ISSN 0021−0382

F−580

IONOSPHERIC DATA IN JAPAN

FOR APRIL 1997

VOL. 49 NO. 4

CONTENTS

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MINISTRY OF POSTS AND TELECOMMUNICATIONS
TOKYO, JAPAN

INTRODUCTION

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

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

A. IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

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

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

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

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

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

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

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

K Presence of particle *E* layer.

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

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

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

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

Q Range spread present.

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

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

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

V Forked trace which may influence the measurement.

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

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

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

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

B. SOLAR RADIO EMISSION

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

B1. Daily Data at Hiraiso

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

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

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

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

B2. Outstanding Occurrences at Hiraiso

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

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

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

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

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

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

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

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

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

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

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

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

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

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

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

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

C2. Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

Transmitting Stations

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

HOURLY VALUES OF foF2 AT WAKKANAI

APR. 1997

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	38	37	43	37	32	31		57	56	A	56	A	67	69		67	64	68	58	56	58	38	44	38
2	35		41	40	32	40	56	57	58	56	60	64	71	70	60	61	60	58	61	56	57	56	38	
3		48	50		37	40		51	58	58	66		A	64		62	60	56	60	57	56	38		38
4		59	38	48	46	46	56	56	57		67	A	66	63	60	61	58	56	58	56		49	57	57
5	56		46	52		32		57	61	61		64	59	63	64	65	60	52	52	56	57	58	38	44
6	37		38	35	38		60	56	61	64	74	71	70	66	65	58	57	58	55	57	58		69	59
7			56	53		38	48	55		57	57		70			59	58	54	60	57	56		58	58
8	56	59	40	47	38	29		58	56	57	68		70		69	66	61	60	53	40		56	56	56
9	54	58	68		38	35		58		58	64		A	70	67	71	64	58	57	56	49	57	56	52
10		59		31	35		41		60	57	66						60	61	55		54	57	57	59
11	59	46	38	38	38	30	56		58	58	A	64	A	80		76	62	58	68		57	57	57	58
12	39		58	38	38	34	55	56	60	63	67	80		A	67	65	63	58	60	60	63	56		
13		38	34	40	38	28	48	A	53	58	66	A	58	68	65	58	61	60	61	58	58	40	40	35
14	38	38		30	28	35			55	A	A	A	59	59	A	61	66	62	57	58	57	57	58	36
15	36		34			40	38	A	A	59	58	A	55	63	66	56	60	60	58	59	56	58	68	
16	38					32		A	52	57	56	A	A	59	A	58	A	53	58	57	60	57		41
17		29	29	37	32	37	A	A	A	A	57	55	A	60	57	56		70	52	56	58	56		
18			38	41		A	47		A	59	63	A	A	A	70	66	60	55	60	56	57	60		38
19	23	A		A	28		38	A	A	A	A	A	A	A	A	A	A	A	57	53	49	49	58	
20	A	38	29	28	24	A	A	A	A	A	A	A	A	A	A	A	A	47	37		37	35	A	A
21	59		35	31		32	A	A	A	A	54	A	A	A	A	A	51		52	49	56	A	A	48
22		38	30	38	N	30	A	A	A	A	A	A	A	A						32	A	A	A	B
23	B	N	N	B	B	N	A	A		34					49					38		38	35	36
24	35	35	28	32	31	44		A	A	A	50	A	A	A	64	63		52	40	35		58		56
25				41	38	40	57	A	59		A	A	A	A	57	63	60	52	56	55	56	56	37	31
26	36	36	38	38	29	35	34	37	A	A	A	A	A	56	A	58	57	52	50	N	57	38	29	37
27	32	28			30	35	A	A	A	49	A	A	A	A	A	A	54	55	50	56	57	57	57	52
28		35	38	35	35	35	38	54	49	A	A	59	A	A	54	57	56	56	58	56	57	57	57	58
29	55		46	41	38	30	29		A	57	57	A	A	A	63	62	58	57			A	56		56
30	36		38	35	34	40	57	54	N	54	A	A	A	A	62	A	A	67	67	71	A	56		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	18	16	22	23	22	24	16	13	15	18	18		10	14	17	22	22	26	27	25	23	26	19	22
MED	38	38	38	38	35	35	48	56	58	58	62		66	64	64	62	60	58	57	56	57	56	57	50
U Q	55	53	46	41	38	40	56	57	60	59	66		70	69	66	65	61	60	60	57	58	57	58	57
L Q	36	35	35	35	31	31	38	54	55	57	57		59	60	58	58	58	54	52	54	56	49	38	38

HOURLY VALUES OF fEs AT WAKKANAI

APR. 1997

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	28			26	G	G		36	27	35	38	38	37	35	30	27	30	27	G	G	G	G	G	G
2	G	G	G	G	G	G	30	30	30	31	34	42	37	36	36	26	29	30	G	G	G	G	G	G
3	G	G	G	G	G	G	G	28	32	35	30	27	31	32		33	31	30	G	G	G	G	22	G
4	G	G	G	G	G	G	22	28	35	34	37	35	33	32	32	34	31	35	39	32		G	G	G
5	G		G	G	G	G		30	29	29	30	33	33	32	30	28	26	28	G	24	G	G	G	G
6	G	G	G	G	G	G	24	29	27	32	35	34	32	31	30	28	26	26	G	G	G	G	G	G
7	G	G	G	G	G	G	32	31	27	31	30	32	34	31	29	29	26	28	G	G	G		G	G
8	G	G	G	G	G	G		28	32	29	29		31		30	28	28	29	G	G	G	G	G	G
9	G	G	G	G	G	G		30		38	37		34	32	32	29	27	28	24	G	G	G	G	G
10	G	G	G	G	G		27	30	27	33	34						26	29	G	G	G	G	G	G
11	G	G	G	G	G	G	29	29	29	29	32	33	32	32		31	25	28	G		G	G	G	G
12	G		26	G	G	G	24	24	28	30	37	34	32	30	42	28	24	28	G	G	G	G	G	G
13	G	G	G	G	G	G	27	30	34	30	33	34	31	30	28	29	33	29	G	G	G	G	G	G
14	G	G	G	G	G	G	28	31	29	29	32	32	32	34	30	27	27		28	29	G	G	G	G
15	G		G	G	G	G		32	34	36	33	31	32	32	34	30	25	25	G	G	G	G	G	G
16	G	G	G	G	G	G		31	27	30	34	35	31	30	35	30	27	29	G	G	G	G	G	G
17	G	G	G	G	G	G	29	25	34	29	31	33	29	29	29	30	30	29	26	G	G	G	G	G
18		G	G	G	G		28	33	28	36	32	56	58	30	29	28	25	41	30	23	G	G	G	G
19	37	40		38	30	G	28	40	30	29		58	30	30	29	28	45	42	33	25	G	G	G	23
20	28	G	G		31		47	44	38	44	38	36		47	54	36	46	40	31		30	30	31	41
21	G	G	G	G	G	G	23	28	27	28	36	34	33	34	31	41	29	28	30	34	28	34		G
22		G	G	G	G	G		24	33	37	42	40	47	35						25	32	36	41	B
23	B	G	G	B	B	G		26		29					31					G	G		28	G
24	G	G	G		G		28	25	33	29	30	34	33	30	30	28	25	30	28	G	G	G		G
25	G	G	G	G	G	G	26	29	28		34	34	34	28	29	28	27	34	G	34	26	G	G	G
26	G	G	G	G	G	G	29	22	32	29	30	30	29	30	31	37	30	26	28	31	G	G	G	G
27		36	25	26	26	G		33			31	31	29	30	32	28	N	28	34	G	27	32	G	33
28	32	G	G	G	G	27	30	32	30	30	42	31	30	38	30	30	26	44		G	G	G	29	29
29	G	G	G	G	G	G	37	34	28	30	38	33	37	37	39	29	58		36	31	41			40
30		G	G	G	G	28	28	33	36	42	34	32	31	38	45	78	71	36	57	41		64	61	61
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	26	28	27	29	26	21	30	27	28	28	26	27	27	26	27	27	26	27	28	28	27	27	29
MED	G	G	G	G	G	G	28	30	30	30	34	34	32	32	30	29	27	29	G	G	G	G	G	G
U Q	G	G	G	G	G	G	29	32	33	35	37	35	34	35	34	31	31	34	30	27	G	G	G	G
L Q	G	G	G	G	G	G	25	28	28	29	31	32	31	30	30	28	26	28	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

APR. 1997

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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT KOKUBUNJI

APR. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	69	59	40	36		59	45	51	52	55	50	61	76	80	78		63	62	71	59	58			A
2	56	35	38	35	35	34	58	67	68	55	A	71	77	79	78	70	67	73	69	68		A		46
3	42	32	38	43	34	A	64	57	55	58		75	75		67	66	63	66		72	58	48	48	
4	48	46	46	43	36	36		58	59	62	66			64	72	60	71		60	60	56	57		
5	48	48	47	44			56	58		62	65	66	68	76	72	70	58	60	56		74	60	57	
6	46	56	48	40	38		52		58	54	68	88	81	73	68	64	61		70	58		51		57
7			70		38	42	50	57	72	68	68	83	100	95	82	74	67	70		56	47	47	44	
8			43	41		38	48	54	56	64	66		103	91			68	66	57	56	47		46	
9	60		46		37	38	50	52		66	66	76	77	77	82	84	58	55	56	62		47	57	60
10	46	48	46	42	40		48	56		64	60	68	82	97			61	70	60		56	45	45	46
11	46	44	48			49	46	56	60	60	66	74	96		82	92	80	73	73		69	69	48	48
12		47	47	41	38	40	57	56	63	64	73	88	95		69	72	71		A	95	61	44		
13	48			69		36		68	71		70	84	84	78	76	68	72	72	70	70	A	A	30	
14	44			38			57			56	52			86	86	74	71	58	57	48	69	47		47
15		46	43	44	36		58	58	61	66	62	71	A	76	73	69	71	81	58		57		57	57
16	46	48	45				51	56		68	67	63	56	65	52		63	63	71		67	46		59
17			40	41		N	71		50	58	77	76					64		77	70	57	58		46
18				25	36	41					64	76	68	72	84	92	73	50	50	48		56	47	56
19	A	43	43	40	40	35		54	64	57	63	A	49	A	59	59	66	70	58	57	59	48	46	
20	36	40		A	34		N		A	A	A	66	73	64	54	54	49	60	55	57		46	44	A
21	38	36	38		59		45	46	52	48	A	49	59	73	74	72	62	56	58	60	A	A	45	A
22	43	A	40		34		42	B	A	A	A	64	61			60	69	68		47	56	56		43
23	45	A	36	34	28	37		N	48	51	A	A	65	54	A		56	57	60	56	57	46		A
24	A	A	59	59		32	47	48	56	60	53	61	69	A	64	82	64	56	48	56		A	56	47
25	46	41	44	38	36	37	56	50	56	52				70	71	68		57	57		58	48		
26		42		38	34	46	51	55	50	A	49	51	59		66	67	65	71		58	57	59	A	
27	36	34	34	34		37	48	45	50	A	B		B	A	66	78	76	67	60	56	58	47	A	
28	56	43	46	37	36	A	46	49	58	51	49	A	A	A	A	A	71	68	64	68	60	55	46	56
29	58				35	40	57	56	52	56	A	49	49		75	81	A	81		69	69	50	A	A
30	A	46	A	69		A	57	66	62	A	A	A	A	A	65	A	81	81	82		70	68		
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	20	19	23	22	19	17	24	23	22	23	20	21	22	18	24	22	28	26	24	23	22	23	15	13
MED	46	44	44	40	36	38	51	56	57	58	66	71	74	76	72	70	66	66	60	58	58	48	46	48
U Q	52	48	47	43	38	41	57	58	62	64	67	76	82	80	78	78	71	71	70	68	67	57	56	57
L Q	43	40	40	37	34	36	47	51	52	55	56	62	61	70	66	66	62	58	57	56	57	47	45	46

HOURLY VALUES OF fEs AT KOKUBUNJI

APR. 1997

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G		28	G	G	G	29	28	28	30	28	31	31	30	G	35	25	28	33	28	29	40	G	30
2	40	G	G	G	G	G	33	39	43	49	39	37	G	47	42	32	31	53	25	29	52		28	32
3	45	29	23	33	25		22	32	34	29	G	30		51	42	33	35	G	G	G	G	G	G	G
4	G	G	G	G	G	G	27	29	29	30	36	29	31	28	27	31	29	28	G	G	G	G	G	G
5	G	G	G	G	G	G	G	G		31	32	28	G	G	33	34	34	29	G	G	G	G	G	G
6	G	G	G	G	G	G	29	29	28	30	32	40	G	34	41	34	50	23	G	G	G	G	G	G
7	G	G	G	G	G	G		30	30	32	32	G	32	31	30	26	26	G	G	G	G		G	G
8	G	G	G	G	G	G		29	33	30	30	30	28	34	33	29	33	24	G	G	G	G	G	G
9	G	G	G	G	G	G	30	G	34	30	31	32	39	G	32	32	31	37	G	G	G	G	G	G
10	G	G	G	G	G	G	G			32	32	32	31	G	41	34	38	30	G	G	G	G	G	G
11	G	G	G	G	G	G		34	34	29	G	42	33	33	30	G		28	G	G	G	G	G	G
12	G	G	G	G	G	G	G	29	31	30	32	34	G	34	43	34	60	52	61	29	G	G	G	
13	G	G		G	G	G		G		32	33	35	40	43	49	33	44	42	40	G		33		
14	G	G		28	G		26	29	27	30	40	59	56	39	31	28	30	29	56	56	G	G		G
15		G	G	G	G	G		G	31	31	31	38	32	42	44	44	26	40	G	G	28	24	G	G
16	G	G	G	G	G	G	24	32	28	30	G	41	32	G	32	29	26	22	G	G	G	G	G	G
17	G	G	G	G	G	G		40	30	40	46	31					30	28	G	G	G	G	G	G
18	G	G	G	G	G	G	25		35	30	G	31	31	31	30	29	27	G	29	29		G		
19		41	G	32	29	G	24	G		30	31	31		40	30	32	25	G	G	G	G	27		G
20	29	28	G		28	G	26	G		46	50		32	39	32	38	25	29	G	G	G	48		50
21		28	G	G	30	G	G	G		38	40	G	G	31	G	43	40	35	G	41		52	29	
22			27	30	G	G	25	B	45	45	47	40	G	G	G	33	30	30	G	G	G	G	G	G
23	G	26	30	28	G	G	38	44	34	38	32	40	40	31	31		46	39	30	23	G	G	G	32
24		25	G	G	G	G	24	G	33	30		42	48	59	50	58	28	27	42	29	33	32		33
25	G	G	G	G	23	23	24	G	G	26	G	G	G	31	30	29	30	35	G	33	29	56	33	31
26		G	G	26	G	G	24	G	27	27	37	G	G	G	27	31	28	28	G	G	G	26		29
27		G	G	G	G	G	27	31	30	30	B	G	B	39	31	30	32	32	G	G	G	28	59	G
28	G	G	G	26	G	26	33	33	47	51	48		50	72			32	24	G	G	G	G	G	32
29	33		G	G	G	G	40	42	46	47	38	41	G	30	48		92	42	40	29	29	28	33	
30	48	33	29	28	25		30	44		58	49	83	52	32	30	60	58	52		41	31	G	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	23	27	28	29	30	27	24	27	23	30	28	28	26	29	28	26	29	30	29	30	27	28	23	25
MED	G	G	G	G	G	G	26	29	31	30	32	32	31	32	32	32	31	29	G	G	G	G	G	G
U Q	G	25	G	26	G	G	29	33	34	38	39	40	39	39	41	34	39	37	29	29	28	28	G	30
L Q	G	G	G	G	G	G	24	G	28	30	30	29	G	29	30	29	27	24	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

APR. 1997

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

APR. 1997

LAT. 31.2N LON. 130.6E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	35			A	B	54	B	58	64		74	90	91		84	83	84		53			
2	41	A	36	A	49	59		B	66	70		B	68			92	66		84		A	A		
3		59				26	49		72	56	48	B	84		80		66	86	89	A	85	A		41
4		A	69	79		B	32	A	62	72			76	82		76	73	71		52		B		
5		B	54	30		B		52	67	70		66		82		72	68				A	31	99	
6		24					23	60		72	70		89	83	81	72		70		72	49		A	41
7	31	31	N	44	N			52		73	65	B	95	105	97		81			A	53	61		B
8	A			30		27		53		B		78	104	107		83	73	77	69			A	79	
9				79				60	66	68	70		B	100	97	95	82			82		A		B
10	49			53				51	53		67	71		94	88		66	66	55	43		A		89
11			A	A	A			B	B	62	63		104	87	82	95	94	83	85	85	83			59
12		24	24		79		50	51	60	73	67	82	102	86	71	A	82	84	A	A				
13						A		66	72	80	78	74		82	85	82	82	83	73	74		A		59
14	69	69	59			49			72	65	69	66	86	96	A					76	86			79
15		69			30		23	54	60	66	67	74	78	84	82	75		61		75	A	A	53	62
16		26		25	38			54	66	82		61	71	80		68	81	70	84	86	76			
17	43	53	50	52			24		57	60	70	81	87	86	85		66	84	83	82	A			52
18	A	43				69		54	60	72	71	76	78	83	86	91	86	83	54		A	A	A	38
19					79		34	60	70	71	64	66	67	84	86	81	71	72				55		32
20	37	28	28	40	A	A	32	48	59	68	71	66		96	98	96	83	67		48	A			A
21	A	59		A	A	N	25	53		A	82	64	76	87	94	96			74	74			53	
22	37	36		A	38	A	A	44	A	A	57	61	70	60	A	60	80	70	69	60			30	59
23		42	A	69	31	31	24		A	50	53	68	76	78	62	60	62	54	52	60			A	40
24	34	30	A	A	A	59	32	54	57	56	64	65		75	78	86	71	72	54	61	58		A	A
25	42		69			69	53	61	53		57	57	63	70	70	61		66	74	84	85			
26	53	54		48	36	36	48	53	50	A	66	56	66	66	71	70	76	72	82	75	A	49		
27	41		25	24	34			53	54	51	A	A	57	57	67	87	97	82		66	A	38	A	
28		36	40		34		53	52	57	A	56	60		71	76	82	85	72	70	73	A			79
29	A	52	A		60			60	A	67	60	68	A	80	82	84	84	74	80	A	A		A	A
30		25		39		A	37	66	71	58	64	A	72	76	71	76	87	90	90	84	84	82	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	11	18	11	13	11		15	23	21	23	24	20	22	28	23	23	25	24	19	20	10			13
MED	41	39	40	44	38		32	54	60	68	66	66	76	83	82	82	81	72	74	74	80			59
U Q	49	54	59	61	60		49	60	68	72	70	74	87	88	88	91	84	83	84	82	85			70
L Q	37	28	28	30	34		24	52	57	58	61	62	70	77	71	72	69	70	69	60	53			40

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

APR. 1997

LAT. 31.2N LON. 130.6E 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		31	G	G	G	26	B		B	28	31		30	24	31	G	28	26	33	G	G	G	G	G
2	28	34	G	31	26		G	B	30	30		B	30	30		G	29	26	31		36	22	31	G
3		42	28	G	G	G	G	G	30	29	30	B	30	29	29	G	34	29	28				G	G
4	G	25	G	30	G	B	G		30	30	G		32	31	G	29	29	32	G	G		B		G
5	G	B	G	G		B	G	25	29	30	G	30	26	29		30	30	31	27		42	G	G	G
6	G	G	G		26	G	26	32	G	31	32		88	32	30	30	G	28	28	27	G	G		G
7	G	G	G	G	G	G	G	28	31	30		B	29	29	28	29	30	G	G	32	G	G	24	B
8		G	G	24	G	G		32		B	G		30	31	G		31	30	27	G	G	24	G	
9		G		G	G	29	G		30	30	30		B	30	29	32	33		G	28	26	36	G	B
10	G	G	G	G	G		G	30	30	30	31	30	G	30	36	37	32	28	27	26	G		G	G
11	G	G	32		30	G	G	B	B	29	30	30	30	30	30	30	29	31	31	24	26	G	G	G
12	G	G	G	G	G	G		32	30	30	30	30	31	G		84		G	72	70	G	G	G	G
13	G		G				G	32	32	30	30	38	28		30	30	28	26	30	G	G		32	G
14		G	G	G	G	25	26	28	30	30	31	31	29				G		G	G	G	G	G	G
15	G	G	25	G	G	G	27	28	32	32	32	39	40	41	55	29	30	30	48	40	41	33	32	25
16	G	G	G	G	G	G		29	30	31	30	30	30	30	30	30	29	31	32	G	G	G	G	G
17	G	G	G	G	G	G		41	31	30	30	29	29	30	32	55		36	32	30	32	G	G	G
18		26	G	G	G	G	34		31	31	33	41	32	35	30	29	31	39	32	G	39	48	30	G
19	G	G	G	G	G	G	28	36	35	50	59	53		30	30	32	28	40	93			G	G	24
20	G		G	28			36	37	30	29	31		39	37	31	30	28	30	32		40	38	N	40
21		32			88	31	27	31		30	31	38	41	39	28	37	44	38	32	28	32	24	G	26
22		24		59	93	58	34	30	40	37	38	31	31	39	38	39	40	36	41	36	32	28	G	G
23	G	28	34	52	26	G	28		27	30	30	31	29	29	30	29	29	26	31	34	28	28	34	45
24		27	30	31	31	G	30	29	30	36	31	42		42	39	30	28	26	27	31	45	40	45	
25		36	27	26	25	24	28	28	30	28	29	29	30	30	30	30	29	29	28	33	36	33	37	30
26	G		40	G	G	G	27	30	30	29	32	31	36	40	30	29	31	29	36	48	46	48	39	30
27	40	44	32	28	G	G	26	29	31	28	37	63	30	30	29	30	32	57	49	41	33	26	28	32
28		33	32	G	G	25	26	29	34	30	43			31	61	39	34	28	32	33	40	30	24	G
29	39	31	48	41	31	G		30	44	39	52	54	40	42	40	54	50	60	71	84			40	40
30	G	G	G	46	G		22	31	35	31	71	56	36	34	61	68	61		57	49	21	32	32	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	25	27	26	27	23	24	23	26	29	28	20	26	28	26	28	28	27	30	25	26	25	27	25
MED	G	G	G	G	G	G	26	30	30	30	31	31	30	30	30	30	30	30	32	30	30	24	G	G
U Q	G	31	30	30	26	25	28	32	32	31	32	41	36	36	36	37	32	36	36	38	39	33	32	28
L Q	G	G	G	G	G	G	G	28	30	29	30	30	29	30	29	29	28	26	27	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

APR. 1997

LAT. 31.2N LON. 130.6E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	16	15	14	14	15	B	14	B	16	17		20		21		17	14	16	21	14	14	15	18
2	14	14	14	15	15	14	15	B	15	15	14	B	21	20		17	17	16	14		16	14	14	
3	14	14	14	18	18	14	14	18	14	16	17	B	20	18	17		17	16	14	15	17	14	20	14
4	15	16	15	17		B	14	23	14	16			20	20		18	17	14		14		B		
5	14	B	15	14		B	14	14	15	16		18	20	18		18	17	14	14		15	14	14	14
6	17	14	14		14	15	15	16		16	20		50		21	18		15	14	14	15	14	17	15
7	15	14	15	14	15	15		15	14	16	14	B	21	20	18	20	17	14		16	14	14	14	B
8	14	20	17	15	15	15	15	14		B		18	20	14		17	16	14	14	20	15	15	14	15
9		22		14	14	14		16	14	17	17		B	20		18	17		41	14	14	14	14	B
10	14	14	15	15	14			15	14	16	17	21		20	18	17	16	15	14	14	15	14	14	14
11	14	14	14	15		17		B	B	16	21	22	20	21	20	20	20	14	15	14	14	15	14	15
12	15	15	15	15	15	14	15	15	15	16	17	17	18		47	45	45	52	48		18	16	18	17
13	21		14			15	15	15	14	16	20	18	20	22	22	20	17	15	14	14	15	15	15	16
14	14	15	14	15	15	14	15	15	14	17	17	20	21	21	14		14			14	14	14	14	15
15	15	15	14	14	15	15	14	16	14	17	20	18	21		18	18	18	15	14	14	14	14	15	15
16	15	15	15	15	14	15		14	15	20	18	18	22	18	18	18	16	14	17	14	14	15	15	15
17	14	14	15	14	16	15	14	14	16	17	20	20	18	18	18	18	16	14	14	14	15	15	14	14
18	14	14	14	14	15	14	14	14	14	16	17	18	17	18	18	15	16	14	14	15	15	15	14	15
19	14	14	14	14	14	14	14	14	14	17	20	20	20	22	17	18	16	16	15	14		14	15	14
20	14	14	14	14	14	14	14	14	16	16	18	20	21	21	18	20	17	16	16	14	14	14	15	14
21	14	14	14	14	14	15	14	14	15	17	21	22	20	20	18	18	20	14	14	14	14	14	14	14
22	14	14	14	14	14	14	14	18	15	17	20	22	21	21	21	18	17	14	14	14	15	15	15	15
23	14	14	14	14	14	14	14		17	18		18	22	21	18	20	17	15	14	14	15	14	14	14
24	14	14	14	14	14	15	14	14	16	17	18	20	21	21	21	18	17	14	16	14	14	14	14	15
25	14	14	14	14	14	15	15	14	18	17	18	21	23	21	22	20	18	16	14	14	15	15	14	14
26	14	14	14	15	15	15	16	17	15	17	18	20	20	21	18	18	17	15	14	14	15	14	15	14
27	14	14	15	15	14	14	16	14	16	18	17	21	21	20	20	18	16	15	14	15	15	14	14	14
28	14	14	14	14	14	14	15	14	16	18	20	21		20	21	18	17	15	14	14	15	14	14	14
29	14	14	14	14	14	14	14	14	14	18	18	20	22	22	22	20	17	15	14	14	15		14	15
30		15	15	14	18	22	14	14	16	16	18	18	23	27	20	18	18	14	15	14	14	14	14	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	29	28	26	27	24	27	26	29	26	23	27	26	25	27	29	28	27	27	28	28	29	25
MED	14	14	14	14	14	15	14	14	15	17	18	20	21	20	18	18	17	15	14	14	15	14	14	15
U Q	14	15	15	15	15	15	15	16	16	17	20	21	21	21	21	20	17	15	15	14	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	16	17	18	20	20	18	18	16	14	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT OKINAWA

APR. 1997

LAT. 26.3N LON. 127.8E 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	37	37	34	43	B	N	B	40		67	65				92	92	92	91			67	55		
2	36	A	A	37		B	B	54		69	72	60	67	91			93	88	93	84	94		43	
3		46		56	A		A	60	64	51	63	72	84	83	91	93	87	87	88	A	83	68	57	
4	57		70	69	B	B	N	63	59	94	78	72	78		92	93	91	91		A	68		41	
5		38		44		B		59	59	59	66		88		94	99		96	89		68	69	41	35
6	38			41		59		59	68	58	73	91	103	104	102	105		87			63	38		
7		43	57	60		28	35		56	67		83	90		117	114		102		64	58		41	44
8	46		69	59	B	B	58	41	56	64	68	78			104	95	91	98	88		58			
9	46	40	43	43	38	B	56		62		71	73	90	103	114	116		95	85	84	80			A
10	63	58	56		43	41	38	45		67	80	91	88	91	95	95	96			88				A
11	44	37			N	B	B	59		68	62		107		92		116		90		93			58
12			58			B	35	57		65	80	86	94	103		99	111	106		A	67	69	56	41
13	A	60	69			N	59	60			88	91	84	91		105		94	91		60		A	46
14	43	A	A	69	69	59		59	59	66	72	84	92	114	116	114	93	83	88	A		43		
15	56			38	B	B	59	59	60	70		78	81		93	81	81	72	83	A	71		38	
16	48			71		31	35			73	70	78	84	96	91	88	92	84	97		71	55	57	48
17	68	66	71		49		A	54	92	60	63	95		88	93	91	72	100	91	A	56	A	A	
18			38	42	A	B	35	60	68			84	82	88	91	95	92	82	82	A	89		43	A
19	A	37	B	36	A	A		52	64	60	68	64	73	102	94	78	71	77	81	71	68	64		69
20	N	36	38	31		B	32		60	63	65	72	90		123	120	122	88	83		49	A		30
21		A	A	38	A	A	A	45			58	67	86	89		118	126	131		87	68	38	43	38
22	48	58		38	29	A	58	41	A	56	58	68	88	75		62	86	73	73	71		56		
23			41	A	A	A	56	48	56	56	A	72	97	94	84	77	A	60	66	71	70		A	44
24	38	32	51	A	A	B	35			68	62		82	90			82	83	57	70	68	61		A
25	46	A	A	38	A	32	B	59	57	54	62	58	70	77	76	76	80	82	91	A	80		A	50
26	58	58			A	B	56	57	48	54	58	65	63	73	77	84	85			A	A	43	A	31
27	39		38			B	A	45	46	A	A		59	73	84	94	112	105	82		68		B	A
28	B	B	31	31	A	69	38			56	A	61	A	82	82	88	93	90	87	A	75	69		
29	B	48	44	43	A	30	35		70	63	68	65	80	86	82	95	92		108		95	68	A	56
30	54	56	57	62	36		56		64		59	66	81	86	87	91	94	106		A	69	A	67	71
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	18	16	17	21			17	22	19	24	24	25	26	22	24	27	24	26	21		26	14	11	14
MED	46	44	51	43			38	57	60	64	67	72	84	90	92	94	92	89	88		68	58	43	45
U Q	56	58	63	59			57	59	64	67	72	84	90	96	98	105	95	98	91		80	68	57	56
L Q	39	37	38	38			35	45	56	57	62	65	80	83	85	88	85	83	82		67	43	41	38

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

APR. 1997

LAT. 26.3N LON. 127.8E 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	B	G	B	24	29		37	G	40	G	40	G	27	26		G	24	G	G	
2	G	24		24	G	B	B	29	30	35	37	G	34	41	G	40	G	32	G	G	G	G	G	G
3	G	G	G	G	28	31	25			35	37	G	G	32	45	41		48	69	43	28		G	
4	G	G	G	G	B	B	G		29	24	26	38	G	G	39	41	G	44	38		G		G	G
5	G	G	G	G	G	B	G	29	32	36	38	G	34	33	G	G	36	42		G	G	G	G	G
6	G	G	G	G	G	G	G		32	37	36	35	35	34	G	28	27	37	39	25	G	G	G	G
7	G	G	G	G	G	G	G		32	35	33	G	G	G	G	36	33	28	G	G	G	G	G	G
8	G	G	G	G	B	B	G		26	30	G	33	G	G	37	G	24	35	34	G	G	G	G	G
9	G		G	G	G	B	G	22	30	33	27	G	G	G	G	G	44	37	29	G	G	G	G	
10	G	G	G	G	G	G	G	29	31	30	32	G	G	G	G	28	G	25	29		G	G	G	
11	G	G	G	G	G	B	B	27	30	34	31	31	G	G	G	G	G	26	28	G	G	G	G	G
12	G	G	G		G	B	G	32	31	30	26	33	28	G	G	39	37	42	37	29	29		25	G
13		49			G	G	G		32	35	49	40	G	G	G	G	49	26	36		G	G	27	G
14	G			G		G	G	29	35	34	36	40	G	G	34	G	29	25	34	82	G	G	G	G
15	G	G	G	G	B	B	G		38	35	33	G	36	G	G	G	G	38	34	40	27	27	30	G
16	G		G	G	G	G	G	33	33	36	32	G	41	39	G	33	35	40	34		G	G	G	G
17	G	G	G	11	G	G	26		41	40	38	42	G	45	37	G	56	56	42	44	39	40	32	G
18	G	G	G	G		B	G		32		36	36	41	55	53	65	38	41	62	58	26	G	24	33
19		29	B	G	25	28	G		24	36	36	38	38	51	49	79		40	37	G	G	G	G	G
20	G	G	34			B	G	40	38	36	44	34	76	48	41	43	39	38	50		33	42	32	G
21		38	38	38	68		65	35	32	35			G	51	62	51	53	44	34	24	G	G	G	30
22	G	G	G	G	G	23	G		32	36	36	36	46	36	36	33	38	33	33	27	24	26	G	G
23	G	G	G	40	34	37	24	27	40	28	33	36	35	40	46	38	68	64	37	28	G	G	32	30
24	G	40	36		41	B	27	35	34	35	34	36	51	51	54	49	41		33		41		32	40
25			50	28	28	25	B	33	34	25	32	G	G	39	G	39	G	27	38	48	40	G		34
26	G	G	G	G	34	B	G		32	36	38	38	41	40	40	G	35	43	40	58	60	62	60	48
27	37	29	32	24	26	B	28	48	77	47	38	G	G	44	G	58	48	50	59	67	G	36	B	26
28	B	B	25	G		G	G			48	40	54	62	53	57	G	29	42	36	38	G	G	G	G
29	B	28	38		37	G	G	38	47	50	51	57	58	G	G	96	60	70	64	58	43	33	58	34
30	50	G	G	G	G	G			44		44	42	38	45	57	58	66	60	61	58	49		30	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	23	25	26	25	22	16	25	16	28	27	29	29	30	30	30	30	28	29	28	24	30	25	28	26
MED	G	G	G	G	G	G	G	30	32	35	36	34	34	35	35	34	36	40	36	28	G	G	G	G
U Q	G	26	25	6	28	24	12	35	36	36	38	38	41	45	45	43	46	44	41	53	29	26	30	30
L Q	G	G	G	G	G	G	G	28	30	33	32	G	G	G	G	G	25	30	33	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT OKINAWA

