53	61	68	71	75	68	69	78	82	66	61	56	57
28	56	58	56	55	48	48	61	66	71	71	75	77	69	72	77	78	86	84	81	78	72	66	64	55
29	57	62	59	47	47	48	65	65	65	70	84	81	88	I A 85	84	89	87	85	91	85	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	82	86	89	88	I R 89	89	67	64	58	59
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	27	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	29	28	28	26
MED	52	52	50	47	41	46	58	65	71	73	75	82	88	90	87	86	83	80	79	74	69	58	56	56
UQ	57	58	55	52	46	48	65	70	77	90	96	92	98	96	96	96	91	88	87	80	72	64	61	59
LQ	48	46	46	43	36	42	48	58	64	67	64	72	76	77	82	76	72	69	72	71	59	54	52	49

The Radio Research Laboratories, Japan

APR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

APR. 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	L 460	L	L 470	L 500	500	L 480	L	L							
2								410	L 470	L	L 460	L 500	U L 480	500	L 450	L	L							
3							L 340	360	400	440	460	I A 480	470	490	480	450	410	L						
4								L	A	L 470	510	480	500	480	470	A	A							
5								L	L	L 470	470	490	500	490	490	H 470	L							
6								L	H 480	L	500	500	L 500	500	L 480	L 480	L	L						
7								L	L	490	H 500	U L 510	490	490	480	460	L	L						
8									A	A	L 510	L	U L 550	540	470	U L 480	L	L						
9								L	L	H 520	I A 500	480	I A 490	I A 500	L 470	430	L							
10									L	L	470	L	L	L 480	470	L	L							
11									L	490	490	490	490	510	H 500	H 470	L	L						
12								L	L	L	470	L 460	480	510	L 460	L 450	L							
13								H 370	L	L	460	L	480	470	450	L	H 420	L						
14								400	440	460	480	480	490	490	460	L 480	L	U L 420						
15								L	A	A	470	470	I A 480	470	H 450	H 440	L	L						
16								L	L 450	450	460	470	490	480	470	L	L	L						
17								U L 410	L	430	500	H 480	480	470	H 450	430	U L 410	L						
18							U L 350	410	420	430	470	460	470	470	450	L 420	L	L						
19							L	L	L 440	460	490	470	470	460	450	L 430	490	L						
20								400	430	I A 440	440	470	460	460	450	L	L	L						
21								U L 410	I A 430	480	H 490	480	I A 470	460	440	420	L	L						
22								360	I A 420	I A 450	I A 460	460	480	480	450	440	400	L						
23									420	440	440	H 460	450	450	450	440	430	U L 390	L					
24								L	H 530	480	490	L	I A 480	I A 470	460	460	L	L	L					
25							L	L	460	I A 480	H 550	470	480	490	470	H 460	A	L						
26							350	400	440	440	450	460	470	470	H 450	440	L							
27								400	460	460	460	480	480	480	460	450	440	L	L					
28								L	L	490	490	490	510	510	H 480	470	A	A						
29							L	L	510	490	480	I A 480	500	I A 480	470	L	L	L						
30							C	C	C	C	C	C	C	C	480	480	L	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	11	16	22	28	25	28	29	30	22	7	2						
MED							L 350	400	440	460	475	480	480	480	465	450	420	U L 405						
UQ							350	410	465	480	495	480	495	500	480	470	435							
LQ							345	385	425	440	460	470	475	470	450	440	410							

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APR. 1973 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

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

Station AKITA Lat. 39 43.5 N. Long. 140 08.2 E Sweep 1 MHz to 20 MHz in 20 sec in 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							200	255	295	310	I A 325	340	355	345	330	320	300	255	A					
2							A	260	290	310	320	I A 330	A	A	A	A	A	A	A					
3						S	A	250	285	310	325	I A 340	355	I A 340	I A 330	A	A	A	A					
4							210	260	300	A	A	I A 360	355	355	335	A	A	A	S					
5							215	255	305	320	330	340	R 350	I A 350	I A 340	325	295	A	A					
6						S	210	265	300	320	330	I A 345	355	355	345	320	290	250	A					
7						S	220	275	305	325	335	A	A	355	340	325	295	245	S					
8						S	215	270	310	325	340	345	355	A	A	325	295	245	S					
9						S	A	270	305	I R 325	I R 340	355	355	355	340	320	280	220	S					
10						S	200	270	310	250	340	355	360	R 355	340	I A 320	280	A	S					
11						S	200	265	305	325	I A 340	I A 350	I A 355	355	345	325	285	245	A					
12						S	235	280	305	320	I A 335	345	355	350	330	315	285	235	A					
13						S	215	275	305	325	I A 335	350	360	350	340	320	285	245	A					
14						S	205	265	305	325	A	A	A	345	I A 325	310	285	235	A					
15						S	215	265	300	320	A	A	A	345	330	320	295	250	A					
16						S	A	265	300	320	I A 330	I A 340	I A 345	345	325	A	A	245	A					
17						S	215	265	300	325	335	345	350	355	340	I A 315	270	I A 235	B					
18						S	215	275	A	A	A	A	350	I A 340	330	310	275	245	B					
19						S	220	265	300	I A 315	I A 330	340	350	350	330	305	280	235	A					
20						S	A	265	300	320	335	A	A	A	A	A	A	235	B					
21						S	215	265	300	I A 320	I A 330	I A 345	355	350	335	315	285	245	B					
22						S	215	265	305	320	A	A	A	I A 350	335	315	295	250	180					
23						S	215	265	300	320	I A 330	I A 340	355	350	335	325	310	285	A					
24						160	230	275	310	A	A	345	I A 355	355	340	325	I A 290	245	A	S				
25						A	235	I A 275	310	I A 320	335	I A 350	365	350	A	A	A	A	A	S				
26						180	245	290	310	330	345	360	365	355	335	I A 320	305	I A 250	A	S				
27						175	240	280	310	325	I A 340	355	360	365	345	325	I A 295	I A 250	195	S				
28						A	230	275	310	325	340	355	365	360	345	330	295	255	A	S				
29						S	230	285	315	335	350	360	A	A	A	335	I A 300	I A 255	A	E				
30						C	C	C	C	C	C	C	C	C	350	I B 340	315	265	A	S				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	24	29	28	26	23	23	22	25	25	24	24	24	2	1				
MED						175	215	265	305	320	335	345	355	350	335	320	292	245	188	E				
UQ						178	230	275	310	325	340	355	360	355	340	325	295	250						
LQ						168	212	265	300	320	330	340	355	350	330	315	285	240						

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APR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J X 44	J X 29	J X 20	F S 14	E S 14	E S 14	22	30	36	J X 54	J X 40	37	40	38	G	G	G	J X 36	29	J X 35	J X 44	J X 20	E S 14	E S 14
2	E S 14	E S 14	M 22	E	E	E S 16	28	J X 40	36	40	38	41	39	39	J X 40	39	J X 41	29	30	J X 22	J X 25	M 21	E S 14	E S 14
3	E S 14	E S 14	E S 14	F S 14	E S 14	E S 14	24	34	39	44	G	J X 85	G	J X 44	J X 44	35	J X 40	J X 31	J X 36	J X 40	J X 44	J X 27	J X 26	J X 24
4	J X 46	J X 30	J X 28	J X 29	J X 25	J X 21	25	30	J X 49	36	38	37	G	G	G	J X 46	J X 54	J X 51	J X 50	J X 61	J X 34	J X 36	J X 76	J X 18
5	J X 34	J X 49	J X 19	J X 29	E S 14	E S 14	G	G	G	35	36	G	G	37	36	J G 32	J X 30	J X 32	J X 28	J X 28	J X 20	E S 14	E S 14	E S 14
6	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	G	37	37	G	G	G	G	G	G	20	J X 18	J X 24	E S 14	M 20	E S 14
7	E S 14	J X 20	J X 21	J X 20	J X 20	E S 14	G	31	33	39	36	J X 48	39	G 35	G	G	32	29	20	J X 31	J X 18	E S 14	E S 14	E S 14
8	E S 14	J X 18	M 20	E S 14	E S 14	E S 14	26	34	47	J X 54	42	37	G	J X 44	J X 64	J G 27	35	30	J X 89	J X 44	J X 46	J X 82	J X 69	J X 40
9	J X 27	E S 14	J X 21	J X 21	E S 14	E S 15	30	38	43	38	54	G	53	53	38	G	G	23	E S 15	J X 22	J X 62	J X 29	E S 14	E S 14
10	E S 14	E S 14	M 18	J X 24	J X 21	E S 14	26	G	G	38	42	39	G	G	G	38	G 27	26	J X 24	J X 21	J X 19	J X 19	M 22	E S 14
11	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	J X 30	G	35	37	38	J X 41	G 35	J X 36	G	G	J G 24	J X 26	E S 14	J X 17	E S 14	E S 14	E S 14
12	E S 14	E S 14	E S 14	E S 14	E	E S 15	25	G	G	35	J X 47	44	J X 40	G	G	36	35	30	J X 24	J X 20	J X 21	E S 14	E S 14	E S 14
13	E S 14	E S 14	E S 14	F S 14	J X 19	E S 14	J X 28	G	35	39	J X 44	46	46	48	G	G	G	27	J X 34	E S 14	E S 14	E S 14	E S 14	E S 14
14	E S 14	E S 14	M 20	J X 20	J X 34	J X 30	J X 41	35	32	38	J X 42	38	36	G	J X 46	40	G	G	J X 29	J X 24	23	J X 28	J X 20	J X 19
15	E S 14	M 21	E S 14	J X 24	J X 37	J X 28	25	J X 44	J X 65	J X 86	41	38	J X 89	G	G	G	G	J G 20	24	J X 37	J X 46	J X 64	J X 51	J X 39
16	J X 36	J X 30	J X 20	J X 25	J X 26	J X 20	32	33	39	37	38	42	J X 44	38	J X 33	J X 37	J X 32	G	24	J X 18	J X 17	J X 22	M 21	E S 14
17	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	35	37	42	37	G	G	G	35	36	33	E B 19	E S 14	E S 14	E S 14	J X 20	E S 14
18	E S 14	E S 14	E S 14	E	E	E S 15	26	31	36	36	J X 44	38	G 35	36	G 30	G	G	G	E B 18	E S 14	J X 26	E S 14	E S 14	E S 14
19	E S 14	J X 19	M 20	J X 20	J X 20	J X 24	26	34	34	37	36	G	40	G	G	G	G	G	22	M 21	E S 14	E S 14	E S 14	E S 14
20	E S 14	E S 14	E S 14	E S 14	E S 14	19	25	29	34	J X 48	36	36	36	41	37	39	32	26	F B 19	E S 14	E S 14	M 20	E S 14	E S 14
21	E S 14	E S 14	E S 14	F S 14	E S 14	E S 14	25	32	J X 58	34	38	40	J X 64	41	G	G	G	G	23	J X 21	J X 36	J X 30	E S 14	E S 14
22	J X 32	J X 20	J X 20	J X 17	J X 17	E S 14	25	35	J X 51	J X 68	J X 54	J X 81	J X 55	J X 37	44	G 23	J X 31	J X 25	G	E S 14	J X 39	J X 22	J X 34	J X 21
23	J X 30	J X 36	J X 31	J X 38	J X 35	19	34	39	42	38	42	36	G	38	40	G	G	G	24	J X 27	J X 54	J X 65	J X 64	J X 39
24	J X 45	J X 20	E	J X 19	J X 20	G	G	31	39	39	J X 77	G	J X 64	J X 64	48	41	J X 50	35	23	J X 18	J X 31	J X 37	J X 55	J X 37
25	J X 20	J X 24	J X 25	J X 44	J X 29	20	G	36	43	J X 61	38	42	40	39	38	J X 45	J X 89	J X 28	J X 39	J X 22	J X 41	J X 26	J X 19	M 20
26	E S 14	E S 14	E S 13	E S 14	E S 14	G	G	G	G	36	G	G	G	G	38	J X 40	32	34	26	J X 36	E S 14	E S 14	J X 17	J X 20
27	E S 14	E S 14	E S 14	E S 14	E S 14	G	29	30	36	G	41	42	40	G	45	J X 55	34	J X 34	G	21	J X 20	J X 29	J X 27	J X 27
28	E S 14	J X 44	J X 24	J X 26	J X 25	J X 25	27	36	36	45	42	J X 61	G	G	G	36	J X 64	J X 55	J X 39	J X 29	J X 37	J X 30	E S 14	J X 35
29	J X 20	J X 20	E S 14	E S 14	J X 19	J X 22	28	32	40	39	45	J X 66	48	J X 84	J X 76	39	36	36	27	J X 39	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	E B 38	42	J X 49	J X 69	J X 86	J X 46	J X 104	J X 67	J X 54
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	29	29	29	29
MED	E S 14	E S 14	18	14	14	E S 14	25	31	36	38	41	38	39	37	34	34	32	28	24	J X 22	J X 25	J X 22	19	E S 14
UQ	J X 27	J X 21	J X 20	J X 24	J X 21	20	28	35	42	44	42	42	44	41	40	39	36	34	J X 30	J X 35	J X 41	J X 30	J X 27	J X 24
LQ	E S 14	E S 14	E S 14	F S 14	E S 14	E S 14	G	29	33	36	37	37	G	G	G	G	G	G 20	20	18	J X 18	E S 14	E S 14	E S 14

APR. 1973 | FOES (0.1 MHZ)

IONOSPHERIC DATA

APR. 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	18	17	15	E S 14	E S 14	E S 14	22	29	35	38	37	37	39	37	G	G	G	20	27	27	34	20	E S 14	E S 14
2	E S 14	E S 14	E	E	E	E S 16	27	38	36	38	38	39	37	38	38	35	36	27	27	20	24	E	E S 14	E S 14
3	E S 14	E S 14	E S 14	F S 14	E S 14	E S 14	23	30	37	40	G	A	G	43	43	35	34	29	34	29	29	E	21	E
4	21	22	20	20	20	18	24	30	44	36	37	37	G	G	G	46	52	27	41	40	24	29	A	18
5	22	22	17	25	E S 14	E S 14	G	G	G	35	36	G	G	37	35	G 29	26	32	24	25	E	E S 14	E S 14	E S 14
6	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	G	37	37	G	G	G	G	G	G	19	E	21	E S 14	E	E S 14
7	E S 14	E	E	E	17	E S 14	G	30	33	38	36	43	38	G 34	G	G	31	27	20	28	E	E S 14	E S 14	E S 14
8	E S 14	E	E	E S 14	E S 14	E S 14	25	34	47	52	42	37	G	39	45	G 25	35	27	31	41	43	A	25	21
9	22	E S 14	18	15	E S 14	E S 15	29	35	43	37	E R 54	G	53	53	38	G	G	23	F S 15	17	21	18	E S 14	E S 14
10	E S 14	E S 14	E	25	18	E S 14	25	G	G	37	42	39	G	G	G	32	G 26	25	22	17	E	E	E	E S 14
11	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	28	G	35	37	38	38	G 33	31	G	G	G 19	19	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	E S 15	25	G	G	35	35	38	37	G	G	35	34	24	18	17	E	E S 14	E S 14	E S 14
13	E S 14	E S 14	E S 14	E S 14	15	E S 14	G	G	35	37	37	42	43	45	G	G	G	27	32	E S 14	E S 14	E S 14	E S 14	E S 14
14	E S 14	E S 14	E	16	A	A	35	33	32	35	40	36	36	G	36	36	G	G	27	20	18	19	18	E
15	E S 14	E	E S 14	18	A	22	25	G	61	U R 86	40	36	62	G	G	G	G	G 19	23	25	40	A	39	30
16	30	20	E	17	18	18	29	30	35	36	36	40	42	37	29	32	29	G	22	E	E	19	E	E S 14
17	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	32	35	36	36	G	G	G	34	34	27	F B 19	E S 14	E S 14	E S 14	E	E S 14
18	E S 14	E S 14	E S 14	E	E	E S 15	24	29	33	35	35	36	G 33	35	G 26	G	G	G	E B 18	E S 14	21	E S 14	E S 14	E S 14
19	E S 14	U R 19	E	16	16	E	24	G	33	35	35	G	37	G	G	G	G	G	19	E	E S 14	E S 14	E S 14	E S 14
20	E S 14	E S 14	E S 14	E S 14	E S 14	19	24	28	33	46	35	36	35	36	35	32	29	G	E B 19	E S 14	E S 14	E	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	24	30	50	34	37	38	57	38	G	G	G	G	23	20	25	24	E S 14	E S 14
22	23	17	E	16	16	E S 14	24	34	46	A	47	43	41	37	37	G 23	24	G 19	G	E S 14	35	20	27	20
23	24	36	19	38	25	19	32	37	36	35	40	36	G	37	38	G	G	G	22	20	38	42	36	27
24	30	17	E	15	E	G	G	30	39	37	38	G	50	62	43	37	36	33	20	E	21	25	E	22
25	E	20	E	24	21	19	G	34	40	51	37	42	39	38	38	34	78	26	37	E	19	21	E	E
26	E S 14	E S 14	E S 13	E S 14	E S 14	G	G	G	G	36	G	G	G	G	37	36	32	29	25	32	E S 14	E S 14	E	E
27	E S 14	E S 14	E S 14	E S 14	E S 14	G	27	30	34	G	38	42	38	G	43	44	33	28	G	E	E	18	21	18
28	E S 14	E	20	20	18	19	26	34	35	44	40	44	G	G	G	35	58	54	29	27	32	28	E S 14	30
29	19	E	E S 14	E S 14	15	19	28	32	38	38	44	63	47	A	39	37	35	36	25	31	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	E B 38	42	49	E R 69	65	35	26	42	18
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	29	29	29	29
MED	E S 14	E S 14	14	14	14	E S 14	24	30	35	37	37	37	37	36	30	31	29	26	22	18	21	18	14	E S 14
UQ	19	17	E S 14	17	18	18	26	33	39	38	40	42	41	38	38	35	35	28	27	27	29	24	21	18
LQ	E S 14	E S 14	E	E S 14	E S 14	E S 14	G	G	32	35	36	36	G	G	G	G	G	G	19	14	14	E S 14	E S 14	E S 14

APR. 1973 | FBES (0.1 MHZ)

IONOSPHERIC DATA

APR. 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 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	E S 13	E S 13	E	E S 14	E S 14	E S 14	15	15	15	18	19	18	19	19	17	18	17	14	14	E S 13	E S 14	E S 14	E S 14	E S 14
2	E S 14	E S 14	E S 14	E	E	E S 16	15	17	17	17	23	18	17	17	15	15	15	15	16	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	14	18	18	19	19	18	19	29	24	15	15	15	14	E S 14	E S 14	E S 14	E S 14	E S 14
4	E S 14	E S 14	E	E	E	E	15	16	16	19	18	20	20	20	20	19	18	15	F S 14	E S 14	E S 14	E S 14	20	E S 14
5	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	17	19	19	20	19	22	20	20	19	17	17	14	14	E S 13	E S 14	E S 14	E S 14	E S 14
6	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	18	15	16	17	18	18	21	16	16	15	14	15	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	E S 14	14	16	16	15	18	18	19	16	18	18	15	15	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 S 14	E S 14	E S 14	15	15	19	15	19	19	18	19	17	15	17	15	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 S 14	E S 15	15	15	17	20	20	24	18	19	19	15	15	16	E S 15	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	E	E S 14	16	17	18	17	27	27	23	24	18	17	16	16	F 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	15	16	17	15	16	19	18	18	16	15	15	14	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	E S 15	15	16	20	18	20	19	20	17	18	15	15	13	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	E S 14	15	15	15	15	18	16	16	19	17	15	14	15	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	E	E S 14	15	15	15	17	16	17	15	19	15	15	14	15	14	E S 14	E S 14	E S 13	E S 14	E S 14
15	E S 14	E S 14	E S 14	E	E	E S 14	14	17	15	17	18	15	18	18	15	15	15	15	15	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	E	E S 14	15	16	15	15	18	18	18	17	16	19	15	15	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	F S 14	E S 14	E S 14	15	15	18	21	18	19	18	18	20	18	15	15	19	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	E	E S 15	15	14	16	16	17	19	19	15	18	18	15	15	18	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	E	E S 14	15	15	15	18	19	19	17	17	13	15	14	15	14	E S 14	E S 14	E S 14	E S 14	E S 14
20	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	14	15	15	15	16	18	14	14	15	14	15	13	19	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	15	15	17	15	18	17	17	16	15	17	18	15	17	E S 13	E S 14	E S 14	E S 14	E S 14
22	E S 13	E	E S 14	E	E	E S 14	15	16	16	18	17	18	20	19	16	15	14	14	15	E S 14	E S 14	E S 14	E S 14	E S 14
23	E S 14	E S 14	E S 14	E	E	E S 14	15	19	17	19	18	18	18	14	15	17	15	14	14	E S 14	E S 13	E S 14	E S 14	E S 14
24	E S 14	E	E	E	E	14	15	15	18	18	20	19	19	22	17	18	17	15	14	E S 14	E S 14	E S 14	E S 14	E S 13
25	E S 14	E S 14	E S 14	E S 14	E S 14	14	18	18	18	18	18	23	22	19	19	18	16	14	13	E S 13	E S 14	E S 13	E S 14	E S 14
26	E S 14	E S 14	E S 13	E S 14	E S 14	15	15	16	18	18	23	22	20	19	21	18	21	16	16	E S 14	E S 14	E S 14	E S 14	E S 14
27	E S 14	E S 14	E S 14	E S 14	E S 14	15	15	15	18	18	18	20	19	19	18	18	16	15	14	E S 14	E S 14	E S 14	E S 14	E
28	E S 14	E S 14	E S 14	E S 14	E S 13	14	15	16	18	16	19	19	19	22	18	15	14	15	14	E S 14	E S 14	E S 14	E S 14	E S 14
29	E S 14	E S 14	E S 14	E S 14	E	E S 13	15	16	18	19	21	22	29	16	16	18	19	15	14	E	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	15	38	17	15	15	E S 14	E S 14	E S 14	E S 14	E S 14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	29	29	29	29
MED	E S 14	E S 14	E S 14	E S 14	E	E S 14	15	16	17	18	18	19	19	19	17	17	15	15	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	15	16	18	18	19	20	20	19	18	18	17	15	15	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	E	E S 14	15	15	16	16	18	18	18	17	15	15	15	14	14	E S 14	E S 14	E S 14	E S 14	E S 14

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APR. 1973 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

APR. 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 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	295	F	F	310	270	290	315	315	325	320	320	315	310	300	315	325	315	310	315	315	305	275	270	265
2	265	270	285	270	255	325	310	I R 270	280	330	320	305	315	320	310	320	330	320	295	I R 285	280	285	I R 290	F
3	290	270	280	285	260	280	275	280	275	295	310	I A 320	325	310	305	315	315	325	335	310	270	F	275	280
4	F	F 290	F 295	320	305	305	330	320	320	320	305	320	315	305	320	330	315	330	345	315	300	290	I A 290	280
5	285	295	305	320	300	305	340	330	330	315	330	320	305	305	305	310	320	325	320	320	320	290	285	280
6	290	285	290	300	290	295	335	320	320	315	315	305	305	310	300	305	310	315	325	320	320	280	275	280
7	280	290	320	310	295	300	335	325	330	310	315	300	305	305	300	310	320	340	330	295	295	280	270	290
8	285	285	295	320	295	295	330	335	325	315	310	315	300	290	305	310	310	325	315	I R 310	310	I A 290	270	I R 275
9	290	285	295	280	280	295	320	325	320	310	305	315	305	300	310	310	315	325	320	305	I R 295	285	290	280
10	280	280	300	300	290	305	330	320	310	305	320	300	300	300	305	310	315	335	330	305	295	280	295	275
11	280	275	295	310	310	295	345	320	305	310	305	310	310	295	300	295	310	305	305	310	315	280	265	265
12	275	290	280	285	280	310	330	H 310	315	330	315	300	320	310	310	315	325	325	320	325	310	280	280	280
13	285	290	285	295	275	285	310	325	340	330	315	310	320	330	310	320	320	310	310	300	270	245	250	270
14	245	I R 270	280	F 320	I A 280	I A 275	270	300	305	315	325	315	310	320	320	300	310	270	295	300	320	290	275	275
15	265	F 265	295	300	I A 305	305	320	320	310	315	325	315	300	320	310	320	330	325	315	I R 305	320	I A 290	285	F
16	F	F	F	F 310	295	310	330	330	310	310	310	320	285	290	305	315	335	315	295	280	300	265	280	275
17	280	270	270	275	305	300	285	290	310	340	290	285	295	305	305	310	315	310	320	310	290	295	I R 275	290
18	F	F	295	320	295	280	295	285	315	310	290	295	305	305	320	325	325	325	295	295	310	305	300	275
19	280	285	305	290	285	315	325	325	320	310	285	290	305	315	320	330	310	315	320	295	310	315	295	285
20	305	285	295	300	320	310	310	320	290	310	310	280	300	310	320	315	335	315	330	320	300	280	275	285
21	285	280	285	305	285	310	345	310	340	250	280	270	300	305	320	325	330	315	290	295	300	330	280	275
22	280	275	285	280	290	315	335	340	300	I A 295	295	310	295	295	320	300	320	315	305	290	300	285	280	275
23	290	285	275	290	285	300	Z 330	I R 305	I R 270	240	260	280	255	285	280	295	295	305	300	305	305	300	280	280
24	275	280	275	305	315	325	310	325	335	310	300	290	300	295	320	315	315	305	285	325	325	305	F	F
25	F	295	F 300	300	295	315	330	315	325	325	270	300	310	305	300	300	295	305	320	330	310	285	290	285
26	285	275	285	310	320	290	280	250	305	250	280	295	I R 275	285	310	325	325	310	320	300	275	285	280	280
27	275	280	285	325	300	310	320	255	G	280	275	280	280	300	305	310	300	290	295	300	300	285	270	280
28	280	285	290	310	315	310	335	310	315	295	310	310	295	290	305	295	315	315	315	310	295	300	275	265
29	265	280	290	290	275	285	320	320	300	285	310	285	300	I A 300	295	300	310	300	310	300	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	295	295	305	310	I R 310	310	305	280	285	280
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	27	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	29	28	28	26
MED	280	282	290	300	295	305	325	320	315	310	310	305	305	305	308	310	315	315	315	305	300	285	280	280
UQ	285	285	295	310	305	310	330	325	325	315	315	315	310	310	320	320	325	325	320	315	310	292	288	280
LQ	275	275	285	290	280	295	310	305	305	295	290	290	300	295	305	300	310	310	300	300	295	280	275	275

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

IONOSPHERIC DATA

APR. 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 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 365	L	L 375	L 360	350	L 340	L	L							
2								I A 325	L 320	L	L 370	L 350	U L 355	350	L 365	L	L							
3							L 310	360	355	395	390	I A 370	380	360	355	355	360	L						
4								L	A 365	365	375	365	375	370	A	A								
5								L	L	L 375	385	370	370	370	365	H 355	L							
6								L	H 340	L	365	365	L 360	360	L 360	L 335	L	L						
7								L	L	370	H 370	U L 355	370	360	360	350	L	L						
8									A	A	L 370	L	U L 350	340	I A 365	U L 340	L	L						
9								L	L	H 365	I A 370	375	I A 365	I A 355	L 370	380	L							
10									L	L	370	L	L	L 375	365	L	L							
11									L	350	365	370	370	355	H 350	H 340	L	L						
12								L	L	L	385	L 380	380	365	L 370	L 355	L							
13								H 385	L	L	395	L	365	I A 360	380	L	H 365	L						
14								340	350	350	360	375	350	350	355	L 335	L	U L 320						
15								L	A	A	375	385	I A 370	375	H 385	H 365	L	L						
16								L	L 355	380	385	370	370	355	350	L	L	L						
17								U L 350	L	375	350	H 360	350	340	H 370	360	U L 360	L						
18							U L 345	330	355	380	350	370	360	350	345	L 360	L	L						
19							L	L	L 350	370	350	355	360	365	345	L 365	290	L						
20								345	360	I A 360	375	370	355	365	355	L	L	L						
21								U L 340	I A 370	350	H 340	350	I A 370	375	385	390	L	L						
22								450	I A 360	I A 365	I A 370	370	365	365	365	370	360	L						
23									360	355	355	H 365	390	380	350	355	365	U L 335	L					
24								L	H 360	360	370	L	I A 380	I A 380	365	370	L	L	L					
25							L	L	365	I A 365	H 345	395	365	370	360	H 365	A	L						
26							335	350	330	395	370	375	370	355	H 370	355	L							
27								350	325	355	370	365	355	355	365	I A 360	340	L	L					
28								L	L 365	350	360	360	360	345	H 375	360	A	A						
29							L	L	340	350	355	I A 360	360	I A 360	365	L	L	L						
30							C	C	C	C	C	C	C	C	360	335	L	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	11	16	22	28	25	28	29	30	22	7	2						
MED							L 335	350	355	365	370	370	365	360	365	358	360	U L 328						
UQ							340	355	360	375	372	375	370	370	370	365	362							
LQ							322	340	340	355	355	360	360	355	355	350	350							

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

IONOSPHERIC DATA

APR. 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 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								250	255	275	255	260	280	300	270	260	255							
2								435	350	285	280	285	270	355	265	265	250							
3							350	390	440	360	340	I A 340	295	315	315	290	290	250						
4								250	260	280	295	265	270	265	285	265	270							
5								245	250	270	265	275	280	285	290	285	260							
6								235	275	265	270	285	285	285	290	285	265	260						
7								240	245	295	275	290	290	280	295	275	250	235						
8									260	270	275	265	290	320	280	280	260	250						
9								245	250	290	295	280	295	295	285	275	260							
10									250	280	270	290	290	295	285	275	260							
11									285	280	290	275	275	300	300	300	270	255						
12								250	235	255	280	280	275	290	280	280	255							
13								255	250	255	260	300	275	265	260	270	260	255						
14								325	295	275	280	285	295	295	280	310	255	320						
15								260	280	I A 285	255	255	300	290	280	275	250	245						
16								255	285	275	290	275	325	315	295	260	250	255						
17								300	250	250	350	330	320	290	280	280	285	255						
18							315	355	275	315	335	300	295	285	270	260	255	250						
19							250	250	280	290	330	310	295	280	270	260	280	260						
20								280	310	300	305	380	300	280	280	270	255	255						
21								305	I A 265	550	385	345	295	280	270	270	255	275						
22								250	360	I A 340	335	300	350	320	285	290	265	270						
23									670	570	465	395	480	380	370	365	325	300	300					
24								255	290	305	330	330	295	335	280	300	290	285	295					
25							250	260	285	280	405	320	300	320	300	300	I A 300	270						
26							400	500	345	540	445	365	375	395	305	295	280							
27								490	G	420	445	420	390	335	315	290	300	275	270					
28								250	265	325	290	295	340	340	320	305	285	270						
29							260	250	340	345	285	330	315	I A 315	320	285	280	280						
30							C	C	C	C	C	C	C	C	325	315	280	275	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							6	25	29	29	29	29	29	29	30	30	30	22	3					
MED							288	255	280	285	290	295	295	295	285	280	262	260	295					
UQ							350	305	310	325	335	330	315	320	300	295	280	275	298					
LQ							250	250	255	275	275	280	285	285	280	270	255	255	282					

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APR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

APR. 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 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	290	280	235	315	290	250	235	240	235	230	230	225	205	215	240	240	250	245	235	255	300	305	340
2	330	325	270	340	355	250	240	I A 240	A 250	I A 240	230	230	220	230	I A 230	235	I A 240	250	250	260	280	265	240	290
3	260	295	285	275	320	295	275	260	I A 240	225	205	I A 230	210	I A 215	I A 215	230	I A 245	I A 240	230	245	I A 285	340	320	290
4	315	295	290	245	290	270	230	230	I A 235	220	215	220	205	220	225	A	A	250	240	255	245	A 290	I A 290	295
5	325	290	260	250	245	245	235	H 225	H 220	220	220	205	205	205	215	H 190	250	245	240	235	215	245	265	295
6	290	285	270	255	250	265	220	205	H 205	230	205	205	200	205	230	230	240	250	230	215	215	285	300	290
7	290	275	255	240	250	270	235	230	230	215	H 220	I A 230	205	215	210	230	230	235	235	245	235	295	275	260
8	280	275	260	245	250	275	230	230	I A 235	I A 235	220	H 185	225	215	I A 230	240	255	240	250	250	275	I A 295	310	320
9	275	260	270	270	275	270	240	230	I A 225	H 200	I A 230	230	I A 250	I A 230	220	220	H 230	250	240	235	245	275	260	265
10	285	285	260	245	270	255	230	240	240	235	230	225	210	205	220	H 200	240	250	235	230	245	255	260	280
11	290	270	270	245	220	275	225	230	230	215	220	210	205	200	H 190	H 190	245	250	245	240	220	245	295	295
12	305	280	270	245	245	230	230	230	230	230	195	230	225	220	215	240	240	235	235	215	220	270	290	290
13	290	290	265	250	295	270	225	H 190	235	230	205	H 215	I A 230	I A 220	215	H 190	H 180	245	245	250	300	340	330	310
14	345	260	250	230	A	A	A	I A 250	240	230	235	205	210	225	235	255	245	255	245	230	220	250	290	300
15	340	340	265	245	I A 240	260	235	250	A	A	A 205	200	I A 205	200	H 200	H 180	235	235	245	245	250	I A 260	I A 275	330
16	I A 300	305	275	245	290	255	240	240	A 230	225	205	215	210	220	220	245	235	250	255	270	260	285	255	285
17	275	315	310	280	245	275	245	235	225	205	230	H 200	215	220	H 190	230	240	245	245	225	255	240	285	275
18	305	285	255	210	255	295	250	245	235	205	215	200	205	205	215	230	230	240	265	245	245	240	230	295
19	285	290	240	255	285	250	240	230	230	205	200	205	230	215	210	235	215	245	245	240	245	235	235	280
20	275	290	285	255	230	235	235	220	220	I A 225	220	200	200	220	225	230	230	240	235	230	250	275	285	280
21	280	295	295	245	270	240	235	240	I A 235	220	H 215	230	I A 230	215	220	210	225	H 220	265	255	245	290	250	280
22	290	295	265	285	280	260	240	I A 230	A	A	A	A	230	215	230	205	230	245	255	255	255	240	310	310
23	290	I A 305	320	I A 310	310	245	260	250	245	225	I A 220	H 210	205	215	255	225	200	225	265	250	280	I A 280	A	A
24	A	320	310	245	225	235	240	235	H 230	235	210	H 195	I A 220	A	A	225	255	260	265	235	225	240	275	325
25	290	280	260	280	290	250	240	235	I A 240	I A 235	H 205	205	240	225	245	H 215	I A 225	245	245	205	220	290	255	295
26	290	295	290	240	235	275	260	235	250	215	215	220	210	210	H 205	240	240	245	250	270	265	290	260	280
27	315	295	280	215	240	250	250	240	240	225	235	235	230	240	A	A	230	250	260	235	245	265	310	285
28	295	290	255	235	245	230	240	230	235	I A 220	240	I A 225	210	230	H 205	225	I A 220	I A 235	240	250	260	265	290	A 325
29	330	275	250	250	290	265	250	230	230	230	A	A	A	A	230	230	245	I A 245	250	260	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	230	250	A	A	A	280	245	255	I A 290	290
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	29	29	28	28	28	29	27	27	27	27	28	27	28	28	28	29	29	30	29	29	28	28
MED	290	290	270	245	262	260	240	235	235	225	220	215	210	215	220	230	238	245	245	245	245	270	285	290
UQ	310	295	285	255	290	272	248	240	240	230	230	230	228	220	230	238	242	250	250	255	260	290	298	305
LQ	285	280	260	245	245	248	232	230	230	218	205	205	205	208	212	212	230	240	240	235	235	250	260	280

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APR. 1973 | H'F (KM)

IONOSPHERIC DATA

APR. 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	105	110	110	S	S	S	150	145	135	125	125	130	130	125	G	G	G	105	115	110	110	110	S	S
2	S	S	150	E	E	S	130	125	125	125	125	115	115	115	110	110	110	110	115	110	110	110	S	S
3	S	S	S	S	S	S	145	130	130	125	G	110	G	110	110	120	115	115	100	120	115	115	110	110
4	105	100	100	100	100	105	150	150	125	125	120	120	G	G	G	110	110	105	100	100	100	100	120	115
5	110	110	110	105	S	S	G	G	G	130	125	G	G	115	110	110	110	105	105	100	110	S	S	S
6	S	S	S	S	S	S	G	G	G	G	130	125	G	G	G	G	G	G	140	100	110	S	100	S
7	S	110	115	100	105	S	G	150	140	130	130	110	110	110	G	G	155	140	140	115	115	S	S	S
8	S	105	100	S	S	S	150	140	130	125	120	130	G	115	110	100	150	140	115	115	115	115	115	110
9	100	S	105	110	S	S	150	135	130	140	130	G	125	120	130	G	G	130	S	120	110	110	S	S
10	S	S	110	105	105	S	150	G	G	130	130	130	G	G	G	115	110	110	110	110	120	120	120	S
11	S	S	S	S	S	S	G	125	G	130	125	115	115	110	110	G	G	105	105	S	100	S	S	S
12	S	S	S	S	E	S	170	G	G	120	115	130	130	G	G	140	130	130	100	100	100	S	S	S
13	S	S	S	S	105	S	125	G	160	145	100	135	130	130	G	G	G	155	135	S	S	S	S	S
14	S	S	130	125	115	120	120	130	130	125	115	115	115	G	115	150	G	G	100	100	155	130	115	100
15	S	100	S	120	115	110	145	125	120	115	115	115	105	G	G	G	G	100	130	115	115	115	110	100
16	100	100	105	100	100	100	145	145	130	130	140	125	110	125	100	115	120	G	135	125	125	115	110	S
17	S	S	S	S	S	S	G	G	140	125	120	130	G	G	G	150	135	130	B	S	S	S	125	S
18	S	S	S	E	E	S	140	130	115	115	110	110	110	110	110	G	G	G	B	S	115	S	S	S
19	S	105	110	105	105	100	140	130	125	120	115	G	130	G	G	G	G	G	140	100	S	S	S	S
20	S	S	S	S	S	140	140	140	130	120	135	125	120	125	125	120	125	125	B	S	S	105	S	S
21	S	S	S	S	S	S	150	135	120	125	125	130	125	125	G	G	G	G	165	135	115	115	S	S
22	105	105	105	105	105	S	140	125	125	115	110	110	110	100	130	100	100	100	G	S	115	110	110	105
23	100	125	115	120	115	155	130	130	125	125	115	120	G	150	135	G	G	G	120	115	115	115	110	110
24	105	150	E	115	110	G	G	145	130	115	110	G	115	120	125	120	120	120	115	115	110	105	110	110
25	145	125	105	105	100	110	G	125	115	115	115	115	160	120	115	110	105	105	100	100	100	100	100	100
26	S	S	S	S	S	G	G	G	G	140	G	G	G	G	120	105	155	130	125	115	S	S	100	105
27	S	S	S	S	S	G	140	150	140	G	145	135	140	G	135	125	120	110	G	110	120	115	115	110
28	S	110	110	105	105	110	155	130	130	120	120	120	G	G	G	140	120	120	120	115	110	110	S	110
29	105	105	S	S	100	105	150	140	125	125	120	115	115	115	110	135	135	125	125	120	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	B	130	120	115	115	115	110	110	110
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	14	15	14	14	10	21	22	23	27	27	24	19	18	17	18	19	23	24	24	24	19	16	13
MED	105	108	110	105	105	110	145	132	130	125	120	120	115	118	115	118	120	120	115	115	115	110	110	110
UQ	105	110	112	115	110	120	150	145	130	130	128	130	130	125	125	135	132	130	132	115	115	115	115	110
LQ	100	105	105	105	100	105	140	130	125	120	115	115	112	110	110	110	110	105	105	100	110	110	110	105

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APR. 1973 | H'ES (KM)

IONOSPHERIC DATA

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

APR. 1973 | TYPES OF ES

IONOSPHERIC DATA

APR. 1973 | FOF2 (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

Station KOKUBUNJI TOKYO Lat. 35 42.4 N. Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 49	50	46	50	39	41	57	J R 79	76	94	101	102	J R 106	110	116	110	99	96	96	J R 78	60	58	58	53
2	50	50	50	44	34	46	50	R 66	75	J R 73	68	94	95	71	120	J R 104	91	78	I R 79	J R 85	I R 83	I R 80	R	S
3	R	R 70	I R 68	59	48	48	45	49	54	65	J R 77	83	I A 60	70	I R 66	70	75	78	65	51	40	R	R	S
4	41	J R 40	40	J R 39	25	31	J R 52	66	75	J R 91	107	121	123	110	90	83	75	85	95	71	51	50	J R 53	50
5	R 46	J R 50	51	46	35	35	60	I R 72	83	96	101	107	115	I R 107	101	98	95	91	86	J R 77	57	50	49	49
6	48	49	46	45	40	41	J R 63	65	J R 76	97	97	98	J R 108	108	106	J R 103	J R 102	J R 102	101	J R 78	50	47	47	49
7	49	49	51	45	37	40	66	J R 75	78	J R 76	86	94	105	J R 104	96	J R 104	99	84	76	66	64	54	56	60
8	57	54	54	49	44	45	J R 69	79	77	90	84	95	101	101	107	104	95	92	89	84	66	64	S 64	64
9	60	56	55	50	49	54	74	92	84	81	98	110	115	111	110	110	J R 102	95	85	I R 73	61	61	60	61
10	58	I R 54	I R 56	51	45	45	I R 64	I R 70	80	93	J R 101	J R 101	109	118	118	123	118	110	90	J R 75	61	60	63	60
11	58	J R 55	J R 52	54	40	42	59	66	76	94	107	115	114	110	113	117	121	109	103	90	85	59	61	61
12	61	66	60	54	53	56	63	67	85	93	88	J R 103	110	R 104	93	98	100	90	84	I A 71	54	I S 50	54	55
13	51	51	52	46	44	44	61	85	88	81	81	82	100	96	91	85	82	87	90	81	70	69	67	J S 70
14	F	F	52	J F 46	29	28	49	S 74	86	91	94	77	99	100	93	83	92	75	91	88	70	I A 46	40	A
15	37	39	41	36	29	35	61	74	87	106	J R 104	88	90	89	99	92	81	75	80	79	66	46	49	S 50
16	49	49	I A 48	44	37	44	58	S 70	79	I R 77	81	J R 86	94	110	R 116	125	110	81	R 75	71	I R 66	61	66	I R 62
17	65	55	56	60	52	J R 52	58	R	80	J R 69	65	I R 84	98	J R 102	I R 92	86	J R 80	95	95	J R 76	R 65	61	I R 57	59
18	55	I R 58	61	46	35	I R 34	53	60	U R 79	74	86	106	109	110	102	96	79	67	68	82	81	52	54	49
19	49	49	50	39	38	43	69	75	65	74	I S 82	I S 98	110	S 100	98	86	74	75	81	J R 79	I R 78	59	49	S 50
20	46	44	42	42	42	44	56	66	69	78	J R 75	85	110	111	95	101	90	R 78	80	I R 61	51	I R 50	J R 52	52
21	50	46	43	46	38	46	J R 54	55	60	56	75	90	106	111	98	90	76	75	76	76	75	69	65	65
22	61	60	61	60	53	49	56	56	56	71	70	I S 78	76	85	97	89	85	73	76	73	70	60	55	J S 53
23	55	50	46	46	45	60	53	50	50	S	S	60	65	I R 60	I R 60	57	60	55	58	65	58	44	I R 43	R
24	40	38	40	F	I R 36	47	51	I R 64	61	70	71	J S 75	89	I S 83	85	80	S	A	77	96	J R 80	44	45	45
25	45	45	44	40	39	45	65	67	S 69	R	R	R	81	93	99	96	94	J R 105	J R 105	90	53	50	I R 49	49
26	47	49	I R 47	48	41	41	47	J R 52	R	S	56	65	64	67	J S 80	73	68	65	66	60	59	59	60	58
27	S	I S 56	55	55	34	41	54	53	J S 50	S 56	59	I S 60	U S 68	85	80	84	73	69	89	90	65	60	59	60
28	59	59	64	49	39	47	64	70	69	77	85	U R 87	S 79	85	89	91	93	95	92	80	69	60	60	60
29	57	J R 60	66	48	44	46	64	68	69	75	84	89	94	91	90	J R 104	95	97	J R 104	86	64	61	S 60	66
30	63	62	S 70	41	29	40	66	69	84	94	I S 84	88	88	89	90	93	96	96	99	89	70	66	64	60
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	30	29	30	30	30	29	29	27	28	29	30	30	30	30	29	29	30	30	30	29	28	26
MED	50	50	52	46	39	44	58	67	76	78	84	89	100	100	96	94	92	85	86	78	65	59	56	58
UQ	58	56	56	50	44	47	64	74	80	93	98	101	109	110	106	104	99	95	95	85	70	61	60	61
LQ	48	49	46	44	35	41	53	64	69	74	75	83	88	85	90	85	79	75	76	71	58	50	49	50

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APR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

APR. 1973 FOF1 (0.01 MHZ) 135 E Mean Time (G. M. T. + 9h)

Station KOKUBUNJI TOKYO Lat. 35 42.4 N. Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	L	L	L	L 500	L	A	L	L							
2								L 490	L	L	L	L	L	L 540	A	A								
3							L 290	L 370	L 420	L 450	L 470	L 410	A	L 480	L 480	L 440	L							
4									L	L	L 490	L	L 500	L 500	L 480	L	L							
5									L	L 480	500	L 490	L 500	490	L	L 450	L	L						
6									L	L	L 500	L	L 510	500	L 500	L	L	L						
7									L	L	L	L	L 500	L	L 490	L	L							
8										L 460	L	L 510	A	A	A	L	L	L						
9								L	L	L	L	L	L	L 490	L	L	L	L						
10								L	L	L	L	R 500	L	L	L	L								
11									L	U L 490	L 500	L 500	U L 500	L	L	L 490	L							
12									L	L	L	L 520	L	L 490	L	A	A		A					
13								L	L	L	L	A	L 500	L	L	L								
14								L	L	L	L	L	L	A	L	L	L	L						
15										A	L	L	L 500	L	L 470	L								
16									L	L	L 470	L 470	L 480	L 490	L 460	L	L							
17								L	L 390	L	L 430	B	L 480	B	L	L	L	L						
18									L	L	U L 490	L	470	470	L	L	L							
19								L	L	L	L	L	480	L 470	L 450	L	L	L						
20								L	L	L	A	L 450	B	A	A	A	L							
21									L		U L 480	L 490	500	L	L	L	L	L						
22								L	L	460	450	L 510	480	L 490	L	L	S	L						
23								L 400	A	S	S	L 450	460	A	L	L 430	L 400	L						
24								L	L	460	L	500	490	L	A	L	A	A						
25								L	L	A	A	L	R	A	L 470	L 450	L	L						
26							L 350	L 390	L 410	S 470	S	470	S	490	L 470	L 450	L							
27							L	410	S 430	S 450	L	L	S 490	H 490	L 490	470	L	L						
28								L	L	490	500	A	510	500	A	L	A	L	A					
29									L	A	L	A	L 500	L 500	500	L	A	L						
30								L	S	L 490	A	A	L 520	A	L	L	L	A	A					
31																								

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	5	4	10	11	13	20	15	11	7	1							
MED							L 320	L 400	L 415	465	L 490	L 490	L 500	L 490	L 480	L 450	L 400							
UQ								L 410	425	L 490	L 500	L 500	L 500	L 500	L 490	L 460								
LQ								L 390	L 400	460	L 470	L 470	480	L 490	L 470	L 445								

The Radio Research Laboratories, Japan

APR. 1973 FOF1 (0.01 MHZ)

IONOSPHERIC DATA

APR. 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 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							200	260	295	320	A	A	A	A	A	325	I A 285	I A 240	B					
2							I A 210	245	290	310	A	R	B	A	A	A	A	A	A					
3							B	R 250	300	B	A	B	A	A	B	A	A	A	A					
4							180	270	300	I A 325	A	R	A	R	A	A	A	A	A					
5							I A 215	I R 260	A	310	R	A	R	A	A	R	290	A	A					
6							160	R	R	335	R 350	I R 355	I R 360	365	I R 355	R 335	295	240	A					
7							205	270	310	330	I A 350	I A 350	A	A	A	330	295	260	B					
8							200	270	310	345	350	A	A	A	A	A	300	A	A					
9							A	280	305	345	B	R	B	B	350	A	A	235	A					
10							190	290	310	330	B	B	A	A	A	A	A	A	A					
11							205	280	310	330	I S 340	A	A	A	A	A	A	R	B					
12							230	I R 270	I R 310	320	B	A	A	A	350	I A 325	A	A	B					
13							225	I A 265	A	A	A	A	A	S	330	310	290	240	A					
14							220	260	290	I A 315	A	A	A	A	A	A	I S 270	220	B					
15							175	255	U S 285	I A 305	340	I B 340	345	350	I R 345	B	R	A	B					
16							A	270	300	I R 320	A	A	A	A	R	300	R	R	B					
17							R	I R 245	R	I R 320	340	I B 345	R	B	B	310	I R 275	A	A					
18							200	A	A	A	B	A	A	I B 345	I R 335	330	R	240	S					
19							215	I R 250	A	S	S	S	B	I B 330	I B 320	S	A	A	160					
20							210	255	290	I R 310	A	B	B	A	A	A	A	A	A					
21							I R 205	260	R	A	340	350	355	I B 345	I A 340	310	285	260	165					
22							210	270	300	I S 345	350	255	365	360	I S 345	I S 325	I R 290	I R 245	180					
23						B	210	285	300	B	A	R	R	A	I A 340	320	A	A	A					
24						B	240	I R 275	R	A	A	A	360	I S 360	I A 350	315	A	A	A					
25						B	I R 235	280	I A 315	B	A	A	A	A	A	A	A	A	R					
26						B	220	B	B	B	A	B	S	355	B	330	B	245	A					
27						B	245	I S 270	I S 320	I B 345	350	S	S	370	360	A	R	I A 260	A					
28						175	220	265	315	A	A	A	S	I S 365	B	330	I A 290	265	B					
29						B	240	I S 295	325	B	A	A	B	B	S	I A 345	I A 320	245	A					
30						B	B	B	S	S	A	A	B	375	I B 360	R	A	250	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	25	26	20	18	9	6	5	11	13	15	12	14	3					
MED						175	210	270	302	322	350	I 348	360	360	I 345	325	290	245	165					
UQ							220	275	310	335	350	I 350	360	365	I 350	330	295	260	172					
LQ							200	260	298	I 315	340	I B 340	355	I 348	I 340	312	I 285	240	162					

APR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

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

Station KOKUBUNJI TOKYO Lat. 35 42.4 N. Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	JX 39	JX 30	JX 29	24	20	ES 15	G	G	36	45	JX 49	JX 40	JX 40	JX 40	JX 84	JX 54	JX 30	JX 30	20	JX 33	JX 36	JX 24	JX 30	JX 26
2	ES 15	ES 15	17	EB 14	EB 13	EB 14	26	31	36	JX 46	JX 44	G	JX 45	JX 42	JX 61	JX 54	JX 35	JX 34	35	JX 62	JX 94	JX 90	JX 63	JX 25
3	JX 38	JX 41	JX 20	JX 20	21	ES 15	23	31	36	36	39	EB 32	JX 90	JX 38	EB 39	34	34	JX 35	JX 31	JX 31	ES 15	21	20	ES 15
4	ES 15	JX 25	M 20	M 23	JX 26	24	28	30	35	JX 54	41	G	39	G	JX 42	35	JX 41	JX 36	JX 30	JX 40	JX 51	JX 45	JX 20	M 30
5	JX 25	ES 15	JX 22	JX 41	M 22	EB 13	JX 25	G	35	36	G	39	G	45	JX 55	G	G	JX 35	25	JX 34	JX 24	ES 15	M 20	ES 15
6	ES 15	ES 15	ES 15	ES 15	EB 13	ES 15	G	G	G	37	G	G	G	G	G	G	G	G	JX 24	JX 20	M 21	EB 14	JX 26	19
7	M 20	EB 12	JX 18	M 20	M 21	M 20	25	30	32	46	41	37	JX 42	46	36	G 25	JG 24	36	JX 29	JX 40	21	JX 19	ES 15	JX 25
8	21	JX 19	19	20	EB 14	ES 15	G 17	34	37	JX 49	JX 60	41	JX 107	JX 100	JX 60	JX 37	JX 36	JX 39	JX 36	JX 26	JX 36	JX 36	JX 25	JX 28
9	JX 23	21	ES 15	M 20	JX 19	JX 22	JX 26	36	42	39	EB 40	G 33	EB 40	EB 40	G	42	JX 46	G	37	M 22	JX 25	JX 45	JX 41	M 21
10	18	M 20	EB 13	EB 13	ES 15	EB 13	29	G	G	G	EB 45	EB 42	JX 44	JX 48	JX 54	JX 46	JX 42	JX 40	JX 27	JX 24	JX 24	JX 25	M 23	ES 15
11	ES 15	ES 15	ES 15	ES 15	ES 15	ES 15	25	29	33	36	ES 40	38	40	40	JS 40	JX 35	JX 30	G 20	EB 16	JX 19	M 19	M 20	M 20	17
12	ES 15	EB 12	EB 14	EB 12	ES 15	EB 12	G	G	G	34	37	47	41	47	41	48	JX 51	JX 43	JX 74	JX 98	JX 54	JX 53	M 20	JX 19
13	M 24	EB 12	ES 15	ES 15	18	ES 15	G	30	JX 40	JX 38	40	JX 74	JX 82	ES 39	G 19	G	39	JX 40	34	20	M 20	ES 15	ES 15	M 20
14	ES 15	EB 12	17	22	22	M 21	G	30	34	JX 39	36	39	JX 50	JX 79	39	34	G	G	EB 17	18	ES 15	M 69	JX 38	JX 75
15	JX 23	JX 24	M 22	ES 15	JX 24	JX 22	22	36	JX 42	JX 48	42	EB 38	38	G	G	EB 30	G 17	JX 30	JX 29	JX 25	JX 21	JX 40	JX 38	JX 55
16	JX 29	JX 24	M 49	M 25	JX 24	21	JX 27	JX 40	JX 43	G	41	JX 41	45	42	G 28	JG 25	G	G 17	25	JX 21	M 22	ES 15	JX 21	M 21
17	ES 15	ES 15	ES 15	EB 13	ES 15	ES 15	G	G	G	G	38	EB 50	G	EB 55	EB 40	36	33	JX 37	JX 28	JX 21	ES 15	ES 15	ES 15	ES 15
18	M 22	21	21	21	ES 15	ES 15	27	JX 42	JX 43	JX 42	ES 35	JX 49	JX 40	EB 35	G 25	G	G	G	ES 15	ES 15	ES 15	EB 12	ES 15	ES 15
19	ES 15	JX 25	JX 22	21	24	M 20	24	G	34	ES 35	ES 38	ES 40	EB 39	EB 40	EB 36	ES 39	G 21	29	23	M 21	ES 15	M 18	ES 15	EB 14
20	M 20	M 20	M 20	ES 15	ES 15	JX 16	G	31	33	34	JX 51	EB 40	EB 50	50	JX 44	75	JX 40	JX 43	JX 35	JX 51	JX 25	JX 21	ES 15	ES 15
21	ES 15	ES 15	21	EB 13	JX 21	ES 15	G	29	33	41	38	41	47	46	45	40	G	32	27	JX 29	JX 35	JX 29	JX 21	19
22	M 19	M 21	24	JX 52	JX 23	19	29	32	34	37	G	41	39	45	ES 39	G	G	G	G	ES 15	EB 13	JX 24	JX 17	JX 29
23	JX 21	JX 40	JX 23	JX 19	EB 12	EB 14	JX 37	33	44	35	40	G	G	65	41	37	36	31	JX 31	JX 52	JX 25	JX 28	JX 24	JX 41
24	JX 39	JX 35	JX 24	ES 15	JX 22	19	29	32	34	37	JX 43	JX 49	G	ES 39	JX 52	JX 43	JX 64	JX 161	JX 30	JX 25	JX 26	JX 24	JX 24	M 20
25	JX 25	JX 30	JX 46	JX 36	JX 30	21	G	JX 38	JX 50	JX 50	JX 74	53	JX 64	56	46	35	JX 35	JX 31	G	JX 44	JX 25	JX 23	JX 25	M 23
26	18	ES 15	ES 15	23	ES 15	ES 15	G	EB 32	EB 33	38	42	EB 37	ES 52	44	37	G	EB 32	34	JX 28	JX 20	JX 20	JX 48	ES 15	EB 13
27	EB 14	19	M 21	EB 12	M 20	18	G	G	G	EB 36	41	ES 39	ES 44	G	G	JX 41	G	30	24	JX 23	JX 28	JX 23	JX 22	JX 25
28	JX 25	JX 26	JX 24	JX 27	JX 26	G	28	34	JX 41	JX 41	41	JX 54	ES 43	ES 44	JX 50	JX 49	JX 52	JX 33	JX 50	JX 26	21	22	ES 15	JX 22
29	JX 22	JX 17	JX 19	JX 19	JX 23	JX 26	27	35	35	JX 55	JX 51	JX 55	46	45	ES 39	47	JX 61	JX 42	JX 34	JX 40	JX 26	JX 40	JX 45	JX 30
30	JX 40	24	21	JX 19	24	JX 26	EB 36	EB 39	ES 54	ES 44	JX 60	JX 75	EB 40	JX 58	46	G	JX 42	JX 48	JX 60	JX 40	JX 52	JX 53	JX 84	JX 53
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	20	20	20	20	20	15	24	30	34	38	40	39	41	43	40	36	34	JX 34	JX 28	JX 26	JX 24	JX 24	JX 21	21
UQ	JX 25	JX 25	JX 22	23	JX 23	21	27	34	40	JX 45	JX 44	JX 48	JX 46	48	JX 46	43	JX 41	JX 39	JX 34	JX 40	JX 28	JX 40	JX 26	JX 28
LQ	ES 15	E 15	E 15	E 15	E 15	ES 15	G	G	33	36	37	EG 37	EG 39	FG 39	EG 36	EG 25	G	29	24	JX 21	20	19	ES 15	E 15

