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IONOSPHERIC DATA IN JAPAN

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CONTENTS

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INTRODUCTION

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

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

A. IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

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

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

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

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

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

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

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

K Presence of particle *E* layer.

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

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

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

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

Q Range spread present.

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

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

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

V Forked trace which may influence the measurement.

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

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

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

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

B. SOLAR RADIO EMISSION

Solar radio observations at 200, 500 and 2800 MHz are carried out at Hiraiso. The observation equipment consists of two parabolic antennas, one with 10-meter diameter for 200 MHz measurements and one with 2-meter diameter for 500 and 2800 MHz measurements, Observations are continuously carried out almost from sunrise to sunset.

B1. Daily Data at Hiraiso

The three-hourly mean and daily mean values of the solar radio emission intensities are tabulated separately for 200 and 500 MHz measurements. The intensities are expressed by the flux density in 10^{-22} Wm^{-2} Hz^{-1} unit.

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

0 quiet or no burst,

1 a few bursts,

2 many bursts,

3 very many bursts.

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

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

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

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

B2. Outstanding Occurrences at Hiraiso

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

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

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

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

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

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

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

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

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

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

C. RADIO PROPAGATION

C1. H.F. Field Strength at Hiraiso

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

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

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

C2. Radio Propagation Quality Figures at Hiraiso

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

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

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

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

C	artificial accident,
S	propagational accident,
U	inaccurate.

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

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

N normal,
U unstable,
W disturbed.

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

C3. Phase Variation in OMEGA Radio Waves at Inubo

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

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

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

C4. Sudden Ionospheric Disturbances

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

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

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

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

Types of fade-out are as follows:

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

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

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

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

b. Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

Transmitting Stations

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

HOURLY VALUES OF foF2 AT WAKKANAI

JAN. 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	31	29	35	B			32	31	A	53			55		N	32	24	26	29	B	N	35	35
2	28	30	29	30	28	B		31	47	38	52	57	61	A	61	52	40	A	A	28	N	28	N	30
3	25	A	28	30	23	B	N	31	58		58	A	66	59	A	61		B		29	26	28	35	30
4	N	28	32	25	25	26	N	35	47	A	A	67		A	65		35	N	B	B	28	28	29	29
5	29	30	N	35	B	29	N	35	38		64	71		57	A	53	32	29	30	29	N	N	A	26
6	30	28		31	28	28	22	35	37		58	61	52	55	61		34	34	29	28	29	28	A	31
7	31	32	29	31	35	29	28	29	54	N	B		60	A	56	54		32	30	29	23	29	32	28
8	A	A	35	29	29	34	25		46	39	55	48	46	39	58	58		A	A	A	30	28	31	25
9	29	30	26	26	26	29	34	36		57				41		57		28		29	N	28	29	A
10	28	31	30	31	25	31	A	A	40	55	52	57	A	A	60	58		30		29	35	34	35	32
11	29	28	26	29		23	N	29			A	A	A		39	53	55	34		N	B	A	29	35
12	29	29	A	25	B	29	26	26	35	38	34	A	63	56		51	43	41	38	35	28	37	35	35
13	35	38	47		37	29	28	35	38	39	59	49	67		69		58		28	26	30	35	31	35
14	29	20	A	30	31	N	23	A	56	54	70		58	54	49		28	A	35	A	35	35	29	30
15	29	30	30	A	B		B	28	A	57			A	37	58	58	N	B	28	31	29	35	26	35
16	35	31	29	29	28		A	29	31	50		58	62		42	60		30	A	27	N	26	29	25
17	35	31	32	29	32	30	28	30	23	40	56		60	54	57	54	A	34	A	A	A	A	35	29
18	30	31	31	29	29	29	23	30	40		39		36		56	57	A	A	A	26	A	A	N	26
19	A	28	29	30	32	29	31	28	N	50		A	39	66	56	53	43	43	41	36	38	36	36	35
20	37	32	29	34	41	35	29	35	50		55	59	56		A	50	52	48	36	A	59	A	24	A
21	35	28	30	29	34	28	28	32	N		53	67	55	A	54	40	34	35	38	35	28	30	30	29
22	30			28	25	25	B	31	N	52	60	55	63	63			54		34	35	40	38	38	40
23	40	38	38	31	35	29	30	31	32		60	59	62	60	55		41		25	A	A	28	A	28
24	34	26	31	29	29	30	29	31	A	A	53	52	60	57	52	58		29		39	24	30	35	35
25	30	B	29	30	32	29	28	31	57	57	49	57	59	56	58	54	A	A	A	A	28	28	28	29
26	28	26	29	28	29	32	26	34	29		48	50	56	A	63	57		A	35		28	32	31	34
27	38	31	38	38	30	34	B	34	25	56	56	A	60		54	53	47	35	35	29	29	35	35	31
28	A	59	29	29	30	N		29	32	54	55	57	61	55	62			38	35	28	28	23	28	28
29	26	28	28	32	32	22		32		47	56		58	54	60	59		41	38	35	30	29	A	28
30	29	35	31	32	29	29	26	29		52	N	A	60	54	63	58	43	A	28	30	31	28	30	30
31	28	35	28		32	30		31	40	49	53	A	57	58	61	A	53		37	35	29	29	28	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	26	27	26	28	26	24	17	28	22	18	23	16	24	19	24	22	17	17	18	22	22	25	25	29
MED	30	30	29	30	30	29	28	31	39	51	55	57	60	55	58	56	43	34	35	29	29	29	31	30
U Q	35	32	31	31	32	30	29	34	47	55	58	60	61	58	61	58	52	39	37	35	31	35	35	35
L Q	29	28	29	29	28	28	25	29	32	40	52	53	56	54	54	53	34	29	29	28	28	28	29	28

HOURLY VALUES OF fEs AT WAKKANAI

JAN. 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	28	G	G	G	B	G	G	G	26	31	30	36	34	40	23	G	27	G	G	G	B	G	G	G
2	G	G	G	G	G	B	G	G	G	28	33	55	36	36	31	26	G	27	29	28	G	G	23	29
3	34	33	40	34	25	B	G	G	G		27	38	36	28	37	G	G	B	G		G	G	G	G
4	G	G	G	30	27	G	G	24	G	48	42	34	30	30	26	23	G	G	B	B	G	G	G	G
5	G	G	G	G	B	28	G	G	24		35	31	32	31	24	G	11	G	G	G	G	G	29	G
6	G	G	G	G	G	G	G	G	G	27	26	31	27	28	26		G	G	G	G		G	35	24
7	G	G	G	G	G	G	G	G	G	G	B	G	26	29	G	24	G	G	G	G	G	G	28	30
8	32	28	40	28	G	G	G	G	32	45	38	38	32	33	40	35	34	50		34	30	G	29	29
9	G	G	G	24	G	G	G	G	29	31		28	28	27		24	G	G	G	G	G	G	26	28
10	24	G	G	G	G	G	27	29	G	27	30	26	28	26	29	34	G	G	G	G	G	G	G	G
11	G	G	G	G		G	G	G	G	28	32	25	26	G	24	26	G	G		G	B	27	G	
12	G	28	26	G	B	G	G	G	G	G	G	27	27	25	28	G	G	G	G	24	G	G	28	26
13	G	G	G	G	G	G	G	G	G	24	30	28	32		23	25	G	G	G	G	G	G	G	G
14	G	23	28	G	G	32	32	31	28	32	34		30	28	26	G	G	34	27	59	31	G	G	G
15	G	G	G	26	B	G	B	G	39	36	26	28	38	27	24	G	G	B	G	G	G	G	G	29
16		G	G	G	G		24	G	G	28		25	28		28	30	G	G	28	G	G	G	G	G
17	27	G	G	G	G	34	26	27	24	32	25	G		28	27	27	33	G	28	34	38		G	27
18	G	G	G	G	G	G	G	29	24	27	24	G	26	G	27	G	36	48	34	26	25	28	27	29
19	30	G	G	28	27	32	G	28	G	28	32	26	28	27	25	G	G	G	G	G	27	G	G	32
20	34	32	34	28	27	27	G	G	G	27	29	34	43	28	34	23	G	27	G	38	G		G	30
21	G	G	G	G	G	G	G	G	26		31	33	43	68	31	23	G	G	G	G	G	G	G	G
22	G	G	G	G	29	24	B	G	G	25	31	27	32	36	36	32	36	34	28	G	G	G	G	G
23	G	G	G	G	G	27	G	G	31	36	42	38	30	30	34		31	30	41	33	35	G	32	25
24	G	G	G	G	34	34	29	29		56	34	31	32	33	36	35	33	42	40	39	30	24	28	27
25	27	B	G	28	34	G	34	24	27	34	42	28	29	31	29	28	40	60	66	33	25	29	31	31
26	G	G	G	G	G	G	G	G	G	26	26	29	28	31	26	32	36	35	24		30	30	G	G
27	G	G	G	G	G	G	B	G		30	45	60	30		26	G	G	G	G	G	G	30	34	32
28	29	26	26	G	G	G	G	G	26	31	28	38	35	28	35	29	G	28	29	G	G	G	G	G
29	G	G	G	G	G	G	G	24	29	39	32	32	35	31	26	31	27	30	26	24	28	26	28	26
30	G	G	G	G	G	G	G	G	28	24	31	35	32	28	25	24	G	29	G	G	G	G	G	G
31	G	G	28	G	G	26		G		28	30	28	34	33	36	35	G	G	G	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	30	30	31	31	26	28	27	31	28	28	28	30	30	28	30	29	31	29	28	28	28	29	31	30
MED	G	G	G	G	G	G	G	G	12	28	31	30	31	28	27	24	G	G	G	G	G	G	G	24
U Q	27	G	G	24	25	26	G	24	27	33	34	35	34	32	34	30	31	32	28	30	27	12	28	29
L Q	G	G	G	G	G	G	G	G	G	27	27	27	28	27	25	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

JAN. 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	15	16	16	15	B		18	15	15	16	17	16	16	16	16	21	16	14	16	15	B	18	15	15
2	15	15	15	15	15	B	17	16	22	18	16	15	17	16	16	15	16	15	15	15	16	15	16	15
3	16	15	16	15	16	B	18	15	20	15	16	16	16	16	16	16	16	B		16	16	20	15	15
4	15	17	15	15	16	18	15	16	15	16	17	17	17	16	16	17	17	16	B	B		16	17	16	15
5	16	15	16	15	B	16	16	16	16		16	16	17	17	17	21	15	15	15	16	20	16	15	17
6	16	15	16	15	16	15	16	15	18	16	17	16	17	26	17		17	17	15	17	16	18	15	15
7	15	15	15	15	15	15	17	15	21	26	B			29	30	17	16	16	15	15	17	16	15	15
8	15	15	16	15	16	16	16	15	15	15	16	16	16	17	15	15	15	15	15	15	15	17	15	16
9	15	15	15	15	15	16	16	16	14	16	16	16	16	17		16	16	15	16	17	15	15	15	15
10	15	15	16	15	15	16	17	15	17	16	18	18	17	16	18	16	15	15	18	16	15	16	15	15
11	15	15	15	15		15	15	16	20	16	16	17		91	24	16	17	15		20	B	17	16	15
12	15	15	16	16	B	15	16	15	21	27	29	71	20	17	24	16	17	15	15	16	16	15	16	15
13	15	15	15	17	15	15	16	15	15	16	16	17	18		16	17	17	15	15	15	15	18	16	15
14	15	17	15	15	16	16	15	16	16	15	16		15	16	15	16	15	15	16	15	15	17	16	15
15	15	16	15	18	B	17	B	16	16	16	16	16	16	16	15	20	17	B	17	16	17	15	15	15
16	15	15	15	16	15		17	17	22	15		16	16		16	16	15	15	17	18	16	16	15	15
17	15	15	15	15	15	16	16	17	16	17	16		22	21	17	16	16	15	15	15	15	15	15	15
18	16	15	15	15	16	15	15	16	15	27	28		28		26	17	15	15	15	16		16	20	15
19	15	15	15	15	15	15	16	15	21	15	16	18	16	16	26	21	18	15	15	16	16	16	16	15
20	15	15	15	15	15	16	15	16	18	24	16	16	16	16	16	15	18	15	16	15	18	15	16	16
21	15	15	15	15	15	15	14	16	16		16	16	16	17	16	15	17	15	15	15	17	16	16	15
22	15	15	15	16	16	16	B	15	15	15	16	15	16	16	15	15	15	15	15	15	15	15	15	15
23	15	16	16	16	15	15	15	16	15	16	15	15	15	16	14		21	15	15	15	15	15	15	15
24	15	15	16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	16	15	16
25	15	B	15	15	15	15	15	16	15	15	16	15	18	18	18	15	15	15	16	16	16	15	15	16
26	16	15	16	16	15	15	16	16	16	15	15	15	15	16	16	15	15	15	15	15	16	16	15	16
27	15	15	15	15	15	15	B	16	23	15	15	16	16		17	15	16	16	16	15	16	15	15	15
28	15	15	16	16	16	16		16	16	15	15	15	16	16	16	16	16	15	15	16	14	15	15	15
29	15	16	16	15	15	16		16	15	15	15	15	15	15	15	15	18	14	15	16	15	16	16	16
30	16	16	15	15	15	15	18	17	17	16	16	16	15	16	15	23	17	15	15	17	15	16	15	15
31	16	15	15	15	15	15		15	23	16	17	16	18	17	16	15	17	15	16	16	15	15	15	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	26	27	25	31	31	29	29	27	29	27	30	29	31	29	28	30	28	31	31	31
MED	15	15	15	15	15	15	16	16	16	16	16	16	16	16	16	16	16	15	15	16	16	16	15	15
U Q	15	15	16	16	16	16	17	16	20	16	16	16	17	17	17	17	17	15	16	16	16	17	16	16
L Q	15	15	15	15	15	15	15	15	15	15	16	15	16	16	15	15	15	15	15	15	15	15	15	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT KOKUBUNJI

