ISSN 0021—0382

F—615

IONOSPHERIC DATA IN JAPAN

FOR MARCH 2000

VOL. 52 NO. 3

CONTENTS

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MINISTRY OF POSTS AND TELECOMMUNICATIONS
TOKYO, JAPAN

INTRODUCTION

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

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

A. IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction (Second Edition) 1972 " and its revision of chapters I-4, published in July 1978.

a. Characteristics of Ionosphere

fxI	Top frequency of spread *F* trace
foF2 *foF1* *foE* *foEs*	Ordinary wave critical frequency for the *F2,F1, E* and *Es* including particle *E* layers, respectively
fbEs	Blanketing frequency of the *Es* layer, e.g. the lowest ordinary wave frequency visible through *Es*
fmin	Lowest frequency which shows vertical ionospheric reflections
M(3000)F2 *M(3000)F1*	Maximum usable frequency factor for a path of 3000 km for transmisson by *F2* and *F1* layers, respectively
h′F2 *h′F* *h′E* *h′Es*	Minimum virtual height on the ordinary wave for the *F2*, whole *F, E* and *Es* layers,respectively
Types of *Es*	See below b.(iii)

b. Symbols

(i) Descriptive Letters

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

A Measurement influenced by, or impossible because of, the presence of a lower thin layer,for example *Es*.

B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

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

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

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.

H Measurement influenced by, or impossible because of, the presence of a stratification.

K Presence of particle *E* layer.

L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

P Man-made perturbations of the observed parameter; or spur type spread *F* present.

Q Range spread present.

R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

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

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normnal *E* trace. (Usually a daytime type.)

q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.

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

a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.

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

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

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

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

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

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

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

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

B. SOLAR RADIO EMISSION

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

B1. Daily Data at Hiraiso

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

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

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

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

B2. Outstanding Occurrences at Hiraiso

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

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

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

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

The polarization is expressed by the polarization degree and sense as follows:

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

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

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

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

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

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

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

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

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

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

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

C2. Sudden Phase Anomaly (SPA) at Inubo

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

Phase advance is shown in unit of degree at its maximum stage. No transmission or no reception during the period is indicated by -, an indistinguishable record is spaced out, and a multi-peak event is marked by *. The most remarkable or distinct phase advance is underlined and listed in the column of *Time*.

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

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

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

Transmitting Stations

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

HOURLY VALUES OF foF2 AT Wakkanai

MAR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	69	70	58	54	59	68	92	112	122	125	131	128	127	123	122	120	117	95	93	65	66	A	51
2		A	64	58	55	53	69	93	124	140	140	140	143	130	128	128	121	103	91	81	84	81	58	A
3	A	57	A		56		68	92	88	117	130	141	133	127	122	126		90	93	95	91	66	67	59
4	58	70	58	54	50	47	60	93	109	122	121	126	122	122	118	114	112	101	90	80	72	66	62	69
5	69	63	50	63	59	54		91	113	123	131	131	133	130			116			77	63	61	A	54
6	63	60	57	54	69	54	68	85	118	120	127	136	131	124		108	121		93		64	70	68	58
7	63	81	67	57	61	68	73	92	125	128	132	142	137	127	126	128	124	116	93	83	81		76	82
8	93	68	70	68	78		70	93	122	128	132	137	128	120	121	121	122	119	100	84	74		70	
9	70	71	62	69	A	69	68		N		131		122	123		120	121	104	85	77	73	79	71	68
10	72	68	A	58	69	A	70	95		122	134	136	140	135	130	123	123	113	96	79	72	67	69	70
11	A	55	62	56		69		94	90		130	128	130	124	126	120	122	102		92	84	72	70	A
12	69	59	70	57	50	59	70	74	86	92	110	122	125	115	122		91	94		82	72	73		70
13	60	69		66	66	70	77	102	121	132	128	134	130	125	127	118	119	102	86	82	66	90	94	93
14	94	68	73	70	70	60	70	93	116	127	121	130	124	120		116		108	102	83	66	82		67
15	84	71	69	70	69	69	82	93	119	126	134	131	131	126	122	118	116	106	115	82	84	84	92	68
16	84	91	72	66	63	61	82		122	127	126	131	124	128	126	127	121	117	101	96	76	95	84	94
17	73	70	68		69	62	71	91	119	132	131	127	127	131	124	122	121	110	94		94	93	81	89
18	94	94	79	70	69		95	103	122	131	134	132	131	128	124	120	121	116	99	93	95	95	91	92
19	74	74		70	69	67	94	94	120	122	133	133	134	130	124	123	123	116	114	115	94	94	82	81
20	70	81	76		67	65	N	116	124	138	136	136	137	136	124	122	121	131	113	94	94		95	83
21	88	82	74	71	69	68	94	93	117	130	141	134	134	133	128	122	122	120	115	94	83	95	83	91
22	94	92	95	74	61	68	95	95	133	130	136	134	131	121	124	122	121	120	102	93	94	92	93	93
23	74		70	70	55	54	68	68	68	68	A	82			88	85	90	88	93	80	74	82		64
24	69	68	70	56	61	68		81	104		128	127	122	123	120		102		91	93	90	82	93	95
25	62	76	63	70	60	58	95	92	90	128	138	136	130	122	122	N	112	109	103	94	90	83		94
26	95	71	95	67	68	66	80	102	122	124	130	132	132	130	126	123	119	104		90	93	93	94	93
27	94	84	72		94	80		89	122	122	136	125	132	126	101	120	111	116		94	93	91	94	95
28	94	84	87	93	67	69			133	138	136	132	128	126	131	123	119	118	116	91	92	78	94	95
29	79	78	78	70	66	66	94	114	132	135		134	127	125	123	112		115	115	99	84	87	93	95
30	70	95	95	73	60	66		121	137	138	141	131	130	123		118	114	116	N	98	94	93	95	94
31	90	95	94	94	72	71	86	112	131	138	129	127	128	124	119	124		103	94	93	94		90	88
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	27	27	29	27	24	28	29	28	29	30	30	30	26	27	27	28	25	29	31	27	25	28
MED	74	71	70	68	66	66	72	93	120	128	131	132	130	126	124	122	121	112	96	92	84	82	84	86
U Q	93	83	78	70	69	69	90	98	124	132	136	136	133	130	126	123	121	116	108	94	93	93	93	93
L Q	69	68	64	58	59	59	68	91	110	122	128	128	127	123	122	118	114	103	93	82	72	72	70	68

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

MAR. 2000

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	28	32	28	G	30	G	G	31	35	32	40	35	32	34	32	34	34	30	29	27	70	33	33	G
2		34	30	G	G	G	G	31	30	48	36	42	41	37	32	31	32	40	29	28	G	G		32
3	32	32	32		29	G	26	37	30	30	33	35	34	32	27	32	27	30	29	G	G	G	G	G
4	G	G	28	G	G	G	G	29	31	31	33	34	34	35	34	46	38	30	28	G	G	G		G
5	G	G	G	30	28	G	G	30	30	36	35	36	36	34	55	30	44	34	24	G	G	30	32	G
6	27	26	G	G	28	G	G	30	32	32	32	36	35	34	35	30	27	26	28		G	G	G	G
7	G	G	G	G	G	G	G	32	32	42	36	38	34	34	36	30	33	G	G	28	G		G	28
8	G	30	G	G	28		G	25	31	33	33	G	38	35	34	32	29	G	G	G	G	G	G	G
9	27	28	G	G	33	G	11		30	33	38	35	33	36	36	32	29	G	28	29	32	27	31	G
10	G	33	32	24	31	32	G	34	30	33	34	34	32	33	33	33	28	G	G	G	G	G	28	29
11	33	39	33	32		29		33	34		36	38	32	38	35	32	42	G	G	G	30	27	G	35
12		30	28	G	30	32	26	33	38	33	38	32	33	32	33		28	40	29	30	G	G	G	G
13	G	29		G	G	G	G	26	29	31	34	31	31	36	34	32	28	G	27	32	36	G	G	G
14	G	32	30	28	30	30	G	32	30	32	31	33	31	30	30	32	35	G	30	25	G	G		G
15	G	G	G	30	31	G		32	33	34	33	33	33	31	34	30	28	28	28	G	G	G	G	G
16	G		27	G	28	G	29	31	33	31	32	33	34	33	40	31	28	21	G	G	G	G	G	G
17	G	32	G		30	G	29	34	34	35	34	34	34	32	32	32	27	28	G	G	G	G	G	G
18	G	G	G	28	G		26	33	33	40	40	38	36	37	34	32	27	G	G	G	G	G	G	G
19	28	23	G	28	28	G		34	37	G	32	37	35	35	36	32	27	28	G	25	G	G	G	G
20		44	27	G	G	32	32	31	31	36	38	36	38	34	34	30	29	28	G	G	G		30	G
21	G	27	G	28	G	G	27	32	31	32	32	34	34	32	32	32	28	G	G	G	G	G	G	G
22	G	G	G	G	G	G	24	28	30	32	33	34	37	31	34	33	30	31	G	G	G	G	G	G
23	G	G	G	G	G	G		34	32	33	32	36			34	32	38	32	28	26	28	G		G
24	G	G	G	G	27	G		27	30	32	34	36	42	36	33		30	G	30	28	G	G	G	G
25	G	G	28	G	29	33	30	33	34	41	38	37	33	31	35	33	30	30	G	G	G	29		G
26	G	G	G	G	30	G	25	34	32	33	32	34	32	37	33		38	34	G	G	G	G	G	G
27	32	G	25	24	31	29	34	34	34	34	34	32	35	38	36	35	31	31	G	G	G		G	G
28	G	G	G	G	G	G		36	32	40	40	37	34	34	36	32	30	24	30	28	G	G	G	G
29	G	G	28	28	G	G	27	29	33	36	37	37	37	37	34	34	30	24	G	27	G	29	G	G
30	32	28	G	G	G	G		35	32	34	34	31	36	29		35	31	25	G	G	G	G	G	G
31	G	30	G	G	G	G		35	32	35	34	38	40	36	31	35	32	24	29	29	G		G	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	30	29	30	29	23	30	31	30	31	31	30	30	30	28	31	31	31	30	31	27	26	31
MED	G	26	G	G	28	G	24	32	32	33	34	35	34	34	34	32	30	26	G	G	G	G	G	G
U Q	27	32	28	28	30	15	27	34	33	36	37	37	36	36	35	33	33	30	29	28	G	G	G	G
L Q	G	G	G	G	G	G	G	30	30	32	33	33	33	32	33	31	28	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

MAR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	14	15	15	15	15	16	15	16	16	17	18	20	21	17	18	17	18	15	15	15	15	15	15
2		15	15	14	15	15	17	15	16	18	20	23	18	24	18	16	16	14	15	15	15	15	15	15
3	16	14	15		14	15	16	15	16	18	22	20	22	21		17	16	15	15	16	15	15	15	15
4	14	15	15	15	15	15	17	14	16	16	16	16	20	17	16	15	15	16	15	15	15	15	15	14
5	15	14	15	15	15	15	17	15	16	16	17	16	20	18	17	17	16	15	15	15	15	14	15	14
6	15	15	14	15	15	15	18	15	15	17	20	17	20	16	18	17	15	20	15		15	14	15	14
7	15	15	15	15	15	15	18	14	15	18	16	18	21	20	20	17	16	21	15	15	15	15	15	14
8	14	14	15	14	16		18	15	15	18	20		20	18	17	17	17	23	15	14	15	15	15	15
9	15	15	14	14	15	15	21		16	20	20	20	22	21	17	17	15	20	14	15	15	15	14	16
10	15	15	15	14	15	15	21	15	16	16	17	20	20	20	20	18	16	23	15	14	15	15	15	15
11	15	15	15	14		15		15	16		20	21	20	20	18	16	15	21	15	15	14	15	14	15
12	15	15	15	15	15	15	16	15	15	17	18	18	17	16	20		16	15	15	15	15	15	15	14
13	15	15		14	14	15	18	15	16	20	22	18	18	17	16	17	17	16	15	15	15	15	16	15
14	14	14	15	15	15	15	20	15	17	18	18	18	17	17	16	15	16	23	15	14	15	15		18
15	15	14	16	16	15	15	18	15	16	16	18	17	17	18	18	17	16	16	16	15	15	15	15	15
16	14	15	14	14	14	15	15	15	15	17	17	18	17	16	16	17	16	24	15	15	15	15	15	15
17	15	15	15		15	15	21	15	16	16	17	21	20	17	20	17	17	16	15	15	14	15	14	15
18	15	14	15	15	15		21	15	16	17	21	21	18	18	17	16	17	23	16	15	15	15	14	15
19	15	15	15	15	15	15	22	15	16	55	23		18	17	17	16	16	15	16	14	15	15	15	15
20	15	15	15	15	15	15	16	15	16	20	21	18	21	18	17	17	16	24	17	15	15		14	15
21	15	15	14	15	14	16	16	15	16	17	18	21	23	20	17	16	16	26	17	15	15	15	15	14
22	15	15	15	15	15	16	23	15	15	17	20	23	22	21	18	18	16	15	17	14	15	15	15	15
23	15	15	15	15	14	15	17	15	16	18	18	21			18	16	16	15	18	16	15	15		14
24	15	15	15	15	15	15	16	16	15	16	20	20	22	23	20		15	49	15	15	15	15	15	14
25	15	15	15	15	15	15	17	14	16	20	18	21	22	20	20	20	17	15	17	15	14	15	15	15
26	15	15	15	15	15	15	18	16	16	17	20	20	24	20	20	20	15	15	17	15	15	15	15	14
27	15	15	15	15	14	15	18	15	15	17	17	20	18	20	18	17	17	16	17	14	15	15	15	14
28	15	15	15	15	15	15	16	14	15	17	17	22	20	17	17	16	15	16	15	15	16	15	15	15
29	15	15	15	15	16	16		15	17	20	18		23	20	20	17	17	16	18	15	15	15	15	15
30	15	15	15	15	15	16		15	16	17	26	17	22	18		17	16	16	18	16	15	15	16	15
31	15	15	16	15	15	16	15	16	16	17	20	20	21	20	17	16	18	15	15	15	15		15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	30	29	30	29	28	30	31	30	31	28	30	30	29	29	31	31	31	30	31	29	29	31
MED	15	15	15	15	15	15	18	15	16	17	18	20	20	19	18	17	16	16	15	15	15	15	15	15
U Q	15	15	15	15	15	15	19	15	16	18	20	21	22	20	20	17	17	23	17	15	15	15	15	15
L Q	15	15	15	14	15	15	16	15	15	17	17	18	18	17	17	16	16	15	15	15	15	15	15	14

HOURLY VALUES OF foF2 AT Kokubunji

MAR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	69	61	60	57	50	48	57	96	104	120	121		131	135	128	130	124	123	114	93	95	69	57	69
2	60	68	72	62	69	57	72	104	133	142	148	152	150	145	151	134	130	131	103	81	77	80	72	66
3	68	62	57	68	57	47	70	80	95	120	152	132	135	132	136	128	123	113	93	86	90		51	64
4	69	68	68	69	47	35		94	122	116	122	128	131	126	120	116	116	116	106	81	74	82	70	82
5	92	64	62	56	58	57	57	95	113	117	127	128	130	132	140	128	122	111	104	93	82	64		95
6	90	71	69	57	56	57	55	107	133	118	123	126	126	127	125	127	121	113	95	81	69	66	71	63
7	69	68	71	56	54	54		106	115	116	126		134	137	128	120	124	114	100	86	85	91	94	
8	93	92	94	77	80		85	105	125	133	132	134	135	137	132	128	127	126	117	82		75	68	93
9	73	68	74	67	58	52		113	125	131	141	138	140	130	126	118	116	113	100	87	95	82	94	81
10	93	81		58	50	46	39	94	113	121	131	137	140	140	136	126	123	116	101	86	79	95	95	72
11	69	68	94	68	57	60		106	122	132	140	142	145		135	128	127	116	99	86	83	94	73	73
12	74	64	63	68	54	60	76	102	133	142	144	152		144	130	130	113	116	112	96	79	71		67
13	70		95	56	57	68		98	116	128	136	137	136	134	121	123	119	126	122	83	90	81	96	90
14	93	80	68	61	48	56	69	92	117	117	132		130	124	121	116	117	118	114	94	90	81	82	81
15	94	82	72	56	57	60		97	114	132	130		135	126	124	118	121	114	95	84	72	83	82	82
16	93	81		72		47	69	96	113	121							123	120	117	106	84	94		93
17	78	68	68	53	56	57	64	95	113	130						126	123	120	113	94	84	78	89	81
18	88	95	68	68	56	57	69	104	117	123	126	134	137	132	132	126	122	118	116	92	86	85	93	93
19	80	77		69	58	60		103	116										117	113	87	96	85	94
20	81		93	94	60	57	82	116	127	126	131	138	136	138	136	127	124	126	116	101	96	93	93	94
21	92	91	80		62	60	92	116	115		125	137	145	140	133	126	124	126	120	104	95	97	94	88
22	92	84	93	94	56	58		113	115	120		133	132	131	128	131	126	116	114	97	84		94	92
23	87	94	95	70	68	70		94	98	102	112	152	141	136	132	132	126	134	116	98	94	93	93	93
24	76	70	64	66	55	60	91	116	124	133	131	132	136	136	130	122	119	121	114	98	99	102	99	98
25	82	94	94	70	56	62		112	123		138	153	136	134	126	127	120	114	116	102	84	92	94	94
26	93	94	94	60	60	60		102	111	120	151	132	142	142	152	128	122	132	111	110	116	116	90	98
27	92	93	92	92	73		93	110	121	133	151	138	134	136	131	125		123	119	105	103	116	100	
28	92	91	94	71	56	53	88	122	131	132	127	131	136	N	137	128	117	117	111	103	96	92	98	
29	114	93	94	94	60	60	95	107	121	131	128	134	133	128	127	126	120	124	117	98	84	96	97	96
30	93	87	94	94	63	60	93	117	140	140	130	134	130	131	125	124	120	120	124	98	81	94	94	100
31	115	96	92	78	73		115	124	123	134	142	137	140	141	137	134	128	123	116	114	104	95	116	103
	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	29	28	30	30	28	20	31	31	28	27	24	27	26	28	29	29	30	31	31	30	29	28	28
MED	88	81	77	68	57	57	74	104	117	127	131	136	136	134	130	127	122	119	114	94	86	92	93	91
U Q	93	92	94	72	60	60	91	113	125	132	141	138	140	138	136	128	124	124	117	102	95	95	94	94
L Q	73	68	68	58	56	53	66	96	113	120	126	132	132	131	126	123	119	116	103	86	82	80	77	77

HOURLY VALUES OF fEs AT Kokubunji

MAR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	28	31	32	24		40	39	35	36	40	40	G	G	G	G	G
2	G	G	37	28	G	26	G	30	30	28	32		34	G		46	32	44	G	G	G	28	G	G
3	G	G	G	G	G	G	G	56	27	34	33	34	G	44	44	38	34	36	G	G	29		33	50
4	25	G	G	G	G	G	G	G	28	32	33	37	47	56	67	73	74	54	48	43	27	32	27	G
5	G	G	G	G	G	G	G	G	31	30	G	G	G	G	G	34	33	29	G	G	G	G	G	G
6	G	G	26	30	G	G	G	24	31	33	36	32	G	G	47	37	37	29	G	27	24	G	G	29
7	G	G	G	G	G	G	27		32	35	37	G	46	47	47	38	30	32	24	G	G	G	G	G
8	G	31	G	G	29	G	G		30	34	35	G	G	G		46	38	34	29	G	G	G	G	G
9	G	G	G	G	G	G	G	28	36	33	33	32	32	34	40	35	32	31	G	26	28	29	G	G
10	G	G	G	G	G	G	G	G	35	32	32	28	G		35	34	34	29	G	G	27	G	G	G
11	G	G	G	G	24	G		24	30	32	40	G	G		37	34	36	29	G	24	G	G	G	31
12	G	G	G	G	G	G		29	35	32	G	G	G	G	G	34	31	32	31	G	G	G	G	G
13	G	G	G	G	G	G	G	26	28	31	G	32	G		37	35	36	G	G	24	29	G	G	G
14	G	G	G	G	G	G	G	30	39	33	33	32	32	G	G	35	36	29	G	G	G	G	G	G
15	G	G	G	G	G	G	G	32	33	36	36	38	44	32	39	32	32	25	G	G	G	G	G	G
16	G	G	G	G		G	G	29	34	31							44	37	34	36	30	G	G	G
17	24	G	G	38	G	G	27	28	34	40						35	32	G	G	G	G	G	G	
18	G	G	G	G	G	G	G	34	37	37	39	G	38	G	G	33	32	30	G	G	G	G	G	G
19	G	G	G	G	G	G			36										G	G	G	G	G	G
20	G	G	G	G	G	G			31	34	G	G	G	34	39	36	37	32	G	G	G	G	G	G
21	G	G	G	G	G	G	G	28	30	34	G	G	G	38	34	32	32	28	G	G	G	G	G	G
22	G	G	G	G	G	G	30	27	32	34	G	G	G	G	34	36	34	40	30	29	11	27	G	G
23	G	G	G	G	G	G	27	32	32	35	G	G	G	G	G	38	38	32	G	G	G	G	G	G
24	G	34	28	G	G	G	33	33	31	31	G	G	G	G		47	36	G	28	31	28	31	G	28
25	G	G	G	G	G	G		31	33	35	50	G	40	29	G	G	33	32	G	25	32	G	G	G
26	G	G	G	G	G	G		32	33	33	39	34	G	G		35	49	38	26	G	G	G	G	G
27	G	G	G	G	G	23	24	34	33	33	32	G	G	30	G	38	36	35	G	G	G	G	G	G
28	G	G	G	30	G	G		35	34	50	43	G	G	G		36	33	34	26	G	25	G	G	
29	G	G	G	G	G	G		32	32	G	G	G	G	G	34	32	32	39	28	G	26	G	G	G
30	G	G	G	G	G	G	24	34	32	33	G	G	G	G	G	G	32	47	48	34	G	G	G	G
31	G	G	G	24	G	G		28	34	54	58	71	54	G	47	34	G	28	28	40	52	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	30	31	22	27	31	30	28	27	27	25	23	29	30	30	31	31	31	30	31	29
MED	G	G	G	G	G	G	G	29	32	33	32	G	G	G	35	35	34	32	G	G	G	G	G	G
U Q	G	G	G	G	G	G	24	32	34	35	36	32	34	34	40	38	36	37	28	26	27	G	G	G
L Q	G	G	G	G	G	G	G	26	30	32	G	G	G	G	G	34	32	29	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

MAR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	15	15	14	17	16	16		23	18	22	15	16	14	14	15	15	14	15	15
2	16	14	15	14	15	14	17	15	14	18	17	18	26	52	16	17	15	16	15	15	14	14	15	14
3	15	14	14	14	15	15	16	14	14	18	23	21		18	17	15	16	17	15	14	14		14	14
4	15	15	14	15	14	20	16	17	15	18	18	27		20	17	15	14	14	14	15	15	15	17	14
5	14	14	14	15	14	14	16	28	14	15		42	46	44		18	16	21	15	14	14	15	16	14
6	15	15	14	14	16	15	17	14	15	15	22	22		47	16	17	14	14	16	15	14	14	15	14
7	15	14	14	15	14	14	16	15	16	18	22	45	32	26	21	16	16	15	16	14	15	14	15	15
8	14	14	14	14	14	15	15	15	17	20	23			45	18	20	15	14	15	15	14	15	15	14
9	15	15	14	14	15		21	18	14	16	17	22	21	48	17	18	15	15	14	15	14	16	15	14
10	14	14	14	14	14	15	20	14	16	17	16		44	26	21	18	15	15	16	15	15	15	15	15
11	17	15	15	15	14	15		26	16	14	16		45		23	22	17	18	15	15	14		15	15
12	14	15	15	14	15	15	22	14	14	21		45	45	42	43	20	14	15	15	14	15	15	15	14
13	14	14	15	15	15	15	18	15	16	17		43	47	28		18	15	15	16	14	14	15	15	14
14	15	14	15	15	14	14	18	16	15	15	20		21		42	20	15	14	17	14	15	15	15	14
15	14	15	15	15	15	15	15	15	15	15	17	29	20	18	17	14	17	15	16	15	14	15	15	16
16	15	14	15	14		14	18	15	15	14							16	15	15	14	15	15	15	14
17	15	15	14	15	14	15	15	15	17	17						16	14	16	16	15	15	15	14	15
18	15	15	15	14	14	15	20	15	16	24	29	46	46	44	43	21	15	15	16	15	14	15	15	15
19	15	14	15	15	15	15	15	14	16										17	15	15	16	14	15
20	15	15	14	14	14	14	15	15	16	21	16		48	27	26	20	17	15	18	15	15	15	15	15
21	15	14	15	14	15	15	21	18	15	16		46	48	27	22	17	15	15	18	15	15	14	15	14
22	14	15	15	15	15	15	15	17	16		42	48	44	42	24	29	17	16	14	15	16	15	16	15
23	15	15	14	15	15	15	20	16	17	14	57	45	46	45	42	20	16	14	18	15	15	14	15	14
24	14	14	15	14	14	14	15	15	15	18		43	45		50	20	17	43	15	14	15	15	14	15
25	15	14	14	15	15	14	14	15	18	16	22		27	22		42	18	14	18	15	15	15	15	14
26	15	15	14	15	14	15	17	15	18	21	26	26		48	23	21	17	14	18	14	15	15	15	14
27	15	14	15	16	14	15	16	14	15	18	21		45	21	43	21	17	16	18	15	14	15	14	15
28	15	15	15	14	15	15	15	15	16	16	28	52	47			21	17	14	16	15	16	15	14	
29	14	14	15	15	14	14	24	15	18	40	46	48	52	54	20	22	15	16	16	15	15	14	15	15
30	14	15	15	14	15	15	18	15	17	20	49	48	46	46	43	42	17	17	15	15	14	14	15	14
31	14	18	15	16	15	15	17	15	18	21	26	39	40	46	46	24		16	15	15	14	15	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	30	30	30	31	31	29	23	20	23	24	24	29	29	30	31	31	31	29	31	30
MED	15	14	15	15	14	15	16	15	16	17	22	43	45	42	22	20	16	15	16	15	15	15	15	14
U Q	15	15	15	15	15	15	18	16	17	20	28	46	46	46	42	21	17	16	17	15	15	15	15	15
L Q	14	14	14	14	14	14	15	15	15	15	17	26	27	24	17	17	15	14	15	14	14	14	15	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES

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

HOURLY VALUES OF foF2 AT Okinawa

MAR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	96	115	115	94	75	58	62	84	106	115	128	133	133		148	152	148	147	166	170	165	165	136	124
2	116		96	96	95		57		125	133	161	158	163	174	176	180	171	173	182	182	165	167	164	
3	150	130	136	111	94	48		60	94	112	123		145	138	146	150	173	169	166	146	171	167	181	134
4	136	115	112	94	70			66	119	115	126	121		125	118	120	122	130	135			119		110
5			98	81	68	54	43	65	101	123	128	144	157	162	170	178	185	184	181	189	177	173	157	
6	136	151	116	94	75	67	46	66	106	118	131	134	152	156	165	171	162	174	168	174	164	164	166	155
7	127	151	133	116	95	70	66	88	106	122	149	136	151	142	134	126	121	122	110	110	90			
8	93	93	84	80	74	60	56	60	110	130	131		154	163	168	168	163	164	159			150		94
9	92	86	92	92	71	53	55	88	114	132		153	152	158	151	152	130	127	139	129	126	150	136	136
10	120	126	122	95	68		58	72	94	122	130	130	153	146	149	148	150	142	139	139	140	140	136	140
11	116	109	94			69	59	82		125	132	154	154	158	156	153	150	146		167	171		159	151
12		150	96	96	82	71	63	83	111	133	139	150	150	149	148	146	142	128	144	146	112			90
13	89	89	89	72	55	56	60	83	112	133	130	125	150	150	149	150	155	146	154	166	165	167	161	N
14	154	122	93	93	57	51	48	82	120	133	127	124	150	148	162	171	173	176	173	170	164	167	151	150
15	122	116	93	82	69	59	51	84	113	132	127	130	150	136	154	170	158	156		159	140		123	132
16	122	109	93	71	38	38		66	93	116	128		146	156	170	160	160	180	159		156	148	136	136
17		126	76	69	47		42	76	106	131	128	131	151	169	180	184	182	181	174	169	134	160	156	152
18	152	129	115		95	50	43	83	96	116	130	134	152	163	171	179	180	167	169	174	171		151	151
19	152	125	122	93	69	54	43	66	96	118	131	122	126	150	158	158	158	151	151	159	159	139	114	94
20	94	87	96	83	56	48	48	83	112	116	124	130	147	166	177	183	177	174	174	168	163	172	155	140
21	151	139	96	71	58	44	43	80	106	121	126	133	150	148	148		148	132	128	160	158	154	136	
22		114	124	116	77	51	50	83	109	112	122	124	152	157	172	172	166	165	147	135	151	154	132	121
23	132	116	117	94	87	94	93	111	121	127	155	157	158	160	171	190	195	194	193		187	189	164	126
24	122	112	116	93	73	68	67	92	120	122	150	132	132	151	150	152	152	149	145		160		172	187
25		89	114	95	82	73	73	94	118	130	134	144	148	168	180	181	186	186	172	174	161	173	165	165
26	180	185	125	81	78	92	88	96	117	121	130	131	146	153	150	148	150	174	145	A	152	161	172	185
27	152		167		81	94	68	91	118	124	133	130	129	130	144	147	128	164	133		141	154	148	133
28	136	130	116	80	50		51	88	118	116	128	116	135	160	172	168	167	174			163			150
29	147	134	116	93	62	60	60	94	114	120	131		150	150	157	171	167	166	165		164	173		174
30	152	132	120	81	69	59	57	94	116	134	120	118	130	130	149	150	138	128	129	129	104	77	127	109
31		147	116	84	69	69	59	99	123	131	133	133			160	165	168	165	160	174	149	164	154	155
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	28	31	28	30	26	28	30	30	31	30	27	29	29	31	30	31	31	28	22	29	24	25	26
MED	132	124	115	93	70	59	57	83	112	122	130	132	150	153	157	162	160	165	159	166	160	162	154	138
U Q	151	133	120	94	81	69	62	91	118	131	133	144	152	161	171	172	173	174	170	174	165	167	164	152
L Q	116	110	94	81	62	51	48	72	106	116	127	125	145	147	149	150	148	146	141	146	140	150	136	124

