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IONOSPHERIC DATA IN JAPAN

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INTRODUCTION

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

Station	Geographic		Geomagnetic		Technical Method
	Latitude	Longitude	Latitude	Longitude	
Wakkanai	45°23.5′N	141°41.2′E	35.3°N	206.5°	Vertical Sounding (I)
Kokubunji	35°42.4′N	139°29.3′E	25.5°N	205.8°	Vertical Sounding (I)
Yamagawa	31°12.1′N	130°37.1′E	20.4°N	198.3°	Vertical Sounding (I)
Okinawa	26°16.9′N	127°48.4′E	15.3°N	196.0°	Vertical Sounding (I)
Hiraiso	36°22.0′N	140°37.5′E	26.3°N	206.8°	Solar Radio Emission (S)
Inubo	35°42.2′N	140°51.5′E	25.6°N	207.0°	Radio Receiving (P)

A. IONOSPHERE

Ionospheic observations are carried out at the above four stations in Japan by means of vertical sounding using ionosondes.The ionosonde produces ionograms,which are recorded digitally on computer storage medium as well as graphically on 35 mm photographic film. The digitally-recorded ionograms are collected from each station by the central computer and reduced to numerical values and Summary Plots by the automatic processing system. The ionograms obtained at Kokubunji are manually scaled as well by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

Digital ionograms are automatically scaled by the pattern recognition method. The following five factors of ionospheric characteristics are published for the present. The reliability of these factors has been ascertained by comparison of the automatically-scaled parameters with the manually-scaled values of large amounts of test ionograms.

The published data consist of tabulations of hourly values of three factors (*foF2, fEs, fmin*) and monthly medians of two factors (*h′Es, h′F*) , daily Summary Plots and monthly medians plot of *foF2*.

a. Characteristics of Ionosphere

foF2	Ordinary wave critical frequency for the *F2* layer
fEs	Highest frequency of the *Es* layer whether it may be ordinary or extraordinary
fmin	Lowest frequency which shows vertical ionospheric reflections
h′Es *h′F*	Minimum virtual height on the ordinary wave for the *Es* and *F* layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

A Impossible measurement because of the presence of a lower thin layer,for example *Es* (for *foF2*).

B Impossible measurement because of absorption in the vicinity of *fmin*.

C Impossible measurement because of any failure in observation.

G Impossible automatic scaling because of too small ionization density of the layer (for *fEs*).

N Impossible automatic scaling because of complex echoes.

Blank No digital record because of trouble in the automatic data processing system, but existence of film record.

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

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

Median (MED) is defined as the middle value when the numerical values 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.

If CNT is less than 10, there are blank spaces left.

d. Reliability of Automatic Scaling

The results of the comparison between automatically-scaled values and manually-scaled ones showed that hourly values of *foF2 , fEs* and *fmin* were scaled within a difference of 1 MHz from about 90 , 90 and 99% , respectively of the test ionograms.

e. Summary Plot

Daily Summary Plots which are made from quarter-hourly digital ionograms are published to present general ionosphere conditions. The upper and middle parts of a Summary Plot show the diurnal variation of the frequency range of the echoes reflected from the *F* and *E* regions, respectively. The two solid arcing lines indicate the predicted values of *fxE* and *foE* calculated by the method described in the CCIR report 340. The lower part shows the diurnal variation of the virtual height where the echo traces become horizontal.

A2. Manual Scaling

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 " and its revision of chapters I-4, published in July 1978.

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 transmisson 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 b.(iii)

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to replaced a numerical value on the monthly tabulation sheets, if necessary.

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 perturbations of the observed parameter; or spur type spread *F* present.

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, if necessary.

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 are present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple trace 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 the 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 normnal *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 (CND) is the number of values from which the median has been computed. In addition to numerical values, the count may include certain descriptive letters.

Median (MED) is the middle value when the numerical values 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 at 200, 500 and 2800 MHz are carried out at Hiraiso. The observation equipment consists of three parabolic antennas, one with 10-meter diameter for 200 MHz measurements, one with 6-meter diameter for 500 MHz measurements and one with 2-meter diameter for 2800 MHz measurements, each being equipped with a pair of crossed doublet antennas as a primary radiator, and three appropriate receivers. Each pair of the crossed doublet antennas is used as a polarimeter. Observations are continuously carried out almost from sunrise to sunset.

B1. Daily Data at Hiraiso

The three-hourly mean and daily mean values of the solar radio emission intensities are tabulated for 500 MHz measurements. The intensities are expressed by the flux density in 10^{-22} Wm^{-2} Hz^{-1} unit.

The following symbols are used in the tables, when interference or radio bursts prevented measuring the base-level flux densities or determining the variability indices:

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

Daily data within parentheses mean that the observation time does not exceed one third of the period.

B2. Outstanding Occurrences at Hiraiso

The table is a list of outstanding occurrences of solar radio emission bursts observed at 200, 500 and 2800 MHz during a month.

Listed in the table are the date, frequencies, the type of event, the start time and the time of maximum, both in U.T. expressed in hours, minutes and tenths of a minute, the duration in minutes, the peak and mean flux densities in 10^{-22} $Wm^{-2}Hz^{-1}$ unit, and the polarization.

The type of event is expressed by a combination of a numerical code and a letter symbol in accordance with the " Descriptive Text of Solar Geophysical Data, NOAA " as defined by H. Tanaka in the " Instruction Manual for Monthly Report of Solar Radio Emission, WDC-C2 " in January 1975:

SGD Code	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+

The polarization is expressed by the polarization degree and sense 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 due to small increase of flux,
00	polarization degree of less than 1 percent.

One of the following symbols may be attached after numerical values, if necessary.

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

B3. Summary Plots of $F_{10.7}$ at Hiraiso

The 10.7 cm solar radio flux at Hiraiso is plotted over a one month period. The 10.7 cm flux ($F_{10.7}$) is determined by adjusting the 10.7 cm radio flux measured at Hiraiso to the Pentincton 10.7 cm radio flux. The figure on the right-hand side shows the $F_{10.7}$ index estimated at Hiraiso.

The following symbols are used in the $F_{10.7}$ index:

*	Measurement made not at 3h U.T..
B	Measurement affected by bursts.

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

The phase values of eight OMEGA radio signals as received at Inubo are depicted for an interval of one month, along with the phase deviation defined as a deviation from a value averaged over the six quietest day within the month. Particulars of the received signals are given in the table below.

In each of the four panels of the figure, the phase (ϕ) is shown in the lower part and the phase deviation ($\Delta\phi$) is shown in the upper part. The phase data are sampled every 30 min, so the curves of the phase and phase deviation are composed of 48 data points per day. The phase delay is measured as a positive value.

The polar cap phase anomaly (PCPA) caused by the solar protons are well detected on the Norway signal. The start, end and maximum times of the PCPA are listed in the table next to the figure, where the times are expressed as day / hour & minute in U.T.. The maximum phase deviation in the list is defined as a phase advance (negative values in the figure) in degrees.

C2. Sudden Phase Anomaly (SPA) at Inubo

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 -, an indistinguishable record is spaced out, and a multi-peak event is marked by *. The most remarkable or distinct phase advance is underlined and listed in the column of *Time*.

In table (b) SPA, *date* indicates the day to which the *start-time* of the 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 Coordinates)		Call Sign	Frequency (kHz)	Radiation Power (kW)	Arc Distance from Inubo (km)
Norway	66°25′N	013°08′E	/N	13.6	10	7820
Liberia	06°18′N	010°40′W	/L	13.6	10	14480
Hawaii	21°24′N	157°50′W	/H	13.6	10	6100
North Dakota	46°22′N	098°20′W	/ND	13.6	10	9140
La Reunion	20°58′S	055°17′E	/LR	13.6	10	10970
Argentina	43°03′S	065°11′W	/AR	13.6	10	17640
Australia	38°29′S	146°56′E	/AU	13.6	10	8270
Japan	34°37′N	129°27′E	/J	13.6	10	1040
North West Cape	21°49′S	114°10′E	NWC	22.3	1000	6990

HOURLY VALUES OF foF2 AT Wakkanai

JAN. 2000

LAT. 45.4N LON. 141.7E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	48	A	A	31	A		59		81	122		135	118	81	88	92	88	42		37		37	37	A
2	A	A	42		41		A	89	70	78	114	92		103	81	90	80	68	37	43	40	A	32	44
3			A				41	A	70	89	88	91	82		91	80	68	38	A	59	A		A	
4	A		A	A		A	A		70	85	82		88	67	86	85	71	60	38	47	38			
5	A	59	37	37	37	A	38		72	90	88		81	81	90	81	72	55	53	43		29		46
6	37	49	42	32	18	36		28	80	80	69	85	N	88	86	68	71	52	46	40		A	38	49
7		37	A	59		69		57	83	109	122	79	66	82	87	83	77	47	37	36			35	38
8	A	A	A	A	A	31		51	70	92	93	83	84	82	89	88	76	57	72	46				N
9	24	A	A	A	40	40		44	93	105	89	90	87	82	88	84	59	53	40	42	A	A	43	44
10	41	46	42	A	42	69		46	68	88	101	102	79	82	88	81	81	65	48	41		69		43
11	18	58	42	45	42		35	50	68	103	87	101	88	86	90	82	62	57	57	48	49	56	43	
12	47	44	42	58			59	52	103		141	140	90	122	120	116	92	92	82	56	50	58	58	A
13	50	59	53	55	56	56		58	72	128	88					88	77	88	61	46		42	44	47
14	48	A	45	46	50	47	35	58	75	89	121				89	90	80	68	57	55	48			
15	A	45	39	44	45	46	37	54	80	116	114	114	104	82	87	87	62	63	61	58	57	47		
16	37	46	42	47	48	46	38	49	76	101	90	82	88	88	87	83	82	68	67	60	56	50	43	44
17	40	57	42	39	50	52	46	56	78	91	89	86	62	59	82	82	82	92	67	57	37	40	44	40
18	58	56	A	40	41	43	41	58	69	88	75		82	71	71	78	73	63	56	54	40	44	47	58
19	48	59		43	58	50	59	69	80	105	90	88	72	88	83	80	82	66	71	68		A		
20	69	69	69	48	29	46	25		68	84	89	89	79	76	77	87	84	82	61	50			A	A
21	A	46		38	32		69	48	69	103			88	87	90	88	72	58	46	47	36		38	A
22	A	A	A	58	43	40	31	56	69	87	96	91	82	80	87	83	72	74	61	41	38	31		
23	A	A	36		69	34	N	47	70	60	60	81	78	82	87	88	75	50	59	40	50	51	58	50
24	47	47	A	A	54	47	47	57	87	103	101	117	89	88	100	82	82	81			69	37	34	47
25	A	43	41	A	42	45	A	44	70	87	108	124		103	91	82	92	71	56		48	41	58	
26	47	42	38	A	38	41		58	68	97	116	114	80		102	88	80	63	47	55		A	A	41
27	A	46	40	40	42	37	29	50	81	N	88	91	91	113	90	83	73	58	56	81	38		44	47
28	59	43	44	A	69	A	36	69	68	72	103		82	91	79	88	75	67	62	68	53	A	A	46
29			A	40	A	A	44	58		78	71	122	90	86	79	91	80	58	54	38		36		59
30	A	30	A	A	A	38	A	59	80	N		112	114	102	88	88	82	70	71	52	A	59	32	A
31	A	A	43	48		42	37	58	70	93	87	90	122	90	101	100	73	67	67	57	38		50	43
	00	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	20	18	19	22	21	19	26	30	28	28	24	26	27	30	31	31	31	28	29	17	16	18	17
MED	47	46	42	44	42	45	38	56	71	90	90	91	86	86	88	85	77	63	57	48	48	43	43	46
U Q	49	57	43	48	50	48	47	58	80	103	105	114	90	90	90	88	82	70	64	57	51	53	47	48
L Q	38	43	40	39	40	39	35	49	69	86	87	87	80	81	86	82	72	57	47	41	38	37	37	43

HOURLY VALUES OF fEs AT Wakkanai

JAN. 2000

LAT. 45.4N LON. 141.7E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	34	26	G	32	G	G		30	34		45	32	28	27	24	G	G	28	G	G	G	G	28
2	28	27	G	G	G		30	G	21	40	33	32		29	26	G	G	G	G	G	G	42	21	G
3	G	G	30	G	G	G	G	28	G	32	32	31	31		28	G	G	G	48	32	30	G	33	G
4	33	G	56	34	G	40	32	G	28	31	32	31	28	30	27	33	30	34	G	G	36	G	G	G
5	32	29	34	28	G	28	30		34	27	28		31	29	27	G	29	G	31	27	28	G	G	G
6	G	G	G	G	G	G	G	32	G	G	G	G	G	G	G	G	G	28	G	24	G	28	G	G
7	G	G	32	G	G	G	G	G	27	30	G	G	G	G	G	28	G	35	32	26	31	G	G	G
8	28	28	30	29	30	G	G	G	36	34	31	27	31	32	33	25	G	33	32	43	26	G	G	43
9	34	32	28	31	30	31	G	44	33	27	49	38	41	61	60	26	26	27	25	28	31	44	G	G
10	34	33	30	31	G	G	G	28	30	N	32	30	36	28	32	26	G	G	G	G	G	G	G	G
11	G	G	G	32	G	G	G	G	31	26	29	G	31	30	28	23	35	G	G	G	G	G	G	G
12	29	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	38	44
13	G	G	G	G	G	G	G	33	36	G	G			G	G	G	G	G	G	G	G	G	G	G
14	28	30	27	G	G	G	G	G	G		G	G	G	G	G	G	29	38	G	28	G	G		G
15	29	G	29	31	G	G	G	G	24	28	39	36	36	34	29	26	G	G	G	G	32	G	G	G
16	G	29	G	G	30	G	G	G	26	31	31	G	57	29	31	G	G	30	26	28	G	G	G	G
17	G	G	28	G	G	G	G	G	25	30	G	G	G	G	G	28	G	32	G	G	G	G	G	G
18	G	G	28	G	G	G	G	G	24	30	G		31	32	30	28	G	G	G	G	G	G	G	G
19	G	G	G	G	G	G	G	G	G	28	31	31	31	31	29	27	25	32	32	30	G	36	G	G
20	27	G	G	G	G	32	G		48	34	28	31	58	32	28	31	G	G	G	G	G	G	32	59
21	32	G	G	G	G	G	32	G	24	29			32	32	29	27	31	G	G	31	G	G	39	38
22	32	30	36	G	46	G	30	G	25	29	31	32	32	32	29	25	G	G	G	G	G	28	G	G
23	36	34	G	G	G	G	G	31	31	32	34	35	36	33	27	26	G	G	31	G	G	G	G	G
24	G	31	40	30	G	G	G	31	27	48	31	30	30	31	29	25	G	G	G		G	G	G	29
25	31	G	G	29	30	G	25	27	34	34	51	31		30	28	21	G	G	G		G	G	G	G
26	G	31	42	45	29	G	G	33	30	29	31	31	31		30	32	30	28	29	G		32	27	G
27	25	31	32	31	29	G	G	29	24	27	30	30	31	31	29	27	31	30	G	28	G		G	31
28	G	G	G	30	28	32	G	G	26	29	32		30	28	28	25	G	G	G	G	G	31	35	G
29		30	34	G	29	29	G	26		30	56	30	31	31	29	27	28	G	G	G	G	G	G	33
30	32	37	32	29	38	33	29	33	34	30		32	34	32	33	25	39	47	38	32	44	45	G	35
31	37	33	28	31		G	G	27	64	59	36	37	34	32	32	25	G	30	30	G	28		G	G
	00	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	31	31	31	30	30	31	28	30	28	28	26	28	29	31	31	31	31	31	29	30	29	30	31
MED	28	27	28	G	G	G	G	G	27	30	31	31	31	30	28	25	G	G	G	G	G	G	G	G
U Q	32	31	32	31	29	G	G	30	33	33	32	32	34	32	30	27	29	30	30	28	28	28	G	29
L Q	G	G	G	G	G	G	G	G	24	28	14	G	30	28	27	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

JAN. 2000

LAT. 45.4N LON. 141.7E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	15	14	15	14	15		15	15		16	18		18	23	17	15	14	15	17	16	16	15
2	14	14	15	15	14		17	15	15	16	17	17		18	18	23	18	15	14	15	16	17	14	15
3	14	15	15	15	14	14	15	15	15	16	16	17	18		17	22	18	15	14	14	15	14	14	15
4	15	15	15	15	15	15	15	16	16	16	17	18	18	17	17	15	18	16	14	14	15	14	14	16
5	15	15	15	14	16	16	15		15	15	17		17	17	18	24	17	15	15	15	15	16	17	15
6	16	15	15	18	15	15	15	15	24	34		50	49	49	33	34	20	15	14	16	16	15	15	16
7	15	17	17	16	17	15	17	16	20	34		50	52	50	48	20	18	15	15	15	15	16	14	15
8	17	15	15	14	16	16	14	16	14	17	18		35	24	33	26	18	15	15	15	15	15	15	15
9	14	15	16	16	14	15	15	17	15	17	17	18	17	15	15	17	18	15	15	15	15	15	15	15
10	14	15	15	15	15	14	16	15	15	18	17	18	21		22	17	21	15	16	14	16	15	15	14
11	15	15	14	15	14	15	15	15	16	20	21	24	23	36	36	26	20	15	14	15	15	15	15	15
12	15	15	15	15	15	18	15	17	24			52	52	50	38	27	20	16	15	14	15	15	15	16
13	15	15	16	15	15	16	15	16	22	52	50					30	21	15	16	15	16	15	15	14
14	15	15	14	14	15	14	15	16	26	50	65		52		49	51	16	14	17	15	15	15		15
15	15	15	14	15	15	14	15	16	26	18	18	20	23	24	21	27	21	15	15	15	15	18	18	21
16	15	15	15	17	15	15	15	17	18	20	22	50	23		22	28	22	15	16	15	15	15	14	15
17	15	15	14	15	15	15	15	16	17	20	49	52	45	49	48	29	22	15	15	15	15	16	15	16
18	15	15	16	14	14	15	14	16	17	33	42		41	24	23	20	21	15	16	15	15	15	15	15
19	15	15	16	15	15	15	15	17	23	20	20	20	21	21	20	17	16	16	14	15	15	18	15	15
20	16	14	15	16	16	15	15		20	18	21	23	23	21	21	20	20	16	14	15	16	15	14	14
21	15	15	15	14	17	17	16	16	26	18			24	24	22	18	22	15	15	15	15	15	15	16
22	15	14	15	15	14	14	17	16	17	17	18	20	21	18	17	18	22	14	15	15	17	17	15	15
23	15	16	15	15	15	15		17	15	17	20	20	20	20	18	17	21	16	15	15	16	15	14	15
24	14	15	14	15	14	14	15	14	15	18	18	18	18	20	18	17	20	15	15		14	15	15	14
25	15	14	14	15	15	14	14	17	15	17	17	18		20	18	24	21	15	15		15	14	16	14
26	15	15	16	15	15	15	15	15	16	20	18	21	16		49	20	18	15	16	14		15	14	15
27	15	15	14	14	15	15	14	15	15	16	18	20	20	22	18	17	15	15	15	16	14		15	15
28	15	14	16	14	15	15	15	15	17	20	20		39	22	34	26	22	15	15	15	15	16	14	14
29		14	15	14	15	15	15	17		16	20	36	23	20	18	26	16	15	15	14	14	16	16	14
30	14	14	14	14	14	15	15	14	16	20		20	23	20	18	17	15	14	14	15	14	15	14	15
31	15	14	15	14		14	16	18	17	20	18	18	18	20	15	16	22	15	15	14	15		15	14
	00	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	31	31	31	30	30	30	28	30	30	25	24	28	24	30	31	31	31	31	29	30	29	30	31
MED	15	15	15	15	15	15	15	16	16	18	18	20	23	21	20	22	20	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	15	17	20	20	21	30	37	24	33	26	21	15	15	15	16	16	15	15
L Q	15	14	14	14	14	14	15	15	15	17	17	18	18	20	18	17	18	15	14	14	15	15	14	14

HOURLY VALUES OF foF2 AT Kokubunji

JAN. 2000

LAT. 39.7N LON. 140.1E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	42		45	28	30		32	68		112	122	150	138	100	94	116	115	66	40	35	47	31	35	25
2	28	35	32	38	34	28	A	61	93	92	114	117	131	125	107	107	87	91	58		58	31		
3	30		30	31	30	31		63	69	92	97	115	120	122	97	92	90	54	53	56	56	47		29
4	34		59	35	32			58	70	91	107	115	107	108	97	92	93	83	42	56	48	38		A
5	46	32	56	34	29	31	31	59	95	97	100	115	98	84		115	94	66	57	60	37		58	59
6	36	35		30	32	31	36	60	68	101	137	110	114	100	93	96	86	68	52	44		59	35	
7	35	A	30	26		A		60	105	112	134	125	124	114	111	97	83	71	46	47	A	A	59	
8	35	31	30	34	30	29	35	60	87	80								93	60	60	48	A	A	29
9	35	31	34	31	31		34	57	78	88	111	110	104	91	84	97	87	66	52	51		36	36	
10	N	69	30	34		30	35	58	81	81	97	112	116	115	85	93	87	83	60	59	38	30	35	30
11	35	38	37		30	31	44	63	67	92	128	114	98	101	100	107	87	83	58	68	42		A	29
12	38	38	36	43	35	31	38	58	94	123		150	133	115	115	116	113	94		63	57	58	60	58
13	44	46	58	46	40	41	43		92	85	121	132	123	106	102	114	93	80	77	68	58	56	44	41
14	38	38	32	59	48	42		69	94	103	114	122	101	107	107	104	104	86	73		68	57		58
15	44	46	58		38	37		68	68	93									60	62	68	62	46	38
16		59	45	59	43	38	37	68	94	94	124	118	104	91	96	106	103	88	58	52	58	46		56
17	38	30			40	35	34	68	93	92	116	115	97	98	98	104	93	78	68	75		58	56	57
18	41	46	56	31	35	30	35	68	94	91	107	93	92	86	81	97	81	82	68	56	57		40	
19	56	36	56	43	58	43	43	69	80	104	118	116	112	95	98	93	97	81	68	60	57	58	31	32
20		35	35		59		31	58	94	92	114	114	101	82	92	114	81	97	84	60	46	60	46	57
21	47	59	56	47	N		29	61	96	94	114	116	101	90	90	103	85	73	60	50	42	40	41	44
22		46	57	32		N	59	58	93	83	94	115	96	92	92	115	91	80	68	57	47	41	46	
23	46		35	34	29			56	83	124	147	116	121	108	120	116	97	68	60	69	58	46	56	58
24	46	58	40	40	31	36		62	87	116	126	114	98	92	92	92	82	82	67	56	38		A	34
25	37	32	35	A		38	30	57	69	93	102	121	123	116	115	98	88	90	68	47	46	58	44	41
26	40		43	38	34	30		71	94	95	120	121	120	111	116	116	85	66	61	56	A	38	A	A
27	A	35		A	31	58	N	55	67	93	121	116	115	91	117	122		82	57	56	50	A	69	36
28	44	58	60	35	36	30		69	94	108	92	115	93	92	91	85	91	92	67	50	47			35
29	38	41	37	30		35		58	71	80	116	122	107	92	87	88	101	83	51	43	35		30	
30	34	A	37	A	59	N	35	63	94	94	116	116	107	116	86	93	97	82		58	46		59	59
31	35		31	42	38	N	29	68	93	102	116	120	118	106	98	92	91	87	58	61	69	34	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	23	28	24	25	21	19	30	30	31	28	29	29	29	28	29	28	30	29	29	26	21	20	21
MED	38	38	37	34	34	31	35	61	92	93	116	116	107	100	97	103	91	82	60	56	48	46	45	41
U Q	44	46	56	42	40	38	38	68	94	103	121	121	120	112	107	114	97	87	68	60	58	58	57	57
L Q	35	35	33	31	30	30	31	58	71	91	107	114	99	91	91	93	86	71	55	50	46	37	35	31

HOURLY VALUES OF fEs AT Kokubunji

JAN. 2000

LAT. 39.7N LON. 140.1E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	34	38	51	34	37	36	26	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	30	20	30	31	40	38	36	34	32	34	G	25	28	G	G	G		
3	G	G	G	G	G	G	G	G		30	35	38	36	32	42	38	G		G	G	G	G	G	G
4	G	G	G	G	G		G	G	31	36	36	36	32	32	31	32	G	G	G	G	G	G	G	30
5	G	G	G	G	G	G	G	G	26	28	43	36	32	34	36	34	22	30	G	28	27		G	G
6	G	G	G	G	G	G	G	G	34	38	36	38	46	45	38	26		24	G	27	25	G	G	G
7	28	30	G	G		24	G	G	25	31	30	32	31	32	29	34	33	39	G	32	35	30	G	
8	G	G	G	G	G	G	G		27									45	34	28	G	30	25	G
9	G	G	G	G	G		G	G			30	32	34	32	32	34	30	G	G	27	G	G	G	G
10	25	G	G	G		G	G	G		32	30	32	34	32	32	28	22	27	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G		30	34	34	35	G	32	30	25	27	G	G	G	G	32	G
12	G	G	G	G	G	G	G	G	34	38	32	G	32	G	34	30	G	G	31	28	31	G	G	G
13	G	G	G	G	G	G	G	G	30	34	84	G	G	34	G	G	G	G	G	G	G	G	G	G
14	G	G	G	26	30	G		G	G	30	G	G	G	G	G	G	G	G	G		G	G	G	G
15	G	G	G	G	G	G	G	G	34	43									G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	28	33	G	G	G	G	G	G	G	G	30	34	G	G	G	G
17	G	G			G	G	G	G	G	G	G	G	G	G	G	G	34	39	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G		G	G	G	G	G	G	31	G	G	G	G	G	G	G	G
19	G	G	G	G	G	G	G	G		30	35	33	30	35	34	30	36	G	G	G	G	G	G	G
20	G	G	G	G	G		G	G	30	35	46	37	G	35	48	44	38	34	G	G	24	24	G	G
21	G	G	G	G	G		G	G		29	33	36	34	33	33	29	26	G	G	G	G	G	G	G
22	G	G	G	G	G	G	G	G	32	35	42	34	36	34	35	30	22	G	G	G	G	G	G	G
23	G	G	G	G	G	G	G	G	35	40	51	61	57	45	35	30	G	G	G	G	G	G	G	30
24	30	25	G	G	G	G	G	G	24	28	51	38	34	73	55	34	31	G	G	33	31	26	27	26
25	G	G	G	39		31	G	G	34	59	37	34	83	81	54	43	37	G	G	G	G	G	G	G
26	G	G	G	G	G	G	G	G	33	32	36	39	33	34	33	38	35	G	35	26	42	38	60	36
27	30	G	G	36	G	G	G	G	34	45	32	34	33	36	47	28	31	30	G	G	G		G	G
28	G	G	G	G	G	G	G		31	37	37	32	29	30	30	28	30	35	29	G	G	G	G	G
29	G	G	25	G	G	G	G	G		35	45	47	33	32	31	28	26	G	G	G	G	G	G	G
30	G	37	25	25	31	34	28	G	33	34	32	44	49	36	33	43	34	34	G	G	G	G	G	G
31	G	G	G	G	G	G	G	G		44	49	54	67	48	31	38	33	32	26	G	34	55	36	35
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	30	30	28	27	30	29	22	29	29	29	29	29	29	29	28	29	31	30	31	29	30	29
MED	G	G	G	G	G	G	G	G	30	34	36	34	33	34	33	30	26	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	34	37	42	38	36	36	36	34	33	31	G	27	24	G	G	G
L Q	G	G	G	G	G	G	G	G	26	30	31	32	29	31	30	28	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

JAN. 2000

LAT. 39.7N LON. 140.1E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	14	15	16	17	16	20	16	16	14	16	17	17	15	14	20	16	15	15	16	15	14	15
2	18	15	14	15		17	15	14	14	15	16	17	20	18	17	14	24	14	14	17	15	16		
3	15	16	17	14	15	16	15	18	14	17	22	20	17	17	15	14	15	14	15	15	15	14	15	14
4	16	22	15	15	15		18	18	17	16	18	18	15	17	18	15	17	15	14	15	15	15	16	15
5	15	15	15	15	15	16	14	20	26	16	16	20	21	16	15	16	23	14	15	14	15		14	15
6	16	15	20	15	15	16	15	20	16	16	17	21	17	16	14	14	15	16	15	15	15	14	16	15
7	16	14	15	18		16	17	18	16	18	23	23	22	18	16	15	15	14	17	15	15	14	18	
8	20	14	15	17	15	15	14	15	14									14	15	14	15	14	16	21
9	16	21	14	16	15		15	20	15	16	17	16	22	20	21	17	14	15	15	14	15	15	16	15
10	16	18	15	17		14	15	20	15	15	15	16	16	17	16	15	15	15	15	15	16	16	14	17
11	15	15	16	14	15	21	15	20	14	14	15	22	15		41	17	18	15	14	15	14	14	15	14
12	15	14	14	15	14		14	21	18	17	20		23	24	21	17	27	17	14	14	15	15	15	15
13	15	15	15	14	16	15	14	21	17	35	33	42	44	40	40	35	29	17	17	15	15	14	14	15
14	15	15	14	15	15	14		20	28		40	44		48	43	40	28	17	14		15	15	16	14
15	15	16	14	21	14	20	16	21	14	15									15	16	15	17	15	15
16	16	16	17	15	16	18	16	24	17	20		45	56	45	46	42	27	17	15	15	16	17	16	15
17	15	15			16	15	14	21	37	40	44	48			50	40	20	15	20	15	14	14	16	15
18	15	14	14	15	15	16	14	18	18		42	43	49	43	42	34	34	17	16	15	18	15	14	22
19	18	16	15	14	15	14	17	21	16	17	20	24	18		21	17	16	17	15	15	14	14	14	15
20	21	15	15	18			14	22	15	17	17	24		40	22	20	18	16	17	14	14	15	22	14
21	14	15	14	15	17		17	21	14	16	16	24	24	20	20	16	16	17	17	15	15	15	14	15
22	18	14	14	14	15	17	15	20	15	15	16	20	20	17	18	15	15	18	15	15	14	14	15	15
23	15	14	15	15	16	16	15	20	15	15	16	16	16	22	18	16	17	18	14	15	15	14	15	14
24	15	14	14	15	15	15	14	20	15	15	18	18	21	18	17	15	15	17	16	15	15	15	14	14
25	15	14	16	17		15	14	21	15	15	14	14	20	20	16	15	14	16	14	15	14	15	15	15
26	14	22	14	15	17	14	14	21	14	15	15	17	20	20	17	15	15	17	15	14	14	14	14	14
27	15	22	17	14	14	15	18	20	15	15	16	16	15	14	16	15	16	15	14	15	14	15	14	15
28	15	15	17	15	17	15	18	20	15	15	17	15	17	16	14	15	15	16	14	16	14	15	20	16
29	14	14	16	20	15	16	14	20	16	14	14	14	20	18	18	16	14	18	14	15	15	16	16	14
30	15	15	14	15	14	14	16	18	15	14	15	16	18	16	23	16	15	15	15	15	14	14	15	15
31	15	14	15	16	14	17	18	20	15	15	14	21	17	16	17	15	14	14	16	15	14	14	14	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	30	30	26	26	30	31	31	28	28	28	26	26	29	29	29	30	31	30	31	30	30	29
MED	15	15	15	15	15	16	15	20	15	16	16	20	20	18	18	16	16	16	15	15	15	15	15	15
U Q	16	16	16	16	16	17	16	21	17	17	20	24	22	22	22	17	21	17	16	15	15	15	16	15
L Q	15	14	14	15	15	15	14	20	15	15	15	16	17	17	16	15	15	15	14	15	14	14	14	14

HOURLY VALUES

IONOSPHERIC DATA of Yamagawa is not available due to the ionosonde trouble.