JAN. 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	36	N	35	28	N	B	B	36		54	47	A	76	80	66	69	51		B	A	B	B	89	28
2	35	29		A	A	A	B	40		58		58	60	54	50	65		48	B	28	29		B	B
3		A	59	34	B	B	B	40	47	56	55	53	66	73	60	60	69	40	A	49	23	N	N	35
4	36	26	26	34	A	A		41	56	57	58	70	55	57	56	65	52	59	29	35	35			28
5	28	29	35		A	A	A	45		48	52	65	66	62	68	69	68		B	59	28	29		29
6	31	29	30	37	29	B	B	43	47	48	58	71	67		58	62			35		N	N	B	38
7	30	N	31	31	29				58	56	56	62	64	52	58	60		A	35	38	35	35		30
8	36	35		34		N	29	46	57		56	58	63	63		64	54		N	36	28	A	B	B
9	49		49		35					69		72	59	60	56	60			45		N		N	25
10	B	28		59	34	B	B	37		50		68	60	60	51	51	56				N	A	49	34
11			35	28	B	B	B	31			58	50	59	65	51		51	50	35		28	B	A	N
12	29		28	24	N	B	B	34	43		51	54	58	59	68	60	52		34	36		B	N	29
13				47		31		41	48		51	68	59	67	68	68	56		37	B	46		69	
14		35	35	35	28	B	N	38												A			A	A
15	35		49		N	B	B	40	59	54		60	71	71	59	82	52	A	28	29	35	B		59
16	59	A	A	A	N	A	B	37	48	56	63		70	72			61	51	28			N	N	N
17		28	32	30	30	B	B	34		56	58	57	69	64	53	58	52	A	B	35	35	36	35	35
18	35	32	35	32	A	N	N	42	59	51	60		57	59	A	67	60		50	41	34	34	B	B
19	N	B	34	38	28	N		34	44	A	56	56	71	60	57	59		40	43	45	46	36		59
20		38	31	40	36	34	32	47	48		67		58	50	55	60	70	56	38	44		59	A	B
21	N	29	34	32	34	35	35	37		68		52	59	55	58	51	49	A	40	47		36	B	B
22	N	29	28		29	A	A	40		47		69	75		66	A	56	50	35		35	37	36	37
23	35	31	33	38	35		31	57	61	68	68	68		A	60	59	57		37	36	33	A	A	A
24	A	29	29	26	29	N	A	58	59		54	60	59	63	60	52	66		30	34	A	53		A
25	A	A	35	26		B	A	48	54	56	51		60	52	N	59	49	40	A	30		28	A	A
26	A	24	A	28		26	B		59		66	58	A	58	67	95	52	48	A	35		59	A	A
27		A	35		38	35	A	56	56	57	55		55	58	62	56	66	43	A	69		24		
28	A	A	A	59	59	N	35		48	51		67	66	60	51	66		46	A	35	B	B	N	28
29	28	26			B	B	B	42		59	63	63	52	59	68	68		45	36		46			
30	29		32		30	31	N	56	45	58		68	66	67		62	56		N	35	36		30	28
31	31		35		N	B	B	41		47	56		70	69	60	66	58	48		44	38	A	B	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	16	16	23	21	15			27	19	22	22	23	28	27	25	27	23	14	17	21	17	12		15
MED	35	29	34	34	30			41	54	56	56	62	62	60	59	62	56	48	35	36	35	36		30
U Q	36	31	35	38	35			46	59	58	60	68	68	67	66	67	61	50	39	44	37	45		37
L Q	29	28	31	28	29			37	47	51	54	57	59	58	55	59	52	43	32	35	28	31		28

HOURLY VALUES OF fEs AT KOKUBUNJI

JAN. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	B	B	G	G	34	40	54	44	43	47	40	32	G	B	26	B	B	G	G
2	G	G	28	33	28	23	B	26	24	30		42	44	34	29	24	32	G	B	G	G	G	B	B
3	G	30	31	G	B	B	B	G	30	30	32	42	58	31	26	30	G	29	29	G	G	G	G	G
4	G	G	G	31	29	30	G	G		31	29	58	70	37	33	27	54	G	G	G	G	G		G
5	G	G	G	46	28	38	30	29		27	30	43	62	53	35	G	24	47	B	G	G	G	G	G
6	G	G	G	G	G	B	B	G	26	30	40	34	34	33	28	30	25	28	G	G	G	G	B	G
7	G	G	G	G	G	G	G		24	35	32	36	32	28	27	31	28	29	G	G	G	G	G	G
8	G	G	G	G	G	G	G	G		31	39	44	37	40	31	30	G		G	G	G	25	B	B
9	G	G	G	G	G	G	G	G		34	37	34	35	34	30	30	21	G	G	G	G	G	G	G
10	B	G	G	G	G	B	B	G	30	33	35	30		30	28	G	28	G	G		30	30	33	G
11	G		G	G	B	B	B	26	33	36	34	40		34		31	26	G	G	G	G	B	55	29
12	24	24	G	G	G	B	B	26	36		32	37	40	34	31	30	27	G	G	G	G	B	G	G
13	G	G	G	G	G	G		24	33	31	40	40	40	38	34	31	28	28	G	B	23	25	24	G
14		G	G	G	G	B	G	26												58		40	54	36
15	29	G	29	32	G	B	B	G	33	38	40	40	54	38	31	31	29	30	G	G	G	B	G	G
16	G		38	30	30	35	B	G	30	40	44	48	48	50	33	34	G	G	G	G	G	G	G	G
17	G	G	24	G	G	B	B	24		35	39	45	34	32	30	30	42	43	B	G	G	27	G	G
18	29		26	28	26	24	G	G		34	33	36	45	48	59	51	41	32	G	G	G	G	B	B
19	G	B	38	30	22	G	G	G	34	45	48	45	44	30	28	32	G	G	G	G	G	G		G
20	G	G	34	31	31	25	G	G	22	30	30		30	30	28	26	29	G	G	G	G	G	28	B
21	G	G	G	G	G	G	G	G	26	30		38	36	34	54	51	34	41	29	G	G	G	B	B
22	G	G	G	G	26	33	26	G		31	34	30	44		50	50	58	44	28	G	39	33	G	25
23	G	G	G	G	G		G	24	34		34	50	49	52	64	35	28	G	G		55	45		34
24		G	G	G		29	26		28	40	40	44	51	52	56	32	48	61	40	45	67	93		
25	30	29	G	24	G	B	35	24	39	56	40	34	40	50	39	36	41	58	40	G	G	G	31	39
26	33	G	27	24		G	B		30	41	46	42	58	35	58	76	53	33	29	G	G	G	40	54
27	30	30	26		G	25	27	G	28	29	40	44	31	35	34	33	34	32	33	G	G	25	30	29
28	30	30	32	32	30	26	G	G	32	37	42	40	35	34	31	31	G	28	29	25	B	B	G	G
29	G	G	G	G	B	B	B	26	30	32		44	36	40	30	36	32	29	G	28	G	G	G	
30	G	G	G	G	G	G	G	G	29	34		33	43	34	35	31	31	G	G	G	G	G	G	G
31	G	G	G	G	G	B	B	24	29	38	33		47	50	40	42	30	30	G	G	29	32	B	39
	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	27	31	30	26	18	17	28	23	28	26	28	28	29	29	30	30	29	26	28	28	26	21	24
MED	G	G	G	G	G	24	G	G	30	34	38	41	44	35	33	31	29	28	G	G	G	G	G	G
U Q	12	G	27	30	26	29	26	24	33	37	40	44	48	45	43	36	34	32	29	G	G	27	30	29
L Q	G	G	G	G	G	G	G	G	26	30	33	36	35	33	29	30	25	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

JAN. 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	15	15	15	14	15	B	B	17	16	15	15	14	15	17	16	14	15	15	B	17	B	B	17	15
2	15	15	14	14	15	15	B	16	17	15		15	14	14	14	18	16	14	B	16	18	16	B	B
3	15	14	15	15	B	B	B	15	14	14	15	15	14	15	16	14	17	15	17	17	15	16	15	15
4	14	14	15	14	16	15	14	15	24	18	15	16	17	17	14	18	15	17	15	14	15	14		15
5	14	15	14	14	15	14	15	15	14	14	14	16	16	16	17	26	16	15	B	15	15	15	15	15
6	14	14	14	14	16	B	B	16	15	15	14	17	16	14	18	15	14	14	15	15	16	17	B	15
7	15	14	14	16	14	15	15		16	15	15	16	15	14	15	15	15	15	15	15	16	16	18	15
8	15	15	15	14	15	15	15	14	16	15	14	15	14	15	16	14	17		15	15	15	14	B	B
9	15		14	14	15	15	15	15		15	15	14	15		15	14	15	14	15	17	16	18	16	14
10	B	15	14	15	15	B	B	15	15	14	15	15	15	14	15	15	18	15	14		15	14	15	15
11	14		15	15	B	B	B	16	14	15	14	14		14	15	15	16	14	15	16	16	B	15	15
12	14	15	15	14	15	B	B	18	15	15	14	14	16	16	14	14	20	15	14	15	15	B	16	15
13	14	15	14	15	15	14		16	15	15	14	15	14	15	15	16	15	14	14	B	14	14	15	14
14		14	14	14	16	B	16	14												14		14	15	14
15	15	14	15	14	14	B	B	17	15	14	14	14	14	15	14	15	14	15	16	16	14	B	20	16
16	14	14	14	14	14	15	B	15	15	15	15	15	15	14	15	14	17	14	15	18	15	16	16	15
17	15	15	14	15	15	B	B	16		15	15	16	16	14	17	14	16	14	B	15	15	15	16	18
18	14	15	14	15	14	14	16	17	15	15	17	20	21	18	16	14	14	14	15	14	15	15	B	B
19	15	B	14	14	15	15	16	17	15	14	14	14	14	14	14	15	14	14	15	14	15	15		14
20	15	14	14	14	14	15	15	16	26		14		15	16	15	15	15	15	15	15	15	15	14	B
21	15	14	14	14	15	15	15	16	16	15		14	15	14	15	15	15	15	15	15	15	14	B	B
22	16	18	16	14	15	14	14	18	14	18	16	15	16		15	15	15	15	14	15	15	14	15	14
23	14	14	14	14	14		15	17	17	15	14	15	14	16	15	15	16	15	14	14	14	15	14	14
24	14	14	14	14	14	14	14	17	15	15	15	15	14	15	15	15	15	14	15	15	14	14		14
25	15	14	14	14	15	B	14	16	15	14	15	14	15	14	15	15	14	15	14	16	16	15	15	15
26	15	14	14	14		15	B		15	16	16	15	15	16	14	15	15	15	14	16	17	14	14	14
27	16	15	15		15	15	14	17	16	15	15	15	16	14	15	14	15	15	15	15	15	15	16	14
28	15	14	15	15	14	15	15	15	15	15	14	15	15	15	16	15	20	16	15	15	B	B	14	15
29	15	14	14	16	B	B	B	16	14	15	15	14	15	14	17	15	14	15	15	15	14	15	15	
30	15	15	15	14	15	15	15	17	15	15		15	15	14	14	15	15	16	18	17	15	17	14	15
31	14	14	14	14	14	B	B	17	16	15	15		15	14	15	15	15	15	18	14	14	14	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	29	28	31	30	27	18	17	29	28	29	27	28	28	28	30	30	30	29	26	29	28	26	22	25
MED	15	14	14	14	15	15	15	16	15	15	15	15	15	14	15	15	15	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	15	17	16	15	15	15	16	16	16	15	16	15	15	16	15	16	16	15
L Q	14	14	14	14	14	14	14	15	15	15	14	14	14	14	15	14	15	14	14	15	15	14	15	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

JAN. 1996

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	69	38	38	58	59	34	N	49	48	57	66	A	A	86	87	70	70	50	58	41	N	43	59	49
2	N	A	89	31	A	A	59	48	50	69		67	67	A	50	74	59	49	44	A		89	69	59
3	49	69	35	N	25	N		N	48	50	68	46	57	80	67	54	61	61	A	49	35	49	A	A
4	38	42	38	59	36	A	A	48	48	66	53	68	66		62	58	61	48	58	N	50	59	109	59
5		40	43		59	49	B	59	62										40		30			B
6	N	59		N	35	N	B	59	50	49		56	63	69	62	66		54		49	49			N
7	36		N	40	48		A	59		68			66	62	60	72			41	A	N	34		69
8	59	N	32	28		A	49	32	42	49	56	A	62	76	70	68	67	67	A		32	35	B	B
9			28			N		70		58	62		75	60	140	70	58	48		A	N	35		59
10	48	44					40	A	50	77	46	62		139	C	93	C	57	63		B	48	54	
11		68	C		89	35	C	53	42		56	49	53	67	A	67		53	42		40			25
12		48		40	48	N	37	38	44		72	63	53	118	62	68	55	62	54		B	59	59	59
13	C	49		43		B	49	59	49	59	50		72	74	68	66	69	59	59	60	32		37	
14			N	36	A	A	A	31	50	A	81	80	67	66	A	60	52	50	43	A	A	89	89	A
15		38	32		N	A	A	37		43	74	66	78	72	61	76	67	53	43			49	A	
16		A	36	26	42	N	N	31		C	56	132	94	A	81	A	A	81	48		48			59
17	N	44		50	A	40	A		48	106	56	62		C	79	59	58	54	A	40		69		
18	A	69	38	48	40		47	33	43		50	61	56		60	60				38			49	35
19		69		46			31		C		A	67	113	108	C	48	54	48	49			43		N
20	47	37	47		30	37	51		44		56		68		50	59	55	58	57				N	N
21	49				59				48		68	66	60	67	69		59	C		48	32			
22	63			47		23		36	49	53	48	113		A	C	C	C	92	48		48	N	38	41
23		47							92	109	69		106	83	90	A	72	48	62		A	34	28	
24		43			C			65	A	56	60		127	104	C	C	C	68		A		A	39	49
25	56	35			78			32	44		59		74	C	57	60	A	48	C	62	A	A	79	A
26	A	62		38	38	C	B	46			62	111	68		C	75	85	61	40	A	59	A		34
27	48	40	54		32	32			82		59	122	70	57	66	68	71	A	A	46	46			52
28					65	A	A	46	112	65		62	67	60		46	72	72	52				N	36
29			62		41		38	41		C	A	C	62		62	68	54	54	56	62		A	89	
30	38	28		26		49	B			114	98	94		C		72	67		C	37		34		
31	34	34		48	49		C	64	C	49	C	C	94	112	C		59	C	75			52	44	30
	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	21	13	16	18			22	21	18	23	19	25	18	20	24	21	24	20	11	12	16	14	15
MED	48	44	38	42	45			47	48	58	59	66	67	75	64	68	61	54	50	48	43	48	56	49
U Q	57	60	50	48	59			59	50	69	68	94	76	104	74	71	69	61	58	60	48	59	79	59
L Q	38	38	33	33	36			36	44	50	56	62	62	66	60	59	56	49	43	40	32	35	39	35

HOURLY VALUES OF fEs AT YAMAGAWA

JAN. 1996

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	G	G	G	G	G	G	G	G	28	34	30	48	56	54	42	32	30	G	G	28	24	32	28	G
2	27	32	27	30	29	28	26	G	30	35		32	29	54	28	40	28	68	25	34	29	30	24	28
3	32	26	30	30	26	24	G	G	37	30	33	34	46	40	42	48	51	31	32	29	G	24	27	28
4	24	30	G	28	G		25	26	G	27	30	34	32	32		55	29	47	41	G	G	26	25	G	G
5	G	G	25	G	G	G	B	G	25										27	G	G	G	G	G	B
6	G	G	G	G	G	G	B	G	28	30	29	39	33	30	31		30	G	G	G	G	G	G	G
7	G	G	G	G	G			G	32	36	29		42	39		30	30	35	34	30	G	G	G	G
8	G	G	30	31	G		G	G			31		47	44	43	36	30	28	33	31	27	23	B	B
9	G		G	G	G	11	37	38	27	32	42		40	32	71	70	32	51		45	29	29	G	G
10	G	G		42	54	22	G		40	46	34	34		62	68	C	31	32	G		B	G	G	G
11		G	C		G	25	C	G	32		46	42	30	34	88	30	29	27	24	G	G	G	G	G
12	G	G		30	G	G	G	G		32	34	42	39	68	30	32	30	28	26	G	B	G	G	G
13	G	G	26	G	G	B	29	G	26	38	32	32	40	42	44	40	30	G	G	G	G	G	G	G
14	25	27	G	G	45	26	24	G	28	33	39	43	53	44		34	40	31	30	39	34	28	29	
15	33	39	39	G	G	29	28	G	28	38	80	50	60	54	42	33	33	G	G	24	27	25		
16	32	34	32	33	27	G	G	G	27	62	53	63		90	52		85	34	31	25	G	G	B	G
17	G	25	37	42	64	11			40	58	40	46	66	C	38	30	30	28	33	G	30	30	G	29
18	30	G	G	28	G	G	G	G	30		44	47	38		30	30	107			31	28		31	30
19	G	G	G	G	G	G	G	G	42		68	50	68	67	C	41	30	29	48	G		G	G	G
20	G	G	G	G	29	27	G		30	35	30	32	35	30	32	36	32	G	G	25	G	G	G	G
21	G			G	G	11			30	28	30	36	32	44	40		34	27	G	G	G	G	G	G
22	G	G	G	G		28	42	G	32	40	35	73		62	C	70	C	C	28	26		30	26	G
23		G							52	50	32		61	66	C	67	42	28	26	36	40	30	28	24
24		30	G		C			36	30	31	35	39	108	98	76	134	C	29	28	27		27	24	G
25	26	25	46			50		25	34	34	38	36	54	C		40	70	32	54	44	33		31	32
26	33	43	31	29	39	C	B	40		72	30	58	60		C	42	32	26	43	40	G	30	49	28
27	47	46	52		26	G	G				41	64	52	49	51	36	45	52	41	34	G	G		
28			G		52	34	50	G	48	31	43	43	41	40	49	30	31	29	28	G	G	26	G	G
29			39	G	G		G	G		50	48	88	40		40	41	31	27	G	G		29	G	G
30	G	32	G	G		G	B		44	46	56	46		C		41	30	28	132	24	26	G		G
31	G	G		26	26		116	G	30	C	C	C	61	C	73	73	C	C	G	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	26	27	25	25	26	23	20	24	26	24	28	25	26	22	21	26	27	27	29	30	25	29	26	26
MED	G	G	G	G	G	11	G	G	30	35	35	43	44	46	43	38	31	28	27	25	G	23	G	G
U Q	27	30	31	30	29	27	28	G	37	46	43	50	60	62	61	42	42	32	33	31	28	29	27	24
L Q	G	G	G	G	G	G	G	G	28	31	31	35	38	40	39	32	30	27	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

