F－335

IONOSPHERIC DATA IN JAPAN

FOR NOVEMBER 1976

VOL.28 No. 11

CONTENTS

RADIO RESEARCH LABORATORIES
MINISTRY OF POSTS AND TELECOMMUNICATIONS
TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I), solar radio emission (S) and radio propagation (P) obtained at the following stations under the Radio Research Laboratories, Ministry of Posts and Telecommunications of Japan.

Station	Geographic		Geomagnetic		Technical Method
	Latitude	Longitude	Latitude	Longitude	
Wakkanai	45°23.6'N	141°41.1'E	35.3°N	206.0	Vertical Sounding (I)
Akita	39°43.5'N	140°08.2'E	29.5°N	205.4	" (I)
Kokubunji	35°42.4'N	139°29.3'E	25.4°N	205.4	" (I)
Yamagawa	31°12.1'N	130°37.1'E	20.3°N	197.8	" (I)
Hiraiso	36°22.0'N	140°37.5'E	26.2°N	206.3	Radio Receiving (S, P)
Inubo	35°42.2'N	140°51.5'E	26.0°N	206.8	" (P)

A. IONOSPHERE

Ionospheric observations are carried out at five stations in Japan by means of vertical sounding method.

The published data consist of tabulations of hourly values of the ionospheric characteristics and figures of daily *f*-plot.

All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction (Second Edition) 1972".

a. Characteristics of Ionosphere

fxI — Top frequency of spread *F* trace

foF2, *foF1*, *foE*, *foEs* — Ordinary wave critical frequency for the *F2*, *F1*, *E* and *Es* including particle *E* layers respectively

fbEs — Blanketing frequency of the *Es* layer, e.g. the lowest ordinary wave frequency visible through *Es*

fmin — Lowest frequency which shows vertical ionospheric reflections

M(3000)F2, *M(3000)F1* — Maximum usable frequency factor for a path of 3000 km for transmission by *F2* and *F1* layers respectively

h'F2, *h'F*, *h'E*, *h'Es* — Minimum virtual height on the ordinary wave for the *F2*, whole *F*, *E* and *Es* layers respectively

Types of *Es* — See below A. b. (iii)

b. Symbols

(i) 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 *fmin*.

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 in use.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.

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.

K Presence of particle *E* layer.

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.

P Man-made perturebation of parameters-Presence of polar spure traces.

Q Range spread present.

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 Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

The following letters are entered in the first column before a numerical value on the monthly tabulation sheets.

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.

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.

M Mode interpretation uncertain.

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-electronic component.

(iii) Description of Types of *Es*

When more than one type of *Es* trace is present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple traces is indicated after the type letter.

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.

l A flat *Es* trace at or below normal *E* layer minimum virtual height or below the particle *E* layer minimum virtual height.

c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. 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.

r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.

a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and

diffuse traces present above it.

s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.

d A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin*.

n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.

k The designation k is used to show the presence of particle *E*. When *foEs>foE* (particle *E*) the *Es* type precedes k.

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.

B. SOLAR RADIO EMISSION

Solar radio observations are carried out on 100, 200 and 500 MHz at Hiraiso. Observation equipments are: a 5 meter parabolic reflector with a total-power receiver for 500 MHz and a 10 meter parabolic reflector with two polarimeters for 100 and 200 MHz. Observations are feasible almost from sunrise to sunset.

Time is expressed in hours, minutes and tenths of minutes U. T. and the unit of flux density is 10^{-22} Wm^{-2} Hz^{-1} for both components of polarization.

All symbols and terminology in the table of data are used in accordance with the "Descriptive Text of Solar-Geophysical Data, NOAA" and "Instruction Manual Monthly Report for Solar Radio Emission, WDC-C2".

a. Daily Data

Flux density. The three-hourly and daily mean values are given.

Variability. The three-hourly and daily mean values are given at 200 MHz only.
Variability is expressed in the following four grades.

0 quiet or no burst,
1 a few bursts,
2 many bursts,
3 very many bursts.

The number of bursts exceeding the mean flux level is counted.

Daily data with parenthesis mean that observation time does not exceed one third of the period.

b. Outstanding Occurrences

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.

Type is denoted by numerical code and letter symbol in parallel as follows:

SGD Cord	Letter Symbol	Morphological Classification
1	S	Simple 1
2	S/F	Simple 1F
3	S	Simple 2
4	S/F	Simple 2F
5	S	Simple
6	S	Minor
7	C	Minor+
8	S	Spike
20	GRF	Simple 3
21	GRF	Simple 3A
22	GRF	Simple 3F
23	GRF	Simple 3AF
24	R	Rise
25	R	Rise A
26	FAL	Fall
27	RF	Rise and Fall
28	PRE	Precursor
29	PBI	Post Burst Increase
30	PBI	Post Burst Increase A
31	ABS	Post Burst Decrease
32	ABS	Absorption
40	F	Fluctuations
41	F	Group of Bursts
42	SER	Series of Bursts
43	NS	Onset of Noise Storm
44	NS	Noise Storm in progress
45	C	Complex
46	C	Complex F
47	GB	Great Burst
48	C	Major
49	GB	Major+

Flux density is the increase of flux over the level at which daily flux is calculated, or the increase of flux over the underlying burst when the event is superposed on another burst of long duration.

Polarization is expressed by the polarization degree and sence as follows:

R or L	right- or left-handed polarization,
W, M or S	weak, moderate or strong polarization,
0	almost zero or unable to detect polarization deu to small increase of flux.
00	polarization degree of less than 1 percent.

The following symbols may be attached after numerical values in table, if necessary.

D	greater than, or later than,
E	less than, or earlier than,
U	approximate, or uncertain.

C. RADIO PROPAGATION

a. Measurement of H. F. Field Strength

Field strength observation of 15 MHz standard waves transmitted from WWV and WWVH stations which are located respectively at Fort Collins, Colorado and Kauai, Hawaii, is carried out at Hiraiso. In order to avoid interference among the same frequency waves, the upper side-band of WWV or WWVH with the audio tone 600 Hz is picked up by the use of a narrow band pass filter with 80 Hz band width. Particulars of the transmitters and the receiver are summarized in the following table.

Characteristics	Transmitter		Receiver
Station Call	WWV	WWVH	
Location	Fort Collins, Colorado	Kauai, Hawaii	Hiraiso, Ibaraki
latitude	40°41'N	22°00'N	36°22'N
longitude	105°02'W	159°46'W	140°38'E
Distance	9150 km	5910 km	-
Carrier Power	10 kW	10 kW	-
Modulation	50 %	50 %	-
Antenna	$\lambda/2$ vertical	$\lambda/2$ vertical	4.5 m vertical rod
Bandwidth	-	-	80 Hz for upper side-band
Calibration	-	-	Every an hour

The tabulated *field strength* in dB above one microvolt per meter is the peak average of the incident upper side-band field intensity in 45 seconds after the universal time indicated on the table. Abbreviated symbols are as follows:

CNT	number of observed values,
MED	median,
UD	value of the uppermost decile when they are ranked according to magnitude,
LD	value of the lowest decile when they are ranked according to magnitude,
U	uncertain,
E	less than,
C	influenced by, or impossible because of, any artificial accident,
S	influenced by, or impossible because of, interferences or atmospherics.

b. Radio Propagation Quality Figures

The tabulated six-hourly quality figures are calculated for standard waves WWV transmitted from Fort Collins and standard waves WWVH transmitted from Kauai.

Quality figures expressing radio propagation conditions are ranged over five grades as follows:

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

Whole day quality figure ranged in grades of 1_0, 1+, 2-, 2_0, 2+, 3-, 3_0, 3+, 4-, 4_0, 4+, 5-, 5_0 stands for an average of six-hourly ones of the two circuits. Abbreviated symbols are as follows:

C	artificial accident,
S	propagational accident,
U	inaccurate.

Radio propagation conditions which can be described with a code in the following

N	normal,
U	unstable,
W	disturbed

are forecast 12 hours in advance and broadcast twice per an hour from JJY Station.

Data on a *geomagnetic storm* correlated with a radio propagation disturbance are tabulated from observation at Kakioka Magnetic Observatory, Japan Meteorological Agency. *Time* (U.T.) is expressed in unit of hour and minute (or tenth of hour), and *range* in gamma. When they are uncertain quantitatively, /'s are replaced with them. Continuation of a geomagnetic storm is denoted by ---.

c. Sudden Ionospheric Disturbances

(i) SWF

The table of short wave fade-out (SWF) is prepared from the record of field intensities measured at Hiraiso.

Drop-out intensities of the 10 MHz, the 20 MHz, and the 25 MHz waves are respectively distinguished by marks ', '' and ''' from these of the 15 MHz wave for WWV and WWVH. Values of *start*, *duration*, *type*, and *importance* are obtained from data of the circuit whose drop-out intensity in dB is underlined as xx. When these quantities are not given correctly, they are accompanied by the following symbols.

D	greater than,
E	less than,
U	uncertain or doubtful.

Types of fade-out are as follows:

S	sudden drop-out and gradual recovery,
SL	slow drop-out taking 5 to 15 minutes and gradual recovery,
G	gradual and irregular in both drop-out and recovery.

Importance of fade-out is scaled according to its amplitude into nine ascending grades as 1-, 1, 1+, 2-, 2, 2+, 3-, 3, 3+.

Correspondence of solar optical flare, solar radio burst, and geomagnetic crochet to SWF is marked by X in accordance with interchange messages of IUWDS and observations at Hiraiso.

(ii) SPA

Data of sudden phase anomaly (SPA) are prepared from the records of phase measurement of VLF radio waves received at Inubo. The transmitting stations are listed in the following table.

Phase advance is shown in unit of degree at its maximum stage. No transmission or no reception during the period is indicated by —, and indistinguishable record is spaced out, and multi-peak event is marked by *.

Out of more than two circuits on which the same SPA event is observed, the *phase advance* on the circuit on which the SPA is the most remarkable or distinct is underlined. As for the underlined, *phase advance*, *start*, *end* and *maximum* times are obtained.

In table (i) SWF and (II) SPA, *date* indicates the day to which *start-time* of event belongs.

The following letters may be attached to the value, if necessary.

D	greater than,
E	less than,
U	uncertain or doubtful.

Transmitting Stations

Name	Location (Geographic Coordinate)		Call Sign	Frequency (kHz)	Radiation Power (kW)	Arc Distance from Inubo (km)
Rugby	52°22'N	001°11'W	GBR	16.0	40	9550
Cutler	44°38'N	067°17'W	NAA	17.8	1000	10640
Jim Creek	48°12'N	121°55'W	NPG	18.6	250	7620
North West Cape	21°48'S	114°09'E	NWC	22.3	1000	6990
Aldra	66°25'N	013°08'E	AL3	13.6	10	7820
Reunion	20°58'S	055°17'E	RE3	13.6	10	10970
North Dakota	46°22'N	098°20'W	ND3	13.6	10	9140
Haiku	21°24'N	157°50'W	HA3	13.6	10	6100

IONOSPHERIC DATA

NOV. 1976 | FXI (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	C	36	39	42	37	32	40											40	40	43	43	39	41	42
2	40	39	40	37	40	41	39											50	33	37	40	39	40	40
3	39	39	40	40	40	36	40											45	48	40	41	40	41	42
4	41	40	41	43	42	38	43											43	37	40	39	37	38	41
5	40	37	39	37	38	40	37						69					46	36	35	37	38	40	40
6	40	40	40	42	37	32	37											49	37	35	35	37	36	36
7	37	39	40	40	39	39	39											43	42	38	35	37	38	38
8	40	40	42	40	40	40	39											40	36	37	36	37	38	37
9	38	41	44	47	44	46	36					75						43	41	43	50	43	43	44
10	48	51	50	48	47	44	40											41	38	38	45	40	43	47
11	49	51	53	49	48	49	A											51	40	40	41	40	42	43
12	45	43	44	50	44	A	A											A	36	41	40	43	45	47
13	43	43	S	42	47	43	40											41	44	45	41	43	42	S 42
14	42	42	40	39	37	33	33											40	44	43	43	47	50	50
15	47	55	53	57	58	43	41											41	35	42	43	41	48	50
16	50	50	50	47	46	46	36											37	37	38	35	36	41	40
17	46	42	41	40	40	27	35											35	37	38	43	35	38	38
18	39	40	40	39	40	35	35											40	36	35	38	39	40	40
19	40	40	41	42	42	42	37											42	43	38	40	43	47	44
20	44	40	40	40	42	42	36											40	40	44	45	45	45	45
21	43	44	44	44	44	43	37											37	40	43	38	48	49	58
22	S	48	41	45	46	40	35											36	40	44	42	42	37	37
23	39	41	43	A	37	37	34											47	A	43	46	47	52	53
24	54	U S 52	47	60	51	46	35										55	36	42	42	45	48	48	45
25	53	46	43	43	43	37	A										49	42	S 47	42	42	41	41	42
26	41	40	39	35	36	39	33										57	39	39	48	45	45	45	S
27	45	45	45	43	44	41	36										50	37	36	39	42	43	43	41
28	45	45	C	44	40	37	36										50	39	A	31	38	40	39	40
29	40	40	40	40	39	41	29										48	36	35	36	37	38	40	39
30	39	39	40	40	42	40	36										46	40	42	38	40	41	45	51
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	30	28	29	30	29	27					1	1				7	29	28	30	30	30	30	29
MED	42	41	41	42	42	40	36					75	69				50	40	40	40	41	40	42	42
UQ	46	45	44	45	44	43	39										52	43	42	43	43	43	45	45
LQ	40	40	40	40	39	37	35										48	37	36	38	38	38	40	40

NOV. 1976 | FXI (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | 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

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	C	32	32	35	30	25	33	C	73	C	81	94	78	63	66	61	56	33	33	36	36	32	34	F
2	F	F	F 33	F 30	F 28	F 28	32	52	62	63	62	73	66	67	67	63	63	43	26	30	33	32	33	33
3	32	32	33	33	33	F 29	33	69	74	66	73	71	73	71	63	62	54	38	39	33	34	33	F	F
4	F 33	F 31	F 34	F 33	F	F 24	F 34	54	67	63	65	74	64	75	66	53	54	36	30	33	32	30	F	F 30
5	33	30	32	30	31	33	30	53	61	66	72	73	F 56	63	58	51	55	39	29	28	30	31	33	F
6	F	F 31	F 30	F 33	30	25	30	50	63	59	61	71	66	53	50	51	50	42	30	28	28	30	29	29
7	30	32	33	33	32	32	32	51	65	61	66	72	76	62	50	47	61	36	35	31	28	30	31	31
8	33	33	F 33	33	F 33	33	32	51	63	53	62	59	61	60	56	54	43	33	29	30	29	30	31	30
9	31	34	F	F	F 34	F 35	F 25	A	A	61	72	F 68	70	60	60	64	66	36	34	36	43	36	36	37
10	F	F	43	F	F	F 35	33	53	60	73	71	63	60	57	62	70	61	34	31	31	38	F 33	36	F
11	F 42	44	F	F	F	F	A	54	86	73	72	83	55	72	70	66	51	44	33	33	F 30	33	35	36
12	38	36	37	43	F	A	A	44	67	84	68	80	64	80	63	63	53	A	30	34	33	36	38	40
13	36	36	S	F	F	F	33	44	65	63	66	67	62	69	67	67	54	34	37	F 36	F	F	F 33	S 35
14	F 33	F 35	33	32	30	26	26	43	66	62	63	63	68	68	74	56	48	F 33	F 33	36	F 31	F	F 43	F 43
15	F 40	F	U F 46	F	F	F 33	F	46	58	71	70	83	70	61	61	57	50	34	28	F 35	F 36	F 31	F 41	F
16	F 43	F	F	F 40	F	F	F 26	47	56	63	63	70	65	62	57	66	46	30	F 28	31	28	F 26	F	F
17	F	F 33	F	F 33	F 33	F	F 28	50	59	60	61	69	67	66	56	60	45	28	30	31	36	28	31	31
18	32	33	33	32	33	28	28	46	57	63	63	66	60	62	61	57	45	33	29	28	31	32	S 33	33
19	33	33	34	35	35	35	30	48	61	63	58	61	61	59	63	61	48	35	36	31	33	36	40	F
20	37	33	33	33	F 33	F 35	F 25	45	71	69	65	67	65	65	60	64	52	33	33	37	38	38	38	38
21	36	37	37	F	F	F 33	F 30	49	63	65	61	60	64	63	61	58	58	30	33	36	31	41	42	F
22	S	F	F	F	F	F 33	F	49	61	63	59	62	60	58	57	54	45	29	F	F	F 35	F 33	F 30	30
23	32	F 31	F 30	A	30	30	27	43	57	62	65	62	60	55	59	51	50	40	A	36	F	F	F	F 44
24	F 47	U S 45	F	F	F 44	F	F 26	44	55	62	64	62	71	66	55	49	48	29	35	35	38	41	41	38
25	F	F 36	F 36	F	F	F	A	A	60	67	64	58	57	61	54	51	42	35	S 40	35	35	34	34	35
26	34	33	30	28	29	30	26	51	68	81	73	72	71	64	58	61	50	32	32	41	38	38	38	S
27	38	38	38	36	37	34	29	47	R	67	76	69	64	60	60	56	43	30	29	32	35	36	36	34
28	38	38	I C 36	F	F	30	29	48	62	76	75	66	60	59	58	53	43	30	A	24	31	F	F	F
29	U F 30	F	F	F 33	F 29	34	22	43	52	A	60	67	57	59	58	51	41	29	28	29	30	31	F 33	32
30	32	32	33	33	35	33	29	37	50	60	57	69	69	58	56	51	39	33	35	31	33	34	38	F 44
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	24	22	19	19	23	25	27	28	28	30	30	30	30	30	30	30	29	27	29	28	26	25	20
MED	33	33	33	33	33	33	29	48	62	63	65	68	64	62	60	57	50	33	32	33	33	33	35	34
UQ	38	36	36	34	34	34	32	51	66	68	72	72	69	66	63	63	54	36	34	36	36	36	38	38
LQ	32	32	33	32	30	28	26	44	58	62	62	63	60	59	57	51	45	30	29	31	30	31	33	31

The Radio Research Laboratories, Japan

NOV. 1976 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | 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											L 400	L	L 400	L										
2										L 380	A	410	400											
3										L	410	L	400											
4												L	L											
5												390												
6																								
7												L	L											
8											380	L 400	390											
9												380												
10										U L 390	U L 400	U L 380	L 380											
11												400												
12											L 400	I C 400	L 390	L										
13																								
14												L 400	390	L 370										
15										L	380	400	L 400	360										
16												L 400												
17												400												
18												L	390											
19												L	U L 380											
20												L	L											
21													L											
22											L 380	L 380	L 380											
23												L 380												
24													L	L 380										
25												A												
26											A	400	L											
27												U L 390	A											
28													U L 390											
29												A												
30												U L 390	380											
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										2	7	16	13	3										
MED										L 385	L 400	400	L 390	L 370										
UQ											L 400	400	400	L 375										
LQ											380	L 385	L 380	365										

NOV. 1976 | FOF1 (0.01 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | FOE (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								C	215	C	A	A	A	A	240	A	S							
2								190	235	A	A	A	A	A	A	A	A							
3								180	220	240	270	A	A	275	250	A	S							
4								S	A	A	A	A	285	A	A	A	S							
5								A	A	A	A	A	A	270	240	210	S							
6								A	A	270	A	290	A	270	A	A	S							
7								S	A	A	A	290	A	A	A	200	S							
8								S	215	A	280	290	285	275	255	205	S							
9								A	A	A	A	290	285	270	250	200	S							
10								A	230	A	A	285	270	A	A	A	S							
11								A	A	A	A	A	270	260	230	180	S							
12								A	A	A	A	275	A	A	215	S	E							
13								A	A	A	A	265	270	250	225	190	S							
14								A	A	245	A	A	A	A	A	A	S							
15								A	205	230	A	270	270	A	A	A	S							
16								S	210	A	A	A	A	A	230	185	S							
17								150	A	A	270	280	280	260	225	A	S							
18								A	A	A	A	275	A	250	A	A	S							
19								150	200	255	270	280	275	260	A	195	S							
20								A	A	260	275	A	270	250	230	A	A							
21								A	225	250	275	280	285	265	230	A	S							
22								185	205	245	260	275	275	260	235	200	S							
23								A	A	A	270	285	280	A	A	A	S							
24								S	225	250	275	285	285	260	225	A								
25								S	200	225	265	275	250	A	235	A								
26								S	210	240	A	A	A	250	225	160								
27								S	205	240	A	A	A	260	215	S								
28								S	205	245	270	A	265	250	225	180								
29								185	A	A	A	A	265	A	A	195								
30								S	A	235	A	A	A	A	A	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								6	15	14	11	16	17	17	18	13	1							
MED								182	210	245	270	280	275	260	230	195	E							
UQ								185	222	250	275	288	285	270	240	200								
LQ								150	205	240	270	275	270	250	225	185								

The Radio Research Laboratories, Japan

NOV. 1976 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOES (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	C	24	22	E	E	E S 15	22	C	J A 40	C	J A 52	J A 36	J A 34	33	33	32	J A 45	31	J A 35	42	28	J A 90	26	22
2	E S 15	24	22	21	28	E S 15	E S 15	25	30	34	41	J A 63	32	36	28	34	35	26	27	30	27	23	E S 16	E S 15
3	E S 15	E S 15	E S 13	E	E S 15	E S 17	E S 15	21	G	G	G	36	J A 50	G 20	G 22	26	27	J A 26	J A 30	26	22	28	E S 16	E S 15
4	E S 15	30	J A 28	J A 30	E S 15	E	E S 15	28	32	45	J A 45	32	G	34	J A 31	J A 51	21	E S 15	E S 16	E S 16	E S 16	E S 15	25	E S 16
5	E S 15	E S 14	E S 14	25	32	31	31	30	28	29	36	41	J A 55	32	29	G	E S 17	E S 15	E S 15	E S 15	E S 15	J A 33	31	27
6	28	J A 32	24	E S 15	E	E S 15	E S 15	31	31	35	43	30	36	G 23	35	J A 40	32	33	E S 16	27	E S 16	E S 15	E S 15	E S 15
7	E S 17	E S 17	E S 14	E	E S 15	23	E S 15	G	26	35	32	J A 36	39	29	26	G	E S 15	E S 17	E S 15	E S 16	E S 17	24	E S 16	E S 15
8	E S 16	E S 15	E S 15	E	E	E	E S 16	E S 19	G	30	G	G	35	G	G	G 16	E S 17	E S 17	E S 15	J A 30	J A 34	33	25	30
9	22	22	E S 16	22	E S 15	25	J A 26	J A 55	J A 66	39	34	G 28	G	G	36	G	E S 16	E S 15	J A 25	E S 15	28	26	28	28
10	30	33	40	26	27	E S 15	31	29	30	33	36	G	G	36	35	31	30	39	28	39	31	31	34	J A 33
11	J A 43	36	28	J A 23	J A 22	33	J A 73	23	J A 54	36	35	35	G	G	G	32	J A 83	J A 50	J A 33	J A 39	E S 16	E S 15	31	35
12	38	26	25	25	J A 28	J A 50	J A 70	37	39	45	27	G 25	30	26	J A 43	J A 37	J A 34	J A 89	36	J A 32	E S 16	E S 16	26	E S 17
13	E S 16	31	22	E S 15	E S 15	E S 15	E S 16	28	26	35	J A 39	G	G	36	G	23	J A 34	E S 16	E S 15	28	J A 30	E S 17	31	29
14	23	23	26	E S 14	E S 15	E S 15	E S 17	22	23	G	30	29	30	J A 38	32	28	30	29	32	28	26	E S 15	29	28
15	E S 17	25	22	22	23	28	E S 15	45	31	G	30	G	G	25	23	28	30	E S 17	E S 17	E S 17	J A 40	28	28	26
16	E S 15	23	27	J A 24	E	E S 14	E S 15	E S 17	G	30	39	38	37	36	27	G	E S 16	E S 15	E S 15	E S 16	E S 15	E S 17	E S 15	E S 15
17	E S 15	E S 15	E S 16	E S 15	E	25	E S 15	19	25	35	35	G	G	G	G 17	28	28	E S 15	E S 15	E S 14	E S 15	E S 15	26	E S 15
18	E S 15	21	20	E	E	E S 13	E S 15	20	24	35	28	G	30	29	25	20	E S 15	E S 15	22	E S 16	24	E S 15	23	E S 16
19	E S 15	E S 15	E S 16	E S 15	E S 16	25	E S 15	20	23	G 17	34	G 22	G	G	25	G	E S 15	28	28	E S 15	33	28	J A 31	22
20	33	E S 16	23	23	E S 13	E S 15	E S 15	19	39	34	33	37	G 24	G	G 21	31	35	37	J A 34	J A 40	J A 31	J A 34	J A 30	J A 33
21	J A 33	24	22	23	27	22	E	J A 30	30	G 20	G 20	34	G 28	G	28	27	E S 16	E S 15	22	E S 15	21	23	J A 50	22
22	J A 23	22	22	27	E	E S 15	21	G	G	G	G	G	G 22	G	G 15	G 19	E S 15	E S 15	E S 15	21	E S 15	E S 15	E S 16	E S 15
23	E S 15	E S 13	E S 15	J A 51	J A 30	J A 52	J A 42	30	J A 35	32	G	32	J A 50	28	33	20	30	J A 45	46	J A 34	26	22	J A 34	33
24	22	E S 15	E S 14	E S 16	E	E S 17	29	J A 31	40	29	44	J A 36	31	34	J A 51	42	E S 15	J A 24	J A 30	37	J A 40	J A 30	30	32
25	E S 16	E S 15	E S 15	E S 16	26	J A 33	41	52	J A 61	A A 66	41	J A 43	39	39	32	48	25	25	25	21	23	E S 15	E S 15	E S 15
26	E S 15	E S 16	20	J A 30	J A 24	E S 16	E S 15	23	28	G	J A 42	34	36	34	G	26	17	E S 15	E S 15	E S 15	24	29	28	31
27	33	30	J A 20	23	25	E S 14	E S 15	20	G	30	30	30	J A 40	29	G	E S 20	E S 15	E S 16	E S 15	E S 14	E S 15	E S 15	E S 15	26
28	E S 15	23	C	E S 16	E	E S 15	21	E S 15	G	G	G	30	G 26	G 24	G	G	20	E S 16	48	37	E S 16	E S 16	E S 17	25
29	E S 16	E S 15	E S 16	E	J A 26	E S 14	28	G	33	71	45	40	G	35	30	24	42	J A 38	J A 35	27	34	24	30	24
30	31	E S 15	25	22	E S 15	E S 17	E S 16	E S 16	20	36	28	30	30	40	39	G	19	E S 16	22	22	23	21	30	26
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E S 16	22	22	22	E E 15	E S 16	E S 16	23	29	33	34	31	30	29	28	26	23	E S 17	24	24	24	22	27	24
UQ	28	25	24	24	26	25	28	30	35	35	41	36	36	35	33	32	32	31	32	32	30	28	30	29
LQ	E S 15	E S 15	E S 16	E S 15	E	E S 15	E S 15	19	23	G 20	28	G 22	G	G	G 17	E G 16	E S 16	E S 15	E S 15	E S 16	E S 16	E S 15	E S 16	E S 15

NOV. 1976 | FOES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | 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	C	E	E	E	E	E S 15	E	C	40	C	30	31	29	27	G	21	21	E	24	32	E	E	E	E
2	E S 15	E	E	E	E	E S 15	E S 15	G	G	30	41	36	30	32	28	25	20	E	E	E	E	E	E S 16	E S 15
3	E S 15	E S 15	E S 13	E	E S 15	E S 17	E S 15	G	G	G	G	32	32	G 18	G 20	G	18	E	E	E	E	E	E S 16	E S 15
4	E S 15	E	E	E	E S 15	E	E S 15	G	G	G	30	29	G	30	26	35	20	E S 15	E S 16	E S 16	E S 16	E S 15	E	E S 16
5	E S 15	E S 14	E S 14	E	E	E	E	22	27	27	28	30	30	22	18	G	E S 17	E S 15	E S 15	E S 15	E S 15	E	E	E
6	E	E	E	E S 15	E	E S 15	E S 15	21	25	G	43	21	30	G 16	26	27	24	25	E S 16	E	E S 16	E S 15	E S 15	E S 15
7	E S 17	E S 17	E S 14	E	E S 15	E	E S 15	G	25	33	30	25	30	27	25	G	E S 15	E S 17	E S 15	E S 16	E S 17	E	E S 16	E S 15
8	E S 16	E S 15	E S 15	E	E	E	E S 16	E S 19	G	27	G	G	G	G	G	G 15	E S 17	E S 17	E S 15	E	23	E	E	E
9	E	E	E S 16	E	E S 15	E	E	A A 55	A A 66	29	32	G 25	G	G	35	G	E S 16	E S 15	E	E S 15	E	E	E	E
10	E	23	23	E	E	E S 15	E	25	G	30	33	G	G	35	30	25	G	30	E	E	E	E	E	E
11	E	25	E	E	E	E	A A 73	22	50	26	27	30	G	G	G	32	20	E	E	E	E S 16	E S 15	E	24
12	21	E	E	E	E	A A 50	A A 70	33	30	39	27	G 25	27	26	40	32	32	A A 89	E	E	E S 16	E S 16	E	E S 17
13	E S 16	E	E	E S 15	E S 15	E S 15	E S 16	22	26	29	33	G	G	35	G	G	23	E S 16	E S 15	E	E	E S 17	21	20
14	E	E	E	E S 14	E S 15	E S 15	E S 17	22	21	G	29	28	27	32	26	21	E	E	E	E	E	E S 15	E	E
15	E S 17	E	E	E	E	E	E S 15	25	G	G	30	G	G	25	23	21	E	E S 17	E S 17	E S 17	E	E	E	E
16	E S 15	E	E	E	E	E S 14	E S 15	E S 17	G	25	30	27	26	25	18	G	E S 16	E S 15	E S 15	E S 16	E S 15	E S 17	E S 15	E S 15
17	E S 15	E S 15	E S 16	E S 15	E	E	E S 15	G	22	25	25	G	G	G	G 17	21	17	E S 15	E S 15	E S 14	E S 15	E S 15	E	E S 15
18	E S 15	E	E	E	E	E S 13	E S 15	20	24	25	27	G	28	G	25	20	E S 15	E S 15	E	E S 16	E	E S 15	E	E S 16
19	E S 15	E S 15	E S 16	E S 15	E S 16	E	E S 15	G	G	G 16	20	G 19	G	G	25	G	E S 15	E	E	E S 15	E	E	25	E
20	E	E S 16	E	E	E S 13	E S 15	E S 15	17	24	20	23	25	G 22	G	G 20	20	20	22	22	E	E	E	23	E
21	E	E	E	E	E	E	E	19	21	G 18	G 20	21	G 19	G	G	21	E S 16	E S 15	E	E S 15	E	E	26	E
22	E	E	E	E	E	E S 15	E	G	G	G	G	G	G 20	G	G 15	G 17	E S 15	E S 15	E S 15	E	E S 15	E S 15	E S 16	E S 15
23	E S 15	E S 13	E S 15	A A 51	E	E	E	30	30	27	G	20	23	27	24	20	G	34	A A 46	E	E	E	E	E
24	E	E S 15	E S 14	E S 16	E	E S 17	E	30	18	18	19	18	22	G	46	37	E S 15	E	29	25	E	E	E	E
25	E S 16	E S 15	E S 15	E S 16	E	E	A A 41	A A 52	56	31	G	40	37	28	G	44	E	E	E	E	E	E S 15	E S 15	E S 15
26	E S 15	E S 16	E	E	E	E S 16	E S 15	G	G	G	40	31	28	31	G	G	E	E S 15	E S 15	E S 15	E	E	E	E
27	E	E	E	E	E	E S 14	E S 15	G	G	20	28	28	37	G	G	E S 20	E S 15	E S 16	E S 15	E S 14	E S 15	E S 15	E S 15	E
28	E S 15	E	C	E S 16	E	E S 15	E	E S 13	G	G	G	28	G 24	G 23	G	G	E	E S 16	A A 48	20	E S 16	E S 16	E S 17	E
29	E S 16	E S 15	E S 16	E	E	E S 14	E	G	22	A A 71	28	38	G	G	G	G	32	E	E	E	E	E	E	E
30	E	E S 15	E	E	E S 15	E S 17	E S 16	E S 16	20	21	27	27	29	29	26	G	E	E S 16	E	E	E	E	E	E
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E S 15	E E 13	E	E	E	E S 14	E S 15	19	21	25	28	25	24	22	20	20	E E 16	E S 15	E E 15	E E 14	E	E	E	E
UQ	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	22	26	29	30	30	29	28	26	25	20	E S 17	E S 16	E S 16	E S 15	E S 15	E S 16	E S 15
LQ	E	E	E	E	E	E	E	G	G	G	20	G 18	G	G	G	G		E	E	E	E	E	E	E

The Radio Research Laboratories, Japan

NOV. 1976 | FBES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | 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	C	E S 15	E	E	E	E S 15	E S 15	C	10	C	10	11	17	12	11	10	E S 14	E	E S 15	E S 17	E S 16	E S 15	E S 15	E S 15
2	E S 15	E S 16	E S 15	E S 15	E S 15	E S 15	E S 15	12	12	12	11	11	15	15	13	11	E S 15	E S 15	E S 16	E S 15	E S 17	E S 15	E S 16	E S 15
3	E S 15	E S 15	E S 13	E	E S 15	E S 17	E S 15	E S 15	16	17	14	18	15	12	12	10	E S 15	E S 16	E S 14	E S 15	E	E S 16	E S 16	E S 15
4	E S 15	E S 15	E S 14	E S 15	E S 15	E	E S 15	E S 17	12	17	16	17	15	15	12	15	E S 15	E S 15	E S 16	E S 16	E S 16	E S 15	E S 15	E S 16
5	E S 15	E S 14	E S 14	E S 15	E S 16	E S 15	E S 16	E S 15	11	15	11	10	10	12	15	18	E S 17	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15
6	E S 15	E	E S 15	E S 15	E	E S 15	E S 15	10	11	11	12	16	13	11	10	10	E S 15	E S 16	E S 16	E S 15	E S 16	E S 15	E S 15	E S 15
7	E S 17	E S 17	E S 14	E	E S 15	E S 12	E S 15	E S 18	15	16	16	15	16	16	13	11	E S 15	E S 17	E S 15	E S 16	E S 17	E S 16	E S 16	E S 15
8	E S 16	E S 15	E S 15	E	E	E	E S 16	E S 19	15	13	16	17	13	16	15	10	E S 17	E S 17	E S 15	E S 15	E S 16	E S 16	E S 15	E S 15
9	E S 15	E S 12	E S 16	E S 12	E S 15	E S 14	E S 15	E S 11	11	11	13	16	17	16	16	15	E S 16	E S 15	E	E S 15	E	E S 16	E S 16	E S 16
10	E S 16	E S 15	E S 15	E S 16	E	E S 15	E S 15	15	17	18	18	19	20	20	16	16	E S 15	E S 15	E S 15	E S 16	E S 16	E S 15	E S 16	E S 16
11	E S 16	E S 15	E S 16	E	E S 15	E S 15	E S 12	E	11	13	15	15	17	16	14	11	E S 15	E S 12	E S 15	E S 16	E S 16	E S 15	E S 15	E S 16
12	E S 15	E S 15	E S 16	E S 14	E	E	E S 15	E	11	12	14	12	12	16	12	E S 16	E	E S 14	E S 15	E S 15	E S 16	E S 16	E S 16	E S 17
13	E S 16	E S 15	E S 16	E S 15	E S 15	E S 15	E S 16	E S 15	16	18	17	18	18	20	20	E S 16	E S 16	E S 16	E S 15	E S 16	E S 15	E S 17	E S 15	E
14	E S 16	E S 17	E S 15	E S 14	E S 15	E S 15	E S 17	E S 15	16	17	17	20	17	16	15	E S 15	E S 15	E S 15	E S 16	E S 15	E S 15	E S 15	E S 16	E S 16
15	E S 17	E S 16	E S 15	E	E	E S 16	E S 15	E	17	15	16	17	15	15	13	15	E S 15	E S 17	E S 17	E S 17	E S 16	E S 16	E S 16	E S 15
16	E S 15	E S 16	E	E	E	E S 14	E S 15	E S 17	11	12	12	11	12	15	11	15	E S 16	E S 15	E S 15	E S 16	E S 15	E S 17	E S 15	E S 15
17	E S 15	E S 15	E S 16	E S 15	E	E S 16	E S 15	E	11	10	12	12	16	12	12	10	E S 15	E S 15	E S 15	E S 14	E S 15	E S 15	E S 14	E S 15
18	E S 15	E S 15	E S 15	E	E	E S 13	E S 15	E S 12	11	10	11	15	15	15	11	11	E S 15	E S 15	E S 14	E S 16	E S 16	E S 15	E S 16	E S 16
19	E S 15	E S 15	E S 16	E S 15	E S 16	E S 15	E S 15	12	10	10	10	10	12	11	10	10	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16
20	E S 15	E S 16	E S 16	E S 16	E S 13	E S 15	E S 15	10	10	10	11	11	10	12	10	10	10	E S 15	E	E S 16	E S 16	E S 15	E S 16	E S 15
21	E S 15	E S 15	E S 16	E S 16	E S 16	E S 15	E	E	10	11	15	10	10	16	10	10	E S 16	E S 15	E S 17	E S 15	E S 16	E S 16	E S 14	E S 15
22	E	E S 15	E S 15	E S 16	E	E S 15	E S 15	E S 15	12	11	10	11	11	10	10	10	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 16	E S 15
23	E S 15	E S 13	E S 15	E S 15	E	E	E S 15	E	15	14	16	12	15	14	12	10	E S 15	E S 15	E S 13	E S 15	E S 15	E S 16	E S 16	E S 15
24	E S 15	E S 15	E S 14	E S 16	E	E S 17	E S 17	E S 16	12	10	10	10	10	10	10	10	E S 15	E S 15	E S 16	E S 17	E S 15	E S 15	E S 15	E S 16
25	E S 16	E S 15	E S 15	E S 16	E	E S 15	E S 15	E S 14	10	10	10	10	10	10	10	10	E S 15	E	E S 16	E S 16	E S 16	E S 15	E S 15	E S 15
26	E S 15	E S 16	E S 15	E S 15	E	E S 16	E S 15	E S 15	10	10	10	10	10	10	10	10	E	E S 15	E S 15	E S 15	E S 15	E S 16	E S 16	E S 15
27	E S 16	E S 15	E	E S 15	E S 15	E S 14	E S 15	E S 15	12	13	15	17	18	17	17	E S 20	E S 15	E S 16	E S 15	E S 14	E S 15	E S 15	E S 15	E S 17
28	E S 15	E S 16	C	E S 16	E	E S 15	E S 15	E S 13	12	17	18	17	16	17	18	15	E S 12	E S 16	E S 17	E S 16	E S 16	E S 16	E S 17	E S 15
29	E S 16	E S 15	E S 16	E	E	E S 14	E S 15	E S 15	11	11	15	17	16	16	17	15	E S 15	E S 15	E S 15	E S 16	E S 16	E	E S 15	E S 17
30	E S 16	E S 15	E S 15	E S 17	E S 15	E S 17	E S 16	E S 16	15	12	11	12	12	12	13	E S 16	10	E S 16	E S 15	E S 15	E S 15	E S 15	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	29	30	29	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E S 15	E S 15	E S 15	E S 15	E	E S 15	E S 15	E S 15	12	12	14	14	15	15	12	10	E S 15	E S 15	E S 15	E S 15	E S 16	E S 15	E S 15	E S 15
UQ	E S 16	E S 16	E S 16	E S 16	E S 15	E S 15	E S 15	E S 15	15	15	16	17	16	16	15	15	E S 15	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16
LQ	E S 15	E S 15	E S 14	E	E	E S 14	E S 15	E E 10	11	11	11	11	12	12	10	10	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15	E S 15

NOV. 1976 | F-MIN (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | 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

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	C	280	280	330	325	300	325	C	340	C	335	360	345	360	350	325	375	325	290	305	315	310	290	F
2	F	F	F 285	F 285	F 295	F 345	310	325	345	370	340	330	365	360	345	350	365	345	290	300	305	305	305	290
3	285	280	305	290	315	F 285	335	375	350	380	355	350	370	345	350	340	350	340	315	315	320	325	F	F
4	F 295	F 290	F 300	F 330	F	F 355	F 350	350	380	365	355	350	365	350	350	345	335	360	305	325	320	310	F	F 305
5	305	300	310	300	320	350	325	360	360	370	375	365	F 350	350	360	335	325	335	340	320	315	305	310	F
6	F	F 290	F 310	F 340	345	320	320	380	380	340	300	325	365	360	360	350	345	345	330	330	320	335	315	325
7	300	285	320	305	310	345	345	355	370	355	380	340	345	365	340	350	360	340	340	340	320	320	300	300
8	270	285	F 295	305	F 295	335	380	345	360	375	345	360	345	340	340	350	370	350	335	335	320	325	320	315
9	300	290	F	F	F 295	F 320	F 390	A	A	345	370	F 350	375	315	350	360	380	345	325	315	310	335	305	325
10	F	F	295	F	F	F 320	305	340	325	340	350	350	335	315	355	355	365	365	340	320	320	F 300	290	F
11	F 285	290	F	F	F	F	A	335	360	375	335	365	325	345	340	350	370	325	360	340	F 300	305	280	285
12	290	285	295	325	F	A	A	365	330	355	330	350	360	350	355	375	360	A	300	325	305	300	325	300
13	305	275	S	F	F	F	310	325	355	365	365	375	340	345	315	300	350	315	325	F 335	F	F	F 300	S 280
14	F 280	F 280	285	290	305	300	300	345	375	350	350	345	355	365	365	375	355	F 335	F 280	335	F 290	F	F 290	F 290
15	F 295	F	U F 285	F	F	F 355	F	370	345	365	355	355	370	355	335	370	350	350	325	F 320	F 320	F 305	F 290	F
16	F 300	F	F	F 300	F	F	F 305	360	375	375	350	355	370	365	350	365	360	325	F 310	320	320	F 305	F	F
17	F	F 295	F	F 325	F 340	F	F 320	360	355	315	360	350	350	380	355	365	365	320	315	305	360	320	295	290
18	290	305	305	310	325	325	330	345	350	370	365	350	355	365	360	340	355	350	350	320	295	305	S 305	310
19	305	300	295	310	310	325	330	345	350	380	360	370	355	340	365	375	345	325	340	330	295	335	300	F
20	295	305	305	295	F 305	F 340	F 280	355	365	360	370	370	375	340	350	370	365	310	310	330	320	305	290	290
21	305	300	320	F	F	F 335	F 315	360	365	370	360	350	365	340	360	360	360	360	325	355	315	300	305	F
22	S	F	F	F	F	F 335	F	355	360	370	355	355	365	345	370	360	355	335	F	F	F 320	F 335	F 300	300
23	310	F 310	F 305	A	330	340	290	350	345	320	370	355	355	350	355	350	340	340	A	315	F	F	F	F 295
24	F 305	U S 300	F	F	F 320	F	F 345	365	365	360	370	370	370	355	365	345	355	310	320	335	315	305	310	290
25	F	F 305	F 315	F	F	F	A	A	335	375	360	360	370	360	350	370	355	340	S 325	315	315	300	295	315
26	315	305	305	330	310	305	305	350	340	360	360	360	365	375	360	360	340	310	310	325	340	295	310	S
27	295	295	290	300	290	325	310	350	R	370	370	360	370	360	360	375	325	315	310	310	320	325	275	310
28	295	290	I C 285	F	F	315	330	355	340	355	360	370	365	355	350	360	350	335	A	325	315	F	F	F
29	U F 285	F	F	F 295	F 285	350	310	370	360	A	375	370	355	360	365	370	345	325	320	325	335	300	F 305	290
30	305	295	305	305	315	310	375	335	340	385	345	360	360	370	340	360	340	335	350	325	335	295	320	F 290
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	24	22	19	19	23	25	27	28	28	30	30	30	30	30	30	30	29	27	29	28	26	25	20
MED	295	292	302	305	310	325	320	355	355	365	360	355	362	355	352	360	355	335	325	325	320	305	300	298
UQ	305	300	305	325	322	342	335	360	365	372	370	365	370	360	360	370	365	345	338	330	320	325	310	310
LQ	290	285	290	298	300	318	310	345	342	355	350	350	350	345	350	350	345	325	310	315	312	300	290	290

The Radio Research Laboratories, Japan

NOV. 1976 | M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1976 | M(3000)F1 (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

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											375 L	L	375 L	L										
2										395 L	A	380	400											
3										L	390	L	410											
4												L	L											
5												390												
6																								
7												L	L											
8											385	400 L	385											
9												430												
10										U L 380	U L 400	U L 395	390 L											
11												375												
12											410 L	I C 375	385 L	L										
13																								
14												400 L	365	400 L										
15										L	400	375	400 L	410										
16												375 L												
17												375												
18												L	385											
19												L	U 395 L											
20												L	L											
21													L											
22											395 L	395 L	395 L											
23												395 L												
24													L	405 L										
25												A												
26											A	410	L											
27												U L 410	A											
28													U L 410											
29												A												
30												U L 395	395											
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										2	7	16	13	3										
MED										388 L	395 L	395	395 L	405 L										
UQ											400 L	400 L	400 L	408										
LQ											388	375	385	402 L										

NOV. 1976 | M(3000)F1 (0.01)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | H'F2 (KM) | 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											245	230	250	230										
2										220	240	270	245											
3										215	255	260	225											
4												250	240											
5												230												
6																								
7												275	250											
8											250	240	250											
9												255												
10										245	245	250	240											
11												230												
12											245	225	245	250										
13																								
14												235	245	240										
15										245	230	250	245	230										
16												235												
17												260												
18												245	235											
19												235	240											
20												245	230											
21													240											
22											240	245	225											
23												245												
24													240	230										
25												230												
26											225	250	245											
27												220	235											
28													230											
29												230												
30												230	225											
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	9	25	20	5										
MED										232	245	245	240	230										
UQ										245	245	250	245	240										
LQ										218	240	230	232	230										

The Radio Research Laboratories, Japan

NOV. 1976 | H'F2 (KM)

IONOSPHERIC DATA

NOV. 1976 | H'F (KM) | 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	C	300	300	250	250	250	240	C	A	C	220	240	205	210	225	225	210	210	305	A	240	235	290	250
2	290	300	260	285	270	215	250	215	225	220	A	215	225	240	250	230	210	200	270	300	265	250	265	265
3	300	300	265	270	250	250	225	220	230	210	200	200	220	245	225	235	210	230	250	235	260	250	295	280
4	300	300	265	225	240	185	225	225	215	220	210	190	225	245	225	A 225	205	200	250	250	225	260	310	280
5	260	270	260	250	250	215	245	205	215	215	225	210	200	225	235	215	215	200	225	250	245	260	255	295
6	295	315	265	220	205	230	240	205	205	200	A	245	225	220	220	230	220	225	250	250	240	225	250	240
7	285	285	260	255	250	210	205	210	225	220	H 200	H 200	230	H 200	200	220	210	200	215	210	240	250	265	260
8	300	300	280	260	250	225	200	200	210	200	200	225	205	235	205	225	200	210	230	250	265	250	250	250
9	275	265	285	265	260	225	200	A	A	205	210	200	240	225	A 245	225	220	195	260	250	250	210	275	250
10	275	275	270	290	275	225	270	215	230	225	210	200	210	225	230	230	210	A	215	250	240	260	310	310
11	300	300	275	255	260	265	A	210	A	220	210	210	210	245	225	240	200	235	215	225	250	255	310	320
12	305	305	300	220	290	A	A	A 220	245	A	205	I C 205	210	200	A	220	A 215	A	255	250	270	255	250	260
13	265	300	270	300	250	225	240	230	220	215	225	230	225	250	210	225	215	250	240	230	250	300	325	330
14	300	300	300	265	260	275	260	225	220	225	215	200	200	225	240	210	205	205	260	225	250	240	260	255
15	290	250	250	240	240	200	215	210	205	205	220	190	240	200	H 200	210	210	205	245	250	250	285	300	285
16	250	240	260	265	265	220	250	215	210	225	225	210	200	200	230	240	205	205	250	235	210	265	300	260
17	300	295	280	245	205	210	250	205	205	200	200	200	235	235	225	220	205	220	250	265	225	250	280	280
18	295	260	250	255	250	235	250	210	215	200	225	230	200	210	220	220	200	220	220	250	260	265	260	255
19	260	275	280	260	260	230	235	220	220	210	210	220	210	210	210	220	210	250	225	245	255	250	280	295
20	300	300	295	300	255	200	230	210	225	210	200	215	230	220	230	215	200	270	285	250	250	250	315	295
21	295	260	250	270	285	230	230	205	210	200	210	220	225	235	230	215	210	200	250	220	270	250	280	275
22	295	295	260	275	260	200	250	205	210	220	200	210	225	235	235	220	205	205	235	250	250	230	260	290
23	270	270	255	A	235	205	260	220	210	210	230	210	220	235	230	205	225	A	A	245	250	230	265	250
24	225	245	265	245	225	200	230	230	A	220	230	210	230	215	A	A	205	305	290	250	270	255	250	290
25	270	260	250	245	230	280	A	A	A	225	240	A	A 225	225	225	A	205	220	220	260	270	275	290	265
26	260	250	260	245	300	250	260	240	225	235	A	225	220	230	225	215	205	210	250	240	215	250	270	290
27	280	270	300	280	255	225	255	220	235	210	230	220	A	245	220	220	200	245	260	250	250	250	275	275
28	270	300	I C 290	270	240	225	250	200	210	200	205	220	210	220	220	215	205	200	A	290	260	250	285	300
29	295	300	275	270	295	205	300	200	210	A	220	A	225	230	225	215	A 240	245	270	245	250	250	275	250
30	250	270	275	270	250	200	200	200	200	225	230	225	225	220	220	210	210	215	215	225	235	285	250	290
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	29	30	29	27	27	25	27	27	28	29	30	28	28	30	27	28	29	30	30	30	30
MED	290	290	268	260	250	225	240	210	215	215	210	210	225	225	225	220	210	210	250	250	250	250	275	278
UQ	300	300	280	270	260	230	250	220	225	220	225	222	225	235	230	225	210	232	260	250	260	260	295	290
LQ	270	265	260	245	240	205	228	205	210	205	205	200	210	215	220	215	205	202	225	235	240	250	260	255

NOV. 1976 | H'F (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | H'E (KM)

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

The Radio Research Laboratories, Japan

NOV. 1976 | H'E (KM)

IONOSPHERIC DATA

NOV. 1976 | H'ES (KM) | 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	C	100	100	E	E	S	140	C	115	C	105	105	105	105	100	100	100	105	105	110	100	105	110	110
2	S	105	100	100	125	S	S	165	150	110	150	150	100	100	100	100	100	100	100	100	100	100	S	S
3	S	S	S	E	S	S	S	120	G	G	G	105	100	100	105	145	100	110	105	110	105	105	S	S
4	S	115	110	105	S	E	S	150	120	120	105	105	G	105	105	100	100	S	S	S	S	S	110	S
5	S	S	S	120	100	100	100	100	105	105	105	100	100	100	100	G	S	S	S	S	S	110	100	110
6	100	100	100	S	E	S	S	105	105	135	105	105	100	100	100	100	100	100	S	100	S	S	S	S
7	S	S	S	E	S	100	S	G	110	105	105	105	105	105	105	G	S	S	S	S	S	100	S	S
8	S	S	S	E	E	E	S	S	G	110	G	G	115	G	G	100	S	S	S	105	105	100	100	105
9	100	115	S	100	S	110	105	105	105	105	105	105	G	G	125	G	S	S	105	S	105	105	100	100
10	100	100	100	100	100	S	105	150	150	105	105	G	G	100	105	105	135	110	110	105	105	105	105	100
11	100	100	100	105	115	110	105	110	105	105	105	105	G	G	G	110	110	105	105	100	S	S	100	105
12	100	100	110	115	110	110	105	105	105	105	105	105	105	105	115	110	105	105	105	105	S	S	100	S
13	S	105	100	S	S	S	S	105	100	100	100	G	G	120	G	120	105	S	S	115	105	S	100	100
14	100	100	100	S	S	S	S	110	105	G	105	105	105	105	105	105	100	100	100	100	100	S	100	100
15	S	105	105	105	100	100	S	110	115	G	110	G	G	105	100	105	100	S	S	S	100	100	100	100
16	S	100	100	110	E	S	S	S	G	110	105	105	100	100	100	G	S	S	S	S	S	S	S	S
17	S	S	S	S	E	105	S	140	110	105	105	G	G	G	100	100	100	S	S	S	S	S	105	S
18	S	100	100	E	E	S	S	110	110	105	105	G	110	110	105	105	S	S	115	S	100	S	100	S
19	S	S	S	S	S	105	S	150	135	100	100	100	G	G	105	G	S	110	105	S	100	100	100	100
20	100	S	100	100	S	S	S	100	100	100	100	100	100	G	100	100	100	105	105	105	100	100	100	100
21	100	100	100	100	100	100	E	100	100	100	100	100	100	G	120	100	S	S	105	S	100	100	100	100
22	100	100	100	100	E	S	105	G	G	G	G	G	100	G	100	100	S	S	S	100	S	S	S	S
23	S	S	S	125	120	110	115	125	100	100	G	105	100	105	100	100	115	105	105	105	100	100	100	100
24	100	S	S	S	E	S	100	100	100	100	100	100	100	120	110	105	S	150	145	135	105	100	105	105
25	S	S	S	S	105	105	135	125	110	115	115	110	110	105	120	105	105	105	150	105	100	S	S	S
26	S	S	105	120	110	S	S	145	125	G	105	105	105	110	G	145	125	S	S	S	105	115	105	100
27	100	100	105	100	110	S	S	130	G	105	100	100	100	120	G	S	S	S	S	S	S	S	S	100
28	S	100	C	S	E	S	100	S	G	G	G	105	100	100	G	G	120	S	105	105	S	S	S	100
29	S	S	S	E	110	S	110	G	105	100	100	145	G	150	160	150	110	110	110	120	110	110	105	105
30	100	S	100	100	S	S	S	S	110	110	110	110	100	100	105	G	100	S	100	100	100	100	110	120
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	17	18	16	12	11	12	22	24	23	25	23	21	22	24	22	19	14	18	18	19	17	21	19
MED	100	100	100	102	110	105	105	110	108	105	105	105	100	105	105	105	100	105	105	105	100	100	100	100
UQ	100	105	105	112	112	110	112	140	115	110	105	105	105	110	108	110	110	110	110	110	105	105	105	105
LQ	100	100	100	100	100	100	102	105	105	100	100	102	100	100	100	100	100	105	105	100	100	100	100	100

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NOV. 1976 | H'ES (KM)

IONOSPHERIC DATA

NOV. 1976 | 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 1	F1 1				F1		C 2		L 2	L 1	L 2	L 1	L 2	L 1	L 2	F1	F2	F3	F1	F2	F1	F1
2		F1 1	F1 1	F1 1	F1			H 1	H 1	L 2	HL 11	L 2	L 1	L 1	L 1	L 1	L 1	F1	F1	F2	F2	F1		
3								C 1				L 2	L 1	L 1	L 1	HL 11	L 1	F1	F2	F1	F1	F1		
4		F1 1	F2	F2				H 1	C 11	C 11	L 2	L 2		L 1	L 2	L 2	L 1						F2	
5				F1 1	F2	F2	F1	L 1	L 2	L 2	L 2	L 2	L 2	L 1	L 1							F2	F2	F1
6	F2	F2	F1					L 1	L 1	H 1	L 3	L 1	L 3	L 1	L 2	L 1	L 1	F2		F1				
7						F1			L 1	L 2	L 1	L 1	L 3	L 2	L 1							F1		
8										L 1			C 1			L 1				F2	F3	F2	F1	F1
9	F1	F1		F1		F1	F1	L 3	L 2	L 2	L 1	L 1			C 1				F2		F2	F1	F1	F1
10	F1	F3	F3	F1	F1		F1	HL 11	HL 11	L 1	L 1			L 1	L 2	L 1	H 1	F2	F1	F2	F2	F2	F2	F2
11	F2	F2	F2	F2	F2	F2	F4	L 2	L 3	L 2	L 1	L 1				C 3	L 1	F2	F1	F2			F2	F3
12	F3	F1	F1	F1	F2	F5	F2	L 4	L 2	L 2	L 1	L 1	L 1	L 1	C 2	C 3	L 3	F4	F2	F2			F1	
13		F2	F1					L 2	L 1	L 1	L 1			C 2		C 1	L 2			F1	F2		F2	F1
14	F1	F1	F1					L 1	L 1		L 1	L 1	L 1	L 2	L 1	L 1	L 1	F1	F2	F1	F1		F1	F1
15		F1 1	F1 1	F1 1	F1	F1		L 2	C 1		L 1			L 1	L 1	L 1	L 1				F2	F1	F1	F1
16		F1 1	F2	F2						L 1	L 2	L 1	L 2	L 2	L 1									
17						F1		H 1	L 1	L 2	L 1				L 1	L 1	L 1						F2	
18		F1 1	F1 1					L 1	L 1	L 2	L 2		L 1	C 1	L 2	L 1			F1		F2		F1	
19						F1		H 1	CL 11	L 1	L 1	L 1			L 2			F2	F2		F2	F2	F2	F1
20	F1		F1	F1				L 1	L 2	L 1	L 1	L 2	L 1		L 1	L 1	L 1	F3	F3	F2	F2	F2	F3	F2
21	F2	F1	F1	F1	F2	F1		L 1	L 1	L 1	L 1	L 1	L 1		CL 11	L 1			F1		F1	F1	F3	F1
22	F2	F1	F1	F1			F1						L 1		L 1	L 1				F1				
23				F2	F1	F1	F1	CL 11	L 3	L 1		L 1	L 1	L 1	L 1	L 1	CL 11	F5	F3	F2	F2	F1	F2	F2
24	F1						F2	L 3	L 2	L 1	L 1	L 1	L 1	CL 11	C 2	L 4		F2	F2	F2	F2	F2	F2	F2
25					F2	F2	F2	C 3	C 4	C 2	C 2	C 2	C 2	L 2	C 1	L 4	F1	F1	F1	F1	F2			
26			F1 1	F1 1	F2			H 1	C 2		L 3	L 2	L 2	C 2		H 1	F1				F1	F1	F1	F2
27	F2	F2	F1	F1	F1			C 1		L 1	L 1	L 1	L 2	C 1										F1
28		F1 1					F1					L 2	L 1	L 1			F1		F3	F3				F1
29					F2		F2		LC 11	L 2	LH 11	HL 11		HLL 11	HLL 11	C 1	F2	F1	F2	F1	F2	F2	F2	F1
30	F2		F1 1	F1 1					L 1	L 2	L 2	L 1	L 2	L 2	L 2		F1		F1	F1	F1	F1	F2	F1
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1976 | TYPES OF ES

