F－287

IONOSPHERIC DATA IN JAPAN

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F—287

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184 JAPAN

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 extra-ordinary 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 Hiraïso 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	λ/2 vertical	λ/2 vertical
Distance	9150 km	6270 km

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

Receiver

Antenna	4.5m 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.

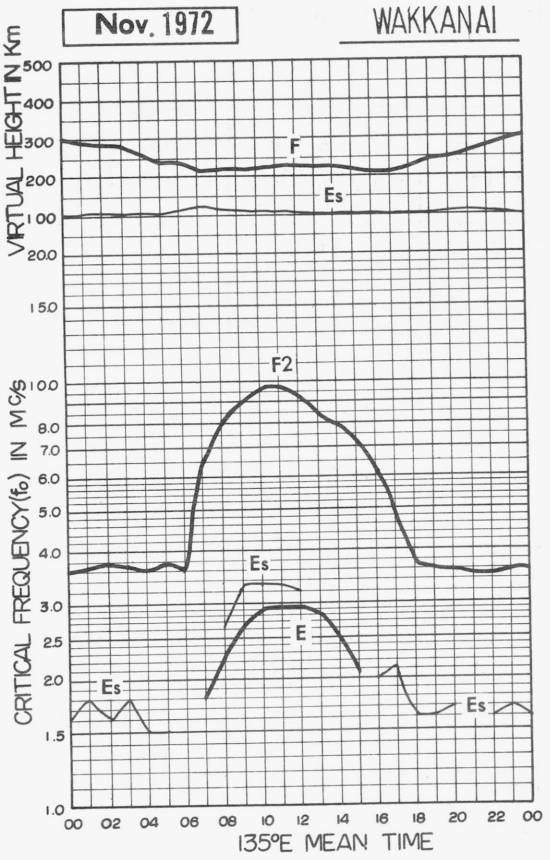
Transmitting Site					Distance (km) to Inubo along the Great Circle
Name	Location (Geographic Coordinate)	Station Call	Frequency (kHz-UTC)	Radiation Power (kW)	
Rugby	52°22′N 001°11′W	GBR	16.0	40	9550
Fort Collins	40°41′N 105°03′W	WWVL	20.0	1.8	9190
Cutler	44°39′N 067°17′W	NAA	17.8	1000	10640
North West 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

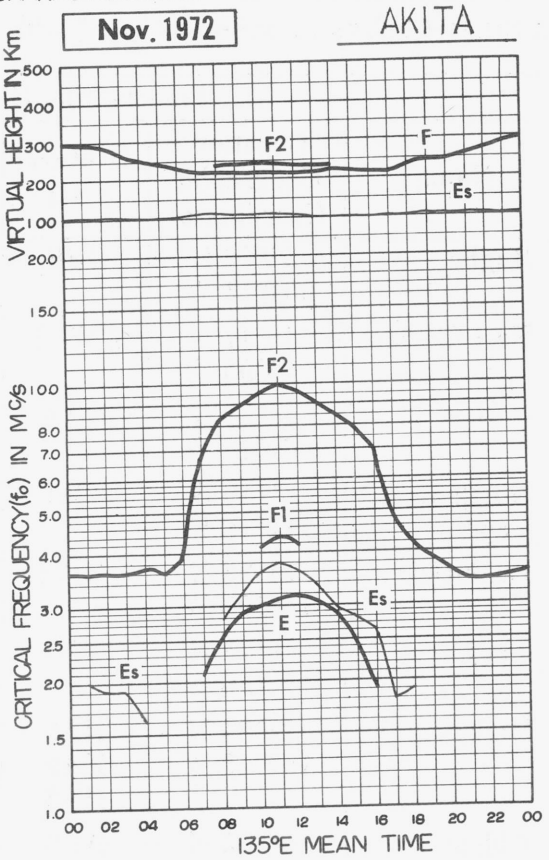
The phase advance is shown in its maximum stage. In the column 'Phase Advance', — means no transmission or no reception during the period, and blank means indistinguishable record.

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.

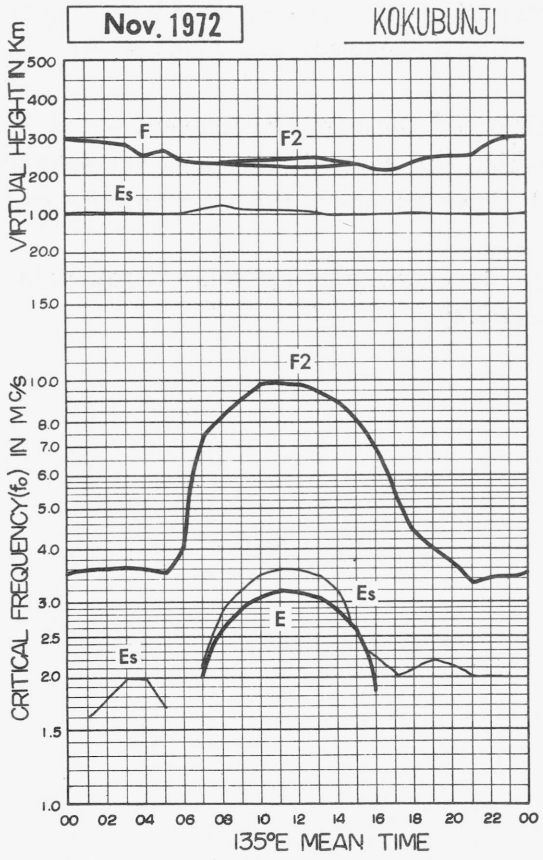
In the column 'Remarks', the event with its corresponding solar X-ray data and solar radio data is shown by 'X' and 'R', respectively.

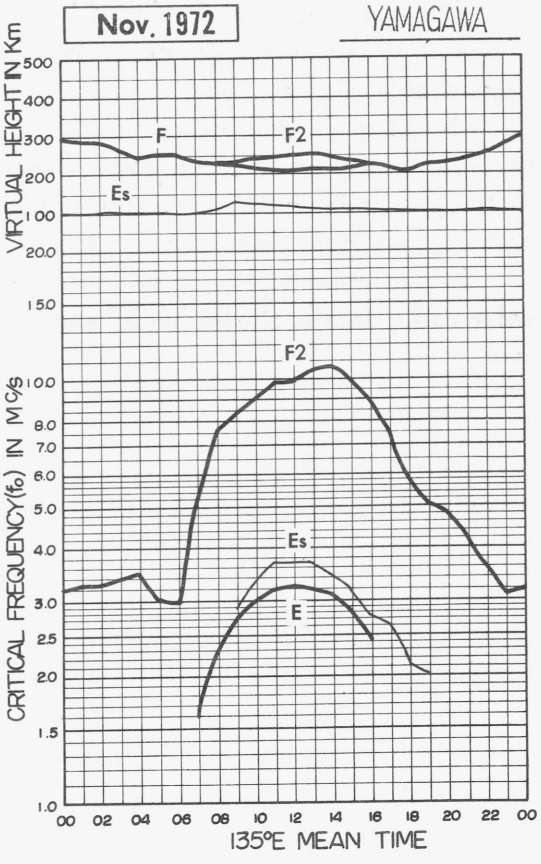
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA

NOV. 1972 | 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 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	35	38	37	36	34	23	42	75	102	91	96	114	122	126	128	147	136	102	58	53	48	56	48	43
2	A	A	21	21	23	25	45	92	116	115	113	108	107	108	109	110	105	83	68	A	42	A	A	A
3	33	F	F	F	38	35	53	68	99	105	111	134	116	98	88	93	81	64	47	S	S	43	45	42
4	43	I S 43	43	F	F	F 40	F 44	68	90	C	C	C	87	79	C	73	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	100	97	87	78	78	80	70	55	43	43	40	42	38	38
6	43	43	43	44	46	38	45	71	85	89	C	88	93	91	86	85	69	59	36	28	28	31	33	36
7	38	39	38	39	36	40	C	66	76	78	101	95	85	82	79	C	78	54	43	40	39	37	33	33
8	36	37	35	36	37	38	40	73	88	100	94	103	93	76	80	70	69	54	40	35	29	33	F 36	F 37
9	39	33	33	33	35	36	35	67	78	68	96	98	91	86	79	65	63	54	38	33	35	33	32	33
10	35	35	34	38	40	43	30	60	66	82	95	96	87	77	73	77	65	53	32	28	A	33	31	32
11	33	35	36	36	35	36	36	66	81	84	86	85	83	78	76	74	62	45	40	40	36	35	36	36
12	37	38	38	39	41	39	33	62	91	93	112	101	85	71	69	73	53	43	35	40	36	38	40	38
13	F	F	41	40	40	35	F	65	78	76	108	103	93	78	78	68	65	42	35	34	36	38	F	39
14	S	F 40	F 40	F 44	48	40	41	64	78	85	84	88	90	81	80	66	67	46	36	29	30	33	35	33
15	35	37	40	41	40	35	31	63	78	82	83	93	96	91	71	66	59	45	35	37	34	36	37	37
16	34	F 38	41	38	43	39	S	56	93	106	107	123	116	92	73	76	70	56	46	42	40	37	40	40
17	38	41	40	36	37	38	38	73	87	93	93	96	94	93	82	78	57	44	33	33	37	35	33	F 30
18	36	42	40	S	39	41	32	58	71	83	94	94	85	81	73	69	60	43	42	37	34	37	33	35
19	38	37	40	38	40	43	39	58	85	95	91	85	82	78	76	72	55	43	42	40	36	35	30	33
20	33	36	36	35	36	S	33	56	81	83	92	100	88	84	89	73	52	31	33	36	F 36	42	43	S 47
21	S 43	F	F	F	F 34	F 30	F 25	63	81	105	109	112	113	92	83	74	56	47	33	F 33	36	S 34	F	F
22	F	F 37	F	F 40	F	F 36	F 36	65	76	85	84	97	83	83	87	67	60	35	35	38	35	33	33	F
23	F	F	F 36	36	F 36	F	35	74	87	103	108	115	106	94	84	74	61	48	41	46	48	43	46	F
24	F	F 45	F 43	F 42	F 44	F 43	48	75	90	90	105	111	96	83	I C 80	75	57	47	38	43	43	33	38	33
25	34	35	33	34	33	33	33	65	71	83	82	92	92	80	77	73	61	48	32	33	29	29	33	35
26	36	36	36	33	33	33	35	53	75	93	103	108	99	85	79	76	60	47	35	39	39	33	36	I S 34
27	38	38	38	38	36	38	37	54	63	86	83	94	93	84	85	71	54	45	38	32	35	31	31	31
28	31	33	33	33	33	37	33	52	78	93	83	88	90	93	83	73	56	43	31	33	36	34	35	38
29	37	34	33	33	F 35	32	F	F	77	75	104	R 95	H 82	75	102	80	56	44	A	A	A	F	F	F
30	F	F	F	F	F	53	F	F 61	70	73	89	83	89	74	76	79	53	41	30	30	I A 30	33	33	F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	23	25	24	26	27	24	28	29	28	28	29	30	30	29	29	29	29	28	26	26	27	25	23
MED	36	37	38	37	36	38	36	65	81	88	96	97	92	83	80	74	61	47	37	36	36	35	35	36
UQ	38	40	40	40	40	40	42	70	88	94	106	108	96	92	85	78	69	54	42	40	39	38	38	38
LQ	34	36	35	34	35	35	33	59	76	82	88	93	87	78	76	71	56	43	34	33	34	33	33	33

The Radio Research Laboratories, Japan

NOV. 1972 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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																								
2																								
3																								
4										C	C	C												
5										C		L	L											
6											C													
7											L	L												
8																								
9												L												
10																								
11																								
12											L	L	L											
13																								
14																								
15													L	L										
16											400													
17																								
18																								
19										380			L											
20												L												
21												L	400											
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24																								
25																								
26																								
27																								
28																								
29												400												
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	1	1	1											
MED										380	400	400	400											
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1972 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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

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	200	240	260	300	300	305	300	270	230	A							
2							S	190	A	A	I A 300	300	I A 300	I A 290	275	225	S							
3								170	A	A	A	305	300	300	270	230	S							
4							S	200	A	C	C	C	305	300	C	230	C							
5							C	C	C	C	A	A	300	295	260	220	A							
6								190	A	A	C	A	A	A	A	A	S							
7								A	A	A	A	A	A	A	A	C	A							
8								190	235	A	A	300	295	285	260	A	A							
9								190	A	A	A	300	300	290	A	A	A							
10								200	A	A	A	A	A	280	250	210	A							
11								170	245	A	A	290	295	285	260	A	A							
12								185	A	A	A	A	295	285	255	205	A							
13							S	175	A	265	280	A	A	A	250	A	A							
14								170	I A 225	285	295	300	295	290	I A 245	205	A							
15								170	235	I A 275	290	290	290	275	250	210	S							
16								180	225	I A 250	285	285	295	290	250	200	125							
17								A	A	280	I A 285	I A 290	295	270	260	210	S							
18								180	230	A	A	295	295	A	A	200	S							
19								140	220	A	A	295	290	275	255	220	A							
20								S	A	A	285	295	290	275	250	A	S							
21								180	230	260	290	A	A	290	A	A	A							
22							S	S	215	285	300	300	300	295	255	A	A							
23								140	225	A	A	A	A	285	255	205	S							
24								160	A	A	A	A	290	280	I C 250	200	S							
25								150	230	270	295	290	290	275	245	215	S							
26								140	A	A	290	300	295	280	245	200	S							
27								S	200	265	290	290	300	275	250	200	S							
28								S	220	270	290	295	I A 290	290	260	205	S							
29								F	210	250	280	290	290	280	230	180	S							
30								A	220	255	285	290	270	260	235	200	S							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								22	16	13	16	20	24	26	24	21	1							
MED								178	225	265	290	295	295	285	252	205	125							
UQ								190	232	275	295	300	300	290	260	220								
LQ								160	220	260	285	290	290	275	250	200								

The Radio Research Laboratories, Japan

NOV. 1972 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 16	J X 18	J X 20	23	E	E S 15	E S 15	G	30	33	32	18 G	G	G	G	22 G	30	E S 16	E S 14	E S 16	E S 15	E S 16	I X 31	J X 55
2	J X 41	M 36	J X 25	J X 29	J X 20	J X 20	E S 15	J X 33	28	33	J X 33	33	34	32	38	J X 55	J X 64	J X 47	J X 84	J X 61	J X 55	J X 95	J X 83	J X 110
3	J X 30	J X 45	J X 20	J X 31	J X 36	20	24	J X 48	J X 33	J X 41	J X 30	28 G	28 G	25 G	20 G	G	E S 17	E S 15	23	20	J X 42	E S 15	E S 15	E S 16
4	E S 15	18	J X 23	J X 23	18	J X 25	E S 15	G	J X 35	C	C	C	24 G	G	C	G	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	J X 53	J X 40	22 G	25 G	22 G	G	24	24	J X 24	25	E S 16	23	E S 14	E S 15
6	J X 21	J X 30	J X 33	J X 25	J X 23	18	J X 21	G	26	J X 35	C	J X 78	J X 71	J X 63	30	32	E S 17	23	E S 15	E S 15	E S 14	E S 14	J X 33	J X 33
7	J X 34	J X 23	J X 23	J X 34	J X 28	J X 25	C	J X 24	25	33	J X 35	J X 33	J X 40	J X 38	J X 50	C	J X 25	J X 25	23	23	E	E S 16	E	E S 16
8	E S 14	J X 28	24	J X 20	J X 21	25	E S 15	G	G	J X 35	33	30	34	34	30	J X 25	J X 26	J X 23	21	24	24	22	J X 28	J X 20
9	J X 30	J X 25	18	23	18	25	E	G	J X 33	J X 48	J X 33	33	J X 33	38	32	29	18	J X 23	E S 14	E S 15	E S 15	E S 15	E S 15	E S 15
10	E S 16	20	E	E S 14	E	E S 13	E S 15	G	29	34	33	J X 34	36	J X 30	G 21	G 20	J X 24	J X 30	22	J X 35	J X 53	E S 15	E S 14	E S 16
11	29	18	E S 15	E	E	21	J X 25	G	G	34	J X 38	J X 32	J X 32	J X 33	G 17	23	J X 33	J X 20	E S 14	21	J X 21	E S 15	E S 15	E S 15
12	E S 14	E	E S 12	18	E	E	E S 14	G	28	J X 43	J X 31	30	G	G 23	G 20	G	20	E S 14	E S 15	E	E	E S 15	E S 15	J X 30
13	E S 15	E	E	E	E	E S 15	E S 15	G	26	G	G 27	J X 63	J X 52	J X 39	29	25	J X 31	J X 30	E S 16	E	E	E S 14	E	E S 14
14	J X 24	E S 15	22	22	15	E	E S 14	G	J X 40	G	G	G 25	G 23	G 23	26	23	J X 25	J X 25	E S 14	E	E S 15	21	E S 14	E
15	E S 14	E	E	E S 14	E	E	E S 16	E	G 21	J X 33	35	G	G 23	G 20	G	G	E S 16	E	J X 23	J X 24	22	J X 22	E S 15	E S 15
16	E S 12	E	E	23	J X 18	E	E	G	34	J X 58	33	41	35	G	G 19	G	G	E	E S 16	24	J X 20	E	26	E S 17
17	J X 23	E S 15	E	J X 35	J X 61	J X 38	J X 53	J X 35	J X 71	J X 31	J X 58	J X 43	34	G	G	G	E S 14	28	19	J X 43	J X 23	J X 35	26	J X 24
18	J X 25	E	E	E S 15	19	E	E	G	G	J X 38	J X 33	G 24	G 23	J X 61	J X 33	G	E S 15	E	E	E S 15	E	E S 15	24	J X 20
19	J X 33	J X 21	18	E	J X 20	J X 23	F	20	G	J X 32	J X 42	37	G 22	G	G	G	J X 23	J X 23	E S 15	22	E	E S 15	F S 14	E S 15
20	E S 16	E	E S 16	E	E	E	F	G	25	27	G	G	G	G	J X 29	J X 25	20	J X 23	24	E	E S 17	E	J X 20	J X 23
21	23	26	J X 20	J X 23	15	E S 15	E S 14	G	28	38	43	J X 40	J X 32	G	26	26	J X 34	J X 43	J X 25	E S 14	19	24	E	E
22	20	23	E	J X 24	22	E S 15	18	27	J X 54	34	G 25	G	J X 33	32	G 17	23	26	J X 31	J X 31	E S 15	E S 15	E S 15	21	J X 20
23	E S 13	E	E	E	E	E	E S 16	24	G	32	35	J X 48	30	G	G 18	G	20	E	F	E S 16	20	E	23	E
24	E	E	15	E	E	E S 15	E	G	31	27	J X 32	J X 31	33	G	C	G	F S 14	E	F S 15	E S 15	E S 16	E	E	E S 15
25	E	J X 23	E	E	E	E	E S 15	G	G	G	G	G 28	G 20	J X 33	30	G	E S 15	E S 14	E S 15	J X 25	26	24	E S 16	22
26	E	E S 15	E	E S 15	E	E S 13	E S 16	20	26	J X 30	G	G	33	G	G	G	E S 15	E S 15	15	E	F	F	25	25
27	E S 15	E	E	E	E	E	E S 15	G	G	G	G	G	G	G	G	G 20	E S 15	E	E	E S 16	E S 16	E S 15	21	J X 23
28	E S 15	22	22	E	E	E	E	G	G	G	36	36	32	23 G	23 G	26	E S 14	E	F	F	J X 21	E S 15	22	J X 21
29	E	E	23	E S 15	E	E	E S 15	20	30	32	33	35	J X 42	G	30	38	J X 33	J X 48	J X 73	J X 73	J X 74	J X 55	J X 25	J X 28
30	E	J X 21	J X 31	J X 22	J X 25	J X 33	J X 30	23	G	G	39	39	34	30	G	G	F S 15	E	E S 16	J X 64	J X 61	J X 34	E S 15	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	28	29	29	28	28	29	30	30	28	29	29	29	29	29	29	29	29	29
MED	16	18	16	18	15	15	E S 15	G	26	33	33	33	32	23 G	22 G	20 G	20	23	16	16	17	E F 15	16	17
UQ	J X 24	J X 23	J X 22	J X 23	J X 20	21	E S 16	20	31	35	36	J X 39	34	33	30	25	J X 26	J X 25	23	24	J X 23	22	25	J X 23
LQ	E S 14	E	E	E	E	E	E F 14	G	G	27	28	25 G	23 G	G	E G 17	G	F S 15	E	E S 14	F S 15	E S 15	E S 15	E S 14	E S 15

The Radio Research Laboratories, Japan

NOV. 1972 | FOES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 16	15	E	E	E	E S 15	E S 15	G	G	G	27	G 18	G	G	G	G 20	29	E S 16	E S 14	F S 16	E S 15	E S 16	18	26
2	A	A	15	15	15	E	E S 15	G	26	29	30	25	31	30	36	47	52	43	62	A	30	A	A	A
3	22	15	E	20	20	17	21	46	30	28	30	G 26	G 27	G 23	G 20	G	F S 17	E S 15	20	20	30	E S 15	F S 15	E S 16
4	E S 15	E	18	16	16	17	E S 15	G	30	C	C	C	20	G	C	G	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	37	32	G 22	G 24	G 20	G	18	19	20	18	E S 16	F	E S 14	E S 15
6	E	22	16	15	14	16	17	G	26	35	C	53	53	30	30	25	E S 17	E	E S 15	E S 15	E S 14	E S 14	18	16
7	E	14	16	26	20	20	C	21	25	33	30	31	31	30	37	C	23	20	15	E	E	E S 16	E	E S 16
8	E S 14	15	E	E	E	E	E S 15	G	G	33	29	25	27	23	20	23	20	20	E	E	E	E	E	18
9	E	18	E	E	15	E	E	G	25	28	30	21	24	G 22	26	22	17	19	E S 14	E S 15	E S 15	E S 15	E S 15	E S 15
10	E S 16	E	E	E S 14	E	E S 13	E S 15	G	26	30	31	32	30	21	G 21	G 20	23	26	E	20	A	E S 15	F S 14	E S 16
11	E	E	E S 15	E	E	E	E	G	G	30	30	24	20	20	G 17	23	20	15	E S 14	E	20	E S 15	E S 15	E S 15
12	E S 14	E	E S 12	E	E	E	E S 14	G	25	30	29	30	G	G 20	G 18	G	17	E S 14	E S 15	F	E	E S 15	E S 15	16
13	E S 15	E	E	E	E	E S 15	E S 15	G	25	G	G 24	31	45	35	20	23	27	16	E S 16	E	E	E S 14	E	E S 14
14	16	E S 15	E	12	13	E	E S 14	G	25	G	G	G 23	G 21	G 18	26	19	16	20	E S 14	E	E S 15	F	E S 14	E
15	E S 14	E	E	E S 14	E	E	E S 16	G	G 20	27	25	G	G 20	G 17	G	G	E S 16	E	E	18	E	E	E S 15	E S 15
16	E S 12	E	E	E	16	E	E	G	34	34	G 23	39	G 23	G	G 18	G	G	E	E S 16	F	17	F	E	E S 17
17	E	E S 15	E	32	17	24	32	30	26	22	31	30	25	G	G	G	E S 14	E	E	24	E	17	E	17
18	19	E	E	E S 15	14	E	E	G	G	34	31	G 24	G 20	40	27	G	E S 15	E	E	E S 15	E	F S 15	E	E
19	20	E	E	E	E	18	E	G	G	29	32	20	G 20	G	G	G	19	19	E S 15	E	E	F S 15	E S 14	E S 15
20	E S 16	E	E S 16	E	E	E	E	G	25	27	G	G	G	G	19	21	G	E	E	E	E S 17	E	20	E
21	E	E	17	16	E	E S 15	E S 14	G	G	G	40	34	30	G	26	21	19	30	E	F S 14	E	E	E	E
22	E	E	E	E	E	E S 15	G	23	G	G	G 24	G	G 20	23	G 17	22	18	20	19	E S 15	E S 15	E S 15	E	E
23	E S 13	E	E	E	E	E	E S 16	G	G	28	30	35	30	G	G 17	G	G	E	E	E S 16	F	E	E	E
24	E	E	E	E	E	E S 15	E	G	30	27	30	30	24	G	C	G	E S 14	E	E S 15	E S 15	F S 16	E	E	E S 15
25	E	E	E	E	E	E	E S 15	G	G	G	G	G 26	G 20	20	19	G	F S 15	E S 14	E S 15	E	E	E	E S 16	E
26	E	E S 15	E	E S 15	E	E S 13	E S 16	G	24	27	G	G	G	G	G	G	E S 15	E S 15	E	E	E	E	E	E
27	E S 15	E	E	E	E	E	E S 15	G	G	G	G	G	G	G	G	G 17	E S 15	E	E	E S 16	E S 16	E S 15	E	20
28	E S 15	E	E	E	E	E	E	G	G	G	G	G	30	G 21	G 20	G	E S 14	E	E	E	E	E S 15	E	20
29	E	E	E	E S 15	E	E	E S 15	G	G	G	G	G	36	G	G	34	20	28	A	A	A	21	16	18
30	E	E	18	14	E	E	17	18	G	G	G	G	G	G	G	G	E S 15	E	E S 16	17	A	26	E S 15	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	28	29	29	28	28	29	30	30	28	29	29	29	29	29	29	29	29	29
MED	E E 14	E	E	E	E	E	E S 15	G	24	27	29	25	22	G 19	G 19	G	17	E E 15	E E 14	E E 15	E E 15	E E 15	E E 14	E E 15
UQ	E S 16	15	E E 15	15	14	15	E S 16	G	26	30	30	31	30	23	24	22	20	20	E S 16	17	F S 17	E S 15	E S 15	17
LQ	E	E	E	E	E	E	E	G	G	G	G	G	G 20	G	G	G	E S 15	E	E	E	E	E	E	E

NOV. 1972 | FBES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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 S 16	E	E S 12	E S 15	E	E S 15	E S 15	13	12	12	12	12	17	16	17	12	12	E S 16	E S 14	E S 16	E S 15	E S 16	E S 16	E
2	E S 15	E	E	E	E	E S 14	E S 15	13	12	16	16	16	16	16	16	12	E S 15	E S 15	E S 13	E	E S 15	E S 13	E S 12	E
3	E S 16	E S 13	E	E	E	E	E	E	E	12	14	17	16	16	14	15	E S 17	E S 15	E	E S 15	E	E S 15	E S 15	E S 16
4	E S 15	E	E	E	E	E	E S 15	E	E	C	C	C	16	18	C	15	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	16	13	17	17	15	17	E S 15	E S 16	E S 15	E S 16	E S 16	E S 16	E S 14	E S 15
6	E S 16	E	E S 13	E	E	E	E S 16	15	14	16	C	17	17	17	16	15	E S 17	E S 15	E S 15	F S 15	E S 14	E S 14	E S 16	E
7	E	E	E	E	E	E	C	E	12	13	15	18	16	17	12	C	11	E S 14	E	E S 14	E	E S 16	E	E S 16
8	E S 14	E	E	E	E	E S 16	E S 15	13	12	11	14	18	12	13	13	E	13	E S 15	E S 15	E S 15	E S 15	E S 16	E S 15	E S 15
9	E S 15	E S 14	E	E	E	E	E	15	12	11	16	13	11	12	11	16	E	E	E S 14	E S 15	E S 15	E S 15	E S 15	E S 15
10	E S 16	E S 15	E	E S 14	E	E S 13	E S 15	E	11	16	15	15	13	12	14	E	E	E S 15	E S 16	E	E S 15	E S 15	E S 14	E S 16
11	E S 15	E	E S 15	E	E	E S 14	E S 16	E	15	14	13	15	14	11	11	14	E	E	E S 14	E S 16	E S 13	E S 15	E S 15	E S 15
12	E S 14	E	E S 12	E	E	E	E S 14	E	12	11	16	16	17	16	15	15	11	E S 14	E S 15	E	E	E S 15	E S 15	E S 14
13	E S 15	E	E	E	E	E S 15	E S 15	12	12	11	12	12	11	E	11	11	E	E	E S 16	E	E	E S 14	E	E S 14
14	E S 12	E S 15	E	E	E	E	E S 14	13	E	13	13	13	12	11	11	11	E	E S 16	E S 14	E	E S 15	E S 14	E S 14	E
15	E S 14	E	E	E S 14	E	E	E S 16	E	E	11	11	11	11	11	16	15	E S 16	E	E S 13	E S 12	E S 16	E	E S 15	E S 15
16	E S 12	E	E	E	E	E	E	E	11	11	12	13	13	11	11	11	E	E	E S 16	E S 16	E	E	E S 16	E S 17
17	E	E S 15	E	E	E	E	E	E	11	12	11	11	12	12	12	11	F S 14	E S 15	E	E S 14	E S 15	E S 16	E S 16	E S 13
18	E S 15	E	E	E S 15	E	E	E	E	11	11	11	15	12	E	11	16	E S 15	E	F	F S 15	F	E S 15	E S 15	E S 15
19	E	E S 13	E	E	E	E	E	E	11	E	12	11	12	11	12	15	E	E S 17	E S 15	E	E	E S 15	E S 14	E S 15
20	E S 16	E	E S 16	E	E	E	E	E S 15	E	11	12	15	12	12	15	E	E S 15	E S 14	E S 15	E	E S 17	E	E	E S 15
21	E S 15	E S 12	E	E	E	E S 15	E S 14	E S 13	E	11	12	12	11	15	16	12	E	E	E S 15	E S 14	E	E S 15	E	E
22	E S 15	E	E	E	E	E S 15	E S 12	E S 13	12	13	11	12	12	12	11	E	E	E S 15	E	E S 15	E S 15	E S 15	E S 15	E S 15
23	E S 13	E	E	E	E	E	E S 16	E S 13	12	12	12	11	13	11	11	15	F S 15	E	E	E S 16	E S 14	E	E S 16	E
24	E	E	E	E	E	E S 15	E	E	11	17	11	13	12	11	C	11	E S 14	E	E S 15	E S 15	E S 16	E	E	E S 15
25	E	E	E	E	E	E	E S 15	E	11	11	12	13	12	11	E	15	E S 15	E S 14	E S 15	E S 15	E S 15	E S 15	E S 16	E S 15
26	E	E S 15	E	E S 15	E	E S 13	E S 16	E	13	17	16	11	13	11	14	16	E S 15	E S 15	E	E	E	E	E	E S 16
27	E S 15	E	E	E	E	E	E S 15	E S 12	14	17	16	12	12	11	11	E	E S 15	E	E	E S 16	E S 16	E S 15	E S 15	E S 15
28	E S 15	E S 15	E	E	E	E	E	E S 13	16	13	17	18	17	16	13	17	E S 14	E	E	E	E S 15	E S 15	E S 16	E S 16
29	E	E	E	E S 15	E	E	E S 15	E	17	17	18	16	19	17	16	17	E S 11	E	E S 15	E S 15	E S 16	E S 15	E	E
30	E	E	E	E	E	E	E	E	17	16	17	17	18	16	17	17	E S 15	E	E S 16	E	F S 15	E	E S 15	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	28	29	29	28	28	29	30	30	28	29	29	29	29	29	29	29	29	29
MED	E S 15	E	E	E	E	E	E S 14	E	12	12	13	13	13	12	13	15	E S 14	E S 14	E S 14	E S 15	E S 15	E S 15	E S 15	E S 15
UQ	E S 15	E S 13	E	E	E	E S 14	E S 15	E S 13	12	16	16	16	16	16	16	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
LQ	E	E	E	E	E	E	E	E	11	11	12	12	12	11	11	11	E	E	E	F	E	E S 13	E S 12	E

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NOV. 1972 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | M(3000)F2 (0.01) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	285	290	290	290	240	260	295	305	345	330	315	305	305	295	280	300	300	315	260	265	250	270	275	320
2	A	A	275	250	250	250	305	330	330	330	320	305	310	305	305	315	325	335	330	A	275	A	A	A
3	290	F	F	F	270	285	305	325	345	345	310	340	330	350	340	345	335	330	340	S	S	300	305	290
4	295	I S 290	280	F	F	F 300	F 320	340	350	C	C	C	335	330	C	355	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	340	355	345	315	335	340	345	330	300	315	320	295	290	285
6	295	300	300	295	320	305	310	365	355	315	C	340	345	330	335	355	350	340	350	330	295	275	305	300
7	290	310	295	305	305	315	C	360	355	345	345	345	340	325	330	C	335	335	325	325	315	310	280	280
8	305	295	295	285	300	325	320	340	340	360	340	330	360	340	350	355	350	345	325	315	330	305	F 305	E 295
9	325	295	290	280	290	305	315	360	345	340	340	350	335	350	355	360	355	360	315	310	315	325	280	275
10	285	285	290	295	300	350	320	335	365	340	355	355	355	350	340	355	360	350	345	285	A	305	300	285
11	295	285	305	305	295	345	305	370	360	360	340	345	350	345	360	360	355	330	320	325	315	285	295	290
12	295	290	290	290	295	315	305	340	355	345	355	355	355	365	350	355	345	335	295	315	305	315	310	295
13	F	F	305	300	320	345	F	355	360	340	325	340	365	360	350	370	370	330	320	320	310	290	F	360
14	S	F 285	F 310	F 320	340	315	340	345	345	350	335	350	355	355	365	360	360	350	335	315	310	295	300	295
15	295	295	295	300	300	345	305	345	350	355	330	310	355	365	370	365	330	335	315	325	310	290	295	280
16	275	F 290	295	290	280	310	S	320	325	340	320	320	335	325	360	355	330	335	325	315	320	295	295	290
17	285	295	300	280	295	290	315	355	365	360	345	330	360	360	345	350	345	320	335	295	325	325	280	F 300
18	280	285	300	S	305	315	300	345	350	355	340	360	340	345	355	360	355	315	320	305	320	340	275	290
19	295	295	285	290	290	315	360	320	355	345	340	355	335	345	340	360	355	305	300	335	345	330	295	275
20	290	285	285	285	280	S	335	330	345	335	350	350	350	345	360	365	340	335	280	270	F 300	285	285	S 295
21	S 305	F	F	F	F 295	F 365	F 270	335	350	345	335	340	335	350	355	350	335	340	305	F 305	330	S 295	F	F
22	F	E 295	F	F 300	F	E 315	E 355	360	355	350	345	350	335	335	345	375	340	345	315	330	330	280	290	F
23	F	F	E 285	280	E 255	F	295	340	320	330	335	330	340	340	340	330	325	335	315	320	315	300	290	F
24	F	F 265	F 365	F 285	F 275	F 300	300	320	335	325	315	340	365	355	I C 340	345	320	320	320	300	340	305	295	280
25	275	285	280	275	280	295	310	345	370	365	335	350	360	350	340	350	325	350	315	325	310	270	275	265
26	265	285	285	305	290	285	300	300	330	345	340	345	345	330	340	370	315	310	325	310	315	280	300	I S 285
27	285	290	290	290	280	315	325	350	355	350	350	360	355	355	365	375	330	340	325	290	295	325	290	295
28	290	280	275	275	275	295	360	345	340	345	335	305	340	365	355	370	355	325	300	310	330	320	295	285
29	285	275	275	290	F 285	300	F	F	340	335	345	R 325	H 330	350	355	370	325	330	A	A	A	F	F	F
30	F	F	F	F	F	310	F	E 330	370	330	360	335	360	330	355	370	360	335	310	330	I A 300	290	310	F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	23	25	24	26	27	24	28	29	28	28	29	30	30	29	29	29	29	28	26	26	27	25	23
MED	290	290	290	290	290	310	310	340	350	345	340	340	345	345	350	355	340	335	320	315	315	295	295	290
UQ	295	295	300	300	300	315	322	352	355	350	345	350	355	355	355	365	355	340	325	325	325	312	300	295
LQ	285	285	285	282	280	298	302	330	340	335	332	330	335	330	340	350	330	330	308	305	305	288	285	282

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NOV. 1972 | M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1972 | M(3000)F1 (0.01) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4										C	C	C												
5										C		L	L											
6											C													
7											L	L												
8																								
9												L												
10																								
11																								
12											L	L	L											
13																								
14																								
15													L	L										
16											390													
17																								
18																								
19										395			L											
20												L												
21												L	415											
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29												420												
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	1	1	1											
MED										395	390	420	415											
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1972 | M(3000)F1 (0.01)

IONOSPHERIC DATA

NOV. 1972 | H'F2 (KM)

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4										C	C	C												
5										C		225	225											
6											C													
7											245	230												
8																								
9												220												
10																								
11																								
12											230	230	225											
13																								
14																								
15													230	225										
16											225													
17																								
18																								
19										245			245											
20												245												
21												240	245											
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29												210												
30																								
31																								

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	3	7	5	1										
MED										245	230	230	230	225										
UQ											238	235	245											
LQ											228	222	225											

The Radio Research Laboratories, Japan

NOV. 1972 | H'F2 (KM)

IONOSPHERIC DATA

NOV. 1972 | 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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	290	275	280	225	350	265	220	210	205	220	220	230	240	245	240	220	200	220	300	305	300	275	245
2	A	A	320	350	400 A	360	270	245	235	220	220	225	225	235	245	A	A	A	A	A	A	A	A	A
3	300	305	300	350	350	300	240	A	230	210	210	220	215	220	225	220	210	210	220	250	270	250	255	250
4	280	265	295	280	250	235	240	220	240	C	C	C	220	225	C	220	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	240 A	210	200	220	225	225	210	215	250	250	245	260	275	300
6	275	270	265	260	240	220	240	210	215	225	C	A	A	230	230	225	210	205	200	215	270	300	295	300
7	300	260	275	300 A	300	250	C	210	215	215	195	225	225	210	240	C	215	210	230	230	230	255	250	300
8	265	265	250	300	260	230	240	210	220	215	205	215	205	215	225	215	215	215	205	220	225	270	265	280
9	225	275	295	280	280	220	245	220	210	205	210	210	205	230	230	215	215	205	210	240	250	245	295	305
10	295	295	300	275	250	215	210	215	205	225	220	225	215	220	200	220	210	215	210	320	A	240	275	300
11	300	295	270	255	255	215	230	220	220	205	215	210	205	195	230	225	200	200	225	250	270	270	280	270
12	280	280	280	270	265	215	230	215	225	215	215	205	205	210	225	220	210	215	260	250	220	255	260	280
13	300	290	245	250	230	210	215	210	220	215	205	235	I A 220	225	230	205	205	200	230	240	240	295	250	205
14	285	280	260	250	205	220	205	200	215	200	215	215	225	225	225	210	210	215	220	250	260	270	270	295
15	270	280	275	260	245	200	250	220	215	210	200	205	210	220	220	215	210	200	225	250	245	295	270	270
16	315	295	275	280	290	220	220	215	225	240	215	225	215	215	220	220	210	205	230	250	250	275	275	285
17	300	270	245	I A 275	300	300	I A 260	225	220	220	225	225	225	225	220	220	200	225	210	300	250	245	275	305
18	305	270	230	250	260	225	225	215	215	225	220	205	215	I A 220	220	215	200	220	220	230	250	230	300	280
19	300	300	300	290	265	240	200	205	220	205	225	220	210	225	225	215	205	250	250	230	230	240	275	285
20	295	285	300	300	295	230	205	230	225	220	215	215	215	220	230	215	200	205	285	305	290	250	295	255
21	225	290	325	325	270	205	320	225	225	230	235	225	210	225	235	210	205	255	220	245	230	290	300	300
22	295	295	280	250	230	215	215	210	215	220	220	225	205	245	230	210	210	215	250	245	225	270	295	325
23	305	300	305	285	320	220	250	225	215	220	210	225	225	220	215	200	210	210	220	245	225	240	250	275
24	265	290	300	260	240	230	240	225	220	205	215	225	220	220	I C 220	215	210	210	245	250	220	225	275	300
25	300	300	305	290	275	250	225	215	205	220	205	220	225	225	220	220	210	205	225	250	250	300	315	315
26	305	270	250	270	265	275	250	220	200	220	235	230	230	235	220	220	215	205	220	270	230	245	275	335
27	300	295	285	275	260	230	215	215	210	220	220	230	225	225	225	210	205	225	240	250	270	255	290	300
28	290	310	320	320	300	250	210	210	220	220	210	225	220	220	225	215	205	215	260	250	240	250	270	300
29	305	305	325	295	260	230	230	215	215	215	230	205	225	190	245	215	205	250	A	A	A	325 A	305	275
30	280	265	300	260	265	230	245	245	210	215	225	225	245	220	225	225	210	220	250	255	I A 245	I A 270	250	240
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	29	29	29	29	28	28	29	28	28	28	29	30	29	28	28	28	27	27	26	28	28	28
MED	298	290	285	280	265	230	235	215	215	218	215	222	220	220	225	215	210	212	225	250	245	258	275	290
UQ	300	295	300	295	290	250	248	222	220	220	222	225	225	225	230	220	210	218	248	250	260	282	295	300
LQ	280	270	270	260	250	220	215	210	215	210	210	212	210	220	220	215	205	205	220	242	230	245	268	272

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NOV. 1972 | H'F (KM)

IONOSPHERIC DATA

NOV. 1972 | H'ES (KM) | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	100	100	100	E	S	S	G	110	110	105	100	G	G	G	100	100	S	S	S	S	S	105	100
2	100	100	100	100	100	100	S	105	115	110	105	105	100	100	120	115	110	110	105	105	105	105	105	105
3	100	100	100	100	100	100	110	110	105	105	105	105	100	100	100	G	S	S	110	105	105	S	S	S
4	S	100	100	100	100	100	S	G	105	C	C	C	100	G	C	G	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	100	100	100	100	100	G	100	100	100	100	S	100	S	S
6	100	100	100	100	100	100	100	G	110	105	C	100	100	100	100	100	S	100	S	S	S	S	100	100
7	100	100	100	100	100	100	C	100	110	110	105	100	100	100	100	C	100	100	100	100	F	S	E	S
8	S	100	100	100	100	100	S	G	G	105	105	100	100	100	100	100	100	100	100	100	100	100	100	105
9	105	100	100	100	100	100	E	G	110	105	105	105	100	120	100	100	100	100	S	S	S	S	S	S
10	S	100	E	S	E	S	S	G	115	105	105	105	105	100	100	100	100	100	100	100	105	S	S	S
11	100	100	S	E	E	100	105	G	G	105	105	105	105	105	100	100	100	100	S	100	100	S	S	S
12	S	E	S	100	E	E	S	G	110	105	105	105	G	105	105	G	105	S	S	F	E	S	S	105
13	S	E	E	E	E	S	S	G	105	G	105	100	100	100	100	100	100	100	S	F	E	S	E	S
14	100	S	100	100	100	E	S	G	105	G	G	105	105	100	110	110	100	100	S	F	S	105	S	E
15	S	E	E	S	E	E	S	E	105	105	105	G	100	100	G	G	S	E	115	105	105	105	S	S
16	S	E	E	100	100	E	E	G	115	105	120	115	120	G	100	G	G	E	S	110	105	F	105	S
17	115	S	E	115	110	110	110	105	105	105	105	100	100	G	G	G	S	105	115	110	105	105	105	100
18	105	E	E	S	100	E	E	G	G	100	105	105	100	100	100	G	S	E	E	S	E	S	110	105
19	100	105	100	E	100	100	E	155	G	110	105	120	105	G	G	G	100	100	S	100	F	S	S	S
20	S	E	S	E	E	E	E	G	110	110	G	G	G	G	100	100	120	115	100	F	S	F	100	100
21	100	100	100	100	100	S	S	G	140	120	115	105	100	G	105	100	100	100	100	S	110	105	E	E
22	100	100	E	100	100	S	145	125	120	125	105	G	100	100	100	100	100	100	100	S	S	S	100	105
23	S	E	E	E	E	E	S	150	G	110	105	105	100	G	100	G	170	E	E	S	105	E	105	E
24	E	E	100	E	E	S	E	G	110	110	105	100	100	G	C	G	S	E	S	S	S	E	E	S
25	E	100	E	E	E	E	S	G	G	G	G	105	100	100	100	G	S	S	S	110	110	105	S	100
26	E	S	E	S	E	S	S	125	115	110	G	G	140	G	G	G	S	S	110	F	E	E	100	100
27	S	E	E	E	E	E	S	G	G	G	G	G	G	G	G	100	S	E	E	S	S	S	100	100
28	S	100	100	E	E	E	E	G	G	G	120	120	110	105	105	145	S	E	E	F	110	S	110	110
29	E	E	100	S	E	E	S	145	120	120	120	120	115	G	125	110	110	105	105	100	100	105	100	100
30	E	105	100	105	110	105	105	105	G	G	120	120	120	125	G	G	S	E	S	100	105	105	S	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	16	15	15	15	11	6	10	20	22	23	24	26	18	21	15	17	16	13	14	14	10	14	14
MED	100	100	100	100	100	100	108	118	110	108	105	105	100	100	100	100	100	100	100	100	105	105	102	100
UQ	102	100	100	100	100	100	110	145	115	110	105	105	105	105	105	105	105	102	110	105	105	105	105	105
LQ	100	100	100	100	100	100	105	105	105	105	105	100	100	100	100	100	100	100	100	100	105	105	100	100

The Radio Research Laboratories, Japan

NOV. 1972 | H'ES (KM)

IONOSPHERIC DATA

NOV. 1972 | TYPES OF ES | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		F1	F1	F1					C2	C1	L1	L1				L1	L3						F2	F3
2	F2	F3	F2	F2	F3	F1		L1	L1	L2	L1	L1	L1	L1	CL21	CL31	C4	F4	F4	F4	F3	F3	F4	F4
3	F4	F2	F1	F2	FF12	F1	F3	C3	L2	L1	L2	L1	L1	L1	L1				F2	F2	F4			
4		F1	F3	F1	F1	F1			L2				L1											
5											L3	L1	L1	L1	L1		L1	F1	F1	F1		F1		
6	F1	F2	F1	F2	F1	F1	F1		L1	L2		L2	L2	L1	L1	L1		F1					F2	F2
7	F2	F1	F2	F3	F3	F2		L1	LL1	L2	L1	L2	L2	L2	L3		L2	F2	F1	F1				
8		F2	F1	F1	F1	F1				L2	L1	L1	L1	L1	L1	L1	L1	F1	F1	F1	F1	F1	F1	F2
9	F1	F2	F1	F1	F1	F1			L2	L2	L2	L1	L1	CL1	L2	L1	L1	F2						
10		F1							L2	L2	L3	L2	L2	L1	L1	L1	L2	F1	F1	F2	F4			
11	F1	F1				F1	F1			L2	L2	L1	L1	L1	L1	L2	L2	F1		F1	F1			
12				F1					L2	L2	L1	L1		L1	L1		L1							F2
13									L2		L1	L2	L3	L2	L1	L2	L3	F1						
14	F1		F1	F1	F1				L2			L1	L1	L1	L1	L1	L1	F1				F1		
15									L1	L1	L1		L1	L1					F1	F2	F1	F1		
16				F1	F2				C4	L2	CL1	CL2	CL12		L1					F1	F2		F1	
17	F1			F4	F4	F5	F5	L3	L2	L2	L3	L3	L1					F1	F1	F5	F1	F2	F1	F2
18	F2				F2					L3	L1	L1	L1	L2	L3								F1	F1
19	F3	F1	F1		F1	F2		H1		L2	L3	CL1	L1				L1	F2		F1				
20									L1	L2					L2	L1	C1	F1	F1				F2	F2
21	F1	F1	F1	F2	F1				H1	C2	C2	L3	L2		L1	L1	L1	F2	F1		F1	F1		
22	F1	F1		F1	F1		H1	C2	C2	C1	L1		L1	L1	L1	L1	L1	F1	F2				F1	F1
23								H1		L3	L2	L2	L1		L1		H1				F1		F1	
24			F1						L2	L1	L2	L2	L1											
25		F1										L2	L1	L1	L1					F1	F1	F1		F1
26								C1	L1	L2			H1						F1				F1	F1
27																L1							F1	F3
28		F1	F1								C1	C2	L1	L1	L1	H1					F1		F1	F2
29			F1					H1	C2	C1	C1	C1	C3		C1	C2	C2	F3	F4	F3	F2	F3	F2	F1
30		F2	F2	F2	F2	F1	F2	L1			C1	C1	C1	C1						F2	F4	F3		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1972 | TYPES OF ES

