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IONOSPHERIC DATA IN JAPAN

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CONTENTS

COMMUNICATIONS RESEARCH LABORATORY
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INTRODUCTION

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

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

A. IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

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

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

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

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

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

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

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

K Presence of particle *E* layer.

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

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

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

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

Q Range spread present.

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

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

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

V Forked trace which may influence the measurement.

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

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

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

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

B. SOLAR RADIO EMISSION

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

B1. Daily Data at Hiraiso

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

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

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

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

B2. Outstanding Occurrences at Hiraiso

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

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

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

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

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

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

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

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

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

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

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

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

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

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

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

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

C2. Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

Transmitting Stations

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

HOURLY VALUES OF foF2 AT Wakkanai

APR. 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	78	95		70	66	68	76	114		134	127	130	A	82	90	93	111		92	93	92	83	76	84
2	94	90		67	66	67	93	119	126	123		129	126	127	127	112		100	94	114		89	84	80
3	79	80	92	92	66	76	99	116	132	138	137	138	136	130	N		121	116	118	94	99	86	83	83
4	83	93	93	94	76	95	88	121	133	145	145	142	140	N	134	130	121	118	99	91	99	92	95	94
5	72	68	68	60		72	95	118	128	137	128	129	133	131	130	121		108	95	93	94		95	94
6	95	95	86	76	64		115	120	130	136	138	134	134	128	122	122	117		95	95	93	A	68	94
7	78	95	92	72	53		59	69	67	70	A	A	A	A	A	80	84	80		96	A			
8		68	70	73	64	72	78	90	95	114	121	105	122		124	122	116	92	96	99	84	94		
9	95		91		53	72	82	86	87	80		A		78	122		106	108	95	77	81	94	92	82
10			91	67	66	67	83	90	88	88	124		123		119	119	121	95	100	94	79	79	76	94
11	78	92	80		68	74	94		127	130	134	131	127	122	122	118	116	119	116	87	92	95	A	
12	95	A			70	A	107	92	86	90	A				118	102	86	98	99	A	A	A	A	A
13							99	94	111	122		130	125			124		119	107	93				
14	96	93	93	77	82		106	125	136	111	124	119	134	132	128		90	90	122	96	93	A	A	
15		74		92	79		101	104	124	131	135	130		128	93	88	106	118	106	92	95			94
16	A	A		93		94			A		A	A		A					A		A			A
17	A		A			A	A		A		137		A		A	A		A		A	A	A	A	A
18				A	A		A			A		A	110			A	A				A	A	A	A
19		A	A	A	A	A			A	A	A	A			A	121	122	121	116	93	92	94	87	95
20	92	94	71	69		56	55	60	A	A	A	A	A	A	A	A	62	64	64	78	66	70	70	70
21	50	67	71	54		72	96	100	89	87	77	A			80	90	89	106	96	91	94		84	93
22	82	81	80	74	73	71	90	86	86	89	107		88	90	117	90	90	92	95	113	98	94	84	81
23	66	76	74	69	70		93	119	108	90	107	92	109		90	101		107	119	94	93	82	84	94
24	80	70	66		58	93	84	82	76	81	65	87		107	88		A	68	108	101	80	74	63	63
25	62		56	52	51	68	93	99	78	91				A	80	80	88	86	92	94	84	93	83	95
26	94	72	79	73	71	81	92	91	78	104	A	87	90	76	90	84		104	59	94	112	95	95	80
27	80	81	82	80	76	80	106	88	92	106	111		114		92	88	92	90	102	100	93		95	94
28	93	94	78	74	74	64	73	67	78	A	A	53	90		88	86		97	93	94	93	93	94	74
29	65	68	68	68	N	70	86	81	78	81														
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	20	20	21	20	19	25	24	23	23	16	15	16	12	20	20	18	23	24	24	21	16	18	19
MED	80	81	80	73	67	72	93	93	92	106	126	129	124	124	118	102	106	100	98	94	93	92	84	93
U Q	94	93	91	78	73	80	99	117	127	131	136	131	133	129	123	121	117	116	107	96	94	94	94	94
L Q	75	71	70	67	64	68	82	86	78	88	109	92	109	86	90	88	89	90	94	92	84	82	76	80

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

APR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G		G	G	G		34	30	35	42		38	33	34	38	32	34	26	28	24	31	G	G
2	25	G		29	G	29	30	30	36	38	36	37	35	34	34	31	30	31	G	G		G	G	28
3	27	G	G	26	26	G	30	34	33	35	37	37	38	36	37		31	23	G	G	27	G	40	G
4	G	G	30	G	G	30	32	36	32	34	36	34	37	35	35	34	30	30	G	G	G	G	G	G
5	G	26	G	G		G	23		32	41	35	38	34	37	35	34	31	24	28	G	G	G	G	G
6	G	G	26	G	G		29	36	33	34	33	35	37	36	35	35	29	G	24	G	G		G	G
7	G	G	G	G	G	G		30	31				36		36	34	G	54		G		G	G	G
8	G	G	G	G	25	G	G	G	33	57			G	34	36	34	31	G	G	G	G	G	G	G
9	G	G	G		G	G	G	36	35	32		35	33	39	35		36	G	G	G	G	G	G	G
10	G	G	G	G	30	G		34	32	G	44	43	37	37	37	35	36		29	32	27	28	28	G
11	25	29	G	G	G	G	32	43	58	106	44	34	55	45	61	62	46	40	34	29	G	G		G
12		29	G	G	G		G	G		G	42	G	G	G	G	34		G	G		48			
13	G	G	G	G	G	G	G	G	G	33	G	38	32	36		46		G	33	G		G	G	G
14	G	G	G		G		G	29	32	37	G	G	27	37	34	44	34	32	G	G	G			G
15	G	G	G	G	G	G	31	G	32	34	35	G		G	52		30	30	G	G	G	G		G
16				G		G		G		G			G			G								
17		G		G	G													141						
18									G		G		31	G	G									
19							G									G	30	25	G	G	G	G	G	G
20	G	G	G	G	G	G	30	29	34	40	62	43	51	37	35	33	G	G	G	G	G	G	G	G
21	G	G	G	54	G	27	32	32	37	34	41	35	G		35	33	32	32	34	G	51		G	G
22	G	G	G	G	G	27	32	30	34	36	34		G	42	41	36	37	26	G	26	G	G	G	G
23	29	G	G	26	G	22	29	31	34	36	36	38	33	38	38	34		G	32	30	27	G	G	G
24	G	29	G	G	G	29	28	30	34	36	34	34		31	33		29	34	39	39	34	57	G	G
25	G	G	G	G	24	29	30	34	43	34				74	36	40	37	38	44	42	34	32	33	29
26	34	G	29	30	G	28	34	31	57	58	79	36	61	43	34	39		44	70	62	59	48	56	G
27	G	G	G	29	28	28	28	46	68	33	37		38	G	35	38	42	35	38	G	G	G	G	G
28	G	G	G	G	G	G	32	30	41	39	41	38	36		35	44		49	25	26	34	27	28	25
29	27		G	G	G	29	31	33	44	42														
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	25	23	25	25	23	23	25	25	25	21	18	23	22	24	22	20	25	24	24	22	21	21	24
MED	G	G	G	G	G	G	30	31	34	35	36	36	35	36	35	34	31	30	24	G	G	G	G	G
U Q	13	G	G	13	G	28	32	34	39	39	42	38	38	38	36	39	36	36	33	28	34	27	14	G
L Q	G	G	G	G	G	G	G	29	32	33	34	34	27	33	34	34	30	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

APR. 2000

LAT. 45.4N LON. 141.7E SWEEP 1MHz TO 25MHz AUTOMATIC 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	15	15		15	16	17	16	15	17	17	17	20	21	26	17	18	15	15	18	15	15	15	15	15
2	15	14		15	15	16	16	16	16	17	20	22	18		17	16	16	16	18	15		15	15	15
3	15	15	15	15	15	17	15	16	17	16	18	18	17	17	17		16	16	20	15	15	15	15	15
4	15	15	15	15	15	17	15	15	16	18	18	23	21	20	18	18	16	15	18	15	15	15	15	14
5	14	15	15	15		17	27	15	16	17	18	24	18	18	18	17	16	18	17	15	16	15	15	15
6	15	15	15	14	15		15	15	16	17	17	21	28	20	18	20	18	28	21	15	21	16	21	17
7	14	16	16	17	20		23	29	23	22	18	21	24	23	17	20		23		17	16	23	15	16
8	15	16	16	16	15	18	24	33	26		23	24	52	47	22	24	21	26	22	24	26	26	23	21
9	15	17	15		16	20	20	28	24	24		21	24		22	23	16	17	18	16	14	14	16	16
10	15	14	15	15	16	17	15	16	16	49	47	23	20	20	18	18	16	18	16	15	16	14	15	16
11	15	15	15	16	15	18	16	16	16	17	20	18	18	21	20	17	17	16	15	15	15	15	17	16
12	15	15	17	17	17	17	26	32	17		28	21			21	21	28	30	20	18	20		21	28
13	17	17		16		16	29	34	21	20	21	20	23	16		23		27	16	22		32	28	23
14	16	17	16	15	16		18	17	21	23			21		21	18	18	16	17	15	16		22	32
15	15	16	16	17	28	18	27	18	18	18	18	22		20	21	18	17	16	21	15	16	15	24	45
16				21	28	24							18	21										
17											21													
18																								
19																	20	18	17	15	16	15	15	16
20	15	15	15	15	18	18	16	22	22	23	28		24	24	20	27		18	22	15	18	16	15	15
21	15	15	15	15	16	17	16	17	18	18	23	21	50		21	18	20	18	18	15	15		15	23
22	16	15	15	16	17	20	16	17	20	18	18		56	20	17	18	16	16	21	15	15	15	15	15
23	15	15	15	15	15	15	15	16	17	24	17	16	22	23	22	22		29	22	15	15	15	14	15
24	15	15	15	15	15	15	16	16	16	17	20	18		18	17		20	18	16	15	15	15	15	15
25	15	15	15	15	15	17	15	15	16	17				20	20	17	16	15	15	15	15	15	15	15
26	15	16	15	15	15	16	16	15	16	17	17	18	20	18	18	17		16	15	15	15	15	15	15
27	15	15	15	15	15	18	15	16	16	17	28		17		18	23	24	21	17	18	16	16	15	15
28	15	15	15	15	15	22	16	15	16	18	20	18	21		15	17		18	16	16	15	15	15	15
29	15	16	15	15	15	15	15	15	16	16														
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	22	25	24	23	25	25	25	23	22	19	21	18	23	22	19	25	24	25	23	22	25	25
MED	15	15	15	15	15	17	16	16	17	18	20	21	21	20	18	18	17	18	18	15	15	15	15	15
U Q	15	16	15	16	16	18	21	20	20	22	23	22	24	23	21	22	20	22	20	16	16	16	19	19
L Q	15	15	15	15	15	16	15	15	16	17	18	18	18	18	17	17	16	16	16	15	15	15	15	15

HOURLY VALUES OF foF2 AT Kokubunji

APR. 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	99	86	93	83	77	93	102	132	137		152	136	138	134	135	126	123	122	118	103	91	98	96	90
2		93	94	77		66	97	120	123	129	136	136	129	131	N	120	115	113	108	115	94	94	93	93
3	82	94	91	95	62	68	94	117	132	137	136	136	140	136	128		125		126	116	92		93	
4	94	93	92	77	80	94	99	122	134	150	153	146	151	151	148	148	143	137	134	123	114	108	106	100
5	93	86	84	94	67	81	92	123	134	148	152	143	146	139	134	131	123	122	114	100	94	99	116	102
6	96	94	94	94	66	N	105	116	126	136	153	134	135	132	128	125		150	126	109	88	93	99	98
7	94	93	84	80	54	49	78	100	116	115	127	128	127	141	122	110	113	107	128	106	93	87	91	84
8	94	93	93	94	73	74	98	116	122	131	138	140	137	140	137	138	134	131	122	104		93	91	94
9	93	94	94	68	60	58	93	105	126	150	126	132	146	145	136	130	123	119	117	103	94	98	97	
10	115	86	95	95	78	94	100	114	126	136	141	140	137	138	135	152	129	131	124		84	94	91	98
11	98	93	94	77	93	94	113	117	119	132	136	138	132	130	127	132	131	124	123	109	86	92	115	114
12	92	93	94	95	77	82	116	122	126	135	139	142	140	136	130	131	123	124	123	110	87	93	94	93
13	93	90	94	82	89		95	106	114	122	134	142	139	141	136	134	128	127	123	116	103	114	105	100
14	96	93	94	92	81	82	116	116	120	124	132	138	132	142	142	138		124	125	117	98	98	99	102
15	101		115	94	75	94	113	124	132	130	130	132	136	135	131	131	127	128	122	111	102	99	101	115
16	104	95	85	81		82	97	116	123		132	131	133	137	133	127	131		118	103	105	100	95	113
17	116	82	96	93	70		106	118	132	134	151	151	145	137	134	127	126	131	131	116	92		92	92
18	89	95	94	94	74	94	107	118	116	118	121	126	132	137	131	122	120	138	132	132	108	99	94	92
19	94	93	93	93	73	81	104	122	130	123	119	127	134	138	140	138	134	136	131	104	92	105	105	94
20	93	93	94	68	56	56		77	A	A			A	A		77	82	78	76	73	67	68	67	68
21	68		66	57	57	70	95	92		97	109	110	117	125	130	132	118	118	120	107	A	93	92	100
22	115	94		81	94	85	103	114	108	117	118	122	131	133	130	127	128	131	132	118	100	93	94	92
23	94	93	91	77	75	86	106	116	117	116	117	130	126	134	130	132	124	136	131	114	98	90	93	94
24	94	93	78	93	78	82	116	110	116	120	128	137	145	138	134	134	131	133	127	116	85	82		95
25	66	74		67	56	68	103	123	123	124	117	112	112	113	109	110	106	105	111	108	92	A	86	94
26	90	94	94	92	77	86	107	116	106	113	116	126	130	133		129	122	123	121	124	107	93	100	103
27	115	104	103		82	93	104	116	116	117	122	126	131	128	126	120	120	119	126	122	114	94	101	96
28	92	99	94	94	86	95	97	102	113	112	122	125	122	123	126	115	114	111	120	116	91	82	82	80
29	95	80	67	67		93	94	101	115	116	117	127	127	124	122	121	114	116	121	103	90	77	81	79
30	69	93	80	93	70	73	84	98	116	122	116	122	129	136	130	128	132	128	132	117	83	81	83	81
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	28	29	27	27	29	30	28	27	29	29	29	29	27	29	28	28	30	29	28	27	29	28
MED	94	93	94	92	75	82	102	116	122	124	130	132	133	136	131	129	124	124	123	111	92	93	94	94
U Q	98	94	94	94	80	93	106	120	128	135	138	139	139	138	135	133	130	131	128	116	101	99	100	100
L Q	92	91	88	77	66	70	95	106	116	117	118	126	129	131	128	121	119	118	120	104	89	90	91	92

HOURLY VALUES OF fEs AT Kokubunji

APR. 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			33	37	37	G	50	112	G		33	38	29	61	30	27	28	30
2	32	27	G	G	G	G	G	29	35	49	G	G	G	G	G	G	31	31	G	G	G	G	G	G
3	G	G	G	G	G	G	31		33	36	G	G	G	G	57	32	32	28	35	24	G	G	G	23
4	27	33	G	G	G	G	G				G	G	G	G	G	G	40	32	G	G	33	G	G	G
5	G	G	G	G	G	G	24	28	33	28	G	G	G	G	G	28	32	31	G	G	G	G	G	G
6	G	G	26	G	G	G	27	30	34	G	G	G	G	G	G				G	G	G	G	G	24
7	G	G	G	G	G	G	32	32	36	38	47	49	58		G		31	34	35	34	30	G	G	G
8	G	G	G	G	G	G	20	G		35	G	G	G	44	38	G	32	28	32	26	29	G	G	G
9	G	G	G	G	G	G	27	27	32	43		46	38	62	55		37	38	31	31	33	30	55	29
10	30	89	72	55	56	G	27		34	G	G	G	G	G	40	35	35	34	G		G	G	G	G
11	G	G	G	G	G	G	G			34	34	G	G	60	G	51	61	32	57	28	33	36	G	G
12	G	G	G	G	G	G	G	28	34	G	G	48	51	G	G		32	31	37	37	32	G		G
13	G	G	G	G	G		25	26	39	32	53	G	61	60	86	34	29	48	42	56	G	G	G	G
14	G	G	G	G	G	G	G		32	G	G	G	G	G	G		34	37		26	26	G	G	G
15	G	G	G	G	G	G	G		34	32	30	28	24			34	30	25	G	26	G	G	G	G
16	G	G	G	G	G	G	G		34	35	G	G	G	G		G	31	G	G	G	G	G	G	G
17	G	G	G	G	G	26	34	28	33	32	G	G	26	34	26	34	47	40	G	25	G		G	G
18	G	G	G	G	G	G	28		33	29	33	32	31			31	43	31	36	28	G	G	G	G
19	G	G	G	G	G	G	33	30	49	52	47	56	G	G	G	G	32	36	38	40	45	38	G	G
20	32	36	32	30	G	28	32	47	50	60	G		48	45	G	G	32	28	28	G	35	28	G	G
21	G	G	G	G	G	G	G		33	33	28	G	G	G	G	G	49	52	32	44	82	27	60	33
22	28	G	G	G	G	29	28	30	34	54	46	G	52	G	G	G	31	53	52	45	41	G	31	G
23	G	30	G	G	G	G	30	G	36	46	G	G	G		G		29	28	36	60		G	G	G
24	G	G	G	G	G	G	32	49	59	52	G	G	G	G		G	31	66	56	53	34	55		G
25	G	G		G	24	G	31	46	57		47	58	57	G		34	32	40	47	47	32	94	43	29
26	G	G	G	G	G	G	31	30	51	54	62	72	57	60	58	G	32	27	G	G		29	33	26
27	26	G	G	G	G	G	29	31	66	53	58	70	54	55	47	46	51	52	56	60	32	25	G	G
28	G	G	G	G	G	G	G		34	34	G	G	G	G	60	76	96	73	87	35	33	30	G	G
29	G	G	G	G		G			39	33	55	47	60	G	G	46	62	55	65	68	34	G	29	29
30	30	28	G	31	G	G	G	28	50	60	46	54	58	71	G	G	55	69	84	77	68		G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	30	29	29	28	18	27	28	29	29	30	26	25	23	29	29	29	29	28	28	28	30
MED	G	G	G	G	G	G	27	30	34	35	G	G	12	G	G	28	32	34	35	31	31	G	G	G
U Q	G	G	G	G	G	G	31	31	49	50	46	47	52	55	43	34	45	50	49	50	33	28	14	23
L Q	G	G	G	G	G	G	G	28	33	32	G	G	G	G	G	G	31	29	G	12	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Kokubunji

APR. 2000

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	15	15	15	15	18	15	15	22	22	49	42	43	52	21	14	15	15	15	15	14	15	14
2	14	15	15	15	15	15	27	17	20	22		48	68	52	44	40	14	15	20	15	15	15	15	15
3	15	15	14	15	14	16	17	15	17	20	47	48	46	45	42	21	15	15	14	15	15	14	15	15
4	15	15	14	15	15	15	26	17	16	20		54	62	49	44	44	16	14	21	14	15	15	15	15
5	15	15	15	14	14	15	16	16	16		45	47	52	45		18	18	15	21	15	14	14	14	15
6	14	15	15	14	15	15	20	16	21	42	45	46	48	48	40	38	16	16	20	15	15	14	14	15
7	14	15	15	15	15	15	17	17	16	23		40	41	44	49	21	16	15	14	15	14	15	15	15
8	15	14	15	15	14	15	27		17		42	48		45	24		16	14	14	15	15	15	15	16
9	15	15	15	15	15	15	27	18	16	18		46	29	40	42	21	17	15	15	15	14	14	15	14
10	14	14	14	14	14	16	27	18	20	50	45	48	48	44	28	21	17	14	21		14	15	15	14
11	14	14	14	15	14	16	15	20	20	15		50		42	48	24	15	15	14	16	15	15	15	15
12	14	14	15	15	14	17	27	16	17		45	39	49		64		15	15	15	14	14	14	14	15
13	15	14	15	15	15		27	34	15	21	40	45	43	44	17	18	16	16	15	14	15	14	15	15
14	16	15	15	14	14	15	26	20	18		45		49	50	45	20	17	16	15	15	16	15	14	15
15	14	15	14	14	15	17	27		16	21	22	48	52	16	16	17	15	15	14	15	14	15	14	14
16	14	15	14	14	15	15	29	18	18	22		45		67	22	45	18	16	21	15	14	14	15	14
17	15	14	14	14	15	15	15	16	16	17	23		45	21	14	21	17	15	20	15	15		15	15
18	15	15	15	14	14	16	14	18	17		22	22	21		45	18	14	15	15	15	15	14	14	16
19	15	15	15	15	14	17	15	18	18	22	40	42		62	49	40	18	16	17	15	15	15	14	16
20	14	14	15	15	15	15	23	30	20	22							18	14	14	14	14	14	15	15
21	15	15	14	14	14	17	29	18	16	23		49		50	45	44	15	16	15	15	15	14	14	15
22	15	14	14	14	14	15		17	18	18		63	64	48	45	50	18	16	16	14	14	15	16	14
23	15	14	14	14	14	17	30		14	48	50		50	48	53	18	18	15	17	14	15	14	15	14
24	14	15	15	15	15	17	30	22	18	23	53	51	44	50	22		15	16	15	18	14	15		14
25	14	15		15	15	21	16	21	21		24		43	48	18	18	17	15	14	15	14	15	14	15
26	15	15	15	16	14	21	24	18	21		40	43	42	40	38	44	22	15	22	15	14	14	15	15
27	15	14	15	14	15	17	16	18	20	22		39	38	39	34	26	17	15	14	14	14	15	15	14
28	15	15	16	15	15	20	18	18	21	23		46	52	45	27	21	16	14	16	14	14	15	14	15
29	15	15	15	15		16	18	17	17	20		N	40	52	49	15	16	17	15	15	15	15	15	14
30	15	15	15	14	14	20		20	22	38	38	41	42	40	47	43	16	16	16	17	14	14	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	30	29	29	28	27	30	23	18	24	24	27	28	26	30	30	30	29	30	29	29	30
MED	15	15	15	15	15	16	24	18	18	22	41	46	46	45	43	21	16	15	15	15	14	15	15	15
U Q	15	15	15	15	15	17	27	20	20	23	45	48	51	50	47	40	17	16	20	15	15	15	15	15
L Q	14	14	14	14	14	15	16	17	16	20	24	42	42	42	25	18	15	15	14	14	14	14	14	14

HOURLY VALUES

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

HOURLY VALUES OF foF2 AT Okinawa

APR. 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	127	151	116	92	112	93	96	124	120	124	117	128	151	152	152	148	148	146		154		117	175	151
2	150	154	156	133	70	76	92		116															
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7																				129	110	117		111
8	122	121	136	93	95	77	94	93	112	131					164	165	170	168	171	179	148	156		155
9	149	137	111	90	64	58	95	93	117	121	122	134	150	166	172	156	146		148		151	146	141	140
10		151	120	92	84	88	94	110	120	142	142	126		160	172	171	172	166	164		133	136	155	151
11	164	156		82	94	95	81	94	118	135	130	130	125	144	147	150	131	140	144	142	119	127	140	111
12	113	116		92	80	94	78	94	124	122	130	124	A	151	153	161	166	164	146		115		156	167
13	156	151	123	92	78	72	76	94	128	120	121	120	141	157	150	160	150	150	145	144	139	149	156	161
14	N	150	168	122	81	93	76	91	118	124	132	126	147	157	158	162	160	148	152	139		150		
15	117	137	116	115		76	94	91	113	120	130	144	148	152	157	159	153	148	146	166		174	177	172
16	166	180		116	95	70	71	92	118	120	124	119	124	147	153	148	150	145		143		115		117
17	92		114	81	80		72	90	106	114	124	142		154	160	169	172	166	147	165	140	133	124	127
18	117	122	116		94	94	92	118	114	120	115	115	N	173	150	146	150	145	172	168		139		
19	178			150	120	107	96		124	113	104	118	136	158	172	170	168	169	150			150		
20	115	133		94		77	78	80	71	68	59	69	81	92	93	103	121	121	126	125	93	112		
21		94	118	95	78		78	93	93	109	115		156	170	186	179	171	173	173	169	164	161	162	166
22	182	151	116	96	82	96	94	104	108	110	113	118	125	144	150	154	172	170	156		126	132	136	155
23	149	152		93	115	91	93	100	117	119	112		146	157	160	166	168	167	163	164			160	161
24		151	156	116	116	96	94	105	113	122	125	117	116	149	172	163	162	161	154	142	118	128		
25			89	92	82	76	76	113	124	120	118	123	146	152	159	157	156	167	172	171		155	174	184
26	161	174	156	127		93	94	100	111	116	120	120	N	174	166	172	180	184	187	173		166	179	183
27	187	180	162		94	93	92	106	116	117	110	115	136	154	157	158	162	166	167	165	132	126		153
28	159	150	151	116		110		121	99	115		130	152	150	150	132	152	150	146	149			110	116
29	109	100		80	93	95	93	93	104	113	116	122	132	142	145	144	150		152	151	111	114	96	100
30			111	112	84	71		94	105	112	118	125	138	156	172	172	168	174	167			139	155	123
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	21	18	23	21	23	23	23	25	24	22	21	18	23	24	24	24	22	22	19	14	22	16	20
MED	149	151	119	94	84	93	92	94	116	120	119	123	140	154	158	160	161	165	153	154	129	138	156	152
U Q	164	153	156	116	95	95	94	106	119	122	125	129	148	158	169	167	169	168	167	168	140	150	168	163
L Q	117	127	116	92	80	76	78	93	107	113	115	118	125	149	150	149	150	148	146	142	115	126	138	120

HOURLY VALUES OF fEs AT Okinawa

APR. 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	35	G	G	G	G	G		36	36	39		G	56	G	G		33	26	G		G	G	G
2	G	G	G	11	G	G	G		38															
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7																				56	28	25	26	62
8	G	G	G	G	G	G	24		37	38					G	G	G	30	41	45	26	34	34	69
9	G	G	G	11	G	G	G	24	29	34	35	G	38	G	G	G		G	34	26	G	G	G	G
10	G	G	G	G	G	G	G	29	35	G	39	G	G	57	64	G	44	46	38	40	G	G	38	G
11	G	G		37	61	38	G	26	35	35	38	40	41	G	G	72	62	51	59	39	G	G	G	28
12	G	G		G	G	G	G	27	38	36	G	68	134	G	G	G	37	32	24	30	28		26	
13	G	G	G	G	G	G	G	26	26	35	G	60	56	G	G	49	35	25	44	40	25	G	33	G
14	G	28	G	G	23	34	G	26	38	43	40	G	G	G	G	G	G	36	40	41		27	G	G
15	G	G	G	G		G	G	35	36	40	G	G	G	G	G	46	43	47	47	42	30	34	25	G
16	G	G		G	G	G	G	37	30	38	44	38	G	G	G	39	40	35	40	32	G	G	G	G
17	G		G	G	G	G	G	42	42	67	G	G	46	G	G	G	41	49	48	43	40	52	44	35
18	44	33	26	G	G	24	G	25	33	38	44	G	G	G	G	G	G	46	42	59	46		56	G
19	G			G	G	G	G		36	G	G	G	G	G	G	G	55	38	38		29	81	64	
20	28	48		31	31		G	31	38	37	62	55	G	G	G	G	G	37	46	60	39	G	G	
21	66	34	28	49	G	42	G	27	36	36	38		39	G	G	G	G	32	36	29	G	G	G	G
22	33	G	47	G	28	26	G	39	39	37	40	G	G			G		33	26		30	G	G	G
23	G	G		G	G	G	G	30	32	38	38		G	G	G	G	G	32	31	58	45	42	30	67
24		G	G	G	G	G	G		46	36	42	56	51	G	G	G	G	38	38	39	48	36		
25		40	57	66	46	51	32	32	42	40	38	G	G	G	G	36	34	29	36	31			34	29
26	G	G	G	G		G	G	24		40	47	59	76	68	84	79	70	57	74	47	60	39	G	G
27	G	G	G		G	G	G		36	42	43	47	G	G	G		G	23	38	40	74	68		45
28	G	G	34	32	34	35	32	32	46	G	56	G	G	G		G	43	44	51	65		32	32	33
29	28	G	G	G	G	G	G	30	46	52	54	64	G	G	G	G	61		61	57	40	36	28	26
30	26	25	G	G	G	G	G	38	44	62	59	G	62	G	G	G	G	31	39	39	26	25		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	23	19	24	23	24	25	19	24	24	23	20	23	22	22	23	21	23	24	23	21	22	22	20
MED	G	G	G	G	G	G	G	30	36	38	39	G	G	G	G	G	35	35	40	40	29	26	26	G
U Q	26	28	26	11	23	25	G	35	40	40	44	55	46	G	G	36	43	46	46	56	42	36	34	34
L Q	G	G	G	G	G	G	G	26	35	35	35	G	G	G	G	G	G	31	36	32	13	G	G	G

