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IONOSPHERIC DATA IN JAPAN

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RADIO RESEARCH LABORATORIES

NUKUI-KITAMACHI, KOGANEI-SHI, TOKYO, 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 extraordinary component.
O	Extraordinary component characteristic deduced from the ordinary component. (Used for x- characteristics only.)
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
U	Uncertain or doubtful numerical value.
Z	Measurement deduced from the third magneto-ionic component.

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

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

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

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

d. Description of Standard Types of *Es*

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

F	An *Es* trace which shows no appreciable increase of height with frequency. The trace is usually relatively solid at most latitudes. This classification may only be used at night; apparently flat *Es* traces observed in the daytime are classified according to their virtual hight: *H* or *L*.
L	A flat *Es* trace at or below the normal *E* layer minimum virtual height in the day or below the night *E* layer minimum virtual height at night.
C	An *Es* trace showing a relatively symmetrical cusp at or below f_0E. 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_0E. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)
Q	An *Es* trace which is diffuse and non-blanketing over a wide

frequency range. The spread is most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)

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

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

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

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

e. Multiple Reflections from *Es*

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

B. SOLAR RADIO EMISSION

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

a. Time and Unit

The time is expressed as U.T.

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

b. Daily Data

Flux density

The three-hourly and daily mean values are given.

Variability

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

Variability is expressed in the following four grades:

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

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

c. Distinctive Events

The phenomena are picked up on the following criteria:

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

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

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

Descriptive type is denoted by the following symbols:

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

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

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

C. RADIO PROPAGATION CONDITIONS

a. Field Strengths of WWV and WWVH

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

±40 Hz bandwidth.

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

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

Transmitter

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

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

Receiver

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

The meaning of *Descriptive symbols* is as follows:

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

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

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

E : Less than the following figure.

b. Radio Propagation Quality Figures

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

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

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

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

N = normal
U = unstable
W = disturbed

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

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

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

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

(i) SWF

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

Circuits and Drop-out intensities

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

Start-time and Duration

Types

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

Importances

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

1−	1	1+
2−	2	2+
3−	3	3+

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

(ii) SPA

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

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

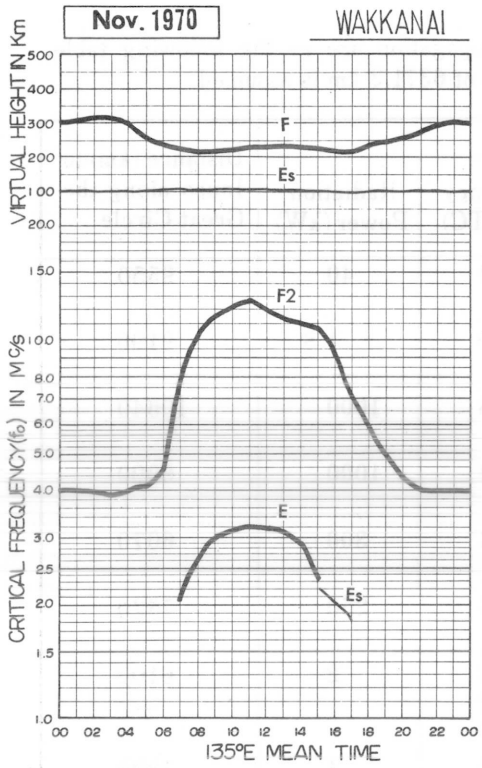
Transmitting Site					Distance (km) to Inubo along the Great Circle
Name	Location (Geographic Coordinate)	Station Call	Frequency (kHz-UTC)	Radiation Power (kW)	
Rugby	52°22′N 001°11′W	GBR	16.0	40	9550
Fort Collins	40°41′N 105°03′W	WWVL	20.0	1.8	9190
Cutler	44°39′N 067°17′W	NAA	17.8	1000	10640
North West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

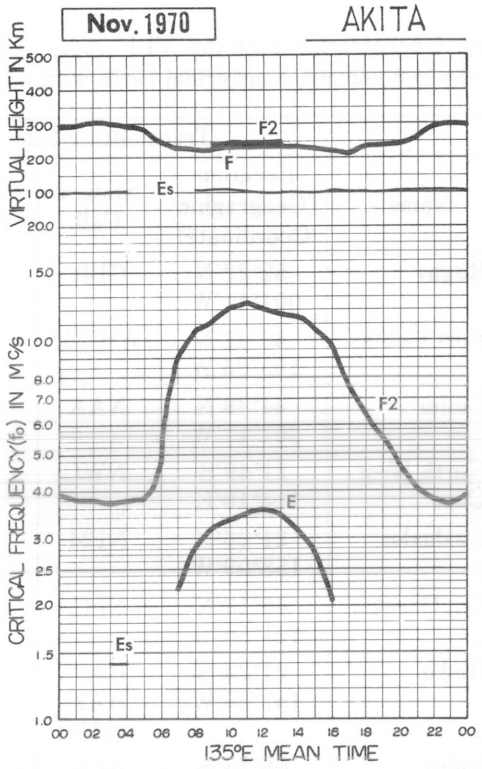
The phase advance is shown in its maximum stage. In the column 'Phase Advance', — means no transmission or no reception during the period, and blank means indistinguishable record.

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

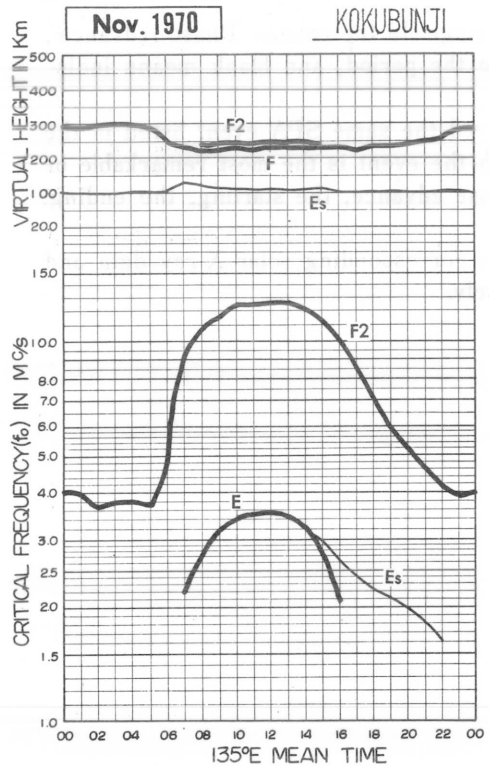
In the column 'Remarks', the event with its corresponding solar X-ray data and solar radio data is shown by 'X' and 'R', respectively.

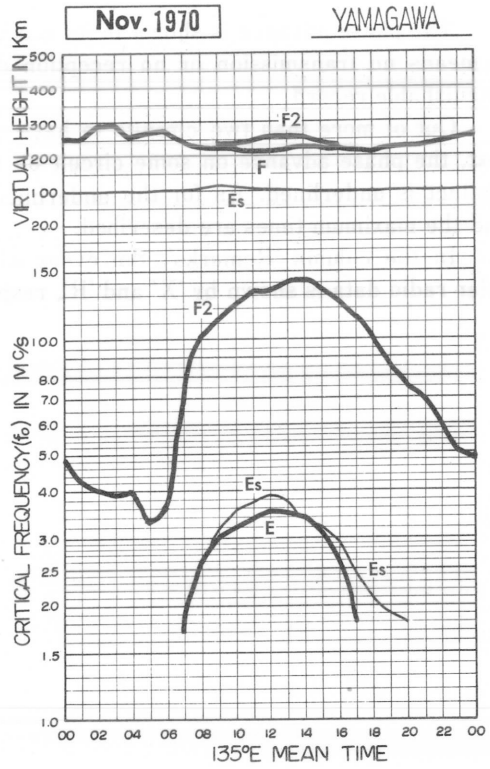
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	45	43	43	43	44	43	59	100	117	111	129	136	128	112	114	110	94	83	63	61	53	50	50	48
2	50	46	43	43	43	43	60	93	116	120	126	141	126	124	120	111	103	83	62	54	45	47	48	45
3	44	45	45	46	45	45	61	93	114	121	126	128	124	118	114	118	117	88	73	55	50	51	53	46
4	47	46	44	43	43	46	64	93	113	118	132	139	132	129	132	123	113	84	74	58	51	53	53	49
5	51	51	50	50	51	46	53	98	115	123	143	151	144	135	132	126	116	105	89	76	61	61	61	61
6	63	60	59	57 F	65	63	53	94	123	129	148	149	132	124	131 I C	128	106	93	85	77	51	50	51	51
7	50	47	49	50	50	50	58	93	122	130	140	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	130	124	104	104	108	98	75	51	49	44	44	43	43
9	42	40	40	39	38	32	43	79	101	116	123	132	126	116	109	104	95	75	58	49	44	40	38	F
10	F	F	F	F	F	34 F	46	77	100	105	121	128	127	115	113	110 I C	96	85	66	58	40	34	34	34
11	38	38	34	35	37	36 I C	52	78	114	115	128	134	126	115	115	112	91	70	61	53	42	40	39	40
12	40	39	40	38	41	44	56	90	108	116	122	135	118	113	115	109	96	73	66	53	45	39	38	37
13	35	36	37	38	40	40	45	85	108	119	115	121	114	105	110	97	86	68	61	50	48	40	40	33
14	33	33	35	35	35	35	47	86	103	133	138	137	119	95	104	125	86	61	44	41	44	40	43	40
15	41	42	41	43	41	43	44	76	107	114	116	126	119	118	104	110	90	64	54	46	38	39	43	43
16	40	43	43	43	43	42	49	88	112	115	B	122	115	104	108	109	81	71	59	41	39	40	40	38
17	38	37	37	34	34	36	47	87	113	124	113	124	123	110	105	100	87	74	59	44	43	43	43	43
18	43	42	40	41	40	41	48	85	101	105	115	119	110	105	113	96	91	76	56	49	43	37	33	33
19	33	32	33	38	40	34	37	71	103	110	145	135	135	131	125	117	105	87	70	63	50	46	47	45
20	F	F	F	40 F	40	40	46	79	110	110	118	118	119	123	115	106	70	69	63	53	46	38	39	40
21	40	43	40	39	41	40	44	80	103	120	117	118	121	106	106	110	89	61	50	43	40	38	36	33
22	30	29	33	33	36	34	34	59	93	108	119	115	107	96	96	93	82	63	38	39	37	34	33	33
23	33	32	33	33	33	34	37	72	97	C	C	C	C	C	110	105	94	67	45	43	43	38	40	39
24	40	36	35	36	34	34	36	69	93	115	123	145	120	127	107	101	83	67	61	56	53	43	44	38
25	40	38	38	41	45	51	54	75	94	113	113	123	124	123	122	107	95	55	49	47	43	43	40	40
26	40	44	43	43	45	45	33 F	61	83	107	120	110	114	103	98	107	76	50	36	36	30	28 F	35 F	36
27	37	38	34	37	36 F	42	27	57	95	103	118	105	86	106	102	93	68	57	36	38	36	32	33	33
28	34	34	36	35	34	34	43	67	85	89	108	113	113	101	93	90	68 H	56	52	34	30	30	33	33
29	33	34	35	35	36	41	30	58	73	95	113	106	104	96	93	92	63	46	49	43	31	26 F	F	F
30	F	F	46 F	F	F	50 F	33	64	71	92	102	114	107	94	93	79	84	52	44	40	33	29	33 F	30 F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	26	27	27	27	29	29	29	29	28	27	28	28	28	29	29	29	29	29	29	29	29	28	27
MED	40	40	40	39	40	41	46	79	103	115	121	127	120	112	110	108	91	70	59	49	43	40	40	40
UQ	44	44	43	43	44	45	53	90	113	120	128	136	126	123	115	111	96	83	63	55	48	44	46	44
LQ	35	36	35	36	36	35	37	71	95	108	116	118	114	104	104	100	83	61	49	43	39	37	36	34

NOV. 1970 | FOF2 (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
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CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1970 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

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

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	225	290	305	330	I A 335	330	320	295	250	A							
2							E	210	290	I A 300	315	330	325	315	300	250	S							
3							S	220	290	305	315	335	325	320	300	245	A							
4							S	220	290	A	A	A	A	A	295	250	160							
5							S	220	A	A	310	325	320	B	320	285	A							
6							A	215	A	A	I A 315	325	325	I A 320	I C 295	A	R							
7							E	215	270	310	315	C	C	C	C	C	C							
8							C	C	C	C	C	315	315	310	280	A	A							
9							S	S	A	290	315	325	315	A	A	A	A							
10							S	A	A	290	305	310	320	300	290	C	A							
11							S	S	S	A	310	310	320	315	290	240	S							
12							E	200	A	300	315	320	325	310	285	I A 230	A							
13							E	200	275	300	315	325	320	310	295	235	A							
14							A	A	A	300	315	I A 320	325	310	295	235	S							
15							E	180	290	300	320	325	335	325	295	230	S							
16							E	170	255	A	B	A	330	A	295	235	S							
17							E	195	275	300	310	320	320	A	A	A	A							
18							E	175	280	300	310	B	B	340	305	A	A		E					
19							S	A	I A 265	300	310	325	330	310	290	220	S							
20							E	185	260	295	300	315	I A 320	A	A	A	A							
21							E	S	250	290	300	I A 310	300	A	A	220	A							
22							E	S	225	290	300	320	A	B	A	R	S							
23							E	S	230	C	C	C	C	C	280	220	S							
24							E	S	A	285	300	310	305	295	280	200	S							
25							E	S	220	300	300	305	305	300	275	215	S							
26								S	255	280	305	305	305	300	265	205	A							
27								S	215	295	305	310	300	300	240	215	S							
28								S	225	290	300	305	300	300	270	215	S							
29								A	230	280	300	305	I A 300	300	280	A	A							
30								S	240	295	305	305	305	300	280	205	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							14	14	21	23	26	25	25	20	24	20	1		1					
MED							E	205	260	300	310	320	320	310	290	230	160		E					
UQ							E	220	280	300	315	325	325	318	295	242								
LQ							E	185	230	290	300	310	305	300	280	215								

NOV. 1970 | FOE (0.01 MHZ)

IONOSPHERIC DATA

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

Station WAKKANAI Lat. 45° 23.6' N Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in 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	28	30	30	E	E	E	E S 15	G	30	G	G	J X 54	29	G	G	G	37	33	20	34	E S 15	34	31	32
2	30	33	26	18	15	E	E	21	40	42	49	G 21	G	G	G 25	G 23	E S 21	20	32	E S 16	E S 15	E	E	E S 16
3	30	29	25	E	E	E	E S 12	25	G 25	40	41	40	40	36	38	G 23	40	31	E S 16	E	E	E	27	E
4	E	E	E	17	E	E	E S 13	G	35	J X 46	43	J X 83	J X 63	J X 60	G 22	G 22	G	E	19	E	E	E	E	E S 15
5	E	E	E	E	E	E	E S 13	G	30	40	36	G	G 29	E B 42	G	G 23	29	40	23	J X 28	23	E	E S 15	30
6	26	J X 34	40	J X 28	J X 33	30	21	G	31	33	39	43	G	J X 52	C	28	G	E	E S 13	E	E	E S 15	23	E S 15
7	E	E S 15	E	E	E	E	E	G	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	G 24	J X 44	31	G 23	38	39	J X 30	30	23	E S 15	E S 15	E S 15	E S 16
9	E S 15	E	E	E	E	E	E S 12	E S 21	J X 43	G 28	G 30	G 31	G 24	31	28	40	40	38	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15
10	33	18	18	20	E	E	E S 13	23	37	G	G	G	G	G	G 25	C	36	33	30	J X 31	E	E S 15	E S 15	E S 13
11	E S 16	E	17	E	E	C	E S 11	E S 21	G	40	36	39	G 29	G	G	G	E S 20	E	E S 15	E S 15	E S 17	E S 15	E	24
12	30	24	16	29	E	E	E	G	40	G 26	G 25	G 24	G 24	G	G 23	30	26	E S 17	25	E S 15	E	E	E	E
13	24	28	E	18	E	E	E	G	G	G	G	G	G	G	G		22	28	30	30	E S 15	E	E	E S 16
14	E	E	E S 15	J X 23	16	E	J X 23	23	29	33	G	40	J X 40	32	G 25	26	E S 18	E S 16	E S 16	20	E	E S 14	E	E S 16
15	E S 15	E	E	E	E	E	E	25	G	G	G	G	G	G	G	G	E S 20	E	E	E S 15	27	E S 15	E S 15	24
16	20	24	J X 25	E	J X 23	J X 21	E	G	G	38	B	36	J X 53	J X 60	J X 50	G	E S 17	J X 23	J X 25	20	J X 24	E	E S 15	26
17	E S 13	E	E	16	J X 25	E	E	G	G	39	G 23	G 22	40	J X 41	45	43	35	38	E	E	30	E	E	28
18	E	E	E	J X 18	E	E	E	G	G	G 28	G	E B 80	E B 38	G 30	J X 45	J X 50	J X 25	20	E	E S 12	E	30	J X 25	E
19	E	E	22	30	E	J X 23	22	28	33	G	G	G	G 25	G	G	G	E S 15	E S 15	16	E	E S 15	E	E	E
20	E	E	E	E	18	17	16	G	G	G	G	G	J X 63	J X 54	J X 61	J X 50	J X 53	20	E S 15	20	E	E	24	21
21	E	40	17	E	18	17	E	G	30	42	40	45	36	J X 53	40	G	28	E S 15	E S 15	E S 15	E	E	E	E S 15
22	E S 15	E	E	J X 33	E	E	E	22	28	32	40	40	40	E B 32	30	G	E S 16	E	E	E	E S 15	E	J X 30	J X 30
23	26	E S 15	18	E	E	E	E	E S 20	G	C	C	C	C	C	G	G	E S 17	18	E S 20	E	E	E S 15	E S 15	E
24	E S 12	E	E	E	13	E	E	E S 20	33	35	G	G	G	G	G	G	E S 15	E S 17	E	E S 16	E	E	E	E S 15
25	E	E	E	E	E	E	E	G	G	G	G	G 30	G	G	G	G	E S 15	E	E S 15	E S 15	E S 15	E	E S 17	E S 16
26	E S 16	21	E	E	E	E	E S 15	G	G	34	32	G 24	33	G 25	G	G	33	31	E S 15	E	E	21	J X 24	28
27	27	20	E	E	E	E	E	G	G	G	G	G 29	G 30	G 24	G	G	18	J X 33	32	34	J X 31	J X 54	J X 31	E S 15
28	E	18	23	E	E	E	E	G	G 21	G 25	G	G 23	G	G	G	G	E S 15	E S 14	E	E	E S 15	E S 16	E S 15	E
29	J X 24	E	E	E	E	E	E S 12	27	28	G	G	J X 63	J X 43	33	G	24	22	E S 15	E	E S 15	E S 15	E S 16	E S 13	E
30	E	E	E	E	E	E	E S 15	G	G	G	G	G	36	G	G	G	E S 15	E	E	E	E 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	28	29	29	29	28	27	28	28	28	28	27	29	29	29	29	29	29	29	29
MED	E S 15	E	E	E	E	E	E	G	G 25	G 28	G	G 25	30	G 26	G 22	G	21	18	E S 16	E S 15	E S 15	E	E S 15	E S 15
UQ	26	24	18	18	13	E	E S 13	21	31	38	36	40	40	U 36	29	27	33	31	23	20	E S 15	E S 15	23	22
LQ	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	E S 16	E S 14	E	E	E	E	E	E

The Radio Research Laboratories, Japan

NOV. 1970 | FOES (0.1 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	18	17	E	E	E	E S 15	G	26	G	G	49	30	G	G	G	28	27	20	20	E S 15	20	20	17
2	18	16	14	E	E	E	E	19	25	33	27	G 20	G	G	G 25	G 20	E S 21	20	19	E S 16	E S 15	E	E	E S 16
3	15	E	E	E	E	E	E S 12	23	G 20	25	20	24	27	25	20	G 19	21	20	E S 16	E	E	E	E	E
4	E	E	E	E	E	E	E S 13	G	G	32	32	37	58	31	G 18	G 17	G	E	E	E	E	E	E	E S 15
5	E	E	E	E	E	E	E S 13	G	28	31	29	G	G 26	E B 42	G	20	20	28	20	26	16	E	E S 15	20
6	E	28	24	17	26	20	14	G	29	30	34	30	G	34	C	25	G	E	E S 13	E	E	E S 15	17	E S 15
7	E	E S 15	E	E	E	E	E	G	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	G 20	28	28	G 22	30	30	22	E	E	E S 15	E S 15	E S 15	E S 16
9	E S 15	E	E	E	E	E	E S 12	E S 21	40	G 26	G 25	G 28	23	31	28	30	28	E	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15
10	18	E	E	E	E	E	E S 13	22	27	G	G	G	G	G	G 22	C	27	25	19	E	E	E S 15	E S 15	E S 13
11	E S 16	E	E	E	E	C	E S 11	E S 21	G	30	26	25	G 23	G	G	G	E S 20	E	E S 15	E S 15	E S 17	E S 15	E	E
12	26	19	14	20	E	E	E	G	27	G 26	G 25	G 23	G 23	G	G 22	28	24	E S 17	15	E S 15	E	E	E	E
13	E	17	E	13	E	E	E	G	G	G	G	G	G	G	G	G	19	15	17	17	E S 15	E	E	E S 16
14	E	E	E S 15	16	E	E	16	22	26	27	G	36	30	25	G 21	20	E S 18	E S 16	E S 16	E	E	E S 14	E	E S 16
15	E S 15	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	E S 20	E	E	E S 15	18	E S 15	E S 15	E
16	E	E	18	E	E	E	E	G	G	36	B	36	30	32	20	G	E S 17	E	18	E	E	E	E S 15	E
17	E S 13	E	E	E	18	E	E	G	G	25	G 22	G 21	29	31	38	36	25	20	E	E	E	E	E	17
18	E	E	E	E	E	E	E	G	G	G 26	G	E B 80	E B 38	G 26	26	27	19	E	E	E S 12	E	18	17	E
19	E	E	E	E	E	15	E S 12	20	27	G	G	G	G 24	G	G	G	E S 15	E S 15	E	E	E S 15	E	E	E
20	E	E	E	E	17	17	14	G	G	G	G	G	32	37	50	31	33	16	E S 15	E	E	E	E	E
21	E	26	E	E	17	E	E	G	G	G	G	33	G	45	30	G	17	E S 15	E S 15	E S 15	E	E	E	E S 15
22	E S 15	E	E	15	E	E	E	G	G	G	G	28	33	E B 32	30	G	E S 16	E	E	E	E S 15	E	15	20
23	E	E S 15	E	E	E	E	E	E S 20	G	C	C	C	C	C	G	G	E S 17	16	E S 20	E	E	E S 15	E S 15	E
24	E S 12	E	E	E	E	E	E	E S 20	30	G	G	G	G	G	G	G	E S 15	E S 17	E	E S 16	E	E	E	E S 15
25	E	E	E	E	E	E	E	G	G	G	G	28	G	G	G	G	E S 15	E	E S 15	E S 15	E S 15	E	E S 15	E S 16
26	E S 16	E	E	E	E	E	E S 15	G	G	G	27	G 23	29	G 24	G	G	26	E	E S 15	E	E	E	16	E
27	E	E	E	E	E	E	E	G	G	G	G	G 25	G 24	G 22	G	G	G	29	E	E	E	E	17	E S 15
28	E	E	E	E	E	E	E	G	G 20	G 23	G	G 20	G	G	G	G	E S 15	E S 14	E	E	E S 15	E S 16	E S 15	E
29	E	E	E	E	E	E	E S 12	20	19	G	G	24	32	20	G	23	16	E S 15	E	E S 15	E S 15	E S 16	E S 13	E
30	E	E	E	E	E	E	E S 15	G	G	G	G	G	G	G	G	G	E S 15	E	E	E	E 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	28	29	29	29	28	27	28	28	28	28	28	29	29	29	29	29	29	29	29
MED	E	E	E	E	E	E	E	G	G	G	G	G 24	G 24	G 22	G 18	G	E G 19	E S 15	E S 15	E	E	E	15	E S 15
UQ	E S 15	15	E	E	E	E	E S 13	E G 20	26	26	25	28	30	30	24	24	24	20	E S 16	E S 15	E S 15	E S 15	E S 15	E S 16
LQ	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	E S 15	E	E	E	E	E	E	E

NOV. 1970 | FBES (0.1 MHZ)

IONOSPHERIC DATA

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

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E_{S15}	14	16	19	20	20	19	16	19	20	E	E_{S15}	E	E	E_{S15}	E_{S15}	E_{S13}	E
2	E	E	E	E	E	E	E	13	12	17	19	17	20	20	18	15	E_{S21}	E	E	E_{S16}	E_{S15}	E	E	E_{S16}
3	E	E	E	E	E	E	E_{S12}	12	12	12	13	12	11	13	E	E	E	E	E_{S16}	E	E	E	E_{S15}	E
4	E	E	E	E	E	E	E_{S13}	12	12	12	12	16	13	15	12	E	12	E	E	E	E	E	E	E_{S15}
5	E	E	E	E	E	E	E_{S13}	12	15	16	16	17	13	42	20	17	12	E	E	E	E_{S16}	E	E_{S15}	E
6	E_{S16}	E	E	E	E	E	E	14	16	12	16	17	17	17	C	E	E	E	E_{S13}	E	E	E_{S15}	E	E_{S15}
7	E	E_{S15}	E	E	E	E	E	12	17	18	16	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	17	16	20	12	12	11	E	E_{S14}	E_{S15}	E_{S15}	E_{S15}	E_{S15}	E_{S16}
9	E_{S15}	E	E	E	E	E	E_{S12}	E_{S21}	19	17	19	18	18	17	17	15	E	E_{S18}	E_{S16}	E_{S16}	E_{S15}	E_{S15}	E_{S15}	E_{S15}
10	E	E	E	E	E	E	E_{S13}	15	17	12	18	17	19	18	16	C	11	E_{S15}	E_{S16}	E_{S14}	E	E_{S15}	E_{S15}	E_{S13}
11	E_{S16}	E	E	E	E	E	E_{S11}	E_{S21}	16	17	17	16	19	20	20	20	E_{S20}	E	E_{S15}	E_{S15}	E_{S17}	E_{S15}	E	E_{S18}
12	E	E	E	E	E	E	E	13	17	17	17	19	17	20	18	E	11	E_{S17}	E	E_{S15}	E	E	E	E
13	E	E	E	E	E	E	E	15	17	18	20	21	20	24	20	19	11	E	E	E	E_{S15}	E	E	E_{S16}
14	E	E	E_{S15}	E	E	E	E	15	16	19	17	20	17	16	16	13	E_{S18}	E_{S16}	E_{S16}	E	E	E_{S14}	E	E_{S16}
15	E_{S15}	E	E	E	E	E	E	15	16	17	18	19	19	17	17	17	E_{S20}	E	E	E_{S15}	E_{S15}	E_{S15}	E_{S15}	E_{S15}
16	E_{S12}	E	E	E	E	E	E	15	12	12	B	25	20	15	E	13	E_{S17}	E	E	E	E	E	E_{S15}	E_{S16}
17	E_{S13}	E	E	E	E	E	E	14	17	16	16	18	17	11	12	E	E	E	E	E	E	E	E	E
18	E	E	E	E	E	E	E	E	18	18	19	80	38	19	17	12	E	E	E	E_{S12}	E	E	E	E
19	E	E	E_{S15}	E	E	E	E_{S12}	E	11	13	17	17	17	13	11	14	E_{S15}	E_{S15}	E	E	E_{S15}	E	E	E
20	E	E	E	E	E	E	E	12	11	11	13	16	17	13	12	11	E	E	E_{S15}	E	E	E	E	E_{S15}
21	E	E	E	E	E	E	E	E_{S15}	17	16	17	20	18	17	17	16	E	E_{S15}	E_{S15}	E_{S15}	E	E	E	E_{S15}
22	E_{S15}	E	E	E	E	E	E	E_{S12}	19	24	24	20	25	32	20	18	E_{S16}	E	E	E	E_{S15}	E	E	E
23	E_{S15}	E_{S15}	E	E	E	E	E	E_{S20}	17	C	C	C	C	C	24	17	E_{S17}	E	E_{S20}	E	E	E_{S15}	E_{S15}	E
24	E_{S12}	E	E	E	E	E	E	E_{S20}	17	18	20	20	20	21	20	17	E_{S15}	E_{S17}	E	E_{S16}	E	E	E	E_{S15}
25	E	E	E	E	E	E	E	E_{S15}	18	20	18	20	20	20	20	16	E_{S15}	E	E_{S15}	E_{S15}	E_{S15}	E	E_{S17}	E_{S16}
26	E_{S16}	E_{S16}	E	E	E	E	E_{S15}	E_{S15}	18	18	20	18	17	17	20	16	E	E	E_{S15}	E	E	E	E	E_{S15}
27	E	E	E	E	E	E	E	E_{S16}	16	18	19	17	16	17	20	16	E_{S11}	E_{S15}	E	E_{S16}	E_{S15}	E_{S15}	E_{S15}	E_{S15}
28	E	E	E	E	E	E	E	E_{S15}	11	17	17	17	16	15	17	15	E_{S15}	E_{S14}	E	E	E_{S15}	E_{S16}	E_{S15}	E
29	E_{S15}	E	E	E	E	E	E_{S12}	E	15	17	20	17	17	17	20	16	E	E_{S15}	E	E_{S15}	E_{S15}	E_{S16}	E_{S13}	E
30	E	E	E	E	E	E	E_{S15}	E_{S12}	16	17	17	18	18	17	17	17	E_{S15}	E	E	E	E_{S15}	E	E_{S15}	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29
MED	E	E	E	E	E	E	E	13	16	17	18	18	18	17	17	16	E_{S11}	E	E	E	E_{S15}	E	E	E_{S15}
UQ	E_{S15}	E	E	E	E	E	E_{S12}	E_{S15}	17	18	20	20	20	20	20	17	E_{S15}	E_{S15}	E_{S15}	E_{S15}	E_{S15}	E_{S15}	E_{S15}	E_{S15}
LQ	E	E	E	E	E	E	E	12	15	14	16	17	17	16	14	12	E	E	E	E	E	E	E	E

NOV. 1970 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	275	255	250	255	270	280	305	330	340	325	310	315	315	305	300	320	300	300	290	295	285	280	280	270
2	280	290	280	255	270	280	300	330	345	335	315	315	300	320	310	315	310	320	280	315	275	300	270	275
3	275	270	280	285	295	300	315	335	335	305	315	320	310	305	315	310	325	300	310	295	280	285	290	285
4	285	280	250	255	260	285	330	355	345	320	310	320	305	310	305	315	320	315	325	305	275	270	280	265
5	285	275	265	260	275	290	315	355	330	325	320	315	320	305	305	315	315	325	305	315	295	285	280	280
6	290	285	265	280 F	290	320	300	325	340	320	330	315	300	305	310 I C	305	300	290	305	335	280	265	265	255
7	265	250	250	250	270	260	290	315	330	320	315	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	315	325	310	310	325	325	325	295	285	280	285	270	265
9	260	255	260	280	280	290	285	330	335	330	310	320	315	310	315	325	325	310	300	295	295	280	260	F
10	F	F	F	F	F	295 F	325	340	340	335	330	315	320	305	300	330 I C	320	320	320	315	325	260	260	260
11	280	275	245	235	250	270 I C	290	330	335	330	320	315	315	305	315	320	320	305	300	300	295	290	255	280
12	275	255	255	250	250	275	305	340	345	310	320	310	315	320	320	320	340	310	305	315	295	295	290	280
13	275	260	255	265	285	285	300	340	335	340	330	325	335	325	320	330	335	295	315	300	305	300	300	275
14	240	245	255	260	255	265	285	335	315	330	325	335	330	315	295	335	310	330	295	280	320	300	300	295
15	270	260	270	255	250	285	305	340	345	335	335	315	330	330	325	325	335	315	310	315	300	275	280	285
16	265	280	280	280	260	285	305	340	340	315	B	315	330	310	335	330	320	315	320	315	285	275	295	270
17	285	295	280	245	255	275	305	335	345	330	325	325	325	325	335	340	305	305	320	295	300	280	285	285
18	295	300	275	270	265	295	315	345	345	345	330	320	320	320	320	325	300	315	310	315	300	295	275	265
19	260	245	240	265	300	290	285	320	320	305	315	315	295	300	305	290	295	300	285	290	300	275	270	265
20	F	F	F	275 F	280	275	295	325	325	325	320	320	315	325	320	340	310	300	315	310	320	300	290	285
21	275	280	275	270	270	280	295	325	330	350	330	305	315	330	325	325	330	305	300	280	250	245	250	235
22	235	225	250	240	255	255	265	270	310	315	320	330	335	335	335	325	310	340	290	295	295	295	275	275
23	270	260	250	250	250	275	295	335	340	C	C	C	C	C	325	340	340	330	300	305	305	275	265	265
24	270	260	255	250	250	275	295	320	345	330	315	320	320	325	335	315	315	315	310	325	310	300	295	295
25	265	280	270	270	270	290	315	345	330	335	325	320	325	325	330	325	320	310	305	300	300	280	285	275
26	275	285	265	280	285	330	295 F	325	330	340	340	325	335	325	310	340	340	320	305	340	325	260 F	270 F	275
27	270	275	270	280	285 F	335	295	315	345	330	340	345	315	340	335	325	320	310	315	315	305	265	275	260
28	260	275	280	290	265	280	325	335	335	350	325	325	340	335	325	345	355 H	315	310	295	305	265	275	275
29	275	270	265	285	285	295	305	340	340	340	335	330	335	355	325	335	320	315	305	335	350	250 F	F	F
30	F	F	285 F	F	F	320 F	305	345	350	350	330	315	340	325	330	340	345	290	330	325	285	290	240 F	285 F
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	26	27	27	27	29	29	29	29	28	27	28	28	28	29	29	29	29	29	29	29	29	28	27
MED	275	272	265	265	270	285	300	335	340	330	325	320	320	320	320	325	320	315	305	305	300	280	275	275
UQ	280	280	275	280	282	295	305	340	345	338	330	325	330	325	325	335	330	320	315	315	305	295	288	282
LQ	265	255	252	252	255	275	295	325	330	320	315	315	315	308	310	320	310	305	300	295	285	270	268	265

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
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19																								
20																								
21																								
22																								
23										C	C	C	C	C										
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

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

IONOSPHERIC DATA

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

Station WAKKANAI Lat. 45° 23.6' N · Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in 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																								
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21																								
22																								
23										C	C	C	C	C										
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1970 | H'F2 (KM)

IONOSPHERIC DATA

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

Station WAKKANAI Lat. 45° 23.6' N Long. 141° 41.1' E Sweep 1 MHz to 20 MHz in 20 sec in 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	275	300	330	325	300	270	245	230	215	210	205	240 I A	220	220	220	225	215	220	220	250	250	290	280	275
2	265	260	260	305	295	255	225	215	220	225	215	230	220	225	230	225	225	210	220	220	260	275	275	275
3	300	295	285	260	240	245	225	205	205	195	210	225	210	220	225	230	220	200	215	210	250	250	250	250
4	275	275	315	325	315	260	220	205	205	215	210	230	I A 225	225	225	215	205	200	220	235	260	270	260	265
5	250	260	275	295	265	200	225	215	215	215	200	210	205	245	235	220	220	225	225	220	240	240	260	275
6	260	280	325	285	275	220	220	225	215	205	215	225	220	220	I C 230	225	205	210	230	225	230	295	305	320
7	285	305	315	315	280	270	275	245	235	225	220	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	220	220	220	220	225	225	215	225	265	265	285	290	300
9	315	270	305	270	245	200	260	220	220	220	205	230	220	225	225	225	220	215	225	245	250	255	300	340
10	330	305	325	320	320	245	215	215	215	215	215	200	240	240	225	I C 235	220	220	230	230	225	300	300	350
11	300	270	360	370	I C 350	310	230	220	215	220	220	235	230	225	225	225	215	230	230	250	270	300	320	300
12	325	350	325	375	320	280	245	225	220	215	200	235	225	235	240	220	210	235	240	230	250	250	260	275
13	305	325	320	345	285	250	245	220	220	220	210	220	225	230	240	215	225	225	230	245	250	250	250	260
14	365	360	360	340	320	295	235	225	220	225	225	235	225	215	220	245	215	200	250	275	250	250	265	265
15	300	300	290	325	315	270	210	225	230	220	230	225	235	240	225	230	210	210	220	250	260	305	300	275
16	240	280	295	290	300	275	230	240	215	205	B	225	235	225	245	230	210	240	225	250	275	290	275	275
17	275	260	265	360	360	300	250	225	225	220	220	200	230	235	230	235	225	225	215	240	260	275	275	280
18	260	260	255	295	300	270	245	220	215	215	225	B	240	240	245	225	220	215	230	240	245	265	290	305
19	320	380	395	300	250	260	240	240	230	245	240	225	225	235	225	225	215	215	210	250	230	275	290	300
20	265	260	250	275	275	300	245	225	215	220	210	220	225	230	A 230	225	215	225	240	225	245	230	260	290
21	300	305	290	290	305	270	250	220	220	235	220	220	230	A 240	225	235	220	210	250	265	350	350	375	360
22	425	445	350	350	335	340	320	250	250	240	240	235	230	225	225	225	200	200	230	255	260	245	300	325
23	315	305	345	325	325	295	235	215	215	C	C	C	C	C	225	220	215	205	255	250	250	300	300	305
24	315	305	305	335	350	250	250	215	215	230	225	235	210	230	220	215	210	220	230	225	225	245	265	270
25	300	300	320	325	300	250	220	210	215	225	215	220	225	235	230	220	210	195	230	270	245	275	275	300
26	300	300	310	275	275	210	220	215	215	220	220	220	225	225	225	225	205	200	250	225	225	325	300	335
27	310	305	325	295	265	200	210	245	245	225	245	225	210	250	230	220	210	240	225	265	260	300	345	345
28	345	300	275	260	300	275	230	215	210	215	210	230	230	220	225	225	215	245	215	220	260	305	325	315
29	335	320	300	300	270	245	240	215	215	225	235	220	225	225	235	215	200	215	250	235	225	320	320	310
30	300	275	275	250	250	215	220	220	210	215	225	215	220	235	225	220	220	205	215	225	250	250	325	355
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	28	27	27	28	28	29	29	29	29	29	29	29	29	29	29
MED	300	300	310	305	300	260	235	220	215	220	220	225	225	228	225	225	215	215	230	240	250	275	290	300
UQ	315	305	325	325	320	275	245	225	220	225	225	230	230	235	230	225	220	225	230	250	260	300	300	320
LQ	275	275	285	290	275	245	220	215	215	215	210	220	220	225	225	220	210	205	220	225	245	250	265	275

NOV. 1970 | H'F (KM)

IONOSPHERIC DATA

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

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

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

NOV. 1970 | H'ES (KM)

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IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F1	F1	F1						L1			L2	L1				L1	F1	F1	F2		F1	F2	F1
2	F1	F1	F1	F1	F1			L1	L1	L2	L2	L1			L1	L1		F1	F1					
3	F1	F1	F1					L1	L1	L1	L1	L1	L1	L1	L1	L1	L1	F2					F1	
4				F1					C1	L2	L1	L2	L2	L1	L1	L1			F1					
5									L2	L2	L1		L1			L1	L1	F2	F1	F3	F1			F2
6	F1	F3	F3	F2	F2	F2	L1		L1	L1	L2	L1		L1		L1							F2	
7																								
8												L1	L1	L1	L1	L1	L2	F1	F1	F1				
9									L3	L1	L1	L1	L1	L1	L1	L2	L1	F1						
10	F2	F1	F1	F1				L1	L1						L1		L1	F1	F1	F1				
11			F1							L1	L1	L1	L1											F1
12	F1	F1	F1	F2					L1	L1	L1	L1	L1		L1	HL11	CL11		F1					
13	F1	F2		F2													L1	F1	F1	F1				
14				F1	F1		L1	L1	L1	L1		L1	L1	L1	L1	L1				F1				
15								H1													F1			
16	F1	F1	F2		F1	F1				L2		L1	L1	L2	L1			F1	F1	F1	F1			F1
17				F1	F1					L1	L1	L1	L1	L2	L1	L2	L1	F2			F1			F1
18				F1						L1				L1	L1	L1	L1	F1				F2	F2	
19			F1	F1		F2	L1	L1	L1				L1						F1					
20					F2	F2	L1						L3	L3	L4	L4	L3	F1		F1			F1	F1
21		F3	F1		F2	F1			H1	C1	C1	L1	C1	L2	L2		L1							
22				F2				C1	C1	C1	C1	L1	L1		L1								F2	F3
23	F1		F1															F1						
24					F1				CL11	C1														
25												L1												
26		F1								H1	L1	L1	L1	L1			L2	F1				F1	F2	F1
27	F1	F1										L1	L1	L1			C1	F2	F1	F1	F1	F1	F2	
28		F1	F1						L1	L1		L1												
29	F1							L1	L1			L1	L1	L1		L1	L1							
30													H1											
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. 1970 | TYPES OF ES

IONOSPHERIC DATA

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

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

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	43	41	41	41	41	43	64	I R 102	129	116	118	132	128	123	114	114	103	82	74	64	61	55	51	47
2	47	44	41	41	39	41	62	I R 104	114	C	C	C	126	127	123	111	97	91	68	55	46	48	S 47	46
3	41	41	42	45	43	42	63	R	C	C	C	C	122	124	115	106	111	94	81	57	47	52	51	46
4	45	45	42	41	42	45	64	I R 98	C	C	C	C	C	131	126	124	109	94	76	60	49	54	52	47
5	47	49	47	47	46	47	57	101	C	C	C	C	136	136 R	129	125	I R 114	102	87	76	63	55	56	56
6	61	I R 58	51	56	57	58	55	90	C	C	C	C	I R 124	124	122	126	116	97	92	84	60	51	50	46
7	49	45	46	47	49	47	62	I R 108	I C 124	I C 132	R 138	144	118	108	116	109	98	76	81	64	46	62	53	54
8	49	48	H 41	47	48	F	S 57	108	127	I R 150	139	135	118	109	99	102	97	78	61	43	46	47	46	44
9	41	42	41	39	F	31	43	94	98	104	122	123	124	I R 124	118	107	101	75	64	55	44	37	36	35
10	38	37	36	36	36	36	46	84	99	100	122	124	121	126	127	114	106	86	73	65	43	36	I A 34	34
11	39	39	32	34	37	39	57	91	I R 103	127	129	127	I R 129	I R 124	123	116	98	75	67	60	49	43	42	38
12	41	36	38	36	39	44	54	99	121	I R 118	126	119	121	121	123	115	104	72	61	63	48	48	41	37
13	34	35	34	36	37	38	51	94	117	118	121	127	I R 119	110	C	C	C	73	72	62	48	44	37	32
14	I R 33	32	32	35	34	34	47	94	123	I R 123	127	121	118	116	93	104	102	71	54	42	40	39	39	34
15	I R 34	35	35	35	36	37	48	88	100	I R 122	I R 114	114	118	114	114	97	101	74	59	52	41	36	41	37
16	36	35	36	36	36	35	46	94	121	I R 112	I B 114	I R 116	R 118	115	I R 108	99	97	64	70	55	42	40	39	38
17	37	38	33	31	32	33	48	91	112	117	I B 117	114	I C 114	113	104	96	87	83	72	49	42	42	43	44
18	45	39	38	37	39	41	46	93	106	104	104	I B 108	113	116	106	104	96	77	70	51	46	35	33	I A 32
19	32	31	32	36	38	37	37	74	113	114	I R 128	I R 134	116	I R 122	117	111	102	87	71	58	56	47	46	46
20	48	44	37	37	37	38	49	88	96	R	C	C	C	R	122	107	I R 88	51	65	I R 60	47	36	38	38
21	39	41	41	41	37	S 36	51	91	I R 107	I R 110	122	I R 122	121	111	108	104	96	I R 74	44	48	40	41	36	36
22	39	32	40	42	43	53	52	71	129	143	141	129	I R 116	108	109	94	86	67	53	42	44	44	32	I R 34
23	31	32	32	32	32	33	40	83	105	110	122	131	123	I R 118	111	109	95	76	59	47	48	36	37	38
24	38	37	34	31	32	32	36	95	I R 96	106	114	136	I R 140	119	122	104	93	63	63	59	52	40	36	F
25	S 39	37	38	40	42	S 44	S 52	78	91	96	125	126	124	125	124	113	96	74	46	44	45	40	36	36
26	S 38	41	39	42	41	38	41	68	84	102	124	I R 126	124	119	102	98	94	59	37	39	30	26	29	29
27	32	32	32	33	38	32	28	I R 64	I R 81	I R 98	113	127	92	91	112	96	84	55	42	32	32	32	S 32	31
28	I A 33	36	37	39	33	31	42	72	82	94	I R 102	116	108	105	94	101	79	53	56	47	32	27	28	32
29	33	32	34	33	36	33	39	64	84	I R 88	101	104	104	99	87	88	79	52	46	55	38	26	26	31
30	33	34	36	37	38	35	32	68	S 80	86	104	107	109	110	94	88	75	63	47	40	36	29	29	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	30	30	30	30	29	29	30	29	26	24	24	24	28	29	29	29	29	30	30	30	30	30	30	29
MED	39	38	38	37	38	38	48	91	106	111	122	125	120	118	114	106	97	74	64	55	46	40	38	37
UQ	45	42	41	41	42	43	57	95	121	120	126	130	124	124	122	113	102	83	72	60	48	48	46	46
LQ	34	35	34	35	36	34	42	78	96	101	114	116	116	110	106	99	93	64	54	47	41	36	34	34