IONOSPHERIC DATA

NOV. 1976 | FXI (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

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	36	38	37	42	36	38													36	41	42	39	A	A
2	39	42	38	39	38	36													A	A	39	42	40	39
3	37	39	38	38	38	36													38	42	38	A	A	A
4	38	37	37	38	37	32													33	37	43	37	35	36
5	37	37	38	40	37	35													A	36	37	36	38	34
6	34	36	37	44	32	31													34	36	36	35	36	36
7	37	36	36	38	38	39													46	39	33	33	34	36
8	36	37	37	38	38	38													35	37	37	34	34	35
9	35	34	35	37	40	40													A	A	43	40	A	41
10	37	38	38	38	38	38													37	38	37	37	37	39
11	45	44	43	44	45	41													38	A	32	A	36	37
12	37	35	36	47	33	31													A	38	38	39	42	36
13	38	39	45	42	47	34													38	42	42	33	37	37
14	A	40	A	40	36	33													44	46	49	52	50	52
15	51	53	52	52	50	47													47	36	39	41	49	50
16	49	45	44	54	49	45	37												35	38	38	35	39	40
17	42	45	42	44	38	27													39	40	40	33	34	35
18	35	38	36	38	38	33													34	33	36	36	38	39
19	38	37	38	38	37	37													39	A	37	33	42	34
20	38	38	39	38	42	38													36	39	38	36	36	38
21	39	38	37	37	37	37													35	39	32	32	36	36
22	38	38	36	36	36	37													32	33	37	32	32	32
23	A	34	36	34	35	33													A	35	A	46	35	38
24	50	61	60	62	59	40	35												A	45	43	38	50	44
25	41	45	40	40	35	35													45	36	38	40	40	38
26	37	37	36	34	34	33													42	46	36	37	40	41
27	40	41	38	37	37	35													40	38	41	47	42	39
28	38	39	39	37	34	33													36	33	32	35	37	36
29	35	36	35	35	34	37													33	37	33	A	37	35
30	35	34	37	36	36	33													34	33	33	33	33	38
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	30	29	30	30	30	2												24	26	29	27	27	28
MED	38	38	38	38	37	36	36												36	38	38	36	37	38
UQ	40	41	39	42	38	38													40	40	40	40	40	39
LQ	36	37	36	37	36	33													34	36	36	34	36	36

NOV. 1976 | FXI (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOF2 (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

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	30	32	31	36	30	32	38	64	84	71	90	85	80	69	A	74	69	48	30	35	36	33	A	A
2	F	F	F	F	F	30	32	59	71	61	59	67	73	66	72	70	62	46	A	A	33	36	34	33
3	31	33	32	32	32	30	37	61	68	65	64	66	70	61	76	60	62	I R 43	32	36	32	A	A	A
4	32	31	31	32	31	26	34	51	67	65	65	84	72	63	69	66	56	48	27	31	37	31	29	30
5	31	31	32	34	31	29	33	50	60	65	74	73	65	58	67	65	52	42	A	30	31	30	32	28
6	28	30	31	38	26	25	34	48	61	61	59	59	66	68	60	63	54	44	28	30	30	29	30	30
7	31	30	30	32	32	33	33	59	66	69	59	67	A	70	54	51	50	45	40	33	27	27	28	30
8	30	31	31	32	32	32	31	50	55	57	56	64	66	64	66	52	49	34	29	31	31	28	28	29
9	29	28	29	31	34	34	36	46	51	C	C	C	59	52	70	61	62	43	A	A	37	34	A	F
10	31	32	32	32	32	32	33	56	51	59	75	86	65	57	60	75	69	39	31	32	31	31	31	33
11	F	F 35	37	F	F	F 32	35	55	62	69	77	70	69	68	63	77	59	A	32	A	26	A	30	31
12	31	29	30	41	27	25	34	61	56	81	95	79	76	69	76	59	A	A	A	32	32	33	36	30
13	32	33	F	F 32	F	28	32	51	70	60	64	71	69	71	68	62	55	A	32	36	36	27	31	31
14	A	34	A	34	30	27	34	49	63	69	62	69	66	67	70	73	47	43	38	40	F 39	F 42	F	F
15	F	F	F	F 43	F	F 39	36	60	57	59	76	75	79	71	56	59	63	40	41	30	33	F	F	F
16	F	39	38	F	F	F	F	55	65	61	67	69	66	60	57	58	54	35	V 28	32	32	F	F	F
17	F	F	F	F	32	21	25	47	56	59	66	71	68	72	65	60	49	30	33	34	34	27	28	29
18	29	32	30	32	32	27	30	50	57	65	69	65	71	68	71	59	51	41	28	27	30	30	32	33
19	32	31	32	32	31	31	31	56	65	62	64	60	67	59	64	55	51	40	33	A	31	27	36	28
20	32	32	33	32	36	32	27	46	61	69	68	65	65	66	64	68	48	39	30	33	32	30	30	32
21	33	32	31	31	31	31	27	50	58	61	64	63	57	60	67	76	50	37	29	33	26	26	30	30
22	32	32	30	30	30	31	26	46	50	60	59	64	57	55	57	53	51	30	26	27	31	26	25	26
23	A	28	30	28	29	27	22	A	50	54	64	70	58	57	A	53	45	35	A	29	A	F	29	F
24	F 41	F	F	F	F	F	E 25	45	50	55	66	72	65	63	60	50	40	U R 35	A	39	37	32	F	F
25	35	F	F	F	29	F 26	V 23	42	57	A	A	69	69	61	60	59	43	35	38	30	32	F	F 31	32
26	31	31	29	28	27	27	26	47	63	76	72	67	60	69	55	57	46	34	36	40	30	31	33	35
27	33	F	32	31	31	29	29	52	62	79	66	64	62	61	58	60	44	31	34	32	35	41	36	33
28	32	33	F	31	28	27	27	59	59	68	75	68	68	59	61	58	48	31	30	27	26	29	F	F
29	29	30	29	29	28	31	28	45	52	64	65	68	67	59	58	65	48	28	27	31	27	A	F	29
30	29	28	31	F	F	27	24	40	49	63	66	72	66	58	57	54	48	32	28	27	27	27	27	32
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	24	22	23	23	28	29	29	30	28	28	29	29	30	28	30	29	27	24	26	29	23	21	21
MED	31	32	31	32	31	30	31	50	60	64	66	69	66	63	64	60	51	39	30	32	32	30	30	30
UQ	32	32	32	33	32	32	34	56	65	69	73	72	69	68	68	66	56	43	34	34	34	32	32	32
LQ	30	30	30	31	29	27	27	47	55	60	64	65	65	59	58	57	48	34	28	30	30	27	29	29

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NOV. 1976 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOF1 (0.01 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	420	400	L	A	A	L								
2									L	L	L	H 410	L	L	L	A								
3									L	A	L	450	L	L	L	L								
4									L	A	H 420	L	H 410	L	A	L								
5										H 410	L	400	380	340	L	L								
6										L 370	L 400	L	L	L 400	L	L								
7										L 360	L 400	400	A	A	A	260								
8										350	370	H 410	H 400	L	L	L								
9										C	C	C	L 400	L	L	A								
10									L	L	A	H 420	H 400	L	L 370	320								
11										A 380	L	A	H 410	L	L	A								
12										400	L	L 420	400	L 400	L	A								
13									L	330	390	L	L	H 400	L	L								
14										L	H 380	L 400	L	L	L	L								
15										L	410	410	L	380	L									
16									280	L	L	410	390	L 370	330	250								
17										L	390	410	400	H 400	L	L								
18										L	H 390	L 400	L	L	L	L								
19										L	L	L	400	380	L	L								
20									L	L	L	420	L	390	L									
21										A	L	L	L	380	L	L								
22										L	L	400	L	L										
23											A	390	L	L 400	A									
24										L	L	400	410	L	L	250								
25										A	A	L	A	L	350									
26										L	400	390	370	A	L									
27										L	L	L 390	L	L 370	L									
28										L 370	H 400	L 400	390	L	L									
29										L	L	390	380	360	L	L								
30									L	L	L	L 400	380	L	290	L								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	7	13	22	14	14	4	4								
MED									280	370	400	400	400	385	340	255								
UQ										385	400	410	400	400	360	290								
LQ										355	390	400	380	370	310	250								

NOV. 1976 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOE (0.01 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

Station AKITA Lat. 39° 43.5' N, Long. 140° 08.2' E Sweep 1 MHz to 20 MHz in 20 sec in 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	195	235	A	A	A	A	A	A	A	A	S						
2							S	200	240	270	275	285	290	285	A	A	A	S						
3							S	195	A	A	A	A	A	280	265	A	A	S						
4							S	200	A	A	280	A	A	A	A	245	A	S						
5							S	195	245	270	A	A	305	290	270	235	A	S						
6							S	175	240	A	280	300	305	A	A	A	A	S						
7							S	195	245	A	A	A	A	A	A	A	B	S						
8							S	175	240	270	280	295	295	290	A	A	A	S						
9							S	190	240	C	C	C	A	280	A	A	A	S						
10							S	A	A	A	A	A	A	A	280	230	A	S						
11							S	A	240	A	A	A	A	A	A	A	A	B						
12							S	A	A	A	A	290	295	A	255	200	B	S						
13							S	A	A	A	A	A	295	275	A	A	B	S						
14							S	A	A	A	A	A	290	280	A	210	A	S						
15							S	A	A	A	A	A	290	280	250	A	A	S						
16							S	170	230	255	275	A	285	275	250	210	B	S						
17							S	175	A	A	285	295	290	275	255	210	B	S						
18							S	A	A	A	A	A	A	A	A	215	A	S						
19							S	A	A	A	285	295	300	290	270	A	A	S						
20							S	185	240	270	285	290	295	280	A	225	B	S						
21							S	190	A	A	275	290	290	275	260	220	A	S						
22							S	180	A	270	280	285	280	A	255	210	B	S						
23							S	170	230	265	280	A	A	A	A	A	160	S						
24							S	B	225	270	A	290	290	280	255	210	B	S						
25							S	B	A	A	A	275	A	A	A	215	B	S						
26							S	B	225	270	280	A	A	A	245	205	B	S						
27							S	B	A	255	270	280	285	265	250	A	B	S						
28							S	A	A	260	270	280	285	A	A	A	A	S						
29							S	175	235	255	270	285	A	A	245	210	A	S						
30							S	A	225	265	A	A	A	A	A	205	B	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								16	15	13	15	14	17	15	14	16	1							
MED								188	240	270	280	290	290	280	255	210	160							
UQ								195	240	270	280	295	295	282	265	222								
LQ								175	230	260	275	285	290	275	250	210								

The Radio Research Laboratories, Japan

NOV. 1976 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 20	J A 26	J A 19	J A 19	J A 17	E S 15	19	26	29	32	J A 46	J A 50	J A 65	J A 66	J A 88	J A 54	J A 32	J A 38	J A 31	J A 25	J A 32	J A 47	J A 39	J A 45
2	J A 18	E S 15	E S 15	J A 27	J A 27	J A 20	J A 25	J A 38	27	G	30	J A 34	37	35	J A 38	J A 46	J A 52	J A 46	J A 40	J A 38	J A 30	J A 25	J A 18	J A 18
3	J A 18	J A 45	J A 18	J A 18	J A 19	J A 18	E S 16	28	J A 38	J A 66	J A 51	J A 42	J A 43	J A 29	28	J A 30	J A 52	J A 44	J A 30	J A 30	J A 43	J A 53	J A 65	J A 68
4	J A 33	J A 31	J A 50	J A 29	E S 15	M 20	E S 16	25	29	J A 43	31	J A 51	J A 41	J A 45	J A 50	G	J A 28	E S 16	E S 16	J A 25	M 19	M 19	J A 25	J A 18
5	J A 26	E S 16	E S 15	J A 17	J A 17	E S 14	E S 16	G	G	30	J A 43	J A 36	J A 34	J G 25	G 20	24	J A 34	J A 36	J A 39	J A 18	E S 15	M 20	M 21	E S 13
6	E S 16	E S 13	M 18	E S 15	E S 14	M 18	E S 15	24	28	29	35	J A 51	J A 51	J A 45	J A 39	J A 38	J A 29	J A 38	J A 26	J A 30	J A 18	J A 17	M 20	J A 39
7	J A 25	J A 28	J A 25	J A 24	J A 25	J A 18	E S 15	G	G	31	J A 34	J A 50	J A 81	J A 57	J A 44	J A 33	21	J A 25	J A 42	J A 27	J A 33	J A 38	J A 20	J A 26
8	J A 18	J A 20	J A 18	J A 19	E S 14	E S 14	J A 18	G	G	G	G	J A 34	J G 28	G	31	25	25	J A 25	J A 24	E S 15	J A 18	J A 41	J A 42	J A 20
9	J A 20	J A 25	J A 18	J A 17	E S 16	E S 15	J A 18	G	25	C	C	C	J A 41	J A 34	39	J A 39	J A 33	J A 22	J A 81	J A 65	20	J A 26	J A 50	J A 21
10	J A 18	J A 26	J A 25	J A 27	J A 20	E S 14	E S 16	25	J A 39	J A 47	J A 51	J A 40	J A 41	J A 34	G	31	27	J A 28	J A 33	J A 30	J A 34	J A 27	J A 32	J A 26
11	J A 24	J A 19	J A 18	M 20	J A 27	J A 26	E S 15	22	29	J A 85	J A 51	J A 42	J A 68	J A 35	J A 31	J A 65	J A 50	J A 64	J A 51	J A 38	J A 24	J A 50	J A 38	J A 23
12	J A 26	J A 18	E S 16	J A 25	E S 13	E S 14	E S 16	20	J A 30	J A 66	J A 45	G	G	34	J A 44	J A 41	J A 51	J A 88	J A 44	J A 37	J A 27	J A 37	J A 24	J A 20
13	J A 18	E S 15	E S 16	E S 16	J A 26	J A 25	J A 27	J A 19	J A 28	J A 80	28	30	32	32	29	24	J A 22	J A 42	J A 37	J A 28	J A 20	J A 21	J A 25	J A 28
14	J A 40	J A 22	J A 45	J A 20	E S 15	E S 14	E S 15	24	J A 42	J A 70	J A 41	33	G	G	J A 28	J A 40	J A 26	J A 19	E S 15	J A 27	J A 20	J A 25	J A 20	J A 18
15	E S 15	E S 13	E S 13	J A 19	J A 19	J A 18	J A 19	22	J A 47	33	J A 30	J A 34	G	G	G 22	J A 49	J A 30	J A 25	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16
16	E S 15	J A 18	M 21	J A 25	J A 25	J A 22	J A 20	G	G	G	G	J A 53	G	G	J A 31	G	G	J A 27	E S 15	E S 14	M 19	M 18	M 20	M 19
17	M 18	M 18	E S 13	E S 15	E S 15	E S 15	E S 15	19	27	32	G	G	G	G	G	G	E B 17	E S 14	E S 15	E S 15	J A 18	E S 15	E S 14	E S 16
18	M 19	E S 13	J A 19	J A 22	E S 16	J A 18	20	21	29	30	34	33	35	30	29	J A 25	J A 38	J A 20	J A 17	J A 18	J A 19	J A 25	J A 28	J A 20
19	E S 16	E S 14	J A 18	J A 18	J A 17	E S 14	E S 15	27	33	40	G	G	G	J A 30	G	J A 30	J A 25	E S 16	J A 35	J A 34	J A 59	J A 25	J A 19	J A 20
20	J A 25	M 21	J A 18	J A 19	J A 20	M 21	J A 18	G	J A 26	J G 25	J A 30	J A 30	G 26	G 25	J A 34	J A 26	E B 17	J A 20	J A 19	E S 15	E S 15	M 21	J A 19	J A 19
21	J A 18	J A 16	J A 21	J A 18	E S 15	J A 18	E S 15	J A 20	J A 34	J A 50	J A 32	G 20	34	J G 24	J A 28	28	J A 36	J A 28	J A 32	J A 21	E S 16	J A 24	J A 25	J A 18
22	J A 20	J A 18	J A 18	E S 13	E S 15	J A 17	E S 16	G	J A 33	31	G	34	G	J A 32	32	30	20	18	E S 15	E S 16	E S 15	E S 15	J A 24	J A 25
23	J A 37	J A 22	J A 20	J A 32	E S 13	E S 14	J A 38	J A 49	J A 41	J A 50	J A 70	J A 44	J A 36	J A 30	J A 77	J A 37	J A 25	E S 14	J A 54	J A 52	J A 53	J A 34	J A 50	J A 16
24	E S 15	E S 13	E S 15	E S 15	E S 15	E S 15	E S 15	20	28	32	J A 39	32	J A 45	J A 44	33	G	E B 15	17	J A 34	J A 32	E S 16	E S 15	J A 20	J A 32
25	J A 25	J A 16	M 19	M 21	J A 23	M 18	J A 17	J A 31	J A 36	J A 124	J A 74	J A 46	J A 61	J A 77	J A 41	G	E B 16	E S 15	J A 25	J A 21	J A 17	M 21	E S 15	E S 15
26	J A 18	J A 24	J A 25	J A 16	J A 18	E S 15	J A 20	25	26	G	G	31	31	J A 43	G	G	20	E S 16	E S 16	J A 20	J A 18	J A 21	J A 26	J A 25
27	J A 18	J A 25	J A 26	J A 20	J A 21	M 21	J A 26	E B 17	J A 25	J A 30	J A 45	J A 44	35	34	G 23	J A 40	E B 16	J A 19	E S 16	J A 20	J A 17	E S 16	J A 19	E S 16
28	E S 16	J A 20	J A 25	M 21	E S 16	E S 15	E S 15	19	29	G 25	G	G	G	J A 35	J A 32	J A 32	J A 52	J A 48	J A 48	J A 34	J A 28	J A 22	J A 20	M 21
29	J A 79	J A 24	J A 17	M 19	J A 18	E S 15	E S 14	G	28	33	35	34	32	29	G 23	22	19	E S 15	J A 18	J A 27	J A 19	J A 40	J A 72	J A 30
30	J A 25	J A 25	M 20	J A 20	E S 16	M 18	E S 15	21	G	31	32	32	32	32	28	J A 25	E B 16	E S 14	J A 18	J A 24	J A 26	J A 33	J A 30	J A 29
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	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A 18	J A 20	J A 18	J A 19	J A 17	18	E S 16	20	28	32	J A 34	J A 34	34	J 32	31	J A 30	J A 26	J A 24	J A 28	J A 26	J A 19	J A 24	J A 24	J A 20
UQ	J A 25	J A 25	J A 21	J A 22	J A 20	J A 18	J A 19	25	J A 33	J A 50	J A 45	J A 44	J A 41	J A 35	J A 39	J A 39	J A 34	J A 38	J A 39	J A 32	J A 28	J A 34	J A 32	J A 26
LQ	J A 18	E S 16	17	J A 17	E S 15	E S 15	E S 15	G	26	30	28	31	G	G 25	G 23	24	19	E S 16	E S 16	J A 18	J A 17	19	J A 20	J A 18

NOV. 1976 | FOES (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | FBES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	19	23	E	16	E	E S 15	18	24	26	30	36	30	38	42	A A 88	27	24	32	18	E	28	20	A A 39	A A 45
2	E	E S 15	E S 15	E	E	E	G	16	27	G	29	25	36	34	28	36	36	32	A A 40	A A 38	23	E	E	E
3	E	E	E	E	E	E	E S 16	24	30	42	34	37	38	25	G	28	26	30	20	21	24	A A 53	A A 65	A A 68
4	23	25	18	E	E S 15	E	E S 16	24	26	41	30	30	33	36	40	G	25	E S 16	E S 16	19	E	E	E	E
5	E	E S 16	E S 15	E	E	E S 14	E S 16	G	G	G	40	33	26	G 19	G 18	19	32	34	A A 39	E	E S 15	E	E	E S 13
6	E S 16	E S 13	E	E S 15	E S 14	E	E S 15	24	28	28	31	36	35	29	29	25	20	G	E	18	E	E	E	E
7	18	22	E	E	E	E	E S 15	G	G	28	31	38	A A 81	56	44	22	20	G	30	22	E	18	E	E
8	E	E	E	E	E S 14	E S 14	G	G	G	G	G	20	G 18	G	28	23	23	G	E	E S 15	E	E	20	E
9	E	E	E	E	E S 16	E S 15	G	G	25	C	C	C	30	19	29	31	20	G	A A 81	A A 65	E	25	A A 50	E
10	E	19	E	E	E	E S 14	E S 16	24	25	33	43	32	31	29	G	29	22	25	25	21	20	19	E	19
11	E	E	E	E	19	17	E S 15	22	27	44	32	33	40	29	28	63	42	A A 64	28	A A 38	18	A A 50	23	E
12	18	E	E S 16	E	E S 13	E S 14	E S 16	20	26	27	32	G	G	31	33	38	A A 51	A A 88	A A 44	E	24	26	24	20
13	18	E S 15	E S 16	E S 16	E	E	19	18	26	27	28	29	32	28	27	24	22	A A 42	19	22	20	19	20	21
14	A A 40	E	A A 45	E	E S 15	E S 14	E S 15	22	24	29	30	33	G	G	26	19	18	17	E S 15	E	E	E	E	E
15	E S 15	E S 13	E S 13	E	E	E	G	19	25	29	28	31	G	G	G 19	26	20	G	E S 16	E S 16	E S 15	E S 16	E S 16	E S 16
16	E S 15	E	E	E	E	E	G	G	G	G	G	30	G	G	20	G	G	16	E S 15	E S 14	E	E	E	E
17	E	E	E S 13	E S 15	E S 15	E S 15	E S 15	19	25	28	G	G	G	G	G	G	E B 17	E S 14	E S 15	E S 15	E	E S 15	E S 14	E S 16
18	E	E S 13	E	16	E S 16	E	G	19	28	29	30	33	31	29	27	20	19	G	E	E	E	E	E	E
19	E S 16	E S 14	E	E	E	E S 14	E S 15	23	28	31	G	G	G	19	G	24	20	E S 16	28	A A 34	23	E	E	E
20	E	E	E	E	E	E	G	G	G	G 20	25	25	G 25	G 23	27	20	E B 17	G	E	E S 15	E S 15	E	E	E
21	E	E	19	E	E S 15	E	E S 15	17	32	36	24	G 20	34	G 20	24	27	29	19	18	E	E S 16	21	E	E
22	E	E	E	E S 13	E S 15	E	E S 16	G	30	30	G	33	G	32	31	26	18	17	E S 15	E S 16	E S 15	E S 15	E	17
23	A A 37	E	E	E	E S 13	E S 14	20	A A 49	29	35	45	35	32	28	A A 77	28	G	E S 14	A A 54	20	A A 53	E	21	E
24	E S 15	E S 13	E S 15	E S 15	E S 15	E S 15	E S 15	19	26	29	33	32	34	35	G	G	E B 15	17	A A 34	30	E S 16	E S 15	E	20
25	E	E	E	E	E	E	G	28	28	A A 124	A A 74	32	50	36	25	G	E B 16	E S 15	16	21	E	E	E S 15	E S 15
26	E	E	E	E	E	E S 15	G	25	25	G	G	31	31	40	G	G	18	E S 16	E S 16	17	E	20	20	E
27	E	16	20	18	E	E	18	E B 17	24	23	25	24	33	30	G 20	31	E B 16	G	E S 16	19	E	E S 16	E	E S 16
28	E S 16	E	E	E	E S 16	E S 15	E S 15	18	24	G 23	G	G	G	31	29	24	32	22	26	18	E	E	E	E
29	E	E	E	E	E	E S 15	E S 14	G	28	33	32	31	30	28	G 22	19	18	E S 15	E	E	E	A A 40	E	19
30	E	E	E	E	E S 16	E	E S 15	19	G	29	31	30	31	29	26	19	E B 16	E S 14	E	E	20	E	E	19
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	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	E	E	E	E	E E 13	E E 14	E S 15	19	26	29	30	31	31	29	26	24	20	16	17	18	E E 15	E E 15	E	E
UQ	16	E S 15	E E 15	E E 13	E S 15	E S 15	E S 16	24	28	33	32	33	34	32	29	28	25	25	28	21	20	20	20	19
LQ	E	E	E	E	E	E	G	G	24	23	24	25	G	G 19	G 19	19	17	G	E S 15	E	E	E	E	E

The Radio Research Laboratories, Japan

NOV. 1976 | FBES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | F-MIN (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

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

NOV. 1976 | F-MIN (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | M(3000)F2 (0.01) | 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	280	285	290	300	350	295	320	335	330	350	340	330	345	335	A	345	355	345	290	295	320	315	A	A
2	F	F	F	F	F	330	330	350	350	350	335	335	340	340	340	355	355	340	A	A	305	285	310	305
3	295	290	300	310	305	310	320	345	345	350	335	310	340	335	345	345	330	I R 340	310	325	290	A	A	A
4	300	300	295	300	320	325	330	350	355	335	330	340	350	345	335	355	360	355	300	305	340	320	295	295
5	295	300	315	330	315	320	340	355	365	345	345	350	330	335	350	350	345	345	A	325	310	305	330	315
6	300	300	310	335	320	320	335	350	345	355	345	345	345	345	335	340	355	350	315	315	320	305	325	315
7	295	300	300	310	315	330	320	355	360	350	345	335	A	350	350	345	350	345	355	345	325	310	315	295
8	290	295	295	300	320	355	325	355	355	355	360	340	330	350	350	340	360	345	335	330	330	320	310	315
9	310	305	300	300	325	335	350	365	365	C	C	C	350	340	335	340	350	340	A	A	310	325	A	F
10	305	295	300	290	300	310	330	350	335	325	340	355	355	330	330	340	355	360	330	325	315	310	300	295
11	F	F 290	305	F	F	F 315	335	340	335	350	335	340	325	320	355	350	350	A	340	A	300	A	290	285
12	280	280	290	335	365	290	310	350	345	315	325	340	340	325	350	350	A	A	A	315	305	300	320	295
13	300	290	F	F 295	F	310	315	335	350	360	355	310	350	320	330	340	345	A	295	325	330	320	280	280
14	A	290	A	305	290	290	320	345	340	345	345	350	345	330	355	355	350	330	315	310	F 305	F 320	F	F
15	F	F	F	F 300	F	F 310	310	350	350	320	340	340	350	350	350	335	355	345	345	340	300	F	F	F
16	F	305	300	F	F	F	F	350	360	340	340	345	330	335	340	330	350	370	V 325	310	320	F	F	F
17	F	F	F	F	340	345	310	345	360	345	330	340	340	335	345	360	355	310	320	330	320	320	295	295
18	300	315	305	310	325	310	315	340	365	345	355	350	350	365	350	350	350	345	315	305	300	295	300	305
19	300	300	300	305	295	305	310	355	355	345	355	345	340	350	345	350	350	345	330	A	330	300	325	305
20	295	290	290	295	305	310	315	340	345	345	355	345	350	345	350	370	365	350	325	305	315	310	285	295
21	295	295	305	290	295	330	325	350	360	350	345	350	350	340	340	350	365	345	320	340	330	300	315	300
22	295	305	295	305	325	350	330	355	365	355	345	355	355	355	345	355	355	335	310	305	315	315	300	290
23	A	295	305	320	310	320	350	A	355	330	340	365	345	345	A	350	360	325	A	345	A	F	310	F
24	F 320	F	F	F	F	F	F 330	370	355	340	320	355	350	360	360	345	350	U R 360	A	325	320	310	F	F
25	290	F	F	F	305	F 310	V 320	360	360	A	A	350	335	360	350	330	350	310	330	315	300	F	F 280	295
26	300	300	310	305	295	310	305	335	330	330	345	350	335	355	355	360	360	310	325	340	350	290	300	285
27	285	F	280	280	295	300	310	345	340	350	345	345	360	340	345	350	350	330	320	305	315	325	320	300
28	295	290	F	305	300	315	315	365	360	345	345	355	350	340	350	370	350	325	325	320	310	315	F	F
29	290	290	295	300	295	310	355	345	360	330	355	355	340	345	335	360	360	330	325	325	315	A	F	295
30	300	300	300	F	F	335	345	350	345	330	340	350	350	360	350	355	360	340	345	340	330	300	285	320
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	24	22	23	23	28	29	29	30	28	28	29	29	30	28	30	29	27	24	26	29	23	21	21
MED	295	295	300	305	310	312	320	350	355	345	345	345	345	342	348	350	355	345	325	325	315	310	300	295
UQ	300	300	305	310	322	330	330	355	360	350	345	350	350	350	350	355	360	345	330	330	325	320	315	305
LQ	292	290	295	300	298	310	315	345	345	332	338	340	340	335	340	340	350	330	315	310	305	300	295	295

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NOV. 1976 | M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1976 | M(3000)F1 (0.01) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	360	355	L	A	A	L								
2									L	L	L	H 385	L	L	L	A								
3									L	A	L	355	L	L	L	L								
4									L	A	H 370	L	H 375	L	A	L								
5										H 365	L	370	375	400	L	L								
6										L 370	L 365	L	L	L 370	L	L								
7										L 375	L 375	A	A	A	A	410								
8										380	400	H 370	H 375	L	L	L								
9										C	C	C	L 375	L	L	A								
10									L	L	A	H 370	H 370	L	L 380	375								
11										A	375	L	A	H 360	L	A								
12										360	L	L 375	375	L 375	L	A								
13									L	415	380	L	L	H 360	L	L								
14										L	H 380	L 375	L	L	L	L								
15										L	365	375	L	380	L									
16									415	L	L	370	375	L 380	380	425								
17										L	380	375	370	H 360	L	L								
18										L	H 375	L 375	L	L	L	L								
19										L	L	L	360	365	L	L								
20									L	L	L	365	L	370	L									
21										A	L	L	L	380	L	L								
22										L	L	375	L	L										
23											A	A	L	L 370	A									
24										L	L	365	370	L	L	395								
25										A	A	L	A	L	380									
26										L	375	380	405	A	L									
27										L	L	L 375	L	L 385	L									
28										L 385	H 375	L 370	380	L	L									
29										L	L	380	395	400	L	L								
30									L	L	L	L 365	380	L	400	L								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	7	13	20	14	14	4	4								
MED									415	375	375	372	375	372	380	402								
UQ										382	380	375	380	380	390	418								
LQ										368	370	368	370	365	380	385								

NOV. 1976 | M(3000)F1 (0.01)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | 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

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									250	230	250	235	240	255	A	230								
2									235	225	260	260	250	255	250	225								
3									225	220	240	285	235	250	250	230								
4									230	235	245	240	240	250	260	235								
5										260	255	245	235	235	240	230								
6										230	250	240	255	250	260	230								
7										235	245	280	A	250	240	225								
8										230	235	260	255	250	240	225								
9										C	C	C	235	255	260	235								
10									230	250	250	245	235	265	245	240								
11										235	250	235	250	275	235	235								
12										280	250	235	250	250	240	230								
13									225	215	235	285	235	270	235	230								
14										235	240	245	235	235	235	230								
15										230	255	240	250	235	225									
16									225	240	250	245	250	240	245	235								
17										235	250	250	240	255	235	225								
18										240	235	235	240	225	250	230								
19										240	230	240	245	240	240	225								
20									230	235	230	245	240	250	240									
21										240	235	245	240	250	255	225								
22										240	245	245	240	240										
23											245	235	245	250	A									
24										235	250	245	240	230	230	220								
25										A	A	245	255	230	245									
26										250	235	235	250	245	235									
27										235	230	235	225	240	240									
28										235	240	235	245	235	240									
29										250	235	235	240	240	225	230								
30									220	255	250	240	235	220	230	230								
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									9	27	28	29	29	30	27	22								
MED									230	235	245	245	240	250	240	230								
UQ									230	240	250	245	250	250	248	230								
LQ									225	232	235	235	235	235	235	225								

The Radio Research Laboratories, Japan

NOV. 1976 | H'F2 (KM)

IONOSPHERIC DATA

NOV. 1976 | H'F (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	325	325	285	285	185	310	235	240	230	220	A	200	A	A	A	A	220	215	300	270	260	270	A	A
2	285	290	315	280	290	235	225	230	210	220	190H	180H	235	240	225	A	220	235	A	A	290	260	255	255
3	285	295	280	250	270	235	230	210	A	A	225	230	A	190H	230	A	225	245	275	240	A	A	A	A
4	A	A	285	255	235	195	230	205	220	A	180H	190H	195H	A	A	230	215	210	265	260	230	250	275	305
5	280	275	260	235	260	215	200	205	210	180H	A	200	180	185	190H	230	220	240	A	225	245	250	230	225
6	310	280	255	220	215	245	225	205	225	180	210	225	230	235	230	230	215	205	250	250	240	255	240	265
7	280	310	295	265	255	215	220	185H	230	180	200	A	A	A	A	185	220	205	240	235	250	290	270	285
8	285	295	280	270	250	210	215	215	215	205	185	180H	180H	230	235	210	220	205	245	235	240	235	285	260
9	265	280	275	280	245	210	200	200	220	C	C	C	220	180H	255	A	215	200	A	A	265	250	A	310
10	275	290	285	290	265	240	215	210	200	235	A	180H	190H	180H	210	A	210	210	A	255	255	245	305	310
11	280	300	260	265	250	245	235	215	215	A	200	230	A	200H	225	A	225	A	A	A	290	A	330	315
12	335	330	295	225	210	295	240	220	235	215	245	215	210	220	230	A	A	A	A	250	A	A	245	260
13	260	305	295	295	245	235	270	235	220	190	195	190H	235	200H	220	205H	205	A	280	255	235	250	340	310
14	A	285	A	265	280	285	240	210	240	230	185H	220	215H	230	195H	180H	200	215	235	250	250	235	255	250
15	275	255	255	255	215	220	235	225	210	205	200	205	190H	195	200	230	215	210	220	220	230	235	280	285
16	290	240	250	245	270	235	245	215	195	205	195	220	195	210	195	195	210	210	250	245	230	255	280	295
17	295	290	280	240	220	225	260	220	225	210	195	200	195	190H	190H	180H	200	215	255	230	255	235	295	300
18	280	275	250	270	235	260	255	215	215	195H	180H	225	230	215	185H	210	205	205	245	265	260	285	275	270
19	270	270	275	260	275	250	255	220	220	220	220	200H	215	220	230	220	210	205	A	A	250	275	240	255
20	280	295	285	290	255	210	255	215	230	200H	180H	215	225	220	230	220	200	205	220	250	250	245	305	285
21	285	285	285	280	280	230	220	210	215	A	190H	180H	230	225	230	235	200	205	255	235	230	310	260	275
22	285	280	290	260	240	210	235	210	210	230	210	235	195H	225	245	230	210	205	230	255	250	245	260	300
23	A	275	255	255	255	240	A	A	205	230	A	A	220	215	A	225	205	205	A	220	A	280	A	285
24	240	255	250	240	210	225	225	205	210	210	235	240	235	A	220	190	200	205	A	275	235	220	250	270
25	280	295	290	245	260	240	250	210	225	A	A	210	A	220	200	230	205	240	220	A	250	295	295	270
26	270	260	250	245	280	260	255	220	230	225	230	225	200	A	210H	235	205	235	230	215	205	280A	290	270
27	280	295	320A	305	280	245	270	235	230	230	225	220	225	215	230	225	205	215	235	250	240	220	220	240
28	290	305	310	275	260	255	250	215	225	200	195H	200	190	225	230	220	210	250	A	245	260	260	295	305
29	305	305	295	280	290	250	210	220	210	235	220	210	190	180	180H	180H	210	200	250	235	230	A	315	300
30	280	300	285	305	250	215	215	210	180H	235	230	230	200	205	185	205	205	200	200	220	250	295	315	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	27	29	29	30	30	30	29	29	29	24	24	27	25	25	26	23	29	27	20	25	27	26	26	28
MED	280	290	285	265	255	235	235	215	220	212	200	210	210	215	222	220	210	210	245	245	250	252	278	280
UQ	288	300	290	280	270	250	250	220	225	230	222	225	225	225	230	230	215	215	255	255	255	280	295	300
LQ	278	275	260	245	235	215	220	210	210	200	190H	200	195	195	195	200	205	205	230	235	235	245	255	260

NOV. 1976 | H'F (KM)

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IONOSPHERIC DATA

NOV. 1976 | H'E (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							S	120	110	110	110	110	A	A	A	A	A	S						
2							S	A 115	110	105		A	A	A	A	A	A	S						
3							S	120	115	110	110	A	A	A	105	A	A	S						
4							S	A 110	105	110		A	A	A	A	115	A	S						
5							S	115	110	110	110	110	A	110	110	110	A	S						
6							S	115	115	110	A	110	105	A	A	A	A	S						
7							S	115	115	110	110	A	A	A	A	A	B	S						
8							S	115	115	110	110	110	110	110	110	A	A	S						
9							S	130	A	C	C	C	A	A	A	A	A	S						
10							S	120	A	A	A	A	A	A	110	115	B	S						
11							S	125	110	110	110	A	A	A	A	110	A	B						
12							S	115	110	110	A	110	110	110	110	110	B	S						
13							S	A	A	A	A	A	A	A	A	A	B	S						
14							S	B 115	115	110	110	110	110	A	A	A	S							
15							S	B 110	110	110	A	110	110	110	A	A	S							
16							S	120	115	115	110	110	110	105	110	115	B	S						
17							S	B 110	110	110	110	110	110	110	110	115	B	S						
18							S	120	110	110	110	110	110	110	110	A	A	S						
19							S	B 110	110	110	110	110	110	110	110	A	A	S						
20							S	130	115	115	A	A	A	A	A	A	B	S						
21							S	A	A	A	A	110	110	110	A	A	A	S						
22							S	145	A	110	110	105	105	A	105	110	B	S						
23							S	B 120	115	110	110	110	110	A	A	B	S							
24							S	B 110	110	110	110	110	110	110	110	B	S							
25							S	B 110	110	110	110	110	110	110	120	B	S							
26							S	B 115	110	110	110	105	110	110	110	B	S							
27							S	B	A	A	A	A	105	110	110	A	B	S						
28							S	B 115	A	110	110	105	A	A	A	A	S							
29							S	E B 160	115	110	110	110	110	110	A	A	A	S						
30							S	B 115	115	110	110	110	110	110	110	A	B	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								15	24	24	22	19	19	17	16	11								
MED								120	115	110	110	110	110	110	110	110								
UQ								125	115	110	110	110	110	110	110	115								
LQ								115	110	110	110	110	108	110	110	110								

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NOV. 1976 | H'E (KM)

IONOSPHERIC DATA

NOV. 1976 | H'ES (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

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

NOV. 1976 | H'ES (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | TYPES OF ES | 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	F 3	F 5	F 2	F 2	F 1		H 2	H 3	H 2	C 2	C 3	C 2	L 2	L 3	L 3	L 3	L 3	L 3	F 3	F 2	F 3	F 3	F 5	F 5
2	F 2			F 2	F 2	F 2	L 2	L 1	H 1		H 1	L 2	HL 11	HL 13	LH 31	L 3	L 2	L 4	F 3	F 3	F 3	F 2	F 2	F 2
3	F 1	F 2	F 1	F 1	F 2	F 1		H 2	C 3	C 3	C 2	L 3	L 3	L 2	H 1	L 3	L 3	L 4	F 3	F 4	F 4	F 6	F 4	F 5
4	F 5	F 5	F 2	F 2		F 1		HL 22	C 2	C 3	C 1	L 3	L 2	L 3	L 4		L 2			F 2	F 1	F 1	F 2	F 1
5	F 2			F 1	F 1					C 1	C 2	C 3	L 2	L 1	L 2	L 3	L 5	L 7	F 6	F 2		F 1	F 1	
6			F 2			F 1		H 2	H 1	C 1	HL 13	H 2	H 1	LH 32	L 3	L 2	CL 11	HL 11	F 2	F 2	F 1	F 1	F 1	F 2
7	F 2	F 3	F 2	F 1	F 2	F 1				C 2	C 3	L 3	L 4	L 6	L 4	L 3	H 3	L 1	F 3	F 3	F 2	F 2	F 1	F 2
8	F 1	F 1	F 1	F 1			L 1					L 1	L 1		C 1	CL 21	HL 32	LL 11	F 2		F 2	F 2	F 2	F 2
9	F 2	F 2	F 2	F 2			L 1		HL 14				LH 21	L 2	HL 13	HL 34	L 2	C 1	F 3	F 6	FE 12	F 2	F 4	F 3
10	F 2	F 3	F 2	F 2	F 1			H 3	LH 21	L 2	L 3	L 2	L 2	L 3		H 2	H 3	C 4	F 3	F 4	F 4	F 2	F 3	F 3
11	F 2	F 2	F 1	F 2	F 5	F 2		H 2	H 2	C 2	C 2	L 2	L 3	L 3	L 3	C 4	L 3	L 2	F 5	F 5	F 4	F 3	F 5	F 2
12	F 4	F 2		F 1				C 2	C 3	C 2	L 2			C 2	C 3	C 5	C 7	L 6	F 4	F 2	F 6	F 4	F 3	F 2
13	F 2				F 2	F 2	L 2	L 2	L 2	L 2	L 2	L 2	HL 11	HL 11	HL 11	L 1	L 2	L 4	F 3	F 5	F 2	F 2	F 3	F 3
14	F 4	F 2	F 4	F 1				H 2	CH 23	C 2	C 2	C 2			L 2	L 2	L 1	L 1		F 2	F 2	F 2	F 2	F 1
15				F 2	F 1	F 1	L 1	C 2	C 3	C 3	C 2	L 2			L 2	L 2	L 1	L 1						
16		F 1	F 1	F 2	F 2	F 1	L 1					C 2			L 1			L 1			F 1	F 2	F 2	F 2
17	F 1	F 1						H 1	C 1	C 2											F 1			
18	F 1		F 2	F 2		F 2	L 2	C 2	C 3	C 2	C 2	C 3	C 2	C 2	C 2	L 3	L 1	L 1	F 1	F 2	F 2	F 2	FE 12	F 1
19			F 2	F 1	F 2			H 2	C 3	C 3				L 1		L 3	L 3		F 3	F 4	F 3	F 2	F 2	F 2
20	F 2	F 1	F 2	F 2	F 2	F 1	L 1		L 1	L 3	L 2	L 3	L 3	L 3	L 2	L 3		L 1	F 1			F 1	F 1	F 1
21	F 1	F 1	F 3	F 2		F 1		L 2	L 5	L 5	L 3	L 2	HL 22	L 2	L 3	HL 12	CL 42	L 3	F 3	FF 21		FF 31	F 2	F 1
22	F 1	F 1	F 1			F 1			L 4	H 1		H 2		L 3	H 2	H 2	H 2	H 1					F 1	F 1
23	F 5	F 2	F 2	F 1			H 5	H 4	H 3	C 2	C 3	C 2	C 3	C 2	L 4	L 3	C 1		F 4	F 4	F 2	F 2	F 2	F 2
24								H 2	H 2	H 2	C 2	H 1	H 2	H 3	H 1			H 1	F 5	F 2			F 2	F 3
25	F 2	F 2	F 2	F 2	F 2	F 1	H 1	H 3	C 3	C 4	C 3	C 2	C 3	C 2	C 1				FF 21	F 4	F 2	F 1		
26	F 2	F 1	F 2	F 1	F 1		H 1	H 3	H 2			C 2	C 2	C 3			H 1			F 2	F 1	F 2	F 3	F 2
27	F 2	F 2	F 3	F 4	F 2	F 1	C 3		L 3	LH 31	LH 21	LC 22	CL 21	C 2	L 1	L 3		L 1		F 3	F 1		F 2	
28		F 1	F 2	F 1				H 1	C 2	L 2				L 2	L 3	L 2	L 2	L 3	F 2	F 2	F 2	F 2	F 2	F 1
29	F 2	F 2	F 2	F 1	F 2				H 2	H 2	H 1	H 1	C 2	C 2	L 2	L 2	L 2		F 2	F 1	F 1	F 5	F 3	F 3
30	F 2	F 2	F 1	F 3		F 1		H 2		H 1	C 2	C 2	C 3	C 3	C 2	L 1			F 1	F 1	F 3	F 3	F 3	F 2
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1976 | TYPES OF ES

IONOSPHERIC DATA

NOV. 1976 | FXI (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	X 34	X 36	S 38	X 36	X 35	X 26													X 35	A	A	X 35	O S 40	X 33
2	A	X 34	X 34	O S 35	S 38	S 33													S 36	S 35	X 37	S 39	X 38	S 38
3	S 36	X 37	S 40	X 38	X 37	X 38													X 37	X 39	S 35	S 36	A	A
4	38	37	S 37	S 38	47	X 28													X 36	X 39	S 39	X 38	S 37	S 35
5	S 37	X 39	X 38	X 39	S 38	S 36													X 32	X 38	X 36	S 37	S 38	S 35
6	35	36	S 38	S 36	X 30	X 27													X 34	X 36	S 36	X 34	X 37	X 35
7	X 36	X 35	X 35	X 37	X 39	X 36													X 44	S 36	X 32	X 30	X 33	S 35
8	S 35	S 35	S 36	X 36	X 39	X 35													X 31	S 37	X 38	X 33	X 31	X 32
9	X 33	X 31	S 33	X 33	S 39	X 33													X 35	X 35	X 38	X 40	O S 36	A
10	X 36	X 36	X 36	X 36	X 36	X 38													X 35	A	A	S 37	O S 37	A
11	40	39	X 40	S 39	S 37	S 36													X 33	S 34	A	A	X 34	S 35
12	S 34	S 33	S 35	X 38	H 34	X 28													C	X 40	S 40	O S 36	S 39	S 39
13	X 39	S 37	O S 39	X 37	S 37	X 35													X 36	X 40	O S 46	X 33	X 35	X 36
14	S 38	X 38	O S 39	S 43	37	X 36													C	C	C	C	C	C
15	C	C	C	C	C	C													X 41	X 37	36	38	38	38
16	S 38	S 37	O S 38	S 37	X 36	X 35													X 31	S 33	S 37	S 31	38	36
17	37	38	X 35	X 40	S 36	X 28													X 41	S 40	39	X 34	S 34	S 35
18	S 36	S 37	S 38	O S 38	S 37	S 31													S 34	X 33	S 35	S 36	S 37	S 38
19	O S 39	X 38	S 37	O S 38	X 37	S 36													X 36	S	X 35	A	X 36	X 35
20	S 37	O S 38	O S 41	X 38	X 38	S 36													X 39	X 35	X 39	X 34	X 33	X 35
21	X 36	X 37	X 36	X 36	X 35	X 35													X 37	X 35	S 35	A	X 33	S 36
22	X 36	S 35	X 35	X 37	X 37	X 33													X 34	X 33	X 37	X 34	O S 35	X 35
23	S 35	X 36	S 37	O S 38	X 38	X 31													A	X 37	S 33	S	S	A
24	S 39	38	37	S 35	S 37	X 33													C	C	C	C	C	37
25	S	S 36	S 36	X 34	S 34	S 35													S 40	X 32	S 35	X 35	S 35	S 36
26	X 36	S 37	S 38	X 35	X 31	X 31													X 42	S 39	A	S 35	X 36	S 38
27	S 36	S 36	X 36	X 38	S 40	S 36													X 37	S 36	S 37	U S 44	X 37	S 35
28	X 36	S 36	S	S	S	37													X 33	S 36	X 31	O S 34	S 33	S 35
29	S 36	S 35	X 35	X 35	X 34	X 32													X 34	S 35	X 37	S	S	X 33
30	A	X 32	X 33	35	X 35	32													X 36	X 32	X 32	X 31	X 33	S 35
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	29	28	28	28	29													26	25	24	23	25	25
MED	36	36	S 37	X 37	X 37	X 35													X 36	X 36	36	X 35	36	S 35
UQ	S 38	37	S 38	X 38	38	X 36													X 37	S 38	38	S 37	S 37	S 36
LQ	36	35	X 35	X 36	X 35	X 31													X 34	X 35	35	X 34	X 34	X 35

The Radio Research Laboratories, Japan

NOV. 1976 | FXI (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOF2 (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	28	30	S 32	30	29	20	38	56	75	86	84	81	69	79	80	63	S 62	48	29	A	A	29	S 34	S 27
2	A	28	28	S 29	32	S 27	34	55	60	64	66	61	70	65	77	71	55	43	30	29	31	S 33	32	32
3	30	31	S 34	32	31	32	37	59	S 71	65	68	76	66	68	81	73	52	48	31	33	29	30	A	A
4	F	F	S 31	32	F 37	22	31	57	58	71	74	84	76	63	66	66	65	43	30	33	33	32	31	S 29
5	31	33	32	33	32	30	36	57	54	59	73	76	63	70	64	64	56	47	26	32	30	31	S 32	S 29
6	F	F	32	30	24	21	33	R 51	53	71	70	63	H 58	67	61	68	52	42	28	30	30	28	31	29
7	30	29	29	31	33	30	36	54	R 63	59	67	64	68	72	H 61	53	48	43	38	30	26	24	27	29
8	29	S 29	30	30	33	29	32	49	51	56	56	60	66	65	65	63	48	37	25	31	32	J S 27	25	26
9	27	25	S 27	27	33	27	S 30	44	48	60	58	69	66	H 53	68	81	62	43	29	29	32	34	30	A
10	30	30	30	30	30	32	34	J R 55	56	57	71	90	J R 70	J R 63	68	65	62	48	29	A	A	31	S 31	A
11	F	F	34	S 33	31	30	34	S 61	58	71	74	94	82	71	68	63	63	S 44	27	S 28	A	A	28	29
12	28	27	29	32	H 28	22	34	H 57	S 63	66	J R 102	H 101	74	71	71	62	50	41	I C 37	34	S 34	S 30	33	S 33
13	33	31	S 33	31	31	29	32	S 62	70	60	67	67	67	H 70	81	61	R 52	J S 42	30	34	S 40	27	29	30
14	32	32	33	37	F	30	J S 40	57	56	74	S 72	H 64	R 73	67	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	68	77	80	78	71	65	58	57	49	35	31	F	F 32	F	F
16	S 32	S 31	S 32	31	31	29	30	55	57	61	73	71	70	67	64	63	57	45	25	27	S 31	25	F	F
17	F	F	29	34	30	22	S 27	S 52	58	61	72	70	69	68	80	60	J S 51	34	35	S 34	F 30	28	S 28	29
18	30	31	S 32	S 32	31	25	29	58	56	59	68	76	65	72	60	66	61	43	28	27	29	30	S 31	32
19	S 33	32	31	S 32	31	30	36	62	60	58	64	65	63	66	62	J S 63	54	46	30	S 31	29	A	30	29
20	31	32	F 35	32	32	30	30	J S 51	60	62	72	64	65	63	70	62	54	44	33	29	33	28	27	29
21	30	31	30	30	29	29	31	48	53	56	69	H 62	60	63	66	73	51	42	31	29	J S 29	A	27	30
22	30	29	29	31	31	27	28	C	C	58	65	63	59	57	58	59	57	36	28	27	31	28	29	29
23	29	30	31	S 32	32	J C 25	27	S 51	51	60	59	76	A	59	56	56	53	37	A	31	S 27	S	S	A
24	S 33	F	F	29	31	27	22	49	51	54	S 64	83	71	59	56	50	43	C	C	C	C	C	C	F
25	S	S 30	S 30	28	S 28	S 29	25	S 45	51	57	73	J S 78	75	63	56	51	47	34	S 34	26	29	29	S 29	30
26	30	31	S 32	27	25	25	26	49	57	81	93	72	63	63	64	51	55	37	36	33	A	S 29	S 30	S 32
27	30	30	30	32	34	30	31	59	55	79	76	63	61	63	66	56	52	34	31	30	S 31	S 38	31	29
28	30	30	I S 30	S	S	F	29	56	61	61	J S 75	78	64	69	61	61	47	31	27	30	25	28	J S 27	29
29	30	29	29	29	28	26	27	47	56	58	C	C	65	C	65	58	52	34	28	J S 29	J S 31	S	S	J S 27
30	A	26	27	F 27	29	F 24	25	47	54	55	J S 76	71	61	61	56	58	53	36	30	26	26	25	27	29
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	24	28	28	27	28	29	28	28	30	29	29	29	29	29	29	29	28	27	26	23	23	23	22
MED	30	30	30	31	31	28	31	55	56	60	72	71	66	66	65	62	53	42	30	30	30	29	30	29
UQ	31	31	32	32	32	30	34	57	60	68	74	78	70	70	68	65	57	44	32	32	32	31	31	30
LQ	30	29	29	30	29	25	28	49	54	58	67	64	63	63	61	58	51	36	28	29	29	28	28	29

The Radio Research Laboratories, Japan

NOV. 1976 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOF1 (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									L	L	L	L	L	L	A	A								
2								L	L	L	L	L	L	L	L	L								
3										L	A	L 410	L	L	L	L								
4									L	L	L	L	L	L	L	L								
5								L	L 350	L	L	L	L	L	L	L								
6										L	L	L	L	L	L	L	A							
7									L	L	L	L	L	L	L	A								
8										L	L	L	L	L	L	L								
9									L	L	L	L	L	H 370	L	L								
10									A	A	A	A	A	L	L	L								
11									L	L	L	L	L	L	L	A								
12									L	L	L	L	L	L	L	L								
13										U L 370	U L 380	L	L	L	L	L								
14										L	L	L	L	L	C	C	C							
15								C	C	L	L	L	L	L	L	L								
16									L	L	L	L	L	L	L	L								
17									L	L	L	L	L	L	L	L								
18									L	L	L	L	L	L	L	L								
19									L	L	L	L	L	L	L	L								
20										L	L	L	L	L	L	L	220							
21										L	L	L	L	L	L	L								
22								C	C	L	L	L	L	L	L	L								
23									A	A	A	A	A	A	L	L								
24										L	L 410	A	L	L	L	L								
25									A	A	A	A	L	L	L	L								
26										A	L	L	L	L	L	L								
27										L	L	L	L	L	L									
28									L	L	L	L	L	L	L									
29										L	C	C	L	C	L	290								
30										L	L	L	L	L	A									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	1	2	1		1		1	1							
MED									350	U L 370	L 395	410		H 370		290	220							
UQ																								
LQ																								

NOV. 1976 | FOF1 (0.01 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | 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							S	200	240	A	A	A	300	A	A	A	190	B						
2							B	A	240	A	295	300	310	295	285	A	A	S						
3							S	205	A	A	A	A	A	A	A	A	A	B						
4							S	A	A	285	A	A	305	300	A	250	A	S						
5							A	A	A	280	A	310	310	295	280	A	A	S						
6							S	200	260	290	A	A	A	A	290	A	A	S						
7							S	200	C 260	280	295	310	300	295	260	A	A	A						
8							S	190	260	285	A	310	310	300	280	250	S	S						
9							S	180	270	280	295	310	310	300	270	H 240	195	S						
10							B	H 210	C 250	A	295	300	A	A	260	250	S	S						
11							S	180	265	A	A	A	A	A	A	240	S	S						
12							S	165	240	A	A	A	A	300	270	A	B	S						
13							B	170	240	265	290	295	A	A	A	A	A	S						
14							S	200	260	A	A	A	A	A	C	C	C	C						
15							C	C	C	A	A	300	290	280	A	A	A	S						
16							S	190	230	A	290	295	A	285	A	225	S	S						
17							S	200	A	A	A	300	300	290	280	235	165	S						
18							S	S	250	270	295	A	A	A	A	A	A	S						
19							B	B	240	A	A	A	300	A	A	A	A	S						
20							S	S	260	280	300	300	300	295	A	225	S	S						
21							B	S	240	280	300	300	A	A	A	A	A	S						
22							S	C	C	270	290	300	R 300	A	280	245	S	S						
23							S	175	245	275	290	A	A	295	280	250	150	S						
24							S	S	A	A	A	A	305	300	275	210	S	C						
25							S	S	240	A	A	A	A	A	A	A	A	S						
26							S	170	245	A	A	300	295	280	260	230	B	S						
27							S	S	240	280	290	295	A	A	A	A	A	S						
28							S	180	A	A	A	A	A	A	A	A	A	B						
29							S	S	250	270	C	C	A	C	270	225	S	S						
30							S	S	A	A	A	A	A	A	A	A	A	S						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								16	21	14	12	15	14	14	14	13	4							
MED								190	245	280	295	300	300	295	278	240	178							
UQ								200	260	280	295	305	310	300	280	250	192							
LQ								178	240	270	290	300	300	290	270	225	158							