APR. 1997

LAT. 26.3N LON. 127.8E 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	18	15	B	15	B	22	14	16		49	51	48	47	44	17	16		14	16	15	15	
2	15	16	15	14		B	B	15	15	17		51	48	50	49	44		15	14	15	16	15	23	21
3		15	17		14	14	15	15	16	17	20		48	47	50	20	16	15	14	14	15	15	15	
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5	15	16	15	15	15	B	18	15	14	15	18		21	23	48	42	14	15	14	15	15	15		16
6	16	16	14	15	15	15	15	16	14	17	23		51	50	46	44	15	15	15	15	16	16	15	17
7	16	15	15	16	18	15	15	23	15	16	22		50	48	52	24	21	15	21	14	16	16	15	14
8	16	15	15	15	B	B	16	15	15	17	46	48	49	49	50	46	41	15	15	15	15	20	15	15
9	15	15	16	15	15	B	20	16	14	17		49	49	48	49	45	20	15	14	15	16	15		15
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13	14	15	15	15	17	16	21	18	15	21	30		48	50	48	48	17	15	14	15	15	15	16	21
14	17	15	15	20	15	17		16	15	17	20		50	50		47	20	16	15	15	16	14	22	15
15	16	17	17	16	B	B	15	16	15	16	21		50	47	49	42	39	16	14	15	15	15	17	15
16	16	16	16	15	16	15	15	16	16	17		48	27	21			18	14	14		16	15	20	15
17	16	15	16	15			16	15	15	18		50	49		18			16	15	15	15	16	15	111
18	16	24	16	15	15	B	16	14	15	15	16	18		38	35	21	17	15	15	14	14	16	15	15
19	16	15	B	15	15	14	27	14	15	17					23	33	29	33	15	15	16	15	18	29
20	18	17	14	15		B	16	14	15	17	28		29	30	27	26	20	14	14		15	15	15	17
21	14	15	14	15	15	15	15	14	16		22	28		22		20	17	18	15	15	16	15	15	14
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23	16	16	15	15	14	14	16	14	16	16	26	28		28	27	22	18	15	14	15	15	16	15	14
24	16	14	14	15	16	B	18	14	16	18		47	34	34	33	30	17	15	14	14	14	14	15	14
25	15	15	14	15	14	15	B	17	15	17	20		50	48	49	42	39	16	15	15	15	17	14	15
26	16	18	15	17	15	B	16	16	15	21		28	29		48	48	40	17	14	14	15	16	14	15
27	15	15	14	15	16	B	15	15	20	18		47	49	48	48	24	30	16	15	15	17	14	B	15
28	B	B	14	17	14	16	16	16		32	33	36	36	37	33	48	18	16	14	14	15	15	15	18
29	B	15	15	14	15	15	17	14	16	18	18	36	33	36	50	34	30	20	14	14	14	14	15	15
30	15	15	15	15	15	16	16		15		23	27	26	28	34	24	18	15	14	15	14	15	14	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	27	29	29	28	23	15	25	29	29	27	20	19	24	27	27	28	28	29	29	28	30	29	26	28
MED	16	15	15	15	15	15	16	15	15	17	22	36	48	47	48	38	18	15	14	15	15	15	15	15
U Q	16	17	16	15	16	16	17	16	16	18	26	49	49	49	49	45	30	16	15	15	16	16	16	16
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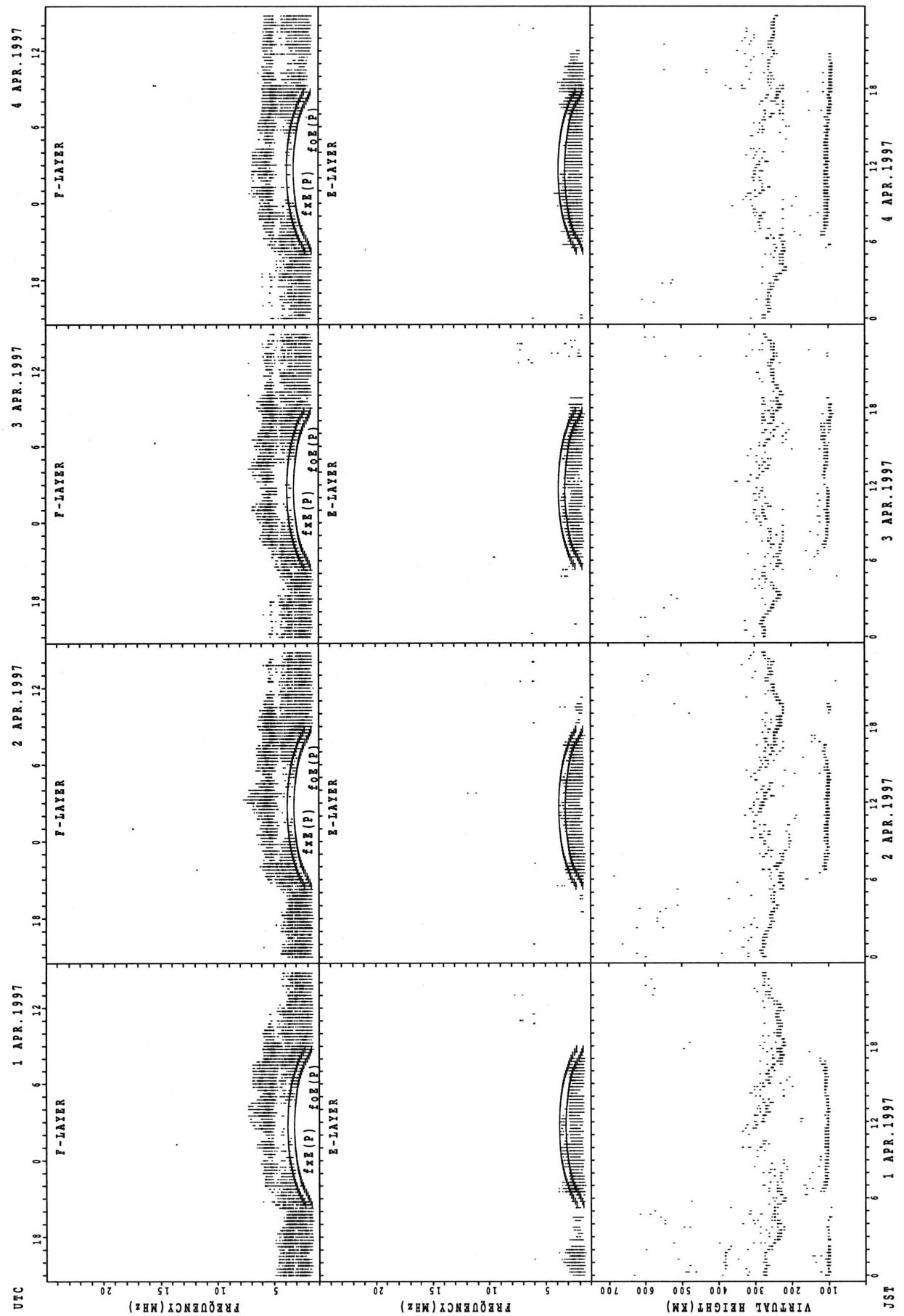
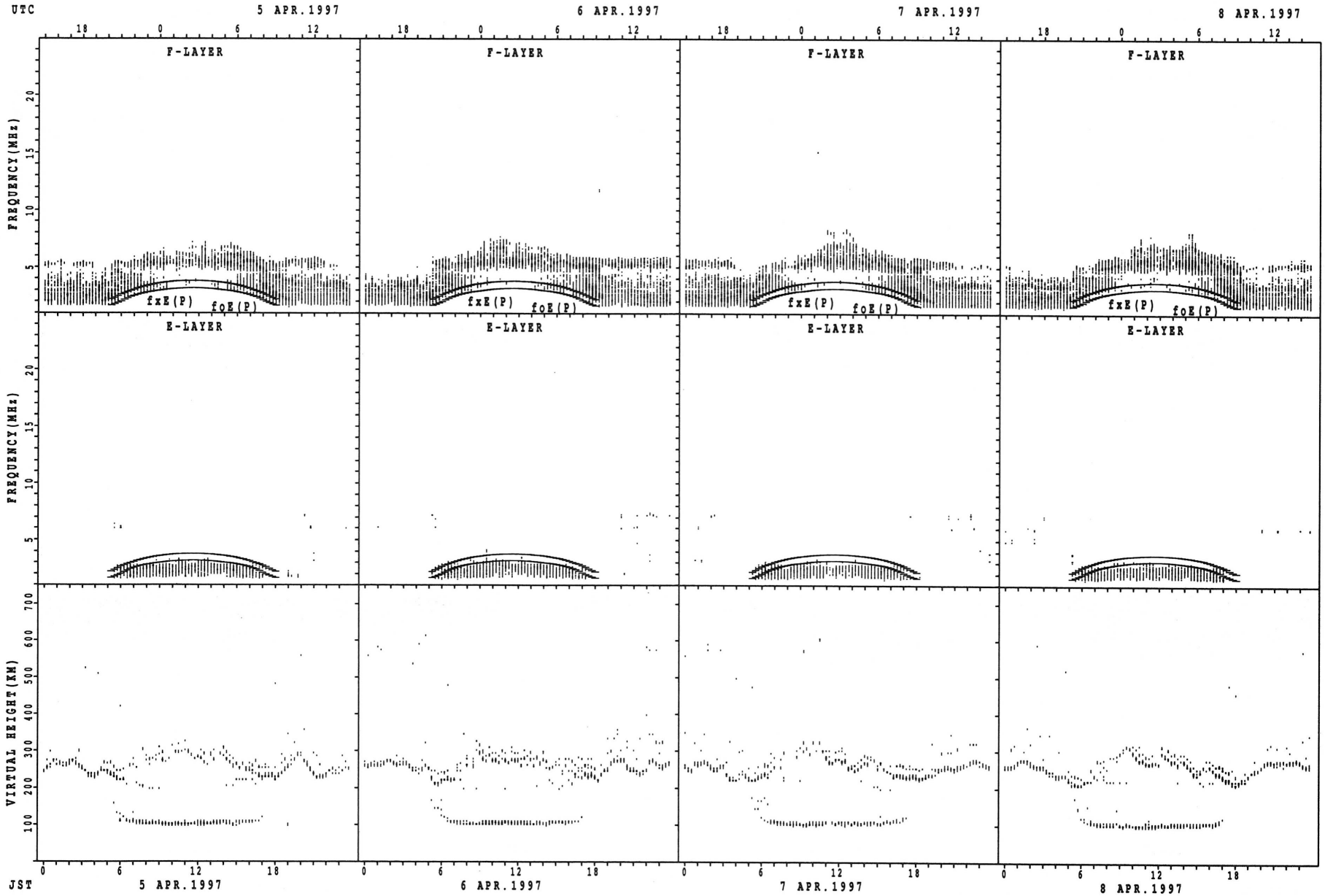
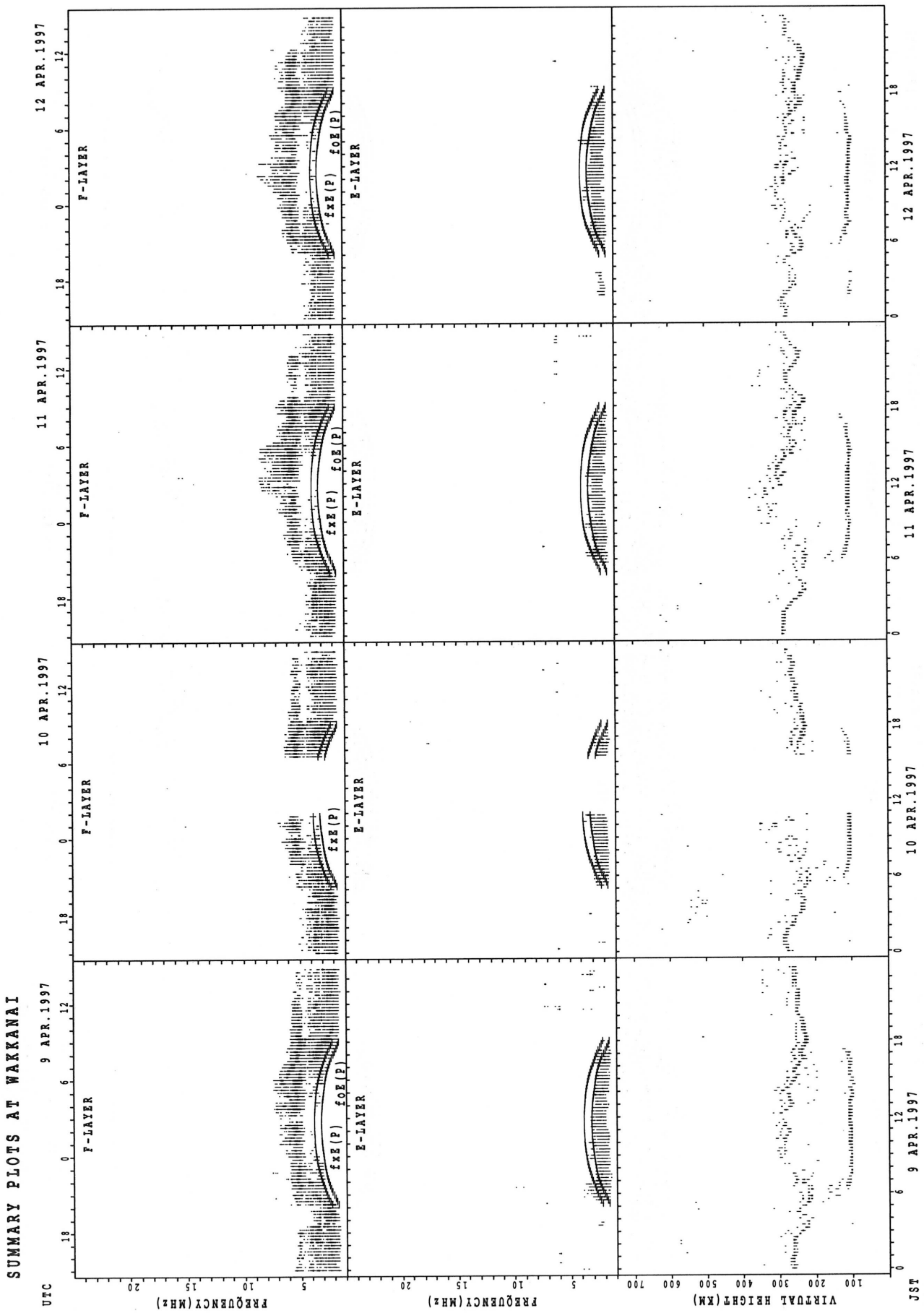

SUMMARY PLOTS AT WAKKANAI
UTC
JST
1 APR.1997
2 APR.1997
3 APR.1997
4 APR.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

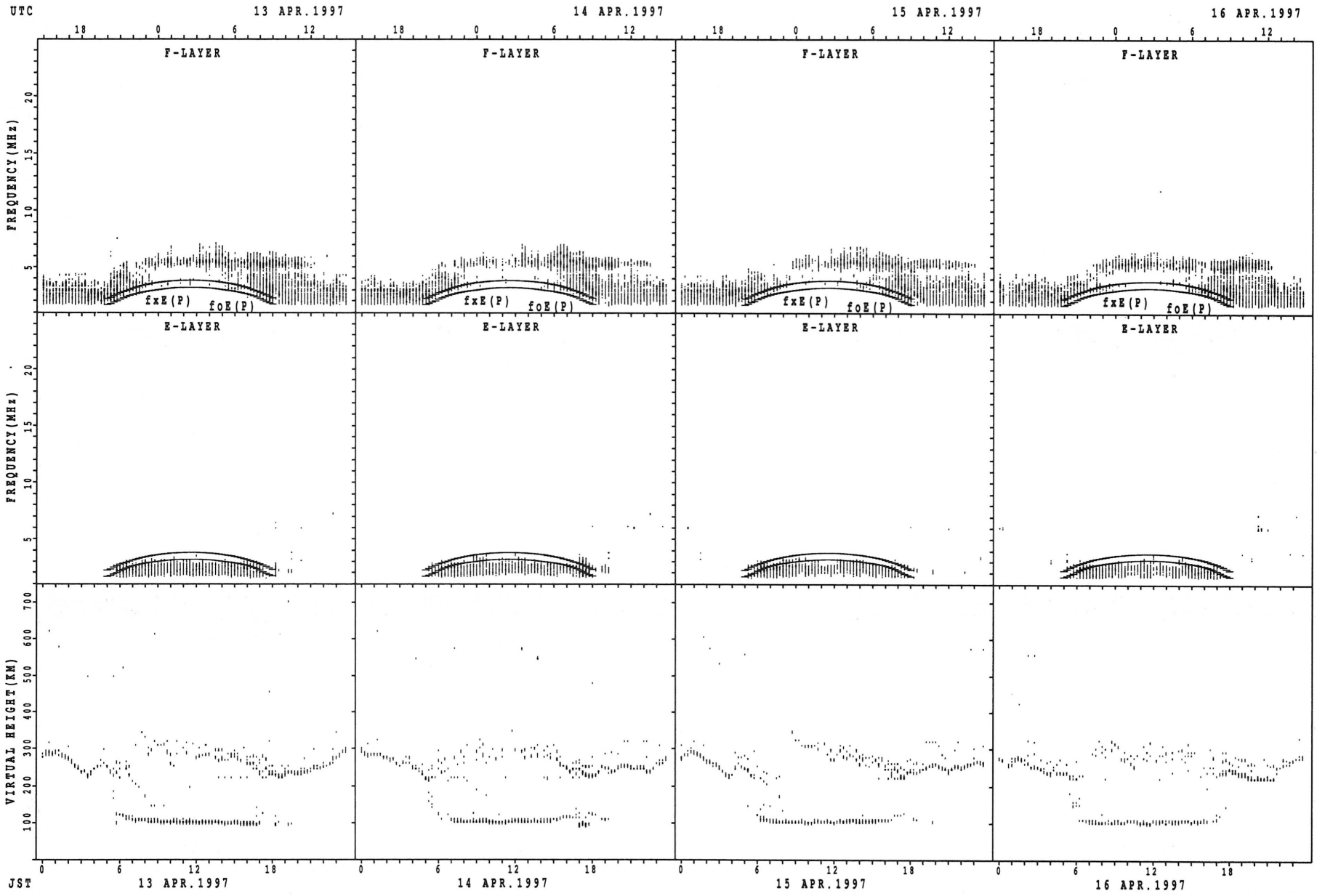
SUMMARY PLOTS AT WAKKANAI



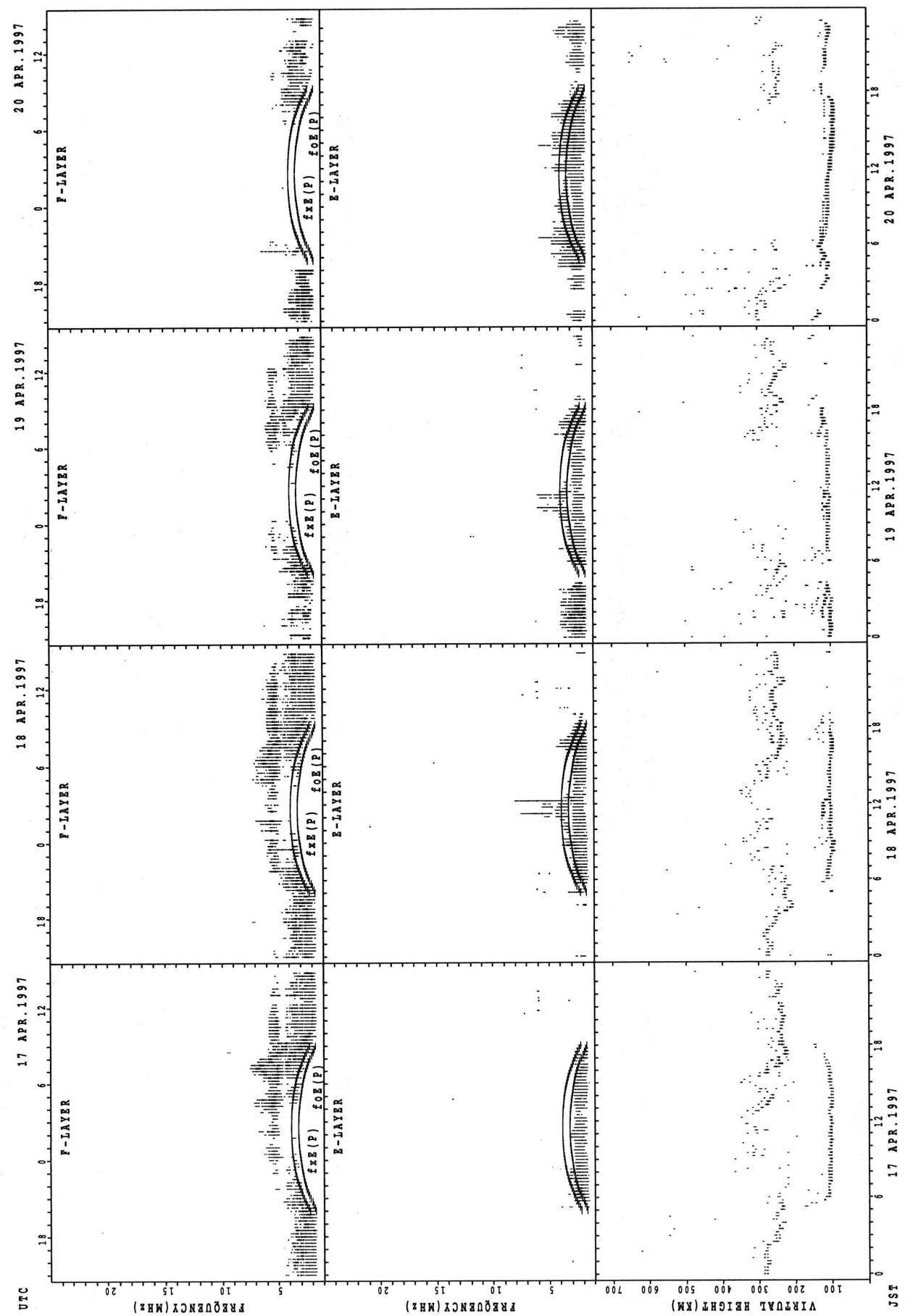
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
9 APR.1997
10 APR.1997
11 APR.1997
12 APR.1997
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

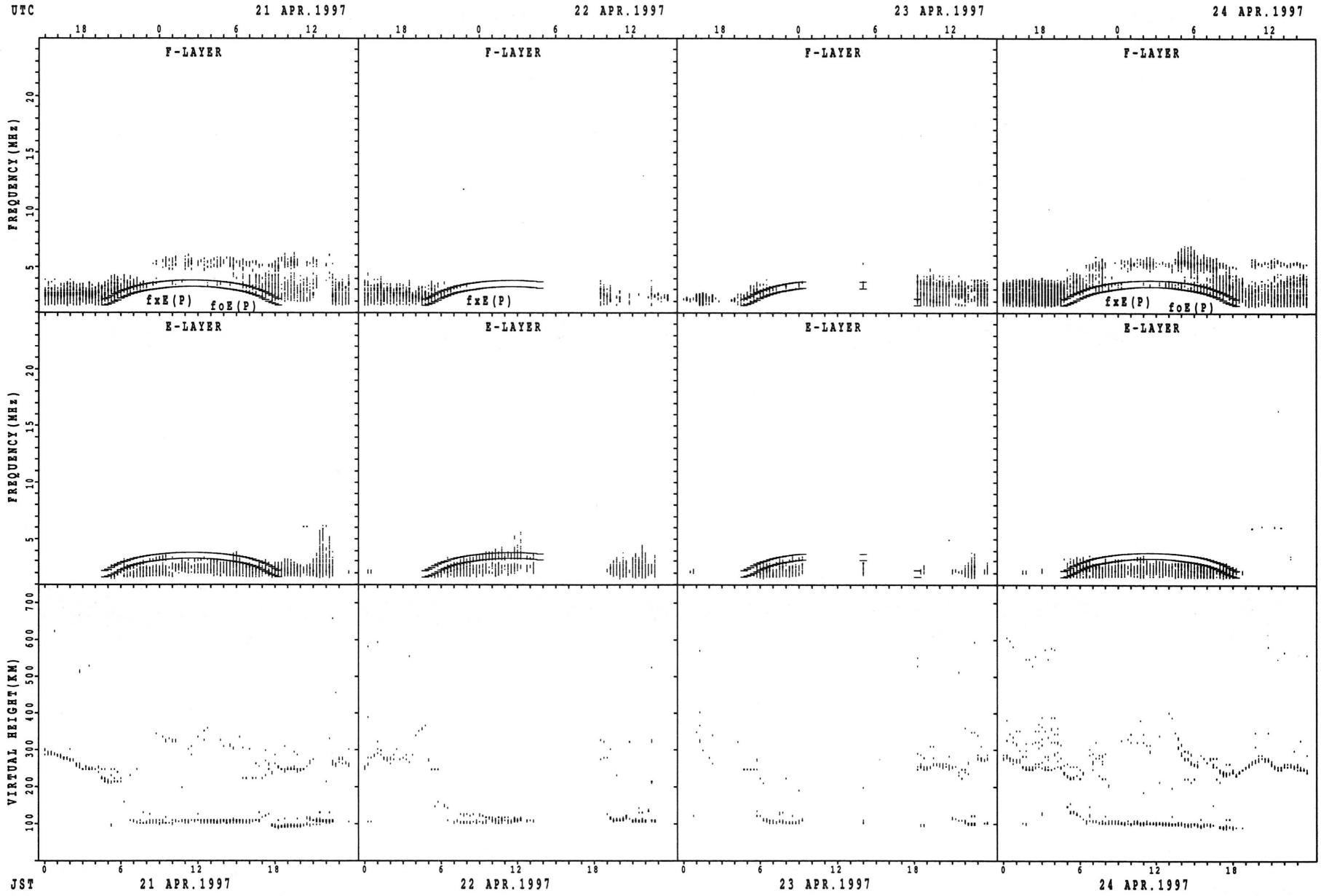
SUMMARY PLOTS AT WAKKANAI



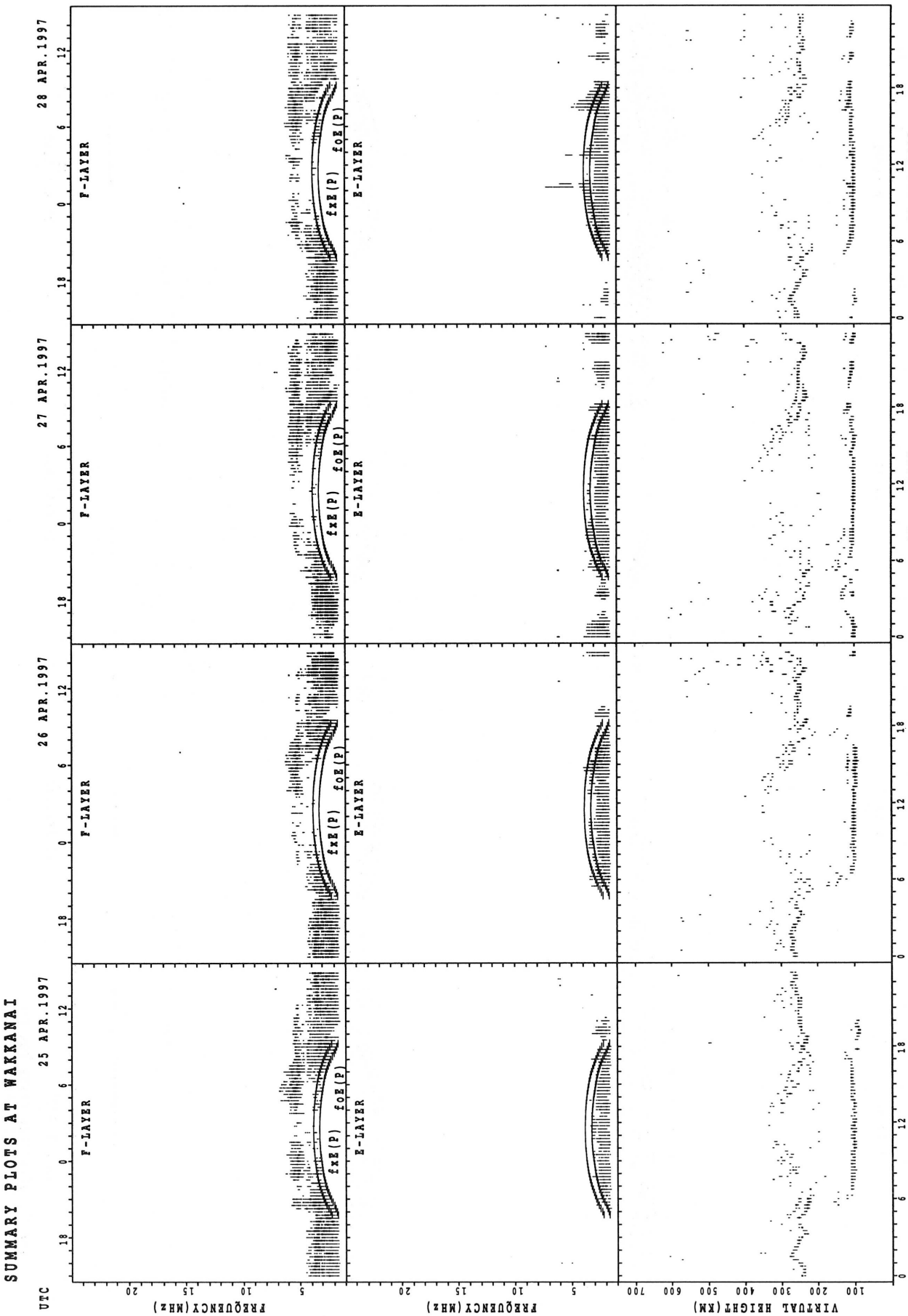
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
17 APR.1997
18 APR.1997
19 APR.1997
20 APR.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

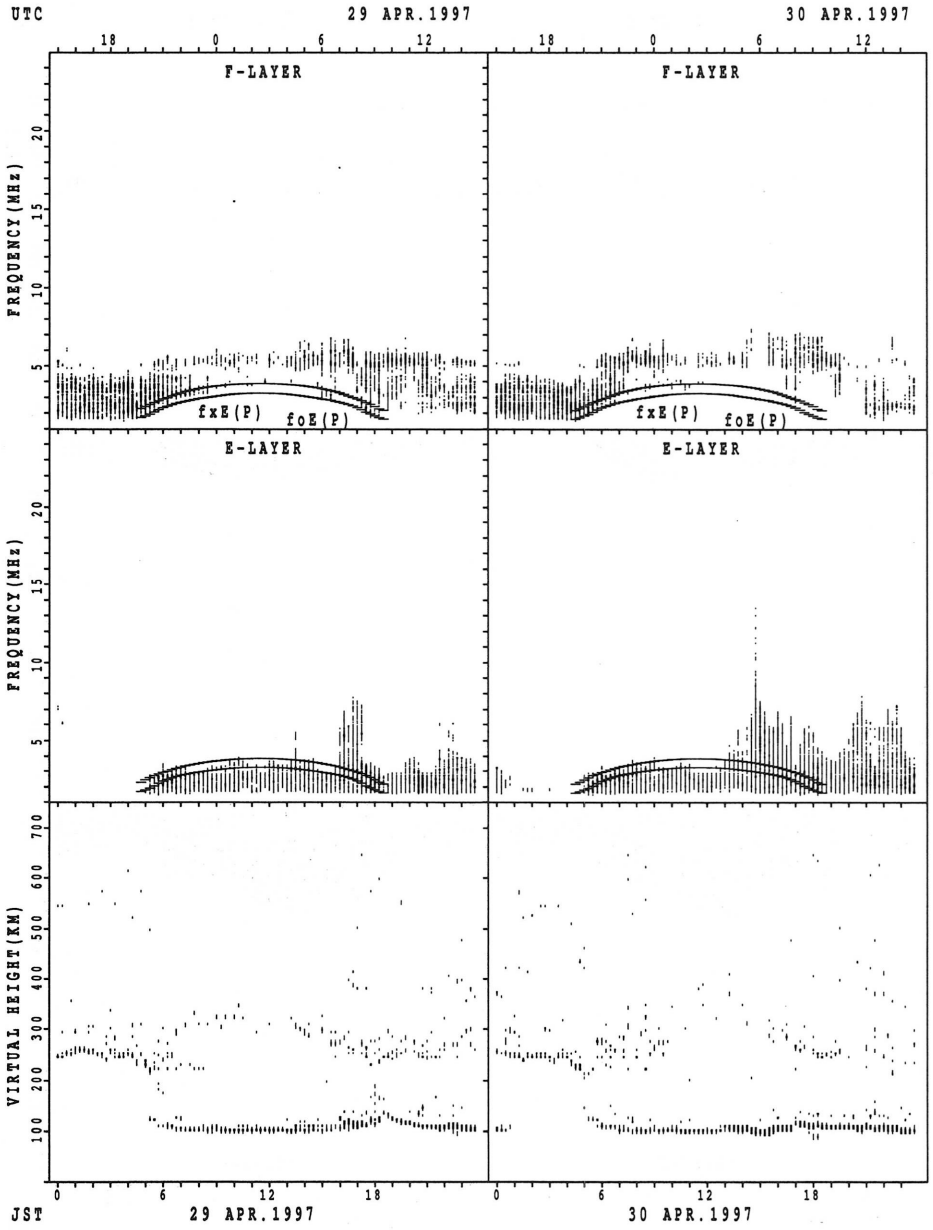
SUMMARY PLOTS AT WAKKANAI



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

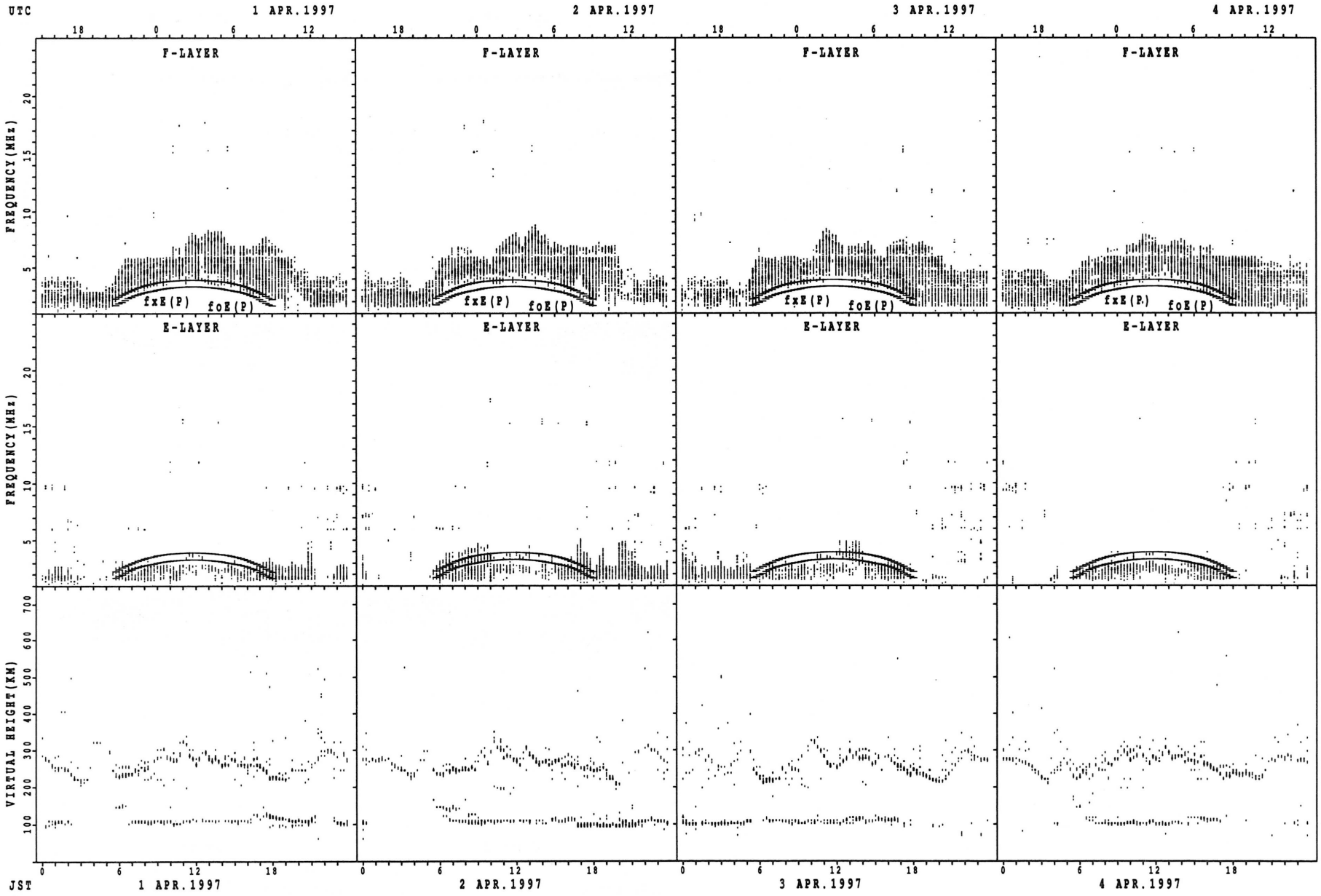

SUMMARY PLOTS AT WAKKANAI
UTC
JST
25 APR.1997
26 APR.1997
27 APR.1997
28 APR.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



