

IONOSPHERIC DATA IN JAPAN

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CONTENTS

Preface	
Introduction	1
A. Ionosphere	
A1. Automatic Scaling	
Hourly Values at Wakkanai (f_oF2 , fEs and $fmin$)	4
Hourly Values at Kokubunji (f_oF2 , fEs and $fmin$)	7
Hourly Values at Yamagawa (f_oF2 , fEs and $fmin$)	10
Hourly Values at Okinawa (f_oF2 , fEs and $fmin$)	11
Summary Plots at Wakkanai	14
Summary Plots at Kokubunji	22
Summary Plots at Yamagawa	30
Summary Plots at Okinawa	31
Monthly Medians $h'F$ and $h'Es$	39
Monthly Medians Plot of f_oF2	40
A2. Manual Scaling	
Hourly Values at Kokubunji	41
f -plot at kokubunji	55
B. Solar Radio Emission	
B1. Daily Data at Hiraiso	64
B2. Outstanding Occurrences at Hiraiso	65
B3. Summary Plots of $F_{10.7}$ at Hiraiso	66
《 Real time Ionograms on the Web	http://wdc-c2.crl.go.jp/index_eng.html 》



COMMUNICATIONS RESEARCH LABORATORY
 INDEPENDENT ADMINISTRATIVE INSTITUTION
 TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I), solar radio emission (S) and radio propagation (P) obtained at the follow-

ing 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

Ionospheric 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 (f_oF_2 , fEs , $fmin$) and monthly medians of two factors ($h'Es$, $h'F$), daily Summary Plots and monthly medians plot of f_oF_2 .

a. Characteristics of Ionosphere

f_oF_2	Ordinary wave critical frequency for the F_2 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 f_oF_2).
- 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 f_oF_2 , 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 f_xE and f_oE 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 1-4, published in July 1978.

a. Characteristics of Ionosphere

f_xl	Top frequency of spread F trace
f_oF_2 f_oF_1 f_oE f_oEs	Ordinary wave critical frequency for the F_2, F_1, 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
$M(3000)F_2$ $M(3000)F_1$	Maximum usable frequency factor for a path of 3000 km for transmission by F_2 and F_1 layers, respectively
$h'F_2$ $h'F$ $h'E$ $h'Es$	Minimum virtual height on the ordinary wave for the F_2, 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 replace 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 atmospheric.
- 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 normal *E* trace. (Usually a daytime type.)
- q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.
- r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.
- a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.
- s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.
- d A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin*.
- n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.
- k The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

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

Median count (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 $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$ unit.

The following symbols are used in the tables, when inter-

ference 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 $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$ 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

SGD Code	Letter Symbol	Morphological Classification
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 Pentecost 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 f_oF₂ AT Wakkanai

JAN. 2001

LAT. 45°23.5'N LON. 141°41.2'E 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		49	34		69	37	30		63	94		95	101	106	123	100	74	77	82	41	48	53		A			
2		40	34	38	46	37		41	68	78	86	94	92	95	93		66		58			39	A				
3		38	42	38		59	44		50	94		114	96	120	105	92		87	80	60	44		A		A		
4		41	38	40	40	37	A	A	A		84	103	103	115		90		88		64	54	53	56	A	A	A	
5		53		37	40	58	49		75	79	81		114	113	104	91	88	78	60	55		44					
6			35		59	37				83	93	100	91			81	74	92	48	54	58	49	A	A	A		
7		38	41	47	46	43	44			94	93	106	93	95	91	94	82	86	54	53		49	A	A			
8			46	47	47	44	47		48	94	85	80	119	106	90	93	113	94	55	47	48	47		A	A		
9		43		43	46	47			53	94	84	92	117	115	91	85	117	93	69		53	59	A		A		
10		48		43	47	38	40		52		81	81	92	93	92	80	83	82	51			62	A		A		
11			34	35	35	34	37		53	84	83	90	82	92	79	88	81	79	52	56		46		A			
12		39		43	45	40	40			94	94	114	115	92	109		90	86	58	64	52			A	A		
13		46		37	31		43				94	116	93		102	119	82	68	71	53		38	A		A		
14		59	34		32	44		54	52		93	119	98	91	91	90	92	84		54	53	47	A	A	A		
15		59	69	37	31	38			59		94	99	92	82	100	92	90	81	54	55	60	46					
16			42	49	42	42	39	41	59	81	79	106	104	87	94	116	76	78	56	59	43	44			43		
17		47	47	38	41	36	40		51	94	106	92	102	91	113	100	80	72	66	48	53	37		A	A		
18		42	37	40	46		61		50	95		92	99	92		81	92		74	59		38	A		A		
19		58	59	60	46	38	48	53	54	82	80	95	115	83	83	82			66	61		46					
20		37	35	38		37	42		53	95	90	93	106	116	82	92	96	82	55	55	35			117			
21		54	42	48	47	47	58	50	A		84	115		115	114		92	103	84	86	85	A	40	A	A		
22		47	59	41	41	43		A	A	64	94	94	92	126	91	108	105	110			58	44	A	A	46	60	
23		47	49	39	58	37	43	44	60	77	106	109	119	100	94	92		83		81	59		98	A	A		
24		A		40	43	47	50	36		A	A		78	105	119	101	90	106		91	99	81	64	149	57	A	A
25		46	38	46	37	38			A	A		85	92	126	122	106	92	96	92		71	75	59	49	A	A	
26		43	44	40	41	38	47	50	74	94	96	93	116	96		92	92	84	82	80		38	A	A			
27			59	41	41	34		109	69	84	94	106	107		94	92	93		74	67	60		A	A	A		
28		69	47		28	35			70	83		104	99		93	92	81	84	71	70	54	33	A		A		
29			A		35		36		69	61	84	82	102	90	94	81	92	93	78	58	53	50		A		A	
30		50	59	69	38	37	37		69	87		95	103	102	91	92	88	82	74	66	N						
31		A		58	38	48	48		59	59	79	87	92	95	114	85	96	85	83	63	74	47			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		23	25	27	28	29	19	10	23	27	26	29	31	26	27	27	28	24	28	28	20	22	1	3	2		
MED		47	42	40	44	38	43	52	59	84	93	99	102	95	93	92	89	83	65	58	53	46	98	64	52		
U Q		53	53	46	47	44	47	59	68	94	94	107	115	106	104	96	92	86	74	66	58	49	49	117	60		
L Q		41	36	38	39	37	39	44	52	82	84	92	93	91	90	90	81	78	55	54	47	39	49	46	43		

HOURLY VALUES OF fEs AT Wakkanai

JAN. 2001

LAT. 45°23.5'N LON. 141°41.2'E 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	G	G	G	G	G	31	G	G	G		G	51	G
2	G	G	G	G	G	G	G	G	53	G	G	G	G	G		G	G	G	G	G	26		G	G
3	G	G	G	G	G	G	G	G	30		G	G	G	G	G	G	G	G	G	G	G		G	
4	G	G	G	G	G	34	52	32	50	G	G	G		G	G	G		G	46	G	G			
5	G	G	G	G	G	G		46	49	G	G	G	G	G	G	G	G	G	G		G	G	G	G
6	G	G		G	G	G	G		32	G	G	G	G	G	G	G	G	G		52	G	G		
7	G	G	28	G	G	G			G	G	G	G	G	G	G	G	G	G		G	G			G
8	G	G	G	G	G	G	G		48	G	G	G	G	G	G		34	G	G	G		G	G	
9	G	G	G	G		G	G	50	G	G	G	G	G	42	41	41	52	41	42		42	G	G	G
10		32	G	G	G		24	26		30	G	G	G	G	G	G	G	G		G	G		G	
11	G	G	G	G	G	G		G	48	G	G	G	G	G	G	G		32	30	G	G	G		G
12	G	G	G	G	G	G			48	G	G	G	G	G		33	32	G	G	G	G	G		
13	G	G	G	G	G	G		32		G	G	G		51		G	G	G		38	G	G		
14	G	G	G	G	G	G	G			41		39		G	G	37	G	G		G	G	G		
15	G	G	G	G		G	G	G		G		G	G	G	G	G	G		44	G	G	G	G	G
16	G	G	G	G	G	G		28	44	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G		G	G		51		G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G			
19	G	G		G		G	G	G	G	G	G	G	G	G	G	G			28	32		G		G
20	G	G	28	G	33	G	G	G		G	G		G	G	G		G	42	49	50	G	G		G
21	G	G	G	G	G	G		32	G		G	G		G			31	G		29	59	52	72	
22	G	G	G		G	33	41	29	G	G	G	G	G		G	43	50		60	76	48	38	32	G
23	G	G	G	G	G	G	G		G	G		43	52	G	G	G	G				30	46	92	G
24	37	G	G	G	G	G		37	60	44		64	G	G	G	G	G		G	11	G			
25	28	G	G	G		G		44	40	G	G	G	G	G		G	G	G	G	G	G			G
26	G	G	G	G	G	G		42	30	36	G	G	G	G		G	G	G	G			32		G
27	G	G	G	G	G	G	G		46	31	G	G	G	G	G	G			30	G	G	G		
28	G	G	G	G	G	G	G		26	G	G	G	G		G	G	G	G	G	G	G		G	
29	G		29	26	G	G	G		56	G	G	G	G	G	G		39	G	G	G	G	G		G
30	G	G	G	G	G	G	G	G	40		G	G	G	G	G		G	G		44	G	G	G	G
31	34	34	G	G	G	G	G	G		G	G		52	G	G	G	G		G	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	31	31	31	31	31	31	27	27	25	27	29	31	29	27	28	30	28	27	28	27	31	13	13	16
MED	G	G	G	G	G	G	G	G	31	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	32	48	G	G	G	G	G	G	G	15	11	35	G	G	19	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

JAN. 2001

LAT. 45°23.5'N LON. 141°41.2'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

$\frac{H}{D}$	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	17	16	15	18	16	15	15	18		17	17	18	16	15	24	16	15	15	15	16			
2	17	16	17	20	18	20	18	16	16	16	16	18	20	18		26	18	15		15	16			
3	17	18	15	22	20	18	15	18	15		18	18	18	18	17	23	18	15	15	15	15			
4	15	16	17	16	18	17	15	15	16	20	18	20		20	18	23		14	16	15	15			
5	20	20	17	18	16	17		16	15	18	22	20	33	20	20	23	20	16	15		16			
6	20	17	21	18	18	18	15		15	15	16	18	18	17	18	27	20	17	15	15	18			
7	20	17	18	16	17	15			24	17	15	17	20	18	17	26	20	15	14	15	16			
8	23	18	16	16	20	17	15	16	20	16	17	17	18	18	16	15	20	14	15	14	15			
9	16	18	18	15	16	21	15	15	26	15	17	18	16	20	15	16	15	15	14	15	18			
10	15	21	18	20	20	15	15	20	15	16	18	18	18	20	20	16	18	15		17	18			
11	18	17	16	16	20	17		16	24	16	17	18	20	20	17	16	15	15	16	14	17			
12	15	20	17	17	20	20	16		15	15	16	18	17	20		15	15	15	15	15	20			
13	21	18	20	18	20	15	18	15		15	16	17	18	16	18	16	20	14	16	15	18			
14		17	20	15	18	18	15	16		17	18	18	21	20	16	16	21		15	15	20			
15	18	20	18	18	15	17	16	16		15	16	17	18	20	20	24	17	15	15	15	16			
16	20	20	15	15	15	17	16	16	20	17	16	18	20	21	20	18	21	15	15	17	17			
17	15	16	20	18	15	17	15	16	23	16	20	22	20	20	21	18	16	15	15	15	17			
18	16	18	18	18	66	20	15	17	24	21	33	40	34	53	33	30	22	18	15					
19	16	18	17	17	18	16	15	17	22	20	21	22	23	33	30	27		16	15		18			
20	18	18	17	17	16	16	15	18	26	20	18	20	18	21	20	17	22	15	14	15	21			
21	15	16	16	17	16	18	15	18	24	17		18	18		16	20	15	15	15	15	15	15	16	
22	17	16	18	17	17	15	14	15	26	18	18	20	20	20	18	21	15		15	15	17	16	17	15
23	16	16	16	15	17	17	15	20	26	20	17	17	21	18	20	20	16		15	18	17	17	16	
24	15	20	17	16	16	18	14		15	17	23	20	18	23	20	17	16	15	16	15	18			
25	16	18	17	20	21	16	15	15	15	18	21	21	21	21	20	20	23	16	17	15	17			
26	17	18	15	16	18	16	15	14	26	32	33	36	49		34	32	23	15	15		18			
27		23	17	17	17	20	15	17	23	20	20	20	22	23	21	20		16	17	15	16			
28	16	18	16	18	18	17	16	20	23	17	20	22		21	20	27	23	15	16	15	20			
29	17	16	16	20	20	18	15	18	15	21	21	24	35	49	34	27	24	15	15	15	20			
30	18	17	16	18	17	20		18	17	20	20	20	23	22	20	18	18	17	16	15	21			
31	16	15	16	18	17	18	15	20	15	16	18	18	16	18	18	15	20	15	15	15	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	29	31	31	31	31	31	27	27	28	29	30	31	29	29	29	31	28	28	29	27	30	3	3	1
MED	17	18	17	17	18	17	15	16	20	17	18	18	20	20	20	20	19	15	15	15	17	16	16	15
U Q	18	18	18	18	20	18	15	18	24	20	20	20	21	21	20	26	21	15	16	15	18	17	17	7
L Q	16	16	16	16	16	16	15	15	15	16	17	18	18	18	17	16	16	15	15	15	16	15	16	7

HOURLY VALUES OF f_oF₂ AT Kokubunji
 JAN. 2001
 LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	38		36	34	35		40	82	106		114	116	114	115	113	106	74	84	46	50	57	59				
2		58	58	59	32	26		69	106	117	116	116	116	111	115	91	81	93	63	47	38	44				
3	59	36		28	36	37	37	68		94	97	117	123	120	115	114	100	82	60	60	69	36	N	32		
4		40	35	38	35	30	41	70	106		116	123	115		116	114	97		59	68	58			29		
5		58	59	30	31	34	38	68		122	113	107	106	118	114	97	91	82	50	57	58	59	59	59		
6	58	35		32	34	32	59	70	94	94	95	97	105	115	94		85	72	44	50	57	46		30		
7	28	35		34	30		37	74	115	122		97	106	116	116	100	93	66	60	56	69		56	36		
8	47	44	38	32	56	59	38	68	92	91	101	116	133	116	115	116	116		46	48	46		69	32		
9	38	44	58	42	37	38	42	68	94	94	94	107	116	123	114	100	107	106	74	56	57			31		
10	34		59		40		37	57	94	94	92	100	100	105	115	92	77		58	51	57	56				
11	23	30	29	31	34	28	32	67	93	94	101	122	112	106	104	97	80	69	47	56	46			30		
12		69	38	44	32		26	67	95	94	122	127	128	123	125	95	92		58	A	58		38			
13		36	38	35	36		37	64	94	97	95	116	123	116	108	122	92	76	69	72	56	36	A	35		
14		59	36	38	36	35	35	67		94		115	103		101	92			60	56	57	37		29		
15	36	A	34	28	34	35	38	70	81	96	105	95	103	101	104	107	118	80	60	57	57	36	49	89		
16	69		57	38	28		38	58	92	94	104	116	98	86	97	115	94		46	56	55	43	A	35		
17		69	37	37	59	36	42	68	92	94		116	116	104	96	105	83	95	60	58	57	57	38	31		
18	34	34	35	35	34		35	68	70	92	103	85	115	116	101	114	104	91	74	60	57	24	59			
19	A		35	38	36	A	A		40	67	78	92	105	116	102	92	81	85		80	58	68	60	46	38	
20		58	56	37	42	31		60	92	94										60	59	56	49	A		
21	A		56		38	38	37	45	58	94										93	76	77	68	57	55	
22	46	A		59	43	41	42	42	69	107	116	120	127	116	116	117	112	93	86	71	70	58	38	43		
23	43	40	A		31	A		34	37	68	93	116		115	105	96	98	100	94	83	67	68		58		
24		35	34	40	47	N		28	57	93	132	116	102	101	98	104	113	91	80	60	58	60	48	59	A	
25	41	43		37	38	30	A		82	122	116		135	105	100	91	97	88	81	68	58	56	68	59	40	
26	44	40	42	34	30	31		68		122		146	126	120	110	107	94		80	62	57	41	43	59		
27		69	34		38	38	44	94	94	114	123	122	116	95	116	113	87	80	76	74	56	56	58			
28	62	59	58	28			46	57	93	99	114	115	114	107	95	102	90	78	62	62	35	43	58	47		
29	43	A		35	30	32	N	A		68	82	93	122	112	116	97	90	108	96	74	56	47	56	59	59	42
30	47	58	46	36		35		70	94		124	125	107	95	96	100	94	86	67	58		36		33		
31	58		56	59	34	35	35	67	94	114	112	120	114	108	106	100	92	73	55	56	57	56	59	69		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	19	25	25	29	27	20	25	31	27	27	23	29	29	27	29	28	27	22	30	30	29	25	16	22		
MED	43	43	38	36	35	35	38	68	94	94	112	116	114	108	106	104	92	80	60	58	57	46	58	36		
U Q	58	58	57	38	38	37	42	70	95	116	116	122	116	116	115	113	96	86	68	62	58	57	59	47		
L Q	36	35	35	31	32	31	36	67	92	94	101	107	105	98	96	97	87	76	56	56	56	37	49	31		

HOURLY VALUES OF fEs AT Kokubunji

JAN. 2001

LAT. 35°42.4'N LON. 139°29.3'E 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	G	G	G	G	G	G	33	G	G	G	G	G		G	
2		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
3		G	G	G	G	G	G	G	G		G		G	G	G	G	G	58	40	28	30		G	G	G	
4		G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		G	G	G	G	G	G	
5		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
6		G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G			G		G	
7		G	G	G		G	G	G	G	34	G	G	G	G	G	G		G	G	G	G	27	26	G	G	
8		G	G	G	G	G	G	G	G		G	G	G	G	G	G	G				G	G	G	G	G	
9		G	G	G	G	G	G	G	G	33	G	G					G	G			27		G	G	G	
10		G	G	G			G	G	G	33	G	G	41	51	42		G	G	G			11	G	G	G	
11		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
12		G	G	G	G	G		G	G	G	G	G	47	45		G	G	G	33	26		G	G	27	G	
13		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	30	G	
14		G	G	G	G	G	G	G	G	G	G	G	47		50	47		G	G	G	G		G	G	G	
15		G	G	G	G	G	G	G	G	G	G	G	48	G	G	G	G	G		25	G	G	G	G	G	
16		G		G		G		G	G	G	G	G	G	G	G	G	G	G			G		G		G	
17		G	28	G	26	G		G	G	G	G	G	G	G	G	G	G			23	G	23	25	G	G	
18		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	31	G	G	G	G	G	G	
19		G	G	G	G	G		G	G	G	G	G	G		G		G	G			33	36	G	G	G	
20		34	G	G	G	G	30	29	26		G	G	G	G								G	G	G	G	
21			G	G	G	G	G	G	G	G												G	G	G	G	
22		28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		30	41	31
23		G	46	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
24		G	34	35	G	G	G	G		G	G	G	G	G	G	G	G		G							
25		G	G	G	G	G	G		G	33	G	G	G	G	G	G	G	G	35	35	46	32	29	24	29	
26		G	G	G	G	G	G	28	38		G	G	G	G	G	G	G	G		31	31	24	28	G	G	G
27		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28		G	G	G	G		G	G		G	G	G	G	G	G	G	G				32	34	29	G	G	G
29		G		G	G	G		G	29		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
30		G	32	G	G		G	G	22	26	29		G	G	G	G								G	G	G
31		G		G	G	G	G	G	G	G	G	G	47	G	G	G	G	48	41	36	46	26	G	G	G	
												43					38	34								
		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	31	30	29	27	31	30	28	29	28	29	29	28	29	29	27	25	30	31	30	31	27	30	
MED		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
UQ		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	28	23	24	23	G	G	G	
LQ		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Kokubunji

JAN. 2001

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

$\begin{matrix} H \\ D \end{matrix}$	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	14	15	16	16	17	14	20	16	15	15	17	17	16	15	14	14	15	17	15	14	15		17
2	17	14	14	16	16	17	15	21	15	16	16	18	17	18	20	16	23	16	15	14	16	15	16	17
3	15	16	14	15	15	15	15	20		14	17	21	23	18	20	15	15	14	15	14	14	15	18	15
4	14	14	15	17	14	16	14	20	15		22	21	24	16	18	17	22		17	15	14	15	15	17
5	16	16	20	16	16	16	14	21	15	16	17	16	17	17	16	16	23	16	15	14	16	14	15	20
6	14	15	15	14	15	16	15	20	15	15	16	16	16	18	16	18	15	15	14	15	15	15		16
7	15	15	15	14	15	16	15	20	14	15	17	20	20	18	15	14	16	15	14	22	14	15	16	15
8	16	15	14	14	14	14	15	20	16	14	16	18	16	21	17	15	15		14	15	14	15	18	15
9	15	15	15	15	16	15	15	20	14	15	15	16	20	18	16	18	14	15	15	15	15	15		18
10	14	14	15		16		14	22	14	17		21	21	21	18	16	16		15	17	15	16	15	
11	14	15	15	14	15	15	14	18	14	16	15	17	17	15	17	15	15	15	16	14	15	17		15
12	14	16	15	15	20		15	15	15	15	16	21	18	17	17	15	15	14	17	14	15	17	14	16
13		15	16	15	14	15	14	20	14	14	15	16	16	16	17	16	14	16	14	15	15	14	14	15
14	17	14	15	14	14	15	14	20	15	14	16	18	23	20	15	16	14	16	15	15	14	15	15	17
15	15	15	14	15	15	15	15	21	15	15	15	15	16	16	15	17	16	15	18	15	15	15	17	21
16	16	14	14	14	16		14	20	18	15	16	18	17	18	17	17	16		16	15	14	15	14	14
17	14	15	14	14	14	14	15	27	16	15	20		16	20	17	15	14	15	15	14	15	16	15	15
18	14	16	14	14	14		15	20	27	16	23	24	42	42	18	17	15	17	14	15	15	15	18	15
19	15	15	15	15	15	15	16	14	14	15	15	17	18	15	24	18	15	14	16	15	15	15	14	15
20		14	21	15	14	14	14	21	15	16										14	15	15	15	14
21	15	17	15	17	15	14	14	14	15										14	14	14	14	15	15
22	14	15	16	16	14	15	14	21	15	14	17	16	16	20	17	16	16	17	15	14	15	15	15	15
23	15	15	15	15	14	15	15	21	15	16	22	21	18	21	20	15	15	18	15	15		14	15	16
24		14	15	15	15	15	17	14	14	15	22	17	15		18	17	15	20	15	15	15	14	15	15
25	16	15	16	21	16	14	15	15	14	15	16	15	17	16	24	18	15	15	15	15	14	14	16	16
26	14	15	14	14	17	17	14	21		17	16	17	20	15	14	20	15	16	14	15	14	15	15	15
27		17	14	14	14	15	15	21	15	15	16	39	21	18		18	14	15	15	15	14	16	21	15
28	15	14	15	16		15	16	15	15	15	17		42	21	18	18	15	15	18	23	17	14	15	15
29	17	15	15	18	16	15	14	14	14	14	21	23	21	21	21	20	15	18	14	15	15	14	15	15
30	14	15	15	18		15	15	15	15	16		26		21	17	17	14	15	14	14	17	16	16	15
31	16		15	16	17	17	17	20	24	15	16	17	20	18	18	14	15	20	14	14	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	27	30	31	30	29	27	31	31	29	29	27	27	28	28	28	29	29	25	30	31	30	31	27	30
MED	15	15	15	15	15	15	15	20	15	15	16	18	18	18	17	16	15	15	15	15	15	15	15	15
U Q	16	15	15	16	16	16	15	21	15	16	17	21	21	20	18	18	16	16	16	15	15	15	16	16
L Q	14	14	14	14	14	15	14	15	14	15	16	16	16	16	16	15	14	15	14	14	14	14	15	15

HOURLY VALUES

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

HOURLY VALUES OF foF2 AT Okinawa

JAN. 2001

LAT. 26°16.9'N LON. 127°48.4'E 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																								
2																								
3																								
4												127	125	153	173	180	168	164		159		117	87	94
5		61	56	41	57		41	47	87	120	166	151	154	142	172	158	158	146	139	110	115	90	94	68
6	59	69	69	69	37	44	38	51	94	124	131	114	122	120	127	138	156	150		141	88		112	94
7	69	61	69	61	69				89	113	122	110	89	103	128	120	121	127	123	76	83	67	70	70
8	67	68	70	69	44			47	73	122	116	117	116	146	161	168	173	178	172	A		92	114	94
9	49	59	60	43	47			69	61	116	113	95	116	132	162	184	170	178	185		112	149	128	93
10	80	82	80	80	69	60	59	47	76	122	115	140	132	138	172	173	166	170	174	110	94	96	94	70
11	56	58	46	44	58			69	83	116	114	117	117	146	154	150	150	123	111	105	85	83	72	69
12	42	43	44	43	36				89	122	146	128		159	166									
13																								
14																								
15																								
16													94	124	131	133	150	144		142	96	118	114	72
17	64	45	70	61	41	43			121	127	126	135	150	161	182	178	173	180	168		117	122	117	94
18	69	43	58	38		59			80		112	118	128	134	151	170	172	184	204	174		123	109	85
19	67	64	62	43		37		44	95	120	111	112	111	106	120	122	107	130		139	92	112	94	70
20		41			37		49	38	81				112	124	150	132	145	176		167	156	151	114	69
21		39	A	40	42		43	39	94	105	124		124	127	131	128	126	166	172	192	171	172	125	69
22	68	70	68	50	40		43	60	84	121	111	126	146	130	124	127	136	135	138		120	124	81	94
23	72	68	43	43	56	38			94	111	117	132	117	120	130	121	124	127	140	149		114	120	96
24	94	54	50	54	70			A	89	119	102	116	124	128	131	120	123	122	117	90	83	91	94	95
25	95	70	60	44	46	89	43	54	126	135	123	130	132	123	118	112	112	119	105	90	93	94	79	69
26	70	62	56	42	35				83	85	116	151	151	165	164	165	173	153	139	123	94	94	95	68
27	60	56		41		59		69	94	114	115	130	130	164	161	159	152		126		117	82	76	82
28	84	70	56		29			89	89	101	116	120	132	146	143	142	154	141	151	142	122	96	90	95
29	91	71		70					95	98	116			144	150		142	120	125	87	90	86	80	69
30	56	58	70	69	69		58		84	94	110	116	118	117	126	131		117	81	88	71	76	67	70
31																		157	144	169	120	124	116	94
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	22	18	20	18	8	8	13	21	20	21	21	22	24	24	22	22	23	19	19	21	23	24	23
MED	68	61	60	44	45	52	43	51	89	118	116	120	124	133	150	140	151	146	139	139	94	112	94	72
U Q	80	69	69	65	58	59	53	69	94	122	123	131	132	146	163	168	168	170	172	159	118	123	114	94
L Q	59	54	56	42	37	40	42	45	82	108	111	116	116	123	129	127	126	127	123	90	89	90	80	69