HOURLY VALUES OF fEs AT Okinawa

MAR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	34	48	34	30	28	G		36	42	46	63		G	44	40	42	33	38	G	G	G	G
2	G	G	G	G	G	G	G			31	42	35	51	G	42	42	42	34	G		32	G	G	G
3	G	G	G	G	G	G	G	G		39	38	39	38	56	40	38	33	34	28	26	G	G	G	G
4	G	38	G	G	G	G		G		37	40	38	56	49	52	41	37	31	G		G	G	G	G
5			G	G	G	G	G	G		28	36	38	40	38	38	G	31	28	23	G	G	G	G	G
6	G	G	25	34	35	G	G	G	26	32	36	38	G	38	G	42	34	39	G	28	G	G	G	G
7	G	G	G	G	G	26	24	23	26	39	35	38	G	G	36	35	48	30	G	G	G	G	G	G
8	G	G	G	G		24	G	23	32	33	36	G	38	40	G	38	34	27	22	G		G	G	G
9	G	34	24	G	G	G	G	G	25	34			37	G	78	75	61	72	33	26	26	G	G	G
10	G	G	G	G	G	G	G	38	27	32	G	G	36	G	G	42	37	40	33		29	G	G	G
11	G	G	G	G	G	G	G		34	41	37	56	37	G	G	44	48	40	35	G	35	26		G
12	G	G		G	G	G	24	25	33	28	G	G	60	64	80	46		42	23	26	G	28		G
13	G	G	G	G	G	G	G	24	25	G	G	34	36	G	G	42	38	39	G	G	G	57	29	G
14	G	G	G	G	G	G	G	30	32	38	42	36	37	36	G	G	31	34	25	G	G	34	24	G
15	G	G	G	G	G	G	G	32	41	39	43	45	54	61	G	G	44	G	34	25	G	G	G	G
16	G	32	30	43	36	G	G		31	38	36		45		40	39	35	37	27		29	G	G	G
17	G	G	G	G	G	G	G		33	39	42	46	G	G	G	37	33	26	21		G	G	G	G
18	G	G	G	G	G	G	G			36	37	39	G	G	34	G	34	36	23	G	G		G	G
19	G	G	G	G	G	G	G		38	G	G	G	48	40	G		35	28		G	G	G	27	G
20	G	G	G	G	G	G	G	21	29	35	38	38	G	G	G	43	38	39	34	G	27	G		G
21	G	G	G	G	G	G	G	G	36	40	36	37	39	36	G		33	30	22	G	G	G	G	
22	G	G	G	G	G	G	G	26	30	36	34	G	G	G	G	G	37	35	25	G	G	G	G	G
23	G	G	G	G	G	G	G		30	34	G	37	G	G	G	45	39	36	23		G	G	G	G
24	G	G	G	G	G	G	G	32	32	34	36	47	G	G	G	G	41	G	34		G	G	G	G
25		G	G	G	G	G	G		31	34	36	35	G	46	G	46	41	34	28	40	35	G	G	
26	G	34	G	G	G	G	G	25	30	36	39	38	G	G	G	40	37	38	29	34	G	G	G	G
27	G		G		G	99	G	34	36	38	37	G	G	G	G	G	41	42	31	G	G	G	G	G
28	G	G	G	G	G		G	27	34	37	40	38	G	58	G	G	36	33	24	G	G	G	G	G
29	G	G	G	G	G	G	G	33	37	36	39	G	47	44	60	37	G	37	26	G	G	G	G	G
30	G	G	G	G	G	G	G		38	G	G	G	G	G	G	G	43	47	44	40	51	G	G	G
31		G	G	G	G	G	G		38	36	39	41			G	G	G	G	32	25	G	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	30	30	30	30	30	21	25	31	30	29	30	28	31	29	30	31	30	24	30	30	28	29
MED	G	G	G	G	G	G	G	24	32	36	36	38	36	G	G	38	37	35	26	G	G	G	G	G
U Q	G	G	G	G	G	G	G	31	36	38	39	39	45	42	38	42	41	39	33	26	26	G	G	G
L Q	G	G	G	G	G	G	G	G	29	32	35	G	G	G	G	G	34	30	22	G	G	G	G	G

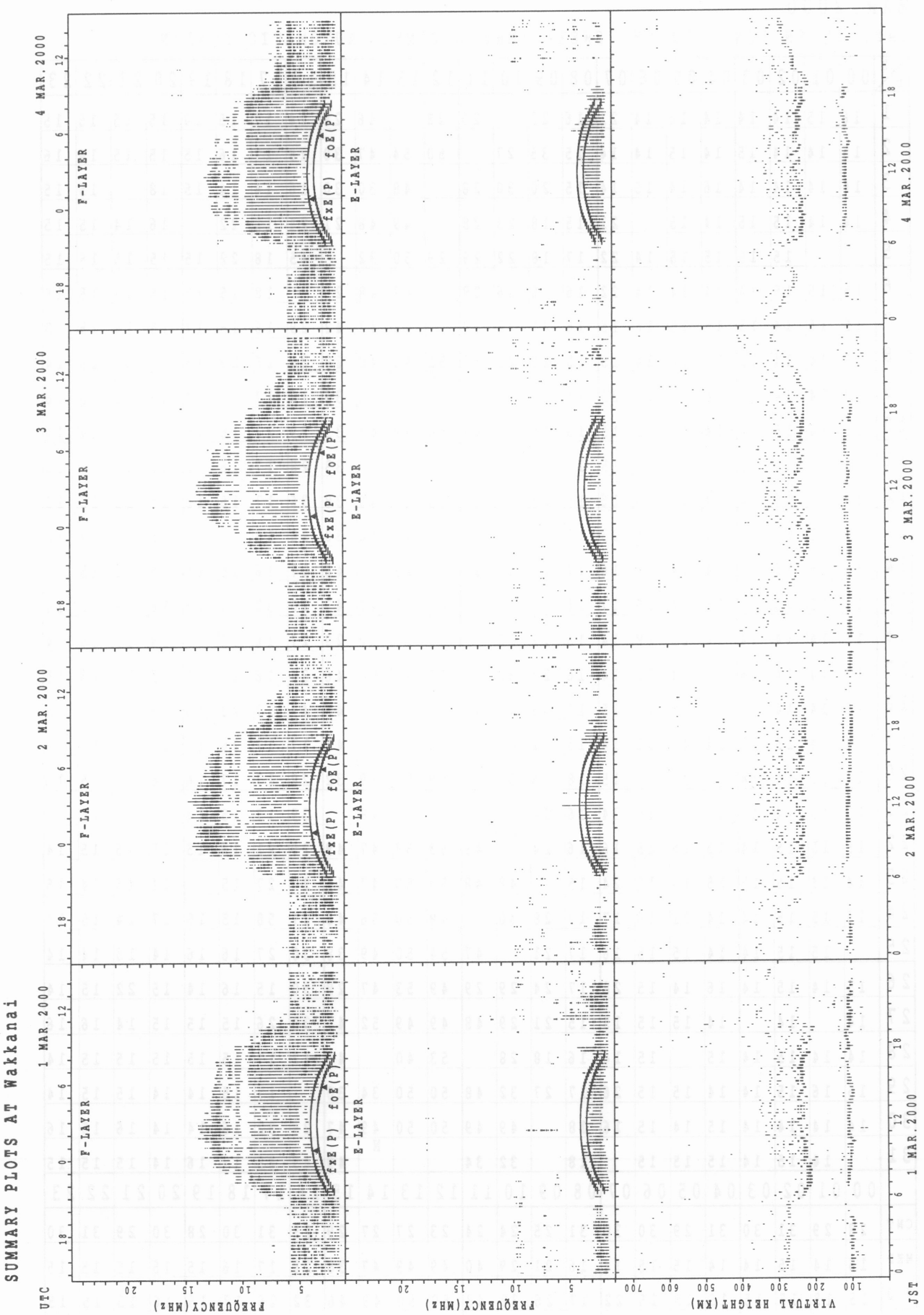
HOURLY VALUES OF fmin AT Okinawa

MAR. 2000

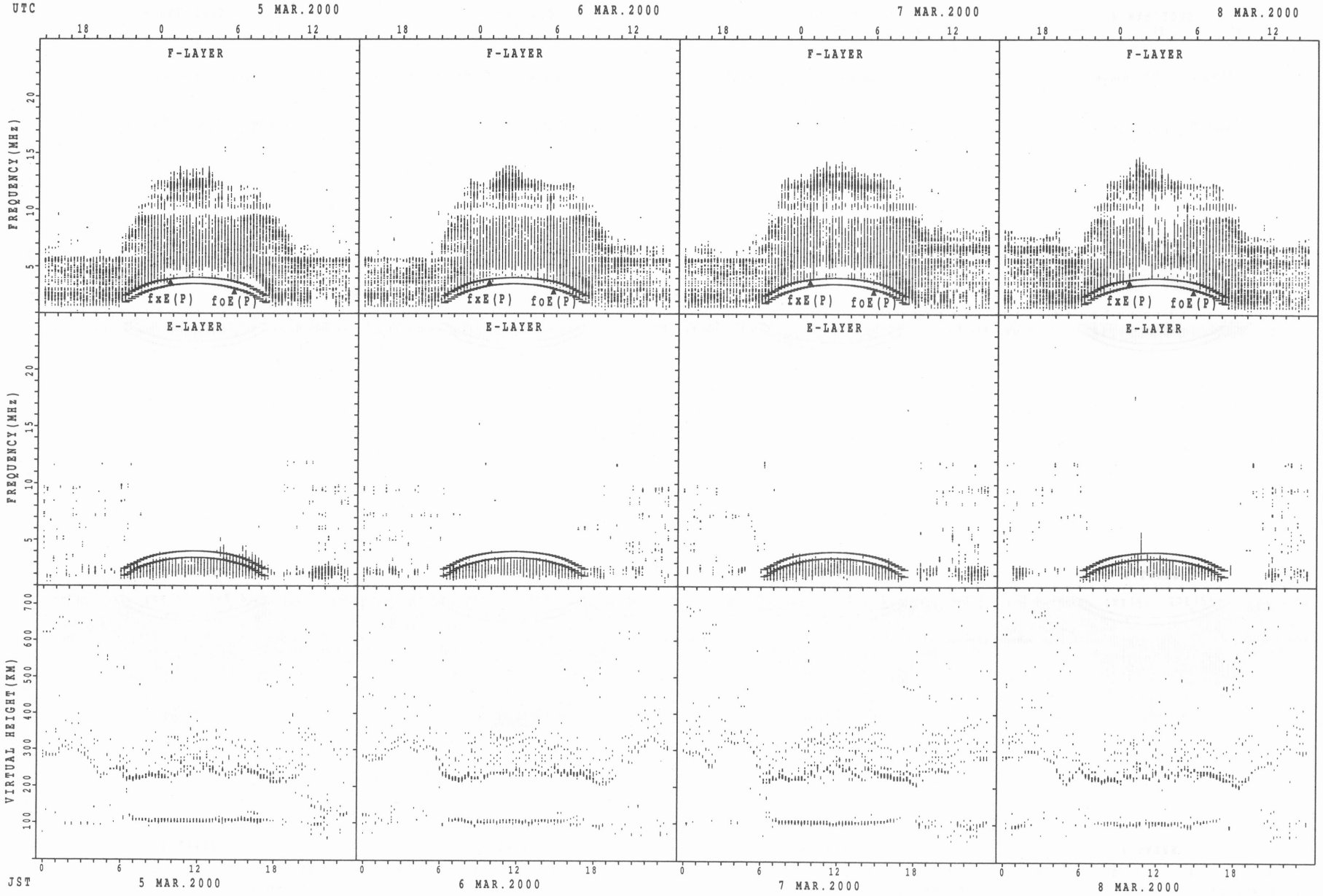
LAT. 35.7N LON. 139.5E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	15	14	14	14	14	14	21	16	22		29	28		46	28	24	17	15	14	15	15	15	15
2	15	14	14	15	14	15	14	14	15	35	27		50	54	47	30	28	17	16	15	15	15	14	16
3	16	14	14	14	16	14	15	14	15	20	30	28		48	30	30	16	14	14	15	18		15	15
4	14	14	15	15	14	15		21	15	18	23	28		49	48	21	24	18	22		16	14	15	15
5			15	15	15	15	14	22	17	18	22	29	29	30	32		45	18	22	15	15	15	15	15
6	15	15	15	14	14	14	14	22	16	16	26	28		48	48	29		18	15	15	16	15	15	15
7	15	15	14	15	15	15	16	15	16	21	28	29		48	47	42	29	16	15	14	15	14	15	15
8	15	14	14	15	14	14	14	15	15	15	29	58	51	48	48	28	24	16	23	15		15	15	14
9	14	14	14	15	14		15	23	15	16		47	47	56	28	39	18	17	15	14	16	15	15	18
10	15	14	15	14	14	15	15	15	15	16		48	50	49	47	33	29	27	16	15	14	14	14	14
11	15	15	14	15	15	14	17	15	16			30		51	49	33	28	17	16	15	14	15	15	15
12	14	17	16	14	14	15	15	16	15	20		47	45	42	46	38	36	17	16	15	16	15	15	15
13	15	15	14	15	14	15	14	23	16		46	27		49	46	30	28	15		15	15	14	14	15
14	15	15	15	15	14	14	16	16	17	17	29	28		28		46	17	16	15	15	15	15	15	15
15	14	15	15	15	15	14	15	17	16		27		41	45	45	47	20	32	14	15	16	16	15	14
16	15	14	14	14	14	20	18	14	16	17	20		29		32	29	27	16	15		14	15	14	14
17	15	14	14	15	14	14	15	14	16	27	32		50	49	50	46	35	16	24	15	15	15	15	15
18	15	14	14	14	15	15	15	15	17	36	46	48	52	50	47	45	47	17	23	15	16		14	15
19	14	14	15	15	14	15	15	14	15	54	47	48	36	30		45	17	17	26	16	15	15	15	15
20	14	15	14	14	14	21	15	15	18	26	32		49	50	49	32	28	17	17	16	14	15	15	15
21	17	15	14	15	15	15	15	24	16	24	29	30	32		48		39	17	15	14	15	15	15	
22	15	15	15	14	15	15	15	16	16	24		49	50	57	47	49	29	21	15	15	15	15	15	14
23	14	14	15	15	15	14	15	24	15		48	48	50	50	47	46	27	27	15		14	15	14	15
24	16	15	15	14	14	21	16	17	17	28	30		49	50	56	48	27	58	15	15	17	14	15	15
25		15	15	14	14	15	15	16	17	21		47	54	50	49	38	30	27	16	16	14	15	14	14
26	15	14	15	14	16	14	15	28	17	24	29	29	49	53	47	29	30	15	16	14	15	22	15	14
27	14		14		14	15	15	15	15	21	29	48	49	49	52	47	30	26	15	15	15	14	16	16
28	14	14	15	14	15		15	14	16	18	28		53	40		48	42	17	15	15	15	15	15	14
29	15	16	15	14	14	15	15	26	17	27	32	48	50	50	34	30		17	15	14	14	15	15	14
30	14	14	14	14	15	14	15	16	18		49	49	50	50	49	47	29	32	16	14	14	16	15	16
31		14	15	14	15	15	15		18		32	34			N	49	49	45	17	16	14	15	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	31	30	31	29	30	30	31	25	24	24	23	27	27	29	29	31	30	28	30	29	31	30
MED	15	14	15	14	14	15	15	16	16	21	29	40	49	49	47	38	28	17	16	15	15	15	15	15
U Q	15	15	15	15	15	15	15	22	17	26	32	48	50	50	49	46	32	26	17	15	16	15	15	15
L Q	14	14	14	14	14	14	15	15	15	17	27	29	41	48	46	30	24	16	15	14	14	15	15	14

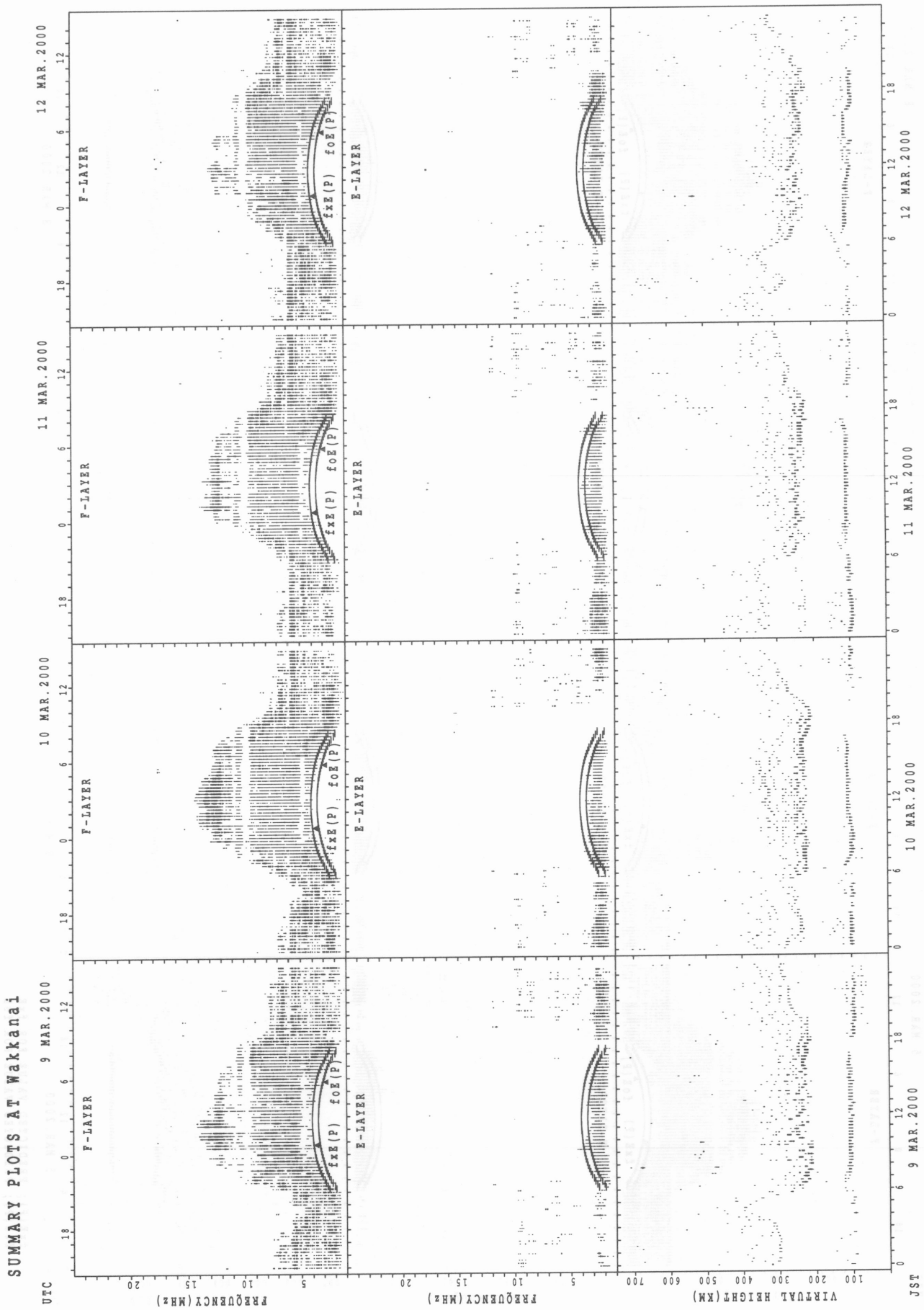
COMMUNICATIONS RESEARCH LABORATORY, JAPAN


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

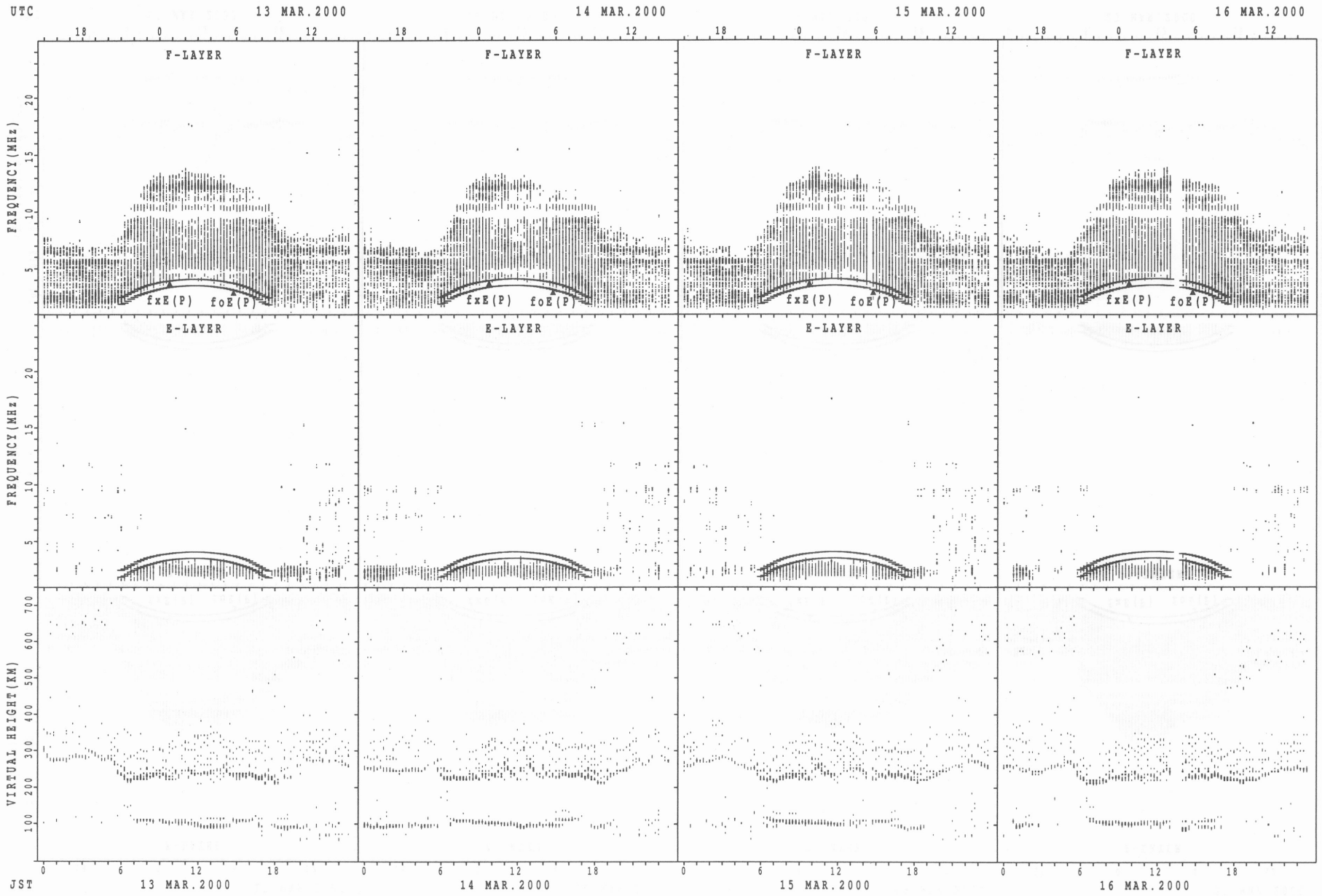
SUMMARY PLOTS AT Wakkanai



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

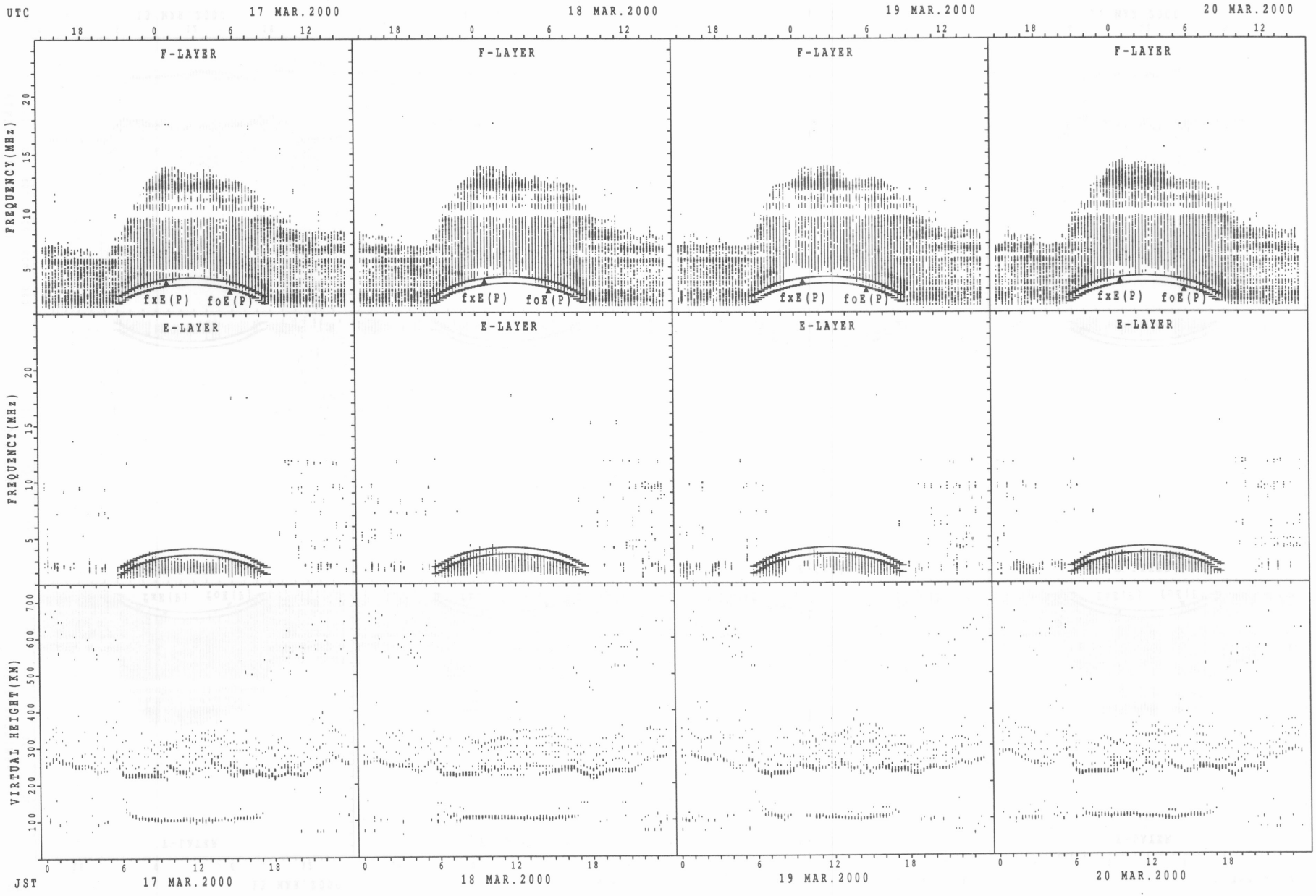

SUMMARY PLOTS AT Wakkanai
UTC
JST
9 MAR.2000
10 MAR.2000
11 MAR.2000
12 MAR.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



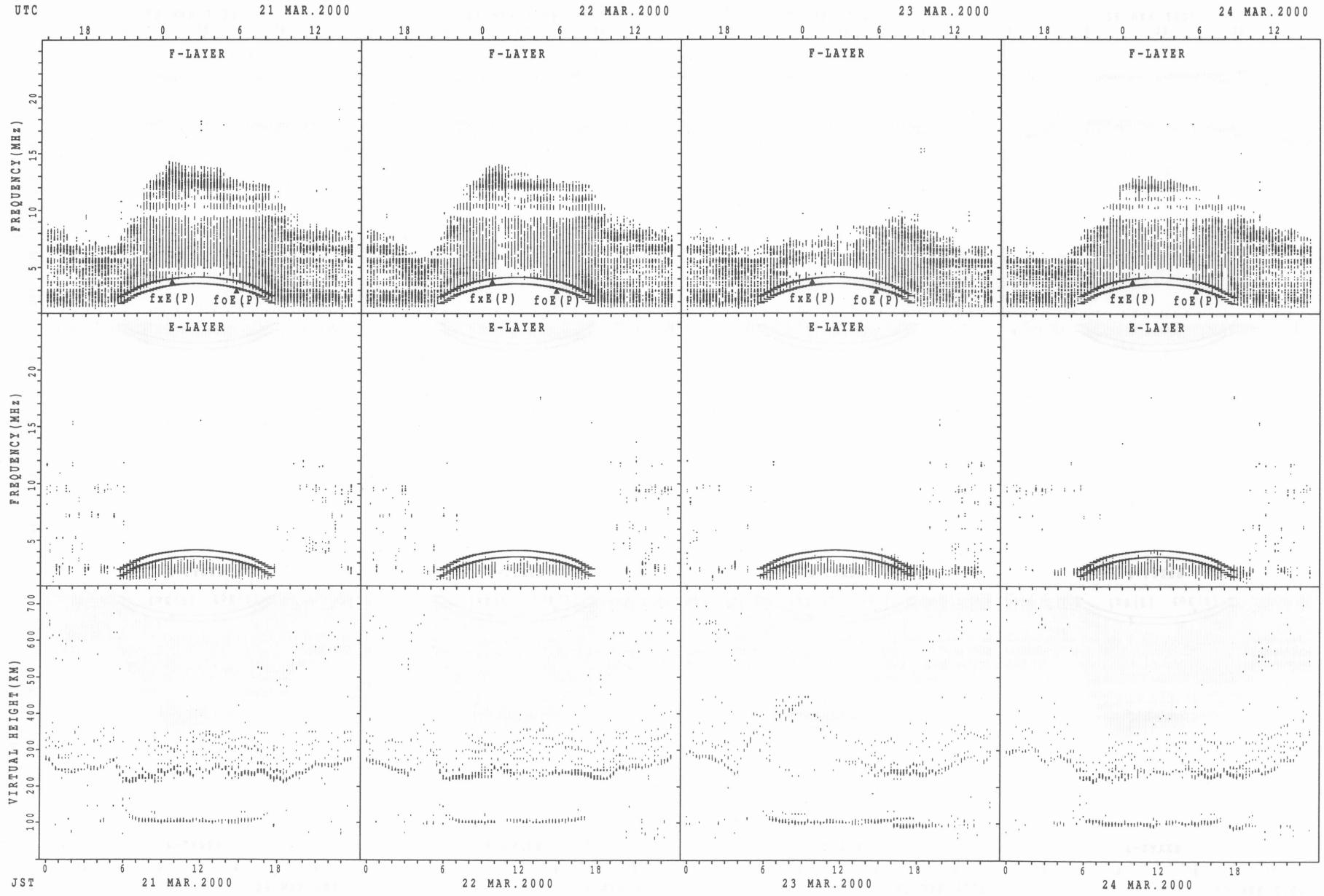
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