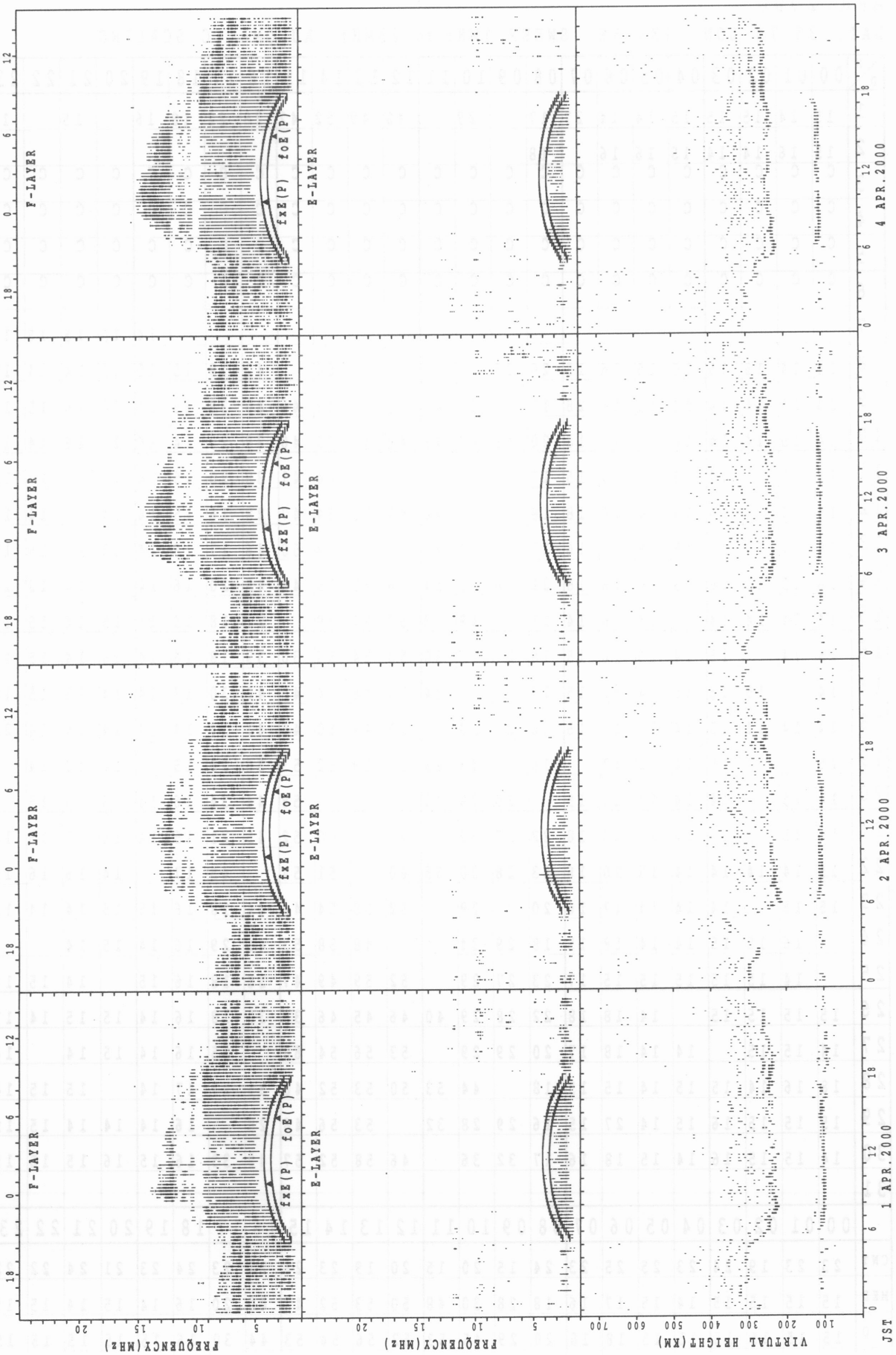
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Okinawa

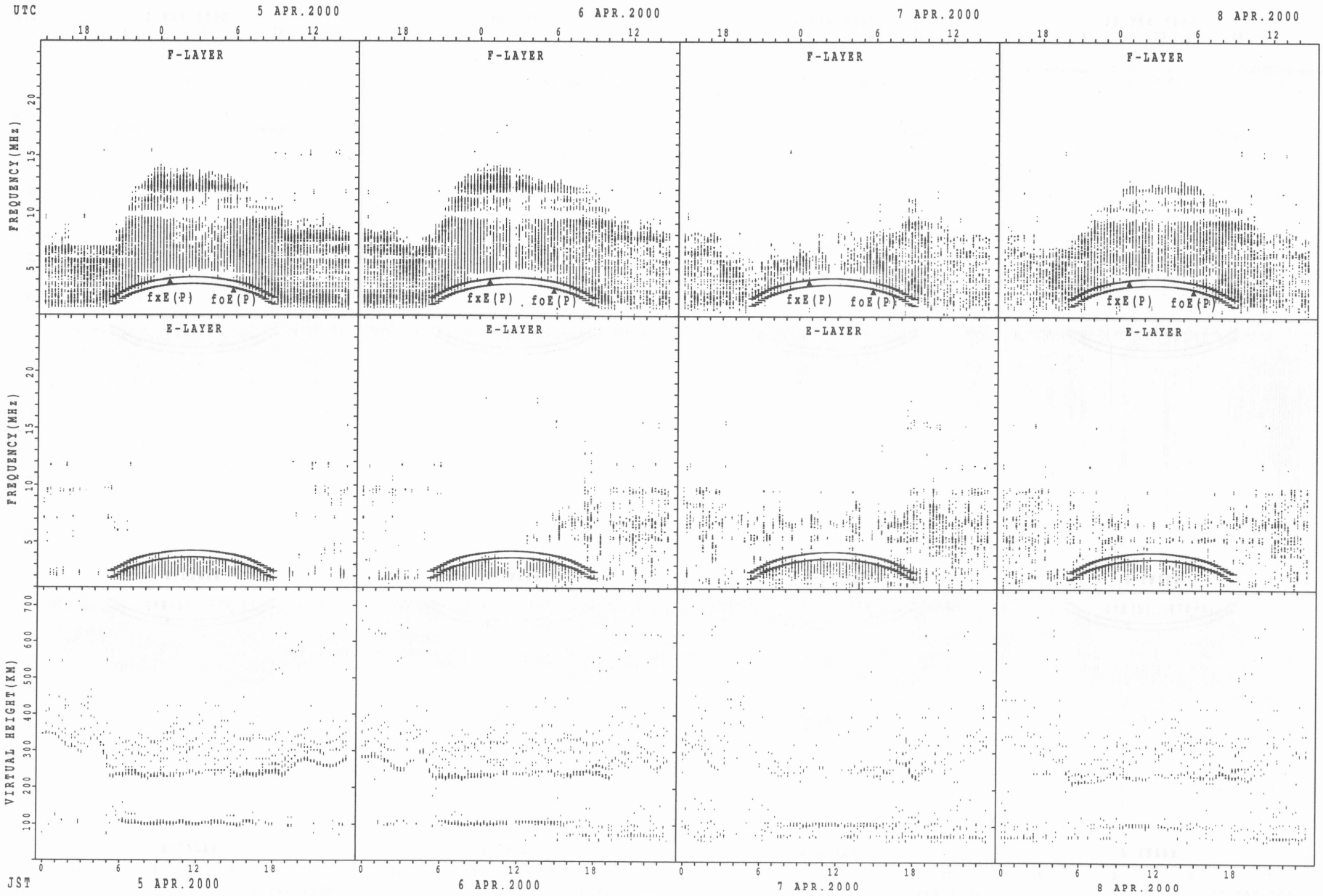
APR. 2000

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

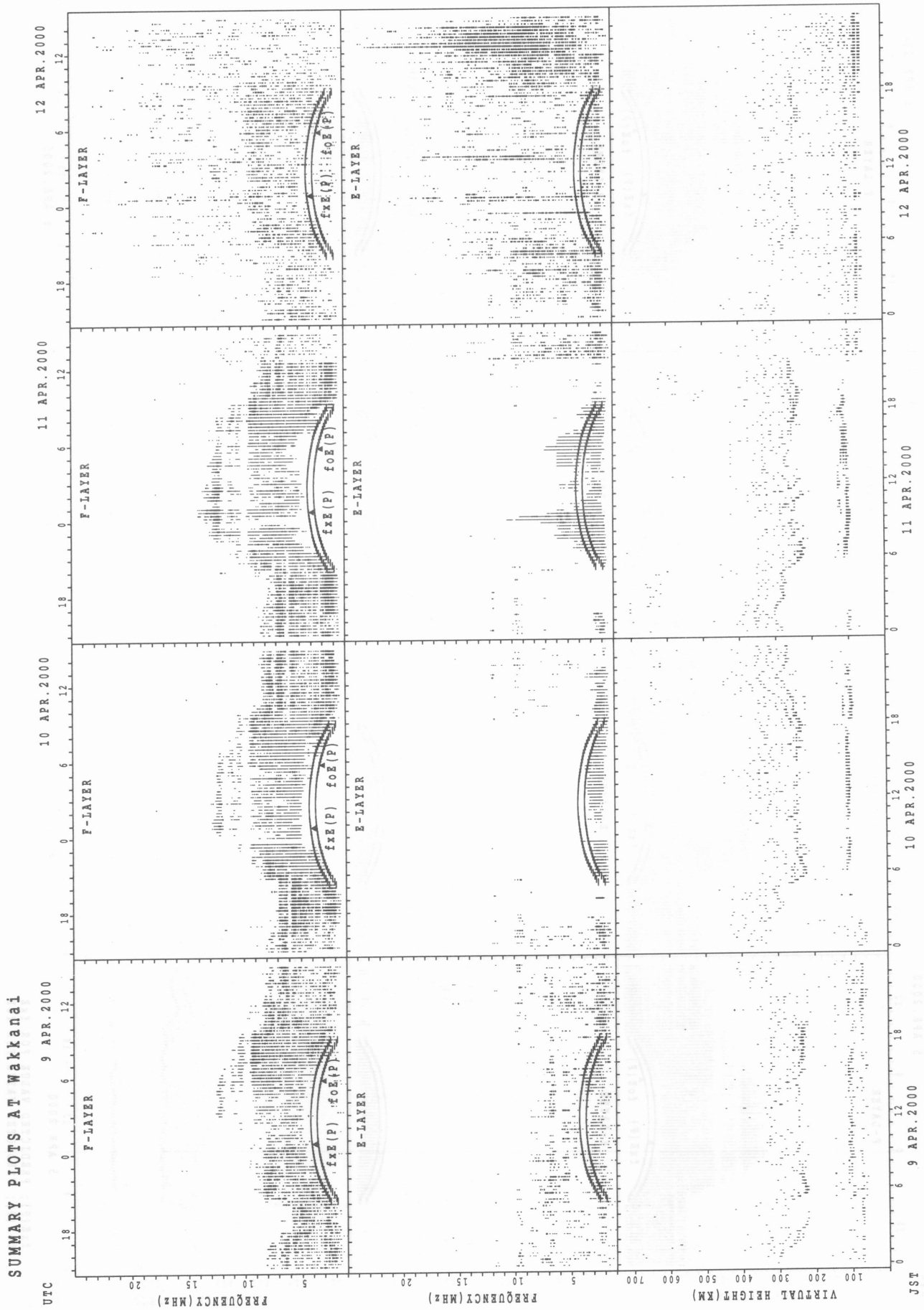
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	14	15	15	15	14	14	27	17		29		48	49	52	42	28	22	18	16		15		17
2	15	16	14	14	15	16	16		18															
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C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

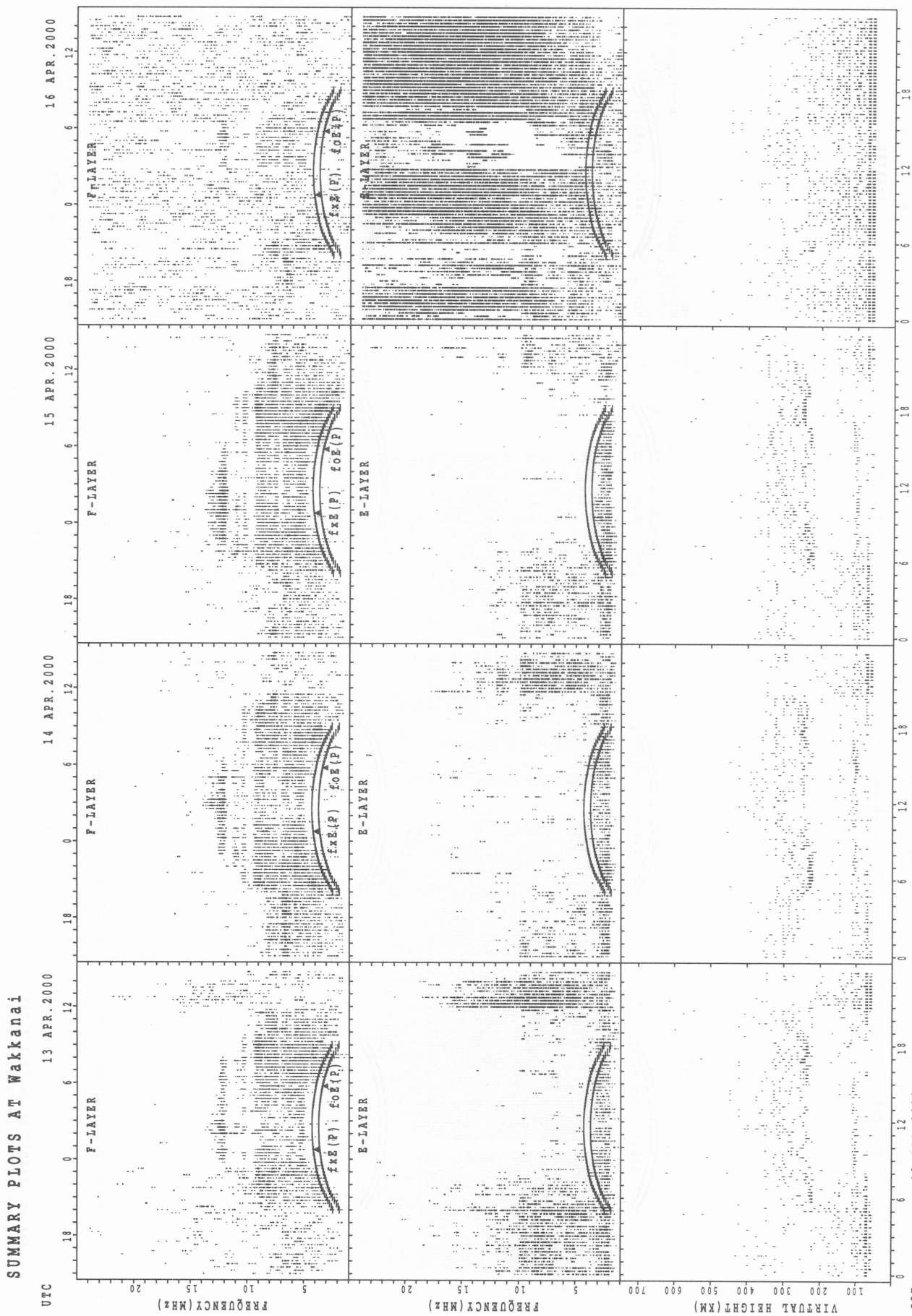

SUMMARY PLOTS AT Wakkanai
UTC
JST
1 APR.2000
2 APR.2000
3 APR.2000
4 APR.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

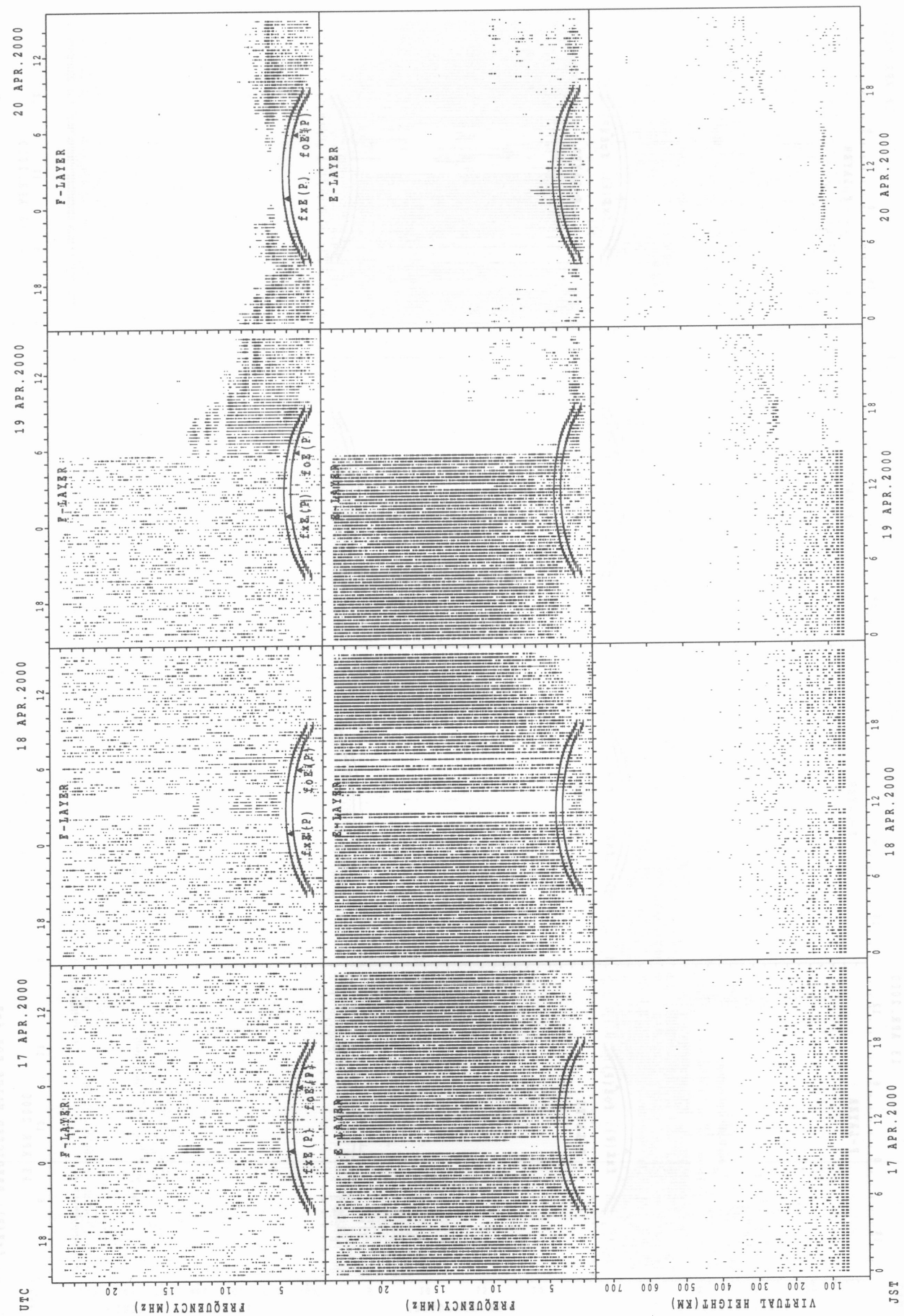
SUMMARY PLOTS AT Wakkanai



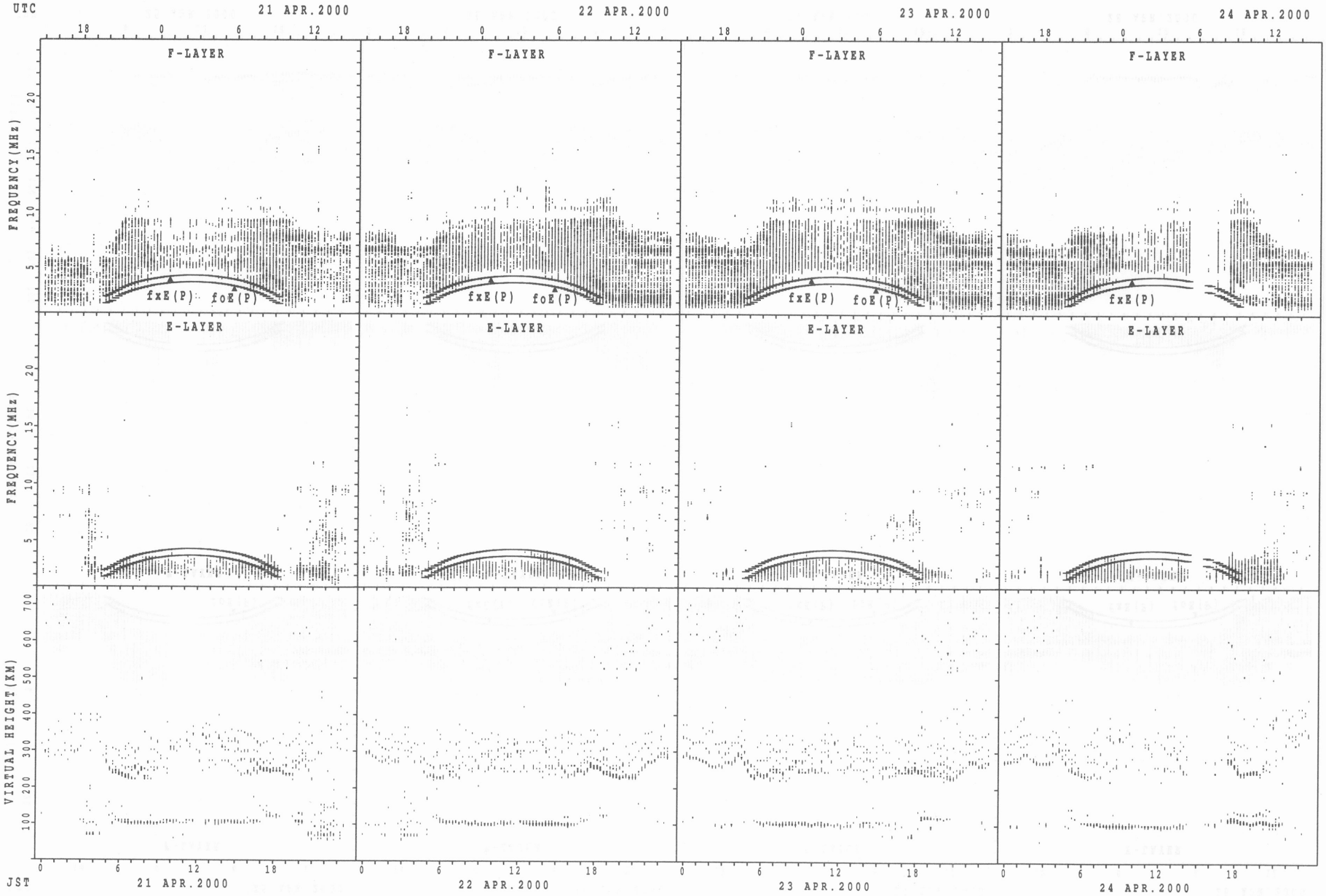
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
9 APR.2000
10 APR.2000
11 APR.2000
12 APR.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

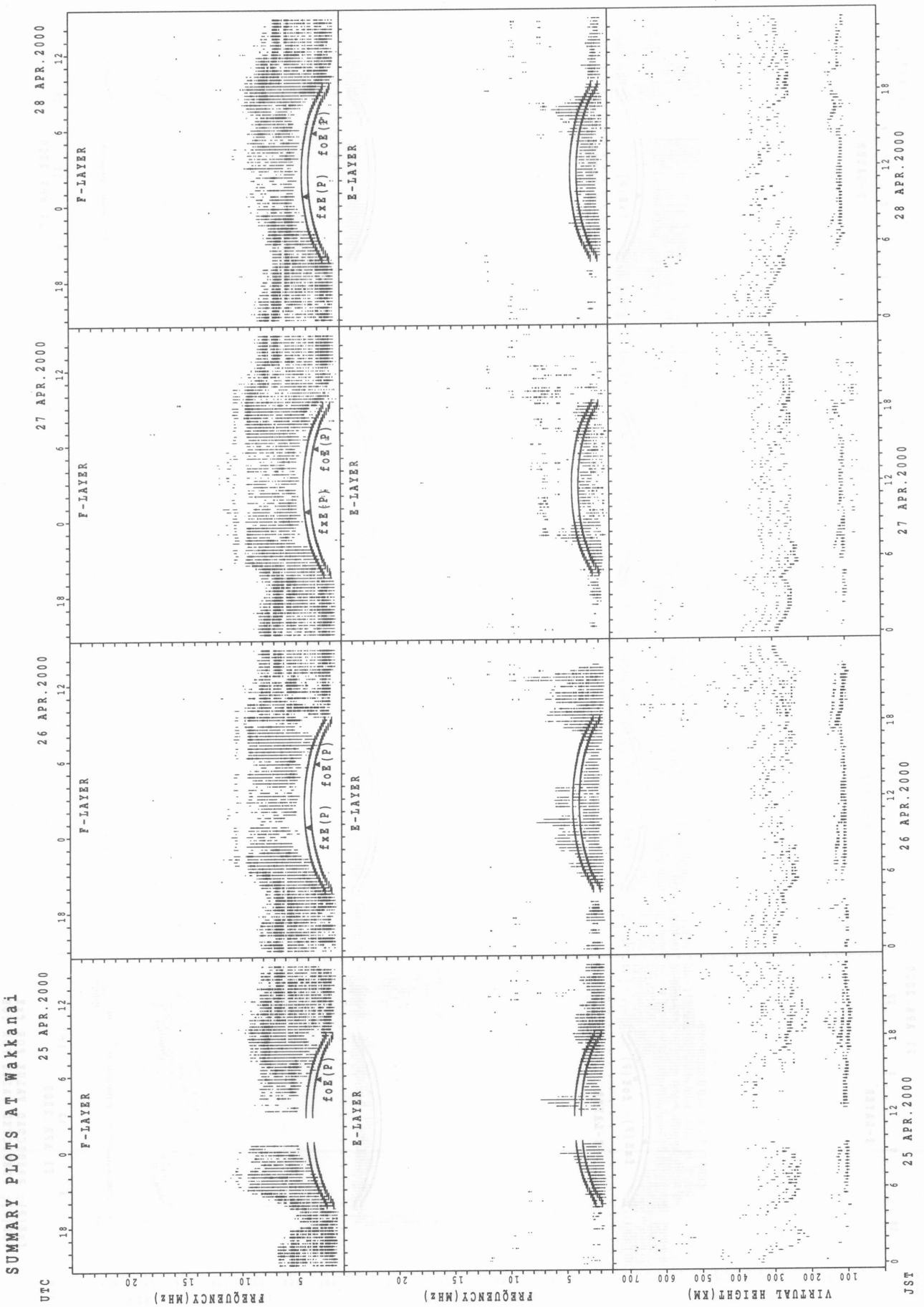

SUMMARY PLOTS AT Wakkanai
UTC
JST
13 APR.2000
14 APR.2000
15 APR.2000
16 APR.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) ; foE(P)
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
17 APR.2000
18 APR.2000
19 APR.2000
20 APR.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