JAN. 1996

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	15	14	14	14	14	16	66	15	14	15	15	16	17	17	17	17	17	17	15	15	15	14		14
2	14	15	14	14	15	15	15	14	16	15		16	16	17	16	15	16	17	15	15	14	15	14	14
3	14	14	14	15	15	16	71	16	16	15	16	18	17	18	16	15	16	15	15	14	14	15	14	15
4	15	14	14	14	14	16	18	14	17	15	17	16	20		20	17	15	14	14	17	14	14	14	14
5	14	14	14	15	14	14	B	14	17										15		14	14	15	B
6	15	14	14	15	14	15	B	14	16	15	16	16	17	17	17	17	16	14	14	14	14	14	14	14
7	14	14	14	14	14	14	16	14	16	15	16	16	16	17	17	15	14	15	14	14	16	15	17	17
8	15	14	15	14	15	15	15	14	16	16	17	16	20	17	17	15	14	14	14	14	15	14	B	B
9	20		14	14	14	14	18	21	16	15	15		16	16	22	17	14	14	20	16	14	14	16	15
10	20	18		23	20		26		15	17	15	16		26	27	21	17	16	18	14	B	15	14	17
11		18	14	15	14	14	24	15	16		14	16	16	17		17	15	14	14	15	14	15	14	14
12	14	20		14	14	14	20	15	15	15	14	15	15	21	16	14	14	14	15	14	B	14	14	14
13	14	14	14	20	14	B	14	14	14	14	15	14	14	16	15	15	14	16	15	14	15	15	14	14
14	14	14	15	15	14	15	14	15	15	15	14	14	14	15	15	15	15	14	14	14	14	14	14	14
15	14	14	14	14	16	15	15	14	15	14	14	15	15	15	16	17	14	17	14	14	15	14	15	
16	14	14	14	14	14	15	18	14	14	20	14	16	16	16	15	15	15	15	15	15	14	15	B	15
17	15	14	14	20	17	20	26		15	20	15	16		27	18	17	16	18	15	15	14	14	14	14
18	14	14	14	14	14		16	15	15	18	14	17	18		17	17	21	24		14	14		14	14
19	14	15	15	14	14		16	14	17		58	16	C	24	20	15	14	15	15	15		14	14	14
20	18	14	14	14	14	14	20	26	17	14	15	16	16	17	17	15	16	16	14	14	14	14	15	
21	17	21		20	14	14		20	15	15	16	16	16	15	16		14	20	14	14	15	18		16
22	21	14	14	14	14	14		14	16	15	15	23	14	17	C	33	30	14	15	14	20	15	14	17
23	20	20				21			16	21	16		18	23	20	15	14	15	14	14	14	14	14	14
24		29	21		18			18	14	15	15	16	21	20	26	21	21	15	14	14		15	15	16
25	18	14	18	30	21	20		14	14	14	16	17	22	C	16	16	15	15	20	20	15	14	14	14
26	15	20	14	14	18	16	B	20		21	16	27	16		40	18	15	15	16	14	15	14	21	15
27	20	14	20		15	14	20		20		15	18	17	17	16	15	15	15	14	15	15	20		14
28	21	14	17		20	15	20	20	20	15	15	16	16	16	16	15	14	15	14	20	15	20	14	14
29			20	15	17		18	18		20	20	21	16		17	15	15	14	15	14		14	14	14
30	14	14	14	14		15	B		23	18	20	20		C		21	14	16	C	15	14	15	20	15
31	15	14		14	14		C	20	15	14	C	16	16	27	22	22	C	38	14	15	14	16	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	29	26	27	29	24	21	26	29	27	28	28	26	24	27	29	29	30	29	31	26	30	26	27
MED	15	14	14	14	14	15	18	15	16	15	15	16	16	17	17	16	15	15	15	14	14	14	14	14
U Q	18	16	15	15	16	16	22	18	16	18	16	17	17	20	20	17	16	16	15	15	15	15	15	15
L Q	14	14	14	14	14	14	15	14	15	15	15	16	16	16	16	15	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT OKINAWA

JAN. 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	36	A	59	56	79						78	82	67	81	105	94	92		70	A	A	A	A	89
2			39			A		A	A	66		84	81	92	93	82	83	84	66			B	59	28
3	31		36			59			A	69	87	82	82	67	83	76	85	79	56	A	A	A		A
4	A		69		A	A	A	A	A	81	69		61	82	63	66		84	44	35			79	
5	31			69	59	B			A	70		64	56	81	87	93	82	73	50		43		49	
6			59	37	47	B			A	44		84	67	73	83	66	70			89			49	
7		89	30						A	40	65	70	84	105	98	120	98		63		44	44	B	
8				69		B	A	A	A	35	54	62	71	92		127	108	A	75	A	42	A	59	
9	B			59			A	B	A	59			A	82	77	76		51	51	A	A	109		B
10	B	B	89			B			43						93		54		52		43	A	A	A
11	A		69	69	33	B	B		A	42			56				84		48				A	A
12	26			B	B				A	55	62	62					75		54	A		B	A	89
13		A	A	A	69	29	A	A	A	A	48			98	104		84		69			B	B	
14			69	A	A	A	A	A		54	76		93		67	A	A	74	82			42	51	
15	38	A	A	A	A	A	A	A	A	61	54		82	74		91	101		92		38	A	38	
16		A	A	A	57	A		A	A	54			88		149	121			93	A	A	A	38	
17	B	B	89	A	55	B			A	73	67	60	61		92	84		79					A	A
18	A	89	A	89		B	B		A	65	59	72	67		92		112	121		85	A	A	A	
19	A	59	58		56		B	69	A	A	84		57		71		62	65	59	69		A	38	A
20	A	39	B	69					A	60		70	64	56	64	69				A			A	109
21	B	B	B	B	48	A				77	69						90	94		43	42			B
22				69		A			A	54	A	56	72		84	81	91		75	A	A	89		89
23		A	A	79	A	B			A	69	A	76	65		97	93	91	84	58	A	A	89	A	A
24		69		69	69	69		A	A	A		55	51		74			A	A	A	62	A	A	
25		B	44		32	A			A	A	65	A	84	93	87	86		A	A	A	A	A	A	A
26			49		43	A		A	A	A	91			84	94			96	60	A	A	A	A	
27	A	A	A	A	A	A	A		53	60	57		92	82			90	86		A	A	A	79	59
28		69			34				39			A	68	68	A	97		66	69	60			B	A
29			69	59			B		A	53		68	73			90	85				69			
30	A		38		59		B		A	62		69			83	97		80	79		A		45	
31				69		B		B	A	A	56			84	83	86			84	83				
	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	13	14					22	17	16	23	17	23	20	19	15	21				11	
MED			59	69	56					60	65	70	68	82	87	88	85	80	63				49	
U Q			69	69	59					69	77	79	82	92	94	95	92	86	75				59	
L Q			39	59	43					54	56	62	61	73	77	78	82	73	53				38	

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

JAN. 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	G	36	G	G	G	G	G	G	G		37	42	59	60	44	34	34	39	26	28	66	45	34	G
2	G	G	G		G		G		45	33	34	43	48		45	44	34	42	G	28	G	B	G	G
3	38	26		G	G	G	G	G	31	36	34	37	44		46	47	44	33	39	42	42	36	29	24
4	38	G		G	40	29	40		48	34	32	47	48	46	33	38	33	33	G	G	G	G	G	G
5	G			G	G	B	G	G	38	30	35	32	32	39	38	30	33	34		G	G	G	G	G
6	G	G	G	G	G	B	G	G	33	33	33	36	40	41	37	37	35	G	G	G	G		G	G
7	G	G	G	G	G	G	G	G	44	33	35	37	48	44	44	32	37		G	G	G	G	B	G
8	G	G	G	G	G	B	33	33	36	35	35		51	43	40	44	36	33	27		44	25	G	G
9	B	G	G	G		G		B	33	38	37	37		39	46	52	37	34	29	33		G	G	B
10	B	B	G	G		B	G	G	G	28	34	40	41	40	41	37	43			G	G	33	30	44
11		29	G	G	G	B	B	G	41	47	46	48	45	41	39	41	32	27	G	G		G	30	51
12	G	G		B	B	G	G	G	38	32	33	40	45	41	38	38	44		G	39	G	B	20	G
13	G			30	G	G	44	39	41	47	34			48	45	38	33	G	G	G	G	B	B	
14	G	G	G	36			47	39	G	42		46	46		46	62	88	82	50		38	43	G	G
15	G		68	40	44	34	48	34	30		28	96	58	61	46	83	41	32	37	G	G	37	G	G
16	36	37	44	62		40	G		48	48	44	46	112	93	127	98	96	95	90	37	59		G	G
17	B	B	G	27	G	B	G	G	27		58	39	40	43	39	32	26	G	G	G			33	32
18	28	24	28	G		B	B	G	27		57	51	46	44	G	48	61	68	46	39	28		48	G
19	59	G	G	G	G	G	B	G	80		43	44	45	43	41				G	G	G	37	G	35
20		G	B	G	G	G	G	G		31		36	38	43	44	40	38	34	44	36	G	28		G
21	B	B	B	B	G	24	G	G		30	38		45	36	44	55	69	50	37			G	G	B
22	G	G	G	G			G	G	23	38	47	54	50		60	60	37		24	31	32	G		G
23		38				B	G	G		51	34	37	45	50	44	35	44	46	41	65	61	37		25
24	G	G	G	G	G	G	G		41	36		46	46	55	50		47		91	88	69	62	34	G
25	G	B	G	G		25	G	G		46	40	49	50	49	59	115		95	47	55		48		25
26	G	G	G	G	G	29	G	28		41	42	47			48	38	79	47	35	69	65	32		G
27	30	34	22	46	36			G		32	38	46	50	62	70	79	38	27		46	46	39	G	G
28	G	38	G	G	G	G	G	G			43	61	62	51	74			36	G	G		42	B	
29	G	G	G	G	G	G	B	G		50	36	43	58	46	39	38	34				50	40		G
30		G	35	34	G	G	B	G	44	34		40	43	45	40	40	36	30	21	24		G	G	G
31	G	G	G	G	43	B	G	B	46	32	42	36	38	48	54	50	71	41	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	23	24	23	27	22	18	24	25	23	25	27	28	28	26	31	28	28	24	27	26	25	24	22	27
MED	G	G	G	G	G	G	G	G	38	35	37	43	46	44	44	40	38	34	26	28	28	32	G	G
U Q	28	27	G	27	G	25	G	G	44	44	43	47	50	50	48	53	45	46	41	39	48	39	30	24
L Q	G	G	G	G	G	G	G	G	27	32	34	37	43	41	39	37	34	31	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