HOURLY VALUES OF fEs AT Okinawa

JAN. 2001

LAT. 26°16.9'N LON. 127°48.4'E 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																									
2																									
3																									
4												G	G	G	G	G		G				G	G	G	
5		G	G	G	G		G	G	G	G	G	G	G	G	G	G	38	G		G	G	G	G	G	
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		42	G	G		49	G	G	G
7	G	G	G	G	G	G		G	33	G	G	G	G	G	G		G	32	25		G	G	G	G	
8	G	G	G	G	G			G	48	G	G	G	G	G	G	G	G	G	G		G	G	G	G	
9	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G		G		56	42	G
10	G	G	G	G	G	G	G	G	G		G	47	51	75	98	G	G		37	43	48	43	28	G	G
11	G	G	G	G	G			G	G	G	G	G	G	G	43	67	G		34	30	45	G	25	25	G
12	G	G	G	G	G			G	32	G	G	G	G	G	G		G	G	G	G	G		G		
13								G							G					G		G			
14	G							G											G	G	G				
15									G									G		G				G	
16	G							G	G		G	G	G	G	43	42	45	39	34	48		G	G	G	G
17	G	G		G	G	G	G	G	G	G	G	G	44	G	G	G	G	G		25		29	28	45	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	42	36	G	37		50	G	G	22
19	G	G	G	G		G		G	G		G	G	G	G	48		56	G		44	50	G	G	G	
20		G	G	G	G	G	G	37	G				G	G	G		G	G		G	G	G	G	G	
21	G	24	28	G	G	G	G	G	G	G	G		G	G	48	43	G	44	29	35	26		G	G	G
22	26	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		24	25	G	G	
23	G	G	G	G	G	G	G	G	G	G	G	G	48	G	G	G	G		38	49	25		G	G	G
24	G	G	G	G	G	G	G	38	G	37	G	G	G	G	G	G	G	G		28	46	G	G	G	G
25	G	G	G	44	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
26	G	26	G	G	G			G	G		38	42	45	G	46	G	G	39	40		G	G	29	G	36
27	G	G	G	G	G	G	G	G	G	38	G	G	G	G	G	G	39			G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	34		G	G	G	G	G	G	44	41		G	42	G	G	G	G
29	28	G	G	G	G			G		G	G	G	G	G	G	G	G	G		26	G	G	G	G	G
30	G	G	G	G	G	G	G		34	G	41	G	G	G	G	G			34	G			G	G	G
31																		G	G	G	G	50	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	22	22	21	22	21	15	14	24	23	19	22	22	24	23	25	23	23	24	22	20	22	25	26	24	
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	41	39	35	28	43	26	25	G	G	
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

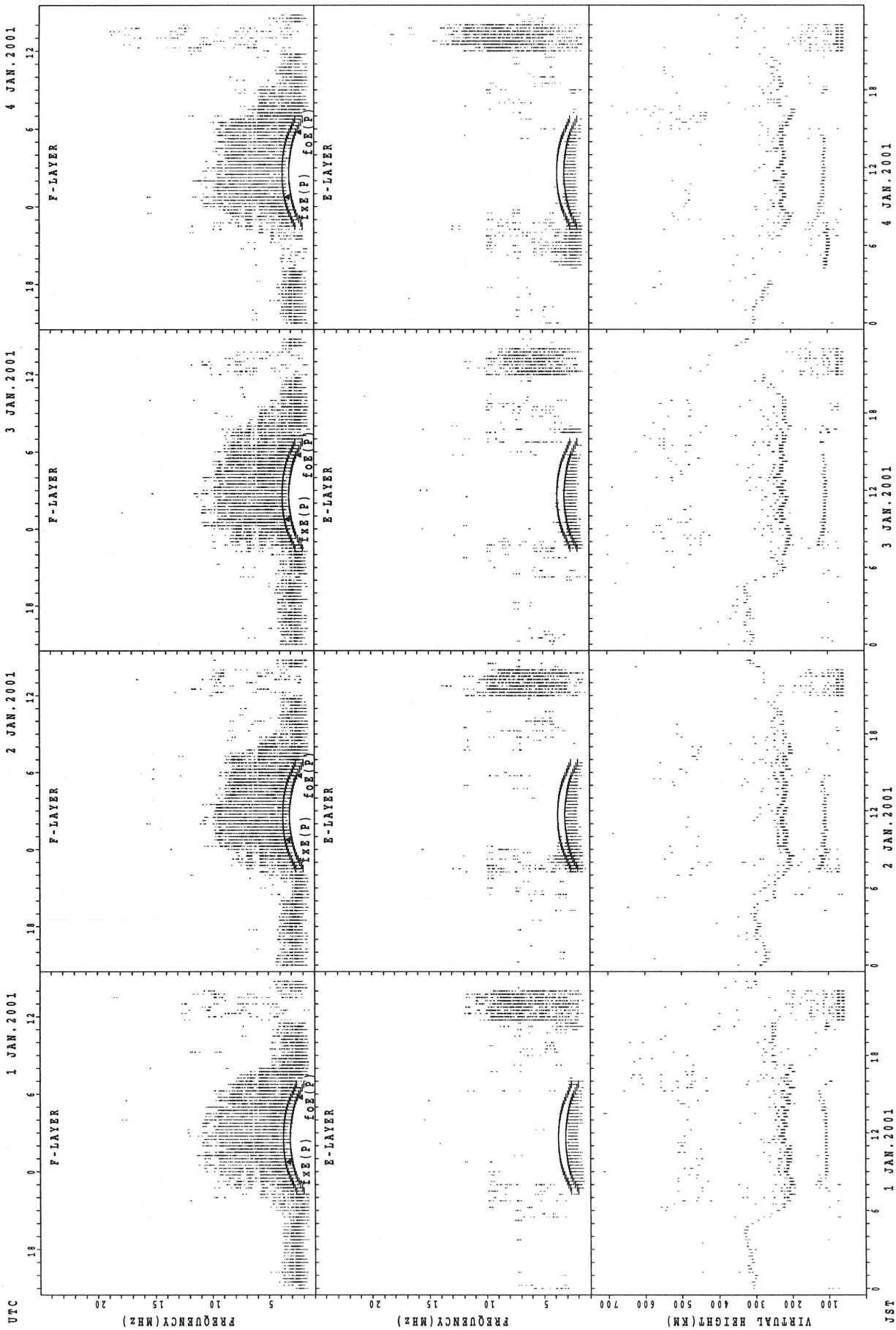
HOURLY VALUES OF fmin AT Okinawa

JAN. 2001

LAT. 26°16.9'N LON. 127°48.4'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

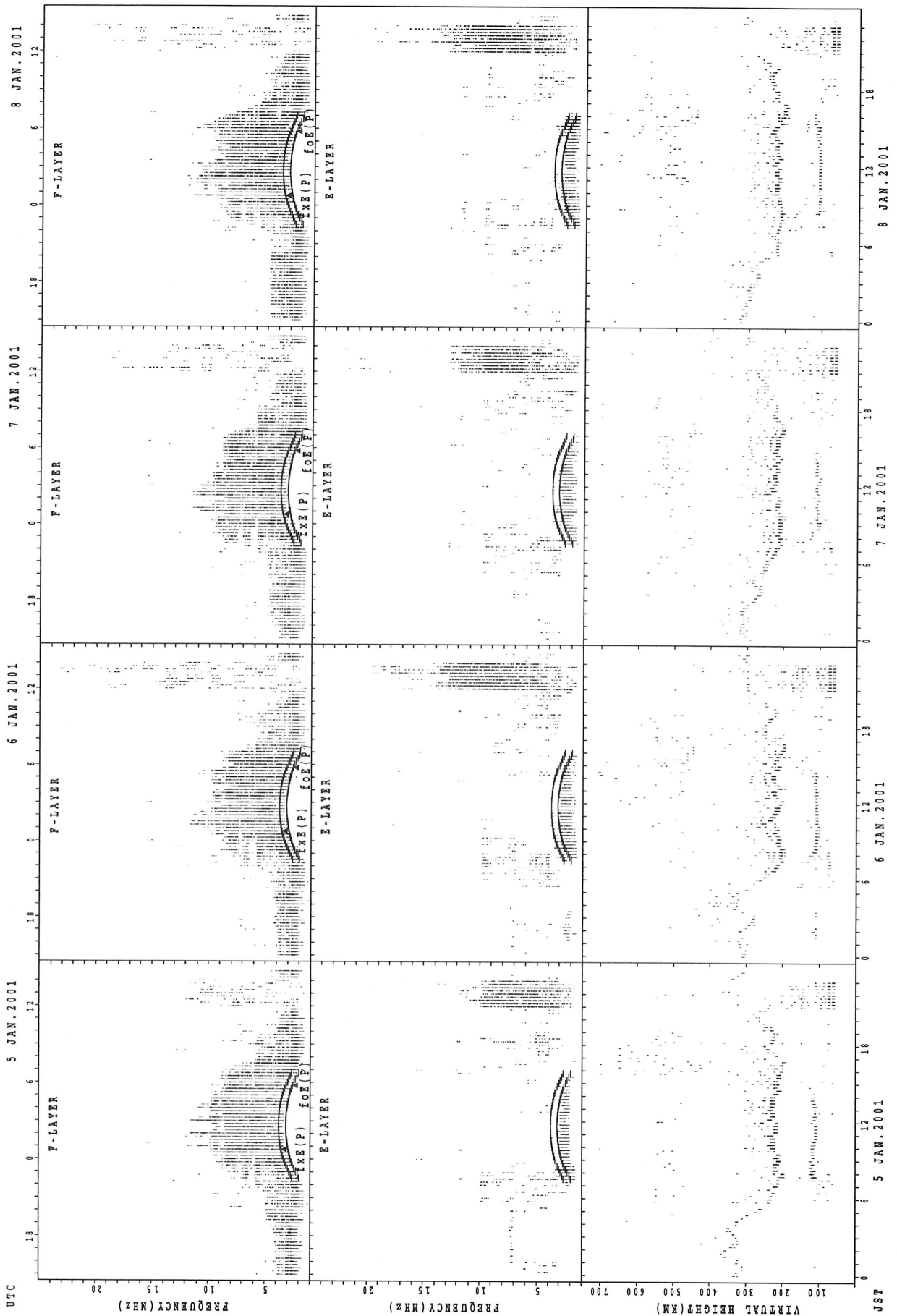
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4												28	29	30	28	27	18	16		14		14	17	15
5		16	14	15	15		15	14	15	17	34	27	30	29		20	32	17	15	15	15	15	15	15
6	14	15	15	15	14	15	15	14	15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

SUMMARY PLOTS AT Wakkanai



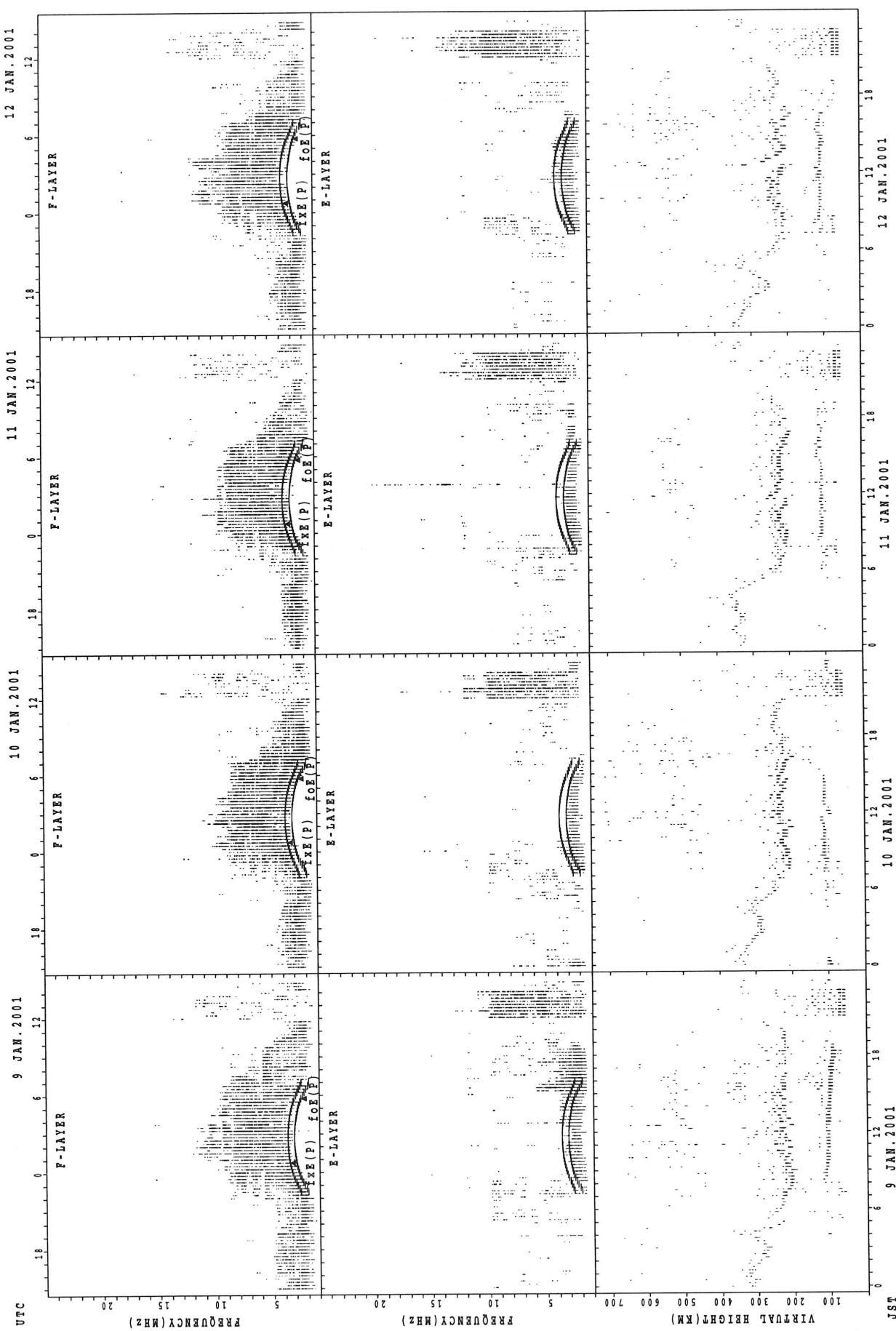
f_xe(P); PREDICTED VALUE FOR f_xe
f_o_e(P); PREDICTED VALUE FOR f_o_e

SUMMARY PLOTS AT Wakkanai



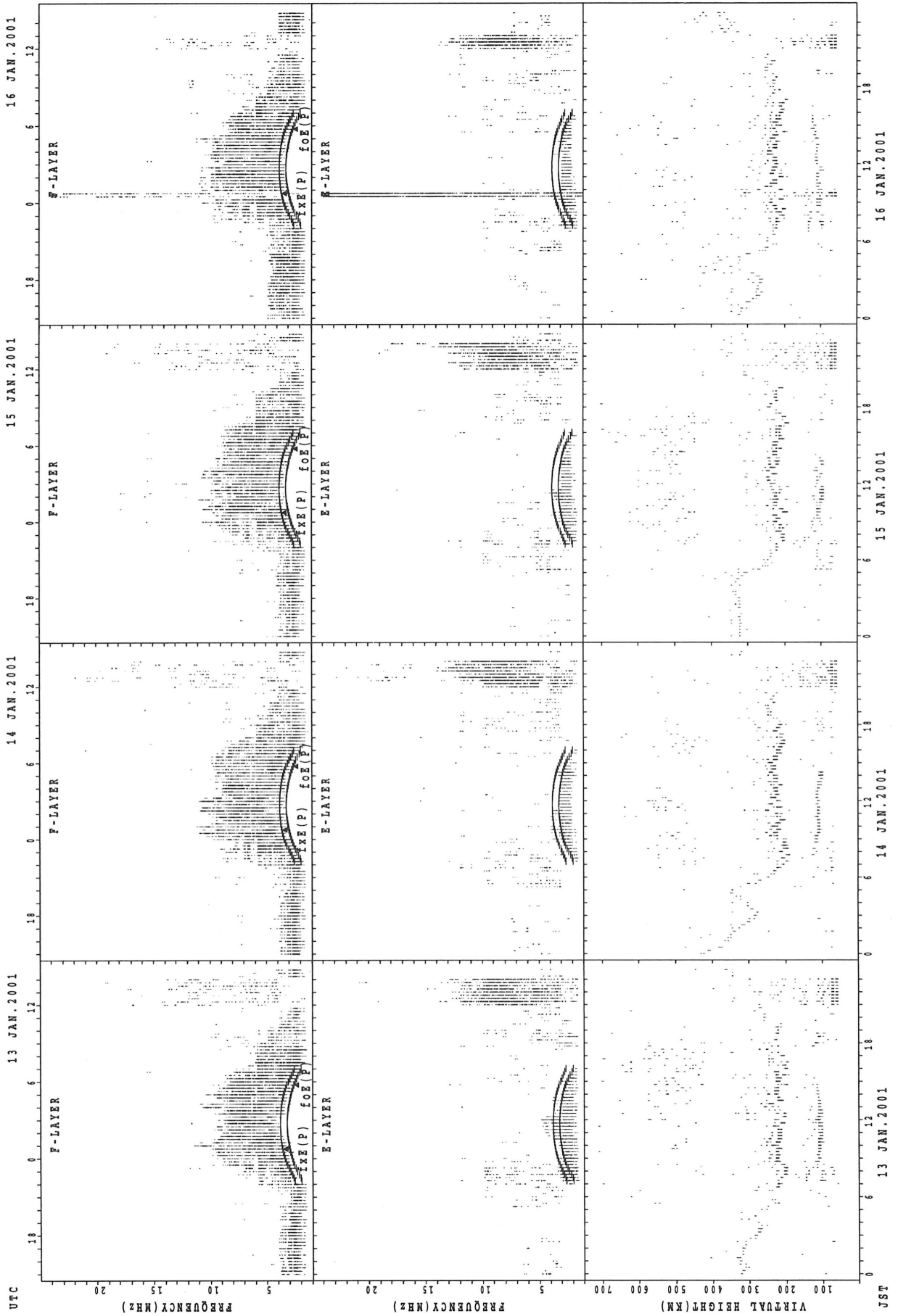
fXe(P); PREDICTED VALUE FOR fXe
fOe(P); PREDICTED VALUE FOR fOe

SUMMARY PLOTS AT Wakkanai



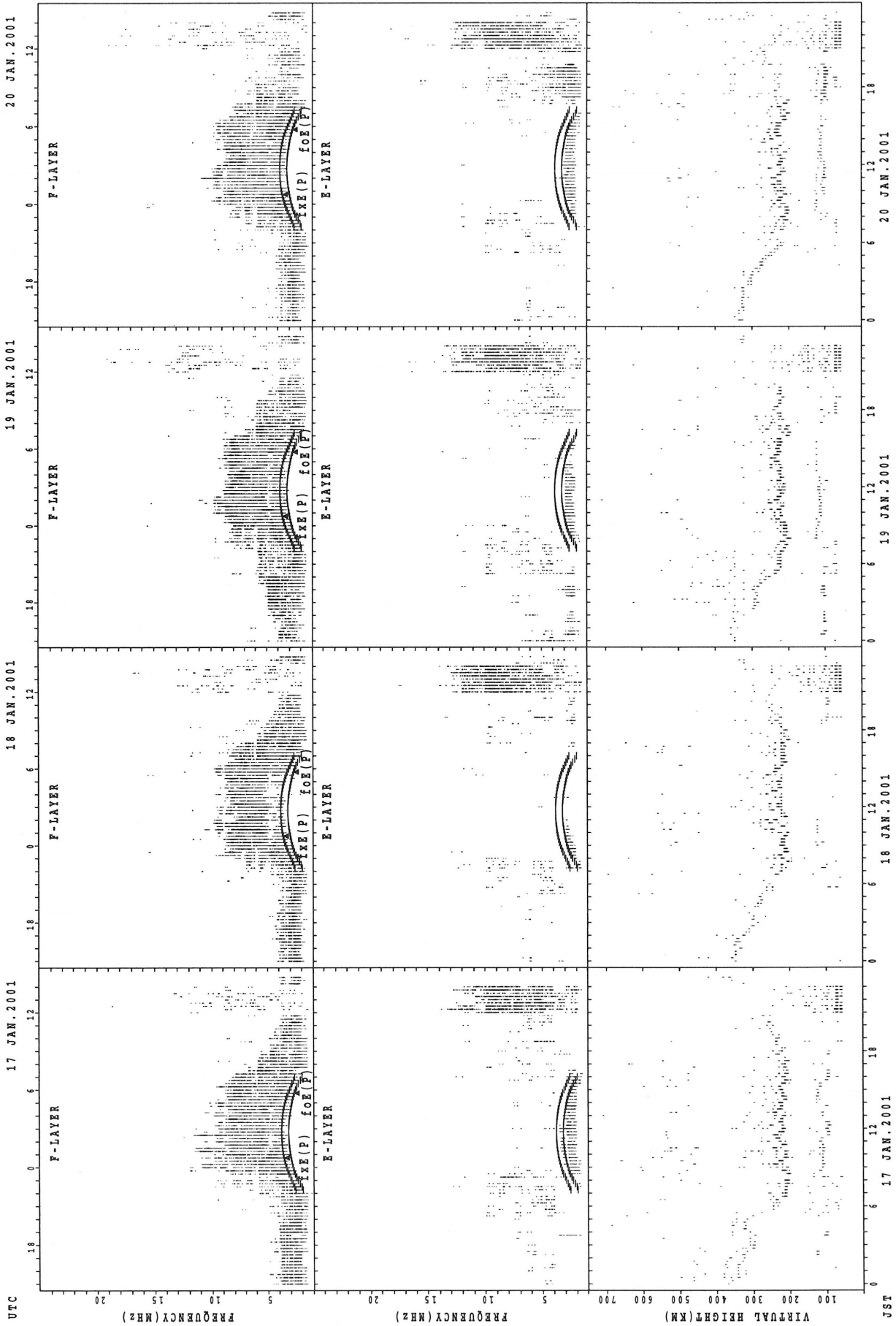
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



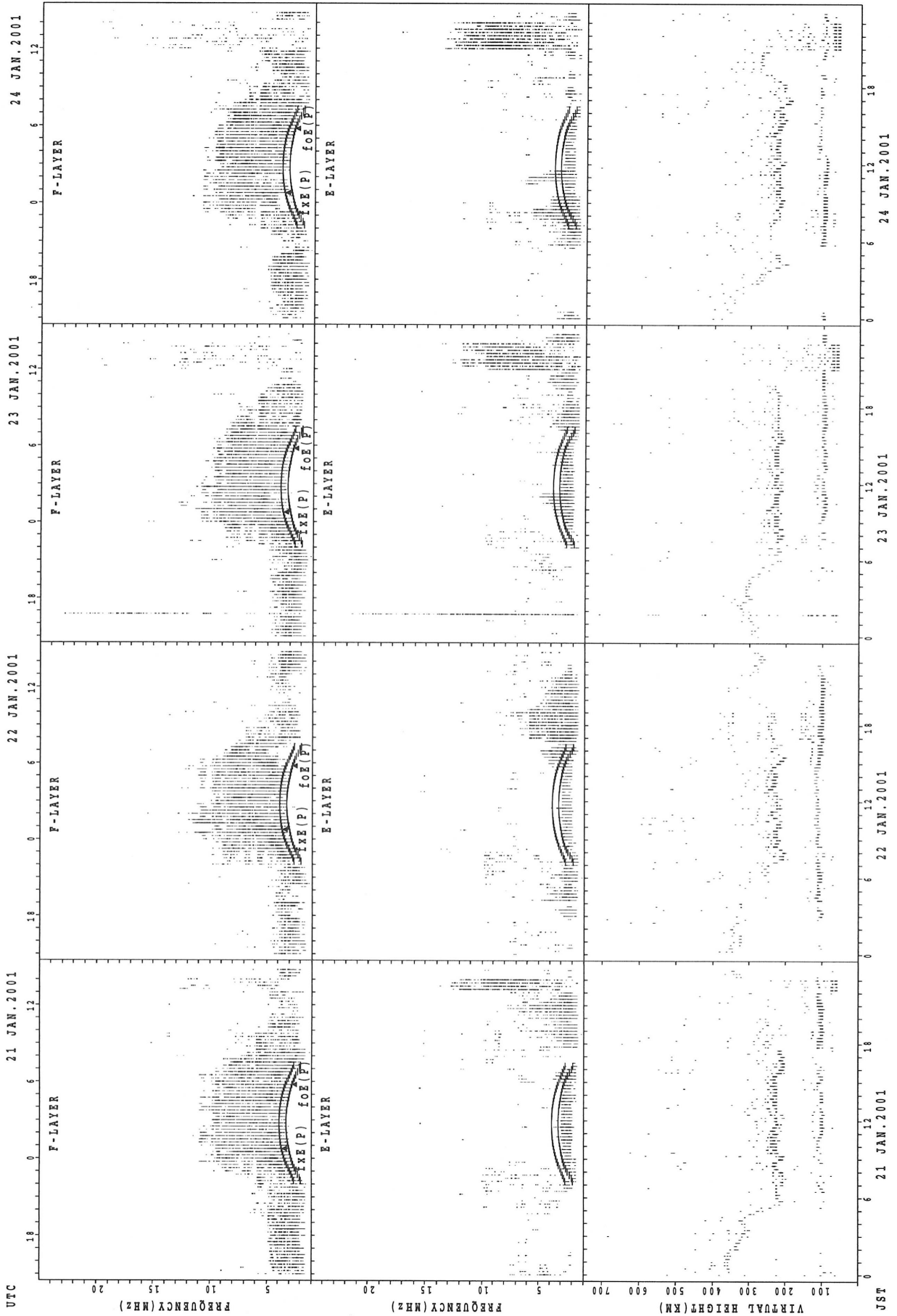
f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanaï



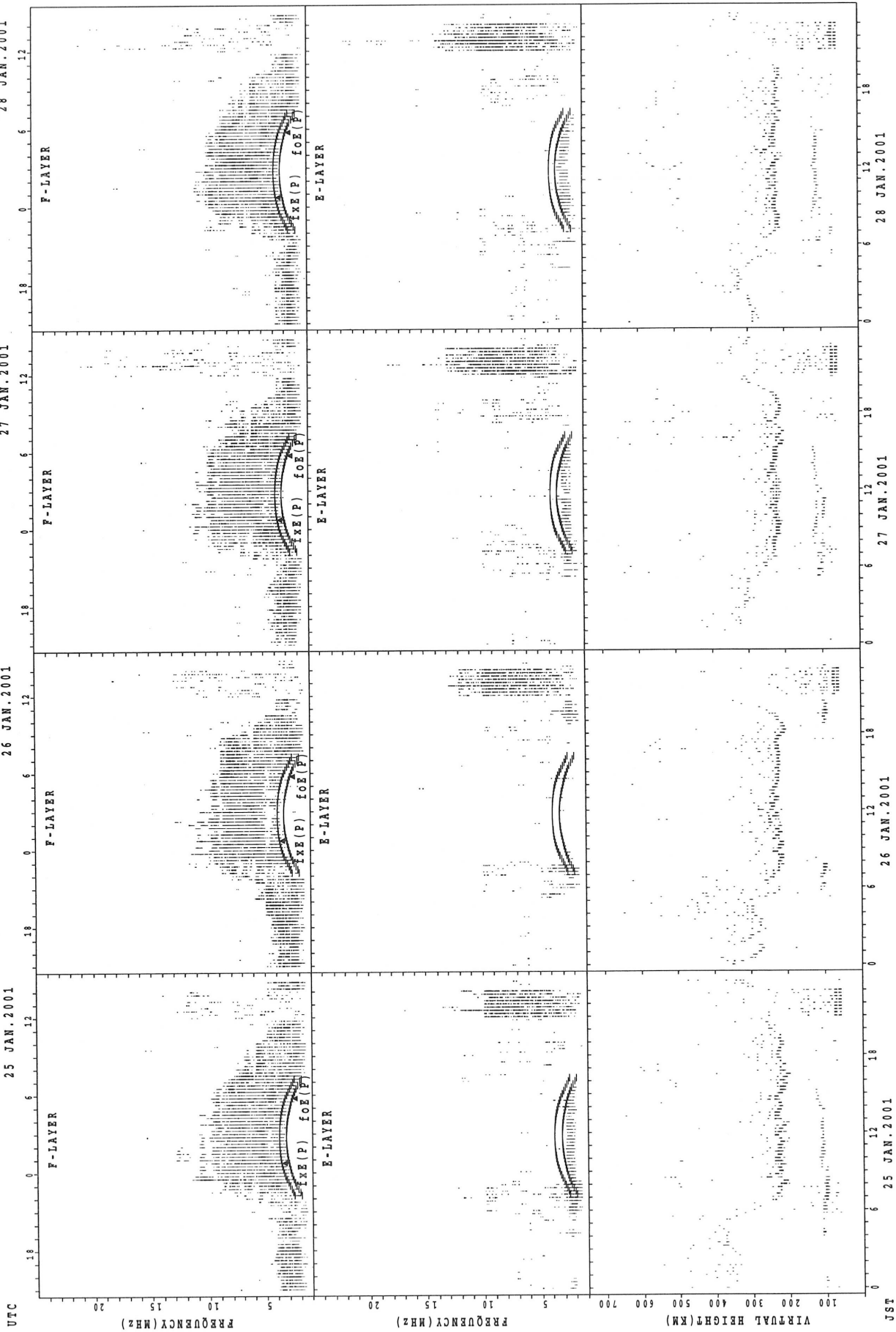
f_oF₂(P); PREDICTED VALUE FOR f_oF₂
 f_oE₃(P); PREDICTED VALUE FOR f_oE₃