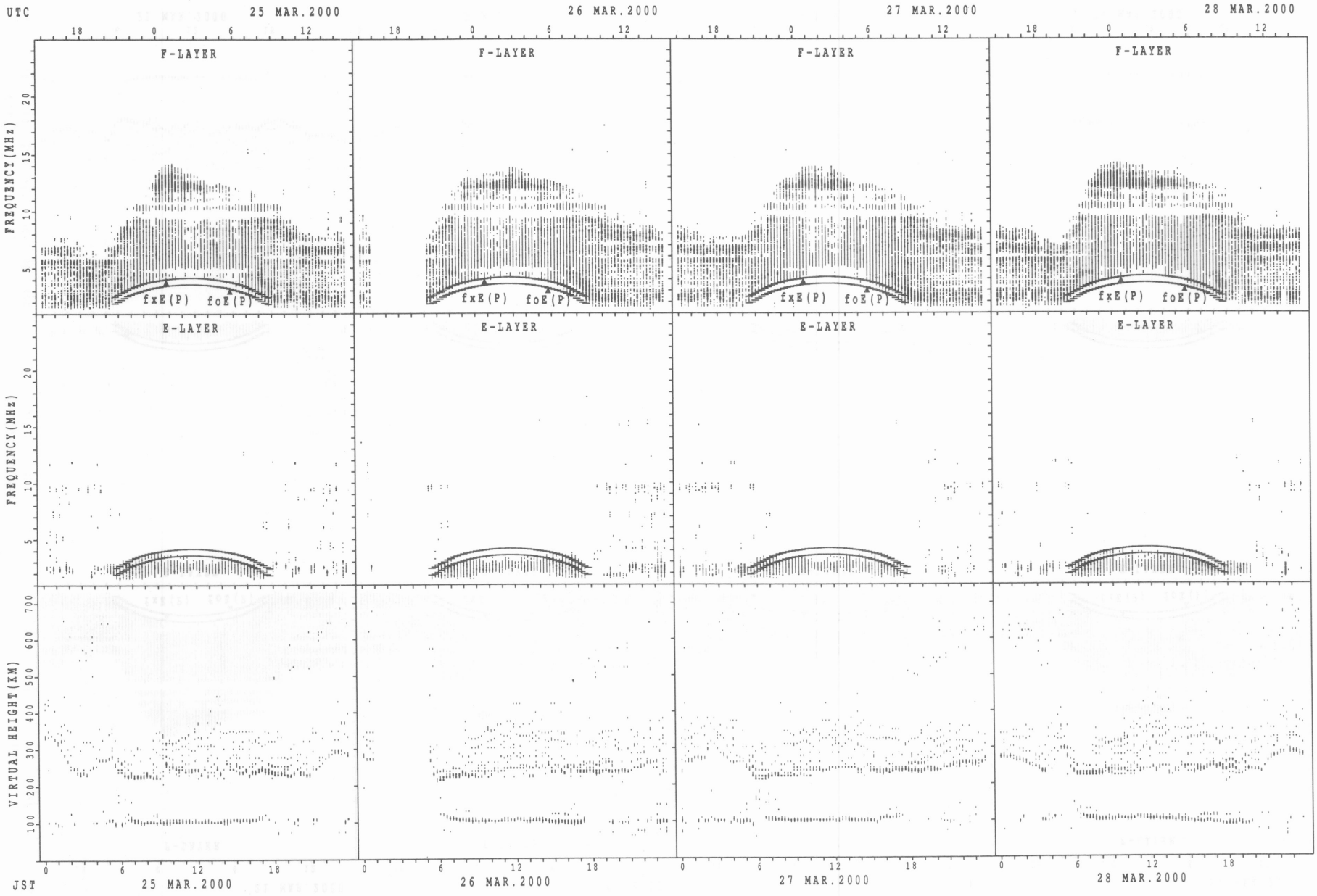
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



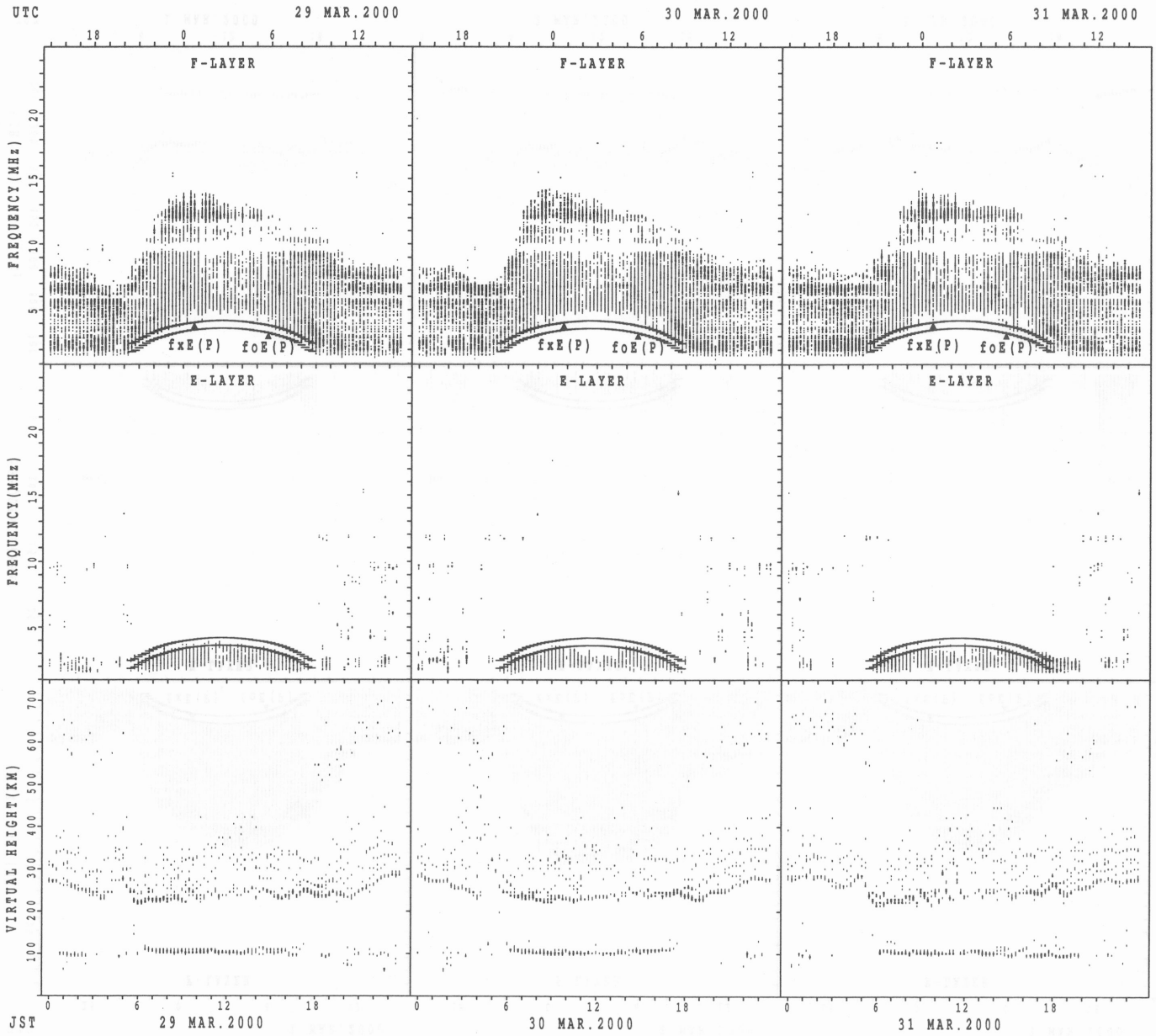
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



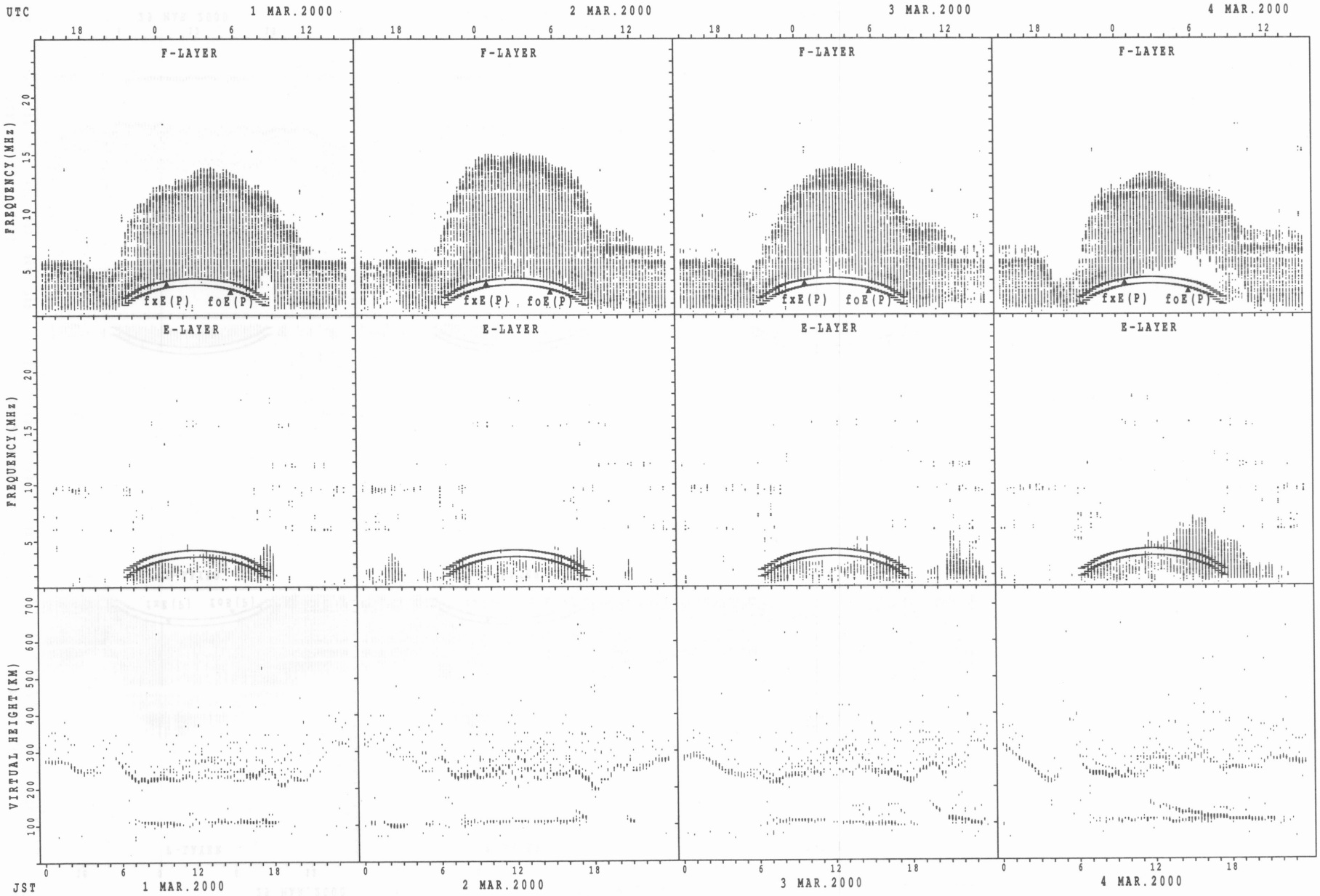
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



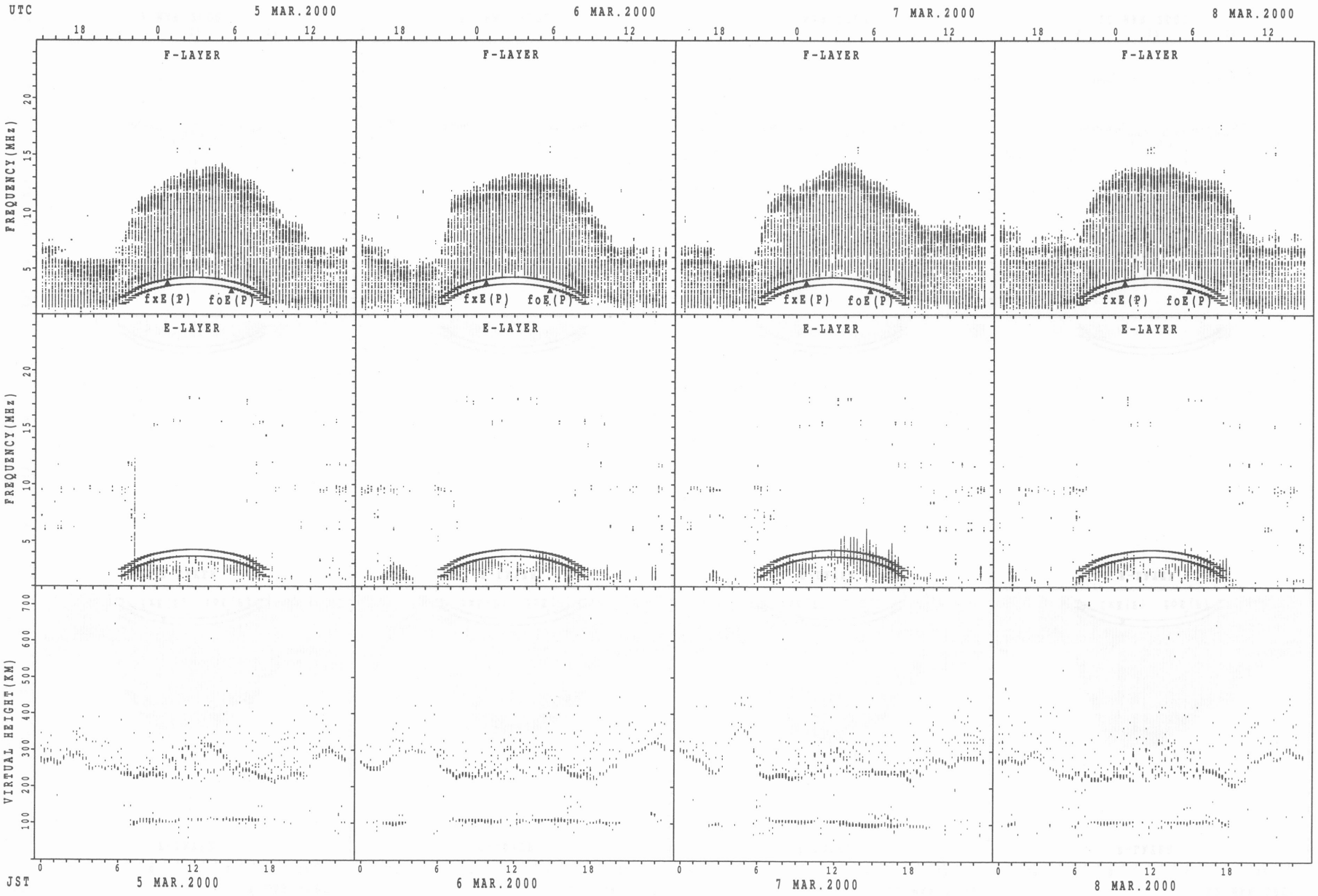
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



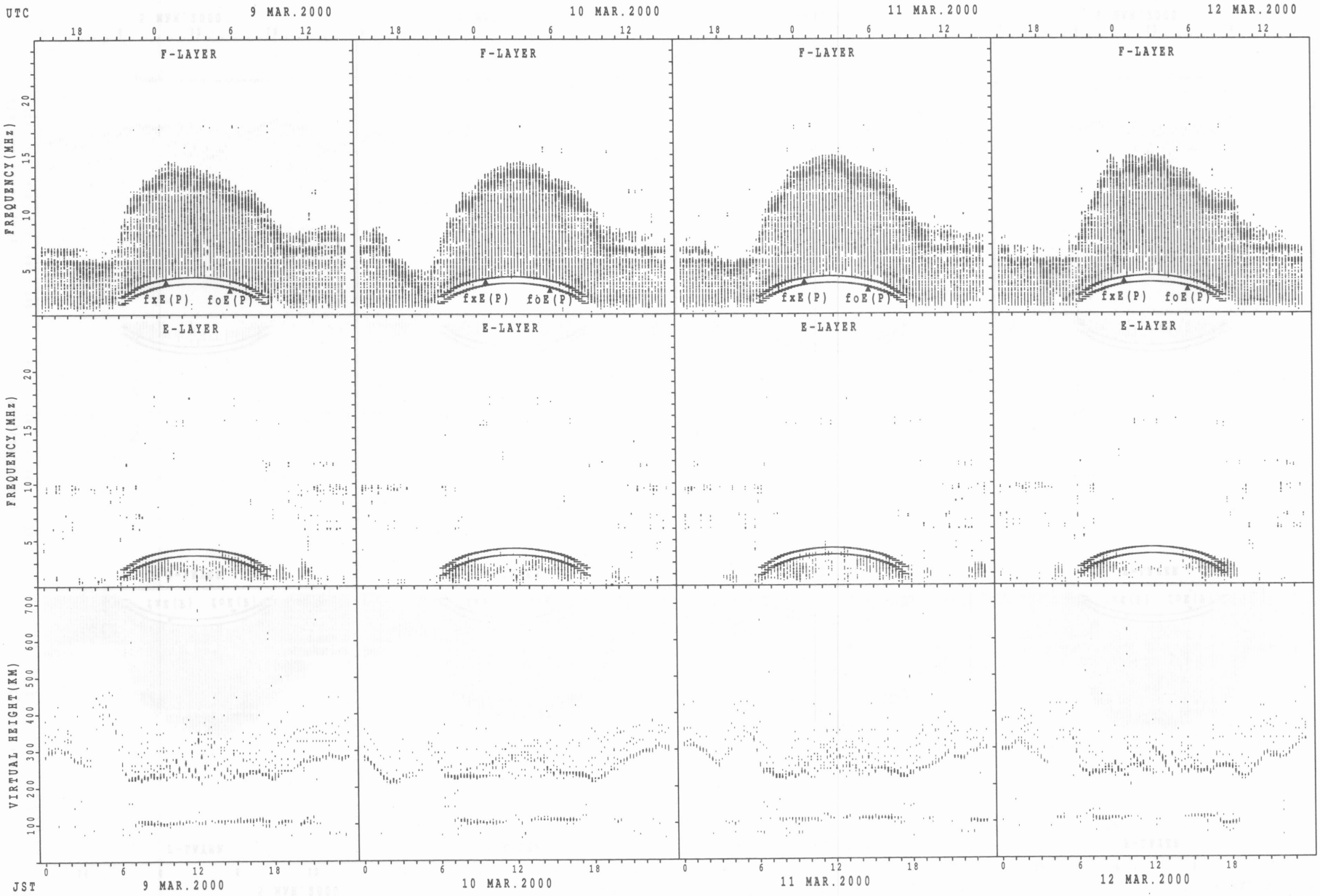
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



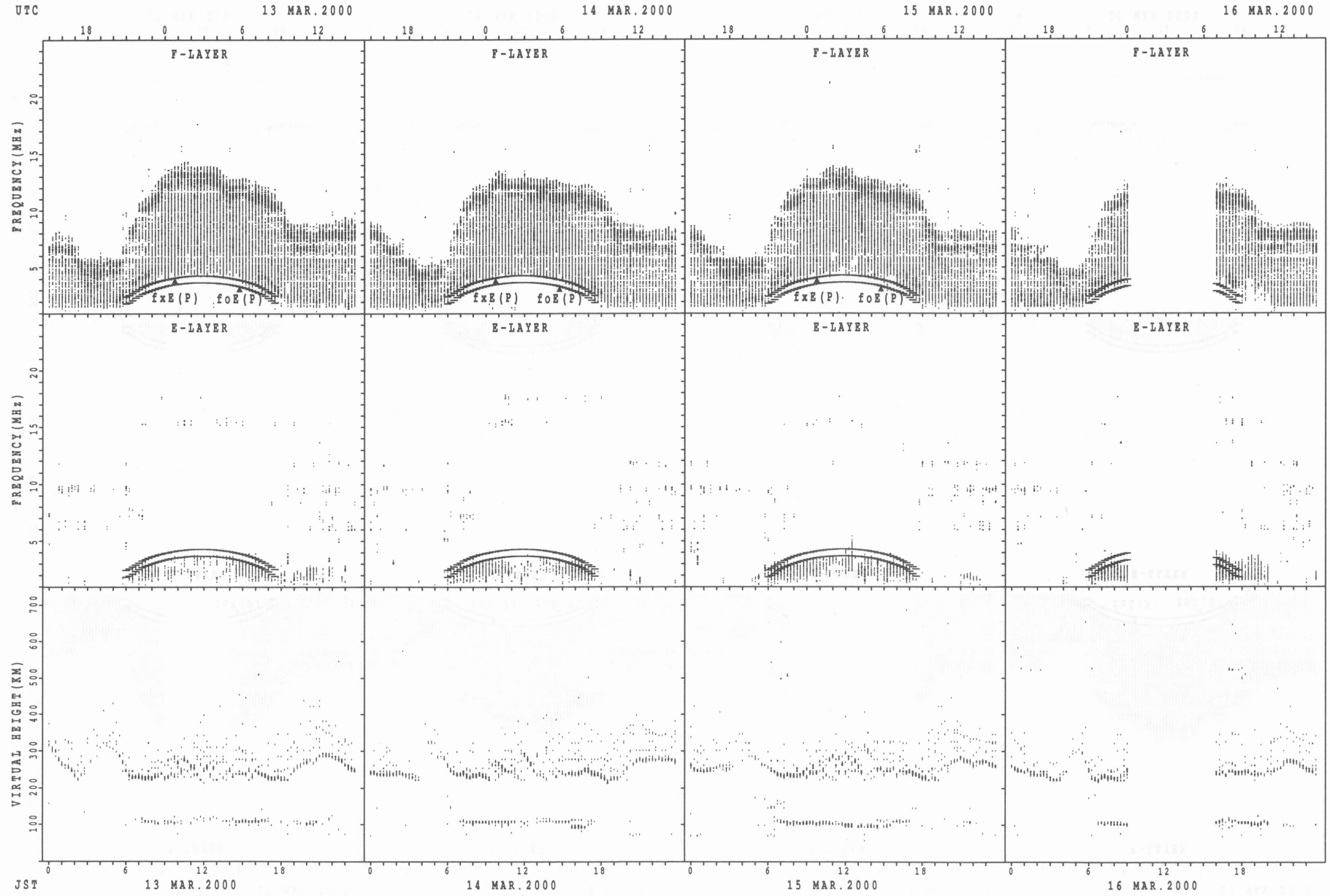
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



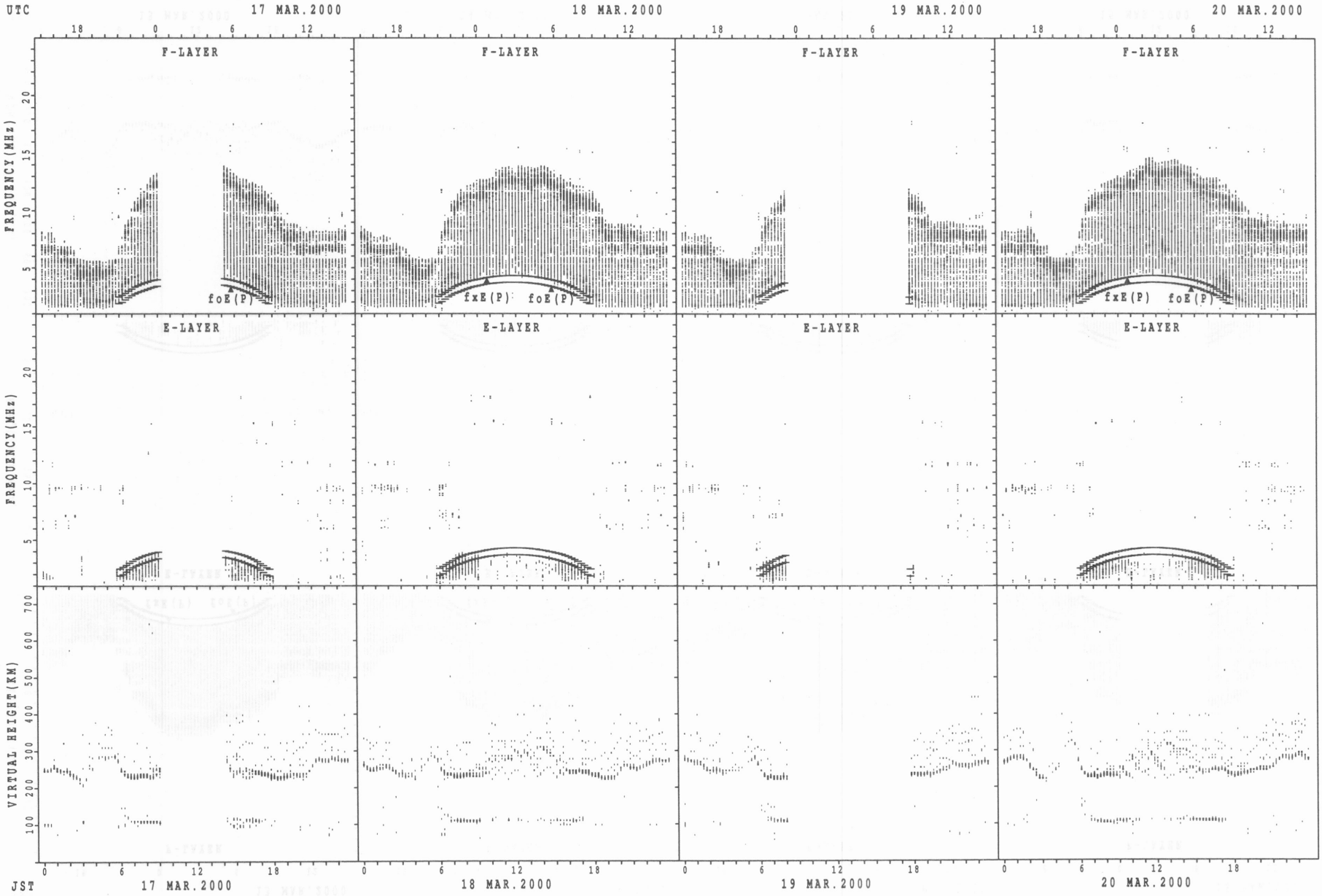
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



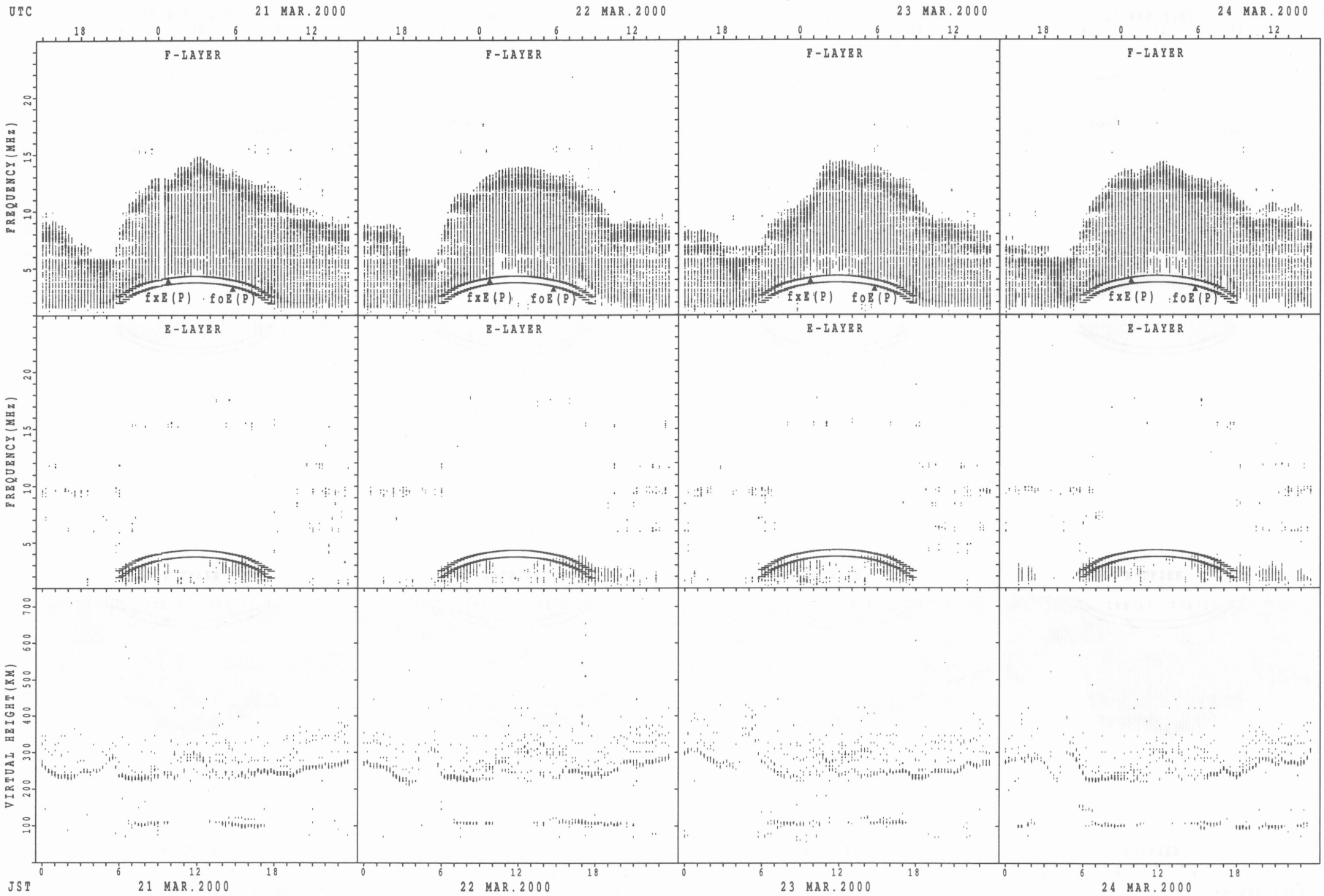
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



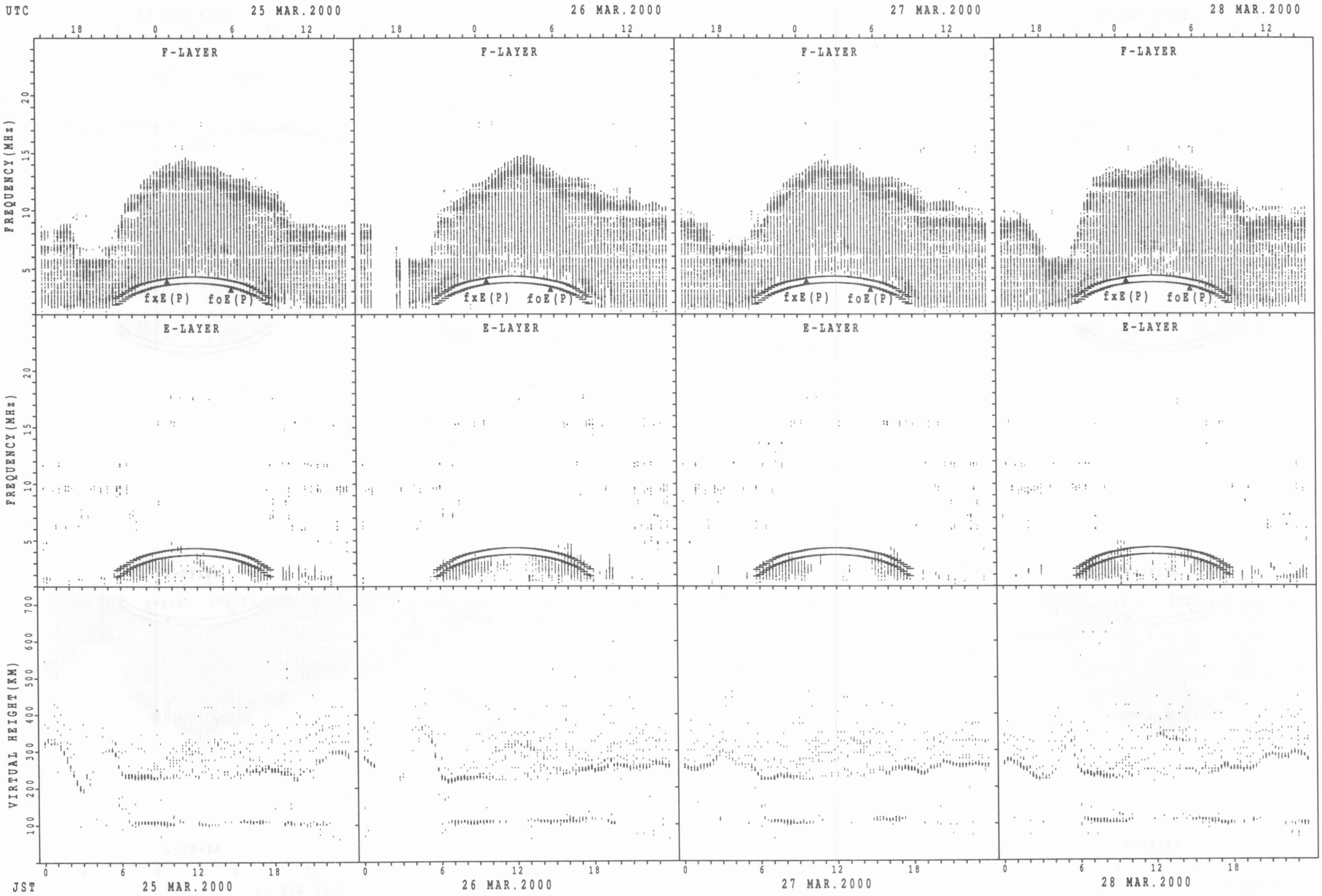
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