IONOSPHERIC DATA

NOV. 1972 | FOF2 (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	36	37	37	37	38	26	39	86	118	94	86	117	136	126	131	155	137	101	81	63	63	62	62	67
2	48	A	A	31	28	29	46	103	131	116	121	115	107	115	110	113	104	90	I R 62	F 46	I A 43	A	A	A
3	F 43	41	40	F 36	F	F	F	85	99	124	129	149	134	114	105	89	94	74	54	37	38	36	I R 35	35
4	32	F 33	F 35	36	35	32	44	75	94	94	98	93	83	80	94	78	68	56	46	47	48	39	42	32
5	36	F	43	F	F 46	F	50	68	87	96	101	104	83	79	87	C	C	C	48	44	46	45	44	43
6	43	46	45	45	49	F 39	45	75	89	88	102	108	91	93	94	92	79	56	43	33	30	33	36	39
7	39	41	41	41	41	38	42	73	81	81	94	99	95	86	91	88	84	64	45	41	36	36	31	32
8	34	36	37	38	41	37	44	78	91	87	97	103	89	81	83	82	74	55	48	42	34	32	38	38
9	36	36	33	36	37	36	41	69	78	81	89	98	102	97	82	77	68	52	38	38	34	34	30	31
10	32	33	33	35	37	36	33	59	71	83	91	101	98	91	83	84	72	47	36	29	31	36	34	33
11	34	35	36	38	37	36	41	72	88	83	86	85	77	75	84	76	66	46	37	36	36	35	36	37
12	36	36	37	38	39	37	39	69	89	97	95	97	81	78	76	67	66	43	36	37	38	39	37	36
13	F	F 41	41	40	39	36	37	69	70	82	87	106	97	82	73	72	61	42	32	36	35	37	F	F
14	36	F	F 46	F	42	37	42	69	69	82	91	92	97	87	80	79	72	43	36	34	32	31	35	33
15	34	35	36	37	38	36	31	69	76	79	94	96	101	100	79	70	61	48	42	36	36	35	I R 35	I R 36
16	36	39	39	39	37	39	41	66	89	119	132	124	121	111	77	75	87	64	49	42	47	33	39	37
17	36	38	42	36	35	38	43	77	92	94	100	101	97	100	88	74	67	47	42	32	37	36	31	33
18	34	36	39	37	36	38	41	70	81	89	91	96	86	91	83	74	62	47	46	39	36	33	30	34
19	37	35	36	36	37	35	39	59	69	97	89	99	83	H 80	79	74	H 69	41	43	40	36	32	26	26
20	31	33	33	33	34	34	34	61	84	92	101	99	96	82	84	84	59	34	29	34	37	36	31	38
21	40	33	31	31	32	I R 32	29	61	84	107	124	120	97	102	82	76	60	41	39	31	33	31	32	33
22	32	33	39	37	35	29	S 31	62	74	83	I R 97	93	92	85	89	80	63	42	30	39	36	29	29	29
23	30	32	F 35	36	36	35	36	67	92	R 100	R 126	121	108	103	92	70	65	51	46	44	41	32	33	33
24	35	37	36	36	36	33	35	70	92	101	99	118	112	91	78	78	73	55	47	41	37	29	27	31
25	31	33	34	35	33	32	37	72	84	79	78	92	88	89	88	82	68	52	37	31	31	29	32	35
26	37	43	39	39	34	33	37	64	71	89	100	108	87	89	82	H 79	H 66	48	44	39	42	38	34	36
27	36	38	36	39	38	40	42	64	75	82	80	91	98	89	98	78	63	43	42	40	37	31	27	31
28	31	31	33	34	34	38	37	55	69	87	93	I R 93	91	H 89	85	76	64	44	37	39	37	34	33	36
29	35	36	35	35	33	36	27	59	82	96	I R 98	101	90	88	91	91	62	48	40	30	31	31	35	F 36
30	F	F	F	F	F	F	F	61	75	71	90	89	96	94	78	81	71	38	37	45	36	37	F	F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	26	28	27	28	27	28	30	30	30	30	30	30	30	30	29	29	29	30	30	30	29	27	27
MED	36	36	36	36	37	36	39	69	84	89	96	100	96	89	84	78	68	48	42	39	36	34	34	35
UQ	36	38	40	38	38	38	42	73	91	97	101	108	101	100	91	84	73	55	46	42	38	36	36	36
LQ	33	33	35	36	34	33	36	62	75	82	90	93	88	82	80	75	63	43	37	34	34	32	31	32

The Radio Research Laboratories. Japan

NOV. 1972 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | FOF1 (0.01 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	U L 520	U L 470	L	L	L								
2									L	L	L	L	L	L	L									
3									A	A	L	L 450	L	U L 440	L									
4									L	L	L	L	L	L	L									
5									L	L	L	L	A	L	A									
6									L	L	L	U L 440	L	L	L	L								
7										L	L	L	U L 400	L	L									
8									L	L	L 410	L	L	L	L	L								
9										L	U L 440	L	L	L	L									
10									L	L	L	L	L	U L 420	A									
11										L	L	L	L	L	L									
12									L	L	L	U L 430	L	L	L									
13									L	L	L 410	L 440	L	L	L									
14										L	L	L	U L 390	U L 420	L									
15										L	H 440	L 460	L 430	L	L									
16									L	L	L 410	L 440	L	L	L									
17										L	L	L	L	U L 370	L									
18									L	L	L	400	L	L	L									
19									L	L	U L 410	L 460	L	L	L									
20									L	L	L	L 410	U L 430	L	L									
21										L 380	L	L	L	L	L									
22											A	L	L		L									
23											L	L	L	L	L									
24										L	L	L	L	L	L									
25										L	L	L	L	L	L									
26										L	L	L	L	L										
27										L	L	L	L	L	L									
28									L	L	L	L	L	L	L									
29										L	U L 460	L 440	L 390	L	L									
30										L	L	L	L	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	7	11	6	4										
MED										L 380	L 410	L 440	U L 415	U L 420										
UQ											L 440	L 455	U L 430	U L 430										
LQ											L 410	L 435	U L 390	U L 395										

The Radio Research Laboratories. Japan

NOV. 1972 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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	230	I A 285	A	A	A	345	I A 330	300	255	205	S						
2							S	225	275	A	A	A	A	A	A	265	A	S						
3							S	A	A	A	A	330	335	330	305	255	A	S						
4							S	A	A	A	A	A	340	I A 330	I A 300	250	A	S						
5							S	210	265	315	A	A	A	A	A	C	C	C						
6							S	215	I A 260	I A 290	315	325	330	325	305	265	A	S						
7							S	215	270	295	310	320	330	320	285	A	A	S						
8							B	220	265	295	305	315	325	305	280	250	A	S						
9							S	205	A	A	A	A	A	A	A	A	A	S						
10							S	215	A	A	A	I A 315	I A 325	A	A	A	A	S						
11							S	215	260	295	I A 300	A	A	A	A	A	A							
12							S	210	I A 260	I A 290	I A 305	I A 315	325	305	280	255	A							
13							S	215	255	290	300	305	315	300	270	250	B							
14							B	A	270	295	310	320	I A 315	305	A	A	A							
15								215	I A 260	290	300	310	320	310	I A 285	245	A							
16								195	A	A	A	A	A	A	I A 280	240	190							
17								A	A	A	A	A	A	A	280	I A 230	165							
18								205	255	I A 285	300	I A 305	315	295	285	245	195							
19								200	255	285	300	315	320	I A 310	280	250	A							
20								180	I A 250	285	300	310	315	310	285	245	180							
21								195	260	280	300	I A 310	I A 310	A	A	215	B							
22								S	250	280	A	A	305	I A 305	270	A	S							
23								180	250	290	310	320	I A 315	295	A	A	A							
24								170	A	A	A	A	320	A	A	A	A							
25								195	255	290	300	310	315	310	290	265	200							
26								A	A	A	305	315	320	305	280	245	195							
27								200	255	290	300	310	315	305	285	A	A							
28								175	250	285	I A 290	I A 300	I A 310	315	A	A	A							
29								A	245	280	A 295	305	315	305	I A 290	235	B							
30								A	245	I A 285	295	305	315	305	280	235	180							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								22	22	20	19	20	24	21	20	19	8							
MED								208	258	290	300	312	318	305	285	250	192							
UQ								215	265	292	305	318	325	315	290	255	198							
LQ								195	250	285	300	308	315	305	280	242	180							

The Radio Research Laboratories. Japan

NOV. 1972 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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 S 14	E S 13	E S 14	J X 18	E S 14	E S 14	E S 14	G	29	34	J X 36	J X 40	J G 33	J X 38	G	G	G	E S 14	J X 19	J X 24	E S 14	E S 17	J X 21	E B 19
2	J X 33	J X 63	J X 44	J X 43	J X 28	J X 20	E S 14	24	30	33	J X 94	J X 76	41	J X 66	J X 36	J X 54	J X 64	J X 54	J X 43	J X 67	J X 54	J X 90	J X 83	J X 67
3	J X 53	J X 53	J X 36	J X 26	J X 23	J X 19	J X 23	J X 39	J X 135	J X 133	J X 34	J X 39	J G 33	J X 36	G	30	J X 29	J X 23	E S 14	J X 20	J X 39	J X 39	J X 54	J X 43
4	J X 33	J X 28	J X 25	J X 19	E S 14	E S 14	J X 26	J X 29	J X 40	J X 36	J X 46	J X 44	J X 43	J X 41	J X 35	34	30	J X 29	J X 28	E S 14	F S 14	J X 19	J X 18	J X 18
5	J X 33	M 20	J X 24	J X 36	J X 29	J X 23	J X 20	J X 25	G	G 30	J X 64	J X 64	J X 91	J X 75	J X 49	C	C	C	J X 23	J X 20	J X 19	J X 23	F S 13	J X 29
6	J X 28	J X 26	J X 23	J X 24	E S 14	E S 14	E S 14	G	29	33	G	G	G	G	G	J X 60	J X 24	J X 18	E S 14	E S 14	J X 26	E S 14	F S 14	E S 14
7	J X 41	J X 33	J X 26	J X 28	J X 19	E S 14	E S 15	G	G	31	J X 39	G	J X 47	G	J G 25	J X 48	J X 79	J X 68	J X 38	J X 29	J X 23	E S 14	E S 14	E S 14
8	E S 14	E S 14	J X 20	J X 19	J X 20	J X 19	E B 19	G	G	G 24	J X 34	J G 29	J X 36	J G 30	J X 29	J X 38	J X 36	J X 36	J X 34	J X 26	E S 14	J X 19	J X 64	J X 29
9	J X 34	J X 30	J X 35	J X 24	J X 19	J X 20	E S 14	G	28	J X 36	J X 38	J X 38	J X 44	J X 47	J X 46	J X 31	J X 30	J X 25	J X 24	E S 14	E S 14	J X 20	F S 14	E S 14
10	J X 19	J X 24	J X 18	J X 19	J X 19	J X 19	J X 19	J X 24	28	J X 38	J X 47	J X 36	J X 59	J X 40	J X 43	J X 41	J X 53	J X 25	J X 29	E S 14	J X 24	J X 43	J X 43	E S 14
11	E B 18	J X 20	J X 28	J X 21	J X 20	J X 19	E S 14	G	G 24	G 23	J X 32	J X 44	J X 54	J X 59	J X 40	J X 43	J X 29	J X 19	E S 14	E S 14	J X 20	E S 14	F S 14	E S 14
12	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	26	28	33	36	33	J X 38	G	G	G	J X 25	E S 14	J X 24	J X 19	J X 19	J X 18	E S 14	E S 14
13	E S 14	E	E S 14	E	E	M 20	E S 14	G	J X 27	G 28	G	G	G	G	G	J X 28	E B 21	E S 14	E S 14	E S 14	F S 13	E S 14	F S 14	E S 14
14	E S 14	E S 14	E S 14	E S 14	J X 23	E S 14	E B 19	25	J X 64	31	40	41	34	33	J X 49	28	J X 29	J X 31	E S 14	E S 14	J X 24	J X 23	F S 14	E S 14
15	E S 14	E S 14	E S 14	E	E	E	E S 14	G	29	33	32	G	G	J G 28	J X 34	J G 20	23	E S 14	E S 14	J X 20	J X 34	J X 36	J X 53	J X 35
16	E S 14	J X 19	M 20	J X 17	E S 14	E S 14	E S 14	G	29	32	34	J X 42	39	32	J X 43	G	G	E S 14	E S 14	E S 14	J X 19	J X 25	J X 24	J X 28
17	E S 14	E S 14	E S 14	J X 19	J X 24	J X 23	E S 14	J X 43	J X 51	J X 72	J X 66	J X 49	J X 41	J X 32	29	28	G	E S 14	J X 18	J X 21	J X 37	J X 24	J X 30	J X 28
18	J X 25	J X 19	E	J X 18	E	E S 14	E S 14	J X 28	30	39	34	38	J X 74	J X 33	J G 28	G	J G 19	E S 14	J X 26	J X 19	E S 14	E S 14	F S 14	E S 14
19	E B 17	J X 33	J X 43	J X 24	J X 34	J X 19	E S 14	G	G	G	G	G	J X 40	J X 44	J G 27	J X 28	J X 29	E S 14	E S 14	E S 14	E S 14	E S 14	F S 14	E S 14
20	E S 14	E S 14	J X 20	E S 14	E	M 19	E S 14	G	24	29	G	J X 34	G	G	G	G	G	E S 14	J X 19	E S 14	J X 24	E S 14	J X 28	E S 13
21	E S 14	E S 14	E S 14	E S 14	J X 17	E S 14	E S 14	G	29	30	39	38	36	33	29	G	E B 17	E S 14	E S 14	E S 14	F S 14	F S 14	F S 14	E S 14
22	E S 14	J X 23	E S 14	M 21	E S 14	E S 14	E S 14	20	29	J X 41	J X 73	J X 33	G 27	J X 34	G	J X 30	31	E S 14	M 23	E S 14	E S 14	F S 14	F S 14	E S 14
23	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	27	32	J X 43	38	33	G	J X 34	J X 34	J X 37	J X 20	J X 18	E S 14	F S 14	J X 20	J X 18	J X 18
24	J X 18	M 22	E S 14	E S 14	E S 14	E S 14	E S 14	20	27	36	36	J X 36	J X 40	J X 50	J X 36	J X 41	J X 48	J X 23	E S 14	E S 14	E S 14	E S 14	F S 14	E S 14
25	E S 14	E S 14	E S 14	J X 18	J X 18	E S 14	E S 14	G	J X 29	J G 29	G	G	G	G	G	G	G	E S 14	J X 28	J X 23	J X 18	J X 21	J X 24	J X 24
26	J X 19	J X 31	J X 25	J X 20	J X 24	J X 25	J X 18	J X 28	J X 31	34	32	J X 49	G	G 29	G	J G 23	G	J X 20	E S 14	E S 14	J X 29	J X 19	F S 14	E S 14
27	E S 14	J X 19	J X 17	J X 17	E S 14	E S 14	E S 14	G	G	J G 29	J G 28	35	J G 25	J G 24	G 22	J X 25	J X 26	J X 45	J X 40	E S 14	E S 14	M 20	E S 14	E S 14
28	J X 19	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	J X 42	J X 42	36	33	31	J X 46	J X 29	J X 23	J X 19	J X 19	J X 20	E B 19	F B 18	E S 14
29	J X 18	J X 25	J X 21	J X 23	J X 17	E S 14	E S 14	25	36	J X 47	J X 62	37	G	G	J X 32	26	E B 16	J X 18	E S 14	E S 14	E S 14	E S 14	E S 14	J X 29
30	E S 14	J X 23	J X 23	J X 24	E S 14	J X 19	J X 20	J X 26	G 23	31	41	42	39	35	G	G	G	J X 18	J X 22	J X 17	J X 25	J X 28	J X 24	J X 22
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	30	30	30	30	30	30
MED	E E 16	J X 20	J X 19	J X 19	16	E S 14	E S 14	G	28	32	J 36	J 38	36	J 33	J 29	J 28	J X 26	J X 18	J X 19	E S 14	J X 19	J X 19	E S 14	E S 14
UQ	J X 25	J X 26	J X 25	J X 24	J X 20	J X 19	E E 18	J X 25	30	36	J X 43	J X 42	J X 41	J X 40	J X 36	J X 38	J X 30	J X 25	J X 26	J X 20	J X 24	J X 23	J X 24	J X 28
LQ	E S 14	E S 14	E S 14	14	E S 14	E S 14	E S 14	G	G 24	G 29	32	33	G 25	G	G	G	E G 16	E S 14	E S 14	E S 14	E S 14	F S 14	F S 14	E S 14

The Radio Research Laboratories, Japan

NOV. 1972 | FOES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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 S 14	E S 13	E S 14	E	E S 14	E S 14	E S 14	G	29	32	34	36	G 29	33	G	G	G	E S 14	E	22	E S 14	E S 17	E	E B 19
2	20	A	A	26	20	E	E S 14	G	29	32	34	42	35	40	34	45	62	48	U R 43	24	A	A	A	A
3	20	30	23	20	17	E	18	34	62	64	32	28	G 28	24	G	29	25	E	E S 14	E	21	29	22	20
4	E	24	18	E	E S 14	E S 14	18	24	28	33	37	38	30	39	31	30	26	20	20	E S 14	E S 14	E	E	E
5	22	E	22	18	24	E	19	19	G	G 27	34	36	58	36	39	C	C	C	E	18	E	19	F S 13	18
6	19	18	18	E	E S 14	E S 14	E S 14	G	29	32	G	G	G	G	G	20	21	E	E S 14	E S 14	20	F S 14	F S 14	E S 14
7	E	19	20	17	16	E S 14	E S 15	G	G	31	28	G	26	G	G 24	34	60	50	32	29	19	E S 14	F S 14	E S 14
8	E S 14	E S 14	E	16	16	E	E B 19	G	G	G 24	26	G 27	26	G 26	24	22	26	24	22	21	E S 14	E	19	E
9	22	19	19	16	15	E	E S 14	G	28	30	32	34	34	34	30	25	24	21	20	E S 14	E S 14	19	F S 14	E S 14
10	E	18	E	E	17	E	E	19	28	29	32	32	42	31	41	27	21	22	22	E S 14	18	18	22	E S 14
11	E B 18	E	18	18	16	E	E S 14	G	G 23	G 23	32	34	36	37	33	35	22	E	E S 14	E S 14	19	F S 14	E S 14	E S 14
12	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	25	28	30	32	33	29	G	G	G	20	E S 14	22	19	E	E	F S 14	E S 14
13	E S 14	E	E S 14	E	E	E	E S 14	G	23	G 27	G	G	G	G	G	22	E B 21	E S 14	E S 14	E S 14	F S 13	F S 14	F S 14	E S 14
14	E S 14	E S 14	E S 14	E S 14	E	E S 14	E B 19	22	20	31	33	37	33	24	30	28	22	19	E S 14	E S 14	E	E	F S 14	E S 14
15	E S 14	E S 14	E S 14	E	E	E	E S 14	G	29	32	32	G	G	G 24	30	G 19	23	F S 14	E S 14	E	E	18	20	22
16	E S 14	E	E	16	E S 14	E S 14	E S 14	G	27	31	34	35	33	31	29	G	G	E S 14	E S 14	E S 14	E	E	E	E
17	E S 14	E S 14	E S 14	E	16	19	E S 14	29	40	32	38	36	33	30	24	27	G	E S 14	E	19	20	18	E	E
18	18	E	E	E	E	E S 14	E S 14	16	28	29	33	33	28	24	G 22	G	G 17	E S 14	E	E	F S 14	F S 14	F S 14	E S 14
19	E B 17	19	25	19	19	E	E S 14	G	G	G	G	G	24	32	G 23	20	19	E S 14	E S 14	E S 14	F S 14	F S 14	F S 14	E S 14
20	E S 14	E S 14	E	E S 14	E	E	E S 14	G	24	24	G	28	G	G	G	G	G	E S 14	E	E S 14	20	E S 14	F S 14	E S 13
21	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	G	29	30	33	36	33	32	28	G	E B 17	E S 14	E S 14	E S 14	F S 14	E S 14	F S 14	E S 14
22	E S 14	18	E S 14	E	E S 14	E S 14	E S 14	19	29	32	62	33	G 27	32	G	27	25	E S 14	E	E S 14	E S 14	F S 14	F S 14	E S 14
23	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	26	31	35	35	32	G	30	24	20	17	E	E S 14	F S 14	E	E	E
24	E	E	E S 14	E S 14	E S 14	E S 14	E S 14	20	26	30	32	32	28	35	30	30	32	E	E S 14	E S 14	F S 14	F S 14	F S 14	E S 14
25	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	G	22	G 25	G	G	G	G	G	G	G	E S 14	E	18	E	18	18	19
26	18	22	20	18	24	19	E	20	27	30	G	28	G	G 29	G	G 18	G	E	E S 14	E S 14	17	E	F S 14	E S 14
27	E S 14	E	E	15	E S 14	E S 14	E S 14	G	G	G 25	G 25	34	G 24	G 22	G 20	25	24	24	22	E S 14	E S 14	E	F S 14	E S 14
28	E	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	32	34	32	30	30	27	19	18	E	E	E	E B 19	F B 18	E S 14
29	E	18	16	18	16	E S 14	E S 14	20	34	35	38	33	G	G	30	26	E B 16	E	E S 14	E S 14	F S 14	F S 14	F S 14	E
30	E S 14	E	15	15	E S 14	E	E	19	G 20	31	37	37	35	34	G	G	G	E	E	E	18	E	18	18
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	30	30	30	30	30	30
MED	E E 14	14	14	14	14	E S 14	E S 14	G	27	30	32	33	28	30	24	24	21	14	14	E S 14	14	E E 14	F S 14	E S 14
UQ	E 18	18	18	17	16	E S 14	E S 14	20	29	32	34	36	33	33	30	27	24	19	20	18	18	18	F 18	E S 14
LQ	E S 14	E	E S 14	E	E S 14	E	E S 14	G	G 20	G 27	26	28	G 24	G	G	G	E G 16	E S 14	E	E S 14	F S 13	E	F S 14	E S 14

The Radio Research Laboratories, Japan

NOV. 1972 | FBES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | F-MIN (0.1 MHZ) | 135 E Mean Time (G. M. T. + 9h)

Station AKITA Lat. 39 43·5 N. Long. 140 08·2 E Sweep 1 MHz to 20 MHz in 20 sec in automatio operation

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

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NOV. 1972 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | M(3000)F2 (0.01) | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	280	285	300	310	325	240	310	330	340	345	290	300	305	300	290	310	315	295	295	270	270	265	260	290
2	290	A	A	270	270	260	300	320	335	320	320	320	315	310	310	320	320	335	I R 330	F 310	I A 290	A	A	A
3	F 290	290	270	F 280	F	F	F	355	325	330	315	320	330	315	330	335	345	340	335	320	295	300	I R 310	280
4	280	F 305	F 285	310	320	295	320	345	345	345	345	345	335	315	325	345	355	340	305	315	330	325	320	305
5	280	F	285	F	F 285	F	325	345	340	345	345	340	330	330	335	C	C	C	320	340	330	310	300	290
6	290	300	300	310	320	F 300	310	340	335	340	325	335	330	330	335	330	350	340	330	320	300	285	285	310
7	285	275	300	295	315	310	320	350	345	340	325	330	325	320	330	340	335	340	340	320	305	300	305	290
8	300	305	300	290	300	310	320	350	360	325	330	335	335	325	340	345	345	330	335	340	325	315	315	325
9	315	320	290	285	300	310	340	355	365	345	330	325	335	335	335	350	355	345	340	325	320	325	305	295
10	290	305	290	310	320	335	345	360	345	330	350	340	350	335	330	340	350	345	350	350	295	290	295	305
11	295	300	305	325	305	305	320	355	355	360	350	330	340	330	335	310	350	335	330	335	325	290	300	310
12	295	305	305	305	315	320	335	350	350	345	350	350	320	335	340	345	350	335	315	315	315	320	325	315
13	F	F 295	295	305	320	320	340	350	345	340	310	320	340	330	350	350	350	350	310	325	315	315	F	F
14	310	F	F 310	F	330	320	335	350	360	345	340	340	350	340	350	345	355	355	310	325	325	305	305	295
15	300	300	305	325	340	340	325	350	355	345	345	330	340	350	355	355	360	325	335	320	335	285	I R 310	I R 295
16	290	305	290	335	300	335	320	335	315	335	340	325	325	335	345	345	340	325	350	310	310	295	310	290
17	285	290	335	300	285	290	315	340	350	340	340	335	330	350	340	345	360	330	345	310	325	305	305	295
18	285	305	290	305	300	315	320	360	345	350	350	345	335	350	345	340	345	335	330	335	320	315	295	295
19	275	285	285	285	320	325	330	360	370	355	335	325	340	325 H	340	340	305 H	320	325	325	330	325	310	290
20	285	280	275	290	290	325	315	335	345	335	345	340	335	340	340	345	350	330	285	280	320	285	295	300
21	320	275	280	290	305	I R 310	310	315	325	325	335	330	335	330	345	345	350	340	330	325	310	310	295	285
22	295	285	275	305	305	315	S 305	355	340	335	I R 330	335	345	340	345	355	360	350	305	325	315	295	275	265
23	280	280	F 275	290	270	300	300	325	340	R 315	R 330	330	330	340	340	350	350	320	325	325	330	330	285	290
24	275	280	265	290	300	300	310	325	355	340	335	335	335	345	330	320	335	310	340	325	325	335	275	290
25	285	280	280	285	295	295	315	355	360	355	350	325	330	325	330	345	345	330	350	305	345	305	290	285
26	290	300	290	300	305	295	310	350	340	325	340	335	335	320	330	325 H	330 H	325	305	300	310	320	295	315
27	300	290	295	290	305	300	305	330	350	315	310	320	340	350	300	320	325	325	310	325	325	335	305	280
28	285	280	270	280	270	305	325	330	335	325	345	I R 330	320	325 H	335	355	360	325	320	315	325	325	305	285
29	285	280	275	290	305	310	305	335	335	350	I R 330	335	335	340	330	350	320	335	330	325	315	290	295	F 305
30	F	F	F	F	F	F	F	340	360	330	335	345	335	355	360	330	350	345	320	315	330	330	F	F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	26	28	27	28	27	28	30	30	30	30	30	30	30	30	29	29	29	30	30	30	29	27	27
MED	290	290	290	295	305	310	320	348	345	340	335	332	335	332	335	345	350	335	330	322	320	310	300	295
UQ	295	305	300	308	320	320	325	355	355	345	345	340	340	340	345	345	350	340	335	325	325	325	308	305
LQ	285	280	278	290	298	300	310	335	340	330	330	325	330	325	330	330	335	325	310	315	310	295	295	290

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NOV. 1972 | M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1972 | M(3000)F1 (0.01) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	U L 350	U L 360	L	L	L								
2									L	L	L	L	L	L	L									
3									A	A	L	L 375	L	U L 430	L									
4									L	L	L	L	L	L	L									
5									L	L	L	L	A	L	A									
6									L	L	L	U L 365	L	L	L	L								
7										L	L	L	U L 390	L	L									
8									L	L	L 385	L	L	L	L	L								
9										L	U L 370	L	L	L	L									
10									L	L	L	L	L	U L 355	A									
11										L	L	L	L	L	L									
12									L	L	L	U L 375	L	L	L									
13									L	L	L 395	L 370	L	L	L									
14										L	L	L	U L 385	U L 380	L									
15										L	H 390	L 370	L 370	L	L									
16									L	L	L 385	L 390	L	L	L									
17										L	L	L	L	U L 390	L									
18									L	L	L	400	L	L	L									
19									L	L	U L 370	L 370	L	L	L									
20									L	L	L	L 385	U L 370	L	L									
21										L 425	L	L	L	L	L									
22											A	L	L		L									
23											L	L	L	L	L									
24										L	L	L	L	L	L									
25										L	L	L	L	L	L									
26										L	L	L	L	L										
27										L	L	L	L	L	L									
28									L	L	L	L	L	L	L									
29										L	U L 365	L 385	L 405	L	L									
30										L	L	L	L	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	7	11	6	4										
MED										L 425	L 385	L 375	U L 378	U L 385										
UQ											L 388	L 385	U L 390	U L 410										
LQ											U L 370	L 370	U L 370	U L 368										

The Radio Research Laboratories. Japan

NOV. 1972 | M(3000)F1 (0.01)

IONOSPHERIC DATA

NOV. 1972 | H'F2 (KM) | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									230	225	245	295	280	265	280	250								
2									250	235	245	245	250	255	250									
3									265	240	235	240	235	235	240									
4									235	225	240	235	235	250	250									
5									240	235	230	245	240	240	250									
6									230	230	250	250	250	250	250	230								
7										230	235	235	240	245	235									
8									230	230	240	245	230	230	240	235								
9										230	250	245	245	245	235									
10									230	220	240	245	245	255	245									
11										225	240	235	230	245	245									
12									225	230	230	235	220	240	240									
13									220	235	245	250	235	230	230									
14										230	245	250	245	250	235									
15										230	235	250	245	240	230									
16									265	240	230	245	240	230	220									
17										235	235	240	240	240	225									
18									230	235	235	245	230	245	230									
19									235	245	245	260	240	225	245									
20									230	245	240	245	240	235	240									
21										260	250	245	235	235	235									
22											I A 240	240	240		240									
23											255	250	240	240	235									
24										250	245	250	240	235	225									
25										225	220	255	235	255	250									
26										230	235	255	235	235										
27										250	220	240	250	235	240									
28									230	235	230	250	250	235	230									
29										245	275	255	240	250	235									
30										215	250	245	250	235	220									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									15	28	30	30	30	29	29	3								
MED									230	232	240	245	240	240	240	235								
UQ									238	240	245	250	245	250	245	242								
LQ									230	230	235	240	235	235	230	232								

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NOV. 1972 | H'F2 (KM)

IONOSPHERIC DATA

NOV. 1972 | H'F (KM) | 135 E Mean Time (G. M. T.+ 9h)

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	300	295	265	260	230	405	255	230	210	215	215	240	230	230	230	240	215	210	235	255	305	305	250H	255
2	245	A	A	A	A	365	285	245	245	230	225	IA225	230	IA230	245	245	245	225	IA240	275	IA335	A	A	A
3	280	A	360	350	330	295	235	210	IA240	IA220	220	200	210	185	180H	230	225	205	205	235	285	IA265	260	320
4	310	IA315	305	280	235	280	240	220	220	210	230	IA210	230	IA230	240	230	215	205	245	250	235	245	245	250
5	340	260	310	305	305	295	215	215	235	220	190H	220	IA235	IA235	IA235	C	C	C	240	245	245	260	270	290
6	295	270	245	255	230	230	235	225	225	215	195H	195	235	230	235	230	220	205	210	235	300	295	295	275
7	280	280	265	265	245	265	230	225	230	220	210	220	205	220	235	235	240	245	260A	IA260	260	265	245	300
8	290	255	255	295	270	230	245	220	215	195	205	205	215	210	215	230	220	215	235	220	235	260	275	235
9	295	250	310	295	265	235	225	220	215	205	210	230	215	240	220	225	220	210	230	245	245	250	260	300
10	310	300	310	270	265	220	215	205	220	205	230	230	IA200	205	IA220	230	215	210	240	220	290	295	295	275
11	300	285	290	255	265	250	230	215	225	215	190H	220	IA210	IA235	IA230	225	215	200	235	235	250	280	285	265
12	285	275	280	265	250	225	220	220	220	215	215	215	210	205H	240	220	215	210	255	245	245	245	245	250
13	290	270	255	245	235	225	215	220	215	220	195	220	200H	220	225	220	205	195	245	245	245	245	255	285
14	245	280	250	225	210	245	235	220	210	215	230	230	205	215	235	220	205	195	240	245	240	300	285	290
15	295	275	280	245	220	215	245	220	215	215	200H	200	205	200H	225	220	210	235	225	250	235	300	290	295
16	295	270	295	240	275	215	240	225	230	235	215	205	215	225	220	225	230	205	205	245	240	245	260	295
17	295	295	240	245	295	295	250	230	230	225	IA225	IA235	220	210	210	215	205	215	225	250	255	255	265	295
18	305	290	290	245	250	245	225	225	230	215	210	195	170H	195H	215	220	210	215	235	225	235	255	270	285
19	290	300	IA320	305	275	220	245	215	190H	245	205	220	225	220	225	230	210	205	245	240	240	235	250	290
20	315	310	305	300	295	245	235	230	180H	220	215	200	205	220	215	225	200	205	295	305	265	300	A	255
21	245	300	335	305	250	235	255	235	230	220	235	225	220	205	235	225	215	200	220	235	245	245	270	285
22	295	320	295	260	245	240	225	230	220	225	IA220	220	210	235	220	230	220	205	255	245	235	260	305	305
23	300	310	300	260	310	270	260	220	230	240	230	220	215	230	230	210	230	235	235	230	240	240	270	270
24	310	290	300	270	255	245	250	235	235	235	215	200H	225	IA225	IA230	230	230	210	215	240	235	230	330	290
25	305	305	310	295	280	275	255	225	220	210	210	190H	185H	200H	240	235	215	215	200	265	245	295	320	315
26	305	285	285	260	IA270	305	255	210	220	210	205	185H	230	235	230	220	205	215	220	245	245	240	285	260
27	295	295	290	290	255	260	220	210	225	200H	205	230	230	230	230	230	210	250	245	230	240	230	280	300
28	290	310	310	325	310	265	205	210H	215	220	225	205H	230	210	220	215	210	210	245	245	240	240	280	300
29	310	305	310	290	240	250	240	230	235	IA225	230	205	205	180H	210	225	205	225	220	230	250	290	260	265
30	260	280	305	280	240	255	230	230	215	205	230	IA235	240	IA235	225	225	215	195	240	220	245	230	300	280
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	29	29	30	30	30	30	30	30	30	30	30	30	29	29	29	30	30	30	29	28	29
MED	295	290	295	270	255	248	235	220	220	218	215	220	215	220	228	225	215	210	235	245	245	255	270	285
UQ	305	302	310	295	275	275	250	230	230	225	225	225	230	230	235	230	220	215	245	250	255	290	288	295
LQ	290	275	280	255	240	230	225	215	215	210	205	200	205	205	220	220	210	205	220	235	240	245	260	265

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NOV. 1972 | H'F (KM)

IONOSPHERIC DATA

NOV. 1972 | H'ES (KM)

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	S	S	100	S	S	S	G	120	115	110	105	105	105	G	G	G	S	110	105	S	S	110	B
2	100	95	95	95	100	100	S	125	120	120	115	115	115	115	115	115	115	115	110	110	110	110	105	105
3	105	105	100	100	100	100	110	110	105	105	105	105	105	100	G	145	100	105	S	110	105	105	105	105
4	105	100	100	100	S	S	100	105	105	105	100	100	105	100	100	125	115	100	100	S	S	100	105	100
5	100	120	105	100	100	100	100	115	G	110	105	105	100	100	100	C	C	C	100	100	105	105	S	100
6	100	100	100	100	S	S	S	G	115	110	G	G	G	G	G	100	100	100	S	S	140	S	S	S
7	105	100	100	100	100	S	S	G	G	135	110	G	105	G	100	100	100	95	100	95	100	S	S	S
8	S	S	100	100	100	100	B	G	G	105	105	105	105	100	100	100	100	100	100	110	S	105	105	105
9	100	100	100	100	100	100	S	G	115	110	105	105	100	100	100	100	100	100	100	S	S	110	S	S
10	105	100	100	100	100	100	100	110	115	110	110	110	105	100	100	105	105	105	105	S	105	105	100	S
11	B	100	100	100	100	100	S	G	110	105	105	100	100	100	100	100	100	100	S	S	110	S	S	S
12	S	S	S	E	S	S	S	150	115	110	110	110	110	G	G	G	110	S	100	100	100	105	S	S
13	S	E	S	E	E	105	S	G	110	110	G	G	G	G	G	100	B	S	S	S	S	S	S	S
14	S	S	S	S	105	S	B	150	110	150	125	120	120	100	115	115	100	100	S	S	105	105	S	S
15	S	S	S	E	E	E	S	G	140	135	125	G	G	105	100	100	125	S	S	110	110	110	105	100
16	S	110	100	100	S	S	S	G	130	125	120	115	120	120	110	G	G	S	S	S	105	105	105	105
17	S	S	S	105	105	105	S	110	110	110	110	110	110	110	110	110	G	S	100	100	105	105	110	105
18	105	105	E	105	E	S	S	100	140	120	120	115	100	100	100	G	100	S	100	100	S	S	S	S
19	B	100	100	100	100	105	S	G	G	G	G	G	105	100	100	100	100	S	S	S	S	S	S	S
20	S	S	100	S	E	105	S	G	110	110	G	105	G	G	G	G	G	S	110	S	105	S	110	S
21	S	S	S	S	105	S	S	G	155	135	120	115	115	115	110	G	B	S	S	S	S	S	S	S
22	S	105	S	110	S	S	S	150	140	125	105	105	105	100	G	110	110	S	105	S	S	S	S	S
23	S	S	S	S	S	S	S	G	130	135	120	120	120	G	100	100	100	100	100	S	S	115	120	105
24	105	105	S	S	S	S	S	135	125	120	120	115	110	105	100	100	100	100	S	S	S	S	S	S
25	S	S	S	100	100	S	S	G	110	110	G	G	G	G	G	G	G	S	105	105	105	105	100	100
26	105	105	105	105	105	100	105	115	115	115	120	110	G	110	G	100	G	100	S	S	110	110	S	S
27	S	105	100	100	S	S	S	G	G	110	105	155	100	100	100	100	100	105	105	S	S	100	S	S
28	110	S	S	S	S	S	S	G	G	G	125	120	115	110	115	100	100	100	105	100	100	B	B	S
29	110	105	105	110	105	S	S	140	125	120	115	125	G	G	115	150	B	105	S	S	S	S	S	110
30	S	110	105	110	S	110	105	105	105	105	125	120	120	120	G	G	G	100	105	110	120	100	105	110
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	13	18	17	21	15	13	6	14	24	28	25	24	23	22	20	21	19	17	18	13	17	17	13	12
MED	105	105	100	100	100	100	102	115	115	110	110	110	105	100	100	100	100	100	102	105	105	105	105	105
UQ	105	105	100	105	105	105	105	140	128	122	120	118	115	110	110	110	108	105	105	110	110	110	110	105
LQ	100	100	100	100	100	100	100	110	110	110	105	105	105	100	100	100	100	100	100	100	105	105	105	100

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NOV. 1972 | H'ES (KM)

IONOSPHERIC DATA

NOV. 1972 | TYPES OF ES | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				F1					C2	C1	L2	L2	L1	L2					F1	F3			F1	
2	F3	F4	F4	F3	F2	F1		H1	C2	C2	C1	C2	C1	C2	C2	C3	C3	C6	F3	F3	F6	F3	F4	F3
3	F3	F3	F3	F3	F2	F1	L1	L3	L3	L3	L2	L2	L1	L1		H2	L2	L1		F1	F2	F4	F2	F4
4	F2	F2	F2	F1			L1	L2	L2	L2	L2	L2	L1	L3	LH21	H2	C2	L3	F1			F1	F1	F1
5	F2	F1	F2	F2	F3	F1	L2	L1		L2	L2	L2	L2	L2	L2				F1	F1	F1	F1		F2
6	F1	F1	F1	F1					C2	L2						L1	L1	L1			F2			
7	F2	F2	F2	F2	F1					H1	L1		L1		L1	L3	L3	L4	F2	F2	F1			
8			F1	F2	F1	F2				L1	L1	L1	L2	L2	L2	L1	L2	L1	F2	F2		F1	F2	F1
9	F3	F2	F2	F1	F1	F1			C2	L2	L2	L2	L2	L2	L2	L1	L2	L3	F1			F2		
10	F1	F2	F2	F1	F1	F2	L1	L1	C2	L2	L2	L2	L2	L2	L3	L3	L1	L3	F3		F2	F2	F2	
11		F1	F2	F2	F1	F1			L1	L2	L2	L2	L2	L2	L2	L3	L1	F1			F1			
12								H2	C2	L2	L2	L1	L1				L1		F2	F2	F1	F1		
13						F1			L1	L1						L1								
14					F1			H1	L1	H1	H2	C2	CL12	LC21	C2	C2	L2	F1			F1	F1		
15									H2	H2	H1			L1	L2	L1	H2			F1	F2	F2	F2	F3
16		F1	F1	F1					H2	H2	C2	C2	C2	C1	L2						F1	F1	F2	F1
17				F1	F2	F2		L3	L2	L2	L2	L2	L2	L2	L1	L2			F1	F2	F2	F2	F2	F2
18	F1	F1		F1				L1	H2	C2	C2	C1	L2	L1	L1		L1		F1	F1				
19		F2	F2	F2	F2	F1							L1	L2	L2	L1	L1							
20			F1			F1			L2	L2		L1							F2		F1		F1	
21					F1				H2	H1	C2	C2	C2	C2	C2									
22		F2		F1				H1	H1	H2	L3	L2	L1	L1		C2	L2		F2					
23									H1	H1	C2	H2	C2		L2	L1	L2	F1	F1			F2	F1	F1
24	F1	F1						H2	H2	C1	C1	C1	L1	L2	L2	L3	L4	F1						
25				F1	F1				L2	L2									F1	F2	F1	F1	F1	F1
26	F1	F2	F2	F2	F3	F3	F1	C1	C2	C1	C1	L1		L1		L1		F1			F2	F1		
27		F1	F1	F1						L1	L2	H1	L1	L1	L1	L2	L3	F3	F3			F1		
28	F1										H1	C2	C1	L1	C1	L1	L1	F2	F1	F1	F1			
29	F1	F2	F2	F2	F2			H1	H2	C2	C1	H1			C1	H1		F1						F2
30		F1	F1	F1		F2	F1	L1	L1	L2	H2	C2	C1	C2				F1	F1	F1	F1	F1	F1	F1
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1972 | TYPES OF ES

IONOSPHERIC DATA

NOV. 1972 | FOF2 (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	36	37	40	40	34	25	43	91	117	87	85	120	140	137	139	159	127	102	95	S 73	73	62	64	66
2	61	54	41	37	36	31	50	108	120	130	127	121	109	112	111	106	J R 102	86	61	45	A	A	A	A
3	U F 38	44	F 40	F 44	F 41	F 40	56	91	87	125	142	140	136	136	125	96	J R 100	83	55	40	38	39	36	A
4	34	34	35	36	34	29	44	85	83	95	J R 101	91	82	87	95	87	67	59	48	49	49	41	39	34
5	32	35	36	37	37	38	44	72	76	96	95	94	95	85	83	83	73	58	49	40	41	39	41	40
6	F 40	46	46	F 44	F 44	F 36	46	S 73	85	92	99	106	J R 103	100	98	96	J R 76	56	44	36	31	33	34	37
7	R 33	36	37	36	36	33	41	I S 72	81	95	90	J R 100	106	95	J R 100	87	87	67	46	40	37	36	33	31
8	32	35	33	35	38	39	47	J R 76	82	J R 79	J R 103	J R 104	85	86	86	86	68	55	49	41	34	30	37	31
9	A	36	35	38	36	39	44	69	76	90	91	97	108	109	95	76	70	54	37	35	34	31	28	29
10	31	33	32	35	38	36	39	56	68	82	98	95	R 93	93	100	81	70	47	44	32	26	30	35	34
11	35	35	37	38	36	36	47	74	80	74	78	R 89	79	82	86	82	66	51	34	36	34	34	34	34
12	36	37	36	39	41	35	40	72	84	82	88	89	94	84	78	68	62	48	37	38	38	38	32	36
13	36	38	39	39	39	37	40	61	76	R 83	79	C	108	94	70	69	66	50	32	36	39	36	34	S 33
14	39	41	J R 41	J R 40	33	33	39	J R 82	J R 76	82	92	98	89	95	84	86	73	45	36	34	30	J R 31	36	34
15	33	35	35	38	35	31	34	66	J R 73	81	96	J R 102	J R 100	101	89	67	56	47	44	36	37	35	36	35
16	I A 35	39	38	J R 43	35	39	39	I S 71	86	126	136	126	120	113	91	78	79	J R 79	53	40	49	33	35	35
17	36	36	43	34	31	35	41	J R 77	91	J R 105	113	110	101	95	89	75	69	52	43	37	34	35	32	31
18	33	35	35	35	34	33	40	63	86	90	90	95	I R 96	93	90	78	64	50	45	47	37	30	33	33
19	35	35	34	36	38	30	36	66	J S 77	71	100	83	97	83	76	74	72	56	40	40	39	32	25	28
20	30	31	34	34	33	33	40	66	80	J R 104	102	J R 91	98	81	J R 85	81	65	41	34	35	40	35	36	34
21	36	31	31	I S 31	27	I S 25	34	59	89	J R 103	131	124	109	J R 101	89	78	68	45	41	31	35	33	37	F
22	34	33	33	35	I R 35	32	31	I R 63	82	89	96	J R 104	102	J R 105	83	C	68	43	31	36	42	29	30	29
23	31	31	33	35	33	35	40	62	R 82	111	128	124	123	108	91	75	66	54	51	46	38	36	31	34
24	35	36	36	36	36	31	36	73	I R 99	J R 100	J R 105	111	J R 104	J R 104	93	89	80	60	53	40	36	32	26	31
25	30	31	33	33	33	31	39	I R 74	R 83	77	84	80	92	91	87	79	69	50	46	29	35	31	36	38
26	39	40	37	42	37	35	39	J R 80	77	91	100	93	93	97	83	81	66	50	50	39	46	I S 40	33	35
27	34	36	36	37	37	C	C	C	C	71	86	97	89	91	92	80	72	48	50	46	36	30	26	30
28	31	30	31	31	34	35	37	55	69	83	104	95	94	90	85	77	H 65	46	41	45	36	37	34	34
29	34	39	37	37	35	35	31	58	86	R 93	R 93	J R 101	95	J R 99	80	87	J R 75	53	39	36	34	27	31	31
30	35	35	35	36	35	34	36	64	J R 77	82	76	93	R 91	95	78	76	73	50	43	43	30	25	29	F 31
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	29	29	29	29	30	30	29	30	30	30	29	30	30	30	30	29	29	29	27
MED	35	36	36	36	36	35	40	72	82	90	97	98	98	95	89	81	70	52	44	40	37	33	34	34
UQ	36	38	38	39	37	36	44	76	86	100	104	110	108	104	95	87	75	58	50	43	39	36	36	35
LQ	33	34	34	35	34	31	37	63	77	82	90	93	93	90	83	76	66	48	39	36	34	31	31	31

NOV. 1972 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | FOF1 (0.01 MHZ) | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	L	L	L								
2									L	A	L	A	A	L										
3									A	L	A	A	A	L	L									
4									L	L	L	L	A	A	A	A								
5									L	L	L	L	L	L	L	L								
6									L	L	L	L	L	L	L	L								
7									L	L	L	L	L	L	L	L								
8								L	L	L	L	L	L	L	L	U L 310								
9										L	L	L	L	L	L	L								
10										L	L	L	L	A	L									
11									L	L	L	L	L	L		L								
12									L		L	L	L	L	L									
13									L	L	L 440	C	L	L	L									
14										L	L	L	L	L	L	L								
15										L	L	L	L	L	L									
16									L	L	L	L	L	L	L	L								
17										L	L	L	L	L	L	L								
18									L	L	L	L	U L 410	L	L	L								
19									L	L	L	L	L	L	L									
20									L	L	L	L	L	L	L	A								
21										L	L	L	L	L	L	L								
22									L	L	L	A	L	L 420	L	C								
23									L	L	L	L	L	L	L									
24										L	L	L	L	L	L									
25										L 410	L	L	L	L	L									
26										L	L	L	L	L	L	L								
27									C	L	L	L 430	L	L	L	L								
28										L	L	L	L 430	L	L									
29									L	L	L	L	A	L	L	L								
30									L	L	L	L	L	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	1	1	2	1		1								
MED										L 410	L 440	L 430	L 420	L 420		U L 310								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1972 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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

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							B	240	280	290	A	340	I R 345	335	310	265	A	B						
2							B	220	260	295	340	350	350	325	305	270	205	B						
3							A	A	A	A	A	A	A	A	A	A	210	B						
4								220	A	300	325	350	A	A	A	A	A	B						
5							B	245	270	270	I A 300	A	A	A	A	A	A	B						
6							B	200	255	R	R	R	A	A	310	265	R	B						
7								210	260	290	300	310	300	290	I R 290	I R 260	200	B						
8							B	A	250	I A 300	320	315	320	A	A	260	A	B						
9							B	A	A	300	I A 310	A	A	A	300	A	A	B						
10							B	205	270	A	A	320	A	A	A	A	A	B						
11							B	210	I R 250	305	315	320	315	315	A	A	A							
12							B	220	260	A	A	A	A	A	290	265	200	B						
13							B	210	260	285	A	C	290	290	285	260	170							
14								190	250	285	305	325	A	A	A	A	180							
15								180	250	290	305	A	310	300	R	A	190							
16							B	220	280	A	A	A	A	310	I R 250	R 250	170							
17							B	A	A	A	A	A	A	300	A	A	180							
18							B	185	250	I A 280	I A 300	A	A	310	290	245	180							
19							B	220	260	I R 285	I R 315	325	330	320	300	A	A							
20							B	175	260	260	A	B	A	310	290	250	R							
21								180	I A 250	280	A	A	A	A	A	250	A							
22								170	R 260	290	305	310	325	305	290	C	B							
23								A	A	A	A	315	A	A	A	250	B							
24							B	I R 200	230	I A 270	A	A	A	A	280	250	200							
25								160	I A 240	295	I A 305	320	325	325	280	270	190							
26							B	195	265	300	I A 330	I A 325	320	320	290	260	A							
27								C	C	A	A	A	330	I A 300	I A 280	I A 265	A							
28							B	200	250	280	I A 300	305	A	A	A	A	A							
29							B	200	I A 250	A	A	315	310	I A 300	I R 275	250	180							
30								200	235	285	305	315	320	I A 300	I A 270	245	175							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								24	24	21	16	16	14	17	18	18	14							
MED								200	258	290	305	320	320	310	290	260	185							
UQ								220	260	295	318	325	330	320	300	265	200							
LQ								188	250	280	302	315	310	300	280	250	180							