SUMMARY PLOTS AT Wakkanai



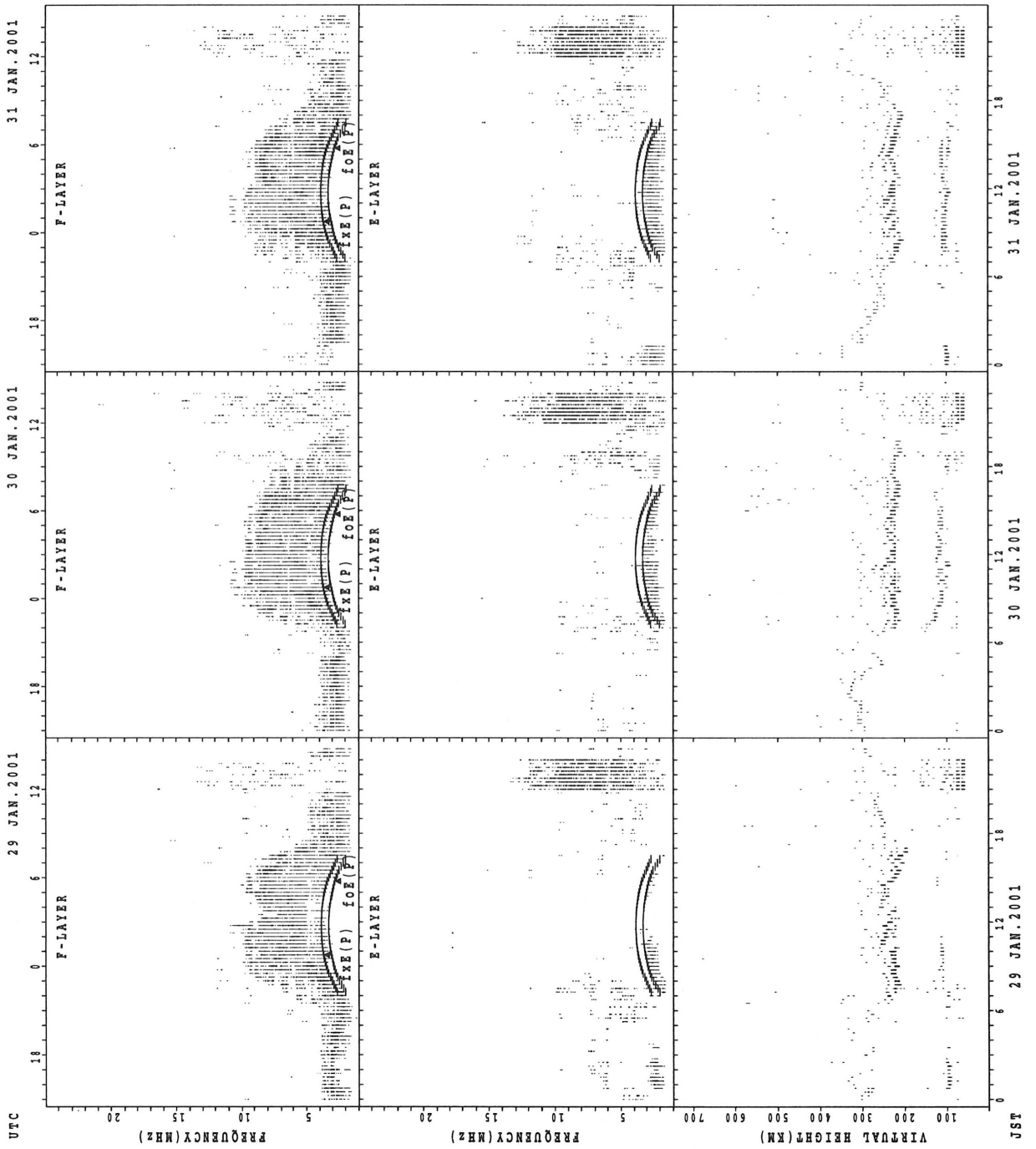
fXE(P); PREDICTED VALUE FOR fXE
fXE(P); PREDICTED VALUE FOR fXE

SUMMARY PLOTS AT Wakkanai



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

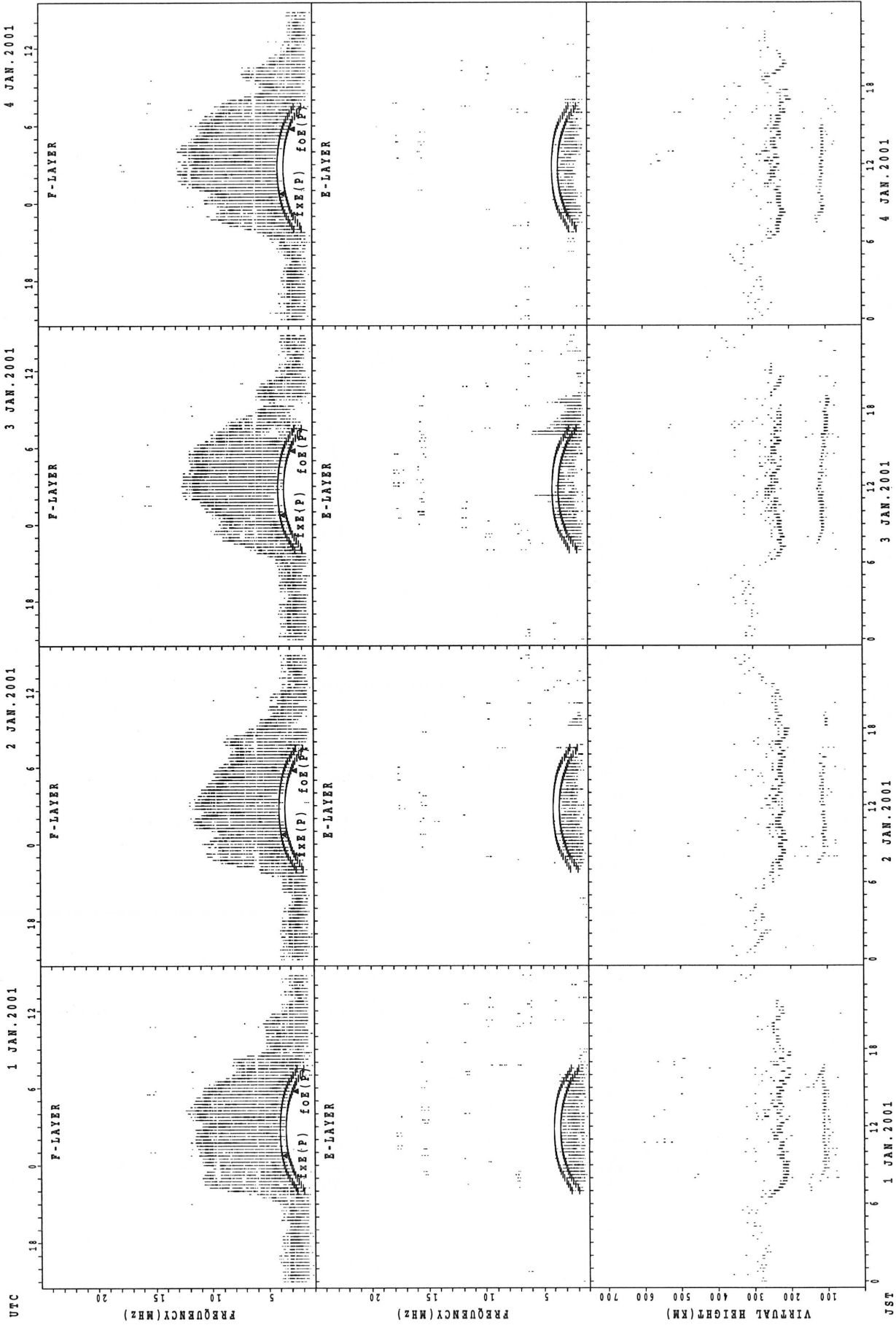
SUMMARY PLOTS AT Wakkanai



fXE(P); PREDICTED VALUE FOR fXE
fOE(P); PREDICTED VALUE FOR fOE

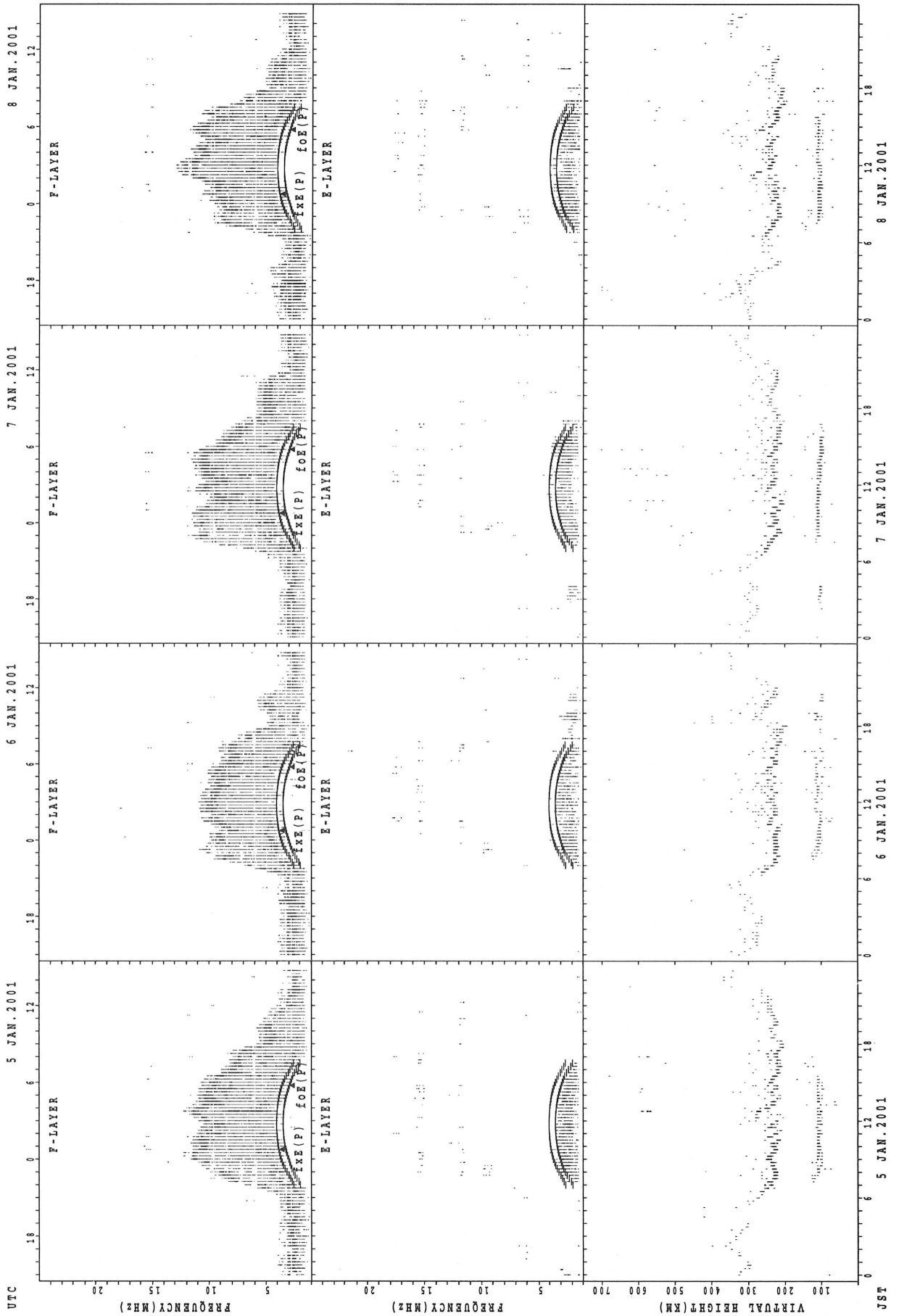
JST

SUMMARY PLOTS AT Kokubunji



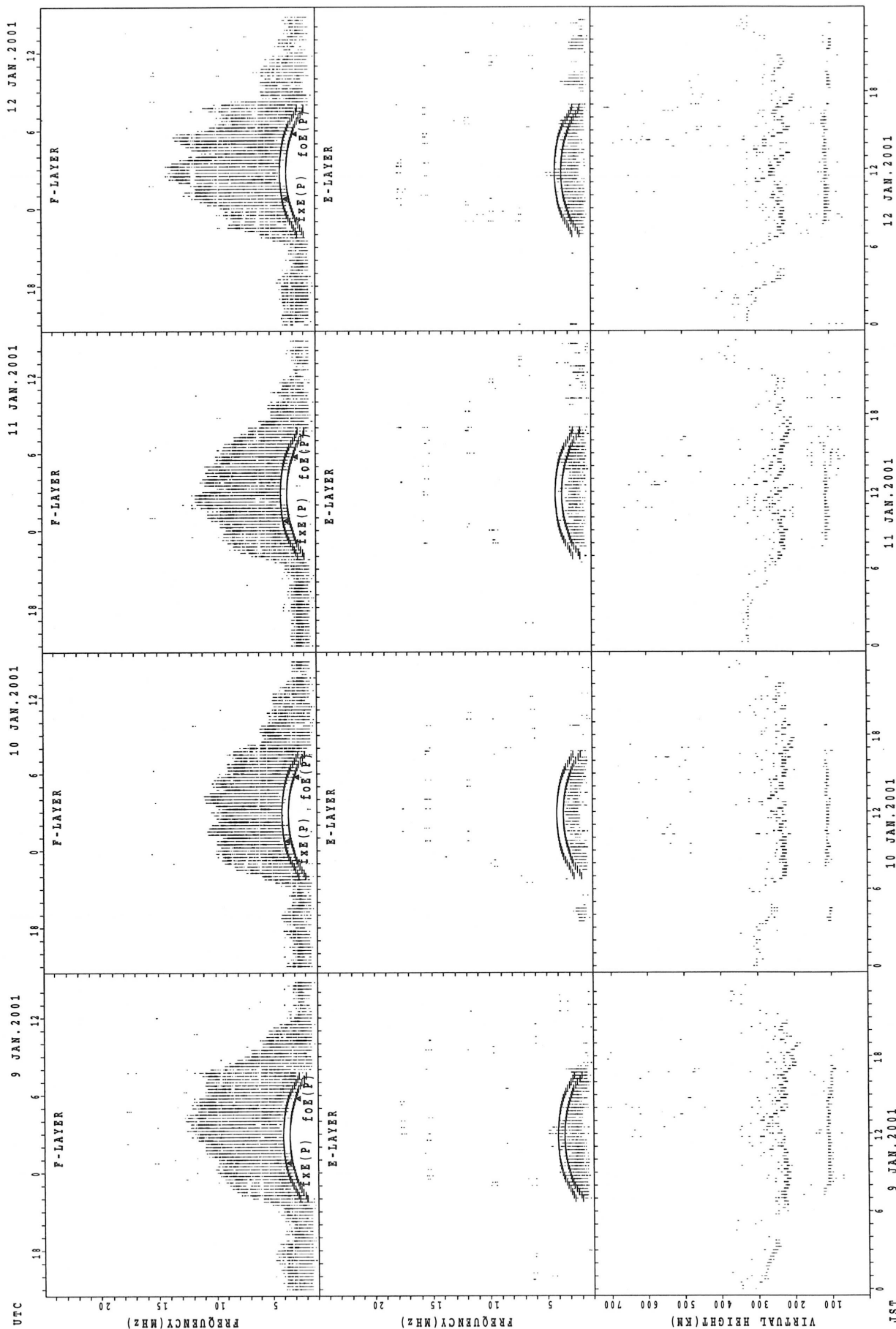
fx(F); PREDICTED VALUE FOR fx(F)
fo(E); PREDICTED VALUE FOR fo(E)

SUMMARY PLOTS AT Kokubunji



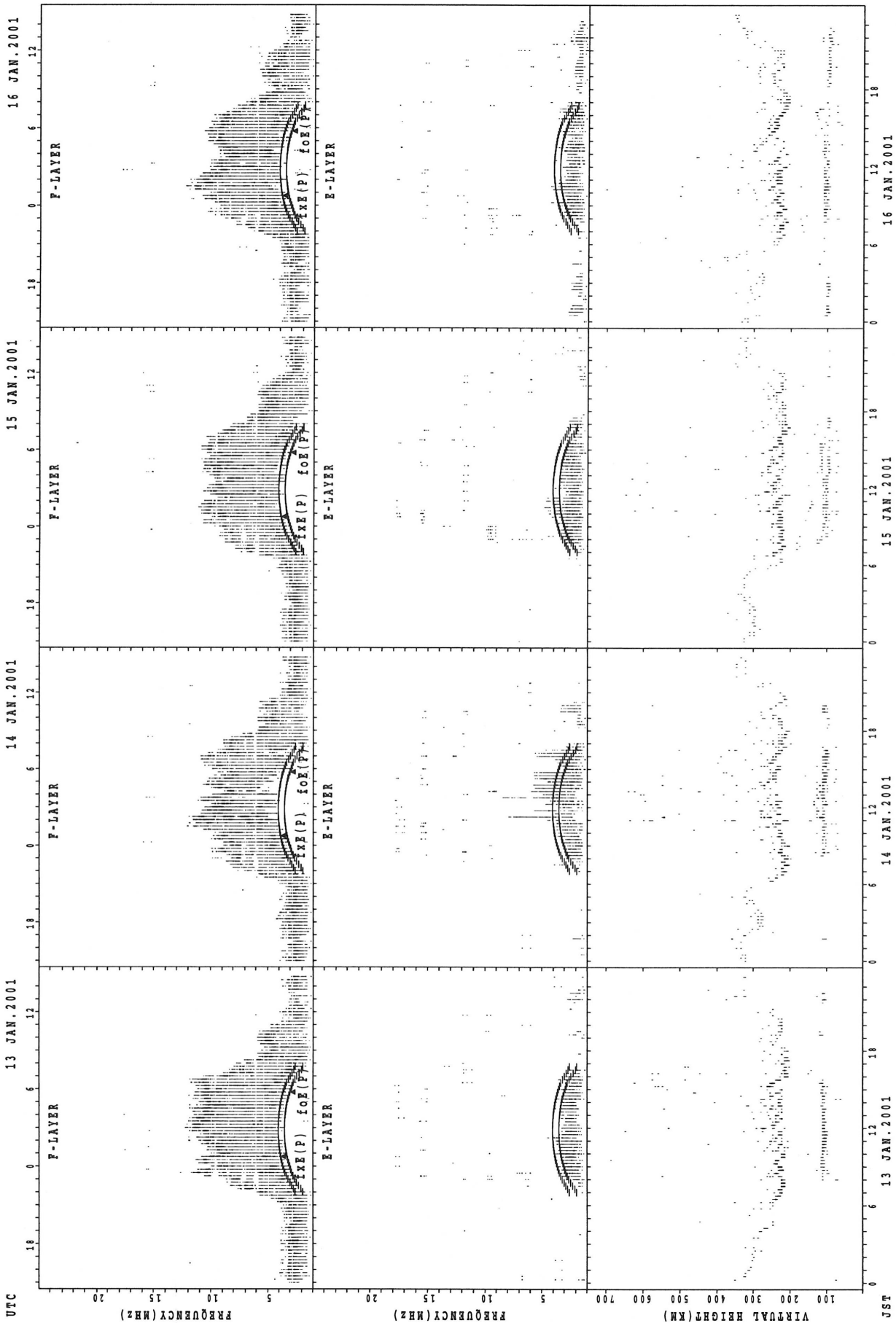
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



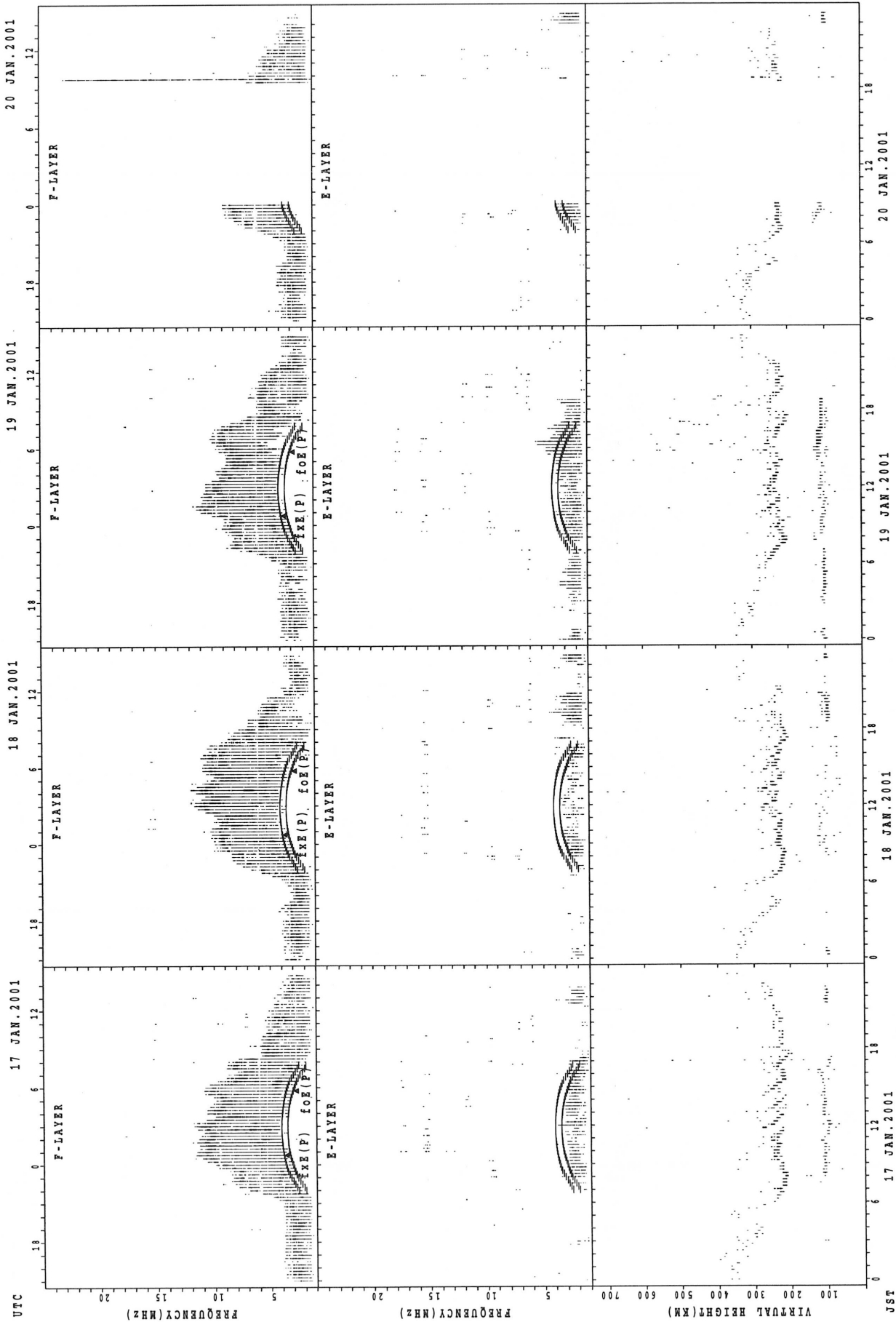
f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



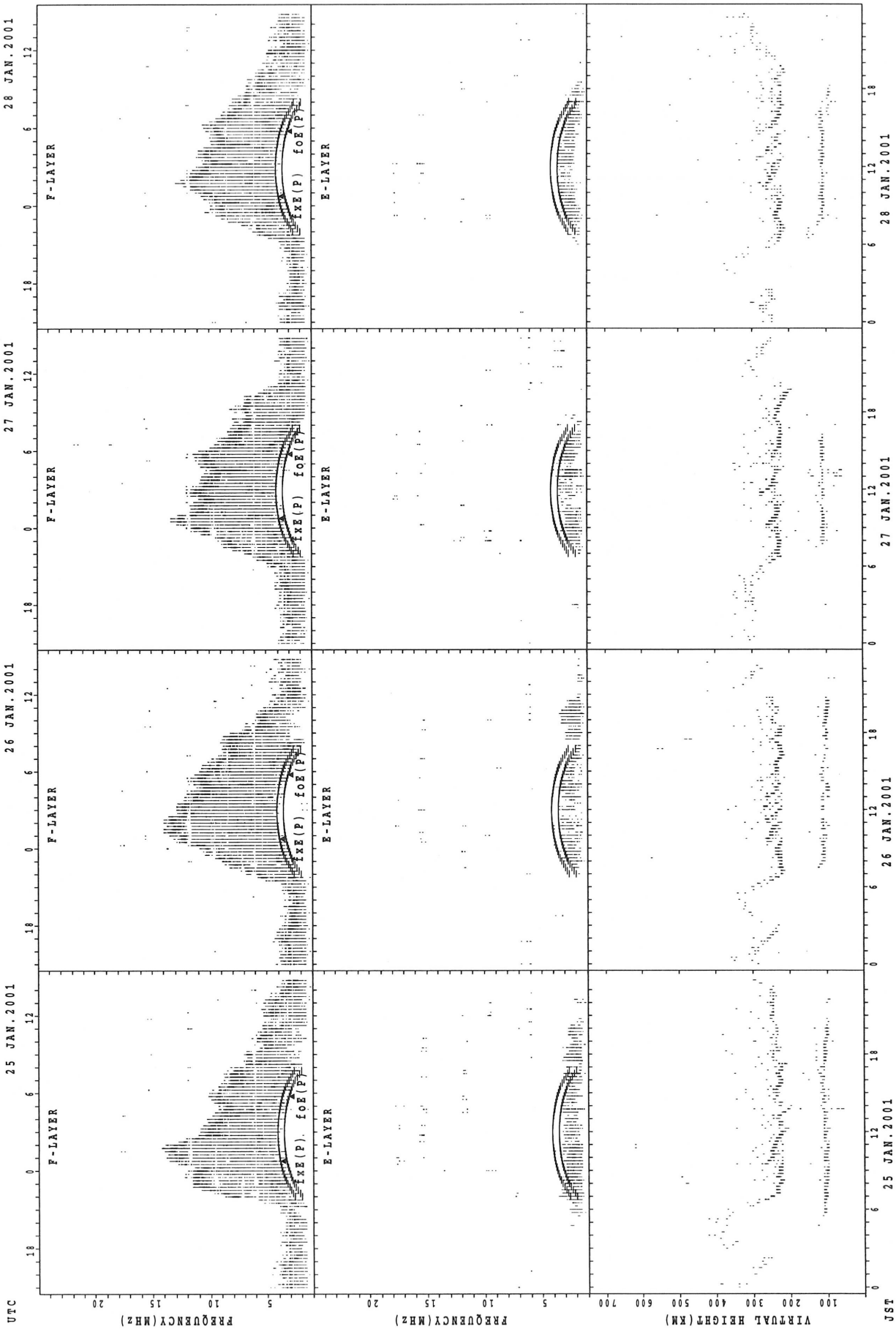
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



