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IONOSPHERIC DATA IN JAPAN

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RADIO RESEARCH LABORATORIES

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CONTENTS

SITE OF THE RADIO WAVE OBSERVATORIES AND HIRAISO BRANCH

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

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

Solar radio emission and radio propagation conditions are observed at Hiraiso Branch and Inubo Radio Wave Observatory.

	Latitude	Longitude	Site
Hiraiso	36°22.0′N.	140°37.5′E.	Isozaki-machi, Nakaminato-shi, Ibaraki-ken
Inubo	35°42.2′N.	140°51.5′E.	9912 Tennodai, Choshi-shi, Chiba-ken

SYMBOLS AND TERMINOLOGY

A. IONOSPHERE

All symbols and terminology in the table of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction," 1961.

Terminology

f_oF2, f_oF1, f_oE — The ordinary wave critical frequency for the $F2$, $F1$ and E layers, respectively.

f_oEs — The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.

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

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

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

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

$h'F2$ — 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 $0.834 f_0F2$.

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 $0.969 f_0F2$).

a. Descriptive Letters

The following letters are entered after or used to replace a numerical value on the monthly tabulation sheets.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *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 non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range. Used in a qualifying sense, see below.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range. Used in a qualifying sense, see below.

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.

H Measurement influenced by, or impossible because of, the presence of a stratification.

L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Intermittent trace.

Z Third magneto-ionic component present.

b. Qualifying Letters

The following letters are entered in the first column before a numerical value on

the monthly tabulation sheets.

D	greater than.
E	less than.
I	Missing value has been replaced by an interpolated value.
J	Ordinary component characteristic deduced from the extraordinary component.
O	Extraordinary component characteristic deduced from the ordinary component. (Used for x- characteristics only.)
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
U	Uncertain or doubtful numerical value.
Z	Measurement deduced from the third magneto-ionic component.

c. Definitions of the CNT, MED, UQ and LQ

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

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

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

d. Description of Standard Types of *Es*

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

F	An *Es* trace which shows no appreciable increase of height with frequency. The trace is usually relatively solid at most latitudes. This classification may only be used at night; apparently flat *Es* traces observed in the daytime are classified according to their virtual 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 nonblanketing over part or all of its frequency range. This is distinguished from the usual group retardation (as in the case of an occulting thick *E* layer) by the lack of group retardation in the *F* layer traces at corresponding frequencies and the lack of complete blanketing.

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

S A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace. The rising trace alone is classified as '*S*'; the horizontal trace is classified separately. At high latitudes the slant trace usually starts to rise from a horizontal *Es* trace such as *Es-L*, or *Es-F*, at frequencies which greatly exceed the *E* layer critical frequency, whereas at low latitudes it usually rises from *Es-Q Es-C* or *Es-H* at frequencies near the regular *E* critical frequency. Type *S* is never used to determine f_0Es and *h'Es*. The slant trace is sometimes observed to start at f_0E without echoes clearly identifiable as *Es* echoes being seen.

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

e. Multiple Reflections from *Es*

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

B. SOLAR RADIO EMISSION

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

a. Time and Unit

The time is expressed as U.T.

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

b. Daily Data

Flux density

The three-hourly and daily mean values are given.

Variability

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

Variability is expressed in the following four grades:

0 = Quiet or no burst,
1 = A few bursts,
2 = Many bursts,
3 = Very many bursts.

The number of bursts exceeding the flux level is counted. Bracket means that observation time does not exceed one third of the period.

c. Distinctive Events

The phenomena are picked up on the following criteria:

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

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

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

Descriptive type is denoted by the following symbols:

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

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

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

C. RADIO PROPAGATION CONDITIONS

a. Field Strengths of WWV and WWVH

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

±40 Hz bandwidth.

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

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

Transmitter

	WWV	WWVH
Location	Fort Collins, Colorado Long. 105°02′W Lat. 40°41′N	Maui, Hawaii Long. 156°28′W Lat. 20°46′N
Power	3 kW for the upper side-band	0.5 kW* for the upper side-band
Antenna	$\lambda/2$ vertical	$\lambda/2$ vertical
Distance	9150 km	6270 km

*Reduced from the carrier power of 2 kW with amplitude modulation of 100%.

Receiver

Antenna	4.5 m vertical rod
Bandwidth	±40 Hz for the upper side-band
Calibration	every half an hour

The meaning of *Descriptive symbols* is as follows:

C : Measurement influenced by, or impossible because of, any non-propagational reasons.

S : Measurement influenced by, or impossible because of, interferences or atmospherics.

U : Inaccurate measurement influenced by interferences, atmospherics, or non-propagational reasons.

E : Less than the following figure.

b. Radio Propagation Quality Figures

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

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

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

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

N = normal
U = unstable
W = disturbed

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

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

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

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

(i) SWF

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

Circuits and Drop-out intensities

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

Start-time and Duration

Types

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

Importances

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

1−	1	1+
2−	2	2+
3−	3	3+

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

(ii) SPA

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

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

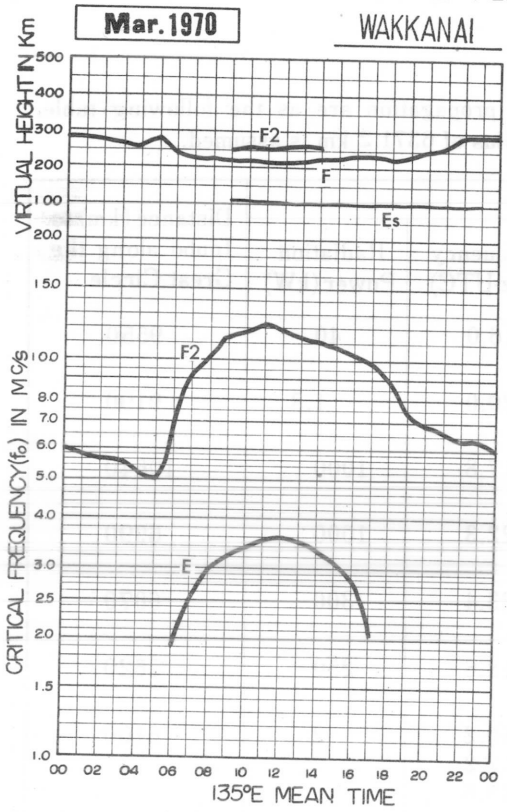
Transmitting Site					Distance (km) to Inubo along the Great Circle
Name	Location (Geographic Coordinate)	Station Call	Frequency (kHz-UTC)	Radiation Power (kW)	
Rugby	52°22′N 001°11′W	GBR	16.0	40	9550
Fort Collins	40°41′N 105°03′W	WWVL	20.0	1.8	9190
Cutler	44°39′N 067°17′W	NAA	17.8	1000	10640
North West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

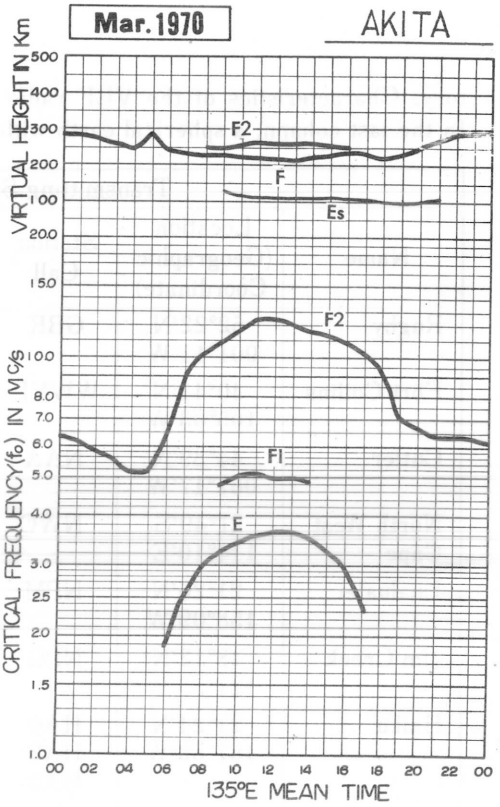
The phase advance is shown in its maximum stage. In the column 'Phase Advance', — means no transmission or no reception during the period, and blank means indistinguishable record.

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

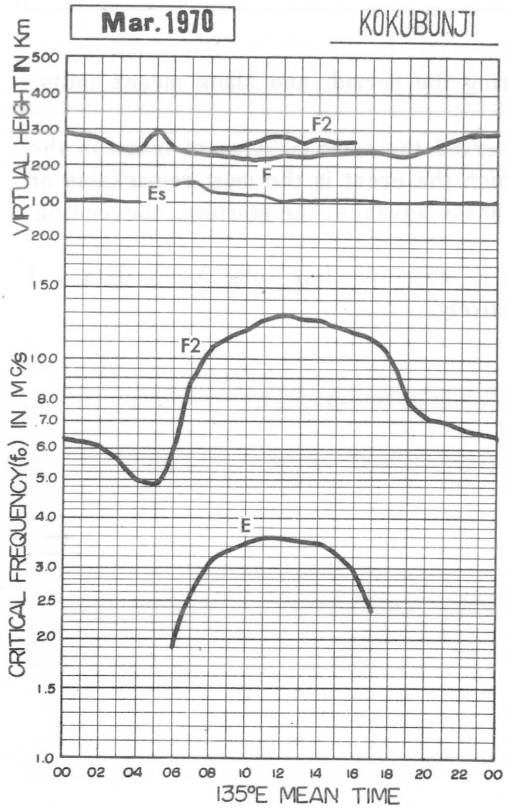
In the column 'Remarks', the event with its corresponding solar X-ray data and solar radio data is shown by 'X' and 'R', respectively.

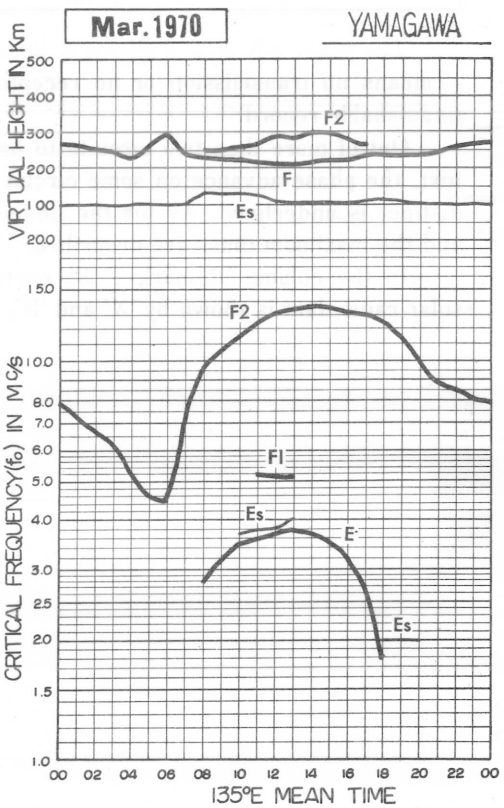
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: WAKKANAI

Mar. 1970

135° E Mean Time (G.M.T.+9h)

CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	060	058	056	056	052	050	068	091	101	114	118	122	119	117	111	107	103	098	089	074	069	066	064	064
	CNT	29	29	28	29	28	24	30	29	30	29	30	30	31	31	31	31	31	31	31	31	31	31	30	30
	Q R	012	011	012	011	014	016	023	011	011	010	011	011	008	005	006	009	007	008	006	012	013	010	014	012
foF1	MED								400F	400	470		500L	500L	U450L										
	CNT								1	1	2		1	2	1										
foE	MED						E	190	250	300	320	335	350	360	350	332	310	275	205	E					
	CNT						7	15	30	30	30	28	27	30	31	30	30	31	25	9					
foEs	MED	E	E	E	E	E	E	G	G	G	034	030G	G	G	G	G	G	G	G	015	E	E015E	E	E012E	E015E
	CNT	31	31	31	31	31	30	30	30	30	30	29	28	30	31	31	31	31	30	31	31	30	31	31	31
	Q R																			D008					
f-min	MED	E	E	E	E	E	E	E011E	012	016	017	017	018	018	017	017	016	016	012	E012S	E	E	E	E	E
	CNT	31	31	31	31	31	30	30	30	30	30	29	28	30	31	31	31	31	30	31	31	30	31	31	31
M (3000) F2	MED	265	265	265	270	270	268	305	320	310	308	305	300	295	295	295	300	300	305	305	290	280	275	268	270
	CNT	29	29	28	29	28	24	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	30	30
M (3000) F1	MED								315F	335	368		380L	380L	U395L										
	CNT								1	1	2		1	2	1										
h'F2	MED								W	635	250	260	255	260	258	260									
	CNT								1	1	9	12	17	12	14	5									
h'F	MED	285	285	275	265	255	278	240	225	225	225	220	220	215	220	225	230	240	240	225	235	250	260	280	280
	CNT	31	31	31	31	31	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31
h'Es	MED	100	100	100	100	100	110	110	145	130	115	110	108	105	102	100	105	102	105	100	102	105	100	100	105
	CNT	4	8	6	6	9	1	6	3	4	17	16	12	12	12	12	9	12	13	9	8	7	5	7	7
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: AKITA

Mar. 1970

135° E Mean Time (G.M.T.+9h)

CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	063	062	058	056	051	052	064	092	102	109	116	125	124	121	116	113	109	102	092	070	067	064	064	064
	CNT	29	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30
	Q R	011	014	014	011	008	011	020	010	011	013	009	005	009	009	005	006	009	010	010	015	011	010	010	013
foF1	MED									390	480L	505L	510L	500	500L	490L	485L								
	CNT									3	8	18	20	21	23	10	2								
foE	MED							190	250	300	320	340	355	365	365	348	325	290	228						
	CNT							9	29	30	31	31	29	29	30	28	28	29	24						
foEs	MED	E014S	E014S	E014S	E014S	E014S	E014S	E014S	G	G	033	G	G	G	G	G	G	G	G	E017S	E014S	E014S	E014S	E014S	E014S
	CNT	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	29	31	29	31	31	31	31	31	31
	Q R																								
f-min	MED	E014S	E014S	E014S	E014S	E014S	E014S	015	017	018	018	020	021	021	020	019	018	016	015	D005		D002			
	CNT	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	29	31	29	E014S	E014S	E014S	E014S	E014S	E014S
M (3000) F2	MED	280	285	285	290	285	275	310	322	322	310	305	300	300	295	295	300	305	310	310	300	290	290	285	285
	CNT	29	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
M (3000) F1	MED									390	378L	375L	365L	375	370L	360L	370L					29	29	29	29
	CNT									3	8	18	20	21	23	10	2								
h'F2	MED									250	250	260	265	260	265	260	260	252							
	CNT									20	30	31	31	31	31	31	31	10							
h'F	MED	285	280	270	260	245	290	240	230	230	230	220	220	220	215	225	230	240	240	220	230	250	265	280	290
	CNT	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
h'Es	MED	105	102	100	100	100		155	150	135	128	120	115	112	115	115	110	108	105	100	100	105	108	105	102
	CNT	1	2	3	2	3		2	4	2	16	14	15	8	6	5	8	8	5	10	7	8	6	4	4
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: KOKUBUNJI

Mar. 1970

135° E Mean Time (G.M.T.+9h)

CHAR \ HR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	064	062	061	056	050	049	061	090	103	111	117	126	130	126	125	120	117	112	102	078	071	070	067	066
	CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	30	30	29	30	31
	Q R	009	011	012	010	006	009	016	010	006	009	013	007	008	008	006	009	009	013	008	011	010	008	009	009
foF1	MED											530L	510L	510L	U510L	535L									
	CNT											3	3	1	1	2									
foE	MED					150		190	260	310	330	350	360	365R	352	350	332	300	235	E190E					
	CNT					1		20	27	24	21	15	12	9	16	20	20	20	13	2					
foEs	MED	E015S	E015	E015	E	E	E012B	G	G	G	G	E036G	G	G	G	G	G	G	017G	E018G	018	E015	E015	E015	E015S
	CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31
	Q R		D006																	D009	D006	D005	D005	D006	D003
f-min	MED	E015S	012	012	010	010	012	014	014	015	015	019	025	025	025	021	016	015	015	E015S	E015S	E015S	E015S	E015S	E015S
	CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31
M (3000) F2	MED	280	285	290	290	280	270	300	320	310	305	298	290	295	290	285	290	295	300	305	295	285	285	275	275
	CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	30	30	29	30	31
M (3000) F1	MED											380L	390L	370L	U380L	365L									
	CNT											3	3	1	1	2									
h'F2	MED									250	250	260	275	280	265	272	270	268							
	CNT									19	29	29	29	30	31	30	25	12							
h'F	MED	290	285	270	250	245	300	250	240	240	230	220	220	230	225	230	240	245	245	240	230	245	265	280	290
	CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31
h'Es	MED	105	102	105	102	100	115	150	160	130	130	125	120	105	110	105	110	108	105	100	100	105	100	100	105
	CNT	6	8	6	6	5	1	7	5	11	14	15	11	9	11	11	11	14	17	15	17	13	13	12	8
hpF2	MED	380	360	350	350	375	390	305	300	300	305	335	340	340	345	350	350	340	310	300	320	350	355	380	380
	CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	30	30	29	30	31
ypF2	MED	100	100	100	100	100	100	090	090	090	095	095	090	090	100	095	100	100	100	090	100	100	100	100	100
	CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	30	30	29	30	31

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: YAMAGAWA

Mar. 1970

135° E Mean Time (G.M.T.+9h)

CHAR \ HR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	078	072	066	062	052	046	045S	077S	098S	106	115	123	131	136	136	135	133	130	125S	112S	098S	088S	085S	080S
	CNT	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
	Q R	012	012	014	016	012	009	010	010	009	006	014	011	012	008	011	010	015	018	017	017	019	013	014	016
foF1	MED									330L	390L	U500L	520L	U520L	510L	U590L	U570L	375	330L						
	CNT									1	2	1	8	5	4	3	1	2	2						
foE	MED								200	280	320	350	360	370	380	370	352	322	272	180					
	CNT								25	31	31	31	30	28	29	30	28	26	26	25					
foEs	MED	E015S	E015	E014S	E012E	E	E014B	E015S	022	G	032	037	038	038	040	034G	031G	030G	027G	020	020	020	E015S	E015S	E015S
	CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	30	31	31	31	31	31	31	31	31	31	31
	Q R	D005	D008	D005								007	003	005	004	010	012	D017			007	D009	D006	D001	D003
f-min	MED	E015S	E015S	E013S	011	E	E013S	E015S	E015S	014	015	016	017	018	018	018	016	015	015	E015E	E015S	E015S	E015S	E015S	E015S
	CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	30	31	31	31	31	31	31	31	31	31	31
M (3000) F2	MED	278	280	290	290	285	270	275S	320S	315S	310	300	290	285	285	280	280	280	290	295S	295S	280S	270S	280S	275S
	CNT	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
M (3000) F1	MED									390L	415L	U375L	378L	U380L	388L	U355L	U335L	408	400L						
	CNT									1	2	1	8	5	4	3	1	2	2						
h'F2	MED									250	250	265	270	290	280	300	295	280	265						
	CNT									9	30	31	31	31	31	31	30	31	17						
h'F	MED	270	265	255	250	225	260	298	240	235	225	225	215	215	210	212H	225	225	240	240	230	230	245	260	270
	CNT	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30	31	31	31	31	31	31
h'Es	MED	100	100	105	100	102	100	100	100	138	130	130	125	112	105	105	105	105	110	115	105	100	100	100	105
	CNT	12	14	9	7	4	6	5	17	12	21	24	26	28	29	23	26	23	22	18	23	18	12	8	9
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA

MAR. 1970 | FOF2 (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

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

IONOSPHERIC DATA

MAR. 1970 | 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														U L 450										
2													L											
3										U L 430				L										
4												L												
5											L													
6																								
7													L											
8													L											
9								F 400	400	510														
10										L	L	L	L		L									
11												L												
12												L	L											
13												L	C											
14														L										
15											L	L		L										
16										L	L	L		L										
17											L	C		L										
18											L	L	U L 500											
19												L		L	L									
20													L	L										
21												L	L	L										
22											L	L	L	L										
23										L	L	L	L 500											
24										L	L	L												
25											L	L	L		L									
26										L	L	L	L											
27												L		L	L									
28														L	L									
29										L	L	L 500		L										
30														L										
31										L	C	C												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1	2		1	2	1										
MED								F 400	400	470		L 500	L 500	U L 450										
UQ																								
LQ																								

The Radio Research Laboratories, Japan

MAR. 1970 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FOE (0.01 MHZ) | 135 E Mean Time (G. M. T. + 9h)

Station WAKKANAI Lat. 45 23.6 N. Long. 141 41.1 E Sweep 1 MHz to 20 MHz in 20 sec in 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	220	275	I C 320	340	345	345	335	330	315	255	170						
2							140	210	280	320	340	355	345	345	315	305	250	190						
3							S	225	290	315	340	340	345	345	330	300	270	180	E					
4							S	230	300	I A 320	340	355	360	360	330	305	270	190						
5							S	220	300	305	325	355	365	350	350	320	265	A	E					
6							A	220	290	310	320	330	345	350	335	310	255	A	E					
7							F	210	270	295	I A 330	I B 360	360	345	325	300	280	185	E					
8							A	225	285	295	295	330	335	335	320	300	255	S	E					
9							A	220	285	I A 305	320	340	335	330	320	300	250	S	E					
10							170	215	290	305	300	I A 345	350	340	330	300	255	200	S					
11							S	230	300	I A 310	340	340	340	340	325	300	275	190	E					
12							S	240	300	315	320	350	360	350	330	300	270	205	A					
13							S	225	300	320	330	330	I C 330	340	330	300	270	195	E					
14							175	250	300	315	335	350	I A 360	345	335	310	270	195	S					
15							S	240	300	325	320	A	A	350	335	310	270	A	A					
16							S	255	300	325	345	A	355	345	330	300	270	A	A					
17							170	265	315	320	340	I C 350	360	345	340	320	280	190	S					
18							S	I A 250	310	335	335	355	360	350	335	315	280	200	A					
19							S	255	300	320	320	350	350	340	330	315	280	205	S					
20							C	C	C	C	C	C	330	330	325	300	275	200	S					
21							S	250	295	320	I A 340	365	370	360	340	315	290	210	S					
22						E	150	260	310	I A 330	350	370	370	340	340	320	280	210	S					
23						E	200	F 280	305	340	350	370	I A 380	370	330	310	280	I C 205	S					
24						E	190	260	300	320	335	370	370	360	335	310	280	225	S					
25						S	190	270	325	340	360	375	360	365	335	315	285	215	S					
26						E	200	280	310	330	330	330	I R 350	360	340	315	280	230	S					
27						E	200	270	305	325	330	345	370	360	340	315	290	230	110					
28						E	195	280	305	325	350	360	370	360	345	320	290	230	S					
29						E	200	270	310	330	B	370	365	360	350	315	290	230	S					
30						S	215	290	320	340	350	350	I A 350	355	340	320	290	225	S					
31						S	220	265	290	305	C	C	380	370	R	A	285	215	S					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						7	15	30	30	30	28	27	30	31	30	30	31	25	9					
MED						E	190	250	300	320	335	350	360	350	332	310	275	205	E					
UQ						E	200	265	305	325	340	360	365	360	340	315	280	215	E					
LQ						E	170	225	290	310	322	342	345	340	330	300	270	190	E					

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MAR. 1970 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1970 | 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 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	24	E	E	E	E S 15	G	J X 33	E C 38	36	G 34	G	G 26	G 20	G	G	G 15	E S 12	E S 15	E S 16	E	E	E S 16
2	E S 17	E S 12	E	E	E	E	G	G	31	33	G 31	G	G	G	G	G	G	G	21	J X 21	24	E S 17	23	E S 15
3	E	E	E	E	E	E	E S 15	G	G	G	G 28	G 30	G	G	G	G	G	G	E	E	E	E S 15	E	E
4	E	E	15	E	E	E	E S 15	G	G	J X 41	G	G 32	G 30	G 27	G	G	G	G	E	E	E	E S 15	E S 15	E S 12
5	E	E	E	E	E	E	E S 17	G	G	G	G	G	G	G	G	39	30	J X 33	J X 33	E	E	E	15	E
6	E	E	E	E	E	E S 15	21	G	G	J X 63	38	G	35	G	G 24	G	30	23	J X 24	J X 23	E	E	E S 15	E
7	E	E	E	E	15	E	24	G	G	38	35	E B 42	G	G	G	G	G	G	E	E	20	E	E	17
8	E	E	E	E	J X 29	E	20	G	G	34	40	G	G 29	G 30	G	G 23	G 22	29	J X 75	J X 73	J X 80	J X 33	J X 24	J X 30
9	E S 13	15	E	E	E	20	J X 33	29	G	31	J X 35	36	G	G	G	G	G	E S 19	E	E	E	E	J X 24	J X 53
10	J X 51	17	E	E	E	E	24	29	32	37	41	35	G	G	G 29	G	G	G	E S 14	E	E	E	E S 16	E
11	E S 16	E	E	E	E	E	E S 20	G	G	42	G	G	G	G	G	G	G	G	E	E	E	E S 12	26	E S 16
12	E S 15	E	E	15	E	E	G	G	G	G	35	G 34	G 30	G	G	G	G	G	J X 23	15	E S 15	E S 14	E S 16	E S 15
13	E	E	17	J X 23	16	E	G	G	G	G	G	G	C	G	G	G	G	G	E	E	E S 15	E	E S 15	E
14	E S 15	E	E	E	E	E	G	G	G	G	G 30	G 31	36	G	G	G	G	G	E S 12	E	20	E	E	19
15	E S 15	E	E	E	E	E S 15	G	G	G	G	38	41	40	41	G 32	G 23	G 24	29	J X 43	J X 33	J X 23	J X 28	E	E S 15
16	E S 17	E	E	E S 15	E	E	G	G	G	34	G	35	G 32	35	G 26	G 20	J X 33	J X 26	J X 24	E S 12	C	E S 15	E S 14	E
17	E S 13	E	E	E	J X 21	E	G	G	G	38	39	C	G	G	G	G	G	20	E S 14	E	E	E	E	E S 15
18	E	E	E	E S 16	E	E	G	J X 31	G	G	G	G	G	G	G	G	G	G	18	J X 21	E S 16	22	E	E S 16
19	E S 15	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E S 15	E S 15	E S 15	E S 16	E	E
20	E	E	J X 20	E C 48	E	C	C	C	C	C	C	C	G	G	G	G	G	G 14	E S 14	E	E S 15	E	E S 12	E S 15
21	23	E	E	E	J X 23	E	G	G	G	37	39	G	G	G	G	G	G 20	25	E S 14	E	E	E S 15	E	E
22	E	E	E	E	E	E	G	G	G	42	41	G	G	39	G 33	G	G 27	G 16	E S 15	E	E S 16	E	E	E
23	E	J X 23	E	18	E	E	G	G	G	42	40	G 34	J X 42	G 30	G 22	G 20	G 20	C	E S 15	E S 16	E S 14	E S 15	E	E
24	E	J X 23	E	E	E	E	G	G	G	G	G	G	G 26	G 31	G 24	G	G	G	E S 15	E	E S 15	E	E	E
25	E	E S 12	E	E	E	E S 15	G	G	G	G	G	G 30	G 26	G 25	G 24	G	G	G	E S 15	E	E	E	E	E S 16
26	E	E	E	E	E	E	G	G	G	G	G	G	G	G 30	G 28	G 18	G	G	E S 15	E	E	E	E S 15	E S 16
27	E	E	E	E	E	E	23	G	G	G	G	G	G	G	G	G	G 15	G	G	15	E	E	18	J X 20
28	E	J X 23	E	E	J X 23	E	G	G	G	46	G	G	G	G 31	G 23	G 27	G 23	G 17	E S 15	21	J X 24	J X 53	J X 43	J X 24
29	J X 20	17	E	J X 21	17	E	G	G	38	40	E B 50	G	38	G	G	G	G	G	E S 15	E	16	J X 22	E	21
30	23	20	J X 33	J X 24	17	E S 13	G	G	G	44	J X 54	40	39	G 30	G 23	34	32	J X 30	E S 15	E	E	E	E	E
31	E	20	J X 31	J X 33	J X 25	E S 11	G	G	G	34	C	C	G	G	G	33	G 25	24	24	E	E S 15	E S 15	E S 16	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	30	30	30	30	29	28	30	31	31	31	31	30	31	31	30	31	31	31
MED	E	E	E	E	E	E	G	G	G	34	G 30	G	G	G	G	G	G	G	15	E	E 15	E	E 12	E 15
UQ	E S 15	14	E	E E 15	16	E	E G 17	G	G	40	38	G 34	G 30	G 30	G 24	G 19	G 22	23	20	E 15	E S 16	E S 15	E S 16	E S 16
LQ	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E S 12	E	E	E	E	E

MAR. 1970 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FBES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

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

The Radio Research Laboratories, Japan

MAR. 1970 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | F-MIN (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E S 15	E	11	E C 38	16	16	22	16	16	11	11	E	E S 12	E S 15	E S 16	E	E	E S 16
2	E S 17	E S 12	E	E	E	E	F	12	E	17	19	17	17	18	19	13	12	E	E S 16	E	E S 15	E S 17	E S 14	E S 15
3	E	E	E	E	E	E	E S 15	17	16	17	21	21	19	20	19	20	19	12	E	E	E	E S 15	E	E
4	E	E	E	E	E	E	E S 15	15	16	17	20	22	20	18	18	18	17	12	E	E	E	E S 15	E S 15	E S 12
5	E	E	E	E	E	E	E S 17	15	17	16	17	18	17	17	29	18	17	14	E	E	E	E	E	E
6	E	E	E	E	E	E S 15	E	E	17	17	17	17	17	17	17	17	17	16	E	E	E	E	E S 15	E S 15
7	E	E	E	E	E	E	F	15	17	18	17	42	20	19	19	17	16	15	E	E	E	E	E	E
8	E	E	E	E	E	E	F	16	17	18	17	19	21	20	17	17	17	E S 16	E	E	E	E	E	E
9	E S 13	E	E	E	E	E	F	16	17	17	17	17	18	17	17	18	17	E S 19	E	E	E	E	E	E
10	E	E	E	E	E	E	E	13	17	17	19	18	19	17	17	17	16	15	E S 14	E	E	E	E S 16	E
11	E S 16	E	E	E	E	E	E S 20	17	17	18	18	16	20	19	17	17	17	14	E	E	E	E S 12	E S 16	E S 16
12	E S 15	E	E	E	E	E	E S 17	13	15	17	18	17	17	19	17	18	16	15	E	E	E S 15	E S 14	E S 16	E S 15
13	E	E	E	E	E	E	E S 17	16	18	18	19	21	C	17	18	17	17	16	E	E	E S 15	E	E S 15	E
14	E S 15	E	E	E	E	E	13	16	17	18	16	17	20	17	19	17	17	15	E S 12	E	E	E	E	E
15	E S 15	E	E	E	E	E S 15	E S 16	17	17	17	20	20	20	20	20	18	15	12	E	E	E	E	E	E S 15
16	E S 17	E	E	E S 15	E	E	E S 15	16	16	16	16	16	20	17	16	13	11	E	E	E S 12	C	E S 15	E S 14	E
17	E S 13	E	E	E	E	E	E	15	17	15	19	C	20	20	18	20	17	E	E S 14	E	E	E	E	E S 15
18	E	E	E	E S 16	E	E	E S 15	15	17	17	22	18	16	19	17	12	15	15	E	E S 14	E S 16	E S 15	E	E S 16
19	E S 15	E	E	E	E	E	E S 15	11	11	12	15	17	17	17	11	16	15	15	E S 15	E S 15	E S 15	E S 16	E	E
20	E	E	E	E C 48	E	C	C	C	C	C	C	C	15	16	17	12	17	E	E S 14	E	E S 15	E	E S 12	E S 15
21	E S 15	E	E	E	E	E	E S 14	11	E	12	19	20	17	17	11	11	E	12	E S 14	E	E	E S 15	E	E
22	E	E	E	E	E	E	E	E	15	18	17	17	17	17	16	16	12	E	E S 15	E	E S 16	E	E	E
23	E	E	E	E	E	E	11	11	12	20	20	17	17	18	17	12	E	C	E S 15	E S 16	E S 14	E S 15	E	E
24	E	E	E	E	E	E	12	11	11	11	18	18	17	12	11	11	17	11	E S 15	E	E S 15	E	E	E
25	E	E S 12	E	E	E	E S 15	F	E	11	17	17	19	18	17	13	16	16	11	E S 15	E	E	E	E	E S 16
26	E	E	E	E	E	E	F	11	11	16	17	20	17	19	17	12	12	12	E S 15	E	E	E	E S 15	E S 16
27	E	E	E	E	E	E	F	11	12	16	16	17	18	17	18	11	11	12	E	E	E	E	E	E
28	E	E	E	E	E	E	11	11	11	11	12	12	16	17	17	15	12	E	E S 15	E	E	E S 16	E	E
29	E S 15	E	E	E	E	E	11	11	11	16	50	20	18	17	17	11	11	11	E S 15	E	E	E S 15	E	E S 15
30	E S 15	E	E	E	E	E S 13	F	12	11	11	17	17	17	17	17	11	E	E	E S 15	E	E	E	E	E
31	E	E	E	E	E	E S 11	11	E	E	15	C	C	20	23	20	17	16	13	E S 14	E	E S 15	E S 15	E S 16	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	30	30	30	30	29	28	30	31	31	31	31	30	31	31	30	31	31	31
MED	E	E	E	E	E	E	E F 11	12	16	17	17	18	18	17	17	16	16	12	E S 12	E	E	E	E	E
UQ	E S 15	E	E	E	E	E	E S 15	16	17	18	19	20	20	19	18	17	17	15	E S 15	E	E S 15	E S 15	E S 14	E S 15
LQ	E	E	E	E	E	E	E	11	11	16	17	17	17	17	17	12	12	E	E	E	E	E	E	E

The Radio Research Laboratories, Japan

MAR. 1970 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | 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 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	270	280	285	265	265	295	315	330	335	320	285	305	300	295	295	295	300	295	280	300	270	255	270
2	280	245	250	275	315	260	285	315	325	300	305	300	310	295	285	290	295	310	310	295	265	265	260	270
3	265	285	265	270	260	270	310	320	335	325	300	305	300	300	300	300	295	310	310	280	280	295	300	275
4	260	260	265	265	265	270	295	320	330	330	300	320	305	305	290	300	320	310	305	305	280	280	250	250
5	245	255	255	265	255	260	280	325	315	330	315	305	305	315	295	310	315	320	310	285	270	275	265	U S 265
6	265	260	250	265	270	260	310	330	325	320	315	290	295	290	290	315	310	295	305	290	280	275	285	270
7	265	260	U S 260	F	F 240	235	270	295	290	300	285	290	290	290	295	315	310	310	300	265	260	275	260	260
8	280	250	F	250	250	F	F 280	320	315	320	320	310	295	305	295	300	290	305	290	260	245	265	255	260
9	285	240	220	230	290	250	265	W	230	W	285	H 295	305	H 280	305	300	320	320	285	260	F 265	F 265	F 260	F 270
10	265	260	255	240	235	250	310	340	315	315	310	300	300	300	320	310	320	305	310	290	275	260	290	290
11	290	265	265	265	265	260	305	325	315	310	320	295	305	295	305	300	305	315	305	280	285	285	280	270
12	280	270	270	295	280	280	305	320	310	310	290	310	305	300	295	290	305	310	305	270	280	265	255	270
13	285	280	280	270	275	270	320	325	310	325	310	305	I C 290	290	285	290	290	300	300	280	275	275	270	270
14	255	255	260	270	275	265	285	300	310	310	310	310	300	295	290	290	315	305	305	280	270	275	275	275
15	275	265	275	275	280	275	310	325	310	305	305	300	295	300	290	285	290	300	310	295	270	270	265	270
16	270	270	265	275	F 285	F 275	305	310	315	310	300	300	290	295	295	285	290	305	295	290	I C 270	280	270	275
17	270	270	275	275	270	280	305	320	310	310	305	I C 305	295	300	290	290	300	310	305	290	280	275	280	270
18	260	270	285	280	265	255	305	310	305	300	295	300	295	280	295	300	310	310	300	290	295	265	265	260
19	265	285	280	275	F 275	F	305	325	305	305	300	310	290	295	305	305	310	310	305	300	275	280	270	270
20	270	270	280	285	290	C	C	C	C	C	C	C	300	300	300	300	295	305	305	285	295	275	280	F 270
21	F	F 280	F 270	F 295	F	F	F 310	325	310	315	305	300	300	290	290	300	310	310	310	295	290	285	295	U 300
22	F 295	F 270	F 275	F 270	F	F	315	325	305	305	310	310	305	295	295	310	300	305	300	285	300	280	285	275
23	F	F	F	F	F	F	F 305	F 310	F 295	F 310	310	300	300	295	285	295	295	I C 305	300	290	295	280	F	F
24	F 265	F	F	F 265	F 270	F	F 325	320	315	305	310	305	280	290	290	290	290	310	310	295	295	295	275	U 270
25	270	265	275	280	285	285	320	320	315	300	305	300	300	275	290	290	285	295	300	290	290	280	285	280
26	265	265	260	280	280	275	310	310	300	305	300	290	290	285	285	285	285	295	300	290	290	285	275	270
27	270	270	265	275	285	280	320	315	295	305	300	290	285	285	280	290	285	305	300	290	290	285	255	270
28	275	280	265	270	260	250	305	295	310	285	285	295	290	285	285	285	290	305	300	290	285	245	245	245
29	260	255	255	260	275	275	285	305	295	290	300	285	295	300	300	300	305	315	305	305	285	270	265	260
30	255	250	250	255	255	260	300	290	310	295	305	285	290	300	300	305	300	300	305	295	315	270	250	240
31	250	280	280	265	260	270	330	325	315	300	I C 290	I C 285	295	295	290	295	305	295	290	280	265	275	240	285
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	28	29	28	24	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	30	30
MED	265	265	265	270	270	268	305	320	310	308	305	300	295	295	295	300	300	305	305	290	280	275	268	270
UQ	275	270	275	275	280	275	310	325	315	315	310	305	302	300	298	300	310	310	305	292	290	280	280	275
LQ	260	260	258	265	260	260	295	310	305	300	300	290	290	290	290	290	290	302	300	280	270	270	255	265

IONOSPHERIC DATA

MAR. 1970 | M(3000)F1 (0.01) | 135° E Mean Time (G. M. T.+ 9h)

Station WAKKANAI Lat. 45° 23·6' N. Long. 141° 41·1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1														U L 395										
2													L											
3										U L 395				L										
4												L												
5											L													
6																								
7													L											
8													L											
9								F 315	335	340														
10										L	L	L	L		L									
11												L												
12												L	L											
13												L	C											
14														L										
15											L	L		L										
16										L	L	L		L										
17											L	C		L										
18											L	L	U L 380											
19												L		L	L									
20													L	L										
21												L	L	L										
22											L	L	L	L										
23										L	L	L	L 380											
24										L	L	L												
25											L	L	L		L									
26										L	L	L	L											
27												L		L	L									
28														L	L									
29										L	L	L 380		L										
30														L										
31										L	C	C												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1	2		1	2	1										
MED								F 315	335	368		L 380	L 380	U L 395										
UQ																								
LQ																								

The Radio Research Laboratories, Japan

MAR. 1970 | M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1970 | 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														240										
2													255											
3										240				260										
4												255												
5											230													
6																								
7													290											
8													280											
9								W	635	W														
10										300	270	265	250		260									
11												245												
12												250	260											
13												L 275	C											
14														270										
15											260	255		250										
16										250	255	255		265										
17											260	C		260										
18											260	260	250											
19												245		260	265									
20													245	265										
21												265	260	250										
22											260	260	250	250										
23										250	260	250	260											
24										250	250	250												
25											260	265	260		270									
26										260	250	265	270											
27												250		250	250									
28														250	260									
29										290	280	260		255										
30														260										
31										250	C	C												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1	9	12	17	12	14	5									
MED								W	635	250	260	255	260	258	260									
UQ										290	260	265	265	260	265									
LQ										250	252	250	250	250	260									

The Radio Research Laboratories, Japan

MAR. 1970 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1970 | H'F (KM) | 135° E Mean Time (G. M. T.+ 9h)

Station WAKKANAI Lat. 45° 23.6' N. Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in 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	325	295	255	250	290	280	260	215	235	I C 230	235	235	225	210	225	240	240	240	230	250	240	255	305	285
2	290	355	305	265	230	265	265	245	240	225	215	235	245	235	245	245	245	240	220	220	260	300	310	300
3	285	255	265	300	300	265	250	240	220	210	225	225	225	225	250	250	245	240	220	225	250	250	250	275
4	305	305	300	310	300	300	250	220	230	220	220	230	215	245	240	245	240	245	235	220	250	260	300	335
5	320	300	305	280	280	290	275	220	225	200	220	200	215	245	245	260	250	220	220	225	260	260	285	300
6	300	300	300	270	260	305	235	225	225	220	210	220	200	235	225	255	240	225	225	250	245	260	265	300
7	300	300	300	300	300	370	295	260	250	250	245	250	225	240	235	220	245	220	225	260	300	290	300	300
8	260	300	360	300	355	365	275	245	230	220	210	240	215	245	235	245	250	245	250	300	335	300	295	315
9	260	350	470	390	250	305	A 360	270	260	225	230	250	245	H 230	220	240	225	215	240	290	300	300	300	300
10	300	280	290	345	350	310	250	240	220	215	220	210	210	220	215	245	240	225	225	235	255	260	290	290
11	280	290	270	270	260	300	245	225	235	225	225	220	225	235	225	235	245	230	215	250	260	260	290	300
12	290	295	280	245	240	280	245	230	225	225	230	220	220	220	215	250	250	230	220	250	260	290	305	300
13	270	260	250	280	275	270	245	220	225	220	225	220	I C 220	225	225	220	240	240	215	235	250	255	275	275
14	305	300	305	270	230	245	250	230	230	230	225	225	240	215	235	225	240	240	215	225	270	270	280	275
15	280	285	285	270	250	270	230	225	225	225	210	215	210	230	225	260	245	245	230	240	260	265	280	275
16	290	290	290	265	230	275	245	240	235	230	220	220	215	225	240	225	250	230	230	225	I C 260	260	295	270
17	275	285	250	260	260	265	230	225	230	235	225	I C 215	210	210	230	225	235	230	215	225	255	270	275	280
18	300	275	245	250	245	300	220	220	220	235	230	225	220	210	220	230	245	235	220	240	250	265	275	295
19	285	255	250	260	250	285	230	220	220	225	225	220	205	210	225	225	230	245	220	225	250	250	265	270
20	300	275	260	I C 240	220	C	C	C	C	C	C	C	200	205	220	225	240	230	220	230	230	240	260	275
21	280	255	250	230	240	270	225	220	220	220	215	215	220	210	200	225	235	225	230	245	250	260	250	255
22	250	255	255	250	260	275	220	220	220	220	220	220	215	200	225	225	235	235	225	240	235	250	260	250
23	270	290	275	250	245	270	220	225	220	230	220	220	200	210	225	220	245	I C 245	225	245	245	250	260	250
24	295	295	275	270	240	260	225	220	225	220	225	220	210	215	225	230	235	250	220	230	250	245	250	260
25	275	275	270	250	250	255	220	225	220	225	220	230	210	200	210	225	250	245	235	240	250	250	250	250
26	275	275	270	255	250	265	220	220	215	225	215	210	210	215	225	230	240	245	230	230	250	245	260	270
27	270	275	280	250	235	250	215	220	225	220	220	215	210	205	215	240	245	245	225	230	250	250	300	280
28	260	260	265	255	255	310	220	220	210	215	225	215	230	220	210	225	240	240	225	220	260	280	330	315
29	275	250	300	260	285	235	240	250	240	235	B	225	210	225	225	225	230	230	225	225	230	260	275	300
30	305	325	325	300	265	280	230	225	225	225	235	220	210	215	220	215	240	250	235	240	225	220	290	350
31	315	270	270	310	280	295	240	240	220	220	I C 215	I C 210	210	235	235	225	240	245	250	260	265	255	325	260
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	30	30	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31
MED	285	285	275	265	255	278	240	225	225	225	220	220	215	220	225	230	240	240	225	235	250	260	280	280
UQ	300	300	300	290	280	300	250	240	230	230	225	225	222	232	235	245	245	245	230	248	260	268	300	300
LQ	275	272	262	250	242	265	225	220	220	220	220	215	210	210	220	225	240	230	220	225	250	250	262	270

The Radio Research Laboratories, Japan

MAR. 1970 | H'F (KM)

IONOSPHERIC DATA

MAR. 1970 | 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

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	E	100	E	E	E	S	G	110	C	105	105	G	100	100	G	G	100	S	S	S	E	E	S
2	S	S	E	E	E	E	G	G	140	110	110	G	G	G	G	G	G	G	100	100	100	S	100	S
3	E	E	E	E	E	E	S	G	G	G	110	105	G	G	G	G	G	G	E	E	E	S	E	E
4	E	E	100	E	E	E	S	G	G	110	G	105	105	105	G	G	G	G	E	E	E	S	S	S
5	E	E	E	E	E	E	S	G	G	G	G	G	G	G	G	125	120	110	110	E	E	E	100	E
6	E	E	E	E	E	S	110	G	G	110	110	G	105	G	100	G	120	115	110	110	E	E	S	E
7	E	E	E	E	105	E	105	G	G	115	110	B	G	G	G	G	G	G	E	E	110	E	E	110
8	E	E	E	E	105	E	105	G	G	110	110	G	105	105	G	100	105	115	110	105	105	105	105	105
9	S	140	E	E	E	110	110	150	G	105	105	100	G	G	G	G	G	S	E	E	E	E	110	105
10	105	110	E	E	E	E	145	145	140	140	115	110	G	G	110	G	G	G	S	E	E	E	S	E
11	S	E	E	E	E	E	S	G	G	110	G	G	G	G	G	G	G	G	E	E	E	S	100	S
12	S	E	E	100	E	E	G	G	G	G	115	110	110	G	G	G	G	G	100	100	S	S	S	S
13	E	E	105	100	100	E	G	G	G	G	G	G	C	G	G	G	G	G	E	E	S	E	S	E
14	S	E	E	E	E	E	G	G	G	G	110	110	110	G	G	G	G	G	S	E	100	E	E	100
15	S	E	E	E	E	S	G	G	G	G	115	110	110	105	105	105	100	100	100	100	100	100	E	S
16	S	E	E	S	E	E	G	G	G	130	G	110	110	105	105	105	100	100	100	S	C	S	S	E
17	S	E	E	E	100	E	G	G	G	125	125	C	G	G	G	G	G	100	S	E	E	E	E	S
18	E	E	E	S	E	E	G	105	G	G	G	G	G	G	G	G	G	G	100	100	S	100	E	S
19	S	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	S	S	S	S	E	E
20	E	E	100	C	E	C	C	C	C	C	C	C	G	G	G	G	G	100	S	E	S	E	S	S
21	100	E	E	E	100	E	G	G	G	115	105	G	G	G	G	G	100	110	S	E	E	S	E	E
22	E	E	E	E	E	E	G	G	G	105	120	G	G	115	110	G	110	110	S	E	S	E	E	E
23	E	100	E	100	E	E	G	G	G	115	115	105	100	100	100	100	100	C	S	S	S	S	E	E
24	E	100	E	E	E	E	G	G	G	G	G	G	100	100	100	G	G	G	S	E	S	E	E	E
25	E	S	E	E	E	S	G	G	G	G	G	105	105	100	100	G	G	G	S	E	E	E	E	S
26	E	E	E	E	E	E	G	G	G	G	G	G	G	105	105	100	G	G	S	E	E	E	S	S
27	E	E	E	E	E	E	150	G	G	G	G	G	G	G	G	G	100	G	G	110	E	E	110	105
28	E	100	E	E	100	E	G	G	G	110	G	G	G	100	100	105	105	105	S	110	105	100	100	100
29	100	100	E	105	105	E	G	G	120	120	B	G	105	G	G	G	G	G	S	E	105	100	E	100
30	100	100	100	100	100	S	G	G	G	115	110	110	105	100	100	100	100	100	S	E	E	E	E	E
31	E	110	105	105	100	S	G	G	G	120	C	C	G	G	G	110	105	155	120	E	S	S	S	S
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	8	6	6	9	1	6	3	4	17	16	12	12	12	12	9	12	13	9	8	7	5	7	7
MED	100	100	100	100	100	110	110	145	130	115	110	108	105	102	100	105	102	105	100	102	105	100	100	105
UQ	102	110	105	105	105		145	148	140	120	115	110	110	105	105	105	108	110	110	110	105	100	108	105
LQ	100	100	100	100	100		105	125	115	110	110	105	105	100	100	100	100	100	100	100	100	100	100	100