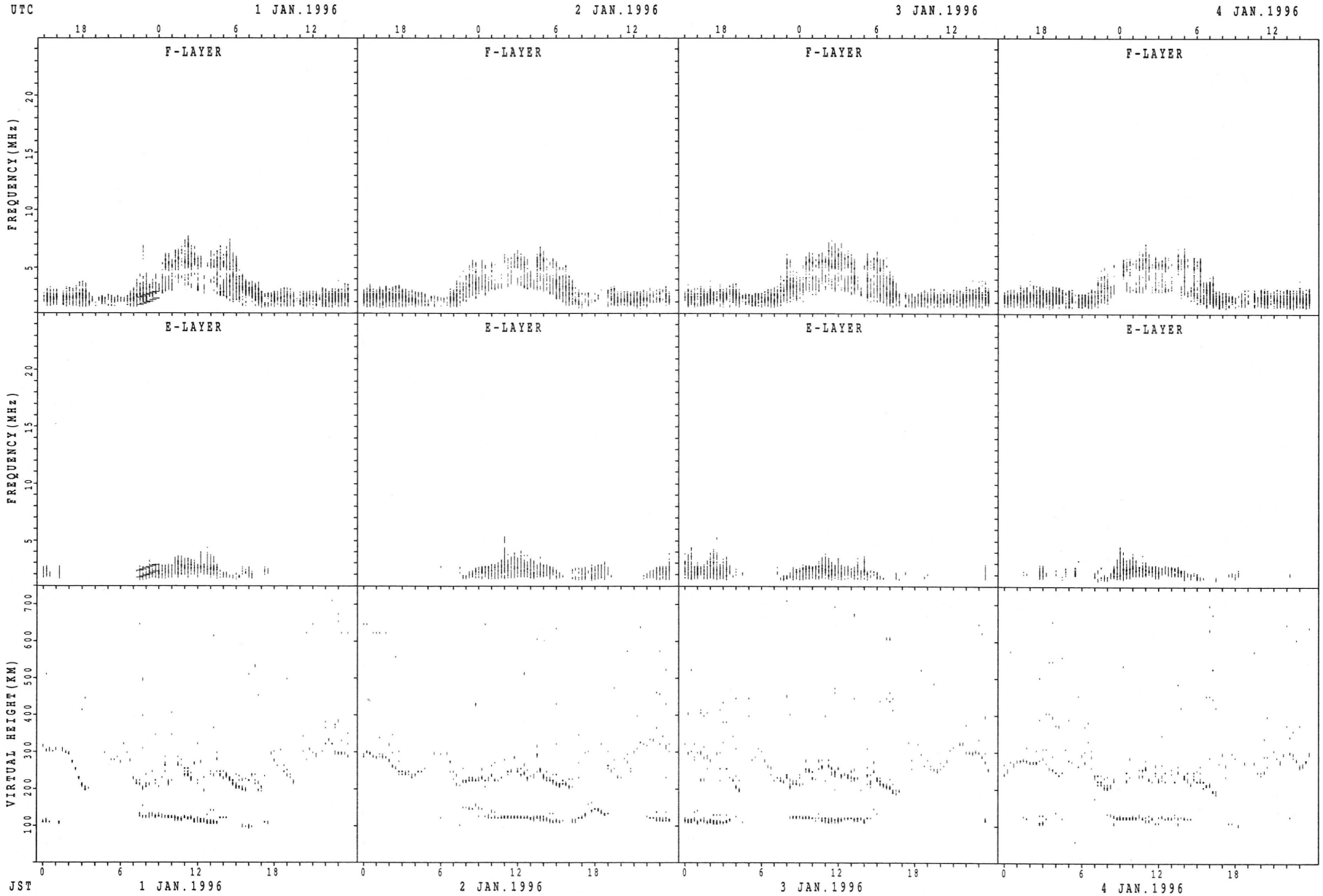
HOURLY VALUES OF fmin AT OKINAWA

JAN. 1996

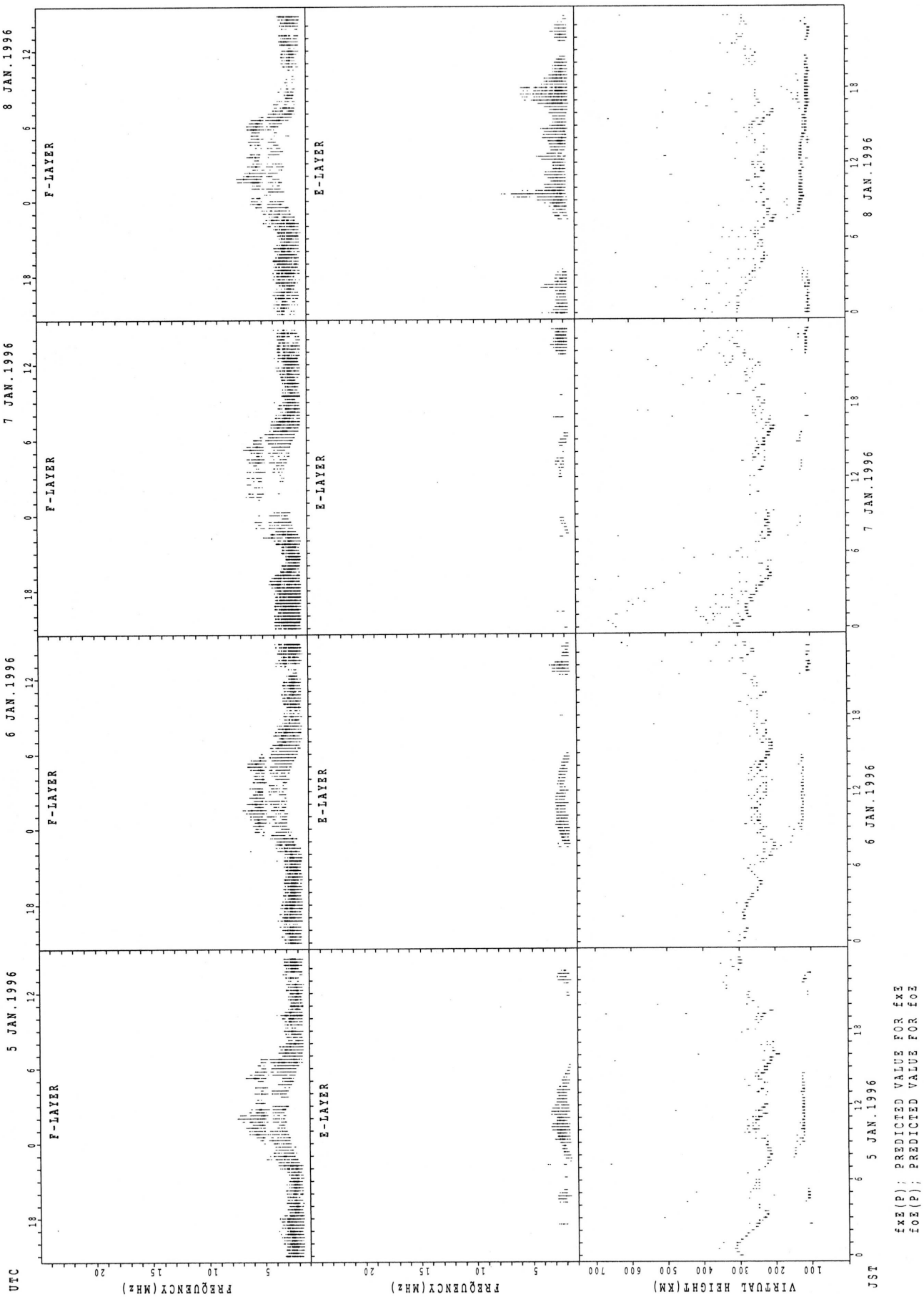
LAT. 26.3N LON. 127.8E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

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

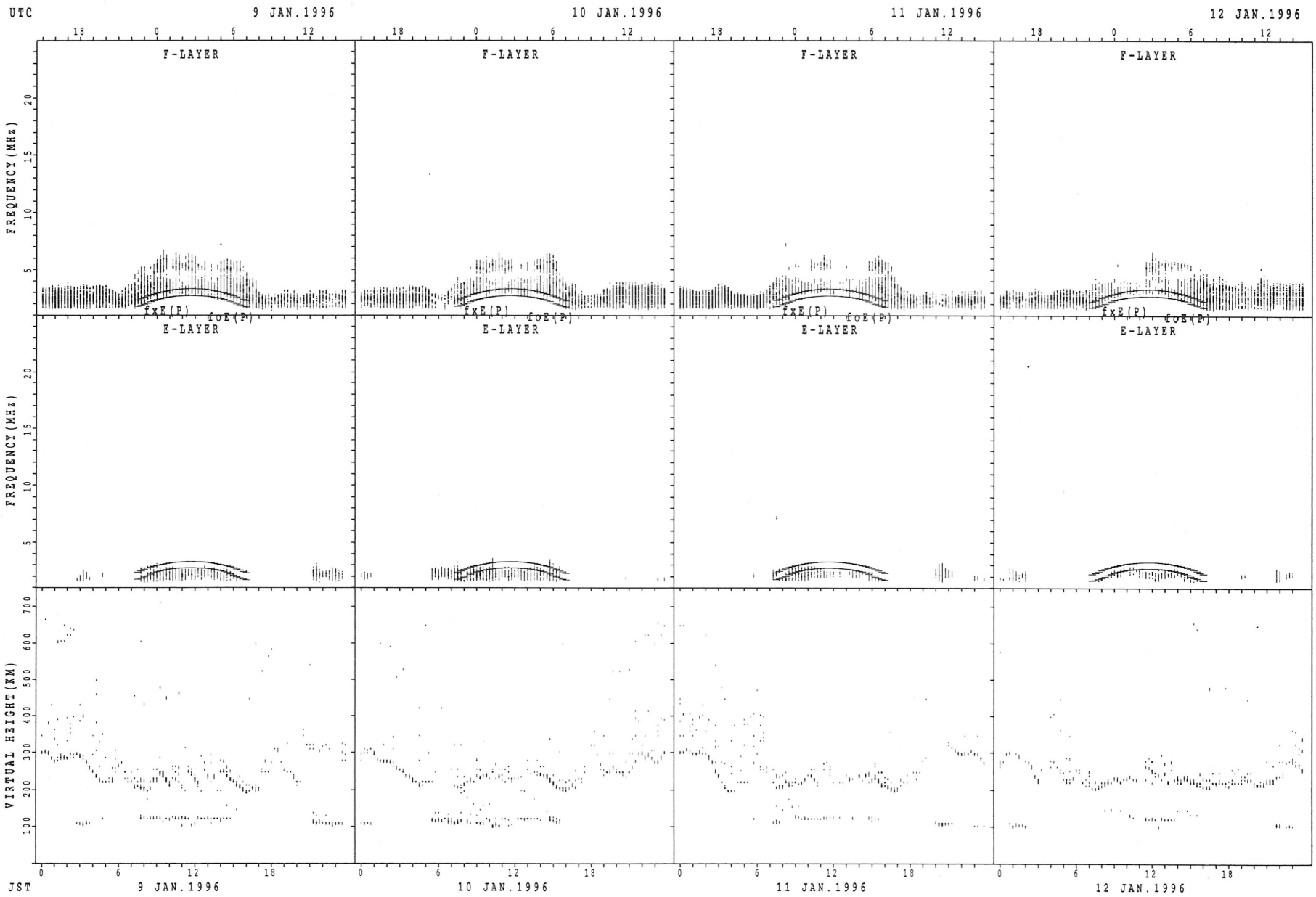
SUMMARY PLOTS AT WAKKANAI



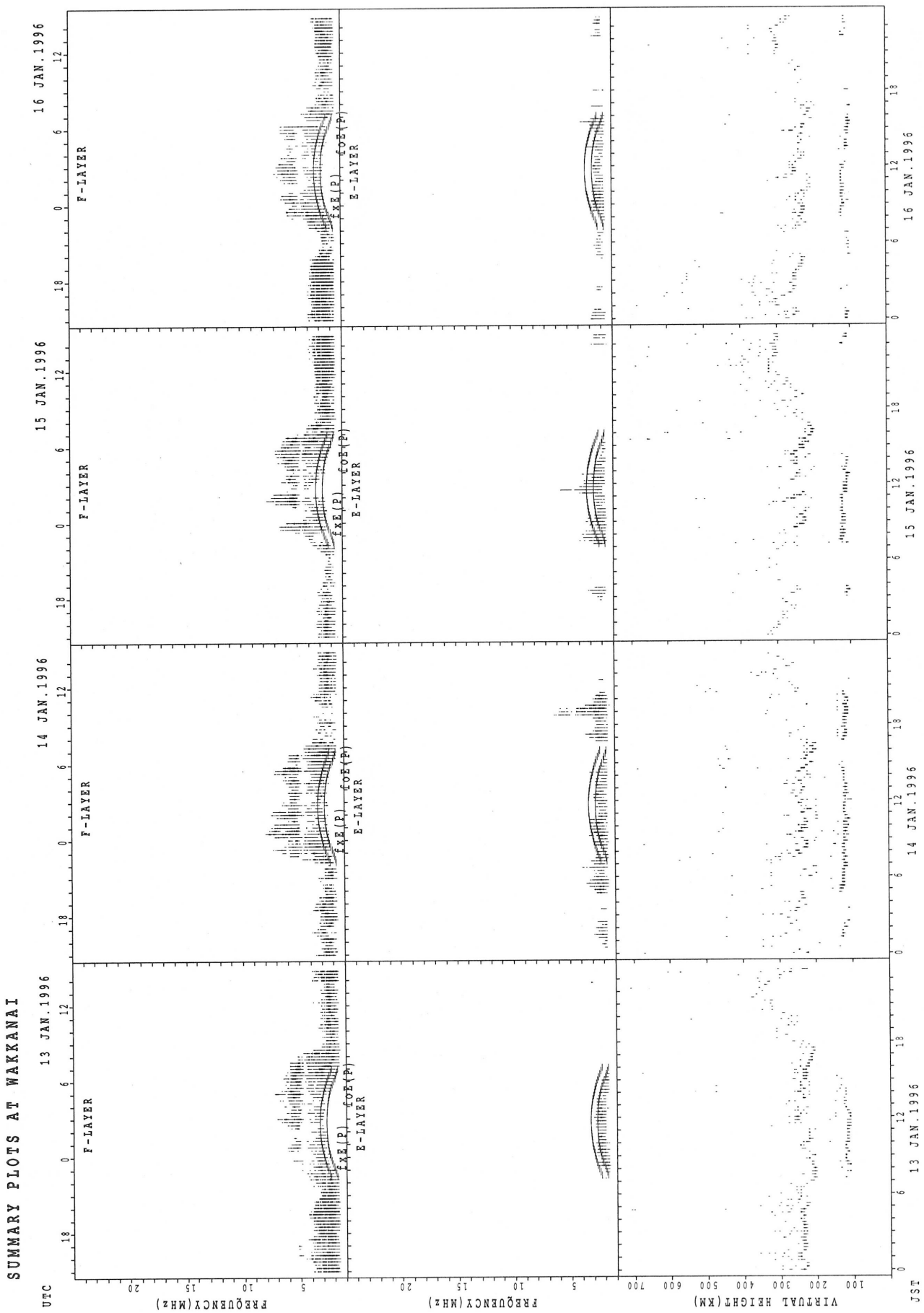
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