HOURLY VALUES OF foF2 AT Okinawa

JAN. 2000

LAT. 35.7N LON. 139.5E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	69	59	43	40		69		46	92	94	127	140	127	122	127	158	161	143		150	92	94	46	
2			44					69	92	99	96	101	122	133	156	177	186			179	139	133	88	70
3	47	57	69	51	56	89	N	59	66	94	104	126	149	140	151	150	169	197		175	123	136	93	69
4	54	58	55	45	41	29		46	83	99	92	116	116	131	130	116	108	139		125	92	116	94	70
5	46	56	58	41				A	94	106	110	121	134	144	168	177	173	156	140	A	92	95	50	49
6	38		56	24	37	31		89	92	127	127	117	117	A	174	157	148	171		159	92	91	69	38
7	36		44	48	44	69	35	A	92	N	132	115	166	168		171	158	153		170	111	122	94	62
8	46	38	47	43				79	86	94	92	123	120	132	145	164	170	183	180	154	114	117	81	69
9	58	57	43	47	41				88	122	123	126	125	176	181	154	157	154	139	87	83	80	82	
10		69	59	69				69	83	102		99	112	126	142	165	172	173	174	143	116		94	69
11	60	57	51	43	37			50	89	93	112	116	118	122	118	116	131	131		83	93	90	71	46
12	68	58	59	57	59		42	55	64	118	130	156	N	127	151	157	147	133	109	82	91	92	67	55
13	56		48	41	56		69	50	87	96	111	114	124	148	161	172	162	167	170	161	158	115	96	60
14	55	47	46		42				82	104	116	115	112	122	133	124	147	160	166	145		117	112	58
15	47	68	43	37	56		A	69	92	122	96	92	98	118		122	124	118	120	141			120	94
16	92	80		57	56	42	37	48		112	126	122	118	127	142	149	168	167	163	154	120	123	93	67
17	59	41	44	43	44	56		48	94	116	116	124		124	121	122	150	167	172	150	150	151		120
18	116	96	80	69	56	41	41	47	89	116	111	125	107	118	112	118	132	127	119	95	94	117	70	70
19	61	57	69	46	41	58		49	88	127	119	120	143	164	168	168	173	178	174		132	94	126	95
20		83	60	48	40	30		69	94	122	102	115	121	120	122	118	121	121	128	93	95	116	93	68
21	58	66	46	57	42		69	41	87	99	103	126	121	126	136	150	167	180		128	118	122	94	93
22	59	70	50	40	38				83	105	113	107	120	123	120	121	131	128		166	156	92	96	58
23	59	62	61	62	40	37			88	112	116	101		117	121	117	127	123	138	A	93	60	75	53
24	48	59	47	44				43	96	118	111	118	131	134	131	121	118	131	114	173	88	92		54
25	42	44		47	38		35	49	88	93	91	110	131	126	125	127	132	119	110	149	67		69	
26	46	38	A				49	109	96	94	117	140	160	181	158	148	170	166	168		88	70	94	69
27	58	57	A	38	38		A		68	82	113	133	122	159		147	156	168	174		76	96	81	69
28	70	71		38					81	91	91	104	121	106	121	118	120	143	126		92	80	68	58
29	43	56	40		28			99	70	94	110	122	114	105	121	118	143	172	136		71	69	70	46
30		49	44		A	A	28	69	55	89	112		95	85	116	117	117	117	140	82	80	94	94	70
31	46	49	N	A	69	A		89	86	79	102	116	141	150	163	172	164	162	164			106	84	59
	00	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	27	25	25	22	11	9	23	30	30	30	30	28	30	28	31	31	30	22	23	28	28	29	28
MED	56	57	48	45	42	42	41	55	88	100	112	118	121	126	134	148	150	155	140	149	93	96	88	68
U Q	60	68	59	54	56	69	59	69	92	116	117	125	131	144	157	164	168	168	170	161	119	117	94	70
L Q	46	49	44	40	38	31	35	48	83	94	102	114	116	122	121	118	131	131	126	95	89	91	70	56

HOURLY VALUES OF fEs AT Okinawa

JAN. 2000

LAT. 35.7N LON. 139.5E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G		G		G	G	34		44	41	35	34	30	27	G		48	G	G	G	
2			G					G	22	35	38	51	50	48	47	46	29			48	20	28	26	G
3	G	G	G	G	G	G	G	G	N	28	38	33	32	36	35	33	29	25		30	G	29	33	34
4	G	G	G	G	G	G		G	G	28	32	34	50	48	38	34	33	38	27	23	G	G		G
5	G	G	G	G	G			46	22	27	36	33	39	38	45	32	64		24	48	30	27	G	G
6		G	G	G	24	G	G	G	32	34	38	40	34	85	46	42	51	34		33	G	24	G	G
7	G	G	G	G	G	G	G	48	G	34	32	39	42	36		33	60	34	28	48	33	G	G	G
8	G	G	G	G		G		G	26	34	45	39	41	39	36	39	39	25	G	48	G	G	G	G
9	G	G	G	G	G			G	G	26	32	40	34	G	36	36	37	36	G	19	G	G	G	G
10	G	G	G	G	G			G	35	34	40	48	41	41	35	38	40	34	45	48	G	G	24	G
11	G	G	G	G	G			G	32	34	38	55	43	39	G	40	41	35		G	G	G	G	G
12	G	G	30	25	G		G	G	26	35	38	48	54	37	39	35	37	25	G	G	G	G	G	G
13	24	G	24	G	G		G	G	30	36	39	49	41	50	39	36	32	26	G	57	45	47	44	35
14	29	25	G		G			G	G	31	40	38	44	50	36	35	43	37	41	42		G	G	G
15	46	27	G	G	G		28	G	26	38	36	40	40	40	38	37	38	32	G		G		G	G
16	G	G	G	G	G	G	G	43		31	37	38	G	G	G	35	34	27	G		G	G	G	G
17	G	G	G	G	G	G		G	24	28	G	35	G	G	G	37	38	27	36	46	32	25		G
18	G	G	G	G	G	G	G	G	G	30	37	46	35	39	38	G	26	27	25	G	G	G	G	G
19	G	G	G	G	G	G	G	28	22	30	34	56	66	57	55	79	33	28	G	G	26	G	G	G
20		G	G	G	G	G		G	24	35	37	42	37	40	G	36	34	33	32	28	G	G	G	G
21	G	G	G	G	G	G	G	G	27	36	34	52	41	40	47	40	34	33		45	34	34	G	24
22	G	G	G	G	G	G		G	47	34	39	48	40	48	47	49	36	32		27	G	G	37	G
23	G	G	G	G	G	G			G	34	40	40	72	58	61	40	64	90	94	46	G	G	G	G
24	G	G	G	G				G	G	29	38	47	42	75	59	40	48	38	35		50	G		G
25	G	G	G	G	G		G	G	22	36	39	54	56	55	36	64	81	43	38		G	G	G	G
26	G	G	26	G			G	G	23	36	38	58	45	38	52	46	49	66	78	53	27	G	G	G
27	G	38	36	G	G		25	G	G	35	50	62	57	38		38		40	28		30	G	G	G
28	30	G	G	G		G	G	G	22	33	44	52	40	38	39	34		32	G		26	G	G	G
29	G	G	G		G	G	G	G	28	35	34	39	44	42	38	38	38	32	G	G	G	G	G	G
30	G	G	G	G	33	28	G	24	30	34	46		53	46	66	78	91	61	34	29	G	G	37	
31	G	G	G	26	G	28		G	22	34	36	36	53	54	38	38	32	36	G			G	G	G
	00	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	31	28	25	18	16	30	29	31	30	30	31	31	29	31	29	29	24	24	29	30	28	29
MED	G	G	G	G	G	G	G	G	22	34	38	43	41	40	38	38	38	33	26	38	G	G	G	G
U Q	G	G	G	G	G	G	G	G	27	35	39	51	50	50	47	40	48	37	35	48	28	G	G	G
L Q	G	G	G	G	G	G	G	G	G	30	36	39	39	38	35	35	33	27	G	21	G	G	G	G

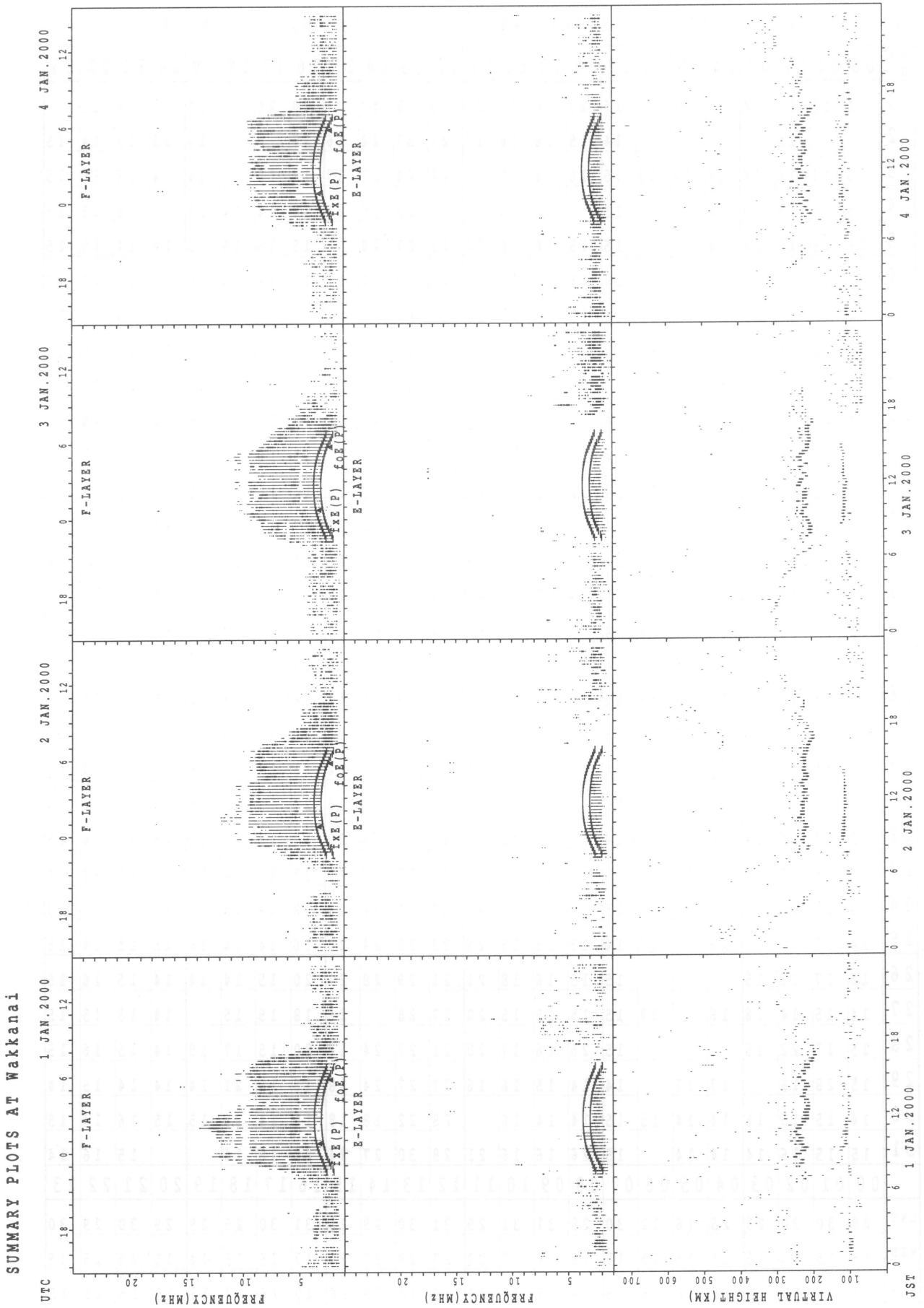
HOURLY VALUES OF fmin AT Okinawa

JAN. 2000

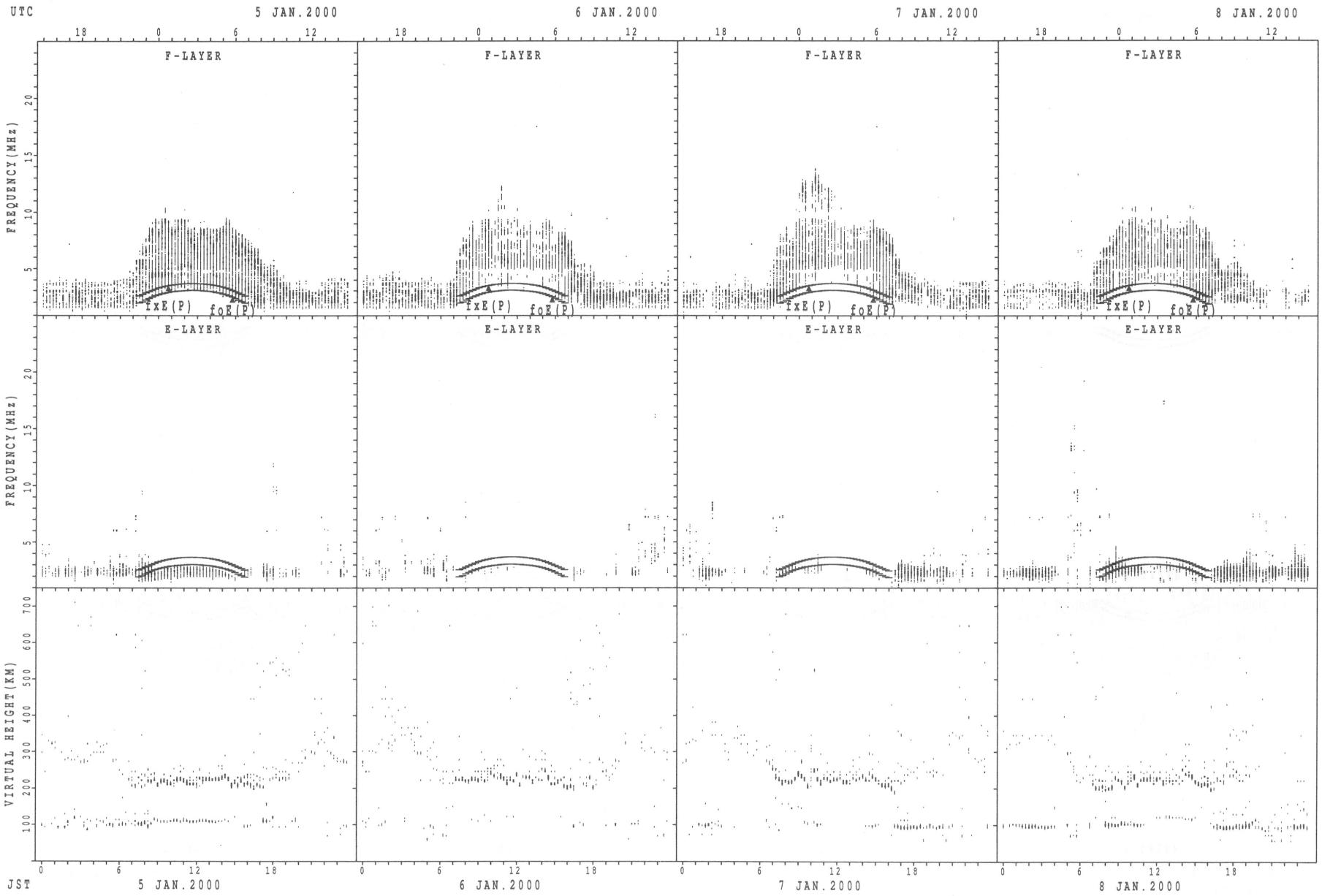
LAT. 35.7N LON. 139.5E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	15	14		16		15	20	16	20	26	20	28	17		20	26		14	15	16	15	
2			15					14	15	16	16	17	27	27	24	16	20			14	15	15	14	15
3	15	14	14	14	14	14	16	15	16	16	18		44	24	27	33	17	15		14	14	15	16	15
4	15	15	15	15	15	15		15		16	16	22	27	28	29	21	18	14	14	14	15	16	15	15
5	15	16	15	14	14			15	15	16	16	20	23	27	20		15	15	16	15	14	14	15	15
6	14	15	16	15	15	15		14	15	17	16	17	20	20	21	17	17	14	14	14	15	14	15	15
7	14	16	15	15	14	21	18	14	26	18	20	20	26	29		17	17	15	14	14	14	14	15	15
8	15	16	16	15		14		15	15	16	20	23	30	28	45	17	17	15	17	14	15	14	16	15
9	16	15	15	15	15			15	27	16	17	41	22	38	46	17	17	15	18	15	15	15	15	15
10	14	18	14	15	16			14	15	16	18	27	18	27	20	16	16	14	14	14	14	15	15	15
11	14	15	15	15	14			14	15	14	16	20	33	32	48	45	18	16		15	15	15	15	14
12	15	16	14	14	17		15	14	15	15	20	32	26	48	18	16	16	16	17	15	16	15	15	14
13	15	14	15	14	15		15	14	15	15	16	20	34	26	29	23	17	17	17	14	14	14	14	15
14	14	14	15		15			14	18	17	21	27	20	20	18	16	15	15	15	14		18	15	16
15	15	14	14	15	15		15	15	18	17	18	28	29		45	23	18	17	18	15	24		15	14
16	15	14	16	16	16	15	14	14		17	22	47	44	49	43	46	36	18	18	14	16	15	15	15
17	14	15	21	17	15	18		14	15	17	38	46	47	45	49	30	15	15	14	14	14	15		28
18	17	17	15	15	15	15	15	15	14	16	27	22	26	28	30	42	16	20	16	14	15	14	15	15
19	15	15	14	15	15	15	15	15	27	17	18	28	28	28	28	26	20	16	20	15	15	23	15	16
20		15	14	15	14	15		14	27	15	17	27	30	30	46	24	18	15	15	14	16	16	14	14
21	14	14	14	15	14		14	15	15	15	18	27	28	29	29	26	24	15		14	14	15	16	15
22	15	15	15	14	14	15		14	15	15	16	27	28	27	26	20	17	16		15	15	14	14	15
23	15	15	15	16	15	21			16	16	15	17	28	29	29	20	17	14	14	14	15	15	14	15
24	14	14	15	15				15	15	17	17	21	32	30	26	20	18	14	15	14	15	15		15
25	14	15		15	14		17	14	15	16	15	26	23	22	24	20	16	14	14	14	15	15	14	15
26	16	17	16	15				15	15	16	18	21	21	29	28	27	20	15	14	14	14	15	16	15
27	14	15	14	16	16		17	15	15	15	15	20	27	28		26	18	15	15		14	15	15	15
28	15	17	22	15				15	26	16	17	20	21	27	24	16	20	15	17	15	14	15	16	15
29	15	28	15		17	17		14	14	15	16	16	27	27	24	18	16	15	21	14	14	14	15	14
30	14	15	15	15	14	14	15	15	14	14	16		28	22	18	18	16	14	14	15	15	16	14	15
31	15	15	16	14	14	14		15	26	16	16	21	28	30	27	24	23	16	14			15	16	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	28	25	16	12	30	29	31	31	29	31	30	29	29	31	30	25	29	29	30	29	30
MED	15	15	15	15	15	15	15	15	15	16	17	22	27	28	27	20	17	15	15	14	15	15	15	15
U Q	15	16	15	15	15	16	16	15	19	17	20	27	30	30	36	26	20	16	17	15	15	15	15	15
L Q	14	15	14	14	14	14	15	14	15	15	16	20	23	27	22	17	16	15	14	14	14	14	14	15

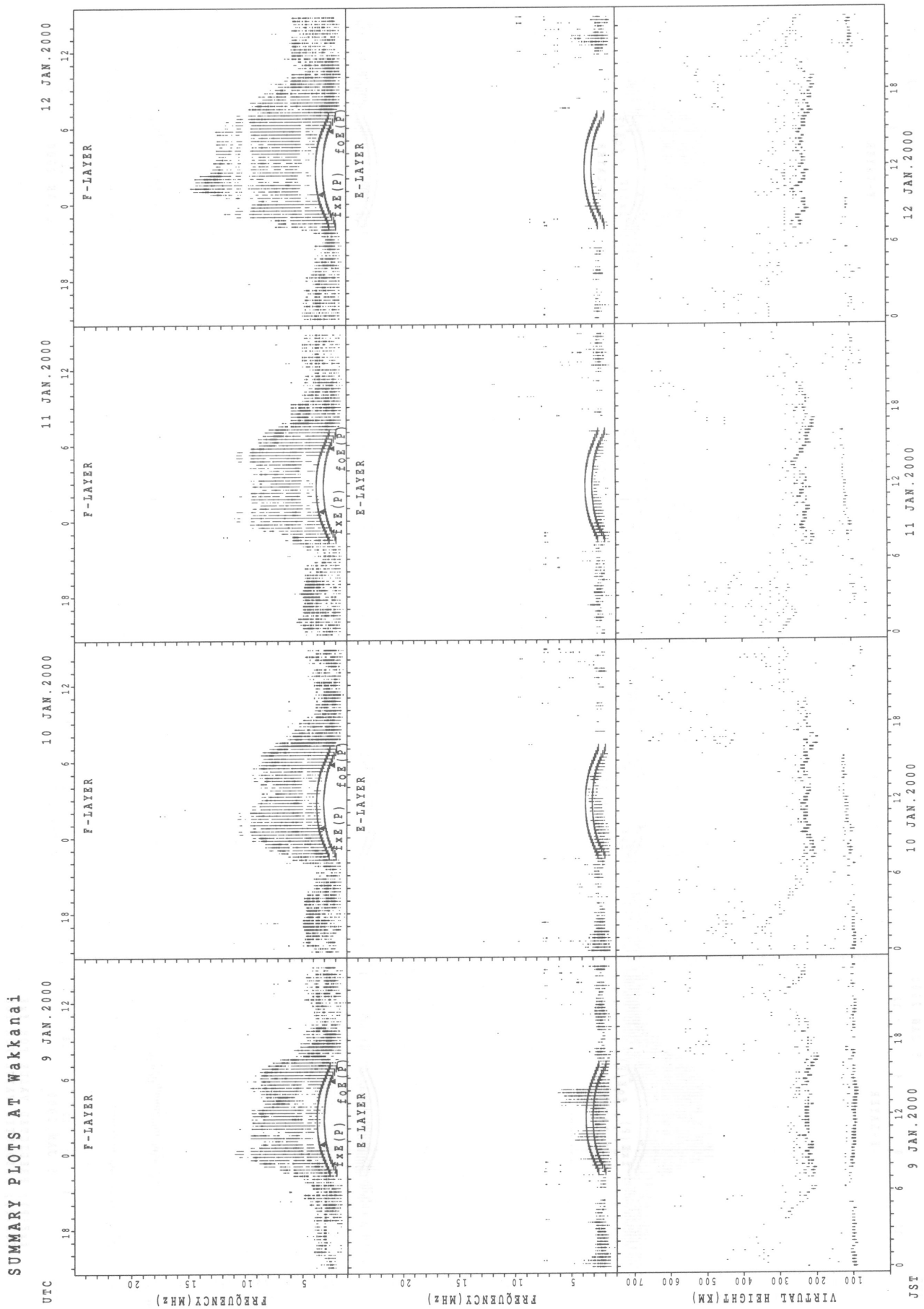
COMMUNICATIONS RESEARCH LABORATORY, JAPAN


SUMMARY PLOTS AT Wakkanai
UTC
JST
1 JAN.2000
2 JAN.2000
3 JAN.2000
4 JAN.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

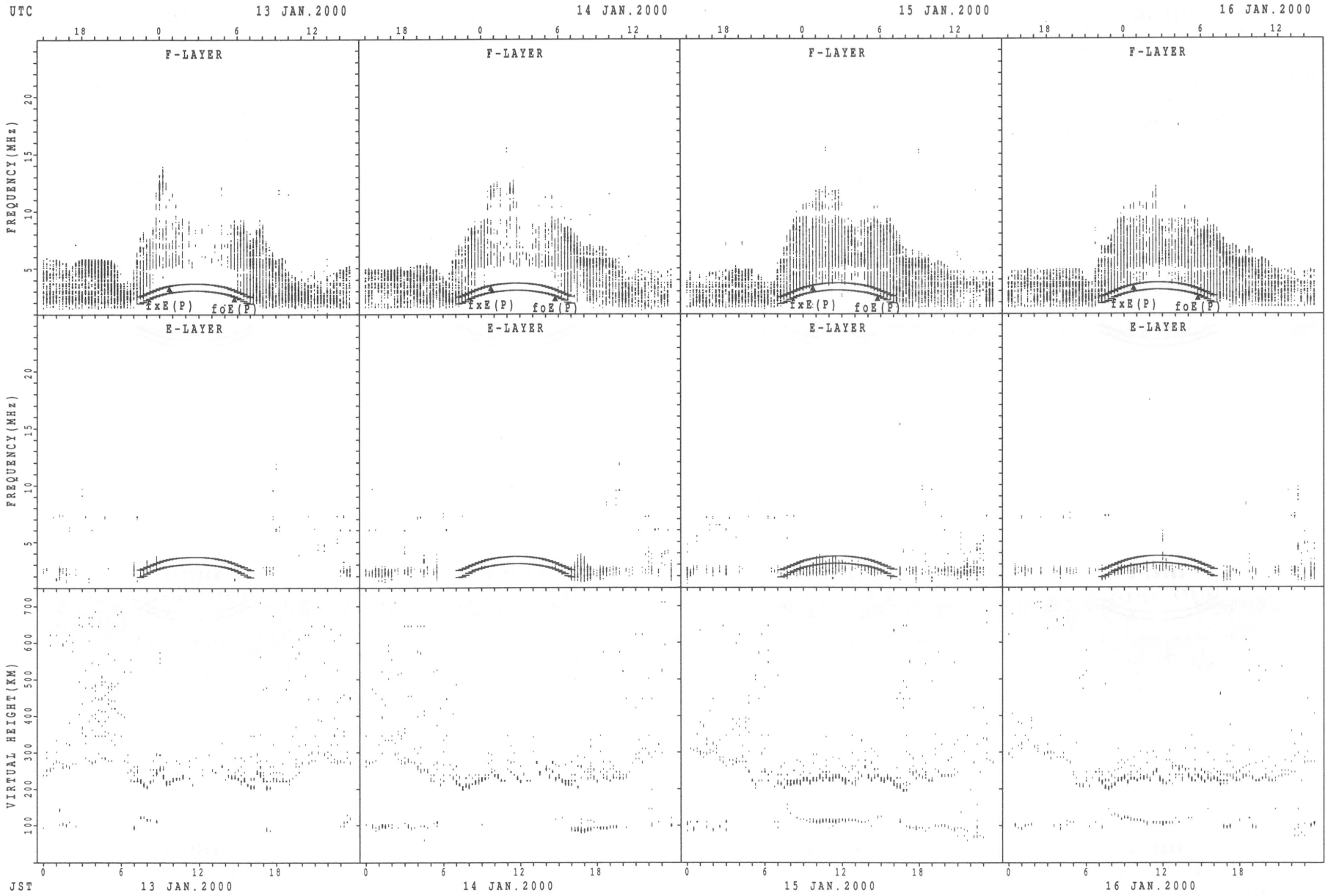
SUMMARY PLOTS AT Wakkanai



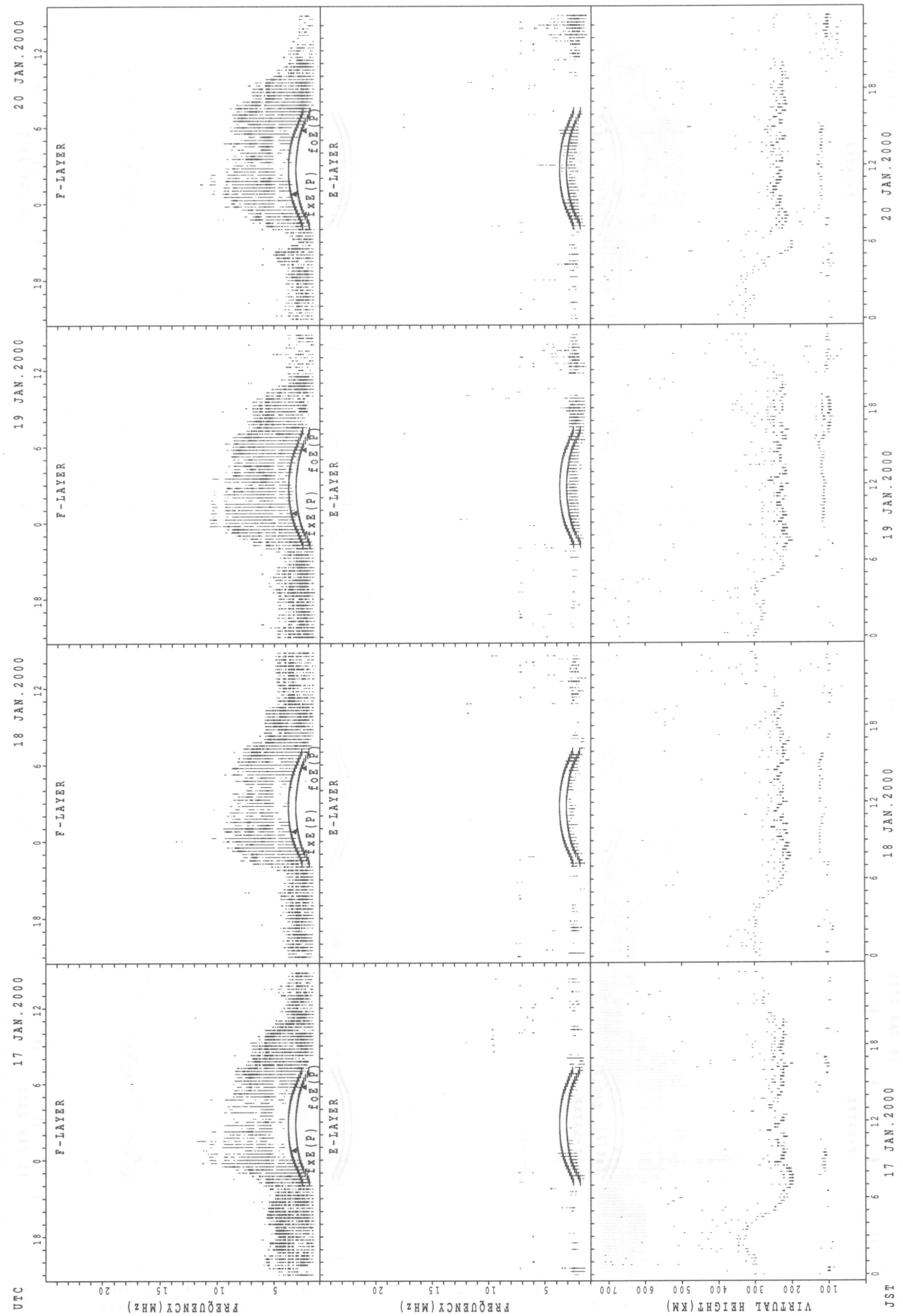
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
9 JAN.2000
10 JAN.2000
11 JAN.2000
12 JAN.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