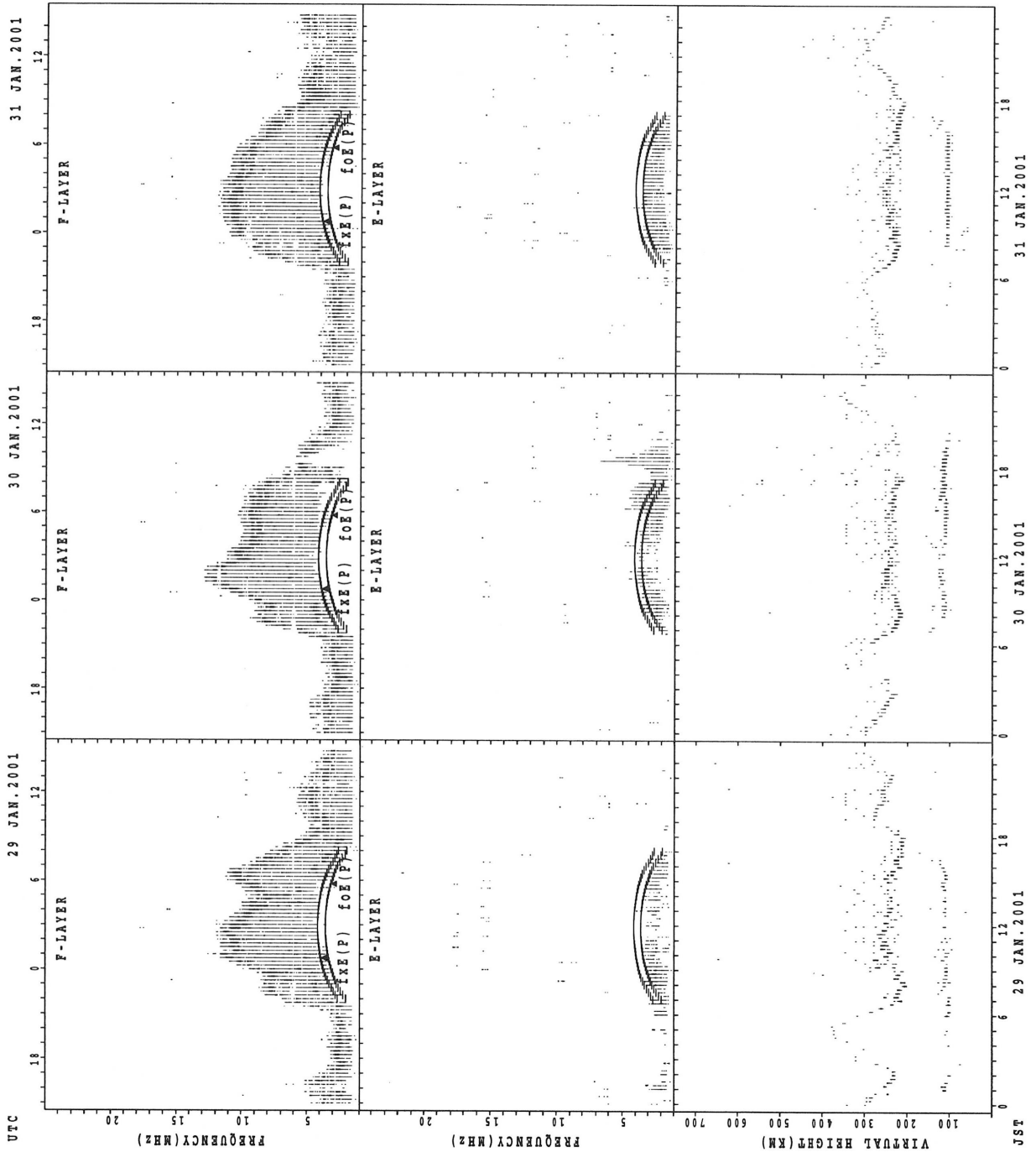
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



fxe(p); PREDICTED VALUE FOR fxe
foe(p); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Kokubunji

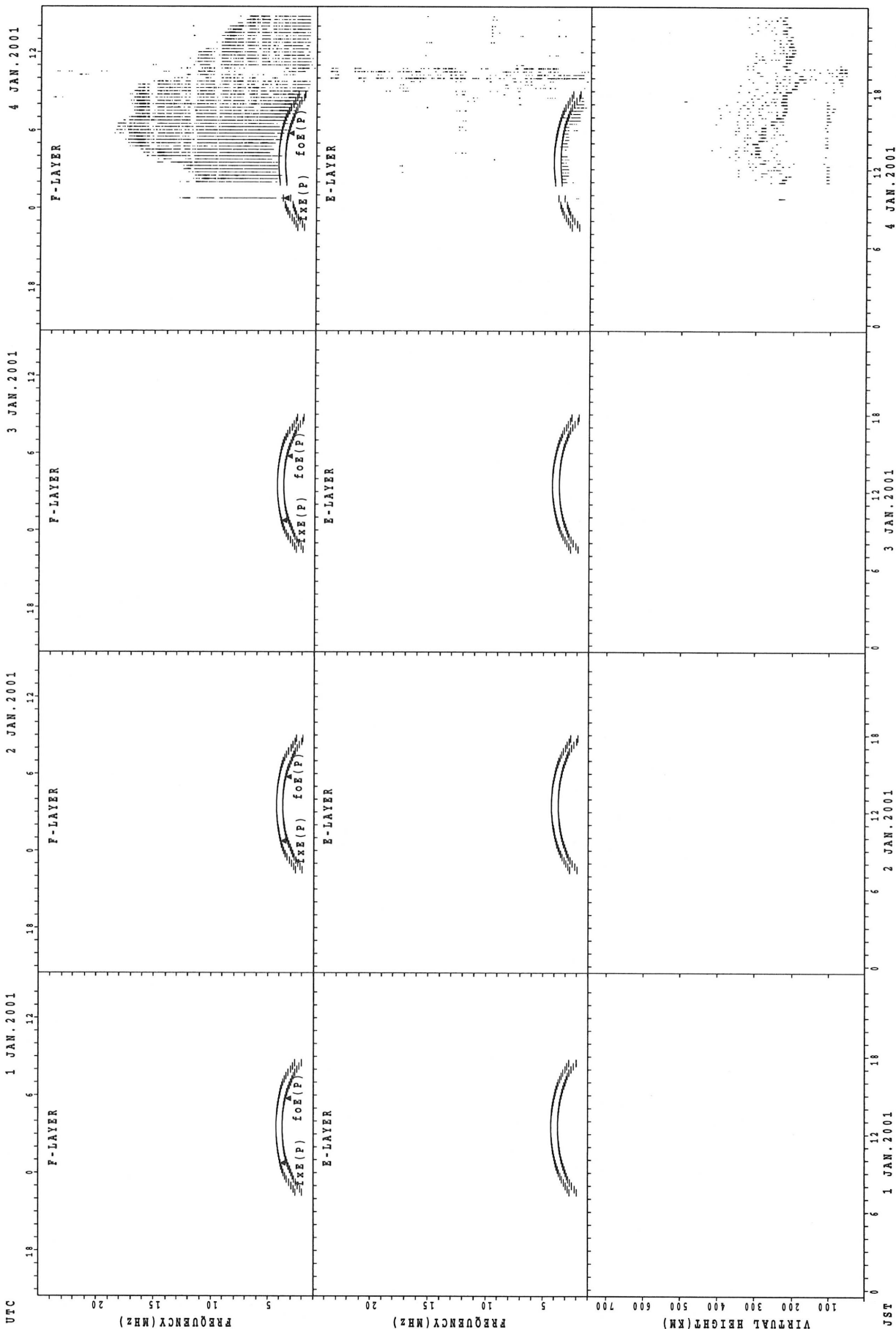


f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS

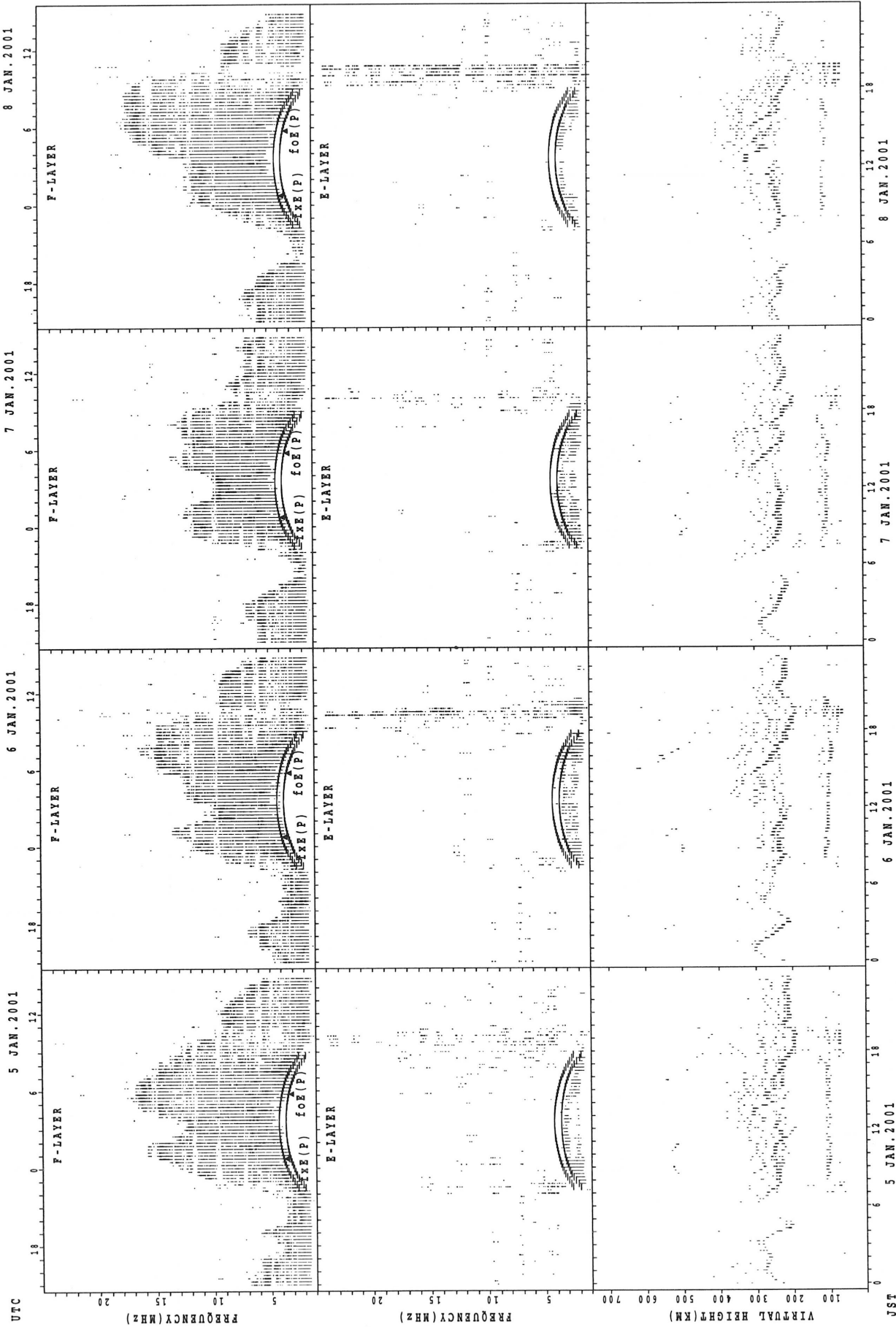
IONOSPHERIC DATA of Yamagawa is not available
due to the ionosonde trouble.

SUMMARY PLOTS AT Okinawa



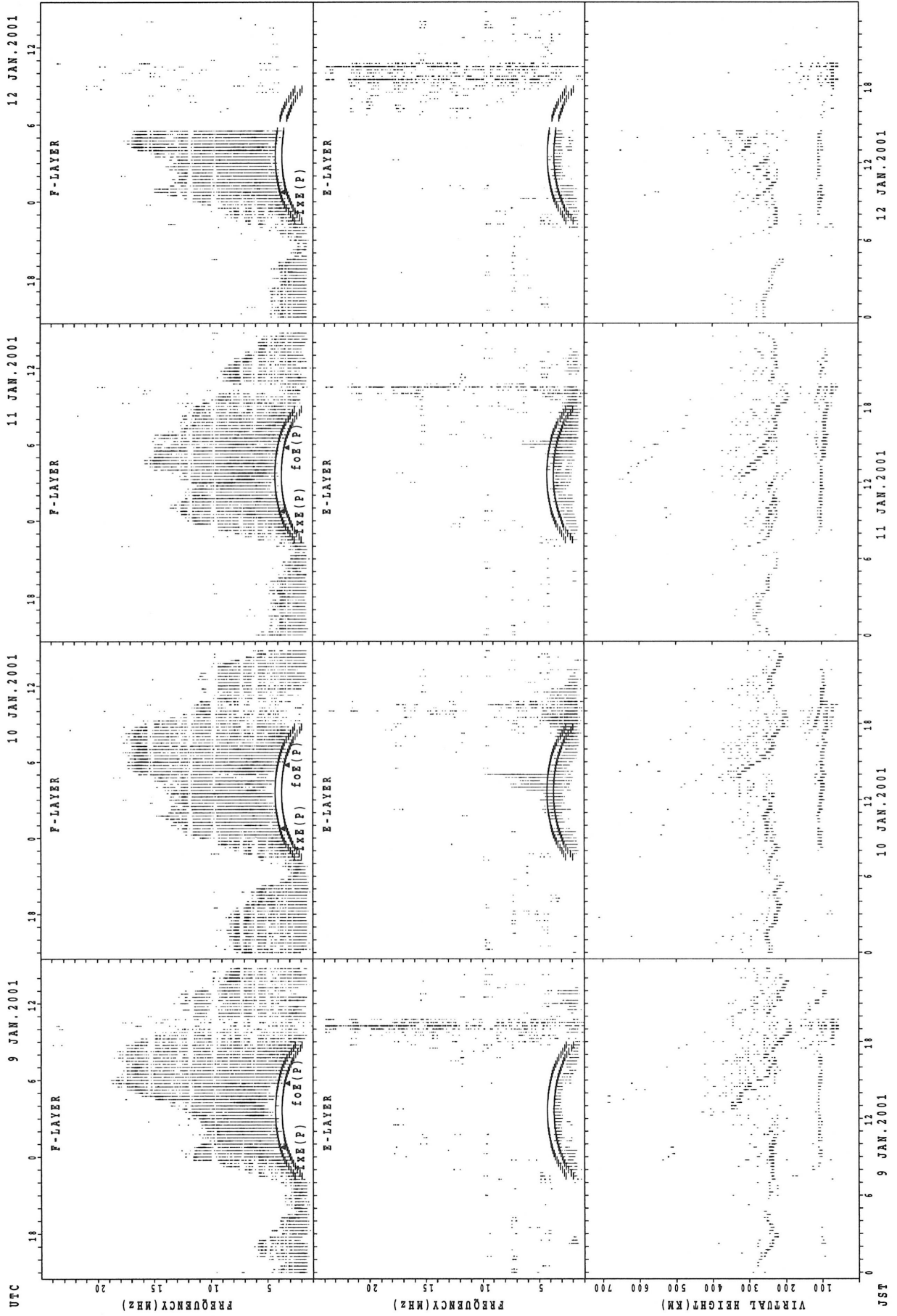
f_oF(P); PREDICTED VALUE FOR f_oF
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



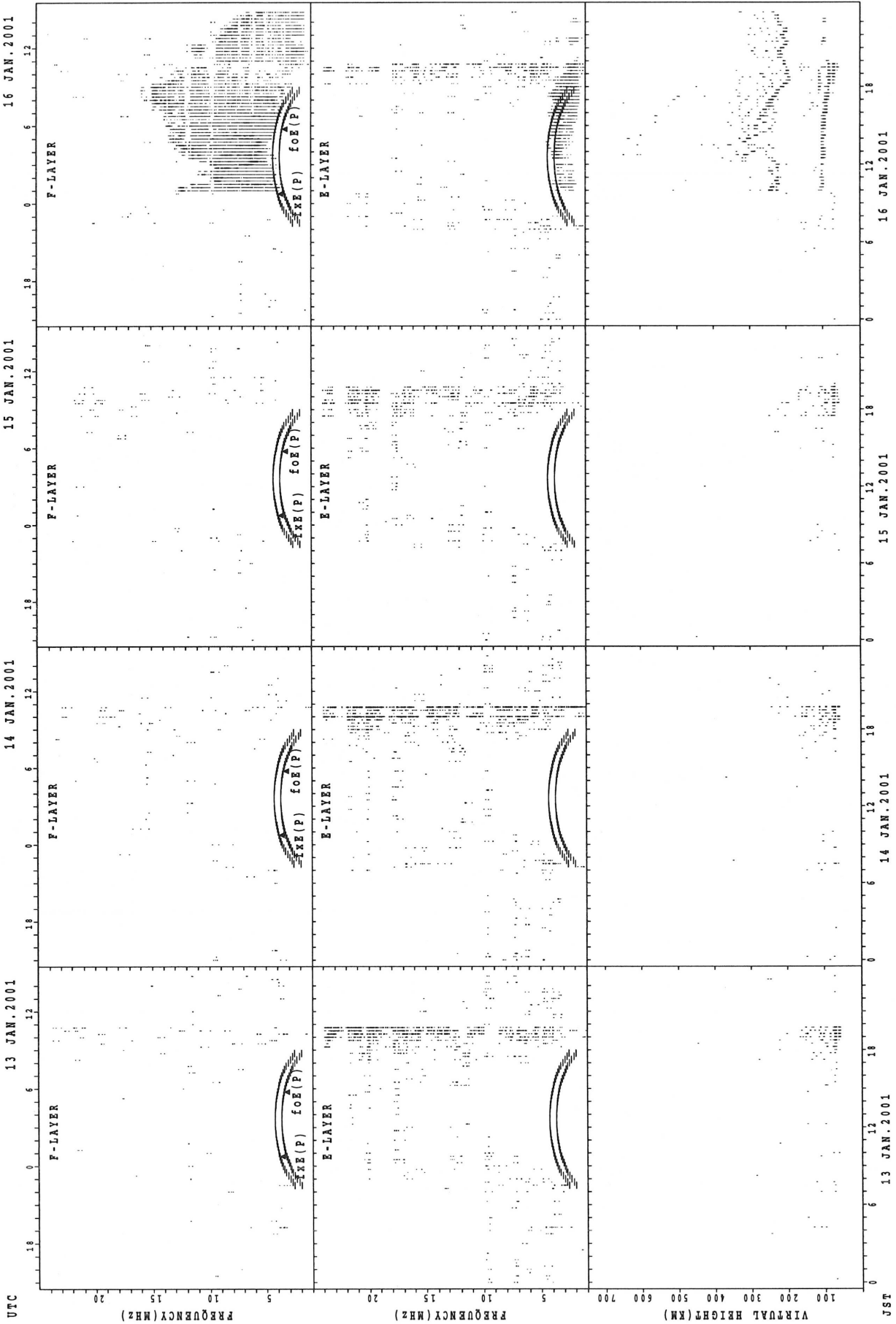
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



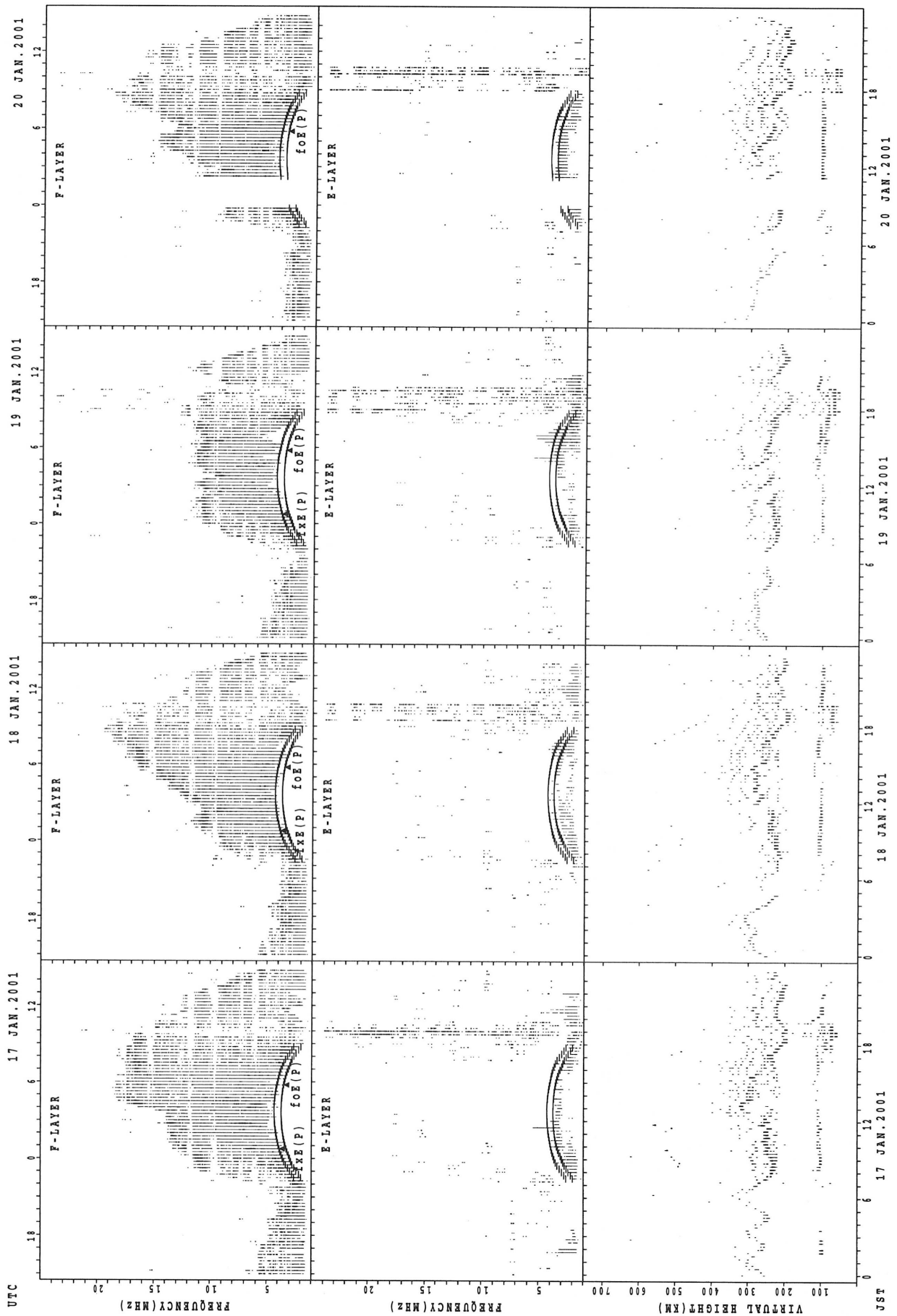
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



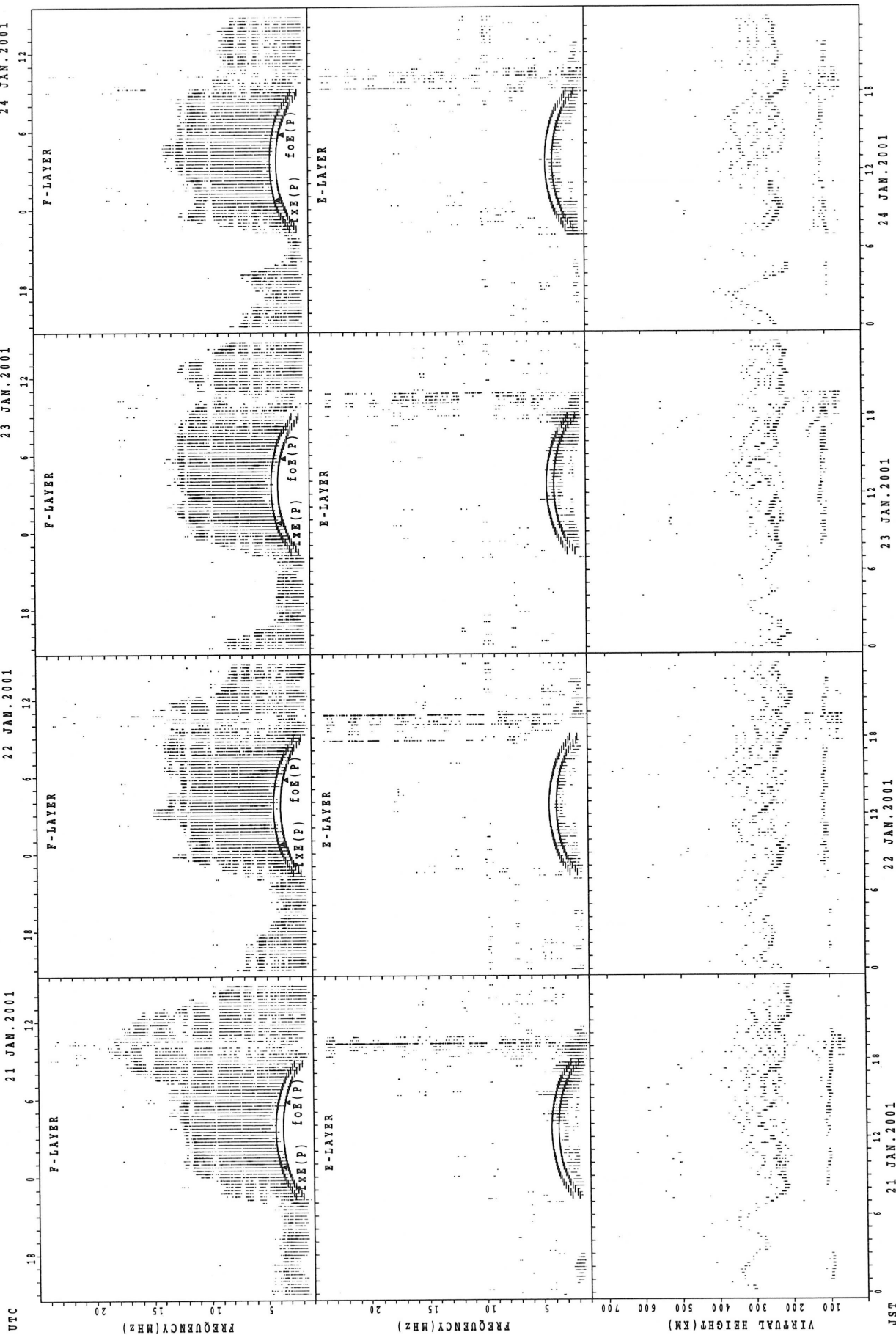
fxe(p); PREDICTED VALUE FOR fxe
foE(p); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