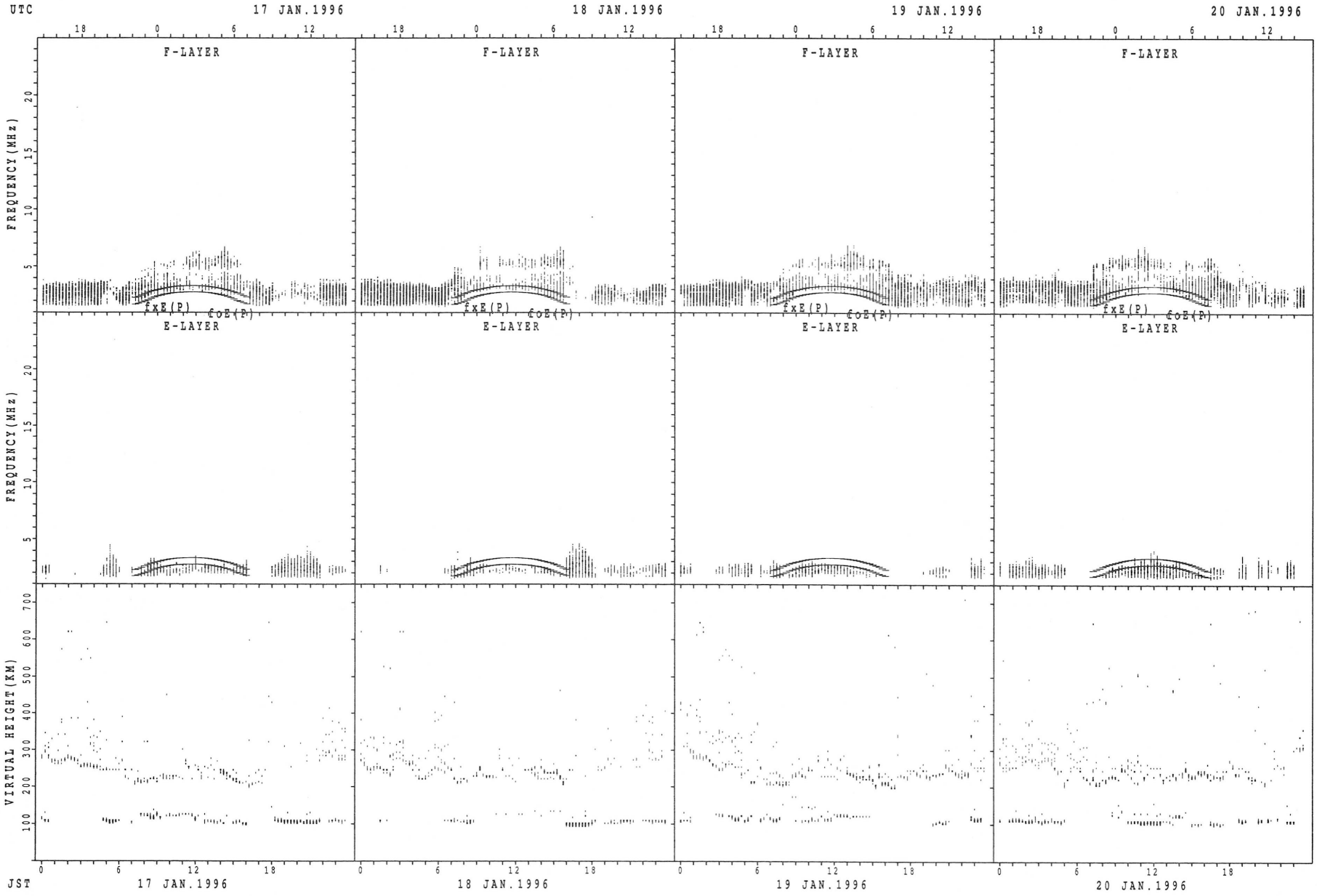
SUMMARY PLOTS AT WAKKANAI



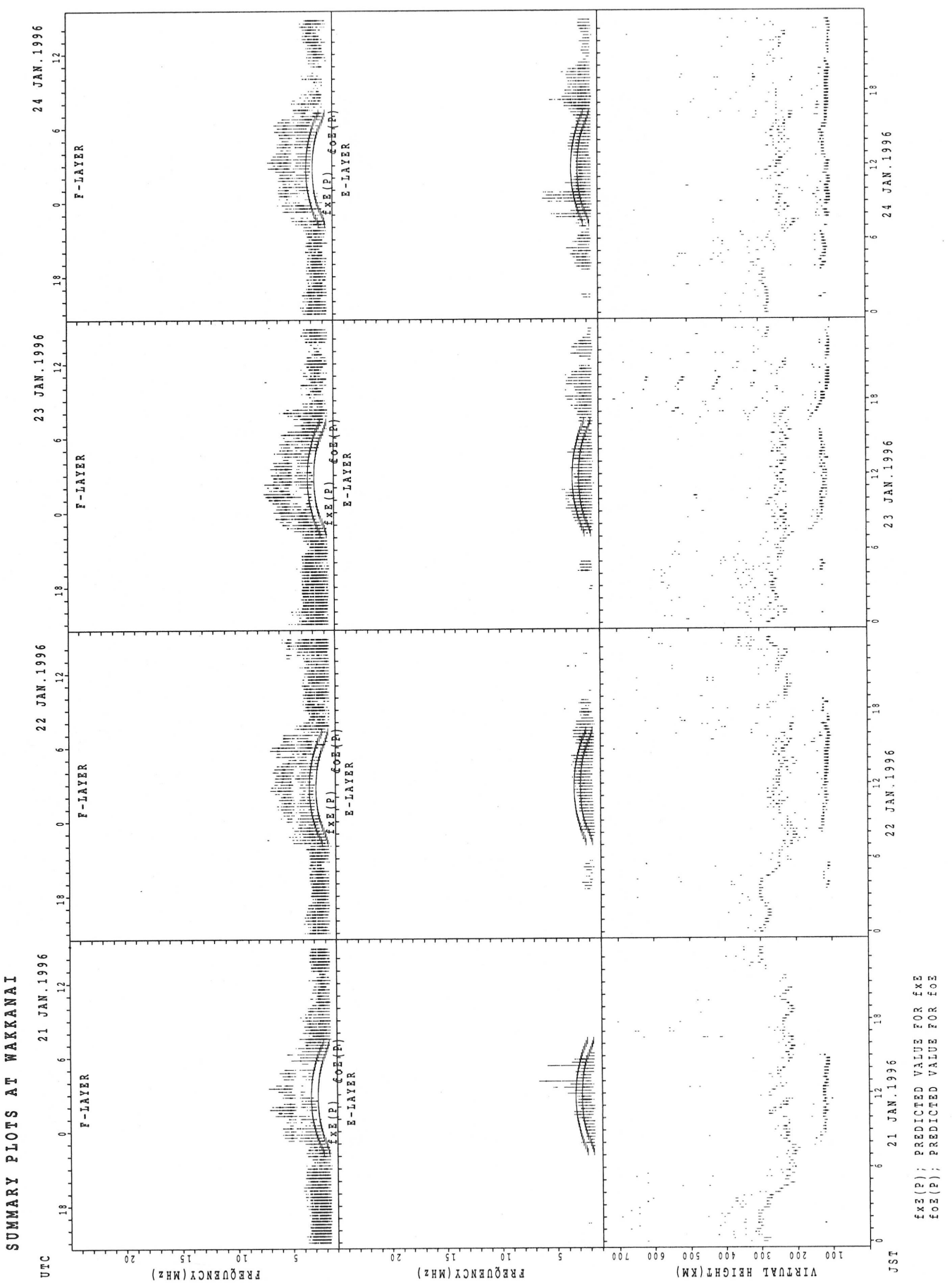
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

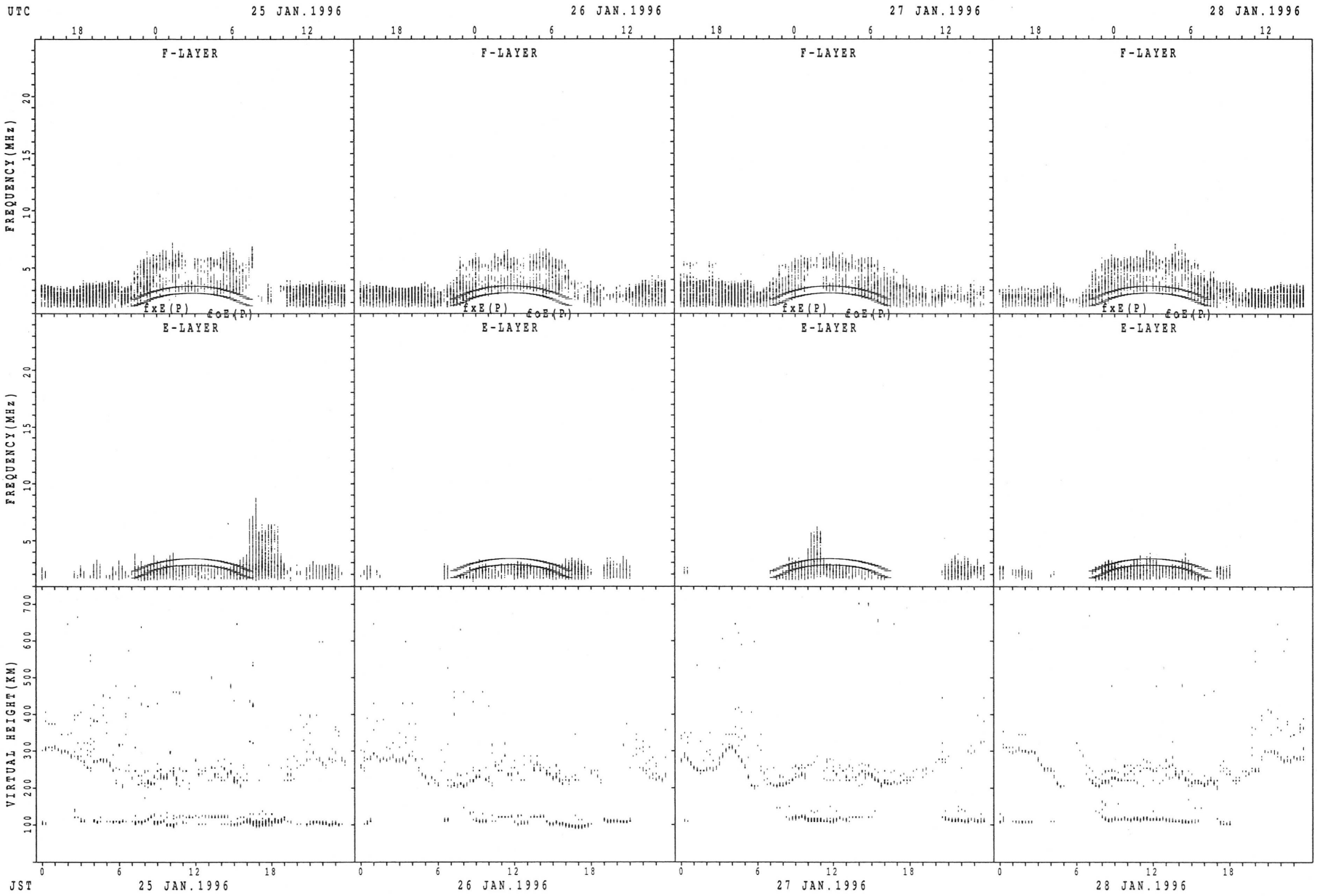
SUMMARY PLOTS AT WAKKANAI



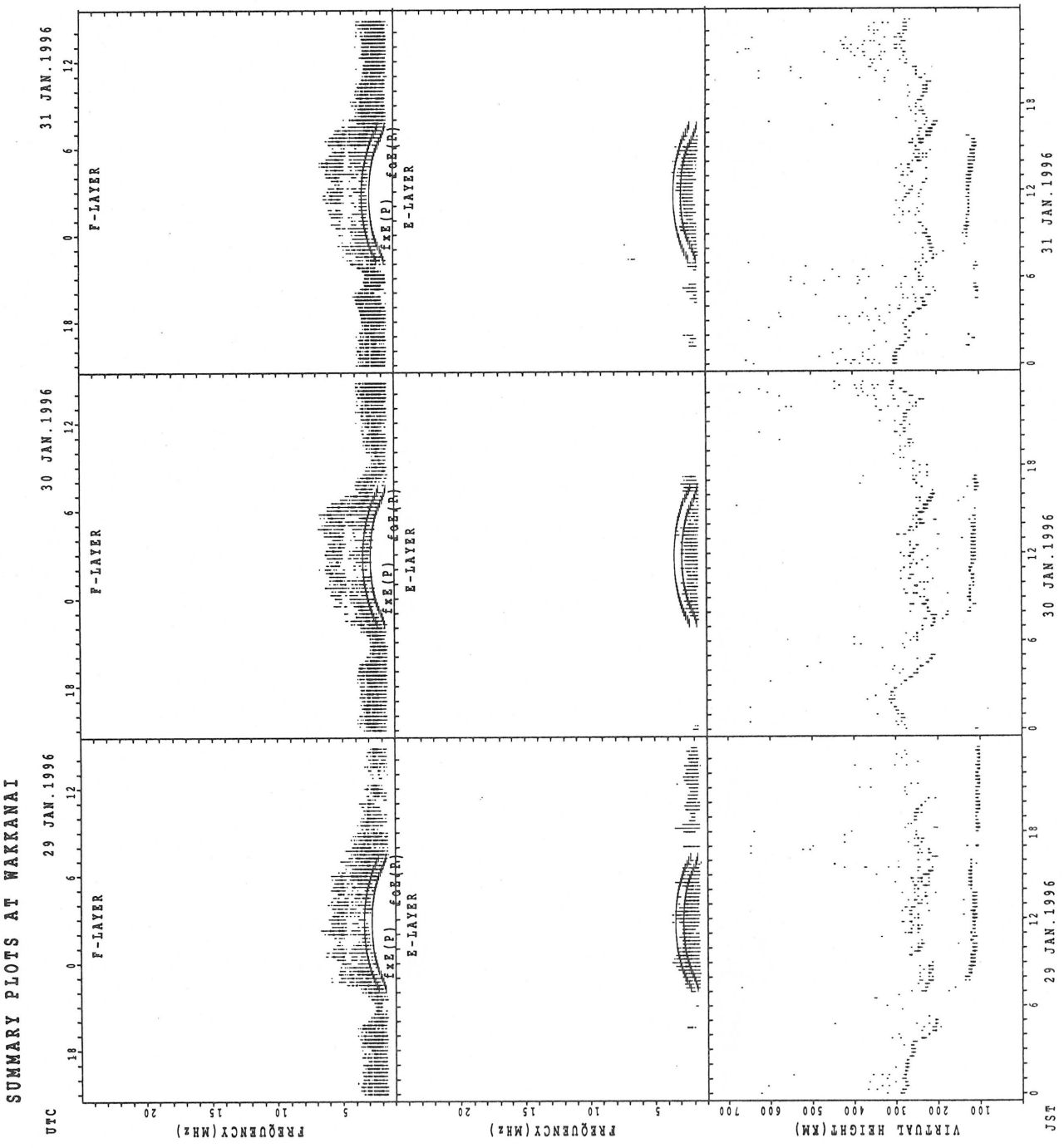
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