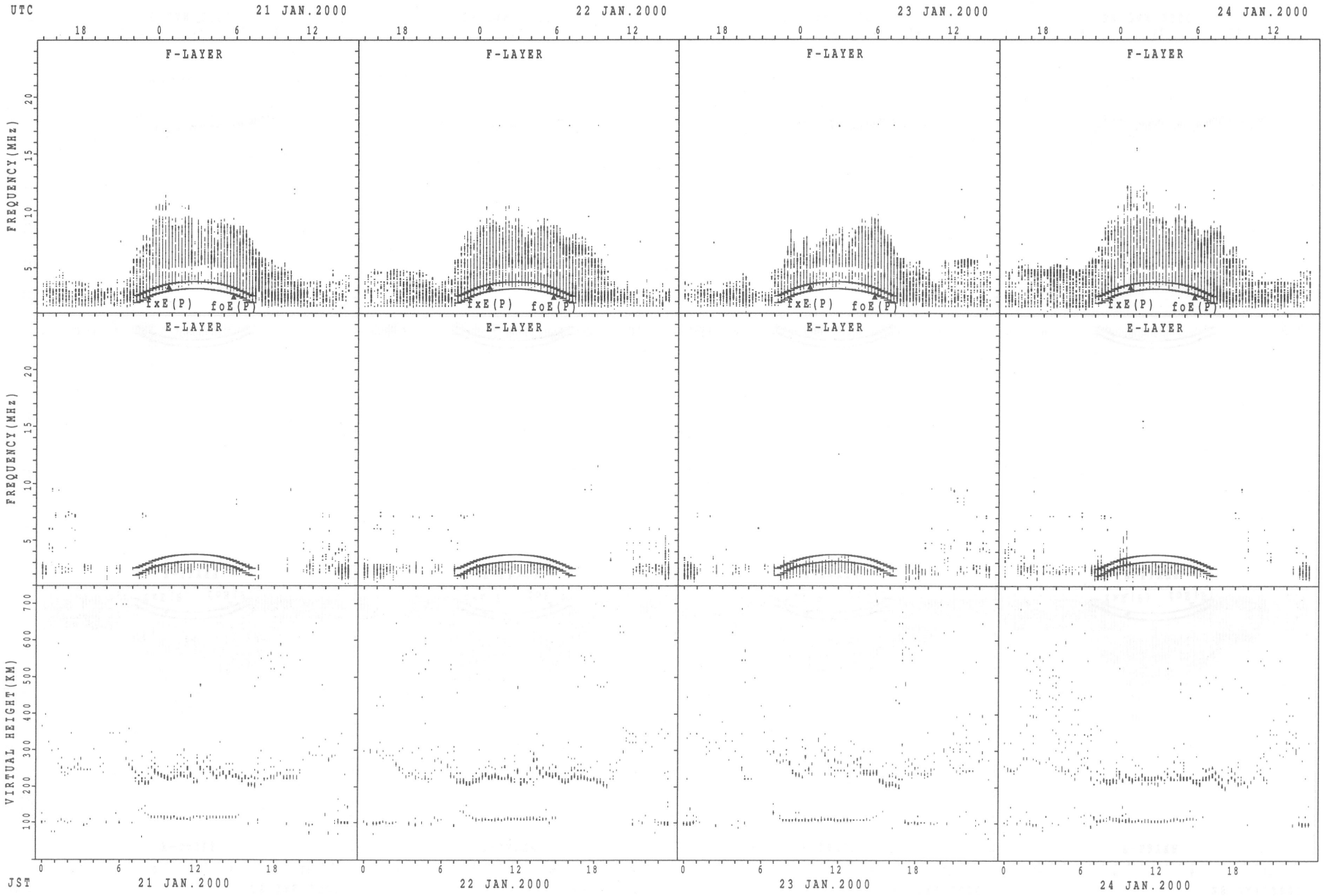
SUMMARY PLOTS AT Wakkanai



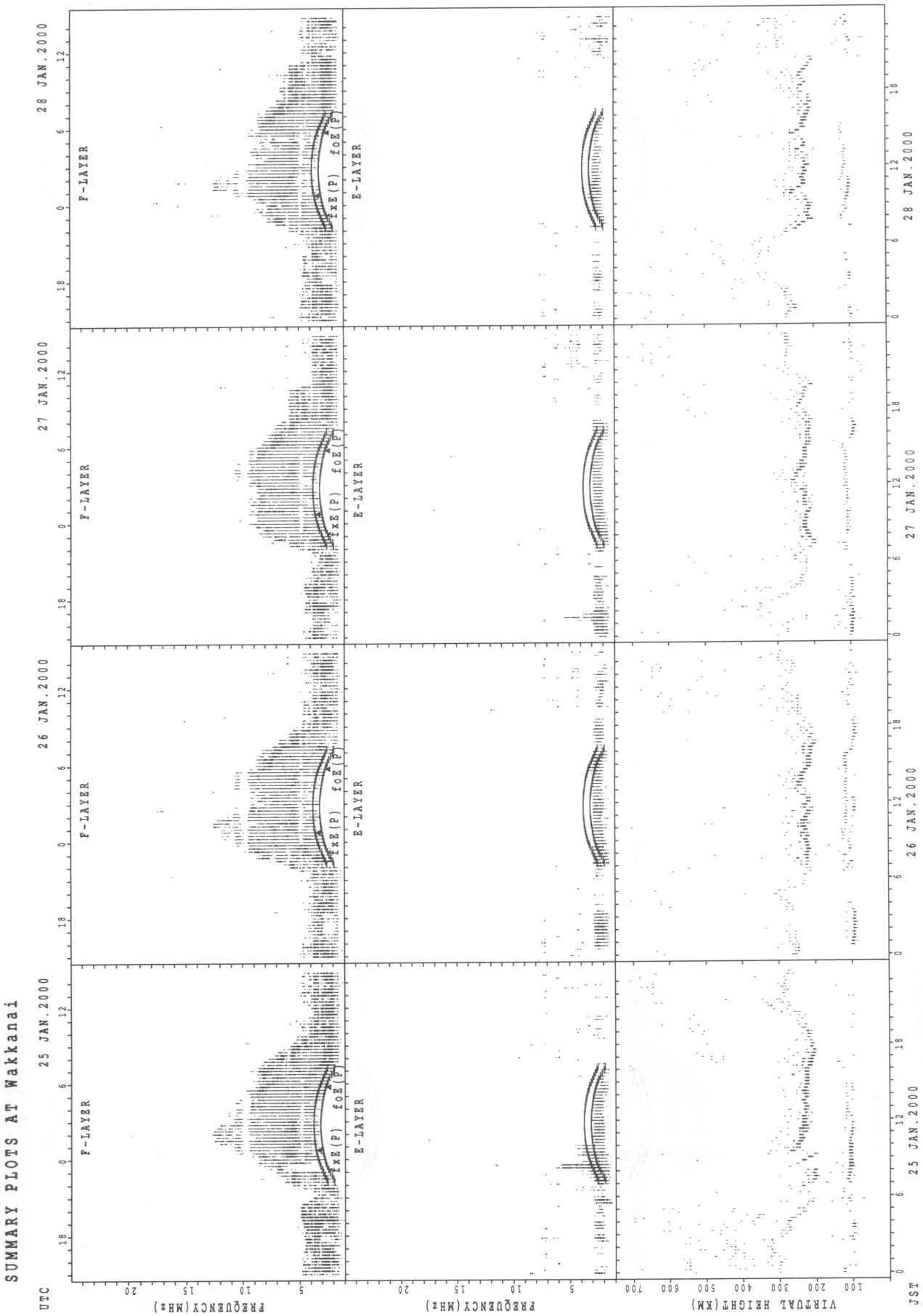
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
17 JAN.2000
18 JAN.2000
19 JAN.2000
20 JAN.2000
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

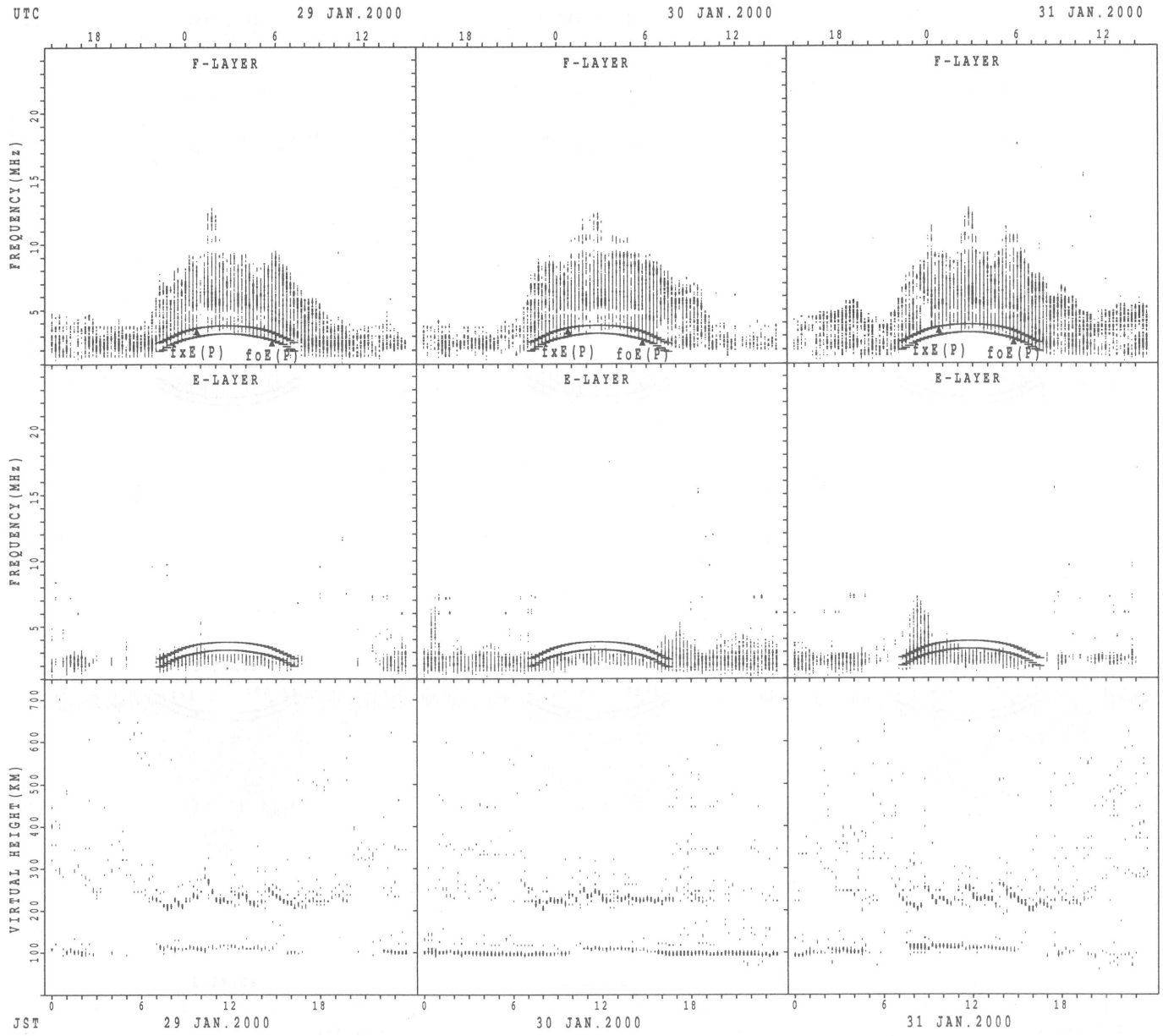
SUMMARY PLOTS AT Wakkanai



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

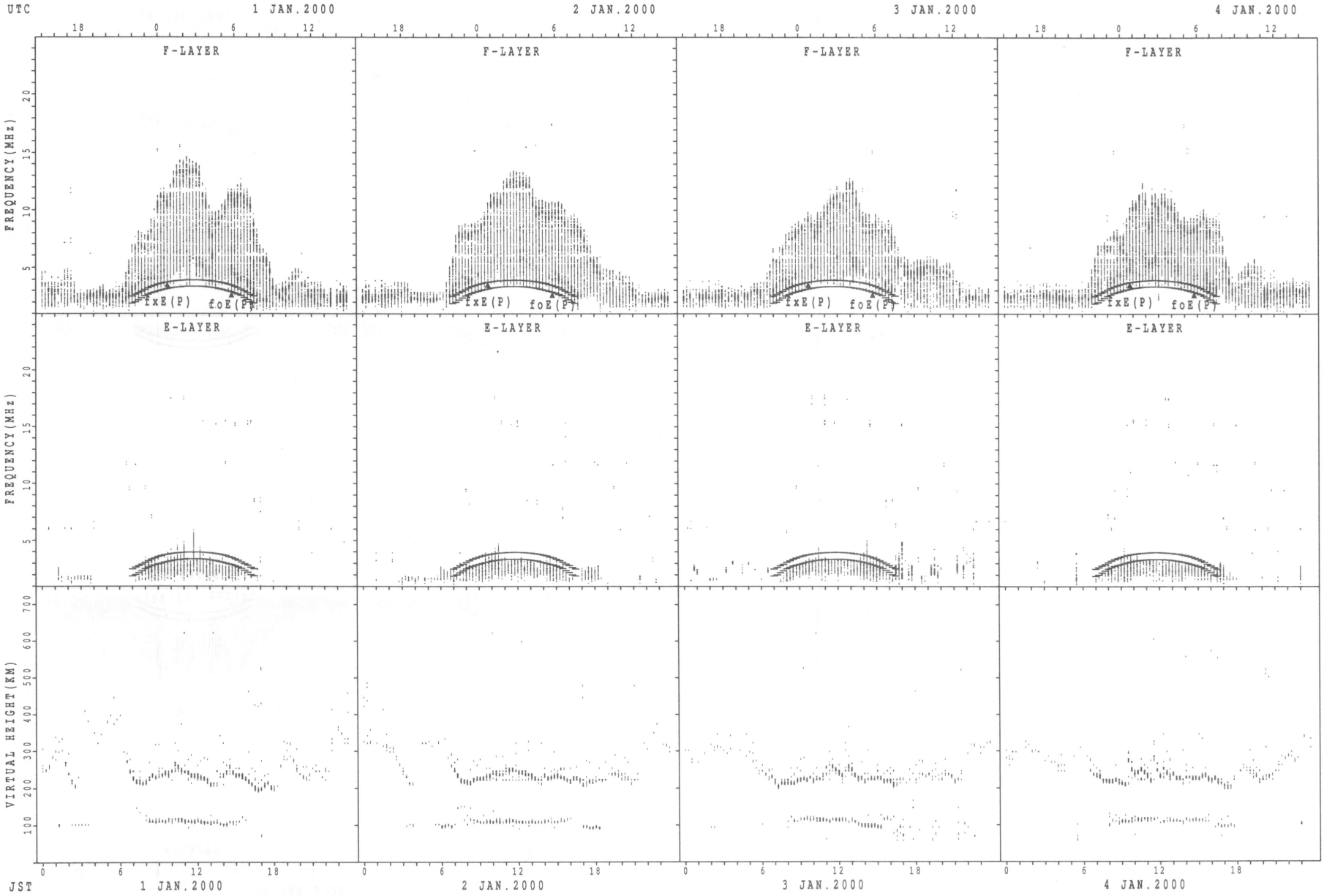

SUMMARY PLOTS AT Wakkanai
UTC
JST
25 JAN.2000
26 JAN.2000
27 JAN.2000
28 JAN.2000
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



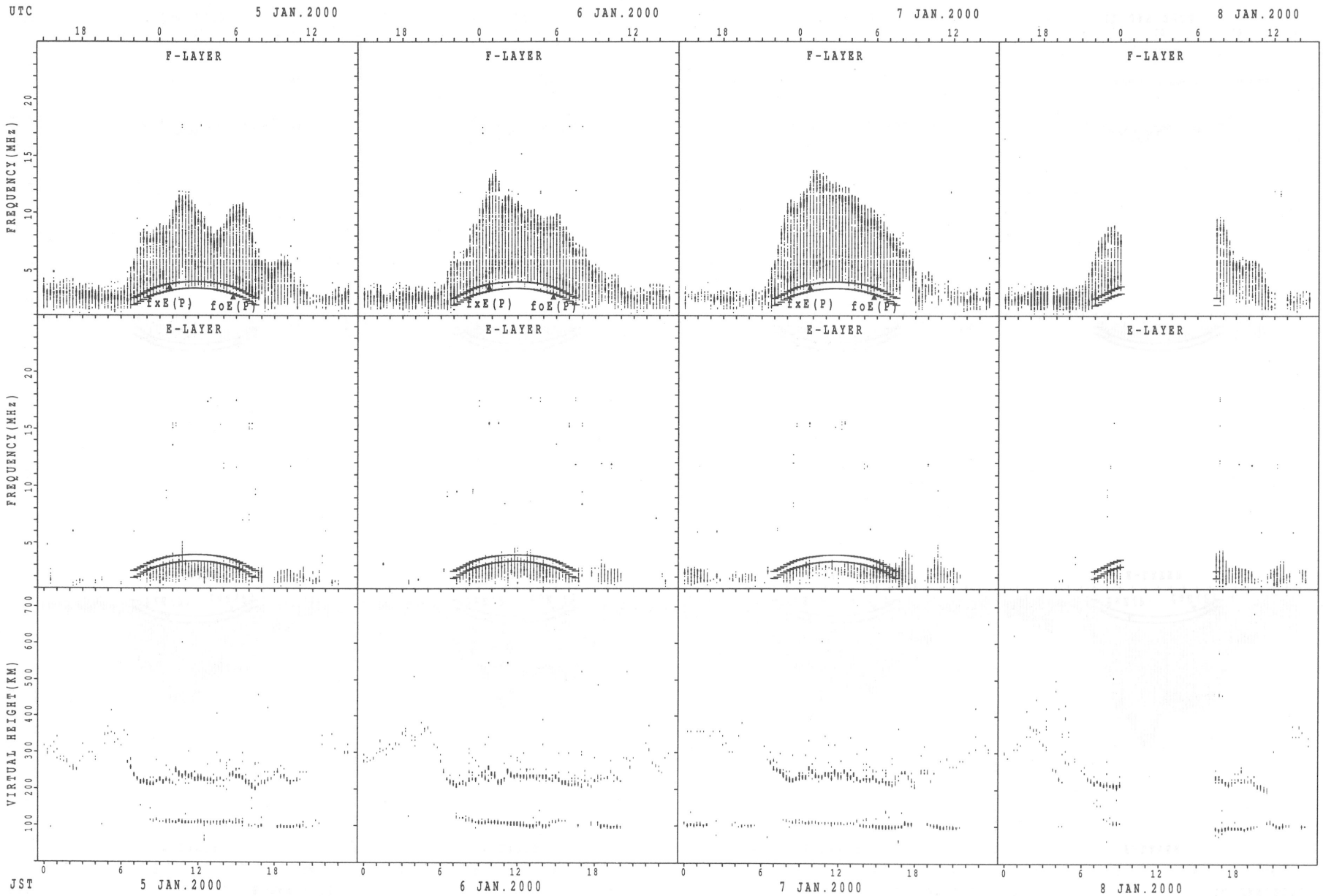
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

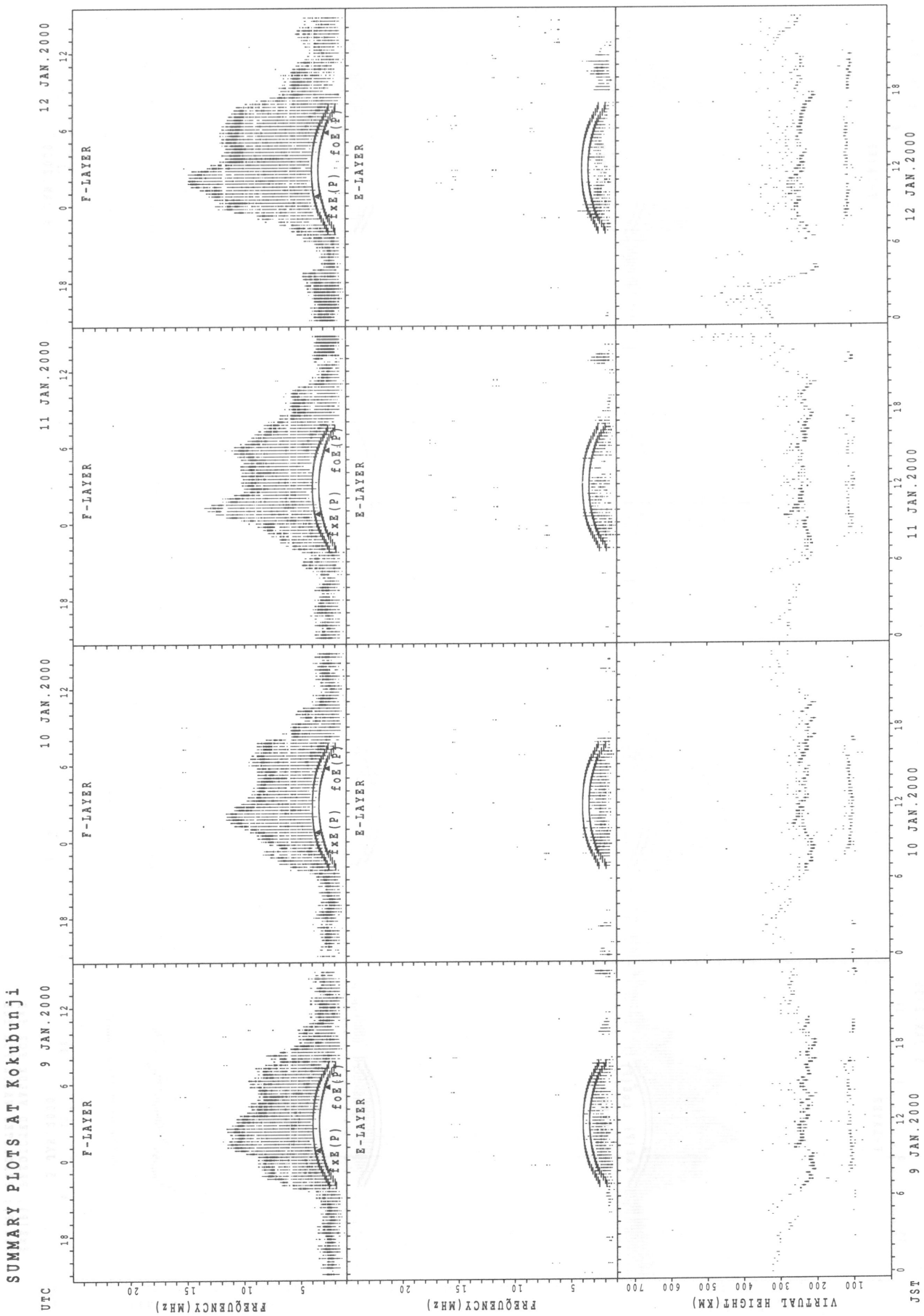


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

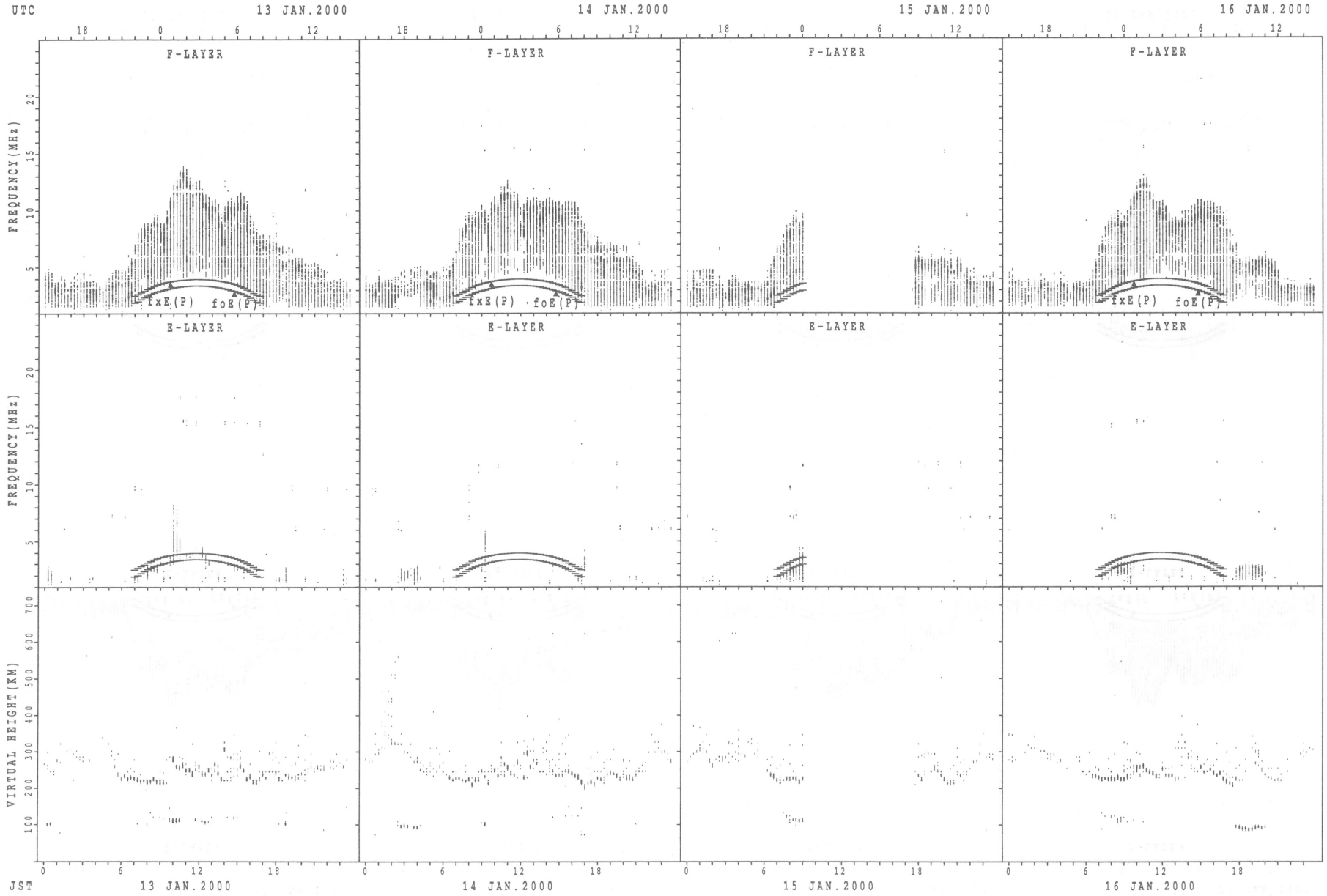
SUMMARY PLOTS AT Kokubunji



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

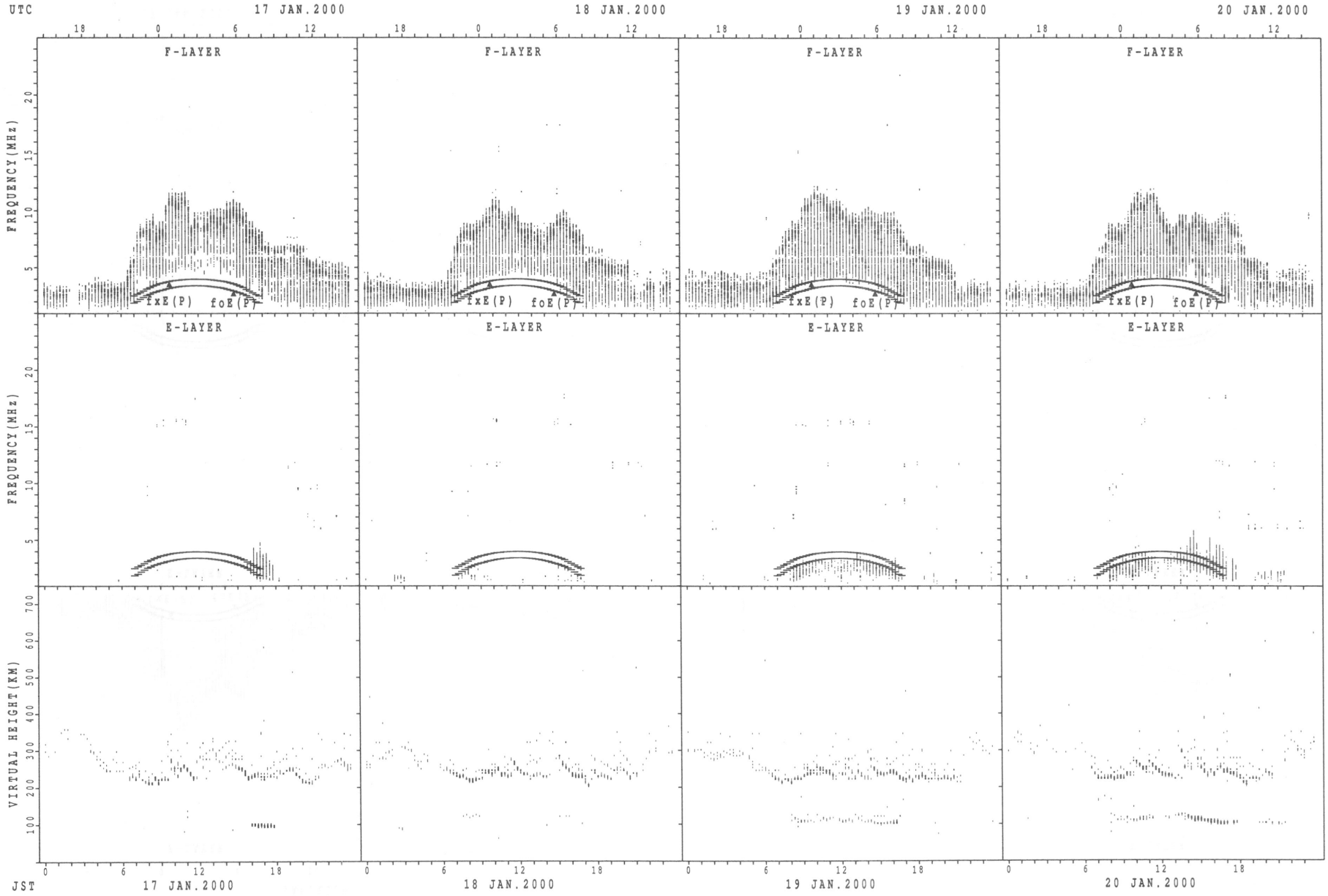

SUMMARY PLOTS AT Kokubunji
UTC
9 JAN.2000
10 JAN.2000
11 JAN.2000
12 JAN.2000
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