NOV. 1970 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L										
2										C	C	C	L	L										
3										C	C	C	L	L										
4										C	C	C	C	L										
5										C	C	C	L	B										
6										C	C	C	L	L	A									
7										C	L	L	L	L										
8										L	L	L	L	L										
9										L	L	L	L	L										
10										L	L	L	L	L										
11										L	U L 440	L	L	L	L									
12										L	L	L	L	L	L									
13										L	L	L	L	L	C									
14										L	L	L	L	L										
15											L	L	L	L										
16										L	B	B	L	L										
17											L	L	C	L										
18											L	B	B	R										
19										L	L	L	L	L										
20										L	C	C	C	L										
21											L	L	L	L										
22											L	L	L											
23											L	L	L											
24										L	L	L	L	L										
25										L	430	L	U L 420	L										
26										L	L	L	L	L										
27										L	L	L	L	L	L									
28											L	U L 450	L	L										
29											U L 480	L	L	L										
30											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											3	1	1											
MED											U L 440	U L 450	U L 420											
UQ											U L 460													
LQ											435													

The Radio Research Laboratories, Japan

NOV. 1970 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

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

Station AKITA Lat. 39° 43.5' N. Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in 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	230	290	330	350	355	I A 360	I A 350	325	280	225	S						
2							S	225	285	C	C	C	360	345	325	285	A	S						
3							S	235	C	C	C	C	A	350	325	285	A	S						
4							S	220	C	C	C	C	C	340	320	285	A	S						
5							S	230	C	C	C	C	A	B	B	315	A	S						
6							S	230	C	C	C	C	A	A	A	A	205	S						
7							S	250	I C 300	I C 320	345	I A 355	355	I A 340	I A 300	A	A	S						
8							S	A	A	325	I A 360	370	I A 355	325	I A 300	A	A	S						
9							S	230	280	325	I A 345	350	355	340	315	I A 270	A	S						
10							S	220	285	A	A	I A 355	I A 355	I A 335	310	A	A	S						
11							S	220	285	325	335	I A 350	360	I A 335	300	260	200							
12							S	230	290	I A 320	340	355	365	355	320	275	A							
13							S	225	295	A	A	I A 350	365	345	C	C	C							
14							S	205	I A 290	325	335	345	350	350	335	295	A							
15								215	285	320	335	345	355	345	325	285	230							
16								225	280	325	B	B	B	355	330	285	215							
17								210	290	330	345	350	I C 350	345	335	290	220							
18								215	285	325	340	B	B	355	I B 350	315	235							
19								220	285	325	340	350	355	350	325	295	A							
20								205	275	325	C	C	C	R 355	330	275	210							
21								215	275	320	335	I A 345	355	345	310	270	205							
22								210	I A 280	A	A	A	355	350	315	260	190							
23								B	275	320	340	350	350	335	310	265	B							
24								200	I A 260	I A 315	I A 330	345	350	345	315	265	B							
25								200	265	315	335	345	350	335	305	260	200							
26								215	270	305	A	A	A	A	295	260	B							
27								215	275	315	330	340	340	315	290	250	A							
28								205	265	I A 310	325	340	345	325	295	250	A							
29								190	260	310	325	340	350	345	300	255	185							
30								205	270	315	335	350	355	350	320	270	195							
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	25	22	19	20	22	27	27	25	13							
MED								218	280	320	335	350	355	345	315	275	205							
UQ								228	285	325	342	352	355	350	325	285	220							
LQ								208	275	315	335	345	350	338	302	260	200							

NOV. 1970 | FOE (0.01 MHZ)

IONOSPHERIC DATA

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

Station AKITA | Lat. 39° 43.5' N | Long. 140° 08.2' E | Sweep 1 MHz to 20 MHz in 20 sec in 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	J X 23	J X 23	J X 25	E S 14	E S 14	E S 14	G	G	G 30	J X 38	G	J X 43	J X 46	G	G	25	J X 23	J X 26	J X 20	E S 14	E S 14	E S 14	E S 14
2	E S 14	J X 24	J X 27	J X 28	J X 18	E S 14	E S 14	G	G	C	C	C	G	G	G	G	J X 24	J X 36	J X 20	E S 14	E S 14	E S 14	J X 19	E S 14
3	E S 14	J X 18	E S 14	E S 14	E S 14	E S 14	E S 14	G	C	C	C	C	J X 39	G	G	J X 33	J X 28	E S 14	J X 24	J X 20	E S 14	J X 29	J X 26	J X 43
4	E S 14	J X 25	E S 14	J X 14	E S 14	E S 14	E S 14	G	C	C	C	C	C	G	G	G	J X 33	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	J X 19
5	E S 14	E S 14	E S 14	J X 18	E S 14	E S 14	E S 14	G	C	C	C	C	J X 57	E B 57	E B 40	33	26	J X 21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
6	J X 30	J X 44	J X 28	J X 19	J X 17	E S 14	E S 14	G	C	C	C	C	J X 54	J X 48	J X 70	J X 64	G	J X 44	J X 39	J X 37	J X 19	E S 14	E S 14	E S 14
7	J X 24	E S 14	J X 19	J X 29	J X 20	E S 14	E S 14	G	C	C	G	J X 43	G	J X 35	J X 43	J X 29	J X 34	J X 21	E B 19	E S 14	E S 14	E S 14	E S 14	E S 14
8	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	J X 28	J X 35	J X 59	G	37	G	J X 39	G	J X 38	J X 34	J X 28	J X 24	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
9	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	26	G	G	35	G	G	G	G	30	32	J X 35	J X 29	J X 23	J X 63	J X 21	E S 14	E S 14
10	E S 14	J X 18	J X 28	J X 26	J X 20	E S 14	E S 14	G	G	J X 38	J X 46	J X 41	J X 43	J X 39	G	J X 27	J X 34	E S 14	E S 14	E S 14	E S 14	J X 33	J X 35	J X 24
11	J X 29	J X 28	E S 14	E S 14	E S 14	E S 14	E S 14	G	G 27	G	G	J X 38	J G 31	J X 43	G	G	G	E S 14	E S 14	J X 46	E S 14	E	E S 14	E S 14
12	E S 14	E	E S 14	E	E	E	E S 14	G	G	J X 45	G	J X 39	G	G	G	32	J X 20	J X 28	J X 35	J X 22	E S 14	E S 14	J X 23	E S 14
13	E S 14	E S 14	E S 14	J X 18	E	E S 14	E S 14	G	G	J X 39	35	J X 49	G	G	C	C	C	J X 28	E S 14	J X 30	J X 20	E S 14	E S 14	E S 14
14	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	G	J X 32	G	G	G	J X 36	G	G	J G 24	J X 28	J X 28	J X 24	J X 20	J X 18	E S 14	E S 14	E S 14
15	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	G	G	G	G	G	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
16	E S 14	E S 14	E S 14	E S 14	E S 14	J X 26	J X 19	G	G	G	B	E B 59	E B 37	G	G	G	G	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 S 14	E S 14	E S 14	G	G	G	G	G	C	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	J X 29	J X 40
18	E S 14	J X 27	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	G	B	E B 60	G	E B 37	G	G	E S 14	E S 14	E S 14	J X 19	J X 24	E S 14	J X 58
19	E S 14	J X 17	E S 14	E S 14	E	E S 14	E S 14	G	G	J X 34	G	G	G	G	J G 29	G	J X 28	E S 14	E S 14	E S 14	E S 14	J X 18	J X 33	E S 14
20	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	G	G	G	C	C	C	G	G	G	G	E S 14	J X 47	J X 47	J X 28	J X 33	J X 18	J X 19
21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	G	36	G	G 31	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
22	J X 18	J X 20	J X 28	J X 20	J X 24	J X 26	E S 14	G	30	37	J X 56	36	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	J X 33
23	J X 27	J X 23	E S 14	E S 14	E	E S 14	E S 14	E B 21	G	G	G	G	G	G	G	J X 28	E B 21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
24	E S 14	E S 14	E S 14	E S 14	J X 16	E S 14	E S 14	G	34	35	35	G	G	G	G	G	E B 20	E S 14	E S 14	J X 25	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	G	G	G	G	G	G	G	G	G	G	E S 14	E S 14	E S 13	E S 13	E S 14	E S 15	E S 14
26	E S 14	E S 14	E S 14	E	E S 13	E S 13	E S 14	G	G	36	J X 39	J X 39	J X 54	J X 33	G	G	E B 19	J X 28	J X 28	J X 17	E S 14	E S 14	E S 14	E S 14
27	J X 17	J X 17	J X 19	J X 18	E	E S 14	E S 14	G	G	G	G	G	G	G	G	G	J X 23	J X 28	J X 19	J X 24	E S 14	E S 14	E S 14	E S 14
28	J X 59	J X 24	E S 14	J X 19	J X 22	E S 13	E S 14	G	G	33	G	G	G	G	G	G	J X 21	J X 20	J X 23	J X 21	E S 14	E S 14	E S 14	E S 14
29	E S 14	E S 14	E S 14	E S 14	E	E	E S 14	G	G	G	G	G	G	G	G	G	G	J X 21	J X 20	E S 13	E S 14	E S 13	E S 14	E S 14
30	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	G	G	G	G	G	G	G	G	G	G	E S 13	E S 14	E S 14	E S 15	E S 14	E S 15	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	25	24	23	23	27	30	29	29	29	30	30	30	30	30	30	30
MED	E S 14	E S 14	E S 14	14	14	E S 14	E S 14	G	G	G	G	G	G	G	G	G	21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
UQ	E S 14	J X 23	E S 14	J X 18	E S 14	E S 14	E S 14	G	G	34	35	38	J X 38	E G 31	G	28	J X 28	J X 28	J X 24	J X 22	E S 14	E S 14	E S 15	E S 14
LQ	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	G	G	G	G	G	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14

NOV. 1970 | FOES (0.1 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 14	E	18	15	E S 14	E S 14	E S 14	G	G	G 28	30	G	38	36	G	G	19	20	20	18	E S 14	E S 14	E S 14	E S 14
2	E S 14	E	20	16	15	E S 14	E S 14	G	G	C	C	C	G	G	G	G	24	21	E	E S 14	E S 14	E S 14	E	E S 14
3	E S 14	E	E S 14	E S 14	E S 14	E S 14	E S 14	G	C	C	C	C	36	G	G	20	23	E S 14	20	E	E S 14	18	E	28
4	E S 14	15	E S 14	14	E S 14	E S 14	E S 14	G	C	C	C	C	C	G	G	G	26	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E
5	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	G	C	C	C	C	42	E B 57	E B 40	33	24	20	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
6	20	28	18	15	14	E S 14	E S 14	G	C	C	C	C	44	44	55	31	G	34	31	30	19	E S 14	E S 14	E S 14
7	18	E S 14	19	19	18	E S 14	E S 14	G	C	C	G	39	G	35	43	29	31	20	E B 19	E S 14	E S 14	E S 14	E S 14	E S 14
8	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	25	34	55	G	37	G	37	G	35	32	25	24	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
9	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	25	G	G	35	G	G	G	G	30	29	29	25	22	27	20	E S 14	E S 14
10	E S 14	E	21	21	17	E S 14	E S 14	G	G	35	39	36	36	37	G	27	28	E S 14	E S 14	E S 14	E S 14	E	E	24
11	20	20	E S 14	E S 14	E S 14	E S 14	E S 14	G	G 23	G	G	36	G 27	35	G	G	G	E S 14	E S 14	E	E S 14	E	E S 14	E S 14
12	E S 14	E	E S 14	E	E	E	E S 14	G	G	34	G	29	G	G	G	31	28	20	34	20	E S 14	E S 14	E	E S 14
13	E S 14	E S 14	E S 14	14	E	E S 14	E S 14	G	G	34	U R 35	49	G	G	C	C	C	21	E S 14	22	19	E S 14	E S 14	E S 14
14	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	G	30	G	G	G	32	G	G	G 24	25	23	19	19	E	E S 14	E S 14	E S 14
15	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	G	G	G	G	G	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
16	E S 14	E S 14	E S 14	E S 14	E S 14	19	E	G	G	G	B	E B 59	E B 37	G	G	G	G	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 S 14	E S 14	E S 14	G	G	G	G	G	C	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E	29
18	E S 14	E	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	G	B	E B 60	G	E B 37	G	G	E S 14	E S 14	E S 14	E	E	E S 14	A
19	E S 14	E	E S 14	E S 14	E	E S 14	E S 14	G	G	31	G	G	G	G	G 27	G	22	E S 14	E S 14	E S 14	E S 14	E	E	E S 14
20	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	G	G	G	C	C	C	G	G	G	G	E S 14	40	34	22	20	18	E
21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	G	G	G	G	36	G	G 30	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
22	E	18	20	18	E	18	E S 14	G	30	35	37	36	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	30
23	20	18	E S 14	E S 14	E	E S 14	E S 14	E B 21	G	G	G	G	G	G	G	20	E B 21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
24	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	G	31	33	35	G	G	G	G	G	E B 20	E S 14	E S 14	E	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	G	G	G	G	G	G	G	G	G	G	E S 14	E S 14	E S 13	E S 13	E S 14	E S 15	E S 14
26	E S 14	E S 14	E S 14	E	E S 13	E S 13	E S 14	G	G	G	34	36	39	33	G	G	E B 19	E	23	15	E S 14	E S 14	E S 14	E S 14
27	E	E	19	17	E	E S 14	E S 14	G	G	G	G	G	G	G	G	G	21	22	E	E	E S 14	E S 14	E S 14	E S 14
28	A	18	E S 14	15	14	E S 13	E S 14	G	G	33	G	G	G	G	G	G	21	17	18	18	E S 14	E S 14	E S 14	E S 14
29	E S 14	E S 14	E S 14	E S 14	E	E	E S 14	G	G	G	G	G	G	G	G	G	G	E	E	E S 13	E S 14	E S 13	E S 14	E S 14
30	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	G	G	G	G	G	G	G	G	G	G	E S 13	E S 14	E S 14	E S 15	E S 14	E S 15	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	25	24	23	23	27	30	29	29	29	30	30	30	30	30	30	30
MED	E S 14	E S 14	E S 14	14	14	E S 14	E S 14	G	G	G	G	G	G	G	G	G	E G 20	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
UQ	E S 14	E S 14	E S 14	15	E S 14	E S 14	E S 14	G	G	32	34	36	35	E G 30	G	24	24	20	19	18	E S 14	E S 14	E S 14	E S 14
LQ	E S 14	E	E S 14	E S 14	E	E S 14	E S 14	G	G	G	G	G	G	G	G	G	G	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14

NOV. 1970 | FBES (0.1 MHZ)

IONOSPHERIC DATA

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

Station AKITA | Lat. 39° 43.5' N | Long. 140° 08.2' E | Sweep 1 MHz to 20 MHz in 20 sec in 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	E S 14	E	E S 14	E S 14	E S 14	14	14	15	14	15	14	14	16	15	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
2	E S 14	E S 14	E	E	E	E S 14	E S 14	14	14	C	C	C	17	16	16	14	14	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 S 14	E S 14	E S 14	E S 14	E S 14	E S 14	15	C	C	C	C	16	16	14	15	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
4	E S 14	E	E S 14	E	E S 14	E S 14	E S 14	14	C	C	C	C	C	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
5	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	14	C	C	C	C	18	57	40	18	16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
6	E S 14	E	E	E	E	E S 14	E S 14	15	C	C	C	C	19	14	19	14	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 S 14	E S 14	E	E	E S 14	E S 14	14	C	C	18	19	18	15	17	14	14	E S 14	19	E S 14	E S 14	E S 14	E S 14	E S 14
8	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	14	17	14	16	20	21	18	18	16	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
9	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	16	15	18	18	19	15	15	15	14	17	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
10	E S 14	E S 14	E	E	E	E S 14	E S 14	17	15	17	16	16	14	17	16	14	17	E S 14	E S 14	E S 14	E S 14	E S 14	E S 13	E S 14
11	E S 14	E	E S 14	E S 14	E S 14	E S 14	E S 14	14	15	15	16	16	17	14	17	15	14	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14
12	E S 14	E	E S 14	E	E	E	E S 14	15	15	15	18	18	19	14	16	14	14	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 S 14	E S 14	E	E	E S 14	E S 14	14	14	20	22	25	22	19	C	C	C	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
14	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	15	16	18	20	20	18	18	19	16	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
15	E S 14	E S 14	E S 14	E	E S 14	E S 14	E S 14	16	18	20	22	20	19	20	18	17	18	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 S 14	E S 14	E	E S 14	15	16	15	B	59	37	21	19	15	16	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 S 14	E S 14	E S 14	14	20	17	19	21	C	21	19	19	18	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 S 14	E S 14	E S 14	E S 14	E S 14	16	23	17	19	B	60	26	37	19	16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
19	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	15	17	18	21	21	19	19	15	16	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	16	16	C	C	C	19	16	15	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	14	14	14	18	20	19	18	16	16	14	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	15	16	17	19	18	20	18	18	16	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	E S 14	E S 14	21	18	20	23	21	19	24	15	18	21	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
24	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	14	19	19	20	20	22	20	18	15	20	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	14	18	19	23	19	21	20	19	15	15	E S 14	E S 14	E S 13	E S 13	E S 14	E S 15	E S 14
26	E S 14	E S 14	E S 14	E	E S 13	E S 13	E S 14	14	17	19	19	16	18	18	16	17	19	E S 14	E S 14	E	E S 14	E S 14	E S 14	E S 14
27	E S 14	E	E S 14	E	E	E S 14	E S 14	16	15	18	19	18	21	18	18	16	16	E S 14	E S 13	E	E S 14	E S 14	E S 14	E S 14
28	E S 14	E S 14	E S 14	E	E	E S 13	E S 14	16	18	15	18	17	19	19	18	16	14	E S 13	E S 14	E	E S 14	E S 14	E S 14	E S 14
29	E S 14	E S 14	E S 14	E S 14	E	E	E S 14	15	15	14	18	19	18	18	18	15	15	E S 14	E S 14	E S 13	E S 14	E S 13	E S 14	E S 14
30	E S 14	E S 14	E S 14	E S 14	E	E S 14	E S 14	16	17	16	19	18	18	19	14	18	15	E S 13	E S 14	E S 14	E S 15	E S 14	E S 15	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	25	24	24	24	27	30	29	29	29	30	30	30	30	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	15	16	17	19	19	19	18	17	15	15	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
UQ	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	16	18	18	20	20	20	20	18	16	16	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14
LQ	E S 14	E S 14	E S 14	E	E	E S 14	E S 14	14	15	15	18	18	18	16	16	15	14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14	E S 14

NOV. 1970 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

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

Station AKITA Lat. 39° 43.5' N Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in 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	270	260	265	270	280	315	I R 335	325	320	310	310	300	295	305	305	320	285	300	295	295	290	290	280
2	300	290	290	275	260	270	305	I R 340	320	C	C	C	305	290	300	305	330	310	305	300	290	285	S 300	300
3	270	270	285	290	300	285	310	R	C	C	C	C	300	300	305	300	315	300	315	310	280	295	305	295
4	290	280	265	255	270	275	315	I R 335	C	C	C	C	C	295	295	310	310	300	290	300	290	285	290	285
5	285	285	280	280	265	295	315	340	C	C	C	C	295	290	R 295	305	I R 310	305	305	305	290	290	285	285
6	295	I R 290	275	280	290	310	300	320	C	C	C	C	I R 305	300	300	300	315	300	300	310	290	275	265	265
7	275	260	250	260	265	275	280	I R 315	I C 325	I C 320	R 315	305	295	295	300	305	310	280	300	265	265	255	275	310
8	275	290	H 250	260	275	F	S 280	315	310	I R 310	305	305	305	310	315	305	320	310	310	285	280	285	280	285
9	275	265	270	280	F	300	290	330	330	325	315	300	305	I R 310	315	320	325	300	290	310	295	290	275	275
10	270	270	260	270	285	305	305	340	345	310	310	310	300	310	305	305	320	315	300	340	290	295	I A 260	275
11	275	285	260	255	260	275	300	320	I R 325	330	305	305	I R 300	I R 300	305	310	320	305	305	300	305	280	295	265
12	280	280	265	240	260	275	315	335	325	I R 320	320	310	305	305	305	315	315	305	295	315	300	315	285	290
13	285	275	270	260	275	280	305	330	335	315	315	310	I R 305	310	C	C	C	300	300	325	310	295	300	285
14	I R 270	255	260	275	280	280	295	330	320	I R 320	315	320	310	310	300	315	315	295	315	310	295	285	295	295
15	I R 280	285	275	265	255	275	305	345	340	I R 325	I R 310	315	315	300	310	310	330	310	305	310	310	300	285	295
16	280	290	285	285	280	285	30ո	325	345	I R 330	I R 315	I R 310	I R 305	310	I R 315	315	330	315	305	315	300	295	285	290
17	280	310	295	255	250	270	305	330	330	325	I R 325	315	I C 315	315	315	330	325	310	310	315	305	300	280	280
18	310	300	285	290	280	290	320	325	335	335	330	I R 315	305	320	320	335	335	310	330	315	325	295	305	I A 280
19	280	240	255	280	305	300	290	325	325	315	I R 310	I R 315	295	I R 300	305	305	305	310	295	295	305	300	280	285
20	310	315	300	300	280	280	310	330	340	R	C	C	C	R	320	325	I R 330	320	325	I R 315	330	310	290	300
21	300	285	285	295	285	S 285	300	320	I R 330	I R 325	320	I R 315	310	315	320	325	325	I R 330	275	315	260	280	270	270
22	250	245	255	270	265	285	270	295	325	320	325	325	I R 320	325	330	320	340	320	320	290	300	315	295	I R 280
23	295	260	260	260	280	270	310	330	340	330	320	320	305	I R 315	325	330	330	330	335	315	320	280	280	280
24	285	275	270	260	260	300	305	330	I R 340	325	320	325	I R 320	310	320	330	335	320	320	325	330	300	305	F
25	S 300	300	280	270	285	S 300	S 310	350	350	320	330	325	320	320	320	320	335	340	310	300	315	300	280	285
26	S 275	265	280	290	290	290	320	340	335	325	330	I R 325	320	310	330	335	340	325	305	320	305	285	285	285
27	285	290	280	285	310	345	310	I R 340	I R 340	I R 335	330	335	330	310	330	335	340	315	315	305	310	300	280	290
28	I A 285	285	300	320	295	285	310	340	335	345	I R 330	335	330	335	330	330	340	300	310	335	320	280	290	285
29	280	280	285	295	305	305	335	325	345	I R 340	330	330	325	325	325	330	345	325	320	315	335	290	275	260
30	285	290	295	305	315	315	320	350	S 345	335	300	310	320	330	330	340	315	335	320	325	325	285	285	280
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	29	29	30	29	26	24	24	24	28	29	29	29	29	30	30	30	30	30	30	29
MED	280	282	275	275	280	285	305	330	335	325	318	315	305	310	315	315	325	310	305	310	302	290	285	285
UQ	290	290	285	290	290	300	315	340	340	330	328	325	320	315	320	330	335	320	315	315	315	300	295	290
LQ	275	270	260	260	265	275	300	325	325	320	310	310	302	300	305	305	315	300	300	300	290	285	280	280

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

IONOSPHERIC DATA

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

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L										
2										C	C	C	L	L										
3										C	C	C	L	L										
4										C	C	C	C	L										
5										C	C	C	L	B										
6										C	C	C	L	L	A									
7										C	L	L	L	L										
8										L	L	L	L	L										
9										L	L	L	L	L										
10										L	L	L	L	L										
11										L	U L 380	L	L	L	L									
12										L	L	L	L	L	L									
13										L	L	L	L	L	C									
14										L	L	L	L	L										
15											L	L	L	L										
16										L	B	B	L	L										
17											L	L	C	L										
18											L	B	B	R										
19										L	L	L	L	L										
20										L	C	C	C	L										
21											L	L	L	L										
22											L	L	L											
23											L	L	L											
24										L	L	L	L	L										
25										L	L 395	L	U L 405	L										
26										L	L	L	L	L										
27										L	L	L	L	L	L									
28											L	U L 375	L	L										
29											U L 355	L	L	L										
30											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											3	1	1											
MED											U L 380	U L 375	U L 405											
UQ											388													
LQ											U L 368													

The Radio Research Laboratories, Japan

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

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										230	240	265	250	250										
2										C	C	C	260	250										
3										C	C	C	250	250										
4										C	C	C	C	255										
5										C	C	C	245	255										
6										C	C	C	250	255	255									
7										I C 240	245	250	240	250										
8										250	250	255	250	245										
9										245	250	250	250	255										
10										240	255	250	250	255										
11										230	245	245	250	260	260									
12										215	250	235	250	250	250									
13										235	250	235	230	230	C									
14										230	235	250	240	250										
15											240	245	250	250										
16										240	I B 250	245	255	250										
17											245	245	I C 240	240										
18											220	I B 250	245	240										
19										250	250	250	240	250										
20										235	C	C	C	260										
21											240	250	250	240										
22											230	230	235											
23											240	250	230											
24										245	235	250	240	225										
25										215	245	230	240	235										
26										230	245	235	245	225										
27										240	220	230	215	225	250									
28											240	230	245	240										
29											245	225	250	235										
30											240	245	230	250										
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										16	24	24	28	28	4									
MED										238	245	245	245	250	252									
UQ										242	250	250	250	252	258									
LQ										230	240	235	240	240	250									

NOV. 1970 | H'F2 (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	270	290	310	320	310	295	250	235	240	230	220	215	235	230	240	240	230	230	245	240	250	260	265	270
2	265	250	280	300	325	295	250	230	230	C	C	C	230	240	245	245	235	240	215	235	250	275	285	250
3	290	305	290	270	250	255	250	220	C	C	C	C	200H	230	240	230	230	220	230	205	280	265	250	280
4	255	295	305	340	330	290	240	220	C	C	C	C	C	235	240	240	215	220	220	220	250	260	250	250
5	270	280	280	295	305	250	220	215	C	C	C	C	IA 225	IB 235	245	240	235	230	235	215	240	250	260	270
6	285	280	310	290	255	230	215	235	C	C	C	C	235	245	IA 245	240	230	250	255	240	245	270	305	295
7	295	300	345	340	295	280	270	245	IC 240	IC 230	225	230	225	235	245	235	225	235	260	295	340	340	290	225
8	330	290	215H	330	270	290	290	250	245	230	235	240	235	225	240	240	235	220	230	245	290	290	285	290
9	290	300	280	270	240	265	255	235	225	230	235	230	235	240	240	235	220	220	240	245	IA 245	290	295	295
10	330	320	380	350	315	250	215	220	220	215	240	245	240	245	245	240	235	210	240	225	240	260	IA 375	IA 355
11	315	290	350	385	355	300	250	230	230	220	215	220	240	235	235	235	220	215	255	235	250	260	270	310
12	290	295	340	375	340	295	235	240	230	215	235	220	230	240	240	235	230	210	275	245	240	240	250	255
13	290	300	310	320	295	290	250	230	235	230	230	235	230	230	C	C	C	245	250	220	245	255	255	265
14	330	345	365	310	320	310	275	230	240	230	230	230	240	240	230	240	255	230H	230	245	245	260	260	265
15	300	290	300	330	345	300	245	220	220	230	230	215	230	240	240	215	230	210	220	220	230	290	285	250
16	250	260	290	280	305	310	250	225	225	215	IB 240	IB 235	230	240	235	220	230	200	245	215	245	260	270	265
17	270	250	260	250	270	320	245	225	235	235	230	230	IC 225	220	225	215	220	215	220	215	240	240	290	300
18	250	250	260	295	290	265	225	225	220	215	215	IB 220	IB 230	240	235	225	220	245	215	220	210	260	255	IA 320
19	330	390	390	300	245	250	240H	230	240	240	230	230	220	240	240	235	230	225	210	250	245	240	280	290
20	255	230	255	280	265	285	250	215	215	225	C	C	C	240	235	215	205	195	260	250	225	250	290	250
21	290	290	290	285	260	295	250	225	215	220	225	230	230	230	225	220	215	195	230	250	340	320	340	340
22	300	420A	360	330	340	280	310	255	240	235	230	225	225	230	235	215	210	200	210	245	245	240	265	IA 300
23	310	320	315	340	300	310	225	210	215	220	230	215	220	235	225	225	220	205	215	245	235	260	300	300
24	295	305	330	350	350	290	245	225	210	215	215	235	230	215	235	220	205	200	230	230	220	235	240	320
25	270	290	300	330	290	250	215	205	215	200	195	225	200	215	225	215	205	200	240	235	215	245	275	300
26	300	300	295	260	255	230	230	205	205	220	215	220	230	215	215	215	205	200	220	215	240	290	305	320
27	300	300	320	305	250	195	260	225	210	215	215	230	210	205	235	220	210	200	205	240	240	255	320	305
28	IA 330	320	280	240	270	300	240	210	205	225	230	205	230	230	230	225	210	205	240	215	240	290	340	330
29	310	295	310	285	250	245	230	205	210	220	205	215	195H	235	215	215	215	205	245	235	205	240	340	340
30	315	305	290	250	250	215	230	215	210	225	230	220	220	220	220	210	230	205	210	220	220	290	310	310
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	26	25	24	24	28	30	29	29	29	30	30	30	30	30	30	30
MED	292	295	302	302	292	288	245	225	222	225	230	228	230	235	235	225	220	212	230	235	242	260	285	295
UQ	310	305	330	330	320	295	250	230	235	230	230	230	232	240	240	240	230	230	245	245	250	290	305	310
LQ	270	290	280	280	255	250	230	215	215	215	215	220	222	230	230	215	215	200	220	220	235	250	260	265

The Radio Research Laboratories, Japan

NOV. 1970 | H'F (KM)

IONOSPHERIC DATA

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

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

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	105	100	100	S	S	S	G	G	110	110	G	105	100	G	G	105	100	100	100	S	S	S	S
2	S	115	100	100	100	S	S	G	G	C	C	C	G	G	G	G	100	105	105	S	S	S	100	S
3	S	100	S	S	S	S	S	G	C	C	C	C	100	G	G	105	100	S	100	100	S	105	105	100
4	S	100	S	100	S	S	S	G	C	C	C	C	C	G	G	G	100	S	S	S	S	S	S	105
5	S	S	S	100	S	S	S	G	C	C	C	C	100	B	B	140	105	100	S	S	S	S	S	S
6	105	100	100	100	105	S	S	G	C	C	C	C	105	105	105	105	G	100	100	100	100	S	S	S
7	105	S	105	100	100	S	S	G	C	C	G	105	G	105	100	100	100	100	B	S	S	S	S	S
8	S	S	S	S	S	S	130	120	115	G	150	G	110	G	105	100	100	100	S	S	S	S	S	S
9	S	S	S	S	E	S	S	150	G	G	140	G	G	G	G	140	120	100	100	100	110	105	S	S
10	S	105	105	105	105	S	S	G	G	105	105	105	100	100	G	100	120	S	S	S	S	110	105	105
11	100	100	S	S	S	S	S	G	105	G	G	100	100	100	G	G	G	S	S	110	S	E	S	S
12	S	E	S	E	E	E	S	G	G	110	G	105	G	G	G	140	125	140	110	110	S	S	105	S
13	S	S	S	100	E	S	S	G	G	120	110	105	G	G	C	C	C	110	S	110	105	S	S	S
14	S	S	S	E	E	S	S	G	110	G	G	G	100	G	G	100	100	100	100	100	100	S	S	S
15	S	S	S	E	S	S	S	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S	S
16	S	S	S	S	S	105	100	G	G	G	B	B	B	G	G	G	G	S	S	S	S	S	S	S
17	S	S	S	S	S	S	S	G	G	G	G	G	C	G	G	G	G	S	S	S	S	S	105	105
18	S	100	S	S	S	S	S	G	G	G	G	B	B	G	B	G	G	S	S	S	105	105	S	105
19	S	105	S	S	E	S	S	G	G	110	G	G	G	G	100	G	110	S	S	S	S	100	100	S
20	S	S	S	S	E	S	S	G	G	G	C	C	C	G	G	G	G	S	105	105	105	100	100	100
21	S	S	S	S	S	S	S	G	G	G	G	120	G	110	G	G	G	S	S	S	S	S	S	S
22	100	100	100	100	105	100	S	G	120	115	115	110	G	G	G	G	G	S	S	S	S	S	S	100
23	100	100	S	S	E	S	S	B	G	G	G	G	G	G	G	100	B	S	S	S	S	S	S	S
24	S	S	S	S	100	S	S	G	120	115	110	G	G	G	G	G	B	S	S	100	S	S	S	S
25	S	S	S	S	S	S	S	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S	S
26	S	S	S	E	S	S	S	G	G	130	105	105	100	100	G	G	B	100	100	100	S	S	S	S
27	100	100	100	100	E	S	S	G	G	G	G	G	G	G	G	G	105	100	100	105	S	S	S	S
28	100	100	S	100	100	S	S	G	G	115	G	G	G	G	G	G	105	100	100	100	S	S	S	S
29	S	S	S	S	E	E	S	G	G	G	G	G	G	G	G	G	G	100	100	S	S	S	S	S
30	S	S	S	S	E	S	S	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S	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	7	13	7	11	7	2	2	2	5	9	8	8	9	7	4	10	14	14	12	13	6	6	7	7
MED	100	100	100	100	100	102	115	135	115	115	110	105	100	100	102	102	105	100	100	100	105	105	105	105
UQ	102	105	102	100	105				120	115	128	108	105	105	105	140	110	100	102	105	105	105	105	105
LQ	100	100	100	100	100				110	110	108	105	100	100	100	100	100	100	100	100	100	100	100	100

NOV. 1970 | H'ES (KM)

IONOSPHERIC DATA

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

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

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	F2	F1						L1	L1		L2	L2			L1	L1	F1	F1				
2		F1	F2	F2	F1												L2	L2	F1				F1	
3		F1											L2			L1	L1		F4	F2		F1	F1	F2
4		F2		F1													L2							F1
5				F1									L2			H1	L1	L2						
6	F1	F2	F2	F1	F1								L1	L2	L2	L1		L3	F2	F2	F1			
7	F1		F1	F2	F1							L1		L2	L2	L2	L2	L1						
8							H2	C2	C2		H1		L1		L2	L2	L1	L2						
9								H1			H1					H1	C1	L2	F1	F1	F2	F2		
10		F1	F1	F2	F1					L2	L2	L2	L2	L1		L2	C2					F1	F2	F2
11	F1	F2							L2			L1	L1	L1						F1				
12										L1		L1				H1	H2	F1	F3	F2			F1	
13				F1						C1	L1	L2						F2		F2	F2			F2
14									L1				L1			L1	L2	F2	F1	F1	F1			
15																								
16						F2	F1																	
17																							F1	F1
18		F2																			F1	F2		F2
19		F1								L1					L1		L2					F2	F2	
20																			F2	F3	F2	F1	F1	F1
21												C1		L1										
22	F1	F2	F2	F2	F1	F2			C1	C1	C1	L1												F1
23	F1	F2														L1								
24					F1				C1	C1	L1									F1				
25																								
26										H1	L1	L2	L1	L1				F1	F1	F1				
27	F1	F1	F1	F1													L2	F3	F1	F1				
28	F3	F2		F1	F1					C2							L2	F1	F1	F1				
29																		F1	F2					
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																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1970 | TYPES OF ES

IONOSPHERIC DATA

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

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

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	44	40	40	39	38	40	63	95	117	131	124	122	130	133	127	115	111	89	74	71	69	62	53	47
2	45	43	37	38	37	38	61	105	124	126	127	135	138	138	134	126	106	86	81	66	58	55	56	56
3	40	41	J 44 R	46	40	38	55	J 101 R	J 105 R	J 108 R	109	124	131	136	124	111	109	101	I 84 R	64	50	I 52 C	51	51
4	45	41	J 42 R	41	41	42	C	C	C	123	136	146	138	141	140	129	118	98	81	69	55	56	51	49
5	46	46	46	I 44 R	41	46	63	91	113	118	138	135	151	145	140	131	114	96	88	77	59	56	54	58
6	58	56	51	54	49	51	H 52	91	122	146	136	141	132	131	131	131	126	101	96	90	69	61	56	51
7	51	46	45	46	46	49	66	109	129	138	150	135	120	119	122	116	102	86	86	72	68	75	79	71
8	51	56	H 48	52	55	52	J F 74	F 115	126	131	133	126	122	115	104	96	100	80	68	48	49	51	48	47
9	42	40	41	38	H 34	34	48	86	J 105 R	101	126	119	126	126	119	111	J 101 R	81	70	61	46	41	39	38
10	38	36	F	38	36	40	46	86	91	J 105 R	126	131	129	141	139	126	112	96	J 82 R	66	62	51	41	42
11	42	41	36	36	39	43	59	100	111	129	134	129	135	137	134	122	J 106 R	89	69	J 69 R	51	46	46	39
12	40	38	38	36	40	42	60	95	119	132	136	121	123	129	119	120	J 104 R	87	61	66	54	J 55 R	41	37
13	36	36	36	36	38	39	56	J 104 R	128	113	122	131	122	122	117	116	106	71	73	J 80 R	51	43	39	35
14	36	36	36	36	36	36	50	J 105 R	126	130	124	116	132	131	110	94	106	89	69	44	38	41	38	37
15	37	36	36	35	34	34	49	99	95	115	109	113	117	127	119	102 R	90	76 R	62	54	43	42	42	39
16	39	37	34	35	35	34	46	93	114	J 120 R	B	111	114	117	116	J 104 R	96	88	66	59	51	46	41	41
17	40	40	30	30	31	31	51	90	112	122	125	119	110	114	119	101	92	89	72	66	50	46	45	46
18	45	41	38	38	39	38	49	86	J 102 R	109	113	I 110 R	124	122	121	106	90	85	81	J 64 R	54	39	39	39
19	36	31	32	39	36	36	46	80	109	123	131	141	119	122	119	113	101	87	J 77 R	60	57	51	46	J 49 R
20	50	47	34	32	35	36	48	96	96	109	117	113	119	108	127	106	98	64	57	59	49	40	40	39
21	39	40	36	38	37	38	48	94	104	110	122	121	126	124	111	107	94	89	58	56	50	59	52	51
22	54	47	52	56	58	68	66	90	139	152	146	126	116	110	107	106	88	70	J 64 R	51	J 53 R	51	40	36
23	34	30	31	31	32	31	45	90	J 100 R	110	122	128	122	129	114	109	96	84	68	48	46	37	38	38
24	41	36	36	35	33	30	41	86	117	97	113	134	142	126	118	108	99	73	61	60	52	41	36	36
25	36	39	38	37	39	36	41	86	86	J 102 R	128	136	128	131	128	120	101	74	48	46	51	38	36	36
26	36	37	36	38	41	36	41	70	76	101	121	132	135	137	113	101	92	66	46	36	33	30	31	31
27	34	34	31	34	36	26	35	66	89	108	131	115	112	95	J 103 R	113	96	66	45	36	41	38	36 R	36
28	38	J 42 R	41	40	34	31	41	J 85 R	81	95	J 104 R	106	102	109	101	104	96	67	57	60	37	27	31	33
29	34	34	34	34	37	29	36	75	89	88	104	100	C	C	C	C	C	60	47	51	42	26	27	30
30	33	35	37	40	S 41	25	36	67	86	81	101	114	115	123	110	95	85	66	49	38	36	30	31	33
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	29	30	30	30	29	29	29	30	29	30	29	29	29	29	29	30	30	30	30	30	30	30
MED	40	40	37	38	38	37	49	91	109	114	125	125	124	126	119	111	101	86	68	60	51	46	41	39
UQ	45	42	41	40	41	42	59	99	119	129	133	134	132	133	127	120	106	89	81	66	55	55	51	49
LQ	36	36	36	35	35	34	45	86	95	105	117	115	119	119	113	104	96	71	58	51	46	39	38	36

NOV. 1970 | FOF2 (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

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

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

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

The Radio Research Laboratories, Japan

NOV. 1970 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1970 | FOE (0.01 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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	230	300	330	350	350	370	355	A	A	A	B						
2							B	255	A	R	I R 355	370	365	360	I R 340	R	200	B						
3							B	A 300	345	365	I R 365	R	R	R	A	A	A							
4							C	C	C	A	A	A	A	A	A	A	A	A						
5							A	255	A	330	355	360	360	B	355	300	230	S						
6							B	230	280	315	I R 335	345	360	355	R	A	A	A						
7							B	225	305	A	R	350	355	345	325	A	A	B						
8							B	220	270	A	A	A	350	A	A	A	A	B						
9							B	175	285	R	R	350	350	340	325	R	A	A						
10							A	210	I A 270	R 335	345	350	365	R 350	A	R	A	A						
11							A	230	R 285	R	340	350	R	R 350	A	A	A	A						
12							B	A	290	340	350	R 360	I A 360	355	325	275	A	A						
13							B	230	290	R	A	R	I A 360	360	325	290	A	A						
14							B	245	A	A	360	370	375	360	335	275	A	B						
15							B	220	300	320	A	A	A	A	I A 325	290	A	B						
16							B	230	275	325	B	B	R	R	A	I R 275	210	B						
17							B	A	A	A	A	R	R	A	A	R	A	A						
18							B	225	B	340	I R 340	B	B	360	R	A	A	B						
19							B	220	A	A	A	R	360	350	320	A	A	A						
20							B	180	R	320	I R 345	I R 355	I A 350	340	325	A	A	B						
21							B	220	270	325	A	A	A	A	310	255	185	B						
22							B	A	265	310	A	A	A	340	R	R	A	A						
23							B	A	260	310	I R 335	345	335	335	310	R	A	A						
24							B	R	A	300	A	A	I R 345	I R 340	I R 325	I R 270	R	B						
25							B	190	R	310	B	I R 320	I R 330	335	310	R	A	B						
26							B	230	A	A	R	345	I R 340	I R 320	300	I R 260	I R 200	B						
27							B	185	275	315	320	335	340	I R 325	305	I R 270	230	A						
28							B	175	A	295	330	340	345	330	305	260	A	B						
29							B	220	I R 270	320	I A 340	R	C	C	C	C	C	B						
30							B	210	270	R	R	350	I R 335	I R 325	310	I R 270	R	B						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								23	18	18	15	18	20	21	18	12	6							
MED								220	278	320	345	350	352	345	325	272	205							
UQ								230	290	330	352	360	360	355	325	282	230							
LQ								210	270	310	I 338	345	342	335	310	I R 265	200							