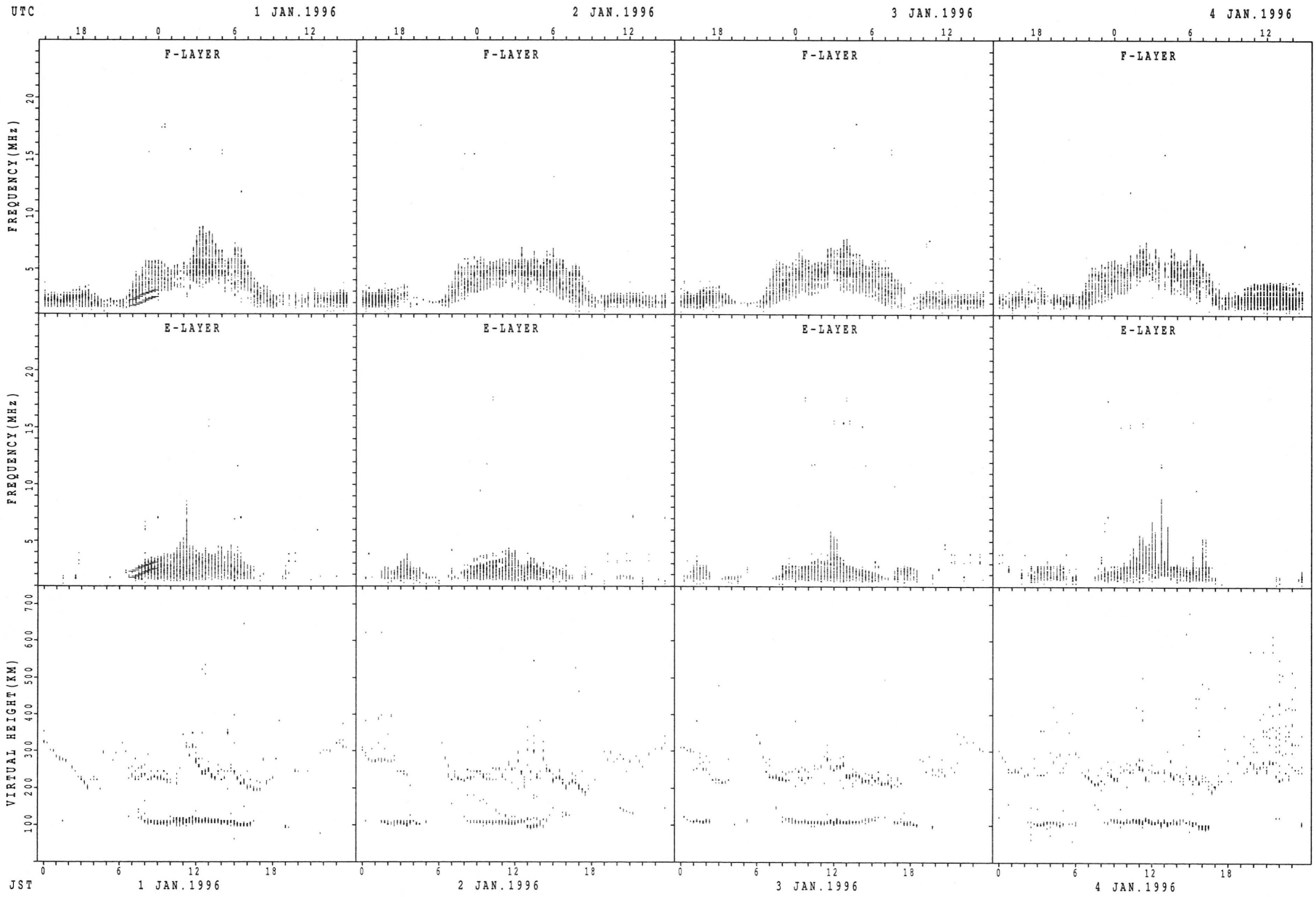
SUMMARY PLOTS AT WAKKANAI



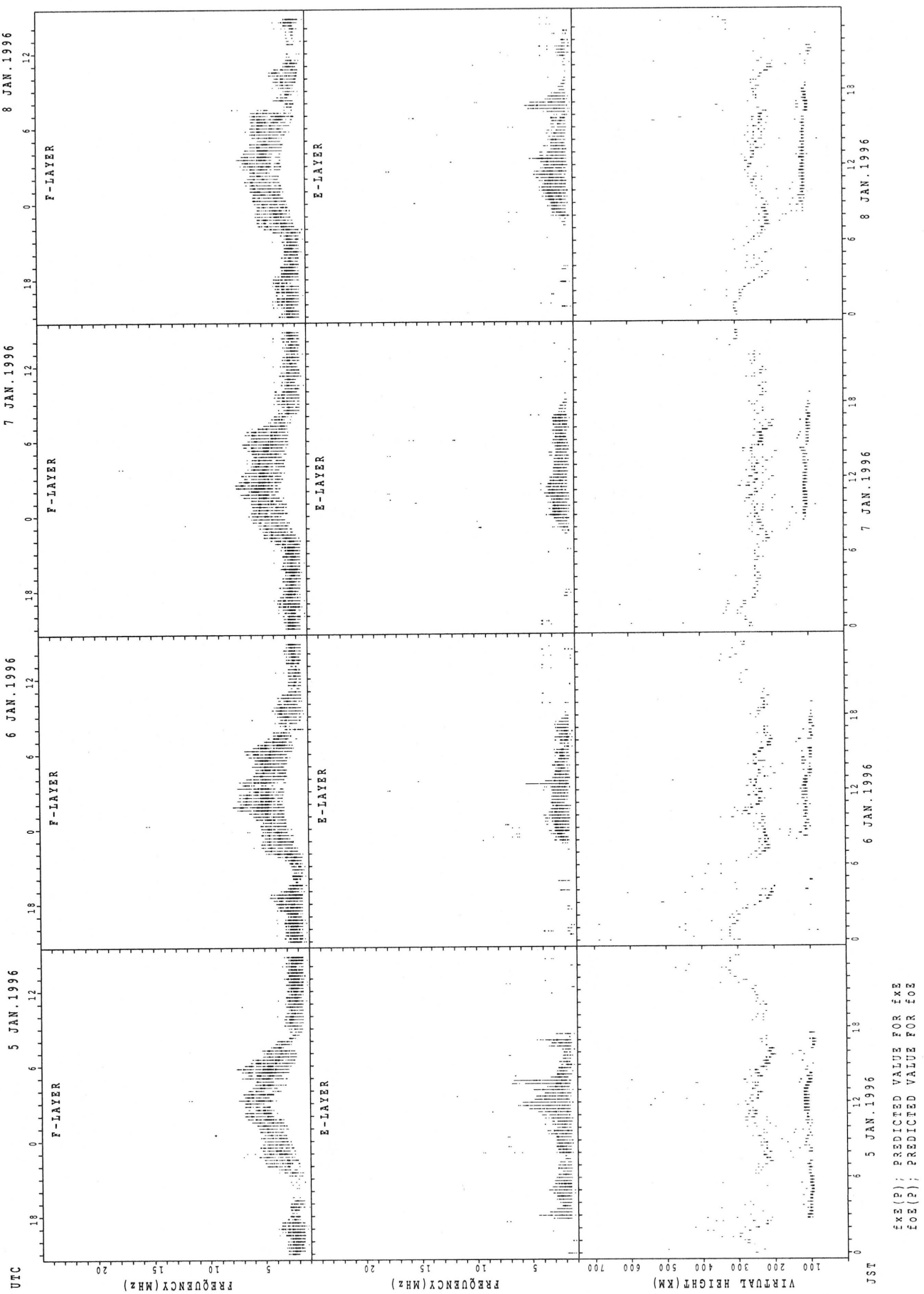
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
29 JAN.1996
30 JAN.1996
31 JAN.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

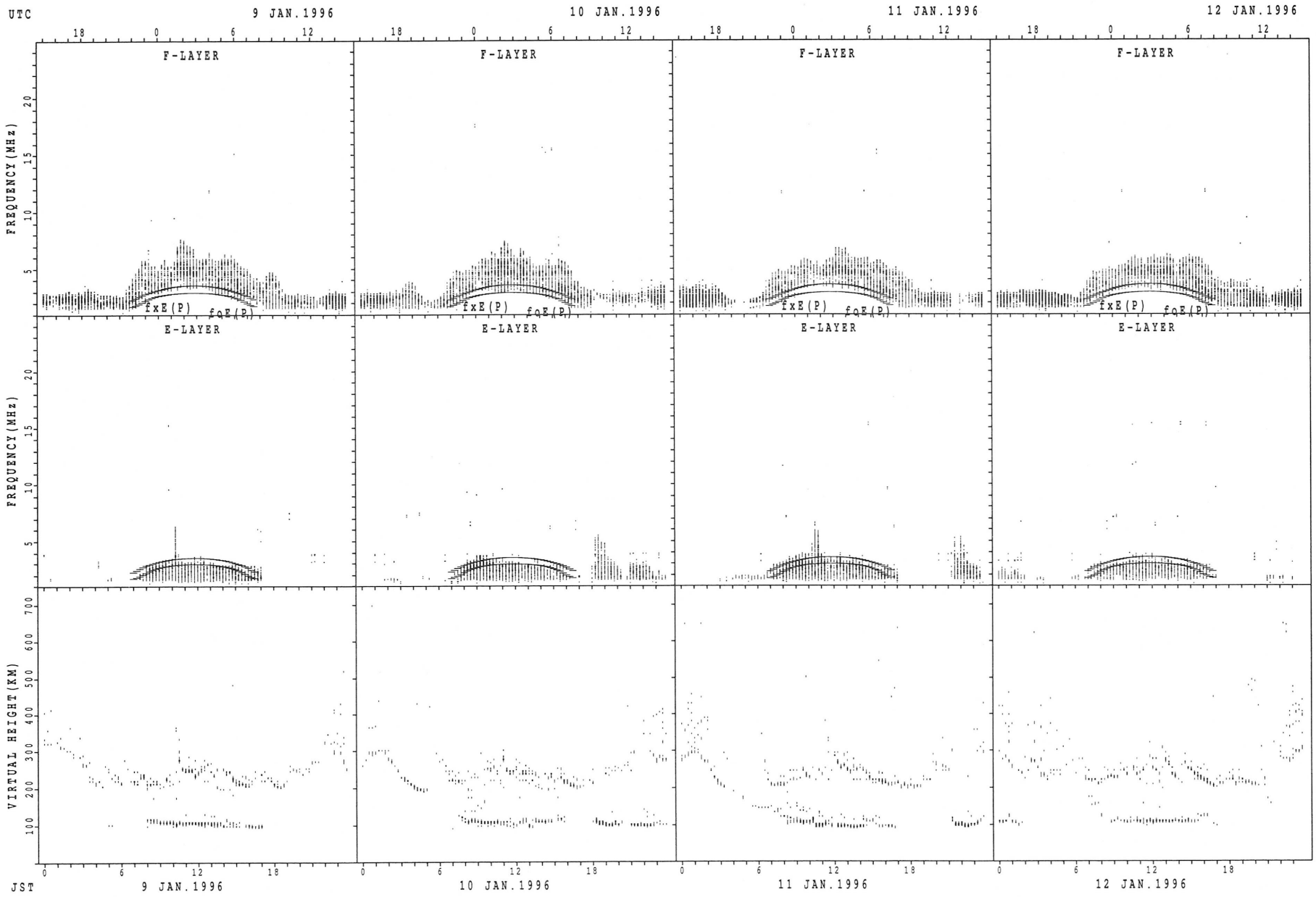
SUMMARY PLOTS AT KOKUBUNJI TOKYO



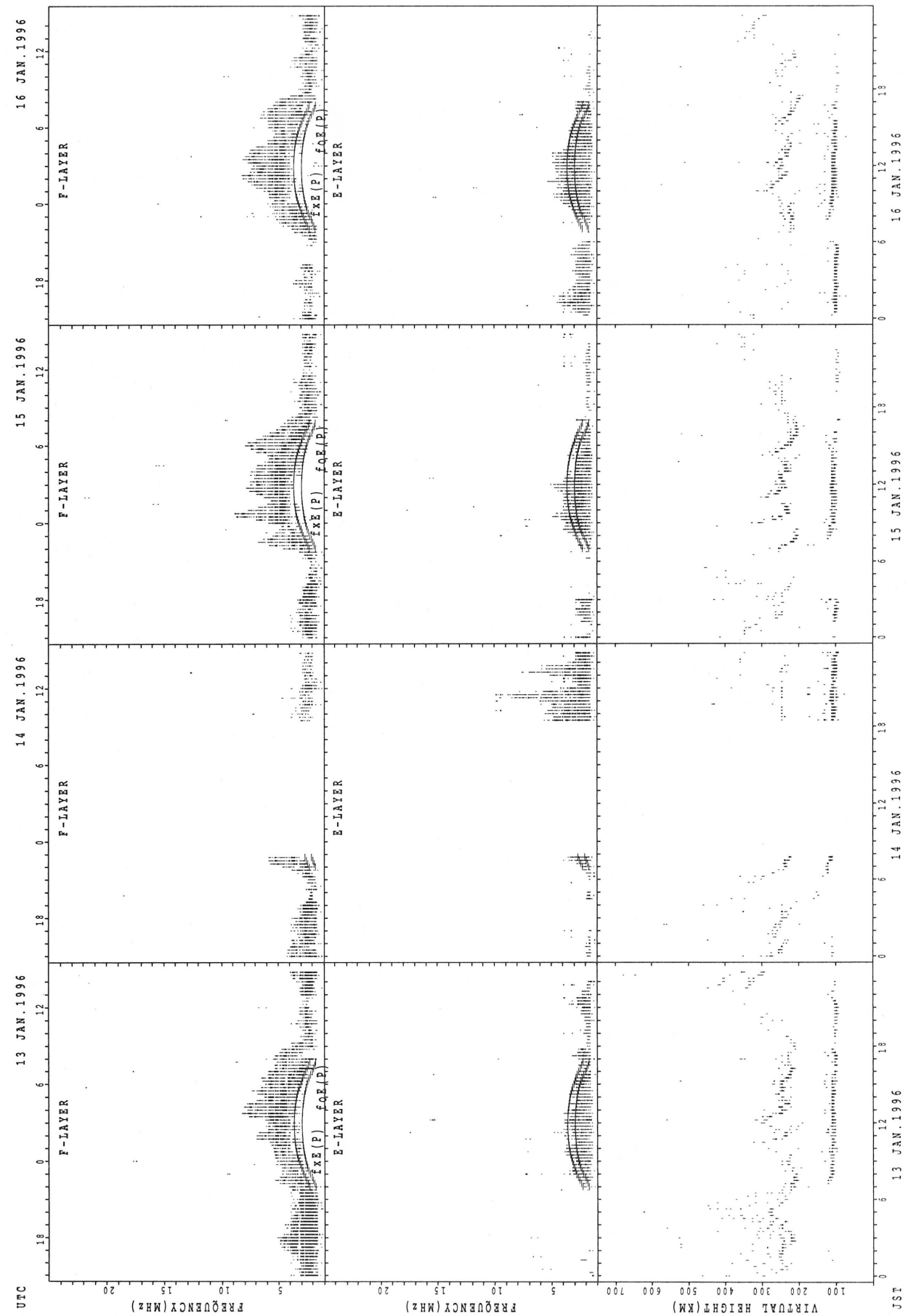
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

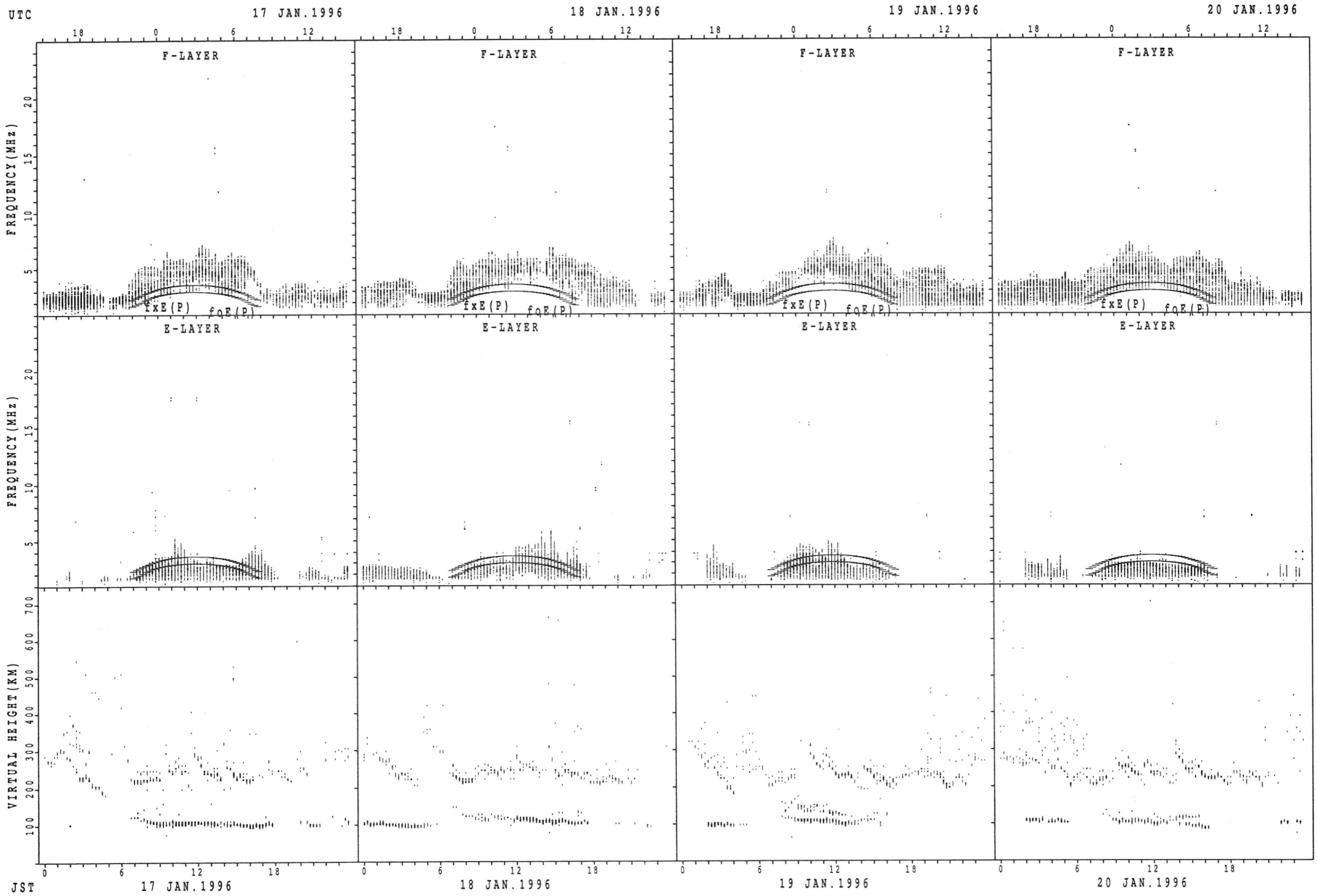
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