MAR. 1970 | H'ES (KM)

IONOSPHERIC DATA

MAR. 1970 | 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 1						CL 12		L 1	L 1		L 2	L 1			L 1						
2							H 1	H 1	H 1	L 1	L 1								F 1	F 1	F 1		F 1	
3											L 1	L 1												
4			F 1							L 1		L 1	L 1	L 1										
5																C 1	C 1	L 2	L 1				F 1	
6							L 1			L 1	C 1		L 1		L 1		C 1	L 2	L 2	F 2				
7					F 1		C 1			C 1	L 1										F 1			F 1
8					F 2		L 1			C 1	C 1		L 1	L 1		L 1	L 1	C 1	C 3	F 2	F 3	F 2	F 1	F 2
9		F 1				F 2	L 3	H 1		L 1	L 1	L 1											F 3	F 3
10	F 2	F 1					H 1	H 1	H 1	H 1	C 1	L 1			L 1									
11										L 1													F 1	
12				F 1							C 1	L 1	L 1						L 1	F 1				
13			F 1	F 1	F 1																			
14											L 1	L 1	L 1								F 1			F 1
15											C 1	L 1	L 1	L 1	L 1	L 1	L 1	L 2	L 2	F 2	F 2	F 1		
16										HL 11		L 1	L 1	L 1	L 1	L 1	L 1	L 2	L 1					
17					F 1					C 1	C 1							L 1						
18								L 1											L 1	F 1		F 1		
19																								
20			F 1															L 1						
21	F 1				F 1					C 1	L 1						L 1	L 1						
22										L 1	C 1			C 1	L 1		L 1	L 1						
23		F 2		F 1						C 1	C 1	L 1	L 2	L 1	L 1	L 1	L 1							
24		F 1											L 1	L 1	L 1									
25												L 1	L 1	L 1	L 1									
26														L 1	L 1	L 1								
27							H 1										L 1			F 1			F 2	F 2
28		F 1			F 1					C 1				L 1	L 1	L 1	L 1	L 1		F 1	F 2	F 1	F 2	F 3
29	F 1	F 2		F 2	F 1				C 1	C 1			L 1								F 1	F 1		F 1
30	F 1	F 1	F 1	F 1	F 1					C 1	C 3	C 1	L 1	L 1	L 1	L 1	L 1	L 1						
31		F 1	F 3	F 3	F 1					C 1						L 1	L 1	H 1	C 4					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

MAR. 1970 | TYPES OF ES

IONOSPHERIC DATA

MAR. 1970 | FOF2 (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

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	45	49	51	43	41	40	47	91	96	98	I R 106	I R 114	I R 124	117	98	101	101	90	76	67	71	56	47	51
2	51	46	46	52	49	39	53	94	I R 100	I R 113	136	131	129	117	114	111	109	101	93	65	53	52	53	S 51
3	51	51	49	48	46	45	52	83	I R 105	105	109	126	138	125	118	114	106	99	91	69	65	66	52	45
4	43	45	44	44	44	44	55	I R 92	106	101	102	125	125	120	115	109	109	100	87	77	62	62	52	53
5	52	56	I R 53	54	51	51	58	96	I R 108	111	133	115	115	131	113	108	113	101	86	64	56	58	I R 52	55
6	S 51	I R 52	I R 54	53	46	46	C	C	C	104	102	116	115	121	115	114	116	I R 102	91	66	65	61	59	48
7	51	48	49	45	41	42	47	72	91	102	96	126	121	117	114	102	101	91	I R 75	51	I R 51	51	51	R
8	R	46	41	45	41	38	47	I R 81	S 94	97	114	125	124	129	116	99	104	R 106	87	54	R	R	R	R
9	R	I R 45	I R 46	46	54	R 28	I R 28	I R 44	62	72	74	106	119	102	120	129	115	82	69	68	R	R	R	72
10	65	I R 60	61	52	48	52	63	I R 74	80	92	126	134	131	108	114	108	108	95	86	68	63	65	I R 62	I R 60
11	58	55	53	48	44	42	56	91	96	102	103	118	119	123	121	112	104	99	88	64	62	59	56	56
12	I R 55	54	52	56	41	39	55	86	100	107	116	126	122	121	113	114	117	I C 104	I C 82	66	63	62	56	54
13	60	61	55	53	51	47	I R 63	92	I R 105	109	112	117	116	118	116	112	114	109	94	67	68	68	65	59
14	57	53	55	I R 56	54	46	58	89	111	121	120	122	124	122	116	114	111	I R 108	91	65	63	64	63	64
15	I R 63	62	58	I R 57	51	52	69	91	102	106	114	123	121	126	114	113	116	109	98	73	66	64	66	I R 68
16	68	66	64	54	57	54	I R 76	100	I R 112	121	116	128	123	123	117	116	108	102	91	69	66	66	I R 64	66
17	64	63	65	56	50	54	64	90	I R 106	121	122	122	124	124	117	114	112	109	92	64	I R 60	64	65	66
18	I R 64	62	66	54	48	48	58	I R 84	96	101	116	124	121	116	109	108	103	98	91	72	67	64	I R 66	64
19	65	65	62	52	54	I R 52	69	I R 92	102	108	116	124	125	113	116	116	104	96	95	70	66	63	64	64
20	I R 63	64	66	66	44	46	62	79	94	106	121	126	118	113	114	111	103	100	96	81	77	67	I R 66	S 66
21	S 67	68	66	S 68	53	56	71	92	102	112	116	125	128	119	116	118	113	95	86	79	I R 73	72	73	71
22	69	66	58	56	51	53	74	91	96	113	118	126	119	114	109	108	100	96	94	81	76	I R 72	68	66
23	66	I R 66	S 66	66	57	56	72	S 98	I R 108	121	124	129	125	121	117	112	108	104	94	73	71	65	I R 66	66
24	63	67	67	61	58	57	76	I R 97	96	108	114	120	119	117	118	113	106	103	100	81	71	73	64	63
25	63	62	62	61	55	53	72	94	96	111	115	I R 118	116	119	118	I C 113	108	I R 105	98	81	77	76	74	71
26	67	I R 68	66	65	58	I R 63	S 80	93	I R 107	119	128	129	130	129	127	I C 119	113	112	102	87	78	77	I R 76	71
27	72	S 71	S 68	66	55	57	78	92	100	118	121	122	123	125	123	119	120	116	110	96	80	78	74	74
28	S 74	70	66	66	61	60	82	96	112	116	124	137	137	134	127	122	123	117	106	92	82	I R 73	72	I R 72
29	I R 76	S 76	68	74	66	67	84	102	112	116	127	138	139	132	121	116	114	104	96	81	69	59	56	54
30	56	51	I R 51	50	50	53	75	101	121	122	123	123	134	136	132	118	107	I C 110	114	96	74	63	57	56
31	57	67	66	58	54	58	91	98	107	114	117	126	131	131	124	115	114	108	101	89	85	78	68	78
	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	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31	29	29	29	29
MED	63	62	58	56	51	52	64	92	102	109	116	125	124	121	116	113	109	102	92	70	67	64	64	64
UQ	66	66	66	63	54	55	75	96	107	116	122	126	128	126	119	116	114	108	97	81	74	72	66	68
LQ	55	52	52	52	46	44	55	86	96	103	113	121	119	117	114	110	105	98	87	66	63	62	56	55

MAR. 1970 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FOF1 (0.01 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA | Lat. 39° 43.5' N | Long. 140° 08.2' E | Sweep 1 MHz to 20 MHz in 20 sec in 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	450 L	L								
2									L	L	L	L	L	460 L	L	L								
3										L	L	500 L	U L 580	490 L	L	L								
4										620 L	460	460	L	L	480 L	L								
5										L	L	L	490	510 L	L	L								
6									C	L	L	L	L	520 L	L	L								
7										L	680 L	L	L	L	L	L								
8										420 L	U L 480	L	L	U L 480	L	L								
9									490	640 H	600 L	510	450	L	L	L								
10									L	500 H	510 L	L	L	L	L	L								
11									L	L	L	L	480	480 L	L	L								
12									L	L	510 L	500	500	500 L	L	L								
13									L	L	460	500	460	520 H	L	L								
14										L	500 L	520 L	510	470	L	L	L							
15									L	L	490	500	L	500	L	520 H	L							
16									390	L	470	510	470	600	450 L	L								
17									L	L	L	L	490	530	L	L								
18										L	L	510	L	500	L	L	L							
19										U 460 L	510	500 H	500 H	L	500	L	L							
20									L	L	510	510 L	L	490	500 L	L	L							
21									L	500 H	L	550 L	510	480	600 H	L								
22									L	L	500 L	520 L	U L 510	500 L	U L 520	L	L							
23									L	L	L	520 L	510 H	550 L	L	L								
24									L	450 L	510	520 L	510	510	470 L	L	L							
25									L	460 L	500	480	440	500	530 L	C	L							
26									L	L	520 L	520 L	500	L	L	C	L							
27										L	480 L	490 L	620 L	530 L	L	L	L							
28									370	L	L	L	480	500	470 L	450 L								
29									L		B	L	520 L	L	L	L								
30									L	L	510 L	560 L	520 L	500	L	L								
31									L	L	L	550 L	580 L	510 L	L	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									3	8	18	20	21	23	10	2								
MED									390	480 L	505 L	510 L	500	500 L	490 L	485 L								
UQ									440	560 H	510 L	520 L	510 L	515 L	520 L									
LQ									380	455 L	480 L	500	480	490	470 L									

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MAR. 1970 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FOE (0.01 MHZ) | 135° E Mean Time (G. M. T. + 9h)

Station AKITA Lat. 39° 43.5' N. Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in 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	235	285	315	335	350	I B 360	360	I B 335	305	275	B	S					
2							S	225	285	315	I A 335	350	365	360	340	320	265	210	S					
3							S	240	290	320	335	355	365	365	345	320	285	A	S					
4							S	235	290	I A 320	335	355	365	365	I A 350	335	295	230	B					
5							S	250	295	320	340	355	365	370	I B 355	335	290	210	S					
6							C	C	C	320	335	350	360	360	355	325	285	220	S					
7							S	230	285	320	340	A	A	355	A	A	A	225	S					
8							S	220	290	I A 320	I A 340	R 350	R 360	355	R 345	310	265	220	S					
9							B	B	285	315	I A 340	I A 360	370	365	345	320	275	B	S					
10							S	255	295	315	335	355	360	360	345	320	285	220	S					
11							S	245	295	320	I A 335	I A 350	360	360	340	320	285	225	S					
12							S	240	285	I A 320	340	I A 355	365	370	345	325	295	C	A					
13							B	250	295	I A 320	340	360	370	365	350	325	295	240	S					
14							175	255	300	I A 320	I A 340	I A 350	R 365	R 365	350	I A 315	265	215	B					
15							R	250	305	325	I A 345	355	I A 360	I A 360	345	325	A	A	S					
16							190	265	300	315	335	360	365	365	350	325	290	230	S					
17							B	260	305	320	340	355	365	365	355	335	295	I S 230	B					
18							B	250	300	325	345	355	365	360	350	330	295	245	S					
19							180	I A 250	300	325	345	360	365	365	350	330	295	225	S					
20							A	235	295	325	I A 345	I A 360	365	360	345	320	295	240	S					
21							S	250	300	325	345	I A 360	370	365	345	325	I A 295	245	S					
22							S	260	305	325	345	355	I A 355	I A 370	I A 350	I A 320	I A 290	240	S					
23							170	265	310	330	350	I A 365	375	I A 370	355	330	295	240	S					
24							B	270	310	325	345	360	370	365	350	330	305	240	B					
25							R	270	310	330	350	370	365	355	340	I C 320	290	225	B					
26							200	260	300	335	355	360	360	350	R	C	280	220	S					
27							200	260	300	335	350	360	365	I A 350	330	320	290	245	S					
28							B	250	300	330	350	I R 360	360	355	340	305	285	215	S					
29							190	260	305	325	I B 350	375	R 380	370	355	325	295	240	B					
30							225	280	310	I A 335	350	I A 360	375	375	355	335	300	C	A					
31							215	270	310	I A 330	I A 350	A	A	A	A	A	I A 295	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							9	29	30	31	31	29	29	30	28	28	29	24						
MED							190	250	300	320	340	355	365	365	348	325	290	228						
UQ							200	260	305	325	348	360	365	365	350	330	295	240						
LQ							180	240	290	320	338	355	360	360	345	320	285	220						

MAR. 1970 | FOE (0.01 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

MAR. 1970 | 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 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_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	G	G	E_{43}^{B}	G	E_{35}^{B}	G	G	E_{23}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
2	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	33	J_{36}^{X}	G	G	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
3	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	G	G	G	G	G	G	G	28	J_{24}^{X}	E_{14}^{S}	J_{20}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
4	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	36	G	J_{38}^{X}	G	41	41	G	$_{23}^{G}$	G	E_{18}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
5	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	36	G	39	G	G	E_{47}^{B}	G	31	G	E_{14}^{S}	E_{14}^{S}	J_{21}^{X}	J_{24}^{X}	E_{14}^{S}	E_{14}^{S}
6	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	C	C	C	G	G	G	G	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	J_{20}^{X}	E_{14}^{S}
7	J_{43}^{X}	E_{14}^{S}	J_{24}^{X}	J_{16}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	26	G	G	G	42	J_{39}^{X}	G	37	36	J_{34}^{X}	G	E_{14}^{S}	J_{20}^{X}	J_{38}^{X}	J_{39}^{X}	E_{14}^{S}	E_{14}^{S}
8	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	J_{38}^{X}	J_{45}^{X}	G	G	G	G	G	G	G	E_{14}^{S}	J_{25}^{X}	J_{44}^{X}	J_{43}^{X}	J_{39}^{X}	J_{29}^{X}
9	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{21}^{B}	E_{18}^{B}	E_{26}^{B}	37	36	37	J_{38}^{X}	G	G	G	G	G	E_{23}^{B}	J_{29}^{X}	J_{19}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	$J_{2?}^{X}$
10	E_{14}^{S}	J_{24}^{X}	E_{14}^{S}	E_{14}^{S}	J_{16}^{X}	E_{14}^{S}	E_{16}^{S}	27	G	35	G	J_{39}^{X}	G	G	G	G	G	G	E_{16}^{S}	E_{14}^{S}	J_{20}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
11	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	37	J_{38}^{X}	G	G	G	G	G	G	E_{15}^{S}	E_{14}^{S}	J_{18}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
12	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{14}^{S}	G	G	39	G	39	J_{31}^{G}	G	G	G	G	C	J_{20}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
13	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{20}^{B}	G	G	37	G	G	G	G	G	G	G	G	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	46	39	40	G	G	G	J_{39}^{X}	G	G	E_{18}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
15	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	J_{16}^{X}	E_{14}^{S}	E_{18}^{B}	G	G	G	37	G	39	38	G	J_{46}^{X}	J_{39}^{X}	J_{46}^{X}	J_{24}^{X}	J_{26}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
16	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	G	G	G	G	G	G	J_{31}^{G}	G	J_{20}^{G}	J_{24}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
17	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{19}^{B}	G	G	G	G	G	G	G	J_{39}^{X}	G	G	E_{26}^{S}	E_{17}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	$J_{2?}^{X}$
18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{21}^{B}	G	G	G	J_{33}^{G}	G	G	G	G	G	G	G	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
19	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	J_{29}^{X}	G	G	G	G	G	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
20	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	22	G	G	G	36	38	$_{34}^{G}$	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
21	E_{14}^{S}	E	E	E_{14}^{S}	E	E_{14}^{S}	E_{17}^{S}	G	G	G	G	46	G	G	G	J_{43}^{X}	33	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
22	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{16}^{S}	G	G	39	42	43	43	38	36	34	30	G	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	$J_{2?}^{X}$
23	E_{14}^{S}	J_{20}^{X}	J_{16}^{X}	E_{14}^{S}	E	E_{14}^{S}	G	G	G	37	42	38	$_{35}^{G}$	J_{38}^{X}	G	G	G	G	E_{17}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
24	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{20}^{B}	G	G	G	G	G	G	G	G	G	G	G	E_{19}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
25	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	23	30	G	G	G	G	G	G	G	C	G	G	E_{16}^{B}	E_{13}^{S}	E_{13}^{S}	E_{13}^{S}	E_{16}^{S}	E_{15}^{S}
26	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	G	G	G	G	G	G	G	G	G	C	G	G	18	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
27	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{13}^{S}	E_{13}^{S}	E_{15}^{S}	G	G	G	36	37	38	G	37	G	J_{35}^{X}	G	G	17	J_{28}^{X}	J_{66}^{X}	22	21	E_{14}^{S}
28	E_{16}^{S}	E_{14}^{S}	J_{23}^{X}	J_{22}^{X}	J_{20}^{X}	E_{16}^{B}	E_{19}^{B}	G	G	38	37	G	G	G	G	G	$_{21}^{G}$	$_{20}^{G}$	18	J_{20}^{X}	E_{13}^{S}	J_{23}^{X}	J_{21}^{X}	E_{16}^{S}
29	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{13}^{B}	G	G	34	41	E_{67}^{B}	G	G	G	G	G	G	G	E_{19}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
30	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	39	38	J_{43}^{X}	J_{39}^{X}	G	G	G	G	C	J_{19}^{X}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
31	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	G	G	G	36	39	40	38	42	36	J_{36}^{X}	J_{51}^{X}	29	J_{21}^{X}	J_{21}^{X}	J_{20}^{X}	J_{24}^{X}	E_{14}^{S}	E_{14}^{S}
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	29	31	29	31	31	31	31	31	31
MED	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	33	G	G	G	G	G	G	G	G	E_{17}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
UQ	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{18}^{S}	G	G	37	37	39	$_{32}^{G}$	G	G	$_{31}^{G}$	E_{21}^{G}	E_{20}^{G}	19	E_{14}^{S}	16	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
LQ	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	G	G	G	G	G	G	G	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}

MAR. 1970 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FBES (0.1 MHZ) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	G	G	E_{43}^{B}	G	E_{35}^{B}	G	G	E_{23}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
2	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	29	36	G	G	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
3	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	G	G	G	G	G	G	G	25	22	E_{14}^{S}	20	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
4	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	35	G	34	G	40	37	G	G 23	G	E_{18}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
5	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	35	G	39	G	G	E_{47}^{B}	G	G	G	E_{14}^{S}	E_{14}^{S}	21	22	E_{14}^{S}	E_{14}^{S}
6	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	C	C	C	G	G	G	G	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}
7	E	E_{14}^{S}	E	E	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	26	G	G	G	42	39	G	36	33	33	G	E_{14}^{S}	19	21	22	E_{14}^{S}	E_{14}^{S}
8	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	35	36	G	G	G	G	G	G	G	E_{14}^{S}	E	34	38	37	24
9	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{21}^{B}	E_{18}^{B}	E_{26}^{B}	34	34	37	37	G	G	G	G	G	E_{23}^{B}	24	19	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E
10	E_{14}^{S}	21	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{16}^{S}	G	G	34	G	34	G	G	G	G	G	G	E_{16}^{S}	E_{14}^{S}	20	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
11	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	37	37	G	G	G	G	G	G	E_{15}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
12	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{14}^{S}	G	G	36	G	39	G 31	G	G	G	G	C	19	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
13	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{20}^{B}	G	G	37	G	G	G	G	G	G	G	G	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	36	39	39	G	G	G	36	G	G	E_{18}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
15	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{18}^{B}	G	G	G	37	G	39	38	G	28	30	34	21	24	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
16	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	G	G	G	G	G	G	G 27	G	G 19	20	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
17	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{19}^{B}	G	G	G	G	G	G	G	21	G	G	E_{26}^{S}	E_{17}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E
18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{21}^{B}	G	G	G	G 29	G	G	G	G	G	G	G	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
19	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	28	G	G	G	G	G	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
20	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	22	G	G	G	36	38	G 34	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
21	E_{14}^{S}	E	E	E_{14}^{S}	E	E_{14}^{S}	E_{17}^{S}	G	G	G	G	43	G	G	G	G	31	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
22	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{16}^{S}	G	G	36	38	39	39	38	36	34	30	G	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	18
23	E_{14}^{S}	E	E	E_{14}^{S}	E	E_{14}^{S}	G	G	G	37	40	38	G 35	38	G	G	G	G	E_{17}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
24	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{20}^{B}	G	G	G	G	G	G	G	G	G	G	G	E_{19}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
25	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	22	30	G	G	G	G	G	G	G	C	G	G	E_{16}^{B}	E_{13}^{S}	E_{13}^{S}	E_{13}^{S}	E_{16}^{S}	E_{13}^{S}
26	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{16}^{S}	G	G	G	G	G	G	G	G	G	C	G	G	16	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
27	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{13}^{S}	E_{13}^{S}	E_{15}^{S}	G	G	G	35	37	38	G	36	G	31	G	G	16	22	28	17	16	E_{14}^{S}
28	E_{18}^{S}	E_{14}^{S}	18	21	18	E_{16}^{B}	E_{19}^{B}	G	G	37	37	G	G	G	G	G	G 20	G 20	17	18	E_{13}^{S}	22	18	E_{16}^{S}
29	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{13}^{B}	G	G	G	41	E_{67}^{B}	G	G	G	G	G	G	G	E_{19}^{B}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
30	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	G	38	38	40	33	G	G	G	G	C	18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
31	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	G	G	G	36	39	40	38	40	36	36	36	29	21	20	19	19	E_{14}^{S}	E_{14}^{S}
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	29	31	29	31	31	31	31	31	31
MED	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	29	G	G	G	G	G	G	G	G	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
UQ	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{18}^{S}	G	G	36	37	38	G 32	G	G	G	G	E_{19}^{G}	17	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
LQ	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	G	G	G	G	G	G	G	G	G	G	G	G	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}

MAR. 1970 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | F-MIN (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

Station AKITA Lat. 39° 43.5' N; Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in 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_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	14	16	20	20	20	43	21	35	19	15	23	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
2	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	15	16	21	21	19	21	18	20	16	15	14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
3	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	15	18	16	19	21	29	21	16	18	20	15	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
4	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	18	18	18	23	21	23	21	19	18	15	18	18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
5	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	18	19	18	19	22	24	21	47	24	16	18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
6	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	C	C	C	18	18	24	23	18	18	18	16	15	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
7	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	15	18	17	18	26	22	15	15	18	18	18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
8	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	18	18	18	20	20	19	20	21	18	20	16	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
9	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	21	18	26	19	18	20	21	21	19	19	21	19	23	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
10	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{16}^{S}	18	20	16	20	21	22	21	21	18	15	14	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
11	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	18	18	18	22	22	21	20	18	16	17	15	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
12	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{14}^{S}	18	18	21	22	24	22	24	20	18	16	C	14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
13	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	20	18	20	18	22	29	28	22	20	18	18	16	E_{18}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	14	15	20	14	27	24	24	20	24	20	19	16	18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
15	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	18	15	20	23	20	21	20	20	22	20	14	18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
16	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	15	18	18	18	19	23	21	21	18	18	14	14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
17	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	19	16	20	21	21	20	20	20	16	20	17	E_{26}^{S}	17	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	21	18	18	21	18	18	18	18	18	18	16	16	E_{18}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
19	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	16	16	20	18	20	21	14	20	15	18	13	13	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
20	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	13	16	14	18	18	20	16	18	16	17	14	E	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
21	E_{14}^{S}	E	E	E_{14}^{S}	E	E_{14}^{S}	E_{17}^{S}	18	15	19	20	23	23	21	23	18	17	18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
22	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{16}^{S}	18	18	17	19	22	23	22	19	18	18	17	E_{16}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
23	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	14	17	18	20	20	21	22	20	18	14	15	14	E_{17}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
24	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	20	16	18	14	18	18	21	16	15	15	16	15	19	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
25	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	19	17	16	18	17	26	21	20	20	C	18	14	16	E_{13}^{S}	E_{13}^{S}	E_{13}^{S}	E_{16}^{S}	E_{15}^{S}
26	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	16	18	18	21	19	20	29	29	20	C	15	13	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
27	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{13}^{S}	E_{13}^{S}	E_{15}^{S}	16	18	18	18	18	20	27	19	22	17	16	15	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
28	E_{16}^{S}	E_{14}^{S}	E_{13}^{S}	E_{13}^{S}	E_{13}^{S}	16	19	16	18	18	17	18	19	18	16	18	15	16	E_{13}^{S}	E_{13}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{16}^{S}
29	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	13	18	16	17	18	67	21	20	18	18	18	16	15	19	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
30	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	16	15	18	17	14	18	20	18	16	14	15	C	18	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
31	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	16	16	17	20	18	21	18	20	18	17	14	14	14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	29	31	29	31	31	31	31	31	31
MED	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	15	17	18	18	20	21	21	20	19	18	16	15	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
UQ	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	18	18	19	20	20	22	23	21	20	18	18	18	15	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}
LQ	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{14}^{S}	E_{14}^{S}	16	18	18	18	20	20	18	17	17	15	14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}

The Radio Research Laboratories, Japan

MAR. 1970 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | M(3000)F2 (0.01) | 135° E Mean Time (G. M. T. + 9h)

Station AKITA Lat. 39° 43.5' N. Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in 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	260	290	305	300	270	270	295	335	340	325	I R 310	I R 310	I R 300	315	305	305	310	320	320	300	295	295	280	295
2	280	260	275	290	290	290	295	325	I R 330	I R 310	310	305	300	305	300	300	310	330	315	315	285	290	275	300 S
3	295	285	290	290	285	290	310	325	I R 335	325	310	295	310	300	300	305	310	315	310	300	300	310	310	290
4	270	270	275	280	270	270	295	I R 330	340	300	300	300	305	295	305	300	310	315	315	300	290	290	270	265
5	275	290	I R 285	280	275	275	295	315	I R 330	320	315	305	295	305	300	300	310	320	315	300	280	295	I R 290	280
6	S 290	I R 285	I R 285	300	300	270	C	C	C	320	305	305	300	300	285	290	310	I R 320	315	305	300	280	290	290
7	295	290	280	265	260	245	300	310	315	325	295	305	300	300	310	310	305	320	I R 320	295	I R 310	310	275	R
8	R	275	255	260	260	250	320	I R 325	S 325	310	315	310	300	305	300	300	295	R 305	320	290	R	R	R	R
9	R	I R 275	I R 250	240	330	R 320	I R 290	I R 300	280	295	290	300	300	280	290	300	315	310	300	280	R	R	R	295
10	290	I R 300	285	270	250	270	320	I R 330	325	305	300	315	290	315	295	315	315	320	300	300	285	295	I R 290	I R 290
11	295	290	290	305	295	270	310	330	335	305	305	305	305	295	295	295	310	310	310	305	290	295	285	280
12	I R 285	285	285	310	290	280	315	325	325	320	305	300	295	300	290	290	310	I C 315	I C 305	295	300	280	285	285
13	285	295	305	290	280	295	I R 310	320	I R 330	320	305	300	295	295	295	295	290	315	315	295	285	295	285	290
14	290	280	270	I R 295	300	270	310	320	325	300	310	300	300	295	295	300	295	I R 320	310	295	285	285	285	295
15	I R 280	285	295	I R 295	285	275	320	320	335	320	300	300	295	300	290	290	300	305	320	330	300	285	275	I R 285
16	290	290	285	300	280	285	I R 310	330	I R 320	315	305	305	300	295	295	295	305	315	310	300	290	295	I R 285	290
17	290	275	300	305	285	270	325	320	I R 315	310	305	295	295	300	290	300	295	305	325	300	I R 275	280	280	285
18	I R 280	275	305	290	290	270	310	I R 320	325	305	310	300	300	300	290	305	310	310	310	290	295	285	I R 290	280
19	280	300	300	290	280	I R 290	305	I R 320	305	315	300	295	300	295	295	300	305	315	310	300	290	285	285	280
20	I R 270	270	310	325	295	270	330	330	310	305	305	310	300	295	300	300	305	310	305	315	305	300	I R 290	290 S
21	S 285	295	305	305 S	300	285	300	320	315	315	310	300	300	290	295	300	300	310	295	300	I R 290	290	295	300
22	295	285	290	305	280	275	310	330	315	310	305	300	300	295	295	300	305	305	310	305	315	I R 290	295	290
23	290	I R 285	290 S	295	300	280	310	320 S	I R 315	305	300	295	290	290	290	285	295	310	310	295	285	295	I R 290	290
24	275	285	290	295	295	280	315	I R 330	325	315	300	300	295	295	290	290	310	305	310	300	290	290	280	275
25	275	275	290	285	310	285	320	330	315	315	300	I R 300	280	280	285	I C 285	290	I R 305	310	295	280	280	285	275
26	275	I R 270	275	280	270	I R 280	320	320	I R 310	300	295	290	280	285	280	I C 280	280	300	300	295	280	280	I R 280	280
27	275	275 S	270 S	290	285	270	320	330	305	300	295	290	285	285	280	280	290	300	310	305	290	275	260	270
28	280 S	285	285	280	270	260	305	305	305	290	285	285	280	290	280	285	290	300	305	300	275	I R 265	255	I R 260
29	I R 270	275 S	255	275	255	275	310	285	300	290	290	300	300	295	290	295	305	310	305	305	300	290	280	285
30	275	270	I R 280	275	270	270	295	315	305	305	295	285	290	295	290	300	300	I C 305	310	315	300	285	280	270
31	265	270	290	260	275	275	290	335	325	300	300	290	290	285	290	295	290	300	310	285	295	275	250	270
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31	29	29	29	29
MED	280	285	285	290	285	275	310	322	322	310	305	300	300	295	295	300	305	310	310	300	290	290	285	285
UQ	290	290	292	300	295	282	320	330	330	318	308	305	300	300	298	300	310	315	315	305	300	295	290	290
LQ	275	275	278	280	270	270	300	320	310	302	300	295	292	292	290	290	295	305	308	295	285	280	280	280

MAR. 1970 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 1970 | M(3000)F1 (0.01) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L 380	L								
2									L	L	L	L	L	L 370	L	L								
3										L	L	L 360	U L 350	L 375	L	L								
4										L 355	395	395	L	L	L 350	L								
5										L	L	L	L 390	L 360	L	L								
6									C	L	L	L	L	L 365	L	L								
7										L	L 340	L	L	L	L	L								
8										L 400	U L 355	L	L	U L 380	L	L								
9									310	H 335	L 350	355	375	L	L	L								
10									L	H 385	L 370	L	L	L	L	L								
11									L	L	L	L	390	L 375	L	L								
12									L	L	L 375	380	375	L 370	L	L								
13									L	L	395	370	380	H 365	L	L								
14										L	L 380	L 370	375	395	L	L	L							
15									L	L	375	365	L	360	L	L 350	L							
16									390	L	385	355	385	340	L 375	L								
17									L	L	L	L	370	355	L	L								
18										L	L	360	L	375	L	L	L							
19										U L 375	355	H 380	H 380	L	360	L	L							
20									L	L	355	L 375	L	370	L 365	L	L							
21									L	H 385	L	L 360	375	L 395	H 350	L								
22									L	L	L 365	L 365	U L 370	L 380	U L 350	L	L							
23									L	L	L	L 365	H 375	L 365	L	L								
24									L	L 380	L 375	L 365	L 375	L 360	L 360	L	L							
25									L	L 375	L 375	400	435	380	L 360	C	L							
26									L	L	L 380	L 380	390	L	L	C	L							
27										L	L 400	L 395	L 350	L 360	L	L	L							
28									410	L	L	L	390	370	L 380	L 390								
29									L		B	L	L 370	L	L	L								
30									L	L	L 370	L 360	L 370	365	L	L								
31									L	L	L	L 365	L 345	L 360	L	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									3	8	18	20	21	23	10	2								
MED									390	L 378	L 375	L 365	375	L 370	L 360	L 370								
UQ									400	385	L 380	380	385	L 375	L 375									
LQ									350	L 365	L 355	L 360	L 370	360	L 350									

The Radio Research Laboratories, Japan

MAR. 1970 | M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1970 | 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										240	260	265	260	250	260	270								
2									245	235	260	250	250	250	250	245								
3										230	250	265	280	255	255	260								
4										265	245	255	260	255	260	250								
5										230	255	250	255	280	250	265								
6									C	250	250	260	250	280	250	250								
7										255	320	270	255	255	260	245								
8										230	260	270	250	250	250	250								
9									360	380	325	310	260	250	255	255								
10									230	255	270	255	245	230	270	250								
11									230	240	240	260	255	270	255	250								
12									250	230	260	265	255	260	245	260								
13									240	250	245	260	250	270	255	250								
14										240	255	265	270	255	255	265	250							
15									240	250	250	255	250	270	265	290	260							
16									230	245	245	270	260	280	255	255								
17									245	255	255	255	265	280	265	255								
18										250	270	280	255	270	250	260	255							
19										250	265	260	260	265	290	265	250							
20									250	260	270	270	260	265	265	260	250							
21									235	260	260	280	270	250	300	270								
22									250	255	260	275	265	260	260	260	250							
23									250	260	265	270	260	270	255	265								
24									250	250	270	275	270	265	265	270	250							
25									250	260	280	280	255	280	290	280 I C	280							
26									250	250	275	275	265	295	275	270 I C	265							
27										250	255	260	305	280	300	270	270							
28									235	250	265	275	260	285	270	265								
29									250		270	270	270	255	260	260								
30									255	245	255	280	285	270	255	250								
31									250	255	250	265	280	275	255	255								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									20	30	31	31	31	31	31	31	10							
MED									250	250	260	265	260	265	260	260	252							
UQ									250	255	270	275	268	278	265	265	265							
LQ									238	240	252	260	255	255	255	250	250							

MAR. 1970 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1970 | H'F (KM) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	330	290	245	220	290	295	255	235	225	230	230	230	240	230	225	220H	245	230	215	250	255	240	270	300
2	280	345	305	270	220	250	270	230	230	225	200H	220	240	215	230	230	245	230	220	205	245	295	290	270
3	260	270	270	280	270	265	230	215	225	230	230	240	220	230	230	245	240	225	220	220	245	240	220	265
4	310	320	295	295	290	305	265	220	225	210	210	205	230	230	230	240	245	240	220	220	230	250	290	320
5	305	300	260	270	260	280	275	230	235	230	240	225	210	250	I 240 B	235	250	230	215	215	265	275	280	295
6	300	305	290	265	235	310	C	C	C	230	220	240	230	220	240	240	250	235	220	205	245	260	275	265
7	285	290	290	285	320	355	275	240	235	230	220	245	235	230	230	230	235	220	210	245	290	290	300	300
8	255	290	360	320	330	370	265	215	225	205	220	205H	230	210	230	230	250	240	220	240	I A 295	I A 300	I A 290	290
9	255	290	470	390	220	290	315	265	250	220H	220	225	240	230	225	230	230	220	245	275	300	270	270	255
10	270	260	255	290	340	310	240	230	215	195H	215	230	220	205	200H	240	240	230	220	220	255	275	265	275
11	270	255	255	245	250	300	250	240	220	225	210	220	210	205	235	230	235	240	220	240	255	270	275	290
12	290	270	265	230	215	290	250	235	230	215	215	210	220	215	220	230	250	I 230 G	215	235	255	270	295	295
13	270	245	250	260	260	280	230	225	230	230	195	220	205	210H	230	230	240	240	215	210	270	260	280	280
14	295	295	300	270	215	260	245	235	230	215	230	220	205	215	220	245	240	240	220	210	265	270	275	265
15	275	265	270	260	230	245	235	230	230	230	215	200	235	205	220	230	240	245	215	215	235	280	305	285
16	280	280	265	250	230	280	260	230	210	230	200	210	215	210	210	230	240	240	220	240	255	265	280	290
17	270	275	250	235	245	285	235	230	230	230	230	230	205	205	235	235	245	240	220	215	275	290	290	290
18	290	290	245	220	225	340	240	230	230	230	235	220	230	210	220	230	240	245	230	220	250	270	280	290
19	290	260	235	270	260	295	245	230	235	230	210	200H	195H	230	225	230	230	245	235	220	255	255	270	290
20	295	285	245	230	200	305	235	230	230	230	225	200	240	205	205	235	240	245	230	220	240	240	280	295
21	290	255	250	240	215	290	240	230	220	205H	230	235	210	200	200H	240	245	230	240	245	255	270	260	250
22	255	255	260	255	270	300	235	230	230	225	225	215	225	215	210	230	240	240	235	240	245	250	265	255
23	295	280	255	240	245	280	240	230	230	230	230	230	205H	215	225	220	240	245	235	230	250	245	265	265
24	295	285	270	245	245	265	240	235	230	225	210	220	215	210	210	240	240	250	235	225	245	245	255	275
25	280	290	270	260	245	270	230	230	230	230	220	215	200	205	230	I 240 G	245	250	240	230	245	260	265	270
26	280	280	275	255	230	275	240	235	230	230	230	200	220	220	240	I 240 G	245	255	235	240	245	255	255	270
27	280	275	275	250	220	270	235	235	235	230	225	225	220	220	225	245	245	255	245	240	250	275	295	295
28	270	255	275	280	260	320	230	235	220	235	225H	235	225	235	220	225	250	250	235	230	245	280	320	310
29	295	250	285	275	265	240	240	235	235	250	I 250 B	230	215	230	235	235	240	240	240	230	230	245	280	295
30	310	315	305	300	280	300	245	235	235	225	215	225	210	230	240	230	240	I 240 G	245	230	220	230	300	330
31	335	280	245	285	280	290	235	235	230	210H	230	205	210	225	230	245	250	250	255	270	250	260	320	300
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	285	280	270	260	245	290	240	230	230	230	220	220	220	215	225	230	240	240	220	230	250	265	280	290
UQ	295	290	288	280	270	302	255	235	230	230	230	230	230	230	230	240	245	245	235	240	255	275	290	295
LQ	270	262	252	245	228	272	235	230	225	222	215	210	210	210	220	230	240	230	220	220	245	250	268	270

The Radio Research Laboratories, Japan

MAR. 1970 | H'F (KM)

IONOSPHERIC DATA

MAR. 1970 | 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

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

MAR. 1970 | H'ES (KM)

IONOSPHERIC DATA

MAR. 1970 | TYPES OF ES | 135° E Mean Time (G. M. T.+ 9h)

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

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

MAR. 1970 | TYPES OF ES

IONOSPHERIC DATA

MAR. 1970 | 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

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

The Radio Research Laboratories, Japan

MAR. 1970 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FOF1 (0.01 MHZ) | 135° E Mean Time (G. M. T.+ 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20 sec in 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								
2										L	L	L	L	L	L	L								
3									L	L	L	L	L	L	L									
4										L		L	L	L	L									
5										L	L	L	L	L	L									
6									L	L	L	L	L	L	L	L								
7											L	L	L	L	L	L								
8									L	L	L	L	L	L		L								
9										L	L 650	L	L	L	L	L								
10									L	L	C	C	C	U L 510	L	L								
11									L	L	L	L	L 510	L	L		L							
12									L	L	L	L	L	L	L	L								
13										L	L	L	L	L	L 510	L	L							
14									L	L	L	L	L	L	L									
15										L	L	L	L	L	L	L	L							
16										L	U L 430	L	L	L	L	L								
17									L	L	L	L	L	L	L	L	L							
18										L	L	L	L	L	L	L	L							
19									L	L	L	L	L	L	L	L	L							
20										L	L	L 450	L	L	L	L								
21									L	L	L 530	L 530	L	L	U L 560	L								
22										L	L	L	L	L	L	L	L							
23									L	L	L	L	L	L	L	L	L							
24									L	L	L	L	L	L	L	L								
25									L	L	L	L 510	L	L	L	L	L							
26									L	L	L	L	L	L	L	L								
27									L	L	L	L	L	L	L	L	L							
28									L	L	L	L	L	L	L	L	L							
29									L	L	B		L	L	L	L								
30									L	L	L	L	L	L	L									
31									L	L	L	L	L	L	L	L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT											3	3	1	1	2									
MED											L 530	L 510	L 510	U L 510	L 535									
UQ											L 590	L 520												
LQ											L 480	L 480												

MAR. 1970 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FOE (0.01 MHZ) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							R	220	295	325	350	375	IR 365	365	350	320	290	225						
2							130	235	IR 285	310	340	IR 345	IR 350	IR 355	R	R	IR 280	220						
3							R	250	310	325	355	360	R	R	R	R	IR 300	A						
4							B	R	300	R	R	R	B	A	IA 350	R	A	A						
5							B	260	305	325	350	A	R	R	B	350	285	R						
6							B	A	A	A	R	345	R	R	IR 350	305	A	A						
7							160	R	A	340	355	B	A	A	A	A	A	A						
8							R	245	300	290	R	A	A	R	R	R	R	R						
9					150		R	210	R	A	A	A	R	350	IR 345	IR 325	A	A						
10							170	230	R	315	C	C	C	R	340	A	A	A						
11							170	260	290	315	R	R	R	350	350	IR 325	290	R						
12							160	250	315	R	A	R	R	R	350	335	A	A						
13							B	IR 235	310	R	A	R	350	IA 355	350	R	R	R						
14							200	R 250	305	335	IA 350	360	IR 375	A	A	B	A	A						
15							R	260	A	A	A	A	A	A	A	A	A	A						
16							190	225	300	330	A	R	R	350	350	340	290	R						
17							190	IR 265	IA 305	340	350	360	360	IR 355	350	335	305	IR 230						
18							210	R	310	IR 330	R 340	IR 350	IR 350	345	350	IR 345	300	IR 245						
19							190	250	A	R	IR 345	350	R	350	IR 350	340	R	R						
20							IR 195	260	IR 310	330	350	R	R	350	340	325	300	230	B					
21							R	250	310	330	R	A	R	350	350	330	295	220	B					
22							B	260	IA 315	A	R	A	A	A	A	A	310	R	190					
23							185	280	310	345	A	R	A	R	R	335	305	R	B					
24							IR 195	250	300	R	R	R	R	IR 360	IR 350	340	300	250	B					
25							185	275	R	R	R	360	R	IR 350	345	330	IR 300	235	B					
26							200	IR 260	R 310	340	350	365	R 375	380	350	330	300	245	A					
27							200	280	310	330	350	350	R	A	IA 355	340	310	250	A					
28							220	270	315	330	IA 350	R	A	A	A	A	300	240	B					
29							210	260	320	355	B	A	380	370	350	330	290	220	B					
30							185	280	IA 315	345	360	IR 375	380	370	350	325	300	240	E					
31							175	280	320	340	R 355	R	R	A	A	IA 335	IR 300	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1		20	27	24	21	15	12	9	16	20	20	20	13	2					
MED					150		190	260	310	330	350	360	R 365	352	350	332	300	235	F F 190					
UQ							200	262	312	340	352	362	R 375	362	350	340	300	245						
LQ							172	248	300	325	350	350	UR 350	350	350	325	290	225						

