ISSN 0021—0382

F—567

IONOSPHERIC DATA IN JAPAN

FOR MARCH 1996

VOL. 48 NO. 3

CONTENTS

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TOKYO, JAPAN

INTRODUCTION

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

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

MAR. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	28	A	31	34	30	28	58	57	A	66	59	68	70	60	57		59			35	30	N	35
2	38	32	32	30	29	34	31	38	57		A	59	66	70	63	60	63	56		32	29	29	35	35
3	30	36	40	38	40	35	30	46		54	60	A	59	60	57	60	61	57		30	37	35	38	36
4		35	32	25	31	29	35	28	62	56	A	66	57	60		68		54	49	A	29	29	34	35
5	28	37	29	38	38	35	28	35	40	A	A	N	70	67	63	53		54		35	35	A	30	36
6	35	38	29	32	38	38	40	57	67	60		A	58	A	40	56	57	54	49	30	36	38	38	38
7	35	35	41		52	34		28	34	A	49	60	63	A	58	A	54		40	A	A	30	24	28
8	28	25		30	29	29	35				55	56	61	60	57	58	52	52	52		35	29	35	36
9		35	37	35	32	29	38	36		55	57	56	61	60	61	54		54		35	32	35	35	
10	38	35	34	29	30	34		46			A	60	69	62	61	58	54	61	41	38	38	35	35	38
11	38	36	35	30	35		38	43		56	61	58	71	68	69	78		59		40	35	56	56	
12		35	35	30	34		22		60	58	62	74	75	68		57	57	58	49	40	40		35	36
13	35	A	35	28	28		35	47	53	58	68	68	66	67	72	64	67	58	53			40	35	
14		35	32	31	22	28		A	57	63	58		68	67	61	A	55	57	54	38	35	32	36	40
15	37	30	28	30	30	29	35		68	61	69		67	61	60	57	57	58		38	40	38	35	38
16	35	30	36	29	30	29		46	56		64	61	58	65	65	67	58	59	52	56	40	40	38	
17	36		36	35	31	30	31	28		61	66	60	N	61	60	60	57	N	56	38	38	32	41	36
18	36	36	35	32	32	34	32	58	51		57	61	64	66	65	58	66	57	55	57	56	40	48	
19	37	36	32	32	35	36	38		57		69	64	70	64	65	56	56	56	57	61		57	44	58
20	56		37	38	41	42	40	30	56	58	65	61	71	70	65	68		58	60	58	56	56	57	
21		58		38			34	40	A	55	53	56	60	60	64	60	58	62	56	57	57	57		
22	35	28	B	59	28	29	30	A	A	A	67	61	65	67	66	62	62	60	56	36			36	
23	40	40	38	37	32	30	34	44		62	63	74	60	69	73	67			57		40	37	44	43
24	35	38	38	35	31	35		56	56	56	70	58	70	60	71	62	53	56	56		57	40	48	57
25		37	35	31	38	34	39	47		54	A	A	56	49	58	61	58	58			A	38	41	A
26	38	36	35	34	38	38	33	57	A	A	68	67	72	66	67	70	60	57	53		35	35		56
27		34	40	35	29	30	38	36		56	A	63	65	67	71	68		57	51	56	59	58	41	
28		38	38	37	38	29			55	57	59	A	A	58	59	55	57	68	60	56		35	38	34
29	31	35	34	32	31	36	35	41	58	61	A	A	58	58	67	61	58	58	52			58	56	56
30	56		34	32	43		40		56	58	57	63	58	68	77		57	48		40	38		35	38
31	36	40	43	43	46	37	38	48	55		58	63	66	66	65	60	56	50	53	57	38	29	38	40
	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	27	27	30	30	26	25	23	19	19	23	23	29	29	29	28	23	28	22	21	24	27	28	21
MED	36	35	35	32	32	34	35	44	56	58	62	61	65	66	64	60	57	57	53	40	38	37	38	38
U Q	38	37	38	37	38	35	38	48	58	61	67	64	69	67	67	65	60	58	56	56	40	40	42	41
L Q	35	34	32	30	30	29	31	36	55	56	57	59	59	60	60	57	56	55	51	35	35	32	35	35

HOURLY VALUES OF fEs AT WAKKANAI

MAR. 1996

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

MAR. 1996

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

HOURLY VALUES OF foF2 AT KOKUBUNJI

MAR. 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	A	35	35	34	29	B	32		57	68	80	90	96		74	68		57		38		49		34
2	36	34	30	34	38	34	34	47	48		63	84	76	85	77	67	59				35		A	
3	A	59	29	30	32	B	32				54	56	67	81			65	68		A	35	A	30	35
4	26	34	35	32	32		69		68	69	69	61	67	69	63	73	88	60		31	31	A		A
5	30	29	28	34	32		32	38	60	58	61	69	84	104	90	62	55	45	38	A	A	A	30	A
6	A		40	38	28	29		69		56	64	67	70	82	80		60	A	42	A	A			38
7	35	A	43	40	35	29		44	56	58	60	67	76	80	79	64	66	58	A	89	A	26		35
8	31	31	35	36		N	35	48	56	48	60	59	61		68	66	59	A	47		69	A	28	
9		34	34	34	A	B	23		69	59	69	67	72	78	68	58	A	A	45	35			35	31
10		34	35	30		N		45		52	56	72	91	100		60		50				69		34
11	34		58	38	N		69	69	68	53	58	74	82		74	66	68			47	56		47	36
12	47	45	32	34					58	67	84		93	105	84	68	58	62	61	56	40	46		46
13	36				31	23	N	68		68	66	77	90	81	76	80	70	66		37		32	44	44
14		38	30	A	29	N	A	68	68	68	92	88		82	74	66	72	A	48	49		A		37
15	36	35	A	A	B	B		69	69	68	79	83	96	84	80	76	68		40		37	35		56
16		32	34	31	B	N	48		57	62	64	70	69	80	76	75	71	61	60	47	38		35	B
17		32		35	29		A	73	66	60	A	60	67	62	58	63	82	86	60		35	N	35	
18	47				32	N	59	57	58	57	60	63	63	68	72	70	61		73	69	61	56		69
19			37	38	31	36	A	48	71		60	71	70	76	76	73	71	68		47	48	46		
20		B		35				70	59	58	68	77	74	96		60	62	71	70	68	59	58	A	59
21	56		44	36	B		A	67		68	65	84	98			60	63		69		57	57	48	47
22	46		56			N	A	69	73	67	74	76	72	67	66	74	77	74	68	69	35	37	A	35
23	36	N		36	B	26		69	69	66	74	91		79	80	76	75	71		A		A	A	38
24		39	34	43		29	43		54	58	62	81	78	87	86		67	60	57	57		25	A	A
25	31	35	32	41	32	35		69	50	66	62	A	64	74		83	70			67	35	38		N
26	31	38	32	35	38	N	31		70	53	66	80	82	91	96	68	58	61	66	60	41	38	38	42
27	44		38	34	34		37		48	55	A	68	81	88		70	58	58	58	68	69	44	34	44
28	38	34	43	37	35	B	64			56		62	84	78		64	67	68	68	57		37	34	30
29	36	28	35	34		N	65	69	74		60	64	78	71	71	67	67	A	53	A	49	58	43	
30	37			40	28		37				A	77	86	94	98	73		57	60	47	A		59	69
31	69		32	34	30	N	41		68		A	70	68	80	81		70	66	68	A	A	35	28	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	18	24	26	18		17	19	24	25	26	29	29	27	24	27	27	20	20	19	18	18	15	20
MED	36	34	35	35	32		37	68	63	59	64	71	76	81	76	68	67	62	60	56	40	41	35	38
U Q	45	38	39	38	34		61	69	69	67	69	80	85	88	80	73	71	68	68	68	57	56	44	46
L Q	32	32	32	34	29		32	48	56	56	60	65	68	76	71	64	60	58	47	47	35	35	30	35

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT KOKUBUNJI

MAR. 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	34	G	G		G	B	G	29	35	35	54	48	47	33	31	34	30	G		G	G	24	G	36
2	28	G		G	G	G	G	G	33	45	48	55	55	34	33	40	31	G	G	G	G	G	24	G
3		G	26	G	G	B	G	26	31	34	36	37	40	38		58	92	85			30	39	28	30
4		27	31	G	G				36	34	36	46	45	49	33	49	51	36	33	G	G	37		36
5	42	29	G	G	G		G	30	34	46	37	51	48	49	45	42	40	33	27	41		56	G	
6	32		G	G	39	G	G	G	23	30	30	30	31	30	47	56	50		68	60	49	36	25	G
7	G		30	30	28	G	G	33	32	35	32	38	55	29	44	35	35	49	38	30	29	24	G	28
8	G	G		G	G	G	G	26	30	34	45	37	32	32	48	42	42	52	G	G	25	26	26	G
9	G	G	G	G		B	G		33	43	48	48	51	32	34	44	57	56	G	G	G	G	40	29
10	G	G	G	G	G	G		33	40	44	48	57	49	42	52	52	31	G	33	34	29	G	G	G
11	G	G	G	G	G	G	G	33	30	34	38	31	34	32	32	34	33	27	G	G	29	G	G	G
12	G	G	G	G	G	G	G		33	34		46	42	46	30	30	32	27	G	G	G	G	G	G
13	G	G	G	G	G	G		32	31	41	50	50	50	38	38	37	40	37	34	25	G	G	G	G
14	G	G		36	26	G		35	44	44	36	44		34	48	48	41	72	57	28	54	31		36
15			28	30	B	B	G	32	36	54	48	49	56	52	38	58	45		G	47	G	G	G	G
16		G	G	G	B	G		28	34	31	35	38	30	37	31	28	25	G	G	G	G	G	G	B
17	G	G	G	G	G	G		29	30	30	30	31	38	38	30	30	32	36		G	G	G	G	G
18	G	G	G		G	G		29	34	43		31	29	27	30	29	32	G	G	G	G	G	G	G
19	G	G	G	G	G	G	34	36	43	44	54	33	34	32	36	28	33	28		34	G	G	G	G
20	G	B	G	G	G	G	28	30	30	29	40	34	32	31	30	28	32	G	G	G	G	26		G
21	G	G	G	G	B	G		32	32	32	36	38	44	31	30	30	32	26	G	G	28	28	G	G
22	G	G	G	G	G	G	28	30	31	31	34	34	42	33	37	36	34	29	G	G	G	G	30	22
23	G	G	G	G	B	G		35	39	48	52	48	39	38	27	48	35	34	32	40	G	45	57	28
24	30	G	G	29	28	30	29	35	43	44	44	37	48	42	32	35	32	30	G	G			57	40
25	28	30	G	G	G	G	G	34	43	46	34	39		34	27	30	25	27	G	G	G	G	G	G
26	30	G	G	G	G	G	30	29	37	48	49	73	37	37	40	47	40	30	G	G	G	G	26	29
27	G	G	G	G	G		28		40	37	46	37	36	35	33	30	33	31	G	G	G	G	G	G
28	G	G	G	G		B	27	30	33	29		34	32	39	37	31	25	30	G	G	G	G	G	G
29	G	G	G	G	G	G	27	28			30	31	41	68	48	50	59	72	60	42	48	30	G	G
30	G	G	G	G	G	G	30	37	48		67		44	34	49	54		50	29	40	41	36	G	G
31	G	G	G	G	G	G		32	44		71	54	40			35	37	60	49		60	30	40	32
	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	27	28	29	25	23	21	27	30	28	28	30	29	30	29	31	30	29	27	29	29	30	28	29
MED	G	G	G	G	G	G	G	30	34	36	42	38	41	34	34	36	34	30	G	G	G	G	G	G
U Q	28	G	G	G	G	G	28	33	40	44	48	48	48	39	44	48	41	49	33	34	29	30	26	29
L Q	G	G	G	G	G	G	G	29	31	33	35	34	34	32	30	30	32	26	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

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

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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				51			N	69	C	36		93	C	114	A		67	67	68	76		89	48	
2			79		A	89	N		72		207	134	86	94	164			59		60		C		72
3	C	B	A	47	B	59	23	A	51	76	76		67	85	100	116		72		C		70	69	
4	A			C	C	C	B	189	94				114	67			85		C		89	29	34	59
5	62			A	83		49			49	B	B		B	B	46	A				A	A		A
6	A		A				89	A	50		71								59			A	69	A
7	A	A				A	A		94	60			86		196	132		71			89			
8		69		60		A			49				138	78		72	70	59	54		A	A	49	
9	51						N	78	69			B		B	B	B	B	B	B		B	B	B	B
10	B	B			B		B	B				B	B	B	B	B			B		B		B	B
11		B		B		B	B		B	B		B	B	B		B			B	B	B			B
12	B			B	B	B		B					57			C	B	66	72	N	109			
13	79					N	B		57	B		74	87	B			83	66	59		60			
14	89		B	49	B			79	55	62	B	70	B					B				109		
15		79		59						72		87	109	A		120	B	71	60	60	A	A	79	79
16		59				79	B		66	59	67	77		112	114	100		73	73	79		N	A	59
17				59					45		56	68	74	74	73	83	96		70	69				
18			69						63															
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26																								
27																								
28																			79	89	89		69	
29	69	60	69	59				59	79						B			C				A	
30			99	C	A	C						C		C	149	C		C		69	A	A	49	
31		A		C	A	79	69	C	C									A			A		99	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									13															
MED									63															
U Q									75															
L Q									50															

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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		66		82	67		G	40	152	G	39	50	86	38	32	152	29	30	G	G		26	51	
2			C	G	32	G	G		40		118	68	40	43	51	63	55	22		24	G	C		36
3	C	B	32	23	B	G	G	C	30	C	C	31	32	41	51	68	40	40	51	C		36	G	26
4	34	38	41	C	C	C	B	45			74		118	52			52		G	G	G	G	27	G
5	G				48	40	G			32	B	B		B	B	72	C				46	39	50	30
6	C		40				23	46	29	34	32				48				29		36	39	40	57
7						37	52		49	41			46		58	44		29	22		24			
8		22		26		28			31				51	50	49	50	33	30	23		32	26	22	22
9							22		44			B	G	B	B	B	B	B	B	G	B	B	B	B
10	B	B	G	G	B	G	B	B	G	G		B	B	B	B	B	G		B	G	B	G	B	B
11	G	B	G	B		B	B		B	B	G	B	B	B		B	G		B	B	B	G	G	B
12	B		G	B	B	B		B	G							G	B	31	23	22			22	
13	22	22		46		22	B		29	B		42	40	B			39	31	27	26	22	22	22	22
14			B	G	B			25	40		B	33	B					B			30	23		
15	G			26						39		32	37	43	G	78	B	39	49	48	59	38		22
16	22	26				G	B		31	30	30	49	31	26	30	27	31	31	31	30	22	22	28	22
17	22		22	22	23	22	22		41	30	38	30	30	40	38	30	32	30	22	22				
18			28						28															
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26																								
27																								
28																		G	G	G	G	G	G	G
29	G	G	G		G		46	42	G						B	G	G	G	G	G	G	C	G	
30	G		G	119	C	C	G	G	G	G	G	G	G	C	38	G		G		G	C		47	G
31	G	168		G	C	G		G	G	G	G	G	G	G	G	G	G	91	G	G		G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10		10	11		10	10		17	10		10	13		11	13	12	14	14	14	12	14	14	12
MED	G		12	23		12	12		30	30		32	37		38	44	32	30	22	G	23	22	22	22
U Q	22		32	46		28	23		40	34		49	48		51	70	39	31	29	24	34	36	40	28
L Q	G		G	G		G	G		G	G		30	15		30	G	G	22	G	G	G	G	G	G

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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		14		23	20		15	20	C		17	17	33	20	14		15	16	16	18		16	17	23
2	18		20	15	15	15	14		16		53	30	18	23	30	28	29			14	14	24		20
3	16	B	14	14	B	15	16	21	14	20	24	17	18	21	27	28		15	20	C		20	15	15
4	15	15	18	15	21	22	B	17	21		22	20	23	20		23	16		21	14	14	15	15	15
5	21		18	28	20	14	14			15	B	B		B	B	16	16				14	14	14	14
6	14		14				14	14	14	14	14			14	14				14		14	14	14	14
7	14	14				14	14		14	14			14		14	14		14	14		14			
8		14		14		14			14				14	14	14	14	14	14	14		14	14	14	14
9	14						14	14	14			B		B	B	B	B	B	B		B	B	B	B
10	B	B			B		B	B				B	B	B	B	B			B		B		B	B
11		B		B		B	B		B	B		B	B	B		B			B	B	B			B
12	B			B	B	B		B					14			24	B	14	14	14	14	14	14	
13	14	14		14		18	B		14	B		14	14	B			14	14	14	14	14	14	14	14
14	14		B	14	B			14	14	14	B	14	B					B			14	14		
15	14	14		14						14		14	14	22	14	14	B	14	14	14	14	14	14	14
16	14	14				14	B		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
17	14		14	14	14	14	14		14	14	14	14	14	14	14	14			14	14				
18			14						14															
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26																								
27																								
28																				16	17	17	16	15
29	16	17	16	17	16		15	21							B			C		20	26	24	17	26
30	18	24	22	20	21	21	20				26	C		21	24	C		C		18	18	26	23	17
31	20	24	17	27	23	21	26	C	C							48			20		20	18	18	17
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	10	10	13		11	11		12				11	10	10	11			12	11	15	16	14	14
MED	14	14	16	15		15	14		14				14	20	14	16			14	14	14	14	14	15
U Q	18	17	18	21		21	16		14				18	21	24	28			18	18	17	19	17	17
L Q	14	14	14	14		14	14		14				14	14	14	14			14	14	14	14	14	14

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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	36	44		A	A	B			A	66	83		126	130	134	124	92		81		50	A	89	
2				69		49			54	62	70		97		123	121	101	104	82		66			43
3			B	38		A		A	A	54	56	66		90			93		68			A		
4	39	46			A		A		A	70	69		58	73		71		70	57	A		109	A	
5	A		89	A	32	A			49	57	59		98	120	120	121	80	A	59	A	43	A	A	A
6		A	A	B	B	A	A	A	A	A	90	99	106	131		133			83	A	A	A	A	70
7	61		A	54	55	A			53	63	55	91	96		133		111	90	82	43	44		46	
8		46			44	A			A	59		68	91	92		120	93			A	A	A	A	69
9	59	A	39		B	B		A	A	A	66	73	93	96	104		90	59	67	42		109		
10	32		46		A	B		A	A	A	55	70	100		128	131	92		57	58			49	
11				49	B	B		A	A	A	A	91	92	119	112	80	87	69	70				89	
12	B	38	A	36		B			A	A	89	98	110	114	123	108	91	91	94	88	86			48
13		69			B	B	B	A	49		64	78	92	101		90	91	88	62					59
14		89	56		B	38		A	A	92	98		92		130	130		A	60	A	A	A	36	A
15	40	37	47	40	A		A		33	A	94	91		147	148	142		108	85		A	A	A	A
16	43		44	A	38		B	59		64	68	93	122	143		136	132		69	69				A
17	89		59	37		B		109	54			86	112	121	128		128		86	A		A	A	27
18		69						39	A	56	54	A	90	88		92	93		94	84				
19			69	A	59		A	A	59	70		94		110	131				91	A			A	
20		59	A	49					A	A	A	82			124	107	102	106	88					35
21	A			49	B		B	89		A	65	84	101	134	128	120	88	83	91	A	A	A	A	
22			49	A	A	A	A		A	A	90	93		130	147	166			121	99	A	A	A	A
23	40	A	A	79	A	A	A	A	44			92		121	120	112	127		83	A	44	A	A	
24		89		38		B		38	A	69	62	81	96		121	126			82	84	66			
25	A	69	A	A	44	A	A	A	44	A	72	68	62	85	127	126	120	93	99		42		A	A
26	A	A	A	39		A	69	53	62	68	83	90	92	112	106	107		86	83	84	A	A	A	A
27	46	A	69	71		49		A		67		60		121			93		92	82	79			
28		99	89		B	B			57			90		99	104	N			83	74			A	A
29		89	89			B			53		94	83	94			73	85	A	63	54	A	A	A	37
30	37			A	69	69			62		84	92			135	103	100	93	92	84	A	A	A	A
31	A	A	A	A	A	A		A	70	N	82	67	82		124	124		91	86	83	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	13	12	13					14	14	23	25	22	22	22	24	21	14	30	14				
MED	40	69	58	49					54	65	70	86	95	116	126	120	93	90	83	82				
U Q	59	89	79	61					59	69	89	92	101	130	131	128	106	93	91	84				
L Q	37	45	46	38					49	59	62	71	92	96	120	105	90	83	68	58				

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HOURLY VALUES OF fEs 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	G	G			43	B	G	G		32	36	48	48		48	44	45	54	38	32	28	36	36	
2			G	G	G	G	G	G	48	34	42	38	34	42	38	38	33	36	G	G	G		G	G
3	G	G	B				G	45		34	36	36	38	37	G	34	43		G		G	45	G	G
4	G	25	34		61	G	48	44	43	42	61	52	56	63	64	63	65	55	38	37	G		48	G
5		G		39	39		G	G	34	46	49	50	60	58	66	69	60	66	42	34	45	39	48	45
6	G	30		B	B	28		42	48	48	38	39	56	66	69	44	60		60		39	38		
7	G			45		27	G	G		36	37	40	40	38	32	36	36	34	G	G	24	G	G	G
8	G	G	G	G	G	27	G	G	34	42		43		40	36	38	38			36	44	44	46	G
9	G		G	G	B	B	G	36	42	42	45	48	48	G	61	49	42	43	G		G	G	37	G
10	G	G	G	G		B	G		42	42	44	40	49	50	43	42	38		G	G	24	43	G	G
11	G		G	G	B	B	G				48	52		51	42	38	46	46	G	G	G	23	G	G
12	B	38	34	G		B	G	G	29		36	38	36	38	41	31	35	35	G	24	G	G	G	G
13	G	G	G		B	B	B	34	33	36	36	44	50	39	38	44	51	44	37	G	G		G	G
14	G	G	G	G	B	G	G	45	42	61				66		47		72		43	91	93	G	26
15		38	27	42	36	G	43	G		59	61	47		60	64	50	57	60	51	40	39		57	39
16	27	24	25	30	28	G	B	G	26	28	39	36	38	44			38	44	34	30	G	G	G	
17	G	G	G	G	G	B	G	G	60		28	34	38	30	36	G	32		G		G	26	29	G
18	G	G	G	G	G	G	G	G				55	45	36	38	40	37		G	G	G	G	G	G
19	G	G	G		G	G		42	53	53	43	37	47	40	47	51	44		40				22	G
20	G	G		G		G	G	G	48	44	51	43	94	52	38	40	38	32	G	G	G	G	G	
21		G	G	G	B	G	B	32	40	38		42		G	36	53	42	39		34	44	49	48	G
22	G	G		40	48	36		G		54	60	37	G	34	38			46	29	40	28	48	42	33
23	G			35		40		44	41	36		51	50	52	49	48	48	41	41	44	41	44	39	G
24	G	G		G	G	B	G			51	42	54		39	38	36	31		G	G	45	G		G
25	48		66	40	39	28		41	37	48		51	39	40	47	35	32	37	G	G	G	G	25	
26	50	35	42	G	G	28		28	40	34	31	47	56	44	52		G	25	32	29	25		38	48
27	G	37	34	G	G	G	G			52	52	49	48	39	38	G	G		33	G	G	G	G	G
28	G	G	G	G	B	B	G		32	38	40	43	53	41		34			27		G	G	38	43
29		G	G	G	G	B	G		30	38	30	25	40	72	62	49	58	80	39	44	48	88	38	
30	38	G	G		G	G	G	48	35	38			36	G	40	27	G	27	G		32	41	48	
31	84		62	47	50	26	G		48	38	40	47	43	56	40	38		37	34	31	27		45	35
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	24	22	24	18	19	22	24	22	27	24	29	25	30	28	28	27	21	28	24	30	24	29	24
MED	G	G	G	G	G	G	G	14	40	42	41	43	47	40	40	40	38	43	28	30	24	31	29	G
U Q	G	24	34	37	39	28	G	42	48	48	48	49	51	52	50	48	48	54	38	36	39	44	43	29
L Q	G	G	G	G	G	G	G	G	34	36	36	38	38	38	38	35	33	35	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

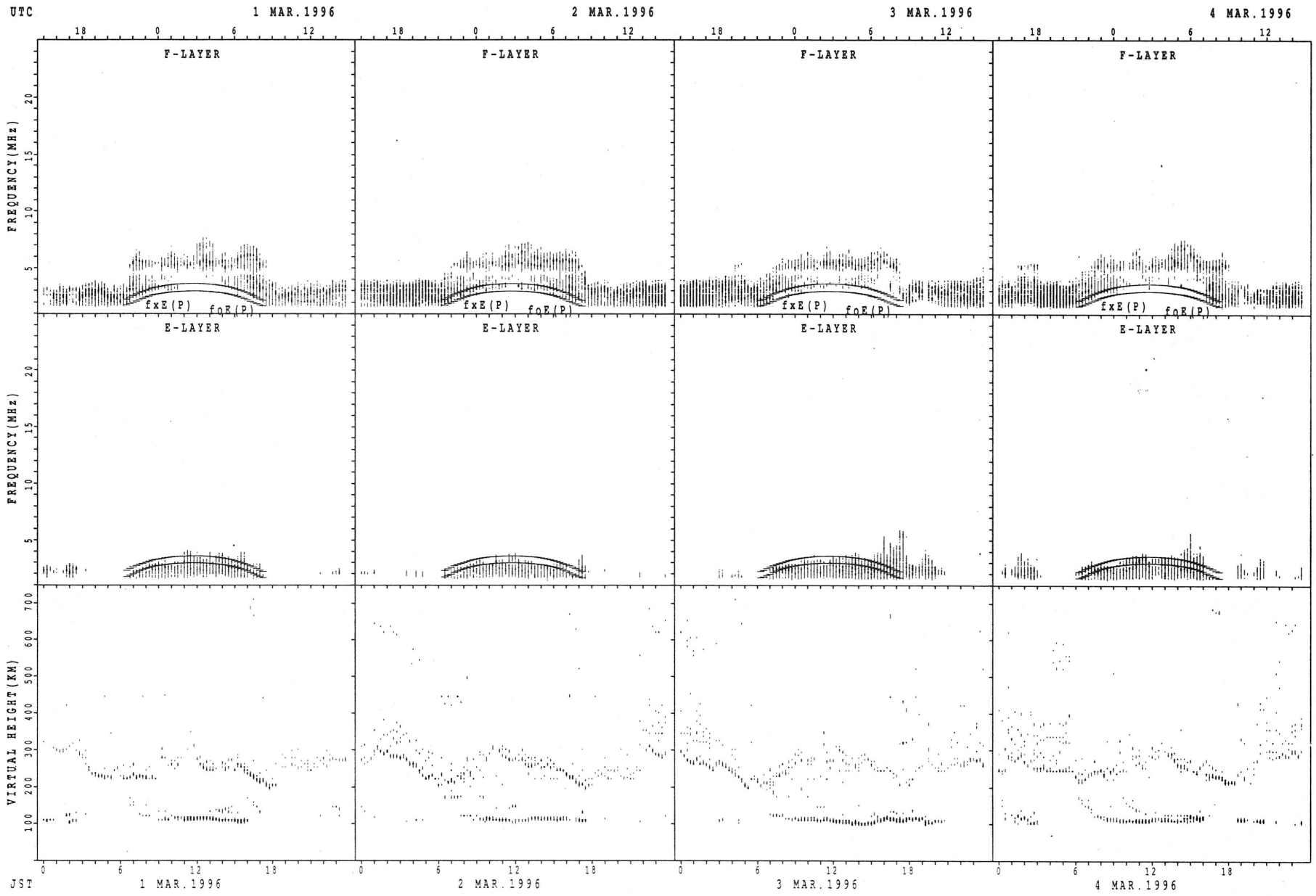
HOURLY VALUES OF fmin AT OKINAWA

MAR. 1996

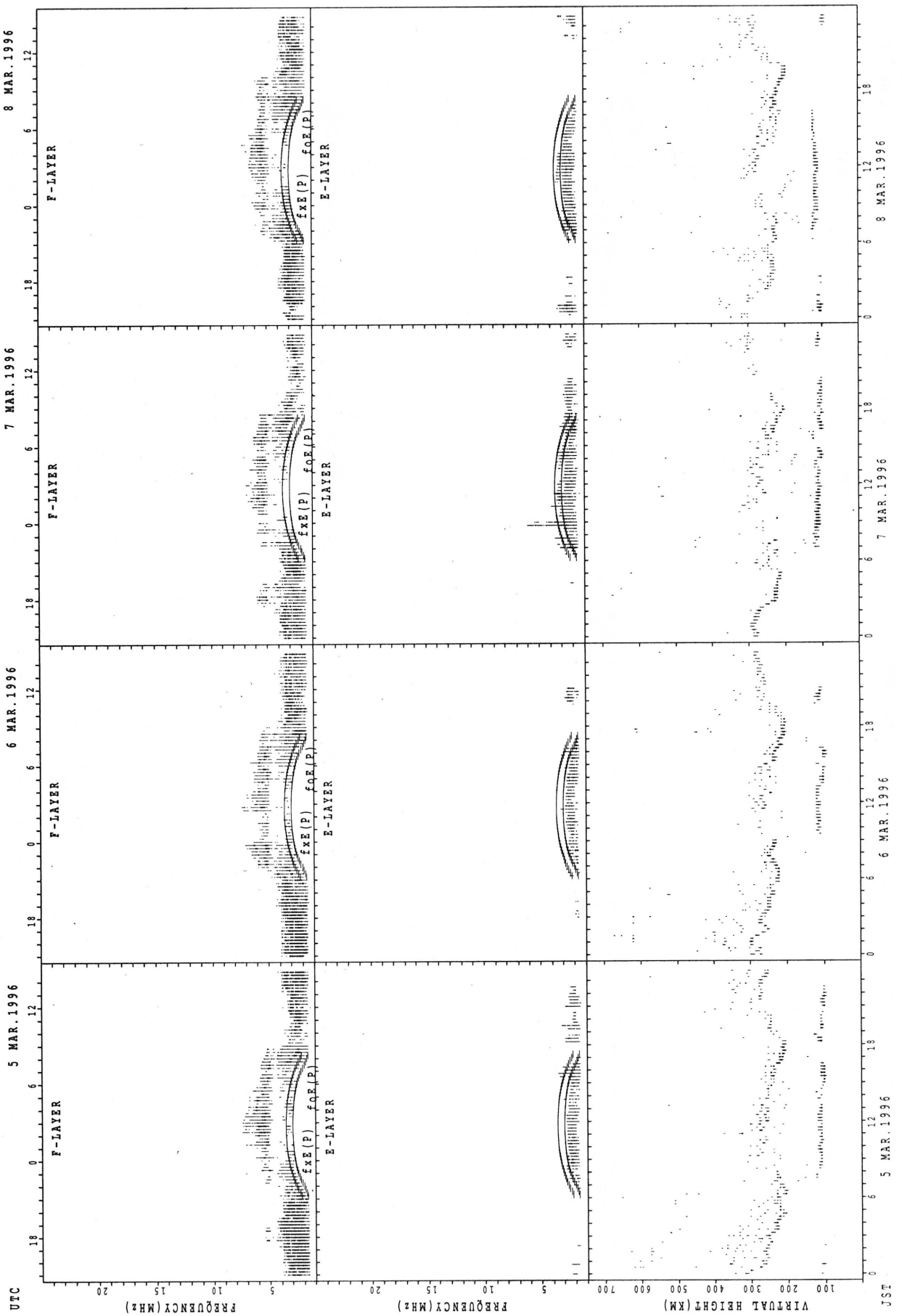
LAT. 26.3N LON. 127.8E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

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			14	14	B	15	15	14	15	15	16	17		18	14	14	14	17	14	18	14	14	14
2		15	15	15	14	16	15	15	14	15	16	17	17	22	30	22	16	15	18	14	14	15	15	15
3	15	14	B	14		15		15	14	14	15	21	18	17		17	15		18	14	14	15	15	18
4	15	14	15		14	15	14	14	14	14	16	18	18	18	18	17	15	15	14	14	14	14	15	
5	15	14	14	15	14	14			14	14	15	15	16	17	17	16	15	14	16	14	14	14	14	14
6	15	14	15	B	B	15	15	14	14	14	15		32	18	17	18	16		15	15	14	14	15	14
7	14	14	14	14	15	14	18	16	14	14	15	16			23	18	16	14	18	14	15	18	14	15
8	14	14	15	14	15	15	15	15	14	15		24	28	17	18	18	15			14	14			14
9	15	14	15	14	B	B	23	16	14	15	15	17	17	17	22	16	15	14	16	14	15	14	14	15
10	18	14	15	14	15	B	15	16	14	14	15	18	16	16	15	15	16		16	14	14	14	15	15
11	15	15	14	15	B	B	15	15	14	15	16	15	18	18	27	18	15	14	20	14	16	14	14	15
12	B	14	15	15		B	15	14	14	15	15	17	17	21	23	17	14	15	17	14	15	14	15	14
13	15	14	14		B	B	B	15	14	15	16	17	21	20	22	20	14	14	15	14	14	15	14	15
14	14	14	15	21	B	14		14	15	14	14		20	28	18	16	15	14	14	14	15	14	14	15
15	15	14	14	14	15	18	15	14	14	14	16	18	21	20	30	27		15	17	15	14	15	14	14
16	15	14	15	15	14	16	B	18	14		18	20	27	21	20	18	15	14	14	14	15	15	14	14
17	15	14	14	14	15	B	14	14	18	15	16	22	21	21	16		17	15	15	14	14	15	14	14
18	14	14	14	15	14	14	14	14	14	14	15	17	27	26	27	18	16		18	15	14	15	14	15
19	15	14	14	18	14	18	20	14	14	15	17	18	18	23	20	17	15		15	14			15	17
20	15	17	15	15	15	24	15	22	14	16	20	22	28	30	26	18	15	14	21	14	15	15	14	15
21	15	15	15	14	B	16	B	14	14	15	16	17	22	30	22	16	16	14	14	14	14	14	14	15
22	15	15	14	14	14	15	16	14	14	15	16	18	18	21	17	16	15	15	14	14	14	14	15	16
23	14	16	14	14	14	14	14	14	14	15	16	17	22	21	28	24	14	15	15	15	14		14	16
24	14	16		15	18	B	15	14	15	14	17			16	18	15			21	15	14	14		15
25	14	14	15	14	14	14	14	14	14	14	18	18		30	34	27	18	16	22	15	15	14	14	15
26	15	14	18	15	17	14	14	14	15	18	21	32	22		18		32	16	22	15	14	14	14	14
27	14	15	15	15	14	16	18	14		16	17	32	27	28	28	32	32		17	15	14	16	15	15
28	15	14	15	14	B	B	15	15	14	18	21	21	22	26	22	20			14	14	15	15	15	14
29		15	14	14	15	B	15	21	15	16	18		21	21		34	18	14	16	14	15	14	14	15
30	14	15	14	14	14	14	18	14	14	16	18	27	24		50	17			23	15	14	14	14	14
31	15	14	14	14	14	14	15	16	14	15	16	17	22	22	18	20		14	14	14	14		14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	28	28	22	21	25	30	30	30	30	27	28	27	29	29	26	21	30	31	30	27	29	30
MED	15	14	15	14	14	15	15	14	14	15	16	18	21	21	22	18	15	14	16	14	14	14	14	15
U Q	15	15	15	15	15	16	15	15	14	15	17	21	23	26	27	20	16	15	18	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	14	15	17	18	18	18	16	15	14	15	14	14	14	14	14