The Radio Research Laboratories. Japan

NOV. 1972 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1972 | FOES (0.1 MHZ) | 135 E Mean Time (G. M. T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35 42 .4 N . Long. 139 29 .3 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 15	E B 12	E B 13	E B 13	E S 15	E S 15	E B 15	G	G	34	34	J G 30	G	37	G	31	32	20	J X 43	J X 25	J X 28	J X 36	M 37	J X 43
2	J X 36	J X 36	J X 31	34	J X 23	J X 30	E B 14	25	35	M 74	G	J X 60	J X 82	38	J X 52	36	30	J X 25	J X 24	J X 52	J X 44	J X 106	J X 60	J X 54
3	J X 55	J X 30	J X 29	J X 24	E B 14	E B 14	J X 33	J X 40	J X 90	J X 43	J X 89	J X 104	J X 84	J X 44	J X 35	30	G	E B 15	E B 15	21	J X 29	J X 29	J X 24	J X 54
4	J X 24	M 21	J X 24	M 21	J X 24	M 20	24	G 21	33	J X 30	G 30	36	J X 86	J X 57	J X 75	J X 60	J X 29	J X 30	22	J X 24	J X 25	J X 25	19	M 21
5	E S 15	J X 23	J X 25	J X 22	J X 29	J X 25	J X 26	J X 24	30	31	33	34	J X 50	J X 41	J X 40	34	J X 35	J X 40	J X 34	J X 29	J X 30	M 21	J X 30	J X 19
6	J X 25	J X 24	J X 26	M 18	E B 12	E B 14	E B 14	24	G	G	G	G	35	35	34	G 24	G	20	E S 15	E S 15	M 21	E S 15	J X 30	E S 15
7	E S 15	E S 15	E S 15	E S 15	E B 12	E S 16	E S 15	25	29	34	J X 66	35	34	33	G 17	G 18	G	E B 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
8	E S 15	E S 15	E S 15	E S 15	M 18	J X 19	J X 24	27	J X 30	30	G	36	34	J X 56	J X 58	G	25	E B 14	J X 29	J X 23	M 21	E S 15	E S 15	M 21
9	J X 54	J X 39	J X 29	J X 29	J X 36	J X 31	J X 19	24	J X 34	32	J X 34	J X 36	J X 55	J X 60	J X 49	J X 40	24	16	19	J X 25	J X 25	J X 30	J X 24	J X 26
10	M 19	19	M 21	M 25	J X 30	19	J X 16	G	G	J X 30	37	J G 31	J X 44	J X 60	J X 89	J X 50	J X 29	J X 30	J X 30	J X 28	J X 24	J X 19	J X 45	J X 35
11	E S 15	M 21	M 20	J X 36	J X 24	J X 24	M 18	G 17	G 22	G	35	G 30	J X 36	J X 43	60	J X 40	J X 29	J X 42	J X 29	J X 22	E S 15	J X 35	M 21	E S 15
12	E S 15	17	E S 15	E B 14	M 20	17	E B 12	24	30	J X 48	35	34	47	J X 40	G 27	G	J X 24	E B 14	J X 25	J X 23	J X 22	M 24	E B 14	E B 14
13	E B 15	E B 13	E B 14	E B 14	M 20	E B 14	18	24	G	J G 25	35	C	J G 26	G	G 16	G	G	E S 15	M 22	M 23	17	M 21	19	E S 15
14	E B 13	E S 15	E S 15	E B 13	M 21	M 20	M 22	24	30	G	36	35	40	35	34	26	G	23	20	J X 20	19	M 22	J X 20	M 21
15	E S 15	E B 12	E B 13	E B 13	E S 15	E S 15	E B 12	J X 29	29	32	33	36	G	J G 27	J X 30	31	G	J X 24	E S 15	E S 16	J X 19	J X 19	J X 25	J X 25
16	43	M 20	M 21	E S 15	M 21	E S 15	E B 13	G	G	36	36	35	35	G	G	G	G	19	J X 29	E S 15	E S 15	E S 15	M 24	M 20
17	E S 15	E S 15	E S 15	E S 15	20	E B 12	E B 12	J X 30	J X 41	J X 55	37	J X 48	J X 48	G 21	36	J X 27	19	J X 22	J X 18	M 25	J X 24	J X 42	J X 35	J X 27
18	J X 24	J X 24	J X 24	E B 12	M 21	E B 14	E B 14	19	G	30	36	35	36	G 31	G	G	J X 23	J X 29	J X 23	J X 19	M 21	E S 15	E S 15	E B 12
19	E B 14	E B 14	M 17	J X 19	J X 19	J X 19	M 21	G	G	G 20	G 21	G 19	G	G 19	J G 27	J X 30	J X 24	J X 21	J X 17	E B 14	E B 14	E B 14	E S 15	E B 14
20	E B 14	E B 14	M 19	J X 19	M 21	M 20	M 20	M 21	G	36	30	E B 38	35	G	G	G 22	G 19	J X 24	J X 20	J X 21	J X 19	E S 15	M 21	E S 15
21	E S 15	E B 12	M 21	M 20	E S 15	E S 15	E S 15	G	34	33	J X 42	J X 61	J X 45	J X 32	33	G 23	J X 29	J X 28	J X 35	M 20	M 20	E S 15	E S 15	E B 12
22	E S 15	E S 15	E B 13	J X 24	J X 18	E S 15	E B 13	G	G	G	36	J X 54	33	35	G	C	E B 15	E B 13	E S 15	M 22	J X 20	M 21	E S 15	J X 23
23	E S 15	M 20	E S 15	M 20	M 20	E B 13	E B 13	J X 23	31	J X 35	J X 34	J X 64	36	38	34	G 19	G 19	J X 25	J X 25	J X 25	M 21	J X 25	J X 34	J X 23
24	J X 25	M 23	J X 20	M 22	E S 15	M 20	E B 15	G	29	36	38	40	36	35	G 22	G	G	E S 15	E B 13	E S 15	E S 15	E S 15	E S 15	E S 15
25	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	26	31	J X 32	G	G	G	G	G	G	E B 14	J X 28	J X 30	J X 24	J X 24	20	17
26	E B 13	E B 14	E B 13	M 21	E B 13	E S 15	E B 14	G	G	33	34	35	G 31	G 30	G	G	J X 25	J X 24	17	E B 14	J X 22	J X 20	J X 24	M 19
27	E B 12	E B 14	E B 12	M 21	19	C	C	C	C	31	36	J X 37	36	34	37	J X 30	J X 24	M 21	J X 19	E B 14	M 19	J X 16	E S 15	E B 13
28	E B 14	E S 15	M 20	E B 13	E B 12	M 21	M 21	G	G	G	39	J X 41	J X 40	35	47	J X 27	J X 29	18	E S 15	E S 15	F B 12	E B 12	E B 12	E B 12
29	19	J X 19	E B 12	J X 24	J X 19	J X 17	E B 12	G	31	J X 44	J X 46	41	40	33	G	G	G	E S 15	23	M 23	M 21	M 20	J X 25	J X 21
30	J X 30	M 21	J X 24	J X 20	J X 30	J X 40	21	G 17	G	36	38	40	37	37	31	G	21	M 20	E S 15	E S 15	J X 17	J X 31	J X 19	J X 22
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	29	29	29	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30
MED	E 15	16	18	20	20	17	E 15	21	29	32	35	36	36	35	32	G 24	22	20	J X 21	22	21	20	20	20
UQ	J X 24	21	J X 24	22	21	J X 20	21	24	31	36	37	J X 41	J X 45	J X 40	40	J X 31	J X 29	J X 25	J X 28	J X 25	J X 24	J X 25	J X 25	J X 23
LQ	E S 15	E B 14	E 15	E 15	E 15	E S 15	E B 14	G	G	30	33	34	34	G 30	G	G	G	E 15	E 15	E E 15	17	E S 15	E S 15	E 15

NOV. 1972 | FOES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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 B 12	E B 13	E B 13	E S 15	E S 15	E B 15	G	G	32	34	G 25	G	37	G	30	32	17	40	17	26	28	35	43
2	22	34	22	32	17	18	E B 14	25	32	70	G	53	75	38	44	36	30	23	20	20	A	A	A	A
3	22	23	E	20	E B 14	E B 14	17	25	54	35	58	85	60	38	35	28	G	E B 15	E S 15	E	E	E	E	A
4	E	E	E	18	18	E	18	G 19	28	28	G 26	36	78	48	59	48	25	27	19	16	25	22	17	E
5	E S 15	E	17	19	24	25	17	18	28	E R 31	33	33	32	40	31	29	25	26	25	25	29	E	26	16
6	19	16	19	E	E B 12	E B 14	E B 14	E S 24	G	G	G	G	35	34	34	G 24	G	G	E S 15	E S 15	E	F 1 15	27	E S 15
7	E S 15	E S 15	E S 15	E S 15	E B 12	E S 16	E S 15	24	29	38	40	35	32	32	G 16	G 17	G	E B 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
8	E S 15	E S 15	E S 15	E S 15	E	16	22	24	28	30	G	36	34	39	31	G	21	E B 14	17	17	E	E S 15	E S 15	E
9	A	31	23	23	25	26	G	23	31	25	33	34	38	39	25	31	23	16	17	18	E	25	17	24
10	E	E	E	16	24	E	G	G	G	31	32	G 29	34	50	40	33	21	28	21	24	23	E	16	22
11	E S 15	E	E	24	E	16	G	G 17	E R 22	G	35	G 29	25	29	45	29	22	28	27	18	E S 15	15	E	E S 15
12	E S 15	E	E S 15	E B 14	E	E	E B 12	24	30	45	34	32	33	35	G 25	G	17	E B 14	17	E	19	16	E B 14	E B 14
13	E B 14	E B 13	E B 14	E B 14	E	E B 14	G	24	G	G 23	35	C	G 25	G	G 16	G	G	E S 15	E	E	E	E	E	E S 15
14	E B 13	E S 15	E S 15	E B 13	E	E	E	24	26	G	35	34	38	35	31	26	G	E	E	E	E	E	E	E
15	E S 15	E B 12	E B 13	E B 13	E S 15	E S 15	E B 12	G	28	31	33	32	G	G 26	G 26	26	G	20	E S 15	E S 16	E	E	20	19
16	A	E	E	E S 15	E	E S 15	E B 13	G	G	36	34	31	32	G	G	G	G	E	E	E S 15	F S 15	F S 15	E	E
17	E S 15	E S 15	E S 15	E S 15	E	E B 12	E B 12	25	34	40	32	43	40	G 21	33	26	16	E	E	17	E	30	16	E
18	20	16	16	E B 12	E	E B 14	E B 14	16	G	29	35	34	33	G 30	G	G	16	26	19	16	E	E S 15	F S 15	E B 12
19	E B 14	E B 14	E	E	16	E	G	G	E R 20	G 21	G 19	G	G 18	G 22	27	22	E	E	E B 14	E B 14	F B 14	E B 14	E S 15	E B 14
20	E B 14	E B 14	E	14	E	E	G	16	G	33	30	E B 38	34	G	G	G 21	E R 19	23	18	E	19	E S 15	E	E S 15
21	E S 15	E B 12	E	E	E S 15	E S 15	E S 15	G	28	33	40	36	35	32	32	G 23	21	22	23	E	E	E S 15	E S 15	E B 12
22	E S 15	E S 15	E B 13	21	16	E S 15	E B 13	G	G	G	33	53	33	35	G	C	E B 15	E B 13	E S 15	E	18	E	E S 15	E
23	E S 15	E	E S 15	E	E	E B 13	E B 13	20	26	32	33	45	36	35	30	G 19	G 17	16	E	22	E	25	18	E
24	20	E	E	E	E S 15	E	E B 15	G	27	32	34	34	33	32	G 20	G	G	E S 15	E B 13	E S 15	E S 15	E S 15	E S 15	E S 15
25	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	G	24	30	32	G	G	G	G	G	G	E B 14	23	25	22	18	E	17
26	E B 13	E B 14	E B 13	E	E B 13	E S 15	E B 14	G	G	27	34	34	G 29	G 28	G	G	21	16	E	E B 14	E	18	17	E
27	E B 12	E B 14	E B 12	E	E	C	C	C	C	310	34	35	35	33	33	27	20	E	E	E B 14	E	E	E S 15	E B 13
28	E B 14	E S 15	E	E B 13	E B 12	E	G	G	G	G	38	38	34	31	33	27	20	E	E S 15	E S 15	E B 12	E B 12	E B 12	E B 12
29	E	E	E B 12	E	E	E	E B 12	G	28	35	35	35	35	32	G	G	G	E S 15	17	E	E	E	16	17
30	25	E	17	E	E	E	E	G 15	G	30	37	39	37	36	30	G	20	E	E S 15	E S 15	17	19	E	17
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	29	29	29	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30
MED	E 15	E E 14	E E 13	E E 14	E E 12	E E 14	E E 13	G 16	26	31	34	34	34	32	28	G 23	16	15	15	E E 15	F E 13	15	15	15
UQ	19	E 15	E 15	16	E 15	E S 15	E B 15	24	28	35	35	38	36	37	33	28	21	22	19	17	19	18	17	17
LQ	E E 14	E	E	E	E	E		G	G	24	32	32	32	G 28	G	G	G		E E 13	E	E	E	E	E

NOV. 1972 | FBES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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	12	13	13	E S 15	E S 15	15	13	13	15	15	16	25	14	19	16	12	15	E S 15	14	14	14	14	E S 15
2	14	12	12	14	13	13	14	15	15	14	15	15	15	16	15	15	15	14	12	13	14	11	F S 15	14
3	12	12	14	12	14	14	11	12	13	15	15	16	14	12	15	15	15	15	E S 15	13	E S 15	F S 15	F S 15	14
4	E S 15	E S 15	E S 15	E S 15	13	E S 15	13	14	15	14	15	19	16	19	14	15	14	16	14	14	12	14	13	E S 15
5	E S 15	14	14	14	14	E S 15	14	12	15	16	15	18	25	25	16	16	16	14	E S 15	13	F S 15	E S 15	F S 15	14
6	E S 15	14	12	14	12	14	14	15	15	15	15	20	25	13	20	18	15	15	E S 15	E S 15	E S 15	F S 15	12	E S 15
7	E S 15	E S 15	E S 15	E S 15	12	E S 16	E S 15	15	15	15	15	15	16	15	13	14	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
8	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	13	15	15	15	15	15	15	14	15	18	15	14	14	13	14	E S 15	E S 15	14
9	E S 15	14	13	14	14	14	14	14	14	14	14	15	14	14	14	14	16	15	14	14	14	14	14	E S 15
10	14	14	12	14	14	14	14	14	14	14	15	15	14	15	14	14	12	14	E S 15	E S 15	14	12	E S 15	14
11	E S 15	E S 15	14	14	13	14	14	12	14	15	15	15	15	15	15	14	14	14	14	15	E S 15	14	F S 15	E S 15
12	E S 15	13	E S 15	14	12	14	12	12	14	15	18	18	15	15	15	15	15	14	14	17	14	12	14	14
13	14	13	14	14	12	14	12	13	14	15	14	C	15	13	13	16	15	E S 15	E S 15	E S 15	F S 15	F S 15	F S 15	E S 15
14	13	E S 15	E S 15	13	E S 15	E S 15	13	15	13	15	15	15	15	15	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
15	E S 15	12	13	13	E S 15	E S 15	12	15	12	14	15	15	15	16	15	15	14	E S 15	E S 15	E S 16	E S 15	F S 15	12	12
16	12	E S 15	E S 15	E S 15	12	E S 15	13	13	13	13	15	15	15	15	15	15	13	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
17	E S 15	E S 15	E S 15	E S 15	E S 15	12	12	12	12	14	15	12	14	15	15	14	13	14	14	14	13	14	12	12
18	12	12	12	12	14	14	14	13	14	14	15	15	14	15	15	15	14	12	12	12	14	E S 15	F S 15	12
19	14	14	12	12	12	E S 15	14	15	13	15	14	15	14	14	12	12	14	14	12	14	14	14	E S 15	14
20	14	14	12	12	12	14	14	12	14	14	15	38	19	15	15	15	13	12	13	E S 15	12	E S 15	E S 15	E S 15
21	E S 15	12	E S 15	E S 15	E S 15	E S 15	E S 15	14	12	13	15	15	15	15	15	15	15	E S 15	13	E S 15	E S 15	F S 15	E S 15	12
22	E S 15	E S 15	13	12	E S 15	E S 15	13	14	12	12	15	15	15	16	15	C	15	13	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
23	E S 15	E S 15	E S 15	E S 15	E S 15	13	13	13	15	15	15	16	18	19	15	14	13	13	E S 15	13	13	E S 15	E S 15	E S 15
24	E S 15	E S 15	12	E S 15	E S 15	E S 15	15	13	13	13	14	25	15	15	13	13	15	E S 15	13	E S 15	E S 15	E S 15	E S 15	E S 15
25	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	12	13	13	15	15	15	14	16	14	16	14	12	12	12	12	E S 15	E S 15
26	13	14	13	14	13	E S 15	14	14	14	14	14	15	15	14	15	15	14	13	14	14	12	14	12	12
27	12	14	12	12	12	C	C	C	C	15	15	15	15	15	15	12	12	14	14	14	14	12	E S 15	13
28	14	E S 15	12	13	12	14	12	15	14	15	15	13	14	12	18	12	15	14	E S 15	E S 15	12	12	12	12
29	E S 15	12	12	12	12	12	12	14	15	15	15	15	16	18	15	15	13	E S 15	12	E S 15	E S 15	E S 15	12	12
30	E S 15	E S 15	13	E S 15	13	13	E S 15	13	16	15	15	15	18	19	16	15	12	E S 15	E S 15	E S 15	E S 15	14	E S 15	12
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	29	29	29	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30
MED	E S 15	13	12	13	13	13	14	14	14	15	15	15	15	15	15	15	14	14	13	14	13	E S 15	E S 15	13
UQ	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	14	15	15	15	15	16	16	16	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
LQ	14	13	12	13	12	14	13	13	13	14	15	15	15	14	15	14	13	14	13	14	14	14	13	12

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NOV. 1972 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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	280	275	310	300	325	250	305	330	350	330	305	285	295	295	280	315	300	295	295	295S	260	270	295	275
2	295	300	295	280	245	260	290	335	315	330	325	320	300	315	315	320	JR 335	325	330	305	A	A	A	A
3	UF 285	300	F 275	F 260	F 265	F 275	340	350	315	305	325	320	315	325	320	335	JR 320	340	330	320	265	310	330	A
4	285	290	290	310	325	315	330	345	340	335	JR 345	340	A	335	335	355	345	330	325	310	325	330	320	280
5	290	290	280	270	295	310	320	360	335	345	340	325	340	330	330	335	335	330	320	320	295	305	295	300
6	F 300	305	290	F 295	F 315	F 305	325	S 340	330	340	325	330	JR 320	320	315	340	JR 345	345	320	310	285	300	295	305
7	R 315	310	305	315	335	310	320	IS 340	335	340	325	JR 300	335	325	JR 330	335	355	345	335	305	310	305	305	270
8	290	295	295	290	290	290	265	JR 320	355	JR 315	JR 340	JR 340	315	325	335	350	340	340	325	330	330	300	330	315
9	A	305	310	285	295	310	320	270	335	340	340	320	325	330	340	340	355	340	325	315	310	295	320	270
10	260	275	280	295	315	330	350	365	355	330	335	315	R 325	325	340	345	365	330	335	340	275	300	285	310
11	275	285	295	300	320	300	330	350	365	350	330	R 335	330	330	335	365	360	370	295	305	325	275	295	305
12	295	285	280	295	330	305	315	335	350	330	350	350	340	335	340	345	355	345	320	315	310	325	250	290
13	300	290	295	295	310	315	335	345	360	R 340	335	C	345	340	345	350	350	340	315	310	335	315	325	S 335
14	310	315	JR 340	JR 330	315	350	310	JR 355	IR 360	345	335	350	335	345	360	360	355	355	295	330	305	JR 300	285	295
15	280	290	315	320	345	325	325	335	JR 345	335	345	JR 335	JR 340	340	350	345	360	325	335	310	300	275	280	290
16	IA 290	285	285	JR 330	260	310	285	IS 315	305	335	335	300	310	320	355	335	320	JR 345	325	305	310	280	290	290
17	285	295	325	325	285	290	320	JR 315	335	JR 335	335	335	340	340	345	350	330	345	330	350	290	285	300	290
18	275	275	285	295	320	280	315	330	360	345	350	360	IR 340	330	345	345	345	340	315	330	325	295	300	275
19	290	285	270	280	330	305	350	350	JS 350	350	340	300	340	340	355	345	345	360	300	315	330	325	275	275
20	265	285	275	295	290	285	305	365	335	JR 335	335	JR 330	350	335	JR 330	345	355	350	305	290	310	275	310	295
21	310	285	265	S	340	IS 285	295	320	325	JR 320	330	335	320	JR 365	335	320	345	330	320	315	290	290	250	F
22	280	285	285	290	IR 305	330	330	IR 325	325	340	335	JR 320	340	JR 330	330	C	340	320	295	310	310	340	275	255
23	270	295	275	275	275	275	330	340	R 305	350	330	325	325	325	340	335	335	315	335	350	320	310	305	275
24	275	310	295	280	310	290	310	325	R	JR 340	JR 340	325	JR 315	JR 320	335	325	340	335	335	330	310	315	275	290
25	280	275	300	300	285	295	310	IR 350	R 355	375	355	320	325	335	325	330	340	325	345	245	285	305	275	260
26	285	305	300	300	325	265	290	JR 345	340	335	340	325	325	330	335	345	345	300	335	310	295	IS 330	275	290
27	280	275	290	280	305	C	C	C	C	355	350	330	305	335	335	345	350	330	320	325	315	300	270	265
28	290	265	275	260	265	295	335	345	325	325	330	325	330	345	335	340	H 340	305	320	310	305	310	290	275
29	265	270	280	290	300	285	325	330	335	R 325	R 345	JR 345	345	JR 335	325	325	JR 345	335	310	315	270	285	280	295
30	290	265	285	310	290	295	310	335	JR 350	365	340	345	R 330	360	345	355	355	300	330	330	335	305	285	E 275
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	29	30	29	29	29	28	30	30	29	29	30	30	29	30	30	30	30	29	29	29	27
MED	285	288	290	295	308	295	320	340	338	338	335	325	330	330	335	345	345	335	322	315	310	300	290	290
UQ	290	300	300	300	325	310	330	350	352	345	340	335	340	340	345	345	355	345	330	330	320	310	305	295
LQ	280	275	280	280	290	285	310	330	328	330	330	320	320	325	330	335	340	325	315	310	290	290	275	275

NOV. 1972 | M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1972 | M(3000)F1 (0.01)

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	L	L	L								
2									L	A	L	A	A	L										
3									A	L	A	A	A	L	L									
4									L	L	L	L	A	A	A	A								
5									L	L	L	L	L	L	L	L								
6									L	L	L	L	L	L	L	L								
7									L	L	L	L	L	L	L	L								
8								L	L	L	L	L	L	L	L	U L 380								
9										L	L	L	L	L	L	L								
10										L	L	L	L	A	L									
11									L	L	L	L	L	L		L								
12									L		L	L	L	L	L									
13									L	L	L 390	C	L	L	L									
14										L	L	L	L	L	L	L								
15										L	L	L	L	L	L									
16									L	L	L	L	L	L	L	L								
17										L	L	L	L	L	L	L								
18									L	L	L	L	U L 415	L	L	L								
19									L	L	L	L	L	L	L									
20									L	L	L	L	L	L	L	A								
21										L	L	L	L	L	L	L								
22									L	L	L	A	L	L 410	L	C								
23									L	L	L	L	L	L	L									
24										L	L	L	L	L	L									
25										L 390	L	L	L	L	L									
26										L	L	L	L	L	L	L								
27									C	L	L	L 370	L	L	L	L								
28										L	L	L	L 390	L	L									
29									L	L	L	L	A	L	L	L								
30									L	L	L	L	L	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	1	1	2	1		1								
MED										L 390	L 390	L 370	L 402	L 410		U L 380								
UQ																								
LQ																								

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NOV. 1972 | M(3000)F1 (0.01)

IONOSPHERIC DATA

NOV. 1972 | 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									240	230	240	290	280	255	300	250								
2									250	255	245	245	A	255										
3									250	245	250	250	255	245	245									
4									240	230	240	230	A	245	A 255	230								
5									225	240	225	245	250	260	260	230								
6									230	245	250	255	255	250	250	245								
7									240	245	245	240	265	255	250	240								
8								250	240	240	260	240	240	260	240	230								
9										245	240	255	260	245	230	230								
10										250	250	250	240	255	250									
11									230	225	250	250	260	260	225									
12									230	230	240	240	245	240										
13									230	250	250	I C 255	250	250	230									
14										250	240	245	240	250	245	245								
15										250	250	240	245	240	240									
16									250	250	240	240	250	240	230	245								
17										250	240	240	240	230	230	220								
18									230	225	230	240	255	250	240	225								
19									230	240	250	230	240	240	230									
20									230	250	245	250	245	245	240	235								
21										250	270	255	240	250	240	230								
22									240	250	245	250	260	250	245	C								
23									235	255	255	250	250	245	240									
24										250	240	240	250	240	250									
25										220	230	225	240	240	240									
26										240	250	230	230	255	230	230								
27									C	220	230	255	230	240	240	220								
28										250	250	255	250	240	230									
29									240	250	250	250	250	250	250	245								
30									240	230	235	230	260	240	240									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	19	30	30	30	28	30	28	16								
MED								250	240	245	245	245	250	248	240	230								
UQ									240	250	250	250	255	255	250	245								
LQ									230	230	240	240	240	240	230	230								

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NOV. 1972 | H'F2 (KM)

IONOSPHERIC DATA

NOV. 1972 | H'F (KM) | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	290	295	260	260	200	400	260	240	225	210 H	190 H	240	240	240	230	245	210	240	250	240	310	310	250	310
2	250	250	270	I A 305	350	360	290	240	240	I A 240	230	I A 235	I A 245	230	245	230	225	220	205	210	A	I A 330	I A 290	I A 260
3	340	280	300	340	300	295	240	210	I A 230	210	I A 240	I A 240	I A 230	220	240	240	240	205	205	210	300	255	250	A
4	305	300	300	275	240	290	240	235	230	195	220	225	A	A	A	A	220	225	225	245	250	240	240	260
5	290	270	290	340	305	270	220	220	215	230	200	185	220	240	220	230	220	220	240	250	300	245	300	255
6	290	255	275	250	220	245	240	220	220	240	240	240	235	240	245	240	210	205	210	240	250	300	300	255
7	250	280	260	250	220	250	240	230	240	240	240	205	200	240	240	225	225	205	205	220	250	255	240	300
8	305	260	260	280	270	260	240	210	210	195	180	230	220	245	220	200	210	210	220	220	220	245	245	250
9	A	I A 300	290	310	320	290	220	220	220	230	210	205	245	240	220	230	220	205	220	230	240	300 A	250	350 A
10	340	305	305	280	280	230	210	205	220	200	180	200	230	A	A	220	210	220	240	250	I A 290	280	290	260
11	300	270	270	290	250	270	230	220	220	205	225	200 H	225	220	250	240	210	210	310	255	245	300	270	260
12	280	290	290	275	220	245	245	230	225	230	210	195	200	220	205	220	210	210	240	240	250	230	250	275
13	275	280	270	255	240	230	220	220	210	240	200	I C 200	200 H	240	210	220	210	200	250	250	240	240	240	290
14	280	250	260	210	230	240	250	210	210	210	220	220	220	200	240	240	205	200	250	240	275	285	290	290
15	300	275	270	250	205	235	220	235	225	220	225	200	220	210	220	235	205	220	220	240	250	250	300	300
16	I A 300	270	300	240	240	250	235	245	240	240	215	220	205	210	210	240	220	210	220	250	250	220	290	300
17	290	300	250	250	300	270	250	240	250	245	205	245	240	230	220	225	210	205	220	220	250	I A 255	250	290
18	300	300	290	270	245	260	240	240	230	205	210	220	180	200	210	230	210	220	250	240	220	250	255	280
19	280	295	310	290	245	220	260	220	230	220	220	200	230	220	225	220	220	205	245	240	220	240	270	300
20	300	310	290	290	290	280	250	210	210	240	200	235	220	220	210	I A 220	215	230	250	290	260	290	250	265
21	245	320	350	300	205	300	275	240	240	240	260	250	210	200	230	220	210	240	250	250	250	250	300	310
22	305	300	300	300	250	230	240	240	230	235	210	I A 215	200	220	235	C	230	200	240	285	250	210	335	350
23	310	300	330	300	300	300	225	220	230	235	245	I A 220	200	240	210	210	210	240	235	240	230	260	285	300
24	350	290	310	300	240	250	260	250	240	230	220	200	220	200	230	240	250	210	235	220	240	240	300	300
25	300	310	300	300	270	285	250	235	220	210	210	205	200	220	230	230	220	200	220	A	290	250	305	300
26	290	245	260	250	220	300	275	240	225	245	225	210	200 H	205 H	230	230	210	200	230	230	260	230	300	275
27	280	290	275	280	255	C	C	C	C	220	195	210	225	210 H	230	225	210	210	240	240	210	230	300	300
28	275	310	310	320	310	280	210	210	230	225	230	240	200	205 H	225	225	200 H	200	220	230	220	240	260	300
29	310	300	305	280	220	275	210	230	240	240	240	240	I A 230	210	200	220	220	210	230	240	250	280	340	270
30	300	260	270	280	250	280	250	240	230	220	235	230	225	210	205	220	210	205	220	225	220	280	260	320
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	29	29	29	29	30	30	30	29	28	28	28	30	30	30	29	29	30	30	29
MED	300	290	290	280	248	270	240	230	230	230	220	220	220	220	225	228	210	210	232	240	250	250	278	290
UQ	305	300	300	300	290	290	250	240	230	240	230	235	230	240	232	238	220	220	245	250	260	280	300	300
LQ	280	270	270	255	220	245	225	220	220	210	205	200	200	210	210	220	210	205	220	230	240	240	250	265

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NOV. 1972 | H'F (KM)

IONOSPHERIC DATA

NOV. 1972 | 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	B	B	B	S	S	B	G	G	115	110	100	G	140	G	140	120	95	110	110	105	105	105	105
2	105	100	100	95	110	110	B	155	125	120	G	125	120	120	115	115	120	110	110	110	115	110	105	105
3	105	100	100	100	B	B	105	110	105	100	100	100	100	100	100	100	G	B	S	110	100	100	105	100
4	105	100	100	100	100	100	100	100	105	100	100	E G 195	100	100	100	100	100	100	100	100	100	100	100	100
5	S	105	100	100	100	100	100	100	145	120	110	110	110	110	110	110	110	105	105	100	100	105	100	100
6	100	95	95	100	B	B	B	160	G	G	G	G	160	145	140	100	G	100	S	S	100	S	130	S
7	S	S	S	S	B	S	S	160	160	140	120	120	120	120	100	100	G	B	S	S	S	S	S	S
8	S	S	S	S	100	100	100	100	135	110	G	150	170	100	100	G	115	B	110	105	105	S	S	110
9	100	100	100	100	100	100	100	120	110	100	100	105	100	100	100	95	110	105	105	105	105	100	100	100
10	105	105	100	100	100	100	100	G	G	110	110	110	100	100	100	100	105	105	105	105	100	105	115	100
11	S	100	100	100	100	100	100	105	105	G	170	105	100	100	100	100	100	100	100	100	S	110	110	S
12	S	100	S	B	100	100	B	155	125	110	115	110	105	105	105	G	105	B	100	100	100	100	B	B
13	B	B	B	B	100	B	110	160	G	105	105	C	105	G	100	G	G	S	100	100	100	100	100	S
14	B	S	S	B	100	100	100	150	140	G	140	140	115	115	140	115	G	100	100	100	100	100	100	100
15	S	B	B	B	S	S	B	100	150	150	140	105	G	105	110	110	G	105	S	S	100	100	100	100
16	100	100	100	S	100	S	B	G	G	115	110	115	110	G	G	G	G	100	100	S	S	S	100	100
17	S	S	S	S	130	B	B	110	110	110	110	110	105	100	100	100	100	110	100	100	110	110	105	100
18	100	100	100	B	105	B	B	110	G	125	115	115	115	110	G	G	100	100	100	100	100	S	S	B
19	B	B	110	100	105	100	100	G	G	100	100	100	G	100	100	90	90	100	100	B	B	B	S	B
20	B	B	105	100	100	100	100	100	G	115	105	B	105	G	G	100	100	100	100	140	110	S	115	S
21	S	B	100	100	S	S	S	G	135	120	110	105	110	110	110	105	100	100	100	100	100	S	S	B
22	S	S	B	100	100	S	B	G	G	G	140	115	140	130	G	C	B	B	S	100	100	100	S	100
23	S	115	S	100	110	B	B	110	110	115	130	110	115	110	110	110	100	100	110	100	100	100	100	100
24	100	100	100	100	S	100	B	G	120	120	110	110	110	105	100	G	G	S	B	S	S	S	S	S
25	S	S	S	S	S	S	S	G	110	110	110	G	G	G	G	G	G	B	105	105	100	100	100	100
26	B	B	B	100	B	S	B	G	G	110	110	110	110	105	G	G	100	100	100	B	115	100	110	100
27	B	B	B	100	100	C	C	C	C	115	115	105	155	120	120	110	100	110	100	B	130	110	S	B
28	B	S	100	B	B	100	105	G	G	G	110	110	110	115	110	95	100	100	S	S	B	B	B	B
29	110	110	B	110	105	115	B	G	130	120	120	130	120	115	G	G	G	S	100	100	100	100	110	110
30	105	100	100	100	100	100	100	100	G	150	125	125	120	110	110	G	145	100	S	S	115	110	110	105
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	15	16	18	20	15	13	18	17	25	27	26	26	26	22	19	19	21	22	20	24	20	20	18
MED	105	100	100	100	100	100	100	110	125	115	110	110	110	110	102	100	100	100	100	100	100	100	105	100
UQ	105	102	100	100	105	100	100	155	135	120	120	118	120	115	110	110	110	105	105	105	108	108	110	105
LQ	100	100	100	100	100	100	100	100	110	110	110	105	105	100	100	100	100	100	100	100	100	100	100	100

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NOV. 1972 | H'ES (KM)

IONOSPHERIC DATA

NOV. 1972 | 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 automatio operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										C 1	C 1	L 1		LH 11		H 1	CL 21	L 1	F 3	F 3	F 5	F 4	F 4	F 4
2	F 3	F 5	F 3	F 4	F 3	F 3		H 1	H 1	H 2		H 2	H 3	C 1	C 2	C 3	C 2	C 2	F 3	F 3	F 5	F 3	F 3	F 3
3	F 3	F 4	F 2	F 3			C 3	C 3	C 3	C 2	L 2	L 3	L 2	L 1	L 1	L 1				F 1	F 1	F 1	F 2	F 2
4	F 2	F 1	F 1	F 1	F 2	F 1	F 1	L 1	C 1	L 2	L 1	HL 11	L 3	L 2	L 3	L 3	L 2	L 2	F 3	F 2	F 2	F 3	F 1	F 1
5		F 1	F 2	F 3	F 4	F 6	L 2	L 2	H 1	H 1	C 1	C 1	C 2	C 2	C 1	C 1	C 1	C 2	F 2	F 4	F 4	F 2	F 4	F 2
6	F 2	F 2	F 2	F 1				H 1					HC 11	HC 11	H 1	L 1		L 1			F 1		F 3	
7								H 1	H 1	H 1	HL 11	HL 11	HL 11	HL 11	L 1	L 1								
8					F 2	F 2	L 3	L 3	H 1	C 1		H 1	H 1	L 2	L 2		C 1		F 1	F 1	F 1			F 1
9	F 3	F 3	F 3	F 3	F 5	F 2	L 2	CL 32	C 3	L 2	L 1	L 2	L 2	L 3	L 2	L 2	L 2	L 1	F 2	F 3	F 2	F 4	F 3	F 3
10	F 1	F 2	F 1	F 2	F 5	F 1	L 1			C 2	C 2	C 2	L 2	L 2	L 3	C 2	C 2	C 4	F 3	F 4	F 4	F 2	F 3	F 2
11		F 1	F 1	F 3	F 2	F 3	L 1	L 1	L 2		H 1	L 2	L 1	LH 21	L 2	L 2	L 2	L 2	F 2	F 2		F 3	F 1	
12		F 1	F 1		F 1	F 1		H 1	H 1	C 2	C 1	C 1	C 1	C 2	L 1		L 1		F 4	F 1	F 3	F 3		
13					F 1		C 1	H 1		L 1	C 1		L 1		L 1				F 1	F 2	F 1	F 2	F 1	
14					F 1	F 2	F 1	H 1	H 1		H 1	H 1	C 1	C 1	HL 11	CL 11		F 1	F 1	F 1	F 1	F 1	F 1	F 2
15								L 1	H 1	H 1	H 1	C 1		L 1	L 1	C 2		F 3			F 2	F 2	F 5	F 2
16	F 4	F 1	F 2		F 1					C 2	C 2	C 1	C 1					F 1	F 1			F 1	F 2	F 1
17					FF 11			C 3	C 3	C 3	C 2	CL 32	C 2	L 1	L 3	L 2	L 1	F 1	F 1	F 3	F 2	F 3	F 3	F 2
18	F 3	F 2	F 2		F 1			L 1		C 1	C 2	CL 11	C 1	L 1			L 2	F 4	F 1	F 2	F 1			
19			F 1	F 2	F 2	F 2	L 2			L 1	L 2	L 1		L 2	L 1	L 3	L 2	F 1	F 2					
20			F 1	F 2	F 2	F 1	L 2	L 1		C 1	C 1		L 1			L 1	L 1	F 2	F 3	F 1	F 2		F 1	
21			F 1	F 1					H 1	H 1	C 2	C 1	C 1	C 1	C 2	L 1	L 1	F 3	F 2	F 2	F 1			
22				F 2	F 2						H 1	C 2	H 1	H 1						F 2	F 1	F 1		F 2
23		F 1		F 1	F 1			C 1	C 1	C 1	H 1	C 1	C 1	C 1	C 1	L 1	L 1	F 2	F 1	F 4	F 1	F 3	F 3	F 2
24	F 3	F 2	F 2	F 1		F 2			H 1	H 1	C 1	C 1	C 1	C 1	L 1									
25									C 1	C 1	C 1								F 3	F 4	F 5	F 3	F 2	F 1
26				F 1						L 1	C 1	C 1	L 1	L 2			L 2	F 1	F 1		F 2	F 3	F 3	F 1
27				F 1	F 1					C 2	C 2	C 1	HL 11	CL 12	CL 11	C 2	L 3	F 1	F 2		F 1	F 1		
28			F 1			F 1	L 1				C 2	C 2	CL 22	CL 21	C 1	L 2	L 2	F 1						
29	F 2	F 1		F 2	F 1	F 1			H 1	H 1	H 1	H 1	H 1	C 1					F 2	F 2	F 2	F 1	F 2	F 2
30	F 2	F 1	F 2	F 1	F 2	F 2	F 1	L 1		H 1	H 2	H 1	H 1	C 2	C 2		HL 11	F 1			F 1	F 2	F 1	F 5
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

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NOV. 1972 | TYPES OF ES

IONOSPHERIC DATA

NOV. 1972 | 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	350	340	290	290	260	390	300	280	250	270	300	350	340	335	355	300	310	330	320	310 S	400	400	310	350
2	310	305	310	A	410	405	340	280	300	290	300	300	310	305	300	290	J R 270	270	265	290	A	A	A	A
3	U F 360	305	F 355	F 405	F 390	F 380	260	250	290	300	280	290	300	295	290	250	J R 290	250	250	260	380	300	260	A
4	360	360	360	300	255	300	260	260	265	270	J R 270	250	A	260	275	250	255	280	290	300	290	270	280	320
5	330	320	345	390	345	305	270	240	260	250	260	280	260	270	270	260	255	270	280	280	300	300	320	305
6	F 330	305	330	F 310	F 285	F 310	295	S 250	260	270	290	290	J R 300	290	290	260	J R 250	250	290	290	320	350	340	300
7	R 290	310	300	290	250	310	290	I S 250	260	260	290	J R 310	290	290	J R 290	260	250	250	250	280	290	300	290	360
8	350	300	340	340	300	340	250	J R 265	250	J R 290	J R 280	J R 260	305	280	280	250	250	250	280	260	250	300	270	290
9	A	I A 310	310	340	320	310	280	250	250	250	250	300	300	290	260	260	245	260	280	290	280	305	295	355
10	380	350	350	315	300	270	240	220	240	270	260	300	R 280	290	280	250	240	250	260	250	I A 340	310	330	300
11	350	345	320	310	300	310	265	245	240	250	260	R 265	280	280	270	245	240	240	315	300	290	350	315	305
12	320	340	355	310	250	300	295	260	250	260	250	255	260	280	255	245	240	250	280	300	300	290	305	325
13	320	330	310	305	300	300	250	250	245	R 250	260	C	260	250	250	250	240	250	300	300	250	270	290	S 300
14	300	300	J R 260	J R 250	260	290	300	J R 250	I R 245	265	260	265	280	250	255	250	240	250	300	260	300	J R 320	340	310
15	350	300	300	280	245	260	260	250	J R 250	270	260	J R 290	J R 280	260	250	250	245	260	250	300	300	340	350	340
16	I A 350	340	350	J R 290	370	300	360	I S 300	300	290	290	290	300	300	250	260	280	J R 270	290	300	300	290	350	350
17	340	390	300	290	360	340	300	J R 290	260	J R 290	270	260	260	260	260	245	250	250	255	250	315	I A 305	300	320
18	330	350	350	325	280	340	295	275	250	250	250	250	I R 270	290	255	250	250	250	290	280	270	320	310	355
19	345	350	360	340	285	295	310	250	J S 250	250	270	305	265	260	250	245	250	240	310	295	280	290	340	320
20	360	360	360	350	340	340	300	220	280	J R 265	260	J R 265	250	260	J R 290	270	250	250	290	350	300	360	290	300
21	290	380	390	S	250	I S 340	360	260	290	J R 300	300	290	300	J R 300	260	280	250	260	290	300	300	300	390	F
22	390	360	360	350	I R 290	250	290	I R 290	260	280	290	J R 300	280	J R 260	290	C	260	290	290	300	300	250	380	400
23	380	360	360	350	360	350	270	250	R 300	300	300	290	300	290	290	280	250	280	260	260	280	290	310	360
24	370	350	350	360	290	340	300	300	R	J R 265	J R 255	300	J R 300	J R 300	280	290	260	280	280	280	300	285	340	350
25	350	360	350	340	340	310	300	I R 255	R 250	220	250	290	270	265	290	260	250	270	250	A	320	300	370	380
26	355	300	320	320	280	370	335	J R 250	250	260	270	270	280	280	260	250	250	300	260	290	315	I S 275	350	320
27	345	350	345	340	310	C	C	C	C	230	250	280	310	275	270	250	240	280	290	290	280	300	350	360
28	310	360	360	370	380	320	260	250	270	280	280	290	270	255	250	250	H 250	270	260	290	295	290	345	350
29	380	350	370	320	290	345	255	270	270	R 300	R 250	J R 360	265	J R 260	290	300	J R 250	280	290	290	300	330	380	300
30	360	360	340	300	290	300	300	250	J R 250	240	260	250	R 280	255	250	245	250	300	280	280	260	300	320	F 370
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	28	30	29	29	29	28	30	30	29	29	30	30	29	30	30	30	29	29	29	29	27
MED	350	348	348	320	295	310	295	250	255	268	265	290	280	280	270	250	250	260	280	290	300	300	320	325
UQ	360	360	360	345	340	340	300	270	270	290	290	300	300	290	290	260	255	280	290	300	300	320	350	355
LQ	330	310	310	300	280	300	260	250	250	250	260	265	270	260	255	250	245	250	260	280	280	290	300	305

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NOV. 1972 | HPF2 (KM)

IONOSPHERIC DATA

NOV. 1972 | 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	110	100	100	80	100	90	110	90	65	110	100	80	90	90	60	80	90	80	S 90	90	70	135	100
2	85	90	95	A	100	90	105	65	60	60	45	60	85	70	80	60	J R 80	70	80	80	A	A	A	A
3	U F 85	75	F 135	F 90	F 100	F 110	55	55	60	90	100	100	90	95	100	110	J R 100	110	100	100	110	90	100	A
4	100	100	100	100	105	90	100	90	75	60	J R 70	90	A	60	50	50	50	70	80	90	50	50	75	120
5	70	80	100	100	100	90	50	90	45	55	50	70	55	75	50	60	80	70	80	80	90	100	80	90
6	F 75	75	75	80	F 85	F 90	60	S 55	55	110	90	100	J R 90	100	100	100	J R 90	100	90	100	70	110	100	90
7	R 90	100	90	100	100	100	100	I S 90	100	90	100	J R 100	100	100	J R 100	100	90	90	90	110	100	90	100	100
8	110	90	100	100	90	100	110	J R 85	90	J R 65	J R 45	J R 50	85	75	40	55	50	55	40	50	55	100	65	60
9	A	I A 60	85	85	80	90	65	50	60	55	55	70	45	50	45	55	55	60	65	60	80	95	100	95
10	80	100	95	85	95	50	60	60	55	50	60	70	R 70	65	35	50	50	95	60	50	I A 75	85	75	60
11	95	60	80	90	70	90	40	55	40	45	45	R 55	35	65	50	50	50	50	100	95	55	95	85	90
12	85	105	90	90	45	95	60	45	50	85	55	45	45	50	45	55	60	50	75	75	100	65	95	90
13	80	115	90	95	55	95	55	50	55	R 90	100	C	80	100	90	90	90	100	90	90	100	120	100	S 90
14	90	90	J R 80	J R 100	100	100	90	J R 90	I R 100	95	100	85	100	100	105	90	90	90	90	100	90	J R 100	100	130
15	110	90	90	90	105	100	100	100	J R 100	110	100	J R 90	J R 100	100	90	90	95	100	110	90	90	100	110	100
16	I A 110	100	110	J R 100	90	90	100	I S 90	90	100	100	100	90	90	100	100	100	J R 120	100	90	90	100	110	110
17	110	70	90	100	100	100	90	J R 90	100	J R 30	50	60	60	60	45	50	50	50	70	50	130	I A 90	95	80
18	90	95	95	75	80	100	60	50	45	50	50	50	I R 60	55	45	50	55	70	60	40	75	125	95	90
19	100	95	100	100	70	100	90	45	J S 50	50	50	85	50	45	50	100	55	55	90	65	75	55	110	125
20	100	80	90	100	75	100	70	50	60	J R 95	100	J R 85	100	100	J R 90	110	100	110	100	110	90	100	90	90
21	100	100	100	S	90	I S 120	100	100	100	J R 90	90	100	90	J R 90	110	110	100	100	100	90	90	90	70	F
22	70	100	100	110	I R 90	110	90	I R 90	100	110	100	J R 80	100	J R 100	90	C	100	100	100	90	90	90	110	90
23	100	100	100	110	100	110	90	100	R 90	90	90	100	90	100	70	100	100	110	100	100	100	100	100	100
24	90	90	110	100	100	120	90	80	R	J R 95	J R 95	90	J R 90	J R 80	100	90	100	100	100	100	90	95	100	110
25	90	100	110	100	100	80	90	I R 105	R 90	50	50	70	70	60	60	60	50	80	50	A	90	100	90	100
26	90	75	90	70	80	90	80	J R 50	50	60	50	75	75	45	60	50	50	95	55	80	80	I S 60	95	80
27	100	100	100	110	90	C	C	C	C	60	50	40	95	70	50	70	60	75	60	60	80	100	95	100
28	90	100	85	90	90	80	60	50	55	50	55	50	60	55	75	60	H 95	80	60	65	100	70	100	100
29	80	100	80	80	70	100	90	50	55	R 90	R 90	J R 100	85	J R 100	90	90	J R 100	100	100	100	90	100	110	90
30	100	100	120	90	100	90	90	100	J R 90	40	45	50	R 50	45	50	55	40	110	65	65	55	100	80	F 80
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	28	30	29	29	29	28	30	30	29	29	30	30	29	30	30	30	29	29	29	29	27
MED	90	98	95	100	90	100	90	80	60	65	65	80	85	75	72	60	80	90	85	90	90	95	100	90
UQ	100	100	100	100	100	100	90	90	90	90	100	100	90	100	90	100	100	100	100	100	90	100	100	100
LQ	85	80	90	90	80	90	60	50	55	50	50	60	60	60	50	55	50	70	65	65	75	90	90	90

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NOV. 1972 | YPF2 (KM)

IONOSPHERIC DATA

NOV. 1972 | 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

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	38	37	37	41S	30	23	30	78S	75	76S	86	Y113S	141	152S	145	156S	118S	108S	117S	100S	J74S	J71S	U88S	57
2	58S	63	54	48	J42S	40	41S	92S	Y122S	Y126S	133	133	117	136	136	133	116S	Y114S	I90C	62	52	48	I48A	49
3	53	45S	I40A	I37A	35S	36S	38	63	84	126	153	139	130	I149C	152	139	131	125	I98S	I77S	I64S	56S	J52S	44
4	42	37S	35	37	36	32	32	63	J85S	Y105S	I104S	97S	81	89	Y106S	100S	87	76	66	59	60S	J63S	U46S	31
5	33	31	31	33	33	34	U39S	60S	80S	91	92	96	98S	Y112S	107	88	90	78	58	43	48	42	33	36
6	35	35	36	39	40	28	30	59S	74	93S	96	100	101S	115S	I112C	113	94	78	55	43	40	36	33	36
7	36	32	33	I34C	36	27H	27	55	74	J84S	J97S	104S	Y107S	U128S	128	I115S	I102S	91	83C	57S	J53S	J50S	46	33
8	31	33	37S	36S	35	33	31	61S	65	73	89	98	100	104S	103S	101	79	67	58	51	47	42S	37	30
9	28	30	32	32	33	34	28	J53S	70	75	84	92	Y111S	116	113	U113S	U91S	70	53	40	43	29	28	27
10	30	32	32	35	38	30	25	53	64	71	90	92	95	Y111S	129	Y109S	84	70	51	I41A	35	34	33	I34A
11	35	34	36	37	38	32	36	55	74	71	78	94	85	87	87	96	91	70	41	36	45B	I30A	27	28
12	30	30	30	31	38	25	27	57	78	78	74	78	88	84	107S	84	81	59	45	40	37	33	27	29
13	30	32	35	33	34	30	28	51	69	76	86	92S	J98S	I108S	96S	77	69	58S	44	32	37	39	F	I40S
14	38S	36S	39	31	27	26F	28	J53S	J76S	75	91	109S	93	94	103S	107S	92S	68	43	45	51	43	40	36
15	35	32	34	36	39	25	23	47	64	71	78	99S	91	102S	107S	97	69	63	51	38	40	38	30	31S
16	33	36	34	40	22	24	28	50S	85	103	U115S	J112S	Y102S	115	U117S	93S	U77S	U83S	66	54	U49S	U51S	36	34
17	36	33	40	30	31	34	32	58	77S	U94S	I106S	Y127S	107S	Y101S	100	82	J84S	74	J59C	49S	45	41S	45S	35S
18	34	34	27	28	29	26	28	52	U82S	84S	81	82	98	97	102S	88	88	72	51	53S	I53C	42S	37	34
19	34	33	32	35	40	27	26	55	81S	80	91	99S	98S	99	90	85	84S	80	53	49	54	48S	29	24
20	27	29	32	36	33	31	31	53	I80C	I107S	100S	100S	98S	94S	97S	Y100S	J84S	58	53	54	53S	40S	37	32
21	30	31S	32S	39S	18	21	21	51	78S	88	100	Y119S	119S	110S	114	88	80	65	48	40	38	39	26	28
22	30	31	31	31	35	27	28H	46	70	83	84	I96S	99	117S	I120S	124	99	71	49	44	52	48S	30	30
23	32	32	31	32	32	32	34	54	72	Y112S	130	130	124	Y121S	103S	U95S	78	70	57	51	J48S	J50S	39S	31
24	31	33	34S	36	43	28	30	56	88	Y105S	101S	113S	109S	I112S	118S	112S	108S	U94S	63	53	52S	58	48S	29
25	31	31	33	32	34	32	32	56	81	87	80	86	82	95	100S	Y103S	91S	91	59	50S	48S	46S	36	31
26	33S	37	30	32	36	30	29	54	79	94	S	95	91	104S	104	88S	80	74	60	58	51	51	42	34
27	31	33	33	33	37	28	27	52	84	82S	101S	89	89	102S	Y107S	I118S	U100S	76	71	J62S	57	I44S	40	31
28	28	29	28	28	30	30	30	48S	66	78	U95S	100S	85	87H	82	78	71	68	56	40	39S	35	33	31S
29	32	34	33S	35	35	32	30	52	74	74S	89S	J97S	S	88	81	88	91	77	57	63	J48S	35	24	27
30	30	31	31S	32F	36	F	F	U48S	S	78	77	78	96	105S	94	75	84	75S	58	48	43	42	28	26
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	29	30	29	30	29	30	29	30	30	30	30	30	30	30	30	30	29	30
MED	32	33	33	34	35	30	30	54	77	84	91	98	98	104S	106	98	88	74	57	50	48	42	36	31
UQ	35	35	36	37	38	32	32	58	81	94S	101S	112S	107S	115S	117	113S	94S	80	63	57	53	50S	42	35
LQ	30	31	31	32	32	27	28	52	72	76	84	92	91	95	100S	88	80	68	51	41	43	38	30	29