IONOSPHERIC DATA

APR. 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	34	15	E	E	E	E S 15	G	G	35	44	45	40	40	40	56	27	30	25	20	17	26	24	28	E
2	E S 15	E S 15	E	E B 14	E B 13	E B 14	25	30	36	44	40	G	45	42	60	51	34	31	30	30	51	57	27	16
3	25	40	E	19	E	E S 15	23	29	34	36	38	E B 32	A	30	E B 39	32	34	25	25	22	E S 15	E	E	E S 15
4	E S 15	25	E	E	E	E	25	30	34	41	39	G	38	G	38	34	29	27	23	30	33	25	20	25
5	E	E S 15	20	18	15	E B 13	22	G	34	32	G	36	G	41	39	G	G	28	22	25	23	E S 15	E	E S 15
6	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	G	G	37	G	G	G	G	G	G	G	G	17	E	E	E B 14	E	E
7	E	E B 12	16	E	E	E	23	30	32	44	41	37	40	45	36	G 25	G 22	30	25	41	E	E	E S 15	E
8	E	E	E	E	E B 14	E S 15	G 17	34	35	42	41	40	58	59	51	37	27	30	26	24	30	15	E	24
9	16	17	E S 15	E	E	16	25	35	36	39	E B 40	E R 33	E B 40	E B 40	G	42	33	G	25	E	E	20	23	E
10	E	E	E B 13	E B 13	E S 15	E B 13	26	G	G	G	E B 45	E B 42	41	43	39	40	40	33	25	23	20	17	E	E S 15
11	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	24	29	33	36	E S 40	38	39	40	38	34	30	E R 20	E B 16	16	E	E	E	E
12	E S 15	E B 12	E B 14	E B 12	E S 15	E B 12	G	G	G	E R 34	E S 37	45	41	40	39	47	48	40	74	A	40	19	E	E
13	E	E B 12	E S 15	E S 15	E	E S 15	G	30	40	36	40	50	39	E S 39	G 19	G	39	34	25	E	E	E S 15	E S 15	E
14	E S 15	E B 12	E	E	E	E	G	30	34	39	36	37	45	71	E S 39	34	G	G	E B 17	E	E S 15	A	E	A
15	20	17	E	E S 15	20	19	21	34	39	48	41	E B 38	37	G	G	E B 30	E R 17	28	26	17	E	31	31	40
16	21	E	A	22	16	19	27	40	42	G	39	37	42	39	E R 28	G 24	G	G 15	24	18	E	E S 15	20	19
17	E S 15	E S 15	E S 15	E B 13	E S 15	E S 15	G	G	G	G	38	E B 50	G	E B 55	E B 40	22	32	28	27	E	E S 15	E S 15	E S 15	E S 15
18	E	E	E	E	E S 15	E S 15	23	42	39	42	E B 35	44	40	E B 35	E R 25	G	G	G	E S 15	E S 15	E S 15	E B 12	E S 15	E S 15
19	E S 15	E	E	16	15	E	23	G	31	E S 35	E S 38	E S 40	E B 39	E B 40	E B 36	E S 39	E R 21	29	22	E	E S 15	E	E S 15	E B 14
20	E	E	E	E S 15	E S 15	E	G	30	32	34	40	E B 40	E B 50	49	42	73	35	42	28	39	24	15	E S 15	E S 15
21	E S 15	E S 15	18	E B 13	18	E S 15	G	28	32	E S 41	36	41	E S 47	E S 46	44	38	G	32	27	29	34	24	15	E
22	E	E	16	30	19	17	28	31	34	36	G	40	39	44	E S 39	G	G	G	G	E S 15	E B 13	24	16	29
23	18	40	19	E	E B 12	E B 14	32	33	44	E S 34	E R 40	G	G	E S 65	41	34	31	27	29	25	23	E	17	31
24	25	20	E	E S 15	22	17	28	23	33	37	42	48	G	E S 39	51	43	56	A	28	25	25	18	22	E
25	E	21	24	19	26	21	G	36	45	46	58	44	45	52	43	34	33	26	G	25	E	E	22	E
26	E	E S 15	E S 15	18	E S 15	E S 15	G	E B 32	F B 33	E S 38	E S 42	E B 37	E S 52	43	37	G	E B 32	34	24	17	17	29	E S 15	E B 13
27	E B 14	E	E	E B 12	E	18	G	G	G	E B 36	40	E S 39	E S 44	G	G	40	G	30	21	19	25	E	17	19
28	24	24	19	22	E	G	27	33	40	41	40	50	E S 43	E S 44	50	44	48	33	50	25	E	16	E S 15	19
29	22	E	E	E	19	20	27	34	35	54	40	55	40	44	E S 39	E S 47	57	37	32	34	20	35	38	25
30	28	21	E	E	15	24	E B 36	E B 39	E S 54	E S 44	56	56	E B 40	56	46	G	42	45	60	35	35	41	40	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	15	E E 14	E E 14	15	15	22	30	34	37	39	38	39	41	38	34	30	28	25	22	16	16	15	15
UQ	20	17	16	16	15	17	26	34	38	42	40	44	43	45	43	40	35	33	28	29	25	24	22	19
LQ	E	E	E	E	E	E E 13	G	G	32	34	E G 38	E G 37	E G 39	E G 39	E G 36	E G 22	G	25	21	15	E	E E 12	E	E

APR. 1973 | FBES (0.1 MHZ)

IONOSPHERIC DATA

APR. 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	12	14	E S 15	14	E S 15	14	15	14	25	22	25	25	25	25	22	15	14	14	12	E S 15	E S 15	E S 15	E S 15
2	E S 15	E S 15	13	14	13	14	14	15	18	25	25	25	33	25	25	25	16	14	13	E S 15	13	E S 15	E S 15	E S 15
3	E S 15	13	E S 15	12	E S 15	E S 15	15	15	15	33	24	32	25	24	39	15	15	15	12	E S 15	E S 15	16	E S 15	E S 15
4	E S 15	E S 15	E S 15	E S 15	12	E S 15	15	15	15	25	25	25	20	25	25	19	15	15	13	E S 15	E S 15	E S 15	E S 15	E S 15
5	E S 15	E S 15	12	12	12	13	15	15	15	15	25	25	25	25	15	15	15	15	13	13	13	E S 15	13	E S 15
6	E S 15	E S 15	E S 15	E S 15	13	E S 15	14	15	15	19	19	25	34	25	21	24	14	14	14	14	14	14	E S 15	E S 15
7	E S 15	12	14	12	14	E S 15	15	15	15	15	25	25	25	22	15	15	15	14	15	14	E S 15	E S 15	E S 15	E S 15
8	E S 15	13	14	14	14	E S 15	14	14	15	21	15	17	19	21	15	15	14	12	11	E S 15	E S 15	14	14	E S 15
9	14	14	E S 15	12	14	14	14	15	15	18	40	30	40	40	25	19	15	15	14	E S 15	13	E S 15	E S 15	E S 15
10	E S 15	E S 15	13	13	E S 15	13	15	15	15	25	45	42	25	25	25	20	15	15	14	12	E S 15	12	E S 15	E S 15
11	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	15	14	15	15	E S 40	25	35	32	29	25	15	14	16	11	E S 15	12	E S 15	E S 15
12	E S 15	12	14	12	E S 15	12	15	15	15	16	35	26	27	25	16	15	15	12	14	14	E S 15	E S 15	14	E S 15
13	12	12	E S 15	E S 15	12	E S 15	15	15	15	15	15	25	29	E S 39	14	14	15	15	15	12	E S 15	E S 15	E S 15	E S 15
14	E S 15	12	E S 15	E S 15	12	E S 15	11	14	15	15	15	E C 21	34	24	19	15	15	12	17	E S 15	E S 15	E S 15	E S 15	E S 15
15	14	14	12	E S 15	13	12	15	15	16	31	19	38	24	26	26	30	14	12	16	12	E S 15	14	14	E S 15
16	14	14	14	11	11	11	14	15	15	15	25	22	25	25	20	15	15	13	15	E S 15	E S 15	E S 15	12	E S 15
17	E S 15	E S 15	E S 15	13	E S 15	E S 15	15	15	15	23	24	50	25	55	40	21	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15
18	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	15	15	22	25	35	32	21	35	21	23	15	14	E S 15	E S 15	E S 15	12	E S 15	E S 15
19	E S 15	12	14	12	12	14	14	15	25	E S 35	E S 38	E S 40	39	40	36	E S 39	12	14	14	E S 15	E S 15	14	E S 15	14
20	E S 15	14	14	F S 15	E S 15	13	15	12	15	23	25	40	50	28	15	15	15	13	15	E S 15	E S 15	13	E S 15	E S 15
21	E S 15	E S 15	12	13	E S 15	E S 15	15	15	15	31	25	15	31	36	31	15	15	14	12	14	14	14	12	E S 15
22	12	14	14	12	E S 15	12	15	14	15	15	21	25	25	31	E S 39	15	15	15	14	E S 15	13	14	12	E S 15
23	14	12	11	12	12	14	14	26	25	30	25	25	26	25	35	24	14	15	12	E S 15	E S 15	E S 15	13	E S 15
24	12	E S 15	E S 15	E S 15	13	15	15	15	14	17	20	26	25	E S 39	35	20	25	14	15	12	12	14	12	14
25	E S 15	14	12	14	14	12	15	15	29	35	30	26	32	30	25	17	15	15	13	E S 15	E S 15	E S 15	E S 15	E S 15
26	E S 15	E S 15	E S 15	13	E S 15	E S 15	15	32	33	34	33	37	E S 52	19	33	19	32	15	15	12	12	E S 15	E S 15	13
27	14	E S 15	14	12	14	14	15	14	15	36	34	E S 39	E S 44	26	27	28	14	15	11	12	12	E S 15	13	14
28	14	E S 15	E S 15	14	14	15	14	14	25	25	26	25	E S 43	E S 44	34	15	25	15	14	12	E S 15	E S 15	E S 15	E S 15
29	12	12	E S 15	F S 15	E S 15	12	15	16	19	36	34	26	39	38	E S 39	E S 35	26	15	12	12	E S 15	14	E S 15	14
30	14	12	E S 15	12	12	12	36	39	E S 54	E S 44	36	29	40	30	37	31	25	15	14	E S 15	E S 15	14	E S 15	E S 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E S 15	13	13	13	13	13	15	15	15	24	25	26	26	26	25	18	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	F S 15	E S 15	E S 15	15	15	18	30	34	31	U 36	U 34	34	24	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15
LQ	13	12	14	12	12	13	14	15	15	16	22	25	25	25	20	15	15	14	13	12	13	14	13	E S 15

APR. 1973 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

APR. 1973 | M(3000)F2 (0.01) | 135 E Mean Time (G. M. T.+ 9h)

Station KOKUBUNJI TOKYO Lat. 35 42.4 N, Long. 139 29.3 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 285	285	275	330	255	295	310	J R 340	315	305	330	315	J R 300	310	310	315	315	320	325	J R 330	285	260	260	260
2	275	270	290	265	290	330	280	R 305	335	J R 320	325	300	315	265	320	J R 320	340	295	I R 300	J R 295	R	R	R	S
3	R	R 275	I R 280	290	265	280	285	310	300	310	J R 325	325	I A 320	325	I R 310	300	320	345	355	335	270	R	R	S
4	295	J R 295	305	J R 300	325	305	J R 345	340	320	J R 310	305	315	310	320	320	325	315	320	325	325	315	280	J R 285	300
5	R 285	J R 280	315	320	285	315	335	I R 325	325	315	310	310	305	I R 305	310	305	315	330	315	J R 325	300	280	290	280
6	290	290	305	315	280	295	J R 350	340	J R 315	320	320	300	J R 295	305	300	J R 305	J R 315	J R 325	335	J R 335	340	290	275	280
7	285	285	305	315	285	295	335	J R 335	330	J R 315	345	290	305	J R 310	310	J R 315	315	325	315	310	295	260	285	285
8	280	285	295	310	280	290	J R 320	340	315	325	300	295	305	295	305	310	315	320	300	320	315	265	S 275	280
9	300	285	295	280	285	280	320	345	325	305	295	310	305	305	310	315	J R 325	315	330	I R 315	315	265	275	295
10	295	I R 310	I R 300	320	315	290	I R 330	I R 335	315	325	J R 310	J R 300	305	305	295	310	305	330	320	J R 335	315	285	285	285
11	295	J R 295	J R 310	330	285	290	340	320	315	305	300	310	305	290	335	290	305	310	310	305	315	280	270	265
12	275	300	305	285	300	320	350	330	325	315	295	J R 305	320	R 310	310	320	325	340	330	I A 315	280	I S 280	265	275
13	285	285	295	305	260	275	315	330	330	320	330	300	315	320	330	320	330	320	320	310	255	255	255	J S 270
14	F	F	300	J F 305	310	255	275	S 310	320	330	320	300	315	310	325	310	295	275	320	230	320	I A 290	265	A
15	275	265	305	305	310	315	330	310	300	320	J R 325	310	310	305	320	325	330	320	315	325	335	280	280	S 280
16	290	285	I A 290	305	300	300	330	S 325	345	I R 330	310	J R 290	290	300	R 295	320	330	320	R 310	295	I R 290	280	275	I R 270
17	280	265	265	295	310	J R 290	335	R	300	J R 305	295	I R 285	310	J R 305	I R 320	315	J R 300	320	340	J R 330	R 290	295	I R 280	285
18	275	I R 300	315	290	290	I R 280	305	300	U R 305	300	285	300	315	320	315	325	330	330	295	320	320	325	290	265
19	290	305	330	285	285	300	335	340	320	310	I S 285	I S 285	310	S 320	325	320	325	315	320	J R 315	I R 320	355	285	S 300
20	300	295	285	305	320	325	355	320	320	310	J R 310	275	310	315	320	330	325	R 320	340	I R 320	315	I R 290	J R 270	290
21	285	285	285	305	290	330	J R 355	330	335	300	265	285	300	325	320	325	335	315	300	315	305	290	295	275
22	275	275	300	300	305	310	340	355	295	325	325	I S 310	305	285	320	315	325	325	330	295	315	290	275	J S 270
23	290	280	285	285	285	335	340	320	290	S	S	280	275	I R 290	I R 295	300	300	340	295	295	310	280	I R 280	R
24	280	270	280	F	I R 295	260	340	I R 335	325	330	310	J S 295	315	I S 300	305	310	S	A	285	330	J R 335	280	275	275
25	280	290	295	300	295	310	350	325	S 330	R	R	R	300	295	305	315	300	J R 315	J R 325	335	305	285	I R 290	270
26	280	290	I R 300	315	340	300	285	J R 310	R	S	270	280	310	295	J S 310	330	335	325	325	305	280	270	280	270
27	S	I S 275	290	325	295	310	335	265	J S 270	S 285	285	I S 290	U S 280	305	315	320	315	290	300	320	320	275	270	285
28	270	280	315	325	295	320	320	325	315	305	295	U R 300	S 305	305	305	310	300	325	325	300	305	295	280	270
29	260	J R 300	315	295	275	285	330	330	315	310	305	295	305	310	290	J R 310	305	300	J R 330	315	300	275	S 265	275
30	E 280	275	S 325	365	270	315	320	335	300	310	I S 280	285	285	280	295	300	310	315	315	315	295	285	280	300
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	30	29	30	30	30	29	29	27	28	29	30	30	30	30	29	29	30	30	29	28	28	26
MED	285	285	300	305	290	300	332	330	315	310	308	300	305	305	310	315	315	320	320	315	310	280	278	278
UQ	290	295	305	315	305	315	340	335	325	320	322	310	310	310	320	320	325	325	330	325	315	290	285	285
LQ	278	275	290	295	285	290	320	320	305	305	295	290	300	295	305	310	305	315	310	305	295	275	270	270

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

IONOSPHERIC DATA

APR. 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

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 360	L	A	L	L							
2								L 310	L	L	L	L	L	L 350	A	A								
3							L 345	L 330	L 355	L 380	L 400	L 410	A	L 370	L 360	L 390	L							
4									L	L	L 385	L	L 365	L 360	L 375	L	L							
5									L	L 370	360	L 390	L 380	360	L	L 360	L	L						
6									L	L	L 370	L	L 360	380	L 350	L	L	L						
7									L	L	L	L	L 350	L	L 360	L	L							
8										L 390	L	L 395	A	A	A	L	L	L						
9								L	L	L	L	L	L	L 350	L	L	L	L						
10								L	L	L	L	R 380	L	L	L	L								
11									L	U L 360	L 360	L 360	U L 370	L	L	L 370	L							
12									L	L	L	L 335	L	L 370	L	A	A		A					
13								L	L	L	L	A	L 340	L	L	L								
14								L	L	L	L	L	L	A	L	L	L	L						
15										A	L	L	L 360	L	L 360	L								
16									L	L	L 380	L 400	L 350	L 345	L 345	L	L							
17								L	L 370	L	L 400	B	L 310	B	L	L	L	L						
18									L	L	U L 340	L	360	360	L	L	L							
19								L	L	L	L	L	350	L 350	L 350	L	L	L						
20								L	L	L	A	L 355	B	A	A	A	L							
21									L		U L 355	L 335	A	L	L	L	L	L						
22								L	L	350	164	L 330	370	L 330	L	L	S	L						
23								L 350	A	S	S	L 380	370	A	L	L 350	L 350	L						
24								L	L	370	L	A	360	L	A	L	A	A						
25								L	L	A	A	L	R	A	L 360	L 360	L	L						
26							L 355	L 335	L 370	S	S	350	S	490	L 470	L 450	L							
27							L	340	S	S 360	L	L	S 325	H 350	L 350	350	L	L						
28								L	L	365	340	A	350	340	A	L	A	L	A					
29									L	A	L	A	L 350	L 350	340	L	A	A						
30								L	S	L 340	A	A	L 340	A	L	L	L	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	5	3	9	11	12	19	15	11	7	1							
MED							L 350	L 335	L 370	L 365	L 360	L 370	L 360	L 350	L 360	L 360	L 350							
UQ								L 340	L 370	L 370	L 382	L 392	L 362	365	L 360	L 380								
LQ								L 330	L 362	360	348	L 342	L 350	L 350	L 350	L 355								

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

IONOSPHERIC DATA

APR. 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								240	280	270	260	270	290	280	275	260	250							
2								345	255	270	285	290	250	385	290	255								
3							360	330	355	290	285	285	A	290	300	280	270							
4									260	285	290	285	265	270	265	270	250							
5									280	270	270	275	285	275	285	290	270	250						
6									285	270	270	275	290	290	290	275	260	255						
7									240	270	295	295	290	270	280	275	260							
8										260	260	310	280	300	290	270	270	250						
9								230	255	250	290	300	290	290	290	290	255	255						
10								240	285	255	280	295	290	300	290	290								
11									270	285	280	275	270	290	300	290	275							
12									255	255	275	300	270	270	280	280	260		A					
13								245	230	255	270	290	280	270	270	275								
14								295	260	260	270	305	280	290	275	275	260	290						
15										270	250	260	280	290	275	270								
16									250	260	270	290	305	300	300	270	250							
17								250	230	250	320	350	310	300	270	275	290	265						
18									300	295	320	290	270	280	260	260	240							
19								240	270	290	310	310	290	270	270	270	260	260						
20								260	275	290	290	340	300	250	290	275	250							
21									255		360	320	300	275	260	260	255	275						
22								245	340	290	290	310	300	310	275	280	260	260						
23								310	390	S	S	380	390	A	350	340	310	290	290					
24								250	270	280	300	345	290	310	290	280	S 300	A						
25								260	260	300	320	340	310	300	300	285	290	270						
26							345	330	R	S	S 440	355	320	360	300	270	255							
27							260	410	450	390	340	355	400	300	290	290	280	280						
28								250	270	315	320	310	310	310	300	280	280	260	250					
29									280	300	300	295	290	300	320	280	280	280						
30								270	310	290	290	320	320	320	310	300	275	260	260					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	18	27	27	29	30	29	29	30	30	26	15	3					
MED							345	255	270	270	290	300	290	290	290	275	260	260	260					
UQ							352	310	285	290	310	320	305	300	300	285	280	278	275					
LQ							302	245	255	260	270	290	280	275	275	270	255	258	255					

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APR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

APR. 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 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	A 310	295	290	210	310	270	240	230	220	A 250	I A 235	230	220	220	I A 220	220	240	250	240	210	260	320	350	340
2	325	310	300	310	260	245	260	A 250	250	255	250	245	245	240	A	A	250	245	260	290	A 300	A 330	300	255
3	305	A 330	290	260	300	290	250	A 250	240	240	200	200	I A 230	220	205	210	210	240	215	210	255	310	350	290
4	290	300	260	240	250	290	220	245	230	240	200	220	220	200	220	220	240	250	230	230	260	350	300	300
5	315	290	250	225	250	270	240	250	240	220	210	200	210	230	240	240	240	245	250	230	240	270	290	300
6	290	270	250	230	250	290	220	240	220	220	210	200	210	205	220	220	225	250	240	205	205	290	300	300
7	290	260	260	225	250	280	230	230	225	A 250	220	210	225	I A 220	210	200	230	240	230	260	230	300	290	270
8	270	275	260	240	250	260	240	230	230	240	210	205	I A 240	I A 225	I A 210	A 250	220	240	240	240	240	270	300	290
9	255	260	270	260	290	290	240	E A 240	230	205	210	250	240	210	210	270	250	240	200	230	220	300	300	270
10	270	250	270	220	250	270	240	220	200	240	250	230	230	250	200	255	265	250	240	240	240	275	275	270
11	270	275	250	220	250	275	220	220	230	220	210	220	205	210	200	245	240	245	240	220	225	205	305	305
12	300	270	255	240	250	220	220	230	220	H 200	245	220	255	220	245	A	A	230	I A 245	I A 260	310	290	300	275
13	290	290	260	240	300	290	240	230	230	225	205	I A 205	240	245	205 H	200 H	260	250 A	240	240	300	340	345	300
14	310	250	260	240	290	305	250	240	225	240	210	250 A	A	A	S	240	230	255	225	220	210	I A 280	350	I A 350
15	340	320	250	250	250	255	240	240	260 A	A	245	220	200	230	200	220	255	240	250	230	210	350 A	350 A	380 A
16	310	290	I A 290	250	290	255	240	260	I A 250	250	220	200	I A 225	250	260	240	240	250	250	255	290	245	300	300
17	290	340	305	270	250	265	240	240	210	230	200	I B 200	I A 250	I B 260	I B 250	245	250	255	240	210	250	240	300	290
18	320	290	240	240	240	285	250	320	I A 215	A 260	220	220	240	210	220	230	225	230	260	240	230	220	250	290
19	280	260	220	250	300	255	240	240	220	225	I S 235	I S 210	220	B 250	245	240	210	255	245	240	240	200	275	255
20	270	270	280	255	225	240	240	230	225	200	I A 240	280	B	I A 285	I A 270	I A 270	250	255	240	250	250	300	300	295
21	285	285	290	250	280	250	245	240	240	E S 290	210	A 250	I A 235	I S 240	I A 245	245	230	260	260	255	260	290	250	290
22	290	300	260	280	250	240	230	230	225	220	220	240	220	I A 220	E S 255	210	195	240	240	245	230	250	290	320
23	290	A 350	300	255	280	240	220	250	A	S	S	205	245	I A 275	240	250	240	250	250	250	250	260	260	300
24	340	350	300	250	260	250	240	240	210	205	A 250	I A 220	200	S 250	A	A	A	A	280	240	205	250	310	310
25	300	300	300	260	300	250	220	240	A	A	A	250	I A 230	I A 210	A 270	240	250	240	250	250	205	260	300	300
26	300	290	275	240	230	250	250	250	240	E S 290	I S 215	240	I S 200	255	245	220 H	245	250 A	245	250	250	330	275	295
27	310	300	255	205	240	260	230	240	I S 240	220	230	230	I S 215	H 205	220	240	220	240	260	240	240	270	310	300
28	310	300	250	220	250	245	240	225	240	225	245	I A 240	I S 215	E S 250	I A 220	A	A	I A 230	I A 225	240	220	220	300	310
29	350	275	245	245	310	270	240	240	225	I A 245	270	A	245	260	240	S	A	A	240	250	240	350	360	310
30	340	300	240	200	290	260	250	260	I S 240	I S 245	A	A	245	A	A	250	A	A	A	250	250	240	350	290
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	28	27	27	28	28	28	26	25	25	27	29	30	30	30	30	30
MED	300	290	260	240	250	260	240	240	230	232	220	220	228	229	220	240	240	245	240	240	240	278	300	300
UQ	310	300	290	255	290	280	240	250	240	245	242	240	240	250	245	245	250	250	250	250	255	310	310	305
LQ	290	270	250	225	250	250	230	230	220	220	210	205	215	215	210	220	225	240	240	230	225	250	290	290

APR. 1973 | H'F (KM)

IONOSPHERIC DATA

APR. 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 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	105	105	100	105	105	S	G	G	130	110	110	110	110	110	105	105	105	105	105	105	105	105	100	105
2	S	S	105	B	B	B	130	120	110	110	110	G	105	105	105	105	105	105	100	105	105	105	100	100
3	100	100	100	100	100	S	150	140	135	130	110	B	100	110	B	110	110	110	110	100	S	100	100	S
4	S	100	100	100	100	150	150	150	140	115	100	G	105	G	110	110	105	100	100	100	100	100	100	100
5	100	S	100	100	100	B	100	G	150	125	G	115	G	110	110	G	G	100	130	100	100	S	100	S
6	S	S	S	S	B	S	G	G	G	130	G	G	G	G	G	G	G	G	100	100	100	B	110	100
7	105	B	105	105	105	105	160	150	150	110	110	110	100	100	100	100	100	140	120	115	110	100	S	115
8	105	100	100	100	B	S	100	145	145	125	110	110	105	105	100	100	100	100	120	115	105	105	100	100
9	105	105	S	100	105	105	105	130	130	145	B	100	B	B	G	100	100	G	100	100	100	100	100	100
10	100	100	B	B	S	B	150	G	G	G	B	B	105	100	100	100	100	100	100	100	100	100	100	S
11	S	S	S	S	S	S	155	180	145	130	S	110	110	110	110	105	100	105	B	100	100	100	100	100
12	S	B	B	B	S	B	G	G	G	130	125	110	105	130	145	130	120	110	105	110	110	110	100	115
13	120	B	S	S	110	S	G	110	105	105	150	105	110	S	100	G	160	150	130	110	100	S	S	155
14	S	B	130	125	115	140	G	145	140	110	110	105	105	100	100	100	G	G	B	105	S	110	110	110
15	105	105	110	S	115	110	115	125	120	110	110	B	130	G	G	B	100	100	100	100	100	100	100	100
16	100	100	100	100	100	100	115	130	125	G	120	100	105	100	100	100	G	100	140	115	100	S	100	100
17	S	S	S	B	S	S	G	G	G	G	130	B	G	B	B	140	140	115	100	100	S	S	S	S
18	115	115	110	110	S	S	130	120	110	105	B	105	105	B	100	G	G	G	S	S	S	B	S	S
19	S	100	105	105	105	105	130	G	110	S	S	S	B	B	B	S	100	100	120	100	S	100	S	B
20	130	125	100	S	S	125	G	120	125	140	105	B	B	100	115	105	100	100	100	100	100	100	S	S
21	S	S	100	B	100	S	G	150	140	130	140	130	125	120	115	115	G	200	150	125	115	110	105	105
22	105	100	100	100	100	125	120	130	140	130	G	130	145	120	S	G	G	G	G	S	B	105	105	100
23	100	105	105	115	B	B	130	140	125	105	110	G	G	100	130	140	115	140	105	100	100	110	100	100
24	100	100	100	S	100	160	150	150	140	110	110	110	G	S	125	125	115	110	110	105	105	105	105	100
25	100	100	120	110	100	100	G	110	110	110	110	110	105	110	110	105	105	100	G	100	100	100	100	100
26	100	S	S	100	S	S	G	B	B	130	120	B	S	110	115	G	B	110	110	105	100	100	S	B
27	B	100	100	B	100	145	G	G	G	B	130	S	S	G	G	115	G	115	120	100	100	100	100	105
28	105	105	100	105	105	G	150	130	130	115	120	110	S	S	125	125	115	130	110	110	105	105	S	105
29	105	105	100	100	100	100	160	140	155	120	110	110	110	120	S	125	115	115	110	110	105	105	105	105
30	140	100	125	110	110	110	B	B	S	S	105	105	B	125	130	G	130	115	105	105	105	105	105	105
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	19	22	18	19	14	18	20	23	24	22	18	18	19	21	21	21	25	25	28	24	24	22	22
MED	105	100	100	102	100	110	130	135	130	118	110	110	105	110	110	105	105	110	110	102	100	102	100	100
UQ	105	105	105	110	105	140	150	148	140	130	120	110	110	115	115	125	115	115	120	110	105	105	105	105
LQ	100	100	100	100	100	105	115	122	122	110	110	105	105	100	100	100	100	100	100	100	100	100	100	100

The Radio Research Laboratories, Japan

APR. 1973 | H'ES (KM)

IONOSPHERIC DATA

APR. 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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F3	F2	F2	F1	F2				H2	C2	C2	C1	C1	C1	L2	L1	L1	L2	L2	F3	F4	F4	F2	F2
2			F1				H2	C1	C2	C2	C1		C1	C1	C2	C2	C2	C4	L3	F3	F3	F3	F3	F3
3	F2	F4	F2	F4	F1		H1	H1	H1	H1	C1		C2	C1		C1	C1	C2	CL13	F4		F1	F1	
4		F2	F1	F1	F1	FF11	H2	H1	H1	C1	L1		L1		C1	C1	C1	L1	L2	F3	F4	F3	F1	F1
5	F2		F4	F4	F1		L1		H1	H1		C1		C1	L2			L2	HL11	F3	F2		F1	
6										H1									L2	F1	F1		F2	F2
7	F1		F3	F1	F1	F1	H1	H1	H1	C2	C1	C1	L2	L2	L1	L1	L1	H2	H2	F3	F1	F1		F1
8	F1	F2	F1	F1			L1	H2	H1	H1	C1	C1	C2	C2	L1	L2	LH21	L2	HL12	F3	F2	F4	F2	F4
9	F2	F1		F2	F2	F4	L3	H2	H2	H1		L1				L1	L2		L1	F1	F3	F2	F3	F2
10	F1	F1					H1						L1	L2	L1	L2	L2	L2	L2	F2	F4	F2	F2	
11							H1	H1	H1	H1		C1	C1	C1	C1	L1	L1	L1		F2	F1	F1	F1	F1
12										H1	H1	C1	L2	HL12	HL12	HL21	HL31	CL32	CL44	FF32	FF33	FF22	F2	F1
13	F2				F1			C1	L2	L2	HL12	L2	L1		L1		H1	HL32	HL32	F1	F1			F1
14			F1	F1	F2	F1		H1	H1	C1	C1	L2	L2	L2	L2	L1				F1		F4	F5	F4
15	F4	F2	FF12		F5	F3	C2	H2	H2	C1	C1		H1				L1	L3	L4	F2	F1	F4	F5	F4
16	F3	F1	F2	F3	F2	F2	C2	H2	H1		H1	C1	C1	L1	L1	L1		L1	H1	HF11	F1		F1	F1
17											H1					H1	H1	C2	L2	F1				
18	F1	F1	F1	F1			H1	H2	C1	C2		L2	L1		L1									
19		F2	F2	F2	F2	F2	H1		C1								L1	L2	H2	F1		F1		
20	F1	F1	F1			F1		C2	H1	H1	C1			L1	C2	C2	L3	L3	L3	F3	F4	F2		
21			F1		F2			H1	H1	H1	H1	H1	H1	H1	C1	C2		H1	H1	F3	F5	F4	F3	F1
22	F1	F2	F2	F4	F4	F2	C1	H1	H1	H1		H1	H1	H1								F5	F3	F4
23	F3	F6	F4	F1			H5	H1	H2	C1	C1			L2	H1	H1	C1	H1	F4	F3	F3	F2	F1	F2
24	F2	F3	F2	F1	F3	H1	H1	H1	H1	C1	C2	C2			H1	H3	C1	C4	C3	F3	F6	F3	F3	F1
25	F2	F3	FF13	F2	F3	F3		C2	C2	C1	C1	C1	C1	C1	C1	C1	C2	L1		F3	F2	F2	F3	F1
26	F1			F1						H1	H1			C1	C1			C2	C2	F4	F2	F3		
27		F1	F1		F1	H1					H1					C1		C1	HL22	F3	F6	F6	F3	F3
28	F3	F3	F2	F3	F2		H1	H1	H1	C1	C1	C1			H1	H1	C2	H1	C2	F3	F1	F2		F2
29	F3	F2	F2	F2	F3	F3	HL11	H1	H1	H2	C1	C1	C1	H1		H1	C2	C2	C3	F3	F2	F3	F4	F4
30	FF22	F3	F1	F1	F4	F3					L2	L2		H2	H1		H1	C3	C3	F4	F4	F4	F3	F3
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

APR. 1973 | TYPES OF ES

IONOSPHERIC DATA

APR. 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	F 350	350	350	270	390	325	280	J R 250	300	310	290	300	J R 320	310	310	300	300	300	295	J R 260	345	400	400	410
2	390	395	360	390	360	290	340	R 350	260	J R 290	290	340	300	410	300	J R 300	280	300	I R 340	J R 350	R	R	R	S
3	R	R 400	I R 275	350	380	360	390	330	350	300	J R 300	300	I A 300	300	I R 310	310	300	275	255	290	360	R	R	S
4	360	J R 360	305	J R 300	280	310	J R 260	280	300	J R 300	315	310	310	300	300	300	300	300	290	290	310	390	J R 350	350
5	R 280	J R 360	310	280	350	310	290	I R 300	300	300	305	300	310	I R 300	310	310	300	300	300	J R 300	300	360	360	360
6	360	360	310	300	310	340	J R 260	280	J R 300	300	300	315	J R 310	305	315	J R 310	J R 300	J R 290	260	J R 250	250	350	370	360
7	350	340	300	270	340	340	260	J R 250	260	J R 290	310	320	310	J R 305	305	J R 300	300	290	290	300	340	395	360	350
8	350	350	320	300	340	340	J R 290	250	290	290	310	340	310	320	305	300	305	300	290	290	290	390	S 370	360
9	315	350	320	360	360	350	290	250	290	305	360	330	330	315	320	310	J R 300	300	290	I R 300	300	360	360	310
10	360	I R 335	I R 315	300	320	350	I R 280	I R 280	300	300	J R 330	J R 350	330	340	350	310	310	300	300	J R 300	310	360	360	360
11	360	J R 360	J R 310	280	350	340	250	280	300	310	310	310	305	330	330	340	310	305	300	310	300	320	380	390
12	375	320	310	340	310	290	250	260	300	300	320	J R 320	300	R 300	310	300	290	260	A	I A 290	350	I S 360	390	360
13	355	350	320	305	390	380	300	270	260	290	280	310	300	300	290	290	290	290	290	300	410	445	430	J S 390
14	F	F	310	J F 300	300	390	350	S 300	300	290	290	320	300	300	290	300	290	350	290	290	290	I A 350	400	A
15	400	390	305	300	290	290	290	300	310	300	J R 280	300	300	310	300	290	290	290	300	290	260	380	360	S 390
16	350	350	I A 345	300	340	300	270	S 280	250	I R 280	300	J R 350	350	350	R 350	300	290	300	R 310	315	I R 340	350	360	I R 380
17	340	400	390	350	300	J R 350	290	R	290	J R 310	360	I R 355	360	J R 310	I R 300	300	J R 250	300	290	J R 300	R 360	300	I R 360	360
18	400	I R 350	300	300	300	I R 330	300	310	U R 310	310	350	310	300	300	290	290	260	290	340	290	290	280	340	370
19	350	320	260	340	350	300	260	255	300	305	I S 340	I S 350	310	S 300	280	290	290	300	290	J R 300	I R 295	250	355	S 340
20	310	330	340	305	290	270	250	300	300	310	J R 300	390	305	300	300	290	300	R 300	280	I R 300	300	I R 350	J R 380	360
21	360	360	360	360	360	290	J R 255	280	290	350	400	360	330	300	290	290	270	300	310	300	310	355	340	370
22	360	380	330	340	310	300	250	250	345	300	300	I S 300	310	350	300	300	290	280	290	320	305	320	360	J S 370
23	390	350	350	340	350	270	250	G	A	S	S	295	400	I R 360	I R 360	360	320	300	310	300	300	360	I R 380	R
24	360	400	390	F	I R 300	300	280	I R 285	300	290	310	J S 320	305	I S 315	305	300	S	A	330	280	J R 275	350	360	370
25	350	350	340	310	320	290	250	280	S 290	R	R	R	330	320	320	310	320	J R 300	J R 300	280	300	360	I R 350	370
26	360	370	I R 350	300	270	300	355	J R 350	R	S	S	360	320	360	J S 310	270	260	290	290	305	350	400	360	370
27	S	I S 370	330	280	305	300	270	420	G	G	350	I S 345	U S 380	310	300	300	300	330	310	290	290	370	390	350
28	380	360	300	280	320	290	290	290	300	315	320	U R 350	S 315	320	310	300	310	290	290	300	300	310	350	390
29	405	J R 320	290	305	360	350	280	280	300	310	320	340	310	320	350	J R 305	310	310	J R 290	290	320	380	S 405	370
30	∠ 380	350	S 290	∠40	360	300	280	280	330	310	I S 370	360	360	350	350	320	310	300	300	300	320	360	380	350
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	30	29	30	30	30	28	27	26	27	29	30	30	30	30	29	29	29	30	29	28	28	26
MED	360	350	318	300	330	305	280	280	300	300	310	320	310	310	308	300	300	300	290	300	300	360	360	365
UQ	378	370	345	340	360	340	290	300	300	310	335	350	330	330	320	310	305	300	300	300	340	380	380	370
LQ	350	350	305	300	300	290	260	265	290	290	300	310	305	300	300	300	290	290	290	290	295	350	360	360

APR. 1973 | HPF2 (KM)

IONOSPHERIC DATA

APR. 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	F 90	90	95	75	110	80	80	J R 50	60	80	50	75	J R 80	90	80	75	70	50	50	J R 60	100	95	100	100
2	80	100	80	80	135	60	120	R 50	60	J R 100	100	120	90	100	90	J R 90	110	90	I R 90	J R 110	R	R	R	S
3	R	R 90	I R 100	90	100	100	100	120	110	90	J R 90	90	I A 90	90	I R 90	90	90	95	105	100	100	R	R	S
4	100	J R 100	95	J R 90	110	90	J R 100	100	90	J R 100	105	90	90	90	90	90	90	90	90	100	90	100	J R 110	110
5	R 110	J R 100	90	100	100	90	100	I R 90	900	90	95	90	95	I R 90	90	110	90	90	90	J R 90	90	100	100	100
6	100	100	90	90	110	100	J R 100	80	J R 90	60	60	90	J R 90	90	85	J R 95	J R 60	J R 60	50	J R 60	50	80	100	90
7	90	70	70	50	110	70	60	J R 55	65	J R 60	90	120	90	J R 85	75	J R 50	60	60	60	70	100	100	80	110
8	95	100	80	90	100	80	J R 60	50	70	60	140	60	90	90	75	75	90	60	60	60	70	100	S 80	90
9	85	90	85	100	90	100	60	50	70	105	100	80	110	95	95	100	J R 90	90	100	I R 90	90	100	100	120
10	80	I R 95	I R 85	90	100	90	I R 95	I R 100	90	90	J R 90	J R 90	85	90	100	100	90	90	90	J R 90	100	100	100	100
11	100	J R 100	J R 90	70	100	100	60	70	60	85	90	70	100	90	115	80	80	90	60	90	70	130	90	100
12	70	80	80	100	90	70	50	60	50	70	120	J R 80	80	R 100	60	60	60	50	A	I A 80	100	I S 90	100	100
13	85	70	80	95	110	70	70	80	60	55	40	80	70	50	60	60	60	70	70	70	100	100	75	J S 100
14	F	F	70	J R 65	80	110	120	S 60	60	50	70	80	90	75	60	80	70	120	70	70	70	I A 85	100	A
15	100	110	85	100	110	70	55	75	90	50	J R 60	100	100	90	50	60	55	60	70	60	60	70	90	S 100
16	90	100	I A 100	100	110	80	50	S 60	50	I R 65	90	J R 100	100	100	R 90	90	100	90	R 90	95	I R 95	110	100	I R 100
17	100	90	100	100	90	J R 90	100	R	90	J R 100	100	I R 100	100	J R 90	I R 90	90	J R 100	90	100	J R 90	R 100	90	I R 100	100
18	90	I R 95	90	90	90	I R 95	90	90	U R 90	90	95	90	70	70	70	50	60	60	100	70	55	70	100	90
19	90	70	50	100	95	90	50	45	70	75	I S 95	I S 80	90	S 60	70	60	60	60	60	J R 70	I R 75	50	85	S 60
20	85	70	100	75	70	55	50	60	50	100	J R 90	100	105	90	110	100	90	R 80	100	I R 90	100	I R 90	J R 100	100
21	100	100	100	100	100	100	J R 105	100	100	95	150	110	80	70	70	60	55	95	90	70	90	95	100	80
22	90	80	70	105	90	100	70	50	75	60	60	I S 80	90	95	55	60	70	45	60	90	90	90	85	J S 80
23	90	95	70	100	100	55	50	G	A	S	S	85	90	I R 100	I R 100	100	100	90	90	90	90	100	I R 95	R
24	100	90	90	F	I R 90	90	110	I R 95	90	60	80	J S 90	65	I S 85	90	95	S	A	95	45	J R 75	90	90	85
25	65	90	70	90	80	70	50	35	S 60	R	R	R	110	100	100	80	100	J R 100	J R 90	100	90	100	I R 100	90
26	100	100	I R 90	90	90	90	95	J R 100	R	S	S	90	55	90	J S 85	80	90	60	60	90	95	100	90	90
27	S	I S 90	70	70	105	70	50	80	G	G	95	I S 85	U S 70	90	60	75	60	80	90	60	70	100	80	90
28	90	90	60	80	100	60	70	60	70	80	90	U R 80	S 85	80	90	80	85	60	60	60	70	100	90	80
29	95	J R 90	70	95	90	95	70	70	95	60	80	105	85	70	95	J R 75	80	85	J R 70	80	90	90	S 105	80
30	Z 70	100	S 60	55	110	90	90	80	80	80	I S 80	90	100	90	90	90	85	70	80	70	90	80	70	60
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	30	29	30	30	30	28	27	26	27	29	30	30	30	30	29	29	29	30	29	28	28	26
MED	90	90	85	90	100	90	70	70	70	80	90	90	90	90	90	80	85	80	90	80	90	98	100	95
UQ	100	100	90	100	110	95	100	90	90	90	98	100	100	90	90	90	90	90	90	90	100	100	100	100
LQ	85	90	70	80	90	70	55	52	60	60	80	80	80	85	70	60	60	60	60	70	70	90	88	85

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APR. 1973 | YPF2 (KM)

IONOSPHERIC DATA

APR. 1973 | FOF2 (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	U S 47	45	S 50	F	F	F	S 43	69	79	83	89	103	S 119	133	129	123	117	S 110	S 108	89	58	55	61	S 57
2	56	I A 55	54	S 57	52	28	34	74	93	81	H 81	90	J S 112	77	129	S 113	91	S 79	U S 88	J S 102	U S 93	S 79	S 77	S 78
3	F 65	61	S 58	S 58	F 54	F	S 54	56	H 69	84	J S 109	112	106	J S 99	109	100	93	S 100	S 91	S 71	S 48	48	S 54	S 53
4	56	54	49	J S 38	22	26	35	64	83	93	104	J S 123	138	135	125	108	107	104	S 109	89	62	54	S 55	61
5	57	55	61	51	33	34	43	71	89	84	92	U S 109	U S 120	H 138	147	145	126	J S 114	S 110	93	60	S 52	S 50	I S 48
6	J S 52	56	53	F	S 35	34	S 46	67	74	S 101	85	91	104	114	118	J S 120	S 121	117	I S 118	S 96	S 64	J S 52	50	S 51
7	51	50	50	49	42	S 40	46	74	88	79	83	92	116	121	S 119	S 120	S 104	J S 102	S 104	93	S 75	60	58	61
8	57	56	S 55	57	43	41	52	69	88	85	78	91	108	124	124	116	S 119	U S 118	S 108	S 96	81	68	60	S 63
9	62	56	53	49	49	S 48	58	73	H 78	86	91	104	126	133	126	J S 123	I S 119	J S 110	J S 110	S 109	S 82	57	55	56
10	54	F 55	S 56	54	43	S 35	48	S 69	S 72	83	94	99	I R 105	J S 121	128	136	143	144	133	U S 105	82	70	70	U S 71
11	67	S 60	57	56	36	33	S 46	67	75	S 85	97	112	S 107	S 101	130	133	138	132	U S 118	J S 112	U S 97	68	S 61	63
12	64	S 73	71	56	48	43	S 49	67	81	82	86	106	127	J S 114	99	J S 98	98	97	89	78	S 60	56	55	57
13	55	54	J S 55	53	44	44	47	80	87	82	81	86	100	S 113	S 101	S 101	89	88	I S 103	S 98	I S 76	73	S	S
14	S	S	F 60	H 52	S 36	A	S 36	79	88	92	97	103	119	117	S 108	89	102	85	U S 107	S 102	78	49	38	40
15	37	I A 38	F	38	S 28	F 22	S 46	76	90	95	95	89	94	100	99	104	104	S 100	S 102	S 99	67	48	I S 47	S 50
16	48	I S 48	48	F 49	41	F 37	S 54	68	66	73	76	86	U S 100	J S 119	134	145	J S 141	S 111	J S 100	J S 98	91	J S 65	64	J S 67
17	64	56	55	S 58	56	43	57	S 71	71	65	71	84	U S 111	J S 111	U S 108	S 95	89	S 96	U S 102	U S 85	63	55	48	S 49
18	47	U S 48	46	38	I A 25	25	41	69	80	76	I S 88	J S 112	125	U S 111	112	U S 110	112	102	90	U S 107	S 106	55	S 47	I S 48
19	48	48	53	34	32	30	50	69	65	81	90	100	121	126	104	J S 105	99	92	92	93	J S 74	S 49	42	44
20	43	41	42	43	30	24	46	71	80	68	80	91	S 114	131	J S 112	115	J S 122	S 101	88	80	57	46	I S 45	I S 47
21	47	47	S 43	39	S 36	33	45	52	56	61	77	95	S 107	J S 110	S 109	104	S 103	S 91	79	J S 83	S 83	68	63	S 62
22	S 63	62	67	J S 82	50	42	54	55	S 59	80	86	87	100	S 102	S 124	J S 120	S 104	95	88	S 79	72	S 60	S 54	56
23	S 56	56	50	51	S 52	50	53	58	61	73	81	93	97	95	101	S 101	86	76	65	68	70	50	S 48	S 50
24	I S 47	S 47	S 44	S 42	F 41	35	S 53	58	62	67	68	91	97	106	S 116	112	101	101	S 99	S 107	S 88	58	57	F 56
25	S 63	J S 64	S 60	S 54	43	S 39	55	67	61	68	78	90	S 106	J S 120	127	125	128	128	S 125	S 109	S 94	J S 74	59	57
26	57	57	61	51	45	32	49	J S 65	63	60	64	85	101	92	91	95	87	81	73	S 74	63	59	59	59
27	59	57	56	56	32	25	49	63	72	H 87	71	V 63	83	103	106	94	83	82	U S 109	108	76	63	63	63
28	S 63	64	71	53	39	38	56	67	71	73	85	94	107	104	107	S 110	S 110	S 109	S 103	S 100	S 88	65	I S 68	69
29	60	69	S 73	61	50	52	59	71	77	77	85	91	97	101	J S 107	123	127	128	122	86	59	61	61	67
30	S 65	S 64	F 63	57	H 28	33	54	75	79	89	85	97	107	110	112	K 108	114	S 113	S 103	92	S 83	S 72	S 75	S 71
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	28	29	27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29
MED	56	56	55	52	41	35	49	69	76	82	85	92	107	112	112	111	106	102	S 103	S 94	76	58	57	S 57
UQ	63	60	60	56	48	42	54	71	83	85	91	103	119	121	126	123	121	S 113	S 109	S 102	S 83	68	61	63
LQ	48	48	50	46	33	31	46	65	66	73	78	90	100	102	107	101	98	92	90	85	63	52	S 50	S 50

APR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

APR. 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 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	A	L 490	L	L	L						
2											L	L	L	L	L	L	L	L						
3								L	L	L	L	L	L	L	L	L	L	L						
4									L	L	L	L	L 510	L 490	L	L	L	L						
5									L	L	L	U L 500	L 500	U L 510	L 500	L 500	L	L	L					
6									L	L	L	L	L	U L 500	L	L	L	L	L					
7									L	L	L	L	L	490	L 500	A	L	L						
8									L	L	L	A	A	500	L	L 490	L	L						
9									L	L	L 490	L	L 520	L 510	L 500	L 500	L	L						
10									L 360	L	A	L	L	U L 530	U L 500	L	L	L	L					
11									L	L	L 500	L 490	L	L	L 510	L	L	L						
12									L	U L 440	L	L 520	L	L	L 490	L	L	L						
13								260	L	L	L	L	460	L	L	L	L	L						
14									L	L	L 430	L	L 490	L	L 460	L 450	U L 470	L						
15								L	L	L	L 480	L	L 480	L 480	L 470	L 470	L	L	L					
16									L	U L 430	U L 480	H 500	L	L	A	L	L	L						
17								L	L	U L 450	L 440	L	H 480	L 470	L 480	H 450	L	U L 370	L					
18								L	L	U L 440	I A 480	L 460	U L 460	I A 460	L 480	U L 460	U L 410	L	L					
19								L	L	L	L 480	470	470	L 480	L 440	L 420	L	L	L					
20								L	L	L	L	L	A	460	460	A	L	L						
21									L	L 450	H 470	H 470	L 480	L 470	H 470	L	L 440	L	L					
22									L	L 470	L 470	L 470	490	H 490	L 470	L	L	L						
23									A	L 480	I A 480	I A 480	480	520	H 480	H 460	U L 430	L 390	L					
24								L	L 460	A	L 470	L 490	L 500	A	A	L 460	L 460	L	A					
25								L	A	L	A	A	A	A	A	L 480	L 450	L	L					
26								L	L	L	L	L 500	L 500	L 490	L 490	L 470	L	L						
27								L	L	L 470	L 460	L	L 510	480	L 500	L 440	L	L	L					
28									L	L	L 500	L 510	L 500	I A 510	L 500	L	L	L	A					
29									L	L	L 460	A	A	A	A	L	A	L	L					
30									L	L	530	L	L 540	L 540	L 490	L	L	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	2	8	16	12	17	19	20	13	6	2						
MED								260	L 410	L 450	L 480	L 490	L 490	L 490	L 490	L 460	L 445	L 380						
UQ										L 470	L 485	L 500	L 500	L 510	L 500	L 480	L 460							
LQ										U L 440	L 465	470	480	480	L 470	L 450	U L 430							

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APR. 1973 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

APR. 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							S	180	260	310	330	350	A	A	A	A	A	A	A					
2							140	170	260	300	320	335	340	A	A	A	290	250	160					
3							A	A	I A 280	I A 305	335	335	340	A	A	330	300	270	160					
4							S	235	H 275	310	325	340	350	345	330	I A 315	300	270	170					
5							B	210	290	315	330	340	R 345	R 350	345	335	I A 320	I A 255	205					
6							S	210	H 280	320	H 335	350	R 350	360	350	330	300	265	170					
7							A	240	I A 285	I A 315	345	340	I A 360	370	370	340	315	280	190					
8							S	210	H 290	H 320	330	A	A	A	A	I A 325	310	270	210					
9							S	240	280	300	I A 330	340	350	350	H 350	320	310	H 270	160					
10							A	I A 225	285	320	350	375	350	A	A	A	A	A	A					
11							S	255	A	A	350	365	A	A	A	A	A	A	190					
12							S	230	280	310	330	350	350	360	345	320	300	270	190					
13							S	230	280	305	330	340	350	360	350	330	300	270	180					
14							S	240	275	310	I A 330	I A 345	I A 355	I R 345	340	320	280	250	180					
15							S	230	280	A	A	A	A	A	330	320	300	260	190					
16							S	220	A	A	A	R	R	A	A	A	I A 300	H 260	190					
17							S	190	265	H 300	R 320	R 335	I R 340	R 345	340	315	290	250	195					
18							S	235	280	A	A	A	A	A	A	315	290	255	A					
19							160	245	265	295	310	330	335	330	320	310	290	240	180					
20							S	215	260	305	320	320	335	325	A	A	305	255	A					
21							S	230	280	300	325	335	340	345	340	330	300	260	160					
22							S	230	H 290	310	330	345	355	350	350	H 340	310	270	190					
23							S	210	290	315	A	A	R 350	360	350	340	315	280	200					
24							B	A	280	I A 310	I A 335	I A 355	370	365	350	330	305	280	190					
25							S	240	290	320	345	350	350	A	A	R 340	300	H 270	200					
26							140	250	290	I A 320	I A 345	360	A	R	R 350	330	I R 310	280	210					
27							S	230	290	I A 315	A	A	A	R	340	330	305	270	210					
28							S	250	290	320	A	A	A	360	360	335	H 310	280	190					
29							S	260	300	325	H 345	I A 360	370	370	360	340	I B 310	H 280	200					
30							B	R 290	320	R 330	355	370	H 375	I A 370	I A 355	I B 335	330	280	H 210					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	28	28	26	24	23	21	18	20	24	27	27	26					
MED							140	230	280	310	330	345	350	355	350	330	300	270	190					
UQ							150	240	290	320	345	352	355	360	350	335	310	275	200					
LQ							140	212	278	305	328	338	340	345	340	320	300	258	180					

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APR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

APR. 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 36	J X 60	J X 31	J X 57	J X 18	J X 18	E S 14	25	31	38	46	48	J X 49	J X 51	J X 91	J X 76	J X 54	J X 49	J X 30	25	J X 38	E S 13	E S 14	E S 14
2	45	J X 60	J X 29	J X 29	13	G	G	29	35	37	40	43	44	40	40	35	37	29	22	15	16	E S 13	E S 13	E S 14
3	E S 13	23	E S 13	38	J X 19	J X 41	J X 29	J X 29	30	32	35	38	41	37	38	J G 30	J X 41	32	28	21	J X 31	J X 23	22	E S 13
4	21	22	E S 12	J X 29	J X 26	J X 19	J X 33	28	30	42	J X 54	41	40	G	40	40	31	30	25	E S 15	E S 14	E S 15	E S 15	E S 14
5	E S 14	E S 13	E S 14	E S 13	E S 13	J X 17	J X 25	G 15	31	33	36	39	39	42	36	G	36	32	25	39	88	27	25	24
6	E S 14	21	E S 13	E	E S 14	19	J X 31	G	32	35	37	37	G	38	37	G	32	G 26	G	J X 17	E S 14	E S 14	E S 14	E S 14
7	E S 12	E S 14	E S 12	20	E S 13	E S 13	J X 23	J X 26	J X 32	36	41	43	J X 55	50	45	51	33	G 16	27	J X 26	20	20	25	23
8	E S 14	E S 13	13	14	J X 13	23	18	37	33	35	G	57	J X 62	52	44	J X 38	G 25	32	30	J X 29	J X 22	J X 21	J X 40	J X 41
9	J X 26	E S 14	19	13	J X 19	E B 11	E S 12	G	32	40	42	53	42	47	46	J X 57	37	32	22	22	J X 28	J X 31	J X 24	J X 25
10	J X 33	J X 36	J X 26	J X 26	J X 18	J X 16	J X 17	24	30	36	50	49	42	J X 59	J X 46	40	J X 37	J X 39	J X 36	J X 36	J X 42	30	35	25
11	27	17	18	E S 13	30	E S 14	E S 13	32	J X 36	37	41	37	38	46	J X 58	J X 47	J X 37	J X 40	J X 25	J X 26	E S 14	20	E S 15	E S 15
12	E S 14	E S 14	E	E S 14	E S 14	E S 13	E S 14	G	G	G	G	38	39	41	43	47	35	33	24	J X 29	J X 30	J X 41	J X 22	J X 26
13	29	J X 25	22	21	24	19	E S 14	G	31	33	37	37	J X 57	40	G	G	31	G	J X 37	J X 29	J X 39	J X 24	25	J X 21
14	E S 13	E S 13	21	12	J X 25	J X 29	23	37	35	G	33	43	37	G 33	G 29	G	G 24	G 25	24	14	19	18	J X 34	J X 20
15	J X 24	71	J X 36	J X 32	J X 24	E S 13	E S 13	25	30	35	35	35	37	35	G	G	G 24	G	24	J X 26	J X 61	J X 64	J X 34	J X 45
16	J X 64	J X 32	J X 24	J X 22	J X 30	23	E S 14	30	J X 50	35	34	33	G 33	43	J X 59	38	J X 32	G 23	18	24	E S 15	J X 35	32	J X 26
17	J X 25	J X 18	J X 17	J X 23	E S 14	E S 15	E S 15	G	J X 32	33	35	G	G	G	G	36	32	32	32	27	25	31	19	23
18	E S 15	38	27	28	37	34	26	27	34	35	J X 68	34	42	56	40	32	J X 33	J X 31	J X 24	J X 36	J X 33	26	28	29
19	E S 15	E S 14	E S 14	E S 13	E S 14	25	25	G 22	30	34	G 27	G 33	G 32	G 32	G 31	G 26	G 23	G 19	23	J X 21	24	22	22	E S 14
20	E S 15	E S 14	E S 14	17	E S 13	E S 14	16	26	36	J X 70	37	36	J X 77	J X 50	45	J X 97	38	31	27	J X 25	E S 14	17	J X 21	J X 23
21	J X 21	21	18	E S 14	E	E S 14	E S 13	27	34	37	38	38	46	36	G	G 23	33	33	25	23	19	20	J X 18	J X 27
22	J X 34	J X 38	J X 32	J X 18	J X 19	E	19	27	35	42	37	43	48	41	38	G	G	G	21	J X 19	14	J X 33	J X 36	J X 33
23	J X 29	J X 32	22	J X 23	19	19	27	45	J X 54	42	J X 60	51	J X 42	G 30	G	G	J G 30	33	29	J X 30	J X 27	J X 31	J X 27	J X 32
24	J X 31	J X 32	E S 14	E S 14	J X 31	29	25	33	37	55	34	37	42	J X 69	50	G	33	39	J X 45	25	J X 36	J X 26	J X 24	J X 56
25	J X 31	J X 28	25	J X 26	J X 19	J X 23	22	39	J X 53	47	J X 54	77	J X 63	J X 93	J X 56	G 31	G 26	G 22	J X 25	J X 28	J X 22	23	E S 15	18
26	E S 14	E S 14	E S 14	E S 14	E B 11	E S 14	G	G 23	G	31	35	G	37	G 33	G 30	35	G 28	35	28	J X 23	J X 27	17	J X 19	21
27	E S 14	E S 14	E S 13	E	E S 14	E S 15	22	G	30	34	37	37	37	G 35	36	G 30	38	40	30	J X 28	J X 26	20	J X 24	19
28	J X 23	18	E S 14	E	E	E S 14	20	29	35	39	44	40	42	J X 65	47	46	34	32	J X 46	J X 29	J X 58	J X 38	J X 23	22
29	J X 26	20	J X 18	J X 19	E S 14	E S 14	22	28	33	40	39	51	J X 77	J X 85	J X 57	J X 49	J X 50	37	33	25	J X 33	47	J X 44	J X 43
30	39	J X 33	J X 32	18	J X 25	J X 33	25	35	45	46	38	42	46	39	42	E B 49	39	J X 52	96	J X 71	J X 39	J X 38	J X 38	J X 26
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	24	21	18	18	18	16	20	27	32	36	37	38	42	41	40	34	33	32	26	J X 26	J X 26	24	24	23
UQ	J X 31	J X 32	25	J X 26	J X 24	23	25	30	35	40	42	43	J X 48	51	46	46	37	35	30	J X 29	J X 36	J X 31	J X 32	J X 27
LQ	E S 14	E S 14	E S 14	E E 13	E S 13	E S 14	E S 14	G 22	30	34	35	37	37	35	G 31	G	G 30	G 25	24	22	19	20	19	18