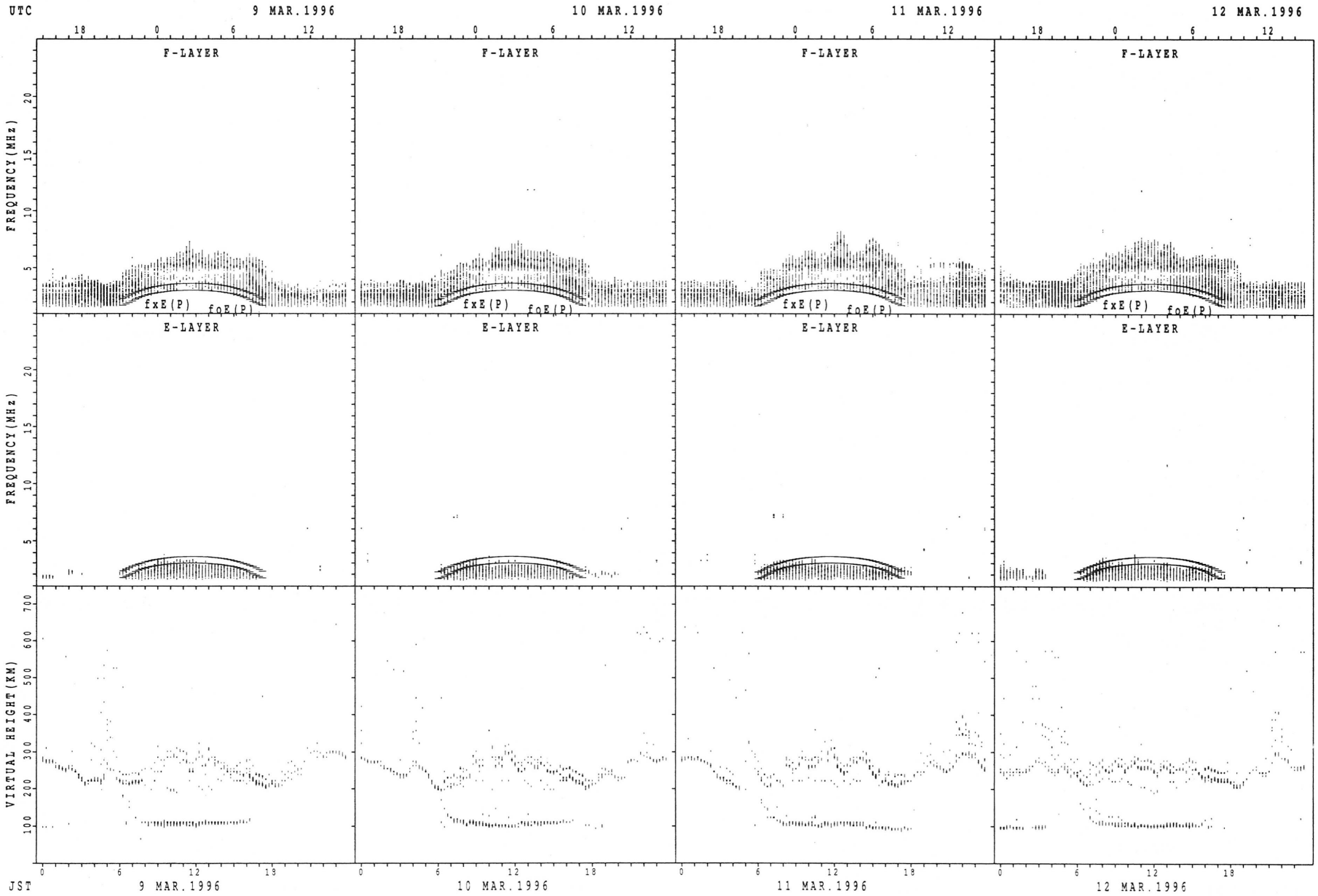
SUMMARY PLOTS AT WAKKANAI



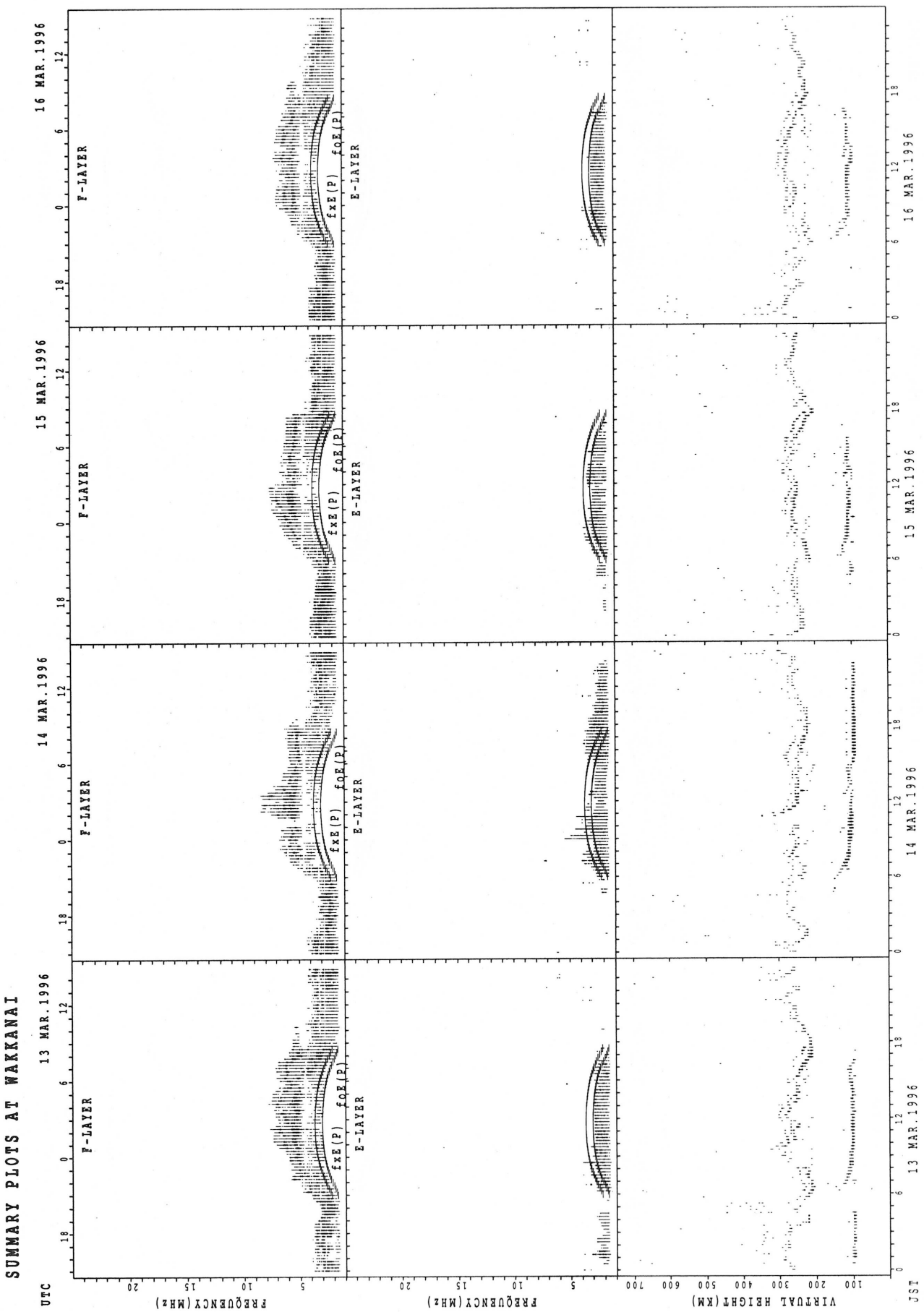
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
5 MAR.1996
6 MAR.1996
7 MAR.1996
8 MAR.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

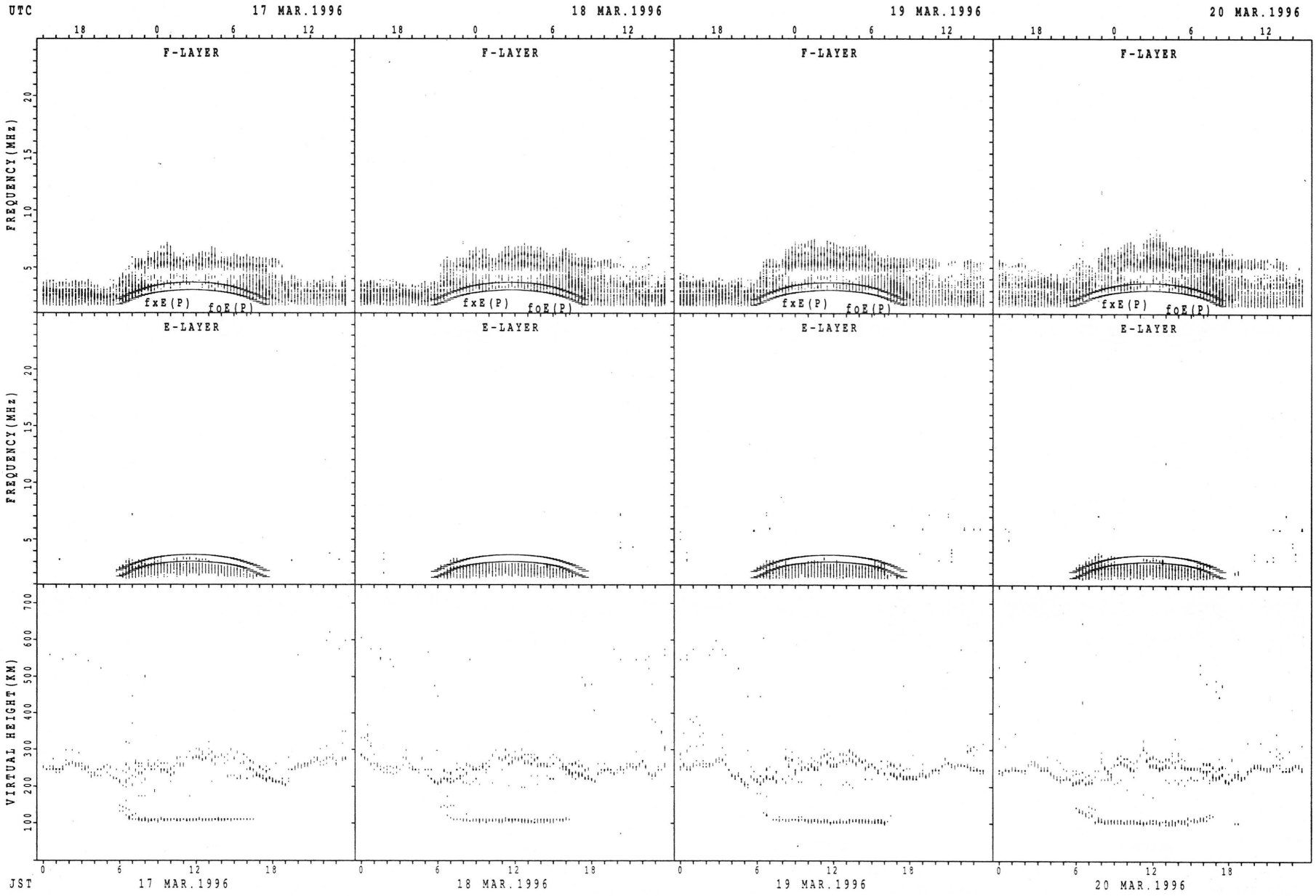
SUMMARY PLOTS AT WAKKANAI



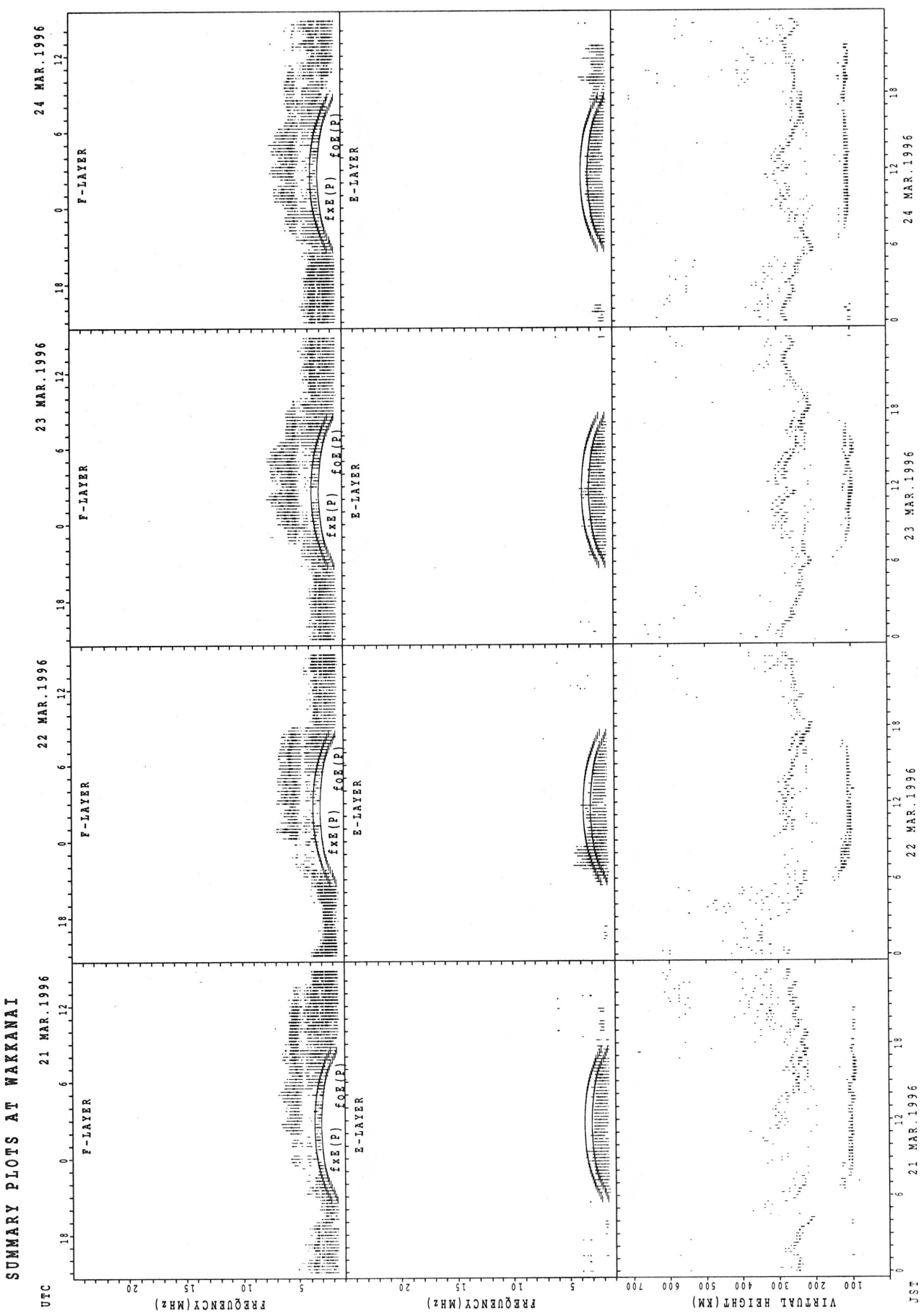
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
13 MAR.1996
14 MAR.1996
15 MAR.1996
16 MAR.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

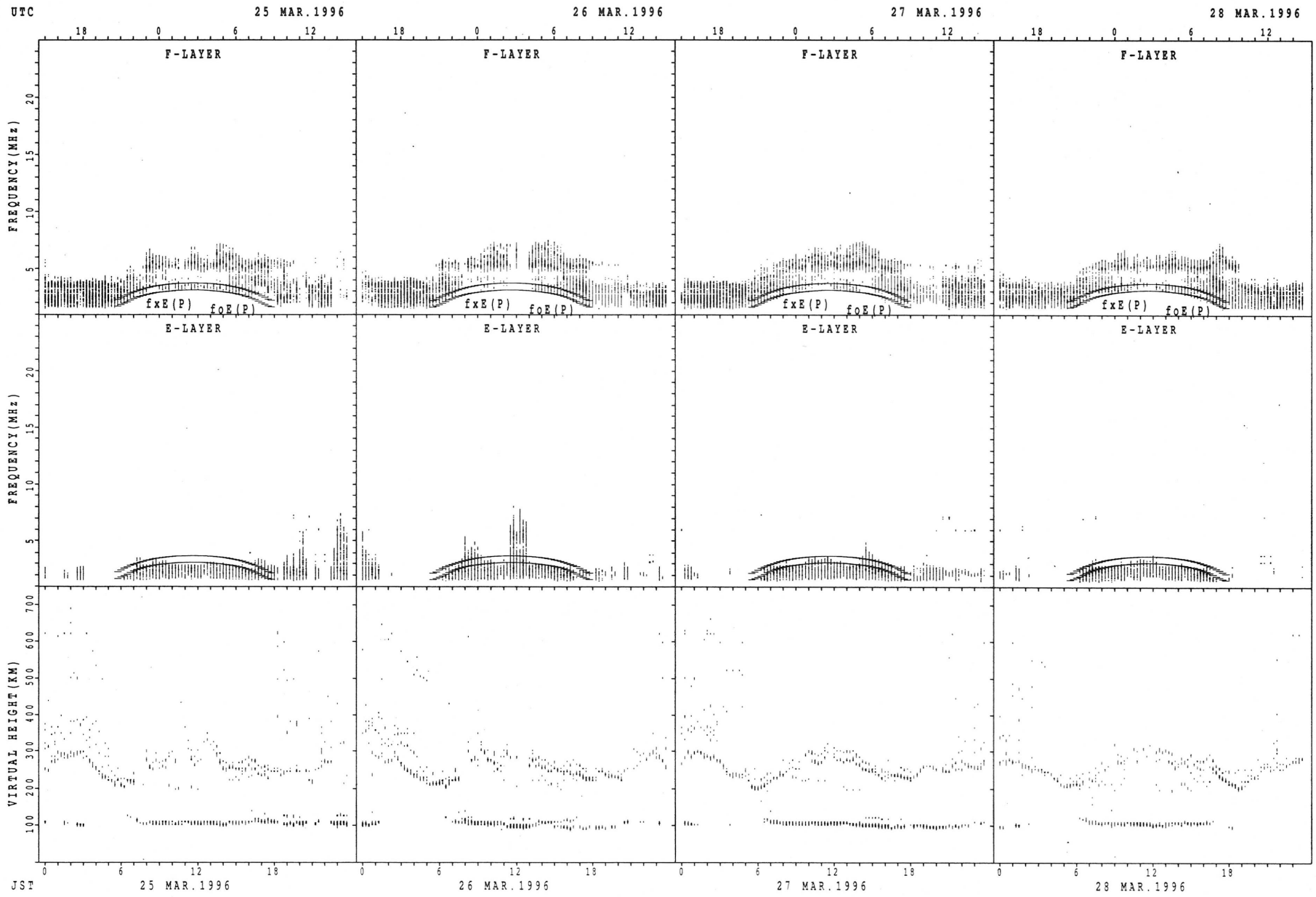
SUMMARY PLOTS AT WAKKANAI



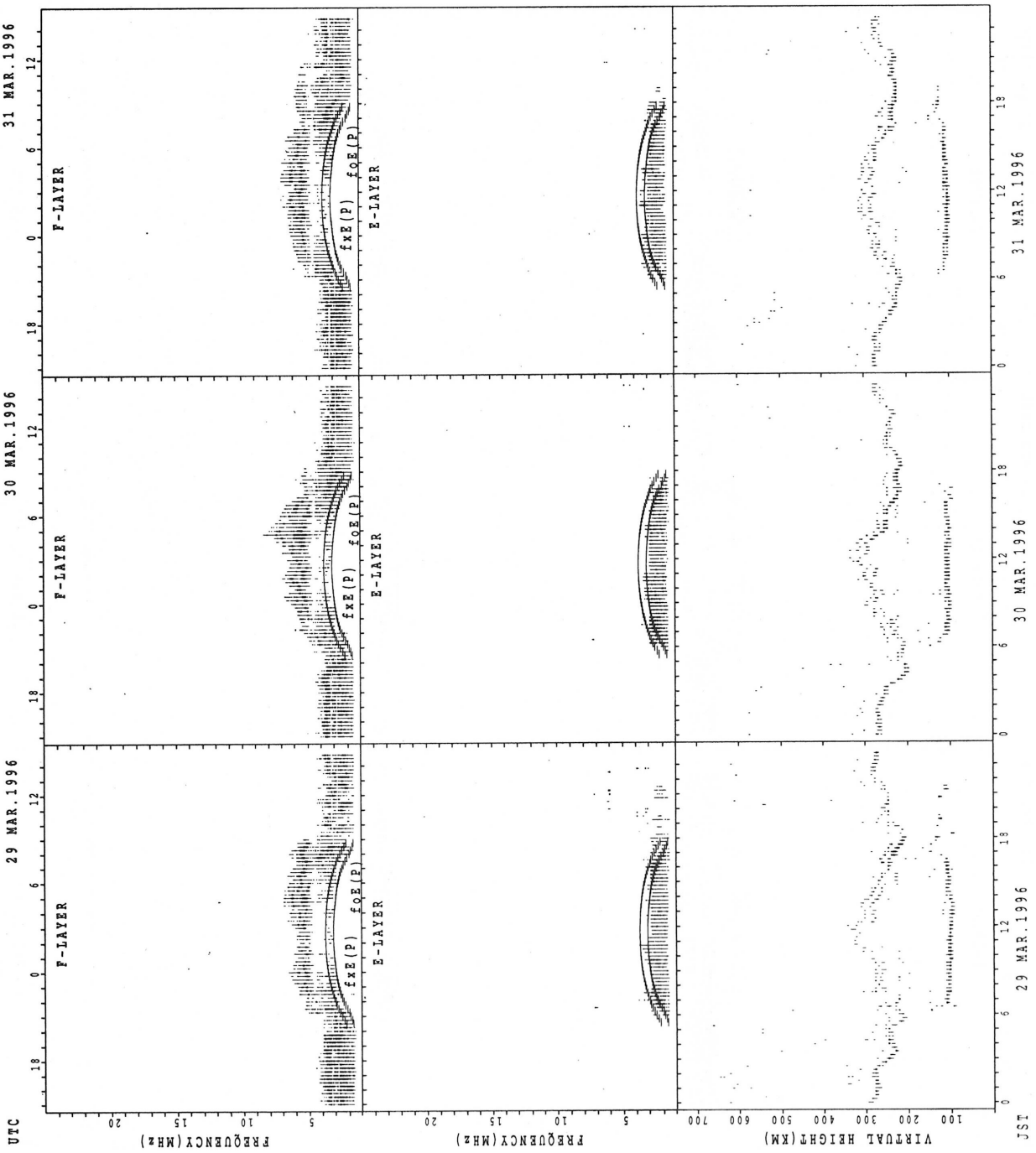
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
21 MAR.1996
22 MAR.1996
23 MAR.1996
24 MAR.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

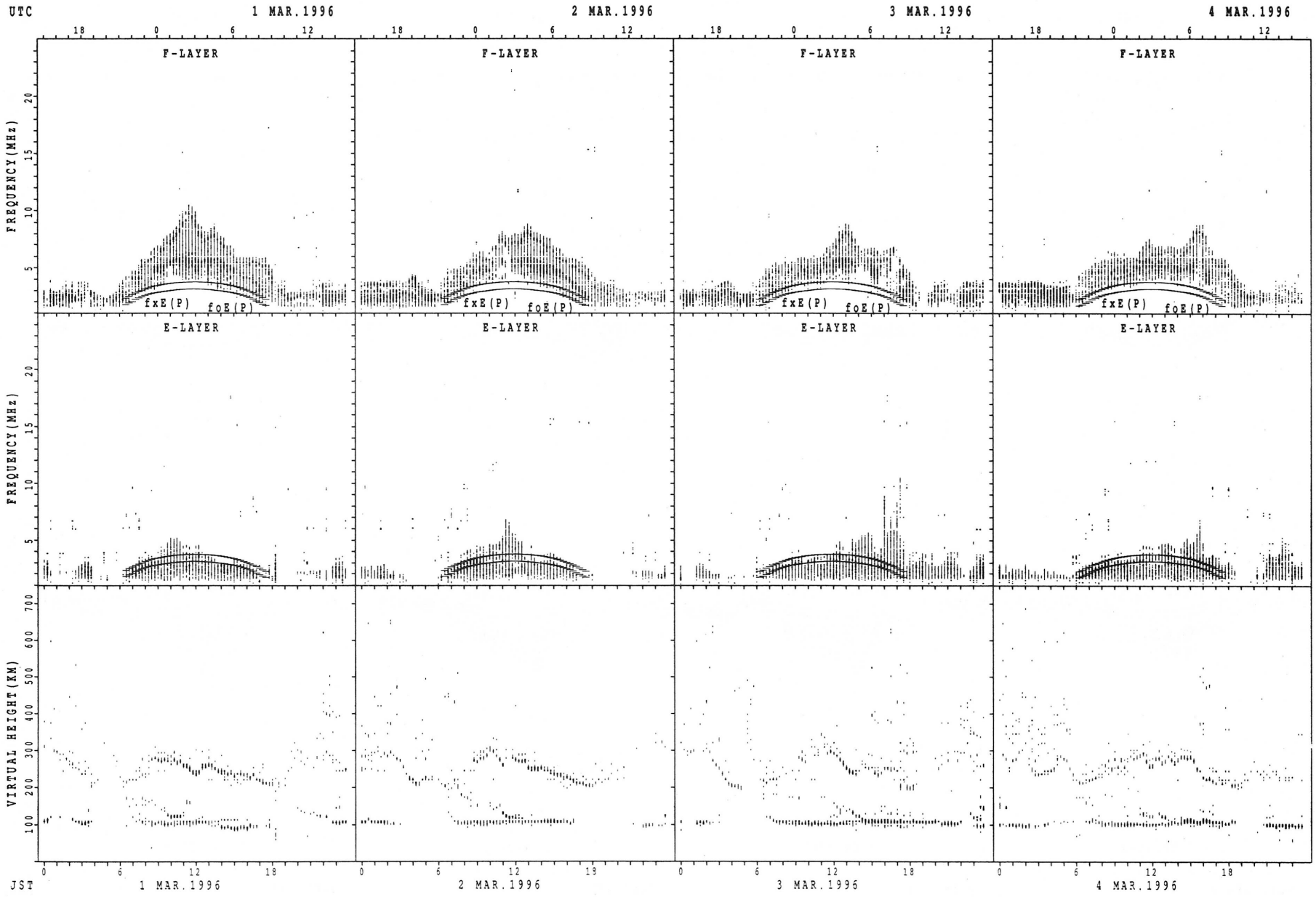
SUMMARY PLOTS AT WAKKANAI



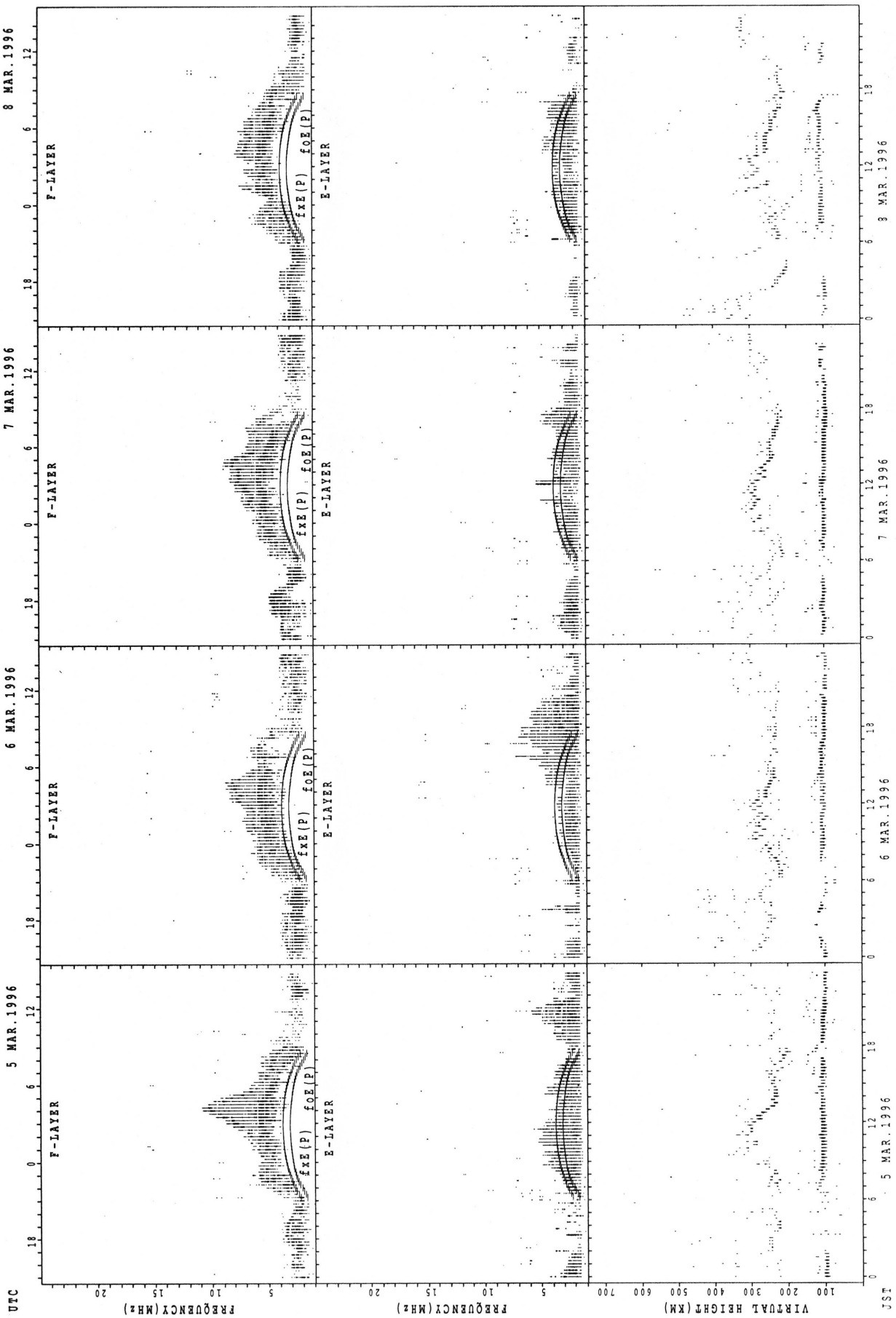
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
29 MAR.1996
30 MAR.1996
31 MAR.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

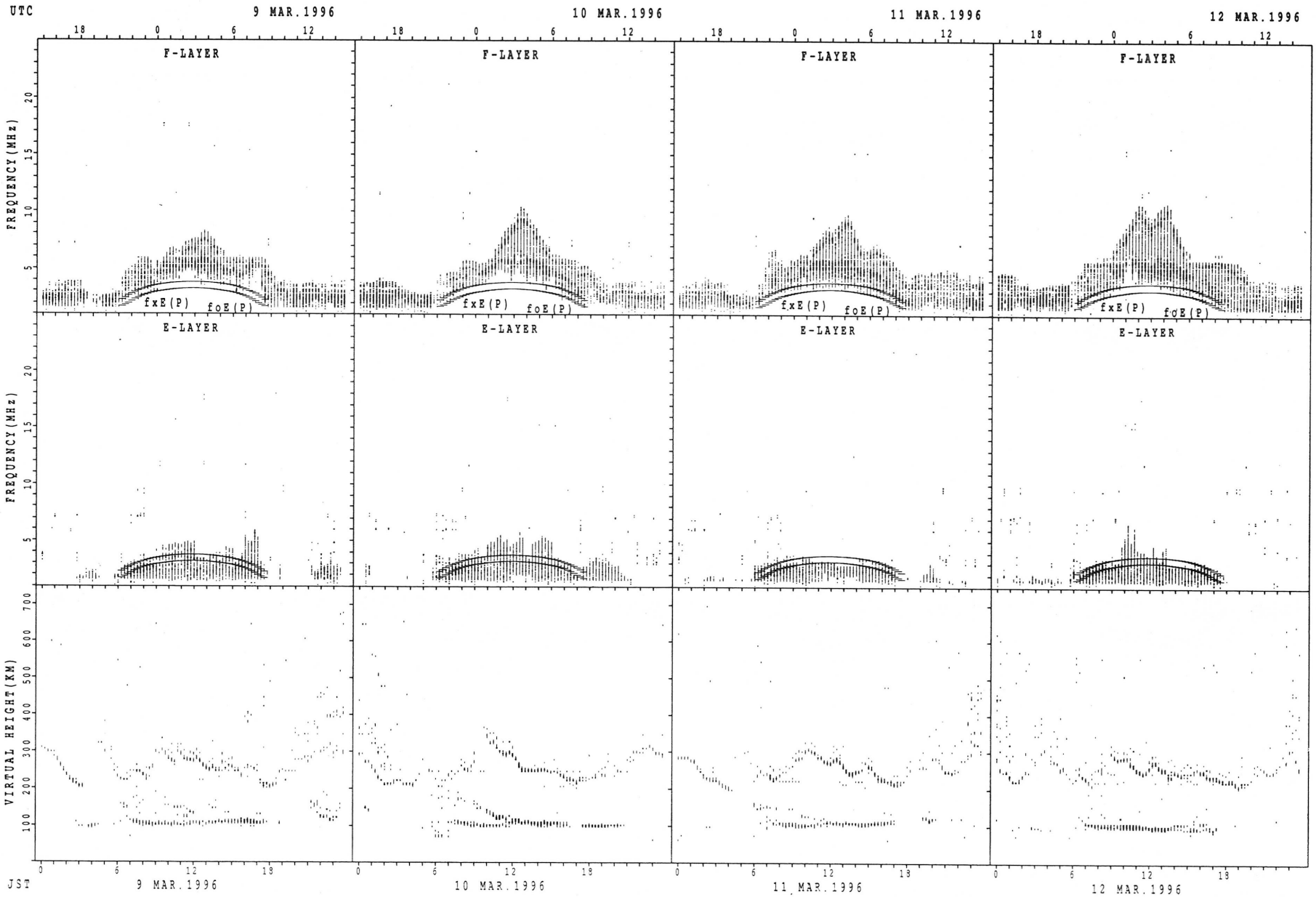
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