The Radio Research Laboratories, Japan

NOV. 1976 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1976 | 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	J A 22	J A 25	J A 28	J A 24	J A 25	E B 13	J S 16	23	34	J A 33	J A 41	J A 32	G	J A 42	J A 55	J A 60	J A 42	J A 36	J A 24	J A 78	J A 62	J A 23	24	E S 16
2	J A 42	J A 27	25	J A 32	J A 26	27	J A 28	J A 26	G	J A 28	J G 28	36	37	34	34	36	24	J A 26	J A 30	J A 30	J A 28	J A 26	22	25
3	E S 16	E B 13	E S 16	J A 23	J A 24	J A 22	23	26	J A 39	J A 42	J A 62	J A 42	J A 61	J A 61	J A 40	31	J A 26	J A 30	J A 27	J A 30	J A 26	J A 26	J A 73	J A 52
4	J A 27	J A 30	J A 26	J A 24	23	E S 16	E S 15	J A 26	32	34	34	J A 31	J G 27	J G 27	J A 30	J A 29	23	23	21	J A 22	J A 54	E S 16	E S 16	E S 16
5	E S 16	E S 16	E S 16	E B 13	J A 24	J A 26	J A 21	J A 26	J A 27	32	31	J G 30	J G 28	G	J A 28	J A 26	J A 26	J A 27	J A 25	J A 19	J A 26	J A 22	20	E S 16
6	E S 16	E S 16	21	E B 13	E S 16	E B 13	E S 16	G	30	G	J A 30	35	36	34	31	J A 42	J A 36	J A 31	J A 27	J A 26	22	J A 24	22	J A 27
7	J A 26	J A 28	J A 28	25	J A 25	27	24	23	G	G	G	36	G 24	G 22	G 25	J A 54	J A 54	J A 32	J A 21	J A 24	J A 21	J A 24	J A 21	25
8	J A 24	24	22	21	E S 16	20	E S 16	G	31	31	34	G	36	G	32	35	24	21	E S 16	21	E S 16	J A 27	23	21
9	E S 16	E S 16	E S 16	E S 16	E S 16	20	J S 16	J A 25	G	34	G 29	36	G	31	36	32	27	18	E B 13	21	J A 22	25	39	J A 42
10	23	J A 27	J A 27	J A 27	J A 26	20	E B 13	G	J A 37	J A 74	J A 63	J A 67	J A 62	J A 37	G	32	J A 31	J A 36	J A 30	J A 36	J A 78	J A 28	J A 26	J A 42
11	J A 26	24	19	E S 16	E S 16	24	E S 16	28	G	J A 33	J A 52	J A 41	J A 43	J A 30	33	J A 52	J A 30	J A 25	J A 26	J A 30	J A 42	J A 40	J A 22	J A 42
12	J A 25	24	E S 16	21	21	E S 16	E S 16	J A 28	31	J A 33	J A 42	J A 43	J A 36	J A 42	J A 42	J A 30	J A 19	J A 30	C	J A 54	22	23	J A 27	23
13	E S 16	E S 16	E S 16	22	E B 13	E S 16	21	G	32	G	G 23	J G 29	J A 41	33	J A 31	J A 27	J A 28	J A 30	J A 24	25	24	21	J A 23	22
14	E S 15	25	J A 26	J A 30	22	J A 25	19	26	G	J A 37	J A 42	J A 37	J A 36	J A 42	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	J A 61	J A 60	J A 30	J G 27	J A 64	J A 41	J A 30	J A 30	20	E S 16	E S 16	21	E S 16	E S 16	E S 16
16	E S 16	E S 16	22	23	21	E B 13	E S 16	G	28	J A 30	G	G	J A 43	J A 30	J A 28	J A 30	E S 16	22	24	24	E B 13	19	19	E S 16
17	E S 16	E S 16	22	E B 13	E S 16	E S 16	E S 16	26	28	32	J A 40	G	J A 31	G	G	G	G	E S 16	E S 16	E S 16	E S 15	E B 13	E S 16	E S 16
18	E B 13	E S 16	21	23	E S 16	E S 16	E S 16	25	31	31	35	36	J A 43	J A 36	J A 33	J A 30	J A 18	J A 23	E S 15	20	22	24	22	E S 16
19	E S 16	E S 16	20	25	E S 16	E S 16	E B 13	23	32	J A 30	J A 40	J A 41	G	J A 37	J A 40	J A 31	J A 37	J A 31	J A 23	J A 34	J A 37	J A 42	J A 27	J A 24
20	23	J A 26	23	E S 16	23	E B 13	E S 16	26	31	J A 52	J A 30	G	G	J A 30	J A 28	J A 24	J A 26	25	E S 16	E B 13	E S 15	20	21	E S 16
21	21	E B 13	E S 16	E S 16	E B 14	22	24	E S 16	31	34	J A 49	34	32	J A 42	J A 36	J A 37	J A 40	J A 28	23	J A 24	J A 43	J A 54	J A 27	24
22	J A 60	J A 27	20	E B 13	22	E S 16	E S 16	C	C	J A 28	37	38	36	38	36	J A 26	J A 26	23	J A 29	21	E S 16	24	J A 25	25
23	J A 26	20	28	26	105	E S 16	J A 22	33	J A 48	J A 45	J A 62	J A 47	J A 108	J A 60	30	G	25	E S 16	J A 30	J A 52	J A 42	J A 42	J A 51	J A 54
24	J A 44	20	E S 16	E S 16	E S 15	23	21	26	34	31	J A 36	J A 68	J A 43	33	G	26	E S 16	C	C	C	C	C	C	E S 16
25	E S 16	E B 13	20	23	22	20	E S 16	J A 27	J A 42	J A 43	J A 74	J A 89	J A 62	J A 42	J A 33	J A 26	J A 21	E S 16	J A 24	J A 24	23	22	23	19
26	E S 16	21	J A 27	24	20	E S 16	E S 16	J A 31	J A 36	J A 43	J A 37	33	32	31	G	G	J A 27	E S 16	J A 26	J A 23	J A 34	J A 24	25	J A 24
27	J A 20	21	21	20	E B 13	J A 24	22	21	G	G	34	36	J A 42	J A 42	J A 30	J A 40	J A 30	J A 26	20	E S 16	E S 16	E S 16	23	E S 16
28	E S 16	20	29	19	E B 13	E S 16	E S 16	G	J A 30	36	36	J A 40	J A 41	32	36	J A 30	J A 28	J A 26	J A 28	20	E B 13	E S 16	E S 16	E S 16
29	E S 16	E S 16	E B 13	E S 16	22	J A 24	22	19	G	31	C	C	30	C	G 25	24	J A 24	36	J A 25	23	E S 16	32	J A 30	J A 27
30	J A 52	25	J A 26	25	25	24	E S 16	23	J A 28	J A 40	J A 39	33	34	37	J A 47	25	J A 22	J A 26	J A 26	J A 24	J A 26	23	E S 16	E B 14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	28	28	30	29	29	30	29	29	29	29	28	27	28	28	28	28	29
MED	20	20	21	22	21	20	E S 16	25	31	J A 33	J A 37	J 36	J 36	J A 34	J A 32	J A 30	J A 26	J A 26	J A 24	J A 24	22	24	23	22
UQ	J A 26	25	26	24	24	24	21	26	33	J A 40	J A 42	J A 41	J A 43	J A 42	J A 36	J A 35	J A 30	J A 30	J A 26	J A 30	J A 36	J A 26	J A 26	J A 25
LQ	E S 16	E S 16	E 16	E 16	E S 16	E S 16	E S 16	18	E G 27	30	31	31	G 28	30	28	J A 26	J A 23	22	20	20	E 16	20	20	E S 16

NOV. 1976 | FOES (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | FBES (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	E	22	20	18	22	E B 13	S	23	26	32	31	32	G	36	51	52	18	20	19	A A 78	A A 62	E	E	E S 16
2	A A 42	20	17	24	23	25	24	20	G	28	G 23	36	36	33	32	30	20	22	24	22	20	E	E	E
3	E S 16	E B 13	E S 16	E	E	16	G	24	36	30	52	32	40	40	35	29	24	20	E	22	20	24	A A 73	A A 52
4	18	18	19	16	E	E S 16	E S 15	21	29	31	32	31	G 27	G 27	28	21	22	G	E	E	E	E S 16	E S 16	E S 16
5	E S 16	E S 16	E S 16	E B 13	16	20	17	22	27	30	30	G 24	G 26	G	25	26	21	24	20	E	20	E	E	E S 16
6	E S 16	E S 16	E	E B 13	E S 16	E B 13	E S 16	G	30	G	30	34	30	33	30	28	29	26	20	22	E	20	E	E
7	E	17	16	E	E	E	G	G	G	G	G	35	G 24	G 22	G 24	39	36	30	E	20	19	E	E	E
8	E	E	E	E	E S 16	E	E S 16	G	30	G	30	G	35	G	31	30	21	G	E S 16	E	E S 16	E	E	E
9	E S 16	E S 16	E S 16	E S 16	E S 16	E	S	G	G	31	G 28	36	G	G	35	32	26	G	E B 13	E	17	17	20	A A 42
10	E	26	20	17	16	16	E B 13	G	30	46	55	55	46	33	G	28	23	30	23	A A 36	A A 78	E	24	A A 42
11	E	16	E	E S 16	E S 16	E	E S 16	23	G	31	40	32	35	29	28	44	27	19	18	22	A A 42	A A 40	E	E
12	E	E	E S 16	E	E	E S 16	E S 16	26	27	29	34	32	31	35	30	26	18	22	C	18	E	E	E	E
13	E S 16	E S 16	E S 16	E	E B 13	E S 16	G	G	30	G	G 23	G 26	35	31	27	27	21	26	E	17	E	E	E	E
14	E S 15	19	17	16	E	17	G	23	G	31	30	35	35	35	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	38	30	27	G 25	23	26	26	17	G	E S 16	E S 16	E	E S 16	E S 16	E S 16
16	E S 16	E S 16	E	E	E	E B 13	E S 16	G	26	28	G	G	33	27	27	G	E S 16	G	E	E	E B 13	E	E	E S 16
17	E S 16	E S 16	E	E B 13	E S 16	E S 16	E S 16	22	26	30	35	G	28	G	G	G	G	E S 16	E S 16	E S 16	E S 15	E B 13	E S 16	E S 16
18	E B 13	E S 16	E	E	E S 16	E S 16	E S 16	21	27	30	32	33	35	33	31	27	15	G	E S 15	E	E	E	E	E S 16
19	E S 16	E S 16	E	E	E S 16	E S 16	E B 13	22	29	28	32	32	G	34	35	28	34	31	20	28	19	A A 42	21	17
20	E	17	E	E S 16	E	E B 13	E S 16	26	29	21	26	G	G	23	27	20	17	G	E S 16	E B 13	E S 15	E	E	E S 16
21	E	E B 13	E S 16	E S 16	E B 14	E	16	E S 16	29	31	40	G	30	29	34	36	40	26	19	E	E	A A 54	E	E
22	22	E	E	E B 13	E	E S 16	E S 16	C	C	21	37	36	35	33	31	19	G	20	E	E	E S 16	E	23	E
23	22	E	19	18	16	E S 16	20	27	47	41	50	45	A A 108	48	G	G	24	E S 16	A A 30	E	18	E	E	A A 54
24	E	E	E S 16	E S 16	E S 15	E	G	22	31	31	28	45	32	G	G	26	E S 16	C	C	C	C	C	C	E S 16
25	E S 16	E B 13	E	E	E	E	E S 16	20	40	40	52	60	40	38	29	24	19	E S 16	E	E	E	E	E	E
26	E S 16	E	E	E	E	E S 16	E S 16	29	33	40	35	32	31	29	G	G	21	E S 16	24	20	A A 34	E	E	E
27	E	E	E	E	E B 13	18	G	19	G	G	32	34	33	34	30	33	20	20	E	E S 16	E S 16	E S 16	E	E S 16
28	E S 16	E	E S 29	E	E B 13	E S 16	E S 16	G	27	29	30	32	32	29	29	27	26	17	23	E	E B 13	E S 16	E S 16	E S 16
29	E S 16	E S 16	E B 13	E S 16	E	E	G	17	G	30	C	C	30	C	G 23	24	21	22	18	E	E S 16	17	19	19
30	A A 52	E	19	16	17	E	E S 16	G	27	38	35	32	33	29	40	E C 25	19	17	21	E	22	E	E S 16	E B 14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	27	28	28	30	29	29	30	29	29	29	29	28	27	28	28	28	28	29
MED	16	16	E E 16	E E 13	E E 14	16	E S 16	20	27	30	32	32	32	29	29	27	21	20	16	E E 14	16	E	E	16
UQ	E S 16	16	16	E 16	E S 16	E S 16	E S 16	23	30	31	35	35	35	34	31	30	24	23	20	21	20	16	16	E S 16
LQ	E	E	E	E	E	E		G	E G 26	28	30	27	G 27	23	25	22	18	E G 16	E	E	E	E	E	E

The Radio Research Laboratories, Japan

NOV. 1976 | FBES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | F-MIN (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

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

NOV. 1976 | F-MIN (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | M(3000)F2 (0.01) | 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	285	285	290S	285	380	300	315	340	340	360	340	340	320	340	350	370	360S	375	285	A	A	300	350S	335S
2	A	305	290	A	345	A	350	345	360	360	350	345	360	340	360	370	385	370	335	300	300	310S	315	310
3	290	300	305S	310	290	310	325	355	370S	330	350	355	320	340	345	370	365	360	335	335	310	315	A	A
4	F	F	305S	325	380F	340	330	375	325	350	340	335	370	335	350	355	385	350	335	315	310	310	320	285S
5	300	310	310	335	345	335	360	385	370	350	360	370	365	350	345	360	375	340	325	340	310	320	310S	310S
6	F	F	340	335	375	325	365	390R	340	365	360	365	295H	345	375	350	385	375	340	305	325	320	330	310
7	320	310	310	325	335	340	350	390	370R	325	360	360	325	340	345H	360	355	370	370	335	350	300	300	300
8	290	290S	300	310	340	380	345	380	370	360	360	340	355	355	355	365	375	370	320	320	345	335JS	320	315
9	310	300	300S	300	350	350	370S	390	360	335	340	340	365	340H	325	375	370	370	325	300	315	345	305	A
10	300	305	300	300	305	335	325	380JR	380	370	330	350	355JR	365JR	355	355	375	375	360	A	A	320	265S	A
11	F	F	300	310S	320	335	325	360S	360	325	325	355	355	350	350	350	380	370S	315	360S	A	A	300	270
12	285	275	295	320	330H	300	325	315H	365S	305	325JR	345H	355	360	365	370	360	325	355IC	325	300S	305S	295	305S
13	305	290	280S	290	305	310	320	370S	380	385	360	350	340	330H	360	360	355R	360JS	315	305	340S	270	275	300
14	310	310	300	350	F	300	325JS	370	375	370	375S	325H	340R	360	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	345	365	350	345	365	370	360	360	345	355	355	F	305F	F	F
16	290S	320S	300S	295	275	310	335	365	360	360	370	350	360	355	345	365	350	360	340	310	320S	310	F	F
17	F	F	310	325	370	340	315S	355S	370	340	350	340	340	340	360	385	370JS	325	320	325S	315F	320	290S	295
18	300	310	310S	310S	320	290	310	380	375	355	355	355	340	360	350	365	360	380	285	305	310	295	295S	305
19	305S	310	305	300S	310	310	335	380	365	380	360	370	365	360	340	370JS	370	365	335	A	345	A	315	325
20	290	300	290F	310	310	350	345	370JS	350	350	375	360	355	365	360	370	370	340	345	310	335	320	300	280
21	310	320	305	300	310	325	330	390	360	375	360	360H	365	365	350	375	390	345	350	295	310JS	A	305	285
22	300	280	295	320	330	305	340	C	C	340	360	370	340	360	360	370	370	360	320	300	315	310	310	290
23	310	310	325	340S	345	320JC	335	375S	370	365	320	355	A	355	360	360	360	360	A	340	295S	S	S	A
24	305S	F	F	320	330	335	365	370	360	350	345S	350	350	370	370	370	380	C	C	C	C	C	C	F
25	S	300S	300S	320	320S	320S	320	365S	350	360	340	360JS	350	365	380	360	360	360	330S	365	295	275	285S	305
26	305	305	310S	315	290	320	305	365	350	345	365	350	350	335	360	370	365	325	335	350	A	290S	300S	310S
27	300	285	280	290	325	300	320	370	345	340	370	365	345	340	350	355	375	350	320	320	320S	325S	340	315S
28	295	275	285IS	S	S	F	340	375	385	365	350JS	360	360	350	380	370	380	360	350	350	320	320	300JS	280
29	300	295	300	310	290	310	335	375	375	355	C	C	365	C	365	375	385	360	340	335JS	335JS	S	S	335JS
30	A	305	295	295F	345	305F	350	370	390	330	370JS	365	360	360	360	370	370	360	335	315	315	350	300	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	22	24	28	27	27	27	29	28	28	30	29	29	29	29	29	29	29	28	27	25	23	23	23	22
MED	300	302	300	310	330	320	335	370	365	352	360	355	355	355	360	370	370	360	335	320	315	310	300	305
UQ	305	310	308	322	345	335	345	380	372	365	360	360	360	360	360	370	380	370	342	340	330	320	315	310S
LQ	290	290	295	300	310	308	325	365	355	340	340	345	340	340	350	360	360	348	320	305	310	302	298	290

The Radio Research Laboratories, Japan

NOV. 1976 | M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1976 | M(3000)F1 (0.01)

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									L	L	L	L	L	L	A	A								
2								L	L	L	L	L	L	L	L	L								
3										L	A	L 395	L	L	L	L								
4									L	L	L	L	L	L	L	L								
5								L	L 425	L	L	L	L	L	L	L								
6										L	L	L	L	L	L	L	A							
7									L	L	L	L	L	L	L	A								
8										L	L	L	L	L	L	L								
9									L	L	L	L	L	H 430	L	L								
10									A	A	A	A	A	L	L	L								
11									L	L	L	L	L	L	L	A								
12									L	L	L	L	L	L	L	L								
13										U L 430	U L 400	L	L	L	L	L								
14										L	L	L	L	L	C	C	C							
15								C	C	L	L	L	L	L	L	L								
16									L	L	L	L	L	L	L	L								
17									L	L	L	L	L	L	L	L								
18									L	L	L	L	L	L	L	L								
19									L	L	L	L	L	L	L	L								
20										L	L	L	L	L	L	L	420							
21										L	L	L	L	L	L	L								
22								C	C	L	L	L	L	L	L	L								
23									A	A	A	A	A	A	L	L								
24										L	L 390	A	L	L	L	L								
25									A	A	A	A	L	L	L	L								
26										A	L	L	L	L	L	L								
27										L	L	L	L	L	L									
28									L	L	L	L	L	L	L									
29										L	C	C	L	C	L	415								
30										L	L	L	L	L	A									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	1	2	1		1		1	1							
MED									L 425	U L 430	L 395	L 395		H 430		415	420							
UQ																								
LQ																								

NOV. 1976 | M(3000)F1 (0.01)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | H'F2 (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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									255	240	250	260	270	255	240	245								
2								240	235	240	250	280	250	275	245	240								
3										245	235	245	250	260	250	240								
4									225	245	250	260	225	270	250	235								
5								230	225	240	250	240	250	250	250	235								
6										240	245	250	235	270	235	225	210							
7									230	260	255	260	250	275	225	230								
8										245	250	280	245	265	250	245								
9									230	285	270	260	240	250	295	230								
10									225	260	290	250	260	250	255	230								
11									240	250	275	250	250	250	245	245								
12									220	245	260	240	240	245	235	230								
13										220	245	240	280	255	240	235								
14										250	240	240	260	240	C	C	C							
15								C	C	250	245	240	250	240	240	240								
16									215	245	245	245	250	250	240	240								
17									230	245	250	275	255	250	240	220								
18									230	240	250	240	250	245	245	240								
19									225	230	250	240	250	250	250	235								
20										245	230	240	260	250	245	225	215							
21										230	250	245	260	250	250	230								
22								C	C	250	245	240	245	250	250	230								
23									E A 250	240	325	245	A	250	240	230								
24										250	275	250	250	240	235	215								
25									250	240	270	250	245	245	240	225								
26										255	245	250	240	250	240	220								
27										240	240	245	250	250	250									
28									230	230	255	240	250	250	235									
29										250	C	C	240	C	240	230								
30										270	240	240	240	240	230									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	16	30	29	29	29	29	29	26	2							
MED								235	230	245	250	245	250	250	240	230	212							
UQ									235	250	255	250	250	255	250	240								
LQ									225	240	245	240	245	250	240	230								

The Radio Research Laboratories, Japan

NOV. 1976 | H'F2 (KM)

IONOSPHERIC DATA

NOV. 1976 | H'F (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

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	320	340	300	330	210	335	245	240	240	235	215	200	H 190	A	A	A	220	205	E A 240	A	A	255	220	245
2	A	300	295	A	250	A	240	H 200	H 200	H 195	195	245	250	225	245	240	H 205	205	E A 250	E A 325	310	290	250	260
3	300	295	265	275	270	250	240	220	240	200	A	210	A	A	250	245	210	210	205	250	280	300	A	A
4	300	320	295	250	215	240	250	225	215	235	210	195	H 195	H 195	H 190	235	205	195	240	250	250	245	250	290
5	295	265	250	250	235	295	220	220	190	200	H 175	205	195	190	205	235	220	210	250	250	275	250	275	260
6	310	280	240	225	200	275	220	200	220	200	235	200	210	E A 240	235	225	A	220	E A 260	E A 290	245	280	250	275
7	260	285	290	260	240	225	235	H 205	210	H 195	H 200	220	H 180	200	210	A	250	225	215	200	245	295	320	300
8	300	300	295	285	240	200	210	H 200	230	H 195	H 175	190	255	220	250	A	H 210	200	240	245	235	235	250	270
9	275	295	305	290	240	215	195	200	225	230	H 200	225	200	H 190	265	A	220	200	220	290	265	240	250	A
10	290	E A 350	320	300	280	240	200	210	A	A	A	A	A	220	215	230	205	210	240	A	A	250	325	A
11	315	305	270	250	250	240	230	215	H 200	220	A	250	240	225	240	A	215	205	260	250	A	A	295	350
12	345	345	295	245	200	320	240	220	230	210	245	240	225	240	215	A	H 210	225	I C 225	245	250	250	280	290
13	290	305	300	290	260	250	250	235	215	195	H 180	200	205	235	240	230	210	210	230	260	235	E S 240	325	300
14	290	280	285	240	300	300	240	220	230	225	195	230	220	A	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	240	200	200	H 185	205	200	H 200	H 185	205	210	215	260	250	305	300
16	290	260	260	270	290	260	240	220	205	195	H 175	200	220	H 200	220	H 200	215	200	210	240	240	290	300	295
17	300	305	275	240	200	250	200	220	220	215	225	200	195	H 200	H 195	220	H 200	240	235	245	240	245	290	290
18	290	275	260	275	240	290	250	220	220	195	H 195	H 195	215	225	220	225	H 200	200	260	255	260	300	300	290
19	285	270	285	275	265	275	240	215	220	220	200	205	200	A	230	A	205	230	250	A	245	A	E A 300	250
20	280	295	305	285	275	240	225	220	235	H 200	230	225	220	205	220	220	190	210	210	255	250	250	E S 300	320
21	290	250	275	285	265	250	225	205	215	210	A	225	195	230	A	A	205	240	230	285	260	A	275	300
22	315	315	300	255	240	260	225	C	C	190	A	A	240	190	230	225	225	200	250	260	250	250	E A 315	300
23	320	275	270	240	240	240	270	220	A	A	A	A	A	A	225	225	210	200	A	220	275	295	340	A
24	270	270	295	255	245	245	210	H 210	225	215	205	A	215	210	205	215	H 185	C	C	C	C	C	C	290
25	270	275	300	250	250	245	235	215	A	A	A	A	A	A	230	200	220	205	220	210	275	325	305	270
26	290	275	270	250	300	265	270	220	240	A	A	205	215	H 200	H 205	210	225	H 185	250	220	A	290	280	290
27	295	320	320	300	250	260	250	225	H 210	225	240	230	215	A	240	240	205	225	250	230	240	245	225	250
28	E S 280	310	A	300	245	280	250	210	230	220	200	200	205	210	215	230	210	200	E A 260	220	240	260	300	310
29	300	300	300	290	292	270	250	205	230	230	C	C	200	C	H 180	210	210	225	240	230	240	250	290	270
30	A	300	330	300	230	290	215	225	220	A	A	230	210	200	A	230	225	205	E A 260	250	A	230	300	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	27	29	28	28	29	28	29	28	25	25	20	24	26	22	26	21	28	28	27	25	23	25	27	25
MED	290	295	295	272	245	255	240	220	220	210	200	205	210	206	220	225	210	205	235	248	250	250	288	290
UQ	300	305	300	290	265	278	250	220	230	225	220	228	220	225	240	230	220	222	248	252	262	290	301	300
LQ	288	275	270	250	240	240	220	208	215	195	195	200	195	200	205	215	205	200	221	230	240	245	262	270

NOV. 1976 | H'F (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | H'E (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							S	125	105	105	105	105	105	A	110	A	A	B						
2							B	A	105	100	E A 120	A	105	105	105	A	A	S						
3							S	130	110	105	105	105	A	A	A	A	A	B						
4							S	A	A	A	A	A	A	A	A	A	A	S						
5							A	A	A	E A 115	E A 115	A	E A 120	105	A	A	A	S						
6							S	135	110	110	A	A	A	A	110	A	A	S						
7							S	120	110	105	105	105	A	E A 115	A	A	A	A						
8							S	130	110	110	110	105	105	110	110	110	S	S						
9							S	145	105	A	A	110	110	110	110	H 110	E S 135	S						
10							B	H 130	120	105	105	105	105	105	110	115	S	S						
11							S	S	110	110	105	A	105	A	105	115	S	S						
12							S	E B 125	110	105	105	105	105	110	110	A	B	S						
13							B	115	120	H 105	A	A	A	A	A	A	A	S						
14							S	125	110	110	110	110	105	110	C	C	C	C						
15							C	C	C	105	105	A	A	A	A	A	A	S						
16							S	125	110	105	105	105	105	A	A	115	S	S						
17							S	130	110	105	105	105	A	105	105	110	140	S						
18							S	S	115	105	105	105	105	105	105	A	A	S						
19							B	B	115	110	110	105	110	110	A	A	A	S						
20							S	S	A	A	A	105	105	A	A	A	S	S						
21							B	S	120	115	A	A	110	A	A	A	A	S						
22							S	C	C	110	A	A	105	100	105	A	S	S						
23							S	S	115	110	105	105	105	105	110	110	120	S						
24							S	S	A	105	A	105	105	105	105	105	S	C						
25							S	S	115	105	105	105	105	105	105	A	A	S						
26							S	E B 140	115	110	105	105	105	105	105	110	B	S						
27							S	S	115	105	E A 115	E A 115	A	A	A	A	A	S						
28							S	130	110	110	110	110	A	A	A	A	A	B						
29							S	S	110	115	C	C	110	C	A	A	S	S						
30							S	S	115	110	110	110	110	110	A	A	A	S						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								14	24	27	21	20	21	17	15	9	3							
MED								129	110	105	105	105	105	105	105	110	135							
UQ								130	115	110	108	106	108	110	110	115	138							
LQ								125	110	105	105	105	105	105	105	110	124							

NOV. 1976 | H'E (KM)

IONOSPHERIC DATA

NOV. 1976 | H'ES (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

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	115	105	100	100	100	B	S	150	120	115	110	110	G	105	110	105	110	110	110	110	110	110	105	S
2	100	100	100	100	100	100	100	100	G	100	100	170	150	145	150	145	105	100	100	100	100	100	100	100
3	S	B	S	100	105	100	100	145	110	110	110	110	105	100	100	140	125	105	105	100	100	100	100	100
4	100	100	100	100	115	S	S	105	125	125	125	100	100	100	100	100	130	100	100	140	105	S	S	S
5	S	S	S	B	100	100	100	100	100	130	120	95	105	G	105	105	105	100	100	100	100	100	100	S
6	S	S	100	B	S	B	S	G	160	G	110	165	110	110	140	100	125	100	100	100	100	105	95	120
7	115	100	100	100	100	100	105	150	G	G	G	150	100	100	100	100	100	100	100	100	100	115	100	95
8	110	100	100	100	S	100	S	G	185	145	130	G	175	G	150	135	115	100	S	110	S	105	105	100
9	S	S	S	S	S	125	S	110	G	140	110	160	G	130	150	140	130	125	B	110	140	130	130	125
10	100	115	115	115	110	100	B	G	125	115	115	110	110	115	G	150	110	110	105	110	100	100	100	100
11	100	100	100	S	S	130	S	145	G	115	110	105	105	105	125	110	110	110	105	100	100	100	100	100
12	100	105	S	100	105	S	S	115	115	115	115	115	115	120	115	110	125	110	C	100	100	100	100	100
13	S	S	S	110	B	S	110	G	160	G	105	105	115	160	105	100	105	100	100	100	100	100	100	100
14	S	105	100	100	100	100	105	150	G	120	110	115	110	110	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	110	110	105	105	105	100	100	100	100	S	S	100	S	S	S
16	S	S	100	100	100	B	S	G	120	115	G	G	105	105	105	100	S	100	100	100	B	100	100	S
17	S	S	100	B	S	S	S	140	125	120	110	G	100	G	G	G	G	S	S	S	S	B	S	S
18	B	S	105	100	S	S	S	140	125	120	125	110	110	110	110	105	105	105	S	100	100	100	100	S
19	S	S	105	100	S	S	B	135	125	120	115	110	G	110	110	110	105	105	105	105	100	100	100	100
20	100	100	100	S	100	B	S	150	145	105	100	G	G	105	100	100	100	100	S	B	S	100	100	S
21	100	B	S	S	B	105	105	S	150	140	130	155	110	100	100	100	100	100	150	150	105	135	120	100
22	120	115	100	B	100	S	S	C	C	105	150	150	170	110	160	100	105	100	155	160	S	150	130	130
23	120	125	125	110	110	S	140	130	130	125	120	115	110	115	130	G	145	S	115	115	110	105	110	105
24	105	100	S	S	S	110	100	145	130	145	105	120	140	145	G	110	S	C	C	C	C	C	C	S
25	S	B	110	110	105	100	S	140	120	115	110	105	105	105	105	110	105	S	105	100	100	100	120	120
26	S	110	105	105	105	S	S	135	120	115	110	115	125	125	G	G	120	S	150	140	125	110	125	100
27	100	100	100	100	B	105	110	145	G	G	125	115	100	100	100	100	100	100	100	S	S	S	100	S
28	S	100	105	100	B	S	S	G	115	110	110	110	110	110	110	110	110	110	105	110	B	S	S	S
29	S	S	B	S	100	105	100	125	G	170	C	C	115	C	110	155	100	100	100	100	S	110	100	100
30	100	100	100	100	100	100	S	100	120	110	110	115	110	110	105	110	105	100	100	100	100	100	S	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	15	17	21	19	17	15	11	21	21	26	27	25	26	26	25	26	26	24	21	24	20	23	23	17
MED	100	100	100	100	100	100	105	140	125	115	110	115	110	110	110	108	105	100	105	100	100	100	100	100
UQ	112	105	105	102	105	105	108	145	130	125	120	120	115	115	125	110	120	108	105	110	105	110	108	105
LQ	100	100	100	100	100	100	100	115	120	110	110	110	105	105	100	100	105	100	100	100	100	100	100	100

NOV. 1976 | H'ES (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | TYPES OF ES | 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	F2	F7	F4	F4	F3		C1	C2	C3	C2	C2	C2		L3	C3	L3	LH22	L3	F4	F4	F4	F2	F2	
2	F3	F3	F2	F5	F4	F5	L4	L2		L3	L2	HL12	H2	H2	H1	HL22	L2	L2	F3	F4	F4	F2	F1	F1
3				F2	F2	F3	LH21	C2	C4	C3	C3	C2	L2	L2	L3	CL22	CL32	L3	F1	F4	F4	F5	F4	F6
4	F4	F7	F3	F2	F1			L4	CL33	CL22	CL22	L3	L2	L2	L2	L3	CL23	L1	F1	FF12	F2			
5					F2	F5	L3	L4	L3	CL23	CL22	L2	L1		L2	L2	L4	L4	F4	F2	F4	F2	F2	
6			F1						H3		L2	HL12	LH11	L2	CL11	L3	CL11	L3	F3	F2	F1	FF31	F2	F2
7	FF21	F2	F2	F2	F2	F2	L1	H1				H2	L1	L1	L2	L2	L4	L4	F3	F4	F2	FF21	F1	F2
8	F2	F2	F2	F2		F1			H2	H1	C2		H2		H2	C3	C2	L1		F1		F4	F2	F2
9						F1	L1	L1		HL22	L2	H2		C1	H2	H3	C2	C1		F1	FF12	F1	FF13	FF23
10	F2	FF61	FF32	FF12	FF32	F1			C2	C4	C3	C4	C3	C2		HC22	C3	C4	F4	F6	F4	F3	F5	F4
11	F4	F2	F1			F1		H3		C2	C3	L3	C2	L2	C2	C4	C5	C4	F5	F4	F5	F4	F2	F4
12	F4	F2		F1	F1			C4	C2	C2	C3	C2	C2	C3	C3	L2	C2	L5		F4	F2	F2	F2	F2
13				F2			L1		H2		L1	L1	CL21	HL12	L1	L2	L2	L3	F2	F3	F2	F2	F1	F1
14		F3	F4	F3	F2	F2	L1	H2		C3	C2	C2	C3	C2										
15										C3	C2	L2	L2	L1	L1	L2	L1	L1			F1			
16			F2	F2	F1				C2	C2			C3	L2	L2	L1		L1	F1	F2		F2	F1	
17			F1					C2	C2	C2	C4		L2											
18			F1	F1				C2	C2	C2	C2	C2	C3	C3	C3	L4	L2	L1		F2	F2	F2	F1	
19			F2	F2				C3	C4	C2	C2	C2		C3	C31	L2	L4	L3	F6	F4	F2	F2	F2	F2
20	F2	F2	F1		F1			C21	C23	LC32	L1			L2	L3	L3	L1	L1				F2	F1	
21	F1					F1	L3		H4	C21	C13	HL12	C21	LH11	LH41	L3	L4	L3	FF22	F2	F3	FF43	F2	F2
22	F4	F2	F1		F1					L2	HL22	HL11	H2	C1	H1	L1	L1	L1	FF41	FF11		F3	F5	F2
23	F2	F1	F2	F3	F1		C5	C4	C4	C3	C4	C4	C4	C4	C2		H4		F6	F2	F2	F3	F3	F4
24	F4	F1				F2	L1	H4	CL44	HC22	LH31	CC33	C2	H1		C3								
25			F2	F2	F2	F1		C2	C5	C4	C3	C3	C5	C4	C3	L3	L2		F2	F3	F2	F2	F2	F2
26		F2	F4	F4	F2			C4	C4	C4	C3	C2	C2	C2			C2		F5	F5	F6	F4	F2	F1
27	F2	F1	F1	F1		F4	L2	H3			CL22	CL22	L3	L3	L2	L3	L2	L3	F1				F1	
28		F1	F1	F1					C2	C2	C1	C2	L2	L1	L2	L2	L2	L3	F4	F1				
29					F2	F2	L2	C1		HL11			C1		L2	HL12	L3	L4	F2	F2		F2	F3	F2
30	F2	F2	F2	F2	F2	F2		LH11	C2	C2	C3	C2	C2	C2	L3	L2	L2	L2	F4	F2	F3	F1		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
UQ																								
LQ																								

The Radio Research Laboratories, Japan

NOV. 1976 | TYPES OF ES

IONOSPHERIC DATA

NOV. 1976 | FXI (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

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	36	A	46	39	41	A														C	A	C	C	C
2	C	C	C	C	40	C														38	40	41	41	43
3	44	43	42	38	40	38														A	44	33	35	35
4	37	38	37	38	55	A														40	47	52	35	33
5	35	36	35	36	43	32														A	39	42	35	32
6	34	35	37	36	40	31														32	36	40	34	33
7	33	34	35	36	39	41														42	41	31	31	34
8	35	36	36	37	40	35														43	37	C	C	C
9	C	C	C	C	C	C														32	34	39	34	29
10	C	35	C	36	C	33														A	35	37	41	39
11	39	41	43	40	37	38														34	33	35	36	37
12	36	37	36	40	45	35														49	39	C	S	36
13	S	36	O S 37	38	36	35														40	46	41	31	34
14	36	38	38	40	32	33														38	41	39	31	34
15	35	35	37	36	42	31														33	34	32	C	35
16	S	36	36	C	38	35														33	36	35	32	33
17	33	S 33	34	43	46	30	30													42	45	39	35	34
18	36	36	39	35	35	31														39	42	42	39	39
19	38	41	39	39	39	37														44	40	38	34	34
20	A	34	35	36	39	35														42	43	47	39	34
21	36	39	38	36	37	34														42	43	36	34	35
22	36	35	36	36	38	28														37	45	54	44	O S 46
23	A	40	39	42	40	26														38	37	A	A	35
24	S 35	S 35	35	S 38	51	25														O S 31	37	S	32	32
25	32	33	35	36	36	35														34	32	33	36	37
26	37	39	40	38	33	S 34	33													33	33	36	33	34
27	33	33	33	38	43	33														37	33	35	35	36
28	36	36	36	38	42	33														33	29	30	30	32
29	34	36	36	36	36	35														37	36	32	34	S 35
30	36	37	35	34	S	S 31														37	34	35	30	29
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	27	27	27	27	26	2													26	29	25	25	28
MED	36	36	36	38	40	34	32													38	37	37	34	34
UQ	36	38	38	38	42	35														42	42	41	36	36
LQ	34	35	35	36	37	31														33	34	33	32	33

NOV. 1976 | FXI (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOF2 (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

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	30	A	40	33	35	A	23	52	68	87	90	80	74	87	97	82	I C 62	I C 61	55	C	A	C	I C 44	I C 30
2	C	C	C	C	F 33	I C 33	27	54	57	58	63	65	64	76	86	71	70	53	S 51	S 32	S 34	S 35	S 35	S 37
3	S 38	S 37	S 36	S 32	S 34	S 32	S 26	S 52	63	61	70	75	69	69	91	91	U S 75	60	A	A	38	27	29	29
4	S 31	32	31	32	49	A	18	44	55	66	65	90	89	67	71	78	A	A	A	34	41	S 46	29	27
5	29	30	29	30	S 37	26	23	49	56	55	72	83	S 72	S 62	67	S 84	58	56	35	A	33	S 36	29	26
6	28	29	31	30	34	25	21	48	56	56	82	78	57	62	86	84	66	44	38	26	30	34	28	27
7	27	28	29	30	33	S 35	28	51	57	53	64	74	S 61	70	79	62	55	50	46	36	35	25	25	28
8	29	30	30	31	S 34	S 29	22	45	56	57	59	H 72	J C 66	64	69	83	J C 63	48	A	37	31	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	74	94	C	S 58	S 40	S 26	S 28	S 33	J S 28	S 24
10	I C 28	S 29	I C 29	S 30	I C 33	S 27	S 29	S 48	I C 54	61	C	85	77	H 81	79	73	59	S 62	45	A	29	31	S 35	33
11	33	35	S 37	34	31	32	27	S 47	51	56	69	89	98	92	101	90	63	50	45	H 28	27	29	30	31
12	U S 30	S 31	S 30	34	39	29	33	50	57	68	108	94	78	86	82	59	55	53	46	S 43	33	I C 28	A	J S 30
13	I S 31	S 30	S 31	32	U S 30	F 27	28	58	63	58	60	62	70	91	92	82	57	73	42	34	40	35	25	28
14	30	32	C 32	34	26	27	30	56	68	65	72	76	78	V 76	75	70	64	63	S 38	32	S 35	33	25	28
15	29	29	31	30	36	25	23	41	65	76	76	84	80	78	79	70	55	71	S 55	27	28	26	I C 28	29
16	I S 31	S 30	S 30	I C 32	S 32	S 29	27	I C 46	S 62	61	73	74	68	79	72	67	57	61	S 41	27	30	29	26	27
17	J S 27	J S 27	F	37	40	24	F 24	43	58	58	70	81	78	80	83	73	54	49	S 39	36	S 39	33	29	28
18	30	30	33	29	29	25	23	54	59	57	68	69	A	82	73	67	77	52	S 38	33	36	36	33	S 33
19	32	35	S 33	33	33	31	32	51	56	58	63	71	63	65	66	68	68	S 57	42	38	34	S 32	28	28
20	A	28	29	30	33	29	28	47	54	62	65	66	64	H 73	68	61	60	56	57	36	S 37	41	33	28
21	30	33	32	30	31	28	27	46	61	54	62	65	66	72	77	68	63	49	40	36	37	30	28	29
22	30	29	30	30	32	22	21	45	53	54	V 56	63	68	61	64	57	57	55	S 32	S 31	S 39	S 48	38	S 40
23	A	S 34	S 33	U S 36	34	21	23	42	56	54	58	72	77	69	77	67	61	49	34	32	31	A	A	29
24	S 28	J S 29	F 29	S 32	U S 45	18	17	39	53	52	54	71	70	66	62	57	48	44	32	25	U S 31	I S 33	F 25	F 26
25	U S 26	S 27	29	30	30	F 29	S 26	42	54	58	57	78	76	78	59	55	53	49	34	28	26	27	30	31
26	31	S 33	34	32	27	S 28	F 25	38	54	62	66	70	C	C	64	56	51	52	50	27	27	J S 30	27	28
27	27	27	27	32	37	27	31	51	64	56	77	66	63	65	69	69	V 60	51	36	31	27	27	29	30
28	30	30	30	32	36	27	30	47	61	52	63	77	75	78	V 82	65	56	51	A	27	23	24	24	S 26
29	28	30	30	30	30	29	31	42	52	64	60	77	64	60	63	V 66	56	50	33	S 31	S 30	S 26	F	S 29
30	S 30	F	S 29	S 28	A	S 25	21	S 40	53	60	62	74	69	76	61	55	60	56	35	31	S 28	29	24	23
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	28	28	27	29	29	29	29	28	29	27	28	30	30	28	29	26	26	29	27	26	29
MED	30	30	30	32	33	27	26	47	56	58	65	74	70	74	74	68	60	53	40	32	31	31	28	28
UQ	31	32	32	32	36	29	28	51	61	62	72	80	77	80	82	82	63	57	46	36	36	34	30	30
LQ	28	29	29	30	31	25	23	43	54	56	61	70	65	66	67	62	56	50	35	27	28	28	26	27

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NOV. 1976 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOF1 (0.01 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

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	C	C	C	L	L	C	C						
2									L	L	L	L	L	A	A	L	A							
3									L	L 340	L 430	L	A	A	U L 430	L	A							
4										L	U L 400	L 440	L	L 400	U L 430	L	A							
5									L	U L 380	L 440	L 440	L	U L 450	L	L	L							
6									L	L	U L 430	L	L 420	L 460	L	A	L							
7									L	L	L	L	L	L	H 390	L	L							
8									L	L	L	L	L	L	L	A	L							
9									C	C	C	C	C	C	C	L	C							
10										L 380	I C 420	L 430	U L 440	420	410	L	290							
11											L	L	L 450	L	L 410	L	L							
12										L	L	A	L	L	U L 410	A	L							
13									L	A	A	L	L	L	L	L								
14										L	L	L	L	L	L	A	L							
15									L	L	L	L	L	L	L	L	L							
16										L	L	U L 390	L	L	L	L	L							
17									L	L 330	L	U L 440	L	L 440	L	L	L							
18											L 430	L	A	U L 410	L	L	280							
19									L	L 350	L	L 420	L	L 450	L 420	L	A							
20									L	L 310	L	L	L	L	L	L								
21										L	L	L	L	L 400	L	L	L							
22										L	A	A	A	L	L	L	A							
23									L		L	L	L 440	A	L	L	290	180						
24												L 410	L 420	L 420	L	L								
25										L	L	L 430	L 430	A	A	A	A							
26										L	L	A	C	C	L 400	L	A							
27										L	L	L	L	L	L	L	L							
28										A	L 380	L 430	L 430	L 430	L	L	R 260							
29										L	L	A	L	L	L	A	A	L 180						
30										A	L	U L 430	L	U L 420	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										6	7	10	7	11	8		4	2						
MED										L 345	L 430	L 430	L 430	L 420	L 410		285	180						
UQ										L 380	L 430	L 440	L 440	L 445	L 425		290							
LQ										L 330	L 410	L 420	L 425	L 415	L 405		270							

The Radio Research Laboratories, Japan

NOV. 1976 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOE (0.01 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	S	A	A	A	U C 310	C	C	C	C	I C 230	I C 190	C					
2							S	S	210	250	A	310	315	330	305	A	A	A	S					
3							S	S	240	270	290	A	A	A	A	A	A	A	S					
4							S	S	H 240	270	280	305	A	300	295	280	A	A	S					
5							S	S	A	A	305	A	310	310	290	275	A	A	S					
6							S	S	230	A	290	A	320	A	A	275	220	A	S					
7							S	S	240	275	290	300	300	300	285	260	225	R	S					
8							S	S	240	270	300	310	310	300	R 280	R 250	A	A	C					
9							C	C	C	C	C	C	C	C	A	275	C	A	S					
10							S	S	C	275	C	A	300	310	300	270	220	A	S					
11							S	S	230	280	A	A	A	A	A	270	230	A	S					
12							S	S	220	270	290	305	A	A	290	265	A	B	S					
13							S	S	235	270	280	290	300	A	A	A	A	A	S					
14							S	S	220	260	280	285	290	A	A	A	A	A	S					
15							S	S	220	A	285	A	A	A	A	R 260	220	A	S					
16							S	C	220	C 270	A	A	A	A	A	A	A	A	S					
17							S	S	A	A	A	A	A	300	295	265	225	A	S					
18							S	S	220	A	280	295	A	310	290	255	220	155	S					
19							S	S	240	270	A	A	A	A	A	A	A	B	S					
20							S	S	230	A	A	A	A	A	290	260	A	B	S					
21							S	S	230	265	300	305	305	A	290	260	220	S	S					
22							S	S	210	265	A	310	300	300	285	260	215	S	S					
23							S	S	215	265	295	305	A	A	A	A	215	S	S					
24							S	S	225	280	295	A	A	A	A	A	A	A	S					
25							S	S	220	275	290	300	310	A	A	A	A	S	S					
26							S	S	200	H 260	270	A	C	C	A	A	A	A	S					
27							S	S	220	260	280	290	300	A	280	250	220	S	S					
28							S	S	A	260	A	A	A	300	A	A	A	S	S					
29							S	S	220	265	A	A	A	A	A	A	A	S	S					
30							S	S	A	A	A	A	A	A	A	A	235	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									23	21	17	14	12	10	13	16	13	?						
MED									220	270	290	305	302	300	290	262	220	172						
UQ									232	270	295	310	310	310	295	272	225							
LQ									220	265	280	295	300	300	285	260	220							

The Radio Research Laboratories, Japan

NOV. 1976 | FOE (0.01 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FOES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	JA 32	60	31	21	JA 29	JA 29	21	18	26	31	50	35	33	34	32	32	C	C	EC 30	C	60	C	C	C
2	C	C	C	C	EB 15	C	ES 15	18	25	26	37	38	36	44	45	36	37	22	33	33	40	31	22	21
3	26	24	21	20	EB 15	20	23	23	G 21	33	36	JA 54	JA 120	JA 95	JA 59	JA 87	JA 48	JA 53	JA 65	JA 74	JA 45	JA 17	22	19
4	JA 26	JA 24	JA 27	22	JA 28	JA 28	JA 21	25	JG 22	31	36	31	32	31	JG 27	31	JA 88	JA 83	JA 62	JA 34	JA 27	JA 25	20	ES 15
5	ES 15	19	JA 24	JA 22	21	ES 15	ES 14	ES 15	27	JA 32	32	33	G	32	33	G 27	JA 28	18	JA 22	JA 44	JA 37	JA 44	ES 15	JA 24
6	JA 18	21	EB 15	19	20	ES 15	ES 15	ES 15	G	JA 32	JA 32	JA 36	JA 49	JA 39	JA 54	JA 64	JA 75	JA 51	JA 53	JA 31	21	21	ES 15	ES 16
7	ES 15	ES 15	EB 15	EB 15	EB 14	ES 15	20	21	26	G	JA 30	G 28	G 23	31	30	G 16	33	25	18	JA 24	ES 15	ES 15	ES 15	ES 15
8	ES 15	ES 15	EB 15	EB 15	EB 14	ES 15	ES 15	ES 15	24	28	33	35	37	40	40	52	27	25	70	45	ES 15	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	34	31	C	31	22	21	20	ES 15	ES 14	EC 17
10	22	ES 15	C	23	C	36	40	17	C	32	C	36	37	G	44	G	G 20	JA 31	JA 34	JA 39	JA 34	JA 27	JA 59	JA 31
11	JA 26	JA 21	JA 19	19	JA 24	JA 21	20	25	30	35	41	JA 45	JA 56	JA 37	36	G 25	G	20	ES 15	ES 15	ES 15	ES 15	EC 22	EC 16
12	JA 21	20	EC 14	EC 14	24	20	19	17	31	35	42	JA 49	JA 83	JA 54	38	JA 41	JA 34	JA 22	21	ES 15	ES 15	19	JA 33	JA 19
13	JA 29	23	JA 29	22	JA 28	22	22	ES 16	25	37	JA 45	JA 48	JA 52	35	JA 48	JA 84	38	JA 36	JA 28	28	25	20	18	20
14	EC 15	EC 15	EC 15	EC 15	EC 14	ES 15	ES 15	ES 15	G	28	40	JA 52	JA 41	30	JA 55	46	24	JA 61	JA 34	ES 15	ES 15	21	22	19
15	EC 15	EC 15	EC 15	EC 13	EC 15	EC 15	ES 15	ES 15	G	27	31	34	31	G 24	G 27	G 22	G	25	21	22	21	20	C	EC 15
16	EC 16	EC 16	EB 15	C	21	21	ES 15	C	G	34	34	32	JA 43	JA 40	JA 35	JA 44	JA 28	JA 30	21	ES 15	ES 15	ES 15	ES 15	ES 15
17	ES 15	ES 15	18	JA 22	ES 15	ES 15	ES 15	ES 15	24	33	33	33	34	JA 31	JG 27	JA 27	G	JA 27	JA 24	23	20	19	19	ES 15
18	ES 15	ES 15	21	17	EB 14	ES 15	ES 15	17	25	31	33	34	JA 68	G	G	G	26	20	22	22	21	ES 15	ES 15	ES 15
19	ES 15	ES 15	ES 15	EB 15	ES 15	20	18	ES 15	G	G 17	35	33	34	37	JA 53	38	JA 85	JA 23	JA 51	35	JA 22	44	18	ES 15
20	35	21	20	EB 14	16	18	20	ES 15	26	31	45	JA 41	JA 36	JA 34	25	G 24	JA 31	22	JA 27	ES 15	ES 15	ES 15	ES 15	ES 15
21	ES 15	ES 15	EB 15	EB 15	EB 15	ES 15	18	20	28	28	32	34	33	JA 49	33	30	30	20	JA 29	JA 21	JA 54	31	24	21
22	JA 26	ES 15	EB 15	EB 14	EB 14	ES 15	ES 15	ES 15	26	30	44	56	48	35	33	32	31	22	20	25	65	32	28	33
23	JA 51	ES 15	28	33	25	ES 15	ES 15	23	26	30	32	JA 44	36	JA 47	JA 44	30	G	ES 15	ES 14	22	19	JA 60	JA 53	JA 29
24	24	JA 27	18	EB 15	EB 15	JA 22	ES 15	ES 15	JA 33	JA 53	34	37	34	JA 39	JA 36	JA 34	30	JA 26	JA 22	JA 20	20	ES 15	ES 15	ES 15
25	21	20	24	ES 15	ES 15	ES 15	ES 15	ES 15	G	31	34	37	JA 52	JA 72	JA 139	JA 46	JA 58	JA 33	21	22	JA 19	ES 15	ES 15	ES 15
26	ES 15	ES 15	JA 31	19	JA 26	JA 21	18	ES 15	G	30	37	JA 61	C	C	31	30	JA 29	21	JA 34	26	23	JA 24	20	ES 15
27	ES 15	ES 14	ES 15	EB 14	EB 14	ES 15	ES 15	24	G	G	31	35	35	37	G 22	JA 26	G 18	24	25	ES 15	ES 15	ES 15	ES 15	ES 15
28	ES 15	ES 14	ES 15	EB 14	EB 15	ES 14	ES 15	ES 15	25	31	37	34	36	35	JA 36	JA 46	25	ES 15	JA 52	19	21	ES 15	ES 15	ES 15
29	23	ES 14	ES 14	EB 15	EB 15	ES 15	ES 15	ES 15	G	31	37	JA 58	56	47	50	48	34	ES 15	31	ES 15	ES 15	ES 15	ES 15	19
30	24	23	21	33	33	27	ES 15	23	40	JA 71	JA 40	JA 35	47	JA 61	JA 36	JA 31	G 18	ES 15	ES 15	ES 15	ES 15	ES 15	ES 15	ES 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	28	28	27	27	28	28	29	28	28	29	28	29	28	28	30	30	28	29	30	29	30	28	27	28
MED	20	EE 15	18	EE 15	EE 15	EE 15	ES 15	ES 16	25	31	36	36	36	37	36	32	30	24	25	22	20	19	EE 18	EE 16
UQ	26	21	22	22	24	21	20	20	26	33	40	JA 45	JA 50	JA 46	JA 45	JA 46	36	JA 31	JA 34	31	27	26	22	20
LQ	ES 15	ES 15	ES 15	EB 15	EB 15	ES 15	ES 15	ES 15	G	28	32	34	34	32	31	27	22	20	21	ES 15	ES 15	ES 15	ES 15	ES 15

NOV. 1976 | FOES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | FBES (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	A A 60	E	E	16	A A 29	G	18	26	30	40	E C 35	E C 33	E C 34	E C 32	31	C	C	E C 30	C	A A 60	C	C	C
2	C	C	C	C	E B 15	C	E S 15	18	25	26	35	37	36	43	40	30	34	21	23	16	17	22	E	E
3	26	E	E	E	E B 15	E	G	G	G 20	32	34	37	50	49	33	30	33	39	A A 65	A A 74	33	E	17	E
4	16	21	23	E	E	A A 28	16	G	G 16	G	G	G	32	28	G 25	G	A A 88	A A 83	A A 62	27	25	16	E	E S 15
5	E S 15	E	16	E	E	E S 15	E S 14	E S 15	26	30	G	33	G	G	G	G 25	24	16	18	A A 44	24	30	E S 15	16
6	E	E	E B 15	E	E	E S 15	E S 15	E S 15	G	27	28	32	29	32	32	55	27	21	16	E	E	E	E S 15	E S 16
7	E S 15	E S 15	E B 15	E B 15	E B 14	E S 15	G	20	G	G	28	G 28	G	G	G	G 15	30	25	17	16	E S 15	E S 15	E S 15	E S 15
8	E S 15	E S 15	E B 15	E B 15	E B 14	E S 15	E S 15	E S 15	23	G	G	35	E C 37	39	39	48	26	21	A A 70	28	E S 15	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E C 34	31	C	22	19	E	E	E	E S 15	E S 14	E C 17
10	22	E S 15	C	E	C	20	23	16	C	30	C	33	31	G	35	G	G 19	31	31	A A 39	19	16	E	21
11	23	16	E	E	E	15	G	20	29	G	31	38	39	32	30	G 25	G	20	E S 15	E S 15	E S 15	E S 15	E C 22	E C 16
12	20	E	E C 14	E C 14	E	E	G	15	28	30	40	43	41	35	33	39	26	G	G	E S 15	E S 15	E	A A 33	18
13	28	E	29	E	16	E	G	E S 16	G	37	43	33	34	31	32	30	28	22	16	E	E	E	16	E
14	E C 15	E C 15	E C 15	E C 15	E C 14	E S 15	E S 15	E S 15	G	G	35	40	31	30	33	39	24	22	21	E S 15	E S 15	E	E	E
15	E C 15	E C 15	E C 15	E C 13	E C 15	E C 15	E S 15	E S 15	G	27	30	30	30	G 24	G 24	G 22	G	20	G	18	18	E	C	E C 15
16	E C 16	E C 16	E B 15	C	E	E	E S 15	C	G	30	31	30	32	30	29	28	24	19	G	E S 15	E S 15	E S 15	E S 15	E S 15
17	E S 15	E S 15	E	E	E S 15	E S 15	E S 15	E S 15	24	30	32	31	31	29	G 20	23	G	21	G	E	E	E	E	E S 15
18	E S 15	E S 15	E	E	E B 14	E S 15	E S 15	15	25	29	32	34	A A 68	G	G	G	G	G	G	E	E	E S 15	E S 15	E S 15
19	E S 15	E S 15	E S 15	E B 15	E S 15	E	G	E S 15	G	G 17	33	30	32	32	32	31	52	G	23	E	E	E	E	E S 15
20	A A 35	E	E	E B 14	E	E	G	E S 15	G	30	35	33	32	33	G 25	G 23	30	17	17	E S 15	E S 15	E S 15	E S 15	E S 15
21	E S 15	E S 15	E B 15	E B 15	E B 15	E S 15	G	G	28	G	G	34	33	30	G	G	G	G	21	E	30	E	E	E
22	E	E S 15	E B 15	E B 14	E B 14	E S 15	E S 15	E S 15	26	28	43	45	48	35	32	32	30	22	G	24	E	21	24	25
23	A A 51	E S 15	19	22	20	E S 15	E S 15	16	25	G	G	40	35	46	41	30	G	E S 15	E S 14	E	E	A A 60	A A 53	16
24	E	E	E	E B 15	E B 15	E	E S 15	E S 15	28	32	G	34	34	35	30	29	30	25	16	E	E	E S 15	E S 15	E S 15
25	E	E	E	E S 15	E S 15	E S 15	E S 15	E S 15	G	G	32	36	41	50	43	34	41	22	G	E	E	E S 15	E S 15	E S 15
26	E S 15	E S 15	E	E	E	E	G	E S 15	G	G	37	52	C	C	30	29	28	17	32	16	22	E	E	E S 15
27	E S 15	E S 14	E S 15	E B 14	E B 14	E S 15	E S 15	G	G	G	G	33	33	33	G 22	23	G 16	G	G	E S 15	E S 15	E S 15	E S 15	E S 15
28	E S 15	E S 14	E S 15	E B 14	E B 15	E S 14	E S 15	E S 15	23	29	31	32	32	G	31	30	23	E S 15	A A 52	E	E	E S 15	E S 15	E S 15
29	E	E S 14	E S 14	E B 15	E B 15	E S 15	E S 15	E S 15	G	29	34	55	35	33	36	40	28	E S 15	16	E S 15	E S 15	E S 15	E S 15	E
30	E	17	E	16	A A 33	16	E S 15	G	22	40	30	33	40	34	30	29	G 18	E S 15	E S 15	E S 15	E S 15	E S 15	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	28	28	27	27	28	28	29	28	28	29	28	29	28	28	30	30	28	29	30	29	30	28	27	28
MED	E E 15	E E 15	15	E E 14	E E 14	E 15	E S 15	E S 15	21	28	32	34	34	32	31	30	26	20	16	15	15	15	E E 15	E E 15
UQ	18	E E 15	E 15	E B 15	E 15	E S 15	E S 15	16	26	30	35	37	38	35	33	31	30	22	23	16	18	E S 15	E S 15	E E 16
LQ	E E 15	E	E	E	E	E	G	E S 15	G	G	E G 28	32	32	28	G 25	G 23	G 17	15	G	E	E	E	E	E 15