APR. 1973 | FOES (0.1 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	18	21	12	E	E S 14	G	G	36	45	46	48	47	39	38	32	34	21	E	36	E S 13	E S 14	E S 14
2	35	A	16	25	13	G	G	28	34	35	39	43	43	39	39	33	35	29	G	15	15	E S 13	E S 13	E S 14
3	E S 13	E	E S 13	14	14	30	25	26	E R 30	E R 32	G	E R 38	40	37	38	G 29	37	30	23	E	28	20	E	E S 13
4	E	13	E B 12	22	15	E	22	G	G	40	50	38	39	G	35	34	28	20	23	E S 15	E S 14	E S 15	E S 15	E S 14
5	E S 14	E S 13	E S 14	E S 13	E B 13	14	19	G 15	G	G	36	38	39	41	G	G	32	27	25	29	E	15	E	16
6	E S 14	E	E S 13	E	E S 14	E	G	G	G	35	G	37	G	38	G	G	G	G 25	G	E	E S 14	E S 14	E S 14	E S 14
7	E B 12	E S 14	E B 12	14	E S 13	E S 13	22	23	29	35	38	39	38	46	43	48	33	G 16	26	25	E	E	E	E
8	E S 14	E S 13	13	13	12	E	16	28	G	G	G	53	59	48	44	35	G 25	31	29	28	20	18	23	22
9	15	E S 14	14	12	11	E B 11	E S 12	G	G	35	42	53	42	42	42	37	35	32	22	22	25	30	16	14
10	18	27	17	15	E	E	15	24	30	34	49	49	E R 42	42	40	35	32	30	22	23	17	19	22	E
11	23	E	E	E S 13	19	E S 14	E S 13	22	34	36	38	E R 37	E R 38	46	45	44	30	33	17	25	E S 14	E	E S 15	E S 15
12	E S 14	E S 14	E	E S 14	E	E S 13	E S 14	G	G	G	G	38	E R 39	40	43	45	35	29	24	27	30	30	20	17
13	E	E	E	15	18	E	E S 14	G	G	G	35	37	40	39	G	G	G	G	25	28	32	16	E	E
14	E S 13	E S 13	E	12	22	A	23	26	34	G	33	43	35	E R 33	G 29	G	G 24	G 23	G	14	E	E	32	15
15	20	A	E	E	13	E S 13	E S 13	G	G	33	33	35	35	35	G	G	G 24	G	G	25	40	25	27	E
16	18	21	16	15	24	E	E S 14	28	30	35	34	E R 33	E R 33	40	57	36	31	G 23	16	20	E S 15	E S 35	30	18
17	23	E	15	E	E S 14	E S 15	E S 15	G	25	G	35	G	G	G	G	G	G	29	22	16	E	E	E	E
18	E S 15	24	16	17	A	E	23	G	30	32	64	34	41	48	35	30	25	26	19	28	30	E	15	20
19	E S 15	F S 14	E S 14	E S 13	E S 14	E	15	G 21	28	33	G 27	G 32	G 32	G 31	G 31	G 25	G 23	G 19	G	17	15	E	E	E S 14
20	E S 15	E S 14	E S 14	13	E S 13	E S 14	E R 16	25	34	36	37	35	73	44	44	82	33	29	27	25	E S 14	E	E	E
21	16	E	15	E S 14	E	E S 14	E S 13	27	32	35	34	38	46	G	G	G 23	G	G	24	20	E	E	E	27
22	E	30	17	14	13	E	18	27	G	39	G	42	45	38	37	G	G	G	G	E	14	E	17	25
23	15	21	E	17	17	16	26	45	52	42	54	50	42	G 30	G	G	G 27	31	28	29	22	20	20	24
24	24	E	E S 14	E S 14	E	E	25	31	36	48	E R 34	E R 37	42	66	49	G	G	34	43	23	29	20	17	21
25	25	23	20	22	15	17	20	34	47	45	51	66	50	54	55	G 31	G 26	G 22	16	23	17	E	E S 15	E
26	E S 14	E S 14	E S 14	E S 14	E B 11	E S 14	G	G 23	G	E R 31	35	G	E R 37	E R 33	G 30	E R 35	E R 28	34	27	19	24	16	16	E
27	E S 14	E S 14	E S 13	E	E S 14	E S 15	21	G	G	32	35	E R 37	E R 37	F R 35	G	G 30	37	39	29	24	E	E	E	E
28	E	E	E S 14	E	E	E S 14	20	G	33	39	43	40	42	64	46	44	33	G	44	27	31	30	E	E
29	20	E	E	E	E S 14	E S 14	22	G	32	38	39	50	77	82	55	49	50	36	31	25	29	46	16	42
30	20	28	27	14	11	26	24	34	44	44	G	E R 42	46	38	41	E B 49	38	50	94	68	35	35	21	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	14	14	14	12	E E 13	16	22	30	35	35	38	40	40	38	31	29	29	23	23	17	E E 15	15	E E 14
UQ	20	21	16	15	15	E S 14	22	27	34	38	42	43	45	46	44	38	33	32	27	27	29	20	20	18
LQ	E S 14	E	E E 12	E E 12	E E 11	E	E S 14	G	G	32	U 30	U 34	U 34	35	G	G	G 24	G 20	16	16	E E 14	E	E	E

APR. 1973 | FBES (0.1 MHZ)

IONOSPHERIC DATA

APR. 1973 | F-MIN (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9 h)

Station YAMAGAWA Lat. 31 12.1 N. Long. 130 37.1 E Sweep 1 MHz to 20 MHz in 20 sec in 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	E S 14	E	E	E S 15	E S 14	13	11	15	15	18	23	20	19	14	12	11	E S 14	E S 15	E S 14	E S 13	E S 14	E S 14
2	E S 14	E	E	E	E	E	E	E S 13	13	14	16	23	23	22	15	17	14	14	E S 14	E S 13	E S 13	E S 13	E S 13	E S 14
3	E S 13	E S 14	E S 13	E	E	E S 14	E	11	14	19	14	21	24	24	23	19	14	11	E S 14	E S 14	E	11	E S 14	E S 13
4	E S 14	E	12	E	11	E S 13	E S 14	11	14	15	15	21	20	18	20	15	14	13	E S 14	E S 15	E S 14	E S 15	E S 15	E S 14
5	E S 14	E S 13	E S 14	E S 13	13	13	12	E S 14	13	14	15	20	24	21	17	14	14	11	11	E	E S 14	E S 13	E S 14	E S 13
6	E S 14	E S 14	E S 13	E	E S 14	11	E S 14	E S 14	14	E C 31	17	18	18	25	24	15	14	13	11	E S 13	E S 14	E S 14	E S 14	E S 14
7	12	E S 14	12	E	E S 13	E S 13	12	13	13	13	14	19	18	20	20	15	14	13	E S 13	E S 13	E S 14	E S 14	E S 15	E S 14
8	E S 14	E S 13	E	E	E	E S 15	E S 12	E S 13	13	14	22	15	25	23	19	20	15	11	E S 14	E S 13	E S 13	E S 13	E S 13	E S 13
9	E S 13	E S 14	E	E	E	11	E S 12	E S 13	13	16	20	23	23	24	23	19	15	14	E S 14	E S 15	E S 14	E S 13	E S 13	E S 13
10	E S 14	E S 13	E S 14	E	E	E	11	E S 14	13	16	30	36	24	21	21	20	15	14	E S 14	E S 14	E S 14	E S 13	E S 13	E S 15
11	E S 13	E S 14	E S 14	E S 13	E S 13	E S 14	E S 13	15	15	15	16	23	23	21	23	21	17	14	13	E S 14	E S 14	E S 15	E S 15	E S 15
12	E S 14	E S 14	E	E S 14	E	E S 13	E S 14	14	14	15	16	22	21	19	21	19	17	14	E	E S 15	E S 14	E S 14	E S 14	E S 14
13	E S 15	E S 15	E S 14	E	E	E S 14	E S 14	E S 14	15	E C 29	17	17	18	18	17	15	15	14	E S 13	E S 13	E S 14	E S 13	E S 14	E S 14
14	E S 13	E S 13	E S 14	E	E	E S 14	E S 12	14	14	15	14	17	22	16	16	15	15	13	E S 13	E S 12	E S 14	E S 14	E S 15	E S 14
15	E S 14	E S 14	E S 14	E S 14	E	E S 13	E S 13	E S 14	15	15	14	16	17	18	15	15	15	15	E S 14	E S 14	E S 14	E S 15	E S 15	E S 15
16	E S 15	E S 14	E S 13	E	E	E S 15	E S 14	E S 14	14	18	15	18	23	25	22	18	15	15	E S 14	E S 15	E S 15	E S 13	E S 14	E S 15
17	E S 15	E S 15	E S 12	E	E S 14	E S 15	E S 15	E S 14	14	16	18	19	21	23	24	15	14	11	E S 14	E S 14	E S 14	E S 14	E S 14	E S 13
18	E S 15	E S 15	E	E S 14	E	E S 14	E S 14	11	14	14	15	19	19	16	20	19	16	15	E S 14	12	E S 14	E S 15	E S 14	E S 14
19	E S 15	E S 14	E S 14	E S 13	E S 14	E S 14	11	E S 14	14	15	23	23	22	18	18	15	14	13	E	E	E S 14	E S 14	E S 15	E S 14
20	E S 15	E S 14	E S 14	E	E S 13	E S 14	E S 14	E S 14	14	16	19	17	16	16	23	18	14	11	11	E	E S 14	E S 13	E S 15	E S 15
21	E S 14	E S 13	E S 13	E S 14	E	E S 14	E S 13	13	14	14	16	16	16	17	19	15	14	13	E S 13	E S 13	E S 13	E S 14	E S 14	E S 13
22	E S 13	E S 12	E	E	E	E	E S 13	E S 13	14	14	18	20	23	23	23	18	17	13	12	E S 14	E	E S 15	E S 13	E S 13
23	E S 14	E S 13	E S 14	E S 14	E	E S 13	E S 14	13	13	20	17	22	19	20	21	21	13	14	11	E S 14	E S 14	E S 14	E S 14	E S 14
24	E S 14	E S 14	E S 14	E S 14	E S 15	E S 15	16	E S 14	19	16	23	25	24	26	23	21	16	15	E S 14	E S 13	E S 14	E S 14	E S 13	E S 15
25	E S 15	E S 15	E S 14	E S 14	E S 14	E S 14	E S 15	14	15	22	19	24	26	28	25	25	14	14	11	E S 14	E S 14	E S 14	E S 15	E S 14
26	E S 14	E S 14	E S 14	E S 14	11	E S 14	E S 13	14	15	15	16	23	23	16	15	14	25	15	E S 14	E S 15	E S 13	E S 14	E S 15	E S 14
27	E S 14	E S 14	E S 13	E	E S 14	E S 15	E S 14	12	14	15	17	23	24	21	19	21	15	14	E S 14	E S 14	E S 13	E S 14	E S 15	E S 15
28	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	13	14	15	20	24	23	23	21	20	15	14	E S 14	E S 13	E S 14	E S 15	E S 15	E S 13
29	E S 15	E S 13	E S 14	E S 14	E S 14	E S 14	E S 14	14	14	17	19	27	25	30	26	21	33	19	E S 13	E S 15	E S 14	E S 14	E S 14	E S 14
30	E S 15	E S 14	E	E	E	E	15	26	24	22	24	23	25	25	24	49	23	14	11	E	E S 13	E S 14	E S 14	E S 14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	14	14	15	17	21	23	21	21	18	15	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
UQ	E S 15	E S 14	E S 14	E S 14	E S 13	E S 14	E S 14	E S 14	14	16	19	23	24	24	23	20	16	14	E S 14	E S 14	E S 14	E S 14	E S 15	E S 14
LQ	E S 14	E S 13	E E 12	E	E	E S 13	E S 12	12	13	15	15	18	19	18	19	15	14	13	11	E S 13	E S 13	E S 13	E S 14	E S 13

APR. 1973 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

APR. 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 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	U S 275	280	300 S	F	F	F	270 S	345	315	305	305	280	295 S	305	310	310	315	315 S	330 S	325	280	255	265	255 S
2	250	A	260	320 S	365	305	235	300	335	320	325 H	300	J S 310	275	310	330 S	320	310 S	U S 290	J S 305	U S 320	280 S	285 S	295 S
3	F 260	270	265 S	290 S	F 280	F	285 S	310	290 H	325	J S 330	330	330	J S 315	305	330	330	345 S	330 S	335 S	275 S	270	290 S	290 S
4	305	305	325	J S 355	245	270	305	330	335	310	305	J F 300	305	305	305	300	300	315	320 S	325	305	260	270 S	285
5	290	300	310	320	305	275	300	335	315	335	305	U S 320	U S 305	295 H	305	310	315	J S 315	330 S	335	325	280 S	285 S	I S 285
6	J S 280	325	305	F	305 S	275	315 S	345	325	335 S	315	300	290	300	305	J S 310	315 S	325	I S 320	345 S	310 S	J S 270	270	285 S
7	285	300	300	310	290	285 S	305	330	340	330	300	290	295	305	305 S	295 S	300 S	J S 305	315 S	305	310 S	290	265	285
8	300	270	275 S	315	295	280	310	335	335	345	310	295	275	300	300	295	295 S	U S 305	320 S	315 S	320	300	270	270 S
9	305	285	285	275	285	270 S	300	340	320 H	325	310	280	305	315	305	J S 310	I S 300	J S 300	J S 315	320 S	350 S	285	270	285
10	285	F 300	290 S	325	340	280 S	320	340 S	335 S	325	310	310	I R 290	J S 290	305	305	310	320	340	U S 345	310	280	285	U S 295
11	300	295 S	315	335	365	280	320 S	340	320	325 S	300	310	305 S	305 S	295	295	305	315	U S 305	J S 315	U S 325	315	265	265
12	275	305 S	325	300	320	310	330 S	340	325	325	290	295	320	J S 300	315	J S 320	325	330	330	330	305 S	280	280	280
13	280	285	J S 290	305	275	270	290	335	360	330	320	305	315	320 S	305 S	320 S	325	310	I S 320	330 S	I S 290	250	S	S
14	S	S	F 310	H 325	S 310	A	290 S	320	340	295	310	300	310	305	325 S	295	310	290	U S 305	315 S	335	285	240	255
15	260	I A 250	F	290	S 285	F 285	305 S	325	330	330	325	305	310	320	305	310	315	310 S	325 S	340 S	325	280	I S 270	265 S
16	270	I S 265	270	F 305	295	F 285	330 S	340	350	330	315	285	U S 280	J S 285	305	325	J S 325	315 S	J S 300	J S 315	310	J S 285	265	J S 270
17	290	270	260	300 S	330	245	315	330 S	330	330	295	270	U S 305	J S 315	U S 315	325 S	310	325 S	U S 325	U S 320	305	310	270	275 S
18	275	U S 290	305	375	I A 280	260	305	335	335	305	I S 275	J S 310	325	U S 300	310	U S 305	320	340	305	U S 330	365 S	325	280 S	I S 290
19	290	310	345	355	285	295	340	345	320	300	295	285	305	320	315	J S 315	330	330	335	335	J S 335	315 S	275	290
20	295	295	295	335	315	300	335	330	360	325	285	265	290 S	330	J S 310	310	J S 325	335 S	330	335	355	280	I S 260	I S 280
21	290	300	285 S	300	315 S	270	330	345	340	295	260	290	290 S	J S 310	315 S	315	320 S	325 S	315	J S 300	315 S	290	275	260 S
22	270 S	275	290	J S 335	320	275	335	365	330 S	325	315	310	290	285 S	310 S	J S 320	325 S	325	315	325 S	300	315 S	270 S	265
23	265 S	275	265	275	270 S	300	340	345	310	315	285	305	295	290	295	305 S	335	335	325	310	325	300	255 S	265 S
24	I S 260	275 S	275 S	270 S	F 295	300	340 S	345	325	330	300	295	300	295	300 S	305	295	305	305 S	325 S	340 S	275	265	265 F
25	245 S	J S 285	275 S	280 S	280	315 S	330	355	330	310	305	285	285 S	J S 305	305	305	315	315	315 S	330 S	305 S	J S 290	270	270
26	255	285	295	300	315	290	315	J S 310	315	300	285	290	290	315	305	325	325	335	330	310 S	295	270	270	265
27	265	255	285	330	310	280	315	325	305	H 335	335	V 295	275	300	310	310	300	280	U S 305	330	330	270	260	275
28	270 S	280	310	340	280	290	325	345	325	305	305	295	295	290	295	300 S	310 S	305 S	310 S	315 S	315 S	295	I S 270	270
29	255	275	320 S	330	260	270	340	325	325	325	300	305	290	275	J S 280	290	305	320	335	325	260	260	260	265
30	285 S	280 S	F 285	335	H 285	275	320	320	305	315	295	280	280	290	300	K 290	305	315 S	310 S	305	290 S	270 S	265 S	270 S
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	29	28	29	27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29
MED	275	285	290	318	295	280	315	335	328	325	305	295	295	302	305	310	315	315	320 S	325 S	312	280	270	270 S
UQ	290	300	310	335	315	292	330	345	335	330	315	305	305	315	310	320 S	325	325	330 S	330 S	325 S	295	275	285 S
LQ	265	275	275	300	280	272	305	325	320	310	295	285	290	290	305	300	305	310 S	310 S	315 S	305	270	265	265

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

IONOSPHERIC DATA

APR. 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 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	A	L 370	L	L	L						
2											L	L	L	L	L	L	L	L						
3								L	L	L	L	L	L	L	L	L	L	L						
4									L	L	L	L	L 355	L 380	L	L	L	L						
5									L	L	L	U L 365	L 380	U L 360	L 385	L 360	L	L	L					
6									L	L	L	L	L	U L 365	L	L	L	L	L					
7									L	L	L	L	L	365	L 350	A	L	L						
8									L	L	L	A	A	A	L	L 355	L	L						
9									L	L	L 370	L	L 345	L 350	L 380	L 350	L	L						
10									L 400	L	A	L	L	U L 340	U L 360	L	L	L	L					
11									L	L	L 370	L 380	L	L	A	L	L	L						
12									L	U L 380	L	L 335	L	L	L 370	L	L	L						
13								440	L	L	L	L	410	L	L	L	L	L						
14									L	L	L 415	L	L 375	L	L 405	L 375	U L 365	L						
15								L	L	L	L 365	L	L 385	L 375	L 380	L 370	L	L	L					
16									L	U L 380	U L 385	H 370	L	L	A	L	L	L						
17								L	L	U L 370	L 395	L	H 375	L 370	L 380	H 355	L	U L 350	L					
18								L	L	U L 375	I A 350	L 370	U L 370	I A 375	L 360	U L 365	U L 365	L	L					
19								L	L	L	L 360	365	370	L 355	L 375	L 385	L	L	L					
20								L	L	L	L	L	A	A	A	A	L	L						
21									L	L 355	H 345	H 360	A	L 385	H 360	L	L 365	L	L					
22									L	L 350	L 360	L 375	365	H 345	L 365	L	L	L						
23									A	A	A	I A 370	370	340	H 330	H 355	U L 360	L 380	L					
24								L	L 350	A	L 395	A	L 360	A	A	L 370	L 345	L	A					
25								L	A	L	A	A	A	A	A	L 355	L 355	L	L					
26								L	L	L	L	L 360	L 360	L 365	L 355	L 360	L	L						
27								L	L	L 360	L 390	L	L 355	375	L 360	L 395	L	L	L					
28									L	L	L 350	L 355	L 360	I A 355	L 340	L	L	L	A					
29									L	L	L 390	A	A	A	A	L	A	L	L					
30									L	L	L 340	U L 320	L 335	L 335	L 365	L	L	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	2	7	15	12	16	17	18	13	6	2						
MED								440	L 375	U L 370	L 370	L 365	L 368	L 365	L 365	L 360	L 362	L 365						
UQ										U L 378	L 390	L 370	375	L 375	L 380	L 370	U L 365							
LQ										L 358	L 355	L 358	L 358	L 350	L 360	L 355	L 355							

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

IONOSPHERIC DATA

APR. 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 automatic operation

Time / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										255	275	300	295	280	275	270	260	245						
2											H 250	325	260	260	285	245	250	245						
3								280	275	280	260	265	250	275	285	250	255	240						
4									250	260	270	280	260	255	265	250	275	250						
5									245	250	285	270	275	285	280	265	250	255	240					
6									245	260	255	300	300	295	300	290	265	255	245					
7									245	255	275	305	305	275	280	275	260	255						
8									245	240	280	305	335	300	280	290	270	265						
9									H 245	270	290	320	290	275	280	270	265	255						
10									235	260	290	285	320	300	285	290	275	255	240					
11									250	275	285	280	275	330	305	300	280	255						
12									225	255	300	310	280	255	280	265	265	245						
13								235	230	260	275	290	280	275	280	270	255	275						
14									245	255	275	275	290	265	255	275	280	255						
15								260	255	255	255	285	275	280	280	270	260	250	235					
16									235	260	280	330	315	320	290	270	245	250	250					
17								245	250	290	295	350	300	280	270	265	290	260	255					
18								250	250	285	E A 330	295	260	275	290	265	255	250	255					
19								240	240	290	310	315	300	270	265	290	255	255	240					
20								260	235	250	300	410	330	260	280	290	250	245						
21									250	310	370	300	300	280	275	285	265	255	250					
22									H 240	285	275	290	320	305	285	260	255	250						
23									320	300	310	300	290	320	310	280	260	260	250					
24								240	295	275	290	295	285	295	290	280	280	280	265					
25								230	250	305	295	340	325	295	275	280	275	260	235					
26								H 250	275	290	360	295	285	280	295	270	270	250						
27								250	295	245	250	H 280	350	290	280	275	255	320	265					
28									275	280	300	300	300	295	290	275	265	260	255					
29									260	275	275	290	E A 340	E A 360	325	310	280	265	230					
30									280	255	310	340	315	300	295	300	275	250						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								11	28	29	30	30	30	30	30	30	30	30	15					
MED								250	250	260	284	300	295	280	280	275	265	255	250					
UQ								255	268	285	300	315	315	298	290	290	275	260	255					
LQ								240	242	255	275	285	280	275	280	265	255	250	240					

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APR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

APR. 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 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	270	290	255	225	E A 250	295	275	225	235	230	E A 250	E A 270	A	A	225	220	215	E A 250	235	205	E A 290	250	300	310
2	E A 375	A	305	255	210	275	355	270	240	240	230	240	E A 245	E A 215	E A 225	225	235	235	250	250	225	250	255	250
3	275	290	320	255	260	340	300	250	215	200	H 195	H 195	H 200	H 180	215	205	I A 225	240	225	210	E A 245	300	280	275
4	260	250	230	220	E A 400	330	280	230	225	240	I A 230	H 200	H 200	210	H 190	200	H 200	230	230	215	205	240	295	255
5	250	255	240	220	230	300	265	240	235	215	205	200	H 195	215	H 190	H 185	H 205	245	240	220	205	250	280	300
6	300	245	245	225	200	280	255	230	230	230	215	200	200	205	H 200	230	225	230	245	205	195	250	300	300
7	285	265	265	240	235	255	270	230	235	220	H 205	H 200	H 190	A	E A 250	I A 245	220	245	230	220	220	220	295	280
8	255	280	275	240	220	275	250	225	230	225	H 220	A	A	A	A	220	H 225	245	240	225	230	225	300	E A 350
9	255	255	275	275	250	280	255	225	225	205	E A 225	A	E A 250	230	220	200	225	240	245	235	210	255	295	285
10	300	280	250	245	205	270	245	225	210	E A 235	A	E A 235	200	E A 235	220	210	235	245	250	210	230	240	290	260
11	265	255	250	230	205	290	255	235	220	H 210	195	H 190	H 200	I A 215	I A 220	A	225	E A 250	245	240	230	200	310	315
12	305	255	240	230	210	240	235	230	220	205	H 190	220	R	E A 245	E A 240	A	220	235	235	225	235	E A 305	300	295
13	290	280	255	250	250	315	250	200	220	205	200	190	200	205	H 180	250	220	H 205	250	235	250	330	F 330	300
14	F 300	275	235	205	A 245	A	300	250	240	H 205	H 200	250	H 200	H 195	190	H 200	H 230	240	245	245	200	235	A	375
15	320	A	250	245	E A 250	E S 350	255	230	230	225	H 205	H 195	H 190	H 185	220	205	205	H 225	245	225	240	275	E A 340	300
16	300	320	290	245	250	250	245	225	230	220	H 210	H 195	190	250	A	220	230	220	245	250	250	H 240	345	300
17	285	300	300	260	230	240	250	245	220	205	210	200	H 200	230	220	H 195	210	230	220	210	235	235	280	315
18	305	295	265	200	A	345	260	240	230	215	I A 220	200	A	A	210	H 220	210	250	250	250	215	200	310	295
19	295	260	240	215	300	265	240	230	220	H 200	205	210	200	H 200	210	215	210	H 210	230	230	220	200	305	290
20	290	285	265	240	230	270	240	225	235	230	230	215	A	A	A	A	210	245	235	225	210	250	335	300
21	275	260	260	250	245	E S 295	240	225	230	H 230	H 210	E A 240	A	205	H 200	H 235	H 225	240	H 220	250	235	240	275	E A 345
22	300	325	280	230	215	250	225	215	225	E A 250	225	E A 240	A	H 210	220	H 205	225	225	H 235	230	245	225	300	320
23	300	275	305	295	275	240	240	245	A	E A 270	I A 230	A	E A 235	225	H 215	H 200	235	225	245	250	230	245	330	325
24	300	290	285	275	250	250	240	235	235	I A 215	H 200	E A 250	E A 250	A	A	H 200	H 215	250	I A 255	225	200	210	300	305
25	310	250	250	250	250	250	235	E A 230	I A 230	A	A	A	A	A	A	H 230	H 220	235	235	225	200	220	290	290
26	300	275	250	235	220	245	250	225	200	H 240	H 205	H 230	210	E A 260	H 200	225	230	E A 245	240	240	H 250	270	300	300
27	300	315	275	220	225	E S 280	240	230	230	H 225	H 200	240	H 200	240	H 210	210	240	260	260	225	215	255	300	300
28	300	285	245	200	H 180	255	230	225	H 220	240	E A 250	225	235	A	A	A	H 205	H 210	I A 240	240	240	250	300	290
29	340	290	220	220	300	290	195	235	230	225	220	A	A	A	A	A	A	A	E A 240	225	260	E A 350	335	350
30	305	300	260	200	H 195	E A 350	250	250	E A 275	255	H 220	E A 245	I A 235	230	230	B	260	A	A	E A 285	255	E A 290	300	275
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	30	30	29	29	30	30	29	29	28	25	21	21	23	24	29	28	29	30	30	30	29	30
MED	300	280	258	238	232	270	250	230	230	222	208	208	200	210	212	212	225	238	240	225	229	244	300	300
UQ	300	290	275	250	250	292	260	240	232	232	222	U 228	U 218	228	220	225	230	245	245	240	242	252	308	310
LQ	275	258	245	220	215	250	240	225	220	210	H 202	200	H 200	205	H 200	200	210	228	235	220	210	225	295	290

APR. 1973 | H'F (KM)

IONOSPHERIC DATA

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

Station YAMAGAWA Lat. 31 12.1 N. Long. 130 37.1 E Sweep 1 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	110	100	100	100	100	100	S	155	140	125	110	110	105	105	105	105	105	100	100	100	100	S	S	S
2	105	105	100	100	100	G	G	125	125	125	115	110	105	105	105	105	110	110	135	115	105	S	S	S
3	S	100	S	100	100	100	100	100	115	105	120	105	105	105	100	100	105	130	115	100	100	100	100	S
4	110	100	B	100	100	100	100	150	150	125	115	115	120	G	115	115	115	100	130	S	S	S	S	S
5	S	S	S	S	B	100	100	100	170	160	140	125	125	115	140	G	110	105	140	95	130	95	95	95
6	S	100	S	E	S	100	100	G	155	145	140	145	G	140	130	G	120	105	G	100	S	S	S	S
7	B	S	B	105	S	S	100	100	100	125	125	120	110	130	130	115	130	100	145	115	110	100	100	105
8	S	S	105	100	100	100	150	130	140	135	G	125	125	125	130	100	100	160	130	115	105	105	100	105
9	100	S	100	100	100	B	S	G	175	110	110	105	110	110	110	110	110	110	110	120	105	105	100	100
10	100	100	100	100	100	100	100	110	110	155	115	110	110	110	110	115	110	110	105	100	100	100	100	100
11	100	100	100	S	105	S	S	105	105	115	120	125	115	105	105	105	105	100	100	100	S	100	S	S
12	S	S	E	S	E	S	S	G	G	G	G	165	155	145	130	125	125	130	120	110	110	105	105	120
13	115	105	105	105	100	100	S	G	145	135	130	130	120	140	G	G	115	G	110	105	100	100	125	115
14	S	S	140	130	120	130	120	150	140	G	110	165	100	100	100	G	100	100	135	125	100	100	110	110
15	105	105	105	105	105	S	S	125	125	105	105	105	110	105	G	G	100	G	150	110	110	105	105	105
16	105	100	100	105	100	110	S	150	110	140	175	100	105	150	100	100	100	100	100	120	S	105	105	105
17	105	105	100	105	S	S	S	G	110	145	150	G	G	G	G	110	115	145	125	95	110	105	135	100
18	S	110	95	110	110	110	140	145	125	105	105	105	100	95	95	100	100	100	100	100	100	110	105	105
19	S	S	S	S	S	105	105	105	125	115	105	100	100	100	100	100	100	100	150	100	100	100	100	S
20	S	S	S	125	S	S	130	150	120	105	110	110	105	105	105	100	110	110	135	110	S	100	120	130
21	100	95	95	S	E	S	S	150	130	135	125	130	125	150	G	100	145	120	110	105	115	105	125	105
22	105	105	100	105	105	E	135	140	140	125	130	125	125	125	125	G	G	G	150	110	120	110	105	105
23	100	110	100	100	105	125	140	130	125	125	110	120	120	105	G	G	100	125	115	110	105	105	105	110
24	105	100	S	S	110	100	125	125	105	105	105	125	130	115	120	G	150	115	110	105	100	100	100	105
25	100	100	95	100	100	105	110	110	110	110	105	105	105	100	100	100	100	100	95	95	100	100	S	95
26	S	S	S	S	B	S	G	105	G	110	105	G	105	105	105	150	100	120	110	95	95	95	100	100
27	S	S	S	E	S	S	165	G	150	105	105	105	110	110	110	105	125	115	120	110	110	115	105	95
28	105	100	S	E	E	S	150	150	130	130	125	135	130	120	115	115	125	120	110	105	105	100	100	95
29	95	95	95	95	S	S	160	155	140	130	125	115	115	110	115	115	110	115	110	115	105	105	120	110
30	110	100	95	100	105	105	150	135	130	130	150	150	145	E G 175	145	B	150	125	110	105	105	105	105	105
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	20	18	20	18	16	19	24	28	28	28	28	28	28	25	21	29	27	29	29	25	26	24	23
MED	105	100	100	100	100	100	125	130	128	125	115	118	110	110	110	105	110	110	115	105	105	102	105	105
UQ	105	105	100	105	105	108	145	150	140	135	128	128	125	126	125	115	120	120	135	110	110	105	108	108
LQ	100	100	95	100	100	100	100	108	112	110	108	105	105	105	105	100	100	100	110	100	100	100	100	100

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APR. 1973 | H'ES (KM)

IONOSPHERIC DATA

APR. 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	FF 52	F 4	F 3	F 5	F 3	F 2		H 2	H 2	H 2	C 2	C 2	C 1	C 2	CL 21	CL 21	CL 21	CL 31	L 4	F 1	F 5			
2	F 6	F 5	F 3	F 4	F 1			H 3	H 3	H 2	C 1	C 1	C 1	C 1	C 2	CL 11	CL 21	C 2	H 3	F 1	F 1			
3		F 1		F 3	F 2	F 6	L 5	L 4	CL 12	L 1	C 1	C 1	C 1	C 1	L 2	L 1	CL 31	HL 21	C 2	F 1	F 3	F 4	F 1	
4	F 1	F 1		F 4	F 3	F 2	L 2	HL 23	HL 12	H 2	C 2	C 1	C 1		C 1	C 1	C 1	L 1	H 2					
5						F 1	L 3	L 2	HL 11	HL 11	HL 11	HL 11	H 1	C 1	H 1		C 2	CH 32	HL 32	F 5	FF 13	F 2	F 1	F 2
6		F 1				F 1	L 2		H 2	H 1	H 1	H 1		H 1	H 1		C 1	L 1		F 1				
7				F 2			L 3	L 2	L 2	HL 23	H 2	C 2	C 2	H 2	H 1	C 2	HL 11	L 1	H 4	F 7	F 1	F 1	F 1	F 1
8			F 1	F 1	F 1	F 2	H 2	H 2	H 2	H 1		HC 22	HC 21	HC 22	HL 12	L 2	L 1	H 2	H 4	F 7	F 4	F 3	F 4	F 4
9	F 5		F 3	F 1	F 1				H 1	HC 11	HC 11	C 2	C 1	C 1	C 1	C 1	CL 21	C 2	C 3	FF 62	FF 41	F 5	F 4	F 2
10	F 3	F 4	F 4	F 4	F 1	F 2	L 1	L 2	C 2	H 1	C 2	C 1	C 1	C 1	C 1	C 1	C 1	L 2	L 2	F 5	F 3	F 5	F 4	F 1
11	F 2	F 1	F 1		F 1			L 4	L 2	C 2	C 1	C 1	CL 11	CL 21	C 2	C 2	L 2	L 3	L 3	F 4		F 1		
12												H 1	H 1	HL 11	HL 11	H 2	HL 11	HL 12	CL 21	FF 32	F 4	F 4	F 4	FF 12
13	FF 11		F 2	F 2	F 3	F 1			HL 11	H 1	H 1	H 1	C 1	H 1			C 1		C 3	F 7	F 5	F 2	F 1	F 2
14			F 1	F 1	F 3	F 4	C 2	H 2	H 1		C 1	HC 11	L 1	L 1	L 1		L 1	L 2	H 3	F 1	F 1	F 2	F 6	FF 21
15	FF 61	FF 42	FF 31	F 2	F 2			HL 12	H 1	C 3	C 1	C 1	C 1	C 1			L 1		H 2	F 6	FF 32	FF 21	F 4	F 2
16	F 3	F 2	F 2	FF 21	FF 31	FF 11		HL 32	CH 12	HL 12	HL 11	L 1	L 1	HL 12	L 2	L 3	L 2	L 1	L 3	FF 41		F 7	F 5	F 3
17	F 3	F 1	F 1	F 1					CH 11	H 1	H 1					C 1	CL 11	HL 11	CL 23	FF 12	FF 11	F 1	F 1	F 1
18		F 3	FF 21	F 1	F 4	F 2	C 2	H 1	C 2	C 2	C 3	C 1	L 2	L 2	L 2	L 2	L 2	L 2	LH 21	F 5	F 5	F 1	F 4	F 3
19						F 2	L 1	L 2	CL 22	CL 11	L 1	L 1	L 1	L 1	L 1	L 1	L 1	L 1	HL 21	F 3	F 1	F 1	F 1	
20				F 1			H 1	H 2	C 2	LH 11	C 1	C 1	C 3	C 1	C 2	C 4	CL 21	C 3	HL 32	FF 51		F 1	F 1	F 1
21	F 2	F 2	F 1					HL 21	HL 21	H 2	HL 11	HL 11	HL 11	H 1		L 1	H 1	H 1	C 2	FF 71	FF 11	F 1	F 1	F 7
22	F 2	F 5	F 3	F 2	F 3		H 2	H 2	H 3	H 2	HL 11	HL 11	H 1	H 1	H 1				H 1	F 1	F 2	F 1	F 3	F 5
23	F 3	FF 23	FF 12	F 1	FF 11	FF 11	H 2	H 4	H 2	HL 21	C 2	CL 11	CL 11	L 1			L 2	H 2	CL 41	F 6	F 3	F 4	F 3	F 5
24	F 2	F 1			F 1	F 1	HL 11	HL 22	C 2	C 2	L 1	HL 11	H 1	C 2	C 1		H 1	C 2	C 4	F 5	F 3	F 3	F 1	FF 22
25	F 3	F 2	F 3	F 3	F 1	F 1	C 1	C 4	C 3	C 2	C 2	C 3	C 2	C 3	C 2	L 1	L 1	L 1	LH 22	F 4	F 1	F 1		F 1
26								L 2		C 1	C 2		C 1	LL 11	LL 11	HLL 11	L 1	HL 11	CL 21	F 3	F 3	F 1	F 2	F 1
27							H 1		HC 12	C 2	C 1	C 2	C 1	C 1	CL 11	L 1	H 2	CL 31	CL 32	FF 42	FF 11	FF 12	F 2	F 1
28	FF 22	F 1					H 1	H 2	HL 11	H 2	HC 12	HC 12	HC 12	H 2	C 1	C 1	H 1	C 2	C 5	F 4	F 2	F 4	F 1	F 1
29	F 2	F 2	F 1	F 2			H 1	H 1	H 2	H 1	H 1	HL 11	C 2	C 2	C 2	C 1	C 2	CL 21	CL 41	F 4	F 6	FF 51	FF 21	FF 51
30	FF 22	F 4	F 5	F 1	F 1	F 5	H 1	H 1	H 1	H 1	H 1	H 1	H 1	HC 11	HC 11		H 1	H 2	C 5	FF 51	F 3	F 7	F 3	F 2
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

APR. 1973 | TYPES OF ES

IONOSPHERIC DATA

APR. 1973 | FOF2 (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	50	S 49	S	S 59	A	F	F	S 62	76	80	87	104	125	144	150	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	77	90	88	118	98	133	122	90	86	95	112	92	S 72	72	S 74
3	57	S 60	51	55	51	S 49	55	69	79	94	113	124	140	147	150	130	106	107	113	86	62	57	60	S 67
4	67	59	S 61	S 48	20	A	29	67	90	105	103	118	144	161	159	153	155	147	S 122	115	106	R 98	R 96	90
5	92	80	84	56	33	30	35	69	85	90	100	112	140	166	178	160	150	156	138	126	93	92	80	S 93
6	83	89	99	90	47	42	47	68	75	96	91	91	105	126	138	144	148	142	124	116	95	81	62	61
7	64	63	64	68	48	41	42	68	C	C	85	104	118	142	146	137	132	137	154	154	118	R 96	83	75
8	80	77	S 70	68	46	39	42	69	90	81	85	96	110	134	136	135	136	140	133	S 116	R 104	93	80	63
9	S 65	70	64	57	54	47	48	62	85	90	96	103	130	140	138	138	135	136	138	122	92	76	62	61
10	S 63	57	61	63	34	29	35	65	74	77	90	98	110	122	145	171	179	190	182	151	116	R 117	R 114	R 104
11	92	85	81	74	49	42	45	67	82	94	97	102	108	122	142	154	153	154	147	126	102	96	81	R 74
12	R 76	82	88	69	47	39	44	73	82	77	89	114	141	143	122	117	106	103	106	91	68	67	64	S 58
13	R 63	58	61	58	42	43	43	75	102	85	85	94	108	120	112	115	108	101	110	112	91	R 76	R 83	S 91
14	F	85	80	R 62	S 46	F	F	71	106	95	100	107	133	150	135	121	120	129	117	R 98	R 76	66	R 53	S 47
15	S 51	S 43	37	32	A	V 22	33	71	96	95	88	88	99	113	120	114	117	130	136	114	S 74	52	R 52	S 51
16	S 50	S 50	56	V 55	44	35	V 45	66	67	72	79	89	105	131	162	172	163	154	139	130	100	84	R 74	J R 74
17	J R 76	R 74	60	S 58	48	35	43	61	72	72	81	92	115	131	119	114	111	120	122	110	76	59	57	J R 52
18	55	56	57	48	24	22	33	68	77	74	87	111	124	133	142	153	150	150	146	152	128	61	62	62
19	S 62	63	68	34	29	30	40	60	73	83	94	103	121	140	114	119	116	110	126	97	60	50	45	45
20	45	S 44	45	43	26	23	38	70	81	62	72	93	108	124	120	127	134	110	114	90	64	C	51	50
21	55	59	57	46	37	29	37	56	58	64	80	101	112	114	117	127	126	112	C	94	94	64	57	59
22	S 59	62	72	79	32	V 29	43	59	59	77	95	93	108	116	138	145	140	122	113	105	85	69	63	60
23	62	S 63	F 64	53	57	51	47	57	67	82	91	98	114	129	140	137	128	110	85	79	79	R 60	50	53
24	S 54	J S 52	53	47	37	F 37	45	55	67	67	83	97	120	132	150	152	154	152	150	R 138	117	105	99	103
25	97	95	R 97	80	71	56	S 62	71	65	73	85	102	113	137	160	164	165	157	150	153	144	105	93	89
26	84	88	R 102	75	55	S 42	40	63	74	67	70	96	126	101	96	113	112	102	84	82	J S 70	64	J S 56	S 59
27	57	52	57	50	V 34	29	44	66	70	86	75	68	91	117	114	100	102	102	120	116	74	S 65	70	S 67
28	J S 74	74	78	50	37	38	47	62	72	R 76	84	100	110	115	121	123	124	117	117	120	110	81	90	90
29	80	84	106	J R 79	49	48	57	81	81	80	86	94	100	112	120	143	160	145	127	91	A	S 72	71	78
30	U S 74	70	J S 72	76	39	A	48	80	71	85	85	101	116	122	124	131	133	125	109	106	S 94	89	92	93
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	28	29	27	25	27	29	28	29	30	30	30	30	30	29	29	29	28	29	28	28	29	29
MED	64	63	64	58	44	38	43	67	76	80	87	99	114	130	137	135	133	129	123	114	92	74	70	67
UQ	78	80	80	69	48	42	47	70	84	90	94	104	125	140	146	152	150	147	138	126	105	92	83	89
LQ	56	57	57	50	34	29	39	62	70	74	84	93	108	117	120	121	116	110	113	97	75	64	57	59

The Radio Research Laboratories, Japan

APR. 1973 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

APR. 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

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 500	U L 510	L	C	C							
2									C	A	L	A	L	A	L	L	L	L						
3									L	L	L	L	L 520	L 490	L 480	L	L	L						
4									L	L	L	A	L	L	L 500	L	L	L						
5									L	L	L 490	L 500	L	L	L 520	L	L	L	L					
6									L	L	U L 490	L 500	L	L	L	U L 500	L	L	L					
7									C	C	U L 510	A	L	L	L	L	L	L	L					
8									L	L	L 450	L	U L 570	L 510	L 520	L	L	L	L					
9									L	L	L	L	L	A	L	L 490	U L 480	L	L					
10									L	L	L	L 500	L	A	A	L 520	L	L	A					
11									L	L	450	470	L	530	H 500	L	L	L	L					
12									L	L	L 500	L 510	U L 530	L	L	U L 500	L	L	L					
13									L	L	U L 480	L 500	H 510	U L 480	L	U L 470	L	L	L					
14									L	L	L	L 490	L	U L 500	L 490	L	U L 500	L	L					
15									L	L	L 470	L	U L 500	U L 480	L 490	L	L	L	L					
16									L	L	L 450	L 510	U L 520	L 480	L 500	L 440	L 400	A						
17									L	L	L 460	L 520	L 480	U L 470	L	L	L	L	L					
18									L	L 450	A	L 470	U L 450	L	L 490	L 470	L 450	L	A					
19									L	L	L 450	490	U L 480	L 470	U L 500	U L 470	L	L	L					
20									L	L	L	U L 480	A	A	U L 440	A	A	L	A					
21										L	L 470	U L 480	L 480	L 470	L 510	L 450	L	L						
22										L 470	L 480	L	L 490	A	L	L 470	L	L	L					
23										L	L 490	A	L 520	A	480	L 460	L	L	L 310					
24									L	L 540	L 530	470	L 520	L 530	480	U L 450	L	L	L					
25									L	L	A	490	L	L 510	A	L	A	L	L					
26									L	L 400	L 510	L	L 490	U L 500	L 500	L	L	L	A					
27									L	L	L	530	L	480	A	A	A	A	A					
28									L	L	L 510	L 500	L 520	L 510	L 500	L	L	L	L					
29								L	L	L	L	L 500	L 510	L 520	L 550	L 500	L	A	L					
30									L	L	L	520	L	L	500	L	L	L	L					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										4	17	19	17	17	18	13	4		1					
MED										L 460	L 480	L 500	L 510	L 500	L 500	L 470	L 465		L 310					
UQ										L 505	L 500	L 505	L 520	L 510	L 500	L 500	U L 490							
LQ										L 425	L 460	L 485	L 490	L 480	L 490	L 460	L 425							

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APR. 1973 | FOF1 (0.1 MHZ)

IONOSPHERIC DATA

APR. 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								175	255	305	330	A	A	350	330	C	C	C	C	C				
2								C	C	300	335	350	350	345	340	335	300	265	195	B				
3								A	250	320	A	A	A	365	360	I A 345	310	I A 280	A	S				
4								225	280	310	335	350	350	350	350	325	A	275	210	S				
5							S	A	I A 270	R 315	I A 330	R 355	360	A	360	A	285	270	A	S				
6							S	200	270	310	335	345	355	365	355	340	305	A	200	A				
7							S	185	C	C	A	360	365	360	360	335	315	280	205	A				
8							B	A	280	320	R 340	350	355	R 350	350	340	325	275	220	A				
9							A	220	280	325	A	355	R 365	R 360	R 350	320	290	A	A	A				
10							S	220	290	A	R	R	370	360	360	340	A	A	A	A				
11							S	230	280	A	A	A	A	A	A	A	A	A	A	S				
12							S	205	285	330	350	370	365	370	365	340	305	280	205	S				
13							S	190	270	320	340	360	A	370	365	345	320	285	A	A				
14							S	I A 200	270	A	A	A	A	A	A	A	A	250	205	S				
15							S	220	A	A	A	A	A	A	A	330	305	270	200	A				
16							S	215	A	A	A	A	A	R 360	350	350	290	A	A	S				
17							S	200	260	290	330	I A 350	R 350	360	350	300	300	250	190	A				
18							A	210	A	A	A	A	A	A	A	A	300	A	A	S				
19							S	A	250	300	A	A	340	I A 345	R 340	335	A	A	A	A				
20							A	205	265	295	320	335	335	340	335	325	300	A	A	S				
21							S	235	280	305	330	335	350	355	350	335	300	280	C					
22							S	A	280	315	330	350	350	355	345	340	330	290	200	A				
23							S	240	285	310	335	A	A	A	350	A	320	A	215	A				
24							S	215	280	320	A	A	A	A	360	350	335	285	205	S				
25							A	A	A	A	A	A	A	A	A	A	A	280	220	A				
26							S	220	A	A	A	A	A	A	A	A	320	280	A	A				
27							B	235	A	A	A	A	A	A	A	A	A	A	220	S				
28							A	240	300	A	A	A	A	A	A	345	325	280	A	A				
29							S	240	A	R 325	A	A	A	A	360	350	325	280	A	S				
30							A	285	310	R 340	A	A	I A 360	R 365	360	B	R 330	R 285	225	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								23	21	19	13	13	15	18	22	20	22	19	15					
MED								220	280	315	335	350	355	360	350	340	308	280	205					
UQ								232	280	320	335	355	362	365	360	345	325	280	218					
LQ								202	270	305	330	350	350	350	350	332	300	272	200					

APR. 1973 | FOE (0.01 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M 17	M 21	J X 20	J X 60	J X 30	J X 35	J X 19	G	29	38	41	J X 44	41	42	41	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	40	J X 46	J X 63	J X 51	J X 63	45	38	32	30	26	25	M 20	J X 18	M 23	E S 16
3	M 21	M 17	J X 19	J X 41	J X 30	E S 15	J X 41	J X 29	30	35	41	40	40	39	39	37	J X 43	30	23	E S 15	E S 15	M 23	J X 30	E S 16
4	E S 16	M 23	J X 20	J X 17	E S 16	J X 23	J X 25	25	30	34	J X 47	J X 54	43	49	40	35	32	30	24	E S 16	M 20	M 18	E S 16	J X 20
5	E S 16	E S 16	E S 15	F B 12	E B 11	E B 12	F S 15	J X 25	J X 43	G 28	J X 37	G 28	G 30	J X 37	G	J X 34	G	29	J X 31	J X 31	J X 36	J X 20	J X 50	J X 26
6	J X 22	J X 19	E S 15	E B 11	E B 12	E S 15	M 19	G 17	32	38	40	40	42	41	41	38	34	30	G 20	J X 19	M 19	M 17	J X 20	M 18
7	E S 16	E S 15	E S 15	E S 15	E	E B 13	E S 16	25	C	C	48	J X 68	46	J X 53	49	42	33	G 22	G	22	J X 31	J X 36	J X 21	J X 28
8	J X 26	J X 18	M 18	J X 17	E B 11	E B 11	E B 11	25	32	38	38	47	47	42	39	G 27	G 23	G 20	35	J X 27	J X 30	J X 22	M 20	J X 26
9	J X 50	J X 26	J X 25	E S 15	J X 19	J X 24	J X 27	23	30	36	40	40	52	J X 64	J X 64	J X 68	J X 63	34	24	M 22	M 22	J X 24	J X 18	E S 16
10	J X 18	E S 16	E S 16	J X 29	J X 23	J X 22	J X 18	G	32	35	G	G	45	J X 51	J X 54	J X 60	J X 64	J X 60	J X 41	J X 61	J X 40	J X 25	J X 19	E S 17
11	E S 15	E S 16	16	E S 15	E B 14	E S 15	E S 15	29	30	J X 39	J X 37	40	J X 48	42	42	J X 52	J X 59	J X 45	35	J X 25	J X 20	J X 18	M 20	J X 17
12	E S 16	E S 15	E S 16	M 17	E B 13	E B 12	M 18	G	G	G	G	40	40	44	41	37	34	30	24	E S 15	M 16	E S 15	J X 28	J X 25
13	21	M 20	J X 17	J X 25	J X 20	J X 24	M 21	G	29	33	G	G	31	G	42	37	42	J X 49	J X 42	J X 22	J X 21	J X 23	J X 18	E S 16
14	M 23	J X 24	M 20	E S 15	M 22	J X 24	J X 29	J X 41	33	J X 37	J X 35	37	J X 51	J X 42	J X 59	J X 45	J X 28	G 19	22	16	M 18	M 18	M 22	J X 40
15	J X 28	J X 24	M 20	J X 25	J X 28	M 18	M 22	G 21	J X 37	J X 43	34	J X 37	38	38	38	39	32	G 20	G 17	17	J X 28	J X 60	J X 52	J X 22
16	J X 24	J X 29	J X 40	J X 23	J X 18	J X 35	20	G 20	J X 30	34	32	35	35	G 32	G 30	G	31	J X 50	J X 32	J X 23	J X 32	M 17	E S 16	J X 25
17	J X 25	J X 28	J X 20	J X 19	J X 18	J X 15	E S 14	G 20	J G 26	G	43	38	G 28	G	G	G	G 28	G 24	G 16	18	M 21	J X 24	M 18	M 18
18	E S 16	J X 21	E B 13	J X 17	E S 15	E B 11	16	26	28	34	J X 48	J X 45	J X 37	36	33	J X 37	G 24	J X 28	31	J X 23	J X 22	M 17	M 17	J X 17
19	E S 16	M 22	E B 12	E B 13	E B 12	E S 15	M 22	24	29	33	33	J X 35	36	J X 39	G 30	G 27	J X 31	41	J X 24	J X 31	J X 29	J X 21	M 18	M 24
20	M 22	E S 16	J X 19	E S 16	E S 15	E B 13	17	27	34	37	40	40	47	49	45	J X 57	J X 47	J X 43	J X 35	E S 15	J X 34	C	J X 18	J X 39
21	J X 20	J X 26	J X 19	J X 17	14	14	J X 35	J X 46	37	42	36	36	38	G	G	36	37	G	C	J X 41	J X 25	31	E S 16	J X 41
22	J X 27	J X 36	J X 25	J X 50	J X 22	J X 25	E S 15	J X 38	36	40	39	43	45	51	J X 47	G	G 23	G 19	G 17	J X 17	J X 19	J X 46	J X 35	J X 28
23	J X 26	J X 25	J X 24	J X 24	E S 15	E B 13	18	30	38	44	43	J X 74	43	47	G 31	J X 37	33	J X 35	23	19	J X 40	J X 26	J X 29	17
24	J X 23	J X 25	J X 29	25	20	J X 19	17	26	36	38	J X 39	37	45	J X 37	G	G	G 29	G 25	G	E S 15	E S 15	E S 15	M 18	J X 70
25	J X 45	J X 53	J X 49	M 20	J X 21	J X 24	J X 25	J X 28	J X 34	J X 38	J X 54	J X 40	J X 53	J X 45	J X 63	J X 46	J X 64	J X 37	G 18	J X 29	J X 20	M 19	J X 19	J X 17
26	E S 16	E S 16	E B 13	E B 11	E B 11	M 17	E S 16	24	J X 36	37	38	J X 38	J X 50	43	J X 40	44	42	39	34	24	J X 20	18	J X 35	J X 25
27	J X 17	E S 15	M 20	16	E B 14	E B 13	G	G 22	30	35	38	42	J X 55	42	62	57	J X 64	J X 67	J X 43	J X 50	J X 51	J X 64	M 21	M 20
28	M 20	M 21	M 20	E B 11	E B 11	M 20	17	26	33	37	42	42	J X 44	41	42	45	41	38	23	J X 18	M 22	J X 16	J X 19	J X 29
29	M 20	J X 25	J X 19	E S 15	E S 15	E B 13	18	26	32	G	J X 43	J X 40	38	40	41	G	40	44	J X 33	J X 43	J X 78	J X 29	J X 28	J X 20
30	J X 19	M 19	M 24	J X 18	J X 25	J X 40	J X 24	35	36	39	42	J X 47	41	45	42	E B 48	G 31	G	34	J X 68	J X 84	J X 73	J X 24	J X 20
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	28	29	30	30	30	30	30	29	29	29	28	29	29	28	29	29
MED	20	21	19	17	E E 15	15	18	25	32	37	40	40	43	42	41	37	33	30	24	J X 22	J X 22	J X 22	J X 20	J X 20
UQ	J X 24	J X 25	J X 20	J X 24	J X 21	J X 24	J X 22	28	36	38	43	44	47	47	45	45	42	J X 41	34	J X 29	J X 32	J X 28	J X 28	J X 26
LQ	E S 16	E S 16	E 16	E E 15	E B 13	E B 13	16	G 21	30	34	36	37	38	38	33	34	31	G 24	21	17	20	18	18	17

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APR. 1973 | FOES (0.1 MHZ)

IONOSPHERIC DATA

APR. 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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	18	50	A	21	E	G	29	37	40	40	40	41	40	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	38	45	60	51	61	45	37	32	29	26	25	E	E	E	E S 16
3	E	E	16	E	17	E S 15	25	23	30	35	40	40	40	39	39	37	36	28	23	E S 15	E S 15	E	18	E S 16
4	E S 16	E	E	15	E S 16	A	20	25	30	34	45	51	43	48	39	35	32	30	23	E S 16	E	E	E S 16	E
5	E S 16	E S 16	E S 15	F B 12	E B 11	E B 12	E S 15	20	29	G 27	37	G 28	G 30	37	G	34	G	29	21	28	17	E	37	27
6	20	E	E S 15	F B 11	E B 12	E S 15	G	G 17	31	37	39	39	41	40	41	37	33	29	G 19	18	E	E	17	E
7	E S 16	F S 15	E S 15	F S 15	E	E B 13	E S 16	24	C	C	40	57	44	44	48	41	33	G 21	G	21	23	22	20	20
8	21	E	18	E	E B 11	E B 11	E B 11	25	31	34	38	47	45	41	39	G 27	G 23	G 20	34	26	29	U A 18	E	E
9	25	23	19	E S 15	13	19	22	G	32	35	38	39	51	54	45	38	33	30	21	15	E	17	E	E S 16
10	E	E S 16	E S 16	25	20	21	G	G	32	35	G	G	44	50	52	44	40	36	29	35	30	22	E	E S 17
11	E S 15	E S 16	16	F S 15	E B 14	E S 15	E S 15	27	30	35	36	40	48	42	39	41	40	35	25	22	20	E	E	E
12	E S 16	F S 15	E S 16	E	E B 13	E B 12	G	G	G	G	G	40	40	42	41	37	34	29	22	E S 15	E	E S 15	17	25
13	E	15	E	15	E	18	G	G	29	33	G	G	E R 35	G	41	36	39	32	34	16	19	23	E	E S 16
14	E	21	E	E S 15	E	18	16	35	33	31	34	37	42	40	40	39	F R 28	G 19	22	G	E	E	E	38
15	28	21	E	E	22	E	E	G 19	33	36	34	37	38	37	37	38	31	G 20	G 15	17	27	22	21	20
16	E	20	23	17	16	E	18	G 18	29	33	E R 32	35	E R 35	G 32	G 30	G	30	40	27	23	29	E	E S 16	U A 30
17	22	19	15	E	15	E	E S 14	G 19	G 24	G	37	37	G 23	G	G	G	G 28	G 24	G 16	17	E	16	E	E
18	E S 16	20	E B 13	17	E S 15	E B 11	15	25	28	33	47	41	36	F R 36	E R 33	34	G 24	26	31	20	21	E	E	E
19	E S 16	E	E B 12	F B 13	E B 12	E S 15	G	24	28	32	E R 33	35	36	37	G 30	G 27	F R 31	31	23	31	29	23	E	E
20	E	E S 16	15	F S 16	E S 15	E B 13	17	27	33	37	39	40	47	48	40	50	45	36	34	E S 15	33	C	16	38
21	E	19	E	E	14	14	G	45	36	41	35	37	38	G	G	36	37	G	C	37	22	23	E S 16	17
22	20	35	22	U A 22	21	21	F S 15	37	35	40	39	43	45	50	47	G	G 23	G 19	G 15	16	17	46	31	28
23	23	22	20	16	E S 15	E B 13	17	30	37	40	43	56	43	47	G 31	36	33	28	23	18	35	25	23	E
24	18	24	18	21	18	E	G	26	33	38	38	37	40	37	G	G	G 29	G 25	G	E S 15	E S 15	E	E	37
25	35	33	23	E	21	16	20	23	29	37	50	40	48	40	54	40	54	22	G 17	21	17	E	18	E
26	F S 16	E S 16	F B 13	F B 11	E B 11	E	F S 16	24	29	33	37	38	38	40	35	43	41	38	30	23	20	17	31	19
27	E	E S 15	E	14	E B 14	E B 13	G	G 22	30	35	36	41	49	42	55	51	63	67	39	50	47	26	E	E
28	E	16	E	F B 11	E B 11	E	17	26	33	36	40	42	40	40	41	44	40	37	22	15	E	14	E	23
29	E	E	E	E S 15	E S 15	E B 13	17	26	31	G	39	39	38	40	41	G	40	42	31	U A 43	A	28	20	18
30	17	E	22	16	20	A	22	35	36	37	41	40	40	45	40	F B 48	G 30	G	30	68	30	50	16	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	28	29	30	30	30	30	30	29	29	29	28	29	29	28	29	29
MED	16	16	E E 15	E E 15	E E 15	E E 13	E G 15	24	30	35	38	40	40	40	40	37	33	29	23	20	20	16	16	E E 16
UQ	20	20	18	16	17	18	17	26	33	37	40	41	45	45	41	40	40	35	30	26	29	23	18	23
LQ	E	E	E	E E 11	E B 12	E B 11	G	G 19	29	33	35	37	38	37	33	34	30	G 22	20	16	E	E	E	E