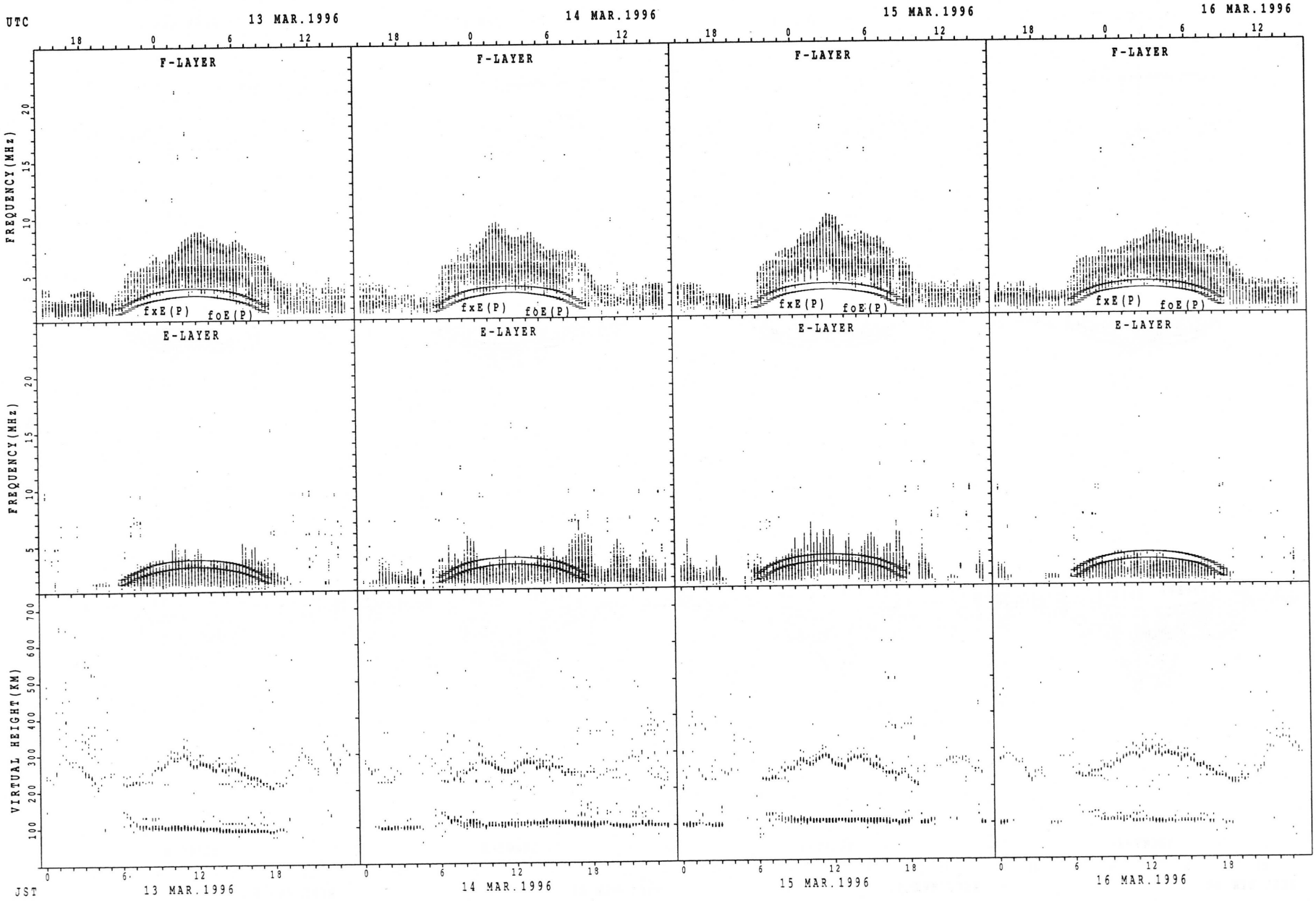

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
5 MAR.1996
6 MAR.1996
7 MAR.1996
8 MAR.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



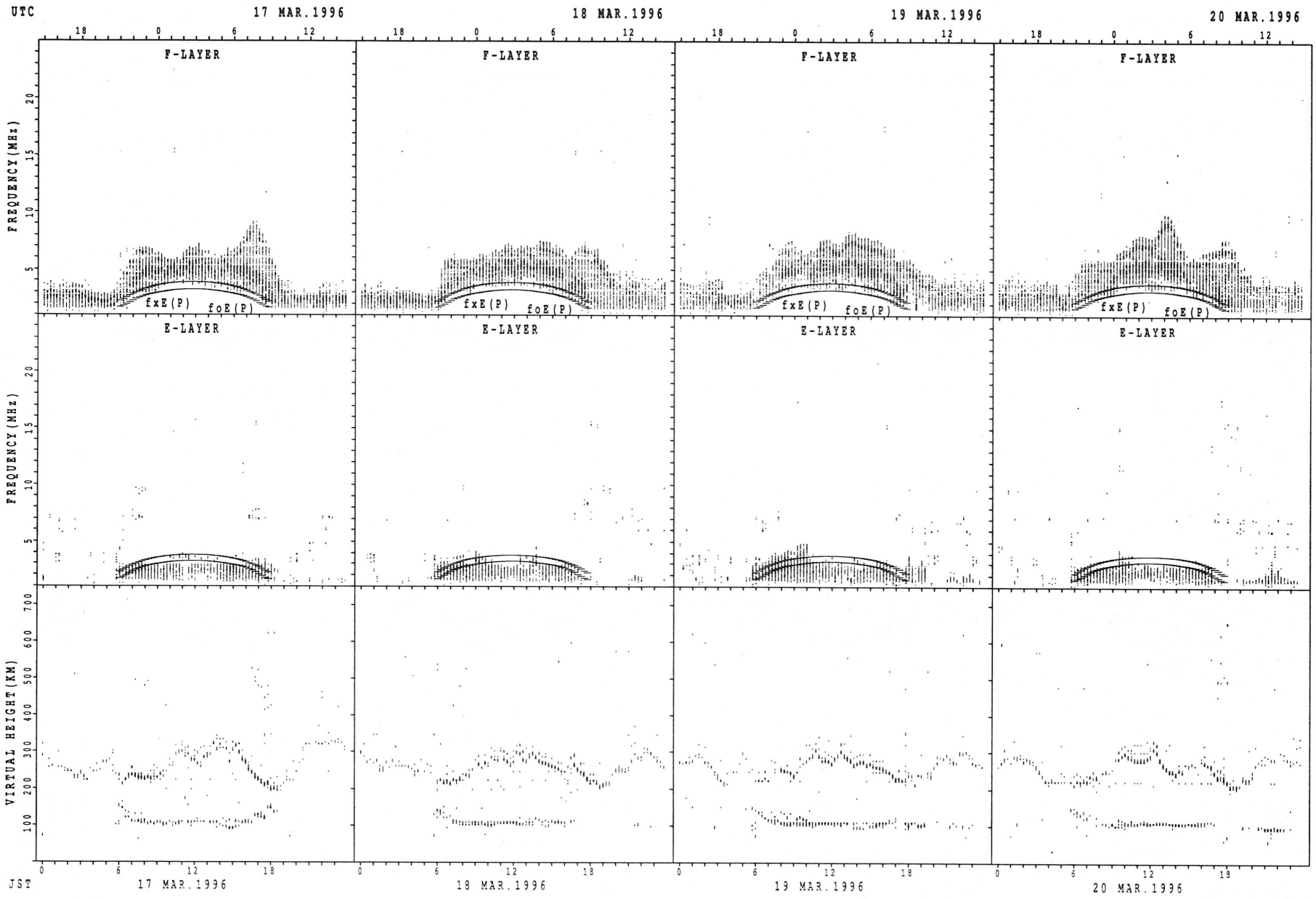
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

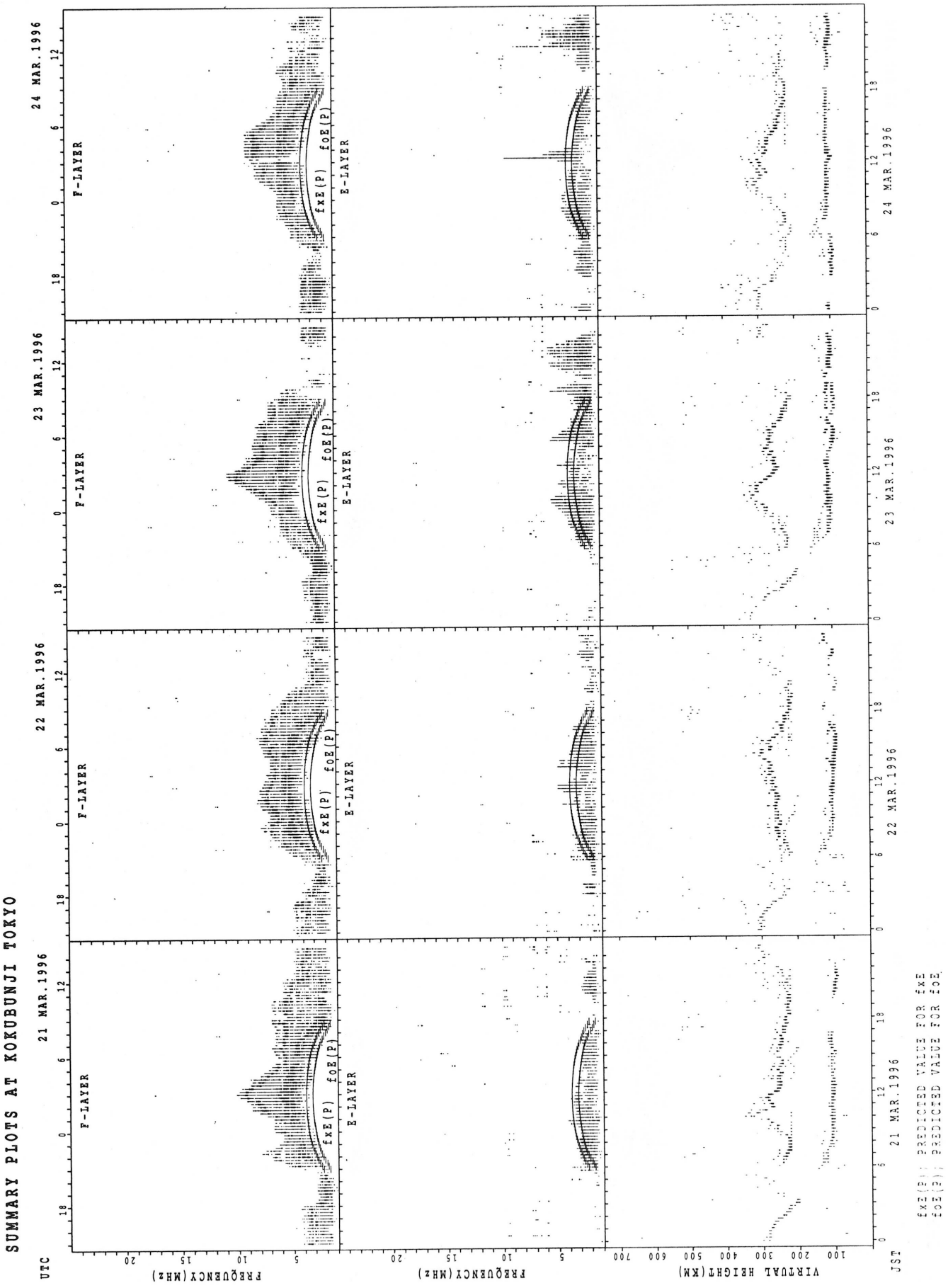


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

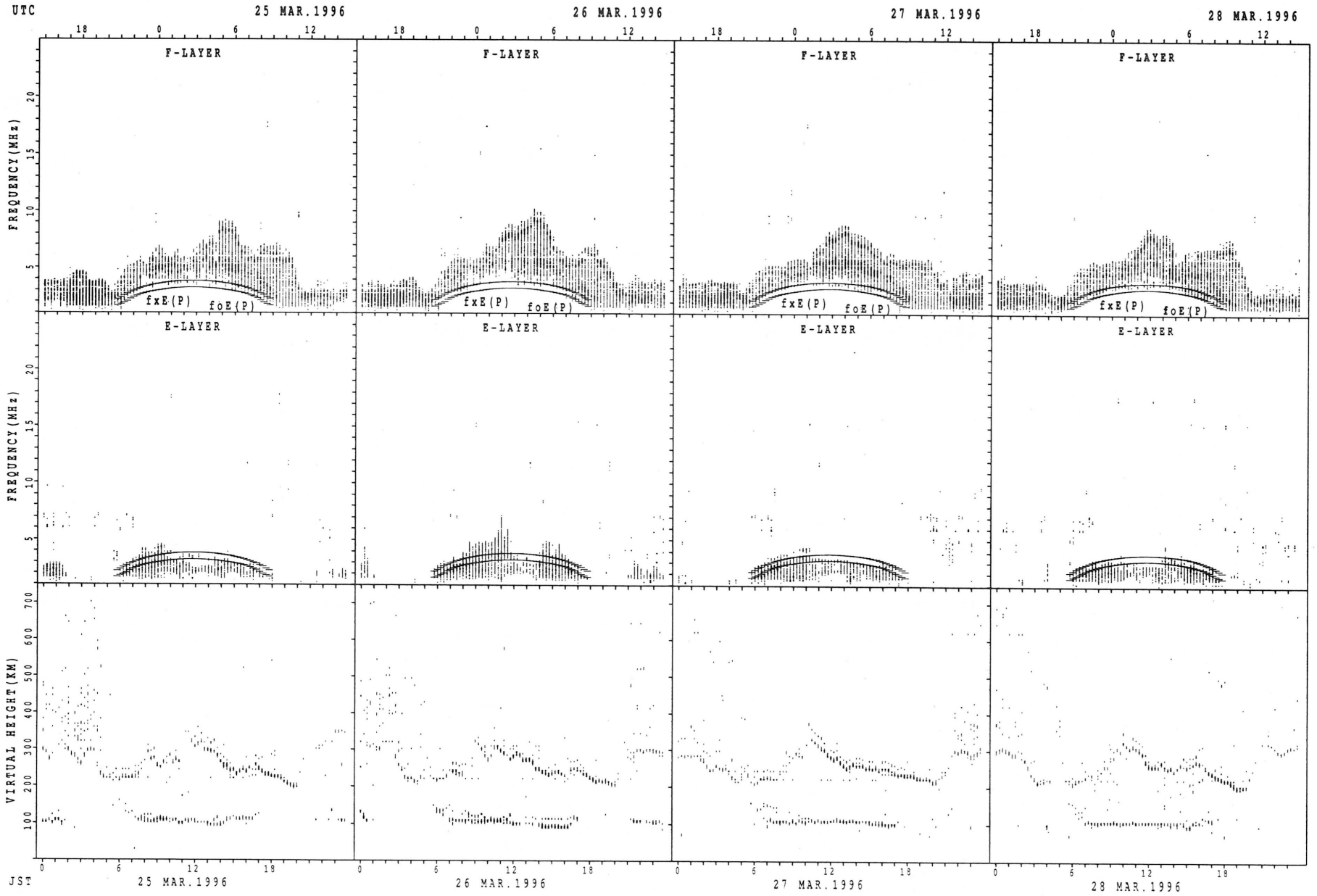
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

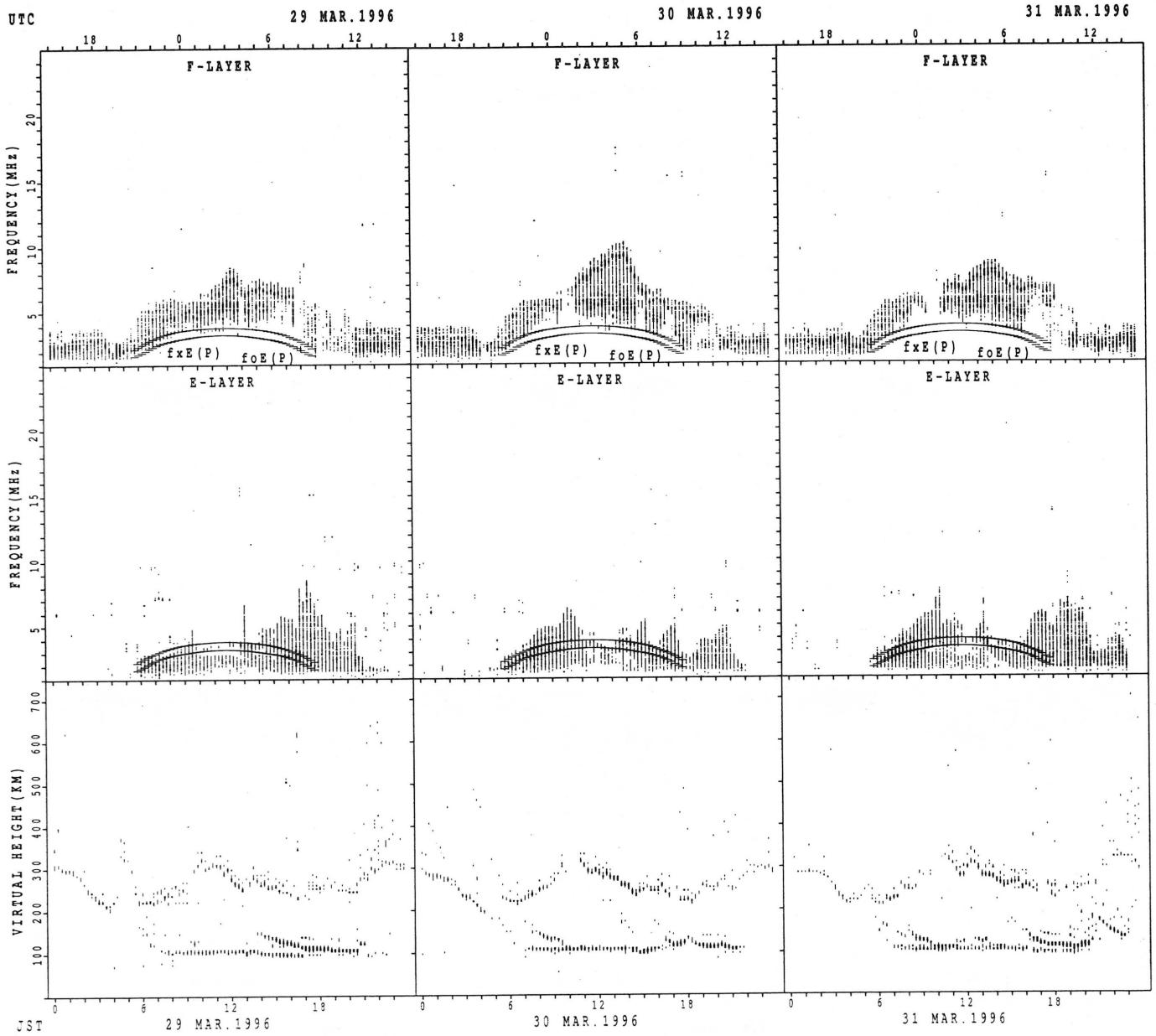

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
21 MAR.1996
22 MAR.1996
23 MAR.1996
24 MAR.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

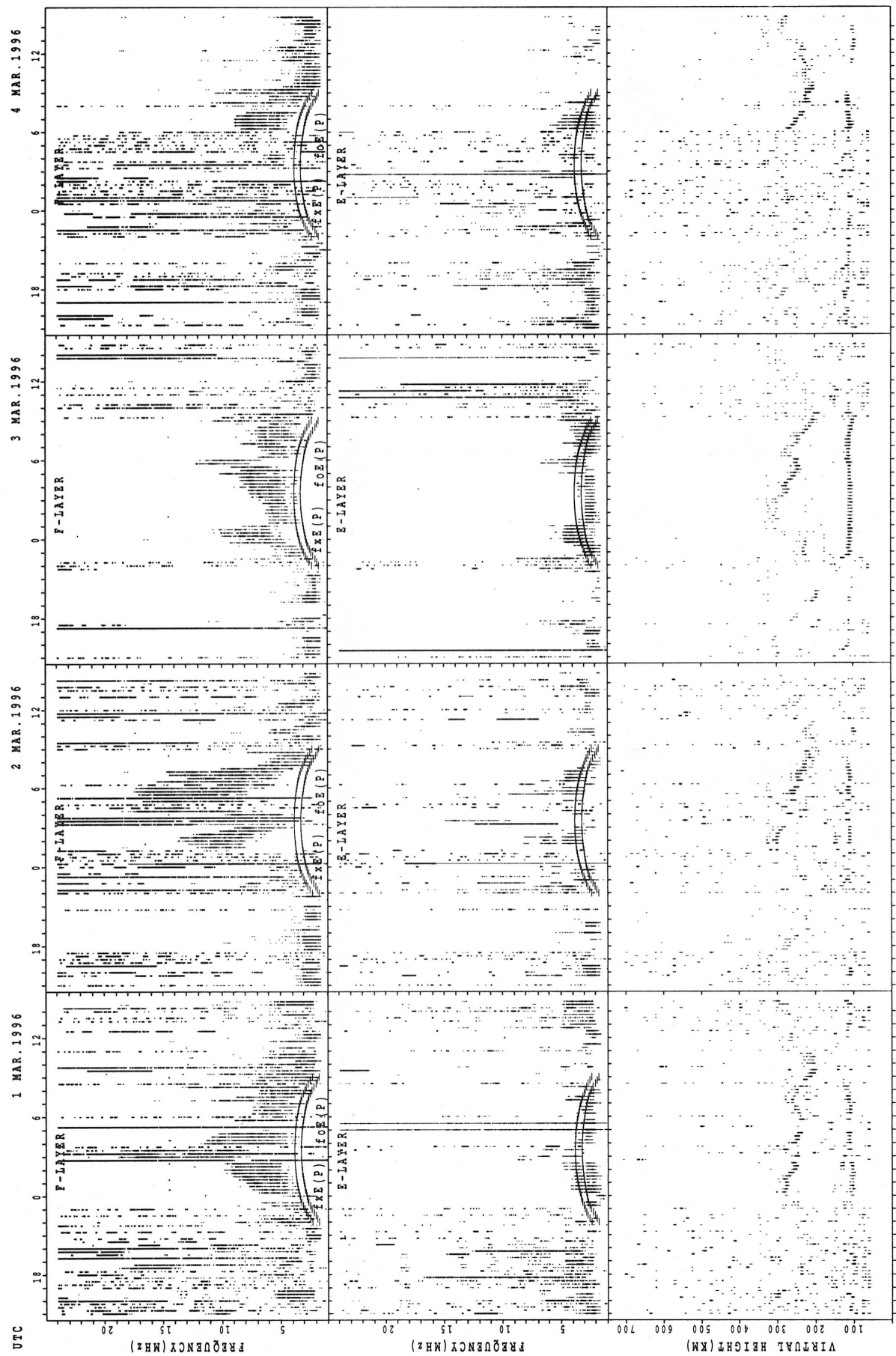


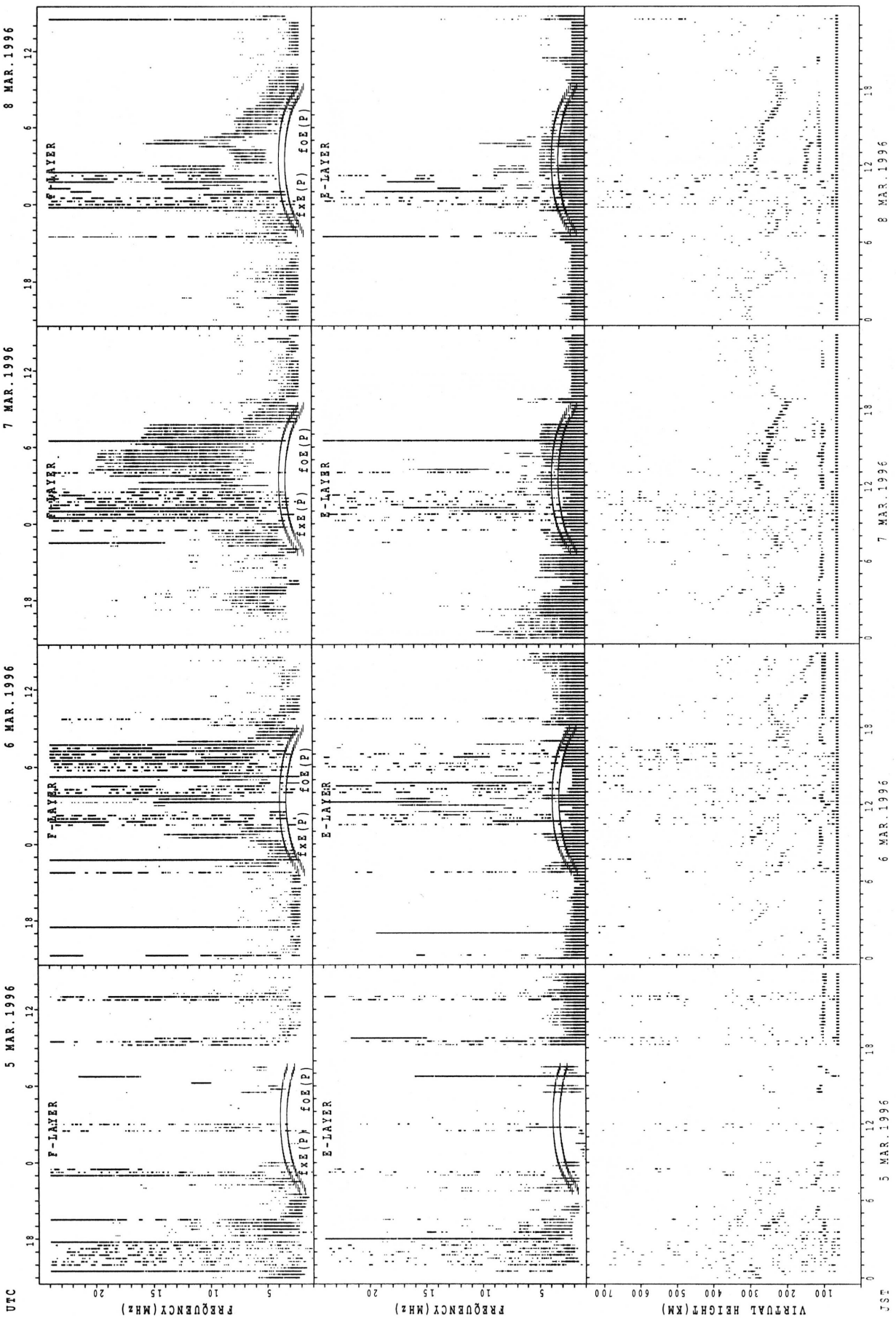
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

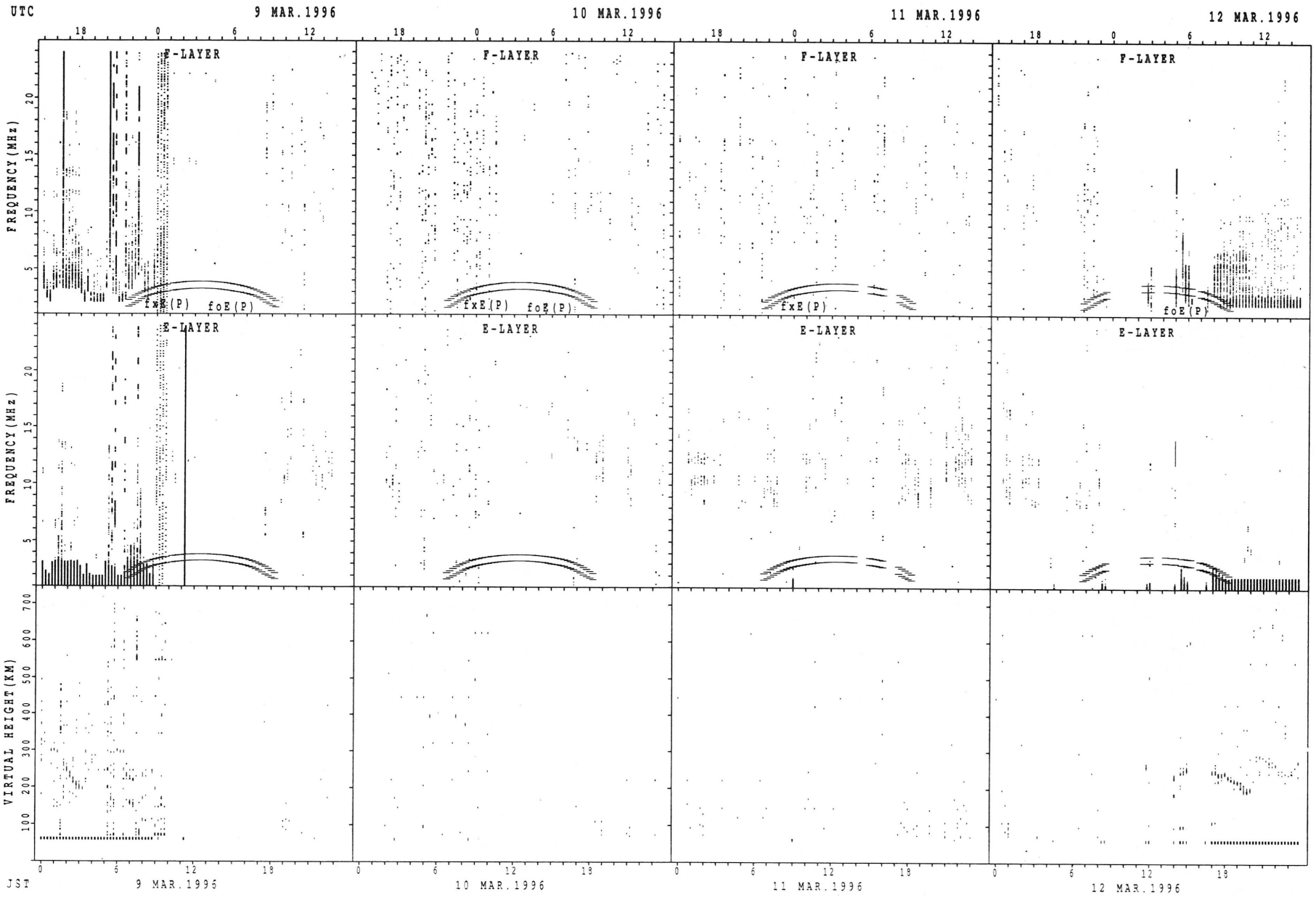


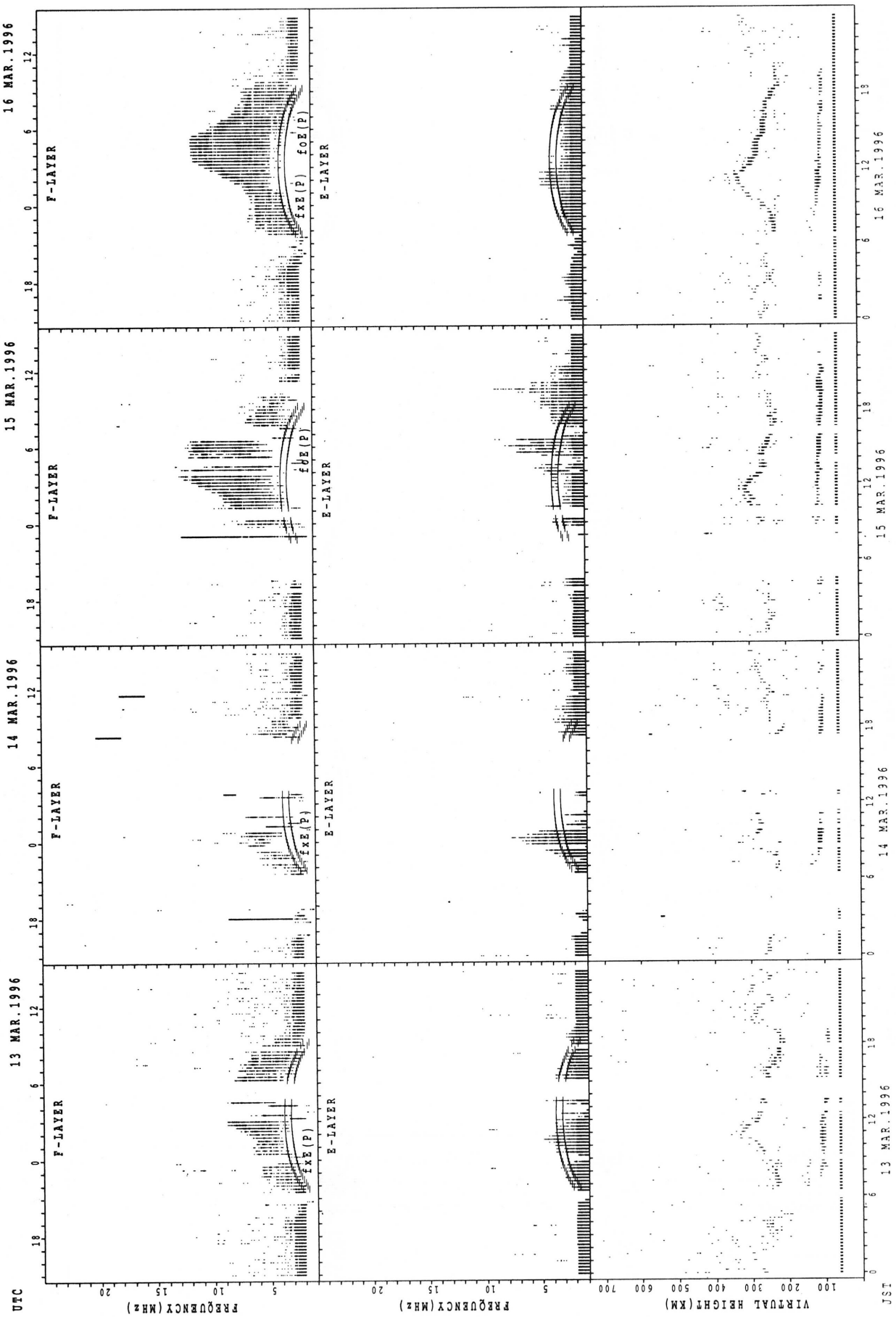
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
1 MAR.1996
2 MAR.1996
3 MAR.1996
4 MAR.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE : PREDICTED VALUE FOR fxE
foE : PREDICTED VALUE FOR foE