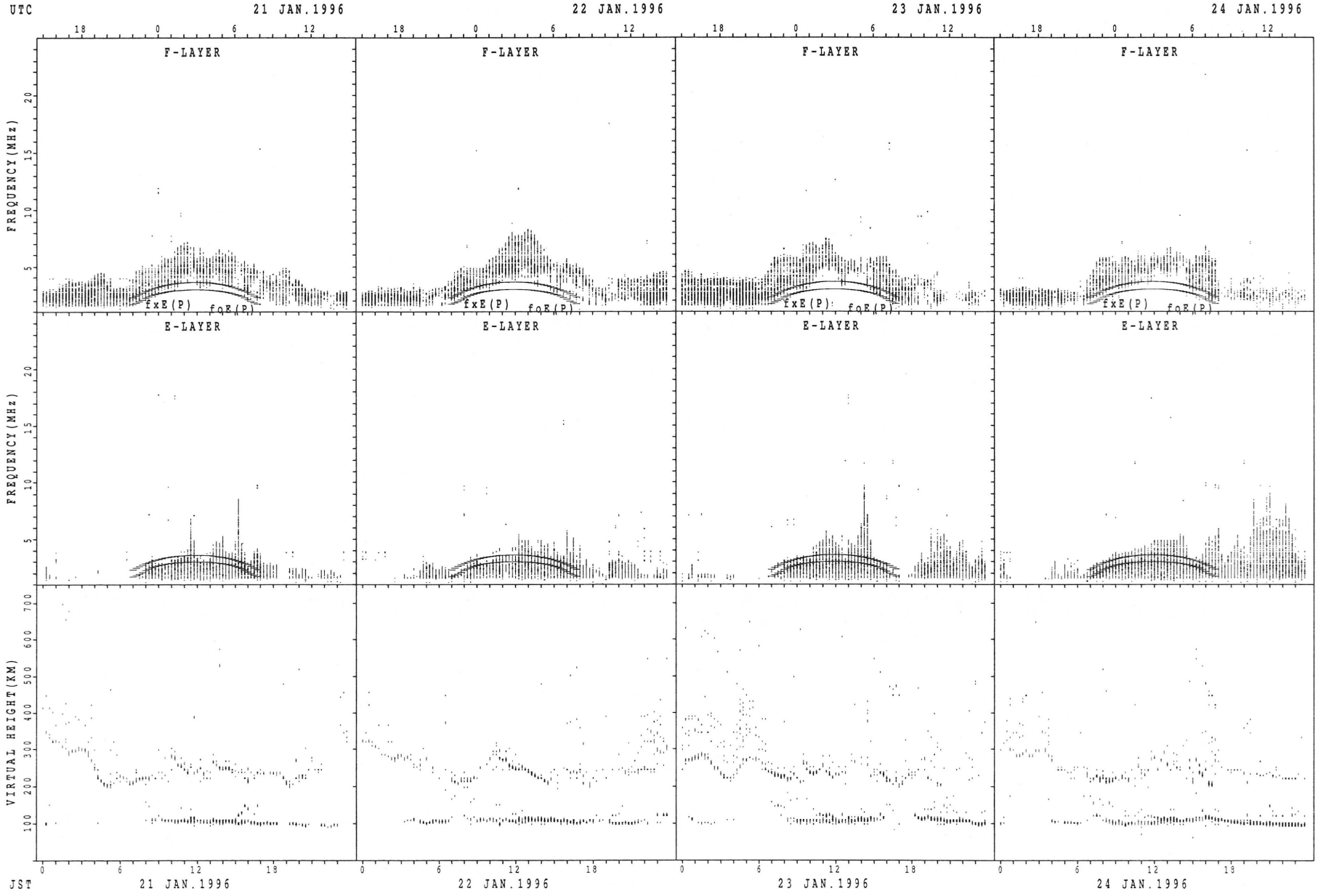

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
13 JAN.1996
14 JAN.1996
15 JAN.1996
16 JAN.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



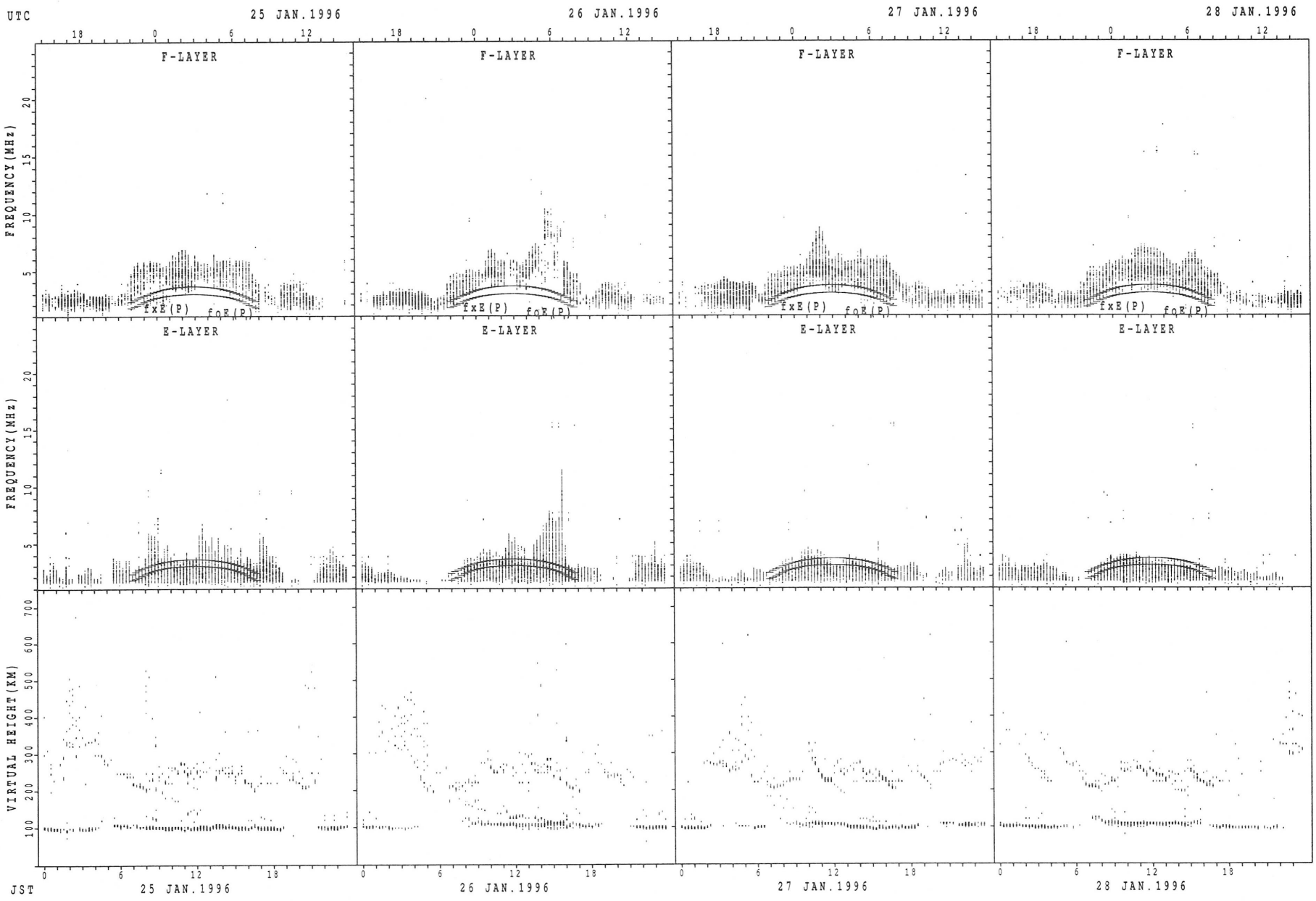
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