MAR. 1970 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FOES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 15	E	J X 16	E	E	E	E B 15	25	G	35	42	40	G 32	42	G	G	33	G 15	E S 15	M 20	E S 15	M 21	E	M 20
2	E S 15	E B 13	E S 15	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	22	E B 13	E S 15	E S 15	E S 15	E S 15
3	E S 15	E B 12	E S 15	E S 15	E	E S 15	E B 15	G	G	G	G	G	G	G	G	G	G	21	21	E S 15	E B 13	E S 15	E S 15	E S 15
4	E S 15	E B 12	E S 15	E S 15	E B 12	E B 13	E B 15	G	G	G	G	G	E B 43	41	40	G	J X 29	J X 36	J X 24	18	E S 15	E S 15	E B 13	E
5	E S 15	E S 15	E B 12	E	E B 13	E B 13	E S 15	G	G	36	41	41	G	G	E B 43	G	G	G	E S 15	E S 15	E S 15	20	J X 25	J X 29
6	21	21	E S 15	E B 13	20	E B 12	E B 15	J X 25	35	36	G	G	G	G	G	G	31	J X 25	21	20	E S 15	E S 15	E B 12	E
7	E S 15	20	21	21	20	E B 13	G	G	32	G	37	E B 45	38	J X 41	39	37	31	23	J X 25	J X 24	19	J X 29	J X 49	73
8	J X 27	J X 29	J X 32	J X 23	E	E B 12	E B 14	G	G	G	G	J X 54	39	G	G	G	G	G	E B 13	J X 21	J X 27	J X 24	J X 21	J X 25
9	J X 25	20	E S 15	E	E	J X 21	20	G	G	36	J X 41	J X 41	G	G	G	J G 28	J X 31	J X 25	J X 27	J X 24	J X 24	J X 29	J X 25	21
10	J X 21	21	E B 13	E	E S 15	E B 12	G	G	G	G	C	C	C	G	G	36	J X 31	J X 24	J X 29	J X 24	E S 15	E S 15	E B 12	E S 15
11	E S 15	E B 12	E B 12	E	E B 12	E S 15	G	G	G	G	G	G	G	G	G	G	G	G	E S 15	20	E S 15	21	E S 15	E S 15
12	E S 15	E B 12	E S 15	E	E	E S 15	G	G	G	G	41	G	G	G	G	G	35	24	J X 24	21	20	20	31	E S 15
13	E S 15	E B 12	E	E	E B 13	E B 12	E B 15	G	G	G	36	G	G	42	G	G	G	G	E S 15	E S 15	E B 12	E S 15	E B 13	E S 15
14	E S 15	E S 15	21	E B 12	E	E B 12	G	G	34	36	J X 38	44	G	36	J X 40	J X 58	39	J X 61	24	M 31	J X 25	J X 24	21	E S 15
15	E S 15	E	E B 11	E	E	E B 11	20	G	35	38	J X 40	J X 41	40	42	47	39	J X 36	22	J X 28	J X 24	20	J X 24	20	E S 15
16	E S 15	E B 13	E B 13	M 21	21	E	G	G	G	G	39	G	G	G	G	G	G	G 20	J X 29	J X 27	20	E S 15	20	E S 15
17	E B 13	E B 12	E B 13	E	E	E B 13	G	G	35	G	G	G	G	G	G	G	G	G	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
18	E S 15	E S 15	20	E	E	E	G	G	G	G	G	G	G	G	G	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 S 15	E B 12	E	E	E B 12	G	G	35	G	G	G	G	G	G	G	G	G	E S 15	E B 13	E S 15	E S 15	E S 15	E
20	E B 12	E S 15	E S 15	E S 15	E B 11	E S 15	G	28	G	35	37	G	G	G	G	G	G	G	E B 16	E B 13	M 17	E B 14	E S 15	E
21	E B 12	E	E B 13	E	E	E B 11	22	G	G	35	G	39	G	G	G	G	G	G	E B 15	J X 14	M 20	M 17	M 21	M 21
22	E	E	E	E B 13	E	E B 14	22	G	J X 33	38	G	45	42	41	41	J X 36	G	G	G	E S 15	E S 15	E S 15	E S 15	E S 15
23	E S 15	E B 13	E B 12	E	E	E B 12	22	G	34	41	42	G	44	G	G	G	J G 29	G	E B 15	E S 15	E B 13	E S 15	E B 13	E S 15
24	E S 15	E S 15	E S 15	E	E	E B 13	G	G	G	G	G	G	G	G	G	G	G	G	E B 16	E S 15	E B 12	E	E B 12	E S 15
25	E B 12	E S 15	E B 12	E B 13	E	E B 12	22	33	G	G	G	G	G	G	G	G	G	G	E B 19	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	E B 13	E B 12	E S 15	23	G	G	37	37	G	G	G	G 26	J G 26	G 25	G 20	J X 18	E	J X 16	M 17	M 20	E S 15
27	E S 15	E	E B 12	E	M 21	E B 12	G	G	32	39	39	38	G	J X 40	44	J G 25	G 19	29	21	J X 21	21	J X 25	27	19
28	21	20	E	19	E	E	G	G	G	36	37	G 35	42	J X 54	J X 36	34	G 21	G 19	E B 16	E B 11	M 19	E B 12	E S 15	E S 15
29	E S 15	21	J X 20	M 21	E	E	G	30	36	G	E B 70	J X 53	G 35	G	G 27	G	G	G 17	E B 15	19	E B 12	E S 15	E B 12	E S 15
30	M 19	E B 13	E S 15	E	E	E S 15	G	G	J X 33	42	40	G	J G 33	G 31	J G 30	J G 30	J G 26	J G 23	J X 24	21	E B 13	E S 15	E S 15	E S 16
31	E S 15	M 20	E	J X 14	J X 17	E S 15	G	G	G	G	G	G	G	41	39	J X 45	G	32	J X 29	20	20	20	20	20
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31
MED	E S 15	E 15	E 15	E	E	E B 12	G	G	G	G	E G 36	G	G	G	G	G	G	G 17	E G 18	18	E 15	E 15	E 15	E S 15
UQ	E S 15	18	E S 15	E B 14	E 12	E B 14	15	G	33	36	40	40	G 34	40	U 36	G 29	30	24	J X 24	21	20	20	20	18
LQ	E S 15	E B 12	E B 12	E	E	E B 12	G	G	G	G	G	G	G	G	G	G	G	G	E S 15	E S 15	E S 15	E S 15	E S 14	E S 15

The Radio Research Laboratories, Japan

MAR. 1970 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FBES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 15	E	16	E	E	E	E B 15	25	G	35	40	40	E R 32	39	G	G	33	G 15	E S 15	E	E S 15	E	E	E
2	E S 15	E B 13	E S 15	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E	E B 13	E S 15	E S 15	E S 15	E S 15
3	E S 15	E B 12	E S 15	E S 15	E	E S 15	E B 15	G	G	G	G	G	G	G	G	G	G	18	E	E S 15	E B 13	E S 15	E S 15	E S 15
4	E S 15	E B 12	E S 15	E S 15	E B 12	E B 13	E B 15	G	G	G	G	G	E B 43	40	37	G	29	29	E	E	E S 15	E S 15	E B 13	E
5	E S 15	E S 15	E B 12	E	E B 13	E B 13	E B 15	G	G	35	39	40	G	G	E B 43	G	G	G	E S 15	E S 15	E S 15	E	E	25
6	16	15	E S 15	E B 13	E	E B 12	E B 15	24	31	32	G	G	G	G	G	G	28	24	E	E	E 15	E S 15	E B 12	E
7	E S 15	E	E	E	14	E B 13	G	G	30	G	37	E B 45	38	40	36	33	30	22	24	19	16	25	16	29
8	E	28	25	18	E	E B 12	E B 14	G	G	G	G	44	38	G	G	G	G	G	E B 13	20	25	24	18	25
9	20	E	E S 15	E	E	19	19	G	G	34	37	38	G	G	G	G 26	29	25	25	21	22	27	24	15
10	18	E	E B 13	E	E S 15	E B 12	G	G	G	G	C	C	C	G	G	34	29	24	27	E	E S 15	E S 15	E B 12	E S 15
11	E S 15	E B 12	E B 12	E	E B 12	E S 15	G	G	G	G	G	G	G	G	G	G	G	G	E S 15	E	E 15	E	E S 15	E S 15
12	E S 15	E B 12	E S 15	E	E	E S 15	G	G	G	G	39	G	G	G	G	G	30	24	18	E	E	E	27	E S 15
13	E S 15	E B 12	E	E	E B 13	E B 12	E B 15	G	G	G	36	G	G	39	G	G	G	G	E S 15	E S 15	E B 12	E S 15	E B 13	E S 15
14	E S 15	E S 15	E	E B 12	E	E B 12	G	G	32	36	38	40	G	E R 36	40	55	33	48	19	19	22	E	E	E S 15
15	E S 15	E	E B 11	E	E	E B 11	G	G	31	35	38	40	40	41	45	34	31	E R 22	22	23	E	20	E	E S 15
16	E S 15	E B 13	E B 13	E	E	E	G	G	G	G	38	G	G	G	G	G	G	E R 20	27	22	E	E S 15	E	E S 15
17	E B 13	E B 12	E B 13	E	E	E B 13	G	G	32	G	G	G	G	G	G	G	G	G	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
18	E S 15	E S 15	E	E	E	E	G	G	G	G	G	G	G	G	G	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 S 15	E B 12	E	E	E B 12	G	G	32	G	G	G	G	G	G	G	G	G	E S 15	E B 13	E S 15	E S 15	E S 15	E
20	E B 12	E S 15	E S 15	E S 15	E B 11	E S 15	G	28	G	35	37	G	G	G	G	G	G	G	E B 16	E B 13	E	E B 14	E S 15	E
21	E B 12	E	E B 13	E	E	E B 11	21	G	G	35	G	E R 39	G	G	G	G	G	G	E B 15	E	E	E	E	E
22	E	E	E	E B 13	E	E B 14	22	G	32	37	G	41	41	40	37	33	G	G	G	E S 15	E S 15	E S 15	E S 15	E S 15
23	E S 15	E B 13	E B 12	E	E	E B 12	20	G	32	39	42	G	41	G	G	G	G 28	G	E B 15	E S 15	E B 13	E S 15	E B 13	E S 15
24	E S 15	E S 15	E S 15	E	E	E B 13	G	G	G	G	G	G	G	G	G	G	G	G	E B 16	E S 15	E B 12	E	E B 12	E S 15
25	E B 12	E S 15	E B 12	E B 13	E	E B 12	21	31	G	G	G	G	G	G	G	G	G	G	E B 19	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	E B 13	E B 12	E S 15	22	G	G	36	37	G	G	G	G 26	G 26	G 25	G 19	17	E	E	E	E	E S 15
27	E S 15	E	E B 12	E	E	E B 12	G	G	32	37	39	E R 38	G	40	38	E R 25	G 18	28	20	19	E	19	19	E
28	E	E	E	E	E	E	G	G	G	36	37	E R 35	40	49	36	33	G 21	G 19	E B 16	E B 11	E	E B 12	E S 15	E S 15
29	E S 15	E	E	E	E	E	G	29	34	G	E B 70	53	G 35	G	G 27	G	G	G 17	E B 15	E	E B 12	E S 15	E B 12	E S 15
30	E	E B 13	E S 15	E	E	E S 15	G	G	33	40	39	G	G 33	G 30	G 30	G 29	G 22	G 19	18	E	E B 13	E S 15	E S 15	E S 16
31	E S 15	E	E	E	15	E S 15	G	G	G	G	G	G	G	40	38	45	G	32	25	E	E	E	E	E
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31
MED	E S 15	E B 12	E B 13	E	E	E B 12	G	G	G	G	E G 36	G	G	G	G	G	G	E G 17	E E 15	15	E 15	E 15	E 15	E S 15
UQ	E S 15	E 15	E S 15	E B 12	E E 12	E B 14	15	G	32	35	38	39	34	39	34	28	28	23	19	E S 15	E S 15	E S 15	E S 15	E S 15
LQ	E S 14	E	E B 11	E	E	E B 12	G	G	G	G	G	G	G	G	G	G	G	G	E 15	E	E	E	E B 12	E E 15

MAR. 1970 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | F-MIN (0.1 MHZ) | 135° E Mean Time (G. M. T.+ 9h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N. Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20 sec in 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	10	10	10	10	10	15	11	13	15	15	21	26	20	26	16	15	10	E S 15	E S 15	E S 15	E S 15	10	E S 16
2	E S 15	13	E S 15	10	10	10	10	14	14	13	18	25	25	15	26	15	13	15	E S 15	13	E S 15	E S 15	E S 15	E S 15
3	E S 15	12	E S 15	E S 15	10	E S 15	E S 15	14	12	14	19	25	20	25	15	15	15	15	E S 15	E S 15	13	E S 15	E S 15	E S 15
4	E S 15	12	E S 15	E S 15	12	13	15	14	14	25	25	15	43	25	14	15	12	12	E S 15	E S 15	E S 15	E S 15	13	10
5	E S 15	E S 15	12	10	13	13	15	14	14	14	25	25	25	25	43	25	16	13	E S 15	E S 15	E S 15	E S 15	E S 15	12
6	12	12	E S 15	13	10	12	15	12	13	13	15	24	25	25	15	24	14	13	E S 15	E S 15	E S 15	E S 15	E S 12	10
7	E S 15	E S 15	E S 15	13	10	13	12	12	15	15	16	45	25	26	17	19	15	12	10	13	13	13	10	13
8	14	10	10	10	10	12	14	16	15	13	15	15	23	15	20	15	15	14	13	12	11	E S 15	10	E S 15
9	13	13	E S 15	10	10	12	15	14	14	15	15	25	23	23	16	13	15	12	E S 15	E S 15	E S 15	E S 15	E S 15	10
10	E S 15	E S 15	13	10	E S 15	12	13	15	15	15	C	C	C	24	20	15	13	12	E S 15	E S 15	E S 15	E S 15	12	E S 15
11	E S 15	12	12	10	12	E S 15	14	15	15	15	15	24	25	25	19	18	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
12	E S 15	12	E S 15	10	10	E S 15	14	14	14	15	18	25	26	25	19	25	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
13	E S 15	12	10	10	13	12	15	15	15	15	25	26	26	19	26	16	16	15	E S 15	E S 15	12	E S 15	13	E S 15
14	E S 15	E S 15	E S 15	12	10	12	13	15	15	16	25	25	25	25	20	41	17	15	E S 15	E S 16	E S 16	E S 16	E S 15	E S 15
15	E S 15	10	11	10	10	11	15	15	15	15	25	25	26	25	17	16	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
16	E S 15	13	13	13	10	10	15	16	15	16	15	26	26	27	25	16	15	12	12	E S 15	E S 15	E S 15	E S 15	E S 15
17	13	12	13	10	10	13	14	14	15	15	19	16	28	25	26	18	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
18	E S 15	E S 15	13	10	10	10	13	15	18	15	15	26	26	25	25	25	15	15	E S 15	E S 15	E S 15	12	E S 15	E S 15
19	E S 15	E S 15	12	10	10	12	14	15	13	15	18	25	29	25	25	25	15	15	E S 15	13	E S 15	E S 15	E S 15	10
20	12	E S 15	E S 15	E S 15	11	E S 15	15	15	15	16	16	18	15	25	26	18	16	15	16	13	11	14	E S 15	10
21	12	10	13	10	10	11	13	16	14	17	25	30	26	19	25	21	16	16	15	13	13	E S 15	10	12
22	10	10	10	13	10	14	14	14	14	15	26	25	25	26	25	17	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15
23	E S 15	13	12	10	10	12	14	15	13	25	26	25	26	27	25	15	14	12	15	E S 15	13	E S 15	13	E S 15
24	E S 15	E S 15	E S 15	10	10	13	15	15	13	16	26	25	25	26	15	25	15	14	16	E S 15	12	10	12	E S 15
25	12	E S 15	12	13	10	12	15	14	15	26	26	25	26	25	23	18	18	13	19	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	12	E S 15	14	12	15	15	26	26	25	25	19	15	15	15	10	10	E S 15	E S 15	E S 15	E S 15
27	E S 15	10	12	10	10	12	15	15	15	16	19	25	26	16	25	15	14	15	13	14	E S 15	E S 15	E S 15	14
28	E S 15	E S 15	10	10	10	10	15	14	15	16	20	16	25	21	21	15	14	14	16	11	E S 15	12	E S 15	E S 15
29	E S 15	12	10	13	10	11	12	10	16	16	70	29	25	25	16	18	14	11	15	E S 15	12	E S 15	12	E S 15
30	E S 15	13	E S 15	10	10	E S 15	15	14	15	15	16	25	25	25	15	16	14	11	10	E S 15	13	E S 15	E S 15	E S 16
31	E S 15	10	10	10	10	E S 15	13	14	16	16	26	15	25	26	26	15	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31
MED	E S 15	12	12	10	10	12	14	14	15	15	19	25	25	25	21	16	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
UQ	E S 15	E S 15	E S 15	12	10	13	15	15	15	16	25	25	26	25	25	20	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15
LQ	U 12	12	12	10	10	12	14	14	14	15	16	24	25	24	17	15	14	12	E S 15	U 12	12	E S 15	11	U 12

The Radio Research Laboratories, Japan

MAR. 1970 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | M(3000)F2 (0.01) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	255	290	335	330	270	255	300	320	325	J R 305	320	290	295	305	290	295	300	305	305	285	280	310	275	265
2	275	255	270	275	295	290	300	315	310	310	300	300	300	295	295	295	300	320	315	295	285	275	275	300
3	290	290	295	295	305	285	315	320	J R 305	305	300	295	I R 305	315	285	300	310	305	305	J R 290	290	310	330	285
4	275	265	270	295	265	265	305	335	340	305	280	290	305	295	295	295	295	J R 305	305	295	285	280	280	265
5	I R 270	280	290	275	255	270	290	310	J R 305	305	305	315	295	285	315	300	300	320	315	290	280	275	280	265
6	270	270 R	290	300	275	255	300	345	320	305	295	285	305	280	285	280	300	300	300	300	275	275	J R 285	275
7	300	290	J R 290	285	255	250	290	315	J R 310	315	310	295	295	300	300	310	300	310	320	295	280	285	275	J R 270
8	295	285	245	270	275	270	285	335	315	310	295	295	295	290	285	285	285	300	290	275	300	J R 285	J R 285	290
9	295	270	215	240	330	260	250	320	305	325	285	280	305	290	280	290	310	305	275	275	265	275	I R 280	I R 290
10	280	290	280	280	250	265	295	325	320	295	C	C	C	295	285	295	305	295	300	J R 285	280	290	295	290
11	280	295	290	315	300	250	300	325	J R 315	315	305	290	300	285	290	285	295	295	310	305	295	285	285	285
12	290	300	290	335	280	265	315	320	315	310	300	300	300	290	285	290	295	300	305	J R 290	285	275	280	275
13	285	305	295	310	280	275	315	320	J R 325	J R 295	300	290	300	285	290	290	275	305	J R 310	290	I R 285	285	290	J R 290
14	280	J R 275	270	290	305	285	295	320	310	310	300	295	290	295	290	290	300	305	290	305	285	280	285	290
15	285	290	290	300	285	285	315	330	J R 315	J R 310	310	295	295	280	285	280	295	305	J R 310	J R 295	280	270	265	270
16	290	290	290	285	285	285	310	330	J R 315	310	310	295	295	290	290	295	295	300	310	J R 285	275	285	275	280
17	290	295	295	335	270	265	300	315	310	310	295	290	290	285	290	290	290	305	320	285	270	275	275	275
18	275	285	305	320	265	245	300	330	J R 325	J R 310	285	290	300	295	295	295	300	J R 290	305	295	290	285	275	275
19	280	295	320	290	275	280	295	325	J R 305	315	285	285	315	290	290	295	300	305	305	R	275	290	275	275
20	65	67	J R 73	J R 69	37	38	58	84	93	J R 104	117	122	305	285	285	295	300	J R 300	R 300	305	J R 290	285	275	275
21	280	295	300	315	315	275	320	315	J R 310	310	300	290	290	285	285	290	300	310	300	290	290	J R 285	J R 290	300
22	305	290	305	290	275	275	310	325	315	315	310	300	295	290	285	285	305	J R 300	295	295	J R 295	280	275	285
23	R 265	280	295	280	295	275	295	310	310	305	300	290	290	290	285	285	290	295	305	J R 305	280	280	280	290
24	285	275	290	305	280	270	305	330	J R 315	295	290	280	290	285	280	295	290	295	J R 305	300	J R 285	295	290	275
25	280	280	285	290	295	280	J R 305	310	J R 315	300	290	280	280	285	275	285	285	300	310	290	R	R	R	R 275
26	280	275	285	290	280	275	330	315	310	295	290	285	280	280	280	285	285	295	305	305	R 290	R	275	R 280
27	J R 290	J R 285	J R 300	305	300	280	J R 310	320	310	300	290	285	275	275	280	280	285	300	310	305	275	330	265	270
28	J R 290	J R 295	275	285	280	260	300	315	295	290	275	290	290	280	280	280	285	295	300	305	275	275	R 255	265
29	255	285	270	J R 275	265	285	300	305	305	300	285	295	295	295	275	285	300	305	305	310	295	290	270	275
30	270	275	265	260	265	265	J R 310	310	300	300	300	290	285	295	290	290	295	290	305	320	290	290	270	265
31	265	280	310	285	270	285	320	325	310	325	290	285	290	285	290	280	285	300	295	310	285	I R 270	245	255
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	30	30	29	30	31
MED	280	285	290	290	280	270	300	320	310	305	298	290	295	290	285	290	295	300	305	295	285	285	275	275
UQ	290	290	295	305	295	280	310	325	315	310	300	295	300	295	290	295	300	305	310	305	290	290	285	288
LQ	272	275	272	280	268	262	295	315	308	300	290	285	290	285	285	285	290	298	300	290	280	275	275	270

MAR. 1970 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 1970 | M(3000)F1 (0.01) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L	L	L	L	L	L								
2										L	L	L	L	L	L	L								
3									L	L	L	L	L	L	L									
4										L		L	L	L	L									
5										L	L	L	L	L	L									
6									L	L	L	L	L	L	L	L								
7											L	L	L	L	L	L								
8									L	L	L	L	L	L		L								
9										L	L 340	L	L	L	L	L								
10									L	L	C	C	C	U L 380	L	L								
11									L	L	L	L	L 370	L	L		L							
12									L	L	L	L	L	L	L	L								
13										L	L	L	L	L	L 370	L	L							
14									L	L	L	L	L	L	L									
15										L	L	L	L	L	L	L	L							
16										L	U L 420	L	L	L	L	L								
17									L	L	L	L	L	L	L	L	L							
18										L	L	L	L	L	L	L	L							
19									L	L	L	L	L	L	L	L	L							
20										L	L	L 420	L	L	L	L								
21									L	L	L 380	L 390	L	L	U L 360	L								
22										L	L	L	L	L	L	L	L							
23									L	L	L	L	L	L	L	L	L							
24									L	L	L	L	L	L	L	L								
25									L	L	L	L 380	L	L	L	L	L							
26									L	L	L	L	L	L	L	L								
27									L	L	L	L	L	L	L	L	L							
28									L	L	L	L	L	L	L	L	L							
29									L	L	B		L	L	L	L								
30									L	L	L	L	L	L	L									
31									L	L	L	L	L	L	L	L	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT											3	3	1	1	2									
MED											L 380	L 390	L 370	U L 380	L 365									
UQ											L 400	L 405												
LQ											L 360	L 385												

MAR. 1970 | M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1970 | 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 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	250	290	270	250	270								
2										250	250	270	270	250	250	250								
3									250	250	255	295	285	280	250									
4										245		260	280	250	250									
5										250	250	250	250	250	270									
6									250	250	250	290	275	250	285	270								
7											250	290	255	260	275	250								
8									220	240	275	260	265	250		250								
9										250	340	280	300	270	285	270								
10									250	265	C	C	C	260	250	280								
11									250	250	265	285	295	285	270		270							
12									250	250	260	270	285	270	295	260								
13										250	250	270	290	260	290	250	275							
14									240	250	250	285	260	290	280									
15										255	260	275	270	260	280	250	270							
16										250	250	290	275	265	285	250								
17									250	260	270	260	295	290	270	290	250							
18										255	265	290	285	250	270	250	250							
19									250	250	250	280	280	260	290	290	250							
20										260	280	270	275	255	290	270								
21									250	270	260	280	260	250	300	275								
22										260	270	265	290	260	270	270	250							
23									250	260	275	270	280	270	260	280	285							
24									250	250	260	275	285	290	250	295								
25									250	250	265	290	300	310	290	280	270							
26									250	255	270	275	275	290	300	290								
27									255	275	255	260	260	300	300	275	280							
28									240	250	260	300	300	300	275	260	250							
29									250	260	E 300	B	290	260	260	290								
30									250	250	260	280	260	280	260									
31									240	250	280	255	290	290	270	280	265							
	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									19	29	29	29	30	31	30	25	12							
MED									250	250	260	275	280	265	272	270	268							
UQ									250	260	270	285	290	288	290	280	272							
LQ									250	250	250	265	270	258	260	250	250							

MAR. 1970 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1970 | 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

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	320	290	225	210	275	310	270	220	220	225	225	210	240	225	225	230	250	245	210	250	275	225	245	325
2	300	325	310	255	240	250	275	230	240	240	210	220	240	240	240	240	240	240	240	200	250	285	290	260
3	250	260	290	285	245	265	250	230	240	240	240	200H	240	240	240	250	250	245	240	210	240	240	240	250
4	300	310	300	290	280	310	295	240	240	220	245	240	240	240	230	240	245	245	240	210	245	285	285	310
5	300	295	270	255	250	305	275	240	240	240	240	240	230	210	250	250	245	240	215	210	285	255	290	310
6	295	295	290	250	250	310	250	240	240	210	240	230	240	240	240	240	250	245	210	210	245	260	275	250
7	265	290	295	265	300	350	295	250	245	240	225	245	225	225	220	230	240	230	210	245	260	300	270	310
8	250	300	300	330	300	340	280	220	205	210	200H	240	240	210	250	210	250	250	240	245	300	295	275	290
9	250	265	460	395	240	E,A 400	350	260	245	240	210	240	240	240	240	240	245	240	260	300	310	305	290	250
10	290	275	255	265	310	310	250	240	240	230	C	C	C	220	220	240	245	240	240	240	275	265	265	270
11	270	285	265	250	230	310	280	240	240	240	220	220	215	240	240	245	230	245	240	205	245	265	295	290
12	280	270	270	240	210	300	260	240	240	240	240	230	205	220	240	240	250	250	230	240	250	270	310	300
13	290	245	245	250	280	300	240	245	245	220	230	210	210	220	220	245	240	245	230	215	255	255	270	265
14	265	300	315	250	200	255	260	245	240	225	220	205	240	210	205H	270A	245	245A	220	230	270	275	270	290
15	275	260	270	245	225	290	245	235	230	225	220	200	220	220	245	225	240	245	240	220	225	290	310	290
16	275	260	270	245	225	280	255	230	230	230	200	230	230	240	210	240	245	240	240	250	250	280	290	295
17	270	275	250	240	245	300	250	240	240	240	230	240	220	210	240	230	240	250	240	220	290	295	295	290
18	290	290	250	210	245	340	255	240	250	240	210	240	210	240	210	230	240	250	245	240	240	250	290	290
19	295	255	240	250	260	295	245	240	240	230	220	210	240	240	230	240	240	245	240	240	245	260	290	290
20	295	285	250	220	210	320	245	250	250	220	210H	200	220	205	220	220	245	245	245	220	230	245	275	295
21	290	250	245	220	225	280	245	245	220H	240	245	205	210	225	205	220	240	240	240	240	245	260	255	250
22	250	255	255	245	245	300	250	240	245	240	230	220	230	220	220	240	240	250	250	240	240	250	265	270
23	290	285	260	250	240	300	250	240	240	230	240	205	240	240	240	220	250	250	240	240	250	270	260	250
24	295	295	290	240	250	290	250	240	240	230	220	220	210	220	240	240	250	250	250	240	240	250	250	290
25	290	290	270	255	210	260	250	250	240	240	240	220	200H	240	240	240	250	250	250	240	250	240	265	285
26	290	295	285	245	250	290	250	250	240	220	210	195	205	205	205	240	245	245	245	225	250	270	270	275
27	290	270	255	245	210	275	240	240	225	220	220	200	220	220	220	225	240	250	245	225	230	290	300	300
28	260	255	250	270	250	310	245	235	210	225	220	225	205	260	210	225	230	240	240	220	230	260	325	310
29	305	270	270	280	270	250	240	240	230	210	I,B 215	280A	230	225	225	230	240	245	245	225	220	240	280	290
30	300	300	300	290	275	300	245	245	230	230	225	210	230	205	225	230	240	250	245	220	210	250	290	340
31	320	275	245	270	290	280	240	240	230	240	210	205	240	210	240	240	250	250	250	255	240	265	310	330
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31	31
MED	290	285	270	250	245	300	250	240	240	230	220	220	230	225	230	240	245	245	240	230	245	265	280	290
UQ	295	295	290	268	272	310	265	245	240	240	240	240	240	240	240	240	250	250	245	240	258	282	290	300
LQ	270	262	250	245	228	280	245	240	230	222	210	205	210	215	220	230	240	242	240	220	240	250	268	270

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MAR. 1970 | H'F (KM)

IONOSPHERIC DATA

MAR. 1970 | H'ES (KM) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	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	E	120	E	E	E	B	175	G	150	135	140	105	140	G	G	130	100	S	115	S	100	E	135
2	S	B	S	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	100	B	S	S	S	S
3	S	B	S	S	E	S	B	G	G	G	G	G	G	G	G	G	G	100	100	S	B	S	S	S
4	S	B	S	S	B	B	B	G	G	G	G	G	B	105	100	G	100	100	100	100	S	S	B	E
5	S	S	B	E	B	B	B	G	G	150	150	140	G	G	B	G	G	G	S	S	S	100	100	100
6	100	100	S	B	100	B	B	110	110	110	G	G	G	G	G	G	120	105	100	100	S	S	B	E
7	S	100	110	100	100	B	G	G	120	G	155	B	110	110	115	110	110	110	105	105	105	105	105	105
8	120	105	100	100	E	B	B	G	G	G	G	105	105	G	G	G	G	G	B	100	105	100	100	100
9	100	100	S	E	E	115	140	G	G	140	130	120	G	G	G	110	110	110	105	110	110	115	100	110
10	110	100	B	E	S	B	G	G	G	G	C	C	C	G	G	140	105	105	105	110	S	S	B	S
11	S	B	B	E	B	S	G	G	G	G	G	G	G	G	G	G	G	G	S	100	S	100	S	S
12	S	B	S	E	E	S	G	G	G	G	130	G	G	G	G	G	145	110	100	100	100	100	100	S
13	S	B	E	E	B	B	B	G	G	G	120	G	G	105	G	G	G	G	S	S	B	S	B	S
14	S	S	100	B	E	B	G	G	130	145	125	125	G	125	110	105	115	105	100	100	100	100	100	S
15	S	E	B	E	E	B	105	G	130	125	120	115	115	110	115	110	110	110	110	110	100	110	100	S
16	S	B	B	100	105	E	G	G	G	G	130	G	G	G	G	G	G	100	100	100	100	S	100	S
17	B	B	B	E	E	B	G	G	130	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S
18	S	S	100	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	S	S	S	B	S	S
19	S	S	B	E	E	B	G	G	130	G	G	G	G	G	G	G	G	G	S	B	S	S	S	E
20	B	S	S	S	B	S	G	165	G	130	125	G	G	G	G	G	G	G	B	B	100	B	S	E
21	B	E	B	E	E	B	145	G	G	180	G	125	G	G	G	G	G	G	B	130	125	115	115	110
22	E	E	E	B	E	B	150	G	110	140	G	120	120	115	115	115	G	G	G	S	S	S	S	S
23	S	B	B	E	E	B	160	G	140	130	120	G	105	G	G	G	105	G	B	S	B	S	B	S
24	S	S	S	E	E	B	G	G	G	G	G	G	G	G	G	G	G	G	B	S	B	E	B	S
25	B	S	B	B	E	B	155	145	G	G	G	G	G	G	G	G	G	G	B	S	S	S	S	S
26	S	S	S	B	B	S	160	G	G	130	125	G	G	G	105	100	105	105	105	E	105	105	105	S
27	S	E	B	E	100	B	G	G	155	130	120	115	G	110	105	105	105	125	115	110	110	105	105	105
28	100	105	E	105	E	E	G	G	G	130	110	105	105	105	105	105	100	105	B	B	105	B	S	S
29	S	110	110	110	E	E	G	160	140	G	B	110	105	G	105	G	G	105	B	105	B	S	B	S
30	115	B	S	E	E	S	G	G	110	125	125	G	105	105	105	105	100	100	100	100	B	S	S	S
31	S	105	E	105	110	S	G	G	G	G	G	G	G	120	120	110	G	105	110	100	100	100	100	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	8	6	6	5	1	7	5	11	14	15	11	9	11	11	11	14	17	15	17	13	13	12	8
MED	105	102	105	102	100	115	150	160	130	130	125	120	105	110	105	110	108	105	100	100	105	100	100	105
UQ	115	105	110	105	105		158	165	135	145	130	125	110	118	115	110	115	110	105	110	105	105	105	110
LQ	100	100	100	100	100		142	145	115	130	120	112	105	105	105	105	105	100	100	100	100	100	100	100

MAR. 1970 | H'ES (KM)

IONOSPHERIC DATA

MAR. 1970 | 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			F 1					H 1		H 1	H 1	H 1	L 1	HL 11			H 2	L 1		F 1		F 1		F 1
2																			F 1					
3																		L 1	F 1					
4														L 1	L 1		L 2	L 2	F 1	F 1				
5										H 1	H 1	H 1										F 1	F 1	F 3
6	F 2	F 2			F 1			L 1	L 1	L 1							H 1	L 2	F 1	F 1				
7		F 1	F 1	F 1	F 2				H 1		H 1		C 1	C 1	C 1	C 1	C 2	C 2	F 4	F 4	F 2	F 5	F 4	F 2
8	F 1	F 3	F 4	F 4								L 2	L 1							F 2	F 3	F 3	F 3	F 2
9	F 2	F 1				F 6	H 1			H 1	H 1	H 1				L 1	L 1	L 1	F 2	F 2	F 3	F 3	F 3	F 2
10	F 2	F 1														H 1	L 2	L 2	F 4	F 2				
11																				F 1		F 1		
12											H 1						H 1	L 1	F 2	F 1	F 1	F 1	F 2	
13											H 1			L 1										
14			F 1						H 1	H 1	H 1	H 1		C 1	C 2	L 2	C 3	L 2	F 4	F 2	F 3	F 2	F 2	
15							L 1		H 1	C 1	C 1	C 1	C 1	C 2	C 2	C 1	C 2	C 2	F 4	F 4	F 1	F 4	F 1	
16				F 2	F 1						H 1							L 1	F 4	F 4	F 1		F 1	
17									H 1															
18			F 1																					
19									H 1															
20								H 1		H 1	H 1										F 1			
21							H 3			H 1		H 1								F 1	F 1	F 1	F 1	F 2
22							H 3		L 2	H 1		H 1	H 1	C 1	C 1	C 1								
23							H 1		H 1	H 1	H 1		L 1				L 1							
24																								
25							H 1	H 1																
26							H 1			H 1	H 1				L 1	L 1	L 1	L 2	L 3		F 2	F 1	F 1	
27					F 1				H 1	H 1	H 1	C 1		C 1	L 2	L 1	L 1	C 1	C 3	F 3	F 1	F 5	F 3	F 1
28	F 2	F 1		F 1						H 1	C 1	L 1	L 1	L 2	L 1	L 1	L 2	L 2			F 1			
29		F 1	F 1	F 2				H 1	H 1			C 1	L 1		L 1			L 1		F 1				
30	F 1								L 2	H 1	H 1		L 1	L 1	L 2	L 1	L 2	L 3	L 2	F 1				
31		F 1		F 1	F 2									H 1	H 1	L 2		L 2	L 2	F 1	F 1	F 1	F 1	F 1
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

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MAR. 1970 | TYPES OF ES

IONOSPHERIC DATA

MAR. 1970 | HPF2 (KM) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	405	355	280	280	375	400	320	300	280	J R 305	300	340	340	305	315	320	315	300	305	350	365	305	360	410
2	385	435	400	370	345	345	330	300	300	300	340	310	340	340	340	340	315	300	300	340	350	390	390	310
3	370	370	350	360	310	380	300	290	J R 300	300	300	350	I R 310	300	340	340	300	300	300	J R 310	340	300	290	380
4	400	400	400	350	380	400	340	260	250	300	380	350	390	340	340	340	340	J R 320	340	310	350	390	380	420
5	I R 410	390	370	390	400	400	350	300	J R 340	300	320	300	330	350	310	300	340	300	300	340	400	390	400	400
6	400	R 395	380	320	350	400	360	250	300	310	340	350	310	390	350	350	350	310	300	340	390	400	J R 350	390
7	390	390	J R 370	370	410	440	350	300	J R 300	300	300	315	315	320	315	305	305	300	295	340	370	355	380	J R 395
8	320	360	460	405	400	445	350	260	280	330	340	340	350	340	350	350	380	340	310	380	350	J R 380	J R 350	370
9	350	400	560	470	290	420	400	300	310	280	350	400	350	340	395	340	300	300	380	400	400	390	I R 360	I R 345
10	350	340	380	390	420	400	340	290	300	350	C	C	C	340	350	320	310	350	340	J R 340	380	350	340	370
11	380	350	370	300	320	400	350	290	J R 290	300	310	350	340	350	340	350	350	340	300	300	340	350	380	380
12	350	340	350	270	340	390	300	300	300	310	320	340	340	340	360	350	340	310	300	J R 340	380	395	390	400
13	380	310	340	330	390	390	300	300	J R 290	J R 305	340	350	350	350	350	350	350	340	J R 300	335	I R 370	350	360	J R 350
14	390	J R 400	400	350	340	350	340	300	300	305	305	325	340	315	340	320	310	305	300	310	350	370	355	340
15	350	345	350	310	345	355	305	290	J R 290	J R 305	310	330	330	355	350	350	345	300	J R 300	J R 310	335	380	405	390
16	350	350	350	355	360	370	305	280	J R 290	300	300	340	340	340	350	340	340	330	300	J R 330	390	350	390	350
17	350	360	330	290	390	395	300	300	300	300	330	340	340	350	350	350	340	300	300	340	400	400	390	390
18	390	380	300	300	390	400	300	290	J R 300	J R 300	350	340	330	340	350	350	340	J R 330	320	320	350	340	390	390
19	380	340	300	360	390	390	340	300	J R 300	300	350	340	320	340	350	340	340	310	310	R	390	370	390	390
20	390	360	J R 310	J R 300	400	390	300	300	300	J R 310	315	310	340	340	340	320	320	J R 315	R 310	300	J R 340	340	380	380
21	370	335	325	300	310	380	300	295	J R 290	305	315	320	340	350	350	340	310	300	315	320	350	J R 350	J R 350	320
22	315	340	320	350	390	390	300	290	300	300	310	340	340	340	350	340	330	J R 340	330	320	J R 350	350	360	360
23	R 390	375	350	375	340	400	330	300	300	310	310	340	340	360	350	350	350	310	310	J R 300	350	350	390	370
24	390	390	350	330	350	390	310	290	J R 300	340	340	340	350	350	350	350	340	340	J R 300	300	J R 350	310	350	390
25	380	390	380	330	360	390	J R 300	300	J R 300	310	340	350	350	350	380	360	350	340	300	330	R	R	R	R 380
26	360	390	360	350	390	390	290	300	300	315	345	345	355	360	355	350	350	320	305	310	R 340	R	360	R 360
27	J R 350	J R 340	J R 325	310	315	375	J R 300	300	300	315	340	350	355	370	355	355	340	315	300	300	345	370	400	400
28	J R 350	J R 340	370	360	370	405	305	300	310	330	360	355	350	360	360	360	350	320	305	310	355	360	R 420	410
29	400	350	370	J R 360	400	355	310	305	310	310	355	350	345	350	360	350	325	300	305	300	315	340	390	380
30	400	390	400	410	400	400	J R 300	305	300	310	315	340	355	345	345	350	340	340	305	290	320	340	390	420
31	415	370	300	360	390	360	290	280	290	280	340	350	340	350	340	340	340	300	300	350	340	I R 400	460	400
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	30	30	29	30	31
MED	380	360	350	350	375	390	305	300	300	305	335	340	340	345	350	350	340	310	300	320	350	355	380	380
UQ	390	390	380	365	390	400	340	300	300	310	340	350	350	350	350	350	348	335	310	340	380	390	390	398
LQ	350	342	328	310	342	380	300	290	290	300	310	340	330	340	340	340	318	300	300	310	340	350	360	365

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MAR. 1970 | HPF2 (KM)

IONOSPHERIC DATA

MAR. 1970 | YPF2 (KM) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	90	90	45	75	85	90	80	50	75	J R 75	55	65	60	70	130	90	85	90	90	95	90	90	130	85
2	105	110	100	90	60	70	80	70	70	100	100	100	90	90	100	100	85	80	100	100	100	100	100	90
3	100	120	110	100	90	110	90	100	J R 100	100	100	90	I R 85	90	100	150	100	100	100	J R 100	100	100	110	110
4	90	100	100	100	100	100	120	90	100	100	70	90	100	110	110	100	100	J R 100	80	90	110	100	110	100
5	I R 100	100	110	100	100	100	100	100	J R 100	100	90	100	110	100	90	100	90	100	100	100	100	100	100	100
6	100	R 95	110	100	100	100	90	90	90	100	100	90	90	100	100	100	100	100	100	80	100	90	J R 100	110
7	100	100	J R 110	100	90	80	100	90	J R 100	70	95	85	85	90	90	90	70	75	60	105	100	90	110	J R 100
8	80	90	90	90	95	100	70	60	100	80	100	80	100	100	100	100	100	80	90	100	100	J R 110	J R 100	110
9	100	100	110	130	110	100	100	90	90	110	90	90	90	100	95	100	100	100	100	100	100	100	I R 100	I R 95
10	100	100	100	100	100	100	110	100	90	90	C	C	C	100	90	90	90	90	80	J R 100	100	100	90	110
11	110	100	110	100	80	100	90	90	J R 90	100	90	90	90	100	100	100	120	80	110	100	100	100	100	100
12	100	100	100	80	110	100	110	100	100	100	100	100	70	100	100	100	100	100	110	J R 100	110	95	110	100
13	100	90	100	110	100	100	100	90	J R 110	J R 95	100	90	90	100	90	100	110	100	J R 100	105	I R 105	100	100	J R 100
14	110	J R 100	90	100	110	100	100	90	100	75	90	90	90	85	85	100	90	75	90	85	75	100	95	65
15	100	65	95	105	100	90	95	55	J R 70	J R 70	75	75	95	105	120	105	100	100	J R 70	J R 85	120	90	95	65
16	60	70	95	95	95	75	90	70	J R 85	100	100	100	100	100	100	100	100	110	100	J R 110	90	100	100	100
17	90	110	110	100	100	95	100	100	100	100	100	100	100	100	90	90	100	100	100	100	100	90	100	100
18	100	100	100	100	100	100	100	90	J R 100	J R 90	100	80	70	80	90	90	100	J R 110	100	80	90	110	100	100
19	100	100	100	100	100	100	100	90	J R 90	100	90	100	100	100	90	80	100	90	90	R	100	120	100	100
20	100	100	J R 90	J R 90	100	100	100	80	100	J R 75	90	95	85	105	100	90	120	J R 85	R 70	R 85	J R 70	75	80	80
21	90	65	70	75	85	90	70	65	J R 70	75	85	100	80	90	95	80	85	75	80	75	70	J R 70	J R 65	75
22	75	70	75	95	100	100	60	60	60	100	90	100	110	100	100	100	100	J R 100	100	80	J R 90	90	100	100
23	R 100	105	90	85	100	100	100	100	90	90	90	100	100	80	90	100	90	90	90	J R 100	100	90	90	110
24	100	100	110	110	100	100	90	100	J R 80	100	100	100	90	90	100	90	100	100	J R 100	100	J R 100	100	100	100
25	110	100	100	80	100	100	J R 90	100	J R 100	100	100	80	100	100	100	100	100	90	100	110	R	R	R	R 100
26	100	100	100	100	100	100	100	90	100	90	100	100	100	95	95	95	100	90	70	90	R 65	R	90	R 85
27	J R 95	J R 60	J R 70	65	110	100	J R 75	50	80	85	105	95	120	100	95	95	90	100	80	70	100	80	90	70
28	J R 55	J R 60	80	85	80	95	90	65	90	90	100	70	90	90	95	100	95	100	90	80	100	90	R 80	75
29	90	75	80	J R 90	90	65	90	90	95	90	95	60	95	90	90	95	90	85	75	75	95	70	100	70
30	90	100	100	90	95	75	J R 70	70	100	80	90	75	85	60	75	80	80	85	75	60	90	60	80	80
31	85	80	70	90	100	80	70	60	80	100	70	90	100	90	100	100	100	100	100	100	100	I R 100	100	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	30	30	29	30	31
MED	100	100	100	100	100	100	90	90	90	95	95	90	90	100	95	100	100	100	90	100	100	100	100	100
UQ	100	100	105	100	100	100	100	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
LQ	90	85	90	90	92	90	85	68	82	82	90	80	85	90	90	90	90	85	80	80	90	90	90	82

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MAR. 1970 | YPF2 (KM)

IONOSPHERIC DATA

MAR. 1970 | FOF2 (0.1 MHZ) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	60	60	58	47	34	33	35S	J63S	U99S	110	123	125	124	135	130	124V	118S	120S	118	91	77	U88S	63	48S
2	50	49	47	48	45	38	33S	63	100S	124	135S	119	126	131	124	125	Y119S	116	Y114S	91	80	J75S	70	72S
3	63S	56	56	54	55	43	U38S	61	87S	107	122S	131	137	150	141	139	135S	131	130S	110S	84S	84	65	52S
4	48	48	49	52	47	44	44	70	89	92	117S	124	129	130	128	132S	122S	Y119S	110S	106	90	U88S	U84S	68
5	70	64	64	54	46	J48S	48	65S	95S	124	133	135	120	134	142	J129R	111	116	113S	U88S	77	78	71	67
6	67	67	J65S	63	54	40	J43S	69	83	I104C	Y120S	122S	133C	131C	136C	140C	141C	146C	Y148S	Y148S	Y150S	Y129S	Y108S	98S
7	U79S	70S	63S	58C	49S	U48S	U45S	U74S	91C	114S	122S	124C	131C	140C	142C	135S	120S	114C	107C	J90S	84C	78C	70	J54S
8	59	55	47	47	48S	43	J39S	U77S	82	92	126	137	141	149	135S	132	128	128	122S	112S	I120S	Y134S	114S	U97S
9	84	56	44	46	52	29	30	106	94	93	113	137	166	152	148	149	131	123	115S	Y110S	Y100S	I98S	92S	J79S
10	J73S	I70S	66	54	51	53	56	70	87	122S	147	133	135	142	129	126	137	141	138	Y128S	Y130S	Y130S	I128S	I104S
11	76S	75S	J68S	64	56S	34	36S	72S	93	107	110	126	145	146	154	Y170S	I178S	166	151	Y148S	Y147S	Y138S	I116S	I104S
12	89	78S	67	62	43	31	33	68	91S	111	115	113	127	134	136	135	142	140	134	Y126S	I106S	94S	79S	68S
13	71S	70	56	53	48	44	J47S	76S	84	105S	113	117	129	132	137	153	160S	Y164S	156S	148S	Y144S	Y112S	Y105S	95S
14	78	60	59S	62S	59	40	40S	78S	Y104S	109	110	Y123S	138	134	132	130	128	127	Y122S	112S	97S	94S	98S	U98S
15	J92S	83S	76S	73	56	50	50S	81	U98S	103S	100	112	121	126	130	126	125	134	Y123R	Y104S	83S	80S	85S	91S
16	Y106S	S	S	85	58	47	46S	77S	98	105S	105	111S	124S	127	Y125S	129	128S	127	I116S	Y109S	I100S	I93S	92S	85S
17	J85S	J76S	73	I78S	40	41	43	J73S	101S	108	105	Y121S	125	134	136	138	141	142S	135S	106S	I98S	I89S	U86S	83S
18	U82S	J76S	J75S	72S	48S	J48S	I50S	77	J99S	102	106	123	134	132	130	132	128	130	128	I120S	I112S	103S	93S	84
19	81S	82	73	53	49	46	45S	78S	110S	105S	107	120S	137	137	129	135	140	133	126	107S	94S	79	78	81S
20	83S	I89S	J93S	78S	36	38	44S	73	Y101S	105S	108	114	117S	I124C	118	115S	120S	119	Y118S	105	83	82	U85S	S
21	S	S	81	67	45	38	37S	72	96S	101S	106	115	126	127	129	134	134	131	Y125S	112S	Y103S	U89S	J91S	J88S
22	79	72	66	57	52S	51S	53S	81S	Y101S	106	109	114	120	126	123S	Y123S	121	112	111	103	U90S	83R	77	77
23	78	78	73S	67	57	47S	49	79S	J99S	108	Y118S	121S	19	146	147	142	133	124	Y116S	105	J89S	78	U75S	69
24	67	65	68	71	51	43	44S	78S	98S	107	114	123	138	136	139	138	132S	122S	Y120S	Y114S	92	85	86S	U77S
25	71	71	67	68	61S	48	48	80S	Y101S	103S	102	112	126	137	139	135	128	U123S	114	Y102S	J85S	84	81	81
26	80	76	71S	68	63	59	59	84	102	105	114	Y121S	131	139	143	144	141	134	130S	115	U93S	91	88S	U88S
27	I85S	84S	83S	74S	57	48	U51S	82	U99S	106	115	117	131	138	141	138S	133	134	133S	Y124R	J98S	91S	82S	80
28	82	73	63	61S	59	54	58	88S	102S	109	Y120S	140	148S	140	138	136	135S	130S	131	Y119S	J98S	88	78	84S
29	80	83	78	74	67	65	67	92	121	118S	123	140	153	153	147	147	147	142	133	Y123R	105S	82	78	75S
30	72S	U72S	62S	59	58	60	U61S	U92S	110	124	122S	128	141	140	138	142	144	150	143	123S	98S	86S	82S	79S
31	74S	75S	77S	67	59	60	64S	86	98S	106	124S	128	136	140	135	139	141	147	133	120S	120S	97S	86	80
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
MED	78	72	66	62	52	46	45S	77S	98S	106	115	123	131	136	136	135	133	130	125S	112S	98S	88S	85S	80S
UQ	82S	76S	73S	70	58	49	50S	81S	101S	110	122S	128	138	140	141	140	141	140	133	122S	106S	95S	92S	88S
LQ	70	64	59	54	46	40	40S	71	92	104	108	117	126	132	130	130	126	122	118S	105S	87S	82	78	72S