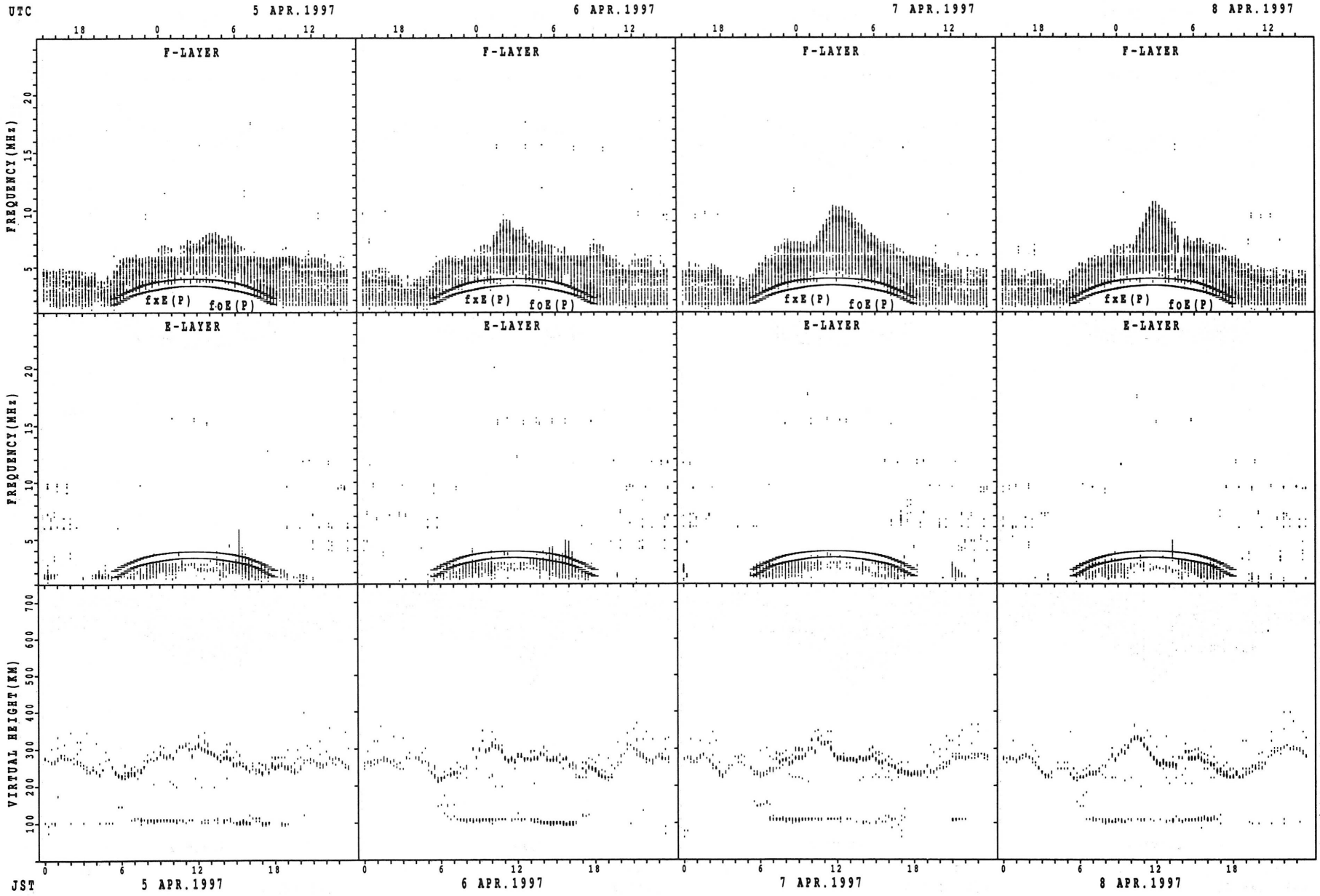
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

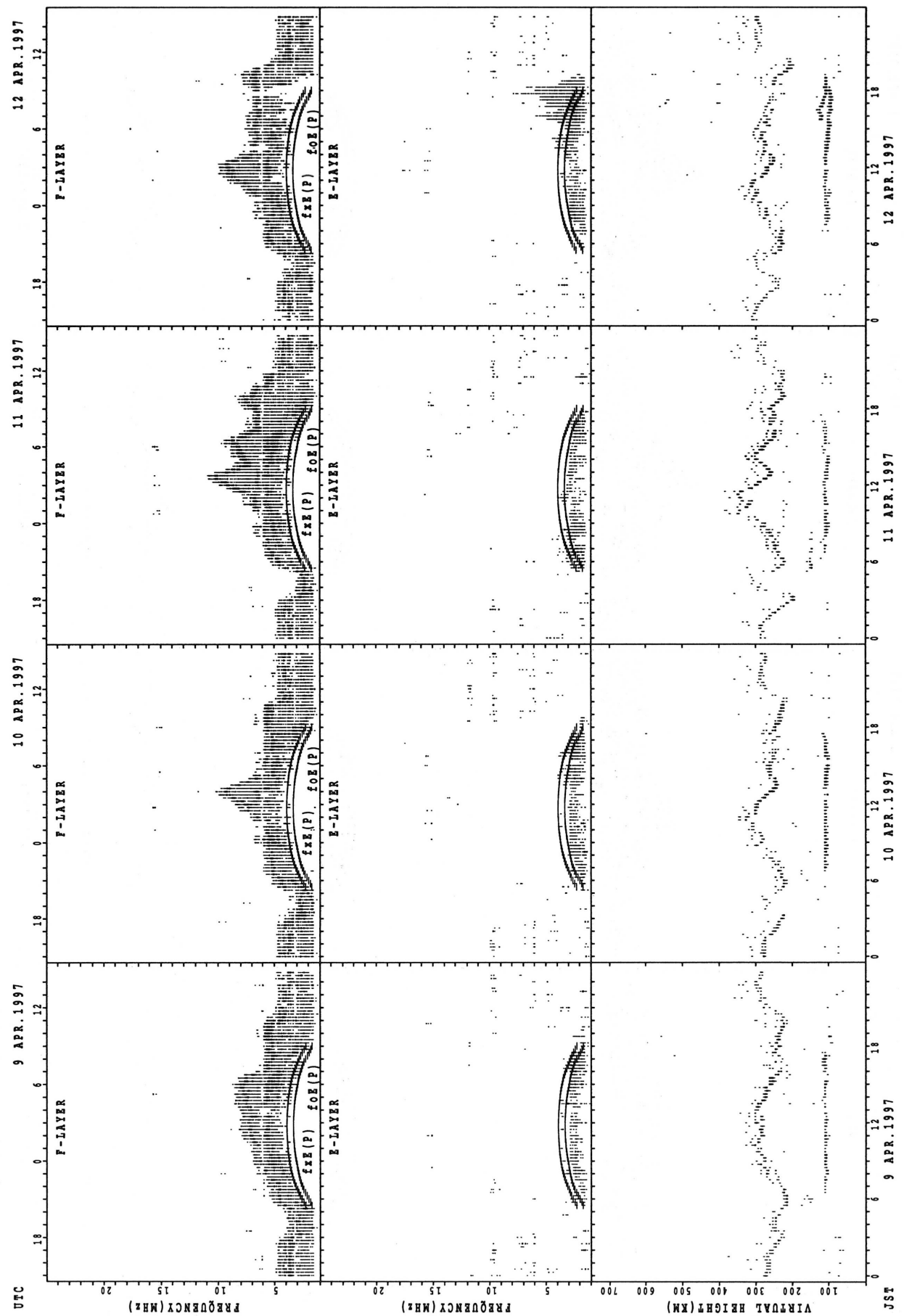


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

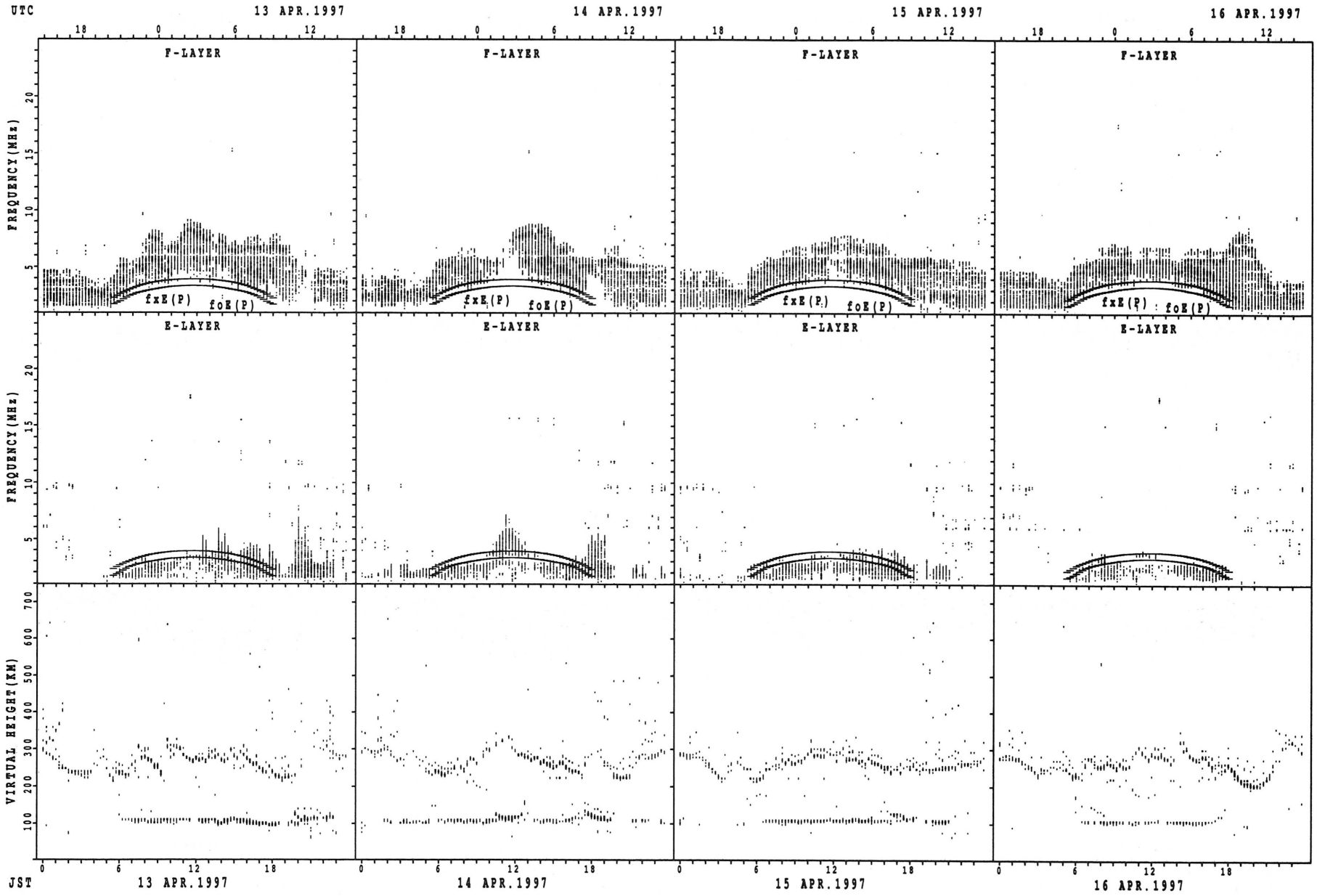
SUMMARY PLOTS AT KOKUBUNJI TOKYO



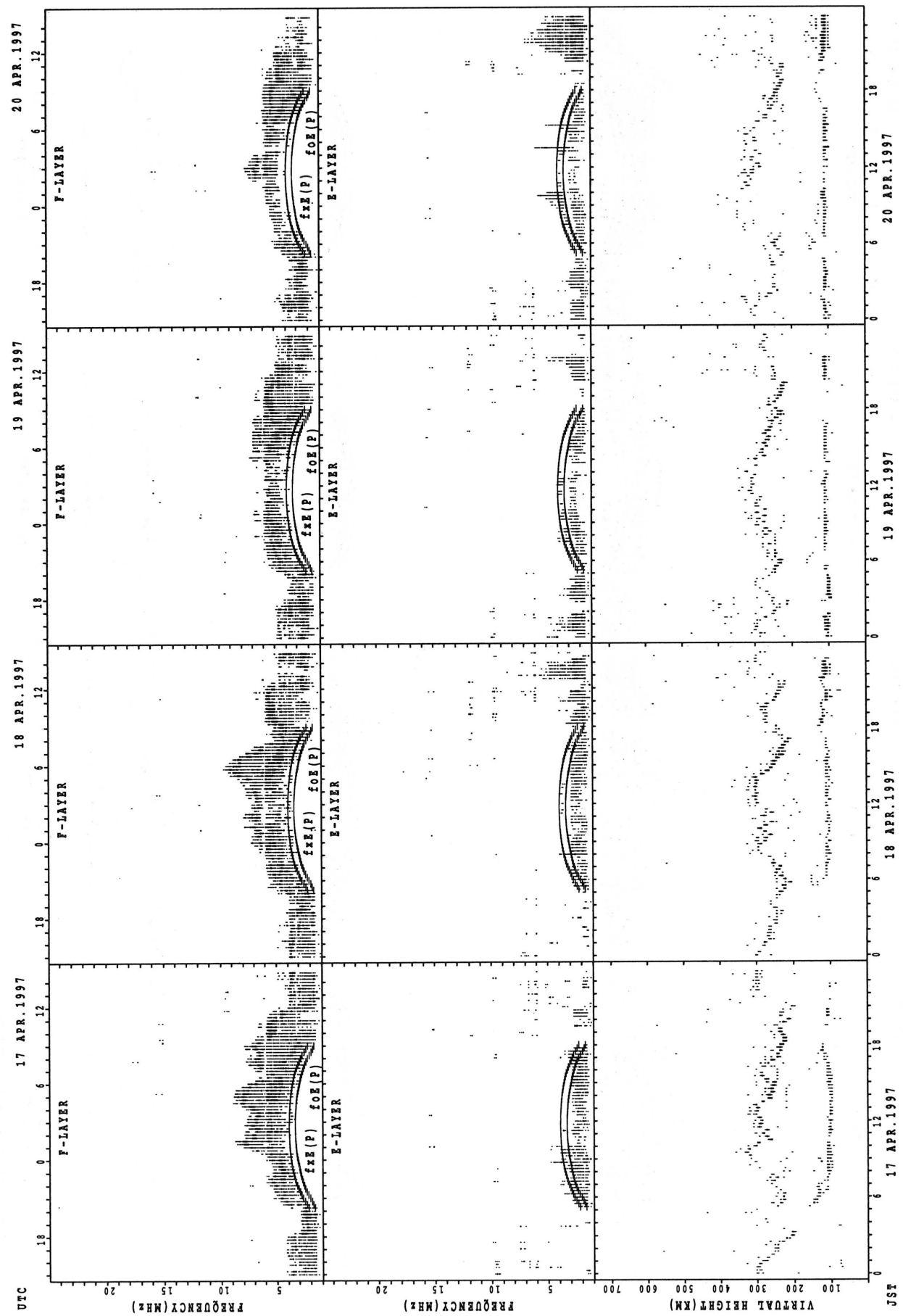
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
9 APR.1997
10 APR.1997
11 APR.1997
12 APR.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

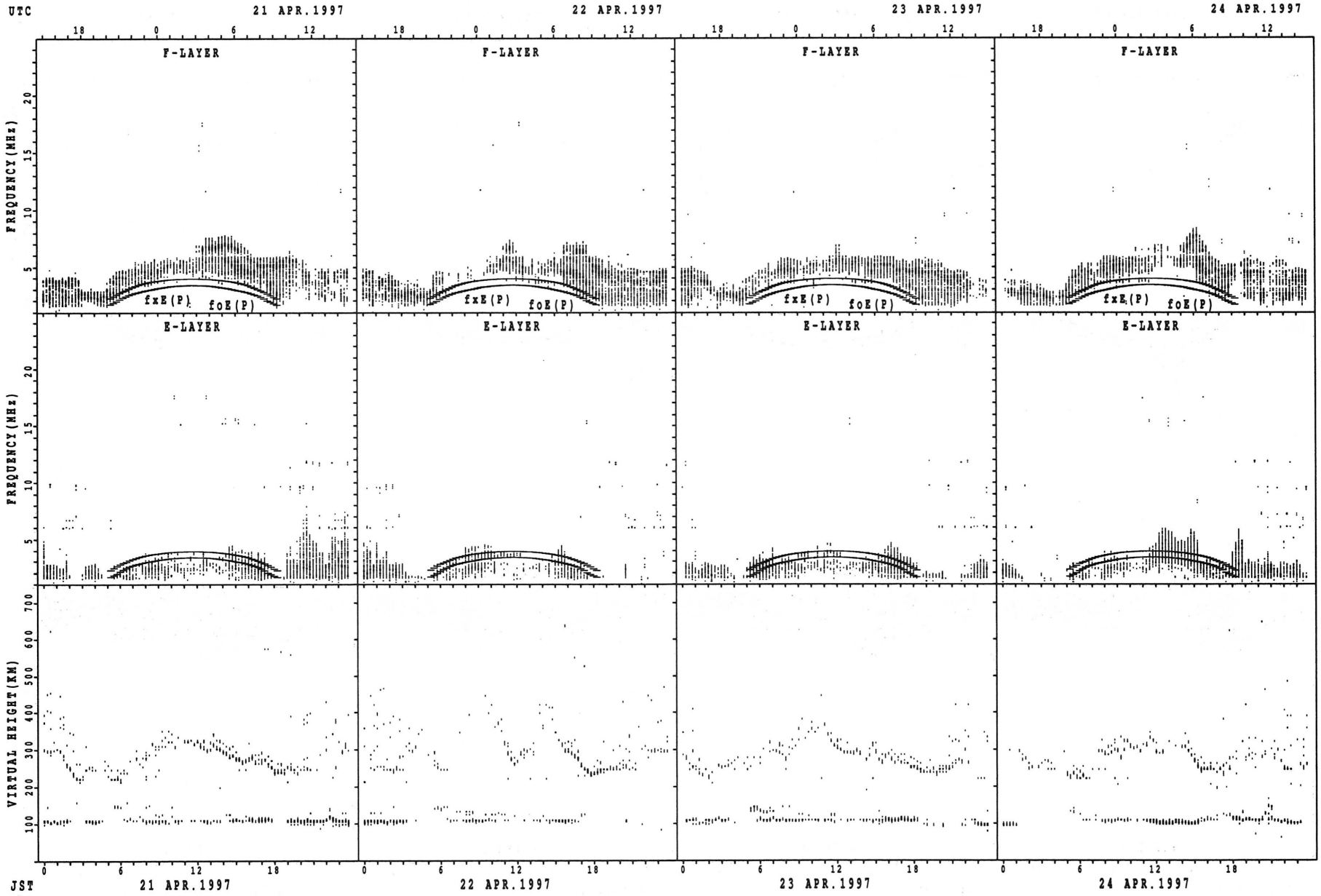
SUMMARY PLOTS AT KOKUBUNJI TOKYO



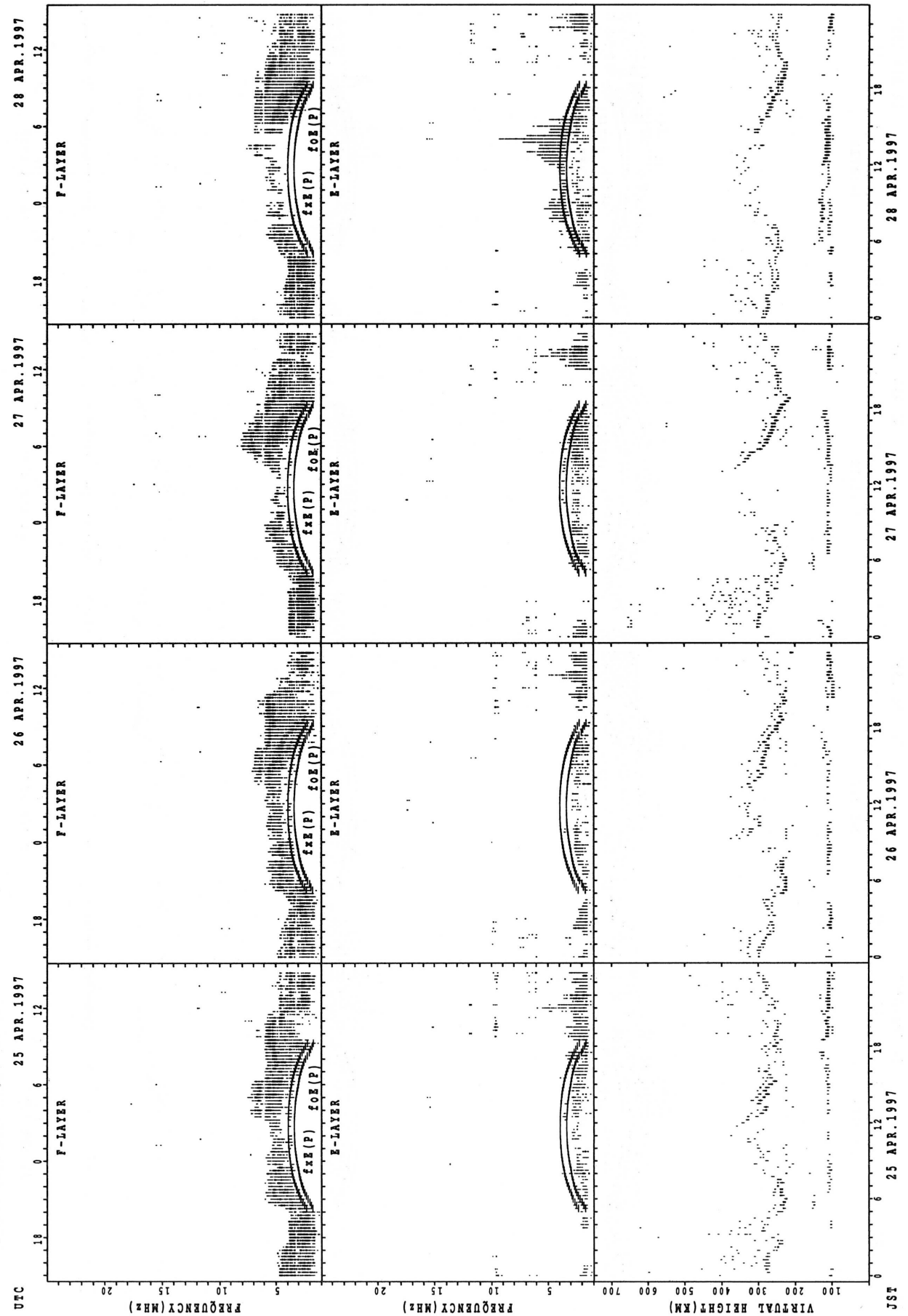
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
17 APR.1997
18 APR.1997
19 APR.1997
20 APR.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

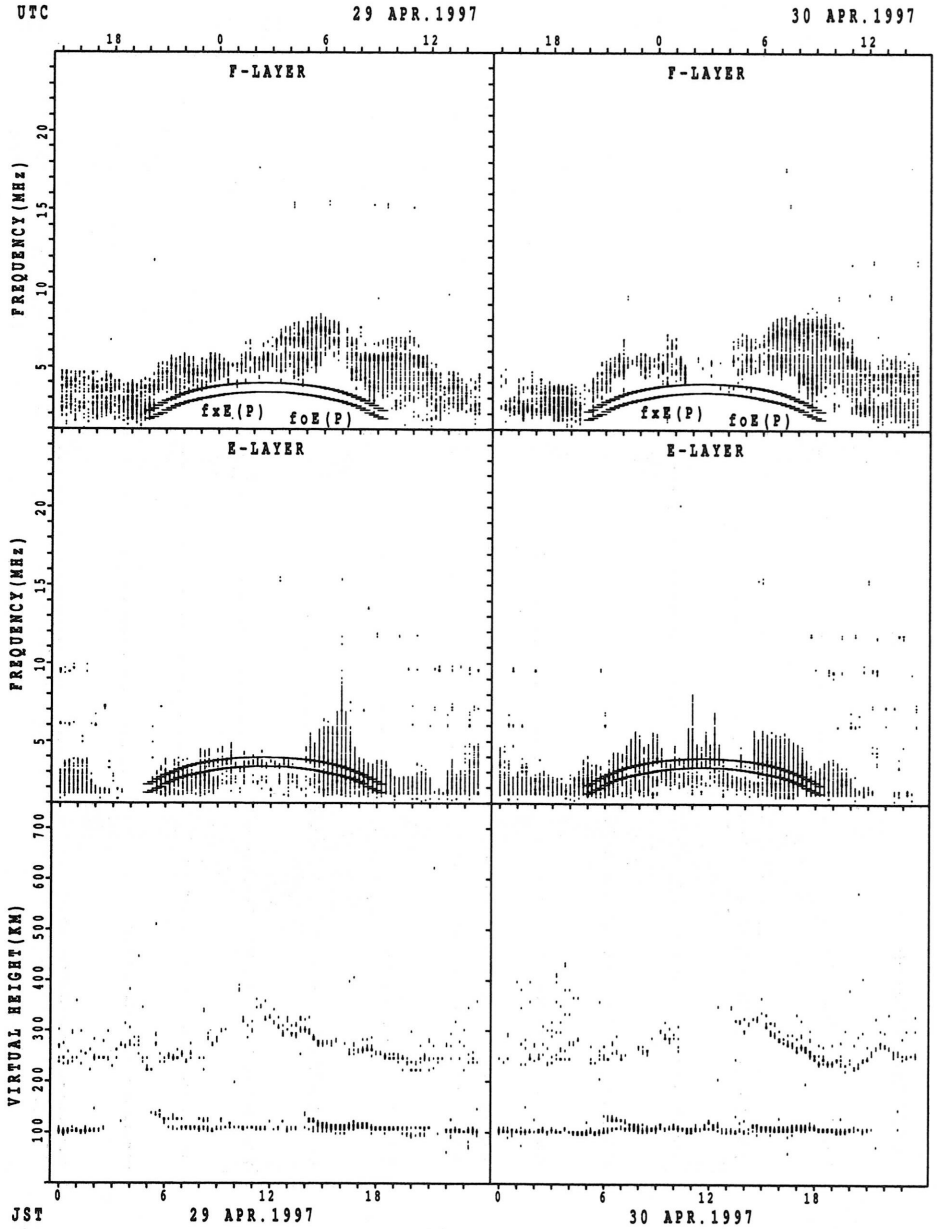
SUMMARY PLOTS AT KOKUBUNJI TOKYO



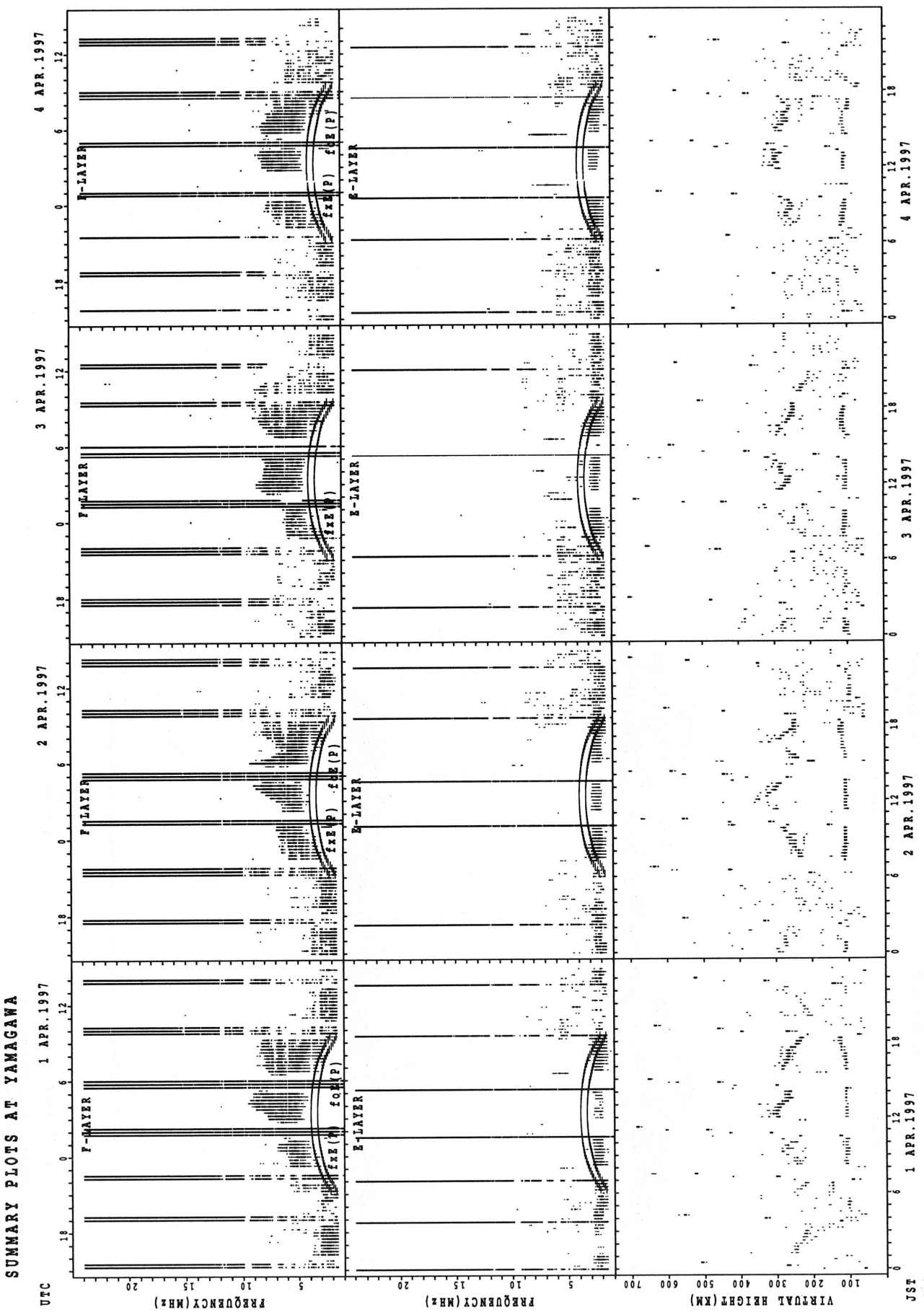
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
25 APR.1997
26 APR.1997
27 APR.1997
28 APR.1997
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

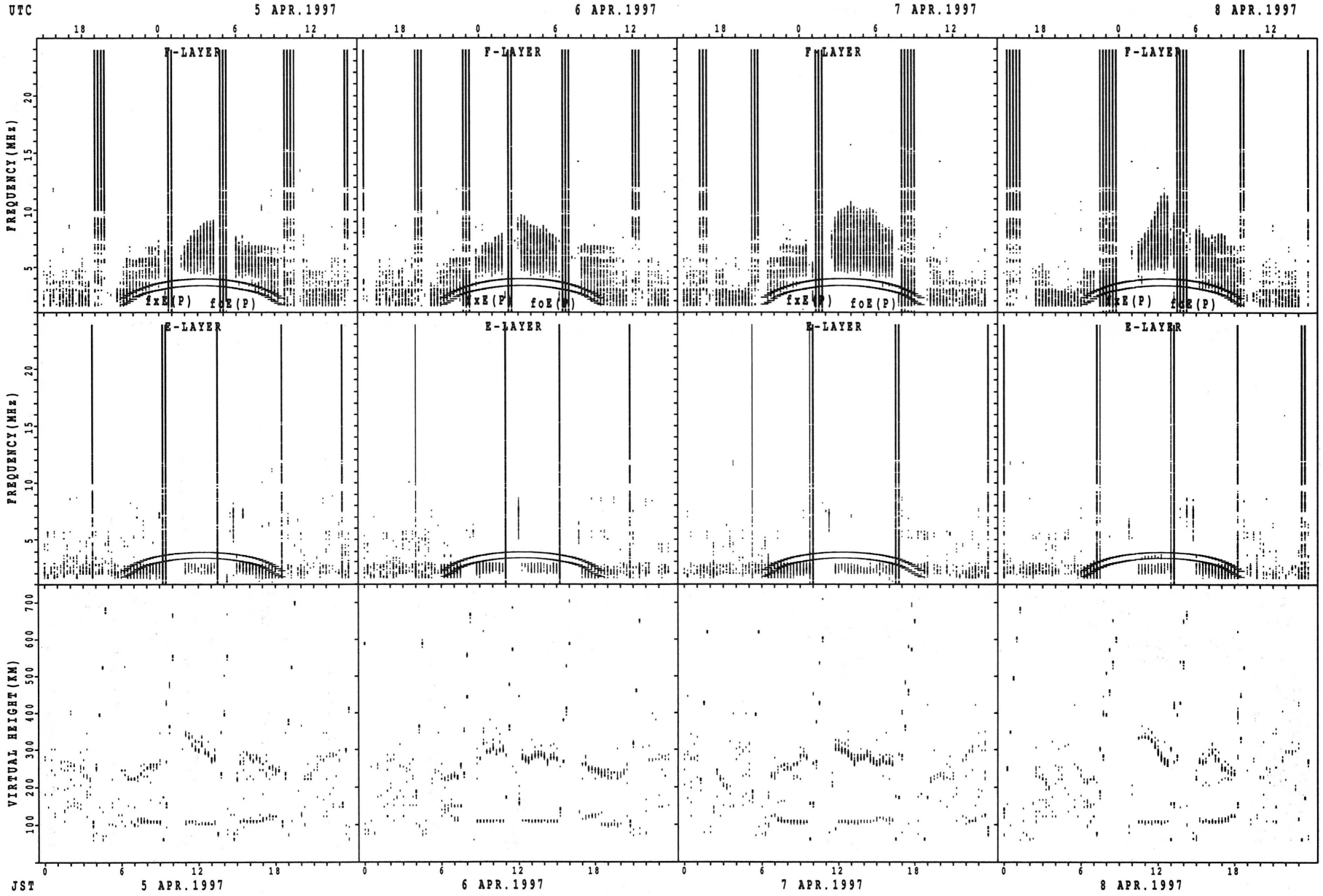
SUMMARY PLOTS AT KOKUBUNJI TOKYO



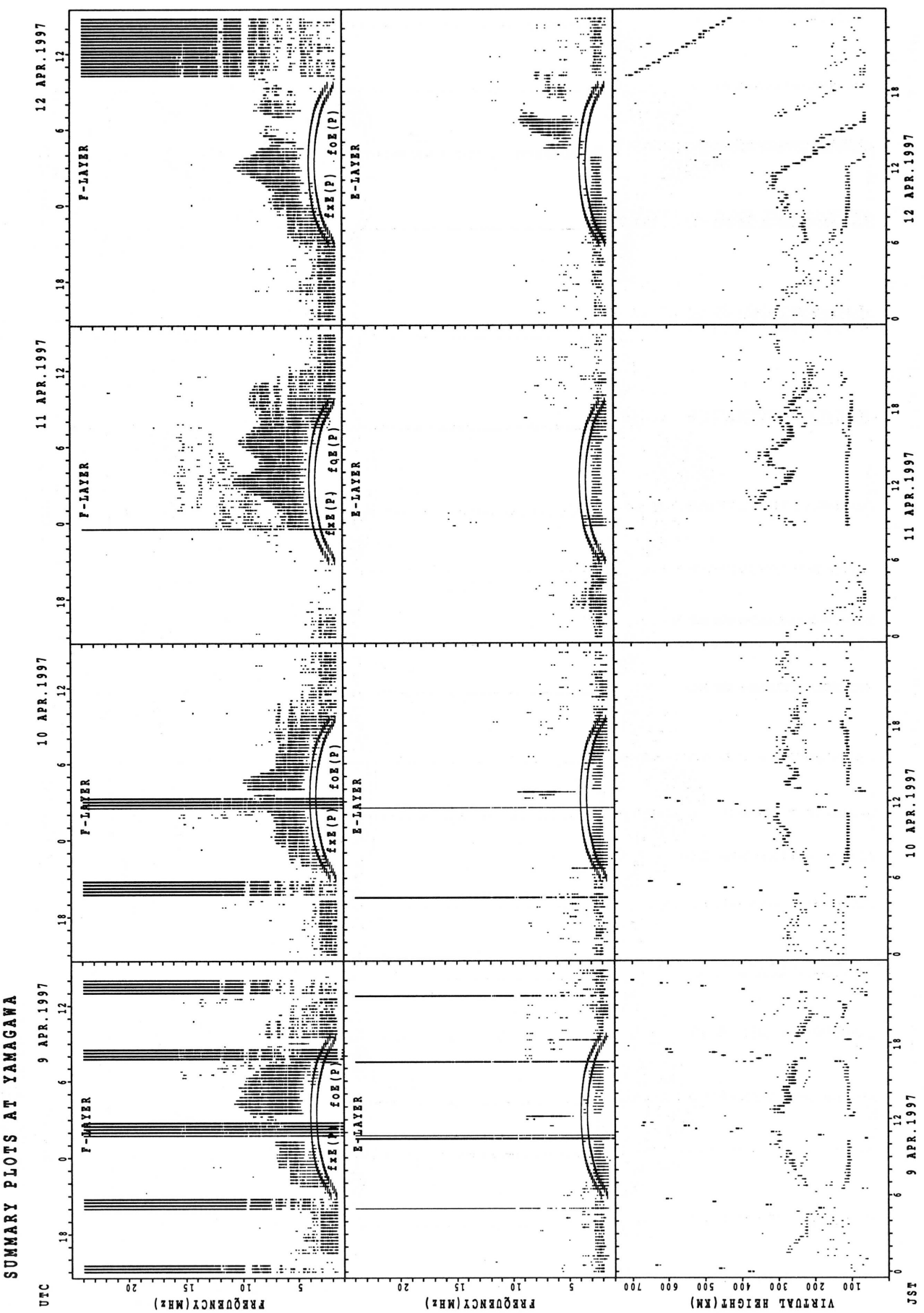
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
1 APR.1997
2 APR.1997
3 APR.1997
4 APR.1997
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

