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IONOSPHERIC DATA IN JAPAN

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CONTENTS

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INTRODUCTION

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

Station	Geographic		Geomagnetic		Technical Method
	Latitude	Longitude	Latitude	Longitude	
Wakkanai	45°23.5′N	141°41.2′E	35.3°N	206.5°	Vertical Sounding (I)
Kokubunji	35°42.4′N	139°29.3′E	25.5°N	205.8°	Vertical Sounding (I)
Yamagawa	31°12.1′N	130°37.1′E	20.4°N	198.3°	Vertical Sounding (I)
Okinawa	26°16.9′N	127°48.4′E	15.3°N	196.0°	Vertical Sounding (I)
Hiraiso	36°22.0′N	140°37.5′E	26.3°N	206.8°	Radio Receiving (S,P)
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 descriptivel etter 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 two parabolic antennas, one with 10-meter diameter for 200 MHz measurements and one with 2-meter diameter for 500 and 2800 MHz measurements, 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 separately for 200 and 500 MHz measurements. The intensities are expressed by the flux density in 10^{-22} Wm^{-2} Hz^{-1} unit.

The table for 200 MHz measurements also presents the variability indices defined by the number of impulsive radio bursts within the three-hour intervals as follows:

0 quiet or no burst,
1 a few bursts,
2 many bursts,
3 very many bursts.

The daily variability index is defined as the daily mean of three-hourly indices.

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.

C. RADIO PROPAGATION

C1. H.F. Field Strength at Hiraiso

Field strength observation of 15 MHz standard waves transmitted from WWV and WWVH stations which are located respectively at Fort Collins, Colorado and Kauai, Hawaii, is carried out at Hiraiso. In order to avoid interference among the same frequency waves, the upper sideband of WWV or WWVH with the audio tone 600 Hz is picked up by the use of a narrow band-pass filter with 80 Hz bandwidth.Particulars of the transmitters and the receiver are summarized in the following table.

The tabulated *field strength* expressed in dB above one microvolt per meter is the average of quasi-peak values of the incident upper sideband field intensity for 45 seconds after the universal time indicated on the table. Abbreviated symbols are as follows:

CNT	number of observed values,
MED	median,
UD	value of the uppermost decile when they are ranked according to magnitude,
LD	value of the lowest decile when they are ranked according to magnitude,
U	uncertain,
E	less than,
C	innuenced by, or impossible because of, any artificial accident,
S	influenced by, or impossible because of, interferences or atmospherics.

C2. Radio Propagation Quality Figures at Hiraiso

The tabulated six-hourly quality figures are calculated for standard waves WWV transmitted from Fort Collins and WWVH transmitted from Kauai.

Quality figures expressing radio propagation conditions range over five grades as follows:

1	very poor(very disturbed),
2	poor(disturbed),
3	rather poor(unstable),
4	normal,
5	good.

Whole day quality figure ranged in grades of 1o, 1+, 2-, 2o, 2+, 3-, 3o, 3+, 4-, 4o, 4+, 5-, 5o stands for an average of six-hourly quality figures of the two circuits. Abbreviated symbols are as follows:

C	artificial accident,
S	propagational accident,
U	inaccurate.

Characteristics	Transmitter		Receiver
Station Call	WWV	WWVH	
Location	Fort Collins, Colorado	Kauai, Hawaii	Hiraiso, Ibaraki
latitude	40°41′N	22°00′N	36°22′N
longitude	105°02′W	159°46′W	140°38′E
Distance	9150 km	5910 km	--
Carrier Power	10 kW	10 kW	--
Power in each sideband	625 W	625 W	--
Modulation	50 %	50 %	--
Antenna	λ / 2 vertical	λ / 2 vertical	4.5 m vertical rod
Bandwidth	--	--	80 Hz for upper sideband
Calibration	--	--	Every hour

The column of conditions presents a record of the forecast of *radio propagation conditions* which is applicable to forthcoming 12 hours and broadcast six times par hour from JJY (Japan Standard Wave) staion. The conditions are denoted as follows:

N normal,
U unstable,
W disturbed.

Data on *geomagnetic storms* which are often correlated with radio propagation disturbances are tabulated based on reports from observation at Kakioka Magnetic Observatory, Japan Meteorological Agency. *Time* (U.T.) is expressed in hours and minutes (or tenths of an hour) , and *range* in nanotesla. When they are uncertain quantitatively, / 's are used to replace the numerical values. Continuation of a geomagnetic storm is denoted by ---.

C3. 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.

C4. Sudden Ionospheric Disturbances

a. Short Wave Fade-out (SWF) at Hiraiso

The table of short wave fade-out (SWF) is prepared from the record of field intensities measured at Hiraiso.

Drop-out intensities of the 10 MHz, the 20 MHz. and the 25 MHz waves are respectively distinguished by marks ′, ″, and ‴ from those of the 15 MHz wave for WWV and WWVH. Values of *start, duration, type,* and *importance* are obtained from data of the circuit whose drop-out intensity in dB is underlined as xx. When these quantities could not be determined accurately, they are accompanied by one of the following symbols.

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

Types of fade-out are as follows:

S sudden drop-out and gradual recovery,
SL slow drop-out taking 5 to 15 minutes and gradual recovery,
G gradual and irregular in both drop-out and recovery.

Importance of fade-out is scaled according to its amplitude into nine ascending grades as 1-, 1, 1+, 2-, 2, 2+, 3-, 3, 3+.

Correspondence of solar optical and X-ray flares, and solar radio burst to SWF is marked by X, being determined with data from interchange messages of IUWDS and observations at Hiraiso.

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

b. 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	Ω / N	13.6	10	7820
Liberia	06°18′N	010°40′W	Ω / L	13.6	10	14480
Hawaii	21°24′N	157°50′W	Ω / H	13.6	10	6100
North Dakota	46°22′N	098°20′W	Ω / ND	13.6	10	9140
La Reunion	20°58′S	055°17′E	Ω / LR	13.6	10	10970
Argentina	43°03′S	065°11′W	Ω / AR	13.6	10	17640
Australia	38°29′S	146°56′E	Ω / AU	13.6	10	8270
Japan	34°37′N	129°27′E	Ω / 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

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

HOURLY VALUES OF fEs AT WAKKANAI

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	27		32	30	40	32	31	33	30	28	34	27	28	26	G	24	G	G
2	G	G	G	G		G	G	28	34	26	32	35		33	30	26	31	31	G	38	35		G	G
3		32	35	31	28	30	31	37	35		39	38	38	41	45	39	36	36	G	G	G	G	G	G
4	G	G	G	G	G	G		24	N	31	37	37		44	34	29	34	G	56	29		G	G	G
5	G		25	G	G	G	29	27	28	31	34	44		33	33	28	24	23	G	33	24	G	24	G
6	G	G	G	G	G	G	31	27	29	30	34		32	31	30	28	25	G	G	G	G	G	G	G
7	G	G	G	G	G	G	26	29	28	26	31	32	34	32	29	27	23	35	27	G	G	G	G	G
8	G	G	G	G	G	G	26	27	27	29		33	31	32	30	30	24	G	G	G	G	G	G	G
9	G	G	G	G	G	G		28	28	28	38	31	30	32	29	28	30	36	36	37	G	G		G
10	G	G	G	G	G	G	30		33	36	34	34	34	31	29	33	34	30	32		26	28	25	G
11	G	G	G	G	26	G	G	25	27	36	33	31	32	32	28	30	25	30	33	G	24	G	G	G
12	G	G	G	G	G	G	29	27	31	30	32	B	30	30	29	28	26	G	G		G		G	G
13	G	G	G	G	G	G		26	32	36	31	33	33	30	25	28	24	G	G	G	G	G	G	G
14	G	G	G	G	G	B	G		29	29	28	33	34	34	32	30	27	G	G	G	G	29	G	G
15	G	G	G	G		G	25	27	34	38	30	30	36	36	29	28	29	37	37	G	30	G	G	G
16	G	G	G	G	G	G	G	29	28	28	34	32	33	32	31	32	26	36	40	30	30	G	28	G
17	G	G	G	G	G	G		25	43	36	36	34	30	28	29	29	26		47	40			27	G
18	G	G		G	G	G	G		36	60		43	35	32	31	27	24	37	67	66	45	38	27	
19	25	G	G	G		G		35	43	38	31	31	37	30	30	31	42	37			41	42	G	
20		29		28	30	G	23	29	31	32	33	30	B	B	35	27	31	39	32	G	27	G	G	27
21	29	27	28	29	26	G	G	25	28	29	32	29	32	30	30	34	29	36	35	27	G	G	G	G
22	G	G	G	G	G	G		28	27	30	30	30	30	30	30	29	27	28	32	27	G	G	G	G
23	G	G	G	G		G	29	28		35	31	36	31	33	36	33	36	43	55		28	G	29	29
24	24	G	G	G	G	G				64	65	64	37	41	27	37	54	54	40		40	40	27	34
25		30	29	27	G		53		107	70	77		60	38	33	34	40	30	46	28	36	31		24
26	25	30		G	G	G		33	38	56		58	42	B	31	30	28	34	40	34	37	36	G	G
27	G	G	G	G	G	G		29	35	36	39	55	35	33	36		34	29	30	24	29		G	G
28	G	G	G	G	G	G		28	30	30	29	30	36	33	31	30	28	26	30	25	G	G	G	
29	G	G	G	G	G	G	38	35	34	39	33	34	32	30		64	60	68	54	58	46	41	29	26
30	26	G	G	G	G	G	39		37	43	53	40	40	41	32	36	54	51	44	38	26	26	G	29
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	27	30	26	28	20	23	27	29	27	27	26	28	29	29	30	29	29	25	28	26	28	27
MED	G	G	G	G	G	G	26	28	32	32	33	33	34	32	30	30	29	31	32	27	25	G	G	G
U Q	G	G	G	G	G	G	30	29	35	38	38	38	36	33	32	33	34	37	42	35	32	29	24	G
L Q	G	G	G	G	G	G	G	27	28	29	31	31	31	30	29	28	26	24	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

APR. 1996

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

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

HOURLY VALUES OF foF2 AT KOKUBUNJI

APR. 1996

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	35	36	34		32	B	46	A	72		67	76	82		71	81	80	58	55	44		A		65
2			A	38		26			68	56	63	66	66	70	72	74	80	81		69	37	45		
3		37	37			A	42	48	51	55	A	84	78	73	68	64	61	64	57	57	66		42	40
4	34	38	38	32	35	28		50	58	56		82	85	75	67	68	68	60	55	64	68		26	
5	35	34	38	38	45		47	A	68	76	83	83	77	78	84		59		62	68		46	44	
6				38	35	28							74	74	70	71			60	57			69	
7		34	30	32	34	29			58	59	52	60	68	68	75	77		94	66	68	71		N	26
8	29	31	38		35		48	52	56		63	67	76	68	71	73	72		67	56	58	59		46
9	40	34	41		31	32		55	56	52	59	76	72	A	66	73	71	66	58	65		44	46	47
10	A	58		38	35	40	56	52	51		70	A	84	86	71	70	79	76	67	58	57			38
11	A	29	32	32		35		56	60	58	67	73	81	85	80	84		70	68	68	59	69	59	40
12	38	89	35	37		25		52	57	57	A	65	60	88	102	92	81	71		81	69			48
13	48	48	43	44	A	A	48		58	55	57	66	64		85	81	74	71	75	64		59		36
14	34		35	32	29	32	A	49	60	54	62	54	78	88	98	78	70	67	61	67	58	57	44	37
15	46	38	38	48	A	A	45	54	73	66		76		87		58	56	74	82				38	38
16	38	38	37	34	40	41	48	53	60		73	70	63		71	71	74	77	A	A	A	A		
17	A	37	35	34	30	35	29		64	63	68	A	A	74	72	76	83		114	58		A	A	35
18	A	47	47		A	38	46	47	47		A	40	71	A	A	A	78	68		60	52		45	
19		42	A	41	37	36	A	48	A	60	A	A	A	A	68	83	88	81		68	57		A	36
20	35	A	38	28	31	35		52	52	52	61	66		88	83	73	71	70	62	60	57	A	A	48
21	46	45	47			37		50	51	59	60			54		77		67		57		57	63	
22		31	38	34	34	A	50	62	57	63	56	A	A	A	55	62	59	59	59				56	B
23	44	44	38		36	59	56	56	58	52	A	57	49	A	60		70	72	70	68	58		59	
24	35	A	59		32	38	40	50	A	A	62	58	61	68	85		95			56		48	47	
25	A	26		A	26		A		60	60	A	A	77	94	113	105		80			69		38	
26	38	38	43	44			46	51	54	54	A	A		68		81	71	67		58		41	48	46
27	47	46	46	42	40			56	47	47	A	A	58		82	82	82	72	70	56		44	A	34
28	44		20	32		41		47	51	52	58	A	66	66	66	80	83	71	71		58	40		38
29	30	36		34	32	43	49	50	47	A	58	66	A	A	66		78	71	A	68	58	48	A	A
30	A	38	38	38	34	37	A	56	A	A	68	77	72	A	A	67	65	67	67	A		50	47	
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	24	24	21	20	20	15	22	26	21	19	20	21	19	25	25	25	25	20	24	16	14	16	17
MED	38	38	38	37	34	36	47	52	58	56	62	66	72	74	71	76	74	71	66	62	58	48	46	38
U Q	44	44	42	39	35	39	49	55	60	60	68	76	77	87	83	81	80	75	70	68	67	57	57	46
L Q	35	34	35	32	31	30	45	50	51	53	58	62	63	68	67	70	69	67	59	57	57	44	43	36

HOURLY VALUES OF fEs AT KOKUBUNJI

APR. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	B	29	35	48	54	60	58	40	51	37	36	30	29	G	G	29	24	G	G
2		50	32	57	38	27	34	40	44	37	29	52	G	29		41	40	36	G		G	G	G	30
3		29	32		28	28	23	30	37	48	54	48	46	45	45	33	49	50	39	G	37	26	32	29
4	G	G	32	G	G	G		25	29	32	39	33	33	G	35	35	32	30	G	G	G	G	G	G
5		G	G	G	G		27	30	31	31	32	32	33	31	G	29	27	24	G	G	G	G	G	G
6	G	G	G	G	G	G							50	35	30	31	26	26	G	G	G	G	G	G
7	G	G	G	G	G	G	23	41	31	30	31	39	33	34	33	38		29	28	31	G	G	G	G
8	G	G	G		G	G		30	32		48		50	44	29	44	30	29	G	24	32	G	G	G
9		G	G		G	24	36	41	51	49	40	56	57	85	G	34	32	42	37	60	81	42		55
10	42	G	G	G	G	G	35	40	40	49	57	65	54	53	34	40	53	26	G		34	30	30	70
11		34	34	38	G	G		30	35	45	72	46	56	57	38	33	34	33	26	33	41	G	G	G
12	G	G	29	G	G	G	29	26	31	34	33	34	G	34	35	36	36	37		38	25	31	24	G
13		G	G	26	30	32	48	28	29	46	47	51	34	32	28	26	33	30	32	28	30	G	G	23
14	G	G	G	G	G	G	40	43	32	32	36	G	30	G	G	46		28	25		30	G	G	G
15	G	41	29	28	25	34	39	29	30		G	G	G	G	39		47	40	31	32	33	G	40	38
16	G	G	G		G	G		24	42	46	47	54	53	52	53	43	53	43	86	106	61	51	G	
17	26	G	27	G	28	31	34		50	58	59	69	109	57	61	62	54	43	40	48	29	42	42	50
18	85		66	44	33	G	33	32	45		59	39		59	75	148	32	29	32	58	58		62	
19		34	52	50	26		48	44	49	55	72	54	76	58	31	44	30	G	G	37	29	27	27	28
20	28	30	28	28	27	24	30	24		34	30	40	25		31	40	44		32	50	69	54	52	28
21	24	24	G	G	G	G	26	25	38	34		32	G	35	33	38	29	37	30	G	37	24	G	G
22	G	G	G	23	23	30	34	33	34		40	46	29	30	39	34	45	28	30	32	26	G	G	B
23	G	G	G	G	G	G	G	30	32	33	47	40	50	62	50	61		48	46	51	31	G	G	G
24		33	24	G	G	G	24	36	70	72	60	75	51	48	50	60	52	52	34	30		45		
25		35	32	30	G	28	42		57	60	76	60	68	60	90			25	39				40	
26		25	G	G	26		26	33	32	30	40	38	G	30	30	29	26	32	G	G		44		26
27	G	27	G	G	24	G	26	32	30	33	39	39	36		60	48	40	38	31	24	G	27	30	G
28	G		G	G		26	36	40	43	38	32	32	33	34	34		44	47	35	G	G	23	G	G
29	G	G	G	G	G	G	31	30	34	33	39	38		55	40	61	60	80	72	38		36		
30		43		G		26	39	43	54	59	38	40				47	44	39	50			48	34	
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	28	29	26	28	26	25	27	28	24	28	28	27	27	28	27	26	29	29	25	25	28	26	23
MED	G	G	G	G	G	G	33	32	36	42	40	40	36	44	35	40	38	33	31	31	30	24	G	G
U Q	24	31	30	28	26	27	37	40	46	51	58	54	53	57	47	47	47	42	38	43	37	39	32	29
L Q	G	G	G	G	G	G	26	29	31	33	34	36	29	31	30	34	30	28	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

APR. 1996

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	14	15	14	15	15	B	15	15	15	20	16	17	16	17	20	15	14	14	15	15	14	15	14	15
2	15	15	15	14	15	14	15	15	15	15	16	17		21	18	18	15	15	15	14	15	15	15	14
3		15	14		14	15	14	15	17	15	20	18	20	21	16	16	16	15	14	15	15	15	14	15
4	14	14	14	14	14	15	22	18	15	15	16	20	26		17	16	14	15	15	14	14	15	15	14
5	15	15	15	14	14		16	14	14	15	17	18	22	17		15	15	21	14	15	15	15	15	15
6	15	15	14	14	15	15	15						17	17	16	15	14	15	14	15	15	15	16	14
7	14	15	15	14	14	16	16	15	15	14	15	17	17	18	17	15		15	15	15	14	14	15	14
8	15	14	15		14	15	14	15	16		15	15	18	17	17	18	15	15	15	15	15	15	15	15
9	15	15	15		15	15	16	15	14	15	20		30	30		17	15	15	15	14	15	14	15	14
10	14	15	15	14	14	14	15	14	15	14	16	21	20	18	18	20	16	20	15	14	14	14	14	14
11	14	14	14	14	15	15		15	15	15	17	18	17	17	16	15	14	15	14	14	15	14	15	15
12	15	15	14	15	15	16	15	15	14	16	24	23			22	17	14	14	15	15	16	15	17	14
13	14	15	15	14	14	15	22	16	16	17	21	26	17	17	17	16	14	14	14	15	14	16	15	15
14	15	14	15	15	15	15	15	14	17	15	21		16		45	16	15	15	21	15	16	14	15	15
15	15	14	15	14		14	15	18	14				49	46	40	36	26	15	14	14	15	15	15	15
16	15	14	15	14	14	15	17	14	14	17	18	22	21	20	16	16	15	15	15	14	14	15	14	
17	15	14	15	15	15	14	15		14	14	16	18	18	17	17	14	16	15	14	15	15	14	15	14
18	15	14	14	15	15	14	18	15	16		15	18	24	21	18	15	14	14	14	15	14		15	
19		14	15	14	15	15	15	15	16	15		21	22	18	15	14	15	17	17	15	15	14	17	15
20	15	14	14	15	14	16	15	16	14	14	16	17		17	18	16	14	15	16	15	15	15	14	15
21	15	14	14	17	14	14	17	14	14	14	15	16		23	16	16	15	15	15	14	15	15	16	15
22	15	15	15	14	15	15	16	14	16	16	14			16		16	14	15	14	14	15	15	15	B
23	14	14	15	14	15	15	23	14	16	14	16	17	20	17	17	15	15	15	15	15	15	15	15	15
24	14	15	14	16	15	14		27	14	17	18		15	16	21	16	15	14	14	15		14	15	
25	14	14	15	14	14	15	14		15	16	20	16	32	18	17	15		14	15		14		15	
26	15	14	15	14	15	17	24	14	15	16	33	23		20	18	16	15	14	18	14		15	15	14
27	15	14	15	14	15	15	14	14	14	16	16	18	18		18	14	15	15	14	15	14	15	15	15
28	15		14	15		15	17	14	15	15	17	22	16	20	14	16	15	15	15	15	16	15	15	14
29	15	15	14	15	15	15	15	15	14	16	17	14	16	20	17	17	16	16	14	15	15	14	15	15
30	15	15	15	14	14	15	15	15	14	14	18	16	18	20	30	16	14	14	14	16		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	29	30	27	28	28	28	27	29	26	27	24	24	26	27	30	28	30	30	29	27	28	30	24
MED	15	14	15	14	15	15	15	15	15	15	17	18	18	18	17	16	15	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	17	15	16	16	20	21	22	20	18	16	15	15	15	15	15	15	15	15
L Q	14	14	14	14	14	14	15	14	14	14	16	17	17	17	16	15	14	14	14	14	14	14	15	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

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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			79				C	C	B	B		B				84	90	153		A		A	79
2	A			49	C	201	C	A	A	39			B	B				C		109	A		A	C
3	89	A	C	B		49		B			B	B				B							
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16												79	87	93	N	A	79	89	86	87		A	A	A
17	49		89		55		36	54	66	65	66	67	87	84	88	94	110	120	88	A		A		A
18		A	A	69	A	49	50	A	A	A	A	A	93	91	82	85	96	81	70	66	A	A	A	A
19	A	A	A	A	59		A	A	54	A	A	A	70	84	96	112	121	108	84	80	81	A		
20	A	A	89		69	59	59	58	66	58	54	68	87	98	98	99	96	87	84	52		A	169	A
21	60	62		A	89		59	66	53	62	66	80	84	81	85	84	82	79		61			A	69
22	32	30	A		A	A	A	54	54	66	74	58	A	61	67	65	66		73				149	
23		34	N	47				54		58	58	59	72	70	61	70			A	82	A	A	149	
24	89	36		53	A	35	47	52	61	A	A		72	83	95		100		84	85	A	A	169	A
25	A					49	42	A	A	60	A	A	68	90	101	123	127		86	A	A	169	A	A
26				30	30	42	37		58		54	58	58		100	103	97		57	66	A	A		
27		24	31	38		59	46	49	48	62	57	68	78	90	98	97	95	82	84	55	59			49
28			89		32		37		50	60	61	70	82	82	84	90	97	74	84		A	169	A	49
29	59			A	A	49	53	50	61			67	73	83	82	A	129		85	82	A	A	169	A
30	A	32		50	A		43	A	A	A	83	73		A	A	75				85	A	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							11		10			11	13	13	13	12	14		13	11				
MED							46		56			68	78	84	88	92	96		84	80				
U Q							53		61			73	87	90	98	101	110		86	85				
L Q							37		53			59	71	81	82	79	84		78	61				

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

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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	134	G	G		G	G		G	G	B	B	G	B	G	G	G	G	G	160	G	C	G	63	G
2		G	G	G	C	C	162	48		55	G		B	B	G	G		80	G	G			C	G
3	G	C	G	B	G		G	B	G		B	B				B								
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16												31	39	60		114	76		70	88	82	86	70	33
17	32	G	G	G	G	G	38	43	43	42	32	35	38	36	38	64	70	80	94	53	45		69	81
18	33	86	65	36	32		40	45	86	102	104	92	92	90	62		75	95	91	94		94		48
19		32		48	44		40		60	72	78	64	51	55	56	60			31			32	G	G
20	28		27	35	G	G		29	31	43	28	69	73	30	37	31	30	28		28	32			
21	34	23	25	28		28	36	29	35	28	44	30	29	29	31	31	51	39		29	28		48	41
22	33	30	30	33	37	30	32	49	49	44	49	40	30	30	30	30	30	44	45	38	G	38	24	G
23	29	G	G	G	G	20	26		51	66		30	40	50		57	64	61	91	70	30	32	26	26
24	26	G		25	24		43	45	45	68			54	50		53	49			56		34	32	40
25	41	26	25	27		G		56	64	59	66	63	54	64	97	96	28		32		77		91	43
26	36	31	31	30	29	28	32	38	48	54	54	56	51	57		34	42	30		30			46	29
27	30	G	25	G	G	G		30	30	30		39	30	30	32	30		28	27	G	G	G	G	27
28	G	G		G	G	G	30	34	43	45	48	39	31	48	44	35		44	30	38	28		30	G
29	G	G	G	29	32	30	26	31	31	39	36	40	48	51	52	116	126		39	30	33		70	
30			38	48	47	30	34	48	55	78	93	76	91	85	78	67	82			46	56	70	86	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	14	14	14	15	14	12	13	14	16	15	12	15	15	16	13	16	13	11	12	15	11		14	15
MED	31	G	25	28	12	10	34	40	44	54	48	40	48	50	38	44	51	44	42	38	32		47	29
U Q	34	30	30	35	32	29	40	48	53	68	72	64	54	58	59	65	75	80	91	56	56		70	43
L Q	26	G	G	G	G	G	28	30	31	42	34	31	31	30	30	30	30	28	30	28	28		26	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

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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	17	17	17	17	23	23		C	C	B	B		B				39		27	20	24	17	22	22
2	22	18	17	17	26	21	22			35			B	B				C		21	20		24	22
3	15	21	C	B	17	17		B			B	B				B								
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16												20	20	21	22	20	17	14	14	14	14	14	14	14
17	14	15	15	14	15	15	14	14	15	17	20	22	20	20	20	17	16	16	14	14	14	14	14	14
18	14	14	14	14	14	14	14	15	16	18	18	20	22	18	20	18	17	14	14	14	14	14	14	14
19	14	14	14	14	14		14	14	14	14	17	20	18	22	30	17	17	17	14	14	14	14	14	14
20	14	14	14	14	14	15	15	14	15	17	17	18	20	20	18	17	18	14	17	14	14	14	14	14
21	14	14	14	15	14	14	14	15	16	20	20	18	16	18	15	17	17	15		14	14		14	14
22	14	15	14	14	14	14	14	15	15	16	17	20		47	22	22	17	16	14	14	15	14	14	14
23	14	14	15	14	14	15	16	14	15	17	17	22	20	21	20	18	17	16	15	14	14	14	15	14
24	14	14		14	15	15	14	15	17	14	22		22	18	18	18	18	16	14	14	14	14	14	14
25	14	14	14	14		14	14	14	16	18	18	18	20	22	22	18	18		16	14	14	14	14	14
26	14	14	14	14	14	14	14	16	16	18	18	21	20	22	21	20	17	17	15	14	14	14	14	15
27	14	14	14	14	14	14	14	16	15	16	18	22	21	21	22	20	18	15	15	14	14	14	15	15
28	14	14	14	15	15	14	15	14	15	16	17	18	18	20	18	17	15	14	14	14	14	14	14	14
29	15	14	14	14	14	14	15	15	16	15	16	18	20	18	18	17	16		14	14	14	14	14	14
30	14	14	14	14	14	14	14	15	16	17	20	18	18	21	21	17	17			14	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	17	17	15	16	16	16	15	14	14	15	14	14	14	15	15	15	16	12	14	17	17	15	17	17
MED	14	14	14	14	14	14	14	15	16	17	18	20	20	21	20	18	17	16	14	14	14	14	14	14
U Q	14	15	15	14	15	15	15	15	16	18	20	21	20	22	22	20	18	16	15	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	15	16	17	18	18	18	18	17	17	14	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT OKINAWA

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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	A	A		A	A	A	A	A	53		73	81		100		93	A	95		A	A	A	A	A
2		A	A	49	A	A	A	40		66		89	75		103	94	92	96	95	61				
3	B	69				B		54	51			85	91	96		131	92	80	84	89	88	B	B	
4		89	89	55	47	A	A	A	52		66						91		87			A		
5	50	A	38		A	A	A	56	61	89														
6	B	B		B		B			B				95			131	121		77	70	60		48	
7	A	52	48	57	47			A	59	56	A	90	90				131	93	83			A	A	
8	69					B		36	59	55	55		86	96		116	91	96	77	86		A		89
9	A	37	27		A	39		A	A	64	63			92	99	102		98	70	83		A	A	A
10	48	A		44		A	A	A	70		84	84		132	134	132	123		116	84			A	
11	A	A	89	A	A				56	53	59			109			A		91	100	A	A	43	
12	43	37	34	47		B		53	57	56		62	83	91				A	85	86	A	A	A	89
13	A	A	53	44	42	46	37	A	62	58		92		134	132	133	134		116	122	A	A	A	A
14	42		60	72			A	A	65		56	73				131	102		116	84				A
15	38		A	A	A	A	A	A		67	A	90		92		111	91	91		N	59	A	49	
16	B	B	59	59	59	B	A	A	52		A	90	98		124	132		94	84	86	A	A	A	A
17	A	A				89	A	A	A	86	65		90		125	133	134		84	A		A	A	A
18	A	A	A	A	A	69	A	A	A	A	A	A	A	135		131	129	98	87	A	A		A	A
19	A	A	A	A	38	A		A	A	A	A	A	78		130		170		116		88	A		A
20	A		55	A	A				79	54	60	71		117	147	150				87	60	A	42	A
21	A	A	59	48	46	B		A	53	62	61	90		121		132	100	90	86		81		42	A
22		A	A		69	59	A	A	62	67		91	90	84	92	68		90		74	A	79	A	A
23		47			49			53	58			93	86	92	74		71	A	74	A	A	A	49	A
24	38	A	A	34	A	89		A	56	A	A	60	90						91	84	A	A	43	
25	46	A	89	A		59		53	A	92	92	A	95		132					62	A	A		A
26	A	A	89		A		A		A	A		58		96		134	136		81	67	A	A	A	A
27	A	A	47	50		A	A	57	57	56	58		89		124		136		90	69				59
28	A	44			23	B		44	A	A	A	71	84	117		125	122	91	69		A	A		A
29		44		37		A	A	A	59	A	60	64	90	N	124		111	89		A	63	A	A	A
30	A	A	A	A	A	A		A	A	62		A	76		92	93	112		85	85	A	89	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			14	12					19	16	13	18	17	16	14	19	20	13	23	18				
MED			57	48					58	62	61	84	90	98	124	131	116	93	85	84				
U Q			89	56					62	67	69	90	90	119	132	132	132	96	91	86				
L Q			47	44					53	56	58	71	83	92	99	102	92	90	81	70				

HOURLY VALUES OF fEs AT OKINAWA

APR. 1996

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	60	60	32	70	60	39	30		42	37	37	59		90	76	84	102	74		61	78	59	38	45
2		46	51		28	28		32	34	34	48	56	55	56	53	60	64	69	36	G	G	G	G	G
3	B	G	G	G	G	B	G		33	34	40	34	33	40	36	G	32	34	G	30	44	B	B	G
4	G	35	38	G	32	33	48	45	48	36	32	41	G			39	42		36	32		38	24	G
5	G	33		50	27	26		41		36														
6	B	B	G	B	G	B	G	G	B				35						27	G	39	25	44	G
7	42			33	34	G	G	31	33	58	63	42	48	42	49	41	39	33	25	29	G	46	40	G
8	43	G	38		G	B	G	37		40			38	33	32	32	42	31	G	G	G	37	48	33
9	41	43	38	28	44	G	G		45	46	43	49	33	48	51	49	53	44	41	33			44	42
10	G	40		38	40	32	34	53	41		52		50	49	46	42	31	34	G	G	G	G		G
11	30	28	24		40	G	G		32	41	42	38	34			97			73	64		44	G	G
12	G	G	38	G	G	B	G	31	35	40	44	38	39	48	38	56	61	96	47	46	46	47	42	38
13	32	27		G	G	G		45	38	44	38	57	66	56	61	42	41		45	34	33	43	30	34
14	G	26	42	G	G		39	46			35	32	67	40	42	25	24	38	G	36	G	G	G	43
15	G	G	46		29	27	36	44	50	45	46	G		25	32	31	29	34	86	36	50	31	36	27
16	B	B	G	G	G	B	40	49	58	59	103	40		66	51	50	48	60	61	58	36		60	66
17	60				G	G		49	56	43	43	60		71	57	55	63	69	64		60	46	46	
18	86		60	59	49	36	40	48	69	67	66	68	147			116	57	79		92		G	47	64
19	44	60	60	45	60	60	G	59	123	92	70	72	73		79		69	60	62	54		37	G	39
20	46	G	48	47	42	G	G		34	42	43	40	36	40	39	34	31	30		27	G	37	G	49
21	41	59		44	G	B	G			58	38	40	52	45	49	46	49	66	36	24	G	G	48	41
22	43	60		G	32		43	50	58			49	36	34	54	55	50		59	44	42	48	38	43
23	G	G	G		G	G	G			51	35	41	49	64	66		98	96	59	64	85	44	48	43
24	40	43	38	36	34	G	27		44		94	47	50	66	66	67			38	40	45	46	48	45
25	36	60	56		G	G		41	60	66	62	62	64	94	101	27	41		28		26	45		41
26	38	38	39		40	G	47		61	66		50	39	44		61	62	67	60	34	30	45	44	41
27	38	45	48		34	39	48	30		40	47	44	40		58	61	41		28	32	29		G	G
28	43	50	G	G	G	B	G			56	67	47	52	48	40	49	43	39	35	45	48	44	G	30
29	G	G	39	48	G		48	41	42	44			53	51	60		68	84	70				68	44
30	43		39	68		62	G	56	85	62	51		61		32	39	46	62		94		135	138	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	26	24	23	20	29	20	25	20	22	25	24	24	25	22	24	25	26	21	25	26	22	24	26	28
MED	39	36	38	34	28	14	G	44	44	44	45	46	49	48	51	49	47	60	38	35	34	44	41	40
U Q	43	48	48	47	40	34	40	49	58	58	62	56	58	64	60	60	62	71	60	54	46	46	48	43
L Q	G	G	24	G	G	G	G	34	35	40	39	40	36	40	39	36	41	34	27	29	G	28	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT OKINAWA