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MAR. 1970 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FOF1 (0.01 MHZ) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	U L 480	L	L	L	L							
2										L	L	L	L	L	U L 480	L	H 350							
3										L	L	L	U L 520	U L 520	L	L	L							
4										L	L	L	L	L	L	L	L							
5										L	L	L	L	L	L		L	L 320						
6										C	L	L	L	L	L	L	L							
7										L	L	L	L	U L 550	L	L	L							
8									L 330	L 390	L	L	L	L	L	L	L	L						
9										U L 390	L	U L 640	L	L	L	L	L							
10										L	L	L	L	L	L	L	L							
11										L	L	L	L	L	L	L	L							
12										L	L	L 500	L	L	L	L	L	L						
13										L	L	L	L	L	L	L	L	L						
14										L	A	L	U L 490	L	L	L	L							
15										L	L	L	L	L	L	L	L	L						
16									L	L	L	L	L	L	L	L	L							
17									L		L	L	L	L	L	L	L	L						
18										L	L	U L 540	L	L	L	L	L	L						
19									L	L	L	L 490	L	470	L	L	L	L						
20									L	L	U L 500	L 510	L	C	L	L	L 400	L						
21									L	L	L	L	U L 550	L	L	L	L							
22										L	L	L	L	L	L	L	L							
23										L	L	U L 530	L	L	L	L	L							
24										L	L	L	L	L 500	U L 590	L	L	L 340						
25									L	L	L	L	L	L	U L 610	L	L	L						
26										L	L	L 530	U L 550	L	L	L	L	L						
27										L	L	L	L	L	L	U L 570	L	A						
28										L	L	L	L	L	L	L	L	L						
29									L	L	B	L	L	L	L	L	L	L						
30										L	L	U L 480	L	L	L	L	L	L						
31									L	L	L	L	L	L	L	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	1	8	5	4	3	1	2	2						
MED									L 330	L 390	U L 500	L 520	U L 520	L 510	U L 590	U L 570	375	L 330						
UQ												U L 535	U L 550	U L 535	U 600									
LQ												L 495	U L 490	485	U L 535									

MAR. 1970 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1970 | 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	260H	320H	350H	360	390R	390	390H	350	315H	270H	150					
2								S	260	305	335	360	375	375	370	350	310	240	155					
3								S	270	305	350	370	380	380	370	350	330	270	165					
4								165	275	320	350	360	370	380	375	360	330	275	140					
5								170	275	320	350	370	380	380	I B 380	370	325	280	170					
6								S	260H	I C 310	C 350	C 370	C 390	C 390	C 385	C 360	C 320	C 275	C 185					
7								C 165	C 270	H 320	H 350	I B 390	C 390	I A 390	C 385	A	A	A	S					
8								165	235	315	340	360	R 370	380	370	H 345	330	275	170					
9								S	265	300	340	360	365	I A 370	370	350	320	270	150					
10								S	245	H 310	330	335	I R 355	370	370	A	A	A	A					
11								200	280	320	350	360	360	I A 365	360	350	320	260	A					
12								H 190	270	320	340	350	370	I A 380	380	360	330	280	A					
13								170	270	320	350	370	365	I A 360	I A 360	350	320	270	160					
14								200	290	330	350	360	I A 365	I A 370	U K 370	360	A	A	170					
15								H 180	280	310	335	355	370	365	350	A	A	A	190					
16								185	270	325	340	350	355	355	I A 350	350	320	285	A					
17								H 215	H 290	320	340	345	355	365	355	350	320	270	170					
18								190	280	320	335	H 335	I A 355	370	370	355	320	290	200					
19								220	280	320	350	365	I A 370	380	380	350	H 320	270	170					
20								210	270	325	345	I A 360	I R 370	I C 370	365	H 350	325	270	200					
21								225	290	320	360	375	I A 380	380	360	350	330	280	210					
22								210	290	330	360	370	I A 370	A	A	355	325	270	A					
23								220	300	345	370	370	A	I A 380	380	365	330	265	180					
24								190	275	325	350	375	380	380	375	355	320	280	H 180					
25								220	295	330	350	I A 360	375	380	375	360	325	285	195					
26								230	295	325	350	R 365	380	380	R 370	355	H 320	280	200					
27								200	280	320	350	355	A	R	375	360	A	A	200					
28								240	H 295	320	345	A	A	I A 380	I A 375	360	325	H 280	190					
29								210	290	340	I B 360	360	I A 370	I A 380	380	360	320	265	210					
30								220	290	330	340	380	380	380	370	350	325	270	H 200					
31								200	280	H 330	H 350	360	375	370	H 370	H 350	325	290	200					
	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	31	31	31	30	28	29	30	28	26	26	25					
MED								200	280	320	350	360	370	380	370	352	322	272	180					
UQ								220	290	325	350	370	380	380	380	360	325	280	200					
LQ								185	270	320	340	360	365	370	370	350	320	270	170					

The Radio Research Laboratories, Japan

MAR. 1970 | FOE (0.01 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FOES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 15	E S 15	E S 12	E B 11	E B 14	E S 12	E S 15	E S 15	G	G	J G 32	G 30	G 27	G 25	G	42	34	36	32	24	E S 15	E S 15	E S 15	E S 15
2	E S 15	E S 14	E S 15	E	E	E S 15	E S 15	E S 15	G	G 25	38	40	42	J G 37	J G 29	J G 29	G	G	25	15	25	17	23	22
3	E S 15	E S 15	E B 13	E B 13	E B 12	E B 12	E S 15	23	G	35	37	G	G	40	39	G	G	G 24	G	E S 14	E S 15	E S 15	E S 15	E S 15
4	18	23	18	E B 12	E	E S 15	E S 15	22	G	G	G	G	41	40	G	G	40	33	J X 36	J X 26	24	E S 13	E S 13	E S 15
5	J X 25	J X 24	18	E B 14	E	E B 12	E S 15	J X 26	G	34	41	46	40	40	E B 50	39	34	G 28	G	E S 14	E S 15	E S 15	E S 15	E S 14
6	E S 15	E S 15	E S 15	E B 14	J X 25	23	E S 15	23	G	C	G	G	G	G 31	J G 35	J G 32	J G 30	G	G	C 22	E S 15	C 23	E S 15	E S 15
7	E S 13	C 20	J C 22	C 22	J X 22	J X 26	C 23	C 23	C 23	J G 29	C 39	E B 49	C 46	C 41	J X 40	C 38	C 38	C 29	E S 17	C 16	J X 27	J X 63	J X 26	J X 27
8	18	J X 29	J X 24	21	E B 11	J X 26	23	22	G	G	G	37	G	42	G	G	G	G	G	21	20	23	23	J X 26
9	J X 25	J X 29	19	E B 12	16	18	22	23	29	32	50	J X 51	44	40	G 34	G 21	G 32	G 26	17	E S 14	E S 15	E S 15	E S 15	E S 15
10	J X 85	J X 33	J X 24	22	E B 14	E B 13	E S 15	24	28	33	35	37	G 35	J X 38	J X 44	J X 61	J X 45	J X 50	J X 27	J X 37	J X 29	21	E S 15	E S 15
11	E S 15	E S 12	E S 15	E B 11	E	E S 15	E S 15	G	G	G	36	38	38	40	G 34	G 24	G 19	G 19	J X 34	J X 20	24	23	E S 15	E S 15
12	J X 21	21	E S 14	E	E B 14	E S 15	E S 15	G	G	G	36	37	G 37	J ^ 40	G 31	G 29	G 17	G 27	J X 26	E S 15	17	E S 15	E S 15	E S 14
13	J X 25	24	E S 13	E B 13	E B 12	12	E S 15	G	G 21	G 25	G 27	39	40	39	37	G 35	G 32	G	G	17	E S 15	E S 15	22	E S 15
14	J X 25	22	E B 11	E	E	E	E S 15	G	G	39	J X 55	40	42	40	G 37	G	36	30	G	E S 14	J X 31	J X 25	E S 15	J X 24
15	23	22	E S 13	E B 11	E	E S 14	E S 15	G	G	34	35	37	40	41	41	41	35	J X 38	G	E S 15	E S 15	20	22	E S 15
16	E S 14	E S 15	E S 13	E	E	E B 12	E S 14	G	G	G	G	38	40	42	38	J G 34	36	J X 31	J X 37	J X 20	22	E S 15	E S 15	E S 15
17	23	J X 25	J X 24	E	E	E S 14	E S 15	G	G	J G 27	G	37	37	38	37	G 34	G 31	G 25	G	E S 15	20	E B 11	E S 15	22
18	E B 12	E B 11	18	22	E B 12	E S 15	E S 15	G	G	G	G	36	36	J X 40	G	J G 28	G 23	G 23	J X 28	J X 23	E S 15	E S 15	E S 15	J X 24
19	E S 15	E S 15	E S 15	E	E	E S 15	E S 15	G	G	34	G 30	38	38	49	G 31	37	G 27	G 17	20	E S 15	E S 13	E S 14	E S 15	E S 15
20	E S 15	E S 15	E S 15	E	E S 13	E S 14	19	28	33	33	37	39	G 36	C	J G 32	G 26	G	28	J X 22	J X 22	18	E S 15	E S 15	E S 15
21	E S 15	E S 15	J X 24	E	E	E B 13	E S 15	G	30	34	38	41	39	39	G	G 34	G 30	G	J X 27	20	E S 13	E S 15	E S 15	E S 13
22	E S 15	23	E B 12	J X 20	E	E S 15	E S 15	22	31	35	38	41	41	44	J X 41	38	J X 34	J X 29	J X 34	J X 37	J X 27	J X 21	18	E S 15
23	E S 15	E B 12	E B 12	E	E	E B 11	22	25	G	G	38	38	38	42	G 32	G 26	J G 30	28	G 18	23	21	E S 15	E S 15	E S 15
24	E S 15	E S 13	E B 13	E B 11	E	E S 15	E S 15	32	32	35	37	G 37	G 33	G 26	39	37	G	G	G	21	E S 15	E S 15	E S 15	E S 15
25	E S 14	E S 12	E B 12	E B 12	E	E B 13	E S 15	J X 32	G	38	39	45	J G 37	J G 33	G	G 24	G	31	26	23	22	E S 15	E S 14	18
26	E S 15	E S 14	E S 12	E B 12	E	E B 12	E S 15	G 23	J X 30	37	38	G 36	G 34	G	G	G	G 29	31	G	19	E S 14	E S 15	E S 13	E S 15
27	E S 15	E S 12	E S 12	J X 23	E	E B 14	E S 15	21	30	35	37	40	42	G 36	40	G 34	J X 47	J X 45	22	20	J X 26	J X 21	E S 15	J X 41
28	J X 19	19	E S 13	22	J X 27	21	E S 15	J X 26	31	36	37	40	40	J X 62	J X 46	G 31	G	G	G	21	21	25	18	18
29	17	18	E S 13	E B 12	E B 12	E B 12	E S 15	G	G	G	E B 51	43	J X 43	39	G 35	G 31	G	G	G	19	E S 15	E S 15	E S 15	E S 15
30	E S 15	E S 15	E S 14	E	E	E S 15	E S 15	23	J G 29	35	37	G	G 37	G 34	G 30	G 26	G 19	G	24	16	J X 21	E S 15	E S 15	E S 15
31	E S 15	E S 13	E S 14	E B 11	E	E S 15	E S 15	G	G	G 30	G 35	40	42	39	41	37	G 23	36	34	J X 26	J X 45	J X 23	J X 26	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	30	31	31	31	31	31	31	31	31	31	31
MED	E S 15	E 15	E S 14	E E 12	E	E B 14	E S 15	22	G	32	37	38	38	40	G 34	G 31	G 30	G 27	20	20	20	E S 15	E S 15	E S 15
UQ	20	22	18	E B 14	E B 12	E S 15	E S 15	23	29	35	38	40	41	41	40	37	34	31	J X 27	22	24	21	16	18
LQ	E S 15	E S 14	E S 13	E	E	E B 12	E S 15	G	G	G	G 31	37	G 36	G 37	G 30	G 25	E G 17	G	G	15	E S 15	E S 15	E S 15	E S 15

The Radio Research Laboratories, Japan

MAR. 1970 | FOES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | FBES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E_{15}^{S}	E_{15}^{S}	E_{12}^{S}	E_{11}^{B}	E_{14}^{B}	E_{12}^{S}	E_{15}^{S}	E_{15}^{S}	G	G	G_{32}	G_{30}	G_{27}	G_{25}	G	40	G	32	30	E	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
2	E_{15}^{S}	E_{14}^{S}	E_{15}^{S}	E	E	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	G	G_{24}	38	40	42	G_{33}	G_{25}	G_{21}	G	G	G	15	16	E	E	E
3	E_{15}^{S}	E_{15}^{S}	E_{13}^{B}	E_{13}^{B}	E_{12}^{B}	E_{12}^{B}	E_{15}^{S}	S	G	G	G	G	G	G	39	G	G	G_{23}	G	E_{14}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
4	E	E	E	E_{12}^{B}	E	E_{15}^{S}	E_{15}^{S}	G	G	G	G	G	41	40	G	G	G	32	32	E	E	E_{13}^{S}	E_{13}^{S}	E_{15}^{S}
5	E	E	E	E_{14}^{B}	E	E_{12}^{B}	E_{15}^{S}	G	G	G	40	44	G	G	E_{50}^{B}	E_{39}^{R}	G	G_{27}	G	E_{14}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{14}^{S}
6	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{14}^{B}	15	E	E_{15}^{S}	S	G	C	G	G	G	G_{31}	G_{33}	G_{28}	G_{27}	G	G	E	E_{15}^{S}	E	E_{15}^{S}	E_{15}^{S}
7	E_{13}^{S}	E	E	E	E	C_{19}	E	G	G	G_{20}	G	E_{49}^{B}	C_{46}	C_{41}	C_{38}	C_{38}	C_{33}	C_{28}	E_{17}^{S}	C_{15}	C_{26}	E	E	18
8	E	16	15	E	E_{11}^{B}	15	E	G	G	G	G	E_{37}^{R}	G	41	G	G	G	G	G	E	E	E	E	20
9	19	19	E	E_{12}^{B}	15	17	E	S	G	G	49	41	40	40	G_{32}	G_{21}	G_{30}	G_{26}	E_{17}^{R}	E_{14}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
10	63	19	E	15	E_{14}^{B}	E_{13}^{B}	E_{15}^{S}	S	G	33	G	G	E_{35}^{G}	34	32	50	43	48	25	26	20	E	E_{15}^{S}	E_{15}^{S}
11	E_{15}^{S}	E_{12}^{S}	E_{15}^{S}	E_{11}^{B}	E	E_{15}^{S}	E_{15}^{S}	G	G	G	G	G	38	39	G_{31}	G_{24}	G_{19}	G_{16}	21	E	E	E	E_{15}^{S}	E_{15}^{S}
12	16	E	E_{14}^{S}	E	E_{14}^{B}	E_{15}^{S}	E_{15}^{S}	G	G	G	G	G	G_{34}	40	G_{31}	G_{29}	G_{17}	G_{27}	21	E_{15}^{S}	E	E_{15}^{S}	E_{15}^{S}	E_{14}^{S}
13	17	E	E_{13}^{S}	E_{13}^{B}	E_{12}^{B}	12	E_{15}^{S}	G	G_{20}	G_{25}	G_{26}	G	E_{40}^{R}	38	E_{37}^{R}	G_{34}	G_{31}	G	G	15	E_{15}^{S}	E_{15}^{S}	E	E_{15}^{S}
14	E	E	E_{11}^{B}	E	E	E	E_{15}^{S}	G	G	G	53	E_{40}^{R}	40	E_{40}^{R}	G_{35}	G	34	27	G	E_{14}^{S}	E	25	E_{15}^{S}	E
15	E	E	E_{13}^{S}	E_{11}^{B}	E	E_{14}^{S}	E_{15}^{S}	G	G	G	G	E_{37}^{R}	39	40	40	40	33	28	G	E_{15}^{S}	E_{15}^{S}	E	E	E_{15}^{S}
16	E_{14}^{S}	E_{15}^{S}	E_{13}^{S}	E	E	E_{12}^{B}	E_{14}^{S}	G	G	G	G	38	E_{40}^{R}	42	E_{38}^{R}	G_{30}	34	14	23	E	E	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
17	15	23	17	E	E	E_{14}^{S}	E_{15}^{S}	G	G	G	G	E_{37}^{R}	37	E_{38}^{R}	E_{37}^{R}	G_{34}	G_{31}	G_{24}	G	E_{15}^{S}	18	E_{11}^{B}	E_{15}^{S}	E
18	E_{12}^{B}	E_{11}^{B}	E	E	E_{12}^{B}	E_{15}^{S}	E_{15}^{S}	G	G	G	G	E_{36}^{R}	E_{36}^{R}	33	G	G_{20}	G_{23}	G_{20}	18	E	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	21
19	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E	E	E_{15}^{S}	E_{15}^{S}	G	G	G	G_{30}	G	E_{38}^{R}	42	G_{31}	G	G_{27}	G_{16}	G	E_{15}^{S}	E_{13}^{S}	E_{14}^{S}	E_{15}^{S}	E_{15}^{S}
20	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E	E_{13}^{S}	E_{14}^{S}	E	27	G	G	G	39	G_{36}	C	G_{32}	G_{25}	G	G	15	20	E	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
21	E_{15}^{S}	E_{15}^{S}	E	E	E	E_{13}^{B}	E_{15}^{S}	G	24	G	E_{38}^{R}	41	E_{39}^{R}	36	G	G_{33}	G_{29}	G	17	E	E_{13}^{S}	E_{15}^{S}	E_{15}^{S}	E_{13}^{S}
22	E_{15}^{S}	E	E_{12}^{B}	E	E	E_{15}^{S}	E_{15}^{S}	G	G	G	G	40	41	41	39	35	30	22	21	21	26	18	E	E_{15}^{S}
23	E_{15}^{S}	E_{12}^{B}	E_{12}^{B}	E	E	E_{11}^{B}	E	G	G	G	G	E_{38}^{R}	E_{38}^{R}	40	G_{32}	G_{26}	G_{28}	G	G_{17}	E	E	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
24	E_{15}^{S}	E_{13}^{S}	E_{13}^{B}	E_{11}^{B}	E	E_{15}^{S}	E_{15}^{S}	32	G	G	G	G_{37}	G_{33}	G_{26}	G	G	G	G	G	E	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
25	E_{14}^{S}	E_{12}^{S}	E_{12}^{B}	E_{12}^{B}	E	E_{13}^{B}	E_{15}^{S}	G	G	G	38	44	G_{35}	G_{30}	G	G_{23}	G	G	25	21	E	E_{15}^{S}	E_{14}^{S}	E
26	E_{15}^{S}	E_{14}^{S}	E_{12}^{S}	E_{12}^{B}	E	E_{12}^{B}	E_{15}^{S}	G	27	G	37	G_{36}	G_{34}	G	G	G	G_{29}	G	G	E	E_{14}^{S}	E_{15}^{S}	E_{13}^{S}	E_{15}^{S}
27	E_{15}^{S}	E_{12}^{S}	E_{12}^{S}	E	E	E_{14}^{B}	E_{15}^{S}	G	G	G	G	40	41	E_{36}^{G}	G	G_{33}	46	44	G	19	26	18	E_{15}^{S}	27
28	15	E	E_{13}^{S}	E	13	E	E_{15}^{S}	G	G	G	37	40	E_{40}^{R}	44	43	G_{31}	G	G	G	E	E	E	E	E
29	E	E	E_{13}^{S}	E_{12}^{B}	E_{12}^{B}	E_{12}^{B}	E_{15}^{S}	G	G	G	E_{51}^{B}	43	41	39	G_{35}	G_{31}	G	G	G	E	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
30	E_{15}^{S}	E_{15}^{S}	E_{14}^{S}	E	E	E_{15}^{S}	E_{15}^{S}	19	G_{27}	G	G	G	G_{34}	G_{33}	G_{30}	G_{26}	G_{19}	G	G	15	17	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
31	E_{15}^{S}	E_{13}^{S}	E_{14}^{S}	E_{11}^{B}	E	E_{15}^{S}	E_{15}^{S}	G	G	G_{29}	G_{32}	39	E_{42}^{R}	E_{39}^{R}	E_{41}^{R}	G	G_{23}	32	33	24	E_{45}^{S}	E	E	E_{15}^{S}
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	27	31	30	31	31	31	30	31	31	31	31	31	31	31	31	31	31
MED	E_{15}^{S}	E_{13}^{S}	E_{13}^{S}	E	E	E_{14}^{B}	E_{15}^{S}	G	G	G	G	E_{37}^{G}	U_{36}	36	G_{31}	G_{26}	G_{23}	G_{16}	G	E_{14}^{E}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
UQ	E_{15}^{S}	E_{15}^{S}	E_{14}^{S}	E_{12}^{B}	E_{12}^{B}	E_{15}^{S}	E_{15}^{S}	G	G	G	U_{34}	40	40	40	U_{35}	G_{34}	G_{30}	27	21	15	E_{16}^{S}	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
LQ	E_{14}^{S}	E	E_{12}^{S}	E	E	E_{12}^{B}	E_{15}^{S}	G	G	G	G	G	U_{30}^{G}	G_{32}	G	E_{20}^{G}	G	G	G	E	E	E	E_{13}^{S}	E_{14}^{S}

MAR. 1970 | FBES (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | F-MIN (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 15	E S 15	E S 12	11	14	E S 12	E S 15	E S 15	13	15	16	15	25	17	22	16	13	14	14	E S 15	E S 15	E S 15	E S 15	E S 15
2	E S 15	E S 14	E S 15	E	E	E S 15	E S 15	E S 15	13	14	15	15	15	15	16	15	16	E S 15	E S 15	E S 12	E S 15	E S 15	E S 15	E S 15
3	E S 15	E S 15	13	13	12	12	E S 15	E S 15	11	14	15	15	17	18	19	15	15	15	E S 15	E S 14	E S 15	E S 15	E S 15	E S 15
4	E S 15	E S 15	E S 15	12	E	E S 15	E S 15	E S 15	14	16	18	18	20	18	18	17	15	12	11	E S 15	E S 15	E S 13	E S 13	E S 15
5	E S 15	E S 15	14	14	E	12	E S 15	E S 15	E S 15	14	16	18	19	18	50	27	18	15	E S 15	E S 14	E S 15	E S 15	E S 15	E S 14
6	E S 15	E S 15	E S 15	14	E	E S 13	E S 15	E S 14	15	C 15	C 16	C 18	C 18	C 18	C 18	C 17	C 15	C 15	E S 15	E S 15	E S 15	E S 13	E S 15	E S 15
7	E S 13	E S 15	15	13	E	E S 14	E S 15	E S 15	E S 15	C 15	C 16	C 49	C 22	C 20	C 18	C 18	C 17	15	E S 17	E S 13	E S 12	E S 15	E S 15	E S 15
8	E S 15	E S 15	12	13	11	13	E S 15	E S 15	E S 15	15	15	17	17	14	17	16	15	E S 15	E S 15	E S 14	E S 15	E S 15	E S 15	E S 13
9	E S 13	13	13	12	E	13	E S 15	E S 15	E S 15	15	16	17	17	17	18	16	16	E S 15	14	E S 14	E S 15	E S 15	E S 15	E S 15
10	E S 15	E S 13	E S 15	11	14	13	E S 15	E S 15	15	15	17	17	19	18	17	17	16	15	13	E S 13	E S 14	E S 14	E S 15	E S 15
11	E S 15	E S 12	E S 15	11	E	E S 15	E S 15	E S 15	15	13	17	18	18	19	16	16	15	E S 13	15	E S 15	E S 15	E S 15	E S 15	E S 15
12	E S 13	E S 15	E S 14	E	14	E S 15	E S 15	E S 15	15	15	17	16	17	19	17	18	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 14
13	E S 15	E S 15	E S 13	13	12	E	E S 15	E S 15	14	15	15	17	16	15	19	16	15	15	E S 14	E S 13	E S 15	E S 15	E S 15	E S 15
14	E S 15	E S 13	11	E	E	E	E S 15	E S 15	13	15	16	19	16	15	18	16	15	E S 15	15	E S 14	E S 15	E S 15	E S 15	E S 15
15	E S 15	E S 15	E S 13	11	E	E S 14	E S 15	E S 13	15	15	16	16	18	17	19	15	15	13	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
16	E S 14	E S 15	E S 13	E	E	12	E S 14	E S 15	14	15	16	19	18	18	18	16	15	12	13	E S 15	E S 15	E S 15	E S 15	E S 15
17	E S 13	12	12	E	E	E S 14	E S 15	E S 15	15	16	17	16	15	16	20	18	16	15	15	E S 15	E S 14	11	E S 15	E S 15
18	12	11	E S 15	11	12	E S 15	E S 15	E S 15	15	15	17	17	16	22	17	16	15	15	11	E S 15	E S 15	E S 15	E S 15	E S 15
19	E S 15	E S 15	E S 15	E	E	E S 15	E S 15	E S 15	11	14	15	16	17	20	20	15	15	E S 14	15	E S 15	E S 13	E S 14	E S 15	E S 15
20	E S 15	E S 15	E S 15	E	E S 13	E S 14	E S 15	E S 15	15	15	16	16	18	C	17	16	16	15	E	E S 15	E S 15	E S 15	E S 15	E S 15
21	E S 15	E S 15	E S 14	E	E	13	E S 15	E S 14	12	15	19	20	18	16	17	15	17	17	E S 15	E S 15	E S 13	E S 15	E S 15	E S 13
22	E S 15	E S 15	12	12	E	E S 15	E S 15	E S 15	15	15	17	18	18	18	17	15	15	E S 15	E S 15	E S 12	E S 15	E S 15	E S 15	E S 15
23	E S 15	12	12	E	E	11	E S 15	E S 15	14	18	18	19	18	20	18	16	15	11	12	E S 14	E S 15	E S 15	E S 15	E S 15
24	E S 15	E S 13	13	11	E	E S 15	E S 15	E S 15	11	13	16	17	17	16	16	14	15	12	E S 14	E S 15	E S 15	E S 15	E S 15	E S 15
25	E S 14	E S 12	12	12	E	13	E S 15	E S 15	15	16	17	19	21	18	20	15	18	11	E S 15	E S 15	E S 15	E S 15	E S 14	E S 15
26	E S 15	E S 14	E S 12	12	E	12	E S 15	E S 15	11	14	15	18	18	20	19	17	15	14	E S 15	E S 15	E S 14	E S 15	E S 13	E S 15
27	E S 15	E S 12	E S 12	E S 15	E	14	E S 15	E S 15	E S 14	15	17	18	18	19	16	16	15	11	14	11	E S 15	E S 12	E S 15	E S 15
28	E S 12	E S 14	E S 13	12	E	13	E S 15	E S 15	14	15	16	18	18	20	18	17	15	15	13	E S 15	E S 12	E S 15	E S 15	E S 15
29	E S 15	E S 13	E S 13	12	12	12	E S 15	E S 15	14	16	51	25	20	19	19	17	15	15	14	E S 15	E S 15	E S 15	E S 15	E S 15
30	E S 15	E S 15	E S 14	E	E	E S 15	E S 15	E S 15	13	15	15	18	17	17	18	16	15	E S 15	E S 15	E S 12	E S 13	E S 15	E S 15	E S 15
31	E S 15	E S 13	E S 14	11	E	E S 15	E S 15	E S 15	15	15	16	16	19	17	18	16	15	14	14	11	E S 15	E S 15	E S 15	E S 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	30	31	31	31	31	31	31	31	31	31	31
MED	E S 15	E S 15	E S 13	11	E	E S 13	E S 15	E S 15	14	15	16	17	18	18	18	16	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
UQ	E S 15	E S 15	E S 15	12	12	E S 15	E S 15	E S 15	15	15	17	18	18	19	19	17	16	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
LQ	E S 14	E S 13	12	E	E	12	E S 15	E S 15	13	15	16	16	17	17	17	16	15	12	13	E S 14	E S 14	E S 15	E S 15	E S 15

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MAR. 1970 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

MAR. 1970 | M(3000)F2 (0.01) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	250	265	310	295	295	250	260	325	305	310	310	305	285	290	290	275	280	290	305	275	260	305	300	245
2	260	245	245	275	265	290	265	300	310	310	315	295	290	295	290	285	295	300	315	295	275	275	285	305
3	310	285	295	285	320	300	295	320	325	310	305	300	290	295	285	285	290	295	295	315	290	305	305	280
4	275	265	275	305	295	280	300	335	335	310	310	305	295	290	285	285	285	300	310	300	290	280	295	265
5	275	265	295	290	270	250	250	305	310	310	305	310	290	290	295	285	285	295	315	305	275	280	280	275
6	275	275	280	300	335	245	265	325	325	315	300	290	285	285	280	280	285	285	290	285	265	275	285	270
7	270	275	285	280	265	250	270	305	300	265	305	295	285	290	285	290	285	295	305	295	285	280	295	260
8	295	285	250	255	315	255	245	335	325	290	300	300	290	295	275	275	280	290	290	280	265	275	295	255
9	315	245	215	230	300	230	215	320	375	280	285	280	300	285	270	285	280	285	285	270	285	285	305	285
10	290	290	285	265	245	255	265	320	300	295	320	300	295	290	280	275	285	285	290	280	275	275	285	285
11	280	260	265	290	275	265	260	320	325	310	305	285	290	275	280	265	260	270	280	285	285	270	285	275
12	260	275	285	305	325	270	275	315	310	310	300	290	285	285	280	275	275	285	285	280	285	260	265	265
13	270	305	295	290	275	270	275	320	310	305	300	275	285	290	270	275	275	275	280	285	270	280	275	285
14	295	250	255	285	315	275	255	315	315	315	300	280	290	285	280	280	280	285	290	295	285	265	260	275
15	290	300	280	305	320	280	280	320	335	315	300	290	285	285	275	280	275	290	300	295	275	265	255	265
16	285	S	S	275	280	280	265	310	310	315	315	295	290	290	275	280	290	295	300	295	275	270	280	285
17	290	290	300	325	335	275	275	320	315	315	290	290	280	285	285	280	290	290	305	290	265	260	280	285
18	280	275	290	320	270	250	260	315	325	320	285	295	295	290	280	280	280	285	295	280	270	260	260	275
19	270	300	315	295	275	260	270	310	320	315	300	285	290	285	280	275	280	295	285	295	280	265	260	260
20	275	290	320	335	275	265	255	300	305	325	295	300	285	295	285	285	290	290	300	310	290	265	280	S
21	S	S	315	335	305	270	275	320	325	310	300	290	295	285	280	285	285	295	295	300	290	275	280	285
22	300	325	295	285	285	270	285	325	320	315	300	285	280	285	280	280	290	295	310	295	295	280	275	275
23	275	290	295	305	300	265	275	310	310	310	300	295	280	290	285	280	280	285	300	295	285	280	280	285
24	280	275	295	325	305	290	275	315	310	305	305	280	285	275	280	285	285	285	295	305	310	265	270	270
25	275	280	290	300	310	305	285	325	320	330	290	275	275	280	275	280	280	295	295	290	280	270	275	280
26	280	290	295	285	270	280	290	315	315	300	290	280	280	275	270	275	280	285	285	305	280	270	295	290
27	290	295	295	290	320	270	285	325	315	305	295	275	275	270	275	275	280	285	295	305	290	270	285	270
28	300	295	290	290	280	260	255	320	315	300	275	285	285	280	275	275	280	275	300	305	280	270	255	265
29	270	290	285	280	275	280	280	290	310	310	280	285	290	285	275	275	285	295	295	300	290	295	270	270
30	275	280	260	250	255	270	280	320	310	305	295	280	285	270	270	270	270	285	300	300	275	265	260	255
31	255	265	295	290	270	285	295	325	305	300	290	290	285	285	280	275	285	295	295	285	285	260	230	250
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
MED	278	280	290	290	285	270	275	320	315	310	300	290	285	285	280	280	280	290	295	295	280	270	280	275
UQ	290	290	295	305	312	280	280	322	325	315	305	295	290	290	285	285	285	295	300	300	288	280	285	285
LQ	270	265	280	282	272	258	260	312	310	305	292	282	285	285	275	275	280	285	290	285	275	265	268	265

The Radio Research Laboratories, Japan

MAR. 1970 | M(3000)F2 (0.01)

IONOSPHERIC DATA

MAR. 1970 | M(3000)F1 (0.01) | 135 E Mean Time (G. M. T.+ 9h)

Station YAMAGAWA Lat. 31 12.1 N. Long. 130 37.1 E Sweep 1 MHz to 20 MHz in 20 sec in 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	UL 390	L	L	L	L							
2										L	L	L	L	L	UL 395	L	H 415							
3										L	L	L	UL 380	UL 385	L	L	L							
4										L	L	L	L	L	L	L	L							
5										L	L	L	L	L	L		L	L 400						
6										C	L	L	L	L	L	L	L							
7										L	L	L	L	UL 355	L	L	L							
8									L 390	L 415	L	L	L	L	L	L	L	L						
9										UL 415	L	UL 310	L	L	L	L	L							
10										L	L	L	L	L	L	L	L							
11										L	L	L	L	L	L	L	L							
12										L	L	L 380	L	L	L	L	L	L						
13										L	L	L	L	L	L	L	L	L						
14										L	A	L	UL 380	L	L	L	L							
15										L	L	L	L	L	L	L	L	L						
16									L	L	L	L	L	L	L	L	L							
17									L		L	L	L	L	L	L	L	L						
18										L	L	UL 350	L	L	L	L	L	L						
19									L	L	L	L 385	L	420	L	L	L	L						
20									L	L	UL 375	L 380	L	C	L	L	L 400	L						
21									L	L	L	L	UL 355	L	L	L	L							
22										L	L	L	L	L	L	L	L							
23										L	L	UL 375	L	L	L	L	L							
24										L	L	L	L	L 390	UL 355	L	L	L 400						
25									L	L	L	L	L	L	U 345	L	L	L						
26										L	L	L 375	UL 365	L	L	L	L	L						
27										L	L	L	L	L	L	U 335	L	A						
28										L	L	L	L	L	L	L	L	L						
29									L	L	B	L	L	L	L	L	L	L						
30										L	L	U 395	L	L	L	L	L	L						
31									L	L	L	L	L	L	L	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	1	8	5	4	3	1	2	2						
MED									L 390	L 415	UL 375	L 378	UL 380	L 388	UL 355	UL 335	408	L 400						
UQ												L 382	UL 380	405	U 375									
LQ												UL 362	UL 365	UL 370	UL 350									

The Radio Research Laboratories. Japan

MAR. 1970 | M(3000)F1 (0.01)

IONOSPHERIC DATA

MAR. 1970 | H'F2 (KM) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										250	275	260	260	250	265	275	250							
2										255	260	250	290	260	255	250	245							
3										250	255	270	265	280	280	275	255							
4										300	255	260	265	280	270	265	250							
5										275	260	255	255	305	290		245	240						
6										250	285	255	300	260	300	295	270							
7										260	255	265	270	285	300	255	240							
8									220	235	275	255	260	290	300	290	290	265						
9										225	280	330	290	255	300	275	280							
10										280	265	275	250	275	250	300	280							
11										250	250	280	280	255	300	295	275							
12										255	260	255	280	280	300	270	290	255						
13										250	265	295	275	280	280	300	290	250						
14										240	250	305	275	275	275	275	280							
15										250	250	280	295	300	300	295	300	275						
16									240	250	255	300	280	280	300	300	280							
17									250		250	290	325	290	295	290	275	260						
18										250	295	290	300	275	295	295	275	275						
19									250	245	280	270	300	270	300	310	280	265						
20									255	255	265	265	295	290	270	300	255	255						
21									255	250	280	270	290	300	300	300	275							
22										250	260	285	300	300	300	300	275							
23										260	280	275	305	300	280	275	275							
24										255	270	300	290	265	305	300	290	250						
25									250	250	285	270	305	290	305	290	290	265						
26										250	255	270	285	300	310	310	290	265						
27										250	260	300	310	325	305	310	290	275						
28										270	300	285	280	275	290	305	300	285						
29									250	245	255	290	300	280	265	300	285	255						
30										250	275	260	290	255	300	310	305	280						
31									230	245	275	255	290	275	300	310	295	270						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									9	30	31	31	31	31	31	30	31	17						
MED									250	250	265	270	290	280	300	295	280	265						
UQ									250	255	278	290	300	290	300	300	290	275						
LQ									240	250	255	260	275	272	280	275	272	255						

The Radio Research Laboratories, Japan

MAR. 1970 | H'F2 (KM)

IONOSPHERIC DATA

MAR. 1970 | H'F (KM) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	275	230	225	250	315	300	240	240	240	240	225	225	225	225H	245	245	250	230	220	270	240	220	310
2	330	310	330	255	215	240	300	260	250	245	240	225	215	220H	230	230	220H	245	240	220	240	270	260	250
3	245	250	255	275	240	220	240	240	235	235	240	225	215	205	220H	230	245	240	235	210	240	235	215	255
4	300	305	300	250	250	290	285	240	220	215H	225H	225	230	230	225	235	230	240	240	225	220	250	245	270
5	285	265	270	250	210	325	325	245	235	240	240	240	220	210	E 270B	250	220	225	235	215	250	255	240	280
6	290	280	270	255	220	250	320	235	235H	I 230C	230	225	220H	240	215H	220H	240	245	235	220	220	240	240	255
7	255	265	275	255	260	E 330A	340	255	235	245	230	E 250B	230	220	200H	230	225	235	240	220	255	250	245	300
8	260	270	315	325	230	305	370	220	205	210	205H	225	220	210H	225H	210H	210H	255	240	245	260	230	235	245
9	225	235	450	405	255	450	E 480S	285	215	210	245	230	225	230	220H	220H	230H	235	235	240	245	260	245	245
10	I 260A	250	245	255	335	325	250	225	225	210H	210H	220H	205	210H	205	250	250	255	230	230	230	240	225	225
11	245	260	250	250	230	230	305	245	230	220H	220	215H	200	210H	200H	220H	230H	240	235	225	205	230	230	255
12	270	255	250	230	200	E 250S	310	245	235	225	230	210	205	215H	210H	225	225	250	235	220	220	230	250	290
13	285	245	235	250	250	260	275	240	225H	205H	210H	190H	215C	200H	200H	225H	225H	245	235	215	220	245	250	250
14	240	275	325	280	210	225	320	250	230	225	I 230A	225	200H	240	225	225H	225H	240H	240	230	225	270	245	260
15	255	250	250	240	200	245	275	230	230H	230	225	220H	210H	210H	220	230H	230H	250	245	225	210	250	285	280
16	265	245	245	230	180H	250	290	245	230	210H	225	205	225H	210	200H	210H	230	245	240	235	230	260	260	260
17	260	275	255	230	200	300	285	240	245H	240	210	210H	200H	195	220H	235	225H	200H	240	210	230H	280	275	270
18	275	280	255	225	205	340	330	245	240	235	225	215H	215H	200H	205H	225H	230H	240	250	230	225	240	270	290
19	260	245	225	240	250C	250C	295C	245C	240C	235C	240C	200C	200H	200	210H	195H	225H	235	245	225	230	250	280	295
20	290	255	240	205	195H	300	295	240	240	225	220	215	200	I 200C	205H	200	220	240	250	240	240	265	270	270
21	270	255	240	220	190H	290	320	240	235	220	225	220	205	210H	200H	200H	240	245	240	230	230	235	260	255
22	245	250	265	250	240	285	285	240	235	225	220	210H	200H	195H	205H	210H	225	235	255	245	245	245	260	275
23	275	260	250	225	215	260	300	240	235	245	220H	210H	205H	200H	195H	225	215	240	250	240	230	245	255	255
24	275	290	260	230	220	255	300	245	240	230	210H	200H	200H	220H	200H	205	225H	235	250	240	220	240	265	260
25	275	275	270	260	220	220	270	245	240	225	220	220	205H	200	220	205	215H	250	245	235	240	260	265	270
26	275	275	260	250	225	260	260	230	240	235	215	205H	215	200H	205	205H	225	240	250	230	240	250	260	260
27	270	265	255	245	200	255	295	230	235	230	215	205	205	205H	225H	225	E 260A	A	255	240	230	250	255	305
28	255	250	250	270	250	290	305	235	230	225	220	215H	220H	225	220	215	220	240	250	230	225	250	315	300
29	275	265	260	270	250	250	250	240	240	225	B	225	220H	215	225	225	235	240	250	225	220	210	265	265
30	295	270	290	305	275	300	300	230	230	225	225	210	205H	195H	210H	220H	225H	250	245	225	225	245	275	300
31	305	275	245	250	280	250	250	225	225	215	205H	195	230H	240	225H	210H	245	250	245	260	260	240	300	325
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30	31	31	31	31	31	31
MED	270	265	255	250	225	260	298	240	235	225	225	215	215	210	212H	225	225	240	240	230	230	245	260	270
UQ	285	275	270	258	250	300	312	245	240	235	230	225	220	220	224	230	231	250	250	238	240	252	268	290
LQ	258	250	248	230	208	250	280	235	230	220	215	210H	205H	200H	205H	210H	225H	240	235	220	222	240	245	255

The Radio Research Laboratories, Japan

MAR. 1970 | H'F (KM)

IONOSPHERIC DATA

MAR. 1970 | H'ES (KM) | 135° E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	B	B	S	S	S	G	G	100	100	100	100	G	150	150	125	115	110	S	S	S	S
2	S	S	S	E	E	S	S	S	G	105	160	150	145	95	95	95	G	G	125	115	110	110	105	105
3	S	S	B	B	B	B	S	100	G	155	160	G	G	140	125	G	G	110	G	S	S	S	S	S
4	95	100	105	B	E	S	S	100	G	G	G	G	140	150	G	G	130	120	115	100	100	S	S	S
5	105	105	105	B	E	B	S	100	G	165	140	125	125	125	B	130	120	110	G	S	S	S	S	S
6	S	S	S	B	100	100	S	95	G	C	G	G	G	105	105	105	100	G	G	100	S	120	S	S
7	S	105	105	120	100	100	100	100	100	100	150	B	120	105	105	105	105	110	S	130	105	105	100	95
8	100	100	100	100	B	100	100	100	G	G	G	150	G	150	G	G	G	G	G	105	100	100	120	105
9	100	105	105	B	155	130	100	100	150	150	120	120	115	110	110	100	110	110	125	S	S	S	S	S
10	100	100	100	100	B	B	S	95	125	130	135	125	105	105	100	100	100	100	100	95	95	95	S	S
11	S	S	S	B	E	S	S	G	G	G	140	125	110	105	100	100	100	100	100	100	100	100	S	S
12	100	95	S	E	B	S	S	G	G	G	140	125	105	100	100	100	100	110	110	S	100	S	S	S
13	100	100	S	B	B	100	S	G	105	100	100	130	125	115	110	105	105	G	G	105	S	S	100	S
14	100	105	B	E	E	E	S	G	G	125	120	125	115	110	105	G	115	110	G	S	100	95	S	105
15	100	95	S	B	E	S	S	G	G	165	130	125	125	115	110	110	110	110	G	S	S	100	100	S
16	S	S	S	E	E	B	S	G	G	G	G	130	125	115	105	105	120	100	100	100	100	S	S	S
17	100	100	100	E	E	S	S	G	G	100	G	130	125	130	130	110	105	110	G	S	100	B	S	100
18	B	B	100	100	B	S	S	G	G	G	G	125	115	100	G	100	100	100	110	110	S	S	S	100
19	S	S	S	E	E	S	S	G	G	150	100	125	120	145	100	150	105	105	130	S	S	S	S	S
20	S	S	S	E	S	S	160	130	150	150	125	105	105	C	105	105	G	150	105	105	100	S	S	S
21	S	S	105	E	E	B	S	G	110	140	140	120	105	105	G	100	105	G	115	135	S	S	S	S
22	S	100	B	100	E	S	S	100	150	135	130	125	120	115	115	105	105	110	105	105	100	100	100	S
23	S	B	B	E	E	B	105	160	G	G	130	125	105	115	105	100	100	120	100	100	100	S	S	S
24	S	S	B	B	E	S	S	140	150	130	130	105	105	100	130	130	G	G	G	115	S	S	S	S
25	S	S	B	B	E	B	S	100	G	115	115	105	105	105	G	100	G	160	135	115	100	S	S	105
26	S	S	S	B	E	B	S	100	105	125	120	105	105	G	G	G	105	125	G	100	S	S	S	S
27	S	S	S	100	E	B	S	100	160	150	135	115	110	105	150	105	105	100	150	110	110	105	S	105
28	105	105	S	100	105	105	S	100	150	130	125	115	105	105	105	105	G	G	G	100	100	100	100	100
29	100	95	S	B	B	B	S	G	G	G	B	110	105	105	105	105	G	G	G	120	S	S	S	S
30	S	S	S	E	E	S	S	100	105	135	120	G	100	100	100	100	100	G	145	125	110	S	S	S
31	S	S	S	B	E	S	S	G	G	100	100	120	120	125	150	125	100	150	120	110	105	105	100	S
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	14	9	7	4	6	5	17	12	21	24	26	28	29	23	26	23	22	18	23	18	12	8	9
MED	100	100	105	100	102	100	100	100	138	130	130	125	112	105	105	105	105	110	115	105	100	100	100	105
UQ	100	105	105	100	130	105	105	100	150	150	140	125	122	115	112	110	110	120	125	115	105	105	102	105
LQ	100	100	100	100	100	100	100	100	105	115	120	115	105	105	102	100	100	105	105	100	100	100	100	100

MAR. 1970 | H'ES (KM)

IONOSPHERIC DATA

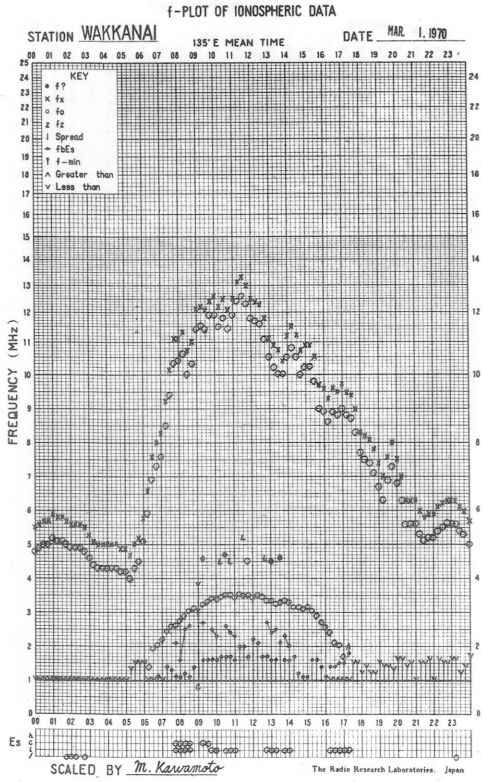
MAR. 1970 | TYPES OF ES | 135° E Mean Time (G. M. T.+ 9h)