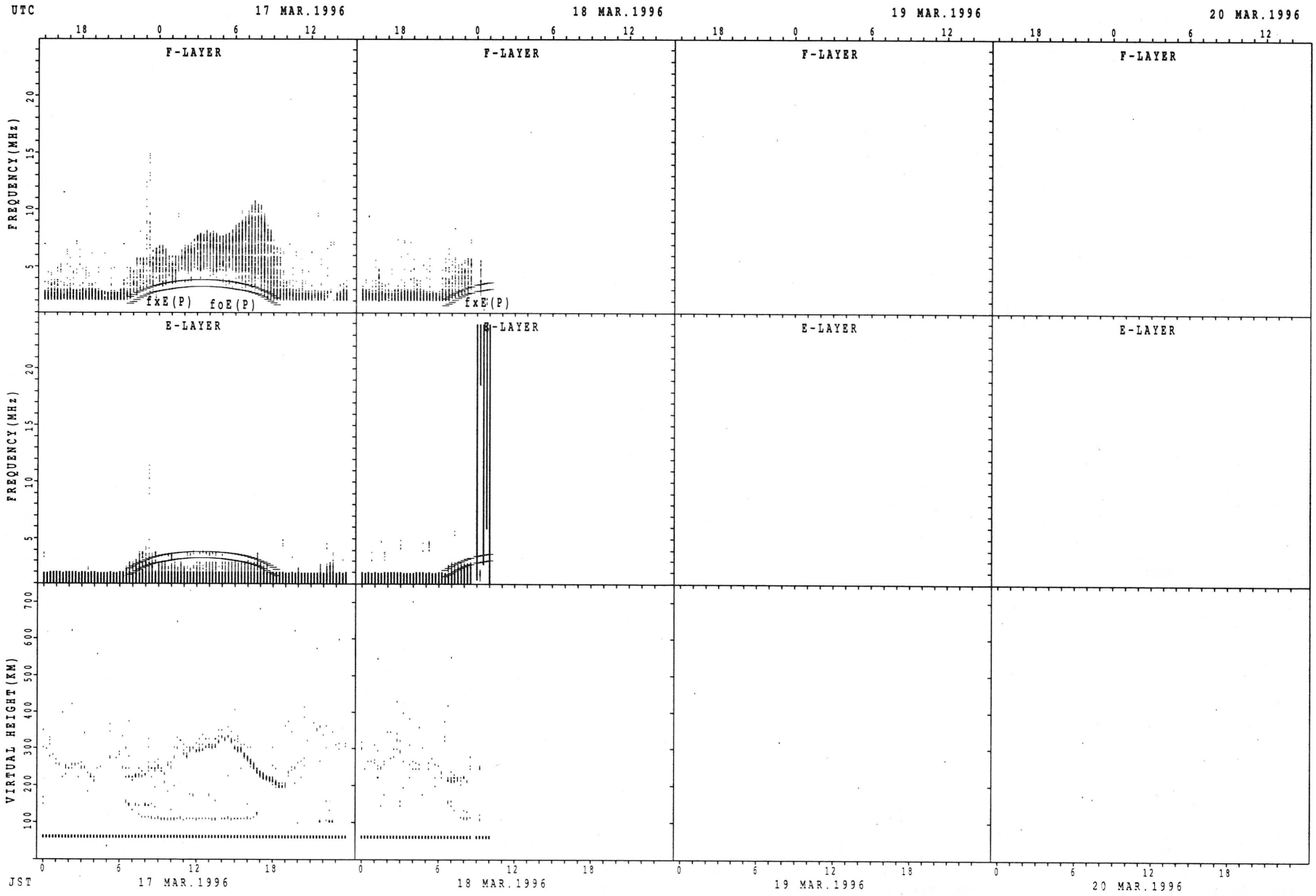

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
5 MAR.1996
6 MAR.1996
7 MAR.1996
8 MAR.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

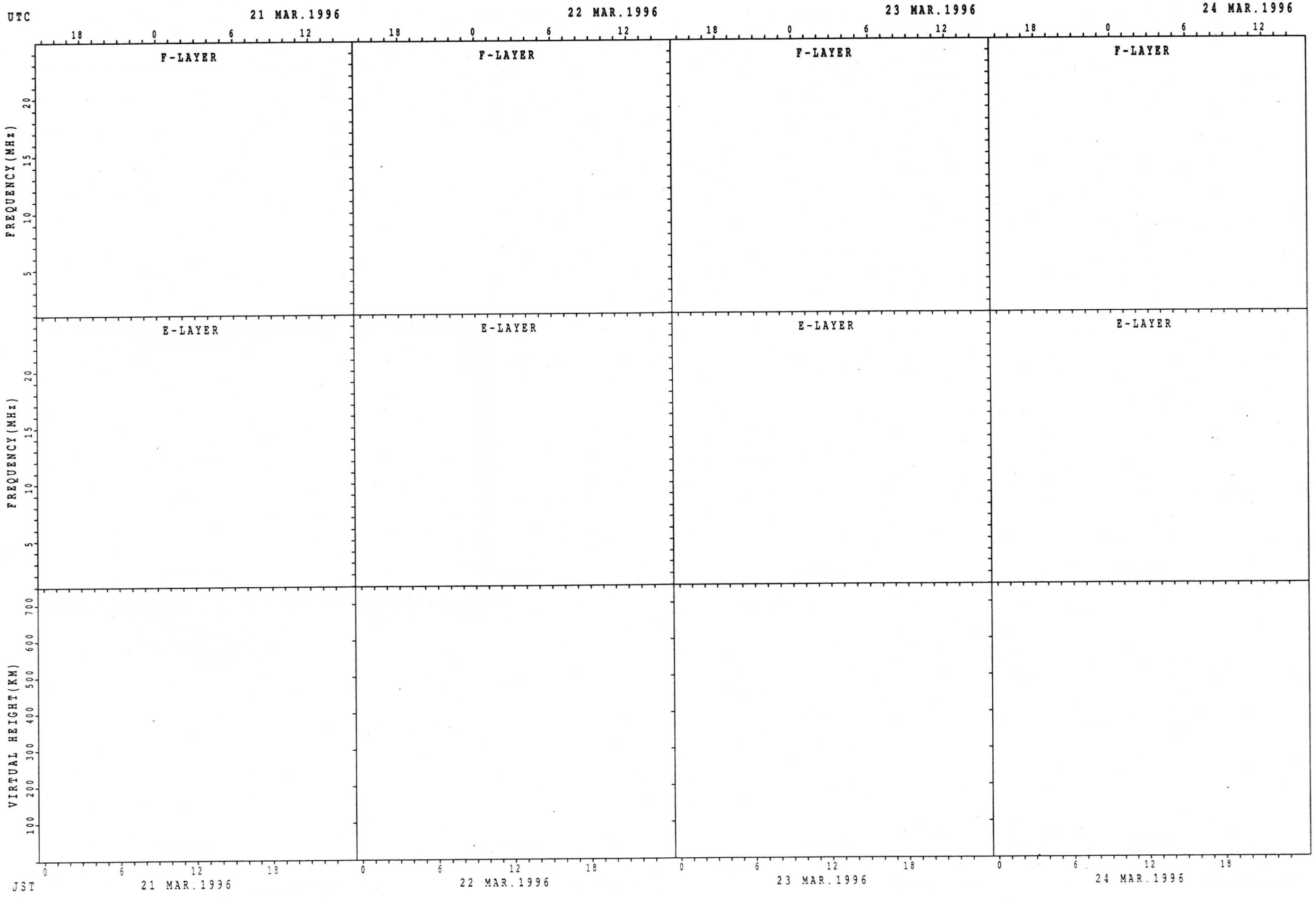



SUMMARY PLOTS AT YAMAGAWA
UTC
JST
13 MAR.1996
14 MAR.1996
15 MAR.1996
16 MAR.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

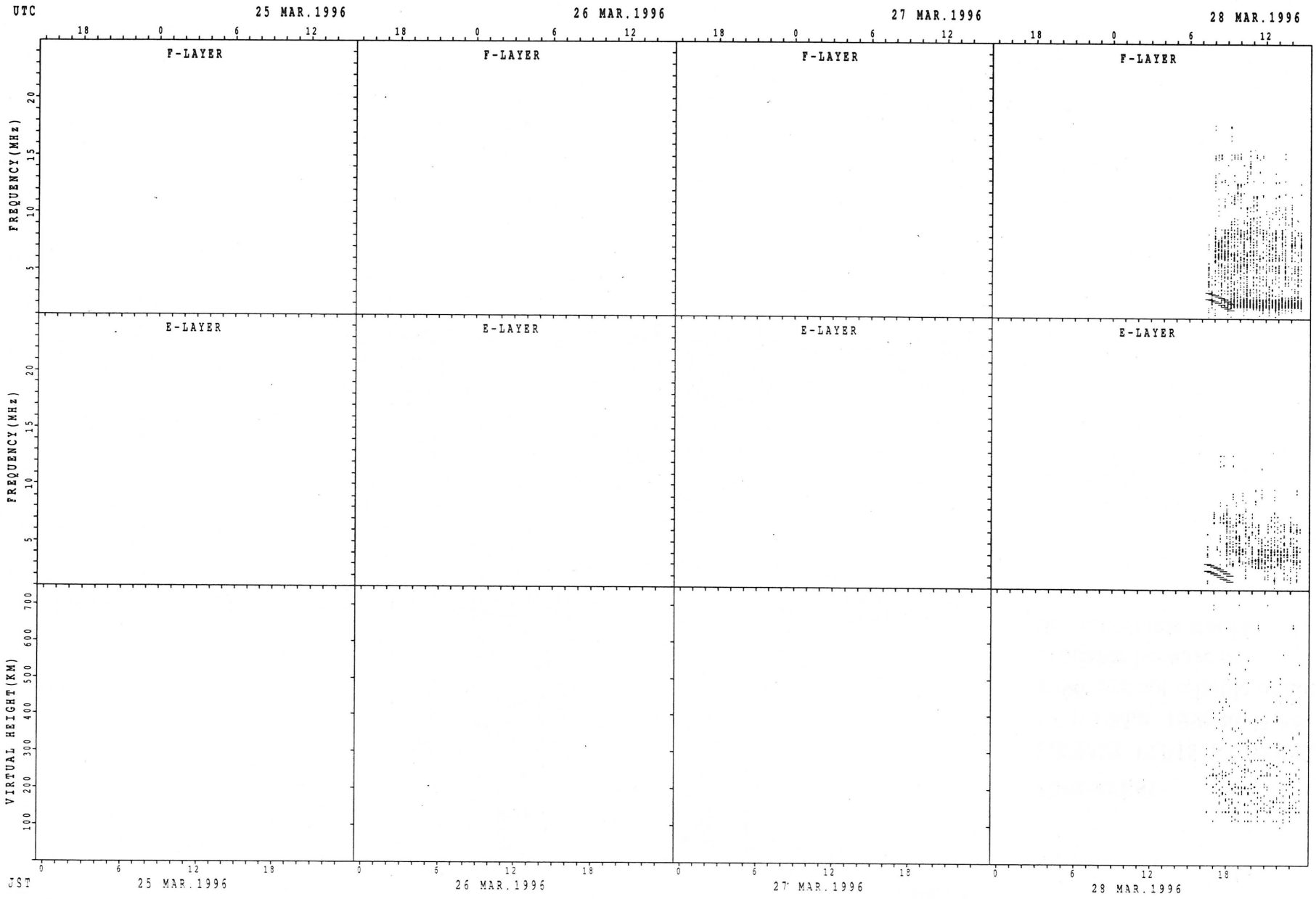


SUMMARY PLOTS AT YAMAGAWA

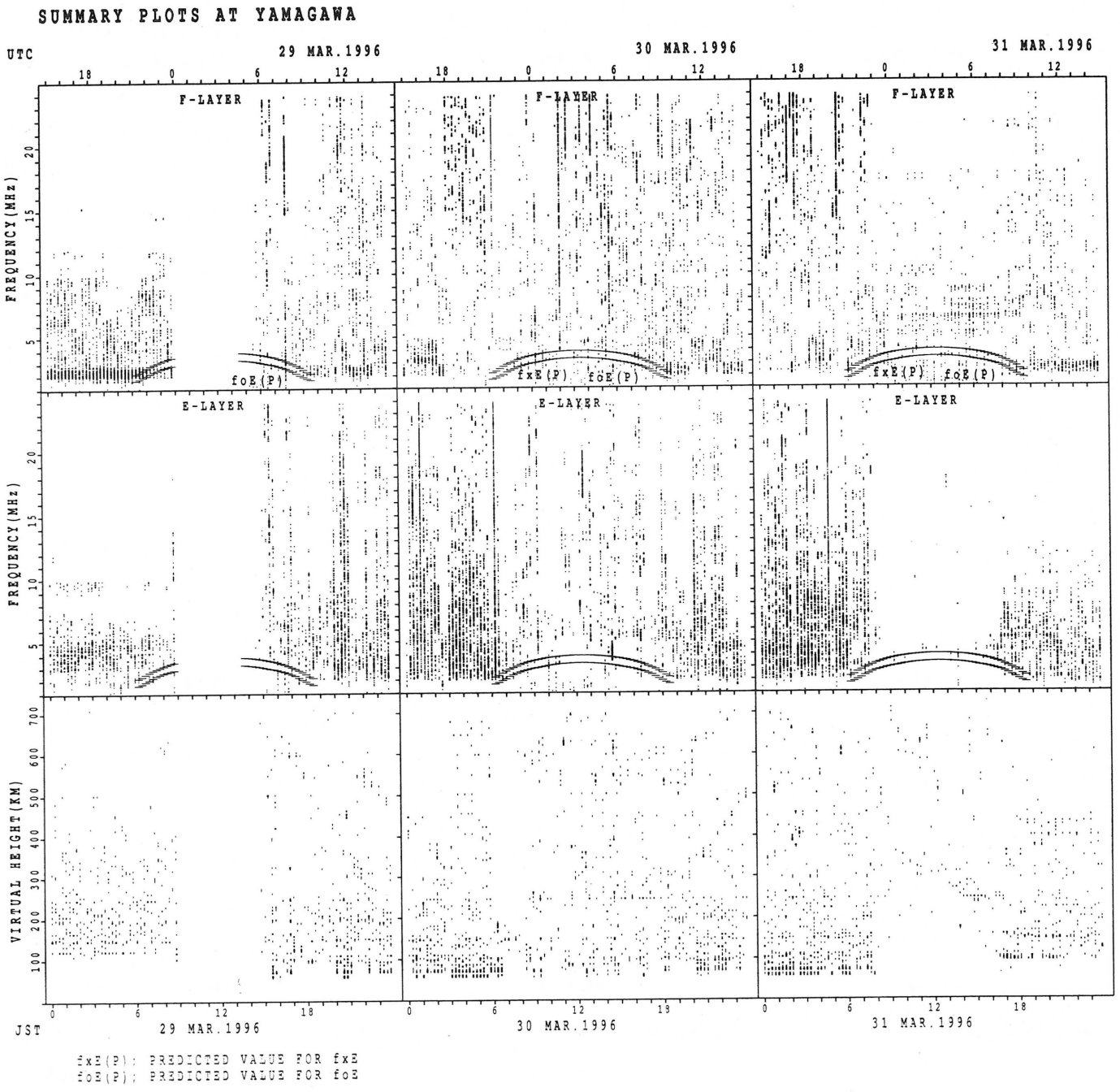


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



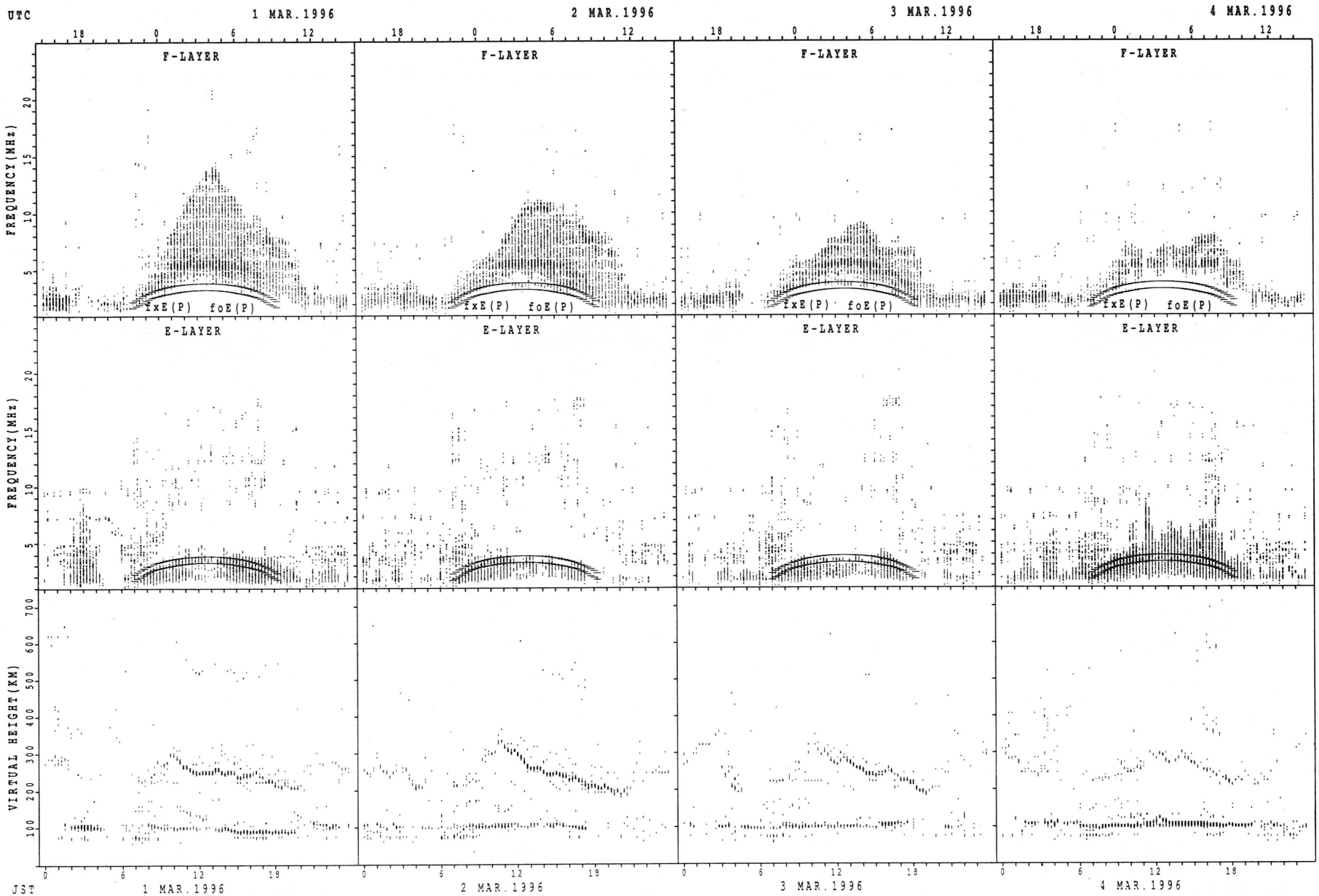
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE



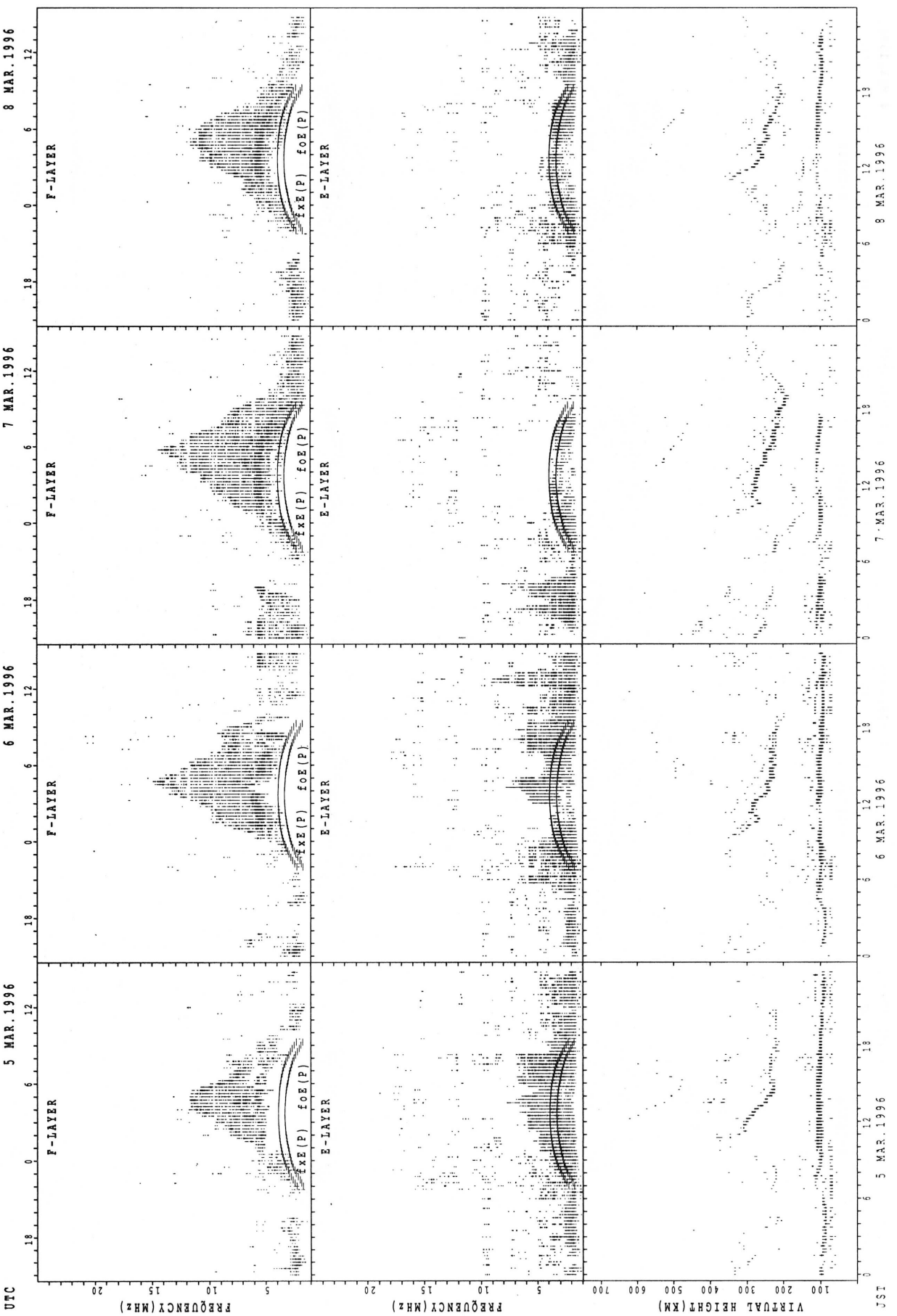
Remarks:

SUMMARY PLOTS AT YAMAGAWA from 1 Mar. 1996 to 31 Mar. 1996 are not reliable or not available because of the ionosonde trouble.

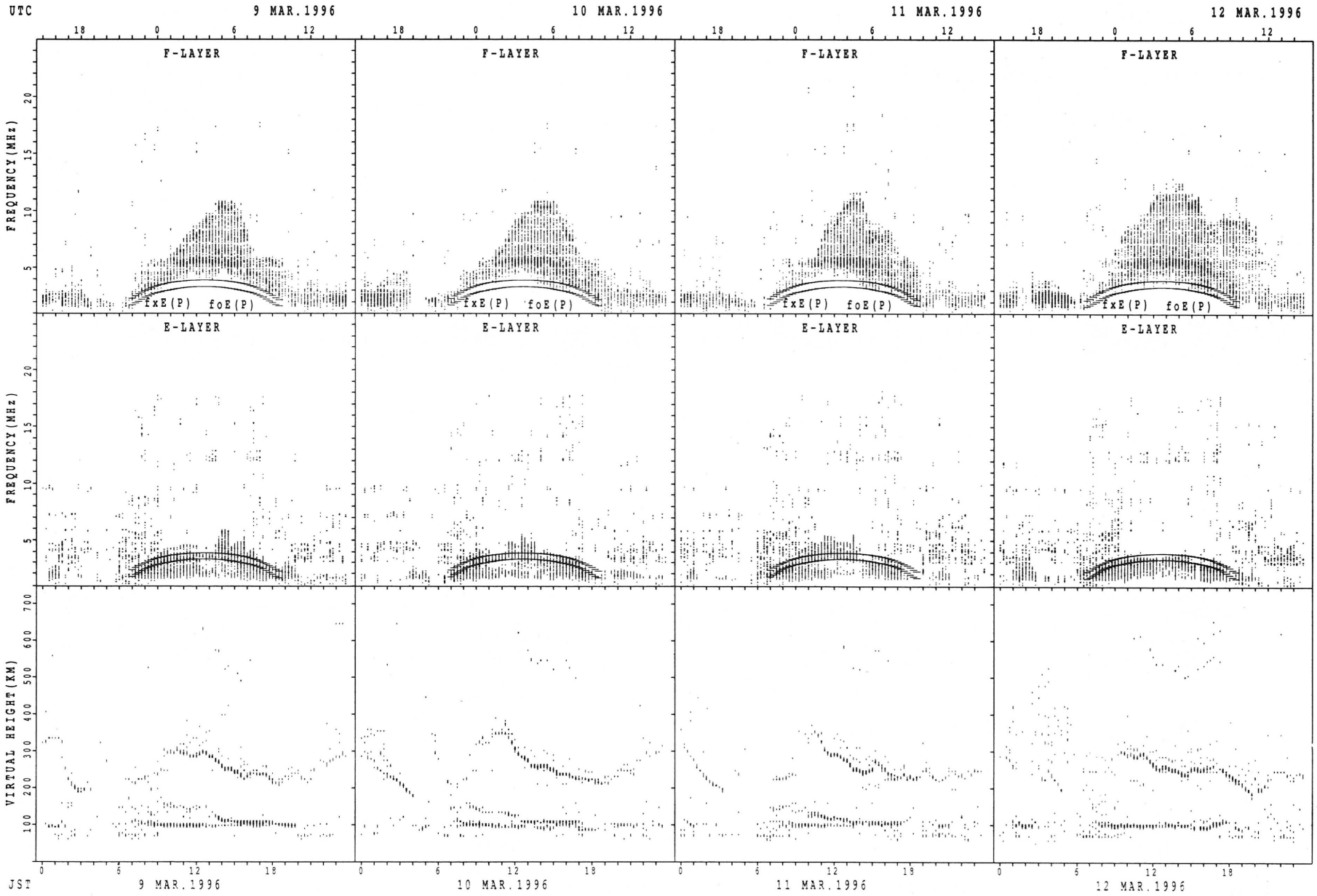
SUMMARY PLOTS AT OKINAWA



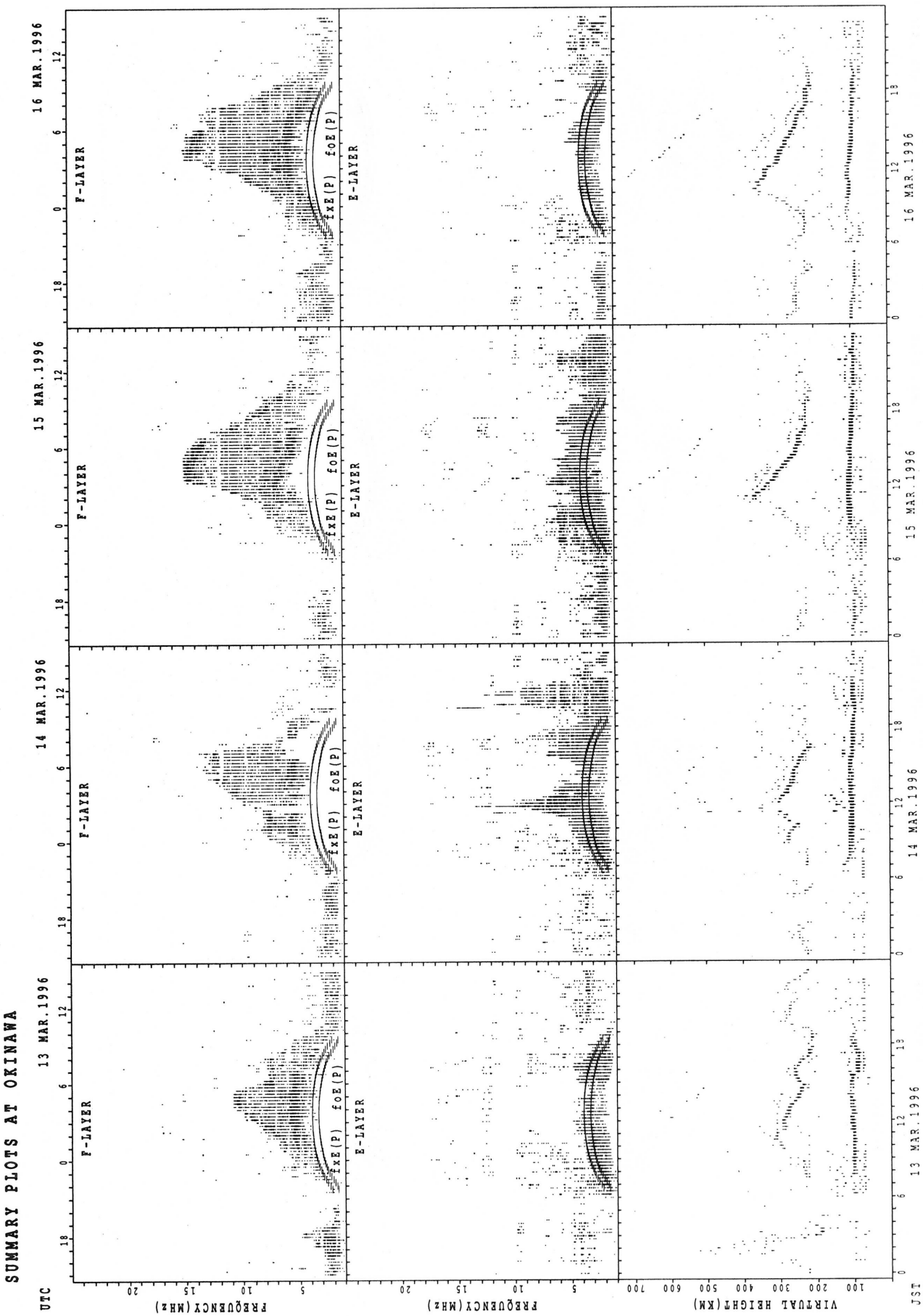
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
5 MAR.1996
6 MAR.1996
7 MAR.1996
8 MAR.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

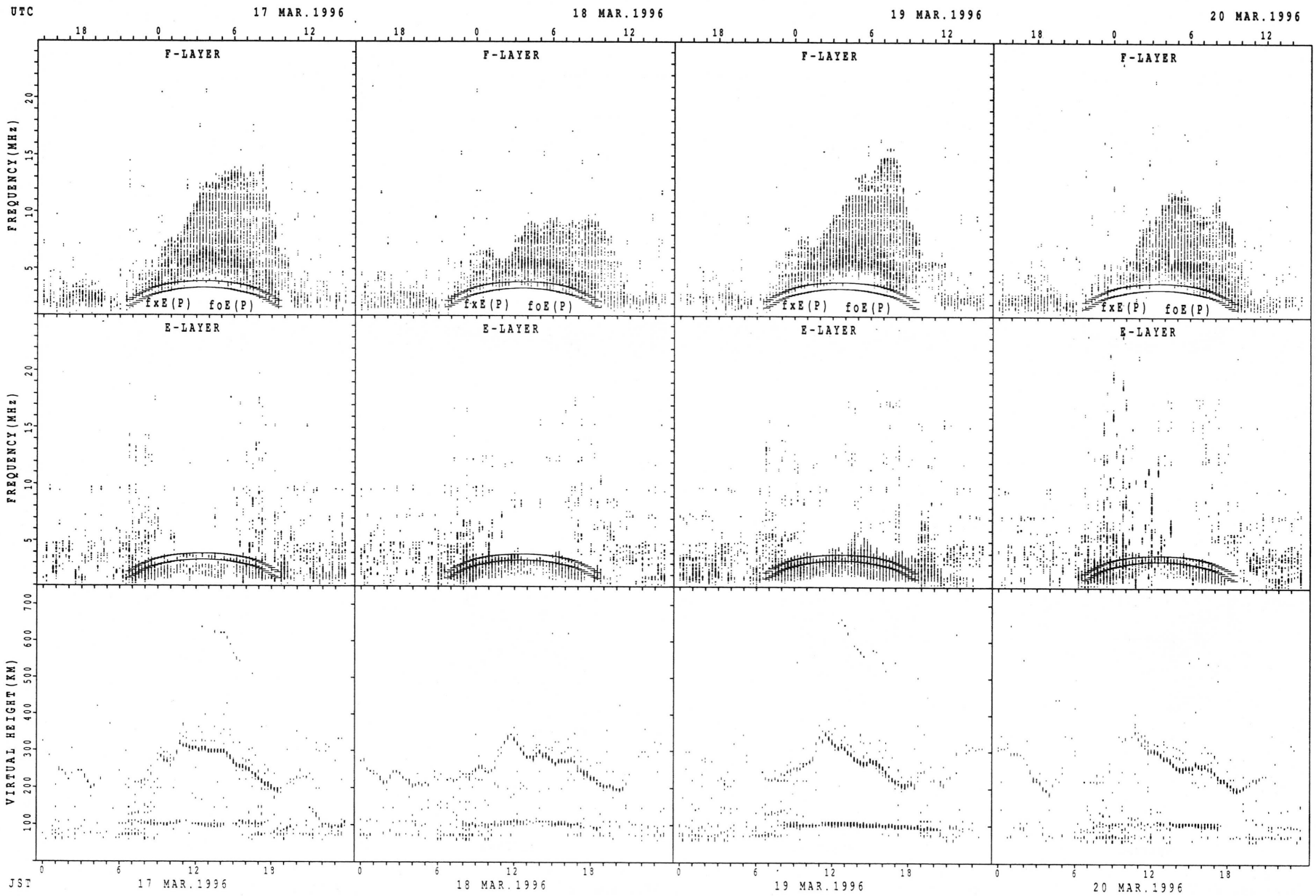
SUMMARY PLOTS AT OKINAWA



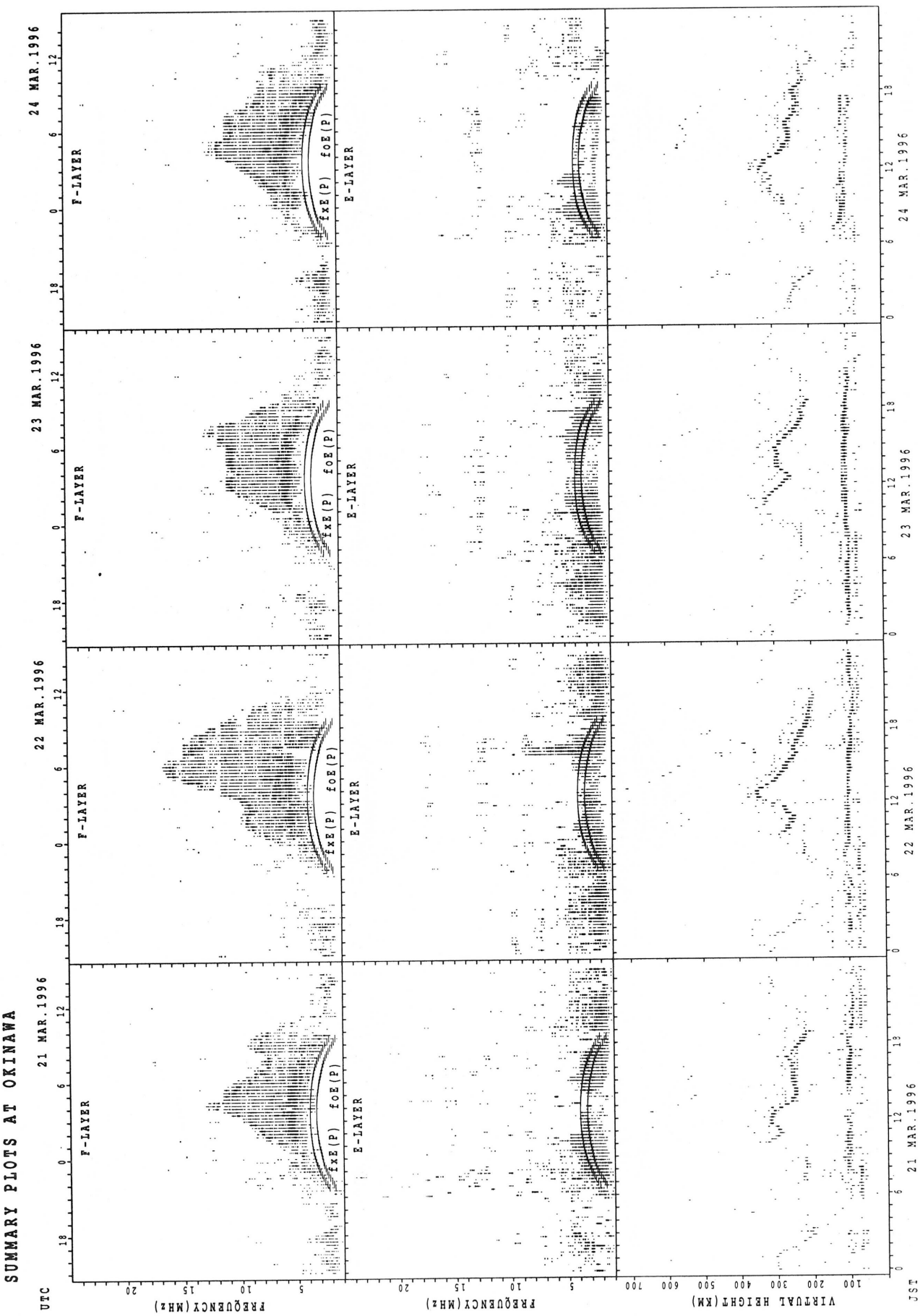
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