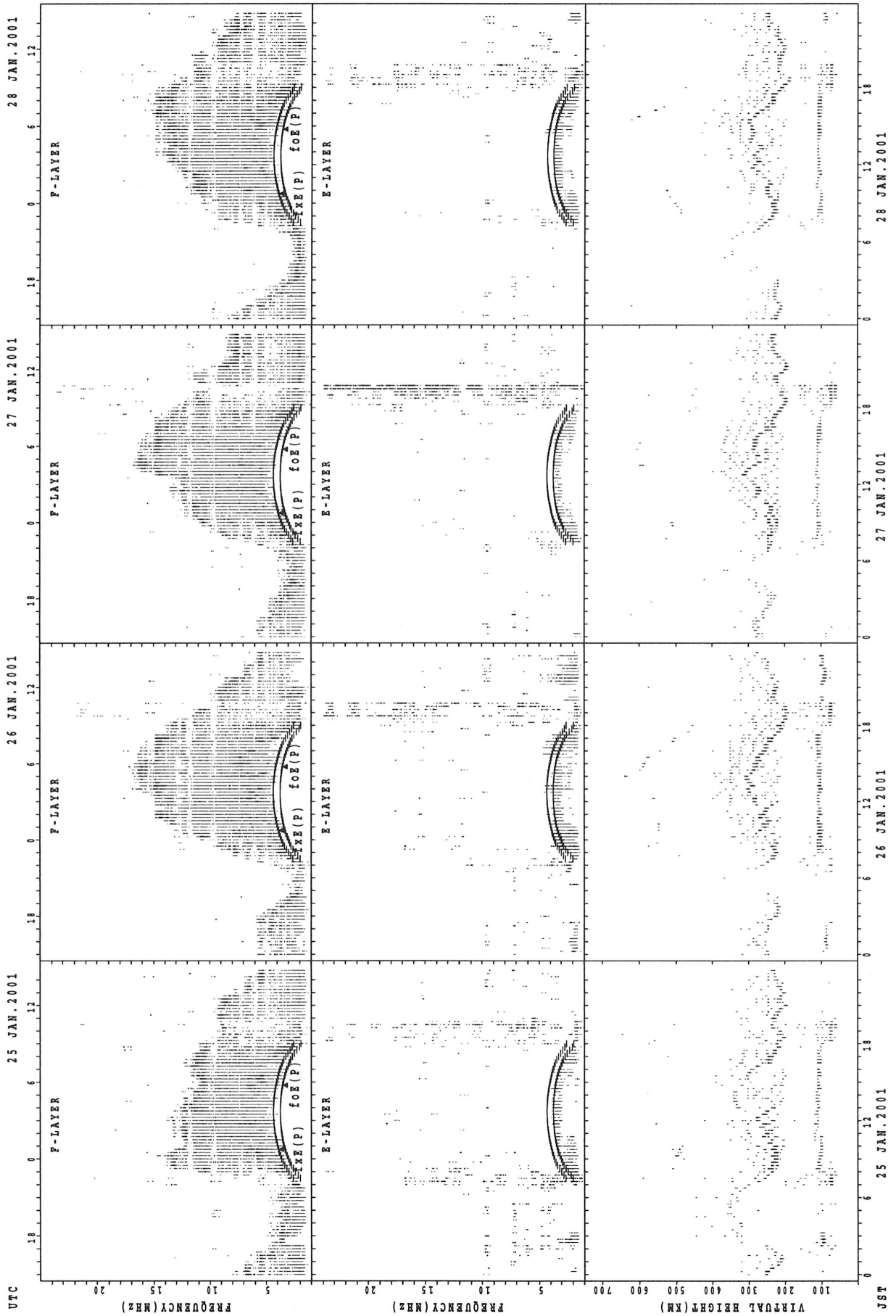
f_oE(P); PREDICTED VALUE FOR f_oE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



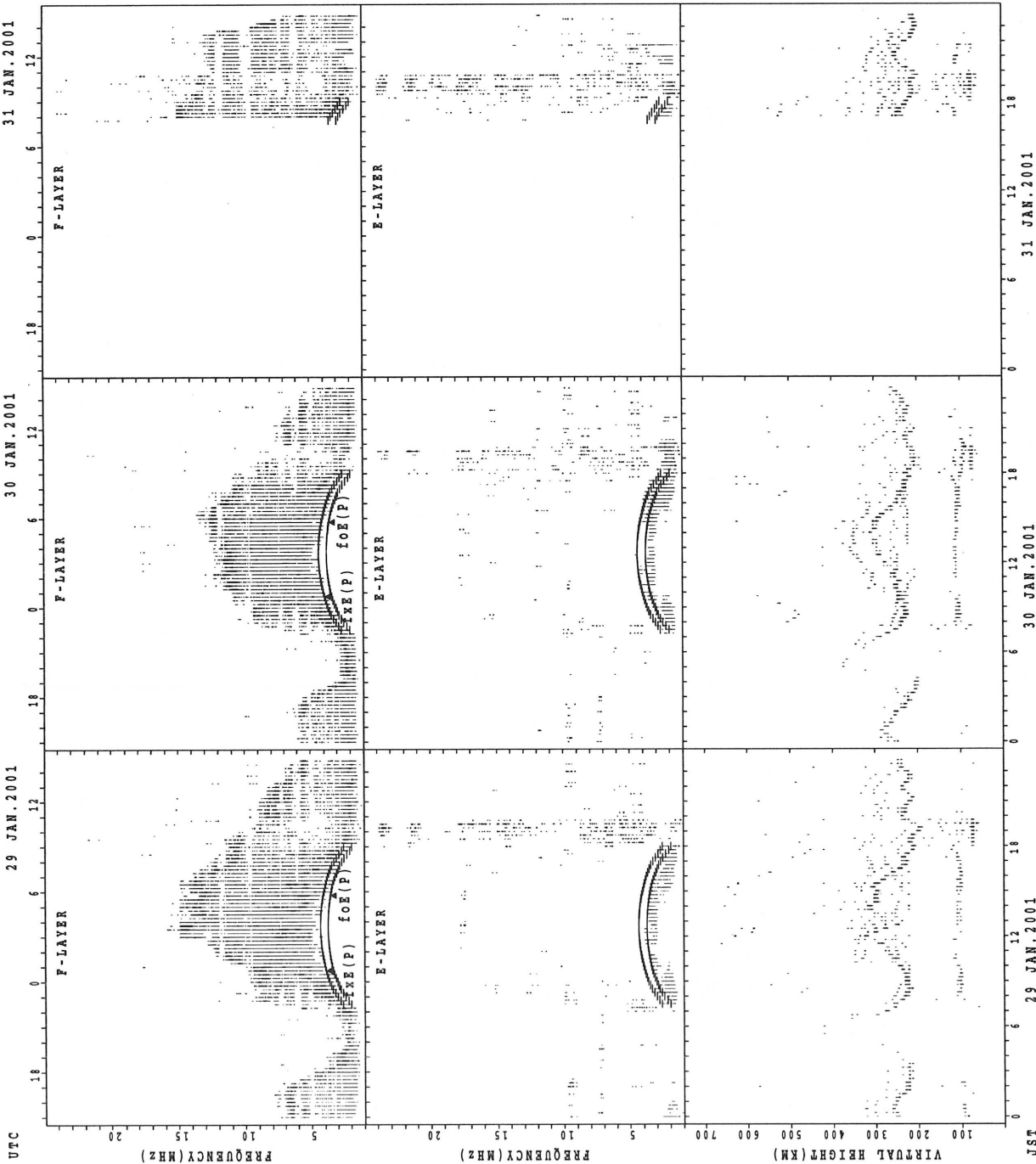
f_{xe}(P); PREDICTED VALUE FOR f_{xe}
 f_{oe}(P); PREDICTED VALUE FOR f_{oe}

SUMMARY PLOTS AT Okinawa



f_{x E}(P); PREDICTED VALUE FOR f_{x E}
 f_{o E}(P); PREDICTED VALUE FOR f_{o E}

SUMMARY PLOTS AT Okinawa



f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

MONTHLY MEDIANS of h'F AND h'Es
 JAN. 2001 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

h'F STATION Wakkanai LAT. 45°23.5'N LON. 141°41.2'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	28	29	30	31	29	29	29	31	27	8	4				2	2
MED								295	230	230	233	236	232	242	240	240	242	287	296				202	263
U Q								318	255	242	248	242	247	252	248	248	248	330	382				202	334
L Q								269	224	223	224	224	229	231	230	232	232	259	247				202	192

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	2	3	1	4	3	5	13	15	2	1	5	2	1	3	6	7	6	10	6	5	3	2	
MED	99	100	105	105	106	111	101	113	121	124	95	105	143	105	103	112	109	107	103	103	103	107	121	
U Q	104	103	119	52	110	111	107	144	137	149	47	117	169	52	113	119	117	111	107	105	106	125	137	
L Q	89	97	99	52	102	107	91	106	103	99	47	97	117	52	103	111	99	95	97	101	101	99	105	

h'F STATION Kokubunji LAT. 35°42.4'N LON. 139°29.3'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	29	29	29	29	29	29	29	29	29	18	6	3	1			
MED								267	232	234	246	242	250	252	264	246	246	254	281	306	322			
U Q								280	242	249	250	254	256	264	272	255	251	274	296	338	161			
L Q								250	224	226	231	238	243	240	247	240	240	236	274	270	161			

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	2	4	1	5	4	2	3	3	4			6	2	2	1	3	10	8	8	8	8	2	5	3
MED	97	104	99	107	104	99	109	107	113			139	124	114	113	109	115	99	104	105	102	102	103	103
U Q	105	110	49	108	105	103	111	143	119			169	139	115	56	123	123	109	111	110	106	105	105	105
L Q	89	103	49	102	103	95	105	105	111			121	109	113	56	99	113	92	103	101	97	99	96	99

h'F STATION Okinawa LAT. 26°16.9'N LON. 127°48.4'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	2	4	1					20	21	22	22	22	19	24	23	22	23	21	20	19	22	20	15
MED	302	299	273	268					241	238	243	246	257	284	288	280	258	246	232	243	260	253	252	272
U Q	316	300	286	134					256	247	250	262	280	310	308	292	272	254	258	264	280	272	273	306
L Q	280	298	265	134					237	232	238	238	248	258	271	264	252	238	218	220	256	238	240	242

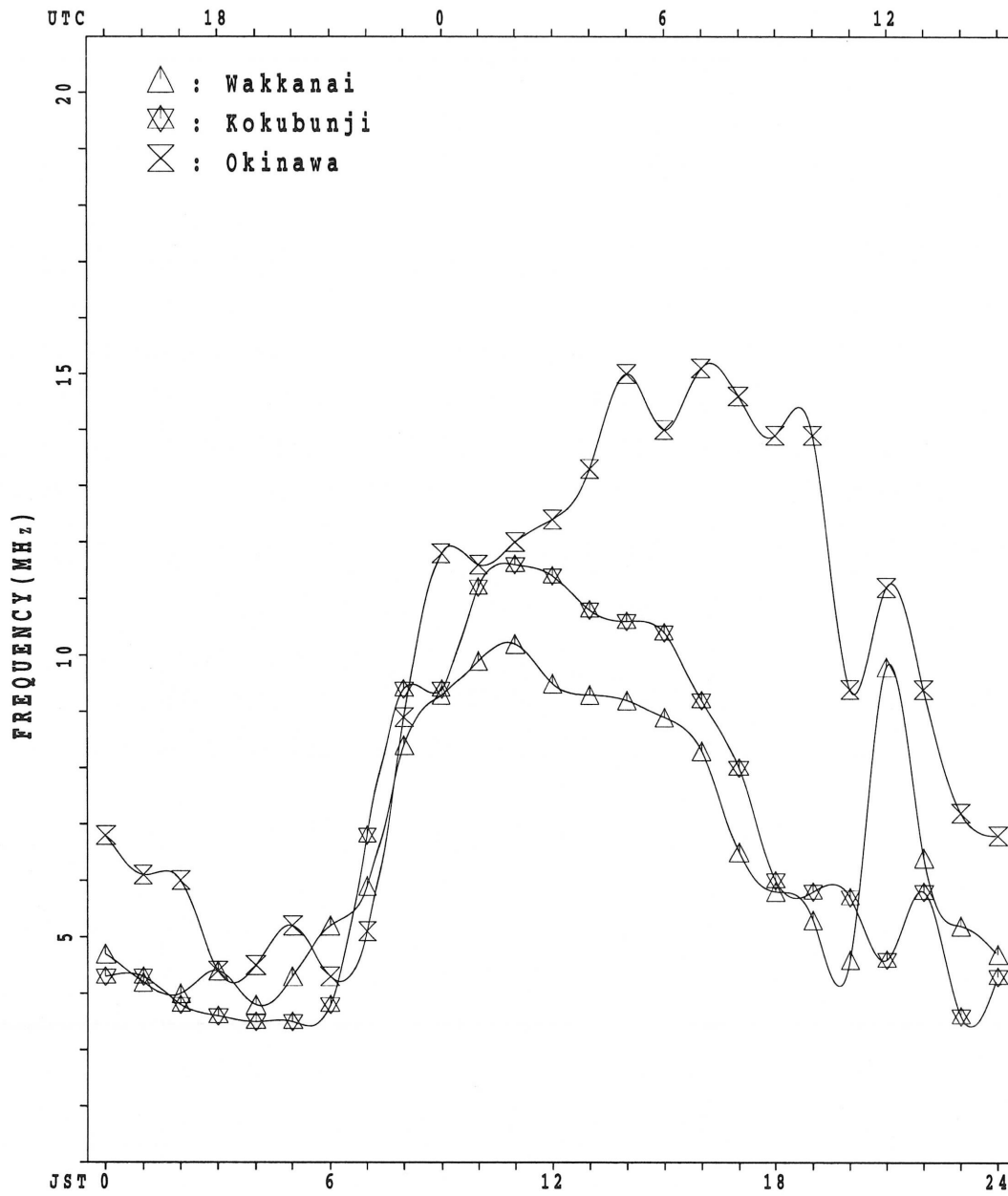
h'Es

	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	2	2	2	1				2	5	3	2	2	3	2	5	6	8	9	9	9	7	7	4	1
MED	98	94	97	99				90	171	119	124	108	105	101	105	109	108	113	99	89	105	99	92	99
U Q	107	99	99	49				97	177	119	141	111	111	105	146	129	112	134	117	101	119	107	94	49
L Q	89	89	95	49				83	166	105	107	105	101	97	95	105	106	96	92	86	99	95	90	49

MONTHLY MEDIANS PLOT OF foF2

JAN. 2001

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 f_{XI} (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

H D	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 44	X 43	X 44	X 41	X 41	X 41	X 45												X 56	X 53	X 56	X 47	X 33	X 38	
2	O 40	X 42	X 42	X 40	X 38	X 37	X 40												X 67	X 52	X 49	X 43	X 39	X 39	
3	R 38	X 42	X 42	O 40	X 41	X 40	X 45												X 63	X 59	X 57	X 44	X 38	X 42	
4	X 44	X 42	X 41	X 41	X 40	X 41	X 47												X 59	X 75	X 53	X 39	X 34	X 36	
5	X 38	X 38	X 38	X 40	X 41	X 40	X 42												O 62	X 59	X 54	X 44	X 38	X 38	
6	X 40	X 41	X 40	X 40	X 38	X 38	X 39												X 50	X 56	X 61	X 43	X 35	X 37	
7	X 40	X 40	X 42	O 40	X 39	X 39	X 42												X 61	X 62	X 58	X 38	X 38	X 42	
8	X 44	X 46	X 44	O 52	X 51	X 39	X 38												O 58	X 54	X 51	X 40	O 41	X 42	
9	X 44	X 46	X 48	X 48	X 42	X 44	X 47												X 78	X 64	X 56	X 40	X 34	X 36	
10	X 40	X 39	X 38	X 43	X 44	X 36	X 37												X 60	X 56	X 54	X 52	R 39	X 35	
11	X 36	X 36	X 36	X 37	X 38	X 35	X 38												X 52	X 50	X 48	X 36	X 36	X 38	
12	X 39	X 40	X 42	X 44	X 39	X 34	X 38												X 59	X 57	X 56	X 47	X 45	X 42	
13	O 42	O 43	X 43	X 40	X 42	X 38	X 41												X 58	X 60	X 49	X 38	X 36	X 40	
14	X 38	X 39	X 41	X 44	X 40	X 39	X 41												X 68	X 61	O 61	X 41	X 38	X 36	
15	X 40	X 41	X 41	O 38	X 39	X 40	X 44												O 67	X 60	X 58	X 39	X 39	O 40	
16	X 41	X 41	X 43	X 43	X 40	X 41	X 44												X 53	X 58	X 55	X 51	X 39	X 39	
17	X 41	X 42	X 43	X 44	X 43	X 42	X 46												X 66	X 60	X 57	X 54	X 48	X 42	
18	X 40	X 39	X 40	X 43	X 44	X 37	X 39												X 79	X 69	X 58	X 45	X 39	X 39	
19	X 40	X 40	X 43	X 42	X 44	X 42	X 45												O 62	X 70	X 63	X 52	X 40	X 42	
20	O 43	X 42	X 43	X 44	X 46	X 39	X 38				C	C	C	C	C	C	C	C	C	C	X 68	X 63	X 53	X 44	X 39
21	X 38	X 38	X 39	X 41	X 42	X 44	X 50				C	C	C	C	C	C	C	C	X 90	X 80	X 81	X 68	O 61	X 56	
22	X 51	X 50	X 48	X 48	X 46	X 48	X 48												X 77	X 77	X 54	X 43	X 47	X 49	
23	X 49	X 46	X 41	X 41	X 42	X 40	X 44												X 86	X 80	X 70	X 50	X 45	X 42	X 46
24	X 42	O 41	X 42	X 44	X 50	X 34	X 33												O 66	X 58	X 57	X 54	X 50	X 50	
25	X 48	X 49	X 46	X 44	X 44	X 41	X 42												X 76	X 65	X 57	X 56	X 55	X 45	
26	X 44	X 45	X 46	X 39	X 38	X 38	X 41												X 84	X 68	X 55	X 47	X 48	X 49	
27	X 47	X 44	X 45	X 45	X 45	X 46	X 47												X 80	X 75	X 50	X 42	X 44	X 46	
28	X 44	X 42	X 40	X 35	X 34	X 37	X 42												O 73	X 68	X 54	X 48	X 49	X 47	
29	X 49	X 55	X 43	X 38	X 38	X 37	X 39												X 58	X 53	X 60	X 60	X 53	X 46	
30	X 48	X 50	X 50	X 42	X 40	X 41	X 40												X 70	X 64	X 52	X 41	X 41	X 42	
31	X 47	X 46	X 45	X 41	X 40	X 40	X 40												X 62	X 60	X 58	X 55	O 56	O 63	
	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												1	30	31	31	31	31	31
MED	X 42	X 42	X 42	X 41	X 41	X 40	X 42												X 86	X 64	X 60	X 56	X 45	X 40	X 42
U Q	X 44	X 46	X 44	X 44	X 44	X 41	X 45												X 76	X 68	X 58	X 52	X 48	X 46	
L Q	X 40	X 40	X 41	X 40	X 39	X 37	X 39												X 59	X 57	X 53	X 41	X 38	X 38	

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 f_oF₂ (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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	38	37	38	35	36	35 ^R	39	83	104	102	108	112	106	116	112	104	78	80	50	47	50	41	28	32		
2	34 ^R	36 ^R	36	34	32	32	34	61	98 ^R	102	97	112	113	106	95	90	80	85	61 ^R	46	43	37	33	33		
3		36 ^R	36	34 ^R	35	34	39	61 ^R	89	88	100	118 ^R	122	118 ^R	114	112	96	79	57	53	51 ^R	38	32	36		
4	38	36 ^R	35	35	34	35	41	68	97 ^R	100	106	120 ^R	121	123	115	108	96	78 ^R	53	69	46	33	28	30		
5	32	32	32	34	35	34	36	68	92	115	112	106 ^R	106	115 ^R	107	102	87	78	56	53	48 ^R	39	32 ^R	32 ^R		
6	34	35	34	34	32 ^R	32	34	70	98 ^R	92	91	97	105	99	94	89	86	72	44 ^R	50	55	37 ^R	28 ^R	31		
7	34	34	36	34	33 ^R	33	36	74 ^R	112	110	108 ^H	96	106	108	112	98	84	67	55	56	52	32	32	36		
8	38	40	38 ^R	46	45 ^R	33	32 ^R	68	93	92	101	113	126	110	101	113	103	72 ^R	52 ^R	48	45	34	35 ^R	36		
9	38	40	42	42	36	38	41	64 ^R	88	94	93	106 ^R	117	122	116	106	103 ^R	101 ^R	72 ^R	58	50	34	28	30		
10	34	33	34	37	38 ^R	30	31	60 ^R	90	94	92 ^R	98	99	105	97	88	82	73 ^R	54	50	47	46		28		
11	30	30	30	31	32	29	32	62 ^R	83	88	102 ^R	111	106 ^R	106	102	91	82	66	46	44	42 ^R	31	30	32		
12	33 ^R	34	36	38	33	28	32	61 ^R	79	93	118 ^R	125	133	117	124	108 ^{U R}	88	98 ^{U R}	53	51	50	41 ^R	38	36		
13	36 ^R	37 ^R	37	34	36	32	35	63 ^R	82	96	97 ^R	107	118	110	106	109 ^{U R}	99	74	52	54	43	32	30	34		
14	32 ^R	33 ^R	35	38	34	33	35	66 ^R	79	84	89	112	101	97	102	94	105	86	62	55	55	35 ^R	32	30		
15	34	35	35	32	33	34	38	69	85	95	106 ^H	102	100	100 ^H	103	106 ^R	100	77	61 ^R	54	52	33	33	34 ^R		
16	35	35	37	38 ^R	34	35	38	62	86	90	100	113	96 ^H	86 ^H	100	100 ^R	93	69	47	52	49	45 ^R	33	35		
17	35	36	37	38 ^R	37	36	40	70 ^R	80	96	112	111	115	103 ^R	96	104	81	82	60	54	51	48	42 ^R	36		
18	34	33	34	37	38	31	33	62	79	94	99	92	114	111	98	106	103	93 ^R	73	62	52	39	33	34		
19	34	34	37	36	37	36	39	72	76	88	106	106 ^R	101	92	83	90	96	80 ^R	56	64 ^R	57	46	34	36		
20	37 ^{U R}	36	37	37	40	33	32	58	82	88											62 ^R	57 ^R	47	38	33	
21	32	32 ^R	33	35	36	38	44	60	79												84 ^R	74 ^R	75 ^R	62	55	50
22	45 ^R	44	42	42 ^R	40	42	43	68 ^R	107	109	122	126	116	113	117	108	93	77	71	71 ^R	48	37	41	43 ^R		
23	43	40	35	35	36	34	37	63 ^R	80	106	128	117	104	94	97	97	93	80	74 ^{U R}	64 ^R	44	39	36	40		
24	36 ^R	35 ^R	36	38 ^R	44	28	27	58	90	131	115	108 ^H	101	98	104	104	91	78	60 ^R		51	48	44	44 ^R		
25	42 ^R	43	40	38	38	35	36	85	118	116	134	134	105	99	91	96	85	79	70	59	52	50	49	39 ^R		
26	38	39	40	33	32	32	35	65	89	105	131	136	126	118	110	106	94	87	78	62 ^R	49	41	42	43		
27	41	38	39	39	39	40	41	69	89	116	122	108	115	103	107	105	85	76	74	69	44	35 ^R	38	40		
28	38 ^R	36	34	29	28	31	36	58 ^R	88	93	107	120	106	106	94	101	89	76	67 ^R	62 ^R	48	42	43	41		
29	43	49 ^R	37	32	32	31	33	66 ^R	77	93	118	111	111	96	91	106	94	74	52	47	54	54	47	40		
30	42	44 ^R	44	36	34	35	34	67	90	93	118	124	108	97	96	98	94	85	64 ^R	58	46	35 ^R	35	36		
31	41 ^R	40 ^R	39	35	34	34	34	65	96 ^R	107	112	113	111	107	104	98	85	75	56	54	52	49	50	57 ^R		
	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	31	31	31	31	31	30	29	29	29	29	29	29	29	29	30	30	31	31	30	31		
MED	36	36	36	35	35	34	36	65	89	94	107	112	108	106	102	104	93	78	58	54 ^R	50	39	34	36		
U Q	38	40	38	38	38	35	39	69	96	106	118	119	116	114	111	106	96	84	70	62 ^R	52	46	42	40		
L Q	34	34	35	34	33	32	33	61 ^R	80	92	100	106	104	98	96	96	85	74	53	51	46	35	32	32		

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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						
2											L		L											
3											L	L			L									
4										L				L										
5													L	L	L									
6											L	L		L										
7															L									
8												L		L										
9												L	L	L	L									
10													L	L	L									
11															L									
12										L	L	L			L									
13												L	L		L	L								
14												9 3 2			L									
15												L	L											
16															L									
17														L	L									
18												L	L	L										
19											L		L		L									
20																								
21																								
22											L	L		L	L									
23										L													L	
24													L	L									L	
25											L			L	L									
26												L		L	L									
27												L	L		L									
28											L		L	L	L									
29										L				L	L								L	
30											L			L	L									
31												L	L		L									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT												1												
MED												9 3 2												
U Q																								
L Q																								

IONOSPHERIC DATA STATION Kokubunji

JAN.2001 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

H D	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								192	U R				U R	U R		R		A	B					
2								168	U R				U R	U R			U R		B					
3								B	248	292						U R	U R	A	B					
4								B	U R	U R		R	R	R	R	R			B					
5								B	U R	A		U R		R			U R	R	B					
6								B	U R	U R		U R	U R	U R		R		B						
7								B	U R	U R		A	U R	U R		A	U R	A	B					
8								184	A	A		A	U R	U R		U R		R	B					
9								B	A	U R	U R	U R		U R	U R		A	A	B					
10								B	U R	R		R		U R	U R		U R	B						
11								B	U R		U R		R			316	288	212	B					
12								B	248	A		U R		A	U R	U R	U R	A	B					
13								B	240	300	340	348		R			U R		B					
14								B	224	280	320	344		R	348		A	U R	A	B				
15								B	252	304	332	344	356	344			U R	U R	B					
16								B	244	288		336		R	R		U R	U R	B					
17								B	R					A	R		U R	B						
18								B	236	288	344		U R	R		R	R	S	B					
19								B	U R	U R		U R	U R				U A	B						
20								B	U R	U R							U R							
21								B	U R															
22								B	U R	A		R		A			A	B						
23								B	252	312	344		U R	U R		R	U R							
24								B	A	A	U R	R		R	352	340	300	228	B					
25								B	A	U R	U R		R	R	U R	U R		B						
26								B	U R				R	R		U R		B						
27								B	252	296							U R	U R	B					
28								B	260	316	340	356		R	R		312	248	B					
29								B	U R	U R		R	R	R	R		U R	B						
30								B	256	308	348		A	A	A		344	308	232	B				
31								180	R		R	A		R			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								4	25	23	16	14	11	14	18	23	21							
MED								182	U R	U R	U R	U R	U R	U R	360	346	320	292	232					
U Q								188	U R	U R	U R	U R	U R	U R	364	352	328	300	244					
L Q								174	U R	U R	U R	U R	U R	U R	344	316	280	218						