The Radio Research Laboratories, Japan

APR. 1973 | FBES (0.1 MHZ)

IONOSPHERIC DATA

APR. 1973 | F-MIN (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 16	E S 15	E S 15	F S 15	13	11	E S 15	15	15	15	16	20	21	21	22	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	17	16	22	21	21	19	19	15	15	15	11	E S 15	E S 15	12	E S 16
3	E S 16	E S 16	13	F S 15	12	E S 15	13	F S 15	15	20	20	21	22	20	22	19	16	15	15	E S 15	E S 15	E S 16	E S 15	E S 16
4	E S 16	E S 16	E S 16	11	E S 16	E S 15	12	13	15	15	17	21	22	21	20	21	17	15	15	E S 16	E S 16	E S 16	E S 16	E S 16
5	E S 16	E S 16	E S 15	12	11	12	E S 15	E S 15	16	19	20	19	20	21	22	18	16	15	14	E S 15	E S 15	E S 16	E S 15	E S 16
6	E S 15	E S 16	E S 15	11	12	E S 15	E S 15	14	15	17	18	19	20	21	20	20	15	15	14	E	E S 15	E S 15	14	E S 16
7	E S 16	E S 15	E S 15	F S 15	E	13	E S 16	13	C	C	17	22	22	22	21	18	16	15	15	11	E S 15	E S 15	12	E S 15
8	12	E S 15	E S 16	E S 15	11	11	11	14	15	17	22	22	22	23	22	20	18	15	11	11	E S 15	13	E S 16	E S 15
9	14	11	E S 15	E S 15	E	11	11	14	14	16	21	22	26	24	22	20	16	15	15	E	E S 15	E S 15	E S 15	E S 16
10	E S 16	E S 16	E S 16	11	11	11	E S 15	15	15	17	28	33	25	28	25	22	17	15	15	13	11	E S 15	11	E S 17
11	E S 15	E S 16	E S 15	E S 15	14	E S 15	E S 15	15	17	18	21	22	23	22	21	20	15	15	14	E S 15	E S 15	E S 15	E S 15	E S 15
12	E S 16	E S 15	E S 16	E	13	12	E S 16	14	15	18	21	22	22	21	21	18	15	15	E	E S 15	14	E S 15	E S 15	E S 15
13	E S 16	11	E S 15	11	11	12	E S 16	14	15	15	21	21	22	20	20	18	15	15	15	12	12	E S 15	E S 16	E S 16
14	E S 16	12	13	E S 15	12	12	E S 15	15	15	16	20	21	20	20	20	17	15	15	15	E S 15	E S 16	E S 16	E S 16	13
15	E S 15	11	13	13	E	E S 16	E S 15	15	16	17	20	20	23	20	20	19	17	15	14	E S 15	E S 15	E S 16	E S 15	E S 15
16	E S 15	11	E S 15	F S 16	E S 15	E S 15	E S 15	E S 15	18	16	17	22	22	22	21	19	15	15	11	E S 15	E S 15	E S 16	E S 16	E S 15
17	E S 15	13	12	E S 15	12	13	E S 14	14	15	19	20	20	20	21	20	21	15	15	15	11	E S 16	E S 15	E S 15	E S 16
18	E S 16	12	13	11	E S 15	11	12	12	15	18	21	21	22	23	21	22	17	15	15	E S 15	E S 15	E S 14	E S 16	E S 16
19	E S 16	E S 15	12	13	12	E S 15	E S 15	14	17	17	23	21	22	15	20	20	18	15	14	11	E S 15	E S 15	E S 15	E S 15
20	E S 16	E S 16	12	F S 16	E S 15	13	12	15	15	15	16	21	21	22	21	20	16	15	15	E S 15	E S 15	C	12	E S 15
21	E S 16	13	13	13	E	11	E S 15	11	15	15	18	20	21	21	20	15	17	15	C	11	12	E S 15	E S 16	E S 15
22	E S 16	E S 16	13	12	11	11	E S 15	15	15	17	20	22	22	21	20	19	16	15	11	E	E S 15	E S 15	E S 16	E S 15
23	E S 16	E S 15	E S 16	E S 15	E S 15	13	E S 15	16	15	17	18	21	21	22	22	20	18	15	14	14	12	11	E S 15	E S 15
24	E S 15	E S 16	E S 15	E S 16	E S 16	E S 16	E S 15	15	18	22	20	26	23	23	23	22	21	18	15	E S 15	E S 15	E S 15	E S 16	E S 15
25	E S 15	E S 16	E S 15	E S 15	E	E S 15	E S 15	15	19	20	20	23	25	21	22	22	20	15	15	11	E S 15	E S 16	E S 15	E S 16
26	E S 16	E S 16	13	11	11	13	E S 16	14	15	20	24	22	21	23	21	21	28	15	15	13	E S 16	E S 15	E S 16	E S 15
27	E S 16	E S 15	E S 15	11	14	13	13	14	15	18	20	21	25	27	20	18	18	15	15	E S 15	E S 15	E S 15	E S 15	E S 15
28	E S 16	E S 15	E S 15	11	11	E S 15	13	15	15	17	20	20	22	21	20	20	18	15	15	E	12	11	E S 15	14
29	E S 15	E S 15	E S 15	E S 15	E S 15	13	F S 14	15	17	21	23	28	25	23	22	21	26	20	15	E S 15	E S 15	E S 15	E S 15	E S 15
30	E S 15	E S 16	11	11	11	12	14	23	22	22	25	23	24	24	25	48	22	18	15	11	13	12	12	E S 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	28	29	30	30	30	30	30	29	29	29	28	29	29	28	29	29
MED	E S 16	E S 15	E S 15	E E 13	12	12	E S 15	15	15	17	20	21	22	21	21	20	17	15	15	E E 13	E S 15	E S 15	E S 15	E S 15
UQ	E S 16	E S 16	E S 15	E S 15	13	E S 15	E S 15	15	16	19	21	22	23	23	22	21	18	15	15	E S 15	E S 15	E S 16	E S 16	E S 16
LQ	E S 15	12	12	11	11	12	12	14	15	16	18	21	21	21	20	19	15	15	14	11	E S 15	E S 15	E S 15	E S 15

APR. 1973 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

APR. 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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	280	S 290	S	S 340	A	F	F	S 330	310	330	280	280	300	305	310	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	355	315	300	300	280	300	325	310	300	295	320	330	S 275	275	S 310
3	270	S 280	270	300	275	S 260	280	350	340	310	315	310	310	305	320	330	310	320	350	350	270	290	270	S 270
4	320	295	S 340	S 340	270	A	300	340	330	330	300	300	300	310	310	310	320	330	S 330	335	320	R 310	R 290	290
5	290	330	350	370	290	280	300	340	330	320	310	300	295	300	290	290	300	310	320	330	295	300	290	S 280
6	290	290	345	365	310	290	310	355	330	340	330	290	290	290	295	300	315	320	320	340	330	290	275	275
7	290	300	310	340	330	290	300	340	C	C	300	300	290	310	310	310	295	300	310	335	325	R 325	270	290
8	295	270	S 290	325	330	310	300	350	350	340	300	290	290	300	300	300	305	315	330	S 340	R 320	330	275	280
9	S 285	300	290	310	320	310	310	330	335	320	300	280	310	310	305	300	305	315	325	345	330	295	280	280
10	S 290	290	310	360	310	290	290	350	340	310	310	290	280	280	295	300	310	310	325	310	315	R 300	R 305	R 295
11	300	300	320	350	320	300	310	330	330	320	310	285	280	285	290	300	290	300	320	350	310	300	260	R 270
12	R 275	310	325	335	320	310	310	330	330	310	280	295	310	320	330	315	320	315	320	340	290	280	290	S 280
13	R 300	305	290	330	290	270	280	330	350	330	315	310	300	320	310	315	325	315	320	340	320	R 260	R 270	S 290
14	F	300	340	R 310	S 300	F	F	300	335	330	295	290	300	320	320	310	310	300	320	R 310	R 310	270	R 275	S 260
15	S 290	S 290	310	300	A	V 290	300	325	340	340	320	300	300	315	310	300	310	320	350	370	350	270	R 270	S 270
16	S 270	S 300	290	V 290	340	320	V 320	350	350	330	300	280	290	290	310	320	310	320	320	340	290	280	R 270	J R 275
17	J R 295	R 280	285	S 310	340	280	290	320	330	335	270	270	295	330	320	305	300	310	340	340	330	290	290	J R 270
18	285	300	325	365	340	270	290	360	350	300	270	300	300	300	280	310	310	325	320	330	380	275	270	295
19	S 280	310	360	340	290	310	315	320	295	290	290	280	300	320	380	310	340	330	350	360	335	300	300	280
20	300	S 290	290	370	380	300	310	360	375	320	245	275	290	310	315	310	330	330	340	360	280	C	280	290
21	300	320	320	320	320	270	310	350	340	300	260	300	310	310	300	315	330	340	C	320	330	310	270	270
22	S 280	280	320	390	280	V 290	320	360	320	305	320	290	300	290	380	315	310	330	320	330	380	295	280	280
23	290	S 290	F 280	270	290	310	330	340	330	315	300	280	290	295	295	310	330	360	330	310	330	R 240	270	280
24	S 280	J S 300	280	300	310	F 320	340	350	350	280	295	295	305	305	310	310	315	310	320	R 335	350	300	295	280
25	280	320	R 330	330	310	290	S 330	340	350	310	280	290	290	290	310	310	310	310	310	320	335	300	270	270
26	270	290	R 330	310	360	S 300	290	320	340	310	280	290	340	310	300	320	320	330	330	310	J S 300	300	J S 270	S 270
27	280	260	300	350	V 290	320	330	340	330	320	355	265	270	310	320	305	295	290	310	340	320	S 260	280	S 265
28	J S 280	315	330	370	290	310	330	330	340	R 305	280	290	290	300	300	305	310	310	310	325	320	280	280	290
29	265	285	350	J R 390	260	280	310	350	350	330	295	290	275	280	290	300	315	330	340	315	A	S 270	260	270
30	U S 290	270	J S 300	360	280	A	320	345	330	300	280	275	300	300	310	305	320	320	320	315	S 305	280	295	290
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	28	29	27	25	27	29	28	29	30	30	30	30	30	29	29	29	28	29	28	28	29	29
MED	288	295	315	340	310	290	310	340	338	320	300	290	300	305	310	310	310	315	320	335	320	290	275	280
UQ	292	300	330	360	325	310	320	350	350	330	310	300	300	310	315	315	320	330	330	340	330	300	290	290
LQ	280	290	290	310	290	280	300	330	330	310	280	280	290	290	300	300	310	310	320	320	308	275	270	270

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

IONOSPHERIC DATA

APR. 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 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	U L 370	U L 365	L	C	C							
2									C	A	L	A	L	A	L	L	L	L						
3									L	L	L	L	L 370	L 390	L 385	L	L	L						
4									L	L	L	A	L	L	L 380	L	L	L						
5									L	L	L 380	L 370	L	L	L 350	L	L	L	L					
6									L	L	U L 370	L 375	L	L	L	U L 350	L	L	L					
7									C	C	U L 380	A	L	L	L	L	L	L	L					
8									L	L	L 400	L	U L 340	L 340	L 350	L	L	L	L					
9									L	L	L	L	L	A	L	L 370	U L 365	L	L					
10									L	L	L	L 370	L	A	A	L 330	L	L	A					
11									L	L	400	420	L	370	H 350	L	L	L	L					
12									L	L	L 360	L 350	U L 300	L	L	U L 365	L	L	L					
13									L	L	U L 380	L 370	H 360	U L 390	L	U L 370	L	L	L					
14									L	L	L	L 370	L	U L 360	L 370	L	U L 360	L	L					
15									L	L	L 380	L	U L 370	U L 405	L 360	L	L	L	L					
16									L	L	L 400	L 360	U L 330	L 370	L 330	L 375	L 390	A						
17									L	L	L 380	L 350	L 380	U L 370	L	L	L	L	L					
18									L	L 370	A	L 360	U L 400	L	L 360	L 350	L 360	L	A					
19									L	L	L 370	360	U L 360	L 355	U L 360	U L 360	L	L	L					
20									L	L	L	U L 350	A	A	U L 385	A	A	L	A					
21										L	L 350	U L 360	L 350	L 365	L 340	L 380	L	L						
22										L 360	L 365	L	L 360	A	L	L 365	L	L	L					
23										L	L 360	A	L 350	A	370	L 360	L	L	L 400					
24									L	L 370	L 350	390	L 330	L 340	370	U L 380	L	L	L					
25									L	L	A	310	L	L 350	A	L	A	L	L					
26									L	L 420	L 340	L	L 380	U L 370	L 350	L	L	L	A					
27									L	L	L	360	L	360	A	A	A	A	A					
28									L	L	L 370	L 360	L 365	L 350	L 380	L	L	L	L					
29								L	L	L	L	L 380	L 360	L 340	L 330	L 340	L	A	L					
30									L	L	L	350	L	L	360	L	L	L	L					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										4	17	19	17	17	18	13	4		1					
MED										L 370	L 370	L 360	L 360	L 365	L 360	L 365	L 362		L 400					
UQ										L 395	L 380	L 370	L 370	U L 370	L 370	L 370	L 378							
LQ										L 365	L 360	L 355	L 350	L 350	L 350	L 350	L 360							

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

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IONOSPHERIC DATA

APR. 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

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										255	305	310	315	300	280	C	C							
2									C	220	255	285	290	315	295	265	255	250L						
3									245	250	255	295	295	280	260	255	260	250						
4									265	270	265	290	295	280	280	280	270	250						
5									250	265	280	300	300	315	300	280	280	270	240					
6									260	260	260	300	320	330	310	295	270	260	240					
7									C	C	300	310	330	300	280	280	280	280	260					
8									250	260	270	310	350	310	300	300	300	280	250					
9									260	250L	290	300L	315	295	300	290	290	270	260					
10									250	240	300	300	310	315	320	300	290	275	240					
11									250	275	280	280L	335	370	330	300	295	280	250					
12									250	250	310L	340	300	275	270	280	270	265	255					
13									260	250	280	295	310	280	280	290	270	275	260					
14									260	250	285	290	315	280	260	275	300	290	280					
15									255	260	255	280L	300	300	280	280	280	270	245					
16									245	270L	285	310L	375	355	300	255	250	245						
17									275	290	300	330	340	280	275	280	300	270	230					
18									255	300	335	310	295	305	305	280	270	265	255					
19									255L	280	305	325L	320	265	290	305	265	280	245					
20									235	260L	305L	360	325	280	295	295	255	255	245					
21										320L	340L	310	300	295	305	280	250	250						
22										315	285	300	320	320	305	275	260	265	245					
23										300	305	320	345	325	305	275	265	240	245					
24									255	370	325	305	325	305	300	280	280	275	250					
25									245	310	305	320	330	325	305	285	280	275	250					
26									250	250	325	345L	270	280	305	280	270	250	245					
27									260	275	250	415	360	305	280	290	305	310	275					
28									250	275	305	325	320	325	305	300	275	275	265					
29								240	250	270	290L	280L	310L	345	355	325	275	250	245					
30									250	300L	300L	350	320	310	320	300	270	250	250					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	24	29	30	30	30	30	30	29	29	29	24					
MED								240	250	270	295	310	318	305	300	280	270	270	250					
UQ									260	290	305	325	330	320	305	295	280	275	258					
LQ									250	250	280	295	300	280	280	280	265	250	245					

The Radio Research Laboratories, Japan

APR. 1973 | H'F2 (KM)

IONOSPHERIC DATA

APR. 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 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	295	280	210	250	A	F 420	260	230	240	235	235	210	200	210	235	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	A	250	A	A	A	I A 225	230	240	240	255	255	205	230	295	255
3	250	305	320	270	280	325	290	220	225	225	220	H 195	210	H 205	H 210	210	235	225	230	210	210	270	305	275
4	250	245	220	200	E S 400	A	305	240	240	235	250	I A 225	230	A	205	H 210	H 200	240	225	240	215	240	250	270
5	265	250	220	200	240	280	280	240	225	220	215	H 190	H 180	L 170	H 185	H 190	220	230	240	220	220	240	280	280
6	270	260	230	200	195	260	260	240	235	240	220	215	200	200	230	220	220	230	240	220	200	220	280	310
7	290	270	250	240	200	250	275	240	C	C	220	A	240	A	A	240	H 210	H 210	260	230	210	240	280	300
8	270	265	270	240	200	245	250	240	230	220	210	A	250	H 200	220	H 200	H 205	H 190	A	230	240	220	230	300
9	310	265	280	260	245	250	270	225	220	220	H 200	H 200	A	A	A	220	215	H 210	245	228	210	230	250	290
10	280	265	260	225	215	300	280	235	240	230	230	H 215	A 210	A	A	A	250	255	I A 240	215	230	260	260	270
11	250	255	250	210	220	220	275	240	240	230	205	200	A	A 205	H 215	255	255	A	255	230	240	220	270	320
12	305	250	245	215	210	245	265	240	240	220	H 195	230	245	250	245	220	210	225	245	220	220	255	285	315
13	280	270	270	240	210	320	290	240	H 220	220	200	200	H 200	H 190	245	215	255	235	255	240	220	335	245	295
14	310	280	210	220	250	325	300	A 265	240	220	210	H 205	230	215	220	225	H 200	240	250	240	215	230	275	420
15	300	265	240	225	260	300	275	250	240	235	210	230	200	195	235	230	210	225	250	215	215	220	225	320
16	300	295	295	250	220	230	250	215	230	210	H 200	H 180	H 190	200	H 175	220	205	A	245	240	245	245	305	A 320
17	290	290	300	250	230	245	265	230	220	H 230	230	205	195	220	H 200	H 230	225	235	230	210	220	250	280	330
18	305	295	245	205	270	340	270	240	H 225	225	A	245	195	215	215	205	220	H 215	A	250	205	200	315	295
19	295	260	220	205	260	260	245	235	235	220	225	205	200	H 180	220	210	225	220	250	210	215	255	295	310
20	295	285	270	205	275	295	255	240	235	215	245	230	A	A	240	A	A	245	A	205	240	C	305	365
21	285	255	235	240	210	300	255	255	245	A 250	225	210	210	215	230	205	245	225	C	255	245	220	280	330
22	325	320	255	A 210	300	340	230	235	235	240	230	250	250	A	A	215	215	230	240	220	245	295	300	335
23	305	280	280	310	275	230	235	230	245	250	A	A	230	I A 235	215	215	225	230	235	250	250	230	325	310
24	305	300	285	280	250	240	230	235	240	225	210	H 205	H 215	205	205	220	210	H 220	240	225	200	215	290	320
25	305	275	250	205	230	240	245	230	230	230	A	200	A	210	A	230	A	220	240	250	215	200	270	305
26	290	260	225	210	205	220	275	H 200	H 200	220	H 205	220	205	210	H 200	A	I A 250	250	I A 245	250	250	250	325	320
27	305	315	275	205	220	245	240	235	235	230	225	205	A	A 250	A	A	A	A	A	240	250	310	305	325
28	295	275	245	200	275	260	230	235	240	220	220	220	A 235	215	230	A	250	250	H 240	245	225	240	290	285
29	330	300	225	200	290	310	250	240	230	225	225	215	220	210	230	220	255	A	250	A 220	A	320	320	310
30	295	300	275	205	255	A	270	250	245	235	240	225	220	250	230	B	220	230	A	280	250	320	270	280
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	28	27	29	29	28	28	27	26	24	23	24	23	26	25	23	29	28	28	29	29
MED	295	275	250	215	238	260	265	240	235	225	220	210	210	210	220	220	220	230	245	230	220	240	280	310
UQ	305	295	275	240	268	305	275	240	240	235	230	225	230	215	230	228	245	240	250	245	242	258	305	320
LQ	280	260	230	205	212	245	250	230	228	220	210	200	200	200	208	210	210	220	240	220	212	220	270	290

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APR. 1973 | H'F (KM)

IONOSPHERIC DATA

APR. 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

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	100	100	100	100	100	100	100	G	150	120	115	115	115	110	110	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	115	115	110	110	105	110	115	140	145	120	110	105	105	105	S
3	100	100	100	100	105	S	100	105	145	135	125	125	130	145	135	115	115	125	140	S	S	110	110	S
4	S	100	105	105	S	100	100	155	170	150	125	115	120	115	120	125	135	170	140	S	100	100	S	100
5	S	S	S	B	B	B	S	120	100	105	100	100	105	120	G	110	G	170	110	110	100	100	115	110
6	100	100	S	B	B	S	100	100	160	145	140	140	130	130	120	125	120	115	110	100	100	100	120	120
7	S	S	S	S	E	B	S	160	C	C	130	120	150	125	120	125	130	100	G	140	110	100	100	100
8	100	100	100	100	B	B	B	160	150	140	U G 180	140	140	140	180	105	105	100	140	120	110	105	110	105
9	100	100	100	S	105	100	100	150	140	125	130	130	120	115	115	115	115	120	115	115	110	110	110	S
10	100	S	S	100	100	100	100	G	U G 170	155	G	G	120	115	115	110	110	105	105	100	100	100	100	S
11	S	S	100	S	B	S	S	150	140	105	110	115	105	105	105	105	105	100	100	100	100	100	100	100
12	S	S	S	105	B	B	105	G	G	G	G	U G 175	160	150	145	145	140	140	130	S	100	S	105	105
13	105	105	105	105	105	105	105	G	145	150	G	G	110	G	170	160	140	120	110	110	105	100	100	S
14	110	105	115	S	145	120	120	130	140	105	105	110	105	105	105	105	105	105	145	100	100	100	110	110
15	110	105	105	110	100	100	105	110	105	105	110	105	170	105	180	150	170	105	105	120	110	110	105	105
16	105	105	105	105	100	105	105	105	105	150	105	105	105	105	105	G	120	100	100	100	110	100	S	105
17	105	105	105	105	105	105	S	105	105	G	U G 175	105	100	G	G	G	105	105	105	150	100	100	100	105
18	S	115	B	110	S	B	140	140	115	110	105	105	105	105	105	115	105	115	125	100	100	105	100	100
19	S	100	B	B	B	S	105	120	135	130	105	105	140	100	105	105	105	145	105	120	110	105	100	100
20	100	S	105	S	S	B	120	130	125	115	115	115	110	110	120	110	110	105	105	S	105	C	105	105
21	100	100	100	105	105	105	105	130	130	125	145	150	140	G	G	145	115	G	C	105	105	105	S	105
22	110	105	105	105	105	105	S	125	125	105	140	130	125	115	115	G	105	105	100	100	100	105	105	100
23	105	105	105	100	S	B	140	135	130	125	130	120	135	130	105	105	130	100	140	115	110	105	110	110
24	110	110	110	100	105	100	135	140	120	115	105	105	110	110	G	G	105	105	G	S	S	E	130	115
25	105	110	105	105	100	100	100	105	105	105	105	105	105	105	100	100	100	100	100	100	100	100	120	115
26	S	S	B	B	B	105	S	145	105	105	105	105	105	160	105	130	135	115	110	110	100	100	100	100
27	100	S	95	105	B	B	G	110	105	105	105	105	105	105	105	105	115	110	110	110	110	110	100	100
28	100	105	105	B	B	105	145	155	145	145	135	135	105	140	135	130	115	110	110	100	100	100	100	100
29	100	95	90	S	S	B	140	150	140	G	105	110	115	110	135	G	120	110	110	105	105	105	105	105
30	105	105	105	105	105	105	110	140	150	145	150	110	170	150	150	B	110	G	115	110	110	105	110	110
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	21	21	18	14	16	21	25	27	26	27	28	30	27	26	23	28	27	26	24	27	26	26	24
MED	100	105	105	105	105	105	105	130	135	122	115	112	115	115	115	115	115	110	110	110	105	102	105	105
UQ	105	105	105	105	105	105	120	150	145	145	132	128	135	130	135	128	130	120	125	115	110	105	110	110
LQ	100	100	100	100	100	100	100	110	110	105	105	105	105	105	105	105	105	105	105	100	100	100	100	100

APR. 1973 | H'ES (KM)

IONOSPHERIC DATA

APR. 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 1	F 1	F 1	F 5	F 4	F 6	F 2		H 1	C 2	C 2	C 2	C 1	C 2	C 2									
2										C 2	C 2	C 3	C 2	C 2	CL 11	CL 11	H 1	H 2	C 3	L 4	F 1	F 1	F 2	
3	F 1	F 1	F 2	F 4	F 3		F 4	L 3	HL 11	HL 11	HL 11	HC 11	HC 11	H 1	H 1	C 2	CL 22	C 1	HL 11			FF 11	F 1	
4		F 2	F 1	F 1		F 6	F 4	HL 14	HL 12	HL 11	H 2	C 2	C 1	C 2	C 1	C 1	HL 12	HL 11	HL 22		F 1	F 1		F 1
5								C 1	L 3	L 1	L 2	L 2	L 1	C 1		C 1		H 1	LH 22	L 6	F 2	F 1	FF 62	FF 21
6	F 3	F 1					L 2	L 1	HL 12	H 2	HL 11	HL 11	HL 11	HL 11	CL 11	C 1	CL 11	C 2	L 1	L 3	F 1	F 1	F 2	F 1
7								H 3			HL 22	C 2	HH 11	C 2	CL 21	CL 11	HL 11	L 1		HL 11	FF 62	F 4	F 2	F 2
8	F 4	F 1	F 1	F 1				H 2	H 1	H 1	H 1	H 2	H 1	H 1	H 1	L 1	L 1	L 1	HL 52	LL 21	FF 61	F 5	F 1	F 2
9	F 4	F 2	F 1		F 1	F 6	L 6	HL 11	CL 11	CL 12	HL 11	H 1	C 1	C 2	C 2	C 1	C 1	C 1	C 2	LL 12	FF 11	F 3	F 1	
10	F 1			F 6	F 4	F 5	L 1		HL 12	HCL 11			C 1	C 2	C 2	C 2	C 2	C 4	L 5	L 3	F 5	F 3	F 1	
11			F 1					HL 22	HL 12	L 2	L 1	C 1	C 1	C 1	C 1	C 3	L 4	L 5	L 4	L 4	F 2	F 1	F 1	F 1
12				F 1			L 1					H 1	HL 11	H 1	H 1	H 1	HL 11	HL 11	HL 11		F 1		F 4	F 5
13	F 2	F 3	F 3	F 1	F 2	F 5	L 1		H 1	HL 11			C 1		HC 11	H 1	H 2	C 2	C 6	L 3	F 2	F 3	F 2	
14	F 2	F 6	F 1		FF 11	FF 52	LL 31	HL 22	HL 11	LH 11	L 1	C 1	C 2	C 2	L 2	L 3	L 1	L 1	H 1	L 1	F 1	F 1	F 1	F 6
15	F 6	F 6	F 2	F 1	F 3	F 1	L 1	L 1	L 3	C 2	C 1	C 1	HL 11	C 1	HL 11	HL 11	HL 12	L 1	L 1	F 1	F 6	FF 31	F 3	F 3
16	F 2	FF 14	FF 13	F 2	F 1	F 2	L 3	L 1	L 2	HL 11	C 1	C 2	C 1	C 1	C 1		C 1	L 3	L 4	L 4	FF 32	F 1		F 6
17	F 5	F 3	F 2	F 1	F 2	F 1		L 2	L 1		HL 11	L 1	L 1				L 1	L 1	L 1	LL 12	F 1	F 2	F 1	F 1
18		F 3		F 2			H 1	H 3	C 1	C 1	C 2	C 2	C 2	C 2	L 1	C 1	L 1	C 2	CL 42	L 3	F 3	F 1	F 1	F 1
19		F 1					L 1	CL 22	HL 11	HL 11	L 1	L 1	HL 11	L 2	L 1	L 1	L 1	HL 22	L 3	LL 41	F 4	F 3	F 1	F 1
20	F 1		F 2				C 2	H 2	H 2	C 1	C 1	C 1	C 2	C 2	C 1	C 3	C 4	C 4	C 5		F 6		F 2	F 3
21	F 1	F 3	F 1	F 1	F 1	F 2	L 2	CL 33	CL 23	CL 22	HL 11	HL 11	HL 11			H 1	C 2			FF 31	FF 41	F 3		F 3
22	F 3	F 3	F 6	F 4	F 6	F 3		C 4	CL 21	HL 21	HL 11	H 1	H 1	C 2	C 2		L 1	L 1	L 1	L 2	F 2	FF 63	F 6	F 3
23	FF 21	F 4	FF 21	F 1			H 2	HL 21	CL 22	CL 21	HL 21	CL 21	HL 11	HL 11	L 1	L 1	HL 11	L 2	HL 11	L 1	F 6	F 3	FF 31	F 1
24	FF 31	F 2	F 2	F 1	F 1	F 1	L 1	HL 11	CL 11	C 2	C 2	C 1	L 1	L 1			L 1	L 1					F 1	F 6
25	F 4	F 3	F 3	F 1	F 3	F 2	L 2	LH 42	LH 21	L 2	C 2	C 1	C 2	C 1	L 2	L 2	L 3	L 2	L 2	L 4	F 1	F 1	F 3	F 2
26						F 1		H 1	L 2	C 1	C 1	C 1	L 1	HL 11	L 1	HL 22	HL 11	CL 23	LL 32	LL 22	F 2	F 1	F 3	F 2
27	F 1		F 2	F 1				L 1	C 2	C 2	C 1	C 1	C 2	C 2	C 2	C 3	LL 33	LL 33	CL 52	LL 32	FF 63	FF 31	F 2	F 3
28	F 1	FF 11	F 1			F 1	H 1	H 1	HL 22	HC 12	HC 11	HC 11	CH 21	HC 11	HC 11	HL 21	CL 31	C 2	L 2	L 1	F 1	F 2	F 1	F 4
29	F 1	F 3	F 2				C 1	H 1	HC 11		L 2	L 1	L 1	C 1	H 1		C 1	C 3	C 2	L 5	FF 42	F 6	F 4	F 2
30	F 4	F 1	F 6	F 1	F 6	F 6	L 3	H 1	H 1	H 1	HC 11	C 1	HC 11	H 1	H 1		L 2		C 4	L 6	F 4	F 5	FF 22	FF 11
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

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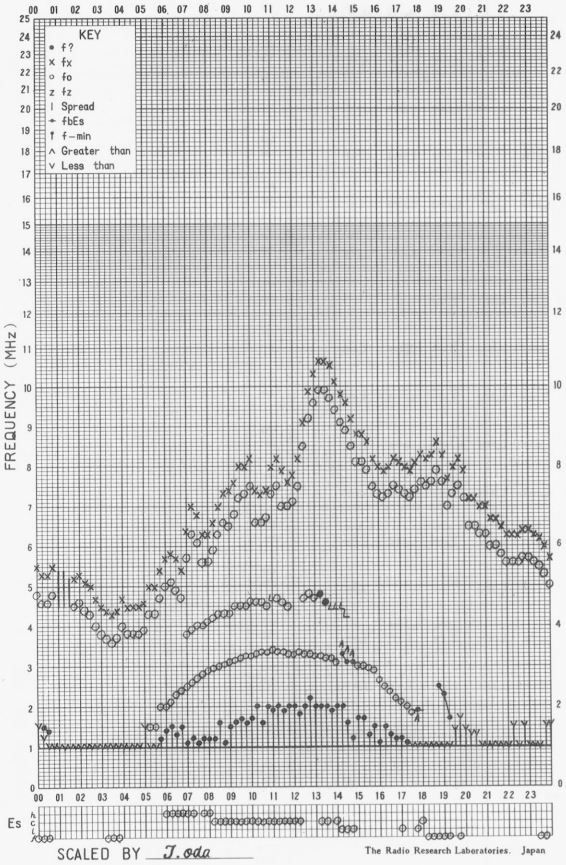
APR. 1973 | TYPES OF ES

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE APR. 1, 1973



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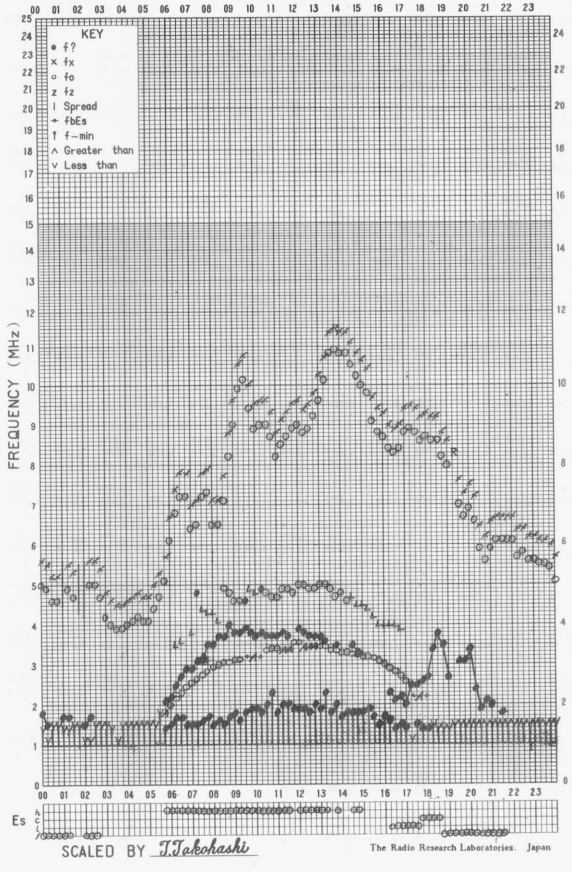
f-PLOT OF IONOSPHERIC DATA

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



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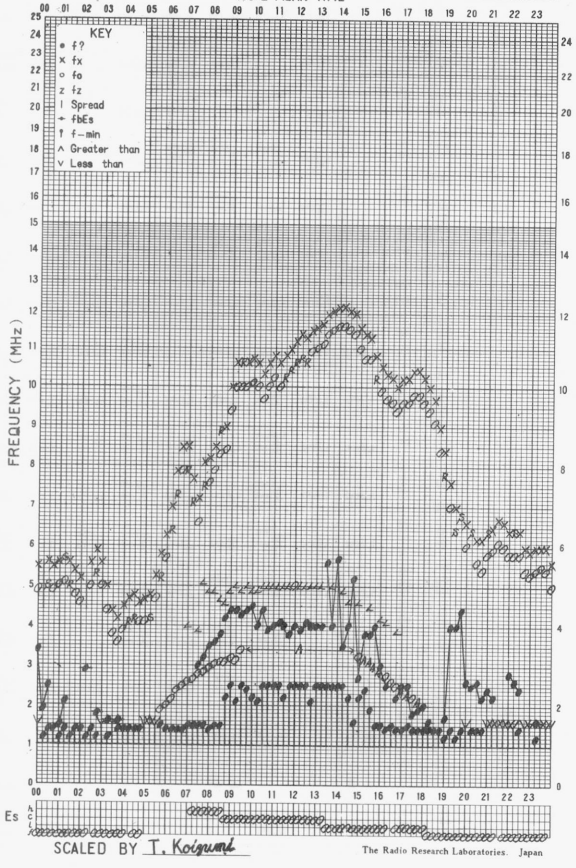
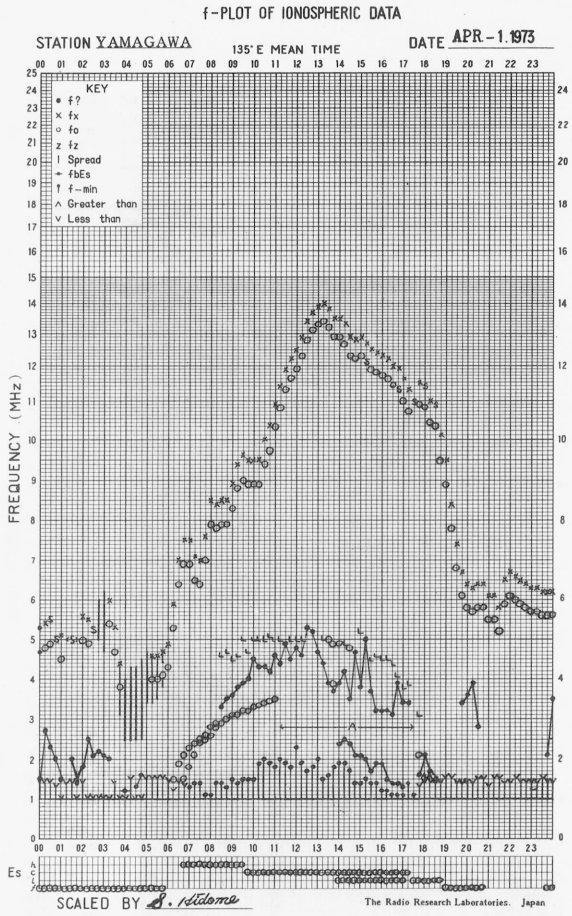
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE APR. 1, 1973



SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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STATION YAMAGAWA
135° E MEAN TIME
DATE APR.-1.1973
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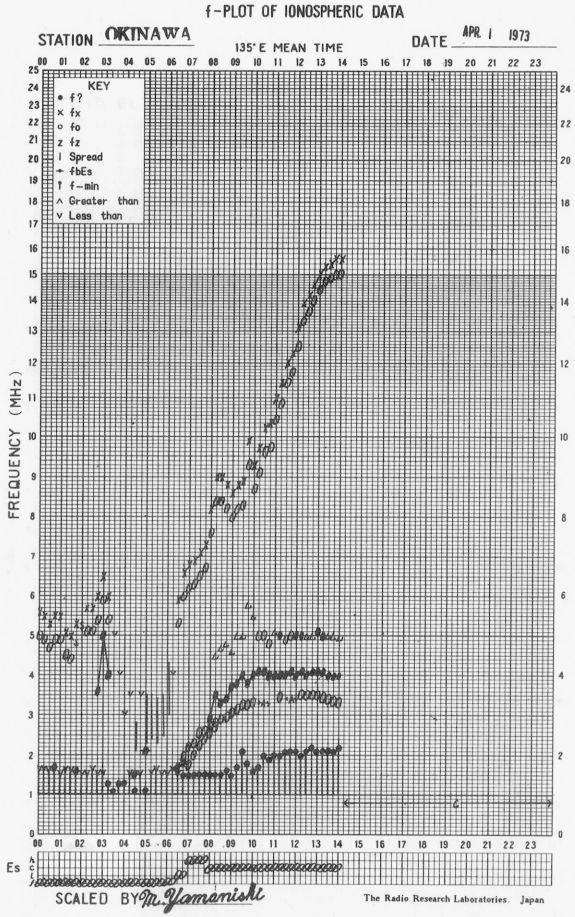
SCALED BY S. Hidema
The Radio Research Laboratories. Japan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STATION OKINAWA
135° E MEAN TIME
DATE APR. 1 1973
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FREQUENCY (MHz)
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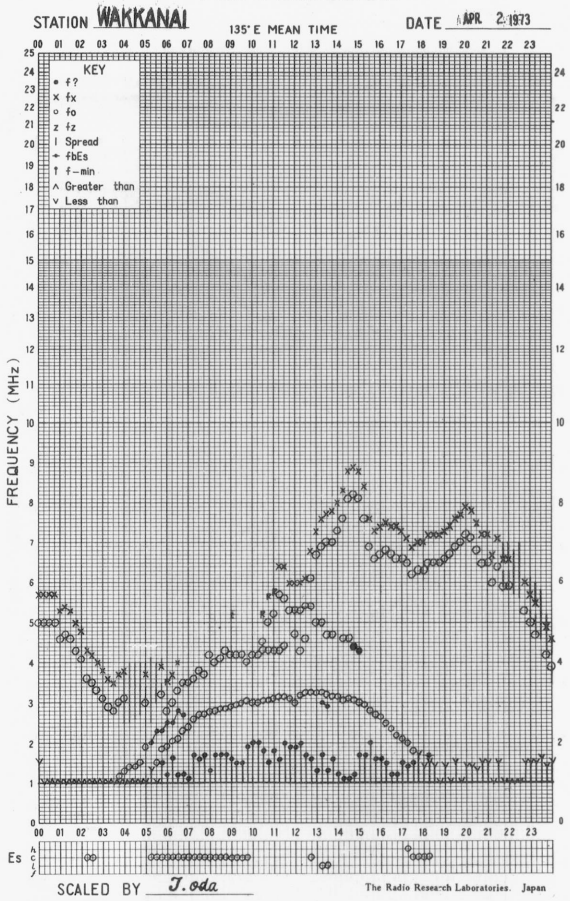
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE APR. 2, 1973



SCALED BY T. oda

The Radio Research Laboratories. Japan

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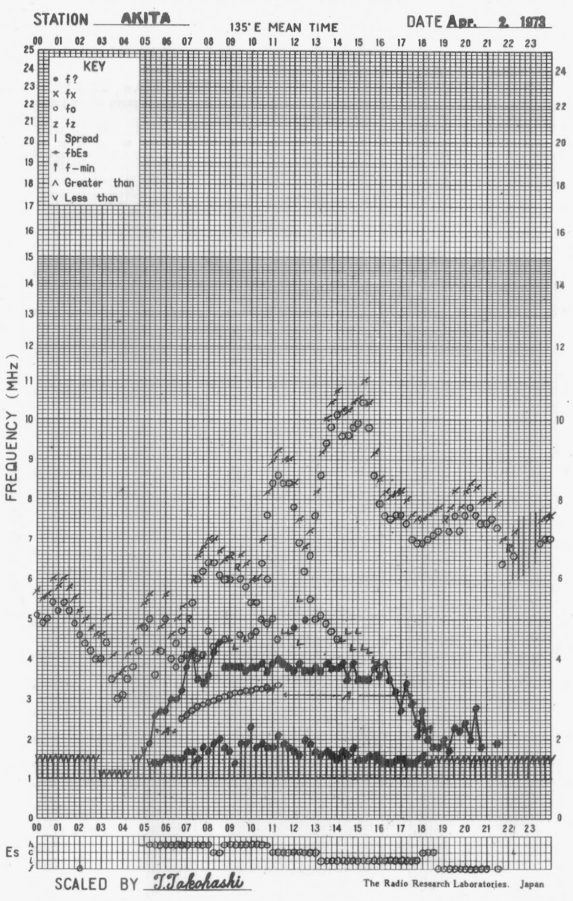

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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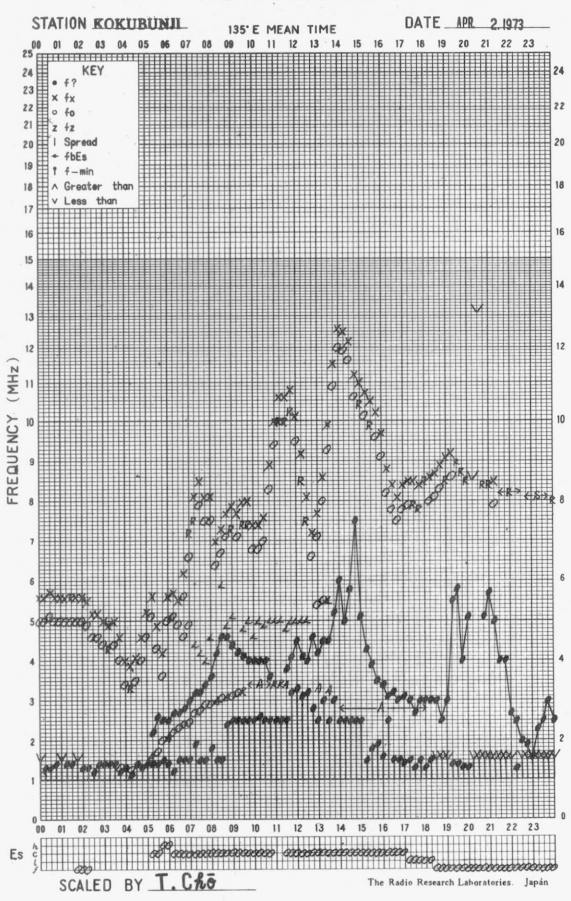

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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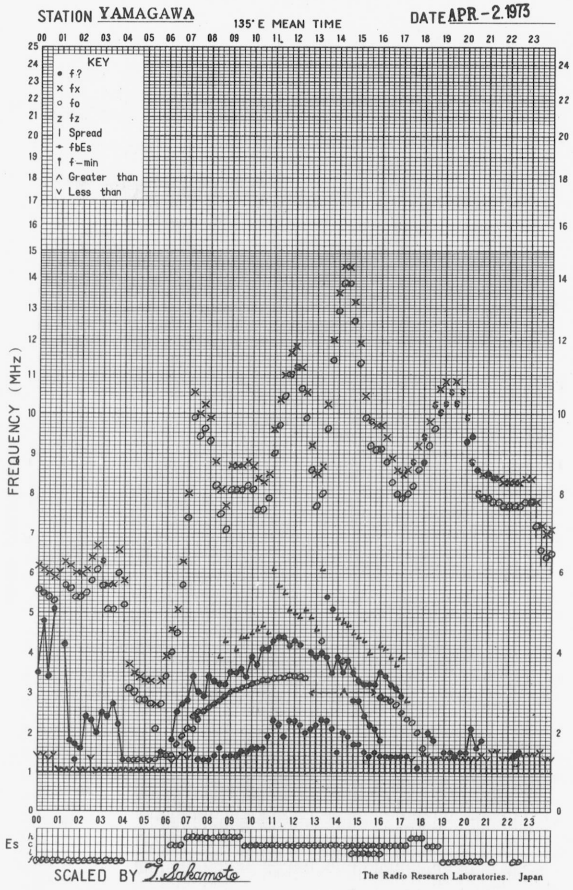

SCALED BY T. Sakamoto

The Radio Research Laboratories. Japan

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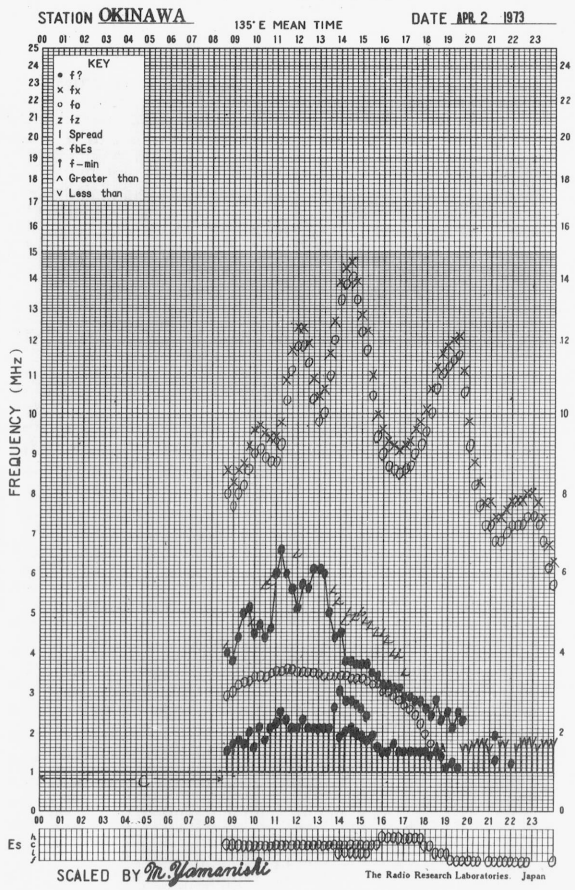

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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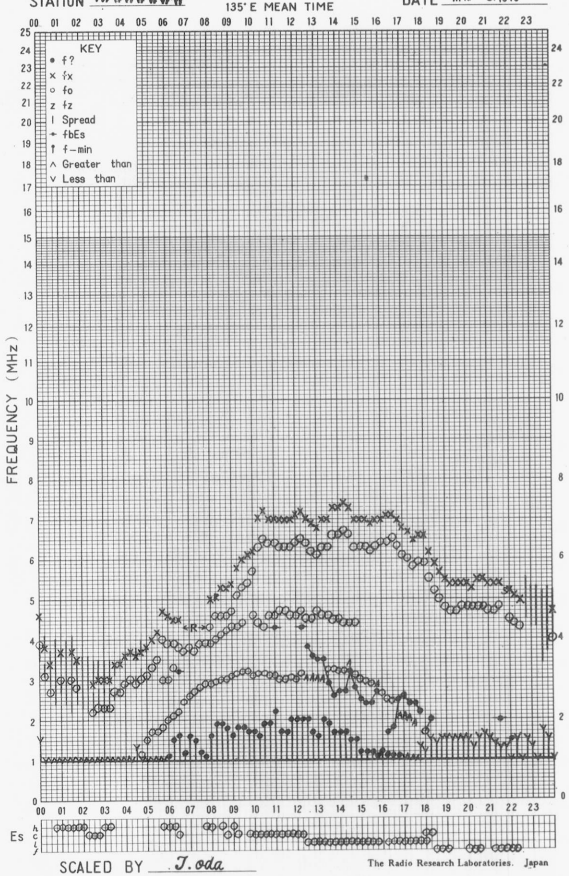

SCALED BY T. oda

The Radio Research Laboratories. Japan

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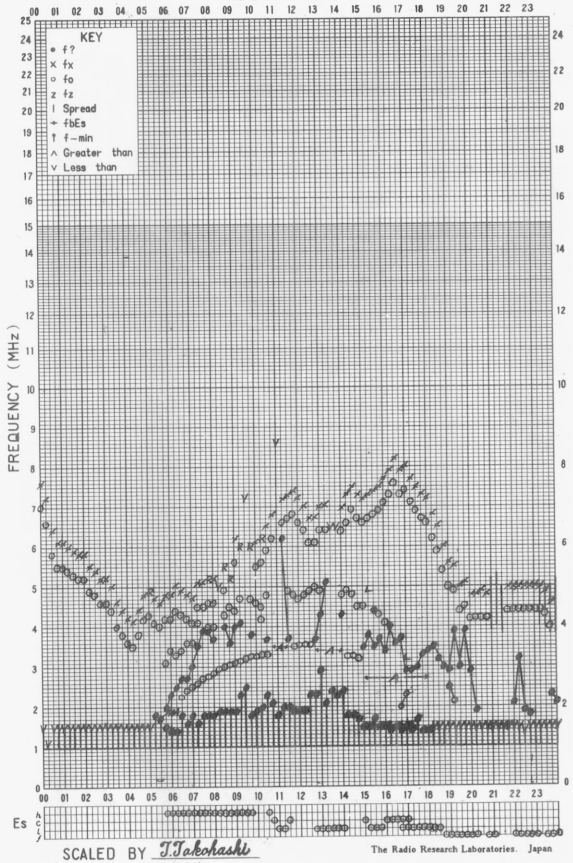

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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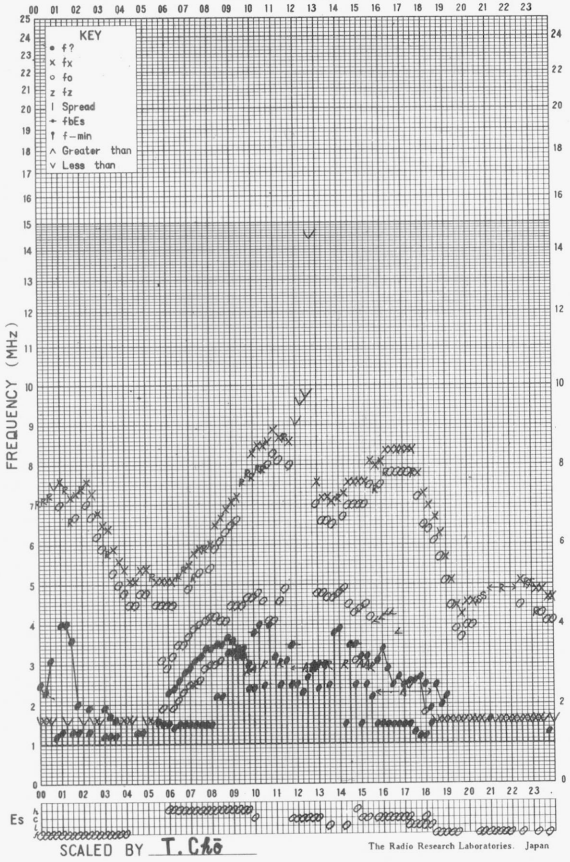
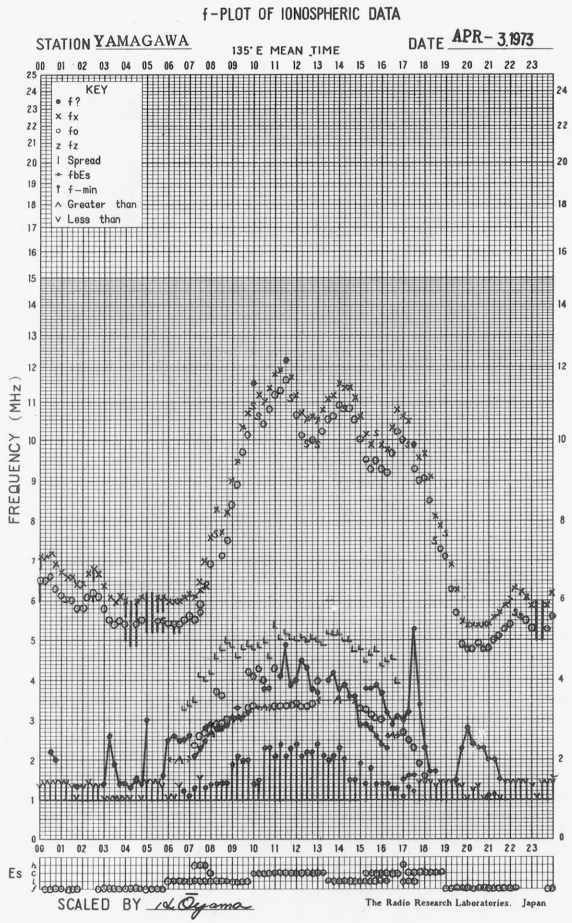


SCALED BY T. Chō

The Radio Research Laboratories. Japan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DATE APR- 3 1973
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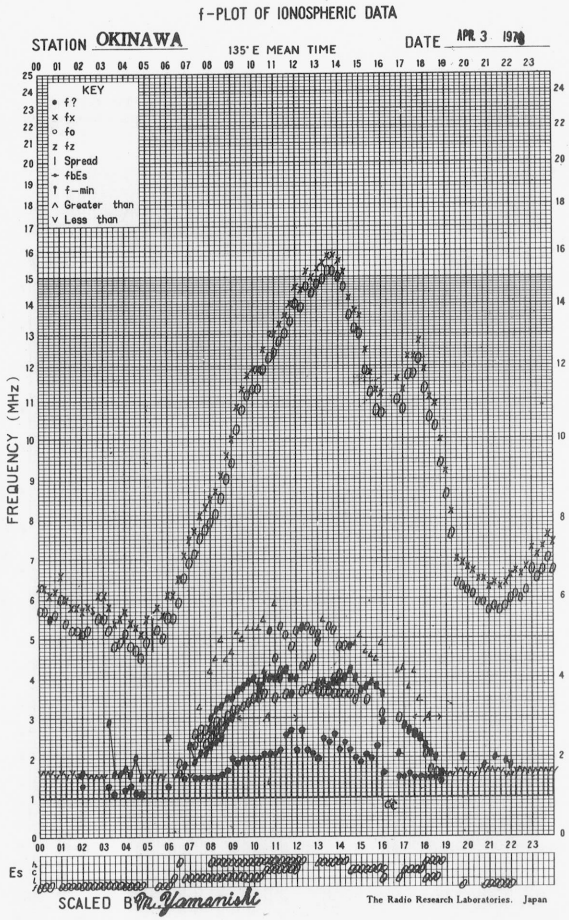
SCALED BY K. Ozama
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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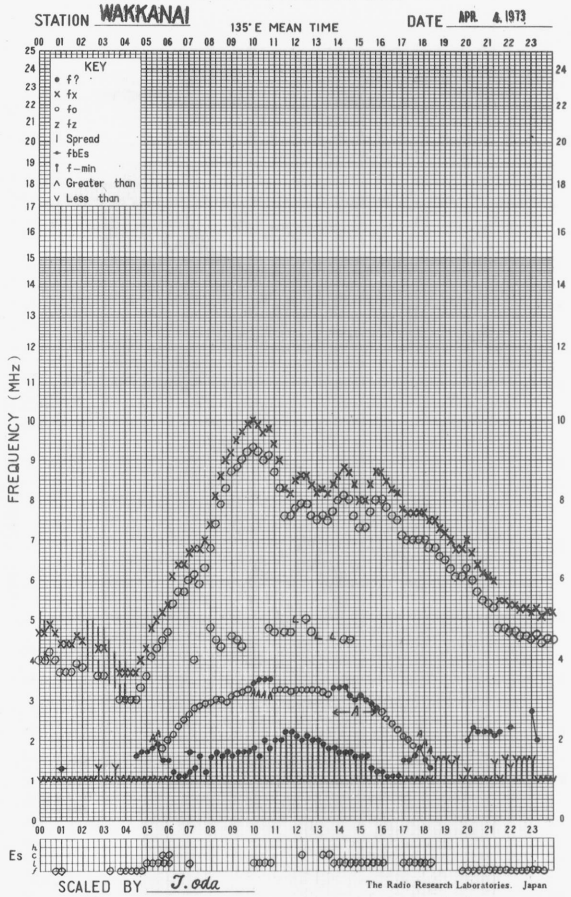
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE APR. 4, 1973