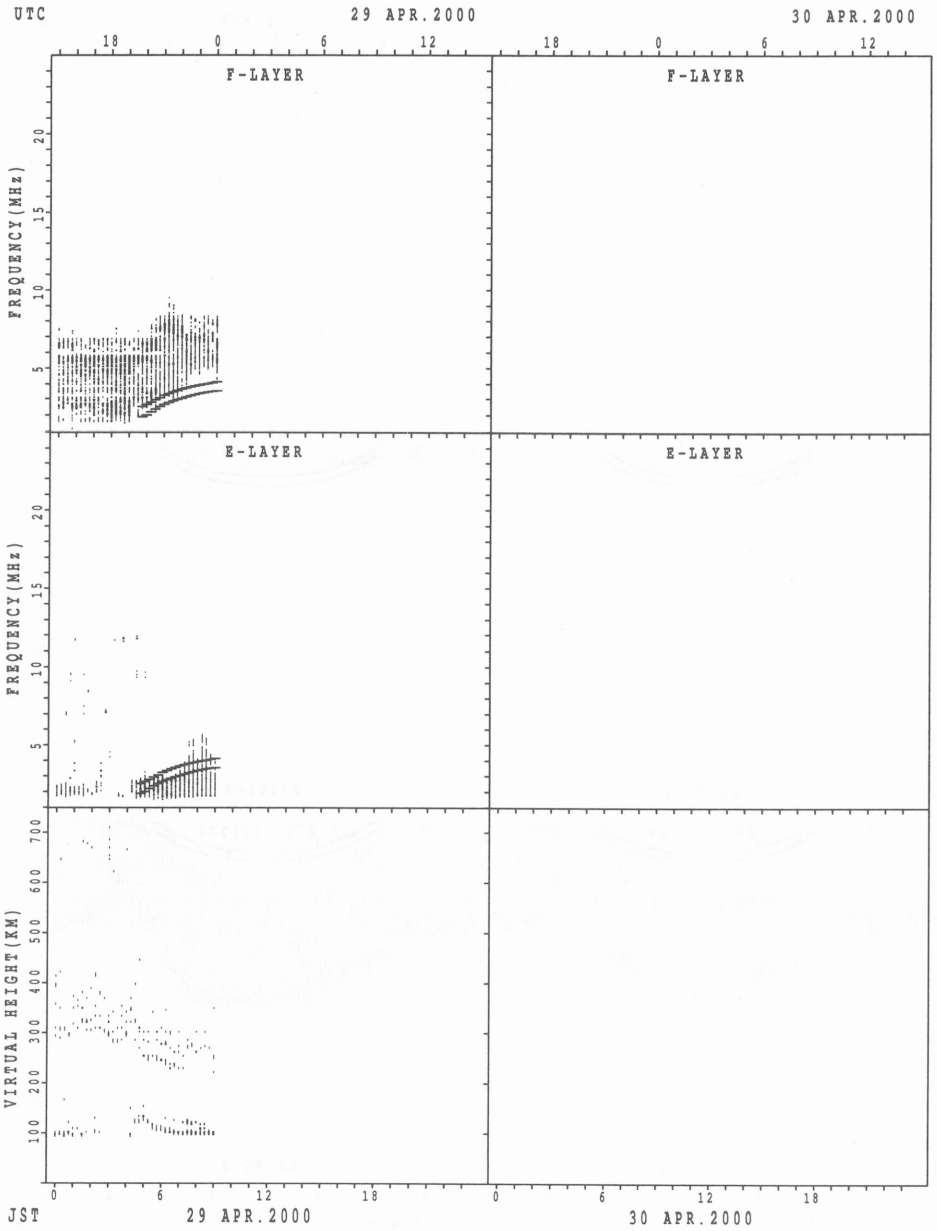
SUMMARY PLOTS AT Wakkanai



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

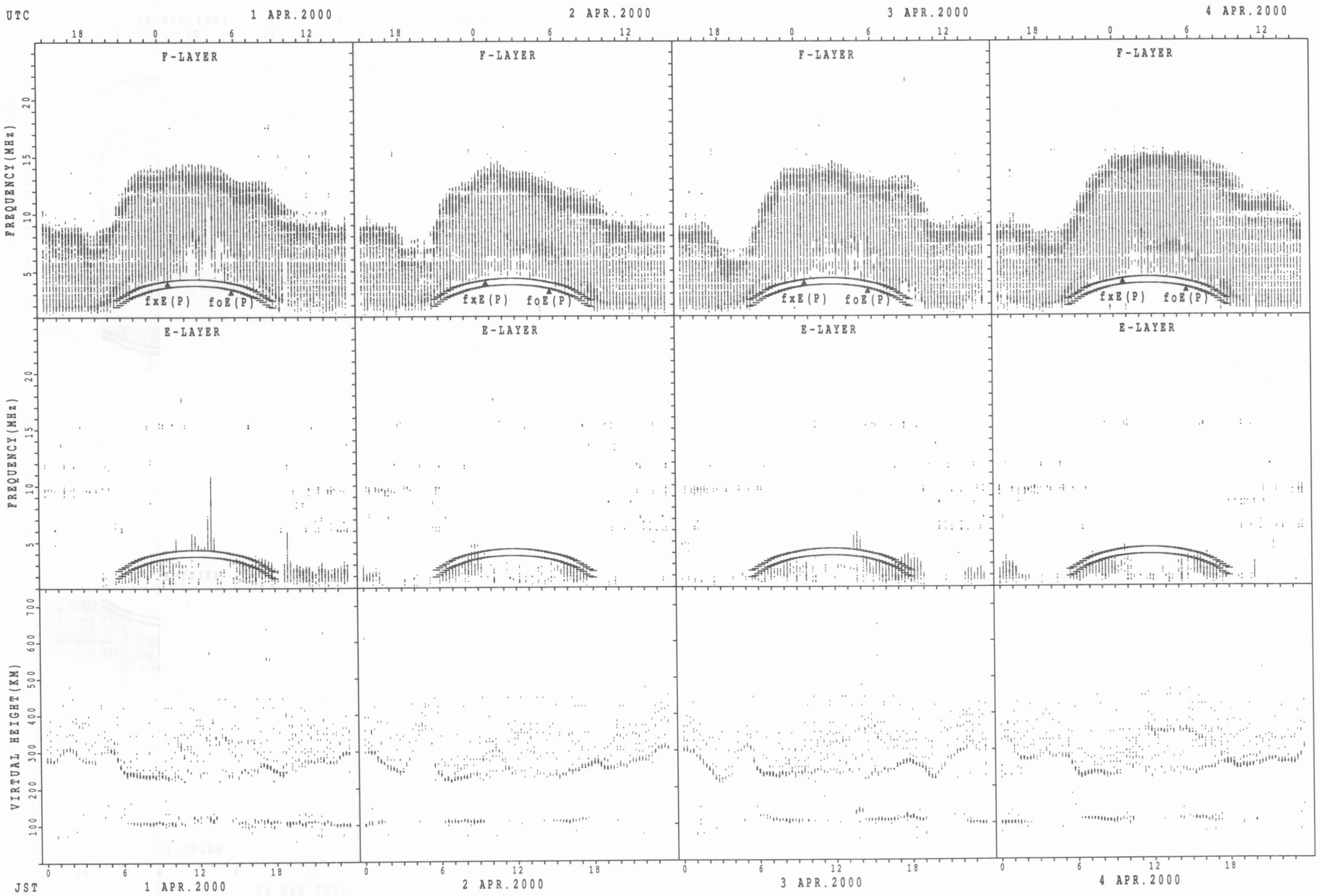

SUMMARY PLOTS AT Wakkanai
UTC
JST
25 APR.2000
26 APR.2000
27 APR.2000
28 APR.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
foE(P)
fxE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



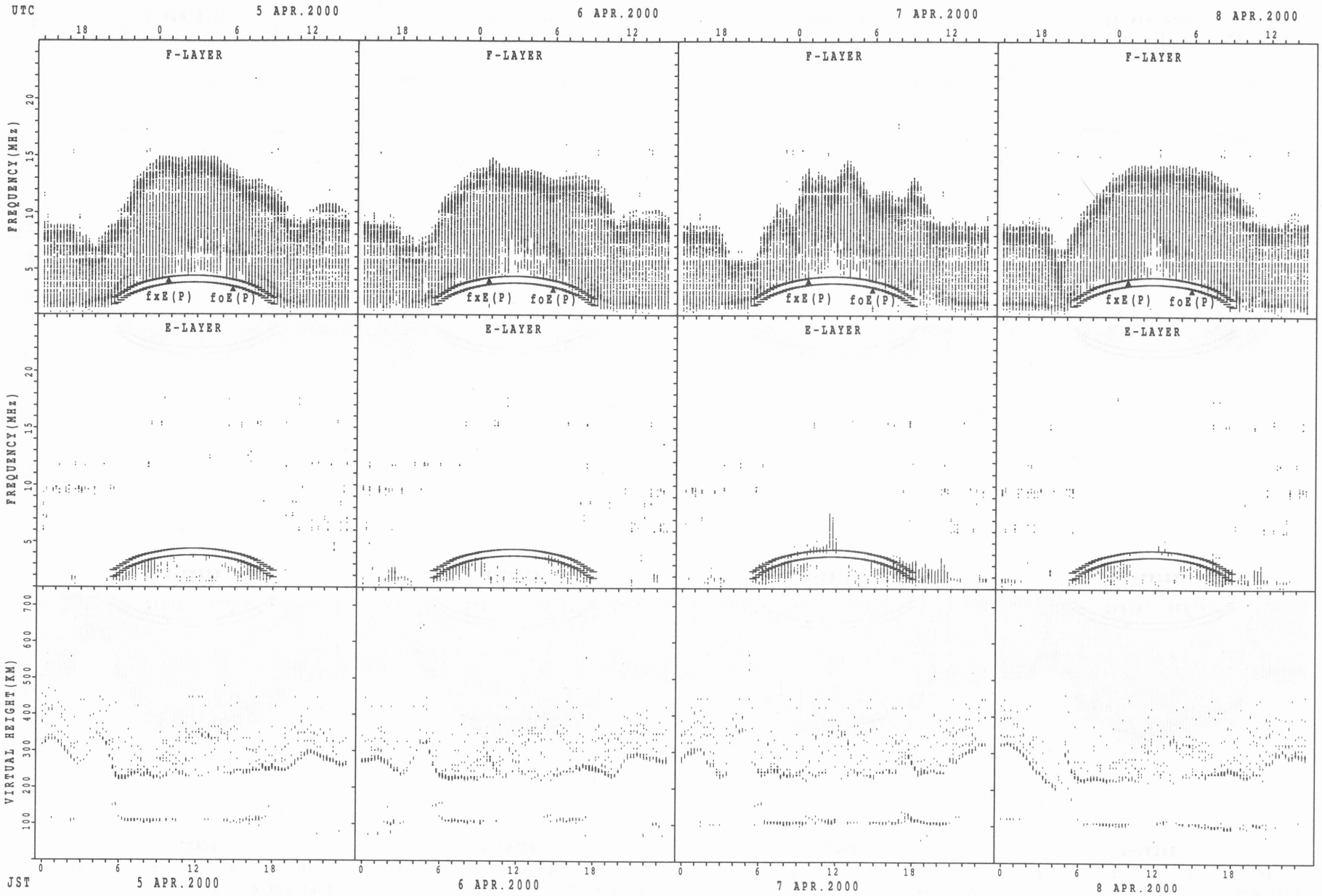
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



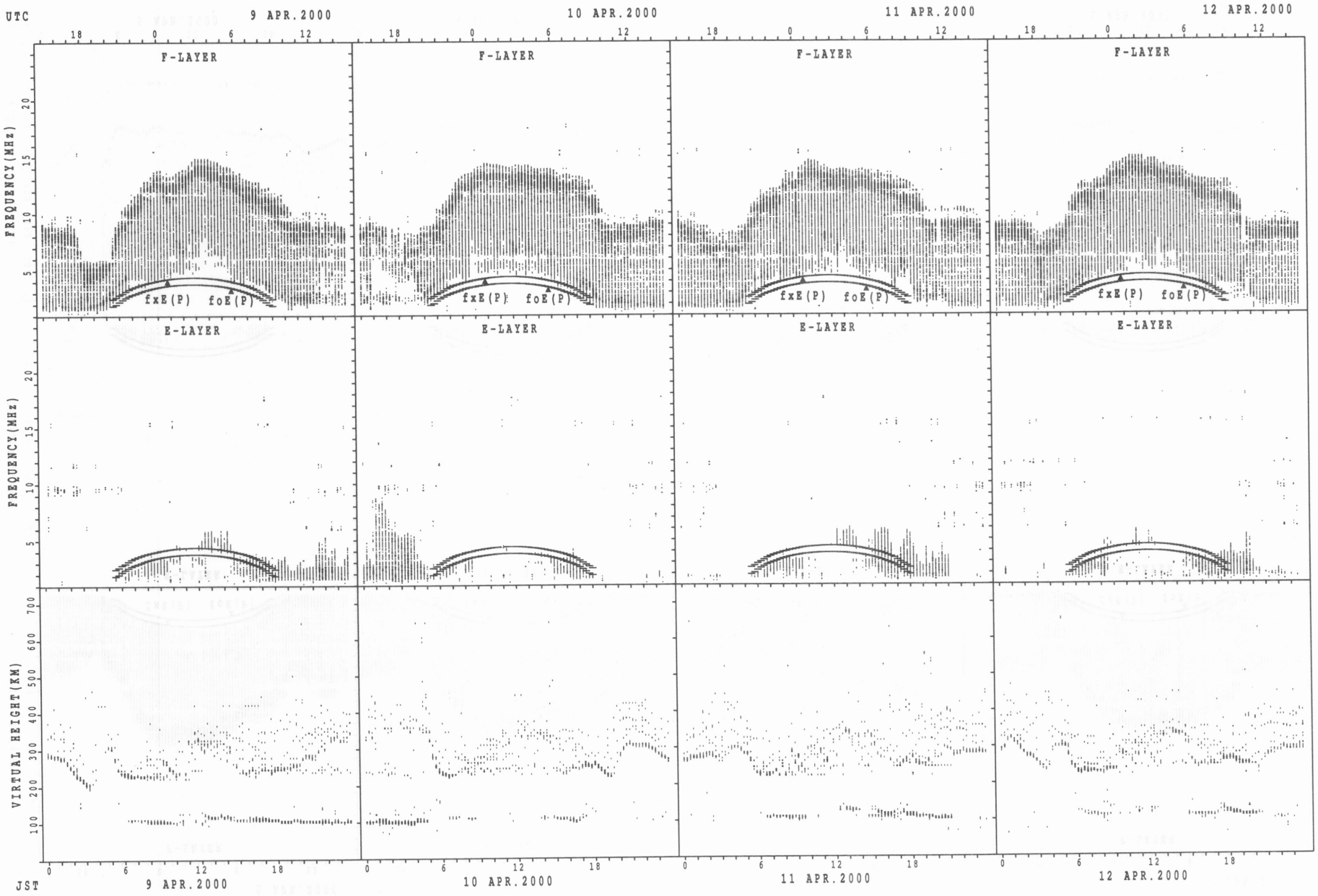
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



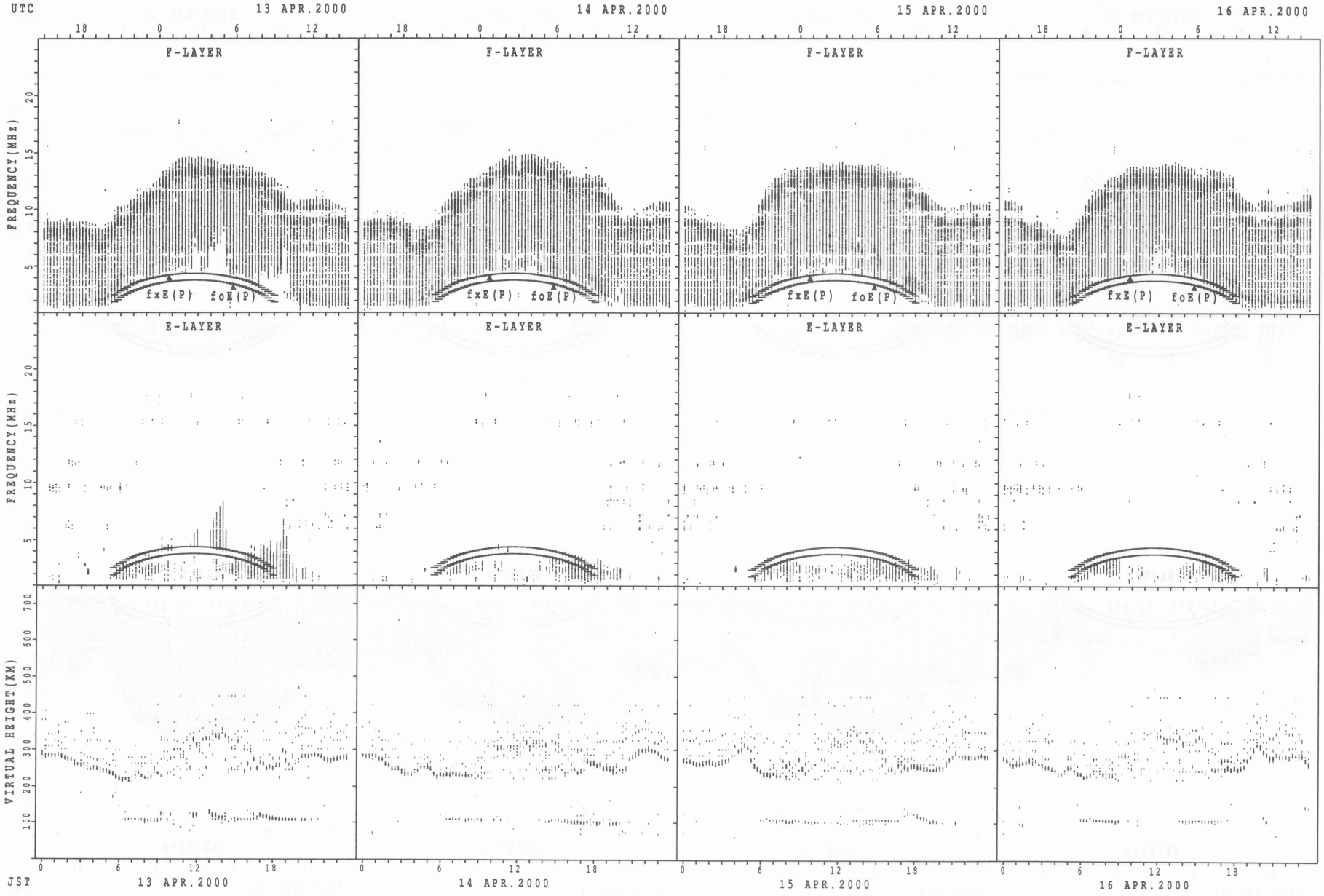
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

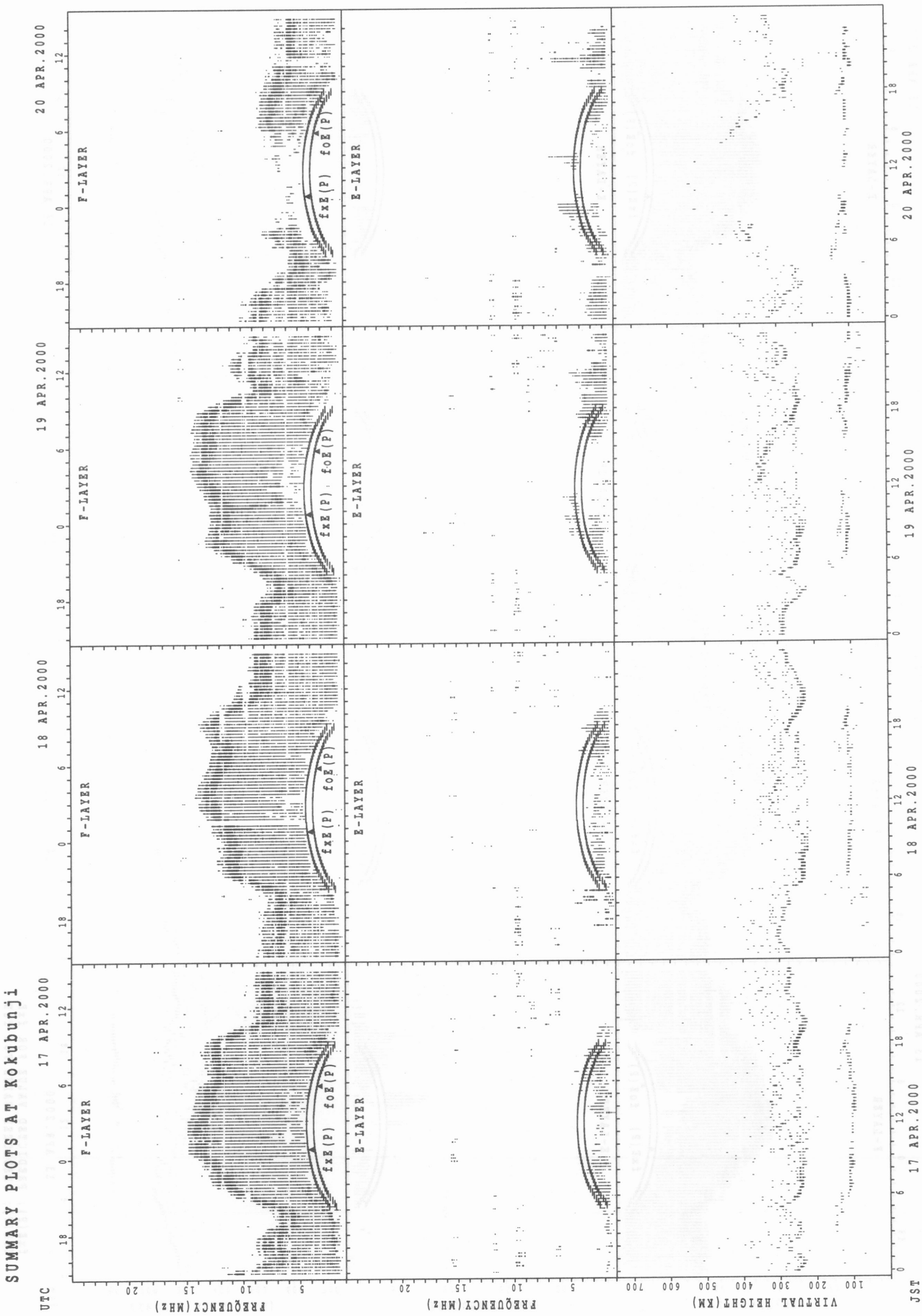


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

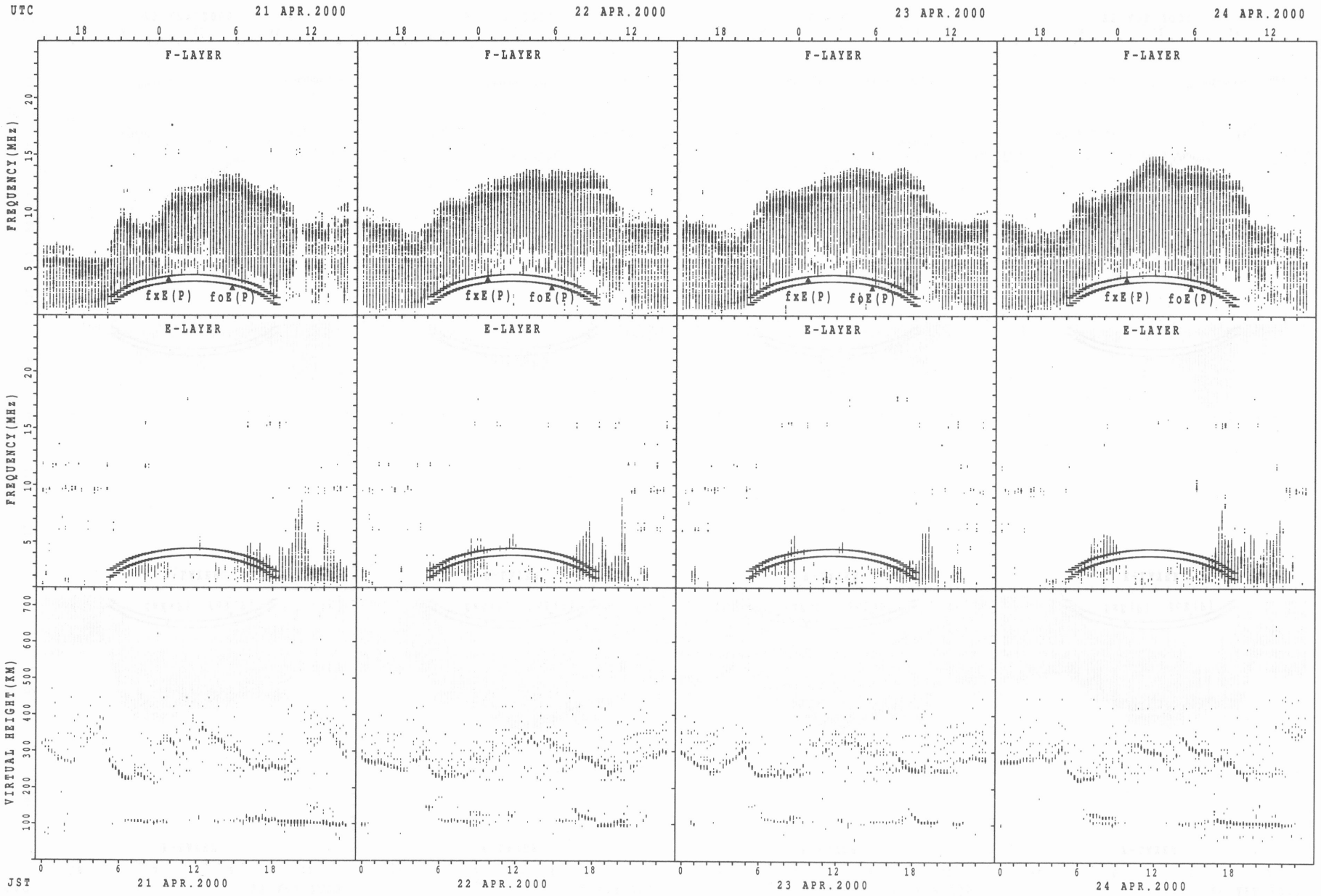
SUMMARY PLOTS AT Kokubunji



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

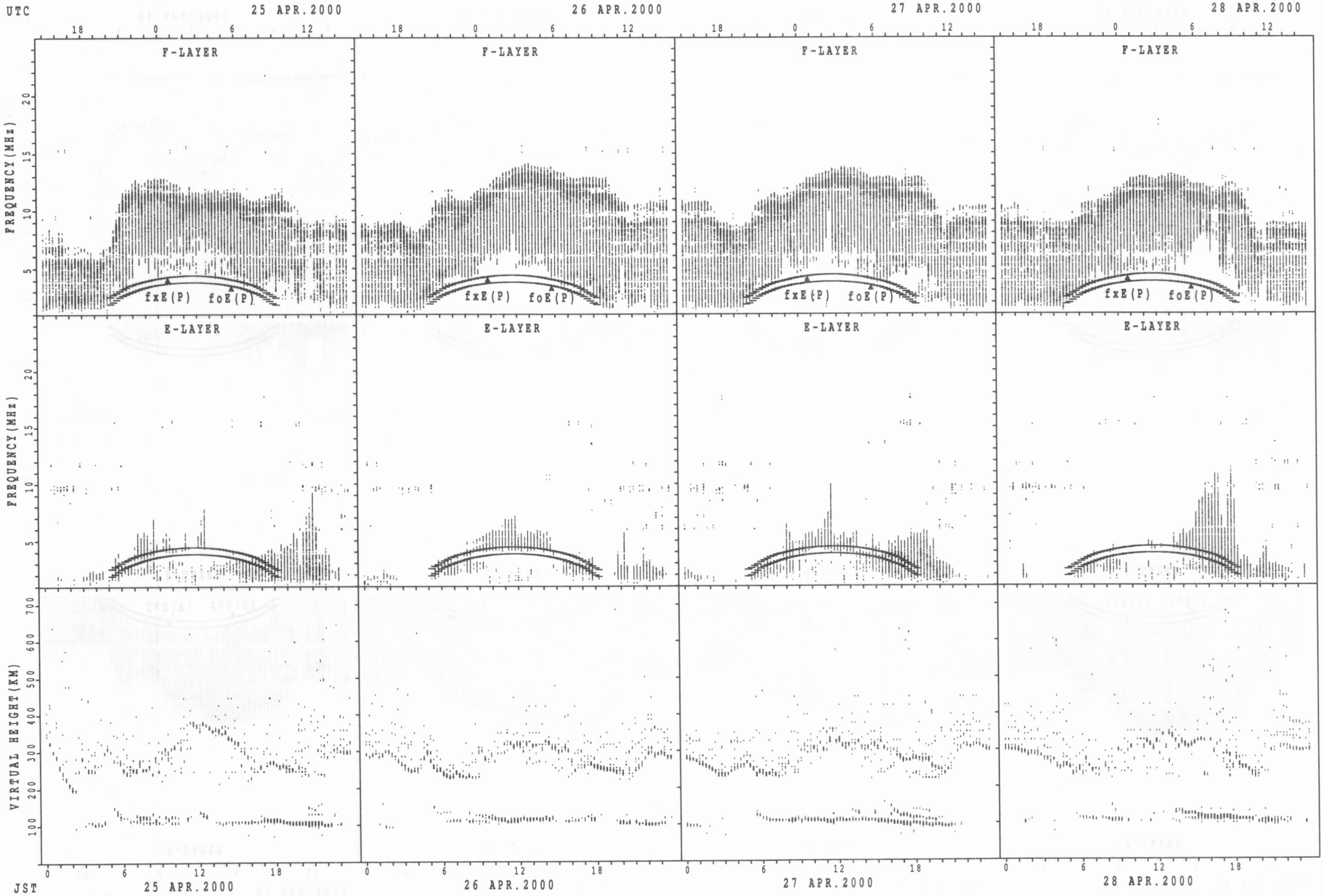

SUMMARY PLOTS AT Kokubunji
UTC
JST
17 APR.2000
18 APR.2000
19 APR.2000
20 APR.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



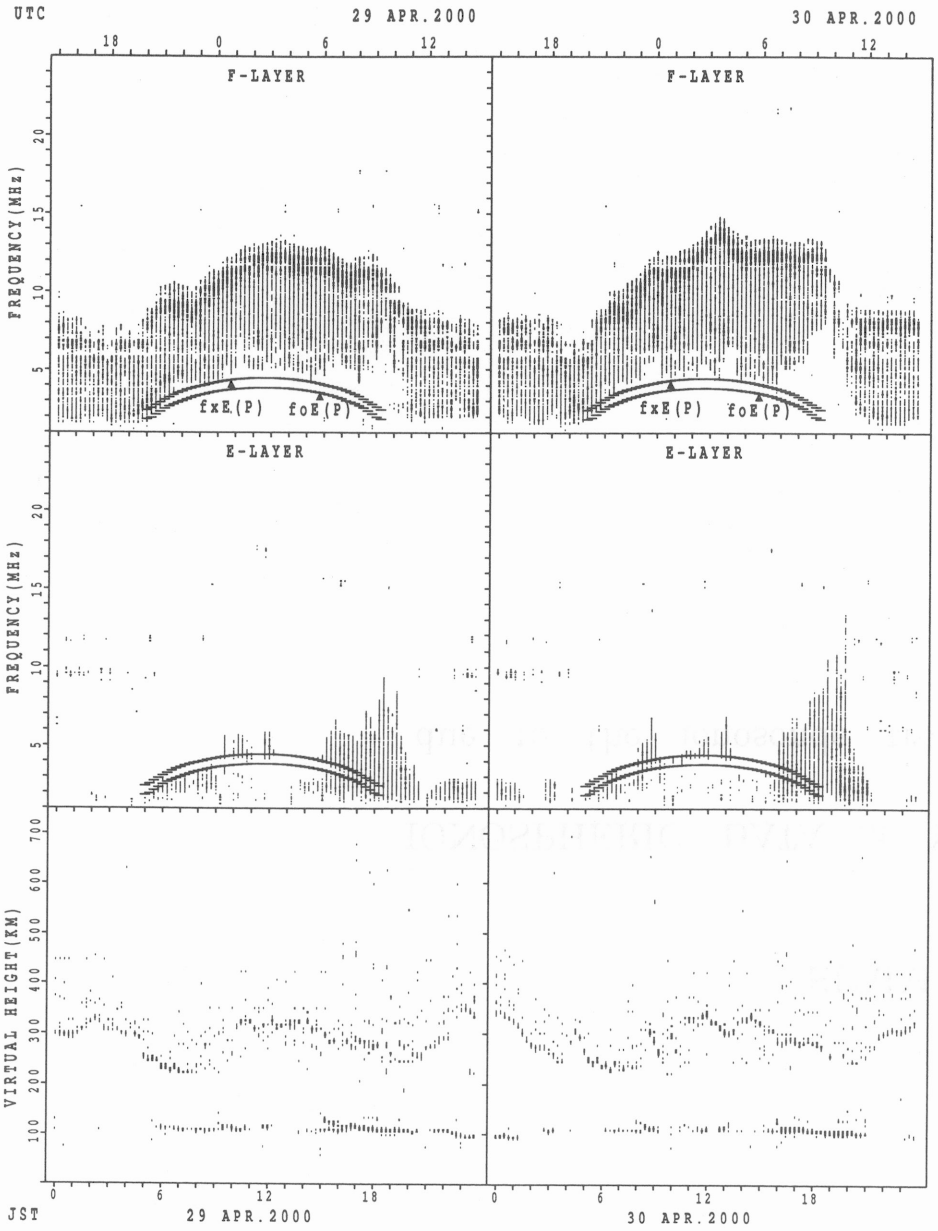
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