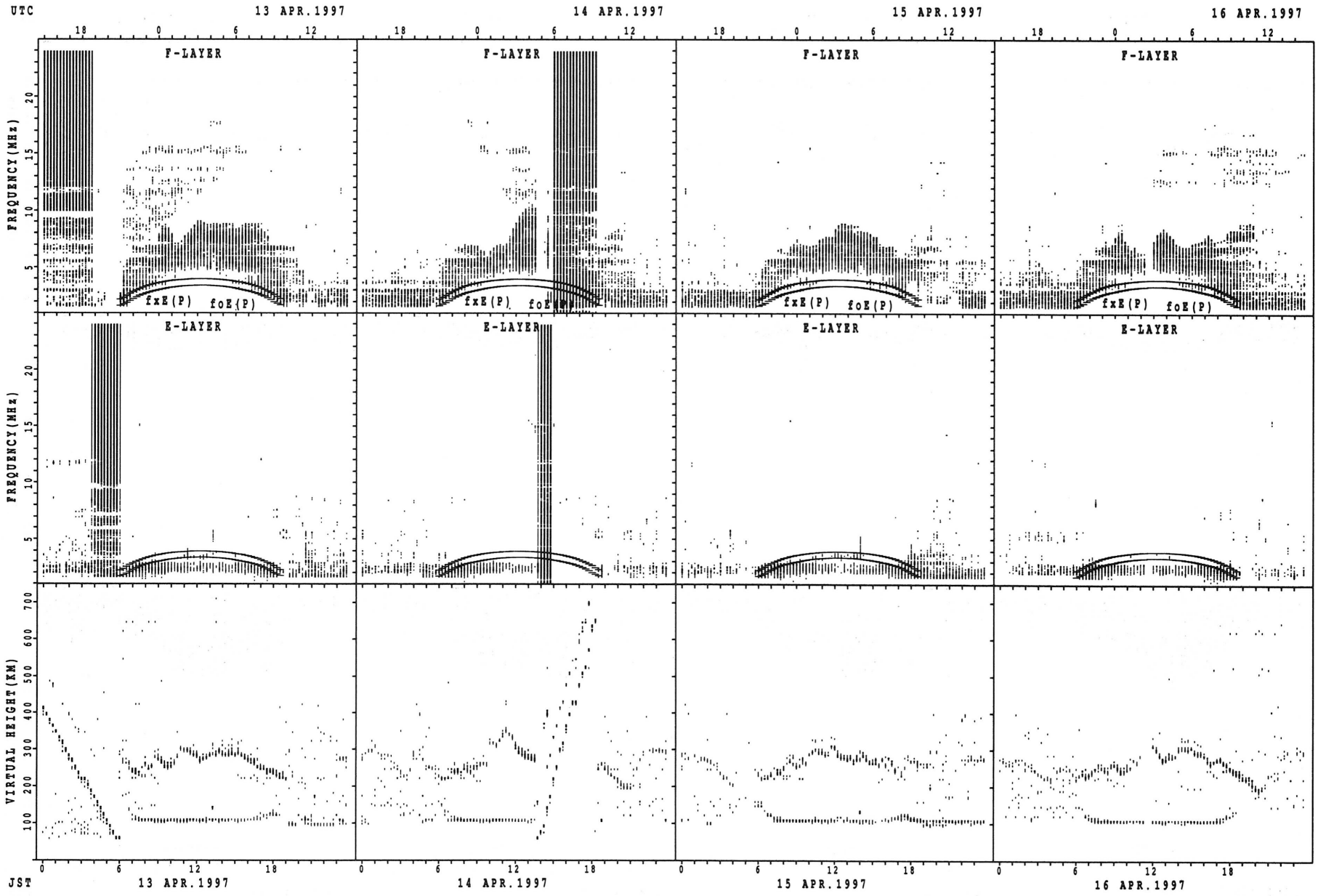
SUMMARY PLOTS AT YAMAGAWA



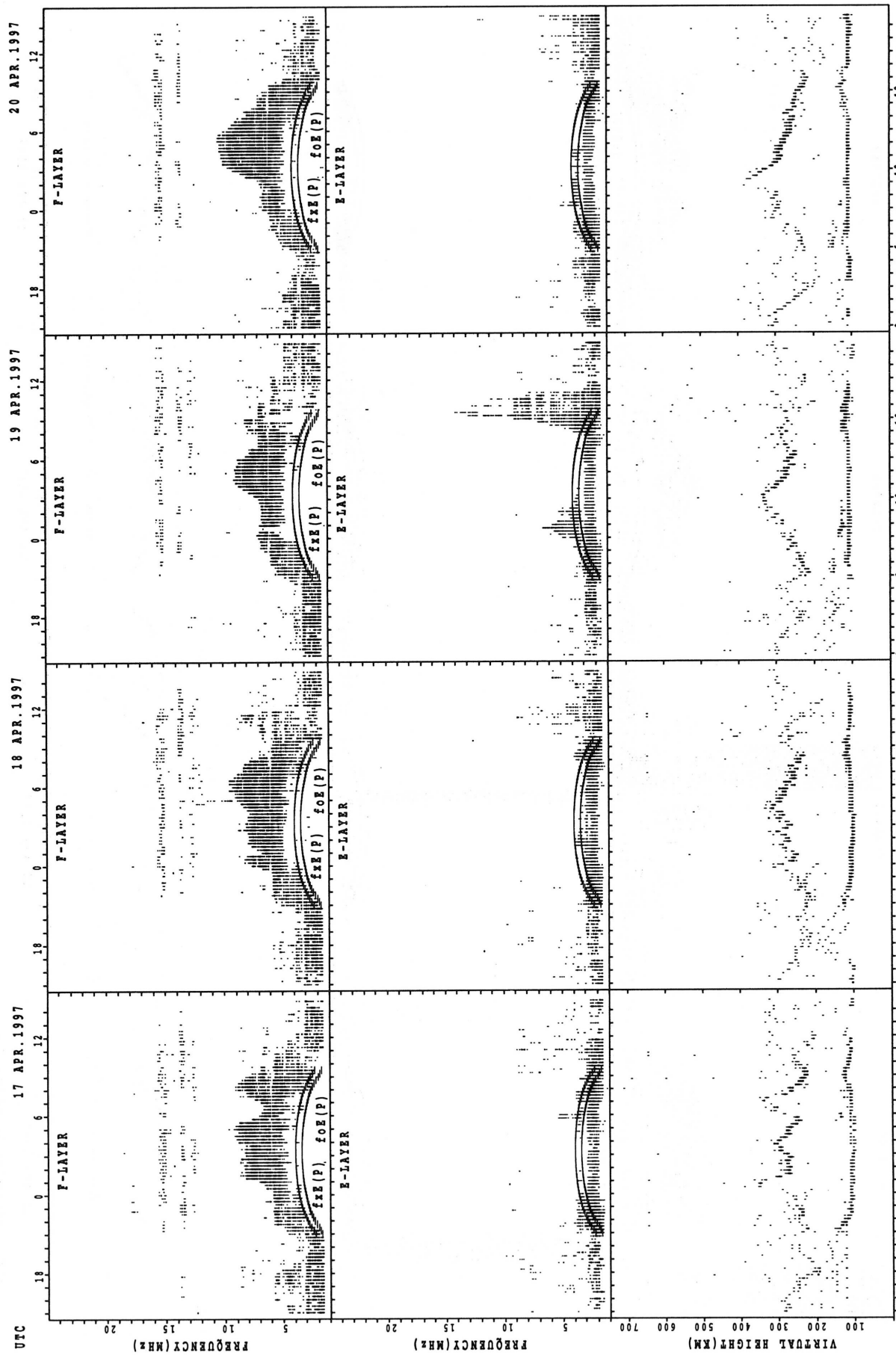
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
9 APR.1997
10 APR.1997
11 APR.1997
12 APR.1997
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

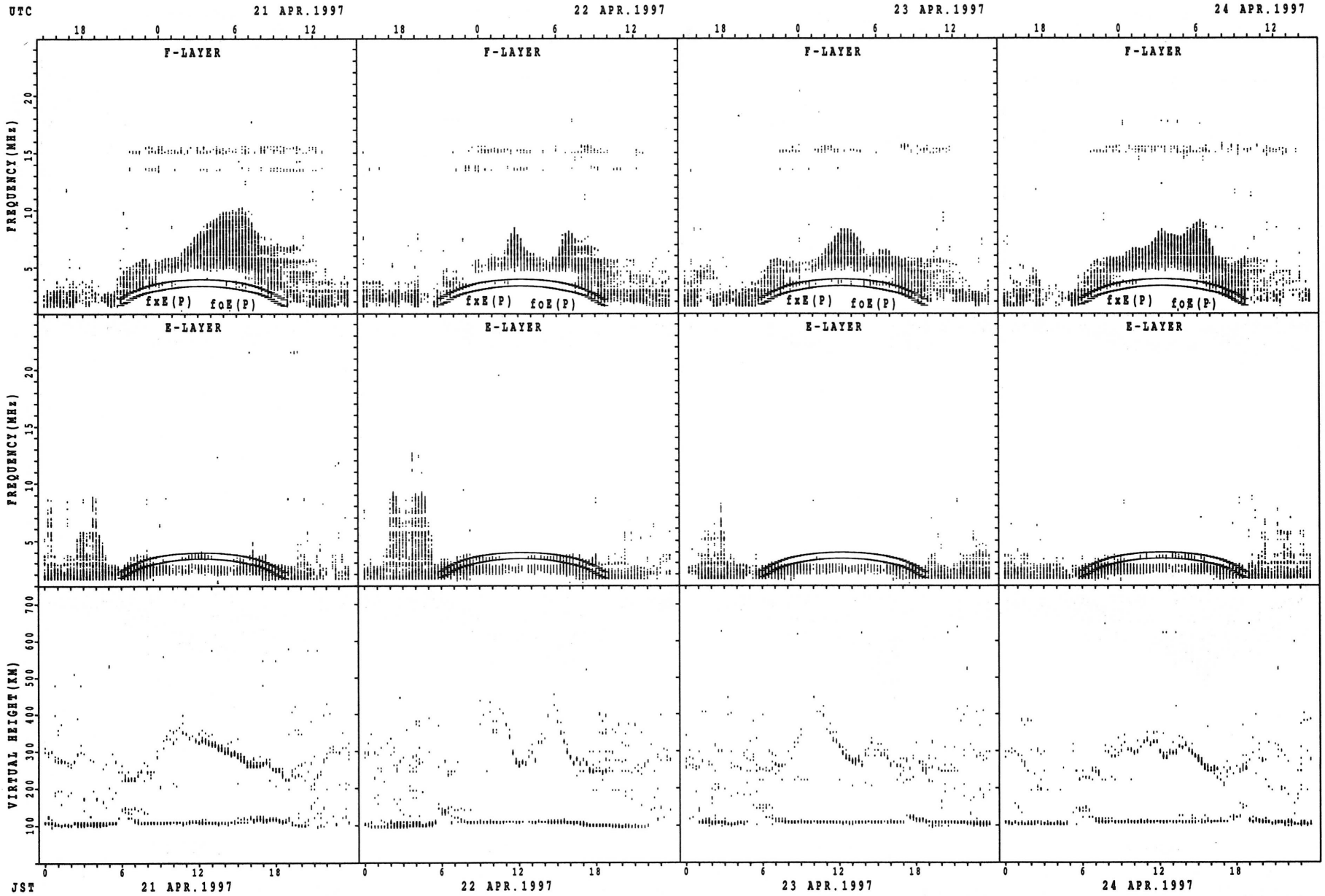
SUMMARY PLOTS AT YAMAGAWA



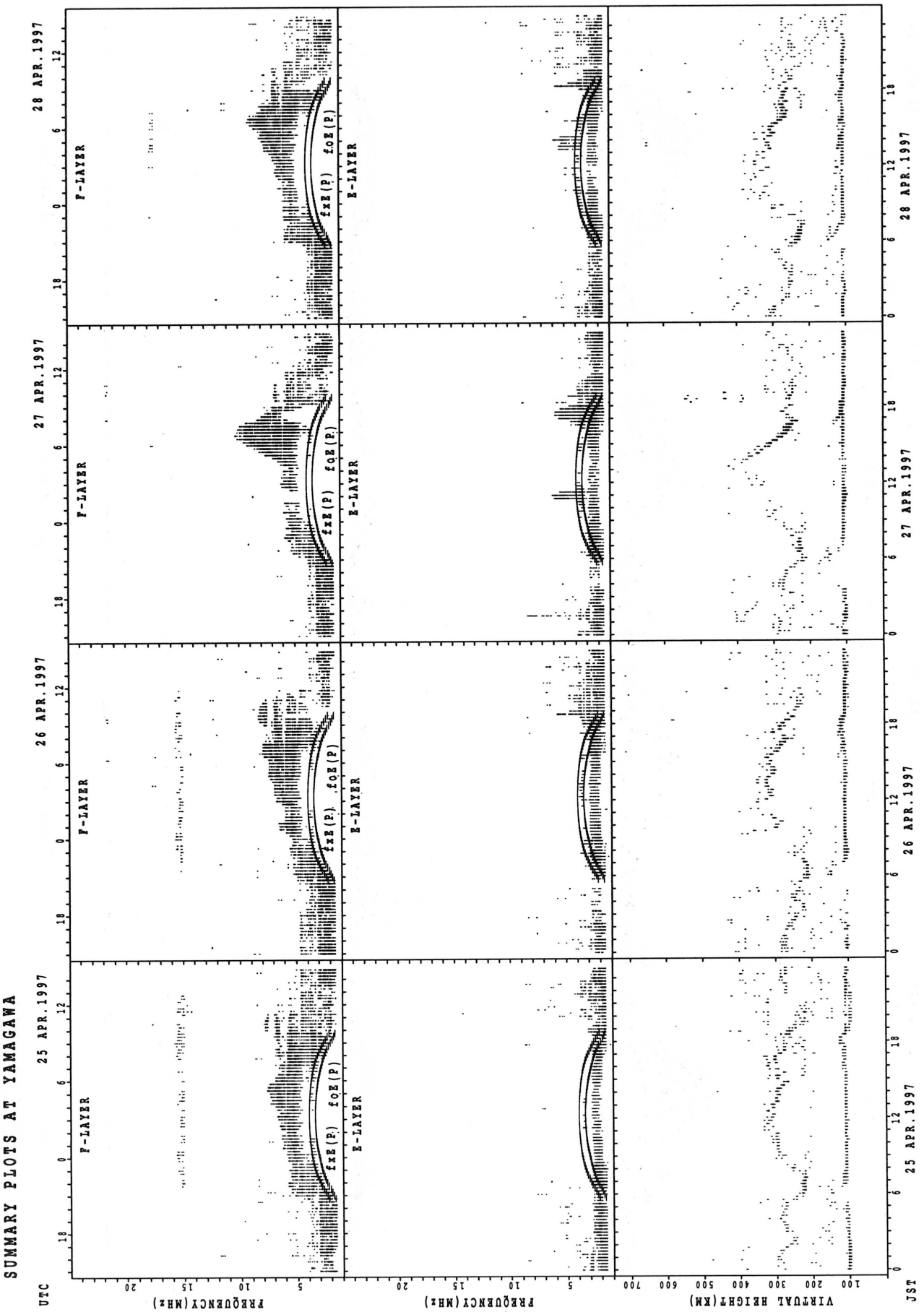
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
17 APR.1997
18 APR.1997
19 APR.1997
20 APR.1997
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

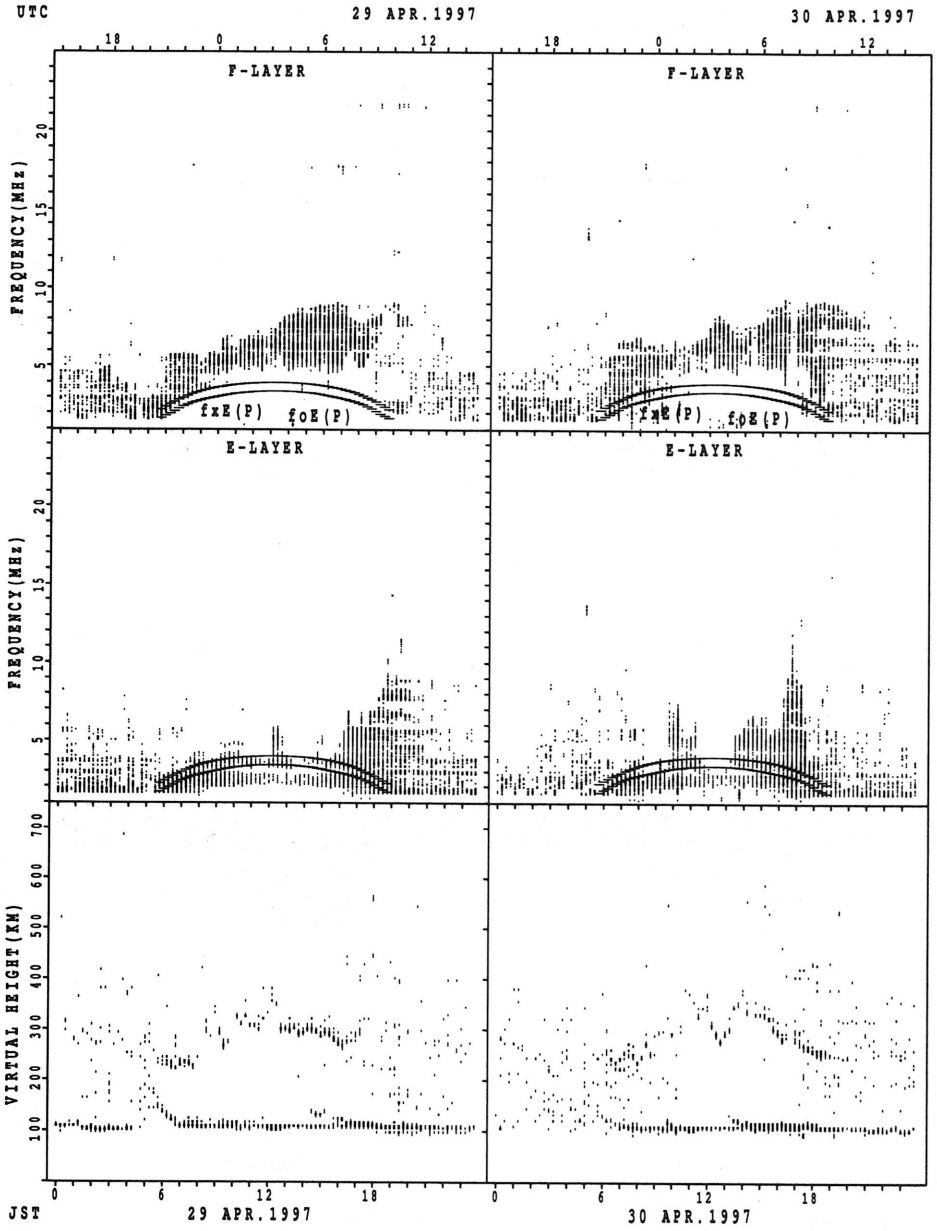
SUMMARY PLOTS AT YAMAGAWA



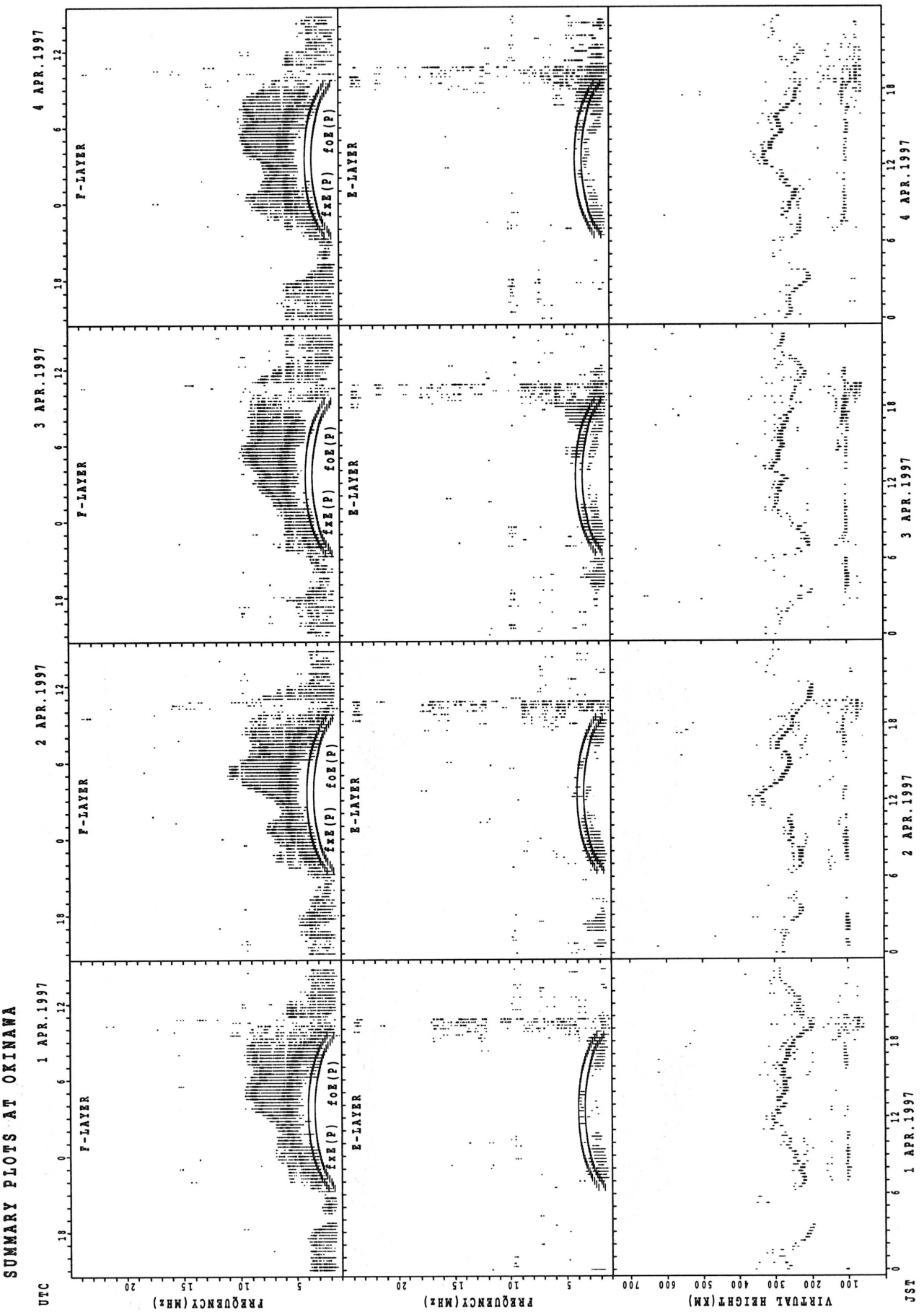
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
25 APR.1997
26 APR.1997
27 APR.1997
28 APR.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

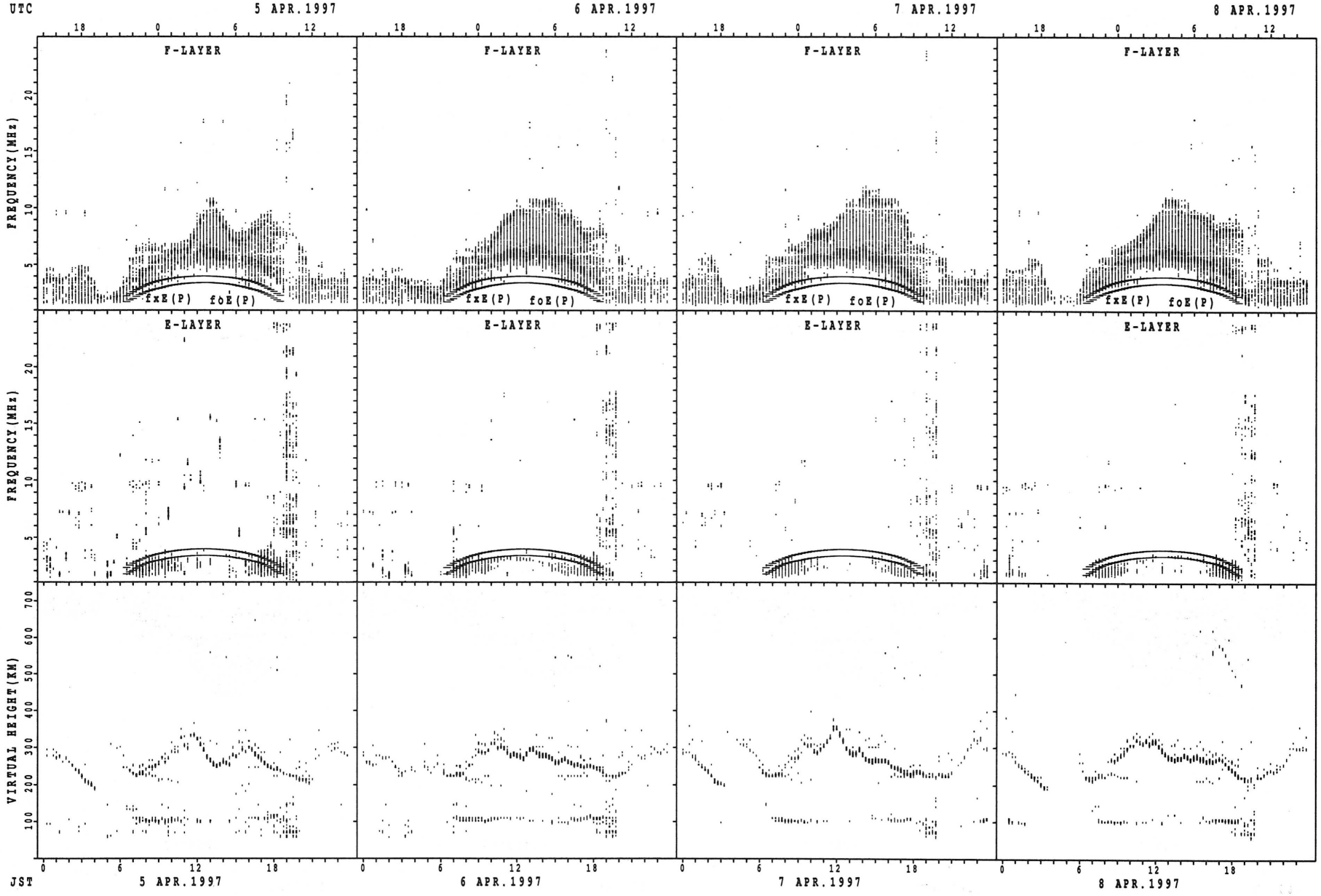
SUMMARY PLOTS AT YAMAGAWA



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

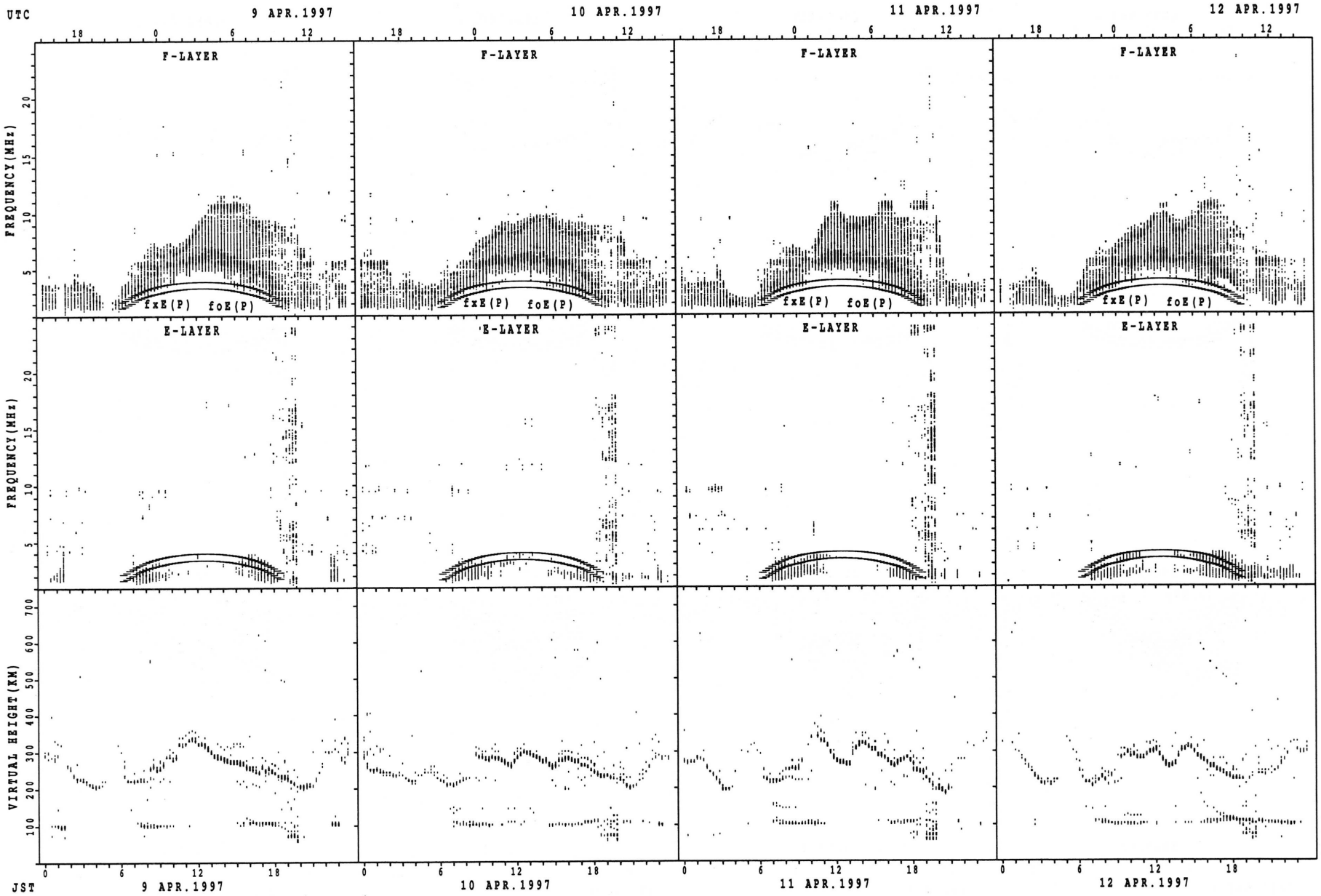

SUMMARY PLOTS AT OKINAWA
1 APR.1997
2 APR.1997
3 APR.1997
4 APR.1997
UTC
JST
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



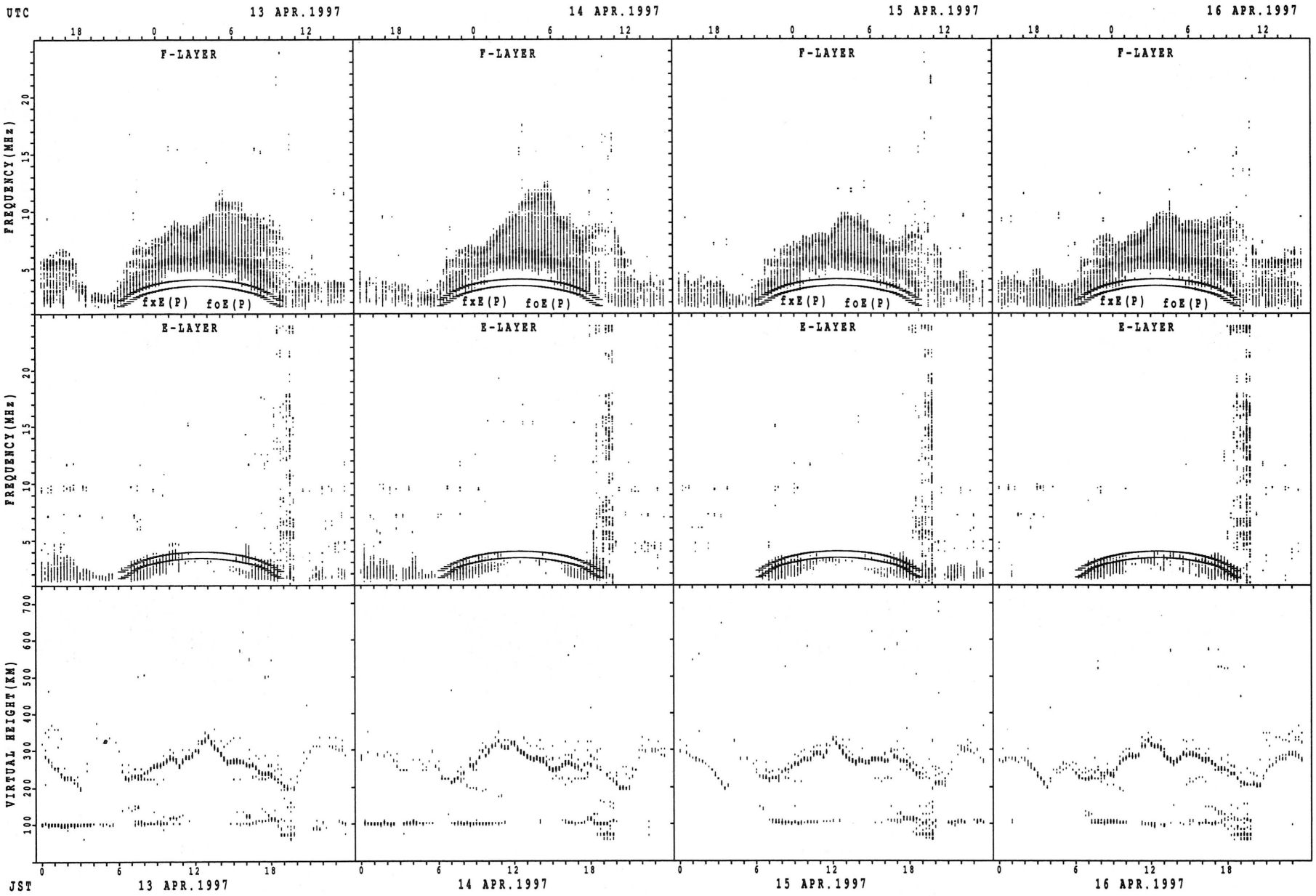
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA

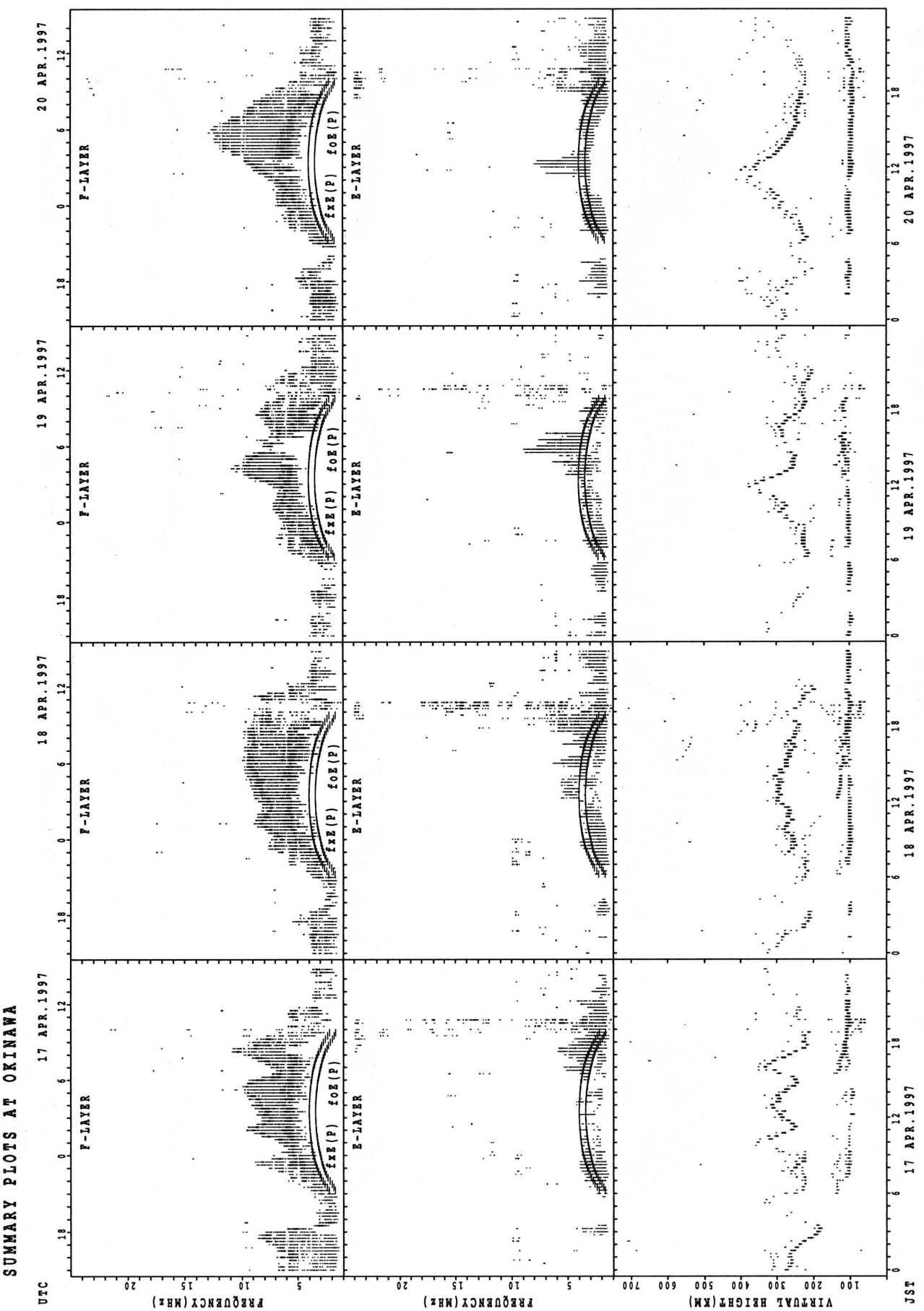


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

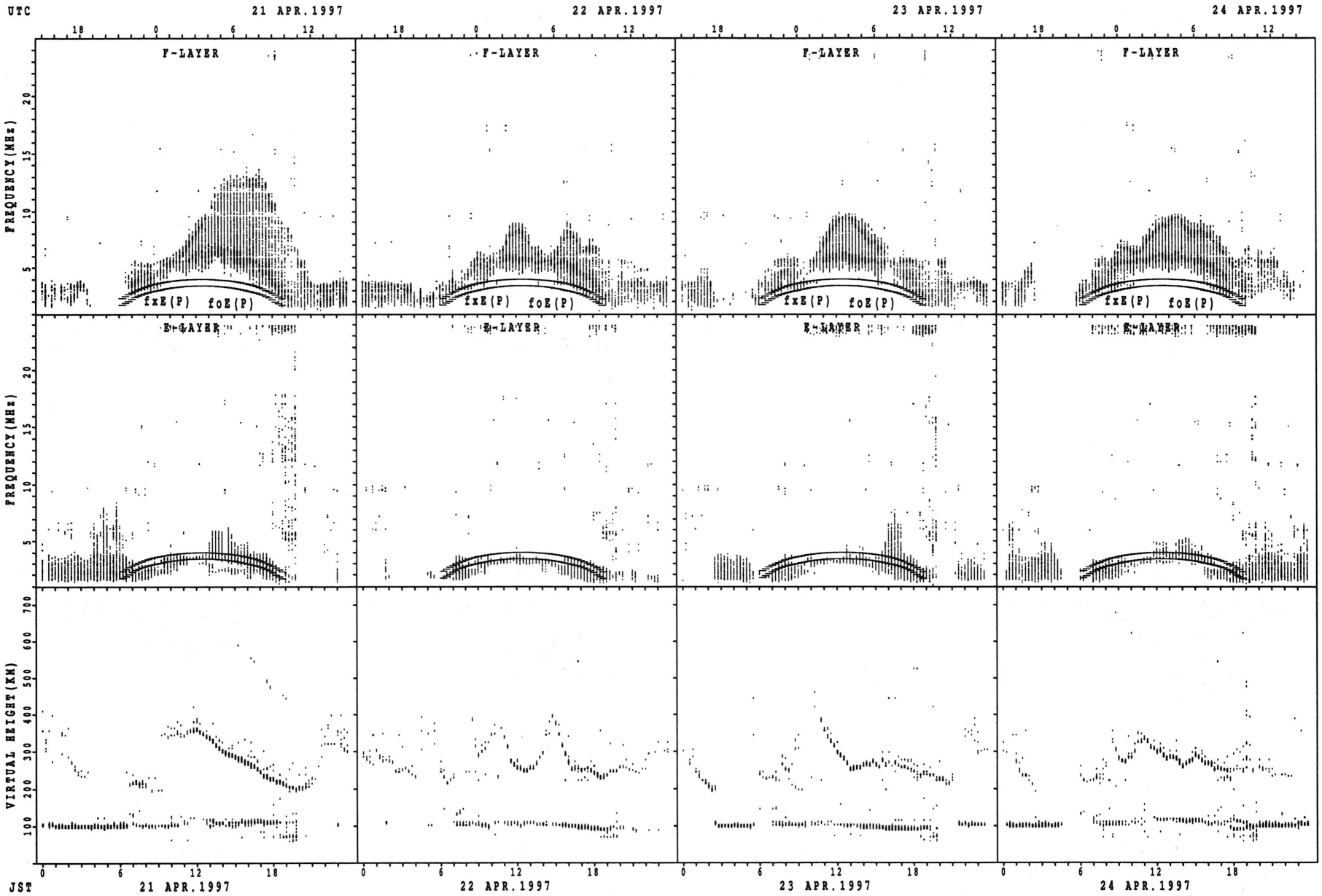
SUMMARY PLOTS AT OKINAWA



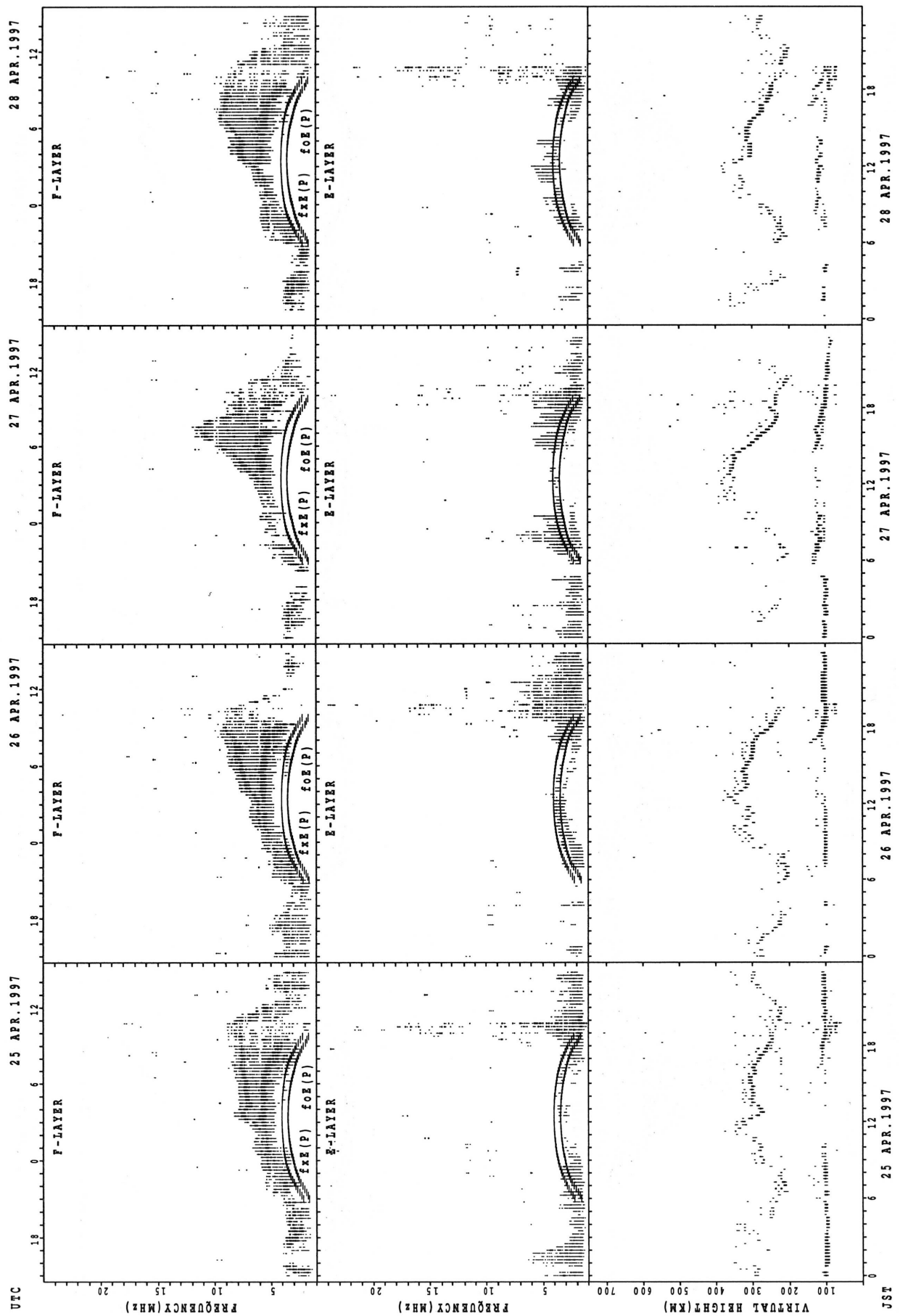
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
17 APR.1997
18 APR.1997
19 APR.1997
20 APR.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

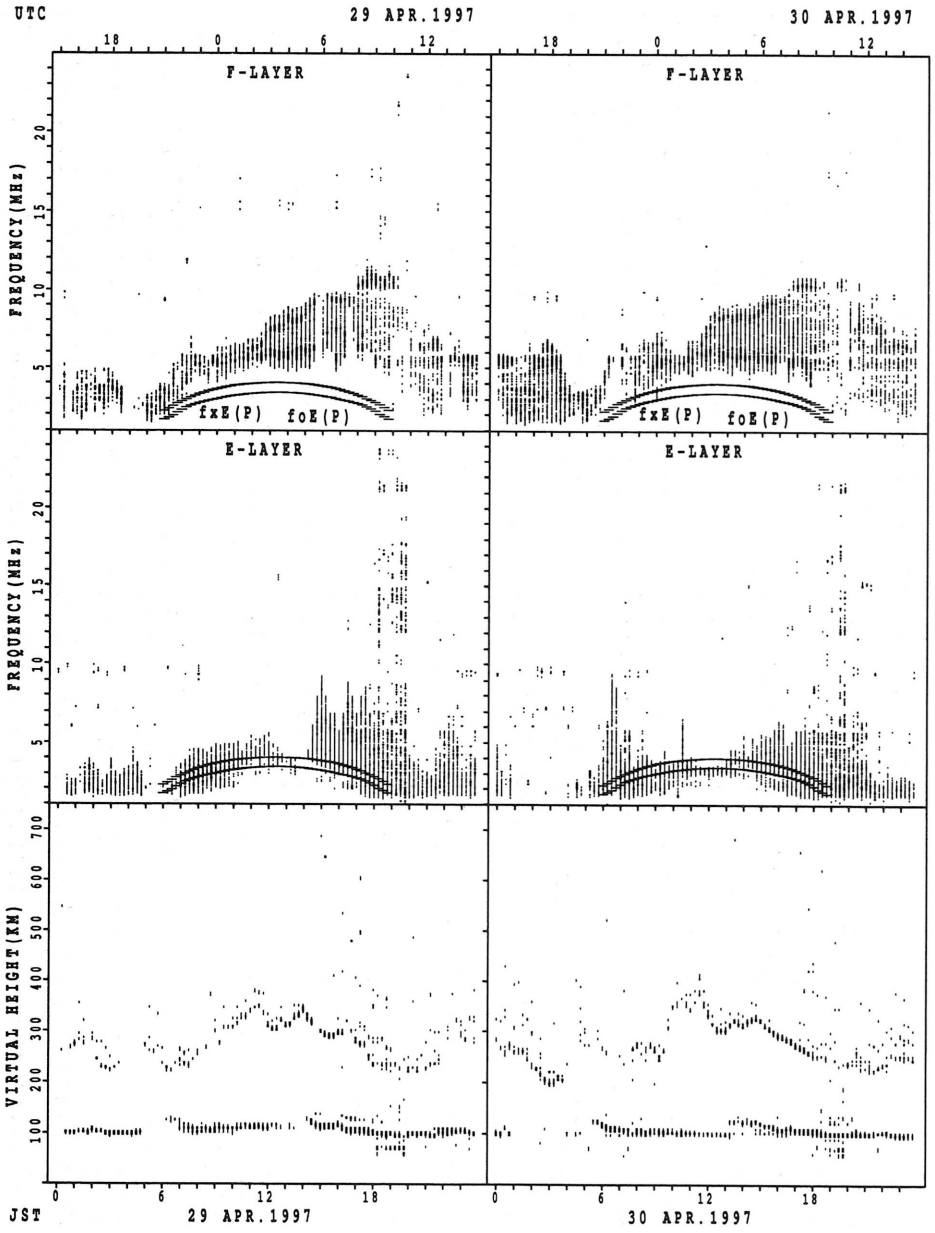
SUMMARY PLOTS AT OKINAWA



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


SUMMARY PLOTS AT OKINAWA
UTC
JST
25 APR.1997
26 APR.1997
27 APR.1997
28 APR.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



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

MONTHLY MEDIANS OF h'F AND h'Es

APR. 1997 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT											14			12	13	20	10							
MED											315			294	298	289	276							
U Q											332			302	312	307	280							
L Q											298			281	286	279	268							

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							29	30	27	28	29	26	28	27	26	26	26	28	14	11				
MED							143	119	107	107	107	106	107	107	107	107	111	117	118	111				
U Q							156	153	125	113	110	109	113	107	109	109	113	121	123	131				
L Q							127	111	107	107	105	105	105	105	105	103	107	104	113	97				

h'F STATION KOKUBUNJI 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									11			16	17	17	21	16	14	16						
MED									296			286	280	278	286	279	280	274						
U Q									300			320	298	293	303	292	288	290						
L Q									276			282	269	267	270	271	264	267						

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	11	10					26	19	27	30	22	24	19	23	26	27	30	26	10	11	10	13	11	11
MED	105	106					148	129	115	109	113	111	113	111	108	111	113	115	112	109	111	111	111	105
U Q	109	107					159	157	131	113	115	113	117	113	113	113	119	119	115	113	113	114	113	109
L Q	105	105					129	113	109	107	107	109	109	109	105	107	109	113	107	101	99	104	107	105

h'F STATION YAMAGAWA LAT. 31.2N LON. 130.6E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										15	12	12	23	28	21	20	25	19	15					
MED										280	302	307	296	286	288	280	282	280	264					
U Q										290	319	340	312	296	306	298	294	288	270					
L Q										270	266	296	278	275	272	258	263	250	248					

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	13	15	12	13	10	11	19	26	26	29	27	23	27	29	26	26	28	26	26	20	18	18	14	11
MED	109	107	107	111	107	111	149	134	119	111	111	111	111	111	112	113	113	119	119	112	111	111	108	107
U Q	113	111	108	127	111	113	155	149	137	112	119	113	113	112	113	113	119	125	123	117	113	111	111	107
L Q	106	105	105	107	107	105	137	123	111	109	111	109	109	109	109	111	113	115	113	103	107	107	107	105

MONTHLY MEDIANS OF h'F AND h'Es

APR. 1997 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

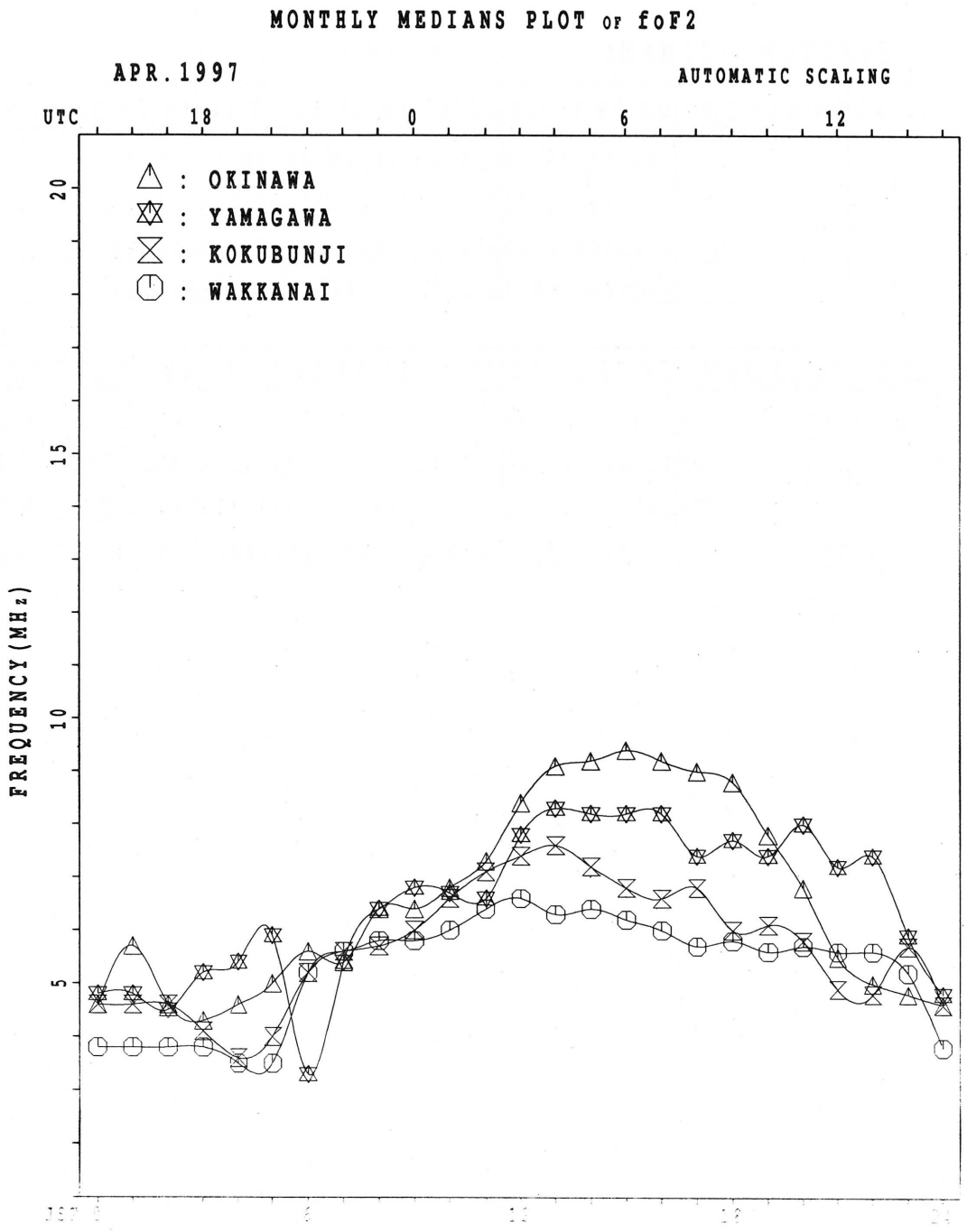
STATION OKINAWA LAT. 26.3N LON. 127.8E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									15	15	19	20	25	29	30	28	28	30	26	11	17			
MED									258	276	286	301	312	294	280	274	271	264	256	220	238			
U Q									276	290	312	313	326	307	304	300	288	274	258	304	248			
L Q									240	260	274	277	292	274	270	264	264	254	246	218	232			

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		11	10		12			28	29	29	29	19	17	18	16	19	24	30	27	20	13	11	12	11
MED		103	103		103			127	105	105	107	113	113	113	112	115	113	113	111	97	103	103	107	105
U Q		105	107		105			143	142	119	121	121	119	121	118	145	120	125	115	104	109	109	107	107
L Q		103	99		100			117	105	105	105	107	105	103	106	107	106	109	103	95	96	95	105	105


MONTHLY MEDIANS PLOT OF foF2
APR. 1997
AUTOMATIC SCALING
UTC
18
0
6
12
△ : OKINAWA
⊠ : YAMAGAWA
⊠ : KOKUBUNJI
○ : WAKKANAI
FREQUENCY(MHz)
5
10
15
20

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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 43	X 45	X 44	X 38	X 32	X 33														X 65	X 54	X 46	X 44	X 46
2	X 47	X 44	X 42	X 42	X 37	X 37														X 75	X 60	X 44	X 45	X 48
3	X 46	X 44	X 42	X 45	X 37	37														X 75	X 64	X 53	X 52	X 53
4	X 51	X 49	X 48	X 48	X 40	X 40														X 65	X 59	X 56	X 54	X 56
5	X 56	X 51	X 50	X 48	X 48	X 42														X 69	X 61	X 59	X 58	X 56
6	X 51	X 49	X 48	X 44	X 44	X 44														X 63	X 56	X 57	X 59	X 56
7	X 56	X 54	X 53	X 49	X 45	X 42														X 60	X 55	X 53	X 51	X 50
8	X 50	X 49	X 46	X 47	X 40	X 41														X 56	X 53	X 49	X 49	X 49
9	X 50	X 49	X 48	X 45	X 43	X 42														X 68	X 59	X 53	X 52	X 51
10	X 52	X 49	X 49	X 44	X 40	X 40														X 69	X 58	X 54	X 52	X 53
11	X 51	X 50	X 50	X 48	X 33	X 35														X 82	X 70	X 56	X 54	X 54
12	X 52	X 51	X 52	X 48	X 43	X 45														X 80	X 65	X 50	X 51	X 50
13	X 50	X 49	X 50	X 45	X 38	X 40														X 74	X 60	X 46	X 49	X 48
14	46	X 45	44	X 41	X 40	X 44														X 72	X 72	X 59	X 56	X 55
15	X 54	X 50	X 48	X 47	X 40															X 68	X 64	X 62	X 58	X 57
16	X 53	X 50	X 49	X 46	X 43	X 42														X 87	X 72	X 50	X 44	X 45
17	X 45	X 44	X 44	X 44	X 35	X 34														X 67	X 63	X 45	X 45	X 48
18	X 47	X 48	X 45	X 44	X 41															X 65	X 70	X 63	X 52	X 50
19	X 50	X 48	X 49	X 44	X 39															X 70	X 60	X 54	X 51	X 48
20	X 46	46	X 46	X 39	X 38															X 57	X 53	50	47	42
21	43	43	43	X 37	X 32															X 67	X 67	X 52	51	53
22	52	46	46	X 38	X 38															X 57	X 55	X 50	X 47	50
23	51	X 51	X 47	X 37	X 36															X 60	X 57	X 49	X 50	X O 43
24	X 41	X 39	X 39	X 34	X 30															X 57	X 58	X 56	X 58	X 52
25	52	49	46	41	41															X 68	X 62	X 54	X 50	X 50
26	C	X 47	X 46	X 43	X 40															X 66	X 69	X 49	X 47	X 43
27	X 39	40	41	40	38															X 59	X 60	X 56	A	X 48
28	X 47	47	X 44	X 42	42															X 69	X 61	X 58	X 55	X 54
29	X 53	X 50	X 47	X 44	X 42															X 74	X 71	X 58	X 50	X 46
30	X 47	X 46	X 45	43	38															X 82	X 70	X 58	X 58	X 58
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	16														30	30	30	29	30
MED	X 50	X 48	X 46	X 44	X 40	X 40														X 68	X 60	X 54	X 51	X 50
U Q	X 52	X 50	X 49	X 46	X 42	X 42														X 74	X 67	X 57	X 54	X 54
L Q	X 46	X 45	X 44	X 41	X 37	X 37														X 63	X 58	X 50	X 48	X 48

APR. 1997 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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	37	39	38	32	26	27	44	55	57	56	R 63	61	74	78	78	67	R 63	69	68	59	48	40	38	40
2	41	38	36	36	31	31	50	65	64	57	56	70	76	78	R 76	68	64	65	64	69	54	38	39	42
3	40	38	36	39	31	30	R 65	53	55	54	58	77	R 75	64	65	62	62	71	68	69	58	47	46	47
4	45	43	42	42	34	34	47	55	61	R 63	68	76	73	70	71	R 64	64	57	59	59	53	50	48	50
5	50	45	44	42	41	36	52	60	55	62	63	65	69	75	71	70	60	54	54	63	55	53	52	50
6	45	43	42	38	38	38	51	57	58	58	71	87	79	72	68	64	61	58	66	57	50	51	53	50
7	50	48	47	43	39	36	49	58	70	68	68	82	98	94	81	72	67	61	55	54	49	47	45	44
8	44	43	40	41	34	35	49	53	58	63	65	87	103	91	69	69	68	66	56	50	47	43	43	43
9	44	43	42	39	36	36	48	52	61	65	66	75	77	76	81	83	63	56	57	61	53	48	46	45
10	45	43	43	38	34	34	47	53	57	64	R 61	68	81	97	69	64	60	55	62	63	52	48	46	47
11	45	44	44	42	27	29	50	58	R 63	R 62	66	75	94	99	83	89	78	71	72	76	64	50	48	48
12	46	45	46	42	37	39	56	56	63	63	72	87	95	R 76	70	72	69	68	70	74	59	44	45	44
13	44	44	44	39	32	34	53	56	70	78	72	83	83	78	76	68	71	71	75	68	54	40	42	42
14	F 38	39	F 36	35	34	38	53	56	61	62	57	R 62	80	84	85	72	67	54	55	66	66	53	50	49
15	48	44	42	41	34	36	49	55	61	65	R 62	70	73	75	71	69	64	59	57	62	58	56	52	51
16	47	44	43	40	37	36	50	56	65	68	67	R 62	63	64	57	64	62	60	70	82	66	44	38	39
17	39	38	38	38	29	28	49	54	50	57	76	74	R 74	74	84	71	R 64	73	76	61	57	39	39	42
18	42	42	39	38	35	41	50	57	58	67	70	76	68	72	81	90	72	48	49	59	64	57	46	44
19	44	42	43	38	33	39	47	53	R 64	62	J R 63	56	R 60	58	66	65	66	65	57	64	54	48	45	42
20	40	F 39	40	33	32	36	46	44	47	50	58	66	72	R 63	60	58	58	54	55	51	47	F 42	F 38	F 32
21	F 34	F 34	F 35	F 30	26	33	44	46	51	52	54	R 60	66	71	73	71	60	54	56	61	61	46	F 43	F 43
22	F 41	F 39	F 38	32	32	30	43	40	46	E G 41	55	64	R 62	53	52	60	68	69	56	51	49	44	40	F 42
23	F 42	45	41	31	30	35	44	49	56	51	54	56	64	R 62	58	58	54	51	51	54	51	43	44	U S 37
24	35	33	33	28	24	34	47	49	56	60	59	61	68	64	64	80	63	50	48	52	52	50	52	46
25	F 42	F 40	F 37	F 31	F 34	36	51	56	52	56	56	56	60	68	71	69	57	55	58	62	56	48	44	44
26	C	41	40	37	34	42	51	55	50	50	58	57	55	60	66	66	64	59	57	60	62	43	41	37
27	33	F J 33	F J 32	F J 32	F 31	35	48	50	53	52	49	51	U R 46	55	66	76	75	66	62	53	54	50	A	42
28	41	40	38	36	F 33	40	50	54	R 54	52	58	57	R 57	68	A	65	65	65	66	63	55	52	49	48
29	47	44	41	38	35	39	50	56	52	56	54	60	66	73	74	79	A	63	62	68	65	52	44	40
30	41	40	39	34	F 30	A	52	64	62	54	69	A	56	U R 50	68	69	80	76	82	76	64	52	52	52
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	29	30	30	30	30	30	29	30	30	29	30	29	30	30	30	30	30	29	30
MED	42	42	40	38	34	36	50	55	58	59	62	66	72	72	71	69	64	60	58	62	54	48	45	44
U Q	45	44	43	40	35	38	51	56	62	63	68	76	79	78	77	72	68	68	68	68	61	51	48	48
L Q	40	39	38	33	31	34	47	53	53	54	57	60	63	64	66	64	62	55	56	57	52	43	42	42

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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									U L 404	L 436	440	472	460	452	440	L 428	L 416	U L 344						
2								L	L 408	432	L 444	444	444	436	436	L 440	L 416	A						
3								L	U L 404	U L 420	L 452	452	456	L 472	L 444	L 428	L 416	U L 356						
4									L 424	440	448	456	452	460	448	L 428	L 420	L						
5								L	L 428	440	448	460	L 464	448	448	L 432	U L 392	L						
6								L	L 408	448	468	444	472	444	452	L 440	A	L						
7									L 436	448	452	460	460	452	452	L 440	U L 412	L						
8									L	444	456	460	460	460	440	L 436	L	U L 344						
9								L	U L 424	440	448	460	468	456	448	436	L 384							
10							L	300	L	440	456	468	456	456	444	428	L							
11									U L 420	L 440	460	464	460	456	448	432	U L 404	L						
12									U L 428	L 448	448	472	464	448	420	436	L 400	L						
13								L 372	L 432	436	480	452	452	460	440	L 448	L 420	A						
14								L	L 420	440	464	U A 464	A	460	444	420	L 404	L						
15								L	U L 424	432	452	456	U R 472	460	440	440	L 408	L						
16								L	420	440	444	468	460	456	L	444	416	L						
17								L	L	L 448	444	456	460	456	436	404	L	L						
18								U L 360	L 420	432	L 452	448	448	456	444	L 416	L	L 304						
19									424	436	444	432	460	456	428	420	400	368						
20							L	L 388	L 408	428	U A 428	448	432	436	408	408	L 384	U L 344						
21								L	416	428	440	444	444	448	432	420	L 412	L 376						
22							L	R 360	U A 376	408	U A 416	432	428	432	428	416	L 400	L 340	U L 204					
23								U A 364	392	L 420	436	444	432	432	420	412	U L 412	A						
24								L	L 420	428	440	448	440	U A 456	U A 428	A	400		A					
25								L	L	424	440	R 452	456	440	432	416	404	U L 388						
26							L 280	L 372	L		L	440	452	440	440	428	408	L 364						
27								L	L 416	L 428	U Y 408	444	416	448	436	412	408	L 360	L					
28							L	U L 396	420	U A 428	436	U R 428	444	A	A	A	404	380	L					
29								L 396	L	L 440	460	440	456	452	448	A	A							
30						A	L	396	A	A	432	A	452	444	R 432	A	U A 424	L 368						
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	10	23	28	30	29	29	29	28	26	24	13	1					
MED							L 280	L 372	L 420	436	446	452	456	452	440	428	L 408	L 360	U L 204					
U Q								L 396	L 424	440	452	460	460	456	446	L 436	L 416	L 372						
L Q								360	L 408	428	440	444	444	444	432	416	L 400	L 344						

APR. 1997 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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							164	236	284	R 308	R	R	340	R	R 312	288	248	216	B					
2							164	248	284	308	324	332	U R 344	U A 328	U R 328	A	268	A	B					
3							180	A 236	296	308	R 324	R 344	U A 340	A	U A 300	A 280	A	212	B					
4							212	240	R 284	304	320	R	R 344	U R 332	U R 308	U R 304	A	212	B					
5							192	244	292	R 316	340	344	R	A	A	292	240	A	B					
6							176	248	284	R 316	R	R 344	U R 348	R	A	A	A	220	B					
7							180	252	R 296	324	332	U R 344	U R 348	R 336	R	300	268	216	B					
8							196	240	288	R 312	R 332	336	344	A	A	292	A	212	B					
9							184	252	292	U R 308	U R 340	R	348	U R 336	332	A	268	A	168					
10							172	R	296	R	R	R 344	R	R	A	300	A	A	B					
11							184	264	292	R 320	R	A	R 348	A	308	296	252	204	B					
12							196	248	288	308	324	A	340	A	A	A	268	208	B					
13							200	252	288	A	A	A	A	A	A	A	A	A	B					
14							188	256	U R 296	R 308	R	344	A 360	340	332	308	268	224	B					
15						B	192	R 256	292	R	332	A	R 360	344	A	A	272	228	B					
16							196	268	296	R	336	R	U R 348	R	316	300	272	228	168					
17							180	260	304	328	R 348	R	R 348	R	320	292	276	232	172					
18						B	204	260	292	320	U R 332	R	344	R	316	300	272	228	B					
19						B	188	260	288	320	R 340	R	A	336	320	A 292	R 260	216	160					
20						B	192	252	288	312	332	R	R 356	A	R	A	248	220	B					
21						B	192	272	296	312	A	U R 344	A	R	316	300	272	A 224	B					
22						B	184	248	300	316	336	344	348	A 336	A 320	A	A	216	B					
23						B	212	264	292	R 316	A	A	U A 348	R	R 320	296	264	220	B					
24						B	184	268	288	312	U R 324	A	A	A	A	A	280	240	A					
25						B	196	276	292	R	R	U R 340	R	R 328	R 320	300	284	220	B					
26						B	228	R	296	U R 324	344	R	U R 352	B	320	300	280	232	164					
27						B	196	264	300	R	R	U R 348	352	348	332	312	280	A	A					
28						B	208	268	300	332	344	352	356	340	324	308	A	240	160					
29						B	224	272	300	324	A	A	A	328	328	312	A 284	228	B					
30						B	A 220	280	308	U A 324	340	A	356	340	A	304	280	240	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							30	28	30	24	19	13	22	13	19	21	22	24	6					
MED							192	256	292	316	332	R 344	348	336	320	300	270	220	166					
U Q							200	266	296	322	R 340	U R 344	352	340	328	304	280	228	168					
L Q							184	248	288	308	324	342	344	330	316	292	264	216	160					