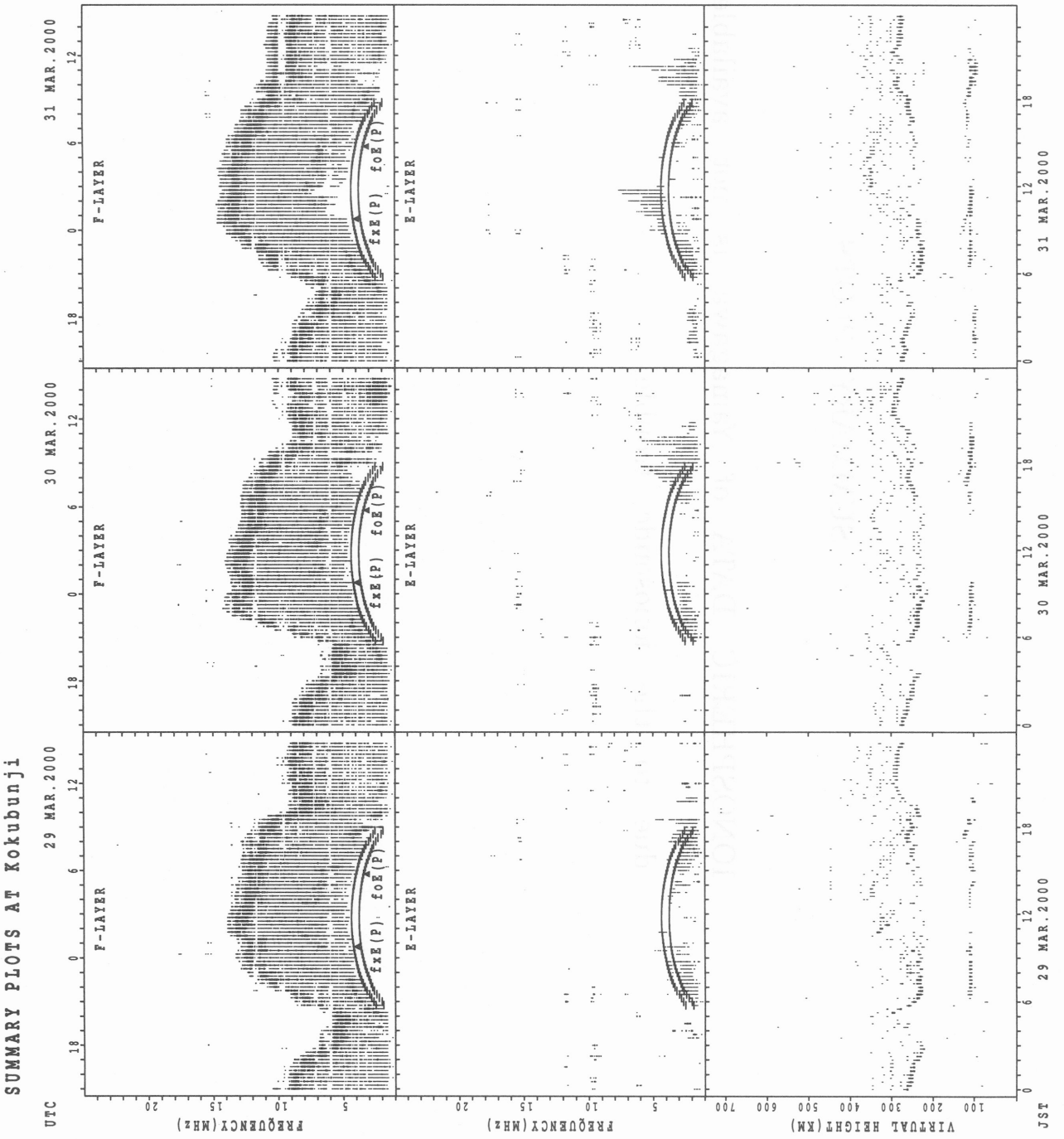


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



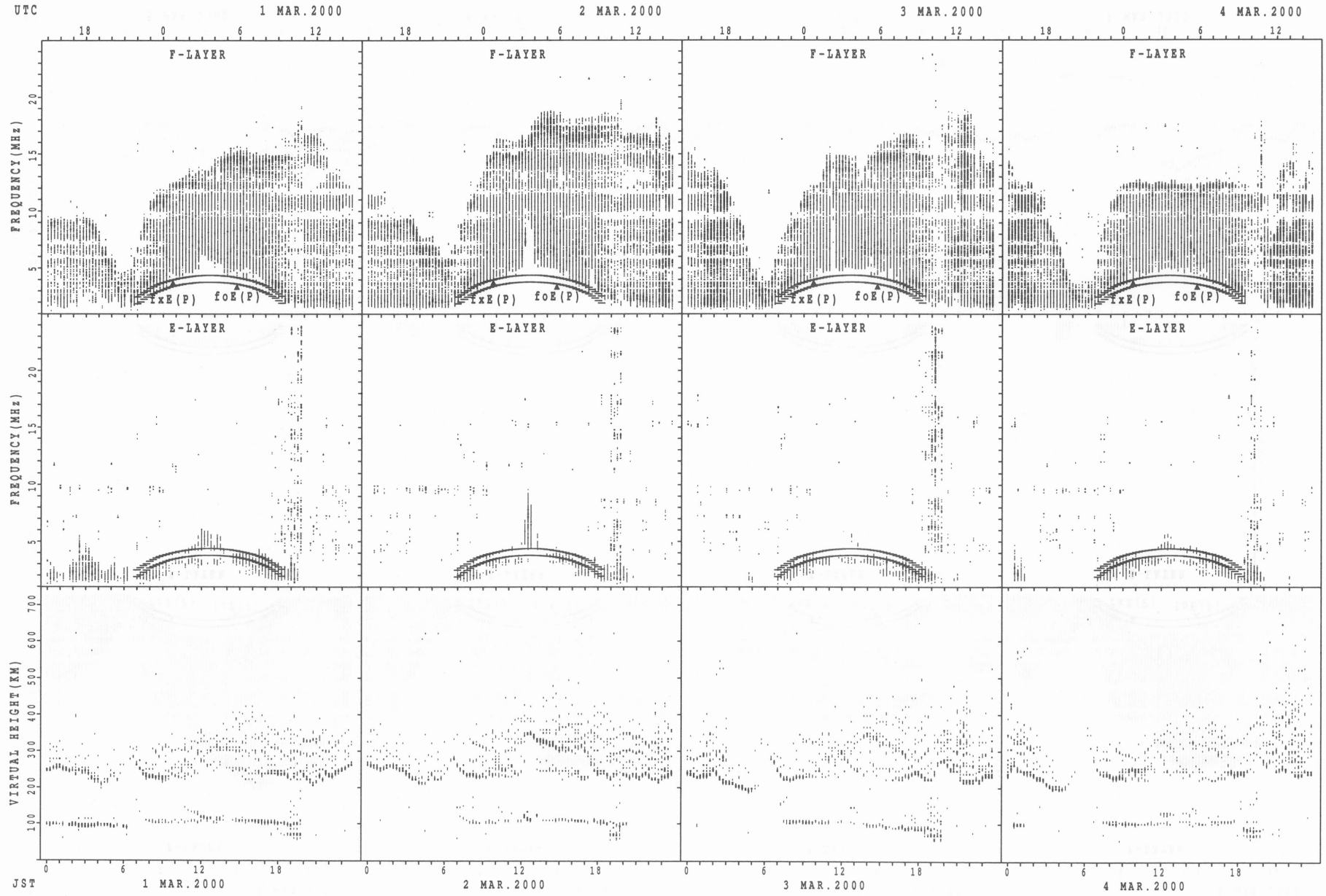
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
UTC
JST
29 MAR.2000
30 MAR.2000
31 MAR.2000
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS

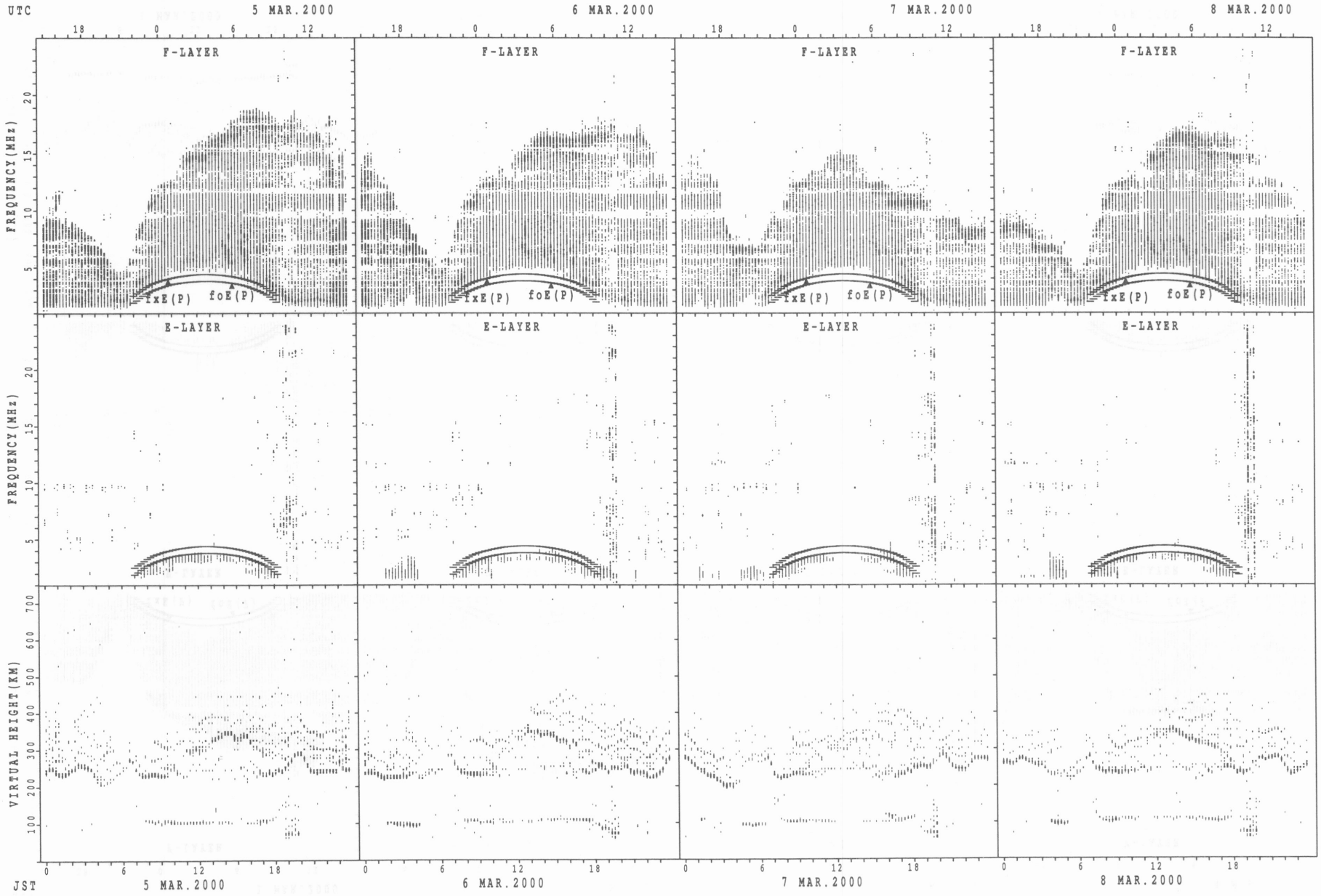
IONOSPHERIC DATA of Yamagawa is not available due to the ionosonde trouble.

SUMMARY PLOTS AT Okinawa



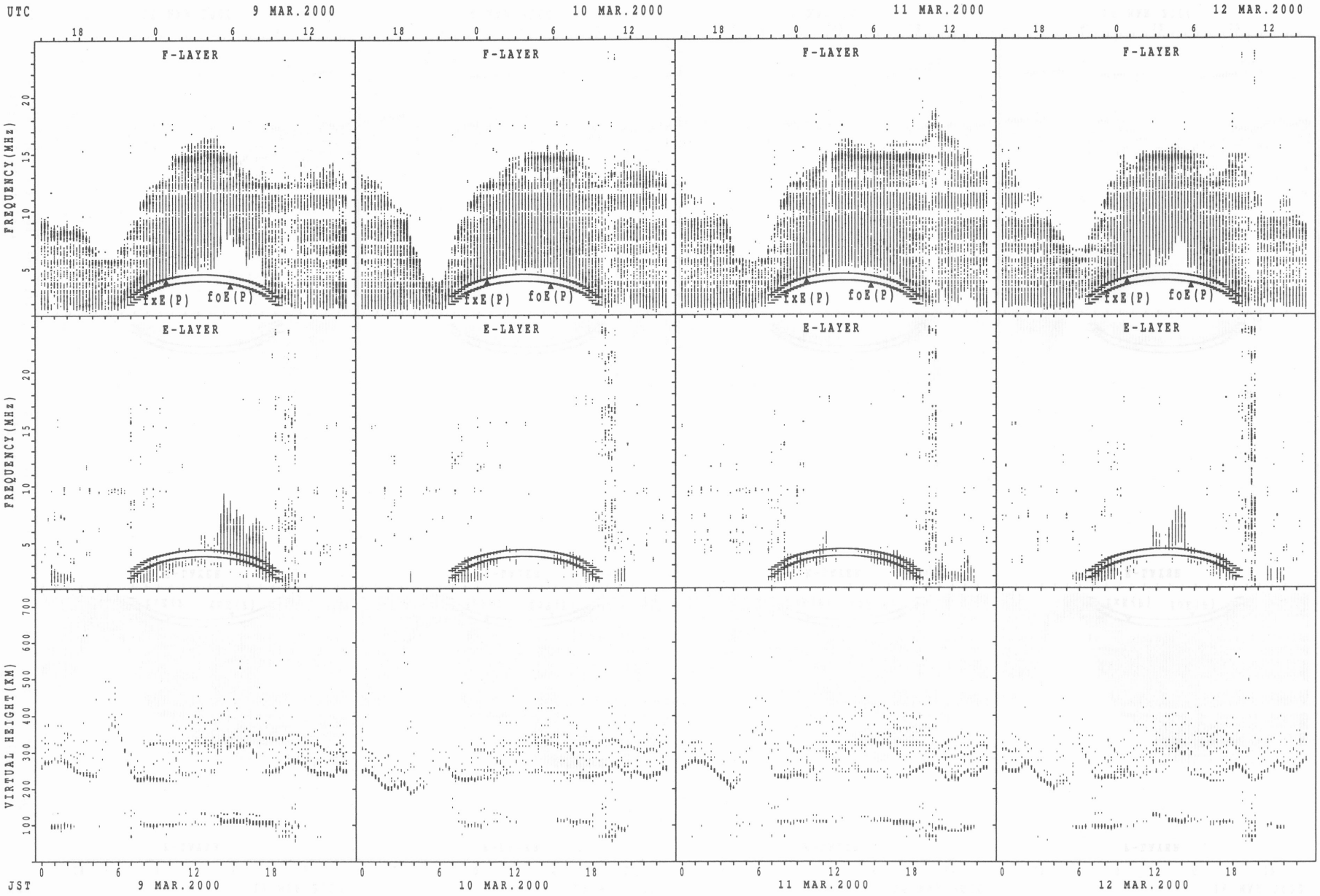
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



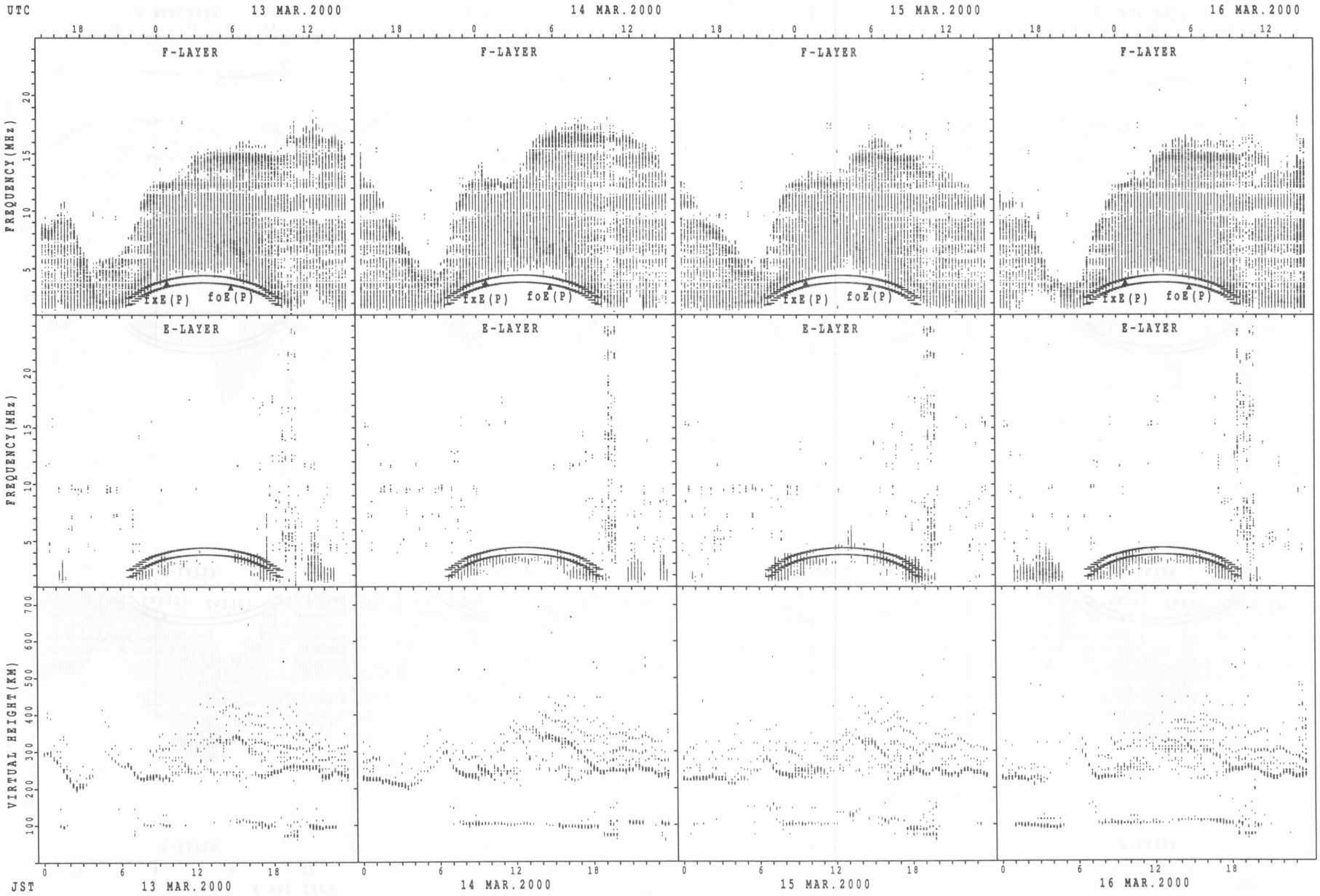
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



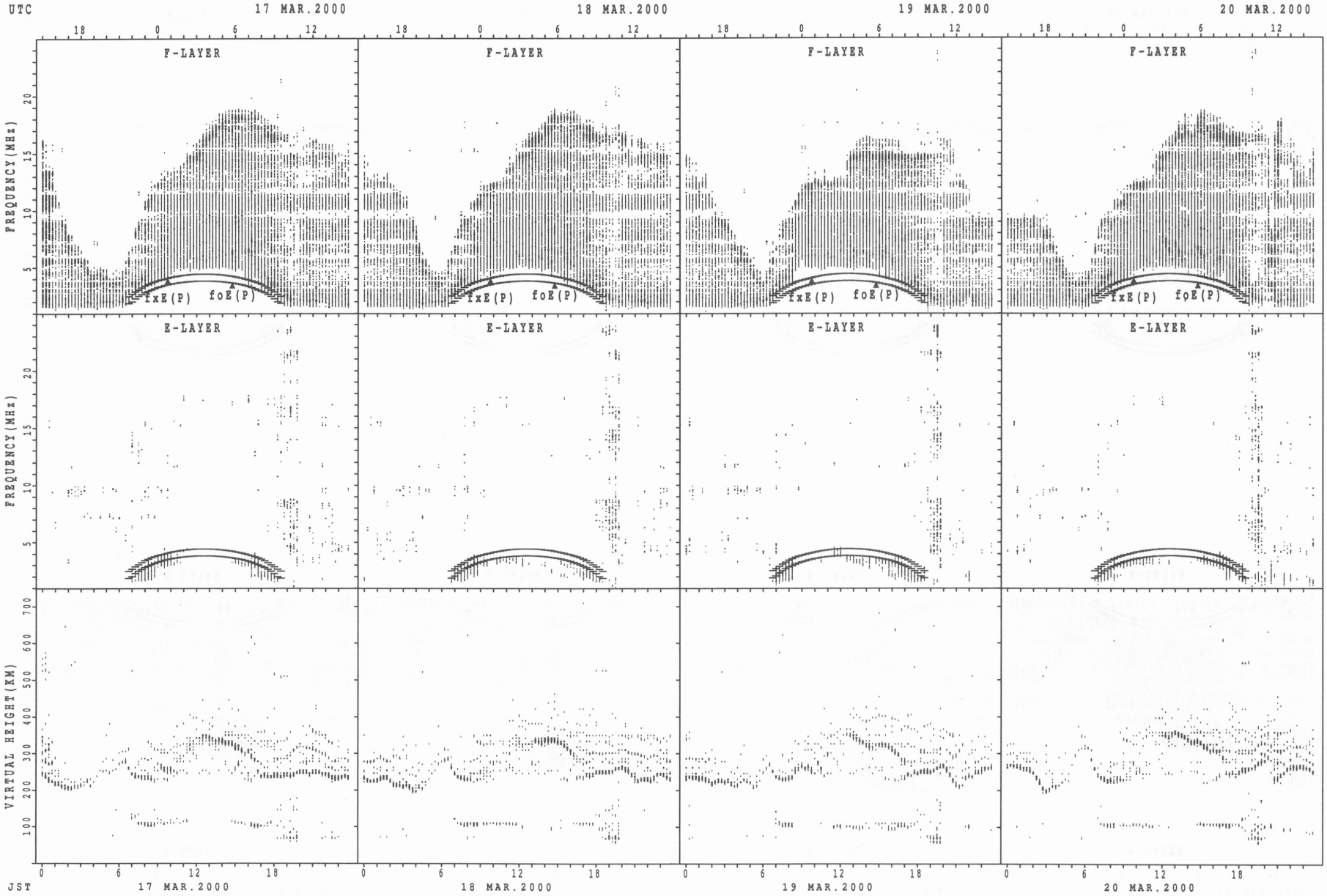
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



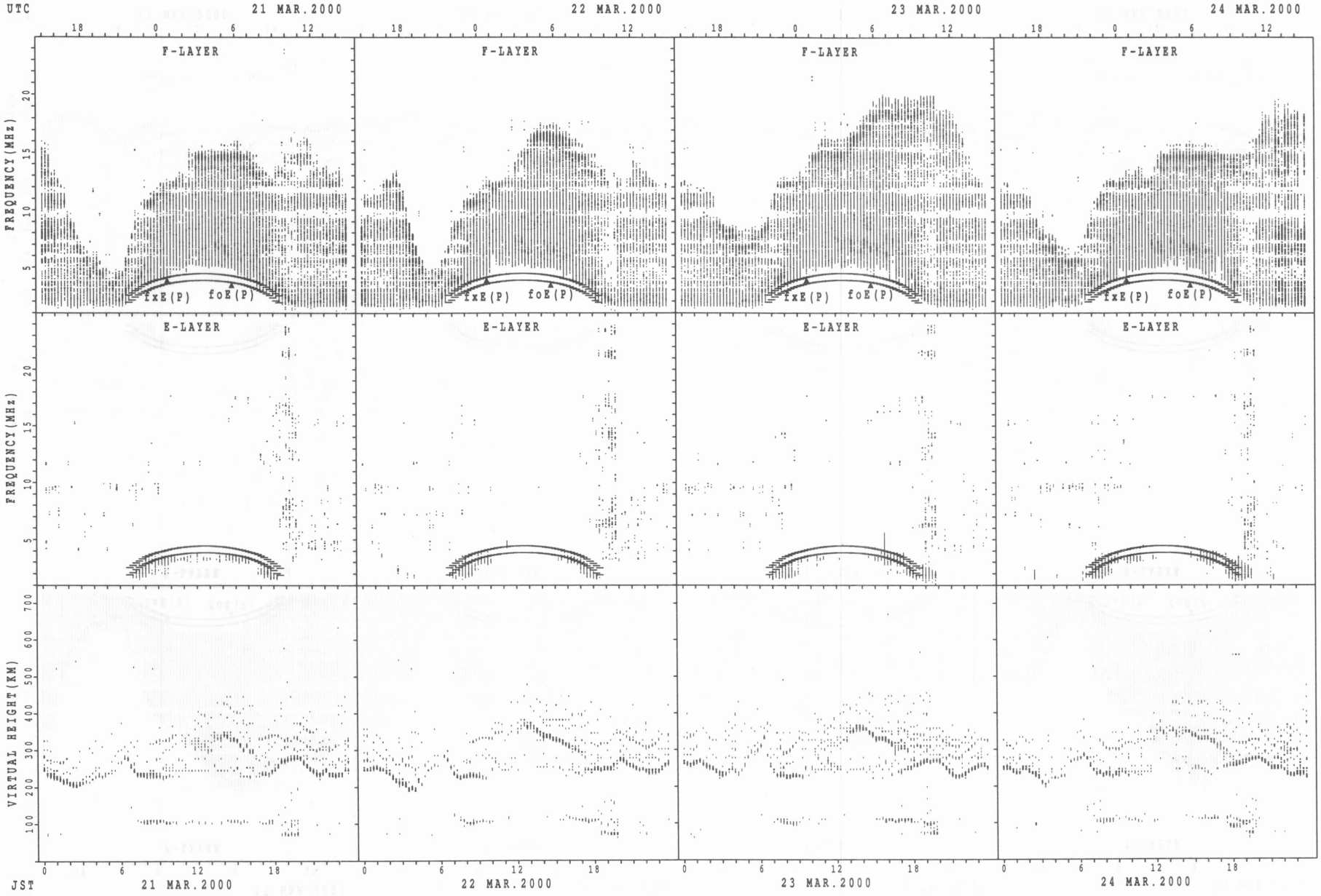
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



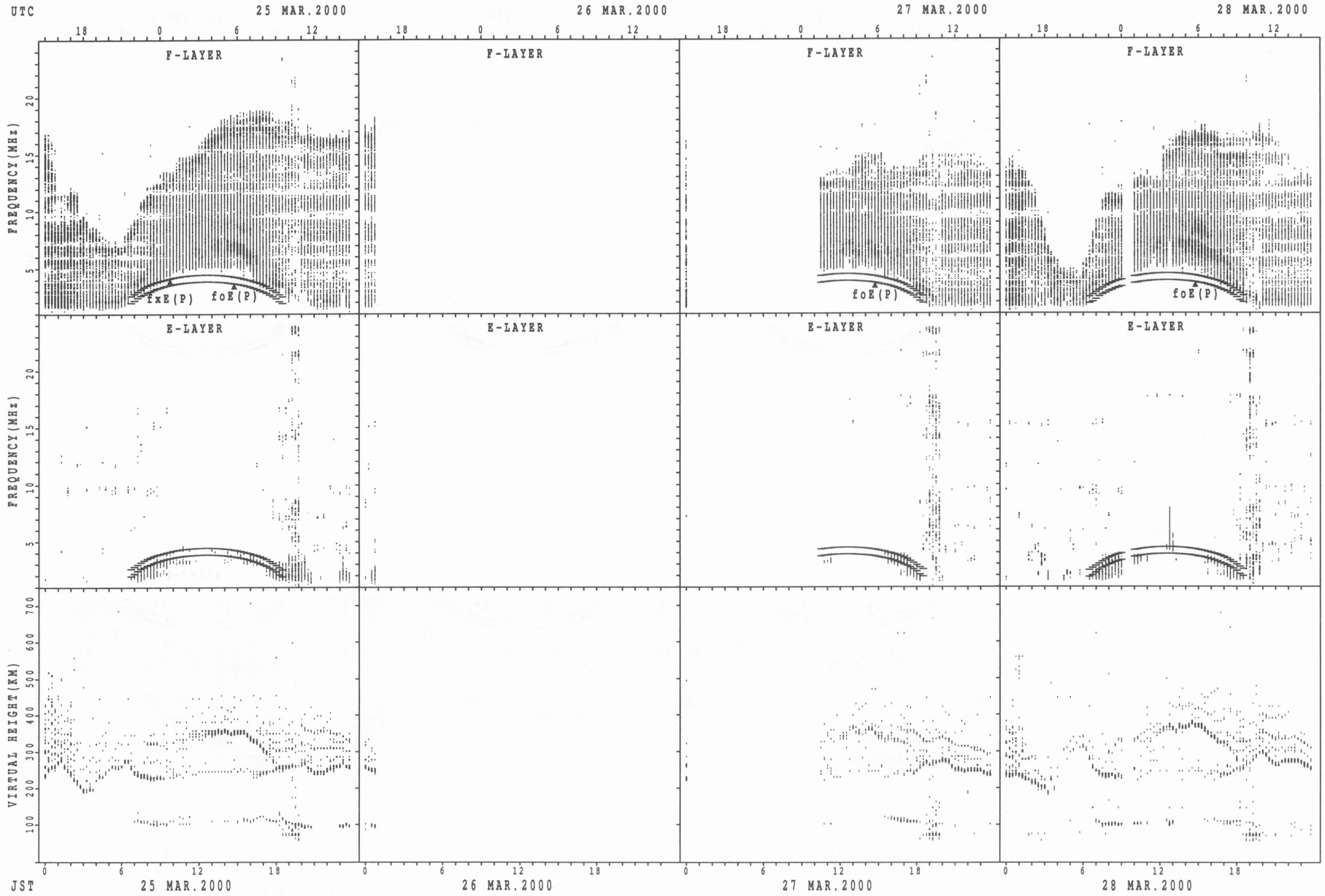
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