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

SUMMARY PLOTS AT Kokubunji

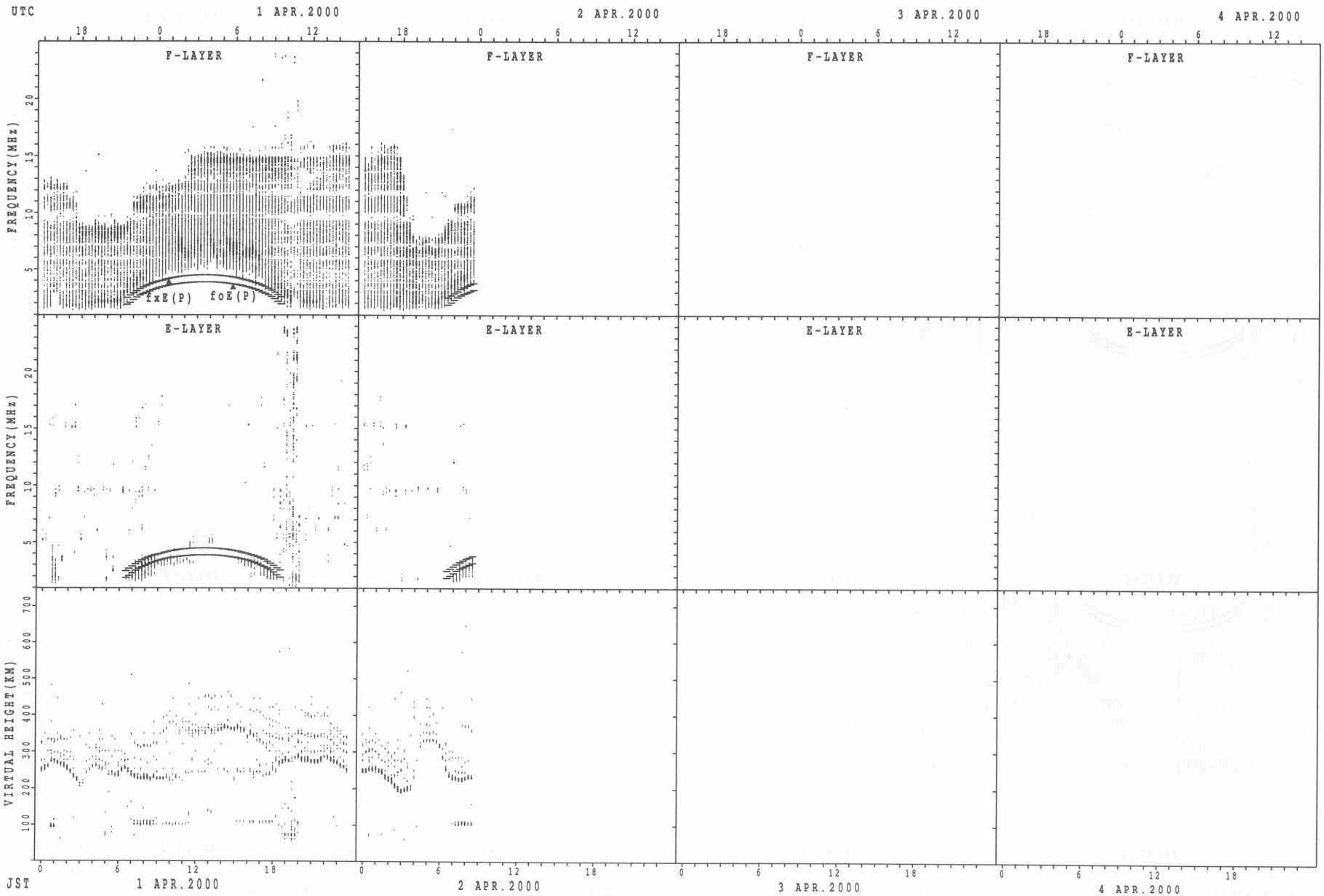


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

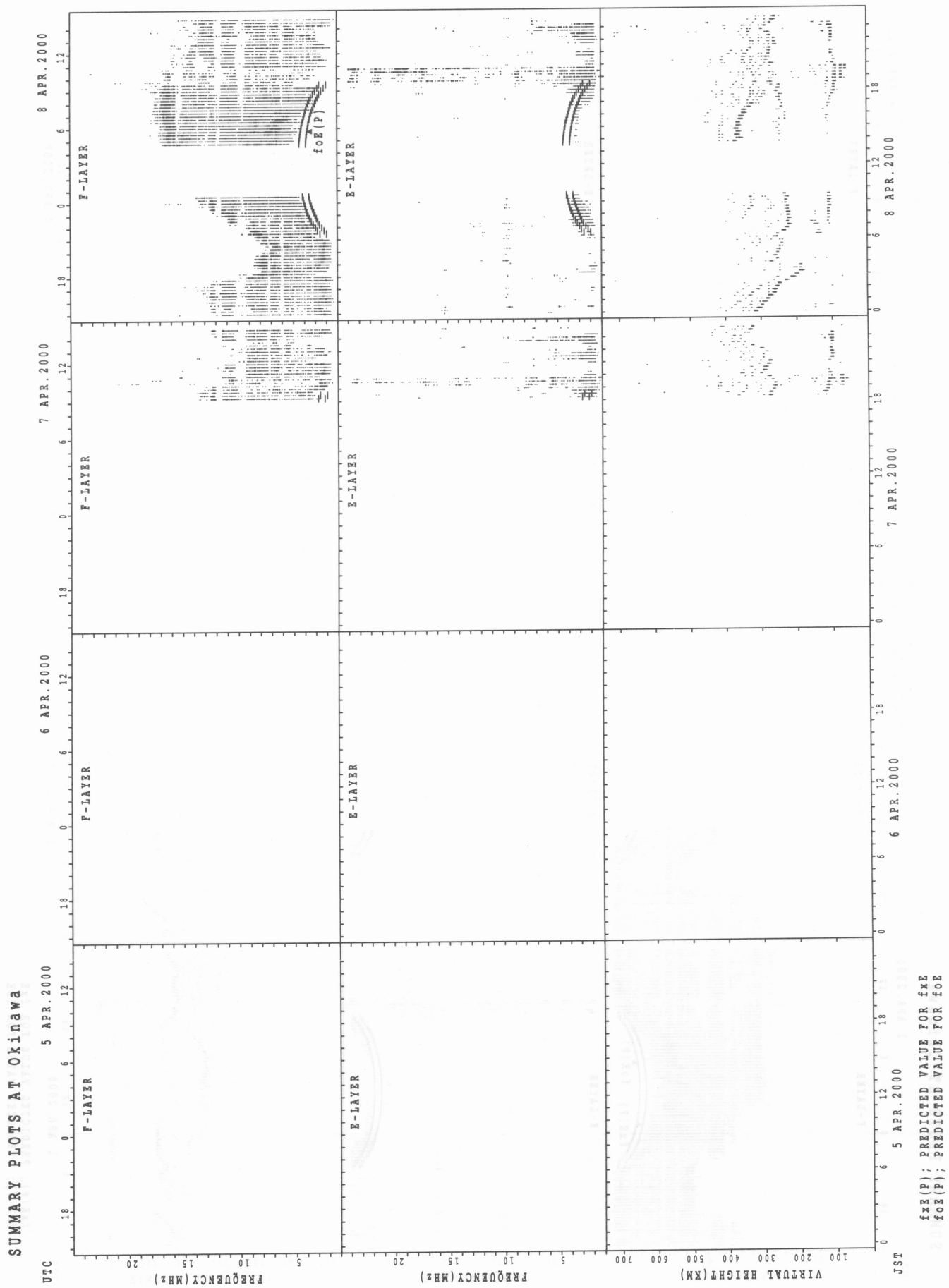
SUMMARY PLOTS

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

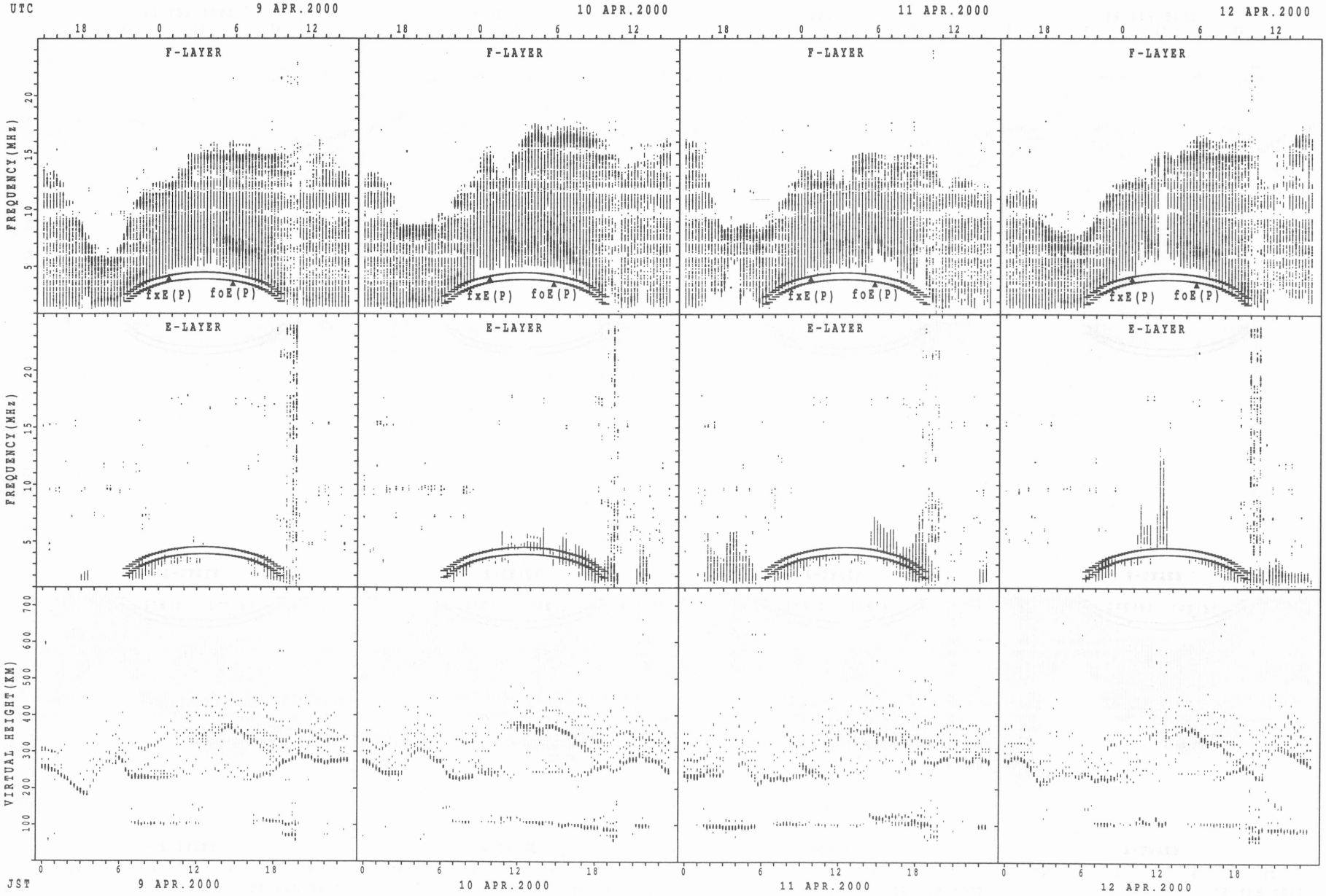
SUMMARY PLOTS AT Okinawa



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

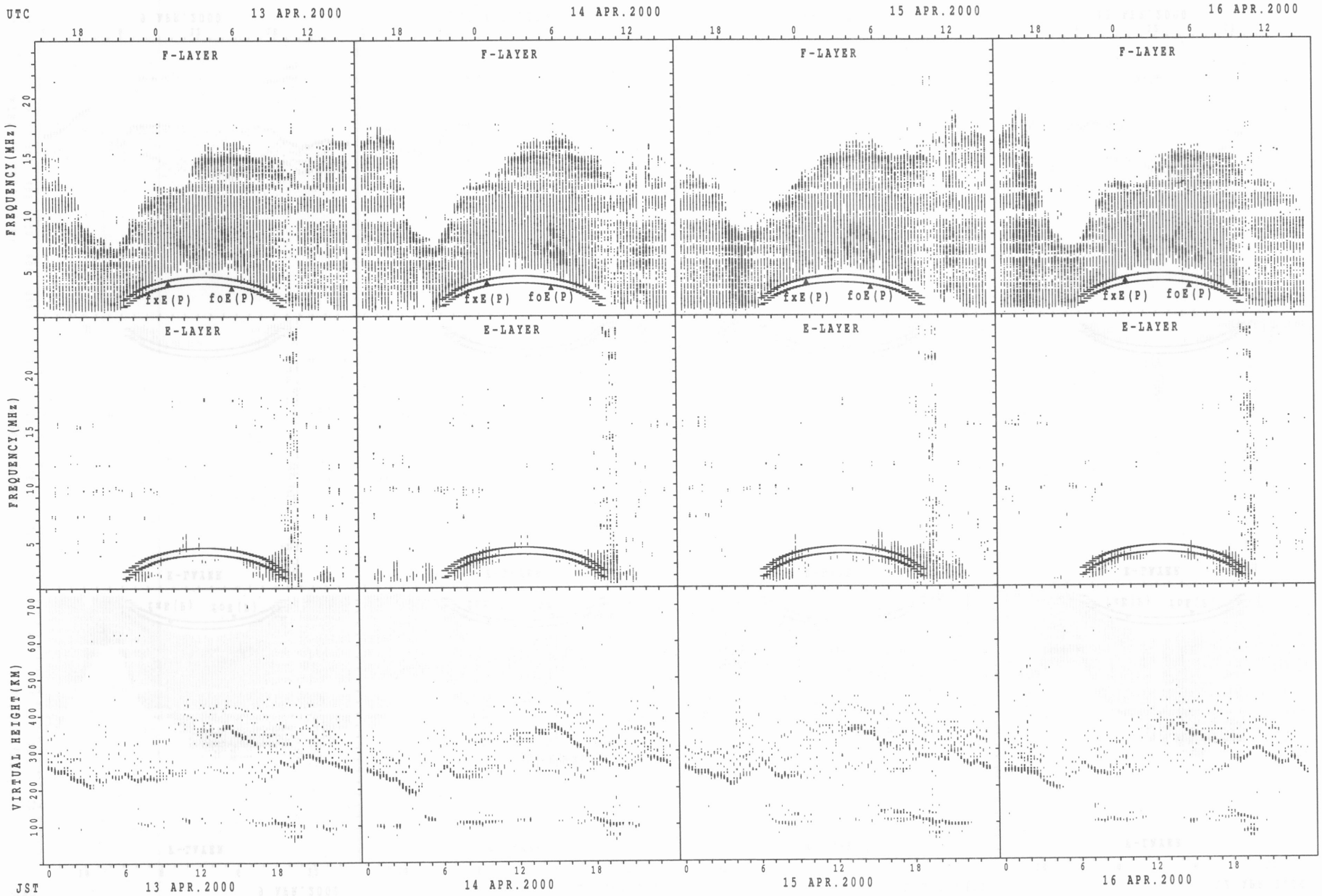

SUMMARY PLOTS AT Okinawa
UTC
JST
5 APR.2000
6 APR.2000
7 APR.2000
8 APR.2000
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



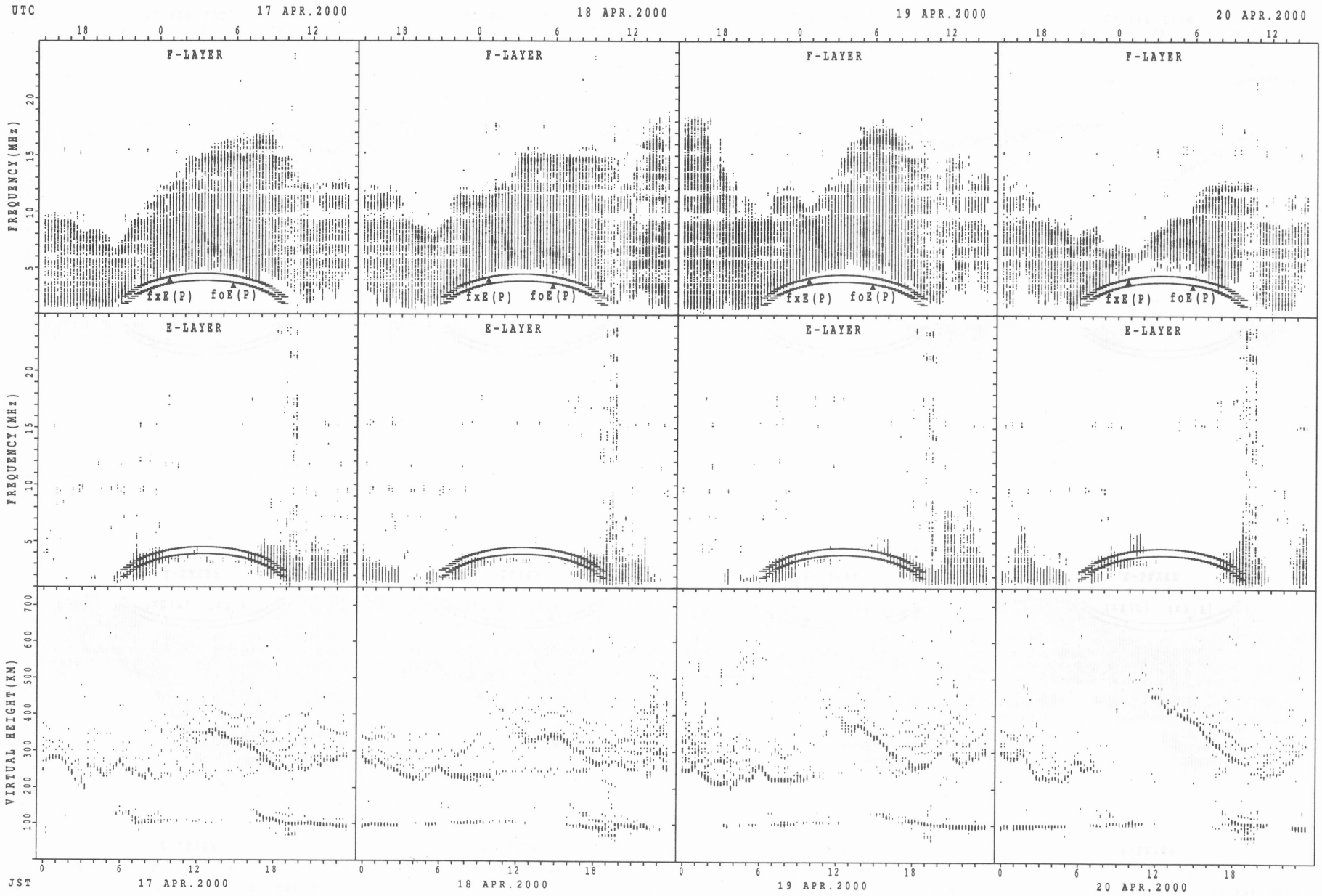
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



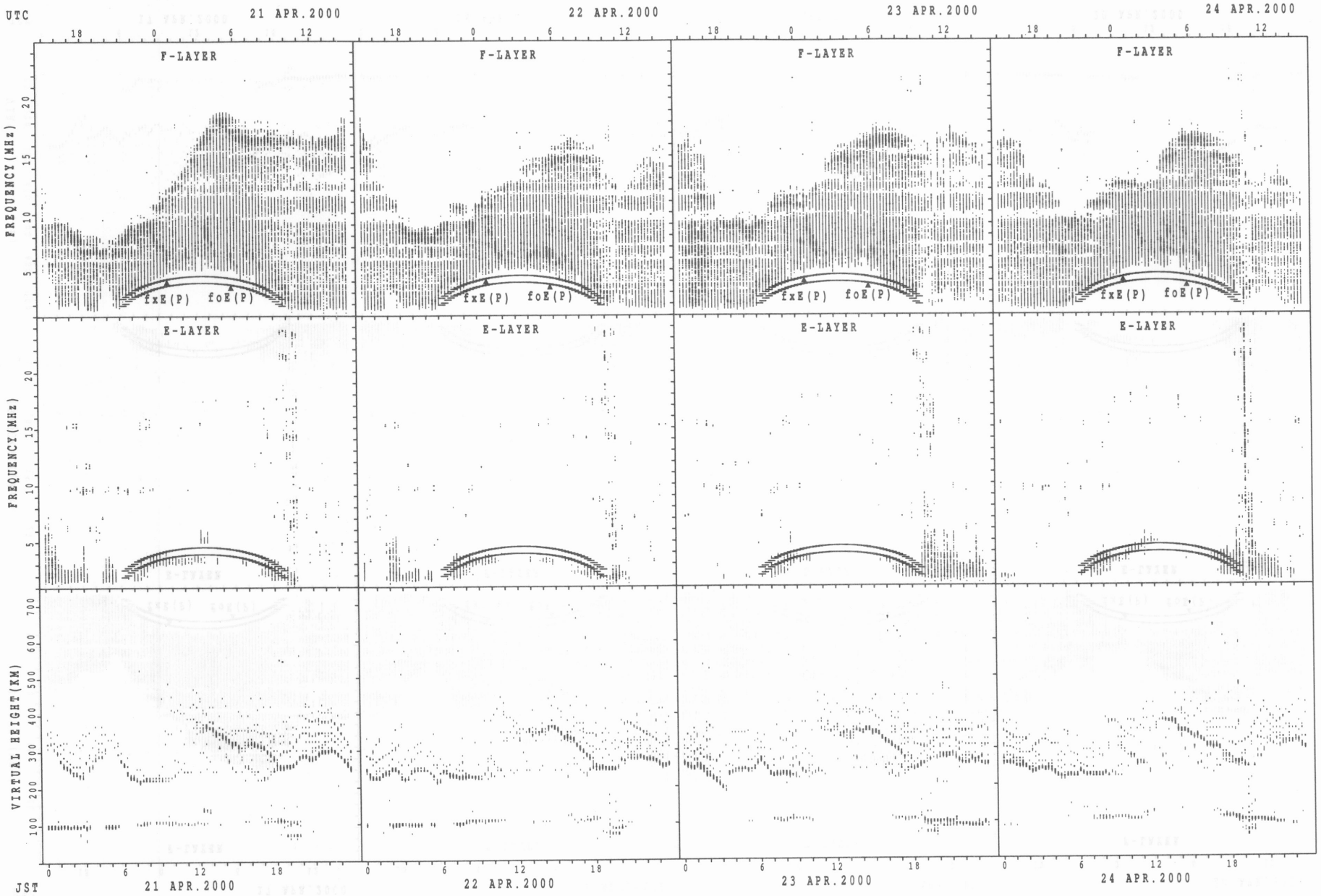
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



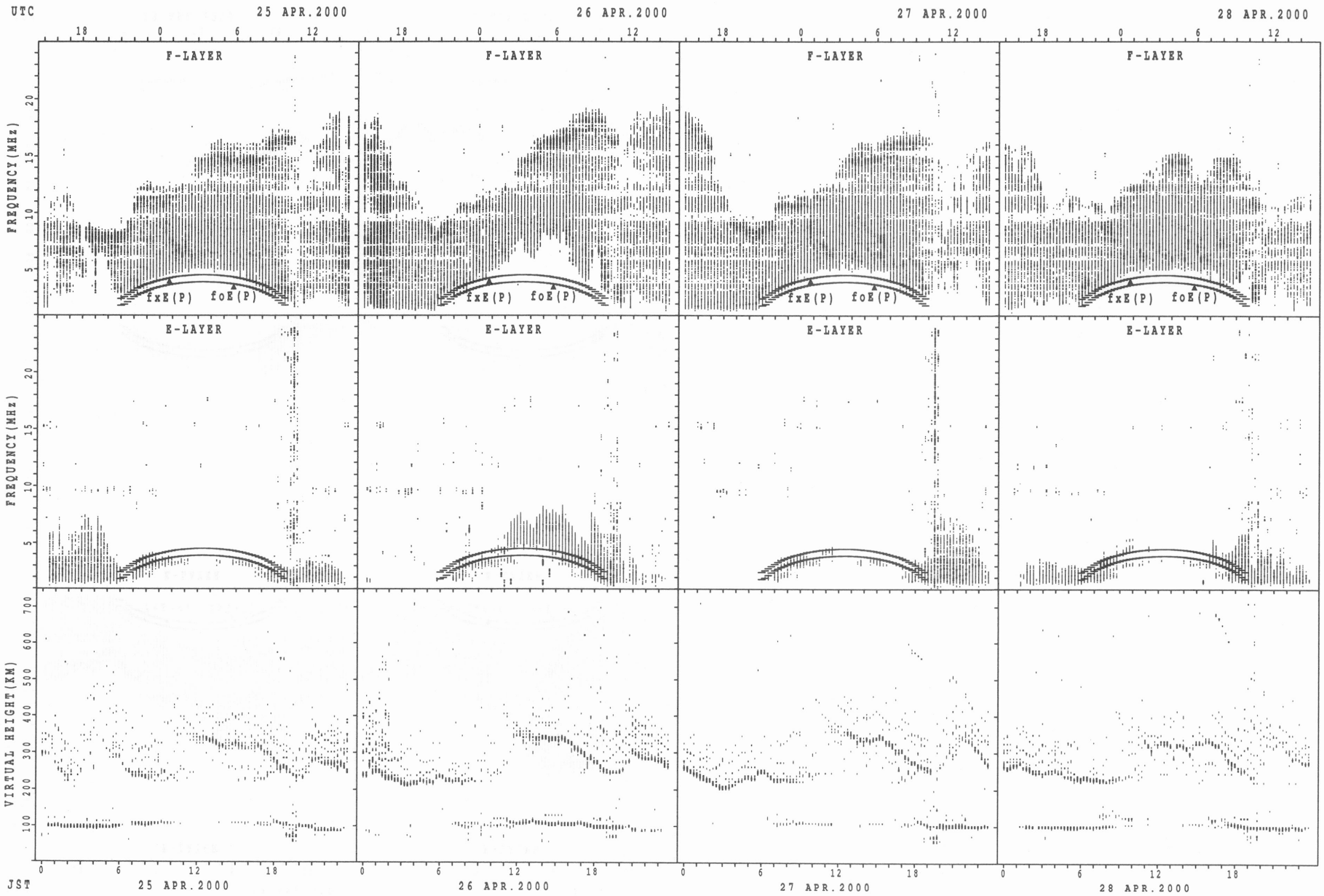
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



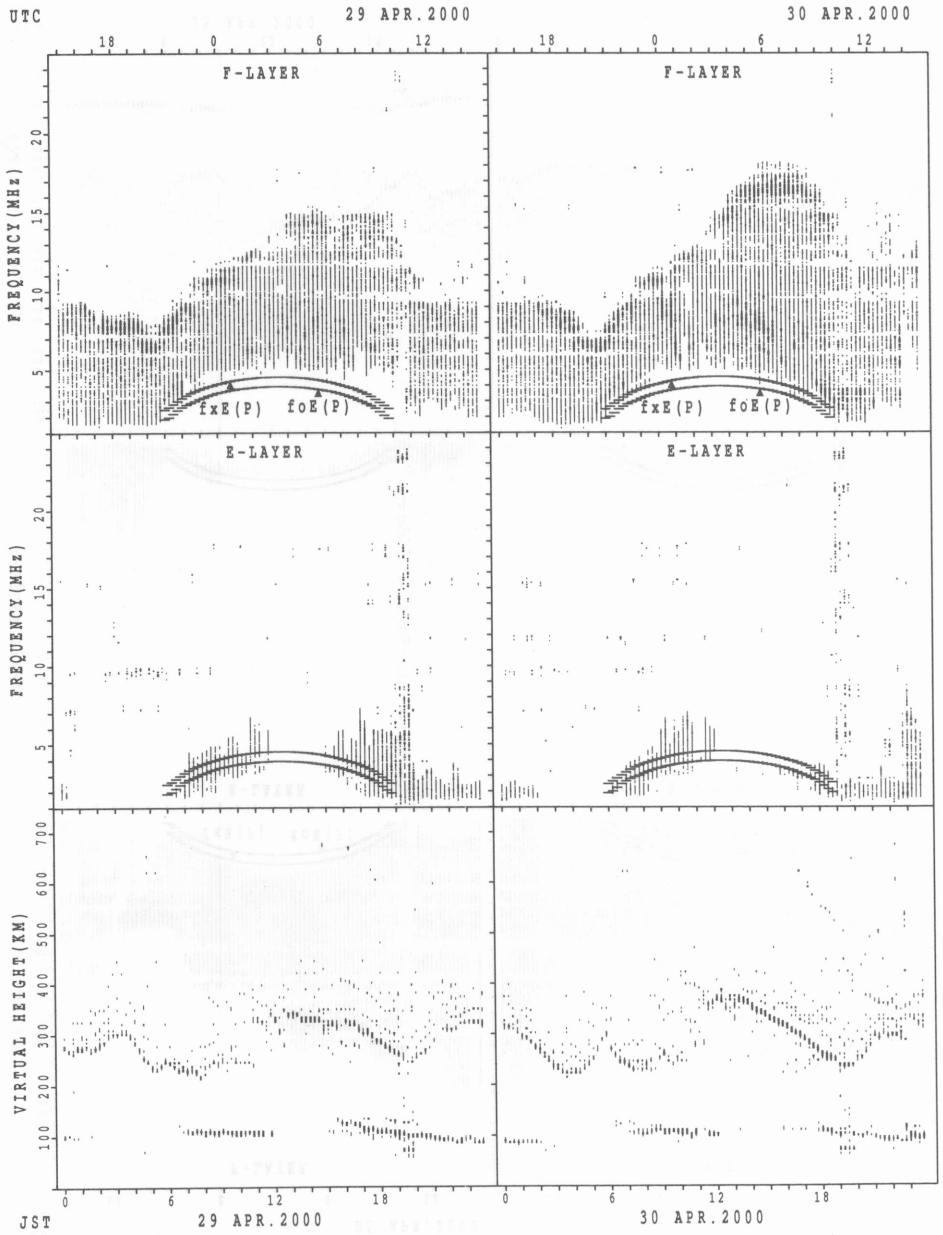
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