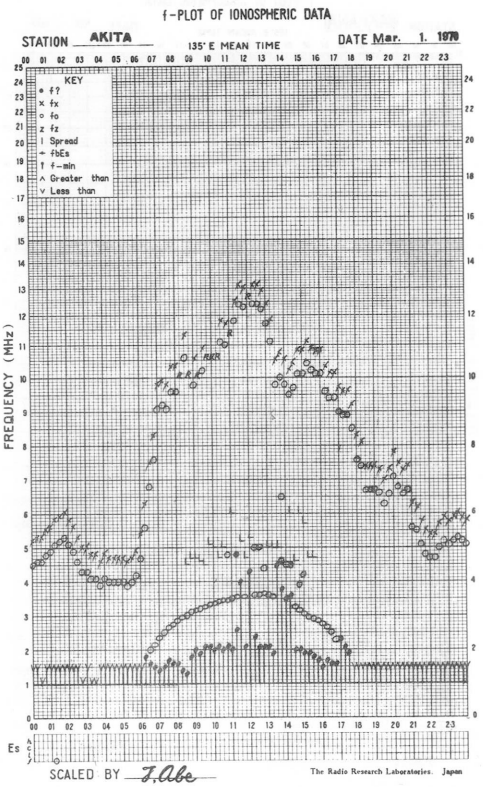
Station YAMAGAWA Lat. 31° 12.1' N. Long. 130° 37.1' E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

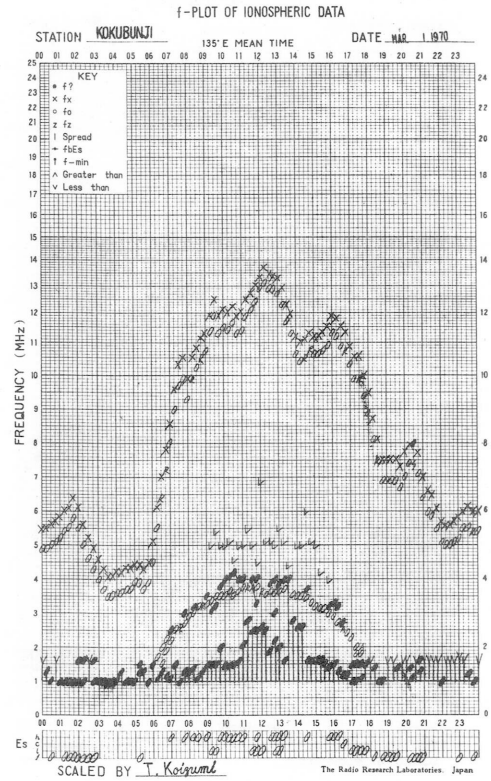
Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L 1	L 1	L 1	L 1		HL 11	HL 11	H 6	C 7	F 1				
2										L 2	H 1	H 1	HL 11	L 3	L 1	L 2			HL 31	F 1	F 3	F 1	F 3	F 1
3								L 1		H 1	HH 11			H 1	H 1			L 2						
4	F 1	F 1	F 1					L 1					H 1	H 1			H 1	CL 31	C 4	F 1	F 1			
5	F 3	F 2	F 1					L 1		H 1	HL 11	H 1	HL 11	H 1		H 1	C 1	L 2						
6					F 1	F 1		L 1						L 1	L 1	L 1	L 2			F 1		FF 11		
7		F 1	F 2	F 1	F 2	F 3	F 3	L 1	L 1	L 1	H 1		C 1	L 1	L 1	L 2	L 1	L 2		F 1	F 4	F 3	F 3	F 2
8	F 1	F 3	F 1	F 1		F 2	F 1	L 1				H 1		H 1						F 1	F 1	F 1	FF 11	F 4
9	F 7	F 5	F 1		F 2	F 3	FF 11	L 1	H 1	H 1	H 2	H 1	C 1	CL 11	LL 11	L 1	L 2	L 2	H 1					
10	F 4	F 3	F 3	F 1				L 1	HL 12	HLL 12	HLL 11	HL 11	L 1	L 1	L 2	L 3	L 3	L 3	L 4	F 5	F 6	F 1		
11											H 1	H 1	C 1	L 1	L 1	L 1	L 1	L 2	L 2	FF 11	F 1	F 1		
12	F 2	F 1									H 1	H 1	L 1	L 1	L 1	L 1	L 1	L 1	L 3		F 1			
13	F 3	F 1				F 1			L 1	L 2	L 1	HL 11	HL 11	CL 11	C 1	L 1	L 1			F 1			F 1	
14	F 2	F 1								H 1	H 2	H 1	C 1	C 1	L 1		C 2	L 2			F 1	F 3		F 1
15	F 1	F 1								HH 11	H 1	H 1	H 1	C 1	C 1	C 2	C 2	L 3				F 1	F 1	
16												H 1	C 1	C 1	L 1	L 1	C 2	L 1	L 4	F 1	F 1			
17	F 2	F 5	F 3							L 1		H 1	H 1	H 1	H 1	L 1	L 1	L 1			F 1			F 1
18			F 1	F 1								H 1	C 1	L 1		L 1	L 1	L 2	LL 21	FF 21				F 6
19										HL 11	L 1	HL 11	CL 11	H 1	L 1	H 1	L 1	L 1	H 2					
20							F 1	H 3	H 2	H 1	H 1	L 1	L 1		L 1	L 1		H 1	L 2	F 2	F 1			
21			F 1						L 2	H 1	H 1	C 1	L 1	L 1		L 1	L 2		L 1	F 1				
22		F 2		F 1				L 1	H 1	H 1	H 1	H 1	C 1	C 1	C 1	L 2	L 2	L 3	L 3	F 3	F 6	F 2	F 1	
23							F 1	HL 11			H 1	H 1	L 1	CL 11	L 1	L 1	L 2	CL 13	L 1	F 2	F 1			
24								HL 41	H 1	H 1	H 1	L 1	L 1	L 1	HL 11	HL 12				F 1				
25								L 1		C 1	C 1	L 1	L 1	L 1		L 1		H 2	H 3	F 2	FF 11			F 1
26								L 1	L 1	H 1	CL 11	L 1	L 1				L 2	H 1		F 1				
27				F 1				L 1	H 1	H 1	H 1	C 1	C 1	L 1	H 1	L 1	L 5	L 5	HL 11	F 4	FF 31	F 4		F 4
28	F 2	F 3		F 1	F 3	F 2		L 1	HL 11	H 1	H 1	C 1	L 1	L 2	L 2	L 1				F 1	F 2	F 2	F 1	F 1
29	F 1	F 1										C 1	L 1	L 1	L 1	L 1				F 1				
30								LL 11	L 2	H 2	C 1		L 1	L 1	L 1	L 1	L 1		H 2	F 1	F 2			
31										L 2	L 2	HL 11	C 1	HL 11	HH 11	H 1	L 1	H 3	H 5	FF 71	FF 71	F 2	F 2	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

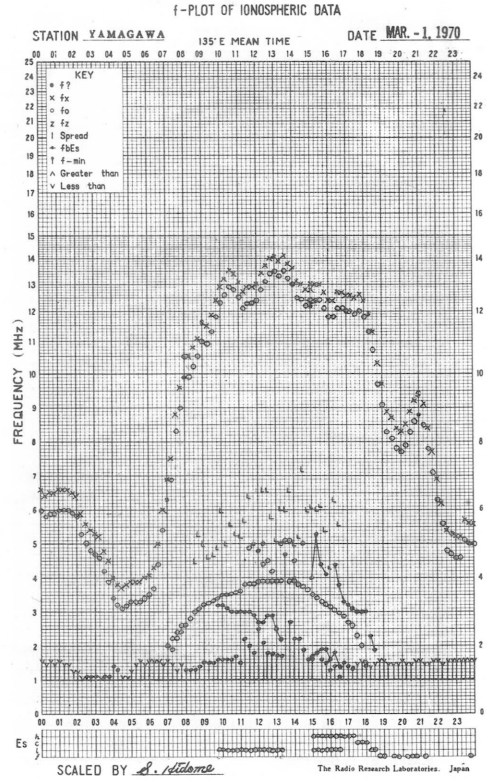
The Radio Research Laboratories, Japan

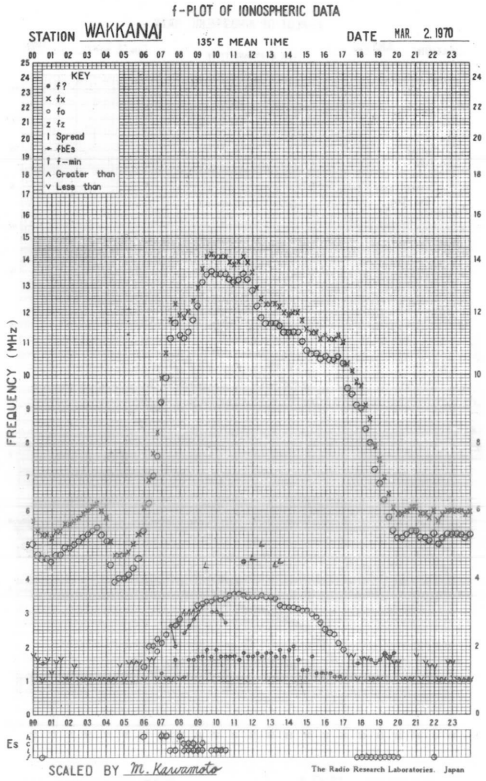
MAR. 1970 | TYPES OF ES


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAR. 1, 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE Mar. 1. 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE MAR 1 1970
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 MAR. - 1, 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Uda
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR. 2. 1970
KEY
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○ fo
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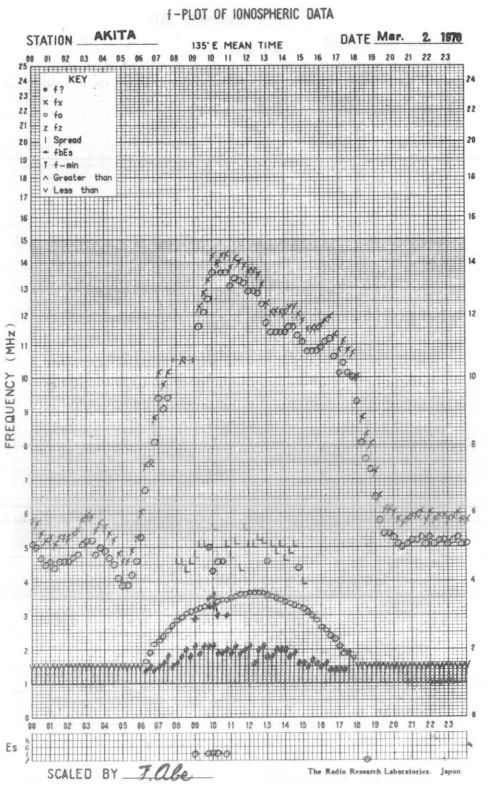
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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DATE Mar. 2. 1970
KEY
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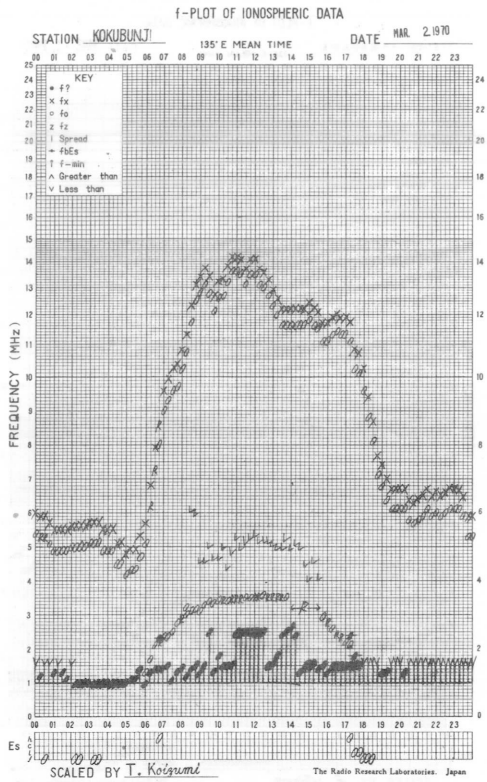
FREQUENCY (MHz)
Es
SCALED BY F. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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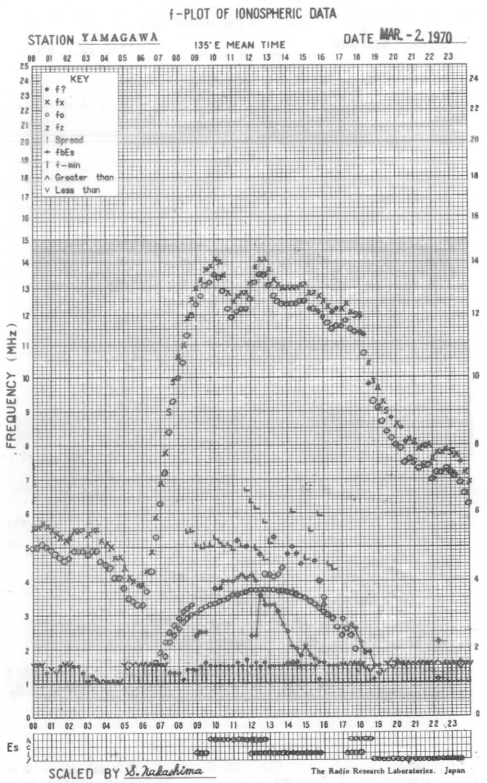
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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v Less than
FREQUENCY (MHz)
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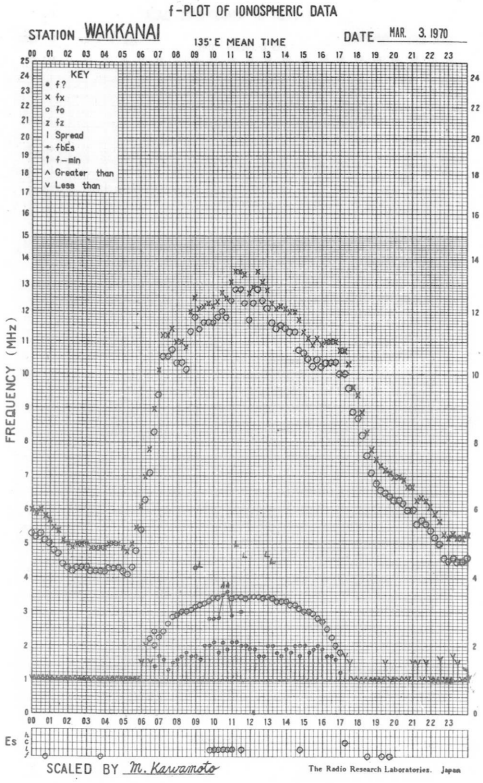
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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KEY
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○ fo
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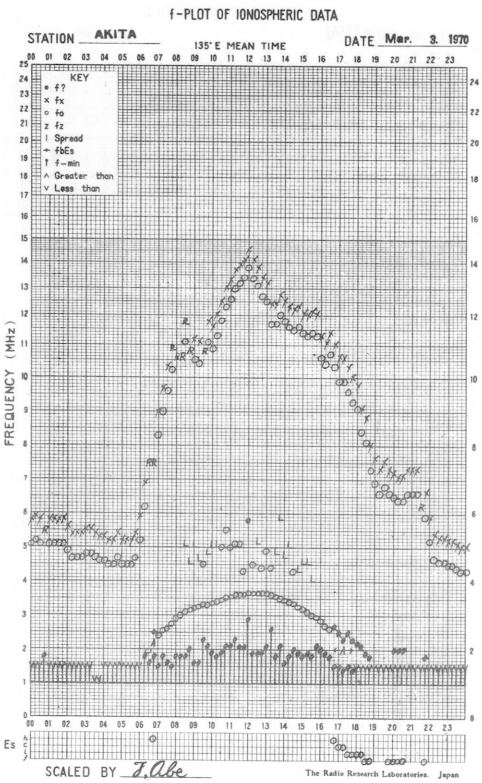
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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○ fo
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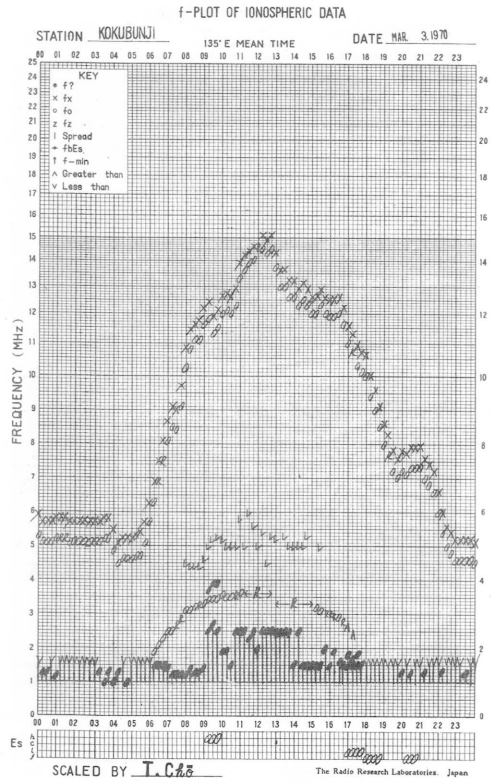
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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○ fo
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v Less than
FREQUENCY (MHz)
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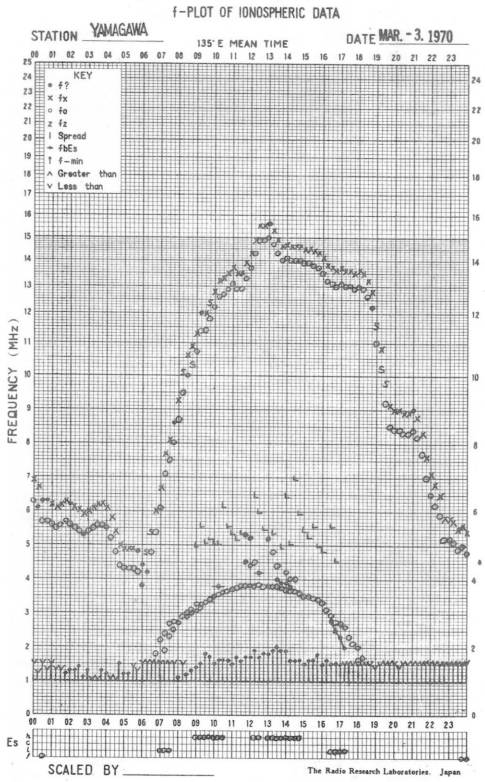
SCALED BY T. Ozo
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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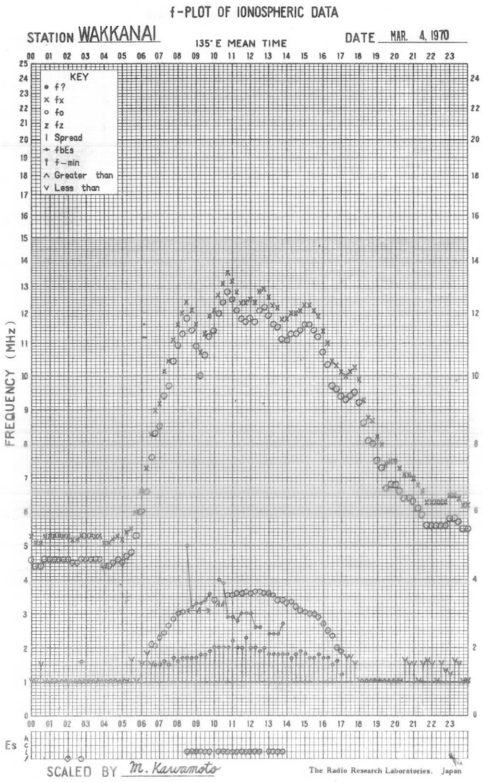
SCALED BY
The Radio Research Laboratories. Japan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KEY
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○ fo
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| Spread
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↑ f-min
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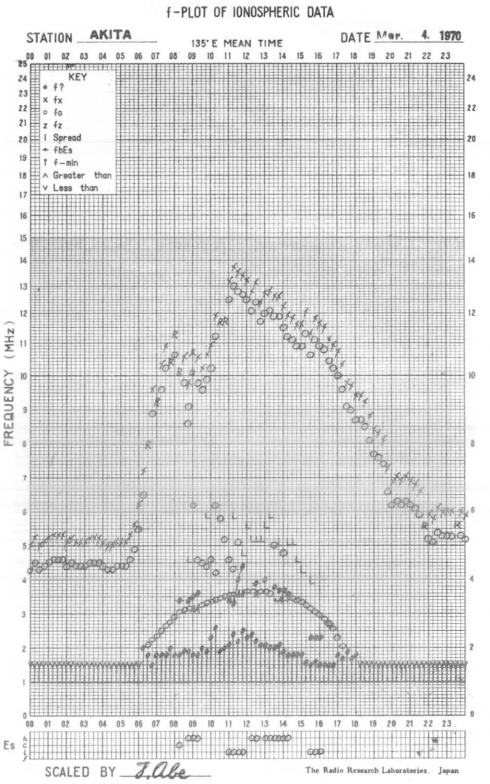
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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○ fo
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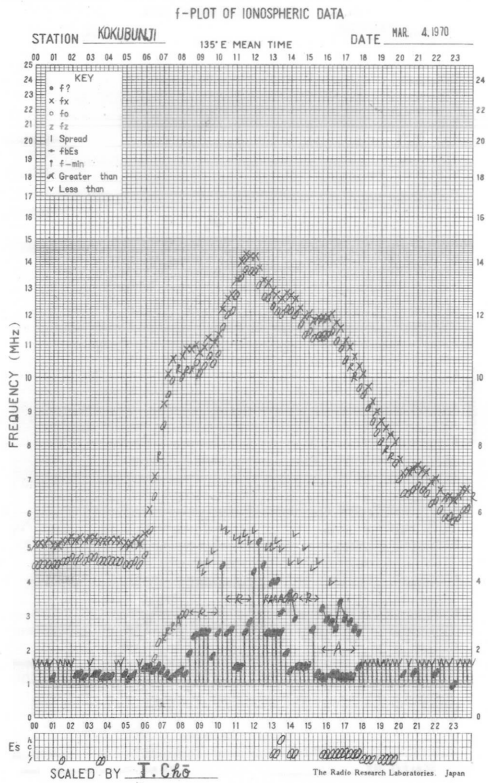
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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○ fo
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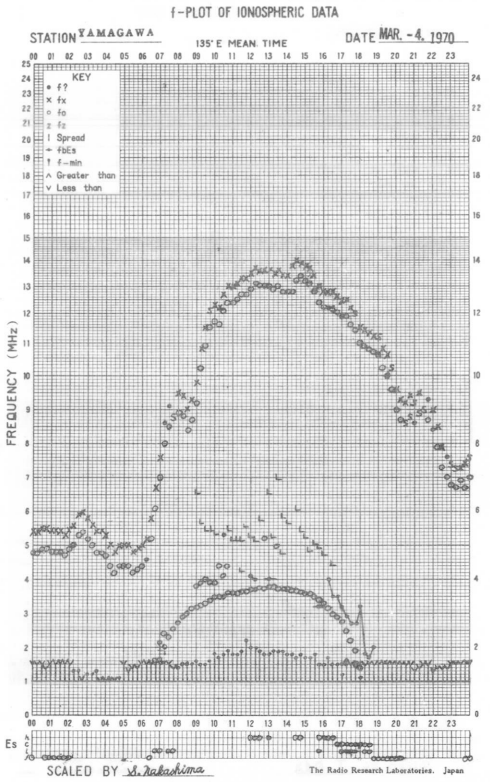
FREQUENCY (MHz)
Es
SCALED BY T. Ohe
The Radio Research Laboratories. Japan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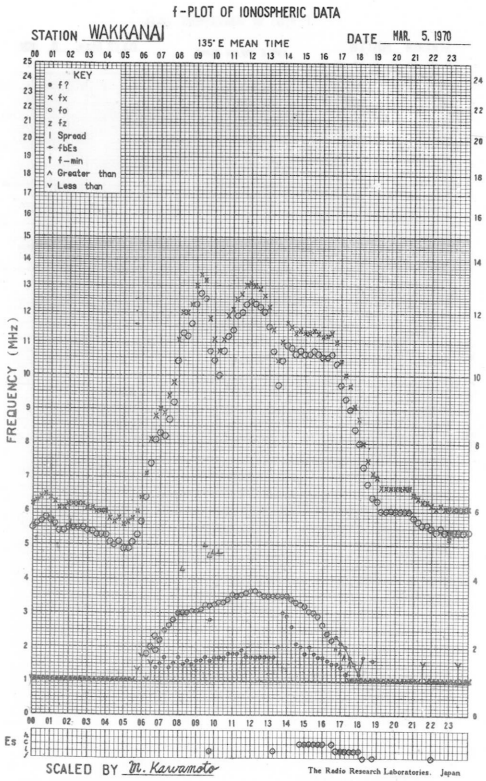
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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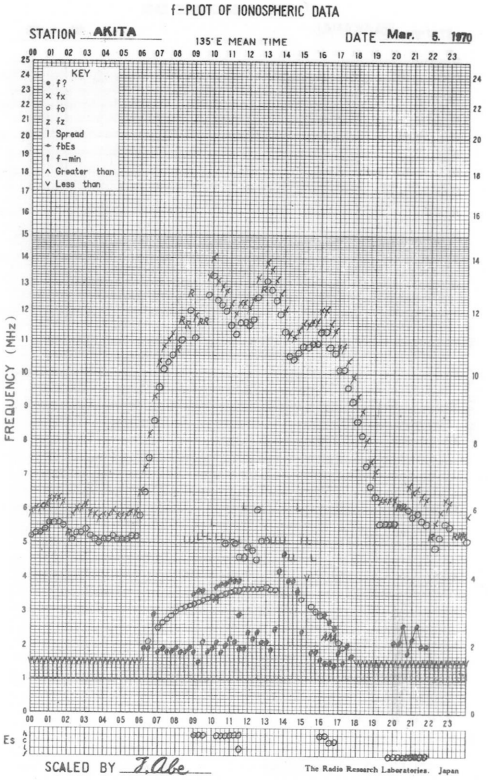
135°E MEAN TIME
DATE MAR. 5, 1970
KEY
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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DATE Mar. 5. 1970
KEY
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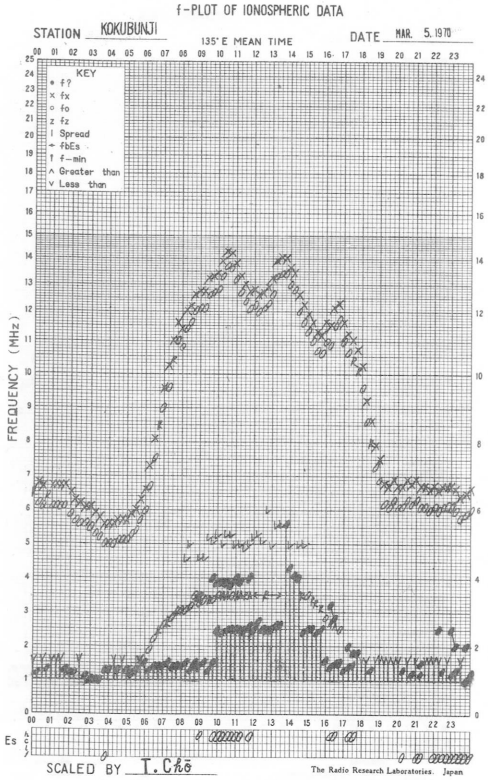
SCALED BY T. Abe
The Radio Research Laboratories. Japan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DATE MAR. 5, 1970
KEY
FREQUENCY (MHz)
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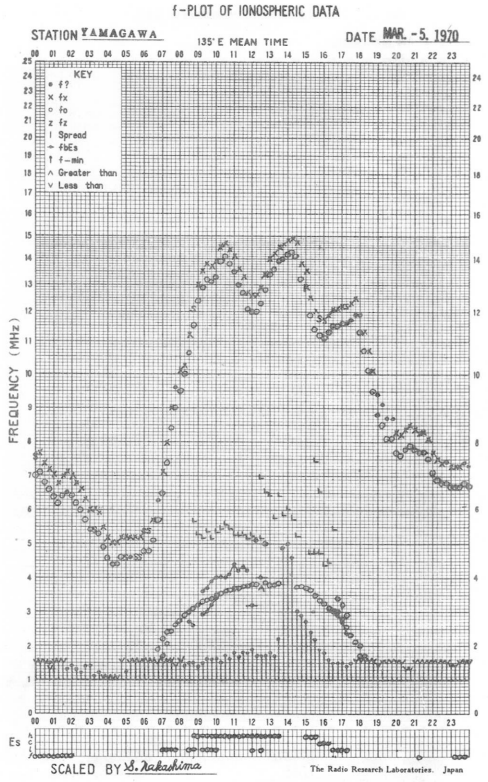
SCALED BY T. Chō
The Radio Research Laboratories. Japan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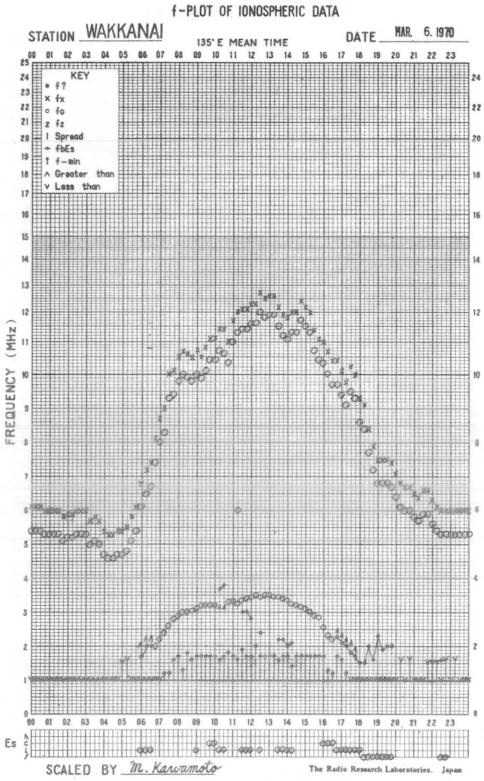
The Radio Research Laboratories. Japan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○ fo
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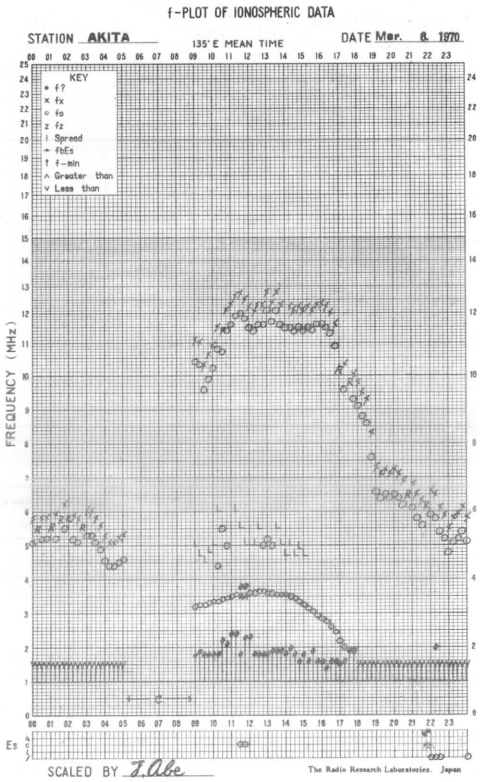
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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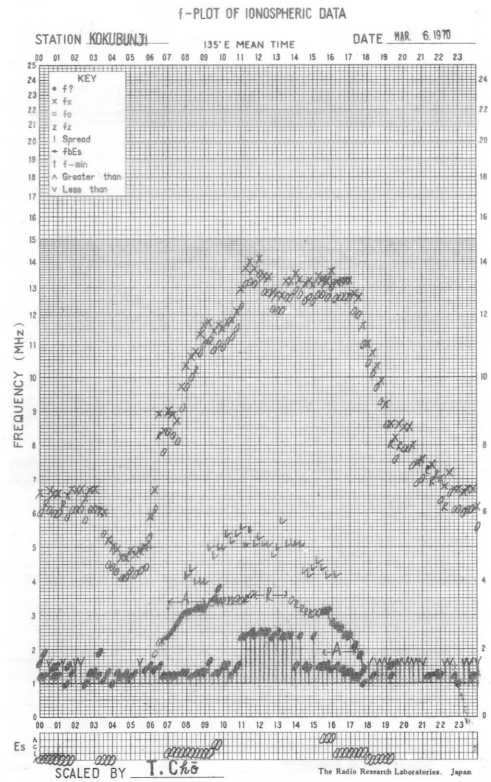
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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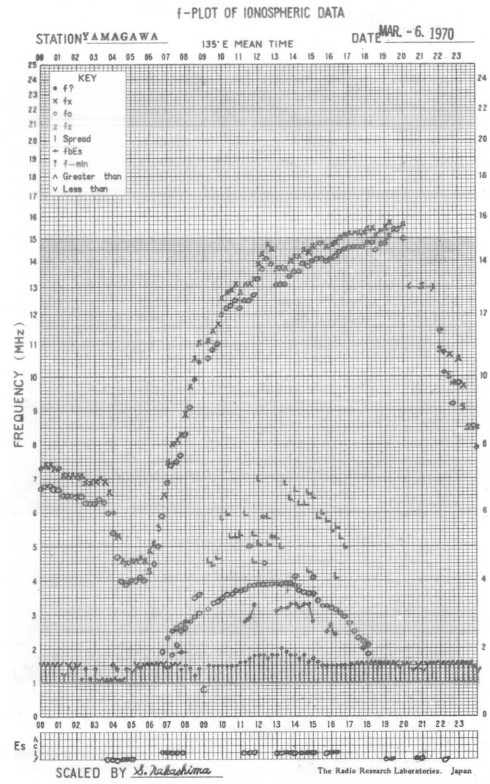
SCALED BY T. Cho
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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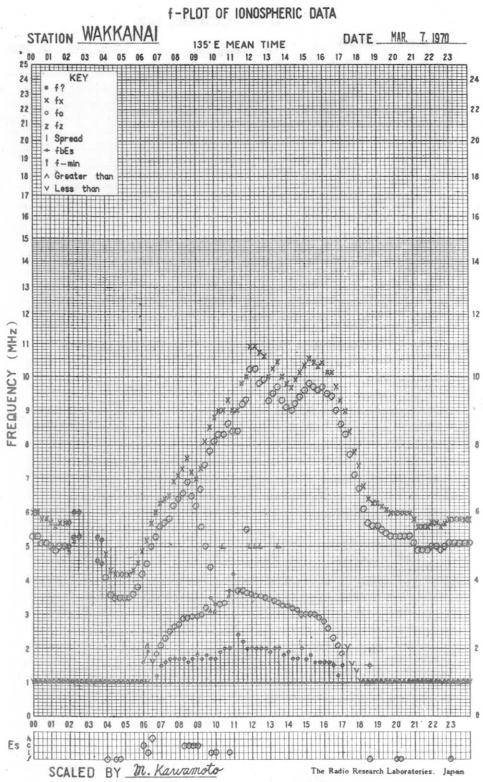
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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○ fo
z fz
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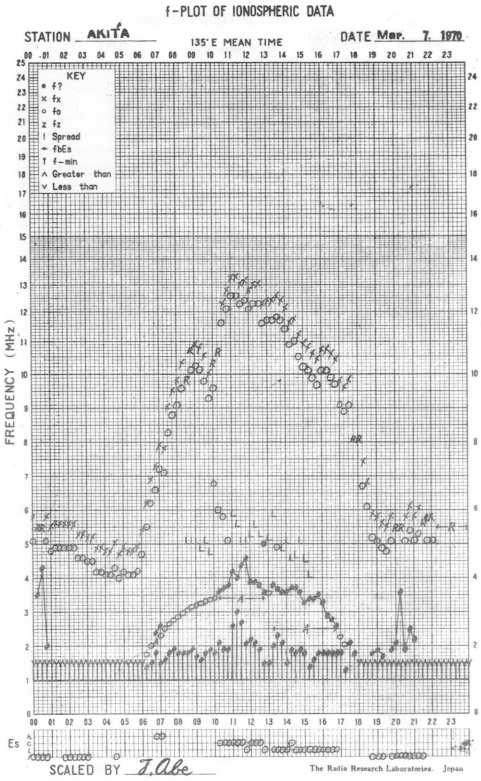
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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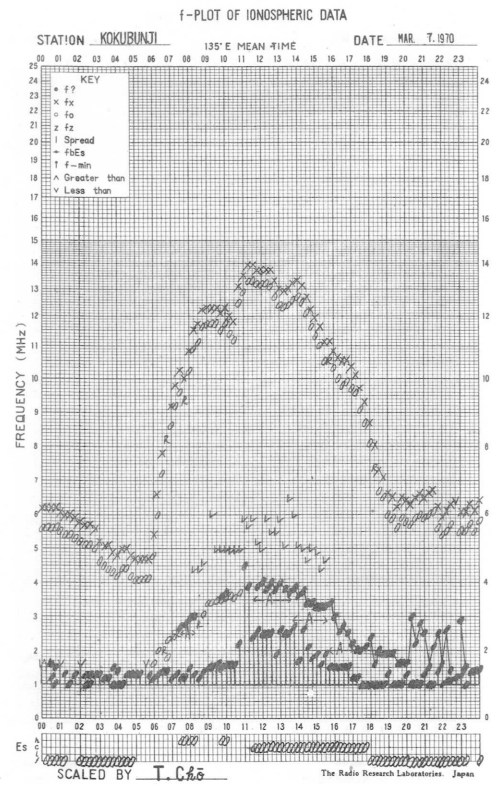
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY I. Abe
The Radio Research Laboratories. Japan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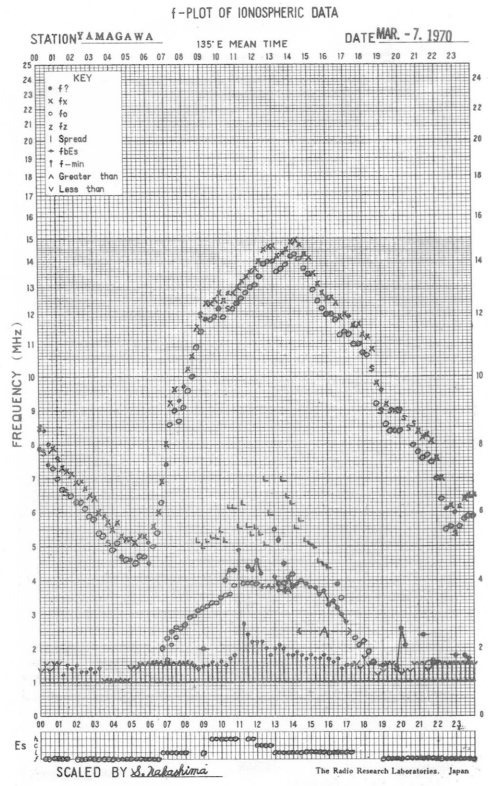
The Radio Research Laboratories. Japan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v Less than
FREQUENCY (MHz)
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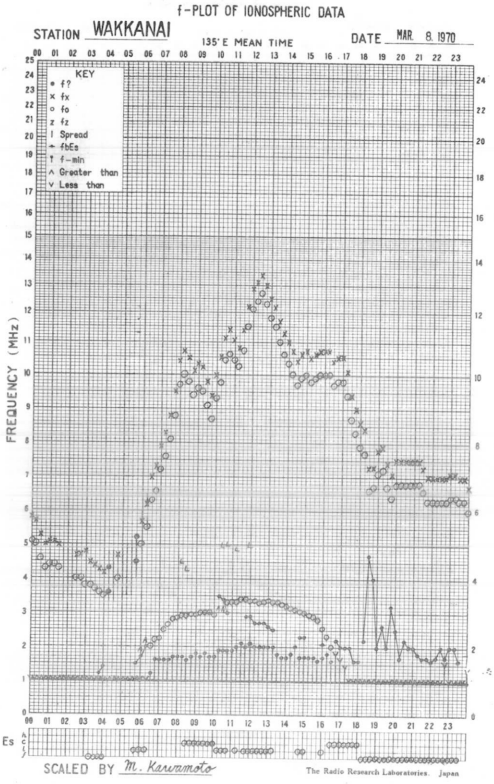
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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↑ f-min
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v Less than
FREQUENCY (MHz)
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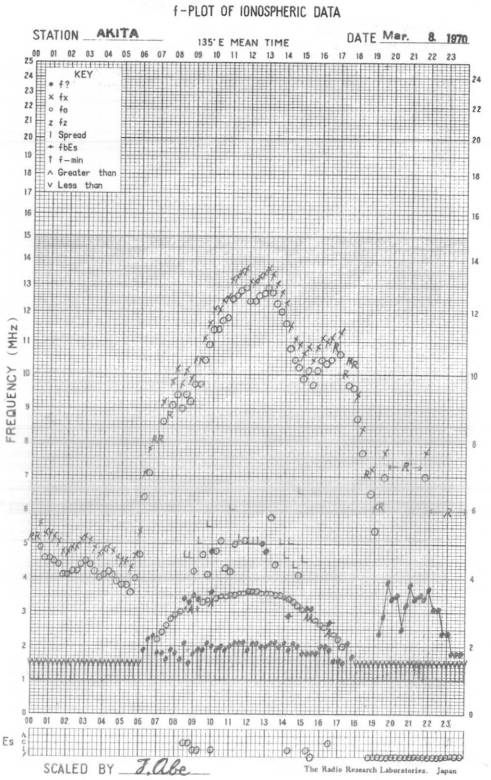
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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○ fo
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FREQUENCY (MHz)
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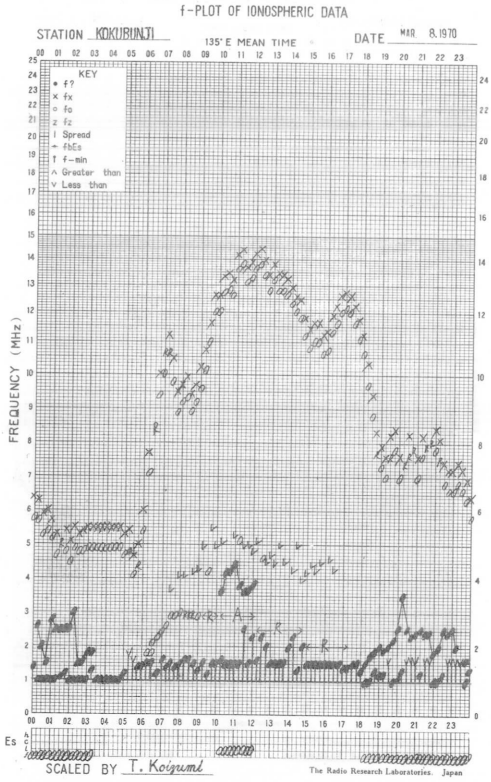
SCALED BY T. Abe
The Radio Research Laboratories. Japan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v Less than
FREQUENCY (MHz)
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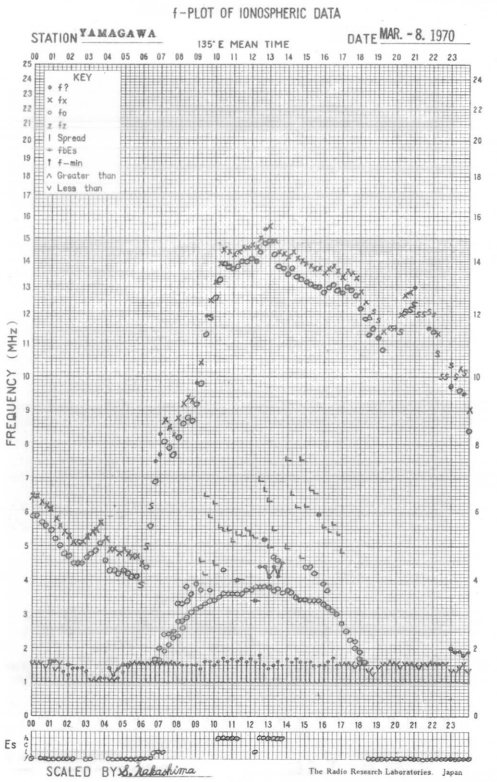
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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v Less than
FREQUENCY (MHz)
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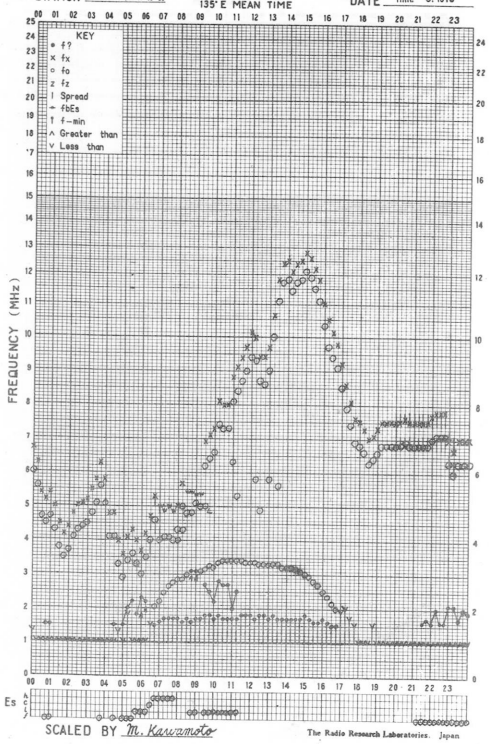
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 9. 1970



SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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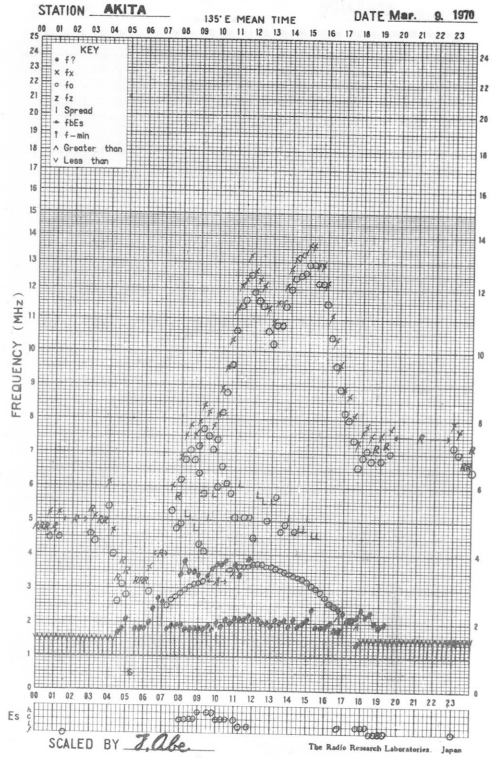