NOV. 1972 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | FOF1 (0.01 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	370	L	L	L	L	L	H 330							
2									L	L	L	A	A	A	L	A								
3									L	L	L	L	L	C	L	L	L							
4										L	L	L	L	L	L	A								
5									L	L	L	L	L	L	L	L	L 260							
6									L 300	L	L	L	L	L	C	L								
7									L	L	L	L	L	L	L	L	L							
8									280	360	L	L 410	L	L	L	L								
9										L	L	L 450	L	A	L	L	L							
10									L	L	L	L	L	L	L	L	330							
11										L	L	L	L	L	L	L	L							
12										L	L	L	L	U L 430	L	L								
13										L	L	L	460	400	L	L	L							
14										L	L	L	L	L	L	L	L							
15										L	L	L	L	L	L	L	L	200						
16									L	L	L	A	L	L	L	L								
17									L	L	L	L	A	L 460	L	A	L							
18										L	L	L 440	L	L	L	320	A							
19										L	L	L 420	L	L	L	L								
20									C	L	L	L	L	H 410	L	L	L 320							
21										L	L	L	A	L	L	L	L							
22									L	L	L	L	L	L	L	L								
23									L	L	L	L	L	L	L	L								
24									L	L 330	L	L	L	L	L	L								
25										L	L	L	L	L	L	L								
26										L	L	L	L	L	L	L	L 280							
27											L	L	A	L	L	L								
28										L	L	L	L	A	L	A	L 280							
29										L	L	L	L	L	L	L								
30										L	L	L	380	L 450	L	330								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	2	1	4	2	5		2	6	1						
MED									290	345	370	L 430	420	L 430		325	L 300	L 200						
UQ												L 445		L 450			330							
LQ												L 415		410			L 280							

The Radio Research Laboratories, Japan

NOV. 1972 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1972 | FOE (0.01 MHZ) | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								S	245	290	H 320	330	340	A	A	A	A	A						
2								165	240	300	320	330	340	A	A	A	A	A						
3								180	250	A	A	A	A	I C 320	315	295	A	A						
4								170	225	275	310	330	330	340	320	295	A	A						
5								160	250	290	305	A	A	A	A	I A 290	250	A						
6								S	235	270	310	320	330	330	C	A	250	A						
7								B	250	280	305	320	I A 320	315	305	A	A	A						
8								S	240	270	300	315	325	330	310	290	240	S						
9								A	260	290	A	A	A	A	A	285	A	A						
10								S	220	270	300	A	A	A	A	A	A	160						
11								S	H 220	H 280	300	310	310	310	310	280	220	S						
12								S	240	270	280	H 320	A	A	310	I A 280	230	S						
13								145	H 245	I C 280	300	310	H 310	R 315	305	A	A	A						
14								S	220	H 275	300	310	315	305	290	A	A	A						
15								C	H 250	265	300	315	315	I A 310	305	280	240	160						
16								S	245	285	300	A	A	A	A	280	240	A						
17								130	230	275	290	310	A	A	A	A	240	A						
18								S	230	290	300	320	320	A	A	280	I A 220	S						
19								S	H 220	H 280	H 310	H 320	A	A	310	A	240	A						
20								S	I C 245	R 270	R 300	320	I A 320	320	310	I A 270	I A 220	A						
21								S 150	240	H 285	A	A	A	A	A	A	A	A						
22								S	I A 235	270	295	320	330	320	I A 305	280	240	S						
23								B	H 225	H 285	I A 310	325	340	A	A	A	250	A						
24								S	230	H 270	300	320	I A 320	I A 320	310	290	240	S						
25								S	H 220	H 280	H 310	330	330	I A 325	320	300	250	S						
26								S	H 220	270	315	320	A	A	A	290	250	S						
27								S	230	270	H 300	320	330	320	300	A	A	S						
28								S	I A 205	275	295	310	A	A	A	I A 275	230	A						
29								S	190	H 275	290	310	320	R 320	300	I A 275	A	A						
30								S	220	270	295	315	325	315	295	260	200	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								7	30	29	27	24	19	16	17	18	18	2						
MED								160	232	275	300	320	325	320	310	280	240	160						
UQ								168	245	285	310	320	330	322	310	290	250							
LQ								148	220	270	300	312	320	315	305	280	230							

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NOV. 1972 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1972 | FOES (0.1 MHZ) | 135 E Mean Time (G. M. T. + 9h)

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

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	23	E S 14	E S 13	E S 14	E S 13	E C 14	E S 14	E S 15	G 21	32	35	37	36	43	J X 38	31	27	J X 26	18	J X 29	66	J X 85	35	J X 52
2	J X 64	55	J X 39	25	27	21	22	G	27	33	44	J X 73	J X 54	J X 103	J X 85	J X 47	J X 39	J X 30	F S 14	24	J X 33	J X 89	101	J X 57
3	J X 44	J X 36	J X 44	J X 47	J X 29	E S 13	E S 15	G	27	J X 31	J X 33	J X 50	40	C	J X 33	J X 33	J X 36	J X 31	E S 15	F S 15	F S 14	E S 14	23	23
4	E S 15	E S 14	J X 33	J X 35	J X 31	17	16	G	G 22	G 22	34	38	39	38	34	J X 74	J X 31	J X 29	J X 28	J X 24	J X 21	E S 15	F S 15	E S 15
5	E S 15	E S 15	E S 14	E S 14	23	J X 26	J X 22	G	29	32	38	J X 47	36	36	J X 33	31	26	J X 29	J X 36	J X 34	J X 23	23	F S 14	E S 14
6	E S 15	24	J X 26	21	23	23	23	21	G	G	35	38	36	37	C	J X 36	J G 17	24	23	20	E B 15	E S 14	25	23
7	E S 15	E S 14	E S 14	C	E	E S 14	E S 15	E B 14	29	31	36	41	35	33	35	33	25	23	E S 14	E S 14	E S 15	J X 20	F S 15	E S 14
8	E S 14	J X 22	J X 17	E S 13	E S 13	E S 14	E S 14	E S 14	G	G	35	38	33	35	32	G	G	21	E S 14	E S 14	E S 15	E S 15	F S 13	E S 15
9	E S 14	J X 32	J X 37	J X 30	J X 25	J X 23	J X 23	J X 24	G	G 28	38	J X 63	J X 73	J X 50	33	30	J X 32	22	J X 23	16	E S 14	J X 32	J X 37	E S 15
10	J X 29	E S 14	23	E S 14	E S 13	E S 14	E S 14	E S 15	G	G	G	35	J X 37	J X 61	J X 43	31	J X 38	21	J X 47	J X 58	J X 29	J X 21	F S 15	J X 64
11	J X 26	E S 14	E S 12	E	E S 14	25	J X 21	J X 20	G	31	G	G	34	G	35	39	27	E S 15	E S 14	J X 20	23	J X 50	F B 17	J X 24
12	E S 15	E S 15	F S 13	J X 20	E S 13	E B 15	E S 15	E S 13	G	29	33	G	34	J X 37	J X 33	J X 40	J X 26	E S 14	16	J X 23	J X 20	E S 15	F S 14	E S 15
13	E S 13	E S 14	E S 14	E	E B 11	E S 14	E S 13	G	G	E C 35	G	36	34	J X 33	J G 26	J X 31	J X 24	J X 38	J X 36	E B 20	E S 13	E S 14	F S 14	E S 14
14	E S 14	E S 14	F S 14	E S 14	E S 13	E S 14	E S 15	E S 14	G	G	35	35	39	35	33	J X 31	J X 34	J X 30	J X 24	E S 15	E S 15	E S 15	J X 24	23
15	J X 25	E S 14	E S 14	E S 15	E B 13	E S 14	E S 15	E C 31	G	30	34	37	40	37	G 25	G 17	G 21	G	E S 14	E S 15	E S 14	E S 14	E S 15	30
16	23	18	E S 14	E S 15	E B 12	E S 15	E S 14	E S 14	G 18	32	36	J X 45	36	37	J X 43	G 27	G 19	J X 29	E S 15	E S 14	E S 14	E S 15	F S 14	E S 14
17	E S 14	E S 11	E S 14	J X 26	E B 14	E B 18	E S 15	G	G	G	31	34	J X 51	36	J X 52	J X 48	27	J X 41	J X 26	E S 14	E S 13	E S 14	F S 14	E S 14
18	E S 15	E S 14	F S 13	E S 14	E B 13	E S 14	E S 14	18	G 19	G	35	38	43	47	J X 38	G 27	J X 30	E S 15	E S 15	J X 19	C	E S 15	F S 15	E S 15
19	E S 15	E S 14	E S 14	J X 24	J X 21	21	E S 15	E S 14	G	G	34	G	35	37	34	29	G 19	J X 34	21	21	20	E S 14	E S 14	E S 15
20	E S 13	E S 13	E S 14	E B 11	E B 11	E S 15	E S 14	E S 15	C	29	G 24	34	34	G 30	33	J X 34	25	J X 23	E S 14	E S 14	J X 26	E S 14	E S 14	23
21	J X 18	E S 14	E S 14	E S 14	E S 13	E S 14	E S 14	J X 18	G	33	41	45	J X 54	40	36	31	30	33	42	30	F S 14	E S 15	F S 15	E S 15
22	E S 15	E S 14	E S 14	E S 15	E S 14	E S 14	20	23	25	G	34	35	37	47	39	G	J X 25	J X 26	J X 27	J X 27	J X 20	E S 15	F S 15	E S 15
23	E S 13	E S 14	E S 12	J X 20	E S 14	E S 13	E C 20	E B 15	G	29	37	38	42	40	37	J X 33	G 24	J X 31	23	E S 14	E S 15	E S 15	F S 15	E S 15
24	J X 21	J X 22	E C 15	E S 14	E S 14	19	E S 15	E S 15	25	31	38	35	38	47	J G 31	41	J X 32	E S 15	E S 15	22	18	E S 14	F S 14	E S 15
25	E S 13	E S 15	E S 14	E S 13	E B 13	20	23	20	G	G	G	J G 33	G 33	41	G 27	G	28	26	22	22	17	17	18	E S 14
26	E S 14	E S 14	E S 14	24	23	E S 14	E S 14	E S 13	G	29	G	37	42	37	33	32	G 25	J X 40	J X 39	J X 27	23	J X 22	J X 41	E S 14
27	J X 24	E S 15	J X 21	E	E	E S 13	E S 13	E S 14	26	G	33	41	J X 54	43	J X 41	29	J X 33	J X 27	21	E S 14	E S 14	E S 13	F S 15	E S 13
28	E S 14	E S 14	E S 13	E S 14	E S 14	19	19	J X 25	28	32	34	37	38	44	34	J X 47	J X 31	25	27	E S 16	E S 15	E S 14	F S 14	19
29	E S 16	17	30	33	20	E B 19	E S 14	E S 14	G	29	G	G	37	34	41	J X 34	J X 41	J X 28	J X 20	J X 27	18	23	E S 14	J X 28
30	J X 22	J X 33	J X 28	E S 14	E B 12	22	22	E S 14	G	G	33	39	37	35	37	38	28	J X 24	E S 13	J X 20	E S 14	E S 14	J X 23	24
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	30	29	30	30	30	30	29	29	30	30	30	30	30	29	30	30	30
MED	E S 15	E S 14	E S 14	E E 14	E 14	E E 15	E S 15	E E 14	G	29	34	37	37	37	34	32	27	J X 26	21	20	E 15	E S 15	E S 15	E S 15
UQ	J X 23	18	J X 23	24	21	20	20	18	25	31	36	41	42	43	38	J X 38	J X 32	J X 30	J X 27	J X 24	21	21	23	23
LQ	E S 14	E S 14	F S 14	E S 14	E 13	E S 14	E S 14	E S 13	G	G	31	35	35	35	33	29	25	22	E S 15	F S 15	E S 14	E S 14	E S 14	E S 14

The Radio Research Laboratories, Japan

NOV. 1972 | FOES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | FBES (0.1 MHZ) | 135 E Mean Time (G. M. T.+ 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{13}^{S}	E_{14}^{C}	E_{14}^{S}	E_{15}^{S}	$^{G}21$	32	35	37	G	40	33	30	21	18	15	26	25	48	28	28
2	32	28	23	17	E_{27}^{R}	14	E	G	G	33	40	57	48	53	45	43	28	20	E_{14}^{S}	E	25	21	A	41
3	33	30	A	A	21	E_{13}^{S}	E_{15}^{S}	G	24	31	33	40	33	C	30	26	31	25	E_{15}^{S}	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	15	16
4	E_{15}^{S}	E_{14}^{S}	26	29	29	17	E	G	$^{G}22$	$^{G}22$	G	37	37	38	34	49	28	23	24	20	E	E_{15}^{S}	F_{15}^{S}	E_{15}^{S}
5	E_{15}^{S}	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	E	22	E	G	28	32	35	36	35	33	32	30	24	20	27	23	18	E	E_{14}^{S}	E_{14}^{S}
6	E_{15}^{S}	E	23	E	E	E	E	S	G	G	34	37	36	37	C	34	$^{G}17$	20	E	18	E_{15}^{B}	E_{14}^{S}	15	E
7	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	C	E	E_{14}^{S}	E_{15}^{S}	E_{14}^{B}	28	30	35	40	33	33	33	32	23	20	E_{14}^{S}	E_{14}^{S}	E_{15}^{S}	15	F_{15}^{S}	E_{14}^{S}
8	E_{14}^{S}	21	17	E_{13}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	35	37	E_{33}^{R}	G	G	G	G	S	E_{14}^{S}	E_{14}^{S}	E_{15}^{S}	E_{15}^{S}	F_{13}^{S}	E_{15}^{S}
9	E_{14}^{S}	20	20	23	22	20	17	23	G	$^{G}28$	36	37	45	47	31	26	31	20	21	E	F_{14}^{S}	16	24	E_{15}^{S}
10	25	E_{14}^{S}	E	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E_{15}^{S}	G	G	G	33	34	44	33	29	30	G	30	A	25	17	E_{15}^{S}	A
11	21	F_{14}^{S}	E_{12}^{S}	E	E_{14}^{S}	E	18	18	G	G	G	G	34	G	33	38	26	E_{15}^{S}	E_{14}^{S}	19	23	A	E_{17}^{B}	E
12	E_{15}^{S}	E_{15}^{S}	E_{13}^{S}	17	E_{13}^{S}	E_{15}^{B}	E_{15}^{S}	E_{13}^{S}	G	G	33	G	33	32	29	35	20	E_{14}^{S}	16	21	20	E_{15}^{S}	E_{14}^{S}	E_{15}^{S}
13	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E	E_{11}^{B}	E_{14}^{S}	E_{13}^{S}	G	G	E_{35}^{C}	G	36	G	28	$^{G}25$	31	E_{24}^{R}	35	32	E_{20}^{B}	E_{13}^{S}	E_{14}^{S}	F_{14}^{S}	E_{14}^{S}
14	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{15}^{S}	E_{14}^{S}	G	G	34	34	37	34	32	28	31	27	18	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}	E	E
15	E	E_{14}^{S}	E_{14}^{S}	E_{15}^{S}	E_{13}^{B}	E_{14}^{S}	E_{15}^{S}	E_{31}^{C}	G	29	34	36	38	33	$^{G}25$	$^{G}17$	$^{G}21$	G	E_{14}^{S}	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	E_{15}^{S}	E
16	E	E	E_{14}^{S}	E_{15}^{S}	E_{12}^{B}	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	$^{G}18$	32	36	44	35	36	43	$^{G}27$	$^{G}19$	26	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	E_{15}^{S}	F_{14}^{S}	E_{14}^{S}
17	E_{14}^{S}	E_{11}^{S}	E_{14}^{S}	20	E_{14}^{B}	E_{18}^{B}	E_{15}^{S}	G	G	G	31	33	45	35	37	36	G	28	20	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	F_{14}^{S}	E_{14}^{S}
18	E_{15}^{S}	F_{14}^{S}	E_{13}^{S}	F_{14}^{S}	F_{13}^{B}	E_{14}^{S}	E_{14}^{S}	18	$^{G}18$	G	32	34	38	45	32	$^{G}26$	26	E_{15}^{S}	E_{15}^{S}	F	C	E_{15}^{S}	F_{15}^{S}	E_{15}^{S}
19	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	18	15	E	E_{15}^{S}	E_{14}^{S}	G	G	G	G	E_{35}^{R}	34	28	29	$^{G}17$	25	21	F	E	E_{14}^{S}	F_{14}^{S}	E_{15}^{S}
20	E_{13}^{S}	E_{13}^{S}	E_{14}^{S}	E_{11}^{B}	E_{11}^{B}	E_{15}^{S}	E_{14}^{S}	E_{15}^{S}	C	G	$^{G}24$	G	33	$^{G}24$	G	33	24	19	E_{14}^{S}	E_{14}^{S}	26	E_{14}^{S}	E_{14}^{S}	E
21	E	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	G	G	30	39	45	53	35	35	29	28	23	28	E	E_{14}^{S}	E_{15}^{S}	F_{15}^{S}	E_{15}^{S}
22	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	E	E	25	G	32	34	36	46	E_{39}^{C}	G	20	16	18	27	16	E_{15}^{S}	E_{15}^{S}	E_{15}^{S}
23	E_{13}^{S}	E_{14}^{S}	E_{12}^{S}	15	E_{14}^{S}	E_{13}^{S}	E_{20}^{C}	E_{15}^{B}	G	G	37	36	41	38	35	32	$^{G}23$	23	F	E_{14}^{S}	E_{15}^{S}	E_{15}^{S}	F_{15}^{S}	E_{15}^{S}
24	14	14	E_{15}^{C}	E_{14}^{S}	E_{14}^{S}	E	E_{15}^{S}	E_{15}^{S}	G	30	33	34	36	35	$^{G}26$	25	20	F_{15}^{S}	E_{15}^{S}	E	E	F_{14}^{S}	F_{14}^{S}	E_{15}^{S}
25	E_{13}^{S}	F_{15}^{S}	F_{14}^{S}	E_{13}^{S}	E_{13}^{B}	E	E	G	G	G	G	$^{G}29$	$^{G}32$	38	$^{G}27$	G	G	25	20	19	E	E	E	E_{14}^{S}
26	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E	E	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	G	F_{29}^{R}	G	E_{37}^{R}	E_{42}^{R}	E_{37}^{R}	31	24	$^{G}21$	21	37	22	19	E	26	E_{14}^{S}
27	14	E_{15}^{S}	15	E	E	E_{13}^{S}	E_{13}^{S}	E_{14}^{S}	G	G	G	G	52	42	31	29	26	15	17	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	F_{15}^{S}	E_{13}^{S}
28	E_{14}^{S}	E_{14}^{S}	E_{13}^{S}	E_{14}^{S}	E_{14}^{S}	E	E	14	21	32	34	37	37	44	33	42	19	15	17	E_{16}^{S}	E_{15}^{S}	E_{14}^{S}	E_{14}^{S}	E
29	E_{16}^{S}	F	E	16	E	E_{19}^{B}	E_{14}^{S}	E_{14}^{S}	G	G	G	G	G	G	37	32	25	16	E	20	18	15	F_{14}^{S}	17
30	17	20	20	E_{14}^{S}	E_{12}^{B}	E	E	E_{14}^{S}	G	G	32	38	36	34	35	28	27	18	E_{13}^{S}	E	E_{14}^{S}	E_{14}^{S}	E	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	29	29	30	30	30	30	29	29	30	30	29	30	30	29	30	30	30
MED	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{E}	E_{13}^{E}	E_{14}^{E}	E_{14}^{S}	E_{14}^{E}	G	G	33	36	36	35	32	29	24	20	16	E_{15}^{E}	E_{15}^{S}	E_{15}^{S}	F_{15}^{S}	E_{14}^{S}
UQ	E_{15}^{S}	E_{15}^{S}	15	16	E_{14}^{S}	E_{15}^{E}	E_{15}^{S}	E_{15}^{S}	$^{G}18$	30	35	37	38	40	34	33	27	23	21	20	18	E_{15}^{S}	F_{15}^{S}	E_{15}^{S}
LQ	E_{13}^{S}	E_{14}^{S}	E_{13}^{S}	E_{13}^{S}	E_{11}^{E}	E_{13}^{S}	E	G	G	G	G	33	33	33	29	26	$^{G}20$	15	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	E_{14}^{S}	F_{14}^{S}	E_{13}^{S}

NOV. 1972 | FBES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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 automatio operation

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

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NOV. 1972 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1972 | 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	295	290	295	320	390	250	285	350	365	330	290	275	285	295	295	290	295	280	290	290	270	260	300	265
2	260	310	315	290	250	260	270	325	320	325	315	320	300	310	310	310	305	325	320	305	270	260	290	305
3	300	330	315	325	300	300	380	390	335	335	345	325	305	315	325	315	320	330	330	320	285	335	305	315
4	295	295	285	300	355	295	325	370	355	355	350	375	330	320	340	325	335	330	340	300	305	345	325	310
5	295	300	280	285	275	275	315	350	355	355	345	340	305	315	335	325	340	340	335	305	320	320	295	305
6	285	295	290	330	340	280	305	345	325	345	350	340	315	350	340	330	340	345	345	310	310	305	300	310
7	305	310	305	305	360	295	305	350	350	340	330	330	310	310	325	345	360	345	355	285	315	320	310	305
8	275	295	295	305	315	350	335	345	340	330	315	335	315	310	330	330	355	365	340	330	350	330	340	320
9	305	295	305	295	315	345	330	360	355	355	350	315	315	325	325	330	345	365	355	330	350	290	315	280
10	280	285	290	315	355	355	300	365	365	345	355	335	325	305	340	340	340	370	330	315	300	320	320	300
11	285	295	305	310	320	305	330	365	380	360	350	355	330	340	330	350	370	370	335	305	310	340	305	285
12	280	285	295	295	330	290	295	340	375	365	365	345	340	325	330	340	370	360	365	315	330	310	295	285
13	285	305	330	315	340	325	340	365	365	355	330	335	325	325	345	355	360	355	340	290	325	320	F	290
14	290	300	345	355	350	270	305	340	340	345	330	350	330	320	335	345	370	355	335	310	310	320	300	310
15	280	295	300	335	360	370	320	340	360	340	330	350	340	335	345	370	365	365	355	320	325	330	295	270
16	305	310	300	335	400	290	320	325	330	340	335	340	330	310	345	360	330	345	355	330	305	335	310	285
17	300	290	325	340	285	290	305	350	350	335	315	330	345	340	350	320	350	340	C	330	305	280	315	295
18	295	310	335	290	325	280	325	350	365	340	335	355	335	330	345	325	340	350	305	305	325	285	295	295
19	280	290	265	270	300	275	295	325	350	335	330	345	325	345	335	345	335	335	360	265	315	300	325	260
20	260	275	295	300	315	290	295	330	320	330	340	340	335	330	330	340	370	345	300	300	330	290	300	305
21	315	280	270	335	390	260	260	325	350	350	310	330	330	320	340	340	370	360	330	310	320	340	310	270
22	275	290	285	295	335	320	325	340	320	370	345	345	315	335	335	335	355	350	330	300	310	335	325	270
23	285	290	280	285	290	280	305	325	330	335	330	330	325	325	325	345	350	355	350	345	320	300	295	295
24	280	290	295	295	355	270	285	335	355	335	325	325	320	310	315	330	330	360	335	330	305	295	310	255
25	275	275	275	280	295	285	295	340	345	345	355	335	330	315	320	340	330	345	340	305	290	285	280	285
26	280	295	285	280	295	285	270	315	330	355	S	330	325	330	335	350	350	355	315	320	285	315	275	295
27	285	275	285	285	300	305	265	315	355	335	345	340	340	330	330	325	335	340	330	305	335	305	280	320
28	285	C	285	270	285	295	310	320	355	340	340	360	340	360	350	350	345	340	345	325	345	330	305	295
29	280	280	285	285	295	290	295	330	350	335	335	335	S	350	345	330	340	335	330	360	310	320	255	290
30	280	290	305	320	335	F	F	320	S	385	370	350	350	340	360	355	340	350	365	340	315	345	315	290
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	29	29	30	29	30	29	30	29	30	30	30	30	30	29	30	30	30	29	30
MED	285	295	295	300	322	290	305	340	350	340	335	338	325	325	335	340	342	348	335	310	312	320	305	295
UQ	295	300	305	320	355	305	325	350	355	355	350	345	335	335	345	345	360	360	350	330	325	330	315	305
LQ	280	290	285	285	295	280	295	325	335	335	330	330	315	315	325	325	335	340	330	305	305	295	295	285

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NOV. 1972 | M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1972 | 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	A	L	L	L	L	L	H 425							
2									L	L	L	A	A	A	L	A								
3									L	L	L	L	L	C	L	L	L							
4										L	L	L	L	L	L	A								
5									L	L	L	L	L	L	L	L	L 440							
6									L 415	L	L	L	L	L	C	L								
7									L	L	L	L	L	L	L	L	L							
8									410	435	L	L 405	L	L	L	L								
9										L	L	L 390	L	A	L	L	L							
10									L	L	L	L	L	L	L	L	410							
11										L	L	L	L	L	L	L	L							
12										L	L	L	L	U L 445	L	L								
13										L	L	L	390	385	L	L	L							
14										L	L	L	L	L	L	L	L							
15										L	L	L	L	L	L	L	L	L 390						
16									L	L	L	A	L	L	L	L								
17									L	L	L	L	A	L 380	L	A	L							
18										L	L	L 410	L	L	L	435	A							
19										L	L	L 380	L	L	L	L								
20									C	L	L	L	L	H 440	L	L	L 455							
21										L	L	L	A	L	L	L	L							
22									L	L	L	L	L	L	L	L								
23									L	L	L	L	L	L	L	L								
24									L	L 425	L	L	L	L	L	L								
25										L	L	L	L	L	L	L								
26										L	L	L	L	L	L	L	L 410							
27											L	L	A	L	L	L								
28										L	L	L	L	A	L	A	L 400							
29										L	L	L	L	L	L	L								
30										L	L	L	430	L 400	L	450								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	2		4	2	5		2	6	1						
MED									412	430		L 398	410	L 400		442	L 418	L 390						
UQ												L 408		L 440			L 440							
LQ												L 385		L 385			L 410							

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NOV. 1972 | M(3000)F1 (0.01)

IONOSPHERIC DATA

NOV. 1972 | 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									240	225	235	300	280	280	270	250	225							
2									245	230	245	235	240	275	250	245								
3									240	260	240	230	280	I C 250	245	245	230							
4										230	235	220	230	255	255	250								
5									225	230	230	240	255	255	255	230	235							
6									220	250	250	250	280	260	I C 250	250								
7									230	240	260	260	275	270	260	240	240							
8									205	240	260	255	270	255	250	235								
9										235	250	250	270	250	245	250	220							
10									250	250	250	260	260	285	250	240	225							
11										220	250	250	245	270	255	250	235							
12										225	230	240	240	255	255	230								
13										235	270	245	250	240	245	225	215							
14										235	250	250	255	260	250	240	225							
15										235	250	245	255	255	240	235	225	210						
16									250	225	270	230	230	250	235	235								
17									220	250	260	250	230	230	235	235	225							
18										225	230	235	255	285	230	235	225							
19										225	245	235	270	235	235	225								
20									I C 230	245	240	250	250	245	255	240	215							
21										245	265	255	250	240	245	240	215							
22									215	225	245	245	270	250	230	240								
23									220	265	250	250	250	255	230	220								
24									225	230	235	245	240	245	250	235								
25										225	230	240	235	270	245	230								
26										225	235	250	255	245	240	230	230							
27											250	230	250	280	245	235								
28										245	245	240	245	245	240	245	225							
29										225	230	250	245	245	230	250								
30										220	230	230	245	255	230	235								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									14	29	30	30	30	30	30	30	16	1						
MED									228	230	245	245	250	255	245	238	225	210						
UQ									240	245	250	250	270	270	250	245	230							
LQ									220	225	235	235	245	245	235	235	222							

NOV. 1972 | H'F2 (KM)

IONOSPHERIC DATA

NOV. 1972 | H'F (KM) | 135 E Mean Time (G. M. T. + 9h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	260	290	275	245	190	E 400 C	295	200	175 H	200	A	220 H	225	E 250 A	225	230	235 H	250	230	230	265	I 290 A	250	E 300 A
2	325	250	260	270	E 355 R	350	320	250	230	230 H	240	A	I 230 A	I 260 A	A	A	225	220	200	210	275	300	I 300 A	E 300 A
3	285	E 300 A	I 330 A	I 350 A	350	310	210	210	215	205 H	205	205	180 H	I 200 C	205	210	230	215	200	205	200	250	250	255
4	255	270	E 350 A	E 320 A	255	295	240	220	220	180 H	205	230	210	220	230	I 225 A	225	220	210	225	245	225	210	250
5	270	275	295	300	320	345	230	210	220	220	205	205	205	205	220	220	230	215	210	250	245	240	255	270
6	295	295	305	245	230	270	260	225	215	195 H	220	235	195	220	I 225 C	230	220	215	200	205	235	255	275	275
7	250	260	280	I 265 C	225	260	250	220	230	220	215 H	I 215 A	205	225	220	215	230	215	205	200	215	230 C	235	E 250 S
8	E 315 S	310	280	260	260	240	230	225	205	190	240	205	220	180 H	210 H	220	220	215	220	220	220	215	230	250
9	260	E 325 A	300	E 315 A	300	240	250	225	220	220	E 245 A	220	I 220 A	A	190 H	215	230	215	205	220	210	270	E 300 A	310
10	E 370 A	305	300	260	220	220	255	220	200	200 H	210 H	210	200	I 205 A	245	205 H	215	210	E 240 A	A	E 290 A	250	250	A
11	310	295	265	250	245	260	250	220	220	205	190 H	200	200 H	240	230	250	235	200	195	250	245	I 255 A	275	300
12	310	305	305	295	240	250	290	245	225	225	200	205	190 H	190	175 H	E 230 A	220	205	210	E 250	E 250 A	250	260	320
13	310	275	250	235	230	225	225	220	225	E 210 C	200	205 H	200	200	220	215	225	220	240	E 275 H	240	245	320	280
14	250	255	240	210	215	E 295 S	275	235	225	220	215	215	210	205	200	225	I 220 A	205	200	255	215	230	255	260
15	300	295	265	245	210	205	270	230	220	230	220	220	205	205	205	195 H	215	220	200	250	240	210	270	350
16	285	260	280	250	190	300	295	250	240	220	225	I 210 A	220	E 225 A	A	205	220	215	205	235	225	225	230	275
17	275	255	250	250	280	300	250	240	220	200 H	200 H	200	I 205 A	205	E 230 A	I 210 A	220	225	205	210	225	225	245	250
18	290	250	210	E 295 S	245	E 290 S	255	230	240	220	205	200	225	230 H	215 H	190	I 220 A	210	205	235	I 215 C	230	245	255
19	300	275	300	295	240	E 220 S	300	245	225	225	225	195 H	220	220	210	220	230	210	205	260	230	210	220	E 300 S
20	E 320 S	305	280	255	210 C	245	250	225	I 220 C	210	210 H	205	215 H	205 H	205 H	245	220	200	225	240	235	250	240	255
21	245	325	335	235	210	E 370 S	E 350 S	245	225	240	240	A	A	205	215	210	I 210 A	210	240	240	240	240	250	335
22	310	300	290	270	240	240	220	215	195	235	225	210 H	200 H	I 225 A	I 210 C	190 H	215	200	200	E 265 A	240	210	235	315
23	305	295	305	295	280	320	260	240	225	225 H	230	215	220	220	220	220	215	215	205	220	215	240	230	260
24	325	300	290	280	225	295	275	245	225	200	220	200	220	220	200 H	225	230	215	200 C	210	245	225	225	E 300 S
25	295	295	295	280	255	255	255	235	225 H	225	215	215	200 H	215 H	205	230	225	220	205	220	225	240 C	250	275
26	300	250	270	280	260	250	300	240	225	235	225	245	240	250	210 H	225 H	225	220	240	240	250	235	E 250 A	250
27	295	300	280	255	250	220	E 280 S	245	230	225	230	220	A	E 250 A	220	205 H	225	225	215	250	210	230	270	255
28	E 300 S	E 310 S	315	E 350 S	290	255	225	240	230	240	235	240	225	I 215 A	235	I 215 A	205	225	200	210	205	240	245	280
29	310	320	305	295	255	E 295 B	230	250	225	210	200	210	240 H	225	230	210 H	225	210	220	210	220	205	E 350 S	E 330 S
30	E 310 A	E 330 A	E 340 A	260	250	260	255	245	230	215	205	220	200	205 H	220	190	230	215	200	220	215	220	230	300
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	29	28	28	29	28	29	30	30	30	29	30	30	30	29
MED	294	288	285	263	244	255	254	232	225	220	215	210	210	212	216	215	225	215	205	225	228	238	248	268
UQ	308	302	302	288	260	298	278	245	225	225	225	220	220	222	224	225	230	220	218	245	242	250	262	290
LQ	272	270	270	250	225	240	240	220	220	202	205	205	200	205	205	210	220	210	200	210	215	225	232	255

NOV. 1972 | H'F (KM)

IONOSPHERIC DATA

NOV. 1972 | H'ES (KM) | 135 E Mean Time (G. M. T.+ 9h)

Station YAMAGAWA Lat. 31 12.1 N. Long. 303 71.E 1 Sweep 2 MHz to 02 MHz in 0 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	95	S	S	S	S	C	S	S	105	145	170	155	180	135	105	110	105	95	90	105	105	105	105	100
2	100	100	100	100	100	100	100	G	155	125	125	115	115	110	110	110	105	110	S	110	105	110	105	105
3	100	100	100	100	100	S	S	G	105	105	100	100	100	C	100	100	95	95	S	S	S	S	100	105
4	S	S	100	100	100	100	100	G	105	105	155	150	140	155	150	110	100	100	100	95	100	S	S	S
5	S	S	S	S	105	100	100	G	125	120	115	110	120	120	110	110	105	100	100	100	100	100	S	S
6	S	100	100	100	100	100	100	100	G	G	150	150	115	150	C	110	100	100	100	100	B	S	105	100
7	S	S	S	C	E	S	S	B	150	150	125	120	120	145	120	105	105	100	S	S	S	C 100	S	S
8	S	95	100	S	S	S	S	S	G	G	165	125	145	125	130	G	G	105	S	S	S	S	S	S
9	S	100	100	100	100	100	100	100	G	105	105	105	100	105	110	105	105	105	105	105	S	105	105	S
10	100	S	100	S	S	S	S	S	G	G	G	105	105	105	105	105	105	110	100	100	100	100	S	105
11	105	S	S	E	S	100	100	100	G	140	G	G	125	G	145	115	110	S	S	100	100	110	B	110
12	S	S	S	100	S	B	S	S	G	125	115	G	110	105	105	105	105	S	100	100	100	S	S	S
13	S	S	S	E	B	S	S	G	G	C	G	130	160	100	100	90	90	100	95	B	S	S	S	S
14	S	S	S	S	S	S	S	S	G	G	130	130	120	115	110	100	100	95	95	S	S	S	100	100
15	100	S	S	S	B	S	S	C	G	180	145	130	115	110	110	110	110	G	S	S	S	S	S	110
16	115	105	S	S	B	S	S	S	110	140	125	110	110	115	105	105	105	100	S	S	S	S	S	S
17	S	S	S	100	B	B	S	G	G	G	115	115	105	110	105	100	100	100	100	S	S	S	S	S
18	S	S	S	S	B	S	S	135	105	G	120	115	110	105	105	105	105	S	S	100	C	S	S	S
19	S	S	S	100	100	100	S	S	G	G	155	G	115	115	105	120	100	90	90	95	115	S	S	S
20	S	S	S	B	B	S	S	S	C	130	105	120	105	105	105	100	100	100	S	S	110	S	S	105
21	110	S	S	S	S	S	S	180	G	115	110	110	110	105	105	105	105	105	105	105	S	S	S	S
22	S	S	S	S	S	S	100	100	115	G	110	145	125	110	105	G	100	100	100	100	100	S	S	S
23	S	S	S	100	S	S	C	B	G	140	115	115	110	110	105	105	110	105	100	S	S	S	S	S
24	100	100	C	S	S	100	S	S	125	120	110	110	105	100	100	100	100	S	S	100	100	S	S	S
25	S	S	S	S	B	100	100	100	G	G	G	105	105	105	105	G	175	155	140	140	100	100	100	S
26	S	S	S	105	105	S	S	S	G	125	G	115	110	110	120	110	100	100	100	95	100	110	105	S
27	105	S	100	E	E	S	S	S	150	G	165	120	115	120	110	105	100	100	100	S	S	S	S	S
28	S	S	S	S	S	105	105	105	105	185	150	145	140	130	105	100	105	100	100	S	S	S	S	100
29	S	110	105	105	105	B	S	S	G	150	G	G	155	160	110	105	100	100	100	105	100	95	S	95
30	110	110	105	S	B	100	100	S	G	G	135	120	120	120	110	120	110	100	S	105	S	S	110	100
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	9	10	11	9	11	10	8	12	18	24	26	30	28	29	27	29	25	19	18	14	10	9	12
MED	100	100	100	100	100	100	100	100	112	128	125	118	115	110	105	105	105	100	100	100	100	102	105	102
UQ	108	105	100	100	105	100	100	120	138	145	150	130	125	122	110	110	105	105	100	105	105	110	105	105
LQ	100	100	100	100	100	100	100	100	105	120	112	110	110	105	105	102	100	100	100	100	100	100	100	100

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NOV. 1972 | H'ES (KM)

IONOSPHERIC DATA

NOV. 1972 | TYPES OF ES | 135 E Mean Time (G. M. T.+ 9h)

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

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

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

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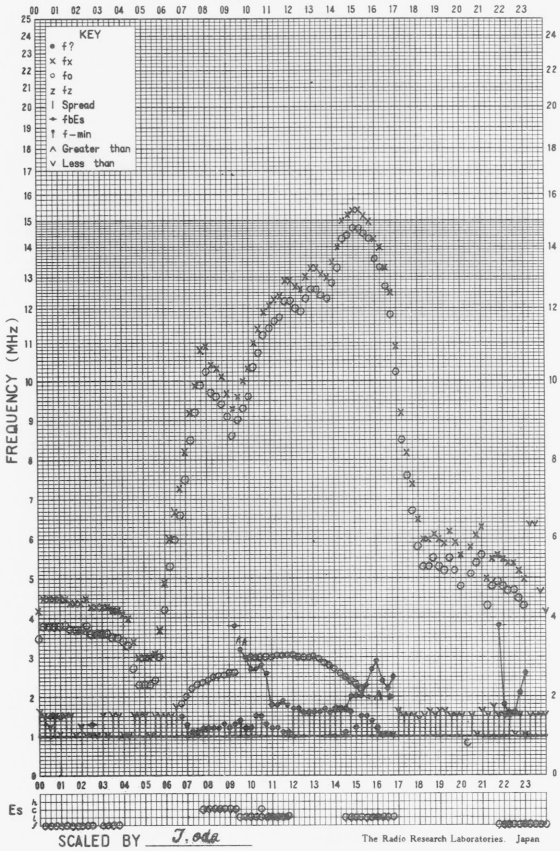
NOV. 1972 | TYPES OF ES

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 1. 1972



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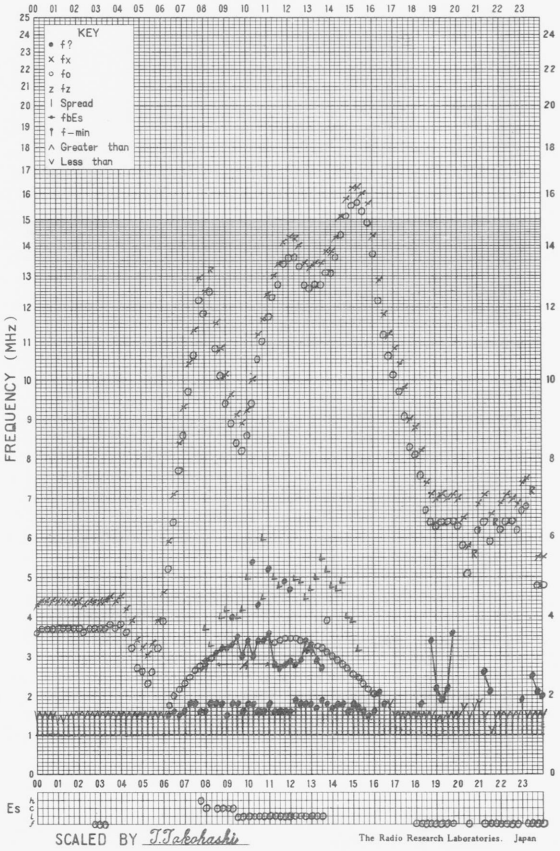
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 1. 1972



SCALED BY T. Takahashi

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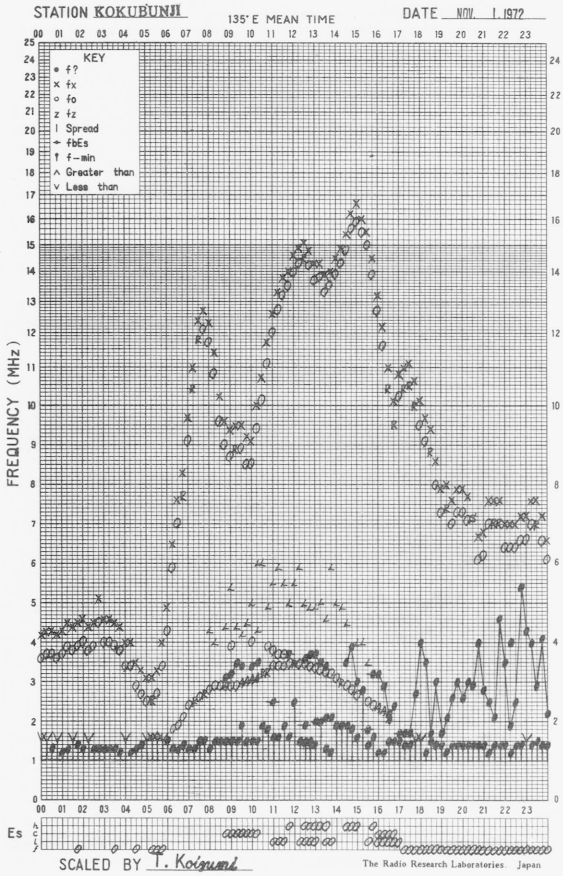
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 1. 1972



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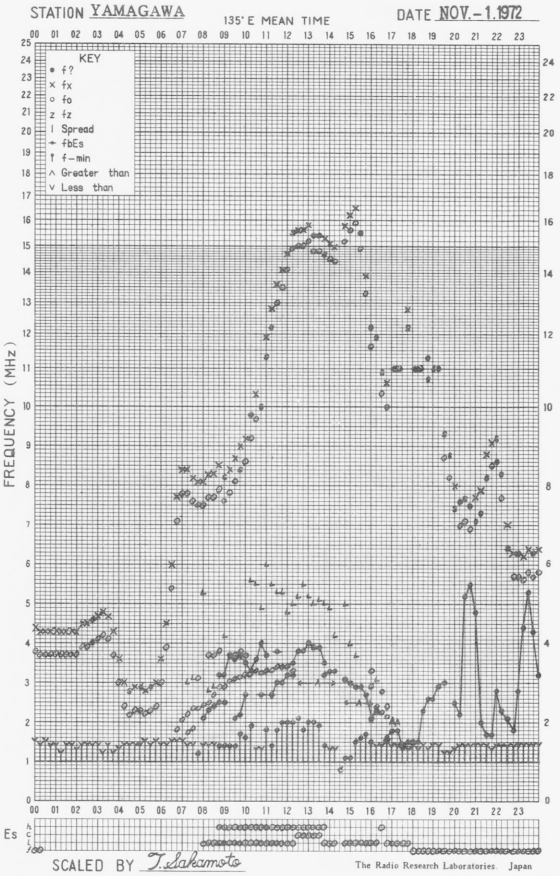
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV.-1.1972



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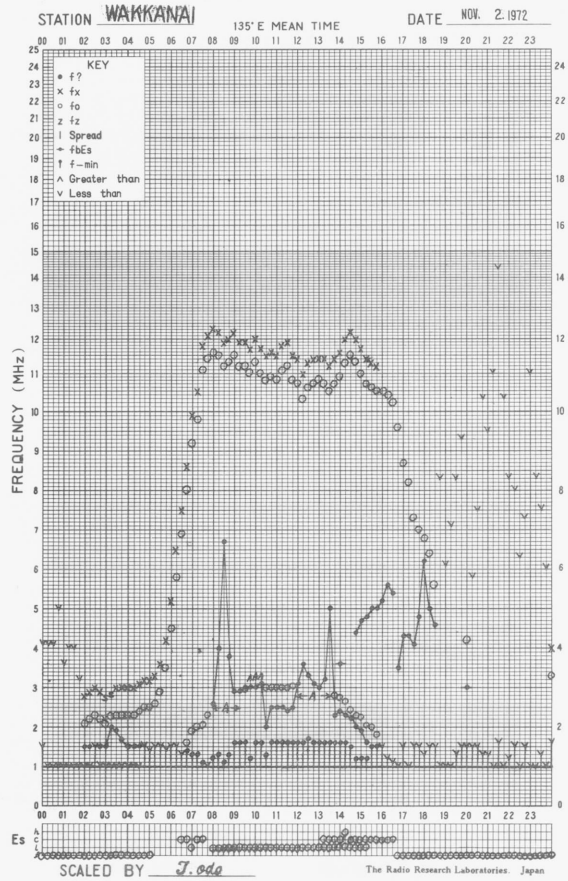
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 2. 1972



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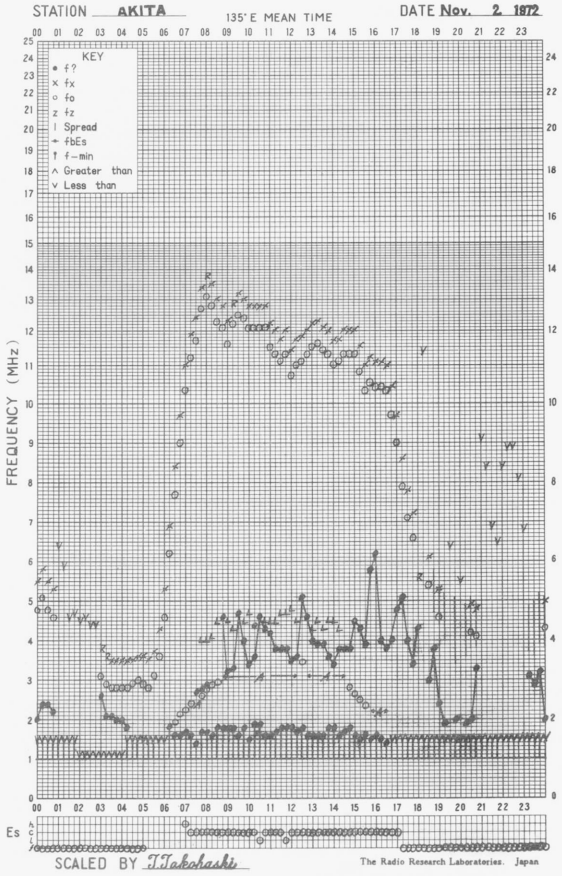
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 2. 1972



SCALED BY T. Takahashi

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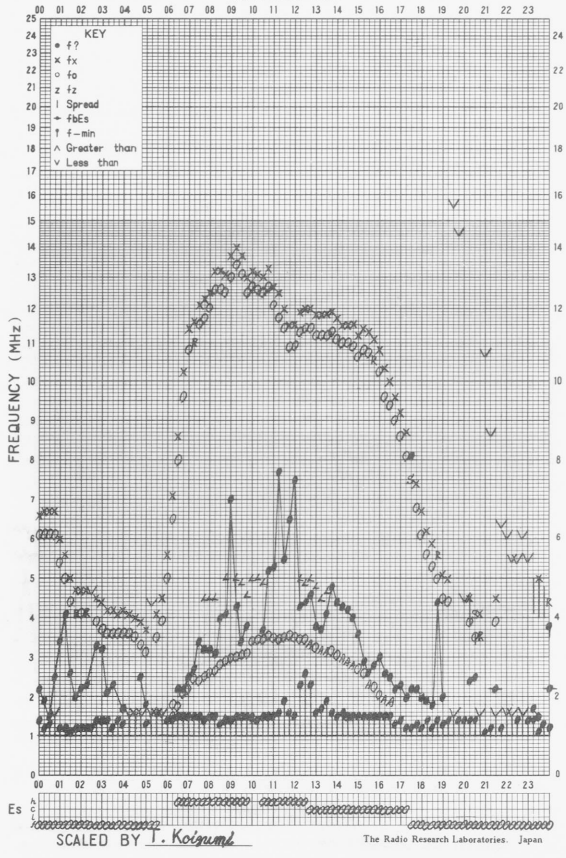
f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 2. 1972