APR. 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	12	11	8	11	8	12	21	22	23	21	17	16	19	18	20	21	18	24	22	23	19	14	13	13
MED	363	368	354	350	338	336	272	266	276	294	272	294	304	316	313	292	298	273	272	282	300	299	336	362
U Q	388	394	388	362	369	362	300	276	304	316	296	310	320	322	322	322	320	288	280	308	326	340	387	380
L Q	335	330	318	328	308	312	254	252	252	258	254	264	288	294	295	271	276	264	266	270	290	284	312	330

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	6	4	3	6	4	10	17	20	23	22	18	15	18	18	22	20	18	18	13	9	10	6	5	3
MED	104	105	105	97	105	145	113	109	107	105	107	105	106	106	105	107	111	114	113	113	106	103	105	99
U Q	113	117	109	103	122	149	134	116	113	107	109	109	107	107	107	110	113	125	122	133	113	115	121	107
L Q	99	93	103	95	104	125	109	106	105	103	105	103	103	105	105	105	107	113	105	98	97	101	105	99

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	25	27	25	17	9	12	28	29	29	29	29	29	28	28	29	29	30	30	30	28	27	24	27	28
MED	332	336	324	348	308	342	256	256	254	268	272	296	319	324	312	308	298	286	277	270	318	336	346	337
U Q	354	374	360	352	366	352	265	265	266	292	292	314	336	337	348	318	306	296	284	289	336	350	362	359
L Q	313	320	307	306	305	322	248	246	248	262	262	275	305	308	297	291	288	274	272	263	288	322	330	323

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	7	6	3	3	2	3	18	16	27	24	14	11	15	10	9	12	29	28	20	22	18	11	7	8
MED	103	104	105	109	110	147	150	113	111	113	114	119	115	116	117	111	113	116	116	111	107	107	113	105
U Q	103	111	105	111	111	147	161	124	121	123	121	119	121	119	121	123	117	121	119	113	107	109	113	106
L Q	101	101	105	105	109	143	135	113	107	109	109	107	113	115	113	109	108	113	113	107	101	105	105	102

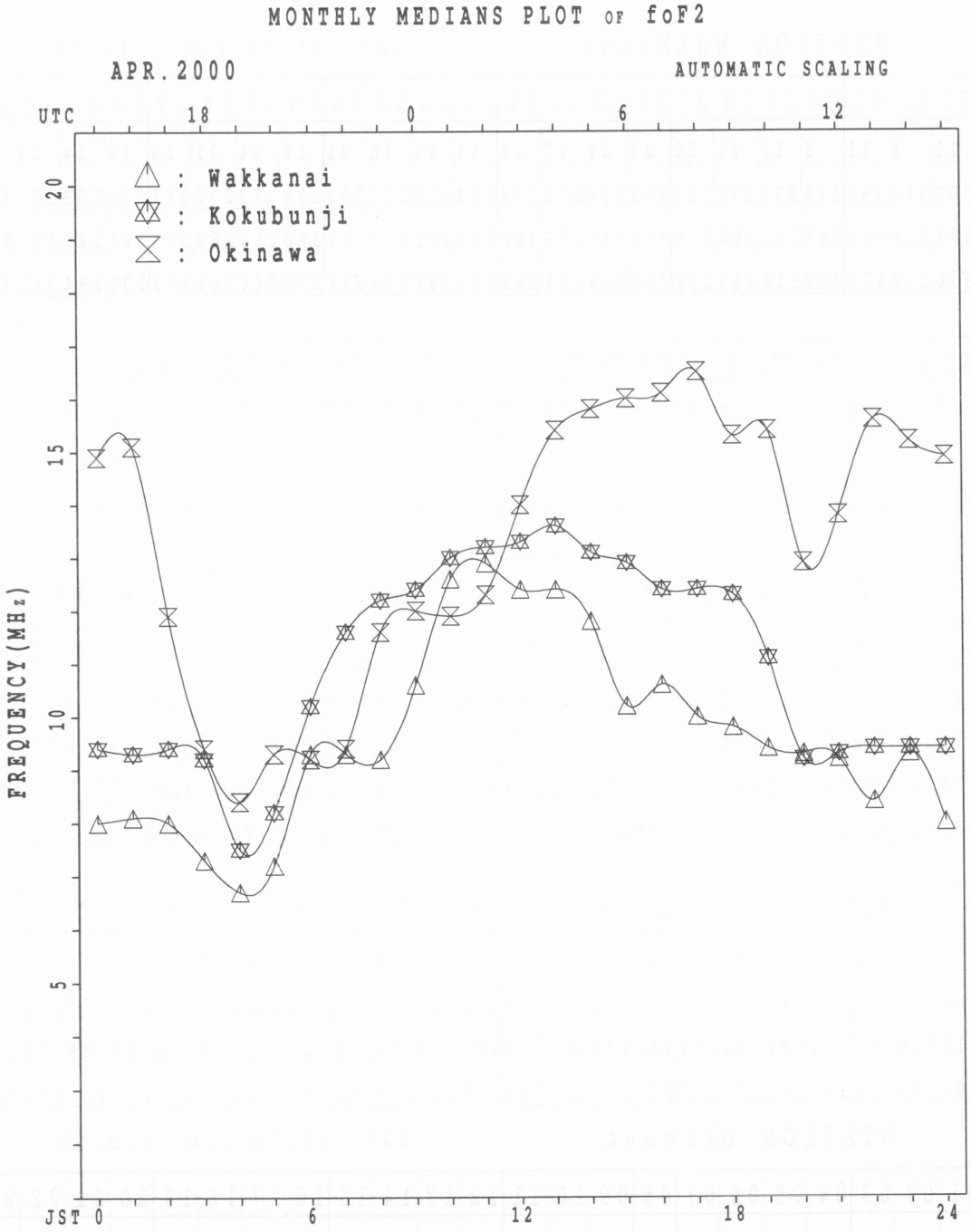
h'F STATION Okinawa LAT. 35.7N LON. 139.5E

	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	23	23	19	21	18	16	18	22	24	22	20	20	22	22	23	23	24	23	24	23	21	24	23	21
MED	276	270	258	248	283	290	300	251	248	268	267	343	362	352	352	342	328	304	279	272	296	306	296	294
U Q	300	300	274	266	334	319	314	272	257	328	339	369	372	366	366	350	335	318	291	290	316	321	312	305
L Q	264	256	240	227	258	265	276	246	240	252	250	257	352	344	338	328	318	290	271	262	283	300	284	283

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	6	7	5	5	6	7	3	19	24	21	18	9	9	3	2	6	12	22	24	22	16	13	13	9
MED	98	99	101	99	100	101	103	125	110	113	110	113	111	115	108	117	119	114	113	104	103	97	99	97
U Q	103	101	102	102	101	103	145	137	113	115	113	114	117	145	111	137	126	125	115	107	105	105	103	108
L Q	95	99	99	97	97	97	103	113	107	109	107	107	106	111	105	107	113	109	111	99	99	96	94	95

COMMUNICATIONS RESEARCH LABORATORY, JAPAN


MONTHLY MEDIANS PLOT OF foF2
APR. 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

APR. 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 106	X 92	X 96	X 91	X 87	X 94														X 111	X 106	X 104	X 106	X 103
2	X 98	X 99	X 97	X 85	X 79	X 77														X 110	X 104	X 101	X 98	X 95
3	X 96	X 96	X 94	X 78	X 70	X 74														X 119	X 98	X 98	X 98	X 99
4	X 97	X 98	X 92	X 86	X 87	X 89													X 140	X 130	X 119	X 119	X 116	X 106
5	X 98	X 94	X 94	X 84	X 79	X 88														X 108	X 101	X 106	X 109	X 108
6	X 102	X 97	X 97	X 83	X 78	X 84														X 118	X 101	X 104	X 104	X 105
7	X 98	X 94	X 92	X 85	X 66	X 64														X 113	X 100		X 98	X 97
8	X 96	X 98	X 99	X 92	X 79	X 82														X 114	X 103	X 98	X 104	X 102
9	X 102	X 96	X 96	X 72	X 64	X 68														X 113	X 102	X 104	X 104	X 103
10	X 100	X 98	X 92	X 90	X 87	X 93														X 106	X 96	X 100	X 100	X 104
11	X 104	X 97	X 91	X 85	X 86	X 92														X 120	X 103	X 106	X 107	X 105
12	X 98	X 98	X 98	X 87	X 84	X 92														X 116	X 98	X 96	X 98	X 97
13	X 97	X 96	X 96	X 91	X 89	X 90														X 116	X 110	X 114	X 112	X 106
14	X 100	X 100	X 100	X 96	X 86	X 88														X 123	X 105	X 104	X 105	X 109
15	X 106	X 99	X 94	X 90	X 86	X 90														X 116	X 106	X 105	X 108	X 108
16	X 110	X 108	X 96	X 90	X 82	X 84														X 110	X 112	X 109	X 108	X 113
17	X 117	X 88	X 91	X 87	X 78	X 80														X 118	X 96	X 92	X 95	X 94
18	X 89	X 88	X 86	X 84	X 81	X 86														X 131	X 114	X 106	X 101	X 100
19	X 98	X 96	X 97	X 87	X 80	X 86														X 111	X 103	X 111	X 112	X 102
20	X 105	X 100	X 96	X 79	X 62	X 61														X 80	X 76	X 71	X 73	X 75
21	X 73	X 75	X 72	X 66	X 66	X 70														X 114	R 88	Q X 98	X 98	X 106
22	X 108	X 100	X 98	X 87	X 84	X 94														X 130	X 108	X 100	X 102	X 102
23	X 100	X 98	X 96	X 86	X 83	X 90														X 120	X 105	X 101	X 98	X 102
24	X 99	X 97	X 88	X 88	X 87	X 94														X 118	X 96	X 90	X 88	X 87
25	X 84	X 82	X 73	X 72	X 65	X 75														X 114	X 103	X 96	X 96	X 98
26	X 96	X 95	X 92	94	X 83	X 92														X 130	X 114	X 108	X 109	X 113
27	X 114	X 110	X 109	X 93	X 89	X 92														X 128	X 106	X 99	X 107	X 105
28	X 106	X 108	X 99	X 98	X 92	X 93														X 110	X 85	X 90	X 90	X 90
29	X 88	X 87	X 78	X 78	X 80	X 90														X 108	X 96	X 90	X 89	X 84
30	X 86	X 86	X 86	X 85	X 76	X 78														X 117	X 94	X 92	X 93	X 96
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30													1	30	30	29	30	30
MED	X 98	X 97	X 95	X 86	X 82	X 88													X 140	X 116	X 103	X 101	X 102	X 102
U Q	X 105	X 99	X 97	X 90	X 86	X 92														X 120	X 106	X 106	X 107	X 106
L Q	X 96	X 94	X 91	X 84	X 78	X 78														X 111	X 96	X 96	X 98	X 97

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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	100	86	90	85	80	87	110	132	137	136	139	141	139	R 140	136	127	124	126	118	105	99	R 98	100	97
2	R 92	93	91	79	73	71	R 96	118	122	132	138	138	132	133	129	122	117	117	112	104	98	95	92	89
3	90	90	88	72	64	68	92	117	132	138	136	140	142	136	131	128	126	129	128	113	92	92	92	93
4	90	92	86	79	81	83	100	122	134	144	150	149	R 154	154	151	150	144	138	134	124	113	113	109	100
5	92	88	88	R 78	73	83	100	123	136	145	147	144	147	146	139	132	125	122	115	101	95	R 100	103	102
6	96	91	91	77	72	78	105	118	129	136	144	137	136	134	130	127	130	129	126	112	94	98	R 98	R 99
7	91	87	86	79	60	58	R 78	100	100	120	129	R 130	130	142	123	112	114	109	127	107	R 94	94	92	91
8	R 90	92	R 93	86	72	R 76	97	109	121	130	140	139	138	141	R 140	138	134	128	122	108	R 97	92	98	R 96
9	R 96	90	90	66	58	62	R 94	109	124	135	130	136	146	145	141	135	128	123	117	106	96	R 98	R 98	R 97
10	94	U R 92	85	84	81	87	99	114	128	136	142	139	137	140	136	135	130	130	124	R 100	90	94	94	R 97
11	R 98	91	85	78	80	86	106	116	123	132	141	140	136	135	133	132	131	128	123	114	R 97	R 100	R 101	99
12	92	92	92	81	78	86	109	122	125	135	141	146	143	140	135	131	126	124	122	110	92	90	92	91
13	91	90	90	85	83	84	R 99	106	114	125	137	142	143	141	136	135	133	130	123	110	104	107	106	100
14	R 94	93	R 94	90	80	82	R 99	112	R 120	126	135	142	U R 142	146	142	139	130	126	125	R 117	98	R 98	R 99	103
15	R 100	93	88	84	80	84	108	124	131	133	133	137	140	137	136	135	131	128	122	110	R 100	R 99	102	101
16	104	102	90	84	76	78	96	112	122	127	134	134	134	137	134	128	130	129	118	104	106	103	102	107
17	111	82	85	81	72	74	103	124	129	137	145	146	144	141	138	131	128	132	130	112	90	86	88	87
18	83	81	80	78	75	79	106	118	116	117	122	130	136	137	130	125	123	125	133	124	108	R 100	95	R 94
19	92	90	91	81	74	80	104	122	128	124	123	128	134	R 141	R 140	139	138	139	130	105	R 97	105	106	96
20	R 98	94	90	R 73	56	55	R 74	R 78	68	A	R	J R 66	R 69	73	R 75	77	81	79	78	74	70	65	68	68
21	67	69	65	60	60	R 64	R 98	94	86	97	112	116	118	126	130	130	122	117	120	108	R	R 92	92	R 100
22	R 102	R 94	92	81	78	88	102	109	109	119	123	126	130	133	129	132	131	132	132	124	102	94	R 96	R 96
23	94	92	90	79	77	84	105	114	R 118	117	121	126	130	134	135	131	128	136	129	114	99	95	92	96
24	93	91	82	82	81	R 88	110	109	116	R 120	129	140	146	R 138	134	137	135	134	126	112	90	84	82	81
25	78	76	67	66	59	68	103	121	122	124	122	115	116	115	115	114	108	106	R 111	108	R 98	90	U R 90	92
26	90	86	86	F	77	86	106	110	106	114	119	129	133	137	134	132	126	124	125	124	108	R 101	103	R 107
27	108	104	103	87	83	86	104	111	110	117	126	129	134	132	R 129	125	124	R 124	125	R 122	R 100	93	R 101	100
28	R 100	R 102	93	92	86	87	R 98	102	110	115	123	125	122	126	126	118	116	114	R 120	104	R 79	83	84	84
29	82	81	R 72	R 71	R 74	84	R 100	101	104	112	120	127	129	127	124	124	117	118	120	102	90	84	83	78
30	80	80	80	R 79	70	R 72	90	R 99	109	122	120	126	139	139	130	131	130	128	129	R 111	R 89	R 85	87	90
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30	30	29	30	30	30
MED	92	91	89	79	76	82	100	113	122	126	133	136	136	137	134	131	128	127	124	110	97	94	96	96
U Q	98	93	91	84	80	86	105	121	128	136	140	140	142	141	136	135	131	130	128	114	100	100	101	100
L Q	90	86	85	78	72	72	97	109	110	118	122	127	130	133	129	125	123	122	120	105	91	90	92	91

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L	L	L	A	L	L	L							
2									L	L	L	L	L	L	L	L	L							
3											L	L	L	L	L	L 696	L							
4									L	L	L	L	L	L	L	L	L							
5									L	L	L	L	L	L 700	L	L	L							
6									L	L	L	L	L	L	L	L	L	L						
7										L		L	L	L	L	L		L						
8										L		L	L	L	L	L	L							
9									L	L	L	L	L	L	L									
10									L	L	L	L	L	L	L	L	L	L						
11								L	L	L	L	L	L	L	L	L	L							
12										L	L	L	L	L	L	L	L							
13								L	L		L	L	L	L	A	L		L						
14										L	L	L	L	L	L	L		L						
15									L	L	L	L	L	L	L	L	L							
16										L	L	L	L	L	L	L	L	L						
17											L	L	L	L	L		L							
18										L	L	L	L	L	L	L	L							
19										L	L	L	L 748	L	L	L	L							
20							L 436	L 436	U L 476	A	B	508	U R 544	U L 532	U R 544	L 520	L 516	L						
21										L	L	L	L	L	L	L	L							
22										L	L	L	L	L	U L 580	L	L							
23											L	L	L	L	U L 580	L	L	L						
24									L	L	L	L	L	L	L	L	L							
25										L	L	L	L	U L 656	L 620	L	L	L						
26										L	L	L	L	L	L	L	L							
27									A	L	L		L	L	L	L	L							
28									L	L	L	L	L	L 644	A	A	A	A						
29										L	L	L	L	L	L	L	L							
30										A	L 556	L	L	A	L	L		A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	1	1		1	1	2	4	4	2	1							
MED							L 436	L 436	U L 476		L 556	508	646	L 650	U L 580	L 608	L 516							
U Q														L 678	L 600									
L Q														L 588	U 562									

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							236	284	R 332	U R 376	U R 384	B	R	B	U R 396	372	324	252	B					
2							236	292	348	A	388	B	B	B	B	U R 328	316	252	B					
3							200	292	U R 348	368	B	B	U R 416	B	B	352	320	260	B					
4							232	284	336	348	A	B	B	B	U R 372	364	328	260						
5							176	A	328	U R 352	B	B	B	B	U R 372	A	316	272	B					
6							188	284	332	B	B	B	B	B	B	372	328	252	B					
7							188	292	A	R	A	B	B	R 392	U R 372	360	316	248	B			B		
8							200	284	332	352	R	R	B	B	R 376	340	312	256	A					
9							216	276	316	R	R	B	R	B	B	U R 352	A	A	B					
10							224	R 292	336	B	B	B	B	A	A	360	312	252	B					
11							216	300	324	R	U R 380	B	B	B	B	356	R 316	264	B					
12							232	304	352	R	B	R	R	B	R	364	320	264	B					
13							236	288	U R 336	R	B	B	B	B	376	348	320	256	B					
14							196	272	324	R	B	B	B	B	B	352	336	A	B					
15							224	296	324	R	R	B	B	388	U R 360	340	292	260	B					
16							228	R	336	360	R	B	B	B	R	B	312	248	B					
17							216	284	336	352	R	R	R	R	R	348	320	264	B					
18							224	300	336	364	R	R	R	U R 380	R	U R 348	324	256	B					
19							220	300	U R 340	R	B	B	B	B	B	B	328	A	188					
20							240	304	R	A	B	B	B	B	R	U R 344	316	264	B					
21							228	292	324	R	R	B	B	B	B	U R 356	324	A	B					
22							244	316	344	R	R	B	B	B	B	B	312	272	B					
23							256	R	356	B	B	B	B	R	B	U R 336	320	276	R 184					
24							240	320	352	A	B	B	B	R	R	R	320	280	A					
25							244	308	A	360	R	R	B	R	U R 368	R	316	256	B					
26							244	312	352	R	R	B	B	B	B	R	320	268	B					
27							240	R 292	344	R	R	R	A	A	A	A	A	A	A					
28							236	300	352	R	R	B	B	R	R	356	316	264	B					
29							248	308	R 344	R	R	R	R	B	R	R	328	272	B					
30							R	R 304	A	A	R	B	B	B	R	R	328	264	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							29	27	26	9	3		1	3	8	20	28	25	2					
MED							228	292	336	360	U R 384		U R 416	R 388	U R 372	352	320	260	186					
U Q							240	304	348	366	388			R 392	R 376	360	324	266						
L Q							216	284	332	352	U R 380			U R 380	U R 370	346	316	254						

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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 16	E B 16	E B 14	G	G	G 30	G	G	E B 50	49	J A 105	G	G	G 18	J A 31	J A 22	J A 54	J A 24	J A 22	J A 21	J A 24
2	J A 25	25	E B 15	E B 15	E B 16	E B 15	G 18	G 26	G	42	G	E B 47	E B 61	E B 50	E B 46	G	G	G	E B 19	E B 16	E B 16	E B 12	E B 12	E B 16
3	E B 16	E B 16	E B 16	E B 13	E B 16	E B 14	26	G	G	G	E B 47	E B 50	46	E B 46	52	G	G	30	J A 30	J A 21	E B 16	E B 16	E B 16	22
4	27	J A 26	19	E B 16	E B 17	E B 16	G	G	G	G	45	E B 50	E B 46	E B 44	G	G	G	G 20	E B 19	20	31	E B 16	E B 15	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	23	34	G	G	E B 45	E B 48	E B 46	E B 45	G	37	G	G	E B 18	E B 16	E B 16	E B 15	E B 16	E B 15
6	E B 16	E B 16	25	20	E B 16	E B 16	26	G	G	E B 43	E B 44	E B 43	E B 47	E B 46	E B 42	G	G	G	E B 20	E B 13	E B 16	18	E B 16	22
7	E B 16	E B 16	21	20	E B 16	E B 14	26	32	38	43	46	48	J A 52	G	G	G	G	32	J A 30	33	29	22	E B 16	E B 16
8	J K 22	J K 19	E B 16	E B 16	E B 14	E B 16	23	G	G	G	44	45	47	44	G	G	G 24	G 20	31	25	28	E B 16	19	E B 16
9	E B 15	E B 15	26	E B 16	E B 15	E B 16	26	G	G	43	G 35	46	48	J A 59	54	G	36	31	24	J A 24	J A 27	28	J A 49	28
10	J A 26	J A 82	J A 64	J A 48	J A 49	20	27	G	G	E B 46	E B 46	46	44	43	39	G 34	G 27	G 18	19	E B 15	E B 15	E B 15	E B 16	E B 16
11	E B 16	E B 16	18	19	E B 16	E B 16	28	G	G	G	E B 34	45	46	J A 54	E B 46	47	J A 56	30	J A 50	27	J A 26	J A 30	E B 16	E B 15
12	E B 16	E B 14	E B 15	E B 16	E B 15	E B 16	26	34	39	44	44	47	50	E B 49	G	G	35	30	30	36	J A 25	E B 15	23	18
13	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	27	G	38	42	46	E B 44	J A 55	53	J A 80	G	40	J A 41	J A 36	J A 50	E B 16	22	E B 16	E B 16
14	E B 15	E B 16	E B 16	E B 15	E B 14	E B 16	24	G	G	G	E B 46	E B 46	E B 43	E B 49	E B 43	G	G 29	37	22	25	21	E B 16	E B 15	E B 16
15	E B 16	E B 15	E B 16	E B 16	E B 16	E B 17	G	G 36	G	G 28	E B 44	E B 46	E B 46	G	G	G	G	29	20	J A 20	E B 16	E B 16	E B 17	E B 16
16	E B 16	E B 16	18	E B 16	E B 15	E B 16	27	G	G	G	E B 45	E B 46	E B 46	E B 45	G	E B 46	G	G	20	E B 16	E B 15	E B 16	E B 15	E B 16
17	20	E B 16	19	19	20	24	28	G	37	38	39	G	G	G 35	G 26	43	40	32	20	J A 20	E B 14	E B 14	E B 17	E B 16
18	E B 14	E B 15	E B 16	E B 15	E B 15	E B 19	27	G	G	G	G 31	G 31	G 30	G	G	39	42	31	J A 30	J A 22	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 15	E B 15	E B 16	E B 16	J A 19	27	35	42	44	46	53	E B 44	E B 48	E B 46	E B 42	G	35	31	J A 32	J A 38	J A 31	19	23
20	31	J A 29	J A 25	J A 23	21	J A 20	31	39	42	J A 54	E B 53	44	47	J A 47	40	G	G	G	22	22	J A 27	E B 22	E B 18	20
21	E B 16	E B 15	18	E B 15	E B 15	E B 17	27	G	G	40	G	E B 48	E B 46	E B 46	E B 47	G	41	J A 45	24	J A 39	81	26	J A 52	J A 27
22	J A 23	E B 14	E B 14	E B 15	E B 15	J A 22	28	36	40	48	45	E B 46	53	E B 46	E B 44	E B 50	G	J A 47	J A 45	46	J A 37	26	J A 25	E B 14
23	E B 16	J A 24	E B 14	E B 15	E B 16	20	30	G	40	46	E B 46	E B 46	E B 44	G	E B 45	G	G	G	29	J A 54	J A 21	E B 16	20	E B 16
24	E B 15	E B 16	E B 14	E B 15	E B 16	E B 18	32	43	J A 52	49	45	E B 46	E B 45	G	G	G	37	J A 60	J A 50	J A 47	34	J A 52	J A 26	E B 16
25	E B 12	21	E B 16	20	22	J A 22	30	39	50	G	48	52	J A 53	46	G	G	G	33	46	J A 40	J A 26	J A 88	J A 38	J A 25
26	21	20	20	E B 15	E B 16	E B 21	30	35	44	46	56	J A 66	J A 52	J A 53	50	G	G	30	E B 22	E B 15	29	28	J A 26	24
27	J A 22	21	18	E B 14	E B 16	E B 18	30	34	J A 60	46	J A 52	J A 63	J A 48	J A 52	42	40	44	J A 45	J A 50	59	J A 24	A E 19	E B 16	E B 15
28	E B 16	E B 16	E B 15	E B 15	E B 14	E B 18	G	G	G	G	G	47	E B 50	45	J A 54	J A 69	J A 90	J A 68	J A 80	J A 29	J A 26	J A 24	J A 19	E B 16
29	E B 14	18	E B 15	E B 16	E B 15	E B 16	G	G	39	42	54	46	J A 54	E B 49	G	44	J A 56	J A 52	J A 60	J A 61	J A 28	20	28	J A 23
30	J A 24	J A 23	A E 16	B J 24	A E 15	B 19	G	35	43	J A 60	46	48	J A 52	J A 72	G	G	49	J A 64	J A 80	J A 72	J A 63	J A 27	A E 15	B E 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	G	G	40	44	46	46	46	E G 40	G	G	31	30	26	26	20	E B 17	E B 16
U Q	J A 22	J A 21	19	19	16	19	28	34	40	46	46	48	J A 52	J A 50	46	40	40	J A 41	J A 45	J A 46	29	J A 26	J A 23	22
L Q	E B 16	E B 15	E B 15	E B 15	E B 15	E B 16	G 23	G	G	G	G	E B 45	E B 46	G 44	G	G	G	G	E B 20	E B 20	E B 16	E B 16	E B 16	E B 16