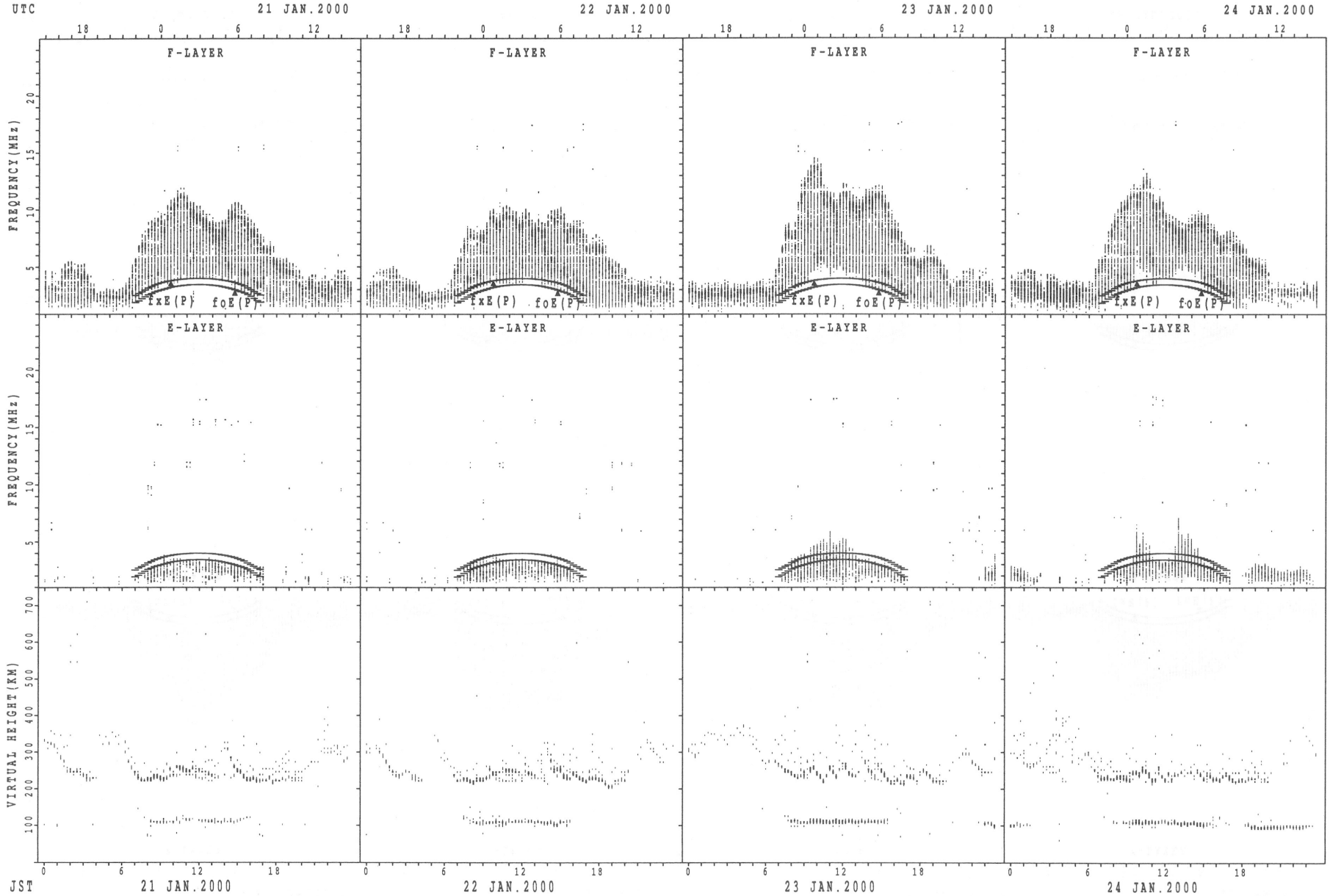
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



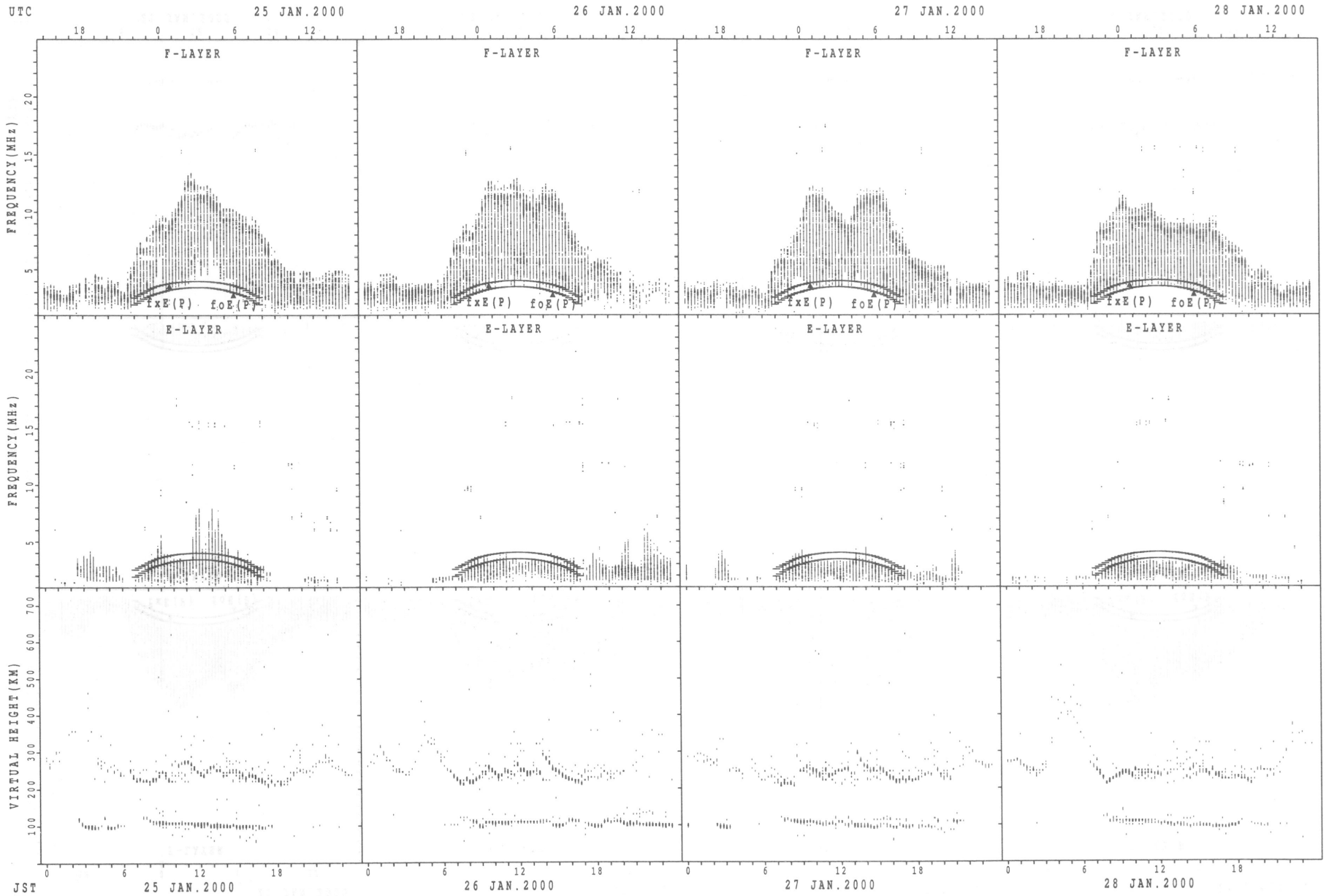
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



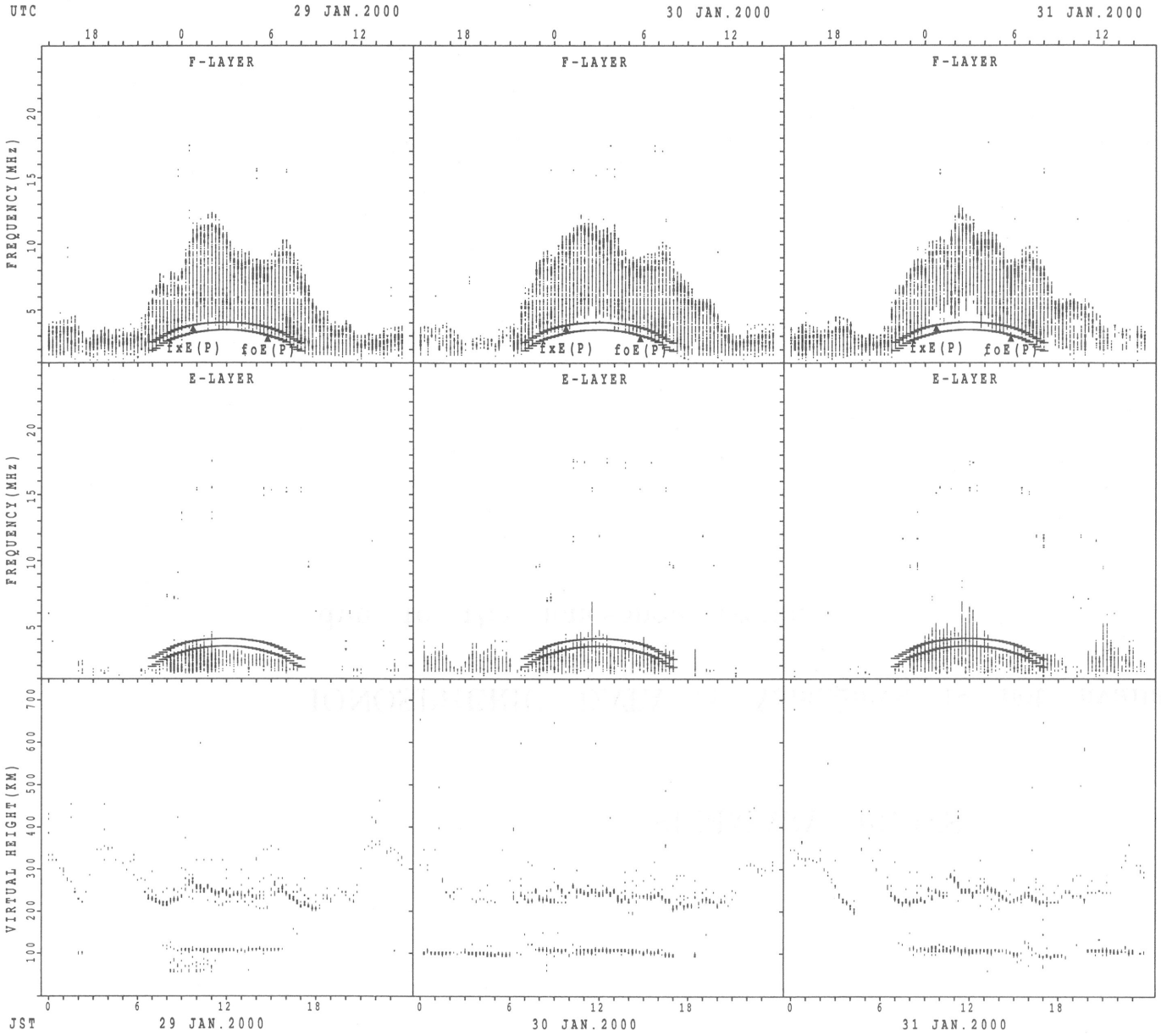
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

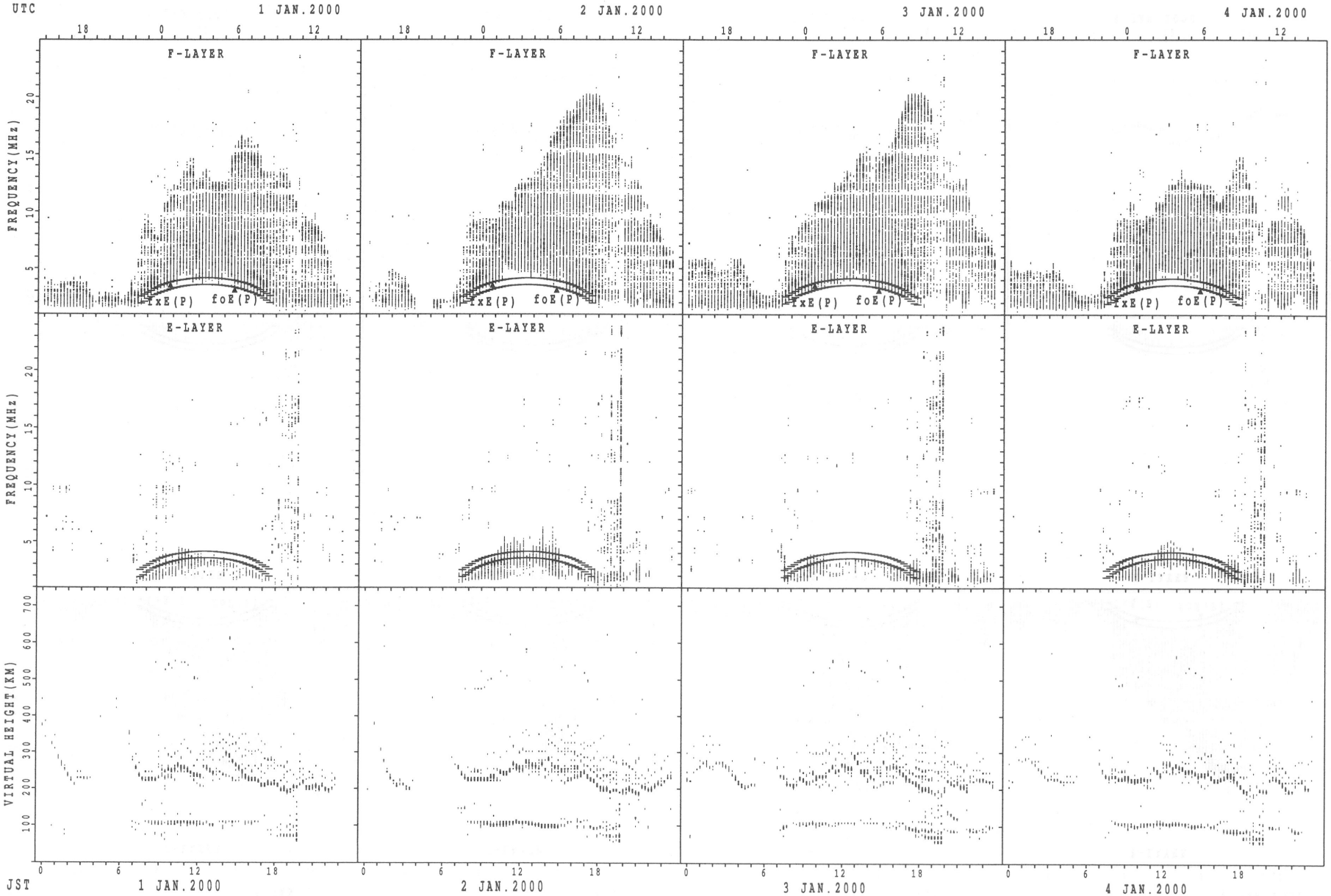


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

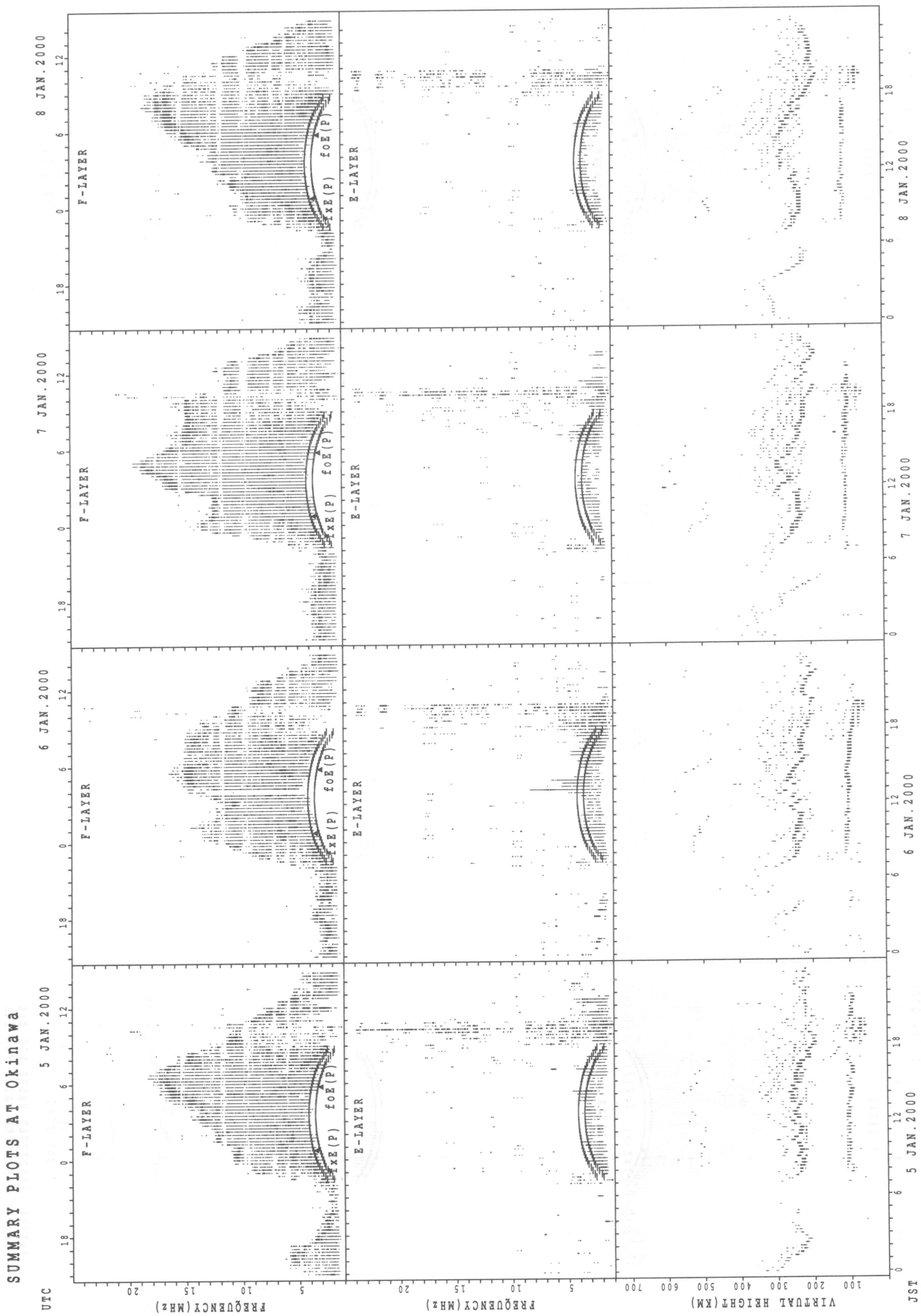
SUMMARY PLOTS

IONOSPHERIC DATA of Yamagawa is not available due to the ionosonde trouble.

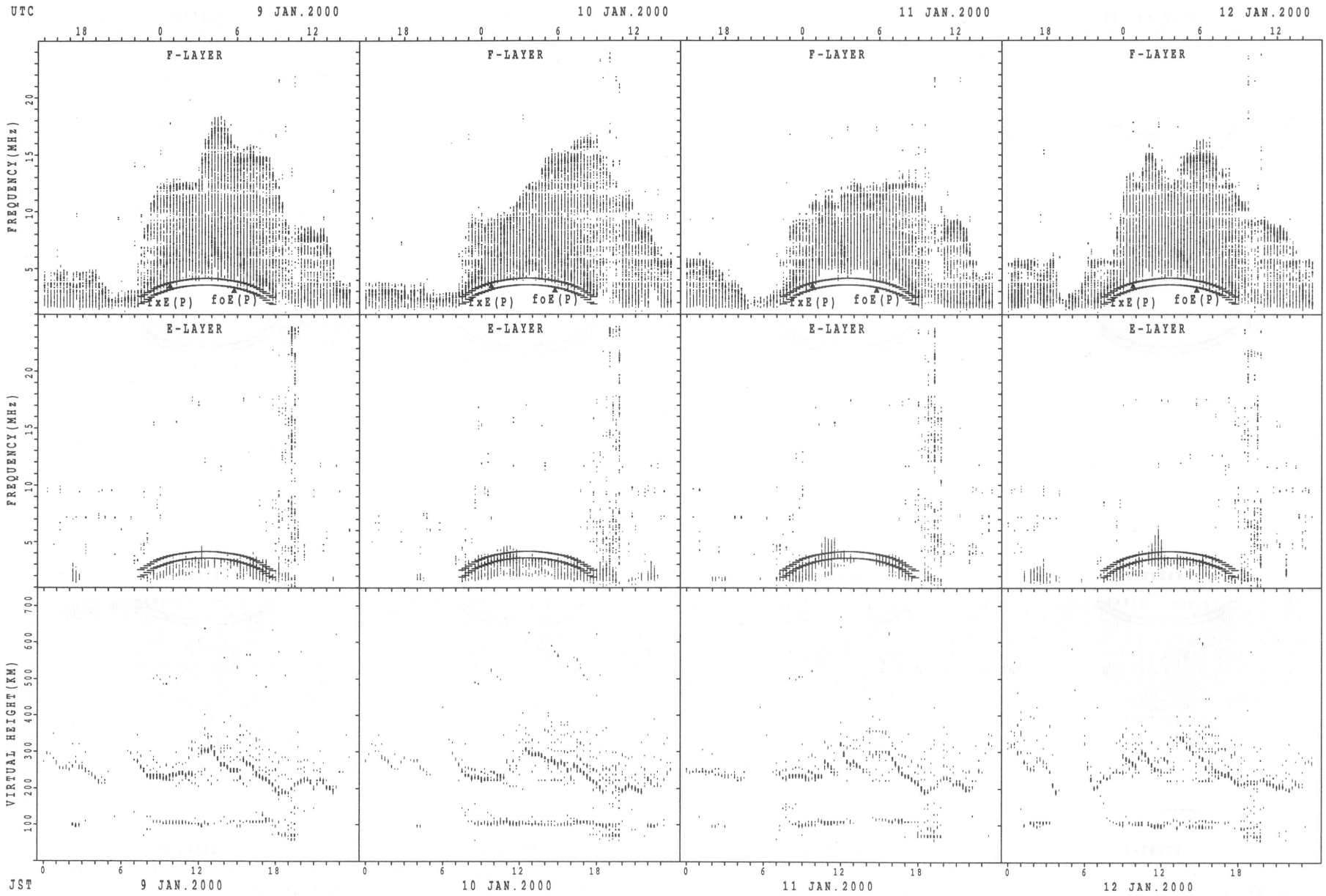
SUMMARY PLOTS AT Okinawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

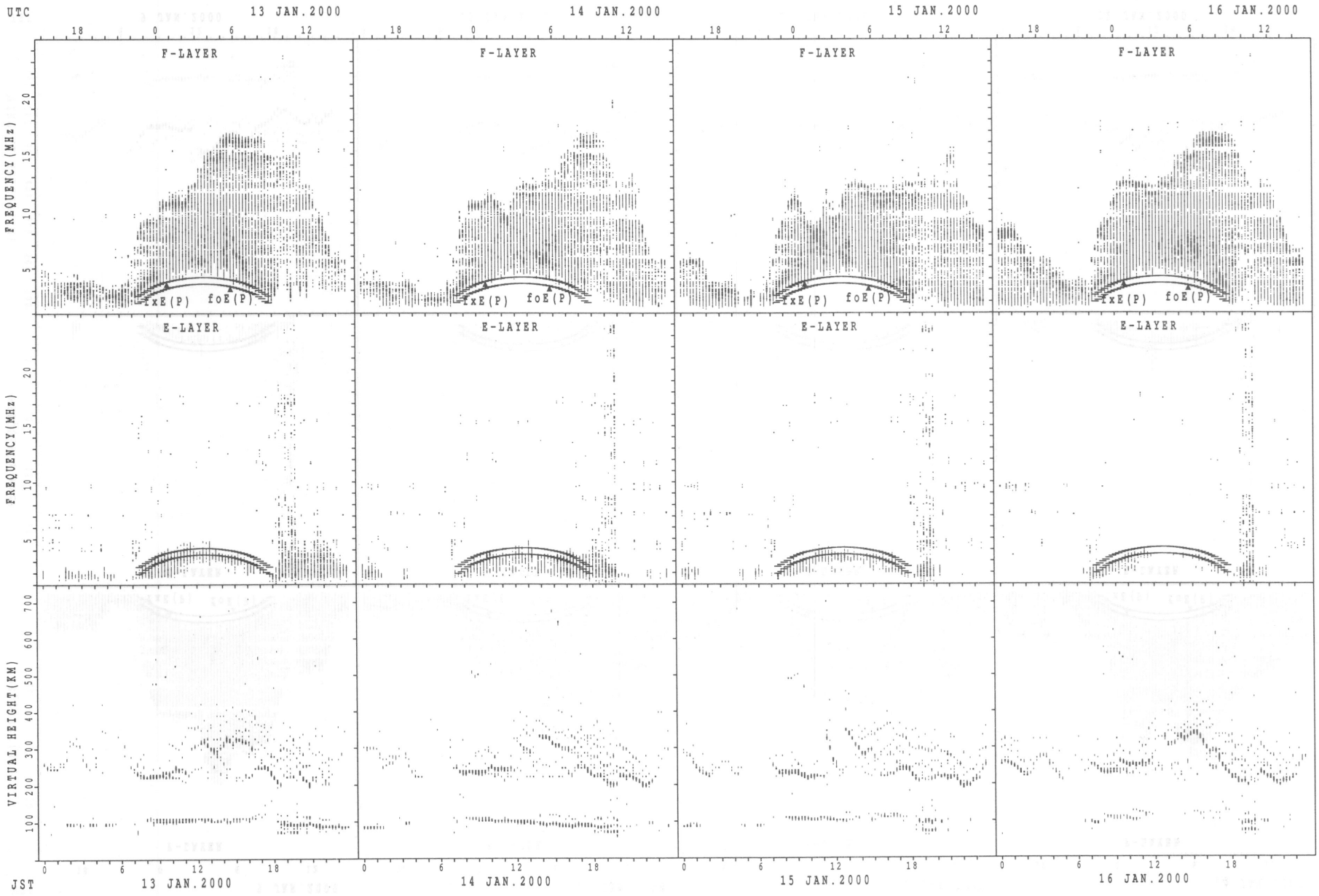

SUMMARY PLOTS AT Okinawa
UTC
JST
5 JAN.2000
6 JAN.2000
7 JAN.2000
8 JAN.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



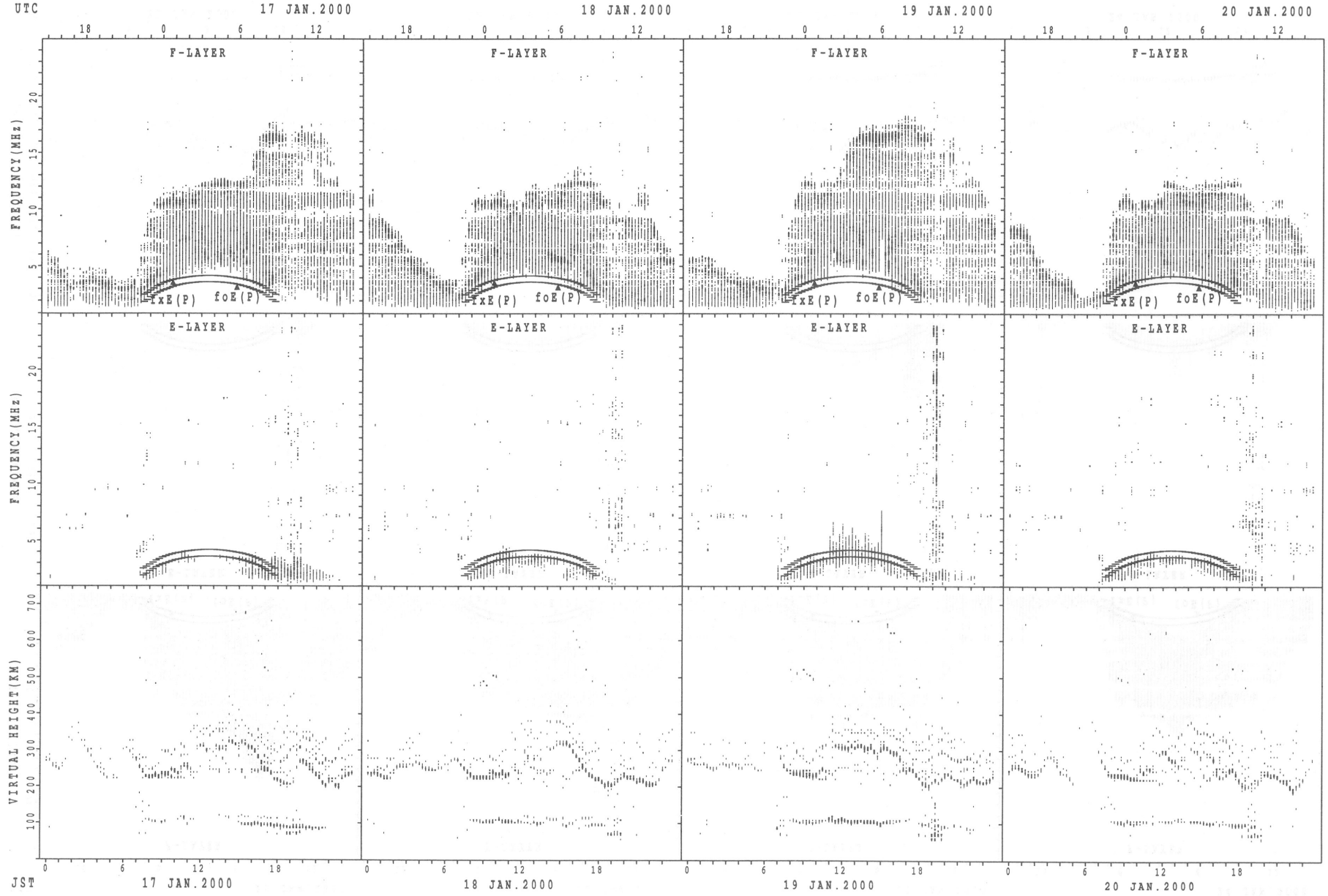
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



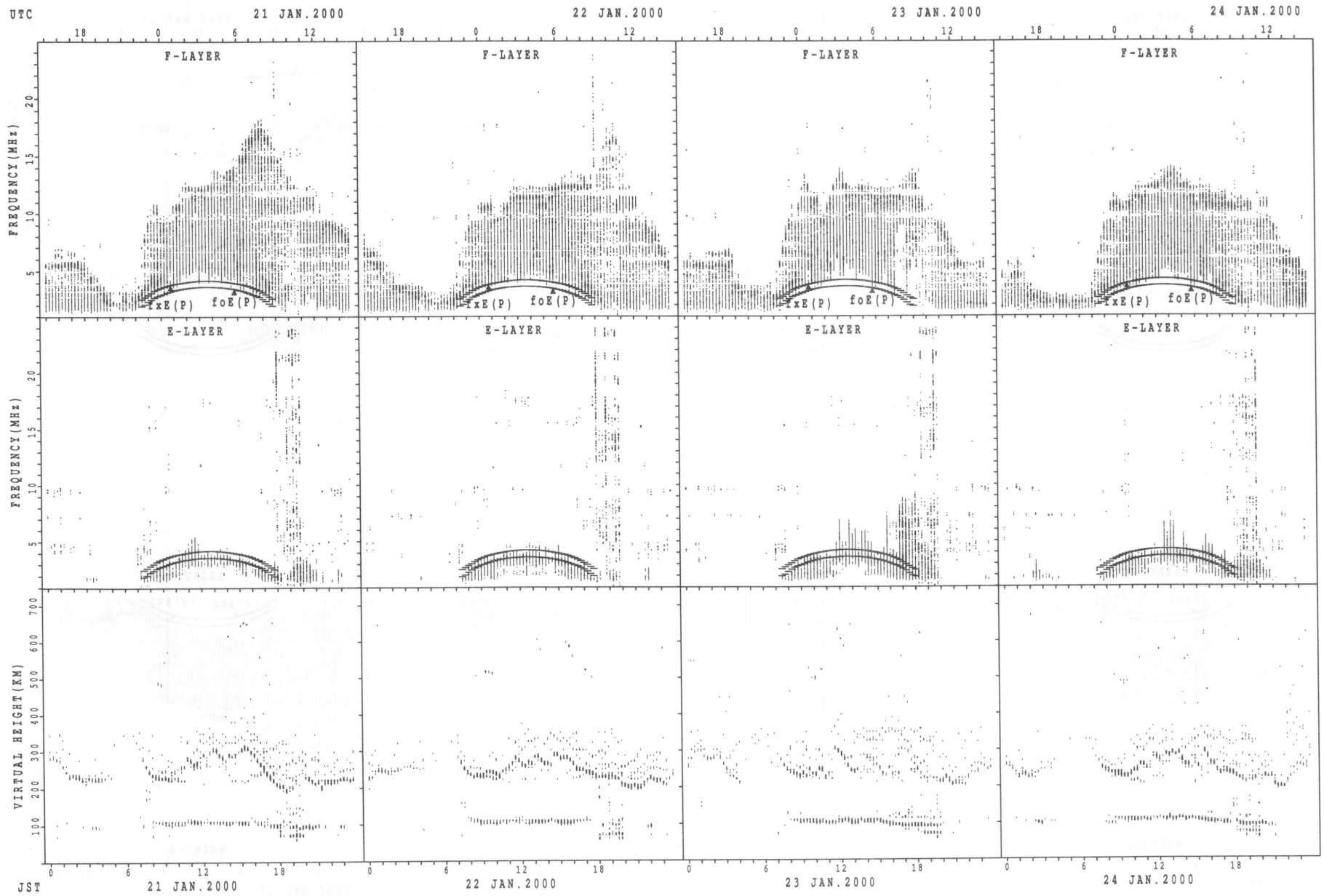
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa

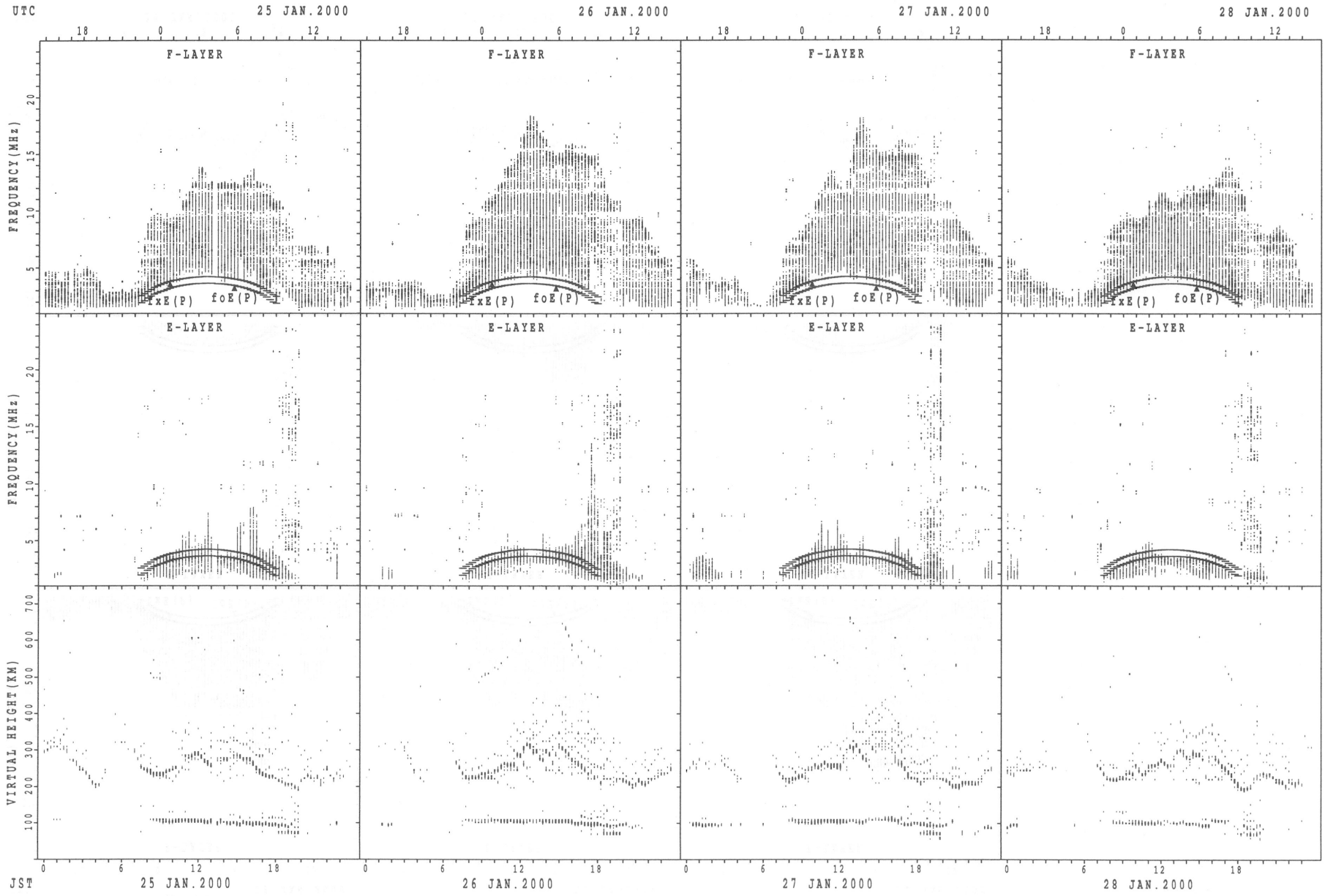


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa

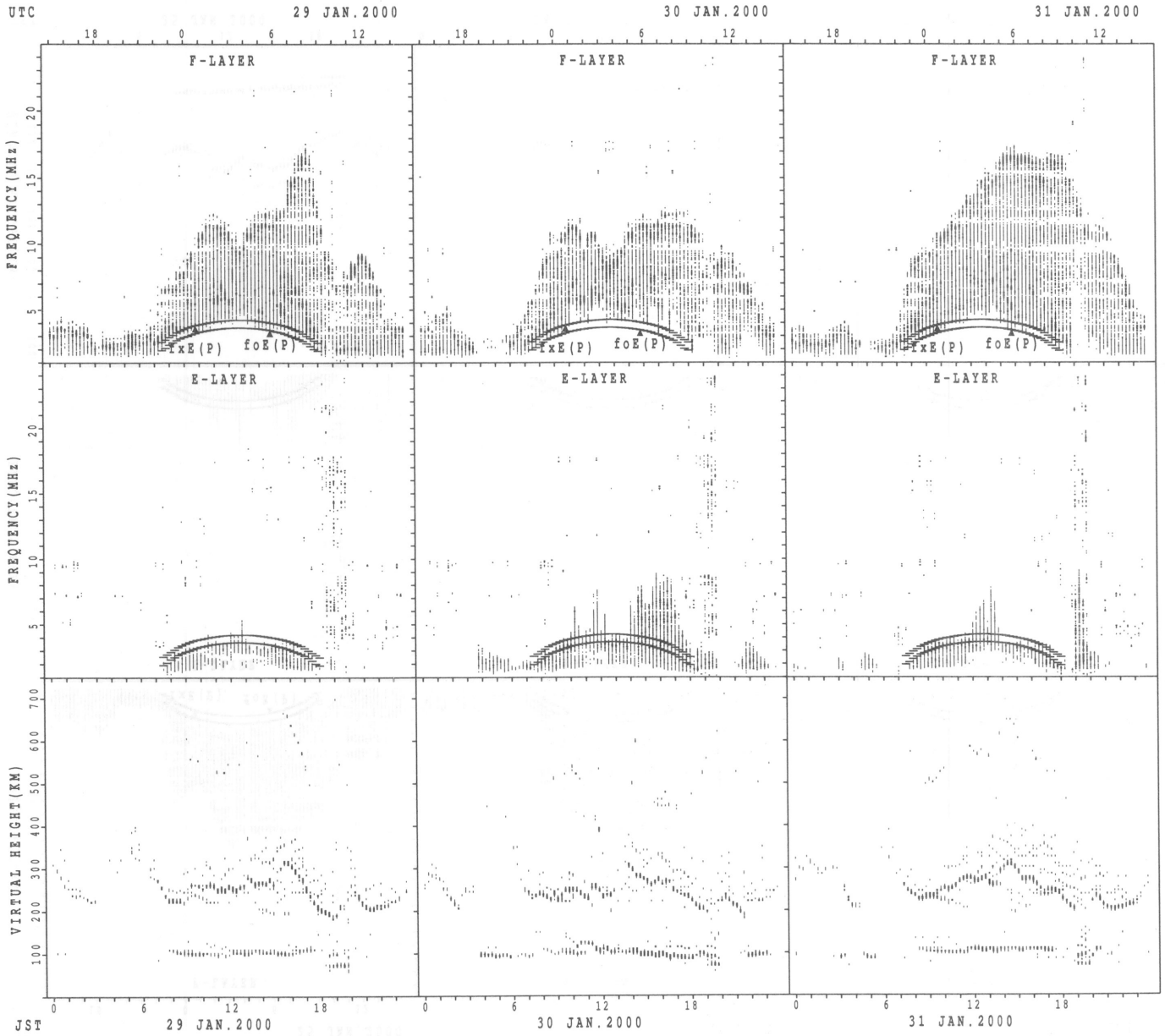


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

MONTHLY MEDIANS OF h'F AND h'Es

JAN. 2000 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION Wakkanai LAT. 45.4N LON. 141.7E

	00	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	29	29	27	25	26	25	30	31	27	8	4				1	
MED								275	232	232	238	230	230	236	243	234	240	255	261				422	
U Q								292	243	238	248	238	238	257	256	242	248	298	269				211	
L Q								258	226	226	224	224	224	230	236	230	230	243	254				211	

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	16	19	14	11	7	7	13	25	27	21	19	23	23	25	23	11	13	12	12	9	8	7	9
MED	101	101	101	99	103	103	101	121	119	113	113	113	113	119	117	127	101	97	99	97	97	98	105	103
U Q	107	105	107	101	109	113	109	143	134	123	119	115	121	123	122	135	105	104	115	99	98	101	155	108
L Q	96	97	97	95	97	91	101	106	107	111	111	111	109	113	113	119	97	95	97	97	95	95	97	95

h'F STATION Kokubunji LAT. 39.7N LON. 140.1E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								7	29	29	29	29	29	29	27	29	29	23	6					
MED								248	232	246	250	248	244	258	268	256	248	250	276					
U Q								256	239	250	256	256	256	274	288	273	256	274	292					
L Q								240	227	234	244	244	240	245	256	245	241	240	262					

h'Es

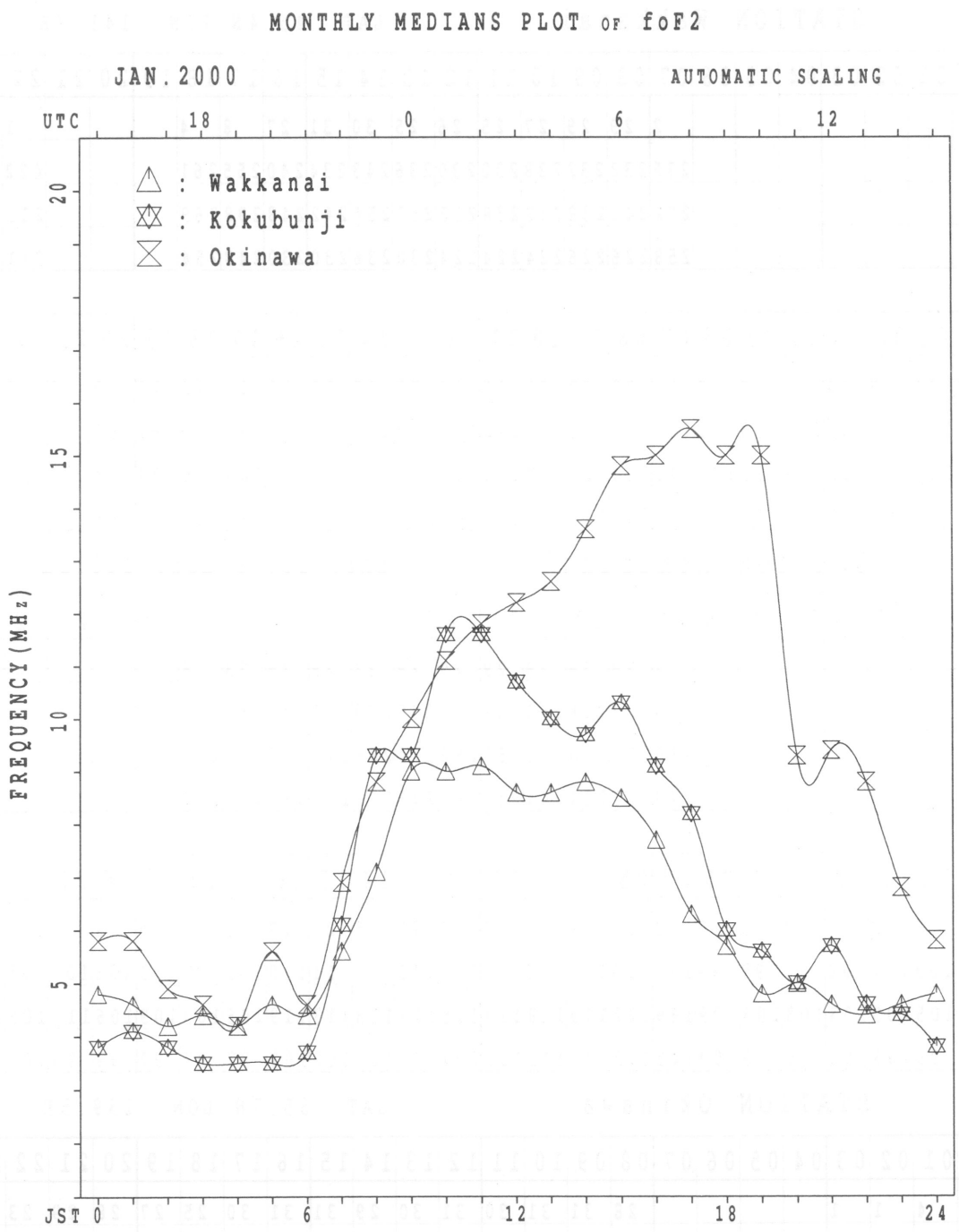
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	3	2	4	2	3	2	3	28	29	25	23	23	23	24	25	18	14	7	9	8	7	5	5
MED	103	103	104	98	99	99	99	161	116	113	113	113	111	111	111	111	110	101	97	101	103	107	105	107
U Q	108	105	105	103	103	103	99	169	122	119	118	117	115	113	113	113	119	105	103	109	106	111	108	108
L Q	102	99	103	96	95	99	99	143	113	111	111	111	107	107	107	102	103	97	97	97	99	99	101	104

h'F STATION Okinawa LAT. 35.7N LON. 139.5E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	4	1	1					28	31	31	30	31	30	29	31	31	30	25	27	28	29	23	9
MED	280	284	298	430					242	236	240	253	274	284	286	286	274	248	230	232	255	242	232	248
U Q	302	309	149	215					256	242	250	258	290	300	314	306	298	262	244	250	273	256	254	311
L Q	272	268	149	215					239	230	236	242	262	272	265	258	262	238	217	218	239	233	224	242

h'Es

	00	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	3	4	2	2	2	2	5	20	31	29	30	29	28	25	30	29	28	15	24	11	7	7	4
MED	89	91	97	101	96	93	96	91	140	107	107	108	109	109	107	106	107	109	97	92	95	97	95	93
U Q	104	97	100	111	97	95	101	128	167	111	112	113	113	111	111	107	113	113	101	98	95	113	101	98
L Q	88	89	97	91	95	91	91	83	117	105	105	107	105	105	103	103	103	98	91	83	93	89	93	89


MONTHLY MEDIANS PLOT OF foF2
JAN.2000
AUTOMATIC SCALING
UTC
18
0
6
12
△ : Wakkanai
✡ : Kokubunji
⧖ : Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	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 50	X 45	X 52	X 34	X 39	X 37	X 38												X 45	X 42	X 52	X 40	X 36	X 34
2	X 38	X 36	X 38	X 41	X 32	X 32	X 33												X 64	X 52	X 50	X 41	X 30	X 34
3	X 35	X 36	X 36	X 38	X 37	X 37	X 39												X 59	X 61	X 57	X 52	X 38	X 38
4	X 39	X 38	X 38	X 40	X 38	X 34	X 34												X 47	X 56	X 52	X 43	X 43	X 40
5	X 44	X 43	X 46	X 40	X 41	X 38	X 38												X 61	X 66	X 44	X 33	X 36	X 38
6	X 41	X 40	X 40	X 39	X 38	X 38	X 42												X 58	X 49	X 42	X 38	X 39	X 41
7	X 37	X 36	X 36	X 36	X 36	X 35	X 36												X 52	X 51	X 40	X 42	X 36	X O 39
8	X 39	X 38	X 42	X 38	X 34	36	X 39				C	C	C	C	C	C	C		X 66	X 64	X 54	X 32	X 32	X 34
9	X 36	X 37	X 39	X 38	X 37	X 36	X 40												X 60	X 56	X 46	X 42	X 43	X 46
10	X 39	X 36	X 38	X 38	X 37	X 36	X 38												X 65	X 56	X 44	X 34	X 39	X 42
11	X 41	X 42	X 43	X 43	X O 41	X 42	X 49												X 65	X 68	X 48	X 38	44	40
12	X 41	X 44	42	X 46	X 43	X 34	X 44												X 72	X 68	X 57	X 46	X 52	X 52
13	X 51	X 45	X 46	X 48	X 44	X 46	X 49												X 83	X 70	X 60	X 57	X 50	X 45
14	X 43	X 43	42	X 50	X 52	X 45	X 50												X 79	X 76	X 73	X 57	X 46	X 49
15	X 48	X 49	X 49	X 42	X 44	X 42	X 43				C	C	C	C	C	C	C	C	X 69	X 68	X 69	X 67	X 52	X 51
16	X 50	X 45	X 48	X 48	X 48	X 44	X 43												X 70	X 62	X 66	X 51	X 44	X 44
17	X 42	X 41	X 42	X 42	X 46	X 42	X 41												X 74	X 81	X 79	X 64	X 57	X 58
18	X 49	X 46	X 44	X 43	X 42	X 39	X 41												X 70	X 62	X 63	X 55	X 46	X 48
19	X 51	X 49	X 49	X 48	X 47	X 48	X 48												X 74	X 65	X 63	X 48	X 42	X 43
20	X 40	X 38	X 41	X 40	X 38	X 38	X 37												X 90	X 66	X 57	X 48	X 50	X 54
21	X 49	X 50	X 58	X 54	X 34	X 34	X 34												X 65	X 56	X 47	X 44	X 44	X 49
22	X 46	X 50	X 52	X 44	X 36	X 32	X 34												X 78	X 61	X 50	X 42	X 44	X 41
23	X 42	X 39	X 39	X 39	X 40	X 42	X 37												X 65	X 68	X 49	X 47	X 52	X 48
24	44	X 48	X 44	X 44	38	X 39	X 42												X 75	X 62	X 48	X 41	X 38	X 40
25	X 43	X 40	X 38	X 42	X 46	X 44	X 34												X 68	X 52	X 49	X 46	X 48	X 52
26	X 44	X 45	X 48	X 42	X 40	X 40	X 44												X 66	X 58	X 50	X 42	A	X 44
27	X 40	X 41	X 43	X 41	X 39	X 38	X 30												X 64	X 58	X 55	X 42	X 43	X 46
28	X 44	X 48	X 49	X 42	X 43	X 40	X 37												X 74	X 56	X 54	X 42	X 38	X 42
29	X 43	X 45	X 44	X 38	X 38	X 39	X 38												X 56	X 46	X 46	X 34	X 36	X 39
30	X 39	X 39	X 42	X 30	X 36	X 37	X 44												X 72	X 64	X 49	X 39	X 39	X 40
31	X 41	X 43	X 43	X 47	X 43	X 31	X 33												X 64	X 66	X 58	X 47	X 42	X 43
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31												31	31	31	31	30	31
MED	X 42	X 43	X 43	X 42	X 39	X 38	X 39												X 66	X 62	X 52	X 42	X 43	X 43
U Q	X 46	X 45	X 48	X 44	X 43	X 42	X 43												X 74	X 66	X 58	X 48	X 46	X 48
L Q	X 39	X 38	X 39	X 38	X 37	X 36	X 36												X 61	X 56	X 48	X 40	X 38	X 40

JAN. 2000 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	44	39	46	28	33	31	32	67	74	110	119	140	139	95	101	114	114	69	39	36	46	34	30	28
2	32	30	32	35	26	26	27	62	84	87	112	123	129	124	105	103	92	87	58	R 46	44	35	24	28
3	29	30	30	32	31	31	33	62	75	88	92	102	116	125	97	93	87	57	53	55	51	46	32	32
4	R 33	32	32	34	32	28	28	55	72	75	106	113	108	108	90	V 89	90	74	41	50	46	37	37	34
5	38	37	40	34	35	32	32	60	80	87	99	112	99	84	87	102	94	63	55	60	38	27	30	32
6	R 35	34	34	33	32	32	36	62	68	100	131	114	108	98	92	96	80	67	52	R 43	35	32	33	35
7	31	30	30	30	30	29	30	58	104	112	134	129	121	112	103	96	82	71	45	45	34	36	30	U R 33
8	33	V 32	F 33	32	29	F 28	33	63	84	79	C	C	C	C	C	C	C	92	60	58	48	26	26	28
9	30	31	33	32	31	30	34	63	80	85	113	108	103	89	86	92	88	73	54	50	R 40	36	R 38	40
10	33	30	32	32	31	30	32	59	80	81	98	114	99	90	85	92	88	77	59	50	38	28	33	36
11	35	36	37	37	35	36	43	55	73	85	128	112	99	98	98	106	88	77	59	62	R 42	32	F 37	F 32
12	F 34	38	F 34	40	37	28	38	57	80	122	131	152	132	114	116	116	110	95	66	62	51	40	46	46
13	45	39	40	42	38	40	43	69	87	86	122	131	122	107	100	110	92	76	77	64	54	51	R 44	39
14	37	37	F 32	R 44	46	39	44	68	94	100	108	122	R 102	108	107	104	104	85	73	70	67	51	40	43
15	42	43	43	U R 37	38	36	37	67	85	92	C	C	C	C	C	C	C	C	63	62	63	61	46	45
16	44	R 39	42	42	42	38	37	66	93	93	118	118	102	92	98	106	102	88	64	56	60	45	38	39
17	36	35	36	36	40	36	35	64	86	86	115	114	96	98	98	103	89	79	68	75	73	58	51	52
18	44	40	38	37	36	33	35	65	84	89	106	93	92	86	79	94	90	75	64	56	57	J R 49	40	42
19	45	43	43	42	41	42	42	63	80	100	118	109	106	95	98	92	96	79	68	59	57	R 44	36	R 37
20	34	R 32	35	34	32	32	31	57	82	84	109	112	100	83	90	92	85	96	84	60	51	42	44	48
21	43	43	52	48	28	28	28	61	87	93	108	109	100	89	88	102	89	73	59	50	41	38	38	43
22	40	44	46	38	30	26	28	57	81	81	92	99	94	87	92	98	88	76	72	55	44	36	38	35
23	36	33	33	33	34	36	31	56	82	124	141	114	118	107	118	116	89	66	59	62	43	41	46	42
24	36	42	38	38	F 29	33	36	60	93	110	118	111	96	88	91	92	78	80	69	56	42	R 35	32	34
25	37	34	32	36	40	38	28	58	74	92	96	123	121	117	100	98	90	80	62	46	43	40	42	46
26	38	39	42	36	34	34	38	71	85	96	123	120	123	110	116	112	88	68	60	52	44	36	A	38
27	34	35	R 37	35	33	32	24	54	68	92	118	108	96	90	116	117	98	73	58	52	49	36	37	40
28	38	42	43	36	37	34	31	62	87	108	98	102	92	86	90	85	90	79	68	50	48	36	33	36
29	37	39	38	32	32	33	32	62	70	82	112	121	105	90	86	87	100	78	50	40	40	28	30	33
30	33	33	36	24	30	31	38	59	84	90	105	117	107	112	86	88	96	80	66	58	43	33	33	34
31	35	37	37	41	37	25	27	63	80	87	102	119	118	106	97	88	94	83	58	60	52	41	36	R 37
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	30	31	31	31	31	30	31
MED	36	37	37	36	33	32	33	62	82	90	112	114	105	98	97	98	90	77	60	56	46	36	37	37
U Q	40	39	42	38	37	36	37	64	86	100	120	122	120	109	102	106	96	80	68	60	52	44	40	42
L Q	33	32	33	32	31	29	30	58	75	85	104	109	99	89	89	92	88	73	55	50	42	34	32	33

JAN. 2000 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L									
2											L	L	L	L	L									
3										L	L	L	L	L	L	L	L 236							
4											L	L	L	L	L									
5										L	L	L	L	L	L									
6										L	L	L	L	L	L	L 336								
7										L	L	L	L	L		L								
8											C	C	C	C	C	C	C							
9									L 300	L	L		L	L	L									
10										348	L	L	L			L	L 272							
11											L	L	L											
12												L	L	L	L									
13											L	L	L	L	L 600									
14										L	L					L								
15											C	C	C	C	C	C	C	C						
16											L	L	L	U L 604	L									
17											L			L	L									
18															L	L								
19										L	L	L		L	L									
20											L	L	L		L									
21												L	L	L	L									
22											L	L		L	U L 520	L								
23											L		L	L	L									
24												L												
25											L	L	A	A		L								
26										L	L	L	L	L	L	L								
27									U L 324		L	L	L	L	L	L								
28											L	L	L	L		L								
29										U L 340	L	L	L	L	L	L								
30											L	L	L	L	L									
31												L	L	L	U L 476									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	2				1	3	1	2							
MED									L 312	344				U L 604	U L 520	L 336	L 254							
U Q															L 600									
L Q															U L 476									

JAN. 2000 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B 180	248	296	324	A	352	324	308	280	188	B						
2								B 180	244	300	A	A	R 344	A	304	276	196	B						
3								B 180	232	284	A	A	A	336	320	280	A	B						
4								164	248	296	320	A	348	340	320	272	216	B						
5								B 180	236	296	332	340	352	340	320	A	H 220	B						
6								B 180	A	A	A	A	A	A	304	272	212	B						
7								B 180	244	304	R 340	348	R	340	324	280	216	B						
8								A 180	256	288	C	C	C	C	C	C	C	B						
9								180	240	280	328	352	R 360	344	324	292	228	B						
10								H 188	252	304	332	348	356	344	324	288	240	B						
11								188	264	304	A	352	356	U R 340	336	304	232	B						
12								176	A 248	A	336	R 360	U R 360	352	336	308	240	B						
13								192	268	A	A	A	A	356	R 336	288	U R 252	B						
14								164	R 256	R	B	B	B	B	B	B	260	B						
15								180	A	A	C	C	C	C	C	C	C	C						
16								180	252	A	R 356	R 372	B	B	B	B	B	B						
17								188	B	B	B	B	B	B	B	B	A	B						
18								B	R 264	U R 316	B	B	B	B	B	308	248	B						
19								172	256	312	R 348	360	R 372	364	344	316	248	B						
20								H 196	252	308	348	368	372	356	A 340	A	A	B						
21								184	256	304	340	A	352	352	336	300	256	B						
22								180	252	308	A	352	A	336	328	296	236	B						
23								B	A	A	A	A	A	A	A	284	236	B						
24								172	232	296	A	A	352	332	320	288	240	B						
25								180	A	A	A	344	A	A	A	A	A	B						
26								176	A	A	324	A	348	A	320	A	A	B						
27								188	A	A	320	348	348	336	A	292	232	B						
28								H 188	268	A	A	348	R 356	336	316	288	A	B						
29								B	244	A	A	A	R 348	340	316	276	236	B						
30								172	264	288	316	A 328	A	A	A	A	248	B						
31								180	260	308	328	A 344	A	A	U R 316	A	A	B						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								21	24	18	15	15	16	18	21	20	21							
MED								180	252	302	332	348	352	340	320	288	236							
U Q								188	258	308	R 340	360	R 358	352	336	298	248							
L Q								174	244	296	324	344	348	336	316	280	218							

JAN. 2000 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	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 B 14	J A 18	18	21	E B E 14	B E 14	B E 14	B E 17	G 23	G 29	36	J A 44	G 33	G 30	G 28	G 23	G	E B E 16	B E 14	B E 14	E B 13	B E 15	B E 16	B E B 16
2	E B E 14	B E B 15	13	19	18	18	J A 22	24	29	G 24	J A J 40	A 35	G 31	34	31	G	G	J A J 18	A E 21	B E 14	B E 15	B E 14	B E 15	B E B 15
3	E B E 14	B E B 14	E B E 14	B E 14	B E 14	B E 15	18	E B 16	G	G	35	36	36	G 31	J A 35	A 30	21	21	E 15	B E 16	B E 14	B E 15	B E 15	B E B 14
4	E B E 14	B E B 15	E B E 14	B E 14	B E 14	B E 14	B E 14	G	J A J 27	A 30	35	35	G 31	G	G 20	G	G	J A 24	20	E 15	B E 16	B E 15	B E 16	B J A 24
5	E B E 14	B E B 14	E B 15	18	E B E 14	B E 14	B E 13	B E 17	26	G	36	G 34	G 27	G 24	G	J A 28	J G 18	J A 23	20	J A J 22	A J 20	A 20	16	19
6	E B E 13	B E B 13	E B 17	B E 14	B E 15	B E 15	B E 14	B E 16	J A J 26	A 32	35	38	J A J 42	A J 39	A J 32	A 24	24	E 15	B J 23	A J 21	A J 19	A E 14	B E 14	B E B 14
7	27	J A J 23	A 17	19	J A 18	23	E B E 14	B 17	G	G 28	G 30	G 31	G 31	G 24	G 26	32	J 27	A J 32	A J 20	A J 25	A J 29	A J 22	A E 13	B E B 14
8	E B E 14	B E B 16	E B 15	B E 15	B E 15	B E 13	B E 14	20	27	33	C	C	C	C	C	C	C	J A J 38	A J 27	A J 22	A E 15	B J A 24	24	E B 15
9	E B E 16	B E B 14	E B 13	E B 14	B E 14	B E 14	B 19	G	G	G	37	38	G	36	G	34	30	E 16	B E 13	B J 21	A 21	E 14	B E 15	B 21
10	J A 19	E B 14	E B 14	E B 14	B E 13	B E 13	B E 15	G	G	32	34	G 25	G 24	G	G	G 27	G	J A 22	E B 14	E B 15	18	E 13	B E 14	B E B 15
11	E B E 13	B E 14	B E 16	B E 13	B E 14	B E 14	B E 15	G	G	G 21	35	G 30	G 23	G 24	G	G 23	G 20	J A 22	18	E 14	B E 15	B E 14	B J A 30	22
12	E B 13	18	E B E 14	B E 14	B E 14	B E 13	B E 14	G	30	35	G 30	G	G 31	G	G	G 28	G 20	J A 19	J A 24	A J 21	A J 24	A E 14	B E 15	B J A 17
13	E B E 13	B 14	20	E B 16	B E 14	B E 13	B E 14	G	29	33	J A 78	42	43	G 27	G	G	G	E B 16	18	E 14	B E 14	B E 14	B E 14	B E B 15
14	18	E B E 14	B 13	J A J 21	A 24	A E 14	B E 13	G	G	G E 31	B E 40	B E 41	E B E 50	B E 45	B E 42	B E 29	B	G E 16	B E 15	B E 14	B E 15	B 19	E B E 14	B 14
15	E B E 16	B E 15	B E 14	B E 16	B E 14	B E 15	B E 16	G	33	J A 39	C	C	C	C	C	C	C	C	E 17	B E 16	B E 14	B E 16	B E 15	B E B 15
16	E B E 13	B E 15	B E 16	B E 16	B E 15	B E 14	B E 13	G	31	32	G	G 31	E B E 44	B E 41	B E 44	B E 36	B E 25	B E 15	B J 24	A J 28	A 25	E B 14	B E 14	B E B 13
17	E B E 14	B E 13	B E 19	B E 14	B E 15	B E 14	B E 13	G	E B E 27	B E 40	B E 40	B E 44	B E 44	B E 45	B E 39	B E 40	B 32	J A 33	J A 21	E 15	B E 13	B E 14	B E 14	B E B 14
18	E B E 15	B E 14	B E 14	B 19	E B 14	E 14	B E 13	B 19	G	G	E B 40	B E 41	B E 48	B E 39	B E 37	B	G	G E 16	B E 13	B E 14	B E 15	B E 13	B E 13	B E B 14
19	E B E 16	B E 14	B E 14	B E 14	B E 14	B E 14	B E 14	G	G	34	G 34	G 32	G 29	G 29	G 27	G 28	G J 30	A E 15	B E 15	B J 18	A E 15	B E 15	B E 14	B E B 14
20	E B E 13	B E 14	B E 14	B E 14	B E 14	B E 13	B E 13	G	29	34	40	40	39	G J 42	A J 37	A	36	J A 25	E B 16	E B 13	22	22	E B 15	B E B 15
21	E B 15	20	E B 14	E B 15	B E 14	B E 14	B E 14	G	G	32	36	36	G	G 33	G	G 22	G	E B 17	E B 16	B E 14	B E 14	B E 14	B E 16	B E B 15
22	E B E 15	B E 13	B E 15	B E 14	B E 14	B E 14	B E 14	G	J G 24	G 29	40	G 33	37	G 29	35	G 28	G 22	E B 15	E B 15	B E 14	B E 15	B E 14	B E 14	B E B 14
23	17	E B E 15	B E 14	B E 15	B E 14	B E 14	B E 14	B E 17	J A J 29	A J 35	A J 45	A J 56	A J 51	A J 39	A 36	G 26	G	E B 18	E B 15	B E 16	B E 14	B E 14	B E 15	B E B 28
24	J A 24	J A E 21	E B 15	E B 15	B E 13	B E 16	B E 14	G	27	G	J A 44	36	38	J 66	A J 47	A 27	G 20	G J A 20	20	J A 22	A J 26	A J 23	A J 19	A J A 20	A 22
25	16	E B E 15	B E 14	B J A 32	A J 25	A J 24	A 20	G	J A J 29	A 54	J 35	G 34	J A J 80	A J 74	A J 46	A J 37	A J 32	A J 24	A E 14	B E 15	B 18	E B 15	19	E B 14
26	E B E 15	B E B 14	15	E B 16	B E 14	B E 15	20	22	J A 26	32	G 32	37	G 32	33	G	38	J A 30	J A J 21	A J 28	A 25	J A 36	A J 26	A J 61	A J A 31
27	J A 24	E B E 15	B E 15	B J A 29	19	19	E B 14	G	J A J 29	A 38	G 30	G 30	G	G J 33	A 41	G 23	G J A 24	25	21	24	20	J A 38	20	E B 14
28	E B E 14	B E 14	B E 14	B E 14	B E 13	B E 13	19	G	G 24	37	36	G 30	G 26	G 30	G 25	G J 25	G J 26	A J 29	A J 22	A 19	20	19	18	E B 17
29	E B E 14	B E 13	B J 18	A E 14	B E 14	B E 15	B E 15	B E 18	G	J A 32	J A 41	A J 40	G 32	G	G	G	G 19	E B 16	B E 15	B E 16	B 19	18	E B 14	18
30	J A 23	J A 29	24	J A 18	29	J A 30	J A 22	G	32	34	36	J A 38	J A 42	36	33	J A 38	32	J A E 27	B E 14	B 14	E B 18	B E 16	B E 14	B E B 14
31	E B E 14	B E B 13	E B 15	B E 14	B E 13	B E 14	B E 14	G	G J 38	A J 43	A J 47	A	J A J 60	A J 42	A 29	G J 32	A J 28	A J 24	A J 24	A E 13	B J 28	A J 50	A J 29	A J A 30
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	30	31	31	31	31	31	31
MED	E B E 14	B E 14	B E 15	B E 15	B E 14	B E 14	B E 14	B 14	G 26	32	36	36	G	G	G	G	G	J A 20	E B 18	E B 16	E B 18	E B 15	B E 15	B E B 15
U Q	16	15	16	18	15	15	16	G	29	J A 35	A 40	40	44	J A 39	38	33	29	J A 24	A J 22	A J 21	A J 21	A J 19	A J 18	A 19
L Q	E B 14	B E 14	B E 14	B E 14	B E 14	B E 14	B E 14	B E 19	G	G	G 34	G 32	G 31	G 30	G	G 26	G	E B 16	B E 15	B E 14	B E 15	B E 14	B E 14	B E B 14