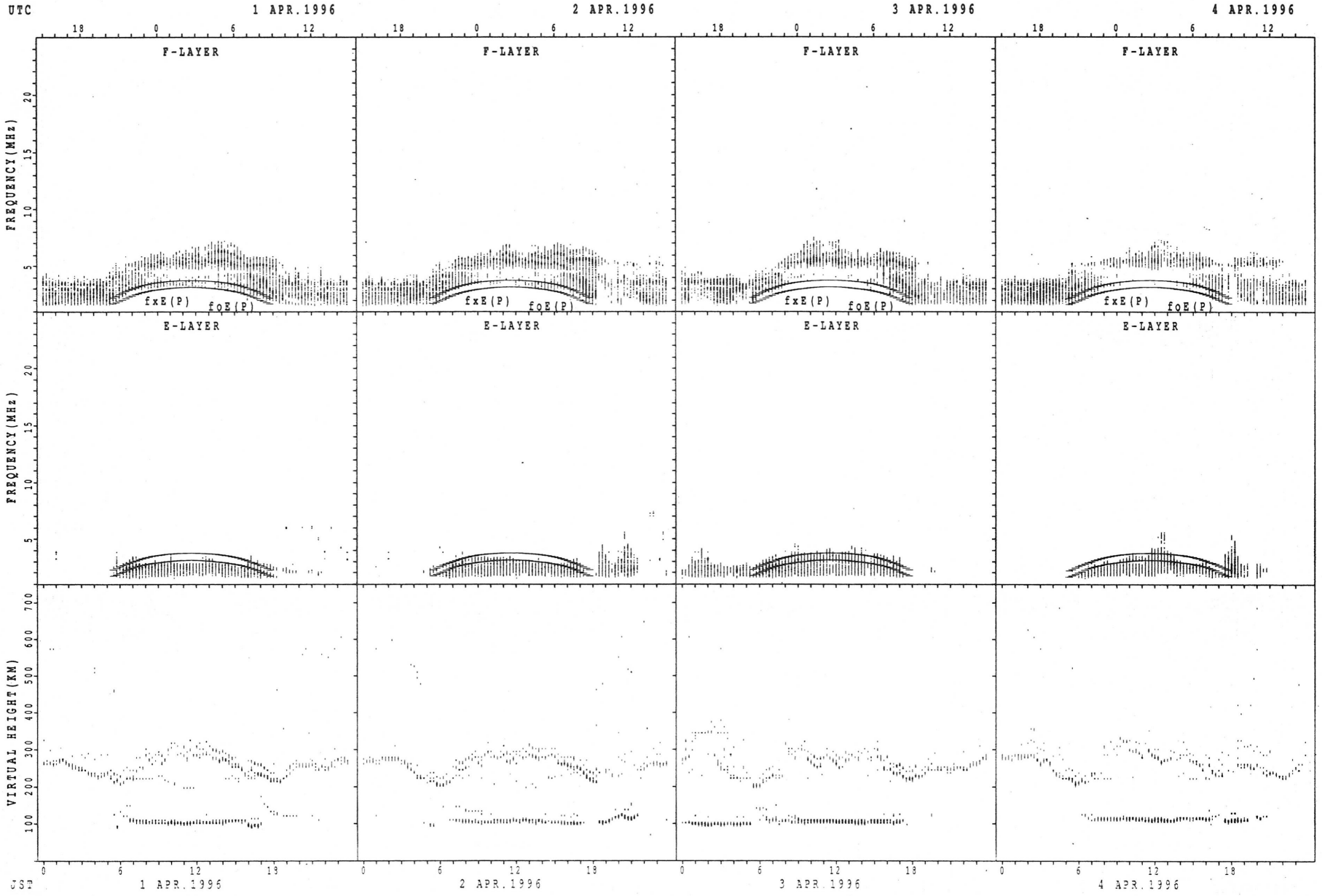
APR. 1996

LAT. 26.3N LON. 127.8E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

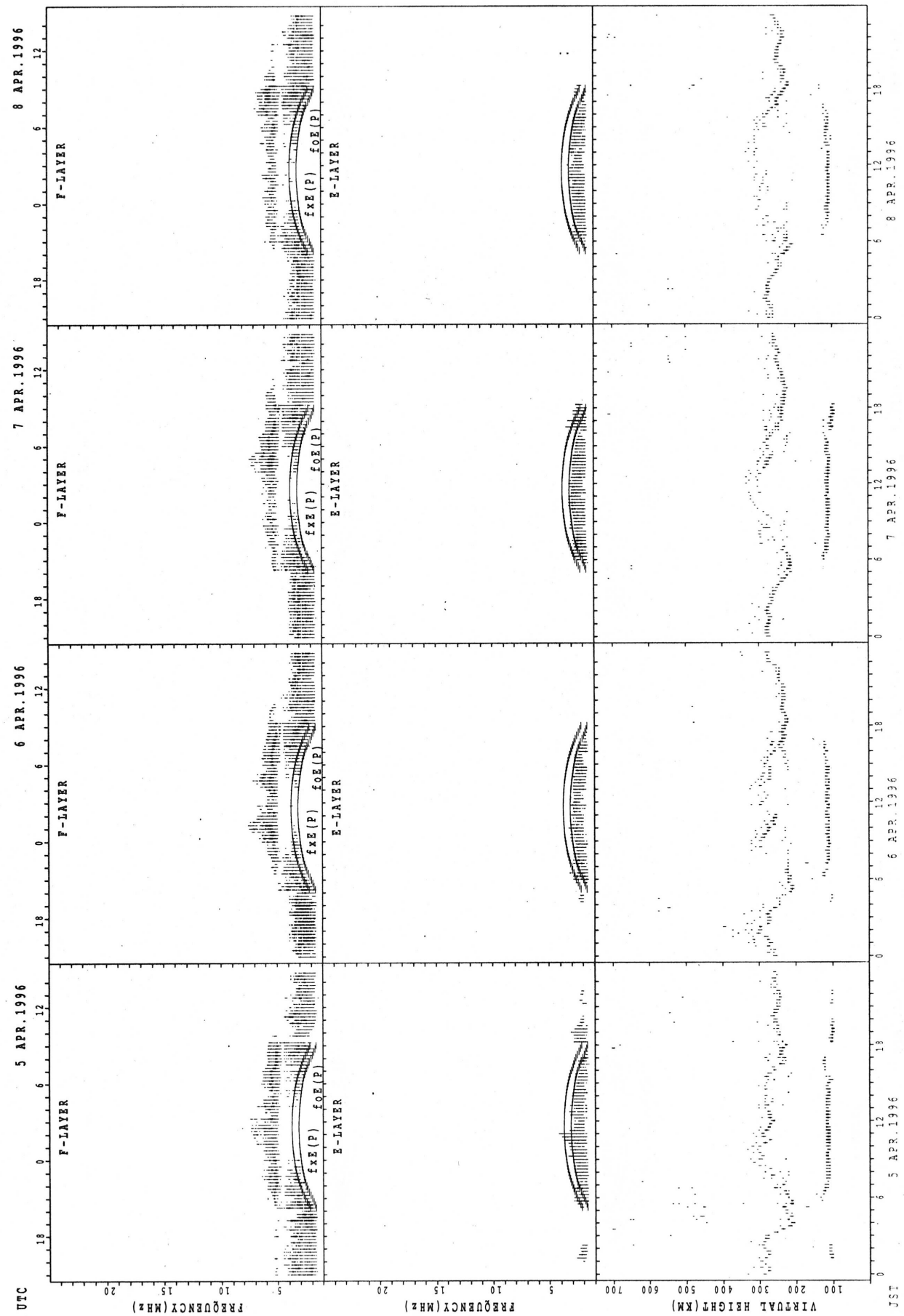
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	14	14	14	14	15	14	14	15	17	18	20	24	24	20	15	16	15	14	15	14	14	14
2		14	14	14	14	15	14	14	14	15	17	21	22	30	20	17	14	16	14	16	15	15	16	15
3	B	15	15	15	14	B	18	15	14	15	18	24	26	24	23		15	14	24	14	14	B	B	
4	14	14	14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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

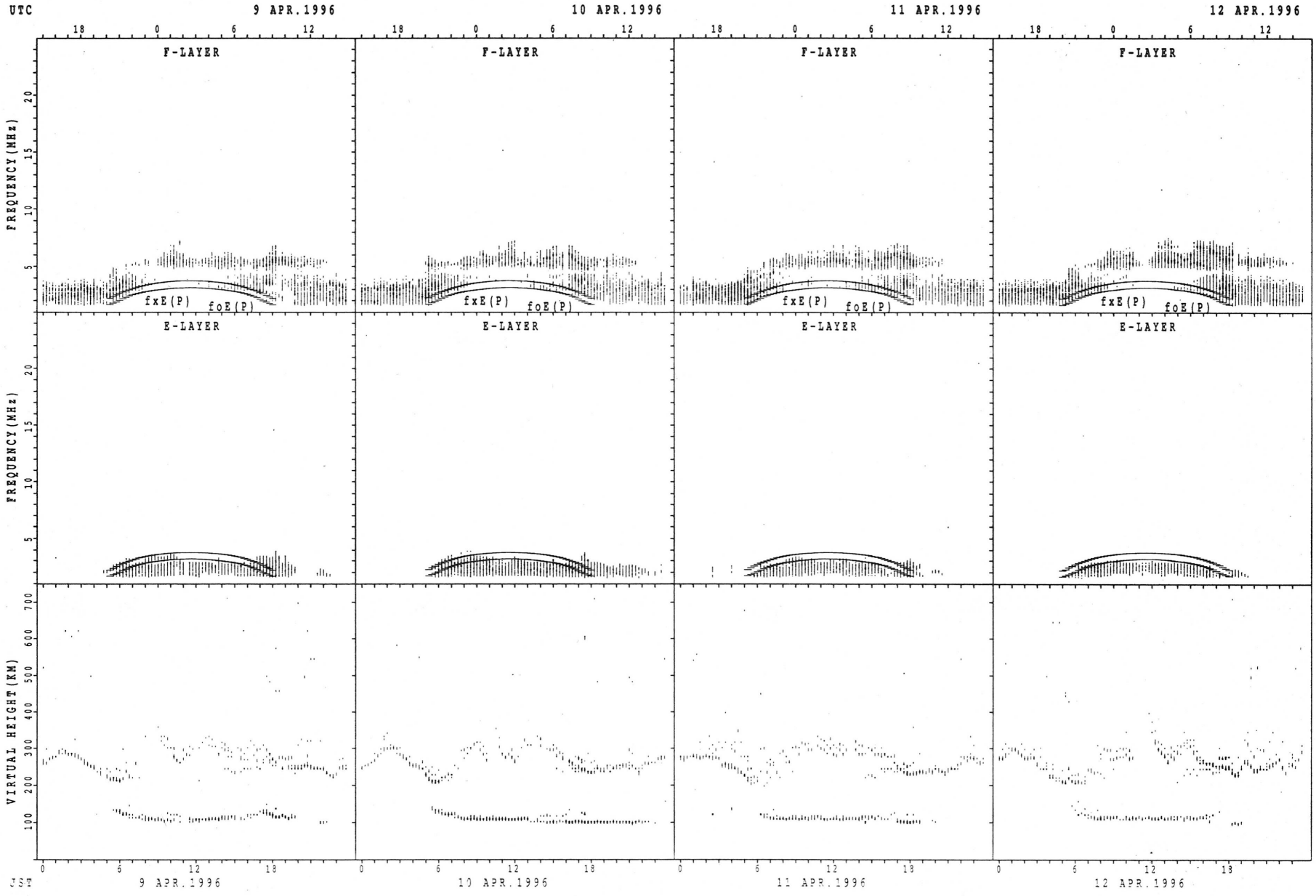
SUMMARY PLOTS AT WAKKANAI



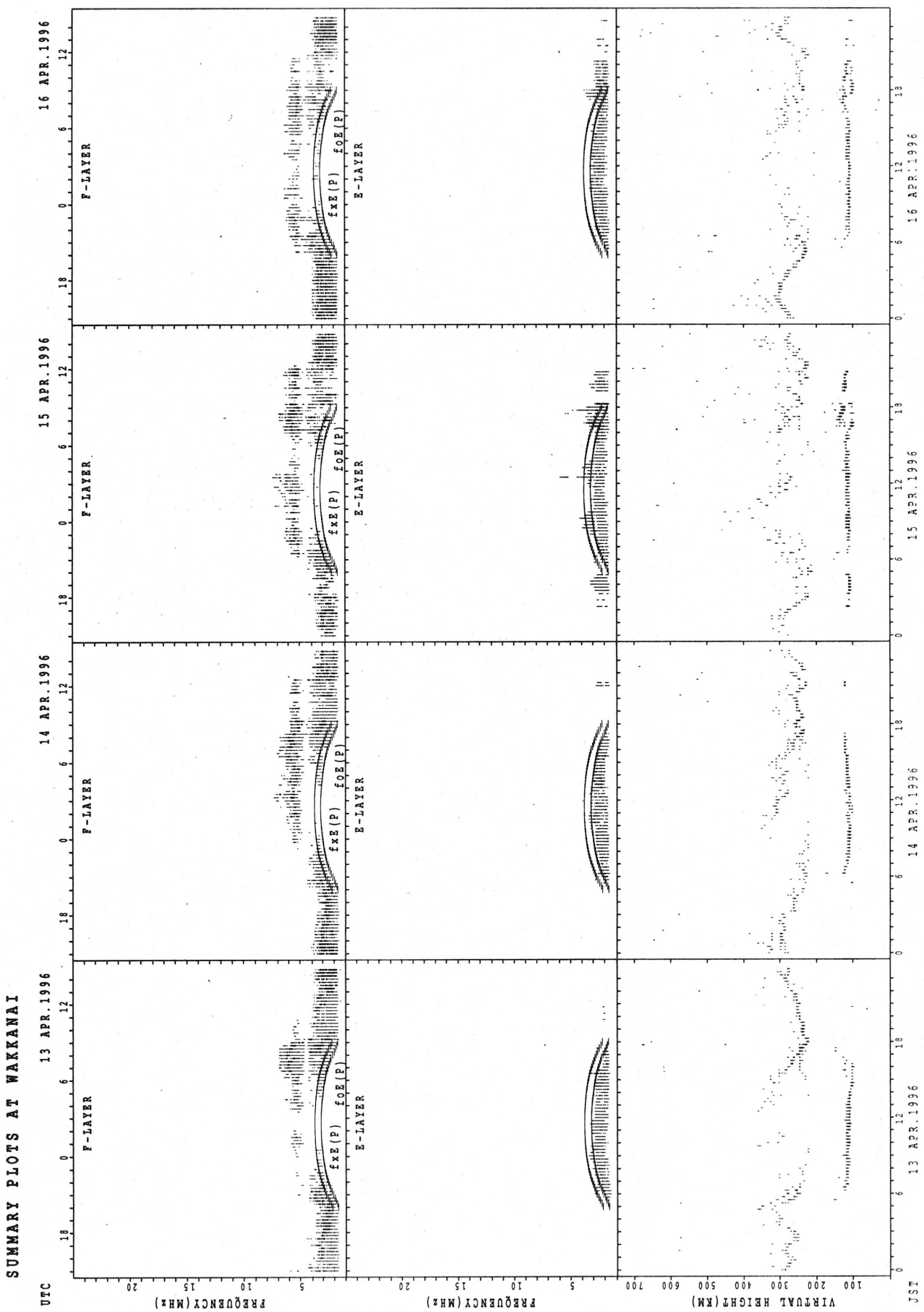
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
5 APR.1996
6 APR.1996
7 APR.1996
8 APR.1996
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

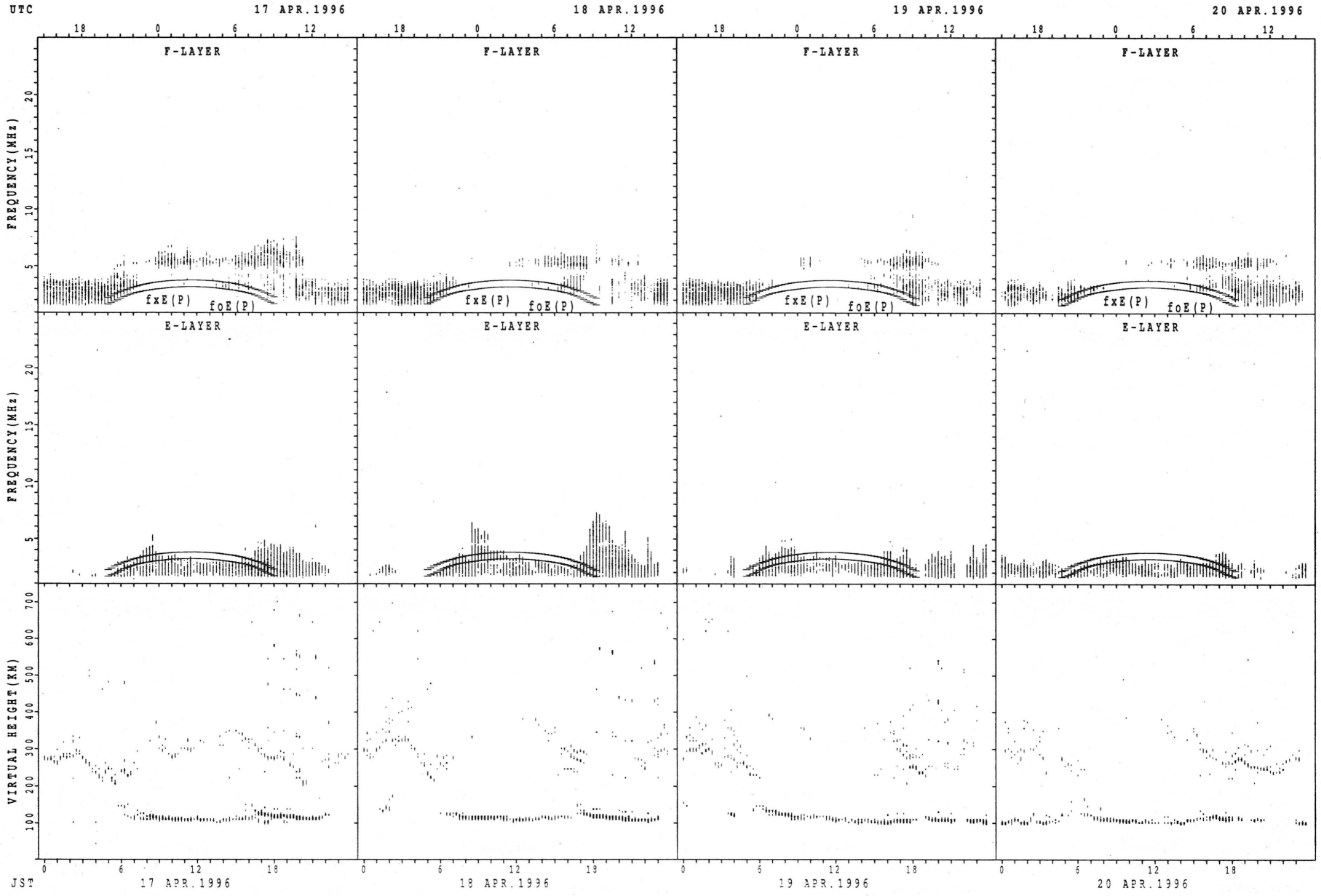
SUMMARY PLOTS AT WAKKANAI



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

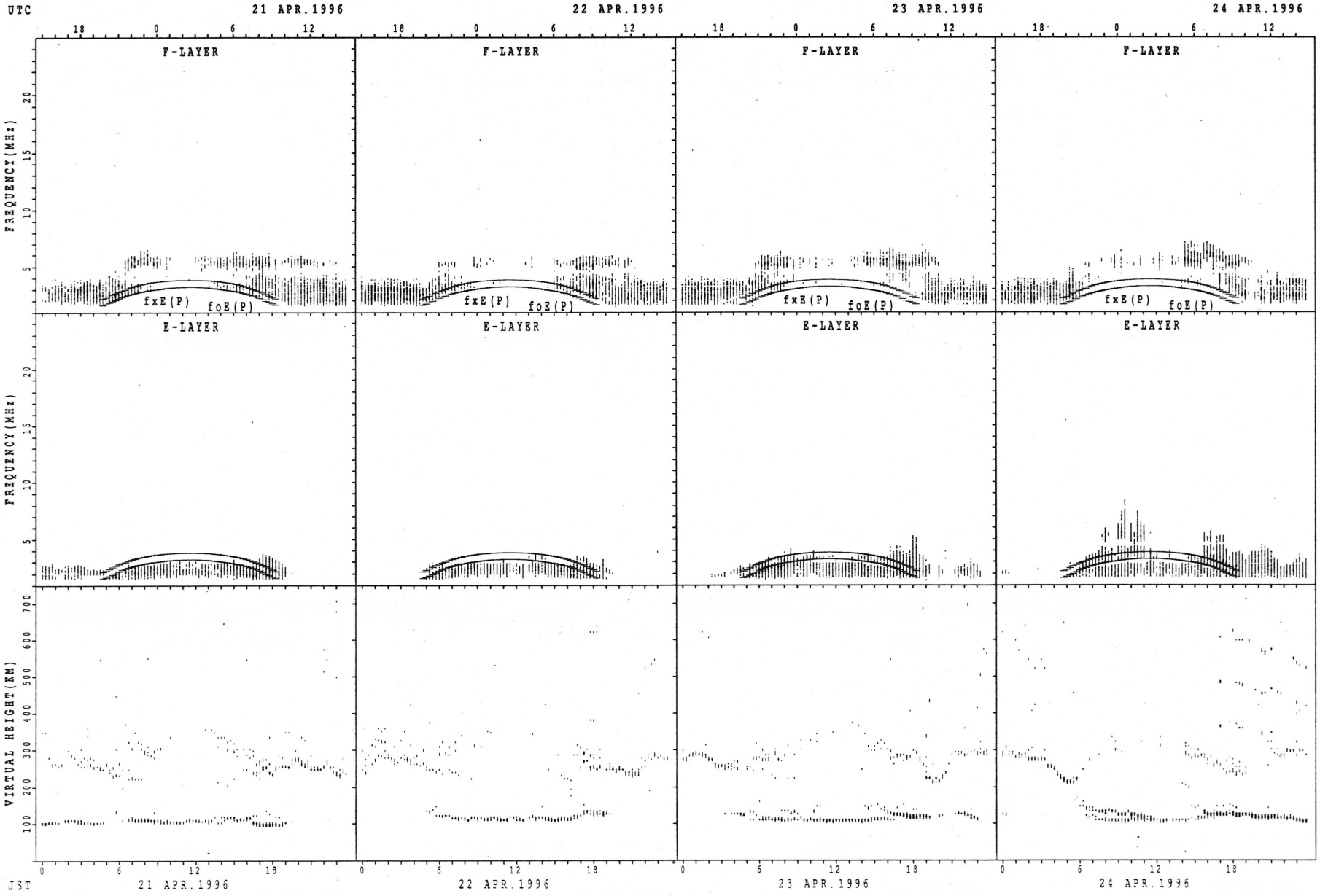

SUMMARY PLOTS AT WAKKANAI
UTC
JST
13 APR.1996
14 APR.1996
15 APR.1996
16 APR.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



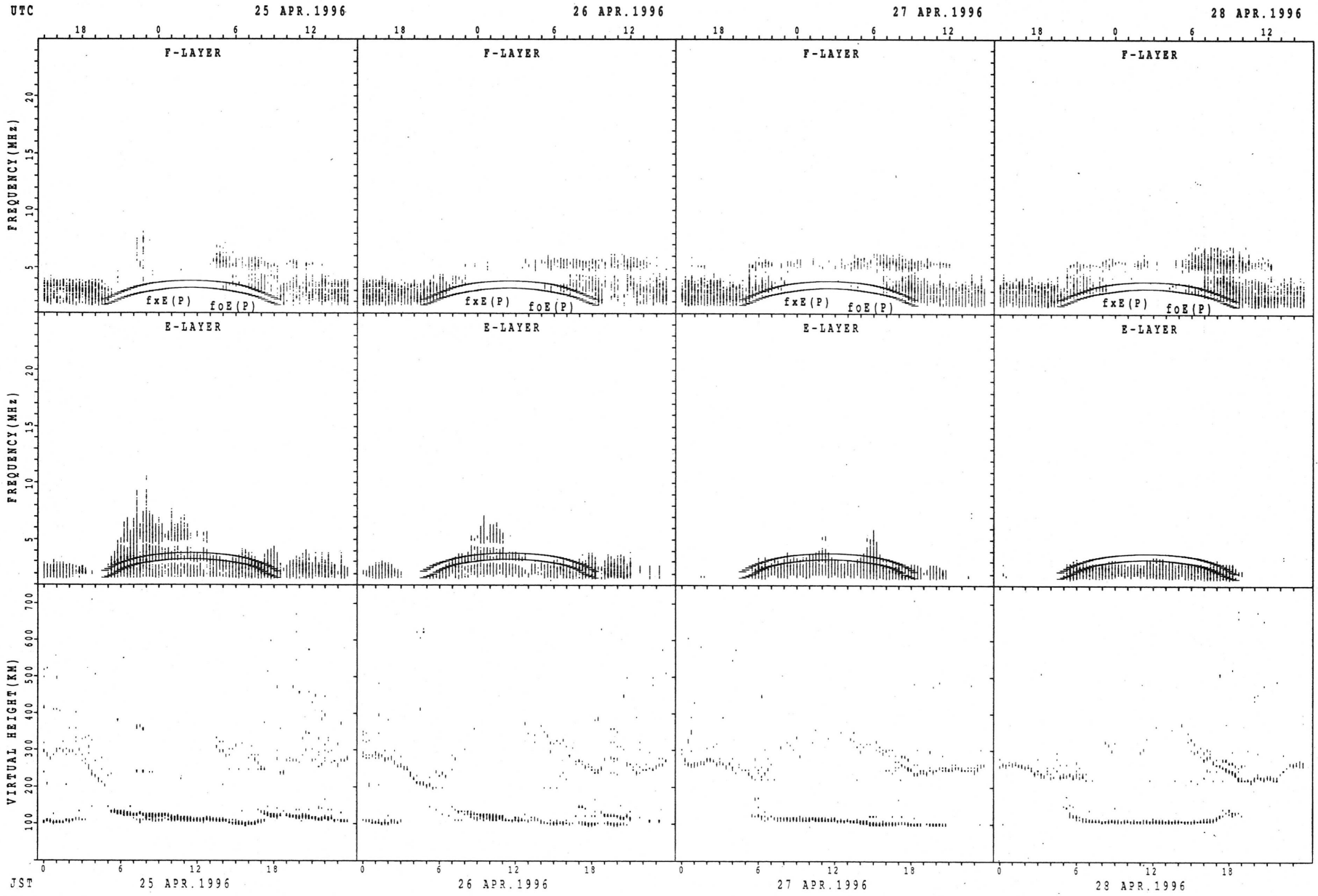
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



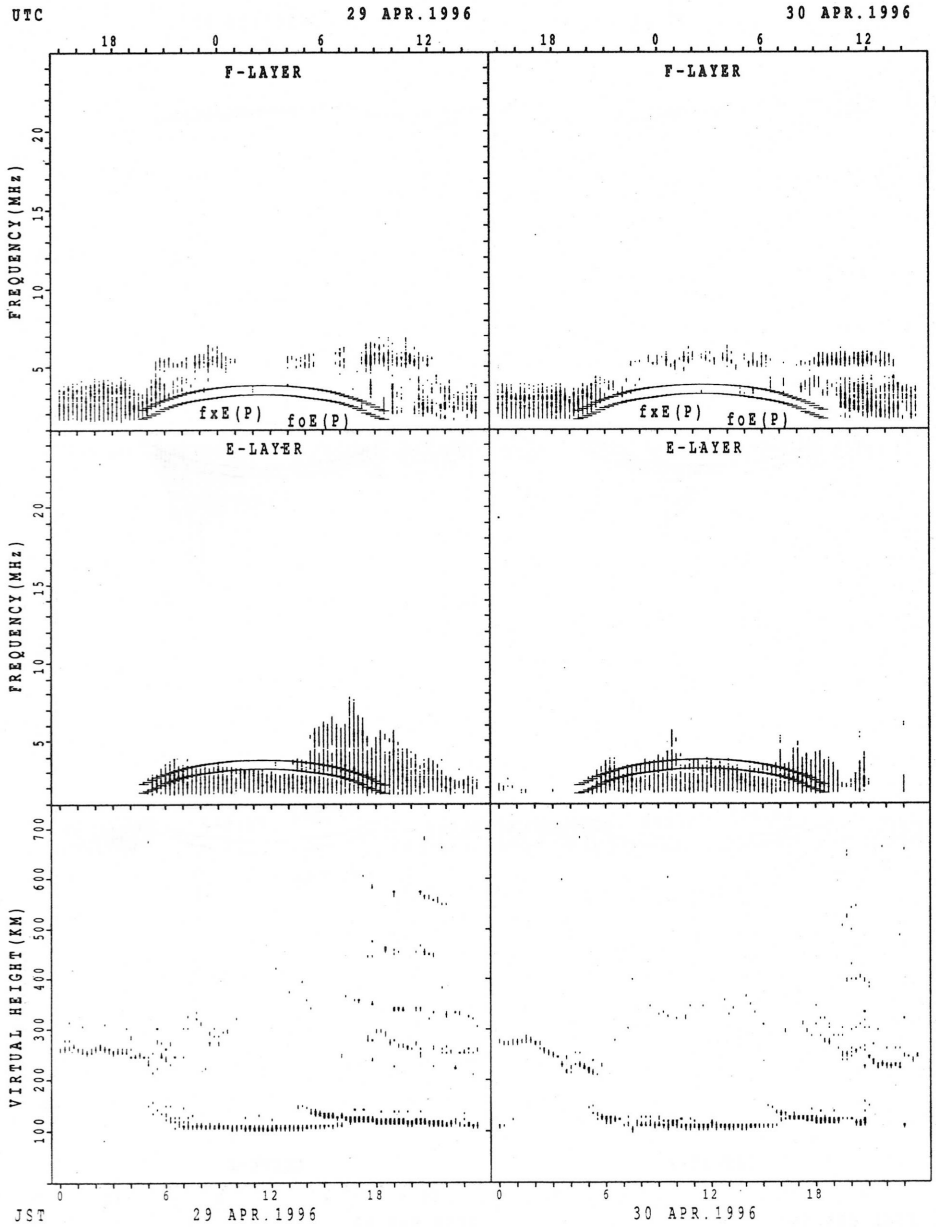
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



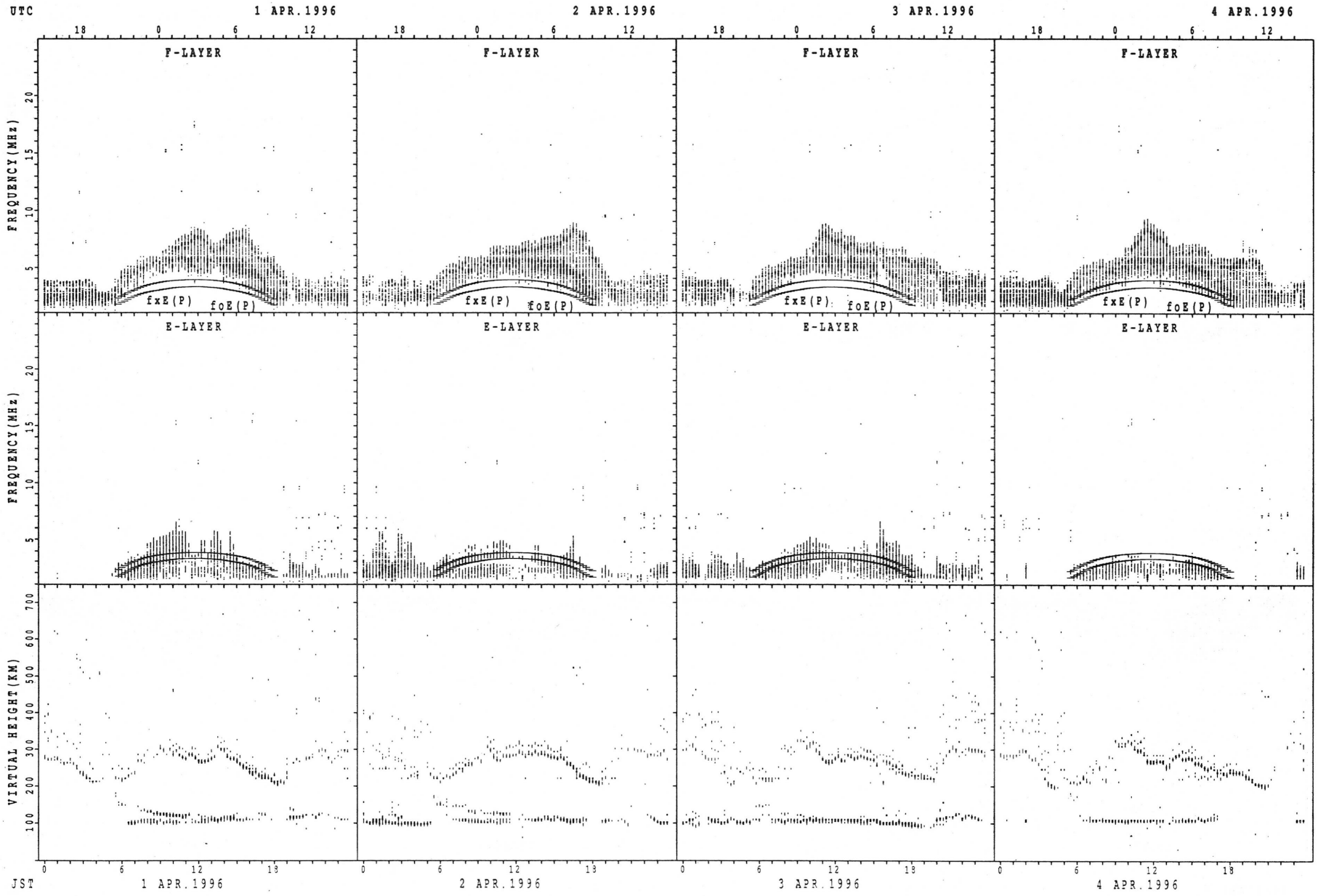
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



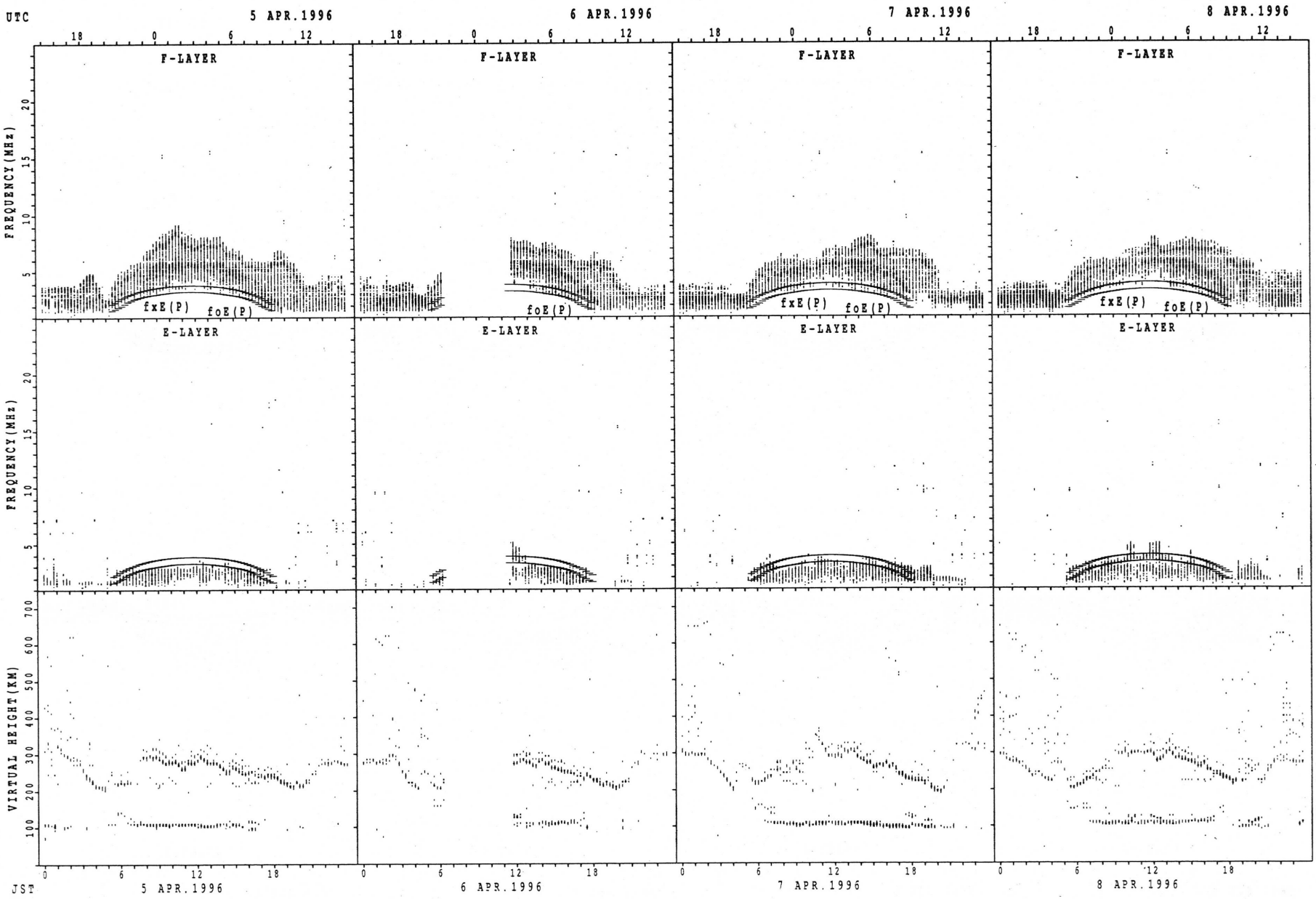
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