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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 16	E B 16	E B 14	G	G	G 30	G	G	E B 50	46	100	G	G	G 17	30	19	26	16	14	16	17
2	19	15	E B 15	E B 15	E B 16	E B 15	G 18	G 24	G	42	G	E B 47	E B 61	E B 50	E B 46	G	G	G	E B 19	E B 16	E B 16	E B 12	E B 12	E B 16
3	E B 16	E B 16	E B 16	E B 13	E B 16	E B 14	24	G	G	G	E B 47	E B 50	46	E B 46	50	G	G	29	28	16	E B 16	E B 16	E B 16	16
4	18	18	16	E B 16	E B 17	E B 16	G	G	G	G	44	E B 50	E B 46	44	G	G	G	G	E B 18	19	16	25	E B 16	E B 15	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	G 23	32	G	G	E B 45	E B 48	E B 46	E B 45	G	G 36	G	G	E B 18	16	E B 16	E B 15	E B 16	E B 15
6	E B 16	E B 16	16	E B 16	E B 16	E B 16	26	G	G	E B 43	E B 44	E B 43	E B 47	E B 46	E B 42	G	G	G	E B 20	E B 13	E B 16	16	E B 16	17
7	E B 16	E B 16	16	16	E B 16	E B 14	24	31	36	42	46	48	50	G	G	G	G	31	26	28	22	16	E B 16	E B 16
8	16	E B 15	E B 16	E B 16	E B 14	E B 16	H 23	G	G	G	43	44	G 46	43	G	G	G 23	G 20	27	18	20	E B 16	16	E B 16
9	E B 15	E B 15	16	E B 16	E B 15	E B 16	26	G	G	42	G 35	45	G 47	58	53	G	35	30	24	22	23	22	25	20
10	18	22	45	27	19	15	26	G	G	E B 46	E B 46	46	G 43	42	G 39	G 34	G 27	G 17	19	E B 15	E B 15	E B 15	E B 16	E B 16
11	E B 16	E B 16	16	16	E B 16	E B 16	26	G	G	G	G E B 34	45	45	51	E B 46	41	53	30	48	20	21	20	E B 16	15
12	E B 16	E B 14	E B 15	E B 16	E B 15	E B 16	26	34	39	44	44	47	49	E B 49	G	G	35	28	30	30	17	E B 15	16	16
13	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	26	G	38	G 41	46	E B 44	53	52	75	G	39	34	33	45	E B 16	16	E B 16	E B 16
14	E B 15	E B 16	E B 16	E B 15	E B 14	E B 16	23	G	G	G	E B 46	E B 46	E B 43	E B 49	E B 43	G	G 28	36	22	16	20	E B 16	E B 15	E B 16
15	E B 16	E B 15	E B 16	E B 16	E B 16	E B 17	G	G	36	G	G E B 28	E B 44	E B 46	G	G	G	G	29	19	16	E B 16	E B 16	E B 17	E B 16
16	E B 16	E B 16	16	E B 16	E B 15	E B 16	27	G	G	G	G	E B 45	E B 46	E B 45	G	E B 46	G	G	20	E B 16	E B 15	E B 16	E B 15	E B 16
17	16	E B 16	E B 15	16	16	17	28	G	G 36	G 37	G 39	G	G	G 34	G 26	42	39	31	19	16	E B 14	E B 14	E B 17	E B 16
18	E B 14	E B 15	E B 16	E B 15	E B 15	E B 19	27	G	G	G	G 30	G 31	G 30	G	G	38	36	30	27	20	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 15	E B 15	E B 16	E B 16	18	26	34	41	44	45	52	E B 44	E B 48	E B 46	E B 42	G	34	30	26	34	24	16	E B 18
20	28	22	23	16	16	20	30	38	42	A E 54	B U 53	Y 43	46	46	G 39	G	G	G	22	16	24	18	E B 18	16
21	E B 16	E B 15	16	E B 15	E B 15	E B 17	G 26	G	G	G 40	G E B 48		E B 46	E B 46	E B 47	G	39	43	23	32	79	18	E B 16	21
22	17	E B 14	E B 14	E B 15	E B 15	22	27	36	39	46	43	E B 46	50	E B 46	E B 44	E B 50	G	44	44	35	31	16	15	E B 14
23	E B 16	16	E B 14	E B 15	E B 16	17	28	G	G 40	45	E B 46	E B 46	E B 44	G	E B 45	G	G	G	28	50	18	E B 16	16	E B 16
24	E B 15	E B 16	E B 14	E B 15	E B 16	E B 18	29	41	48	46	44	E B 46	E B 45	G	G	G	36	56	48	45	31	32	22	E B 16
25	E B 12	16	E B 16	16	15	20	28	38	48	G	48	50	48	45	G	G	G	28	44	38	22	58	21	16
26	15	15	E B 16	E B 15	E B 16	E B 21	29	G 34	42	45	54	64	50	51	50	G	G	29	E B 22	E B 15	20	21	20	17
27	16	16	16	E B 14	E B 16	E B 18	28	34	58	45	50	62	45	49	41	40	39	44	49	53	22	16	E B 16	E B 15
28	E B 16	E B 16	E B 15	E B 15	E B 14	E B 18	G	G	G	G	G	E B 44	E B 50	G 44	G 52	67	76	48	53	26	22	18	16	E B 16
29	E B 14	16	E B 15	E B 16	E B 15	E B 16	G	G	38	G 42	50	46	48	E B 49	G	G 44	50	42	58	48	24	17	20	19
30	22	18	E B 16	22	E B 15	18	G	34	43	58	45	48	48	66	G	G	48	56	76	41	34	16	E B 15	E B 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	G	G	G E G 44		46	46	E G 46	G	G	G	30	26	21	20	16	E B 16	E B 16
U Q	16	16	16	16	E B 16	18	27	34	G	45	46	48	48	49	G	G	39	36	44	35	24	18	17	16
L Q	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G	G	39	G	G	44	45	G	45	44	G	G	20	E B 16	E B 16	E B 16	E B 16	E B 16

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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	16	16	14	14	14	16	25	23	50	29	42	23	18	14	17	14	16	16	14	14	16
2	16	14	15	15	16	15	15	17	22	21	24	47	61	50	46	22	15	15	19	16	16	12	12	16
3	16	16	16	13	16	14	14	15	19	20	47	50	22	46	43	21	16	16	14	12	16	16	16	16
4	15	15	16	16	17	16	14	16	19	19	24	50	46	44	20	21	18	14	19	14	14	16	15	16
5	16	16	16	16	15	16	14	16	16	18	45	48	46	45	28	18	20	15	18	16	16	15	16	15
6	16	16	15	16	16	16	15	16	21	43	44	43	47	46	42	21	16	16	20	13	16	16	16	15
7	16	16	16	15	16	14	15	19	16	22	28	42	41	27	23	16	16	14	15	16	16	16	16	16
8	16	15	16	16	14	16	16	16	16	20	21	25	44	39	23	20	17	15	13	15	13	16	15	16
9	15	15	15	16	15	16	16	18	16	20	24	41	25	41	42	21	21	16	14	16	16	16	16	16
10	16	16	16	15	14	14	16	20	20	46	46	41	39	23	27	20	19	15	16	15	15	15	16	16
11	16	16	16	16	16	16	14	19	20	17	15	45	42	42	46	23	16	16	14	16	16	16	16	15
12	16	14	15	16	15	16	16	16	20	25	40	32	36	49	30	26	16	13	16	14	16	15	15	15
13	16	16	16	15	16	16	16	14	15	21	41	44	43	44	23	21	16	14	15	16	16	15	16	16
14	15	16	16	15	14	16	16	18	19	24	46	46	43	49	43	24	18	14	14	16	16	16	15	16
15	16	15	16	16	16	17	16	15	19	22	20	44	46	18	16	17	14	16	15	16	16	16	17	16
16	16	16	14	16	15	16	16	20	18	21	21	45	46	45	21	46	18	15	16	16	15	16	15	16
17	15	16	15	16	15	12	16	15	19	19	22	20	20	22	19	21	15	16	15	16	14	14	17	16
18	14	15	16	15	15	19	16	17	19	21	21	23	22	23	21	19	14	16	16	16	16	16	16	16
19	16	15	15	16	16	16	14	20	18	18	40	39	44	48	46	42	20	17	15	16	14	16	15	18
20	15	16	15	15	16	16	18	20	20	19	53	41	41	39	23	28	19	14	15	16	14	16	18	16
21	16	15	15	15	15	17	18	19	16	21	20	48	46	46	47	22	14	18	16	16	15	15	16	16
22	16	14	14	15	15	16	16	15	20	18	20	46	46	46	44	50	17	15	18	15	16	16	13	14
23	16	15	14	15	16	15	18	22	21	41	46	46	44	23	45	20	18	16	16	15	15	16	16	16
24	15	16	14	15	16	18	18	18	21	23	42	46	45	25	24	26	18	16	15	20	15	16	15	16
25	12	16	16	16	15	20	16	18	22	24	21	27	42	23	19	20	16	16	16	15	14	15	16	15
26	15	15	16	15	16	21	22	20	22	24	28	44	42	42	39	22	20	16	22	15	15	15	16	16
27	14	14	15	14	16	18	16	18	16	22	25	40	23	29	18	21	17	16	14	16	15	15	16	15
28	16	16	15	15	14	18	16	18	20	22	22	41	50	22	26	22	18	16	16	14	15	15	15	16
29	14	16	15	16	15	16	16	18	20	20	23	20	28	49	25	19	16	18	16	16	16	16	16	16
30	14	16	16	15	15	15	18	20	22	26	29	42	39	42	27	21	20	16	16	17	16	16	15	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	15	16	16	16	18	19	21	24	44	42	42	26	21	17	16	16	16	16	16	16	16
U Q	16	16	16	16	16	17	16	19	20	24	42	46	46	46	43	23	18	16	16	16	16	16	16	16
L Q	15	15	15	15	15	15	15	16	16	20	21	40	36	25	23	20	16	15	15	15	15	15	15	16

IONOSPHERIC DATA STATION Kokubunji

APR. 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

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	270	258	250	253	240	257	291	301	294	281	274	270	265	R 263	267	262	266	278	279	267	264	R 267	268	265
2	R 268	281	284	276	246	233	R 280	303	292	282	281	275	258	257	260	258	255	270	269	270	261	260	265	255
3	262	266	289	286	259	251	294	302	292	286	274	270	265	262	255	256	259	269	283	293	264	259	260	263
4	262	273	268	251	255	260	287	295	289	283	282	265	R 264	259	258	258	263	267	277	277	269	270	279	280
5	255	247	257	R 243	232	248	299	284	294	283	278	266	265	264	259	263	265	274	280	274	259	R 264	271	287
6	282	277	286	281	255	254	303	303	298	290	292	275	268	264	263	257	263	272	280	285	259	260	R 266	R 276
7	270	258	271	280	234	228	R 284	288	302	263	269	R 259	252	265	264	255	260	257	283	278	R 260	261	261	256
8	R 252	255	R 277	289	291	R 259	308	305	295	289	285	275	269	265	R 266	269	273	279	283	274	R 259	262	265	R 271
9	R 272	280	305	327	253	261	R 306	307	295	296	276	271	273	273	272	270	272	279	279	277	263	R 267	R 261	R 263
10	262	R 273	252	244	247	247	283	283	292	286	281	274	268	265	263	265	265	275	287	R 277	256	257	258	R 270
11	R 281	280	266	257	253	269	301	305	284	292	281	283	272	271	263	271	274	280	284	285	R 264	R 270	R 265	270
12	264	261	277	275	252	264	303	306	299	287	283	278	275	270	269	270	280	281	290	295	273	260	267	271
13	274	273	278	273	284	289	R 320	301	294	279	278	275	273	268	265	265	272	280	284	273	257	265	280	278
14	R 280	282	R 295	300	285	288	R 302	309	R 292	283	279	277	R 274	273	271	276	274	279	288	R 295	272	R 265	R 263	276
15	R 286	290	279	278	261	269	298	305	297	293	281	272	272	265	268	275	279	290	296	294	R 275	R 263	270	275
16	280	292	285	282	286	276	306	300	295	286	282	275	267	267	269	266	270	286	290	267	254	263	261	272
17	303	274	260	277	266	264	301	301	284	275	279	278	276	275	276	276	281	289	299	308	278	260	268	280
18	276	263	266	264	270	274	303	314	304	294	280	275	277	277	273	278	279	279	297	306	293	R 279	274	R 273
19	278	275	282	283	270	277	304	306	314	295	280	269	263	R 269	R 269	269	274	287	297	287	R 257	260	270	259
20	R 262	270	294	R 271	291	253	R 264	R 268	252		A	R	R	R 244	258	R 258	262	282	283	281	274	276	256	253	255
21	254	266	274	261	249	R 260	R 322	314	295	272	276	267	263	264	270	276	285	287	291	290		R 265	263	R 269
22	R 281	R 287	289	284	266	276	296	306	287	287	275	273	272	271	268	270	272	278	294	304	283	266	R 263	R 267
23	272	281	289	271	271	279	304	302	R 299	280	272	272	269	270	273	276	275	289	296	297	278	266	270	272
24	282	286	265	267	266	R 270	305	292	288	R 275	270	280	279	R 276	270	277	278	287	293	303	271	254	245	245
25	236	259	258	278	263	253	283	302	291	284	273	256	251	261	261	276	278	282	R 289	298	R 297	268	U R 276	264
26	272	273	275	F	282	275	320	318	287	281	276	273	274	278	275	280	280	282	291	297	294	R 272	R 266	R 269
27	275	287	299	300	282	284	305	295	291	272	279	273	278	274	R 276	273	279	R 278	290	R 298	R 291	257	R 260	257
28	R 260	R 268	267	265	273	279	R 281	300	284	277	273	280	272	276	280	278	282	278	R 294	301	R 264	257	262	266
29	267	267	R 263	R 257	R 263	273	R 316	297	270	278	276	280	274	277	276	280	279	285	302	295	286	262	267	252
30	243	259	274	R 286	270	R 279	305	R 294	278	299	277	268	272	281	270	274	280	288	299	R 311	R 285	R 263	262	259
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	30	30	29	29	29	30	30	30	30	30	30	30	30	29	30	30	30
MED	271	273	276	276	264	266	302	302	292	283	278	273	270	268	268	270	274	280	290	292	269	263	265	269
U Q	280	281	286	284	273	276	305	306	295	290	281	276	274	274	272	276	279	286	294	298	280	R 266	270	273
L Q	262	263	266	262	253	254	291	295	287	278	274	270	265	264	263	263	266	278	283	277	260	260	261	259

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L	L	L	A	L	L	L							
2									L	L	L	L	L	L	L	L	L							
3											L	L	L	L	L	L 326	L							
4									L	L	L	L	L	L	L	L	L							
5									L	L	L	L	L	L 336	L	L	L							
6									L	L	L	L	L	L	L	L	L	L						
7										L		L	L	L	L	L		L						
8										L		L	L	L	L	L	L							
9									L	L	L	L	L	L	L									
10									L	L	L	L	L	L	L	L	L	L						
11								L	L	L	L	L	L	L	L	L	L							
12										L	L	L	L	L	L	L	L							
13								L	L		L	L	L	L	A	L		L						
14										L	L	L	L	L	L	L		L						
15									L	L	L	L	L	L	L	L	L							
16										L	L	L	L	L	L	L	L	L						
17											L	L	L	L	L		L							
18										L	L	L	L	L	L	L	L							
19										L	L	L	L 331	L	L	L	L							
20							L 301	R 304	R 339	A	B	368	R 339	R 361	U R 347	L 339	L 321	L						
21										L	L	L	L	L	L	L	L							
22										L	L	L	L	L	U L 368	L	L							
23											L	L	L	L	U L 340	L	L	L						
24									L	L	L	L	L	L	L	L	L							
25										L	L	L	L	R 328	L 326	L	L	L						
26										L	L	L	L	L	L	L	L							
27									A	L	L		L	L	L	L	L							
28									L	L	L	L	L	L 350	A	A	A	A						
29										L	L	L	L	L	L	L	L							
30										A	L 363	L	L	A	L	L		A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	1	1		1	1	2	4	4	2	1							
MED							L 301	R 304	R 339		L 363	368	335	343	U L 344	L 332	L 321							
U Q														356	U 358									
L Q														332	L 333									

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

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APR. 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											332	340	350	376	340	332	332							
2									294	322	308	274	356	354	350	356	350							
3											328	322	350	338	364	370	346							
4									282	298	294	346	340	354	360	344	326							
5									264	288	306	340	346	346	350	346	338							
6									280	284	292	338	278	338	344	372	332	308						
7										336		328	354	336	360	382		328						
8										284		320	330	344	322	318	308							
9									284	278	286	334	326	334	318									
10									278	306	290	318	350	346	338	336	328	310						
11								272	296	300	304	302	342	342	352	314	324							
12										302	278	316	328	328	336	350	312							
13								274	286		330	288	324	336	350	316		294						
14										282	308	302	314	314	318	324		300						
15									266	280	290	288	330	348	332	320	302							
16										308	274	326	340	340	328	340	316	280						
17											264	326	330	326	322		316							
18										290	256	324	312	320	310	316	296							
19										276	286	336	360	342	346	322	306							
20							380	376	440	A	520	Y	512	434	438	404	348	322						
21										328	332	302	344	348	332	322	288							
22										286	300	320	338	330	306	322	314							
23											326	308	332	330	308	298	314	296						
24									298	332	336	324	310	302	340	320	306							
25										306	320	344	364	360	354	324	300	300						
26										310	322	338	322	324	334	308	286							
27									268	284	314		330	302	310	310	302							
28									288	300	322	324	292	336	316	322	324	288						
29										318	326	326	324	322	308	316	302							
30										294	302	336	344	308	338	330		290						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	3	13	24	28	28	30	30	30	28	25	11						
MED							380	274	284	299	307	324	335	337	337	323	314	300						
U Q								376	295	309	326	336	350	346	350	345	330	310						
L Q								272	273	284	290	312	324	326	318	317	302	290						

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

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APR. 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	284	292	308	276	280	308	248	240	238	238	232	258	242	A	252	236	244	264	246	260	266	276	272	288
2	306	280	254	248	326	368	240	228	234	230	228	238	282	258	242	240	248	258	274	254	264	266	276	310
3	302	286	250	220	262	314	244	236	234	228	240	240	240	246	252	244	246	264	266	242	232	280	298	304
4	308	296	272	280	280	282	234	236	232	234	234	252	230	230	238	240	244	258	266	254	270	270	264	266
5	316	332	292	268	330	320	230	234	236	232	234	242	236	234	246	246	244	250	256	248	276	294	280	268
6	272	278	270	234	280	328	240	230	230	222	234	234	232	230	228	240	248	256	258	244	246	290	288	282
7	282	300	272	230	344	368	250	254	244	244	248	248	246	242	246	236	260	272	278	246	246	282	294	314
8	326	316	290	246	218	300	224	236	232	230	236	220	242	232	226	246	242	248	254	236	252	276	308	294
9	288	280	242	206	260	308	240	234	234	228	236	218	242	278	270	236	248	248	246	254	278	282	318	312
10	312	324	342	328	310	324	236	234	240	242	234	238	238	234	242	244	238	254	258	228	280	310	306	286
11	268	272	280	266	300	286	230	226	226	240	220	222	232	258	236	228	274	246	274	252	274	294	286	286
12	290	316	278	252	292	304	232	230	228	232	234	234	252	246	248	266	242	250	264	246	236	270	284	290
13	290	282	278	258	254	248	222	222	226	240	242	228	246	264	A	238	252	250	244	272	270	288	274	278
14	288	282	258	246	240	256	234	240	232	230	228	224	218	260	244	224	242	244	266	248	244	282	300	290
15	272	262	270	268	292	308	244	238	216	216	206	220	222	244	238	226	252	246	264	252	252	286	284	282
16	276	266	270	258	240	254	238	242	232	226	226	234	234	238	224	250	236	238	258	276	316	284	288	290
17	254	244	274	242	256	298	250	242	238	234	236	220	250	230	240	250	246	252	256	236	236	248	284	272
18	278	300	300	290	270	272	234	234	226	220	218	218	226	242	234	234	230	254	272	242	234	244	254	280
19	290	288	278	242	236	286	246	246	236	226	218	252	218	252	252	256	248	256	250	244	306	308	274	302
20	318	280	262	218	258	342	296	E 356	E A 284	A	B	Y 248	E A 258	242	260	246	238	254	278	268	286	280	318	318
21	320	282	266	302	342	302	242	226	228	216	230	236	236	242	246	246	248	264	264	256	E A 378	298	314	314
22	286	266	262	252	274	284	234	234	232	244	218	224	262	244	230	290	250	278	274	258	248	258	284	292
23	296	270	258	246	280	290	240	244	234	246	228	214	222	212	236	232	252	254	256	264	250	254	278	286
24	274	276	282	292	278	276	228	234	246	238	230	220	238	248	238	254	246	286	274	242	240	310	356	344
25	340	256	200	266	258	304	256	252	246	220	252	266	238	232	250	212	232	240	270	260	246	358	290	302
26	294	282	288	258	246	276	242	246	236	234	268	306	260	260	266	246	236	240	258	248	232	250	296	294
27	280	266	252	232	254	260	238	238	A	226	258	302	232	E A 274	230	228	254	272	282	270	236	266	312	314
28	304	300	294	274	254	254	236	236	226	H 208	240	234	E B 264	232	A	A	A	A	274	240	248	298	302	296
29	302	298	318	308	296	256	238	228	224	230	258	234	248	274	U R 258	262	E A 268	274	274	266	256	268	292	350
30	342	324	280	266	264	272	240	232	238	A	220	232	248	A	242	256	276	A	288	260	262	260	302	308
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	29	28	29	30	30	28	28	29	29	28	30	30	30	30	30	30
MED	290	282	273	258	272	294	239	236	233	230	234	234	238	242	242	244	246	254	265	252	252	281	289	293
U Q	308	300	288	274	292	308	244	242	238	238	240	248	248	258	251	250	252	264	274	260	274	294	302	310
L Q	280	272	262	242	254	272	234	232	228	226	227	222	232	233	236	235	242	248	256	244	244	266	280	286

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APR. 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							134	110	120	112	110	B	114	B	114	114	116	116	B					
2							140	126	114	114	116	B	B	B	B	116	112	118	B					
3							122	114	110	110	B	B	112	B	B	114	114	114	B					
4							112	114	110	110	114	B	B	B	114	118	112	118						
5							124	112	110	112	B	B	B	B	116	A	114	118	B					
6							126	114	114	B	B	B	B	B	B	124	118	122	B					
7							116	114	112	114	114	B	B	114	116	114	114	116	B			B		
8							124	118	114	110	114	114	B	B	116	112	116	122	A					
9							120	114	110	108	110	B	112	B	B	114	114	116	B					
10							118	116	114	B	B	B	B	110	116	128	118	118	B					
11							124	116	114	108	124	B	B	B	B	116	112	116	B					
12							124	116	110	116	B	120	120	B	118	116	112	116	B					
13							138	116	110	110	B	B	B	B	114	114	112	120	B					
14							122	114	110	114	B	B	B	B	B	112	120	A	B					
15							114	114	110	110	118	B	B	112	110	114	112	114	B					
16							118	116	112	110	110	B	B	B	112	B	116	116	B					
17							118	112	110	110	110	106	114	A	118	112	112	118	B					
18							118	114	110	112	116	116	A	110	112	122	114	116	B					
19							122	114	112	110	B	B	B	B	B	B	112	118	118					
20							134	116	110	110	B	B	B	B	110	122	112	116	B					
21							122	114	110	124	108	B	B	B	B	112	112	120	B					
22							118	114	112	112	112	B	B	B	B	B	114	118	B					
23							132	120	114	B	B	B	B	110	B	112	114	116	E B 144					
24							124	118	114	114	B	B	B	112	112	116	110	120	122					
25							122	114	112	114	110	112	B	110	110	114	114	120	B					
26							134	114	110	116	114	B	B	B	B	116	116	118	B					
27							118	114	114	110	114	B	112	114	116	114	A	A	A					
28							118	114	116	110	112	B	B	112	114	114	116	112	B					
29							118	114	110	112	114	112	110	B	112	114	112	118	B					
30							122	116	114	118	114	B	B	B	110	116	114	116	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							30	30	30	27	19	6	7	9	19	26	29	28	3					
MED							122	114	112	112	114	113	112	112	114	114	114	118	120					
U Q							124	116	114	114	114	116	114	113	116	116	116	118	E B 144					
L Q							118	114	110	110	110	112	112	110	112	114	112	116	118					

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

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APR. 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	G	G	106	G	G	B	126	116	G	G	100	122	114	108	108	114	114	106
2	106	110	B	B	B	B	126	112	G	118	G	B	B	B	B	G	G	G	B	B	B	B	B	B
3	B	B	B	B	B	B	154	G	G	G	B	B	154	B	136	G	G	144	120	116	B	B	B	106
4	106	104	102	B	B	B	G	G	G	G	124	B	B	B	G	G	G	106	B	104	106	B	B	B
5	B	B	B	B	B	B	154	116	G	G	B	B	B	B	G	122	G	G	B	B	B	B	B	B
6	B	B	106	108	B	B	160	G	G	B	B	B	B	B	B	G	G	G	B	B	B	116	B	108
7	B	B	110	106	B	B	164	172	124	134	122	118	116	G	G	G	G	130	124	116	112	116	B	B
8	128	126	B	B	B	B	174	G	G	G	126	126	120	114	G	G	106	104	100	116	110	B	100	B
9	B	B	86	B	B	B	178	G	G	138	106	128	130	118	118	G	116	112	112	110	110	108	106	106
10	106	108	102	102	108	114	174	G	G	B	B	124	124	120	112	112	106	106	130	B	B	B	B	B
11	B	B	120	118	B	B	132	G	G	G	110	B	146	132	B	130	116	140	120	114	108	108	B	B
12	B	B	B	B	B	B	178	160	142	134	138	120	128	B	G	G	148	146	120	114	112	B	104	100
13	B	B	B	B	B	B	174	G	148	138	126	B	122	134	118	G	132	128	118	112	B	112	B	B
14	B	B	B	B	B	B	146	G	G	G	B	B	B	B	B	G	106	104	132	118	104	B	B	B
15	B	B	B	B	B	B	G	G	116	G	102	B	B	G	G	G	G	168	128	112	B	B	B	B
16	B	B	102	B	B	B	178	G	G	G	G	B	B	B	G	B	G	G	136	B	B	B	B	B
17	138	B	132	184	150	152	136	G	122	126	124	G	G	102	102	144	138	132	124	114	B	B	B	B
18	B	B	B	B	B	B	162	G	G	G	104	106	104	G	G	150	134	126	118	114	B	B	B	B
19	B	B	B	B	B	166	150	146	130	124	122	122	B	B	B	B	G	152	126	110	110	110	98	112
20	106	104	106	112	166	148	140	132	126	118	B	124	114	116	124	G	G	G	122	122	98	110	B	112
21	B	B	98	B	B	B	172	G	G	120	G	B	B	B	B	G	120	114	112	110	110	110	108	102
22	102	B	B	B	B	146	178	150	136	130	130	B	136	B	B	B	G	130	118	114	108	104	114	B
23	B	106	B	B	B	144	146	G	132	124	B	B	B	G	B	G	G	G	134	112	116	B	114	B
24	B	B	B	B	B	B	148	136	126	122	128	B	B	G	G	G	184	122	116	110	110	110	108	B
25	B	110	B	108	108	154	134	128	122	G	126	120	136	144	G	G	G	120	116	112	108	108	106	106
26	102	102	98	B	B	B	138	140	130	126	118	112	118	116	116	G	G	146	B	B	110	110	104	106
27	102	96	98	B	B	B	130	132	112	116	110	108	112	138	116	108	146	126	118	112	96	98	B	B
28	B	B	B	B	B	B	G	G	G	G	G	128	B	140	124	122	114	114	114	112	104	106	108	B
29	B	136	B	B	B	B	G	G	146	124	116	118	116	B	G	144	122	120	116	112	114	116	114	102
30	98	94	B	110	B	138	G	144	130	116	120	122	114	118	G	G	132	118	112	108	108	106	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	11	12	8	4	8	24	12	16	16	18	14	17	13	9	8	16	24	25	24	20	17	13	11
MED	106	106	102	109	129	147	154	138	128	124	122	121	122	118	118	126	121	124	118	112	109	110	108	106
U Q	106	110	108	115	158	153	174	148	134	132	126	124	133	136	124	144	136	136	125	114	110	113	114	108
L Q	102	102	98	107	108	141	139	130	122	119	110	118	115	116	114	117	110	114	115	110	107	107	104	102

IONOSPHERIC DATA STATION Kokubunji

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

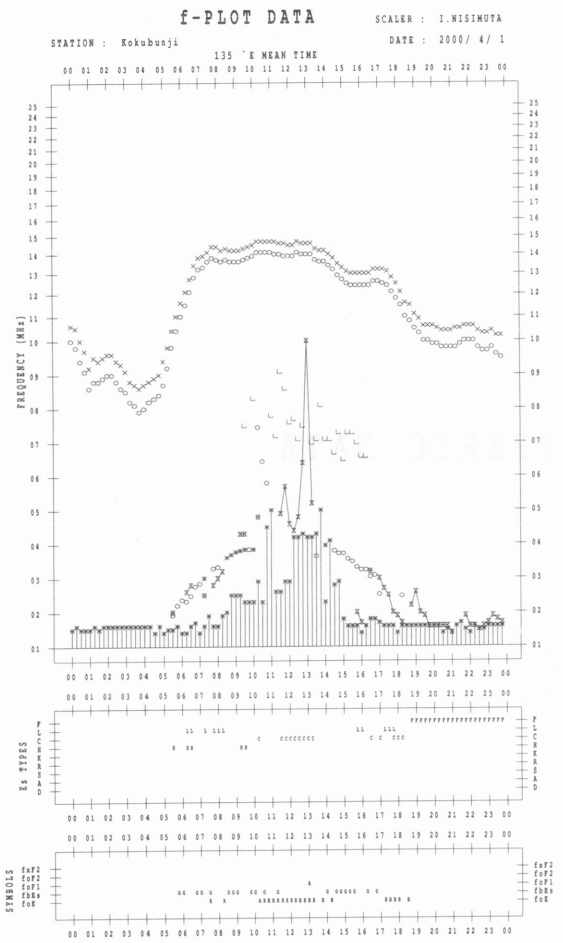
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