NOV. 1970 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1970 | 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

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

NOV. 1970 | FOES (0.1 MHZ)

IONOSPHERIC DATA

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

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

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

NOV. 1970 | FBES (0.1 MHZ)

IONOSPHERIC DATA

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

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20 sec in 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	14	13	14	E S 15	E S 15	14	13	15	14	15	16	15	15	23	15	15	14	13	E S 15	E S 15	14	14	14	E S 15
2	E S 15	14	14	13	12	13	16	14	15	15	24	15	15	15	18	15	14	15	14	E S 15	E S 15	E S 15	E S 15	14
3	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	16	14	15	15	14	19	19	20	15	15	14	14	14	12	E S 15	E S 15	E S 15	E S 15
4	14	E S 15	13	13	14	14	C	C	C	15	15	23	15	15	15	14	14	14	14	E S 15	E S 15	E S 15	13	E S 15
5	E S 15	E S 15	13	13	E S 15	E S 15	15	15	18	16	16	18	24	51	28	16	15	E S 15	E S 15	13	14	13	E S 15	E S 15
6	13	13	E S 15	14	13	13	15	15	16	15	24	15	15	16	15	15	14	14	E S 15	13	E S 15	E S 15	E S 15	E S 15
7	E S 15	E S 15	E S 15	13	14	13	15	14	14	15	21	15	16	15	16	15	14	14	E S 15	E S 15	E S 15	E S 15	13	13
8	13	14	14	13	13	13	14	14	14	16	16	24	16	15	15	15	15	13	13	E S 15	E S 15	E S 15	E S 15	E S 15
9	14	E S 15	14	14	12	13	16	14	14	14	15	14	15	14	16	15	14	15	14	E S 15	E S 15	E S 15	E S 15	13
10	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	15	14	14	15	15	15	15	15	15	13	14	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
11	13	E S 15	E S 15	E S 15	13	E S 15	15	15	15	15	18	15	23	15	15	14	14	14	15	E S 15	E S 15	E S 15	E S 15	E S 16
12	E S 15	E S 15	E S 15	E S 15	E S 15	14	15	15	15	15	16	15	19	22	15	15	15	14	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
13	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	13	14	15	19	25	26	24	25	15	15	14	14	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
14	13	E S 15	E S 15	E S 15	13	E S 15	14	14	15	26	22	25	26	26	22	15	14	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
15	14	E S 15	12	14	14	14	16	16	15	17	26	26	26	17	22	16	15	14	E S 15	E S 15	E S 15	14	14	E S 15
16	14	14	14	12	13	12	14	14	18	16	B	43	28	26	16	15	14	15	13	13	13	E S 15	E S 15	E S 15
17	E S 15	E S 15	14	14	13	E S 15	13	15	15	23	26	25	28	16	20	23	15	13	13	13	13	E S 15	E S 15	14
18	E S 15	E S 15	13	E S 15	E S 15	13	13	14	34	14	26	B	50	25	26	19	14	13	13	13	13	E S 15	E S 15	E S 15
19	E S 15	E S 15	E S 15	13	13	13	15	13	14	14	15	26	25	15	15	15	13	13	13	E S 15	E S 15	E S 15	E S 15	13
20	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	15	15	22	15	15	15	16	15	14	14	12	14	E S 15	14	E S 15	E S 15	E S 15	E S 15
21	E S 15	12	13	14	E S 15	E S 15	14	14	14	15	29	18	17	18	15	15	15	14	14	14	E S 15	E B 14	E B 14	E S 15
22	13	12	13	13	12	14	15	14	16	15	15	16	20	19	14	15	15	15	14	E S 15	14	E S 15	E S 15	E S 15
23	E S 16	14	E S 15	12	13	E S 15	14	14	15	24	18	25	15	15	15	15	15	15	14	12	E S 15	E S 15	E S 16	E S 15
24	E S 15	E S 15	E S 15	E S 15	E S 15	13	15	15	16	19	23	20	25	13	23	16	18	15	14	E S 15	13	E S 15	E S 15	E S 15
25	E S 15	E S 15	E S 15	13	13	13	13	16	18	23	35	25	25	26	19	19	14	13	14	13	E S 15	E S 15	E S 15	E S 15
26	E S 15	13	E S 15	E S 15	13	E S 16	13	15	15	18	23	24	23	19	15	15	15	13	13	E S 15	E S 15	E S 15	E S 15	E S 16
27	E S 15	13	13	12	13	E S 15	13	15	15	15	15	22	26	17	18	15	15	13	14	E S 15	13	13	E S 15	E S 15
28	E S 15	E S 15	14	13	13	E S 15	15	14	15	15	15	15	16	16	15	15	14	13	E S 15	13	E S 15	14	14	E S 15
29	13	E S 15	13	13	12	14	15	15	15	16	16	18	C	C	C	C	C	16	13	E S 15	E S 15	12	13	13
30	13	E S 15	14	14	14	14	14	14	15	15	15	15	25	18	15	16	15	15	E S 15	E S 15	E S 15	E S 16	E S 15	E S 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	29	29	30	30	30	29	29	29	29	29	30	30	30	30	30	30	30
MED	E S 15	E S 15	13	14	13	14	15	14	15	15	17	18	20	17	15	15	14	14	14	E S 15	E S 15	E S 15	E S 15	E S 15
UQ	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	15	15	16	17	24	25	25	22	18	15	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
LQ	14	14	13	13	13	13	14	14	15	15	15	15	16	15	15	15	14	13	14	13	14	E S 15	E S 15	E S 15

NOV. 1970 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	290	300	295	280	275	285	325	335	335	335	325	300	305	305	305	305	320	315	310	315	310	310	305	290
2	300	310	290	295	260	280	325	345	340	325	325	305	300	295	300	300	330	295	315	305	285	275	275	290
3	280	270	295 J R	305	295	290	300	350 J R	335 J R	320 J R	310	305	305	310	300	300	305	310	300 I R	315	270	285 I C	295	300
4	290	290	265 J R	270	275	285	C	C	C	315	310	310	290	300	300	305	315	315	320	305	280	295	295	290
5	270	290	300	280 I R	290	285	335	345	335	315	310	305	310	305	300	310	315	310	310	310	305	295	285	285
6	290	295	265	275	300	335	305 H	330	320	325	315	315	305	305	310	300	300	300	315	320	295	285	270	280
7	285	260	260	265	280	265	300	330	325	320	355	320	305	305	295	300	305	295	300	285	255	265	275	325
8	270	270	245 H	260	290	290	285 J F	330 F	340	325	330	300	305	305	315	315	330	315	320	315	280	320	310	290
9	300	290	305	290	280 H	295	325	325	345 J R	330	325	305	310	310	305	315	320 J R	310	305	330	285	270	280	280
10	265	275	F	265	290	310	315	340	350	310 J R	315	320	305	310	310	300	320	320	315 J R	305	295	280	275	280
11	285	300	255	260	255	290	305	325	325	335	320	310	305	310	315	320	320 J R	315	305	305 J R	300	290	285	290
12	285	275	275	245	255	295	320	325	335	325	330	315	305	310	305	310	320 J R	320	310	320	305	315 J R	295	295
13	260	270	270	270	275	265	295	325 J R	340	325	310	330	305	300	300	315	335	300	300	325 J R	315	310	285	280
14	255	255	255	280	255	270	300	325 J R	345	335	290	300	310	310	300	300	325	335	330	335	285	300	290	285
15	285	295	265	255	250	265	300	365	350	330	325	320	315	315	320	335 R	320	330 R	330	315	295	295	300	295
16	290	290	280	285	270	270	310	335	340	325 J R	B	315	300	305	315	310 J R	315	325	310	325	320	305	305	290
17	265	310	300	250	250	260	315	345	295	330	320	325	320	300	320	305	315	315	310	320	305	300	285	290
18	290	300	290	275	270	300	310	335	345 J R	330	325	305 I R	305	300	305	310	320	325	300	320 J R	330	260	285	255
19	250	260	250	260	270	295	285	315	330	320	310	315	295	300	295	295	300	300	300 J R	300	300	315	280	280 J R
20	300	340	275	275	270	285	305	335	345	340	330	320	310	295	315	330	340	315	300	335	325	305	290	280
21	295	315	290	285	270	275	310	350	345	335	330	320	320	320	310	320	320	325	295	305	250	245	270	255
22	260	235	250	250	245	275	260	295	325	340	315	315	310	320	325	330	335	300	320 J R	315	280 J R	305	285	280
23	295	270	265	270	265	270	310	345	350 J R	325	320	320	305	320	320	310	315	320	330	320	325	295	265	285
24	285	265	255	280	270	265	305	315	290	330	310	305	315	320	310	330	335	315	310	315	325	300	290	280
25	250	290	275	270	280	305	315	350	330	325 J R	315	315	295	315	315	335	340	325	340	290	330	290	300	270
26	270	275	260	300	295	270	305	345	340	325	315	330	315	320	320	330	335	335	325	315	310	305	275	285
27	275	290	285	265	305	270	285	340	350	320	335	320	335	315	310 J R	335	350	335	340	310	300	315	300 R	290
28	270	275 J R	315	310	305	265	305	355 J R	335	335	335 J R	330	315	330	315	325	365	330	315	350	335	265	255	270
29	270	280	275	280	325	285	285	350	345	340	350	330	C	C	C	C	C	335	310	320	335	275	255	255
30	270	275	295	290	330 S	285	295	335	350	320	320	325	295	315	330	325	330	320	330	300	305	275	270	265
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	29	30	30	30	29	29	29	30	29	30	29	29	29	29	29	30	30	30	30	30	30	30
MED	282	285	275	275	275	285	305	335	340	325	320	315	305	310	310	310	320	315	310	315	302	295	285	285
UQ	290	295	290	285	290	290	315	345	345	335	330	320	310	315	315	325	335	325	320	320	320	305	295	290
LQ	270	270	260	265	265	270	300	325	330	320	315	305	305	305	300	305	315	310	305	305	285	275	275	280

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

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L	L								
2									L	L	L	L	L	L	L	L								
3										L	L	L	L	L	L	L								
4							C	C	C	L	L	L	L	L	L									
5										L	L	L	L	L										
6									L	L	L	L	L	L	L									
7											L	L	L	L	L	L								
8										L	A	L	L	L	L									
9										L	L	L	L	L	L	L								
10									L	L	L	L	L	L										
11									L	L	L	L	L	L										
12									L	L	L	L	L	L	L									
13									L	L	L	L	L	L										
14										L		L	L	L										
15											L	L	L		L									
16										L	B	L	L	L	L	L								
17									L	L	L	L	L	L	L									
18											L	B		L										
19										L	L	L	L	L	L									
20											L	L	L	L	L	A								
21										L	L	L	L			L								
22										L	L	L	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	L	L								
27										L	L	L	L	L	L									
28										L	L	L	L	L	L									
29									L		L	L	C	C	C	C	C							
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																								
MED																								
UQ										.														
LQ																								

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

IONOSPHERIC DATA

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

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N Long. 139° 29.3' E Sweep 1 MHz to 20 MHz in 20 sec in 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	240	240	260	250	250	230								
2									230	250	245	250	255	250	250	250								
3										245	240	250	290	260	250	240								
4							C	C	C	250	255	250	250	250	250									
5										240	245	245	285	270										
6									240	250	245	245	250	250	250									
7											255	245	290	280 H	280	245								
8										230	245	260	245	240	230									
9										250	250	245	250	250	250	240								
10									240	235	250	240	255	260										
11									245	250	245	245	260	250										
12									240	250	245	245	245	255	250									
13									240	240	240	250	240	250										
14										235		275 L	270	240										
15											220	250	260		240									
16										230	I B 250	240	255	250	250	240								
17									250	250	250	250	250	250	250									
18											240	B	260	245										
19										250	250	250	250	285	260									
20											230	230	250	230	245	230								
21										240	240	240	255			245								
22										245	245	240	240	250		250								
23										245	250	250	245	250										
24										245	250	250	250	250	250									
25										250	250	240	250	250	250									
26										250	250	250	250	250	240	240								
27										250	250	250	250	240	250									
28										230	235	230	230	245	240									
29									245		240	245	C	C	C	C	C							
30										240	250	250	240	245	250	260								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									8	25	29	29	29	27	20	11								
MED									240	245	245	245	250	250	250	240								
UQ									245	250	250	250	255	250	250	248								
LQ									240	240	240	240	250	248	248	240								

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NOV. 1970 | H'F2 (KM)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	260	260	290	300	300	290	240	225	225	205	230	205	220	230	230	230	230	220	250	230	240	250	245	260
2	255	245	245	275	330	290	250	230	230	210	220	210	240	220	210	240	230	210	230	215	245	285	285	245
3	250	310	285	250	250	265	245	240	235	210	205	205	225	240	240	235	245	230	210	205	275	260	260	250
4	250	300	320	330	340	300	C	C	C	240	240	230	240	240	240	240	240	250	245	240	250	250	230	260
5	280	295	280	290	300	255	240	230	235	220	205	200	230	E B 245	245	245	225	220	240	230	220	255	260	275
6	255	260	290	290	245	220	H 210	230	220	220	230	210	240	240	240	240	245	240	245	240	245	245	300	250
7	285	270	325	340	300	300	285	240	240	225	H 210	220	225	H 220	H 225	220	220	210	260	260	300	310	260	220
8	250	320	H 230	325	270	290	295	250	225	220	I A 230	220	230	225	225	225	230	220	230	220	300	290	270	270
9	250	280	270	240	H 220	260	250	220	220	240	220	240	240	240	240	240	230	230	275	235	210	265	260	300
10	300	330	340	310	295	240	230	230	210	200	H 200	200	240	250	240	230	235	245	235	210	235	255	320	300
11	290	260	350	350	345	290	250	225	240	210	240	200	240	240	245	245	230	230	240	240	235	245	250	250
12	265	295	320	390	350	295	245	240	220	240	205	240	240	240	240	245	215	230	215	240	245	240	240	250
13	300	330	310	315	300	300	260	240	240	230	210	240	220	240	245	245	235	210	250	230	210	240	260	300
14	300	330	350	300	310	320	280	245	245	235	230	220	H 225	230	215	220	230	220	220	220	A 290	250	255	270
15	280	260	280	320	300	330	255	220	225	230	225	220	220	230	230	225	220	210	220	220	230	270	270	250
16	255	250	260	260	290	305	255	230	225	210	I B 235	230	240	240	240	240	235	230	230	210	240	245	250	270
17	265	245	240	360	390	345	250	240	240	240	240	240	240	240	240	230	240	230	220	215	220	250	265	275
18	260	295	255	300	300	260	245	220	240	240	240	B	B	240	245	240	230	230	240	215	220	240	250	315
19	A 390	390	400	315	240	280	250	240	245	240	240	240	240	240	240	240	235	240	240	210	250	245	290	290
20	270	240	260	300	290	300	255	230	215	220	225	220	225	230	230	I A 225	A 220	200	230	240	230	250	260	290
21	260	250	260	280	280	300	260	230	225	225	230	220	240	230	225	220	220	220	205	A 270	300	315	250	295
22	320	A 420	375	340	350	295	310	260	240	240	240	220	230	240	245	240	220	200	240	235	290	240	235	275
23	280	320	310	360	315	340	250	235	230	240	240	240	230	240	245	240	215	230	230	230	240	250	310	290
24	250	300	360	280	350	300	260	220	210	230	240	210	240	240	230	240	225	205	250	240	230	240	240	300
25	280	290	300	310	290	250	250	220	215	210	230	200	240	210	210	240	215	205	205	260	240	250	280	300
26	315	310	310	280	250	290	240	210	210	240	230	240	240	240	220	230	225	200	210	240	240	280	305	320
27	300	290	335	320	250	E B 250	250	230	235	220	210	240	240	210	240	245	240	210	210	240	260	245	280	290
28	300	300	250	250	255	315	260	230	220	220	230	220	220	220	230	240	220	230	255	220	220	255	345	330
29	300	290	300	280	240	250	290	220	230	230	230	H 200	C	C	C	C	C	200	240	245	230	205	325	350
30	330	305	290	260	225	240	240	225	225	210	240	240	230	210	240	220	230	200	220	220	250	285	310	340
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	29	29	29	30	30	29	28	29	29	29	29	30	30	30	30	30	30	30
MED	280	292	295	300	298	290	250	230	225	225	230	220	240	240	240	240	230	220	232	230	240	250	260	282
UQ	300	310	325	325	315	300	260	240	240	240	240	240	240	240	240	240	235	230	245	240	250	265	290	300
LQ	255	260	260	280	250	260	245	225	220	210	220	210	225	230	230	230	220	210	220	220	230	245	250	260

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NOV. 1970 | H'F (KM)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	B	100	100	S	B	B	180	G	105	105	105	100	G	105	105	105	105	105	105	100	100	100	S
2	S	100	B	B	B	100	105	G	140	G	G	G	100	G	G	G	110	B	B	100	100	100	S	B
3	S	S	S	S	S	100	B	135	G	G	G	G	G	G	G	100	100	100	100	100	100	S	100	S
4	B	S	100	100	B	B	C	C	C	105	105	105	100	100	100	100	100	100	100	100	100	100	100	S
5	S	S	B	B	S	S	100	G	110	G	105	100	G	B	G	140	130	100	95	100	100	100	100	S
6	B	B	S	B	100	100	B	170	150	G	G	G	G	G	G	100	100	100	100	100	100	S	S	S
7	S	110	100	100	100	100	B	180	G	115	105	G	G	100	G	110	100	100	100	105	105	S	130	100
8	100	100	100	B	100	B	130	120	115	110	110	110	150	105	110	105	100	100	100	100	100	100	100	100
9	100	100	B	100	100	B	150	G	180	G	G	G	G	G	G	G	115	110	100	100	S	100	100	100
10	100	S	S	S	S	S	100	G	100	100	105	100	100	G	100	100	130	110	110	S	S	S	S	S
11	B	S	S	100	B	S	100	G	G	G	G	G	G	100	100	100	100	100	100	100	100	100	S	100
12	100	S	S	S	S	B	B	130	G	G	G	100	100	G	140	175	145	120	100	110	110	100	100	100
13	100	100	100	100	100	S	100	G	G	G	120	G	120	130	120	G	110	100	S	S	100	S	100	S
14	B	S	S	S	B	S	B	G	115	110	105	105	G	G	105	125	100	100	105	105	105	105	105	105
15	B	S	B	100	B	B	B	G	G	115	115	115	110	105	105	105	115	100	S	S	S	100	100	S
16	B	B	B	B	B	105	100	G	G	G	B	B	G	G	110	110	105	B	B	100	B	S	S	S
17	S	S	B	B	B	S	B	120	120	110	110	G	110	110	110	110	110	110	110	110	100	100	100	B
18	100	100	B	S	S	B	B	150	B	G	G	B	B	G	G	110	110	B	B	B	B	100	100	100
19	100	100	100	100	100	100	100	G	130	115	110	G	G	G	G	110	100	100	100	S	110	110	100	100
20	100	100	S	S	S	S	B	150	G	110	G	110	110	105	100	110	105	105	110	100	100	100	100	100
21	S	B	100	B	S	S	B	115	110	140	120	115	110	110	105	120	G	B	105	100	100	B	B	S
22	105	100	100	100	100	105	105	125	125	120	115	115	110	G	G	G	100	100	B	100	100	S	S	100
23	S	100	100	100	B	S	B	110	150	G	G	G	100	G	G	100	100	100	100	100	100	100	S	S
24	100	100	100	100	S	B	B	G	135	130	115	110	G	G	G	G	G	B	100	100	100	S	100	100
25	S	S	S	B	B	B	B	G	G	G	B	110	G	G	G	G	105	100	100	100	S	100	S	S
26	S	B	S	S	B	S	B	115	110	110	G	110	G	G	G	G	G	B	100	100	S	S	S	S
27	S	B	100	100	100	S	B	G	150	145	G	110	G	G	G	110	110	100	100	100	100	100	S	S
28	S	100	100	100	100	100	100	150	140	120	G	G	105	105	105	105	100	100	100	B	S	B	B	S
29	B	S	100	B	B	B	S	110	115	G	110	110	C	C	C	C	C	100	100	100	100	B	B	B
30	B	S	B	100	100	B	B	G	G	G	G	G	G	G	G	G	G	B	S	S	S	S	S	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	11	12	13	14	10	8	11	15	17	16	15	16	14	10	14	21	25	23	23	23	21	17	16	11
MED	100	100	100	100	100	100	100	130	125	112	110	110	108	105	105	110	105	100	100	100	100	100	100	100
UQ	100	100	100	100	100	102	105	150	140	120	115	110	110	110	110	110	110	102	102	100	100	100	100	100
LQ	100	100	100	100	100	100	100	118	115	110	105	105	100	100	100	100	100	100	100	100	100	100	100	100

NOV. 1970 | H'ES (KM)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 1		F 1	F 1				H 1		L 1	L 2	L 1	L 1		L 2	L 2	L 3	L 5	F 3	F 2	F 1	F 1	F 1	
2		F 1				F 1	L 1		HC 11				L 1				L 1			F 1	F 1	F 1		
3						F 1		H 1								L 2	L 2	L 3	F 2	F 1	F 1		F 1	
4			F 5	F 2						L 2	L 1	L 2	L 2	L 2	L 2	L 3	L 3	L 3	F 3	F 3	F 2	F 1	F 1	
5							L 1		C 1		L 1	L 1				HL 11	HL 21	LH 11	F 1	F 3	F 3	F 1	F 1	
6					F 1	F 1		H 1	H 1							L 2	L 2	L 3	F 2	F 4	F 1			
7		F 1	F 1	F 3	F 1	F 1		H 1		CL 11	L 1			L 1		L 1	L 2	L 1	F 1	F 2	F 3		FL 21	F 3
8	F 2	F 2	F 1		F 1		H 4	C 2	C 2	CL 21	C 2	C 1	HL 11	L 1	LL 21	L 2	L 2	L 3	F 3	F 1	F 2	F 4	F 2	F 1
9	F 1	F 1		F 1	F 1		H 1		H 1								CL 22	CL 22	F 2	F 1		F 1	F 1	F 1
10	F 1						L 1		L 2	L 1	L 1	L 1	L 1		L 3	L 1	H 1	CL 21	F 1					
11				F 1			L 2							L 1	L 2	L 3	L 1	L 2	F 1	F 1	F 1	F 2		F 1
12	F 1							H 1				L 1	L 2		HL 11	HL 11	HL 11	HL 11	F 2	F 2	F 2	F 3	F 1	F 1
13	F 1	F 1	F 1	F 1	F 1		F 1				H 1		H 1	H 1	H 1		CL 11	L 2			F 1		F 2	
14									C 1	C 1	L 1	L 1			L 1	HL 22	L 3	L 3	F 4	F 4	F 3	F 2	F 1	F 1
15				F 2						C 1	C 1	C 1	C 1	L 2	L 2	L 1	C 1	L 2				F 2	F 1	
16						F 1	L 1								C 1	L 1	L 1			F 1				
17								H 1	H 1	C 1	C 1		L 1	L 1	L 1	L 1	L 1	L 1	F 1	F 1	F 1	F 3	F 1	
18	F 1	F 2						H 1								C 1	L 1					F 1	F 2	F 2
19	F 3	F 1	F 1	F 2	F 1	F 1	F 2		H 1	C 1	C 1					L 1	L 3	L 1	F 1		F 2	F 1	F 2	F 1
20	F 2	F 1						H 1		L 1		L 1	L 2	L 2	L 2	C 4	L 4	L 4	F 2	F 3	F 3	F 1	F 2	F 2
21			F 1					L 1	L 1	HL 11	C 1	C 1	C 2	L 2	L 1	H 1			F 1	F 4	F 2			
22	F 2	F 3	F 3	F 3	F 4	F 1	L 1	H 2	H 2	H 1	C 1	C 1	C 1				L 2	L 1		F 2	F 3			F 2
23		F 3	F 1	F 2				LH 11	H 1				L 1			L 1	L 1	L 2	F 1	F 1	F 3	F 1		
24	F 1	F 1	F 2	F 2					H 1	H 1	C 1	L 1							F 2	F 1	F 1		F 2	F 1
25												L 1					L 1	L 1	F 1	F 2		F 1		
26								L 1	C 1	C 1		L 1							F 1	F 1				
27			F 1	F 2	F 1				H 1	H 1		L 1				L 1	L 1	L 1	F 3	F 3	F 2	F 1		
28		F 2	F 1	F 1	F 1	F 1	L 1	H 1	H 1	H 1			L 1	L 1	L 2	L 1	L 2	L 2	F 1					
29			F 1					L 1	L 1		L 1	L 1						L 1	F 2	F 1	F 1			
30				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. 1970 | TYPES OF ES

IONOSPHERIC DATA

NOV. 1970 | HPF2 (KM) | 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	335	330	350	370	370	360	280	275	270	280	285	310	330	320	305	310	295	300	310	300	305	310	310	340
2	310	305	330	340	415	360	285	260	270	300	300	340	350	360	350	350	290	340	300	330	340	350	350	340
3	350	400	J R 350	300	340	350	300	J R 255	J R 260	J R 300	300	340	340	330	350	340	330	330	I R 305	320	350	I 360 C	350	340
4	340	370	J R 390	400	400	360	C	C	C	320	350	350	350	350	350	325	340	320	310	310	350	340	300	350
5	350	340	350	I R 355	400	350	265	280	290	300	305	310	315	340	330	315	300	315	300	300	300	340	350	355
6	340	340	390	370	305	260	H 310	275	285	280	300	310	350	330	340	340	340	350	340	300	350	350	390	360
7	360	380	400	400	390	390	350	300	300	290	290	300	310	325	325	320	305	330	340	360	425	410	390	290
8	350	405	475 H	420	350	360	J E 355	285 E	260	295	290	310	310	310	300	310	290	295	295	295	370	320	310	330
9	320	350	320	320	365 H	345	290	270	J R 250	290	300	320	330	330	300	300	J R 300	310	300	290	320	350	350	380
10	390	400	F	390	350	300	300	280	270	J R 300	300	310	350	330	340	330	300	300	J R 300	300	350	360	400	395
11	360	350	410	400	400	350	300	290	300	270	300	330	340	305	320	300	J R 300	300	300	J R 300	350	340	340	360
12	345	390	400	450	410	350	300	300	290	300	290	300	340	330	340	300	J R 300	300	300	300	300	J R 300	310	330
13	390	390	390	395	380	390	350	J R 290	270	295	300	290	340	330	340	300	285	340	350	J R 285	300	300	350	385
14	390	400	400	385	390	400	340	J R 290	270	260	330	320	305	305	295	305	285	270	275	250	340	320	330	330
15	340	325	370	395	420	405	310	240	250	290	280	300	300	305	295	270 R	280	280	290	290	305	315	330	305
16	340	315	340	345	360	375	305	265	260	J R 300	B	325	340	340	330	J R 300	300	300	300	300	300	300	350	350
17	340	390	340	400	420	400	300	270	300	290	300	300	300	320	300	315	300	300	300	300	300	350	350	350
18	350	350	360	390	360	350	300	290	J R 270	290	285	I R 330	340	350	310	310	300	300	300	J R 285	275	370	320	390
19	400	440	450	390	350	350	340	300	290	300	310	310	340	330	350	330	350	350	J R 330	300	350	350	350	J R 355
20	350	250	360	390	350	360	330	260	250	270	270	290	305	315	300	280	260	290	315	270	280	310	320	350
21	315	310	330	350	355	370	300	250	260	270	290	295	295	290	305	295	275	280	300	310	420	420	390	415
22	410	490	455	430	440	380	400	330	290	270	320	300	300	300	300	290	290	300	J R 300	300	J R 360	300	340	350
23	350	360	390	400	380	400	320	270	J R 255	300	300	300	350	300	300	300	300	300	280	280	285	335	380	360
24	350	400	400	400	400	380	350	300	340	290	300	310	320	300	300	290	290	300	300	300	290	300	340	360
25	450	370	380	390	360	300	300	250	290	J R 300	340	300	340	300	310	300	290	300	260	340	300	340	350	390
26	390	390	390	350	300	360	340	280	280	300	300	300	310	300	300	300	280	280	275	290	290	310	360	380
27	360	350	390	390	290	360	360	290	280	300	270	300	290	300	J R 300	290	260	280	280	290	340	300	350 R	370
28	400	J R 360	340	300	330	390	300	J R 250	260	260	J R 275	280	300	280	300	280	240	270	300	260	280	390	400	370
29	370	350	360	345	280	310	340	250	270	260	250	285	C	C	C	C	C	270	305	290	260	350	400	415
30	370	360	340	310	270 S	320	300	260	250	300	300	290	310	300	290	300	280	300	260	280	300	350	390	390
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	29	30	30	30	29	29	29	30	29	30	29	29	29	29	29	30	30	30	30	30	30	30
MED	350	360	380	390	362	360	305	275	270	292	300	305	330	320	305	300	295	300	300	300	305	340	350	358
UQ	390	390	400	400	400	380	340	290	290	300	300	320	340	330	340	315	300	315	305	300	350	350	380	380
LQ	340	340	350	350	350	350	300	260	260	280	290	300	305	300	300	300	285	290	295	290	300	310	330	340

NOV. 1970 | HPF2 (KM)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	85	85	95	80	105	95	70	65	75	40	75	95	80	85	90	95	75	100	90	75	90	65	90	80
2	80	95	85	70	90	85	75	50	50	80	100	100	100	90	100	90	110	110	100	110	110	100	100	110
3	100	90	J R 100	100	110	100	100	J R 85	J R 80	J R 100	100	100	100	110	90	100	110	110	I R 95	110	100	I C 95	90	100
4	110	80	J R 100	100	100	90	C	C	C	110	90	90	100	100	90	95	100	100	90	90	100	100	100	100
5	100	100	100	I R 95	90	100	105	100	90	70	80	90	85	65	85	80	70	85	75	80	95	70	100	70
6	80	85	80	90	95	85	H 90	65	85	110	100	90	90	110	100	100	100	90	100	100	100	100	100	100
7	90	70	90	100	100	100	100	100	100	35	60	75	95	80	100	85	90	95	75	90	100	80	95	70
8	125	90	H 125	100	70	95	J E 95	E 65	65	90	65	85	85	100	70	85	65	75	65	125	75	90	95	95
9	100	95	85	140	H 110	105	65	75	J R 55	110	90	100	110	110	100	100	J R 90	90	100	110	100	90	100	110
10	100	100	F	100	100	100	100	110	110	J R 100	100	90	100	100	100	100	90	100	J R 100	100	100	100	100	95
11	90	100	110	100	100	100	100	100	100	120	100	110	100	105	100	100	J R 100	100	100	J R 100	100	100	100	100
12	105	100	100	100	90	100	100	100	110	100	110	100	90	110	100	100	J R 100	100	100	100	100	J R 100	110	110
13	100	100	100	95	110	100	100	J R 90	110	95	100	110	100	110	110	100	100	100	100	J R 95	100	100	100	95
14	100	100	100	105	110	100	100	J R 90	70	65	115	85	70	90	120	90	60	65	50	60	105	80	75	85
15	80	75	100	75	85	85	90	55	50	35	70	60	75	60	65	70 R	80	75 R	60	70	95	95	70	95
16	80	90	90	100	90	95	70	60	60	J R 80	B	75	100	100	110	J R 90	100	100	100	100	100	100	90	100
17	100	100	100	100	90	100	100	90	100	90	80	100	100	80	100	85	100	100	100	100	100	100	100	100
18	100	90	90	100	90	100	100	90	J R 90	90	75	I R 85	90	90	90	90	100	80	100	J R 95	105	90	100	100
19	100	90	100	100	100	90	100	100	90	90	90	90	100	90	90	90	90	100	J R 100	100	100	90	100	J R 105
20	100	100	90	100	100	90	110	100	100	40	60	65	70	130	60	90	60	110	100	50	70	90	100	100
21	85	90	80	90	105	80	70	50	50	60	60	65	75	85	90	65	70	75	120	70	130	130	110	100
22	90	105	95	90	120	75	100	80	60	90	100	100	100	100	100	100	100	100	J R 100	100	J R 90	100	110	100
23	90	90	100	100	100	100	110	110	J R 85	100	100	100	80	100	100	100	100	100	100	100	95	105	100	90
24	100	100	100	100	100	100	100	100	90	110	100	90	100	100	100	110	90	100	100	100	90	100	110	110
25	90	110	110	100	90	100	100	100	90	J R 100	100	100	100	100	100	100	110	100	100	100	100	100	90	90
26	100	100	100	100	100	100	100	100	100	80	100	100	90	100	100	100	100	100	95	90	90	90	100	100
27	100	100	90	90	90	100	100	90	100	100	120	80	90	100	J R 100	90	110	100	100	90	100	80	R 100	110
28	80	J R 90	100	100	100	90	100	J R 100	120	60	J R 45	70	95	65	55	75	60	75	70	50	70	110	100	100
29	80	95	65	75	40	135	105	55	30	60	50	65	C	C	C	C	C	85	65	65	60	145	100	85
30	100	90	75	95	S 50	95	120	60	50	100	100	110	90	100	100	100	100	100	100	100	100	100	100	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	30	30	29	30	30	30	29	29	29	30	29	30	29	29	29	29	29	30	30	30	30	30	30	30
MED	100	95	100	100	100	100	100	90	90	90	100	90	95	100	100	95	100	100	100	100	100	100	100	100
UQ	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
LQ	85	90	90	90	90	90	95	65	60	65	75	80	85	90	90	90	80	85	90	80	90	90	95	95

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NOV. 1970 | YPF2 (KM)

IONOSPHERIC DATA

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

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

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 53	48	42	40	40	33	S 42	S 87	S 120	S 123	132	137	139	S 158	158	151	138	131	S 108	S 92	J S 93	S 78	57	50
2	48	S 47	40	41	36	36	40	S 88	S 111	J S 120	S 138	134	149	169	J S 182	U S 188	U S 177	U S 157	U S 150	S	S	S	U S 92	S 83
3	J S 63	U S 51	S 51	I S 48	37	29	J S 36	77	J S 101	111	J S 122	133	S 137	150	U S 154	139	S 129	U S 129	S 114	U S 107	U S 73	67	71	J S 63
4	54	S 41	U S 41	41	40	42	42	76	U S 103	J S 121	135	U S 151	145	165	S 173	168	146	U S 145	J S 128	I S 108	S	74	S 65	47
5	41	43	42	I S 42	41	41	39	69	S 95	S 117	130	137	138	159	155	142	J S 125	107	97	J S 86	70	U S 61	S 61	56
6	55	53	S 51	51	58	42	33	70	107	128	135	128	S 136	154	155	157	154	145	J S 132	S 123	I S 110	94	S 82	S 67
7	S 61	S 54	46	46	46	45	S 50	S 94	128	U S 137	138	133	S 130	S 138	142	134	114	112	U S 104	U S 95	98	93	I S 92	J S 88
8	71	J S 52	51	55	56	56	56	U S 97	J S 135	J S 122	129	126	131	140	128	112	109	U S 104	U S 96	U S 90	S 74	74	69	58
9	52	S 36	36	35	H 30	30	32	J S 72	J S 105	S 103	U S 120	129	122	136	140	137	S 118	U S 113	J S 102	J S 91	U H 83	U S 63	S 59	U S 52
10	J S 51	42	39	38	39	35	29	68	90	109	129	132	J S 138	S 153	I C 160	U S 154	J S 146	J S 137	S	S	S	S	J S 89	U S 80
11	J S 67	J S 54	U S 41	41	42	43	43	S 80	J S 104	113	U S 132	S 135	146	S 155	149	S 139	127	S 116	113	J S 105	U S 88	79	68	U S 64
12	U S 62	U S 52	46	43	43	47	47	73	S 110	126	S 139	134	125	141	140	136	S 128	115	J S 93	S 84	88	U S 70	S 52	47
13	J S 42	S 39	38	37	39	33	U S 36	S 73	115	115	133	135	133	141	143	S 145	130	113	J S 104	S 103	J S 87	U S 72	U S 63	55
14	44	S 37	35	37	32	32	37	U S 76	J S 117	S 126	J S 125	U S 137	140	154	145	J S 122	117	S 119	J S 104	71	U S 70	J S 67	S 53	S 45
15	U S 45	44	40	38	34	33	U S 37	U S 79	J S 97	106	J S 121	U S 118	131	142	145	127	109	95	75	J S 64	J S 65	S 72	U S 62	J S 51
16	43	38	S 36	35	35	33	35	U S 78	J S 107	J S 122	I B 112	116	127	142	142	U S 135	U S 119	U S 115	J S 104	82	U S 86	74	U S 59	47
17	S 49	S 47	31	28	28	30	U S 34	S 73	106	114	S 120	121	117	117	127	J S 123	109	U S 103	103	86	70	S 72	J S 61	56
18	U S 52	44	40	40	43	36	33	U S 63	90	101	123	R 114	119	128	139	U S 134	112	111	J S 104	93	S 83	68	54	47
19	36	33	35	43	S 50	U S 47	U S 50	74	U S 96	111	I S 124	140	114	115	127	128	S 114	106	J S 100	S 86	68	64	57	U S 51
20	54	56	30	29	30	30	32	S 69	J S 101	S 97	S 114	109	115	I S 120	130	135	126	S 98	65	S 62	71	67	58	47
21	44	45	39	34	32	31	32	J S 67	105	111	115	S 120	138	137	133	124	J S 123	U S 120	I S 94	79	I S 83	S 88	U S 88	U S 71
22	68	U S 66	57	66	66	S 80	85	S 110	U S 151	S 159	J S 155	151	132	140	147	135	S 118	111	J S 105	S 86	U S 85	J S 79	J S 67	52
23	48	38	32	30	31	30	32	74	S 96	S 105	J S 123	S 130	131	143	S 133	J S 123	113	S 100	J S 84	61	67	66	46	44
24	42	31	31	32	I C 33	32	J S 36	S 71	S 93	96	S 117	148	144	129	135	133	118	S 98	77	66	J S 68	J S 65	U S 49	S 43
25	40	39	37	34	36	32	30	61	S 90	J S 104	S 121	139	S 137	S 138	144	143	131	108	S 71	I S 68	J S 76	S 62	S 46	39
26	S 36	36	38	S 43	S 47	25	30	60	82	92	S 116	133	153	144	149	132	126	S 104	79	54	58	S 54	49	42
27	39	37	S 36	35	46	24	S 26	S 53	S 97	S 118	S 117	142	139	138	135	141	127	S 98	76	59	56	S 60	56	45
28	42	37	41	40	32	27	30	S 63	S 93	107	111	107	111	133	133	117	124	111	S 73	76	77	72	40	33
29	34	35	37	35	45	34	S 23	55	I C 84	J S 103	113	102	102	112	S 116	J S 111	S 117	113	71	53	H 61	J S 62	S 42	31
30	34	38	41	38	S 42	S 36	26	53	81	S 100	112	114	S 120	138	J S 136	125	S 105	S 91	63	47	52	52	45	37
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	28	27	28	30	30
MED	48	42	40	39	40	33	36	S 73	S 102	S 112	S 123	133	132	140	142	135	124	S 112	S 100	S 85	S 74	S 69	S 59	50
UQ	S 54	S 51	42	43	45	42	42	S 78	S 110	S 122	132	137	139	153	149	142	129	S 119	J S 104	S 92	S 86	74	S 68	S 58
LQ	42	37	36	35	33	30	32	S 67	S 93	104	S 117	120	122	136	133	125	114	S 104	77	65	68	S 64	52	45

NOV. 1970 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

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

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L	L								
2										L	380	L	L	L	L	L	L							
3										370	L	L	L	L	L									
4								280	300		L	L	L	L	L	L								
5										350	L	L	L 430	B	L	L								
6										L	L	L	L	L	L	L	330							
7										L	L	L	L	L	L	360								
8										L		L	L	L	A	A	A							
9											L	L	L	L	L	L	L	L						
10										360	L	L	L	L	C									
11											U L 440	L	L	L	L	340	330							
12										L	L	L	L	L	L	L								
13										L	L	L	L	L	L	L								
14										L	L	L	L	L	L	L	L							
15										L	L	L	L	L	L	L								
16										L	B	B	L	L	L									
17										L	L	L	L	L	L	L								
18										L	L	B	L	L	L									
19										L	L	L	L		L									
20										L	L	L	L	L	L	U L 380								
21										L	L	L	L	L	L	L								
22										A	L	L	L	L		L	L							
23										L	L	L	L	L		L								
24											L	L	L	L	L	L								
25										L	L	430	L	L	L	L								
26											L	L	L	L	L	L								
27										L	L	L	L	L	L	L								
28										L	L	U L 470	U L 490	L	L	L	L							
29											L	L	L 460	L 540	L	L								
30											L	L	L 460	L	L	L								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1	3	2	2	4	1		3	2							
MED								280	300	360	410	450	460	540		360	330							
UQ										365			L 475			370								
LQ										355			L 445			350								

NOV. 1970 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

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

Station YAMAGAWA Lat. 31° 12·1' N · Long. 130° 37·1' E Sweep 1 MHz to 20 MHz in 20 sec in 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								170	280	I A 320	350	370	380	365	350	A	A	A						
2								170	260	300	330	A	A	A	350	320	260	A						
3								190	I A 270	I A 320	I A 345	I A 355	I A 360	360	340	I A 315	270	200						
4								165	260	I C 310	340	345	365	360	340	310	270	185						
5								170	270	310	335	350	360	I B 365	I B 360	330	285	165						
6								A	270	310	330	340	I A 350	350	345	310	270	A						
7								155	270	310	325	I A 345	H 350	H 350	335	300	265	A						
8								155	260	310	330	350	A	A	A	315	A	A						
9								160	250	300	330	340	345	I A 350	340	310	I A 255	S						
10								S	240	300	325	340	360	355	I C 345	320	260	A						
11								160	260	305	325	340	345	H 350	335	310	265	A						
12								160	H 270	310	325	345	360	360	335	I A 310	270	200						
13								180	280	315	335	340	360	360	345	325	260	180						
14								155	260	300	300	335	355	360	360	320	I A 270	165						
15								175	280	315	340	355	360	345	350	315	300	220						
16								S	250	H 310	I B 330	I B 350	B 360	360	340	I B 320	270	160						
17								S	H 280	305	315	340	350	C	330	310	250	A						
18								170	270	310	315	B	B	A	A	340	290	210						
19								S	280	310	325	I A 350	370	365	340	310	260	S						
20								S	260	295	315	I A 330	I A 360	A	A	A	A	A						
21								S	255	300	335	A	A	A	A	310	I A 265	A						
22								170	250	295	320	A	A	A	325	300	A	A						
23								S	I A 240	300	A	A	350	350	H 325	300	260	A						
24								160	250	280	310	320	350	350	340	310	260	A						
25								S	230	295	I A 320	330	340	I A 340	320	A	A	A						
26								S	230	A	A	A	A	A	320	280	230	A						
27								S	220	H 290	320	U R 330	350	345	340	300	A	A						
28								S	H 240	300	I A 325	340	340	350	335	300	240	A						
29								S	C	A	330	350	I A 345	340	320	300	H 250	A						
30								S	250	300	325	A	A	340	H 330	H 300	250	155						
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								16	29	28	28	23	23	22	26	27	24	10						
MED								168	260	305	325	340	355	350	340	310	262	182						
UQ								170	270	310	332	350	360	360	345	318	270	200						
LQ								160	250	300	320	340	350	350	330	300	258	165						