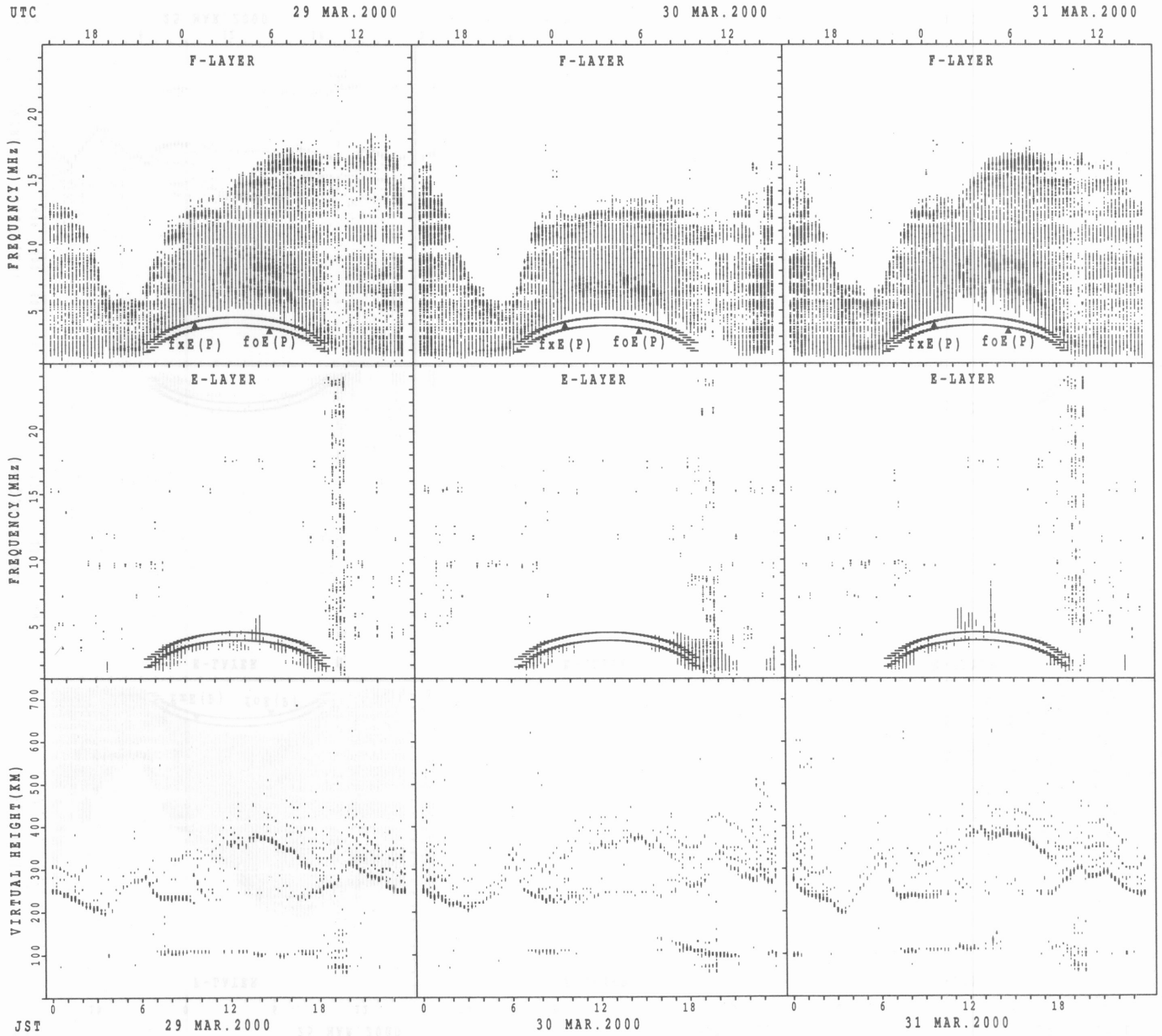
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	9	8	5	1		17	29	30	29	30	31	30	29	30	29	31	31	31	28	20	17	19	16
MED	337	340	327	338	422		262	242	238	242	254	258	264	262	259	274	256	248	256	287	304	334	332	338
U Q	380	360	353	375	211		271	252	248	255	272	272	282	288	306	282	280	264	264	315	317	345	354	365
L Q	330	322	314	300	211		248	236	232	238	244	244	250	250	250	254	248	246	248	274	285	321	326	324

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	10	18	13	10	16	7	19	30	31	29	31	30	30	30	30	29	31	21	15	13	5	8	8	5
MED	101	99	101	103	105	103	149	113	107	107	107	107	107	107	107	109	113	115	95	97	97	110	98	99
U Q	109	113	105	107	123	111	157	115	113	107	107	107	109	107	111	113	113	124	105	102	104	116	115	112
L Q	95	97	98	99	98	99	123	111	105	105	105	105	105	105	105	107	111	98	93	94	91	98	89	93

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	21	17	7	3	1	17	31	31	30	28	28	28	27	28	29	30	30	31	31	26	28	26	24
MED	322	312	306	318	338	338	296	242	242	248	264	272	278	288	283	278	269	257	264	290	326	340	332	337
U Q	344	334	338	328	374	169	325	258	254	256	270	279	290	314	312	295	288	264	274	304	352	346	356	357
L Q	303	291	294	292	334	169	264	238	240	240	256	262	271	272	276	261	260	252	256	280	298	313	316	308

h'Es

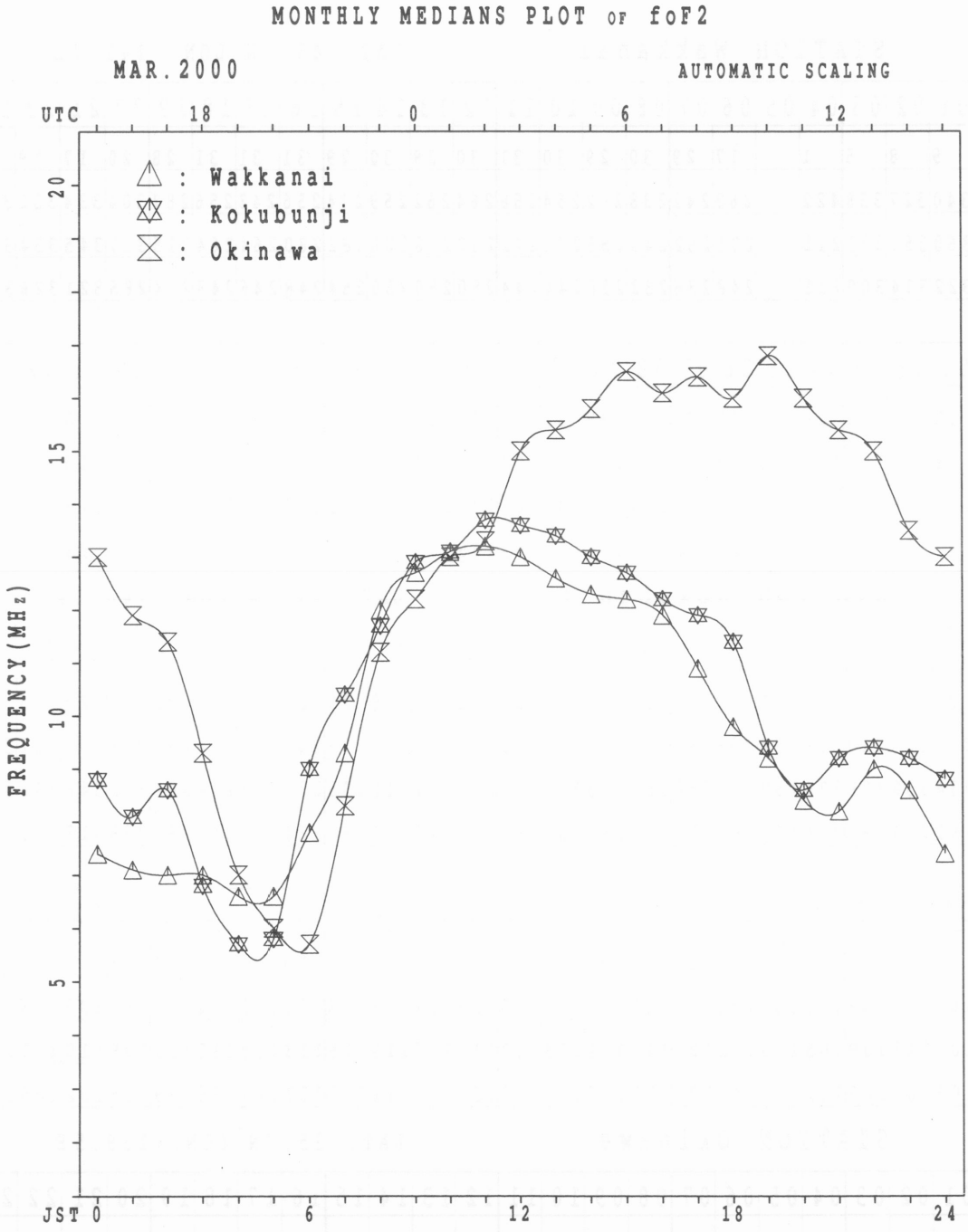
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	2	3	5	2	2	15	27	31	29	18	12	10	12	20	27	29	27	13	11	13	5	2	5
MED	101	105	103	103	103	105	151	111	109	107	110	110	109	111	113	113	111	113	111	107	107	107	108	105
U Q	105	107	113	109	105	105	155	125	113	111	113	113	113	116	115	115	113	119	115	111	109	110	111	120
L Q	97	103	101	100	101	105	141	109	107	106	107	107	107	105	111	109	107	107	98	99	105	102	105	103

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	29	26	13	1		20	29	29	28	29	29	28	29	29	30	30	30	27	29	29	30	29
MED	268	260	256	254	298	360		280	248	250	256	288	336	343	342	330	322	303	272	278	282	274	272	276
U Q	278	297	280	262	314	180		303	264	264	270	323	354	358	358	344	338	336	296	288	311	303	286	294
L Q	250	246	238	234	245	180		272	238	246	253	265	294	323	324	316	310	290	258	252	273	265	264	259

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		3	5	3	4	3	3	22	28	25	21	21	17	14	10	18	28	27	25	13	8	4	6	1
MED		99	99	97	96	97	95	154	107	111	111	111	113	110	110	113	113	111	113	95	99	101	97	97
U Q		105	104	97	97	99	97	161	111	116	113	113	125	115	115	115	118	113	131	117	102	106	105	48
L Q		97	97	97	94	95	95	143	106	106	108	107	108	109	105	111	111	107	106	89	96	94	95	48


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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 67	X 65	X 66	X 60	X 55	X 55													X 118	X 99	X 87	X 71	X 68	X 69
2	X 68	X 66	X 71	X 68	X 68	X 63													X 108	X 88	X 86	X 84	X 78	X 74
3	X 72	X 69	X 67	X 69	X 62	X 54													X 98	X 92	X 92	X 84	X 74	X 74
4	X 73	X 72	X 72	X 69	X 51	X 44													X 112	X 90	X 84	X 84	X 84	X 84
5	X 80	X 76	X 68	X 65	X 63	X 60													X 110	X 98	X 95	X 81	X 75	X 77
6	X 80	X 76	X 68	X 62	X 60	X 60													X 108	X 88	X 77	X 77	X 76	X 74
7	X 74	X 76	X 76	X 62	X 62	X 62													X 106	X 92	X 95	X 96	X 92	X 92
8	X 94	X 89	X 79	X 81	X 82	X 82													X 114	X 88	X 82	X 82	X 82	X 83
9	X 81	X 78	X 78	X 72	X 67	X 66													X 106	X 88	X 86	X 86	X 90	X 90
10	X 84	X 88	X 81	X 64	X 56	X 52													X 106	X 91	X 88	X 85	X 84	X 81
11	X 78	X 79	X 79	X 72	X 68	X 68														X 92	X 88	X 88	X 84	X 80
12	X 80	X 74	X 72	X 74	X 66	X 67														X 98	X 88	X 86	X 83	X 77
13	X 79	X 82	X 75	X 63	X 63	X 66														X 92	X 90	X 90	X 93	X 97
14	X 95	X 85	X 74	X 67	X 57	X 56														X 99	X 92	X 89	X 86	X 86
15	X 88	X 81	X 71	X 66	X 63	X 64														X 92	X 86	X 90	X 86	X 86
16	X 86	X 76	X 72	X 68	X 54	X 55					C	C	C	C	C	C				X 107	X 92	X 89	X 92	X 90
17	X 85	X 80	X 75	X 61	X 59	X 59					C	C	C	C	C					X 98	X 90	X 84	X 86	X 86
18	X 89	X 80	X 79	X 73	X 63	X 59														X 98	X 90	X 91	X 88	X 85
19	X 84	X 80	X 79	X 71	X 63	X 63				C	C	C	C	C	C	C	C	C		X 106	X 96	X 95	X 92	X 89
20	X 87	X 83	X 87	X 76	X 66	X 66														X 106	X 100	X 97	X 97	X 92
21	X 95	X 94	X 84	X 76	X 70	X 65														X 115	X 106	X 102	X 99	X 96
22	X 93	X 90	X 92	X 82	X 63	X 62														X 101	X 95	X 98	X 96	X 92
23	X 89	X 86	X 84	X 76	X 72	X 75														X 104	X 98	X 96	X 91	X 86
24	X 82	X 77	X 74	X 73	X 66	X 69														X 106	X 104	X 108	X 105	X 104
25	X 90	X 87	X 93	X 76	X 68	X 72														X 108	X 94	X 92	X 90	X 89
26	X 91	X 94	X 84	X 66	X 67	X 67														X 118	X 116	X 114	X 107	X 108
27	X 103	X 98	X 92	X 80	X 79	X 79														X 111	X 109	X 110	X 105	X 103
28	X 98	X 99	X 96	X 77	X 65	X 65														X 110	X 103	X 104	X 105	X 104
29	X 106	X 100	X 90	X 77	X 71	X 68														X 104	X 96	X 100	X 102	X 102
30	X 97	X 94	X 88	X 78	X 70	X 68														X 105	X 98	X 102	X 106	X 106
31	X 106	X 102	X 98	X 88	X 82	X 79														X 120	X 113	X 111	X 113	X 110
	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													10	31	31	31	31	31
MED	X 86	X 81	X 79	X 72	X 65	X 65													X 108	X 99	X 92	X 90	X 90	X 89
U Q	X 94	X 90	X 87	X 76	X 68	X 68													X 112	X 106	X 98	X 100	X 99	X 97
L Q	X 80	X 76	X 72	X 66	X 62	X 59													X 106	X 92	X 88	X 84	X 84	X 81

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	60	58	59	54	49	49	59	96	103	118	120	127	132	135	131	130	122	120	112	93	81	65	62	63
2	62	60	64	62	61	57	70	104	130	143	149	149	153	149	148	137	135	127	102	82	80	R 78	72	68
3	66	63	61	63	56	R 48	55	78	101	118	127	132	135	135	136	128	121	108	92	86	86	78	68	68
4	67	66	66	63	45	38	49	92	113	117	120	128	130	128	119	115	114	112	106	84	R 78	78	R 78	78
5	74	70	62	59	57	54	63	97	109	118	126	132	132	136	139	131	125	115	103	92	89	75	69	R 71
6	74	70	62	56	54	54	61	107	117	119	124	126	129	129	128	127	124	111	102	82	71	71	70	68
7	68	70	70	56	56	56	72	105	120	116	122	132	137	140	132	124	119	112	100	86	89	90	86	86
8	88	83	73	75	76	76	77	104	124	131	133	136	135	137	134	127	125	124	108	82	76	76	R 76	77
9	75	72	72	66	61	60	R 76	108	125	129	140	137	140	132	129	120	117	110	100	82	80	80	84	84
10	78	82	75	58	50	46	R 63	94	112	118	131	137	140	139	138	129	123	116	100	85	82	79	78	75
11	72	73	73	66	62	62	72	105	119	136	141	144	150	144	136	132	128	115	99	86	82	82	78	74
12	74	68	R 66	68	60	61	75	100	130	142	144	142	149	144	133	129	116	111	113	92	82	80	77	71
13	73	76	69	57	57	60	74	102	115	128	136	137	136	134	124	125	121	117	104	86	84	84	87	91
14	89	79	68	61	51	50	R 63	98	116	118	132	126	129	124	124	121	120	120	113	93	86	83	80	80
15	82	75	65	60	57	58	74	R 99	114	126	129	135	135	127	125	121	120	118	106	86	80	84	80	80
16	80	71	66	62	48	50	U R 64	96	110	120	C	C	C	C	C	C	121	119	116	R 101	86	83	86	84
17	79	74	69	55	53	53	68	97	116	128	C	C	C	C	C	130	122	118	109	92	84	78	80	80
18	83	74	73	67	57	53	68	101	117	122	126	134	136	135	134	129	122	118	112	92	84	85	82	79
19	78	74	73	65	57	57	75	100	113	C	C	C	C	C	C	C	C	C	114	100	90	89	86	84
20	81	77	81	70	60	60	81	112	122	126	132	139	139	141	140	130	127	124	114	100	94	91	91	86
21	89	88	78	70	64	59	78	106	118	128	127	138	144	140	132	129	123	120	119	109	100	96	93	89
22	87	84	86	76	57	56	R 74	110	112	121	129	134	136	134	132	128	127	119	110	95	89	92	90	86
23	83	80	78	70	66	69	76	92	97	105	116	138	141	138	136	134	128	124	110	97	91	90	85	80
24	76	71	68	67	60	63	88	108	122	132	130	134	139	135	130	125	123	120	111	100	98	102	99	98
25	84	80	87	70	63	66	86	111	122	131	138	141	140	137	131	125	123	118	115	102	88	86	84	83
26	85	88	78	60	61	61	90	101	110	120	125	135	142	145	138	132	126	125	120	112	110	108	100	102
27	97	92	86	74	73	73	89	109	R 120	128	134	142	138	136	132	126	125	123	119	105	103	104	R 99	97
28	92	93	90	72	59	59	82	118	128	132	132	131	138	142	139	132	122	120	118	104	97	98	99	98
29	100	94	85	71	65	62	84	108	119	129	128	137	134	130	129	127	126	123	117	98	90	94	96	96
30	91	88	82	72	64	62	84	118	139	136	132	137	134	131	126	124	124	120	113	99	92	96	R 100	R 100
31	100	96	92	82	76	73	94	112	126	137	144	142	141	142	141	136	130	126	115	114	107	105	107	104
	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	28	28	28	28	28	29	30	30	31	31	31	31	31	31
MED	80	75	73	66	59	59	74	104	117	127	130	136	138	136	132	128	123	119	111	93	86	84	84	83
U Q	88	84	81	70	63	62	82	108	122	131	135	138	140	140	137	130	126	123	115	100	92	94	93	91
L Q	74	70	66	60	56	53	64	97	112	118	126	132	134	133	129	125	121	115	103	86	82	78	78	75

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L			L		U L 428								
2										L	L	L	L		L		L							
3										L	L	L	L	L	L									
4											L	L				A								
5											L	U L 624	L	L	L		L							
6												L	L	L			L							
7										L	L	L	L		L									
8									L	L	L	B		L	L	L								
9										L		L	L 728	U L 720	U L 720	L								
10										L	L	L	L	L	L									
11									L	L	L	L	L	L	L		L							
12										L	L	L	L											
13									L	L	L	L	L	L	L	L	L							
14											L	L	L	L										
15											L	U L 632	L	L	L									
16									L	L	C	C	C		C	C	L							
17										L	C	C	C	C	C	L								
18												L	L	L	L	L								
19										C	C	C	C	C	C	C	C	C						
20										L	L		L	L		L	L							
21											L	L	L	L		L								
22											L		L	L	L	L								
23								L		L	L	L	L	L	L									
24											L	L	L	L	L	L								
25											L	L	L	U L 704	L	L	L							
26											L	L	L	L			L							
27												L	L	L	L	L	L							
28												L	U L 756	L	L	L								
29									L	L		U L 708		L	U L 740	L	L							
30										L	L	L	L	L	U L 736	L	L							
31												L	U L 788	U L 704	U L 732	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												3	3	3	4	1								
MED												U L 632	U L 756	U L 704	U L 734	U L 428								
U Q												U L 708	U L 788	U L 720	U L 738									
L Q												U L 624	L 728	U L 704	U L 726									

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

IONOSPHERIC DATA STATION Kokubunji

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

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

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							B 228	288	336		R 380	U R 392		A	A	A	A	U A 216						
2							B 240	316	U R 352	384	R 392	U R 400		B	R 376	348	288	208						
3							B 232	304	R 352	R	R	R 408	400	392	352	308		A						
4							144 220	296	340	372	R 392	U R 412	400	384	348		A	224						
5							B H 236	296	R 332	R 376	R 396	B	R	U R 392	U R 352		A	232						
6							B 232	R 308	U R 340	R	384	R 396	396		A	A	A	196						
7							B 240	U R 312	R	R	R	A	A	A		356	300	A						
8							148 252	320	348		R	B	R	U R 388	368	360	316	228						
9							S H 160 264	A	R	R	R	396	388	372	336		A	A						
10							H 164	248	304	336	R 388	A	U R 380	368	352	300	204							
11							B 252	312	352	372	A	A	A	R	R 348		A	A	B					
12							B 260	312	332	U R 380	R	R	U R 388	R 376	352	304		A	B					
13							184	R 260	308	U R 344	U R 372	R	392	392	372	348		A	A	B				
14							168 256	A	340	R	R	392	384	372	348	292	232		B					
15							172 264	324	A	R	R	A	U R 380	360	340	300	236		B					
16							188 248	312	R 348	C	C	C		C	C	304	U A 236		B					
17							B 264	328	352	C	C	C	C	C	356	300	224		B					
18							168 272	320	R 372	A	B	R	384	364	336		A	236	B					
19							192 284	332	C	C	C	C	C	C	C	C	C		B					
20							H 200 276	336	R 368	R	R	R	R	380	R	R	A	A	B					
21							196 276	328	U R 360	R	R	B	R	R 356	312	248			B					
22							220 288	R 336	R	R	B	B	R	U R 376	368	328	U A 260		B					
23							192 284	U R 340	R	B	R	A	A	A	A	A	A	160						
24							U A 192 284	336	R 372	R 388	U R 400	B	U R 404	400	A	A	B	B						
25							H 216 284	R	364	R 396	R	A	R	U R 392	R	R 336	252		B					
26							228 276	R	R	R	R	R	R	R 380	360	320	U A 268		A					
27							H 220 276	A 340	R	R	R	B	396	384	372	328		A	B					
28							208 296	352	A	A	B	R	B	R	A	312	252		B					
29							H 224 288	360	B	A	A	B	A	384	R	328	240		B					
30							204 296	336	U R 372	B	B	B	B	R	R 368	336	272		B					
31							196 308	352	U A 388	U A 408	A	A	B	U A 388	360	344	272		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							22	31	27	21	9	7	8	13	20	21	19	20	1					
MED							192	264	320	R 352	R 380	U R 392	396	388	378	352	312	236	160					
U Q							208	284	336	R 366	R 392	R 396	U R 404	398	386	360	328	252						
L Q							168	248	308	340	R 372	384	392	384	372	348	300	224						

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 15	E B 16	E B 15	E B 15	E B 15	E B 15	G	G 26	38	G 32	G	G	42	40	35	J A 30	J A 33	40	E B 14	E B 15	E B 15	E B 15	E B 14
2	E B 14	E B 13	J A 31	J A 22	E B 13	24	E B 16	G	G 21	G	G	G	G 34	E B 46	G	J A 40	J A 32	J A 38	16	E B 14	E B 15	J A 22	E B 15	E B 15
3	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	J A 51	G 26	G	G 32	G 32	G 28	43	44	39	34	J A 31	J A 18	E B 16	J A 22	J A 54	J A 27	J A 32
4	J A 19	E B 16	E B 15	E B 16	21	E B 14	G	G	34	G 30	G 28	44	48	50	J A 60	J A 71	J A 66	J A 48	48	J A 38	26	J A 25	J A 21	E B 15
5	E B 16	E B 16	E B 15	E B 15	E B 14	E B 15	E B 15	26	31	G	G 37	G	E B 45	G 31	G	G	33	G 21	18		E B 14	E B 15	E B 15	E B 14
6	E B 16	18	J A 19	J A 24	18	E B 14	E B 16	27	G 27	G 31	G 33	G 32	G	G	J A 41	37	31	26	J A 20	25	22	E B 14	E B 15	J A 23
7	E B 16	E B 14	E B 14	19	18	E B 14	20	28	34	G	G 32	G 36	44	48	J A 47	42	34	J A 32	24	19	19	E B 16	E B 16	E B 16
8	E B 15	J A 25	E B 14	E B 13	J A 28	J A 22	J A 20	G	G	G	39	E B 51	G 26	G	G	40	36	26	J A 24	E B 15	17	E B 15	E B 16	18
9	18	E B 15	E B 15	E B 16	E B 15	E B 14	G	G 22	30	G 32	G 31	G 32	G 30	42	41	36	34	J A 25	22	24	26	J A 22	E B 14	E B 16
10	E B 16	E B 16	E B 14	E B 15	E B 16	E B 14	24	27	G 27	G	G	G	41	G	G 36	G 33	32	24	E B 16	E B 16	J A 20	E B 16	E B 15	E B 16
11	E B 16	E B 15	E B 15	18	22	E B 15	E B 16	G 20	G	G	40	42	42	46	G 36	G 33	35	24	E B 16	J A 17	E B 15	21	E B 15	J A 25
12	21	E B 15	E B 15	E B 16	E B 14	E B 14	21	G 22	G 28	37	G 28	G 28	G 26	G	G	G	G	J A 30	J A 27	E B 16	E B 16	E B 16	E B 16	E B 15
13	E B 15	E B 16	E B 15	E B 16	E B 15	E B 15	G	G	G	G	G 27	G 36	G 36	G	G	G	36	24	23	22	J A 23	J A 24	J A 25	E B 15
14	E B 14	E B 16	E B 14	E B 14	E B 15	E B 15	20	28	J A 33	G 32	G 32	G 32	G 32	G 26	G	G	33	J A 25	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15
15	E B 15	E B 14	E B 16	E B 16	E B 15	E B 15	J A 20	31	G J A 31	36	G 36	G 36	44	G 31	G 34	G 21	G 28	25	J A 20	18	E B 14	22	19	E B 16
16	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	21	27	34	G	C	C	C	C	C	C	37	J A 30	J A 29	J A 31	J A 22	E B 14	E B 15	E B 15
17	23	E B 16	E B 15	J A 30	E B 14	E B 15	20	30	35	40	C	C	C	C	C	G 25	G 20	G	E B 15	E B 14	19	E B 15	E B 15	18
18	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	G	G 26	35	G	40	E B 42	G 37	G	G 26	G	32	G 23	21	E B 14	E B 15	E B 16	E B 16	E B 16
19	E B 14	E B 13	E B 13	E B 15	E B 14	E B 15	G	G	G	C	C	C	C	C	C	C	C	C	J A 16	E B 16	E B 15	E B 14	E B 15	E B 15
20	E B 14	E B 16	E B 15	E B 15	E B 14	E B 14	G	G	G 28	39	G 31	G 30	G 34	G 32	G	G 35	J A 34	J A 25	E B 18	E B 14	E B 16	E B 14	E B 16	E B 15
21	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14	G	30	G 26	G	G 32	G E B 34	43	G 36	G 33	G 31	G 26	G 21	E B 16	E B 16	E B 15	E B 15	E B 16	E B 15
22	E B 15	E B 14	E B 15	E B 14	E B 14	E B 14	J A 24	G	G	G 32	G	E B 46	E B 43	G	G 32	G	G	J A 34	J A 24	J A 22	J A 17	26	E B 15	E B 15
23	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15	G 24	G 30	G E B 34	E B 46	G 32	44	43	39	38	J A J A 34	J A 26	G E B 14	E B 15	E B 15	B	18	E B 14
24	E B 15	32	J A 21	E B 14	E B 13	E B 15	26	32	36	G 30	G	G E B 44		G	G J A 40		32	E B 42	J A 24	J A 25	J A 21	J A 26	E B 15	26
25	18	E B 14	E B 15	E B 15	J A 23	E B 15	G	31	G	40	44	G	43	G 30	G 25	G	G	G 25	22	23	J A 26	J A 20	20	E B 15
26	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	G	31	G 32	G 32	41	G 32	G	G	G	38	J A 42	J A 32	J A 20	24	E B 14	E B 15	E B 15	E B 15
27	E B 16	E B 14	E B 15	E B 18	J A 14	E B 17	G	32	36	G	G	G E B 42	41		G	40	35	J A 30	E B 17	E B 14	20	E B 15	E B 15	E B 16
28	E B 15	E B 14	E B 15	J A 23	E B 15	E B 15	G J G 28		G J A 33	45	43	43	G E B 43		G	39	G	J A 34	E B 21	14	24	E B 16	20	21
29	22	E B 14	E B 16	E B 15	E B 14	E B 15	G	30	38	E B 40	42	41	E B 46	39	G 34	G 30	G 22	31	J A 22	E B 15	J A 19	E B 14	E B 14	E B 14
30	E B 14	E B 15	E B 15	E B 14	E B 14	E B 15	24	32	G	G E B 48	E B 45	E B 44	E B 45		G	G	G J A 41	J A 48	34		J A 20	E B 14	E B 16	E B 15
31	E B 14	E B 15	22	22	E B 14	E B 13	23	G	38	J A 48	J A J A 51	64	48	E B 44	46	G 33	G	G J A 23	38		51	E B 18	E B 16	E B 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	28	28	28	28	28	29	30	30	31	31	31	31	31	31
MED	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G	G	G	G	G	U 39	G	G	G	32	26	21	E B 16	19	E B 16	E B 15	E B 15
U Q	16	E B 16	15	J A 18	15	E B 15	21	30	34	37	40	42	44	43	40	39	34	J A 32	J A 24	24	22	J A 22	16	16
L Q	E B 15	E B 14	E B 15	E B 14	E B 14	E B 14	G	G 27	G 28	G 34	G 32	G 32	G 35	G	G 36	G 34	G	G E B 16	E B 14		E B 15	E B 15	E B 15	E B 15