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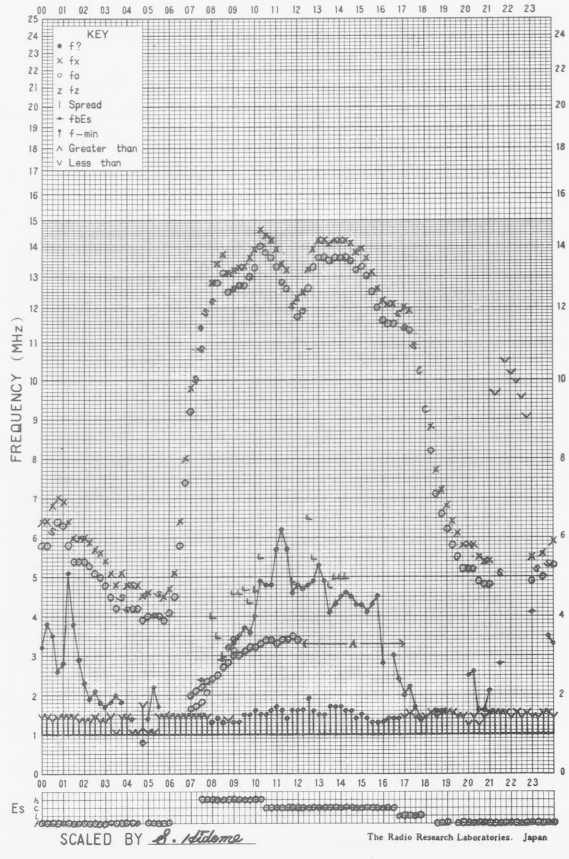
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV.-2.1972



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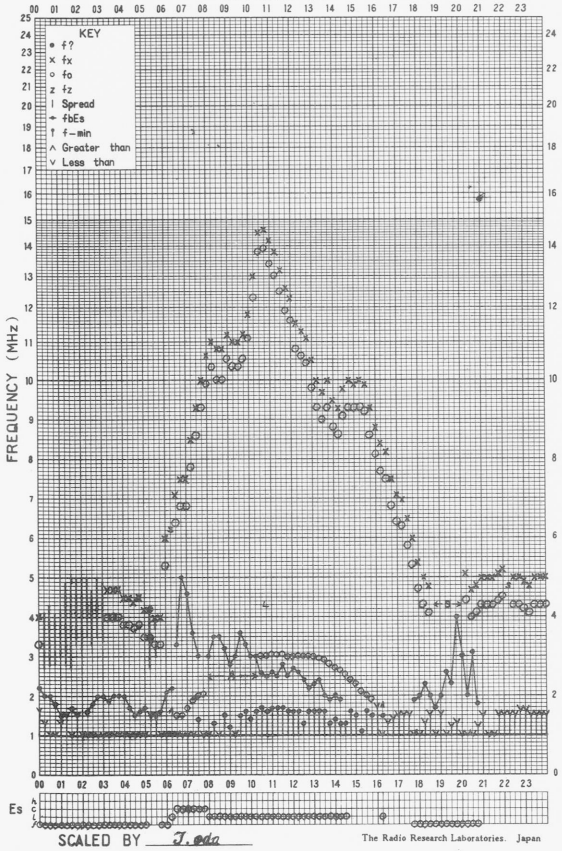
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 3.1972

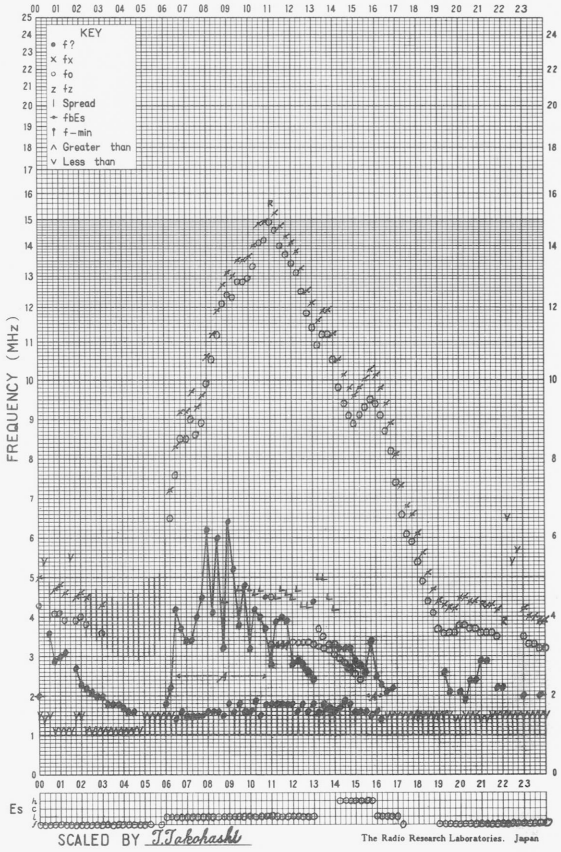


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 3. 1972



SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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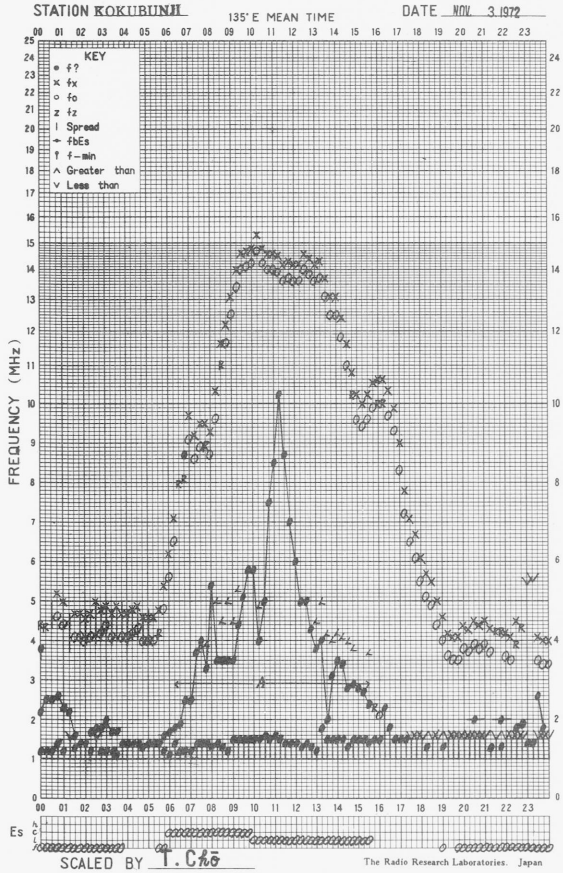

SCALED BY T. Cho

The Radio Research Laboratories. Japan

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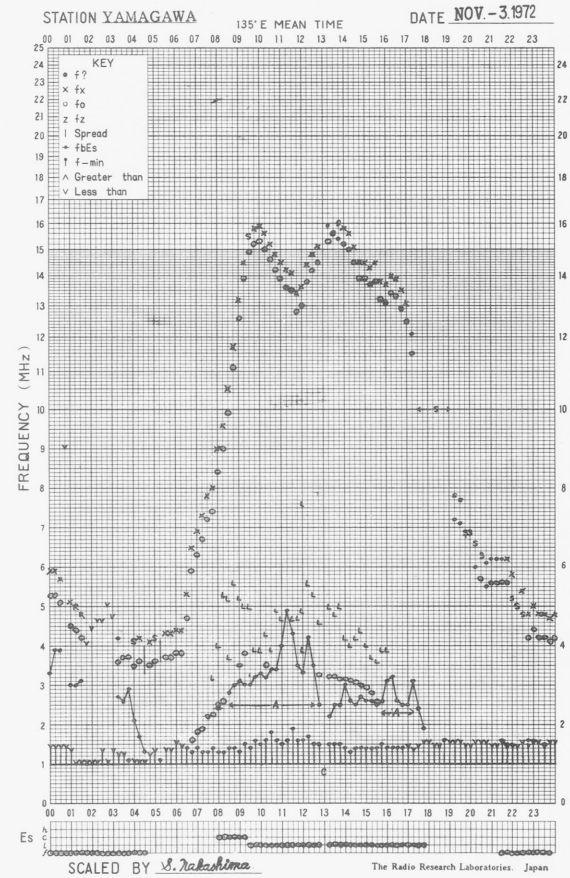

SCALED BY S. Takashima

The Radio Research Laboratories. Japan

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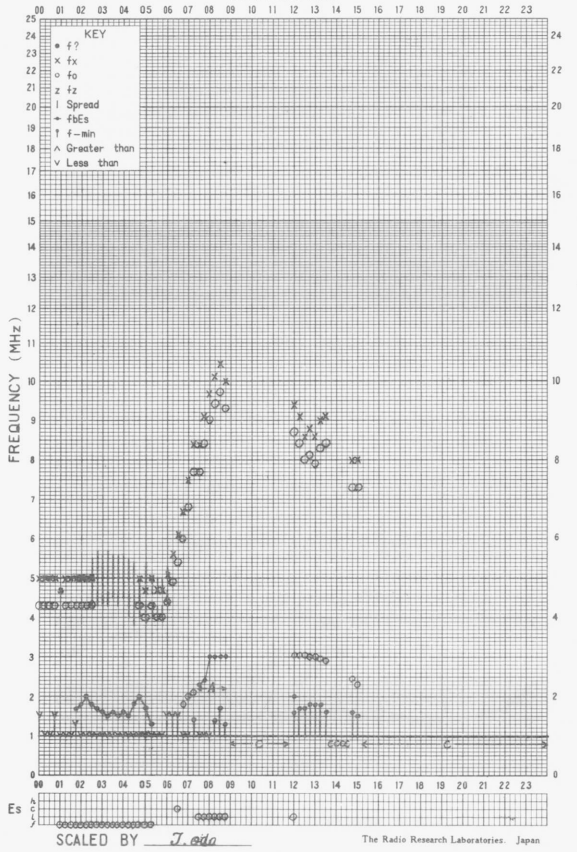

SCALED BY T. oda

The Radio Research Laboratories. Japan

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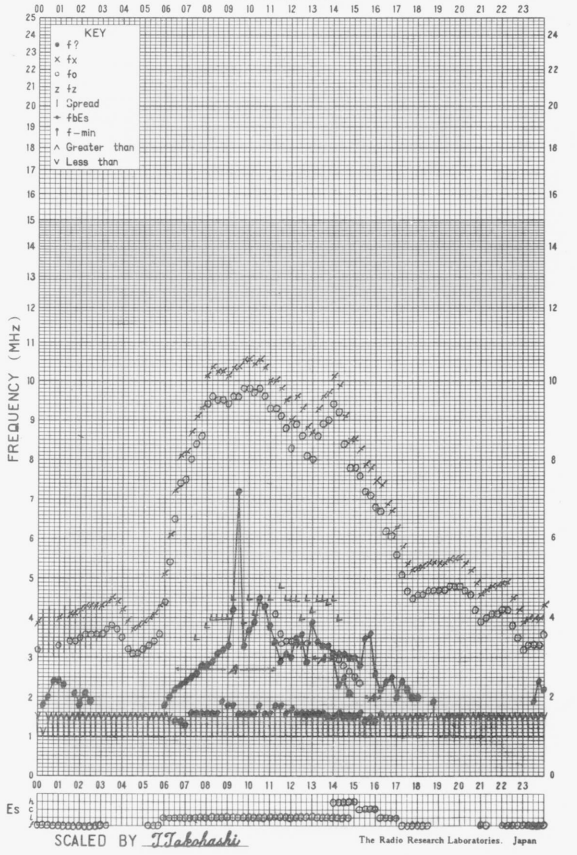

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The Radio Research Laboratories. Japan

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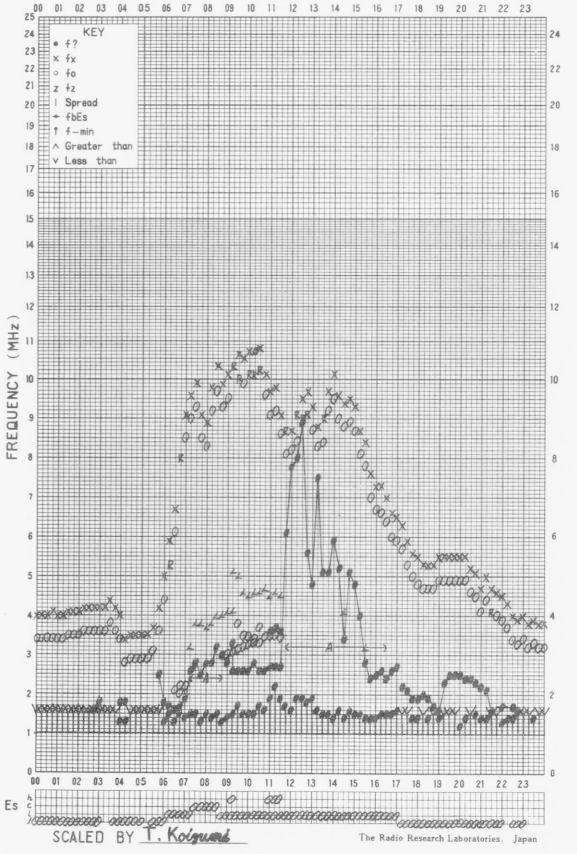

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The Radio Research Laboratories. Japan

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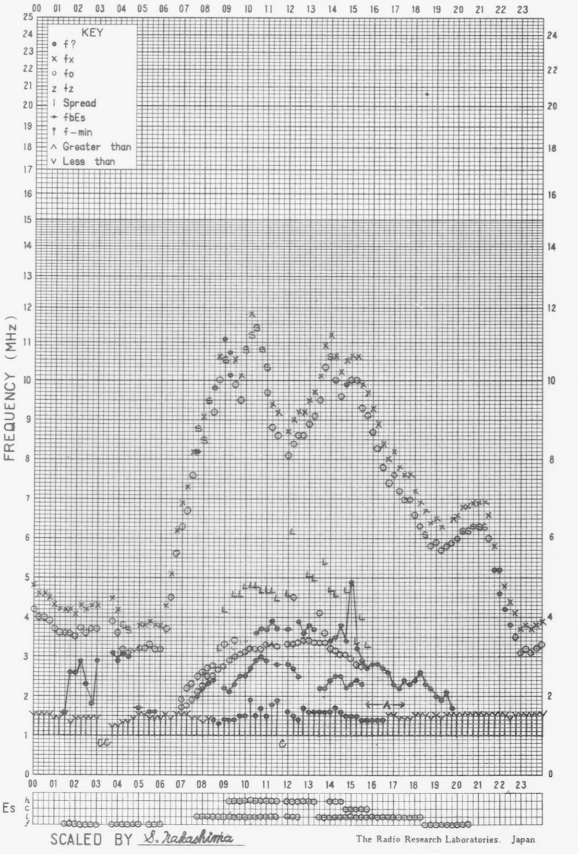

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The Radio Research Laboratories. Japan

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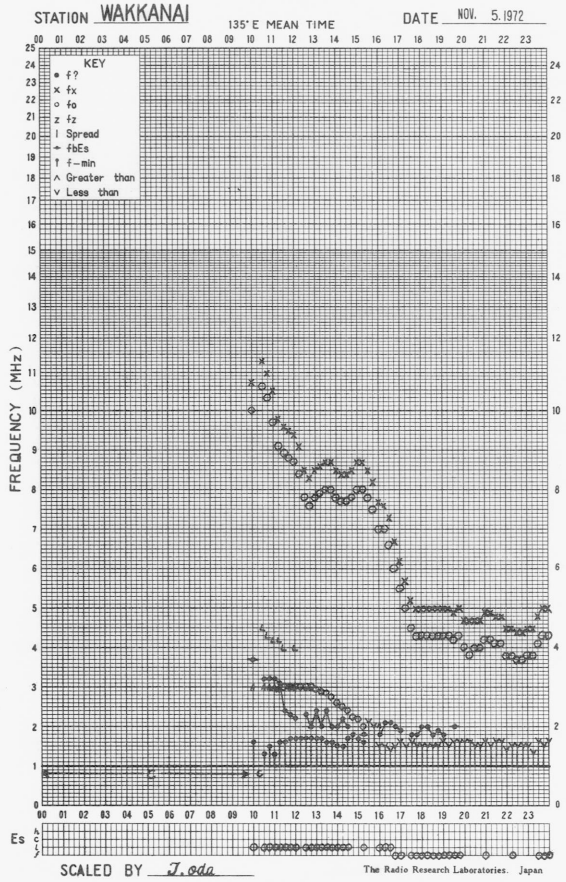

SCALED BY J. Oda

The Radio Research Laboratories. Japan

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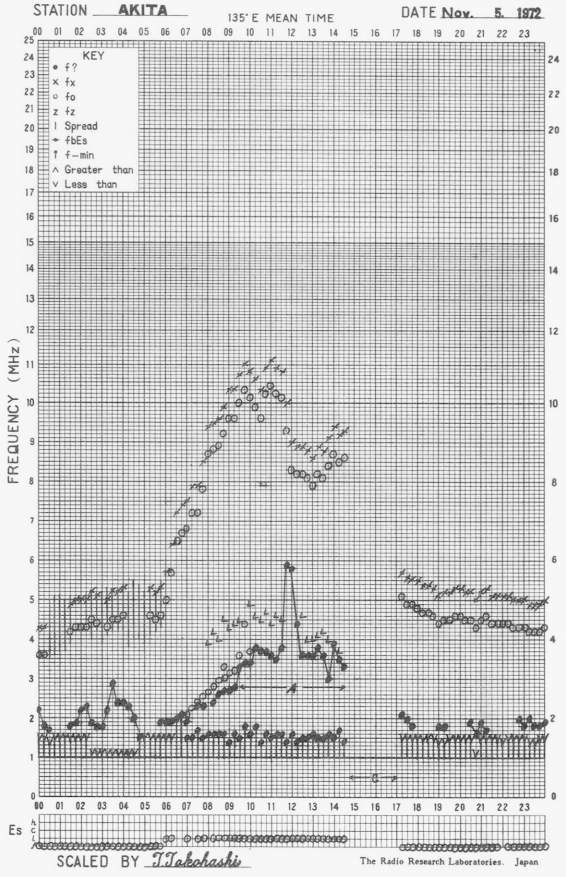

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The Radio Research Laboratories. Japan

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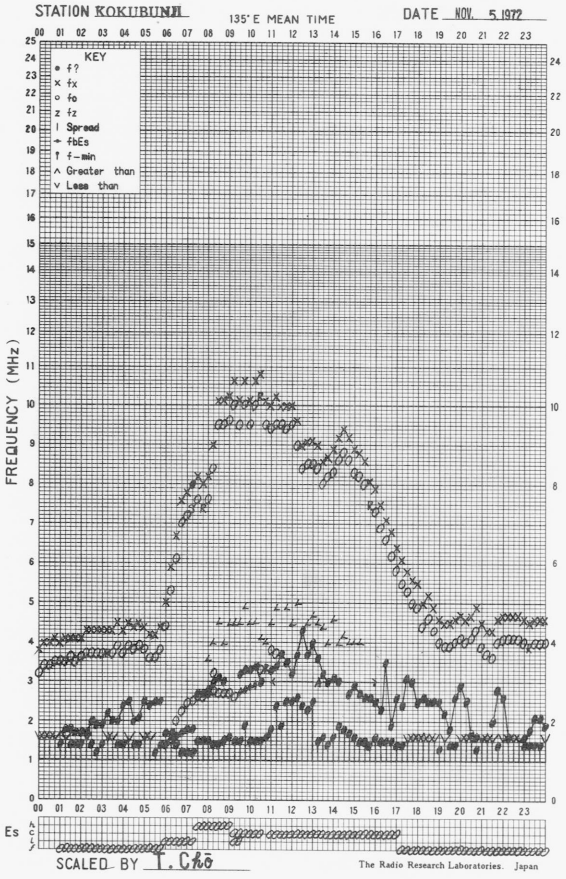

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The Radio Research Laboratories. Japan

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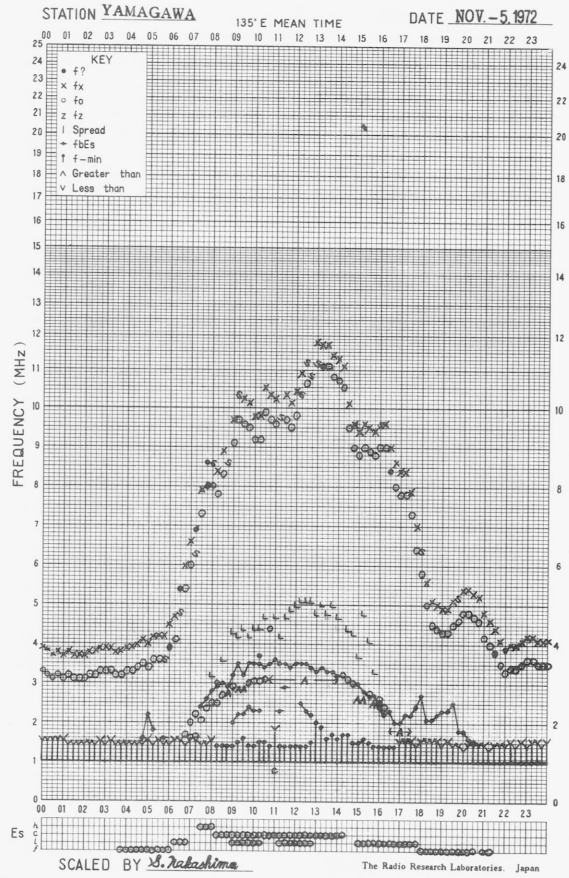

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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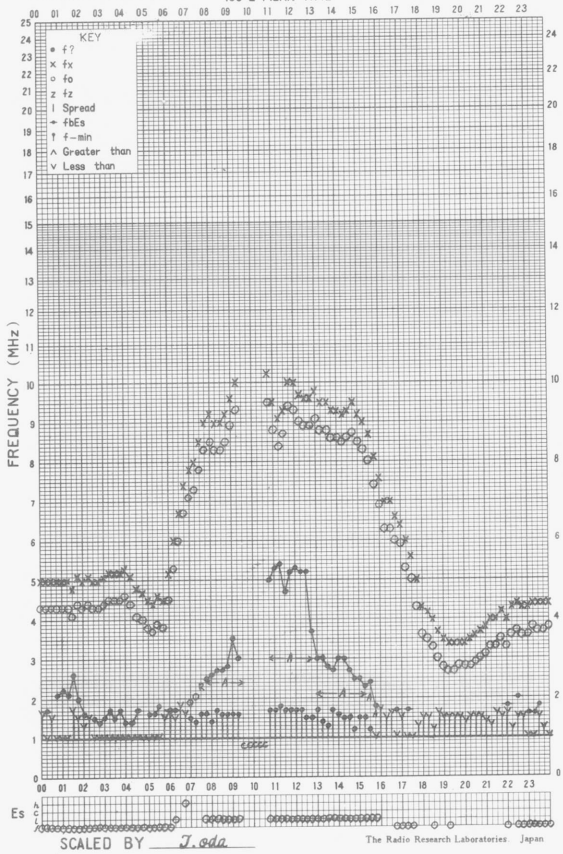

SCALED BY J. oda

The Radio Research Laboratories. Japan

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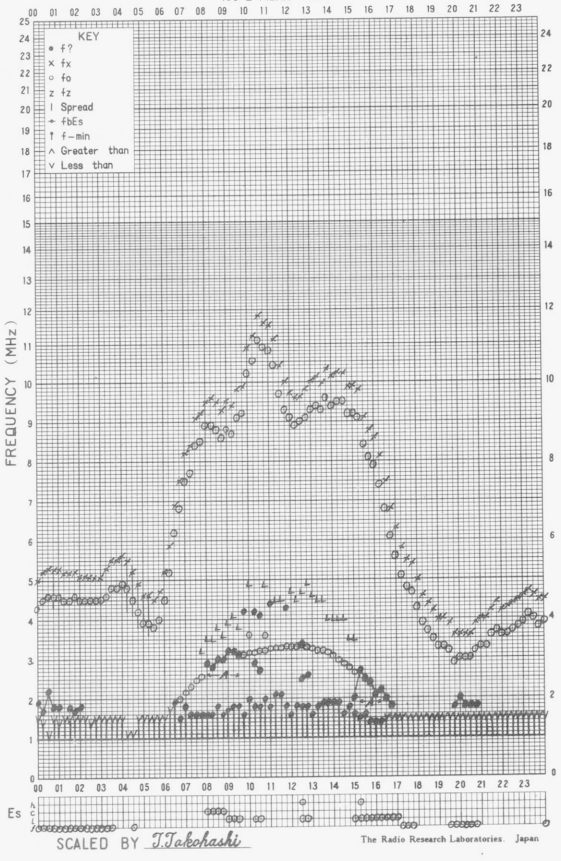

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The Radio Research Laboratories. Japan

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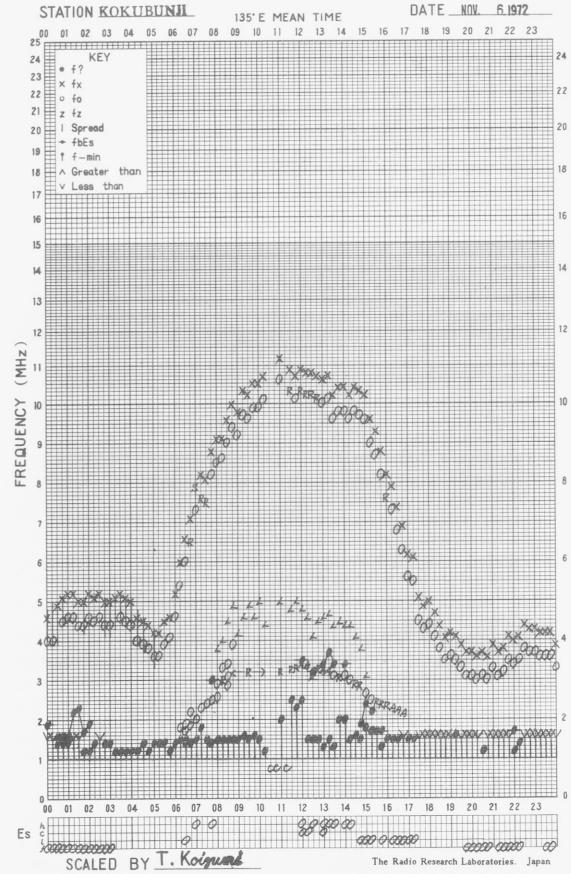

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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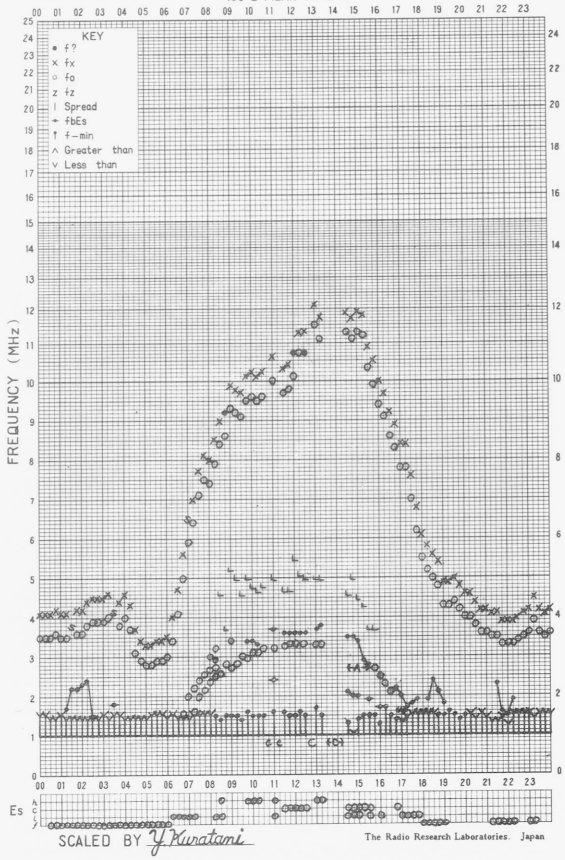

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The Radio Research Laboratories. Japan

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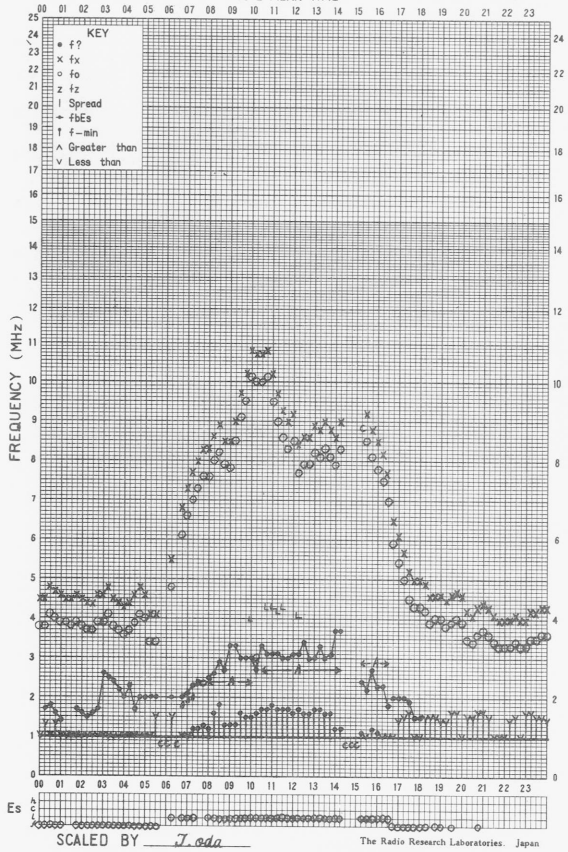

SCALED BY T. Oda

The Radio Research Laboratories. Japan

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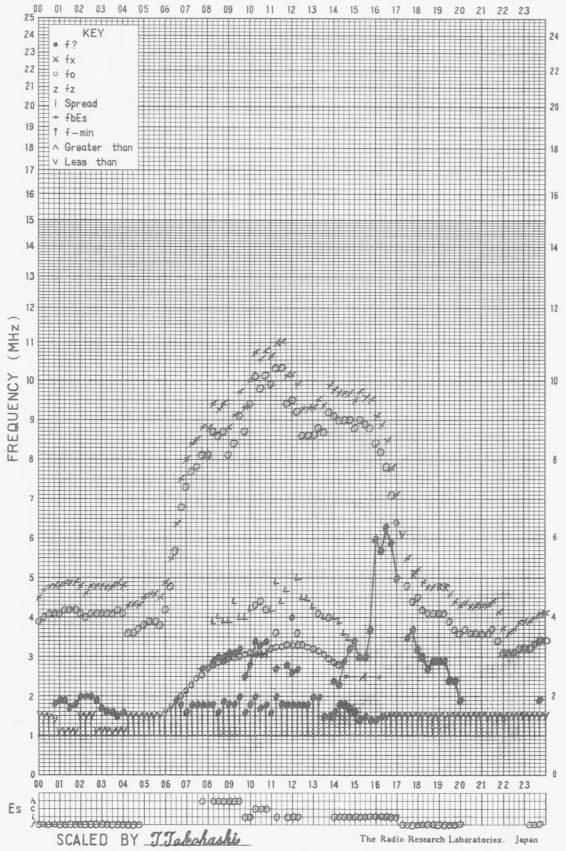

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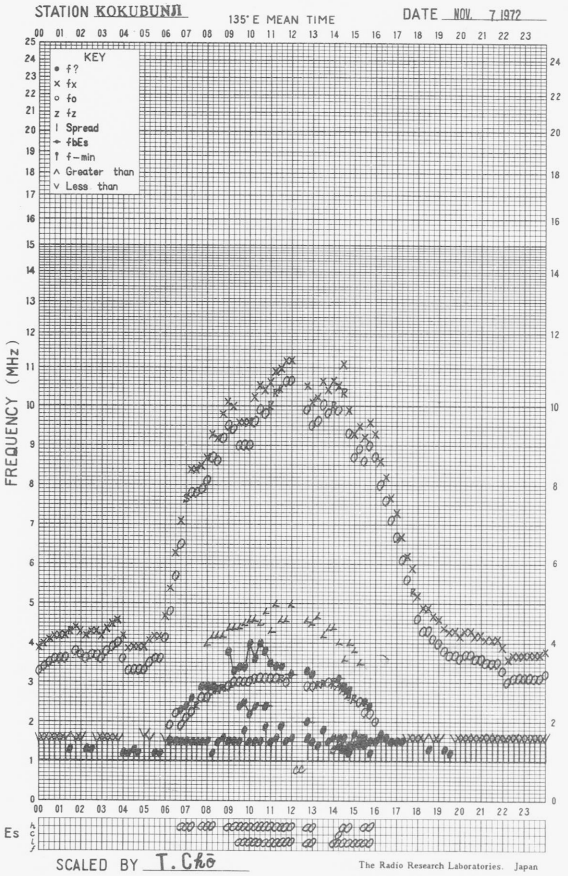

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The Radio Research Laboratories. Japan

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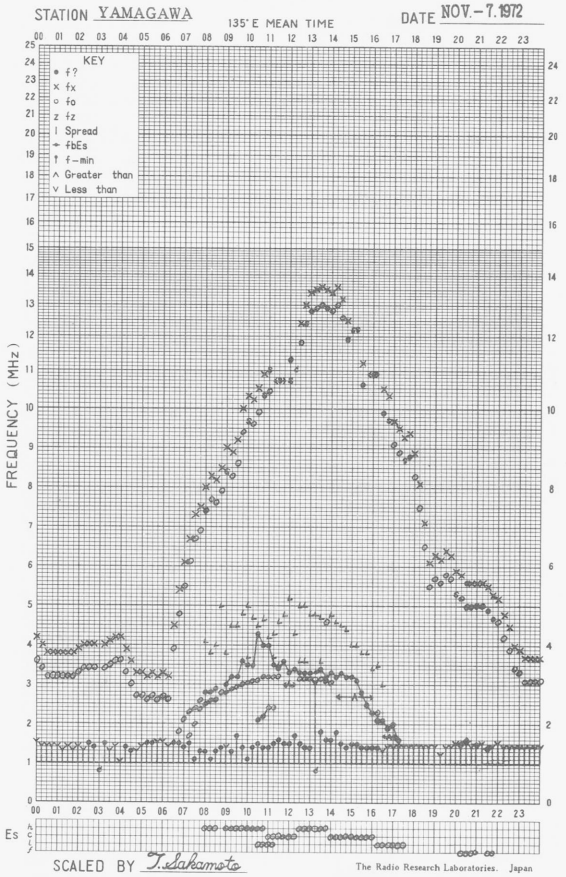

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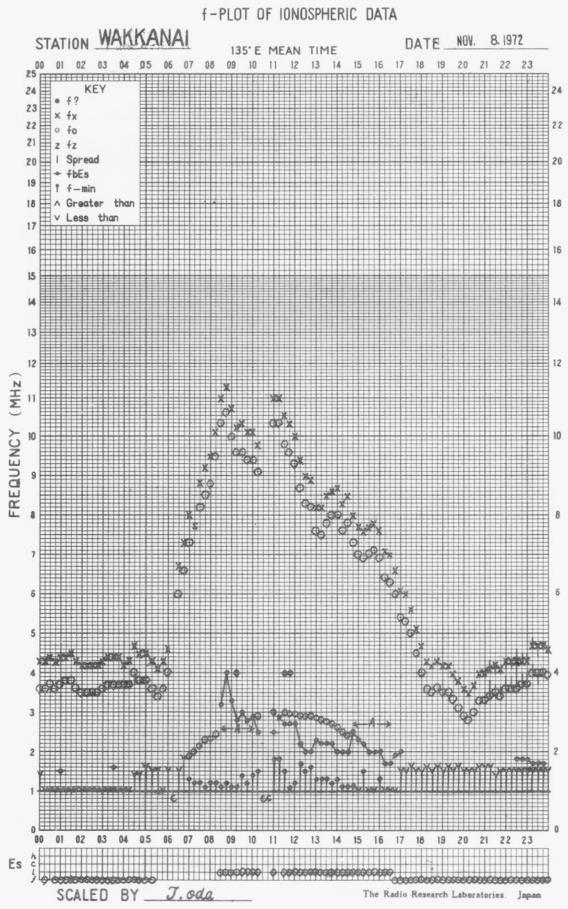
The Radio Research Laboratories. Japan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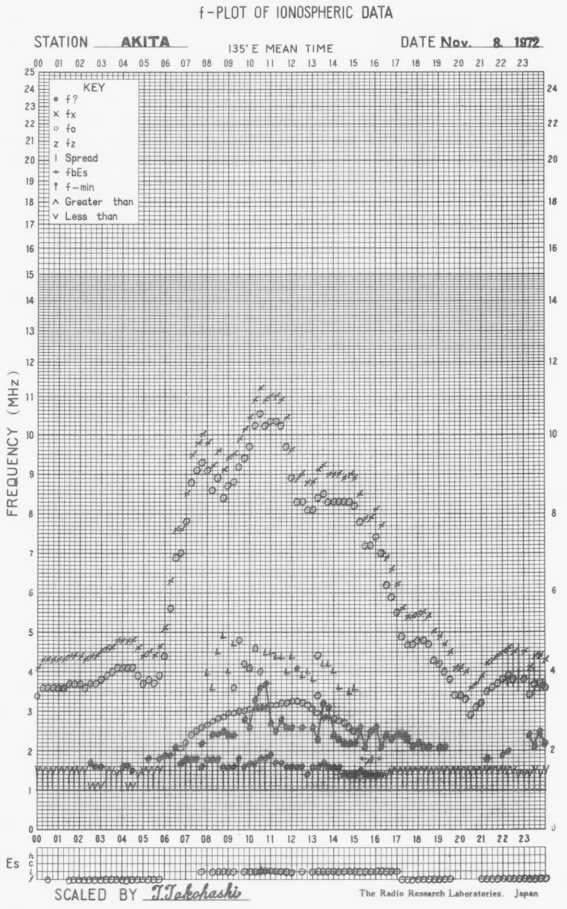
SCALED BY T. oda
The Radio Research Laboratories. Japan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DATE Nov. 8. 1972
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FREQUENCY (MHz)
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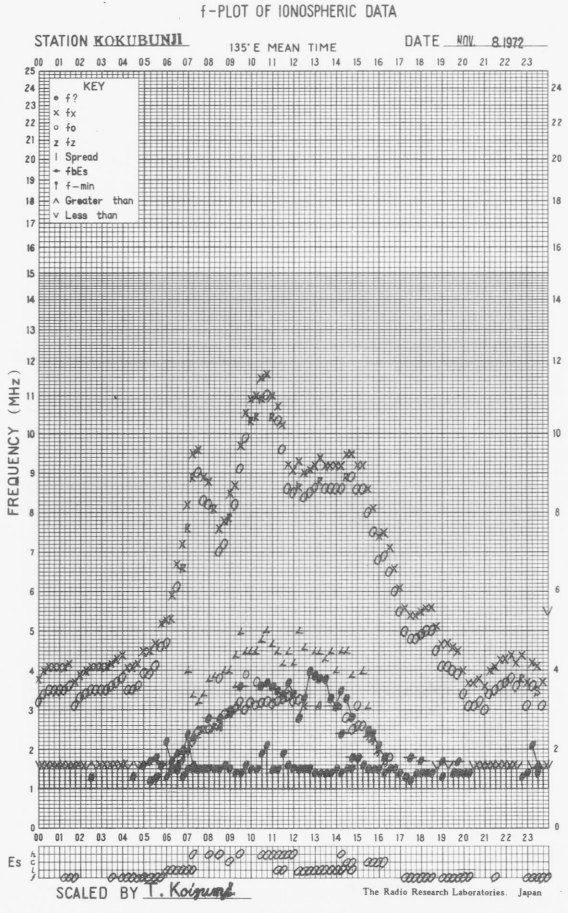
The Radio Research Laboratories. Japan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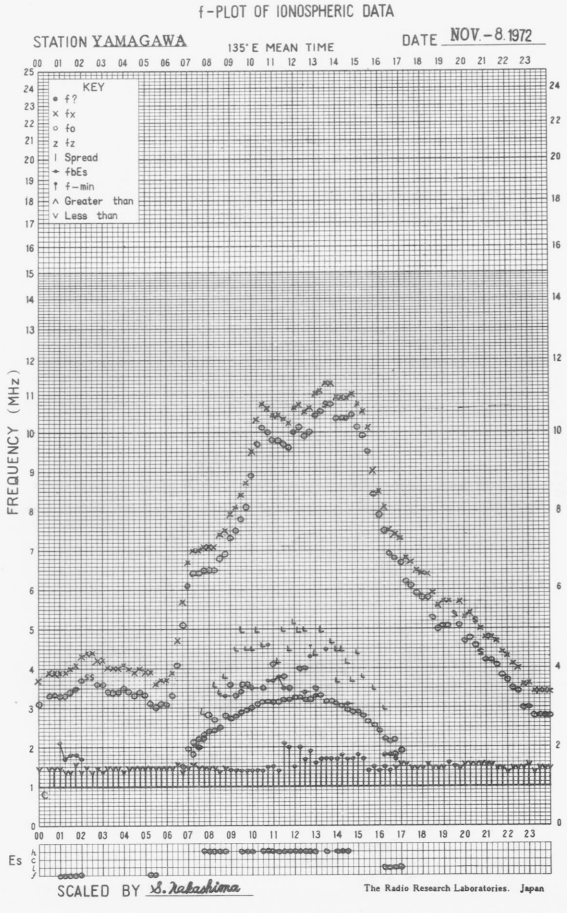
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY S. Nakashima
The Radio Research Laboratories. Japan

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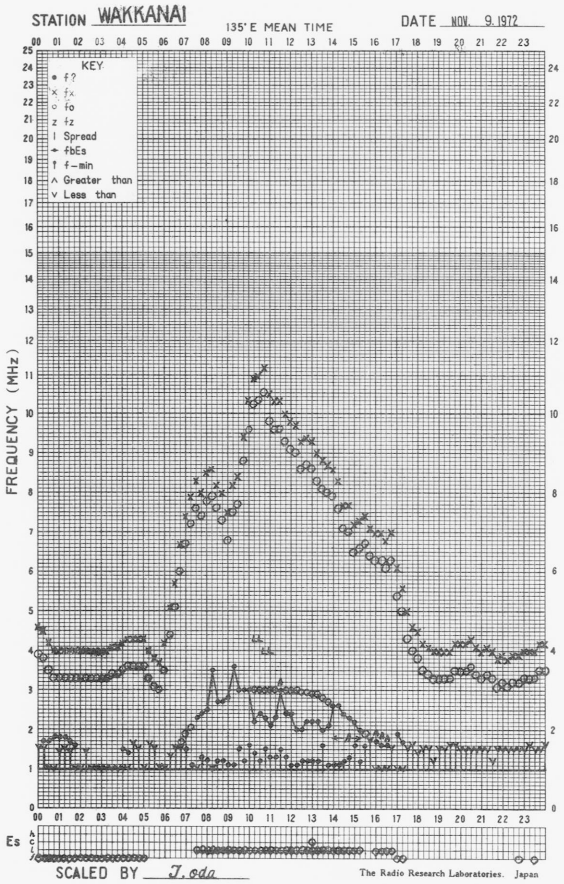

SCALED BY T. oda

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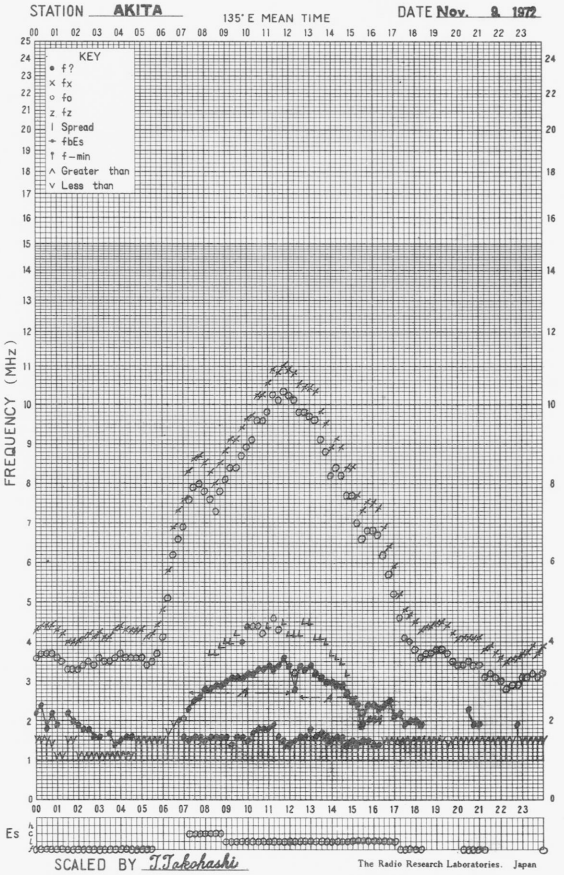

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The Radio Research Laboratories. Japan

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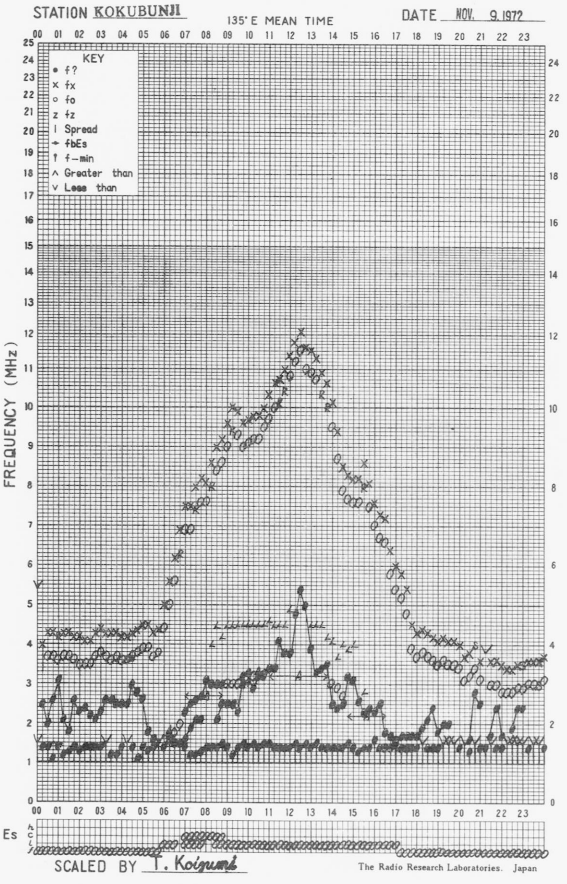

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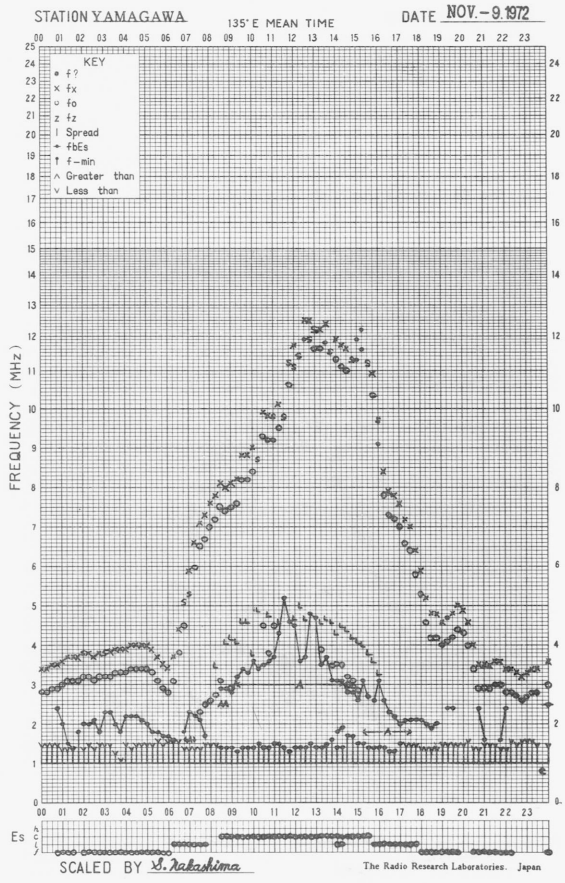
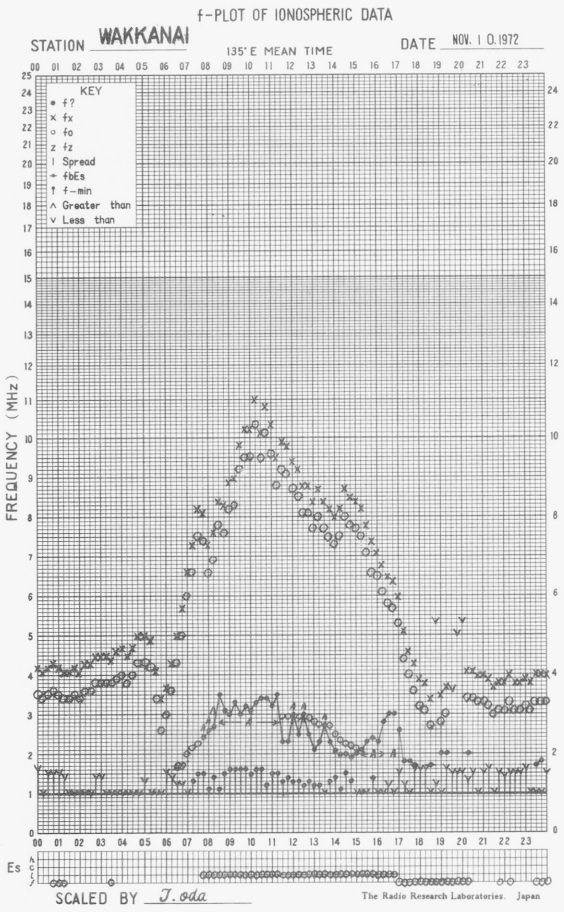