NOV. 1970 | FOE (0.01 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 15	E S 12	E B 11	E	E	E S 15	E S 15	G	J G 26	35	G 29	G 32	G 32	J G 35	J G 31	33	30	J X 28	25	J X 19	J X 21	17	E S 15	J X 21
2	E S 11	E B 11	E B 11	E	E B 11	E B 11	E S 11	G	G	32	36	38	38	J X 42	G 33	G 32	G 16	J X 25	J X 21	J X 24	25	21	E S 15	E S 15
3	E S 15	E S 15	E B 12	E B 12	E B 11	E S 15	E S 15	G 19	31	35	J X 37	39	J X 41	J G 36	J X 38	J X 45	J X 38	J X 24	J X 30	21	18	E S 15	E S 15	E S 15
4	E S 15	E S 13	E S 15	E S 11	E S 13	E S 15	18	G	G 26	36	G 34	37	J X 43	J X 39	J X 88	G	J G 24	G	E S 15	E S 15	E S 15	E S 15	E S 14	E S 15
5	E S 15	E S 15	J X 36	J X 20	E	E B 12	24	G	G 25	G	G	G	G	E B 61	E B 41	G 28	31	23	19	E S 15	E S 15	E S 15	E S 15	E S 15
6	E S 15	J X 22	20	E B 15	25	J X 20	J X 25	20	G	G	G	G 31	38	G 29	G	G	G 23	J X 25	18	18	E B 11	25	E S 14	E S 15
7	E S 15	E	E	E	E	E S 14	E S 15	23	G	G	35	38	42	G	G	31	34	J X 26	E S 15	23	E S 15	23	J X 27	J X 33
8	J X 38	J X 29	J X 27	J X 25	J X 26	24	23	G	30	35	45	46	50	J X 104	J X 79	J X 89	J X 82	J X 29	J X 27	J X 26	J X 25	18	21	E S 15
9	E S 15	E B 11	E S 15	E	E	E	E S 15	G	30	33	G 18	35	37	38	35	J X 34	29	E S 15	E S 15	E S 13	E B 17	E S 15	E S 15	18
10	E S 15	E S 14	E S 15	E	E	E	E S 15	E S 15	G	G	G 27	G	J G 25	37	C	J X 36	29	J X 24	20	19	J X 52	20	J X 21	J X 27
11	J X 26	E S 15	E S 15	E	E B 15	E S 15	E S 15	24	G	G	G	G	G	40	39	G	G	J X 26	J X 32	J X 19	E S 15	E S 15	J X 53	J X 21
12	J X 23	18	E S 15	E S 15	E S 13	E S 15	E S 15	G	G	G	35	36	J X 61	G 29	J X 37	J X 39	33	31	J X 37	25	E S 15	J X 18	E S 15	17
13	J X 18	E S 15	E S 15	19	E	E S 12	E S 15	G	G	34	38	41	39	39	38	G	G	G	22	24	E S 15	E S 15	E S 15	E S 15
14	E S 14	E B 11	J X 25	J X 19	J X 18	E S 15	E S 15	G	29	36	J X 44	39	39	39	G	37	J X 30	24	E S 15	E S 15	E S 15	E S 15	E	E S 15
15	E S 15	E S 12	E S 11	E S 13	E	J X 18	19	G	G	34	40	44	43	40	G 33	G 29	G	23	J X 25	J X 21	E S 15	E S 15	E S 15	E S 15
16	E S 15	E S 13	E S 11	E	E	E	E S 15	E S 15	G	35	B	E B 48	40	38	G 34	33	J X 29	J X 21	J X 25	J X 30	20	E S 15	E S 13	E S 15
17	E S 15	E S 15	E B 11	E B 11	E	E B 15	E S 15	23	29	36	35	38	39	E C 70	39	39	32	J X 61	J X 29	E S 15	J X 23	J X 22	E S 15	E S 11
18	E S 15	E S 11	E S 12	E	E	J X 20	J X 25	G	G	33	36	E B 101	E B 49	39	40	G 34	G	G	E S 15	E S 11	E S 15	E S 15	E S 15	J X 19
19	E S 13	J X 32	J X 19	E	E	E S 15	E S 15	E S 15	G	35	38	40	39	J X 38	G	G	G 20	18	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
20	E S 15	E S 15	E B 11	J X 20	E	E S 15	E S 11	24	30	32	37	J X 41	J X 43	J X 41	40	34	28	J X 28	E S 11	E S 15	24	E S 15	E S 15	J X 24
21	E S 15	E S 11	E S 15	E B 11	E	E S 12	E S 15	J X 26	G	31	G 33	37	J X 45	J X 46	J X 39	J X 39	J X 35	J X 29	J X 29	J X 18	22	21	20	E S 15
22	E S 15	E S 15	J X 31	J X 32	J X 20	J X 22	19	J X 20	J X 26	J X 62	44	J X 45	42	J X 43	J X 36	J G 30	J X 51	J X 41	J X 26	E S 15	E S 14	E B 11	E	E S 15
23	E B 12	J X 25	J X 27	J X 25	E	18	J X 18	J X 50	25	31	38	39	J G 31	G 34	G 27	J X 50	J G 25	21	18	E S 15	J X 19	19	J X 24	J X 19
24	E S 15	E S 14	E B 11	E S 15	E B 13	20	18	20	J X 32	38	J X 48	40	37	G 34	G	J X 32	G	20	21	23	J X 22	J X 18	E S 15	E S 15
25	E S 15	E B 11	E	E	E	18	20	J X 26	G 23	G 29	33	37	G 33	J X 48	J G 32	J X 49	J X 35	J X 30	J X 30	J X 19	E S 15	E B 11	E S 15	E S 15
26	E B 12	E S 14	E B 13	E	E	11	E S 15	E S 15	G	32	36	J X 73	39	J X 40	J X 33	J X 31	G	20	E S 15	J X 21	J X 21	E S 15	E S 15	E B 13
27	E	E B 11	E	E	E	E	E S 15	E S 13	G	G	36	G 33	G	G	G	G 29	J X 30	27	J X 31	J X 36	J X 31	J X 30	J X 26	J X 28
28	E S 15	E B 13	E B 11	E	E B 11	E B 11	E S 15	E S 14	G	31	34	35	G 32	G 34	G 30	G 26	J X 28	J X 34	J X 22	J X 21	J X 24	J X 22	E S 12	E S 15
29	E	E S 14	E	E	E	E	E S 11	E S 15	C	37	35	36	39	G 28	G 32	J X 32	G 16	J X 24	J X 19	E S 14	E S 15	E B 11	E	E S 11
30	E S 15	E S 12	E B 11	E	E	E S 15	E S 15	E S 14	G	G 21	36	39	38	J X 49	J G 29	J G 24	J X 30	J X 21	E S 11	18	J X 23	E S 15	E S 12	E S 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	29	30	29	30	30	30	29	30	30	30	30	30	30	30	30	30
MED	E S 15	E S 14	E E 12	E E 11	E	E 15	E S 15	15	G	32	36	38	39	38	G 33	32	29	J X 24	21	19	18	E 15	E S 15	E S 15
UQ	E S 15	E S 15	E 15	E 15	E 13	18	18	20	26	35	38	40	42	J X 41	38	J X 37	J X 32	J X 28	J X 27	J X 23	J X 23	20	E S 15	J X 19
LQ	E S 15	E S 11	E B 11	E	E	E E 11	E S 15	G	G	G 21	G 33	35	G 33	G 34	G 29	G 28	G 16	21	E S 15	E S 15	E S 15	E S 15	E S 14	E S 15

The Radio Research Laboratories, Japan

NOV. 1970 | FOES (0.1 MHZ)

IONOSPHERIC DATA

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

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

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 12	E B 11	E	E	E S 15	E S 15	G	G 17	33	G 26	G 28	G 31	G 30	G 27	32	29	22	18	17	E	E	E S 15	E
2	E S 11	E B 11	E B 11	E	E B 11	E B 11	E S 11	G	G	G	G	37	37	38	G 32	G 30	G 15	17	E	19	17	E	E S 15	E S 15
3	E S 15	E S 15	E B 12	E B 12	E B 11	E S 15	E S 15	G 18	29	32	35	39	40	G 33	30	32	25	S	20	E	17	E S 15	E S 15	E S 15
4	E S 15	E S 13	E S 15	E S 11	E S 13	E S 15	E	G	G 24	34	G 33	G	34	32	29	G	G 15	G	E S 15	E S 15	E S 15	E S 15	E S 14	E S 15
5	E S 15	E S 15	26	16	E	E B 12	E	G	G 24	G	G	G	G	E B 61	E B 41	G 28	G	21	18	E S 15	E S 15	E S 15	E S 15	E S 15
6	E S 15	16	17	E B 15	19	E	17	17	G	G	G	G 31	36	G 29	G	G	G 20	20	12	16	E B 11	E	E S 14	E S 15
7	E S 15	E	E	E	E	E S 14	E S 15	G	G	G	30	37	40	G	G	G	30	20	E S 15	E	E S 15	E	26	31
8	35	19	20	16	14	14	E	G	G	34	42	40	48	42	76	59	73	16	24	19	20	E	E	E S 15
9	E S 15	E B 11	E S 15	E	E	E	E S 15	G	G	G	G 18	G	G	36	G	G	27	E S 15	E S 15	E S 13	E B 17	E S 15	E S 15	E
10	E S 15	E S 14	E S 15	E	E	E	E S 15	E S 15	G	G	G 26	G	G 23	G	C	25	G	20	E	E	28	E	E	E
11	24	E S 15	E S 15	E	E B 15	E S 15	E S 15	G	G	G	G	G	G	39	36	G	G	16	20	16	E S 15	E S 15	30	15
12	16	E	E S 15	E S 15	E S 13	E S 15	E S 15	G	G	G	G	G	31	G 28	30	33	30	30	31	E	E S 15	E	E S 15	E
13	E	E S 15	E S 15	E	E	E S 12	E S 15	G	G	G	38	41	G	39	36	G	G	G	E	E	E S 15	E S 15	E S 15	E S 15
14	E S 14	E B 11	15	15	E	E S 15	E S 15	G	G	34	42	37	G	39	G	35	30	23	E S 15	E S 15	E S 15	E S 15	E	E S 15
15	E S 15	E S 12	E S 11	E S 13	E	13	E	G	G	G	39	42	42	40	G 33	G 28	G	20	22	15	E S 15	E S 15	E S 15	E S 15
16	E S 15	E S 13	E S 11	E	E	E	E S 15	E S 15	G	G	B	E B 48	E R 40	E R 38	G 33	32	25	S	E	20	E	E S 15	E S 13	E S 15
17	E S 15	E S 15	E B 11	E B 11	E	E B 15	E S 15	19	G	G	34	G	38	E C 70	39	37	31	42	20	E S 15	18	20	E S 15	E S 11
18	E S 15	E S 11	E S 12	E	E	E	E	G	G	G	34	E B 101	E B 49	39	40	G 31	G	G	E S 15	E S 11	E S 15	E S 15	E S 15	E
19	E S 13	E	E	E	E	E S 15	E S 15	E S 15	G	G	37	37	35	32	G	G	G 19	E R 18	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
20	E S 15	E S 15	E B 11	E	E	E S 15	E S 11	S	29	G	35	35	37	36	37	31	27	25	E S 11	E S 15	E	E S 15	E S 15	18
21	E S 15	E S 11	E S 15	E B 11	E	E S 12	E S 15	S	G	G	G 33	36	44	39	36	26	27	16	23	E	E	E	E	E S 15
22	E S 15	E S 15	29	20	E	19	E	S	19	60	42	37	38	36	26	25	33	29	19	E S 15	E S 14	E B 11	E	E S 15
23	E B 12	E	16	15	E	E	E	G	26	29	33	36	G 31	G 31	G 27	26	G 21	20	16	E S 15	19	E	19	E
24	E S 15	E S 14	E B 11	E S 15	E B 13	E	E	G	G	34	35	39	33	G 31	G	25	G	18	18	E	17	15	E S 15	E S 15
25	E S 15	E B 11	E	E	E	E	E	G	G 22	G 28	E R 33	26	G 27	37	G 29	33	26	15	19	15	E S 15	E B 11	E S 15	E S 15
26	E B 12	E S 14	E B 13	E	E	E B 11	E S 15	E S 15	G	30	33	41	35	33	29	25	G	18	E S 15	E	E	E S 15	E S 15	E B 13
27	E	E B 11	E	E	E	E	E S 15	E S 13	G	G	35	G 30	G	G	G	G 29	28	22	25	31	27	19	17	16
28	E S 15	E B 13	E B 11	E	E B 11	E B 11	E S 15	E S 14	G	28	32	31	G 32	G 32	G 30	G 24	20	20	S	14	18	17	E S 12	E S 15
29	E	E S 14	E	E	E	E	E S 11	E S 15	C	32	30	G	35	G 28	G 29	26	G 16	22	14	E S 14	E S 15	E B 11	E	E S 11
30	E S 15	E S 12	E B 11	E	E	E S 15	E S 15	E S 14	G	G 21	35	37	36	30	G 29	G 19	17	S	E S 11	E	E	E S 15	E S 12	E S 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	27	29	30	29	30	30	30	29	30	30	27	29	30	30	30	30	30
MED	E S 15	E S 13	E E 12	E	E	E E 12	E S 15	G	G	G	33	34	34	33	G 29	26	20	20	15	15	E E 15	E 15	E S 15	E S 15
UQ	E S 15	E S 15	E 15	E 15	E E 11	E S 15	E S 15	E S 15	G 17	32	35	38	38	38	34	32	28	22	20	15	17	E S 15	E S 15	E S 15
LQ	E S 14	E E 11	E E 11	E	E	E	E	G	G	G	G 26	G	G 27	G 30	G 26	G 19	G	16	E S 14	E	E S 14	E	E S 12	E S 11

NOV. 1970 | FBES (0.1 MHZ)

IONOSPHERIC DATA

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

Station YAMAGAWA Lat. 31° 12'.1 N. Long. 130° 37'.1 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 15	E S 12	11	E	E	E S 15	E S 15	E S 15	12	15	16	18	16	15	15	15	11	E S 15	E S 15	E S 11	E S 15	E S 15	E S 15	E S 15
2	E S 11	11	11	E	11	11	E S 11	E S 15	15	11	16	16	15	16	20	15	11	E S 15	E S 15	E S 11	E S 15	E S 15	E S 15	E S 15
3	E S 15	E S 15	12	12	11	E S 15	E S 15	E S 15	E S 15	15	16	19	16	16	16	15	11	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
4	E S 15	E S 13	E S 15	E S 11	E S 13	E S 15	E S 15	E S 15	E S 15	E C 32	15	16	17	16	15	11	11	E S 15	E S 15	E S 15	E S 15	E S 15	E S 14	E S 15
5	E S 15	E S 15	11	E S 12	E	12	E S 15	E S 15	15	15	15	15	15	61	41	21	16	E S 15	E S 12	E S 15	E S 15	E S 15	E S 15	E S 15
6	E S 15	E S 15	14	15	11	15	E S 15	E S 15	E S 15	E C 20	16	20	19	16	15	20	15	E S 14	E S 11	E S 15	11	E S 15	E S 14	E S 15
7	E S 15	E	E	E	E	E S 14	E S 15	E S 14	14	15	16	17	19	17	18	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	11	11
8	E S 15	11	11	11	E	E	E S 15	E S 15	11	15	15	15	16	17	15	15	11	11	E S 15	11	E S 15	E S 15	E S 15	E S 15
9	E S 15	11	E S 15	E	E	E	E S 15	E S 15	E S 15	11	11	15	15	17	19	11	11	E S 15	E S 15	E S 13	17	E S 15	E S 15	E S 15
10	E S 15	E S 14	E S 15	E	E	E	E S 15	E S 15	E S 15	14	15	15	16	16	C	11	12	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
11	11	E S 15	E S 15	E	15	E S 15	E S 15	E S 15	E S 15	15	15	16	15	15	15	12	11	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	110
12	E S 15	E S 15	E S 15	E S 15	E S 13	E S 15	E S 15	E S 15	E S 15	15	15	19	19	19	16	15	15	E S 15	E S 14	17	E S 15	E S 13	E S 15	E S 15
13	E S 14	E S 15	E S 15	13	E	E S 12	E S 15	E S 15	E S 15	16	17	16	16	23	20	16	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
14	E S 14	11	E S 12	E	11	E S 15	E S 15	E S 15	11	16	19	20	22	19	20	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E	E S 15
15	E S 15	E S 12	E S 11	E S 13	E	E S 12	E S 15	E S 15	E S 15	16	17	20	18	23	22	19	20	19	E S 11	E S 11	E S 15	E S 15	E S 15	E S 15
16	E S 15	E S 13	E S 11	E	E	E	E S 15	E S 15	E S 15	16	B	48	30	20	17	12	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 13	E S 15
17	E S 15	E S 15	11	11	E	15	E S 15	E S 15	16	16	16	22	20	E C 70	20	24	16	16	E S 15	E S 15	E S 15	E S 11	E S 15	E S 11
18	E S 15	E S 11	E S 12	E	E	E S 15	E S 15	E S 15	E C 20	15	19	101	49	26	25	22	17	E S 15	E S 15	E S 11	E S 15	E S 15	E S 15	E S 15
19	E S 13	E S 15	E S 15	E	E	E S 15	E S 15	E S 15	E S 15	15	15	15	19	15	15	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
20	E S 15	E S 15	11	E	E	E S 15	E S 11	E S 15	E S 15	15	15	16	17	16	16	15	12	E S 15	E S 11	E S 15	E S 15	E S 15	E S 15	E S 15
21	E S 15	11	E S 15	11	E	E S 12	E S 15	E S 15	E S 15	15	15	20	16	16	15	15	E S 15	E S 11	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
22	E S 15	E S 15	E S 14	E S 13	12	E S 11	E S 15	E S 15	E S 15	15	15	16	20	18	16	14	11	11	11	E S 15	E S 14	11	E	E S 15
23	12	12	11	E	E	E S 15	E S 15	E S 15	14	15	15	16	19	17	18	E S 15	E S 15	E S 15	E S 15	11	E S 15	11	12	E S 15	E S 15
24	E S 15	E S 14	11	E S 15	13	E S 16	E S 15	E S 15	15	16	16	20	19	20	19	17	E S 15	E S 15	11	E S 15	12	11	E S 15	E S 15
25	E S 15	11	E	E	E	E S 14	E S 15	E S 15	E S 15	16	17	15	17	15	15	16	E S 15	11	11	11	E S 15	11	E S 15	E S 15
26	12	E S 14	13	E	E	11	E S 15	E S 15	E S 15	15	15	18	19	16	15	14	14	E S 14	E S 15	E S 15	E S 14	E S 15	E S 15	13
27	E	11	E	E	E	E	E S 15	E S 13	E S 15	11	15	15	16	19	17	14	E S 15	E S 14	11	E S 14	E S 15	E S 14	E S 15	E S 15
28	E S 15	13	11	E	11	11	E S 15	E S 14	E S 14	11	11	20	19	19	20	15	15	E S 15	E S 15	E	E	E S 12	E S 12	E S 15
29	E	E S 14	E	E	E	E	E S 11	E S 15	C	15	16	17	15	15	15	14	11	11	E	E S 14	E S 15	11	E	E S 11
30	E S 15	E S 12	11	E	E	E S 15	E S 15	E S 14	14	14	14	15	20	14	16	15	E S 14	E S 15	E S 11	E S 15	E S 15	E S 15	E S 12	E S 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	29	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30
MED	E S 15	E S 13	E S 11	E	E	E S 14	E S 15	E S 15	E S 15	15	15	16	18	16	16	15	15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
UQ	E S 15	E S 15	E S 15	E S 12	11	E S 15	E S 15	E S 15	E S 15	16	16	20	19	19	20	16	15	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	11	11	E	E	E S 11	E S 15	E S 15	E S 15	15	15	15	16	16	15	14	11	E S 14	E S 11	E S 13	E S 15	E S 13	E S 14	E S 15

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NOV. 1970 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	285	285	285	285	300	275	275	335	335	325	315	305	285	290	290	295	295	305	310	285	315	320	315	280
2	290	310	285	310	290	265	295	330	335	295	320	295	290	290	300	300	305	295	300	S	S	S	275	290
3	275	285	300	310	360	275	290	350	335	325	315	300	290	285	290	290	285	300	305	305	290	275	310	305
4	310	295	275	275	270	290	305	320	320	320	305	310	280	290	290	295	295	300	295	295	S	290	315	290
5	280	295	295	300	295	300	335	335	325	325	305	305	290	300	295	290	300	305	295	300	305	290	290	295
6	300	295	285	275	340	330	285	325	330	325	335	315	290	295	290	295	295	295	285	295	300	295	295	285
7	255	280	260	265	260	265	285	310	345	330	315	305	285	295	280	300	295	300	290	280	285	265	S	305
8	350	250	255	260	285	295	285	315	335	310	325	310	305	305	310	305	310	310	300	310	280	300	320	295
9	320	295	280	290	295	275	305	335	335	340	325	320	300	300	310	310	310	310	315	320	300	275	285	265
10	265	275	280	275	305	325	295	340	340	315	315	305	290	305	300	300	270	300	S	S	S	S	255	280
11	270	285	260	250	255	280	295	335	340	320	310	305	305	300	305	300	300	310	315	310	310	290	295	285
12	275	290	285	260	275	305	310	330	325	320	325	330	295	300	305	300	310	325	310	295	320	305	315	310
13	280	260	270	280	295	285	285	330	345	325	320	320	300	295	300	295	305	305	305	315	340	290	300	290
14	295	260	265	290	295	275	275	315	335	325	315	315	285	305	305	300	305	315	315	305	265	285	295	280
15	280	310	285	285	285	255	280	340	350	320	325	320	305	295	310	300	310	320	320	290	285	305	305	285
16	290	280	285	285	285	275	285	315	330	345	330	300	300	295	300	290	295	315	325	305	325	310	290	285
17	290	310	305	350	245	260	295	335	345	330	320	320	305	290	305	305	305	305	325	325	295	315	285	295
18	295	290	290	290	310	310	320	340	340	340	335	315	305	295	295	300	305	315	325	325	300	320	285	275
19	260	255	240	270	310	275	290	325	335	315	310	315	305	285	285	295	305	300	305	305	275	295	295	285
20	305	345	335	250	285	285	295	320	345	340	330	325	310	305	300	315	320	340	325	295	310	310	290	285
21	280	295	305	290	270	260	265	315	340	330	325	315	310	305	300	285	315	315	320	305	275	275	300	265
22	255	255	240	255	245	275	270	265	310	325	315	320	310	295	305	315	315	315	315	280	305	280	280	265
23	310	295	330	280	275	255	285	340	355	325	325	310	300	315	305	310	325	330	330	310	320	290	260	270
24	310	260	255	250	250	260	250	325	355	345	300	320	310	305	310	320	330	335	325	310	295	290	285	280
25	275	290	290	265	280	280	310	320	340	315	305	325	310	300	305	310	320	325	325	295	280	290	260	270
26	275	265	275	300	340	295	280	335	345	325	315	315	315	310	315	305	320	315	320	280	295	280	285	260
27	265	285	260	265	300	335	275	300	330	335	320	325	315	300	295	320	330	325	330	305	285	300	275	265
28	245	255	295	325	315	235	265	325	345	320	330	325	305	300	305	305	320	325	315	295	305	305	250	245
29	265	270	270	270	320	250	260	325	320	310	335	325	305	305	310	300	325	335	325	285	310	275	245	250
30	260	275	295	275	305	355	305	320	335	330	320	310	300	305	295	310	325	340	330	305	290	290	290	270
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	28	27	28	29	30
MED	280	285	285	278	292	275	285	325	335	325	320	315	302	300	300	300	308	315	315	305	300	290	290	282
UQ	295	295	295	290	305	295	295	335	345	330	325	320	305	305	305	310	320	325	325	310	310	305	300	290
LQ	265	265	265	265	275	265	275	320	330	320	315	305	290	295	295	295	300	305	305	295	285	282	280	270

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IONOSPHERIC DATA

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

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L	L								
2										L	415	L	L	L	L	L	L							
3										405	L	L	L	L	L									
4								415L	450		L	L	L	L	L	L								
5										435	L	L	405L	B	L	L								
6										L	L	L	L	L	L	L	415							
7										L	L	L	L	L	L	445								
8										L		L	L	L	A	A	A							
9											L	L	L	L	L	L	L	L						
10										445	L	L	L	L	C									
11											U L 415	L	L	L	L	430	425							
12										L	L	L	L	L	L	L								
13										L	L	L	L	L	L	L								
14										L	L	L	L	L	L	L	L							
15										L	L	L	L	L	L	L								
16										L	B	B	L	L	L									
17										L	L	L	L	L	L	L								
18										L	L	B	L	L	L									
19										L	L	L	L		L									
20										L	L	L	L	L	L	U L 410								
21										L	L	L	L	L	L	L								
22										A	L	L	L	L		L	L							
23										L	L	L	L	L		L								
24											L	L	L	L	L	L								
25										L	L	405	L	L	L	L								
26											L	L	L	L	L	L								
27										L	L	L	L	L	L	L								
28										L	L	U L 380	U L 345	L	L	L	L							
29											L	L	L 415	L 370	L	L								
30											L	L	L 415	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	3	2	2	4	1		3	2							
MED								415L	450	435	415	392	410	370		430	420							
UQ										440			415L			438								
LQ										420			375L			420								

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

IONOSPHERIC DATA

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

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										250	240	250	280	290	270	255								
2										240	230	235	280	270	270	250	240							
3										225	250	250	290	275	255									
4								230	225		255	265	245	290	270	255								
5										230	250	260	235	285	275	240								
6										240	240	240	300	255	255	260	240							
7										240	235	240	245	285	280	245								
8										250		255	265	250	255	250	E A 265							
9											250	250	250	250	250	245	220	220						
10										230	250	240	275	275	I C 260									
11											240	235	290	275	250	230	225							
12										235	230	245	275	260	250	235								
13										240	235	250	230	275	270	250								
14										225	215	255	285	250	230	220	250							
15										250	235	240	280	250	260	225								
16										235	B	250	255	255	260									
17										235	225	240	235	290	260	250								
18										230	250	B	275	260	275									
19										255	250	250	225		280									
20										225	240	230	250	235	275	245								
21										230	240	230	270	250	245	225								
22										240	245	245	315	250		250	225							
23										250	250	240	290	275		275								
24											290	250	250	260	250	245								
25										245	240	250	240	250	260	240								
26											230	250	265	235	250	240								
27										225	225	255	240	225	245	250								
28										245	240	240	245	250	255	230	220							
29											240	240	240	270	275	250								
30											245	245	245	255	255	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	1	23	28	29	30	29	28	25	8	1						
MED								230	225	240	240	245	260	260	260	245	228	220						
UQ										245	250	250	280	275	270	250	242							
LQ										230	235	240	245	250	250	240	222							

IONOSPHERIC DATA

NOV. 1970 | H'F (KM) | 135° E Mean Time (G. M. T.+ 9h) | Station YAMAGAWA | Lat. 31° 12'.1 N | Long. 130° 37'.1 E | Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	260	250	260	275	245	250	275	245	230	225H	225	225	215H	210H	225H	225H	235	230	205	240	230	225	230	260
2	250	230	240	250	250	270	260	245	230	220H	220	210	205H	210	220	230	225	210	215	205	225	215	240	230
3	250	290	250	245	205	280	255	220	220	210	205H	225	225	245	225	225	225	245	220	225	225	265	230	240
4	250	250	300	300	300	275	230	200	200	230	210	210	210	200H	210H	225	225	240	215	215	225	240	225	270
5	255	265	305	295	255	250	205	210	215	200	215H	220	205	B	E 250B	240	230	230	240	230	220	250	245	250
6	260	265	285	300	240	200	275	240	230	225	225	205	200H	210H	225H	200H	220	225	200H	220	210	230	240	245
7	265	245	290	300	275	290	290	250	235	225	225	225	225	210H	215H	200	220H	235	230	250	260	300	255	250
8	220	345	310	320H	255	250	300	250	225	215	245	220	E 250A	240	A	A	A	220	215	225	230	255	235	245
9	235	225	280	240	200H	280	275	230	220	225	215	215	200H	200H	220	220	220	210H	205	215	200	225	255	275
10	260	280	290	275	250	215	210	225	220	200	220	220H	200H	225	I C 240	230	235	220	200	215	220	235	255	260
11	250	230	275	345	300	270	265	240	230	220	205H	205	230	230	230	220	215	215	225	220	205	225	255	240
12	250	245	275	305	305	250	235	225	235	220	205	200H	210H	225	220	230	225	225	215	245	215	210	210	240
13	250	300	300	290	250	230	290	255	230	220	215	225	220	225	240	235	220	210	205	215	200	215	235	250
14	250	275	325	275	255	355	305	250	235	225	225	225	210	230	225	215	225	225	205	200	230	215	205	260
15	290	250	255	265	255	310	295	235	220	225	230	225	210H	220	210H	225	220	215	205	215	225	230	230	240
16	265	240	255	270	275	300	290	250	220	225	I B 230	I B 235	240	235	225	225	220	225	210	220	225	220	225	250
17	265	230	225	340	365	350	270	240	230	225	210	210	220	I 210C	240	240	220	240	215	210	220	240	235	250
18	245	230	250	250	250	240	225	225	225	220	215H	B	E 250B	225	240	240	220	225	210	210	200	205	245	265
19	305	360	400	300	220	260	255	245	225	235	235	225	220	225	230	240	225	225	215	225	205	250	235	250
20	255	225	205	325	295	280	260	240	225	220	215	225	225	225	225	210	225	210	200	230	225	215	225	260
21	295	250	240	245	275	335	310	250	225	220	215	215	E 250A	230	230	225	225	210	205	220	235	280	240	205
22	300	250	380	315	325	320	295	265	235	I 230A	235	220	210H	205H	240	240	220	220	200	205	220	230	225	235
23	250	250	260	300	290	345	300	235	225	225	225	215	205H	225	240	230H	230	210	200	230	230	230	280	295
24	240	E 250S	340	355	350	355	320	250	205	230	220	240	215	220H	220	235	230	210	200	230	230	220	210	260
25	280	280	250	300	280	260	245	235	220	200H	230	210	230	205	200	225	225	205	195	250	240	210	250	300
26	290	325	300	250	210	240	290	230	225	225	205H	215	200H	215H	200H	220	230	210	200	210	225	240	240	275
27	270	250	290	295	245	190	300	255	240	225	220	200H	200H	210	205H	230H	225	210	205	250	250	250	250	255
28	295	300	250	225	250	E 300B	E 300S	245	235	220	220	205	200H	205	210	220	220	210	190	240	200	205	205	310
29	295	290	280	250	240	200	E 325S	240	I 220C	225	240	215	170H	200H	200H	200H	240	225	195	220H	200	205	225	E 315S
30	335	280	245	240	245	195	E 260S	245	225H	240	230	230	200	220H	210H	225	230	220	195	200	240	240	255	275
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	29	29	29	29	30	30	30	30	30	30	30
MED	260	250	278	292	255	268	274	240	225	225	220	220	210	220	225	225	225	220	205	220	225	230	235	251
UQ	290	280	300	300	290	300	298	250	230	225	230	225	222	225	230	230	230	225	215	230	230	240	250	268
LQ	250	242	250	250	245	240	255	230	220	220	215	210	200H	210H	210	220	220	210	200	215	210	215	225	245

NOV. 1970 | H'F (KM)

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IONOSPHERIC DATA

NOV. 1970 | 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 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	B	E	E	S	S	G	100	115	100	100	100	100	95	105	105	105	100	100	100	100	S	100
2	S	B	B	E	B	B	S	G	G	120	120	115	105	105	105	100	100	100	100	100	95	95	S	S
3	S	S	B	B	B	S	S	115	110	105	105	100	100	100	100	100	100	100	100	105	100	S	S	S
4	S	S	S	S	S	S	100	G	105	120	105	120	100	100	100	G	100	G	S	S	S	S	S	S
5	S	S	100	100	E	B	100	G	110	G	G	G	G	B	B	105	135	120	95	S	S	S	S	S
6	S	100	100	B	100	100	100	100	G	G	G	100	100	100	G	G	100	100	100	115	B	100	S	S
7	S	E	E	E	E	S	S	140	G	G	105	105	130	G	G	120	130	105	S	100	S	105	100	100
8	100	100	95	115	105	100	100	G	150	155	140	125	130	105	120	110	110	110	100	100	100	100	100	S
9	S	B	S	E	E	E	S	G	155	165	100	135	125	110	120	110	110	S	S	S	B	S	S	95
10	S	S	S	E	E	E	S	S	G	G	100	G	100	125	C	95	115	100	100	100	100	100	100	100
11	95	S	S	E	B	S	S	100	G	G	G	G	G	150	140	G	G	100	95	95	S	S	105	100
12	105	100	S	S	S	S	S	G	G	G	130	130	100	100	100	100	150	125	115	110	S	100	S	100
13	100	S	S	100	E	S	S	G	G	125	125	115	120	120	115	G	G	G	100	95	S	S	S	S
14	S	B	100	100	100	S	S	G	150	120	110	120	120	115	G	120	110	165	S	S	S	S	E	S
15	S	S	S	S	E	100	100	G	G	130	120	110	110	110	105	105	G	100	100	100	S	S	S	S
16	S	S	S	E	E	E	S	S	G	160	B	B	120	125	100	105	105	100	105	100	100	S	S	S
17	S	S	B	B	E	B	S	140	155	125	110	115	115	C	115	115	115	105	105	S	100	100	S	S
18	S	S	S	E	E	100	100	G	G	120	115	B	B	110	110	110	G	G	S	S	S	S	S	100
19	S	100	100	E	E	S	S	S	G	120	120	105	105	105	G	G	100	100	S	S	S	S	S	S
20	S	S	B	100	E	S	S	100	150	140	115	100	100	100	105	105	105	105	S	S	105	S	S	100
21	S	S	S	B	E	S	S	100	G	120	105	105	105	100	100	100	100	100	100	100	110	100	95	S
22	S	S	100	100	100	95	100	100	100	105	110	100	100	100	100	100	100	100	100	S	S	B	E	S
23	B	100	100	100	E	105	100	100	105	105	105	105	105	100	100	100	100	105	105	S	100	100	100	100
24	S	S	B	S	B	100	100	100	100	110	110	110	105	105	G	100	G	100	100	100	100	100	S	S
25	S	B	E	E	E	100	105	100	115	105	105	100	105	100	100	100	100	100	100	100	S	B	S	S
26	B	S	B	E	E	B	S	S	G	115	105	105	100	100	100	100	G	100	S	100	100	S	S	B
27	E	B	E	E	E	E	S	S	G	G	145	100	G	G	G	100	100	100	100	100	100	100	100	100
28	S	B	B	E	B	B	S	S	G	100	100	100	100	100	100	100	100	95	100	100	95	95	S	S
29	E	S	E	E	E	E	S	S	C	110	105	150	100	100	100	100	100	95	100	S	S	B	E	S
30	S	S	B	E	E	S	S	S	G	105	155	150	140	100	100	100	100	100	S	100	100	S	S	S
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	5	7	7	4	8	10	11	13	23	26	25	26	26	22	25	24	26	21	19	15	13	7	10
MED	100	100	100	100	100	100	100	100	110	120	110	105	105	100	100	100	100	100	100	100	100	100	100	100
UQ	102	100	100	100	102	100	100	108	150	125	120	120	120	110	110	105	110	105	100	100	100	100	100	100
LQ	98	100	100	100	100	100	100	100	105	108	105	100	100	100	100	100	100	100	100	100	100	100	100	100

NOV. 1970 | H'ES (KM)

IONOSPHERIC DATA

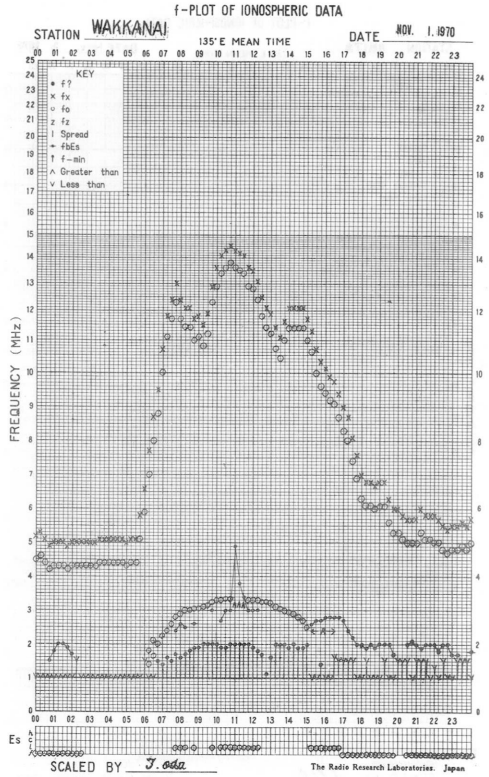
NOV. 1970 | TYPES OF ES | 135° E Mean Time (G. M. T. + 9h)

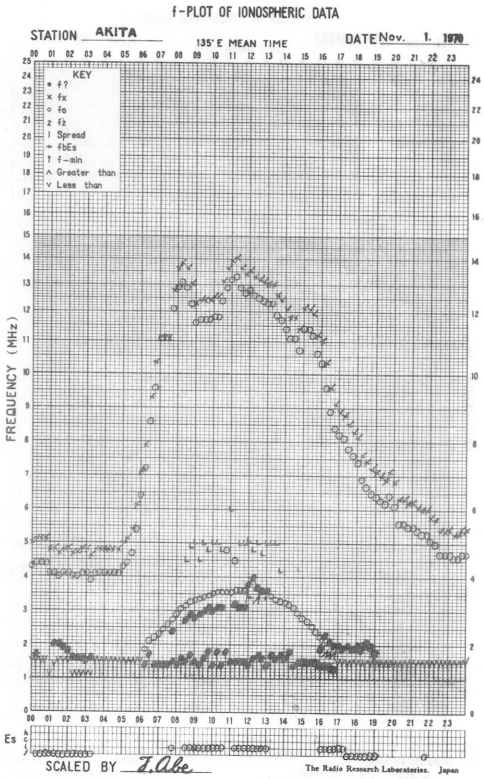
Station YAMAGAWA Lat. 31°12'·1 N Long. 130°37'·1 E Sweep 1 MHz to 20 MHz in 20 sec in automatic operation

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 2	L HL 21	L 2	L 2	L 2	L 2	L 3	LL 21	LL 42	LL 53	F 2	F 2	F 1	F 1		F 1
2										C 1	C 1	C 1	L 2	L 2	L 1	L 2	L 1	L 2	F 1	F 2	F 1	F 1		
3								L 1	L 2	L 2	L 1	L 1	L 2	L 1	L 2	L 3	L 2	L 1	F 2	F 1	F 1			
4							F 1		L 1	C 2	L 1	CL 11	L 1	L 1	L 1		L 1							
5			F 3	F 1			F 1		L 1							L 1	H 1	C 1	F 2					
6		F 1	F 1		F 1	F 1	F 3	L 2				L 1	L 1	L 1			L 1	L 2	F 1	F 1		F 1		
7								H 2			L 1	L 2	HL 11			CL 11	HL 22	LL 11		F 1		F 2	F 6	F 4
8	F 5	F 4	F 2	FF 21	FF 11	F 1	F 1		H 2	H 1	H 1	H 2	HL 21	L 2	CL 42	CL 42	CL 32	CL 11	F 2	F 2	F 2	F 1	F 1	
9									HL 11	H 1	L 1	HL 11	HL 11	L 1	C 1	CL 21	LL 21							F 1
10											L 2	L 1	HL 11			LC 11	CL 11	LL 11	F 1	F 1	F 3	F 1	F 1	F 1
11	F 3							L 1						HL 12	HL 11			L 1	F 3	F 1			F 4	F 2
12	F 3	F 1									H 1	H 1	L 2	L 1	LH 21	LH 31	HL 22	H 4	F 5	F 1		F 1		F 1
13	F 1			F 1						H 1	H 1	C 1	C 1	C 1	C 1				F 1	F 1				
14			F 2	F 1	F 1				H 1	C 2	C 2	C 1	C 1	C 1		CL 11	C 3	HL 11						
15						F 1	F 1			H 1	C 1	C 1	C 1	C 2	L 1	L 1		L 1	F 2	F 1				
16										H 1			C 1	H 1	L 1	LL 11	L 2	L 1	F 1	F 2	F 1			
17								HL 11	H 1	H 1	C 1	C 1	C 1		C 1	C 1	C 2	L 3	F 2		F 2	F 2		
18						F 1	F 1			C 1	C 2			L 1	L 1	L 1								F 1
19		F 2	F 1							C 1	L 1	L 1	L 1	L 1			L 1	L 1						
20				F 1				L 1	H 1	H 1	C 1	L 2	L 1	L 1	L 1	L 2	L 3	L 3			F 2			F 3
21								L 1		C 1	L 1	L 1	L 3	L 3	L 3	L 3	L 4	L 2	F 4	F 1	FF 11	F 2	F 2	
22			F 3	F 3	F 2	F 3	F 1	L 1	L 1	C 5	C 2	L 1	L 1	L 2	L 2	L 3	L 5	L 3	F 1					
23		F 2	F 2	F 1		F 1	F 1	L 1	L 1	L 1	L 1	L 2	L 1	L 1	L 1	L 2	L 2	L 2	F 1		F 2	F 1	F 2	F 1
24						F 1	F 1	L 1	L 1	C 2	C 2	C 2	L 1	L 1		L 1		L 1	F 2	F 1	F 3	F 1		
25						F 1	F 1	L 1	L 1	L 1	L 2	L 1	L 1	L 2	L 2	L 3	L 2	L 1	F 2	F 1				
26										C 2	C 1	C 2	L 2	L 2	L 2	L 3		L 2		F 1	F 1			
27											H 1	L 1				L 1	L 5	L 4	F 4	F 5	F 6	F 2	F 1	F 2
28										L 2	L 1	L 1	L 1	L 1	L 1	L 1	L 1	L 3	F 1	F 1	F 4	F 2		
29										C 3	L 2	HL 11	L 1	L 1	L 2	L 2	L 1	L 2	F 1					
30										L 1	H 1	HC 11	HL 11	L 2	L 2	L 1	L 2	L 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																								