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

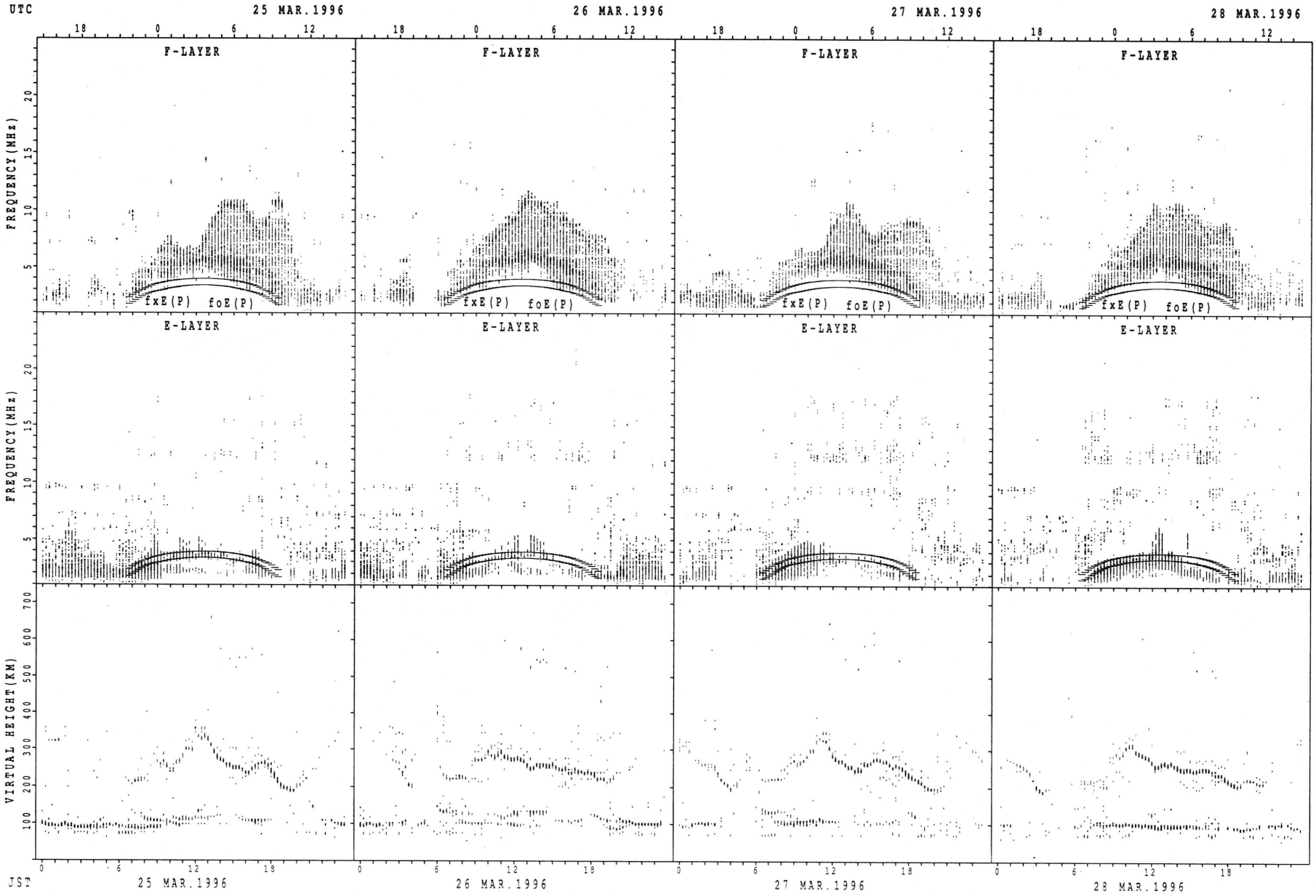
SUMMARY PLOTS AT OKINAWA



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

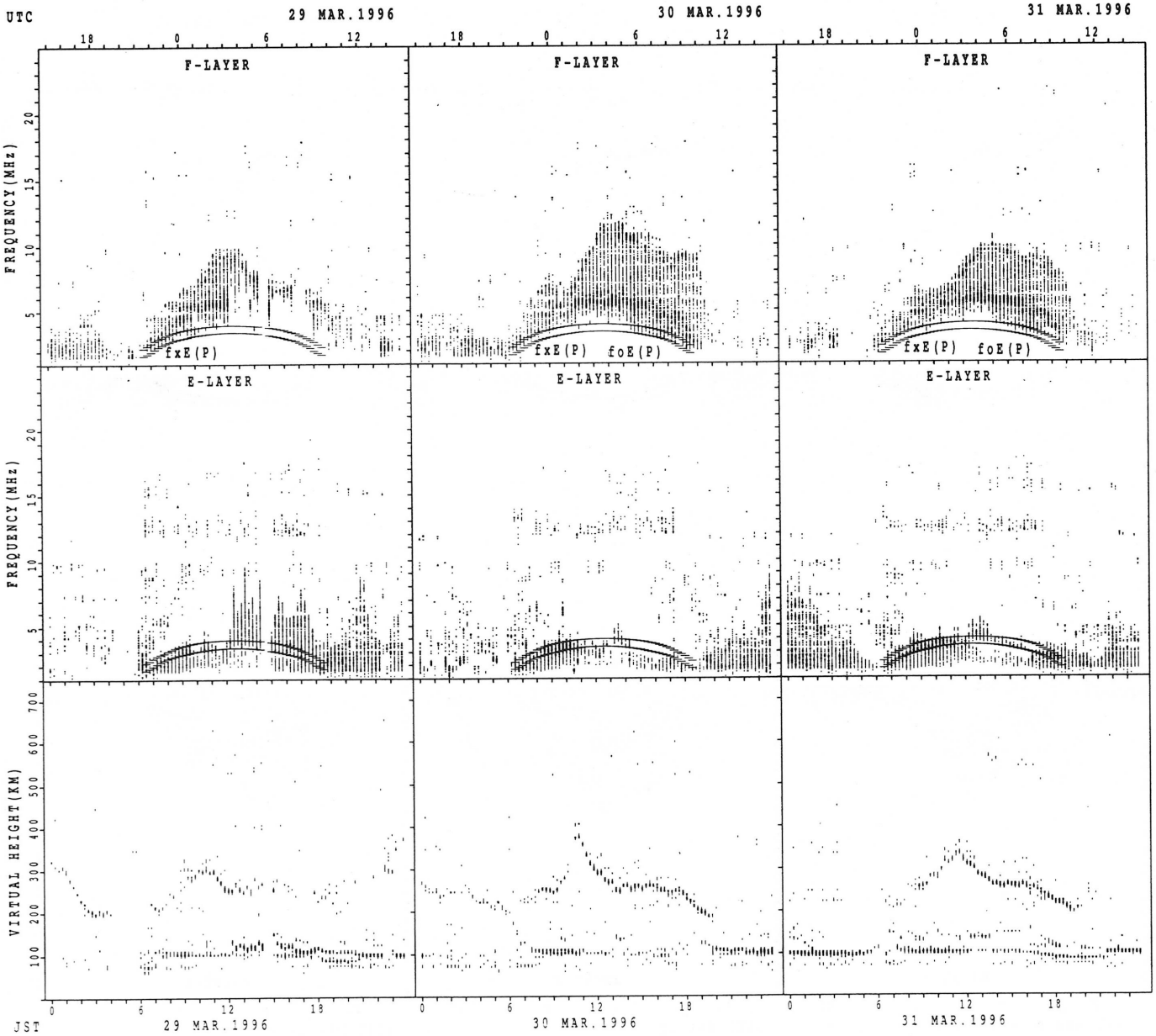

SUMMARY PLOTS AT OKINAWA
UTC
JST
21 MAR.1996
22 MAR.1996
23 MAR.1996
24 MAR.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

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

MAR.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										11	19	19	27	26	26	19								
MED										272	280	294	296	290	278	276								
U Q										280	290	304	306	304	290	280								
L Q										262	270	282	280	276	268	266								

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								30	30	28	31	30	31	29	29	31	27	13		10				
MED								129	119	112	109	109	113	107	107	109	113	111		105				
U Q								155	125	119	117	115	119	117	117	119	117	133		115				
L Q								119	113	107	105	105	107	107	105	107	103	97		99				

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	12	16	25	28	28	26	22	18							
MED									261	282	303	292	283	263	263	263	262							
U Q									270	303	321	309	297	277	272	280	272							
L Q									248	273	284	277	268	258	248	258	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	11						17	26	31	29	30	31	30	30	31	31	31	24	12	13	12	15	11	12
MED	107						143	123	119	113	111	113	113	111	113	111	111	111	109	109	107	105	107	107
U Q	113						155	137	137	131	121	133	123	121	123	119	113	117	114	115	113	123	129	114
L Q	99						137	115	111	109	107	109	107	105	107	107	103	105	105	104	104	101	101	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													10											
MED													291											
U Q													294											
L Q													280											

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10			10					13				10	10	10	10		11	10		11	13	10	10
MED	86			109					115				107	127	110	110		107	99		101	89	89	86
U Q	99			131					125				119	145	149	131		109	119		113	129	101	129
L Q	63			83					107				103	111	89	101		103	83		89	86	63	63

MONTHLY MEDIANS OF h'F AND h'Es

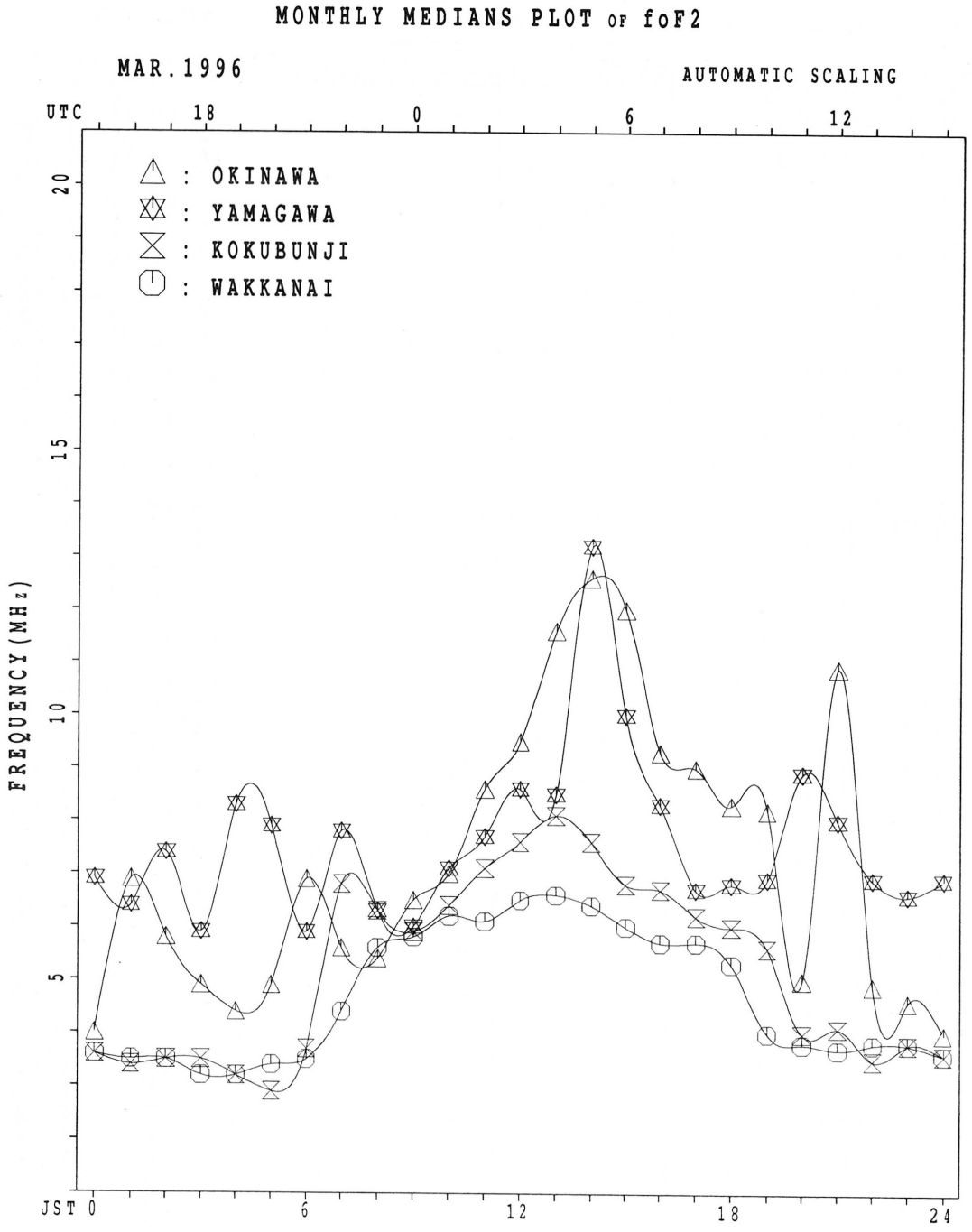
MAR.1996 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION OKINAWA LAT. 26.3N LON. 127.8E

	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	24	30	31	30	31	29	19	23	12				
MED											300	309	294	272	255	250	248	238	228	230				
U Q											320	332	314	284	264	264	259	262	238	248				
L Q											264	293	278	262	248	244	235	224	220	216				

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	14	12	11	10		18	30	31	30	30	30	28	30	29	26	22	17	20	16	20	18	14
MED		95	95	98	101	99		121	111	107	111	111	115	111	109	107	105	104	99	95	99	101	96	96
U Q		97	99	124	109	103		135	139	119	131	137	139	144	129	111	107	111	109	102	121	108	107	101
L Q		95	91	89	89	91		89	103	101	105	105	107	105	105	105	99	97	97	89	90	83	89	91


MONTHLY MEDIANS PLOT OF foF2
MAR.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

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

MAR. 1996 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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 28	28	31	32	25	20	31	44	58	68	76	92	95	79	73	63	56	57	45	30	28	31	F 32	F 31
2	F 30	32	F 31	F 32	F 36	F 29	29	45	47	60	61	78	75	85	76	67	58	52	42	34	29	24	26	27
3	27	F 26	F 26	30	32	J R 17	F 27	46	50	51	53	56	66	84	64	63	61	A	41	27	30	F 31	F 28	F 30
4	F 30	F 30	F 30	F 32	F 28	F 27	32	46	53	60	57	60	66	62	63	73	84	57	50	35	29	A	26	A
5	F 26	26	28	F 30	F 31	F 27	29	50	61	53	61	70	83	103	89	60	57	50	40	33	A	A	F 26	F 27
6	F 28	F 30	28	28	F 28	F 26	S 34	48	58	56	63	66	70	81	78	56	59	U A 50	39	A	32	32	32	F 32
7	F 32	33	F 34	F 40	34	F 26	34	46	54	58	64	68	75	79	83	64	62	58	40	30	29	31	31	F 32
8	F 30	F 27	28	34	30	22	34	48	60	48	60	59	61	74	68	66	59	49	45	40	30	26	28	28
9	28	31	34	33	22	22	33	46	55	52	65	66	72	78	R 64	58	54	58	46	35	F 31	F 32	F 32	F 30
10	F 27	F 32	F 34	F 30	28	23	J R 35	43	52	51	56	72	90	94	74	60	57	49	47	36	36	34	32	32
11	33	32	36	33	23	23	30	55	50	55	60	73	82	93	73	66	63	50	40	43	43	46	40	S 34
12	F 38	F 42	F 31	F 28	F 30	F 31	40	58	58	66	83	104	92	103	82	61	58	60	56	52	39	40	S 36	35
13	F 34	28	29	F 31	F 31	22	36	R 52	56	63	65	76	84	81	75	76	70	64	49	42	42	40	39	35
14	39	36	34	27	26	26	41	56	J R 62	67	84	90	79	80	73	65	62	66	48	37	37	35	F 33	F 34
15	36	F 32	28	23	F 22	20	38	53	62	65	78	82	94	80	76	76	73	61	50	36	36	34	36	R 37
16	32	32	34	29	26	27	38	54	57	60	63	70	74	78	76	74	69	62	62	46	39	34	34	32
17	32	33	35	31	27	25	R 40	58	66	60	53	60	66	61	59	63	80	81	58	34	29	U R 27	30	31
18	31	32	30	28	26	25	39	57	56	58	58	64	R 63	66	72	68	60	R 65	66	54	44	40	40	40
19	37	36	36	37	29	25	41	46	66	68	60	72	70	75	75	72	68	60	53	44	41	39	37	38
20	36	S 38	38	37	36	30	43	56	54	60	68	76	74	95	79	60	62	69	74	51	42	42	38	40
21	38	38	39	37	24	23	38	72	60	62	63	83	97	84	68	60	62	61	66	66	56	54	47	46
22	44	44	42	39	30	22	39	57	67	67	72	76	71	66	66	73	74	70	63	50	36	36	35	34
23	31	31	34	36	F 22	F 23	42	51	56	62	74	92	102	83	79	75	74	66	59	36	33	35	U A 35	F 34
24	F 34	F 34	F 33	F 34	28	24	44	48	53	56	61	78	79	86	86	74	60	54	52	53	50	42	F 39	F 38
25	F 32	F 34	F 37	F 37	F 34	F 29	39	49	49	66	59	56	64	74	88	82	62	66	67	65	36	30	31	R 29
26	F 30	F 32	F 28	J F 33	F 38	F 20	38	52	54	55	65	78	82	90	95	73	58	59	68	55	39	37	F 36	F 35
27	F 35	36	F 35	F 32	F 32	F 24	42	50	49	54	53	68	81	87	77	69	59	58	57	56	51	41	F 36	F 38
28	F 37	F 33	F 33	35	27	F 20	43	49	51	56	60	68	84	78	64	63	63	68	72	61	30	30	31	32
29	31	30	32	34	25	24	45	49	56	52	58	65	77	71	71	70	65	A	U A 55	43	A	F 37	F 38	34
30	F 34	34	34	36	30	21	42	52	58	57	61	76	86	93	97	72	61	56	53	50	J R 43	32	30	31
31	33	32	31	32	30	26	42	52	58	58	60	69	68	80	84	74	68	69	66	A	A	31	F 31	F 29
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	31	29	28	29	31	30
MED	F 32	32	33	32	28	24	38	50	56	58	61	72	77	80	75	67	62	60	53	43	36	34	33	33
U Q	36	34	35	36	F 31	F 26	42	55	60	63	65	78	84	87	82	73	68	66	63	52	42	40	37	35
L Q	F 30	30	30	30	26	22	34	46	53	55	59	66	70	75	68	63	59	55	45	35	30	31	31	31

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

IONOSPHERIC DATA STATION Kokubunji

MAR. 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									L 388	L 420	U 440 A	432	420	420	420	L 400	L	L						
2									L 420	U L 436	L	432	448	420	416	400	L 340	L 232						
3								244	U L 360	U L 420	L	444	440	428	440	U L 408	A	A						
4										L 416	L 420	428	428	432	420	L 424	U L 380	L						
5									L	L 408	L 444	432	432	420	424	L 400	U L 348							
6								L	L	U L 412	420	432	440	424	416	A	U L 348	A						
7								L	L	L 420	420	440	440	428	420	400	L 360	L 252						
8								U L 296	L 388	U L 400	428	436	440	428	420	400	L 364	A						
9									U L 388	L 428	420	428	428	424	420	L 400	A							
10									L	U L 420	432	U A 488	440	428	U A 432	U A 440	L 356	L 228						
11								L	L	U L 412	L 436	428	440	424	420	L 408	L							
12								L	U L 392	L 420	A	440	440	440	420	U L 404	L	L						
13									L	L 420	432	452	L 444	440	432	L 408	U L 388	L						
14									L	L 452	440	L 444	440	452	L 440	L 416	L							
15									L	L 420	436	440	A	U A 428	440	U A 424	U L 380							
16								L	U L 388	L 416	L 436	448	440	444	440	420	L 400	L						
17									L 392	408	L 420	440	440	L 440	424	432	L 384							
18									L	L	L 436	L 452	440	432	428	L 412	L	L						
19									L 404	L 400	L 436	440	432	440	432	L 420	U L 400	L						
20									L	L	L 440	448	440	L 440	L 440	L 424	U L 400	L						
21								L	L	L 420	452	440	448	444	436	L 436	U L 384	L						
22									U L 408	L 440	L 440	L 436	L 444	L 440	L 468	L	U L 392	L 280						
23									L	U L 428	U A 432	444	440	440	L 440	L 416	U L 392	L						
24									L	U L 416	444	440	452	444	440	L 420	U L 392	L						
25									L	428	432	L	L 440	448	440	416	L	L						
26									L	L 452	440	U A 460	448	448	432	U L 416	L							
27										L 412	L	440	448	436	428	412	L	L						
28								L	U L 380	U L 440	L 448	460	440	444	428	L 412	388	L						
29									L	L	L 452	440	436	A	424	U A 420	U A 396	A						
30										U L 424	A	448	440	440	432	L 448	L	A						
31									L 388	A	A	U A 452	L 456	444	420	L 416	U L 408	A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	10	27	26	30	30	30	31	29	20	4						
MED								270	U L 388	L 420	436	440	440	440	428	L 416	U L 386	L 242						
U Q									U L 392	L 428	L 440	448	444	444	440	422	U L 394	L 266						
L Q									U L 388	L 412	432	436	440	428	420	L 406	L 362	L 230						

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

IONOSPHERIC DATA STATION Kokubunji

MAR. 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							B	H 240	H 280	292	304	320	332	328	316	284	244	188						
2							B 200		244	300	316	328	332	324	316	A	A 252	B						
3							B 200		256	284	304	A 320	328	328	312	U A 288	A	A						
4							B 196		260	H 300	H 312	320	324	316	300	A 292	A	168						
5							B 212		A	A	304	U A 312	A	A	312	A	A	176						
6							B 188		256	284	304	320	324	312	292	272	A 228	A						
7							B	A 264	292		R	A 336	A 340	R 340	320	A	272	A						
8							B 212	A	284	308	324		328	320	312	280	264	A						
9							B	A 268	292	324	340		344	324	312	288	A 252	A						
10							B	A 256	292	312	324		A	A	A	A	240	180						
11							B	196	260	296	308	A 316	R 328	316	304	284	252	188						
12							B	212	268	304	312	A	A	A	308	288	A	180						
13							B	204	264	A	A	A	A	332	320	A	A	A						
14							B	220	264	A	A	A	A	320	A	A 280	A	B						
15							B	A	276	A	A 300	A	A	A	A	A	A	A						
16							B	236	276	304	A	A	332	332	316	292	248	200						
17							B	232	284	308	R 320	U R 332	336	332	316	292	260	196						
18							R 172	232	268	A 300	R	332	332	328	316	296	256	204						
19							B	224	280	296	A	332	U R 332	R	316	292	A	A						
20							B	236	280	304	A 312	A	320	320	308	284	260	188	B					
21							A	236	288	304	316	U A 328	A	324	308	292	256	196	B					
22							B	220	260	292	308	A	A	R	A	288	A	208	B					
23							A	212	A	300	312	A	A	A 324	316	A	A	A	B					
24							168	H 240	280	A 304	U A 304	A	A	A	A	A	A	A	B					
25							180	244	276	304	A	324	R 336	A	316	296	252	212	B					
26							B	252	280	A 312	A 328	A 332	A	328	320	A	A	A	B					
27							A	200	A 260	300	320	328	328	A	316	296	A	A	B					
28							176	248	280	304	320	A	R 336	328	316	288	260	204	B					
29							168	H 228	280	312	332	R 336	340	A	A 328	300	256	208	B					
30							164	244	296	312	332	A 332	A	A	A 328	A	H 276	216	B					
31							176	252	296	308	320	A 328	328	324	A	304	268	208	B					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	27	28	27	24	21	19	20	25	21	18	17						
MED							172	224	272	300	312	328	332	324	316	288	256	196						
U Q							176	240	280	304	320	332	336	328	316	294	260	208						
L Q							168	204	260	292	306	320	328	320	310	284	252	184						

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

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	J A E B J A J A 23 14 16 26				22	E B E B 14 14		G 19	34	34	J A 48	J A 42	39	37	G 30	33	J G 23	G	S E B 18 15		J A 18	24	19	36
2	26	24	J A 22	21	E B E B 14 14		18	20	34	38	41	J A 50	J A 52	35	G	32	G 23	E B 16	E B 15	E B E B 13	E B E B 14	E B 14	23	E B 16
3	J A E B 24 15		26	20	E B E B E B 14 14 15			G	J G 23	34	36	G 30	39	39	J A 48	J A 52	J A 86	84	J A 36	J A 40	J A J A 24	34	27	J A 22
4	J A J A 31 20		J A 25	21	J A 18	23	20	26	31	34	36	40	40	42	35	J A 43	J A J A 46 31		J A E B 27 13		E B J A 15 30		J A 35	34
5	J A J A 32 24		20	E B 16	19	24	19	26	33	J A 40	37	J A 45	J A 44	J A 42	38	J A 37	J A J A 34 26		J A J A 22 34		J A J A 48 49		21	26
6	J A J A 26 26		18	17	J A 33	20	J A 22	J A 21	G 22	30	34	36	37	35	40	J A 50	J A J A 47 60		J A J A 61 54		J A J A 46 29		24	22
7	22	J A 31	J A J A 24 24		27	18	20	J A 27	J A 26	35	G 31	37	J A 50	37	J A 37	35	J A J A 29 44		J A J A 36 24		J A J A E B 29 17		J A 14	22
8	18	21	24	23	E B E B E B 13 14 15			G	29	G 26	39	36	38	40	42	36	36	J A J A 46 18		18	J A 18	26	24	E B 14
9	E B E B E B 14 15 14			20	J A E B J A 20 14 23			24	32	37	40	42	44	35	34	38	J A 50	54	E B E B 14 15		E B E B 12 15		J A J A 27 23	
10	19	E B E B E B 16 13 14			16	E B J A J A 14 27		28	34	37	40	J A 50	J A J A J A 43 36 46			51	G 21	G	J A J A 27 29		J A 22	18	E B E B 16 15	
11	E B E B 12 15		18	17	E B E B J A 14 15 19			26	32	33	38	34	G 32	G 31	G	G	G	J A E B 22 15		18	J A 23	18	E B E B 15 15	
12	20	E B 14	19	22	21	18	25	G	J G 27	32	J A J A 51 40		J A J A J A 38 42		G 28	G 19	J A 28	J A E B 20 13		E B E B 14	E B E B E B 15 12		E B E B 15 15	
13	E B E B E B E B 16 13 14 13				18	19	J A 18	26	29	33	J A J A 44 46		J A J G 46 31		38	J A 30	39	38	J A 31	26	E B E B E B E B 16 16 16 14			
14	19	21	J A 26	J A J A 30	J A E B J A J A 20 12 19 27				J A J A 38 44		35	38	36	33	J A 44	J A 41	J A 34	72	J A 51	26	J A 50	29	J A J A 37 32	
15	31	J A 26	J A J A 24 24		E B E B E B 13 14 15			26	38	J A 48	J A J A 42 42		J A J A J A 50 45		36	J A 51	J A 40	57	E B J A 15 41		J A 14	19	E B E B 15 14	
16	J A 27	19	E B E B 14 14		21	E B E B 14 14		26	29	G 30	35	36	G	G 24	G 23	G 22	J G 18	25	23	E B 13	E B E B E B E B 14 13 14 14			
17	E B E B E B E B E B E B J A 15 13 15 15 15 16 25							G	G 21	G	G	G	37	G	34	J G 24	G	30	J A E B 26 15		E B E B E B E B 15 14 14			
18	E B E B E B E B 15 15 14 14				16	18	23	29	32	36	G 26	36	35	G	G	36	30	27	E B E B 14 14		E B E B E B 14 14 19		E B 14	
19	E B E B E B E B E B E B J A J A 15 15 15 14 14 14 24 31								J A 37	38	J A 48	G	G 32	G 31	35	31	27	20	J A J A E B 34 28		14	18	E B 16	19
20	E B E B 14 17		18	E B E B E B J A 14 14 15 20				G 19	30	G 29	34	34	G 30	G 28	G 28	G 27	G 24	G 18	E B E B 15 15		18	24	25	18	
21	E B E B E B E B E B E B J A 12 14 14 15 14 14 22							G	G	32	37	38	37	G 32	G 28	31	G	22	E B E B 15 16		J A J A 22 22		20	E B 14
22	E B E B E B E B E B 14 14 14 14 13				19	J A 20	29		30	32	34	34	J A 36	G 31	36	35	J A 28	G	E B 23 15		21	18	J A 23	25
23	J A E B E B E B E B 26 15 14 14 14 18				J A 22		27		J A 33	J A J A J A 41 46 42			39	38	G 24	46	33	J A 28	J A J A J A 27 35		J A J A J A 28 41		50	27
24	29	E B E B J A J A J A 13 16 22 22 25				25	29		37	37	37	37	J A J A 44 43		32	J A 31	26	J A 24	E B E B 15 14		29	J A 34	J A J A 52	J A 35
25	J A J A 21 24		E B E B 15 14		E B E B E B 12 15		G	28	37	41	34	38	38	34	G 27	G	G	G E B E B 14 14			E B E B E B 15 14 15		21	
26	J A 23	19	E B E B 14 13		E B E B E B 13 15		23	G 21	36	J A J A J A 43 43 67			37	G J A 26 34		36	J A 35	29	E B E B 14 15		20	20	25	J A 22
27	20	18	E B E B 14 13		E B E B E B 14 14		21	28	33	36	39	36	35	35	G	G 28	26	J A 24	E B E B 15 15		E B E B E B 15 13		E B E B 15 15	
28	E B E B 15 15		18	E B 14	J A E B 28 14		G	G 24	32	34	34	34	G	38	36	31	G J A E B 23 15		22		E B E B E B 15 15 15		19	
29	E B E B E B E B E B E B J A 15 15 14 13 14 14 22							26	32	36	G	G 29	42	68	40	J A 44	J A 52	72	61	44	47	J A 22	18	E B 14
30	E B E B E B E B E B E B 14 14 15 12 14 15				22		30		39	44	J A 60	40	38	33	41	J A 48	32	50	J A 23	40	40	J A E B 30 14		16
31	E B E B E B E B E B E B 12 14 14 13 13 14				24		30		38	J A 49	70	J A 48	40	J A 45	38	36	35	J A 55	50	J A 95	J A 55	21	J A J A 37	27
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	19	E B 15	E B E B 15 15		E B E B 14 15		20	26	32	36	37	38	38	35	35	35	29	27	22	18	18	19	19	19
U Q	J A J A 26 21		J A J A 20 21		20	18	23	28	36	J A 40	J A J A 43 42		J A 43	J A 40	38	J A 43	J A 36	50	J A J A 31 34		J A J A 29 29		J A 25	25
L Q	E B E B E B E B 15 14 14 14				E B E B E B 14 14 18			G	G 29	32	34	34	G 36	G 32	G	G 30	G	G E B E B 20 15 15			E B E B E B E B 15 15 15 14			

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

IONOSPHERIC DATA STATION Kokubunji

MAR.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	16	E B 14	E B 14	17	E B 13	E B 14	E B 14	G 16	30	33	44	37	38	36	G 21	G 24	G 20	G	17	E B 15	E B 14	E B 14	16	18
2	17	17	16	16	E B 14	E B 14	E B 16	G 18	32	35	39	39	43	35	G	31	G 22	E B 16	E B 15	E B 13	E B 14	E B 14	E B 16	E B 16
3	E B 14	E B 15	17	E B 14	E B 14	E B 14	E B 15	G	G 20	G	35	G 27	37	35	40	36	48	A A 84	18	18	17	21	E B 13	17
4	E B 13	14	E B 15	E B 14	16	16	E B 16	24	30	32	36	37	39	38	33	37	30	G	22	E B 13	E B 15	A A 30	21	A A 34
5	16	18	E B 13	E B 16	E B 16	17	16	24	28	32	34	35	34	33	36	33	26	G	17	26	A A 48	A A 49	E B 16	17
6	17	17	E B 13	16	18	E B 14	E B 16	G	G 20	30	34	34	36	34	38	44	28	U A 41	34	A A 54	28	19	E B 14	E B 15
7	E B 15	19	17	15	E B 13	E B 13	E B 12	21	G 20	34	U G 31	37	G 33	37	G 28	29	G 22	20	E B 14	19	20	E 13	E B 14	E B 15
8	E B 13	17	16	E B 14	E B 13	E B 14	E B 15	G	27	G 24	38	34	36	38	36	33	34	35	E B 15	16	E B 15	E B 15	17	E B 14
9	E B 14	E B 15	E B 14	17	16	E B 14	E B 16	24	30	36	39	40	40	34	33	36	42	47	E B 14	E B 15	E B 12	E B 15	E B 14	E B 14
10	E B 13	E B 16	E B 13	E B 14	15	E B 14	E B 15	26	31	36	40	49	36	34	43	44	G 20	G	22	19	18	16	E B 16	E B 15
11	E B 12	E B 15	16	E B 14	E B 14	E B 15	18	24	30	33	35	33	G 29	G 27	G	G	G	G 17	E B 15	E B 13	18	16	E B 15	E B 15
12	E B 13	E B 14	17	E B 13	E B 15	16	E B 17	G	G 20	31	50	37	35	33	G 28	G 18	25	G 15	E B 13	E B 14	E B 15	E B 12	E B 15	E B 15
13	E B 16	E B 13	E B 14	E B 13	E B 14	16	E B 15	24	28	32	35	35	34	G 24	G 26	29	30	25	23	E B 14	E B 16	E B 16	E B 16	E B 14
14	16	E B 14	18	E B 15	16	E B 12	17	G 18	G 21	32	32	36	34	G 29	35	G 28	29	48	28	E B 14	19	17	17	17
15	18	E B 14	17	18	E B 13	E B 14	E B 15	22	G	38	38	40	48	43	33	42	31	39	E B 15	19	E B 14	E B 14	E B 15	E B 14
16	E B 14	17	E B 14	E B 14	E B 13	E B 14	E B 14	25	28	G 27	33	34	G	G 22	G 18	G 18	G 16	G 16	E B 14	E B 13	E B 14	E B 13	E B 14	E B 14
17	E B 15	E B 13	E B 15	E B 15	E B 15	E B 16	E B 16	G	G 21	G	G	G	35	G	G 33	G 21	G	27	E B 16	E B 15	E B 15	E B 14	E B 14	E B 14
18	E B 15	E B 15	E B 14	E B 14	E B 16	E B 14	19	27	31	34	G 23	35	34	G	G	34	29	24	E B 14	E B 14	E B 14	E B 14	13	E B 14
19	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14	20	28	31	34	35	G	U G 32	U G 31	35	31	25	19	E B 15	20	E B 14	E B 14	E B 16	E B 14
20	E B 14	E B 17	17	E B 14	E B 14	E B 15	18	G 16	30	G 23	34	34	G 30	G 27	G 27	G 25	G 20	G 15	E B 15	E B 15	E B 14	16	18	16
21	E B 12	E B 14	E B 14	E B 15	E B 14	E B 14	18	G	G	32	34	35	35	G 29	G 28	31	G	22	E B 15	E B 16	18	19	17	E B 14
22	E B 14	E B 14	E B 14	E B 14	E B 13	E B 14	18	27	30	32	33	33	35	U G 31	35	G 23	24	G	E B 15	E B 15	18	E B 14	20	17
23	16	E B 15	E B 14	E B 14	E B 14	E B 14	19	26	30	39	43	40	36	36	G 22	35	26	18	19	27	E B 14	23	U A 26	16
24	18	E B 13	E B 16	18	18	18	20	27	33	34	36	34	36	35	32	28	26	21	E B 15	E B 14	21	18	19	24
25	E B 14	E B 14	E B 15	E B 14	E B 12	E B 15	G	26	34	36	33	38	38	34	G 24	G	G	G	E B 14	E B 14	E B 15	E B 14	E B 15	E B 14
26	E B 14	E B 15	E B 14	E B 13	E B 13	E B 15	21	G 21	32	38	36	46	U Y 37	G 24	G 22	32	27	24	E B 14	E B 15	E B 15	E B 14	E B 14	17
27	E B 15	E B 14	E B 14	E B 13	E B 14	E B 14	19	27	32	35	38	36	35	34	G	G 26	26	21	E B 15	E B 15	E B 15	E B 13	E B 15	E B 15
28	E B 15	E B 15	E B 13	E B 14	16	E B 14	G	G 21	30	33	34	34	G	37	35	30	G	G E 18	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14
29	E B 15	E B 15	E B 14	E B 13	E B 14	E B 14	21	26	31	35	G	G 28	40	62	36	42	40	A A 72	46	34	A A 47	17	E B 14	E B 14
30	E B 14	E B 14	E B 15	E B 12	E B 14	E B 15	20	29	37	40	55	40	37	33	40	42	30	38	18	34	34	23	E B 14	E B 13
31	E B 12	E B 14	E B 14	E B 13	E B 13	E B 14	23	28	34	46	55	45	40	41	36	35	32	47	41	A A 95	A A 55	E B 15	17	E B 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14	E G 16	24	30	33	35	35	36	34	33	31	26	21	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
U Q	16	16	16	15	16	15	19	26	31	36	39	39	38	36	36	36	30	38	19	19	19	18	17	17
L Q	E B 14	E B 14	E B 14	E B 14	E B 13	E B 14	E B 15	G	G	G 32	33	34	G 34	G 31	G 28	G 28	G	G	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14