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 15	E B 16	E B 15	E B 15	E B 15	E B 15	G	G 24	36	U G 30	G	G	42	38	34	29	24	38	E B 14	E B 15	E B 15	E B 15	E B 14
2	E B 14	E B 13	18	19	E B 13	16	E B 16	G	G 18	G	G	G	G 32	E B 46	G	37	G 26	34	15	E B 14	E B 15	18	E B 15	E B 15
3	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 23	G	U G 31	U G 32	G 28	43	43	37	34	25	E B 16	E B 16	19	20	17	23
4	17	E B 16	E B 15	E B 16	E B 14	E B 14	G	G	33	G 29	G 27	43	46	47	55	60	53	41	39	28	E B 15	22	17	E B 15
5	E B 16	E B 16	E B 15	E B 15	E B 14	E B 15	E B 15	26	31	G	G 33	G	E B 45	U G 31	G	G	32	G 20	16	E B 14	E B 14	E B 15	E B 15	E B 14
6	E B 16	E B 14	E B 14	18	16	E B 14	E B 16	26	G 26	G 30	U G 33	G 32	G	G	40	36	31	23	18	19	E B 14	E B 14	E B 15	E B 16
7	E B 16	E B 14	E B 14	E B 14	E B 14	E B 14	18	27	33	G	U G 31	U G 36	42	43	41	42	34	27	E B 16	E B 15	15	E B 16	E B 16	E B 16
8	E B 15	E B 15	E B 14	E B 13	E B 15	E B 13	G	G	G	G	U Y 39	E B 51	U G 26	G	G	39	35	25	E B 14	E B 15	16	E B 15	E B 16	E B 15
9	E B 16	E B 15	E B 15	E B 16	E B 15	E B 14	G	G 20	U Y 30	U G 32	G 30	G 30	G 29	U Y 41	41	36	32	23	E B 15	E B 15	E B 15	E B 14	E B 14	E B 16
10	E B 16	E B 16	E B 14	E B 15	E B 16	E B 14	G	26	G 24	G	G	G	39	G	G 34	G 32	G 26	24	E B 16	E B 16	E B 14	E B 16	E B 15	E B 16
11	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G 18	G	G	38	41	U Y 42	42	U G 36	G 28	30	23	E B 16	E B 14	E B 15	19	E B 15	19
12	E B 15	E B 15	E B 15	E B 16	E B 14	E B 14	E B 17	G 20	G 24	36	G U 27	U G 28	U G 26	G	G	G	G	26	E B 18	E B 16	E B 16	E B 16	E B 16	E B 15
13	E B 15	E B 16	E B 15	E B 16	E B 15	E B 15	G	G	G	G	G U 26	G 35	G 35	G	G	G	30	24	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15
14	E B 14	E B 16	E B 14	E B 14	E B 15	E B 15	18	26	32	G 30	G U 31	G 32	G 31	G 24	G	G	G 24	G 20	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15
15	E B 15	E B 14	E B 16	E B 16	E B 15	E B 15	G	28	G 27	35	U G 35	U G 36	43	G 30	G 29	G 19	G 26	24	E B 16	15	E B 14	E B 15	E B 14	E B 16
16	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	G 15	27	33	G	C	C	C	C	C	C	36	26	25	24	E B 14	14	E B 15	E B 15
17	E B 15	E B 16	E B 15	E B 14	E B 14	E B 15	18	27	34	39	C	C	C	C	C	G 22	G 20	G	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15
18	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	G	G 24	34	G	U Y 40	E B 42	U G 37	G	G 25	G	31	G 20	E B 14	E B 14	E B 15	E B 16	E B 16	E B 16
19	E B 14	E B 13	E B 13	E B 15	E B 14	E B 15	G	G	G	C	C	C	C	C	C	C	C	C	E B 16	E B 16	E B 15	E B 14	E B 15	E B 15
20	E B 14	E B 16	E B 15	E B 15	E B 14	E B 14	G	G	G 28	38	U G 31	U G 30	U G 32	G 31	G	U G 35	30	24	E B 18	E B 14	E B 16	E B 14	E B 16	E B 15
21	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14	G	30	G 25	G	U G 32	U G 34	E B 43	U G 36	U G 33	G 30	G 24	G 20	E B 16	E B 16	E B 15	E B 15	E B 16	E B 15
22	E B 15	E B 14	E B 15	E B 14	E B 14	E B 14	24	G	G U 32	G	E B 46	E B 43	G	G 31	G	G	G	32	20	19	E B 16	E B 13	E B 15	E B 15
23	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15	20	G 23	G U 30	G E 33	B U 46	G 32	U Y 44	43	U Y 39	37	32	26	G E 14	B E 15	B E 15	B E 15	B E 15	B E 14
24	E B 15	E B 26	E B 14	E B 14	E B 13	E B 15	24	30	35	G 29	G	G E 44	B	G	G	38	32	E B 42	18	20	18	22	E B 15	18
25	16	E B 14	E B 15	E B 15	E B 15	E B 15	G	30	G	39	42	G	42	U G 28	G 24	G	G	G E 22	B E 16	B E 15	E B 15	E B 14	E B 14	E B 15
26	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	G	30	U G 32	G 31	40	U G 32	G	G	G	36	41	30	18	E B 15	E B 14	E B 15	E B 15	E B 15
27	E B 16	E B 14	E B 15	E B 14	E B 14	E B 15	G	G 23	35	G	G	G E 42	B U 41	Y G	40	35	28	E B 17	E B 14	E B 14	E B 14	E B 15	E B 15	E B 16
28	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	G	G 25	G 29	42	42	42	G E 43	B	G	37	G	G 22	17	E B 14	E B 13	E B 16	E B 14	E B 15
29	E B 15	E B 14	E B 16	E B 15	E B 14	E B 15	G	30	37	E B 40	U Y 42	U Y 41	E B 46	U Y 39	G 33	G 30	G 22	29	19	E B 15	18	E B 14	E B 14	E B 14
30	E B 14	E B 15	E B 15	E B 14	E B 14	E B 15	22	30	G	G E 48	B E 45	B E 44	B E 44	B E 45	B	G	G	G	38	25	22	E B 16	E B 14	E B 16	E B 15
31	E B 14	E B 15	E B 15	17	E B 14	E B 13	22	G	37	45	49	62	47	E B 44	45	G 30	G	G	20	32	37	E B 14	E B 16	E B 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	28	28	28	28	28	29	30	30	31	31	31	31	31	31
MED	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	G	G	G	G	G	G U 37		G	G	G	30	24	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15
U Q	E B 16	E B 16	E B 15	E B 16	E B 15	E B 15	18	27	33	36	40	42	44	43	38	37	32	28	18	16	16	16	E B 16	E B 16
L Q	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G 27	G 33	G U 31	G 32	G 34	G	G 35	G 33	G	G	E B 15	B E 14	E B 14	B E 14	E B 15	B E 15

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	16	15	15	15	15	16	16	16	16	23	20	20	21	17	16	15	15	14	15	15	15	14
2	14	13	15	15	13	14	16	16	15	18	17	19	23	46	22	19	16	14	12	14	15	15	15	15
3	15	15	15	15	15	15	15	15	15	20	18	21	21	22	20	17	14	15	16	16	15	15	15	16
4	15	16	15	16	14	14	12	16	15	20	17	20	23	17	18	18	16	15	16	15	15	14	15	15
5	16	16	15	15	14	15	15	16	15	15	18	21	45	24	22	20	18	15	14	14	14	15	15	14
6	16	14	14	13	14	14	16	16	16	17	20	21	24	21	20	19	16	16	15	15	14	14	15	16
7	16	14	14	14	14	14	14	15	16	20	20	33	23	22	19	18	16	14	16	15	15	16	16	16
8	15	15	14	13	15	13	13	15	16	17	24	51	21	26	20	18	16	15	14	15	14	15	16	15
9	16	15	15	16	15	14	14	16	16	16	19	21	22	22	18	17	16	16	15	15	15	14	14	16
10	16	16	14	15	16	14	14	16	16	16	16	20	22	21	18	18	17	15	16	16	14	16	15	16
11	16	15	15	15	15	15	16	15	17	16	17	17	32	26	22	20	18	15	16	14	15	16	15	15
12	15	15	15	16	14	14	17	15	15	21	20	23	22	28	26	20	18	16	16	16	16	16	16	15
13	15	16	15	16	15	15	15	14	16	20	18	22	22	26	21	18	16	15	15	14	14	14	15	15
14	14	16	14	14	15	15	13	15	16	17	20	20	19	21	22	18	16	15	15	15	14	15	15	15
15	15	14	16	16	15	15	15	15	14	16	17	22	20	21	18	15	16	14	16	14	14	15	14	16
16	15	15	14	15	15	15	14	15	15	15	C	C	C	C	C	C	17	15	15	14	14	14	15	15
17	15	16	15	14	14	15	16	15	16	16	C	C	C	C	C	16	16	16	15	14	15	15	15	15
18	15	14	15	14	15	15	14	16	17	23	26	42	22	24	22	20	14	16	14	14	15	16	16	16
19	14	13	13	15	14	15	14	16	15	C	C	C	C	C	C	C	C	C	16	16	15	14	15	15
20	14	16	15	15	14	14	14	15	16	19	25	26	28	24	22	19	16	15	18	14	16	14	16	15
21	15	15	14	14	14	14	16	15	15	18	23	26	43	26	22	20	16	15	16	16	15	15	16	15
22	15	14	15	14	14	14	15	17	16	22	22	46	43	27	24	21	19	16	17	15	16	13	15	15
23	15	14	15	15	15	15	14	16	17	22	46	24	26	21	25	17	16	15	14	14	15	15	15	14
24	15	14	14	14	13	15	13	15	15	18	27	25	44	28	28	19	17	42	15	15	15	15	15	14
25	14	14	15	15	15	15	15	15	16	16	21	26	22	22	19	23	20	14	16	15	15	14	14	15
26	15	15	15	14	14	15	15	15	18	18	20	22	28	28	24	20	18	15	15	15	14	15	15	15
27	16	14	15	14	14	15	14	14	14	18	20	25	42	22	30	21	17	15	17	14	14	15	15	16
28	15	14	15	14	15	15	14	16	16	16	22	40	32	43	25	20	20	15	16	14	13	16	14	15
29	15	14	16	15	14	15	16	22	19	40	24	37	46	35	20	20	16	16	16	15	15	14	14	14
30	14	15	15	14	14	15	14	16	17	20	48	45	44	45	30	21	18	16	16	16	16	14	16	15
31	14	15	15	14	14	13	14	16	18	21	24	28	40	44	31	25	26	16	15	15	14	14	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	28	28	28	28	28	29	30	30	31	31	31	31	31	31
MED	15	15	15	15	14	15	14	15	16	18	20	24	24	24	22	19	16	15	16	15	15	15	15	15
U Q	15	15	15	15	15	15	15	16	16	20	24	30	41	28	24	20	18	16	16	15	15	15	16	16
L Q	15	14	14	14	14	14	14	15	15	16	18	21	22	22	20	18	16	15	15	14	14	14	15	15

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	281	287	298	299	281	269	302	339	324	323	311	295	289	287	283	287	296	302	297	296	304	277	258	253
2	265	260	279	263	284	270	280	304	308	300	303	290	289	279	279	282	289	300	291	285	279	R 284	281	280
3	278	279	289	302	313	R 309	295	330	310	311	300	291	287	279	286	284	294	298	288	281	296	290	269	272
4	269	274	298	316	316	262	290	329	329	318	308	292	291	294	288	288	294	298	300	293	R 272	273	R 284	285
5	290	301	281	276	275	289	308	328	318	306	297	283	285	278	286	283	284	289	291	285	286	266	275	R 282
6	297	309	296	274	262	260	287	326	319	306	284	280	278	279	276	276	289	289	290	290	274	276	269	256
7	264	275	297	266	250	253	293	318	319	294	292	286	277	278	283	274	278	289	282	274	269	279	268	275
8	285	277	269	261	278	295	295	325	311	308	290	282	283	274	283	281	278	299	298	285	273	272	R 264	269
9	264	262	265	269	247	243	R 281	313	306	297	297	296	288	283	283	283	284	292	292	285	269	270	273	277
10	280	298	316	299	277	272	R 306	335	318	301	301	290	287	288	288	285	287	299	296	279	273	270	266	268
11	261	261	273	271	251	255	275	313	302	302	295	288	287	285	280	283	286	296	283	282	271	271	266	268
12	268	248	R 254	273	255	254	282	303	306	313	296	289	287	288	283	292	288	291	296	291	275	270	269	262
13	260	289	302	279	260	260	300	320	306	301	298	297	289	286	279	281	290	293	294	276	272	269	278	298
14	309	311	307	300	266	271	R 304	320	320	305	308	294	290	285	281	278	282	286	298	298	273	281	283	284
15	295	314	289	271	267	281	299	R 328	314	305	300	299	289	278	283	286	288	298	303	283	270	275	284	285
16	300	312	308	316	281	259	U R 325	318	310	310	C	C	C	C	C	C	295	299	305	R 306	279	274	283	302
17	303	304	309	276	266	272	298	322	309	312	C	C	C	C	C	289	294	299	307	300	291	274	277	277
18	299	297	304	300	284	275	300	321	316	308	294	288	286	282	282	288	289	292	307	305	280	287	285	280
19	282	291	296	300	278	280	316	326	316	C	C	C	C	C	C	C	C	C	299	298	282	283	283	282
20	282	276	296	294	279	261	301	324	317	305	296	281	283	276	279	283	285	293	294	292	291	280	278	276
21	282	307	314	295	282	276	303	323	307	303	286	285	283	282	281	281	284	288	293	295	284	282	290	288
22	282	288	296	308	278	260	R 315	329	317	298	293	283	279	277	276	275	282	291	291	288	270	272	279	274
23	268	265	271	269	255	243	255	293	276	286	279	294	286	286	278	282	284	297	296	279	292	286	274	272
24	271	275	265	268	256	260	299	313	304	297	289	279	279	275	276	277	282	290	293	278	276	284	281	284
25	248	250	284	282	258	261	293	311	300	293	289	279	280	276	273	274	279	284	292	293	270	269	266	269
26	281	304	311	278	249	251	322	323	301	295	280	275	273	274	274	272	275	280	290	285	282	279	281	282
27	295	298	289	261	265	276	309	301	R 296	289	278	280	272	269	271	270	275	283	291	278	274	279	R 283	289
28	286	295	312	306	265	254	298	308	307	296	279	269	266	267	267	269	272	277	281	280	260	265	268	280
29	287	300	293	287	273	267	311	C	300	292	277	276	270	260	263	263	268	279	288	276	256	263	270	276
30	286	288	293	290	260	260	277	295	309	299	280	274	272	267	263	268	274	283	282	277	259	257	R 269	R 272
31	283	281	286	271	265	263	293	301	283	285	273	272	261	261	259	262	262	268	268	272	258	260	265	272
	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	30	31	30	28	28	28	28	28	29	30	30	31	31	31	31	31	31
MED	282	288	296	279	266	262	299	320	309	302	294	286	284	278	280	281	284	292	293	285	274	274	275	277
U Q	290	301	304	300	279	275	306	326	317	308	299	292	288	285	283	284	289	298	298	293	282	281	283	284
L Q	268	275	281	271	258	259	290	311	304	296	282	280	278	274	275	274	278	286	290	279	270	270	268	272

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L			L		U L 420								
2										L	L	L	L		L		L							
3										L	L	L	L	L	L									
4											L	L				A								
5											L	U L 339	L	L	L		L							
6												L	L	L			L							
7										L	L	L	L		L									
8									L	L	L	B		L	L	L								
9										L		L	L 359	U L 354	U L 338	L								
10										L	L	L	L	L	L									
11									L	L	L	L	L	L	L		L							
12										L	L	L	L											
13									L	L	L	L	L	L	L	L	L							
14											L	L	L	L										
15											L	U L 352	L	L	L									
16									L	L	C	C	C		C	C	L							
17										L	C	C	C	C	C	L								
18												L	L	L	L	L								
19										C	C	C	C	C	C	C	C		C					
20										L	L		L	L		L	L							
21											L	L	L	L		L								
22											L		L	L	L	L								
23								L		L	L	L	L	L	L									
24											L	L	L	L	L	L								
25											L	L	L	U L 324	L	L	L							
26											L	L	L	L			L							
27												L	L	L	L	L	L							
28												L	U L 316	L	L	L								
29									L	L		U L 325	L	L	U L 302	L	L							
30										L	L	L	L	L	U L 317	L	L							
31												L	U L 310	U L 317	U L 303	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												3	3	3	4	1								
MED												U L 339	U L 316	U L 324	U L 310	U L 420								
U Q												U L 352	L 359	U L 354	U L 328									
L Q												U L 325	U L 310	U L 317	U L 302									

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											260			290		258								
2										288	262	300	300		L 294		286							
3										264	272	292	282	318	288									
4											L 272	294				286								
5											280	288	280	324	306		252							
6												L 256	306	318			254							
7										238	268	324	288		304									
8									242	268	270	260		L 306	286	300								
9										276		282	336	328	318	254								
10										280	276	278	282	290	282									
11									244	276	286	282	298	268	286		246							
12										244	278	268	298											
13									L 268	274	274	266	L 300	L 290	252	L 300	256							
14											272	272	300	298										
15											284	290	308	260	302									
16									L 262	258	C	C	C		C	C	272							
17										262	C	C	C	C	C	294								
18												290	306	292	314	282								
19										C	C	C	C	C	C	C	C	C	C					
20										264	286		274	324		276	298							
21											254	300	292	298		298								
22											270		314	316	330	306								
23								278		L 304	L 298	286	L 306	306	314									
24											258	L 326	314	310	L 280	318								
25											288	312	314	320	320	322	294							
26											L 316	318	332	320			304							
27												L 306	L 322	336	322	L 326	302							
28												L 324	348	332	336	326								
29									264	290		328	L 320	360	352	346	L 320							
30										254	306	L 328	L 326	L 348	358	340	L 334							
31												336	362	352	362	340	332							
	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	5	15	21	25	25	24	20	17	13							
MED								278	262	268	274	292	306	317	310	300	294							
U Q									266	280	286	321	321	326	326	326	312							
L Q									243	258	269	280	295	295	287	284	255							

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	274	278	264	242	246	300	270	234	226	230	228	236	232	232	234	224	234	250	234	220	224	244	296	320
2	318	324	298	284	274	250	286	236	238	234	234	224	H 208	B 254	H 216	238	242	236	H 204	224	258	256	260	272
3	278	286	276	252	236	232	240	220	234	236	238	242	232	246	248	244	238	234	218	254	254	268	274	306
4	308	286	268	230	216	330	288	242	236	234	230	234	250	258	E A 260	A	A 262	250	254	244	254	282	280	270
5	270	270	290	288	242	256	254	238	236	234	226	222	B 240	242	242	242	234	236	226	222	238	258	294	290
6	276	250	270	294	294	298	288	248	238	230	234	214	198	242	254	236	246	238	234	240	258	288	304	322
7	304	280	256	248	336	358	270	232	240	228	234	H 230	238	248	230	250	242	242	224	244	280	264	286	288
8	272	282	274	290	262	238	244	244	226	H 230	238	B	250	238	234	246	250	246	220	220	266	292	286	300
9	292	302	284	264	320	396	272	230	228	H 228	246	234	226	234	234	228	246	244	234	244	268	280	284	286
10	286	248	218	228	238	282	258	232	234	H 212	228	232	228	228	230	232	240	236	224	238	268	290	302	314
11	310	312	278	266	304	340	262	240	224	232	222	228	240	226	220	234	248	230	236	248	266	292	278	298
12	302	310	302	280	276	336	256	236	240	228	204	H 218	232	238	242	236	240	248	248	222	254	282	276	300
13	318	270	238	256	310	312	248	234	230	232	230	232	H 218	222	218	H 216	234	234	230	238	274	288	290	266
14	246	240	238	236	242	294	270	240	236	236	232	208	226	238	232	248	242	252	240	228	252	274	282	280
15	264	248	256	254	274	284	264	240	236	238	224	228	252	236	232	232	242	246	234	228	262	284	268	274
16	262	244	236	230	236	300	254	232	H 230	232	C	C	C	C	C	C	242	248	238	236	234	256	276	260
17	250	254	242	218	256	284	258	234	238	236	C	C	C	C	C	H 232	238	244	234	232	236	262	274	278
18	266	252	258	238	230	270	260	238	236	238	228	240	224	232	232	238	244	244	236	230	250	256	266	276
19	278	270	242	242	242	268	248	230	228	C	C	C	C	C	C	C	C	C	240	238	244	264	262	266
20	270	282	262	224	250	318	256	234	234	230	224	244	234	232	234	238	242	250	234	242	250	258	284	288
21	272	242	234	246	244	270	242	236	234	234	226	226	222	234	236	234	240	248	250	244	250	262	268	268
22	272	264	256	226	220	304	248	238	232	232	230	B 238	222	224	238	234	250	244	240	242	264	276	272	276
23	294	304	284	262	256	352	284	258	246	234	B 242	236	238	228	232	246	250	252	236	236	254	246	270	266
24	270	298	286	276	220	294	252	228	234	236	224	H 220	234	230	222	232	242	260	242	260	286	278	272	272
25	316	324	262	H 194	252	304	248	234	238	234	234	234	236	230	234	238	246	256	254	242	234	258	282	296
26	284	260	238	236	312	340	236	226	232	232	228	224	230	242	242	238	246	250	254	260	262	256	256	268
27	260	250	262	290	266	260	232	226	234	232	228	230	228	234	232	242	242	254	252	244	260	268	260	264
28	266	266	242	224	242	310	246	238	232	234	232	228	228	224	234	244	240	252	250	250	264	294	284	294
29	264	256	242	230	250	278	248	C	238	230	232	230	B 246	238	226	232	252	262	254	240	272	288	288	288
30	272	268	256	248	254	314	256	242	234	224	238	236	232	236	230	234	250	A 258	254	262	264	292	294	290
31	274	274	272	258	258	292	238	230	234	242	248	E A 268	A 242	228	238	246	238	260	264	A 288	A 294	290	284	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	31	31	31	31	31	31	31	30	31	30	28	27	28	28	28	28	30	30	31	31	31	31	31	31
MED	274	270	262	248	252	298	256	235	234	232	230	230	232	234	234	237	242	248	236	240	258	274	280	282
U Q	294	286	276	266	274	318	270	240	238	234	234	236	239	240	238	243	246	252	250	244	266	288	286	296
L Q	266	252	242	230	242	270	248	232	232	230	227	224	226	229	230	232	240	242	234	230	250	258	270	270

MAR. 2000 h'F (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B 140		128	120	A	122	120	120	A	A	A	126						
2							B 126		124	118	116	116	124	B	118	118	132	126						
3							B 126		126	122	120	A	124	122	122	120	118	126						
4							186	126	120	A 126	120	130	130	126	124	120	A	122						
5							B 124		124	110	120	116	B	A	120	122	114	A 144						
6							B 120		124	124	A	126	120	118	116	116	A	A 140						
7							B 124		132	118	A	A	A	A	A	122	118	A						
8							132	118	120	116	116	B	A	120	120	134	126	122						
9							162	130	A	A	122	124	122	116	112	116	A	A						
10							160	138	128	116	114	116	A	124	134	126	130	A 144						
11							B	130	120	116	122	112	A	A	A	140	A	A	B					
12							B	130	134	A 136	118	A	Y 132	126	126	120	120	A	B					
13							E B 184	128	116	114	118	A	128	124	118	118	A	A	B					
14							172	120	A	128	128	A	126	122	114	116	A 122	A 146	B					
15							A	A	A 134	A	A	A	A	122	122	120	132	126	B					
16							152	128	126	110	C	C	C		C	C	112	124	B					
17							B	120	120	116	C	C	C	C	C	118	122	126	B					
18							148	130	120	118	A	B	A	120	120	122	116	128	B					
19							154	120	120	C	C	C	C	C	C	C	C	C	C	B				
20							126	120	A 130	118	A	122	A	124	120	136	A	A	B					
21							154	130	122	118	A	A	B	A	A	122	124	124	B					
22							158	126	118	A	114	B	B	120	122	120	120	120	B					
23							148	132	128	A	B	A	118	122	A	118	A	A	128					
24							160	118	126	122	118	120	B	120	118	116	A	B	B					
25							160	120	116	116	112	112	A	A	116	116	114	A 140	B					
26							160	118	A	122	A	A	120	120	118	116	114	126	A					
27							146	138	A	108	112	114	B	116	124	120	130	A	B					
28							144	E A 152	A 134	122	116	B	118	B	118	A	122	A 132	B					
29							138	C	118	B	116	A	B	A	124	A	120	118	B					
30							132	E A 148	116	116	B	B	B	B	118	120	116	122	B					
31							140	118	120	118	116	A	A	B	128	132	130	128	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							21	29	27	25	18	12	12	18	23	26	21	21	1					
MED							153	126	124	118	117	118	123	121	120	120	120	126	128					
U Q							160	130	128	122	120	123	127	124	124	122	128	A 136						
L Q							142	120	120	116	116	115	120	120	118	118	116	123						

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	B	G	114	E G 200	106	G	G	130	120	114	114	120	114	B	B	B	B	B
2	B	B	104	102	B	108	B	G	106	G	G	G	114	B	G	122	118	126	128	B	B	116	B	B
3	B	B	B	B	B	B	B	106	108	G	114	110	110	156	150	154	154	136	102	B	140	114	114	106
4	96	B	B	B	104	B	G	G	E G 202	114	108	182	158	144	132	130	124	118	116	112	112	112	114	B
5	B	B	B	B	B	B	B	178	146	G	118	G	B	114	G	G	122	118	134	112	B	B	B	B
6	B	108	106	102	104	B	B	188	114	114	114	112	G	G	120	118	114	166	108	108	108	B	B	130
7	B	B	B	104	106	B	154	176	E G 188	G	110	114	114	108	104	132	134	122	100	98	98	B	B	B
8	B	108	B	B	108	102	112	G	G	G	130	B	114	G	G	154	140	134	112	B	128	B	B	134
9	128	B	B	B	B	B	G	116	106	106	104	108	108	130	128	128	120	116	118	112	112	124	B	B
10	B	B	B	B	B	B	102	168	110	G	G	G	126	G	116	116	114	164	B	B	110	B	B	B
11	B	B	B	108	102	B	B	106	G	G	130	120	120	118	118	114	114	114	B	114	B	102	B	108
12	110	B	B	B	B	B	114	112	110	126	110	108	110	G	G	G	G	122	96	B	B	B	B	B
13	B	B	B	B	B	B	G	G	G	G	116	116	116	G	G	G	116	154	116	110	110	114	130	B
14	B	B	B	B	B	B	160	E G 194	112	110	110	112	110	110	G	G	100	108	B	B	B	B	B	B
15	B	B	B	B	B	B	158	120	110	110	114	110	108	104	104	100	120	164	108	100	B	118	110	B
16	B	B	B	B	B	B	160	194	174	G	C	C	C	C	C	C	120	126	112	110	114	B	B	B
17	108	B	B	112	B	B	146	140	132	124	C	C	C	C	C	106	104	G	B	B	102	B	B	108
18	B	B	B	B	B	B	G	112	130	G	118	B	114	G	110	G	122	112	104	B	B	B	B	B
19	B	B	B	B	B	B	G	G	G	C	C	C	C	C	C	C	C	C	142	B	B	B	B	B
20	B	B	B	B	B	B	G	G	108	132	114	112	114	112	G	114	114	114	B	B	B	B	B	B
21	B	B	B	B	B	B	G	172	110	G	110	114	B	112	110	108	102	102	B	B	B	B	B	B
22	B	B	B	B	B	B	184	G	G	112	G	B	B	G	108	G	G	118	112	110	110	110	B	B
23	B	B	B	B	B	B	176	110	112	108	B	112	128	126	124	130	116	116	G	B	B	B	114	B
24	B	110	116	B	B	B	150	156	178	110	G	G	B	G	G	120	114	B	106	102	108	104	B	106
25	116	B	B	B	104	B	G	160	G	134	122	G	114	106	106	G	G	114	126	112	114	116	110	B
26	B	B	B	B	B	B	G	190	110	112	116	112	G	G	G	144	126	126	124	116	B	B	B	B
27	B	B	B	116	B	110	G	110	156	G	G	G	B	134	G	134	148	120	B	B	106	B	B	B
28	B	B	B	106	B	B	G	112	110	130	126	122	G	B	G	114	G	108	106	B	112	B	102	106
29	108	B	B	B	B	B	G	C	140	B	120	114	B	112	110	104	104	150	124	B	110	B	B	B
30	B	B	B	B	B	B	174	186	G	G	B	B	B	B	G	G	G	124	114	112	114	B	B	B
31	B	B	104	106	B	B	170	G	154	130	122	114	112	B	124	120	G	G	128	116	118	106	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	6	3	4	8	6	3	13	21	24	16	21	17	17	15	16	21	24	27	23	15	18	11	7	7
MED	109	108	105	106	104	108	158	148	112	114	114	112	114	114	117	120	117	120	114	112	111	114	114	108
U Q	116	110	111	110	106	110	172	182	150	130	121	115	118	130	124	131	123	134	124	112	114	116	114	130
L Q	108	108	104	103	104	102	130	112	110	110	110	111	110	110	109	114	114	114	106	108	108	106	110	106

MAR. 2000 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

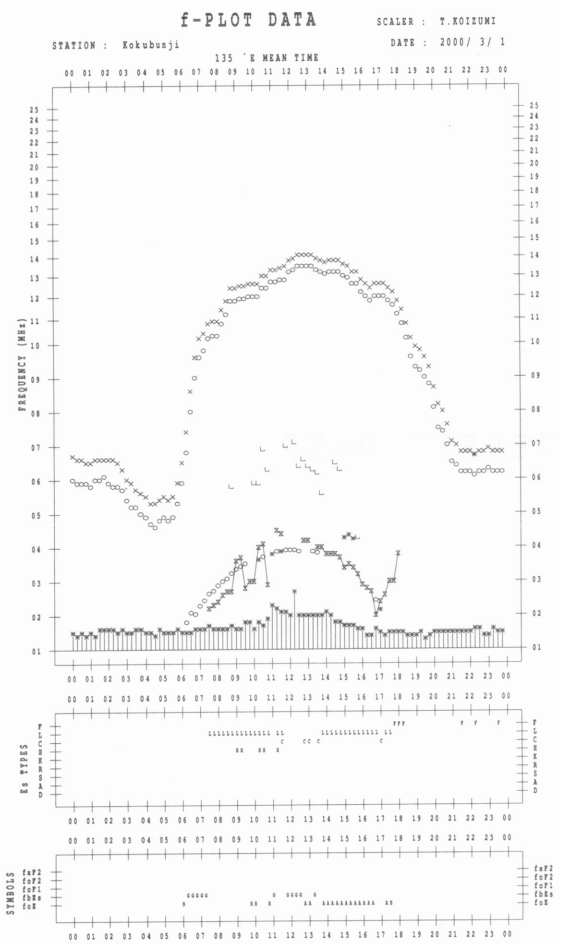
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

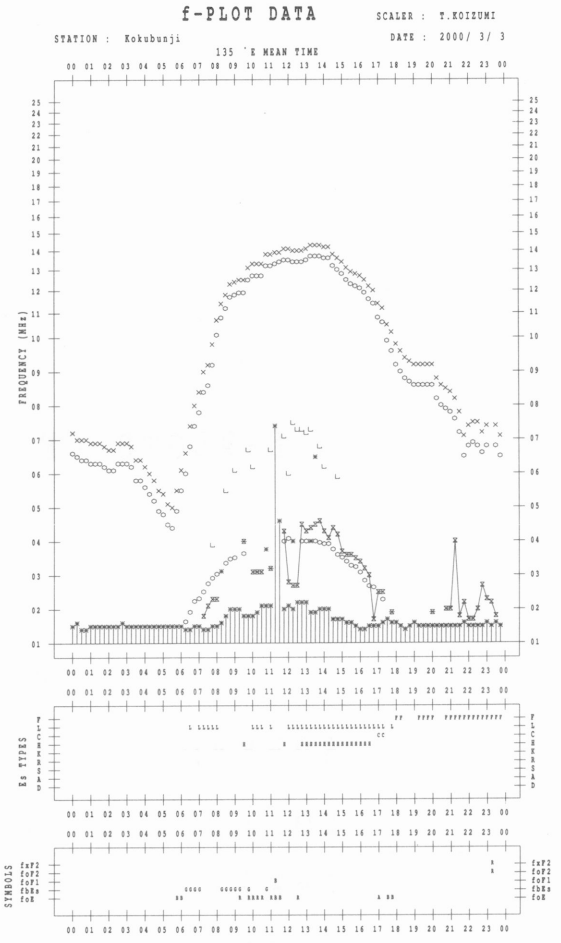
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L 1	HL 11	L 1			C 1	L 1	L 1	L 1	C 2	F 3					
2			F 2	F 2		F 2			L 1				L 1			C 1	L 1	CL 31	F 1			F 2		
3								L 1	L 1		L 1	L 1	L 1	HL 11	HL 11	HL 11	HL 11	CL 11	F 1		F 3	F 3	F 2	F 2
4	F 2				F 1				HL 11	L 1	L 1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