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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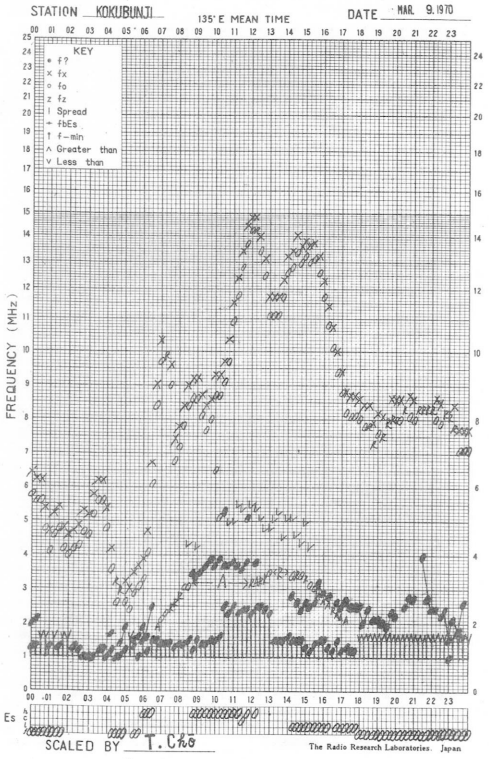

SCALED BY T. Cho

The Radio Research Laboratories. Japan

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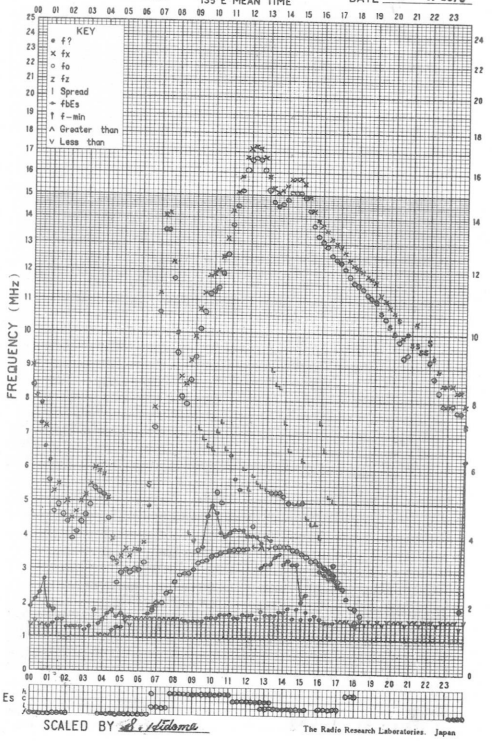
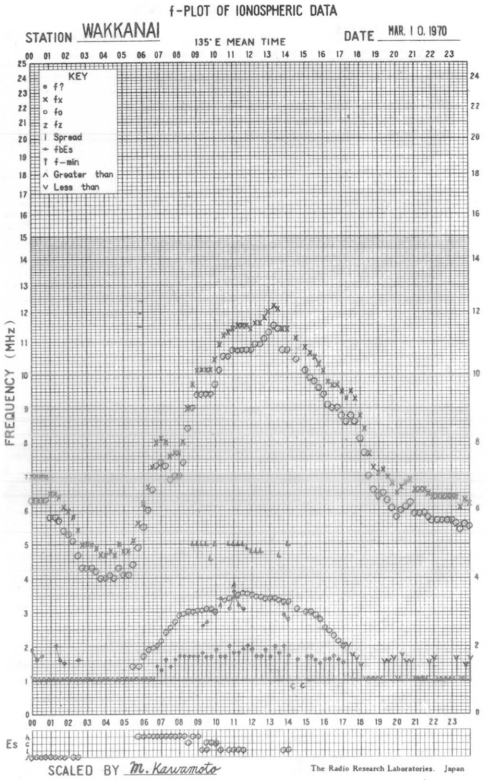
STATION YAMAGAWA 135°E MEAN TIME DATE MAR. - 9. 1970



SCALED BY K. Hidoma

The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR. 10. 1970
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○ fo
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| Spread
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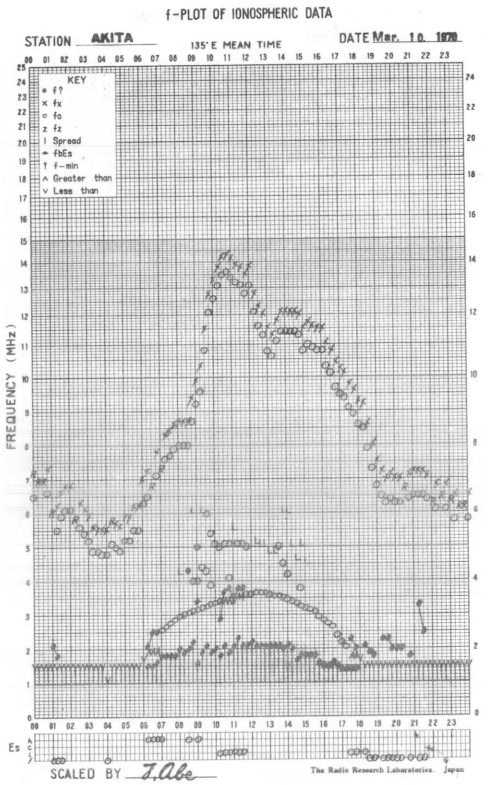
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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○ fo
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FREQUENCY (MHz)
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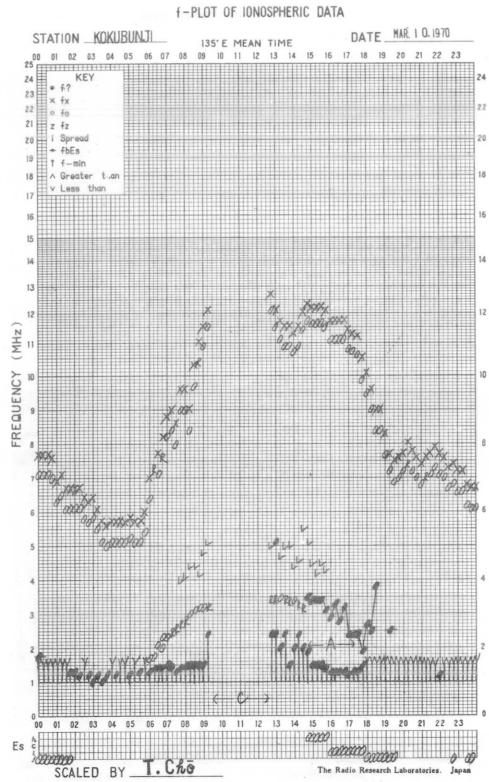
SCALED BY T. Abe
The Radio Research Laboratories. Japan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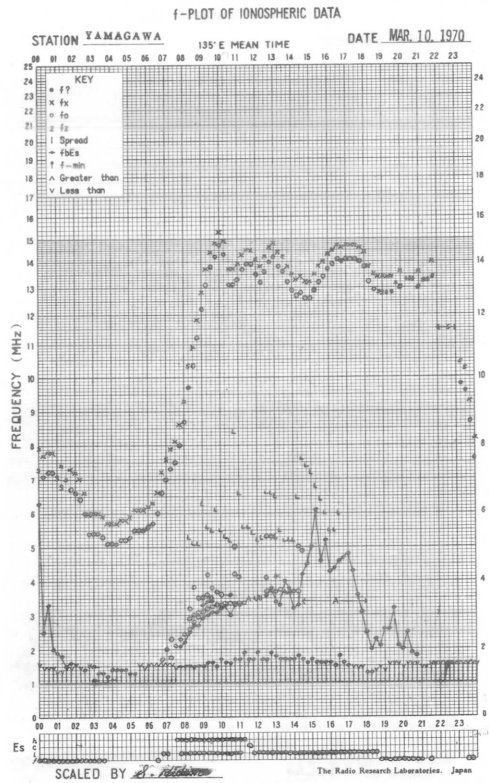
z fz
| Spread
← fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAR. 10. 1970
KEY
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○ fo
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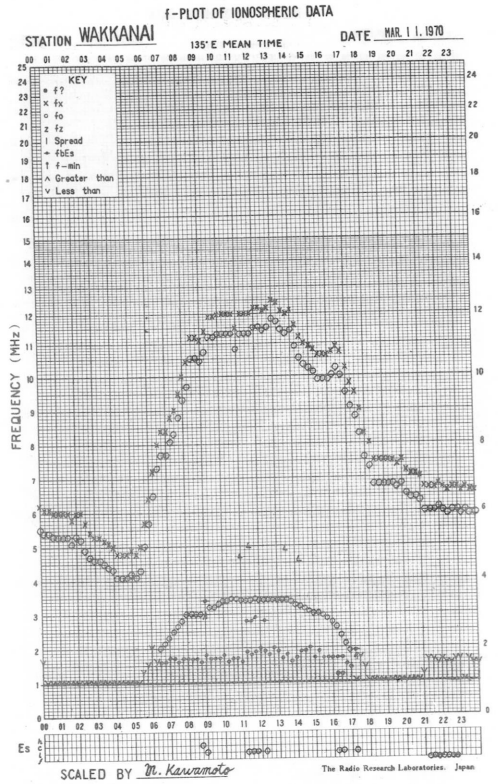
FREQUENCY (MHz)
Es
SCALED BY S. Hitotsuya
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
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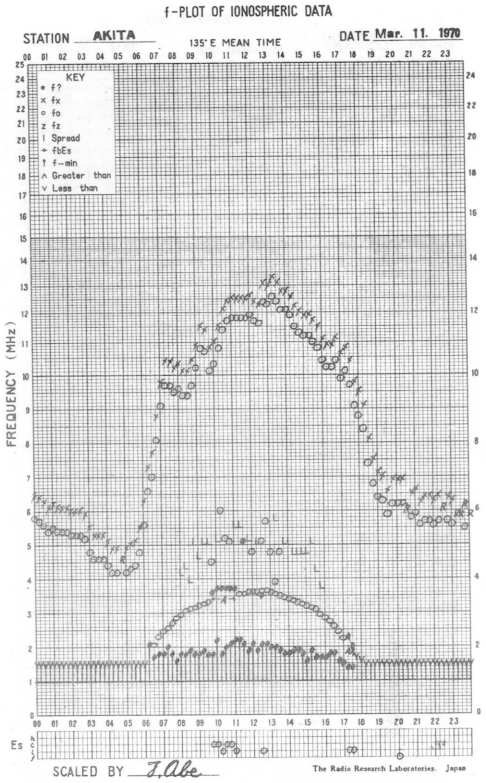
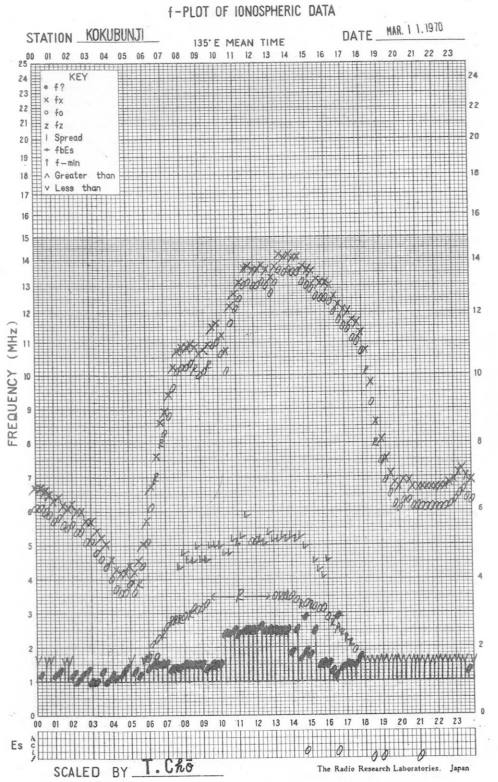
135° E MEAN TIME
DATE MAR. 11. 1970
KEY
FREQUENCY (MHz)
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE Mar. 11. 1970
KEY
FREQUENCY (MHz)
SCALED BY I. Abe
The Radio Research Laboratories. Japan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DATE MAR. 11. 1970
KEY
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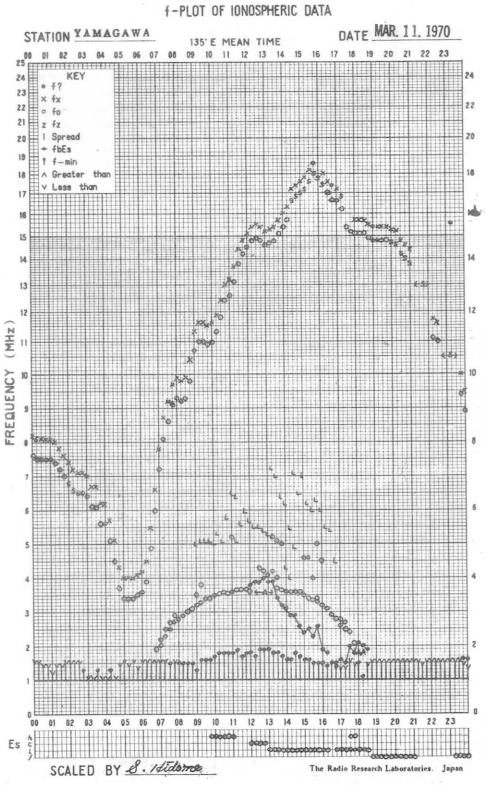
SCALED BY T. Cho
The Radio Research Laboratories. Japan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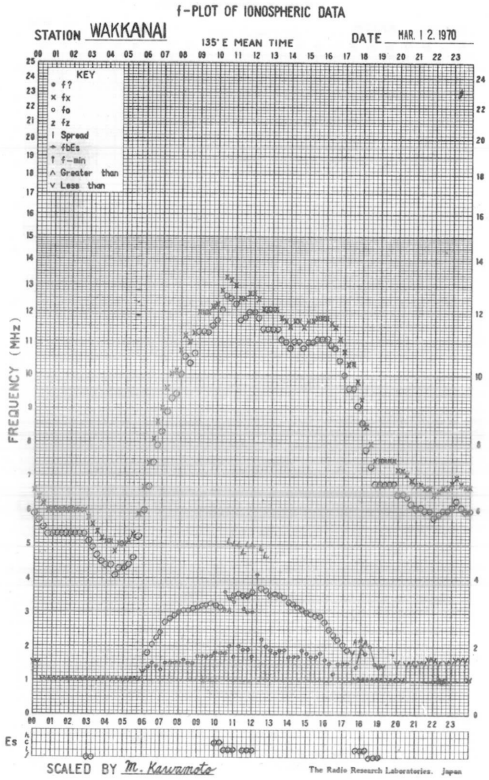
DATE MAR. 11. 1970
KEY
FREQUENCY (MHz)
SCALED BY S. Watanabe
The Radio Research Laboratories. Japan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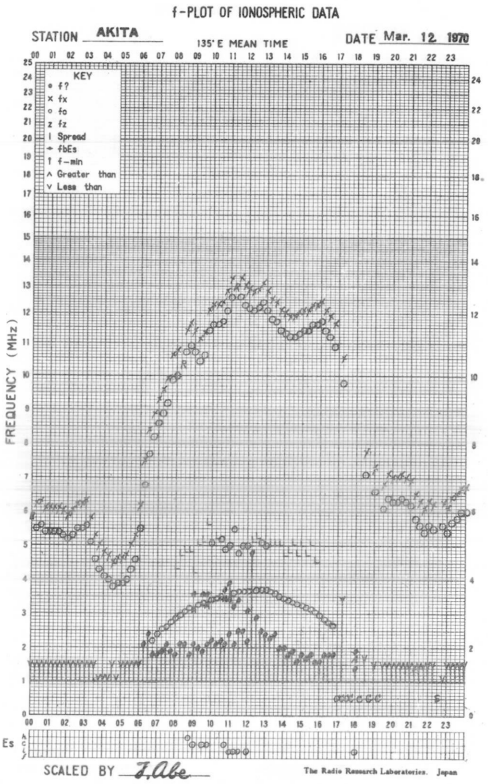
135° E MEAN TIME
DATE MAR. 12. 1970
KEY
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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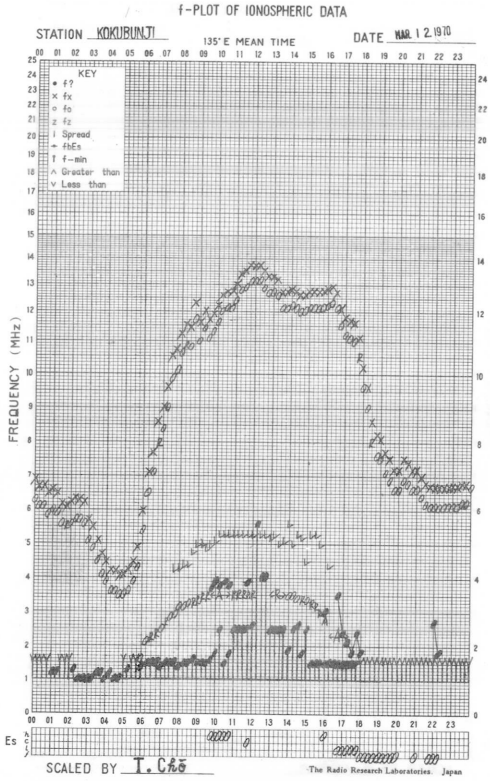
135° E MEAN TIME
DATE Mar. 12. 1970
KEY
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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DATE MAR. 12. 1970
KEY
FREQUENCY (MHz)
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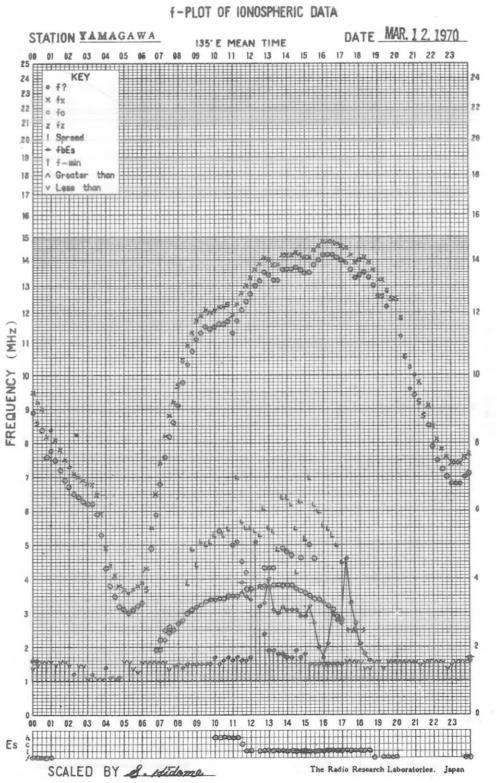
SCALED BY T. Chō
The Radio Research Laboratories. Japan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DATE MAR. 12. 1970
KEY
FREQUENCY (MHz)
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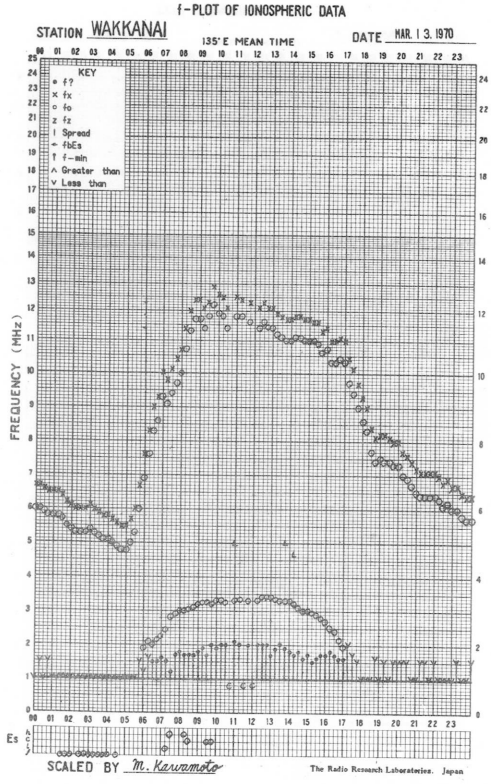
SCALED BY S. Shidama
The Radio Research Laboratories. Japan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STATION WAKKANAI
135°E MEAN TIME
DATE MAR. 13. 1970
KEY
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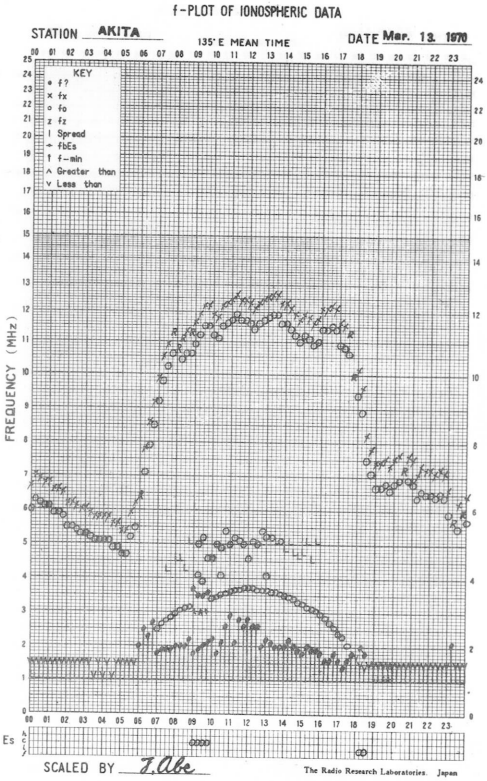
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE Mar. 13. 1970
KEY
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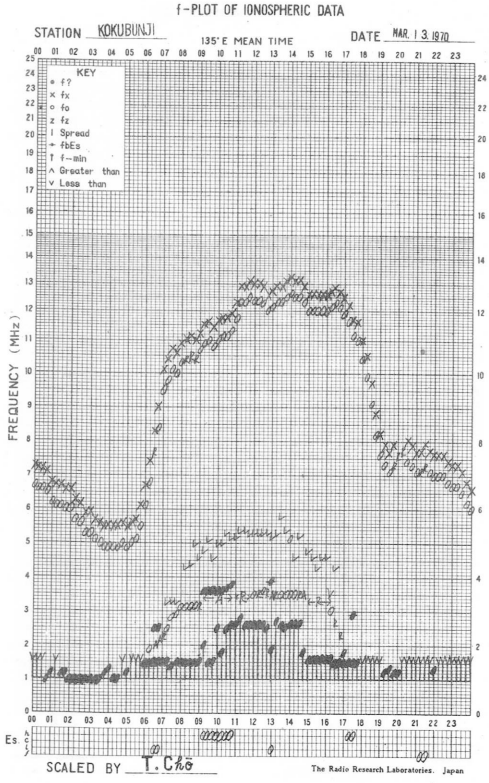
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR. 13. 1970
KEY
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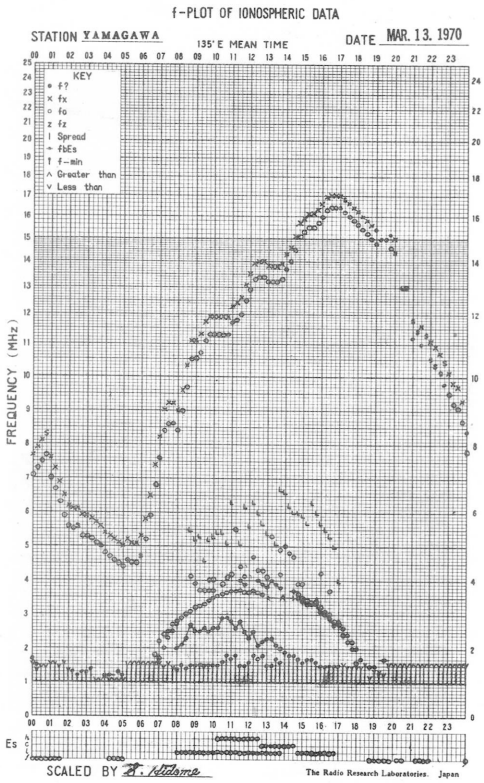
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR. 13. 1970
KEY
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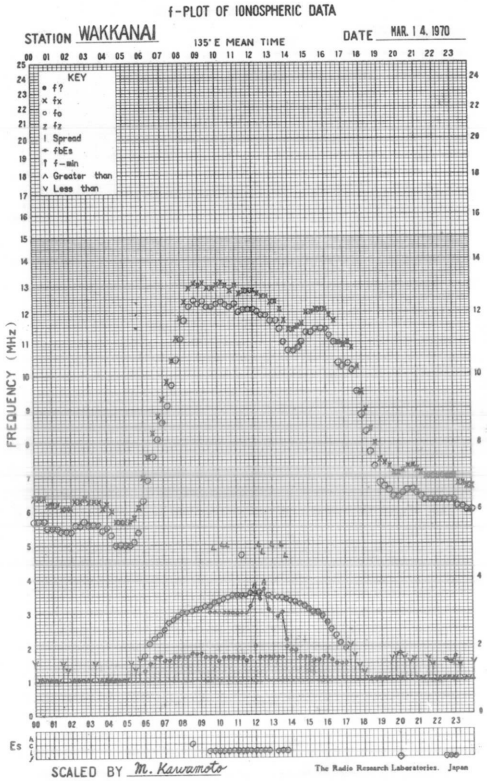
FREQUENCY (MHz)
Es
SCALED BY K. Kitsome
The Radio Research Laboratories. Japan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STATION WAKKANAI
135° E MEAN TIME
DATE MAR. 14. 1970
KEY
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○ fo
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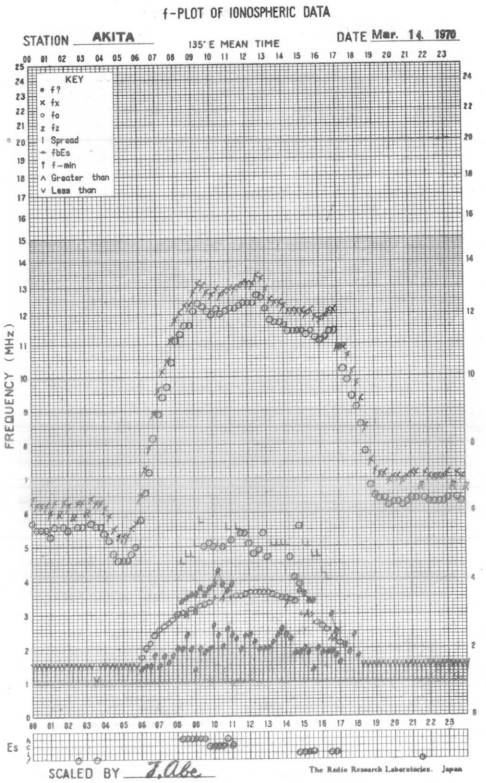
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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DATE Mar. 14. 1970
KEY
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FREQUENCY (MHz)
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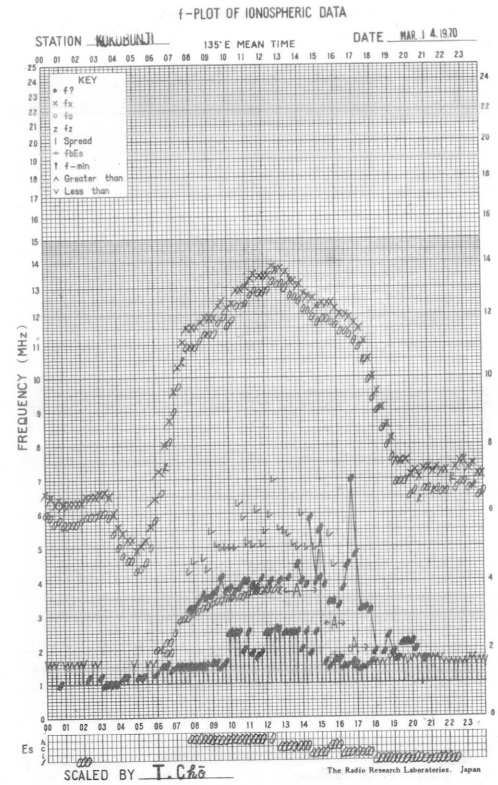
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE MAR. 14. 1970
KEY
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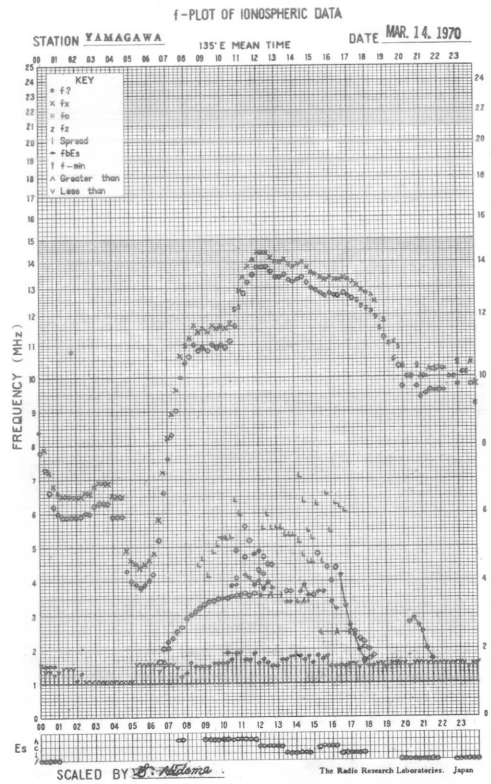
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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KEY
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○ fo
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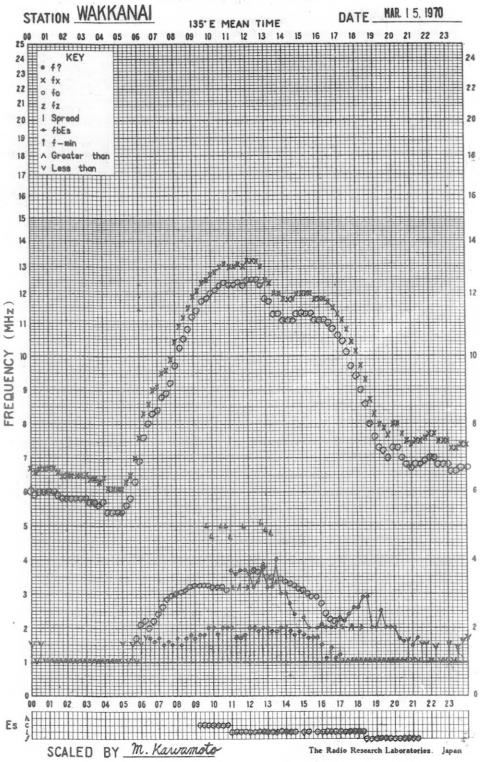
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY K. Hatdama
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR. 15, 1970



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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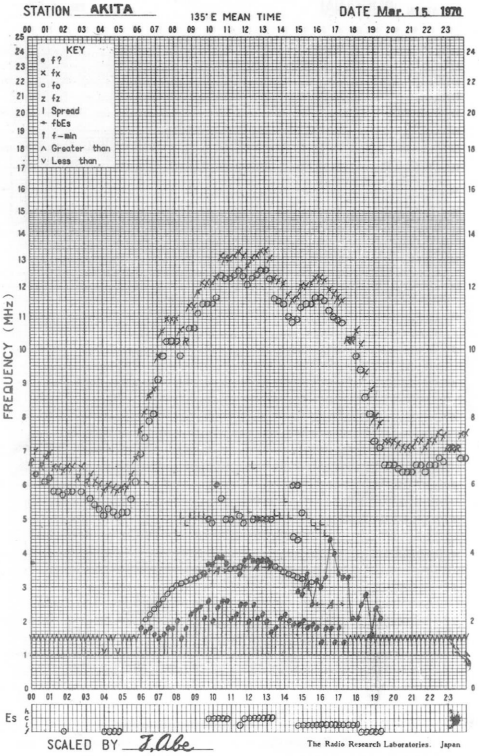

SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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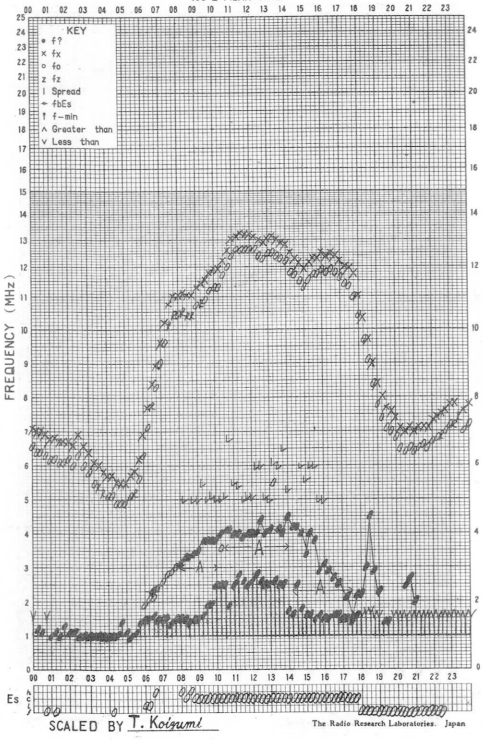

SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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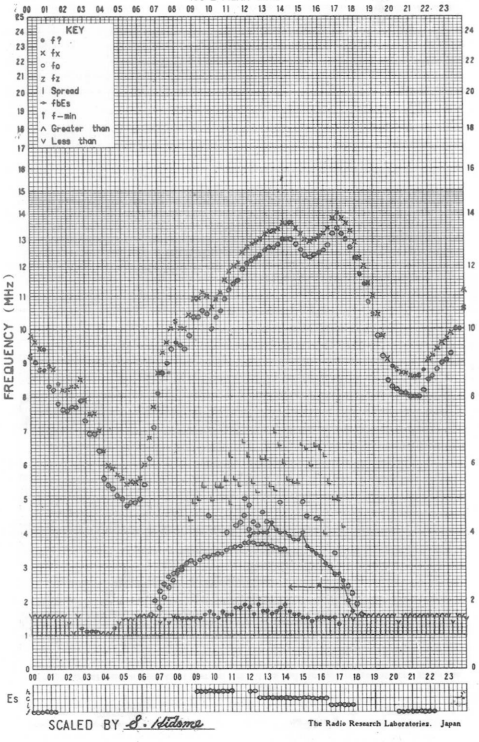

SCALED BY S. Ishizume The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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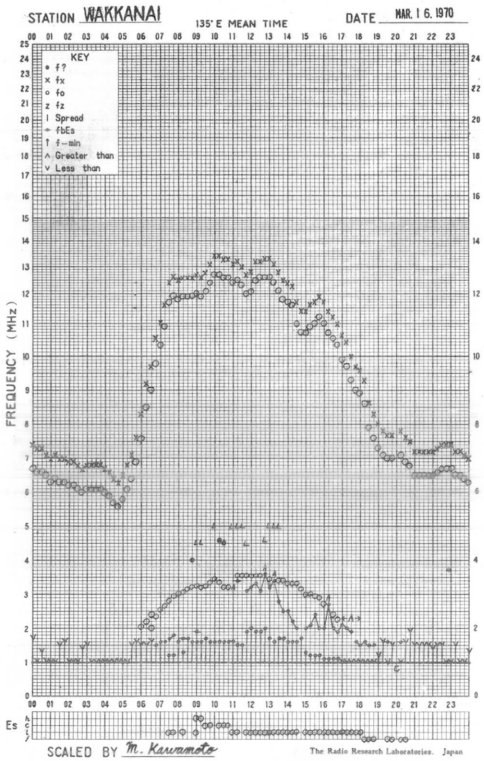

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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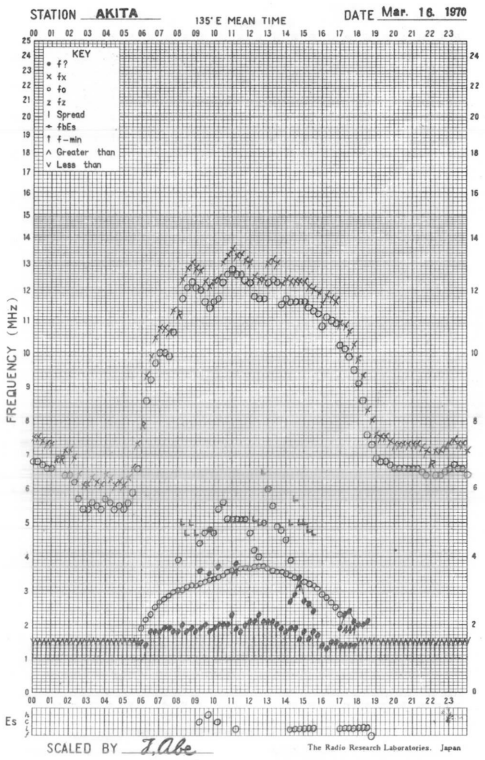

SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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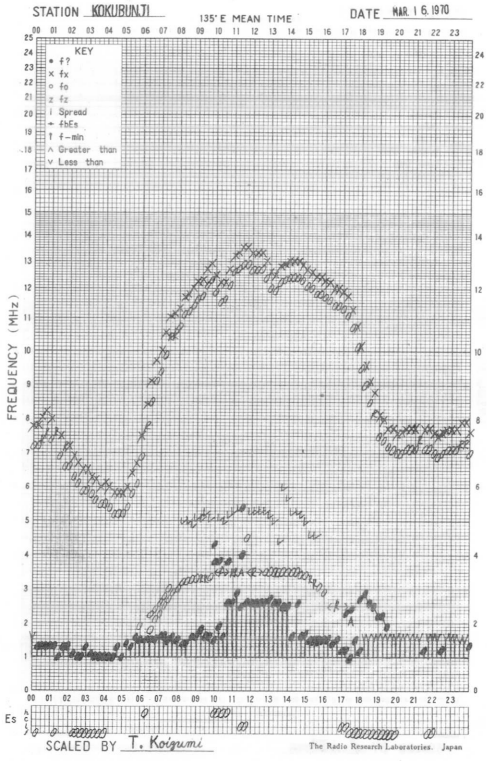
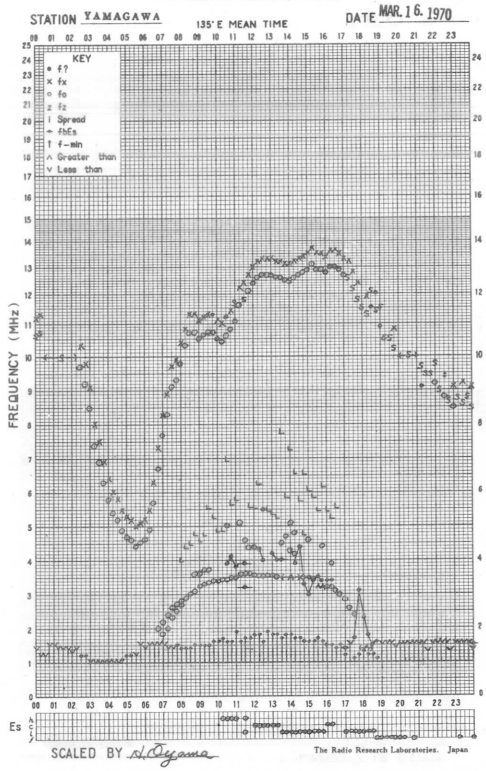


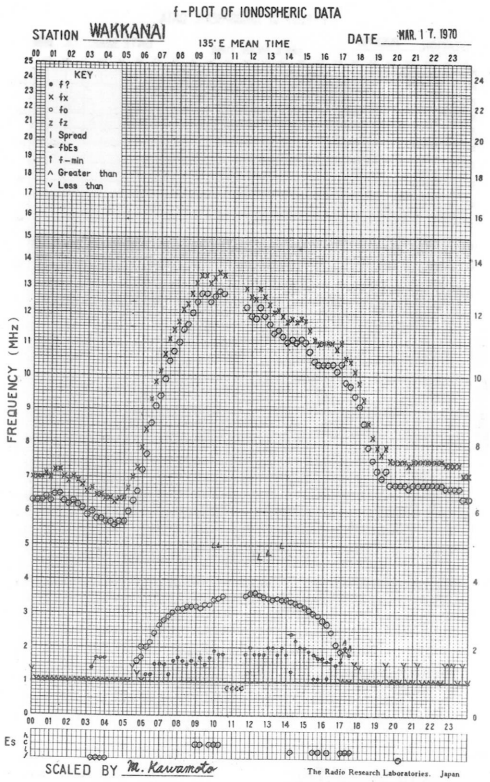
SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAR. 16. 1970