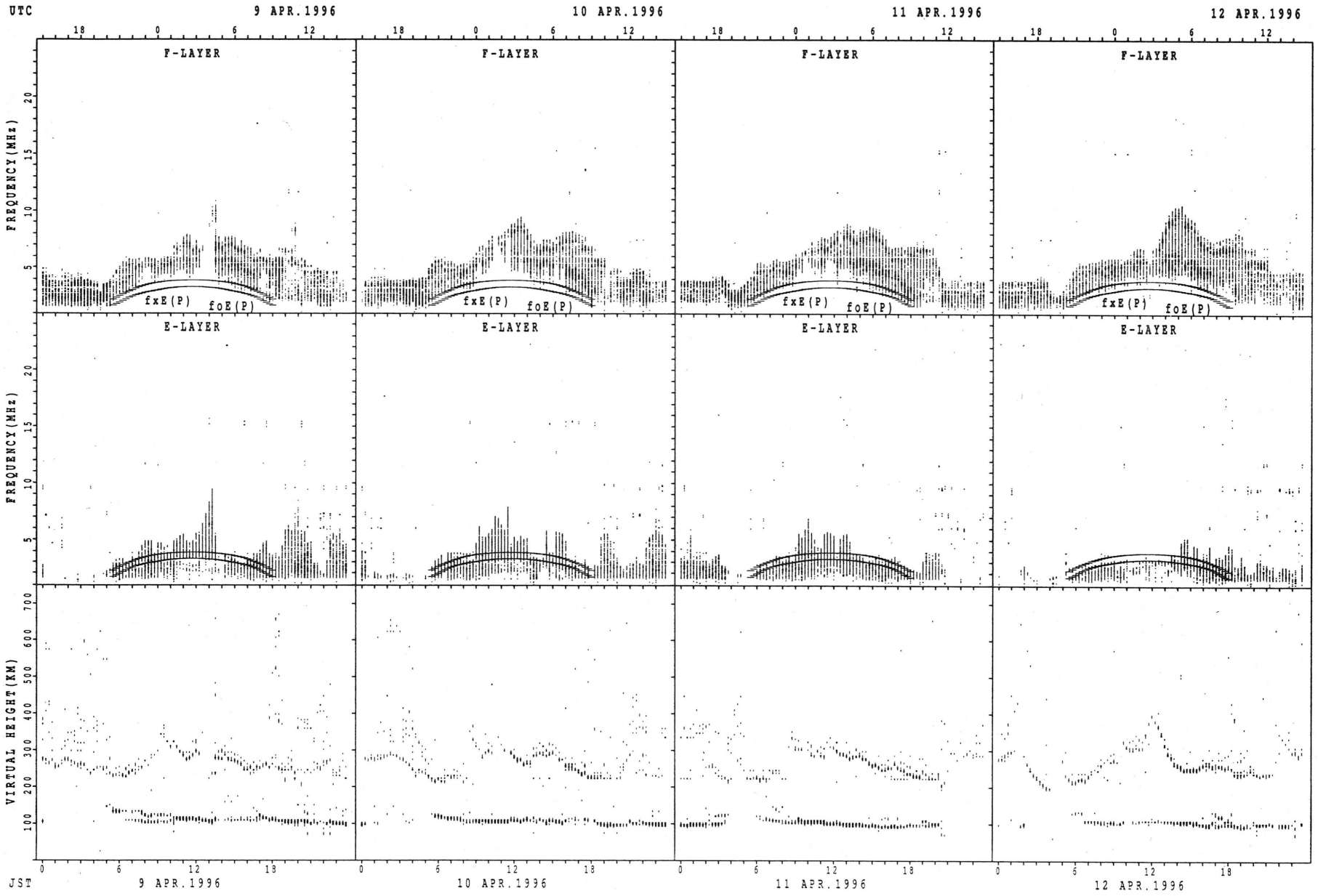
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

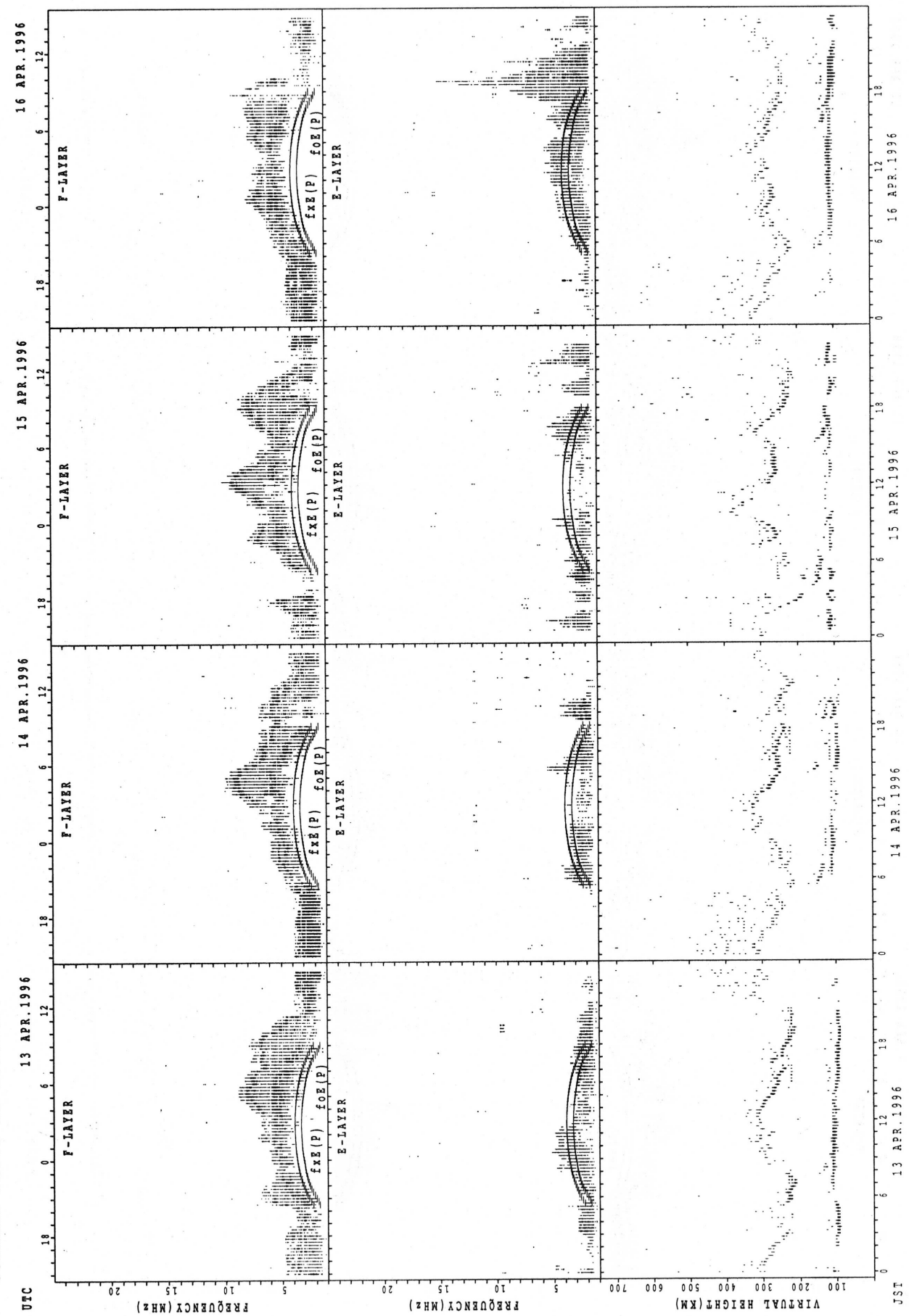


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

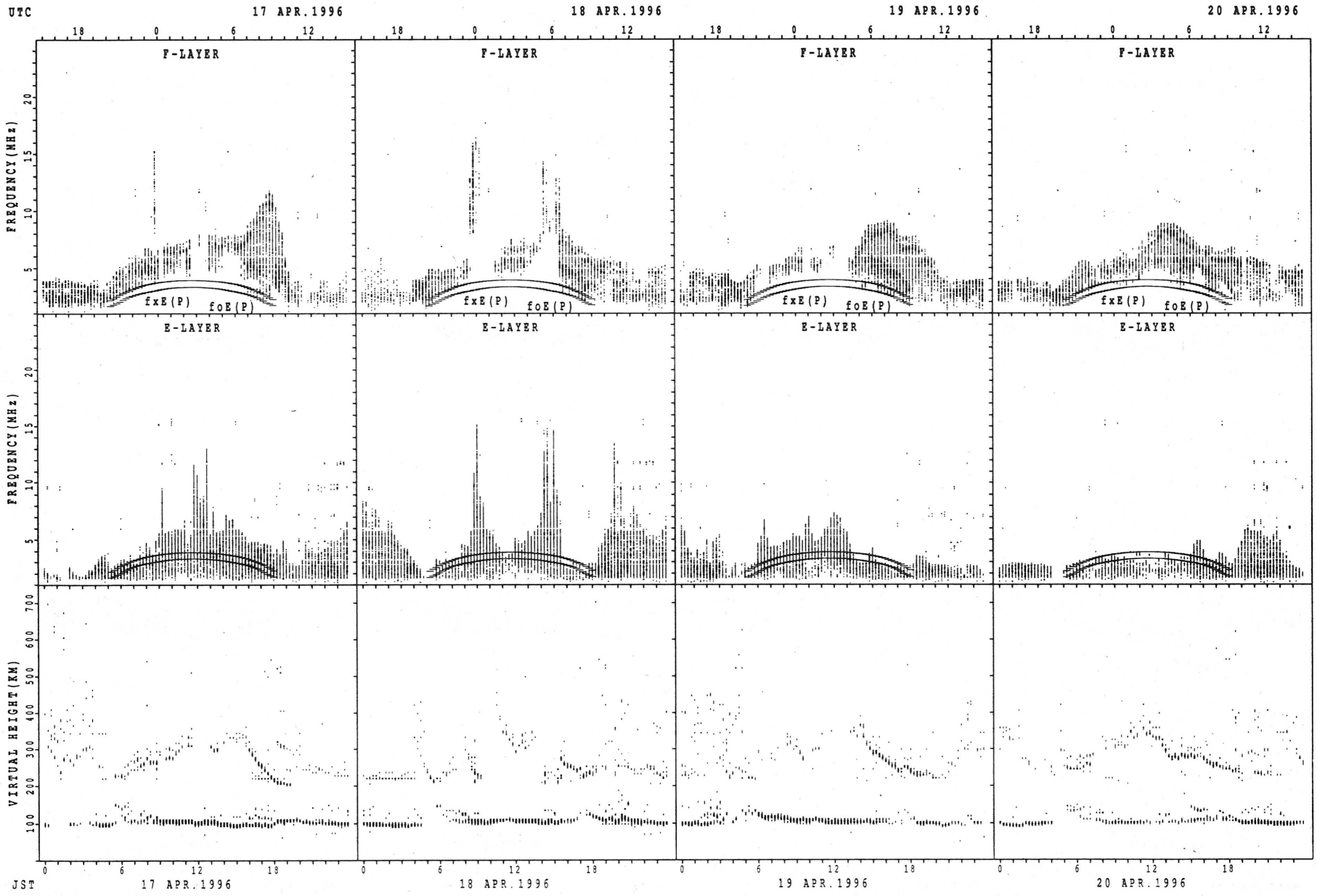
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

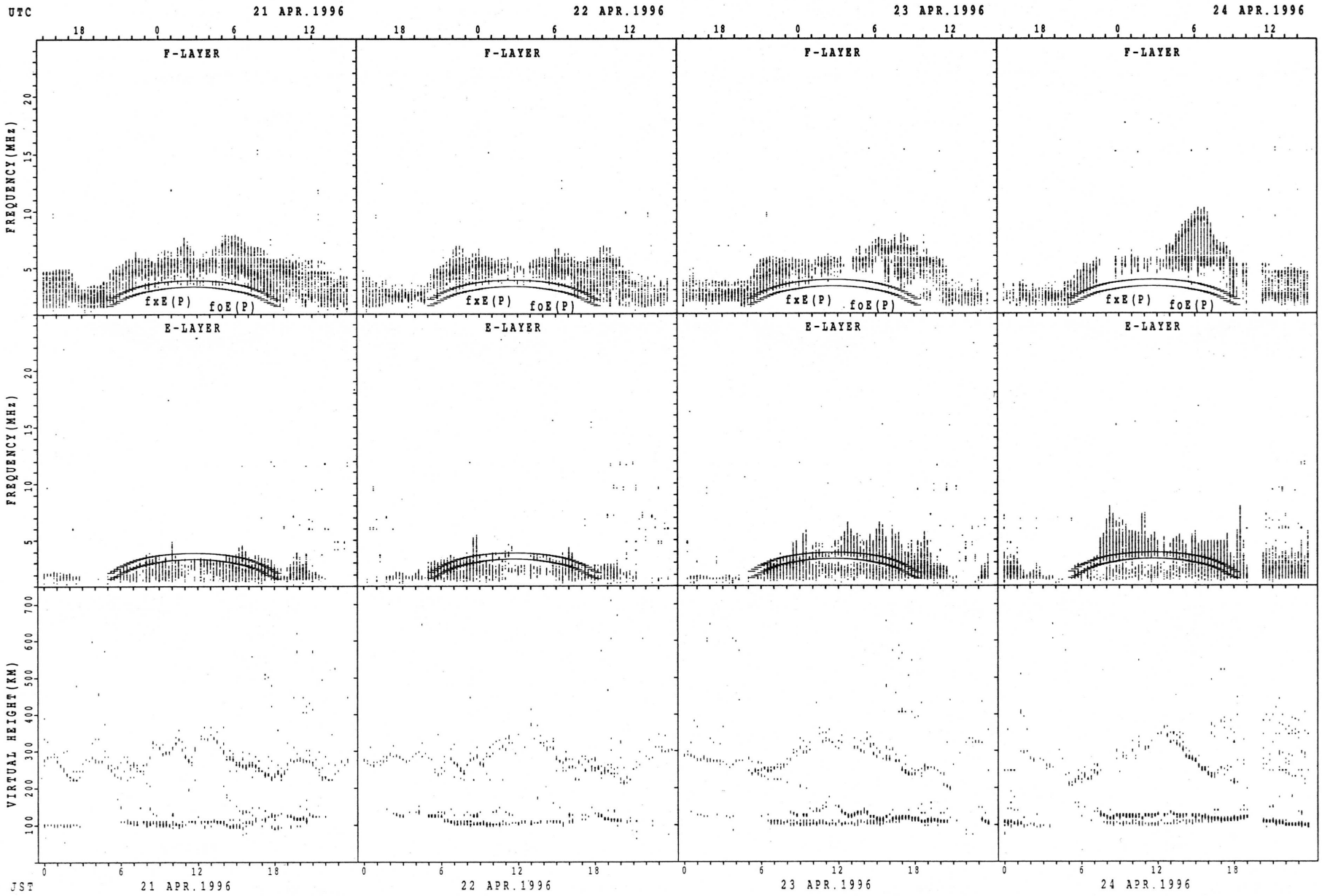

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
13 APR.1996
14 APR.1996
15 APR.1996
16 APR.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



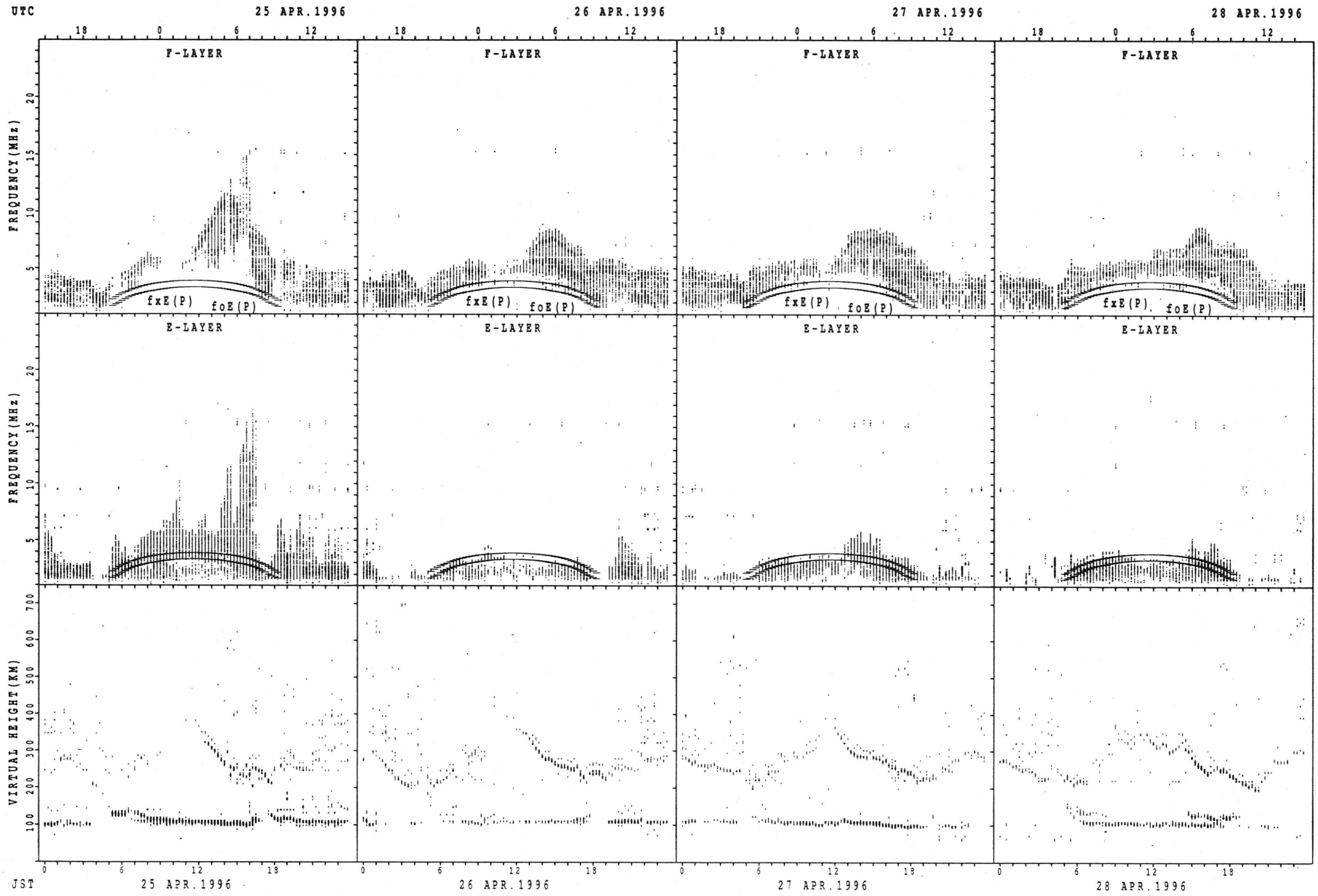
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



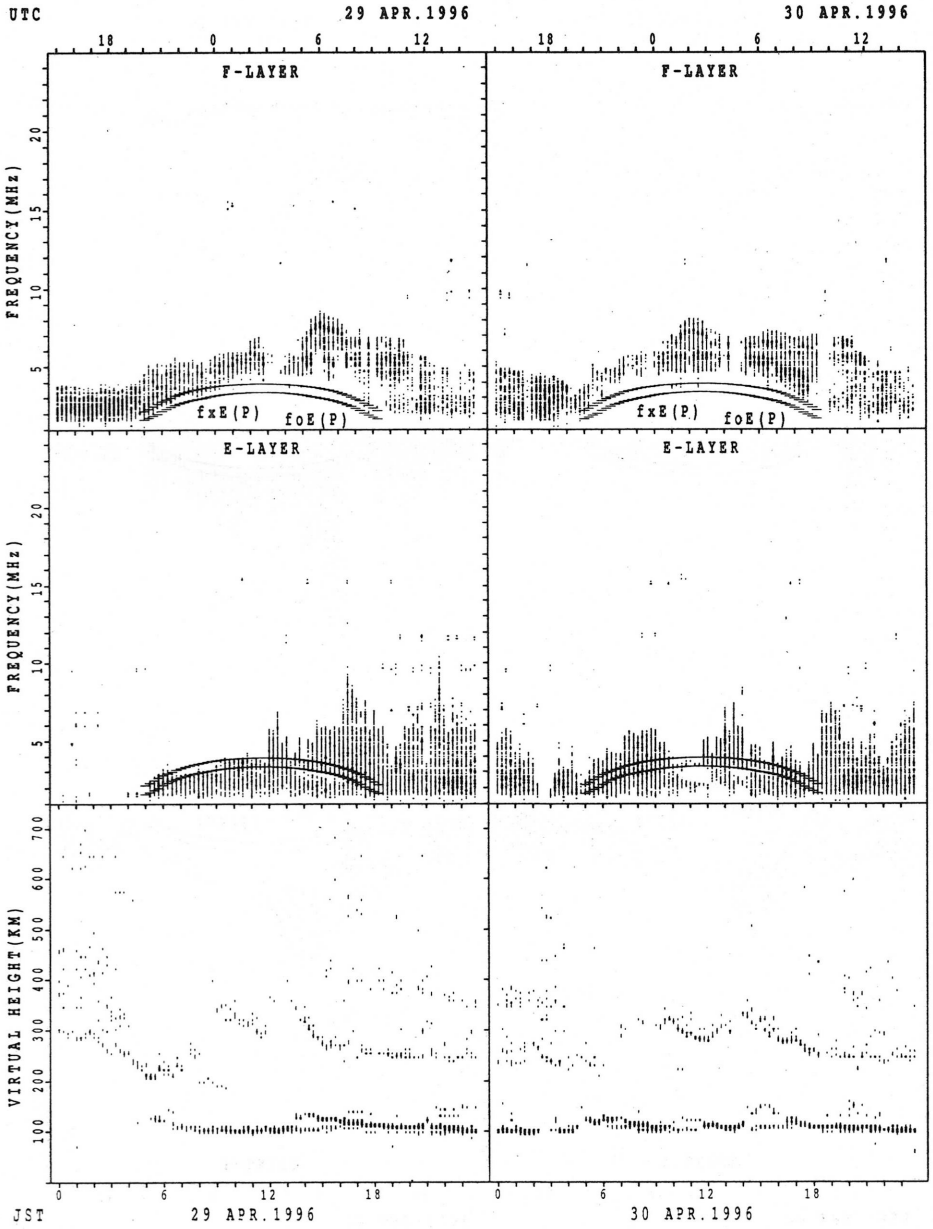
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



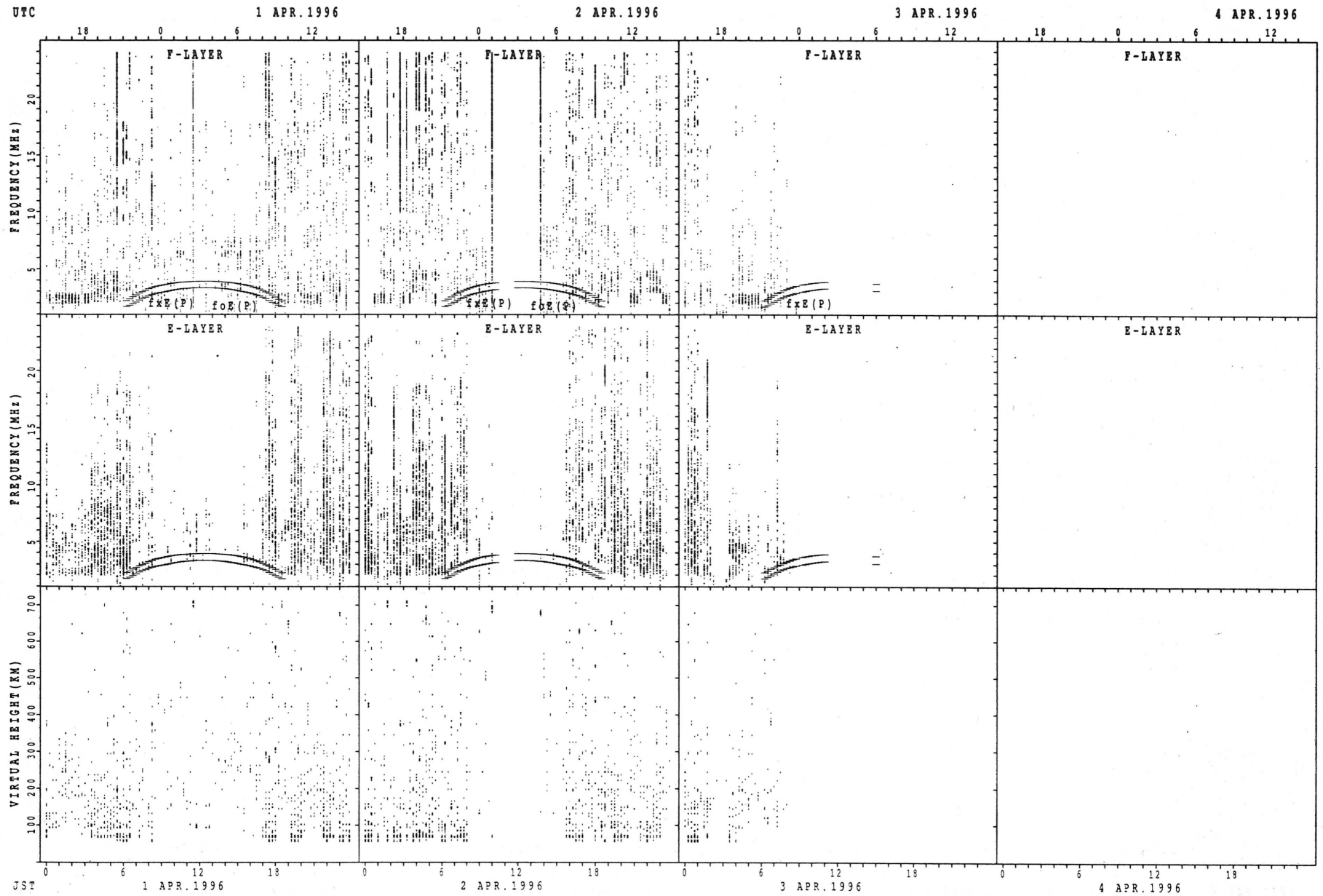
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



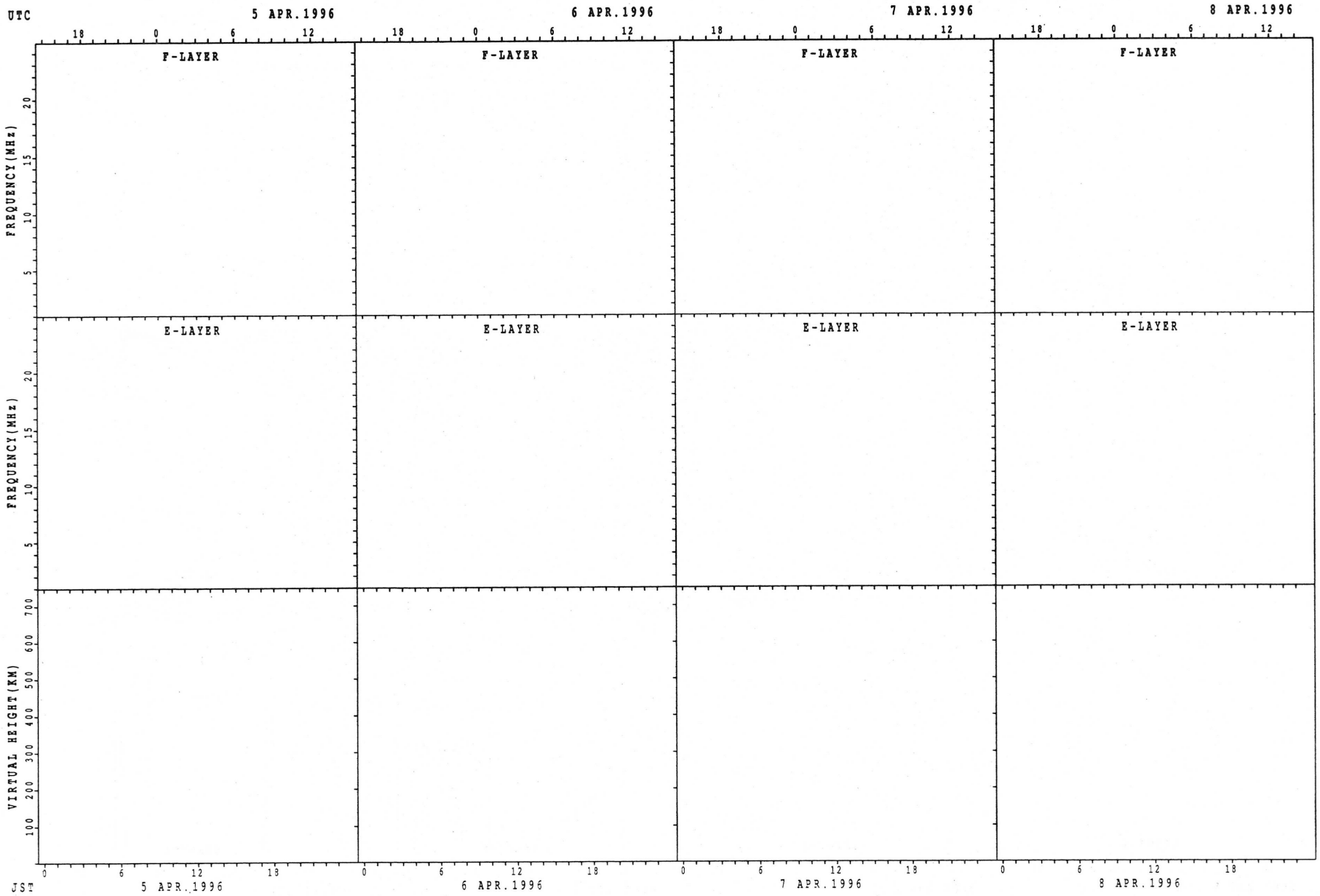
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



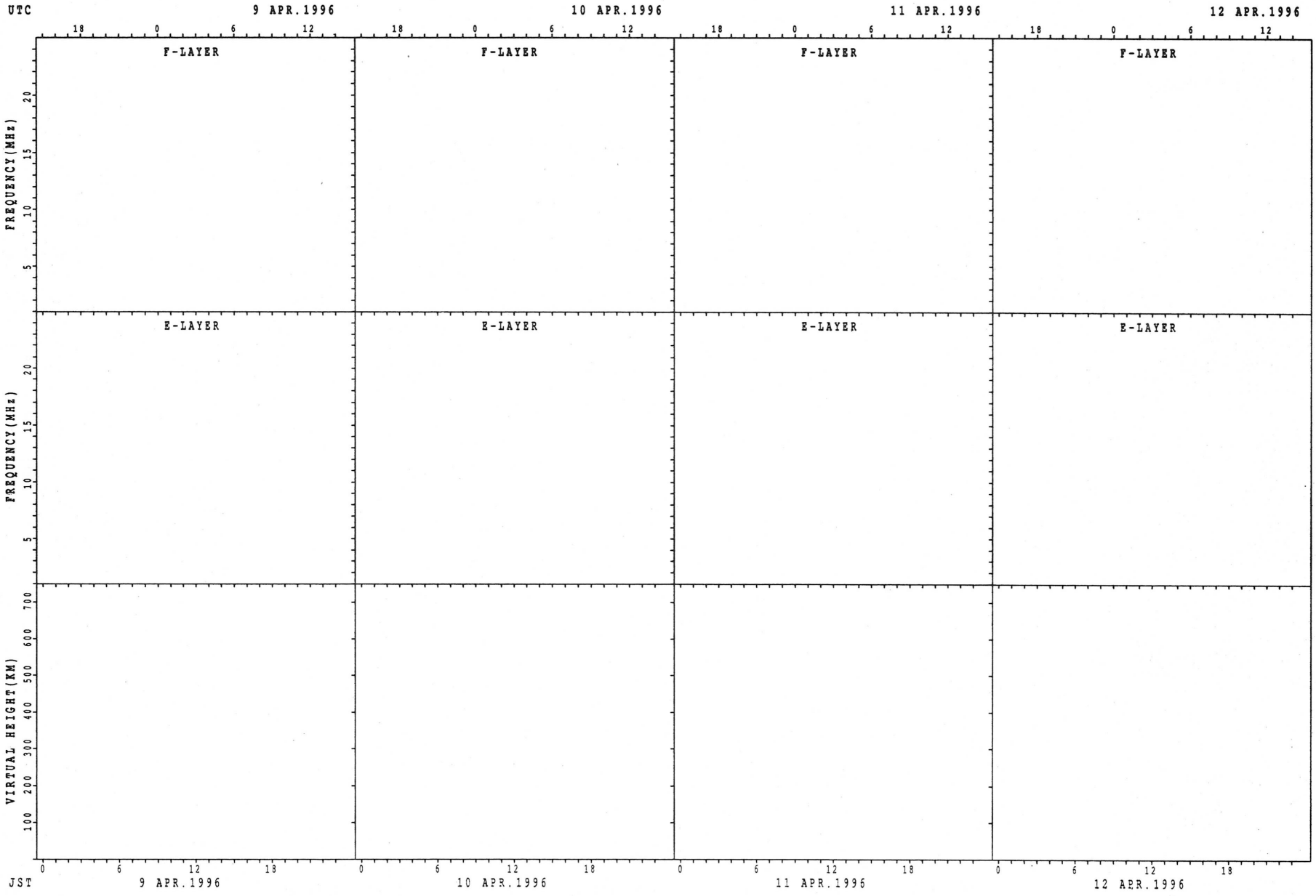
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