JAN. 2000 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	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 B 14 14	E B 14 14	E B 14 15	E B 14 15	E B 14 14	E B 14 14	E B 14 14	E B 14 17	G 21	G 26	36	41	G 30	G 28	G 26	G 21	G	E B 16	E B 14	E B 14	E B 13	E B 15	E B 16	E B 16
2	E B 14 15	E B 13 13	E B 14 15	E B 19	E B 14	27	G 22	34	33	G 30	34	G 27	G	G	G	G	G	E B 14	17	E B 14	E B 15	E B 14	E B 15	E B 15
3	E B 14 14	E B 14 14	E B 14 14	E B 14 15	E B 15	E B 16	G	G	34	35	35	G 30	G 25	G 21	20	E B 16	E B 15	E B 16	E B 14	E B 15	E B 15	E B 14		
4	E B 14 15	E B 14 14	E B 14 14	E B 14 14	E B 14 14	E B 14	G	G 19	G 26	G 28	34	G 30	G	G 19	G	G	G	E B 16	E B 14	E B 15	E B 16	E B 15	E B 16	E B 16
5	E B 14 14	E B 14 15	E B 14 14	E B 14 14	E B 14 14	E B 13	E B 17	25	G	G 34	G 29	G 25	G 22	G	G 28	G 17	E B 16	E B 14	18	18	E B 19	13	16	
6	E B 13 13	E B 17	E B 14	E B 15	E B 15	E B 14	E B 16	24	30	34	35	36	34	G 24	G 23	23	E B 15	E B 14	18	18	E B 14	E B 14	E B 14	
7	E B 13 18	17	E B 14	E B 14	E B 14	E B 14	E B 17	G	G 26	G 27	G 30	GU G 28	G 24	G 23	G 30	G 19	19	18	E B 14	20	21	E B 13	E B 14	
8	E B 14 16	E B 15	E B 15	E B 15	E B 15	E B 13	E B 14	20	27	32	C	C	C	C	C	C	C	25	20	19	E B 15	E B 15	E B 14	E B 15
9	E B 16 14	E B 13	E B 14	E B 14	E B 14	E B 14	18	G	G	G	36	37	G	35	G	32	28	E B 16	E B 13	18	E B 14	E B 14	E B 15	E B 15
10	18	E B 14	E B 14	E B 14	E B 13	E B 13	E B 15	G	G	31	34	G 24	G 23	G	G	G 26	G	17	E B 14	E B 15	E B 15	E B 13	E B 14	E B 15
11	E B 13	E B 14	E B 16	E B 13	E B 14	E B 14	E B 15	G	G	G 20	34	G 28	G 22	G 22	G	G 22	G 19	18	E B 14	E B 14	E B 15	E B 14	18	12
12	E B 13 14	E B 14 14	E B 14 14	E B 14 14	E B 14 13	E B 14	E B 14	G	28	31	G 25	G	G 30	G	G	G 27	G 19	19	21	17	18	E B 14	E B 15	E B 14
13	E B 13 14	E B 14 14	E B 14 16	E B 14 13	E B 14 14	E B 14	E B 14	G	28	32	49	41	42	G 26	G	G	G	E B 16	17	E B 14	E B 14	E B 14	E B 14	E B 15
14	17	E B 14	E B 13	17	21	E B 14	E B 13	G	GU	G 31	E B 40	E B 41	E B 50	E B 45	E B 42	E B 29	G	E B 16	E B 15	E B 14	E B 15	E B 14	E B 14	E B 14
15	E B 16	E B 15	E B 14	E B 16	E B 14	E B 15	E B 16	G	27	33	C	C	C	C	C	C	C	C	E B 17	E B 16	E B 14	E B 16	E B 15	E B 15
16	E B 13	E B 15	E B 16	E B 16	E B 15	E B 14	E B 13	G	28	32	G	G 30	E B 44	E B 41	E B 44	E B 36	E B 25	E B 15	21	23	22	E B 14	E B 14	E B 13
17	E B 14	E B 13	E B 19	E B 14	E B 15	E B 14	E B 13	G	E B 27	E B 40	E B 40	E B 44	E B 44	E B 45	E B 39	E B 40	32	21	18	E B 15	E B 13	E B 14	E B 14	E B 14
18	E B 15	E B 14	E B 14	E B 13	E B 14	E B 14	E B 13	E B 19	G	G	E B 40	E B 41	E B 48	E B 39	E B 37	G	G	E B 16	E B 13	E B 14	E B 15	E B 13	E B 13	E B 14
19	E B 16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G 33	G 29	G 30	G 26	G 29	G 26	G 25	G 20	E B 15	E B 15	16	E B 15	E B 15	E B 14	E B 14
20	E B 13	E B 14	E B 14	E B 14	E B 14	E B 13	E B 13	G	28	33	39	39	38	G	41	37	34	17	E B 16	E B 13	E B 14	E B 14	E B 15	E B 15
21	E B 15	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	G	G	G 32	36	36	G	G 31	G	G 21	G	E B 17	E B 16	E B 14	E B 14	E B 14	E B 16	E B 15
22	E B 15	E B 13	E B 15	E B 14	E B 14	E B 14	E B 14	G	G 22	G 28	36	G 31	36	G 27	G 29	G 26	G 20	E B 15	E B 15	E B 14	E B 15	E B 14	E B 14	E B 14
23	E B 15	E B 15	E B 14	E B 15	E B 14	E B 14	E B 14	E B 17	25	30	34	43	37	35	31	G 25	G	E B 18	E B 15	E B 16	E B 14	E B 14	E B 15	19
24	E B 15	16	E B 15	E B 15	E B 13	E B 16	E B 14	G	26	G	38	34	36	G 28	G 28	G 25	G 18	16	E B 15	18	18	18	17	E B 15
25	15	E B 15	E B 14	26	E B 14	21	E B 15	G	24	34	33	G 30	50	72	38	30	28	19	E B 14	E B 15	E B 14	E B 15	E B 14	E B 14
26	E B 15	E B 14	15	E B 16	E B 14	E B 15	E B 14	G	24	30	G 30	G 35	G 30	G 33	G	32	25	19	20	E B 14	E B 21	E B A 14	A 61	19
27	17	E B 15	E B 15	24	E B 13	E B 13	E B 14	G	23	33	G 26	G 26	G	G 24	G 32	G 20	G 18	19	16	E B 15	E B 14	22	16	E B 14
28	E B 14 14	E B 14 14	E B 14 14	E B 14 14	E B 13 13	E B 13	E B 13	G	G 21	30	33	G 27	G 22	G 25	G 21	G 20	24	20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 17
29	E B 14	E B 13	17	E B 14	E B 14	E B 15	E B 15	E B 18	G	28	34	35	G 27	G	G	G	G 19	E B 16	E B 15	E B 16	E B 15	E B 14	E B 14	E B 14
30	E B 14	20	17	E B 13	17	22	18	G	G 21	32	35	37	38	35	32	32	G 20	19	E B 14	E B 14	E B 14	E B 16	E B 14	E B 14
31	E B 14	E B 13	E B 15	E B 14	E B 13	E B 14	E B 14	G	G	35	38	39	49	36	G 29	29	25	20	20	E B 13	21	17	18	20
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	30	31	31	31	31	31	31
MED	E B 14 14	E B 14 14	E B 14 14	E B 14 14	E B 14 14	E B 14 14	E B 14 14	G	G	G	34	34	G	G	G	G	G	E B 16	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15
U Q	15	E B 15	15	E B 15	E B 14	E B 15	E B 15	G	27	32	37	39	40	35	32	30	24	19	17	16	18	15	16	15
L Q	E B 14 14	E B 14 14	E B 14 14	E B 14 14	E B 14 14	E B 14 14	E B 14 18		G	G 30	G	G 30	G 29	G 28	G 26	G 24	G 20	E B 16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14

JAN. 2000 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	15	14	14	14	17	14	16	15	16	17	18	15	16	15	16	14	14	13	15	16	16
2	14	15	13	13	14	15	14	14	14	16	16	18	20	18	16	15	15	14	14	14	15	14	15	15
3	14	14	14	14	14	15	15	16	14	17	19	18	18	18	16	16	14	16	15	16	14	15	15	14
4	14	15	14	14	14	14	14	13	15	15	19	19	17	20	16	15	14	16	14	15	16	15	16	16
5	14	14	15	14	14	14	13	17	15	15	16	21	20	18	15	16	14	16	14	14	14	15	13	13
6	13	13	17	14	15	15	14	16	15	16	18	18	19	18	16	16	14	15	14	14	15	14	14	14
7	13	14	14	14	14	14	14	17	16	18	18	20	21	19	15	16	14	15	15	14	15	14	13	14
8	14	16	15	15	15	13	14	14	16	15	C	C	C	C	C	C	C	15	14	14	15	15	14	15
9	16	14	13	14	14	14	13	14	15	16	15	16	20	18	20	18	16	16	13	15	14	14	15	15
10	14	14	14	14	13	13	15	14	16	14	15	17	17	18	16	16	15	13	14	15	15	13	14	15
11	13	14	16	13	14	14	15	14	14	14	14	22	17	17	25	17	15	15	14	14	15	14	14	12
12	13	14	14	14	14	13	14	14	18	16	18	23	21	21	21	20	15	16	14	14	14	14	15	14
13	13	14	14	16	14	13	14	14	17	21	26	25	35	24	28	21	18	16	13	14	14	14	14	15
14	13	14	13	14	13	14	13	13	18	23	40	41	50	45	42	29	20	16	15	14	15	14	14	14
15	16	15	14	16	14	15	16	14	14	16	C	C	C	C	C	C	C	C	17	16	14	16	15	15
16	13	15	16	16	15	14	13	14	18	20	23	23	44	41	44	36	25	15	14	16	15	14	14	13
17	14	13	19	14	15	14	13	14	27	40	40	44	44	45	39	40	20	16	15	15	13	14	14	14
18	15	14	14	13	14	14	13	19	17	24	40	41	48	39	37	23	20	16	13	14	15	13	13	14
19	16	14	14	14	14	14	14	14	16	16	20	23	20	21	21	16	16	15	15	13	15	15	14	14
20	13	14	14	14	14	13	13	15	16	17	18	18	22	22	22	20	19	15	16	13	14	14	15	15
21	15	14	14	15	14	14	14	15	18	17	16	25	20	21	20	17	18	17	16	14	14	14	16	15
22	15	13	15	14	14	14	14	14	14	15	19	20	18	18	18	16	15	15	15	14	15	14	14	14
23	15	15	14	15	14	14	14	17	14	14	15	16	16	16	17	17	15	18	15	16	14	14	15	15
24	15	14	15	15	13	16	14	14	14	16	16	17	18	18	18	15	16	13	15	14	14	15	14	15
25	13	15	14	15	14	14	15	15	16	15	15	20	20	20	19	16	17	16	14	15	14	15	14	14
26	15	14	13	16	14	15	14	15	16	16	15	18	20	18	17	14	15	17	15	14	15	14	14	15
27	15	15	15	14	13	13	14	14	15	15	14	17	17	15	14	16	15	16	13	15	14	15	14	14
28	14	14	14	14	13	13	13	14	15	15	16	14	19	16	16	15	14	16	14	14	14	14	14	17
29	14	13	15	14	14	15	15	18	15	18	18	16	15	18	19	16	15	16	15	16	15	14	14	14
30	14	14	14	13	14	14	15	14	15	15	15	16	17	17	18	14	16	16	14	14	14	16	14	14
31	14	13	15	14	13	14	14	14	15	15	14	19	18	18	17	15	16	15	14	13	15	14	13	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	30	31	31	31	31	31	31
MED	14	14	14	14	14	14	14	14	15	16	16	19	20	18	18	16	15	16	14	14	14	14	14	14
U Q	15	15	15	15	14	14	14	16	16	17	19	23	21	21	22	19	18	16	15	15	15	15	15	15
L Q	13	14	14	14	14	14	13	14	14	15	15	17	17	18	16	16	15	15	14	14	14	14	14	14

JAN. 2000 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	317	291	339	264	263	258	275	344	341	317	312	324	327	330	312	321	337	341	356	293	334	316	327	279
2	273	292	292	327	278	284	287	320	362	356	327	319	327	337	324	331	330	334	338	R 319	335	359	303	280
3	289	303	297	299	289	298	319	365	363	350	352	325	329	339	326	343	351	334	310	327	323	344	289	293
4	R 307	286	293	297	323	301	314	339	355	349	335	356	329	342	337	V 325	333	347	309	329	335	310	299	276
5	287	290	307	296	286	273	278	336	370	358	331	343	346	348	306	328	346	318	307	347	330	294	283	290
6	R 311	292	289	267	275	262	308	371	328	330	343	320	335	328	331	324	345	323	326	R 322	357	293	295	313
7	288	277	284	284	265	272	298	315	339	335	333	329	329	320	318	333	334	327	344	338	318	314	291	U R 310
8	304	V 295	F 258	291	345	F 289	343	348	361	351	C	C	C	C	C	C	C	348	332	343	348	322	265	290
9	271	298	289	295	307	297	311	352	359	344	327	329	325	325	300	314	329	327	342	330	R 307	304	R 292	306
10	306	291	285	290	292	298	337	354	361	329	314	325	342	323	305	317	322	342	347	342	319	282	298	292
11	290	300	298	295	312	277	328	343	347	331	329	337	315	294	298	316	328	325	313	314	R 325	310	F 288	F 295
12	F 277	260	F 272	298	360	247	306	329	315	325	302	310	312	297	293	304	310	328	304	307	314	281	279	288
13	298	286	288	286	280	264	320	338	356	337	318	326	319	300	294	295	332	313	324	319	311	289	R 292	326
14	308	291	F 281	R 293	302	307	318	327	354	347	323	319	R 326	304	297	303	311	291	310	308	316	316	279	290
15	296	276	298	U R 298	278	282	301	357	339	341	C	C	C	C	C	C	C	C	317	306	319	303	287	290
16	292	R 281	278	294	291	279	306	338	353	328	322	325	325	290	288	296	310	322	315	300	321	312	295	282
17	289	268	262	278	300	303	323	327	355	340	329	330	299	292	288	312	316	313	300	311	311	300	292	296
18	303	303	286	289	302	294	307	331	353	339	323	319	329	313	286	304	319	323	312	309	309	J R 300	269	288
19	282	293	293	286	288	295	309	343	339	318	326	318	307	302	299	308	313	321	315	311	323	R 334	275	R 291
20	293	R 295	307	285	287	287	299	341	349	320	318	314	326	287	319	320	300	317	340	317	309	286	269	282
21	274	274	307	326	312	290	286	321	334	347	310	327	334	312	290	314	320	316	324	324	316	304	290	288
22	283	289	322	319	354	275	305	342	364	344	334	330	315	302	304	334	331	323	323	318	314	297	273	294
23	286	269	272	269	264	276	319	280	315	312	344	323	311	298	297	317	321	323	303	328	331	277	300	321
24	296	302	309	317	F 325	287	293	328	335	326	316	346	319	311	317	320	334	328	329	317	343	R 307	275	279
25	295	293	280	283	287	306	342	331	335	333	313	312	316	320	315	317	327	337	332	328	300	314	299	305
26	317	292	308	316	281	278	316	360	366	331	337	325	321	311	301	322	329	325	314	343	308	303	A	297
27	295	296	R 313	316	322	327	355	357	351	320	346	352	320	293	306	317	323	326	322	318	325	312	287	314
28	320	311	322	314	262	250	273	313	340	334	327	310	321	317	318	321	325	319	317	341	321	320	264	276
29	270	299	347	272	272	273	309	343	336	308	327	325	339	318	310	307	328	330	331	329	329	296	264	267
30	284	303	333	265	255	257	319	315	343	323	313	326	326	323	317	313	319	342	331	326	350	316	285	289
31	280	270	272	314	353	289	307	340	340	328	329	316	328	308	332	311	329	332	313	314	328	308	292	R 292
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	30	31	31	31	31	30	31
MED	292	292	293	294	289	284	309	339	349	333	327	325	326	312	306	317	328	326	322	319	321	307	288	290
U Q	304	298	308	314	312	297	319	348	359	344	334	330	329	324	318	323	332	334	332	329	331	316	295	297
L Q	283	281	281	284	278	273	299	327	339	325	317	319	318	299	297	310	319	321	312	311	314	296	275	282

JAN. 2000 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L	L									
2											L	L	L	L	L									
3										L	L	L	L	L	L	L	L 393							
4											L	L	L	L	L									
5										L	L	L	L	L	L									
6										L	L	L	L	L	L	L 394								
7										L	L	L	L	L		L								
8											C	C	C	C	C	C	C							
9									L 406	L	L		L	L	L									
10										397	L	L	L			L	L 378							
11											L	L	L											
12												L	L	L	L									
13											L	L	L	L	L 351									
14										L	L					L								
15											C	C	C	C	C	C	C	C						
16											L	L	L	U L 357	L									
17											L			L	L									
18															L	L								
19										L	L	L		L	L									
20											L	L	L		L									
21												L	L	L	L									
22											L	L		L	U L 358	L								
23											L		L	L	L									
24												L												
25											L	L	A	A		L								
26										L	L	L	L	L	L	L								
27									U L 395		L	L	L	L	L	L								
28											L	L	L	L		L								
29										U L 398	L	L	L	L	L	L								
30											L	L	L	L	L									
31												L	L	L	U L 358									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	2				1	3	1	2							
MED									L 400	398				U L 357	U L 358	L 394	L 386							
U Q															U L 358									
L Q															L 351									

JAN. 2000 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										256	256	252	238	212	242									
2											254	258	244	236	244									
3										232	224	264	250	250	222	236	224							
4											250	238	244	246	234									
5										228	258	248	234	230	232									
6										240	244	236	246	246	240	238								
7										250	260	246	250	242		232								
8											C	C	C	C	C	C	C							
9									218	226	264		240	236	234									
10										220	244	256	244			256	234							
11											264	248	L 288											
12												272	248	298	260									
13											290	256	268	242	310									
14										250	256					L 284								
15											C	C	C	C	C	C	C	C						
16											264	252	258	L 320	310									
17											262			318	L 274									
18															242	298								
19										274	266	248		L 304	302									
20											276	274	248		280									
21												252	260	242	L 326									
22											248	256		244	306	258								
23											246		278	246	268									
24												232												
25											280	280	244	266		258								
26										250	246	252	256	254	292	248								
27									224		254	240	254	L 254	266	260								
28											254	244	238	256		266								
29										244	262	254	248	248	246	L 296								
30											250	252	248	252	234									
31												288	256	268	250									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	11	24	24	23	23	22	12	2							
MED									221	244	256	252	248	248	255	258	229							
U Q										250	264	257	256	266	292	275								
L Q										228	249	247	244	242	240	243								

JAN. 2000 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	256	280	244	378	338	356	330	232	220	234	226	240	210	214	214	238	222	200	200	276	240	240	238	342
2	316	320	300	246	222	288	A 328	252	220	232	228	224	224	226	218	236	222	222	214	236	230	212	B 296	334
3	290	264	300	292	294	282	242	220	218	222	234	H 210	228	236	226	220	A 236	208	222	240	230	222	268	298
4	290	290	300	274	248	256	268	238	220	218	234	212	232	218	208	228	224	206	240	244	226	246	272	292
5	308	292	260	276	282	330	302	244	220	226	224	218	228	218	212	238	222	210	236	232	232	314	308	294
6	278	286	B 318	334	326	348	274	218	218	222	240	218	232	216	222	220	218	214	224	232	228	268	308	258
7	286	336	330	328	296	338	302	264	236	232	234	222	228	232	236	238	222	228	214	240	268	268	278	282
8	288	B 296	340	318	256	258	242	222	222	216	C	C	C	C	C	C	C	228	226	230	210	234	370	342
9	324	296	304	288	260	298	272	232	204	210	218	242	222	226	210	236	232	230	206	236	218	264	264	264
10	256	296	296	300	262	296	248	230	220	210	190	228	228	232	230	240	246	220	226	238	220	274	298	292
11	280	272	270	260	246	326	230	226	222	236	236	242	H 218	232	246	250	236	226	228	238	208	252	296	292
12	302	322	350	282	196	398	264	230	246	250	248	242	232	230	226	244	242	222	242	238	238	260	302	260
13	256	254	284	278	256	320	230	228	220	220	A	A 242	A 244	220	222	238	238	238	244	234	240	252	258	266
14	286	292	320	298	276	252	250	232	226	222	242	254	B 242	B 242	B 236	236	240	210	232	242	236	228	282	300
15	274	304	264	274	274	298	258	224	228	230	C	C	C	C	C	C	C	C	238	244	226	234	256	282
16	278	280	310	282	268	290	240	236	230	230	234	230	B 248	216	E 266	B 254	244	220	228	272	240	230	258	286
17	292	304	B 356	326	274	244	246	228	218	222	234	252	226	240	226	254	234	230	236	252	224	218	254	270
18	258	278	286	300	262	284	252	236	224	228	242	230	244	232	224	250	238	216	234	226	246	238	298	302
19	300	290	280	290	288	260	246	226	218	232	240	236	234	224	220	242	246	222	228	224	226	220	302	300
20	304	330	300	312	276	240	268	230	230	230	238	242	242	226	242	248	236	244	226	224	230	248	310	290
21	318	302	252	244	222	294	308	248	228	234	242	242	234	224	242	250	230	230	222	228	226	266	304	288
22	286	300	246	242	226	304	276	226	224	226	234	228	228	222	220	248	246	224	228	208	226	274	308	278
23	302	320	336	308	332	324	256	270	248	242	238	A 252	A 236	226	234	240	222	236	242	226	224	292	274	246
24	280	278	264	250	226	278	268	236	232	232	236	224	228	222	242	234	236	238	230	232	230	276	294	320
25	288	278	328	A 380	280	264	226	226	224	236	226	228	A	A	242	232	242	220	220	230	252	250	278	256
26	242	288	264	236	274	320	270	230	224	H 200	H 210	228	214	222	226	236	224	222	232	228	246	256	A	304
27	278	278	264	A 290	236	262	220	220	206	238	238	230	216	218	218	234	230	222	228	240	236	288	294	260
28	268	266	246	254	342	378	304	252	224	240	234	230	218	212	230	242	252	226	228	216	250	236	308	328
29	322	290	234	294	330	306	276	234	222	220	234	234	220	232	212	H 194	244	220	208	230	248	276	350	336
30	308	A 330	242	306	388	E A 412	270	240	236	230	222	232	230	212	208	236	244	214	216	230	220	234	296	292
31	306	316	312	262	212	320	270	238	226	228	242	228	A 240	234	208	224	242	222	228	240	236	252	314	324
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	28	29	28	28	29	29	29	30	31	31	31	31	30	31
MED	288	292	296	290	274	297	268	232	224	230	234	230	228	225	225	238	236	222	228	234	230	252	296	292
U Q	304	304	318	308	294	326	276	238	228	234	239	242	235	232	236	246	243	228	234	240	240	268	308	304
L Q	278	278	264	262	246	264	246	226	220	222	227	226	223	218	216	234	224	216	222	228	226	234	272	270

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B	136	134	122	120	A 138	128	130	124	130	B						
2								B	128	126	A	A	128	A	132	118	118	B						
3								B	132	124	A	A	A	134	A 128	A 128	A	B						
4								154	132	A 140	140	A	136	124	120	122	122	B						
5								B	126	120	118	134	126	122	120	A	130	B						
6								B	A	A	A	A	A	A	A 126	130	124	B						
7								B	124	A 138	130	132	A	126	124	126	130	B						
8								A	136	122	C	C	C	C	C	C	C	B						
9								178	126	118	A 138	122	126	120	122	134	128	B						
10								150	126	130	126	126	124	118	118	134	130	B						
11								138	130	124	A	128	120	114	126	124	132	B						
12								154	A	A	130	120	134	122	124	128	A 140	B						
13								116	132	A	A	A	A	124	124	124	134	B						
14								B 180	132	A	B	B	B	B	B	B	136	B						
15								152	A	A	C	C	C	C	C	C	C	C						
16								160	130	A	132	130	B	B	B	B	B	B						
17								B 176	B	B	B	B	B	B	B	B	A	B						
18								B	128	132	B	B	B	B	B	130	140	B						
19								164	128	122	142	130	126	128	126	128	130	B						
20								B	128	126	126	128	136	124	124	A	A	B						
21								150	126	128	120	A	126	134	126	126	126	B						
22								144	130	A 136	A	134	A	134	132	126	136	B						
23								B	A	A	A	A	A	A	A	132	126	B						
24								174	128	120	A	A	128	A 136	A 136	A 126	126	B						
25								152	A	A	A	136	A	A	A	A	A	B						
26								170	A	A	126	A	128	A	122	A	A	B						
27								178	A	A	124	122	118	126	A	118	A 124	B						
28								158	130	A	A	124	122	120	122	122	A	B						
29								B	124	A	A	A	130	120	122	120	130	B						
30								144	A 142	134	118	122	A	A	A	A	130	B						
31								154	124	132	120	120	A	A	132	A	A	B						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								20	23	18	15	16	16	18	21	20	21							
MED								154	128	127	126	127	127	124	124	126	130							
U Q								172	132	A 134	132	131	132	128	129	129	133							
L Q								150	126	122	120	122	125	120	122	123	126							

JAN. 2000 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	124	110	108	B	B	B	B	120	118	124	120	114	110	108	114	G	B	B	B	B	B	B	B
2	B	B	B	112	108	108	102	104	140	116	114	118	114	114	114	G	G	100	96	B	B	B	B	B
3	B	B	B	B	B	B	106	B	G	G	124	118	120	116	102	98	122	102	B	B	B	B	B	B
4	B	B	B	B	B	B	B	G	104	122	122	122	118	G	110	G	G	102	102	B	B	B	B	110
5	B	B	B	106	B	B	B	B	166	G	130	112	114	114	G	114	110	102	104	100	104	106	150	98
6	B	B	B	B	B	B	B	B	124	120	116	114	110	106	104	112	178	B	120	104	102	B	B	B
7	116	108	116	114	112	106	B	B	G	120	114	118	114	112	108	138	106	106	116	114	104	104	B	B
8	B	B	B	B	B	B	B	160	192	178	C	C	C	C	C	C	C	96	100	100	B	114	108	B
9	B	B	B	B	B	B	102	G	G	G	164	164	G	142	G	156	136	B	B	106	108	B	B	122
10	102	B	B	B	B	B	B	G	G	158	142	108	108	G	G	118	G	104	B	B	106	B	B	B
11	B	B	B	B	B	B	B	G	G	108	118	116	104	102	G	108	116	116	104	B	B	B	106	142
12	B	108	B	B	B	B	B	G	156	114	112	G	118	G	G	116	114	112	116	112	110	B	B	112
13	B	B	102	B	B	B	B	G	142	130	120	116	122	112	G	G	G	B	110	B	B	B	B	B
14	110	B	B	100	98	B	B	G	G	108	B	B	B	B	B	B	G	B	B	B	B	108	B	B
15	B	B	B	B	B	B	B	G	120	118	C	C	C	C	C	C	C	C	B	B	B	B	B	B
16	B	B	B	B	B	B	B	G	168	126	G	116	B	B	B	B	B	B	98	96	98	B	B	B
17	B	B	B	B	B	B	B	G	B	B	B	B	B	B	B	B	108	102	106	B	B	B	B	B
18	B	B	B	98	B	B	B	B	G	G	B	B	B	B	B	G	G	B	B	B	B	B	B	B
19	B	B	B	B	B	B	B	G	G	182	120	120	114	114	114	108	106	B	B	112	B	B	B	B
20	B	B	B	B	B	B	B	G	170	158	152	150	150	G	126	116	112	106	B	B	110	104	B	B
21	B	106	B	B	B	B	B	G	G	144	132	124	G	118	G	114	G	B	B	B	B	B	B	B
22	B	B	B	B	B	B	B	G	116	110	124	114	130	116	110	112	114	B	B	B	B	B	B	B
23	150	B	B	B	B	B	B	B	118	118	116	114	116	116	116	116	G	B	B	B	B	B	B	112
24	104	110	B	B	B	B	B	G	200	G	120	116	188	112	110	112	116	110	112	102	104	102	104	108
25	122	B	B	106	106	102	106	G	118	112	116	112	106	104	104	104	102	108	B	B	108	B	100	B
26	B	B	126	B	B	B	108	104	122	104	116	112	112	118	G	102	124	116	104	114	110	110	108	104
27	104	B	B	98	100	114	B	G	118	116	112	110	G	102	98	98	98	98	102	96	98	110	130	B
28	B	B	B	B	B	B	104	G	112	110	114	110	106	104	104	100	100	96	102	104	98	100	102	B
29	B	B	106	B	B	B	B	B	G	122	116	110	110	G	G	G	114	B	B	B	102	100	B	102
30	126	106	104	108	104	102	102	G	120	136	132	122	116	116	116	106	108	100	B	B	102	B	B	B
31	B	B	B	B	B	B	B	G	G	132	124	120	112	116	112	106	116	100	100	B	114	114	110	106
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	6	6	9	6	5	7	3	19	25	25	25	22	20	16	21	19	18	16	12	16	11	9	10
MED	113	108	108	106	105	106	104	104	122	120	120	116	114	114	110	112	114	102	104	104	104	106	108	109
U Q	124	110	116	110	108	111	106	160	166	134	127	120	118	116	114	116	116	108	111	112	109	110	120	112
L Q	104	106	104	99	100	102	102	104	118	113	116	112	110	108	104	105	106	100	101	100	102	102	103	104