SCALED BY T. oda

The Radio Research Laboratories. Japan

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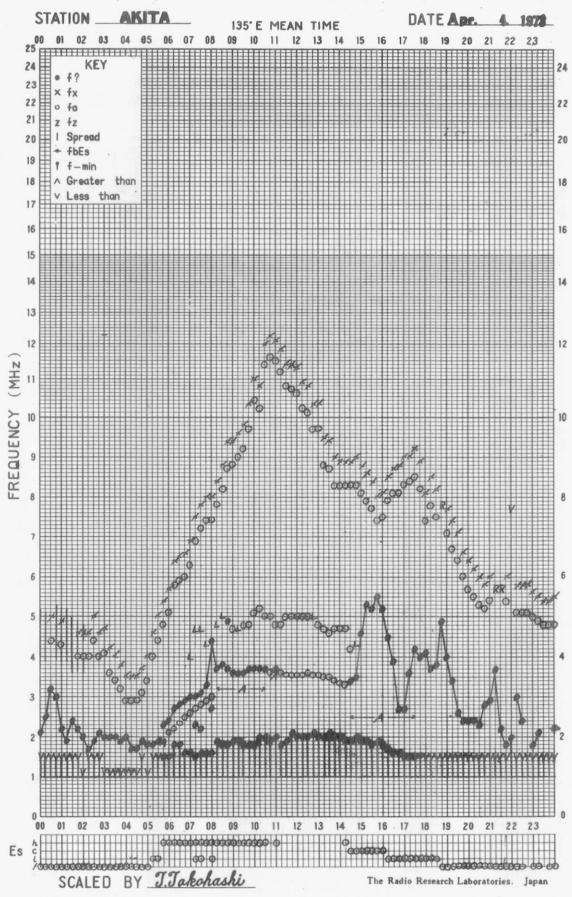

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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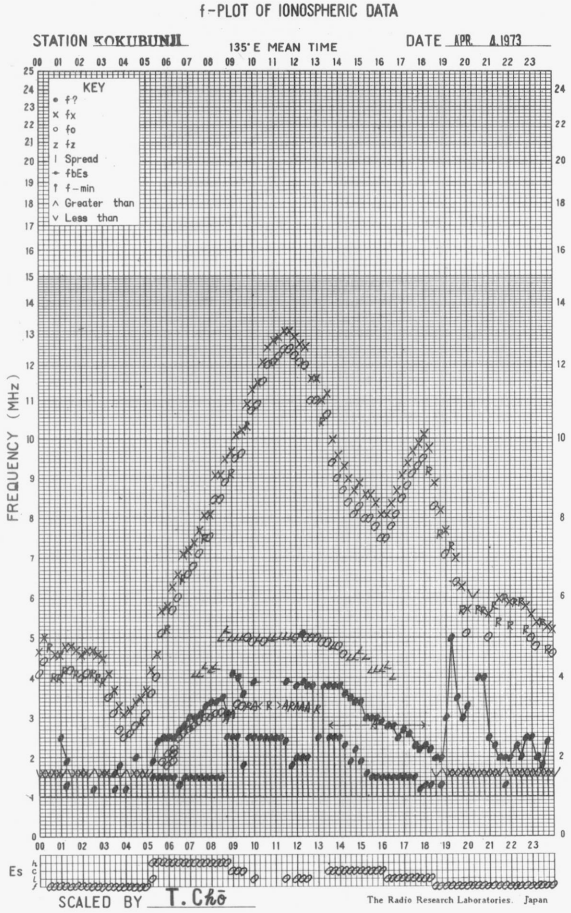

SCALED BY T. Cho

The Radio Research Laboratories. Japan

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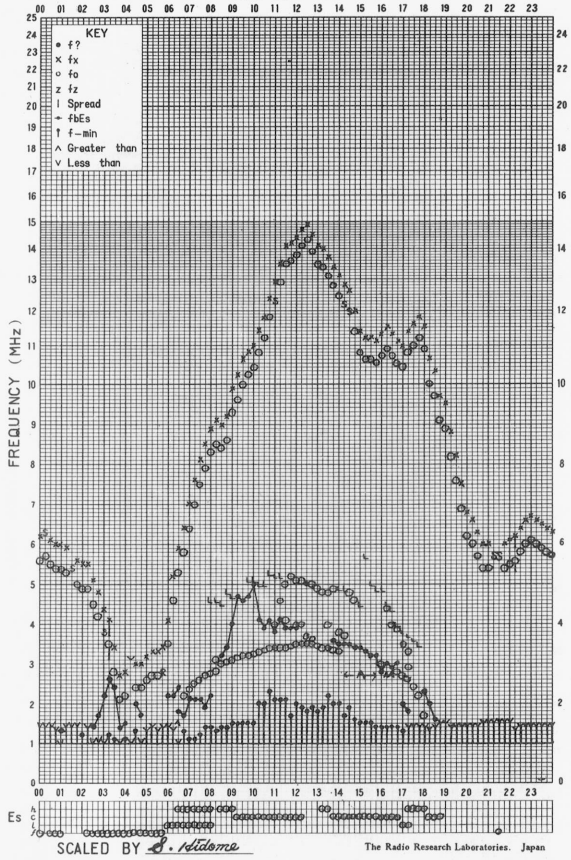

SCALED BY S. Hidaka The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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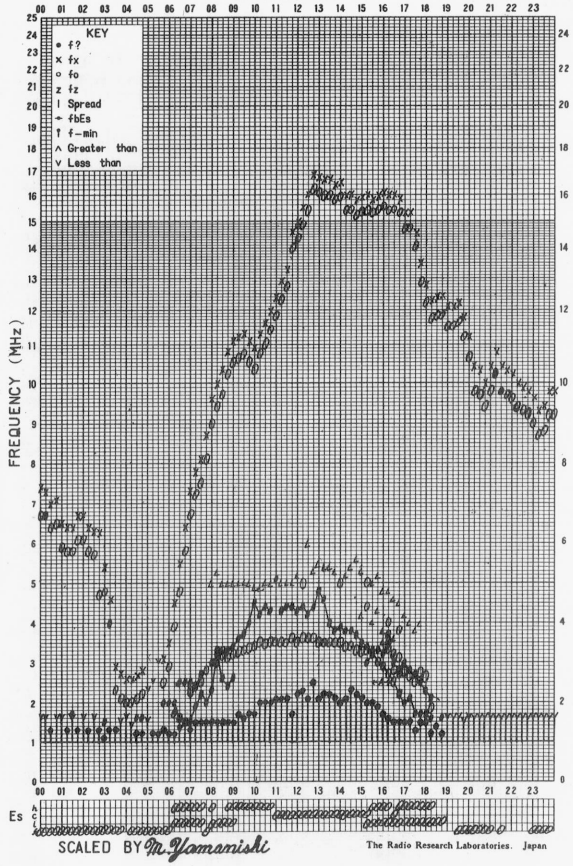

SCALED BY M. Yamanishi The Radio Research Laboratories. Japan

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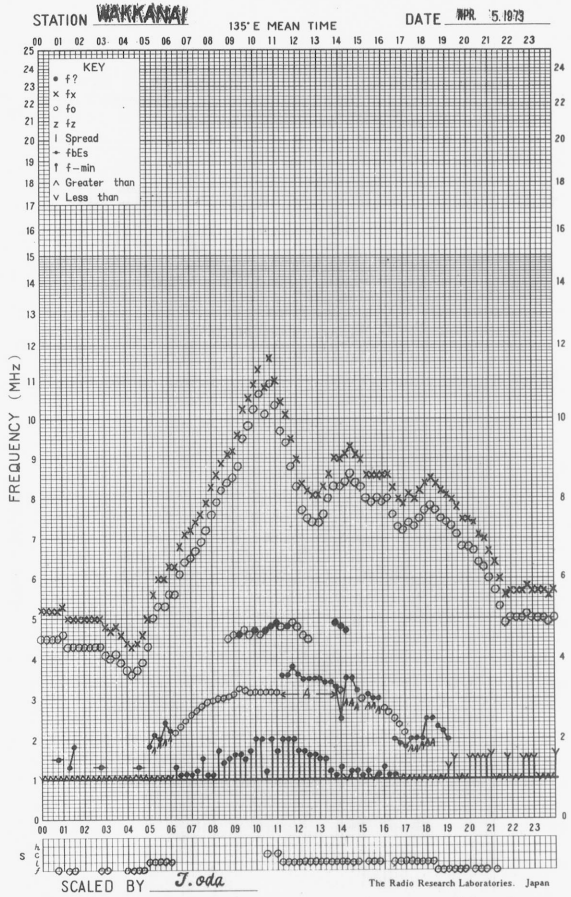

SCALED BY J. oda

The Radio Research Laboratories. Japan

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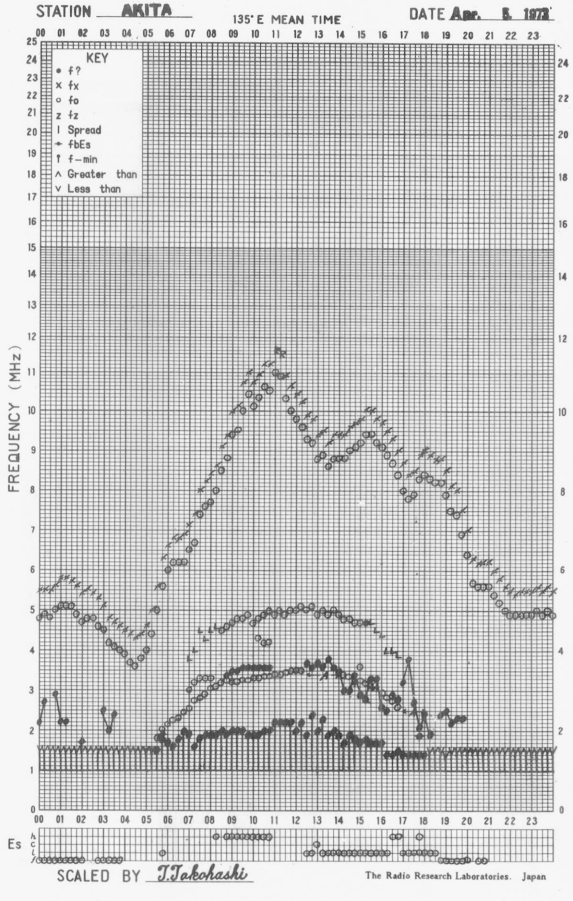

SCALED BY J. Takahashi

The Radio Research Laboratories. Japan

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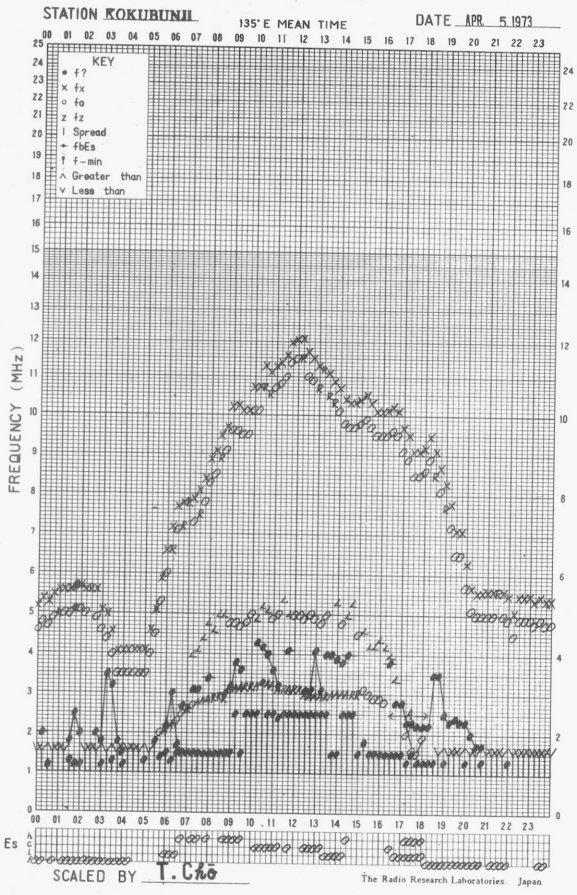

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The Radio Research Laboratories. Japan

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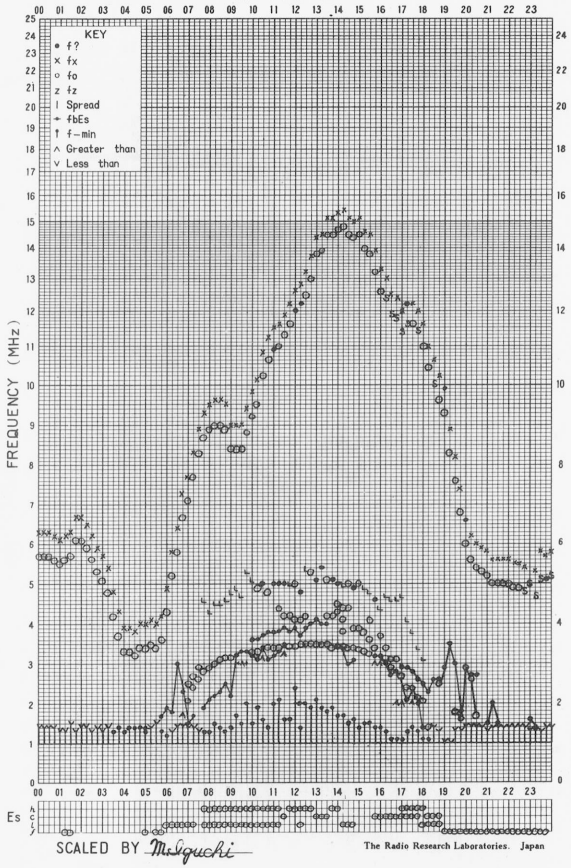

SCALED BY M. Iguchi

The Radio Research Laboratories. Japan

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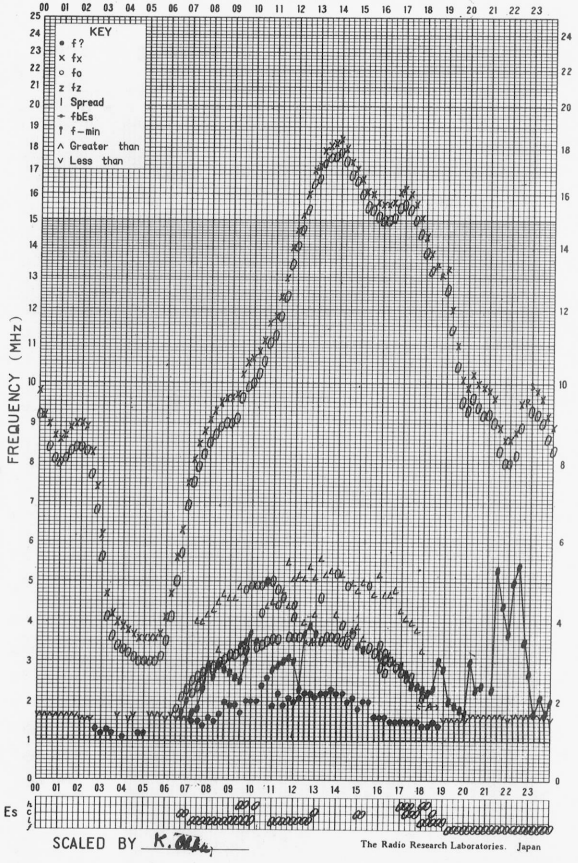

SCALED BY K. Ma...

The Radio Research Laboratories. Japan

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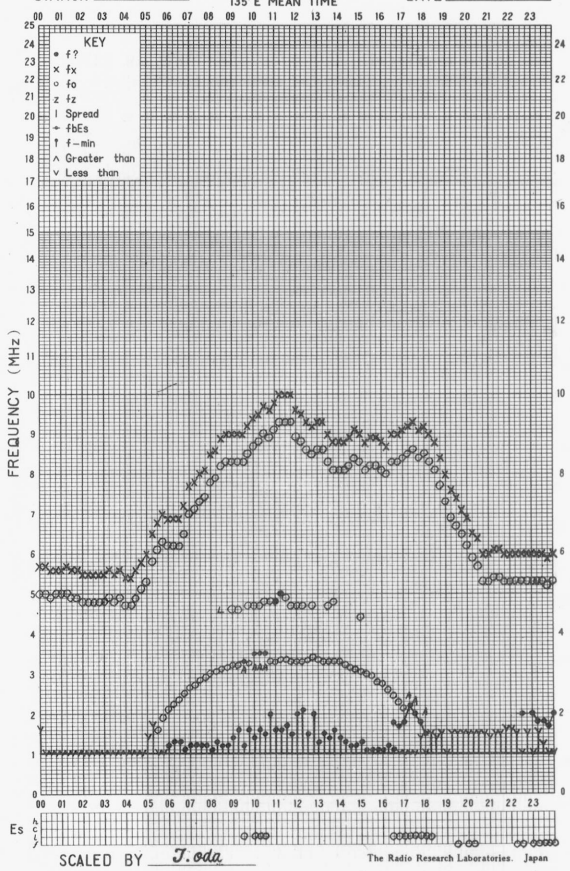

SCALED BY T. oda

The Radio Research Laboratories. Japan

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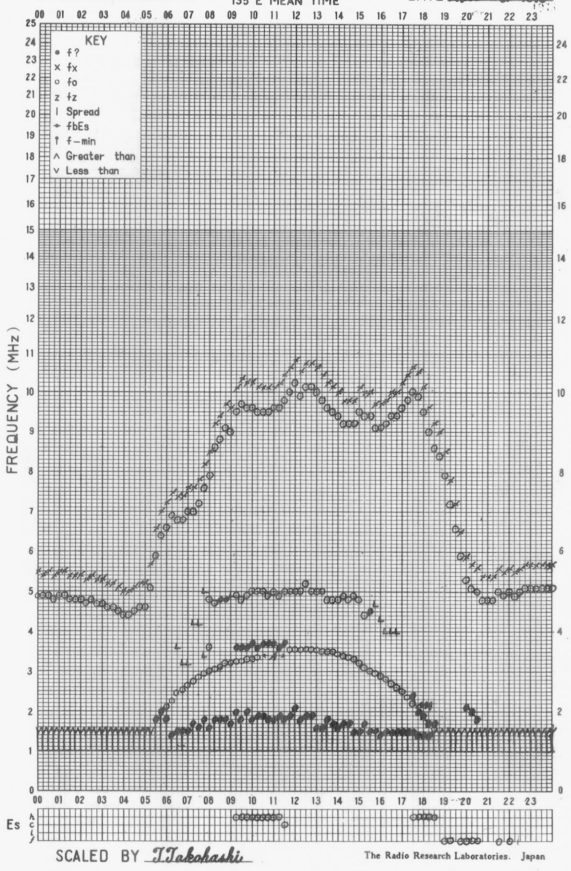

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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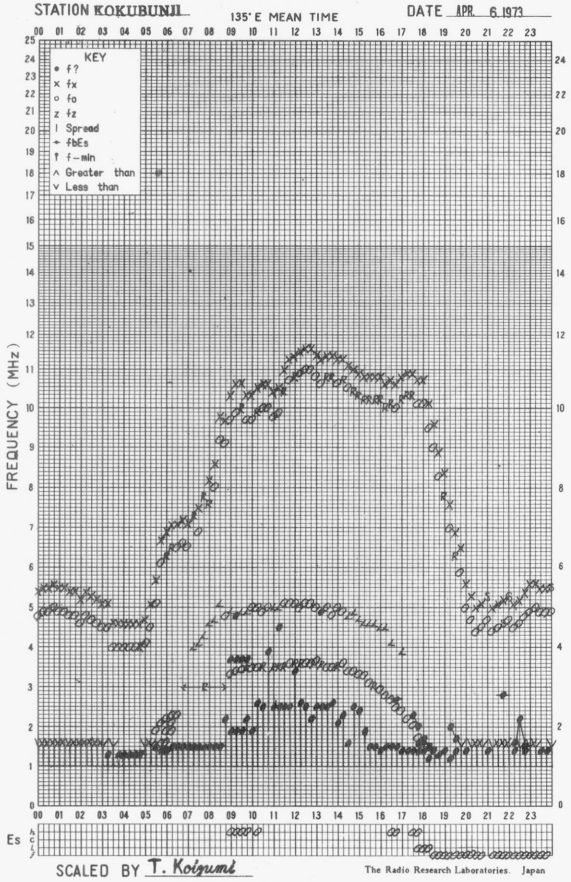
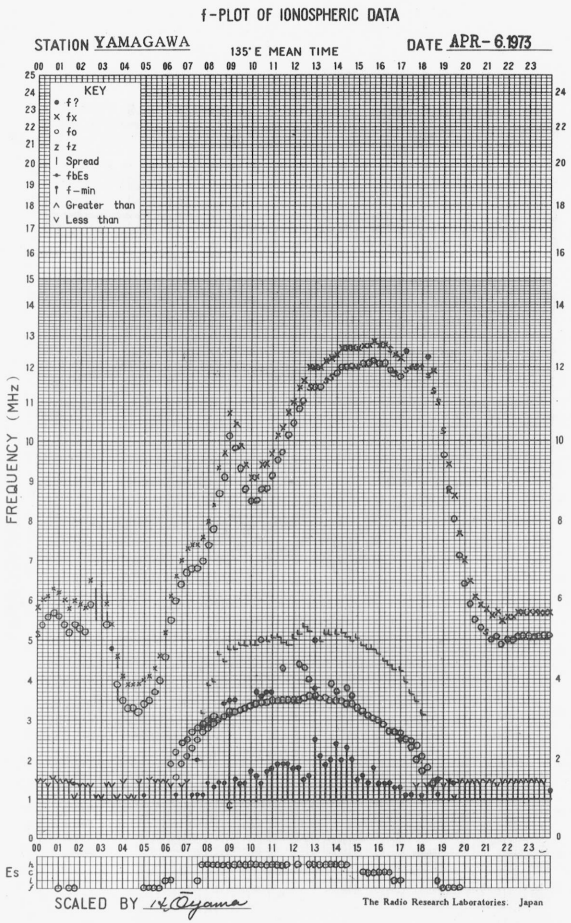


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE APR-6.1973
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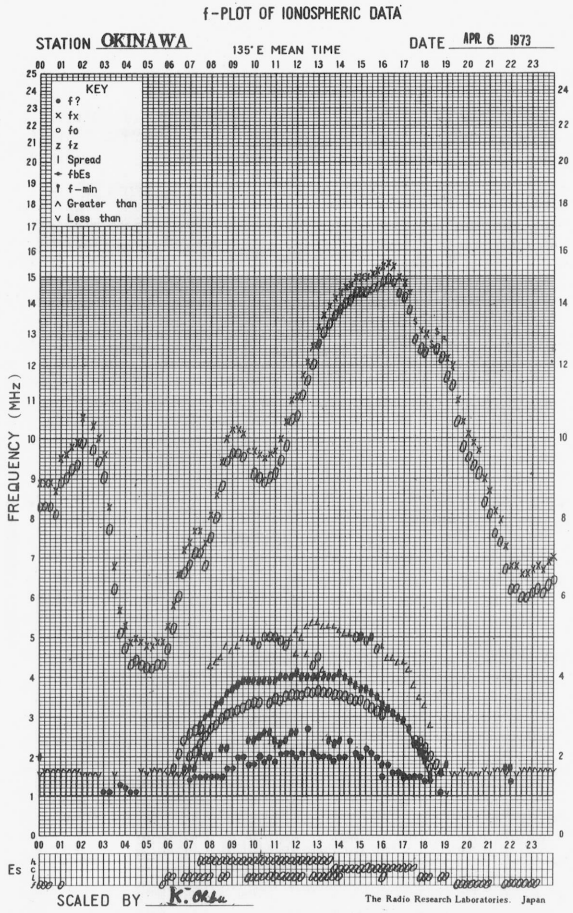
SCALED BY K. Ōyama
The Radio Research Laboratories. Japan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SCALED BY K. Oka
The Radio Research Laboratories. Japan

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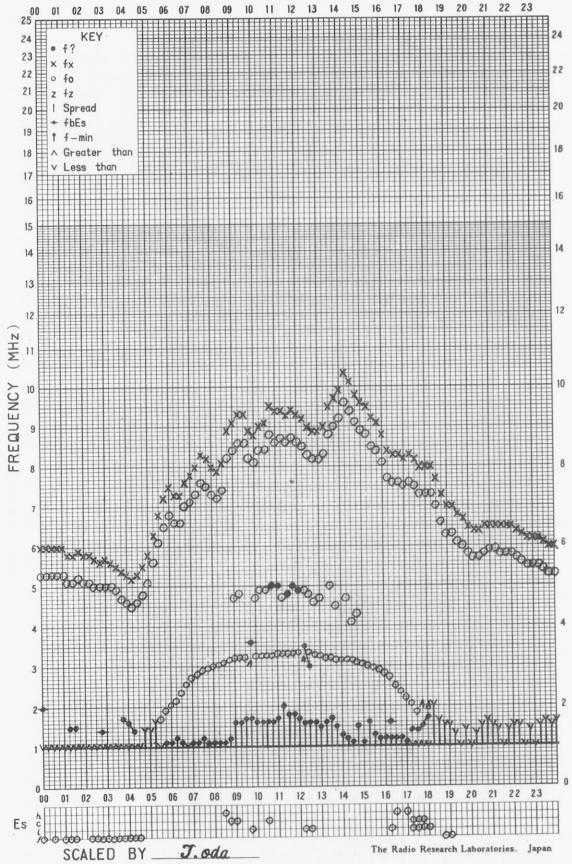

SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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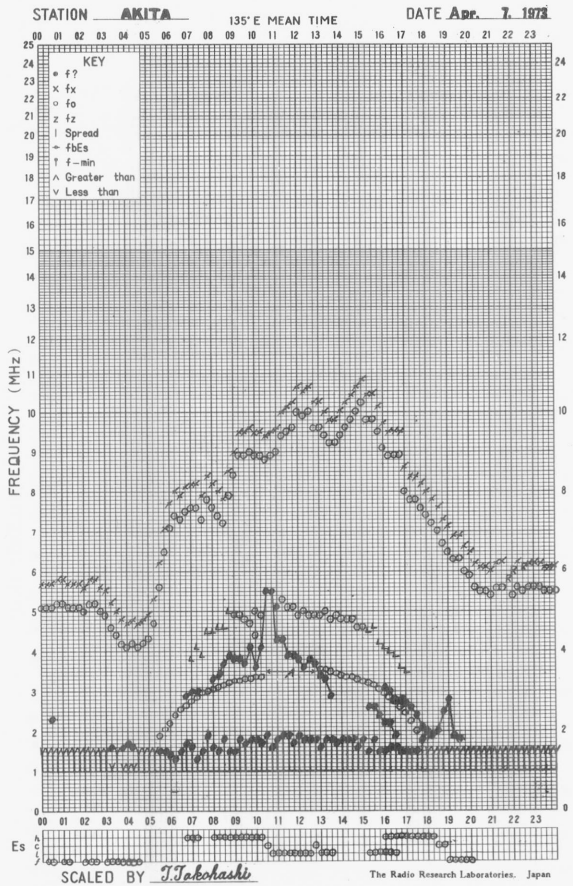

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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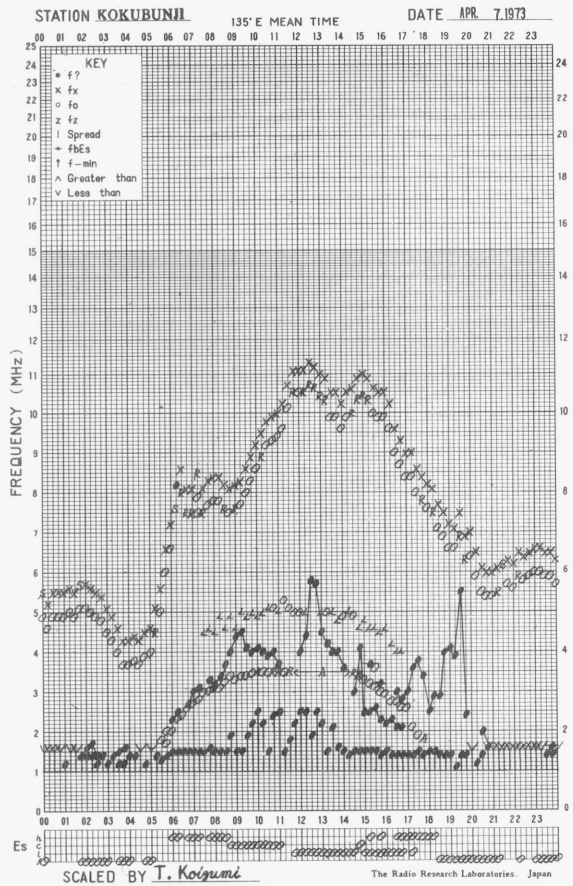
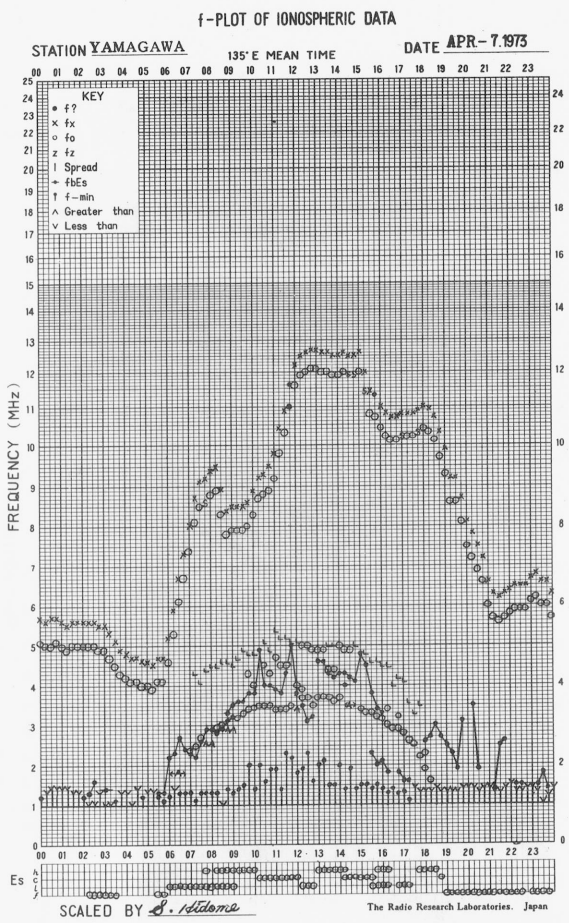


SCALED BY T. Koigumi

The Radio Research Laboratories. Japan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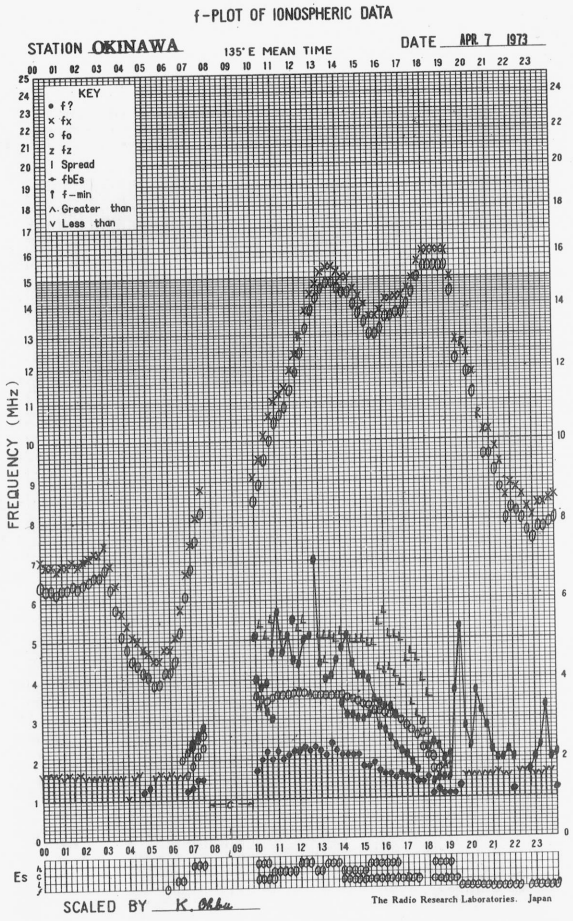
SCALED BY S. Ishioma
The Radio Research Laboratories. Japan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SCALED BY K. Okku
The Radio Research Laboratories. Japan

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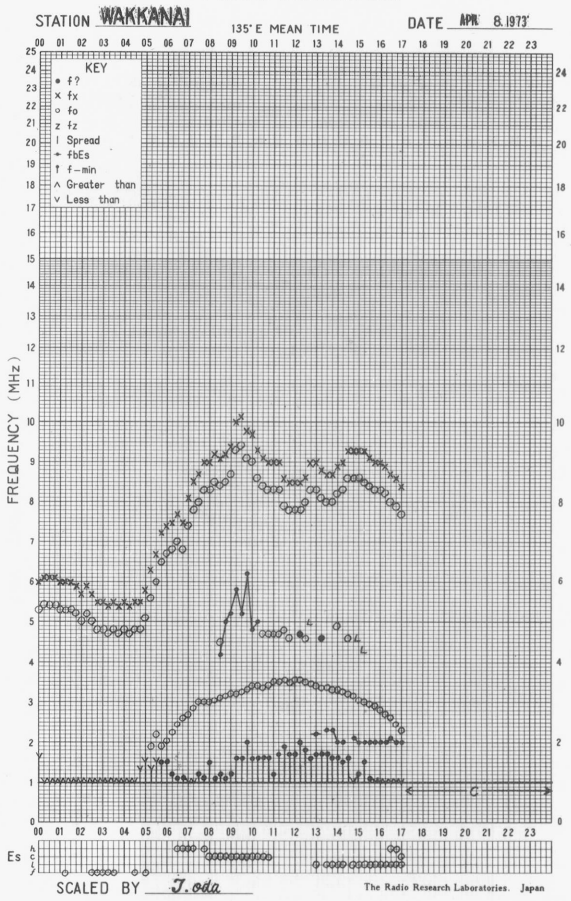

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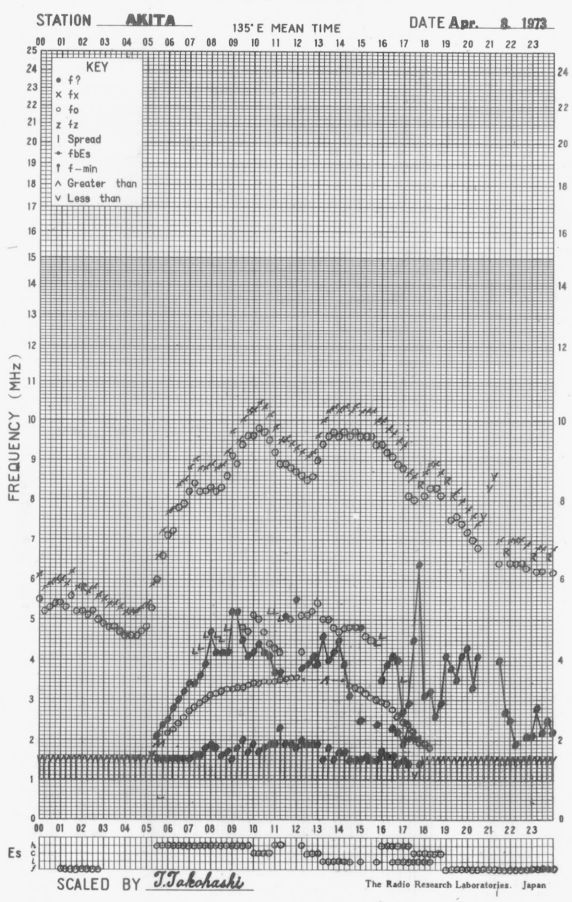

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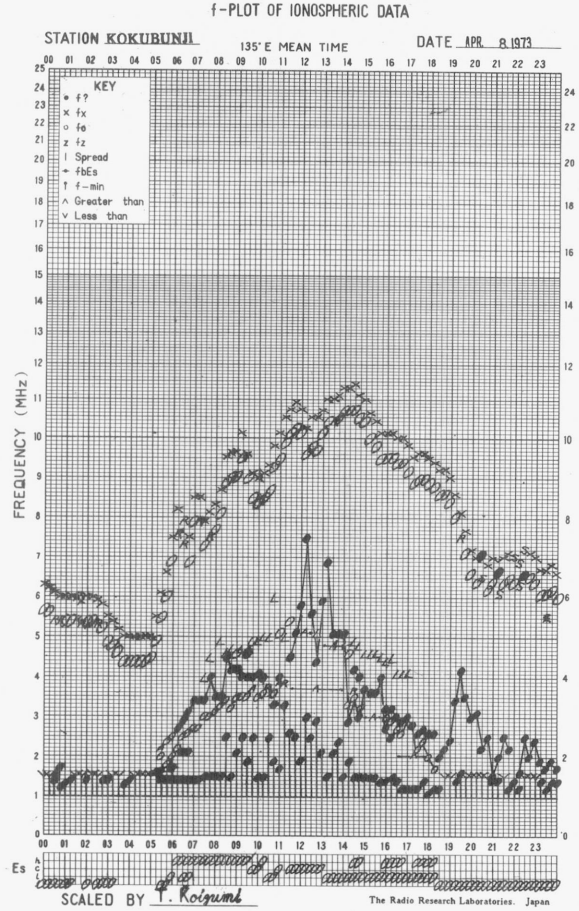

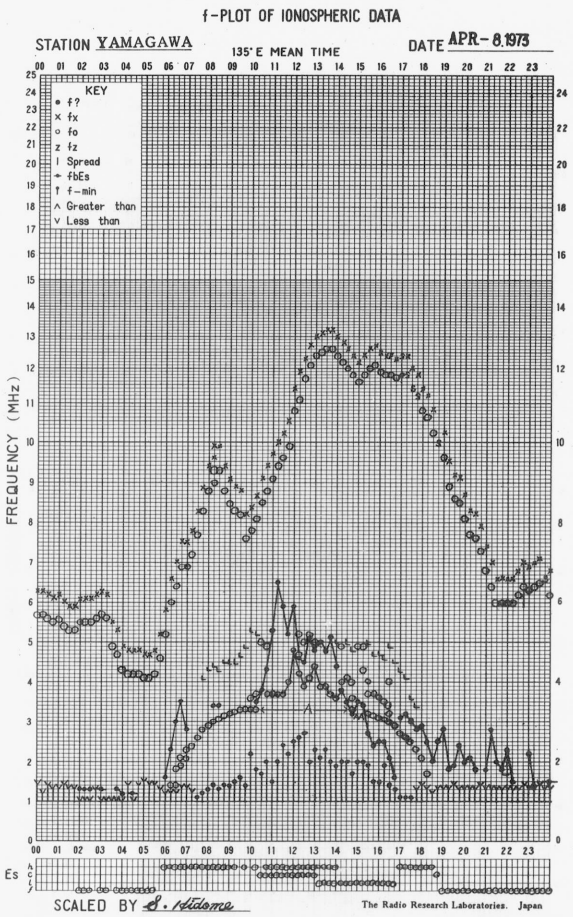
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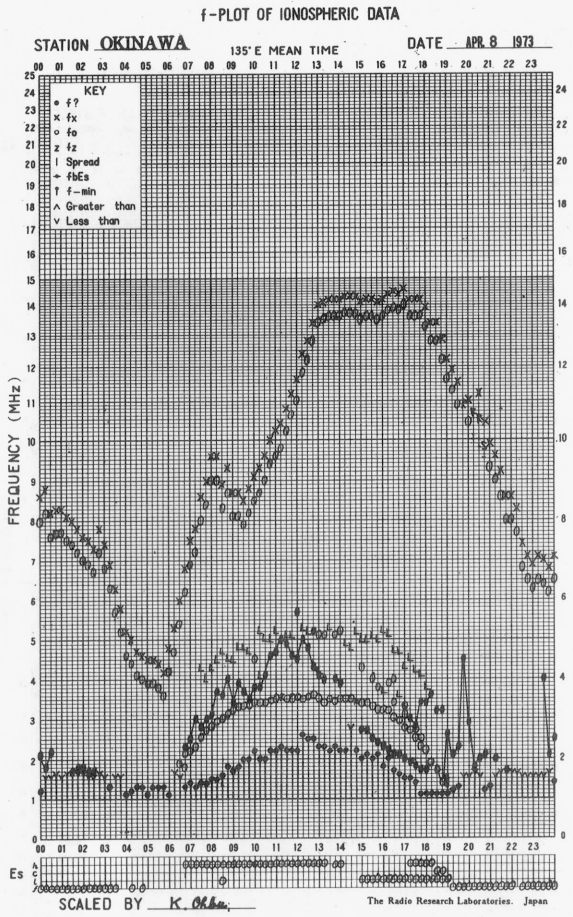
SCALED BY S. Ichidome
The Radio Research Laboratories. Japan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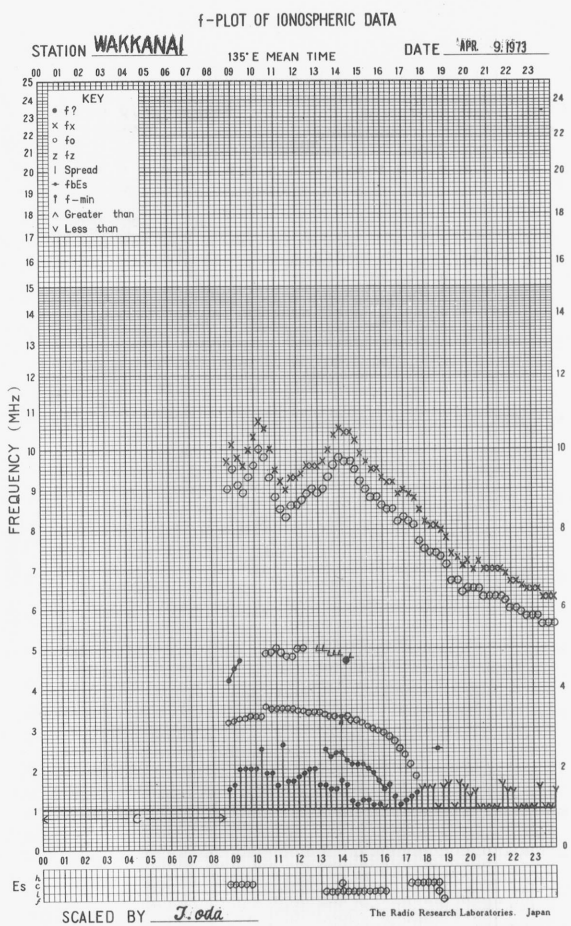
SCALED BY K. Okba
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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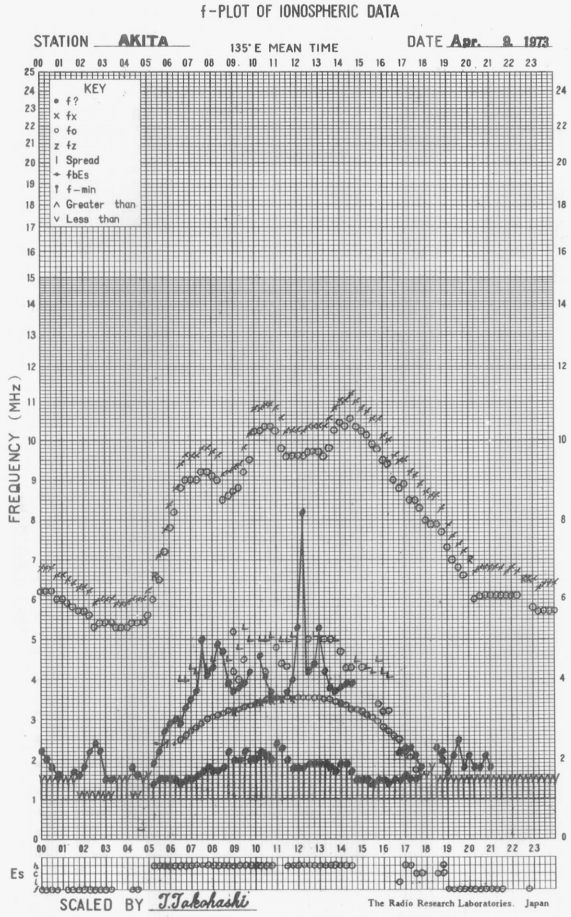
SCALED BY I. oda
The Radio Research Laboratories. Japan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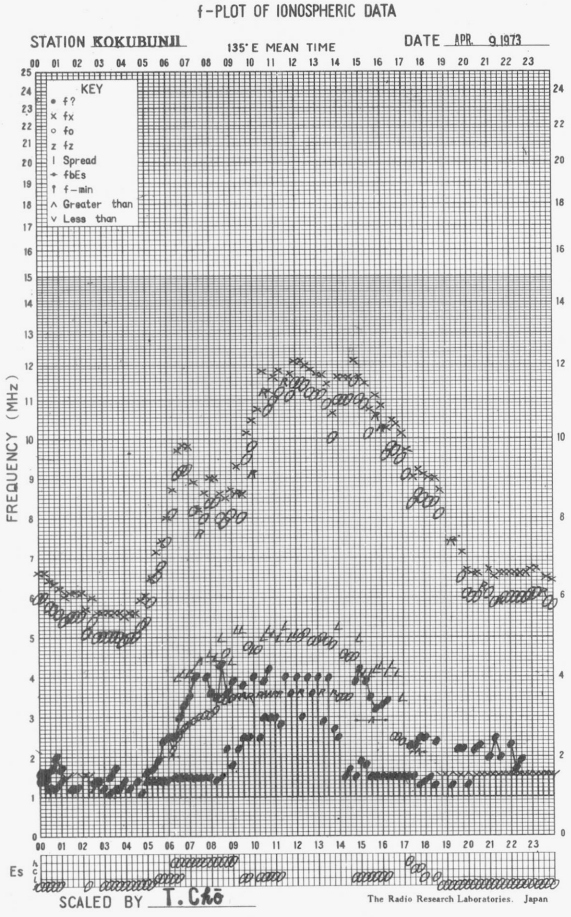
SCALED BY T.Takahashi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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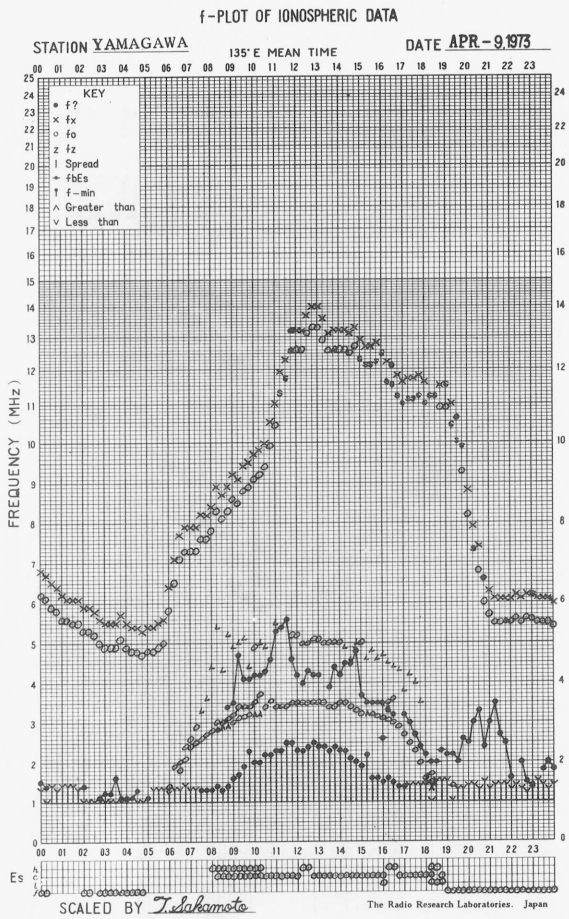
SCALED BY T. Cho
The Radio Research Laboratories. Japan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DATE APR.-9.1973
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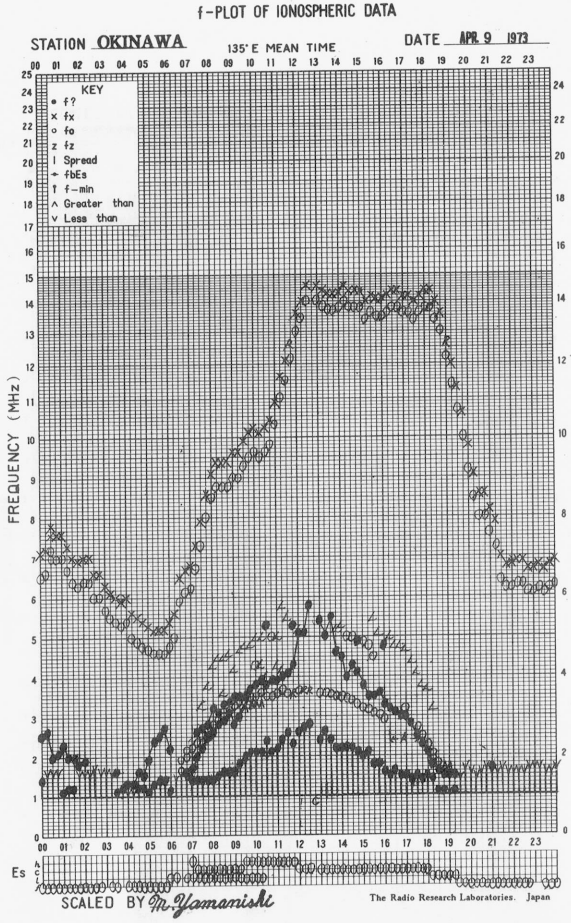
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Sakamoto
The Radio Research Laboratories. Japan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∧ Greater than
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FREQUENCY (MHz)
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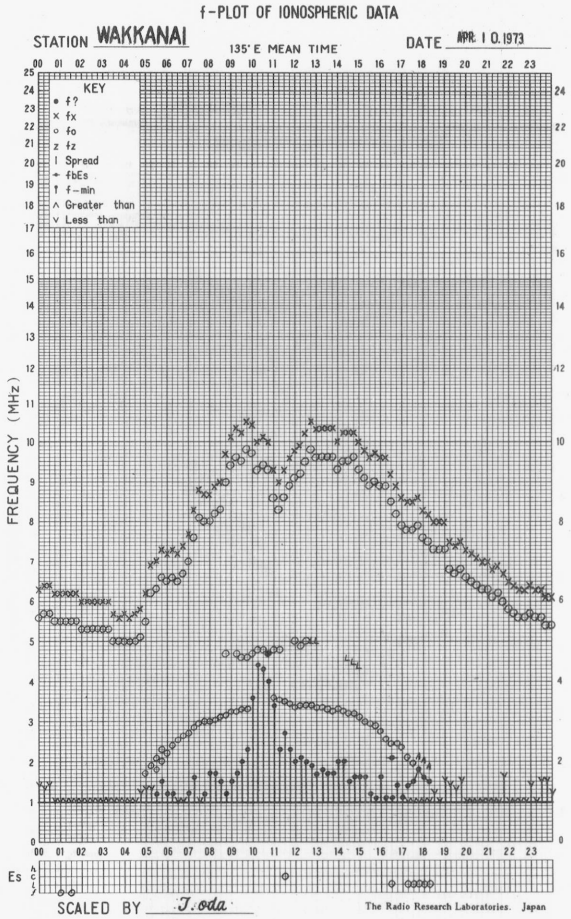
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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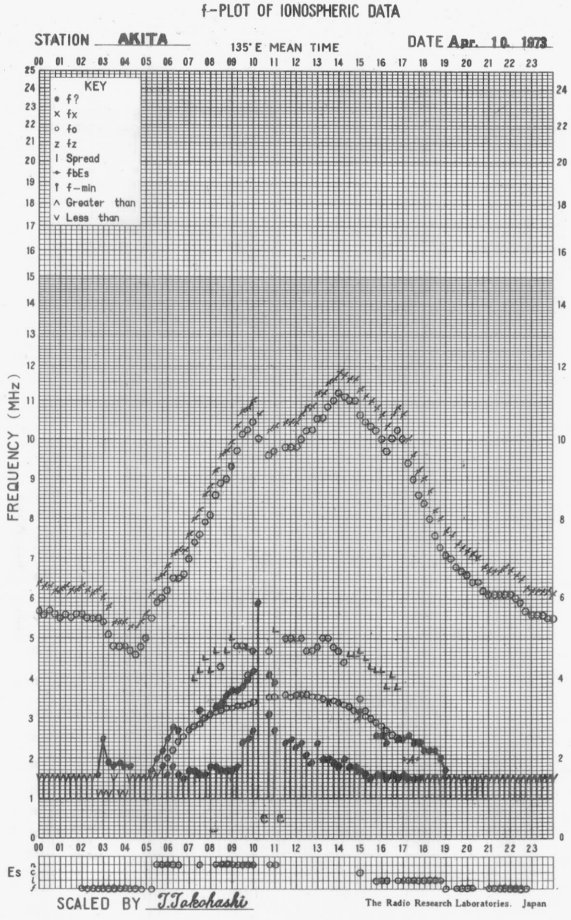
SCALED BY T. Oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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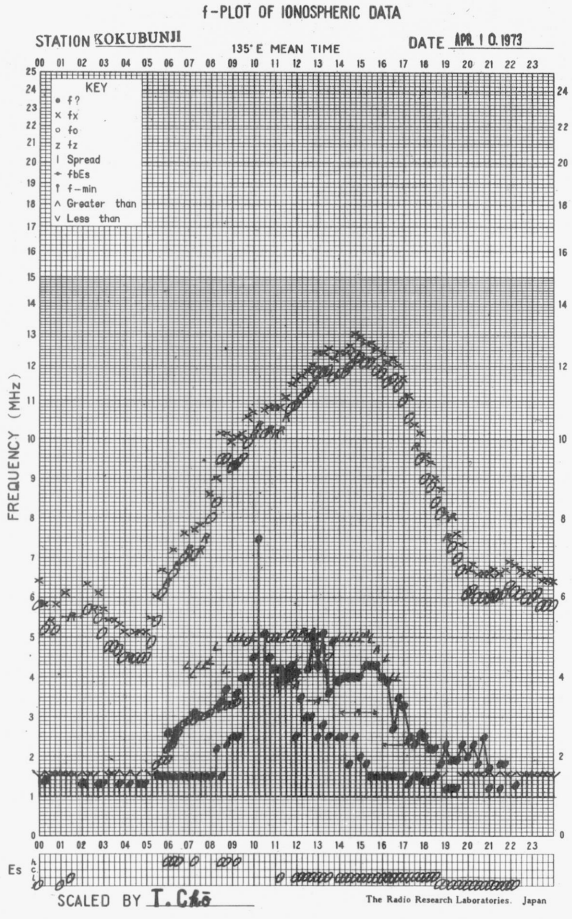
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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DATE APR. 10. 1973
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FREQUENCY (MHz)
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SCALED BY T. Ito
The Radio Research Laboratories. Japan

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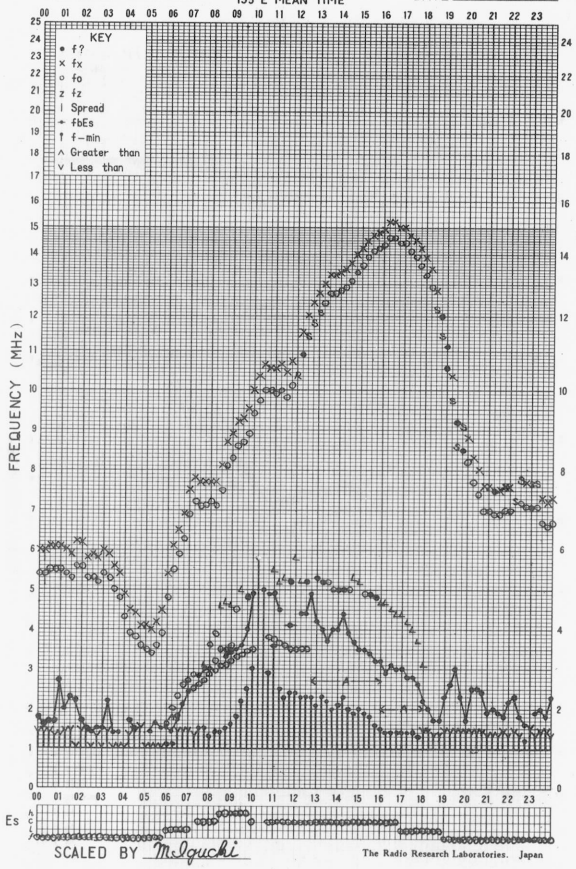

SCALED BY M. Iguchi

The Radio Research Laboratories. Japan

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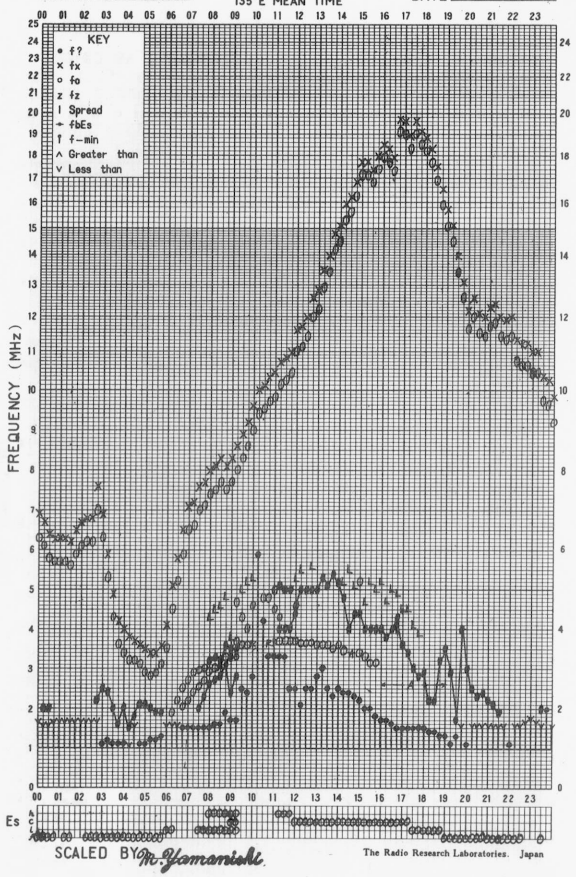