The Radio Research Laboratories, Japan

NOV. 1976 | FBES (0.1 MHZ)

IONOSPHERIC DATA

NOV. 1976 | F-MIN (0.1 MHZ) | 135° E Mean Time (G. M. T. + 9 h)

Station YAMAGAWA Lat. 31° 12.1' N, Long. 130° 37.1' E Sweep 1 MHz to 20 MHz in 20 sec in 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	Es 14	Es 15	15	15	14	Es 15	Es 15	Es 15	15	15	17	19	Ec 28	Ec 28	Ec 28	Ec 27	C	C	Ec 30	C	Es 15	C	C	C
2	C	C	C	C	15	C	Es 15	Es 15	15	15	14	15	15	15	15	15	15	15	Es 14	Es 15	Es 15	Es 15	Es 15	Es 15
3	Es 15	Es 15	15	15	15	Es 14	Es 15	Es 15	15	15	15	15	16	15	15	15	15	15	Es 14	Es 15	Es 14	Es 14	Es 14	Es 15
4	Es 14	13	14	15	14	Es 15	Es 15	Es 14	14	15	15	15	15	15	15	15	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
5	Es 15	Es 15	15	15	15	Es 15	Es 14	Es 15	15	15	15	15	16	17	16	16	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
6	Es 15	Es 15	15	15	15	Es 15	Es 15	Es 15	15	15	16	16	15	15	15	15	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 16
7	Es 15	Es 15	15	15	14	Es 15	Es 15	Es 15	15	15	15	15	15	15	15	14	15	15	Es 15	Es 14	Es 15	Es 15	Es 15	Es 15
8	Es 15	Es 15	15	15	14	Es 15	Es 15	Es 15	15	15	15	16	14	19	Ec 19	15	15	15	Ec 18	Es 15	Es 15	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	Ec 22	C	14	Es 14	Es 15	Es 15	Es 15	Es 14	Ec 17
10	Es 15	Es 15	C	15	C	Es 15	Es 15	Es 15	C	15	C	15	16	15	16	15	15	14	Es 15	Es 15	Es 15	Es 15	Es 15	15
11	Es 15	15	15	14	15	Es 14	Es 15	Es 15	15	15	15	15	16	16	16	15	14	13	Es 15	Es 15	Es 15	Es 15	Ec 22	Ec 16
12	Ec 14	Ec 15	Ec 14	Ec 14	Ec 15	Es 15	Es 15	Es 13	14	15	14	16	15	15	15	16	15	15	Es 15	Es 15	Es 15	Ec 16	Ec 15	Ec 15
13	Ec 15	Ec 15	Ec 15	Ec 16	Ec 13	Es 15	Es 15	Es 16	15	15	15	15	17	16	15	15	15	13	Es 15	Es 15	Es 15	13	Es 15	Es 15
14	Ec 15	Ec 15	Ec 15	Ec 15	Ec 14	Es 15	Es 15	Es 15	14	15	15	15	17	16	15	16	14	14	Es 14	Es 15	Es 15	Es 14	Ec 14	Ec 15
15	Ec 15	Ec 15	Ec 15	Ec 13	Ec 15	Ec 15	Es 15	Es 15	14	15	16	17	17	17	16	16	15	15	Es 15	Es 15	Ec 15	Es 15	C	Ec 15
16	Ec 16	Ec 16	15	C	Es 15	15	Es 15	C	15	15	16	17	15	15	15	14	15	15	Es 14	Es 15	Es 15	Es 15	Es 15	Es 15
17	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	14	14	15	15	15	15	15	14	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
18	Es 15	Es 15	Es 14	13	14	Es 15	Es 15	Es 14	13	14	15	15	15	15	15	15	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
19	Es 15	Es 15	Es 15	15	Es 15	Es 15	Es 15	Es 15	15	15	14	14	15	15	15	15	15	15	Es 14	Es 15	Es 15	Es 15	Es 15	Es 15
20	Es 15	Es 15	Es 15	14	14	Es 15	Es 15	Es 15	15	15	15	15	18	19	15	15	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
21	Es 15	Es 15	15	15	15	Es 15	Es 15	Es 15	15	14	15	14	15	15	15	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 14
22	Es 15	Es 15	15	14	14	Es 15	Es 15	Es 15	13	14	15	15	16	15	15	15	15	Es 14	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
23	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	15	14	15	15	15	15	15	15	15	Es 15	Es 14	Es 15	Es 15	Es 15	Es 15	Es 15
24	Es 15	Es 15	Es 15	15	15	Es 15	Es 15	Es 15	15	15	15	15	15	15	15	15	15	Es 14	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
25	Es 15	Es 14	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	15	15	14	15	16	15	15	14	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
26	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	15	15	15	15	C	C	15	15	15	13	Es 14	Es 13	Es 15	Es 15	Es 14	Es 15
27	Es 15	Es 14	Es 15	14	14	Es 15	Es 15	Es 15	15	15	15	17	15	15	15	15	13	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
28	Es 15	Es 14	Es 15	14	15	Es 14	Es 15	Es 15	15	15	15	20	22	15	16	15	14	Es 15	Es 15	Es 15	Es 14	Es 15	Es 15	Es 15
29	Es 15	Es 14	Es 14	15	15	Es 15	Es 15	Es 15	15	15	15	16	15	16	15	16	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
30	Es 15	Es 15	Es 15	14	15	15	Es 15	Es 15	15	14	15	15	15	15	15	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 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	28	28	27	27	28	28	29	28	28	29	28	29	28	28	30	30	28	29	30	29	30	28	27	28
MED	Es 15	Es 15	E 15	14	15	Es 15	Es 15	Es 15	15	15	15	15	15	15	15	15	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
UQ	Es 15	Es 15	15	15	15	Es 15	Es 15	Es 15	15	15	15	16	16	16	16	15	15	15	Es 15	Es 15	Es 15	Es 15	Es 15	Es 15
LQ	Es 15	Es 15	E 15	14	14	Es 15	Es 15	Es 15	14	15	15	15	15	15	15	15	15	Es 14	Es 14	Es 15	Es 15	Es 15	Es 15	Es 15

NOV. 1976 | F-MIN (0.1 MHZ)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | M(3000)F2 (0.01) | 135° E Mean Time (G. M. T. + 9 h)

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

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	280	A	300	305	345	A	285	355	340	345	350	350	335	345	350	370	I C 355	I C 360	365	C	A	C	I C 335	I C 350
2	C	C	C	C	F 335	I C 380	335	350	370	320	335	375	350	340	350	380	380	385	S 345	S 310	S 300	S 300	S 300	S 310
3	S 285	S 295	S 325	S 330	S 340	S 320	S 345	S 365	375	375	355	320	345	335	325	355	U S 345	370	A	A	325	305	320	315
4	S 285	305	305	320	385	A	295	350	360	355	325	340	365	355	335	340	A	A	A	305	315	S 335	350	310
5	305	320	290	310	S 350	350	315	370	385	345	345	350	S 370	S 340	335	S 350	370	390	375	A	310	S 335	325	320
6	305	310	325	310	355	345	265	360	365	360	365	365	345	315	350	360	385	390	365	365	295	345	335	320
7	315	315	295	310	340	S 350	330	380	385	365	320	335	S 355	335	360	365	380	370	350	360	370	300	315	315
8	310	300	295	310	S 360	S 380	335	365	385	370	340	H 335	C	345	335	375	C	375	A	325	340	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	315	360	C	S 365	S 375	S 345	S 285	S 335	S	S 290
10	I C 285	S 310	I C 300	S 285	I C 350	S 325	S 325	S 365	I C 375	335	C	345	335	H 325	345	370	365	S 365	390	A	285	325	S 315	290
11	295	300	S 315	330	340	335	345	S 365	360	325	320	330	335	325	355	345	365	365	355	H 295	305	310	300	290
12	U S 300	S 290	S 275	300	340	280	320	360	335	295	350	330	340	345	365	370	375	345	360	S 360	370	I C 315	A	J S 300
13	I S 300	S 300	A	330	U S 315	F 305	290	370	370	380	365	355	330	330	360	365	355	355	345	295	325	355	280	270
14	300	315	C 315	325	290	295	300	355	385	355	345	345	340	V 330	365	370	360	350	S 340	345	S 315	335	300	280
15	285	285	310	300	335	380	305	330	355	395	335	345	345	330	350	380	345	360	S 370	300	340	300	I C 300	295
16	J S 300	S 315	S 335	I C 320	S 320	S 325	335	I C 365	S 370	370	360	360	340	350	355	360	365	370	S 365	300	315	325	315	305
17	J S 295	J S 295	F	320	370	310	F 290	350	380	350	345	345	345	345	365	380	375	370	S 330	325	S 345	325	315	310
18	300	295	325	340	315	300	295	355	375	365	360	350	A	355	345	350	380	385	S 345	295	325	335	305	S 305
19	325	320	S 320	315	320	305	335	365	385	360	365	365	350	340	365	345	365	S 365	345	315	320	S 315	305	285
20	A	285	285	325	345	310	320	385	375	340	370	355	330	H 340	355	365	365	355	370	305	S 295	315	320	285
21	300	320	325	315	325	320	335	345	385	390	365	345	335	345	365	365	355	365	315	305	325	300	280	295
22	300	310	295	300	345	295	310	355	395	390	V 365	350	360	345	350	350	370	380	S 360	S 300	S 305	S 290	305	S 265
23	A	S 300	S 320	U S 325	350	310	320	365	370	370	335	350	350	335	345	360	380	365	355	340	330	A	A	305
24	S 310	J S 310	F 315	S 315	U S 355	385	300	345	370	375	355	345	365	355	370	375	365	375	360	295	U S 305	I S 370	F 330	F 305
25	U S 345	S 310	300	320	325	F 315	S 380	350	380	355	360	345	350	360	375	365	365	375	375	335	295	295	300	285
26	295	S 300	300	330	315	S 285	F 295	330	365	355	350	355	C	C	360	355	350	345	360	315	300	J S 300	295	320
27	295	275	290	285	325	295	310	355	360	355	355	350	365	335	350	360	V 365	390	310	360	330	295	315	305
28	305	285	285	295	325	295	330	360	385	350	335	355	340	335	V 335	370	375	375	A	335	330	310	305	S 280
29	290	305	300	315	315	285	330	355	345	365	340	375	355	365	355	V 355	385	360	320	S 305	S 335	S 345	F	S 260
30	S 290	F	S 295	S 295	A	S 305	305	S 335	365	360	375	365	350	360	375	340	355	385	325	355	S 325	335	315	285
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	26	28	28	27	29	29	29	29	28	29	26	28	30	30	27	29	26	26	29	27	25	29
MED	300	302	300	315	340	310	320	355	370	360	350	350	345	340	352	362	365	370	358	315	320	315	315	300
UQ	305	310	320	325	350	340	335	365	385	370	362	355	355	348	365	370	375	375	365	345	330	335	320	310
LQ	290	295	295	302	322	298	300	350	365	350	338	345	340	335	345	355	358	360	345	300	305	300	300	285

The Radio Research Laboratories, Japan

NOV. 1976 | M(3000)F2 (0.01)

IONOSPHERIC DATA

NOV. 1976 | M(3000)F1 (0.01) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	C	C	C	L	L	C	C						
2									L	L	L	L	L	A	A	L	A							
3									L	A	L 370	L	A	A	U L 355	L	A							
4										L	U L 400	L 355	L	430	U L 355	L	A							
5									L	U L 420	L 350	L 365	L	U L 365	L	L	L							
6									L	L	U L 360	L	L 415	L 365	L	A	L							
7									L	L	L	L	L	L	H 390	L	L							
8									L	L	L	L	L	L	L	A	L							
9									C	C	C	C	C	C	C	L	C							
10										L 380	I C 370	L 370	U L 385	400	385	L	430							
11											L	L	L 360	L	L 365	L	L							
12										L	L	A	L	L	U L 375	A	L							
13									L	A	A	L	L	L	L	L								
14										L	L	L	L	L	L	A	L							
15									L	L	L	L	L	L	L	L	L							
16										L	L	U L 425	L	L	L	L	L							
17									L	L 425	L	U L 355	L	L 360	L	L	L							
18											L 390	L	A	U L 365	L	L	425							
19									L	L 425	L	L 380	L	L 375	L 380	L	A							
20									L	L 435	L	L	L	L	L	L								
21										L	L	L	L	L 395	L	L	L							
22										L	A	A	A	L	L	L	A							
23									L		L	L	L 365	A	L	L	435	445						
24												L 395	L 385	L 380	L	L								
25										L	L	A	A	A	A	A	A							
26										L	L	A	C	C	L 375	L	A							
27										L	L	L	L	L	L	L	L							
28										A	L 420	L 360	L 370	L 360	L	L	R 420							
29										L	L	A	L	L	L	A	A	L 445						
30										A	L	U L 360	L	U L 380	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										5	7	9	6	11	8		4	2						
MED										L 425	L 370	L 365	L 378	L 375	L 375		428	445						
UQ										L 425	L 395	L 380	L 385	L 388	L 382		432							
LQ										L 420	L 365	L 360	L 365	L 365	L 360		422							

NOV. 1976 | M(3000)F1 (0.01)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | H'F2 (KM) | 135° E Mean Time (G. M. T. + 9 h)

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

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									250	250	250	250	E C 285	270	245	240	I C 225	I C 210						
2									230	325	260	240	285	265	250	225	215							
3									220	225	250	250	250	270	275	230	220							
4										250	250	260	235	240	255	250	A							
5									210	230	270	250	230	275	250	235	210							
6									220	240	255	235	235	340	250	245	220							
7									220	240	295	255	245	255	240	240	230							
8									220	250	255	235	260	255	275	240	230							
9									C	C	C	C	C	C	300	230	C							
10										270	C	250	250	255	250	230	215							
11											275	250	265	250	245	230	215							
12										250	250	255	240	260	230	215	215							
13									205	220	230	240	275	270	235	235								
14										230	240	265	250	250	245	240	235							
15									230	220	255	245	245	245	245	225	215							
16										225	240	240	265	255	250	235	225							
17									210	230	265	250	250	255	240	225	210							
18											245	270	A	245	255	245	220							
19									210	240	245	245	250	275	245	250	225							
20									210	210	230	255	270	240	255	225								
21										220	240	250	255	260	235	230	225							
22										225	240	255	250	250	250	245	230							
23									220		250	250	255	270	250	230	215	205						
24												250	245	250	235	230								
25										250	240	255	250	250	235	230	235							
26										230	250	245	C	C	245	235	225							
27										230	245	250	250	250	245	245	210							
28										205	240	245	240	255	245	225	215							
29										235	245	230	240	245	240	240	215	200						
30										250	230	240	240	240	230	235								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									13	25	27	29	27	28	30	30	24	3						
MED									220	230	250	250	250	255	245	235	220	205						
UQ									220	250	255	255	256	268	250	240	225	208						
LQ									210	225	240	245	242	250	240	230	215	202						

The Radio Research Laboratories, Japan

NOV. 1976 | H'F2 (KM)

IONOSPHERIC DATA

NOV. 1976 | H'F (KM) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	310	A	250	245	230	A	Es 300	240	225	225	Ea 245	C	C	C	210	230	Ic 225	Ic 205	205	C	A	C	Ic 240	Ic 225
2	C	C	C	C	230	Ic 200	220	220	210	H 175	225	A	Ea 230	A	A	210	A	205	200	250	275	Ea 290	270	260
3	Ea 300	270	250	235	250	235	220	H 215	205	Ea 220	215	Ea 240	A	A	Ea 250	A	A	220	A	A	Ea 300	270	255	260
4	310	270	300	250	205	A	A	230	220	215	215	H 200	235	190	H 175	220	A	A	A	Ea 275	275	220	220	270
5	280	270	300	275	230	195	270	205	200	200	H 205	200	H 185	205	220	H 180	215	205	195	A	Ea 310	Ea 270	250	260
6	275	270	250	250	220	200	Es 350	220	205	H 190	200	235	200	220	A	A	Ea 220	200	200	210	285	225	220	250
7	260	255	285	270	245	210	210	225	210	200	H 190	H 200	H 180	H 190	H 185	H 170	225	200	205	205	205	290	270	260
8	270	270	290	260	220	190	250	220	H 205	H 200	195	230	Ec 250	A	A	A	A	205	A	Ea 270	230	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	Ea 235	C	205	200	210	275	250	205	Ec 300
10	Ec 300	280	Ic 290	290	C	Ea 275	Ea 280	210	Ic 205	205	C	220	A	225	225	H 205	185	220	200	A	Ea 300	255	260	Ea 315
11	Ea 330	295	250	250	225	230	225	210	205	230	200	A	Ea 250	230	210	220	200	205	195	H 225	230	275	Ec 300	300
12	325	295	305	295	210	300	250	205	230	240	A	A	A	220	220	A	200	220	205	205	200	250	A	270
13	A	295	A	265	265	285	270	235	205	A	A	195	H 180	H 175	220	220	215	225	210	215	240	205	330	325
14	295	250	250	250	245	270	275	225	210	225	225	Ea 255	H 185	200	245	A	200	205	205	215	230	230	255	315
15	300	300	260	270	230	200	Es 300	245	215	H 205	200	200	195	H 200	H 195	H 185	205	215	190	Ea 300	230	Es 300	Ic 270	300
16	265	270	250	Ic 260	250	250	240	Ic 215	H 220	220	H 185	180	H 175	H 180	205	220	220	215	190	250	245	250	255	285
17	300	325	310	235	200	255	250	215	210	200	200	190	H 200	H 180	H 200	225	205	210	205	250	205	250	245	275
18	270	285	250	235	250	295	295	225	205	225	H 200	H 200	A	200	H 185	205	200	200	195	230	250	225	260	275
19	255	255	255	255	245	250	230	225	210	200	220	200	H 200	205	205	220	A	H 200	215	205	220	245	250	250
20	A	295	300	250	225	245	245	215	220	200	200	200	215	220	205	H 200	220	205	205	200	245	220	220	295
21	295	245	240	255	240	250	220	210	220	200	200	H 200	H 200	210	225	230	200	200	205	200	Ea 300	250	300	285
22	265	270	280	260	225	Es 250	Es 250	205	205	195	A	A	A	220	225	220	A	200	200	Ea 305	275	300	270	300
23	A	255	270	245	250	Es 225	Es 250	215	215	220	H 205	A	220	A	A	220	200	200	195	225	225	A	A	285
24	275	290	295	265	200	215	Es 350	220	220	225	230	200	215	220	200	210	220	205	205	300	265	210	255	300
25	250	270	270	250	250	260	200	225	220	220	H 210	Ea 250	A	A	A	A	A	210	200	225	Es 300	275	275	295
26	300	285	280	220	285	305	250	235	215	225	245	A	C	C	200	220	A	210	215	225	A	250	250	250
27	290	300	320	300	240	Es 315	260	225	230	H 200	H 235	220	225	H 220	H 195	200	225	200	225	200	230	250	260	255
28	250	295	300	300	240	250	240	210	215	A	200	200	H 200	220	215	220	200	205	A	220	210	Es 250	255	295
29	285	255	275	275	250	285	230	205	215	225	215	A	205	200	A	A	A	180	200	Es 245	215	200	Es 290	Es 320
30	300	280	300	300	A	230	Es 300	225	220	A	225	200	A	200	200	205	230	205	200	205	255	230	245	335
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	27	27	28	27	27	28	29	29	26	25	21	20	22	23	23	20	29	26	26	28	27	27	29
MED	282	270	280	258	240	242	239	220	215	208	205	200	200	205	205	220	208	205	200	218	238	248	255	280
UQ	300	295	300	272	250	265	U 264	225	220	225	222	210	210	220	220	220	220	210	205	U 238	264	260	268	298
LQ	270	270	250	250	225	212	226	210	205	200	200	200	H 190	200	200	205	200	200	200	205	228	226	248	260

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IONOSPHERIC DATA

NOV. 1976 | H'E (KM) | 135° E Mean Time (G. M. T. + 9 h)

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

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							S	S	105	100	100	100	C	C	C	C	I C 110	I C 110	C					
2							S	S	105	E A 115	A	E A 110	E A 115	E A 115	E A 115	A	A	A	S					
3							S	S	E A 110	100	105	100	100	A	A	A	A	A	S					
4							S	S	110	100	105	E A 120	A	E A 130	E A 120	E A 125	A	A	S					
5							S	S	105	100	105	105	100	105	A	E A 125	A	A	S					
6							S	S	105	A	A	A	E A 125	A	A	105	110	A	S					
7							S	S	105	105	E A 130	E A 120	105	105	105	105	110	B	S					
8							S	S	A	105	100	100	100	100	100	100	A	A	C					
9							C	C	C	C	C	C	C	C	105	110	C	A	S					
10							S	S	C	105	C	100	100	100	105	105	E A 110	A	S					
11							S	S	110	100	100	100	100	A	100	E A 120	105	A	S					
12							S	S	110	105	105	100	100	100	105	105	A	B	S					
13							S	S	120	E A 115	E A 110	E A 110	100	100	100	105	A	A	S					
14							S	S	110	105	105	105	105	105	105	105	A	A	S					
15							S	S	110	100	E A 115	A	A	E A 115	E A 110	E A 110	105	A	S					
16							S	C	110	105	105	105	105	A	A	A	A	A	S					
17							S	S	105	105	105	105	100	E A 120	105	E A 110	105	A	S					
18							S	S	105	105	105	100	100	100	100	105	105	125	S					
19							S	S	105	E A 110	E A 105	E A 105	100	A	A	A	A	B	S					
20							S	S	110	105	A	A	A	A	E A 110	E A 105	A	B	S					
21							S	S	115	E A 110	E A 110	E A 110	A	A	E A 110	E A 105	110	S	S					
22							S	S	E A 115	E A 120	A	E A 115	E A 110	E A 115	E A 115	E A 110	E A 120	S	S					
23							S	S	105	105	105	105	100	100	105	105	105	S	S					
24							S	S	110	105	105	105	105	100	A	A	A	A	S					
25							S	S	110	105	105	105	105	105	105	A	A	S	S					
26							S	S	110	105	100	100	C	C	105	105	105	A	S					
27							S	S	110	105	100	100	100	A	E A 105	E A 105	E A 115	S	S					
28							S	S	110	105	100	105	105	105	105	105	A	S	S					
29							S	S	115	105	105	100	A	A	A	A	A	S	S					
30							S	S	105	105	105	A	105	105	A	A	E A 115	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									27	28	24	25	22	18	21	21	14	2						
MED									110	105	105	102	100	102	102	105	108	118						
UQ									110	105	105	105	105	E A 115	E A 110	E A 110	110							
LQ									105	105	101	100	100	100	105	105	105							

The Radio Research Laboratories, Japan

NOV. 1976 | H'E (KM)

IONOSPHERIC DATA

NOV. 1976 | H'ES (KM) | 135° E Mean Time (G. M. T. + 9 h)

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

Day \ Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	100	100	100	100	100	100	145	120	110	110	110	110	110	110	110	C	C	C	C	135	C	C	C
2	C	C	C	C	B	C	S	150	150	140	100	150	150	140	130	130	100	100	100	100	95	100	105	105
3	100	100	100	100	B	100	100	100	100	110	110	105	100	100	100	100	100	100	100	100	100	100	100	100
4	100	100	100	100	100	100	100	100	100	130	120	120	130	100	100	170	95	100	95	95	95	95	90	S
5	S	100	100	100	100	S	S	S	115	105	105	120	G	110	150	100	100	100	100	100	100	100	S	100
6	100	100	B	100	100	S	S	S	G	105	100	100	100	100	100	120	115	110	110	105	100	95	S	S
7	S	S	B	B	B	S	100	135	150	G	105	105	100	130	115	100	150	135	120	110	S	S	S	S
8	S	S	B	B	B	S	S	S	105	120	110	115	110	110	105	105	105	100	100	100	S	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	110	140	C	100	100	100	100	S	S	C
10	100	S	C	100	C	100	100	100	C	120	C	110	110	G	135	G	100	100	100	100	110	115	110	105
11	95	95	100	100	105	100	100	130	130	120	110	105	105	100	105	105	G	100	S	S	S	S	C	C
12	100	100	C	C	100	100	100	135	120	120	120	115	105	115	110	105	105	105	100	S	S	100	100	100
13	100	100	100	100	100	100	100	S	125	115	110	110	110	115	110	110	105	100	100	100	100	120	100	100
14	C	C	C	C	C	S	S	S	G	125	110	105	105	110	105	100	100	100	100	S	S	100	100	100
15	C	C	C	C	C	C	S	S	G	105	160	105	105	100	100	100	G	100	100	100	100	100	C	C
16	C	C	B	C	100	100	S	C	G	120	105	105	105	100	100	100	100	100	100	S	S	S	S	S
17	S	S	110	120	S	S	S	S	120	110	110	110	105	100	100	100	G	100	100	100	100	100	100	S
18	S	S	100	100	B	S	S	120	115	110	110	165	105	G	G	G	135	100	100	100	100	S	S	S
19	S	S	S	B	S	100	100	S	G	100	105	105	105	100	100	105	105	105	100	100	105	110	100	S
20	100	100	100	B	100	100	100	S	150	105	100	100	100	100	100	100	100	100	100	S	S	S	S	S
21	S	S	B	B	B	S	100	100	145	150	150	165	150	100	120	150	120	100	100	100	100	100	100	100
22	110	S	B	B	B	S	S	S	150	155	130	125	120	165	155	150	150	130	100	105	105	135	125	105
23	105	S	110	105	100	S	S	130	125	120	120	110	105	105	105	105	G	S	S	125	105	120	100	95
24	105	105	100	B	B	110	S	S	125	125	125	105	105	105	100	100	100	100	100	100	100	S	S	S
25	105	105	100	S	S	S	S	S	G	130	115	110	105	105	105	100	100	100	100	100	100	S	S	S
26	S	S	105	105	100	100	100	S	G	145	105	105	C	C	105	105	105	100	100	100	100	100	100	S
27	S	S	S	B	B	S	S	100	G	G	155	125	115	100	100	100	100	100	95	S	S	S	S	S
28	S	S	S	B	B	S	S	S	110	120	110	105	105	105	105	110	105	S	100	140	135	S	S	S
29	100	S	S	B	B	S	S	S	G	145	115	105	100	100	100	100	100	S	100	S	S	S	S	100
30	100	100	100	100	100	100	S	150	105	105	105	105	105	105	100	100	100	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	15	12	14	13	12	13	12	13	19	27	28	29	27	26	29	28	24	25	26	21	20	16	13	11
MED	100	100	100	100	100	100	100	130	120	120	110	110	105	105	105	105	100	100	100	100	100	100	100	100
UQ	102	100	100	100	100	100	100	135	138	128	120	115	110	110	110	110	105	100	100	100	105	112	100	102
LQ	100	100	100	100	100	100	100	100	112	110	105	105	105	100	100	100	100	100	100	100	100	100	100	100

NOV. 1976 | H'ES (KM)

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

NOV. 1976 | TYPES OF ES | 135° E Mean Time (G. M. T. + 9 h)

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

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	F 1	F 2	F 3	F 1	F 2	F 3	L 1	H 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1					F 2			
2								H 1	H 1	HL 11	L 1	HL 11	HL 11	HL 11	HL 21	HL 11	L 4	L 2	L 5	F 3	F 3	FF 23	FF 12	FF 12
3	F 2	F 2	F 2	F 1		F 1	L 1	L 1	L 2	C 2	CL 31	C 2	C 3	L 3	L 2	L 2	L 4	L 7	L 6	F 3	F 4	F 2	F 2	F 1
4	F 2	F 3	F 3	F 1	F 3	F 3	L 2	L 1	L 1	H 1	CL 12	CL 11	HL 11	L 1	L 2	HL 11	L 4	L 5	L 7	F 5	F 3	F 3	F 1	
5		F 1	F 2	F 1	F 1				C 2	C 1	C 1	C 1		C 1	HL 12	L 1	LH 21	L 2	L 4	F 4	F 3	F 3		F 2
6	F 1	F 1		F 1	F 1					L 2	L 1	LH 21	LH 21	LH 21	LH 22	HL 41	C 1	C 2	LL 21	FF 21	F 2	F 1		
7							L 1	H 2	H 1		L 1	L 1	L 1	HL 11	CL 11	L 1	H 1	H 1	C 2	FF 41				
8									L 1	C 2	C 1	C 2	C 1	C 1	C 2	C 2	L 1	L 1	L 2	F 2				
9															C 1	H 1		L 2	L 1	F 1	F 1			
10	F 1			F 1		F 3	L 3	L 2		C 1		C 2	C 2		HC 11		L 1	L 8	L 7	F 3	FF 13	FF 21	FF 11	FF 13
11	F 4	F 2	F 1	F 1	F 1	F 3	L 1	H 2	H 1	C 2	C 1	C 1	C 2	L 1	L 1	L 1		L 2						
12	F 4	F 2			F 4	F 1	L 1	C 1	C 1	C 1	C 3	C 2	C 2	C 2	C 2	C 4	L 2	L 1	L 1			F 1	F 2	F 2
13	F 1	F 2	F 4	F 2	F 3	F 2	L 2		H 1	CL 41	CL 21	CL 11	C 2	C 1	C 2	C 1	L 1	L 1	L 1	F 2	F 1	F 1	F 1	F 1
14										H 1	C 3	C 2	C 1	C 1	C 2	C 3	L 2	L 3	L 4			F 1	F 1	F 1
15										C 1	HL 11	L 1	L 1	L 1	L 1	L 1		L 1	L 1	F 2	F 1	F 1		
16					F 2	F 1				C 1	C 2	C 1	C 3	L 2	L 3	L 2	L 2	L 2	L 1					
17			F 1	F 1					C 2	C 2	C 2	C 1	C 2	L 1	L 1	L 1		L 2	L 1	F 2	F 1	F 1	F 1	
18			F 1	F 1				C 1	C 2	C 2	C 2	H 1	C 3				H 1	L 1	L 1	F 1	F 2			
19						F 2	L 1			L 1	CL 21	CL 11	C 2	L 1	L 1	L 3	LL 41	L 1	L 1	F 3	F 2	FF 21	F 2	
20	F 2	F 1	F 1		F 1	F 1	L 1		H 2	C 2	L 4	L 2	L 2	L 1	L 1	L 2	L 3	L 1	L 2					
21							L 2	L 1	H 2	HL 11	HL 11	HL 11	HL 11	LC 11	CL 11	HL 11	C 2	L 1	L 2	F 2	F 5	F 4	F 5	F 2
22	FF 11								HL 21	HL 12	HL 21	CL 21	CL 21	HL 11	HL 11	HL 11	HL 21	CL 11	L 1	F 6	FF 42	FF 12	F 5	F 6
23	F 4		F 5	F 3	F 2			C 1	C 1	H 1	H 1	C 2	C 2	C 2	C 4	C 1				F 2	F 1	FF 13	F 4	F 2
24	FF 11	F 2	F 1			F 2			H 3	H 3	H 1	C 2	C 2	C 2	L 2	L 2	L 3	L 3	L 1	F 1	F 1			
25	F 1	F 2	F 2							H 1	C 2	C 2	C 2	C 3	C 3	L 3	L 3	L 2	L 1	F 1	F 1			
26			F 3	F 1	F 2	F 2	L 1			H 3	C 2	C 2			C 1	C 1	L 5	L 3	L 6	F 2	F 2	F 1	F 1	
27								L 1			H 1	H 1	C 1	L 2	L 1	L 1	L 1	L 1	L 1					
28									C 2	C 1	C 1	C 1	C 1	C 1	C 1	C 1	L 2		L 3	F 1	F 1			
29	F 1									H 1	C 2	C 2	L 2	L 2	L 2	L 3	L 1		L 1					F 1
30	F 2	F 2	F 2	F 2	F 3	F 2		C 1	C 2	C 3	C 1	L 2	C 3	C 3	L 4	L 2	L 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																								

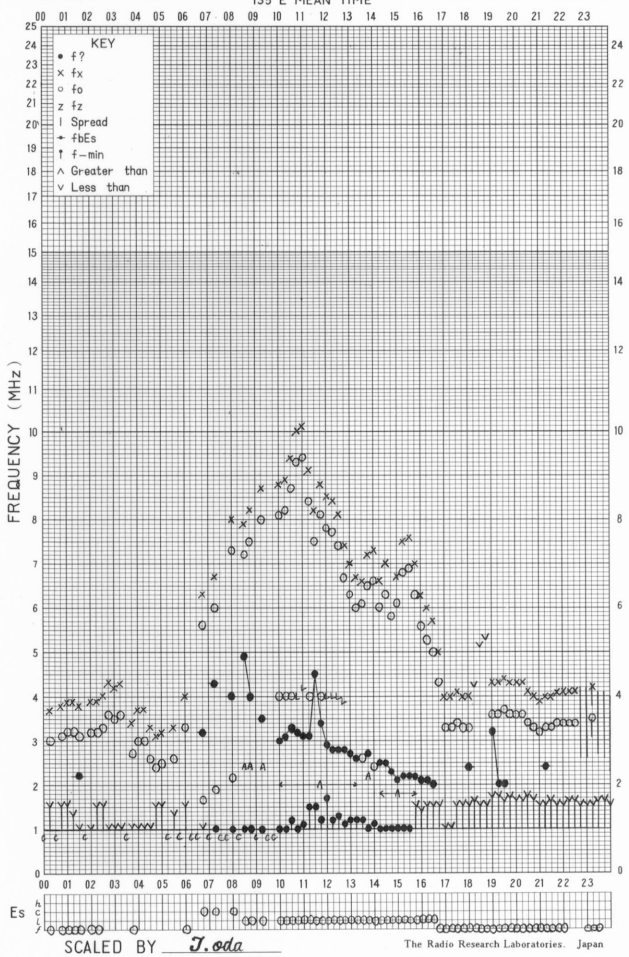
The Radio Research Laboratories, Japan

NOV. 1976 | TYPES OF ES

f-PLOTS OF IONOSPHERIC DATA

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV 1 1976

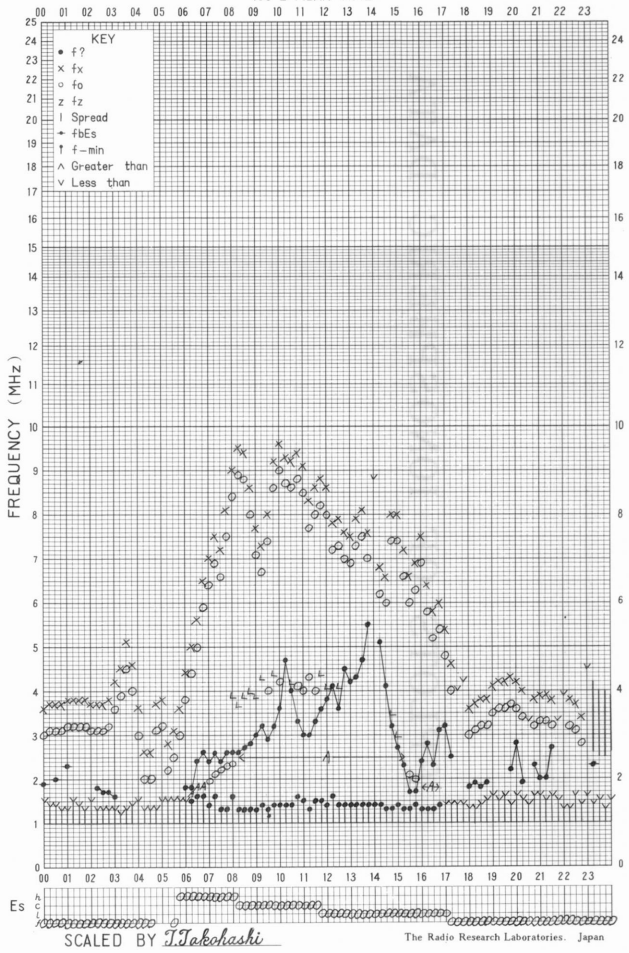


SCALED BY J. oda

The Radio Research Laboratories. Japan

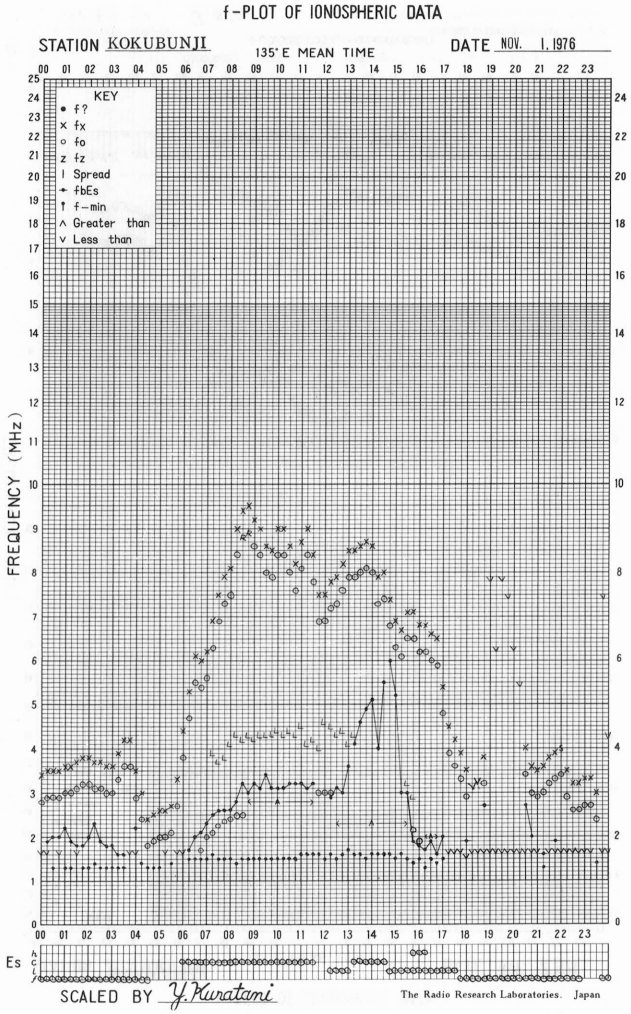
f-PLOT OF IONOSPHERIC DATA

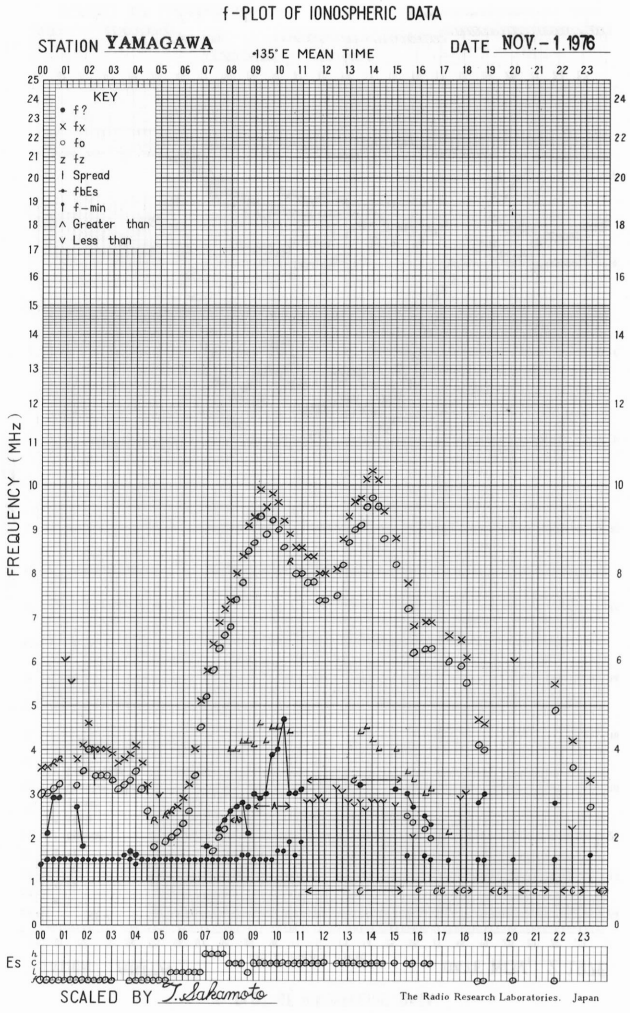
STATION AKITA 135°E MEAN TIME DATE NOV, 1, 1976

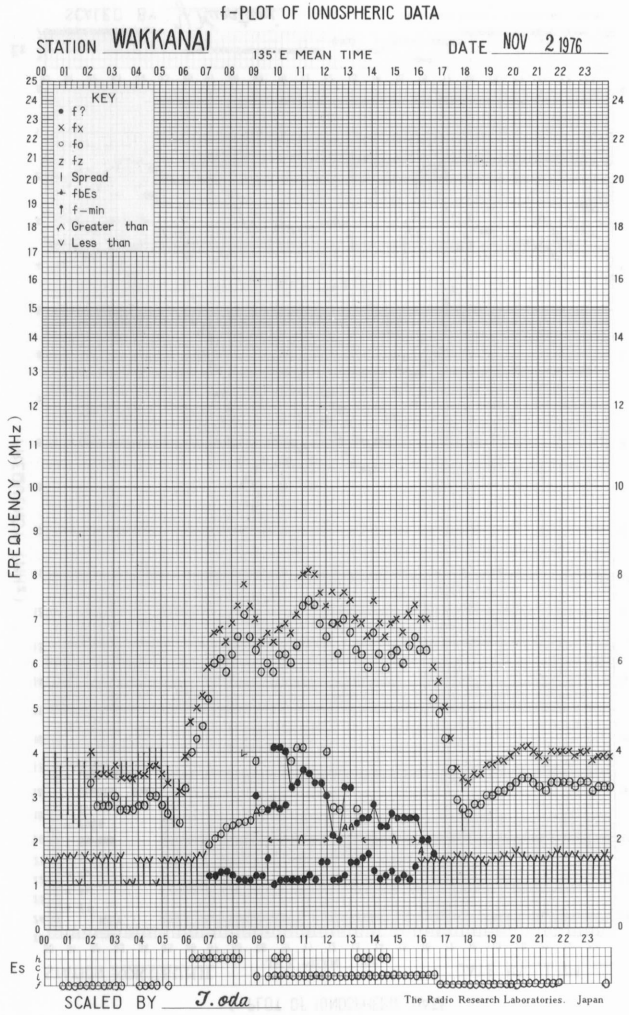


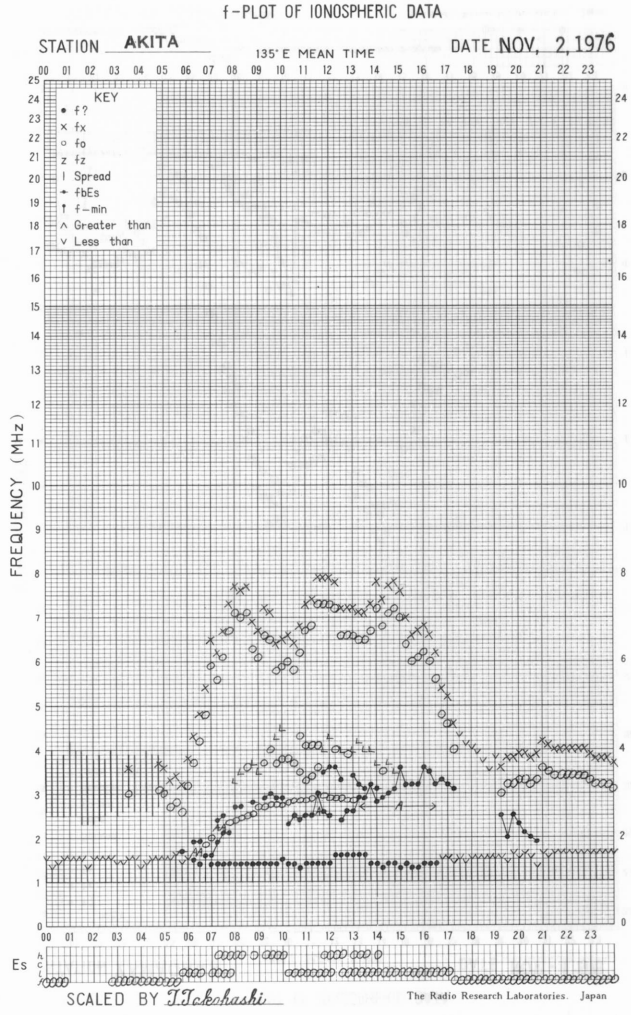
SCALED BY T. Takahashi

The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE NOV. 1, 1976
KEY
• f?
× fx
○ fo
z fz
! Spread
⌁ fbEs
† f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan

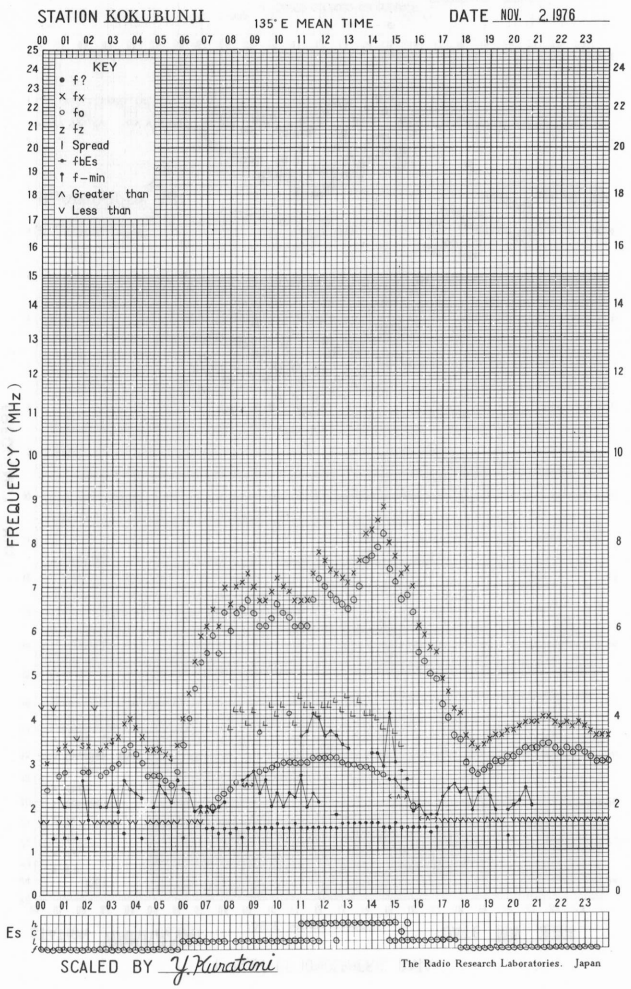

f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE NOV.-1, 1976
KEY
• f?
× fx
○ fo
z fz
! Spread
⌁ fbEs
† f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Sakamoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE NOV 2 1976
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, 1976
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 2, 1976



SCALED BY Y. Kuratani

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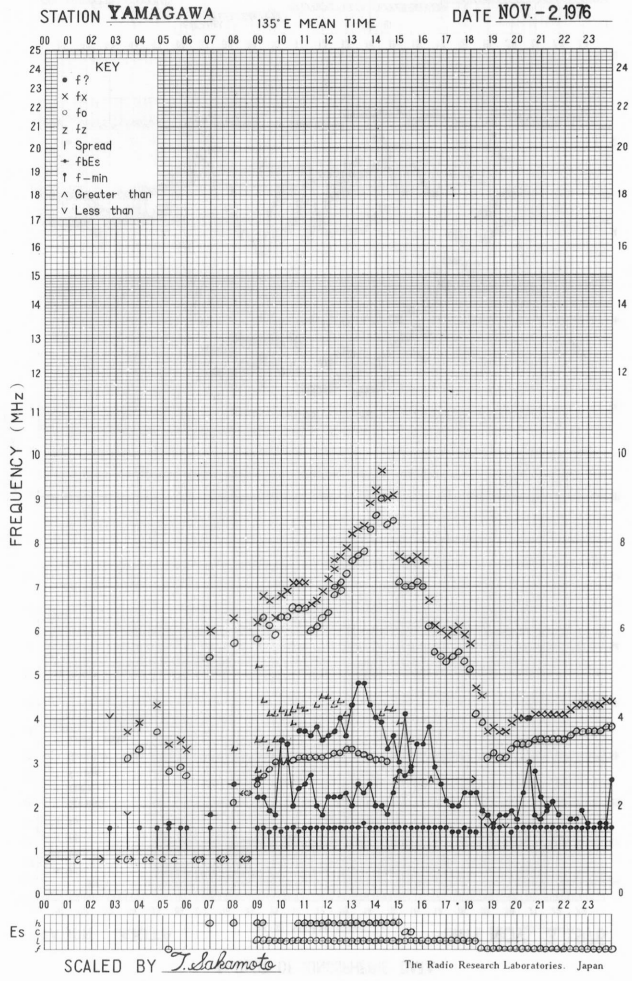
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV.-2, 1976



SCALED BY T. Takamoto

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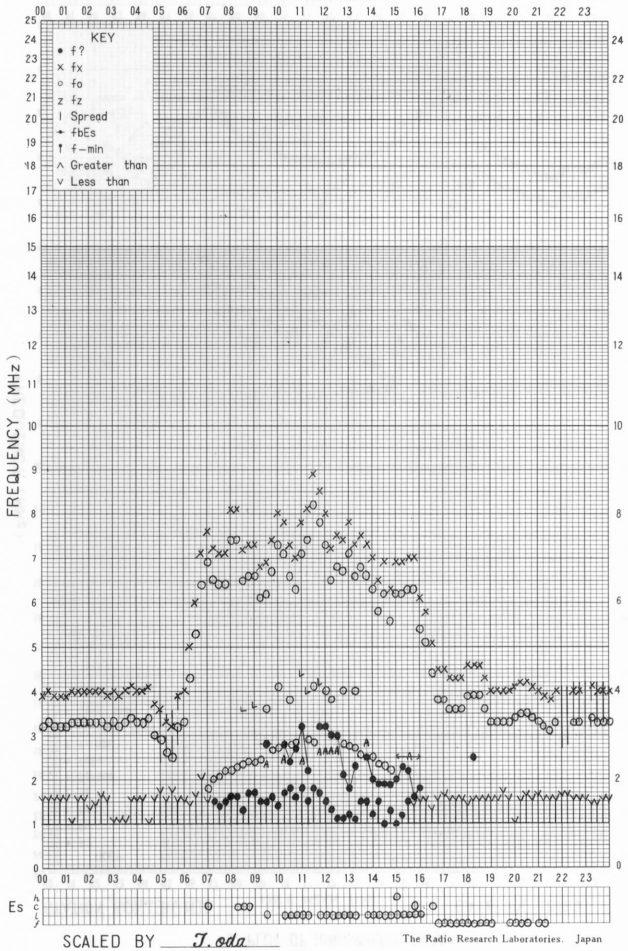
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV 3 1976



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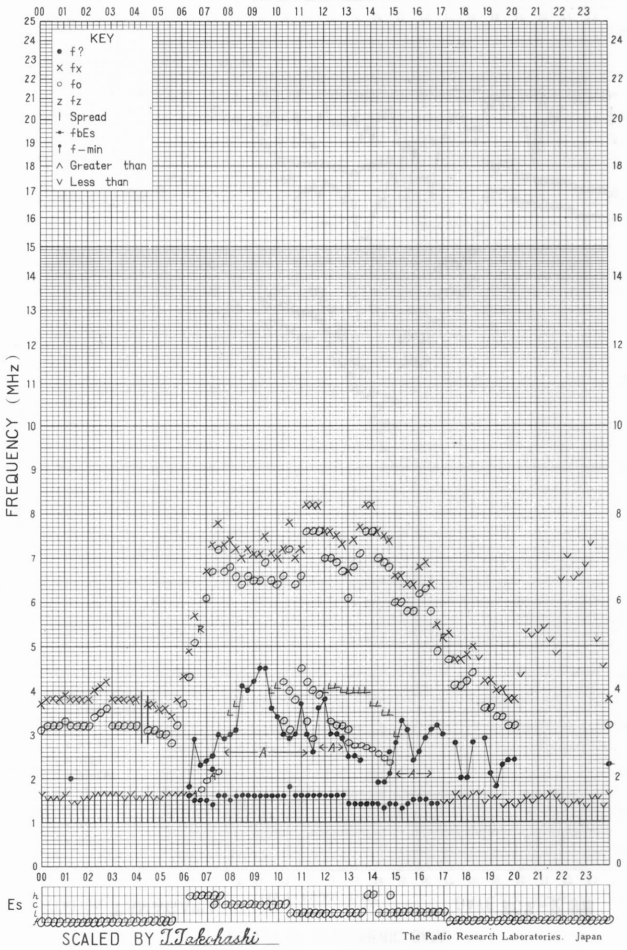
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE NOV, 3, 1976



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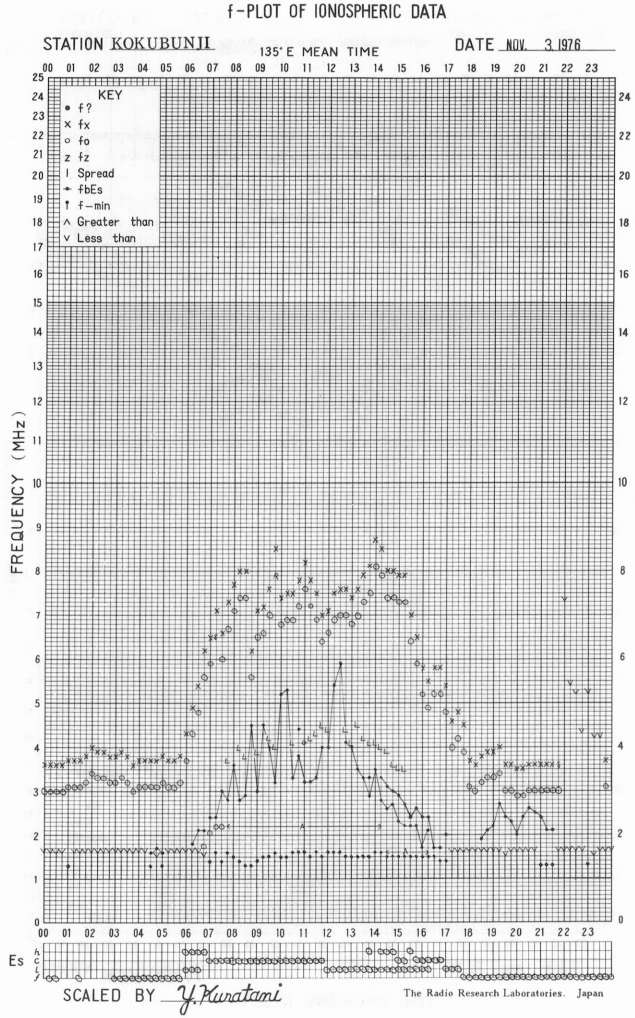
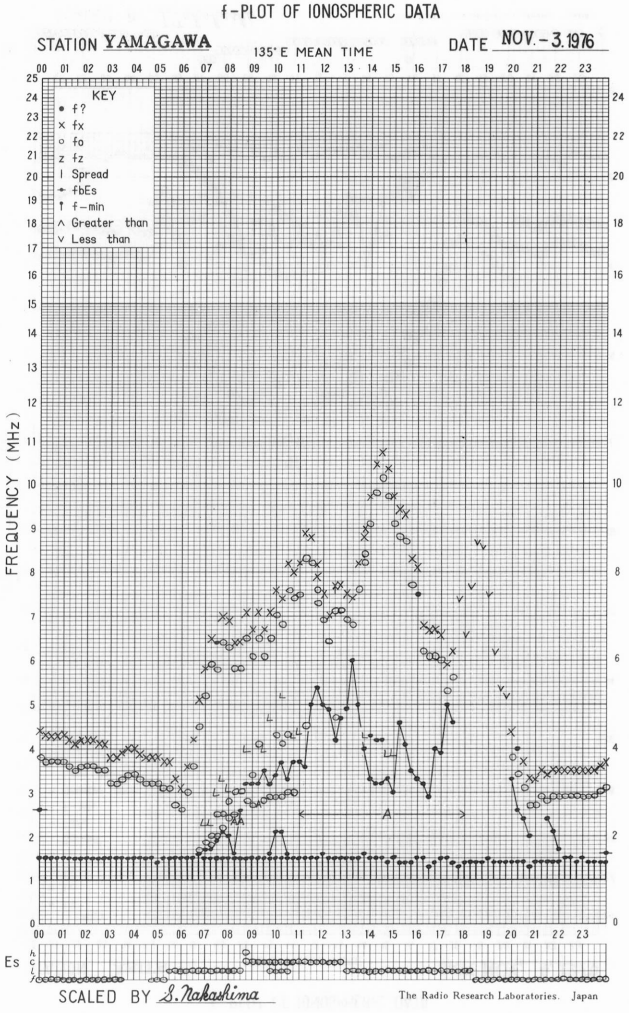

f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE NOV. 3 1976
KEY
f?
fx
fo
fz
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan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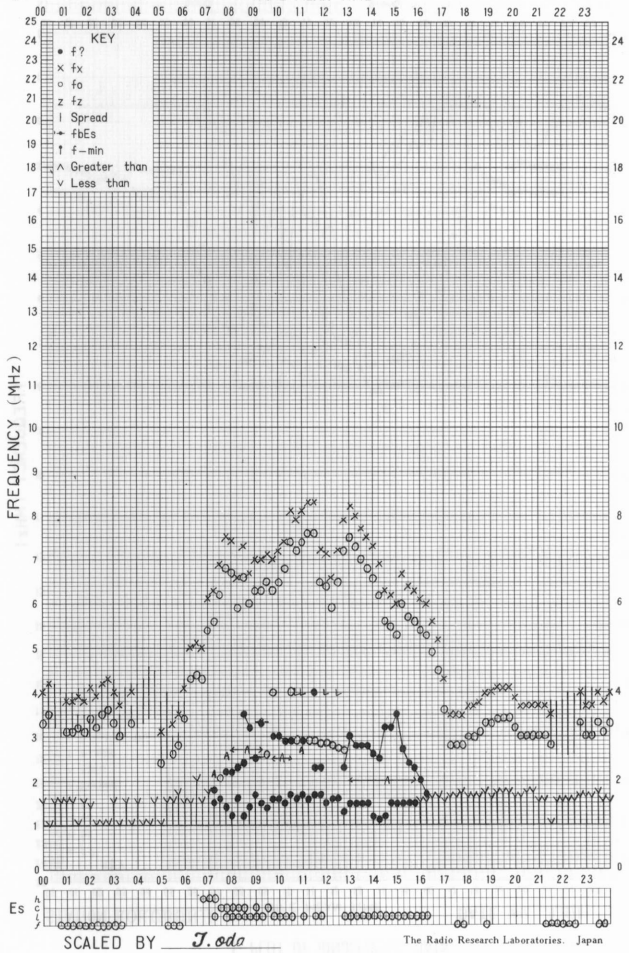
STATION YAMAGAWA
135°E MEAN TIME
DATE NOV.-3.1976
KEY
f?
fx
fo
fz
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV 4 1976