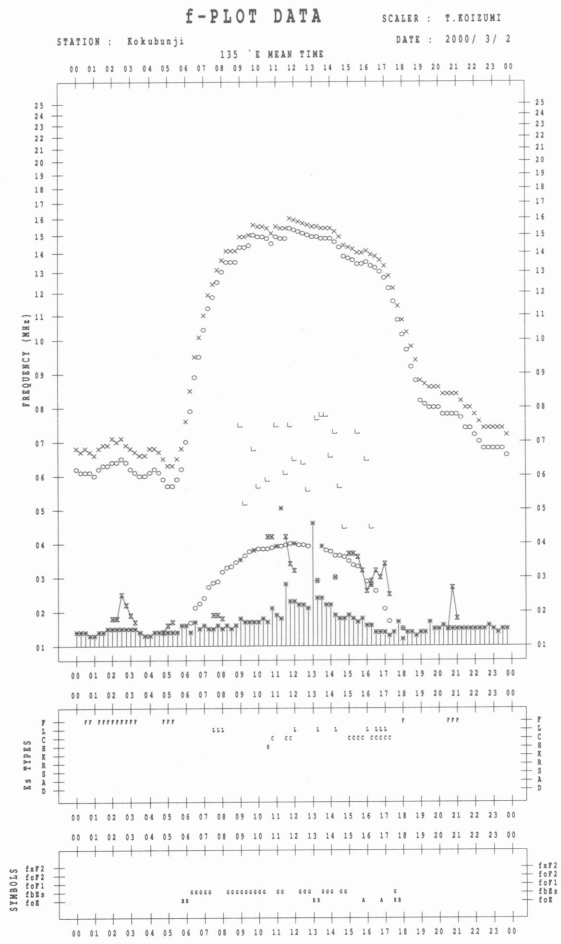
MAR. 2000 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

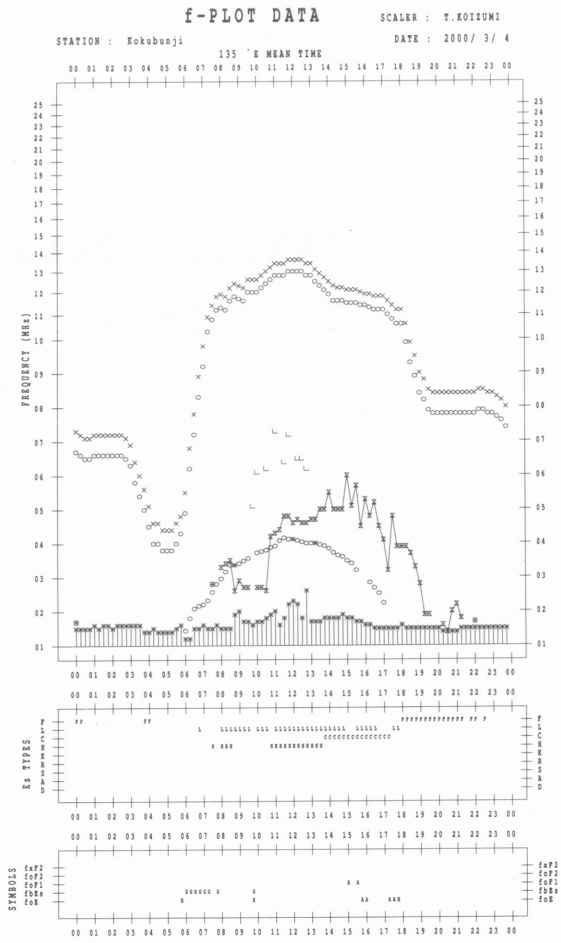
f-PLOTS OF IONOSPHERIC DATA

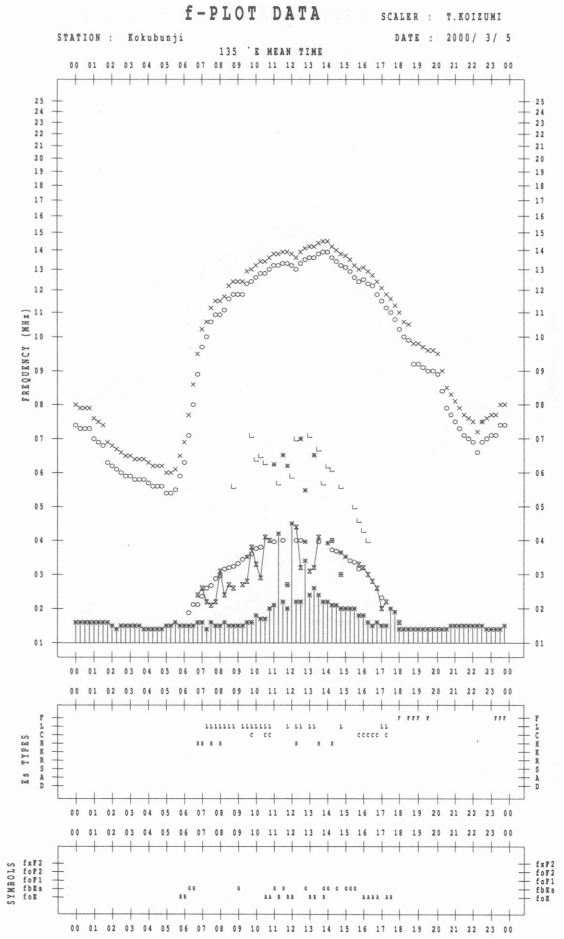
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