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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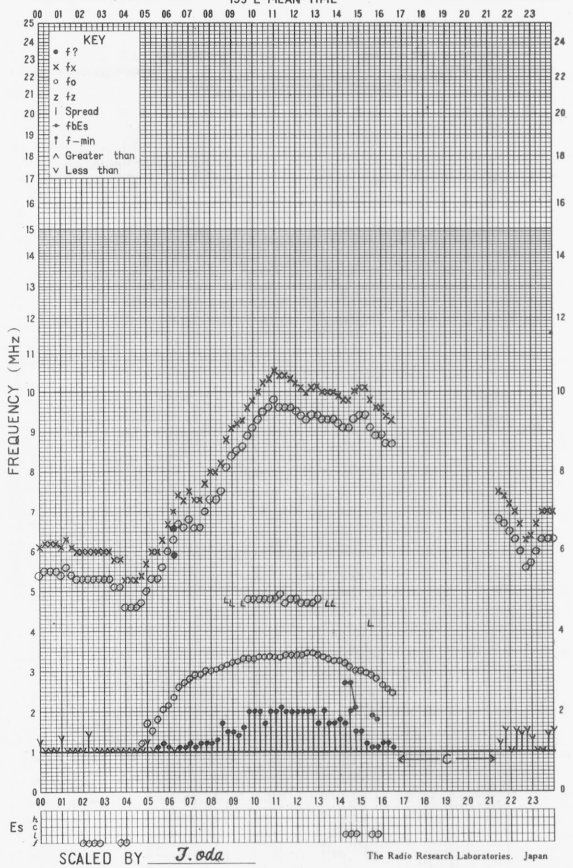

SCALED BY J. oda

The Radio Research Laboratories. Japan

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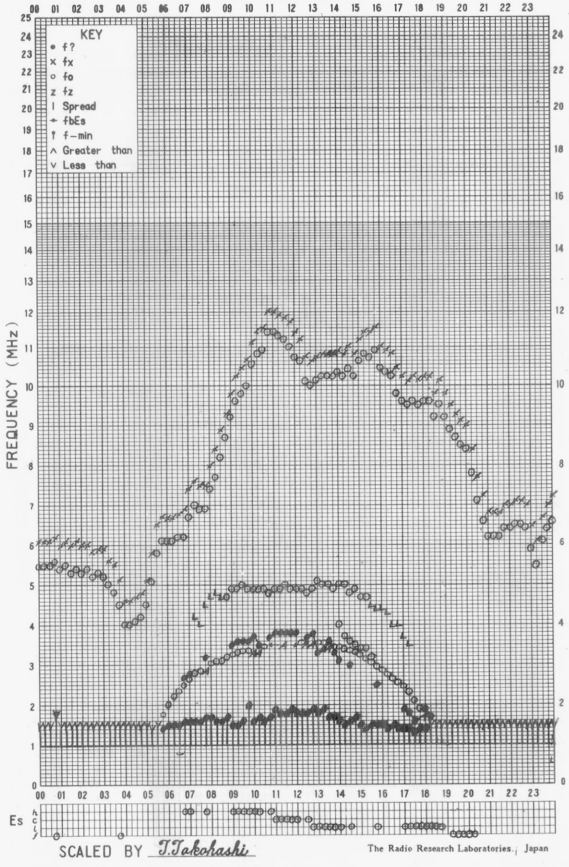

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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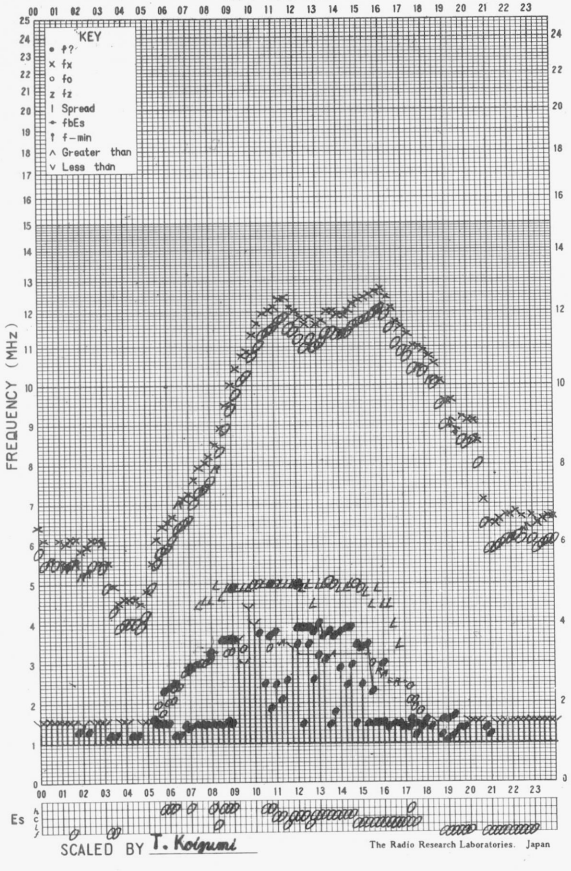
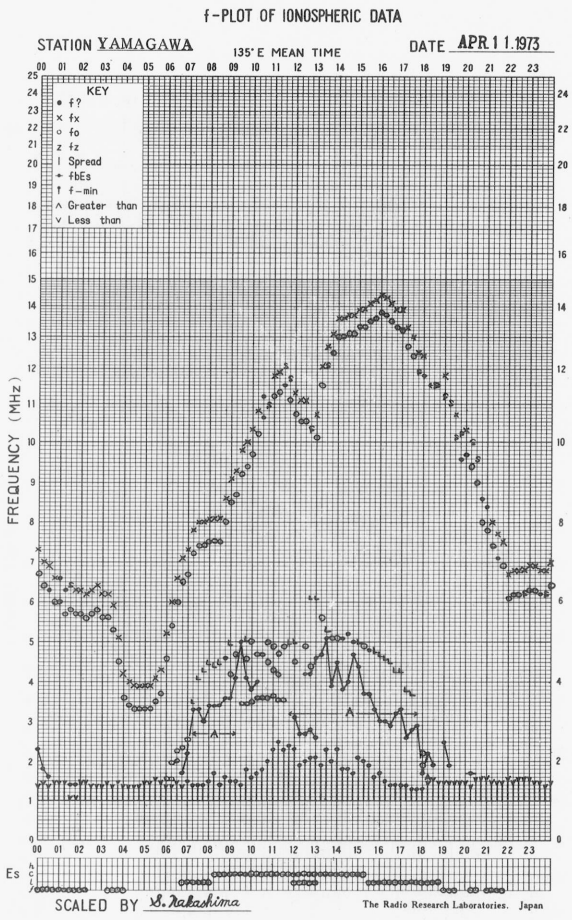


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE APR 1 1.1973
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FREQUENCY (MHz)
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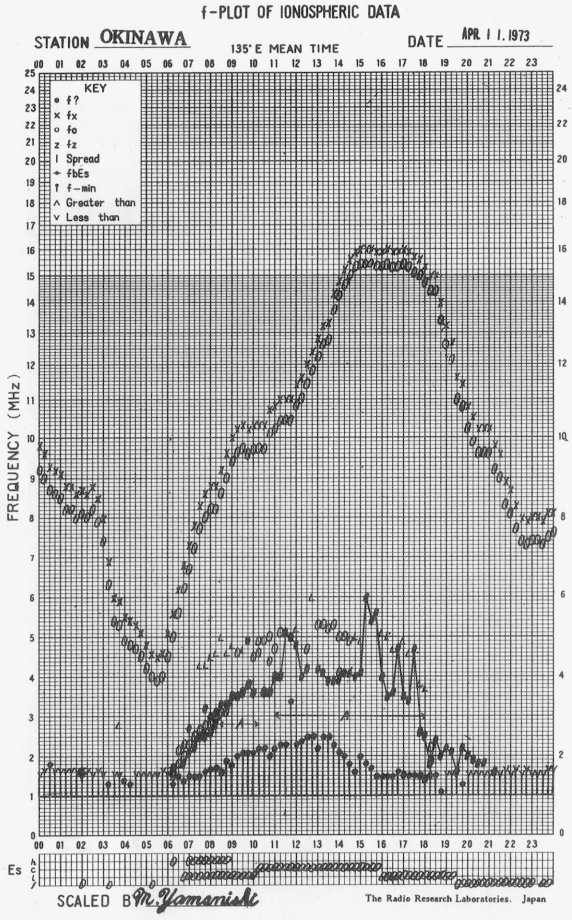
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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DATE APR 1 1.1973
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FREQUENCY (MHz)
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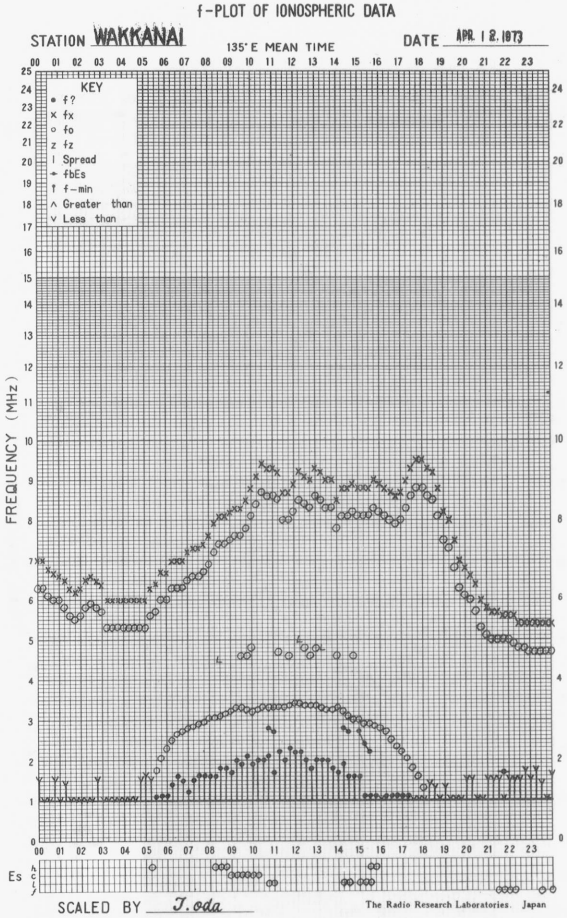
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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



SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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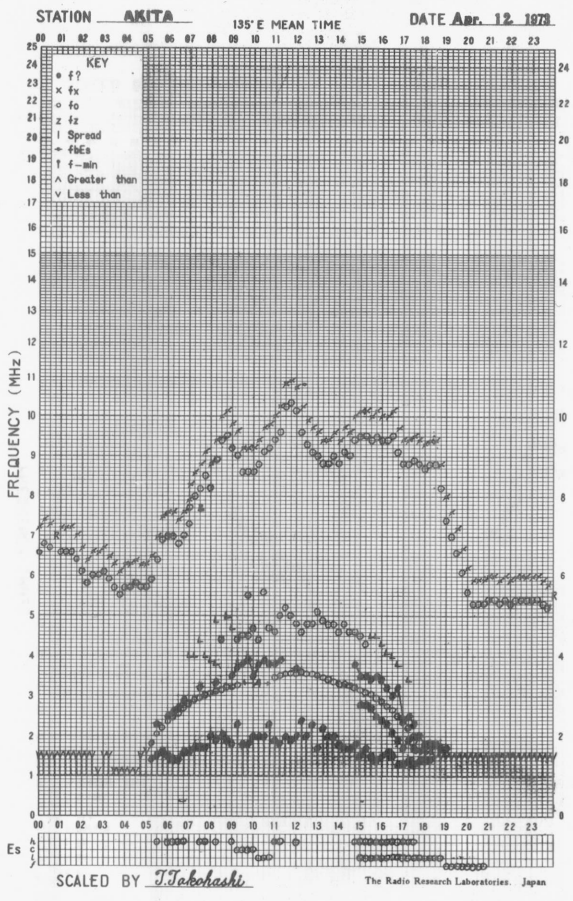

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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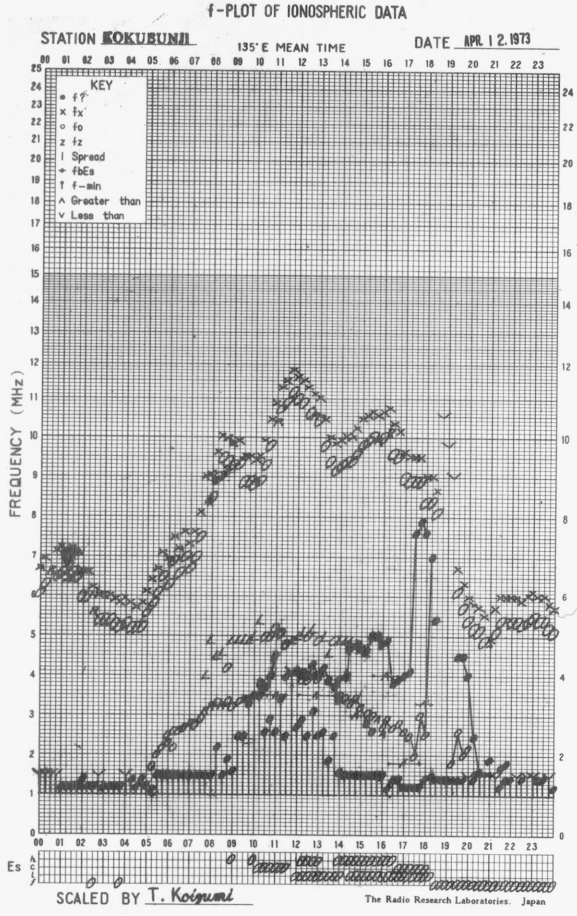

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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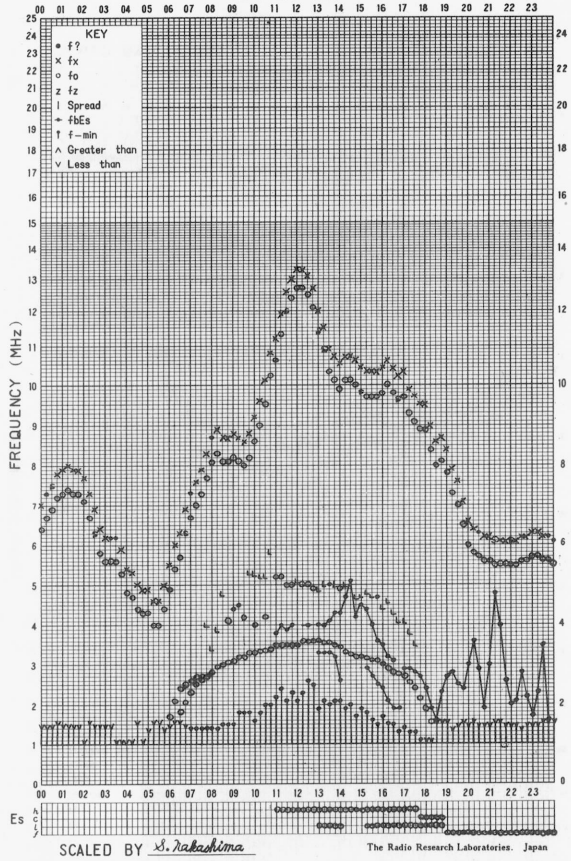

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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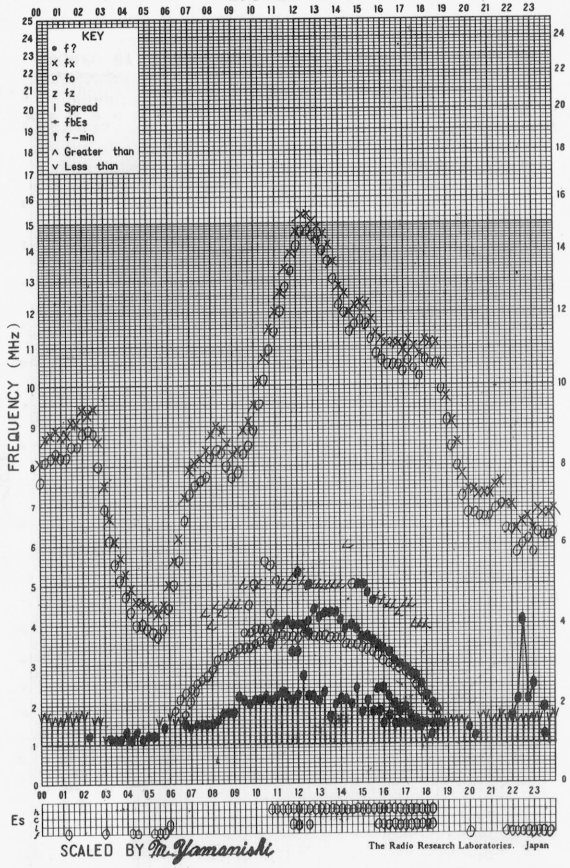

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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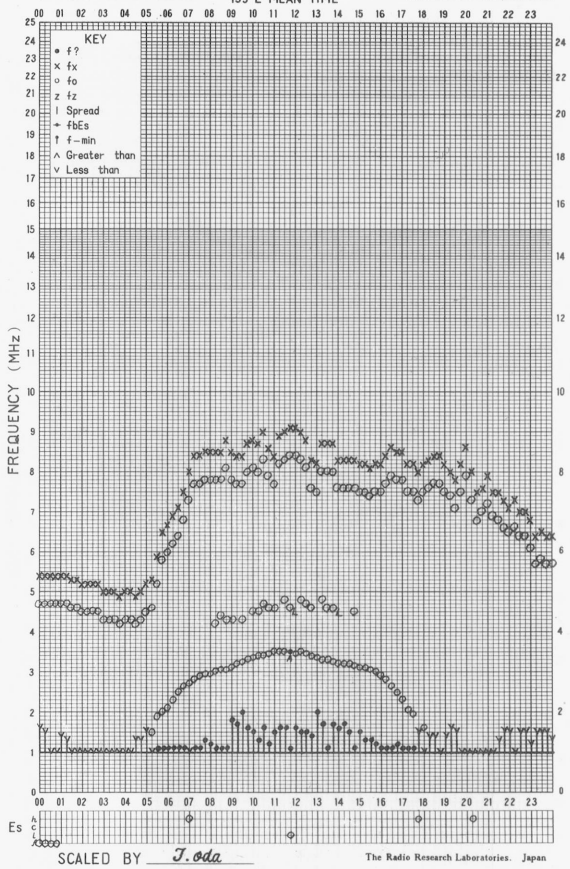

SCALED BY T. oda

The Radio Research Laboratories. Japan

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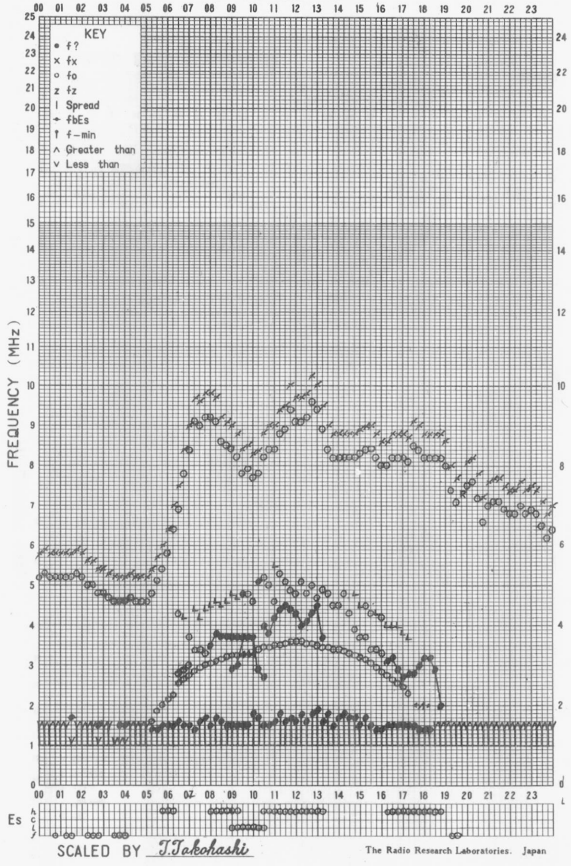

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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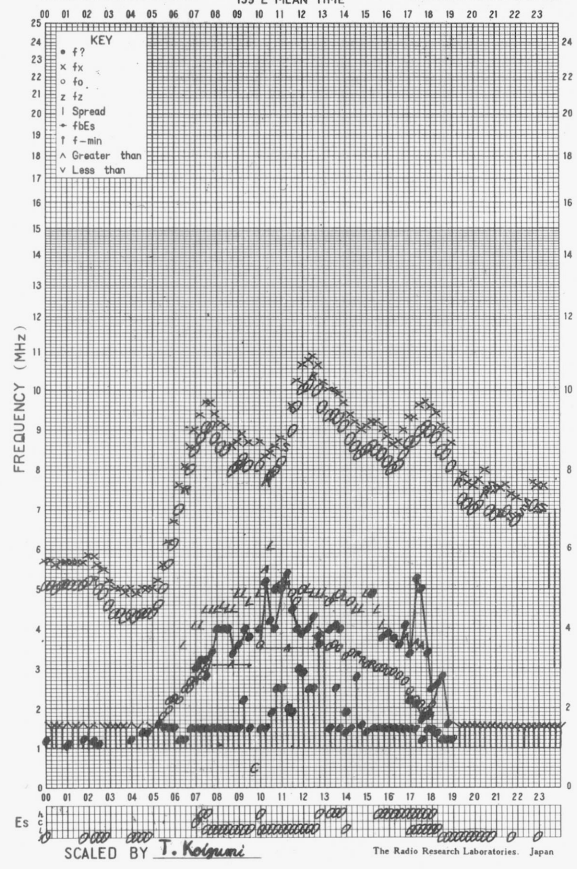

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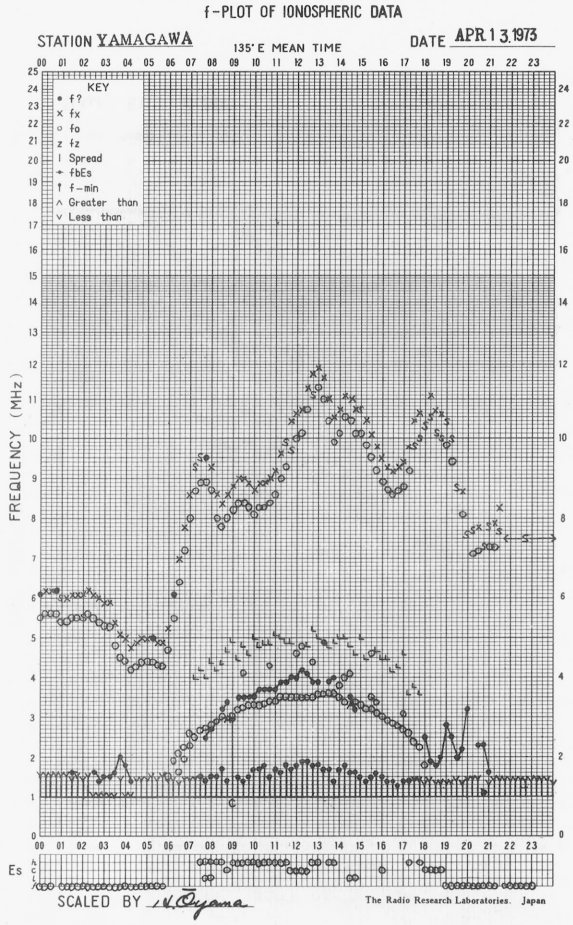
The Radio Research Laboratories. Japan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DATE APR 13 1973
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Spread
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Less than
FREQUENCY (MHz)
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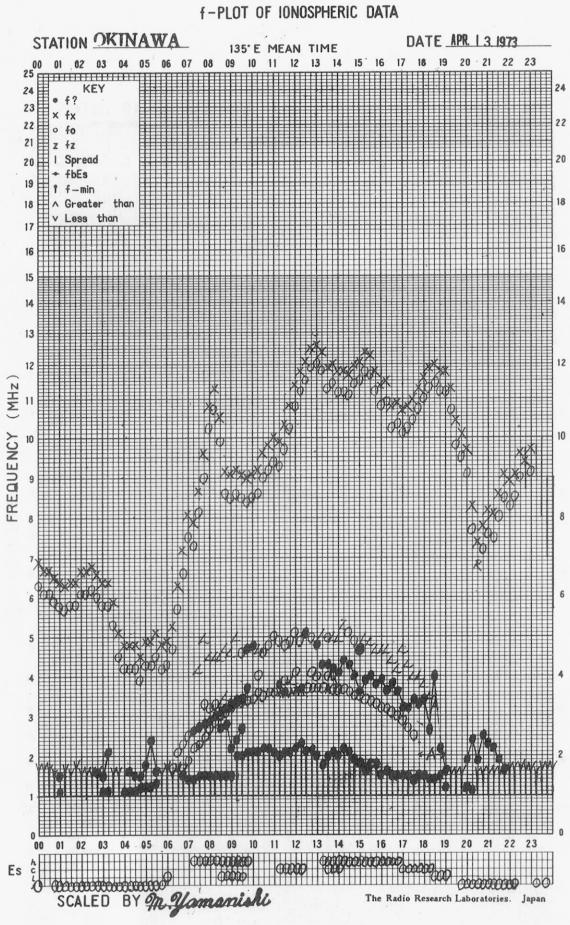
SCALED BY N. Oyama
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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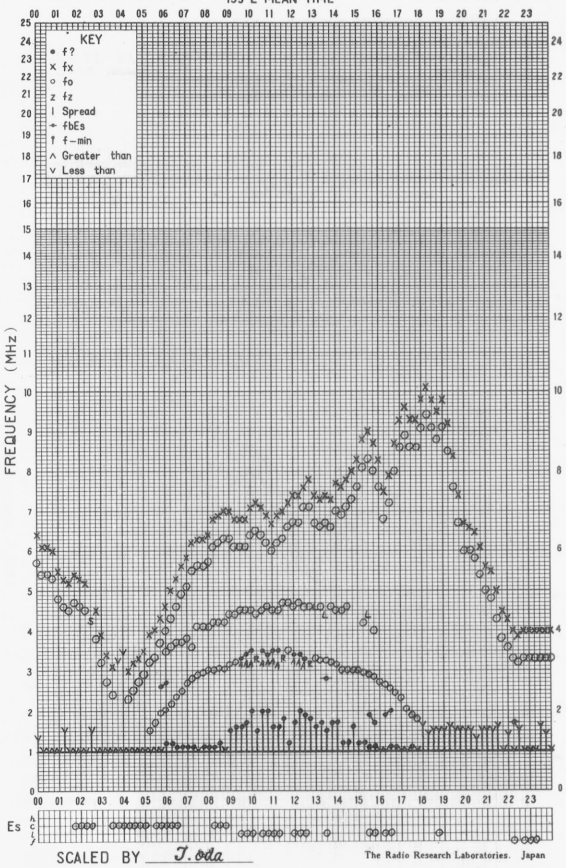

SCALED BY T. oda

The Radio Research Laboratories. Japan

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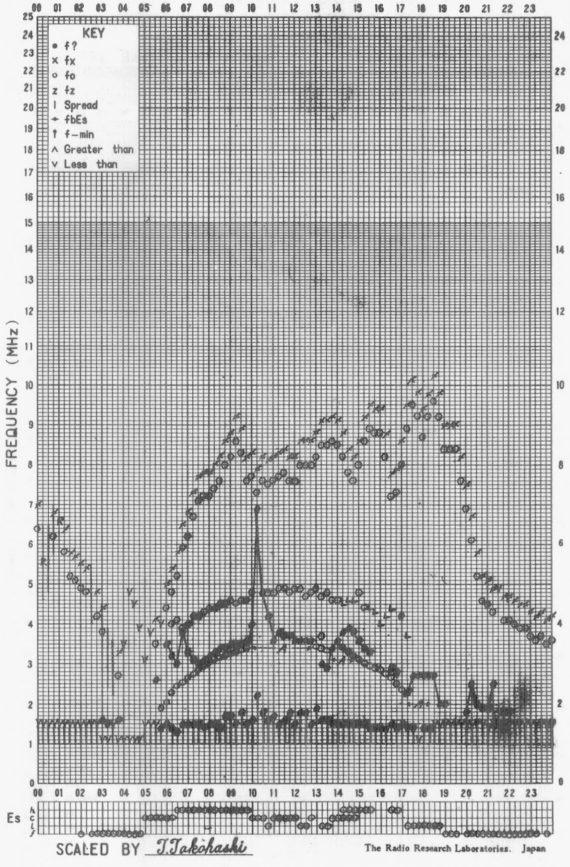

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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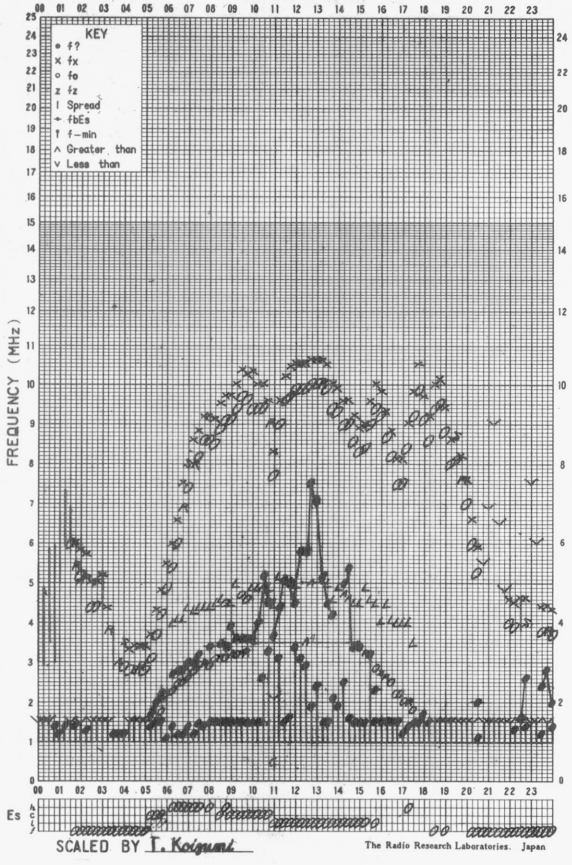

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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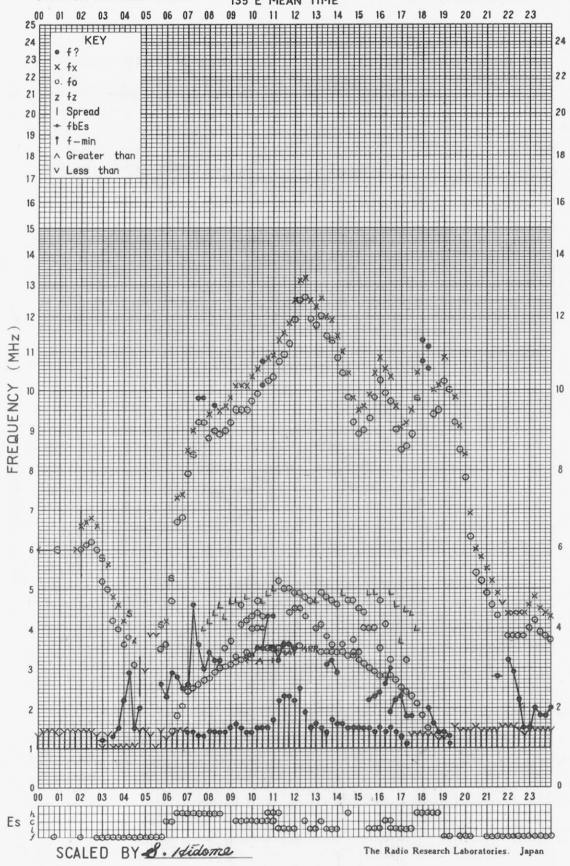

SCALED BY S. Hidoma

The Radio Research Laboratories. Japan

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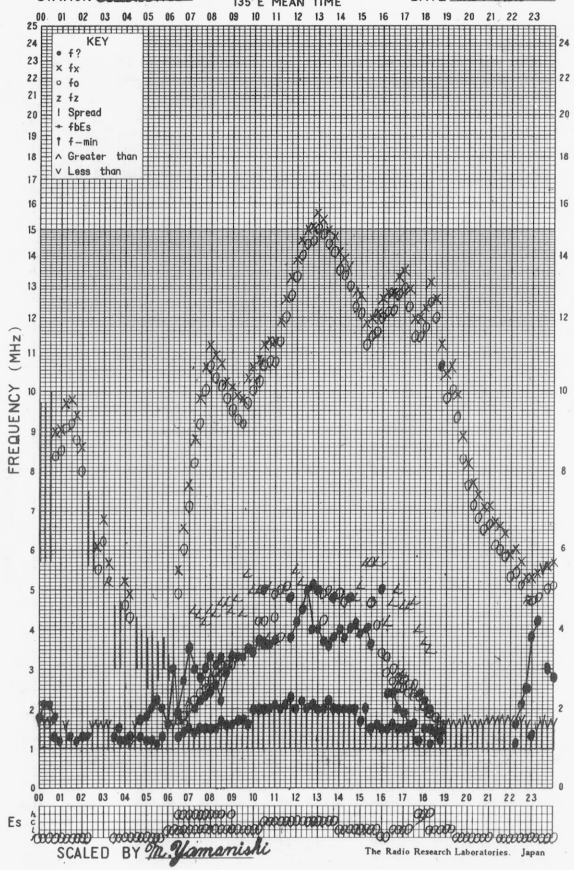

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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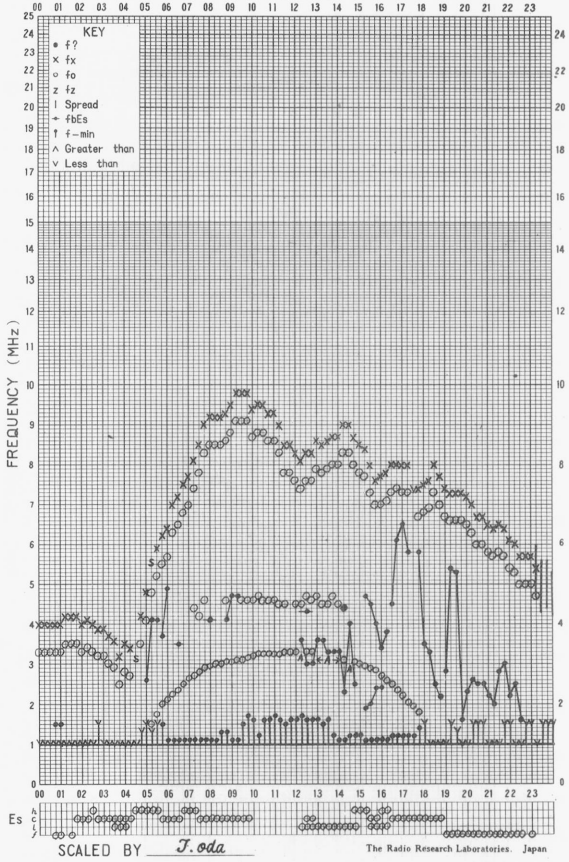

SCALED BY T. oda

The Radio Research Laboratories. Japan

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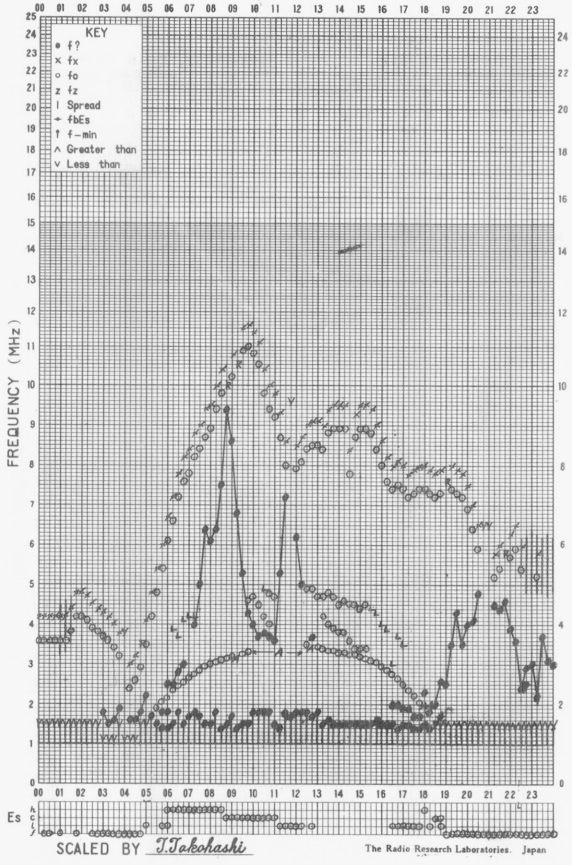

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The Radio Research Laboratories. Japan

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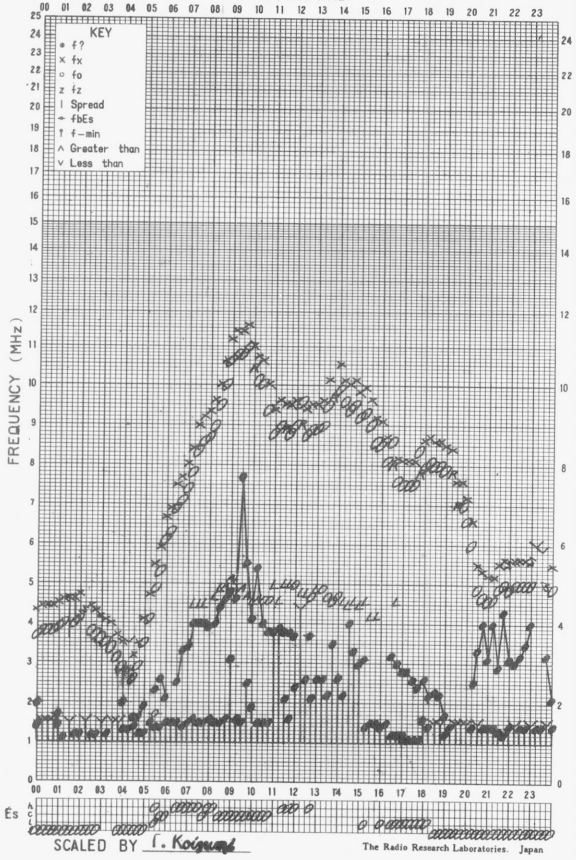

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The Radio Research Laboratories. Japan

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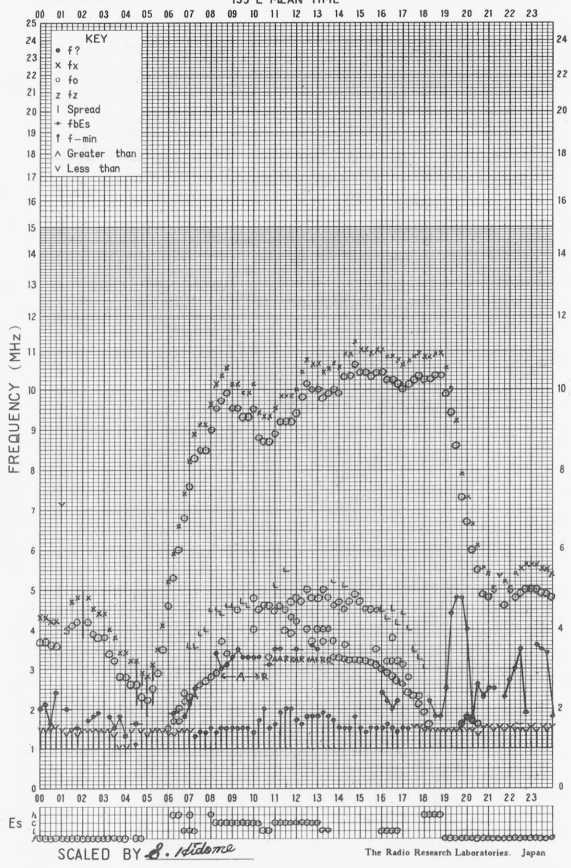

SCALED BY S. Hidema

The Radio Research Laboratories. Japan

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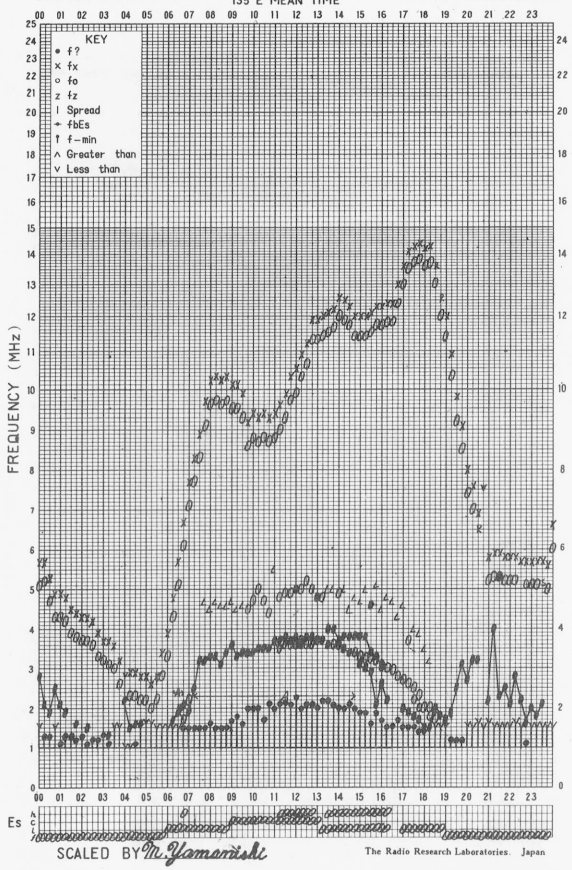

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

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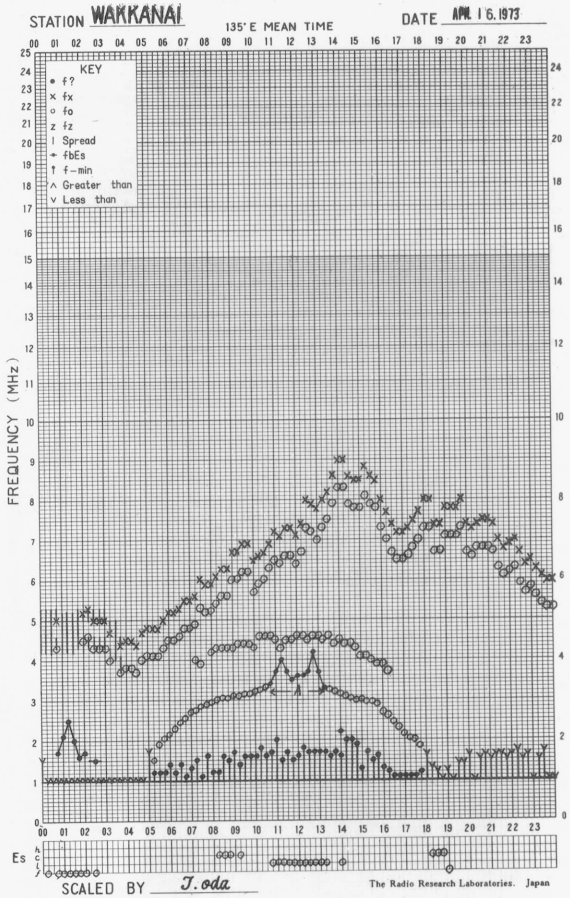

SCALED BY T. oda

The Radio Research Laboratories. Japan

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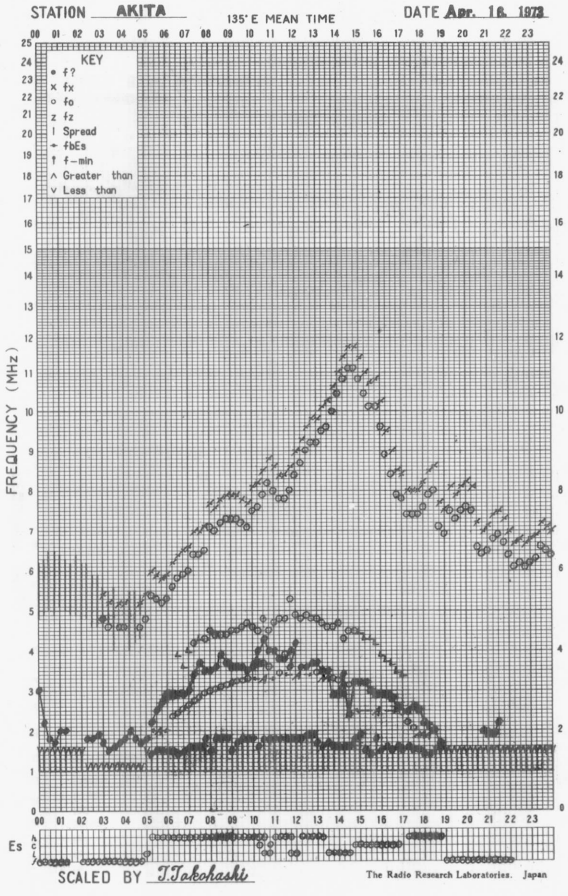

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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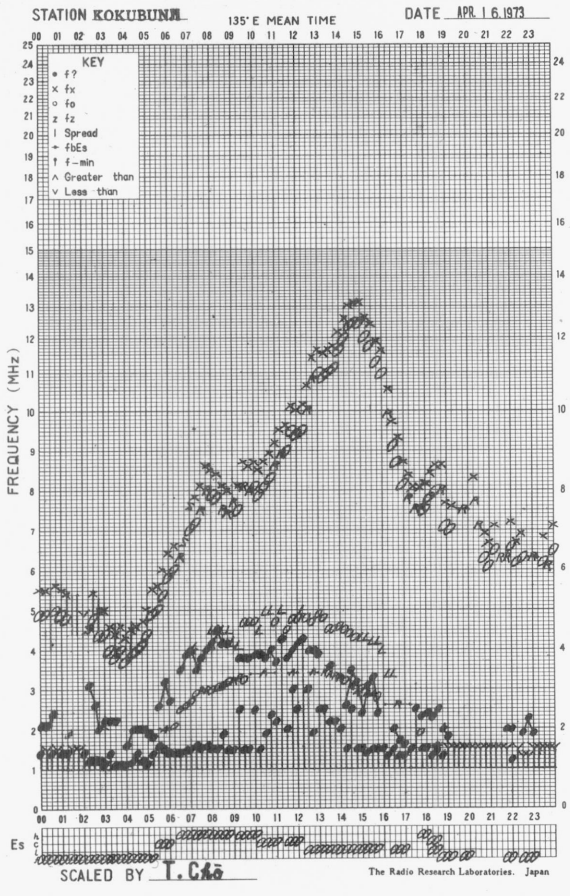
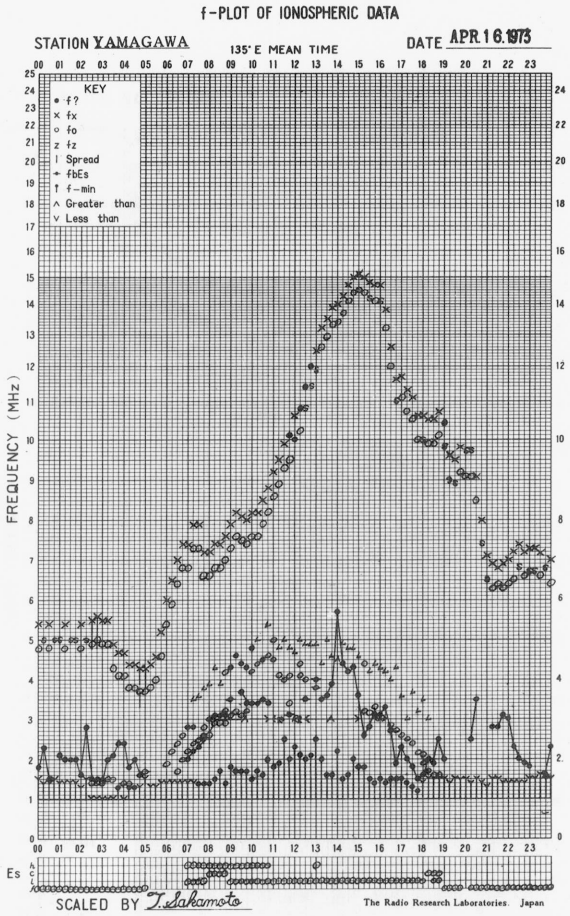


SCALED BY T. Chō

The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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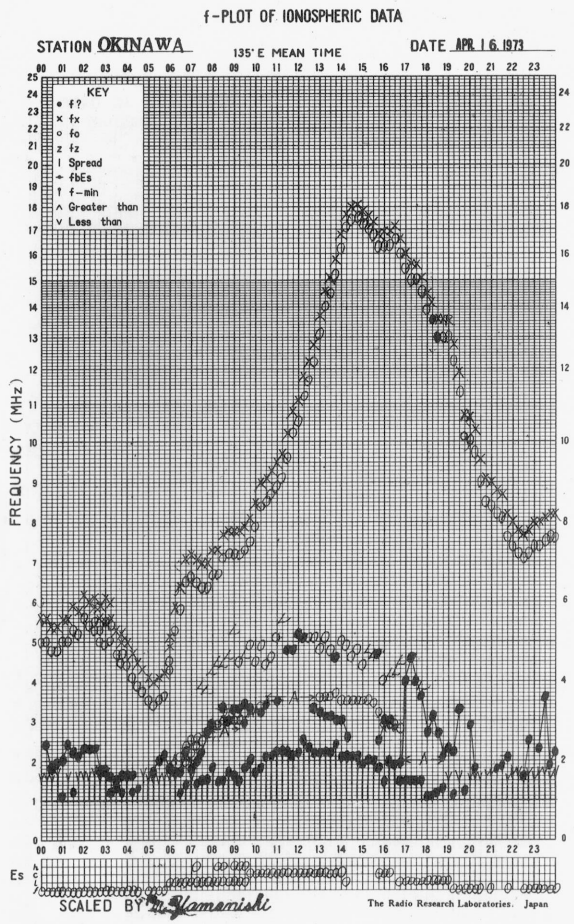
SCALED BY T. Sakamoto
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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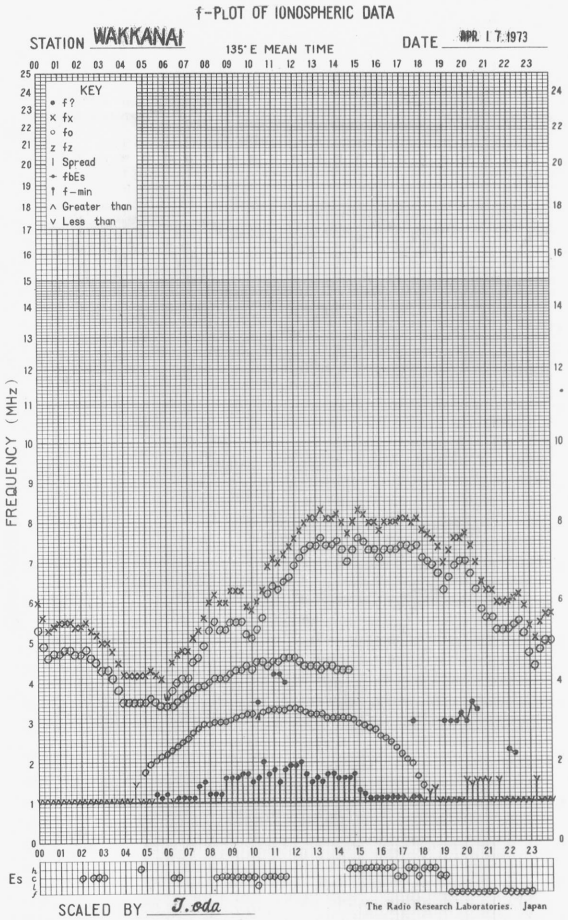
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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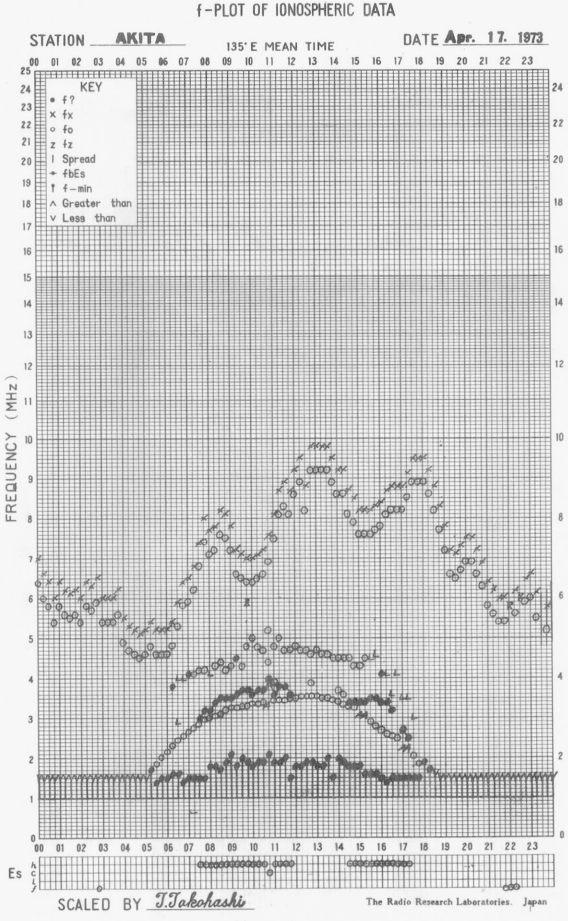
SCALED BY T. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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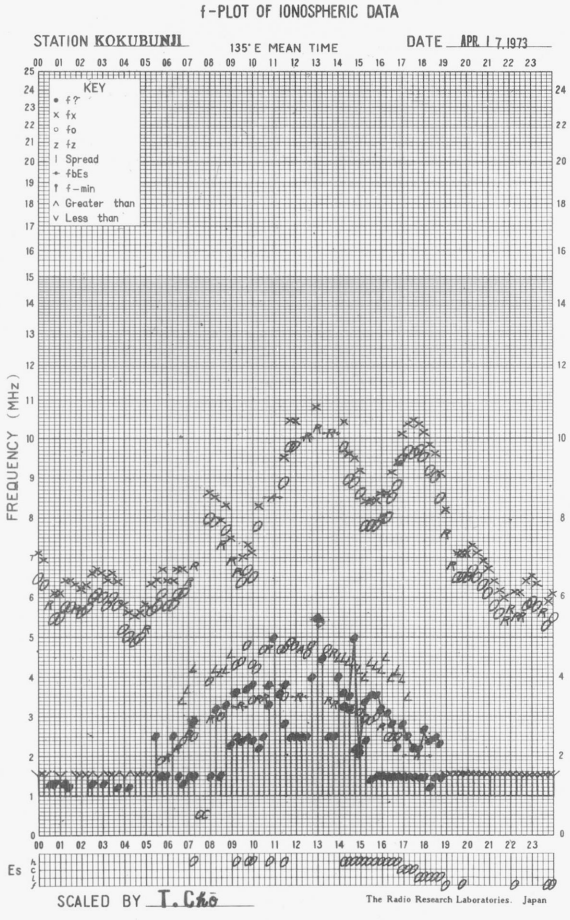
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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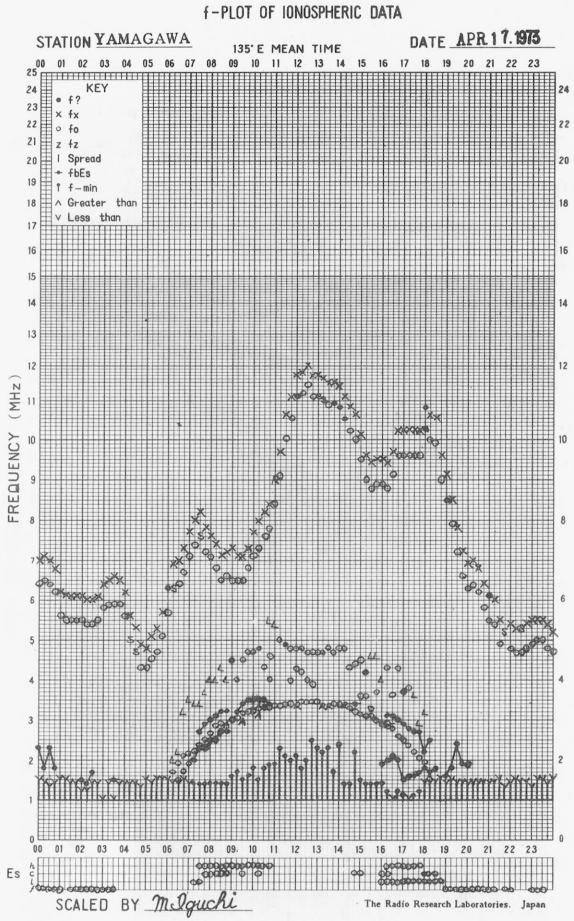
SCALED BY T. Cho
The Radio Research Laboratories. Japan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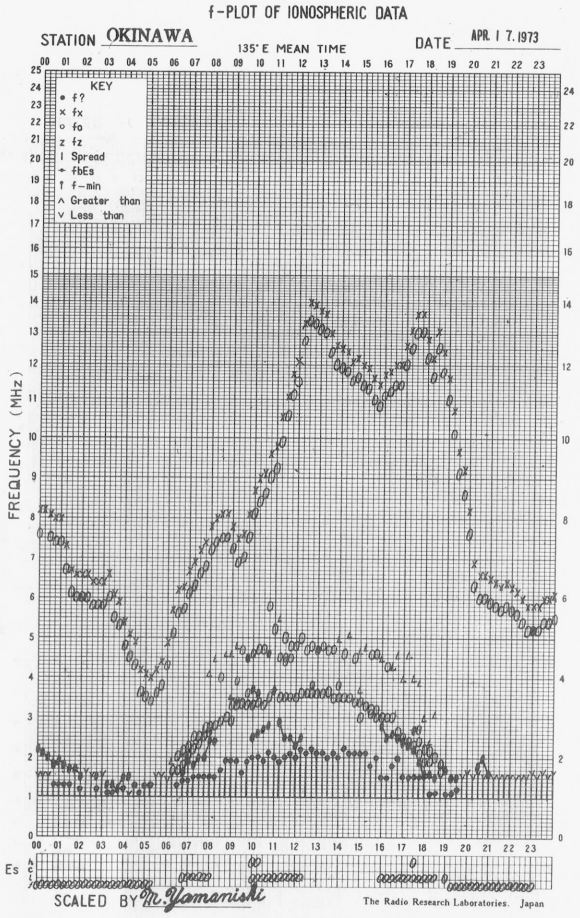
Es
SCALED BY M. Iguchi
The Radio Research Laboratories. Japan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STATION OKINAWA
135° E MEAN TIME
DATE APR. 17. 1973
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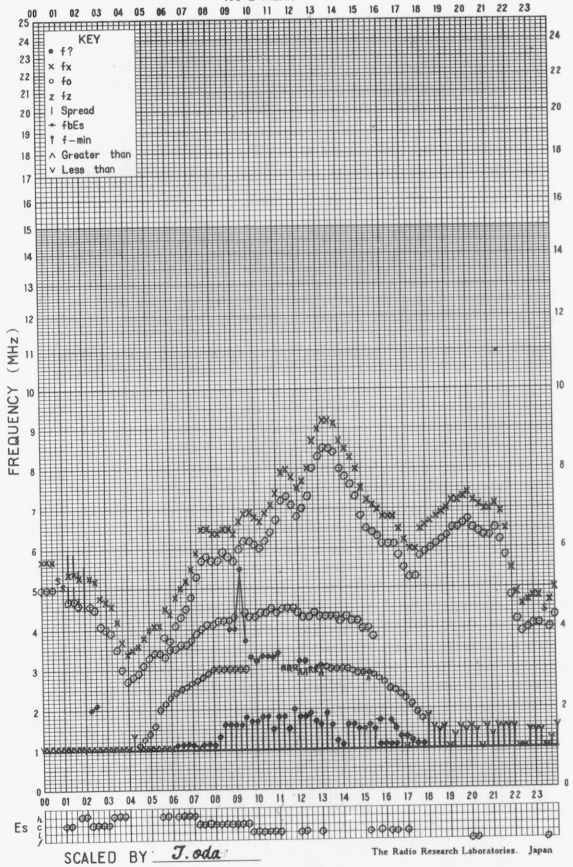
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE APR. 1 8. 1973



SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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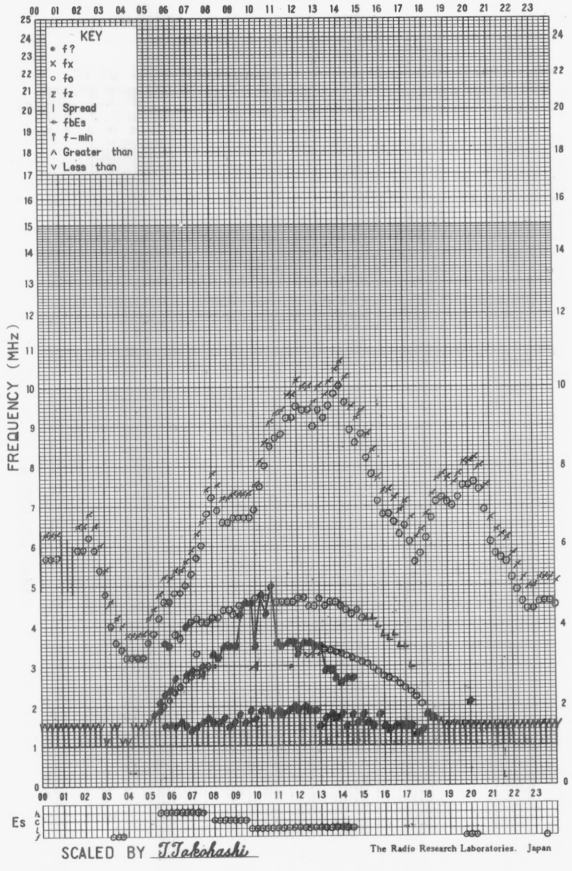

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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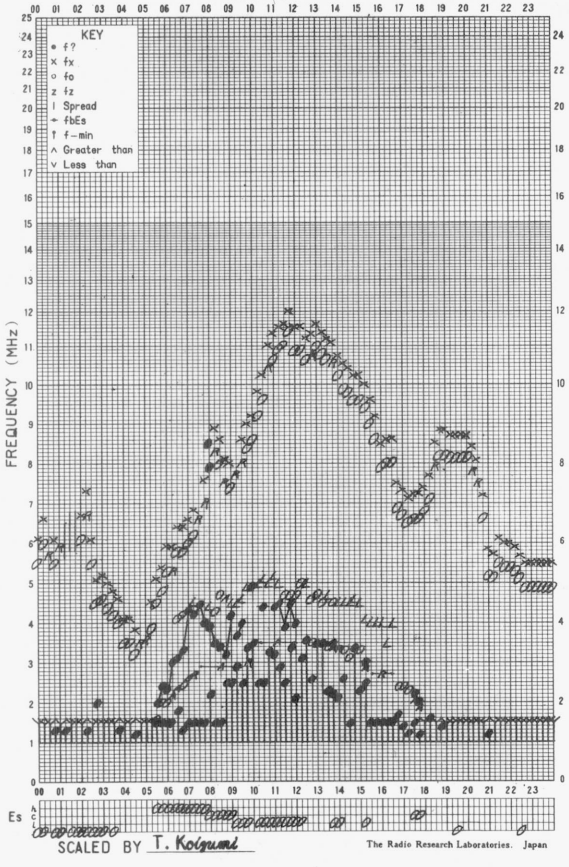
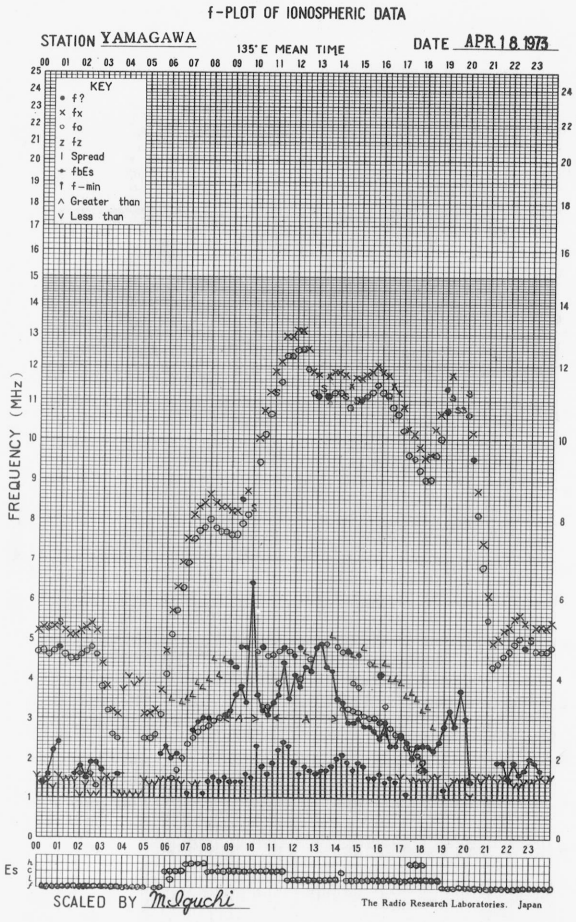


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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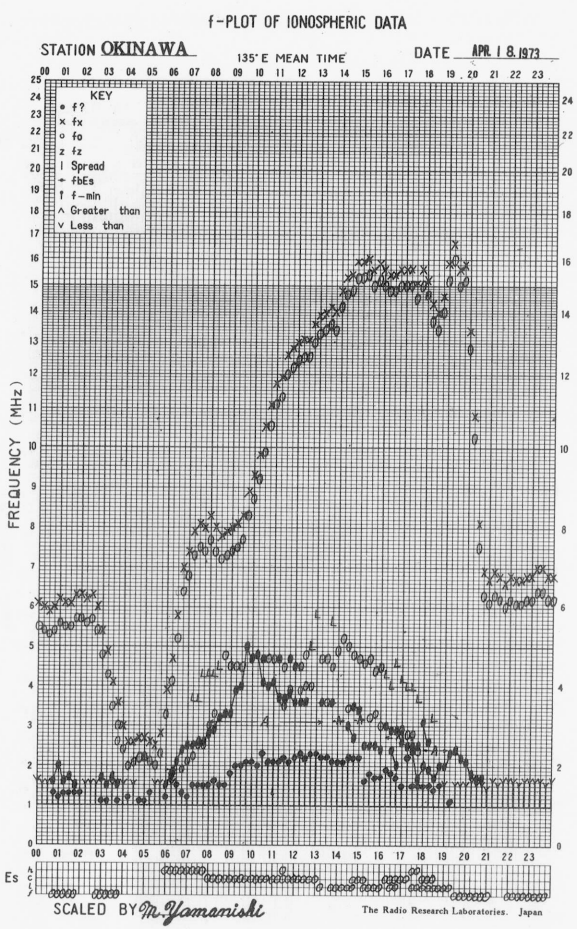
FREQUENCY (MHz)
Es
SCALED BY M. Iguchi
The Radio Research Laboratories. Japan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DATE APR 18 1973
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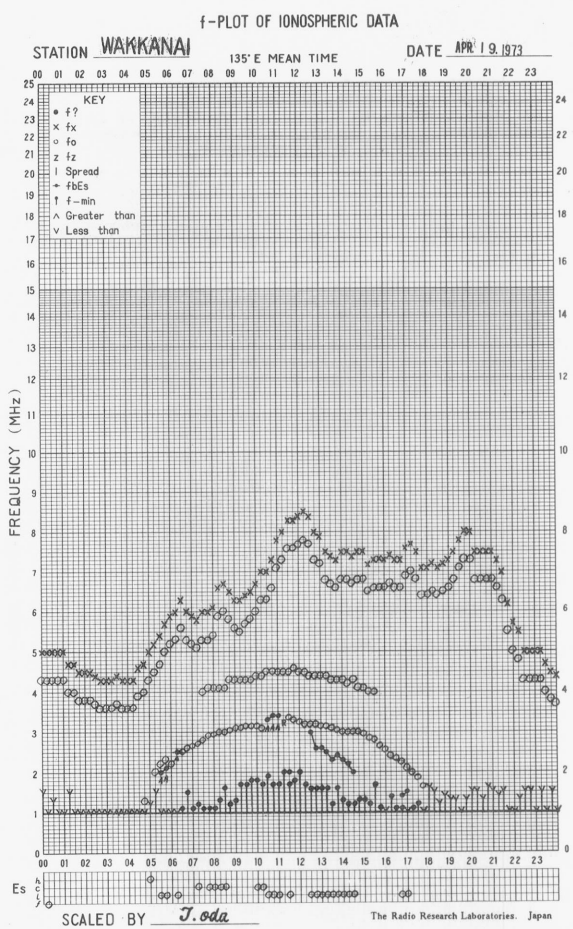
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan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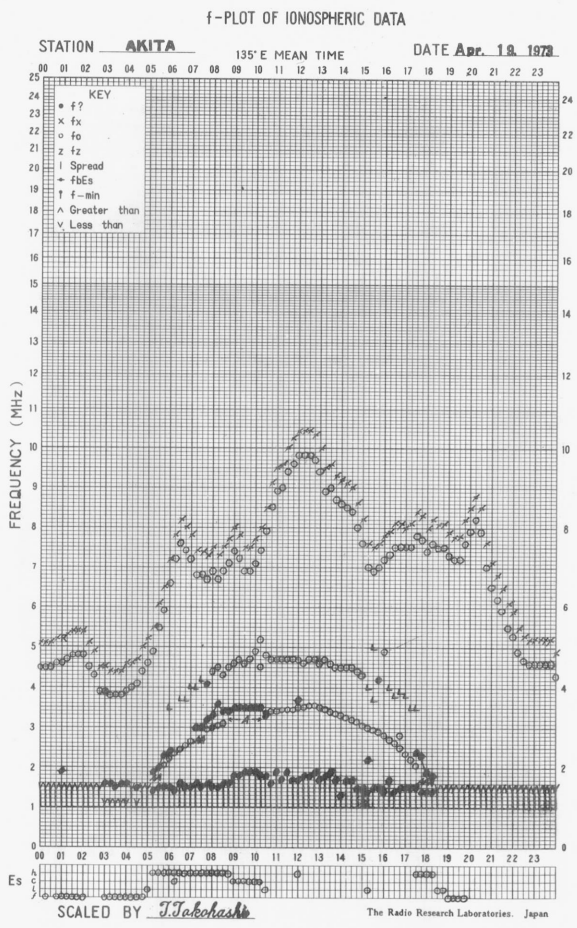
SCALED BY T. oda
The Radio Research Laboratories. Japan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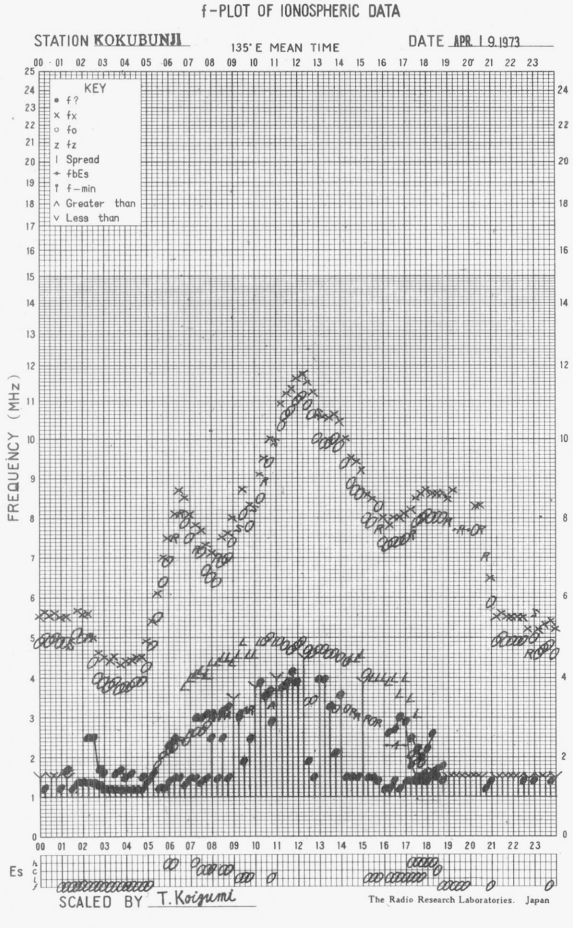
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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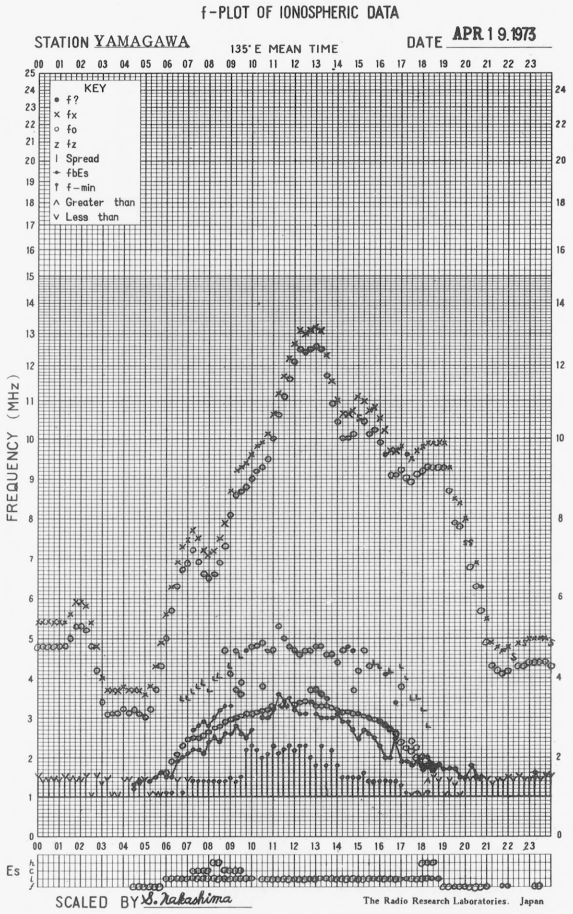
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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DATE APR. 19. 1973
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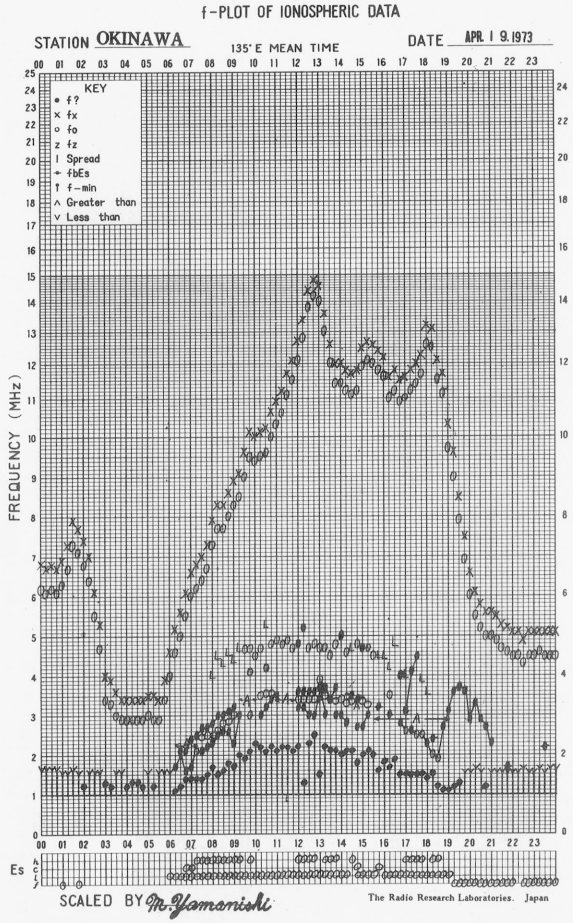
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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DATE APR. 19. 1973
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FREQUENCY (MHz)
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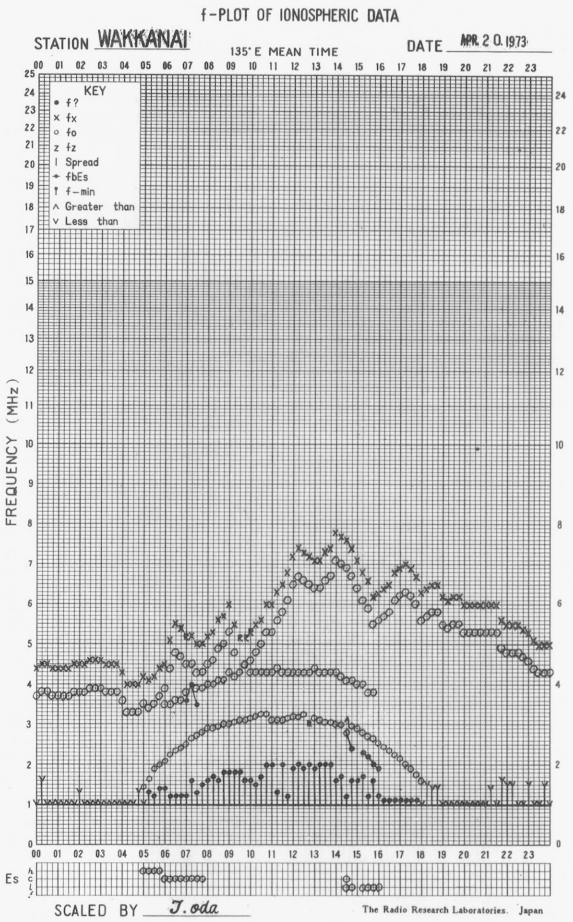
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan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DATE APR. 20. 1973
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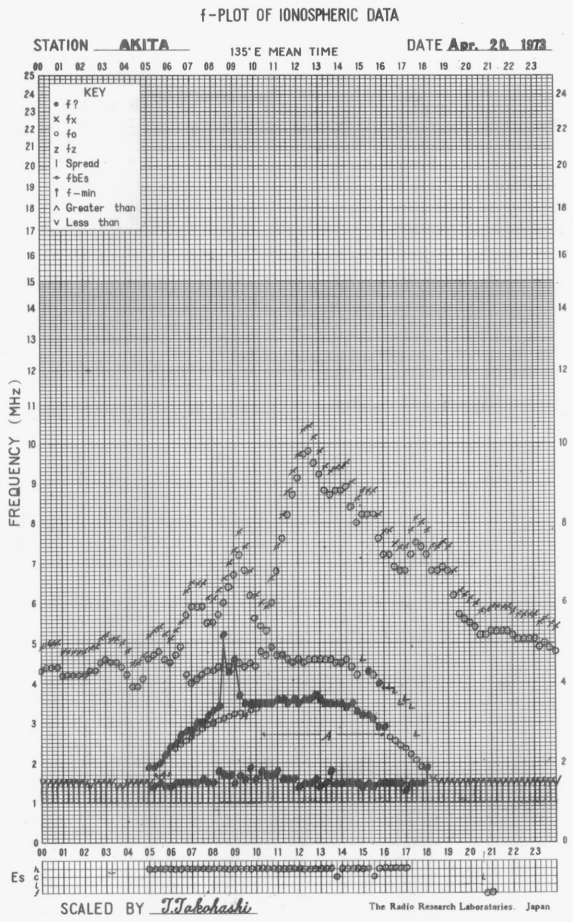
SCALED BY T. oda
The Radio Research Laboratories. Japan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DATE Apr. 20. 1973
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FREQUENCY (MHz)
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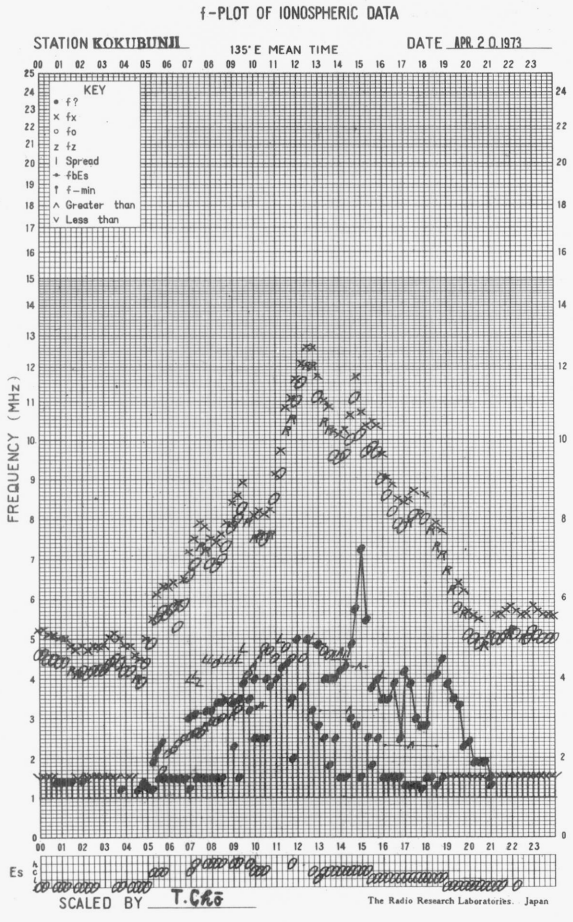
SCALED BY T.Takahashi
The Radio Research Laboratories. Japan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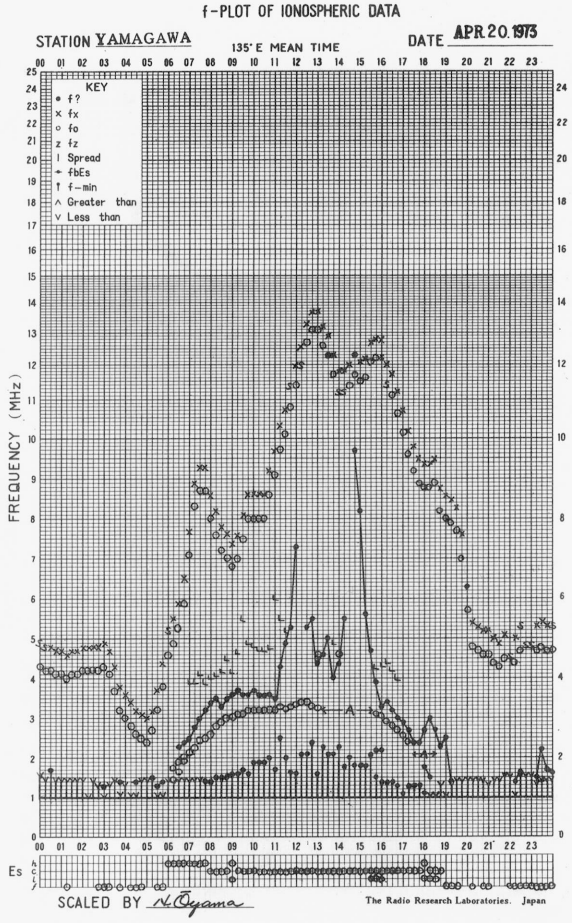
SCALED BY T. Cho
The Radio Research Laboratories. Japan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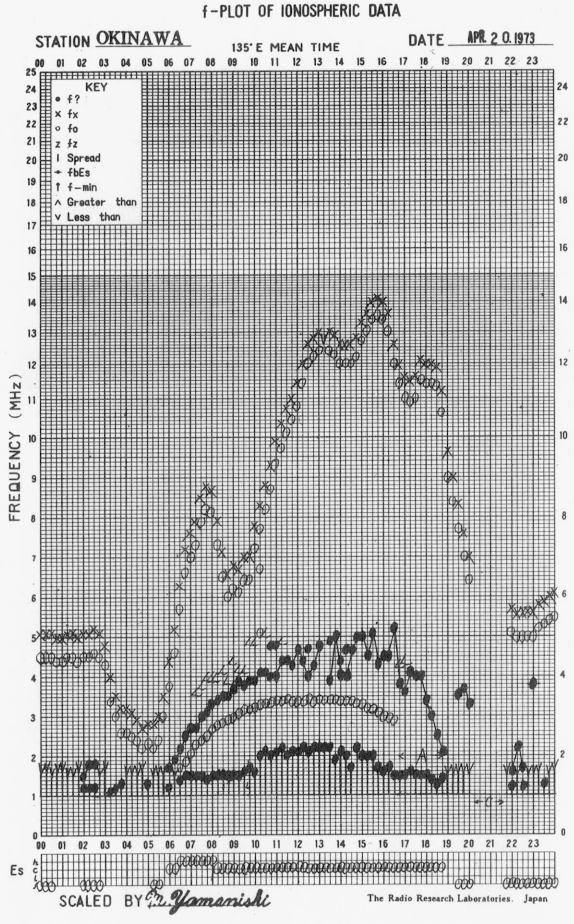
SCALED BY N. Ogama
The Radio Research Laboratories. Japan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KEY
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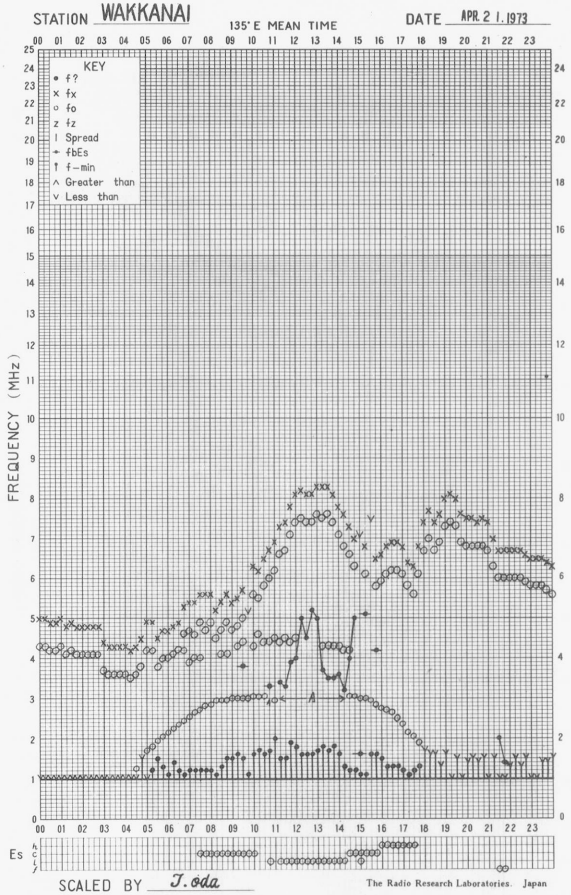
SCALED BY T. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE APR. 2 1. 1973



SCALED BY T. oda The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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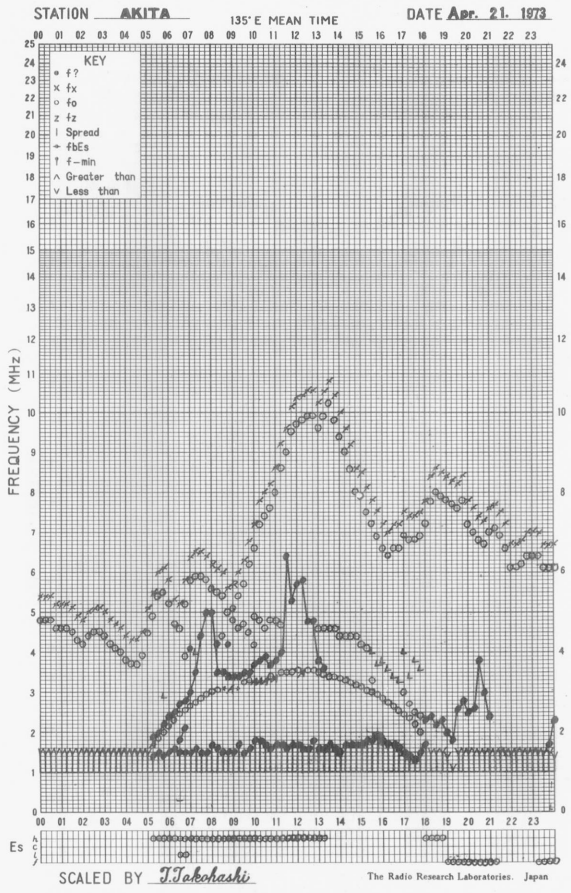

SCALED BY T. Takahashi The Radio Research Laboratories. Japan

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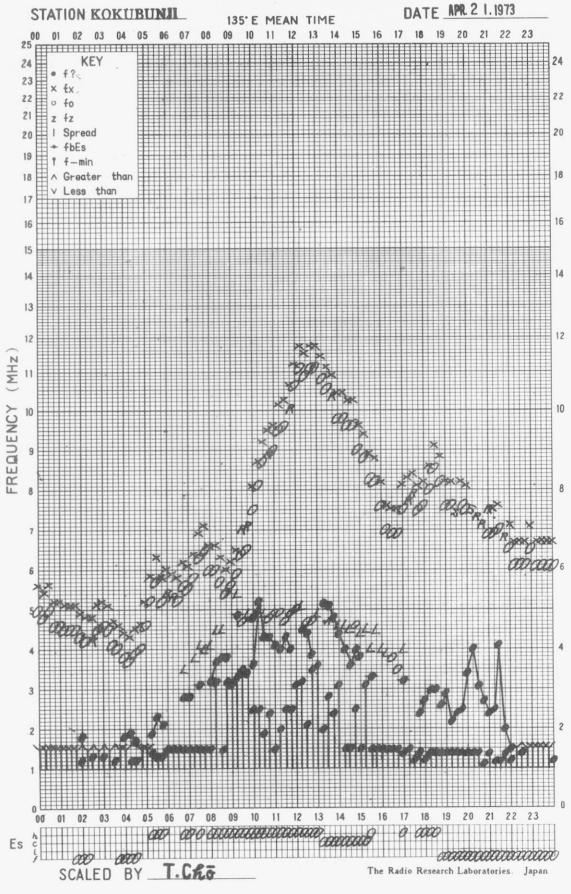

SCALED BY T. Chō The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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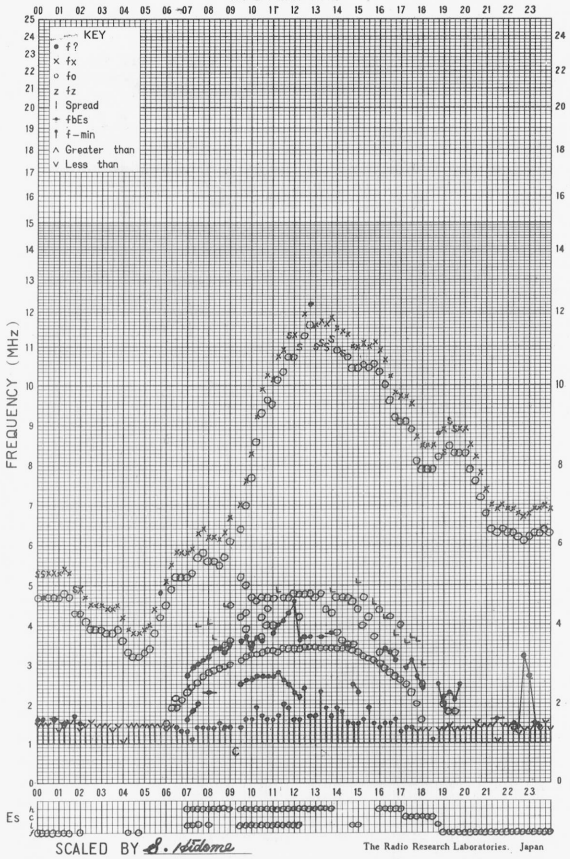

SCALED BY S. Hideme

The Radio Research Laboratories. Japan

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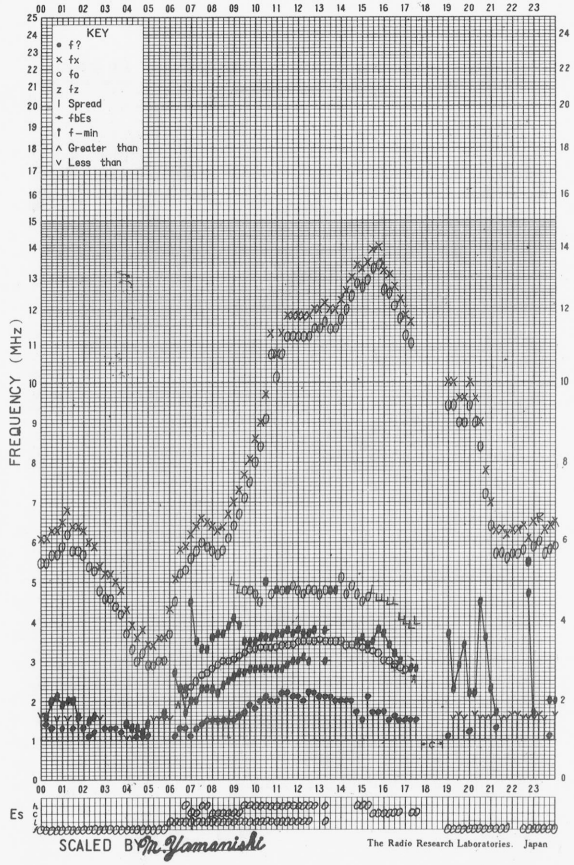

SCALED BY M. Yamanishi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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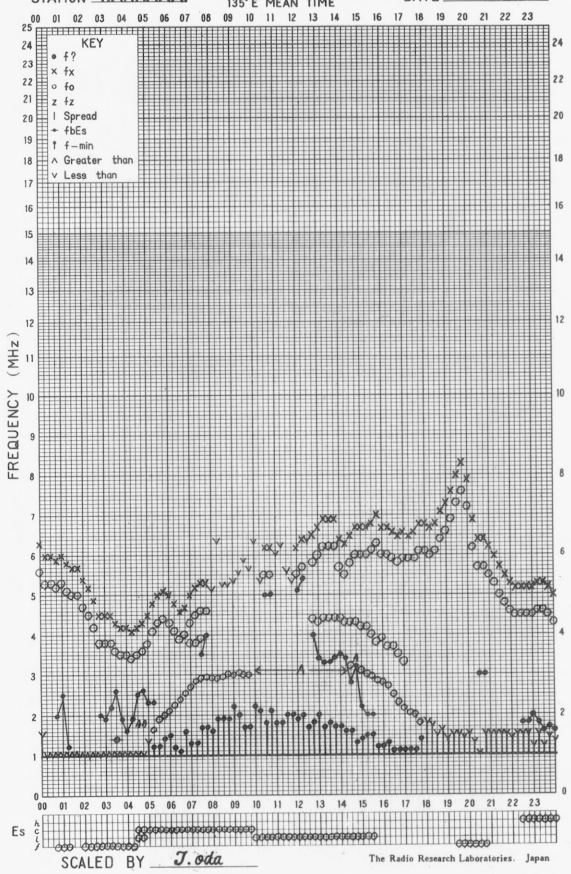

SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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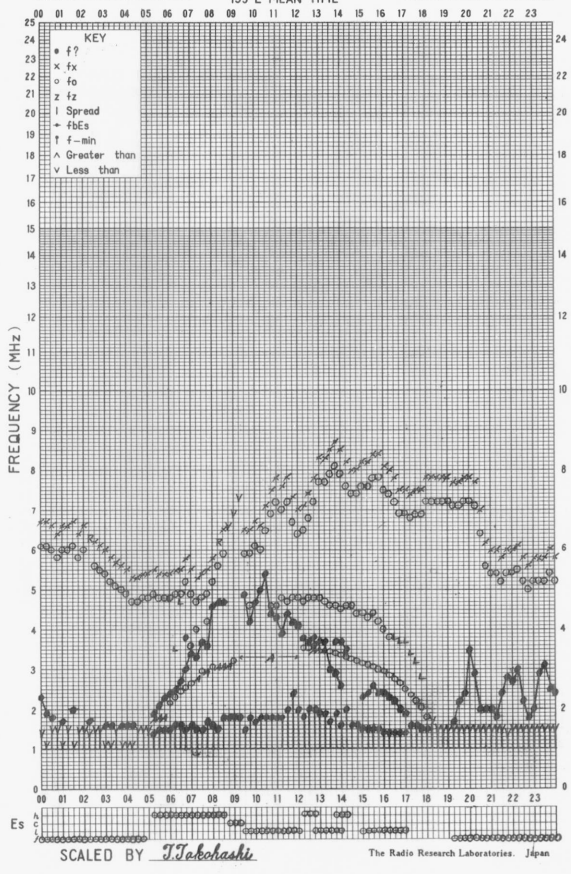

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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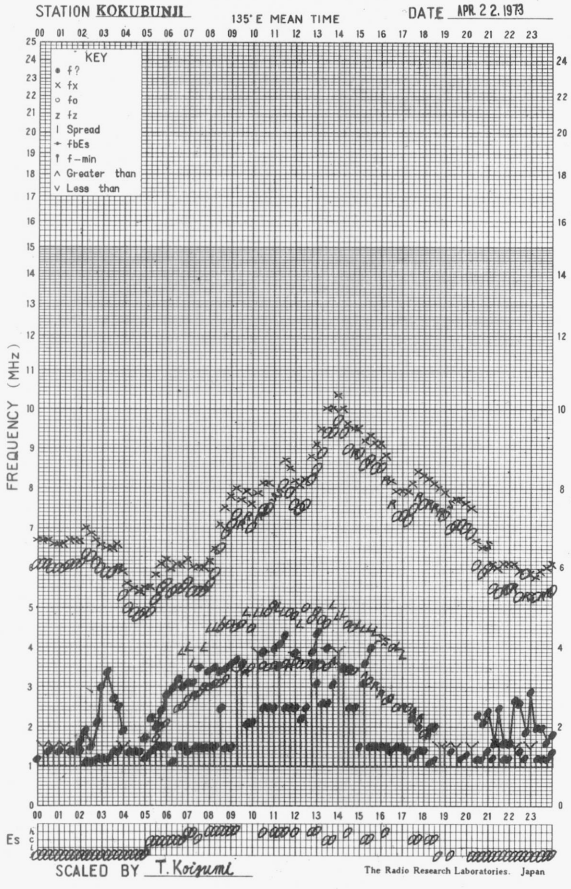
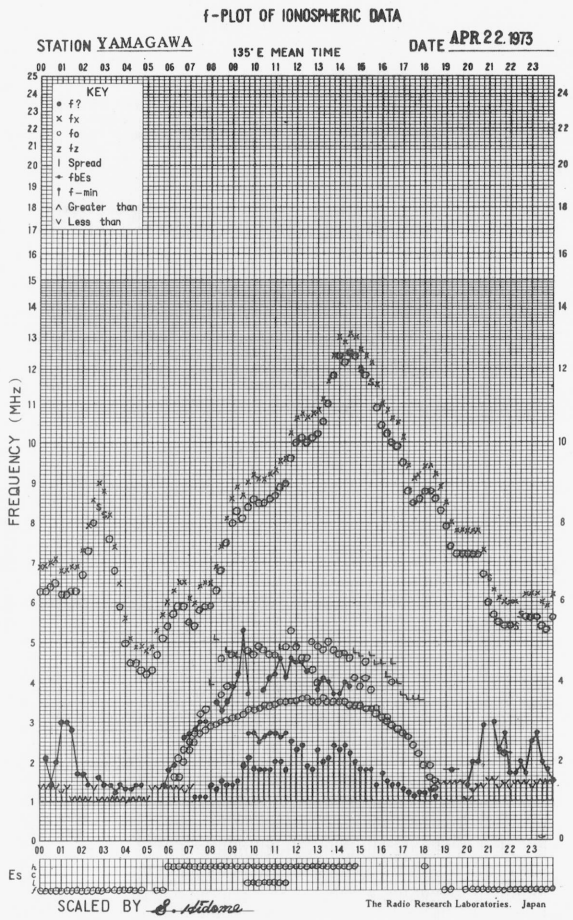


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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STATION YAMAGAWA
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DATE APR 22 1973
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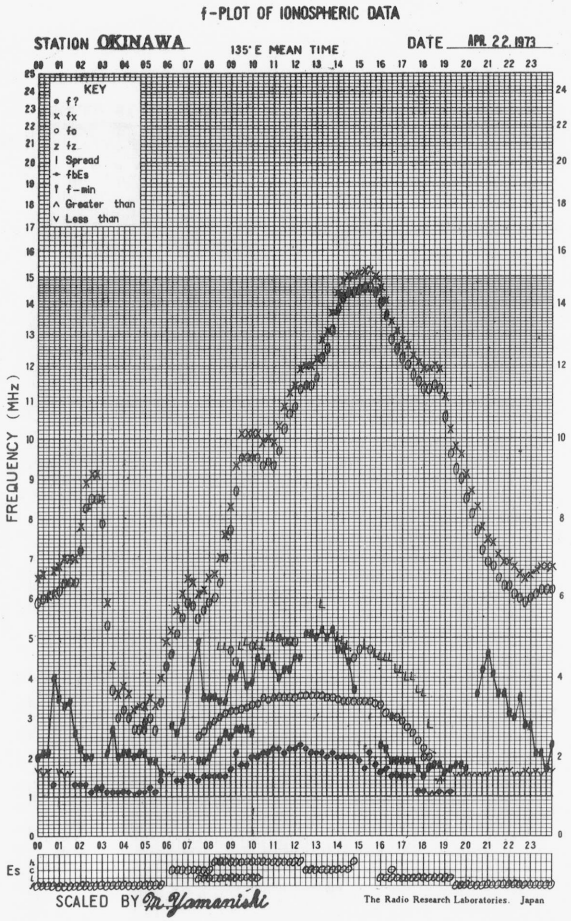
SCALED BY S. Ishidome
The Radio Research Laboratories. Japan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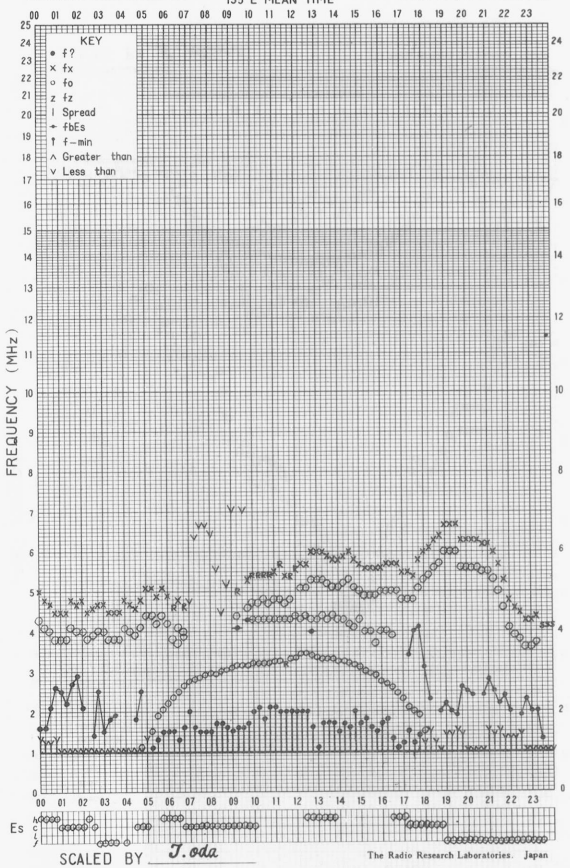
SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE APR. 23. 1973



SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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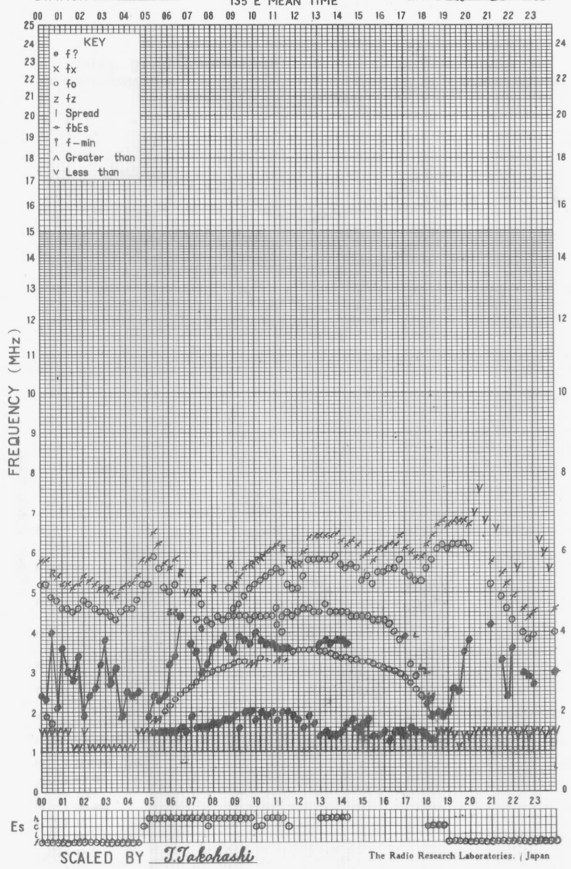

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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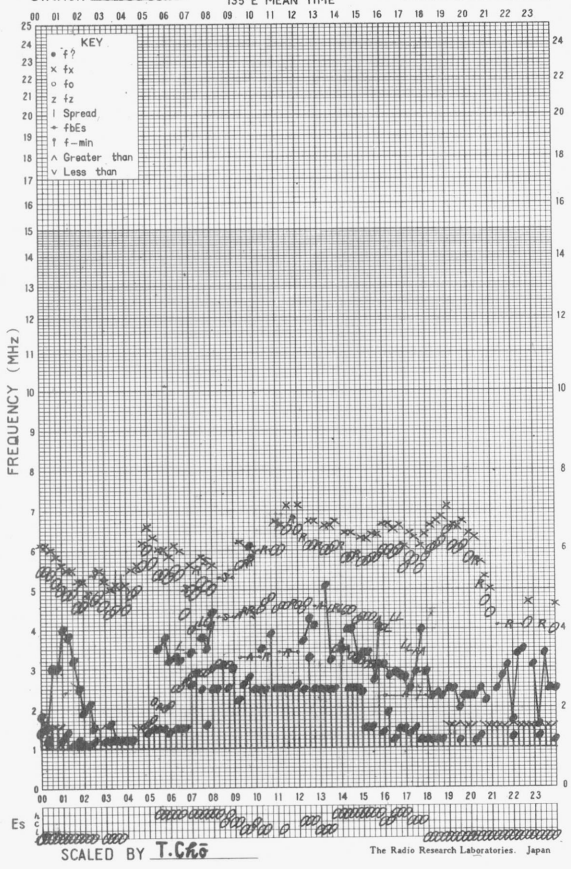
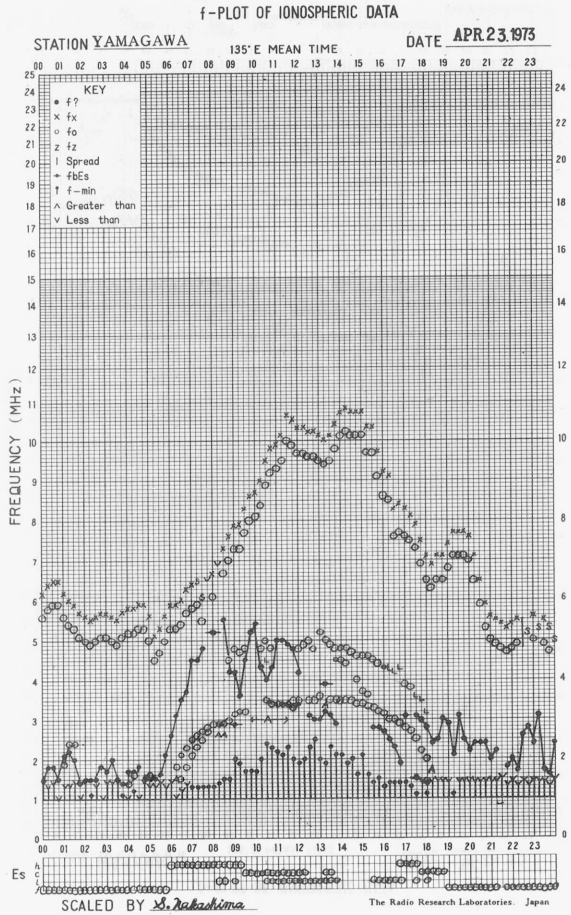


SCALED BY T. Ichō

The Radio Research Laboratories. Japan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135°E MEAN TIME
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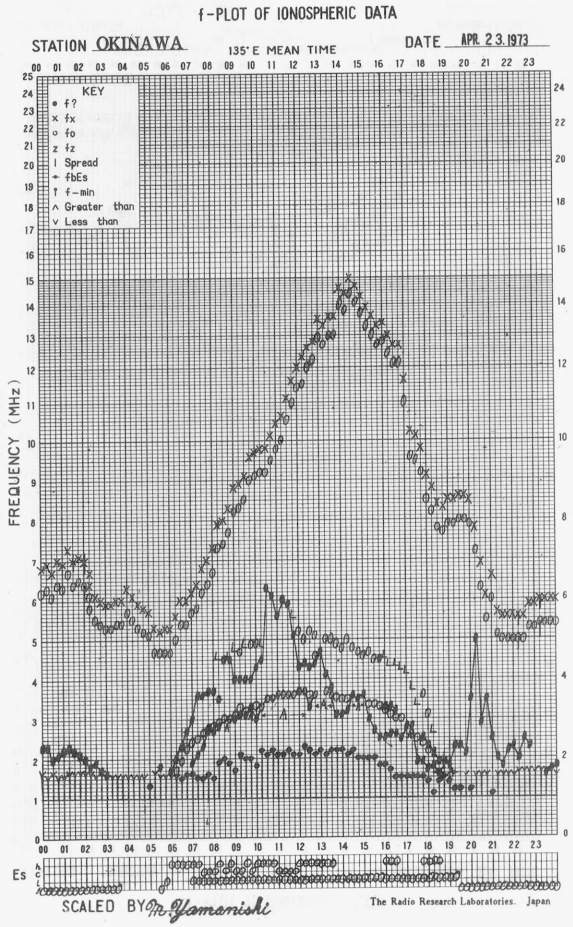
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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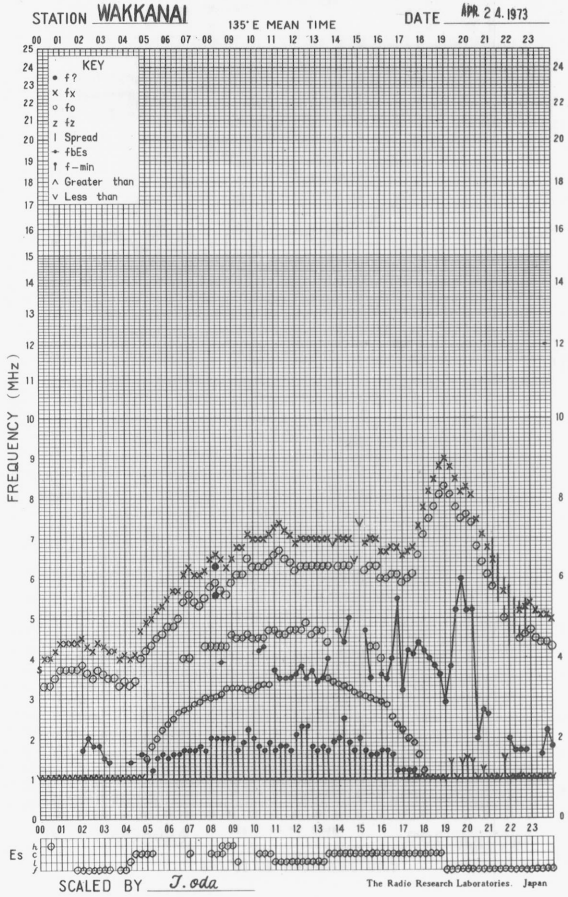

SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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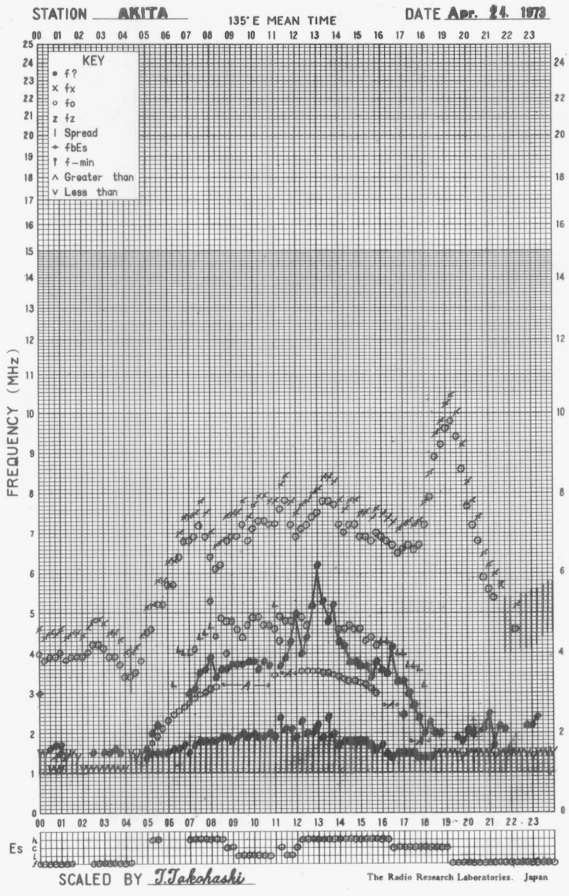

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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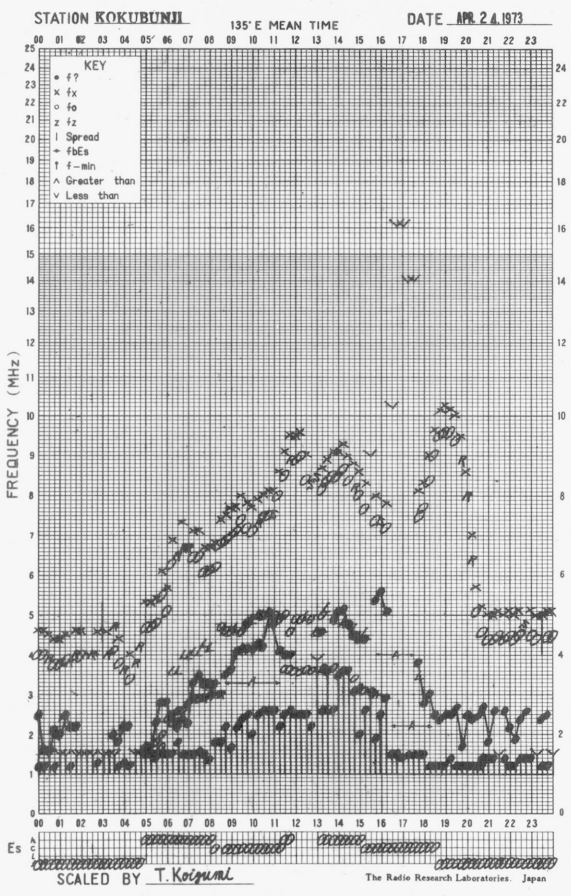
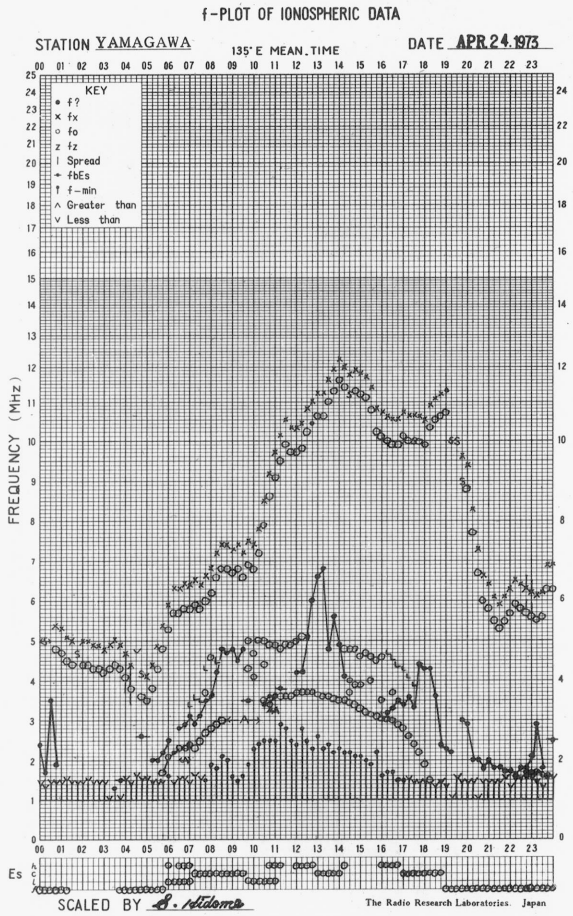