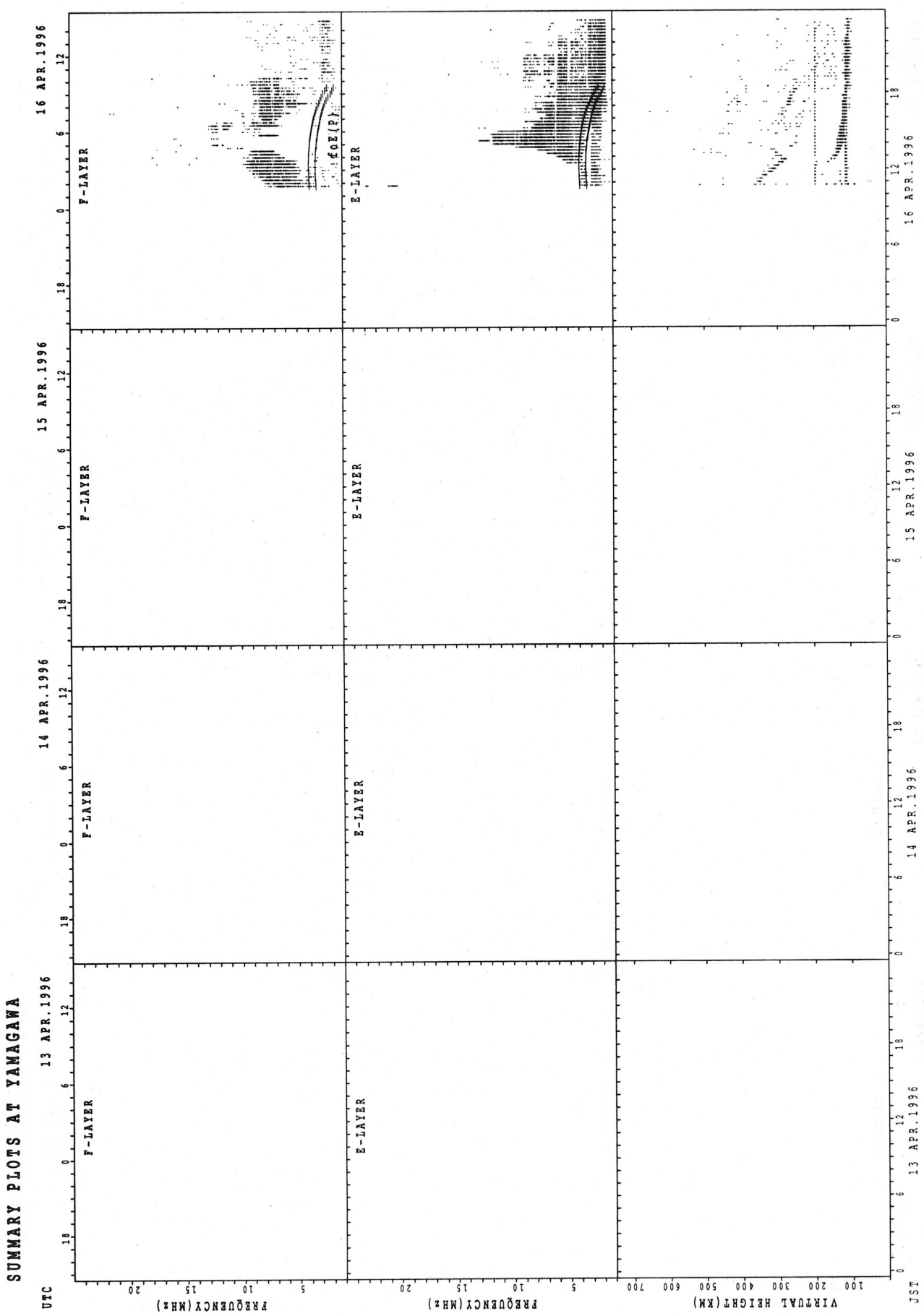


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

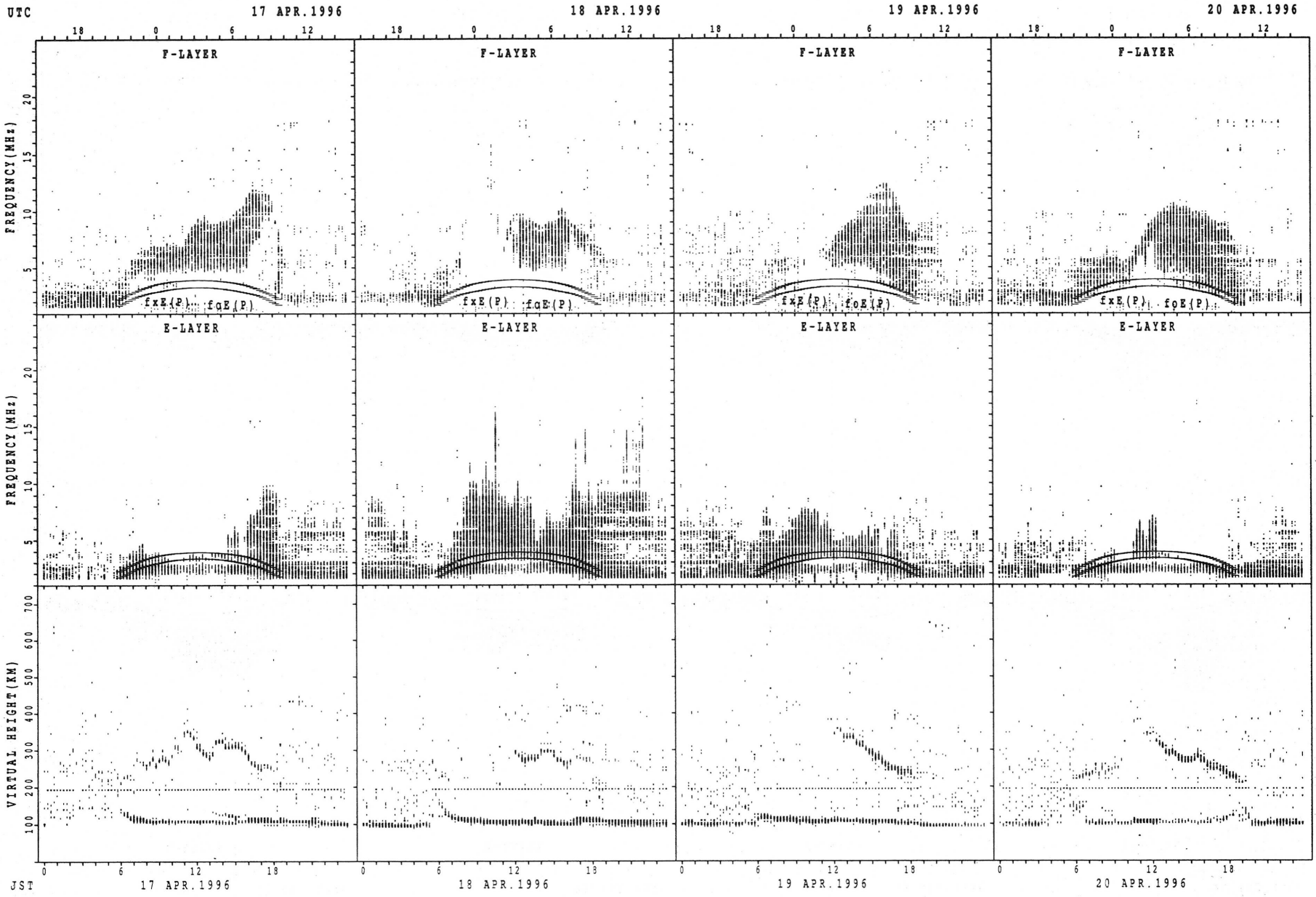
SUMMARY PLOTS AT YAMAGAWA

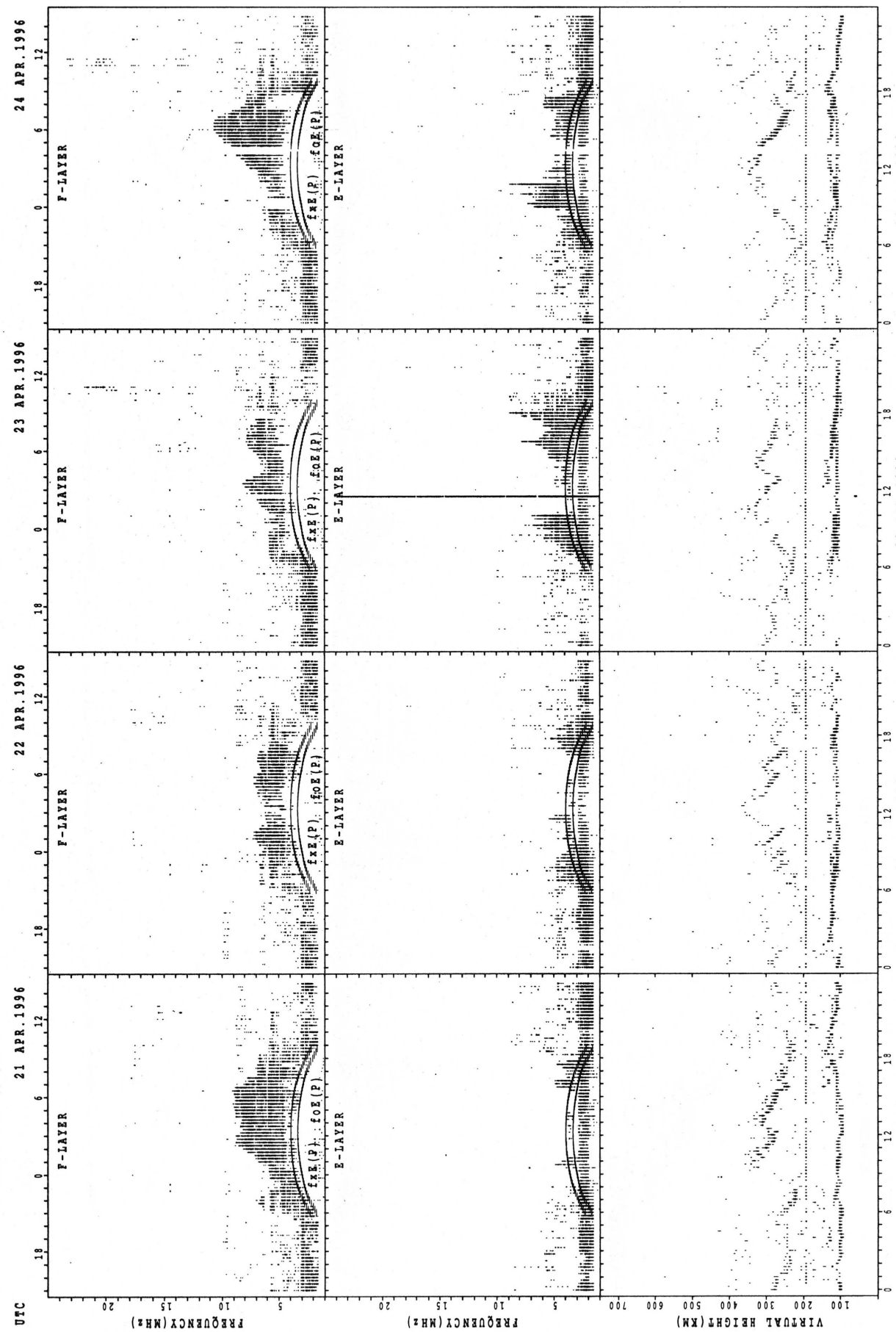


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

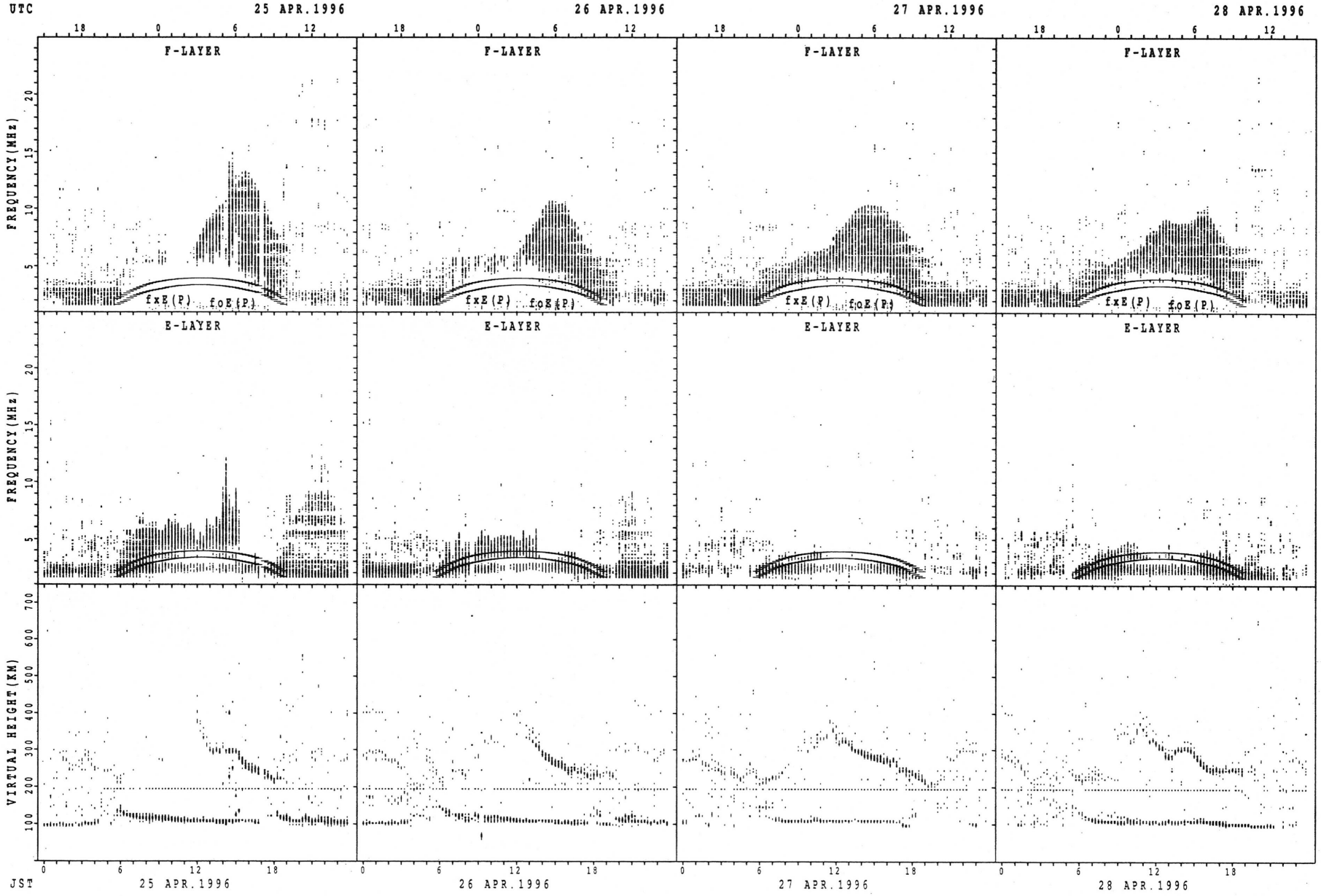

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
13 APR.1996
14 APR.1996
15 APR.1996
16 APR.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



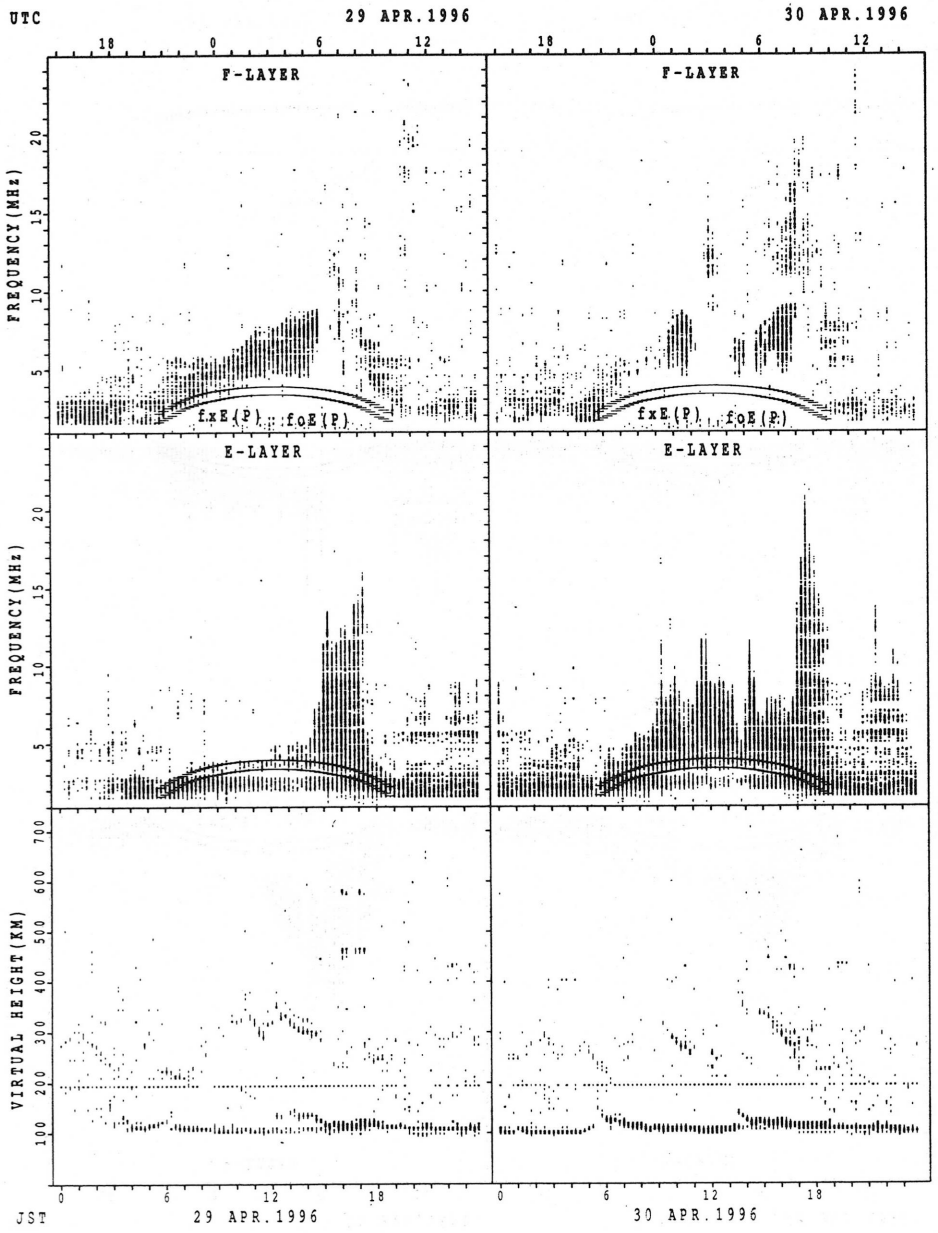

SUMMARY PLOTS AT YAMAGAWA
UTC
21 APR.1996
22 APR.1996
23 APR.1996
24 APR.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P), foE(P)
JST
21 APR.1996
22 APR.1996
23 APR.1996
24 APR.1996
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



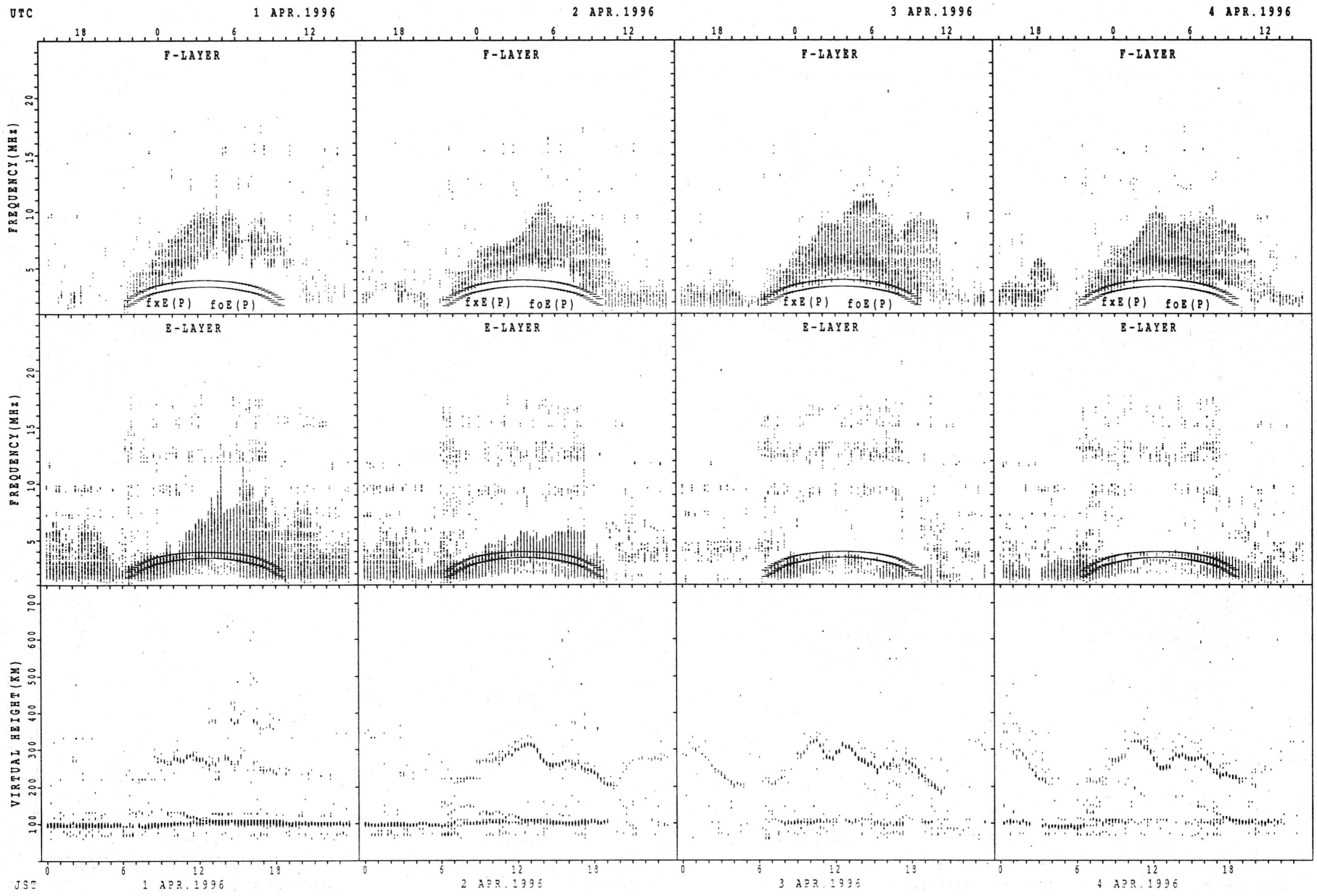
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



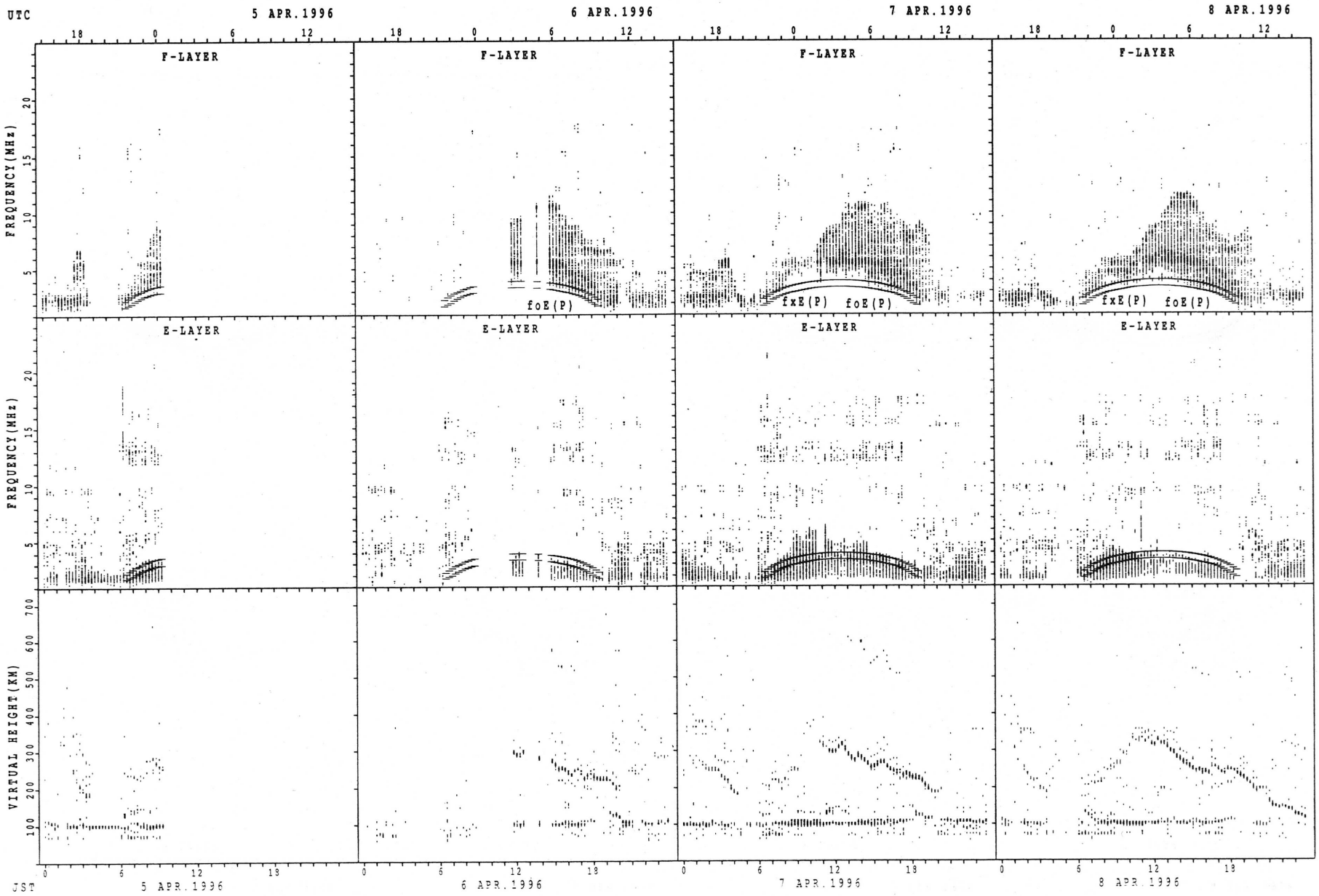
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA

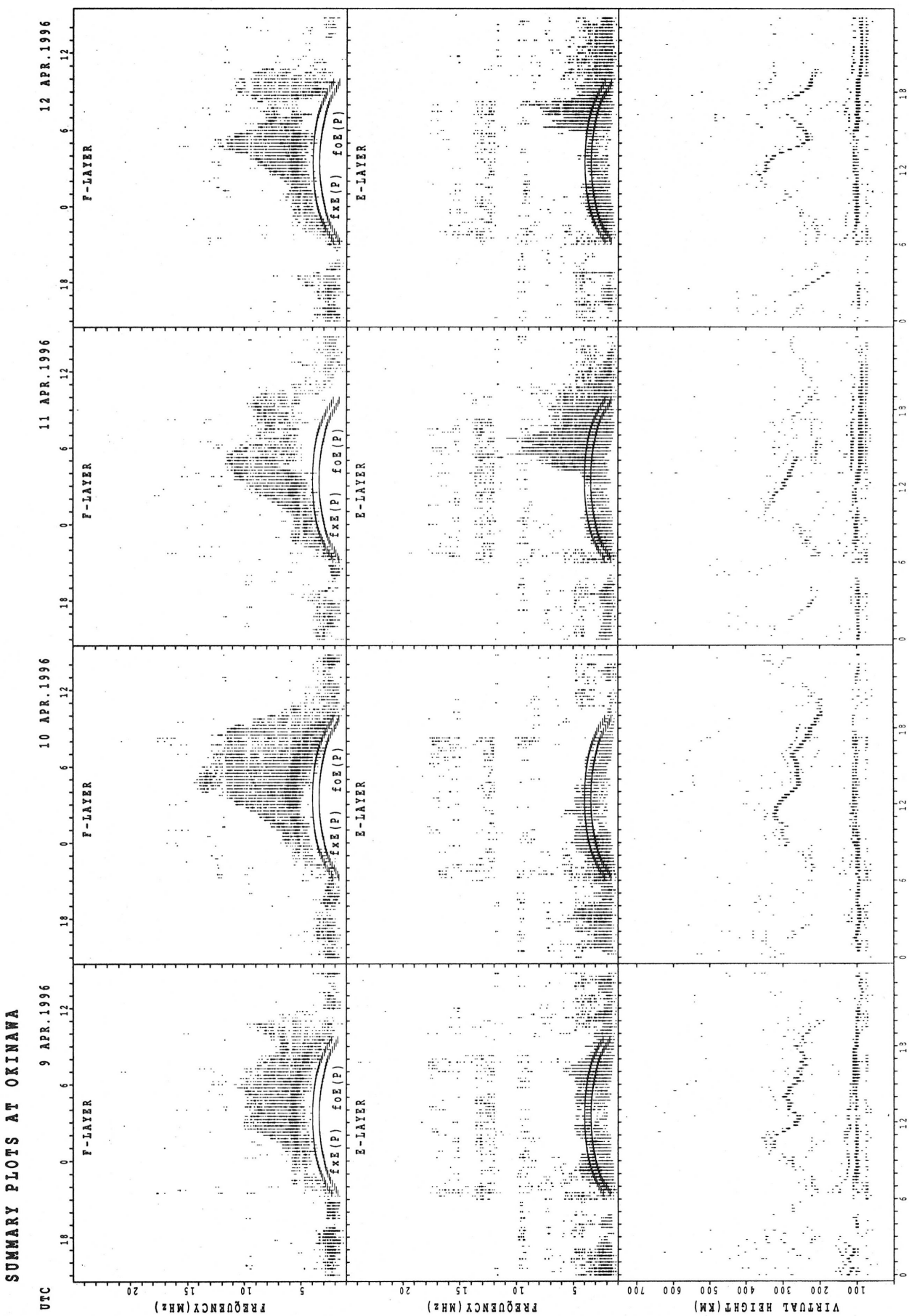


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

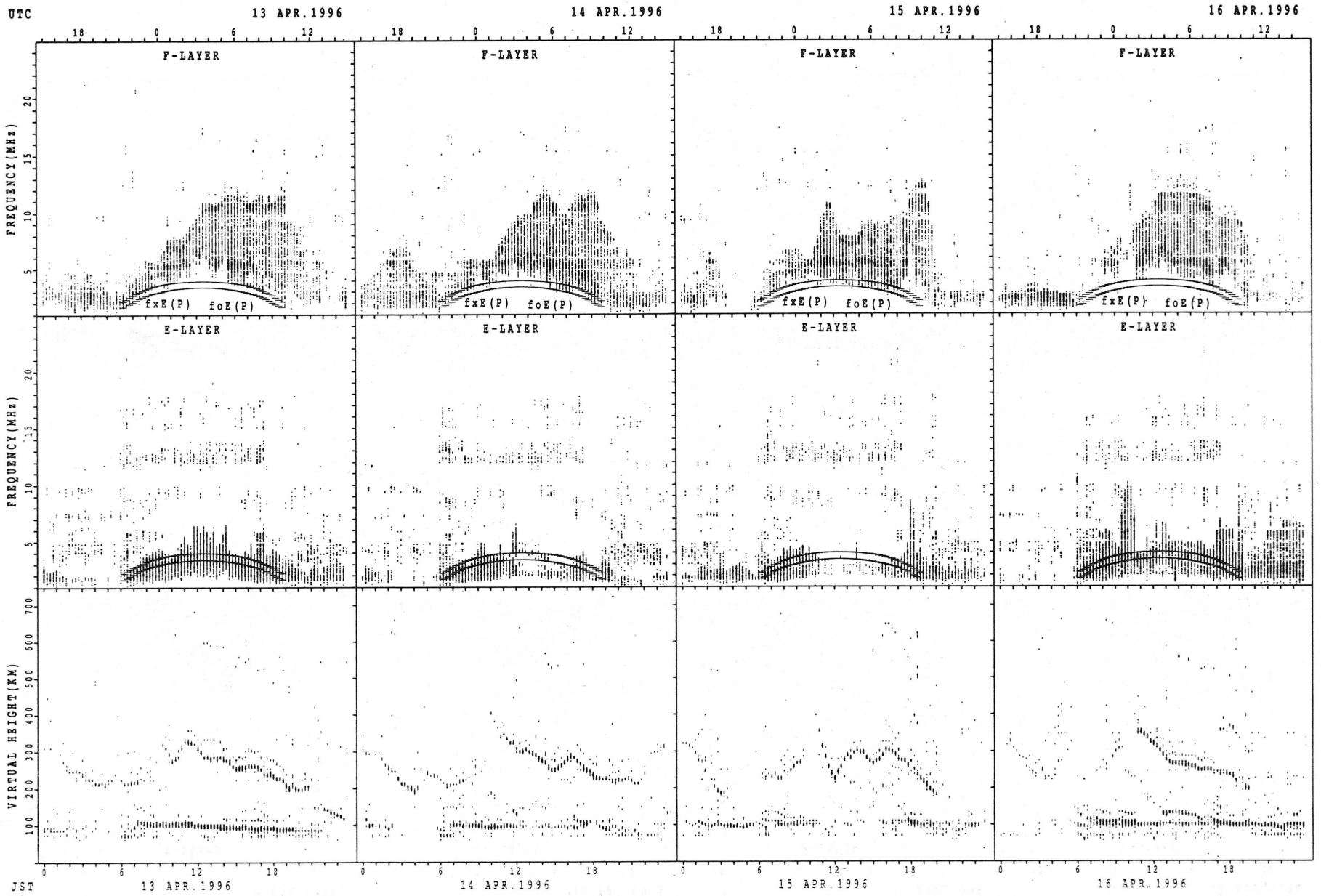
SUMMARY PLOTS AT OKINAWA



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

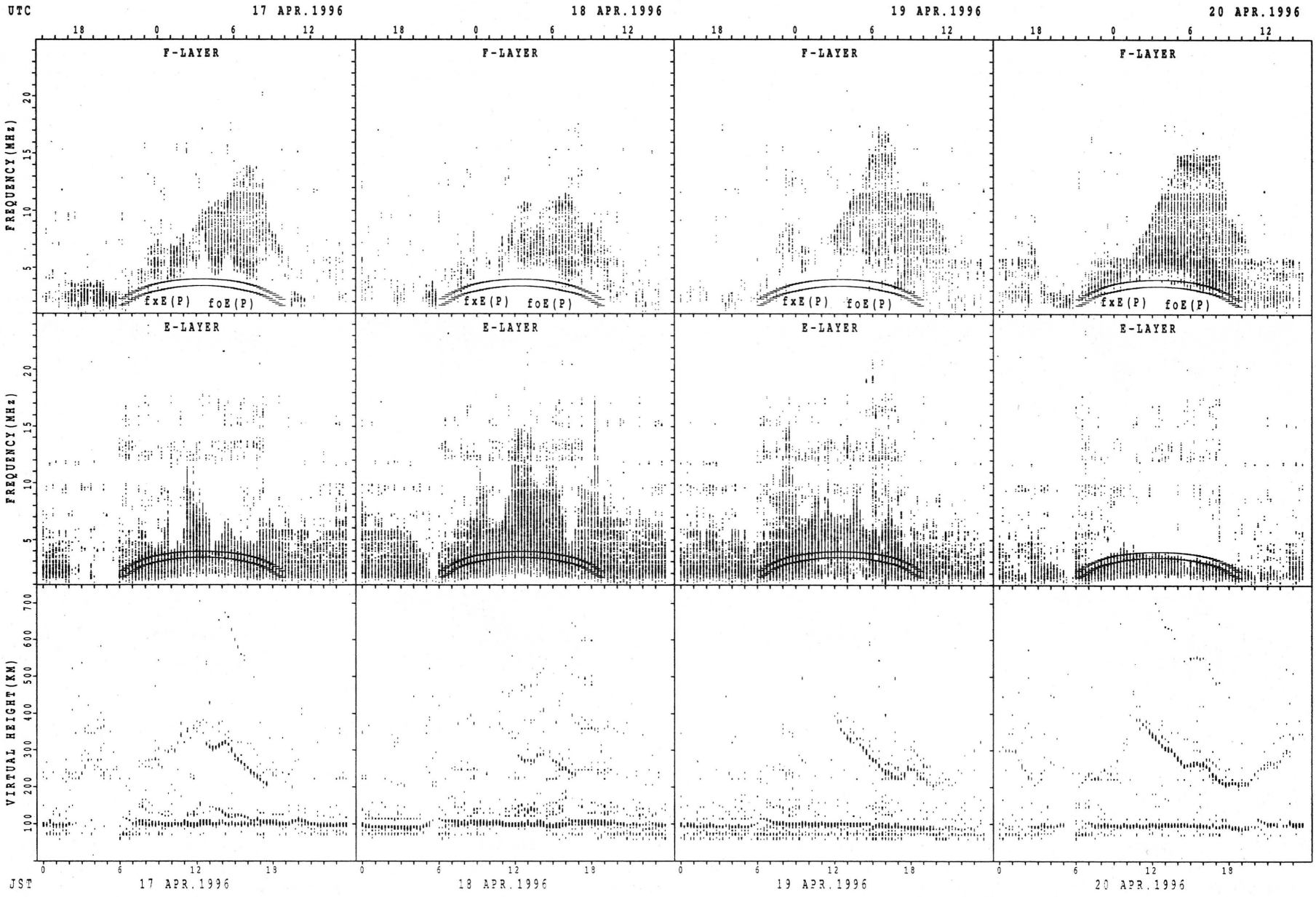

SUMMARY PLOTS AT OKINAWA
UTC
JST
9 APR.1996
10 APR.1996
11 APR.1996
12 APR.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE BY PREDICTED VALUE FOR FXE
foE BY PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT OKINAWA