SCALED BY J. odo

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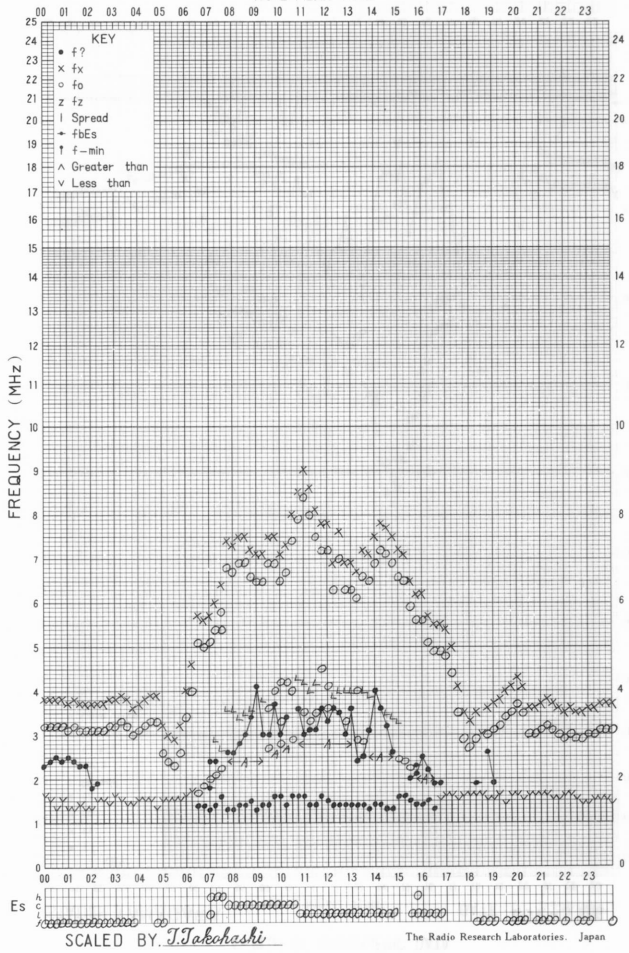
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE NOV, 4, 1976

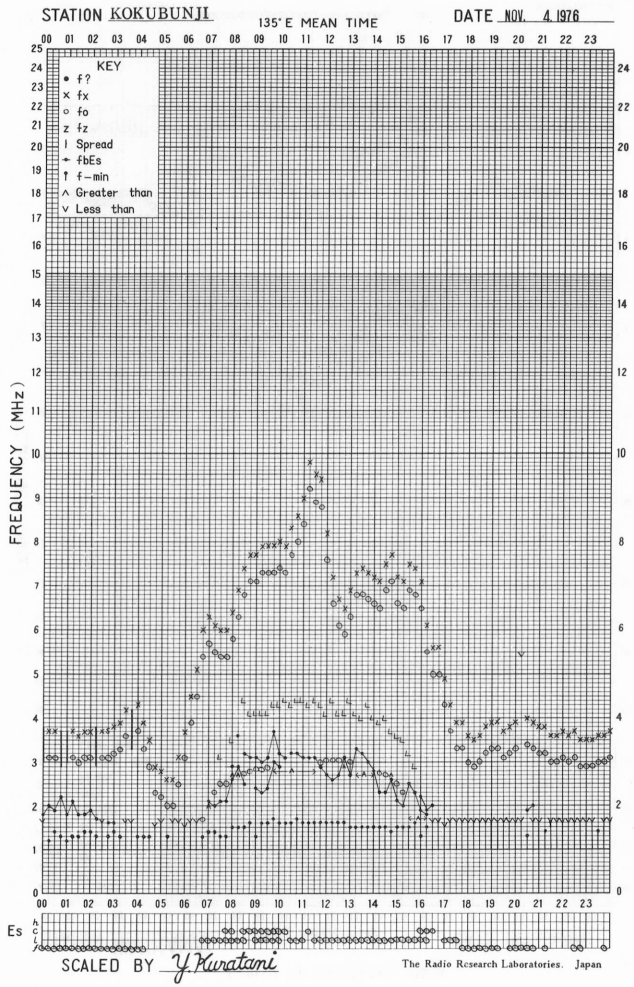


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 4. 1976



SCALED BY Y. Kuratani

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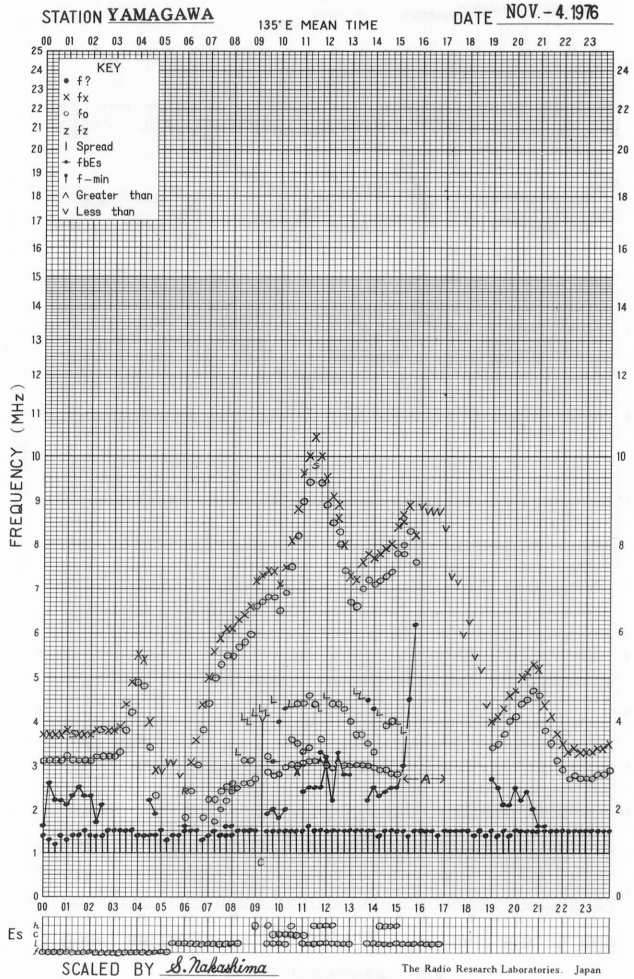
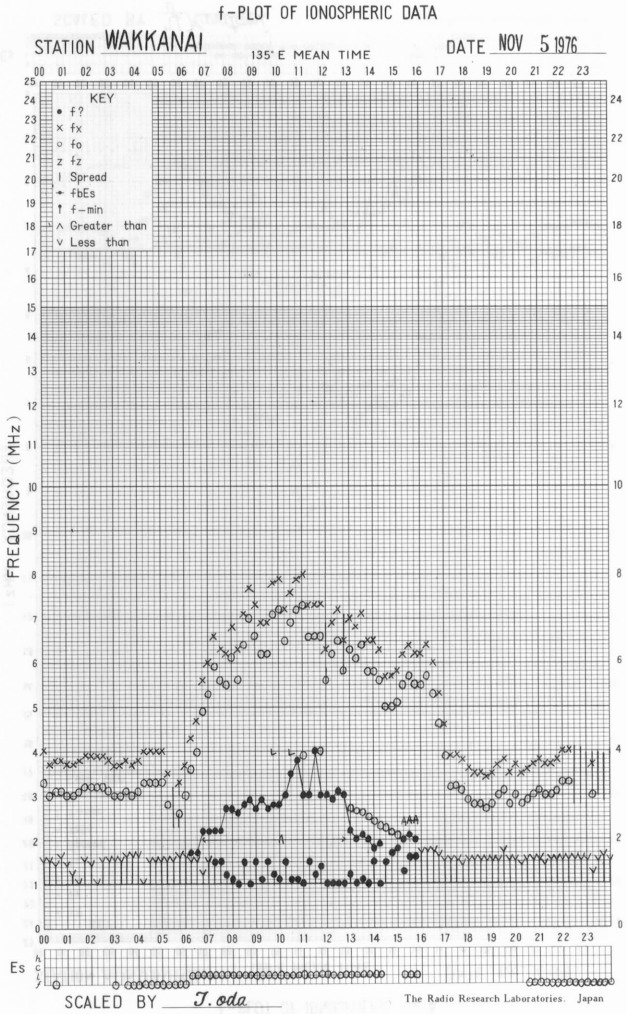
f-PLOT OF IONOSPHERIC DATA

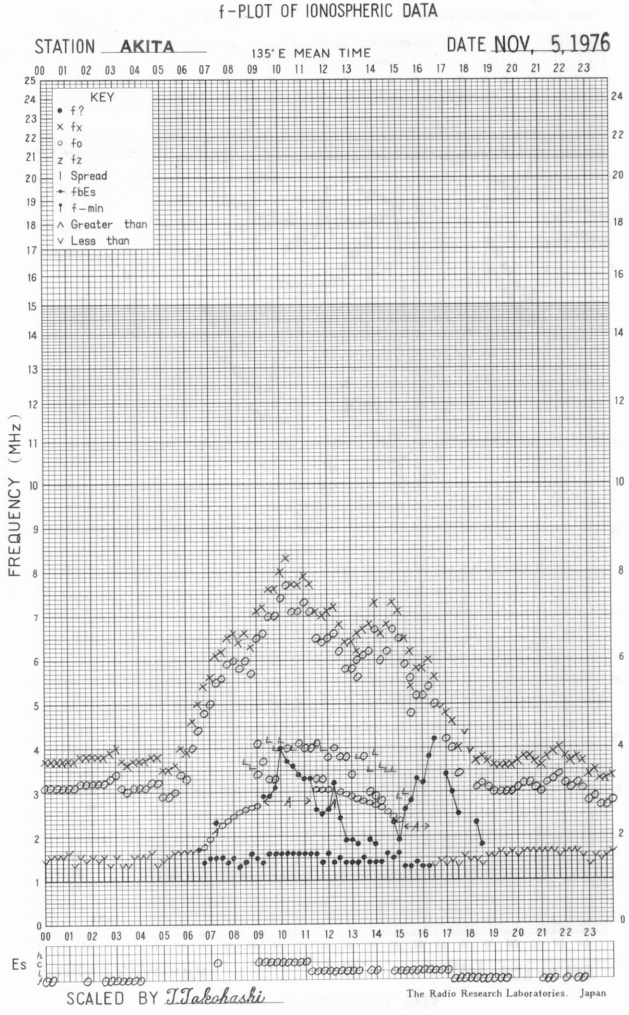
STATION YAMAGAWA 135°E MEAN TIME DATE NOV.-4.1976



SCALED BY S. Nakashima

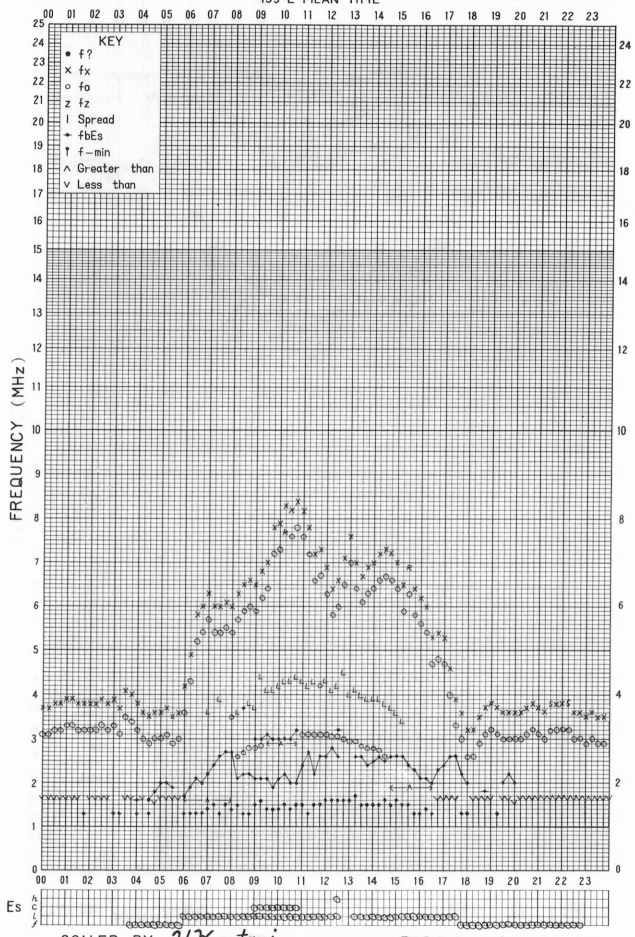
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE NOV 5 1976
KEY
f?
fx
fo
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, 5, 1976
KEY
f?
fx
fo
fz
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 5, 1976



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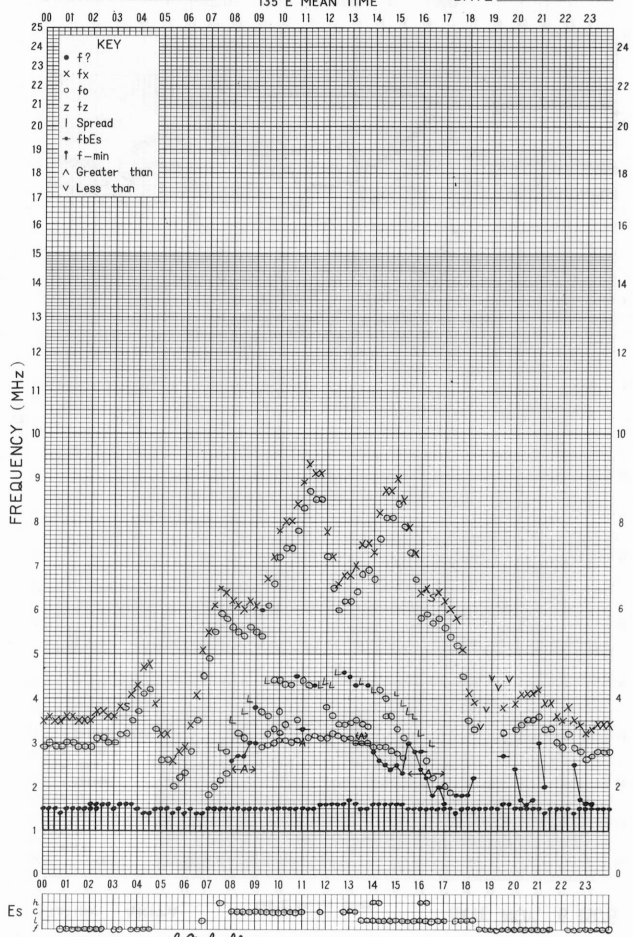
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV.-5.1976



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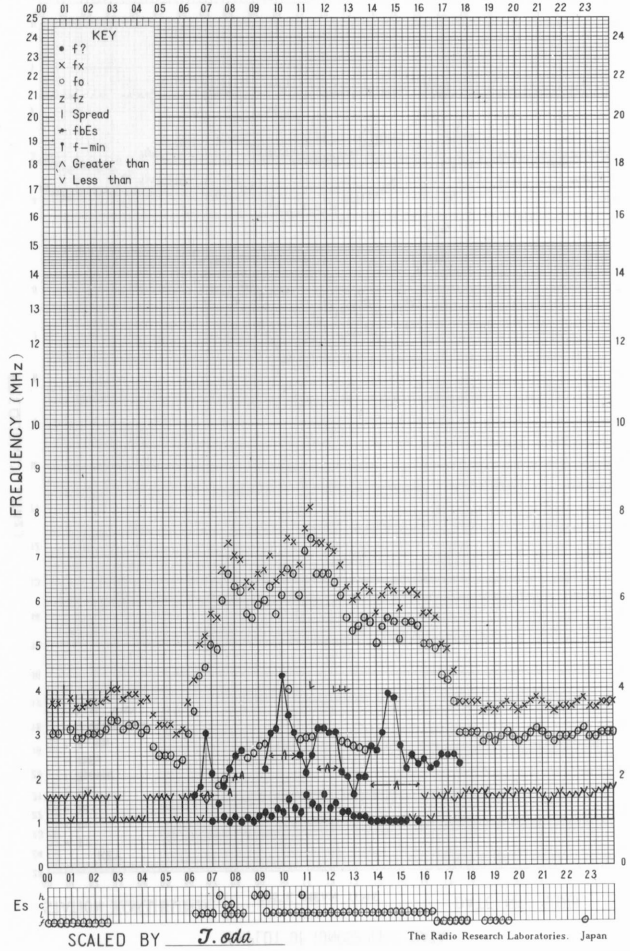
f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE NOV 6 1976

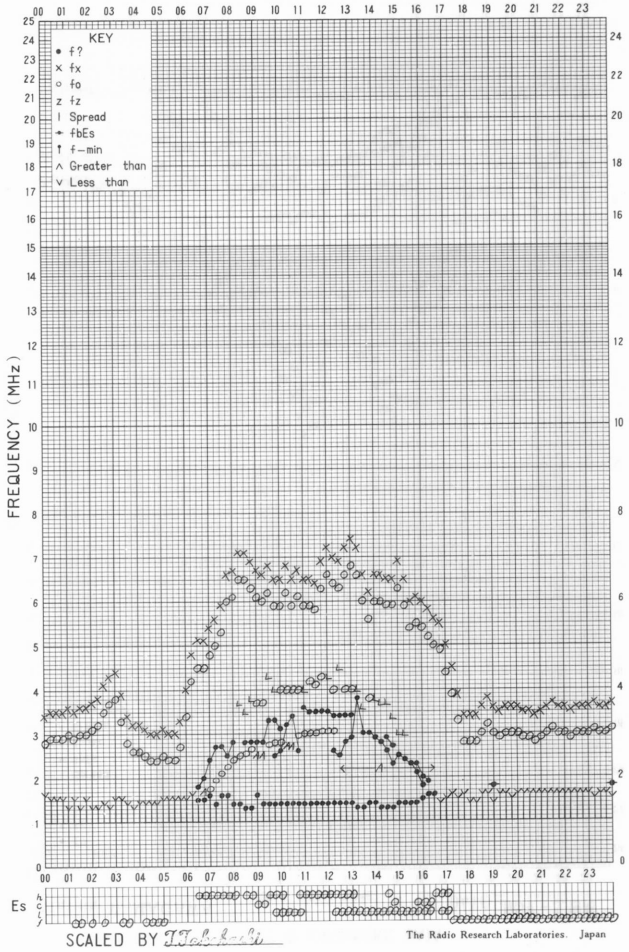


SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE NOV, 6, 1976



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The Radio Research Laboratories. Japan

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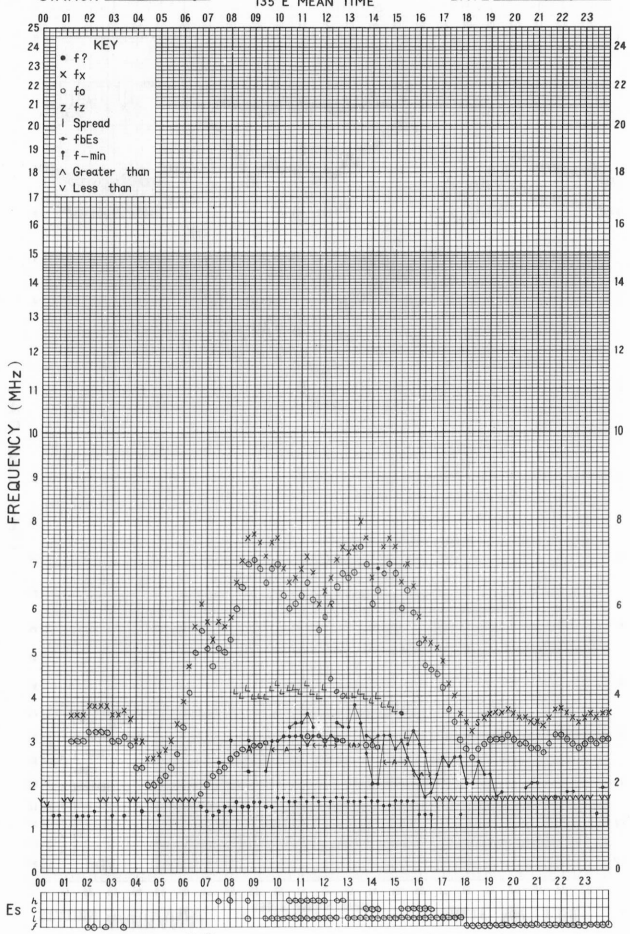

SCALED BY H.Ōzama The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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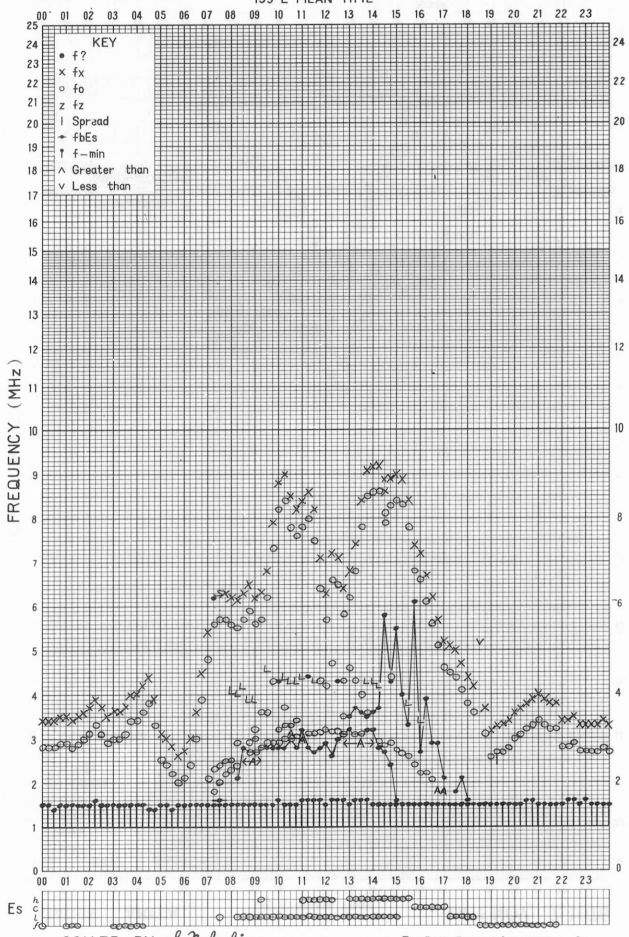

SCALED BY S. Nakashima The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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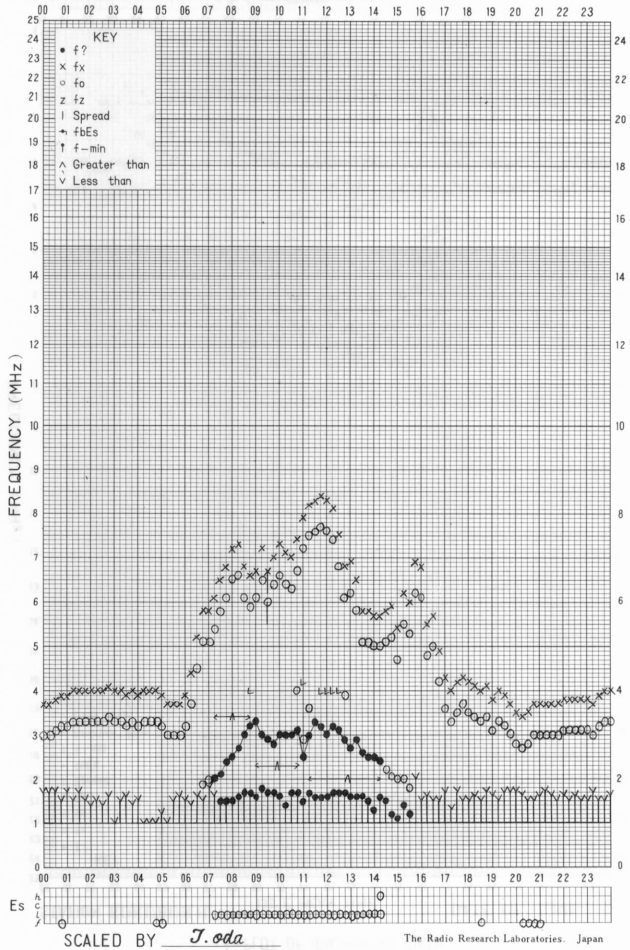

SCALED BY T. oda

The Radio Research Laboratories. Japan

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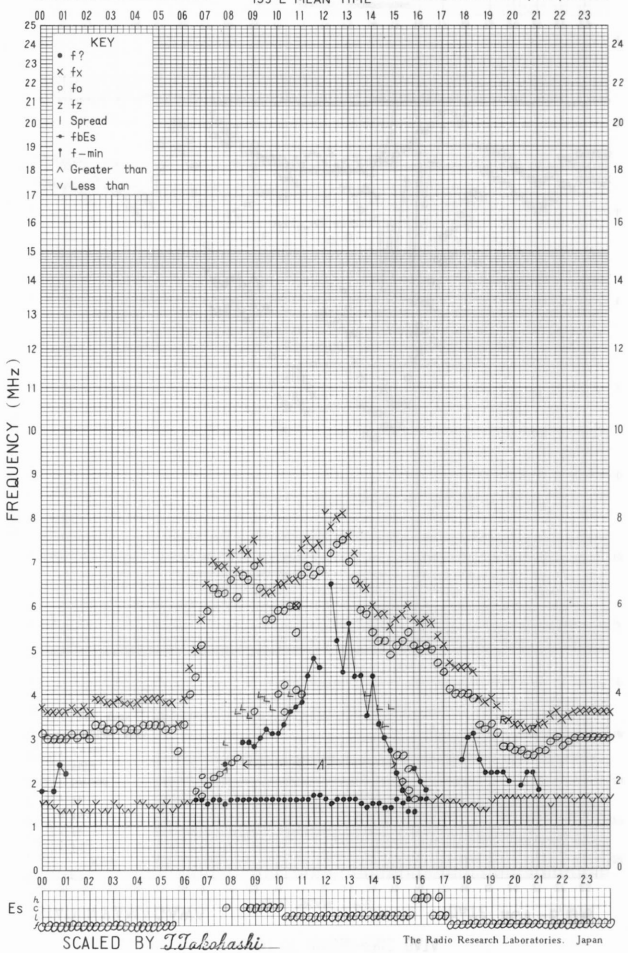

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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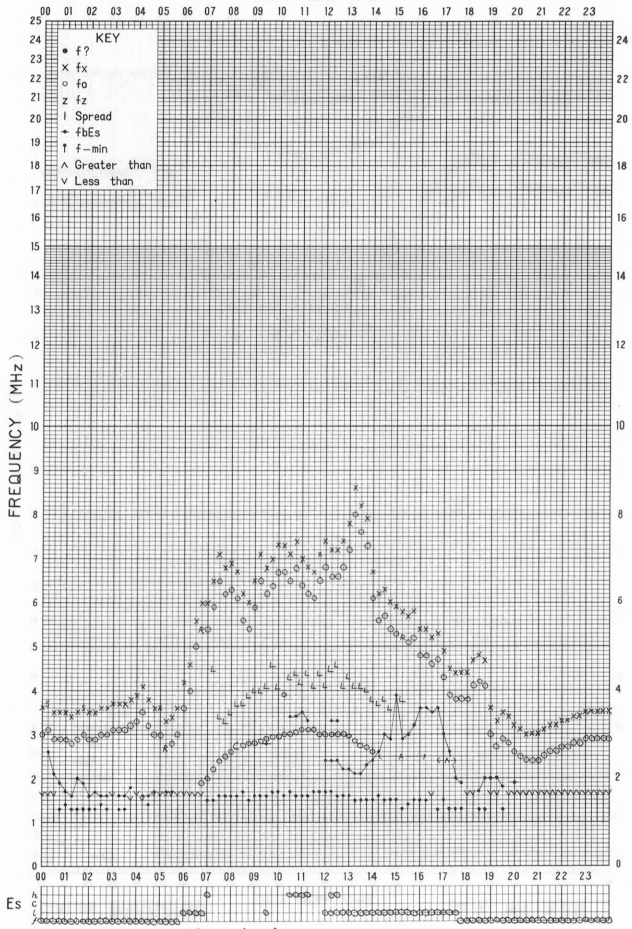

SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

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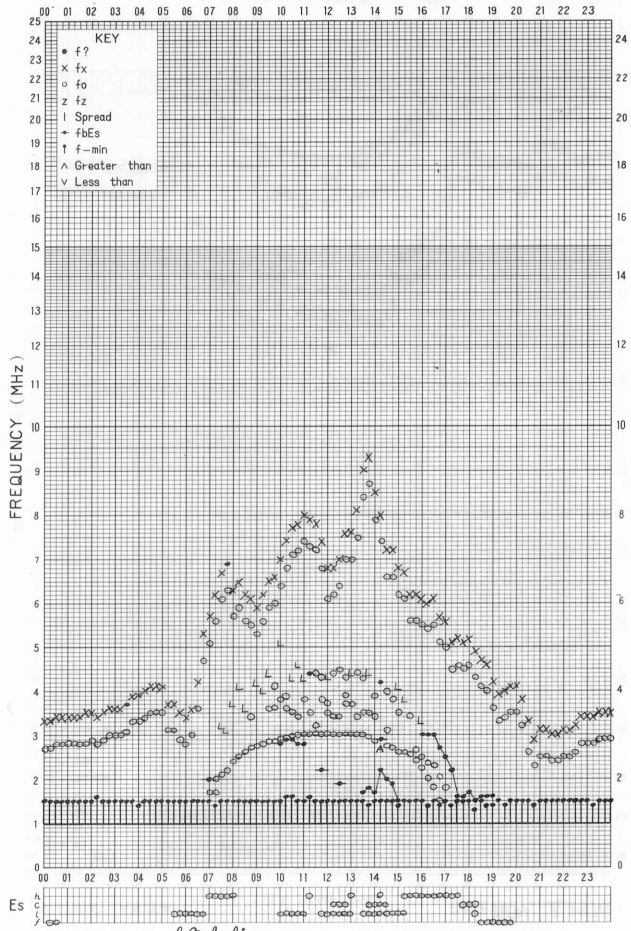

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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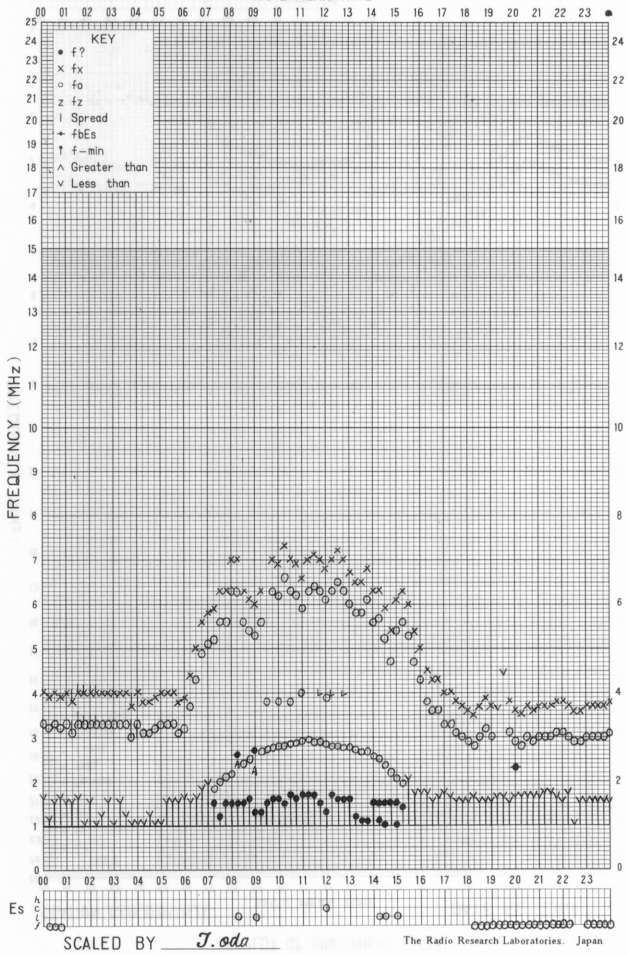

SCALED BY J. odo

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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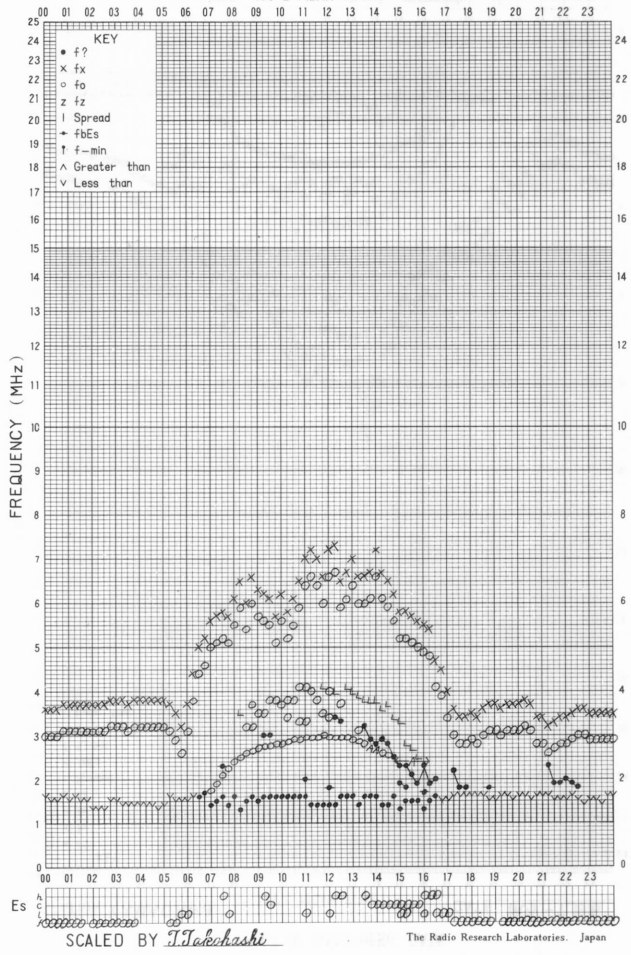

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The Radio Research Laboratories. Japan

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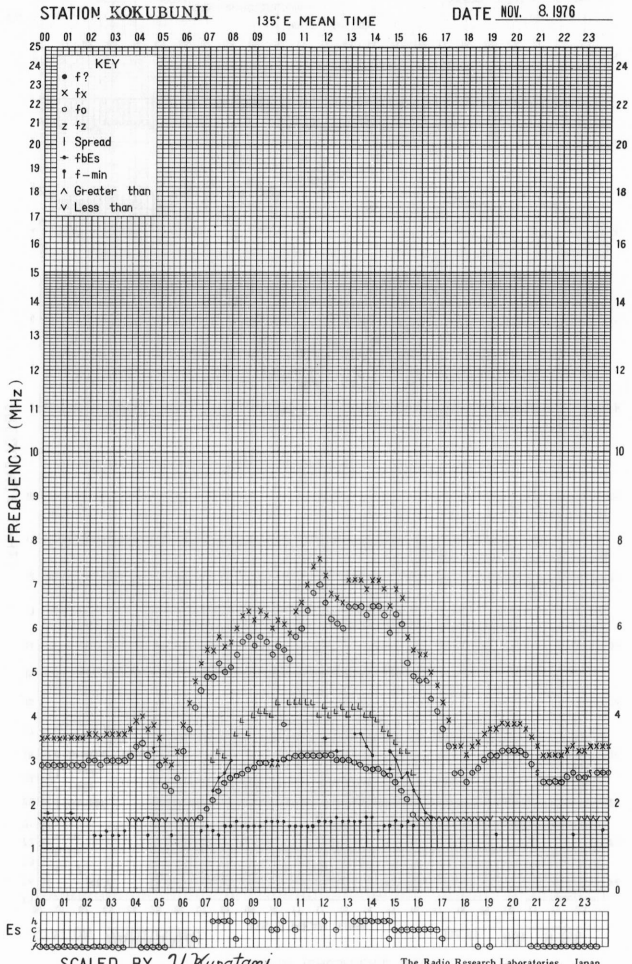

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The Radio Research Laboratories. Japan

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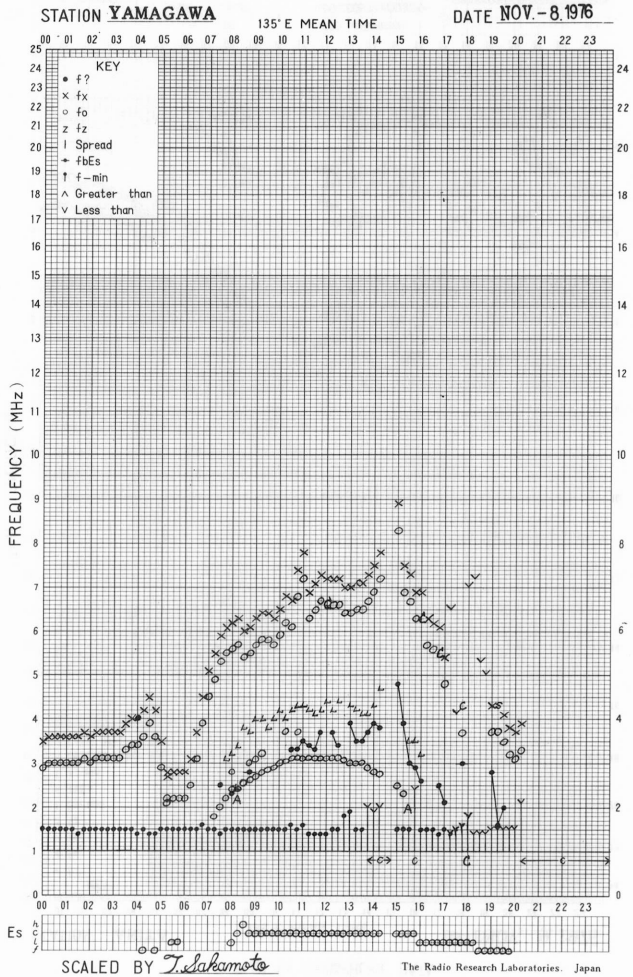

SCALED BY T. Takamoto

The Radio Research Laboratories. Japan

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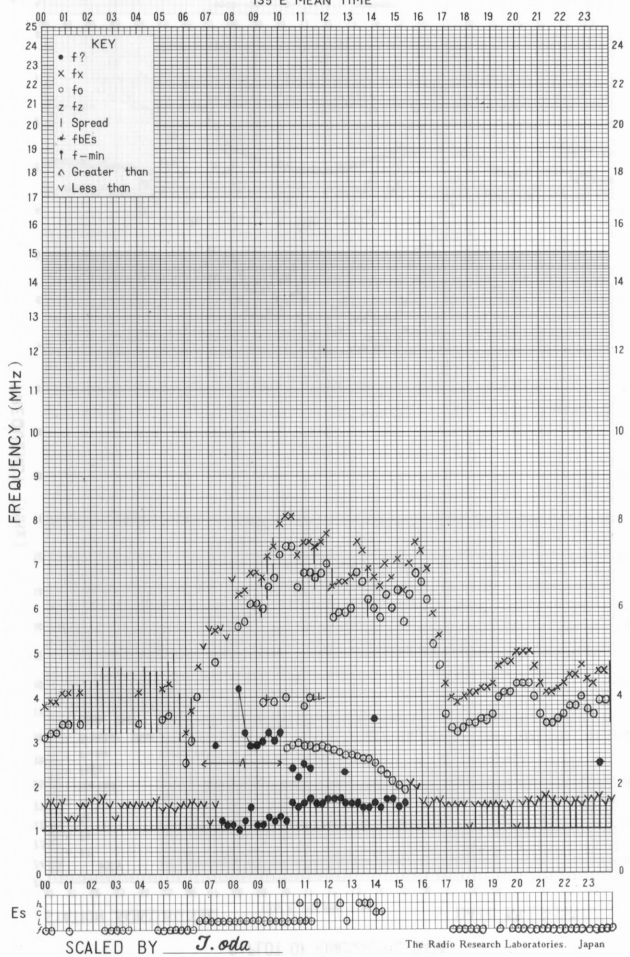

SCALED BY T. oda

The Radio Research Laboratories. Japan

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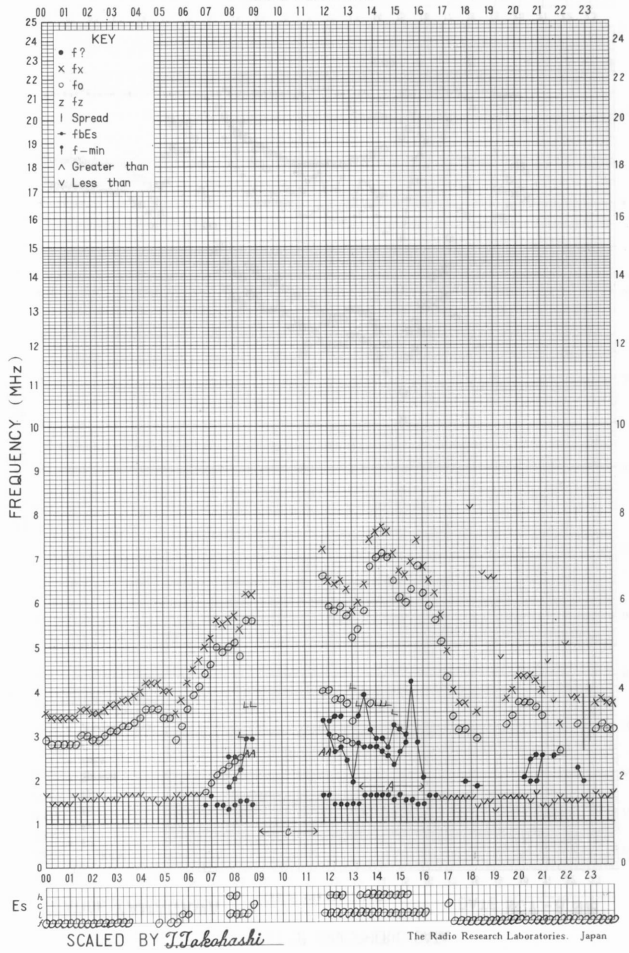

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The Radio Research Laboratories. Japan

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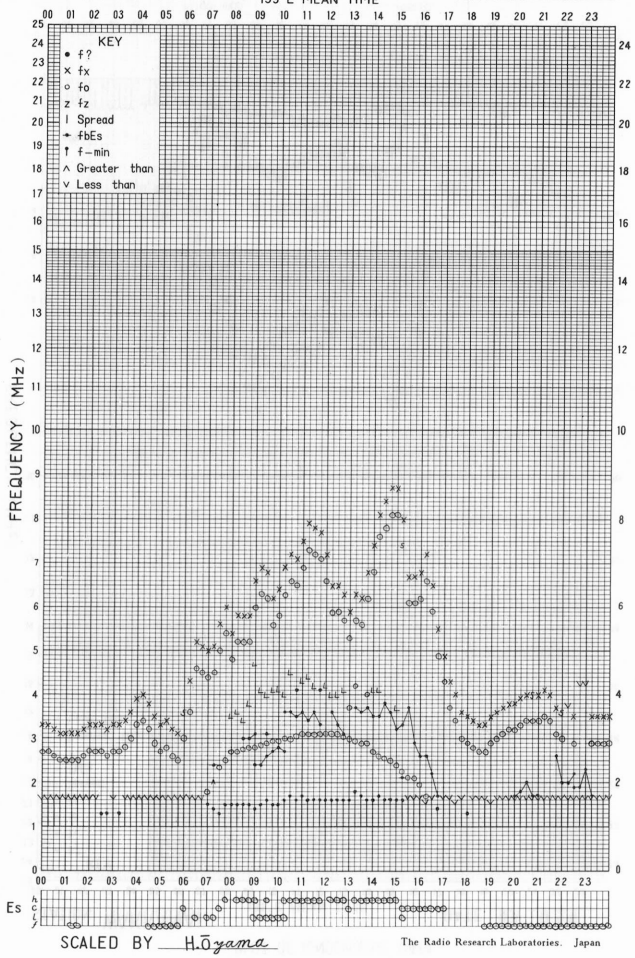

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The Radio Research Laboratories. Japan

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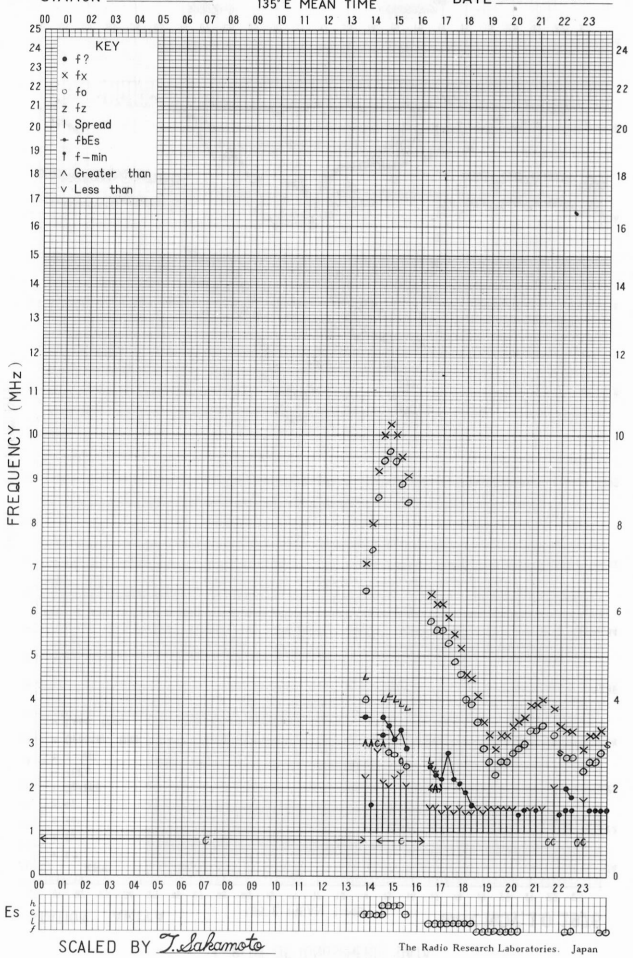

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The Radio Research Laboratories. Japan

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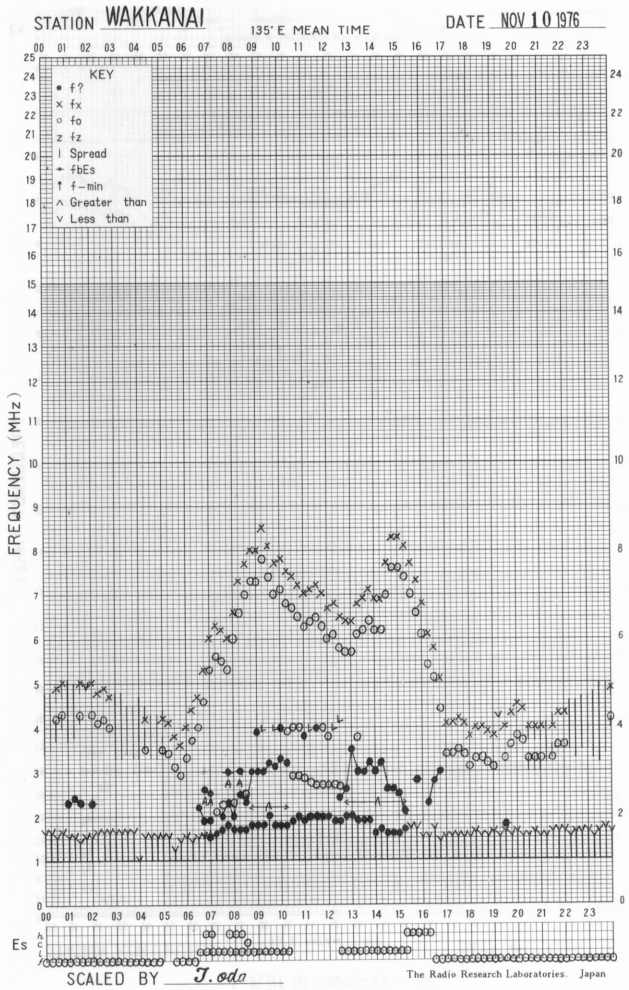

SCALED BY J. oda

The Radio Research Laboratories. Japan

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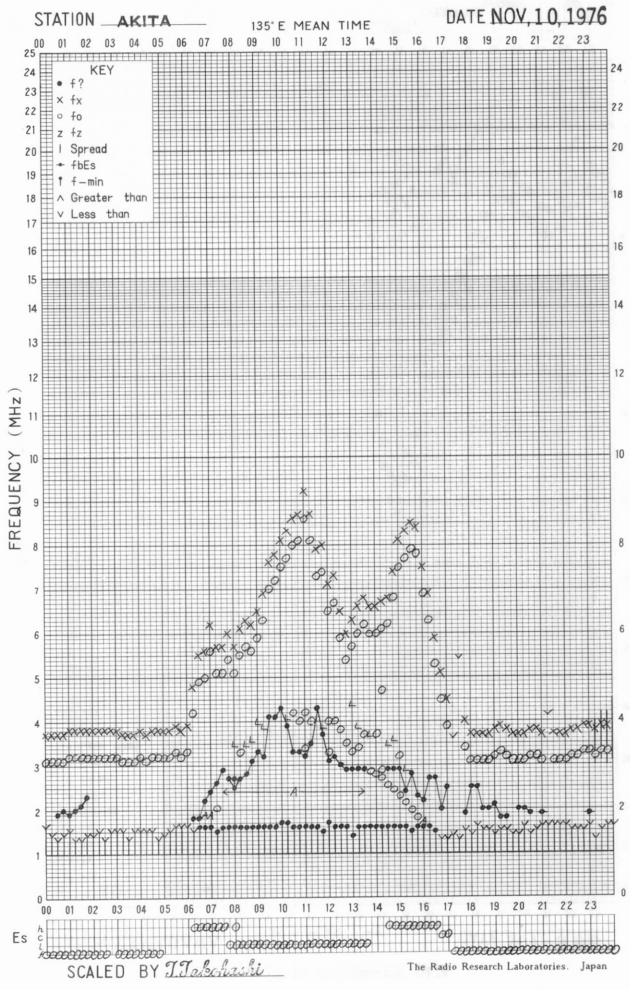

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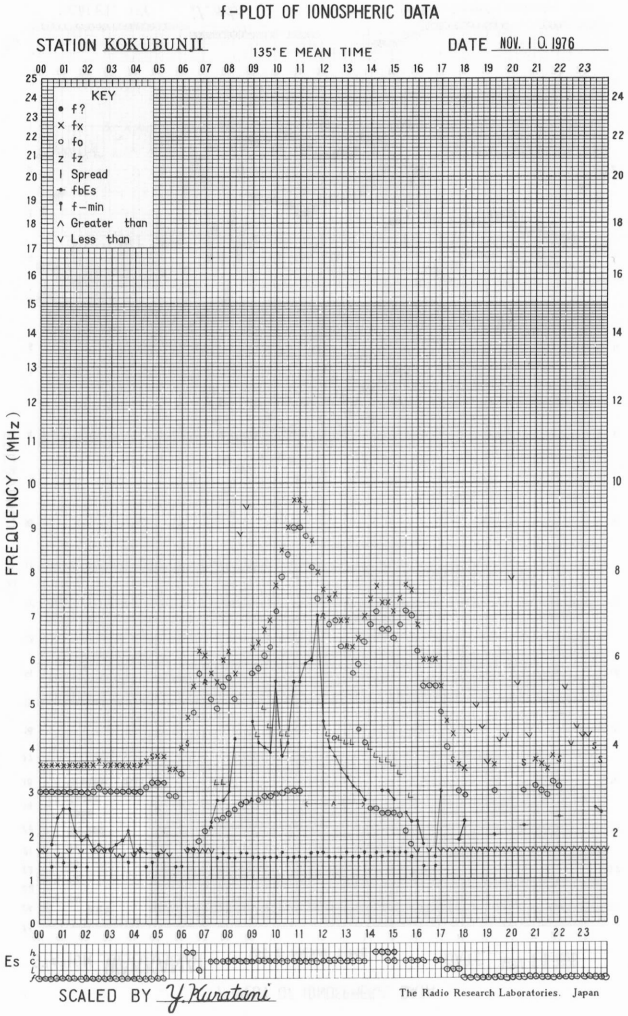
The Radio Research Laboratories. Japan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STATION KOKUBUNJI
135°E MEAN TIME
DATE NOV. 10. 1976
KEY
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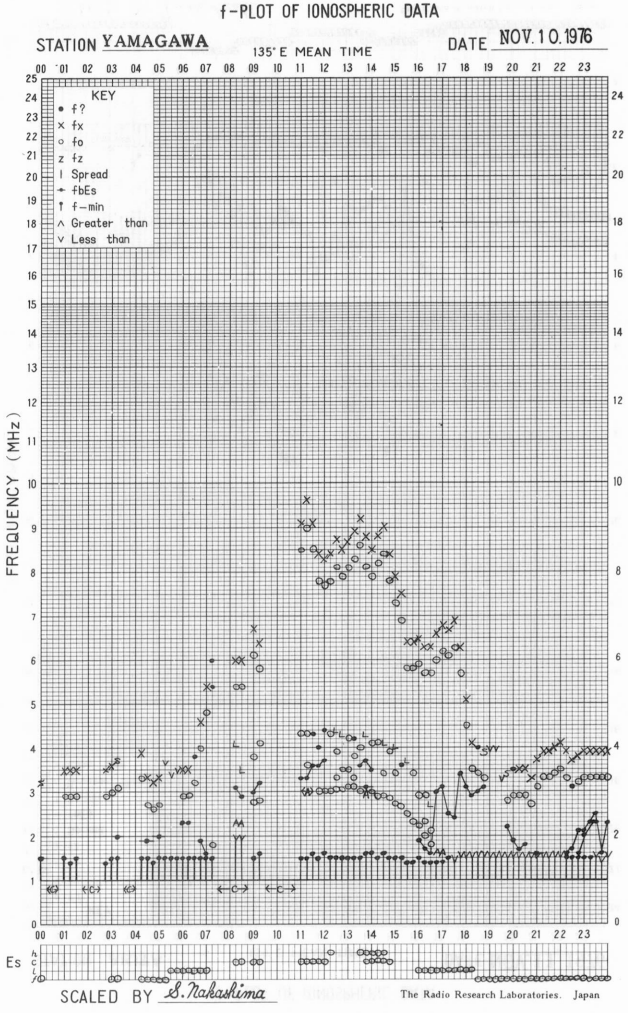
FREQUENCY (MHz)
Es
SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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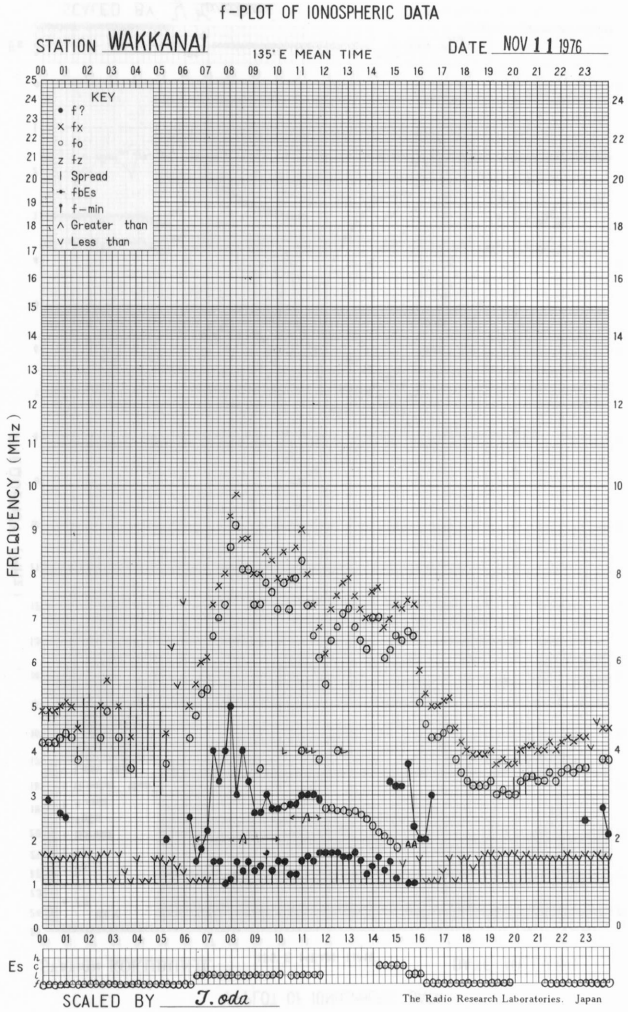
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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KEY
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Greater than
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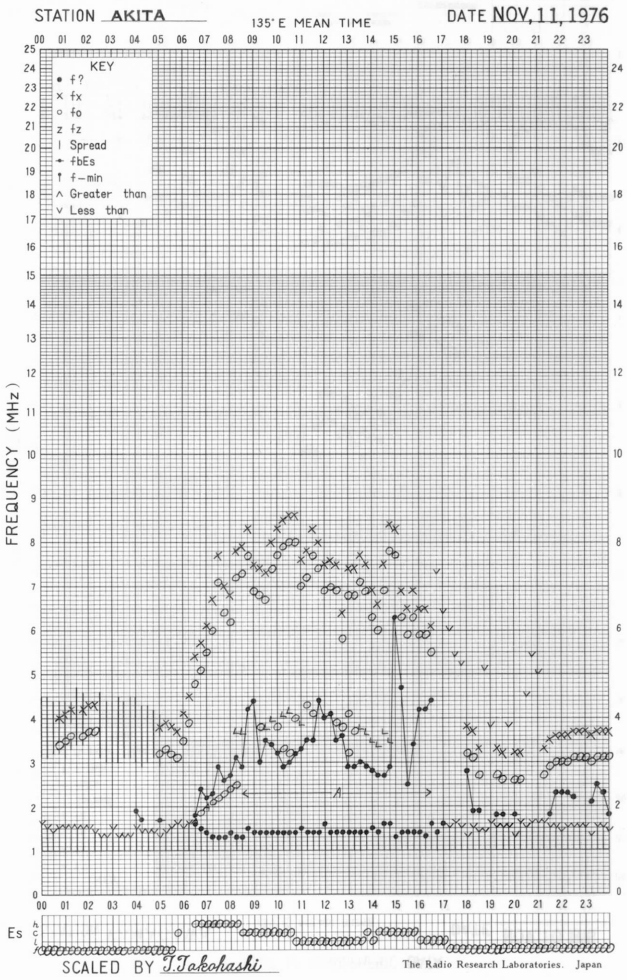
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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Greater than
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FREQUENCY (MHz)
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SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