The Radio Research Laboratories, Japan

NOV. 1970 | TYPES OF ES


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE NOV. 1, 1970
KEY
* f?
× fx
○ fo
z fz
| Spread
⌁ fbEs
↑ f-min
∧ Greater than
∨ 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. 1. 1970
KEY
* f?
× fx
○ fo
z fz
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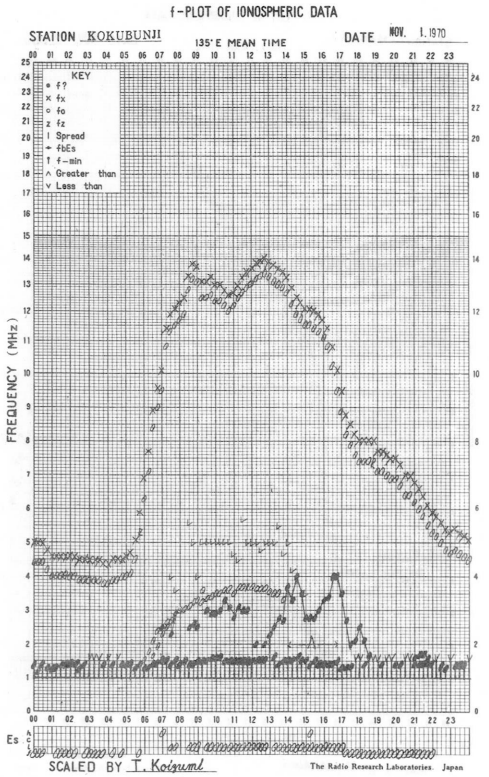
⌁ fbEs
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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STATION KOKUBUNJI
135°E MEAN TIME
DATE NOV. 1, 1970
KEY
* f?
× fx
○ fo
z fz
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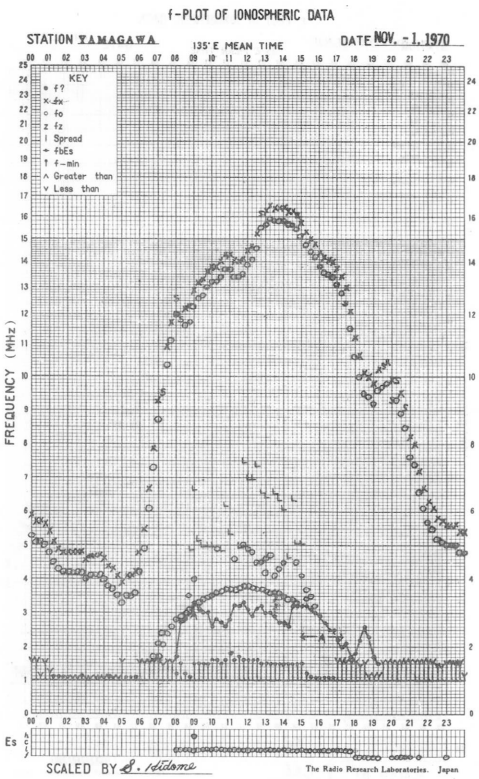
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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DATE NOV. - 1, 1970
KEY
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○ fo
z fz
| Spread
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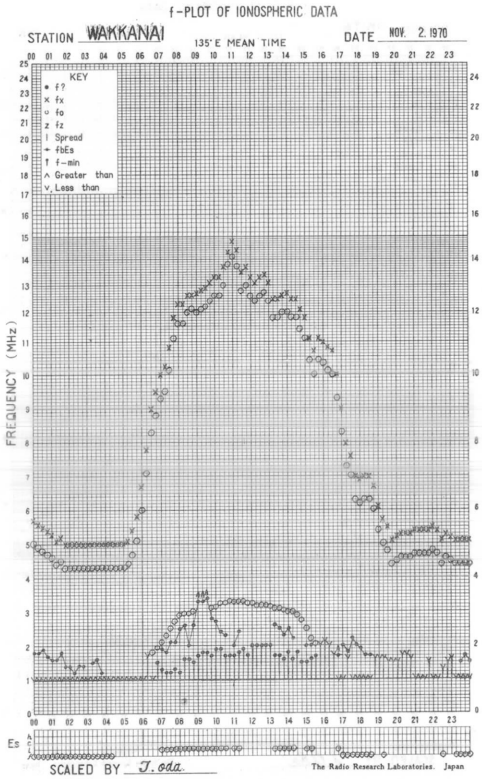
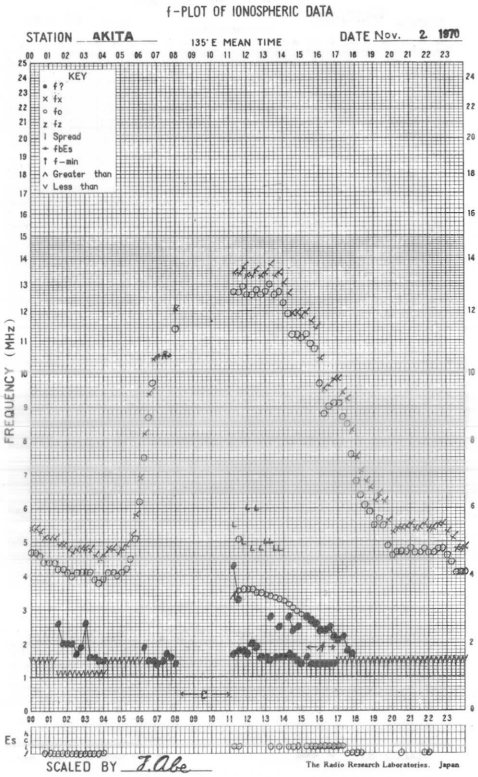
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Hidoma
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE NOV. 2. 1970
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. 2. 1970
KEY
● f?
× fx
○ fo
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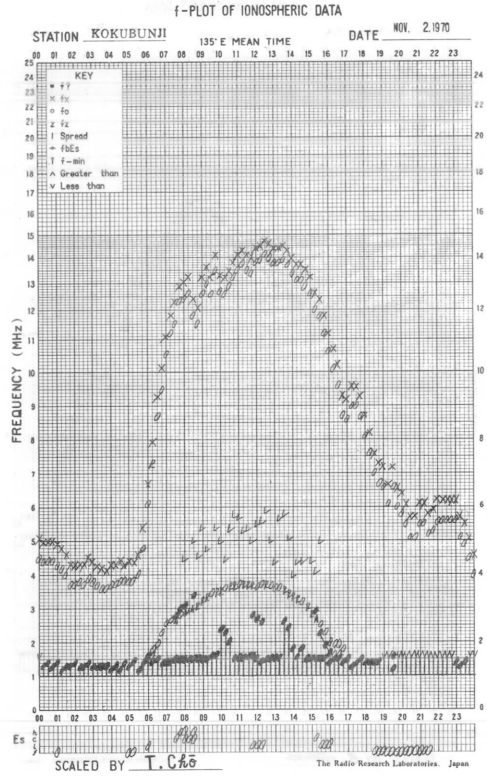
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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STATION KOKUBUNJI
135° E MEAN TIME
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KEY
● f?
× fx
○ fo
z fz
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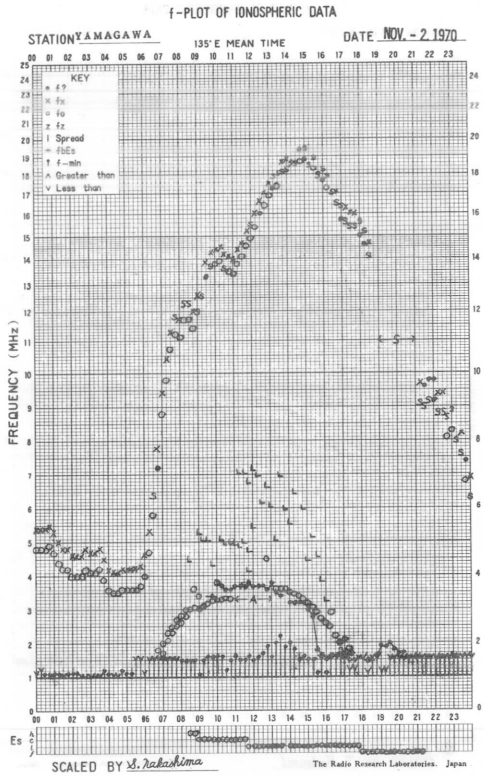
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Chō
The Radio Research Laboratories. Japan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KEY
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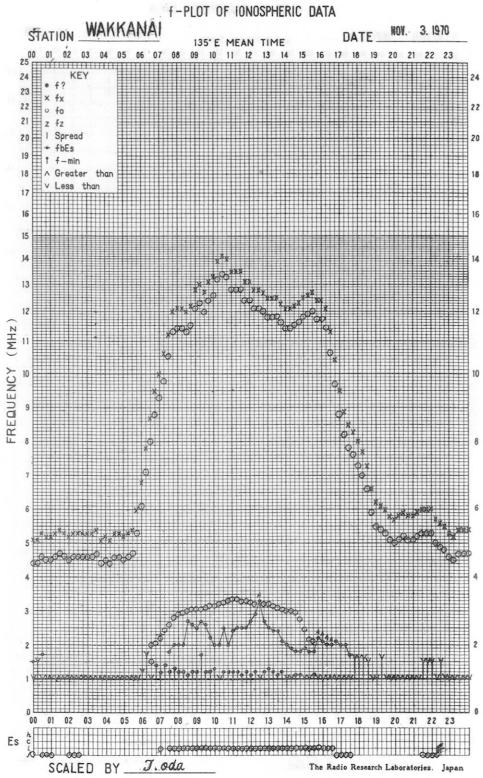
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE NOV. 3. 1970
KEY
• f?
× fx
○ fo
z fz
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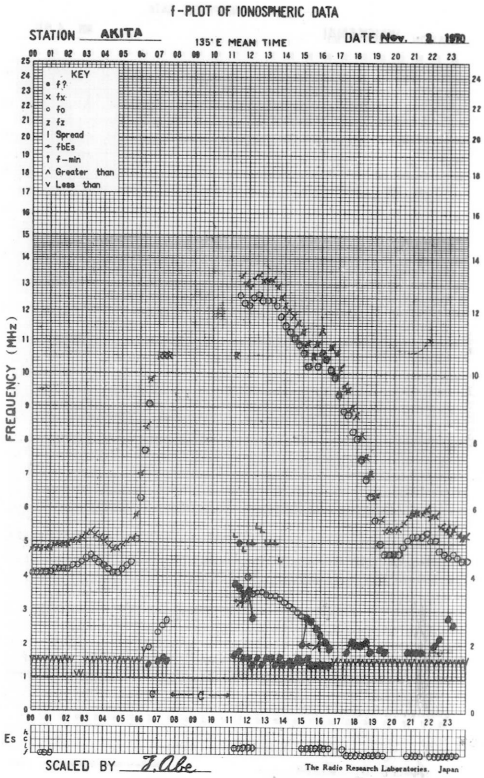
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE Nov. 3. 1970
KEY
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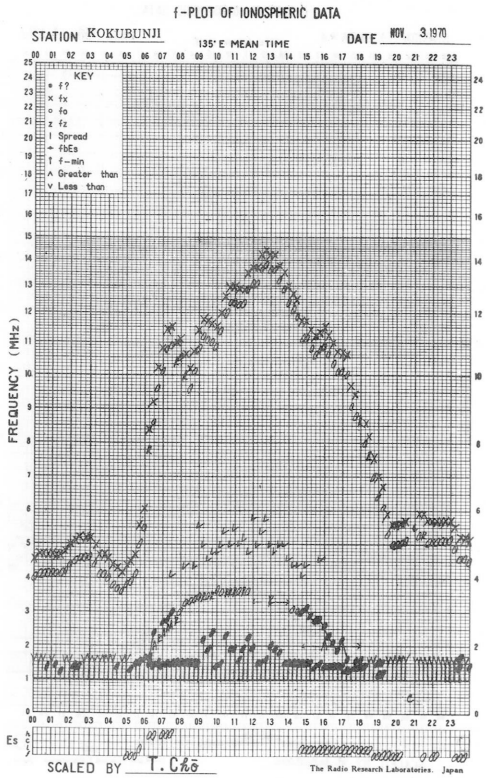
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe.
The Radio Research Laboratories. Japan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STATION KOKUBUNJI
135° E MEAN TIME
DATE NOV. 3. 1970
KEY
• f?
× fx
○ fo
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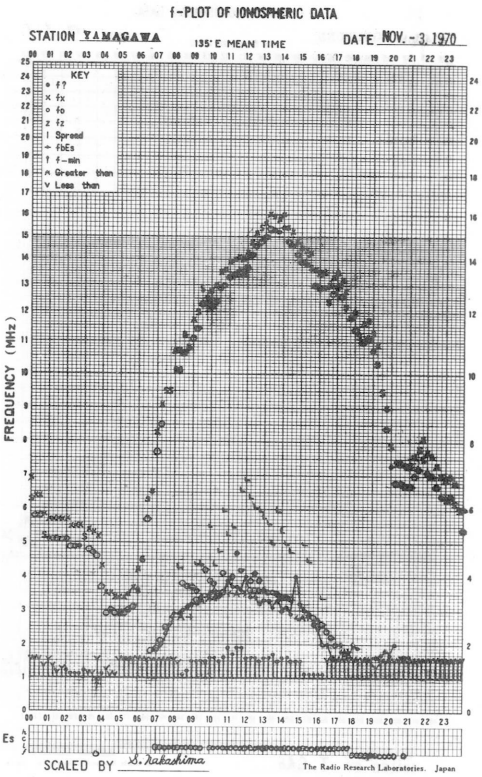
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Chō
The Radio Research Laboratories. Japan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KEY
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○ fo
z fz
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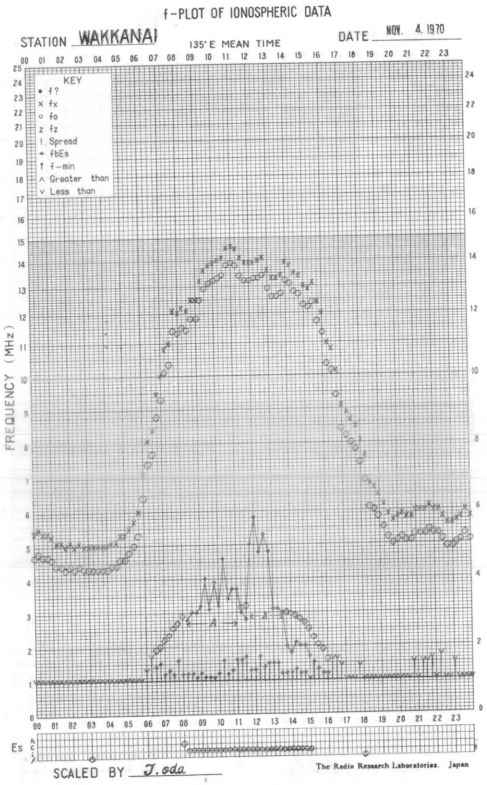
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
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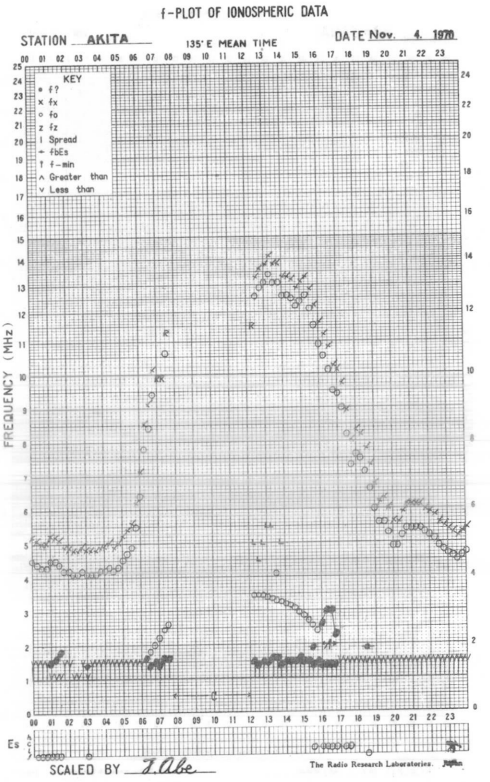
135° E MEAN TIME
DATE NOV. 4. 1970
KEY
• f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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DATE Nov. 4. 1970
KEY
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× fx
○ fo
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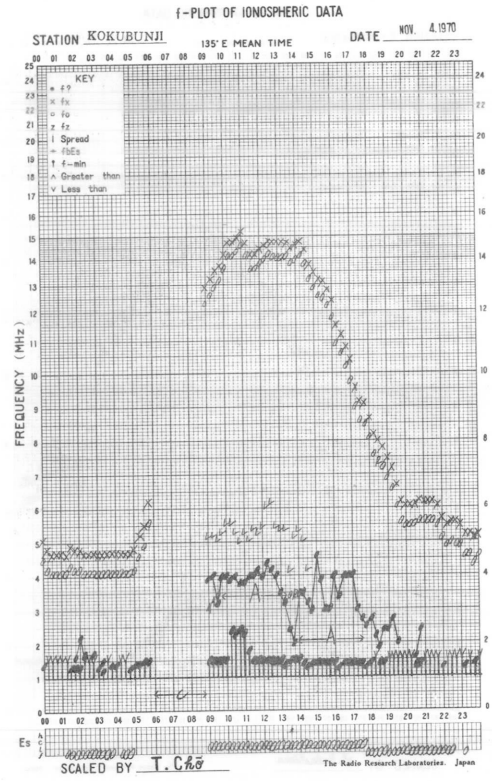
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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KEY
• f?
× fx
○ fo
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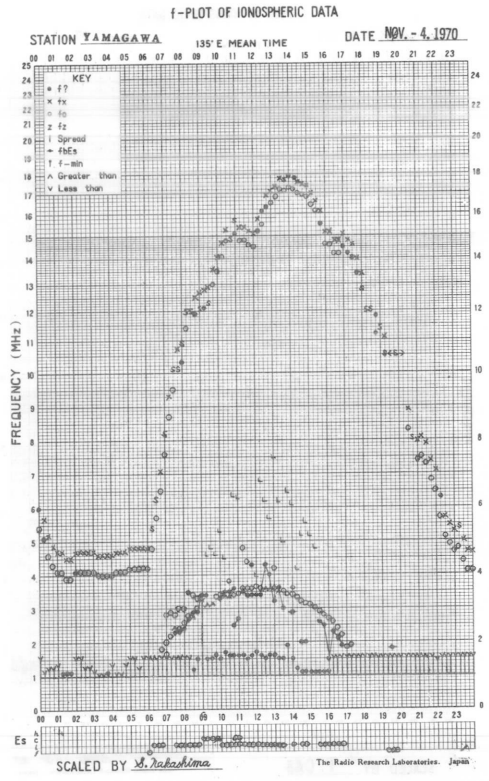
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Chō
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE NOV. - 4. 1970
KEY
• f?
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○ fo
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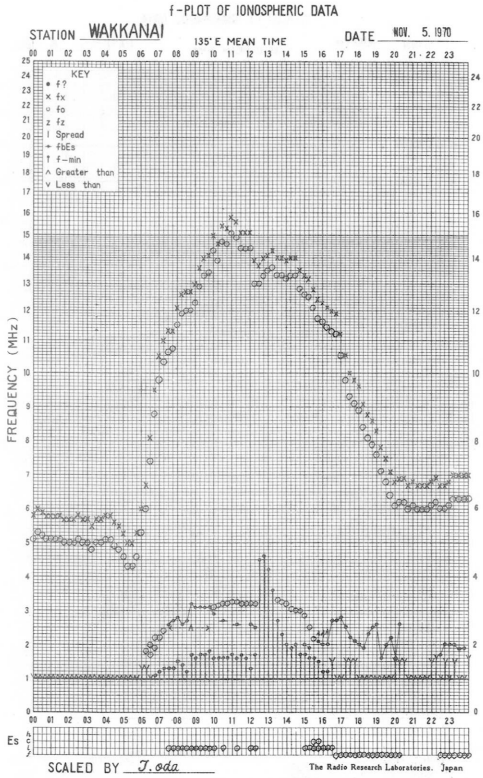
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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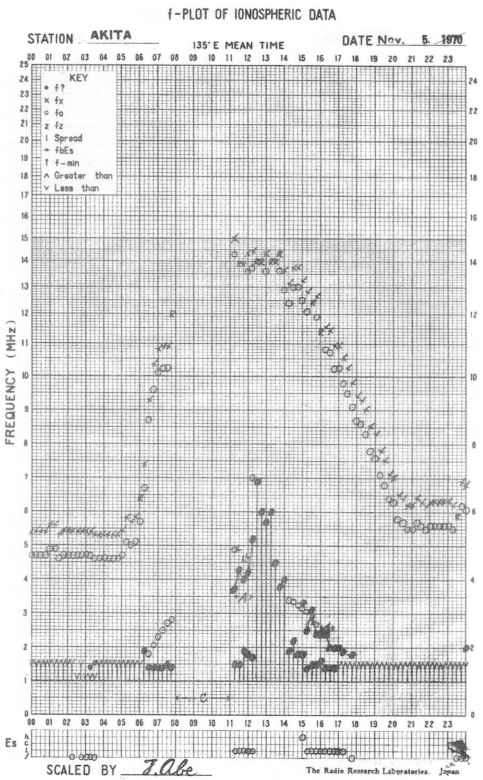
135° E MEAN TIME
DATE NOV. 5. 1970
KEY
FREQUENCY (MHz)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan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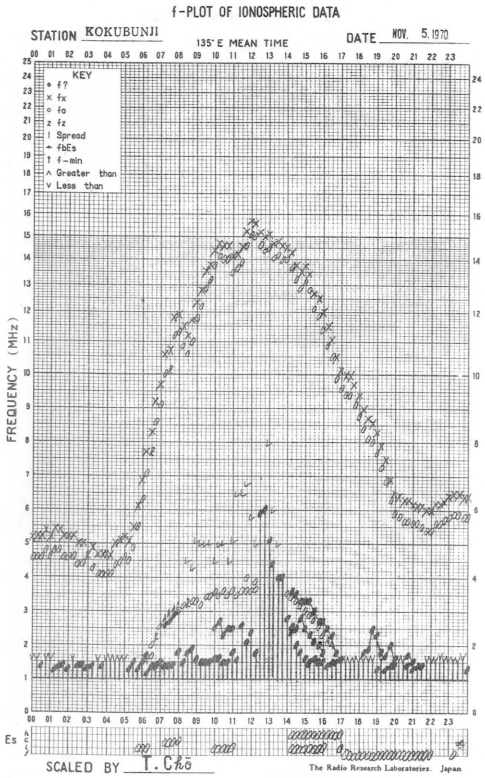
135° E MEAN TIME
DATE Nov. 5. 1970
KEY
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE NOV. 5. 1970
KEY
FREQUENCY (MHz)
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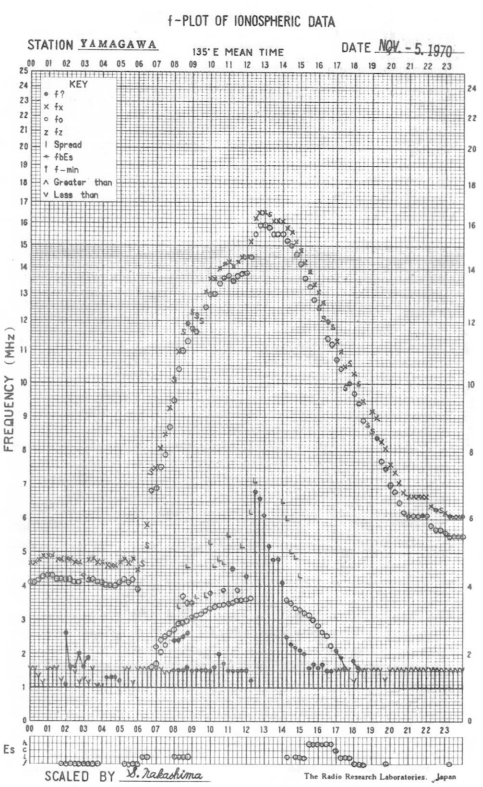
SCALED BY T. Ito
The Radio Research Laboratories. Japan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KEY
FREQUENCY (MHz)
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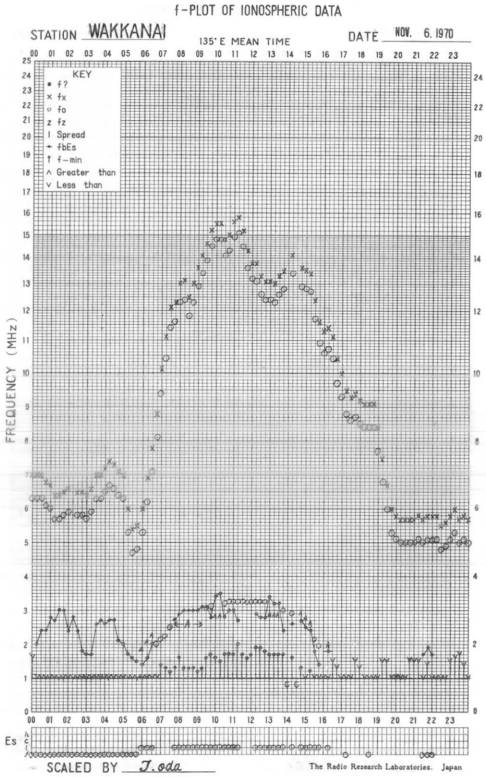
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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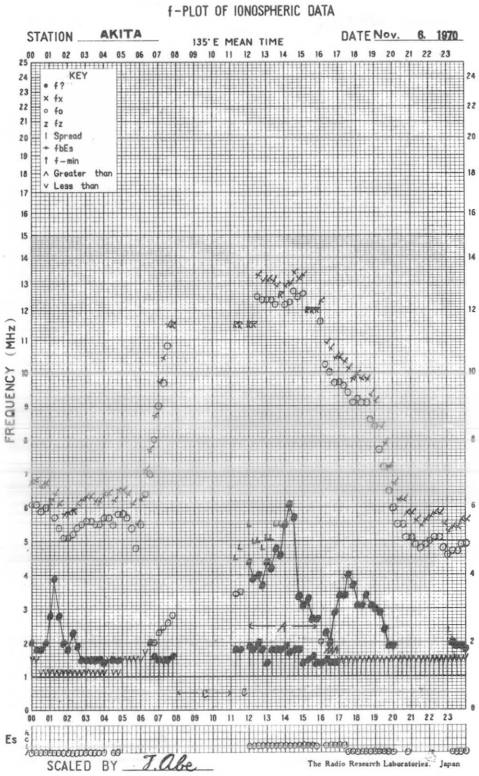
KEY
* f?
× fx
○ fo
z fz
| Spread
= fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Oda
The Radio Research Laboratories. Japan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○ fo
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| Spread
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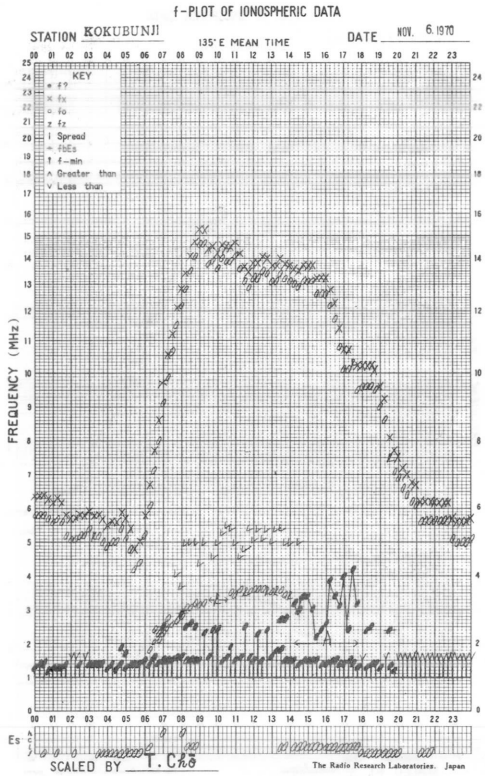
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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STATION KOKUBUNJI
135°E MEAN TIME
DATE NOV. 6.1970
KEY
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○ fo
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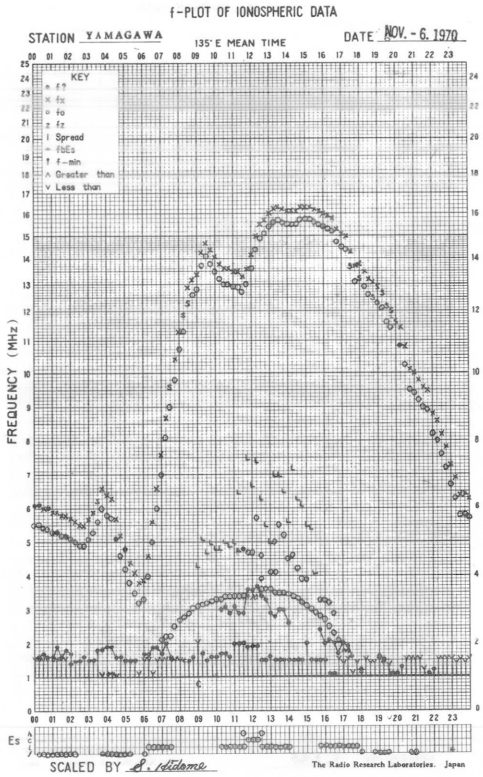
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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○ fo
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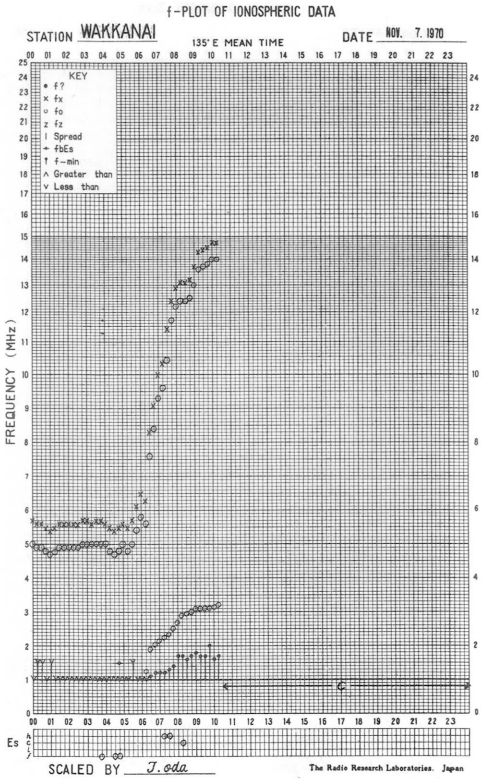
SCALED BY S. Ichitome
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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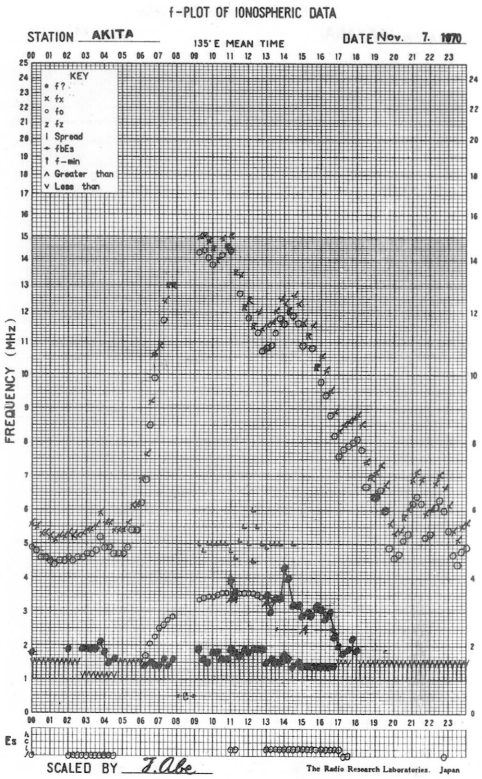
SCALED BY J. Oda
The Radio Research Laboratories. Japan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KEY
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FREQUENCY (MHz)
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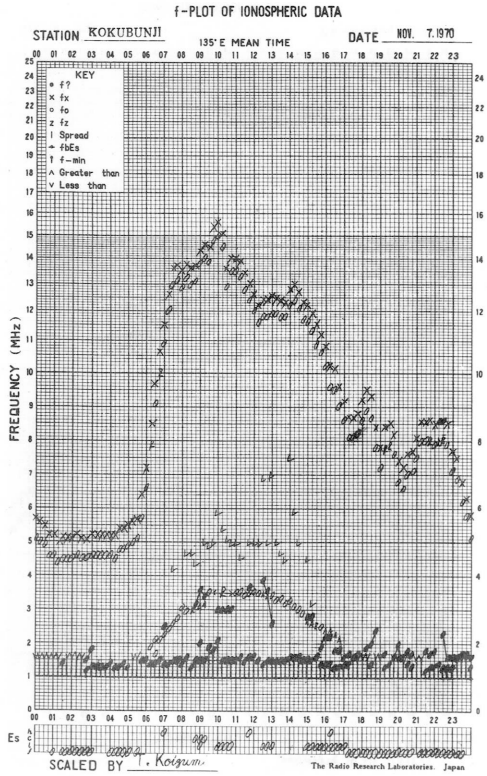
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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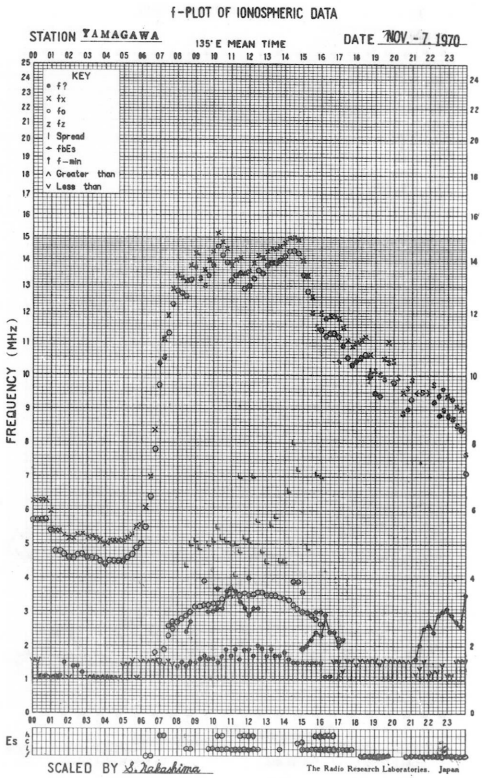
SCALED BY T. Kogure
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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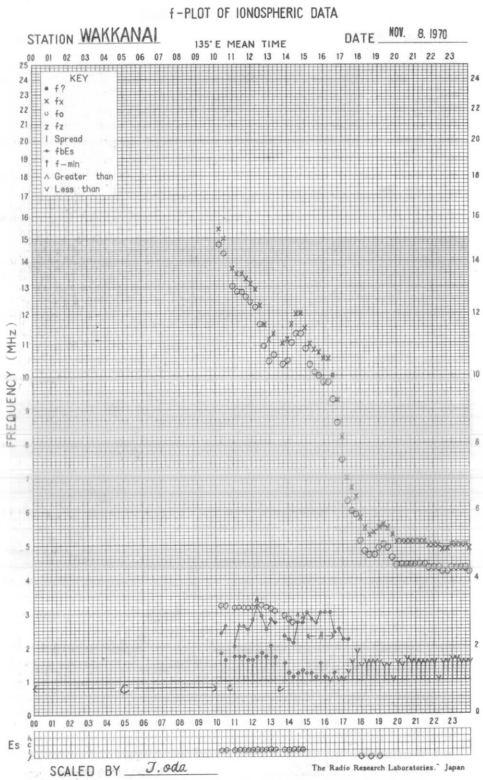
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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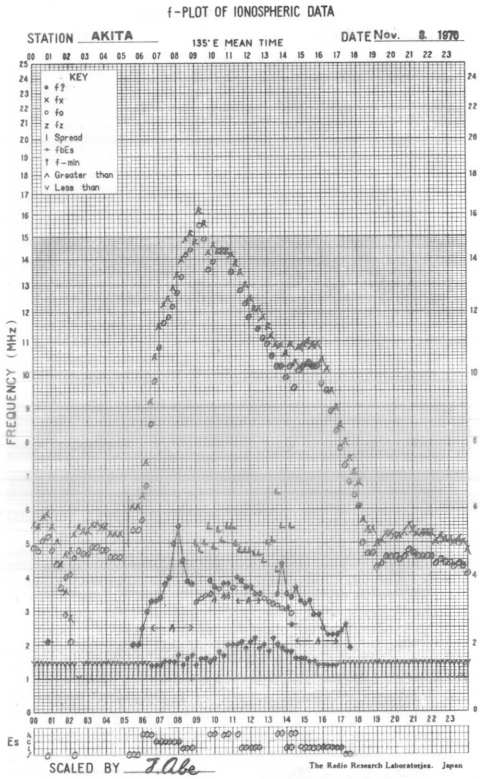
SCALED BY J. oda
The Radio Research Laboratories. Japan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KEY
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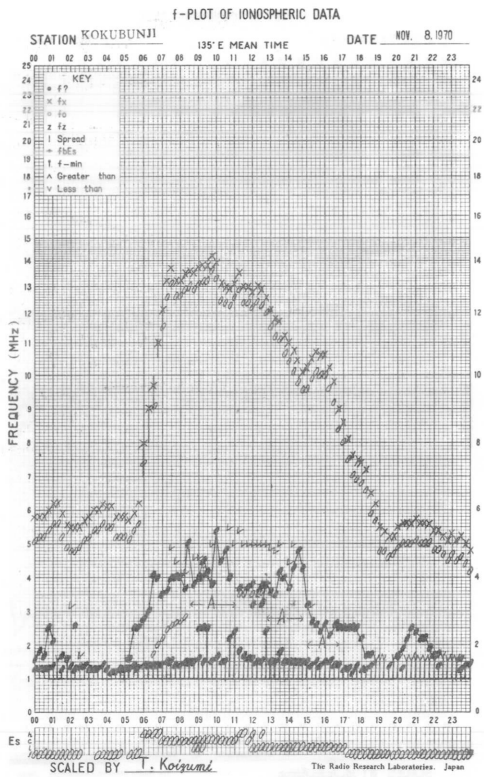
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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KEY
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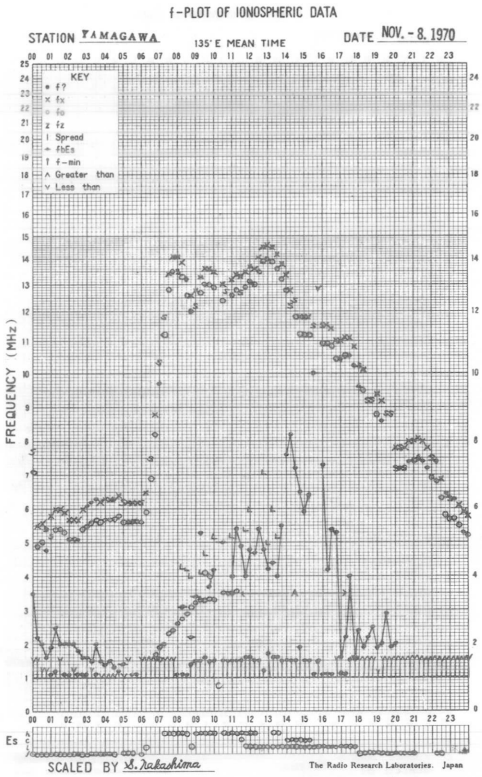
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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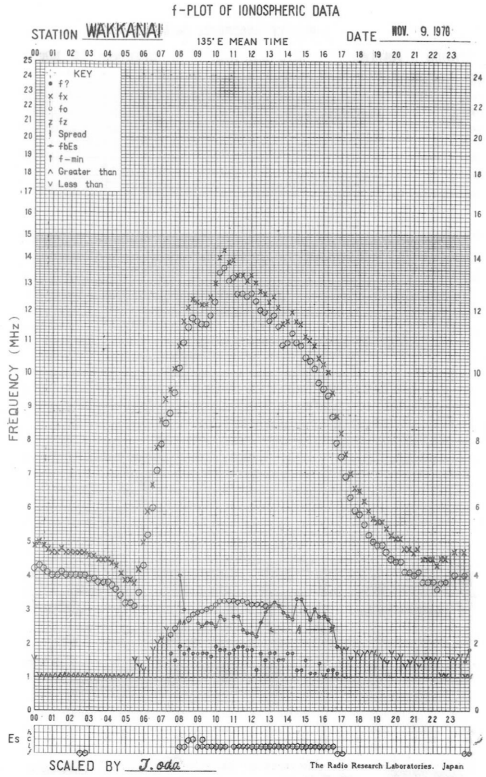
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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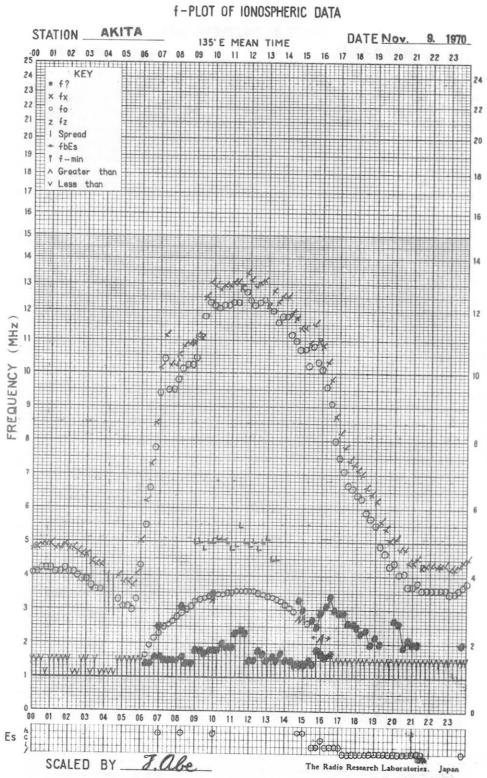
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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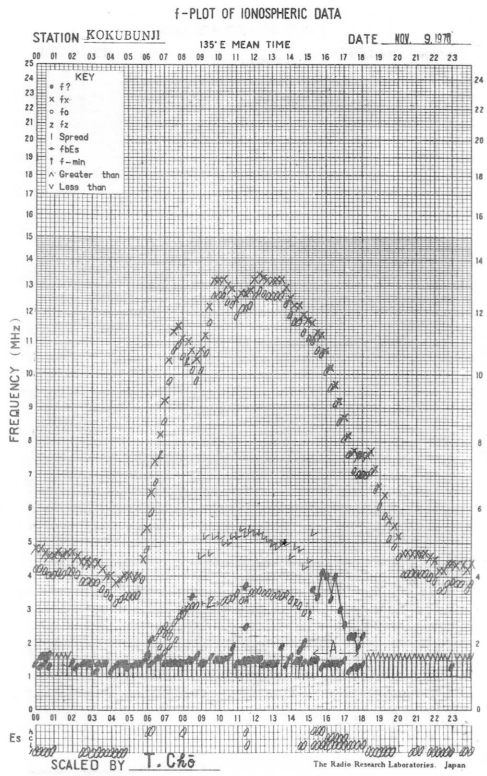
SCALED BY T. Abe
The Radio Research Laboratories. Japan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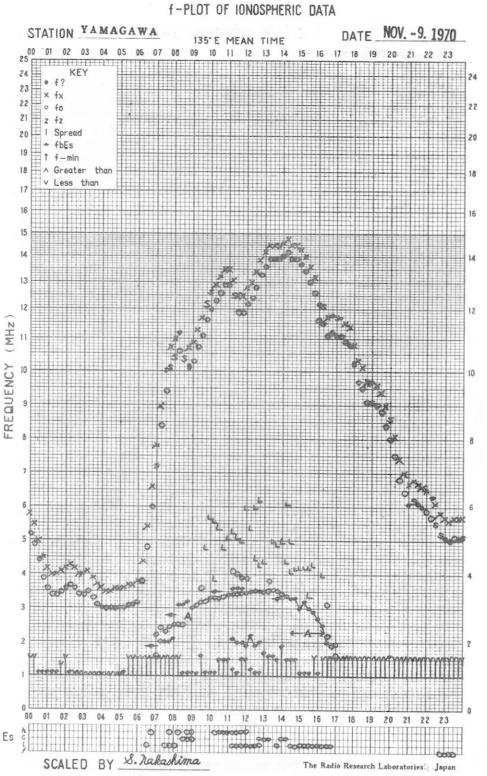
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Chō
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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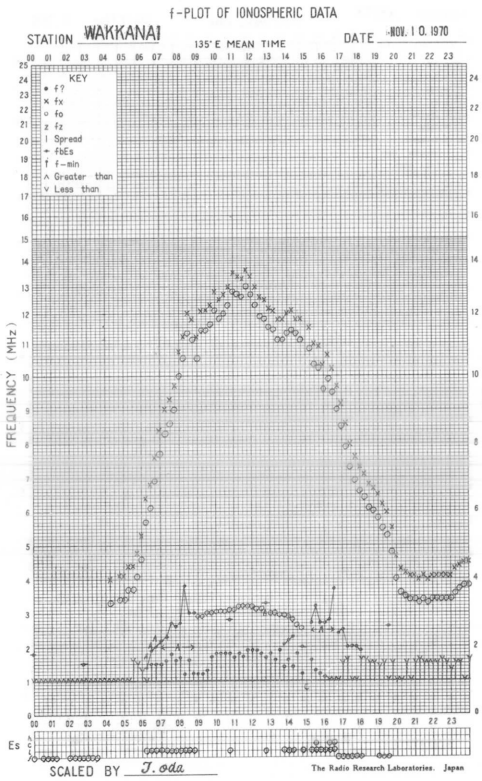
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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KEY
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FREQUENCY (MHz)
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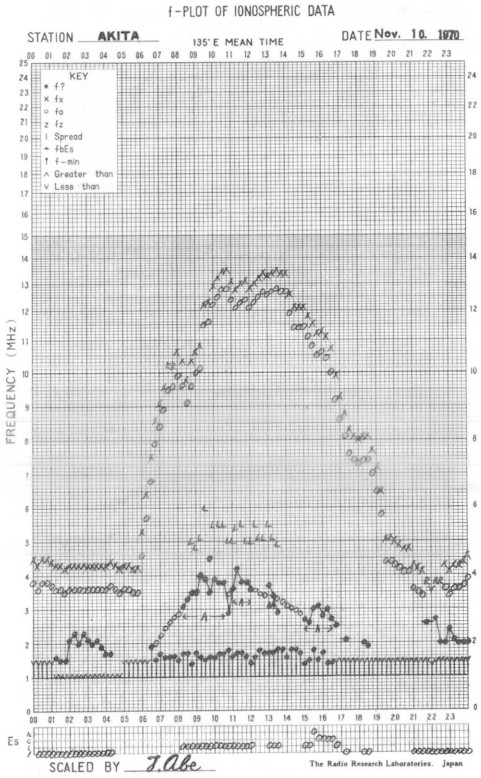
SCALED BY J. Oda
The Radio Research Laboratories. Japan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KEY
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∧ Greater than
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FREQUENCY (MHz)
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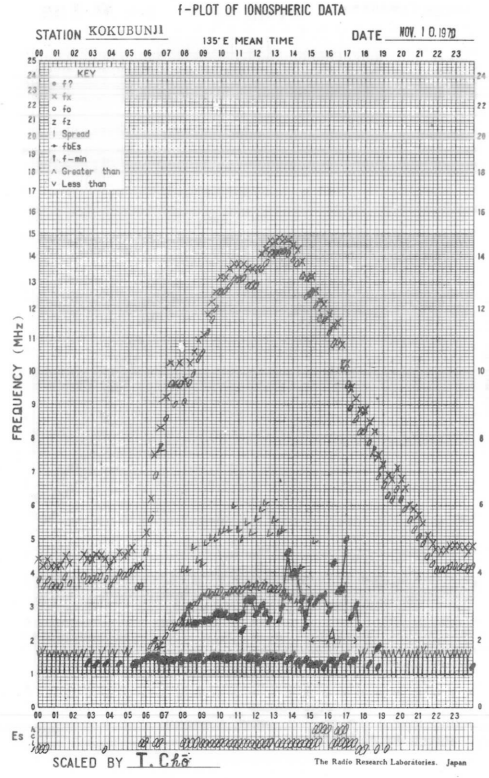
SCALED BY T. Abe
The Radio Research Laboratories. Japan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∨ Less than
FREQUENCY (MHz)
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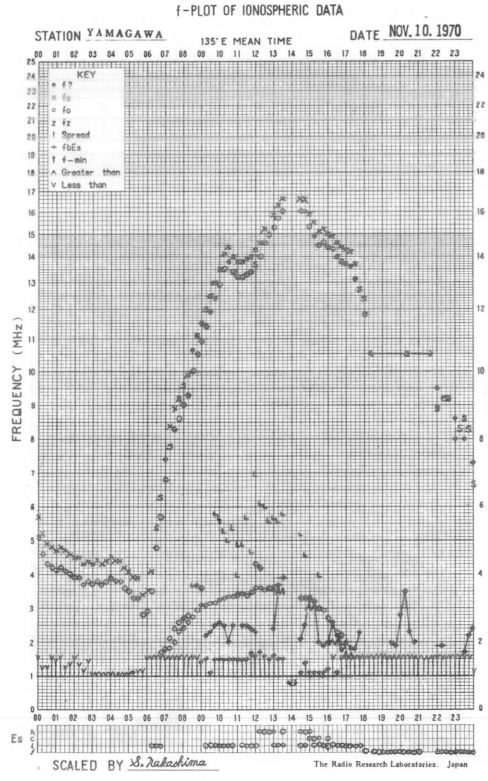
SCALED BY T. Chō
The Radio Research Laboratories. Japan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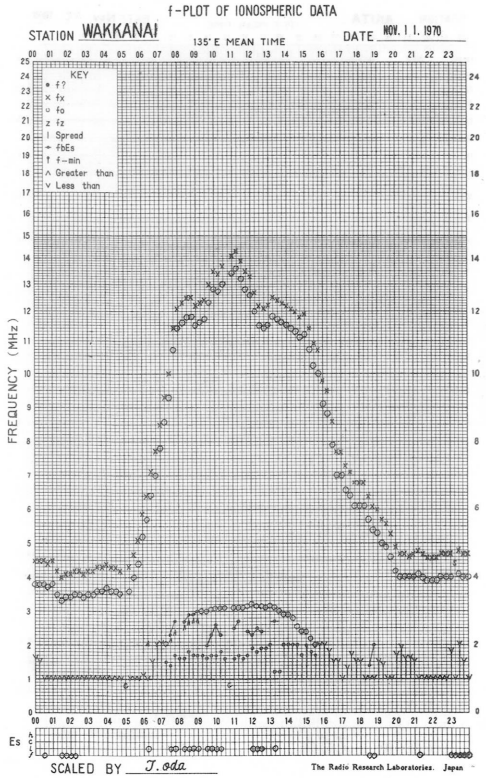
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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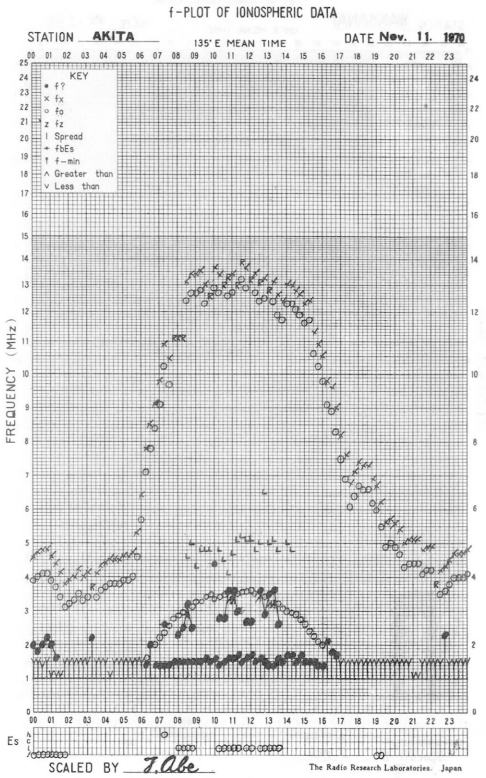
SCALED BY T. Oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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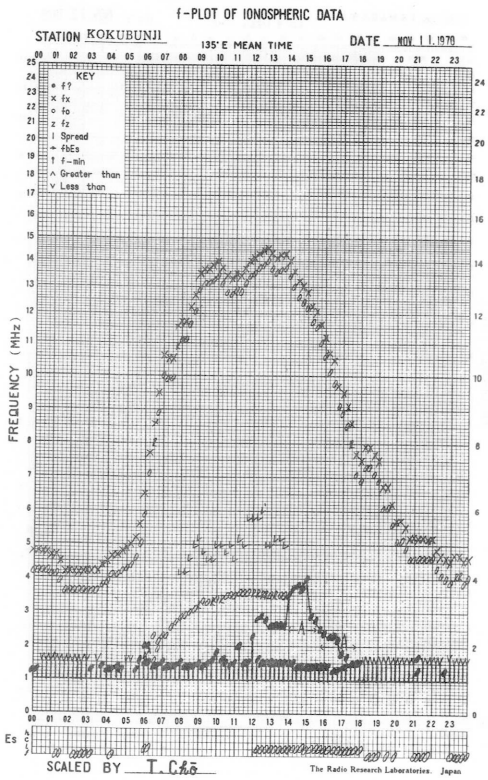
SCALED BY T. Abe
The Radio Research Laboratories. Japan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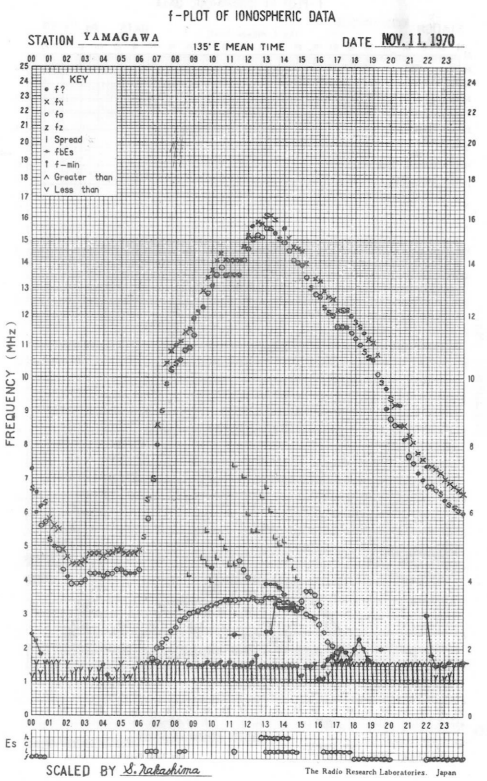
SCALED BY T. Ohs
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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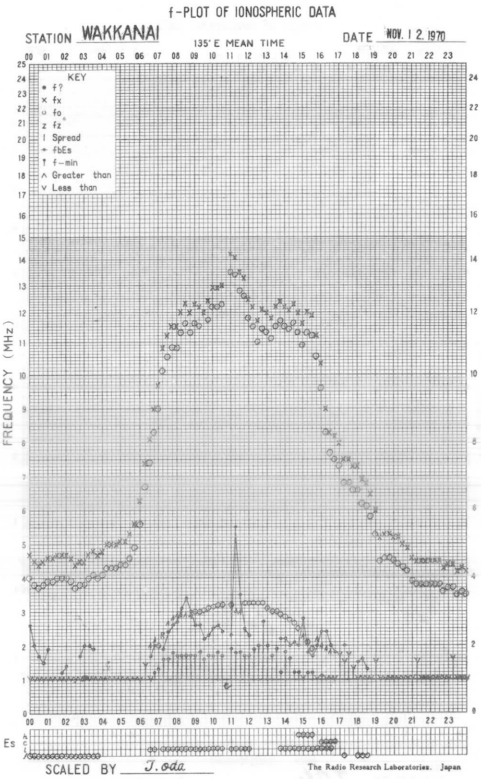
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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○ fo
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! Spread
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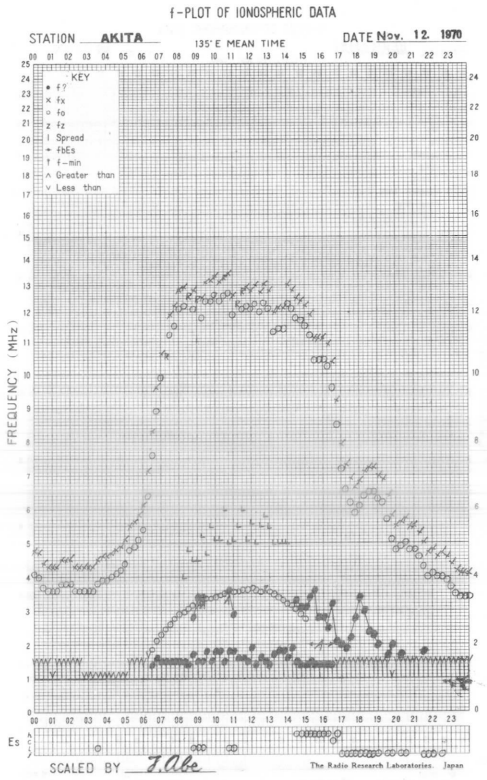
† f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY J. Oda
The Radio Research Laboratories. Japan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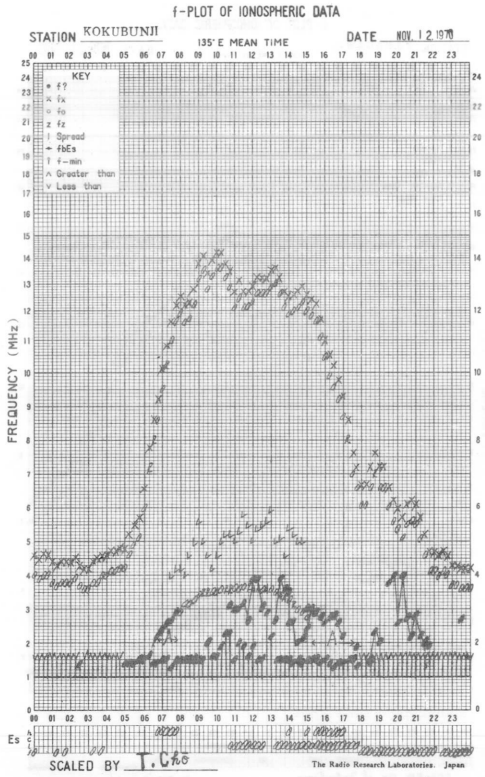
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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○ fo
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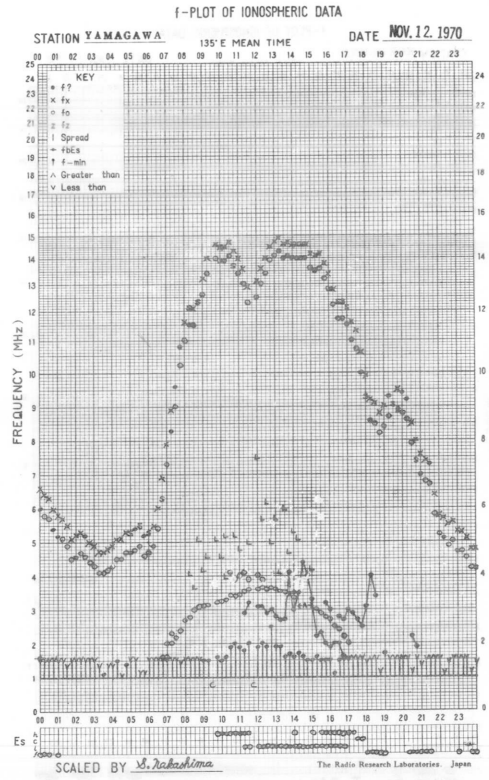
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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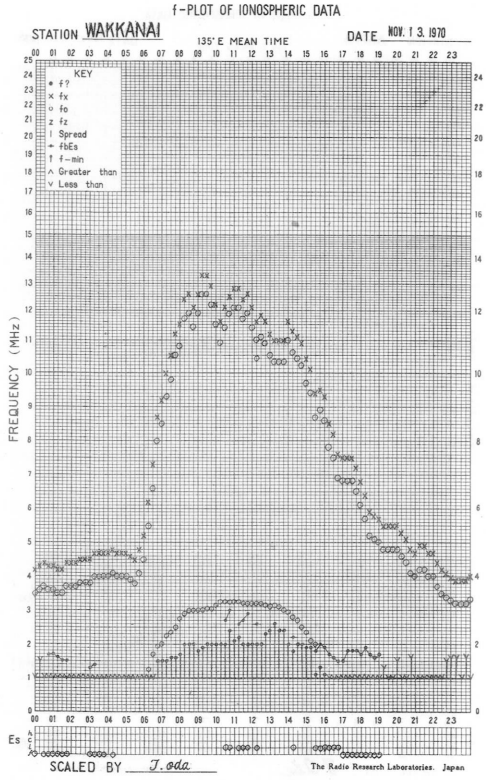
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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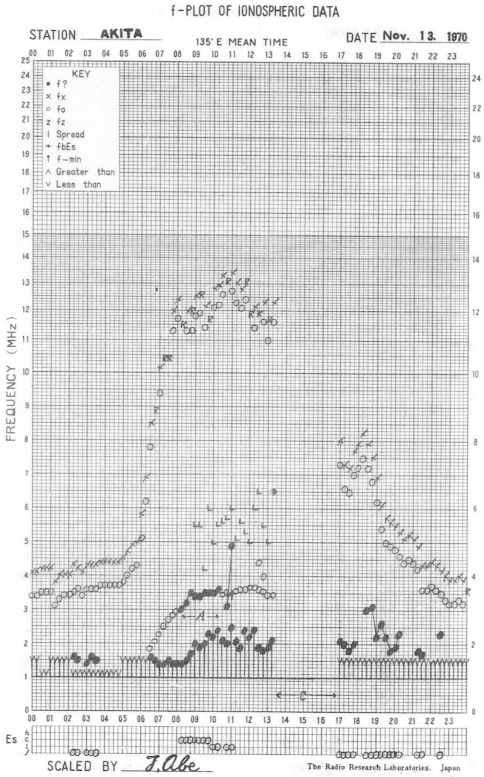
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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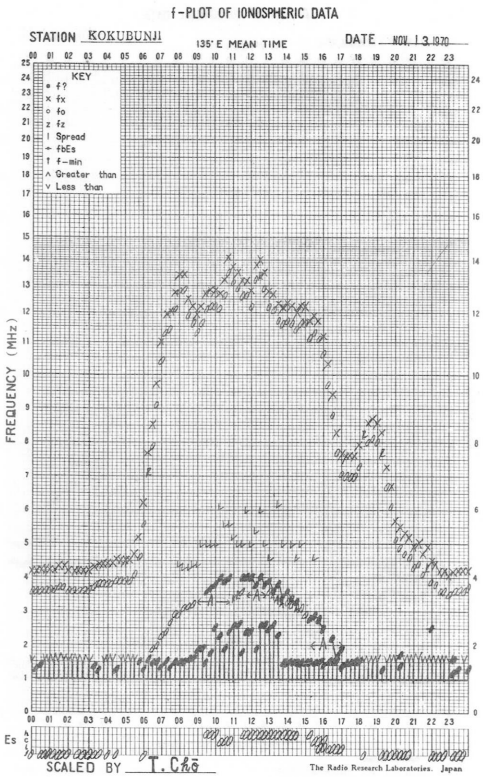
The Radio Research Laboratories. Japan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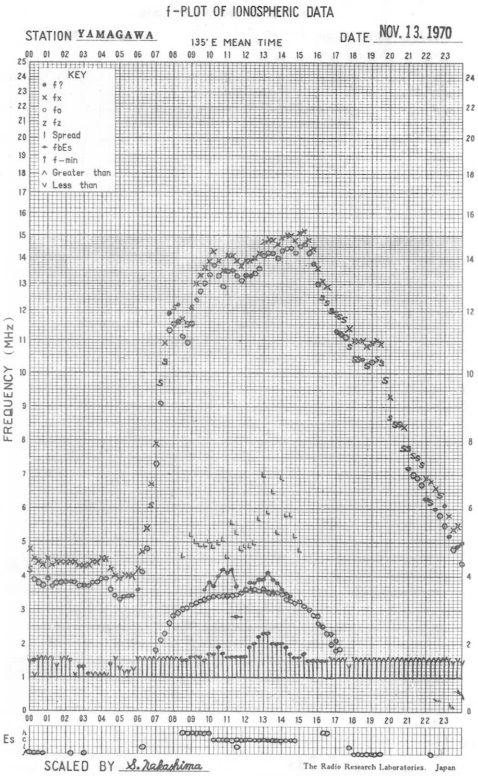
FREQUENCY (MHz)
Es
SCALED BY T. Cho
The Radio Research Laboratories. Japan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v Less than
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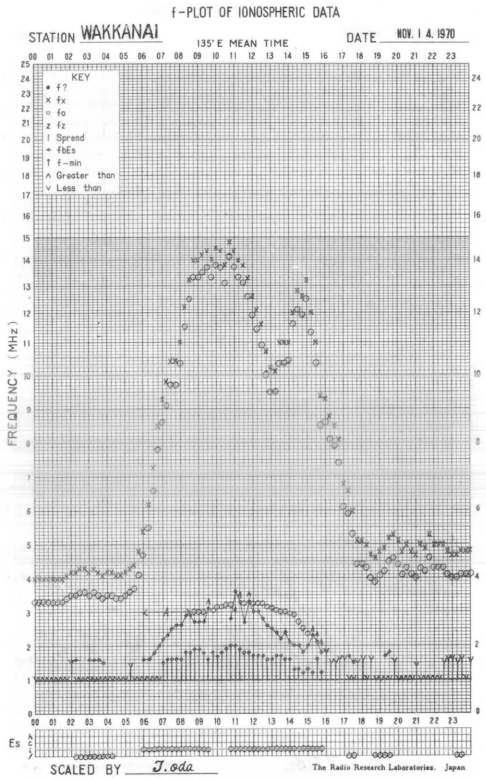
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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○ fo
z fz
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⌁ fbEs
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∧ Greater than
∨ Less than
FREQUENCY (MHz)
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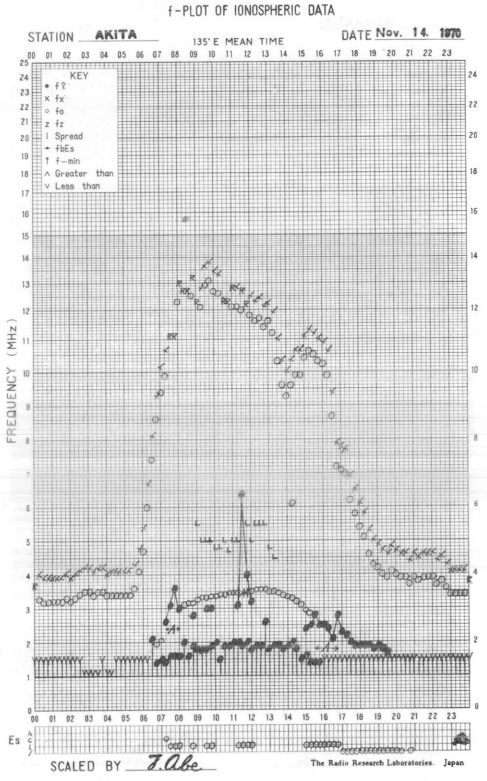
SCALED BY T. Oda
The Radio Research Laboratories. Japan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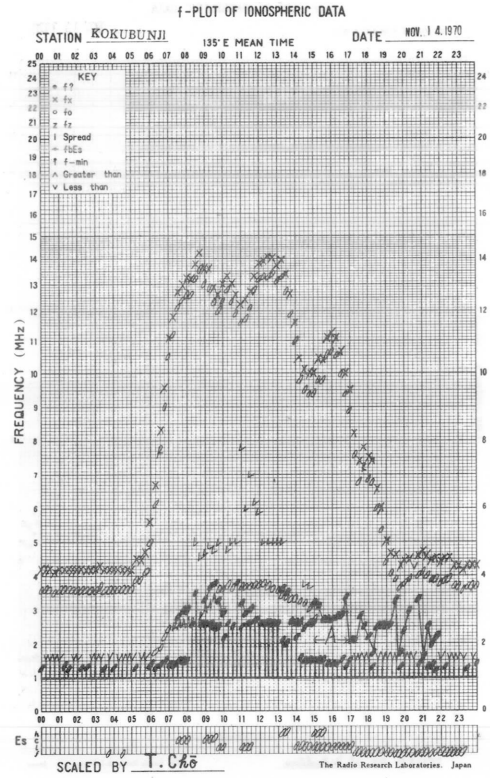
SCALED BY T. Abe
The Radio Research Laboratories. Japan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STATION KOKUBUNJI
135° E MEAN TIME
DATE NOV. 14. 1970
KEY
• f?
× fx
○ fo
z fz
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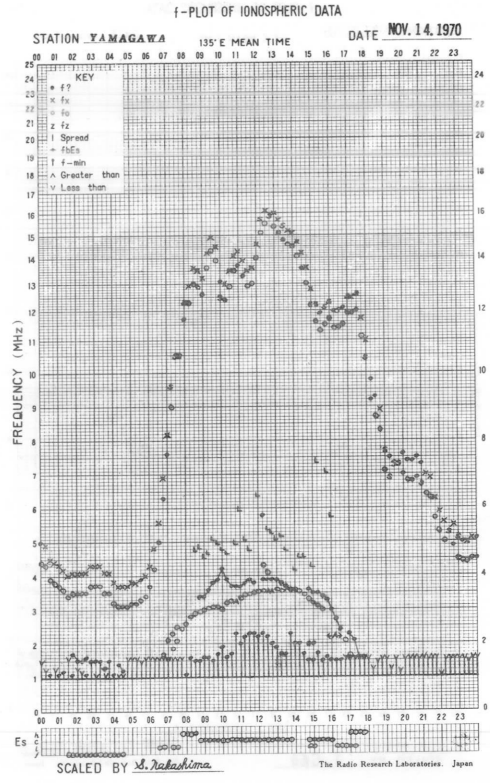
↑ f-min
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY T. Oho
The Radio Research Laboratories. Japan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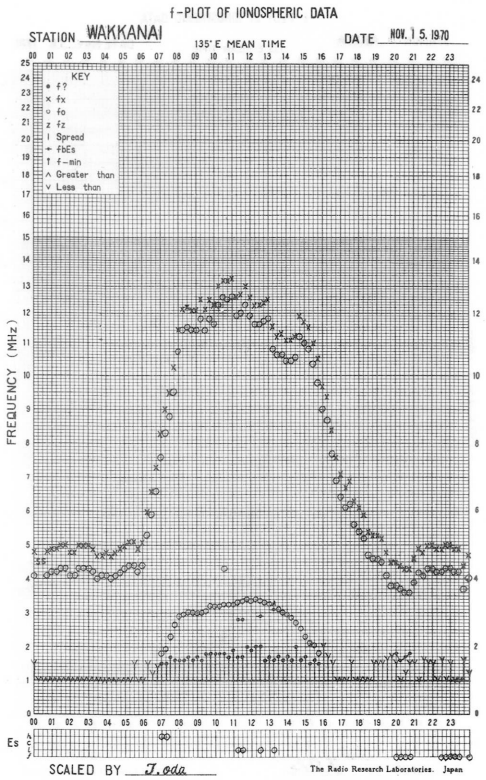
∧ Greater than
∨ Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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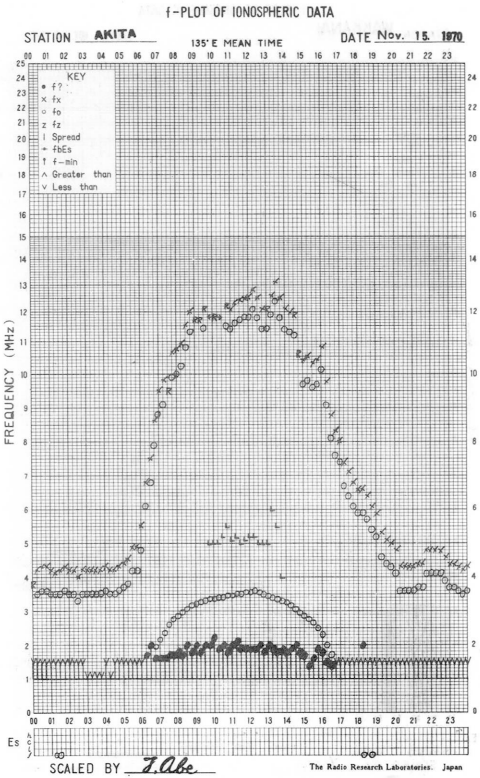
SCALED BY T. Oda
The Radio Research Laboratories. Japan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DATE Nov. 15. 1970
KEY
FREQUENCY (MHz)
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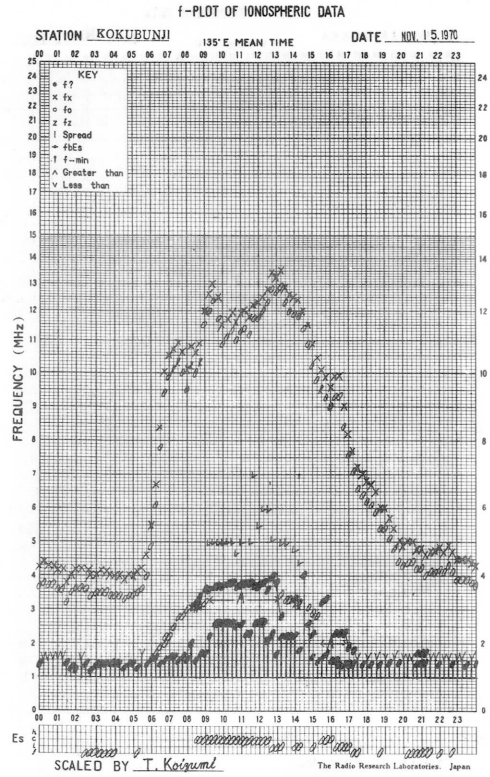
SCALED BY T. Abe
The Radio Research Laboratories. Japan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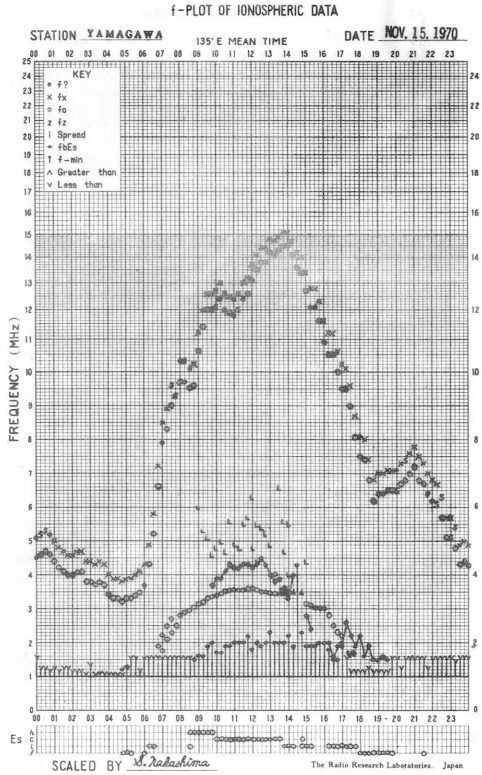
The Radio Research Laboratories. Japan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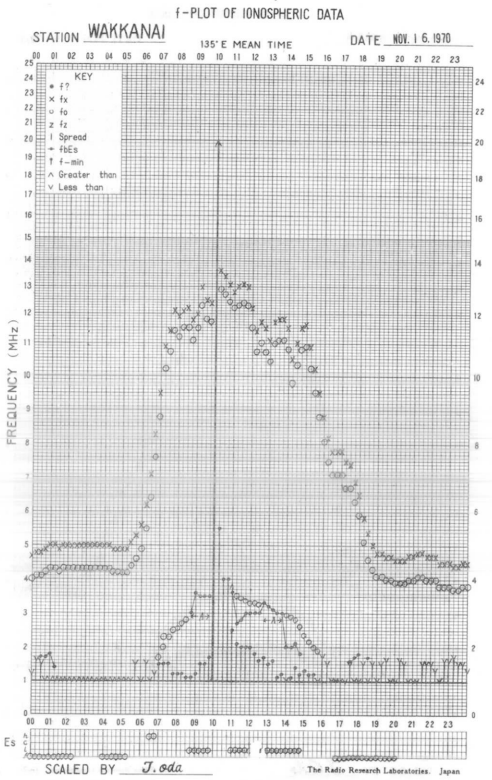
The Radio Research Laboratories. Japan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Less than
FREQUENCY (MHz)
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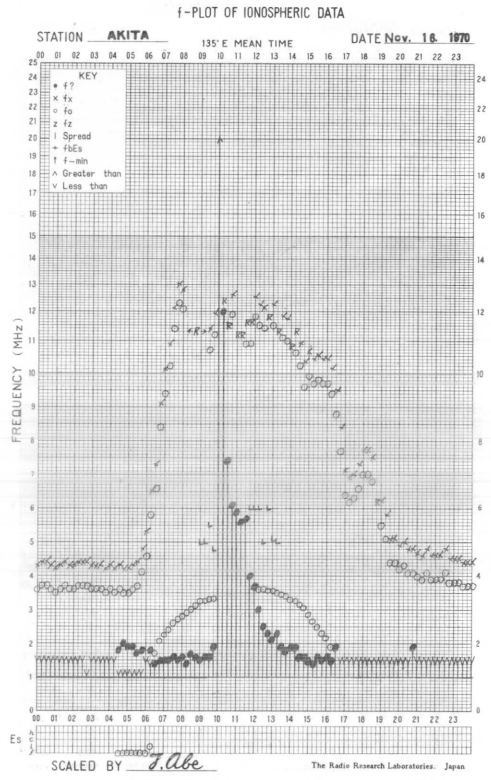
SCALED BY J. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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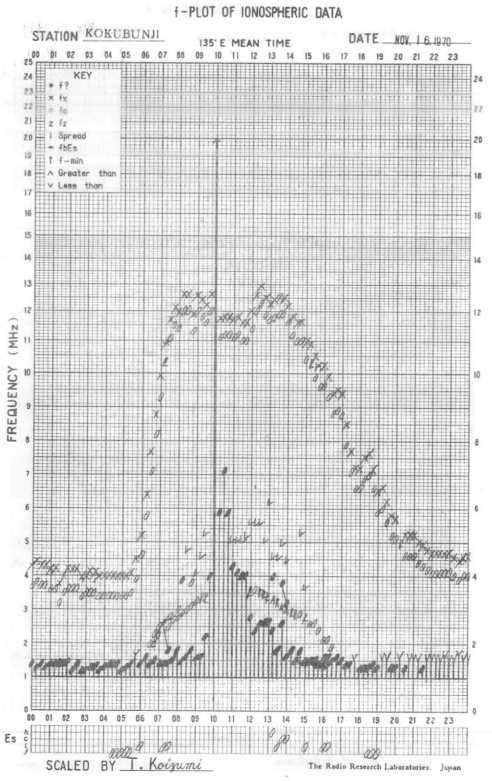
SCALED BY J. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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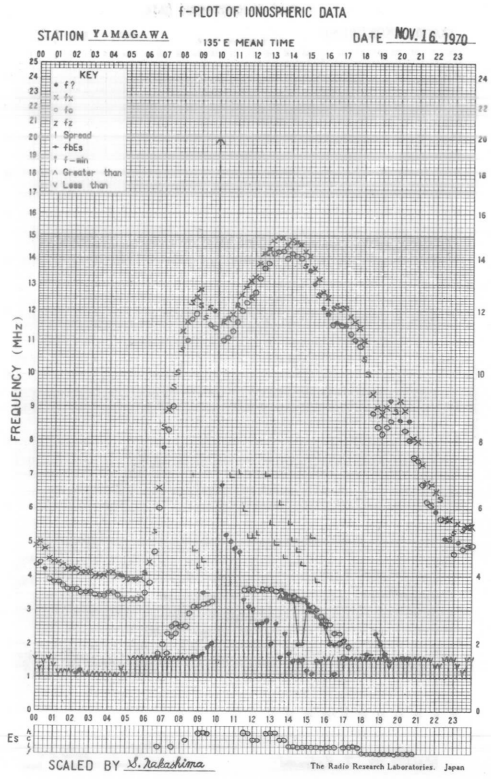
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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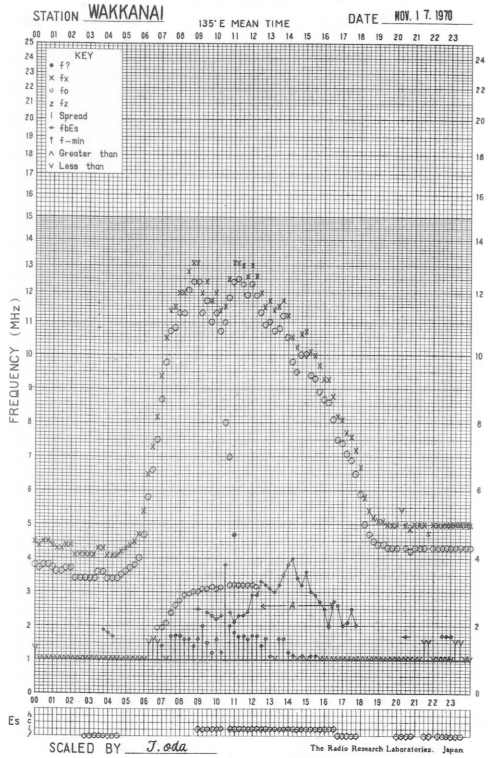
SCALED BY S. Takashima
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV. 17. 1970