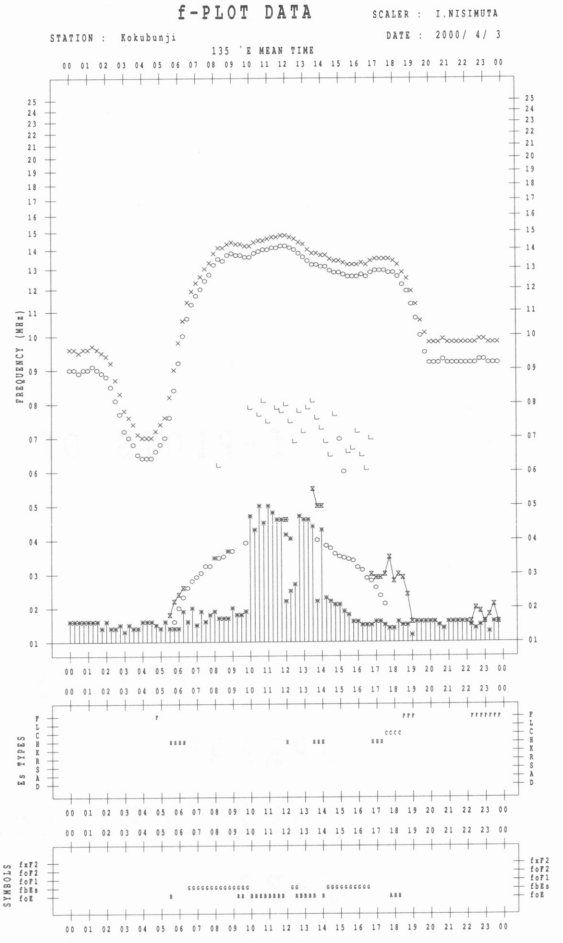
H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L 1				C 1	C 2			L 1	C 2	C 1	F 3	F 1	F 1	F 1	F 2
2	F 2	F 1					L 1	L 1		C 1														
3							H 1						H 1		H 1			H 1	C 3	F 2				F 2
4	F 2	F 2	F 1								C 1							L 1		F 1	F 3			
5							H 1	C 1								C L 1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

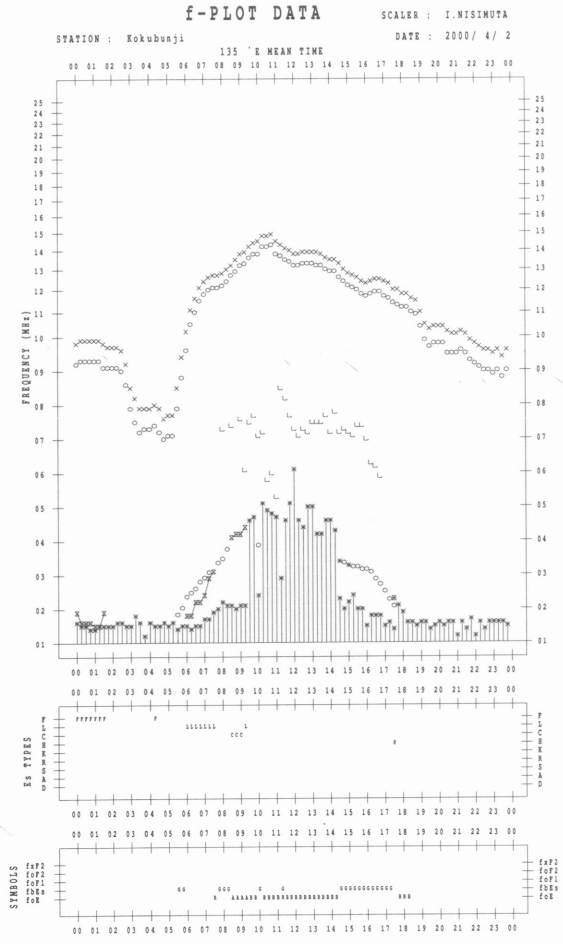
APR. 2000 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

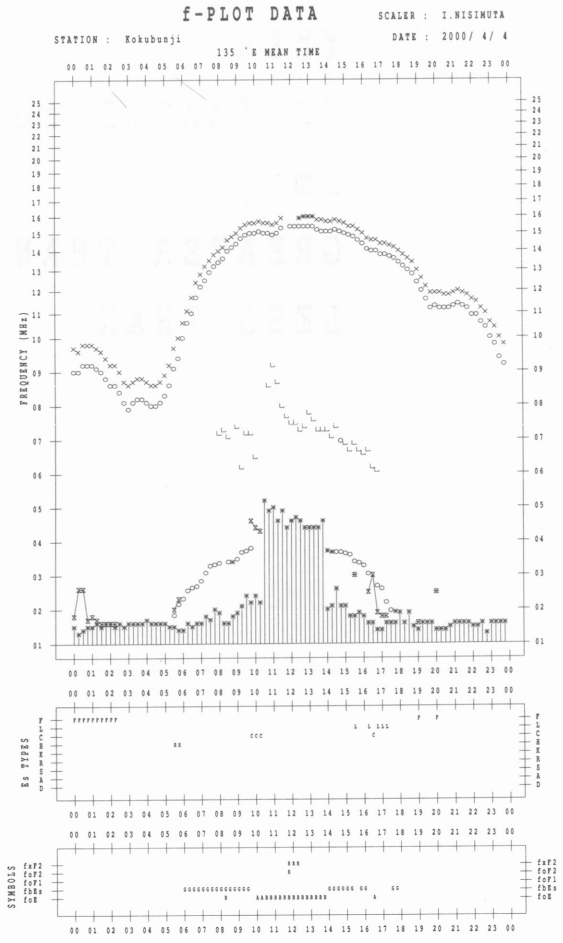
f-PLOTS OF IONOSPHERIC DATA

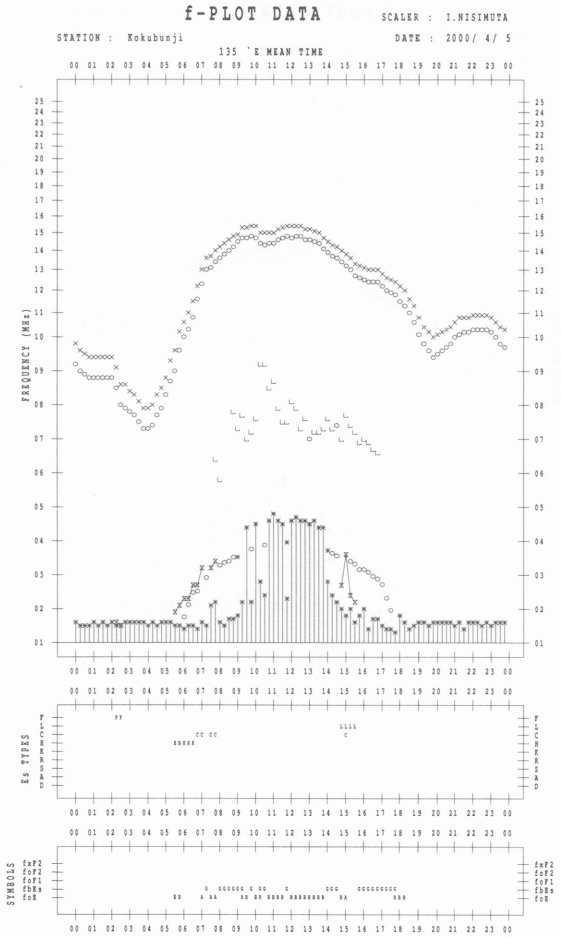
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