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan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135°E MEAN TIME
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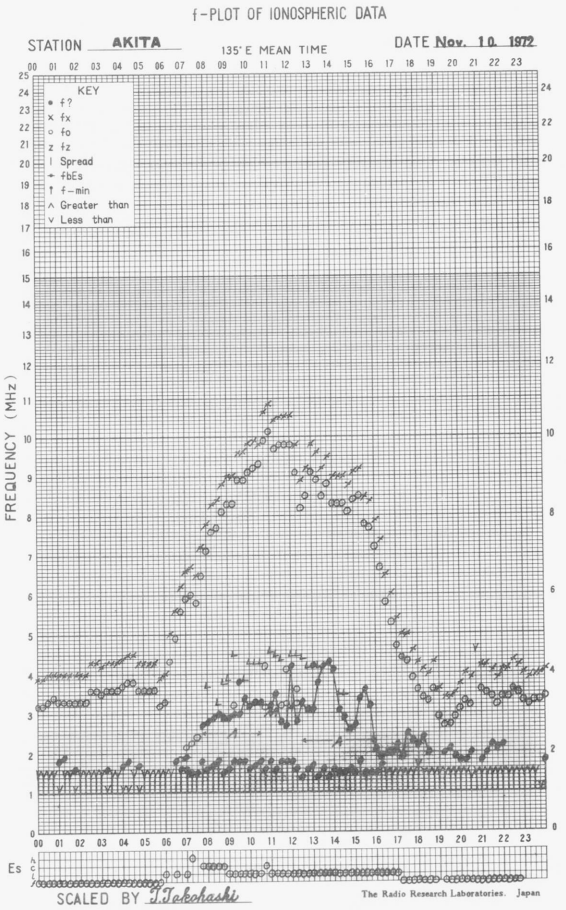
FREQUENCY (MHz)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan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DATE Nov. 10. 1972
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FREQUENCY (MHz)
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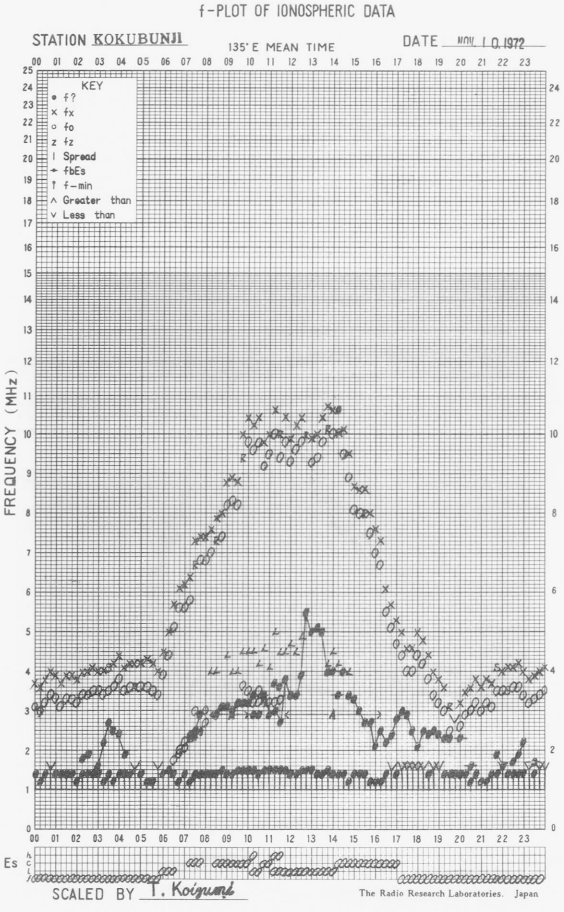
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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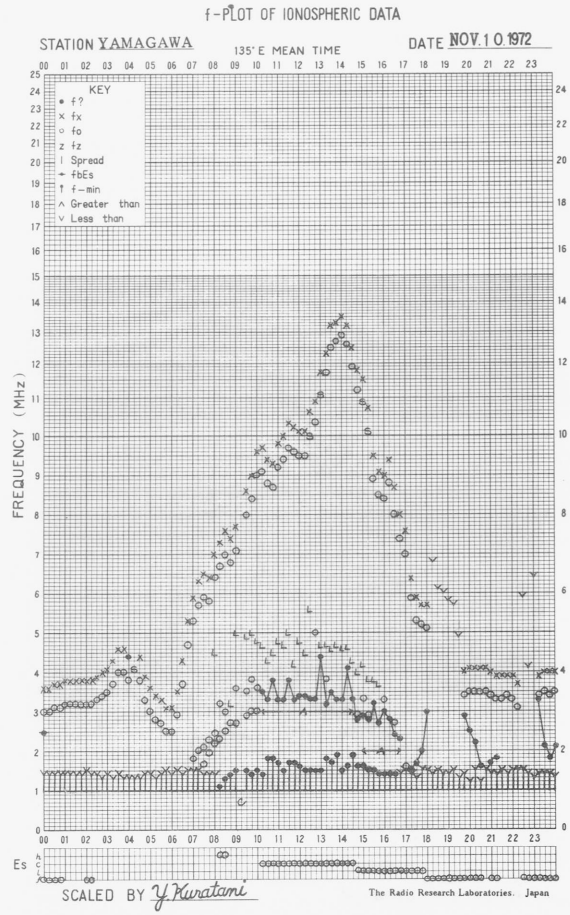
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan

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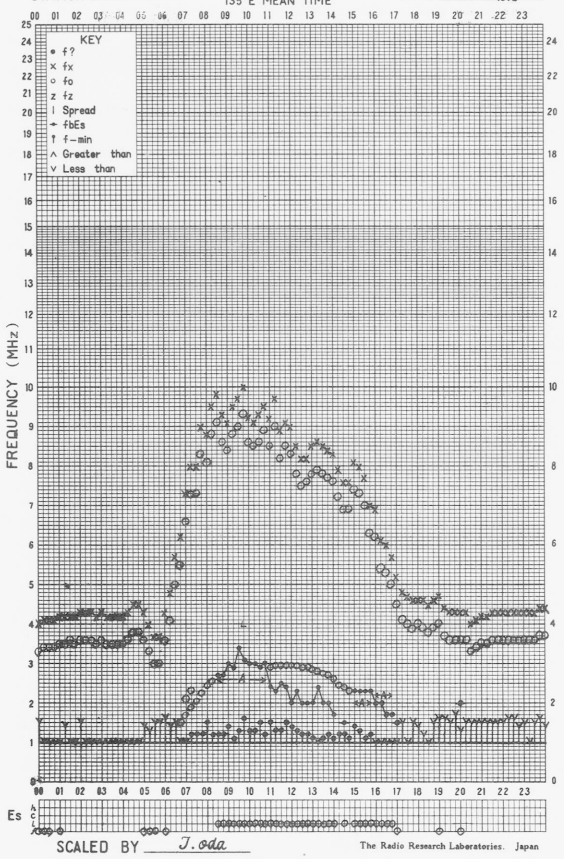

SCALED BY T. oda

The Radio Research Laboratories. Japan

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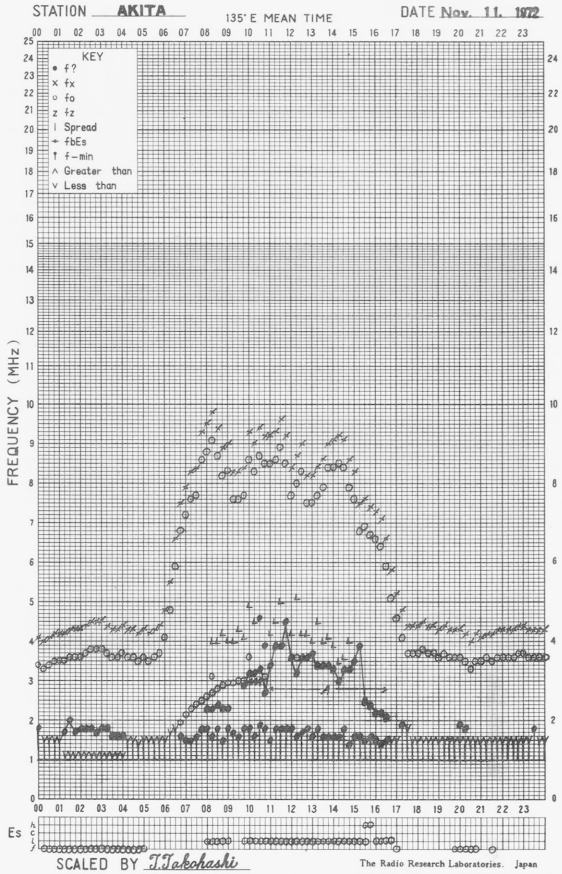

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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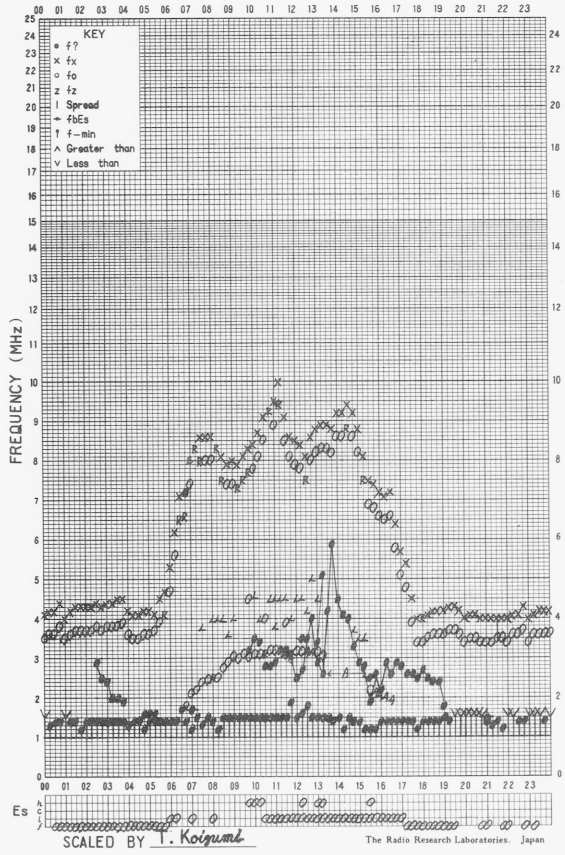

SCALED BY I. Koizumi

The Radio Research Laboratories. Japan

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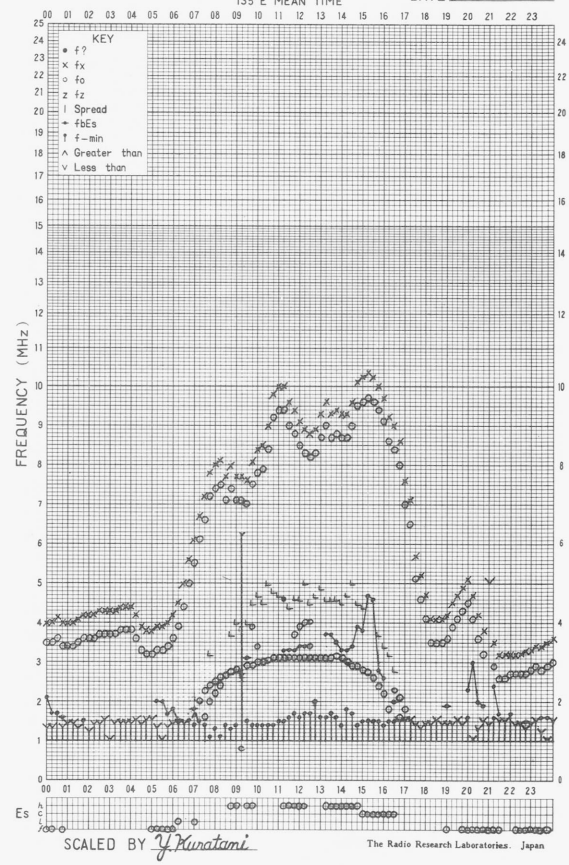

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The Radio Research Laboratories. Japan

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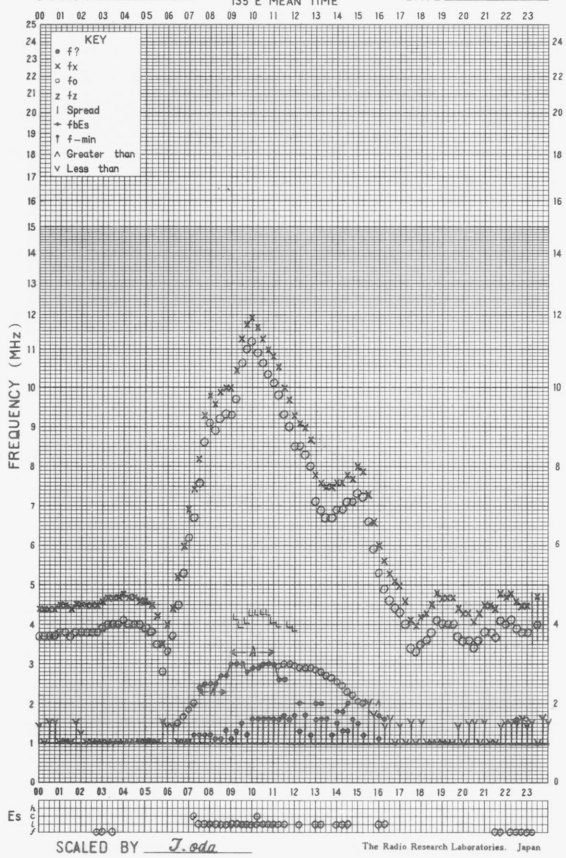

SCALED BY T. oda

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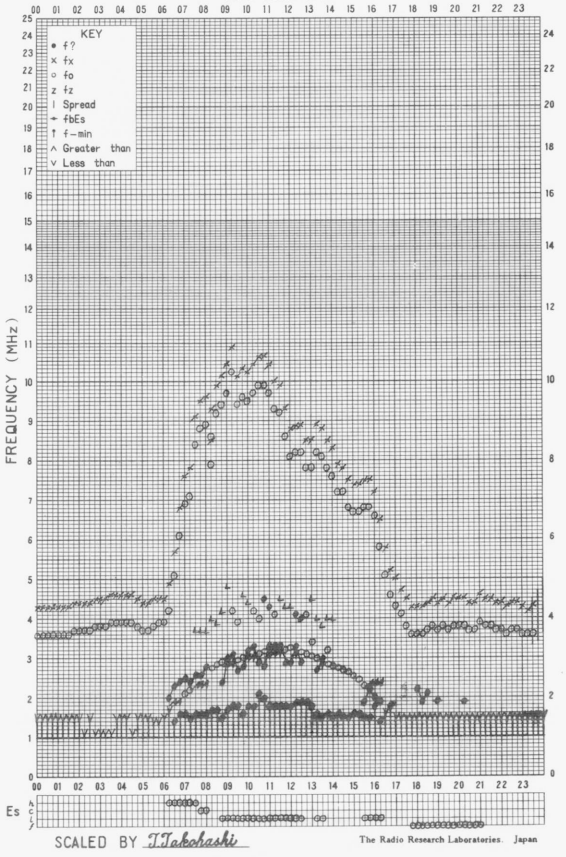

SCALED BY T.Takahashi

The Radio Research Laboratories. Japan

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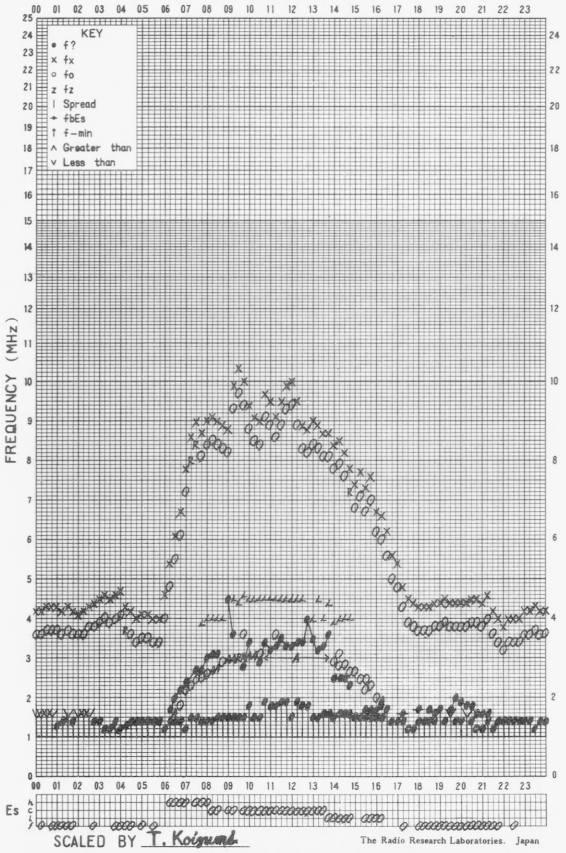

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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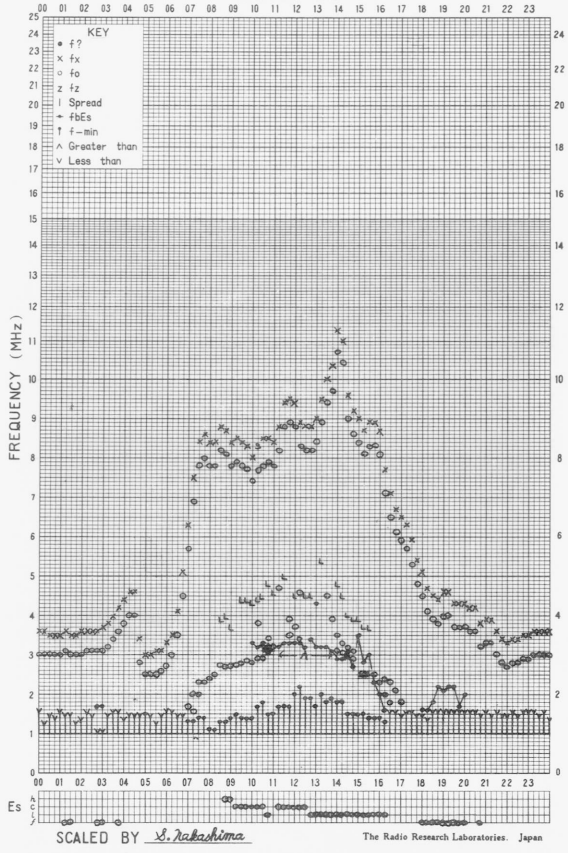

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The Radio Research Laboratories. Japan

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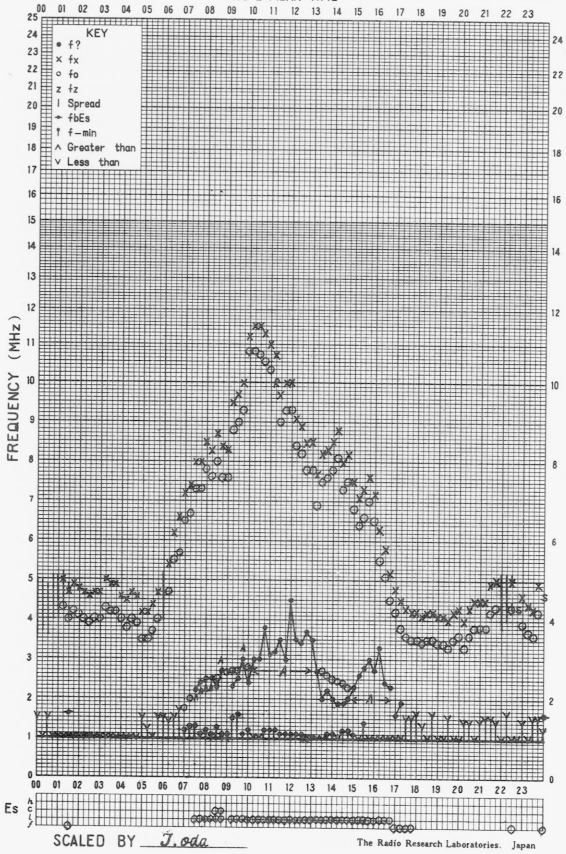

SCALED BY T. Oda

The Radio Research Laboratories. Japan

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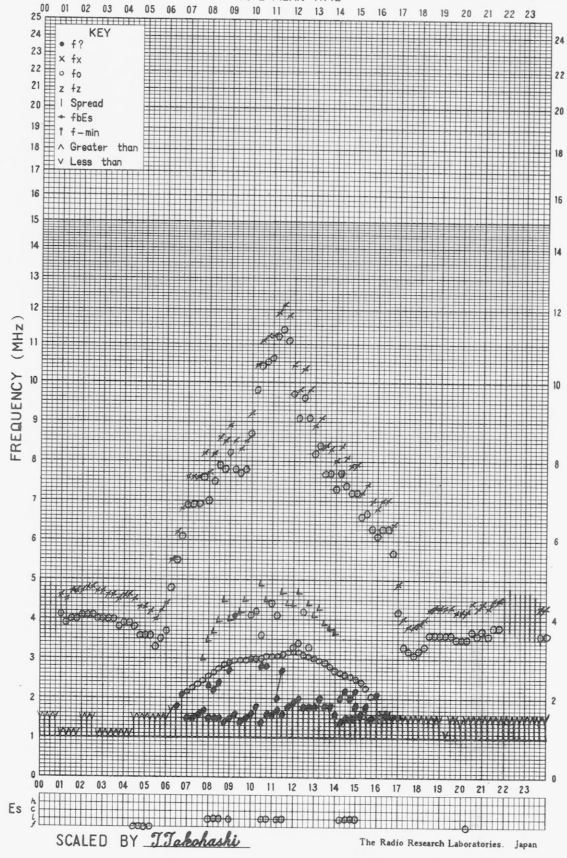

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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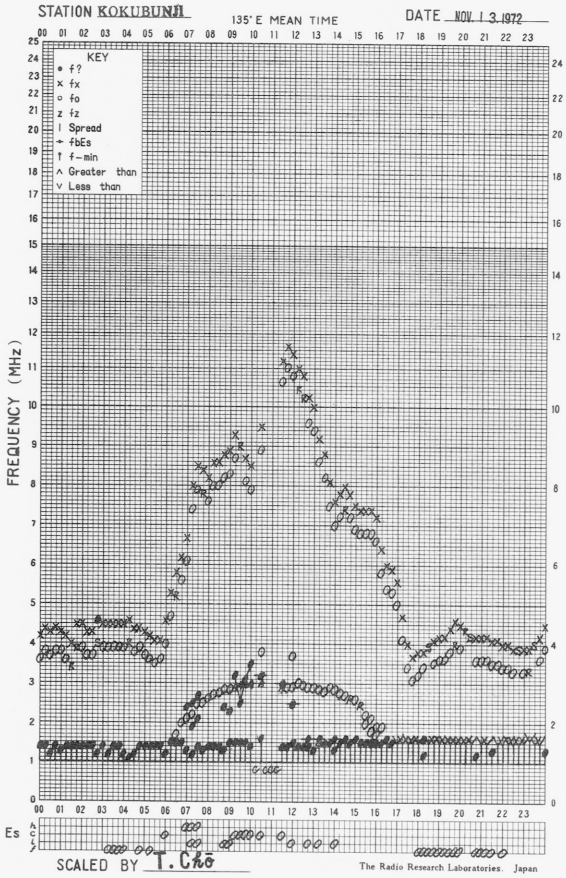
STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 13.1972

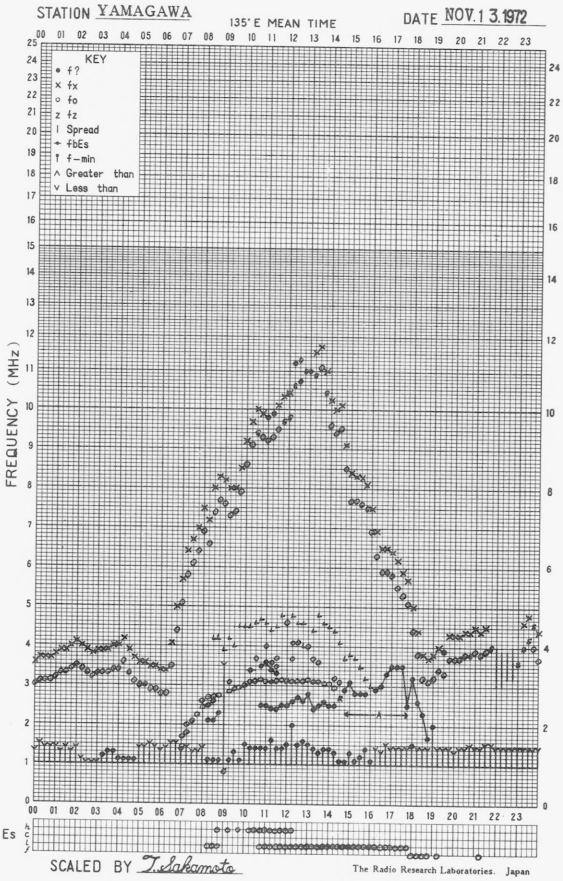


SCALED BY T. Cho

The Radio Research Laboratories. Japan

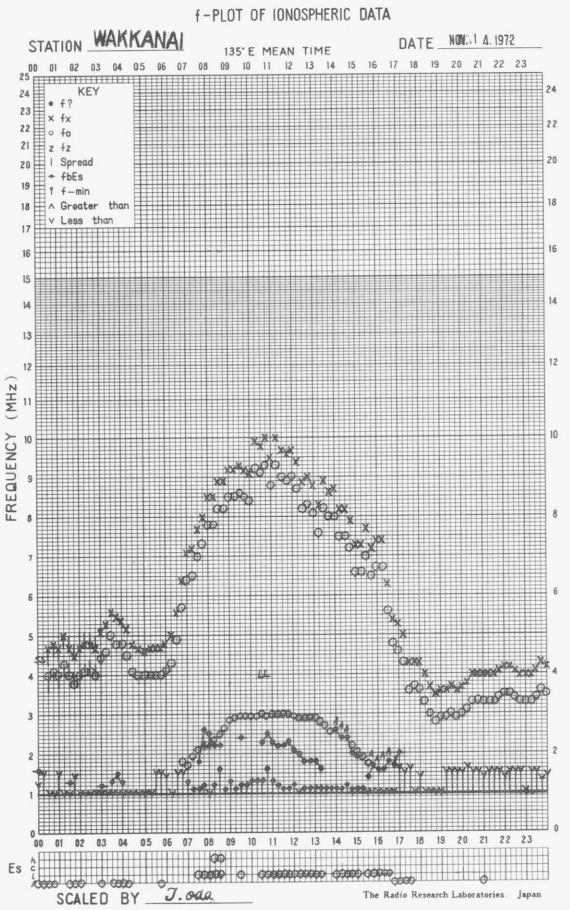
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 13.1972



SCALED BY T. Takamoto

The Radio Research Laboratories. Japan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DATE NOV. 14. 1972
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FREQUENCY (MHz)
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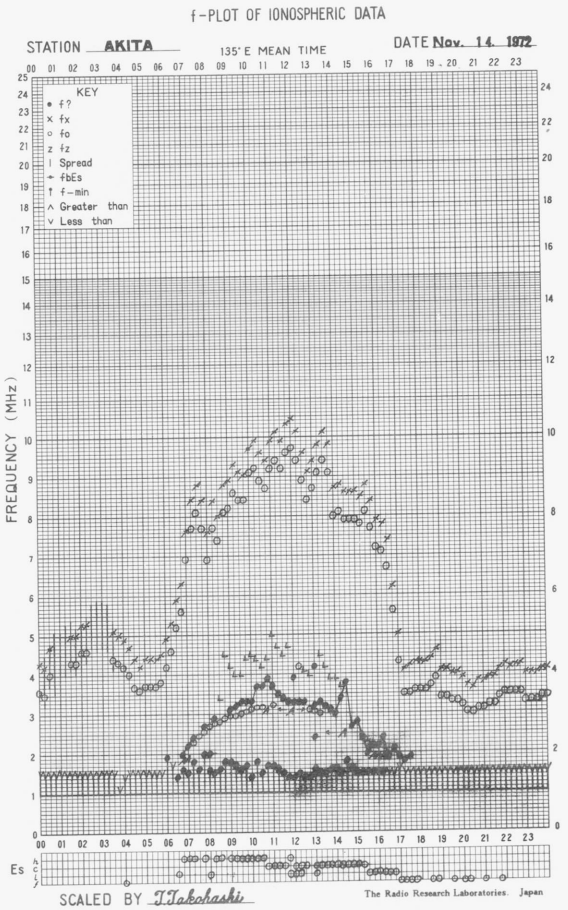
SCALED BY T. Ooa
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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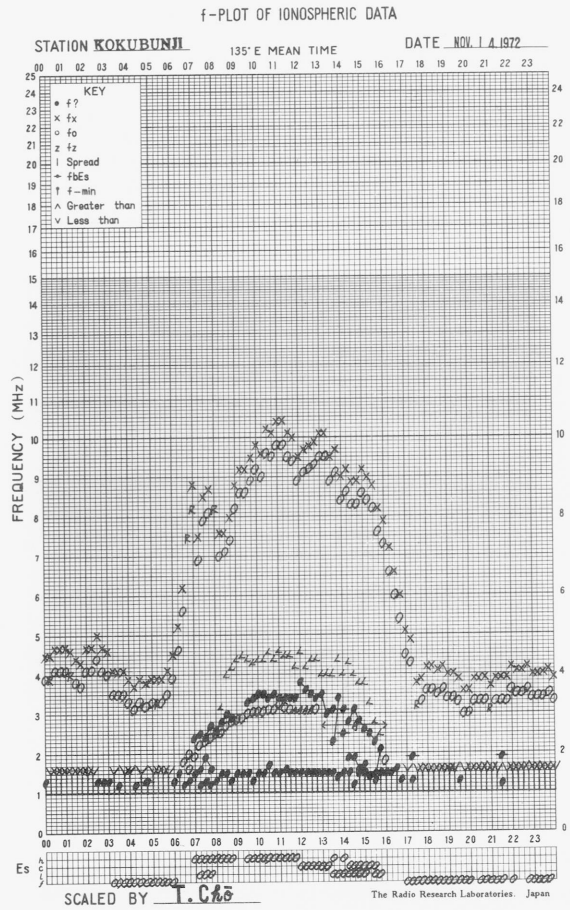
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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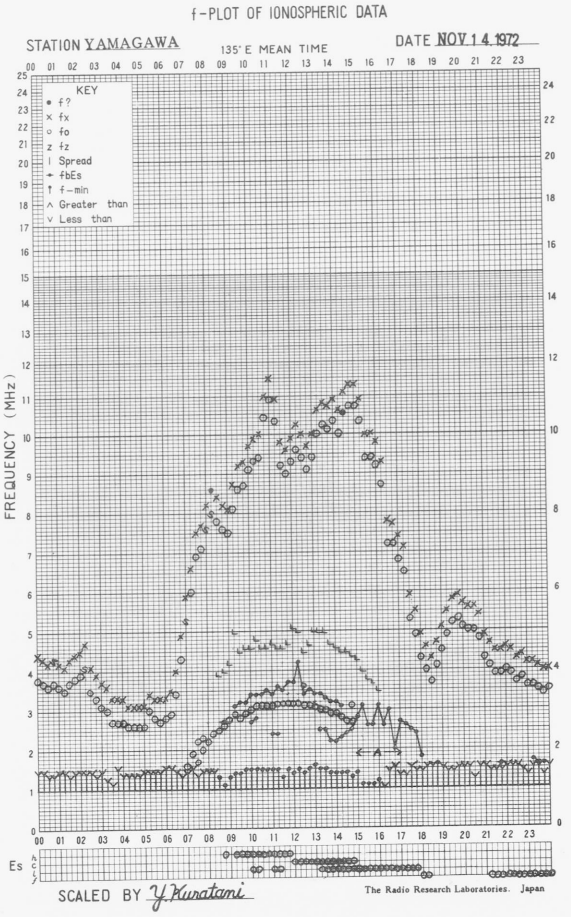
SCALED BY T. Cho
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan

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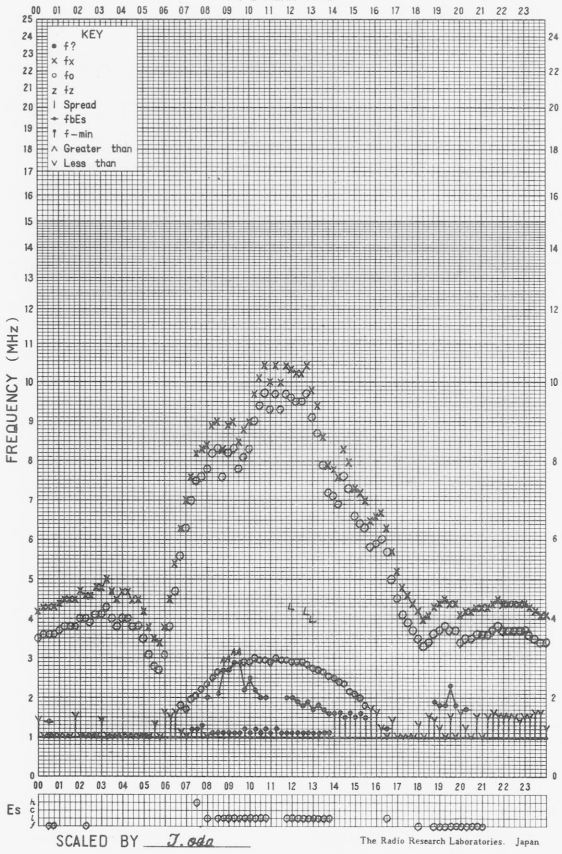

SCALED BY T. Oda

The Radio Research Laboratories. Japan

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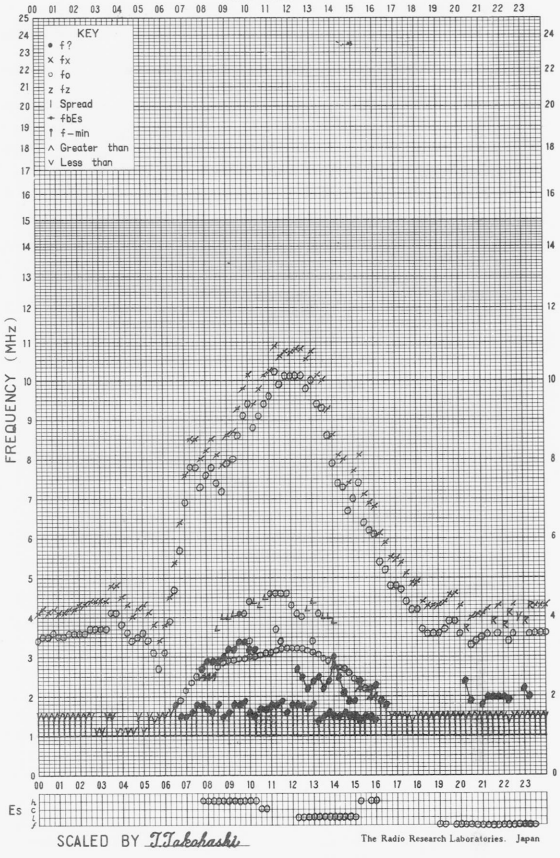

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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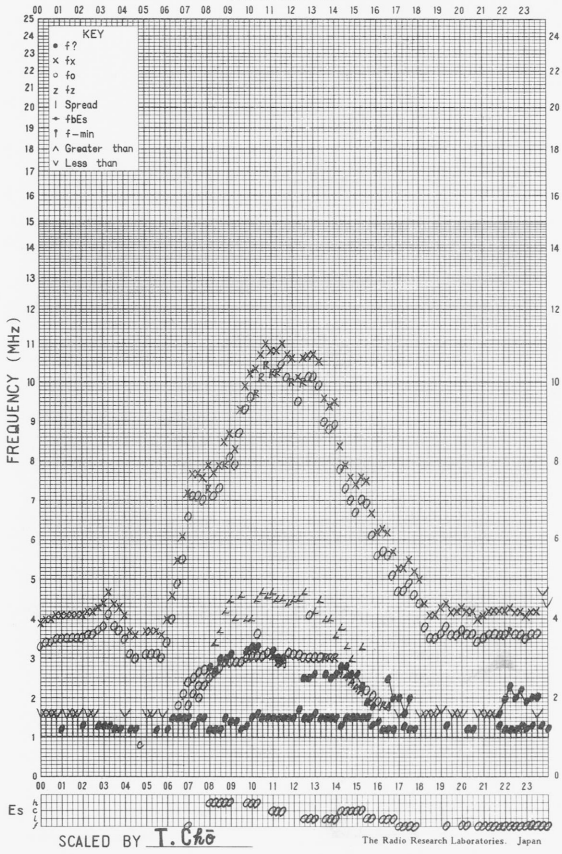

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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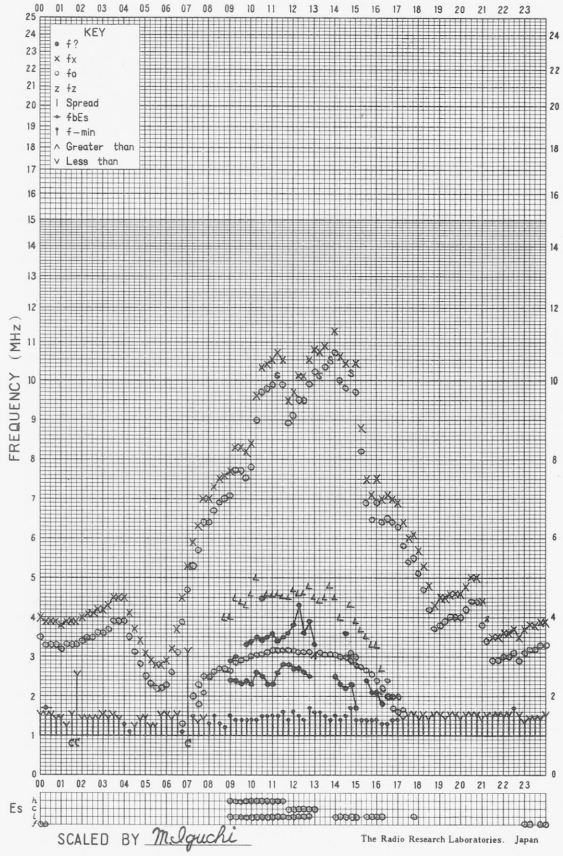

SCALED BY M. Iguchi

The Radio Research Laboratories. Japan

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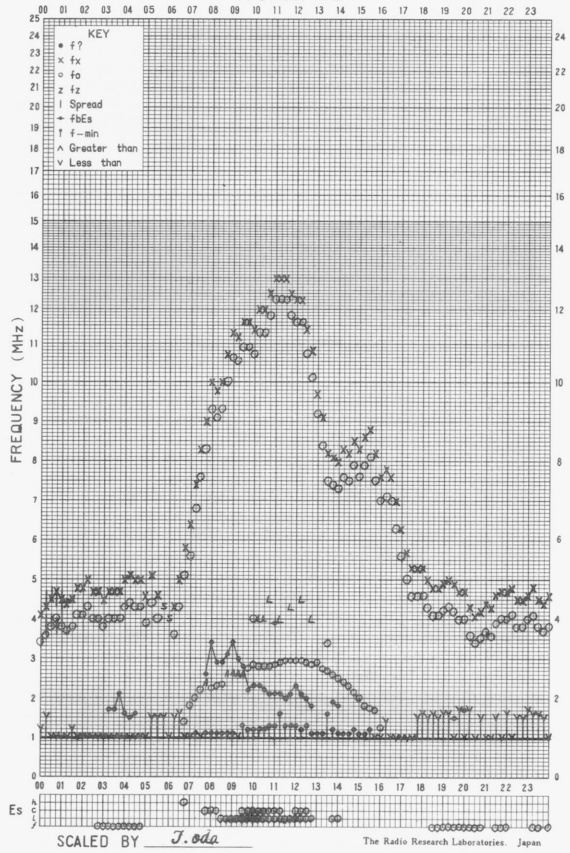

SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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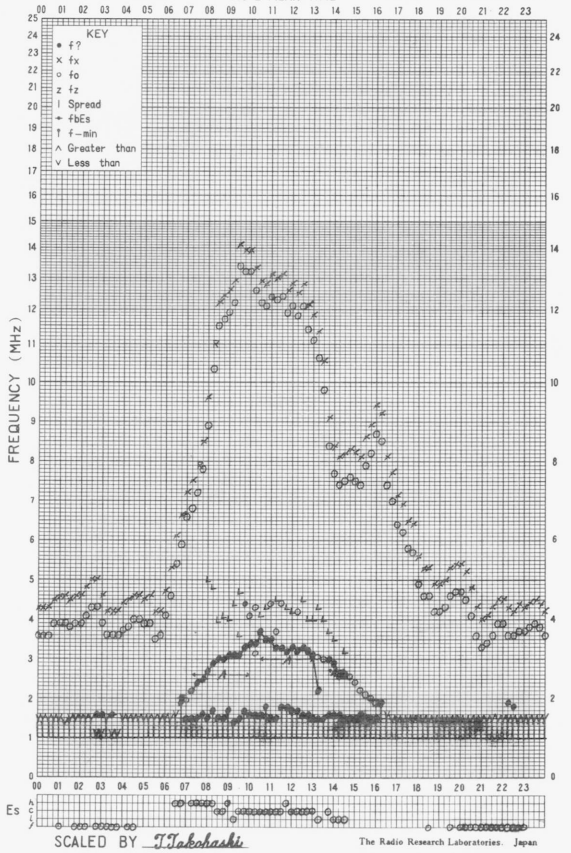

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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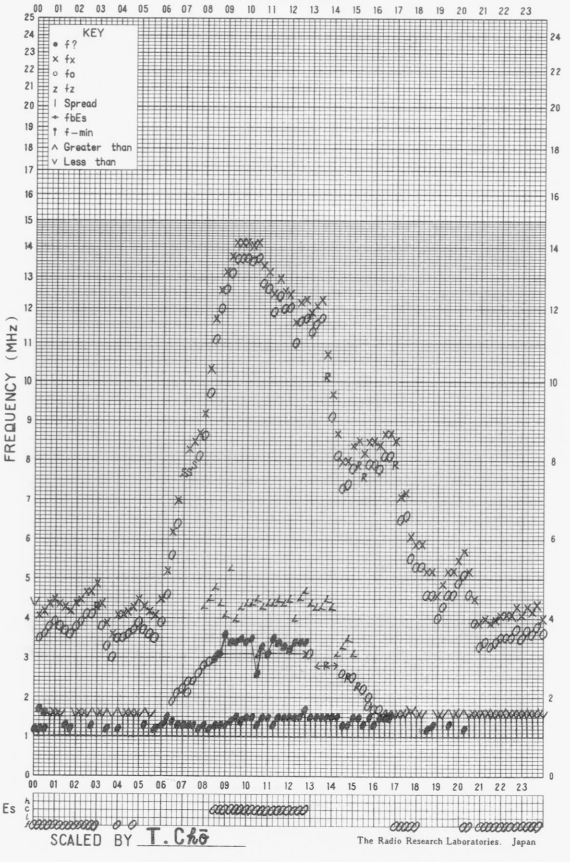

SCALED BY T. Cho

The Radio Research Laboratories. Japan

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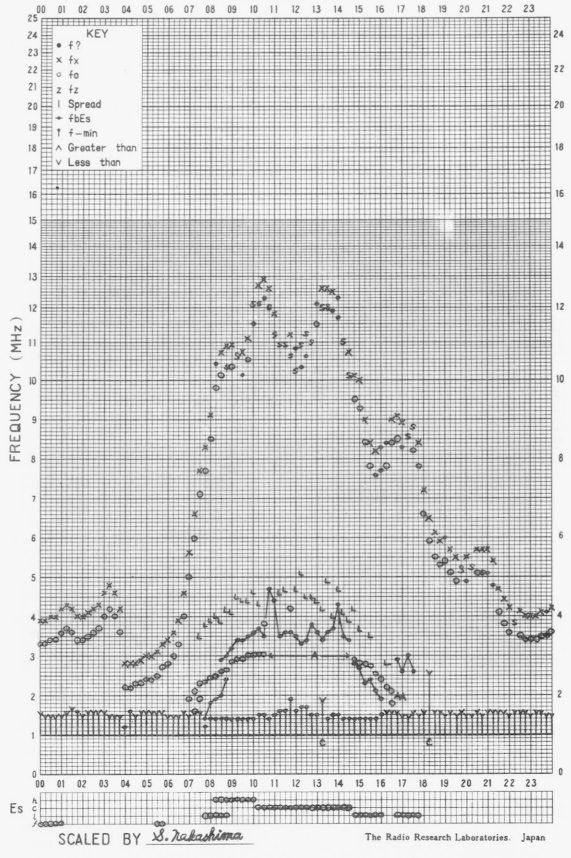
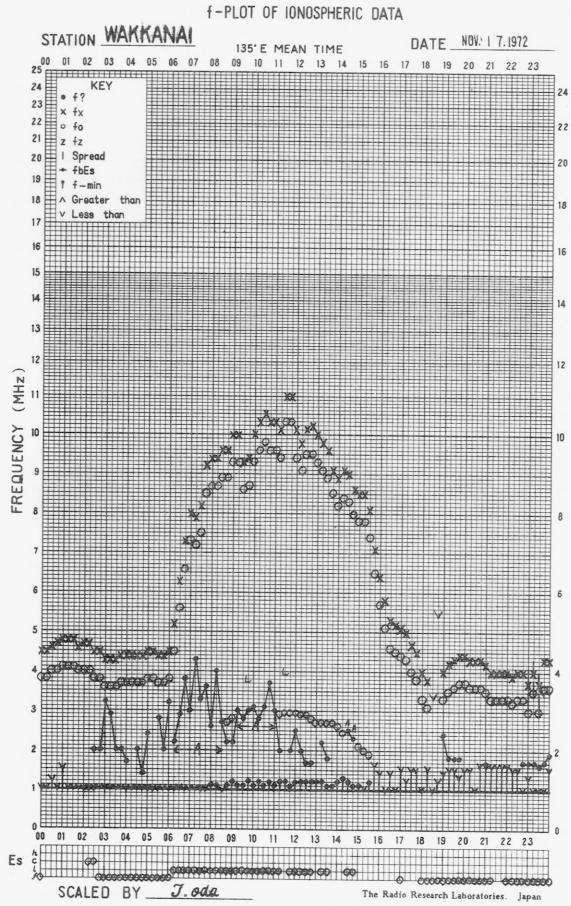


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan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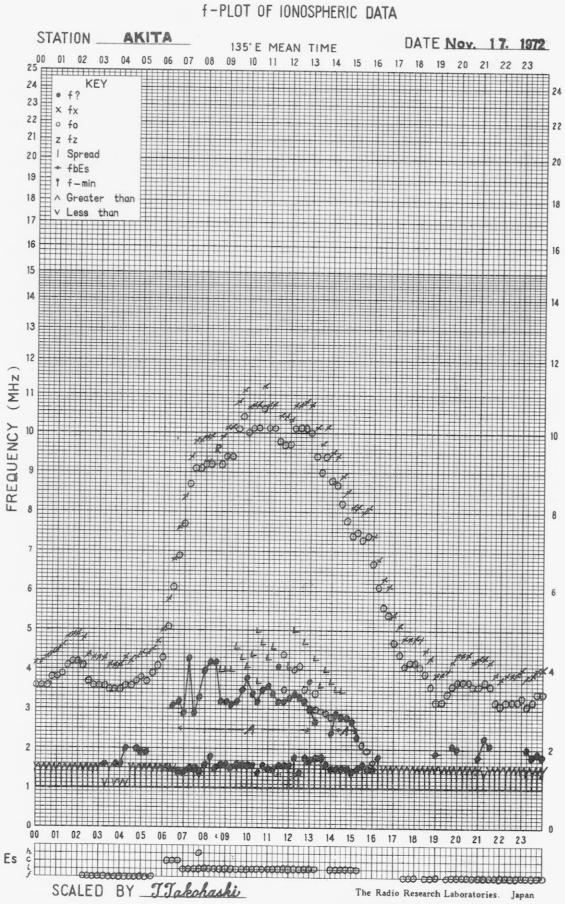
SCALED BY T. oda
The Radio Research Laboratories. Japan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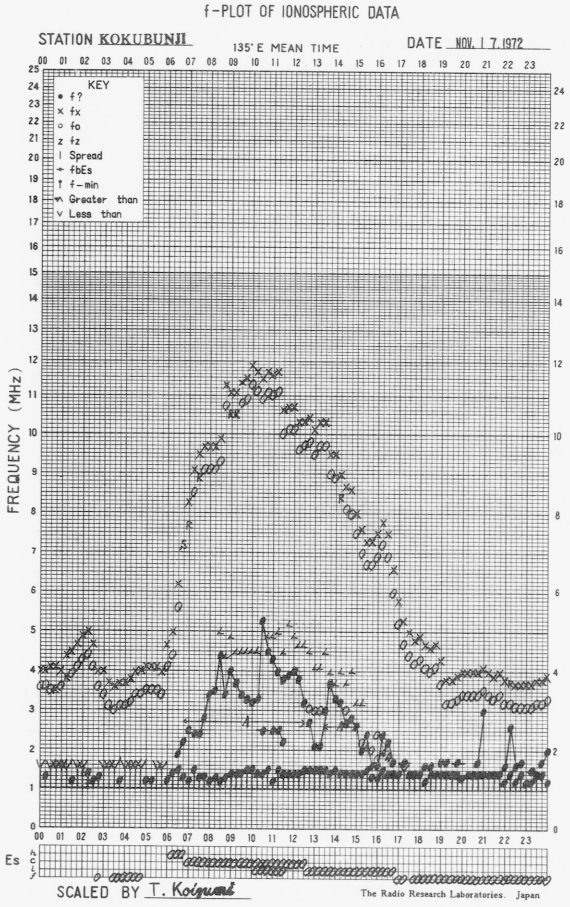
SCALED BY T Takahashi
The Radio Research Laboratories. Japan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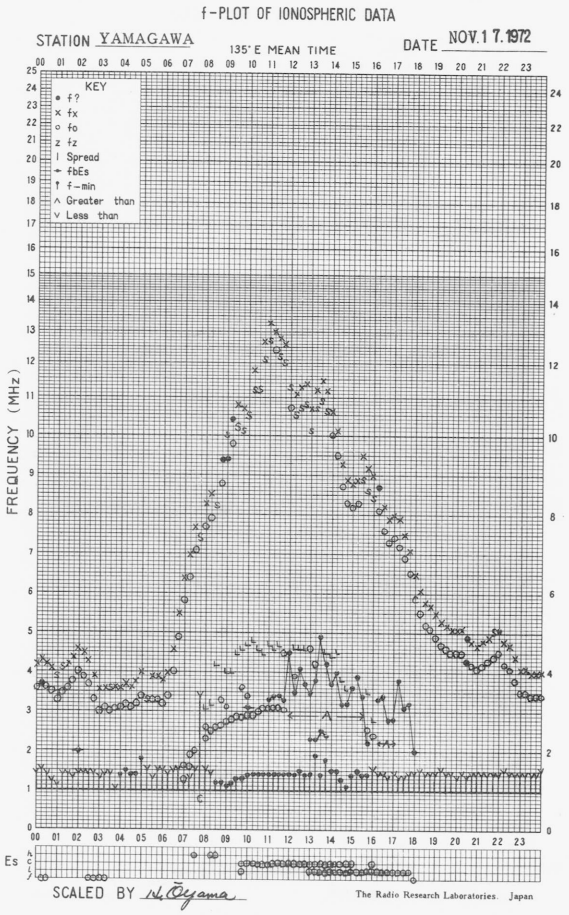
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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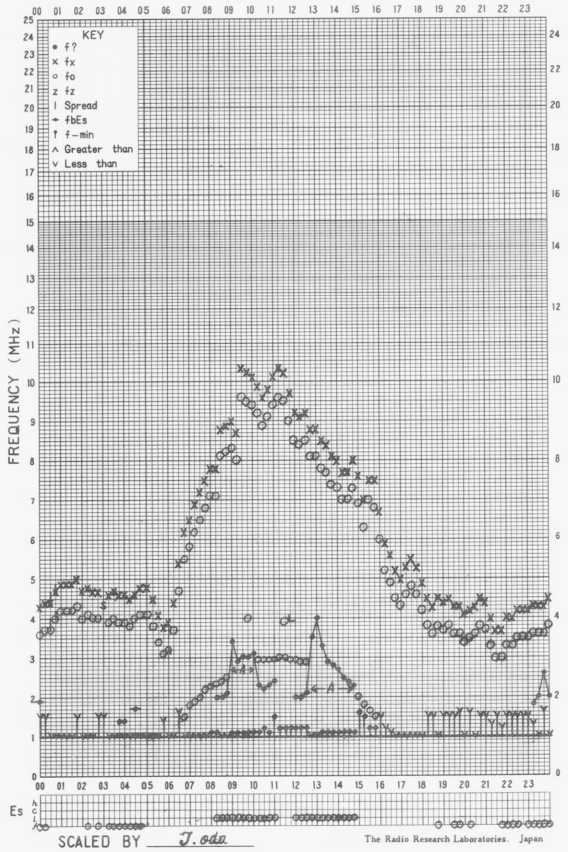
SCALED BY H. Ōyama
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 18. 1972



SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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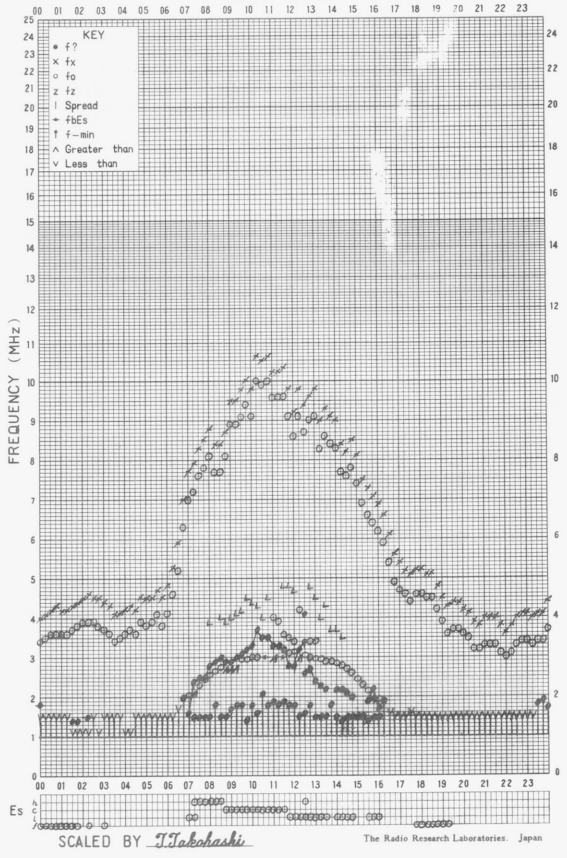

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The Radio Research Laboratories. Japan

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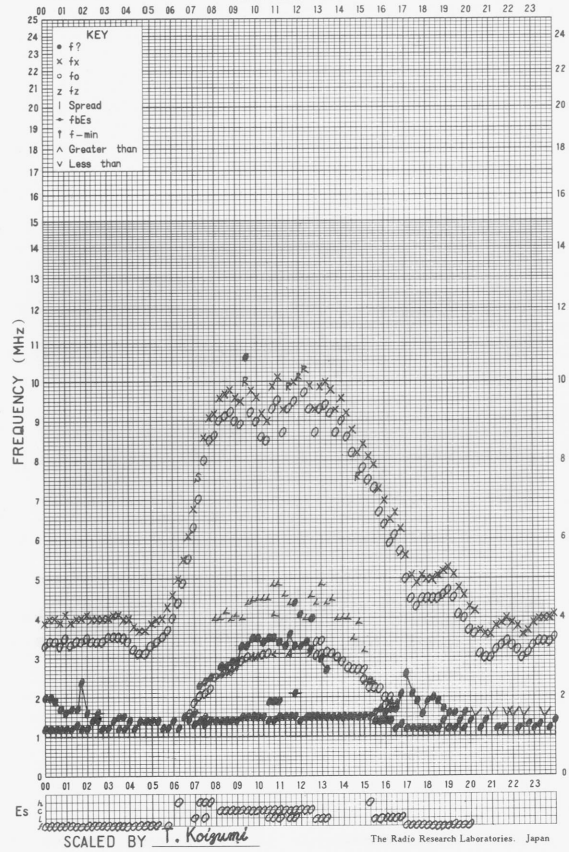

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The Radio Research Laboratories. Japan

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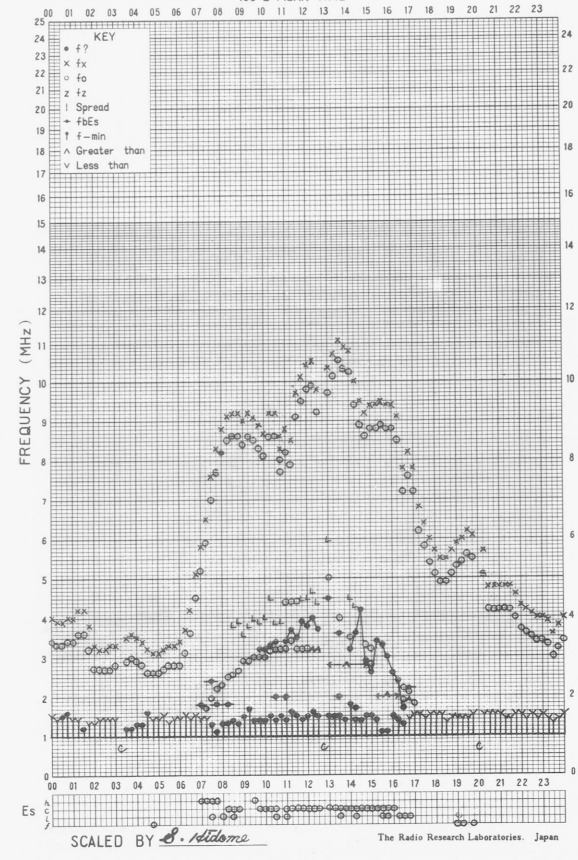

SCALED BY S. Ishitomo

The Radio Research Laboratories. Japan

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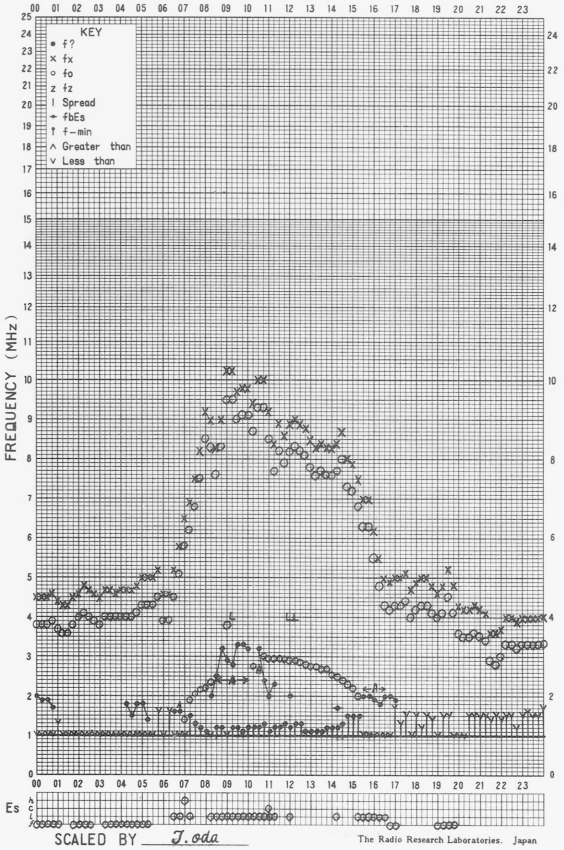

SCALED BY T. oda

The Radio Research Laboratories. Japan

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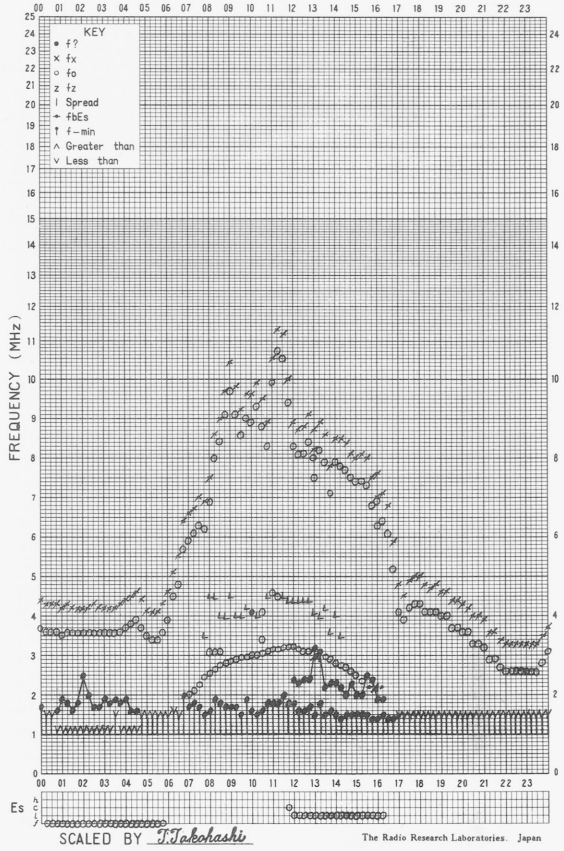

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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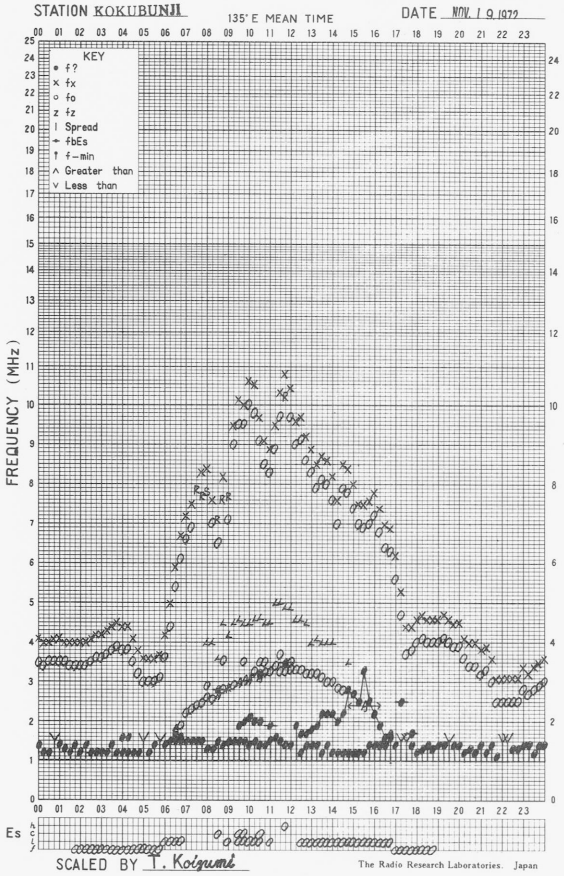

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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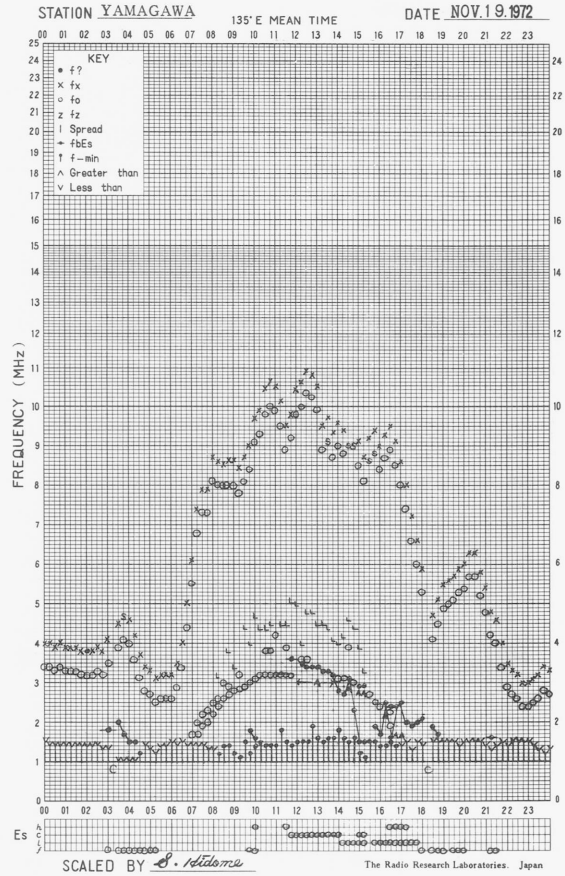
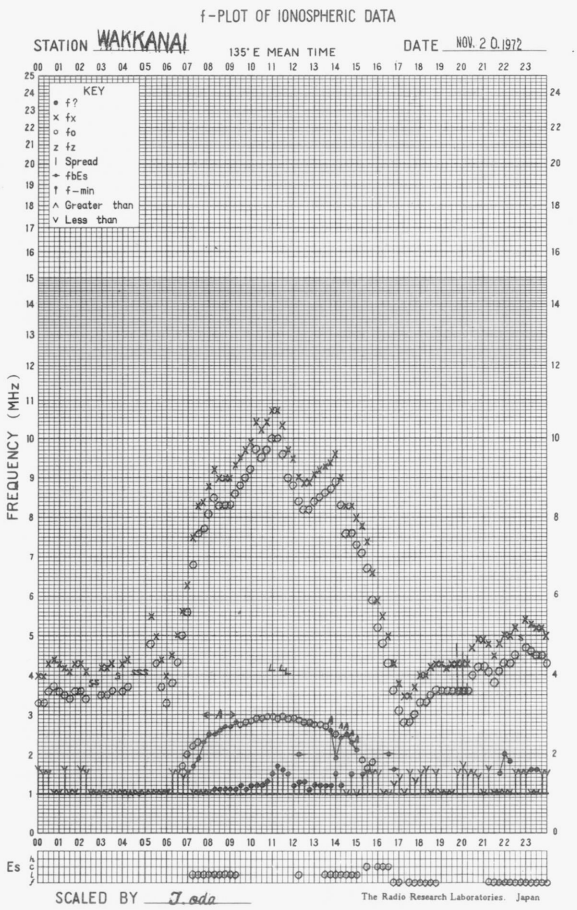


SCALED BY S. Ichidome

The Radio Research Laboratories. Japan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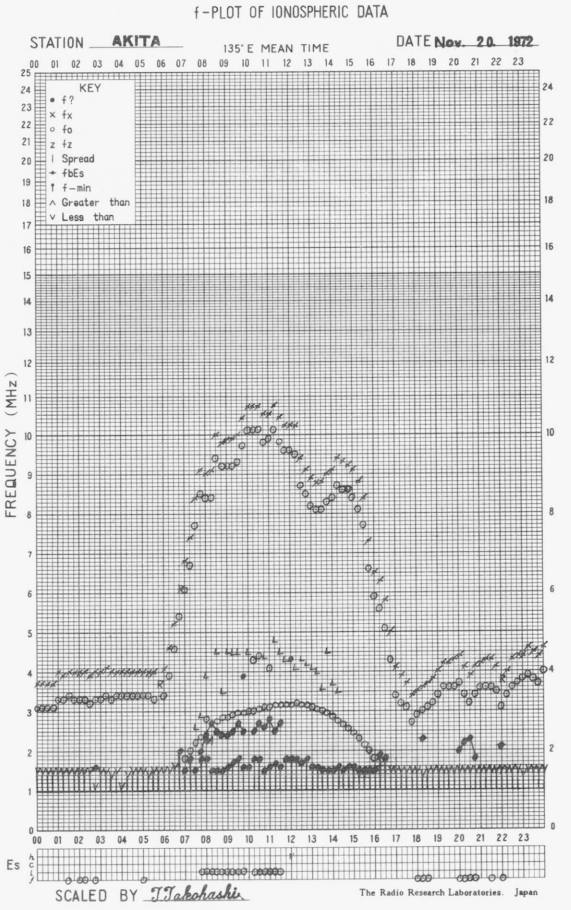
SCALED BY T. oda
The Radio Research Laboratories. Japan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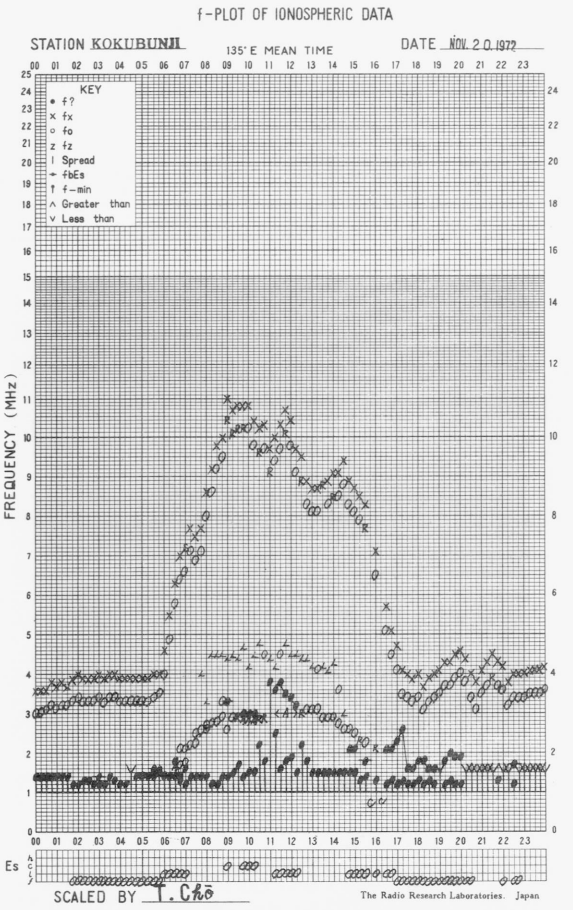
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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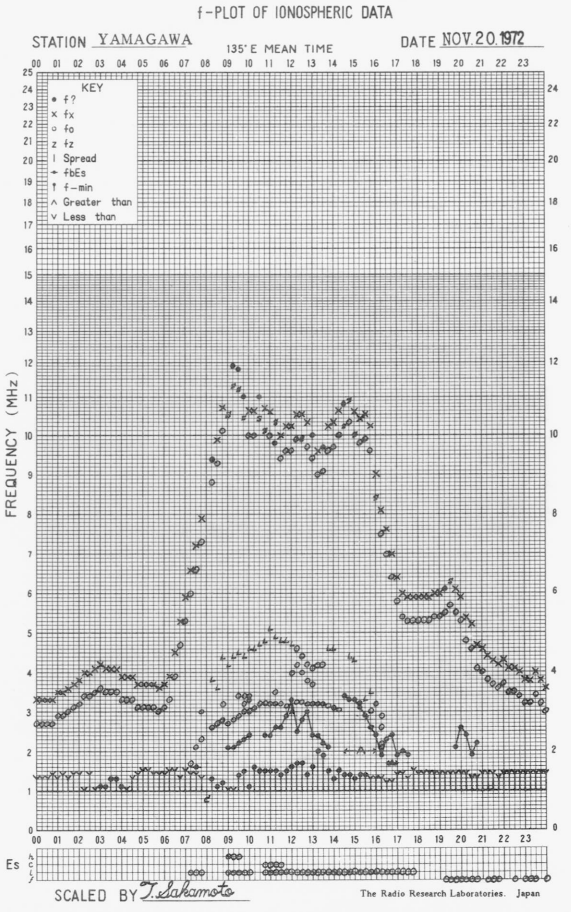
SCALED BY T. Cho
The Radio Research Laboratories. Japan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SCALED BY T. Sakamoto
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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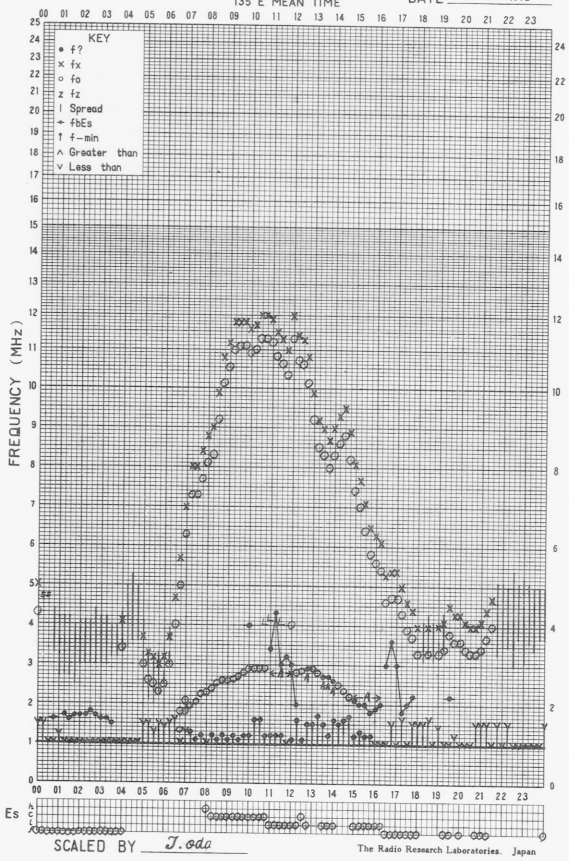

SCALED BY T. oda

The Radio Research Laboratories. Japan

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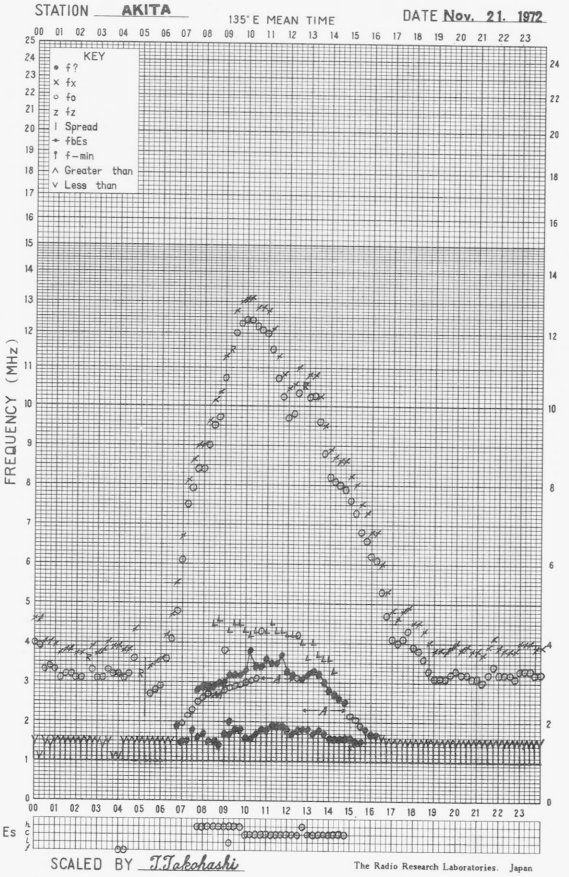

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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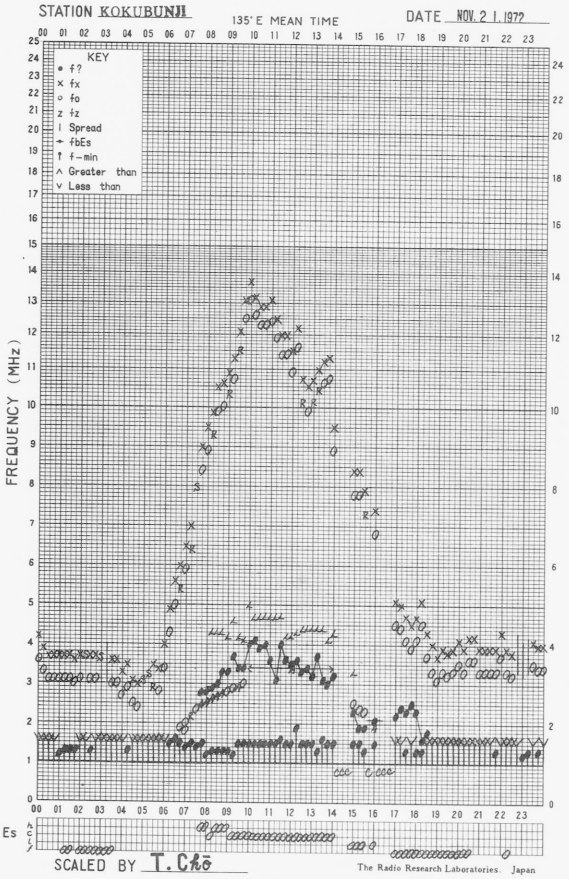

SCALED BY T. Chō

The Radio Research Laboratories. Japan

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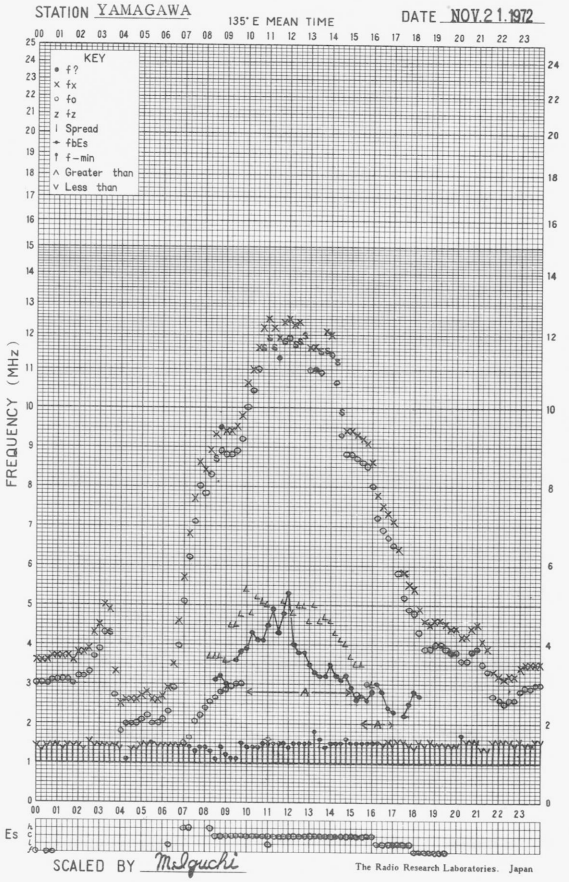

SCALED BY M. Iguchi

The Radio Research Laboratories. Japan

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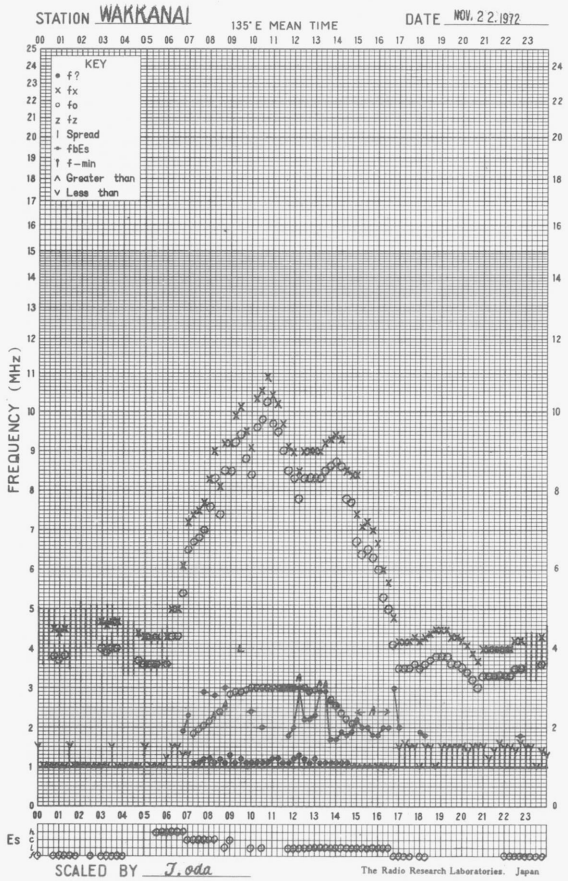

SCALED BY T. oda

The Radio Research Laboratories. Japan

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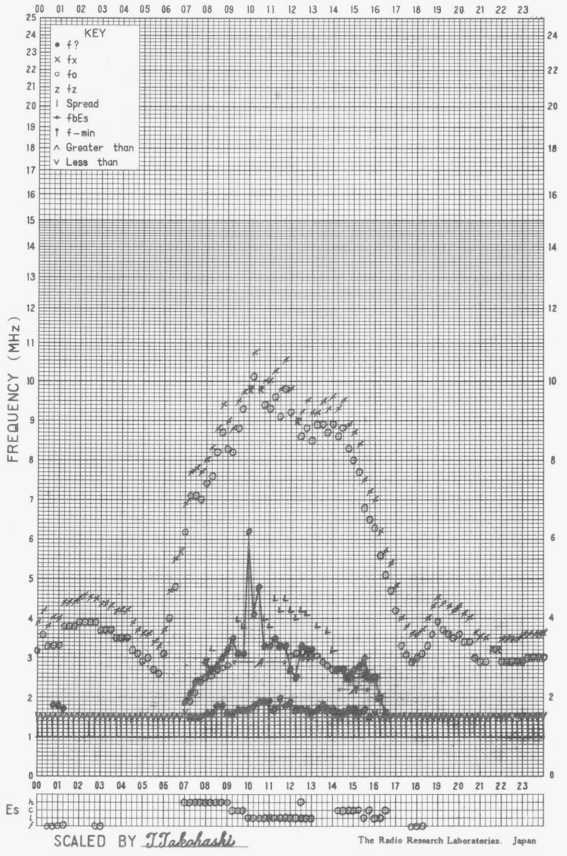

SCALED BY T. Takahashi

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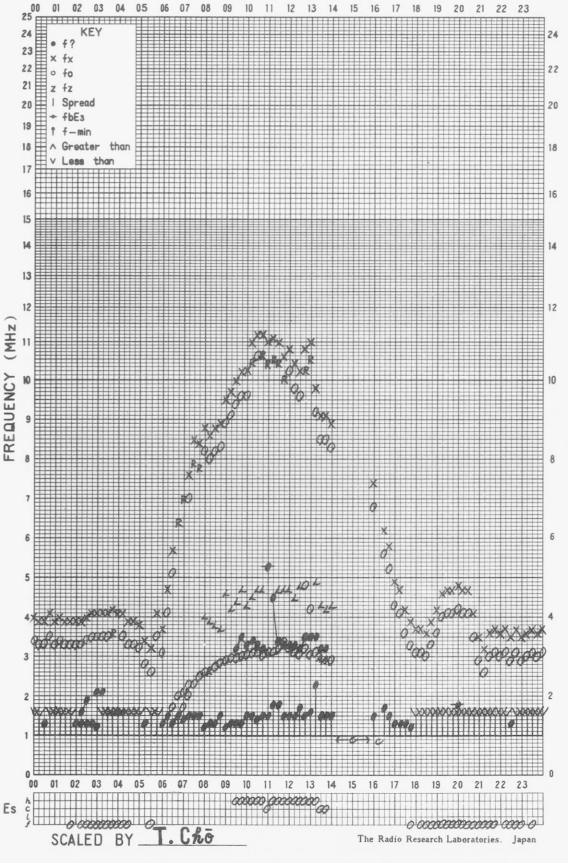

SCALED BY T. Cho

The Radio Research Laboratories. Japan

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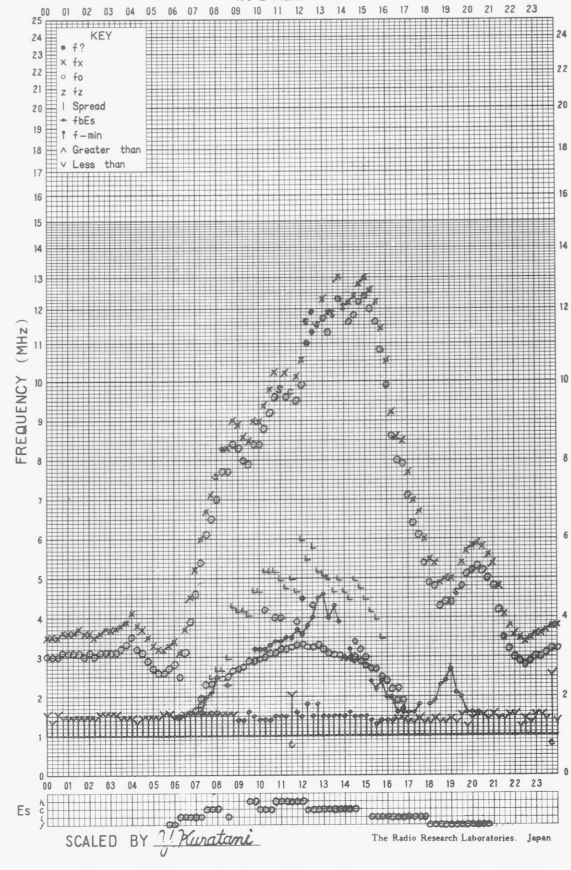

SCALED BY J. Kuratani

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 2 3.1972

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FREQUENCY (MHz)

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SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 23. 1972

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SCALED BY T. Chō

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV.2 3.1972

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

FREQUENCY (MHz)