SCALED BY T. oda

The Radio Research Laboratories. Japan

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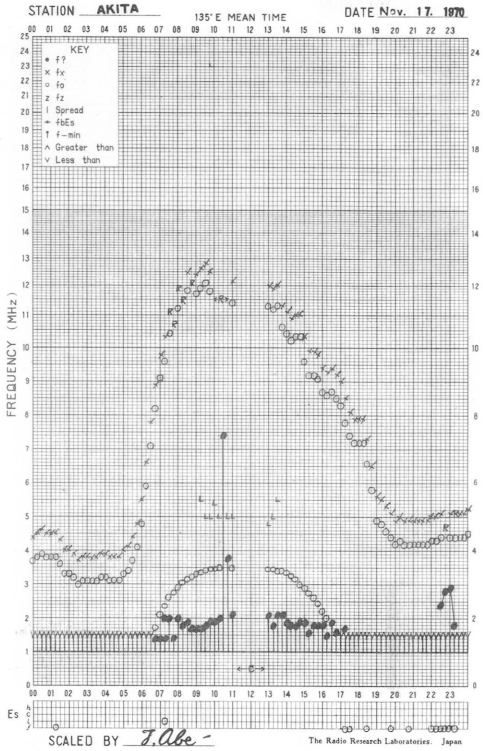

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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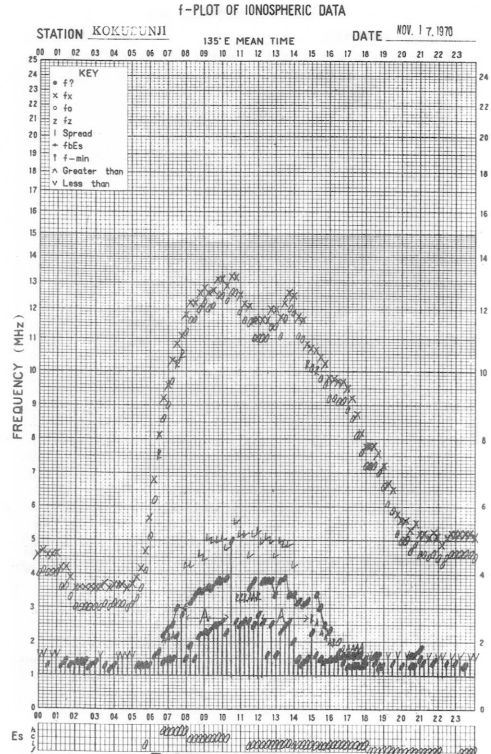

SCALED BY T. Cho

The Radio Research Laboratories. Japan

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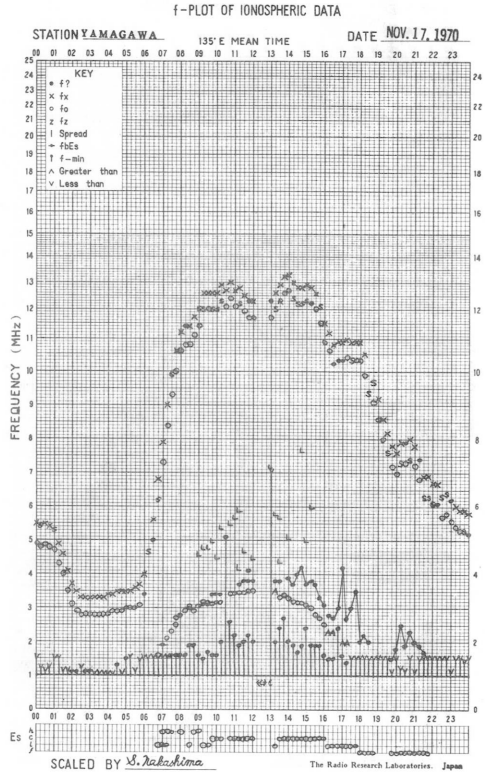
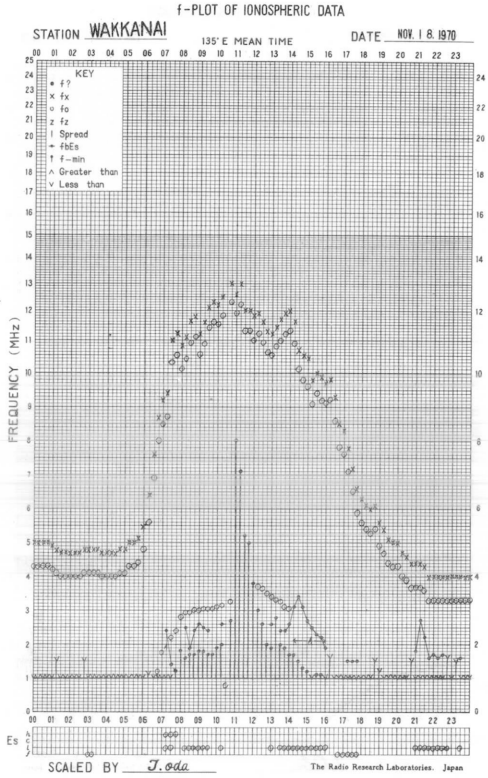
STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 17. 1970