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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

H D	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	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
2	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
3	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
4	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
5	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
6	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
7	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
8	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
9	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
10	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
11	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
12	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
13	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
14	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
15	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
16	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
17	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
18	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
19	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
20	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
21	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
22	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
23	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
24	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
25	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
26	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
27	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
28	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
29	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
30	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
31	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	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	31	31	31	31	31	31	31	31	31	30	29	29	29	29	29	29	29	29	30	31	31	31	31	31
MED	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
UQ	16	16	16	16	18	16	16	20	28	32	34	39	40			32	30	22	23	22	22	19	20	16
LQ	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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

H D	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	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
2	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
3	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
4	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
5	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
6	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
7	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
8	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
9	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
10	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
11	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
12	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
13	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
14	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
15	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
16	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
17	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
18	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
19	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
20	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
21	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
22	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
23	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
24	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
25	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
26	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
27	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
28	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
29	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
30	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
31	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	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	31	31	31	31	31	31	31	31	31	30	29	29	29	29	29	29	29	29	30	31	31	31	31	31
MED	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
UQ	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
LQ	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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

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

JAN. 2001 fmin (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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		302	295	300	289	288	279 ^R	301	347	370	350	331	326	313	310	318	324	323	318	297	314	315	330	304	280		
2		282 ^R	291 ^R	301	300	289	273	310	336 ^R	358 ^R	363	321	330	325	310	329	331	328	328	336 ^R	338	321	336	308	298		
3			285 ^R	292 ^R	280 ^R	287	276	309	351 ^R	352	345	329	307 ^R	318	307 ^R	306	319	327	327	333	316	339 ^R	319	256	268		
4		290	316 ^R	298 ^R	297	280	266	306	333	364 ^R	335	309	323 ^R	306	311	307	306	315	320 ^R	287	334	337	316	308	270		
5		277	297	272	274	290	269	311	320	346	333	332	320 ^R	297	320 ^R	312	315	322	318	338	316	324 ^R	310	308 ^R	264 ^R		
6		294	296	304	301	307 ^R	270	296	341	350 ^R	360	332	306	318	318	301	317	322	316	348 ^R	302	329	301 ^R	320 ^R	264		
7		286	280	301	288	310 ^R	275	295	328 ^R	359	360	328 ^H	334	317	307	314	345	319	313	306	318	337	319	289	264		
8		285	283	272 ^R	281	327 ^R	297	326 ^R	336	345	333	342	300	305	307	301	321	319	307 ^R	316 ^R	311	325	326	265 ^R	265		
9		275	281	312	315	269	269	324 ^R	333	341	336	317	311	307	313	305	298	309 ^R	331 ^R	312 ^R	309	309	304	279	267		
10		280	282	285	287	316 ^R	294	309	338 ^R	343	349	323 ^R	351	325	319	321	330	334	313 ^R	313	319	327	307 ^R		274		
11		279	287	286	278	286	302	318	336 ^R	352	341	304 ^R	312	337	312	327	314	345	327	314	320	325	311	260	259		
12		283 ^R	284	284	307	337	277	286	330 ^R	347	323	325	304 ^R	312	303	287	338 ^R	302	326 ^R	321	295	311	280 ^R	303	280		
13		272 ^R	283 ^R	294	299	309	287	309	330 ^R	335	338	329	319	324	310	298	312	332 ^R	333	320	327	353	314	267	273		
14		292	271 ^R	278	296	298	290	297	349 ^R	361	352	329	311	332	338	319	306	335	326	319	321	327	306 ^R	294	289		
15		278	293	287	289	277	284	320	347	354	328	302 ^H	341	329	300	318	323	343	329	316 ^R	305	330	340	267	288 ^R		
16		278	275	283	301	273	257	324	341	337	337	319	325	300 ^H	271 ^H	315	332 ^R	343	324	298	313	300	324 ^R	285	264		
17		260	265	273	282	291	269	316	338 ^R	367	329	336	326	314	312	301	334	325	341	316	310	314	296	311	301 ^R		
18		279	281	281	289	328	272	309	339	357	348	342	336	324	309	319	321	327	324 ^R	329	337	329	321	278	275		
19		274	282	281	280	300	294	321	350	363	350	329	314 ^R	329	320	314	317	328	320 ^R	312	317 ^R	324	342	285	288		
20		276 ^R	274	284	280	311	286	314	345	354	332											312 ^R	294 ^R	301	301	281	
21		271	269 ^R	273	281	289	266	336	342	358												318	294 ^R	315	300	283	287 ^R
22		267 ^R	272	278	275	277	281	283	332 ^R	336	330	311	313	311	306	311	322	322	315	298	328 ^R	330	278	276	278 ^R		
23		306	315	297	267	274	268	317	348 ^R	349	325	337	329	323	316	304	314	332	330	318	327 ^R	314	294	307	284 ^R		
24		291	275 ^R	238	275	324	306	274	327	327	339	330	318 ^H	311	299	303	315	321	317	314 ^R		333	281	302	269 ^R		
25		258 ^R	276	292	260	252	261	267	326	344	327	329	329	313	317	299	319	323	324	324	305	300	311	322	321 ^R		
26		278	290	323	309	287	262	298	341 ^R	333	316	315	310	300	308	297	310	326	318	326	318 ^R	310	265	278 ^R	281		
27		280	283	276	274	277	289	310	334	336	314	340	325	321	310	303	320	323	313	315	333	311	287 ^R	284	300		
28		313	301	328	287	271	281	323	359 ^R	341	346	315	326	326	318	305	314	321	324	306 ^R	321	309	286	279	274		
29		279	313 ^R	338	277	275	262	285	352 ^R	377	310	334	310	308	307	282	295	317	324	312	274	294	301	307	292		
30		279	295 ^R	321	292	267	291	293	330	353	322	323	323	308	303	305	322	319	337	313 ^R	331	313	299	286	264		
31		299 ^R	312 ^R	301	299	291	289	294	324 ^R	339	332	328	323	316	307	307	317	329	327	313	313	293	266	274	292 ^R		
		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	31	31	31	31	31	30	29	29	29	29	29	29	29	29	29	30	30	31	31	30	31	
MED		279	283	287	287	289	277	309	338 ^R	350	336	329	323	316	310	306	319	323	324	316	316	321	306	286	278		
U Q		290	295	301	299	309	289	318	347 ^R	358	348	332	328	324	316	316	324	330	328	321	327	329	319	307	288		
L Q		276	276	278	278	277	269	295	330	341	328	318	311	308	307	301	314	320	318	312	310	310	294	278	267		

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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						
2												L		L											
3												L	L			L									
4											L				L										
5														L	L	L									
6												L	L		L										
7																L									
8													L		L										
9													L	L	L	L									
10														L	L	L									
11																L									
12											L	L	L			L									
13													L	L		L	L								
14													316			L									
15													L	L											
16																L									
17															L	L									
18													L	L	L										
19												L		L		L									
20																									
21																									
22												L	L		L	L									
23											L							L							
24														L	L		L								
25												L			L	L									
26													L		L	L									
27													L	L		L									
28												L		L	L	L									
29											L				L		L								
30												L			L	L									
31													L	L		L									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT													1												
MED													316												
U Q																									
L Q																									

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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

H D	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											254						264							
2										268	274													
3										268	280			284										
4									268				274											
5												304	250	268										
6										270	242		284											
7															290									
8											296		284											
9											282	288	294	316										
10												270	274	282										
11															274									
12										280	254	298			286									
13											268	276		294	298									
14											358			268										
15											248	256												
16															288									
17														296	300									
18												252	270	298										
19											272		268		330									
20																								
21																								
22											270	268		280	272									
23											274						268							
24													306	272		278								
25											254			264	304									
26												280		270	322									
27												264	264		292									
28											284		252	272	298									
29											294			278		312								
30												272		306	286									
31												268	272		282									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										4	9	14	12	15	19	4		1						
MED										277	270	268	271	278	288	288		264						
U Q										287	272	282	282	294	300	305								
L Q										271	261	254	266	272	282	273								

JAN. 2001 h'F2 (KM)

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IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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

H D	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	266	272	270	260	284	304	258	242	218	216	216	212	228	240	238	234	208	216	212	238	246	222	276	316
2	304	286	266	268	288	326	242	228	226	228	222	228	222	230	220	226	228	230	210	214	224	234	264	306
3	302	286	286	294	298	332	256	222	220	230	218	230	240	238	222	244	232	222	216	246	224	246	E B	338
4	294	240	274	268	298	338	268	230	222	226	232	222	230	236	222	234	214	204	250	238	210	234	242	E B
5	328	280	318	302	280	E B 324	270	236	228	238	232	226	226	212	218	218	222	224	210	234	232	236	248	E B 332
6	312	268	270	256	284	326	280	238	230	222	220	206	232	230	230	230	230	206	200	252	244	218	248	E B 338
7	E B 322	298	270	284	270	E B 326	278	186	228	228	220	208	184	232	228	226	220	208	226	250	226	216	272	E B 312
8	294	290	296	292	242	270	228	244	218	224	210	228	240	200	236	244	228	202	204	240	228	244	336	E B 338
9	E B 308	274	272	252	272	304	230	234	224	220	226	238	240	238	222	230	224	212	210	192	238	254	332	E B 342
10	E B 300	286	294	290	260	270	276	228	224	228	224	238	232	230	234	228	226	208	226	218	226	228	230	E B 312
11	E B 328	E B 314	E B 316	308	304	244	256	236	230	218	204	242	234	244	218	230	228	214	248	222	226	228	332	E B 360
12	E B 330	302	292	264	230	E B 350	294	228	224	230	222	234	246	228	216	216	228	214	240	234	230	234	272	E B 326
13	E B 338	300	292	274	262	282	248	224	222	224	220	208	200	236	230	214	210	222	208	236	222	258	334	E B 312
14	E B 320	E B 332	E B 312	272	276	300	266	216	212	208	226	212	230	240	222	232	234	226	206	228	240	224	244	E B 312
15	300	286	294	296	308	300	240	240	224	228	232	218	A 238	240	242	230	214	218	224	220	220	306	300	
16	300	E A 308	286	278	288	E B 352	244	232	222	202	226	232	220	218	220	246	230	212	208	246	226	228	270	322
17	E B 340	E B 334	E B 310	306	270	E B 346	252	234	216	202	238	236	222	212	224	244	224	220	232	216	228	234	254	E B 260
18	314	E B 320	308	282	244	282	266	224	218	232	220	216	190	230	226	238	230	214	218	228	234	226	292	E B 310
19	E A 350	E B 318	E B 298	300	E A 290	284	262	234	210	224	222	226	232	230	218	238	234	206	234	230	224	222	258	E A 294
20	E B 314	E B 314	E B 298	296	266	244	260	220	226	228	C	C	C	C	C	C	C	C	C	C	226	232	232	E A 320
21	340	E B 354	E B 342	300	290	E B 324	232	218	222	C	C	C	C	C	C	C	C	C	208	224	232	230	240	E A 266
22	290	E A 338	282	302	310	300	268	240	230	218	236	234	228	222	220	228	220	218	238	224	212	282	322	E A 294
23	260	274	282	328	310	E B 328	252	220	216	230	236	228	212	212	230	228	230	226	226	220	212	258	270	E B 284
24	294	E B 326	E B 352	E A 342	240	E B 270	318	244	230	232	226	232	226	218	236	230	220	218	218	256	234	282	256	E B 324
25	E B 324	288	266	338	E B 368	E B 368	330	252	230	230	220	226	218	212	202	236	226	222	242	232	224	248	248	244
26	286	286	254	228	278	E B 342	280	222	226	234	232	226	228	216	230	232	228	228	220	242	236	262	290	272
27	304	300	286	294	298	280	260	234	208	234	236	216	212	236	218	236	224	226	230	214	220	294	292	268
28	252	266	242	278	E B 330	E B 318	240	220	232	226	218	248	228	220	236	248	228	226	228	222	238	260	298	284
29	298	266	228	280	290	E B 352	300	218	208	214	226	238	238	220	244	246	220	218	212	252	268	256	236	E B 284
30	290	278	246	242	286	276	286	240	220	232	234	238	218	230	234	240	236	224	238	266	234	236	290	E B 344
31	288	254	264	268	262	266	288	248	232	230	230	218	220	224	220	230	234	226	214	242	260	300	290	266
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	29	29	28	29	29	29	29	29	30	31	31	31	31	31
MED	297	280	280	282	281	287	260	232	224	228	226	228	228	230	224	232	228	218	218	232	228	234	264	U 298
U Q	E B 324	E B 314	E B 298	300	298	E B 332	280	240	228	230	232	235	232	236	234	241	230	225	232	242	236	258	298	E B 332
L Q	294	274	270	268	266	280	248	222	218	220	220	217	219	218	220	228	221	212	210	222	224	228	248	284

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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

H D	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 144	122	124	122	116	118	118	A	118	128	B							
2								E B 182	118	126	120	124	122	120	126	124	120	B							
3								B	118	116	A	A	122	122	124	122	A	B							
4								B	122	118	120	122	130	A	120	122	118	B							
5								B	E A 122	138	116	128	118	116	128	128	130	B							
6								B	A	124	120	124	118	130	116	118	122	B							
7								B	E A 126	136	A	A	122	A	122	122	124	B							
8								E B 150	128	116	A	122	116	120	120	116	A	B							
9								B	A	124	128	122	130	132	118	128	A	B							
10								B	118	132	118	126	118	118	116	122	120	B							
11								B	118	124	124	138	128	126	128	118	120	B							
12								B	122	A	A	120	A	120	122	124	A	B							
13								B	130	126	128	128	122	120	120	130	132	B							
14								B	118	122	122	118	126	126	A	124	A	B							
15								B	124	122	120	120	E A 130	116	118	120	118	B							
16								B	126	118	126	120	118	120	116	122	126	B							
17								B	A	124	120	120	A	118	124	120	122	B							
18								B	120	118	124	118	120	120	122	124	128	B							
19								B	122	122	128	120	120	122	122	118	120	B							
20								B	122	128															
21								B	130																
22								B	E A 142	A	120	124	E A 134	A	122	122	116	B							
23								B	126	120	124	122	118	124	122	122	118								
24								B	A	A	120	122	116	116	118	118	116	B							
25								B	A E A 134	118	120	118	118	126	122	118	B								
26								B	118	120	118	120	128	116	122	124	122	B							
27								B	118	122	118	120	128	B	122	118	122	B							
28								B	126	118	124	126	128	118	124	128	118	B							
29								B	118	120	124	118	118	120	120	120	118	B							
30								B	122	118	124	124	120	124	118	116	116	B							
31								E B 138	122	120	132	A	122	120	118	A	122	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								4	26	27	25	26	27	25	27	28	24								
MED								E B 147	122	121	122	122	121	120	122	122	120								
U Q								E B 166	126	126	124	124	128	123	124	124	123								
L Q								E B 141	118	118	120	120	118	118	118	118	118								

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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

H D	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	114	B	B	B	B	B	B	G	148	110	110	104	G	G	110	142	122	96	B	B	B	B	B	B	
2	B	B	B	B	B	B	B	184	122	138	140	104	112	G	114	112	G	B	B	110	B	B	B	B	
3	B	B	B	B	B	B	B	154	180	120	106	114	114	108	110	106	106	98	104	102	B	B	B	B	
4	B	B	B	B	B	B	B	140	G	G	112	110	110	G	106	G	B	B	B	B	B	B	B	B	
5	B	B	B	B	B	B	B	112	142	108	108	106	G	110	106	114	B	B	B	B	B	B	B	B	
6	B	B	B	B	B	B	B	112	110	108	106	106	106	G	G	G	B	106	116	100	B	B	B	B	
7	B	B	B	106	104	B	B	116	114	108	110	108	108	106	104	146	G	B	B	120	B	B	B	B	
8	B	B	B	B	B	B	B	166	144	118	128	108	166	108	110	G	116	112	114	B	B	B	B	B	
9	B	B	B	B	B	B	B	G	110	110	108	168	140	132	126	106	104	96	B	B	B	B	B	B	
10	B	B	B	B	108	120	B	B	G	110	116	110	108	106	G	112	156	B	B	B	B	B	B	B	
11	B	B	B	B	B	B	B	B	146	110	104	110	110	106	154	140	G	B	B	B	116	110	B	B	
12	B	B	B	B	B	B	B	156	118	108	124	158	122	108	112	152	110	104	B	106	B	118	98	96	
13	B	B	B	B	B	B	B	B	112	110	108	106	110	110	110	114	160	B	B	118	B	B	110	B	
14	B	B	B	B	110	B	B	B	144	106	106	144	126	126	128	110	104	134	B	96	110	B	B	B	
15	B	B	B	B	B	B	B	B	110	106	148	140	148	100	96	G	G	98	B	B	B	98	102	B	
16	B	104	104	102	B	B	B	B	108	108	110	106	106	112	108	152	G	B	102	96	100	98	96	100	
17	B	B	B	108	B	102	B	B	110	112	110	108	98	110	114	110	G	128	114	B	92	108	B	B	
18	104	B	B	B	B	B	B	B	G	106	G	G	G	G	106	G	102	152	B	120	96	110	118	108	
19	100	B	B	108	102	104	104	106	110	108	102	104	176	158	138	124	116	112	114	B	B	B	B	B	
20	B	B	B	B	B	B	B	B	G	110	C	C	C	C	C	C	C	C	C	C	B	B	B	100	
21	106	106	B	B	B	B	B	B	110	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	
22	B	104	B	B	110	B	B	B	116	148	108	180	156	138	150	138	118	114	B	B	B	102	98	104	104
23	106	102	100	106	106	112	106	B	110	174	110	110	108	110	112	106	G	B	B	B	B	B	B	B	
24	B	B	B	108	108	106	B	138	108	110	G	G	G	G	154	138	116	B	108	106	104	106	104	106	
25	B	B	B	B	B	B	110	108	106	106	106	102	108	110	116	116	144	120	112	106	104	B	104	B	
26	B	B	B	B	B	B	B	B	G	108	106	G	112	100	102	110	108	108	104	106	102	102	96	98	
27	B	B	B	104	B	B	B	B	108	108	110	G	110	B	132	G	112	B	B	B	B	B	B	B	
28	B	B	B	B	B	B	B	142	112	108	110	114	112	112	110	116	128	92	98	92	B	B	B	B	
29	B	116	106	B	104	112	110	106	G	108	112	G	G	G	G	G	G	B	B	B	B	B	B	B	
30	B	B	B	B	B	B	B	152	168	G	132	124	124	140	G	164	124	114	118	114	108	B	B	B	
31	B	B	B	B	B	B	104	150	112	108	110	112	112	110	110	108	142	B	B	B	B	B	B	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	5	5	3	7	8	6	5	13	26	28	26	24	25	23	23	24	19	13	12	14	11	8	10	6	
MED	106	104	104	106	107	109	106	142	112	109	110	110	112	110	112	113	116	108	110	106	104	104	104	100	
U Q	110	111	106	108	109	112	110	155	144	110	116	119	125	112	128	139	142	117	114	114	110	114	108	104	
L Q	102	103	100	104	104	104	104	112	110	108	108	106	108	106	110	107	110	97	104	96	100	98	98	98	

JAN. 2001 h'Es (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 2001 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	F1									H1	L1	L1	L1			L2	H1	CL21	L1						
2									H1	C1	HL11	HL11	L1	L1		L1	L1				F2				
3									H1	H1	C1	L1	L1	L1	L1	L1	L1	L2	L3	F1	F1				
4									H1			L1	L1	L1		L1	L1								
5									L1	CL11	L1	L1	L1	L1		L1	L1	L1							
6									LC11	L1	L1	L1	L1	L1						F1	F1	F1			
7			F2	F2				C1	C1	L1	L1	L1	L1	L1	L1	HL12					F1	F1			
8								H1	HL11	CL11	CL11	L1	HL11	L1	L1	L1		L1	C1	F1					
9									L2	L1	L1	HL11	HL11	CL11	CL11	LC11	L2	L2							
10			F1	F1						L2	CL11	L1	L1	L1		L1	H1								
11									H1	L1	L1	L1	L1	L1	HL11	HL11						F1	F1		
12								H1	C1	L2	CL11	HL11	CL11	L1	L1	HL11	LC11	LH11		F1		F1	F2	F1	
13									L1	L1	L1	LH11	L1	L1	L1	L1	HL11			F1			F2		
14				F1					H1	L1	L1	HL11	CL11	CL12	CL12	L1	L2	C1		F1	F3				
15									L1	L1	HL11	HL11	HL11	L1	L1			L1					F1	F1	
16		F2	F1	F2					L1	L1	L1	L1	L1	L1	L1	H1			F1	F1	F1	F2	F1	F1	
17				F2		F2			L1	L1	L1	L1	L2	L1	L1	L1		CL11	F1		F1	F2	F2	F1	
18	F1									L1				L1		L1	H1		F1	F2	FF32	F2	F1		
19	F2		F1	F3	F3	F1	L1	L1	L1	L1	L1	L1	H1	HL11	HL11	CL21	C1	CL31	FF11						
20										L1															F3
21	F2	F1							L1																
22		F2		F1				C1	HL11	L1	HL11	HL11	HL11	HL11	CL11	C2	C2					F1	F1	F2	F2
23	F1	F2	F2	F1	F2	F1	F1		L1	HL11	L1	L1	L1	L1	L1	L1									
24			F2	F1	F1			H1	L2	L1					H1	H1	C2		F2	F3	F2	F1	F1	F1	
25						F4	L3	LH21	L1	L1	L1	L1	L1	L1	L1	L1	H1	C2	F2	F1	F1	F1	F1	F1	
26									L1	L1		L1	L1	L1	L1	L1	L1	L1	F2	F2	F2	F1	F1	F1	
27			F1						L1	L1	L1		L1		C1		L1								
28								H2	L1	L1	L1	L1	L1	L1	L1	L1	C1	L1	F1	F1					
29		F2	F1		F1	F1	F3	L2		L1	L1														
30								H1	H1		H1	C1	C1	HL11		H1	C2	C4	F3	F2	F1				
31						F1	H1	L1	L1	L1	L1	L1	L1	L1	L1	L1	HL11								
		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																									

f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
◊	f _o F ₂ , f _o F ₁ , f _o E
×	f _x F ₂
✱	DOUBTFUL f _o F ₂ , f _o F ₁ , f _o E
⊗	f _b E _s
└	ESTIMATED f _o F ₁
†, ‡	f _{min}
^	GREATER THAN
v	LESS THAN