APR. 1997 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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 16	J A 22	J A 22	19	E B E B 14 16	23	27	30		G	G	G	G	G	G	J A 36	G	26	J A 27	J A 22	28	40	E B 15	27
2	J A E B E B E B E B 32 16 16 15 14 13	25	32	35	41	38	36	37	J A 40	41	33	30	52	24	28	J A J A 49 36	27	30						
3	J A 42	27	22	J A 26	24	J A 32	21	30	32	G	G	G	40	J A 46	J A 37	32	32	22	E B E B 16 15	19	E B 16	E B E B 16 15		
4	E B E B E B E B 16 15 14 16	20	E B 15	G	28	G 25	33	37	G 28	38	G 28	G 25	G 22	28	G 20	E B E B 15 14	E B E B 16 15	E B E B 16 14						
5	E B E B E B 20 14 15 16	21	19	G	G	G	G	G	G	G	32	34	32	34	29	E B 16	20	18	E B 16	E B E B 15				
6	E B E B E B E B 15 15 15 16	E B E B 14 15	22	29	31	G	G	G	G	G 33	34	34	49	G	E B E B 15 14	20	E B 15	E B E B 16 15						
7	E B E B E B E B 24 15 14 14	E B E B 15 16	25	29	G	G	36	J A 44	G	G	G 28	G 20	G	G	E B E B 14 14	E B 15	28	18	E B 15					
8	E B E B E B E B 16 16 16 14	E B E B 14 15	G	28	32	G	36	36	G	36	32	G 24	29	G	E B E B 15 15	19	E B 16	E B E B 16 15						
9	E B E B E B E B 16 15 16 16	E B E B 15 17	G	28	34	35	38	G 30	39	38	G	31	30	J A 30	G	E B E B 13	E B 16	E B 16	E B E B 15	E B 15				
10	E B E B E B E B 16 16 16 16	E B E B 15 15	21	G 22	33	G 30	G	G	G 29	G 32	35	34	37	J A 24	20	E B 14	E B 16	E B E B 14 14	E B 15					
11	E B 13	19	E B E B 16 15	E B E B 15 15	26	34	33	G 29	G	J A 38	G 32	34	G 29	G 20	G	G	E B E B 17 15	E B E B 16 15	E B 16	E B E B 15 15				
12	E B 16	19	E B E B 16 15	E B E B 15 15	23	29	31	G 29	34	35	37	34	J A 36	34	J A 53	50	59	J A E B 22 14	E B E B 14 15	E B E B 15 16				
13	E B E B E B E B 14 16 15 15	E B E B 16 15	24	G	35	32	34	35	36	36	48	33	J A J A 38 36	38	18	J A 77	30	J A E B 26 18						
14	E B E B 16 15 22 27	22	24	23	G 24	G 26	G	G J A 31 52	54	39	G	G	30	27	54	J A E B 48 15	16	J A 22	E B 16					
15	J A E B E B E B 19 15 16 16	E B 15	18	23	30	33	G	36	38	40	38	J A 38	40	32	J A J A 33 22	19	28	24	19	E B 16				
16	E B E B E B E B 16 15 16 15	E B E B 14 14	25	30	34	G 30	40	G	G	G	G	G	G	G	G	E B E B 15 16	E B 16	E B E B 16 16	E B 16					
17	18	E B E B E B 15 14 14	20	E B 13	29	32	33	41	J A 49	G 30	G 27	G 25	G 22	G 27	31	28	G E B 16	23	E B E B 14 15	18				
18	E B E B E B E B 16 16 15 15	E B E B 16 17	24	29	34	G	G	G 30	G	G 29	G	G 25	G	G	21	J A J A 23 32	21	J A J A 53 40						
19	24	J A 37	19	28	J A 22	20	24	28	34	35	38	G	J A 42	39	G	31	G	G	G	19	E B 16	26	J A E B 40 15	
20	28	27	19	J A 30	J A J A 22	E B 15	25	28	34	39	J A 44	G	41	38	G 31	31	G	G	19	E B E B 15 15	J A J A 43 64			
21	J A 49	28	20	21	J A E B 24 14	24	30	32	37	39	33	G	38	G 30	35	J A 38	32	J A J A J A 29 20	J A J A J A 35 48		45	29	J A 40	
22	J A J A 46 45	28	J A 23	E B E B 15 15	24	32	38	39	42	40	39	36	34	33	J A 28	G E B 16	E B E B 14 16	E B 18	E B 14					
23	E B 16	26	29	J A 22	19	20	33	38	34	38	34	40	39	G	G	32	J A J A J A 40 32 24	20	20	E B 15	28	J A 24		
24	J A 26	24	21	J A 20	E B J A 18 17	24	30	34	G	G	37	J A 42	J A 53	J A 44	J A 51	33	31	J A 38	J A 24	33	J A 27	J A 25	33	
25	22	E B 15	E B 15	E B 14	21	J A 17	24	G 22	32	G 26	G 24	G	G 24	G	G 21	G	31	27	20	J A 27	J A 23	J A 50	32	30
26	C	E B 15	20	25	22	E B 16	G	G 20	34	35	37	G	G	E B 36	G	G 24	G	G	21	21	23	25	J A 42	28
27	28	24	E B 16	E B E B 13	E B 14	E B 17	27	31	32	G	G	G	G	39	37	36	33	J A 28	18	E B 14	E B E B 16	J A 20	J A E B 57	15
28	22	E B 15	E B 14	25	19	J A 20	32	33	41	43	39	38	43	J A 65	J A 97	64	32	G	G	20	E B 16	18	E B 14	32
29	33	39	21	E B 13	E B E B 13 15	33	34	38	39	38	38	44	39	41	J A 59	93	J A 36	39	28	29	28	J A 29	J A 29	
30	J A 42	30	J A 24	29	J A J A 20 36	30	J A 38	J A 50	J A J A 51	J A 43	82	J A 45	G	40	J A 52	J A 50	J A J A J A 47 33	J A 35	28	22	E B 16	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	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	19	E B 16	E B 16	E B 16	E B 16	E B 16	24	29	33	G	36	G	37	34	33	32	31	26	20	19	19	19	17	E B 16
U Q	J A 28	26	21	23	21	18	25	32	34	38	38	38	40	39	37	J A 36	34	J A 31	24	J A 23	28	28	J A 29	29
L Q	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	G 22	G 28	32	G	G	G	G	G	G	G	G	G	E B 17	E B 15	E B 16	E B 16	E B 15	E B 15

APR. 1997 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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 16	E B 16	E B 16	E B 16	E B 14	E B 16	22	26	30	G	G	G	G	G	G	33	G	24	25	16	17	18	E B 15	18
2	E B 16	E B 16	E B 16	E B 15	E B 14	E B 13	24	30	35	39	38	36	36	38	38	U Y 32	30	44	E B 15	18	26	20	18	22
3	E B 16	13	E B 15	23	18	17	20	28	32	G	G	G	40	37	35	32	30	G 20	E B 16	E B 15	16	E B 16	E B 16	E B 15
4	E B 16	E B 15	E B 14	E B 16	16	E B 15	G	28	G 23	32	36	U G 28	38	G 26	G 24	G 21	27	G 18	E B 15	E B 14	E B 16	E B 15	E B 14	E B 14
5	E B 15	E B 14	E B 15	E B 16	E B 17	E B 15	G	G	G	G	G	G	G	U Y 32	34	G 24	G 20	23	E B 16	E B 16	17	E B 16	E B 15	E B 15
6	E B 15	E B 15	E B 15	E B 16	E B 14	E B 15	21	28	31	G	G	G	G	U G 32	32	33	43	G	E B 15	E B 14	E B 14	E B 15	E B 16	E B 15
7	E B 15	E B 15	E B 14	E B 14	E B 15	E B 16	24	28	G	G	36	38	G	G	U G 28	G 18	G	G	E B 14	E B 14	E B 15	20	E B 15	E B 15
8	E B 16	E B 16	E B 16	E B 14	E B 14	E B 15	G	28	31	G	35	36	G	35	U Y 32	G 24	28	G	E B 15	E B 15	E B 15	E B 16	E B 16	E B 15
9	E B 16	E B 15	E B 16	E B 16	E B 15	E B 17	G	28	34	35	37	U G 30	U Y 38	U Y 38	G	31	G 24	21	G	E B 13	E B 16	E B 16	E B 15	E B 15
10	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	20	U G 22	33	U G 30	G	G	G 28	U G 32	34	G 27	30	24	E B 17	E B 14	E B 16	E B 14	E B 14	E B 15
11	E B 13	16	E B 16	E B 15	E B 15	E B 15	26	34	33	G 28	G	36	G 30	U Y 34	G 28	G 20	G	G	E B 17	E B 15	E B 16	E B 15	E B 16	E B 15
12	E B 16	E B 15	E B 16	E B 15	E B 15	E B 15	22	27	G 26	G U Y 24	U Y 34	U Y 35	36	33	36	33	36	31	56	19	E B 14	E B 15	E B 15	E B 16
13	E B 14	E B 16	E B 15	E B 15	E B 16	E B 15	23	G	34	U Y 32	U Y 34	U Y 35	36	36	40	33	33	34	32	E B 15	27	23	17	E B 18
14	E B 16	E B 15	E B 16	17	E B 16	E B 14	22	G 22	G 25	G U G 31	46	U Y 54	37	G	G	29	26	42	17	E B 15	E B 16	E B 15	E B 16
15	17	E B 15	E B 16	E B 16	E B 15	16	23	30	33	G	36	37	39	37	36	35	31	27	19	17	21	E B 15	E B 16	E B 16
16	E B 16	E B 15	E B 16	E B 15	E B 14	E B 14	23	30	34	U G 29	37	G	G	G	G	G	G	G	G	E B 15	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 15	E B 14	E B 14	E B 14	E B 13	27	32	33	36	37	U G 30	G 26	G 24	G 22	G 25	30	26	G	E B 16	E B 15	E B 14	E B 15	17
18	E B 16	E B 16	E B 15	E B 15	E B 16	E B 17	23	29	32	G	G	U G 30	G	G 29	G	G 23	G	G	20	18	18	E B 16	17	17
19	23	E B 15	E B 16	17	17	E B 14	23	28	34	34	37	G	40	38	G U Y 31		G	G	G	E B 16	E B 16	18	18	E B 15
20	18	17	E B 16	22	17	E B 15	24	26	33	37	43	G	U Y 40	38	U G 31	30	G	G	17	E B 15	E B 15	20	19	20
21	18	E B 15	E B 14	E B 16	18	E B 14	23	28	32	36	38	G 30	37	U G 30	34	37	32	27	19	31	33	34	19	26
22	21	28	E B 16	17	E B 15	E B 15	24	31	38	37	42	37	38	36	34	33	27		G E B 16	E B 14	E B 16	E B 14	E B 14	E B 14
23	E B 16	18	19	E B 16	E B E B 15	17	30	36	34	37	33	38	38	G	G	32	36	29	22	15	E B 15	E B 15	22	18
24	20	16	18	E B 14	E B E B 18	E B 15	23	U Y 30	33	G	G	36	36	46	43	48	32	30	35	22	25	21	18	22
25	E B 14	E B 15	E B 15	E B 14	E B E B 16	E B 16	23	G 21	U Y 32	U G 24	G 23	G	G 24	G	G 20	G	30	27	19	23	E B 14	18	18	E B 15
26	C	E B 15	E B 15	E B 15	17	E B 16	G	U G 20	33	35	37	G	G	E B 36	G	G 23	G	G	21	E B 16	E B E B 17	E B 16	24	19
27	E B 16	E B 16	E B 16	E B 13	E B 14	E B 17	25	30	U Y 32	G	G	G	G	37	37	35	32	28	17	E B 14	E B 16	18	A A 57	E B 15
28	16	E B 15	E B 14	E B 14	E B 14	17	26	32	39	43	39	37	42	63	A A 97	61	31		G	G E B 15	E B E B 16	E B E B 14	E B 14	21
29	22	25	E B 14	E B 13	E B E B 13	E B 15	30	33	33	39	37	38	38	38	41	56	A A 93	33	32	18	17	20	25	22
30	30	19	18	18	E B 15	A A 36	29	34	44	46	38	A A 82	42	G	38	51	42	34	26	28	17	E B 15	E B E B 16	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	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 15	E B 16	E B 16	E B 15	E B 15	23	28	33	G	36	G	36	34	32	32	30	24	G	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	18	16	E B 16	16	16	16	24	30	34	36	37	37	38	37	36	33	32	28	22	18	17	18	18	18
L Q	E B 16	E B 15	E B 15	E B 14	E B 14	E B 15	G 21	G 26	G 31	G	G	G	G	G	G	G 25	G	G	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15

APR. 1997 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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	16	16	16	16	14	16	14	15	16	18	16	18	21	22	21	15	15	14	14	13	15	14	15	15
2	16	16	16	15	14	13	13	14	14	15	20	20	22	18	18	18	15	14	15	16	16	15	15	15
3	16	12	15	16	15	15	15	14	15	16	15	18	18	18	25	16	15	15	16	15	14	16	16	15
4	16	15	14	16	15	15	15	15	16	17	16	22	21	19	20	16	16	16	15	14	16	15	14	14
5	15	14	15	16	17	15	15	15	16	17	16	21	21	22	16	18	14	14	16	16	14	16	15	15
6	15	15	15	16	14	15	14	14	15	14	18	18	19	18	17	17	15	14	15	14	14	15	16	15
7	15	15	14	14	15	16	14	15	15	16	20	20	21	23	19	15	15	14	14	14	15	13	15	15
8	16	16	16	14	14	15	13	13	16	15	16	18	21	22	19	17	15	16	15	15	15	16	16	15
9	16	15	16	16	15	17	14	15	17	20	21	16	19	21	24	18	16	15	14	13	16	16	15	15
10	16	16	16	16	15	15	14	14	16	15	19	18	19	22	16	16	14	14	17	14	16	14	14	15
11	13	15	16	15	15	15	15	16	16	16	19	17	24	22	16	16	17	16	17	15	16	15	16	15
12	16	15	16	15	15	15	15	14	14	16	17	20	18	19	22	16	14	16	15	15	14	15	15	16
13	14	16	15	15	16	15	14	15	16	16	18	17	27	18	22	21	16	14	15	15	14	E 17 S	15	18
14	16	15	16	15	16	14	14	18	15	16	17	23	23	19	20	16	15	15	15	16	15	16	15	16
15	16	15	16	16	15	15	14	15	16	16	19	19	18	18	16	16	16	14	16	15	16	15	16	16
16	16	15	16	15	14	14	16	15	15	16	18	20	18	25	19	16	14	14	14	15	16	16	16	16
17	16	15	14	14	14	13	14	14	15	17	16	19	18	17	18	17	16	14	16	16	15	14	15	14
18	16	16	15	15	16	17	16	15	14	16	16	16	21	17	17	16	16	16	15	15	15	16	15	16
19	15	15	16	14	14	14	16	16	17	16	20	20	22	17	17	17	16	15	14	16	16	16	14	15
20	14	15	16	16	16	15	17	16	16	18	19	22	20	20	17	19	16	16	16	15	15	16	15	15
21	15	15	14	16	14	14	14	16	16	16	17	17	18	17	24	19	15	16	16	16	15	15	14	16
22	14	16	16	16	15	15	14	14	16	18	20	21	20	18	23	16	16	16	16	14	16	14	14	14
23	16	16	16	16	15	14	13	17	15	16	19	16	24	22	20	17	16	15	14	15	15	15	15	16
24	16	14	14	14	18	15	15	18	16	16	19	19	20	19	20	17	16	16	16	14	17	15	15	15
25	14	15	15	14	16	16	14	18	15	16	20	20	20	20	16	19	16	15	15	14	14	14	15	15
26	C	15	15	15	16	16	14	16	18	17	17	22	20	36	20	18	16	16	13	16	17	16	16	16
27	16	16	16	13	14	17	15	15	16	18	21	22	17	20	18	15	15	14	14	14	16	15	14	15
28	14	15	14	14	14	15	15	16	16	16	19	18	20	20	17	16	18	15	13	15	16	14	14	16
29	14	14	14	13	13	15	15	14	16	16	19	22	21	15	19	15	15	14	16	16	15	16	15	15
30	16	15	17	14	15	16	14	15	16	16	19	15	22	17	16	16	15	14	14	14	14	15	16	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	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	15	16	15	15	15	14	15	16	16	19	19	20	19	19	16	16	15	15	15	15	15	15	15
U Q	16	16	16	16	16	16	15	16	16	17	19	21	21	22	20	18	16	16	16	16	16	16	16	16
L Q	14	15	15	14	14	15	14	14	15	16	17	18	19	18	17	16	15	14	14	14	15	15	15	15

APR. 1997 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR.1997 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	310	329	332	366	294	308	350	363	362	338	R 336	310	345	338	349	335	R 336	332	332	338	331	302	304	308
2	304	315	321	332	305	313	342	357	354	351	318	335	336	318	R 329	340	328	335	321	330	362	300	286	304
3	285	299	315	342	312	292	R 371	373	353	347	309	335	R 352	326	331	333	323	338	321	335	339	309	295	299
4	308	306	314	333	330	334	357	332	R 336	331	339	328	336	317	325	R 330	333	336	329	324	320	308	306	300
5	309	298	309	328	341	326	354	355	354	337	341	313	312	323	329	334	335	343	311	314	298	311	303	309
6	312	312	314	309	307	321	370	363	361	328	304	327	322	339	331	332	349	338	331	330	285	287	299	297
7	306	301	311	331	303	316	344	334	333	339	319	296	325	317	332	339	344	350	343	316	309	299	316	303
8	303	309	313	333	320	319	369	356	337	334	304	302	331	339	319	323	328	352	339	319	309	292	297	293
9	312	312	322	335	317	332	378	348	336	335	318	328	323	317	322	339	358	334	336	326	321	293	298	299
10	306	303	334	338	314	321	369	352	340	331	R 325	306	313	346	363	338	343	334	332	322	332	299	298	299
11	298	303	325	373	314	314	362	344	R 340	R 335	295	277	304	327	306	313	328	315	308	330	329	312	287	293
12	290	294	310	326	308	302	358	361	328	316	317	313	333	R 333	335	328	338	335	323	327	342	299	297	303
13	288	311	319	331	321	323	359	336	337	350	318	324	327	330	333	326	334	342	333	343	337	300	291	302
14	F 287	299	F 297	313	316	335	363	341	356	347	336	R 319	318	333	340	356	350	354	321	308	321	318	292	292
15	302	298	313	335	313	322	368	353	340	340	R 327	323	327	334	334	336	353	349	327	313	319	318	300	302
16	306	307	316	326	311	310	366	346	353	354	355	R 325	329	336	318	329	336	329	315	345	357	338	307	290
17	298	317	326	379	323	299	364	335	345	317	315	324	R 318	318	331	349	R 305	329	347	327	337	352	289	292
18	294	298	318	322	319	337	348	362	337	329	318	324	314	316	308	336	355	368	309	298	316	324	321	303
19	307	311	324	326	307	323	353	342	R 345	336	J R 328	343	R 323	320	334	343	337	336	319	324	322	308	315	300
20	307	F 288	314	322	321	332	361	329	315	293	299	314	330	R 333	326	332	346	340	346	328	338	F 311	F 328	F 313
21	F 303	F 306	F 328	F 351	350	336	372	351	339	331	323	R 322	301	317	317	332	340	334	331	321	343	303	F 299	F 306
22	F 285	F 300	F 332	307	307	293	338	305	303	G	281	314	R 341	330	309	299	292	325	331	313	301	313	303	F 292
23	F 305	327	358	327	328	320	341	333	343	320	300	301	320	R 330	345	331	338	335	333	318	320	312	315	U S 334
24	309	313	325	336	333	326	366	351	329	317	323	320	326	323	315	336	363	353	327	302	294	299	318	317
25	F 315	F 323	F 324	F 309	F 307	341	361	362	354	340	334	309	303	333	331	346	333	323	322	326	331	317	315	296
26	C	309	318	314	310	340	372	375	339	328	321	339	327	322	324	321	326	331	335	322	343	339	308	312
27	332	F 307	J F 301	J F 314	F 334	335	365	353	337	367	267	323	U R 309	286	299	327	336	341	343	322	322	319	A	321
28	305	306	318	326	F 318	330	344	364	R 346	343	327	303	R 300	307	A	A 318	329	336	325	325	322	313	305	308
29	319	308	330	316	302	336	355	359	353	338	310	321	310	322	315	334	A	322	318	322	337	311	317	314
30	303	309	333	301	F 313	A	353	350	349	311	346	A	304	U R 297	314	294	310	316	326	331	329	310	313	315
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	29	30	30	30	30	30	29	30	30	29	30	29	30	30	30	30	30	29	30
MED	305	307	318	328	314	323	361	352	340	335	318	321	323	324	329	332	336	336	328	324	326	310	303	302
U Q	309	312	326	335	321	334	368	361	353	340	328	326	330	333	334	338	345	342	333	330	337	317	315	309
L Q	298	300	314	316	307	314	353	341	337	328	309	310	312	317	316	327	328	331	321	318	319	300	297	297

APR.1997 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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									U L 378	L 367	376	383	357	375	367	L 363	L 354	U L 355						
2								L	L 379	A 377	L 382	412	419	398	399	L 365	L 353	A						
3								L	U L 385	U L 393	L 383	382	373	L 368	L 370	L 363	L 355	U L 360						
4									L 374	H 397	393	390	374	358	370	L 362	L 354	L						
5								L	L 373	367	376	374	L 377	373	361	L 359	U L 378	L						
6								L	L 386	367	367	406	357	381	364	L 355	A	L						
7									L 362	355	389	381	372	H 371	359	L 359	U L 370	L						
8									L	367	366	364	363	371	385	L 363	L	L						
9								L	U L 368	H 370	377	Y 351	Y 353	Y	373	353	L 383							
10							L	416	L	364	360	372	356	374	388	373	L							
11									U L 380	L 370	361	352	353	367	363	351	L	L						
12									U L 361	L 361	375	353	376	388	393	357	A 378	L						
13								L 391	L 354	364	H 356	382	H 401	372	A	L 351	L 353	A						
14								L	L 373	381	382	A	A	358	350	376	L 348	L						
15								L	U L 366	370	373	375	U R 378	375	388	364	L 375	L						
16								L	356	378	400	390	H 394	368	L	346	348	L						
17								L	L	L 350	364	356	371	357	374	371	L	L						
18								U L 396	L 363	375	L 366	388	393	377	364	L 367	L	L 435						
19									346	362	390	394	357	358	372	362	366	351						
20							L	L 344	L 359	373	A	357	Y	375	397	367	L 369	U L 382						
21								L	379	386	390	389	402	375	381	A 354	L 350	L 350						
22							L	R 354	A	368	A	376	380	383	371	351	L 351	L 358	U L 389					
23								A	377	L 369	363	372	392	379	380	381	A 377	A						
24								L	L 357	383	379	374	380	A	A	A	368		A					
25								L	L	377	367	R 387	361	389	378	367	367	U L 352						
26							L 415	Y	L	L	384	399	382	396	367	369	357	L 362						
27								L	L 378	L 400	U Y 380	H 387	397	390	379	386	353	L 361	L					
28							L	U L 381	373	A	A	U R 355	A 343	A	A	A	370	359	L					
29								L 373	L	A 365	385	430	363	379	361	A	A							
30						A	L	377	A	A	425	A	A	402	R 388	A	A	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	8	22	27	27	28	27	27	26	26	22	11	1					
MED							L 415	L 379	L 373	370	377	382	374	375	372	363	L 362	L 359	U L 389					
U Q								L 394	L 378	378	385	390	392	383	385	367	L 370	L 362						
L Q								L 364	L 361	365	366	368	357	368	364	355	L 353	L 352						

APR. 1997 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

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APR. 1997 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									254	286	284	328	266	282	262	274	260	260						
2								258	256	268	302	286	274	292	264	270	268	260A						
3								222	248	254	330	286	256	302	284	270	290	256						
4									278	280	278	290	282	296	288	274	268	242						
5								238	272	292	282	314	314	294	278	264	246	244						
6								242	256	302	314	280	284	272	288	276	258	254						
7									272	276	304	316	276	274	270	276	260	244						
8									260	288	320	314	266	260	274	280	270	246						
9								240	272	278	292	284	302	300	280	262	240							
10							228	234	276	288	314	324	298	260	250	268	264							
11									260	280	352	344	302	262	304	286	252	268						
12									280	298	302	310	276	264	280	288	266	266						
13								H 260	282	256	298	288	276	284	278	286	280	248						
14								264	246	264	300	324	302	280	266	250	254	240						
15								252	274	266	292	288	290	278	272	274	252	252						
16								270	258	258	256	310	294	280	L 332	286	290	266						
17								272	L 266	322	310	286	292	304	272	258	L 300	250						
18								242	292	282	292	286	302	308	308	258	246	220						
19									272	284	278	288	308	326	302	274	274	260						
20							252	330	336	388	354	314	292	292	304	304	272	270						
21								268	288	308	324	332	328	308	302	280	278	276						
22							274	398	380	G	404	324	272	310	366	348	304	262	240					
23								298	282	334	362	372	314	296	294	298	292	266						
24								268	294	302	318	318	302	312	316	276	248		A 272					
25								248	274	284	302	374	348	288	290	272	282	292						
26							230	236	L 290	L 288	324	302	324	322	306	296	286	282						
27								260	270	248	E 468	Y 350	Y 374	402	334	292	270	256	240					
28							250	260	286	302	316	370	368	A 350	A	A	284	268	256					
29								258	270	284	368	304	334	306	308	280	A							
30						A	258	256	272	E 340	A 284	A	380	354	308	344	292	274						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							6	23	30	30	30	29	30	30	29	29	29	26	4					
MED							251	258	272	284	305	314	300	295	288	276	270	260	248					
U Q							258	268	282	302	324	326	314	308	307	287	285	268	264					
L Q							230	242	260	276	292	288	276	280	273	270	256	248	240					

APR. 1997 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 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	286	260	252	218	284	302	240	240	226	228	E Y 248	220	E Y 276	210	216	228	H 196	238	230	226	224	260	294	298
2	274	270	278	248	240	276	242	248	A 240	E A 250	224	198	192	222	212	H 212	220	A	248	236	216	288	308	300
3	292	296	282	258	256	318	224	220	210	208	202	204	228	206	208	208	230	238	250	230	220	250	288	278
4	274	272	262	230	236	268	232	238	232	H 194	H 192	H 178	224	226	194	226	222	236	246	242	226	264	280	276
5	270	280	272	262	238	262	232	238	218	206	208	196	204	200	204	214	224	H 224	254	252	254	268	254	264
6	254	262	266	254	276	250	222	232	212	218	H 210	188	218	218	208	212	A	230	244	218	270	300	272	280
7	278	268	268	230	264	260	232	244	234	228	206	212	206	H 180	222	232	224	232	236	242	246	284	278	286
8	278	270	278	240	246	250	230	238	224	230	206	218	212	212	208	204	210	230	228	236	252	282	302	304
9	272	268	252	232	250	242	222	206	232	H 190	226	Y	E Y 262	Y	214	210	218	232	242	240	224	264	280	292
10	282	282	256	228	262	254	222	212	222	208	232	212	220	Y 240	210	206	224	248	250	238	222	270	284	280
11	280	286	254	202	272	290	226	250	240	226	216	230	222	220	218	Y 236	234	232	262	228	232	232	282	282
12	300	290	268	242	276	274	234	232	230	226	210	228	236	204	214	238	E A 256	A	A	244	208	276	292	294
13	302	268	242	236	252	254	240	226	236	246	H 214	198	H 178	198	A	242	228	A	242	222	252	312	302	284
14	286	284	306	276	280	244	242	H 200	228	206	180	A	A	A 246	238	218	216	244	E A 288	250	228	232	282	280
15	290	284	264	230	244	260	218	238	226	200	188	214	218	212	206	A 232	244	250	248	248	250	254	262	264
16	274	278	262	236	248	262	232	232	238	222	206	184	H 176	226	212	H 190	H 204	230	262	220	206	218	276	322
17	298	280	252	210	274	268	238	244	212	216	216	216	224	228	230	210	244	238	240	240	222	208	304	300
18	292	284	264	254	242	242	226	234	222	206	216	214	192	218	228	230	228	212	252	278	258	234	254	300
19	288	304	250	254	276	256	236	242	246	220	204	202	A 248	236	230	236	230	236	248	240	224	248	270	274
20	290	304	262	272	272	240	250	234	244	222	A	238	Y	232	210	224	228	H 230	244	238	230	276	260	E A 334
21	308	296	258	226	246	238	224	210	H 194	210	226	202	192	238	206	E A 270	240	234	244	256	238	A 302	304	324
22	324	A 334	262	270	292	288	252	A 262	A	A 256	A	234	228	224	226	232	238	230	B 242	248	250	256	284	298
23	290	250	226	250	250	258	A 258	A	244	248	224	240	212	218	220	218	E A 258	A	254	246	244	254	270	298
24	304	294	258	244	252	242	230	228	234	214	212	206	216	A	A	A	240	246	A	A 272	296	300	260	268
25	268	272	260	254	284	248	232	228	228	216	230	206	210	198	210	216	228	228	258	246	232	254	278	280
26	C	290	270	268	268	238	220	Y	210	204	224	198	212	204	216	224	220	240	252	238	232	232	A 296	268
27	276	302	294	272	254	246	232	240	228	210	232	H 206	220	214	210	228	226	230	242	226	246	252	A	262
28	286	276	268	256	256	254	234	A 232	E A 262	A	A	246	A	A	A	A	220	222	242	234	230	244	256	290
29	278	282	252	238	270	232	242	234	220	E A 258	214	186	244	216	E A 272	A	A	260	A 262	244	232	238	272	278
30	A 352	292	262	270	270	A	240	A 242	A	A	200	A	A	200	208	A	A	A	256	238	234	240	272	262
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	29	30	28	28	28	27	27	26	27	27	26	27	25	28	30	30	30	29	30
MED	286	282	262	246	259	254	232	234	228	216	213	206	216	218	212	222	226	232	248	240	232	255	280	282
U Q	295	292	268	258	274	268	240	241	237	228	224	220	228	226	222	232	238	239	254	246	250	276	293	298
L Q	275	270	254	230	248	243	226	228	221	207	206	198	206	204	208	212	220	230	242	234	224	240	270	276

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APR. 1997 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							148	114	126	114	116	118	118	120	116	116	114	122	B					
2							156	A 138	120	112	110	106	116	112	112	A	116	A	B					
3							130	A	122	112	110	116	114	114	118	114	A	122	B					
4							152	118	124	120	A 120	A	A	118	120	124	A	A 136	B					
5							142	116	116	116	112	110	114	A	A	A 124	A 124	A	B					
6							152	120	114	116	114	114	114	A	A	A	A	122	B					
7							150	A 134	112	114	114	114	116	116	A	124	116	118	B					
8							136	118	120	114	112	118	116	A	110	126	A	124	B					
9							B 162	118	122	A	116	A	126	118	120	A	138	A	180					
10							136	126	A 136	A	114	114	120	A	A	A 132	A	A	B					
11							138	128	116	124	120	A	134	A	A 122	118	122	120	B					
12							154	126	E A 144	128	116	A	118	A	A	A	122	A 126	B					
13							120	116	118	116	A	A	A	A	A	A	A	A	B					
14							A 138	A 128	130	114	A	116	112	118	114	112	116	128	B					
15						B	120	128	E A 142	118	110	A	A	A 132	A	A 122	114	118	B					
16							144	118	A 132	A	122	116	116	120	114	114	120	120	136					
17							134	116	116	114	120	A	126	116	116	126	A 138	120	132					
18						B	134	120	116	112	108	A	114	122	112	122	116	124	B					
19						B	146	118	114	114	114	112	A	112	116	118	118	126	136					
20						B	126	118	116	116	116	116	116	A	A	A	118	126	B					
21						B	122	120	112	112	A	126	A	A	126	126	120	118	B					
22						B	126	120	118	116	116	116	116	114	118	116	A	126	B					
23						B	A 148	A 136	132	118	118	A	120	116	118	A 128	122	116	B					
24						B	126	120	116	114	112	A	A	A	A	A	118	116	A					
25						B	140	A 130	122	126	120	118	120	120	118	118	118	122	B					
26						B	152	A	A 140	A	114	112	120	B	118	122	122	126	142					
27						B	124	128	A	116	118	116	114	114	114	116	124	A	A					
28						B	130	118	124	A 124	116	116	116	114	112	116	116	118	B 168					
29						B	130	120	118	116	A	A	A	A 132	116	116	114	118	B					
30						B	A	118	116	116	120	A	116	114	118	116	118	118	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							29	28	29	26	26	18	23	19	21	23	23	24	6					
MED							138	120	119	116	116	116	116	116	116	118	118	122	139					
U Q							149	A 128	A 128	118	118	116	120	120	118	124	122	126	168					
L Q							128	118	116	114	112	114	114	114	114	116	116	118	136					

APR. 1997 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

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APR. 1997 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	112	112	118	B	B	150	164	178	G	G	G	G	G	G	124	G	158	124	122	116	118	B	114
2	112	B	B	B	B	B	150	148	130	122	120	122	122	112	120	120	150	100	106	102	118	112	112	114
3	124	106	110	108	108	114	162	166	154	G	G	G	120	118	118	120	114	112	B	B	96	B	B	B
4	B	B	B	B	108	B	G	184	108	122	122	106	162	106	108	108	118	116	B	B	B	B	B	B
5	110	B	B	B	108	108	G	G	G	G	G	G	G	114	114	108	104	104	B	100	104	B	B	B
6	B	B	B	B	B	B	158	156	156	G	G	G	G	110	104	104	100	G	B	B	120	B	B	B
7	106	B	B	B	B	B	154	164	G	G	126	112	G	G	104	108	G	G	B	B	B	114	114	B
8	B	B	B	B	B	B	G	170	162	G	128	126	G	122	112	112	116	G	B	B	102	B	B	B
9	B	B	B	B	B	B	G	168	178	172	180	110	146	174	G	116	120	118	G	B	B	B	B	B
10	B	B	B	B	B	B	162	112	166	112	G	G	110	114	114	106	114	112	100	B	B	B	B	B
11	B	110	B	B	B	B	156	150	148	112	G	114	114	110	108	112	G	G	B	B	B	B	B	B
12	B	136	B	B	B	B	168	158	120	112	126	118	150	112	108	106	126	122	114	116	B	B	B	B
13	B	B	B	B	B	B	172	G	134	120	118	116	114	112	104	114	108	104	100	108	122	118	122	B
14	B	B	112	108	112	110	166	114	112	G	112	120	118	132	G	G	128	150	126	118	B	B	116	B
15	108	B	B	B	B	106	182	172	158	G	132	122	156	166	114	116	148	130	120	120	110	114	116	B
16	B	B	B	B	B	B	172	162	138	112	134	G	G	G	G	G	G	G	G	B	B	B	B	B
17	130	B	B	B	156	B	140	136	152	132	132	110	106	106	104	110	158	142	G	B	122	B	B	128
18	B	B	B	B	B	B	156	138	132	G	G	110	G	112	G	110	G	G	136	124	116	116	116	118
19	110	108	132	106	106	110	160	152	138	138	128	G	120	146	G	120	G	G	G	116	B	116	114	B
20	112	112	122	112	112	B	144	154	134	124	118	G	E G 198	116	112	112	G	G	138	B	B	118	114	114
21	114	110	114	114	112	B	156	170	148	122	122	112	120	110	130	122	120	118	118	114	112	112	114	114
22	116	112	118	112	B	B	142	142	132	130	128	124	126	126	122	118	114	G	B	B	B	106	B	B
23	B	118	116	116	114	158	142	136	154	130	120	124	124	G	G	138	118	116	114	100	100	B	112	104
24	100	100	102	102	B	B	146	138	128	G	G	116	110	106	108	104	184	192	120	118	114	124	112	108
25	108	B	B	B	110	B	152	112	156	112	110	G	112	G	106	G	164	138	142	114	120	114	114	110
26	C	B	110	110	110	B	G	110	164	150	138	G	G	B	G	116	G	G	146	124	106	114	110	110
27	112	136	B	B	B	B	150	154	156	G	G	G	G	138	138	146	144	130	122	B	B	114	114	B
28	110	B	B	110	116	112	138	138	130	134	126	140	130	118	116	118	130	G	G	130	B	120	B	112
29	108	108	110	B	B	B	134	132	128	128	124	116	114	128	136	120	114	120	116	112	112	114	112	110
30	108	108	124	110	110	106	136	130	118	118	120	112	124	G	124	118	114	116	116	110	112	114	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	16	13	12	12	13	8	25	28	28	19	21	19	21	23	22	27	22	19	17	17	17	17	15	12
MED	110	110	113	110	110	110	154	151	143	122	126	116	120	114	113	116	119	118	120	116	112	114	114	113
U Q	113	115	120	113	113	113	162	164	156	132	130	122	138	128	120	120	144	138	131	121	119	118	116	114
L Q	108	108	110	108	108	107	143	136	130	112	120	112	114	110	108	108	114	112	114	109	105	114	112	110