SCALED BY S. Nakashima

The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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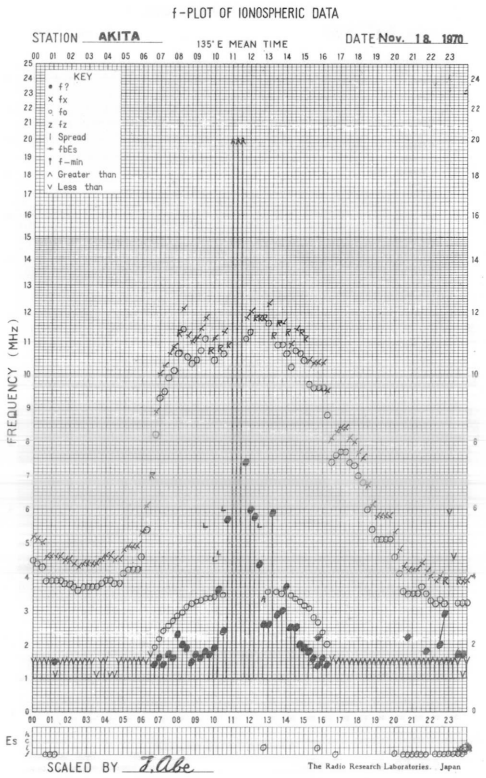
SCALED BY T. Oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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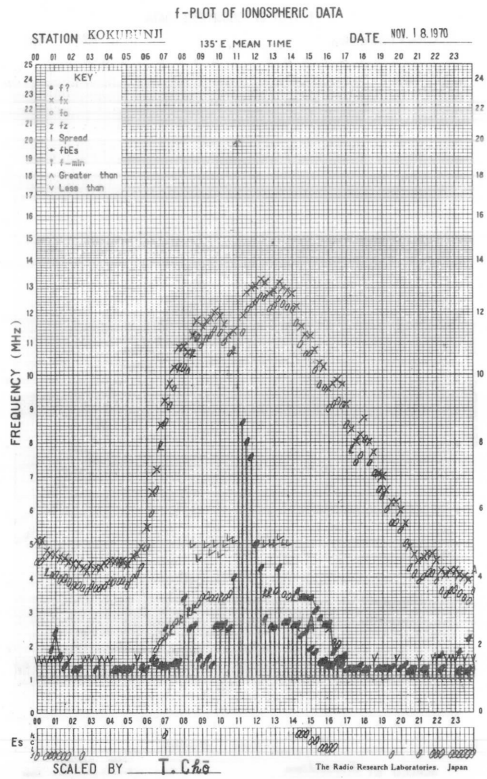
SCALED BY T. Abe
The Radio Research Laboratories. Japan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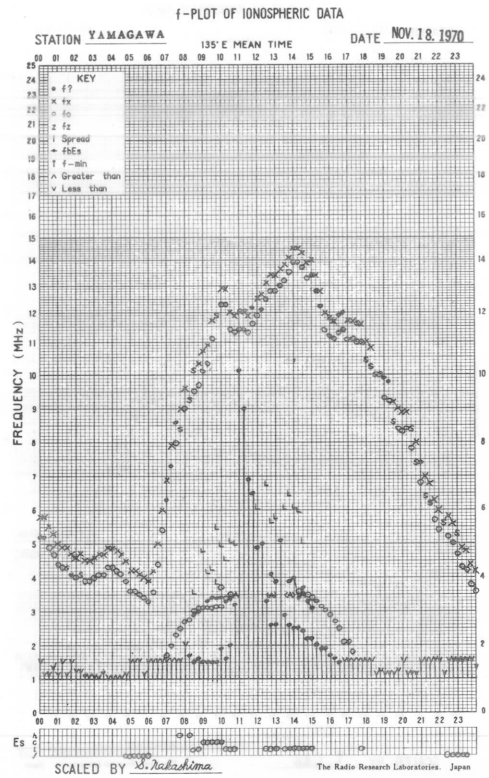
SCALED BY T. Chō
The Radio Research Laboratories. Japan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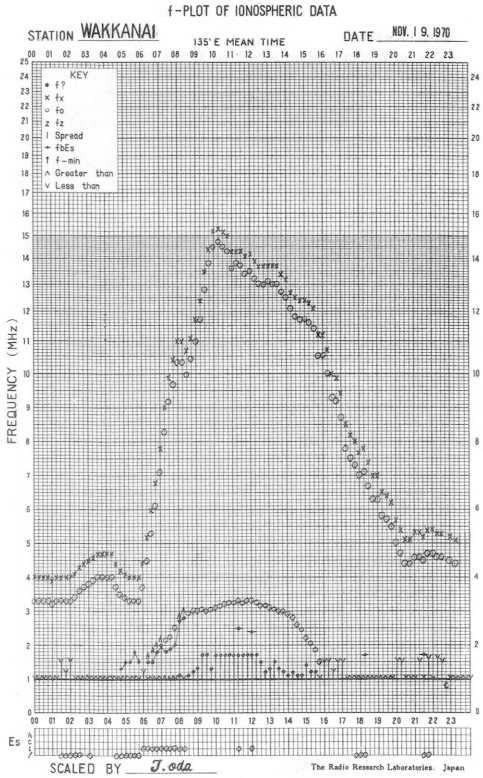
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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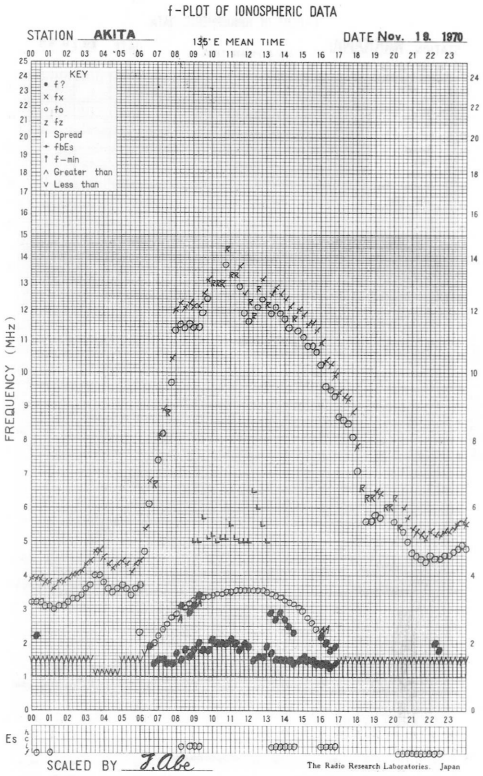
SCALED BY T. oda
The Radio Research Laboratories. Japan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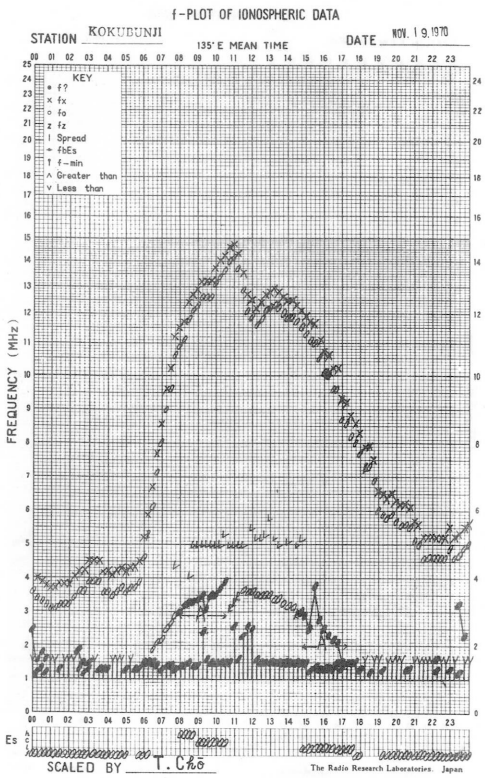
SCALED BY T. Abe
The Radio Research Laboratories. Japan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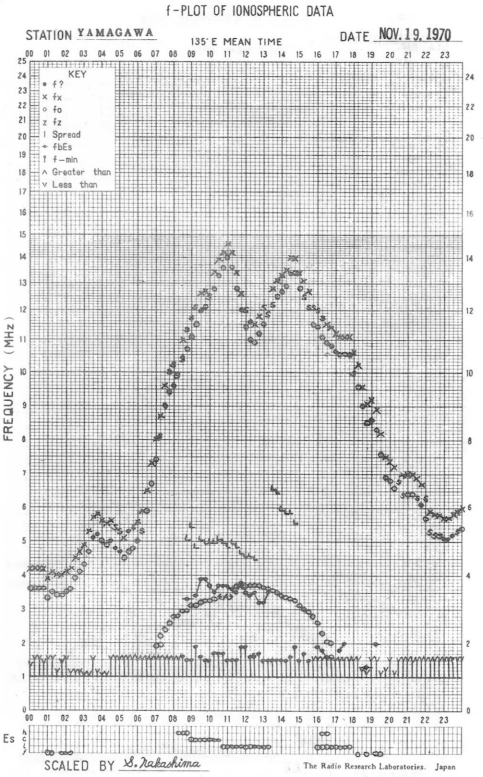
The Radio Research Laboratories. Japan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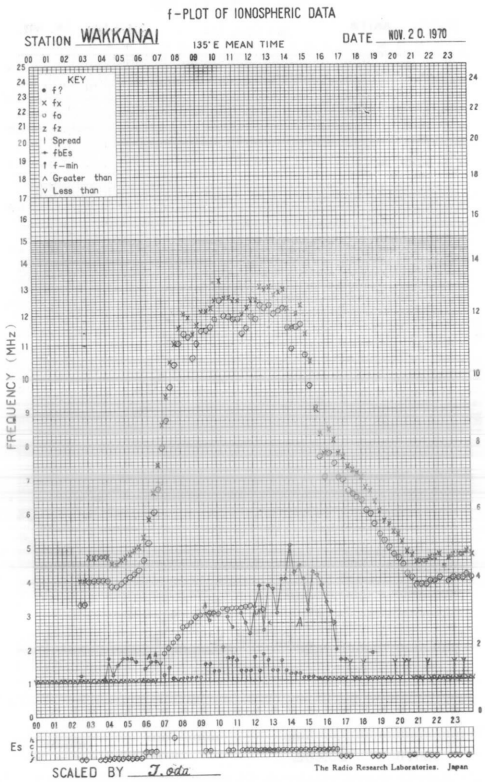
The Radio Research Laboratories. Japan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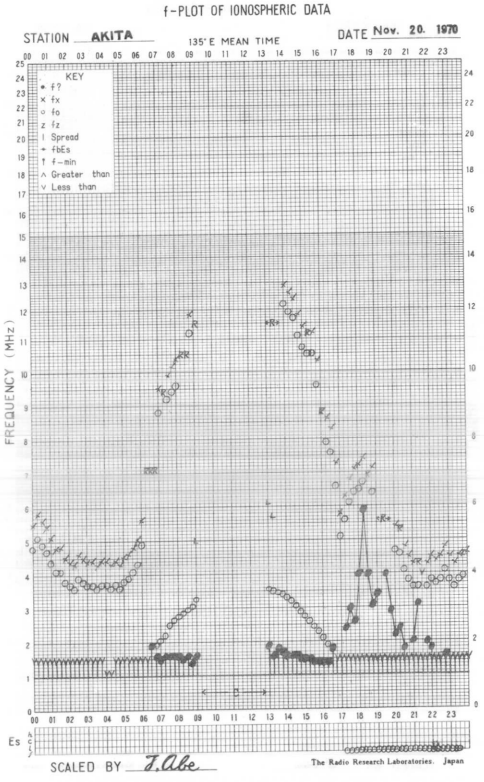
SCALED BY T. Oda
The Radio Research Laboratories. Japan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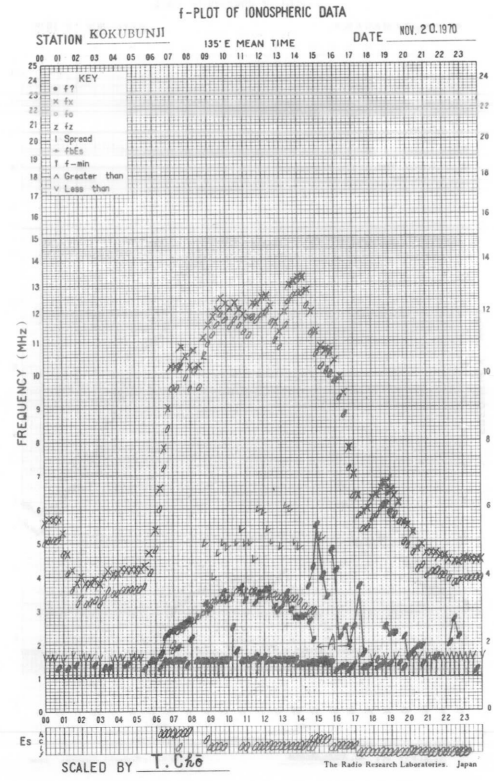
The Radio Research Laboratories. Japan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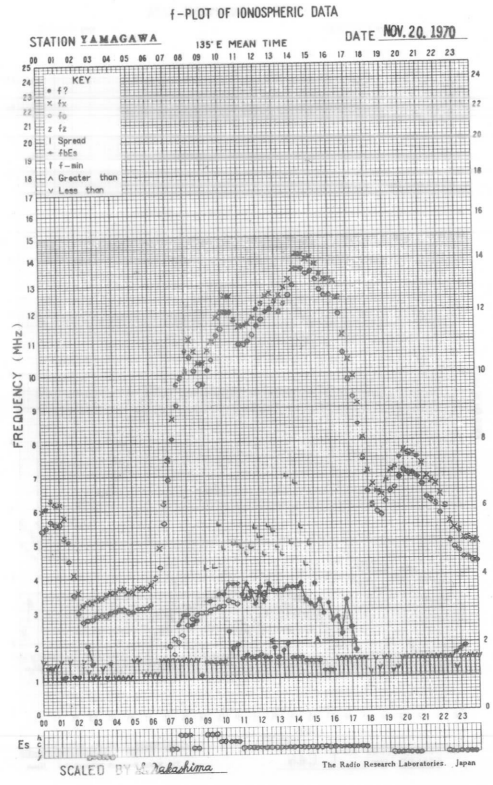
The Radio Research Laboratories. Japan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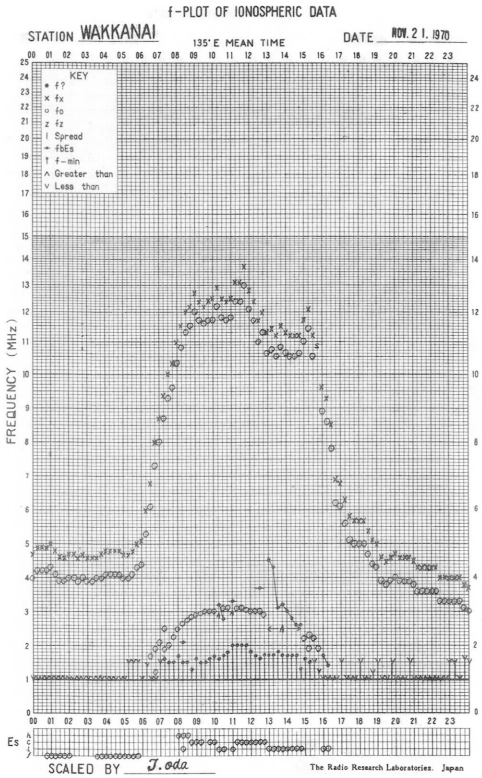
The Radio Research Laboratories. Japan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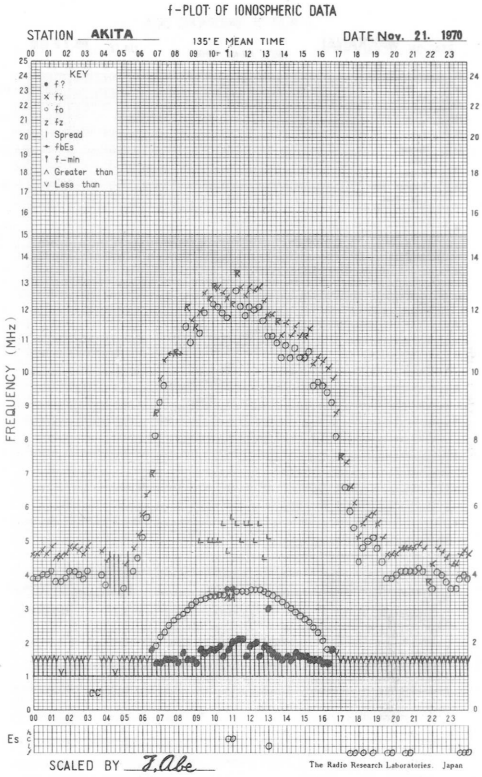
SCALED BY J. Oda
The Radio Research Laboratories. Japan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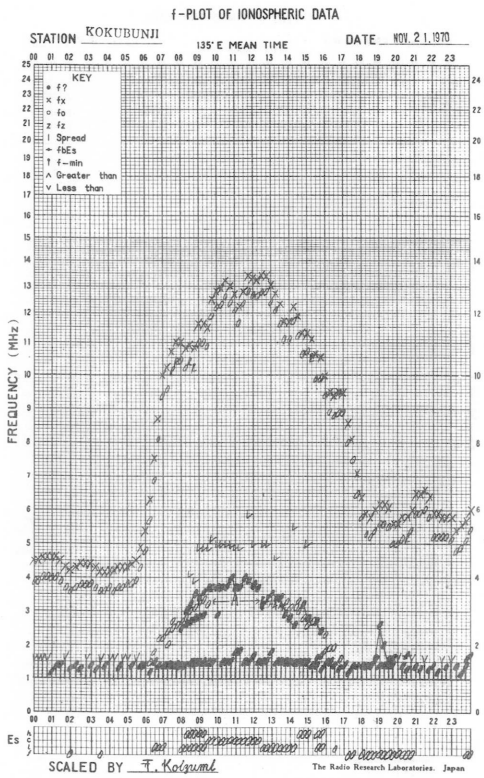
The Radio Research Laboratories. Japan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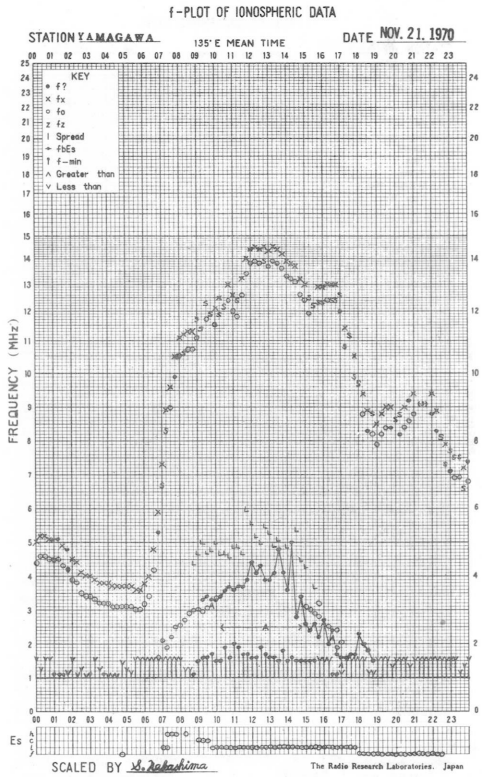
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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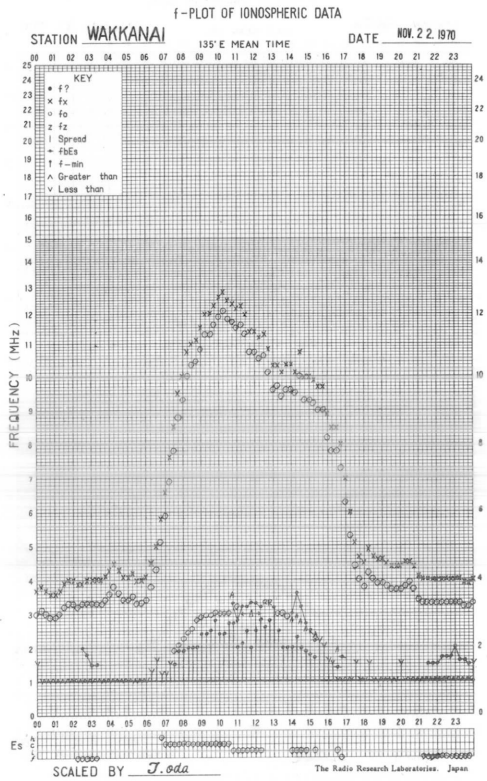
SCALED BY S. Takashima
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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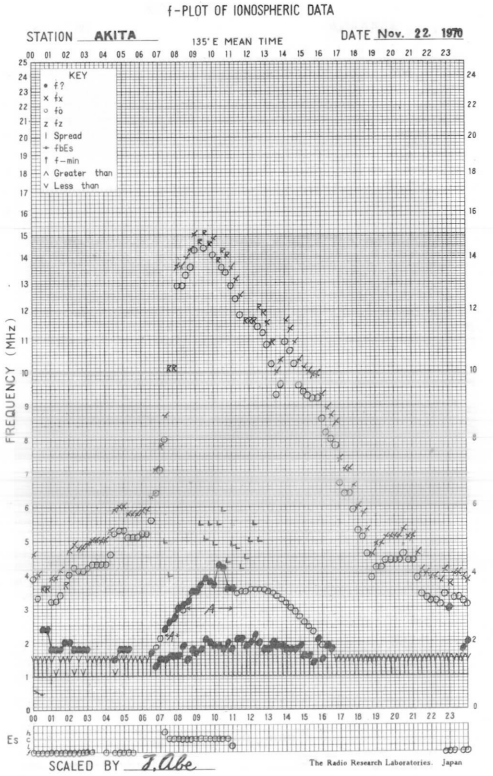
SCALED BY J. Oda
The Radio Research Laboratories. Japan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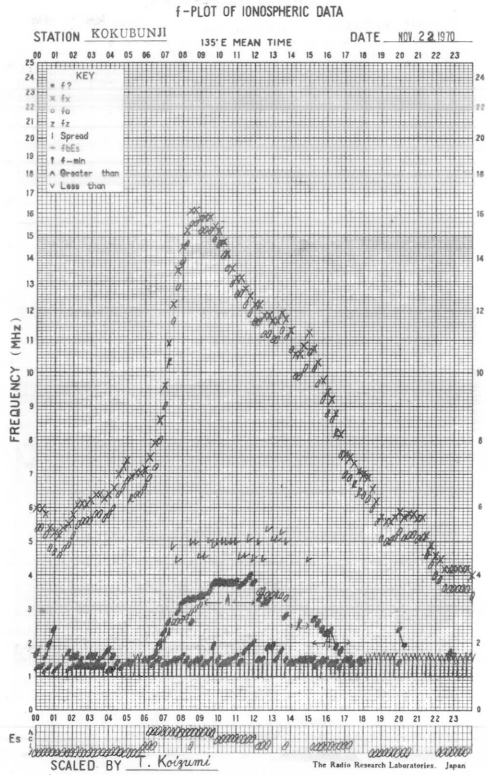
SCALED BY T. Abe
The Radio Research Laboratories. Japan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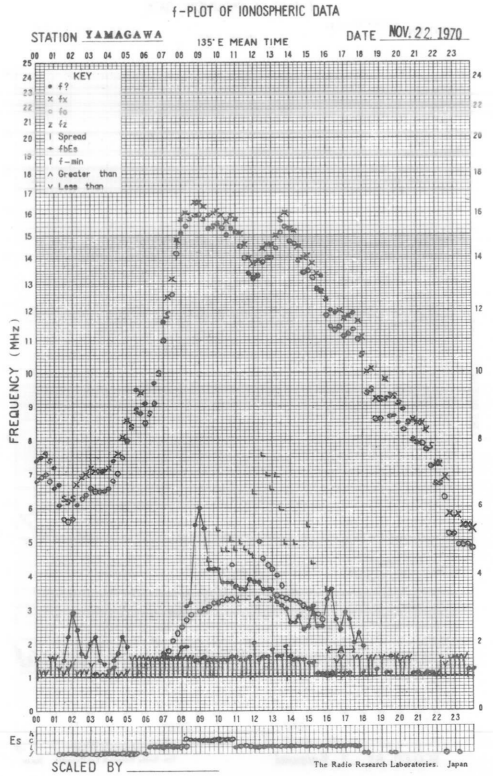
SCALED BY T. Kozyumi
The Radio Research Laboratories. Japan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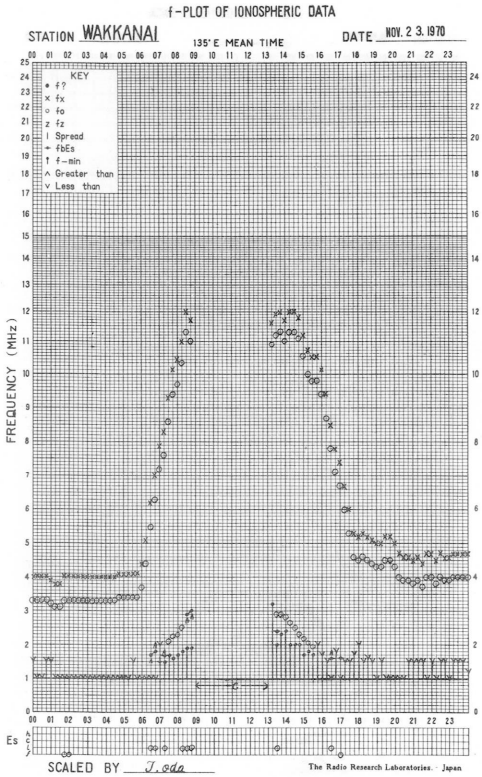
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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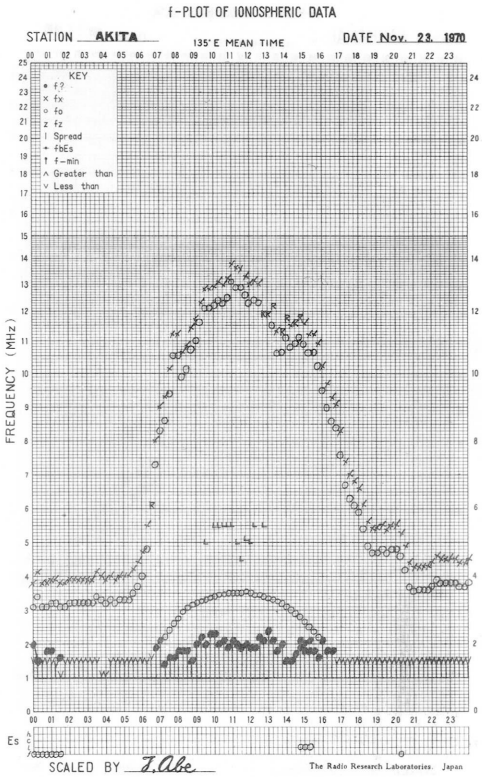
SCALED BY T. Oda
The Radio Research Laboratories. Japan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STATION AKITA
135° E MEAN TIME
DATE Nov. 23. 1970
KEY
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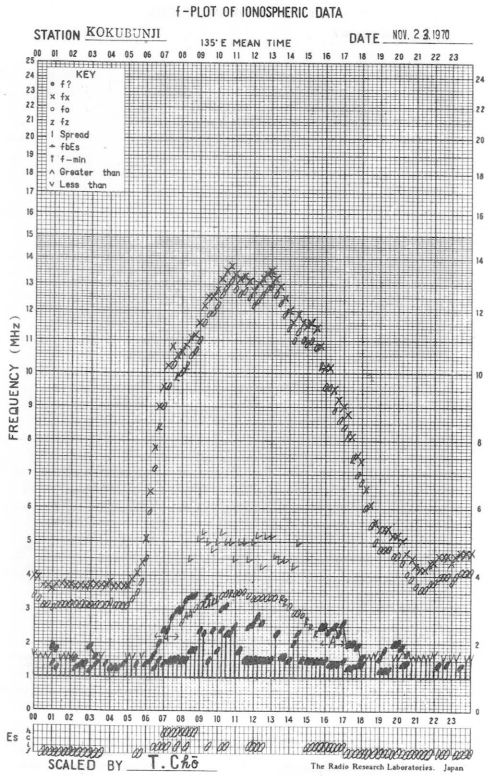
FREQUENCY (MHz)
Es
SCALED BY T. Abe
The Radio Research Laboratories. Japan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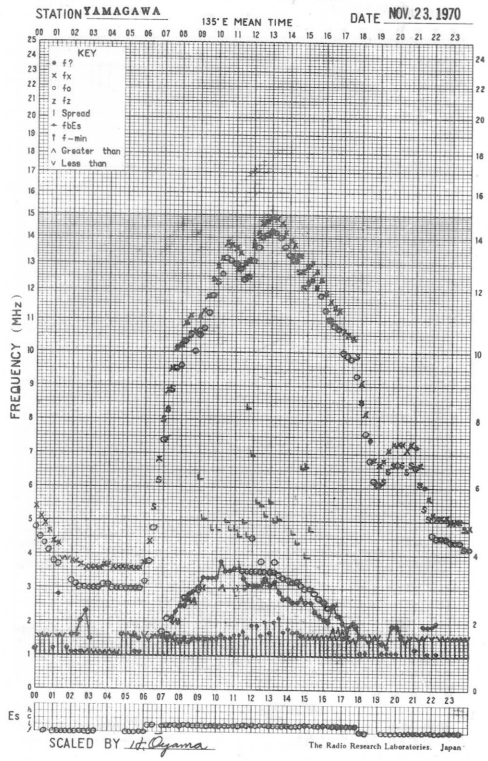
SCALED BY T. Cho
The Radio Research Laboratories. Japan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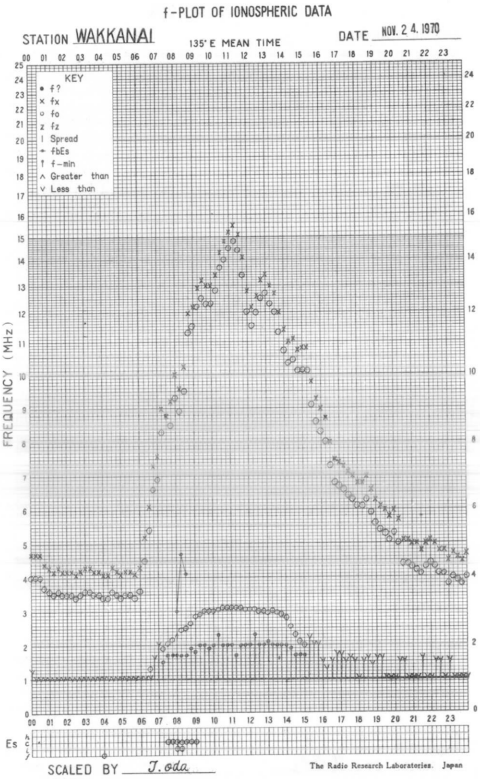
SCALED BY H. Oyama
The Radio Research Laboratories. Japan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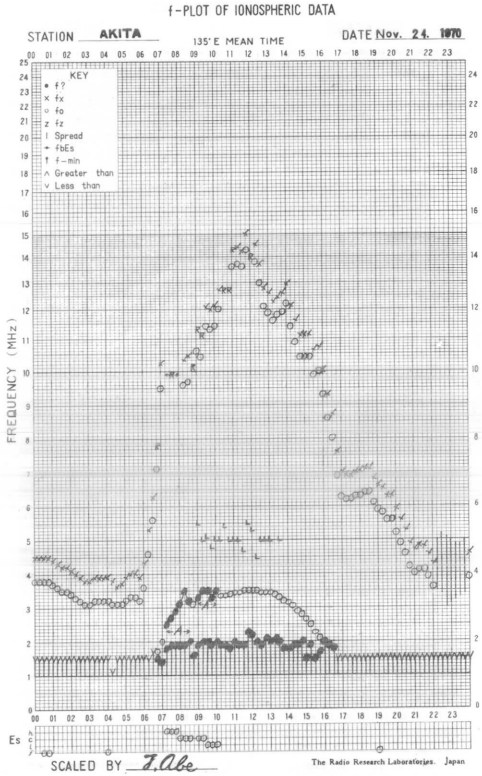
SCALED BY J. Oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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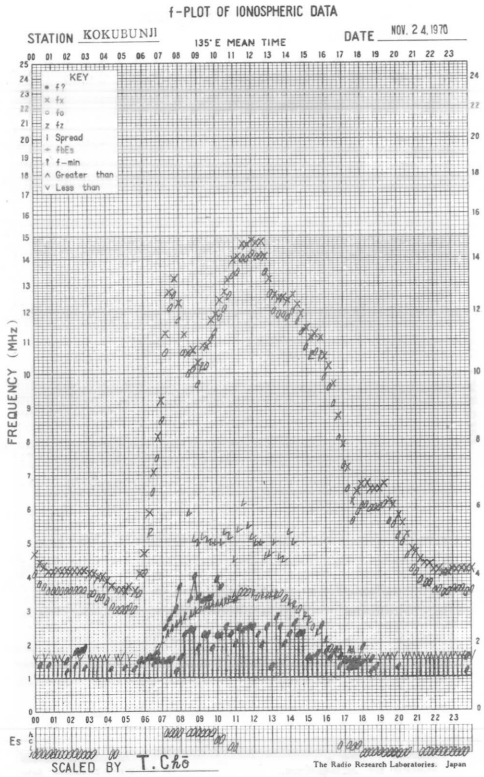
SCALED BY T. Abe
The Radio Research Laboratories. Japan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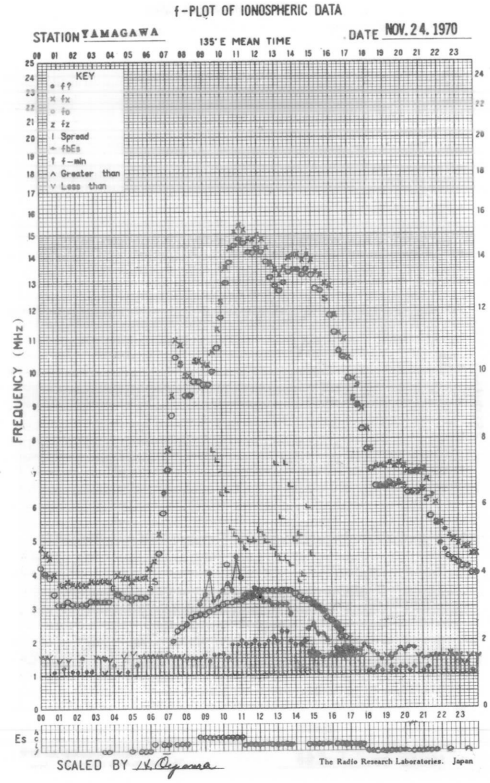
The Radio Research Laboratories. Japan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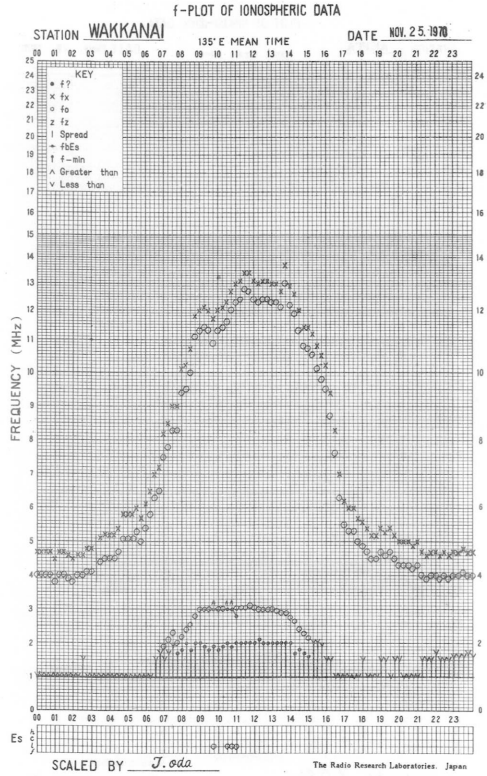
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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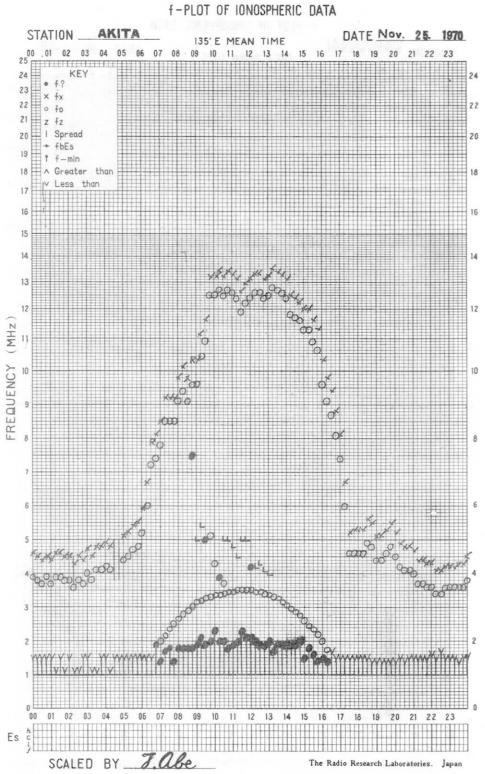
SCALED BY T. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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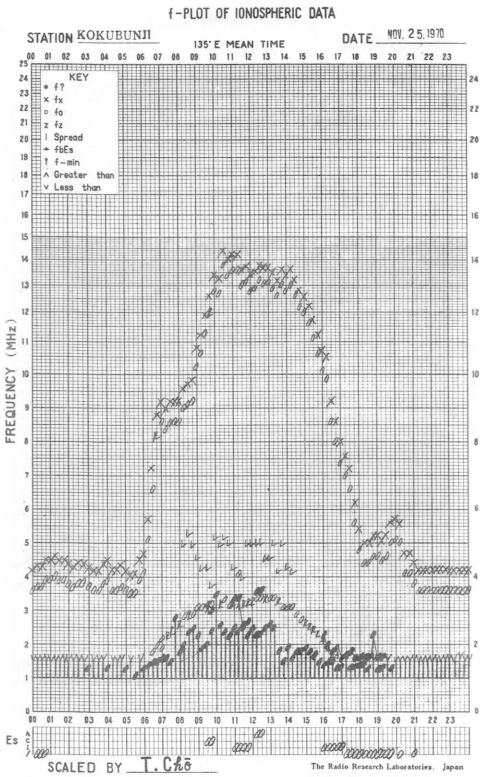
SCALED BY T. Abe
The Radio Research Laboratories. Japan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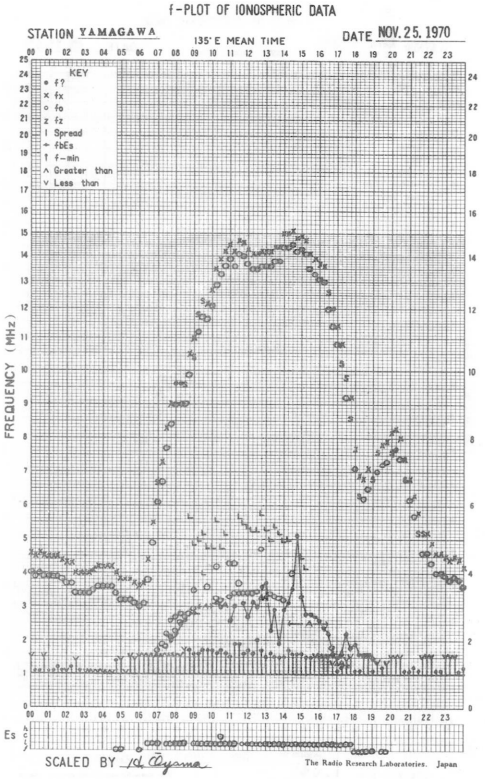
The Radio Research Laboratories. Japan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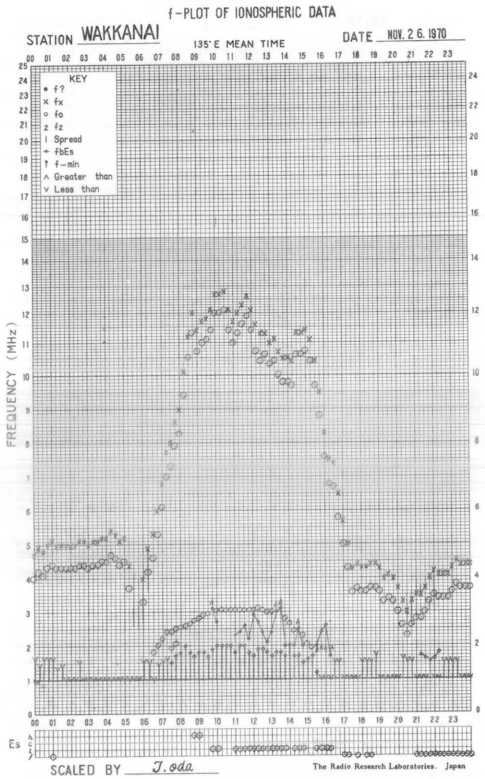
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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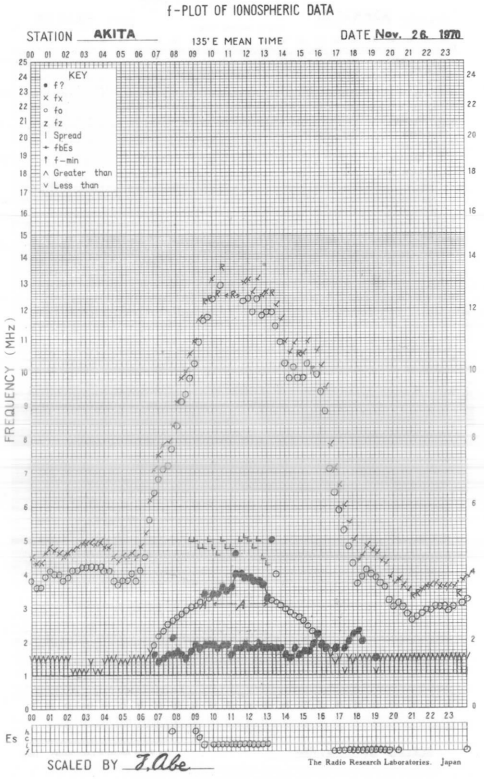
SCALED BY J. Oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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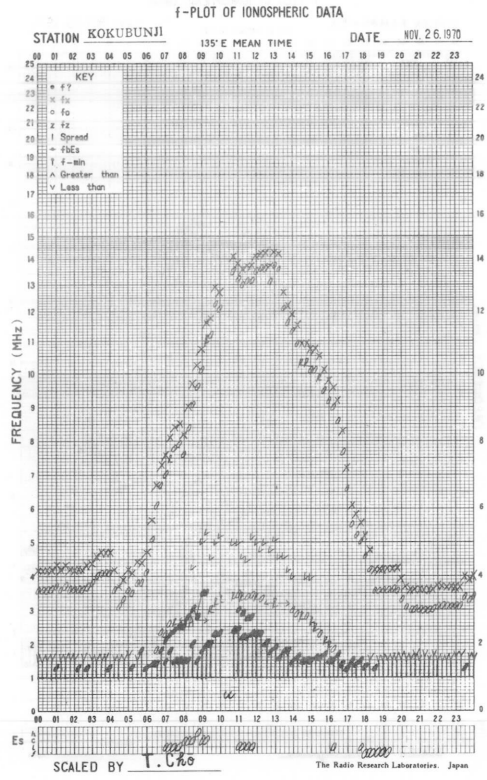
SCALED BY T. Abe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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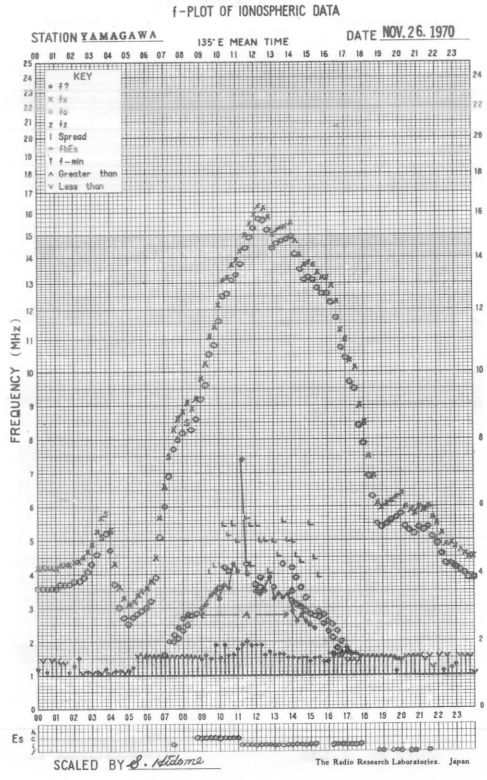
SCALED BY T. Cho
The Radio Research Laboratories. Japan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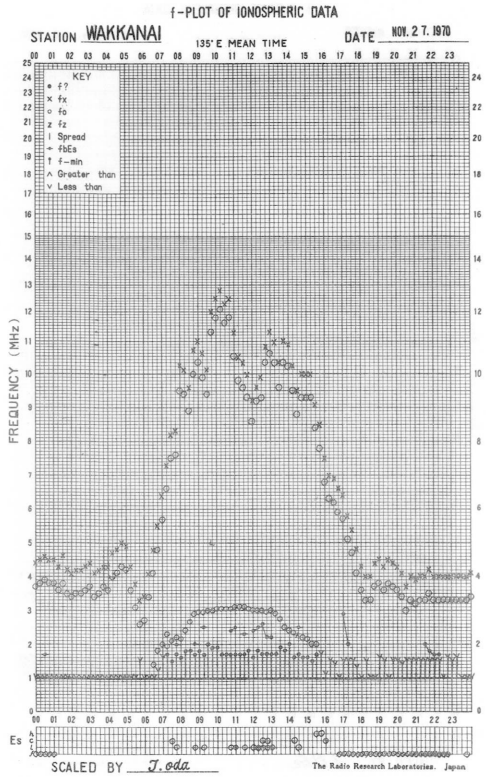
SCALED BY S. Hitotsuma
The Radio Research Laboratories. Japan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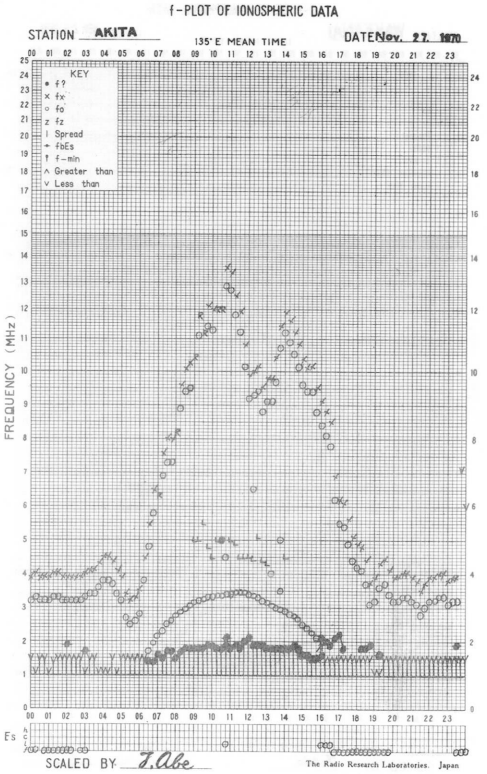
SCALED BY T. Oda
The Radio Research Laboratories. Japan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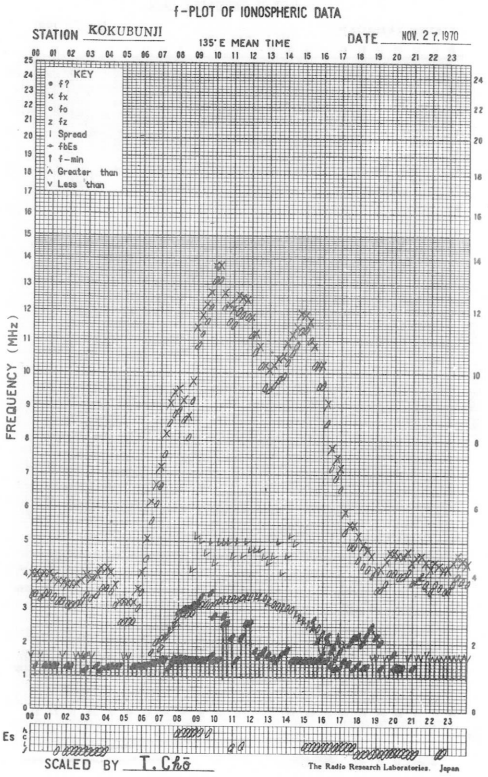
The Radio Research Laboratories. Japan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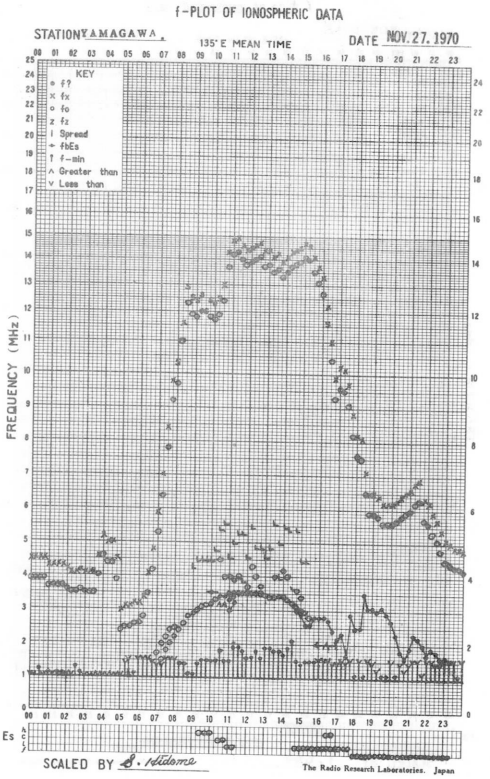
SCALED BY T. Ohe
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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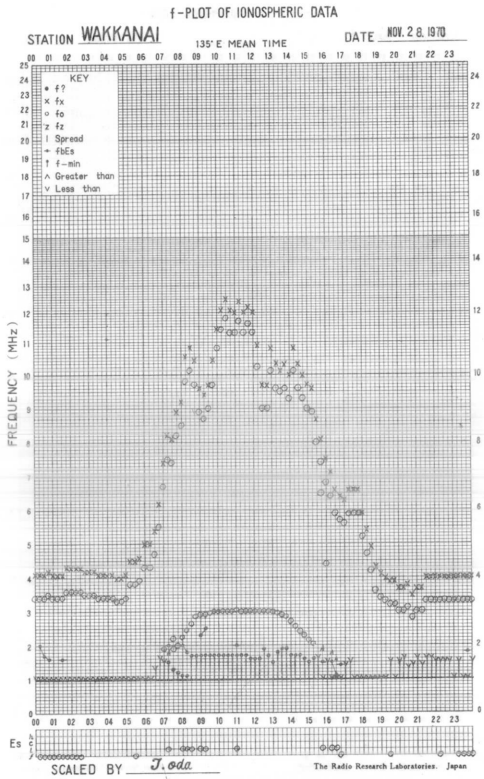
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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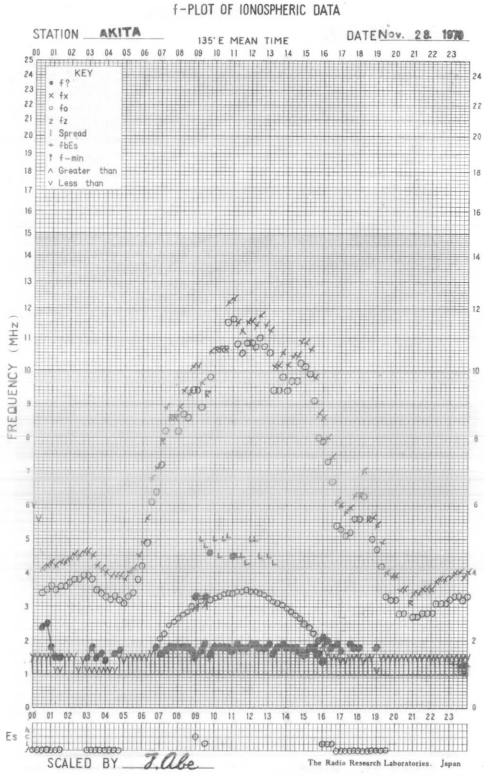
SCALED BY T. Oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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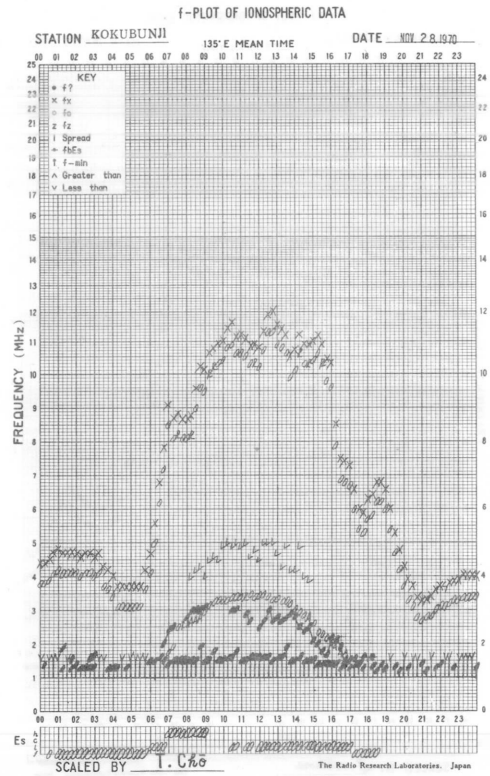
SCALED BY T. Abe
The Radio Research Laboratories. Japan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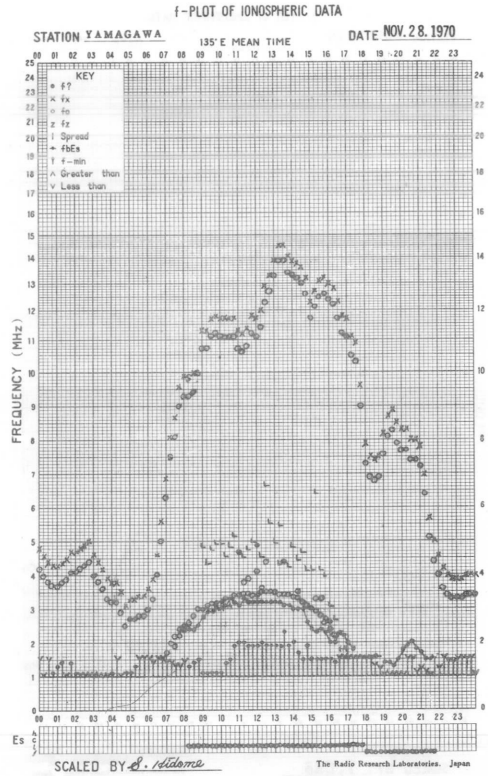
The Radio Research Laboratories. Japan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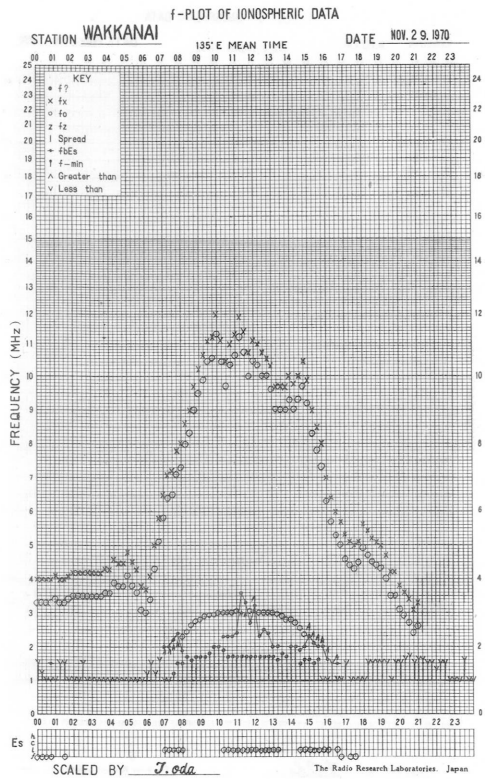
SCALED BY S. Aidoma
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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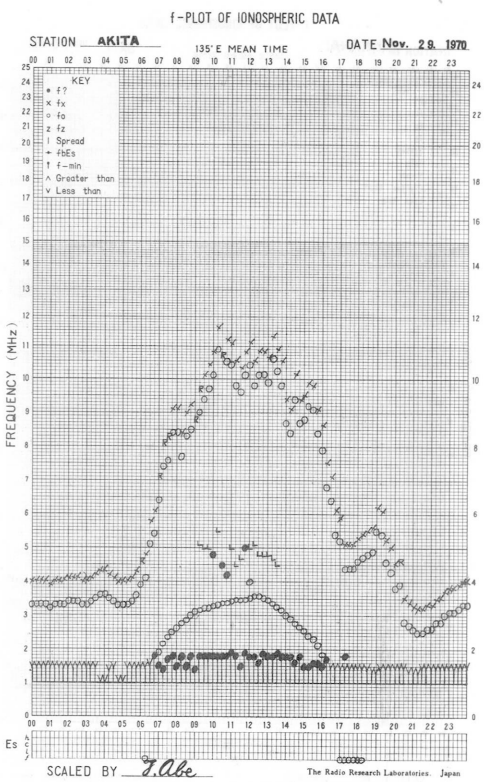
SCALED BY J. oda
The Radio Research Laboratories. Japan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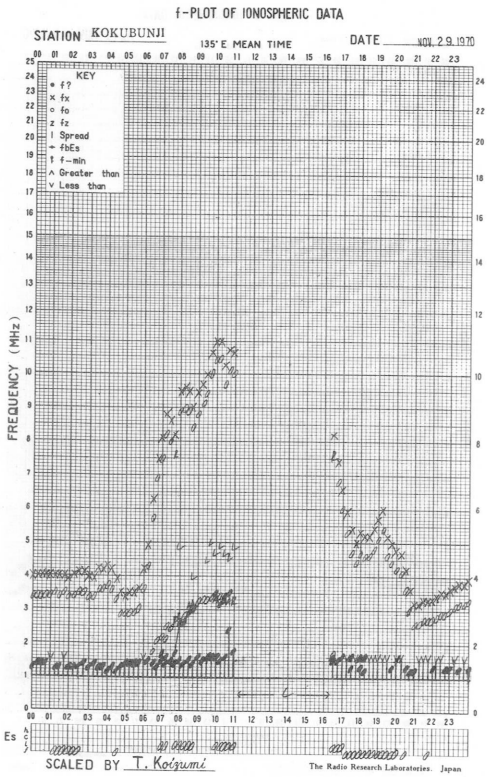
SCALED BY T. Abe
The Radio Research Laboratories. Japan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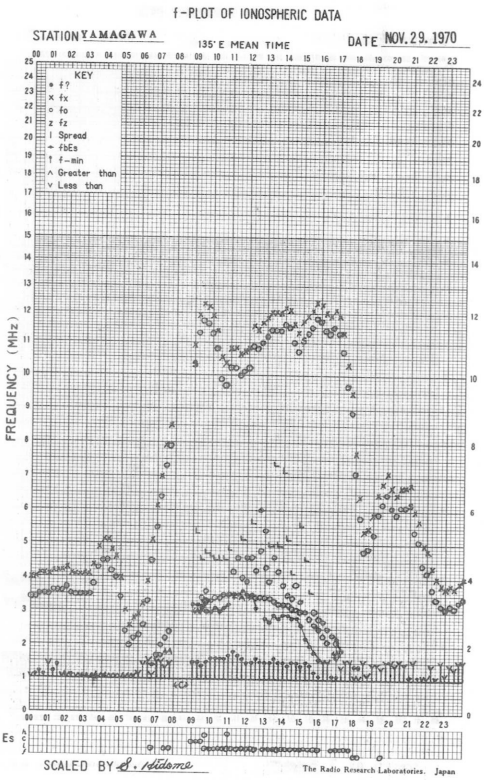
SCALED BY T. Koizumi
The Radio Research Laboratories. Japan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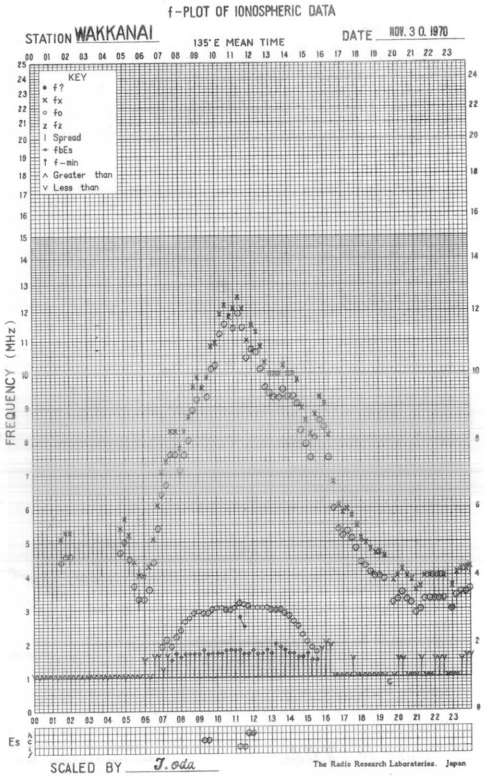
SCALED BY S. Aidome
The Radio Research Laboratories. Japan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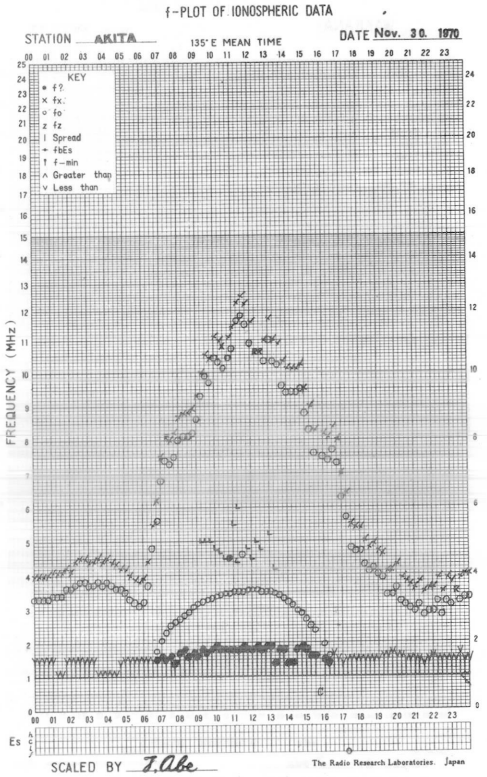
The Radio Research Laboratories. Japan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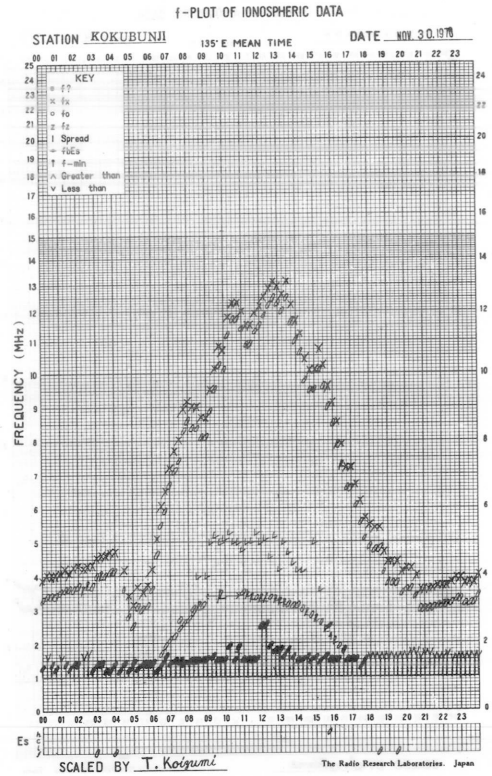
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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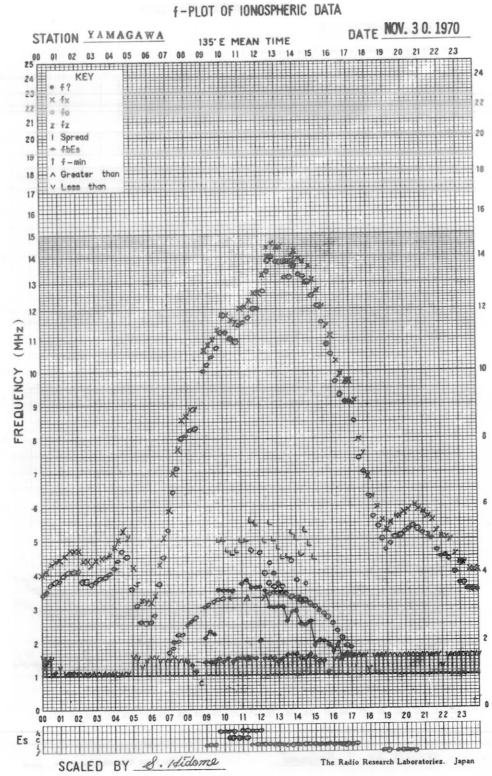
SCALED BY T. Koigumi
The Radio Research Laboratories. Japan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^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY S. Kitamo
The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: November 1970
Observing station: Hiraiso
Frequency: 200 MHz