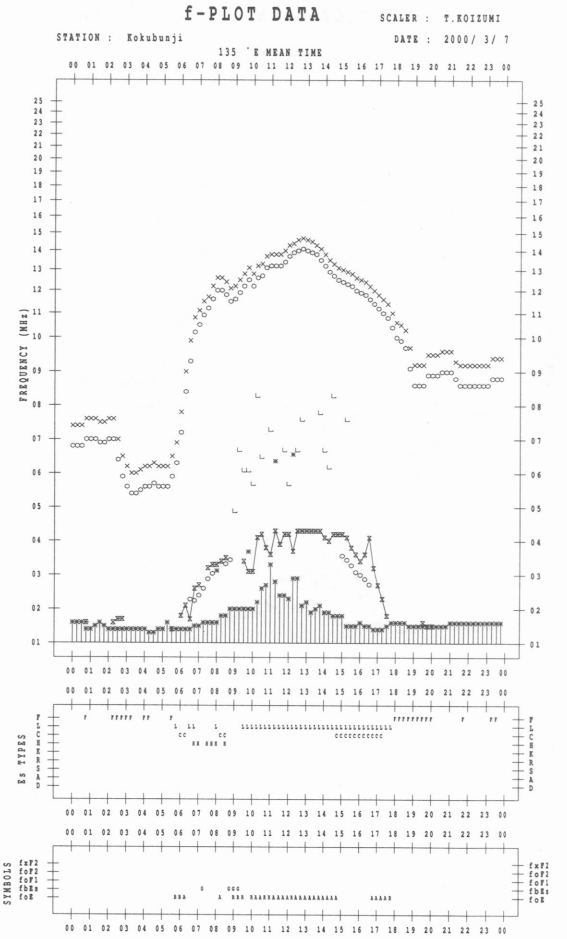

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

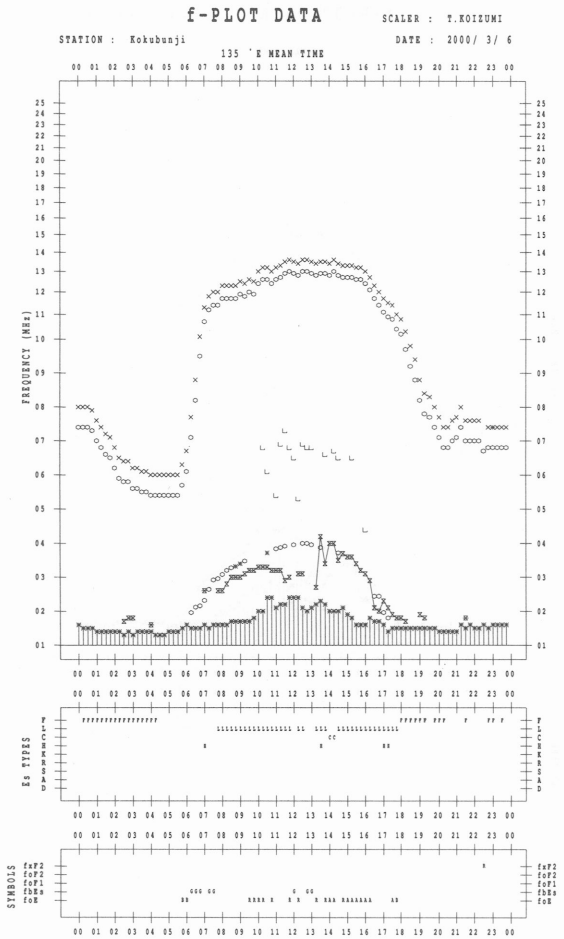

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

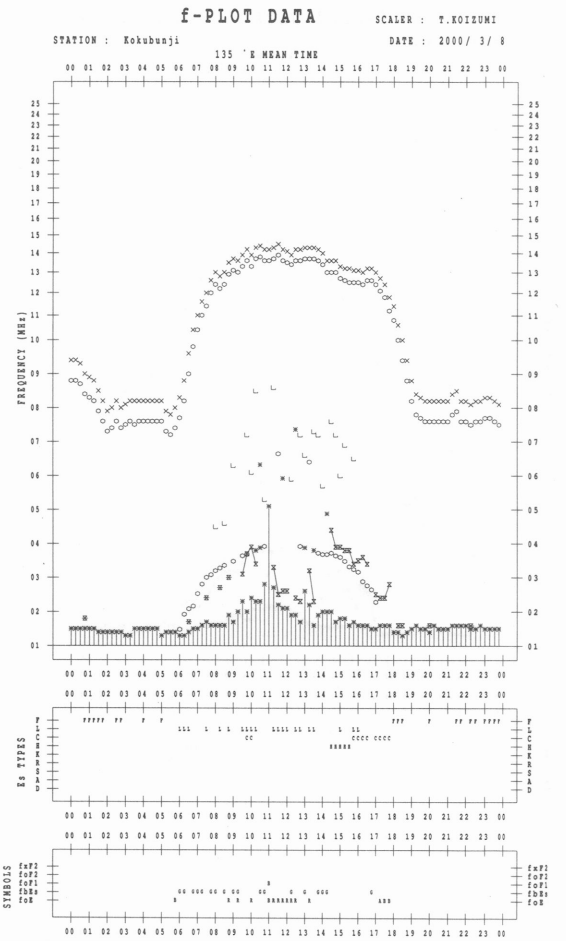

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

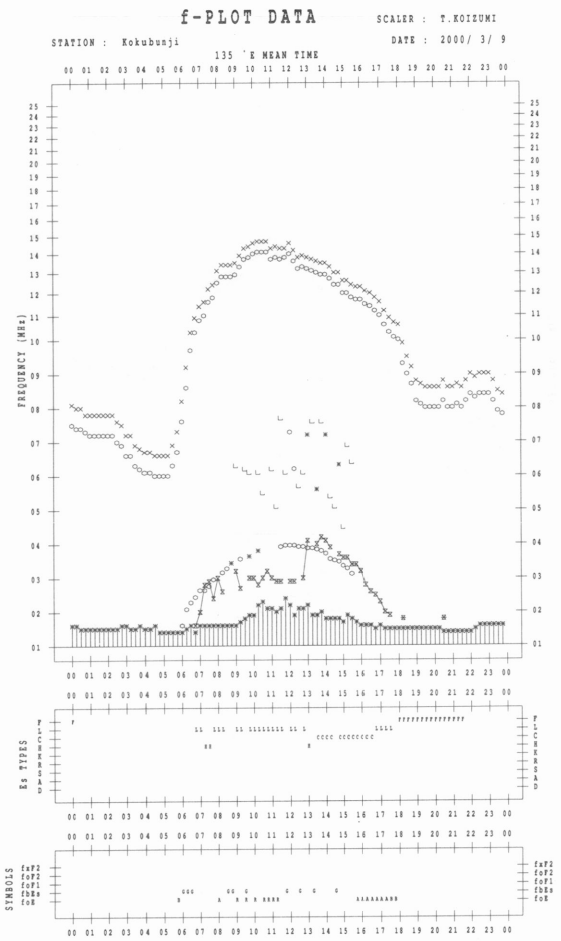

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

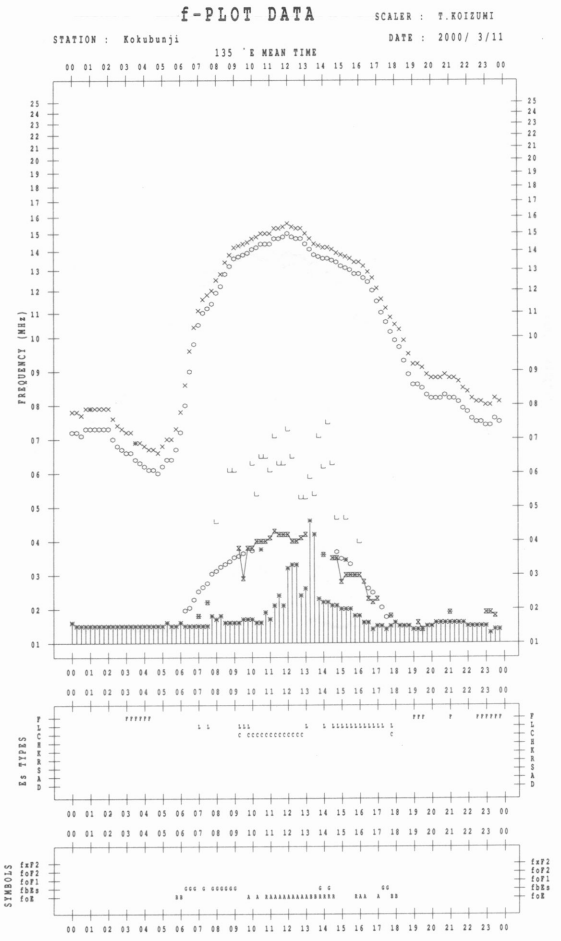

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

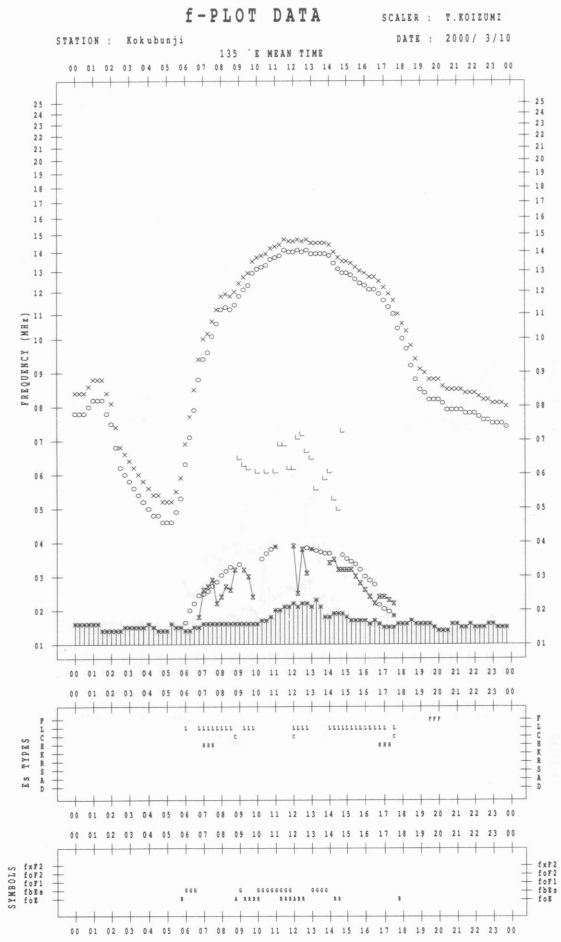

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

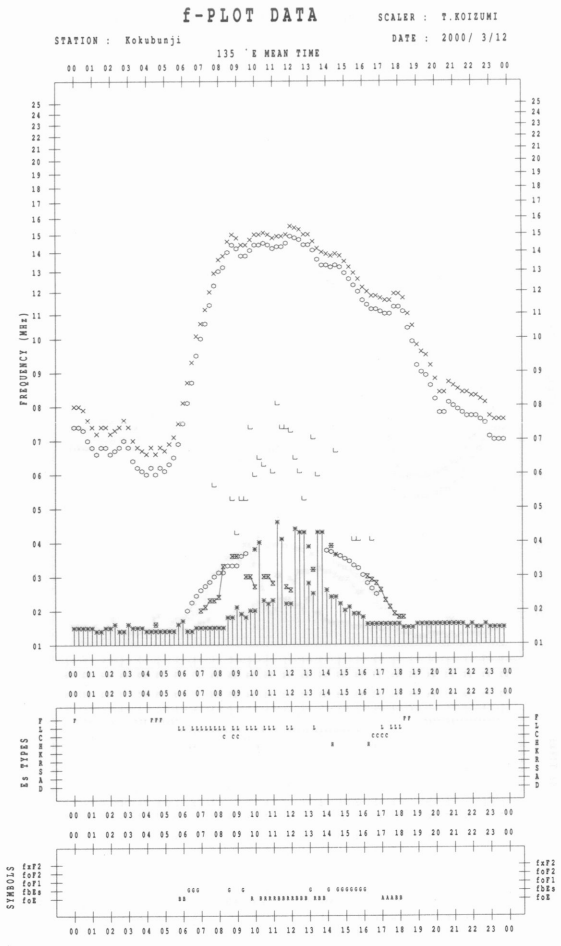

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

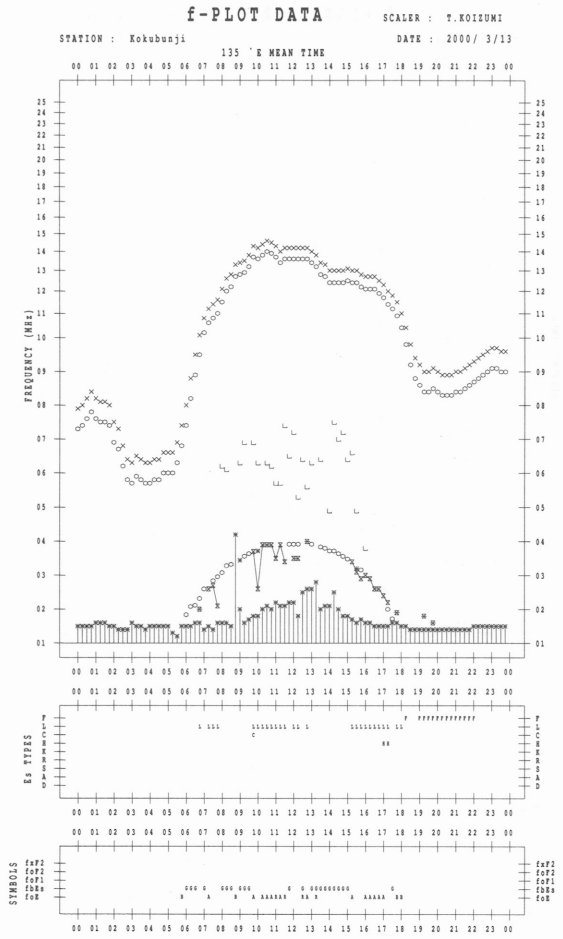

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

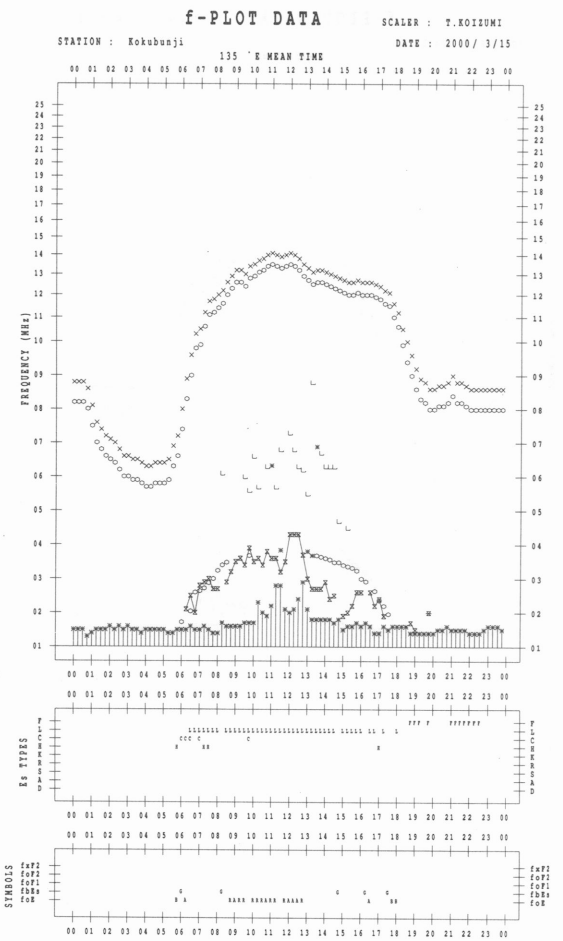

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

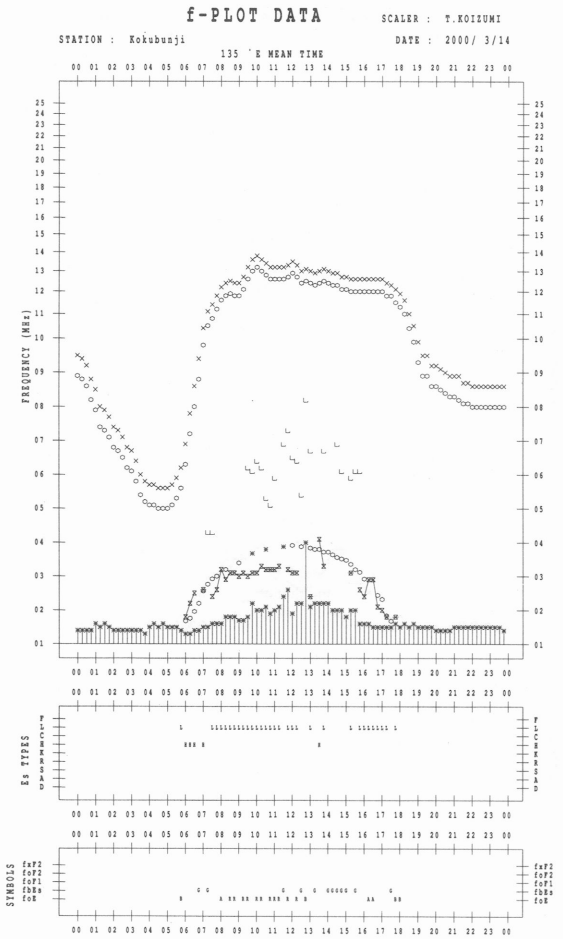

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

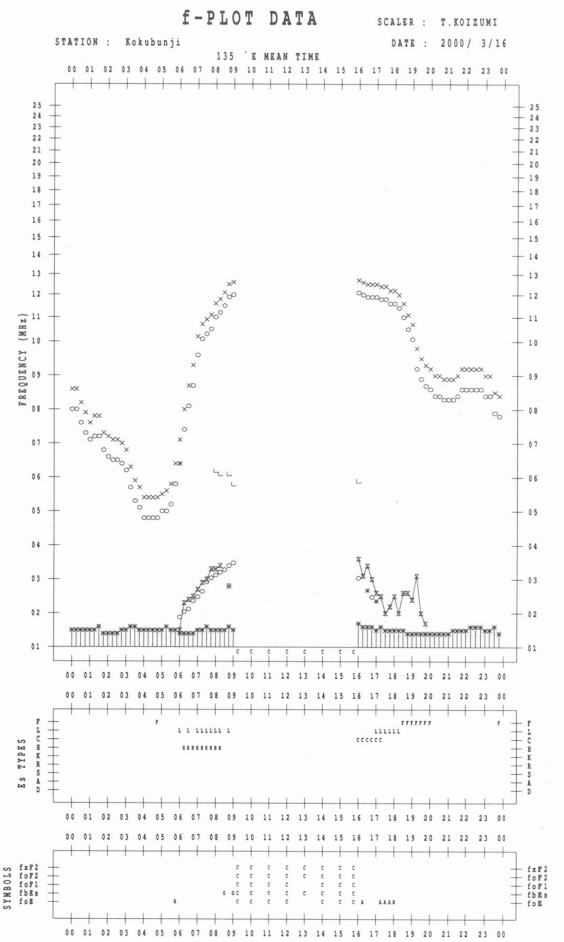

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

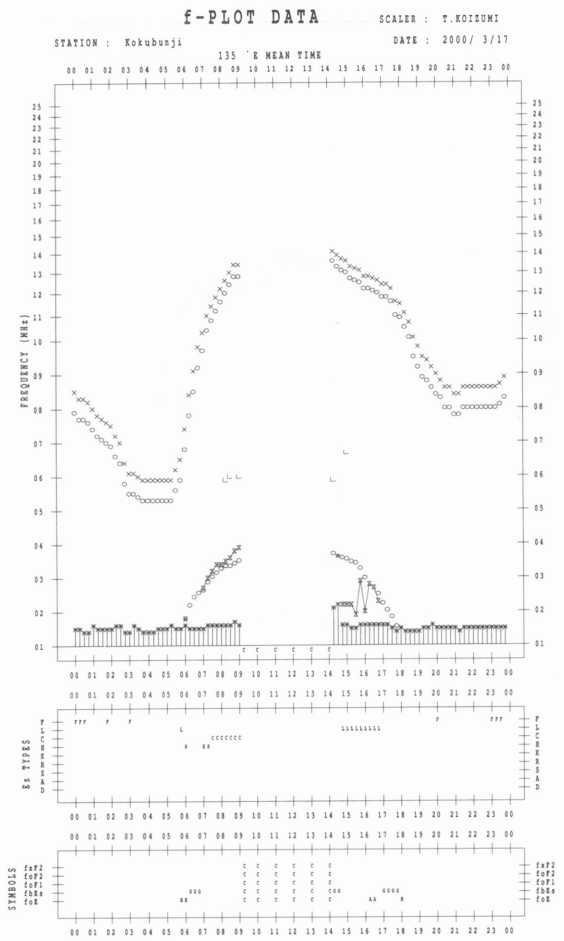

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

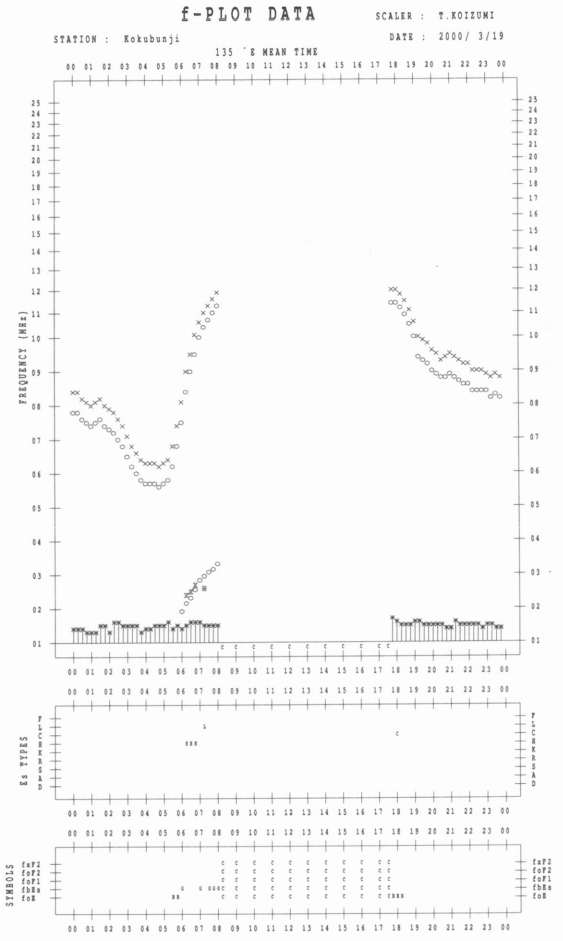

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

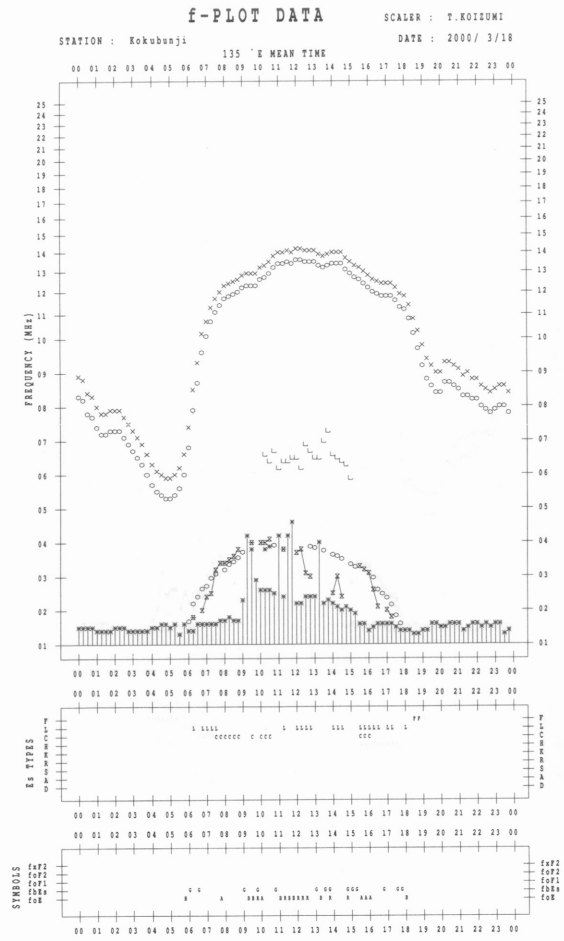

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

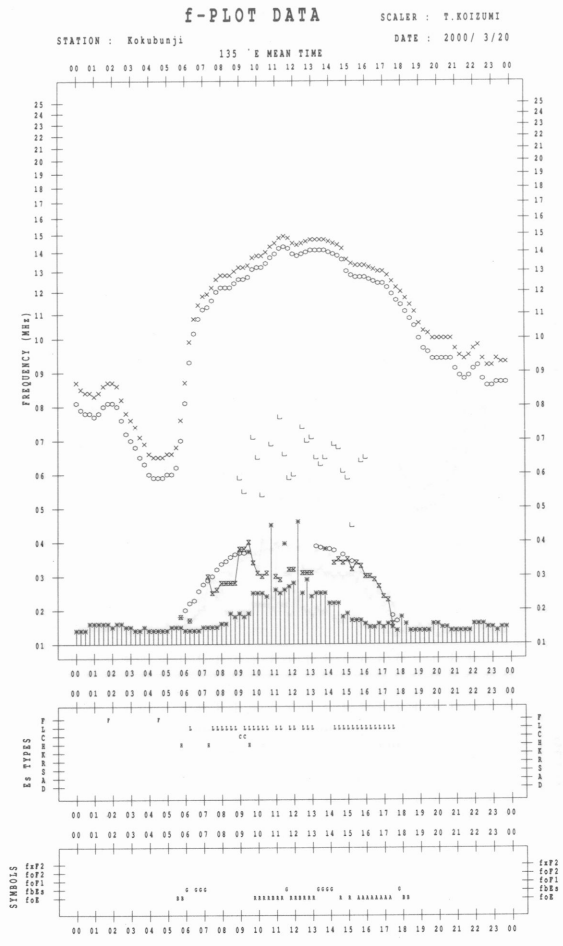

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

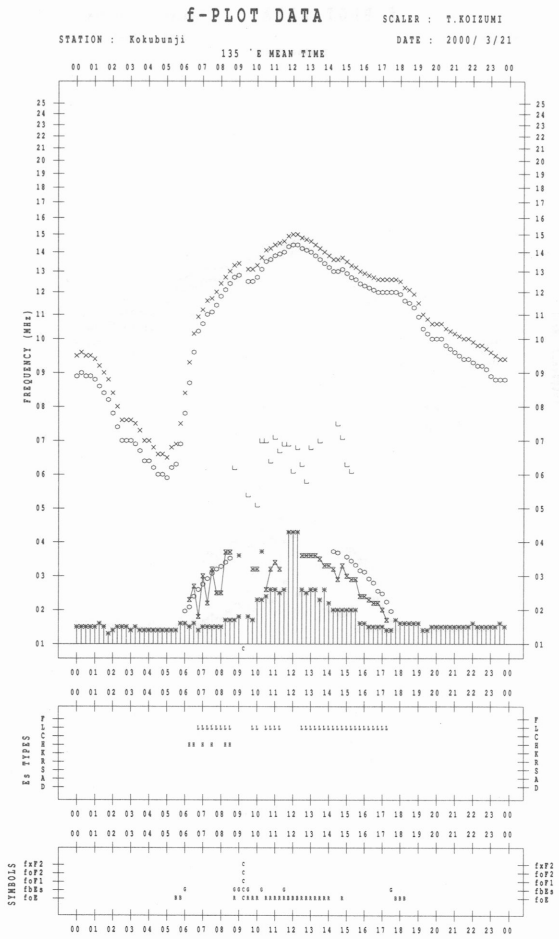

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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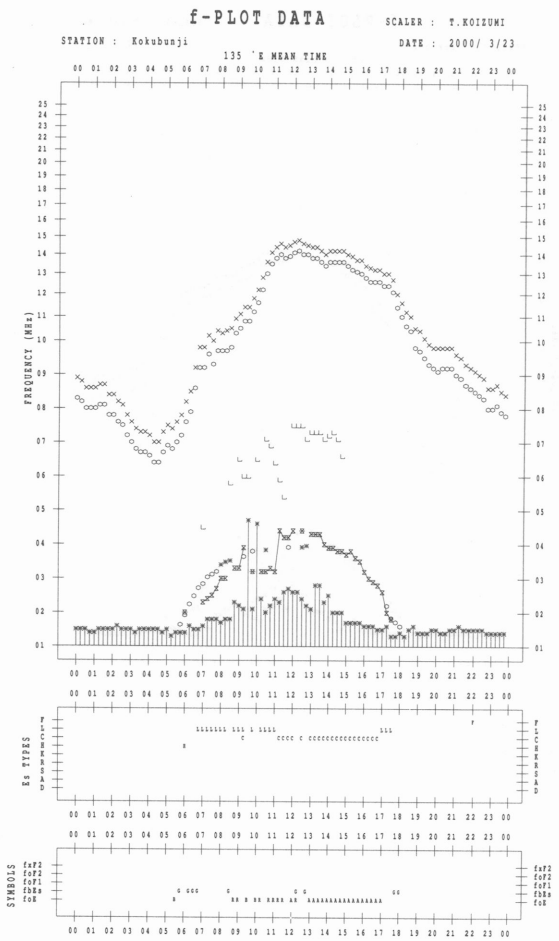
STATION : Kokubunji
DATE : 2000/ 3/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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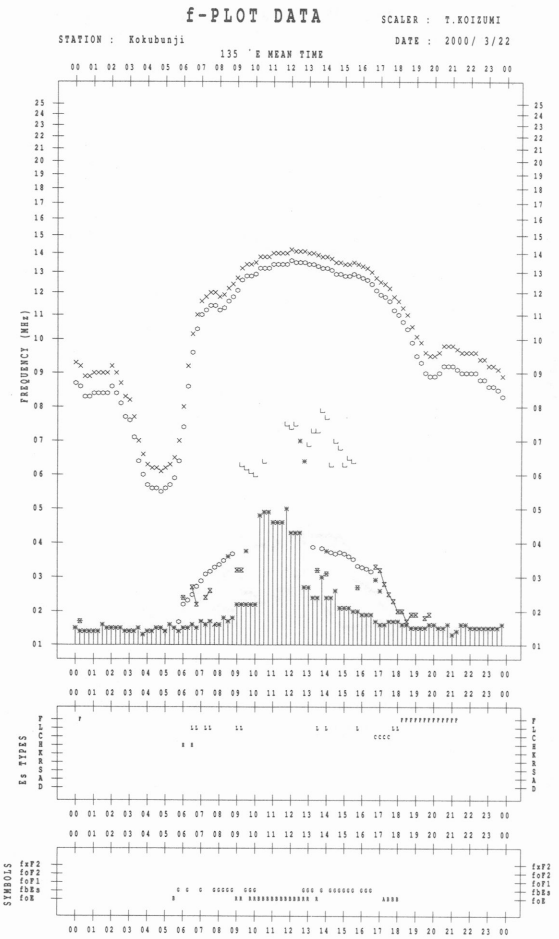
STATION : Kokubunji
DATE : 2000/ 3/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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FREQUENCY (MHz)
Es TYPES
SYMBOLS
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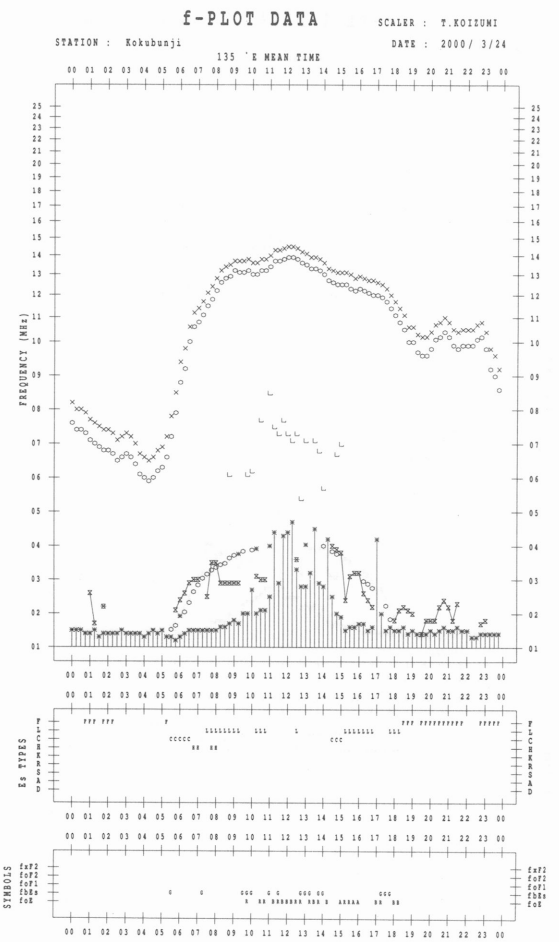
foF2
foF1
fbEs
foE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STATION : Kokubunji
DATE : 2000/ 3/24
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FREQUENCY (MHz)
Es TYPES
SYMBOLS
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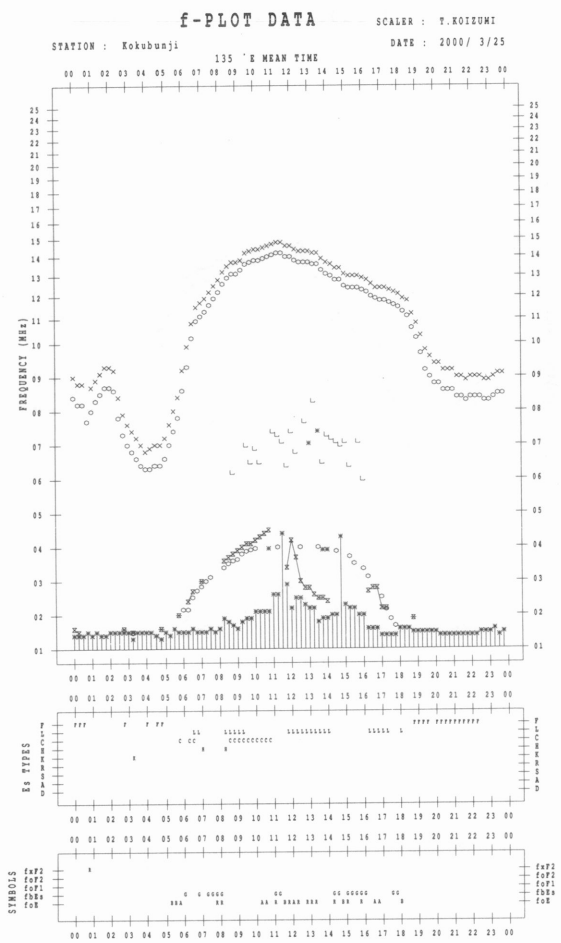
foF2
foF1
fbEs
foE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STATION : Kokubunji
DATE : 2000/ 3/25
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FREQUENCY (MHz)
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SYMBOLS
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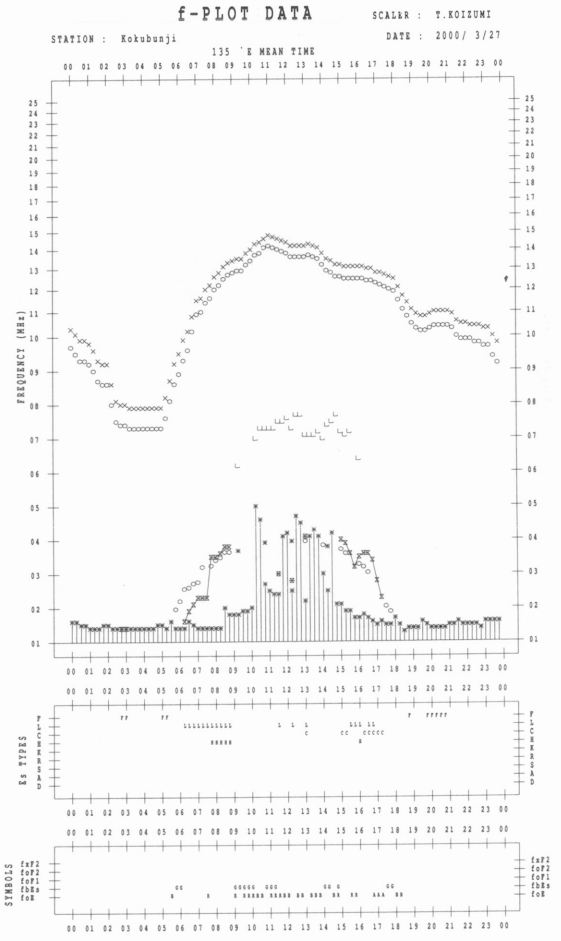
foF1
fbEs
foE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STATION : Kokubunji
DATE : 2000/ 3/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
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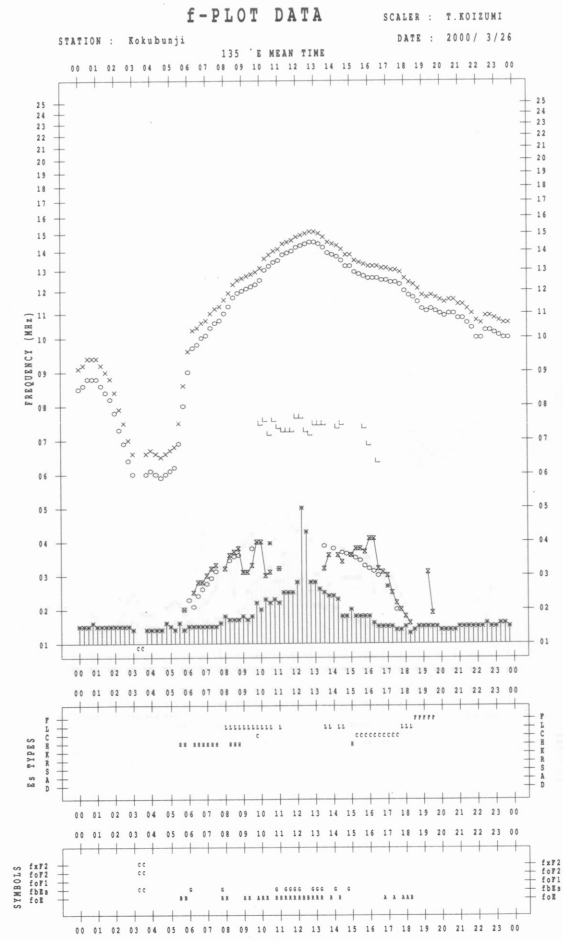
foF2
foF1
fbEs
foE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STATION : Kokubunji
DATE : 2000/ 3/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
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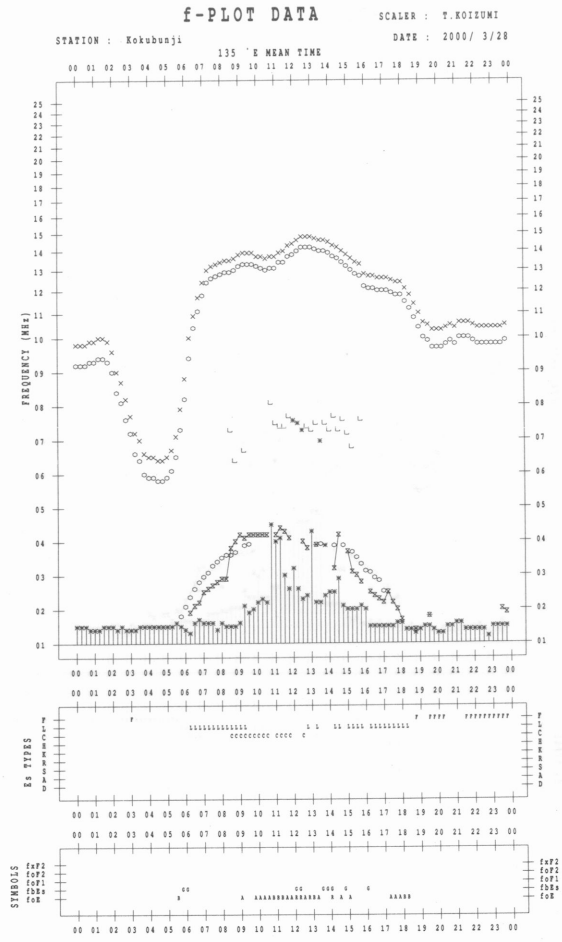
foF2
foF1
fbEs
foE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STATION : Kokubunji
DATE : 2000/ 3/28
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FREQUENCY (MHz)
Es TYPES
SYMBOLS
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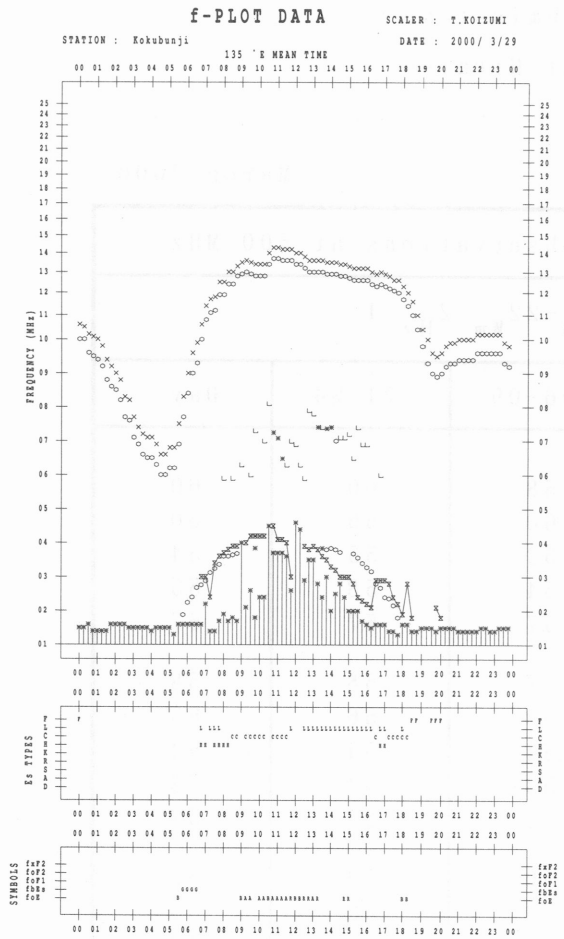
foF2
foF1
fbEs
foE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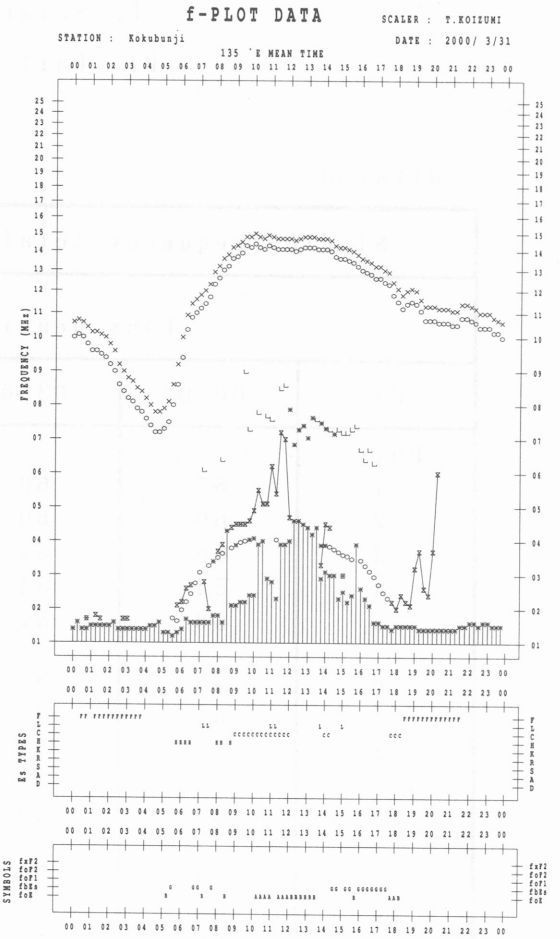
STATION : Kokubunji
DATE : 2000/ 3/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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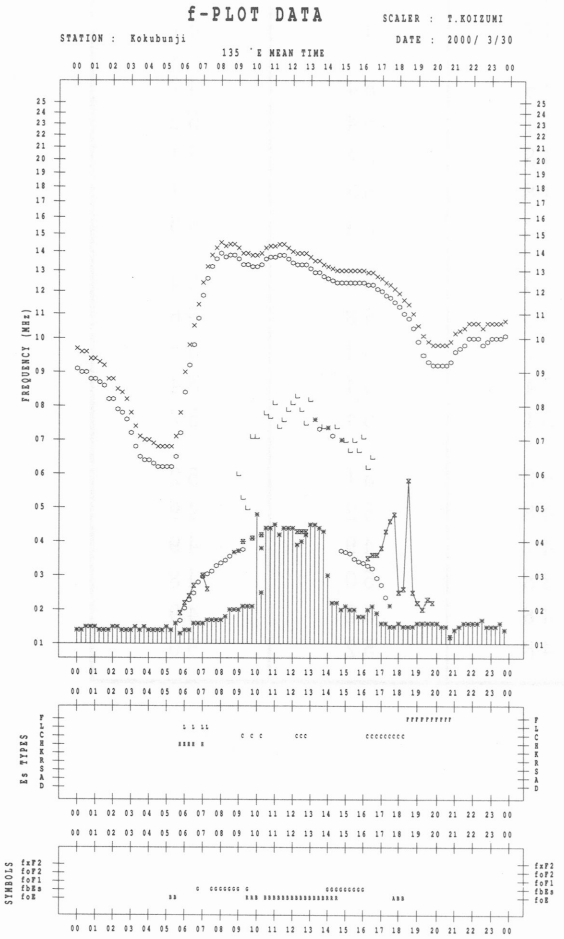
STATION : Kokubunji
DATE : 2000/ 3/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 2000/ 3/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso March 2000

Single-frequency total flux observations at 500 MHz					
Flux density: 10^{-22} $Wm^{-2}Hz^{-1}$					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	62	60	58	60	60
2	60	60	60	59	60
3	56	54	53	55	54
4	54	54	54	58	55
5	58	57	57	57	57
6	58	58	57	58	58
7	55	54	53	56	55
8	55	54	54	54	54
9	53	53	53	54	53
10	52	50	50	54	52
11	54	52	50	53	52
12	54	53	53	52	53
13	50	49	47	50	49
14	50	48	48	50	49
15	48	47	47	47	47
16	45	45	45	54	47
17	53	52	51	54	52
18	52	50	48	54	51
19	52	50	48	53	51
20	53	52	52	54	53
21	53	53	53	56	54
22	55	55	55	58	56
23	57	57	57	54	56
24	54	54	54	54	54
25	53	51	51	54	52
26	53	52	52	51	52
27	50	48	48	52	49
28	51	48	47	49	49
29	48	48	48	50	48
30	49	48	48	52	49
31	51	49	48	52	50

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso March 2000

Single-frequency observations

Normal observing period: 2050 - 0850 U.T. (sunrise to sunset)

MAR. 2000	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
1	200	8 S	0602.0	0602.0	1.0	240	-	0
	500	8 S	0602.0	0602.0	1.0	70	-	0
	200	8 S	2256.0	2256.0	1.0	180	-	WL
	200	47 GB	2337.0	2340.0	4.0	1900	-	WL
2	200	47 GB	0214.0	0214.0	1.0	1100	-	WL
	200	42 SER	0245.0	0249.0	6.0	260	-	0
	200	42 SER	0446.0	0456.0	11.0	140	-	WR
	500	27 RF	0634.0	0704.0	70.0	60	-	WR
	200	42 SER	0823.0	0824.0	2.0	400	-	WL
3	500	46 C	0211.0	0213.0	5.0	480	-	0
	2800	4 S/F	0211.0	0213.0	5.0	200	-	0
	200	46 C	0211.0	0215.0	6.0	320	-	WL
5	500	27 RF	0123.0	0224.0	80.0	40	-	WR
	200	8 S	0206.0	0206.0	1.0	400	-	WL
	200	8 S	0515.0	0515.0	1.0	80	-	WL
	500	42 SER	0515.0	0516.0	3.0	140	-	0
	200	8 S	0650.0	0650.0	1.0	300	-	WL
	500	47 GB	0650.0	0650.0	1.0	700	-	0
	200	8 S	0730.0	0730.0	1.0	200	-	WL
	200	42 SER	2321.0	2323.0	4.0	480	-	WL
6	200	42 SER	0032.0	0032.0	1.0	240	-	WL
	200	47 GB	2257.0	2301.0	5.0	2100	-	0
	500	42 SER	2301.0	2302.0	2.0	90	-	0
	200	47 GB	2322.0	2322.0	1.0	1900	-	0
	500	42 SER	2323.0	2323.0	1.0	280	-	0
7	200	8 S	0247.0	0247.0	1.0	380	-	0
	200	42 SER	0316.0	0323.0	7.0	240	-	0
	500	8 S	0323.0	0323.0	1.0	70	-	0
	200	42 SER	0418.0	0418.0	6.0	100	-	0
8	200	8 S	0244.0	0244.0	1.0	420	-	0
	200	8 S	0630.0	0630.0	1.0	50	-	0
	200	42 SER	0737.0	0739.0	3.0	160	-	WR
	200	47 GB	2128.0	2128.0	2.0	1900	-	0
	200	42 SER	2230.0	2230.0	1.0	80	-	WR

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso March 2000

Single-frequency observations

Normal observing period: 2050 - 0850 U.T. (sunrise to sunset)

MAR. 2000	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
8	200	47 GB	2238.0	2238.0	2.0	1500	-	WR
9	200	47 GB	0529.0	0529.0	2.0	1000	-	0
	200	8 S	0559.0	0559.0	1.0	90	-	0
11	2800	3 S	2136.0	2138.0	4.0	30	-	0
	500	42 SER	2137.0	2139.0	2.0	50	-	0
13	200	42 SER	2310.0	2310.0	3.0	140	-	0
	200	8 S	2333.0	2333.0	1.0	60	-	0
14	200	8 S	0746.0	0746.0	1.0	440	-	0
16	500	8 S	0422.0	0422.0	1.0	40	-	WR
	200	47 GB	0423.0	0423.0	1.0	1200	-	0
	500	42 SER	0742.0	0747.0	5.0	200	-	MR
17	200	8 S	0216.0	0216.0	1.0	90	-	0
	200	46 C	0227.0	0231.0	4.0	120	-	0
	200	8 S	0304.0	0304.0	1.0	60	-	0
	200	8 S	0522.0	0522.0	1.0	140	-	0
	2800	4 S/F	2356.0	2357.0	4.0	100	-	0
18	200	47 GB	0224.0	0224.0	1.0	1200	-	0
	200	8 S	2109.0	2109.0	1.0	70	-	WL
	200	8 S	2152.0	2152.0	1.0	300	-	0
	2800	4 S/F	2153.0	2153.0	3.0	70	-	0
	500	8 S	2155.0	2155.0	1.0	50	-	0
	500	46 C	2158.0	2201.0	7.0	180	-	MR
	200	8 S	2250.0	2250.0	1.0	70	-	0
	2800	46 C	2326.0	2329.0	9.0	50	-	0
	2800	6 S	2354.0	2355.0	8.0	340	-	0
19	200	8 S	0243.0	0243.0	1.0	240	-	0
	200	8 S	0511.0	0511.0	1.0	90	-	0
	200	47 GB	0614.0	0614.0	1.0	880	-	0
	500	46 C	2209.0	2215.0	14.0	40	-	WL
20	200	8 S	0144.0	0144.0	1.0	440	-	0
	200	42 SER	0529.0	0529.0	1.0	70	-	0
	500	8 S	0826.0	0826.0	1.0	50	-	0
21	200	8 S	0153.0	0153.0	1.0	140	-	0
	2800	29 PBI	2130.0	2131.0	5.0	40	-	0

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso March 2000

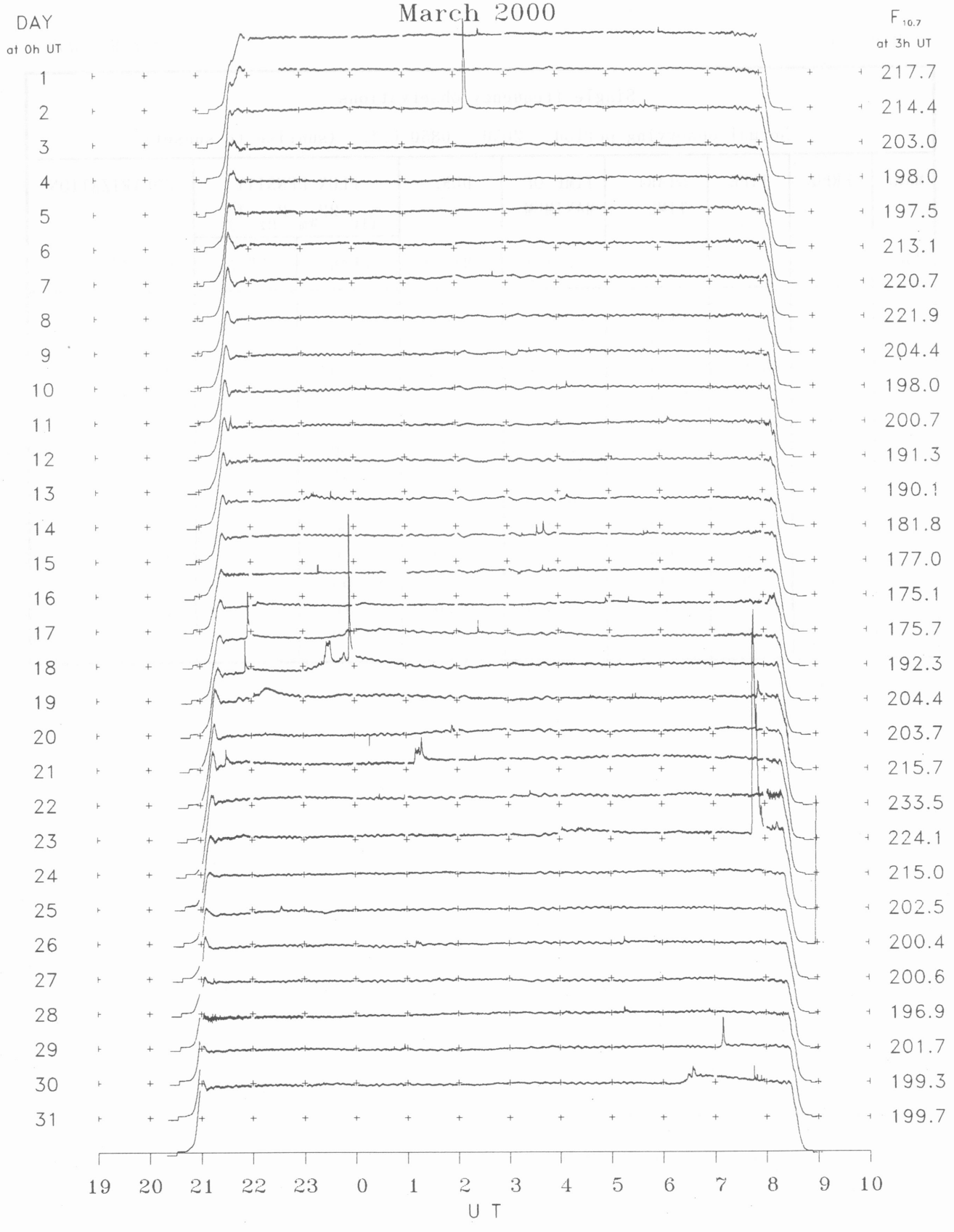
Single-frequency observations

Normal observing period: 2050 - 0850 U.T. (sunrise to sunset)

MAR. 2000	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
22	2800	46 C	0111.0	0119.0	10.0	50	-	0
23	200	47 GB	0509.0	0509.0	1.0	800	-	0
	200	8 S	0654.0	0654.0	1.0	220	-	0
24	200	42 SER	0743.0	0743.0	5.0	120	-	0
	2800	46 C	0745.0	0748.0	13.0	500	-	0
	500	46 C	0747.0	0753.0	10.0	280	-	0
25	200	46 C	2234.0	2235.0	2.0	340	-	WR
27	200	46 C	0647.0	0648.0	2.0	280	-	0
30	200	47 GB	0043.0	0043.0	1.0	1100	-	0
	200	42 SER	0056.0	0056.0	2.0	90	-	0
	500	8 S	0057.0	0057.0	1.0	50	-	0
	200	46 C	0706.0	0706.0	4.0	70	-	MR
	2800	3 S	0708.0	0710.0	4.0	60	-	0

B. Solar Radio Emission

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



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

IONOSPHERIC DATA IN JAPAN FOR MARCH 2000
F-615 Vol.52 No.3 (Not for Sale)

電離層月報（2000年３月）
第52巻 第３号（非売品）
2000年７月23日 印刷
2000年７月30日 発行
編集兼 郵政省通信総合研究所
発行所 〒184-8795 東京都小金井市貫井北町４丁目２－１
☎（042）（327）７４７８(直通)

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