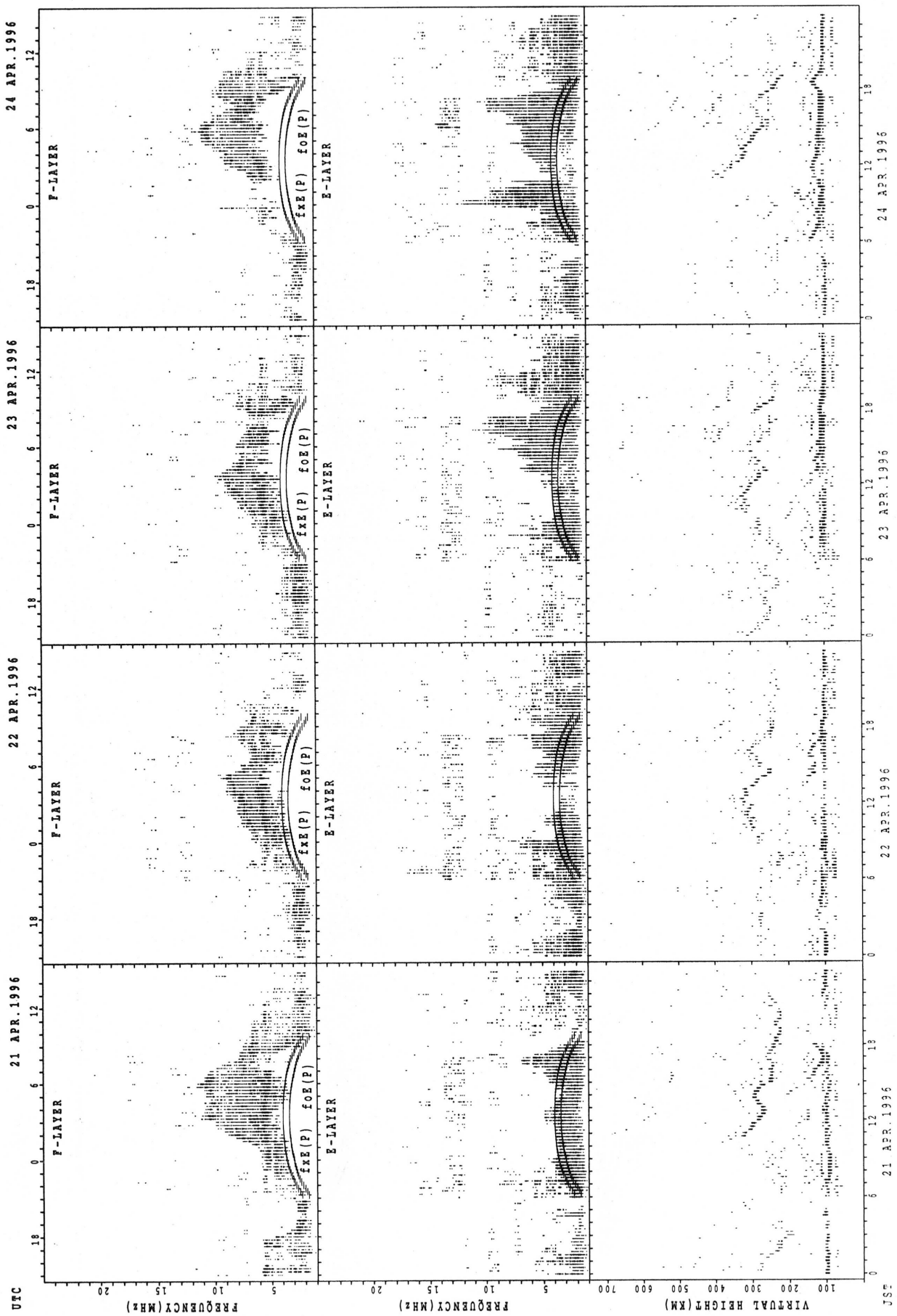


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

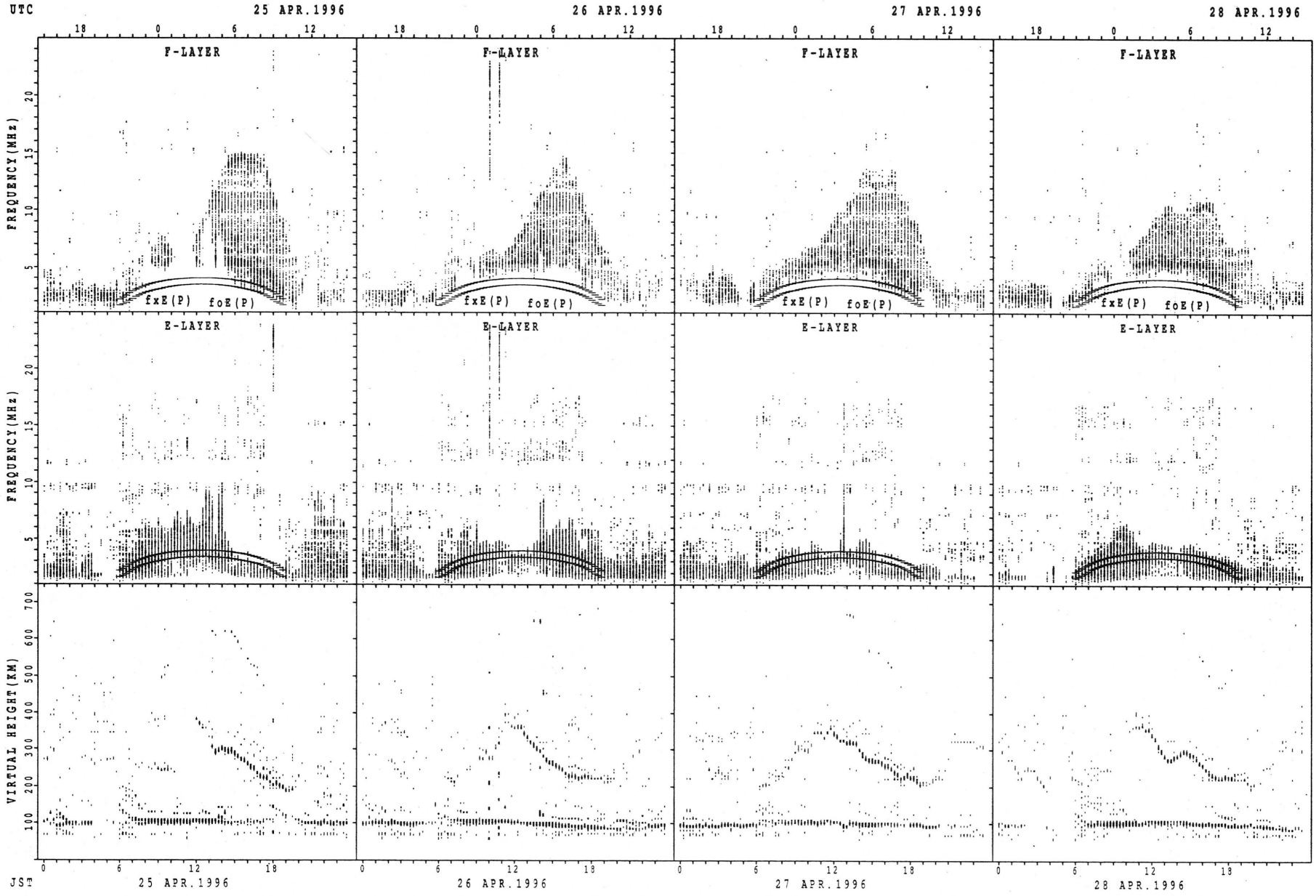
SUMMARY PLOTS AT OKINAWA



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

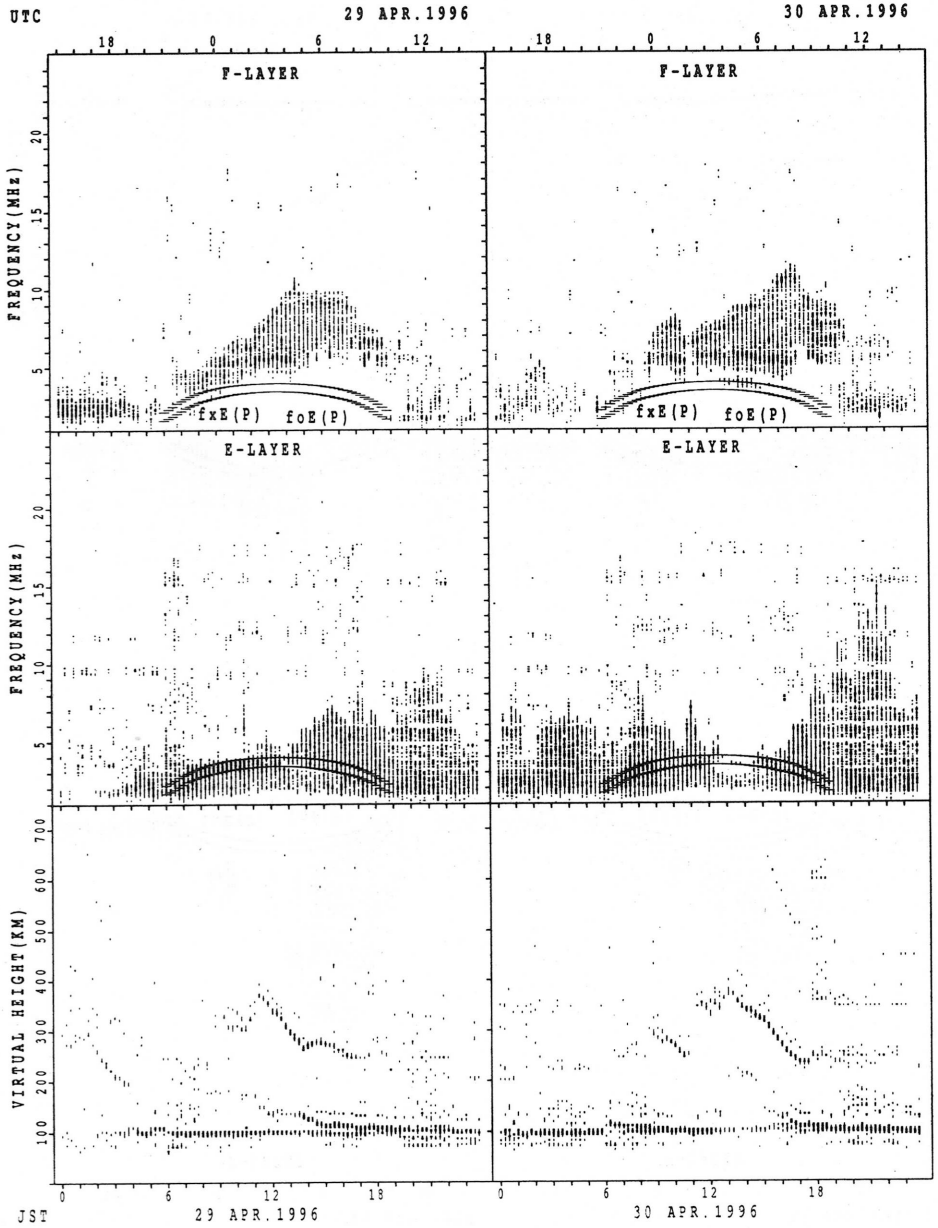

SUMMARY PLOTS AT OKINAWA
UTC
21 APR.1996
22 APR.1996
23 APR.1996
24 APR.1996
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



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

SUMMARY PLOTS AT OKINAWA



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

MONTHLY MEDIANS OF h'F AND h'Es

APR.1996 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										10					11	12								
MED										311					312	307								
U Q										336					322	322								
L Q										294					292	298								

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							24	28	29	30	29	28	28	28	30	30	29	24	22	17	16	12		
MED							138	125	123	115	115	113	113	113	113	115	115	124	119	119	116	117		
U Q							148	144	125	119	121	116	115	113	119	119	120	131	127	123	120	119		
L Q							131	118	115	113	111	111	111	110	109	111	106	106	103	109	107	113		

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										10	10	11	16	19	24	26	21	20	12					
MED										312	318	288	296	294	290	273	270	258	254					
U Q										328	336	296	316	312	305	286	276	270	278					
L Q										292	284	274	278	280	279	264	259	251	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	14	13	13	10	12	13	28	26	29	27	28	27	25	27	27	30	28	29	21	21	20	16	15	11
MED	106	103	105	101	105	113	139	121	117	113	113	113	107	111	111	113	113	115	113	105	111	105	105	105
U Q	109	111	114	117	113	145	155	137	121	119	123	115	114	113	119	127	123	122	120	113	113	113	109	111
L Q	105	102	99	99	101	102	130	113	112	111	107	107	105	107	107	107	107	107	102	99	103	103	103	103

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													12	13	12	12	14	13	11					
MED													314	292	294	281	257	252	248					
U Q													341	318	303	289	274	262	262					
L Q													294	277	286	268	248	246	240					

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	14		10	11		10	15	15	15	15	14	14	15	15	15	15	15	13	14	14	15	13	15	12
MED	104		103	107		115	143	121	119	113	112	112	113	113	113	117	119	115	117	113	107	111	111	105
U Q	109		111	119		123	155	129	127	119	117	113	127	129	123	123	125	128	131	121	117	119	113	111
L Q	101		99	99		103	117	115	115	111	109	107	105	107	109	109	109	109	111	111	99	105	105	103

MONTHLY MEDIANS OF h'F AND h'Es

APR. 1996 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

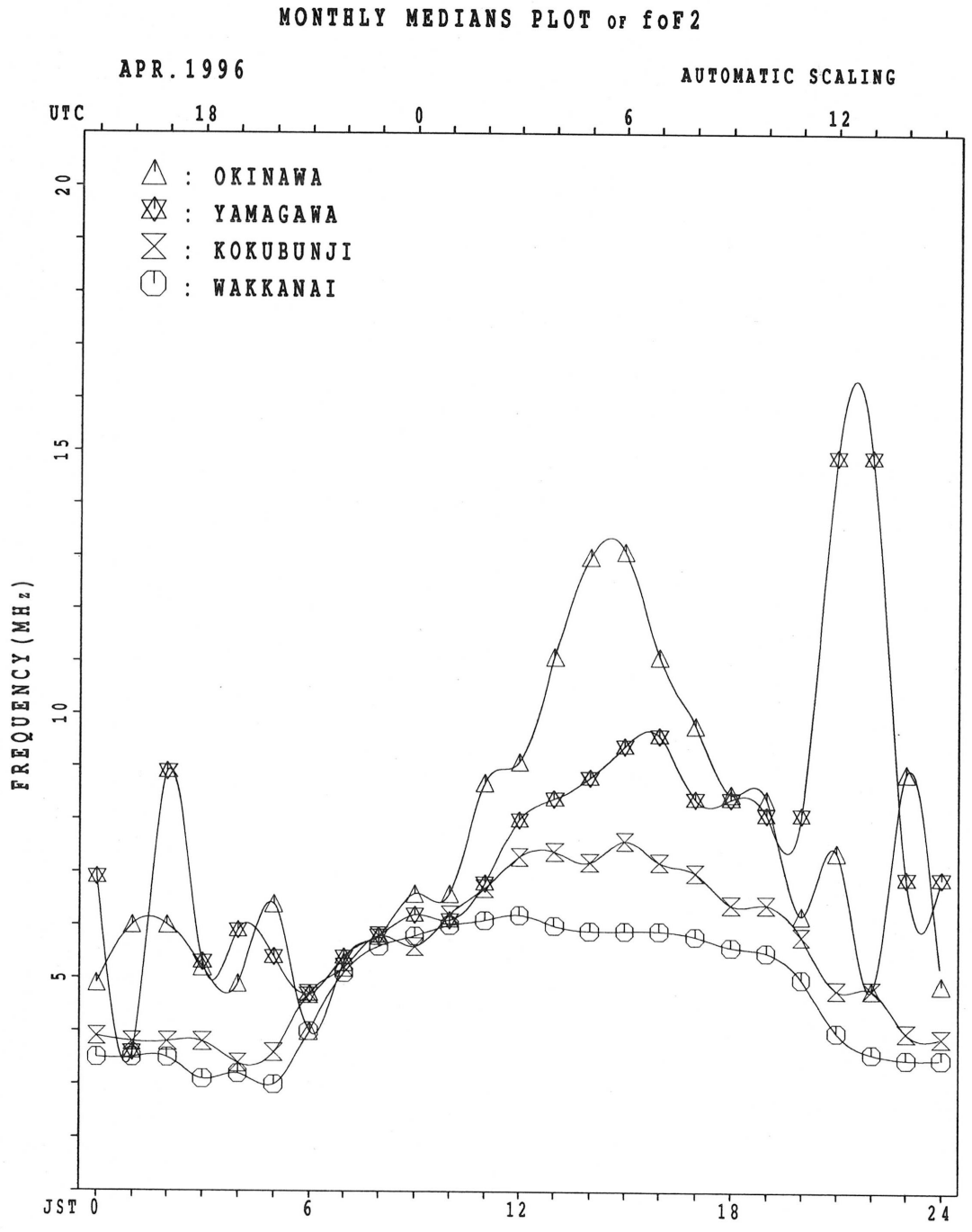
STATION OKINAWA LAT. 26.3N LON. 127.8E

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									10	15	17	18	25	26	26	27	27	23	27	19				
MED									265	288	318	319	310	298	278	262	256	242	242	226				
U Q									310	308	346	332	338	314	294	270	272	264	268	250				
L Q									258	276	290	314	292	278	262	248	248	226	232	220				

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	18	21	23	19	17	12	16	27	29	29	26	27	27	26	26	26	29	25	24	25	22	23	20	21
MED	102	99	99	97	97	98	99	111	107	107	106	107	113	111	112	107	107	107	107	101	96	97	90	95
U Q	105	104	103	99	100	103	125	125	115	112	113	129	131	129	123	123	120	110	112	106	107	105	108	103
L Q	91	95	97	91	90	96	90	103	103	103	103	105	105	105	105	103	96	100	101	91	89	89	88	91


MONTHLY MEDIANS PLOT OF foF2
APR. 1996
AUTOMATIC SCALING
UTC
18
0
6
12
△ : OKINAWA
⊠ : YAMAGAWA
⧖ : KOKUBUNJI
◯ : WAKKANAI
FREQUENCY (MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 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	40	X 38	X 38	X 38	X 35	X 34														X 46	X 44	X 41	X 46	X 45
2	43	44	41	43	41	36														X 51	X 41	X 44	X 46	45
3	46	43	40	42	X 34	X 29														X 63	X 56	48	45	46
4	45	44	42	40	42	32														X 70	X 67	X 42	X 37	X 39
5	X 37	39	42	43	51	33														X 70	X 56	X 47	X 45	X 46
6	X 46	X 45	43	41	41	33		C	C	C	C	C	C	C	C	C	C			X 62	X 50	X 40	X 38	X 38
7	39	39	39	X 37	X 32	X 32														X 68	X 56	X 34	X 35	35
8	36	39	39	40	35	37														X 60	X 57	X 46	46	45
9	48	44	44	44	41	39														X 69	A	X 52	X 48	51
10	X 45	X 44	X 42	41	44	46														X 64	X 50	X 48	50	43
11	44	41	43	X 43	36	38														X 78	X 65	X 42	X 42	X 38
12	X 41	40	X 38	43	X 34	X 33														X 82	X 71	X 62	X 50	X 53
13	X 49	X 50	X 47	X 50	X 42	X 41														X 70	X 56	X 40	40	41
14	41	37	38	38	36															X 75	X 68	X 63	X 46	X 44
15	X 46	44	X 43	54	O X 25															X 85	X 67	X 47	X 40	45
16	43	45	45	45	44															A	A	X 45	X 42	44
17	40	44	40	40	37															X 64	X 42	A	42	A
18	A	A	A	A	40															X 61	58	54	51	52
19	A	47	46	45	42															X 71	X 59	X 44	X 40	42
20	41	X 40	X 41	X 38	X 36															X 64	64	X 57	X 50	50
21	52	X 49	X 51	X 36	X 36															X 59	X 58	X 59	X 56	X 46
22	X 44	X 40	X 38	X 37	X 36															X 71	X 60	X 48	X 46	X 44
23	X 44	X 42	X 41	X 39	X 38															X 69	X 64	X 38	X 37	X 38
24	X 38	X 38	39	X 36	X 34															X 55	C	X 52	52	52
25	48	45	43	40	34															X 57	A	X 53	55	51
26	44	45	44	51	X 38															X 62	X 59	X 53	52	53
27	53	X 50	X 49	X 46	X 44															X 58	X 51	X 48	X 46	X 45
28	X 46	46	43	42	36															X 74	X 56	X 44	X 42	41
29	40	41	38	39	39															X 72	X 62	57	A	55
30	53	50	45	45	40															X 69	X 76	58	53	49
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	29	29	29	30	13														29	26	29	29	29
MED	44	44	42	41	38	34														X 68	X 58	X 48	X 46	45
U Q	46	45	44	44	41	38														X 71	X 64	X 54	50	50
L Q	40	40	39	X 38	X 35	32														X 60	X 56	X 43	X 41	42

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 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	F 32	32	32	32	29	F 24	43	49	55	57	68	74	81	70	72	80	76	61	53	40	38	35	40	39
2	F 37	F 36	F 34	F 34	33	F 28	42	50	56	56	62	65	66	68	71	74	80	81	64	45	35	38	40	F 38
3	F 39	F 36	F 33	F 33	28	23	40	48	52	56	63	83	77	72	68	68	63	63	58	57	50	F 41	F 38	F 39
4	F 36	F 38	F 33	F 33	F 35	F 24	44	49	54	56	66	81	84	74	66	68	67	58	56	64	61	36	31	33
5	32	F 32	F 32	F 36	F 43	F 25	46	52	61	75	83	83	76	78	78	68	59	57	61	64	50	41	39	40
6	40	39	F 36	F 33	34	F 26	43	C	C	C	C	C	C	C	C	C	C	56	59	56	44	34	32	32
7	F 31	F 31	F 30	31	26	26	45	52	60	61	58	60	67	66	74	77	65	66	65	62	50	28	29	F 30
8	F 28	F 30	F 30	F 31	F 28	F 27	47	53	55	55	63	66	74	68	70	72	71	72	66	54	51	40	F 39	F 37
9	F 41	F 37	F 35	J F 37	F 32	F 29	46	55	56	52	62	75	70	U A 68	70	72	65	62	59	63	A	46	42	F 41
10	39	38	36	F 33	F 34	F 38	53	51	51	61	70	74	86	82	70	71	78	75	65	58	44	42	F 39	F 35
11	F 34	F 32	F 34	37	F 23	F 30	50	50	50	58	66	73	78	83	79	82	71	64	67	71	59	36	36	32
12	35	F 32	32	F 36	28	27	46	51	54	58	59	64	63	88	101	91	74	70	76	76	65	55	44	47
13	43	44	41	44	36	35	60	61	51	55	58	64	64	73	84	79	74	72	73	64	50	34	F 32	F 31
14	F 31	J F 30	F 31	F 31	F 28	F 31	41	49	54	55	61	R 64	77	91	93	78	69	63	61	69	62	57	40	38
15	40	F 36	36	F 47	19	28	44	54	73	65	63	76	94	86	70	59	60	74	82	78	62	41	34	37
16	F 35	F 38	F 38	F 37	F 36	F 39	48	54	61	71	72	67	V 68	61	71	70	73	74	U A 70	A	A	39	35	F 36
17	F 34	F 36	F 33	F 31	F 30	32	47	52	J R 62	62	68	69	A	76	74	74	82	100	111	58	36	A	F 34	A
18	A	A	A	A	F 29	F 38	43	46	51	A	A	63	70	68	69	A	76	68	58	55	F 51	S 46	43	F 43
19	A	J F 41	F 38	F 36	F 34	35	47	48	51	60	A	58	64	60	67	82	87	80	74	65	53	38	34	F 34
20	F 33	34	35	32	30	33	48	51	51	58	60	65	78	87	82	72	66	61	62	58	F 58	F 49	44	F 43
21	F 43	43	45	30	30	37	48	55	V 56	59	61	73	58	60	73	76	65	64	54	53	52	53	50	40
22	38	34	32	31	30	34	48	62	57	63	56	55	53	52	56	62	58	52	58	65	54	42	40	38
23	38	36	35	33	32	36	52	55	54	R 53	49	58	58	58	60	70	69	76	69	63	57	32	31	32
24	32	32	F 30	30	28	37	45	54	A	57	61	63	61	69	83	95	94	68	54	49	C	45	F 41	F 40
25	F 41	F 36	F 35	F 33	F 24	33	41	50	60	60	A	58	76	94	113	104	86	75	56	51	A	46	F 44	F 42
26	F 36	F 36	F 37	F 42	32	35	44	49	53	54	45	52	56	66	79	81	70	65	52	56	53	47	F 44	F 45
27	F 45	44	43	40	38	40	49	52	53	51	56	53	59	76	81	80	80	72	70	52	45	42	40	39
28	40	F 39	F 36	F 34	F 27	F 38	50	46	51	52	58	58	65	64	65	78	81	70	71	67	50	38	36	F 34
29	F 33	F 32	F 30	J F 31	F 31	41	48	50	50	53	58	62	56	53	66	82	76	69	U R 65	66	56	F 50	A	F 47
30	F 44	F 42	F 36	F 34	F 34	36	42	51	53	58	67	R 76	72	67	63	67	69	65	67	63	70	F 50	F 46	F 41
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	29	29	29	30	30	30	29	28	28	26	29	28	29	29	28	29	30	30	29	26	29	29	29
MED	F 36	F 36	F 35	F 33	30	33	46	51	54	58	62	65	69	69	71	75	71	68	64	62	52	41	39	F 38
U Q	F 40	38	F 36	F 36	F 34	37	48	54	56	60	66	74	77	80	80	80	79	74	70	65	58	46	42	F 41
L Q	F 33	F 32	F 32	31	28	F 27	43	49	51	55	58	59	62	65	68	70	66	63	58	54	50	37	34	34

APR. 1996 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 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									A	U A 444	U A 460	436	440	444	440	412	L 392	L U L 336						
2									L	L 436	448	U A 432	440	440	440	420	L 392	L						
3									L 432	440	U A 440	436	440	L 460	432	432	392	L						
4									L	L 436	456	448	432	R 440	440	L 420	U L 404	L						
5									L 424	420	452	444	456	432	436	L 424	U L 392	L						
6								C	C	C	C	C	C	C	C	C	C	L 332						
7									L 404	416	432	440	440	448	428	420	L 404	L						
8									U L 408	440	440	452	444	440	432	416	400	L 344	L					
9								L	A	U A 412	436	U A 468	464	A	428	420	L 388	324						
10									U L 384	440	U A 480	A	U A 452	444	444	L 440	L 388	U L 344						
11								L	L	436	A	440	U A 456	U A 448	436	408	L 392	U L 360						
12								300	L 404	436	440	448	460	440	436	L 412	U L 400	L						
13								L		U L 432	L 440	452	444	436	436	412	L 392	U L 348						
14								U A 344	L 404	428	432	444	452	448	428	U A 416	388	L						
15								L	412	432	L 456	U L 508	R 464	452	L 420	L 420	U L 420	U L 376	L					
16								L	L 416	428	444	L 468	444	460	U A 420	420	392	A	A					
17								L	412	440	U A 432	452	A	448	U A 428	A	404	U A 344	L					
18									392	A	A	440	440	A	A	A	388	U L 352						
19							A	U L 368	A	A	A	U A 440	A	U A 452	436	412	400	348	L					
20								U L 372	412	428	432	U L 508	R 448	Y 448	420	416	L 412	L 352						
21								L 380	U L 412	428	436	444	448	444	432	428	L 404	U L 364						
22							L	L 384	408	420	428	444	444	436	432	420	L 400	U L 340	L					
23							L	U L 392	408	U L 428	L	440	440	A	436	A	396	U L 360	L					
24								U A 340	A	U A 428	U A 420	456	456	U A 412	U A 452	A	A							
25							A	A	A	A	A	U A 440	U A 452	U A 436	A	A	A	U L 348						
26							260		L 400	424	U L 420	432	436	448	428	408	388	L 352	204					
27									404	L 424	436	U R 440	436	U A 444	U A 428	404	392	L 352						
28									U L 408	444	432	440	444	R 444	420	400	384	U L 352						
29							L	L 352	L	L 452	436	440	448	U A 436	R 432	A	A	A	A					
30							A	L	A	A	436	Y 448	U A 448	A	432	U A 404	400	364	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	9	18	25	24	28	27	25	27	23	26	20	1					
MED							260	U L 368	L 408	432	436	444	444	444	432	416	L 392	U L 350	204					
U Q								L 382	L 412	440	446	452	452	448	436	L 420	L 400	U L 356						
L Q								U A 342	L 404	426	432	440	440	438	428	412	392	L 344						

APR. 1996 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 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							A 204	A 240	284	304	320	332	A 332	320	304	300	272	216	B					
2							A 184	240	276	300	316	332	U R 332	A 316	A 300	U A 280	A	A	B					
3							204	244	288	308	320	A	A 328	A	A	A	A	A	B					
4							184	252	296	308	336	R 340	R 344	R	324	A	268	224	B					
5							192	248	A 276	304	R 332	R	R	R	312	296	260	200	B					
6							176	C	C	C	C	C	C	C	C	C	C	220	B					
7							188	248	284	R	332	A	332	A	A	A	248	A 208	B					
8							A	252	288	308	324	336	336	328	316	300	268	216	B					
9							196	256	284	316	328	332	332	324	R	312	288	232	B					
10							184	252	280	A 312	A 312	U A 320	A	A 328	A	A	260	212	B					
11							204	268	296	316	U A 328	A	A	A	A	A	A	A	B					
12							A 204	252	284	304	324	R	R	A	A	A	A	224	A					
13							204	252	292	308	A 316	A	A	R	312	292	A	A	B					
14						B	228	H 264	A 284	304	A 320	U R 336	U R 340	R	R 324	A 312	264	220	B					
15						B	204	252	288	304	A	A 332	U R 336	R	320	300	268	U A 216	A					
16						B	200	248	284	308	A 332	A 332	340	A 328	320	320	A 296	228	A					
17						B	H 208	264	292	312	A	A	A	A	A	A	272	A	A					
18						B	196	260	288	A 300	A	A	A	A	A	A	272	212	B					
19						B	212	A 260	284	304	320	A	A	A	320	A	256	U S 212	B					
20						B	192	260	288	A 316	A	340	R 340	A	328	316	284	232	B					
21						B	200	256	292	316	332	340	348	340	A	300	272	236	B					
22						B	200	244	284	312	328	336	U R 344	R	B	308	280	224	160					
23						B	204	260	304	308	332	344	348	340	328	300	268	224	A					
24						B	208	264	296	312	336	340	348	340	320	300	276	236	A					
25						B	208	260	292	308	328	336	A 332	U A 320	A	A	A	224	A					
26						148	224	276	304	312	324	332	R	R	324	296	264	224	168					
27						B	216	260	308	A	A	R	A	A	A 328	A	A	A	A					
28						B	216	264	300	316	R 332	R	336	A	A	308	276	224	160					
29						B	212	276	304	324	328	340	A	A	324	304	280	240	A					
30						B	224	280	300	316	A	332	U A 336	U A 332	320	312	280	244	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	27	28	29	27	23	18	17	11	17	18	22	24	3					
MED						148	204	258	288	308	328	336	336	328	320	300	272	224	160					
U Q							212	264	296	316	332	340	344	340	324	312	280	230	168					
L Q							196	252	284	304	320	332	332	A 320	314	300	264	216	160					

APR. 1996 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 14	E B 15	E B 15	E B 15	E B 15	E B 14	24	34	40	48	J A 53	J A 51	39	J A 46	36	36	31		G E B 15	20	27	22	18	21
2	J A 27	J A 44	J A 26	J A 54	35	26	26	33	36	38	38	44	G	35	37	34	J A 34	J A 30	E B 14	27	20	20	E B 14	28
3	J A 33	28	J A 25	J A 30	J A 24	J A 22	J A 21	29	36	J A 42	J A 47	41	41	J A 39	38	32	48	J A 43	J A 32	20	J A 31	J A 19	J A 26	J A 23
4	E B 15	E B 15	J A 26	E B 12	E B 14	E B 14	G	G	G	33	G	G	G	G	G	34	G 26	G	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15
5	24	26	20	18	E B 13	19	23	28	31	G	G	G 31	G 31	G 30	G	G 27	G 21	25	E B 15	19	E B 15	E B 16	E B 16	E B 15
6	E B 15	E B 14	E B 12	E B 13	E B 14	E B 14	G	C	C	C	C	C	C	C	C	C	C	G 20	E B 16	E B 14	19	E B 16	E B 15	E B 14
7	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	22	34	31	G 28	G	39	G	37	32	J A 32	J G 24	28	J A 25	J A 24	20	20	18	E B 14
8	E B 14	E B 13	E B 15	E B 14	E B 15	E B 16	24	30	33	34	40	38	44	37	34	36	30		G E B 14	26	J A 26	19	E B 16	16
9	27	E B 16	E B 14	E B 16	18	23	30	36	J A 46	43	40	J A 50	J A 50	84	G	34	32	36	36	60	J A 78	J A 34	22	J A 49
10	J A 34	22	19	E B 13	18	E B 13	28	33	33	J A 42	J A 50	J A 59	J A 48	J A 47	33	J A 42	J A 50	26	E B 15	J A 50	32	J A 24	J A 24	J A 81
11	J A 28	J A 31	J A 28	J A 32	E B 14	J A 25	G	30	34	39	J A 66	J A 42	55	J A 51	40	34	32	32	J A 20	32	41	E B 15	E B 14	E B 15
12	E B 14	E B 15	E B J A 22	E B 15	E B 13	E B 14	23	28	32	34	G	G 32	G 34	34	35	J A 32	J A 30	30	J A 49	J A 32	23	31	25	23
13	J A 26	E B 15	22	25	J A 24	J A 25	G	29	36	40	40	J A 45	34	31	G	30	26	J A 23	J A 26	J A 23	J A 23	20	19	J A 20
14	E B 15	E B 14	E B 13	E B 15	E B 14	E B 15	33	37	33	35	35	G	G	G	G	42	J A 28	G 22	24	40	J A 25	19	E B 16	20
15	E B 15	J A 35	J A 24	J A 22	24	J A 30	32	28	34	38	38	38	G	G	38	31	40	39	J A 24	J A 25	J A 28	18	J A 32	J A 32
16	17	21	20	22	17	20	26	30	36	38	39	J A 47	J A 46	J A 47	J A 48	36	J A 48	J A 37	85	J A 106	J A 56	J A 46	16	J A 31
17	25	E B J A 12	20	18	J A 23	J A 24	27	32	J A 43	J A 50	J A 53	J A 63	108	J A 52	J A 55	J A 58	J A 47	42	J A 34	J A 40	J A 22	39	J A 32	J A 46
18	J A 79	J A 77	J A 64	43	J A 28	E B 13	28	32	40	151	J A 53	39	J A 48	J A 52	74	147	G 24	G	J A 26	J A 52	J A 52	J A 61	J A 56	J A 48
19	J A 58	J A 30	J A 49	J A 45	23	J A 28	47	J A 38	J A 42	J A 49	J A 66	J A 48	J A 68	J A 51	G 30	J A 39	G 23	G	21	J A 32	J A 23	J A 22	25	J A 24
20	J A 22	J A 24	J A 24	J A 24	J A 21	J A 17	24	29	36	36	35	40	G 25	39	G 26	39	J A 40	27	J A 25	49	J A 62	J A 46	J A 44	J A 21
21	22	22	22	19	E B 15	J A 16	24	29	35	36	J A 46	36	G	G	33	38	36	30	24	J A 21	J A 32	24	E B 15	E B 15
22	E B 16	E B 14	19	22	21	J A 22	28	33	33	J A 42	40	42	G 28	G 29	38	34	J A 39	G	22	J A 26	J A 22	20	E B 15	18
23	16	21	18	E B 15	19	E B 14	G	30	35	38	41	40	43	J A 58	42	J A 55	J A 39	J A 41	J A 42	J A 44	J A 25	18	E B 15	23
24	J A 36	32	J A 18	20	18	E B 14	25	36	J A 65	J A 67	J A 54	J A 68	44	42	49	56	J A 46	J A 46	30	27	C	J A 38	J A 40	J A 35
25	J A 62	J A 31	J A 26	J A 25	E B 15	J A 22	J A 41	36	J A 50	J A 54	J A 70	J A 54	J A 63	J A 52	J A 86	83	J A 125	G 22	40	39	68	J A 50	J A 34	J A 50
26	J A 41	26	E B 15	E B 14	26	G	25	33	33	34	40	38	G	G	35	G	G	J A 26	G E B 14		J A 49	J A 38	J A 22	J A 19
27	25	26	19	22	23	E B 14	28	31	36	34	34	G 33	35	J A 46	J A 54	J A 42	J A 33	J A 32	30	23	19	26	23	E B 14
28	17	E B 14	E B 14	E B 14	E B 14	E B J A 19	29	34	J A 37	37	37	G 30	36	34	34	J A 49	38	J A 40	J A E B 30	14	18	20	18	E B 15
29	E B 16	E B 15	E B 14	E B 15	18	J A 16	30	G 24	G 27	G 30	G 32	38	J A 52	J A 49	39	J A 56	J A 54	76	71	38	J A 54	J A 26	J A 80	J A 68
30	J A J A 46	J A 37	J A 32	21	J A J A 30	J A 21	32	37	J A 48	J A 52	37	40	J A 48	J A J A 72	J A 79	40	37	J A 33	J A J A 43	J A 72	J A 48	J A 40	32	J A 50
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	29	30	30	30	29	30	30	30
MED	23	22	20	18	18	16	26	32	36	38	40	40	39	39	36	36	34	29	25	27	J A 26	22	20	22
U Q	J A 33	J A 30	J A 25	J A 24	J A 23	J A 22	29	34	J A 40	J A 46	J A 52	J A 48	J A 48	J A 51	J A 45	J A 46	J A 43	J A 37	34	J A 40	J A 48	J A 38	J A 32	J A 35
L Q	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	G 23	29	33	34	G 35	G 37	G	G	G	33	G 27	G	G	21	21	19	E B 16	E B 15