IONOSPHERIC DATA STATION Kokubunji

APR. 1997 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

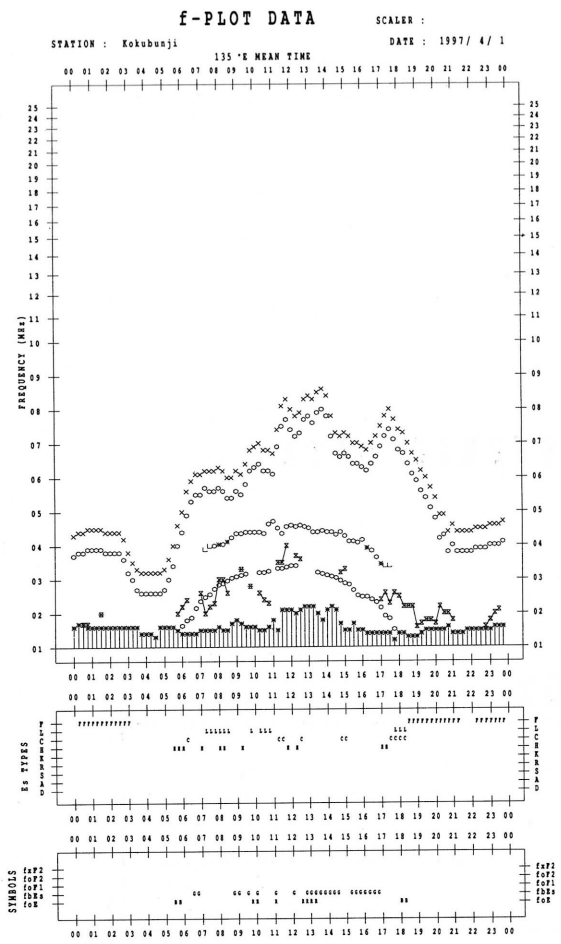
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

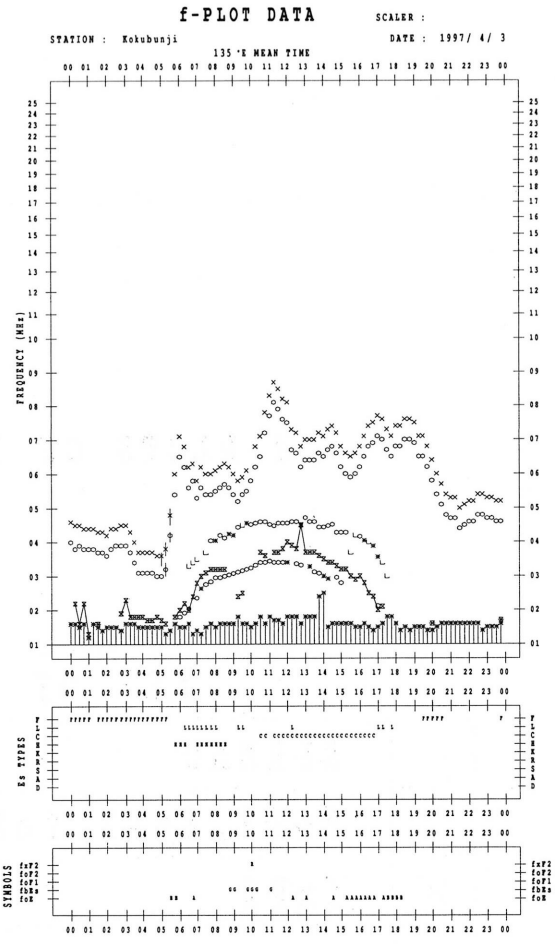
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		F2	F2	F1			H1	H1	HL11							C1		H1	CL21	FF21	FF11	F2		F3
2	F3						C1	HL11	C2	C2	C1	C1	C1	C1	C1	C1	H1	L5	L2	F3	FF14	FF22	F2	F3
3	FF23	F2	F1	F3	F2	F2	H1	HL11	HL11				C1	C1	C1	C1	C1	L2			F2			
4					F2			H1	L1	CL11	CL11	L1	HL11	L1	L1	L1	L1	L2						
5	F1				F1	F1								C1	L1	L1	L2	L2		F1	F1			
6							C1	H1	H1					L1	L1	L2	L2				F1			
7	F1						C2	HL11			C1	C1			L1	L1						F3	F1	
8								H1	HL11		C1	CL11		CL11	C1	L1	L1				F1			
9								H1	HL11	HL11	H1	L1	HL11	HL11		L1	L1	L1						
10							H1	L1	HL11	L1			L1	L1	L1	L1	L2	L2	L1					
11		F1					H1	HL11	H1	L1		C1	L1	L1	L1	L1								
12		F1					H1	HL11	L1	L1	C1	L1	H1	L1	L1	LC21	CL22	CL22	CL42	F2				
13							H1		H1	C1	C1	L1	L1	L2	L2	L1	L2	L3	L3	F1	FF31	F1	F2	
14			F1	F3	F1	F1	HL11	L1	L1		L1	C1	C1	H1			C1	HL21	C3	F3			F1	
15	F2					L1	H1	HL11	HL11		C1	CL11	HL11	HL11	L1	L1	H1	CL21	C1	F1	F2	F1	F1	
16							H1	H1	HL11	L1	CL11													
17	F1				F1		C2	C1	H1	C1	CL11	L1	L1	L1	L1	L1	HL11	C1			F1			F1
18							HL11	H1	C1			L1		L1		L1			C2	F2	F3	F1	F3	F2
19	F1	F2	F1	F3	F2	L1	H1	H1	H1	H1	C1		C2	H1		C1				F1		F2	F5	
20	FF31	F2	F1	F3	F2		C1	H1	C1	C1	C1		H1	L1	L1	L1			C1			F4	F2	F3
21	F2	F2	F1	F1	F2		H1	H1	H1	C1	C1	L1	L1	L1	C1	CL21	C1	C2	L1	F3	F2	F2	F2	F3
22	F2	F3	F2	F2			C1	H1	C1	C1	C1	C1	C1	C1	C1	C1	L1					F1		
23		F1	FF12	F2	F1	H1	CL22	CL21	HL11	CL11	C1	CL11	C1			CL11	C3	C3	C3	FF11	F1		FF22	F2
24	F2	F2	F1	F1		C1	C1	H1	C1			L1	L1	L2	L2	L2	H1	H1	L2	F4	F3	FF21	F3	F3
25	F2				F2	H1	H1	L1	HL11	L1	L1		L1		L1		H1	H1	C1	F3	F1	F2	F3	F2
26			F2	F1	F1			L1	HL11	HL11	H1					L1			C1	F1	FF11	FF11	F2	F2
27	F3	FF11					C1	HL11	HL11					HL11	H1	H1	HL11	C2	C1			F2	F5	
28	F2			F2	F1	L2	C1	C1	CL11	CL11	C1	H1	C1	C2	C2	C2	C1			F1		F1		F6
29	F4	F5	F2				C2	C1	C1	C1	C1	C1	LC11	CL11	C1	C3	C3	C2	C4	F4	FF22	FF32	F2	F3
30	F5	F5	FF21	F3	F2	L2	CL12	C1	C2	C2	C1	C2	C1		C1	C2	C2	C3	C3	F3	F2	F2		
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																								

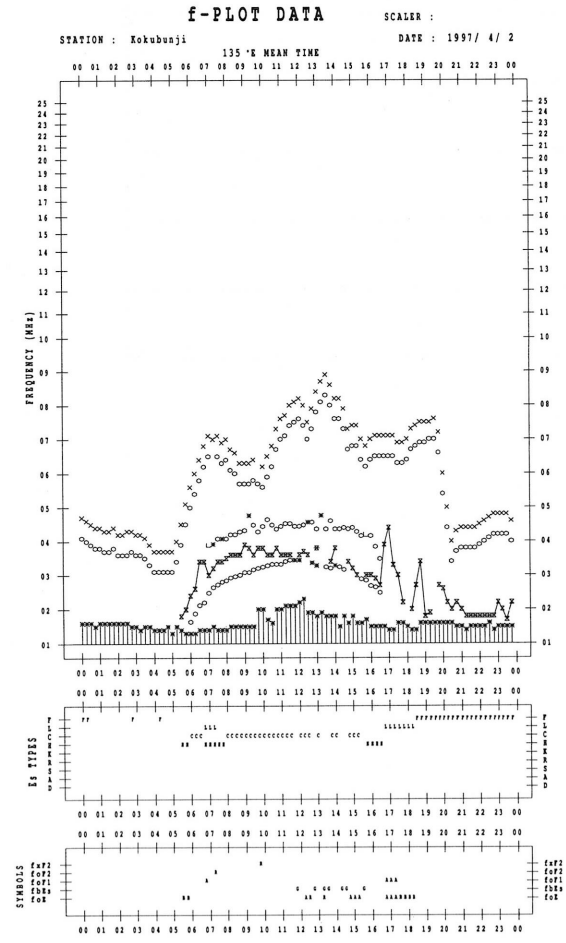
APR. 1997 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

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 :
STATION : Kokubunji
DATE : 1997/ 4/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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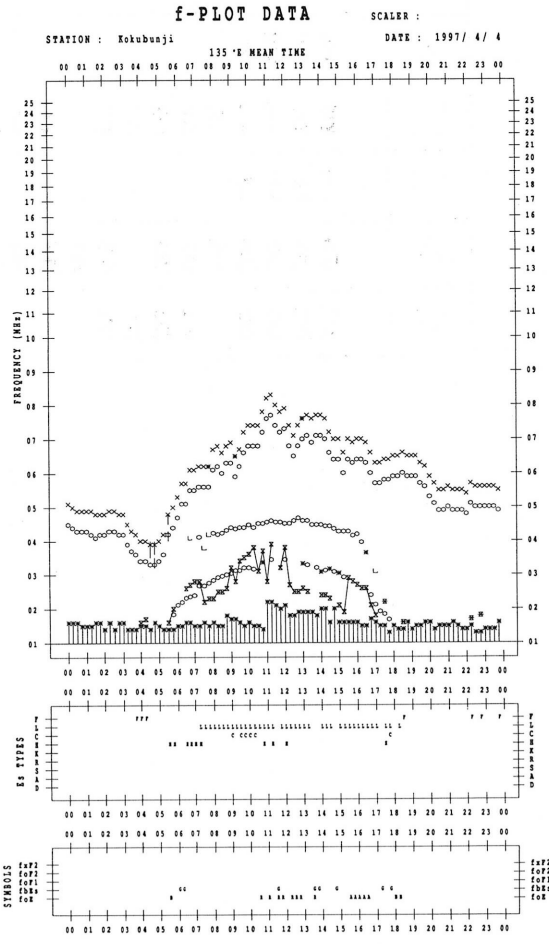
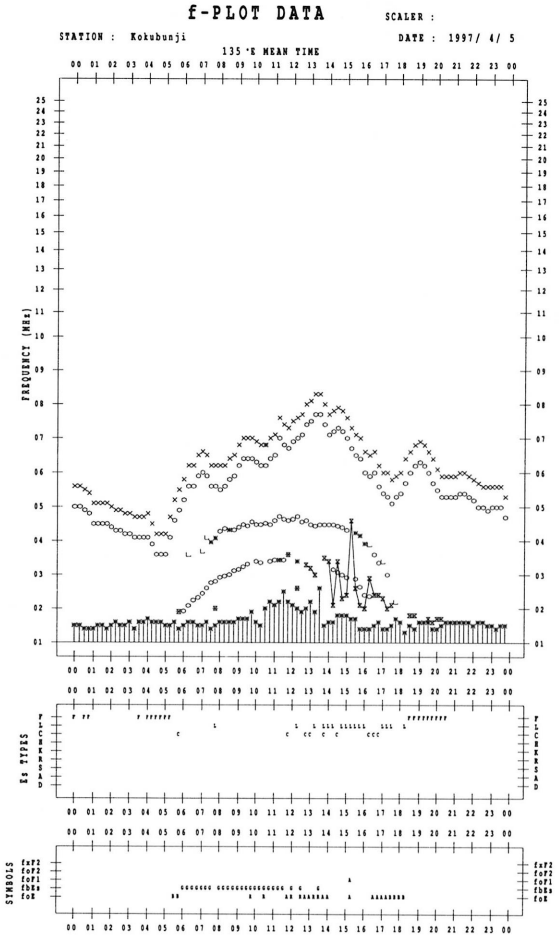
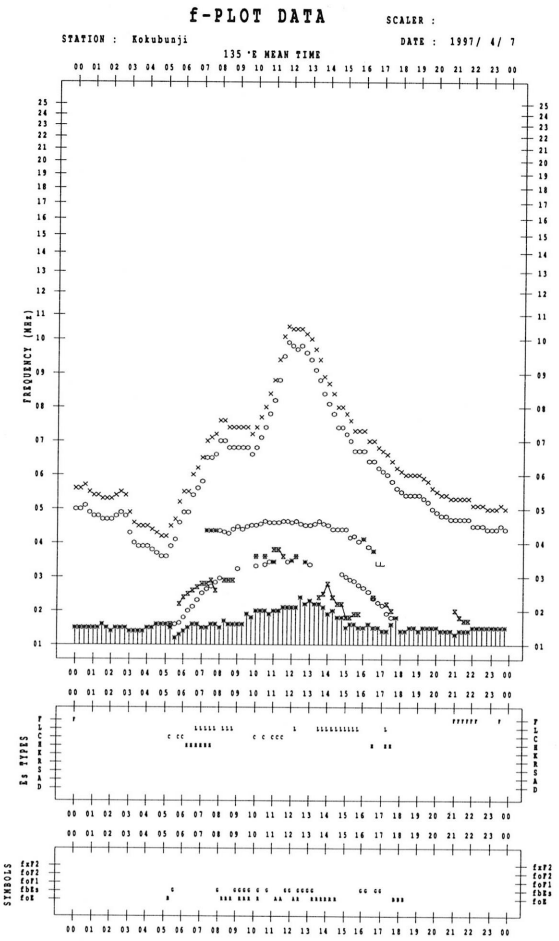
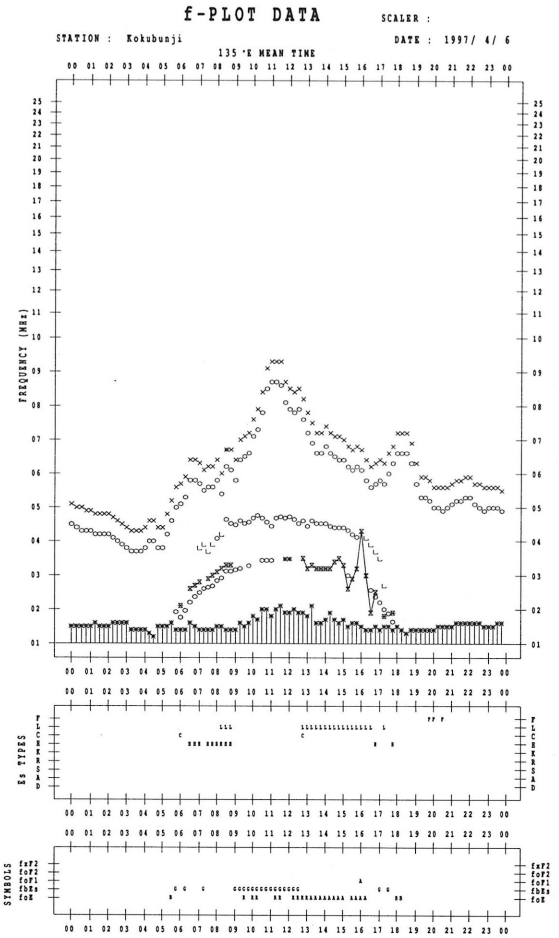
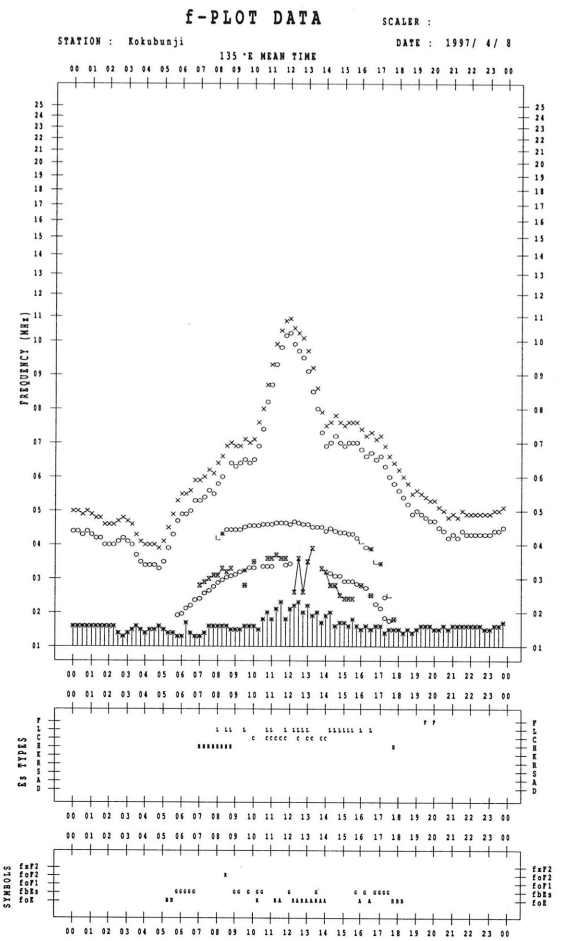
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