MAR.1996 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

IONOSPHERIC DATA STATION Kokubunji

MAR. 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 282	321	330	356	372	323	352	363	325	336	332	340	352	342	366	367	357	358	354	360	314	307	F 301	F 326
2	F 328	308	F 302	F 327	F 370	F 343	365	366	354	338	317	343	332	348	355	370	376	366	349	329	338	324	311	289
3	308	F 302	F 304	334	386	J R 348	F 363	376	360	343	323	302	322	352	368	361	364	A	376	340	317	F 323	F 307	F 320
4	F 302	F 318	F 326	F 325	F 328	F 330	368	368	340	335	345	332	351	342	335	326	367	376	354	337	335	A	322	A
5	F 285	303	363	F 339	F 361	F 322	342	354	363	354	312	306	317	345	373	366	374	361	354	347	A	A	F 289	F 310
6	F 304	F 331	339	341	F 343	F 327	S 365	353	347	343	345	349	322	349	370	370	371	A	366	A	A 323	A	319	F 301
7	F 302	315	F 334	F 338	379	F 349	362	378	313	332	327	320	312	342	346	354	364	384	363	335	320	324	320	F 296
8	F 276	F 293	329	355	383	317	337	361	375	350	319	319	325	352	353	362	373	362	350	340	323	305	303	295
9	307	302	353	384	318	322	341	369	362	329	334	322	331	345	R 352	356	353	356	355	327	F 307	F 324	F 277	F 311
10	F 315	F 331	F 329	F 357	380	332	J R 411	372	352	345	307	317	316	343	356	364	352	361	357	336	317	314	295	301
11	311	314	341	373	374	319	352	350	369	339	319	322	326	339	359	343	346	373	324	319	303	321	310	S 316
12	F 318	F 333	F 346	F 316	F 307	F 328	340	364	350	319	318	341	321	335	347	363	350	357	335	332	318	321	S 314	282
13	F 315	313	304	F 331	F 346	354	341	R 362	352	347	329	318	322	332	343	348	363	367	373	316	281	316	288	299
14	294	308	347	311	327	306	359	356	J R 361	327	330	347	321	325	337	336	355	352	367	314	293	303	F 300	F 309
15	328	F 326	365	372	F 329	309	352	364	347	335	340	318	329	323	332	343	359	369	360	332	310	316	310	R 321
16	319	314	342	338	310	316	348	360	352	348	332	327	314	322	328	346	352	360	370	350	318	301	285	309
17	306	309	313	337	329	328	R 354	361	378	377	331	325	335	335	316	312	332	369	375	326	315	U R 284	283	280
18	303	304	319	331	347	326	362	369	370	324	339	308	R 327	334	331	345	342	R 340	328	353	325	314	303	301
19	312	312	307	342	331	335	359	365	359	363	327	323	339	330	331	331	342	356	359	339	301	310	301	304
20	308	S 294	301	325	343	350	356	363	356	319	314	323	305	336	352	338	324	332	349	333	308	296	303	300
21	304	305	347	387	289	310	330	354	375	338	307	319	338	340	351	336	347	350	334	344	321	322	302	295
22	287	287	300	333	324	336	363	352	351	340	323	330	337	335	317	321	342	350	352	343	337	310	299	291
23	295	297	312	363	F 337	F 322	355	357	354	330	298	308	339	333	326	335	342	364	359	393	297	308	A	F 298
24	F 297	F 293	F 312	F 321	355	295	363	368	338	339	315	321	308	319	325	358	358	358	340	317	335	322	F 298	F 297
25	F 281	F 261	F 290	F 318	F 286	F 358	349	365	335	352	339	332	320	309	334	345	350	336	342	344	369	295	285	R 294
26	F 295	F 299	F 299	J F 335	F 335	F 373	377	350	357	314	328	310	314	321	352	349	334	336	348	352	329	297	F 281	F 306
27	F 310	301	F 308	F 321	F 320	F 349	352	374	362	334	297	311	321	340	337	349	342	352	337	336	344	313	F 312	F 313
28	F 305	F 312	F 303	358	383	F 336	360	365	358	332	304	312	342	333	353	348	329	345	340	361	349	281	307	285
29	304	314	324	368	366	300	358	354	357	356	316	314	335	349	336	352	360	A	A	336	A	F 304	F 282	297
30	F 298	302	310	325	384	314	359	353	356	347	322	310	316	325	347	348	355	353	354	336	J R 321	363	297	305
31	296	301	313	331	358	328	367	372	357	347	A 333	315	312	321	333	338	346	352	366	A	A	304	F 299	F 307
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	30	29	28	28	30	30
MED	F 304	308	319	337	343	328	358	363	356	339	323	320	322	335	346	348	352	358	354	336	319	312	301	301
U Q	311	F 314	341	357	372	F 343	363	368	362	347	332	330	335	343	353	361	363	365	363	346	332	322	310	F 309
L Q	F 295	301	F 304	F 325	327	317	349	354	350	332	315	312	316	325	332	338	342	351	342	330	309	304	289	295

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

IONOSPHERIC DATA STATION Kokubunji

MAR. 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									L	L 359	A	365	A 373	394	366	L 371	L	L						
2									L	A 362	L 372	A	A	388	375	373	L 394	L 400						
3								412	U L 378	U L 363	L	H 383	365	H 375	A 395	A	A	A						
4										L 368	L 375	377	A 374	367	375	A 357	U L 370	L						
5									L	L 379	L 343	383	361	363	370	L 375	U L 369							
6								L	L	U L 380	382	374	369	392	A 379	A	A	A						
7								L	L	L 368	376	380	A	379	372	384	L 384	A						
8								U L 397	L 371	U L 396	A 340	H 393	364	A	A 357	376	A	A						
9									L	L 359	A 350	A	A	H 374	374	A	A							
10									L	U L 370	A 347	A	370	365	A	A	L 381	L 410						
11								L	L	U L 374	L 359	372	364	375	371	L 357	L							
12								L	U L 359	L 363	A	368	382	376	371	L	L	L						
13									L	L 361	376	357	L 376	367	361	L 357	L	L						
14									L	L 344	360	L 363	383	365	A 351	L 360	L							
15									L	A 378	374	A 361	A	A	A 360	A	A							
16								L	U L 397	L 385	L 395	380	380	H 377	359	350	L 361	L						
17									L 382	410	L 412	407	H 402	L 391	361	342	L 355							
18									L	L	L 375	L 376	379	385	372	L 362	L	L						
19									L 363	L 393	L 378	396	397	385	366	L 354	U L 335	L						
20									L	L	H 367	357	371	L 367	L 352	L 359	U L 361	L						
21								L	L	L 371	350	378	350	358	366	L 362	U L 360	L						
22									U L 371	L 369	L 378	L 393	363	L 370	L 347	L	U L 357	L 398						
23									L	A	A	A 359	377	366	L 356	A 359	L	L						
24									L	U L 380	369	381	358	363	356	L 358	L	L						
25									L	366	399	L	L 356	355	351	382	L	L						
26									L	L 358	377	A	371	H 373	369	L	L							
27										L 383	L	373	374	377	377	365	L	L						
28								L	U L 387	U L 369	L 368	355	379	389	384	L 375	370	L						
29									L	L	L 369	H 382	A	A	374	A	A	A						
30										A	A	A 351	368	378	A 370	L 418	L	A						
31									A 389	A	A	A	L 366	A	389	A 365	U L 368	A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	9	25	24	25	26	27	30	22	13	3						
MED								404	U L 378	L 369	373	376	371	375	370	L 362	U L 368	L 400						
U Q									U L 388	L 380	L 378	382	379	385	374	375	L 376	L 410						
L Q									L 367	L 362	360	362	364	366	359	357	U L 358	L 398						

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

IONOSPHERIC DATA STATION Kokubunji

MAR. 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									L 266	276	266	264	242	262	244	238	242	222						
2									236	274	312	262	274	258	256	240	232	214						
3								224	242	276	L 298	350	298	258	252	254	A 248	A						
4										280	274	288	262	270	274	286	232	216						
5									240	266	314	316	296	262	232	246	232							
6								226	250	266	270	264	294	262	238	242	236	A						
7								224	H 252	292	296	288	292	264	244	246	236	214						
8								234	244	264	314	312	296	264	262	246	232	236						
9									240	308	284	298	276	258	250	264	E A 254							
10									268	280	344	306	296	252	254	248	234	220						
11								254	240	270	304	292	272	266	248	266	232							
12								238	260	302	290	256	264	256	250	246	254	248						
13									258	270	292	302	282	268	258	262	242	228						
14									252	300	274	252	262	276	268	266	252							
15									250	266	264	286	266	270	284	260	244							
16								236	244	256	284	276	302	286	284	272	256	232						
17									230	238	268	308	284	292	320	306	276							
18									242	286	270	308	274	278	278	264	254	256						
19									258	238	284	294	274	294	274	276	260	230						
20									244	288	300	284	294	270	244	272	284	250						
21								240	228	270	332	280	266	258	260	274	252	252						
22									258	260	264	264	270	278	310	288	248	236						
23									250	286	324	294	258	262	280	270	246	238						
24									242	268	316	282	304	284	266	246	246	234						
25									L 270	262	288	276	308	302	274	250	254	258						
26									250	336	278	302	286	276	252	240	244							
27										286	L 328	320	288	264	266	258	260	242						
28								234	244	290	332	312	268	274	256	264	272	246						
29									242	262	322	316	282	E A 274	266	264	246	A						
30										270	E A 330	316	292	280	258	250	254	242						
31									252	274	E A 314	314	300	284	272	264	262	242						
	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								9	28	31	31	31	31	31	31	31	31	21						
MED								234	247	274	293	294	282	269	260	262	247	236						
U Q								239	255	286	316	312	296	278	274	270	254	247						
L Q								225	242	266	274	276	268	262	250	246	236	225						

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MAR. 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	308	294	270	242	212	294	232	220	234	250	A	A 246	A	226	234	214	220	226	210	212	278	270	278	280
2	268	286	286	270	222	226	218	204	198	A 246	238	A	A	210	212	224	204	206	206	220	226	254	286	328
3	308	298	312	254	204	B 210	234	190	184	H 188	214	H 176	244	H 198	A 228	A	A	A	196	A 258	272	278	272	270
4	318	266	288	238	246	276	224	220	238	236	A 248	A 240	E A 254	246	220	A	A 238	220	210	202	248	A	A 336	A
5	348	324	254	250	224	240	230	238	232	220	242	218	230	224	236	A 230	206	216	210	A 250	A	A	332	302
6	320	272	266	244	250	274	224	206	H 204	222	210	206	H 220	208	A	A	A	A	A	A	A	A	276	282
7	308	288	270	228	202	240	232	208	216	234	H 218	226	A	234	234	216	208	A 226	198	254	A 278	264	248	300
8	310	318	288	224	202	276	228	210	206	200	A	H 180	244	A	E A 256	238	A	A	210	226	258	294	296	318
9	308	292	238	206	270	284	238	226	240	234	A	A	A	H 204	234	A	A	E A 244	210	238	250	270	304	288
10	298	260	212	218	212	264	232	226	A 250	A 246	A	A	224	232	A	A	214	212	222	242	264	264	294	308
11	284	278	238	222	208	280	242	240	230	226	230	212	230	214	224	216	224	218	234	260	288	254	250	296
12	286	238	234	264	290	258	234	H 208	214	228	A	A 228	208	188	H 186	H 208	216	H 186	224	216	228	250	254	306
13	242	266	282	252	210	240	228	236	230	228	A 228	210	196	212	216	236	A 244	A 228	210	236	302	258	314	268
14	278	258	226	282	260	282	234	232	236	210	208	224	214	202	E A 254	226	A 234	A 230	A 222	238	260	278	298	282
15	254	272	224	254	260	312	230	228	230	E A 256	A 238	A	A	A	212	A	A	A 230	220	248	260	270	270	246
16	278	278	242	236	278	254	238	228	220	210	204	H 190	208	H 178	210	212	224	H 186	218	222	242	272	310	308
17	284	266	252	242	244	258	236	240	222	202	190	202	H 184	188	224	242	240	228	204	208	238	306	314	330
18	298	270	264	262	252	254	226	218	224	222	220	214	214	192	208	232	230	262	218	212	248	260	286	290
19	266	276	274	236	252	272	232	226	A 238	A 224	212	200	H 196	210	224	230	222	230	212	242	252	288	284	276
20	264	284	280	266	220	222	220	226	H 212	H 196	H 196	216	208	210	232	230	226	H 204	226	214	238	282	294	278
21	284	268	246	208	314	274	262	240	224	222	222	216	222	228	212	220	228	240	238	234	228	244	256	284
22	296	298	276	240	228	270	228	238	240	224	206	194	208	234	222	222	234	224	226	218	218	248	A 306	300
23	322	300	274	216	B 224	B 330	232	232	228	A	A	E A 262	216	A 240	222	E A 246	226	228	214	224	282	A 306	A	298
24	288	288	282	256	220	A 336	218	224	228	220	204	196	226	222	222	216	220	232	228	248	236	240	286	A 348
25	306	332	302	268	290	220	222	230	A 234	A 240	204	202	E A 268	218	224	226	H 206	246	232	214	204	268	298	326
26	320	320	320	262	220	238	222	242	236	246	216	A	Y 236	H 188	210	236	216	252	228	214	206	280	298	300
27	288	284	272	254	246	236	218	230	236	224	214	224	220	222	H 200	210	234	242	236	226	218	240	296	290
28	302	302	292	226	216	278	218	216	206	H 196	210	208	228	204	198	H 188	222	234	222	208	216	296	302	308
29	310	298	266	224	228	306	228	228	224	216	208	H 194	A	A	A 230	A	A	A	A	E A 266	A	296	302	314
30	300	288	270	238	204	280	230	234	250	A	A	E A 276	224	H 198	A	218	238	A	230	A 254	A 254	266	290	288
31	282	290	282	254	218	248	220	228	A 238	A	A	A	A 240	A	226	A 250	A 244	A	A 230	A	A	300	306	318
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	28	23	25	25	27	28	24	25	25	29	29	27	28	30	30
MED	298	286	270	242	224	270	230	228	230	224	214	210	221	210	222	224	224	228	220	226	248	270	295	299
U Q	308	298	282	256	252	280	234	234	236	235	228	A 225	233	226	231	234	A 234	237	228	248	264	285	304	308
L Q	282	270	246	226	212	240	222	218	216	213	206	H 198	208	H 198	212	216	216	217	210	214	228	256	278	282

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MAR. 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							B 142		116	128	116	A 124	A 130	116	A 118	A 124	122	134						
2							B 168		112	E A 144	A 124	122	114	114	116	A	124	B						
3							B 112		122	122	A 130	124	122	A 124	120	112	A	A						
4							B 132		116	A 128	122	A 124	120	120	112	112	A	134						
5							B 130		A	A	A 132	110	108	A	126	120	A	E B 150						
6							B 136	A 134	130	128	126		120	112	118	118	114	A						
7							B	A A 126	124		A	A	A	116	E A 146	A	128	A						
8							B 130	A	128	128	118		120	120	A 130	A 134	A 128	116						
9							B	A A 134	A 134	A 128	A 124		126	120	116	122	114	112						
10							B	A A 130	118	116	116		A	A	A	A	118	122						
11							B 132	120	120	A 122	120		A 134	A 136	118	114	116	A						
12							B 126	A 138	130	112	110		A	A	A 122	114	A	A						
13							B 124	130	A	A	A		A	A 130	120	A	A	A						
14							B 128	A 124	A	A	A		112	A 134	A	A	A	B						
15							B 122	118	110	112	112		116	A	A	A	112	A						
16							B 128	118	A 128	114		A	112	118	118	118	120	A 126						
17							B 126	118	118	114	114		112	118	114	116	114	120						
18							140	124	A 126	A	118	A 128	120	116	120	120	116	148						
19							B 134	A 136	118	112	118		A	A	112	116	A	A						
20							B 134	124	124	112		A	A 128	126	A 130	128	126	124	B					
21							A 128	120	112	110	112		108	A 134	A 134	118	118	A 132	B					
22							B 122	116	120	120	116		A	A	A	122	A	136	B					
23							A 130	A	114	110	112		A	122	120	A	A	A	B					
24							132	124	122	114	112	A	A	A	A	A	A	A	B					
25							E B 186	130	112	112	A	A 122	A	A	A 120	120	120	118	B					
26							B 128	124	118	114	112		A	A 126	A 120	A	A	A	B					
27							A 142	A	130	112	116		114	114	122	A 124	A	A	B					
28							132	A 138	A 126	A 144	114	A	118	112	A	114	114	138	B					
29							146	132	118	116	112	120	124	A	A 124	A 132	A 124	124	B					
30							132	128	120	114	114	114	116	116	A	A	A 138	122	B					
31							B 162	128	A 126	114	112	110	110	108	A	A 120	A 126	122	B					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	28	27	27	27	24	21	22	23	21	19	17						
MED							136	129	122	120	114	117	118	119	120	120	120	124						
U Q							B 162	133	A 126	A 128	A 122	A 123	123	A 126	A 124	A 123	A 126	135						
L Q							132	126	118	114	112	112	112	116	118	115	114	121						

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

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	116	B	122	110	120	B	B	126	170	148	126	132	156	152	100	96	96	G	112	B	144	134	142	112
2	112	114	110	112	B	B	114	124	174	156	152	134	122	144	G	114	114	B	B	B	B	B	102	B
3	112	B	116	114	B	B	B	G	112	174	164	104	160	146	126	116	114	110	130	110	114	108	108	126
4	152	106	100	106	112	110	110	164	166	160	148	134	130	124	126	116	116	110	106	B	B	106	104	104
5	102	102	104	B	110	122	100	172	116	112	150	112	114	116	134	126	108	114	128	108	110	104	106	104
6	104	114	102	108	112	100	108	106	114	174	136	140	130	138	120	112	120	108	104	104	102	104	100	102
7	124	102	106	104	106	108	106	104	104	184	102	154	108	160	100	102	100	98	100	102	122	104	B	120
8	106	100	96	100	B	B	B	G	112	108	164	168	156	152	140	140	130	112	96	96	112	150	154	B
9	B	B	B	104	100	B	122	160	170	174	158	148	136	132	162	126	114	110	B	B	B	B	130	118
10	106	B	B	B	126	B	124	190	166	152	142	124	116	116	108	108	106	G	108	104	108	112	B	B
11	B	B	106	108	B	B	160	158	152	148	136	126	114	112	G	G	G	116	B	138	124	118	B	B
12	126	B	108	102	108	106	146	G	108	172	114	108	104	100	114	100	118	98	B	B	B	B	B	B
13	B	B	B	B	120	108	148	134	150	110	108	104	104	102	98	96	94	110	108	126	B	B	B	B
14	116	106	100	102	104	B	140	120	116	116	112	116	114	114	114	114	112	108	106	114	102	104	104	104
15	102	104	106	102	B	B	B	126	134	114	110	110	106	108	110	106	106	104	B	106	112	114	B	B
16	102	104	B	B	100	B	B	152	126	120	116	116	G	102	106	108	104	104	96	B	B	B	B	B
17	B	B	B	B	B	B	108	G	112	G	G	G	172	G	170	96	G	130	156	B	B	B	B	B
18	B	B	B	B	B	178	142	148	148	152	106	154	170	G	G	194	184	188	B	B	B	B	110	B
19	B	B	B	B	B	B	142	148	136	130	120	G	112	110	174	E G 172	110	118	110	108	B	112	B	106
20	B	B	104	B	B	B	136	122	136	112	118	120	112	118	112	114	114	116	B	B	108	102	100	104
21	B	B	B	B	B	B	136	G	G	130	118	118	116	114	114	126	G	154	B	B	108	102	100	B
22	B	B	B	B	B	152	144	130	126	128	122	112	102	104	96	96	116	G	128	B	98	98	110	134
23	148	B	B	B	B	180	146	140	130	120	112	110	114	122	108	118	114	118	122	114	120	108	104	110
24	108	B	B	100	100	100	152	142	126	122	118	114	104	110	116	114	114	114	B	B	110	114	106	104
25	110	114	B	B	B	B	G	140	120	116	114	180	E G 194	104	104	G	G	G	B	B	B	B	B	124
26	138	116	B	B	B	B	142	114	136	126	122	114	104	108	104	98	94	118	B	B	122	118	116	110
27	112	104	B	B	B	B	144	156	140	130	120	124	122	116	G	110	106	104	B	B	B	B	B	B
28	B	B	110	B	104	B	G	112	182	150	122	118	G	174	162	126	G	116	B	124	B	B	B	126
29	B	B	B	B	B	B	164	146	154	144	G	110	154	106	152	136	128	116	112	114	110	126	102	B
30	B	B	B	B	B	B	156	162	148	132	110	114	116	118	154	110	164	122	132	120	116	112	B	118
31	B	B	B	B	B	B	154	150	136	126	116	114	122	122	162	172	152	124	114	132	116	126	148	172
	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	12	14	13	13	10	24	26	30	30	29	29	29	29	27	29	26	26	18	16	19	21	18	18
MED	112	105	106	104	108	109	142	141	136	130	120	118	116	116	114	114	114	114	111	112	112	112	106	111
U Q	124	114	110	109	116	152	147	156	152	152	139	134	145	135	152	126	118	118	128	122	120	118	116	124
L Q	106	103	102	102	102	106	118	124	116	120	113	112	110	108	106	104	106	108	106	105	108	104	102	104

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

IONOSPHERIC DATA STATION Kokubunji

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

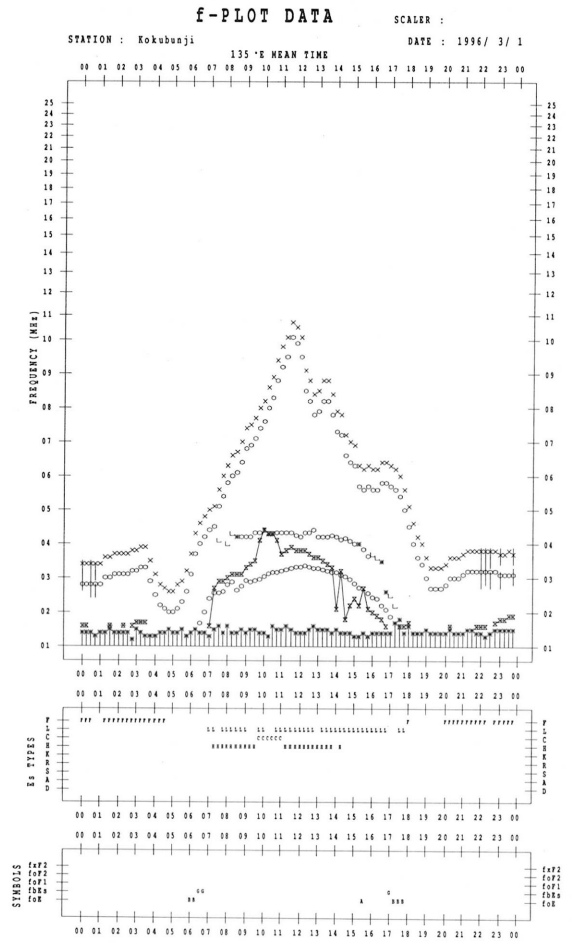
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

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	F 1		F 1	F 2	F 1			L 1	HL 11	HL 11	CL 21	CL 21	HL 11	H 1	L 1	L 2	L 2		F 1		F 1	F 1	FF 11	F 3
2	F 3	F 3	F 2	F 1			L 1	L 1	HC 11	HL 22	HL 11	HL 11	C 2	HC 11		C 2	L 2						F 1	
3	FF 21		F 2	F 1					L 2	HL 11	HL 11	L 1	HCL 11	HL 11	C 1	C 3	L 2	C 4	FF 12	F 2	F 2	F 3	F 1	FF 22
4	FF 11	F 2	F 1	F 1	F 1	F 2	LH 11	HL 11	HL 11	HL 11	HL 12	HL 11	CL 11	CL 21	C 1	C 2	C 3	L 1	F 3			F 4	F 5	F 5
5	F 2	F 3	F 1		F 1	FF 11	L 1	HL 11	L 2	C 2	HL 11	C 2	C 1	C 2	CL 21	CL 11	L 2	L 1	F 1	F 4	F 4	F 4	F 1	F 3
6	F 2	FF 11	FF 11	F 1	F 3	F 2	L 1	L 1	L 2	HL 12	HL 11	CL 11	CL 11	C 1	CL 11	CL 21	C 2	L 4	F 4	F 4	F 5	F 3	F 4	F 2
7	F 2	F 4	F 1	F 2	F 1	F 1	L 1	L 2	L 2	HL 11	L 1	HL 11	LH 11	HL 11	LH 21	LH 21	LC 21	L 3	F 2	F 2	FF 12	F 1		FF 11
8	F 1	F 3	F 2	F 2					L 2	L 1	HL 11	HL 11	H 1	HL 11	HL 21	HL 11	CL 21	CL 41	F 1	F 1	F 2	FF 12	FF 21	
9				F 1	F 2		C 1	L 1	HL 12	HL 11	HL 11	HCL 11	CL 11	CL 11	H 1	CL 11	C 2	L 3					FF 11	F 1
10	F 1				F 1		CL 11	HL 11	HL 11	HL 11	HL 11	CL 21	C 1	C 1	L 2	L 2	L 2		F 3	F 4	F 3	F 1		
11			F 1	F 1			C 1	C 2	H 1	HL 11	HL 11	CL 11	L 1	L 1				L 2		FF 11	F 2	F 1		
12	F 1		F 1	FF 11	F 1	F 1	C 1		L 2	HL 12	C 3	C 2	L 3	L 2	L 1	L 2	CL 22	L 1						
13					F 1	F 1	C 1	CL 11	HL 12	LC 21	L 2	L 1	LC 11	L 2	L 3	L 3	L 3	CL 13	FF 13	F 1				
14	F 1	F 2	F 3	F 1	F 1		C 1	LC 11	LC 21	C 1	L 1	L 1	C 1	L 1	L 1	LC 21	C 3	L 3	L 3	F 2	F 3	FQ 21	F 2	F 2
15	F 4	F 2	F 2	F 3				C 1	C 1	C 2	C 2	C 2	C 2	C 1	L 2	L 3	L 3	L 3		F 2	F 1	F 1		
16	F 2	F 1			F 1			H 1	CL 11	LL 11	CL 11	CL 11		L 1	L 1	L 1	L 1	L 1	F 2					
17							LH 11		L 1				H 1		HL 11	L 2		C 2	FF 21					
18						F 1	C 1	C 1	CL 21	HL 11	L 1	HL 11	HL 11			H 1	H 1	HL 21					F 1	
19							CL 11	C 2	CL 11	C 1	C 1		L 1	L 1	HL 11	HL 11	L 2	L 2	F 2	F 2		F 1		F 1
20			F 1				C 1	L 1	CL 11	L 1	C 1	C 1	L 1	L 1	L 1	L 1	L 2	L 1			F 1	F 2	F 2	F 1
21							C 1			C 1	C 1	C 1	C 1	L 1	L 1	CL 11		HL 11			F 3	F 3	F 2	
22						F 1	CL 11	C 2	CL 21	CL 11	CL 11	CL 11	C 2	L 1	L 2	LC 21	CL 22		CL 11		F 2	F 1	F 2	FF 21
23	F 2					F 1	C 1	CL 11	CL 21	C 2	C 2	C 1	L 1	CL 11	L 1	CL 23	L 1	CL 22	CL 12	F 2	F 2	F 3	F 2	F 2
24	F 2			F 1	F 3	F 3	CL 11	C 1	C 2	C 1	C 1	C 1	L 2	L 1	L 1	L 1	L 2	L 2			F 4	F 2	F 3	F 4
25	F 2	F 2						CL 11	C 2	C 2	C 1	HL 11	HL 11	L 2	L 1									F 1
26	F 2	F 1					C 1	L 1	CL 11	CL 21	C 1	C 2	L 1	L 1	L 1	L 2	L 2	L 1			F 1	F 1	F 2	F 2
27	F 1	F 1					C 1	CL 11	CL 21	CL 11	C 1	C 1	C 1	C 1		L 1	L 2	L 2						
28			F 1		F 1			L 1	HL 11	HL 11	C 1	C 1		H 1	HL 11	CL 11		L 1		F 1				F 1
29							C 1	HL 11	HL 11	H 1		L 1	HL 11	L 2	HL 11	HL 12	CL 22	C 5	C 4	F 6	F 6	F 2	F 1	
30							C 1	HL 11	HL 21	C 2	C 3	C 2	C 1	C 1	HL 11	CL 22	HL 12	C 4	C 3	F 4	F 5	F 5		F 1
31							C 1	HL 21	CL 21	C 2	C 3	CL 21	C 1	C 1	HL 11	HL 11	HL 11	CL 31	CL 51	FFF 24	FF 51	FF 21	F 3	FF 11
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