APR. 1996 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 14	E B 15	E B 15	E B 15	E B 15	E B 14	22	27	40	44	46	41	38	42	35	33	29	G	E B 15	E B 14	18	18	E B 15	E B 15
2	E B 13	19	17	17	18	17	25	32	35	36	37	43	G	33	36	34	32	22	E B 14	19	E B 15	17	E B 14	17
3	17	E B 14	16	22	E B 16	19	G 16	28	34	40	44	40	39	38	38	31	35	22	22	E B 14	22	17	18	E B 14
4	E B 15	E B 15	16	E B 12	E B 14	E B 14	G	G	G	U Y 33	G	G	G	G	G	31	G 24	G	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15
5	18	18	E B 14	17	E B 13	18	21	28	29	G	G	U G 31	U G 31	U G 30	G	G 26	G 19	22	E B 15	17	E B 15	E B 16	E B 16	E B 15
6	E B 15	E B 14	E B 12	E B 13	E B 14	E B 14	G	C	C	C	C	C	C	C	C	C	C	G 17	E B 16	E B 14	17	E B 16	E B 15	E B 14
7	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	21	32	30	U G 28	G	37	G	37	32	30	G 21	G 17	20	17	E B 15	E B 14	E B 13	E B 14
8	E B 14	E B 13	E B 15	E B 14	E B 15	E B 16	22	29	32	33	39	36	42	37	34	34	28	G	E B 14	17	20	E B 14	E B 16	E B 16
9	18	E B 16	E B 14	E B 16	17	E B 15	26	33	44	41	40	47	44	U A 62	G	34	31	29	30	59	A A 78	18	E B 15	23
10	32	E B 14	E B 16	E B 13	E B 14	E B 13	26	32	31	40	48	57	45	40	33	35	G 22	25	E B 15	24	20	E B 13	E B 15	20
11	21	19	17	16	E B 14	E B 14	G	28	32	38	54	36	46	45	33	31	28	22	17	32	38	E B 15	E B 14	E B 15
12	E B 14	E B 15	17	E B 15	E B 13	E B 14	23	27	31	33	G U 32	U G 33	34	34	31	26	26	34	20	20	20	19	E B 16	
13	E B 15	E B 15	E B 14	17	20	20	G	28	35	36	39	44	34	U G 30	G	30	26	22	22	17	18	16	18	18
14	E B 15	E B 14	E B 13	E B 15	E B 14	E B 15	32	34	31	34	35	G	G	G	G	42	G 22	G 18	21	31	17	E B 15	E B 16	E B 15
15	E B 15	17	16	12	E B 14	23	30	27	32	35	37	37	G	G	37	G 30	35	35	17	16	E B 14	E B 15	17	20
16	15	16	E B 13	E B 14	E B 13	E B 16	24	30	33	38	38	42	42	40	42	35	34	34	U A 56	A A 106	A A 56	22	E B 13	20
17	E B 15	E B 12	17	E B 14	17	19	24	30	39	34	43	44	A A 108	43	43	51	32	34	20	29	17	A A 39	27	A A 46
18	A A 79	A A 77	A A 64	A A 43	18	E B 13	25	30	37	A A 151	A A 53	38	40	52	66	A A 147	G 24	G	21	42	E B 16	40	32	22
19	A A 58	E B 15	E B 14	18	17	18	41	34	41	47	A A 66	44	49	45	G 28	32	G 20	G	17	18	17	E B 14	18	18
20	16	20	E B 14	18	E B 14	E B 14	22	28	36	36	34	39	G 24	U Y 38	G 24	35	35	26	23	28	31	34	32	18
21	E B 15	16	E B 13	E B 14	E B 15	E B 15	22	28	32	34	35	35	G	G	32	35	32	30	22	17	22	E B 15	E B 15	E B 15
22	E B 16	E B 14	E B 15	E B 15	E B 13	21	26	29	32	35	38	42	G 28	U G 29	38	33	34	G	20	17	E B 15	E B 15	E B 15	E B 16
23	E B 14	E B 14	E B 15	E B 15	E B 14	E B 14	G	29	32	34	38	37	42	54	41	53	33	30	19	25	E B 14	E B 14	E B 15	E B 15
24	21	18	E B 13	17	E B 13	E B 14	25	34	A A 65	43	42	44	42	41	45	53	44	34	21	16	C	21	29	28
25	26	18	17	17	E B 15	20	33	32	45	51	A A 70	44	45	44	58	74	65	G 21	22	32	A A 68	18	19	19
26	17	E B 14	E B 15	E B 14	E B 14	G	24	32	32	33	39	37	G	G	34	G	G	G 20	G	E B 14	25	19	17	E B 14
27	E B 14	E B 14	E B 14	E B 14	E B 13	E B 14	26	30	34	33	34	U G 33	U Y 35	44	43	36	28	24	23	E B 13	E B 15	14	E B 15	E B 14
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	27	31	35	36	36	U G 30	U Y 36	34	33	36	33	29	25	E B 14	E B 15	E B 15	E B 14	E B 15
29	E B 16	E B 15	E B 14	E B 15	E B 16	E B 16	26	G 21	G 23	G 30	G 29	G 28	40	44	37	46	50	64	U A 49	32	41	E B 15	A A 80	33
30	20	17	E B 14	E B 14	E B 13	19	30	35	44	48	36	U Y 40	45	52	38	40	36	28	38	55	30	32	21	28
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	29	30	30	30	29	30	30	30
MED	E B 15	E B 15	E B 14	E B 15	E B 14	E B 15	24	30	33	36	38	38	38	38	34	34	31	22	20	18	18	16	E B 16	E B 16
U Q	18	17	16	17	16	18	26	32	38	40	44	44	43	44	40	41	34	29	23	31	28	19	19	20
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 21	28	32	33	G 34	G	G	G	G	31	G	G	G	E B 16	E B 15	E B 15	E B 15	E B 15

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	15	15	15	14	14	15	14	18	16	17	16	16	20	14	15	15	15	14	15	15	15	15
2	13	14	14	14	15	14	13	14	14	14	16	15	22	18	18	14	15	16	14	13	15	15	14	14
3	14	14	14	15	16	13	13	14	17	15	18	15	20	22	15	16	15	15	15	14	15	13	15	14
4	15	15	14	12	14	14	16	15	16	16	15	18	22	18	18	16	14	14	15	14	15	15	15	15
5	15	15	14	14	13	13	14	14	14	15	15	18	22	15	18	14	13	15	15	14	15	16	16	15
6	15	14	12	13	14	14	13	C	C	C	C	C	C	C	C	C	C	15	16	14	15	16	15	14
7	14	14	14	15	14	14	15	14	15	15	15	16	18	18	16	14	14	14	13	14	15	14	13	14
8	14	13	15	14	15	16	13	15	15	15	15	16	16	16	16	15	15	15	14	15	16	14	16	16
9	15	16	14	16	15	15	14	14	14	16	15	15	19	16	21	15	14	14	14	14	14	16	15	13
10	14	14	16	13	14	13	14	15	15	15	15	16	19	17	20	17	14	14	15	15	12	13	15	12
11	14	14	14	14	14	14	12	14	14	14	14	18	16	16	14	15	14	14	14	15	15	15	14	15
12	14	15	13	15	13	14	15	14	15	15	24	20	18	16	22	16	13	14	12	15	14	15	14	16
13	15	15	14	14	14	15	15	14	15	15	16	19	16	17	16	15	15	13	14	15	16	14	15	15
14	15	14	13	15	14	15	16	15	15	14	18	22	17	19	16	15	14	15	15	15	14	15	16	15
15	15	13	12	11	14	12	14	15	16	19	23	19	21	18	18	21	14	14	13	12	14	15	13	14
16	13	13	13	14	13	16	15	14	14	14	18	19	16	18	15	16	16	14	16	15	14	15	13	13
17	15	12	14	14	14	16	13	15	15	14	15	19	15	16	15	15	14	14	14	14	14	15	16	14
18	15	15	13	14	15	13	14	15	16	14	14	18	15	20	20	14	14	15	14	15	16	15	14	15
19	14	15	14	13	14	14	14	14	15	15	15	20	20	17	16	15	14	14	14	16	13	14	14	14
20	13	15	14	14	14	14	13	15	16	15	16	16	19	15	15	15	15	15	15	15	15	14	14	13
21	15	13	13	14	15	15	15	16	15	15	14	16	24	17	16	15	15	15	14	14	16	15	15	15
22	16	14	15	15	13	15	13	13	14	15	16	16	18	16	34	17	14	15	12	15	15	15	15	16
23	14	14	15	15	14	14	15	14	16	15	15	16	17	15	15	15	14	14	13	15	14	14	15	15
24	15	14	13	14	13	14	15	15	14	15	14	16	15	15	18	16	14	14	14	15	C	16	15	15
25	15	14	15	14	15	15	14	16	14	14	17	15	16	14	17	15	15	15	13	16	15	14	15	15
26	14	14	15	14	14	13	15	13	16	15	16	17	18	17	17	17	15	15	14	14	14	15	14	14
27	14	14	14	14	13	14	13	14	14	15	16	16	18	19	18	15	15	14	14	13	15	14	15	14
28	14	14	14	14	14	15	15	14	14	16	14	20	16	18	14	14	14	15	13	14	15	15	14	15
29	16	15	14	15	16	16	15	16	15	17	16	15	16	16	16	14	15	15	14	14	16	15	14	15
30	12	15	14	14	13	14	14	15	14	14	20	20	20	17	17	16	14	14	14	16	14	16	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	29	30	30	30	29	30	30	30
MED	14	14	14	14	14	14	14	14	15	15	16	17	18	17	17	15	14	14	14	14	15	15	15	15
U Q	15	15	14	15	15	15	15	15	16	15	16	19	20	18	18	16	15	15	15	15	15	15	15	15
L Q	14	14	13	14	14	14	13	14	14	14	15	16	16	16	16	14	14	14	14	14	14	14	14	14

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 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	F 336	329	329	366	360	F 331	366	332	330	323	325	322	336	329	314	330	355	367	354	333	319	314	288	303
2	F 306	F 306	F 300	F 327	346	F 325	370	360	348	342	332	330	327	325	324	328	331	352	370	350	305	295	290	F 314
3	F 309	F 303	F 316	F 310	354	321	372	356	330	318	311	332	328	322	324	338	340	346	340	338	352	F 277	F 290	F 299
4	F 300	F 305	F 305	F 321	F 335	F 348	376	361	358	312	303	312	327	346	331	335	350	355	334	322	352	359	304	292
5	299	F 308	F 319	F 338	F 358	F 334	359	336	325	321	320	332	317	327	343	349	355	347	337	343	360	308	311	303
6	307	308	F 295	F 349	360	F 330	368	C	C	C	C	C	C	C	C	C	C	363	345	348	349	313	308	315
7	F 293	F 312	F 320	329	375	336	363	369	357	355	338	313	326	318	323	336	334	349	347	361	388	316	294	F 283
8	F 310	F 315	F 321	F 349	F 349	F 368	377	366	350	318	328	321	326	318	323	331	338	347	353	338	348	329	F 302	F 306
9	F 303	F 319	F 326	J F 339	F 333	F 321	358	369	359	329	317	316	322	A	329	337	348	351	322	A 342	A	315	307	F 317
10	308	324	313	F 308	F 343	F 338	365	376	329	316	323	311	327	334	315	318	338	349	357	341	328	278	F 311	F 299
11	F 295	F 301	F 317	372	F 358	F 324	367	359	347	326	325	325	304	323	315	335	344	341	334	341	363	296	299	312
12	306	F 296	325	F 364	395	335	372	363	357	347	318	318	274	302	337	346	335	324	323	331	330	333	283	294
13	288	300	318	343	314	306	377	389	370	336	319	338	317	322	330	337	351	348	349	356	339	298	F 284	F 308
14	F 308	J F 298	F 314	F 326	F 322	F 344	371	368	357	345	319	R 297	303	317	343	349	335	332	313	310	315	331	307	290
15	293	F 292	322	F 396	326	314	355	312	349	322	271	274	318	345	349	340	312	322	318	347	334	308	287	297
16	F 282	F 308	F 295	F 311	F 319	F 346	368	332	316	332	334	330	V 304	312	325	320	340	344	A	A	A	309	321	F 285
17	F 279	F 325	F 323	F 307	F 312	343	374	344	J R 360	324	323	313	A	312	313	303	303	339	364	372	295	A	F 301	A
18	A	A	A	A	F 299	F 339	363	348	344	A	A	293	306	312	A 311	A	344	349	346	316	F 316	A 316	284	F 298
19	A	J F 315	F 291	F 308	F 331	339	343	345	321	317	A	312	301	295	282	313	327	344	336	337	353	318	298	F 303
20	F 304	296	315	305	336	320	344	357	327	331	309	278	281	311	327	327	332	343	333	311	F 303	F 309	302	F 285
21	F 295	312	355	318	319	329	341	354	V 339	327	314	329	316	304	320	338	350	348	331	312	300	307	321	306
22	309	322	305	317	318	331	350	344	348	347	334	336	318	307	327	336	355	334	325	329	335	301	302	293
23	298	307	310	327	328	327	351	358	361	R 325	317	312	327	A 317	322	328	321	343	339	331	348	319	282	291
24	300	303	F 314	322	310	358	360	333	A	329	327	314	306	301	311	330	351	347	360	323	C	301	F 306	F 310
25	F 295	F 322	F 307	F 330	F 361	349	370	356	355	340	A	303	285	303	327	339	335	337	348	334	A	311	F 307	F 281
26	F 313	F 297	F 320	F 357	399	355	363	366	328	340	318	297	296	297	314	329	348	360	340	334	320	318	F 307	F 304
27	F 305	311	318	328	336	307	370	352	340	340	332	296	294	310	320	317	326	336	353	329	319	305	291	303
28	312	F 320	F 320	F 337	F 339	F 337	373	363	342	300	313	305	310	314	305	316	349	334	339	341	369	315	309	F 299
29	F 305	F 320	F 304	J F 314	F 320	358	364	381	342	309	316	320	314	291	311	325	343	345	A	337	347	F 321	A	F 328
30	F 310	F 329	F 298	F 337	F 358	347	346	338	318	323	301	R 322	333	316	301	310	319	320	328	A 331	349	F 321	F 314	F 308
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	29	29	30	30	30	29	28	28	26	29	28	28	29	28	29	30	28	29	26	29	29	29
MED	F 304	F 308	F 316	F 328	336	336	366	357	346	326	319	314	316	315	323	330	340	346	340	337	337	313	302	F 303
U Q	F 308	F 320	320	F 346	358	346	371	366	357	340	327	327	326	322	328	338	350	349	351	342	352	318	308	F 308
L Q	F 295	F 302	F 305	F 316	320	325	358	344	330	320	314	304	304	306	314	322	332	337	332	329	319	303	290	292

APR. 1996 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 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									A	A	A	A 376	392	A	351	355	H 357	L						
2									L	L 363	369	A	375	361	365	364	A 356	L						
3									L 367	A 354	A	A 358	372	L 352	370	349	367	L						
4									L	H 384	383	H 379	393	R 380	H 381	L 360	U L 362	L						
5									L 351	373	369	390	368	381	363	L 363	U L 371	L						
6								C	C	C	C	C	C	C	C	C	C	L 395						
7									L 376	385	395	406	382	371	372	363	L 349	L						
8									U L 389	375	A 357	396	A	383	374	375	355	L 372	L					
9								L	A	A	A	A	A	A	363	357	L 367	A 386						
10									U L 408	A	A	A	A	372	365	L 350	L 349	L						
11								L	L	A 348	A	372	A	A	367	366	L 369	L						
12								422	L 376	364	390	379	358	363	362	L 358	U L 354	L						
13								L		U L 364	L 378	A	381	370	354	362	L 359							
14								A	L 386	380	394	390	378	359	H 382	A	373	L						
15								L	365	360	L 339	U L 326	R 364	358	A 366	L 359	U L 345	A	L					
16								L	L 365	364	A 358	A 343	A	A 341	A	364	A 368	A	A					
17								L	A	A 369	A	A	A	A	A	A	350	A	L					
18									A	A	A	A 361	A 372	A	A	A	371	L						
19								A	A	A	A	A	A	A	360	365	354	370	L					
20								U L 381	380	390	H 382	U L 322	R 389	Y	370	355	A 357	L 360						
21								L 384	U L 385	368	399	388	388	384	H 386	361	L 359	L						
22								L	L 365	385	383	391	A	386	397	356	358	A 369	U L 377	L					
23								L	U L 373	396	U L 388	L	395	A 345	A	A	A	362	A	L					
24									A	A	A	A	A	A	A	A	A	A						
25								A	A	A	A	A	A	A	A	A	A	U L 371						
26							436		L 375	371	U L 374	395	411	371	375	374	370	L 363	400					
27									410	L 383	409	Y	384	A	A	380	367	L 372						
28									U L 374	366	386	375	376	R 369	374	362	366	A						
29								L	L 407	L	L 380	H 401	371	A	R 365	A	A	A	A					
30								A	L	A	A	Y 389	A	A	345	A	A 351	357	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	6	16	21	18	18	19	16	22	21	26	10	1					
MED							436	L 382	L 378	371	384	379	378	370	366	362	360	L 372	400					
U Q								407	L 388	383	394	395	388	380	374	364	368	L 377						
L Q								L 373	L 370	364	369	A 361	371	360	362	358	L 354	L 363						

APR. 1996 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR.1996 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									A 288	312	292	278	272	278	302	272	242	236						
2									260	284	304	284	290	292	292	282	264	236						
3									300	324	312	272	278	286	286	274	264	250						
4									258	330	332	300	268	256	290	278	254	246						
5									294	292	282	268	290	280	266	264	254	252						
6								C	C	C	C	C	C	C	C	C	C	244						
7									250	262	294	328	294	306	290	266	278	246						
8									262	310	292	308	296	302	290	278	272	246	230					
9								248	260	306	318	292	304	A	280	272	252	256						
10									262	316	302	A 302	284	270	296	296	262	248						
11								248	256	308	302	292	312	288	292	262	252	260						
12								234	266	280	316	314	400	324	264	252	262	270						
13								218		296	294	280	316	306	278	264	246	248						
14								238	252	278	318	330	318	288	264	264	264	262						
15								L 316	262	298	374	376	280	260	266	272	322	278	244					
16								276	296	278	272	296	290	332	294	288	270	248	A					
17								268	280	296	282	320	A	314	306	310	302	260	222					
18									302	A	A	356	300	314	A	A	260	250						
19							E A 288	280	A 294	310	A	326	324	350	370	294	272	244	244					
20								262	320	310	318	378	346	300	276	286	278	260						
21								264	272	314	314	292	334	348	302	268	264	250						
22							258	272	272	270	298	312	354	374	324	284	262	274	262					
23							254	256	270	316	L 338	336	314	E A 358	302	284	282	252	238					
24								244	A	300	306	310	338	324	306	274	238							
25							A 236	250	262	A 292	A	354	346	308	266	260	A 270	246						
26							224		300	290	L 350	388	360	340	290	266	256	242	244					
27									276	288	306	Y 374	368	316	288	286	280	248						
28									280	374	330	352	328	322	320	286	254	264						
29							232	226	260	344	338	322	336	400	326	264	258	A	A					
30							234	292	324	314	324	298	284	312	336	322	284	284	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							7	17	27	28	26	29	28	28	28	28	29	28	8					
MED							235	256	272	303	309	312	313	308	291	274	264	250	244					
U Q							258	274	294	314	324	344	337	328	304	286	275	260	253					
L Q							232	241	260	289	294	292	290	288	279	265	254	246	234					

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APR. 1996 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	284	270	264	236	216	274	226	234	A	A	A	A	224	A	242	A 250	H 200	226	216	222	272	284	292	290
2	298	314	288	272	248	266	220	234	A 248	A 232	220	A	200	204	222	A 240	E A 256	240	218	212	258	294	290	282
3	290	294	274	A 288	214	E A 324	220	222	234	E A 260	A	A	226	A 236	232	216	A 244	238	234	230	238	290	280	306
4	286	282	296	264	204	232	210	218	214	H 186	H 188	H 184	204	H 186	H 174	224	232	232	242	236	208	204	290	304
5	318	320	288	260	218	A 236	228	230	226	222	232	206	192	H 200	H 186	214	H 214	232	242	222	216	240	274	284
6	280	272	290	252	214	244	214	C	C	C	C	C	C	C	C	C	C	214	232	218	212	246	286	288
7	312	298	288	248	206	242	222	240	228	214	214	192	218	222	214	202	H 190	H 184	230	216	202	250	308	310
8	302	280	266	240	224	244	214	236	218	212	A	196	A	210	208	222	228	220	224	220	236	254	284	276
9	278	256	276	260	242	244	238	242	A	A	A	A	A	A	212	236	A 242	A	A 264	A	A	252	266	340
10	A 332	276	282	276	246	236	222	230	214	A	A	A	A	A 250	222	244	H 202	232	224	236	240	286	292	A 328
11	328	348	270	226	218	250	228	220	220	A	A	204	A	A	216	204	238	236	240	240	224	240	282	282
12	278	290	288	224	198	240	218	212	220	206	198	206	230	216	226	210	226	240	A 260	238	244	232	300	302
13	304	290	276	238	268	286	226	238	A 232	A 232	A 242	A	210	212	H 192	224	224	H 218	240	224	224	262	318	294
14	316	312	286	266	240	244	230	A	230	214	196	190	212	212	H 208	A	218	H 208	242	274	252	230	244	302
15	300	318	276	200	E B 328	A 328	A 238	226	240	242	E A 266	228	228	H 204	A	190	A 260	A	242	228	218	224	280	310
16	316	308	272	276	258	236	226	236	232	A 254	A	A	A	A	A	252	E A 254	A	A	A	A	292	274	A 320
17	322	260	270	298	272	234	234	248	A	224	A	A	A	A	A	A	A 248	A	226	206	H 272	A	E A 350	A
18	A	A	A	A	330	246	224	244	A	A	A	E A 264	E A 264	A	A	A	234	228	240	A	256	A	A	A 332
19	A	316	308	282	230	234	A	A	A	A	A	A	A	A	220	236	H 220	H 210	246	232	214	246	A 288	296
20	300	320	270	256	240	262	250	242	230	218	H 214	250	186	A	236	A 260	A	238	248	272	290	A 296	E A 332	306
21	266	280	230	248	276	264	238	232	220	210	194	198	208	194	H 188	248	A 234	A 236	234	250	282	268	236	252
22	272	264	288	274	276	268	242	236	228	212	228	A	206	196	E Y 276	242	E A 254	208	248	238	224	242	270	302
23	292	278	276	264	272	246	H 206	228	216	210	232	H 194	A	A	A	A	A 240	A	A 242	248	226	252	322	324
24	A 348	316	284	264	258	214	220	A	A	A	A	A	A	A	A	A	A	242	222	248	C	282	E A 334	A 326
25	A 342	280	278	252	212	248	A	A	A	A	A	A	A	A	A	A	A	228	236	A 260	A	270	276	318
26	280	296	246	218	206	236	208	248	H 214	234	A 244	204	192	Y 240	224	H 194	H 214	224	218	230	256	254	278	268
27	280	272	258	254	238	224	230	234	202	194	184	210	210	A	A	A 234	H 200	230	242	226	232	272	280	292
28	276	258	250	230	252	226	222	218	A 228	220	216	214	222	H 192	222	E A 266	A 240	A	242	218	202	240	274	300
29	304	290	296	258	258	216	218	212	200	196	190	H 176	A 244	A	230	A	A	A	A	A 240	A 252	250	A E 324	
30	288	260	276	242	210	246	A	A	A	A	208	Y	A	A	E A 268	A	A	238	A	A	A 242	A 264	278	A 324
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	29	29	29	30	30	27	24	21	20	17	16	18	15	21	21	24	23	27	26	26	28	28	29
MED	299	290	276	256	240	244	224	234	226	215	214	202	210	210	219	229	229	230	240	231	237	253	282	302
U Q	316	313	288	269	258	262	230	239	231	A 232	A 232	212	226	222	231	246	A 243	238	242	240	256	277	296	A 322
L Q	280	272	270	239	214	236	218	224	215	210	195	H 193	204	196	H 208	212	H 216	H 218	226	222	218	241	275	289

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IONOSPHERIC DATA STATION Kokubunji

APR. 1996 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							A	A		A	A	A							B					
							126		126		124	122	118	114	114	114	118	124						
2							A											A	A	B				
							120		114	110	108	110	120	114	112	112								
3								A	A	A	A	A	A	A		A	A	A	B					
							148	138	128	126	132		124		116									
4																A	A		B					
							138	118	114	112	116	114	118	118	114		130	120						
5												A	A	A		A	A		B					
							134	118	116	112	108				118	126	122	120						
6								C	C	C	C	C	C	C	C	C	C		B					
							146											118						
7								A	A	A		A		A	A	A			B					
							148	134	132		114		108				118	106						
8							A		A	A									B					
								116	128	128	108	110	116	114	112	114	114	122						
9									A										B					
							136	116	124	114	114	112	114	114	116	116	116	120						
10															A	A	A		B					
							126	122	114	112	114	114	114	114			124	120						
11												A	A	A	A	A	A	A	B					
							124	118	114	110	112													
12								A				A	A	A	A	A	A	A	A					
								116	114	112	116							130						
13												A	A	A		A	A	A	B					
							134	120	116	112	110				116	122								
14						B		A	A							A	A	A	B					
							156	130		112	114	122	110	118	114		126	132						
15						B					A								A					
							134	120	114	114		120	116	116	118	120	122	118						
16						B		A	A										A					
							142	126	122	112	114	112	112	114	112	116	116	118						
17						B	A	A				A	A	A	A	A		A	A					
							134	134	114	112	108						118							
18						B			A		A	A	A	A	A		A		B					
							140	130	122	112						108	122	118						
19						B						A	A	A	A	A			B					
							134	118	114	112	112				120		118	118						
20						B					A	A							B					
							130	116	128	110		116	116	118	120	120	118	118						
21						B			A	A					A		A		B					
							120	118		134	112	108	118	114		116	126	122						
22						B				AE	AE	AE		A	B				B					
							122	114	114	138	140	132	118			118	114	122	142					
23						B						A							A					
							132	120	124	118	112	122	112	112	112	110	114	124						
24						B		A											A					
							130	126	112	114	112	110	110	110	114	112	116	118						
25						B										A		EA						
							122	116	112	110	112	112	110	110	110		110	144	126					
26								A										A						
						164	132	128	116	114	114	114	116	116	116	116	112	138	132					
27						B		A		A	A	A	A			A	A	A	A					
							122	132	114					112	114									
28						B		EA				A		A	A	A	A	A	A					
							120	142	116	112	110		110			126	122	126	124					
29						B		A	A	A	A	A		A	A				A					
							124	130	128	124	122	128			112	116	114	118						
30						B										A			A					
							132	114	110	108	112	114	114	114	112	126	114	116						
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	26	28	27	26	25	18	20	17	20	18	23	24	4					
MED						164	133	120	116	112	112	114	115	114	114	116	118	120	129					
U Q							138	130	124	114	115	122	118	116	116	120	122	124	137					
L Q							124	117	114	112	111	112	111	113	112	114	114	118	125					

APR. 1996 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	156	106	136	126	120	120	126	116	118	128	132	G	B	116	122	126	136	120
2	130	108	108	118	102	102	156	150	142	138	132	126	G	124	116	114	108	108	B	110	112	112	B	108
3	110	102	118	106	116	106	108	150	130	122	116	116	116	112	114	114	104	108	102	100	116	118	118	122
4	B	B	114	B	B	B	G	G	G	130	G	G	G	G	G	112	118	G	B	B	B	B	B	B
5	114	116	108	108	B	112	142	124	124	G	G	112	110	108	G	114	102	164	B	102	B	B	B	B
6	B	B	B	B	B	B	G	C	C	C	C	C	C	C	C	C	C	106	B	B	100	B	B	B
7	B	B	B	B	B	B	158	140	174	108	G	110	G	178	112	106	104	106	130	102	104	102	102	B
8	B	B	B	B	B	B	150	154	144	138	122	128	124	124	136	122	128	G	B	114	116	102	B	B
9	108	B	B	B	112	146	136	136	128	128	126	116	114	112	G	160	162	126	118	112	106	106	112	104
10	102	108	132	B	112	B	120	120	126	114	110	108	114	114	120	114	108	152	B	100	100	112	108	102
11	100	102	104	102	B	100	G	170	144	128	110	108	104	100	100	100	100	100	100	112	108	B	B	B
12	B	B	106	B	B	B	188	140	126	124	G	114	114	114	112	110	102	134	116	106	110	106	108	110
13	112	B	106	102	104	100	G	160	138	122	112	112	108	108	G	134	100	98	100	96	98	94	102	106
14	B	B	B	B	B	B	144	136	138	130	124	G	G	G	G	160	98	100	102	130	128	100	B	118
15	B	114	116	120	158	110	140	154	130	122	124	122	G	G	168	128	130	118	130	118	108	102	120	118
16	96	108	140	108	120	112	136	136	124	120	118	118	118	122	118	152	132	120	112	106	108	108	128	100
17	104	B	104	106	106	102	148	140	120	114	110	110	104	120	100	100	118	98	118	112	114	108	108	106
18	104	100	100	100	100	B	150	134	124	108	106	116	108	108	106	106	110	G	124	110	110	110	106	104
19	102	104	124	140	108	126	128	118	118	114	110	110	106	108	108	104	106	G	114	102	104	98	104	108
20	106	98	108	104	104	B	140	148	130	126	118	172	104	122	108	152	140	148	120	108	106	104	104	104
21	106	104	106	110	B	B	154	158	140	126	126	124	G	G	112	154	140	136	128	126	120	128	B	B
22	B	B	140	130	140	130	128	126	128	134	142	140	108	110	158	158	130	G	138	120	116	120	B	118
23	124	134	130	B	132	B	G	150	132	138	138	148	150	124	140	120	132	122	118	112	114	118	B	148
24	108	112	116	100	110	B	154	138	122	122	124	126	134	134	124	122	122	116	116	126	C	112	108	104
25	102	106	108	118	B	142	130	134	120	116	114	114	112	110	106	106	104	116	122	122	114	112	110	118
26	126	112	B	B	108	G	168	150	148	132	122	124	G	G	168	G	G	114	G	B	112	112	146	112
27	112	118	118	116	114	B	168	146	128	118	108	104	108	118	110	110	106	104	100	104	130	116	110	B
28	90	B	B	B	B	B	140	132	132	124	122	108	122	118	112	128	130	122	128	B	102	102	102	B
29	B	B	B	B	138	140	146	114	106	108	110	106	106	108	140	128	124	120	114	114	112	122	110	106
30	104	106	100	110	108	124	128	130	118	114	120	124	116	110	120	150	136	120	112	112	110	114	108	108
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	17	21	17	18	14	25	28	28	28	25	27	22	24	24	28	28	24	22	26	27	26	20	21
MED	106	108	108	108	111	112	144	139	129	123	120	116	113	114	115	121	118	117	117	112	110	111	108	108
U Q	112	113	121	118	120	130	155	150	138	129	124	124	118	122	130	142	131	124	124	116	116	116	115	118
L Q	102	103	106	103	106	102	133	131	124	115	110	110	108	109	109	110	104	106	112	104	106	102	105	104

APR. 1996 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 1996 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

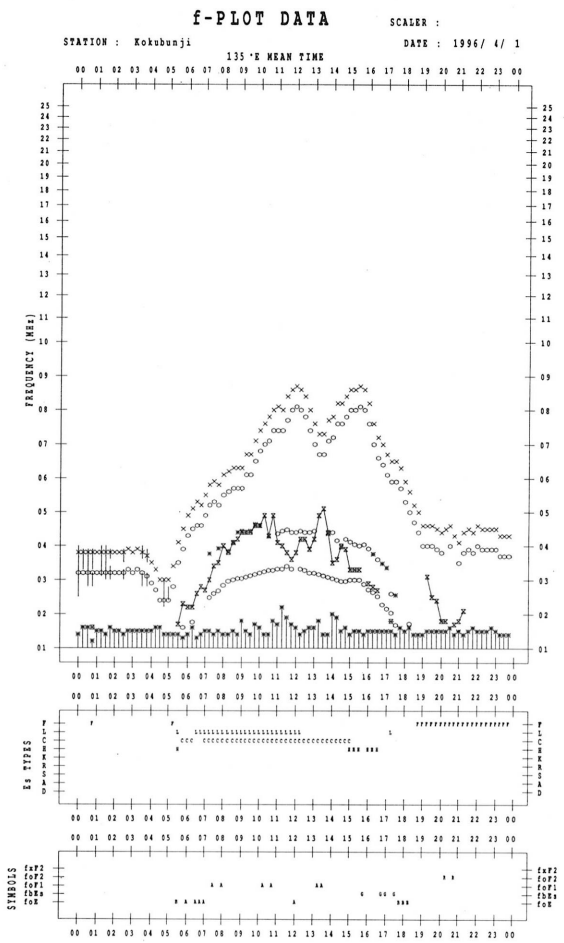
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

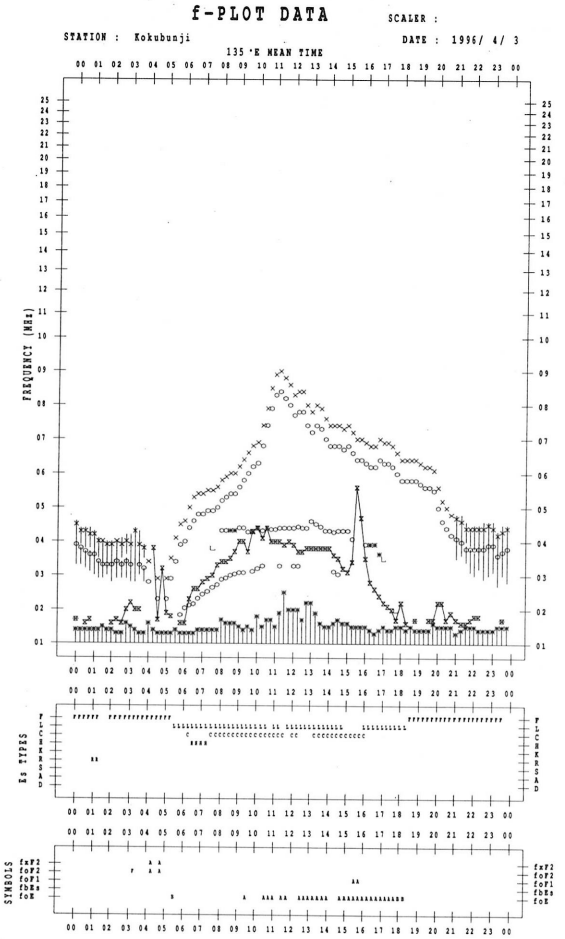
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C 1	LC 31	CL 21	CL 21	CL 21	CL 21	CL 11	C 1	C 1	CH 11	H 1			F 1	F 3	F 2	F 1	F 2
2	FF 12	F 2	F 2	FF 23	F 4	F 3	C 2	H 2	H 1	C 1	C 1	C 1		C 1	C 1	C 2	L 2	L 3		F 2	F 2	F 1		F 2
3	FF 12	RF 11	F 1	F 4	F 2	F 2	L 2	HL 11	CL 22	CL 21	CL 21	CL 11	CL 11	L 2	CL 11	C 2	LC 21	L 2	L 2	F 2	F 3	F 2	F 2	F 1
4			F 2							C 1						L 1	L 1							
5	F 2	F 2	F 1	F 1		F 1	C 1	C 1	C 1			L 1	L 1	L 1		L 1	L 1	H 1		F 1				
6																		L 1			FF 11			
7							C 1	CL 21	HL 11	L 1		C 1		HL 11	L 1	L 2	L 2	L 2	CL 22	F 3	F 1	F 2	F 1	
8							C 1	H 1	HL 11	HL 11	C 1	C 1	CL 21	C 1	H 1	C 1	C 1			FF 12	FF 21	F 2		
9	F 1				F 1	F 1	C 2	C 2	CL 21	C 1	C 1	C 2	C 2	C 2		H 1	H 1	C 2	C 5	F 4	F 3	F 3	F 1	F 4
10	F 5	F 2	F 1		F 1		C 2	C 2	C 1	C 2	C 2	C 2	C 1	C 1	C 1	C 2	L 1	H 1		F 3	F 3	F 2	F 2	F 4
11	F 3	F 2	FF 22	F 2		F 1		H 1	H 1	C 1	C 3	L 1	L 2	L 2	L 2	L 2	L 2	L 2	L 1	FF 31	F 5			
12			F 2				HL 11	H 1	C 1	C 1		L 1	L 1	L 1	L 1	L 2	L 2	CL 21	CL 22	FF 21	FF 21	F 2	F 1	F 1
13	F 2		F 1	F 3	F 2	F 3		H 1	H 1	C 2	C 1	C 1	C 1	L 1		HL 11	L 2	L 2	L 2	F 2	F 2	F 2	F 1	F 1
14							C 2	CL 21	CL 11	C 1	C 1					HL 11	L 2	L 2	L 1	FF 43	FF 11	F 1		F 1
15		F 2	FF 11	FF 21	F 1	LC 31	C 2	H 1	C 1	C 1	C 1	C 1			H 1	C 1	C 1	C 2	C 2	F 1	FF 11	F 1	FF 31	F 4
16	F 1	F 1	F 1	F 2	F 1	L 1	C 2	CL 11	CL 21	C 2	C 1	C 1	C 1	C 1	C 2	H 1	C 2	C 4	C 4	F 3	F 6	F 3	F 1	F 2
17	F 2		F 2	F 1	F 1	L 3	HL 21	HL 11	C 1	C 1	C 2	C 2	C 3	CL 21	L 2	L 3	CL 23	HLC 32	CL 23	F 4	F 2	F 5	F 3	F 4
18	F 6	F 5	F 5	F 4	F 2		C 1	CL 11	CL 21	C 3	C 2	C 1	C 1	L 2	L 3	L 3	L 2		C 2	F 6	F 2	F 4	F 4	F 4
19	F 6	F 3	FF 21	FFF 22	F 2	CL 11	CL 31	C 2	C 2	C 2	C 3	C 1	C 2	L 1	L 1	L 2	L 1		C 1	F 2	F 1	F 2	F 2	F 1
20	F 1	F 2	FR 11	F 1	F 1	C 1	C 1	H 1	HL 11	CL 11	CL 11	HL 11	L 1	C 2	L 1	HL 11	C 2	H 1	C 2	F 4	F 3	F 4	F 5	F 2
21	F 1	F 2	F 1	F 1		C 1	H 1	H 1	HL 11	CL 11	CL 11	C 1			L 1	HL 12	HL 21	H 2	CL 32	F 1	FF 31	F 1		
22			F 1	F 2	F 1	C 2	C 2	C 1	C 1	CL 11	HL 11	HL 11	L 1	L 1	H 1	H 1	CL 21		C 2	F 1	F 1	F 1		F 1
23	FF 11	F 1	FF 11		F 1			HL 11	CL 11	HL 11	HL 11	HL 11	H 1	C 3	H 2	C 3	C 2	C 3	C 2	F 3	F 1	F 1		F 1
24	F 3	F 2	FF 11	F 2	F 1		H 1	CL 11	C 3	C 2	C 1	C 1	C 1	C 1	C 1	C 2	C 2	C 3	C 3	F 2		F 5	F 6	F 5
25	F 4	F 2	F 2	FF 11		C 1	C 2	C 2	C 3	C 3	C 2	C 1	C 2	C 2	C 2	C 3	L 3	L 1	C 4	F 4	F 5	F 3	F 2	FF 12
26	FF 22	F 1			F 1		H 1	HL 11	HL 11	H 1	C 1	C 1			H 1			L 1			F 3	F 2	F 1	F 1
27	F 2	F 1	F 1	F 2	F 1		H 1	CL 11	C 1	C 1	L 1	L 1	L 1	C 1	C 2	C 2	L 2	L 2	L 2	F 1	F 1	FF 22	F 1	
28	FF 11					C 1	CL 21	CL 21	C 1	C 1	C 1	L 1	C 1	C 1	C 1	CL 21	CL 22	CL 32	C 4		F 1	F 2	F 1	
29					F 1	C 1	CL 22	L 1	L 1	L 1	L 1	L 1	L 1	L 1	H 1	CL 21	C 2	C 4	C 3	F 4	F 4	F 1	F 5	F 3
30	F 5	F 3	F 2	F 1	F 1	C 1	C 3	C 2	C 2	C 2	C 1	C 1	C 1	C 2	C 1	HL 21	H 2	C 2	C 3	F 5	F 5	F 5	F 5	F 5
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																								