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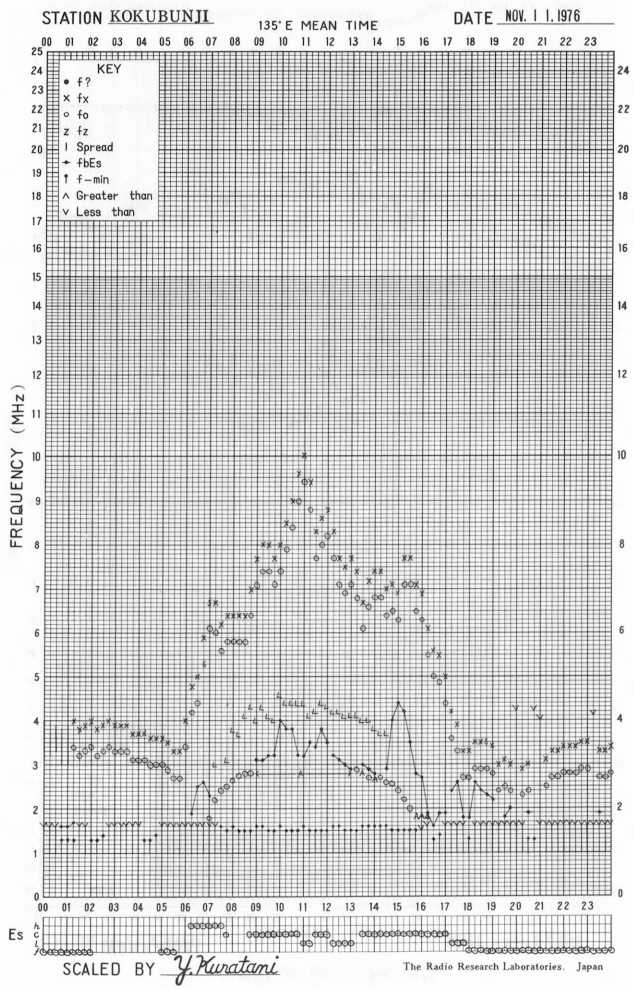
STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 11. 1976



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The Radio Research Laboratories. Japan

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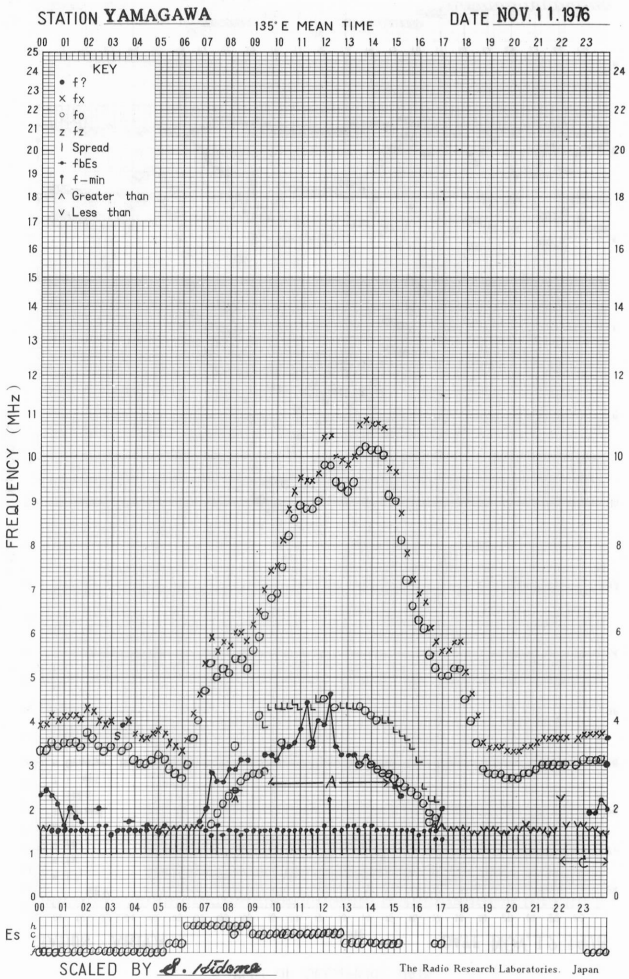

SCALED BY S. Iidoma

The Radio Research Laboratories. Japan

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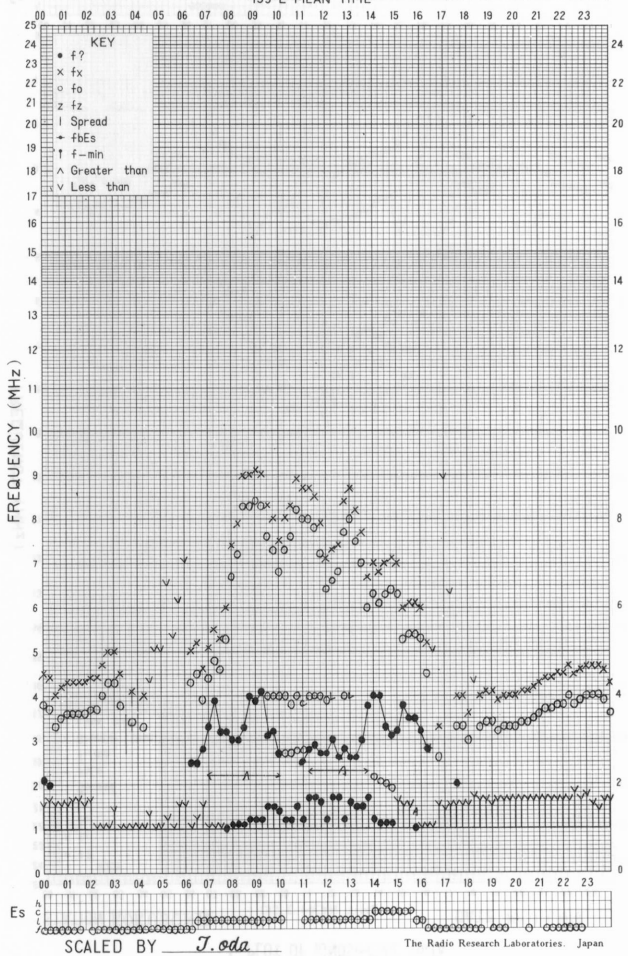

SCALED BY J. oda

The Radio Research Laboratories. Japan

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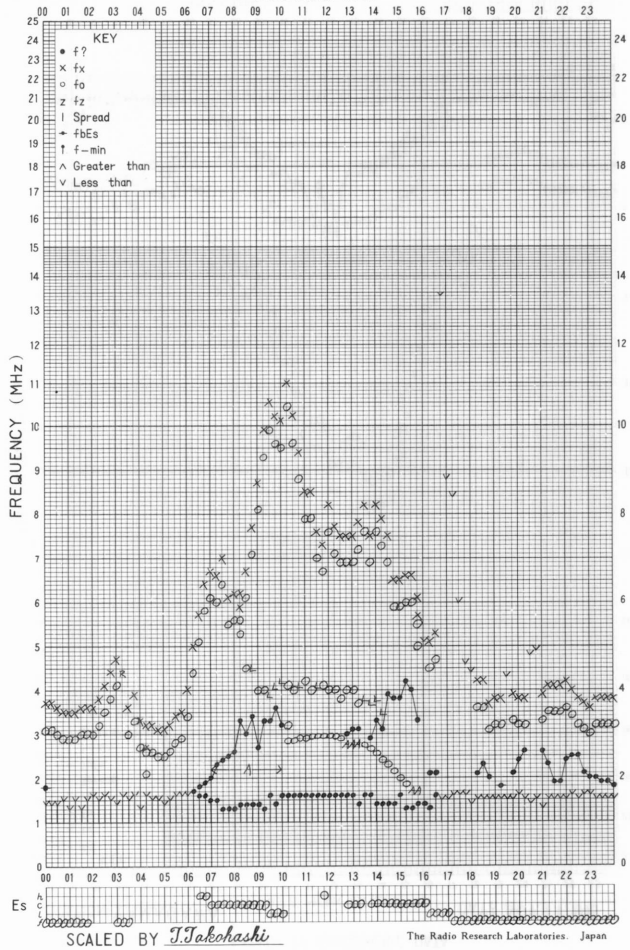

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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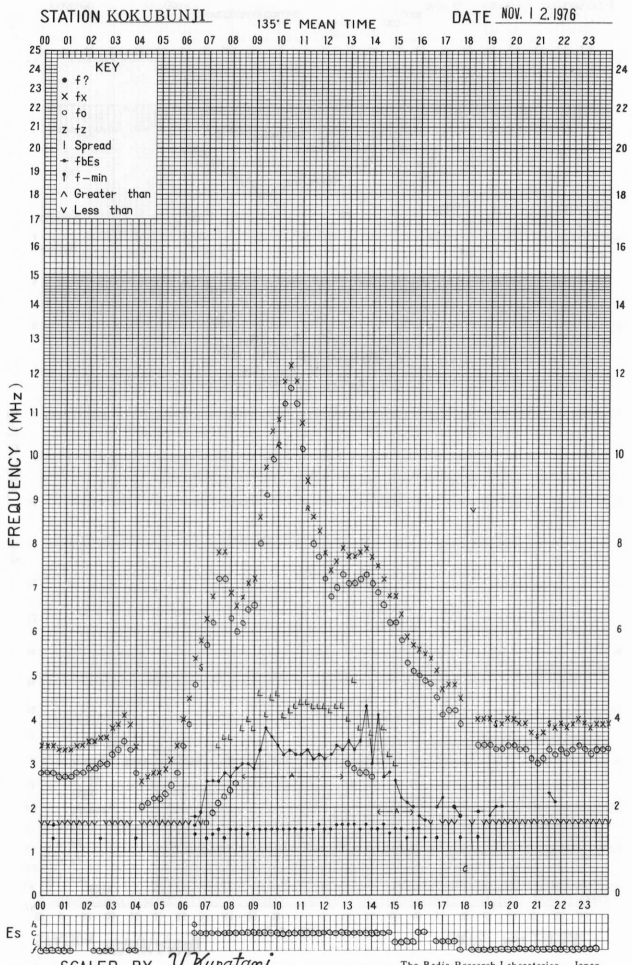

SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

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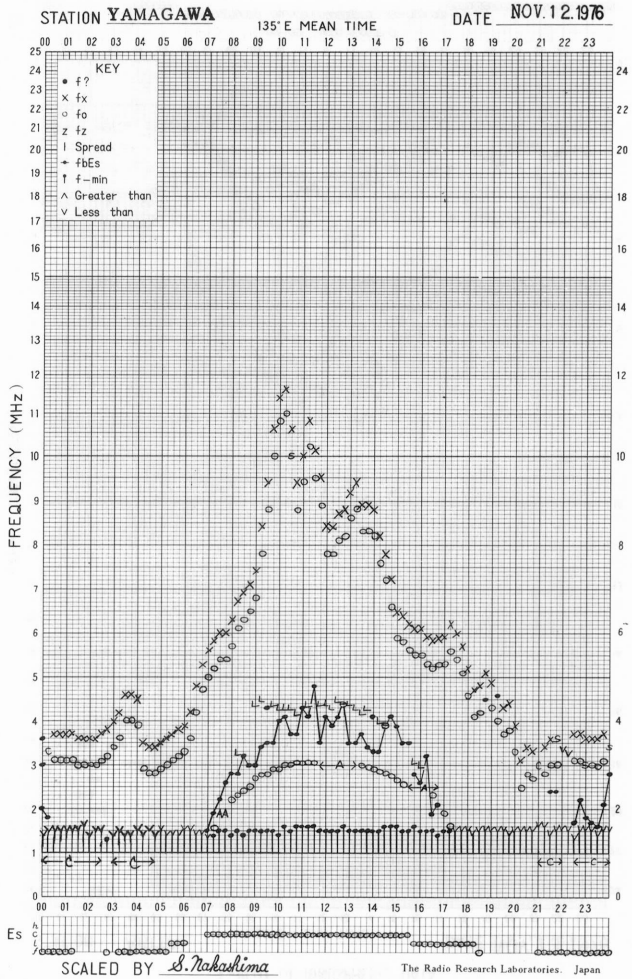
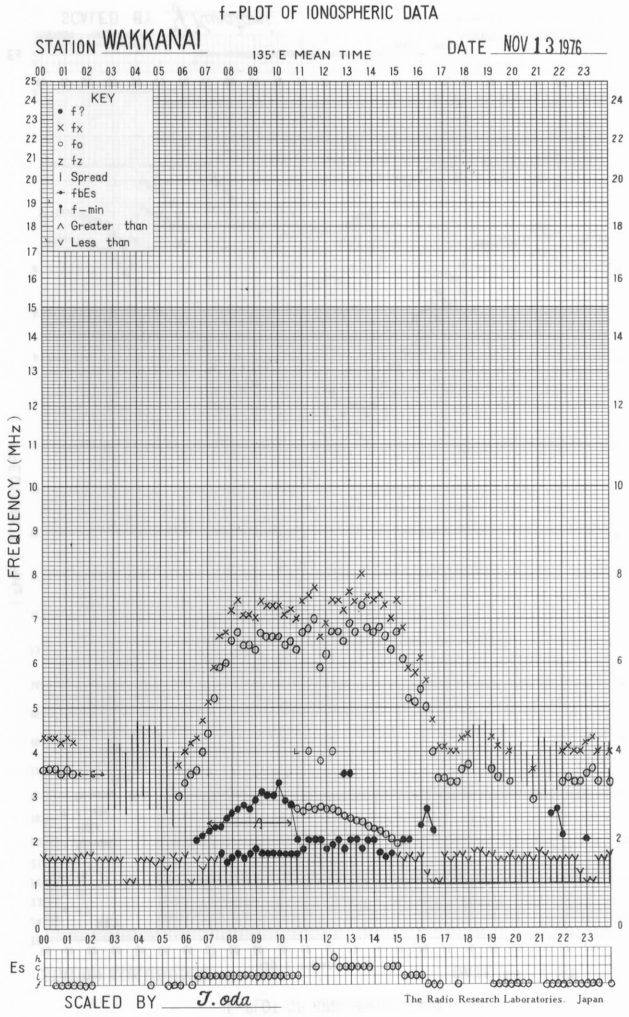


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE NOV 13 1976
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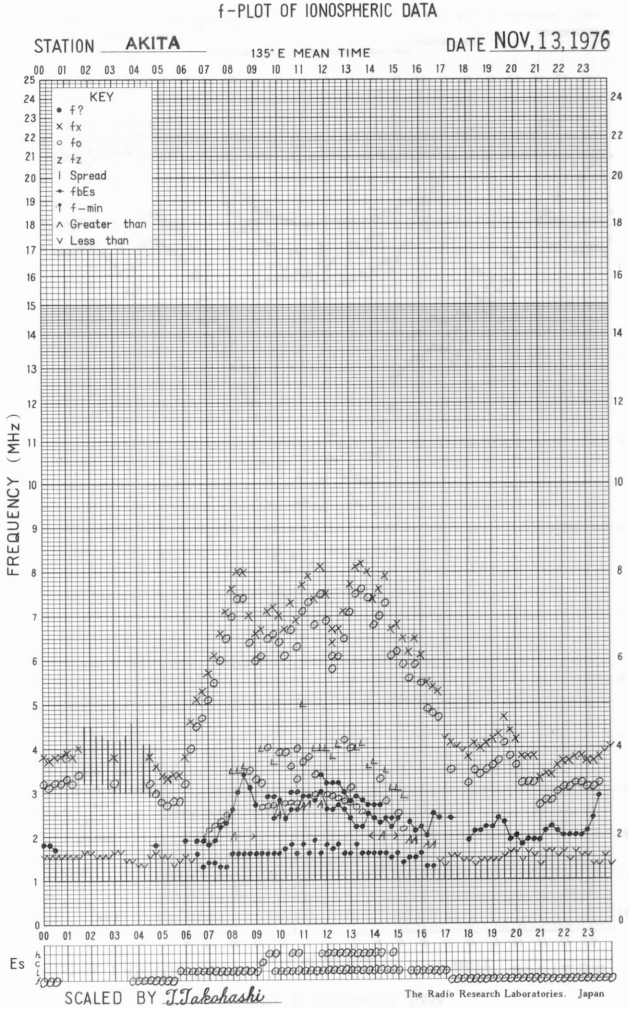
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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DATE NOV, 13, 1976
KEY
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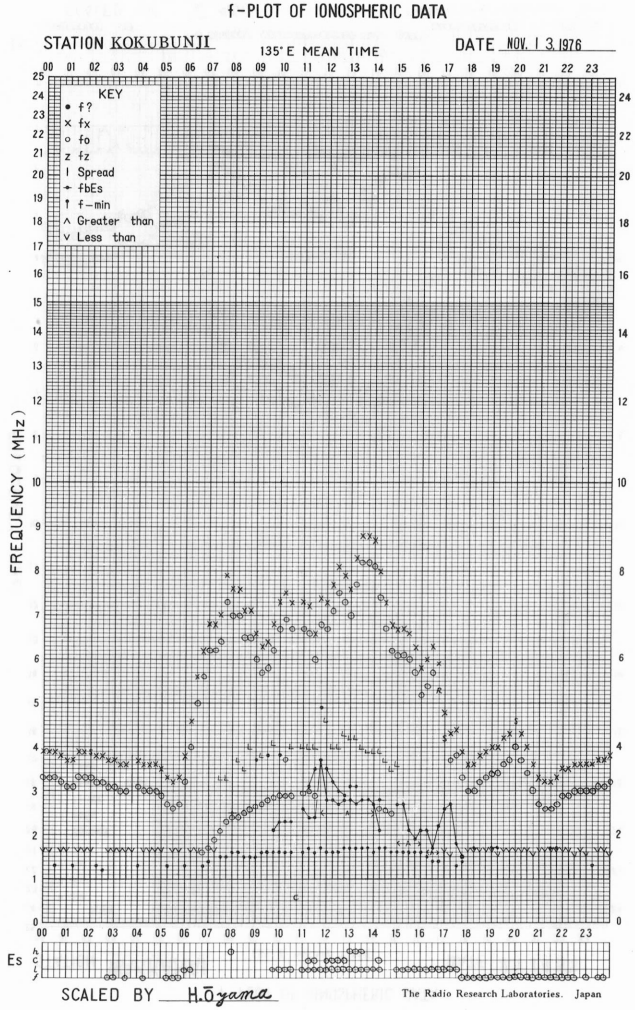
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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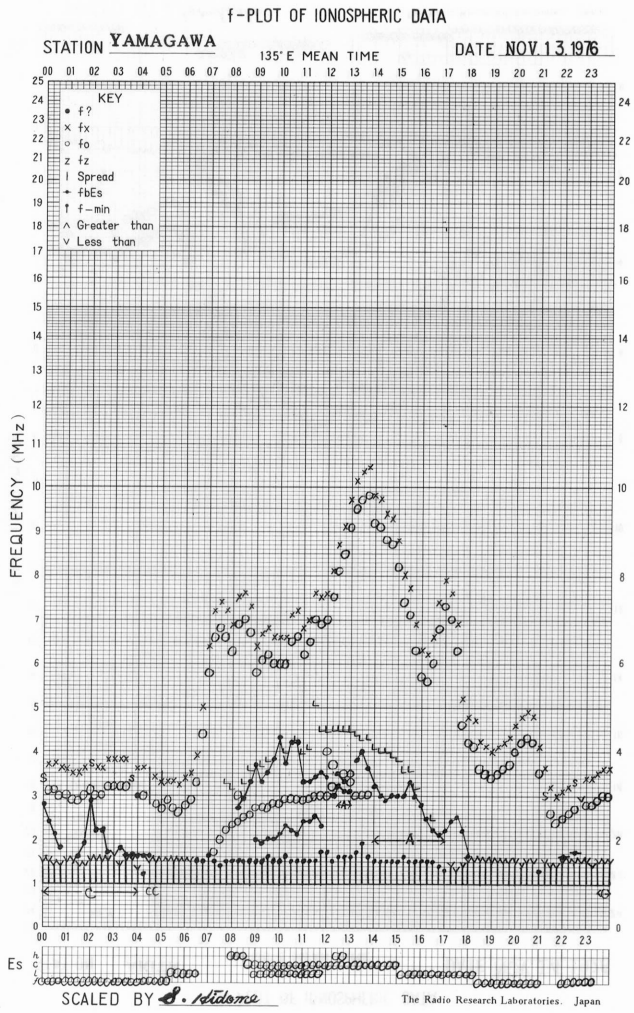
SCALED BY H.Ōzyama
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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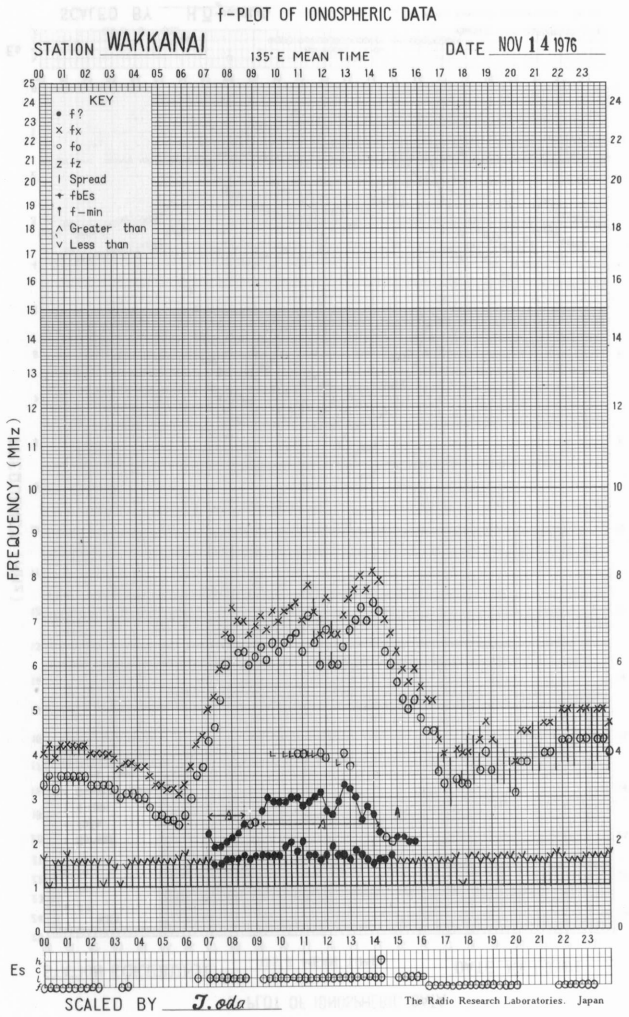
SCALED BY S. Ishidome
The Radio Research Laboratories. Japan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135°E MEAN TIME
DATE NOV 14 1976
KEY
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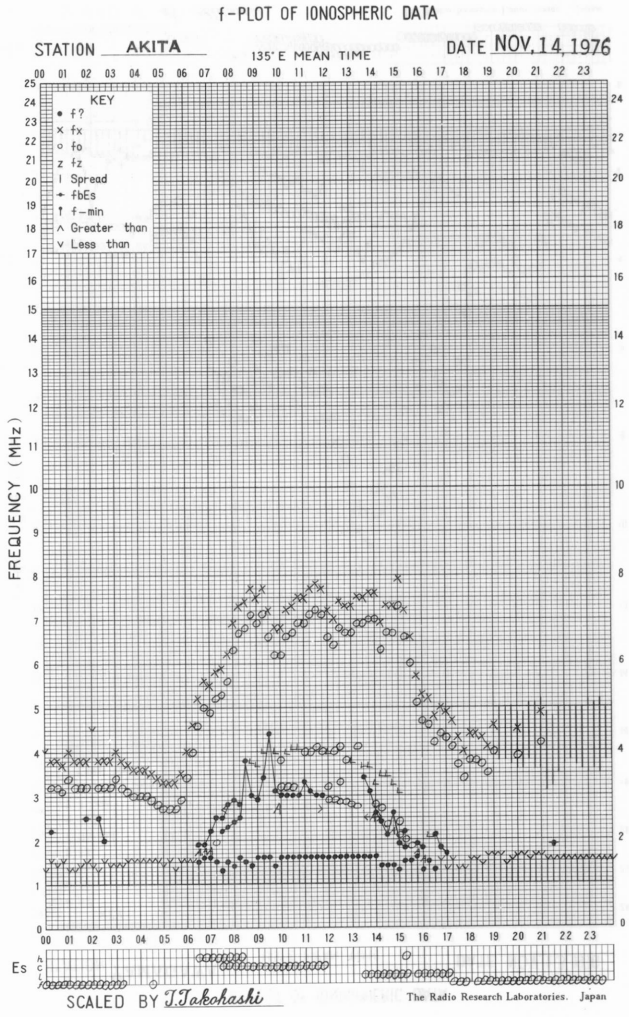
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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DATE NOV. 14, 1976
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FREQUENCY (MHz)
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SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

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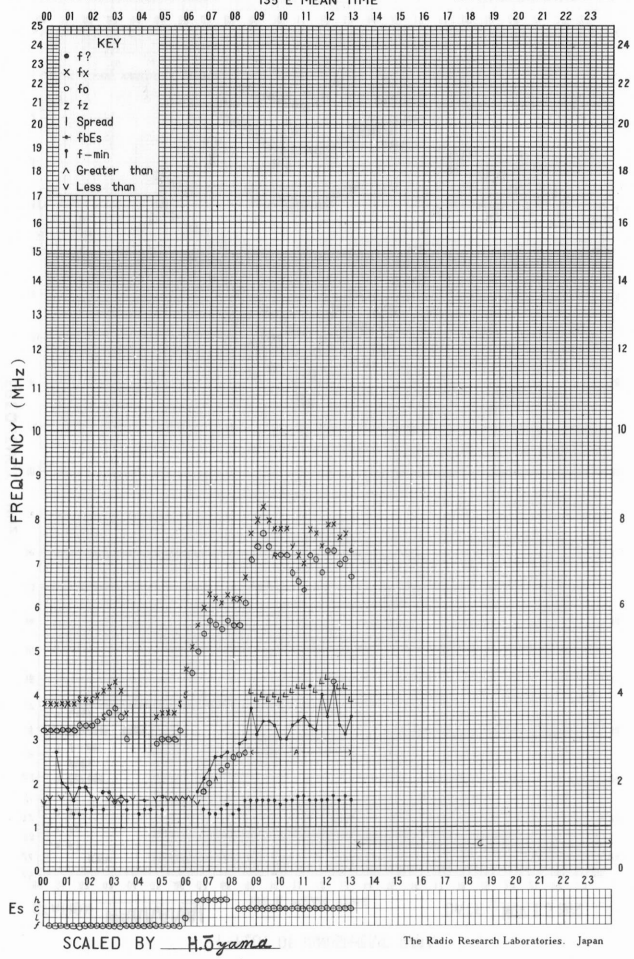
STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 14, 1976



SCALED BY H.Ōyama

The Radio Research Laboratories. Japan

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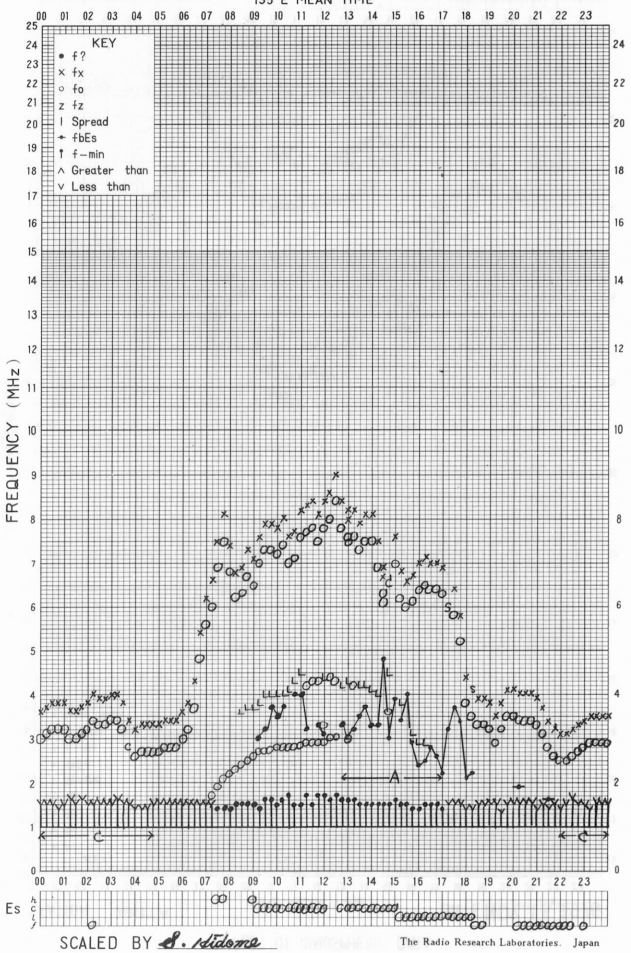

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The Radio Research Laboratories. Japan

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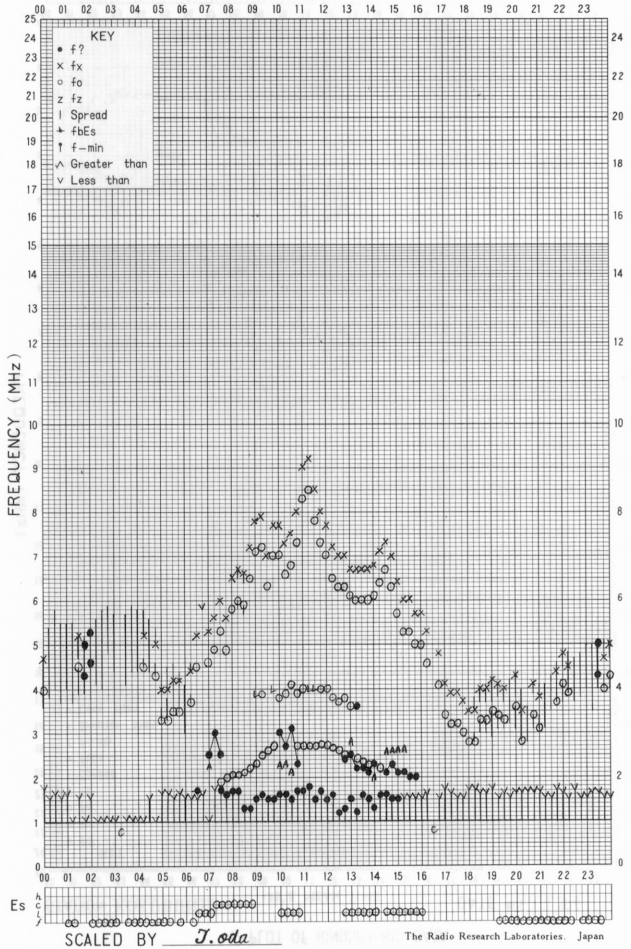

SCALED BY T. oda

The Radio Research Laboratories. Japan

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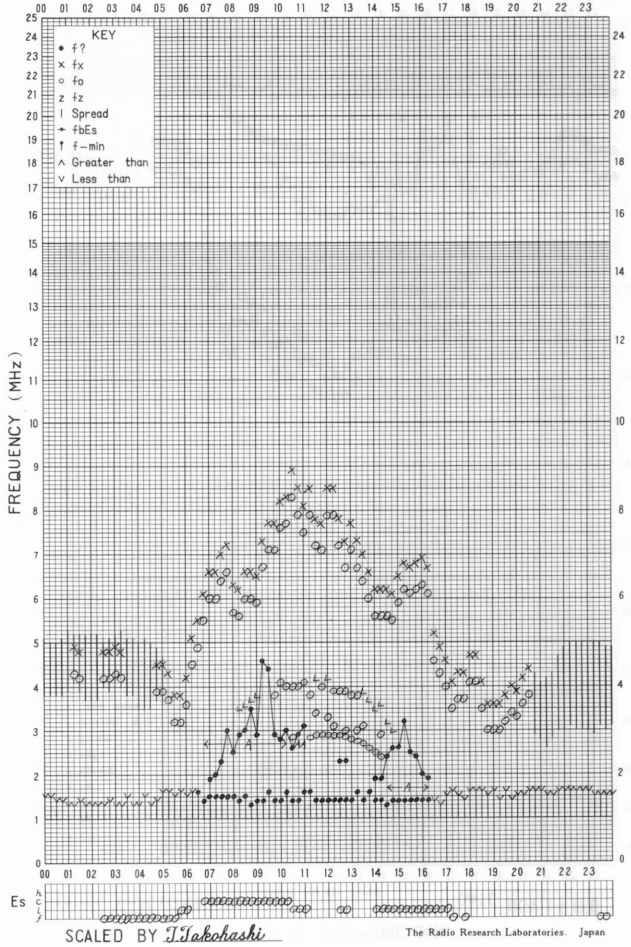

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The Radio Research Laboratories. Japan

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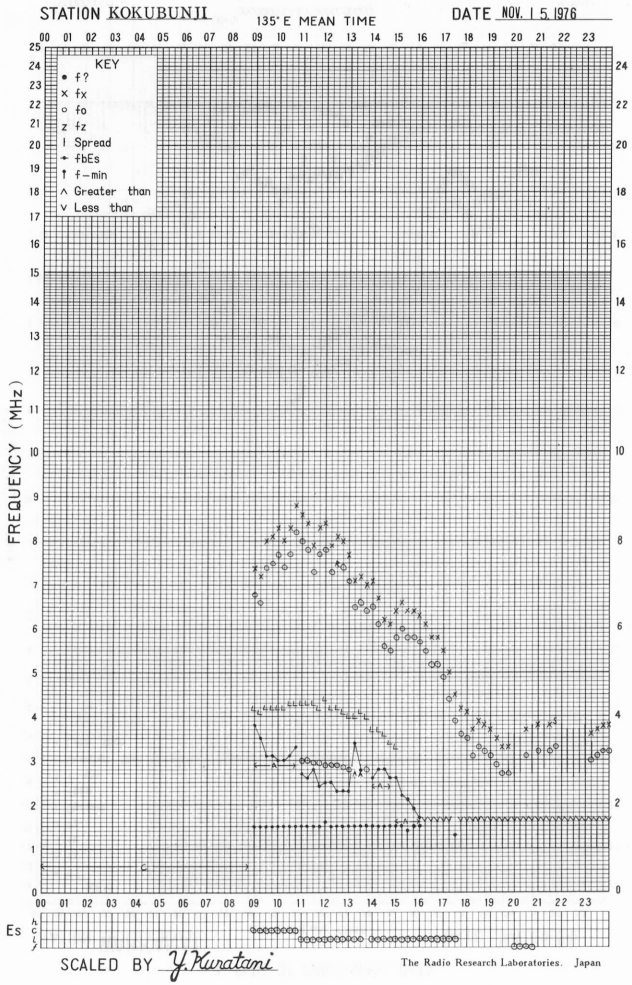

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The Radio Research Laboratories. Japan

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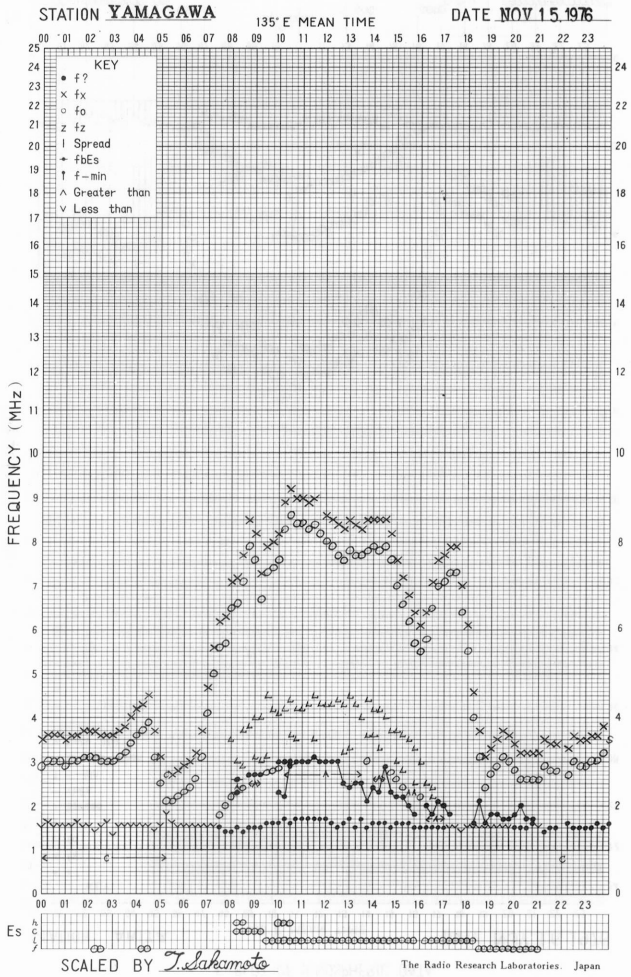

SCALED BY T. Sakamoto

The Radio Research Laboratories. Japan

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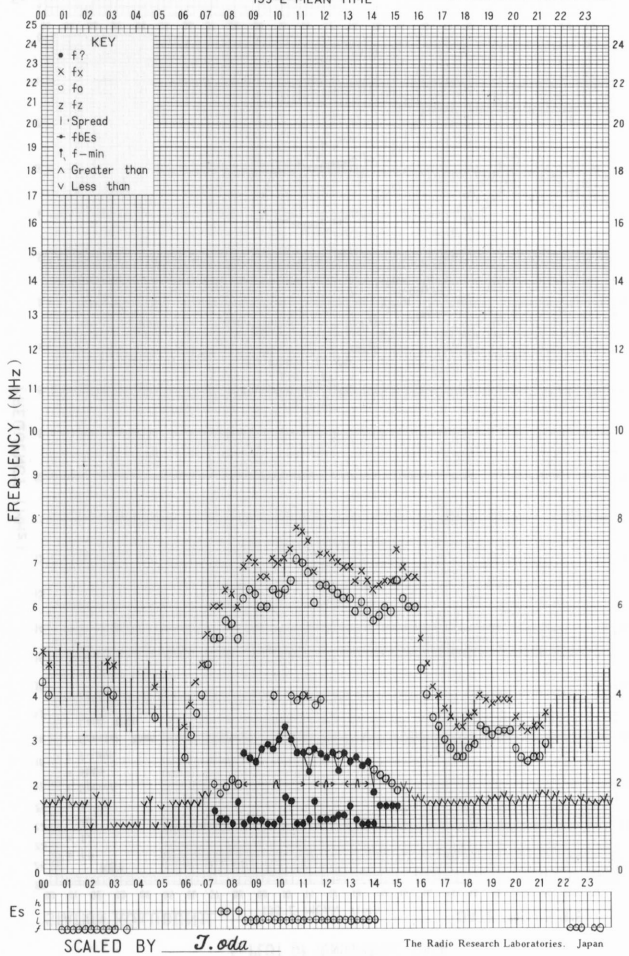

SCALED BY J. oda

The Radio Research Laboratories. Japan

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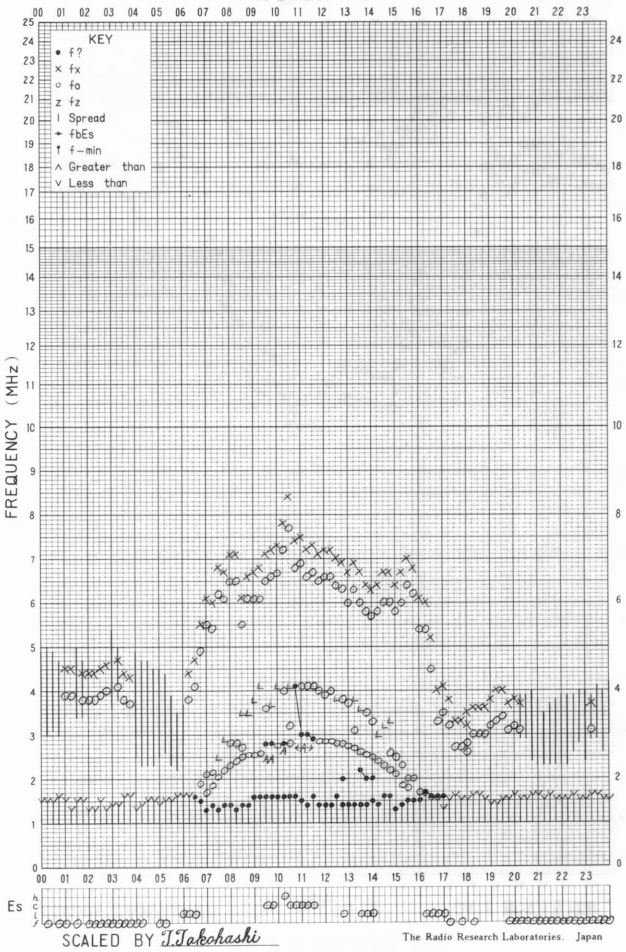
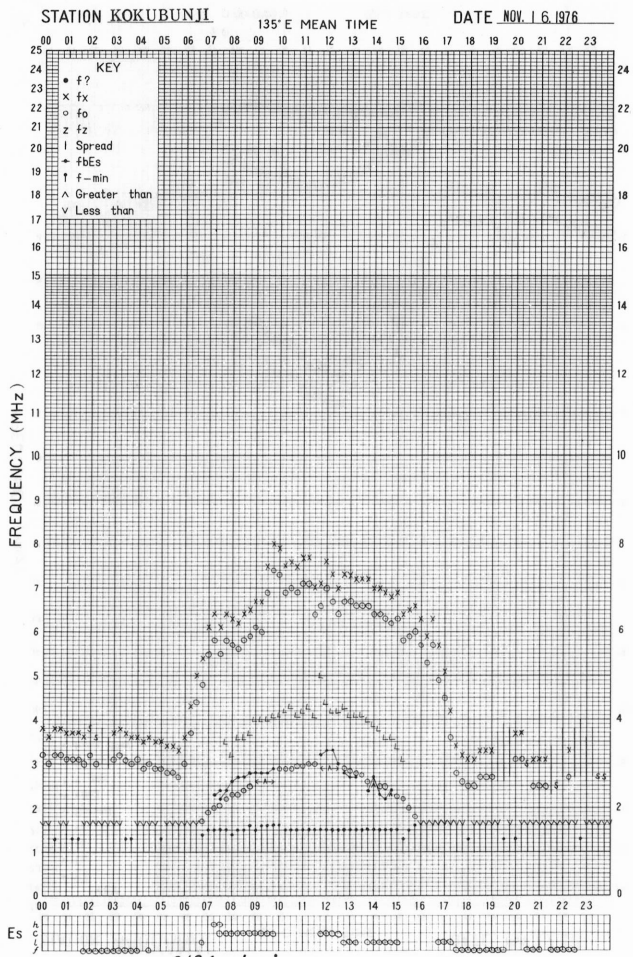


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 16, 1976

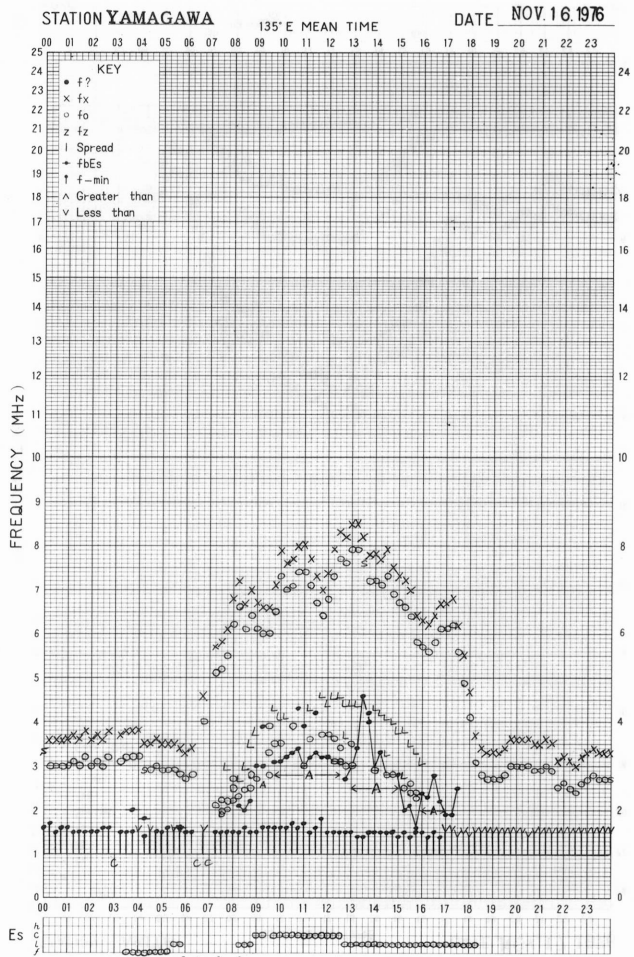


SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

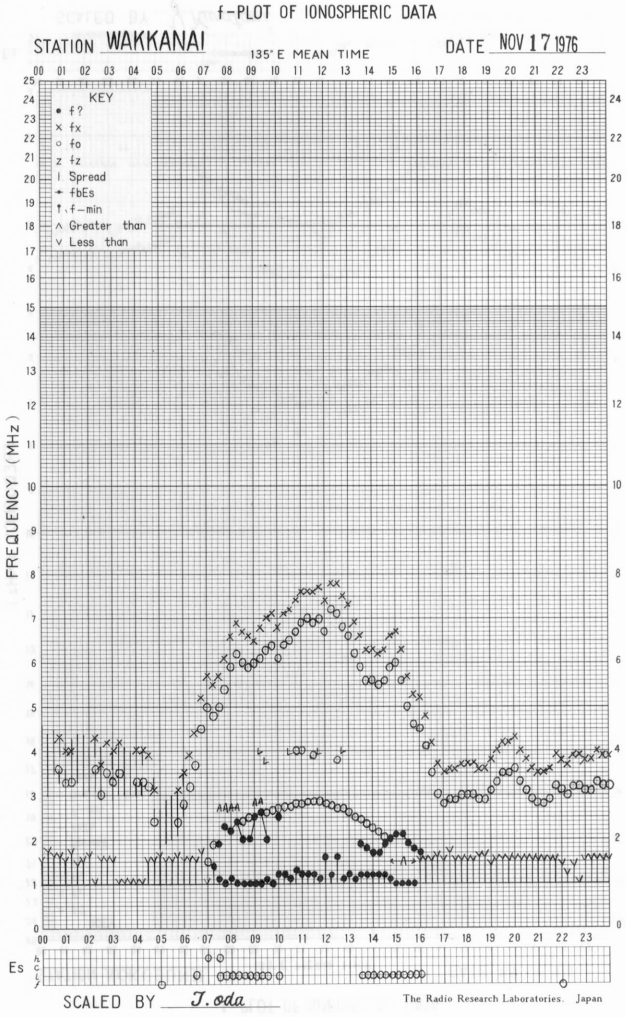
f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 16, 1976



SCALED BY S. Nakashima

The Radio Research Laboratories. Japan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DATE NOV 17 1976
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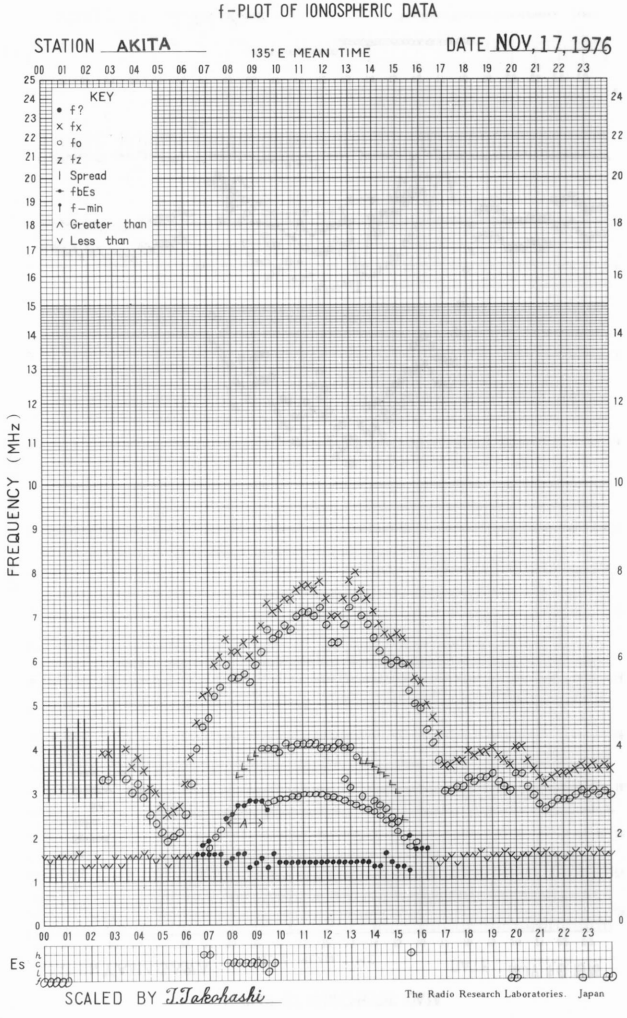
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

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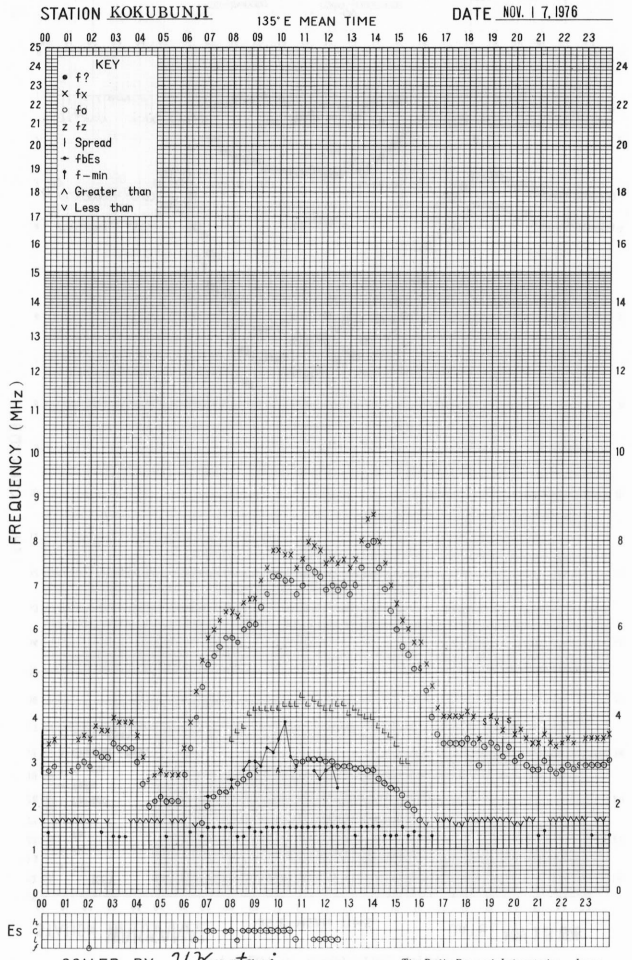

SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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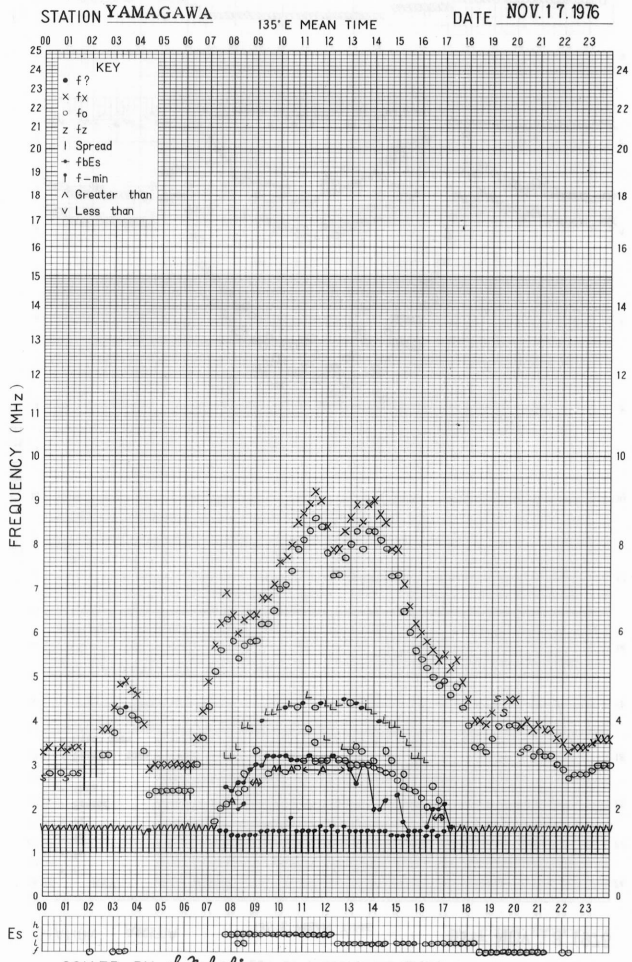
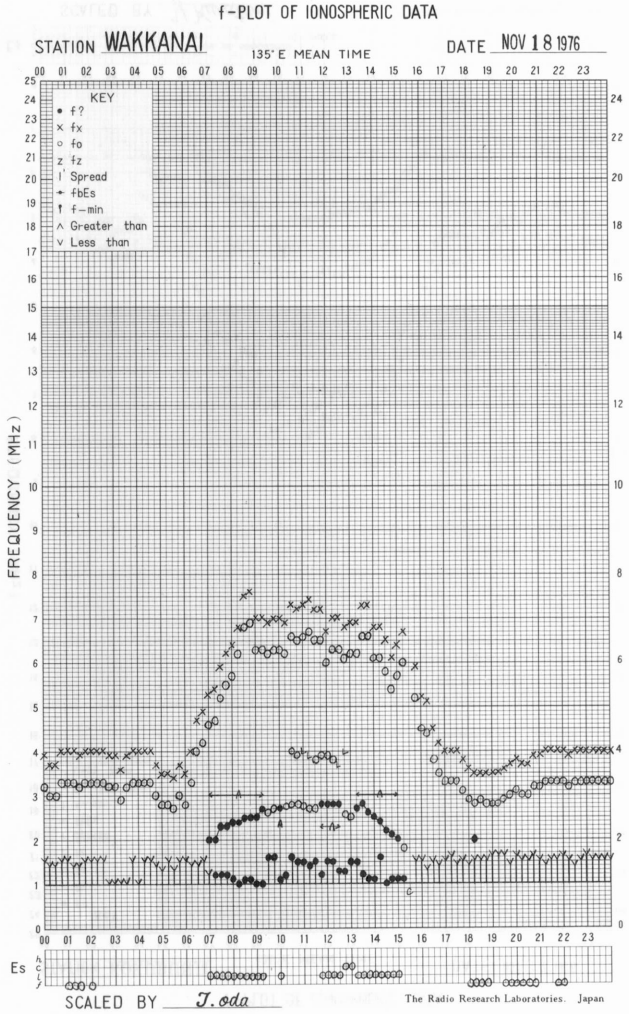