SCALED BY A. Ayama The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE MAR. 17. 1970
KEY
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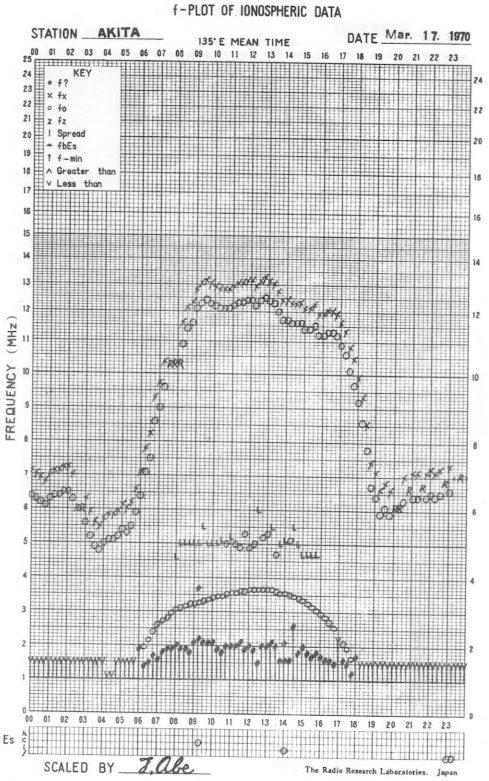
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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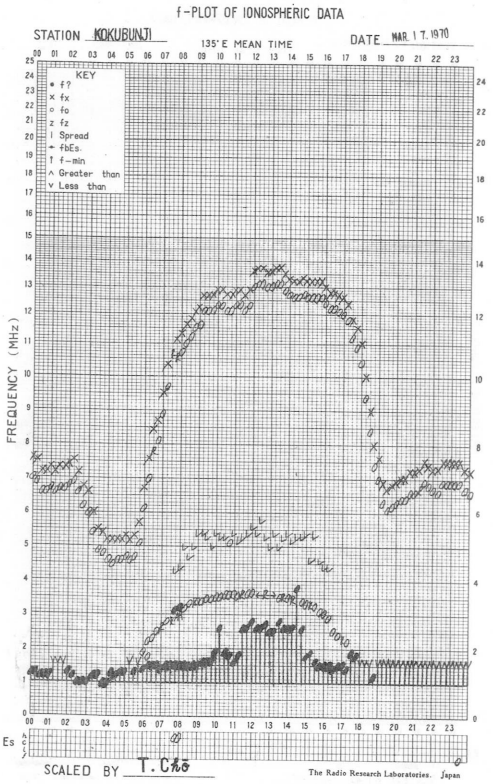
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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KEY
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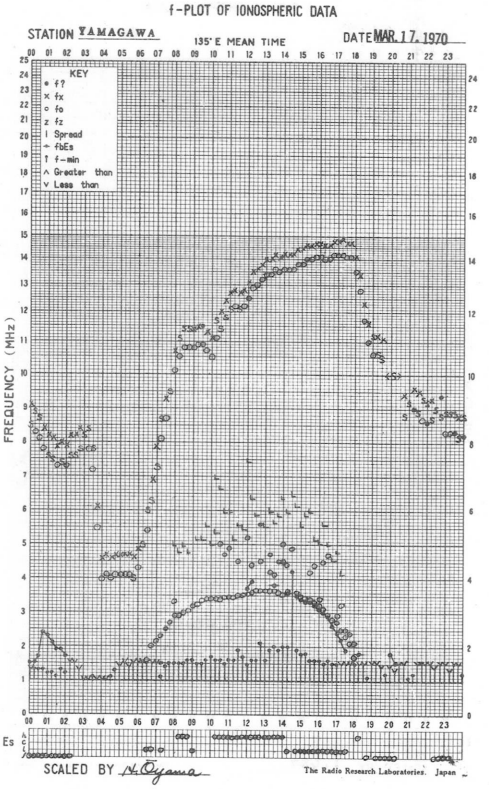
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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KEY
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○ fo
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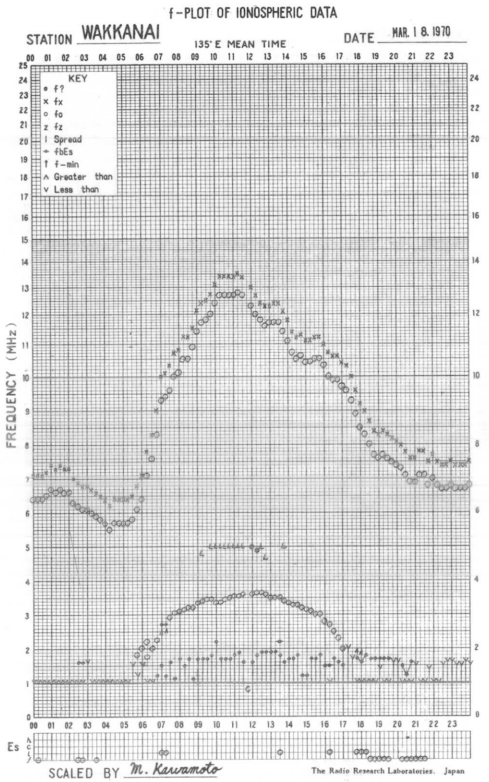
v Less than
FREQUENCY (MHz)
Es
SCALED BY H. Oyama
The Radio Research Laboratories. Japan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DATE MAR. 18. 1970
KEY
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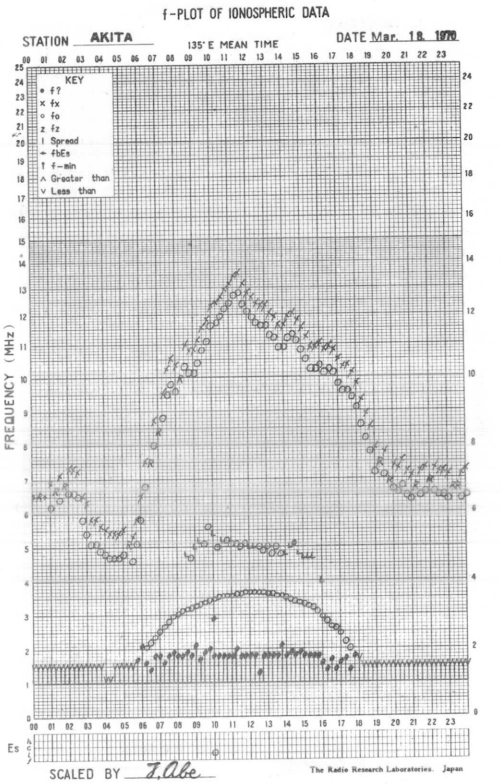
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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DATE Mar. 18. 1970
KEY
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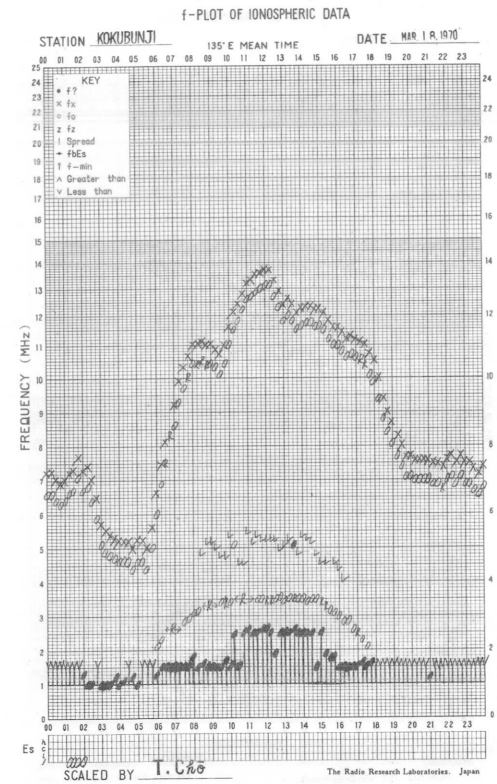
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE MAR 18, 1970
KEY
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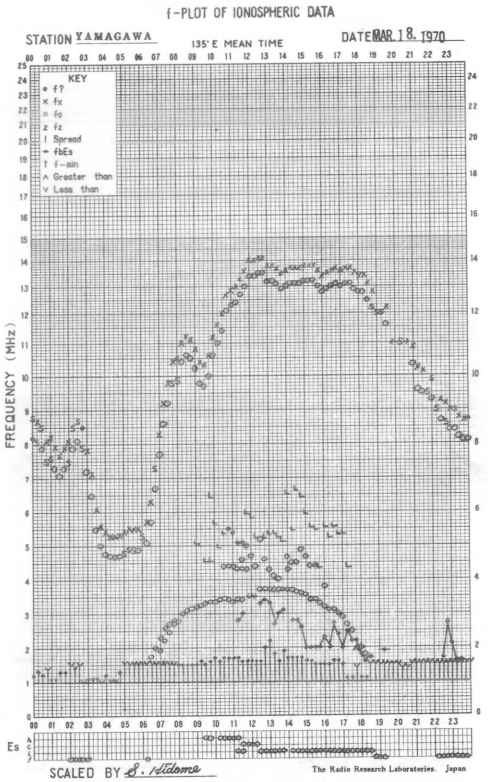
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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DATE MAR 18. 1970
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∨ Less than
FREQUENCY (MHz)
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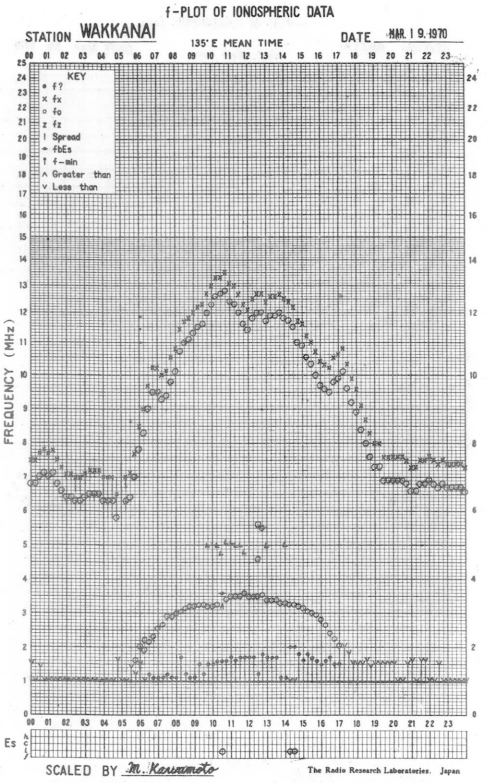
SCALED BY S. Iidoma
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE MAR. 19. 1970
KEY
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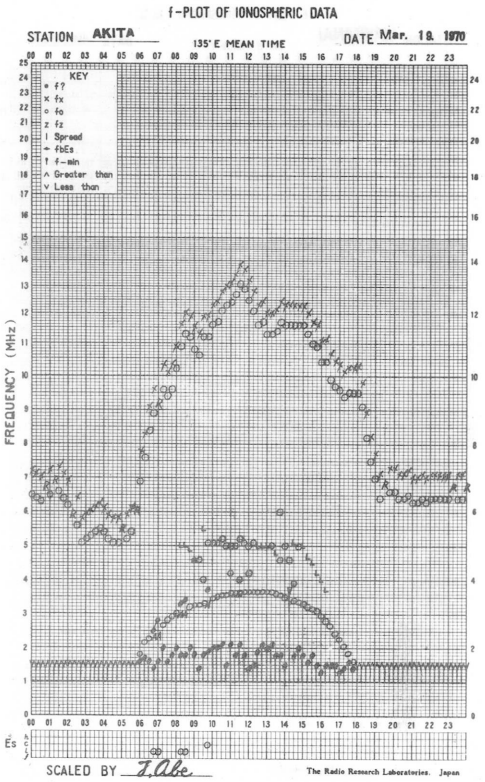
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
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DATE Mar. 19. 1970
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⌁ fbEs
↑ f-min
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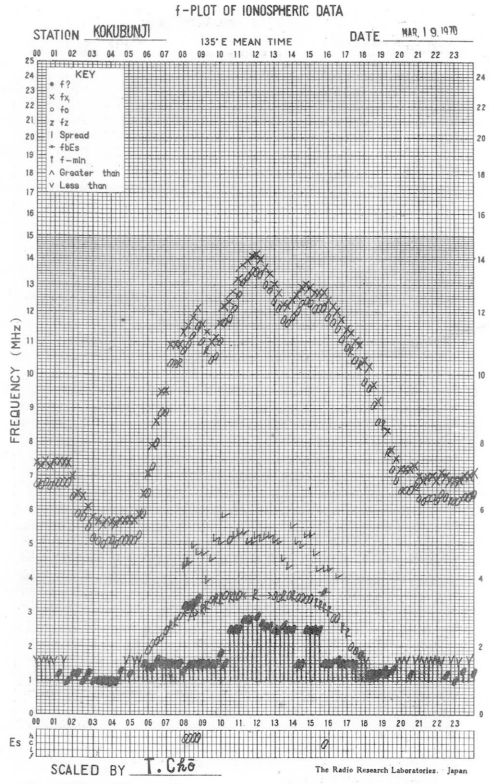
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR. 19. 1970
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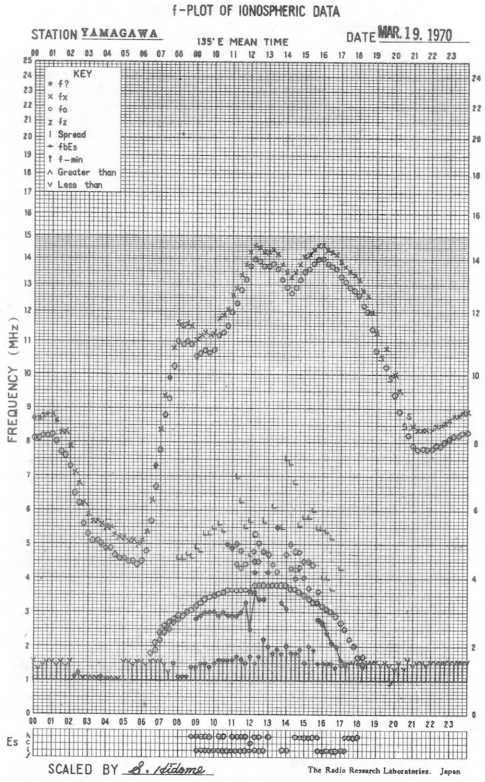
| Spread
⌁ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAR. 19. 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY A. Hidemi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE MAR 20 1970

KEY
• f?
× fx
○ fo
z fz
I Spread
⌁ fbEs
↑ f-min
∧ Greater than
∨ Less than

FREQUENCY (MHz)

Es

SCALED BY M. Kanamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Mar. 20. 1970

KEY
• f?
× fx
○ fo
z fz
I Spread
⌁ fbEs
↑ f-min
∧ Greater than
∨ Less than

FREQUENCY (MHz)

Es

SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE MAR 20 1970

KEY
• f?
× fx
○ fo
z fz
I Spread
⌁ fbEs
↑ f-min
∧ Greater than
∨ Less than

FREQUENCY (MHz)

Es

SCALED BY T. Cho

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE MAR. 20. 1970

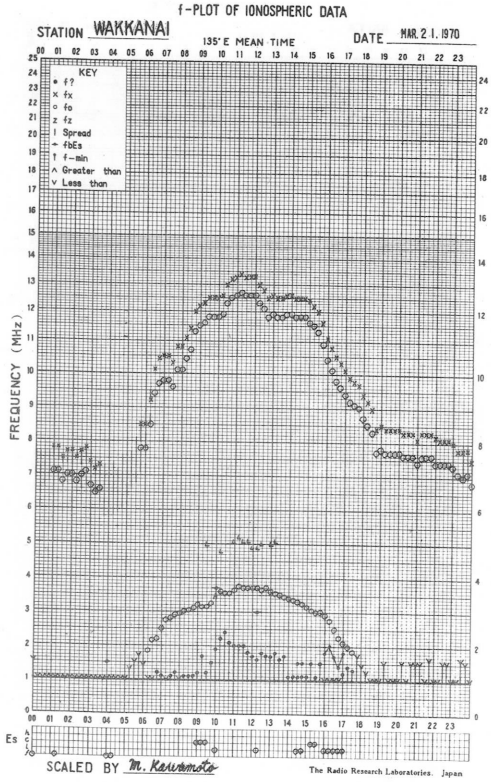
KEY
• f?
× fx
○ fo
z fz
I Spread
⌁ fbEs
↑ f-min
∧ Greater than
∨ Less than

FREQUENCY (MHz)

Es

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR. 21. 1970
KEY
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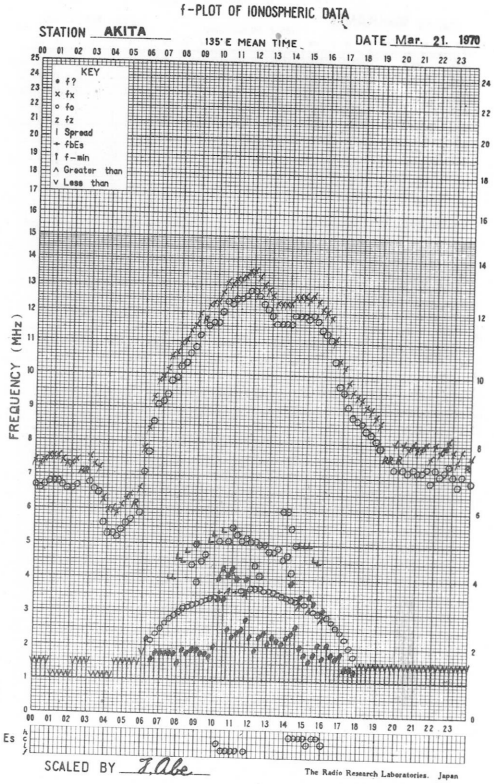
× fx
○ fo
z fz
I Spread
⌐ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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KEY
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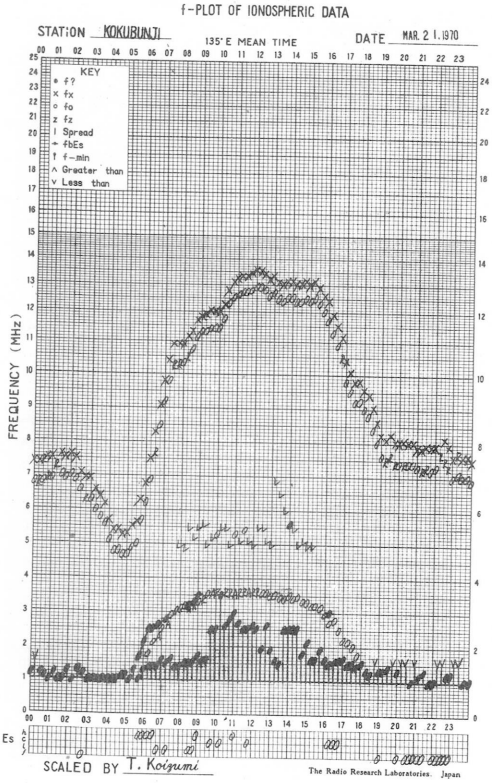
○ fo
z fz
I Spread
⌐ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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DATE MAR. 21. 1970
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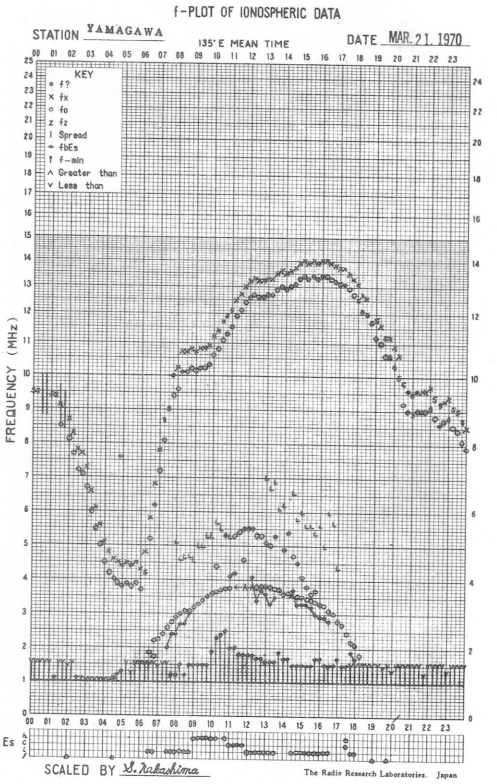
× fx
○ fo
z fz
I Spread
⌐ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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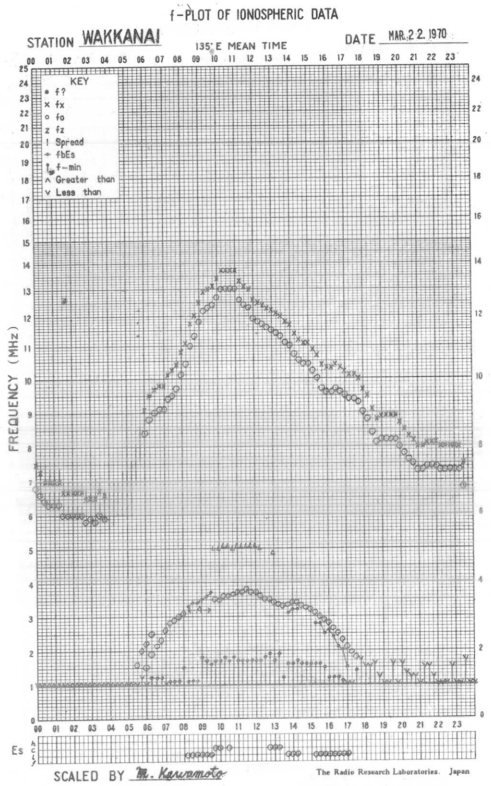
× fx
○ fo
z fz
I Spread
⌐ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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135°E MEAN TIME
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KEY
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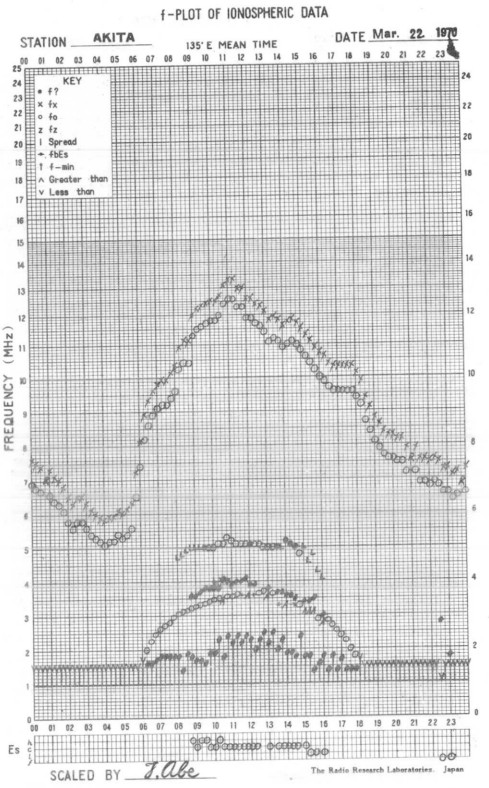
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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DATE Mar. 22. 1970
KEY
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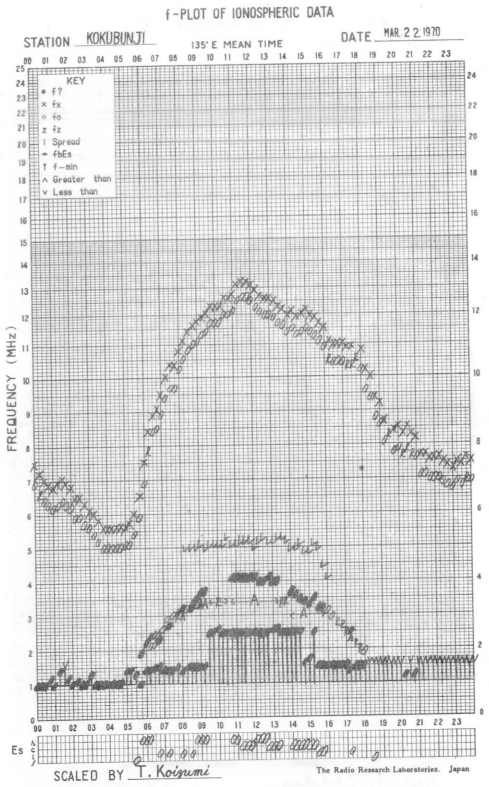
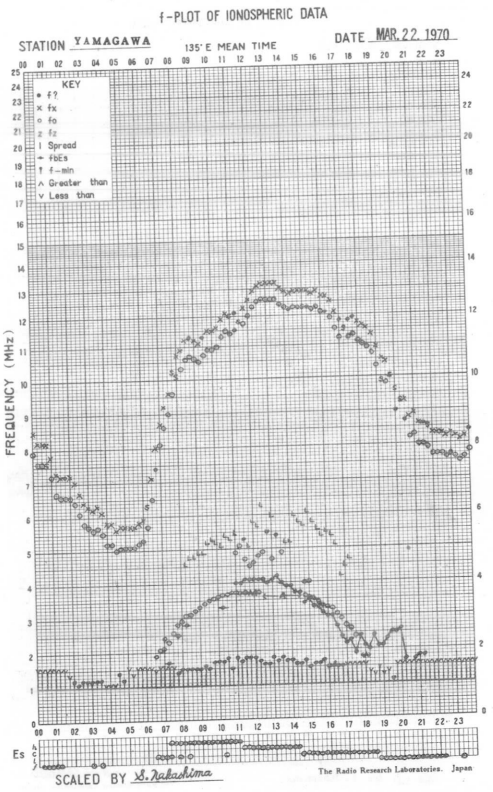
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE MAR. 22. 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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DATE MAR. 22. 1970
KEY
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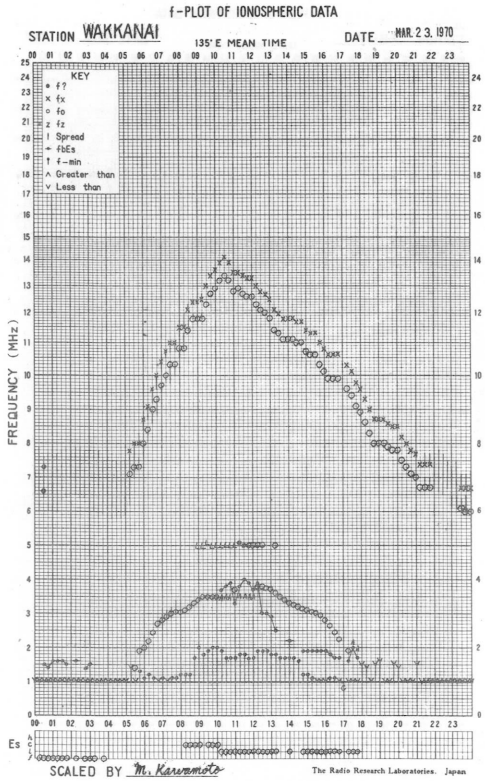
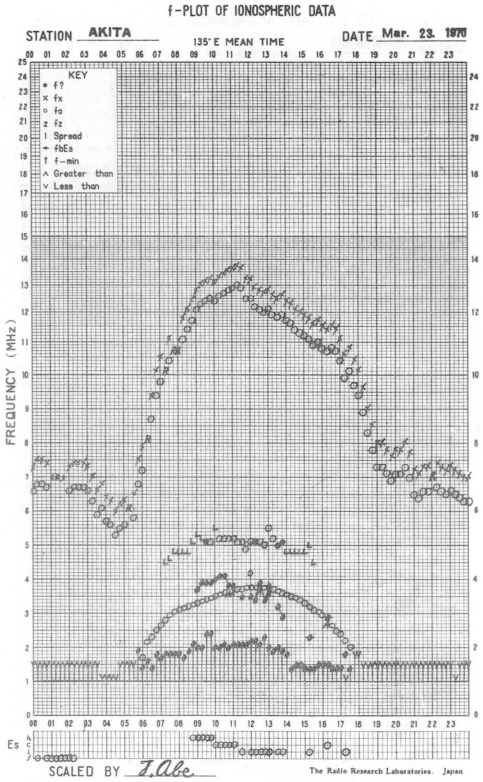
× fx
○ fo
z fz
| Spread
⊣ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Takashima
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAR. 2 3. 1970
KEY
● f?
× fx
○ fo
z fz
| Spread
← fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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STATION AKITA
135° E MEAN TIME
DATE Mar. 23. 1970
KEY
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○ fo
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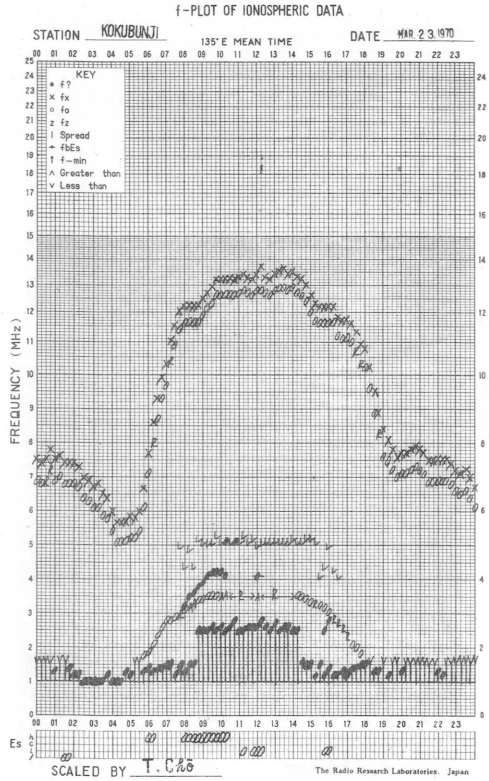
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE MAR. 2 3. 1970
KEY
● f?
× fx
○ fo
z fz
| Spread
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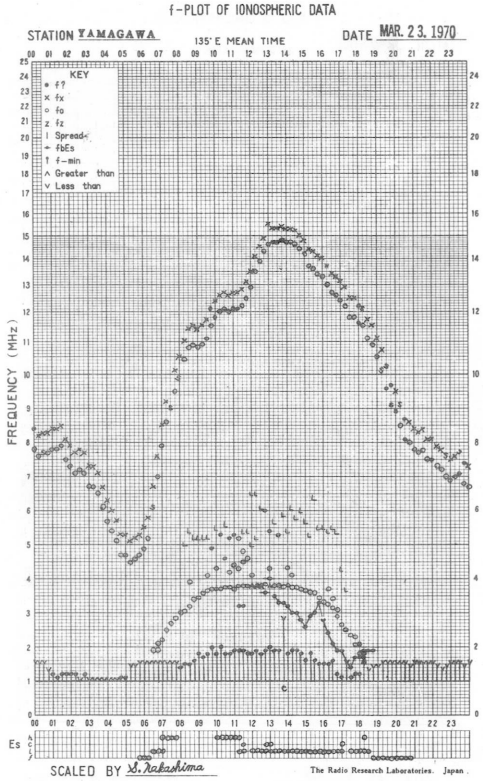
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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KEY
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○ fo
z fz
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v Less than
FREQUENCY (MHz)
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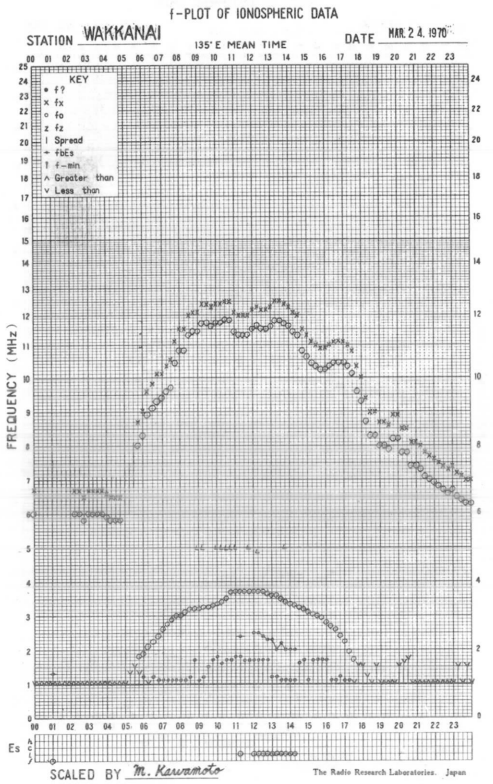
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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STATION WAKKANAI
135°E MEAN TIME
DATE MAR. 24. 1970
KEY
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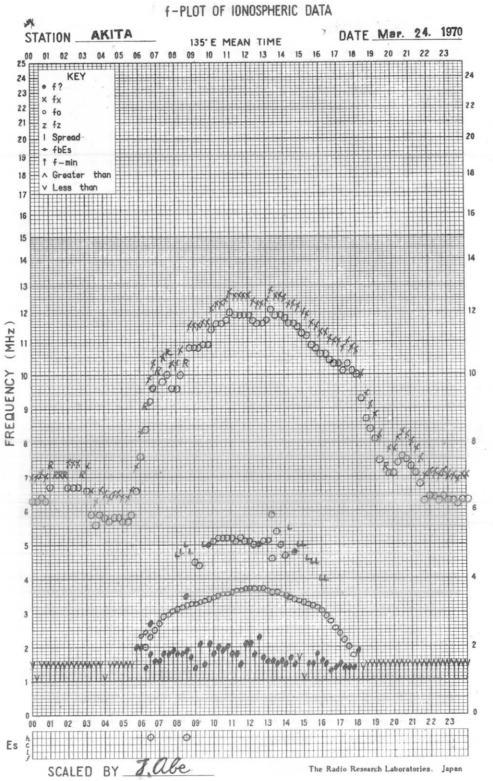
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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135°E MEAN TIME
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KEY
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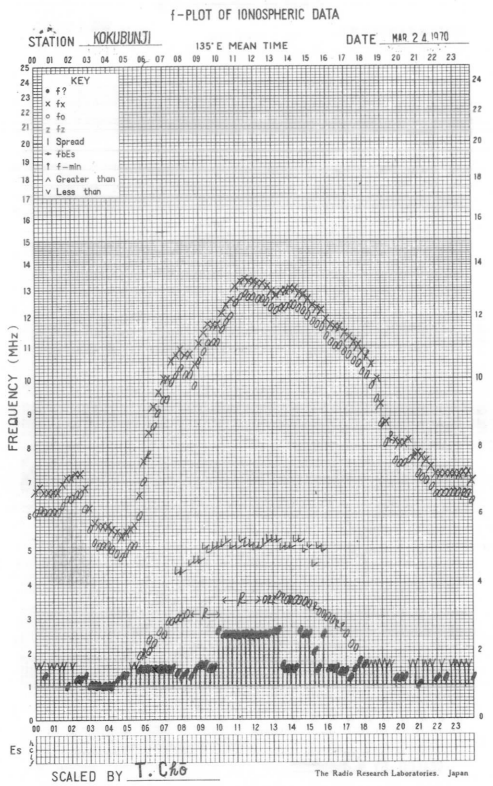
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY I. Abe
The Radio Research Laboratories. Japan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STATION KOKUBUNJI
135°E MEAN TIME
DATE MAR 24 1970
KEY
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× fx
○ fo
z fz
| Spread
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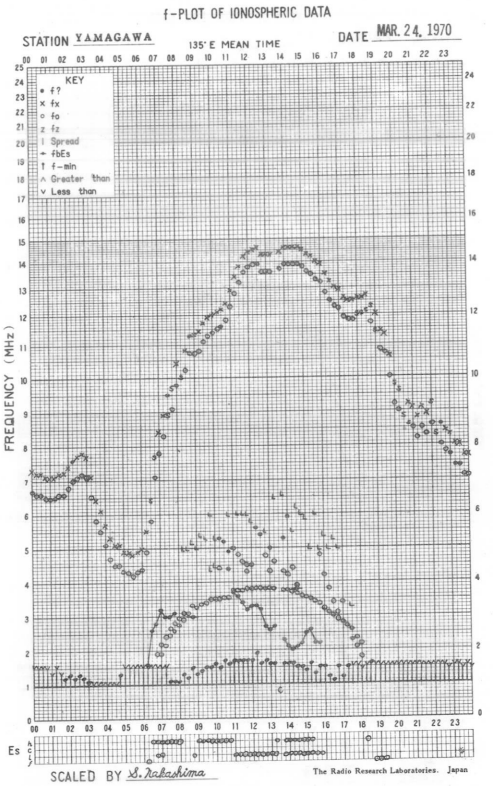
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR. 24, 1970
KEY
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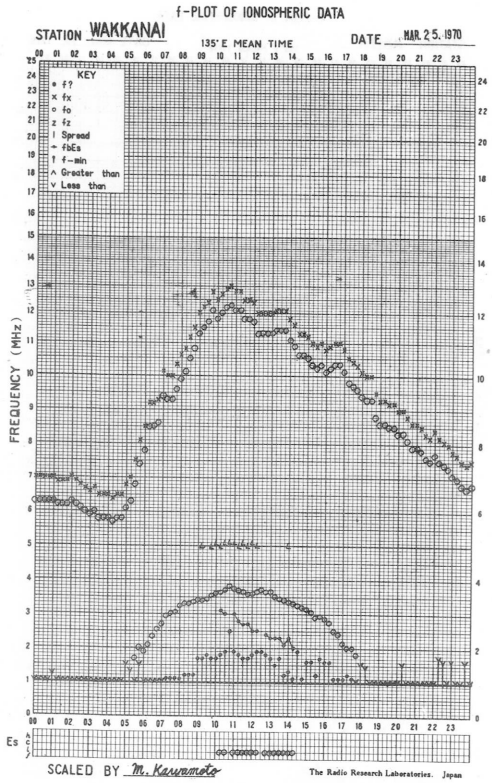
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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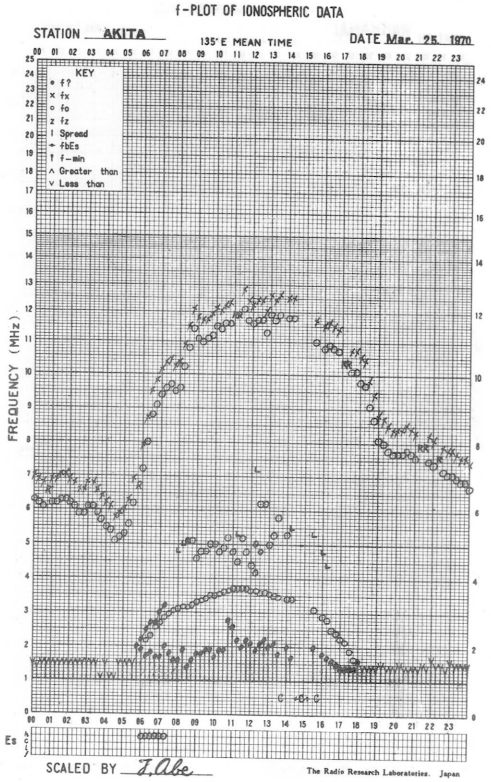
135°E MEAN TIME
DATE MAR 25 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE Mar. 25. 1970
KEY
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× fx
○ fo
z fz
| Spread
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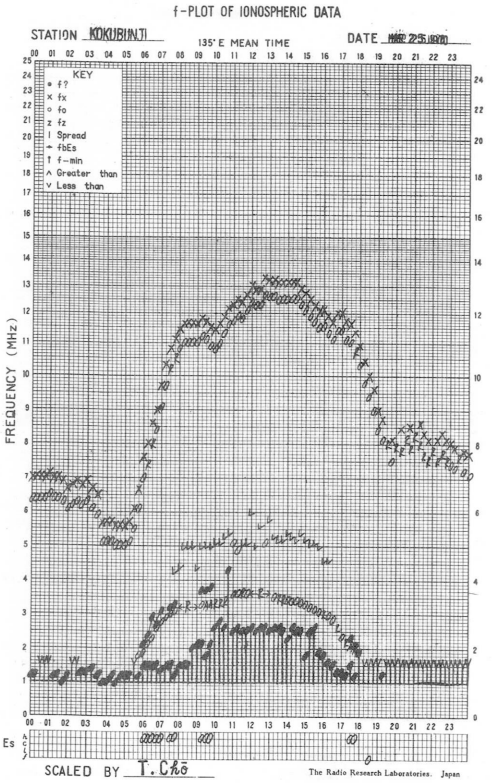
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE MAR 25 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
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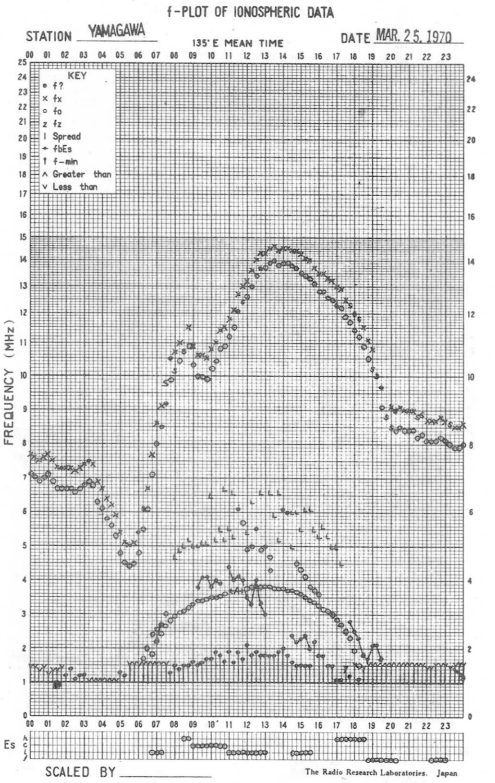
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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KEY
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× fx
○ fo
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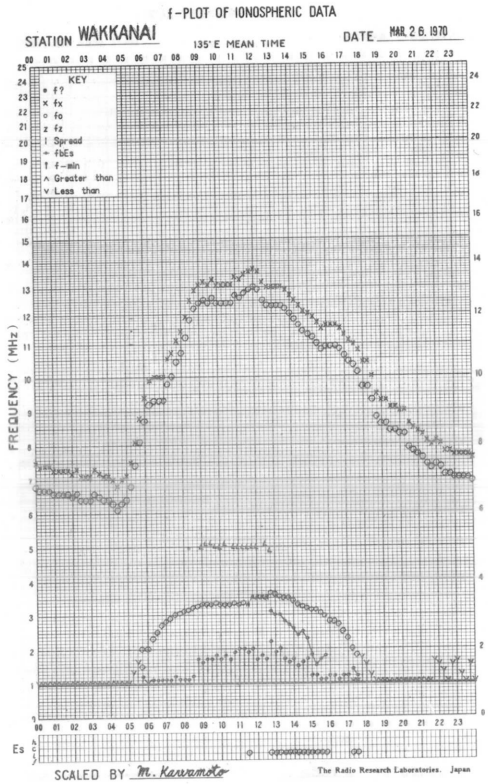
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY
The Radio Research Laboratories. Japan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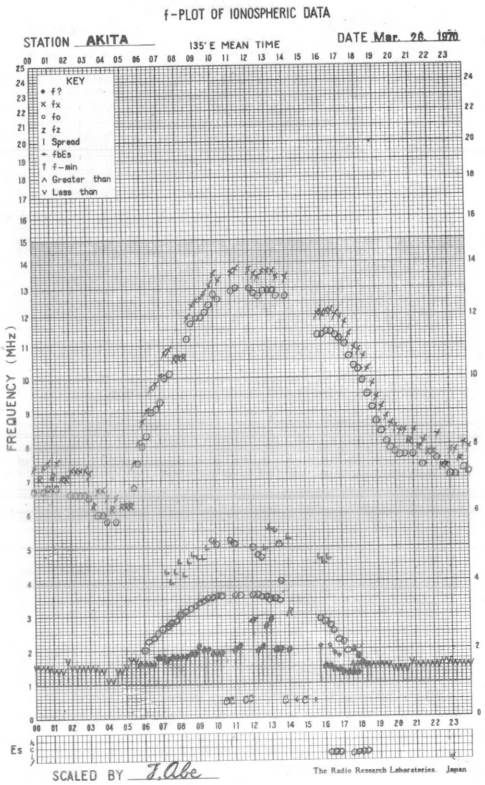
STATION WAKKANAI
135°E MEAN TIME
DATE MAR. 26. 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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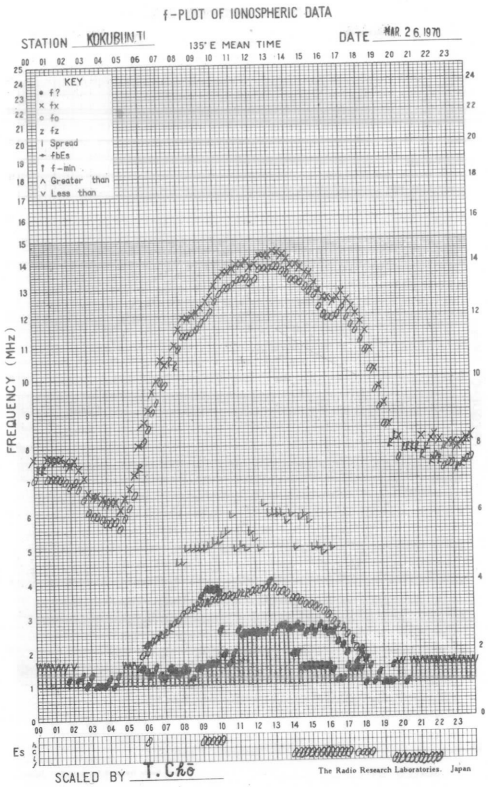
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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○ fo
z fz
| Spread
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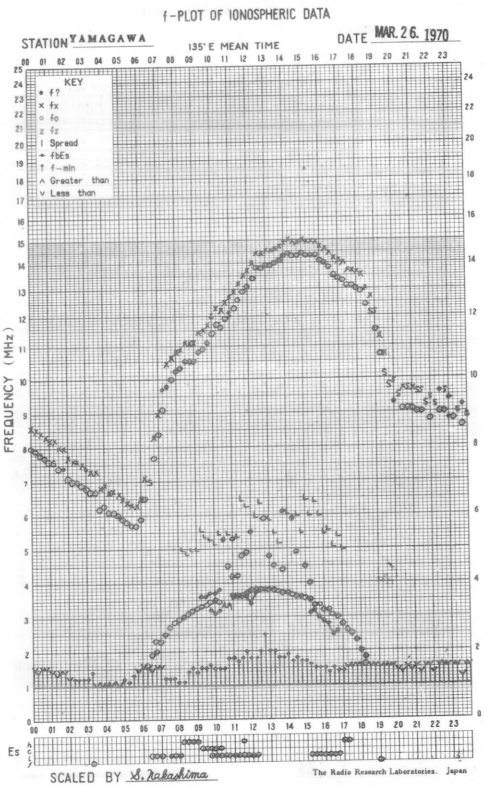
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Chō
The Radio Research Laboratories. Japan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DATE MAR. 26. 1970
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× fx
○ fo
z fz
| Spread
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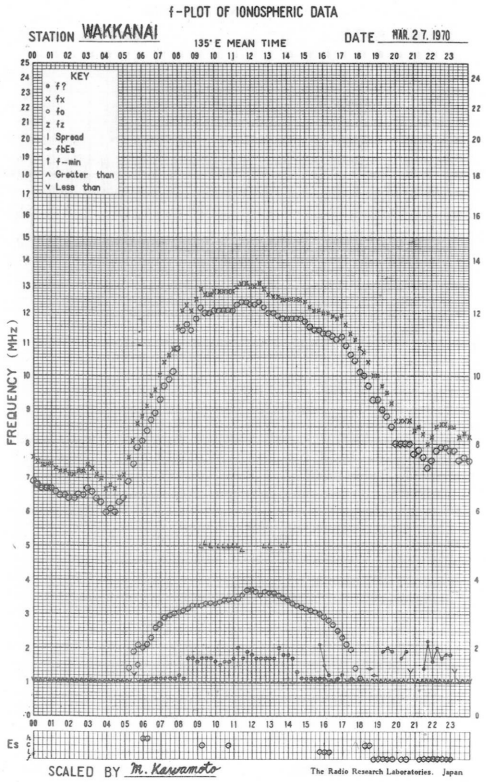
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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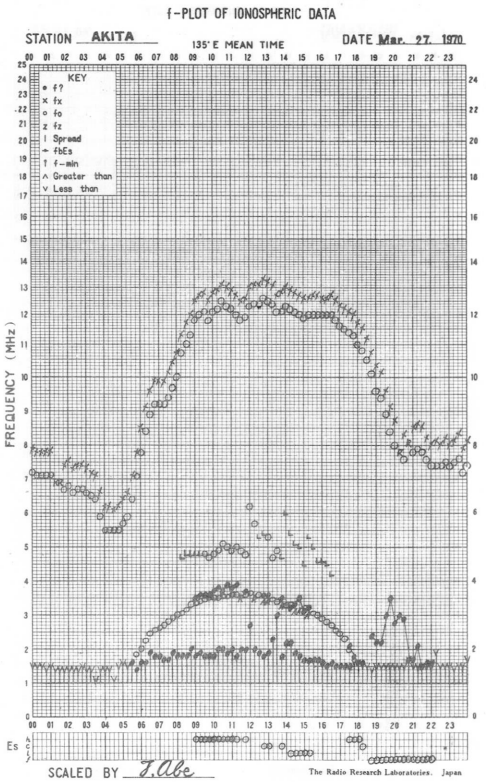
135° E MEAN TIME
DATE MAR. 27. 1970
KEY
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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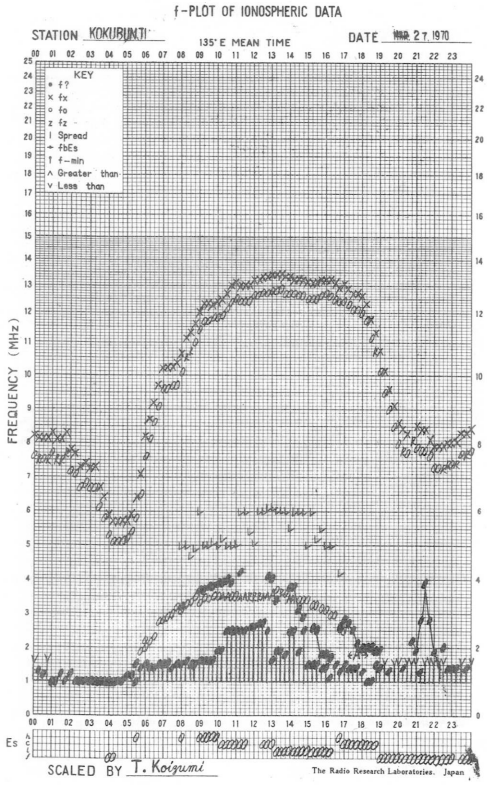
SCALED BY T. Abe
The Radio Research Laboratories. Japan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DATE MAR. 27. 1970
KEY
FREQUENCY (MHz)
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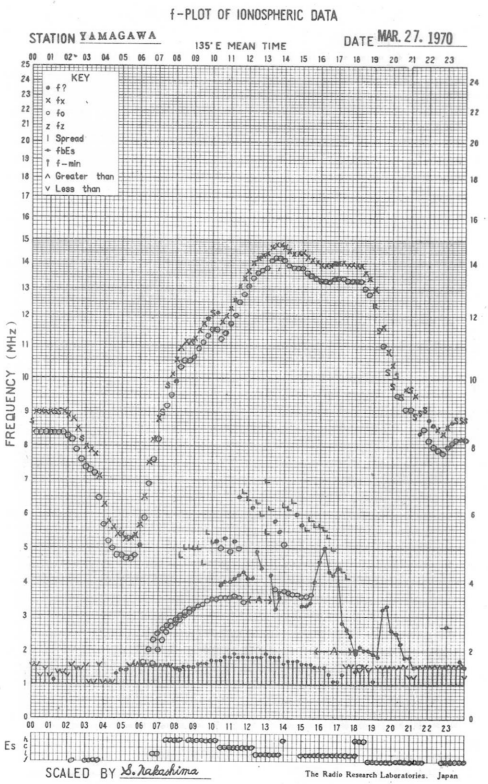
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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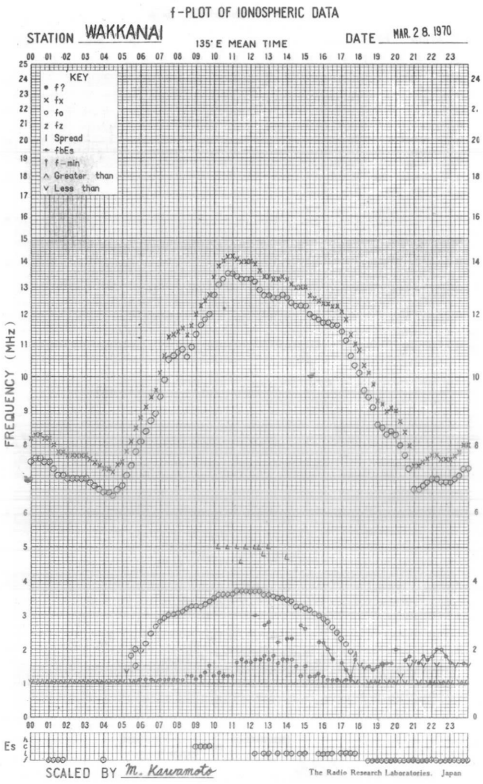
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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STATION WAKKANAI
135°E MEAN TIME
DATE MAR. 28. 1970
KEY
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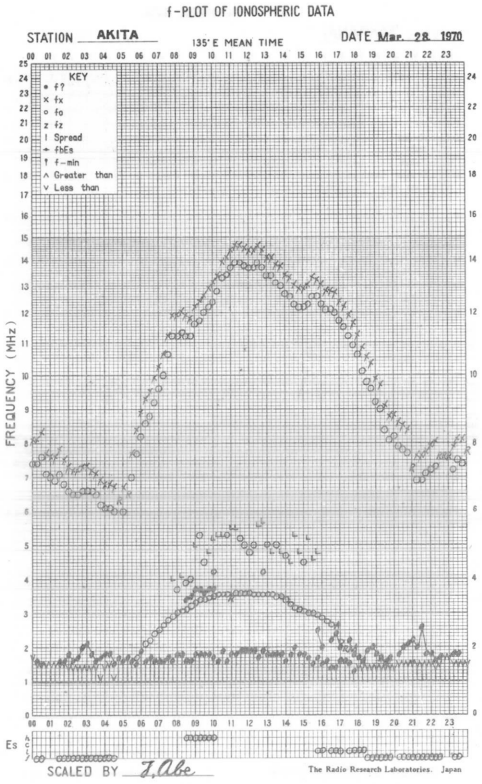
○ fo
z fz
| Spread
~ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan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○ fo
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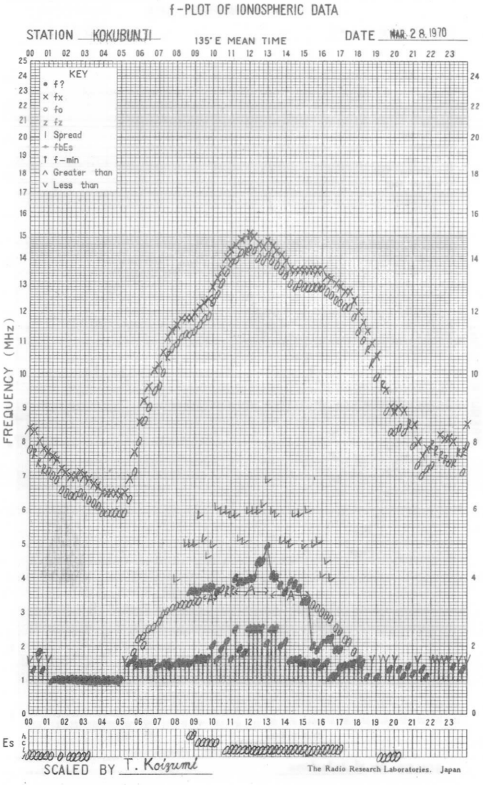
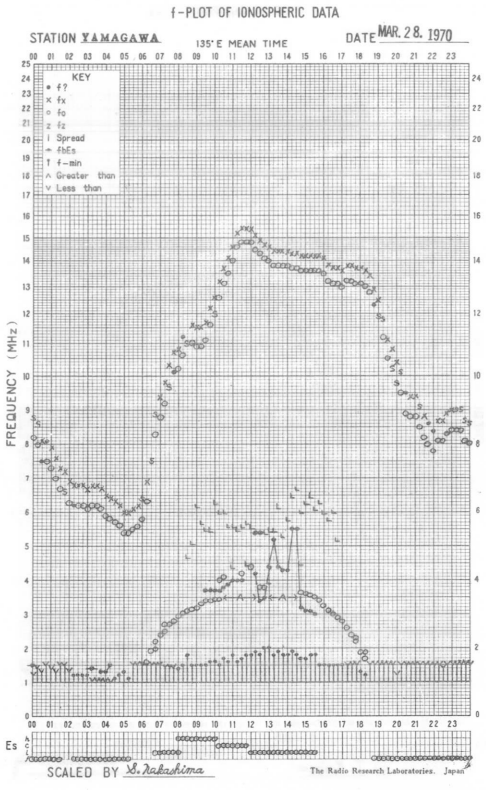
| Spread
~ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE MAR. 28. 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
~ fbEs
↑ f-min
∧ Greater than
∨ 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 MAR. 28. 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
~ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
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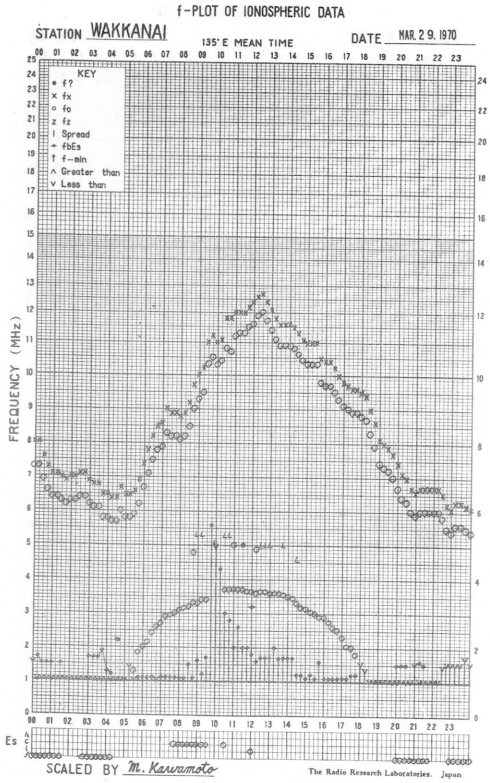
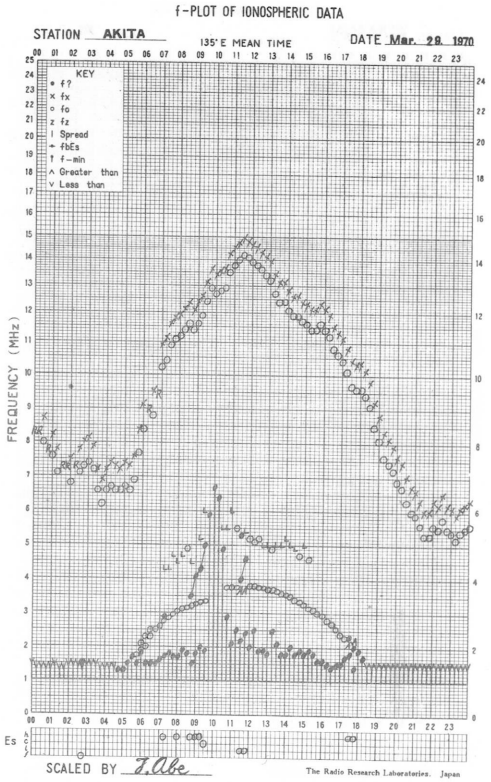
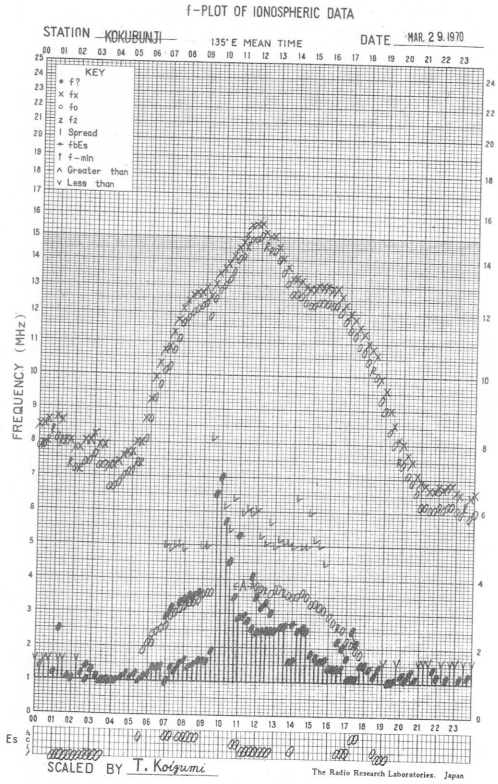