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan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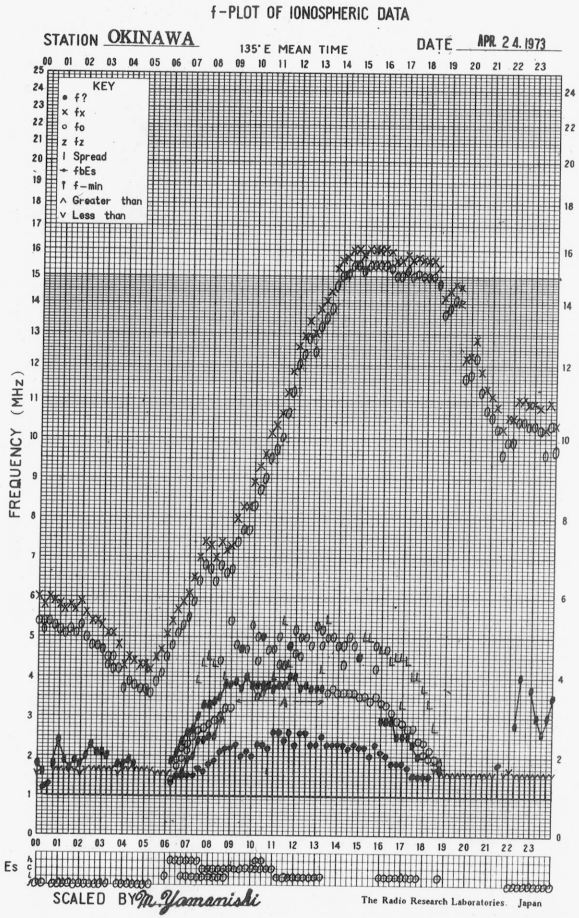
SCALED BY S. Ishidome
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY M. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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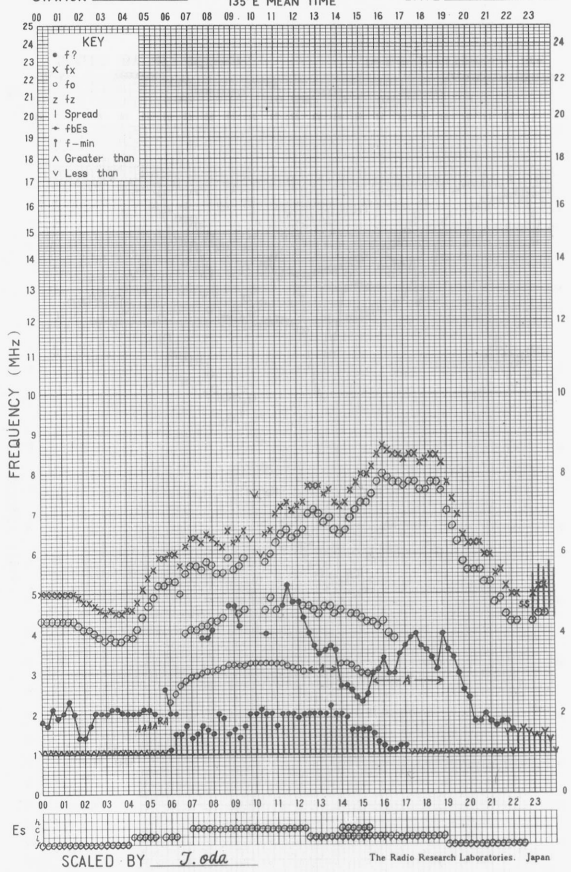

SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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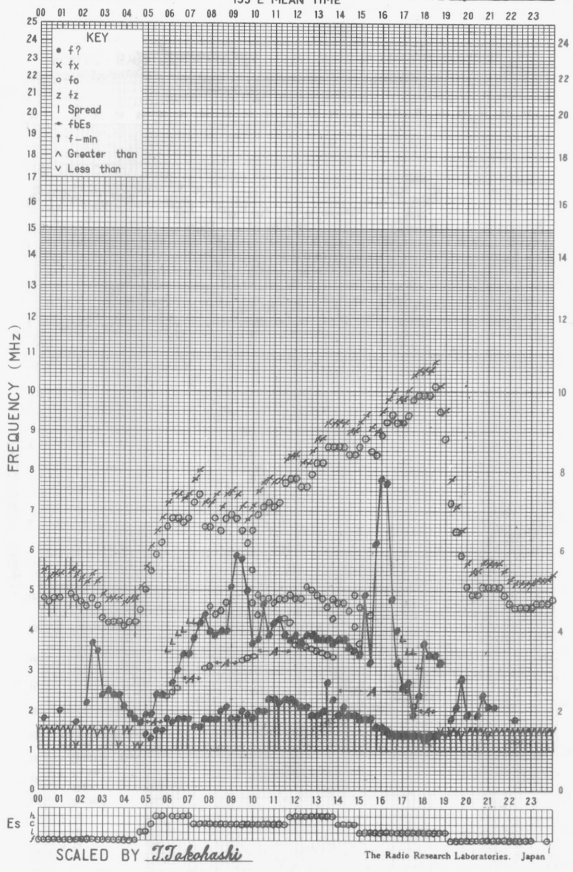

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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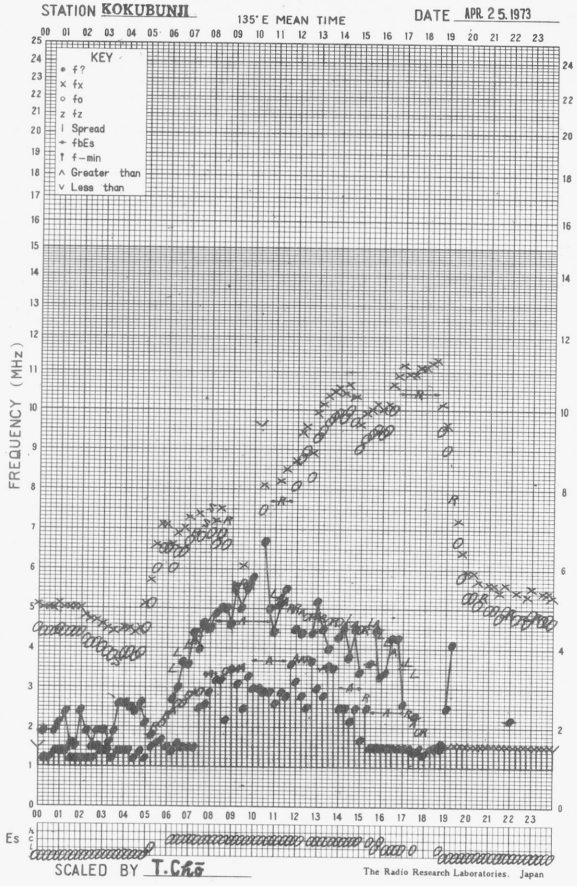
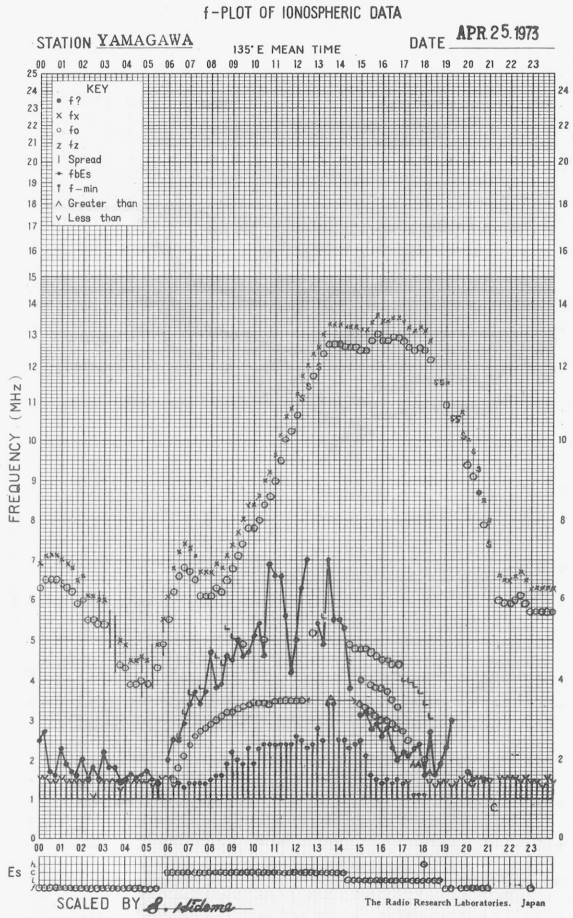
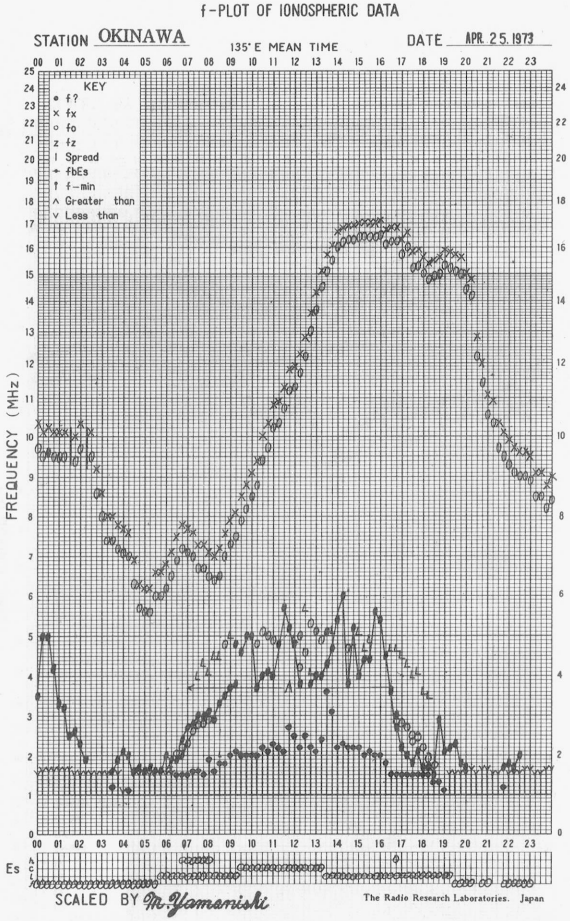


SCALED BY T. Ono

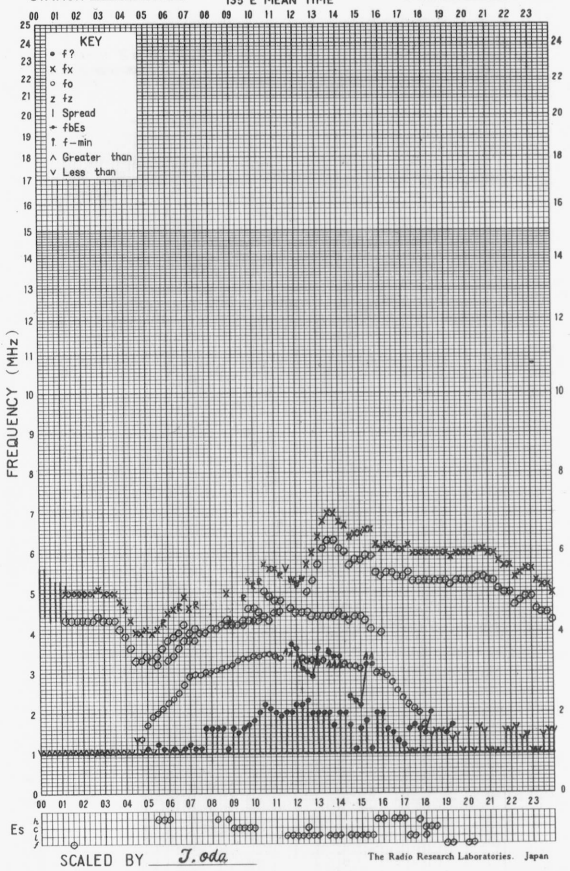
The Radio Research Laboratories. Japan


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


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

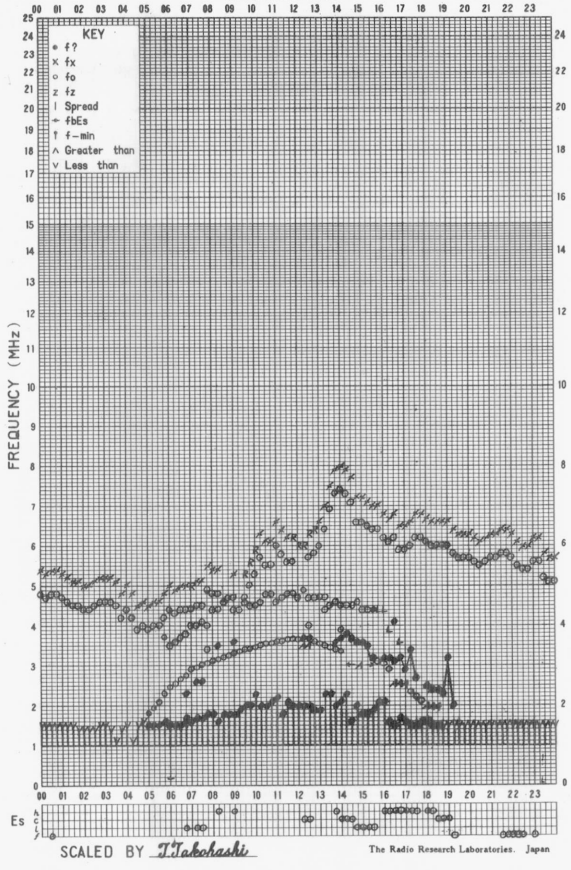
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE APR. 26. 1973



f-PLOT OF IONOSPHERIC DATA

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



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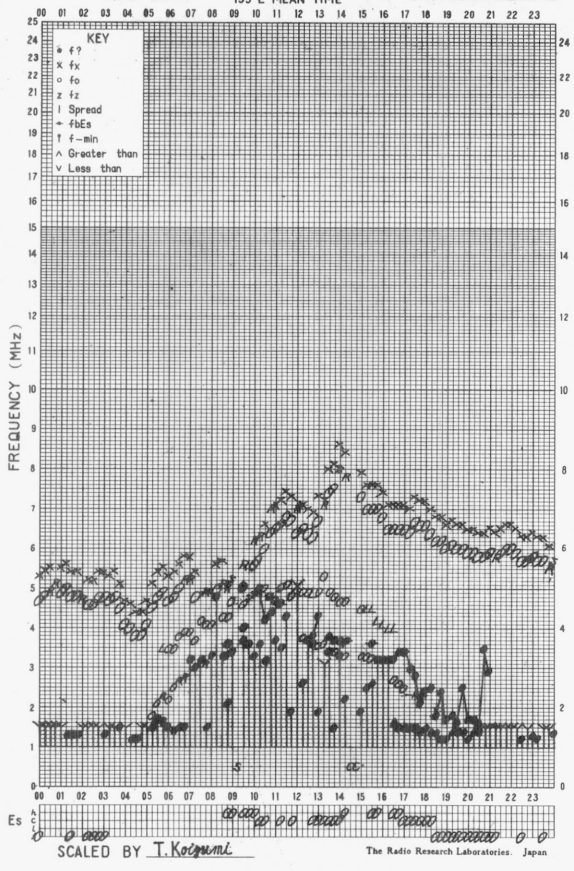
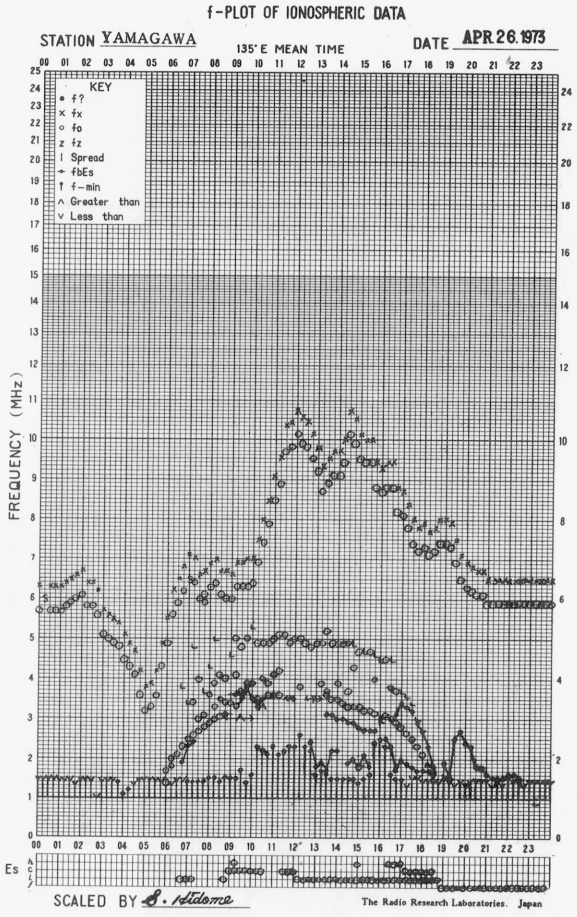
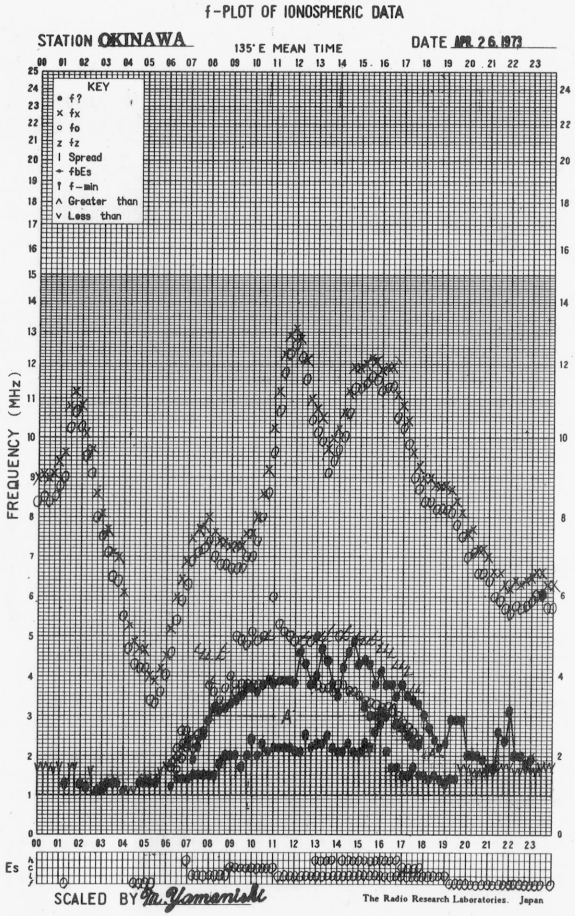
STATION KOKUBUNJI 135°E MEAN TIME DATE APR. 26. 1973

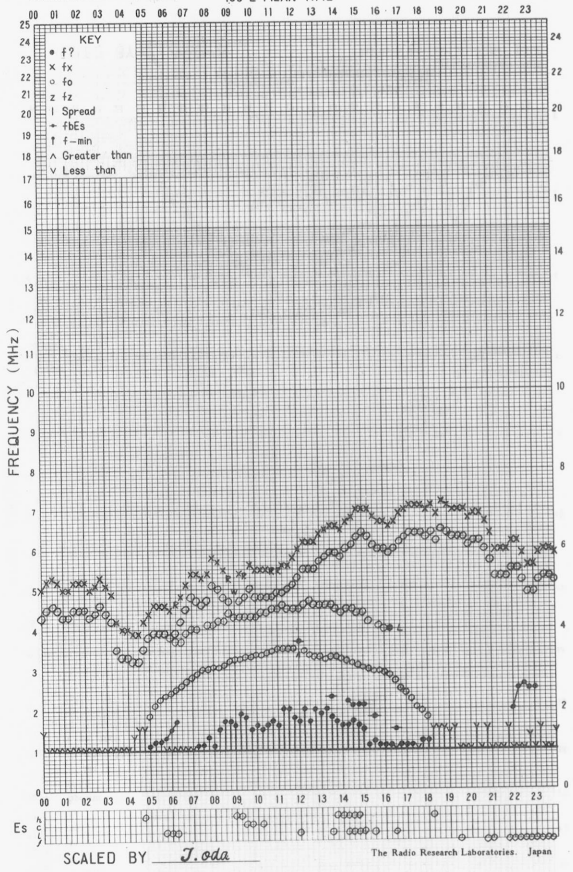



f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE APR. 26. 1973
KEY
• f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Ishidome
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135° E MEAN TIME
DATE APR. 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 APR 27. 1973

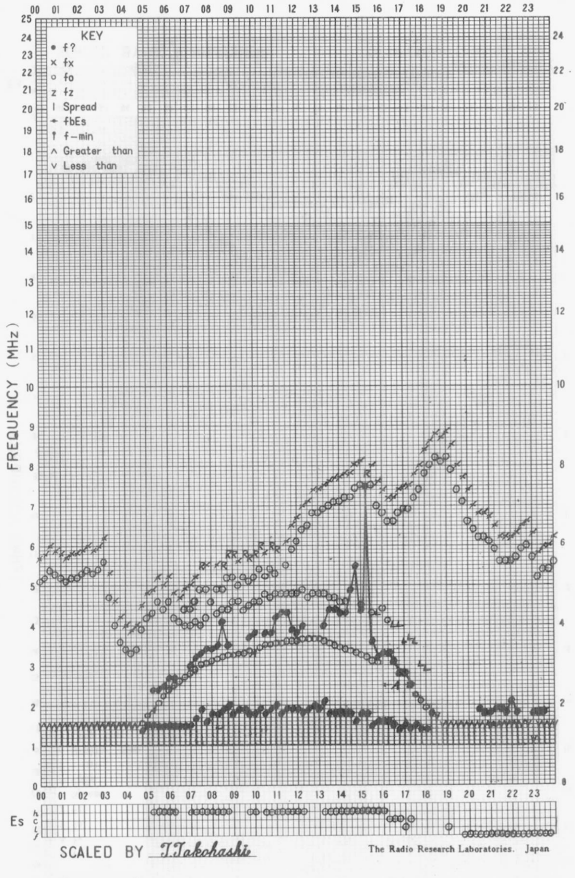


SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Apr. 27. 1973

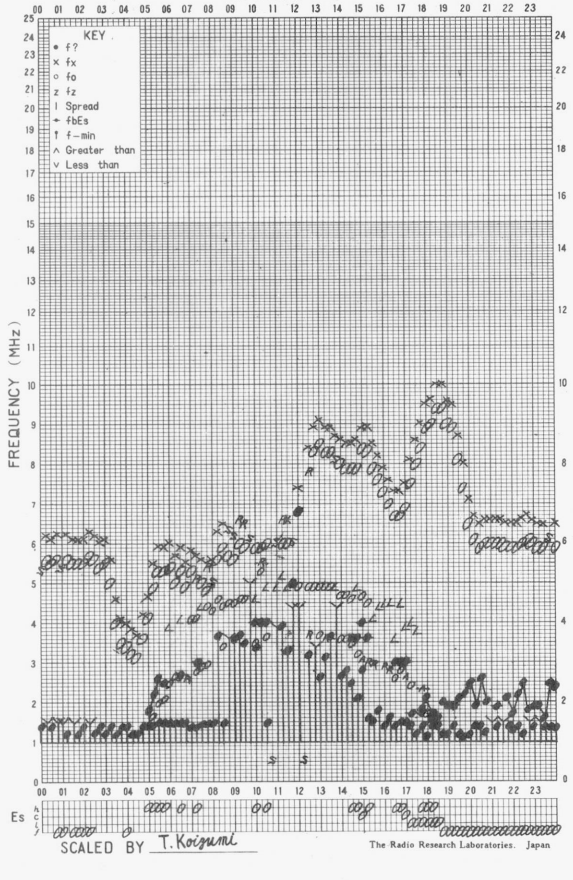


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

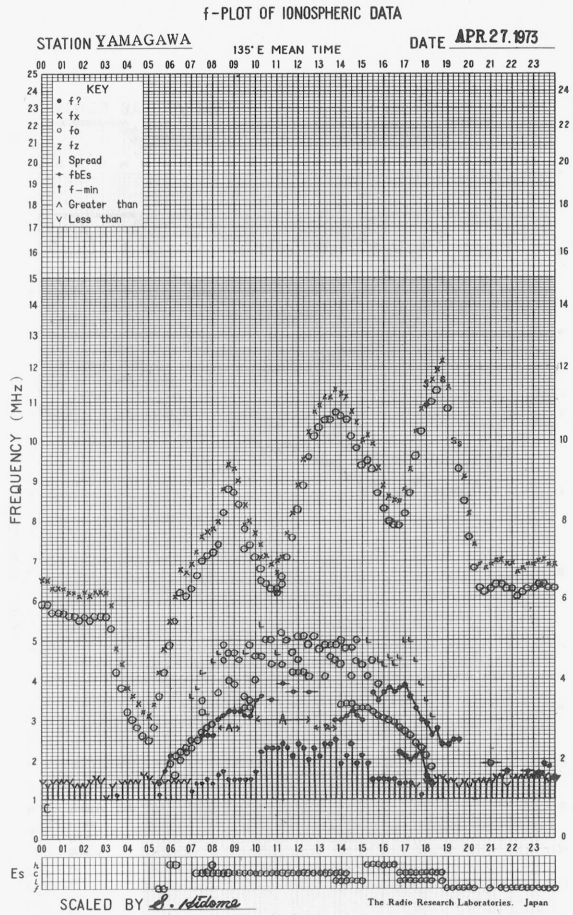
f-PLOT OF IONOSPHERIC DATA

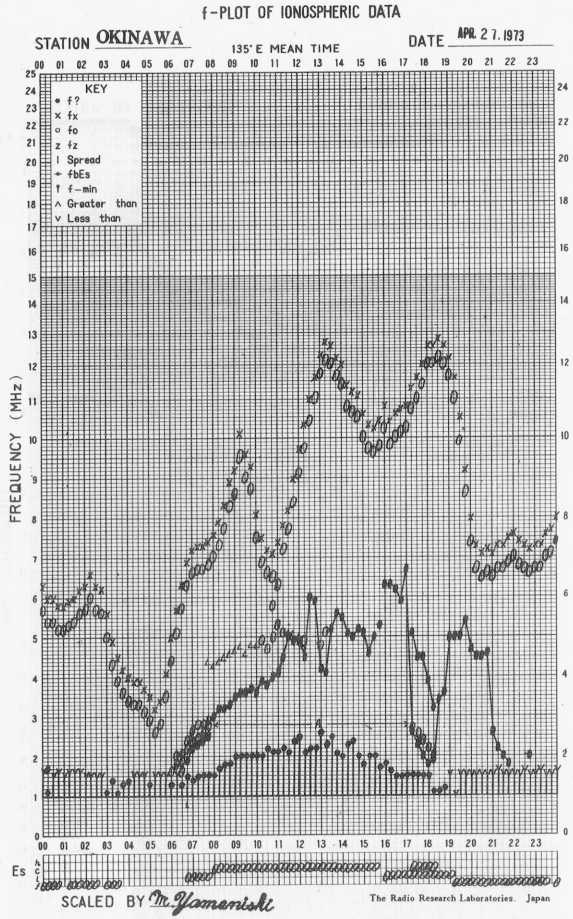
STATION KOKUBUNJI 135°E MEAN TIME DATE APR 27 1973



SCALED BY T. Koizumi

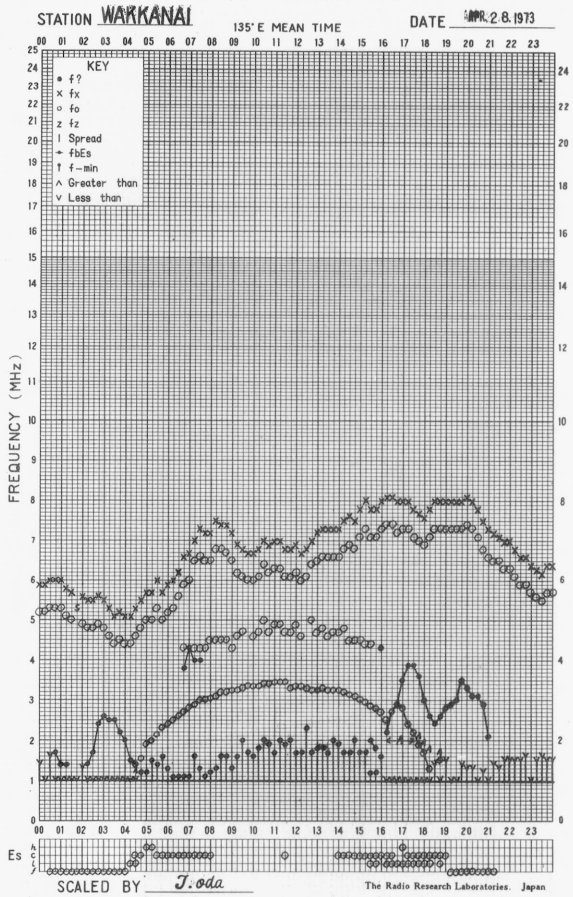
The Radio Research Laboratories. Japan


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


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135° E MEAN TIME
DATE APR. 27. 1973
KEY
• f?
× fx
○ 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 APR. 2 8. 1973

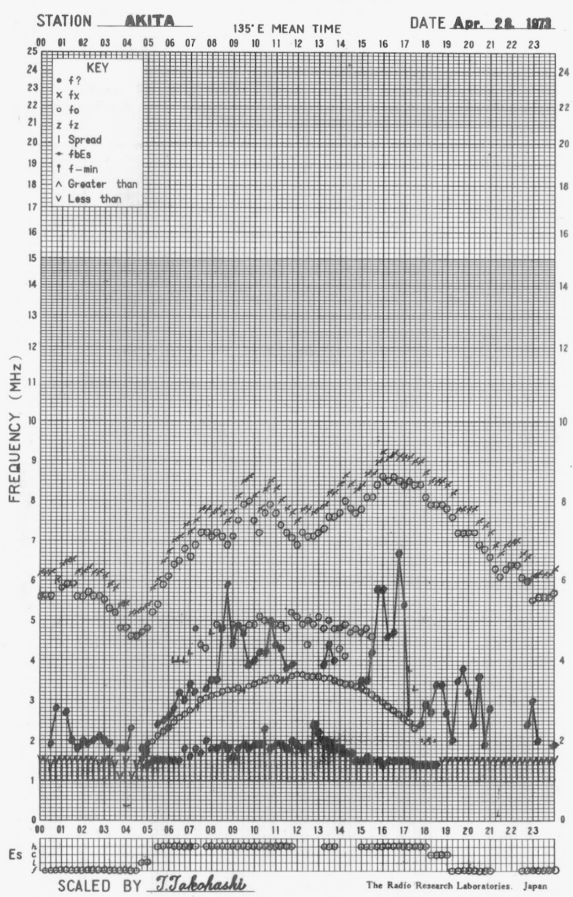


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Apr. 28. 1973

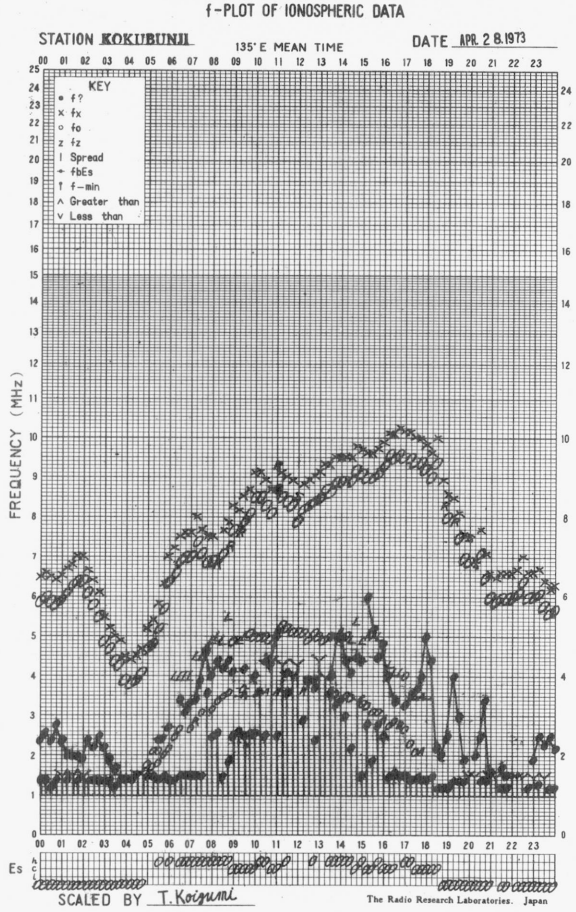


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

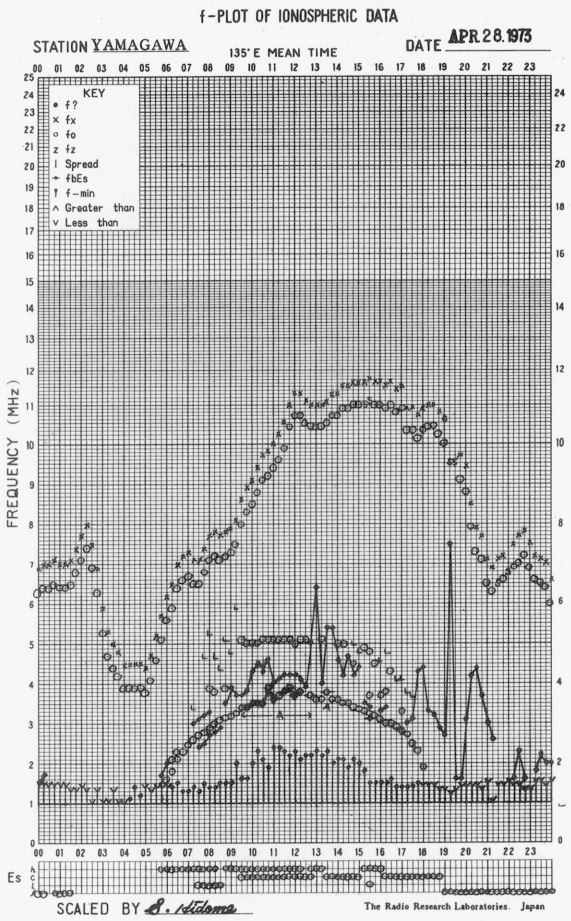
f-PLOT OF IONOSPHERIC DATA

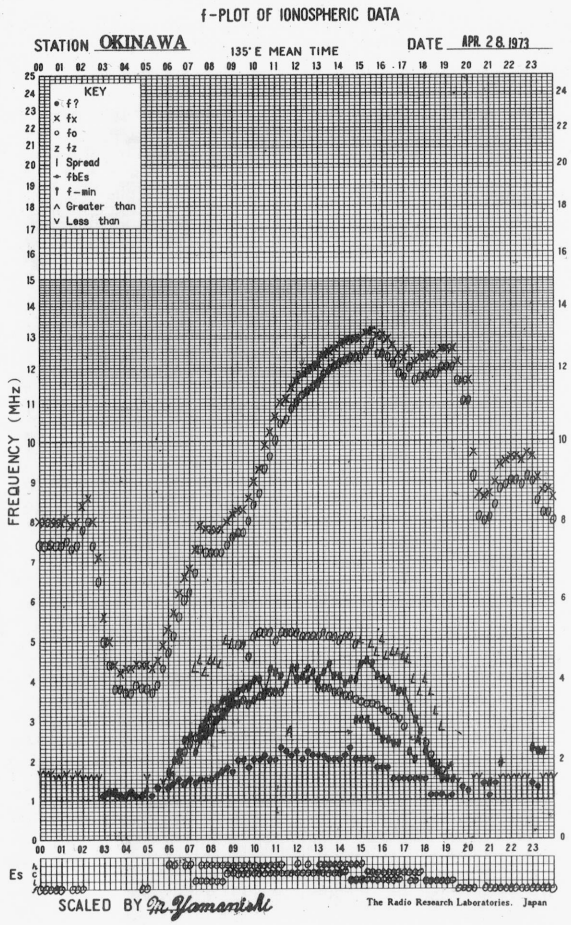
STATION KOKUBUNJI 135° E MEAN TIME DATE APR. 2 8. 1973



SCALED BY T. Koizumi

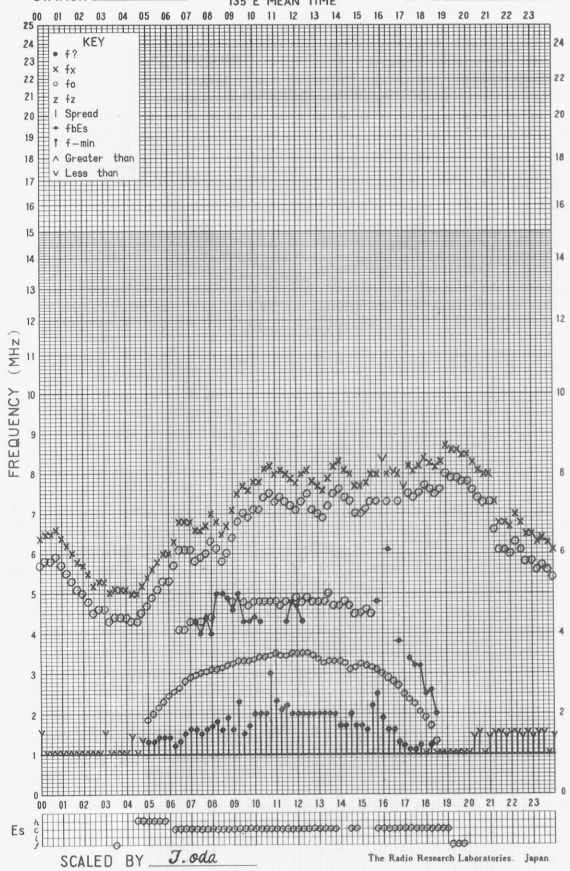
The Radio Research Laboratories. Japan


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

f-PLOT OF IONOSPHERIC DATA

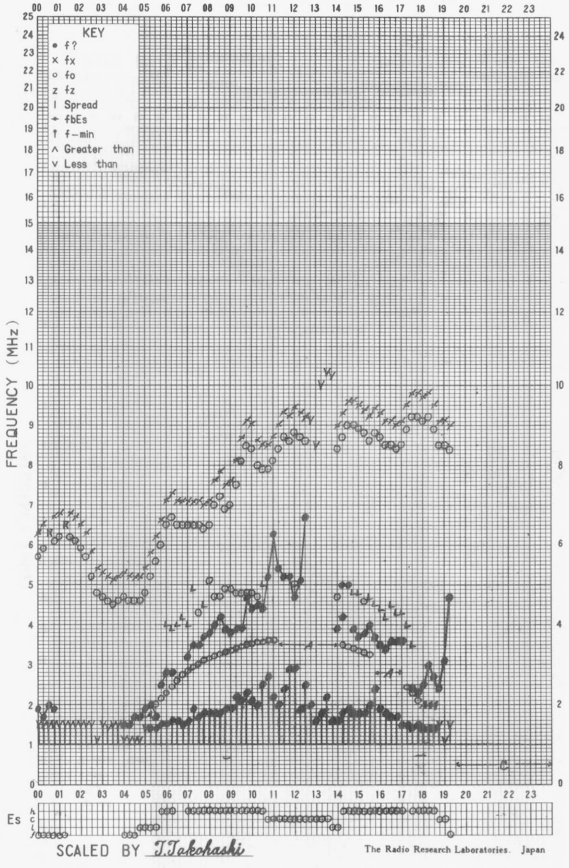
STATION WAKKANAI 135°E MEAN TIME DATE APR. 29. 1973



SCALED BY T. oda The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

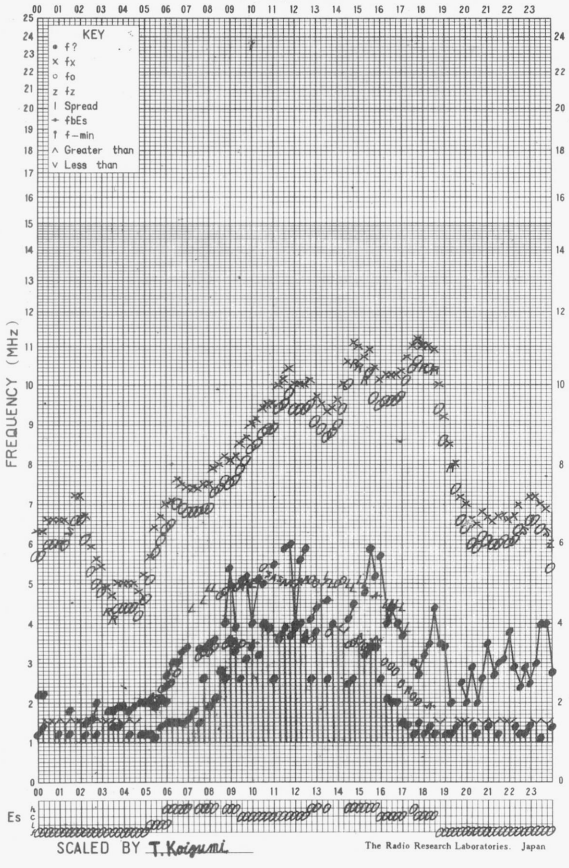
STATION AKITA 135°E MEAN TIME DATE Apr. 29. 1973



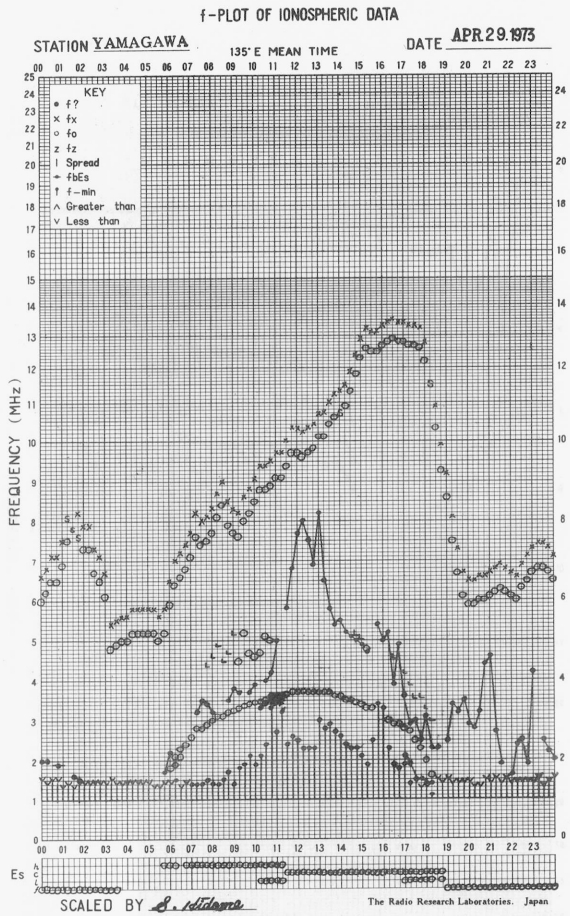
SCALED BY T. Takahashi The Radio Research Laboratories. Japan

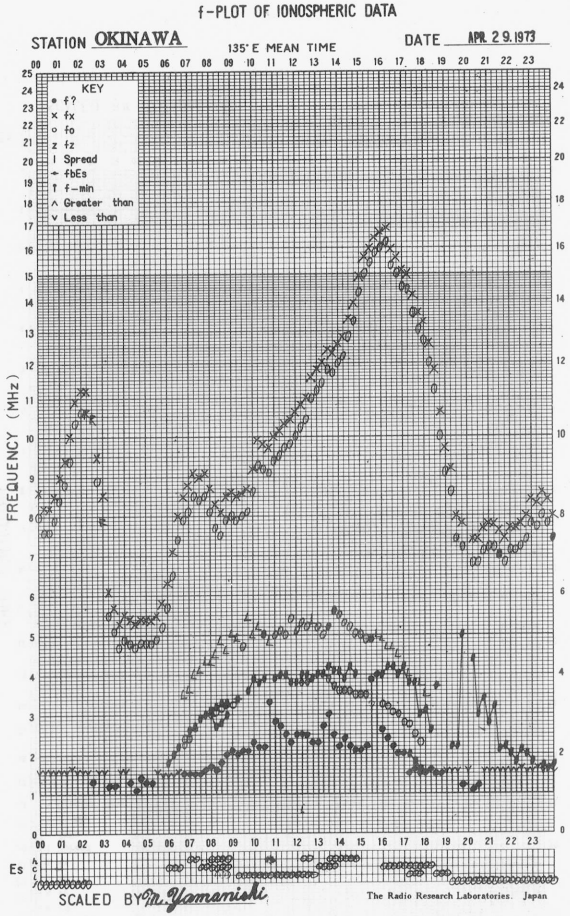
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE APR. 29. 1973



SCALED BY T. Koizumi The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE APR. 29. 1973
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Ichidome
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135° E MEAN TIME
DATE APR. 29. 1973
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY Dr. Yamanishi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE APR 3 0.1973

KEY
• f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than

FREQUENCY (MHz)

Es

SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Apr. 30. 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 APR 3 0.1973

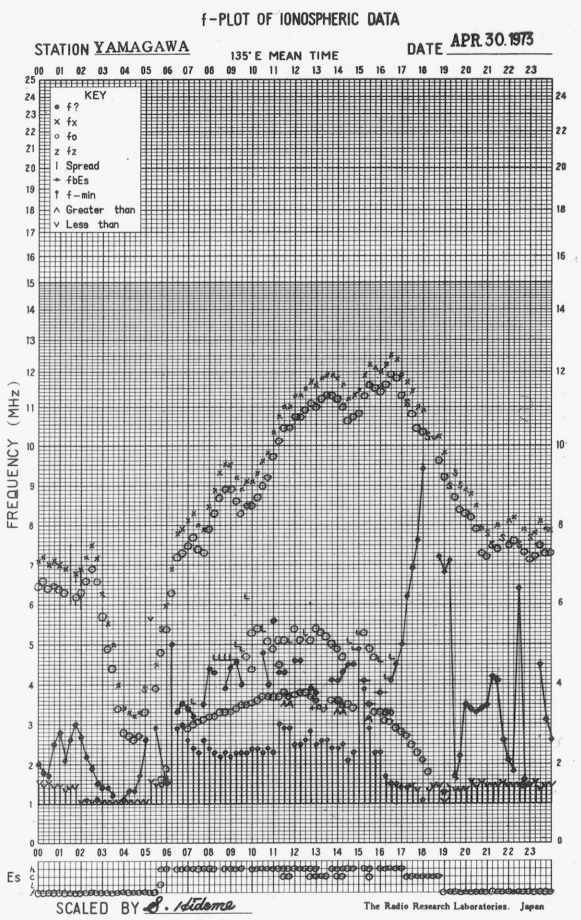
KEY
• f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
^ Greater than
v Less than

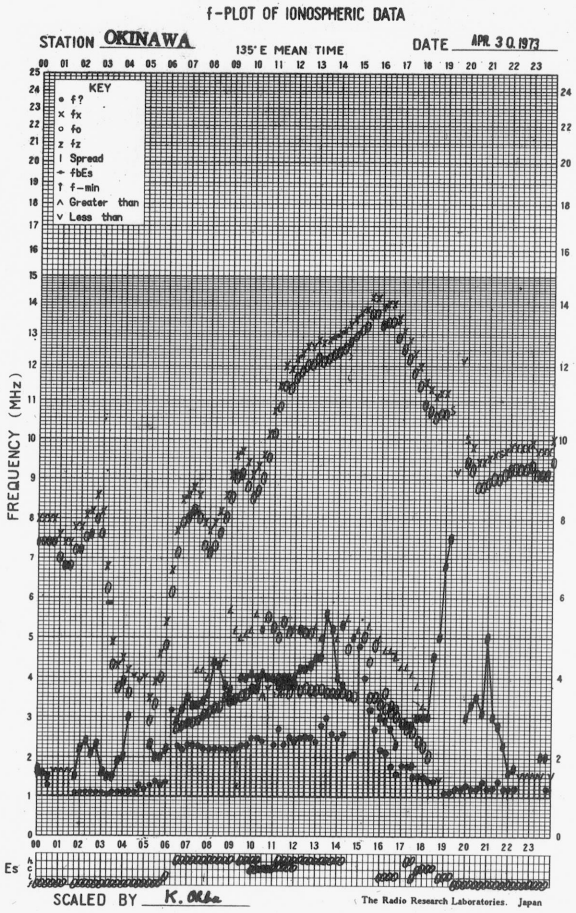
FREQUENCY (MHz)

Es

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE APR. 30. 1973
KEY
● f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Iidoma
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION OKINAWA
135°E MEAN TIME
DATE APR. 30. 1973
KEY
● f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY K. Oka
The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: April 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	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	-	-	-	10	-	-	-	-	0	-
12	7	7	7	7	8	0	0	0	0	0
13	7	7	8	8	7	0	0	0	0	0
14	7	7	8	7	7	0	0	0	0	0
15	6	6	6	5	6	0	0	0	0	0
16	5	5	5	5	5	0	0	0	0	0
17	5	5	5	6	5	0	0	0	0	0
18	8	8	8	9	8	0	0	0	0	0
19	9	8	8	8	8	0	0	0	0	0
20	8	8	8	13	8	0	0	0	1	0
21	10	10	13	-	11	0	0	0	-	0
22	7	8	10	21	8	0	0	0	1	0
23	31	27	32	-	27	1	1	2	-	1
24	17	19	23	9	20	2	2	2	0	2
25	11	16	8	6	11	0	1	0	0	0
26	6	7	6	7	6	0	0	0	1	0
27	7	8	10	13	8	0	0	0	0	0
28	12	17	16	9	15	0	0	0	0	0
29	8	10	13	17	10	0	0	*	1	0
30	15	12	11	13	14	1	1	0	0	1

Note No observations during the following periods:

1st 0000- 11th 0910 21st 2000- 22nd 0030
12th 2300- 2400 23rd 2000- 2400

*: interference.

SOLAR RADIO EMISSION

Flux Density

Month: April 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	26	26	26	28	26
2	35	33	32	27	32
3	32	32	32	25	31
4	29	31	32	25	29
5	26	27	27	q	26
6	q	q	q	25	q
7	26	28	28	25	27
8	27	27	29	26	27
9	29	31	30	30	29
10	30	29	27	28	29
11	28	27	26	26	28
12	26	25	25	-	26
13	22	21	20	20	21
14	22	22	21	23	21
15	24	24	23	23	24
16	23	24	23	22	23
17	21	21	20	21	21
18	20	21	21	20	21
19	21	21	21	21	21
20	22	22	21	22	22
21	23	24	22	22	23
22	23	23	23	23	23
23	23	23	22	23	23
24	25	25	25	22	25
25	22	23	21	22	22
26	24	22	23	24	22
27	25	27	25	25	25
28	25	25	25	26	25
29	26	27	27	27	26
30	27	27	26	26	27

Note No observations during the following periods:

9th 2100- 2200
11th 2000- 2200
12th 0750- 13th 0035

q: quiet level, when radiometer is unstable.

Distinctive Events

(single-frequency observations)

Month: April 1973
Observing station: Hiraiso
Normal observing period: 2000 - 0910 (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		
1	100	2212.5	2216.7	6.0	C	190	70	r	
3	100	0458.0	0458.2	1.0	S	140	50	lr	
		0501.0	0501.5	1.0	C	70	20	lr	
4	100	2315.7	2316.5	3.5	C	60	25	lr	
5	100	0241.5	0242.0	1.5	C	210	120	lr	
10	500	0025.0	0026.1	2.0	C	440	20		
		0030.0	0031.0	3.0	C	220	45		
		0048.0	0053.2	6.0	C	85	20		
		0147.5	0149.5	5.0	C	920	250		
		0156.5	0157.0	2.0	C	160	50		
	100	2007E	2036	259D	RF	200	35	r	sunrise
	500	2043.0	2050.0	9.0	C	1500	500		
21	200	0105.5	0107.0	4.5	C	140	15	s	
	100	0105.8	0106.0	1.0	S	55	10	r	
		0650	0736	140D	RF	20	10	R	sunset
22	100	0240.0	0240.2	4.0	C	115	20	rlr	
		2144.0	2239.5	143	RF	40	15	R	
		2148.0	2150.0	5.0	C	160	60	r	
	200	2149.0	2151.0	21.0	C	130	30	r	
23	100	0326	0348	160	RF	20	10	R	
		0757.5	0757.5	1.0	eS	100	40	r	
24	200	0626.0	0627.0U	2.5	C	140D	50D	R	
	100	0626.5	0627.0	1.5	C	140	70	rl	
25	100	0104.0	0104.7	1.5	C	110	50	rl	
		0340	0412	105	RF	30	10	r0r	
	200	0416.0	0422.3	14.0	C	130	15	rlr	
	100	0417.2	0420.5	14.0	C	180	70	0	
		0818.9	0819.0	1.0	S	160	50	rl	
26	100	2001.5	2002.5	4.5	C	240	90	rl	
	200	2302.0	2302.0	7.0	eC	150	30	s	
	100	2302.5	2302.8	5.0	C	180	40	rlr	
27	100	0117.6	0118.0	1.5	S	240	110	r	
28	100	2126	2150	55	RF	20	10	r0r	
29	100	0120	0150	85	RF	65	20	0	
29	500	2056.0		259	C+		660		
			2102.5			2700			1st peak
			2145.8			4600			2nd peak
			2158.4			7400			3rd peak
			2210.0			10000			4th peak
	200	2059	-	130	C+	330D	200D	lrl	*
	100	2100	2102U	103	C	1000D	110D	l0r	
30	500	0115.0	0322.5	205	pi	120	20		
	100	0132.0	0132.9	2.0	C	420	80	lr	
		0138.4	0139.8	2.5	C	600	100	lR	
		0512.0	0513.0	4.5	C	320	90	rs	
	200	0512.0	0513.4	4.3	C	170	20	s	
		0554.5	0555.5	9.0	C	150	10	s	
	100	0554.5	0555.5	10.5	C	500	60	lr	
	200	0640.5	0641.5	2.0	C	150	70	s	
	100	0641.0	0641.4	2.0	C	400	100	rl	

*: saturated at low level.

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

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

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

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

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Apr. 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	4o	5U S S 3U	4 4U S 4	N N N N	---	---	202
2	3+	3U S S 3U	4 3 4U 3	U U U U	---	---	
3	4-	4U S S 4U	4 2U S 4	U U U U	---	24.0	
4	4-	4U S S 5	4 2 4U 4	U U U U			
5	4o	5U S 5U 4	4 4 3U 4	N N N N			
6	5-	5U S 5U 5	4 4 S 4	N N N N			
7	4+	5U S 5U 4	4 4 4U 4	N N N N			
8	5-	5U S 5U 5	4 4 5U 4	N N N N			
9	5-	5U S 5U 5U	4 4 5U 4	N N N N			
10	4+	4U S 5U 5U	3 4 5U 4	N N N N			
11	4+	5U 4U 4U 4U	4 5 5U 4	N N N N			
12	4-	3U S S 5	4 3 S 4	N N N N			
13	4o	5U S S 3U	4 4 S 4	N N U U	04.38	24.0	185
14	4o	3U S S 4	4 5 4U 4	U U U U	02.47	---	183
15	4-	3U S S 4	4 3 5U 4	U U U U	20.5	03.0	98
16	4o	4U S S 4U	4 4 4U 4	N N N N	---	---	
17	4-	4U S S 3U	4 3U 4U 4	N N N N	---	---	
18	3+	3U S S 4U	4 3U 3U 4	U U U U	---	---	
19	4-	3U S S 3U	4 4 S 4	U U U U	---	---	
20	3+	3U S S 3	4 3U 4U 4	U U U U	---	---	
21	4-	3U S S 3U	4 5 4U 4	U U U U	---	---	
22	4-	3U S S 3U	4 5 5U 3	U U U U	---	---	
23	4o	3U S S 4U	4 5 S 4	U U U U	---	17.0	
24	4o	4U S S 4	4 4 5U 4	U U U U			
25	4-	4U S S 3U	4 4 4U 3	N N N N			
26	4-	4U S S 4U	4 3 4U 3	N N N N			
27	4o	3U S S 4U	4 4 5U 4	N N N N			
28	5-	4U S S 5	4 5 5U 4	N N N N			
29	4o	4U S S 3U	4 5 5U 3	N N N N			
30	3o	2U S S 3U	3 4 S 3	N N N N			

SUDDEN IONOSPHERIC DISTURBANCES

HIRAISO

Time in U.T.

Apr. 1973	S W F							Correspondence		
	Drop-out Intensities (dB)				Start	Duration	Type	Imp.	Solar Flare	Solar Noise	Geomag. Crochet
	CO	HA	1)	2)							
10			14		0013	40	G	1			
10			24		0054	24	SL	2	X		
10			19		0119	24	SL	1+			
11		37			1843	25	S	3+			
11		15			20//	//	SL	2-	X	X	
25		//	10		0422	18	SL	1-		X	
29			14		0136	20	SL	1	X	X	
29			6		0415	16	SL	1-			
29			17	//	0629	30	S	1+			
29		>25		>30	2058	30	S	2+	X	X	
30			18	20	0556	20	SL	1+	X	X	
30		>25			2253	//	S	3		X	

NOTES

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

I N U B O

Apr. 1973	S P A									Remarks
	Phase Advance (degrees)						Time (U.T.)			
Date	GBR	NAA	NWC	NPG	ND3	AL3	Start	End	Maximum	
1			10	7	19	—	0009	0112	0032	
1	23		35			—	0811	0908	0817	X
1	28	32	19	33	32	—	2203	2310	2214	X
2				20		—	0006	0106	0028	
2				12		—	0208	0300	0228	
3				27			0229	0418	0330	
3				25			0502	0637	0550	
3	—	—	14				0759	0908	0808	X
4					22		0541	0642	0607	
4		12		11			2202	2217	2207	
5				20	33		0600	0627	0605	
5				23	34		0643	0706	0649	
5				42			0752	0906	0811	
6				9			0222	0249	0231	
7		—	8	9			2252	2316	2300	
8		—	24	12			0208	0249	0220	X
8		—	24	11			0305	0347	0316	X
8	—	—	9				0517	0552	0524	
8			12				0604	0648	0610	
8	31		34				0656	0752	0704	X
8	10		10				0813	0838	0818	X
8	18		8				0855	0930	0900	
8			6	4			2238	2305	2241	
9				20	47		0126	0255	0208	
9			11	5			2312	2336	2316	

Apr. 1973	S P A									Remarks
	Phase Advance (degrees)						Time (U.T.)			
Date	GBR	NAA	NWC	NPG	ND3	AL3	Start	End	Maximum	
10	14	81*	120*	21	73*		0013	0404	0112	X
10	35			49			0057	0202	0114	
10			22				0438	0611	0506	X
10			—	17			2136	2215	2142	X
11				13			0626	0702	0637	
11		77		31			1842	1911	1848	X
11		15		11			2031	2107	2036	
11	-10			-14	-29		2237	2314	2255	
12	15	18	22	18	17		0003	0100	0010	X
12			17	12	—		0358	0453	0406	
12	20	10		20			0707	0801	0718	
12				8	—		2210	2228	2214	
13			18				0509	0558	0518	
14			23	13	16		0308	0400	0313	
14		21		47	26		0621	0721	0631	
14	13	29	—	37	38		2137	2214	2145	
15			14	8			0326	0357	0332	
15	22	27	16	47	37		2236	2304	2239	
16				5	17*		0127	0216	0200	
16				18	26*		0252	0402	0303	
16	26		14				0759	0828	0810	X
16					47		0821	0905	0835	
18	31	49	19	11			0720	0828	0738	
19			35	38			0006	0136	0044	
21		64					0716	0838	0732	

Apr. 1973	S P A									Remarks
	Phase Advance (degrees)						Time (U.T.)			
Date	GBR	NAA	NWC	NPG	ND3	AL3	Start	End	Maximum	
22	26	35		54	64		2131	2323	2205	
24				21			1927	1950	1934	X
25	—			7	28		0302	0349	0334	
25	—		50	13	26		0423	0532	0437	X
25	—			9			0514	0550	0528	
25				7			0601	0635	0609	
26	32		74	11			0625	0807	0652	X
26			8*	11	44		2248	2351	2313	X
27					32		0052	0142	0056	
29			61	23	57	83	0132	0223	0140	X
29			39	9			0415	0503	0423	X
29					51		0544	0623D	0553	
29	75		112	40	46		0626	0818	0637	X
29	51	205		243	201	90	2054	0143	2106	
30	46	21	90	30	37		0553	0736	0605	X
30				17			1728	1752	1736	X
30	70	96	124	163	141	88	2252	0049	2258	X

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