MAR. 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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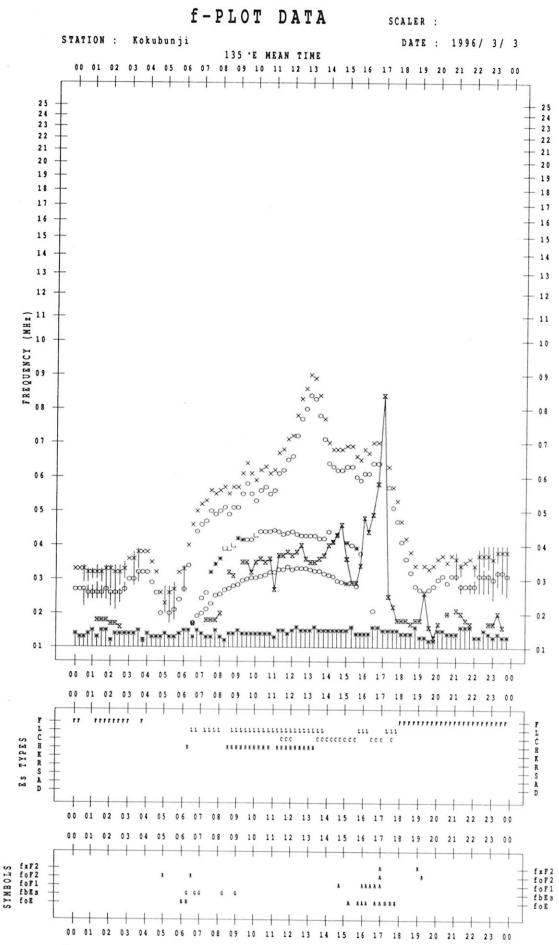
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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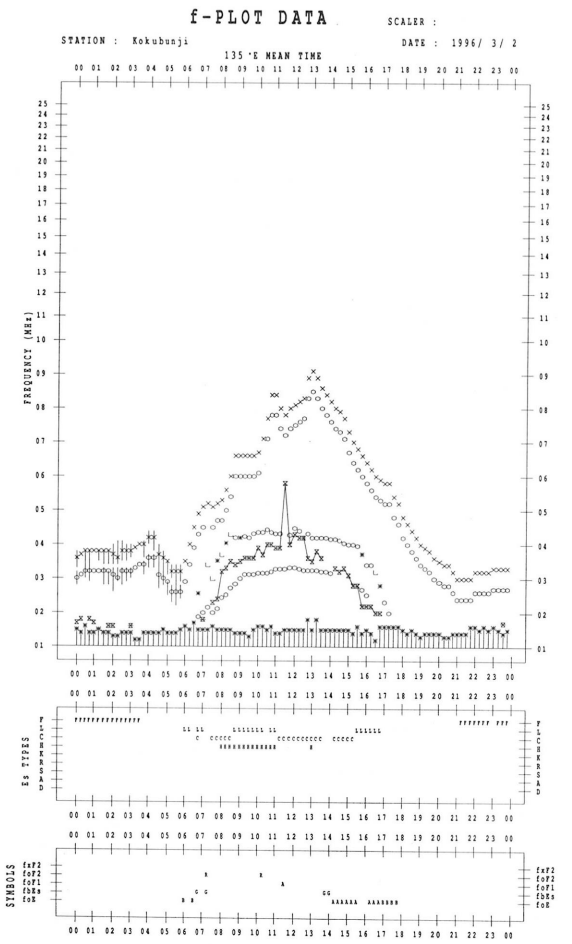
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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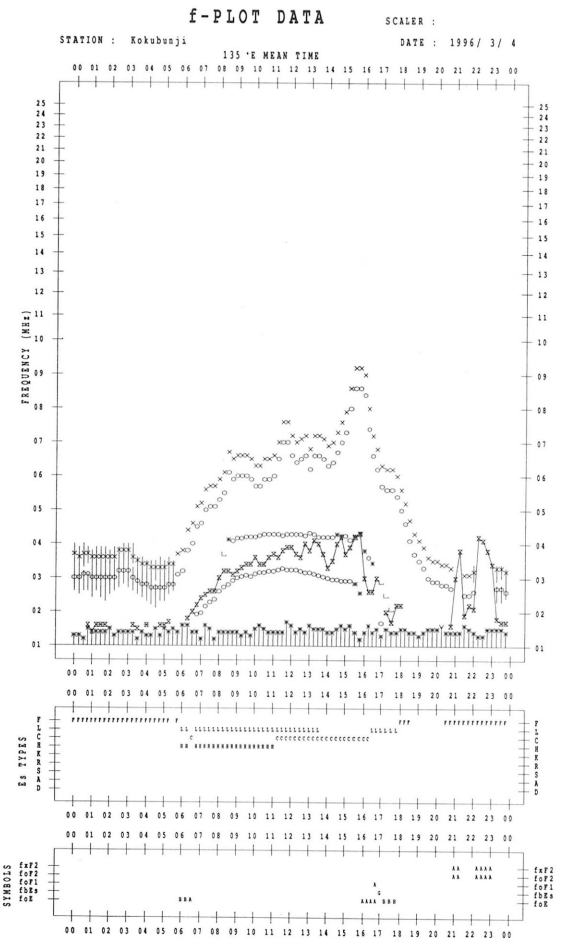
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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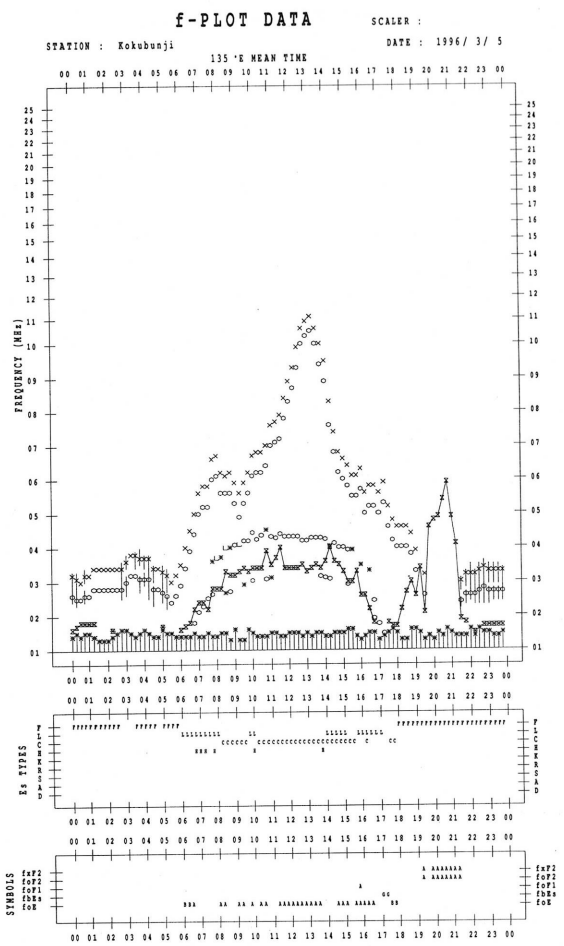
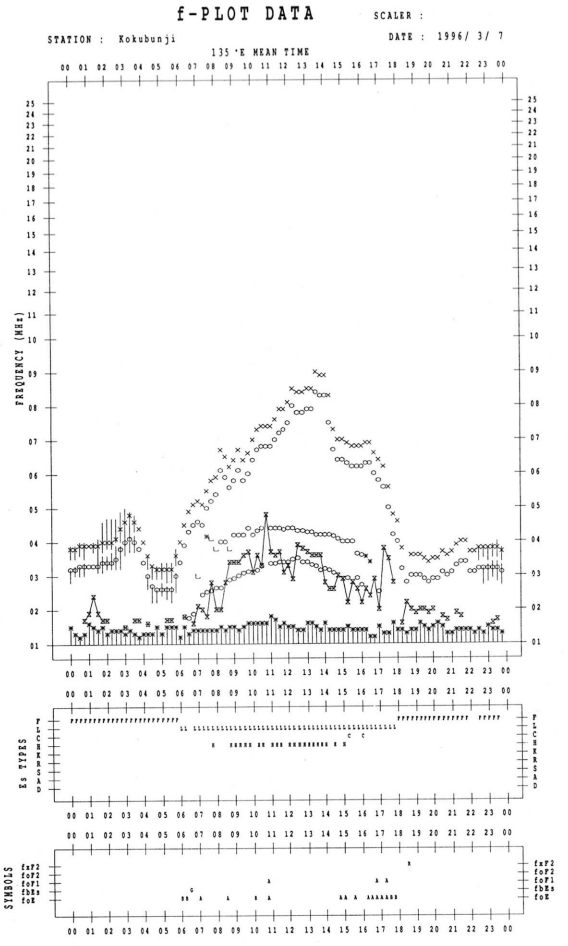
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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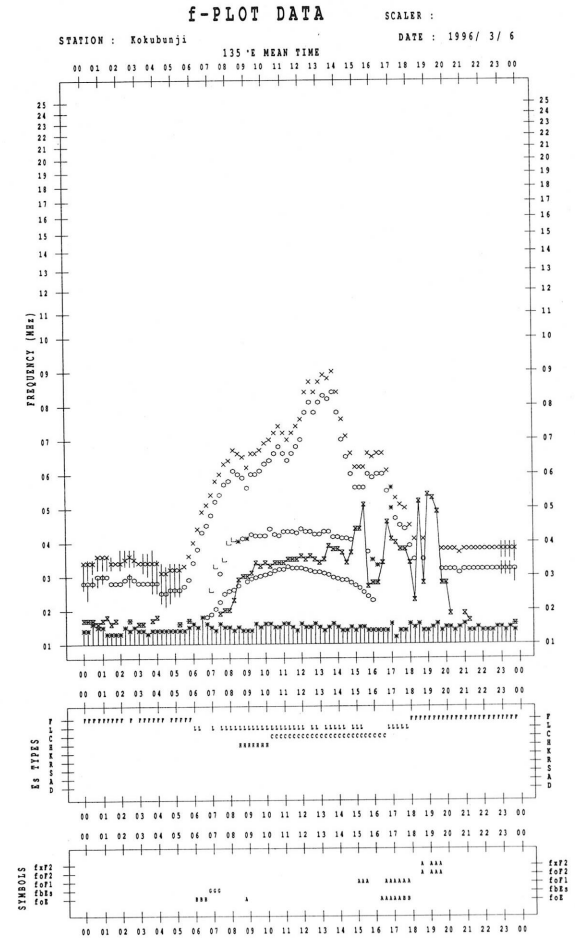
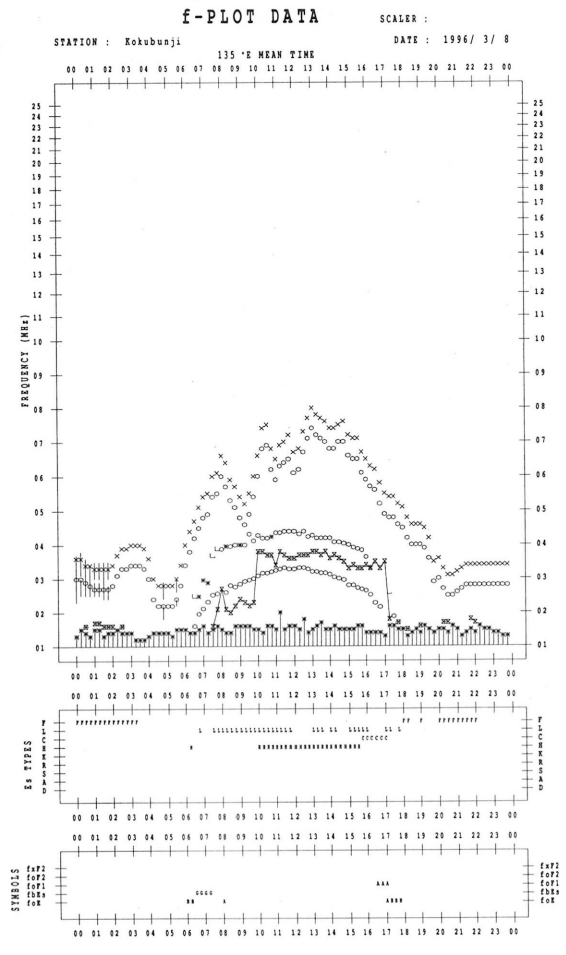
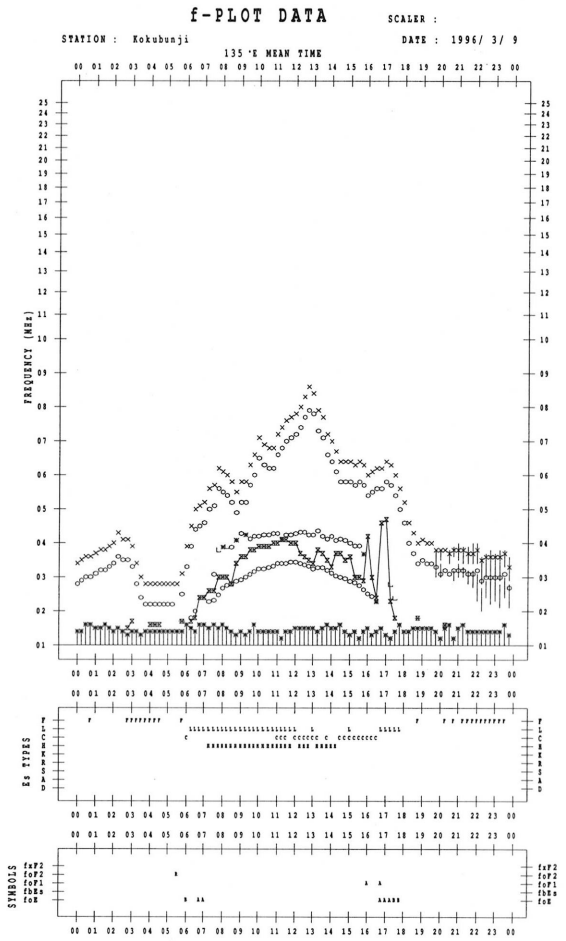
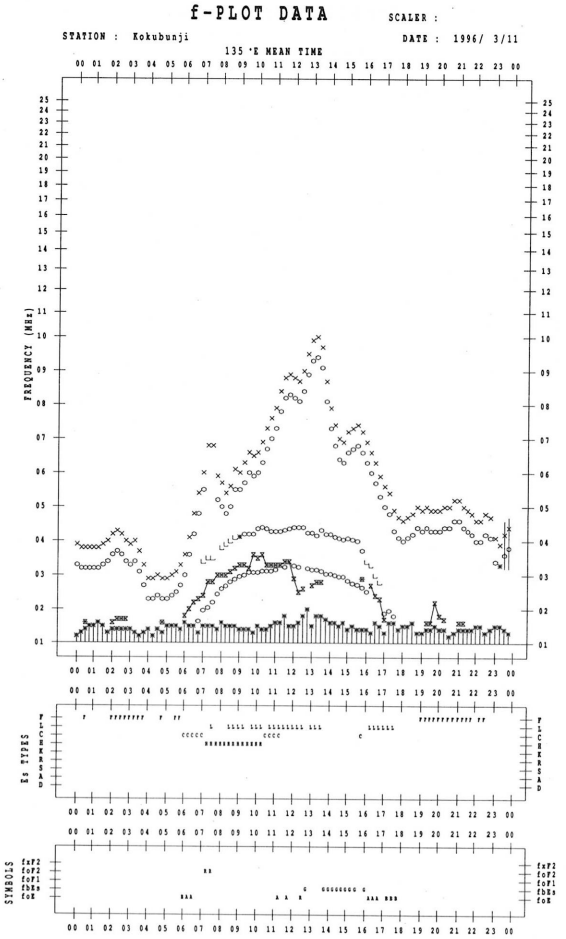
STATION : Kokubunji
DATE : 1996/ 3/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE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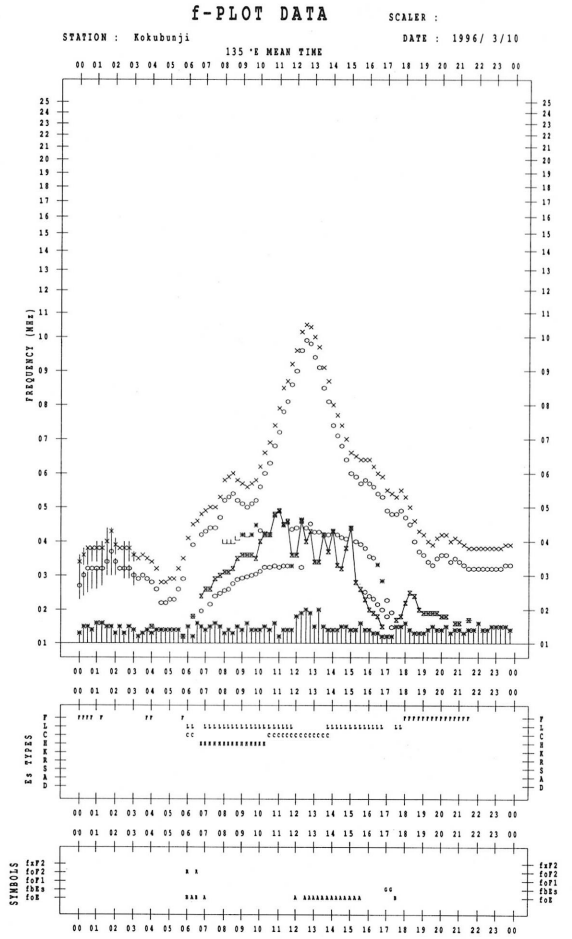
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE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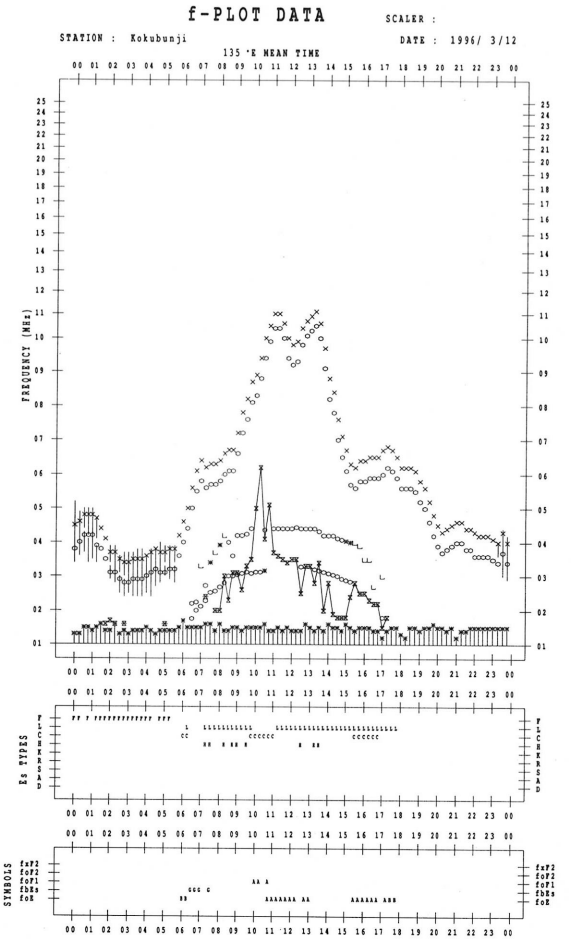
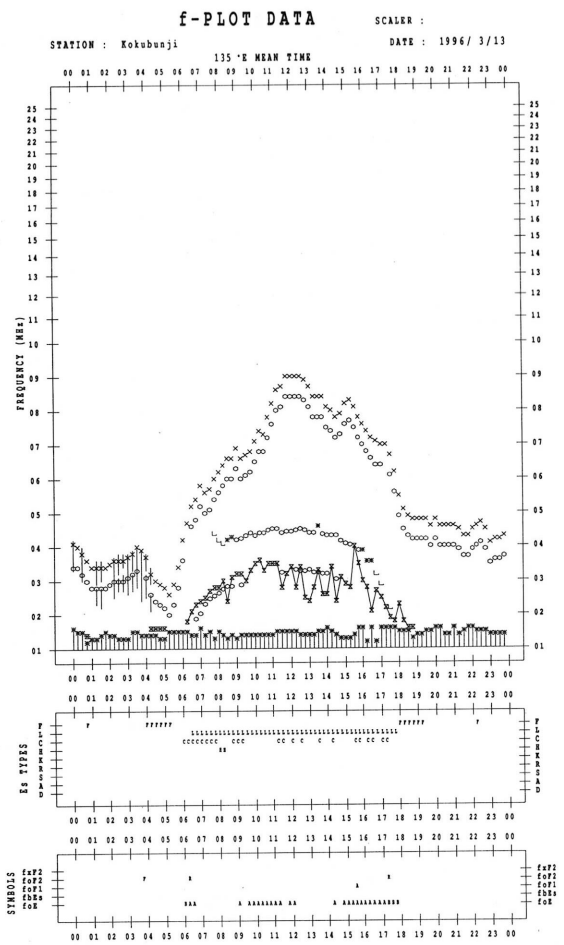
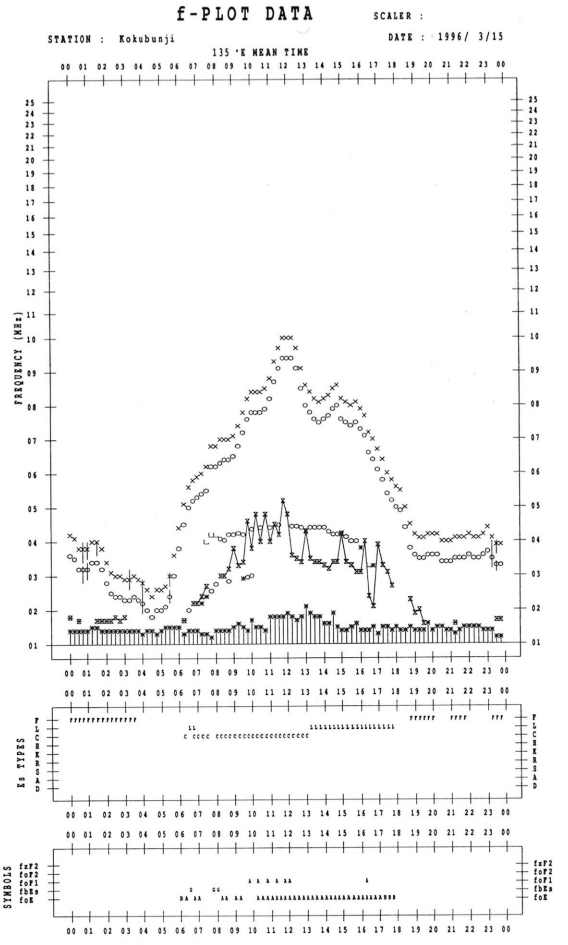
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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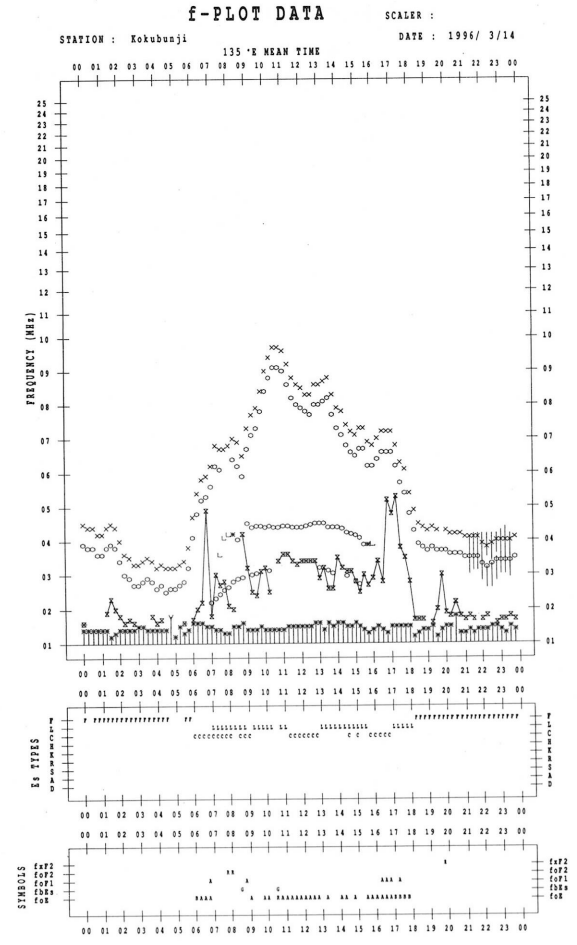
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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SCALER :
STATION : Kokubunji
DATE : 1996/ 3/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
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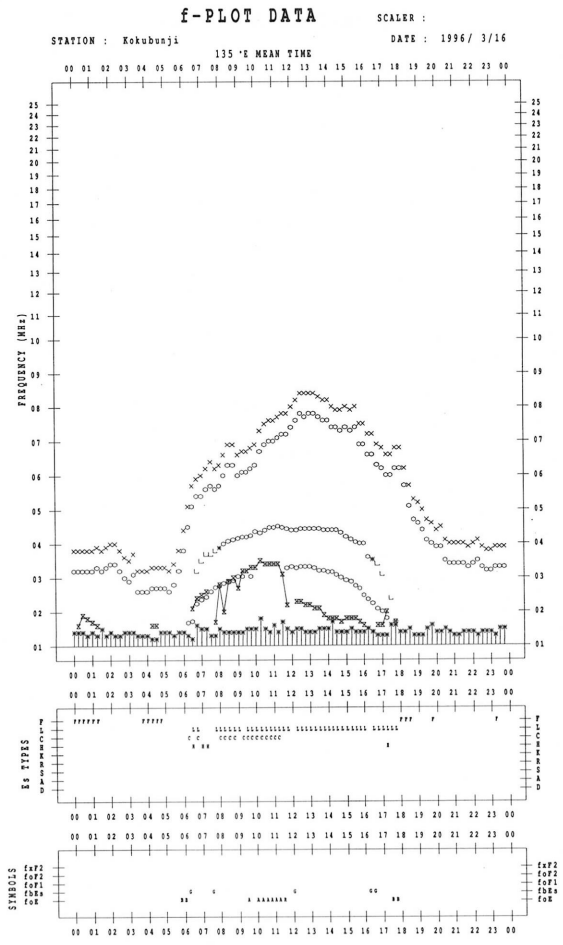
foF2
foF1
fbEs
foE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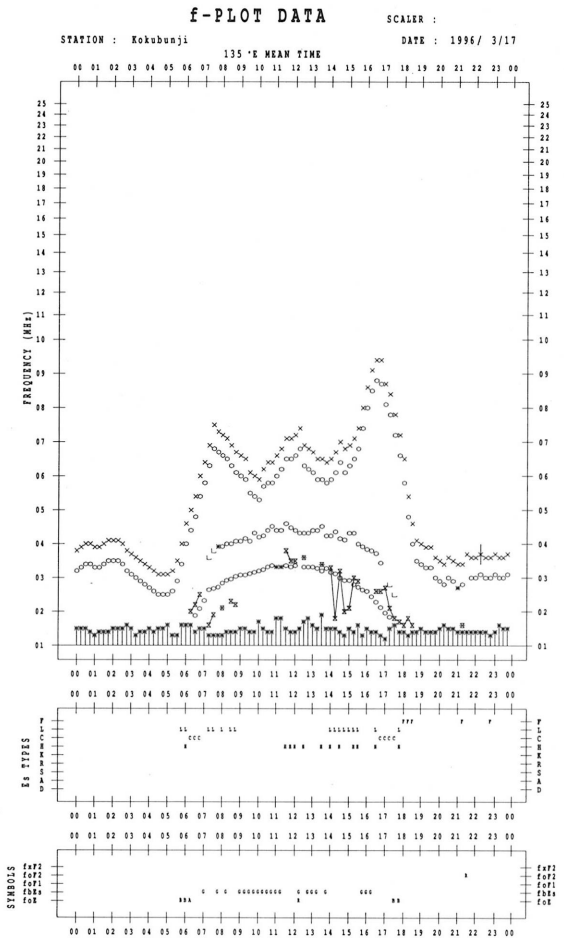
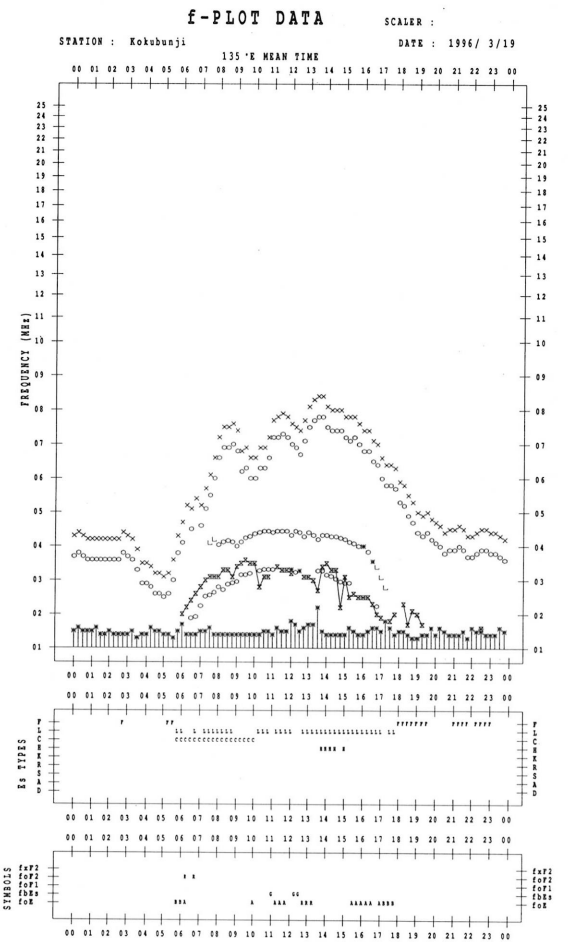
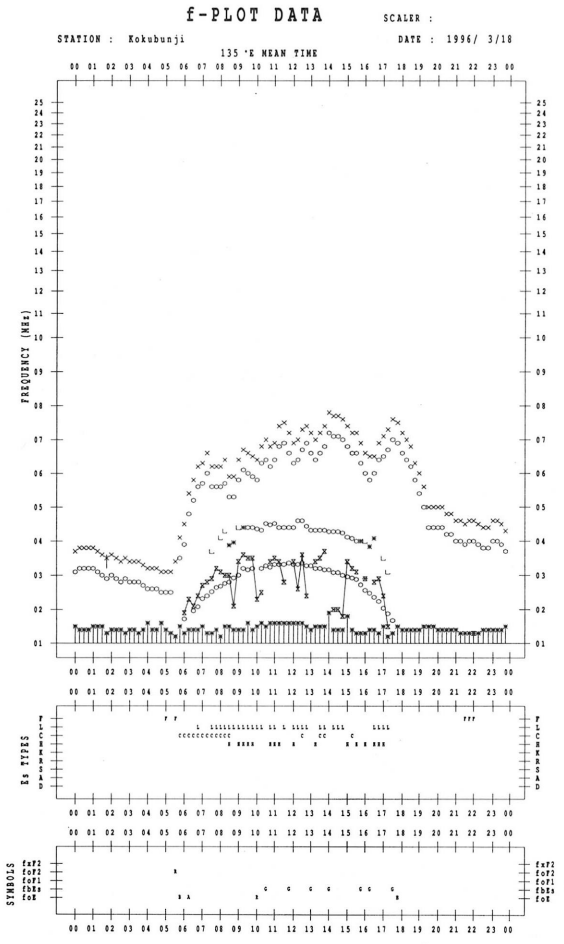
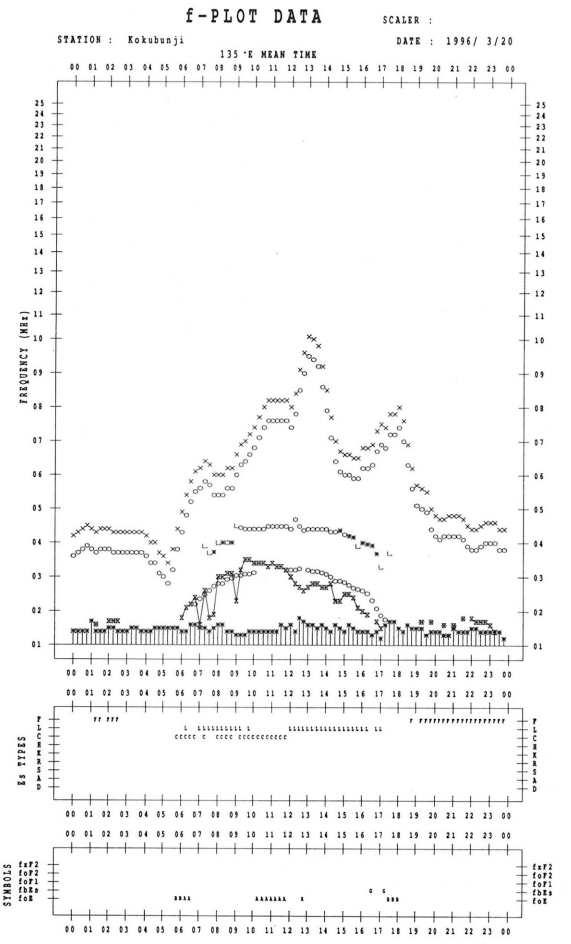
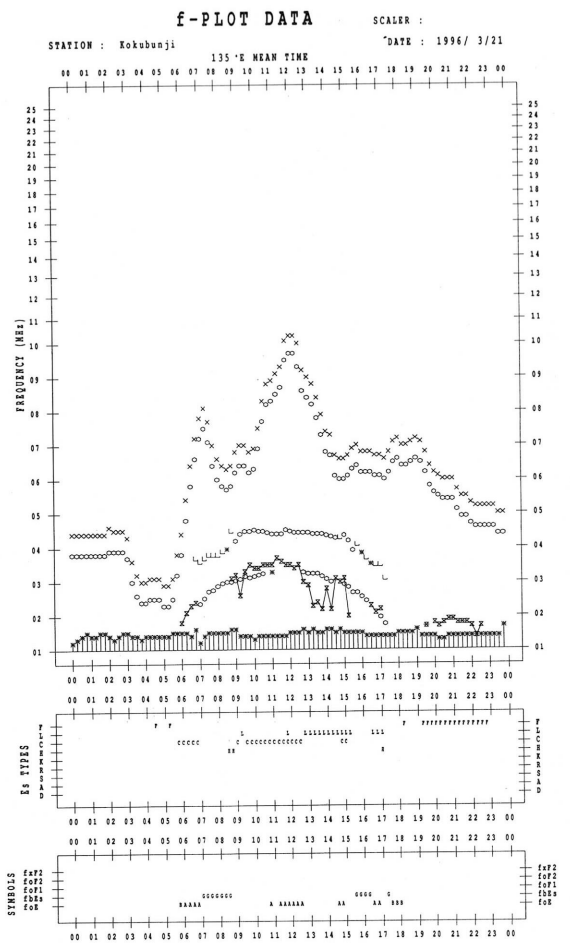
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