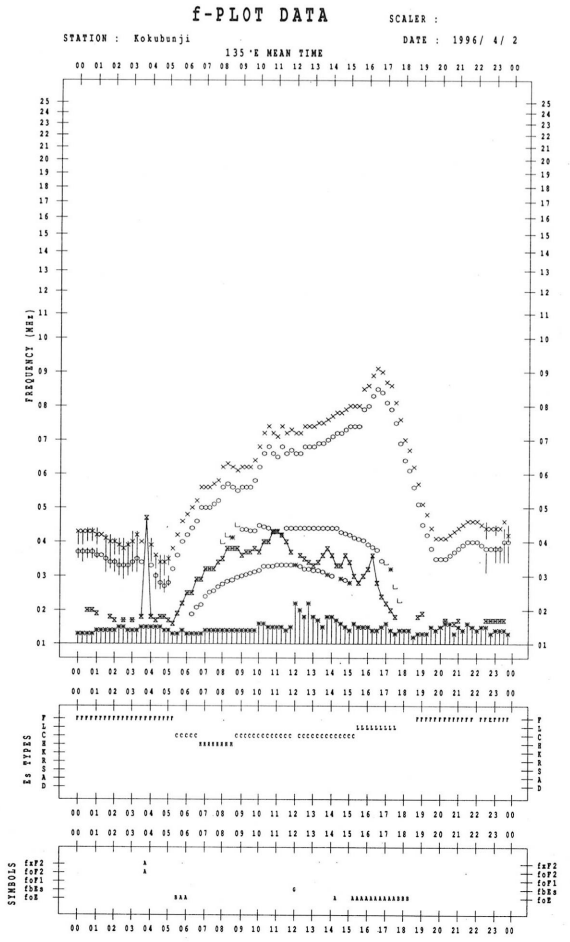
APR. 1996 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

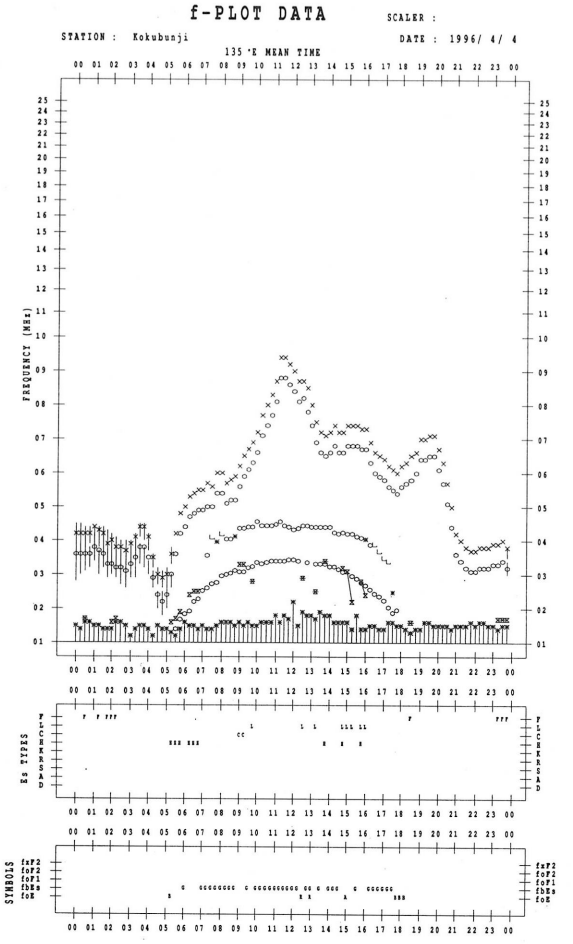
f-PLOTS OF IONOSPHERIC DATA

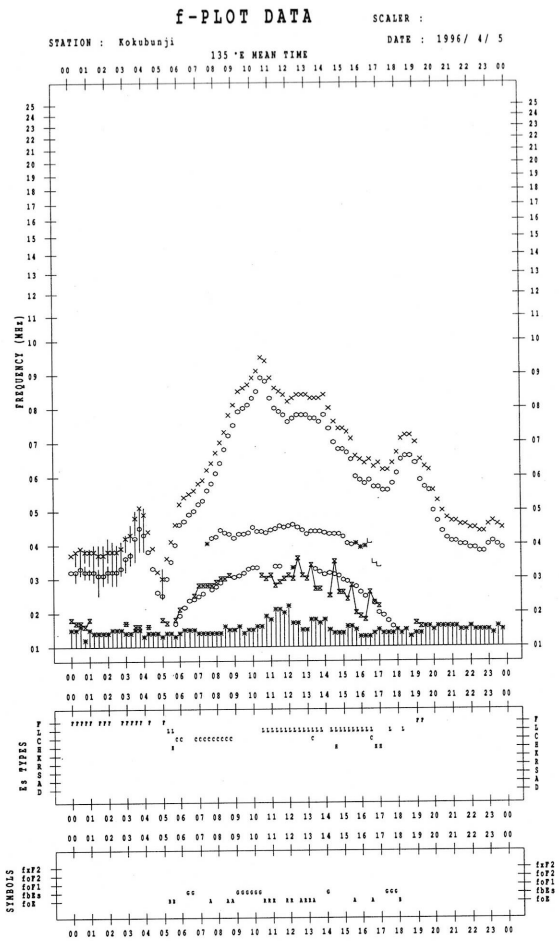
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