IONOSPHERIC DATA STATION Kokubunji

JAN. 2000 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

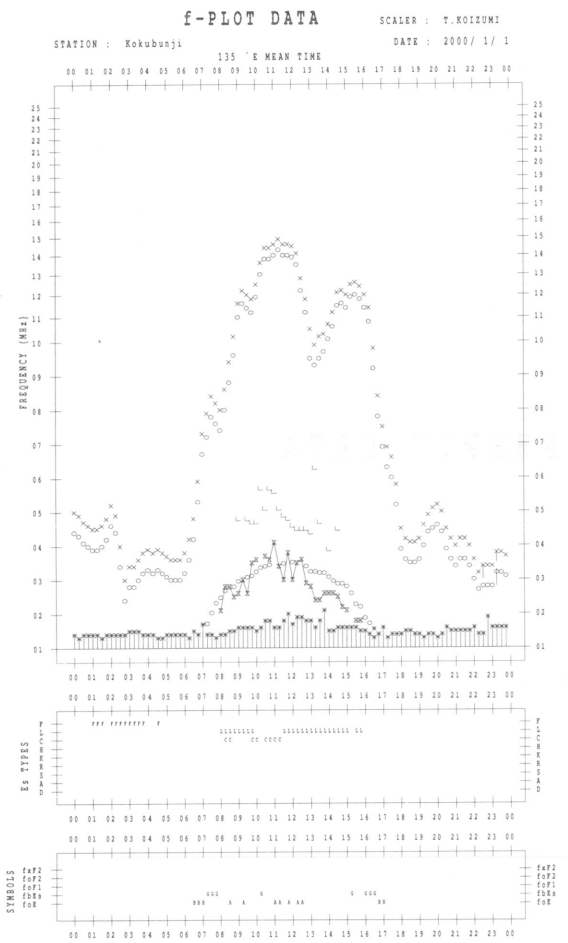
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

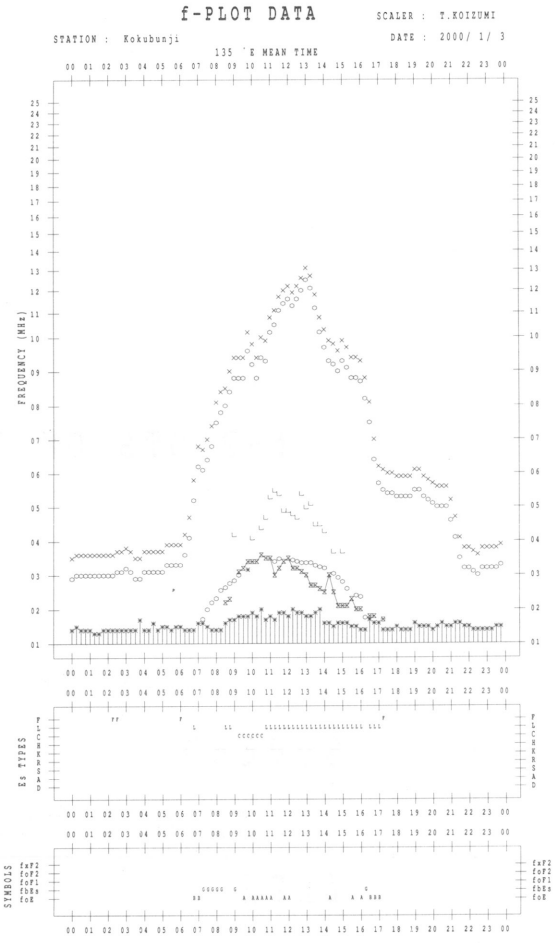
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		F F 1 1	F 1	F 1					L 1	L 1	C 1	C 1	L 2	L 1	L 2	L 1								
2				F 1	F 1	F 1	F 3	L 1	H L 1 1	L 1	L 1	C 1	L 1	L 1	L 1			L 1	F 1					
3							F 1				C 1	L 1	L 1	L 1	L 2	L 2	L 1	L 1						
4									L 1	L 1	L 1	L 1	L 1		L 1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

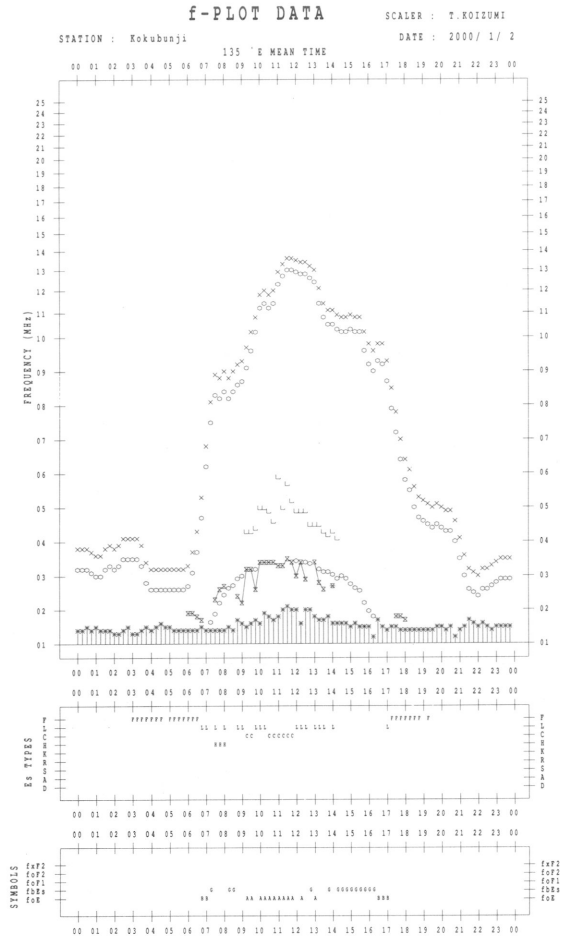
JAN. 2000 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

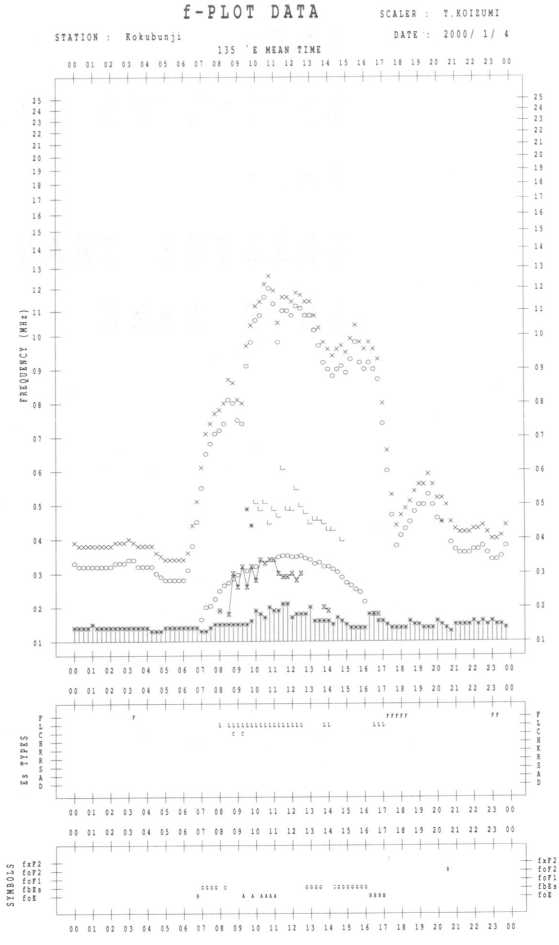
f-PLOTS OF IONOSPHERIC DATA

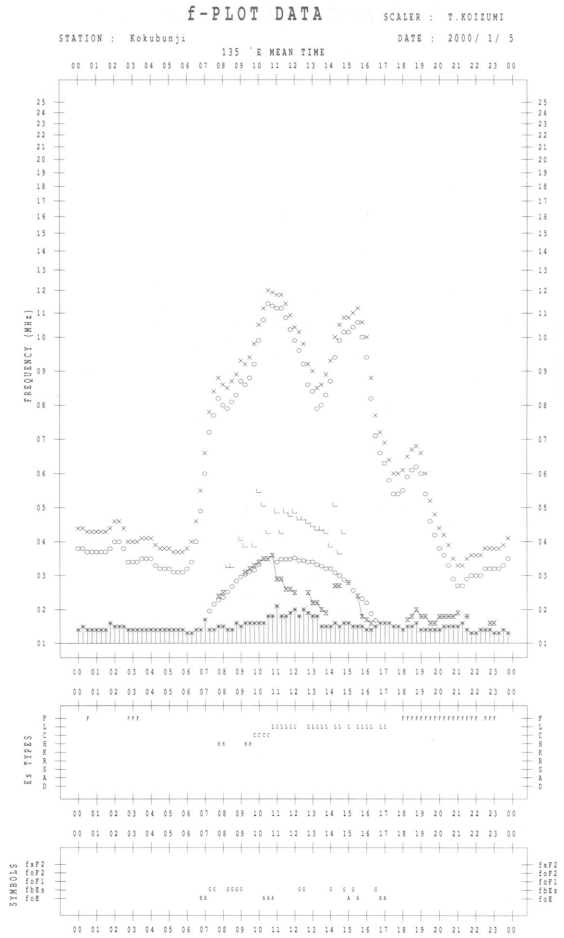
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