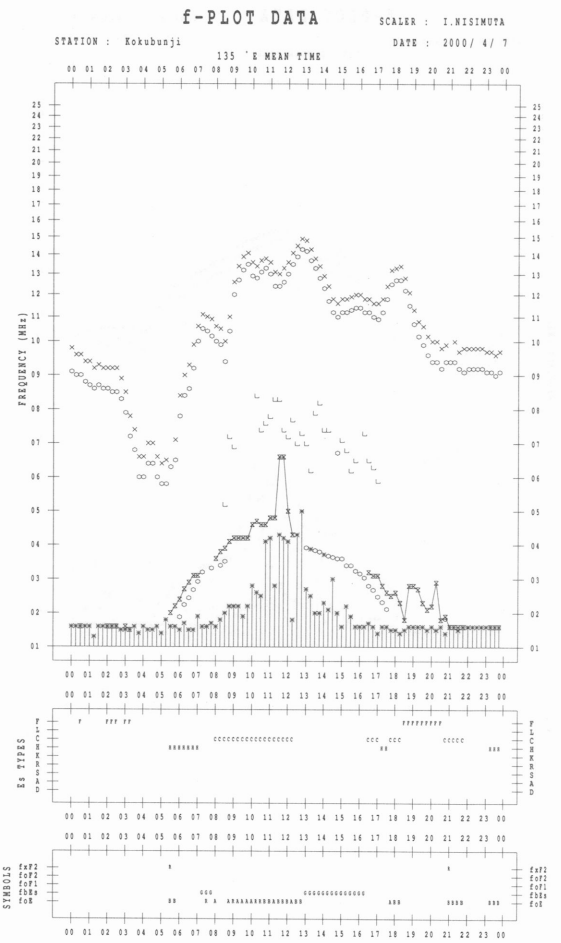

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

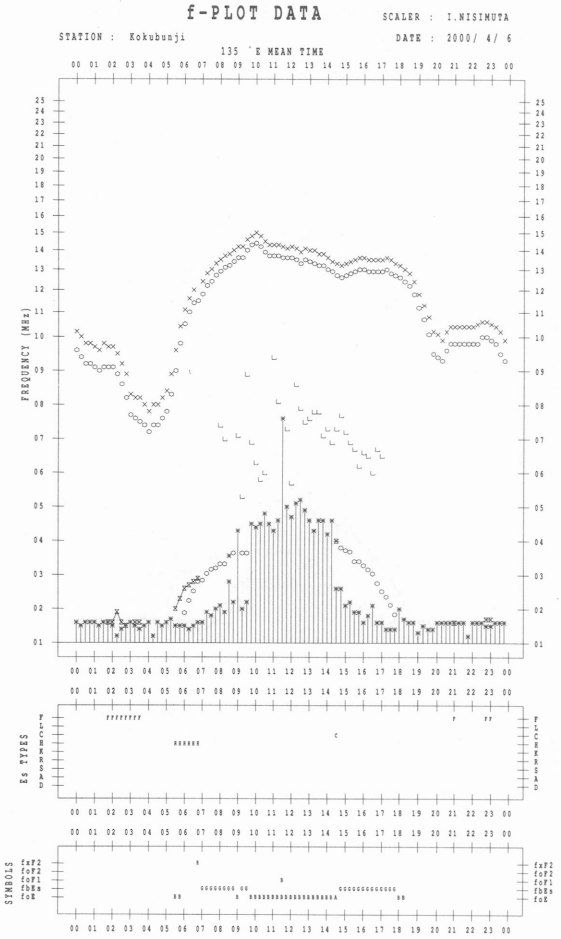

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

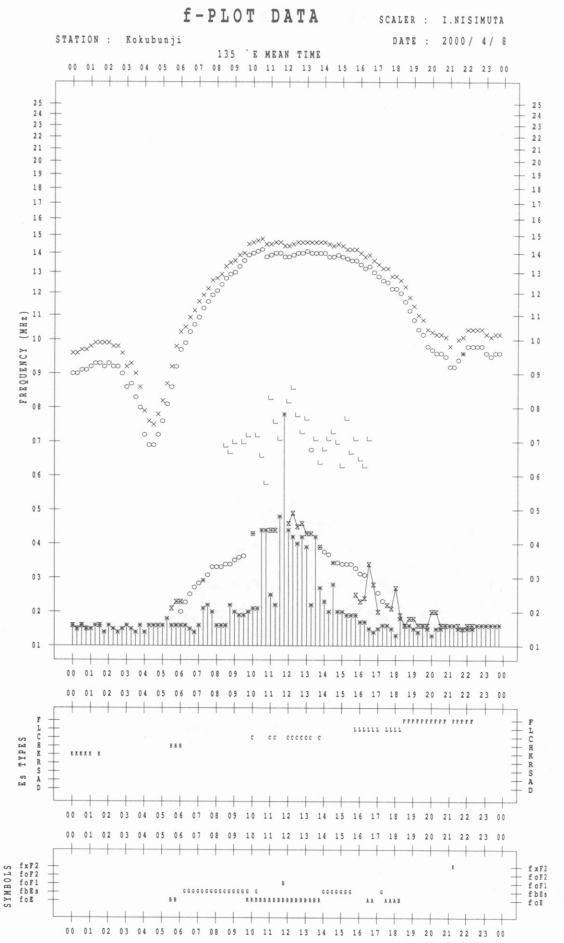

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

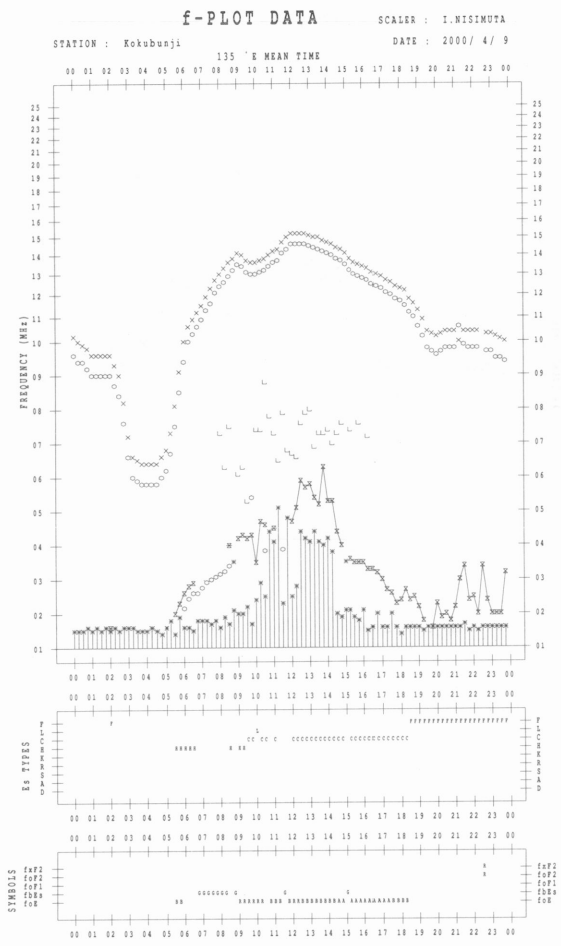

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

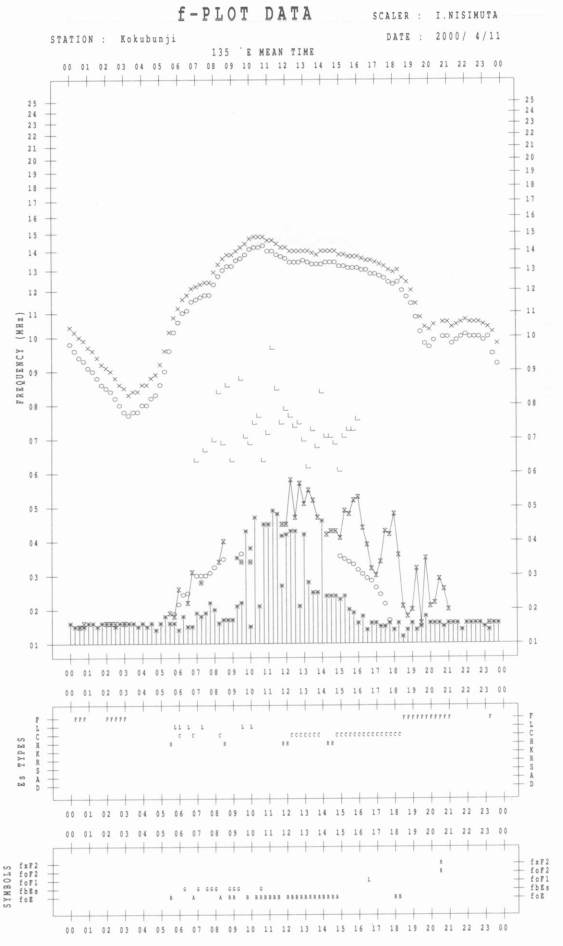

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

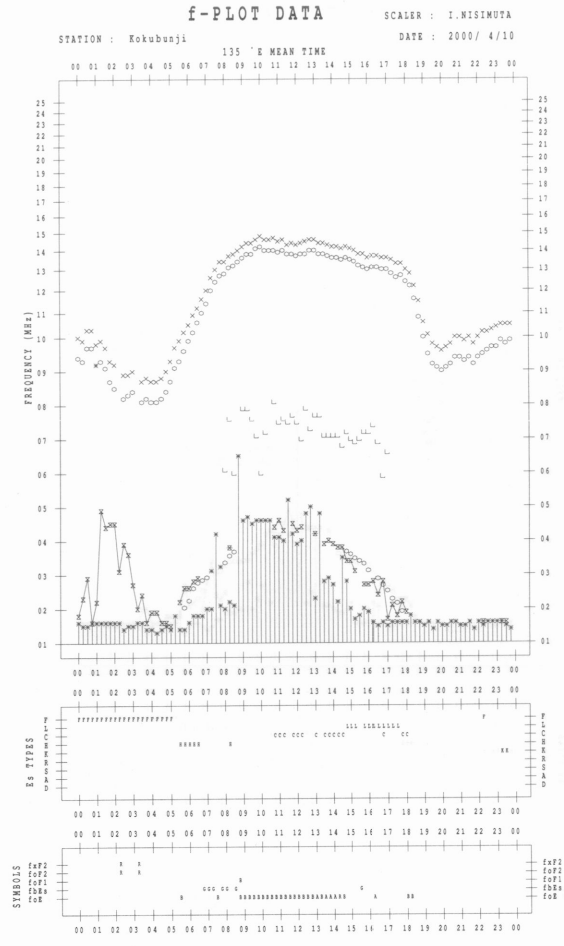

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

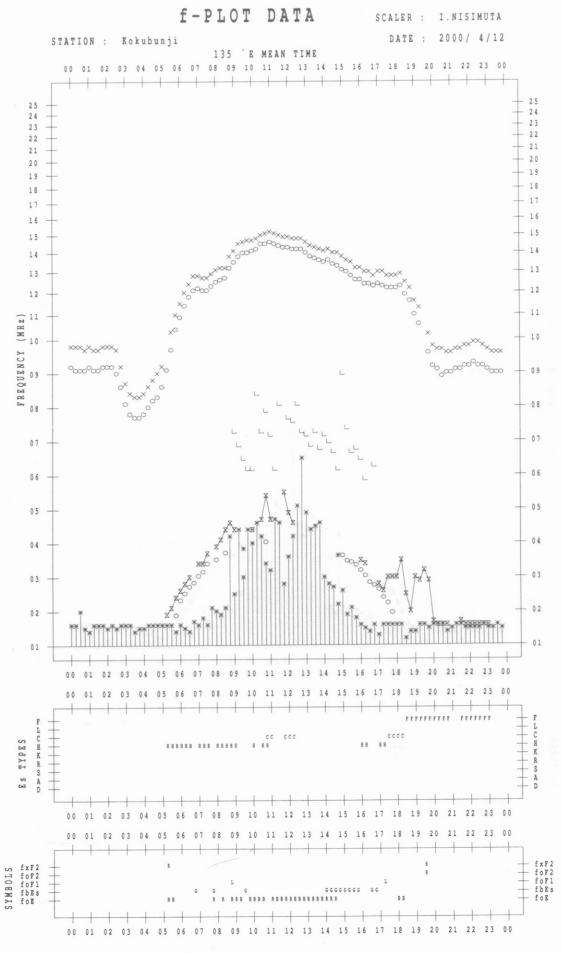

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

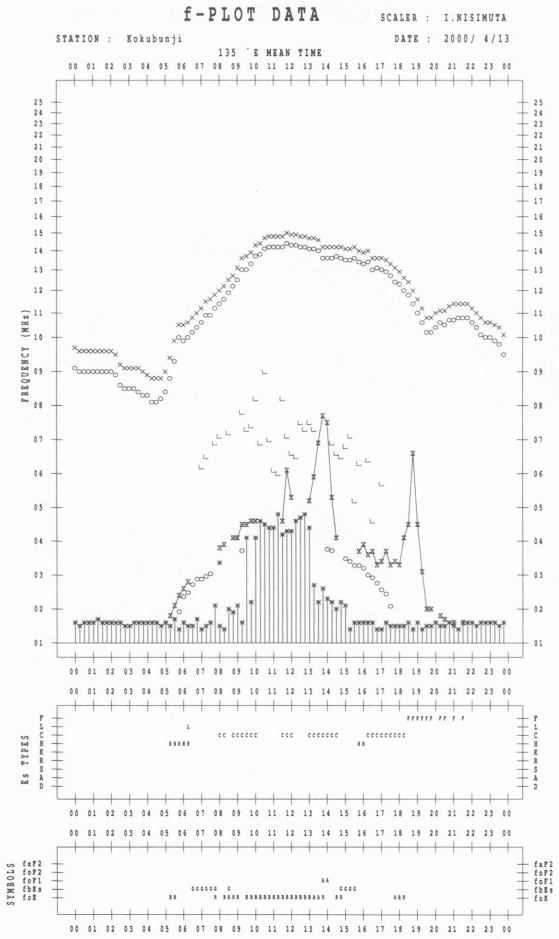

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

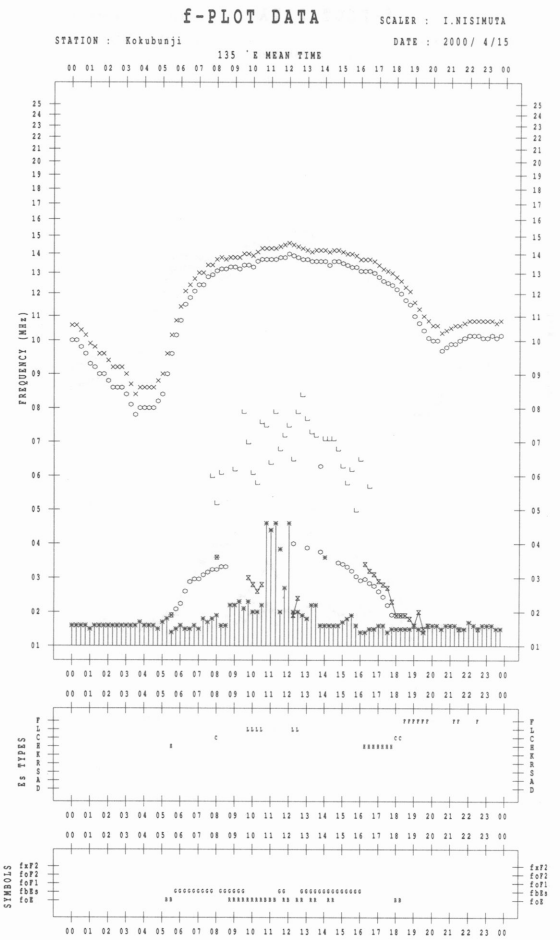

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

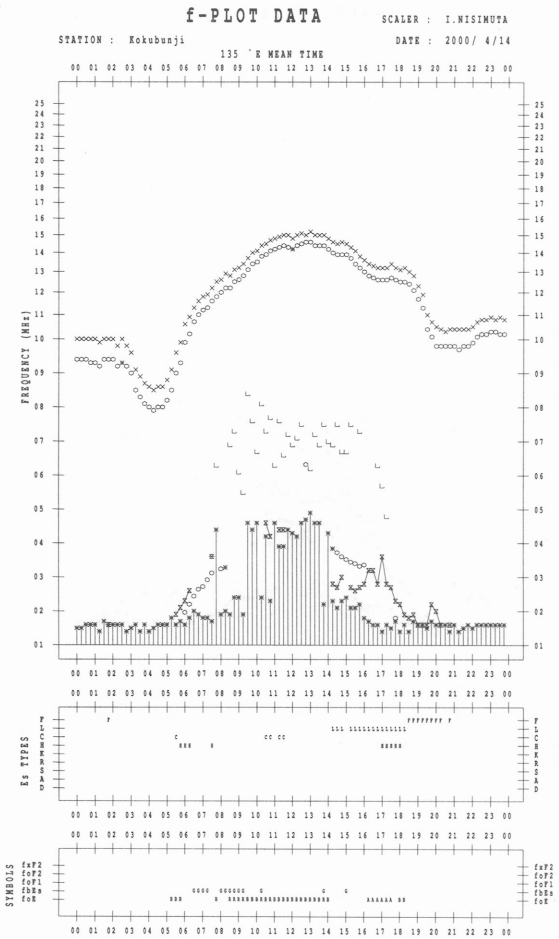

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

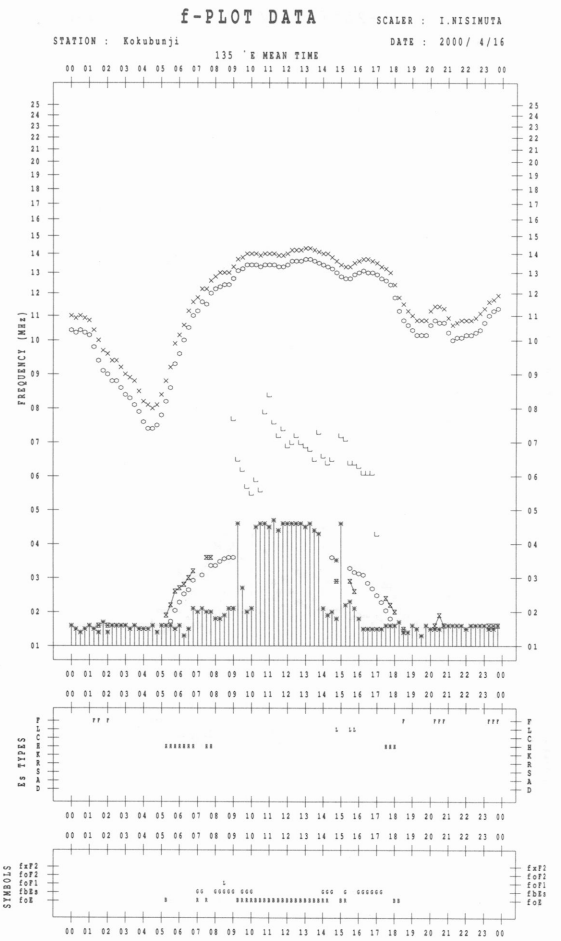

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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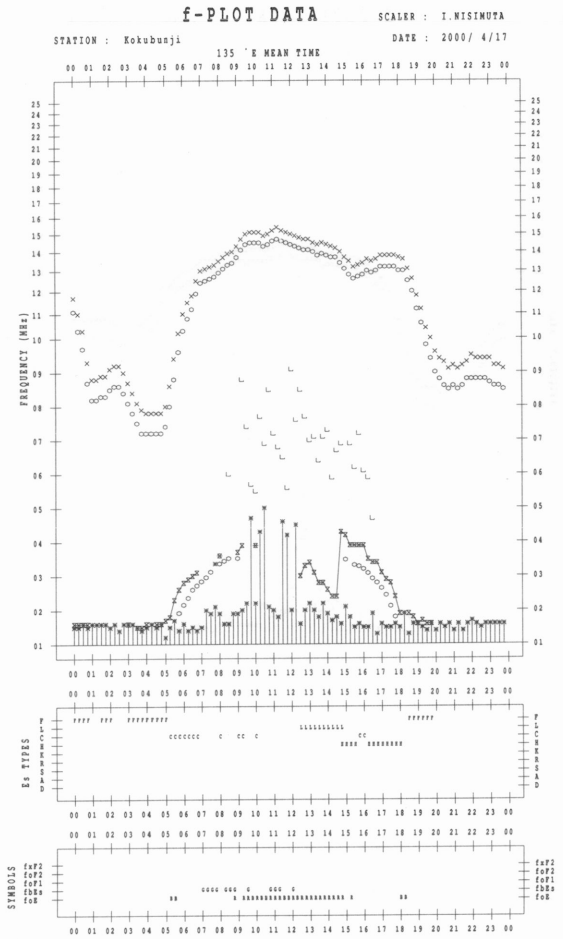
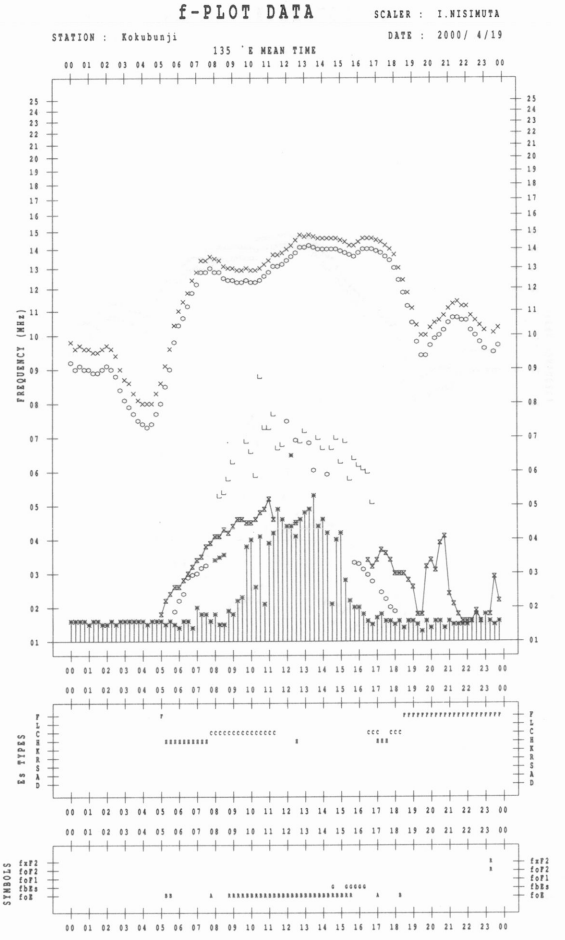
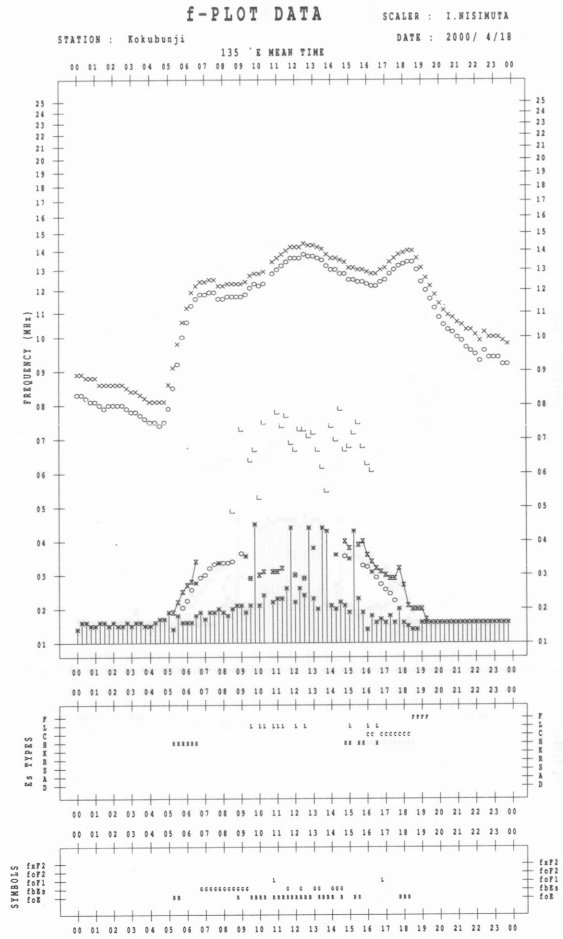
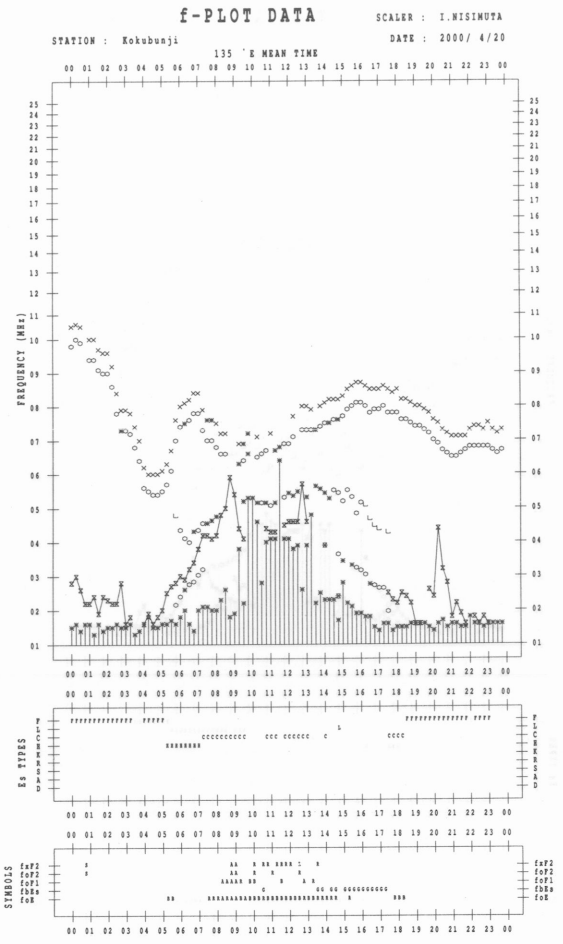
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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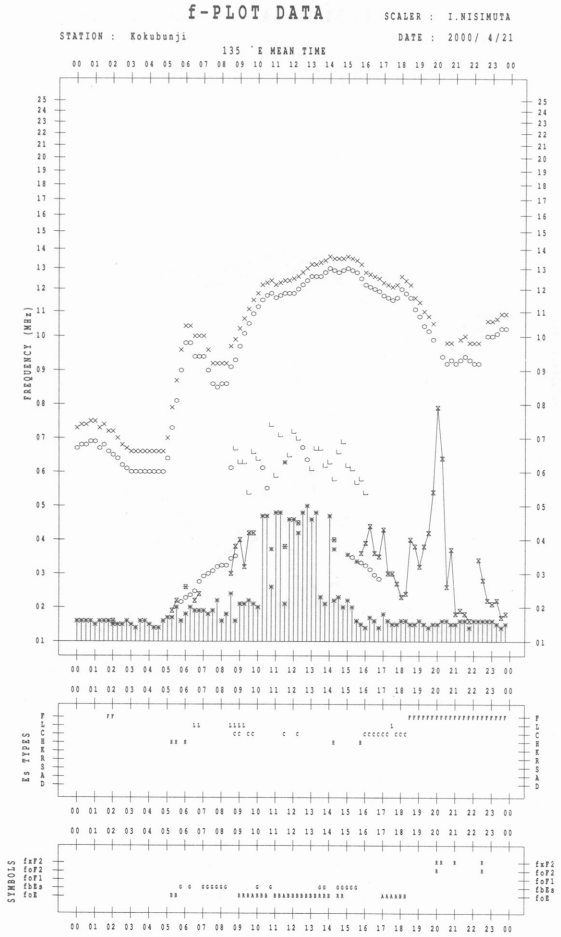
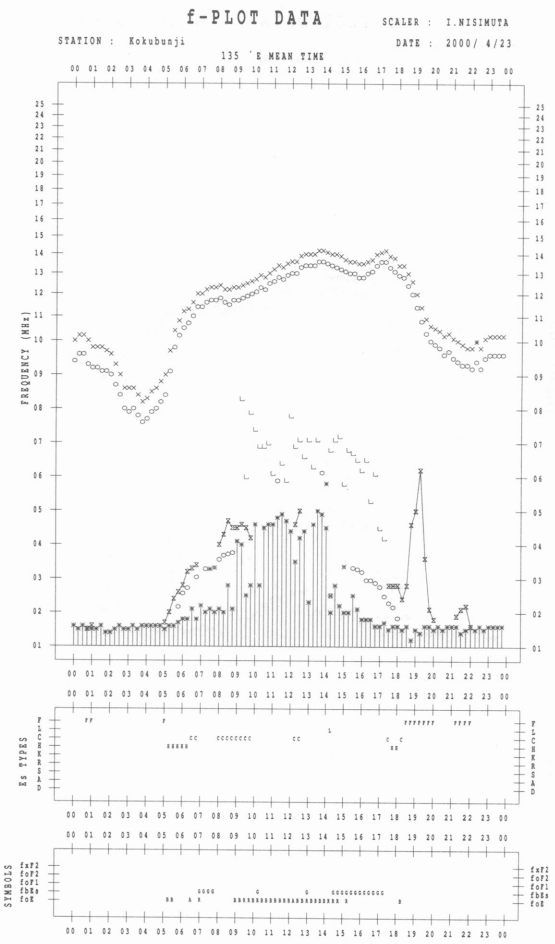
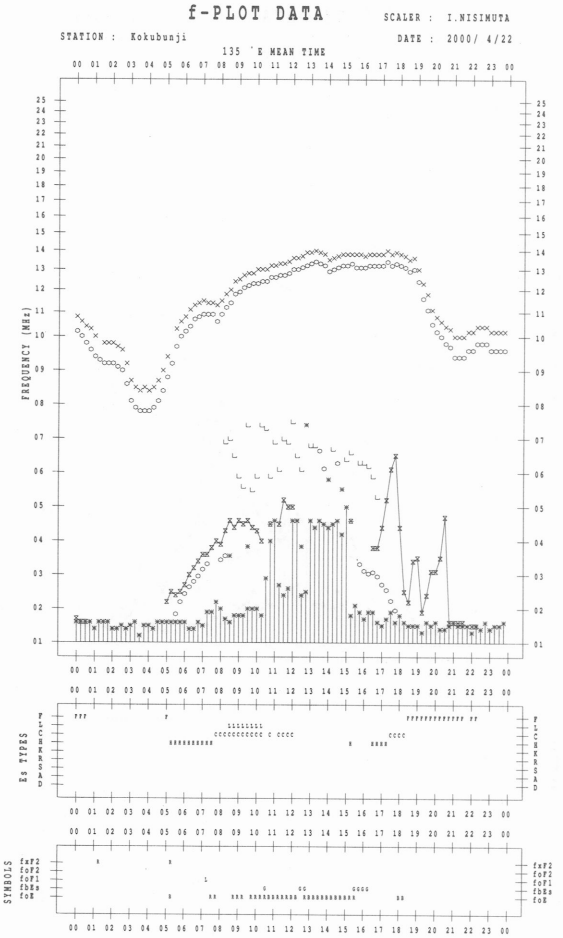
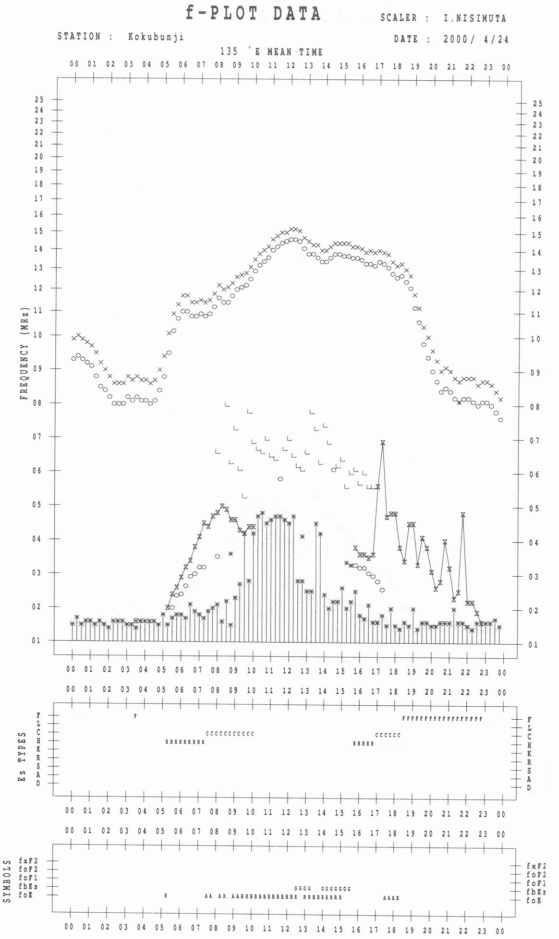
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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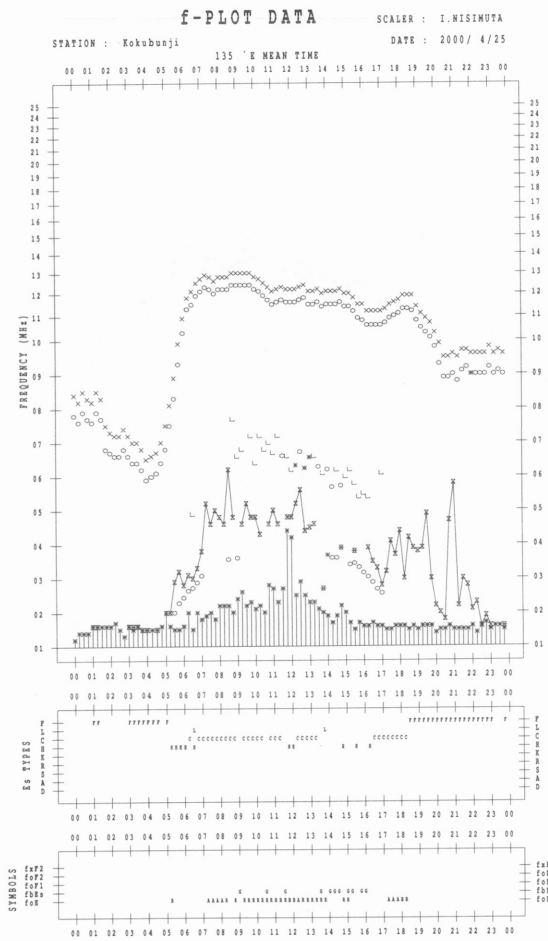
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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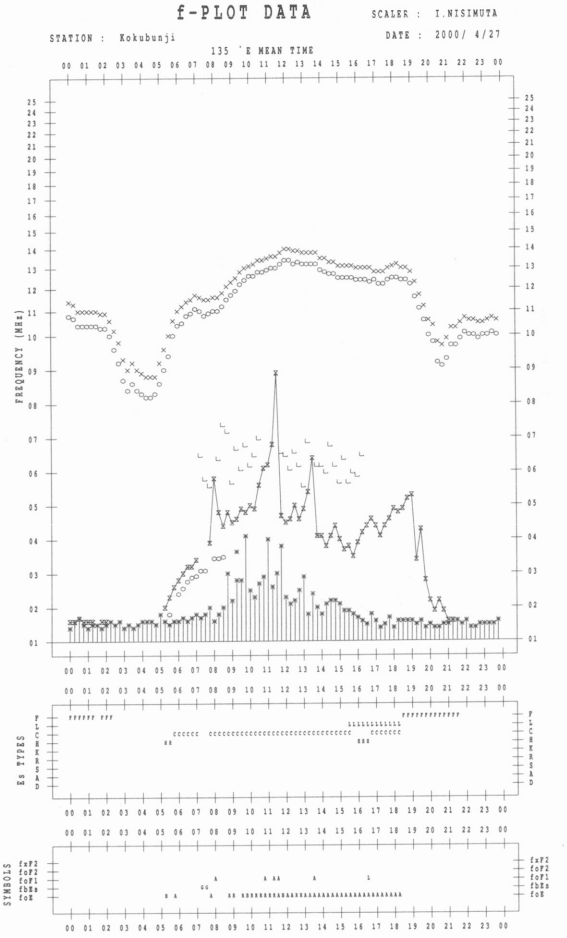
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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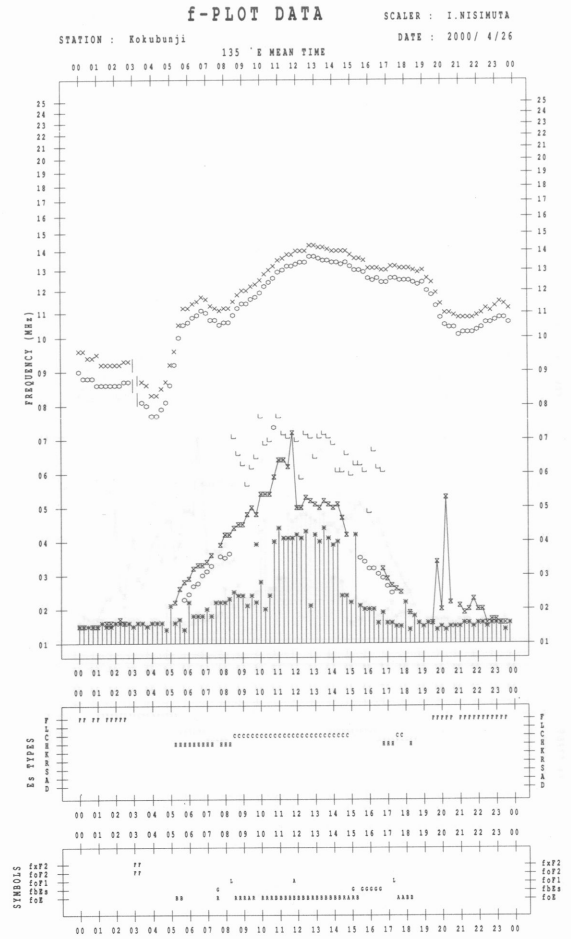
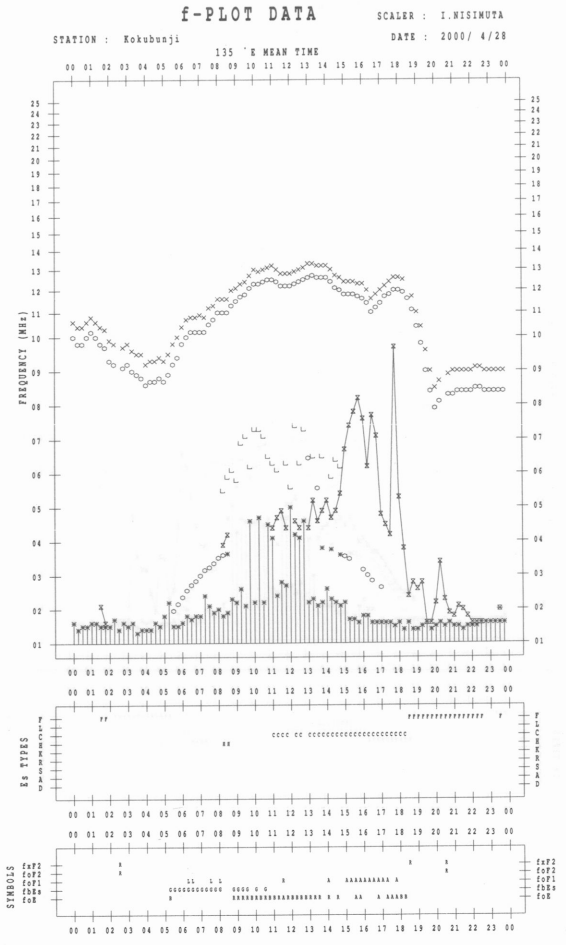
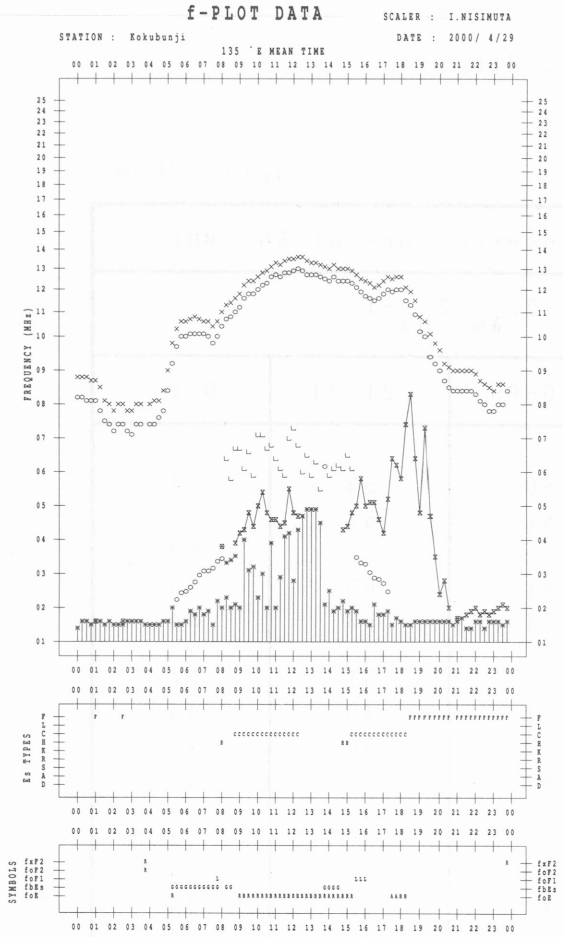
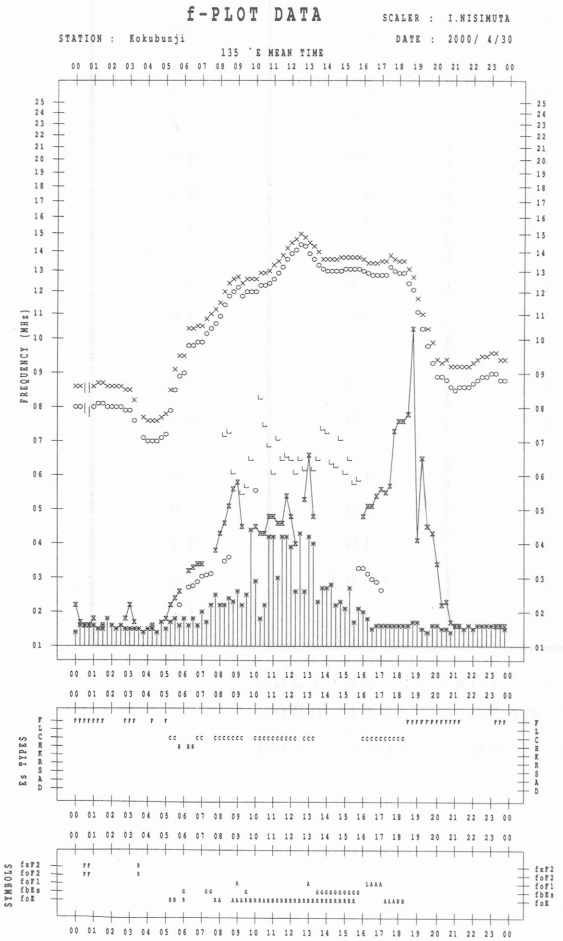
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2000/ 4/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso April 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	52	51	50	53	51
2	52	51	51	53	52
3	53	52	-	-	52
4	53	52	51	55	53
5	55	54	54	53	54
6	52	51	-	51	51
7	50	48	47	49	49
8	48	47	47	50	48
9	49	47	47	50	48
10	49	49	49	50	49
11	49	48	47	50	49
12	49	47	47	48	48
13	46	45	44	49	46
14	47	45	44	46	46
15	46	48	51	50	48
16	48	48	47	51	48
17	-	-	-	47	47
18	47	45	45	48	46
19	46	45	45	47	46
20	47	47	(47)	47	47
21	46	46	45	48	46
22	47	47	47	50	48
23	50	52	52	52	51
24	51	49	48	54	50
25	53	50	49	59	52
26	59	59	59	48	56
27	48	47	46	50	48
28	48	46	45	49	47
29	49	49	49	(50)	49
30	48	47	47	-	47

Note: No observations during the following periods.
3rd 0600 - 4th 0100 6th 0600 - 6th 0800
17th 0000 - 17th 0800 30th 2100 - 30th 2400

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso April 2000

Single-frequency observations

Normal observing period: 2000 - 0920 U.T. (sunrise to sunset)

APR.	FREQ.	TYPE	START TIME	TIME OF MAXIMUM	DUR.	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1})		POLARIZATION
2000	(MHz)		(U.T.)	(U.T.)	(MIN.)	PEAK	MEAN	REMARKS
1	200	8 S	2350.0	2350.0	1.0	580	-	0
6	2800	4 S/F	0220.0	0222.0	4.0	90	-	0
8	500	46 C	0237.0	0237.0	8.0	240	-	WR
	2800	4 S/F	0237.0	0238.0	7.0	120	-	0
	200	8 S	0745.0	0745.0	1.0	70	-	0
9	200	42 SER	2122.0	2122.0	5.0	220	-	WR
	500	46 C	2330.0	2335.0	21.0	60	-	0
	2800	46 C	2330.0	2335.0	15.0	140	-	WL
10	2800	3 S	0020.0	0021.0	3.0	80	-	0
12	200	8 S	0130.0	0130.0	1.0	460	-	0
	200	42 SER	0623.0	0623.0	5.0	280	-	0
	500	8 S	0623.0	0623.0	1.0	70	-	WR
13	200	8 S	2311.0	2311.0	1.0	70	-	0
14	2800	46 C	0141.0	0145.0	6.0	80	-	WR
	200	8 S	2241.0	2241.0	1.0	100	-	0
15	500	42 SER	0705.0	0705.0	1.0	240	-	WL
	200	8 S	0758.0	0758.0	1.0	320	-	0
	500	47 GB	0758.0	0758.0	1.0	1000	-	WL
	200	46 C	2137.0	2137.0	4.0	420	-	0
	500	8 S	2137.0	2137.0	1.0	80	-	0
	500	46 C	2138.0	2138.0	2.0	60	-	WL
	2800	3 S	2138.0	2139.0	2.0	30	-	0
16	2800	46 C	0010.0	0012.0	5.0	50	-	0
	200	8 S	0012.0	0012.0	1.0	340	-	0
	500	40 F	0600.0	0615.0	30.0	40	-	WL
17	200	8 S	2203.0	2204.0	1.0	50	-	0
	200	8 S	2258.0	2259.0	1.0	60	-	0
18	200	42 SER	0802.0	0802.0	2.0	200	-	0
	500	8 S	0803.0	0803.0	1.0	50	-	WL
19	500	42 SER	0200.0	0201.0	2.0	50	-	ML
	200	8 S	0530.0	0530.0	1.0	160	-	0
	500	8 S	0530.0	0530.0	1.0	40	-	ML
	200	42 SER	0555.0	0555.0	2.0	200	-	0
	500	46 C	0555.0	0555.0	2.0	70	-	ML

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso April 2000

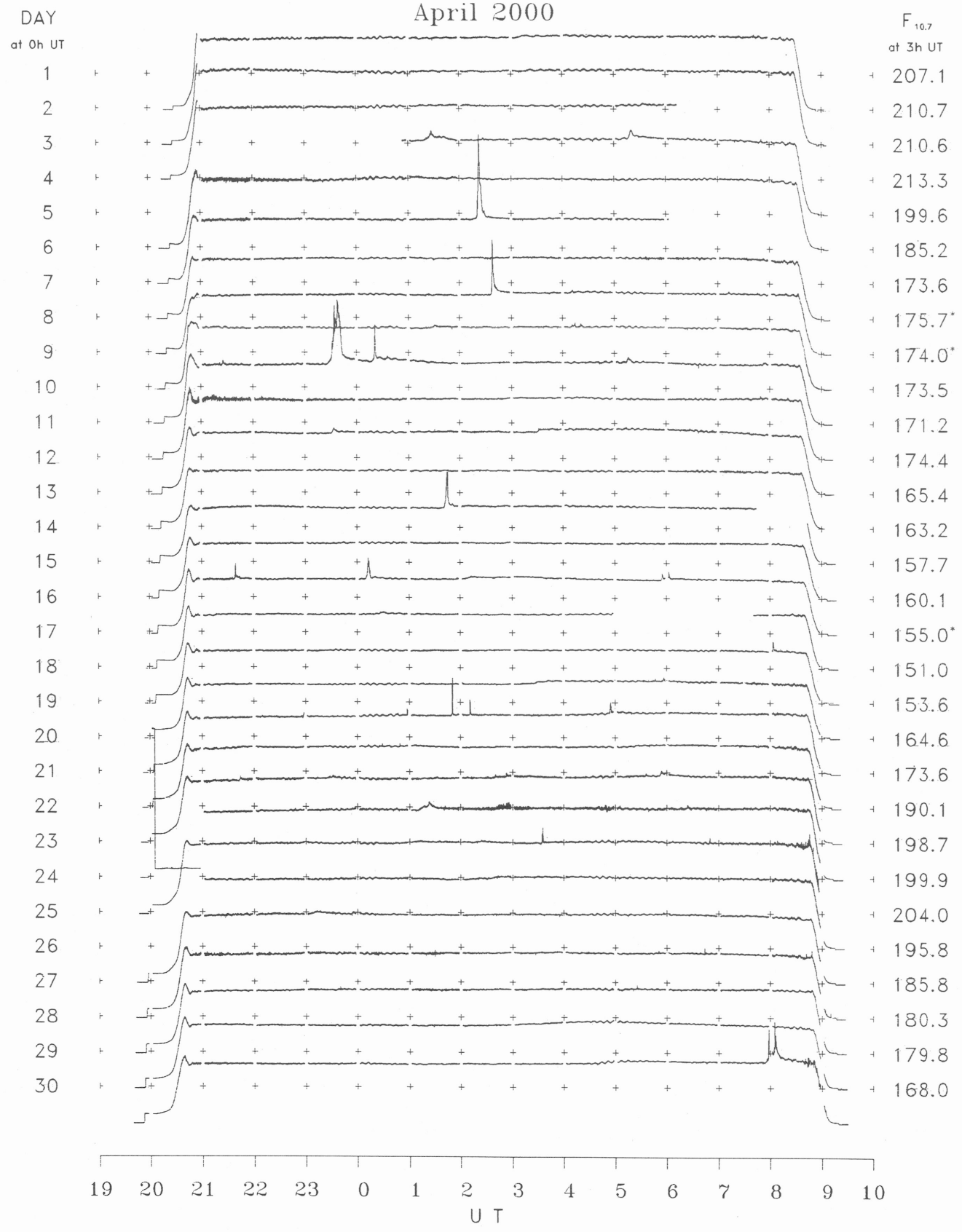
Single-frequency observations

Normal observing period: 2000 - 0920 U.T. (sunrise to sunset)

APR. 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
19	500	46 C	0904.0	0905.0	2.0	100	-	ML
	200	46 C	2256.0	2258.0	6.0	380	-	ML
	500	47 GB	2256.0	2259.0	8.0	760	-	WL
	2800	4 S/F	2257.0	2258.0	2.0	30	-	0
20	2800	8 S	0150.0	0150.0	1.0	80	-	0
	500	8 S	0210.0	0210.0	1.0	460	-	ML
	2800	8 S	0310.0	0310.0	1.0	40	-	0
	500	27 RF	0440.0	0530.0	140.0	160	-	ML
	200	46 C	0441.0	0445.0	5.0	80	-	0
21	200	8 S	0048.0	0048.0	1.0	340	-	0
	500	8 S	0048.0	0048.0	1.0	140	-	WL
	500	8 S	2033.0	2033.0	1.0	80	-	ML
	200	8 S	2327.0	2328.0	1.0	260	-	0
	500	8 S	2329.0	2329.0	1.0	200	-	ML
22	200	47 GB	0240.0	0241.0	2.0	640	-	0
	500	46 C	0251.0	0257.0	6.0	30	-	WL
	200	46 C	0254.0	0257.0	4.0	70	-	WL
	200	46 C	0552.0	0552.0	5.0	60	-	0
24	500	42 SER	0334.0	0335.0	2.0	120	-	0
	2800	42 SER	0334.0	0335.0	2.0	30	-	0
25	200	42 SER	2204.0	2205.0	3.0	240	-	ML
27	500	8 S	0550.0	0550.0	1.0	220	-	0
29	500	22 GRF	2020.0E	2115.0	220.0D	40	-	WR, SUNRISE
30	500	47 GB	0753.0	0805.0	30.0	780	-	WL
	2800	46 C	0756.0	0805.0	15.0	50	-	W

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°.

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☎（042）（327）７４７８(直通)

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