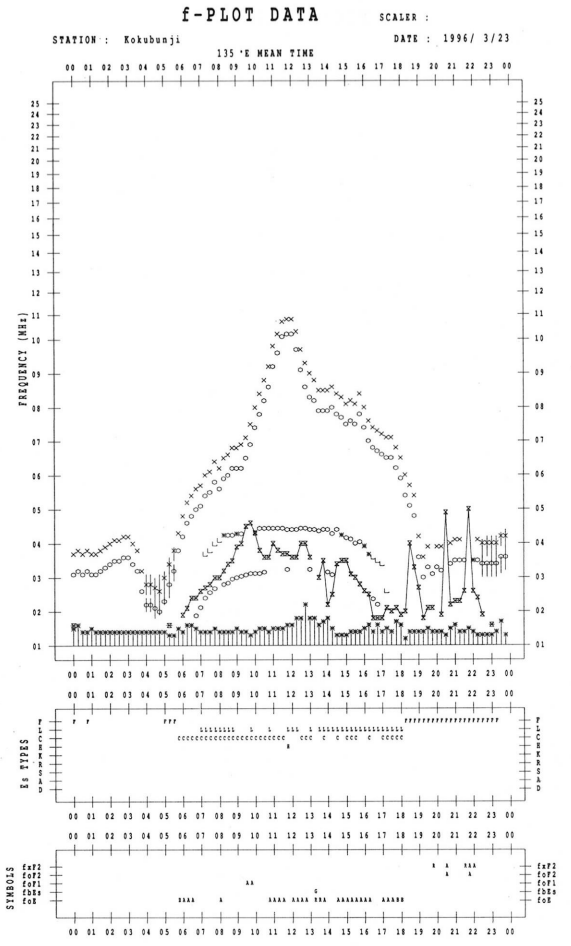

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

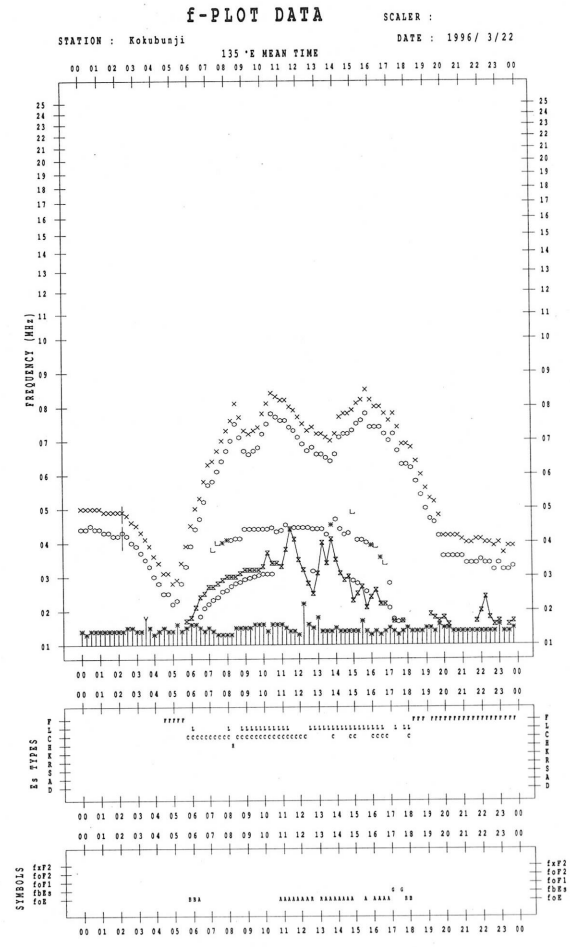

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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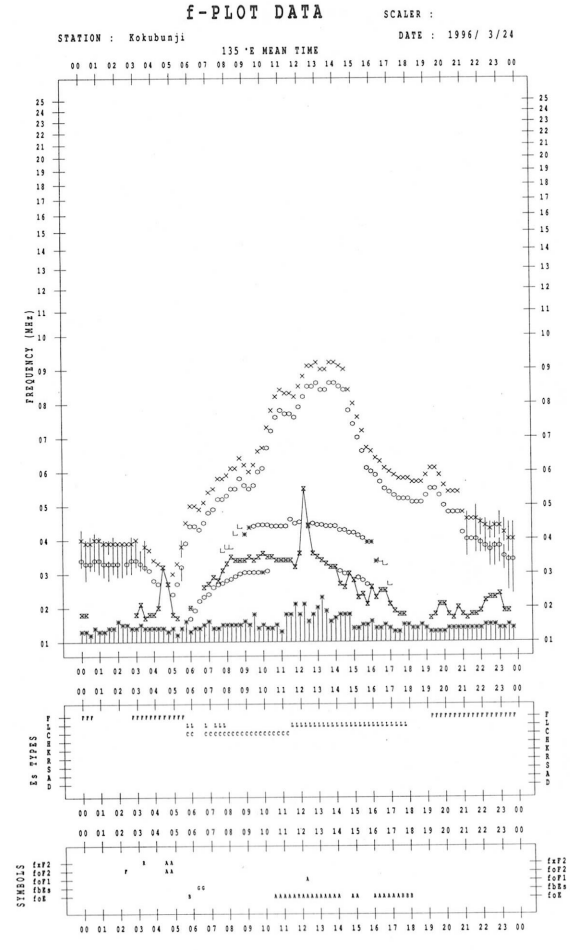
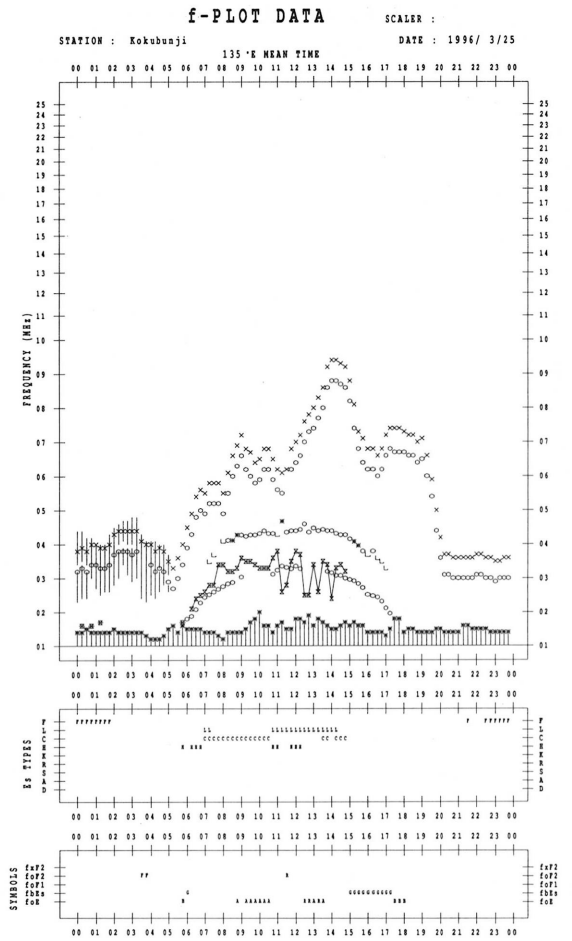
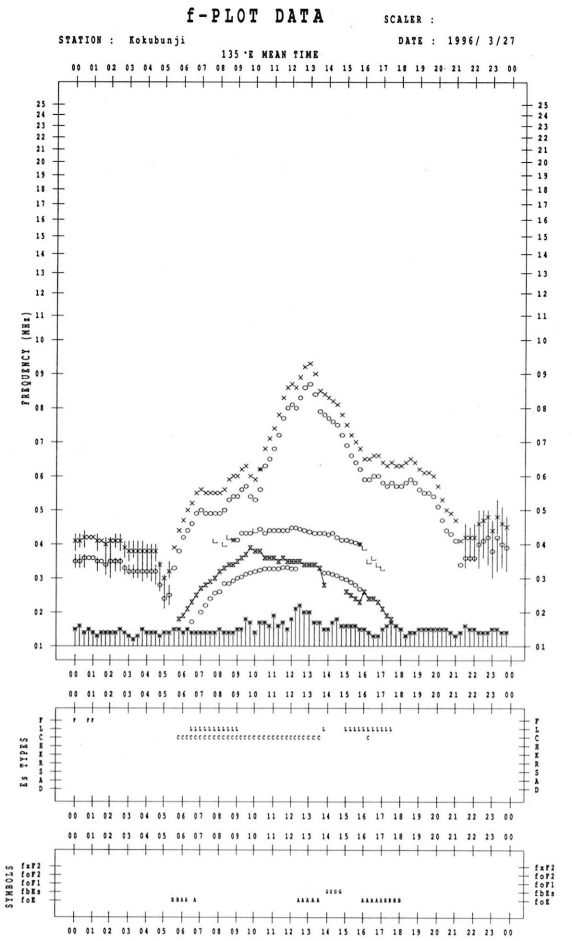
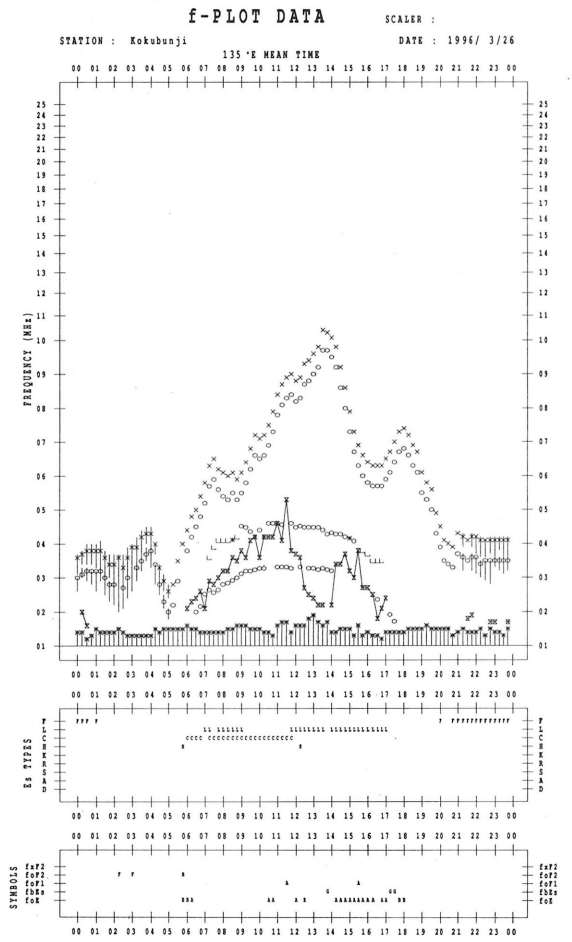
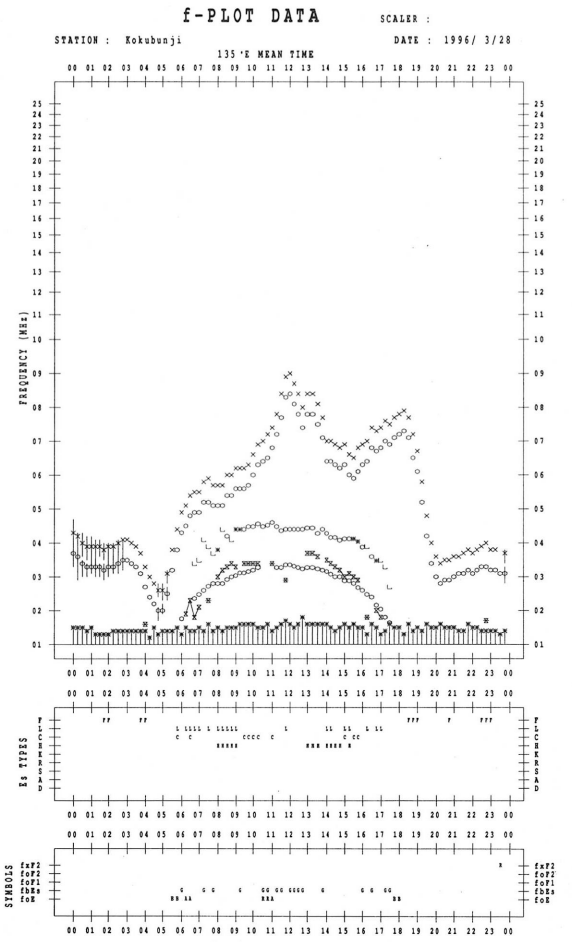
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

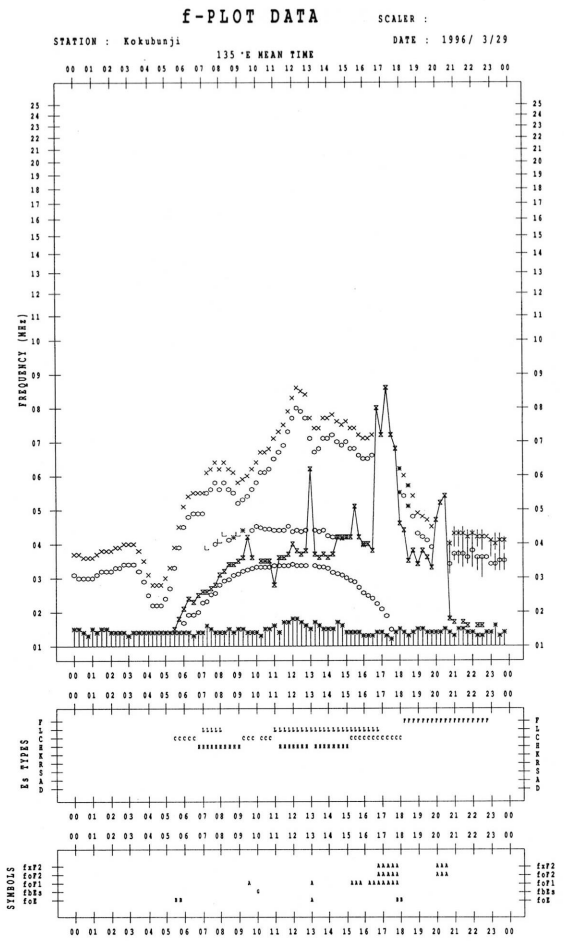

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

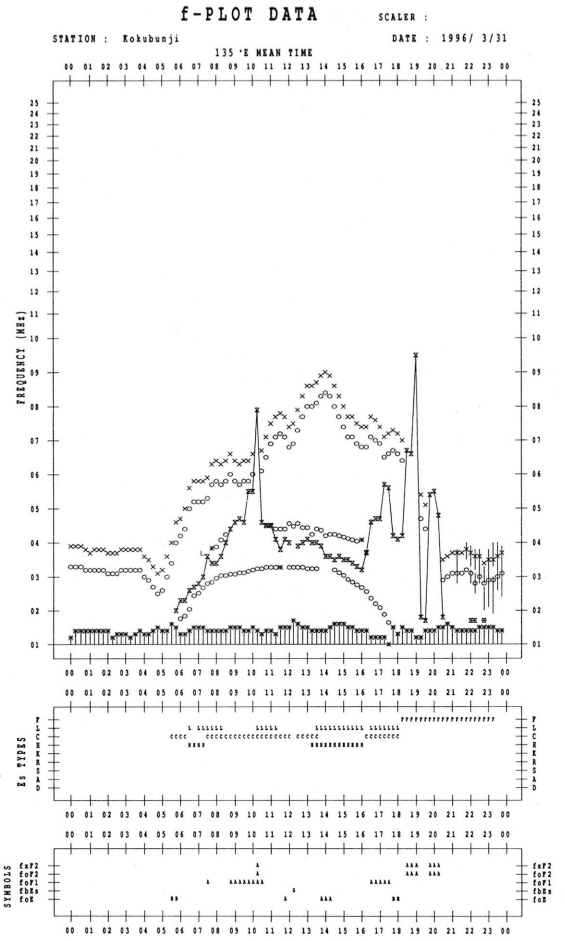

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

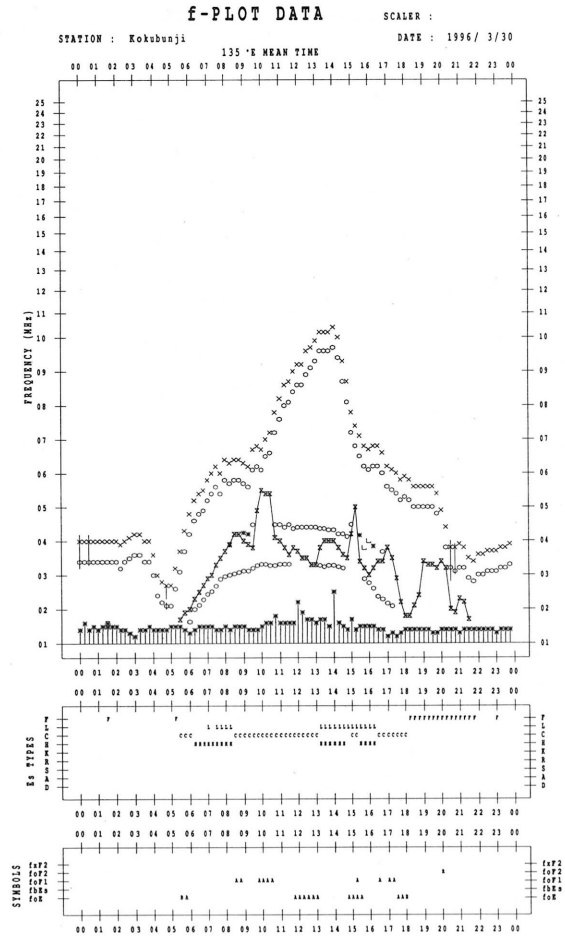

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 3/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE

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 March 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	26	26	26	26	26
2	26	26	26	26	26
3	26	25	25	26	25
4	26	25	25	25	25
5	25	25	25	25	25
6	25	25	-	-	25
7	-	-	-	-	-
8	-	(25)	25	26	(25)
9	25	25	25	25	25
10	25	25	25	25	25
11	25	25	25	25	25
12	25	26	26	25	25
13	25	25	25	25	25
14	25	26	26	25	25
15	25	26	25	26	25
16	25	25	25	25	25
17	25	25	25	24	25
18	24	25	25	25	25
19	25	25	25	25	25
20	25	25	25	25	25
21	25	25	25	25	25
22	25	25	25	25	25
23	25	25	25	25	25
24	25	25	25	25	25
25	26	25	25	25	25
26	25	25	25	25	25
27	25	25	25	25	25
28	25	25	25	25	25
29	25	25	25	25	25
30	25	25	25	25	25
31	25	25	25	25	25

Note: No observations during the following periods.

6th 0600 - 8th 0506

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso March 1996

Single-frequency observations

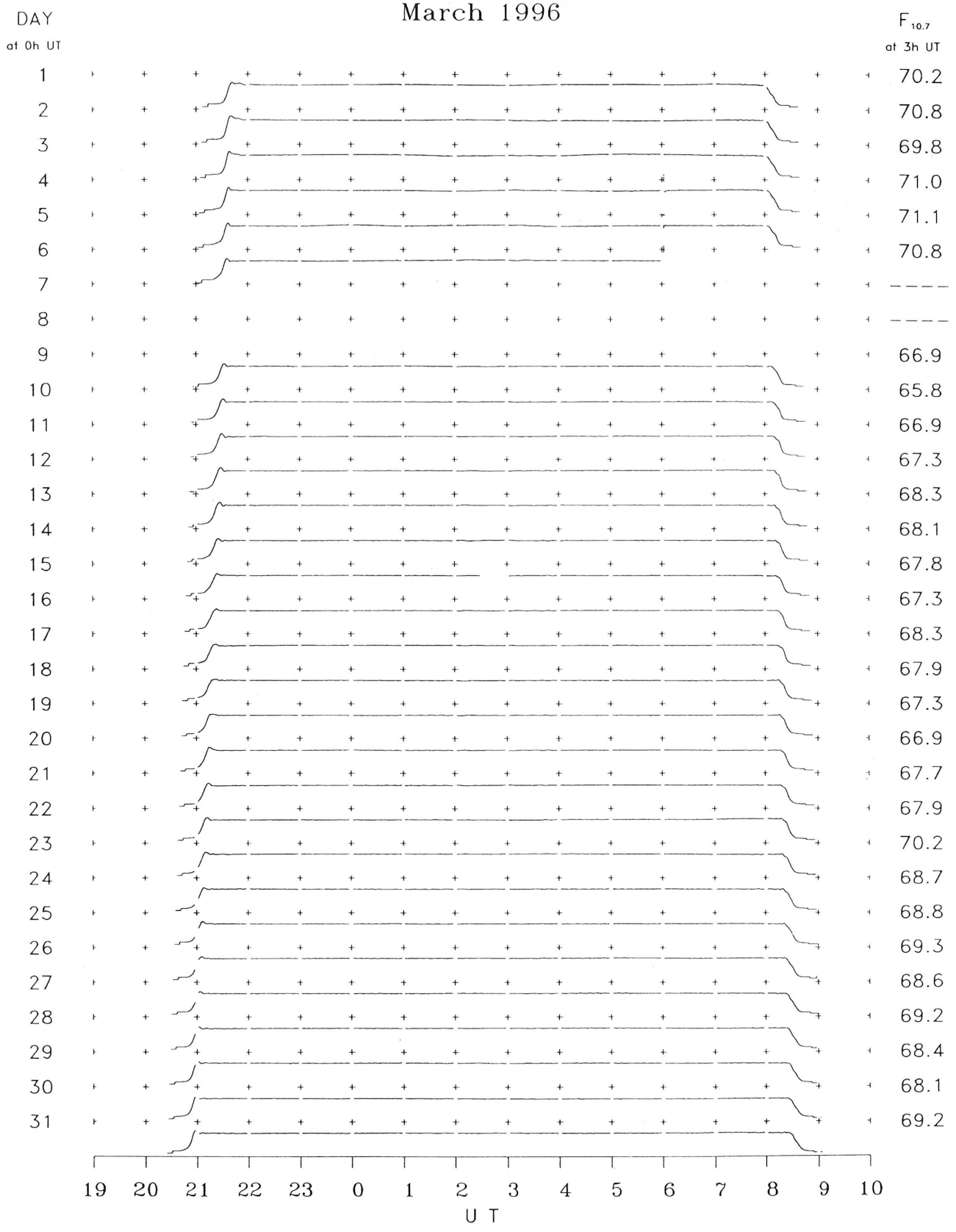
Normal observing period: 2050 - 0850 U.T. (sunrise to sunset)

MAR. 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
13	200	42 SER	0228.5	0231.5	5.0	7	-	WR
	200	42 SER	0339.5	0340.9	3.0	5	-	0
	200	8 S	2146.0	2146.0	0.5	4	-	0
	200	8 S	2150.3	2150.4	0.3	8	-	0
14	200	8 S	0125.1	0125.7	0.6	7	-	0
26	200	8 S	2343.5	2343.7	0.3	74	-	WL

B. Solar Radio Emission

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

March 1996



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)

MAR 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		
1	2	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	4	6
	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	ES
3	-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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4																								
	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
5	-24	-24	-24	-24	-24	-6	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	2	4	4
	ES	S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
6	-24									-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	2	2	-1
		S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			ES
7	-1									-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-3	1	-24
		ES		S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
8	-1	-24	-1							-24	-24	-24	-9	-9	-9	-9	-9	-9	-9	-9	-9	4	19	17
			S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
9	4	2							-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	4
		S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	
10	2									-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	4	-24	3
			S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
11	3	8								-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
12	-24	-24	-24	5	3	4	-3	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	2	-24
	ES	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		
13	-24					3	4	7	8	-23	-23	-23	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	7	5
		S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
14	2									-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	3	2	3
	ES	S	S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
15	-23										-23	-23	-24	-24	-24	-24	-24	-24	-24	-24	-24	3	2	6
			S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
16	4	4								-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	3	4	4
		S	S	ES	ES	ES	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
17	4			-24	-24	-24				-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	6	2	6
		ES	ES	ES	ES	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
18	3	-24		-24	-24				-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	0	2	3
	ES	ES	S	S	S	S	S	S	S	S	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	-3	-3
		ES	S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
20	2	-24									-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	S	S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
21	-24										-24	-24	-24	-23	-23	-23	-23	-23	-23	-24	-24	-24	-24	3
		S	S	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
22	4										-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
	ES	ES	S	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
23	-24	-24								-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-3
		ES	ES	S	S	S	S	S	S	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
24	0	-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	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
25	-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	S	S	S	S	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
	ES	ES	S	S	S	S	S	S	S	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	-1	-24	-24
	ES	ES	ES	ES	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	-24	-24	-1	2	-24
	ES	ES	ES	S	S	S	S	S	S	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	-1	-3
	ES	ES	S	S	S	S	S	S	S	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	-3	-3	-24
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
31	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-1	5	-14

CNT	30	20	11	10	9	9	8	8	10	24	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	US	ES	ES	SC	SC	SC	SC	SC	SC	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	US		
MED	-24	-24								-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-2	-3
			ES	SC	SC	SC	SC	SC	SC	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
UD	4	4								-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	4	5	6
	ES	ES	ES	SC	SC	SC	SC	SC	SC	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
LD	-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)

MAR 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
1	10	12	14	12	12	-3	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	ES -24 ES	0 ES	ES -24 ES	ES -24 ES	12	9	10
2	4	4	6	7	9	-1 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	2	6	6
3	13 C	8 C	4 C	6 C	6 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	-24 C	0 C	7 C	4 C
4							ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
5	3	12 S	13 S	14 S	17 S	8 S	-24 S	-24 S	-24 S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	4	8	8	9
6	8	S	S	S	S	S	S	S	S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	5	6	11	12
7	7			S	S	S	S	S	S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-3 ES	2	5	6
8	6	9	17 S	S	S	S	S	S	ES	-24 ES	-24 ES	-24 ES	-9 ES	-9 ES	-9 ES	-9 ES	-9 ES	-9 ES	-9 ES	-9 ES	-9	17 ES	22	24
9	9	10 S	S	S	S	S	S	S	-24 S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	4	-24 ES	9	9
10	13		S	S						-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	2	-24	11	13
11	12	12 ES			20	20	12	22	12 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	4	9	9	7
12	9	-24 S	16 S	14 S	16 S	17	17	12	-24	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	7	9	11	9
13	5	S	S	S	S	11 S	16 S	15 S	11 S	-23 ES	-23 ES	-23 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	5	9	11	8
14	9	S	S	S	S	S	S	S	S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	4	14	18	11
15	4	S	S	S	S	S	S	S	S	-23 ES	-23 ES	-23 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	4	6	9	9
16	7	9				US	S	S	S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	7	13	10	8
17	14	10	9	12	10	19 S	S	S		-24	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	3	12	3	6
18	8	7	9 S	10 S	19 S	S	S	S	8 S	4 S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24	6	3	9	9
19	6	9	S	S	S		S	S	S		-24 ES	-24 ES	-24	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	13 ES	7	4	4	9
20	9	13 S	S	S	S	14 S	S	S	S	8	-24	-24	21	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24	3	4	7	3
21	6	S	S	S	S	S	S	S	S	5	10	7 ES	7 ES	-23 ES	-23 ES	-23 ES	-23 ES	-23 ES	-23 ES	3 ES	5	7 ES	12	12
22	9	S	S	S	S	S	S	S	S	2 ES	-14 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	8	-24	6	6
23	8	7		S	S	S	S	S	S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	2	4	10	2
24	3	6	13		S	S	S	S	ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	0 ES	6	5	5
25	4	7 S	7 S	18 S	S	S	S	S	-24 S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24	-24	2	2	2
26	4	S	S	S	S	S	S	S	S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-1 ES	4	10	10	7
27	9	10						ES	ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24	7	5	9	3
28	4	14	5	15 S	12 S	21 S	14 S	-24 S	-24 S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-14 ES	4	-1	4	3
29	9	7	12 S	S	S	S	S	S	S	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	5	-6	-1	7
30	6	11							ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24	-24	-24	6	-3	-3	3
31	3	8	8	8	18	22	21	12	-24	-24	-24	-24	-24	-24	-24	-24	-24	11	-3	-3	11	4	1	-1
CNT	30	21	13 SC	10 SC	10 SC	11 SC	9 SC	9 SC	12 SC	29 ES	30 ES	30 ES	30 ES	30 ES	30 ES	30 ES	30 ES	30 ES	30 ES	30 ES	30	30	30	30
MED	8	9	SC	SC	SC	SC	SC	SC	SC	-24	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24 ES	-24	4	4	9	7
UD	13	13	SC	SC	SC	SC	SC	SC	SC	4 ES	-23 ES	-23 ES	-9 ES	-24 ES	-24 ES	-24 ES	-24 ES	-23 ES	-9 ES	-1 ES	7 ES	13 ES	12	12
LD	3	4								-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	1	2

C. Radio Propagation

C2. Radio Propagation Quality Figures at Hiraiso

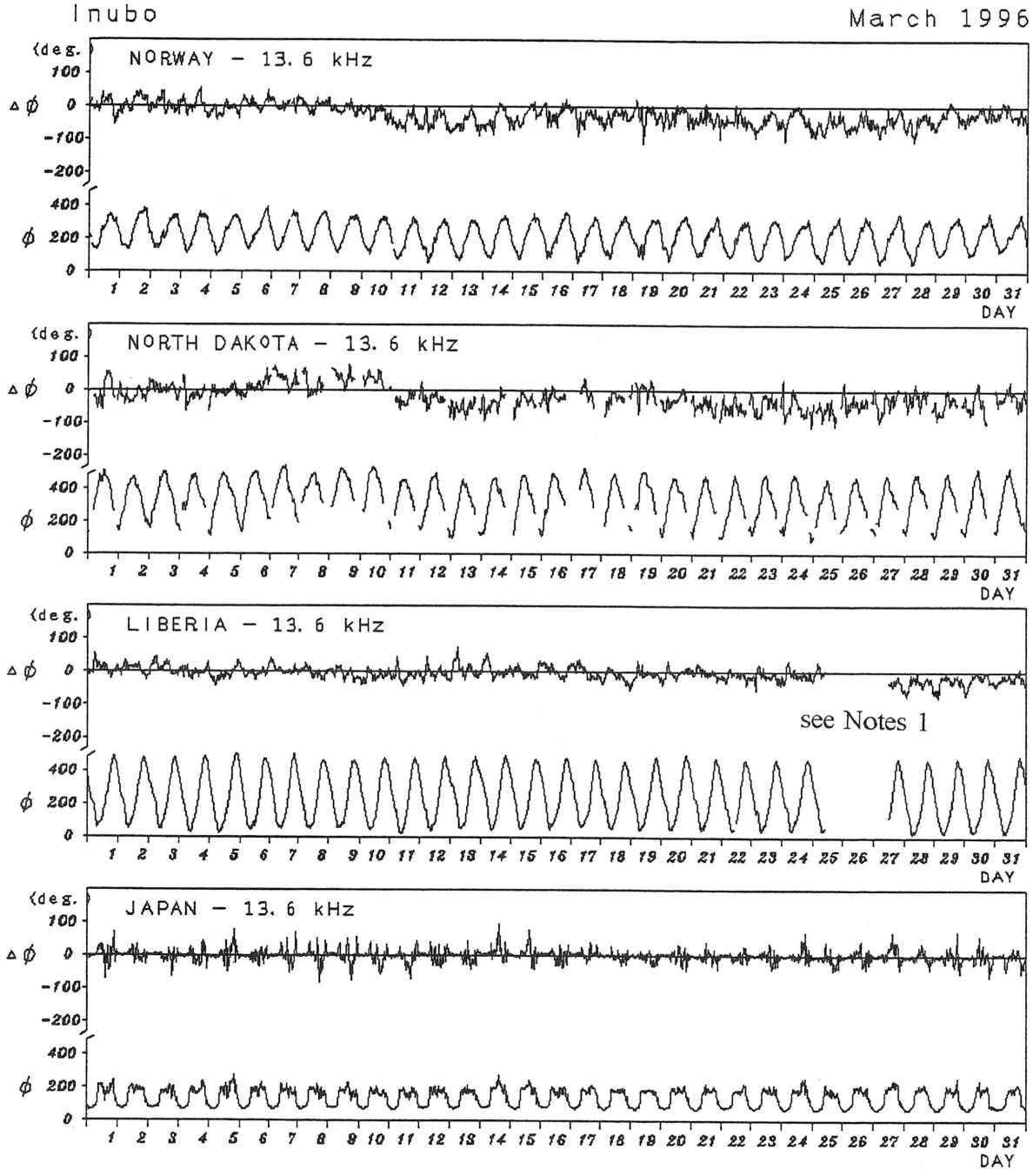
Hiraiso

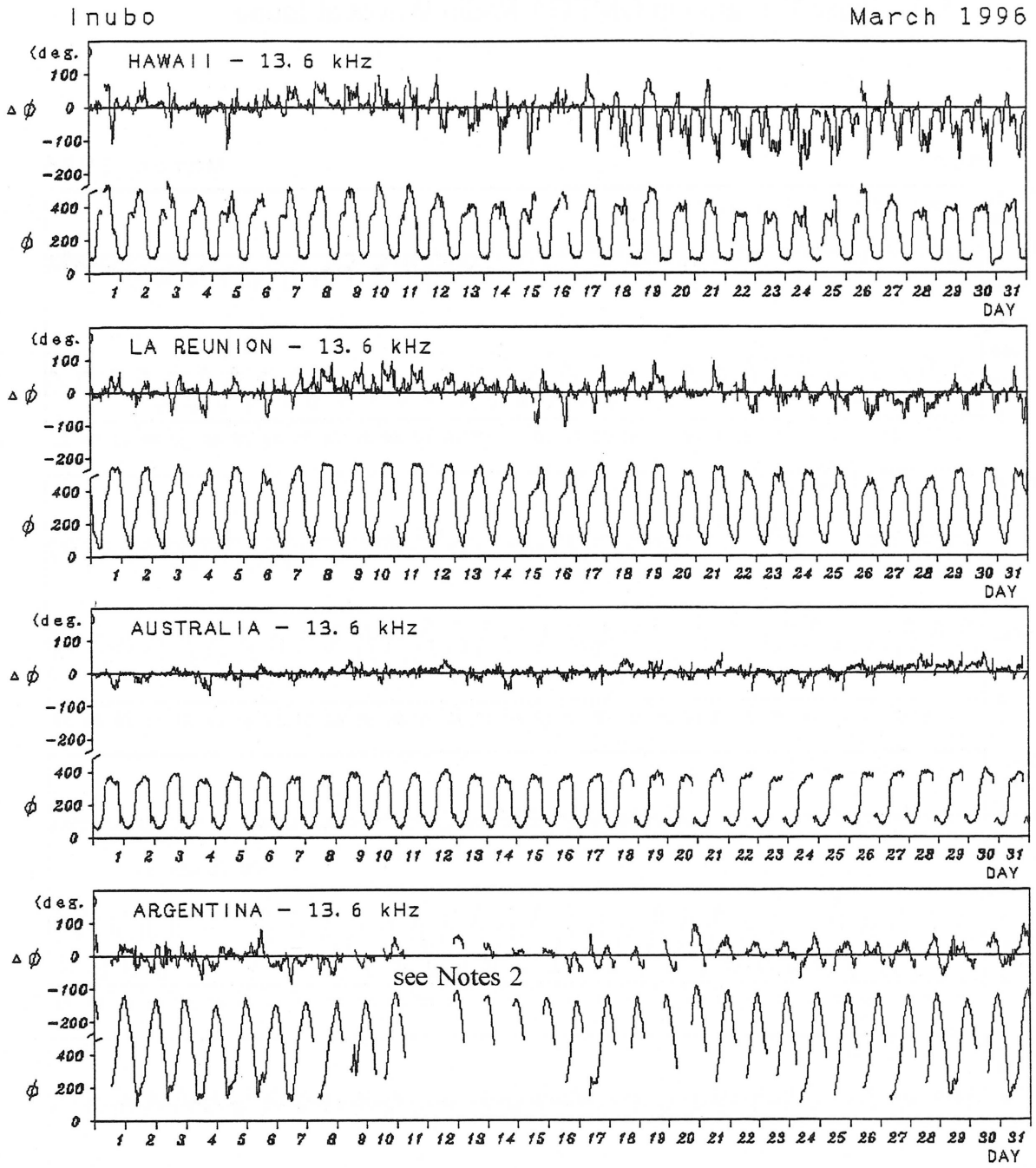
Time in U.T.

Mar. 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	4o U	- - - 4U	4U - - 4U	N N N N	None		
2	3o U	- - - 3U	3U - - 3U	N N N N			
3	3+ U	- - - 3U	4U - - 3U	N N N N			
4	C	C C C C	C C C C	N N N N			
5	4o U	- - - 5U	3U - - 4	N N N N			
6	4o U	S- - - 4	S - - 4	N N N N			
7	4o U	S - - 4U	S - - 4	N N N N			
8	4+ U	5U - - 5	4U - - 4U	N N N N			
9	4o U	5U - - 4U	4U - - 3U	N N N N			
10	3+ U	S - - 4U	S - - 3U	N N N N			
11	4o U	5U - - 3U	4U - - 4	N N N N			
12	3o U	- - - 3U	2U - - 4	N N N N			
13	4+ U	S - - 5U	S S - 4	N N N N			
14	4o U	S - - 4U	S - - 4	N N N N			
15	4+ U	S S - 5	S - - 4	N N N N			
16	4+ U	5U - - 5	4U - - 4	N N N N			
17	4+ U	- - - 5	4U - - 4	N N N N			
18	4o U	- - - 4U	4U - - 4	N N N N			
19	4o U	S S - 4U	4U - - 4	N N N N			
20	4o U	- - - 3U	4U 5U - 4	N N N N			
21	4+ U	S S - 4U	S 5U - 4	N N N N			
22	3o U	S S - 3U	S S - 3U	N N N N			
23	4o U	S S - 4U	4U - - 4	N N N N			
24	3+ U	S - - 3U	3U - - 4	N N N N			
25	3+ U	- - - 3U	4U - - 3U	N N N N			
26	3+ U	S S - 3U	S - - 4	N N N N			
27	4- U	S - - 3U	4U - - 4	N N N N			
28	4o U	- - - 4U	4U - - 4	N N N N			
29	4- U	S - - 4U	4U - - 3	N N N N			
30	4- U	S - - 4U	4U - - 3	N N N N			
31	4- U	- - - 4U	3U - - 4	N N N N			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo





Notes 1 : As for LIBERIA-13.6 kHz, no record during 25 March 0935 UT to 27 March 1245 UT, due to the maintenance of transmitter.

Notes 2 : As for ARGENTINA-13.6 kHz, no record during 11 March 1200 UT to 14 March 2100 UT, and 15-21 March 1200 UT to 2100 UT daily, due to the maintenance of transmitter.

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.

Mar. 1996	S W F						Correspondence	
	Drop-out Intensities(dB)				Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS BBC						
11	20	22			0512	20	SL	2+	x	C

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

Mar. 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
11			11	7			0328	0345	0336
11			14				0450	0506	0457
11			7				0826	0836	0829

IONOSPHERIC DATA IN JAPAN FOR MARCH 1996
F-567 Vol.48 No.3 (Not for Sale)

電離層月報（1996年３月）
第48巻 第３号（非売品）
1996年８月24日 印刷
1996年８月30日 発行
編集兼 郵政省通信総合研究所
発行所 〒184 東京都小金井市貫井北町４丁目２－１
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