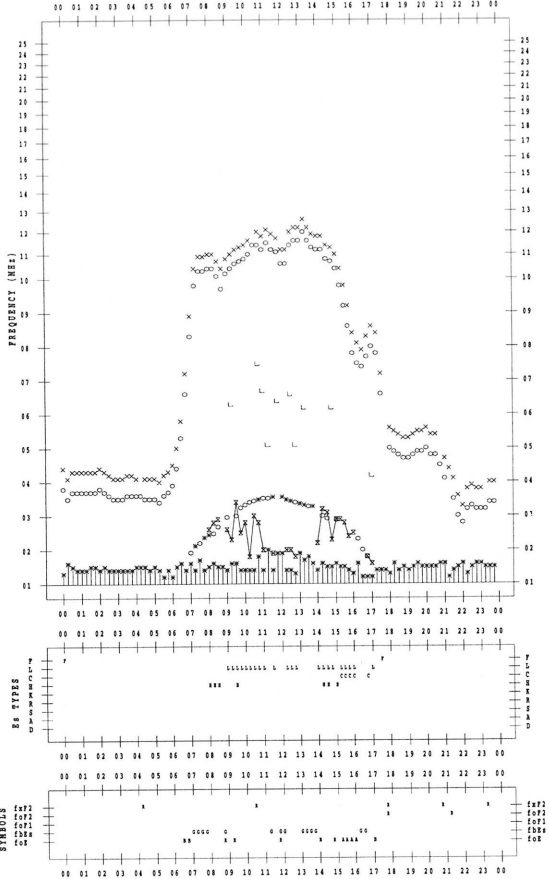
f-PLOT DATA

SCALER : I.NISIMOTA

STATION : Kokubunji

DATE : 2001/ 1/ 1

135 °E MEAN TIME



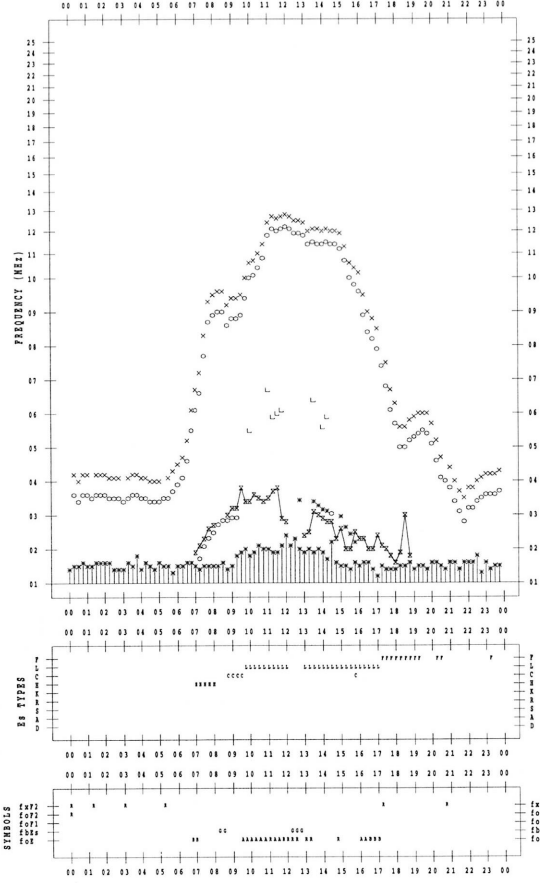
f-PLOT DATA

SCALER : I.NISIMOTA

STATION : Kokubunji

DATE : 2001/ 1/ 3

135 °E MEAN TIME



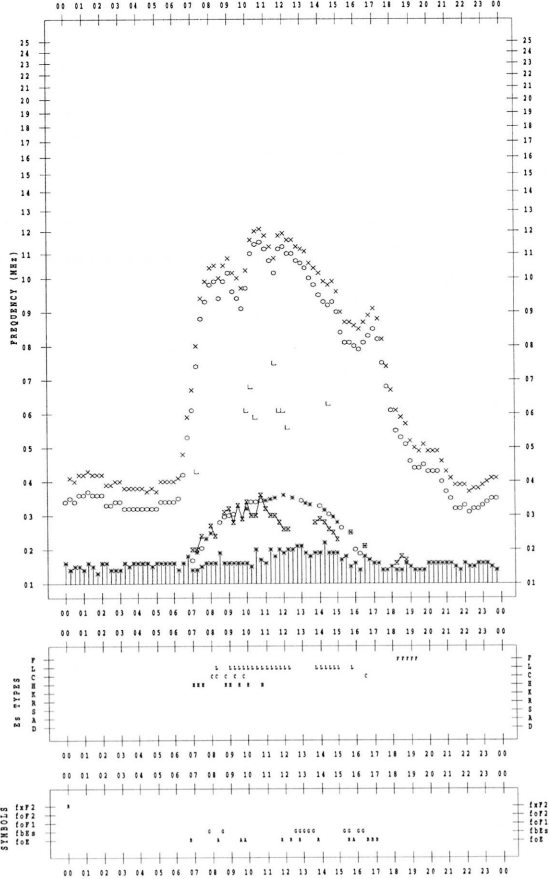
f-PLOT DATA

SCALER : I.NISIMOTA

STATION : Kokubunji

DATE : 2001/ 1/ 2

135 °E MEAN TIME



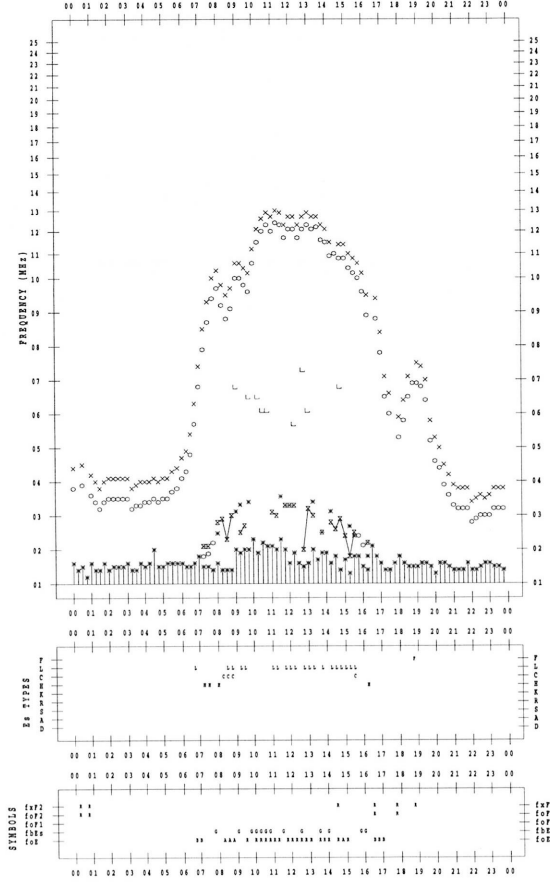
f-PLOT DATA

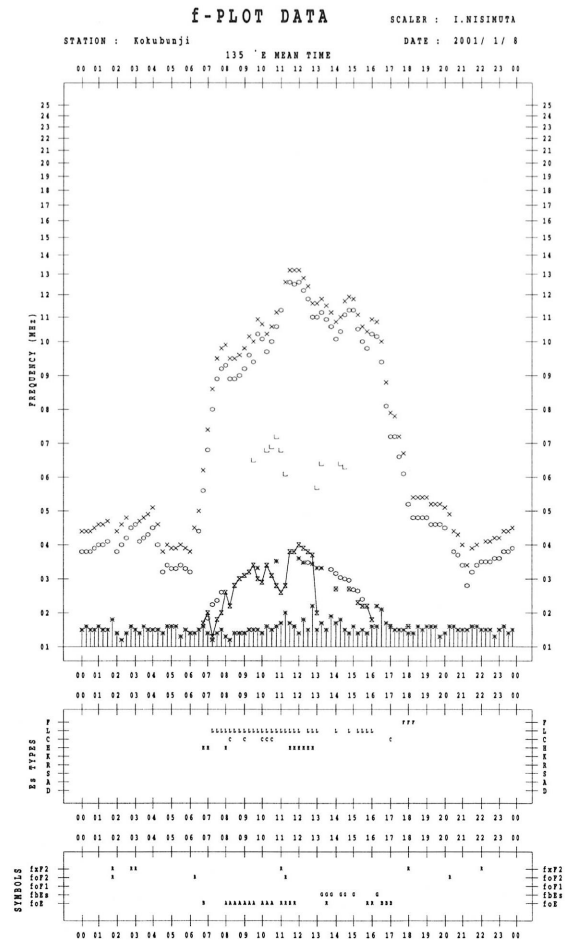
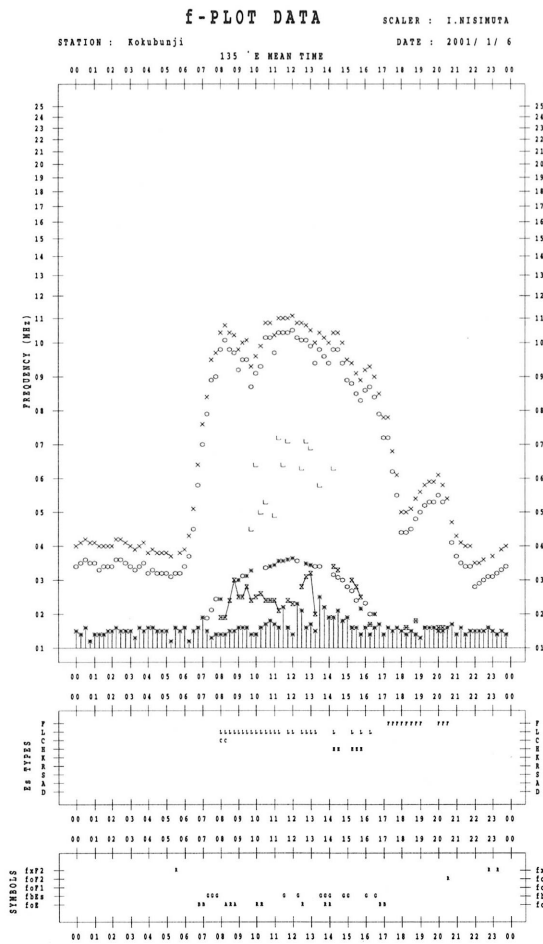
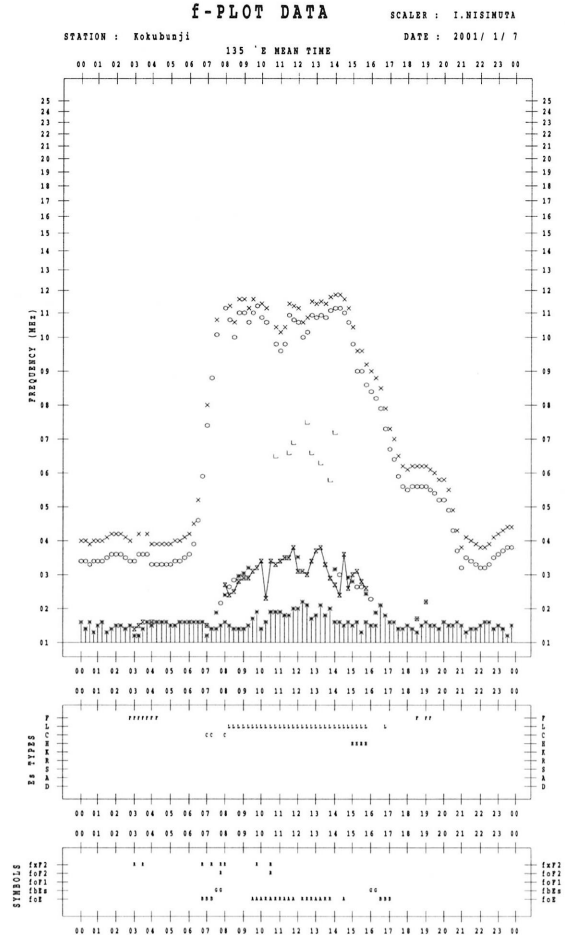
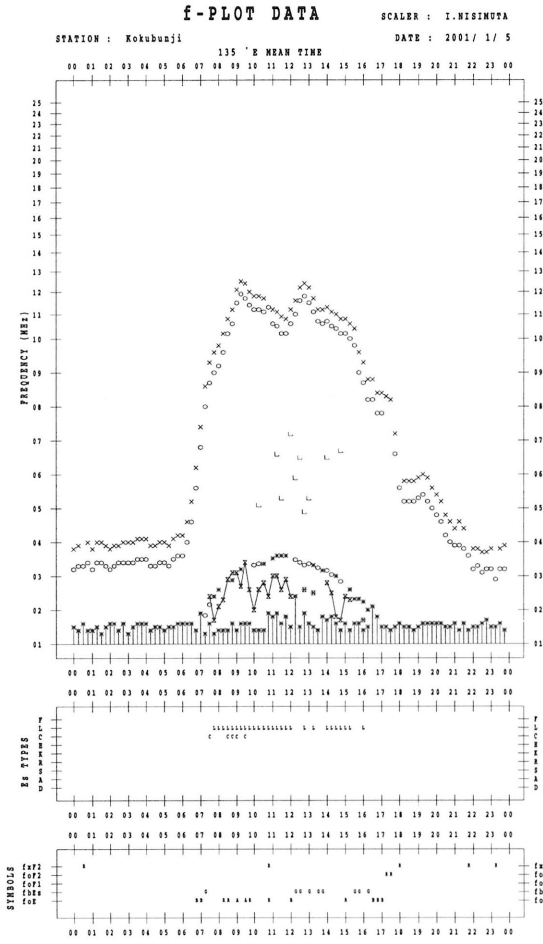
SCALER : I.NISIMOTA

STATION : Kokubunji

DATE : 2001/ 1/ 4

135 °E MEAN TIME





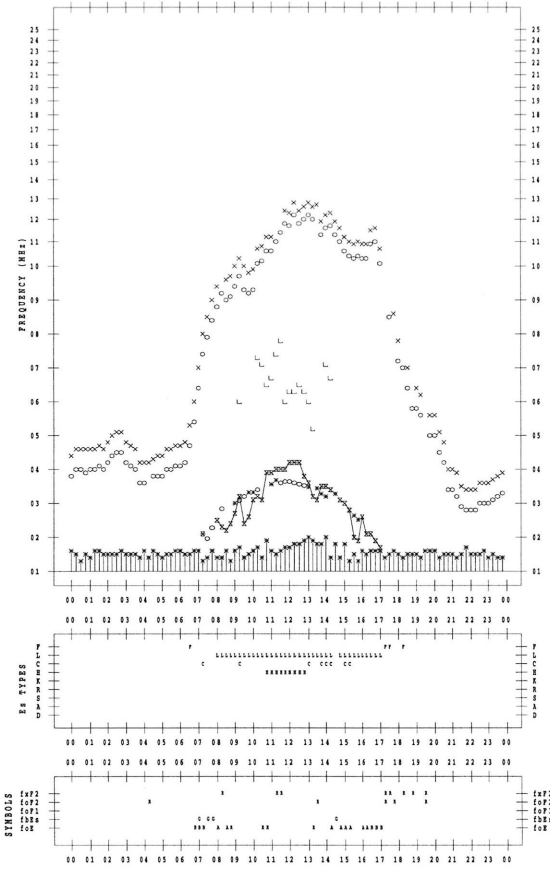
f-PLOT DATA

SCALER : I.HISIMUTA

STATION : Kokubunji

DATE : 2001 / 1 / 9

135 °E MEAN TIME



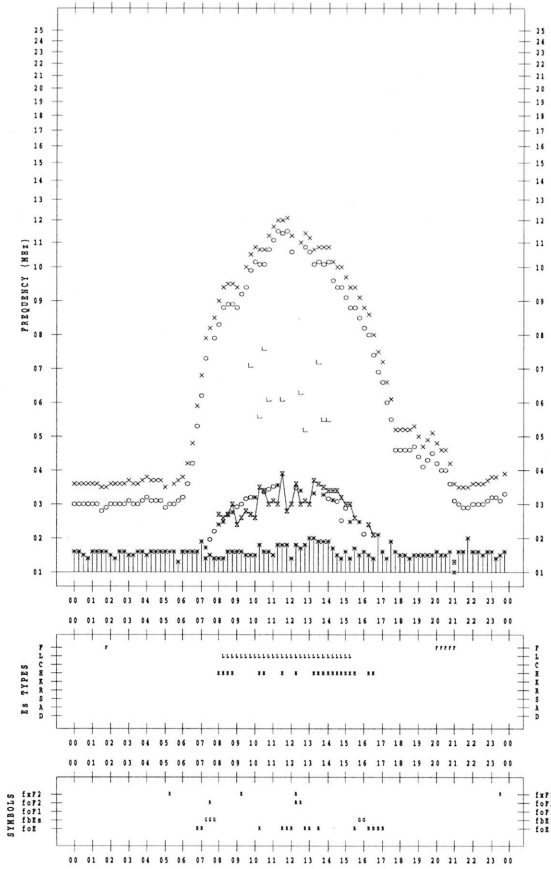
f-PLOT DATA

SCALER : I.HISIMUTA

STATION : Kokubunji

DATE : 2001 / 1 / 11

135 °E MEAN TIME



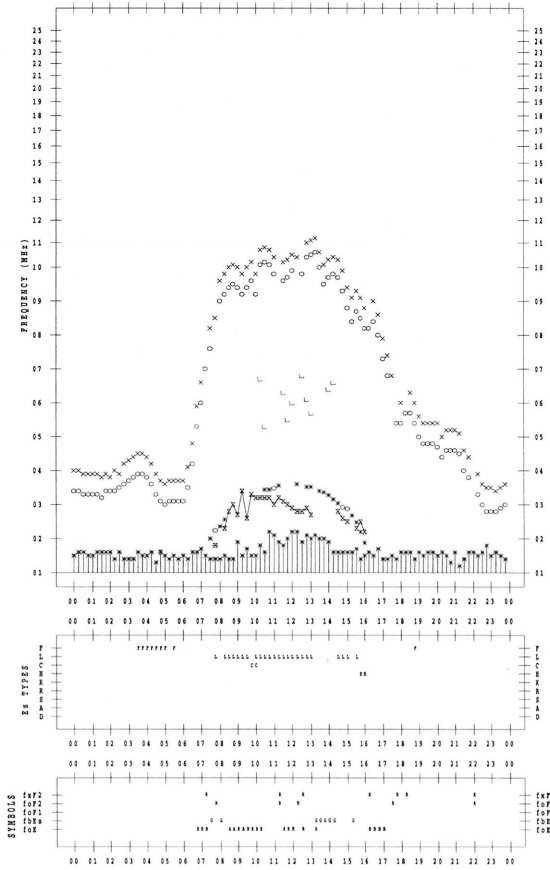
f-PLOT DATA

SCALER : I.HISIMUTA

STATION : Kokubunji

DATE : 2001 / 1 / 10

135 °E MEAN TIME



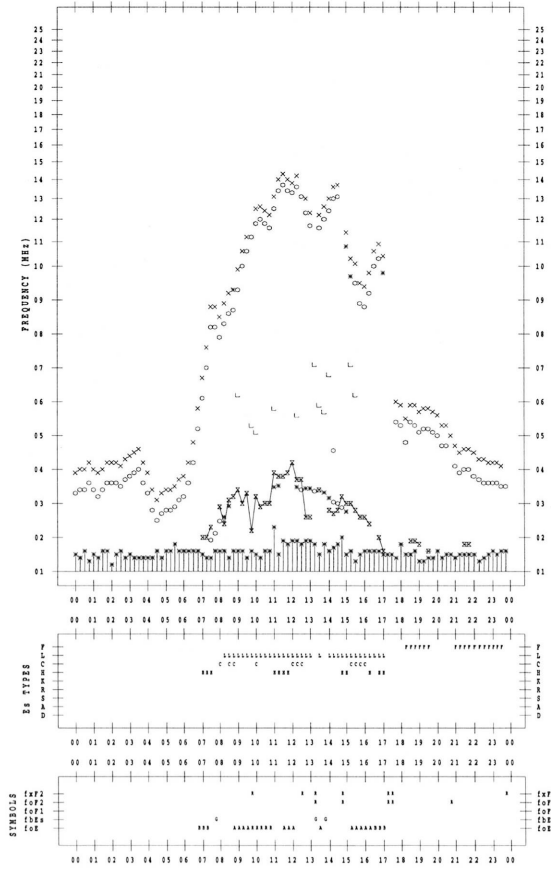
f-PLOT DATA

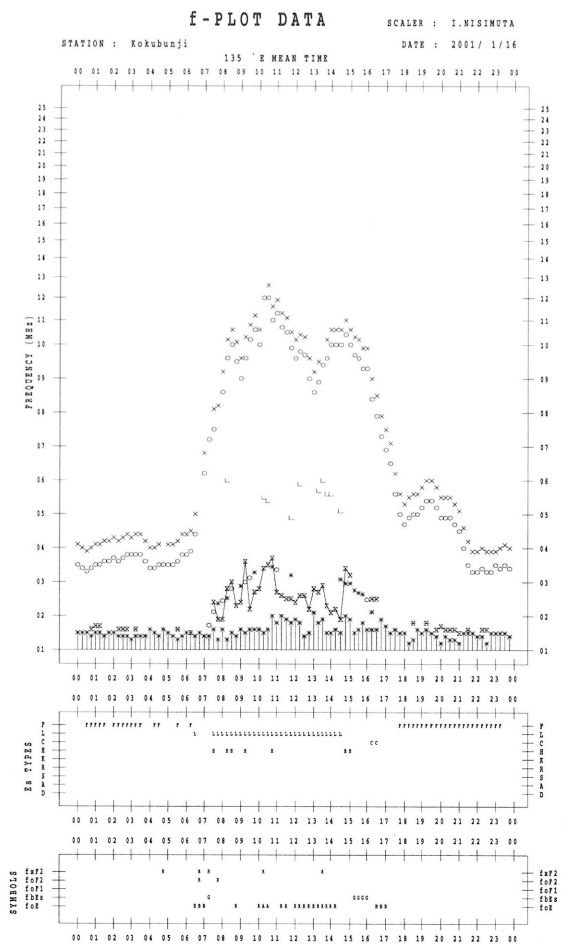
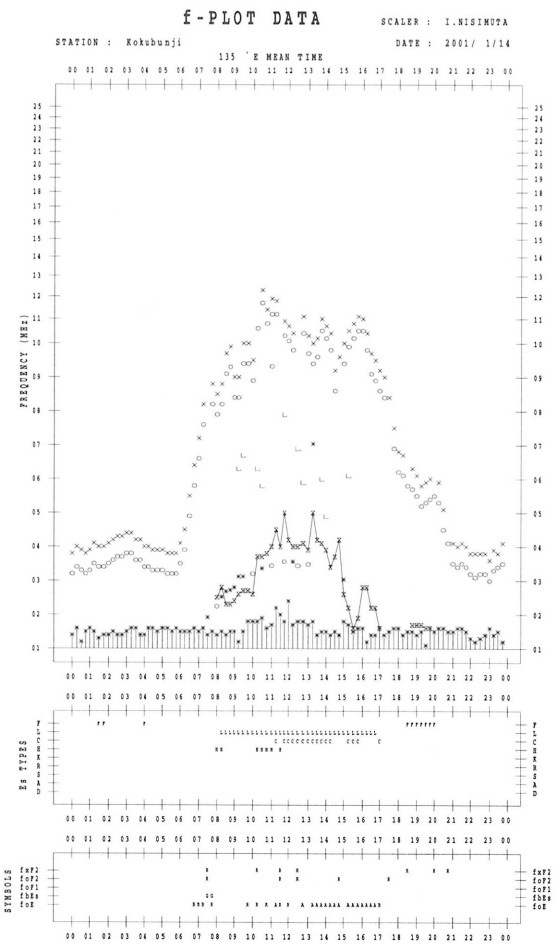
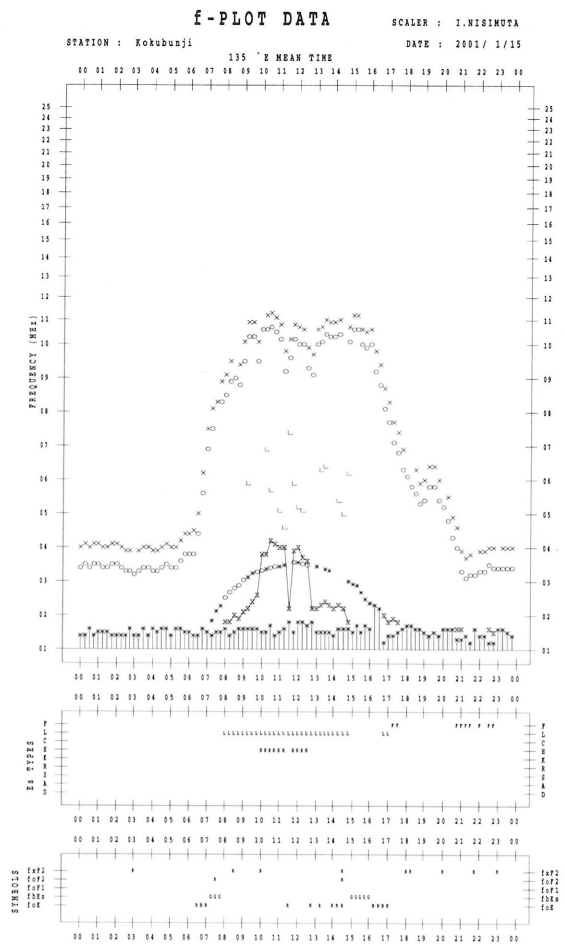
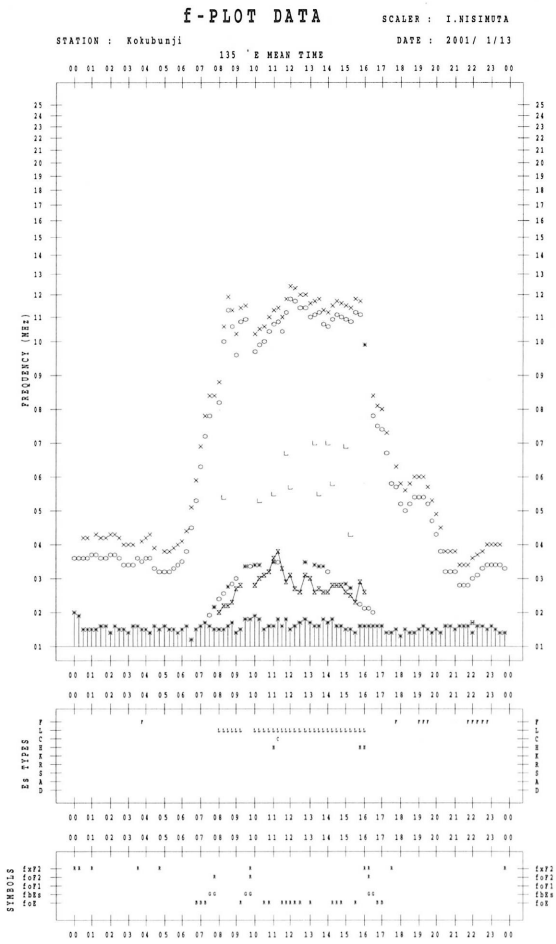
SCALER : I.HISIMUTA