	Flux density $10^{-22}Wm^{-2}(Hz)^{-1}$					Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	8	6	(16)	9	9	1	0	(0)	0	0
2	9	8	(9)	9	9	0	0	(0)	0	0
3	8	7	(9)	7	8	0	0	(0)	0	0
4	8	8	(9)	7	8	0	0	(0)	1	0
5	14	10	(10)	10	11	0	1	(0)	1	1
6	8	7	(8)	11	8	0	*	(*)	*	0
7	8	8	(9)	7	9	*	0	(0)	0	*
8	8	7	(10)	q	8	0	0	(0)	0	0
9	9	8	(8)	8	8	0	0	(0)	0	0
10	10	9	(9)	10	9	0	0	(0)	0	0
11	13	17	(15)	24	14	0	1	(0)	1	0
12	26	25	(21)	65	25	1	1	(1)	0	1
13	51	52	(79)	-	58	0	1	(1)	-	0
14	19	19	(16)	52	19	1	1	(1)	1	1
15	47	19	(19)	-	36	1	1	(1)	-	1
16	110	90	-	190	98	1	1	-	0	1
17	210	170	(160)	91	180	1	1	(1)	0	1
18	110	110	(120)	43	110	1	0	(0)	1	0
19	24	13	(11)	29	23	1	1	(1)	1	1
20	30	26	(23)	10	28	1	1	(1)	0	1
21	10	7	(8)	7	9	0	0	(0)	0	0
22	7	7	(8)	9	7	0	0	(0)	1	0
23	9	9	(9)	9	9	0	0	(0)	0	0
24	8	8	(9)	9	9	0	0	(0)	0	0
25	9	9	(9)	7	9	0	0	(0)	0	0
26	8	7	(5)	7	7	0	0	(0)	0	0
27	8	8	(7)	8	7	0	0	(0)	0	0
28	9	8	(7)	8	8	0	0	(0)	0	0
29	8	9	(9)	9	8	0	0	(0)	0	0
30	9	9	(9)	9	9	0	0	(0)	0	0

Note No observations during the following periods:

13th 2120- 14th 0025
15th 2120- 2400
16th 0600- 0730
18th 0100- 0210
18th 0435- 0515

q: quiet level, when radiometer is unstable.

*: interference by atmospherics.

SOLAR RADIO EMISSION

Flux Density

Month: November 1970
Observing station: Hiraiso Frequency: 500 MHz

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

UT	00-03	03-06	06-09	21-24	Day
Date					
1	-	-	-	-	-
2	-	-	-	-	-
3	-	-	-	-	-
4	33	32	(31)	-	32
5	32	33	(33)	32	32
6	32	32	(32)	31	32
7	31	31	(31)	31	31
8	30	30	(29)	29	30
9	30	29	(29)	30	29
10	30	31	(30)	32	30
11	33	33	(32)	34	33
12	35	36	(33)	35	35
13	35	34	(33)	32	34
14	32	33	(32)	36	32
15	37	37	(40)	41	37
16	45	41	(40)	45	42
17	45	47	(51)	50	46
18	56	55	(56)	41	55
19	41	40	(37)	37	40
20	37	37	(36)	32	37
21	33	34	(32)	31	33
22	33	31	(31)	32	32
23	32	31	(30)	30	31
24	31	31	(30)	29	31
25	29	29	(29)	29	29
26	31	31	(29)	30	30
27	30	30	(29)	28	30
28	29	29	(29)	29	29
29	29	28	(28)	28	29
30	30	31	(30)	30	30

Note No observations during the following periods:

1st 0000- 4th 0045
4th 2120- 5th 0035

Distinctive Events

(single-frequency observations)

Month: November 1970
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	200	0034.0	0034.5	0.7	C	570	240	
4	200	2150.0	2303.0	160	C	60	20	
5	500	0318.8	0420.0	128	C	260	75	
	200	0321.0	0339.0	137	C	470	40	
12	500	0335.1	0336.5	9.4	C	195	20	
	200	0338.0	0339.0	3.0	C	4200	330	
15	500	0641.5		>44	C		(50)	sunset
			0642.8			380		1st peak
			0646.7			100		2nd peak
			0654.5			310		3rd peak
			0703.6			120		4th peak
			0718.2			(60)		5th peak
	200	0658.0	-	>25	C	-	(ca 70)	sunset
16	500	0103.0	0112.3	23.0	C	390	35	
18	200	0316.0	0316.5	1.0	C	700	300	
	500	0505.6	0506.0	1.4	C	520	150	
19	200	2256.0	2257.0	2.0	C	320	120	
20	500	0110.0	0113.5	7.0	C	30	20	
		0419.8	0421.0	2.0	C	20	10	
	200	0419.0	0419.5	1.0	C	820	160	
22	500	0437.0	0437.5	2.0	C	35	10	
	200	0435.5	-	3.5	C	>5500	>340	
		2125.0	2125.5	1.5	C	290	90	
		2235.2	2236.0	3.0	C	470	50	
23	500	0009.5	0012.3	9.0	C	340	35	
	200	0009.0	0010.5	4.0	C	980	80	

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

NOV 1970 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT / DAY	00H 15M	01H 15M	02H 15M	03H 15M	04H 15M	05H 15M	06H 15M	07H 15M	08H 15M	09H 15M	10H 15M	11H 15M	12H 15M	13H 15M	14H 15M	15H 15M	16H 15M	17H 15M	18H 15M	19H 15M	20H 15M	21H 15M	22H 15M	23H 15M
1	8	12	16	19	18	6	ES -12	ES -3	ES -10	ES -11	ES -14	ES -2	ES -22	ES -3	-10	1	-19	ES -30	ES -30	ES -30	-2	13	13	11
2	11	12	12	16	2	ES -20	ES -4	ES -12	ES 7	ES -14	ES -3	ES -3	ES -13	ES -12	-11	-19	ES -30	-22	-13	ES -25	0	13	15	8
3	11	16	17	20	22	2	1	5	-3	ES -4	ES -5	ES -1	ES -4	ES 6	-11	ES -3	ES -30	ES -30	ES -30	ES -30	6	10	14	13
4	13	17	22	19	27	17	-8	-11	ES -11	ES -14	ES -11	ES -6	ES -17	ES 8	17	8	11	ES -30	ES -30	ES -30	6	24	13	11
5	15	17	19	19	8	ES -17	-8	ES -2	ES -8	ES -11	ES -13	ES -2	ES -19	ES -17	-5	-2	2	-12	17	13	13	14	16	14
6	17	19	21	21	17	ES -13	ES -8	ES -7	ES 2	ES 2	ES -12	ES 12	ES -11	ES -11	-5	-8	ES -11	ES -14	ES -19	ES -17	7	16	16	15
7	16	17	26	12	16	-4	ES -16	-8	-6	ES -13	ES -7	ES -19	ES -14	ES -14	-4	10	-14	-12	2	12	1	17	12	16
8	7	8	11	ES -17	ES -9	ES -14	ES -14	ES -14	ES -14	ES -14	ES -9	ES -8	ES -30	-19	-19	ES -22	ES -30	ES -30	ES -30	ES -30	-2	5	7	10
9	13	16	12	24	14	-10	ES -11	ES -11	ES -8	ES -11	ES -11	ES -3	ES -30	ES -19	-14	ES -30	ES -30	ES -30	ES -34	ES -34	US 4	8	6	9
10	5	10	18	11	ES -5	ES -3	-4	7	4	ES -20	ES -11	ES -3	ES -25	ES -25	-13	-14	ES -34	ES -34	ES -34	ES -34	1	8	6	9
11	14	14	19	17	-7	10	ES -11	ES -8	ES -9	ES -15	ES -6	ES -3	ES -8	ES -13	-13	-19	ES -34	ES -34	ES -34	ES -34	6	14	7	13
12	10	12	16	19	ES -14	ES -16	ES -12	ES -11	ES -9	ES -19	ES -9	ES -3	ES -16	ES -16	ES -16	ES -14	ES -30	ES -30	ES -30	ES -30	-4	13	13	14
13	15	19	19	ES -3	ES -12	ES -14	ES -17	ES -16	ES -19	ES -18	ES -19	ES -2	ES -30	ES -13	ES -30	ES -19	ES -30	ES -30	ES -30	ES -30	-3	12	13	5
14	14	13	13	20	8	ES -25	ES -13	ES -16	ES -7	ES -19	ES -20	ES -13	ES -19	ES -30	-19	ES -30	ES -30	ES -30	ES -30	ES -30	-8	2	6	8
15	3	12	16	20	ES -17	ES -19	ES -11	ES -19	ES -19	ES -14	ES -30	ES -8	ES -17	ES -30	-19	-25	ES -30	ES -30	ES -30	ES -30	-2	8	13	13
16	12	-22	10	15	ES -1	ES -19	ES -13	ES -11	ES -8	ES -13	ES -8	ES -9	ES -14	ES -12	-11	ES -30	ES -30	ES -30	ES -30	ES -30	-6	10	9	8
17	12	22	19	22	2	-14	ES -14	ES -8	ES -15	ES -21	ES -12	ES -3	ES -11	ES -7	-8	7	ES -17	ES -30	ES -30	ES -30	-2	12	17	6
18	17	15	ES -30	13	ES -19	ES -16	ES -20	ES -11	ES -9	ES -19	ES -12	ES 3	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -28	-1	7	11	13	8
19	12	16	20	20	22	13	9	7	12	-8	ES -8	ES -8	ES -11	ES -19	-13	-19	ES -30	ES -30	ES -30	ES -30	-8	12	17	16
20	18	8	21	2	ES -19	ES -16	ES -10	ES -16	ES -16	ES -20	ES -3	ES -3	ES -19	ES -16	ES -30	ES -25	ES -30	ES -30	ES -30	ES -30	-2	9	20	15
21	12	19	13	21	ES -5	ES -11	ES -7	ES -3	ES -19	ES -7	ES -8	ES -4	ES -19	ES -12	ES -30	ES -30	ES -25	-19	-19	-19	-12	23	17	15
22	16	13	-13	ES -8	ES -19	ES -12	ES -12	ES 7	ES -8	ES -16	ES -12	ES 6	ES -25	ES -13	-11	-21	ES -30	ES -30	ES -30	ES -30	-19	6	2	6
23	-1	10	11	ES -10	ES -19	ES -22	ES -15	ES -15	ES 6	ES -19	ES -12	ES -4	ES -14	ES -30	-16	ES -25	ES -30	ES -30	ES -30	ES -30	-9	2	1	7
24	4	14	15	ES 1	ES 6	ES -19	ES -7	ES -6	ES -8	ES -8	ES -9	ES 3	ES -30	ES -17	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	2	2	4	6
25	9	19	22	21	0	-9	-15	ES -12	ES -6	ES -20	ES -17	ES -1	ES -8	ES -28	-17	ES -25	ES -25	ES -25	ES -30	ES -30	-19	4	8	12
26	15	15	18	15	ES -15	ES -12	ES 1	ES -1	ES 8	ES -7	ES -24	ES -3	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	-19	1	15	10
27	18	13	24	21	ES -19	ES -8	ES -14	ES -16	ES -10	ES -30	-16	ES -3	ES -25	ES -19	ES -30	ES -25	ES -25	-21	ES -30	ES -30	ES -30	4	9	11
28	11	14	17	-6	ES -2	ES -16	ES -4	ES -13	ES -13	ES -10	ES 1	ES 1	ES -30	ES -19	ES -13	ES -19	ES -19	ES -19	ES -30	-19	ES -25	8	12	9
29	7	11	16	16	ES -2	ES -12	ES -8	ES -12	ES -3	ES -13	ES -4	ES -25	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	-13	ES -25	-19	5	13	6
30	3	12	9	21	ES -8	ES -8	ES -3	ES -3	ES -10	ES -19	ES -19	ES -12	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	-19	-3	9	9
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	12	14	16	18	ES -2	ES -12	ES -11	ES -11	ES -8	ES -14	ES -11	ES -3	ES -19	ES -17	VS -15	ES -22	ES -30	ES -30	ES -30	ES -30	-2	10	13	10
UD	17	19	22	21	22	10	ES 1	ES 7	ES 7	ES -7	ES -3	ES 3	ES -8	ES -3	-5	7	ES -11	ES -14	-13	-1	7	17	17	15
LD	3	8	9	ES -8	ES -19	ES -20	ES -16	ES -16	ES -19	ES -20	ES -20	ES -13	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -34	ES -34	-19	2	4	6

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

NOV 1970 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT DAY	00H 45M	01H 45M	02H 45M	03H 45M	04H 45M	05H 45M	06H 45M	07H 45M	08H 45M	09H 45M	10H 45M	11H 45M	12H 45M	13H 45M	14H 45M	15H 45M	16H 45M	17H 45M	18H 45M	19H 45M	20H 45M	21H 45M	22H 45M	23H 45M
1	2	2	8	14	19	23	7	22	17	12	5	ES -2	ES 3	ES -2	-14	ES -34	ES -30	ES -30	ES -30	6	8	8	5	3
2	3	3	16	14	22	24	11	17	20	7	-3	ES 1	-4	ES 7	ES -17	ES -30	-19	-11	-13	1	4	12	4	1
3	2	3	6	16	20	22	21	23	18	1	ES -2	ES -1	ES 7	ES 10	ES -3	ES -12	ES -30	ES -30	ES -30	6	6	6	4	5
4	5	3	11	18	19	22	20	23	18	14	-3	ES -3	ES 13	ES -5	-15	-19	ES -30	ES -30	ES -30	-4	11	-6	6	1
5	2	3	7	ES -30	4	18	26	22	20	20	ES 4	ES -7	ES 6	ES -14	ES -12	ES -10	ES -19	-8	8	13	9	3	3	10
6	2	4	16	18	33	34	28	27	27	27	ES 8	ES 7	-3	-8	-9	ES -8	-11	-13	6	8	11	8	13	3
7	8	7	11	16	18	26	21	12	6	22	2	ES 9	0	17	-7	-20	-6	11	12	8	12	8	6	3
8	2	5	11	16	23	20	11	20	17	ES -4	ES 2	ES -4	-8	-19	ES -30	ES -30	ES -30	ES -30	ES -30	-14	16	12	9	2
9	6	7	10	19	21	24	24	21	17	6	ES 1	ES -3	-12	-14	ES -25	ES -30	ES -30	ES -22	ES -34	-1	13	2	2	2
10	3	7	10	16	20	21	22	23	22	-2	ES 3	ES -9	ES -19	-13	-13	ES -34	-19	-14	ES -34	4	13	8	3	5
11	6	6	12	13	18	22	19	20	12	4	ES 11	ES -6	-3	-8	-17	-16	ES -34	ES -34	ES -34	12	14	7	9	3
12	-1	4	10	7	22	19	13	24	16	10	ES 8	ES -3	ES -2	-13	-13	ES -30	ES -30	-19	ES -30	-3	18	14	-1	1
13	-1	7	14	15	22	9	21	22	23	6	22	ES -6	ES -19	-22	ES -19	ES -30	ES -30	ES -30	ES -30	-11	13	8	2	4
14	2	1	8	15	19	25	24	19	17	8	ES 2	ES -4	-8	-22	ES -30	ES -30	ES -30	ES -30	ES -30	-19	1	2	3	2
15	6	12	17	22	22	19	19	7	24	25	ES 5	ES -8	-13	-14	ES -11	ES -30	ES -30	ES -30	ES -30	-22	6	2	7	2
16	-11	ES -30	-3	12	24	16	28	23	27	8	ES -1	ES -3	-2	-7	-11	ES -30	ES -30	ES -30	ES -30	-9	6	0	1	2
17	4	-7	12	20	18	20	11	23	15	ES -3	ES 2	ES -3	ES 6	ES 2	ES -19	ES -25	-20	ES -30	ES -30	-4	10	-2	ES -17	2
18	0	ES -17	ES -30	13	19	20	20	22	20	-1	ES -9	ES -2	ES -8	-19	ES -30	ES -30	ES -30	-19	2	8	13	2	0	3
19	3	5	8	15	22	19	23	2	3	13	ES 2	ES -5	ES -1	ES -6	-19	ES -30	ES -30	ES -30	ES -30	-19	13	7	7	5
20	6	10	12	18	23	24	4	13	ES -1	ES 7	ES 8	ES -3	-16	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	-8	3	6	6	5
21	3	12	14	19	24	26	24	22	15	ES -4	-1	ES 1	ES -4	-12	-19	ES -25	ES -30	12	18	9	7	9	5	8
22	9	8	9	17	20	26	23	19	16	0	ES 2	ES 4	-4	-13	-16	ES -30	ES -30	ES -30	ES -30	ES -30	10	9	4	2
23	-1	6	11	13	19	23	24	19	13	ES -4	ES 0	ES -4	-16	-13	-16	ES -30	ES -30	ES -30	ES -30	3	12	5	0	5
24	1	9	19	19	20	29	21	21	7	-5	ES 8	ES -3	ES -17	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	-17	13	10	7	7
25	10	10	14	16	22	39	19	15	4	ES -6	ES 4	ES -1	ES -7	-10	ES -25	ES -25	ES -25	-19	ES -30	-22	11	7	5	7
26	6	15	17	31	36	22	3	0	ES 1	-12	ES -12	ES -13	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	6	7	6	13
27	9	14	19	21	23	20	24	16	12	-7	-11	ES -1	-8	-14	ES -30	ES -30	ES -30	ES -28	ES -30	ES -30	16	9	6	9
28	8	10	13	21	22	13	21	0	22	-5	-3	ES -9	ES -25	ES -13	ES -13	ES -19	ES -19	-19	ES -25	ES -30	7	6	7	0
29	6	11	16	21	20	4	3	-3	-3	-12	ES -4	ES -12	ES -30	ES -30	ES -25	ES -25	ES -25	ES -30	ES -30	ES -25	6	11	7	6
30	3	7	9	19	23	19	5	12	6	-9	-14	ES -14	-19	-19	-13	-22	-16	-4	ES -30	ES -30	9	8	6	6
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	3	6	11	16	22	22	21	20	16	US 2	ES 2	ES -3	ES -8	ES -13	ES -17	ES -30	ES -30	ES -30	ES -30	-6	10	7	5	3
UD	9	12	17	21	24	29	26	23	24	22	ES 8	ES 4	ES 6	ES 7	ES -9	ES -12	-16	-4	8	9	16	12	9	9
LD	-1	-7	6	12	18	13	4	0	ES 1	ES -9	ES -11	ES -12	ES -25	ES -30	ES -30	ES -30	ES -30	ES -30	ES -34	ES -30	4	0	0	1

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Nov. 1970	Whole Day Index		W W V 00 06 12 18 / 06 12 18 24	L M 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	H
1	4+		5 (4)(5) 4	4 - - -	4 4 (4) 4	N N N N			
2	4+		5 (5)(5) 4	4 4 - 4	4 4 (5) 5	N N N N			
3	4+		5 (5)(5) 4	4 4 - 4	4 4 (5) 4	N N N N			
4	4+		5 (4)(5) 4	5 4 - 4	4 4 (5) 4	N N N N			
5	4+		5 (4)(5) 4	4 4 - 4	3 4 (5) 5	N N N N			
6	5-		5 (5)(5) 5	4 4 - 4	4 5 (5) 5	N N N N			
7*'	4+		5 (4)(5) 3	4 5 - -	4 4 (5) 5	N U U U	00.46	22××	166[Y]
8*'	3°		(2)(3)(4) 3	3 - - -	4 4 (4) 4	U U U U			
9'	4-		5 (4)(3) 3	4 3 - 4	4 4 (4) 4	N N N N			
10	4°		4 (5)(4)(4)	3 3 - 4	4 4 (4)(4)	N N N N			
11	4+		(4)(5)(5) 4	4 4 - 4	(4) 4 (5) 4	N N N N			
12	4°		4 (4)(4)(4)	3 4 - 4	4 4 (4) 4	N N N N			
13	4°		(4)(3)(3) 5	3 4 - 5	4 4 (4) 4	N N N N			
14	4°		(5)(3)(3) 4	5 4 - -	4 4 (4) 4	N N N N			
15	4°		4 (3)(3) 5	5 - - -	4 4 (4) 4	N N N N			
16	4°		4 (4)(4) 4	3 4 - 4	3 4 (4) 4	N N N N			
[17]	4+		5 (4)(5) 4	4 4 - 4	4 4 (5) 4	N N N N			
[18*]	4-		(2)(3)(3) 5	4 4 - 4	3 4 (4) 5	N N N N	12.25	---	132[Y]
[19*]	5°		5 (5)(4) 5	5 5 - 5	4 4 (4) 4	U U U U	---	16××	
20	4°		3 (4)(4) 5	4 3 - 4	4 (4)(3) 4	N N N N			
21*	4-		3 (4)(4)(3)	4 4 - -	4 4 (5) 5	N N U U	06.22	21××	129[Y]
22	3+		(2)(4)(4) 3	4 - - -	4 4 (4) 4	U U U U			
23	3+		(2)(4)(4) 3	4 4 - 3	4 4 (4) 4	N N N N			
24	4-		3 (4)(3) 4	5 4 - 3	4 4 (3) 4	N N N N			
25	4°		(3)(4)(4) 3	5 4 - 4	5 4 (4) 4	N N N N			
26	4-		3 (5)(3) 3	4 3 - 4	5 3 (3) 4	N N N N			
27	4-		3 (3)(4) 4	5 3 - 4	5 4 (4) 4	N N N N			
28	3°		2 (4)(4) 3	3 3 - -	4 3 (4) 4	N N N N			
29	3+		4 (3)(3) 3	4 - - -	4 2 (3) 4	N N N N			
30	3°		3 (3)(3) 3	3 3 - 4	4 3 (4) 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

Time in U.T.

Nov. 1970	S W F									Correspondence		
	Drop-out Intensities (db)					Start-time	Duration	Type	Imp.	Flare	Solar Noise	Mag.
	CO	LM	HA	TO	SH							
4	10	8				21.43	17	Slow	1-	×	×	
4		12				22.50	14	S	1-	×		
5	30	27	30'	20'		03.16	79	G	2	×	×	
12		6	22			03.38	19	S	2+		×	
13			5'			03.40	30	Slow	×	×	×	
13	8	10				23.01	40	G	1-			
14		×				04.40	45	S	×		×	
15			×			05.19	60	G	×		×	
16	>35	>32				00.47	88	S	3-	×	×	×
	38"											
16		23				22.15	65	S	2	×		
17	30	8	×			01.22	50	S	2+	×	×	×
	13"											
17			20'			04.27	30	S	2+	×	×	×
			5									
17			×			05.46	35	S	×	×		
17		9				21.37	23	S	1-			
17	15	16				22.43	36	Slow	1			
18	>40	>43	>25'	>45'		01.37	102	G	3+	×	×	
				20'								
18						04.11	25	S	2		×	
19		8				22.53	13	S	1-	×		
20		8				01.07	16	S	1-	×	×	

I N U B O

1970	S P A							Remarks
Nov.	Phase Advance (degrees)				Time (U. T.)			
DATE	GBR	WWVL	NAA	NWC	Start	End	Maximum	
1				12	0040	0110	0048	
1				16	0228	0316	0233	X
1				4	0437	0456	0443	
2			9	63	0406	0543	0430	
4		35	24	40	2250	2340	2256	X
5				24	0222	0257	0230	
5	55	101	47	145	0311	0430	0340	X
12	45	—	44	104	0336	0518	0344	
12			13	18	2336	2349	2339	X
13			16	54	0340	0507	0410	
13			19		0540	0615	0546	
13	28		35	70	2301	0005	2317	X
14			6	24	0101	0116	0107	X
14			17	44*	0136	0304	0225	X
14	28		14	64	0440	0527	0450	
14			8	13	2300	2316	2303	X
14			10	4	2341	2353	2347	
15				4	0010	0021	0014	
15			21*	12	0036	0110	0043	X
15				8	0125	0136	0128	
15			16*	12	0204	0232	0212	
15				8	0251	0309	0257	X
15			10	8	0307	0347	0322	
15			4	24	0421	0440	0427	
15	20		19	64	0448	0512	0453	X

1970 Nov.	S P A							Remarks
	Phase Advance (degrees)				Time (U. T.)			
DATE	GBR	WWVL	NAA	NWC	Start	End	Maximum	
15	45		47	131	0516	0625	0529	
15				88	0623E	0743D	0700	
15	30			88	0746	0802	0747	
16	83	58	113	—	0046	0332	0059	
16	20		8	40	0537	0617	0542	
16	33				0951	1021	1000	X
16	56		22		1221	1314	1234	
16				4	2147	2209	2155	X
16		—	44	75	2219	2347	2230	
17			19	32	0007	0049	0015	
17	35	43	63	136	0123	0223	0130	
17			11	22	0233	0315	0242	
17	50		19	92	0422	0539	0437	X
17	25		8	64	0544	0712	0555	X
17	20			128	0734	0754	0739	
17			45		1758	1848	1804	
17		—42		— 8	2140	2233	2156	
17		—108	40	80	2242	0011	2300	
18				8	0037	0055	0040	
18	58*	223	83	189	0123	0402	0206	
18	42		37	72	0410	0638	0416	X
18			10	32	2323	2356	2335	
19	17		13	32	0011	0049	0017	X
19		49	15	64	0242	0334	0251	
19		55	28	60	2248	2335	2258	X

1970 Nov.	S P A							Remarks
	Phase Advance (degrees)				Time (U. T.)			
DATE	GBR	WWVL	NAA	NWC	Start	End	Maximum	
20	35	25	31	88	0101	0205	0118	X
20	15	13	8	36	0421	0507	0425	X
21	30		6	24	0147	0206	0151	X
21			9	16	0213	0250	0220	
23	50				1747	1830	1803	
23	33				1841	1906	1849	
24		16		56	0407	0515	0420	X
24	40		20		0456	0534	0503	
24	36		24		0818	0845	0830	
26			8		0430	0444	0434	
26			8		0545	0553	0547	
27			6	16	0237	0300	0243	
28	20			56	0417	0542	0430	X
30				14	0508	0541	0513	
30				16	0843	0912	0845	

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.

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