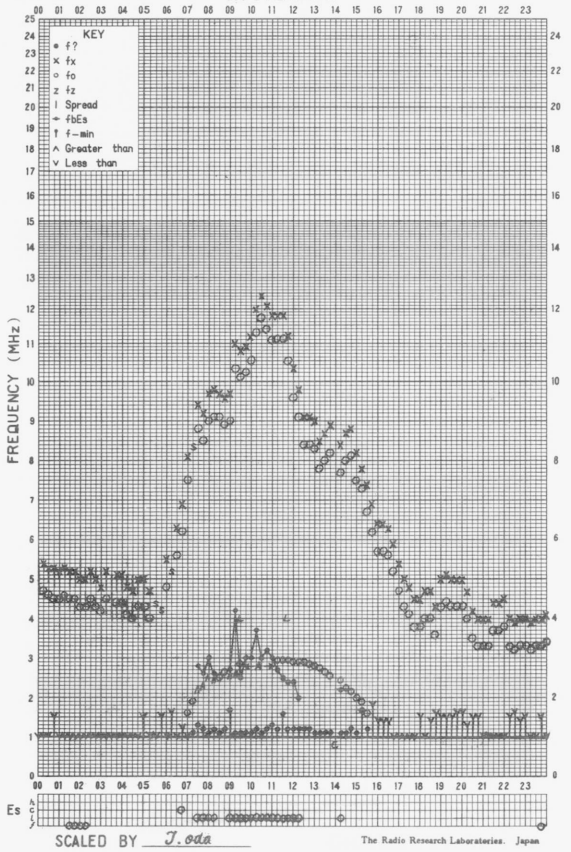
Es

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 24. 1972

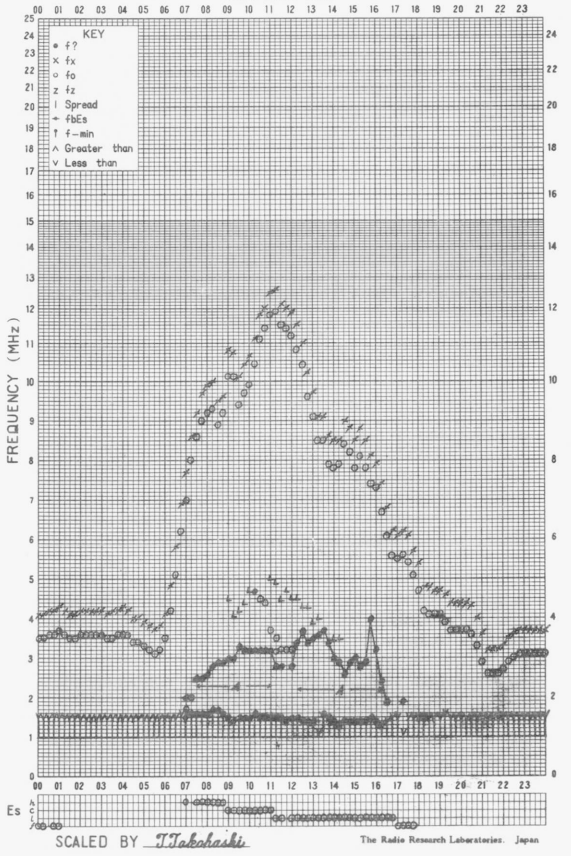


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 24. 1972

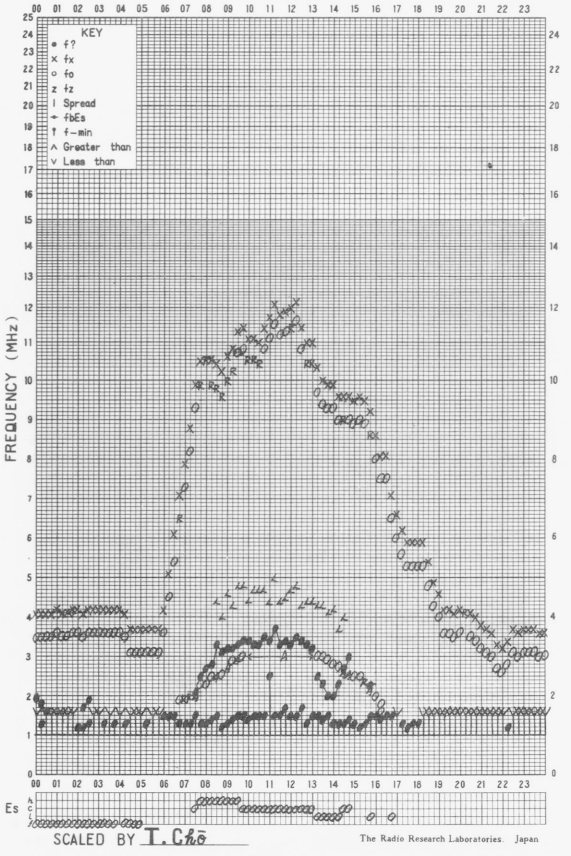


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 24. 1972

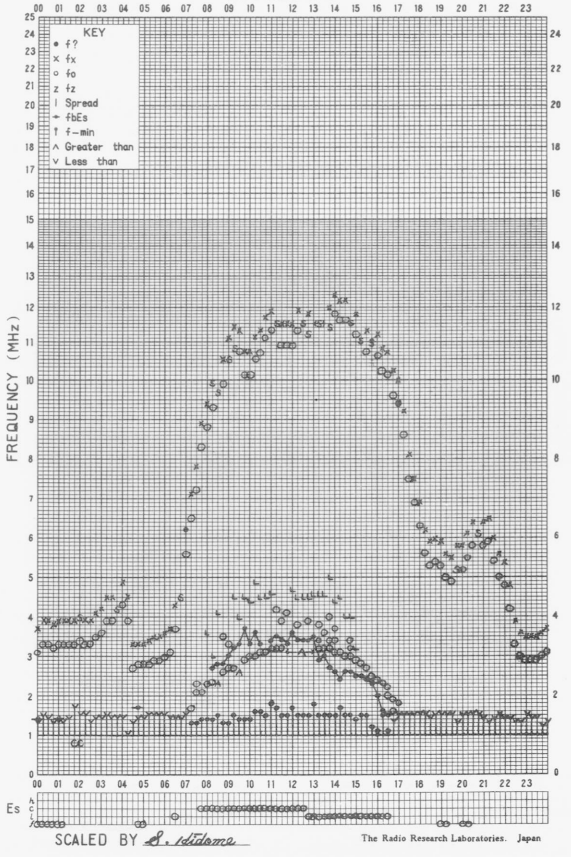


SCALED BY T. Cho

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 24. 1972

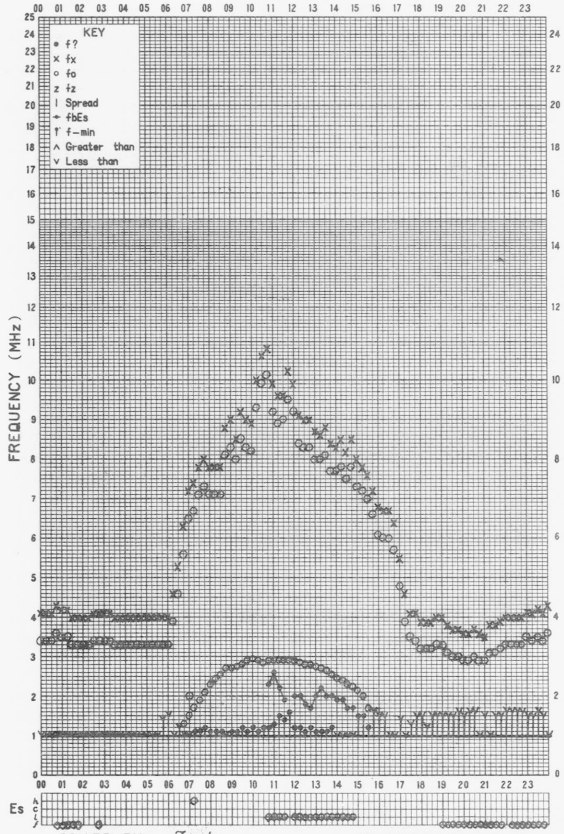


SCALED BY A. Ichidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 25. 1972

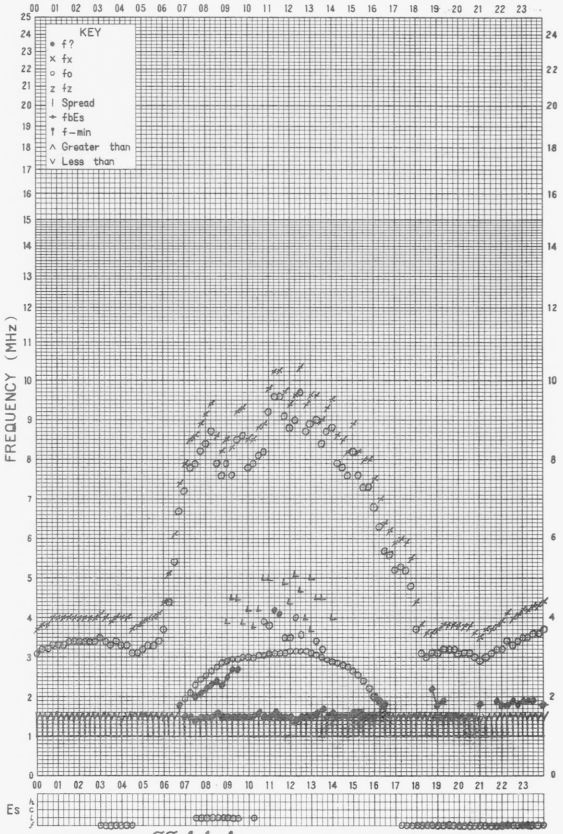


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 25. 1972

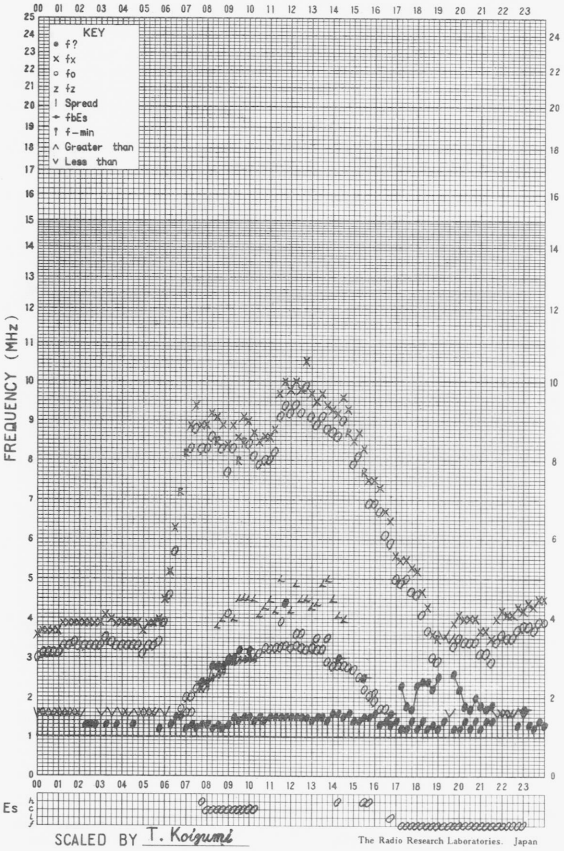


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 25. 1972

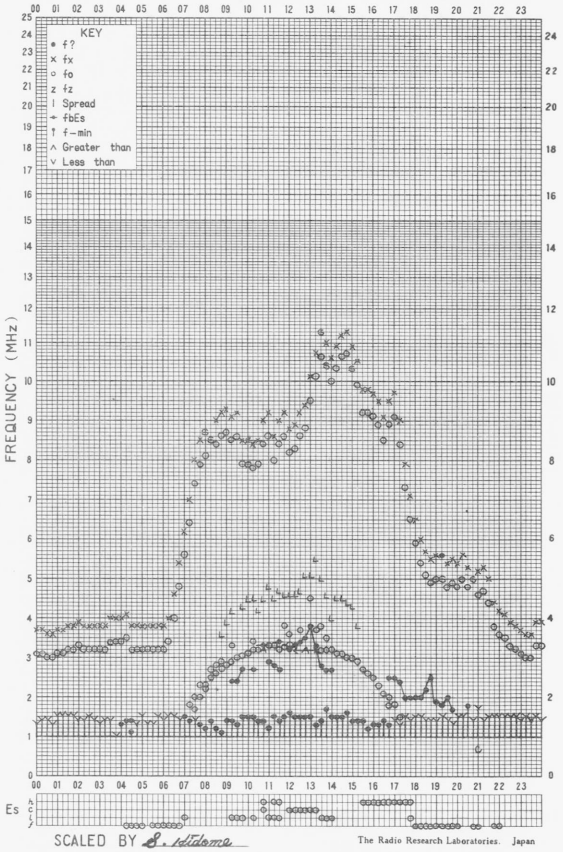


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 25. 1972

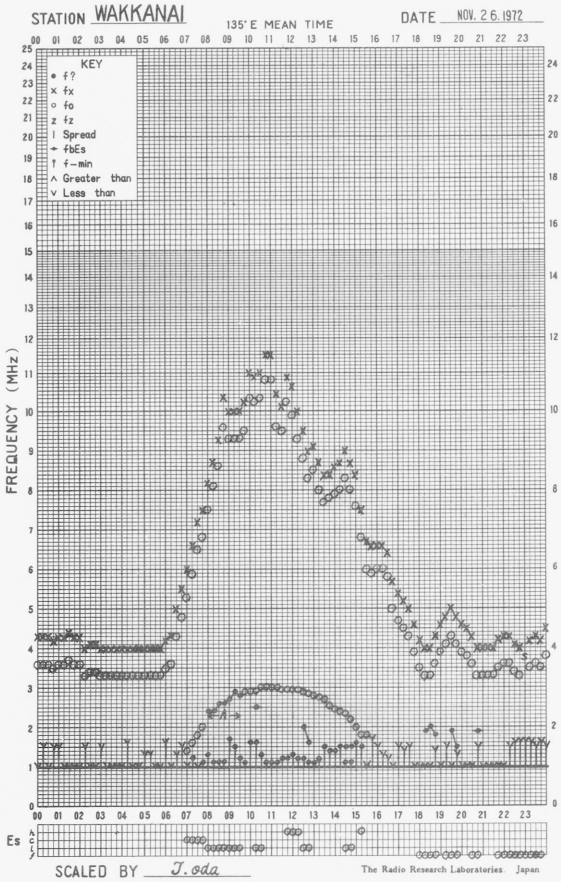


SCALED BY S. Ishidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 26. 1972

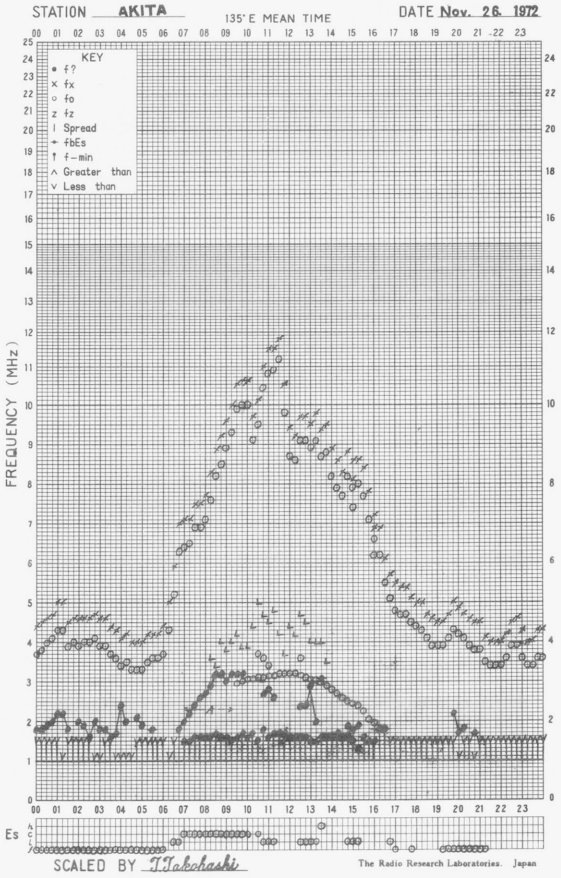


SCALED BY J. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 26. 1972

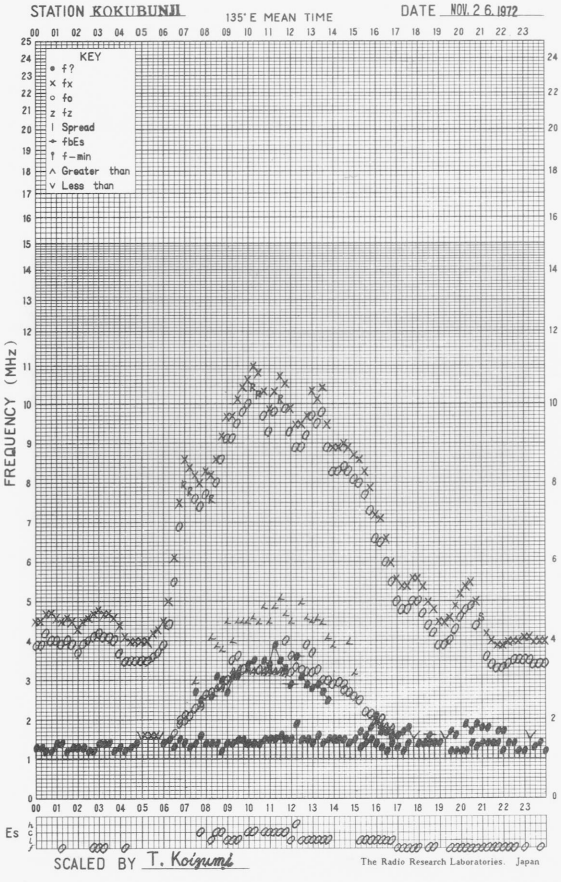


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 26. 1972

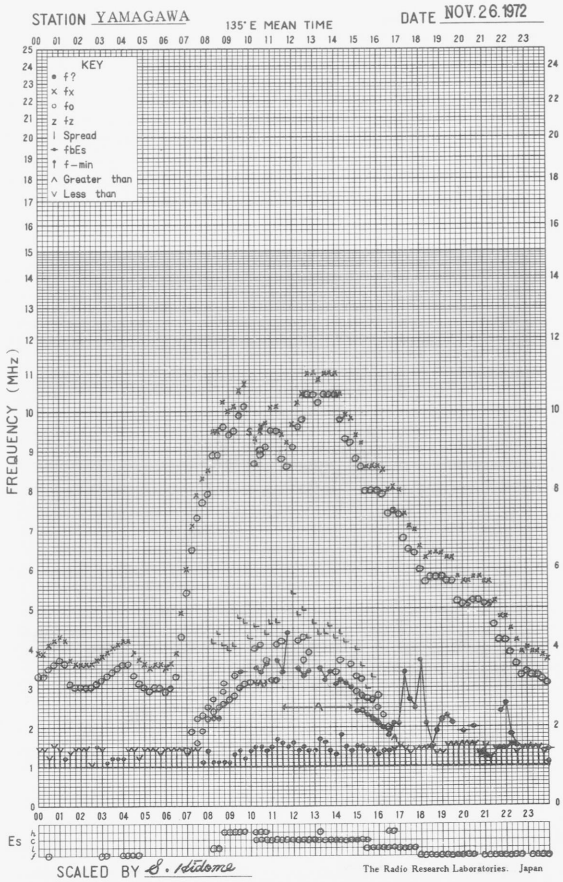


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 26. 1972

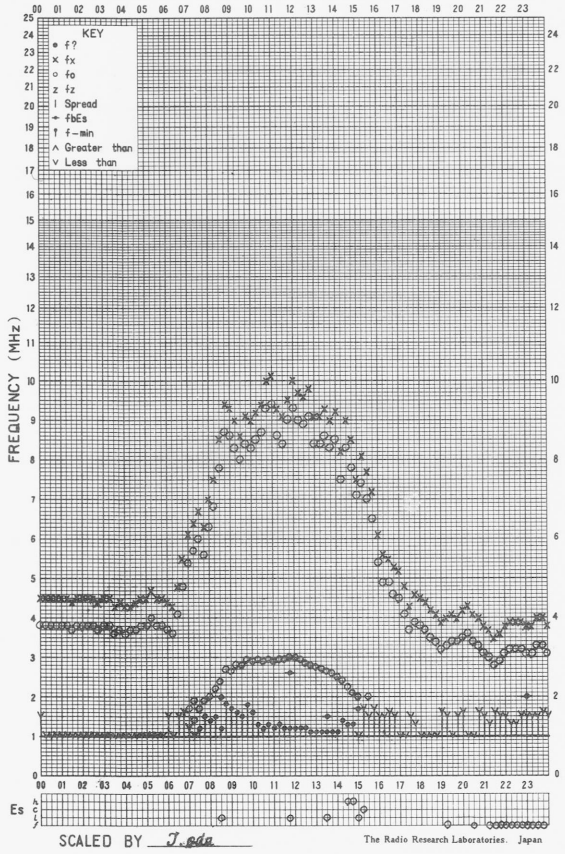


SCALED BY S. Iidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 27. 1972

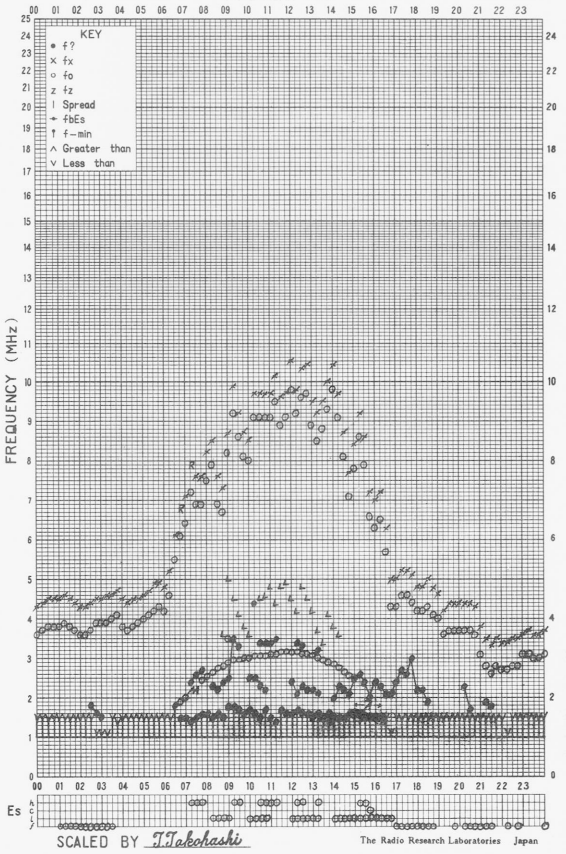


SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 27. 1972

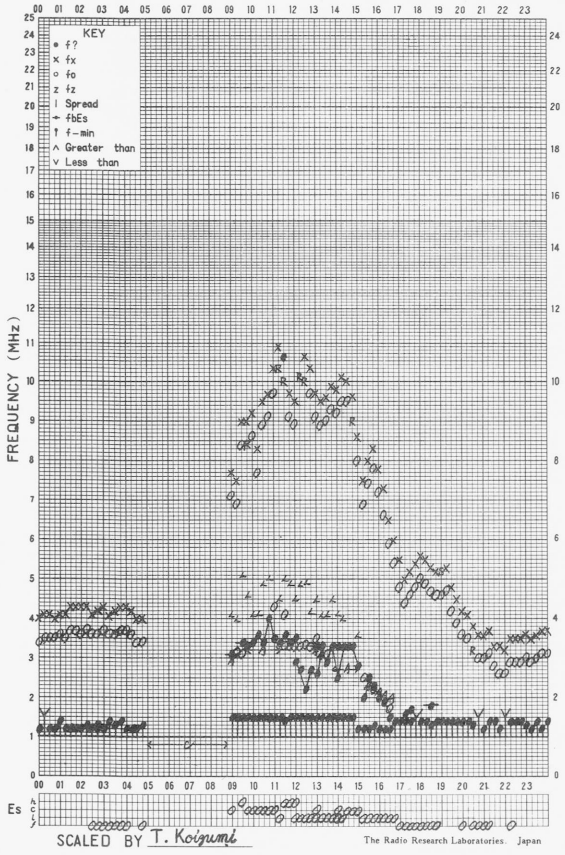


SCALED BY T.Takahashi

The Radio Research Laboratories Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 27. 1972

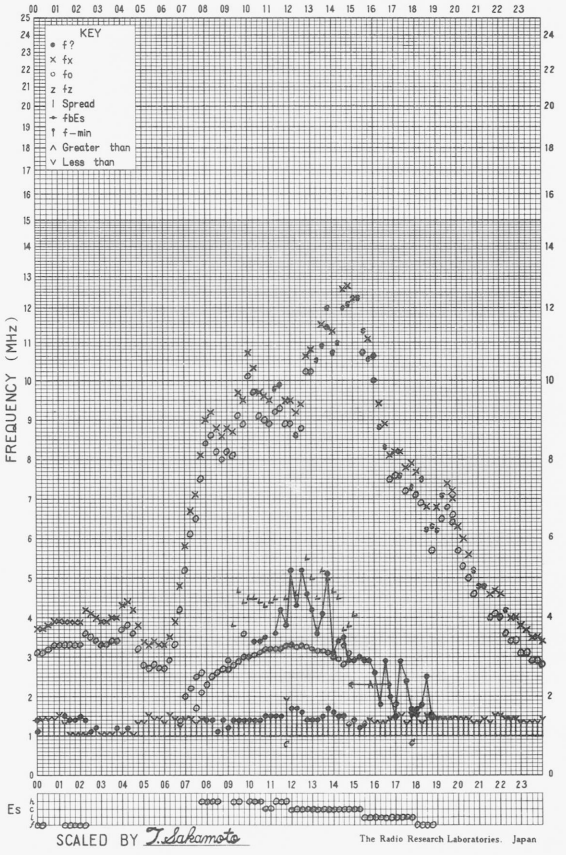


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

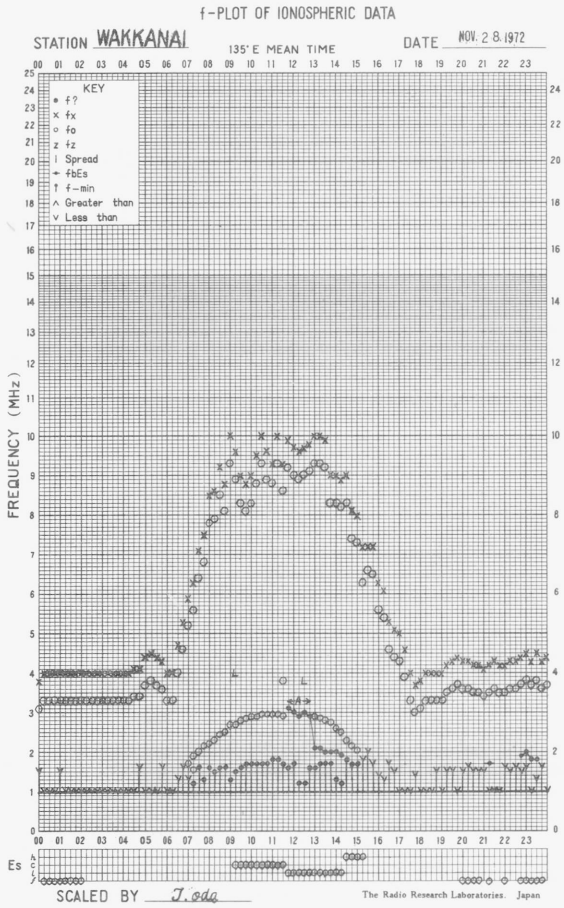
f-PLOT OF IONOSPHERIC DATA

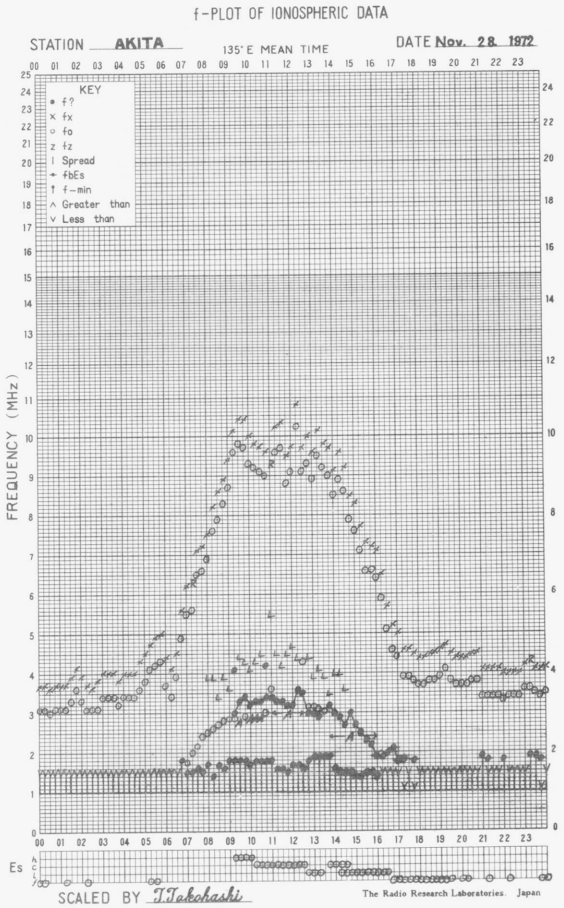
STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 27. 1972

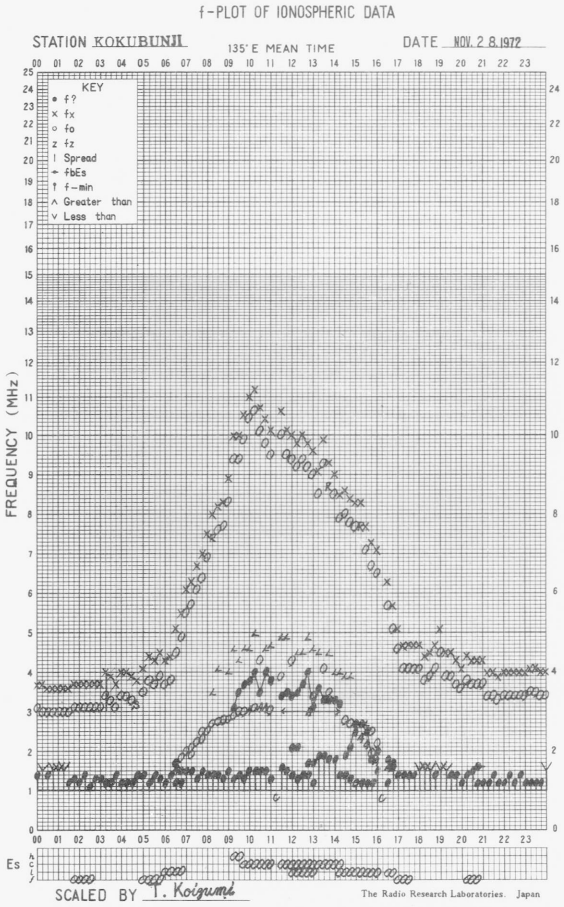


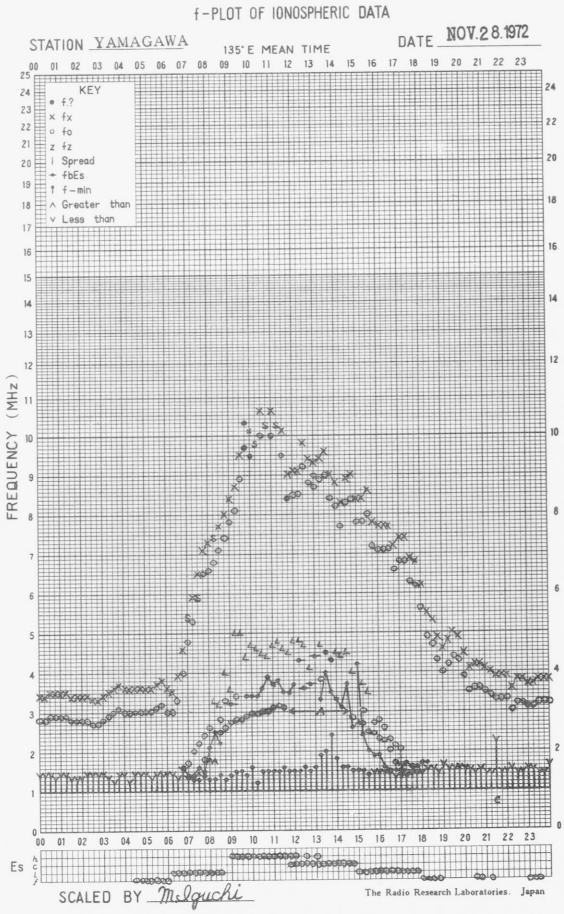
SCALED BY T.Sakamoto

The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE NOV. 28. 1972
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan

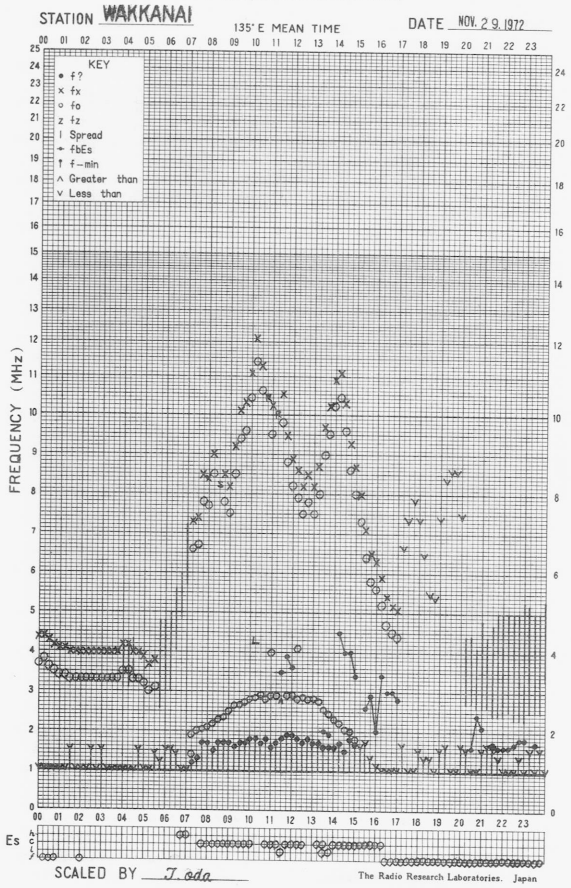

f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE Nov. 28. 1972
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE NOV. 28. 1972
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 NOV. 28. 1972
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY M. Iguchi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 29. 1972

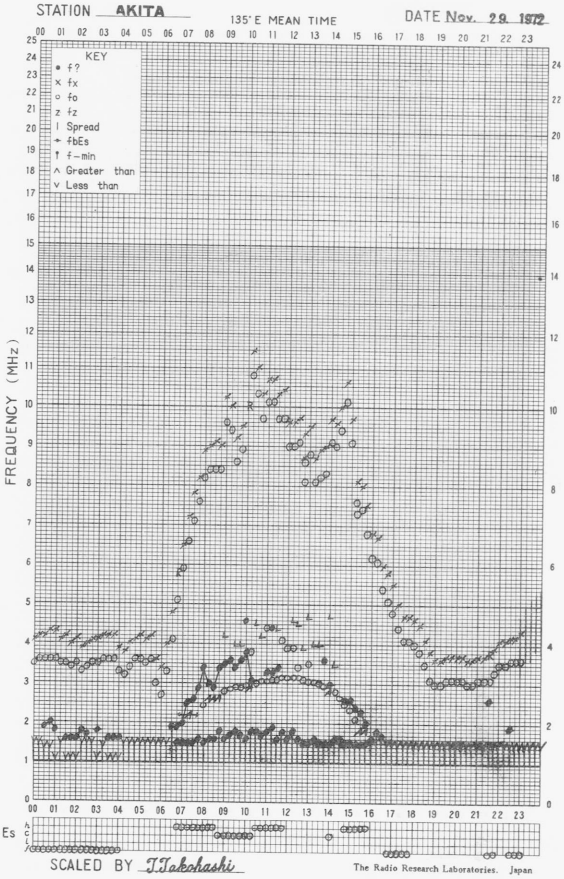


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 29. 1972

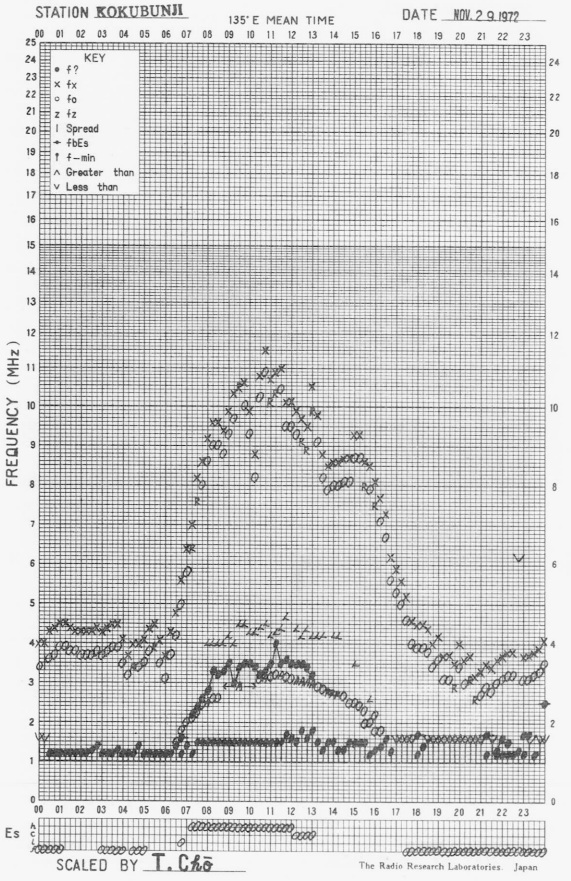


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 29. 1972

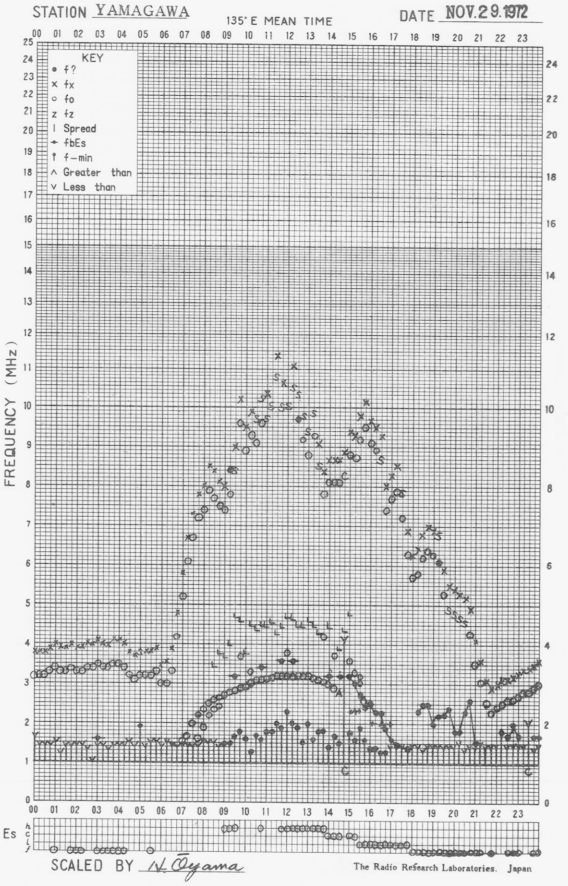


SCALED BY T. Ōis

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 29. 1972

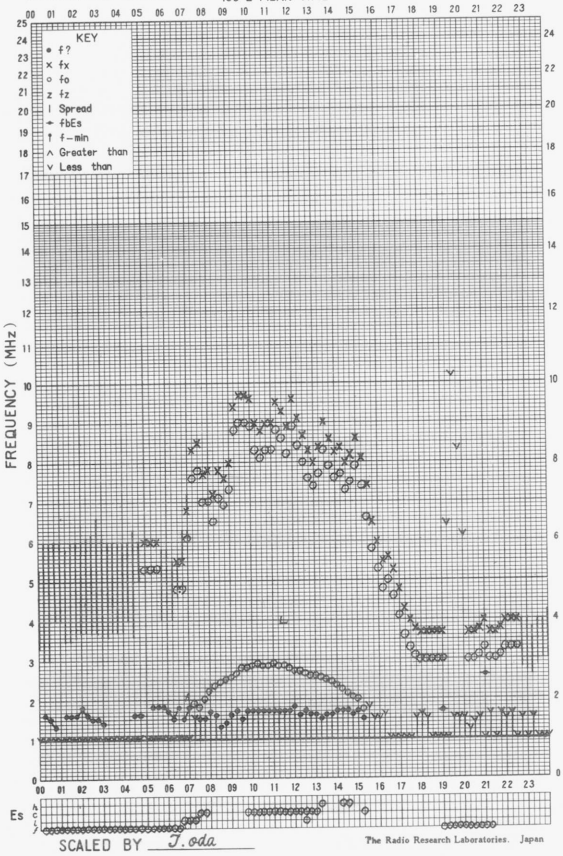


SCALED BY N. Ōyama

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 30.1972

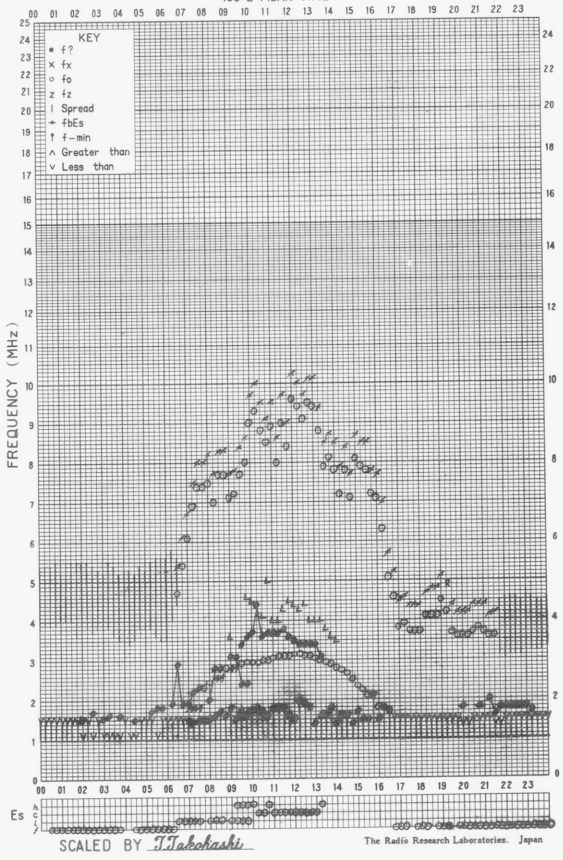


SCALED BY T. Oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Nov. 30. 1972

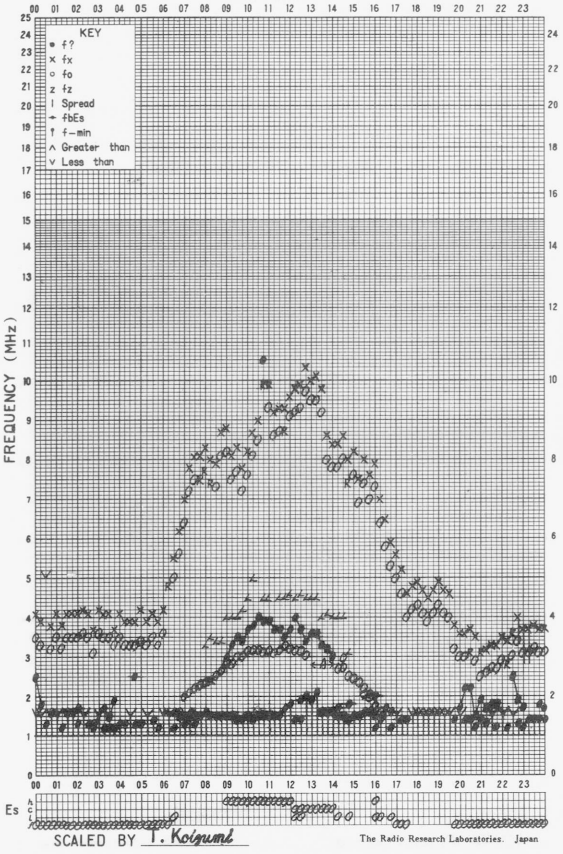


SCALED BY T. Takekoshi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 30.1972

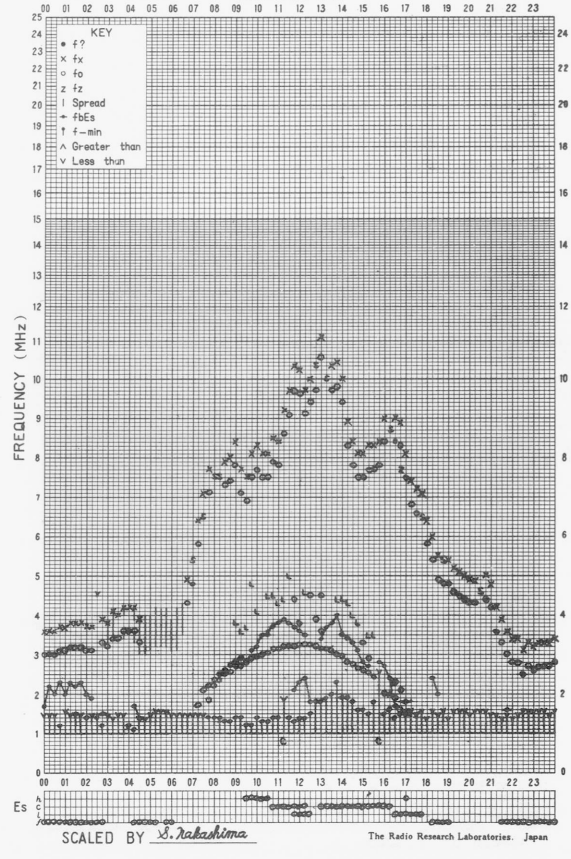


SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 30. 1972



SCALED BY S. Takashima

The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: November 1972
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	10	14	(18)	16	12	0	0	(0)	0	0
2	12	10	(8)	6	12	0	0	(0)	0	0
3	6	6	(7)	5	6	0	0	(0)	0	0
4	6	5	(5)	7	5	0	0	(0)	0	0
5	6	6	(7)	6	7	0	0	(0)	0	0
6	5	5	(6)	7	5	0	0	(0)	0	0
7	7	7	(7)	6	7	0	0	(0)	0	0
8	7	6	(5)	7	6	0	0	(0)	0	0
9	6	6	(6)	6	6	0	0	(0)	0	0
10	6	7	(5)	6	6	0	0	(0)	0	0
11	6	9	(8)	7	7	0	0	(0)	0	0
12	7	6	(6)	5	6	0	0	(0)	0	0
13	6	6	(5)	6	6	0	0	(0)	0	0
14	6	7	(7)	5	6	0	0	(0)	0	0
15	7	6	(6)	5	6	0	0	(0)	0	0
16	6	7	(5)	6	6	0	0	(0)	0	0
17	6	6	(6)	6	6	0	0	(0)	0	0
18	7	6	(5)	7	6	0	0	(0)	0	0
19	6	6	(6)	7	7	0	0	(0)	0	0
20	7	7	(8)	6	7	0	0	(0)	0	0
21	6	6	(q)	8	6	0	0	(0)	0	0
22	8	7	(q)	8	8	0	0	(0)	0	0
23	7	7	(8)	6	8	0	0	(1)	0	0
24	6	6	(6)	10	6	0	0	(0)	0	0
25	11	10	(8)	10	10	1	0	(0)	1	0
26	9	9	(7)	8	9	1	0	(0)	*	0
27	-	-	-	6	(8)	-	-	-	0	(*)
28	6	6	(6)	6	6	0	0	(0)	0	0
29	6	6	(6)	6	6	0	0	(0)	0	0
30	7	7	(6)	5	7	0	0	(0)	0	0

Note No observations during the following periods:

21st 0430- 0500
27th 0000- 0745

q: quiet level, when radiometer is unstable.

*: interference by atmospherics.

SOLAR RADIO EMISSION

Flux Density

Month: November 1972
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	31	30	(29)	32	30
2	31	29	(27)	30	30
3	31	26	(25)	25	28
4	25	25	(25)	25	25
5	25	24	(23)	28	25
6	27	27	(26)	25	27
7	24	23	(25)	25	24
8	25	23	(22)	23	24
9	23	23	(22)	23	23
10	25	25	(24)	24	25
11	24	23	(21)	24	23
12	23	22	(22)	23	23
13	24	23	(23)	24	23
14	25	25	(25)	26	25
15	26	25	(25)	26	26
16	25	26	(26)	26	26
17	26	26	(27)	26	26
18	27	27	(29)	28	27
19	28	28	(27)	27	28
20	27	27	(26)	27	27
21	27	27	(27)	29	27
22	29	29	(q)	28	29
23	30	29	(30)	26	29
24	26	26	(26)	27	26
25	26	27	(27)	27	26
26	26	25	(26)	24	26
27	25	25	(23)	25	24
28	25	24	(24)	22	25
29	24	23	(24)	24	23
30	24	24	(23)	24	24

Note No observations during the following periods:

10th	0010-	0045	15th	0520-	0605
13th	0320-	0425	22nd	0320-	0410

q: quiet level, when radiometer is unstable.

Distinctive Events

(single-frequency observations)

Month: November 1972
Observing station: Hiraiso
Normal observing period: 2120 - 0730 (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	100	0241.8	0242.2	1.5	C	200	80	P: l
	200	0241.8	0242.0	0.6	C	2400	210	
	500	0242.0	0242.2	0.7	S	20	3	
		0245.5	0246.2	1.0	S	20	10	
	100	(0246.5)	(0246.5)	$\geq$1.0	C	(140)	(50)	P: l, * 0244.5-46.5
		0643.5	0644.0	1.0	C	50	30	P: R
		0714.5	0715.0	2.0	C	250	120	P: l
	200	0715.0	0715.0	1.0	eC	2900	1500	
3	100	0205.4	0206.7	2.3	C	110	30	P: r
	200	0213.2	0214.8	1.5	C	130	30	
23	500	0203.0	0203.0	3.0	eC	65	10	
	100	0203.0	0203.2	1.0	C	20	5	P: l
	200	0204.0	0205.0	2.0	C	180	35	
	500	0206.0	0207.0	3.0	S	5	1	
24	100	2345.0	2345.2	1.0	C	65	20	P: R
28	100	0404.8	0405.5	28.0	C	550	80	P: l
	200	0415.5	0419.0	5.0	C	40	20	

P: means polarization degree.

*: interrupted by calibration.

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

NOV 1972 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	5	4	15	-1	ES -26	ES -17	ES -8	ES -4	ES -11	ES -8	ES -15	ES -26	ES -17	ES -9	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-25	2	1	1
2	ES -4	ES -6	ES -7	ES -4	ES -12	ES -12	ES -7	ES -4	ES -1	ES 1	ES 7	ES 2	ES 6	ES 6	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -17	ES -11	ES -17	ES -11
3	-14	-6	-9	ES -5	ES -4	ES -4	ES -4	ES -4	ES -4	ES -4	ES -9	ES -14	ES -17	ES -17	ES -17	ES -26	ES -26	ES -26	ES -26	ES -26	-14	-4	-9	-9
4	-11	-9	ES -15	ES -22	ES -9	ES -6	ES -6	ES -9	ES -6	ES -8	ES -9	ES -5	ES -14	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-11	1	-1	-4
5	ES -11	FS 0	-1	ES 5	ES -5	ES -4	ES -5	ES -4	ES -3	ES -9	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -18	1	3	4
6	2	0	5	ES -14	ES -4	ES -4	ES -4	ES -3	ES -4	ES -9	ES -26	ES -26	ES -1	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-14	4	0	6
7	6	2	3	-3	ES 0	ES -5	ES -3	ES -2	ES 0	ES 0	ES -3	ES -25	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-5	-1	2	0
8	-5	-2	2	ES -6	ES -5	ES -6	ES -6	ES -3	ES -3	ES -10	ES -12	ES -23	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -17	-5	2	2
9	-10	-7	-13	ES -13	ES -1	ES -8	ES -3	ES -5	ES -5	ES -10	ES -28	ES -28	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	-2	-2	-1	1
10	1	-4	ES -17	ES -12	ES -13	ES -4	ES -4	ES 0	ES -2	ES -4	ES -5	ES -14	ES -26	ES -26	ES -26	ES -26	-4	-1	ES -26	ES -26	ES -26	0	4	5
11	4	9	ES -18	ES -16	ES -8	ES -5	ES -5	ES -4	ES -4	ES -15	ES -27	ES -27	ES -27	ES -27	ES -27	C	ES -27	C	C	C	C	C	C	C
12	C	C	ES -12	ES -5	ES -10	ES -6	ES -4	ES -4	C	ES -28	C	ES -13	C	ES -27	C	ES -27	-2	-2	ES -27	-3	3	5	10	9
13	9	9	-2	-2	ES -13	ES -6	ES -5	ES -4	ES -7	ES -27	ES -27	ES -27	ES -27	ES -27	-21	ES -27	-6	-18	6	ES -27	-18	5	10	6
14	3	8	ES -18	ES -12	ES -6	ES -6	ES -5	ES -4	ES -4	ES -13	ES -6	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	-2	ES -27	-2	10	7	7
15	11	10	ES -12	ES -8	ES -7	ES -9	ES -13	ES -13	ES -10	ES -27	ES -27	ES -27	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	3	4	12	14
16	14	11	15	12	ES -8	ES -1	ES 9	ES 1	ES 3	ES -3	ES -5	ES -22	ES -24	ES -24	ES -24	ES -24	ES -24	-2	ES -24	ES -24	1	11	12	12
17	10	4	ES -10	ES 4	ES -2	ES -4	ES -3	ES 1	ES -3	ES -16	ES -3	ES -16	ES -6	ES -10	ES -6	ES -6	ES -25	ES -14	ES -10	-5	0	10	10	10
18	9	-1	ES -17	ES -17	ES -17	ES -4	ES -1	ES 1	ES -4	ES -5	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-11	ES -15	0	1	7	10	12
19	9	10	-5	ES 15	ES -8	ES -6	ES 3	ES 0	ES -5	ES -10	ES -18	ES -27	ES -28	ES -28	ES -28	ES -28	ES -17	ES -11	-11	ES -7	-6	5	8	9
20	10	6	ES -5	ES -6	ES -5	ES -4	ES -2	ES 0	ES -15	ES -10	ES -27	ES -27	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	0	4	7
21	5	11	3	ES -14	ES 2	ES -4	ES -4	ES -4	ES -7	ES -3	ES -27	ES -27	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-14	5	4	10
22	8	8	-11	ES -11	ES -11	ES -5	ES 0	ES 0	ES -7	ES -17	ES -28	ES -28	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	-9	7	4	11
23	12	17	13	ES -8	ES 1	ES -2	US 0	ES -1	ES -1	ES -2	ES 3	ES -7	ES -27	ES -27	ES -27	ES -27	-15	-7	8	ES -27	ES -27	6	9	9
24	9	10	18	ES -10	ES -3	ES -4	ES -2	ES -2	ES -1	ES -7	ES -18	ES -10	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	5	9	7
25	12	12	C	-3	ES -9	ES -1	ES -7	ES -4	ES -4	ES -4	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	6	11	9
26	12	12	13	9	-3	ES -5	ES -5	ES -2	ES -6	ES -18	-13	ES -9	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	6	15	15
27	7	9	0	ES -9	ES -14	ES -12	ES -2	ES 0	ES 10	ES -7	ES -27	ES -27	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-17	7	5	7
28	10	10	2	ES -12	ES -12	ES -4	ES 5	ES 6	ES 4	ES -22	ES -26	ES -26	ES -7	ES -25	ES -25	-10	-3	-3	1	-13	ES -25	16	15	10
29	11	11	-4	ES -11	ES 1	ES -1	ES -1	ES 5	ES 7	ES 7	ES -1	ES -14	ES -26	ES 9	ES -26	ES -26	-5	17	-1	-1	-4	10	10	6
30	7	-4	ES -26	ES -12	ES -6	ES -1	ES 7	ES 3	ES -6	ES -20	ES -7	ES -4	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	3	4	6
CNT	29	29	29	30	30	30	30	30	29	30	29	30	29	30	29	29	30	29	29	29	29	29	29	29
MED	7	8	-5	ES -8	ES -6	ES -4	ES -4	ES -2	ES -4	ES -9	ES -18	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-14	5	5	7
UD	12	12	15	ES 9	ES 1	ES -1	ES 5	ES 3	ES 4	ES 0	ES -1	ES -5	ES -6	ES -9	ES -21	ES -24	-4	-2	1	-3	1	10	12	12
LD	ES -11	ES -6	ES -18	ES -16	ES -14	ES -12	ES -7	ES -5	ES -10	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	-4	-1	-4

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

NOV 1972 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	5	7	8	19	20	24	24	28	25	21	15	20	21	23	21	12	6	7	-1	ES -26	19	15	12	10
2	8	9	10	19	18	19	20	7	ES 1	ES 5	ES 1	ES 2	ES 2	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-1	15	15	9	13
3	9	10	10	14	21	15	3	1	9	10	ES -4	ES -17	ES -17	ES -17	ES -17	ES -28	ES -26	ES -26	3	-4	14	10	9	8
4	14	8	13	15	11	-3	-5	ES -5	ES -3	-7	ES -4	ES -9	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	2	16	15	11	15
5	13	14	14	19	20	6	-2	ES -1	ES -6	ES -7	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-17	14	18	13	12
6	10	16	19	21	22	26	15	-1	ES -4	5	-14	ES -26	ES -2	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	15	18	12	10
7	11	15	20	22	20	22	15	6	0	ES -2	ES -7	ES -25	ES -26	ES -26	ES -26	ES -26	ES -26	5	ES -26	-17	18	19	10	14
8	13	11	17	18	18	14	-3	ES -3	ES -3	ES -3	ES -7	ES -23	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	1	14	14	12	14
9	12	13	15	16	12	2	7	ES -2	ES -7	ES -10	ES -28	ES -28	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	-18	0	18	13	10	17
10	15	15	15	20	19	0	ES -1	ES -2	ES -2	ES -3	ES -4	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	10	17	14	8
11	9	13	18	19	18	9	2	ES 0	ES 0	ES -9	ES -27	ES -27	ES -27	ES -27	ES -27	C	ES -27	C	C	C	C	C	C	C
12	C	C	18	18	14	ES -3	ES -2	ES -3	C	ES -28	C	ES -28	C	ES -27	ES -27	ES -27	ES -27	-12	ES -27	-6	13	13	14	9
13	16	17	19	20	18	13	ES -2	ES -3	ES -18	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	-12	ES -27	ES -27	14	10	10	8
14	10	13	14	20	16	ES -4	ES -4	ES 0	ES -7	ES -27	ES -4	ES -10	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	-12	18	18	14	9
15	16	15	15	15	18	-6	ES -13	-10	ES -18	ES -27	ES -27	ES -27	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-4	14	12	14	13
16	14	15	16	16	18	ES -1	ES 1	ES 0	9	ES 1	ES -15	1	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	ES -24	18	19	13	17
17	13	17	18	20	21	ES 0	ES 1	ES 0	ES -2	ES -10	ES -16	ES -5	ES -10	ES -10	ES -10	ES -10	ES -11	ES -12	ES -7	-10	17	17	15	15
18	14	14	18	20	19	15	ES -2	ES 0	ES -4	ES 0	-17	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -15	ES -15	1	15	16	16	14
19	13	15	17	ES 19	15	ES -2	ES -4	ES -3	-2	ES -9	ES -27	ES -27	ES -28	ES -28	ES -28	ES -28	ES -11	ES -7	ES -11	ES -7	11	12	11	7
20	12	10	15	20	18	ES -2	ES -1	ES -4	ES -12	ES -27	ES -27	ES -27	-9	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	4	14	15	9
21	9	10	16	18	21	ES -3	ES -1	ES 10	ES -5	ES -16	ES -27	ES -27	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	-17	14	14	16	15
22	14	14	12	19	18	13	ES 0	ES -2	ES -11	ES -28	ES -28	ES -28	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	13	16	16	11
23	13	13	15	20	20	9	US 0	ES 1	ES -4	ES 3	ES -4	ES -2	ES -27	ES -27	ES -27	ES -27	ES -27	ES -12	ES -14	ES -27	13	18	15	14
24	9	13	14	18	23	19	4	1	ES -1	ES -7	ES -5	ES -9	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	13	15	12	11
25	14	14	16	16	19	0	ES -4	ES -2	ES -5	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	12	15	18	14
26	12	12	16	18	25	18	ES -2	ES -5	ES -4	-3	ES -4	ES -9	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	9	11	15	5
27	7	13	13	24	10	-1	ES -2	ES -2	ES -5	ES -4	ES -27	ES -27	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	10	7	12	15
28	13	14	15	18	21	12	ES 0	ES -1	ES -12	ES -9	ES -26	ES -26	ES -25	ES -25	ES -25	ES -25	ES -25	-7	ES -25	ES -25	7	16	11	14
29	11	12	19	20	13	18	ES 4	ES -2	ES -1	ES -11	ES -13	ES -6	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	0	ES -26	9	16	14	9
30	13	13	13	11	10	2	ES -3	ES -3	ES -11	ES -11	ES -3	ES -17	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	9	12	14	10
CNT	29	29	30	30	30	30	30	30	29	30	29	30	29	30	30	29	30	29	29	29	29	29	29	29
MED	13	13	15	19	18	8	ES -1	ES -2	ES -4	ES -8	ES -15	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	ES -26	US -24	14	15	13	12
UD	15	16	19	21	22	22	15	ES 7	9	5	ES -3	ES 1	ES -2	ES -17	ES -17	ES -24	ES -11	-7	-1	1	18	18	16	15
LD	8	9	10	ES 15	11	ES -3	ES -4	ES -5	ES -12	ES -27	ES -27	ES -28	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	9	10	10	8

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Nov. 1972	Whole Day Index	W W V 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*	4°	(5) - - (3)	4 (5)(5) 4	N U W W	---	---	302γ
2*	3°	(3) - - (3)	4 (5) - 4	U U U U	---	---	
3'	3°	(3) - - (3)	4 (4) - 4	U U U U	---	12	
4'	3°	(2) - - (4)	4 (4) - 4	U U U U			
5	4-	(3) - - (4)	4 - - 4	U U U U			
6	4°	(4) - - (4)	4 (4) - 4	N N N N			
7	4°	(4) - - (4)	4 (5) - 4	N N N N			
8	4-	(4) - - (3)	4 - - 4	N N N N			
9	2+	(2) - - (3)	4 - - 4	N N N N			
10	4°	(3) - (5)(4)	4 - - 4	N N N N			
11	4°	(4) - - (4)	4 - - C	N N N N			
12	5-	- - (5)(4)	(4) - - 4	N N N N			
13	4+	(4) - (5) 4	4 - - 4	N N N N			
[14]	4°	(4) - - (4)	4 - - 4	N N N N			
[15]	4°	(4) - - (4)	4 - - 4	N N N N			
[16]	5-	(5) - - (4)	4 (5) - 4	N N N N			
17	4°	(4) - - (4)	4 - - 4	N N N N			
18	4-	(3) - - (4)	4 - - 4	N N N N			
19	4°	(4) - - (4)	4 - - 4	N N N N			
20	4-	(4) - - (3)	4 - - 4	N N N N			
21	4°	(4) - - (4)	4 - - 4	N N N N			
22	4°	(4) - - (4)	4 - - 4	N N N N			
23	4+	(4) - (5)(4)	4 - - 4	N N N N			
24	4°	(4) - - (4)	4 (4) - 4	N N N N			
25	4°	(4) - - (4)	4 - - 4	N N N N			
26	4°	(4) - - (4)	4 - - 3	N N N N			
27	4°	(4) - - (4)	3 - - 4	N N N N			
28	5-	(5) - (5)(4)	4 - - 4	N N N N			
29	4+	(4) - (5)(4)	4 - - 3	N N N N			
30	3°	(3) - - (3)	3 - - 4	N N N N			

GEOALERT

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

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

C = artificial accident
--- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES (S.I.D.)

HIRAISO

No Sudden ionospheric Disturbance was observed during November, 1972

I N U B O

1972 NOV.	S P A									Remarks
	Phase Advance (degrees)						Time (U.T.)			
DATE	GBR	NAA	NWC	NPG	HA3	AL3	Start	End	Maximum	
1	36*		—	57		30*	0237	0451	0310	
1		27	45		5	11	0636	0758	0645	X
2		8	8	5	12		2220	2300	2227	
2		10	8	13	9		2318	2342	2327	
3				35			2020	2140	2044	
3			5		11		2248	2322	2253	
8				54			2327	0230	0030	
14	16					13	1640	1712	1647	
14	16						1729	1803	1735	
15				54			2338	0315	0036	
16	26	—		—		33	1930	2016	1938	
18		29*		7			0138	0157	0140	
23	23	17	56	33	40	21	0202	0312	0208	X
26		6	35				0510	0608	0519	X
27	40					29	1557	1638	1618	
27	29					31	2005	2052	2008	
27	32					17	2146	2234	2151	
28		26	52	20	14	29	0359	0620	0423	

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 NOVEMBER 1972

第 24 巻 第 11 号

1973年 4 月 10 日 印 刷
1973年 4 月 25 日 発 行

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発 行 人 今 野 清 恒
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