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan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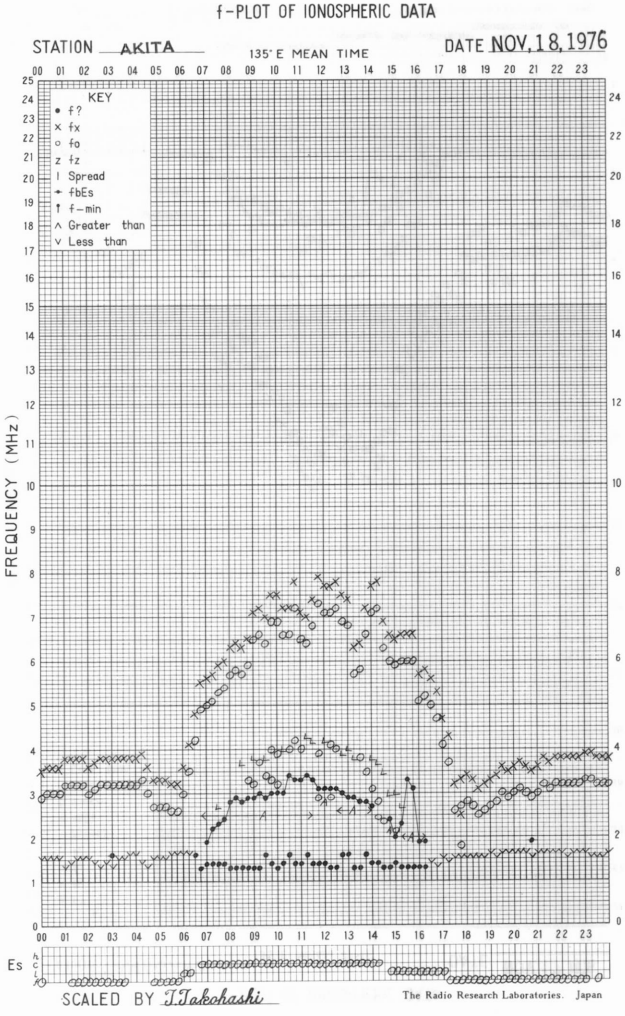
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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FREQUENCY (MHz)
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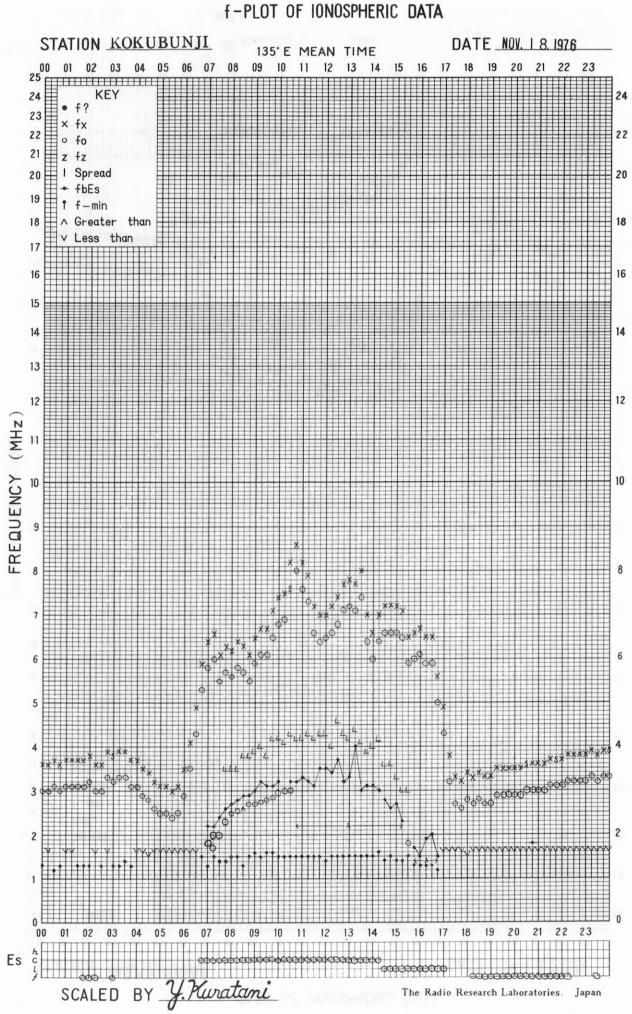
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE NOV. 18. 1976
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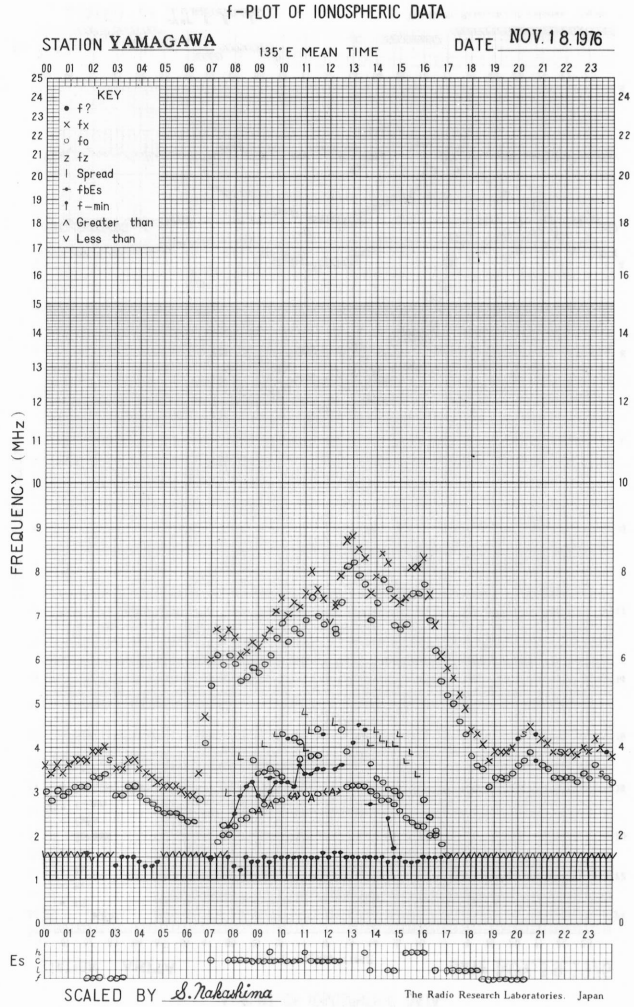
Activity
SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan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DATE NOV. 18. 1976
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FREQUENCY (MHz)
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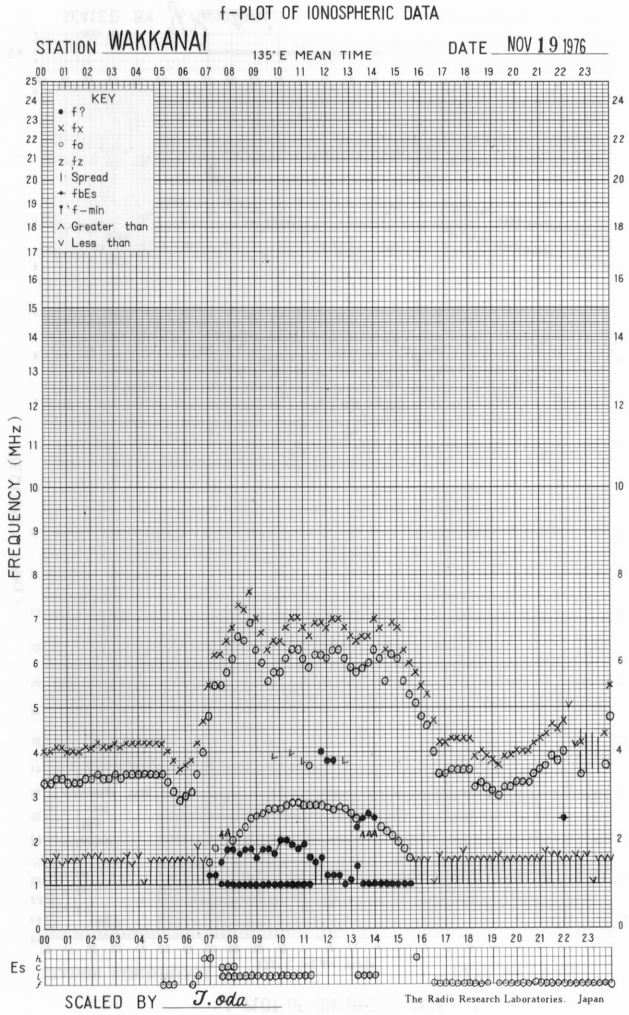
Activity
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan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DATE NOV 19 1976
KEY
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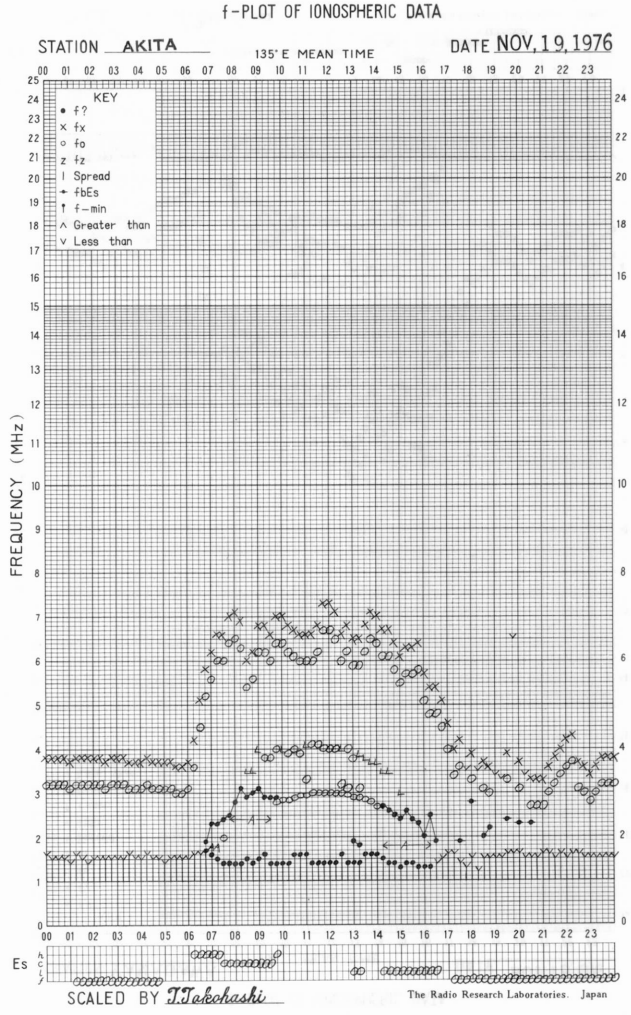
v Less than
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE NOV, 19, 1976
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FREQUENCY (MHz)
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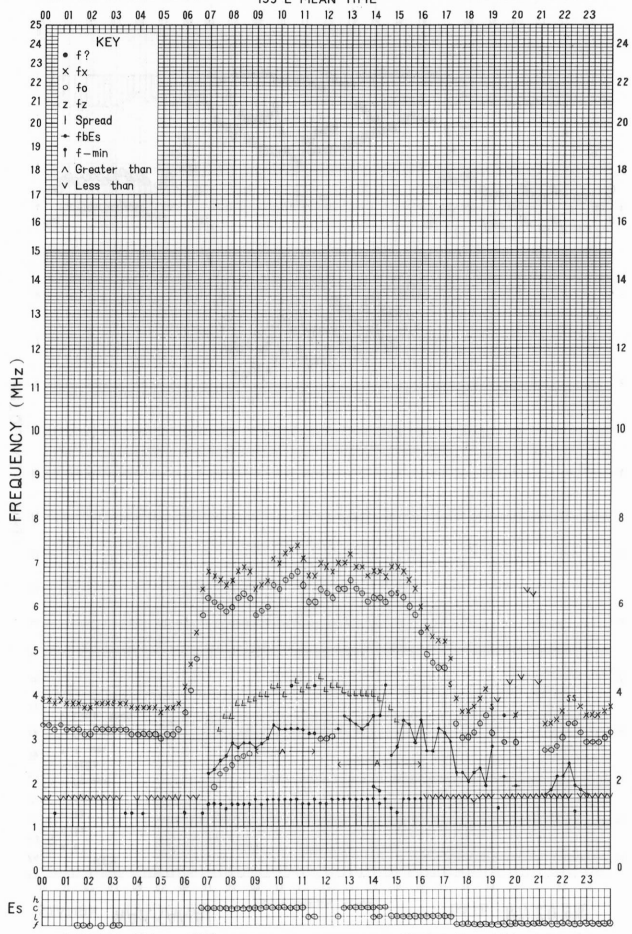
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 19 1976



SCALED BY H.Ōzama The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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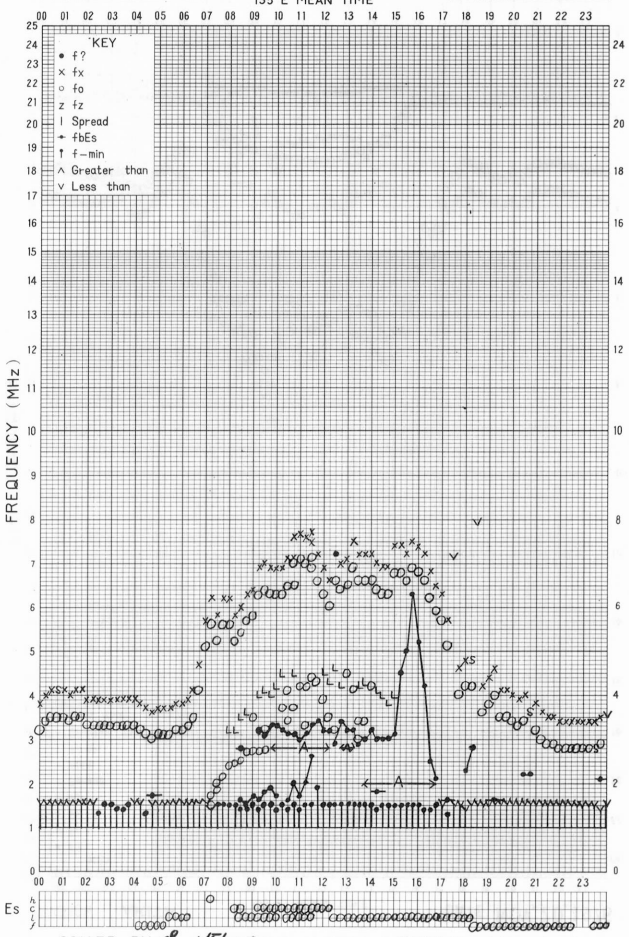
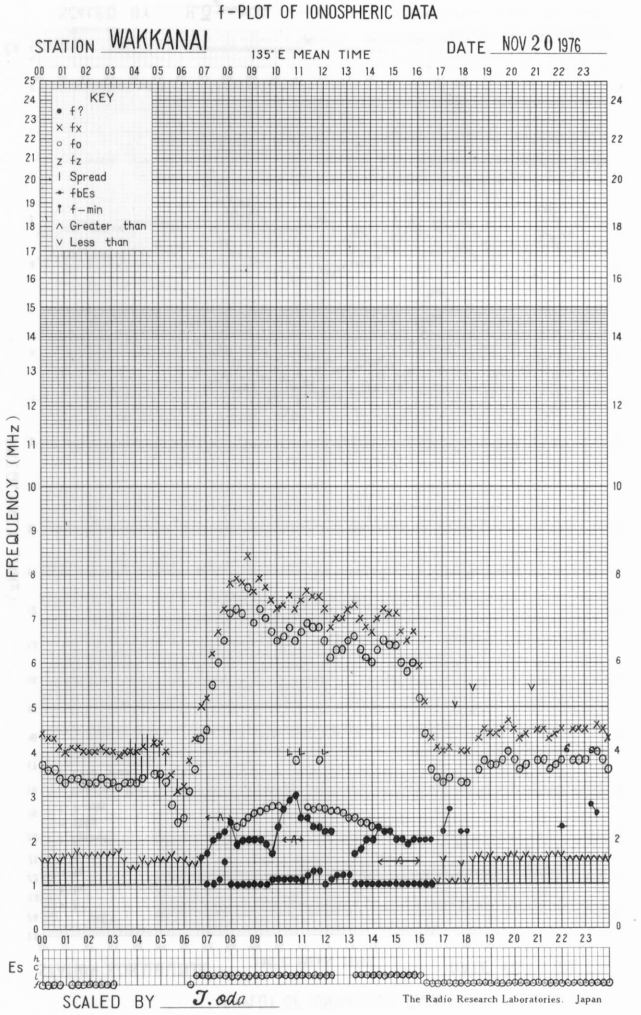


SCALED BY S. Kitoma The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE NOV 20 1976
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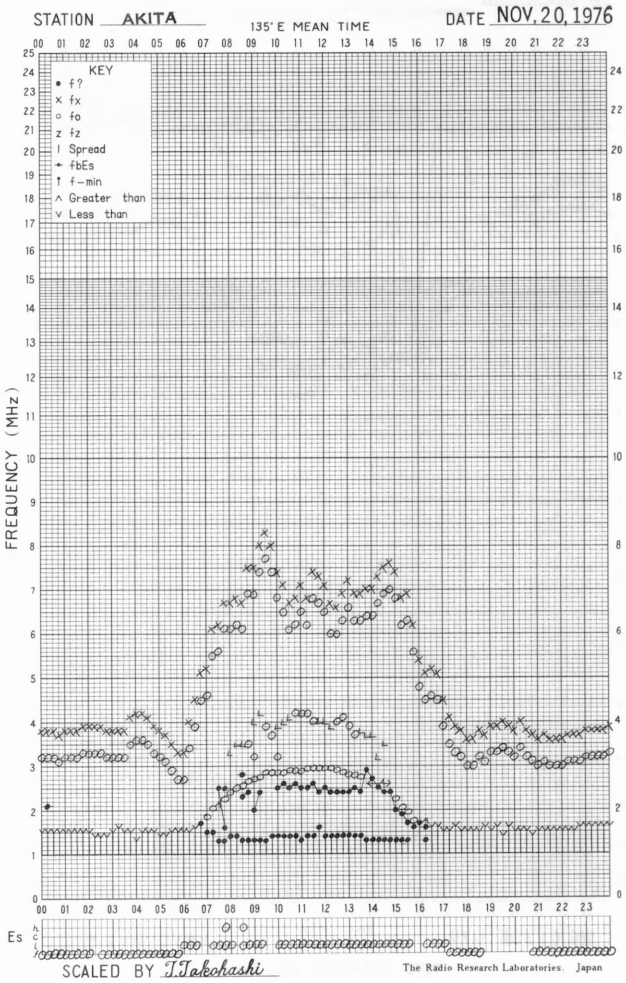
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan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DATE NOV. 20, 1976
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FREQUENCY (MHz)
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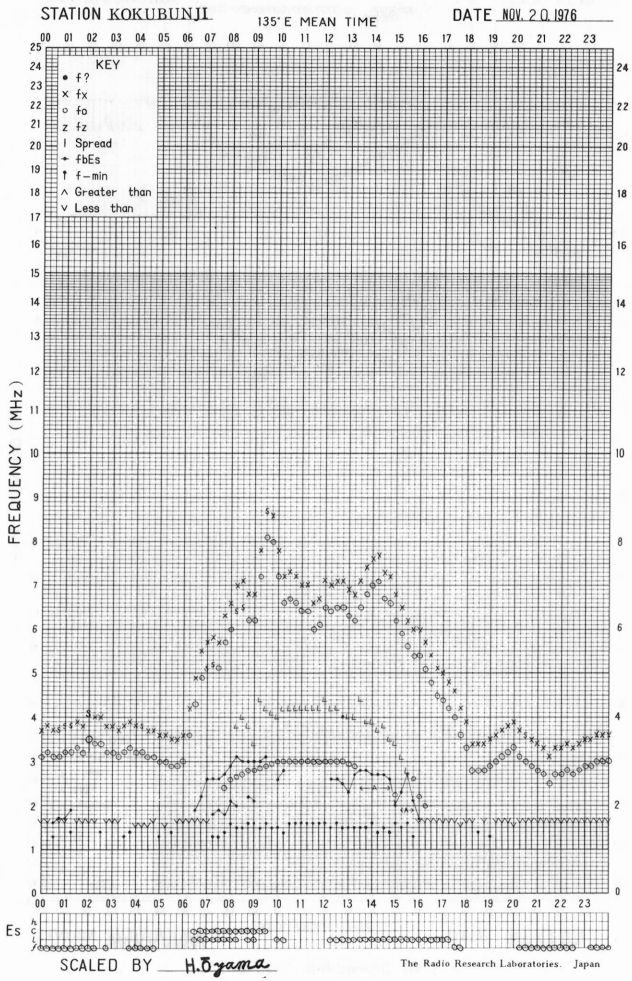
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE NOV. 20 1976



SCALED BY H. Ozama

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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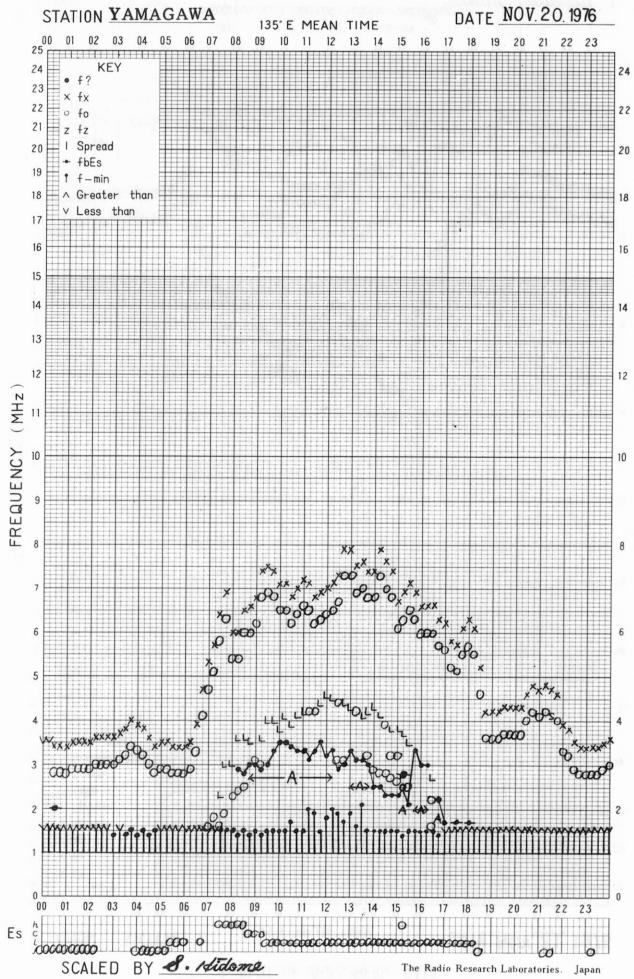
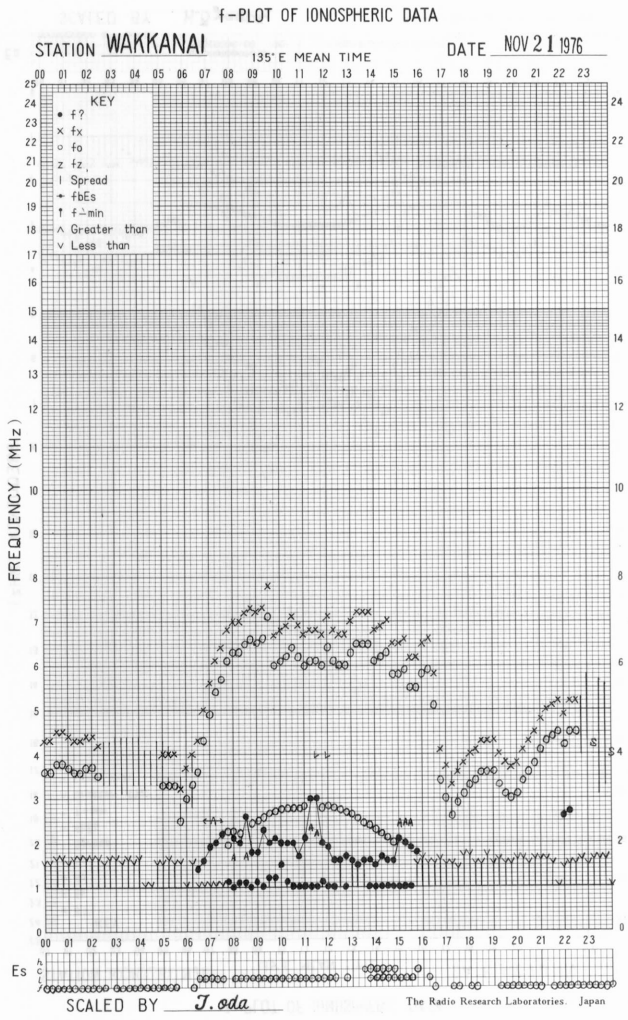


SCALED BY S. Nitsuma

The Radio Research Laboratories. Japan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DATE NOV 21 1976
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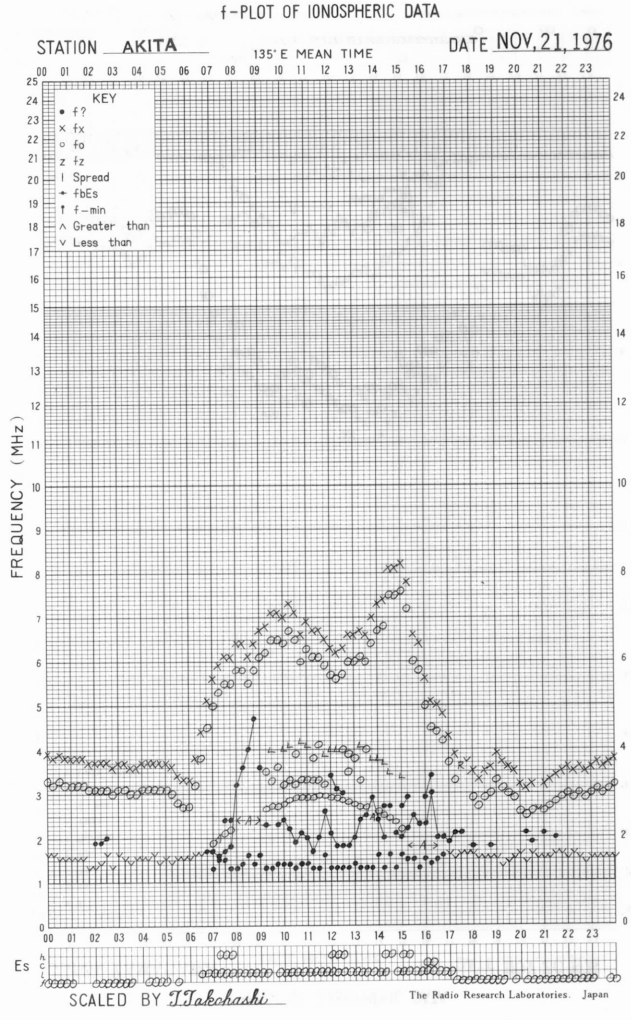
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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∧ Greater than
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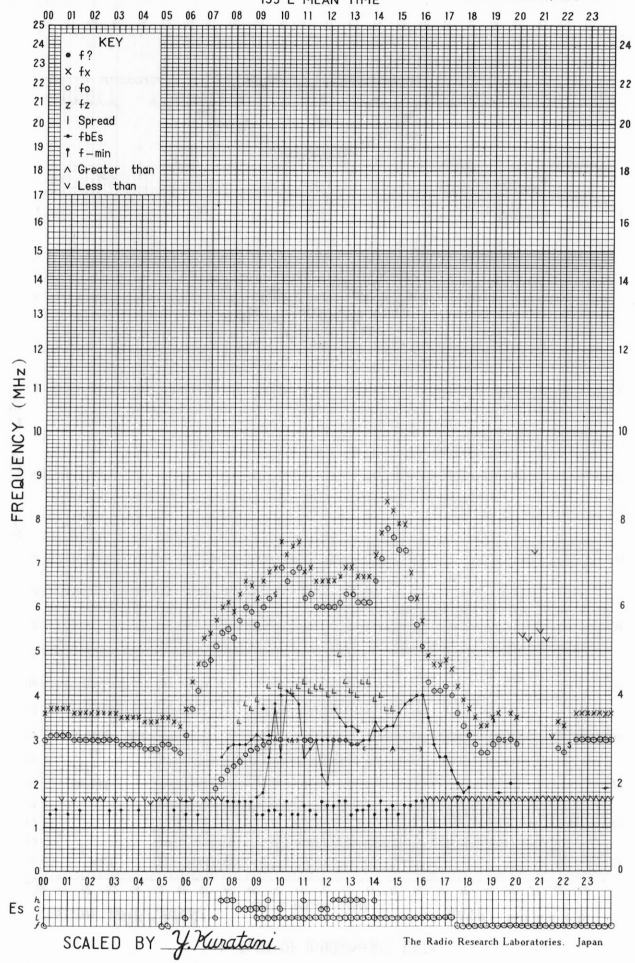
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 21, 1976



SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

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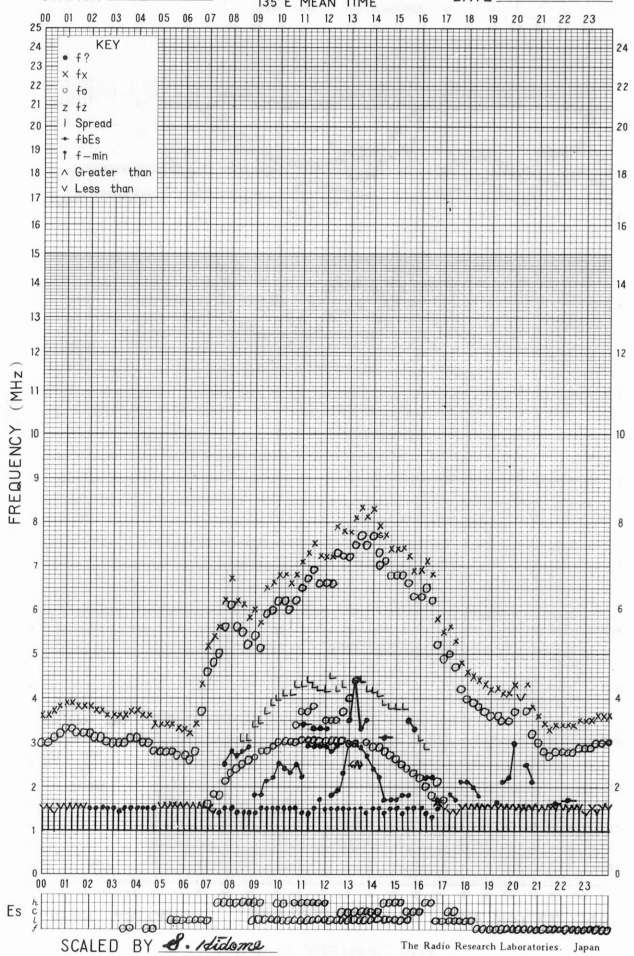

SCALED BY S. Iidaka

The Radio Research Laboratories. Japan

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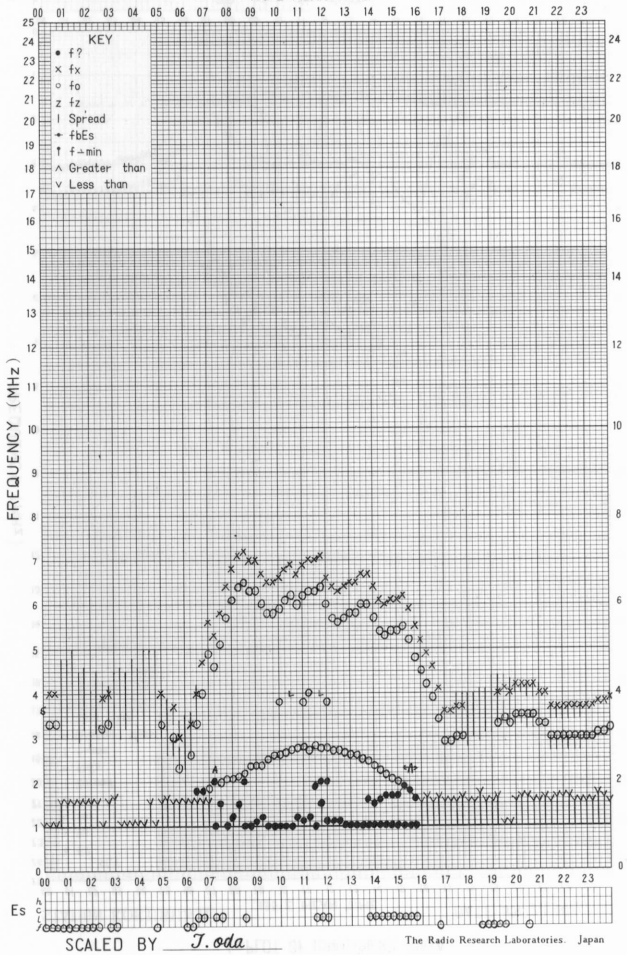

SCALED BY J. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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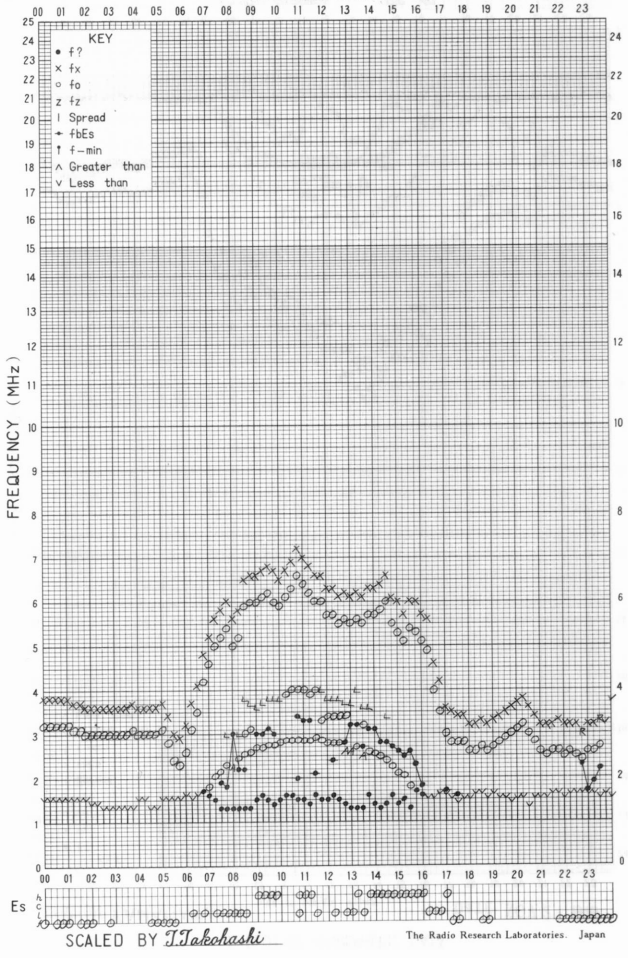

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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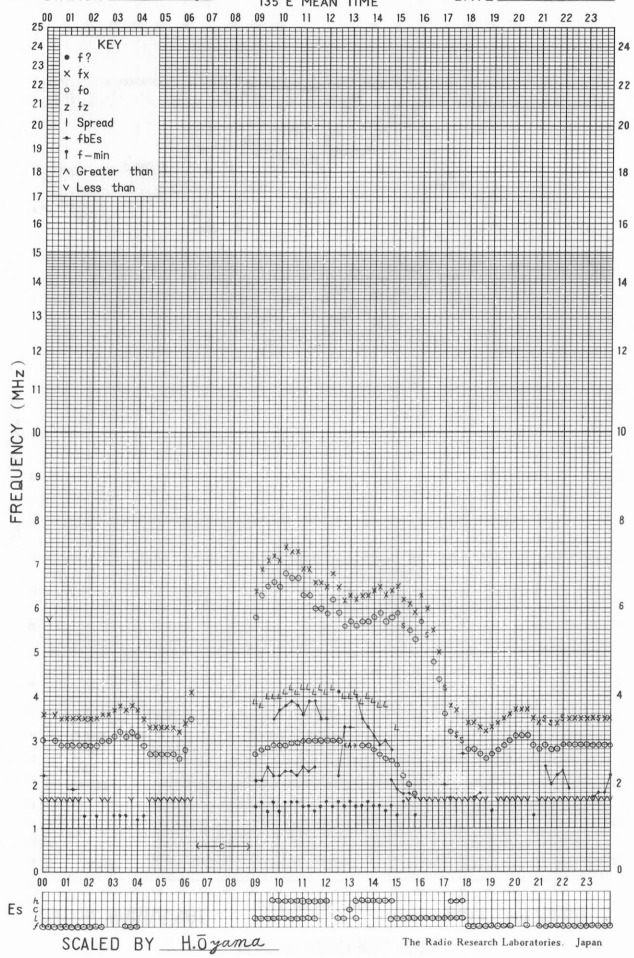

SCALED BY H.Ōyama

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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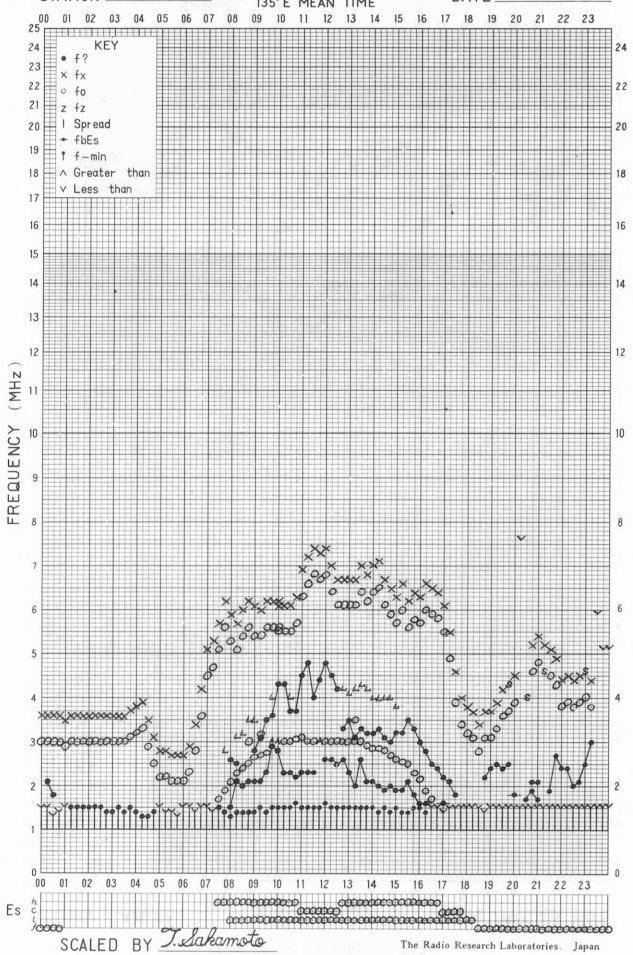

SCALED BY T. Sakamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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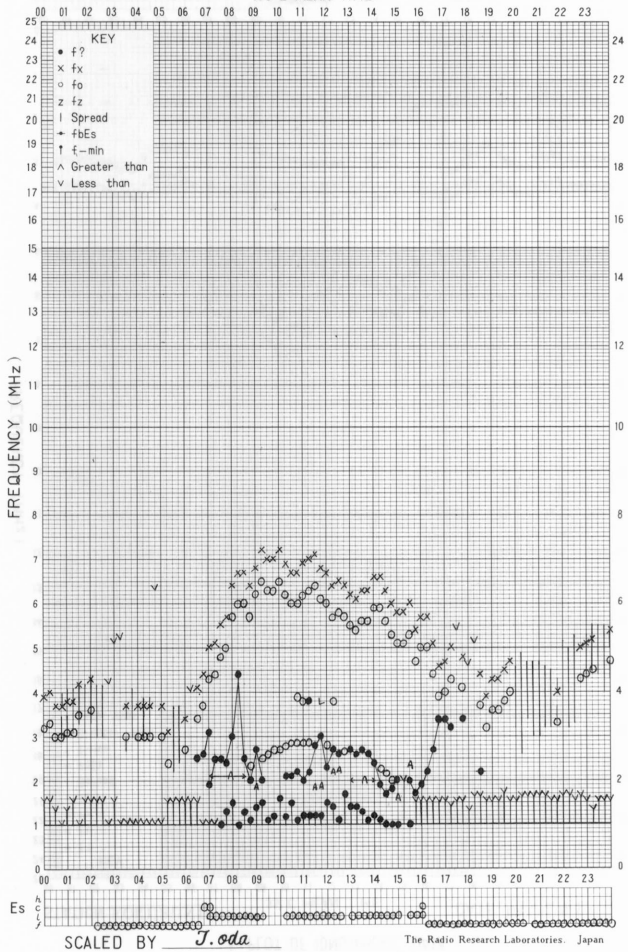

SCALED BY J. oda

The Radio Research Laboratories. Japan

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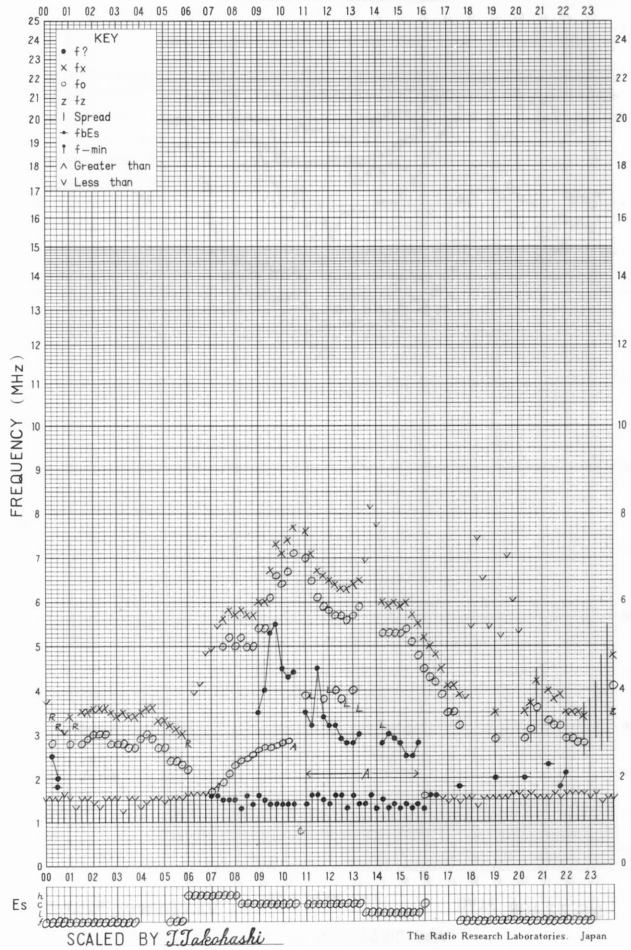
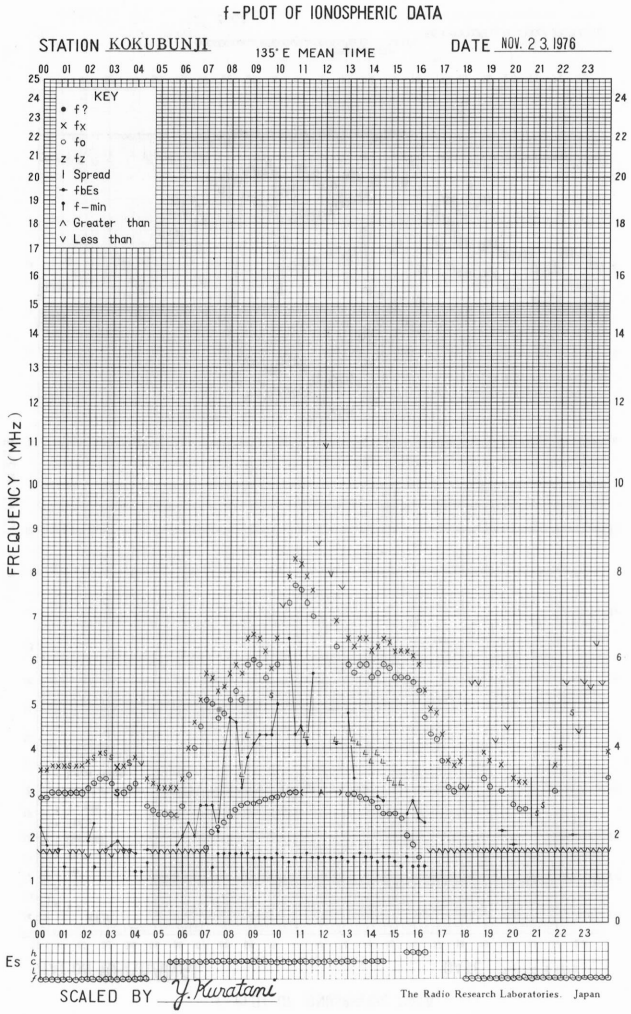


SCALED BY T. Takahashi

The Radio Research Laboratories. Japan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STATION KOKUBUNJI
135° E MEAN TIME
DATE NOV. 23, 1976
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FREQUENCY (MHz)
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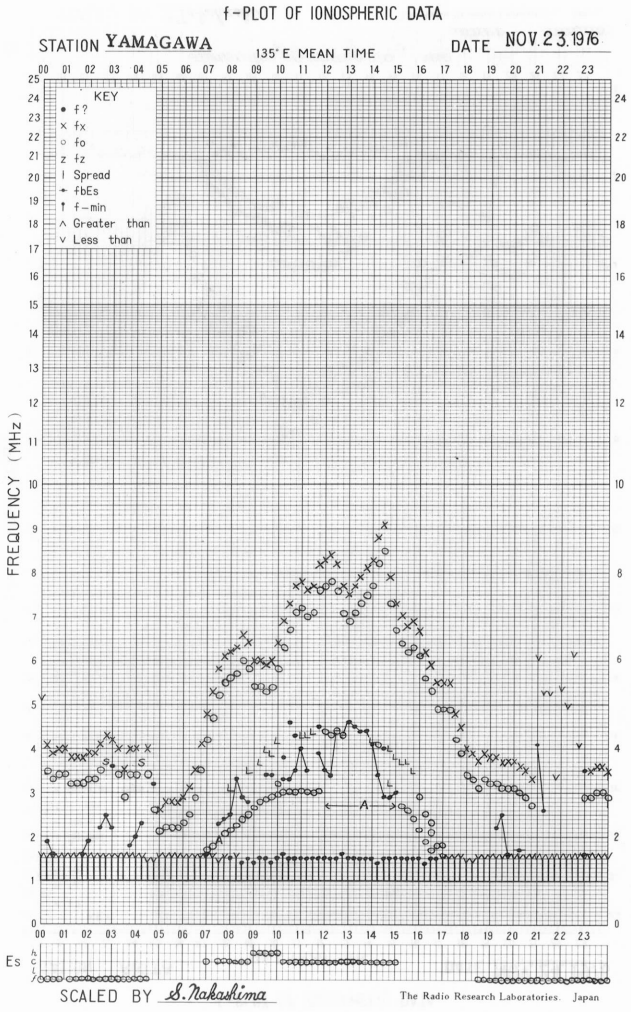
SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan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Spread
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f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY S. Nakashima
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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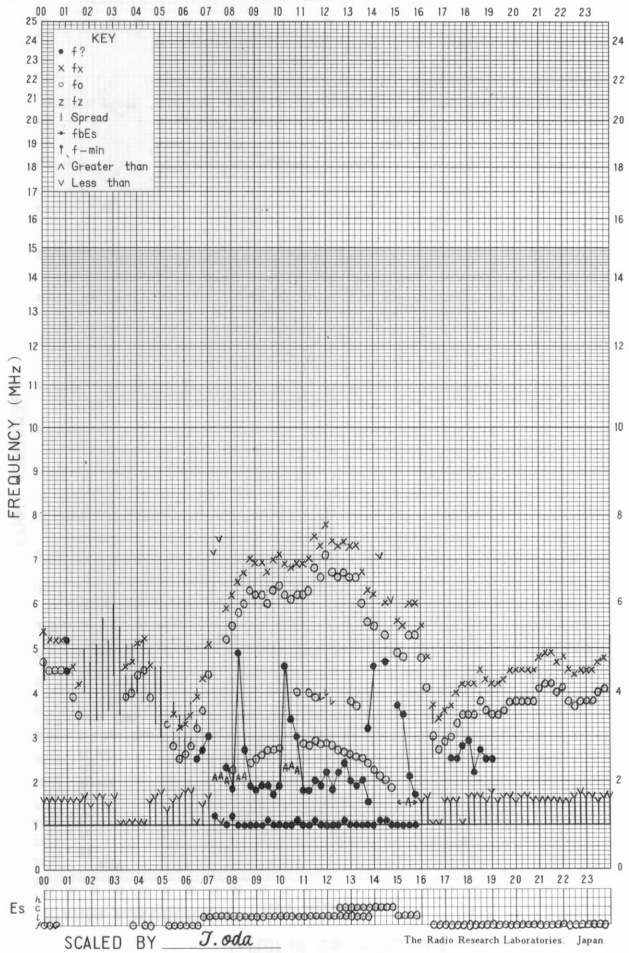

SCALED BY T. oda

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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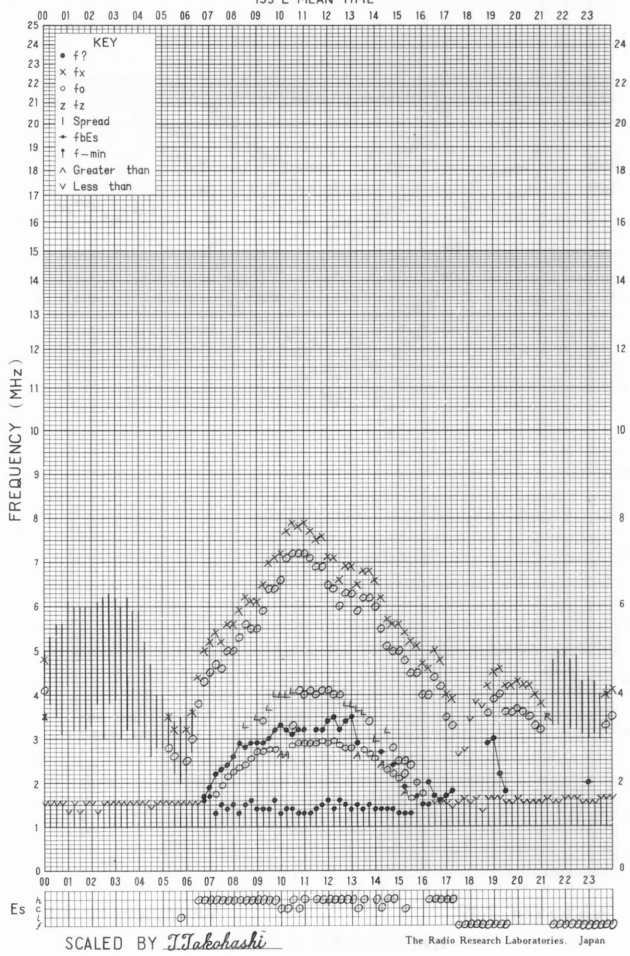

SCALED BY T. Takahashi

The Radio Research Laboratories. Japan

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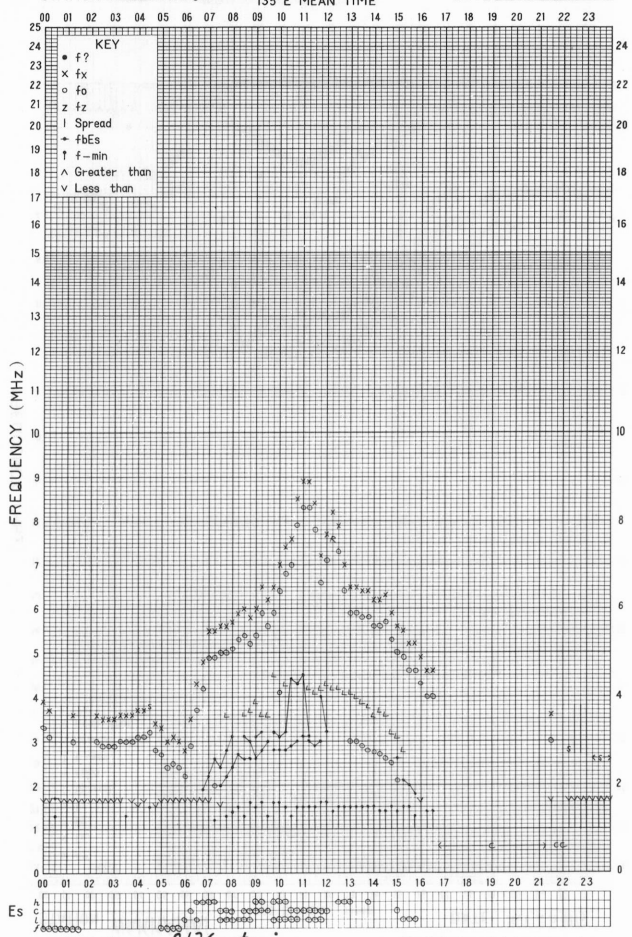

SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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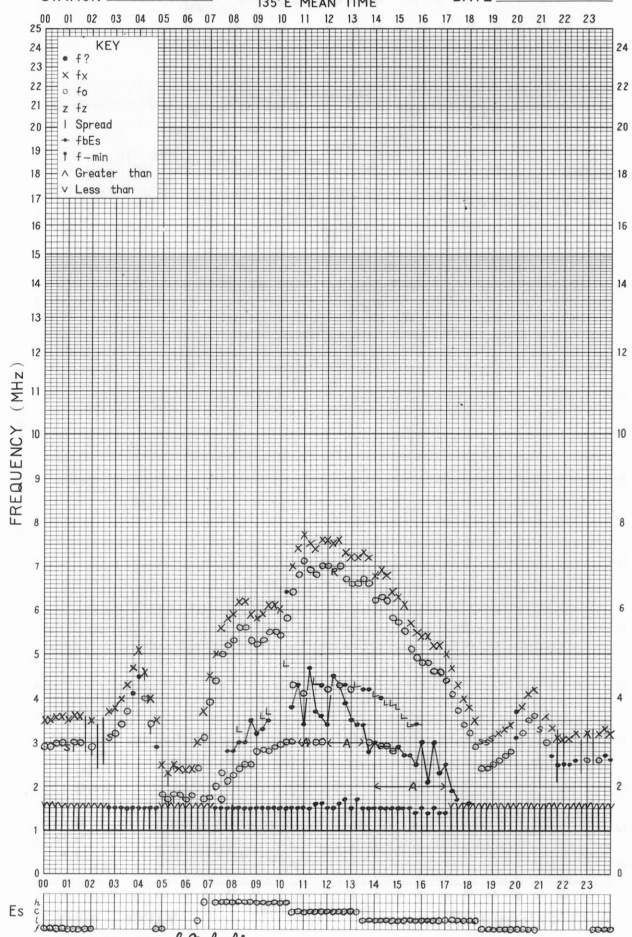
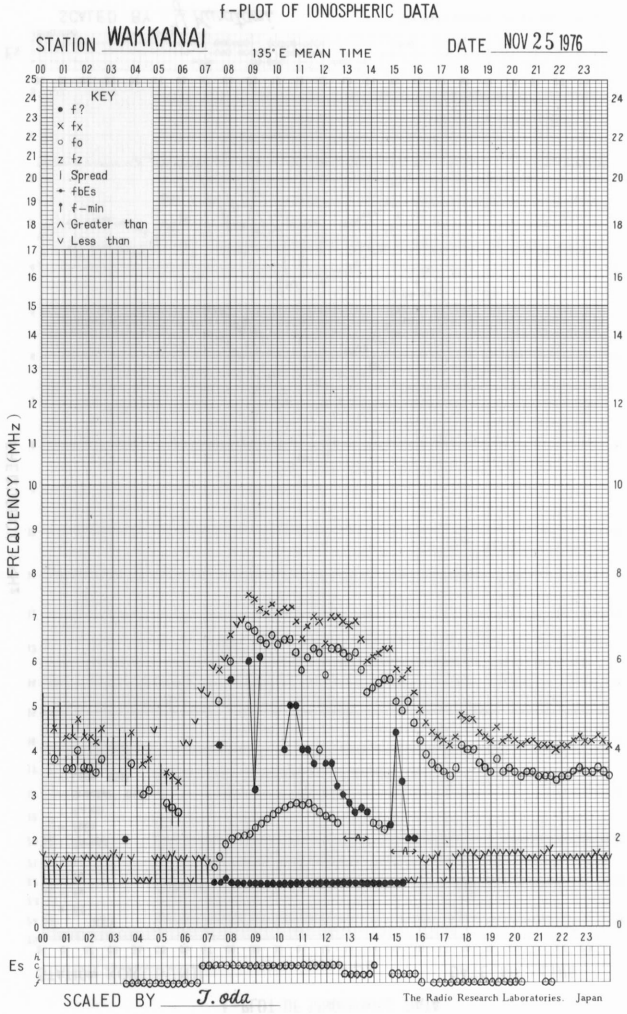


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan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135° E MEAN TIME
DATE NOV 25 1976
KEY
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^ Greater than
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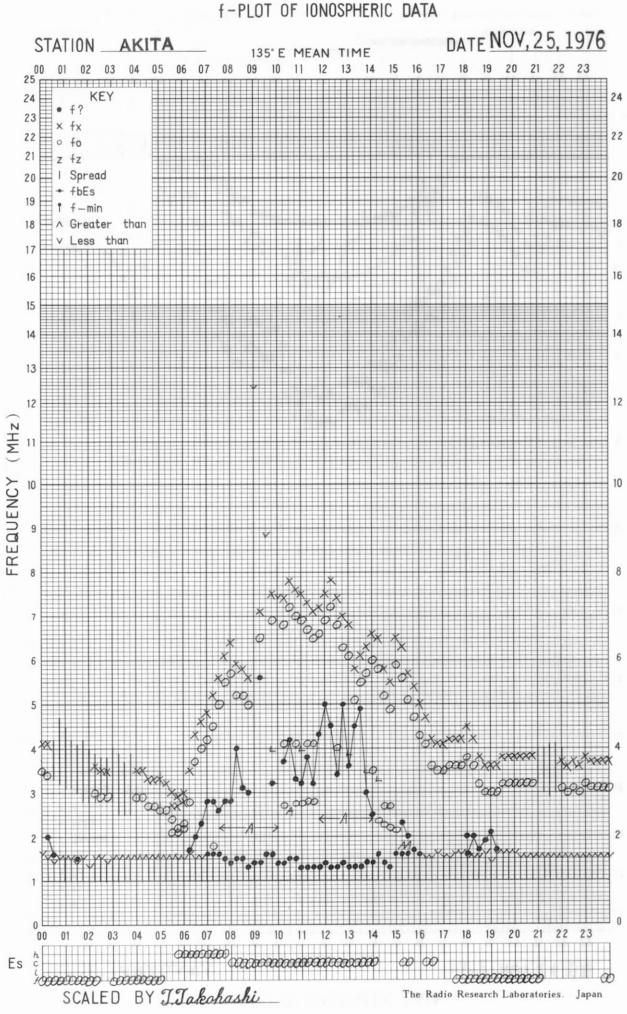
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan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DATE NOV, 25, 1976
KEY
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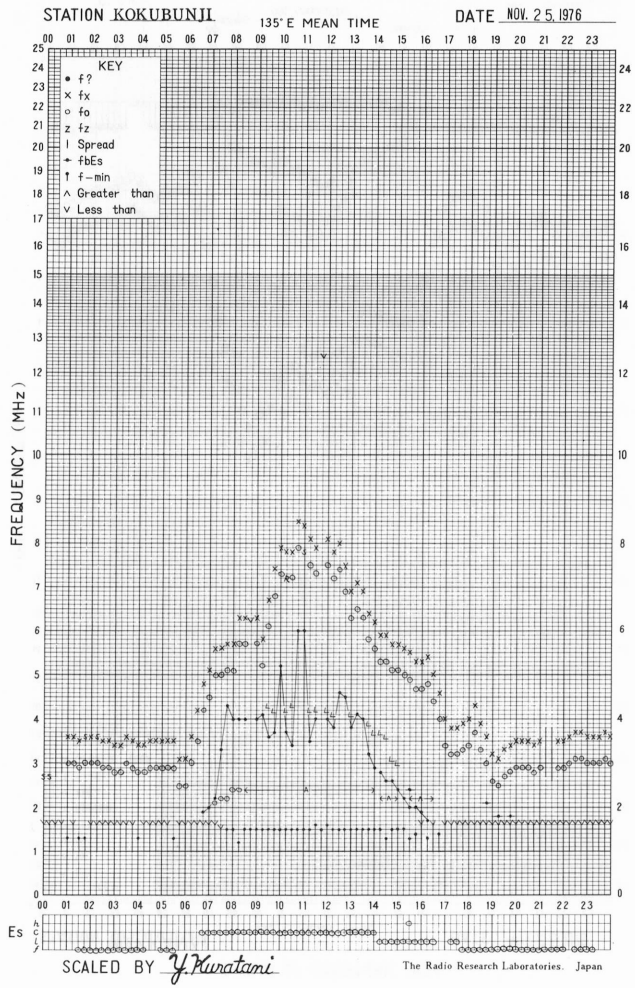
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE NOV. 25, 1976



SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

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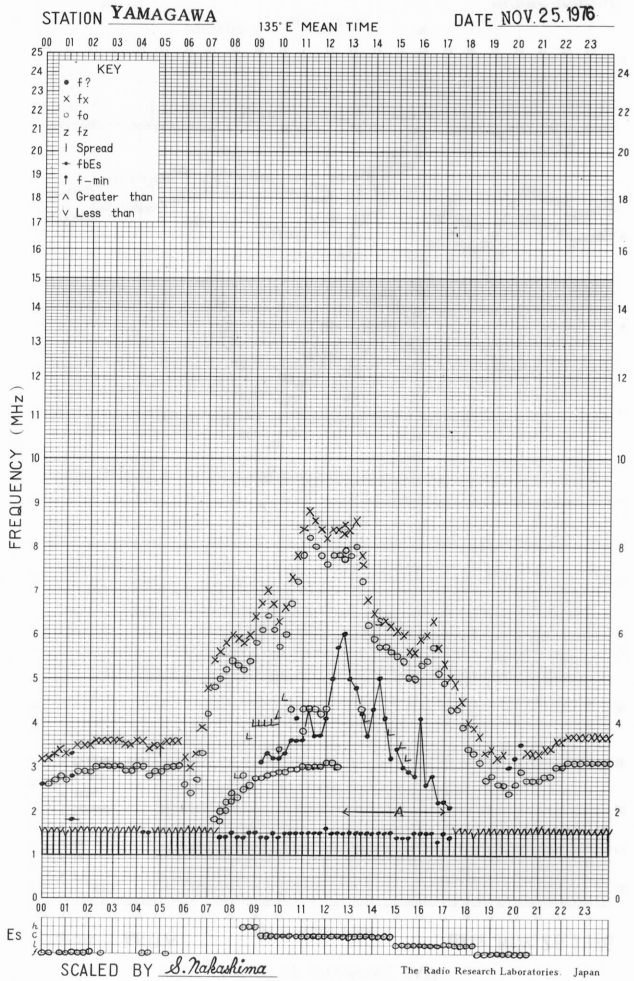
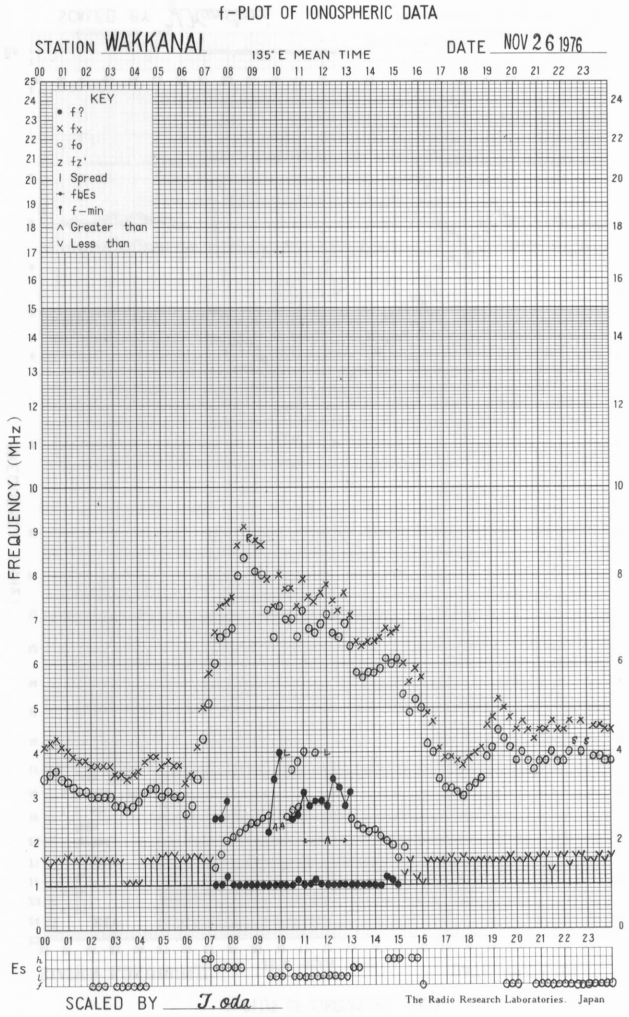
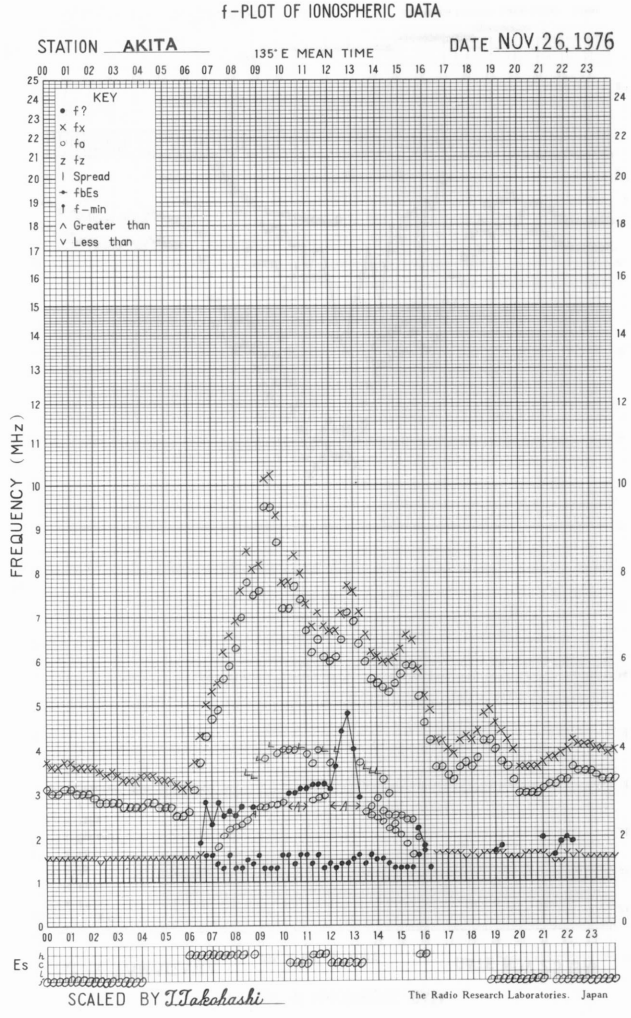
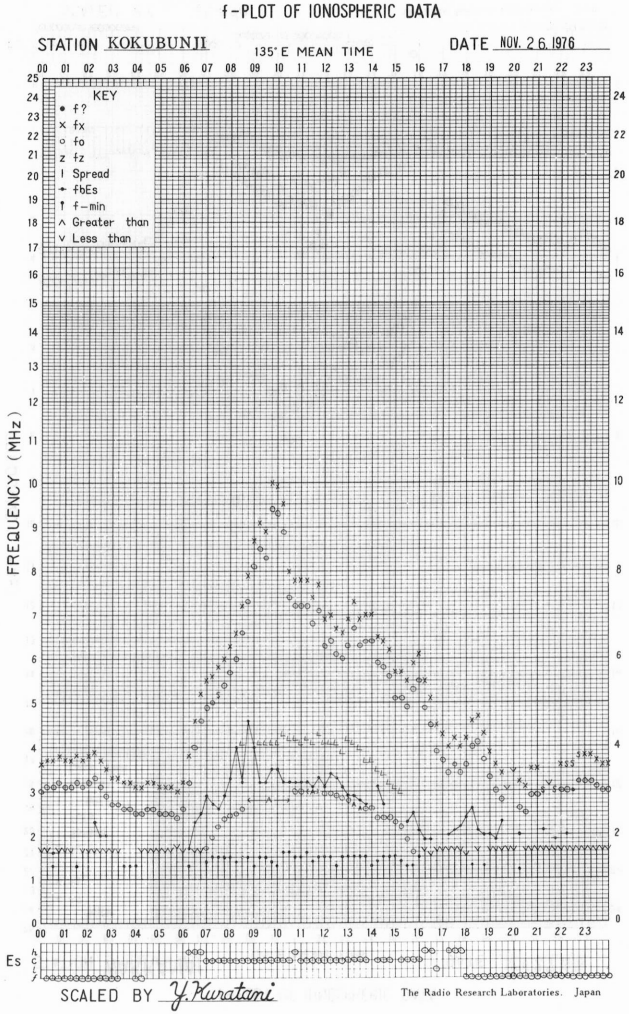


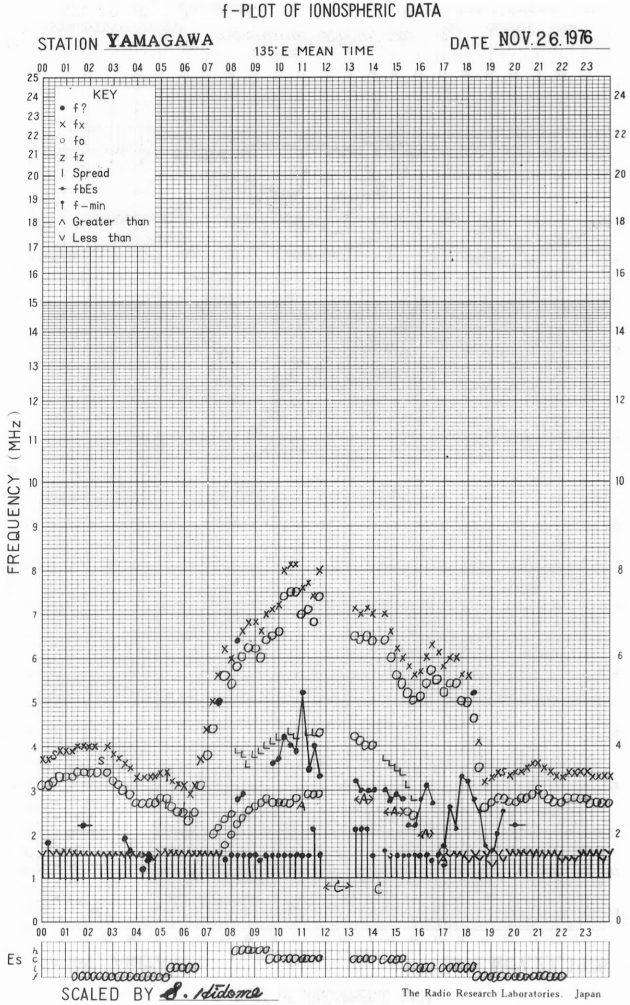
SCALED BY S. Nakashima

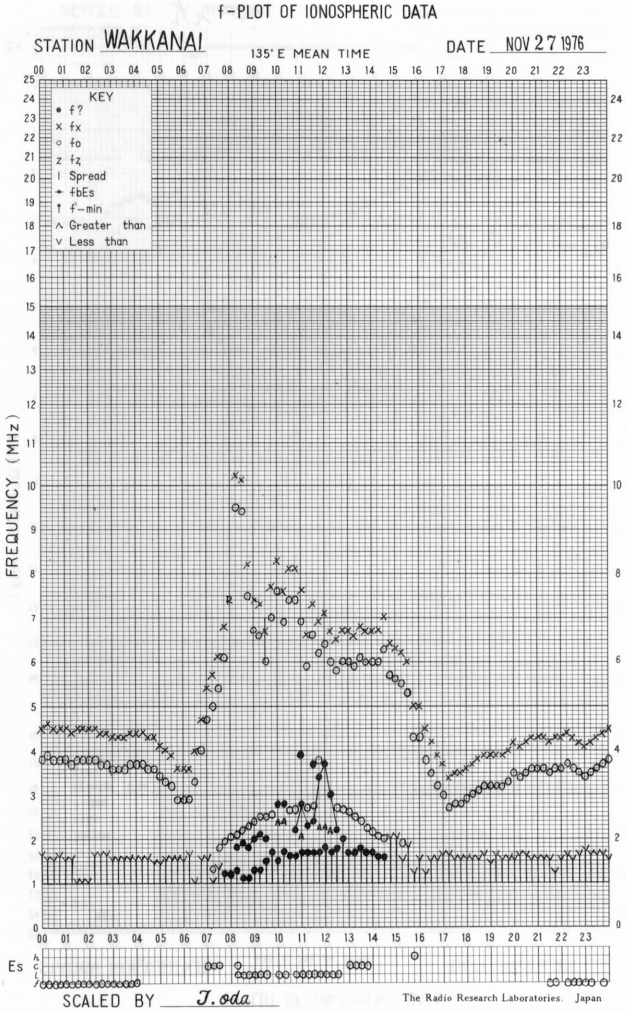
The Radio Research Laboratories. Japan

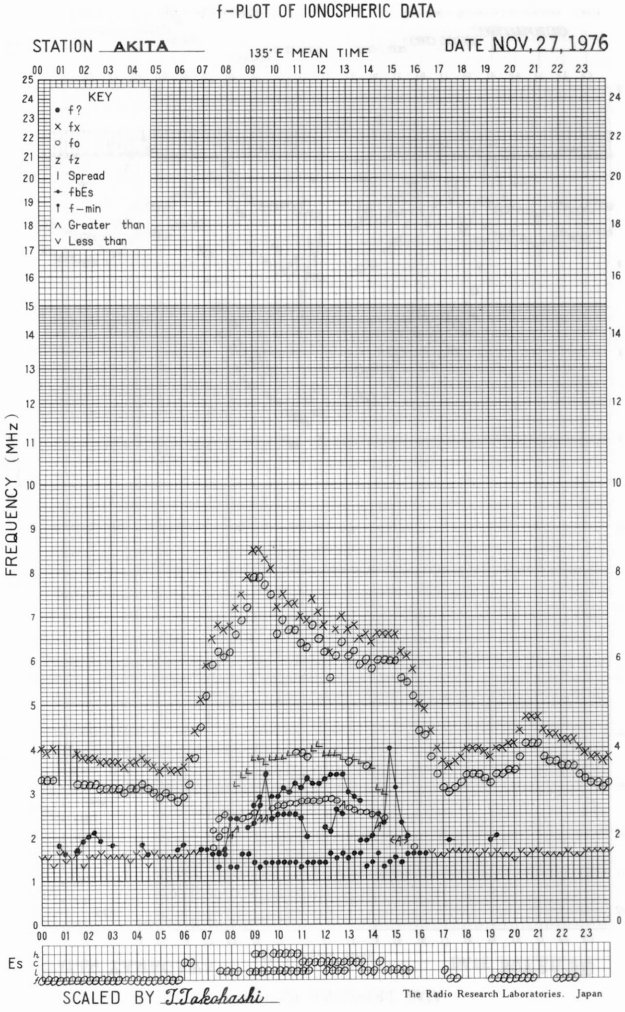

f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE NOV 26 1976
KEY
f?
fx
fo
fz'
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY T. oda
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135°E MEAN TIME
DATE NOV. 26, 1976
KEY
f?
fx
fo
fz
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135° E MEAN TIME
DATE NOV. 26, 1976
KEY
f?
fx
fo
fz
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY Y. Kuratani
The Radio Research Laboratories. Japan

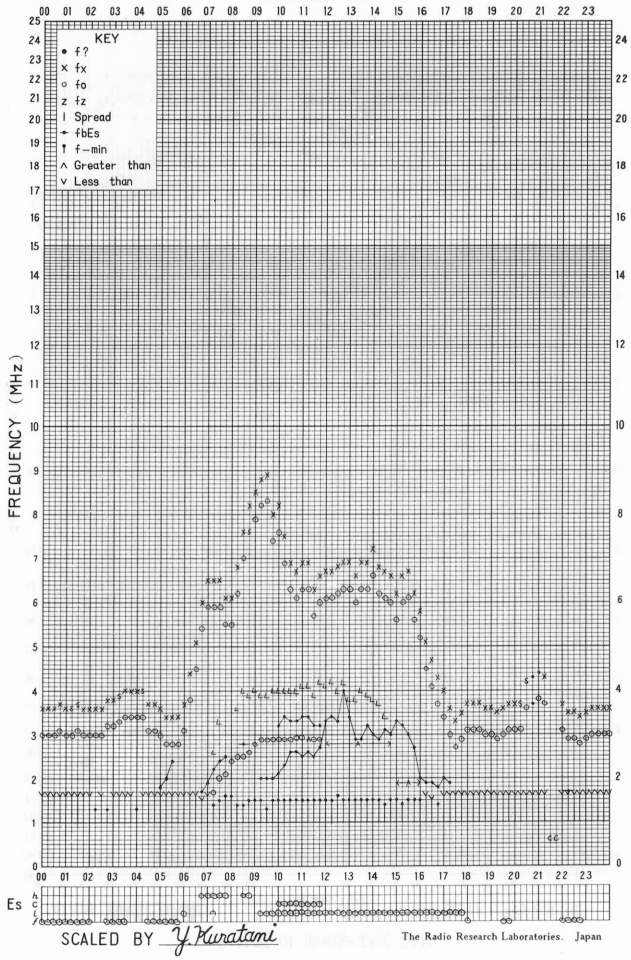

f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135° E MEAN TIME
DATE NOV. 26, 1976
KEY
f?
fx
fo
fz
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY S. Sidoma
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE NOV 27 1976
KEY
• f?
× fx
○ fo
z fz
I 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, 27, 1976
KEY
• f?
× fx
○ fo
z fz
I Spread
← fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE NOV. 27, 1976

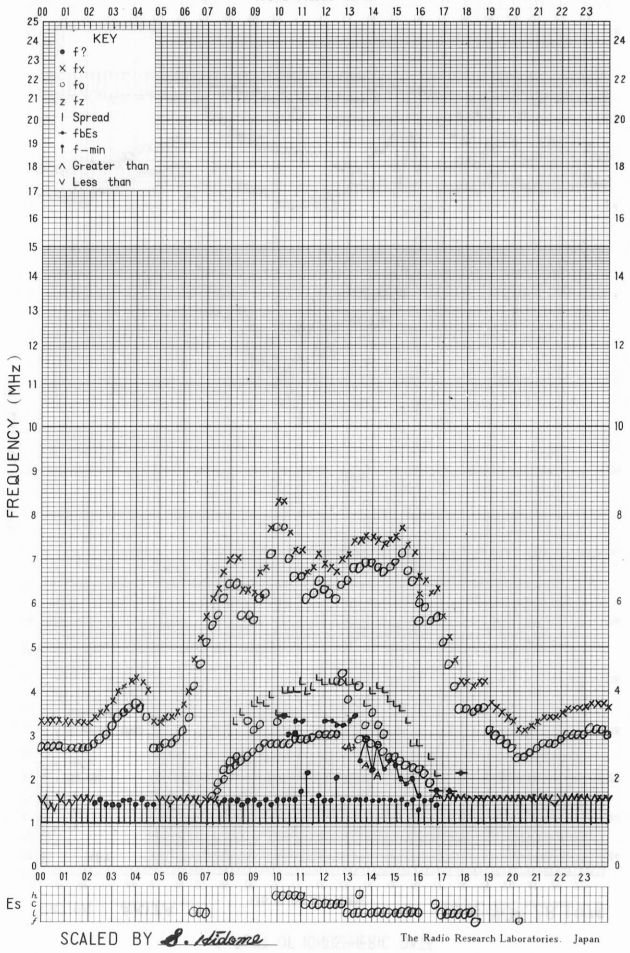


SCALED BY Y. Kuratani

The Radio Research Laboratories. Japan

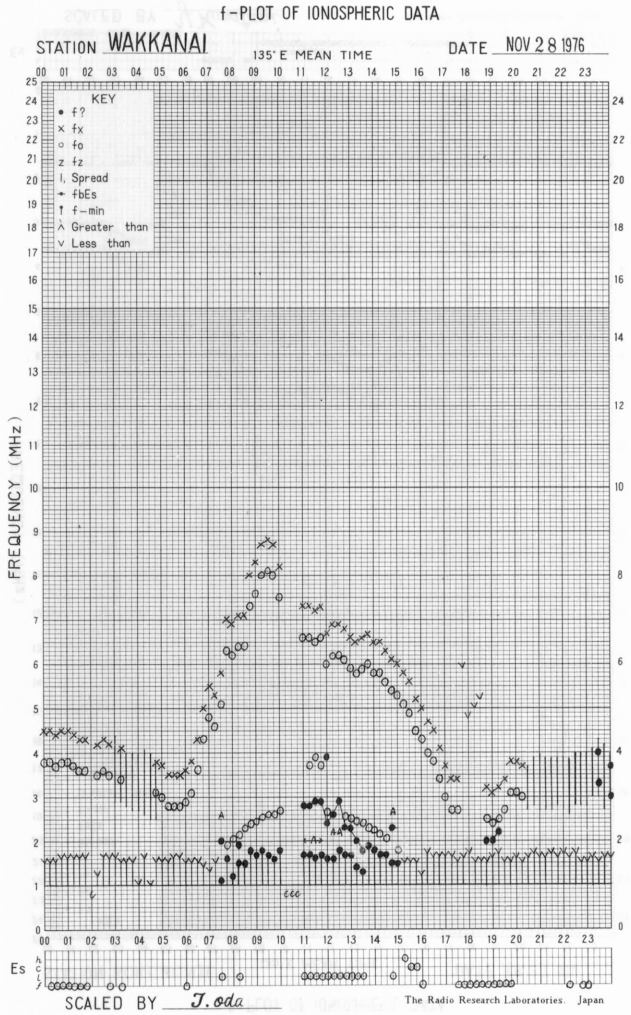
f-PLOT OF IONOSPHERIC DATA

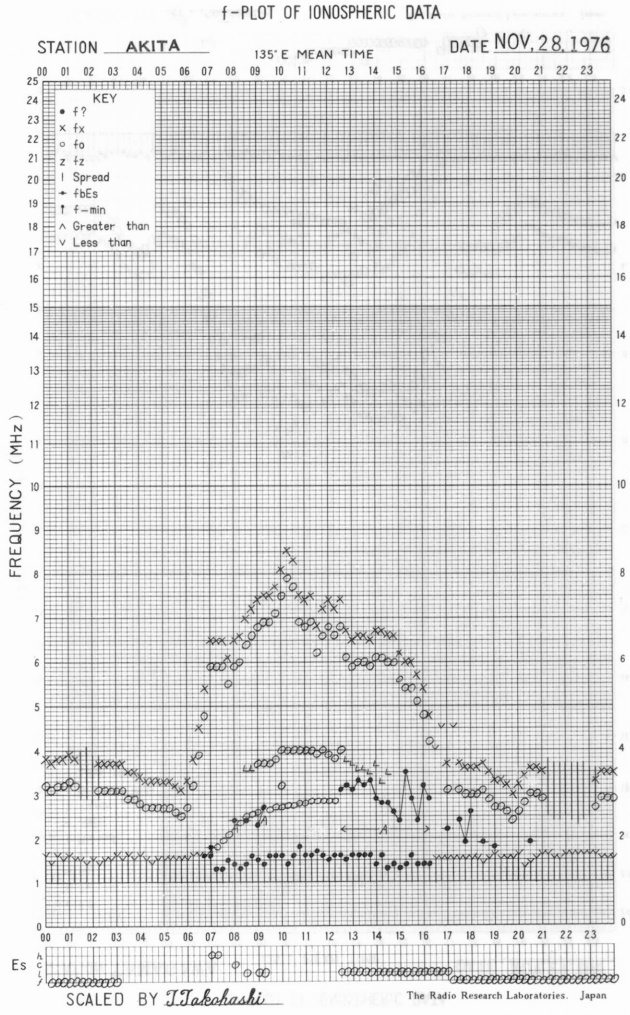
STATION YAMAGAWA 135°E MEAN TIME DATE NOV. 27, 1976



SCALED BY S. Ishioma

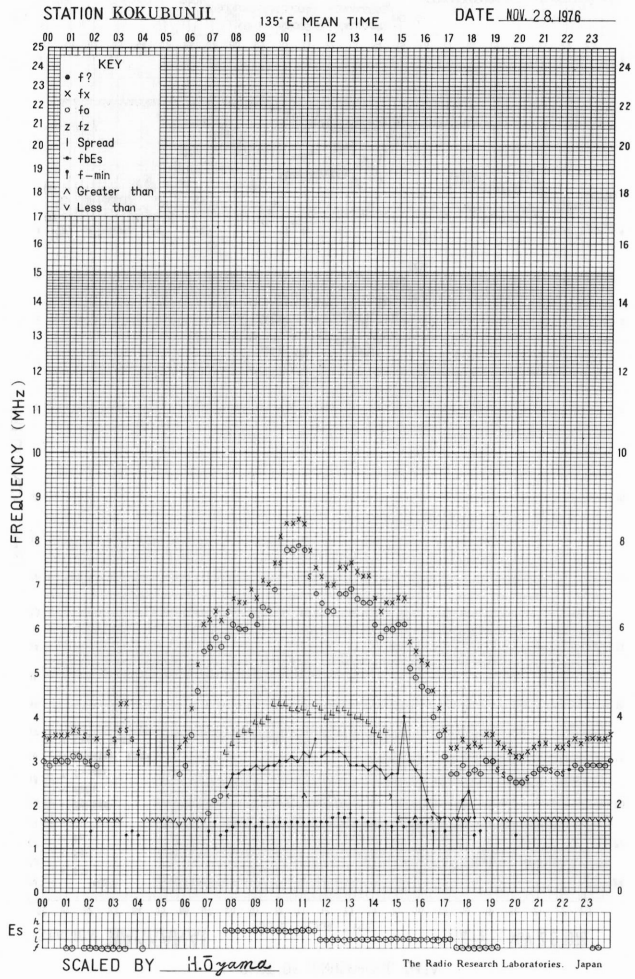
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135° E MEAN TIME
DATE NOV 28 1976
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY J. oda
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION AKITA
135° E MEAN TIME
DATE NOV. 28. 1976
KEY
• f?
× fx
○ fo
z fz
| Spread
+ fbEs
↑ f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE NOV. 28 1976

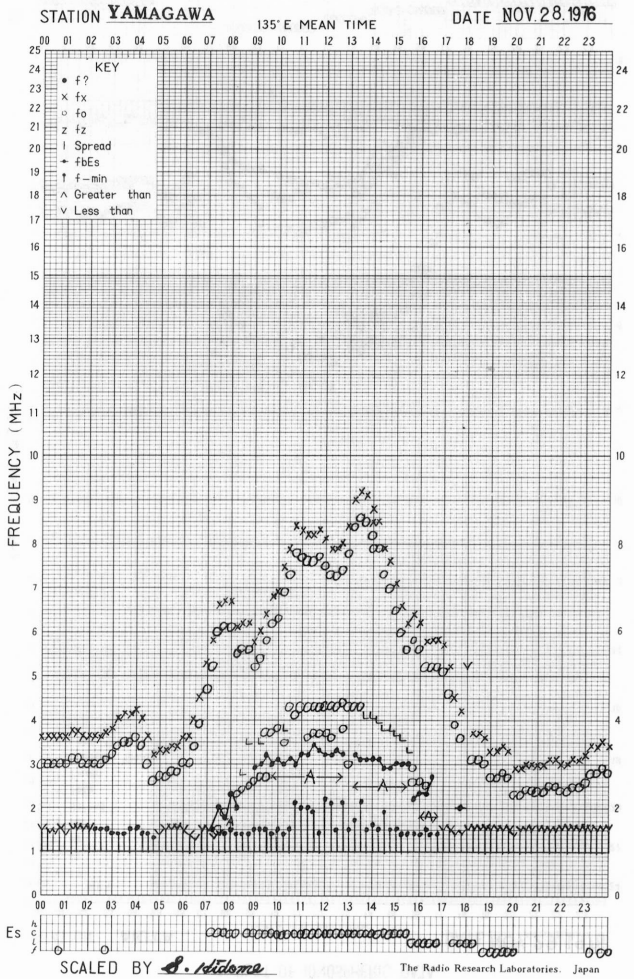


SCALED BY H. Ōzyama

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE NOV. 28. 1976

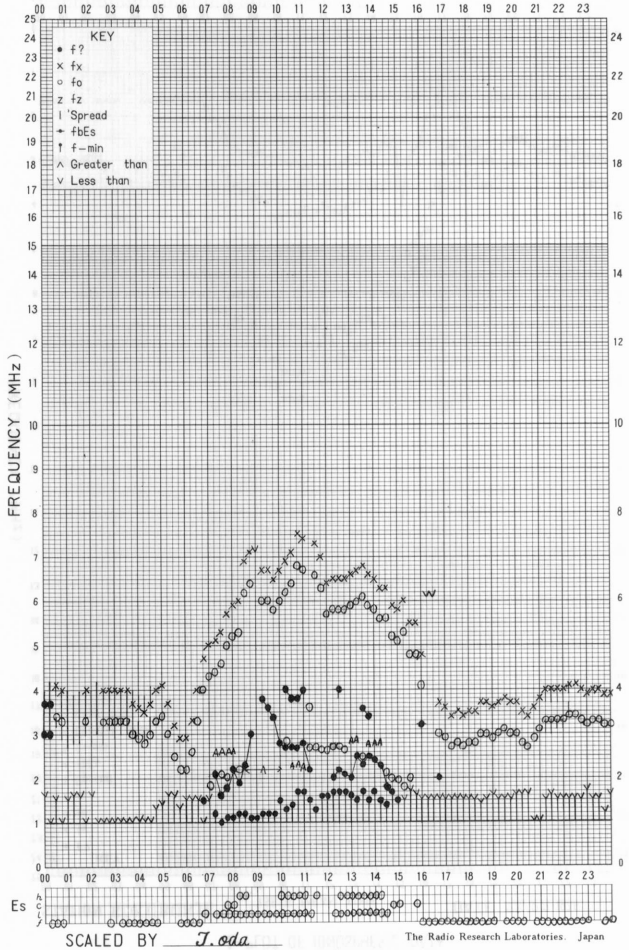


SCALED BY S. Ishidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE NOV 29 1976

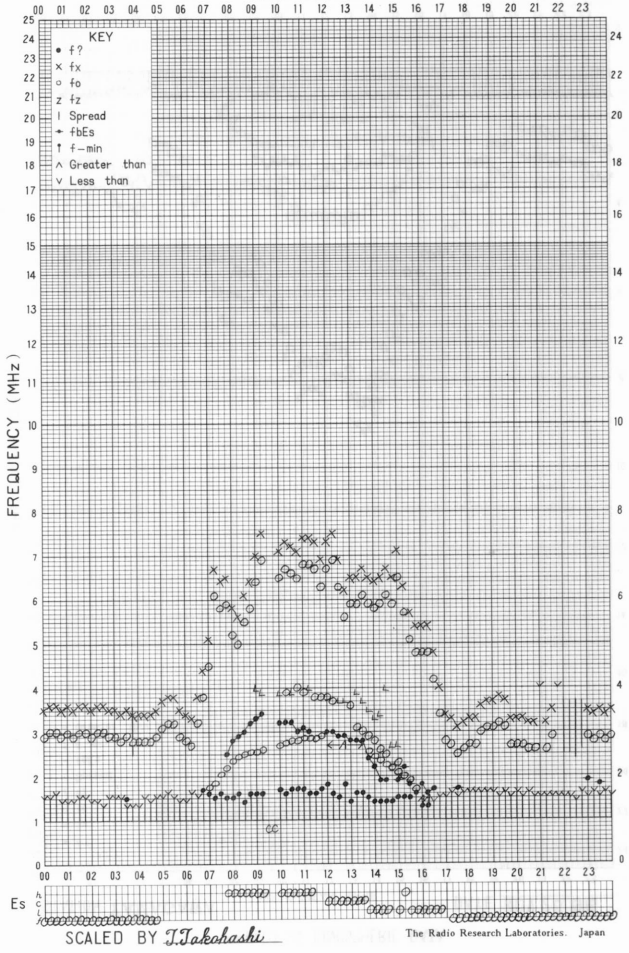


SCALED BY T. oda

The Radio Research Laboratories. Japan

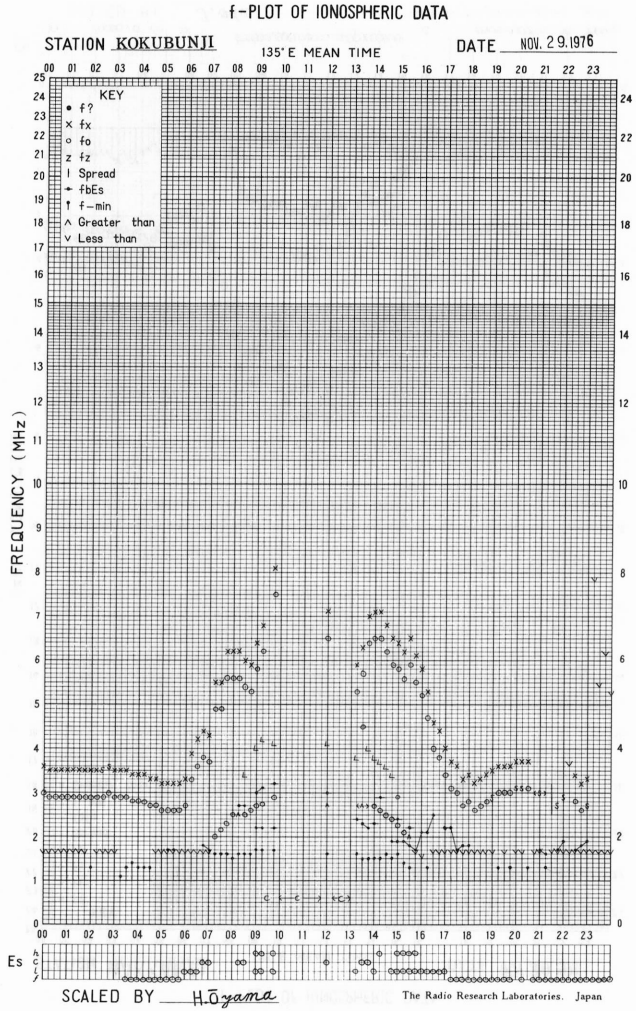
f-PLOT OF IONOSPHERIC DATA

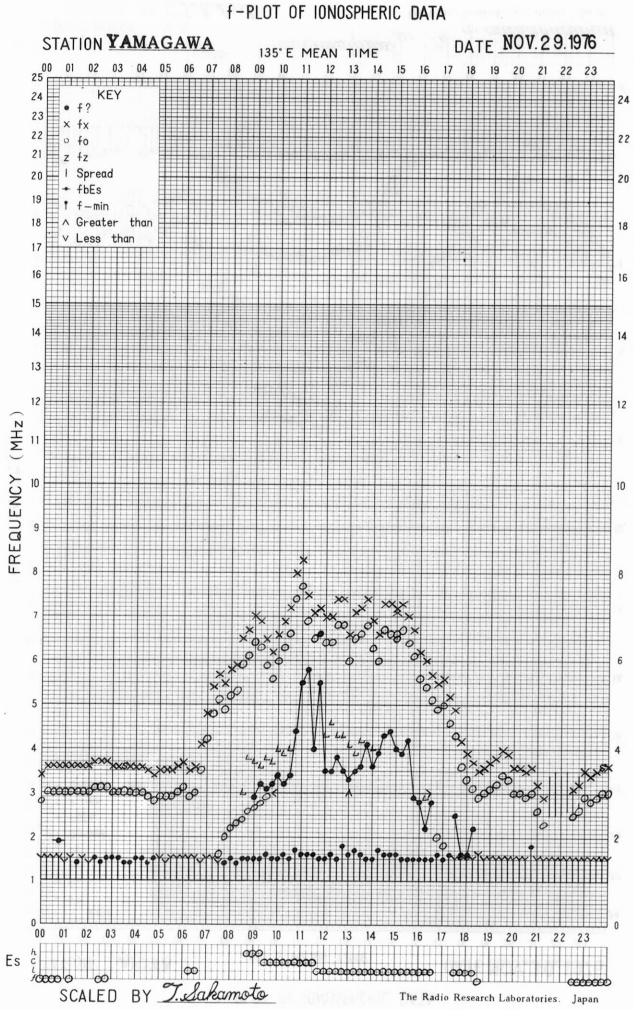
STATION AKITA 135°E MEAN TIME DATE NOV. 29, 1976

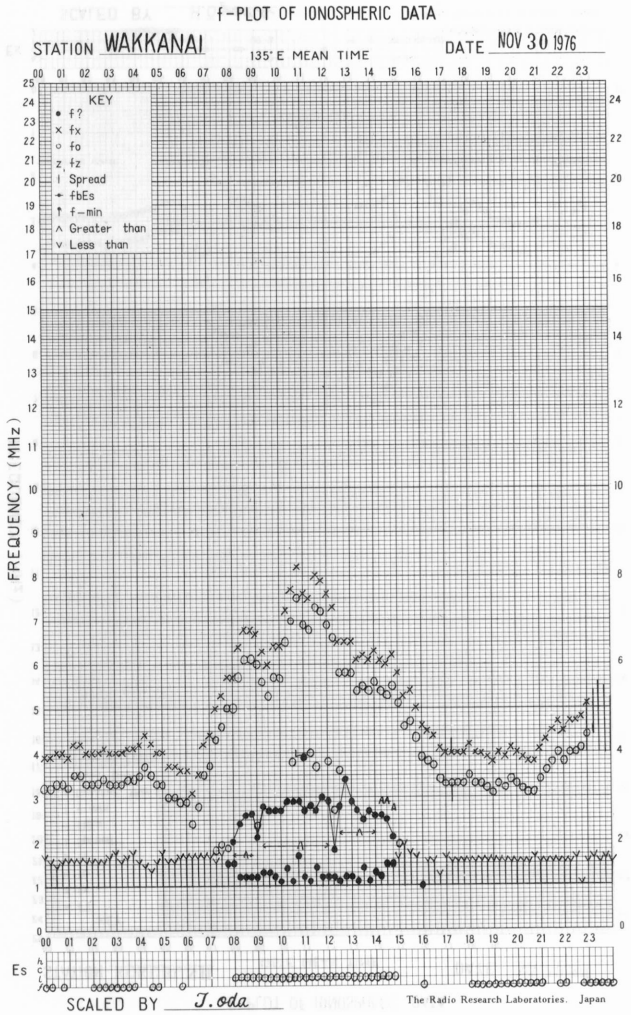


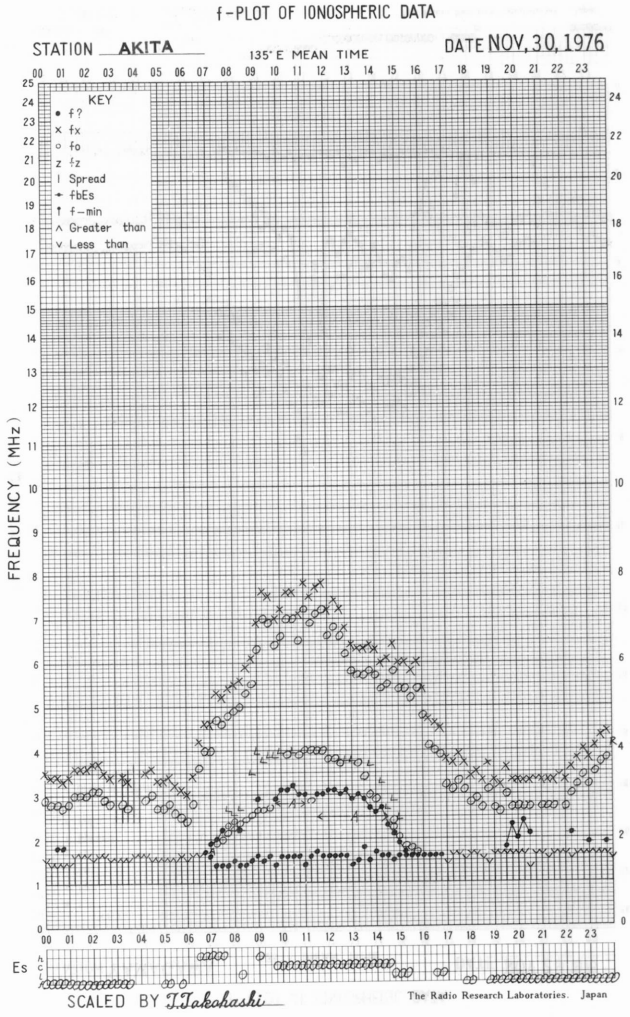
SCALED BY T. Takahashi

The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION KOKUBUNJI
135°E MEAN TIME
DATE NOV. 29.1976
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
† f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY H.Ōyama
The Radio Research Laboratories. Japan

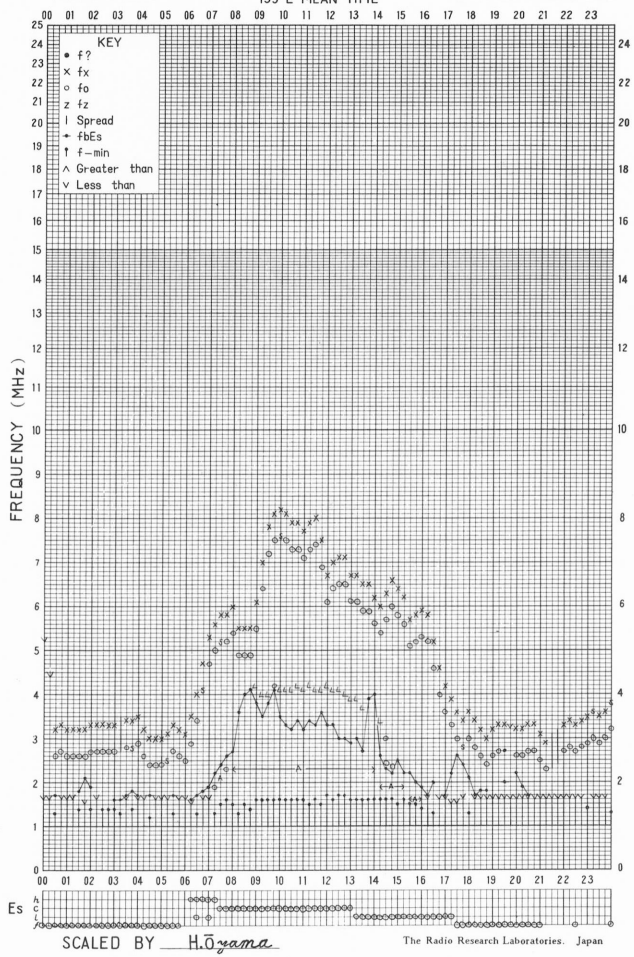

f-PLOT OF IONOSPHERIC DATA
STATION YAMAGAWA
135°E MEAN TIME
DATE NOV. 29.1976
KEY
• f?
× fx
○ fo
z fz
| Spread
⊸ fbEs
† f-min
^ Greater than
v Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takamoto
The Radio Research Laboratories. Japan


f-PLOT OF IONOSPHERIC DATA
STATION WAKKANAI
135°E MEAN TIME
DATE NOV 30 1976
KEY
f?
fx
fo
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, 30, 1976
KEY
f?
fx
fo
fz
Spread
fbEs
f-min
Greater than
Less than
FREQUENCY (MHz)
Es
SCALED BY T. Takahashi
The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE NOV. 30. 1976

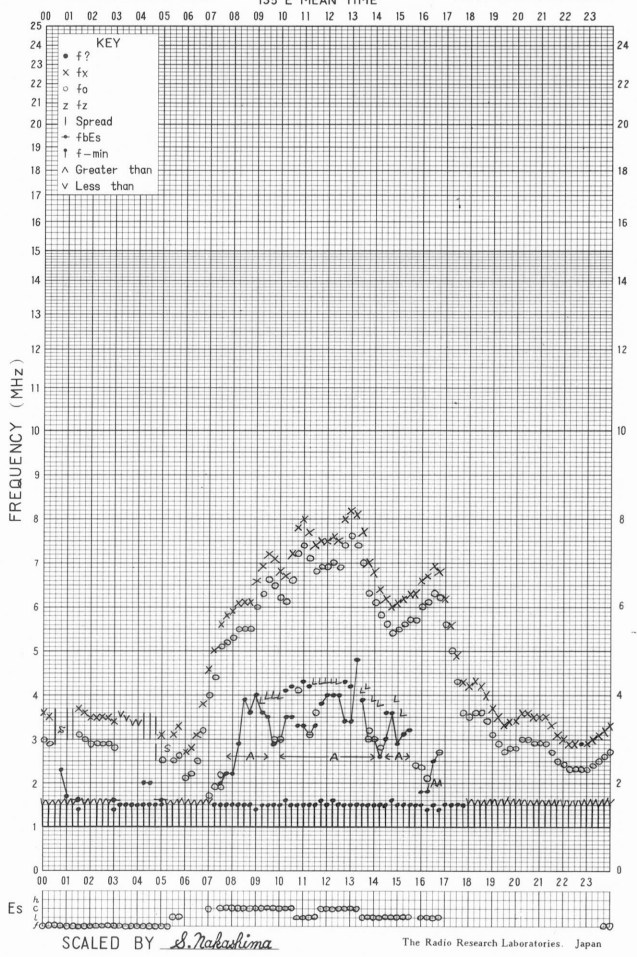


SCALED BY H.Ōzawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE NOV. 30. 1976



SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

HIRAISO (HIRA)

36.37N 140.62E

Hiraiso Branch, R.R.L.,
Nakaminato, Ibaraki,
311-12 JAPAN

November 1976

Single-frequency total flux observations at 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	8	(8)	8	8	0	0	(0)	0	0
2	8	8	(8)	8	8	0	0	(0)	0	0
3	8	8	(8)	8	8	0	0	(0)	0	0
4	8	7	(7)	7	8	0	0	(0)	*	0
5	7	7	(7)	7	7	*	*	(*)	0	*
6	7	8	(8)	7	7	0	*	(0)	0	0
7	7	7	(q)	7	7	*	*	(*)	0	*
8	7	7	(7)	7	7	0	0	(0)	0	0
9	7	7	(7)	7	7	0	0	(0)	0	0
10	7	7	(7)	7	7	0	0	(0)	0	0
11	8	8	(7)	7	7	0	0	(0)	0	0
12	7	7	(7)	7	7	0	0	(0)	0	0
13	7	7	(7)	7	7	0	0	(0)	0	0
14	8	8	(7)	7	8	0	0	(0)	0	0
15	7	8	(8)	7	7	0	0	(0)	0	0
16	8	8	(7)	7	7	0	0	(0)	0	0
17	7	8	(7)	7	7	0	0	(0)	*	0
18	8	8	(8)	9	8	0	0	(0)	1	0
19	9	8	(8)	8	8	1	0	(0)	1	1
20	8	8	(8)	8	8	2	2	(1)	2	1
21	8	8	(8)	8	8	1	2	(2)	0	1
22	8	9	(9)	8	8	0	0	(0)	0	0
23	9	8	(7)	7	8	1	0	(0)	0	0
24	9	8	(7)	8	8	0	0	(0)	0	0
25	8	9	(8)	8	8	0	0	(0)	0	0
26	8	8	(8)	9	8	0	0	(0)	1	0
27	8	8	(8)	7	8	1	0	(0)	0	0
28	8	7	(8)	7	8	0	0	(0)	0	0
29	7	7	(7)	7	7	0	0	(0)	0	0
30	7	7	(7)	7	7	0	0	(0)	0	0

q: likely quiet.

*: interference.

SOLAR RADIO EMISSION

HIRAISO (HIRA)

36.37N 140.62E

Hiraiso Branch, R.R.L.,
Nakaminato, Ibaraki,
311-12

November 1976

Single-frequency total flux observations at 500 MHz

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

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

Note No observations during the following periods:

1st 2105 - 2nd 0010
2nd 2105 - 3rd 0010
5th 0630 - 2400
23rd 2125 - 2350
24th 0140 - 0230
25th 2125 - 2345
30th 2130 - 2350

SOLAR RADIO EMISSION

HIRAISO (HIRA)

36.37N 140.62E

Hiraiso Branch, R.R.L.,
Nakaminato, Ibaraki,
311-12 JAPAN

November 1976

Outstanding Occurrences

(single-frequency observations)

Normal observing period: 2125 - 0730 (sunrise to sunset)

NOV. 1976	FREQ	STATION	TYPE	START TIME UT	TIME OF MAXIMUM UT	DUR MIN	FLUX DENSITY		POLARIZATION POSITION REMARKS
							PEAK	MEAN	
19	200	HIRA	45 C	0050.9	0052.0	2.5	450	100	SL
	100		45 C	0051.5	0052.2	1.0	220	80	WL
	500		45 C	0051.5	0052.3	1.0	12	5	SL
	200		45 C	0253.0	0253.5	1.5	150	30	ML
	500		45 C	0253.0	0253.7	1.5	6	2	ML
	200		44 NS	2120E	0306	600D	60	10	SL
20	200		44 NS	2120E	2230	600D	130	10	SL

RADIO PROPAGATION

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

NOV 1976 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

RADIO PROPAGATION

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

NOV 1976 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	16	13	17	19	17	8	3	6	6	1	-5	ES -28	ES -28	-24	ES -28	ES -28	ES -28	ES -28	-16	-14	13	17	18	18
2	12	16	18	12	12	8	ES -9	ES -9	ES -13	ES -14	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-10	15	12	19	17
3	10	15	19	13	15	ES -8	ES -8	ES -8	ES -8	-5	ES -28	ES -28	ES -13	ES -28	ES -28	ES -28	ES -28	-10	-11	-6	7	4	13	10
4	13	18	17	14	15	6	ES -8	ES -4	ES -15	ES -19	ES -19	ES -19	ES -13	ES -11	ES -28	ES -28	ES -28	-19	-24	ES -28	9	16	22	13
5	13	19	21	17	10	ES -11	ES -8	ES -9	ES -17	ES -12	ES -23	ES -23	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	11	9	17	11
6	12	20	17	15	16	-4	-9	ES -3	ES -22	ES -14	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	19	17	12	17
7	15	15	21	22	11	14	ES -11	ES -13	ES -14	ES -13	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-19	14	12	13	9
8	18	18	19	15	17	10	2	ES -11	ES -24	ES -19	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-17	ES -28	-19	3	15	15	13
9	17	21	17	12	ES 6	9	ES -4	ES -7	ES -16	ES -18	ES -20	ES -29	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-13	21	16	15	9
10	13	19	18	20	11	8	-3	ES -10	ES -13	ES -15	ES -16	ES -16	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	17	14	16	19
11	23	21	18	14	17	17	4	ES -3	ES -14	ES -11	ES -23	ES -22	ES -14	ES -28	ES -28	ES -28	ES -28	-17	4	ES -28	14	11	12	18
12	18	20	19	18	17	6	8	-2	ES -13	ES -8	ES -21	ES -27	ES -8	ES -29	ES -29	ES -29	ES -29	-18	-23	ES -25	8	13	16	12
13	23	17	22	17	21	14	10	-3	-11	ES -16	-24	-19	ES -19	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	17	23	17	20
14	17	13	17	17	17	ES -10	ES -8	ES -10	ES -17	ES -19	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-17	6	-17	12	20	14	24
15	17	17	22	23	12	-8	ES -12	ES -13	ES -14	ES -21	ES -27	ES -27	FS -25	ES -25	ES -25	ES -29	ES -20	ES -20	-14	-17	13	10	20	17
16	23	16	19	14	23	-10	ES -12	ES -10	ES -21	ES -27	ES -27	ES -27	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	-2	13	16	24
17	22	22	23	24	17	ES -6	ES -6	ES -12	ES -19	ES -25	ES -25	ES -25	ES -24	ES -24	ES -24	ES -28	ES -28	ES -28	ES -28	-17	11	21	20	26
18	22	22	14	18	3	-3	-7	ES -13	ES -16	ES -21	ES -25	ES -25	ES -21	ES -25	ES -25	ES -28	ES -28	ES -28	ES -28	ES -28	17	17	23	16
19	21	19	23	24	15	11	8	-5	ES -19	ES -14	ES -23	ES -23	ES -13	ES -26	ES -26	ES -26	ES -26	ES -26	-20	-20	15	22	19	19
20	24	16	14	21	13	-3	ES -7	ES -10	ES -16	ES -24	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-10	8	8	15	19	19
21	15	23	18	22	4	-6	ES -5	0	ES -22	ES -22	ES -28	ES -28	ES -28	ES -28	ES -28	ES -19	ES -28	ES -3	ES -5	ES 7	14	16	17	17
22	19	21	18	19	8	4	-1	ES -1	ES -11	ES -20	ES -24	ES -19	ES -19	ES -19	ES -20	ES -27	ES -27	ES -28	9	8	18	15	20	18
23	19	18	15	18	11	7	3	-4	-8	-5	-3	-8	ES -16	ES -29	ES -29	ES -29	ES -29	ES -29	-20	-20	17	16	18	16
24	18	19	22	20	11	11	-9	-14	ES -27	ES -26	ES -21	ES -26	ES -20	ES -29	ES -29	ES -16	ES -16	ES -20	ES -29	ES -29	15	17	16	15
25	16	ES 22	20	16	17	7	ES -7	-8	-6	ES -16	ES -27	ES -27	-14	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	-9	11	22	20	20
26	20	18	20	20	23	12	2	ES -10	-8	ES -23	ES -17	ES -17	ES -8	-15	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	4	23	18	18
27	20	16	18	18	12	12	1	ES -14	-16	ES -29	-20	-16	ES -29	ES -25	ES -25	ES -29	ES -29	ES -29	-16	-20	13	23	20	18
28	19	20	21	17	10	10	5	-4	-9	ES -22	ES -28	ES -28	ES -26	ES -21	ES -24	ES -26	ES -18	ES -15	ES -16	ES -17	12	14	14	14
29	16	17	23	19	5	1	ES -9	ES -9	ES -22	ES -28	ES -22	ES -22	ES -9	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	ES -30	14	12	14	16
30	15	16	17	21	21	8	ES -8	ES -9	ES -18	ES -18	ES -30	ES -30	ES -30	ES -30	ES -30	-15	ES -30	ES -30	-13	-4	9	6	17	16

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	18	US 18	18	18	14	7	US -6	ES -9	ES -16	ES -18	ES -24	ES -27	ES -26	ES -28	ES -28	ES -28	ES -28	ES -28	ES -26	US -20	13	16	17	17
UD	23	22	23	23	21	14	8	ES -1	-8	-5	ES -16	ES -16	ES -9	ES -19	ES -24	ES -19	ES -20	ES -15	4	ES 7	18	23	20	24
LD	12	ES 15	15	13	ES 5	ES -10	ES -11	ES -13	ES -22	ES -27	ES -28	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	ES -29	4	9	13	10

RADIO PROPAGATION

RADIO PROPAGATION QUALITY FIGURES

HIRAIO

Time in U.T.

Nov. 1976	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Condition 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start	End	Range
1	4+	4U S 5U 5	4 5U 4U 4	N N N N	---	13.0	
2	4o	4U S S 4U	4 S S 4	N N N N			
3	4o	S S 5U 4U	4 4U 4U 4	N N N N			
4	4o	S S 5U 4U	4 S 3U 4	N N N N			
5	4-	S S S 4U	4 S S 3	N N N N			
6	4o	S S S 4U	4 S S 4	N N N N			
7	4o	4U S S 4U	4 S S 4	N N N N			
8	4o	S S S 4U	4 S S 4	N N N N			
9	4+	5U S 5U 4U	4U S S 4	N N N N			
10	4+	5U S 5U 4	4 S S 4	N N N N			
11	4+	4U S S 4	4 S 5U 4	N N N N			
12	4+	S S S 4	4 5U S 4	U U U U			
13	4+	S S S 4	4 5U S 4	U U U U			
14	4+	S S S 4	4 S 5U 4	U U U U			
15	4o	S S S 4	4 S S 4	U U U U			
16	4-	S S S 4	4 S S 3U	N N N N			
17	4-	S S S 3	4 S S 4	N N N N			
18	4o	S S S 4U	4 S S 4	N N N N			
19	4o	S S S 4	4 4U S 4U	N N N N			
20	4o	S S S 4	4 S S 4	N N N N			
21	4o	4U S 5U 4	4U 4U S 4	N N N N			
22	4+	S S 5U 4U	4 S S 4	N N N N			
23	4o	3U S 5U 4	4U 5U S 4	N N N N			
24	4-	4U S S 4U	4 3U S 4U	N N N N			
25	4o	S S S 4	4 4U S 4	N N N N			
26	4+	S S S 4U	4 5U S 4	N N N N			
27	4o	4U S S 4	4 4U S 4	N N N N			
28	4+	S S S 4	4 5U S 4	N N N N			
29	4o	S S S 4	4 S S 4	N N N N			
30	4+	S S S 4U	4 S 5U 4U	N N N N			

RADIO PROPAGATION

SUDDEN IONOSPHERIC DISTURBANCE

HIRAISO

No Sudden Ionospheric Disturbance was observed during November, 1976

RADIO PROPAGATION

Sudden Ionospheric Disturbance (SPA)

I N U B O

No Sudden Phase Anomaly was observed during November 1976.

IONOSPHERIC DATA IN JAPAN FOR NOVEMBER 1976
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編集兼 郵政省電波研究所
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☎ (0423) (21) 1211(代)
印刷所 株式会社オートプレス
〒180 東京都武蔵野市中町3－2－17
☎ (0422) (54) 7364(代)

Queries about "Ionospheric Data in Japan" should be forwarded to:
The Radio Research Laboratories, Ministry of Posts and Telecommunications,
2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184 JAPAN.