STATION : Kokubunji

DATE : 2001 / 1 / 12

135 °E MEAN TIME





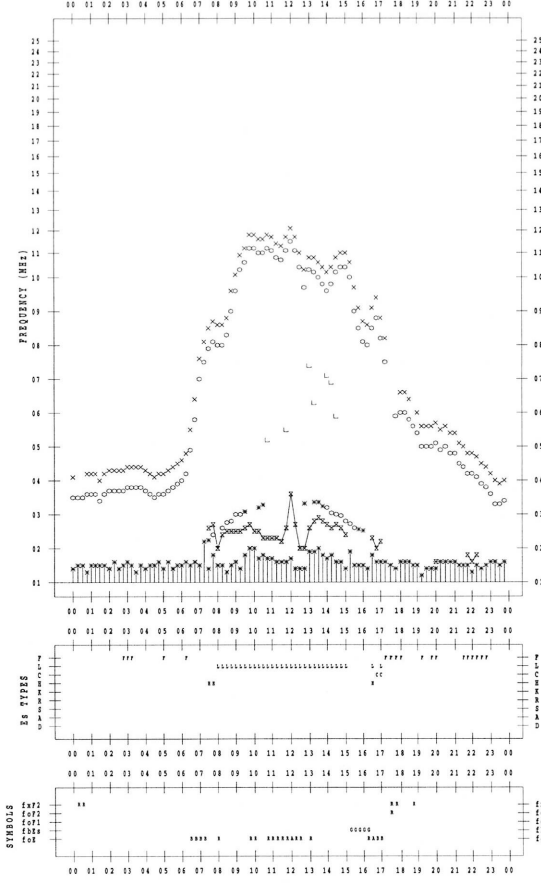
f-PLOT DATA

SCALER : I.NISIMUTA

STATION : Kokubunji

DATE : 2001/ 1/17

135 °E MEAN TIME



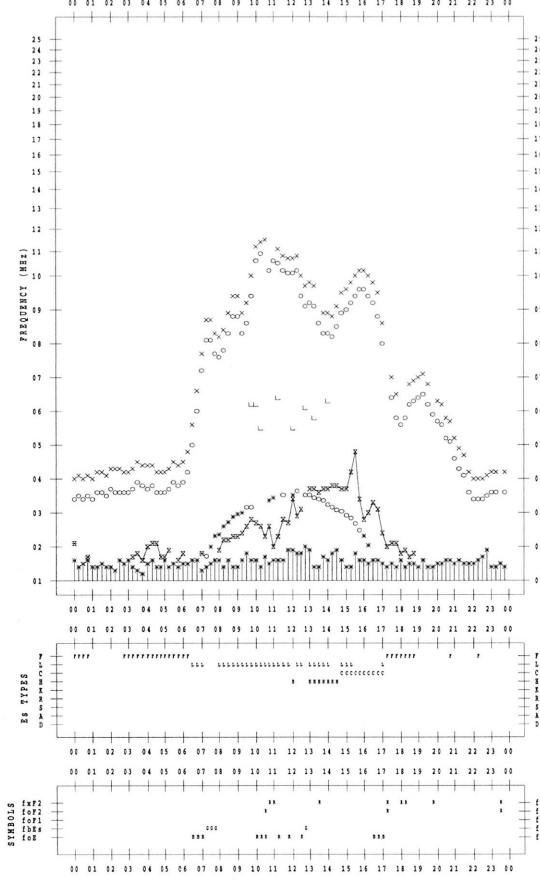
f-PLOT DATA

SCALER : I.NISIMUTA

STATION : Kokubunji

DATE : 2001/ 1/19

135 °E MEAN TIME



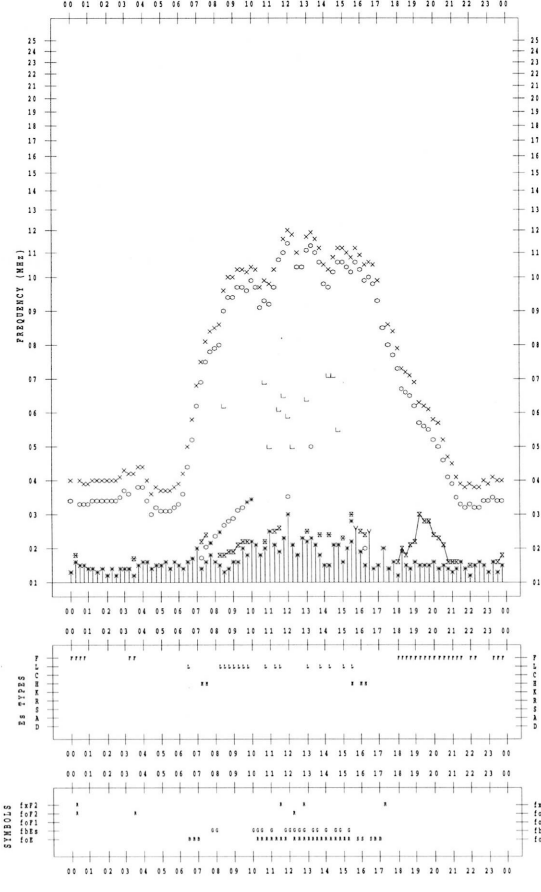
f-PLOT DATA

SCALER : I.NISIMUTA

STATION : Kokubunji

DATE : 2001/ 1/18

135 °E MEAN TIME



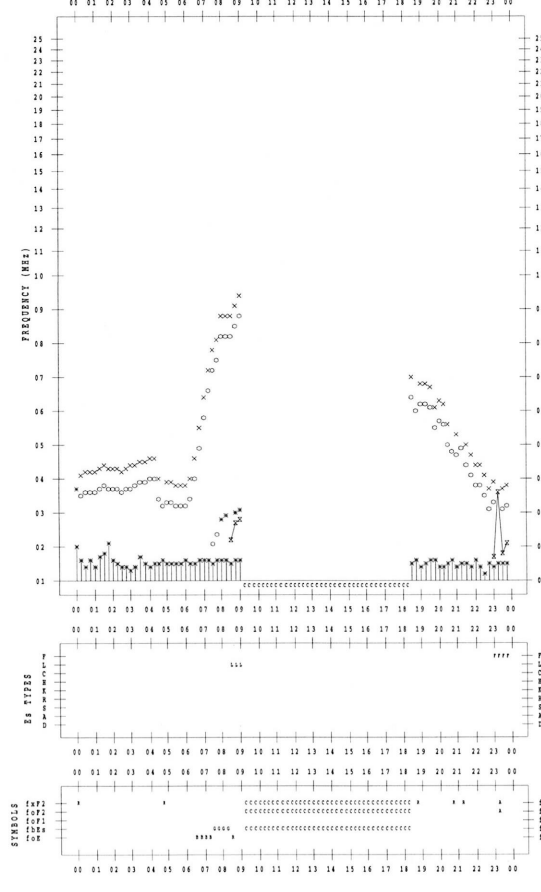
f-PLOT DATA

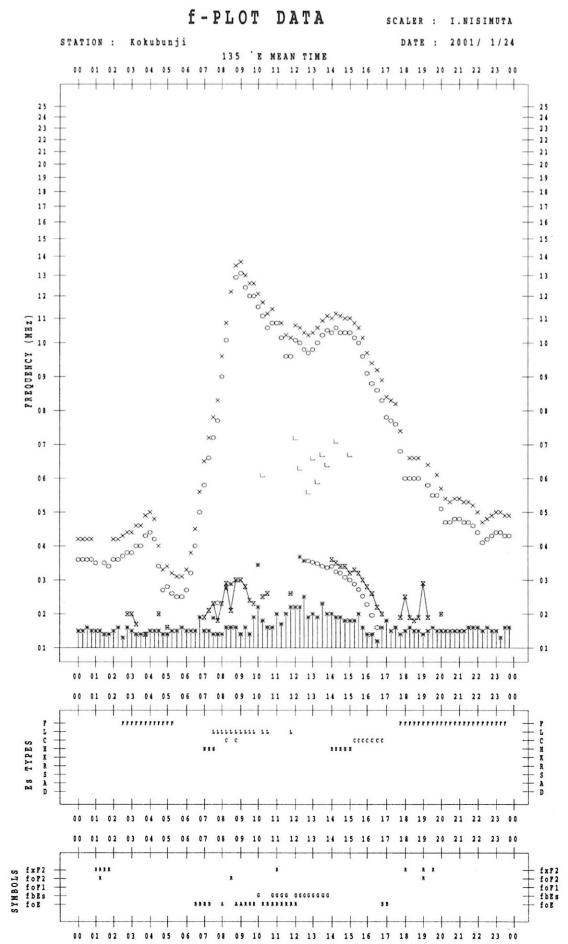
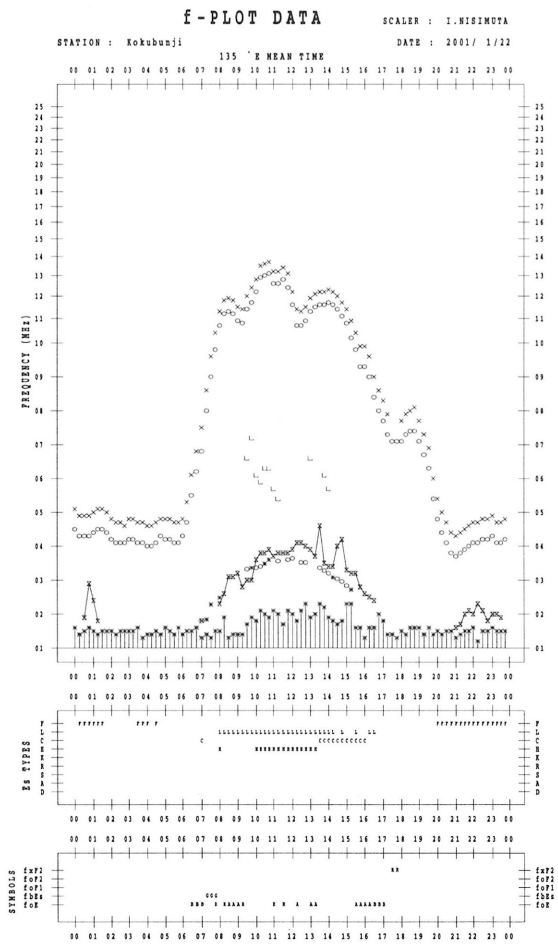
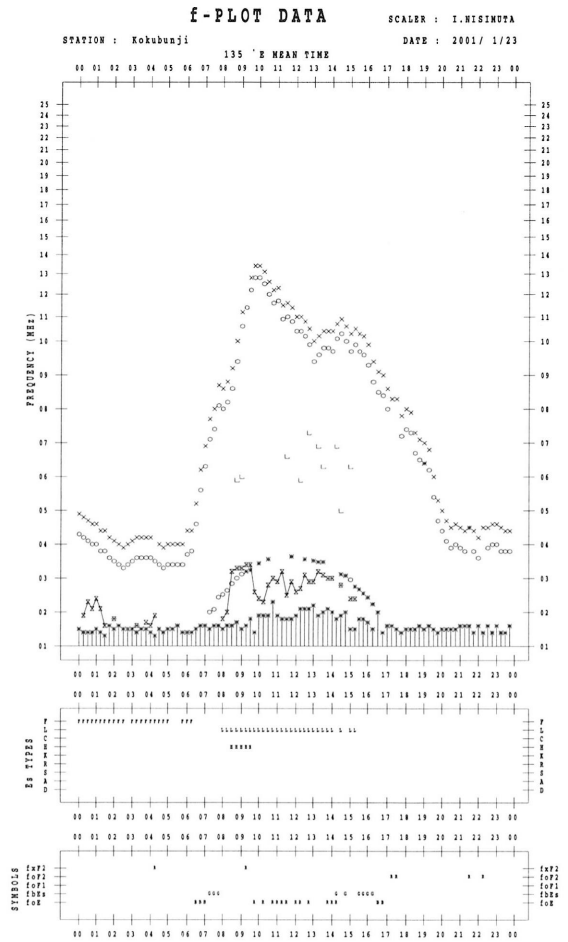
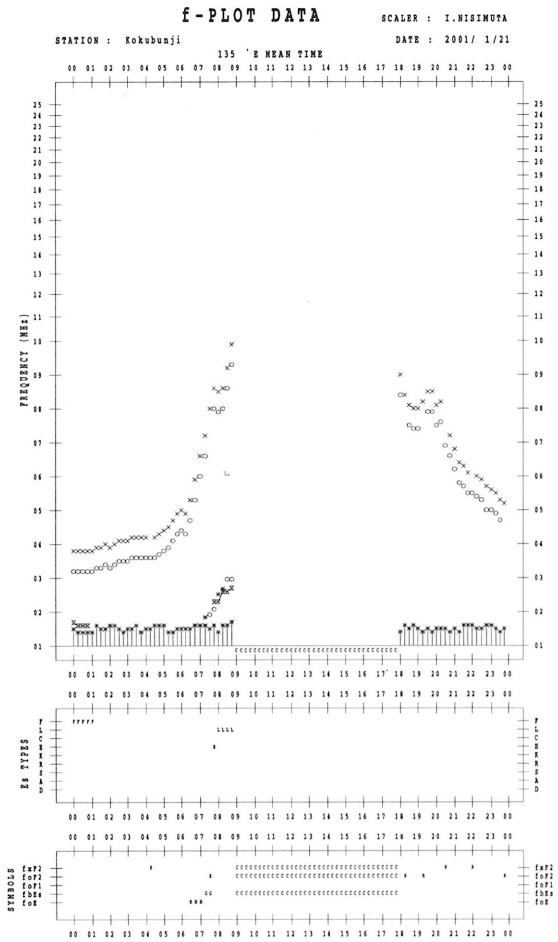
SCALER : I.NISIMUTA

STATION : Kokubunji

DATE : 2001/ 1/20

135 °E MEAN TIME





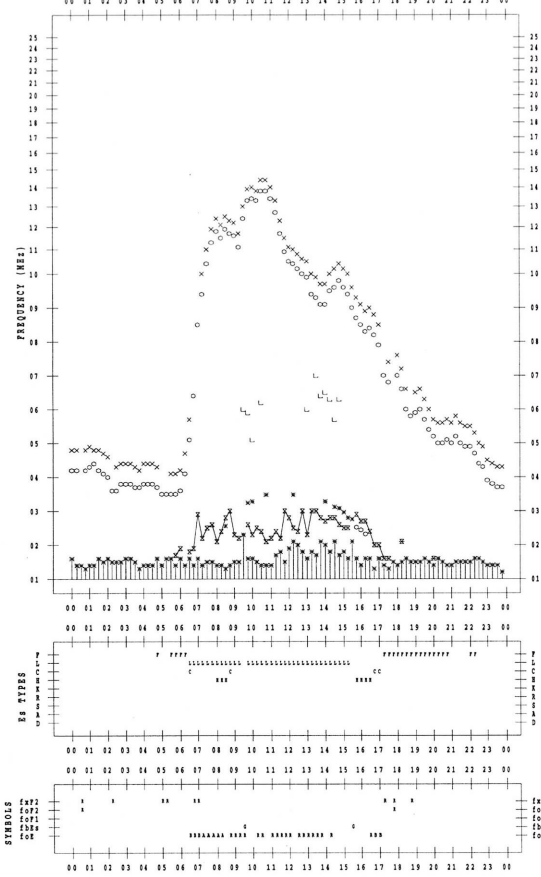
f-PLOT DATA

SCALER : I.WISIMUTA

STATION : Kokubunji

135 °E MEAN TIME

DATE : 2001 / 1 / 25



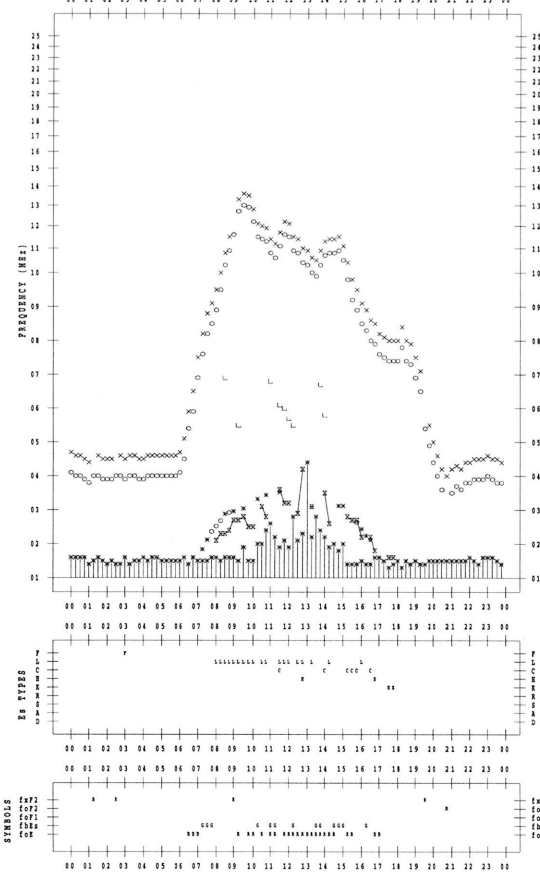
f-PLOT DATA

SCALER : I.WISIMUTA

STATION : Kokubunji

135 °E MEAN TIME

DATE : 2001 / 1 / 27



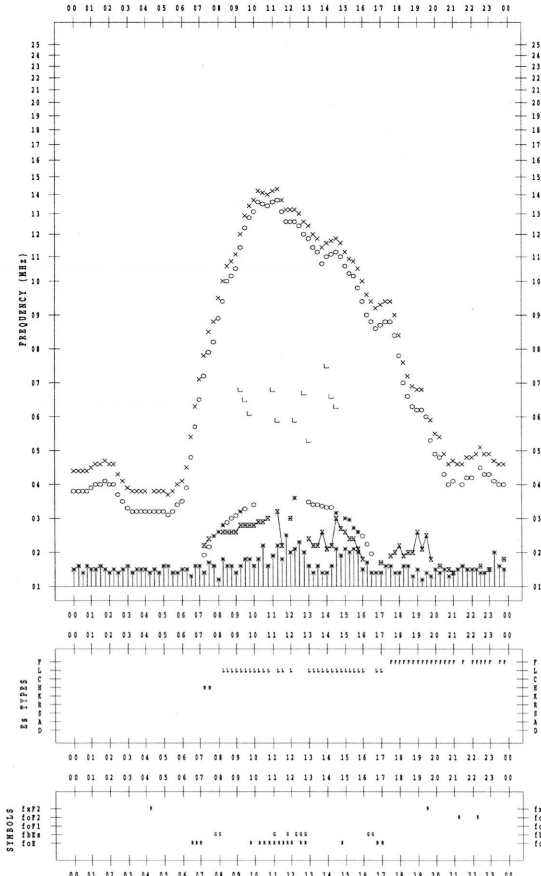
f-PLOT DATA

SCALER : I.WISIMUTA

STATION : Kokubunji

135 °E MEAN TIME

DATE : 2001 / 1 / 26



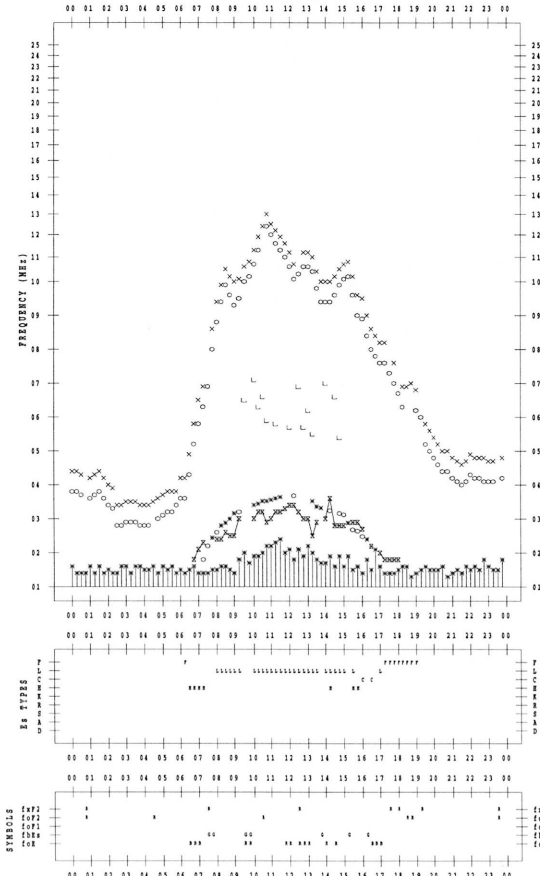
f-PLOT DATA

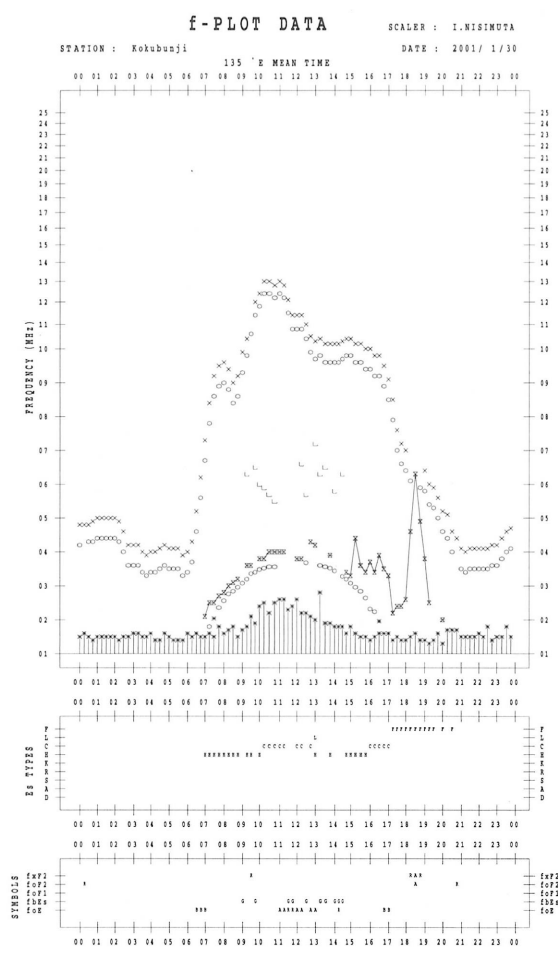
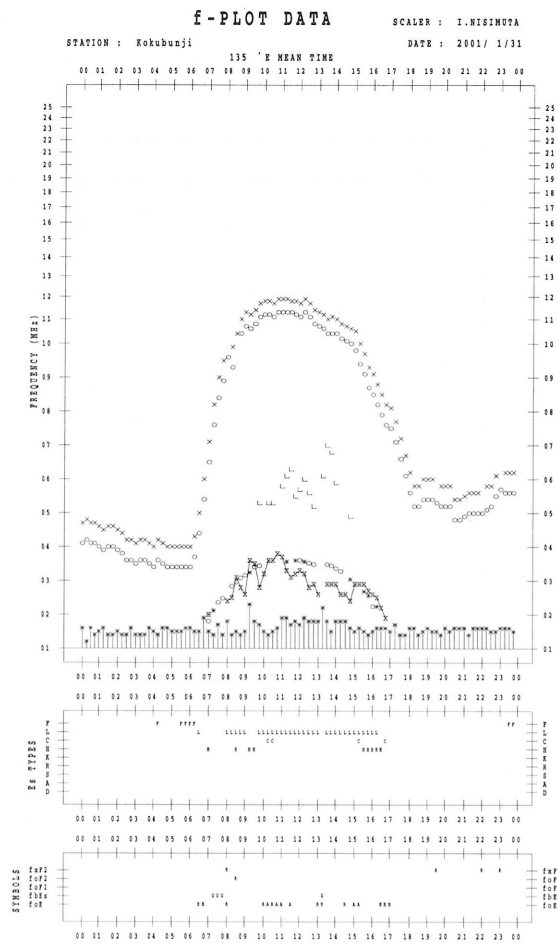
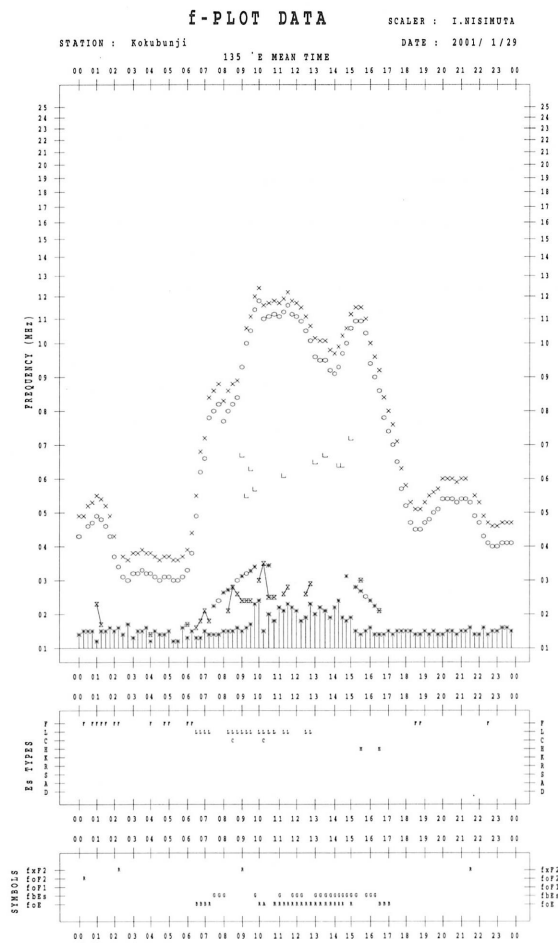
SCALER : I.WISIMUTA

STATION : Kokubunji

135 °E MEAN TIME

DATE : 2001 / 1 / 28





B. Solar Radio Emission
 B1. Daily Data at Hiraiso
 500 MHz

Hiraiso

January 2001

Single-frequency total flux observations at 500 MHz					
Flux density: $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$					
UT Date	00-03	03-06	06-09	21-24	Day
1	-	-	-	56	56
2	53	48	47	51	50
3	48	45	44	53	48
4	50	50	49	56	51
5	51	47	46	-	49
6	50	49	47	53	50
7	50	49	50	44	48
8	49	50	48	49	49
9	48	48	46	47	48
10	47	46	45	50	47
11	49	45	43	51	47
12	48	46	45	52	48
13	49	48	49	51	49
14	50	48	48	58	51
15	54	50	48	-	52
16	-	49	46	51	49
17	48	46	47	51	48
18	49	45	44	49	47
19	49	47	46	48	48
20	48	47	48	51	49
21	49	46	46	53	48
22	49	46	47	56	49
23	51	45	46	53	49
24	50	49	48	51	50
25	50	49	48	48	49
26	49	48	47	43	47
27	43	45	42	45	49
28	47	45	43	50	46
29	48	47	46	52	48
30	48	44	43	49	46
31	46	46	45	46	46

Note: No data is available during the following periods.

1st 0000 - 1st 2400

5th 2100 - 5th 2400

15th 2300 - 16th 0300

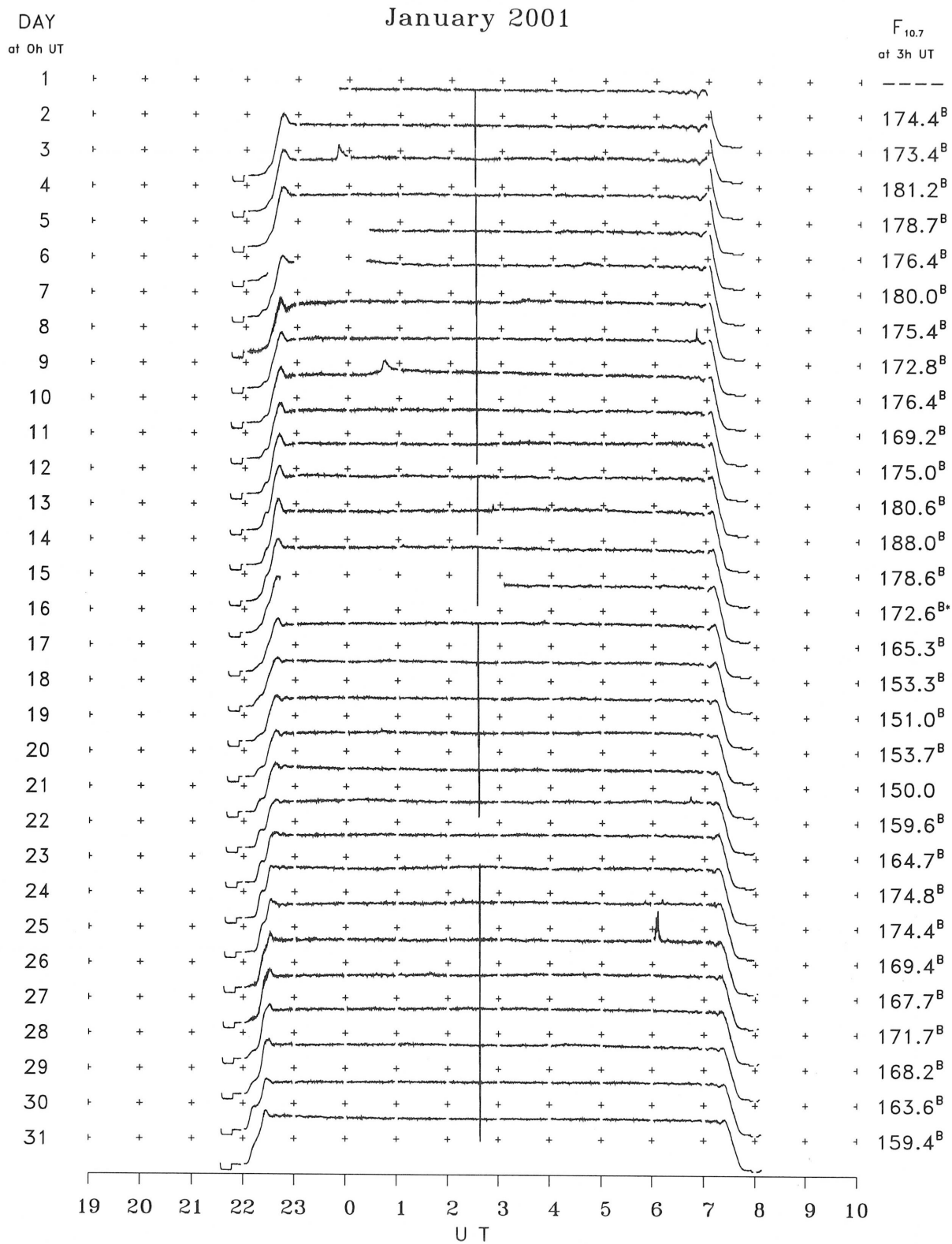
B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso

January 2001

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 ($10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$)		POLARIZATION REMARKS
						PEAK	MEAN	
2	200	42 SER	0535.0	0539.0	10.0	60	–	
2	200	8 S	0646.0	0646.0	2.0	110	–	
3	200	42 SER	0212.0	0223.0	11.0	230	–	
3	200	8 S	0407.0	0408.0	1.0	50	–	
4	200	4 S/F	0112.0	0115.0	5.0	50	–	
5	200	8 S	0423.0	0426.0	3.0	80	–	0
6	200	8 S	2247.0	2247.0	2.0	120	–	0
9	500	8 S	0648.0	0650.0	3.0	70	–	0
10	2800	1 S	0022.0	0042.0	29.0	40	–	0
10	500	7 C	0024.0	0046.0	30.0	30	–	0
10	200	7 C	0029.0	0034.0	12.0	50	–	0
10	200	8 S	0203.0	0203.0	2.0	40	–	ML
13	200	8 S	0630.0	0630.0	1.0	40	–	0
16	200	8 S	2222.0	2223.0	1.0	70	–	0
16	200	8 S	2227.0	2228.0	1.0	150	–	0
17	200	8 S	0049.0	0049.0	1.0	50	–	0
17	200	8 S	0132.0	0133.0	1.0	30	–	0
17	200	8 S	0332.0	0333.0	1.0	40	–	0
17	200	8 S	0346.0	0347.0	1.0	40	–	0
18	200	8 S	0648.0	0649.0	1.0	200	–	0
22	200	8 S	0643.0	0644.0	1.0	30	–	MR
23	200	8 S	0434.0	0435.0	3.0	170	–	MR
26	2800	7 C	0601.0	0606.0	8.0	80	–	0
26	200	47 GB	0604.0	0605.0	5.0	610	–	0
27	200	8 S	0724.0	0724.0	1.0	120	–	WR
28	200	8 S	0114.0	0114.0	1.0	30	–	0

B. Solar Radio Emission
 B3. Summary Plots of $F_{10.7}$ at Hiraïso



Note: A vertical grid space corresponds to a 100 sfu.
 Elevation angle range $\geq 6^\circ$.

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☎ (042) (327) 7 4 7 8 (直通)

Queries about "Ionospheric Data in Japan" should be forwarded to :
Communications Research Laboratory, Independent Administrative Institution, 2-1
Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184-8795 JAPAN