f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE MAR. 29. 1970
KEY
* f?
× fx
○ fo
z fz
! Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE Mar. 29. 1970
KEY
* f?
× fx
○ fo
z fz
! Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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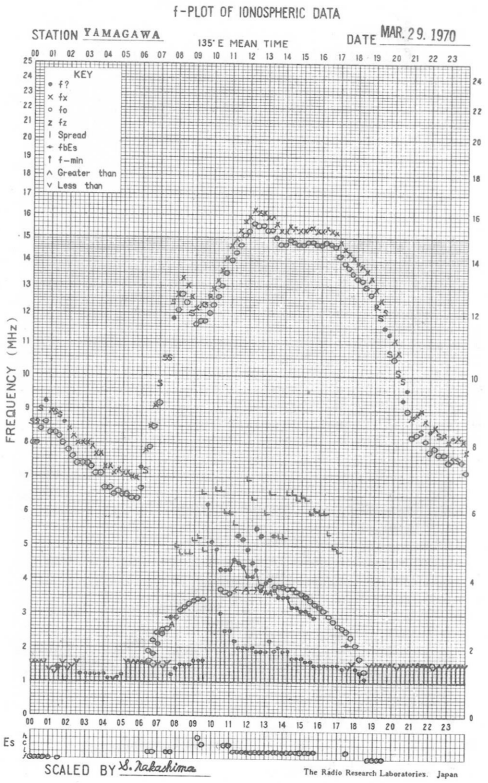
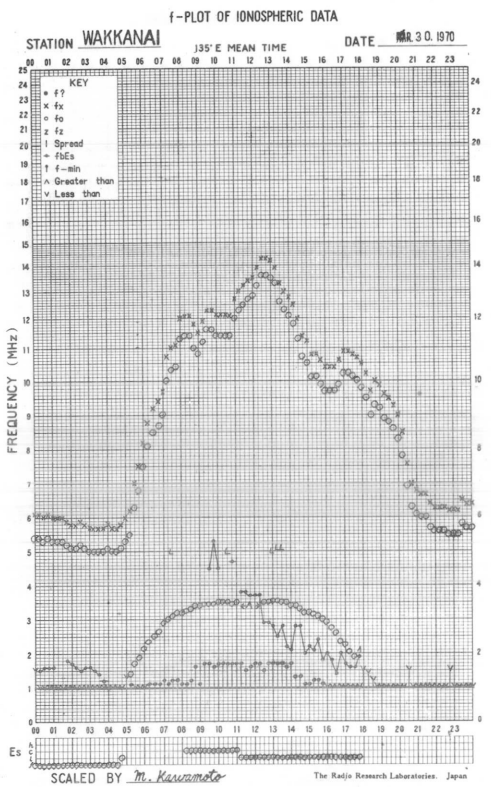
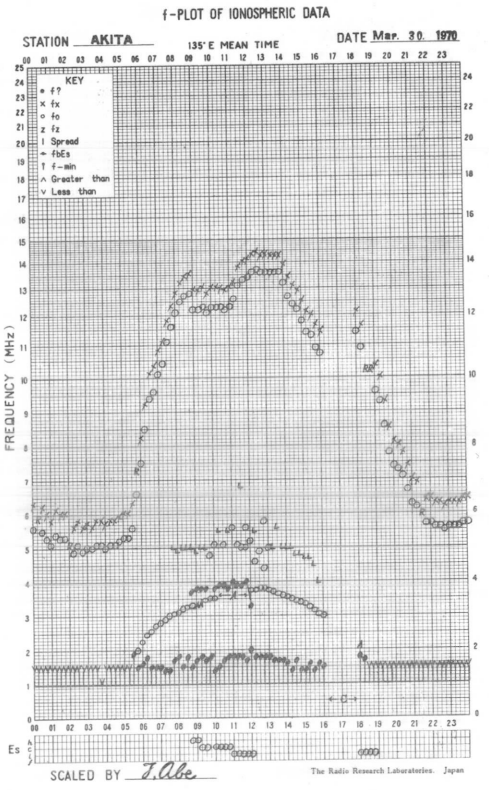
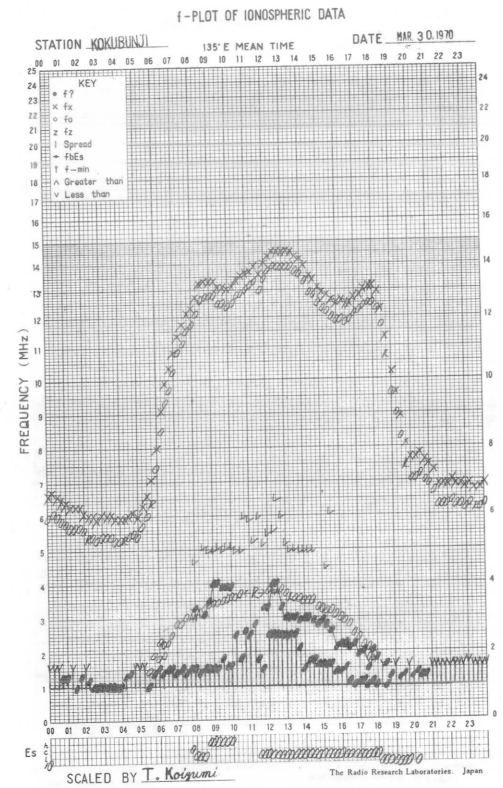
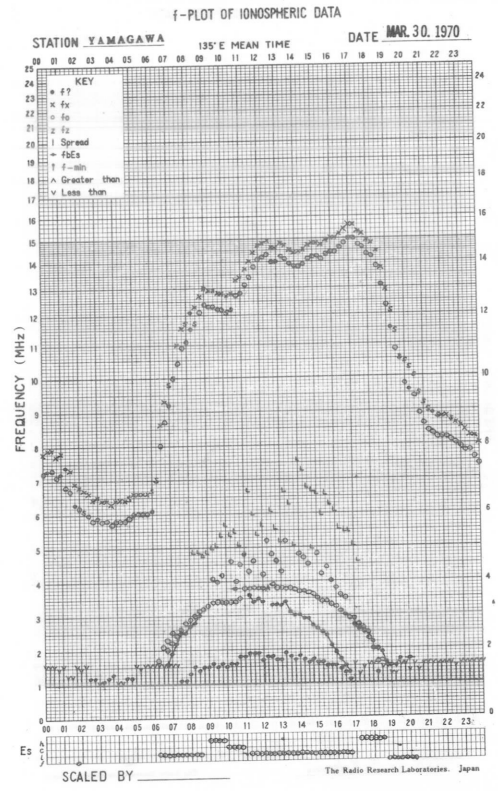
STATION KOKUBUNJI
135°E MEAN TIME
DATE MAR. 29. 1970
KEY
* f?
× fx
○ fo
z fz
! Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan

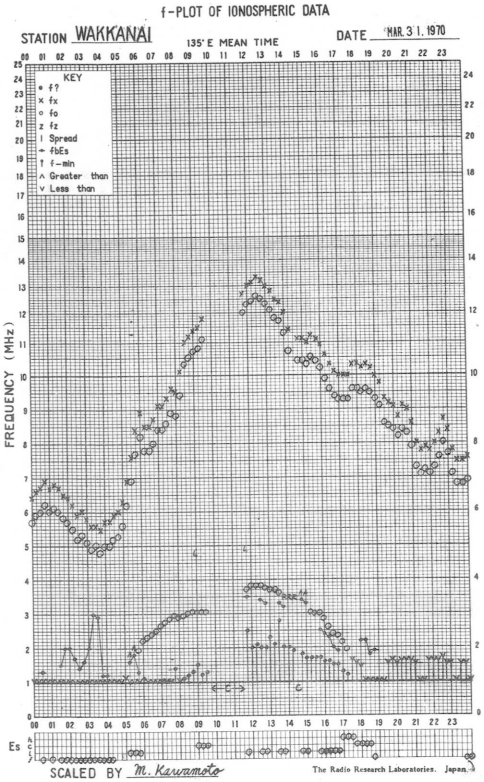

f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE MAR. 29. 1970
KEY
* f?
× fx
○ fo
z fz
! Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan

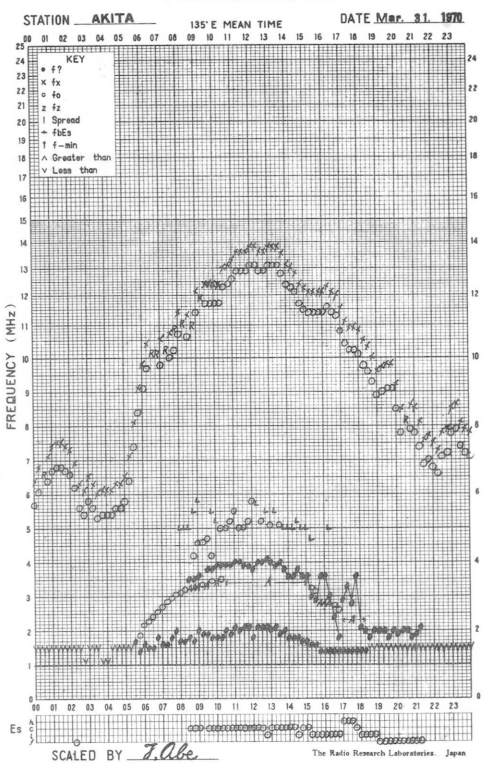

f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE MAR. 30. 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kasuamoto
The Radio Research Laboratories. Japan

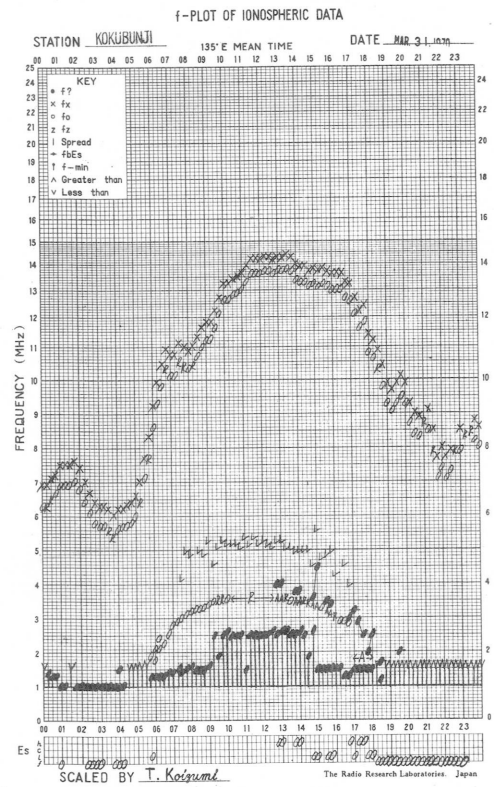

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE Mar. 30. 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan

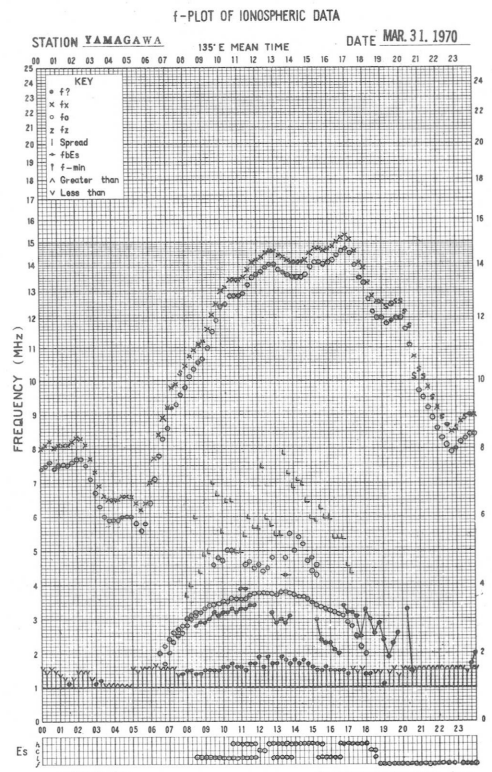

f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE MAR. 30. 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE MAR. 30. 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE MAR. 31, 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
⌐ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Kawamoto
The Radio Research Laboratories. Japan.


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE Mar. 31, 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
⌐ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE MAR. 31, 1970
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 MAR. 31, 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
⌐ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY
The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: March 1970
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	15	18	9	11	14	2	1	1	1	1
2	12	10	10	38	10	1	1	1	1	1
3	31	21	15	30	26	1	1	1	1	1
4	19	20	20	16	22	1	2	2	1	1
5	13	14	12	7	14	1	1	1	1	1
6	7	7	7	17	7	0	0	0	1	0
7	10	11	12	6	12	1	1	1	0	1
8	6	6	12	6	7	0	0	1	0	0
9	6	6	6	6	6	0	1	1	0	0
10	5	5	6	6	5	0	0	0	0	0
11	6	6	6	6	6	0	0	0	0	0
12	6	6	6	6	6	0	0	0	0	0
13	6	6	10	6	7	0	0	0	0	0
14	6	6	6	6	6	0	0	0	0	0
15	6	6	6	6	6	0	0	0	0	0
16	6	7	6	5	6	0	0	0	0	0
17	6	7	7	7	7	0	0	0	1	0
18	7	6	6	7	6	0	0	1	0	0
19	6	6	6	7	6	0	0	0	0	0
20	6	6	5	6	6	0	0	0	0	0
21	6	5	6	5	6	0	0	0	0	0
22	5	5	5	5	5	0	0	0	0	0
23	6	6	6	6	5	0	0	0	0	0
24	5	5	6	-	5	0	0	0	-	0
25	7	6	(6)	7	6	0	0	(0)	0	0
26	6	6	7	7	7	0	0	0	0	0
27	7	7	(7)	6	7	0	0	(0)	0	0
28	7	7	6	7	7	0	0	0	0	0
29	6	6	6	7	6	0	0	0	0	0
30	6	6	7	5	7	0	0	0	0	0
31	5	5	5	5	5	0	0	0	0	0

Note No observations during the following periods:

17th 2330- 2355
24th 2050- 25th 0100
25th 0610- 0700
27th 0700- 0840

SOLAR RADIO EMISSION

Flux Density

Month: March 1970
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	32	31	34	30	32
2	33	33	34	31	33
3	32	32	32	-	32
4	35	37	41	37	37
5	36	36	35	32	36
6	33	34	34	-	33
7	37	37	37	31	37
8	33	33	36	33	33
9	33	34	34	30	33
10	31	32	33	30	32
11	31	32	33	29	32
12	32	33	32	29	31
13	33	34	34	32	32
14	32	31	31	29	32
15	32	34	33	31	32
16	33	33	33	31	33
17	32	33	32	33	32
18	35	34	32	33	34
19	33	33	30	32	32
20	33	32	31	29	32
21	32	31	30	-	31
22	32	32	31	-	32
23	33	q	33	32	33
24	33	32	33	32	32
25	32	33	33	33	33
26	35	34	34	33	34
27	34	34	34	31	34
28	31	31	30	31	31
29	31	32	34	33	32
30	34	34	34	31	34
31	33	33	34	31	33

Note No observations during the following periods:

3rd 2050- 4th 0010
6th 2050- 7th 0005
21st 2050- 22nd 0100
22nd 2050- 23rd 0010

"q" means quiet level, radiometer being unstable.

Distinctive Events

(single-frequency observations)

Month: March 1970
Observing station: Hiraiso
Normal observing period: 2050 - 0840 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22}Wm^{-2}(Hz)^{-1}$		Remarks
	MHz	UT	UT	minutes		peak	mean	
1	500	0244.0	0245.3	10.0	C	810	150	
	200	0243.0	0244.0	8.0	C	(1200)	(40)	* 0243-45
	500	0330.6	0332.0	2.5	C	320	180	
		0426.2	0426.6	1.0	C	740	500	
		0432.0	0434.0	6.0	C	540	40	
		≥0500.0	0502.0	≤ 10.0	C	(5900)	(820)	* 0503-04
	200	0501.0	0505.0	7.0	C	> 1250	> 330	
	100	≥0500	0507.0	≤ 80	RF	> 350	> 10	* 0547.5-48.5
	500	0551.6	0617.8	45.0	C	110	40	
		0808.6	0809.5	1.5	C	1190	310	
	200	0808.0	0809.0	2.0	C	370	70	
		2142.0	2143.0	2.0	C	420	60	
	500	2236.3	2242.0	7.0	F	80	10	
	200	2239.0	2239.5	1.5	C	280	40	
	500	2310.5	2319.8	33.0	F	550	25	
	200	2332.0	2338.0	11.0	C	260	30	
2	500	0028.0	0028.0	2.0	C	360	20	
	200	0028.0	0028.5	2.0	C	330	60	
	100	0028.0	0029.0	2.0	C	> 365	> 185	
	500	0040.3	0046.0	10.0	C	520	80	
	200	0046.0	-	6.5	C	(770)	(40)	* 0047-49
	500	0110.0	0110.0	96.0	F	520	10	
		0335.0	0340.5	20.0	F	80	10	
	200	0339.5	0340.0	2.0	C	390	110	
	500	0433.5	0438.5	7.0	C	85	20	
	200	0436.0	0438.0	4.5	C	390	80	
		0638.0	0640.5	5.0	C	140	20	
3	500	0630.7	0638.2	10.0	C	140	10	
	200	0630.5	0644.0	81	C	50	20	
	100	0627.0	0631.5	10.0	C	310	70	
	500	0643.9	0644.4	7.0	C	45	20	
	100	0643.0	0644.5	5.0	C	> 300	> 100	
4	500	0054.5	0056.0	3.5	C	200	50	
		0608.5	0611.0	4.0	C	160	25	
5	500	0028.0	0028.0	1.0	C	70	55	
	200	0028.5	0028.8	0.5	C	420	190	
	100	0028.0	0028.5	1.5	C	> 350	> 100	
		0042.0	0042.5	1.0	C	> 350	> 60	
6	100	0643.5	0644.0	1.5	C	390	100	
		2109.5	2110.5	2.0	C	> 330	> 60	
7	200	0115.5	0120.0	8.0	C	380	30	
	100	0116.0	-	7.0	C	> 340	> 60	
	500	0141.0	0148.0	19.0	C	110	25	
	200	0141.0	0144.0	21.0	C	2100	50	

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22}Wm^{-2}(Hz)^{-1}$		Remarks
	MHz	UT	UT	minutes		peak	mean	
7	100	0139.5	-	25.5	C	> 360	> 150	
	500	0722.1	0724.0	2.5	C	150	25	
	200	0720.0	0722.0	5.0	C	610	45	
	100	0720.0	0723.0	5.5	C	> 450	> 130	
		0816.0	0818.0	5.0	C	> 450	> 110	
8	500	0659.7	0659.7	0.3	C	70	-	
	200	0658.0	0659.8	2.0	C	230	45	
	100	0658.0	0659.0	3.0	C	> 340	> 60	
	500	0703.5	0703.6	2.0	C	20	5	
	200	0702.5	0703.5	2.0	C	50	15	
	100	0702.5	-	2.0	C	> 330	> 110	
9	500	0340.0	0340.5	1.0	C	540	240	
	200	0340.2	0340.5	0.7	C	60	20	
	100	0340.0	0340.4	1.0	C	> 340	> 100	
10	100	0412.0	0412.3	1.0	C	> 380	> 160	
		2156.5	-	12.0	C	> 390	> 23	
12	500	0306.5	0310.5	14.0	C	50	10	
	200	0306.0	0307.0	31.0	C	40	5	
	100	0306.0	0306.0	34.0	C	150	5	
14	200	0406.0	0406.0	1.0	C	170	55	
	100	0406.3	0406.5	1.0	C	100	20	
	200	0707.0	0707.5	4.0	C	260	70	
	100	0707.0	0707.5	2.0	C	> 230	> 30	
15	100	0031.7	0033.5	4.5	C	> 230	> 20	
		0348.7	0351.0	6.5	C	> 230	> 10	
		0634.0	0635.0	1.5	C	> 230	> 65	
		0752.7	0753.0	3.5	C	> 230	> 30	
17	200	2239.0	2239.5	2.5	C	270	10	
	100	2240.7	2241.5	1.7	C	> 180	> 40	
	500	2248.6	2249.6	> 4.5	C	85	10	* 2253.5-54.5
	200	2250.0	2252.8	4.5	C	70	15	
18	500	0727.5	0729.7	5.5	C	15	8	
	200	0716.0	0717.0	5.5	C	310	20	
	100	0715.2	0717.0	6.0	C	> 210	> 100	
27	100	0021.5	0023.5	6.0	C	> 250	60	
29	500	0036.0	0059.4	92.0	C	8000	110	
	200	0034.0	0103.2	138	C	> 13300	> 1100	
	100	0038.7	-	139	C	> 3000	-	
30	500	0625.5	0626.8	3.0	C	20	8	
	200	0625.0	0630.8	9.0	C	10	4	
	100	0629.5	0632.0	4.2	C	> 270	30	

* Interrupted by calibration.

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

MAR 1970 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	3	11	6	12	19	10	-3	2	ES -3	ES -15	ES 0	5	11	7	8	3	ES -33	-12	15	2	-3	7	6	6
2	1	7	12	13	6	-3	ES -8	ES -9	ES -1	ES 3	ES -7	ES -10	ES -9	ES -4	-4	-6	ES -8	ES -34	ES -34	ES -34	-3	1	2	5
3	2	2	8	9	18	15	ES -18	-14	ES -14	ES -8	ES 6	ES 2	ES 2	ES -12	-9	ES -34	ES -34	ES -34	ES -17	ES -34	0	-2	1	-4
4	3	0	6	7	13	21	17	ES -3	ES -5	ES -3	ES -3	-14	3	6	23	19	15	-3	-4	ES -34	-4	4	2	2
5	2	7	8	ES 12	18	16	17	ES -3	ES 2	ES -7	ES 2	ES 2	ES 7	ES -9	7	4	ES -6	1	2	ES -34	-3	2	3	2
6	3	6	5	14	17	23	23	8	1	ES -3	ES -2	ES 0	1	3	12	-7	-13	-19	ES -34	ES -34	ES -34	4	7	3
7	4	3	3	10	3	-8	9	7	ES -3	ES -2	ES 2	-6	ES -8	ES -9	ES 4	ES -5	ES -33	ES -33	ES -33	ES -33	-5	3	4	8
8	6	7	10	19	11	ES -10	ES -9	ES -3	ES 3	ES -6	ES 3	ES -3	ES 2	ES 2	ES -11	ES -34	ES -34	ES -34	ES -34	ES -34	ES -34	ES -34	2	-4
9	ES -19	ES -11	ES -10	ES -11	ES -5	ES -19	1	-1	ES -9	ES -11	ES 1	ES -5	ES -2	ES -7	ES -9	ES -19	ES -13	ES -8	ES -34	-7	-2	-2	-1	-3
10	3	-2	2	6	6	17	-15	ES -11	ES -11	ES 3	ES -5	ES 1	ES -3	ES -11	ES -8	-13	ES -16	1	ES -19	ES -17	-9	-12	-13	-4
11	ES -10	ES 2	-4	-2	7	13	1	-2	ES -4	ES -2	ES 3	ES -6	ES -12	ES -8	-2	-5	ES -8	9	-1	ES -33	-2	-6	-8	ES -8
12	-11	-4	4	-11	12	9	ES -4	C	ES 3	ES -3	ES 2	ES -10	-11	-7	2	0	5	0	ES -34	ES -34	-9	-9	1	5
13	-9	-2	4	13	14	26	C	ES -3	ES -2	ES -3	ES -6	-2	-7	-1	21	11	0	-8	5	4	-9	-17	-4	6
14	ES -10	0	2	5	5	16	2	-1	-1	-5	ES -4	ES 1	ES -12	-6	-2	1	7	12	3	ES -19	-1	0	2	3
15	4	6	7	12	18	16	13	5	7	4	6	-6	C	-6	-6	-5	6	13	12	8	-16	2	-2	8
16	0	3	8	11	18	23	5	1	ES -3	-8	1	ES -6	-5	-4	1	3	-4	15	10	3	4	6	11	7
17	2	5	6	10	16	23	17	0	-1	ES -4	-4	ES -24	ES -13	ES -6	-6	6	-3	1	7	-5	-7	7	12	7
18	6	1	3	6	13	22	23	2	ES 3	2	ES 2	ES 0	ES -13	-2	11	5	-2	7	6	6	4	8	8	4
19	-6	ES -11	-1	5	12	17	16	-1	ES 7	ES 0	ES 3	ES -11	ES -13	-6	US 27	9	8	13	16	3	0	7	4	3
20	4	3	8	11	11	16	27	ES -3	ES 2	-3	ES 1	2	ES -10	ES -8	-5	-2	13	16	9	12	6	6	7	6
21	5	0	5	11	21	21	21	1	0	-4	2	ES 2	ES -13	ES -4	-4	-7	4	7	10	5	1	6	2	7
22	6	3	11	12	13	21	17	-2	ES -1	ES 2	ES -1	ES -2	ES 2	-1	4	2	11	12	10	1	4	3	4	4
23	-3	2	7	11	12	16	21	21	-3	-4	1	-3	-11	4	7	2	4	13	10	2	2	5	5	7
24	5	8	7	12	14	21	28	27	22	-1	-2	ES 1	ES -18	19	1	-4	5	11	10	8	4	4	1	5
25	0	0	10	10	16	22	24	26	3	3	2	3	ES 6	24	0	-1	5	2	7	7	5	0	8	7
26	3	5	12	14	16	23	29	28	26	5	3	0	ES 3	16	2	22	3	1	3	2	1	0	1	0
27	0	8	0	0	9	3	5	4	ES -35	1	5	4	2	6	6	12	18	28	21	16	4	-1	0	0
28	1	4	11	14	19	24	20	9	24	27	5	0	ES 5	21	6	4	15	1	20	14	15	10	10	8
29	4	ES -27	4	16	4	-10	-7	-4	2	1	1	-5	ES -16	-6	-8	ES -7	-7	-14	-10	-6	20	8	10	6
30	11	5	6	12	18	11	-5	-5	-1	1	7	-2	9	-7	6	12	6	12	ES -20	ES -17	6	4	5	1
31	2	1	7	9	22	16	-2	-4	ES -12	ES 1	4	1	15	-1	7	2	-9	ES -9	5	-12	-5	-2	4	2
CNT	31	31	31	31	31	31	30	30	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31
MED	2	3	6	US 11	13	16	11	-1	ES -1	ES -2	ES 2	ES -2	ES -4	US -4	US 2	1	0	1	5	-5	-1	3	3	4
UD	6	8	11	14	19	23	27	26	22	4	ES 6	3	9	19	21	12	15	15	16	12	6	8	10	8
LD	ES -10	ES -11	-1	ES -2	4	-10	ES -9	ES -9	ES -12	ES -8	ES -5	ES -11	ES -13	ES -9	ES -9	ES -19	ES -33	ES -34	ES -34	ES -34	-16	-12	-4	-4

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

MAR 1970 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	-2	-5	2	7	9	23	18	27	28	28	12	20	5	-2	-13	ES -33	ES -33	10	18	-1	3	0	-4	-7
2	-9	-4	2	8	11	20	25	16	20	20	2	-9	ES -3	1	-11	ES -4	ES -7	ES -34	ES -34	ES -34	6	1	-6	-4
3	-5	-4	1	6	15	19	22	21	23	17	16	9	ES -8	ES -5	ES -35	ES -34	ES -34	-19	ES -34	ES -34	ES -16	-1	-12	-6
4	-3	-10	-7	5	8	17	18	21	28	28	1	0	1	-4	-9	-11	ES -12	12	5	-13	6	-3	2	-3
5	ES -5	-4	1	ES 8	-5	19	22	22	24	27	2	12	17	-7	-9	ES -8	ES -6	20	7	-19	0	-1	-3	-3
6	-3	-3	-2	5	10	19	17	17	21	19	2	ES 3	23	17	-7	ES -23	ES -34	25	-23	-23	1	-1	-5	-4
7	-4	-14	-6	7	10	15	25	17	17	ES -4	-4	-4	-3	-4	ES -7	ES -33	ES -33	ES -33	ES -33	-9	10	4	-2	-4
8	-6	-1	2	8	14	20	23	20	28	23	18	17	17	-2	-3	ES -34	ES -34	ES -34	11	-19	-5	-3	-3	-4
9	ES -8	0	-1	8	12	12	23	-1	-1	ES -5	-1	ES 1	ES 2	ES -7	ES -9	ES -8	ES -8	ES -34	ES -34	6	-2	-2	-1	-3
10	3	-5	2	6	9	16	19	18	19	22	13	21	12	ES -9	ES -8	ES -11	ES -19	1	ES -17	-1	5	-3	1	ES -4
11	ES -2	-4	1	3	12	17	22	18	25	15	15	12	12	ES -8	ES -2	ES -7	ES -12	9	ES -33	-2	4	0	-2	C
12	-4	-4	2	2	12	16	23	26	24	23	5	10	-5	-8	-3	-2	ES -10	-26	ES -34	-4	6	0	-5	-2
13	-2	-7	2	7	16	19	29	24	27	27	23	24	3	0	1	ES -9	-20	17	12	4	6	1	2	-4
14	-9	-1	5	2	9	20	21	23	23	22	20	16	2	ES -9	-11	ES -12	ES -19	10	-17	6	6	1	-3	-1
15	-2	-2	2	7	9	24	22	21	23	23	24	0	C	-8	-9	ES -13	ES -16	21	22	5	7	2	-3	-3
16	-3	-3	4	10	10	17	21	19	26	16	17	2	2	1	-14	ES -9	ES -7	12	-9	2	8	3	-3	-3
17	-2	-4	-2	7	12	16	26	22	21	28	5	18	2	ES -1	ES -14	-8	ES -13	28	ES -25	0	7	5	-3	-1
18	-2	-2	0	7	12	23	26	15	27	27	27	20	19	-4	-9	ES -2	-8	5	14	3	6	3	2	1
19	ES -6	-1	0	3	16	22	18	26	20	27	20	15	16	-6	ES -13	ES -9	ES -19	13	-14	0	4	1	0	-4
20	-2	-2	2	8	17	17	28	18	28	29	22	ES 7	ES 1	ES -5	ES -18	ES -9	ES -11	8	12	5	11	3	3	-2
21	-3	ES -16	-2	9	11	21	22	26	26	26	17	16	20	27	-12	-7	ES -23	23	16	1	7	2	-2	-3
22	-9	0	5	8	13	16	29	24	27	28	17	26	21	18	1	ES -4	ES -9	21	12	4	2	0	0	-5
23	ES -13	-3	0	7	12	17	20	26	21	26	23	19	21	3	-7	ES -3	-7	23	-9	3	2	0	-4	2
24	-8	-2	0	7	15	21	24	29	28	32	22	23	29	10	-8	ES -7	ES -10	20	10	3	3	-1	-4	-5
25	-7	ES -24	1	6	14	22	25	25	21	25	18	21	28	23	-5	-9	-9	19	15	3	1	-2	-2	-1
26	-5	-2	1	5	11	24	23	26	27	23	20	20	23	21	16	12	24	18	9	2	1	1	-1	ES -7
27	25	14	1	3	-8	15	15	2	-6	-3	-3	-1	-5	-4	1	6	16	19	24	23	26	24	27	23
28	20	10	23	5	13	19	23	25	25	21	27	20	1	0	27	1	3	14	19	6	5	0	0	-5
29	ES -35	-17	-4	6	7	9	16	20	27	19	-4	ES -6	C	ES -15	ES -6	ES -4	ES -27	ES -23	-12	8	6	1	-1	-6
30	ES -6	-6	1	5	10	19	21	26	24	21	35	23	-1	-9	-8	-2	6	13	ES -20	0	5	0	-6	-5
31	-6	-4	1	7	14	21	27	29	27	20	20	26	23	23	22	12	-3	23	12	6	-3	0	ES -15	ES -4
CNT	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	31	31	31	31	31	31	31	31	30
MED	US -4	-4	1	US 7	12	19	22	22	24	23	17	16	4	US -4	ES -8	ES -8	ES -11	13	5	2	5	0	-2	-4
UD	3	0	5	8	16	23	28	27	28	28	27	24	23	23	16	6	6	23	19	6	10	4	2	1
LD	ES -9	ES -16	-4	ES 3	7	15	17	15	17	-3	-3	ES -4	ES -5	ES -9	ES -14	ES -33	ES -34	ES -34	ES -34	-23	-3	-3	-6	ES -6

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Mar. 1970	Whole Day Index	H B 06 12 18 / 12 18 24	W W V 00 06 12 18 / 06 12 18 24	L M 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	ΔH
1	4o	(3) C (4)	4 4 4 4	(4) - - -	4 5 4 4	N N N N	01.8	22xx	67γ
2	4-	3 (3) 5	3 4 4 4	4 4 - 4	4 4 4 4	N N N N			
3	4o	4 (4) 4	4 4 3 4	4 4 - 4	4 4 4 3	N N N N			
4	4+	4 4 4	5 5 5 4	4 4 - 4	3 4 4 4	N N N N			
5	4+	5 4 4	4 4 4 4	4 5 - 4	4 4 4 4	N N N N			
6'	4-	4 3 4	5 4 4 3	4 4 - 3	4 4 4 4	N N N N	08.05	---	121γ
7'	4-	3 3 3	3 4 4 (3)	4 5 - -	3 3 4 4	N N N N	---	---	
8*'	3o	(3)(3) 2	3 3 4 1	(4) - - -	4 5 4 3	N N N N	14.17	14xx	323γ
9*'	2+	2 (3) 4	1 1 2 3	2 (2) - 3	3 3 (3) 3	N N N N	---	---	
10	3o	3 4 3	3 2 2 3	3 4 - 4	4 5 3 4	N N N N	---	06xx	
11	4-	4 5 4	3 (3) 3 3	4 3 - 4	4 4 4 4	N N N N			
12	4o	3 3 4	4 4 4 4	4 5 - 4	4 4 5 4	N N N N			
13	4o	4 4 4	4 4 4 3	4 5 - 4	4 5 5 5	N N N N			
14	4+	4 5 4	3 5 4 4	4 5 - -	4 4 4 4	N N N N			
15	4o	3 (3)(4)	4 5 4 4	(4) - - -	4 4 3 5	N N N N			
16	4+	4 4 4	4 4 5 5	4 (4) - 4	4 4 3 4	N N N N			
17	4+	4 4 4	5 5 4 4	4 4 - 4	4 4 4 4	N N N N			
18	4+	4 4 4	5 4 4 4	5 4 - 5	4 5 5 5	N N N N			
19	4+	4 4 5	4 5 5 4	4 5 - 4	4 5 4 4	N N N N			
20	4+	5 5 5	4 4 4 5	4 4 - 4	4 4 3 5	N N N N			
21	4+	5 5 4	4 4 4 5	C 3 - -	4 5 4 4	N N N N			
22	4+	5 5 4	4 3 5 5	(4) - - -	4 4 5 4	N N N N			
23'	4+	5 5 5	5 4 4 5	4 3 - 4	4 4 5 4	N N N N			
24'	5-	5 5 5	5 5 4 5	4 3 - 4	4 5 4 5	N N N N			
25	4+	5 4 4	5 5 4 4	5 (4) - 4	4 4 5 5	N N N N			
26	4+	5 5 4	4 5 4 4	4 4 - 4	4 4 5 4	N N N N			
27*	4o	5 4 3	4 4 5 4	4 3 - 4	4 5 5 5	N N N N	05.56	24xx	95γ
28*	4o	4 4 3	4 5 5 3	5 4 - -	4 4 4 5	N N N N			
29*'"	3o	3 3 3	3 4 3 3	(3) - - -	(3) 3 3 4	N N N N			
30*'	4-	3 3 4	3 4 4 3	4 4 - 4	4 4 4 4	N N N N			
31*'	3+	3 (4)(4)	(3) 3 3 2	4 (5) - 2	4 5 5 3	N N N N	07.29	---	124γ

GEOALERT

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

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

C = artificial accident
--- = continuing magnetic storm

SUDDEN IONOSPHERRIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

Mar.	S W F										Correspondence		
	Drop-out Intensities (db)						Start-time	Dura-tion	Type	Imp.	Flare	Solar Noise	Mag.
1970	CO	LM	HA	TO	HB	SH							
1	11	x					04.20	35	Slow	1-		x	
1	14						05.00	15	S	1		x	
2	x	9					00.15	11	Slow	1-		x	
3	18‴	8	x				00.23	14	Slow	1+			
3	15"	25	x				20.33	26	S	2-			
5	13"						04.37	40	Slow	1			
7	12"	11	10		x		01.44	26	Slow	1+	x	x	
12	18 9"	10					03.07	28	Slow	1+	x	x	
17		10			11		05.28	12	S	1			
24					10		09.24	16	Slow	1-	x		
25	20"	15		17'			01.35	10	Slow	2-			
25					18		12.15	75	G	1+	x		
26	27‴	28	x				20.07	11	S	3+	x		
29	25"	20		20'			00.38	80	Slow	2	x	x	

I N U B O

1970	S				P	A			
Mar.	Phase Advance(degrees)					Time (U. T.)			Remarks
DATE	GBR	WWVL	NAA	NWC	HA2	Start	End	Maximum	
1		-			25	0008		0041	X
1	30	-	22	64*	37*	0249	0312	0257	
1	50	-	39	112	73	0422		0439	X
1	50	-	34	112		0503	0730	0508	X
1				20		0810	0851	0819	X
1		-	90			2004		2011	X
1		-	12	-	30	2334	0006	2344	
2	33	-	32	-	75	0014	0041	0019	X
2	23	-	26	-	68	0047	0200	0051	X
2		-		40		0418	0605	0510	
2		-		8		0708	0737	0720	
2		-		16		0737	0804	0742	X
3	28	-	29	72	66	0022	0123	0033	
3				8	12	0200	0238	0208	
3				12	9	0241	0335	0252	X
3			22	8		0410	0502	0434	
3	67	-	31	80		0632	0810	0654	X
3		-			97	2034	2146	2046	
3		-	26	16	42	2238	0006	2301	
4	18	-	29	68	60	0056	0210	0115	
4	50	-	24	48	40	0227	0357	0245	
4			13	32		0608	0706	0620	
5	105	-	66	136	121	0420	0720	0455	
5	55	-	21			0805	0903	0817	
7	50		45	104	99	0145	0353	0203	X
7				24		0620	0724	0645	X
8					12	2254	2312	2300	
9					4	0241	0254	0248	
10				24		0720	0830	0740	
10					13	2200	2230	2212	X
12	60	-66*	58	116	97	0307	0610	0320	X
12	63		11	16		0635	0706	0639	
12				8		0717	0738	0722	X
13			12	32	33	0130	0230	0141	
17	35	-	38	80	62	0528	0650	0534	X

1970	S P A								
Mar.	Phase Advance(degrees)					Time (U. T.)			Remarks
DATE	GBR	WWVL	NAA	NWC	HA2	Start	End	Maximum	
17	30			12		0817	0841	0822	
17	25	–	45	24	57	2246	2343	2300	X
18	–		10	20		0730	0805	0742	X
19	23	–	13	48	31	0334	0520	0350	
19			13	40	15	0613	0705	0624	X
21			19	48	53	0050	0230	0120	
21					15	2253	2310	2300	
22			6	32		0016	0130	0055	X
22		–	35	–	57	2329	0100	2350	
23		–	10		9	0041		0046	X
24		–		16	15	0156	0227	0209	
24	17	–	10	40		0637	0735	0646	X
24	35			28		0923	1018	0930	X
25	46	–	31	100*	94*	0101	0300	0142	X
25		–	4	24	11	0444	0525	0453	X
25	15	–		24		0639	0740	0650	X
26		–	6	24	20	0145	0226	0206	X
26		–	12	28	22	0233	0315	0242	X
26	17	–	10	32	15	0334	0430	0345	X
26		–			119	2006	2120	2020	X
27		–	6	24	13	0210	0235	0217	
28		–		8	9	0412	0445	0419	
28		–			11	2326	2350	2334	
29	60	–	55	140	152	0039	0320	0053	X
30		–	14	12	29	2237	2327	2248	X
31	17	–	22		70	2208	0000	2229	X

NOTES (1) : The letter E or D attached to a time shows that the pertinent time is earlier or more delayed than the given time, respectively.

(2) : The mark * shows a multi-peak event.

(3) : The mark ** shows a time on the day before the pertinent day.

IONOSPHERIC DATA IN JAPAN FOR MARCH 1970
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