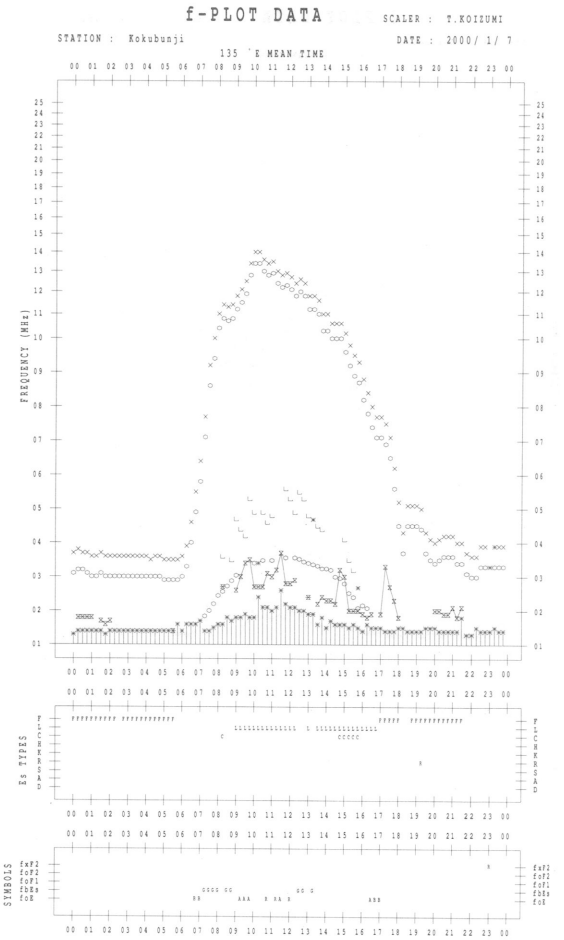

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

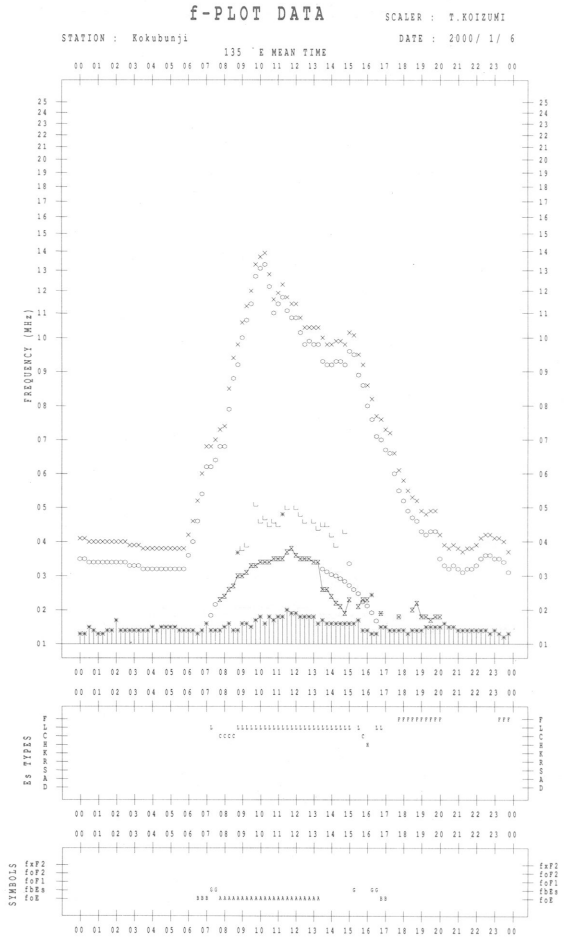

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

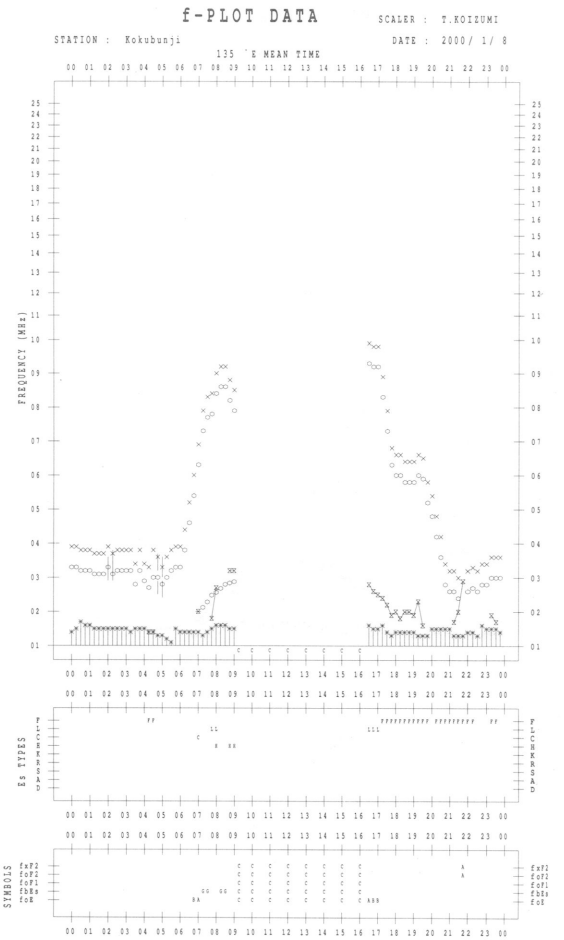

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

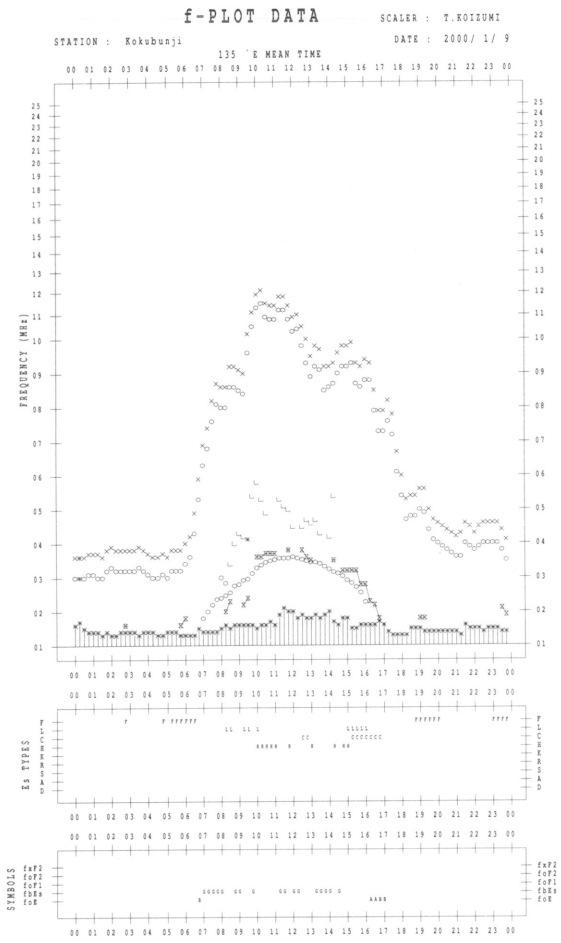

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

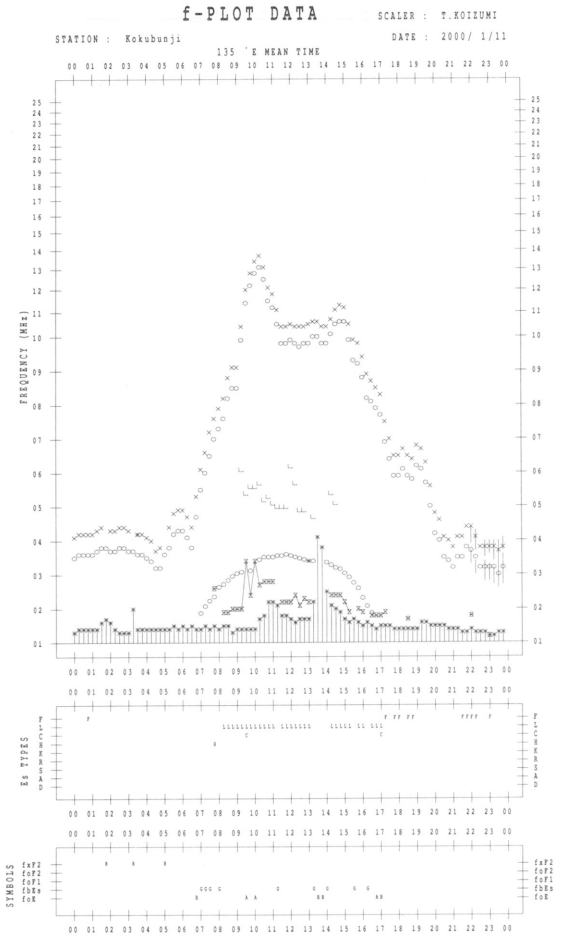

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

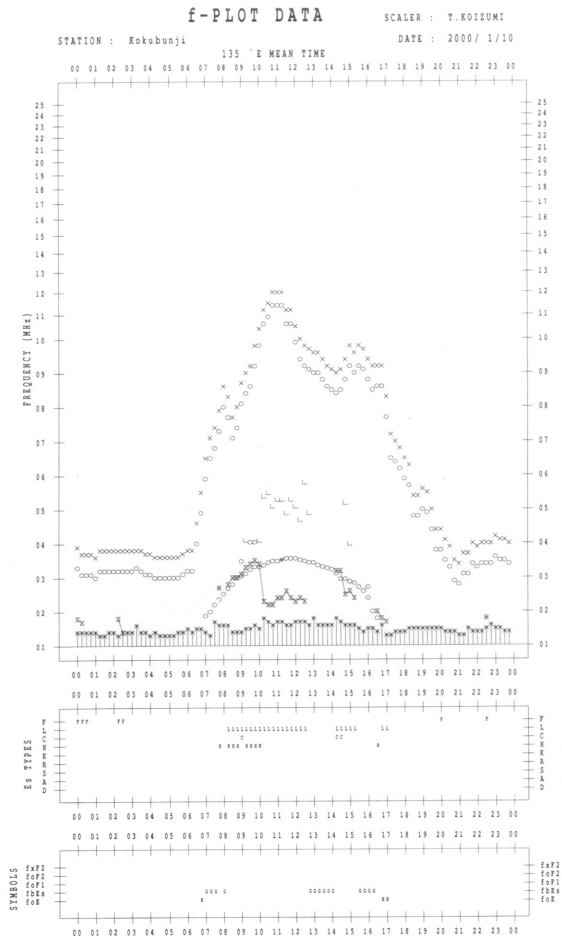

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

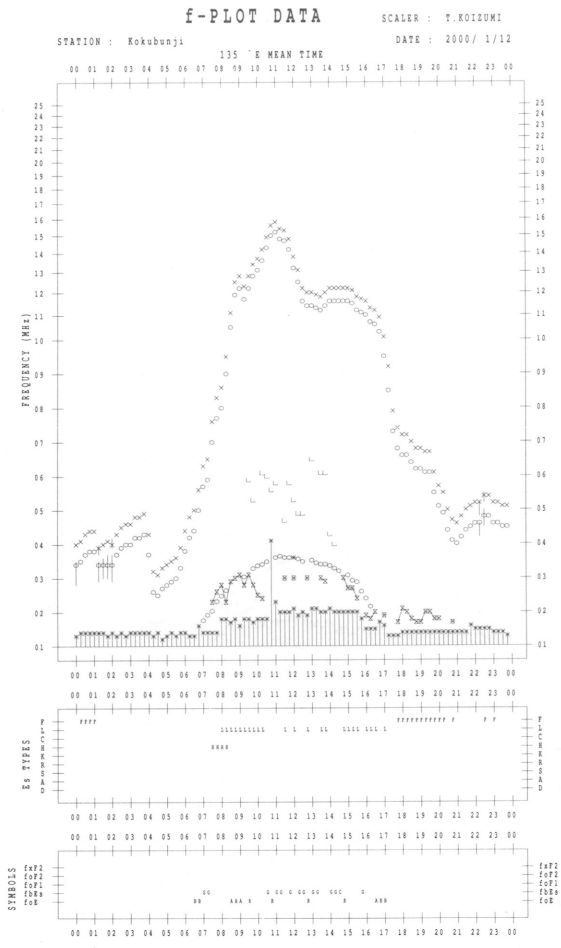

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

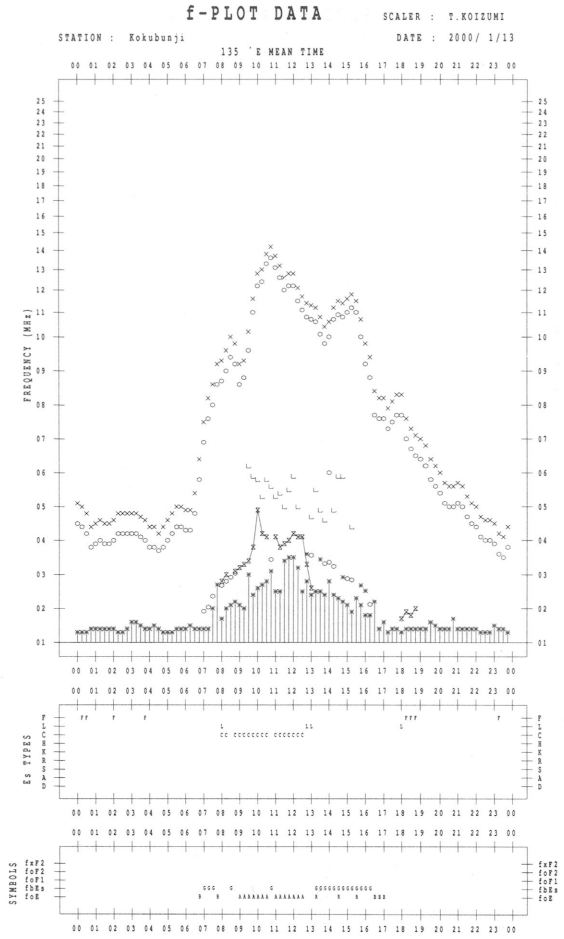

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

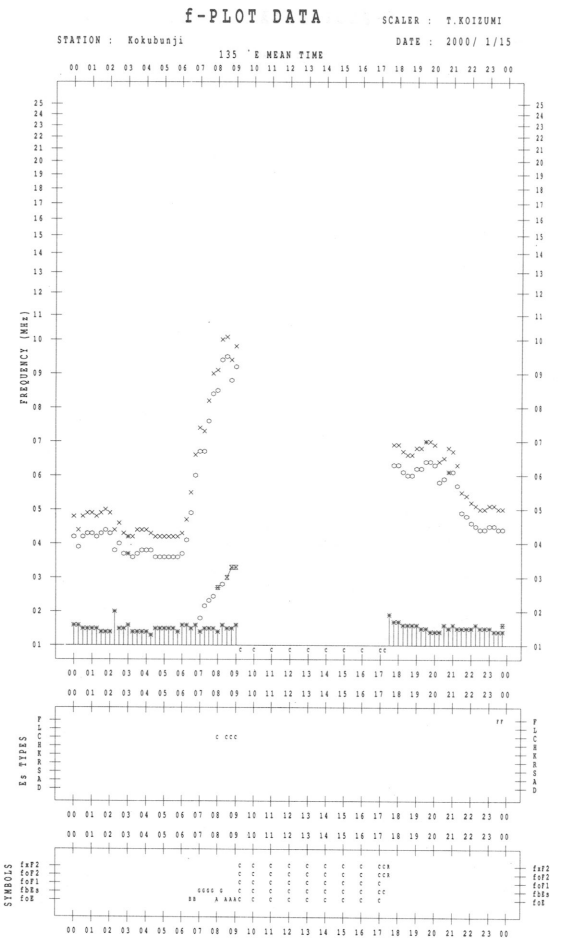

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

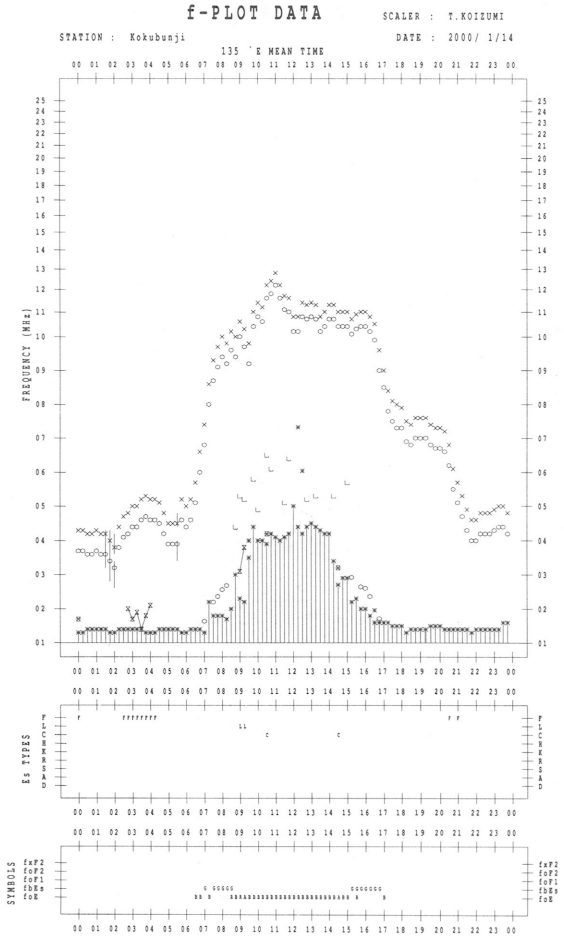

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

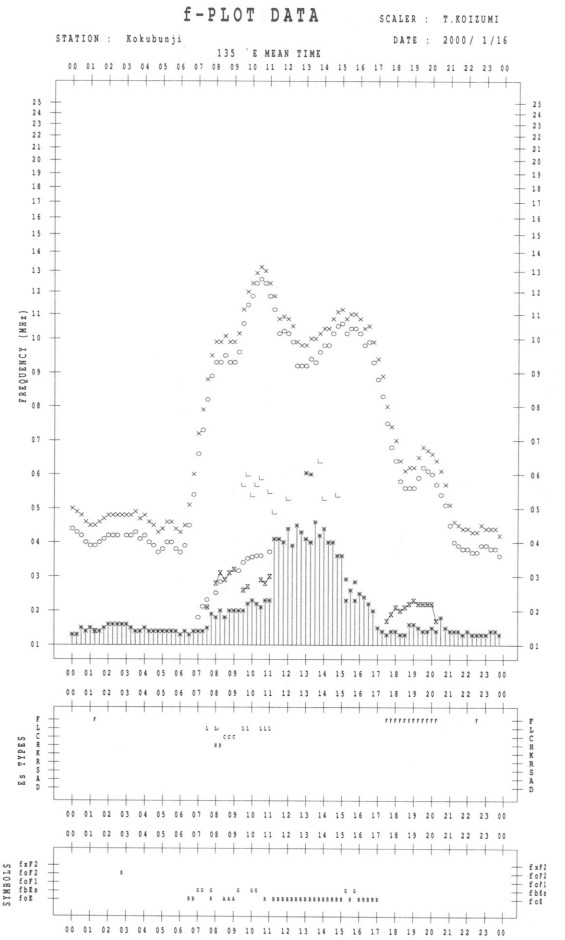

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

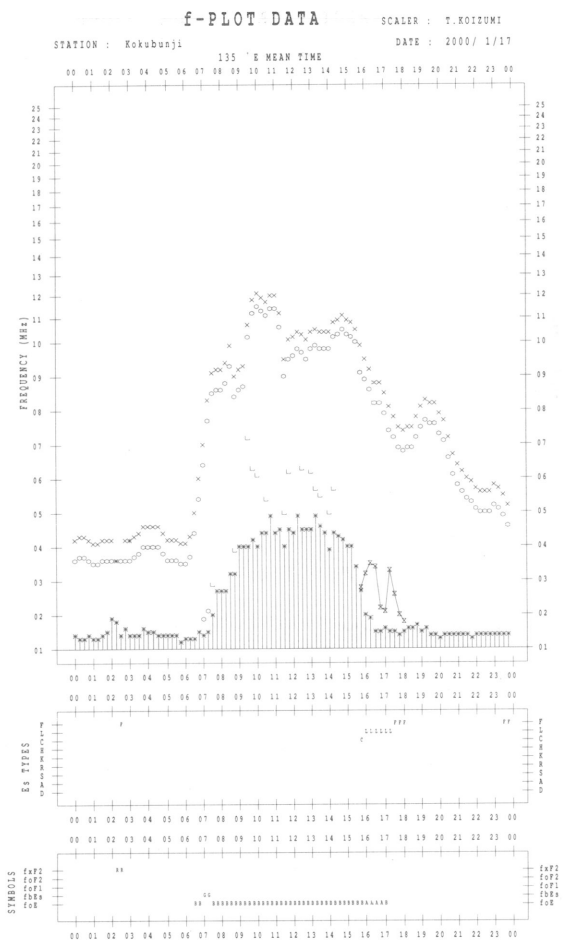

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

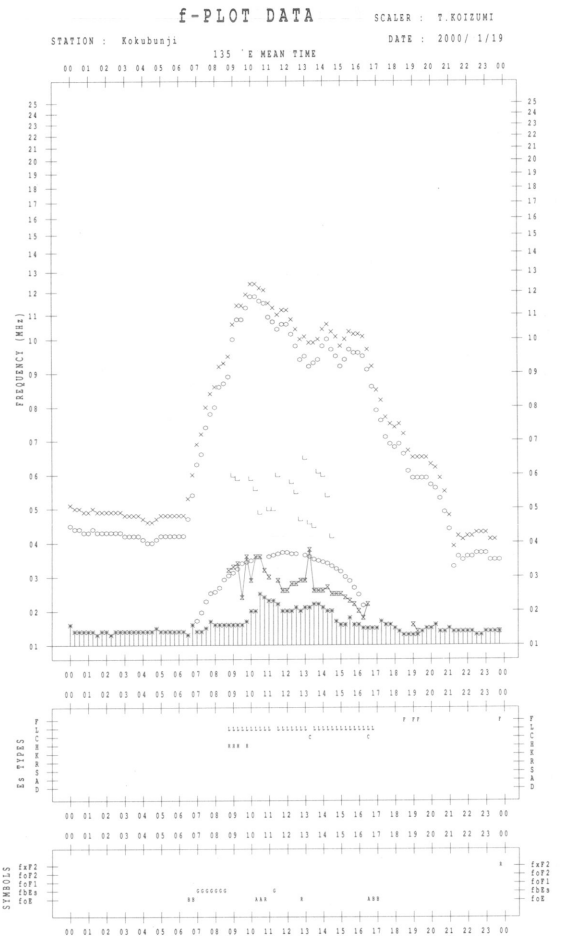

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

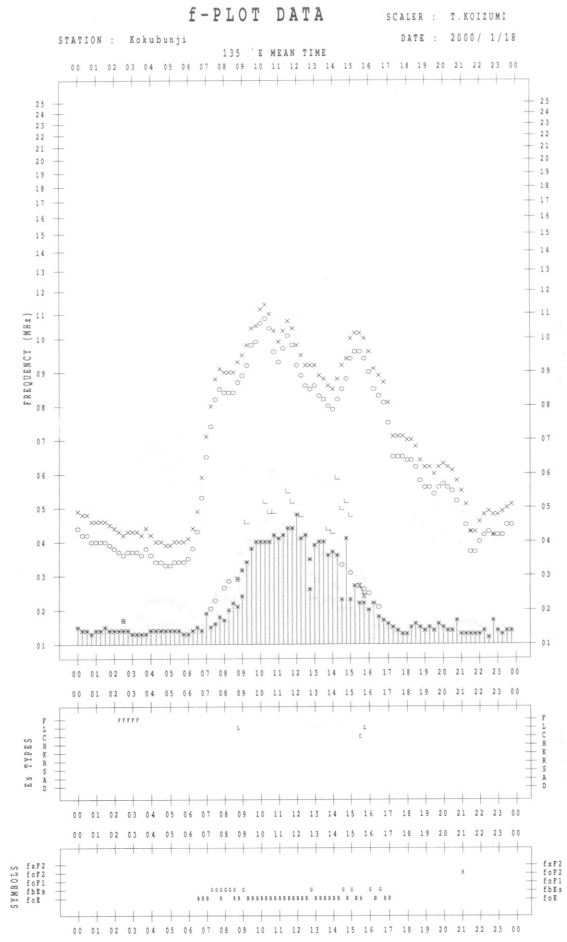

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

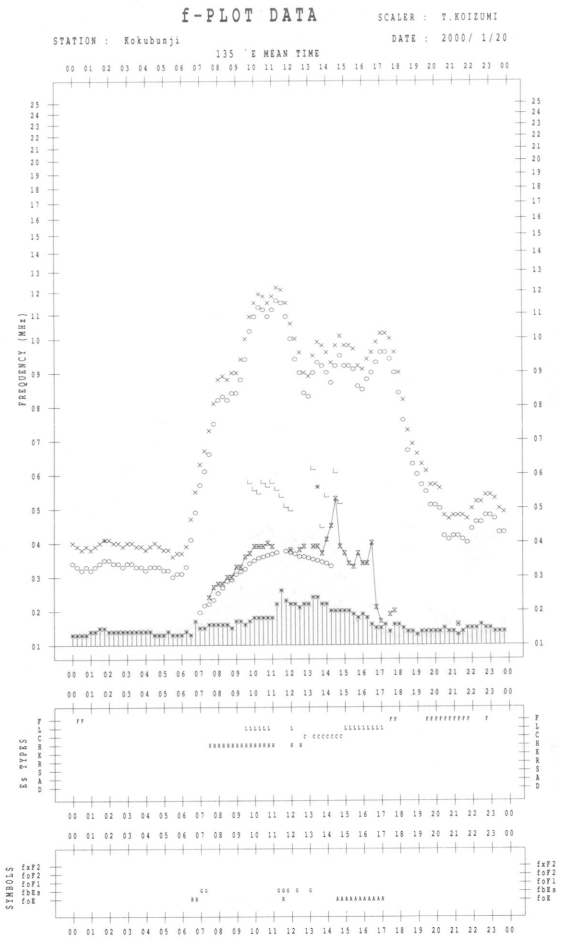

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

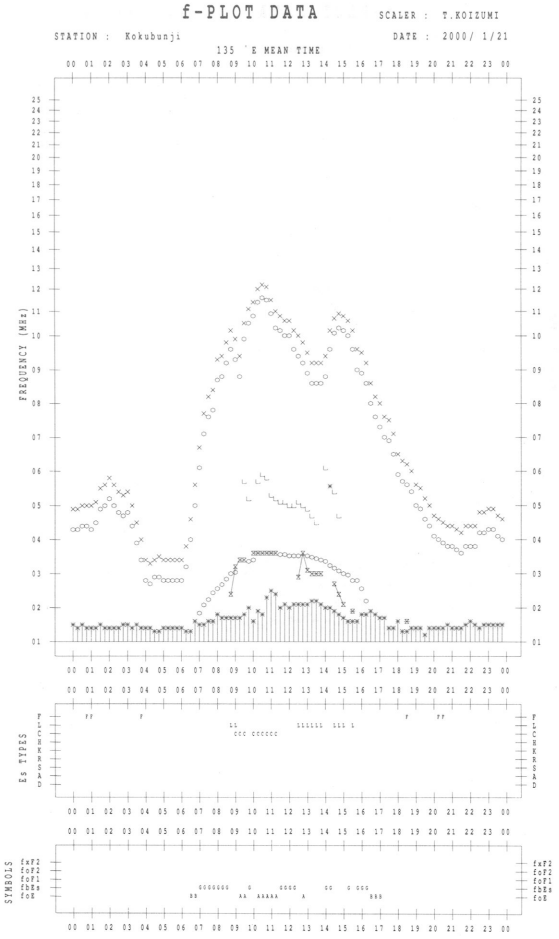

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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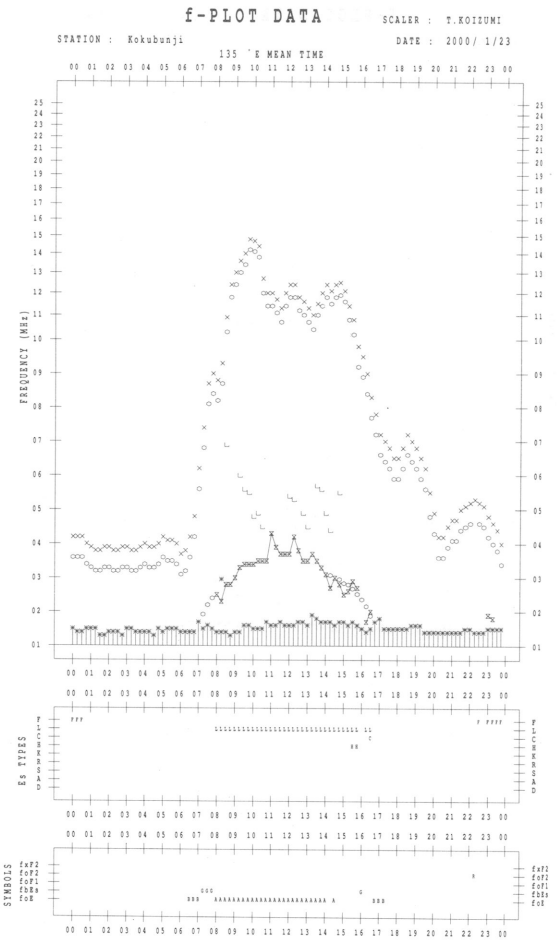
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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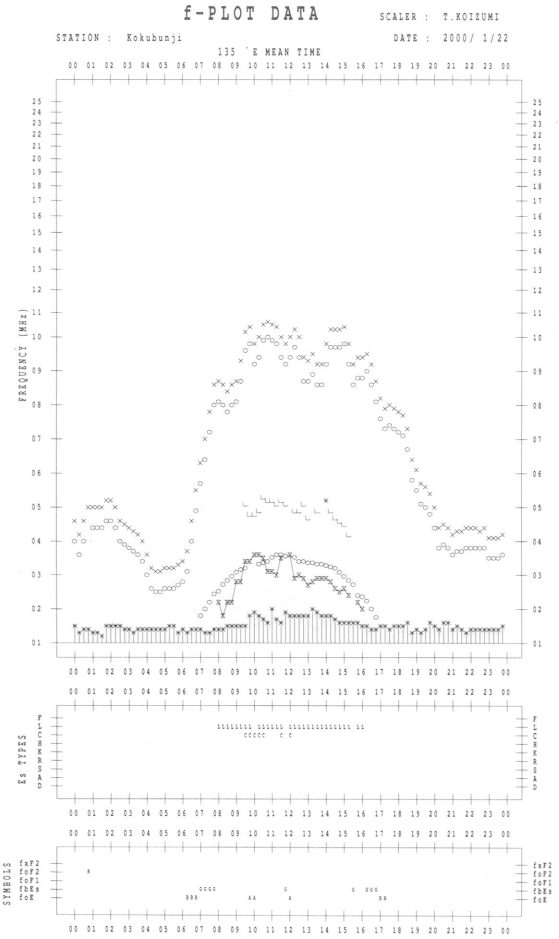
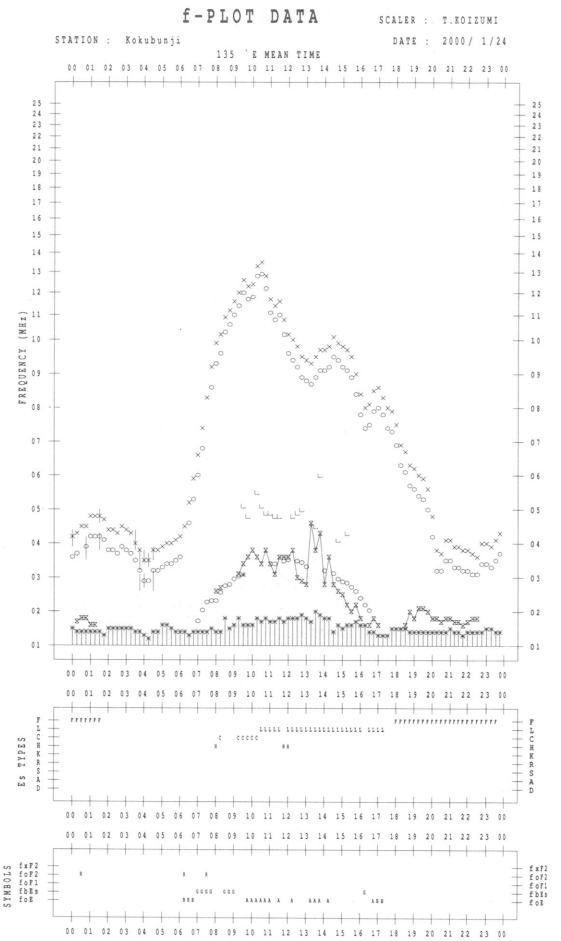
STATION : Kokubunji
DATE : 2000/ 1/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/24
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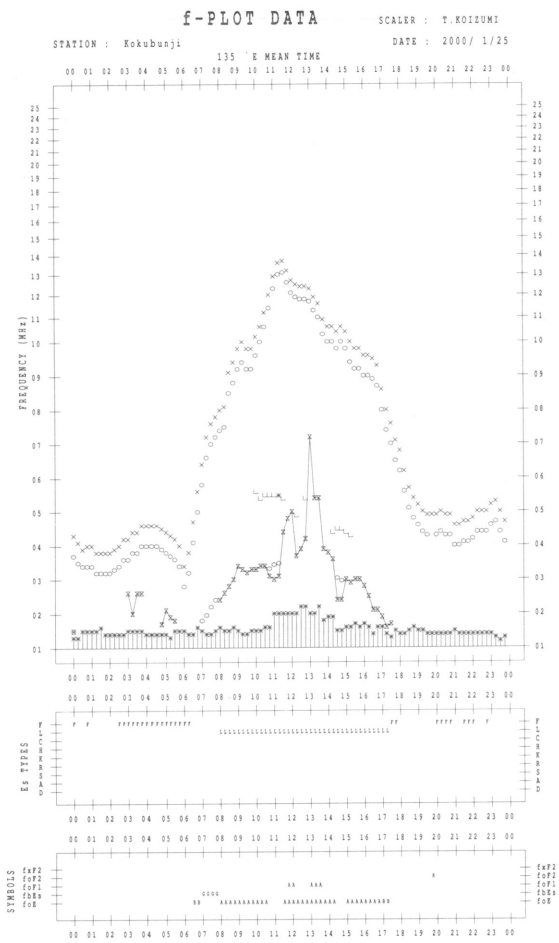
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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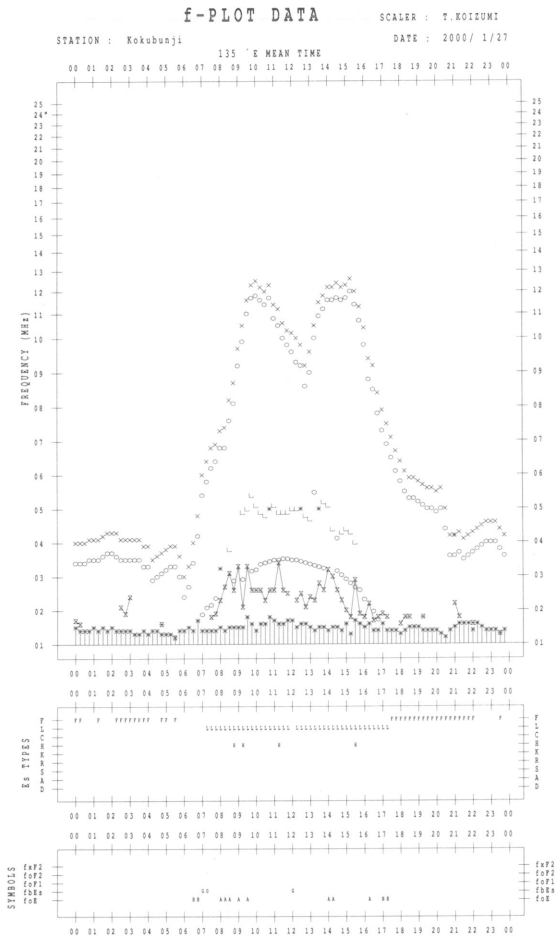
STATION : Kokubunji
DATE : 2000/ 1/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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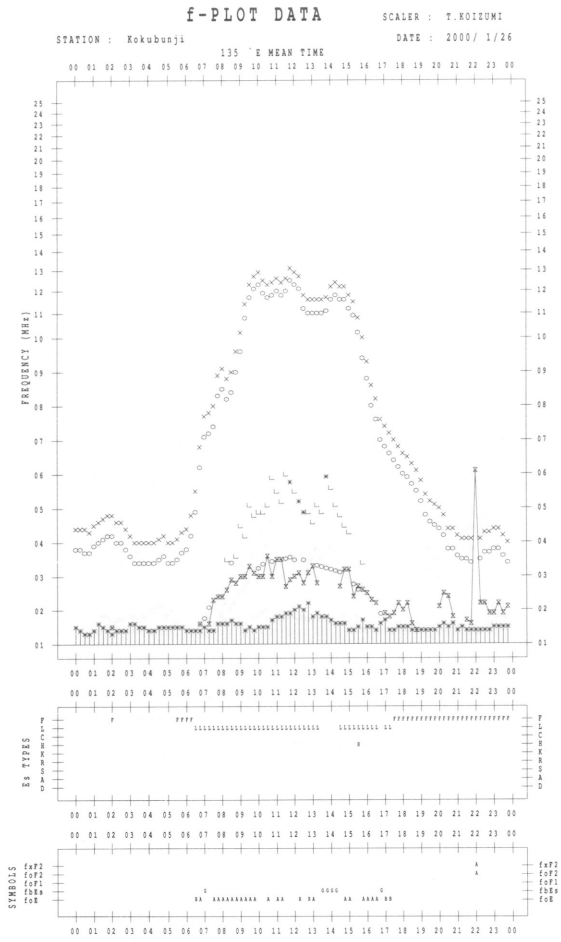
STATION : Kokubunji
DATE : 2000/ 1/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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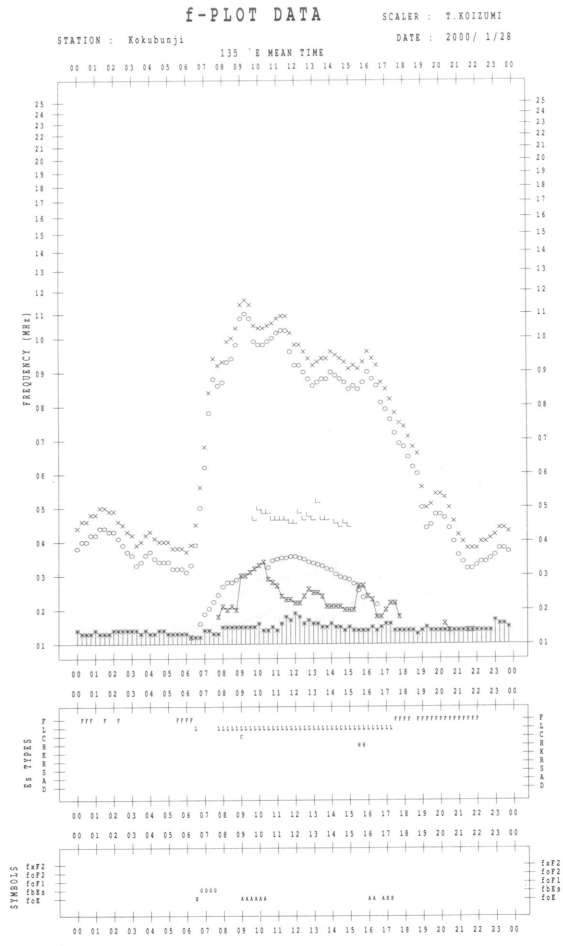
STATION : Kokubunji
DATE : 2000/ 1/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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STATION : Kokubunji
DATE : 2000/ 1/28
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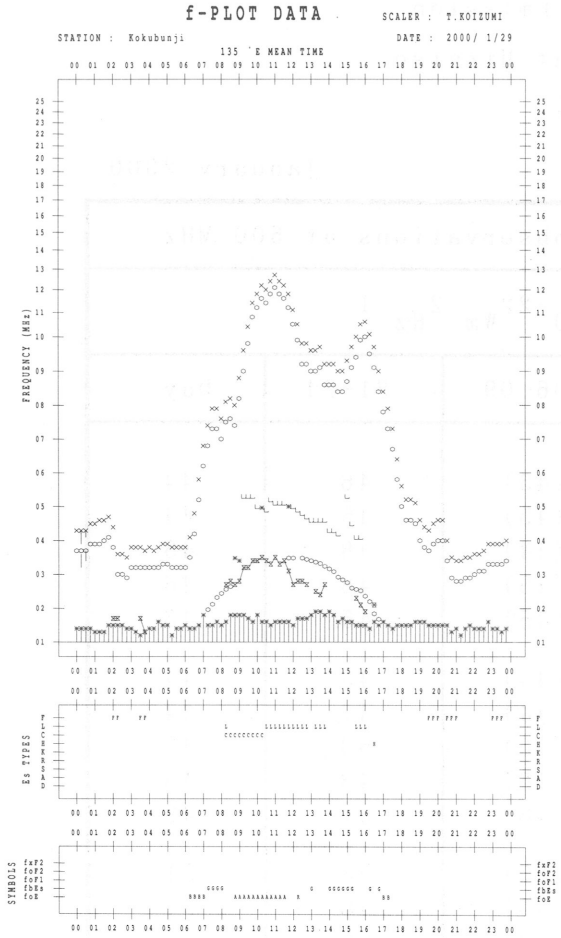
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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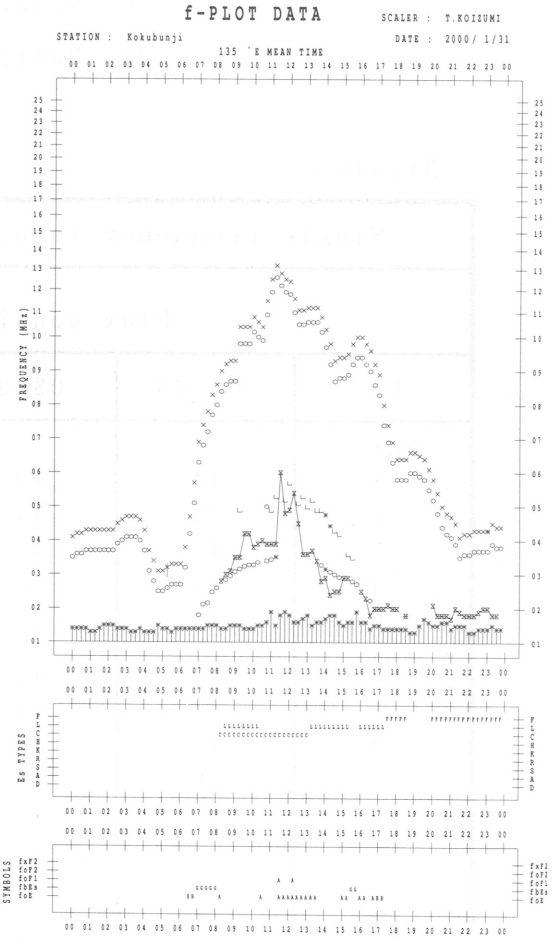
STATION : Kokubunji
DATE : 2000/ 1/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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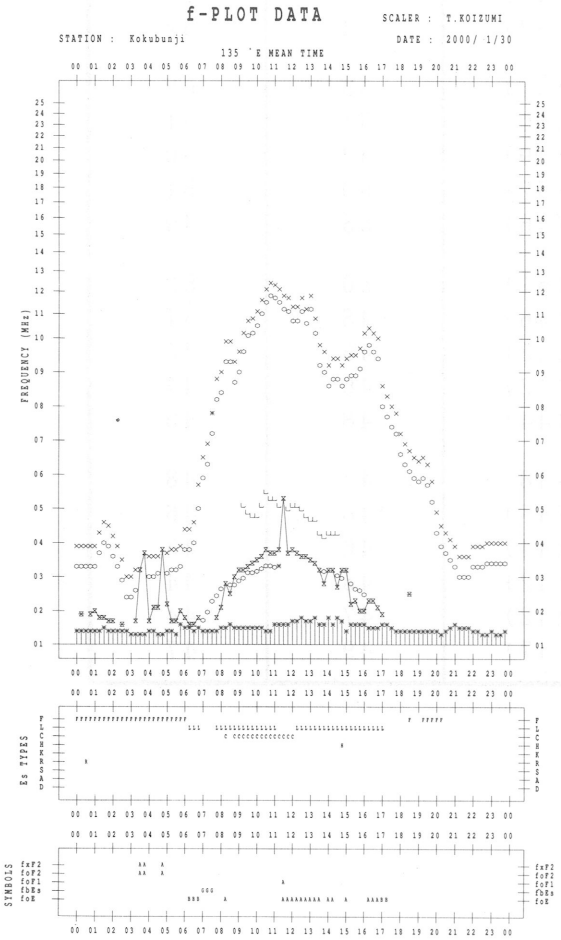
STATION : Kokubunji
DATE : 2000/ 1/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 1/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso January 2000

Single-frequency total flux observations at 500 MHz					
Flux density: 10^{-22} $Wm^{-2}Hz^{-1}$					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	44	43	(43)	46	44
2	45	44	(43)	45	44
3	45	45	(44)	48	45
4	47	46	(45)	48	46
5	47	45	(45)	45	46
6	45	44	(44)	43	44
7	44	44	(44)	47	44
8	47	47	(46)	50	47
9	49	49	(48)	48	48
10	49	48	(48)	51	49
11	51	51	(50)	53	51
12	52	52	(50)	48	51
13	49	51	(50)	50	50
14	50	49	(49)	51	50
15	52	52	(52)	54	52
16	53	52	(51)	53	52
17	52	50	(50)	51	51
18	51	49	(49)	52	50
19	52	52	(52)	50	51
20	49	47	(46)	55	49
21	54	52	(51)	50	52
22	48	46	(46)	48	47
23	47	44	(43)	45	45
24	44	43	(43)	46	44
25	46	45	(44)	48	46
26	48	48	(48)	47	48
27	46	45	(45)	46	46
28	45	45	(44)	46	45
29	45	43	(42)	45	44
30	44	43	(42)	47	44
31	47	47	(47)	49	47

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso January 2000

Single-frequency observations

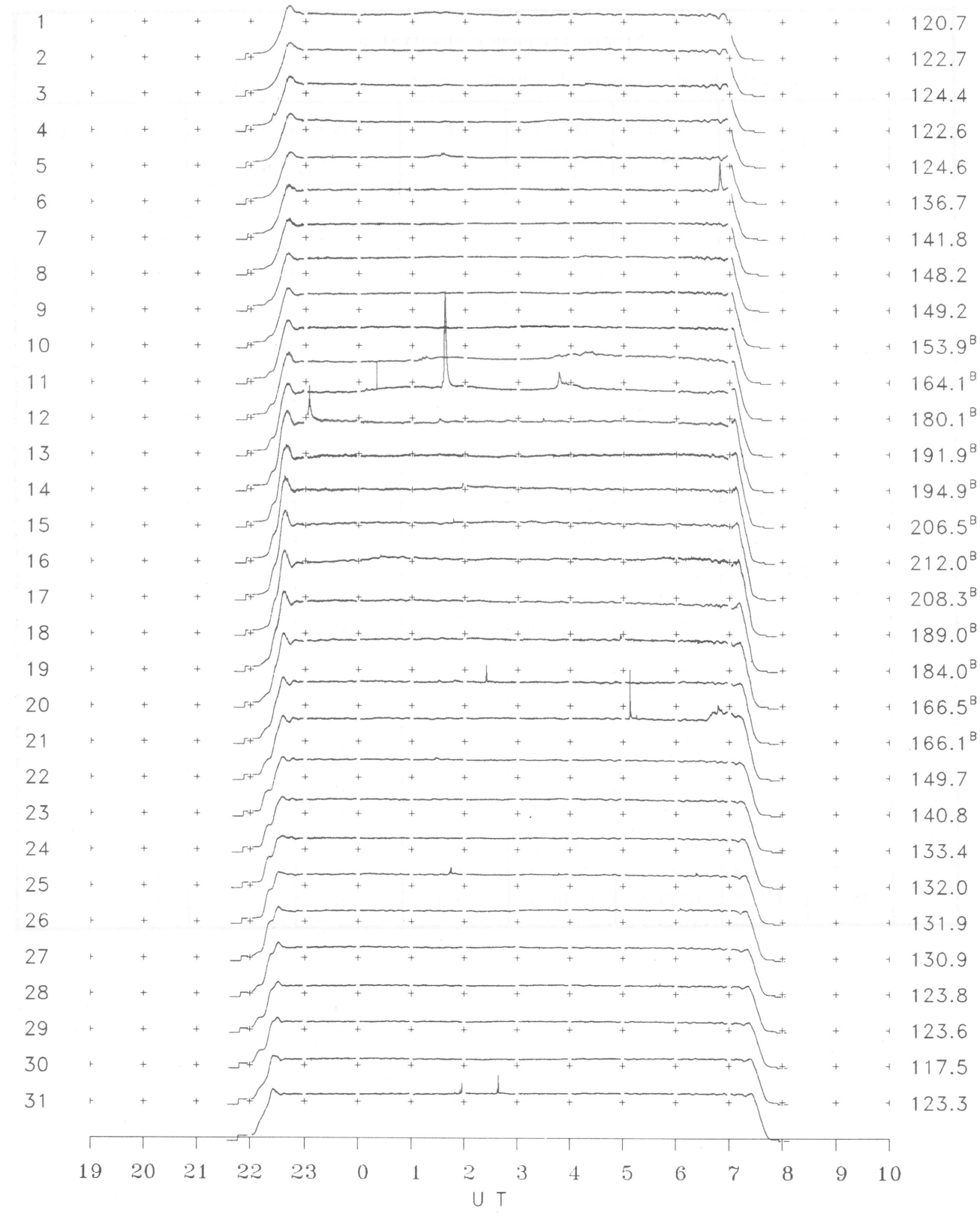
Normal observing period: 2140 - 0750 U.T. (sunrise to sunset)

JAN. 2000	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
2	200	47 GB	2223.0	2223.6	6.6	670	-	0
	500	46 C	2223.0	2224.0	5.6	100	-	0
6	2800	4 S/F	0647.6	0649.0	4.8	60	-	0
12	2800	4 S/F	0133.6	0136.8	11.0	220	-	0
	2800	3 S	2300.0	2304.4	10.0	80	-	0
17	200	8 S	0156.2	0156.4	0.4	70	-	0
	200	8 S	0253.8	0254.0	0.4	170	-	0
18	200	42 SER	0420.0	0422.4	3.0	200	-	WL
19	200	42 SER	0511.2	0511.4	4.0	220	-	0
	200	47 GB	2214.0	2216.2	3.0	500	-	ML
20	200	42 SER	0223.4	0223.6	6.0	320		ML
	500	42 SER	0223.8	0228.2	5.2	270	-	ML
	2800	3 S	0224.0	0224.6	1.2	40	-	0
21	200	8 S	0507.2	0507.4	0.4	110	-	0
	500	46 C	0507.2	0507.6	1.8	340	-	0
	2800	4 S/F	0507.4	0507.6	1.2	110	-	WR
	200	42 SER	0612.0	0612.2	1.0	70	-	0
	500	8 S	0612.0	0612.2	0.4	50	-	WL
30	200	42 SER	0427.2	0427.8	0.8	80	-	0
31	500	42 SER	0156.6	0157.0	2.2	80	-	0
	200	42 SER	0157.6	0158.4	1.0	120	-	0
	200	47 GB	0236.8	0242.0	6.0	1000	-	0
	500	42 SER	0237.2	0240.0	4.6	340	-	0
	2800	4 S/F	0239.8	0240.0.	0.4	40	-	0

B. Solar Radio Emission

B3. Summary Plots of $F_{10.7}$ at Hiraiso

January 2000



Note: A vertical grid space corresponds to a 100 sfu.
Elevation angle range ≧ 6°.

IONOSPHERIC DATA IN JAPAN FOR JANUARY 2000
F 613 Vol.52 No.1 (Not for Sale)

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2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184-8795 JAPAN