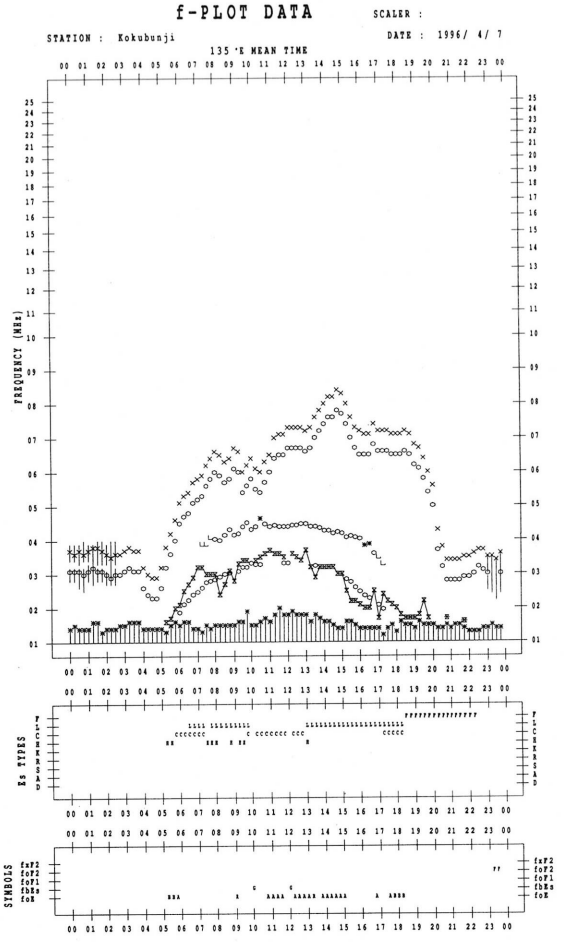

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

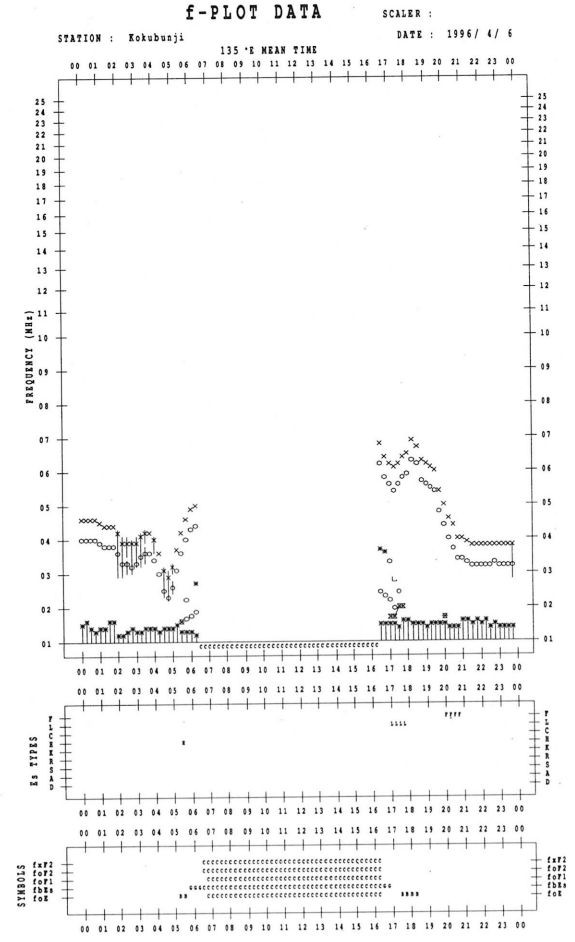

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

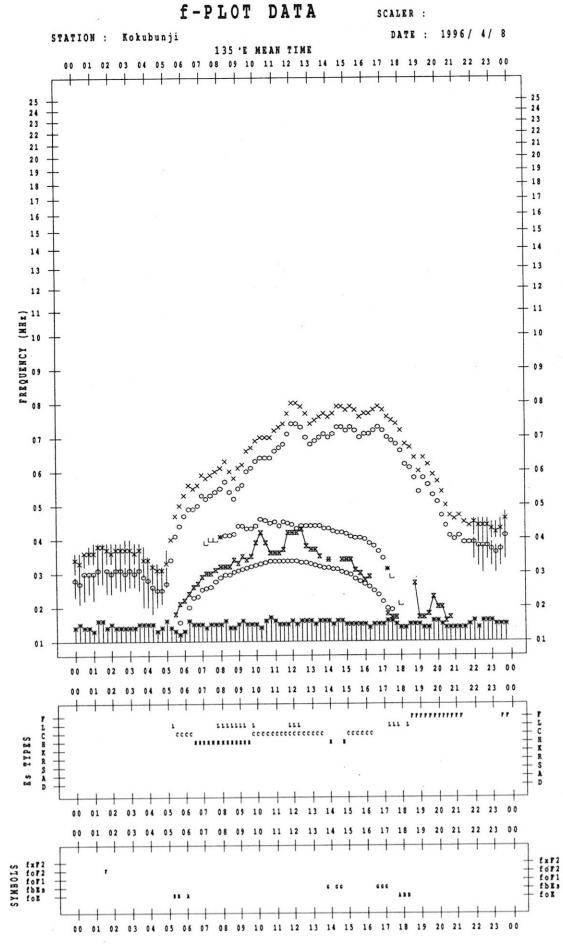

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

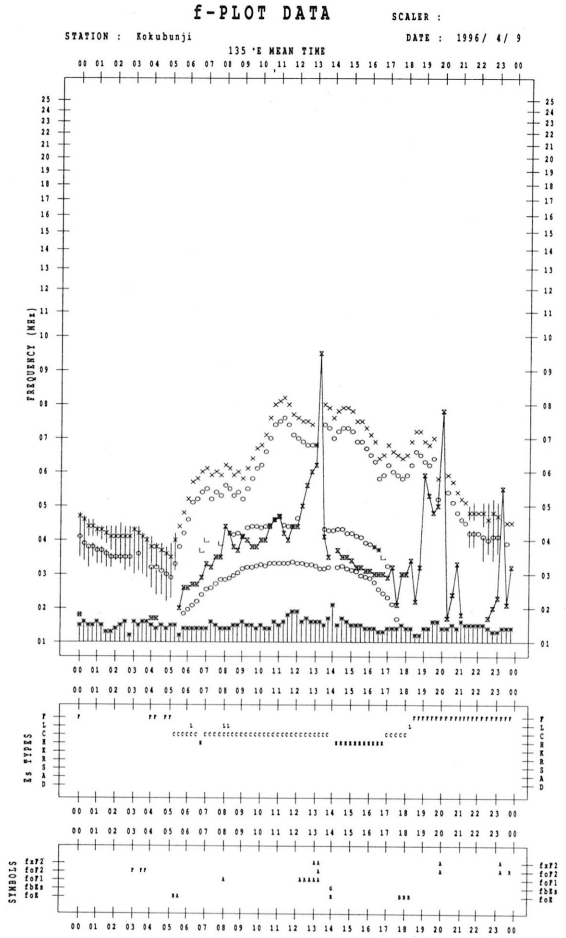

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

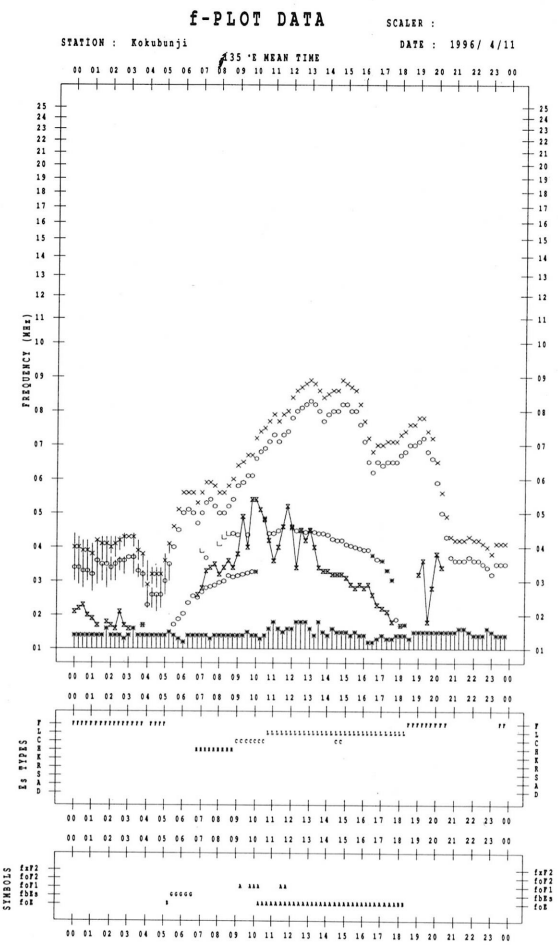

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

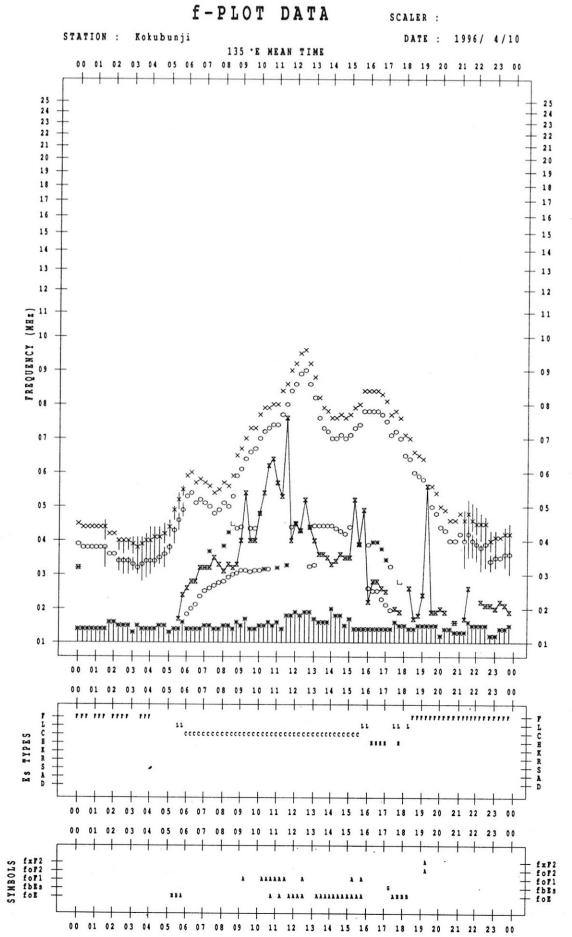

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

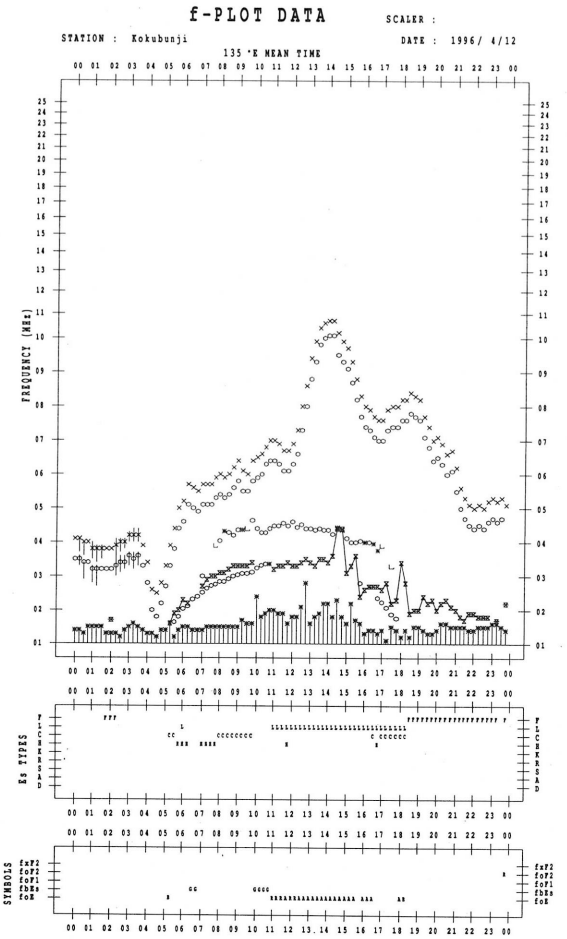

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

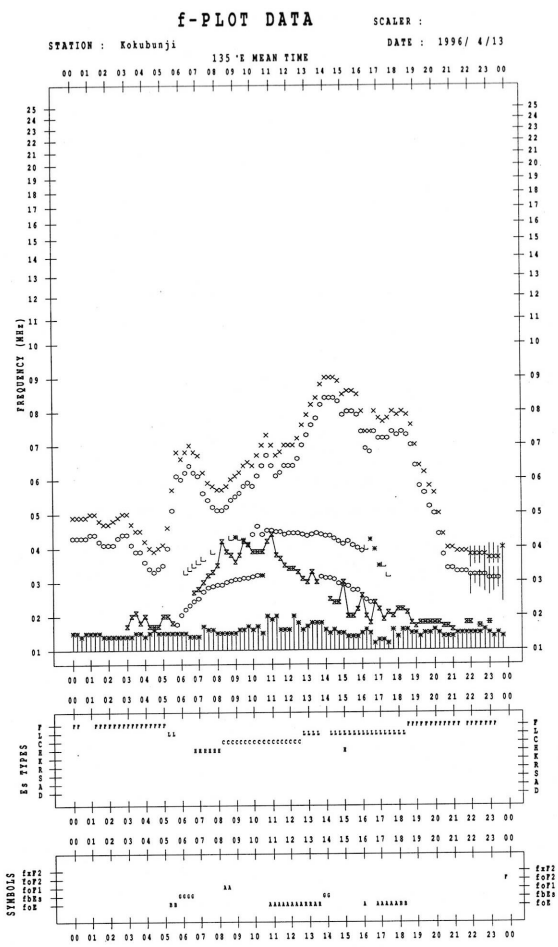

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

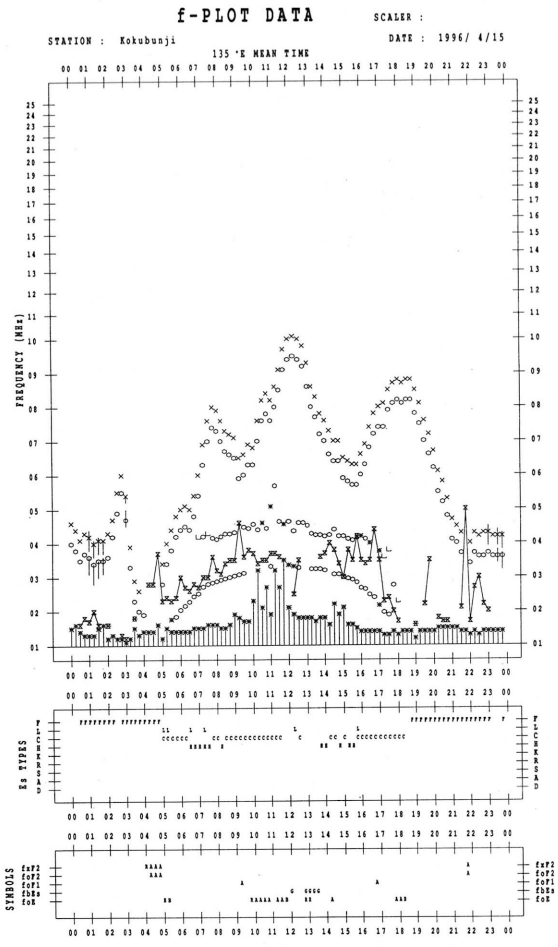

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

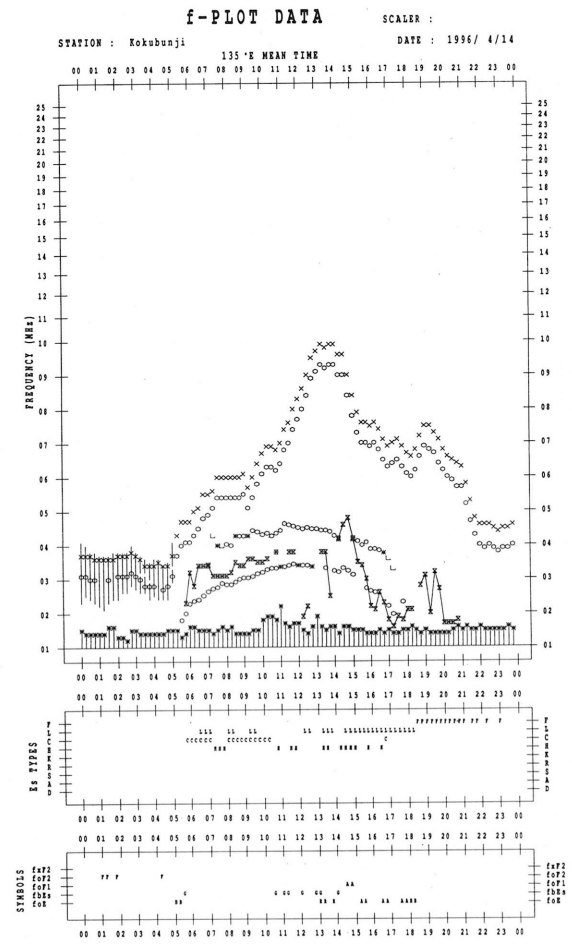

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

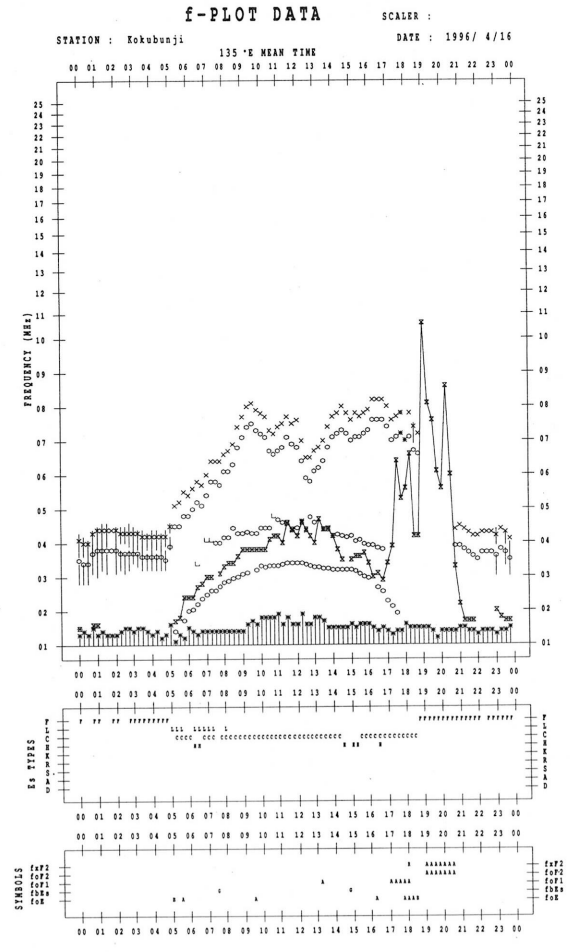

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

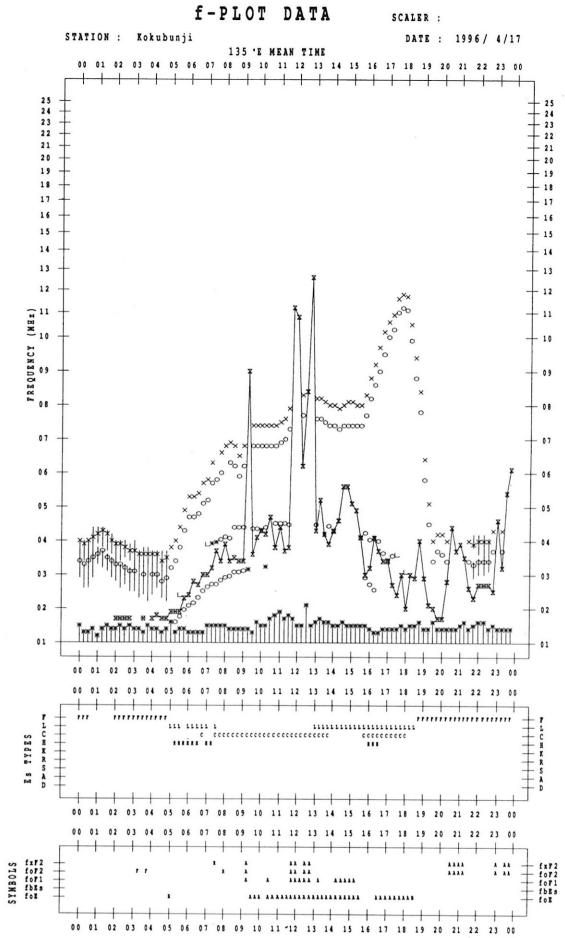

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

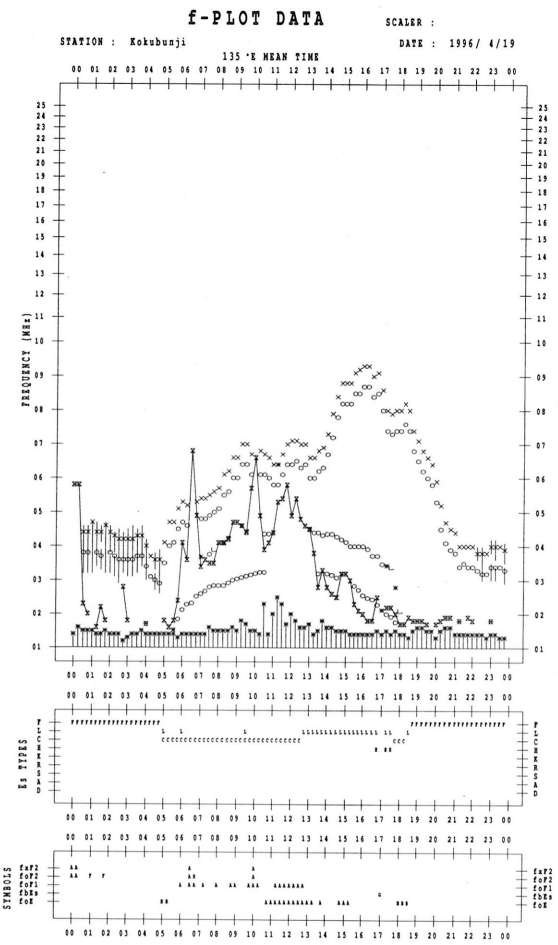

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

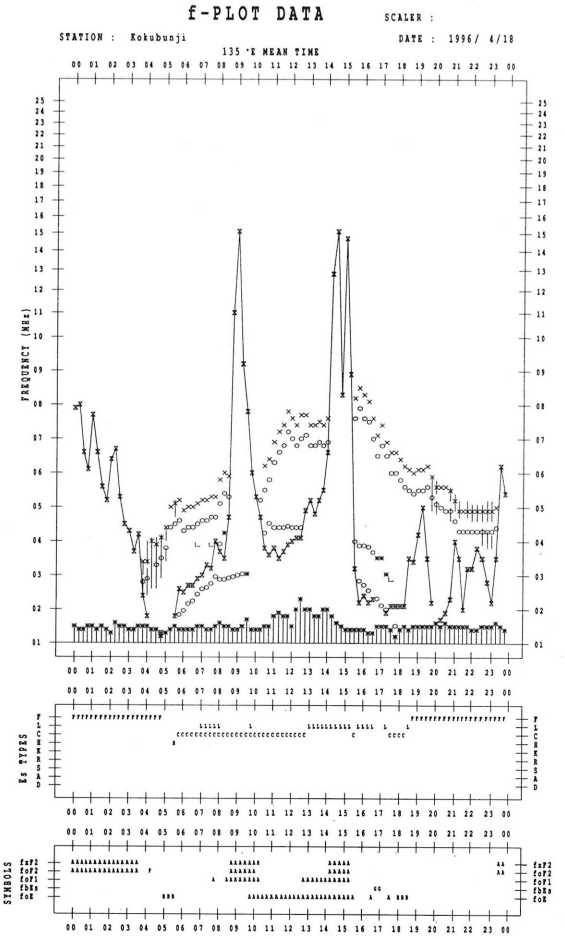

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

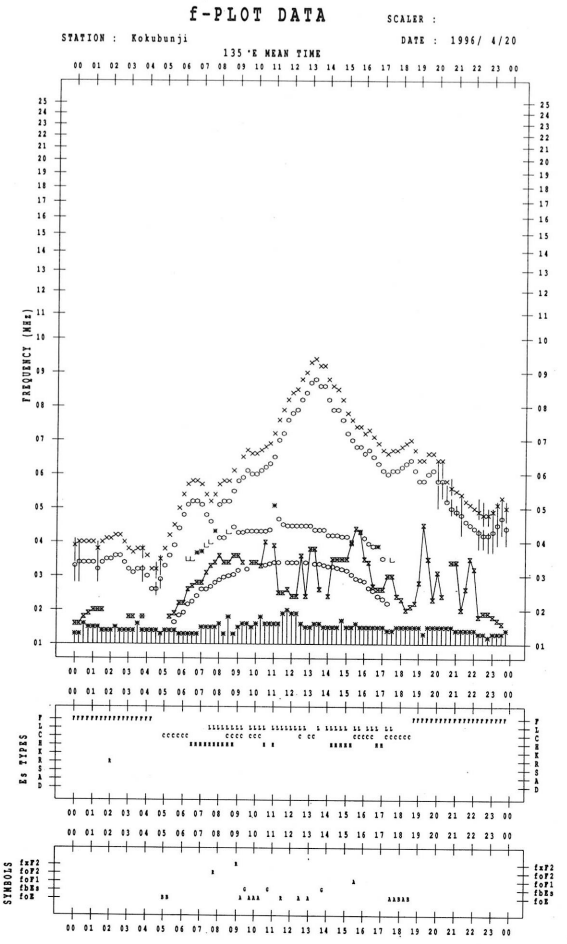

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

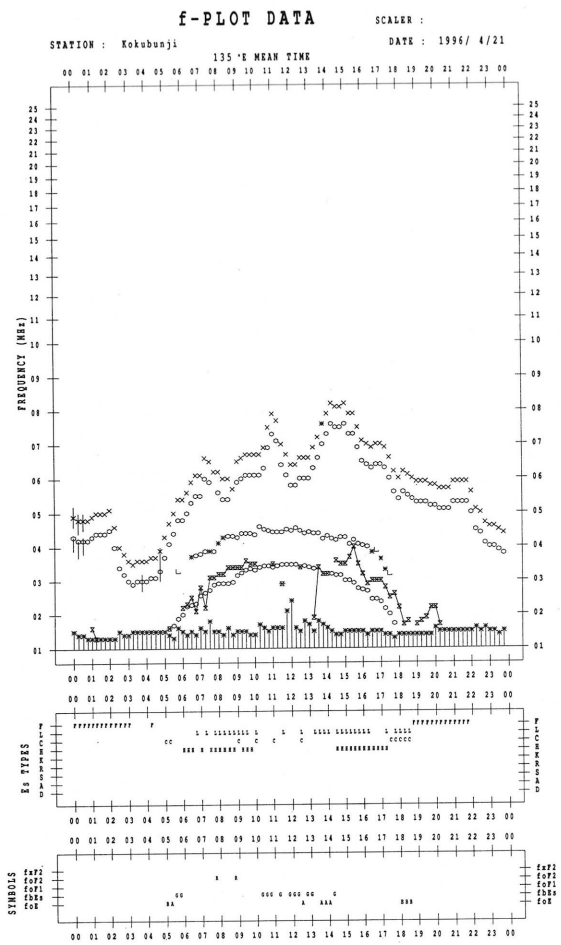

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

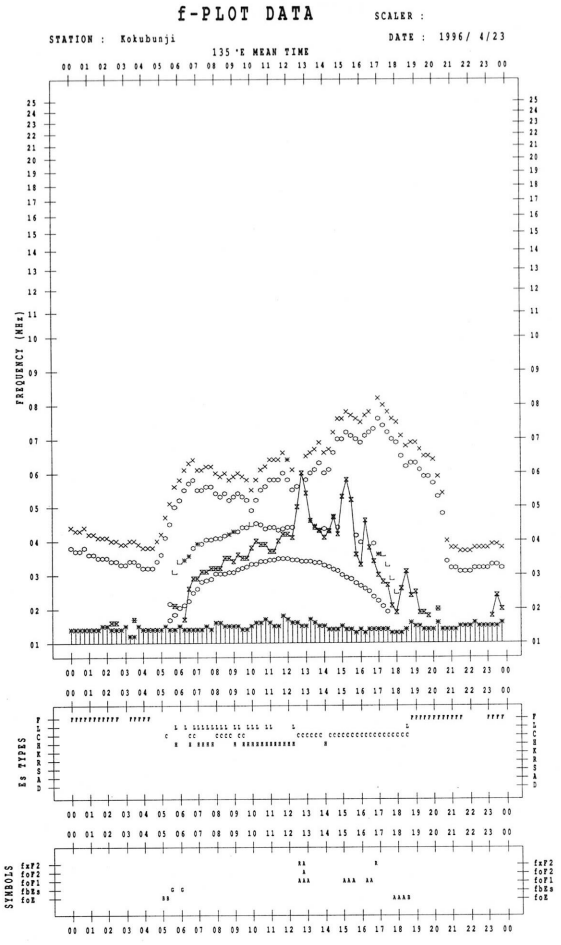

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

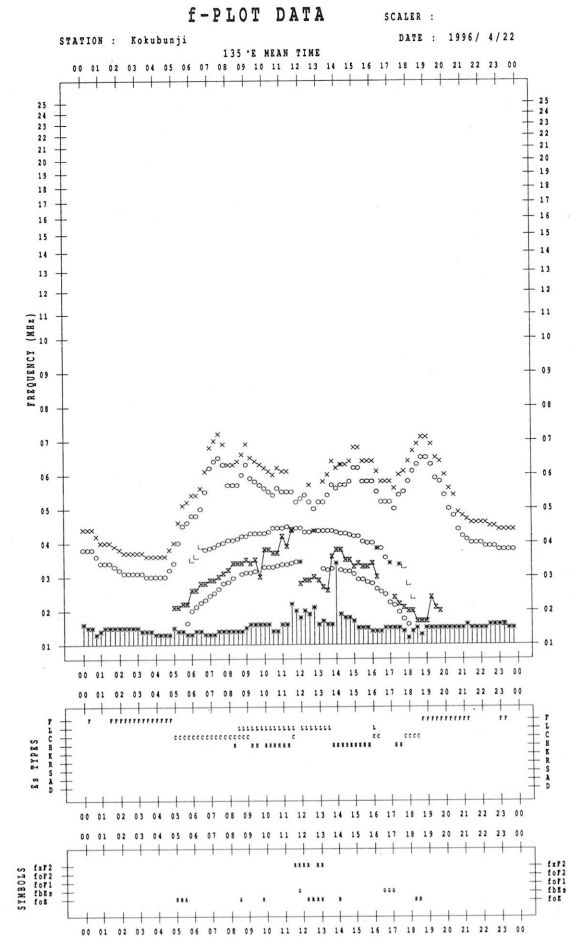

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

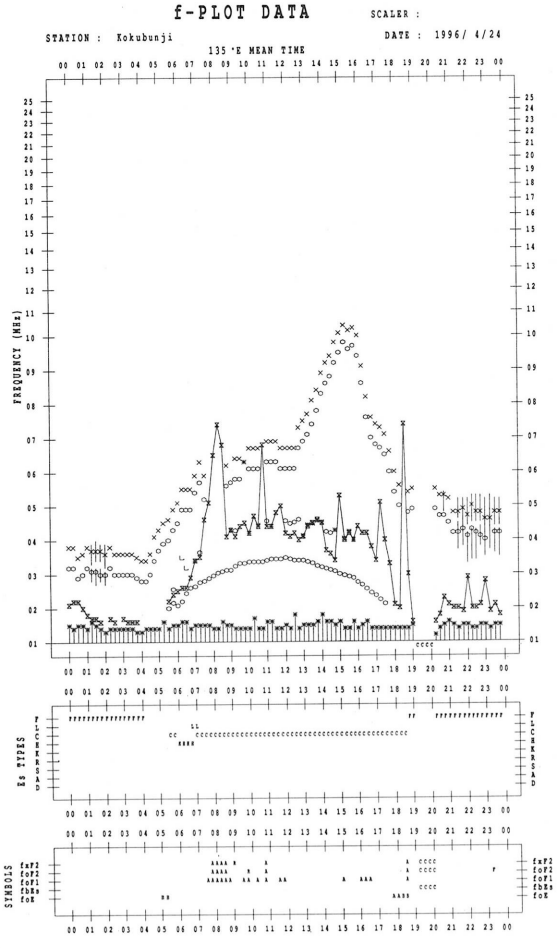

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

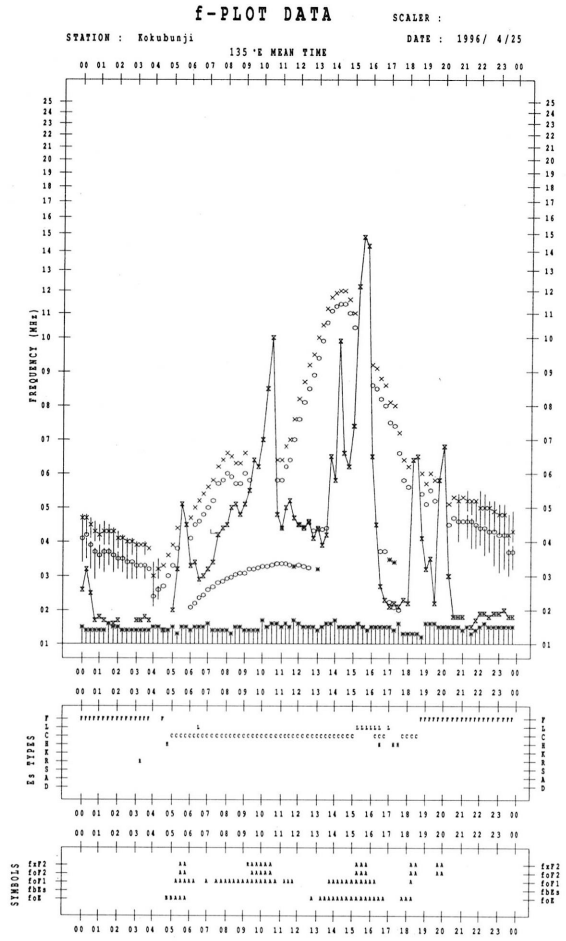

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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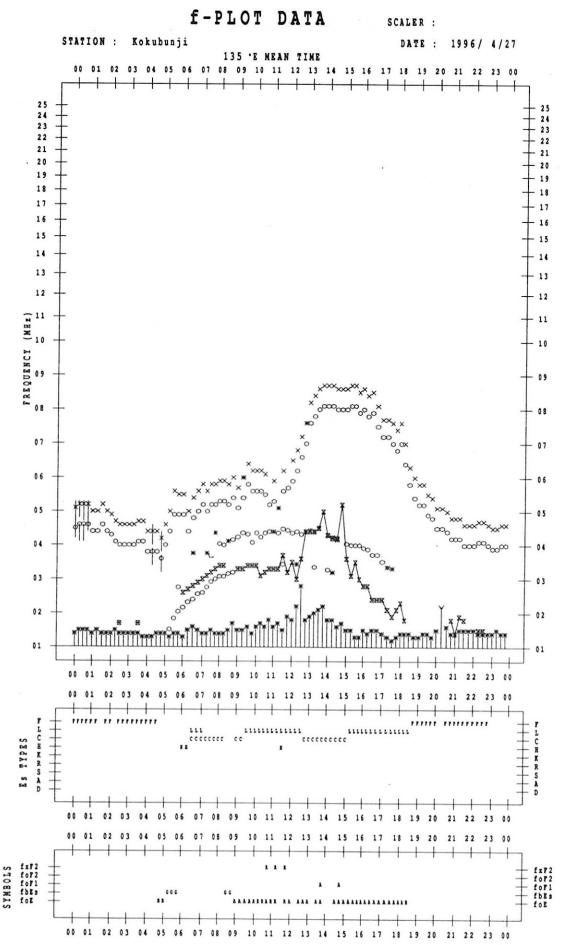
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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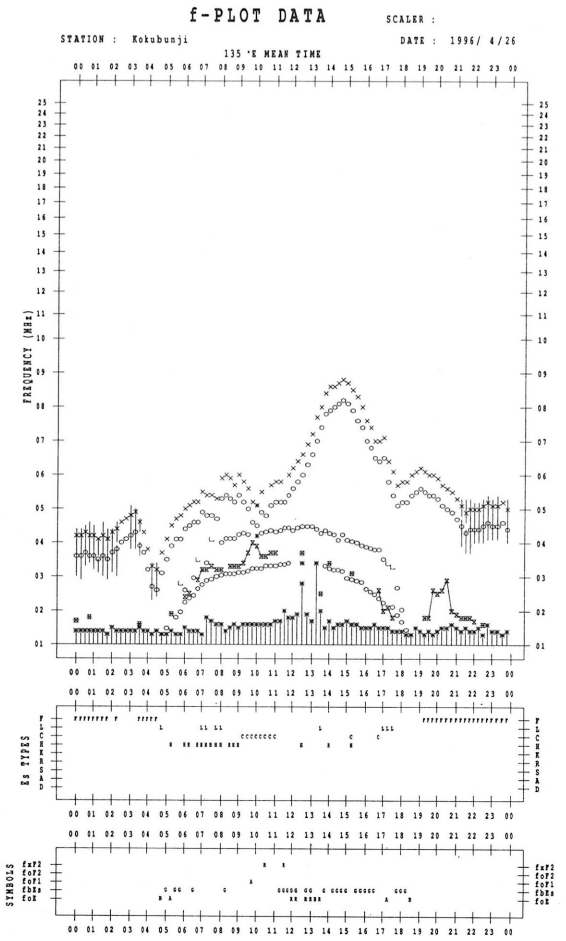
DATE : 1996/ 4/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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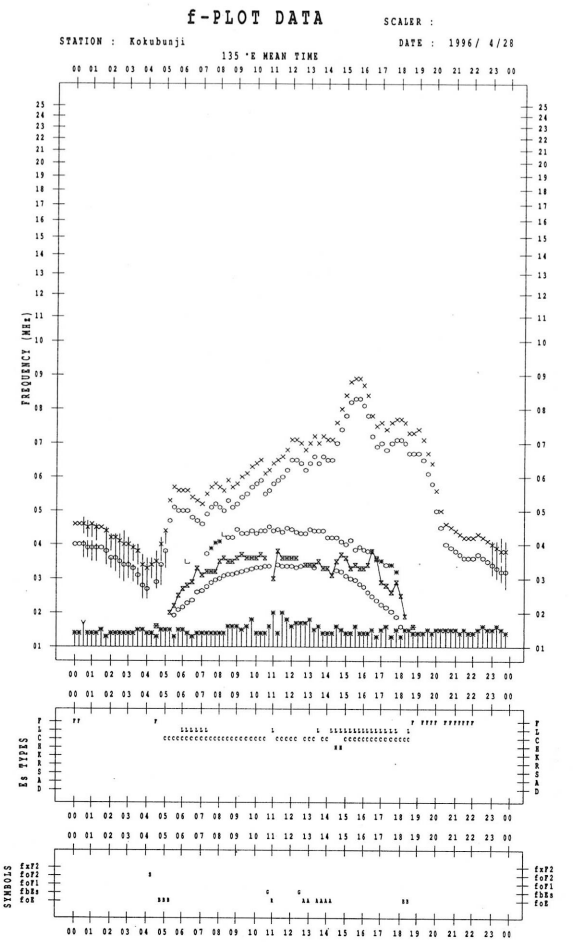
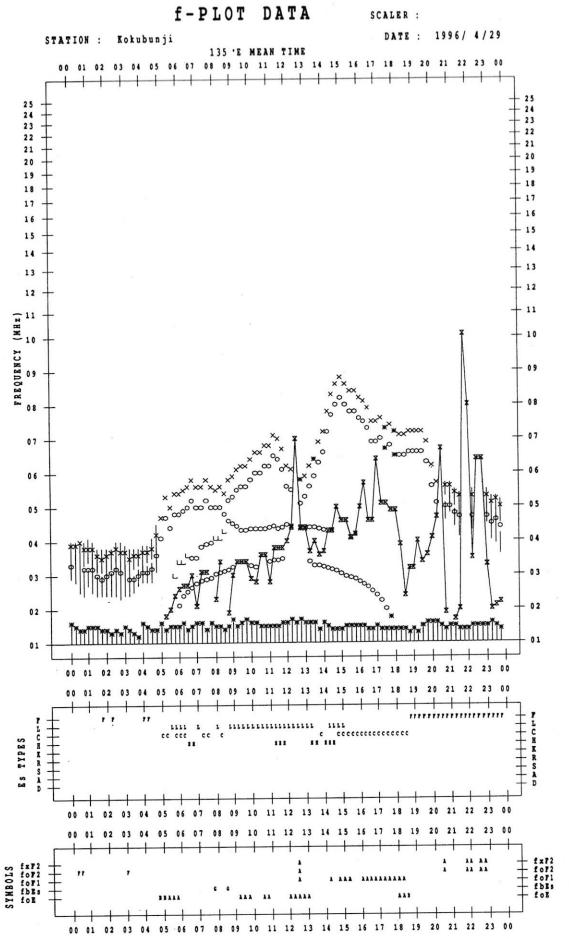
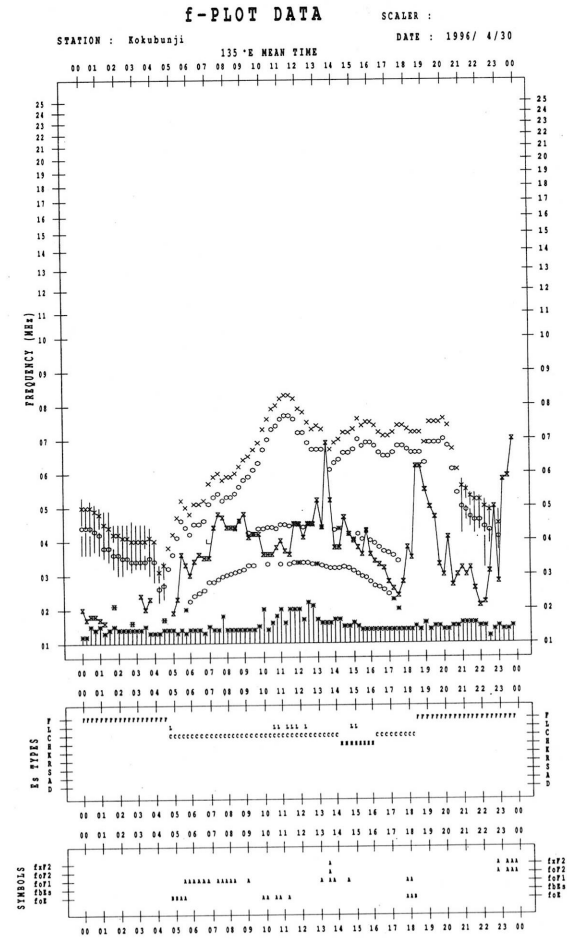
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 4/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Not available until system improvement is completed.

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso April 1996

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

Note: No observations during the following periods.

13th 2050 - 14th 0111 15th 2045 - 16th 2350
24th 2040 - 30th 2400

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso April 1996

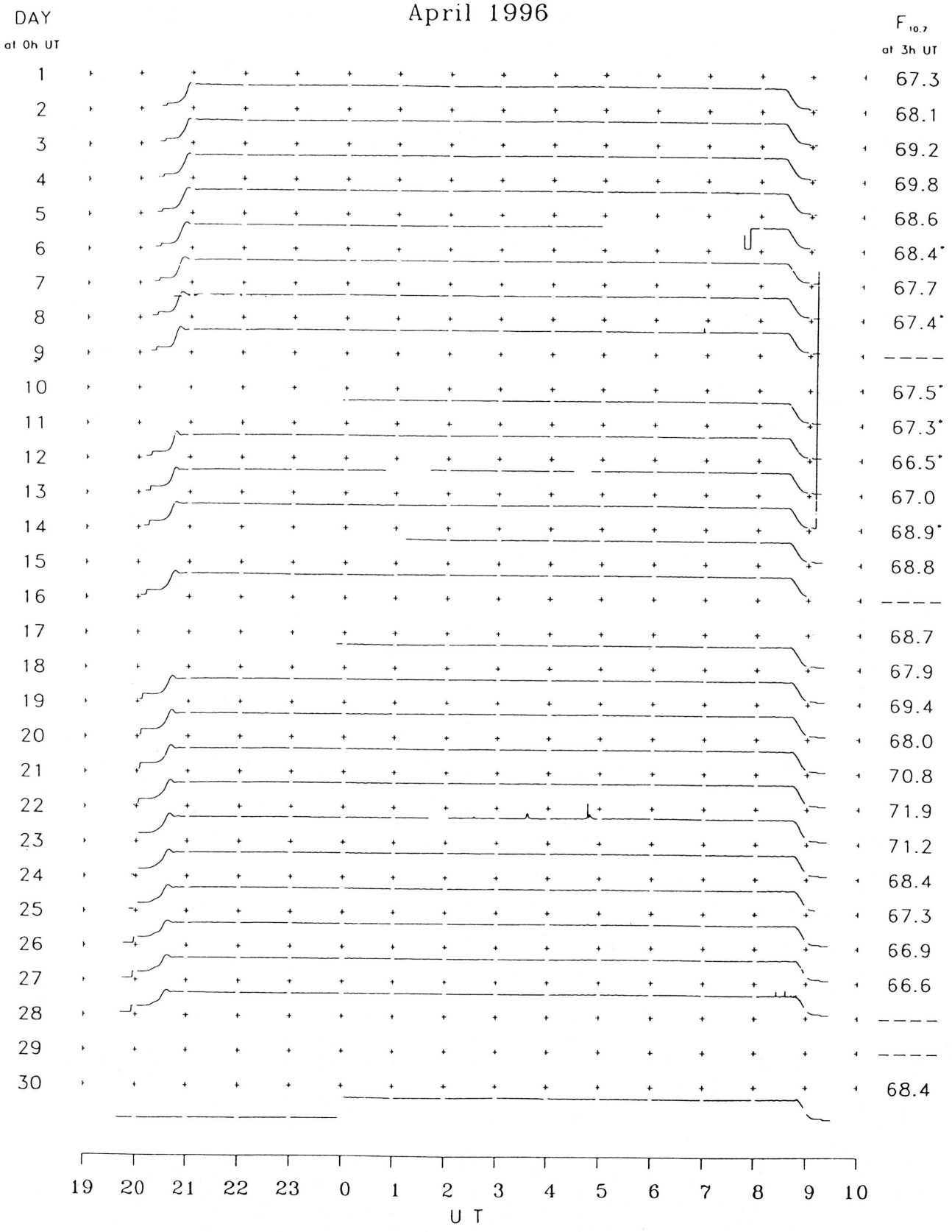
Single-frequency observations

Normal observing period: 2005 - 0900 U.T. (sunrise to sunset)

APR. 1996	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
3	200	8 S	2313.4	2313.4	0.8	10	-	0
9	200	42 SER	0745.9	0746.2	3.0	8	-	WL
21	200	8 S	0154.0	0154.3	0.4	100	-	0
22	2800	42 SER	0208.0	0210.6	3.0	4	-	0
	200	8 S	0210.3	0210.6	0.5	9	-	0
	200	43 NS	0221.0	0244.7	112	15	4	WR
	500	42 SER	0226.4	0226.9	8.0	20	-	0
	2800	8 S	0233.2	0233.8	0.7	6	-	0
	2800	8 S	0300.2	0300.5	0.3	18	-	0
	500	6 S	0300.2	0301.0	1.0	9	6	0
	200	8 S	0300.4	0300.5	0.5	43	-	0
	500	46 C	0333.7	0334.8	4.5	193	90	0
	2800	3 S	0333.7	0336.0	7.5	16	11	0
	2800	42 SER	0445.3	0445.8	8.0	45	-	0
	500	48 C	0445.3	0445.8	3.0	3680	1150	WR
	200	45 C	0445.3	0449.0	4.5	532	110	0
23	500	8 S	0041.5	0041.9	0.5	8	-	0

B. Solar Radio Emission

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



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

C. RADIO PROPAGATION

C1. H.F. FIELD STRENGTH (UPPER SIDE-BAND OF WWV)

APR 1996 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT	00H	01H	02H	03H	04H	05H	06H	07H	08H	09H	10H	11H	12H	13H	14H	15H	16H	17H	18H	19H	20H	21H	22H	23H
DAY	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M
		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
1	0	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
2	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
3	-24	-24	-1	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
4	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
5	-24	-24	-24	-24	-24	-24	-24			-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	E	E	E	ES
6	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	2	-1	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
7	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	
8			-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	-24	-24	-1
		S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
9	-5									-24	-24	-23	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES
10	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	C	C	C	C
11	-24	-24	-24	-23	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24				
	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES
12	-24	-24	-24	4	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	0	-24	-24	-24	-24	-24	-24
	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
13	-24	-24	-1	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
14	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
15	-24	-24	-24	-24							-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES			ES	ES	ES	ES	ES	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
16	-24	-1	0	-24	-24	-24	-24	-24			-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	-24	-24	-24	-24	-24	-24	-24	-24	-24															
	C	C	C	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
18				-24	-24	-24	-24	-24	-24	-24	-24	-24	-23	-23	-23	-23	-23	-23	-23	-23	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES
19	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-3	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
20	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
21	-1	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
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		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
23	-3	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
		ES	ES	ES	ES	ES	ES	ES	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
25	1	-24	-24	-24	-24	-24	-24	-24			-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES		ES
26	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	-24	-1	-24
	ES	ES	ES	ES	ES	ES	ES	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
27	-24	-24	-24	-24	-24	-24	-24			-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
28	-24						-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
29	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
30	-24			-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
CNT	28	25	26	28	27	27	28	26	24	26	29	29	29	29	29	29	29	29	29	29	28	28	28	28
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
MED	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
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UD	-1	-24	-1	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	-24	-24	-24
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LD	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24

C. RADIO PROPAGATION

C1. H.F. FIELD STRENGTH (UPPER SIDE-BAND OF WWVH)

APR 1996 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT DAY	00H 46M	01H 46M	02H 46M	03H 46M	04H 46M	05H 46M	06H 46M	07H 46M	08H 46M	09H 46M	10H 46M	11H 46M	12H 46M	13H 46M	14H 46M	15H 46M	16H 46M	17H 46M	18H 46M	19H 46M	20H 46M	21H 46M	22H 46M	23H 46M
										ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES			
1	3	10	9	13	16	19	19	6	6	-24	-24	-24	-24	-24	-24	-24	-24	-24	4	-24	-24	2	2	8
										ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES				
2	5	2	8	5	12	14	10	2	2	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	0	3	4
									ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES				
3	2	6	9	7	14	14	10	-1	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	8	4	-8	4
									ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES					
4	5	9	10	8	14	10	16	11	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	12	8	29	4	6
								S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES				
5	-3	4	10	19	14	17	16			-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	6	6	5	6
								ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	E	E	E	E	E
6	2	4	10	13	17	12	10	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	2	6	-3	3	2
									ES	ES	ES	ES	ES	ES	ES	ES		ES	ES					
7	2	4	9	9	9	12	16	7	-24	-24	-24	-24	-24	-24	-24	-24	-1	-24	-24	6	-3	4	4	-1
	S									ES	ES	ES	ES	ES	ES	ES	ES	ES	ES					
8		7	6	17	15	17	18	13	2	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	2	4	10	6
		S	S	S	S	S	S	S	S			ES	ES	ES	ES	ES	ES	ES	ES					
9	-5									0	-14	-23	-24	-24	-24	-24	-24	-24	-24	5	7	3	6	-8
											ES	ES	ES	ES	ES	ES	ES	ES	ES					
10	-1	2	6	7	13	12	18	16	16	4	-24	-24	-24	-24	-24	-24	-24	-24	-24	6	6	9	2	3
													ES	ES	ES	ES	ES	ES	ES	C	C	C	C	C
11	-3	5	-1	6	6	10	17	17	16	20	12	7	-24	-24	-24	-24	-24	-24	-24					
									ES				ES	ES	ES	ES	ES	ES	ES					
12	-1	15	9	14	14	17	14	12	-24	-8	-8	12	-24	-24	-24	-24	-24	-24	-24	-8	0	13	2	-3
									ES	ES		ES	ES	ES	ES	ES	ES	ES	ES					
13	4	2	-1	16	19	15	17	11	-24	-24	-3	-24	-24	-24	-24	-24	-24	-24	-24	-2	6	-1	2	6
									ES	ES		ES	ES	ES	ES	ES	ES							
14	2	6	9	15	10	10	16	7	-24	-24	-1	-24	-24	-24	-24	-24	-24	8	-1	5	-1	2	2	3
					S		S	S	S		ES	ES	ES	ES	ES	ES	ES	ES	ES					
15	5	6	12	12		6				7	-24	-24	-24	-24	-24	-24	-24	-24	-24	-6	-1	9	4	2
									S				ES	ES	ES	ES	ES							
16	2	11	6	6	8	16	16	9		-1	-8	-1	-24	-24	-24	-24	-24	2	-1	2	7	7	2	1
										C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	2	10	9	9	11	20	18	11	6															
	C	C										ES	ES	ES	ES	ES	ES	ES	ES					
18			6	10	13	15	14	17	9	0	0	-24	-23	-23	-23	-23	-23	-23	-23	4	6	0	3	2
												ES	ES	ES	ES	ES	ES	ES	ES	ES				
19	2	6	6	6	12	20	18	19	18	15	8	-24	-24	-24	-24	-24	-24	-24	-24	-24	6	12	-3	4
										ES	ES	ES	ES	ES	ES	ES	ES	ES	ES					
20	-1	6	11	16	16	15	15	15	25	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	4	4	9	4	4
									ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES					
21	5	7	7	4	19	14	18	21	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	12	6	4	2
												ES	ES	ES	ES	ES	ES	ES	ES					
22	-3	4	2	6	-1	15	16	14	14	6	1	-23	-24	-24	-24	-24	-24	-24	-24	4	8	-3	-6	-6
									ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES					
23	6	6	9	9	13	16	18	13	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	0	6	-1	-1	-1
										ES		ES	ES	ES	ES	ES	ES	ES	ES					
24	0	6	9	8	16	16	14	5	4	-24	-1	-24	-24	-24	-24	-24	-24	-24	-24	-3	-1	-1	-6	4
									S		ES	ES	ES		ES	ES	ES	ES	ES					ES
25	4	12	7	10	16	18	17	14		1	-24	-24	-24	-1	-24	-24	-24	-24	-24	3	1	-1	-1	-24
									ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES				
26	6	6	9	10	17	29	24	16	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	0	-3	-1	4
								S	S		ES	ES	ES	ES	ES	ES	ES	ES	ES					
27	-1	6	12	12	18	19	20			6	-24	-24	-24	-24	-24	-24	-24	-24	-24	4	6	-6	-6	4
		S	S	S	S								ES	ES	ES	ES	ES	ES	ES	E	E	E	E	E
28	-1					16	20	17	15	10	6	2	-24	-24	-24	-24	-24	-24	-24	7	3	0	-20	4
															ES	ES	ES	ES						
29	9	12	12	14	10	24	24	24	20	20	20	12	-3	-3	-24	-24	-24	-24	5	10	-3	-3	-1	-1
		S											ES	ES	ES	ES	ES	ES	ES				ES	ES
30	15		14	12	16	24	20	20	19	10	9	-3	-24	-24	-24	-24	-24	-24	-24	-1	7	3	-24	-24
CNT	28	26	28	28	27	29	28	26	24	29	29	29	29	29	29	29	29	29	29	28	28	28	28	28
										US	US	ES	ES	ES	ES	ES	ES	ES	ES	US	US		US	US
MED	2	6	9	10	14	16	17	13	3	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	1	6	2	2	3
													ES	ES	ES	ES	ES	ES		E				
UD	6	12	12	16	18	24	20	20	20	15	9	7	-24	-23	-24	-24	-24	-23	-1	7	8	12	5	6
									ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	E	E	E	E
LD	-3	2	2	6	8	10	10	2	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-3	-3	-8	-8

C. Radio Propagation

C2. Radio Propagation Quality Figures at Hiraiso

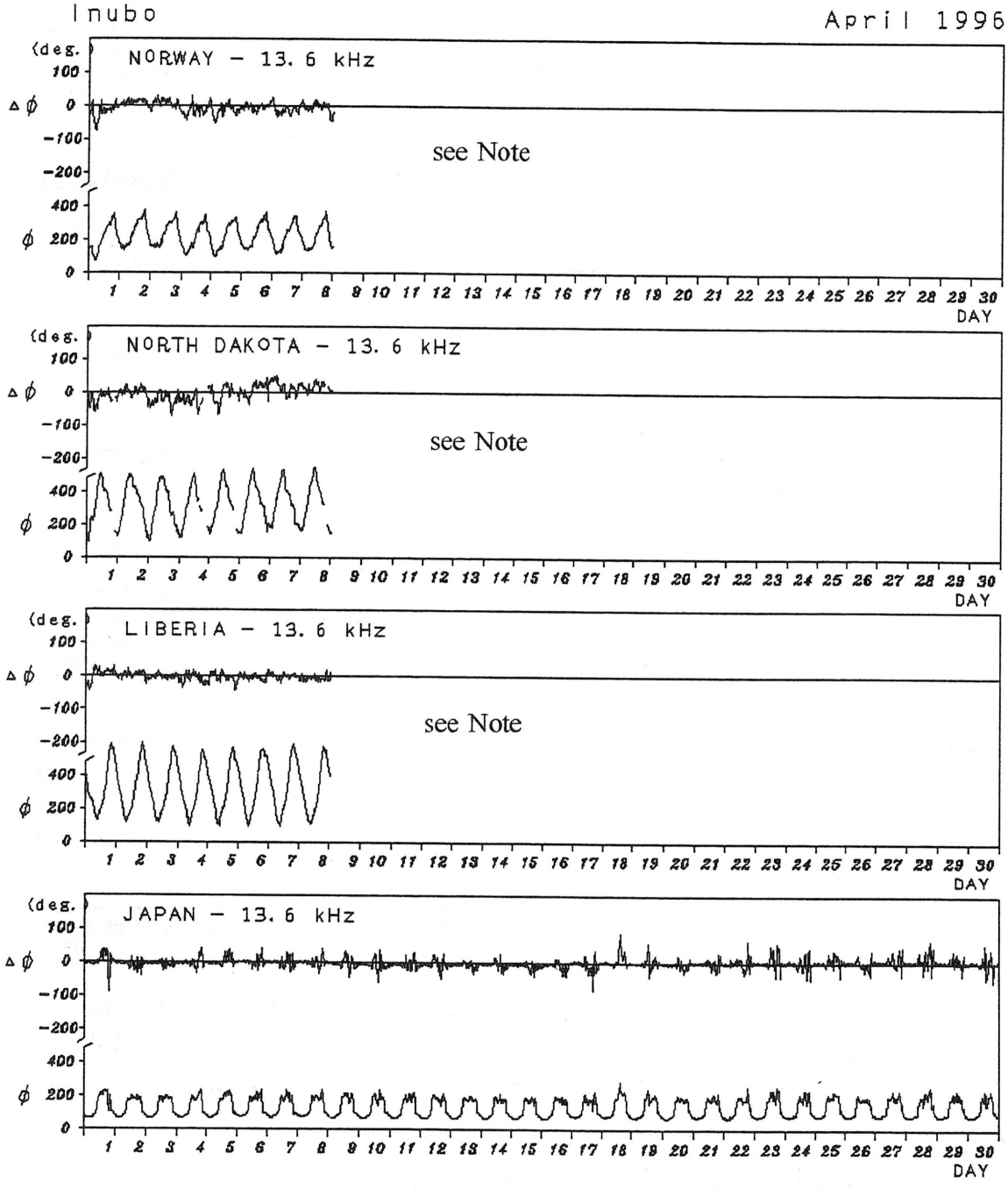
Hiraiso

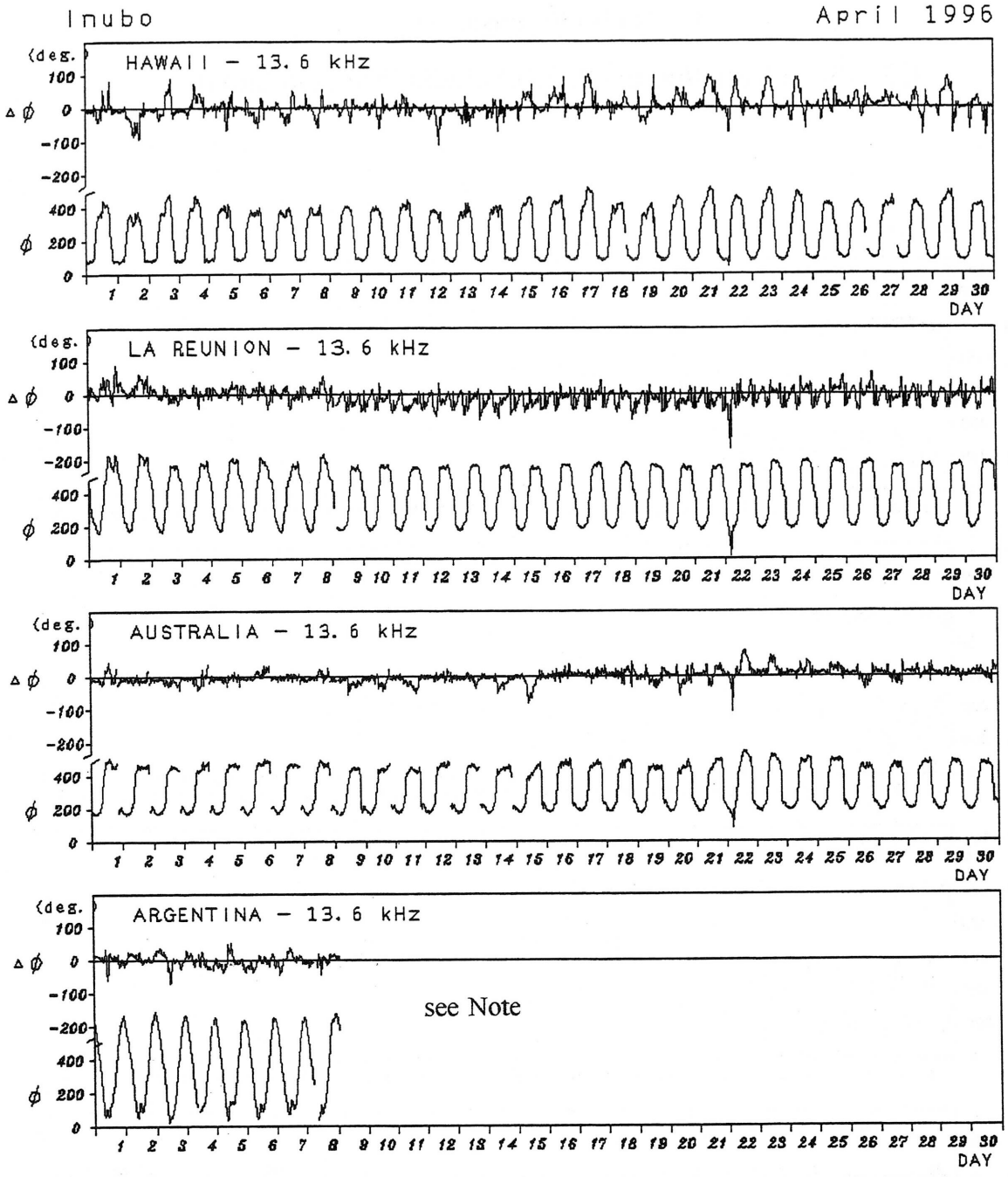
Time in U.T.

Apr. 1996	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Condition 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start h m	End h	Range nT
1	4- U	- - - -	4 4U - 3	N N N N	None		
2	4o U	- - - -	4 4U - 4	N N N N			
3	3+ U	- - - -	4 3U - 3	N N N N			
4	4- U	- - - -	4 3U - 4	N N N N			
5	4- U	- - - -	4 4U - 3	N N N N			
6	4- U	- - - -	4 3U - 4	N N N N			
7	4- U	- - - -	4 3U - 4	N N N N			
8	4o U	- - - -	4 4U - 4	N N N N			
9	4+ U	S S S S	S 5U - 4	N N N N			
10	4o U	- - - -	4 4 - 4	N N N N			
11	4o U	- - - C	3 5 - C	N N N N			
12	4o U	- - - -	4 4 - 4	N N N N			
13	4o U	- - - -	4 4U - 4	N N N N			
14	4- U	- - - -	4 3U - 4	N N N N			
15	4o U	- - - -	4 4U - 4	N N N N			
16	5- U	5U - - -	4 5 5U 4	N N N N			
17	4o U	- C C C	4 4 C C	N N N N			
18	4+ U	- - - -	4 5 - 4	N N N N			
19	4o U	- - - -	4 5 - 3	N N N N			
20	4o U	- - - -	4 4 - 4	N N N N			
21	4o U	- - - -	4 4U - 4	N N N N			
22	4- U	- - - -	3 5 - 3	N N N N			
23	4- U	- - - -	4 3U - 4	N N N N			
24	4o U	- - - -	4 4 - 4	N N N N			
25	4o U	- - - -	4 4U - 4	N N N N			
26	4o U	- - - 5U	4 4U - 3	N N N N			
27	4o U	- - - -	4 4U - 4	N N N N			
28	4+ U	S - - -	S 5 - 4	N N N N			
29	5- U	- - - -	5 5 5U 4	N N N N			
30	4o U	- - - -	4 5 - 3U	N N N N			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo





Note : As for NORWAY-13.6 kHz, NORTH DAKOTA-13.6 kHz, LIBERIA-13.6 kHz and ARGENTINA-13.6 kHz, no record during 9 April 0108 UT to 30 April 2400 UT, due to the receiver trouble.

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

NONE

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

(a) Short Wave Fade-out (SWF) at Hiraiso

Hiraiso

Time in U.T.

Apr. 1996	S W F								Correspondence	
	Drop-out Intensities(dB)					Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS	BBC						
22			18			0334	15	S	1+		
22		>43	42			0445	14	S	3+		
22			14			0227	18	SL	1		
22			12			0301	14	S	1		

NOTE CO:Colorade(WWV) HA:Hawaii(WWVH) AUS:Australia MOS:Moscow BBC:London
* Optical and X-ray Flares

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Apr. 1996	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
22		–	40	32	18	–	0229	0300D	0239
22		–	29	32	22	–	0300E	0330D	0307
22		–	140	86	50	–	0330E	0434D	0340
22		–	209	148	90	–	0434E	0610	0449

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