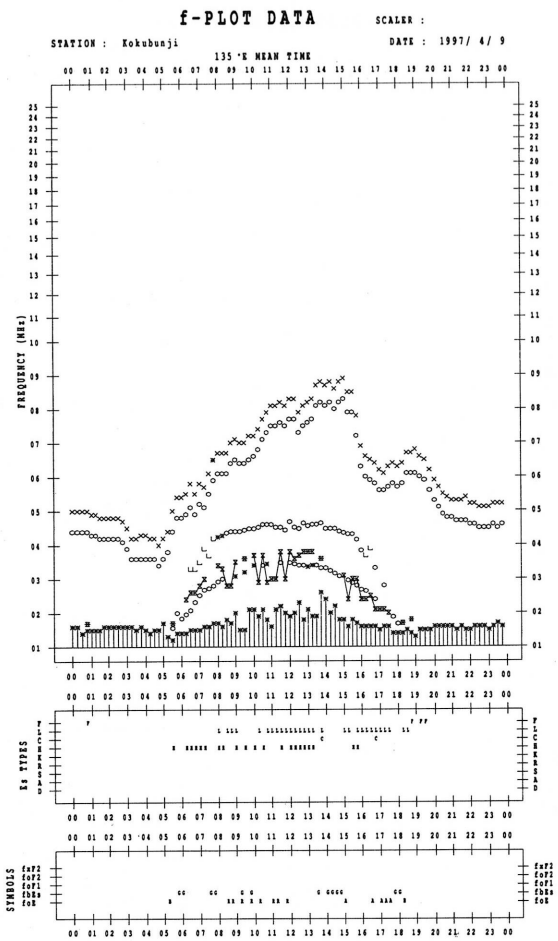

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

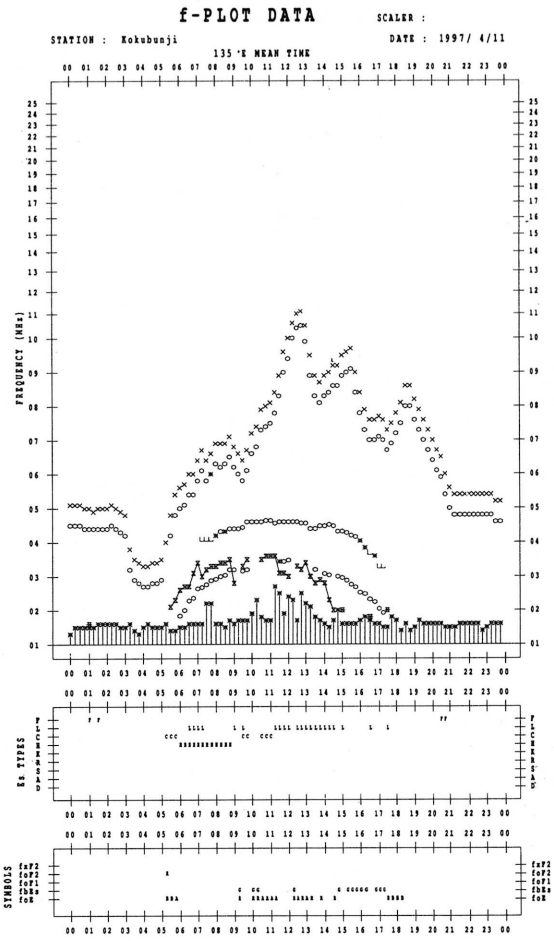

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

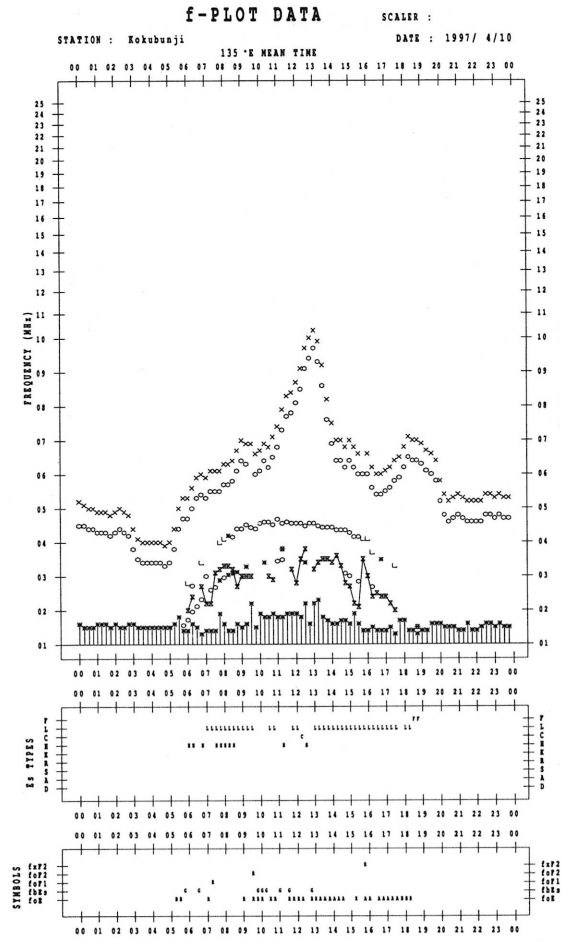

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

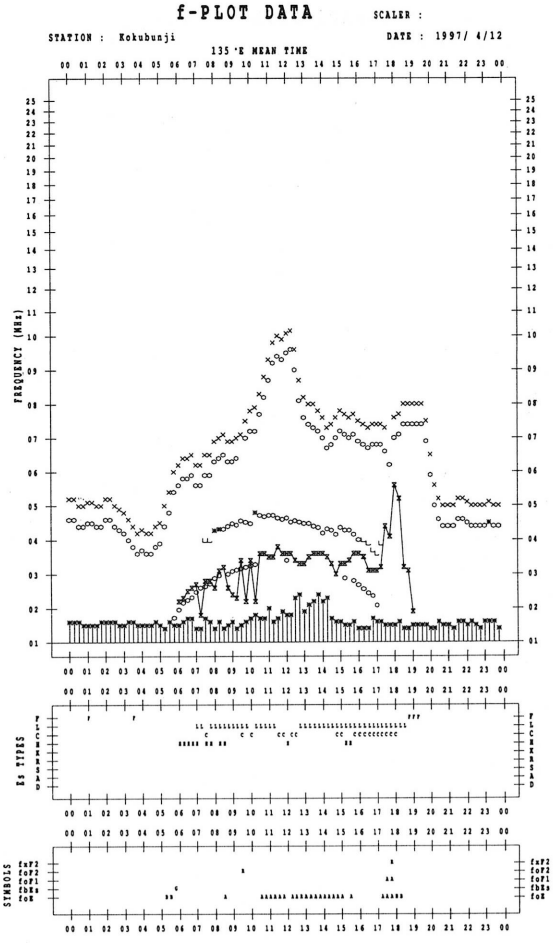

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

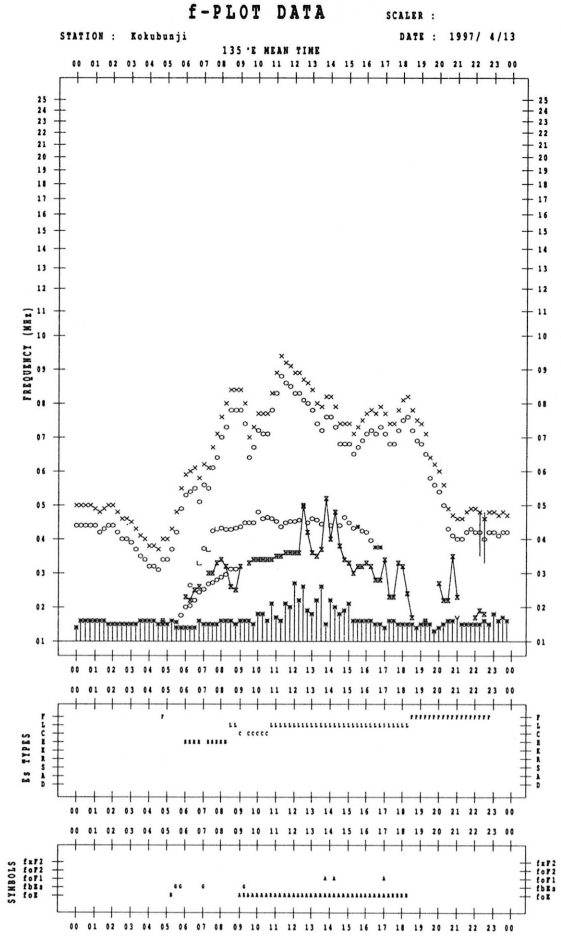

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

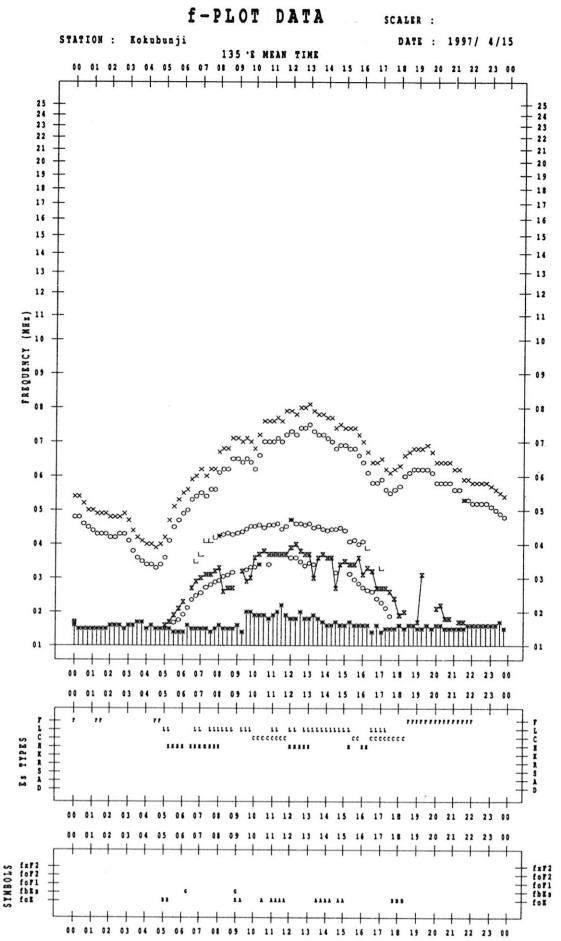

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

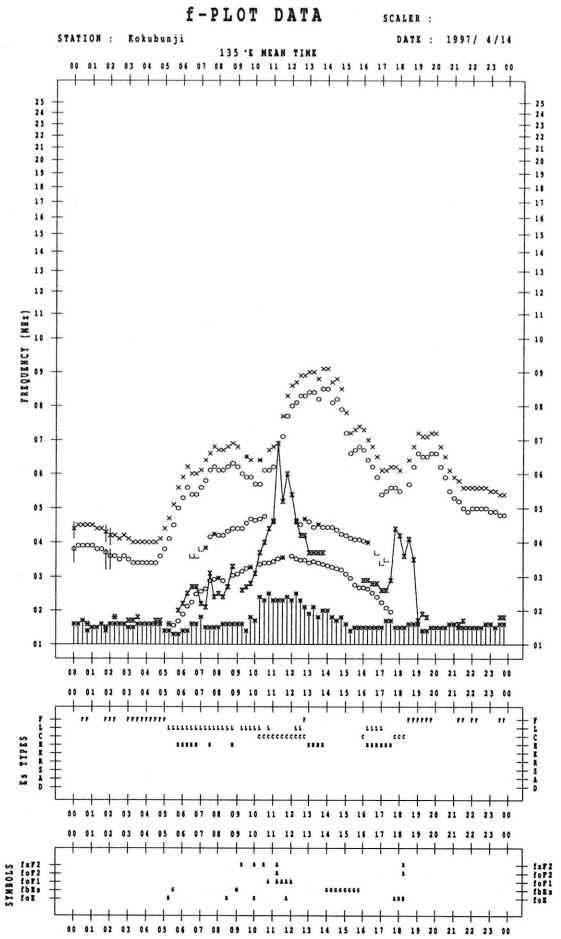

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

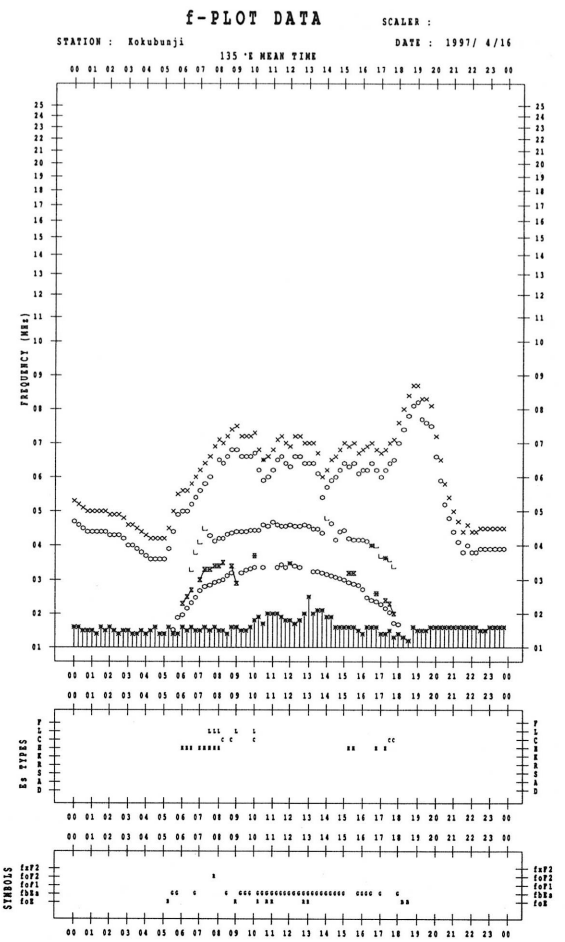

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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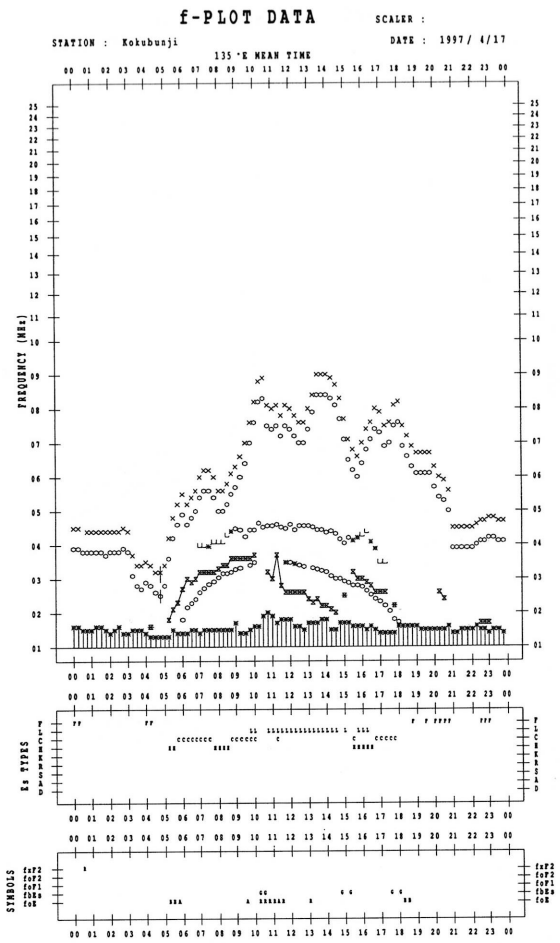
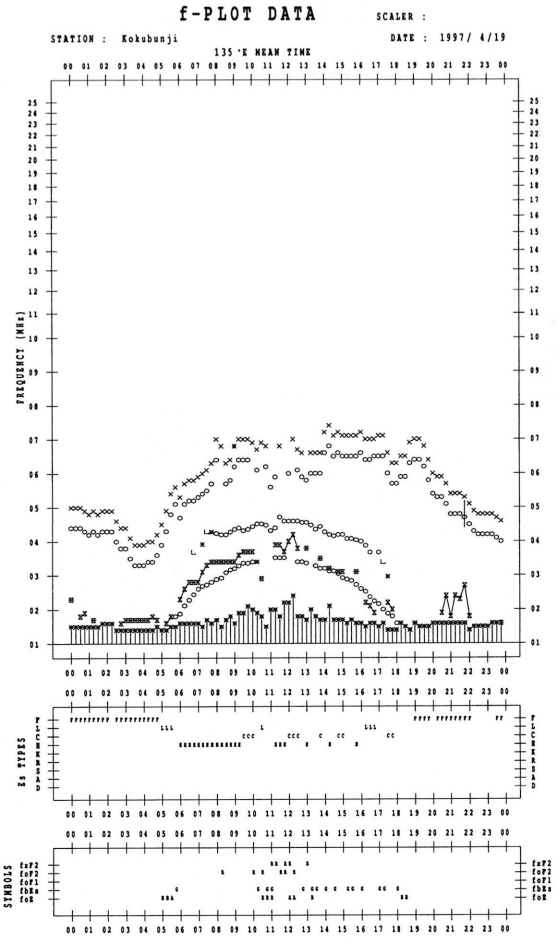
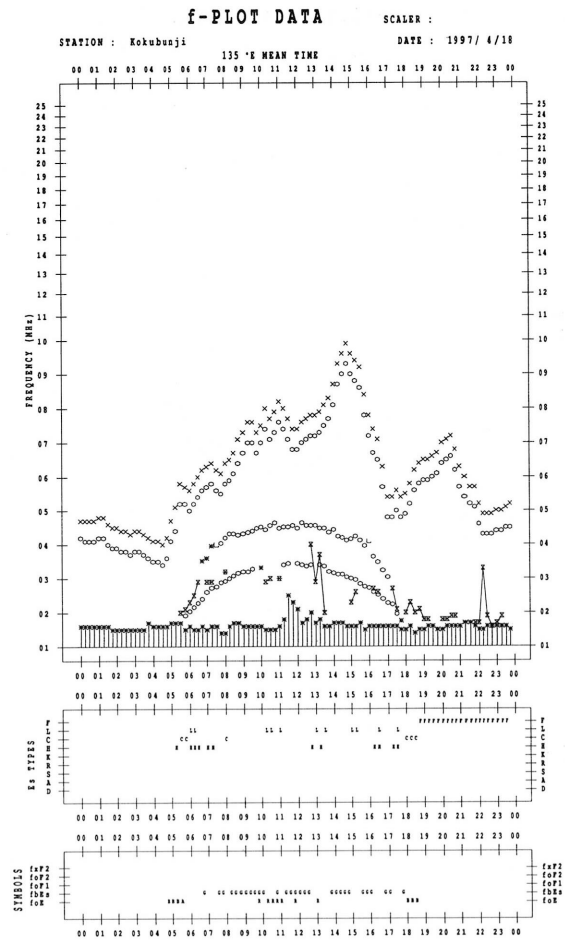
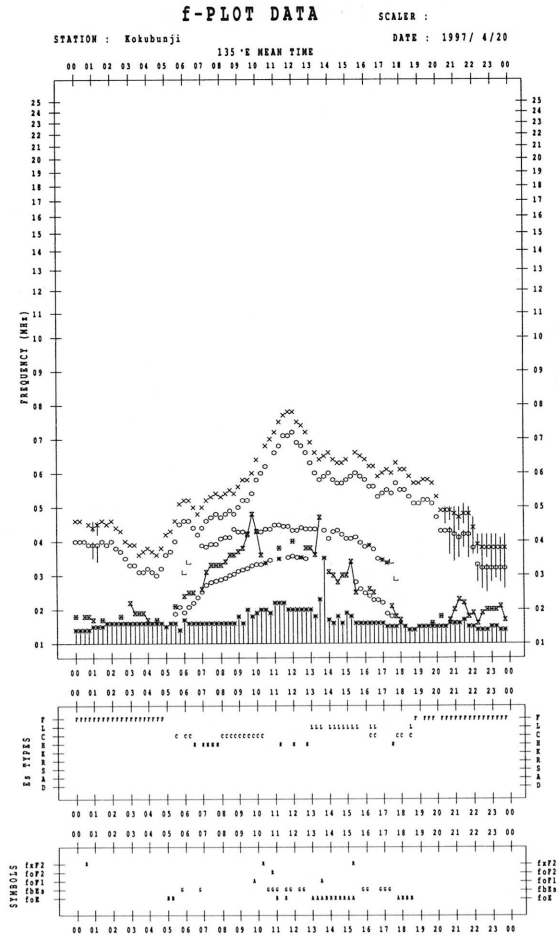
DATE : 1997/ 4/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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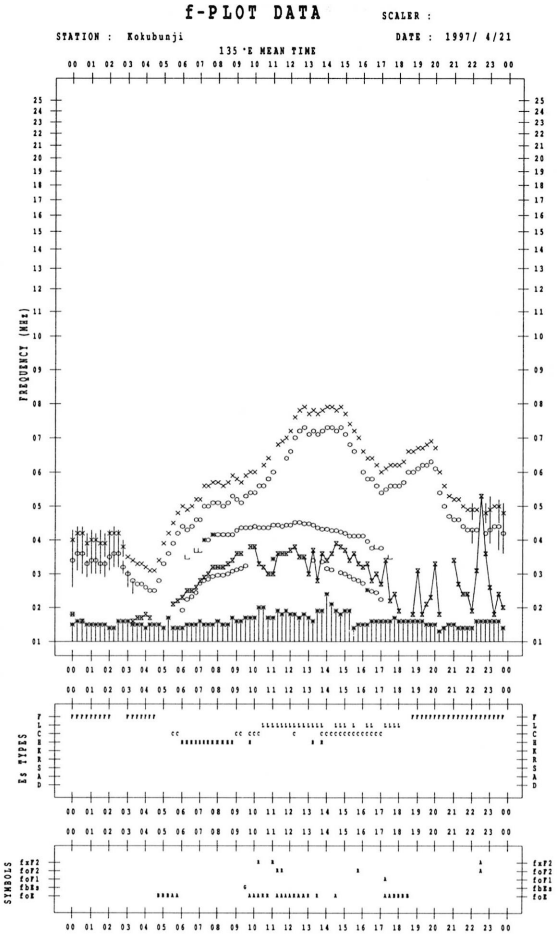
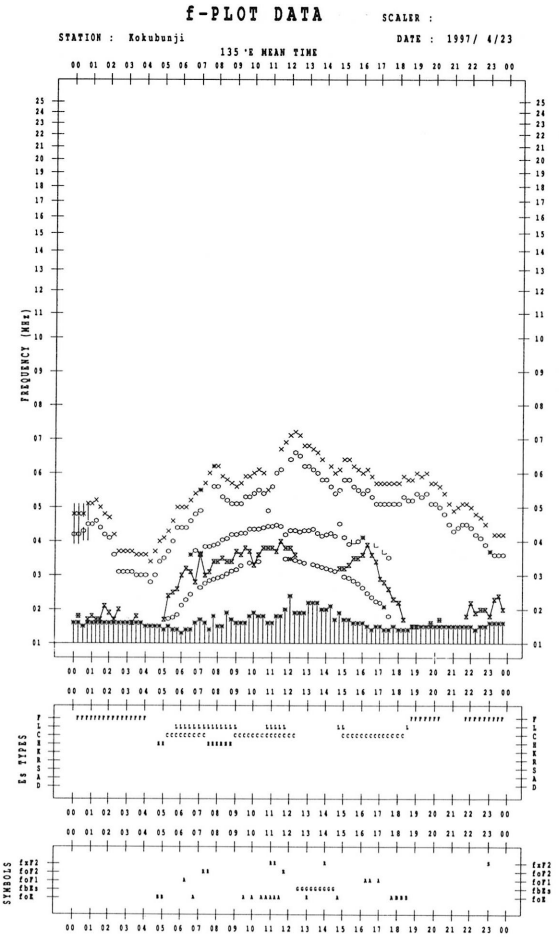
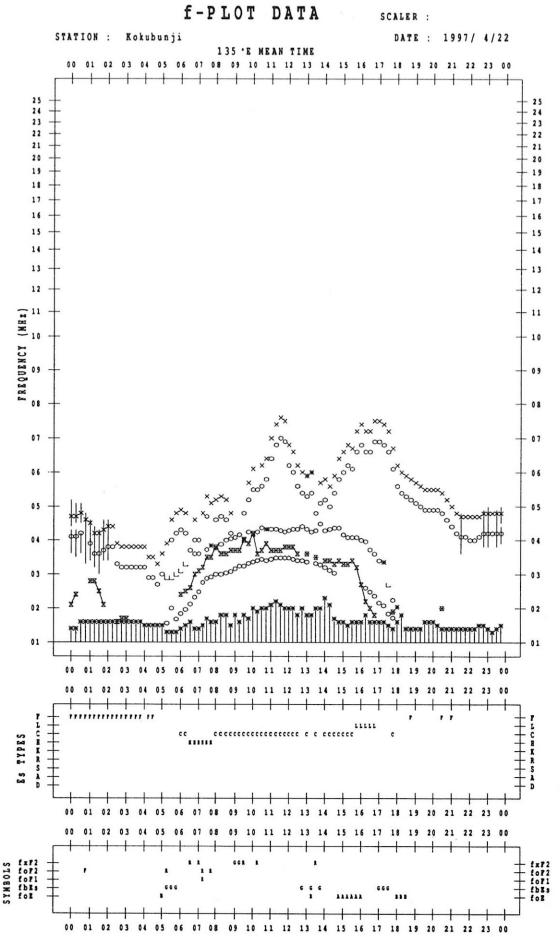
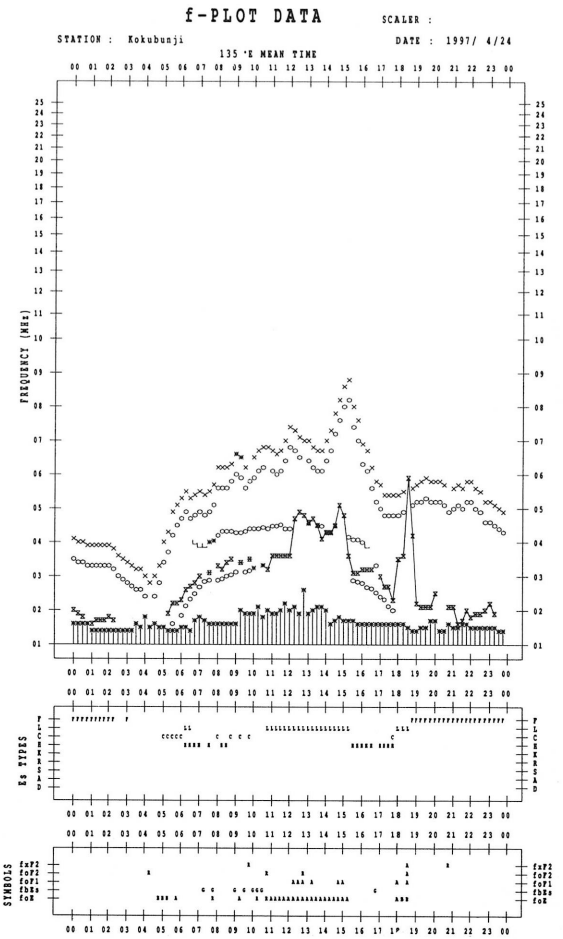
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE


f-PLOT DATA
SCALER :
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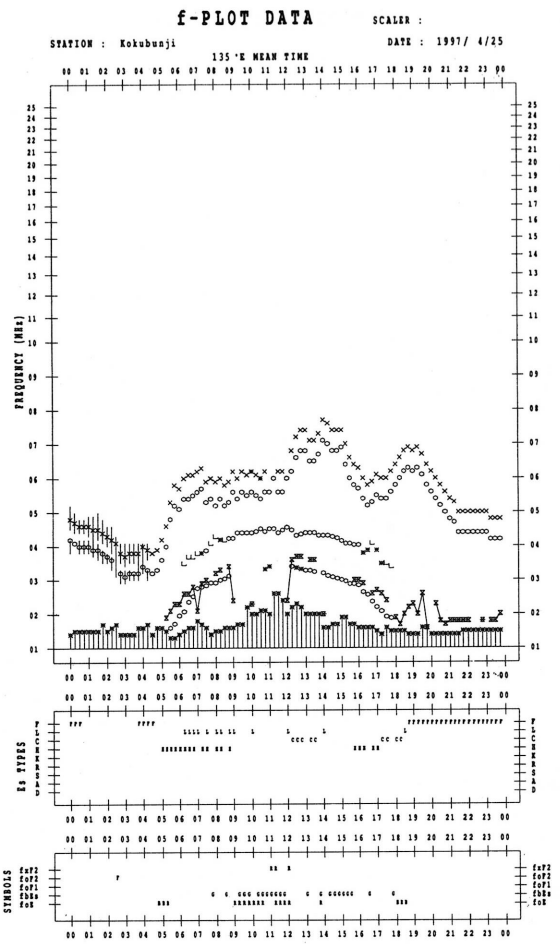
DATE : 1997/ 4/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE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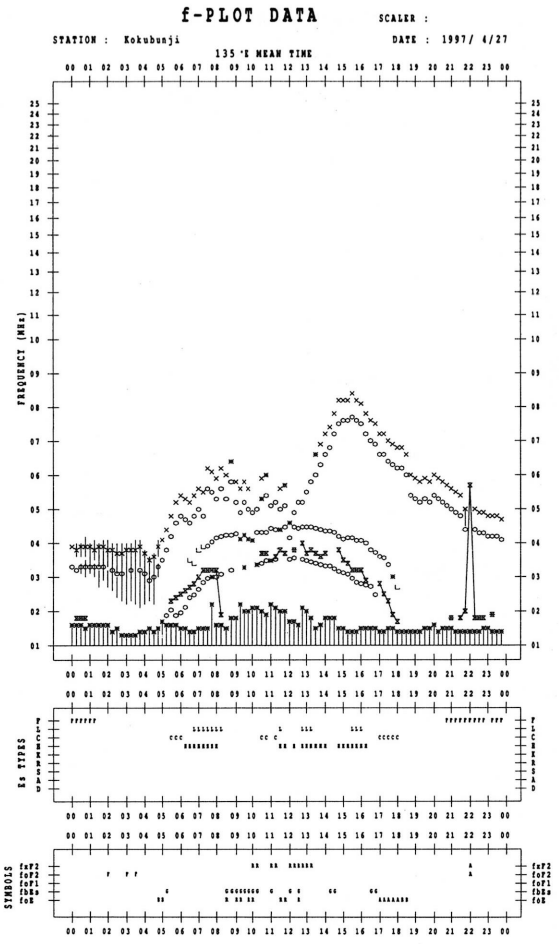
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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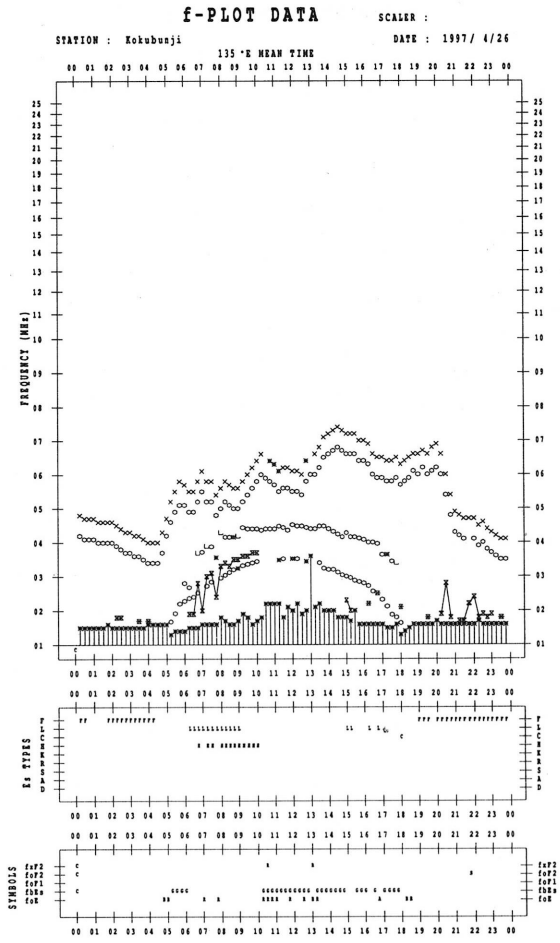
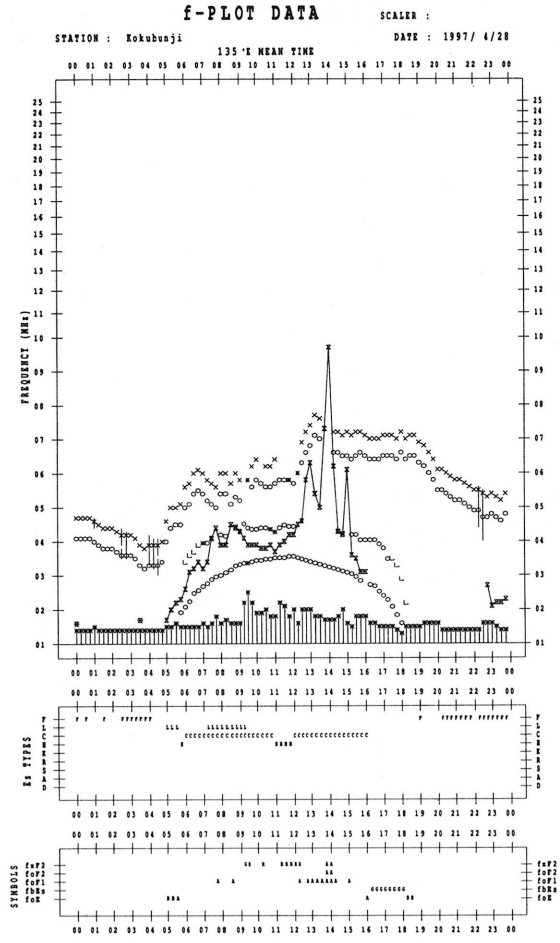
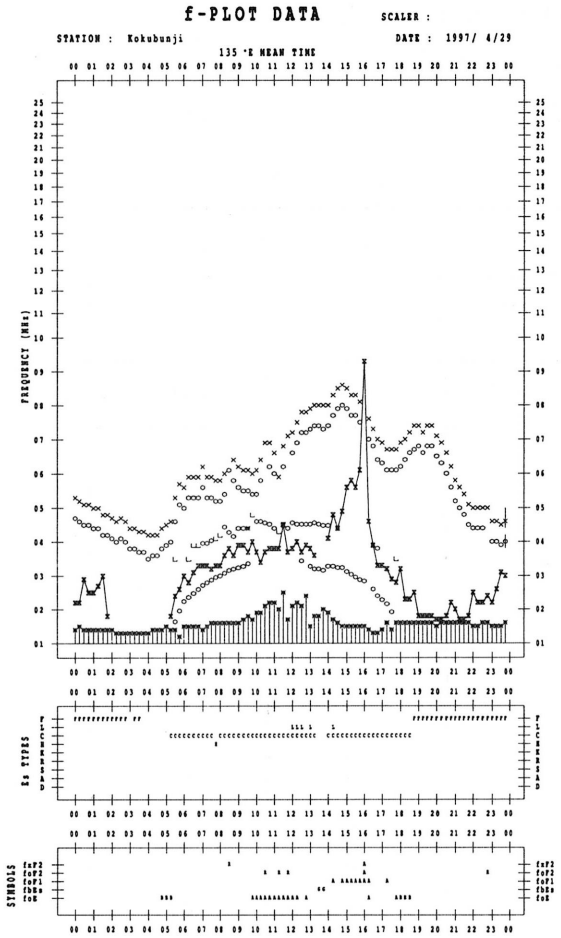
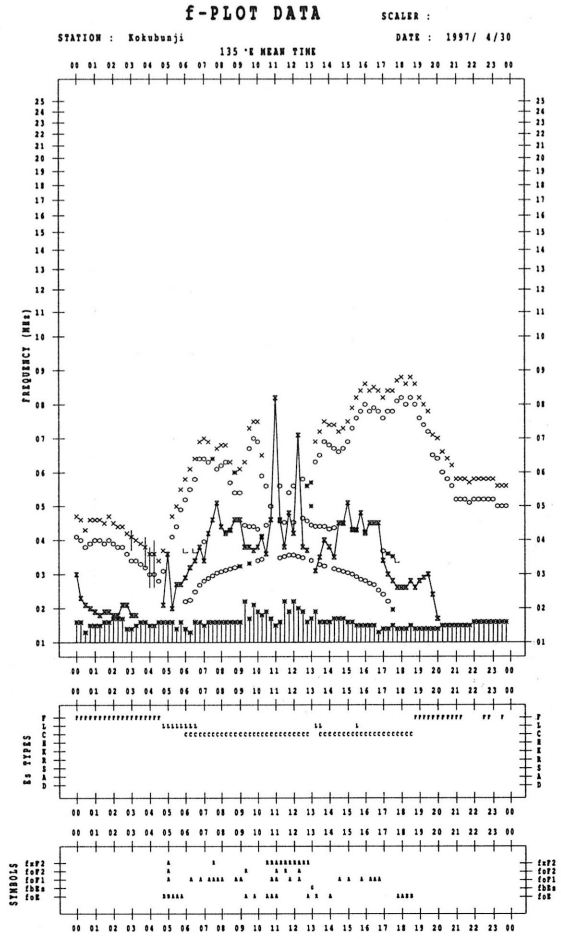
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 4/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso April 1997

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

Note: No observations during the following periods.
3rd 0700 - 8th 0830 16th 2050 - 17th 0100

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso April 1997

Single-frequency observations

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

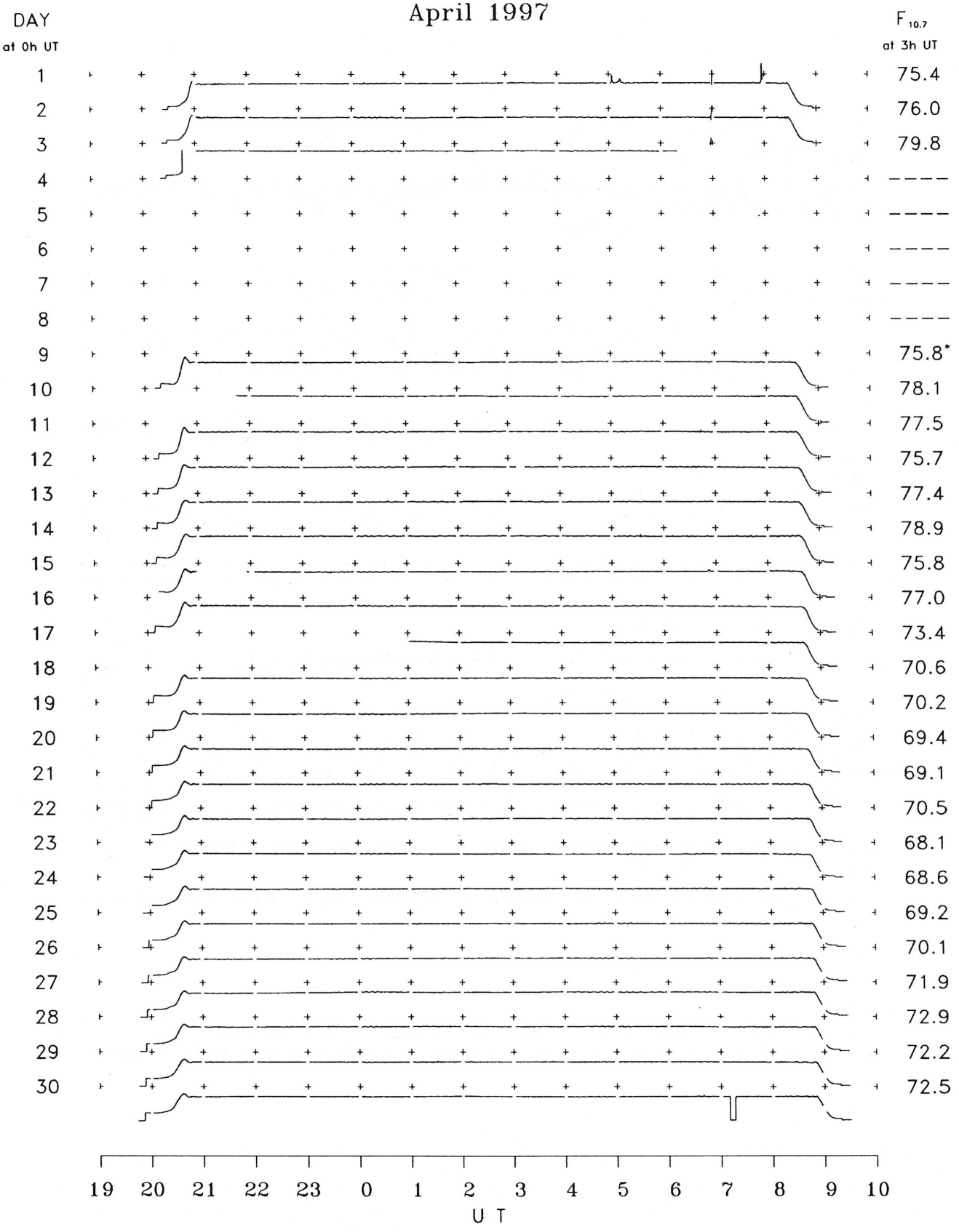
APR. 1997	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
1	200	8 S	0014.4	0014.6	0.7	79	-	WL
	500	8 S	0014.8	0015.0	0.7	15	-	WL
	500	8 S	0024.8	0024.9	0.2	22	-	ML
	500	8 S	0238.9	0239.0	0.2	3	-	WL
	500	42 SER	0301.0	0303.0	3.4	6	-	WL
	200	8 S	0303.2	0303.7	1.0	43	-	WL
	200	46 C	0438.0	0439.3	2.5	45	10	WL
	500	42 SER	0438.2	0438.4	1.6	2	-	WL
	2800	6 S	0503.4	0504.0	2.0	17	3	0
	200	6 S	0503.5	0503.7	1.4	630	98	0
	500	46 C	0503.5	0504.0	2.2	28	13	WL
	500	46 C	0510.5	0513.2	4.1	14	5	WL
	2800	6 S	0510.5	0513.6	6.2	9	2	WR
	200	46 C	0511.7	0513.2	2.6	55	12	0
	200	6 S	0755.0	0756.5	3.2	270	45	WL
	2800	6 S	0755.7	0756.5	4.0	48	6	0
	500	46 C	0755.7	0756.7	3.0	70	25	ML
	200	6 S	2116.7	2116.9	1.2	83	23	0
	500	1 S	2116.7	2116.9	1.0	3	-	0
	500	42 SER	2331.4	2331.6	1.7	3	-	0
	200	42 SER	2331.4	2332.6	1.4	13	-	0
	500	42 SER	2354.8	0000.7	8.0	11	-	WR
2	500	25 R	0016.4	0016.6	12.2	5	2	0
	500	41 F	0028.4	0031.5	11.7	54	-	WR
	200	42 SER	0031.8	0032.2	3.2	203	-	0
	200	42 SER	0037.9	0038.0	2.2	120	-	0
	500	42 SER	0053.0	0054.3	5.0	6	-	0
	500	41 F	0106.6	0115.2	25.0	14	-	WL
	500	1 S	0236.2	0236.5	0.6	2	-	0
	500	42 SER	0405.0	0410.0	6.5	21	-	WL
	500	1 S	0543.0	0543.2	0.7	17	-	0
	200	42 SER	0543.0	0546.4	3.4	330	-	0
	500	42 SER	0545.5	0545.7	1.5	64	-	0
	500	46 C	0551.0	0552.0	2.9	18	5	WL

2	500	8	S	0714.5	0714.7	0.5	16	-	WL
	200	46	C	0758.2	0758.5	1.7	118	27	WL
	500	8	S	0758.4	0758.6	0.5	6	-	WL
15	200	46	C	0637.6	0639.7	5.0	88	18	WL
	500	46	C	0639.3	0639.8	3.3	735	110	ML
	200	46	C	0649.8	0650.4	3.2	177	32	ML
	500	46	C	0650.1	0650.8	3.7	10	3	0
	2800	2	S/F	0651.3	0651.5	1.8	3	1	0
	500	46	C	0807.6	0808.8	2.3	33	11	0

B. Solar Radio Emission

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

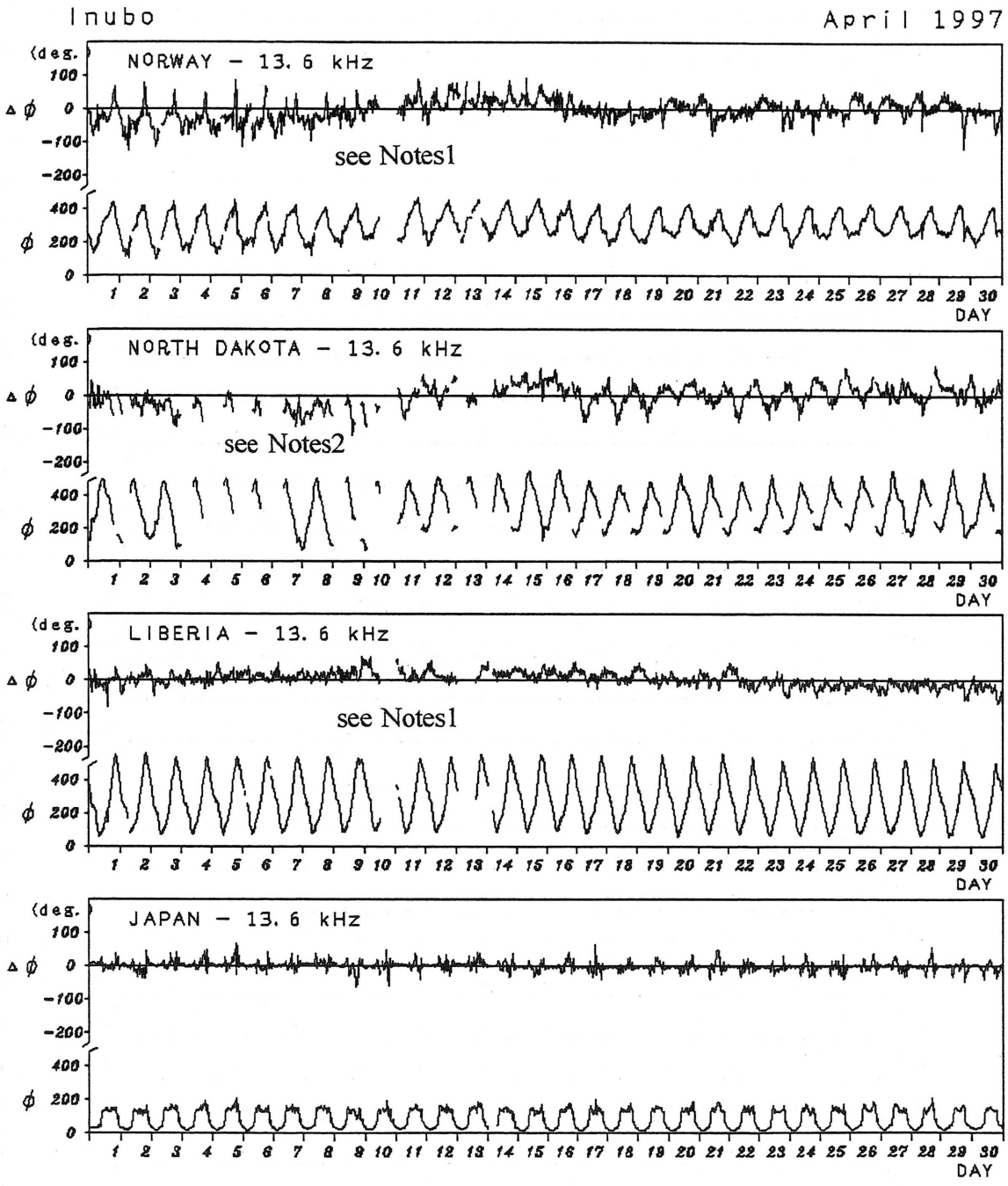
April 1997



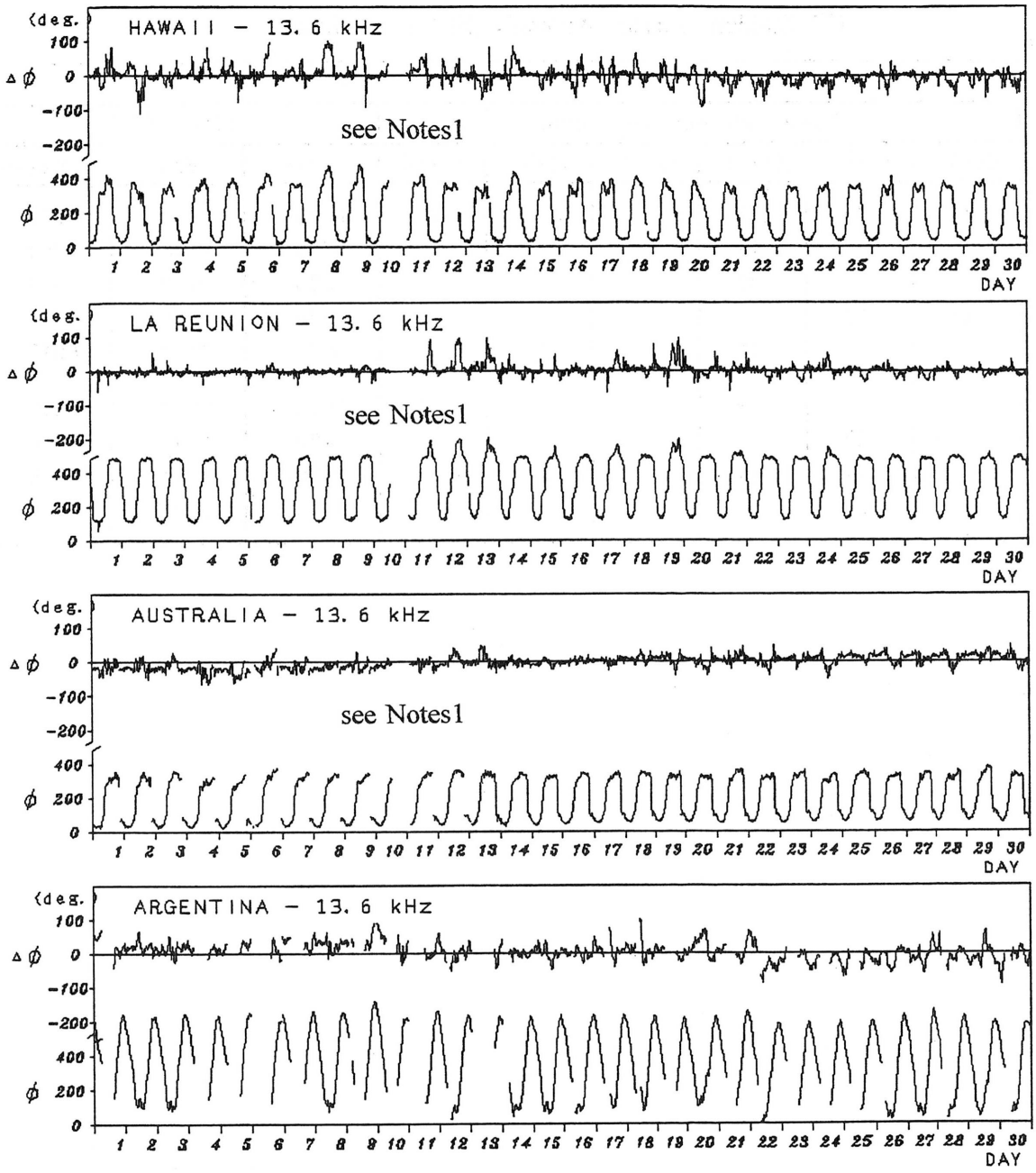
Note: A vertical grid space corresponds to a 100 sfu.
Elevation angle range ≧ 6°.

C. Radio Propagation

C1. Phase Variation in OMEGA Radio Waves at Inubo



Inubo April 1997



Notes1 : As for NORWAY-13.6 kHz, LIBERIA-13.6 kHz, HAWAII-13.6 kHz, LA REUNION-13.6 kHz and AUSTRALIA-13.6 kHz no record during 10 April 1305 UT to 11 April 0235 UT, due to the receiver trouble.

Notes2 : As for NORTH DAKOTA-13.6 kHz, Gaps in the record are due to the receiver trouble.

Polar Cap Phase Anomaly (PCPA) on Norway-Inubo Circuit

NONE

C2. Sudden Phase Anomaly (SPA) at Inubo

Inubo

Apr. 1997	S P A								
	Phase Advance (degrees)						Time (U. T.)		
Date	Ω/N	Ω/L	Ω/LR	Ω/AU	Ω/H	Ω/ND	Start	End	Maximum
1	36	49	149	–	23	42	0504	0630	0512
1			13	–			0756	0840	0804
1			40	–			1026	1100	1034
1	18	83		–			1340	1520	1356
2			11	23	25		0037	0130	0045
2			9				0528	0630	0538
7		29					1400	1507	1410
15		17	18				0730	0830	0736
15		37					1410	1505	1421

IONOSPHERIC DATA IN JAPAN FOR APRIL 1997
F-580 Vol.49 No.4 (Not for Sale)

電離層月報（1997年４月）
第49巻 第４号（非売品）
1997年９月１日 印刷
1997年９月５日 発行
編集兼 郵政省通信総合研究所
発行所 〒184 東京都小金井市貫井北町４丁目２－１
☎（0423）（27）７４７８(直通)

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