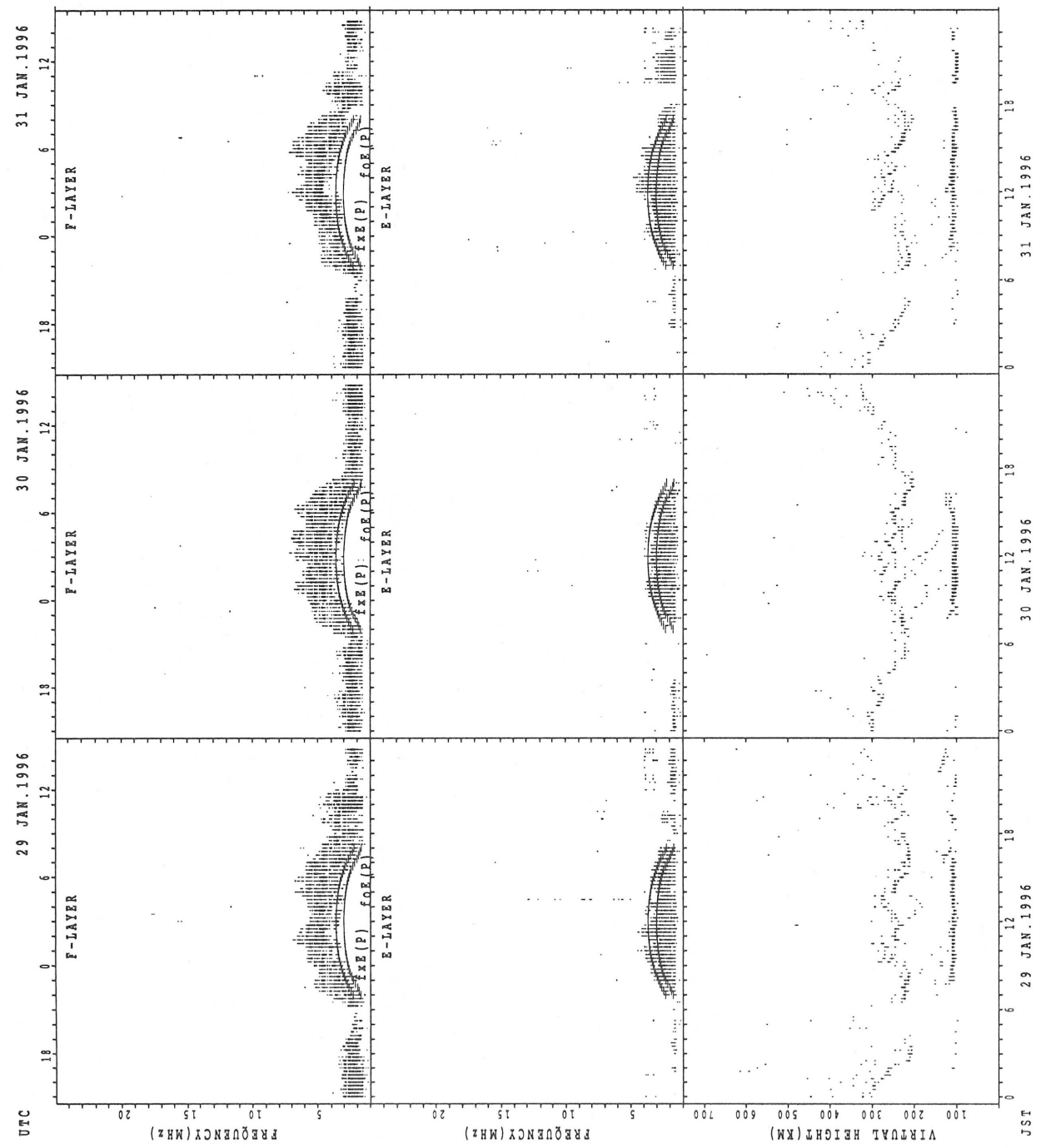


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

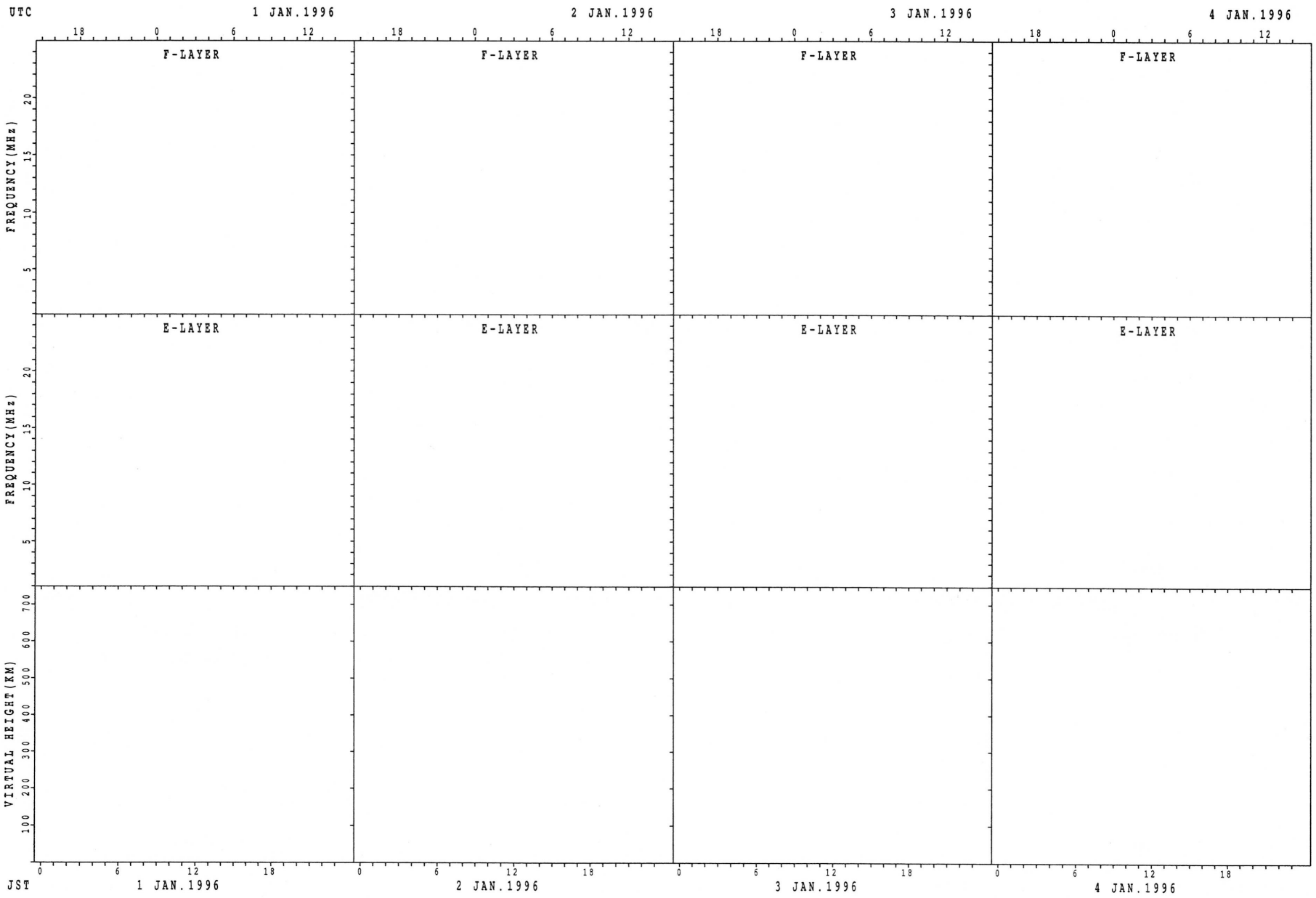
SUMMARY PLOTS AT KOKUBUNJI TOKYO



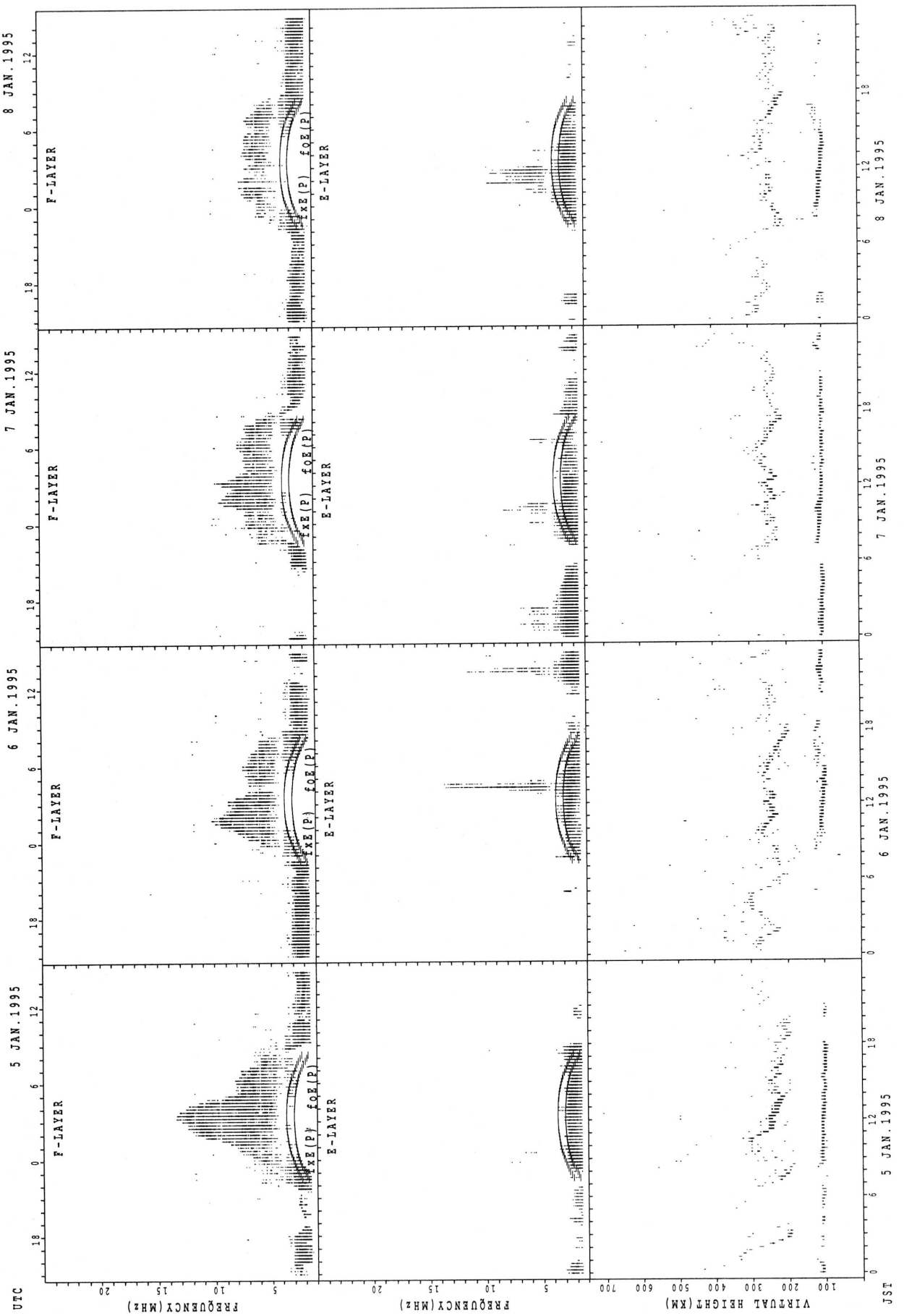
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

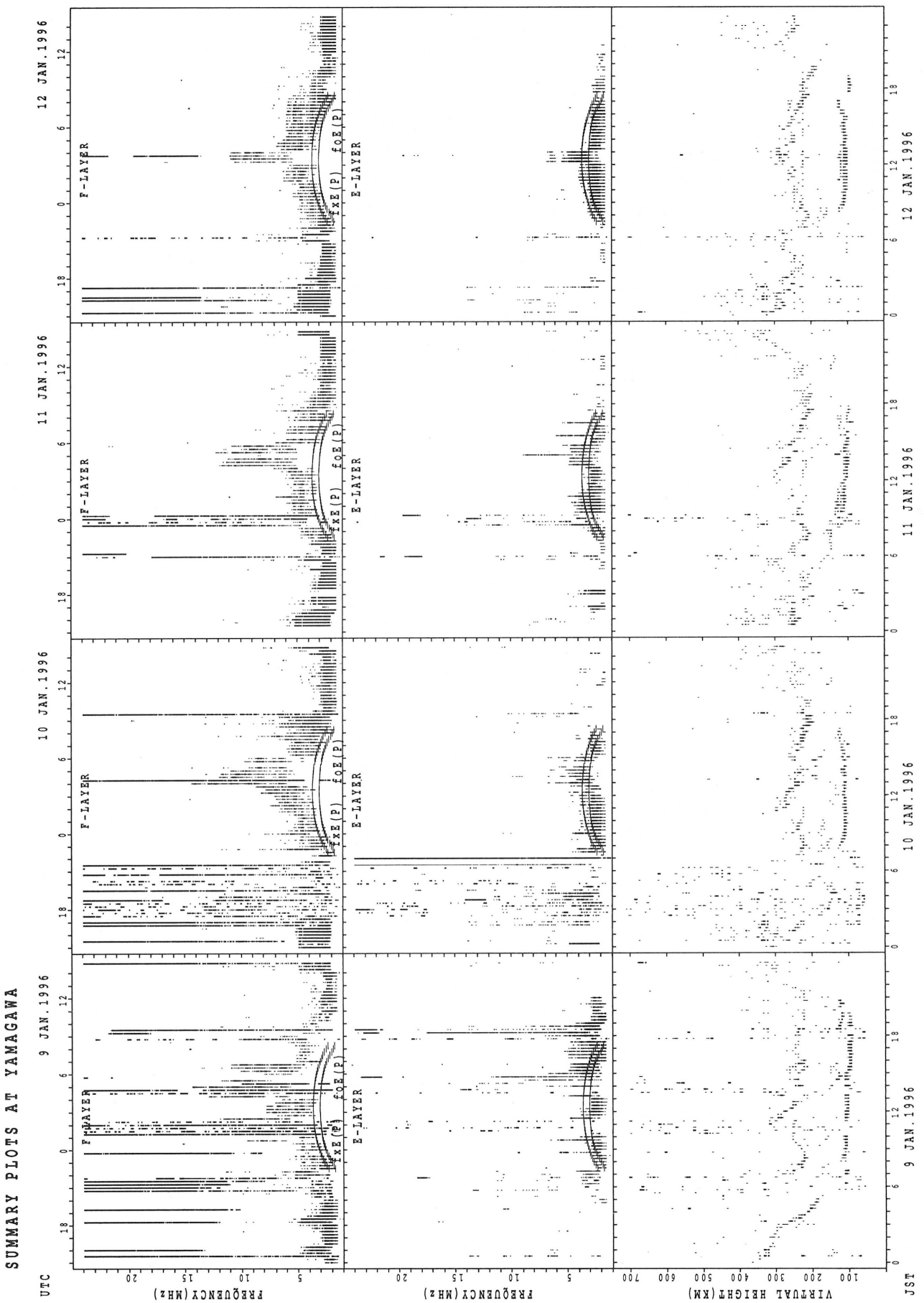

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
29 JAN.1996
30 JAN.1996
31 JAN.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

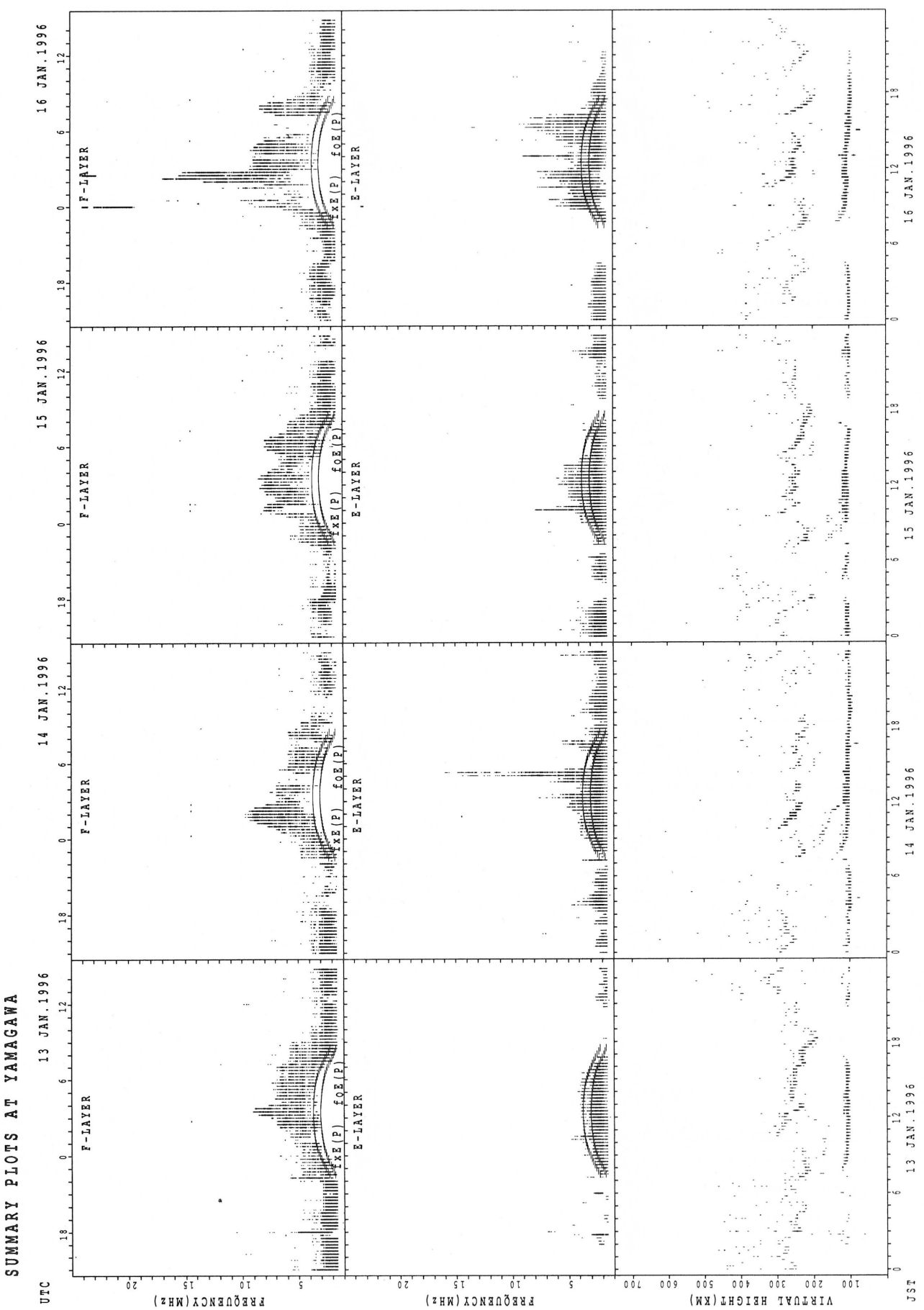
SUMMARY PLOTS AT YAMAGAWA

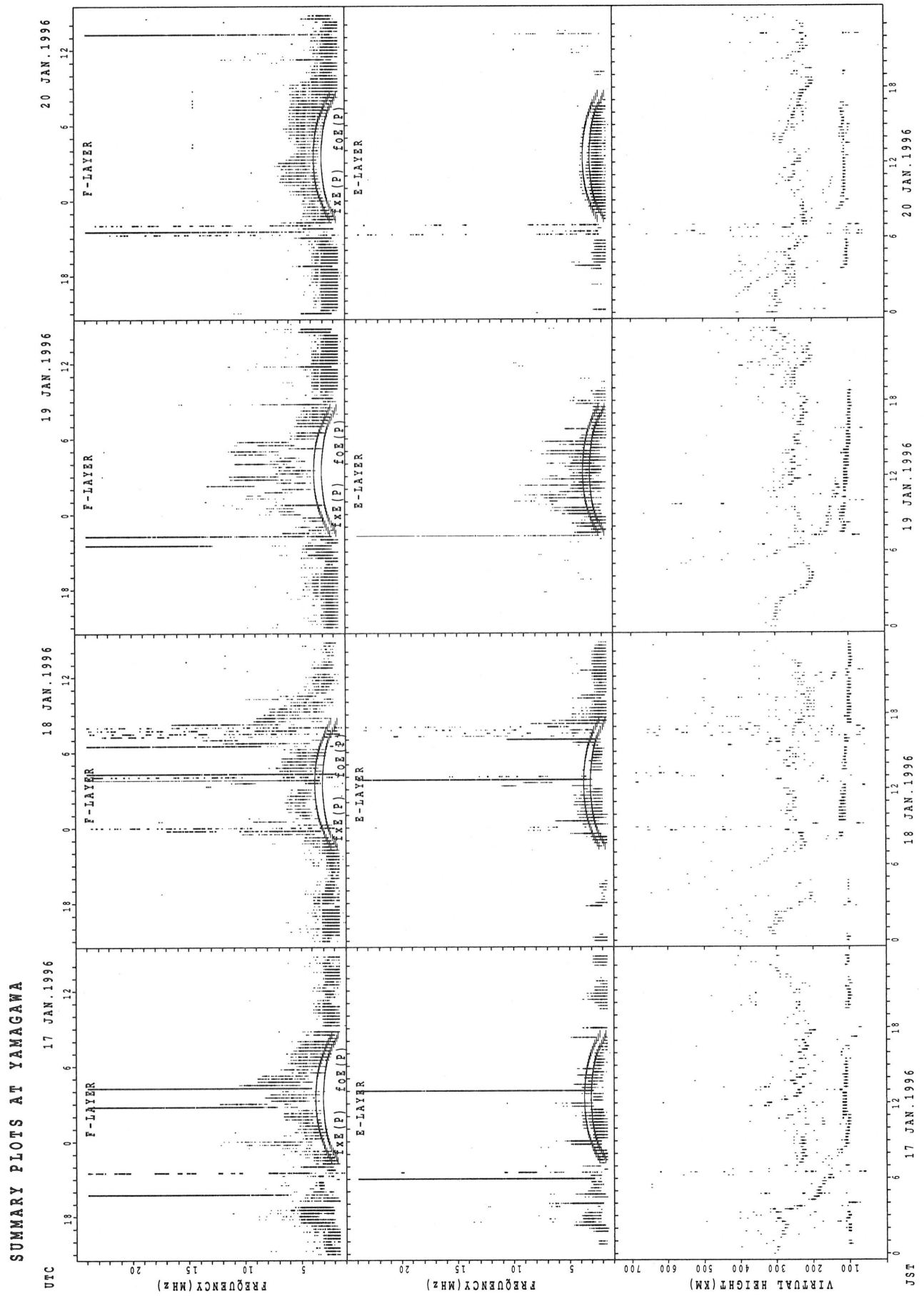


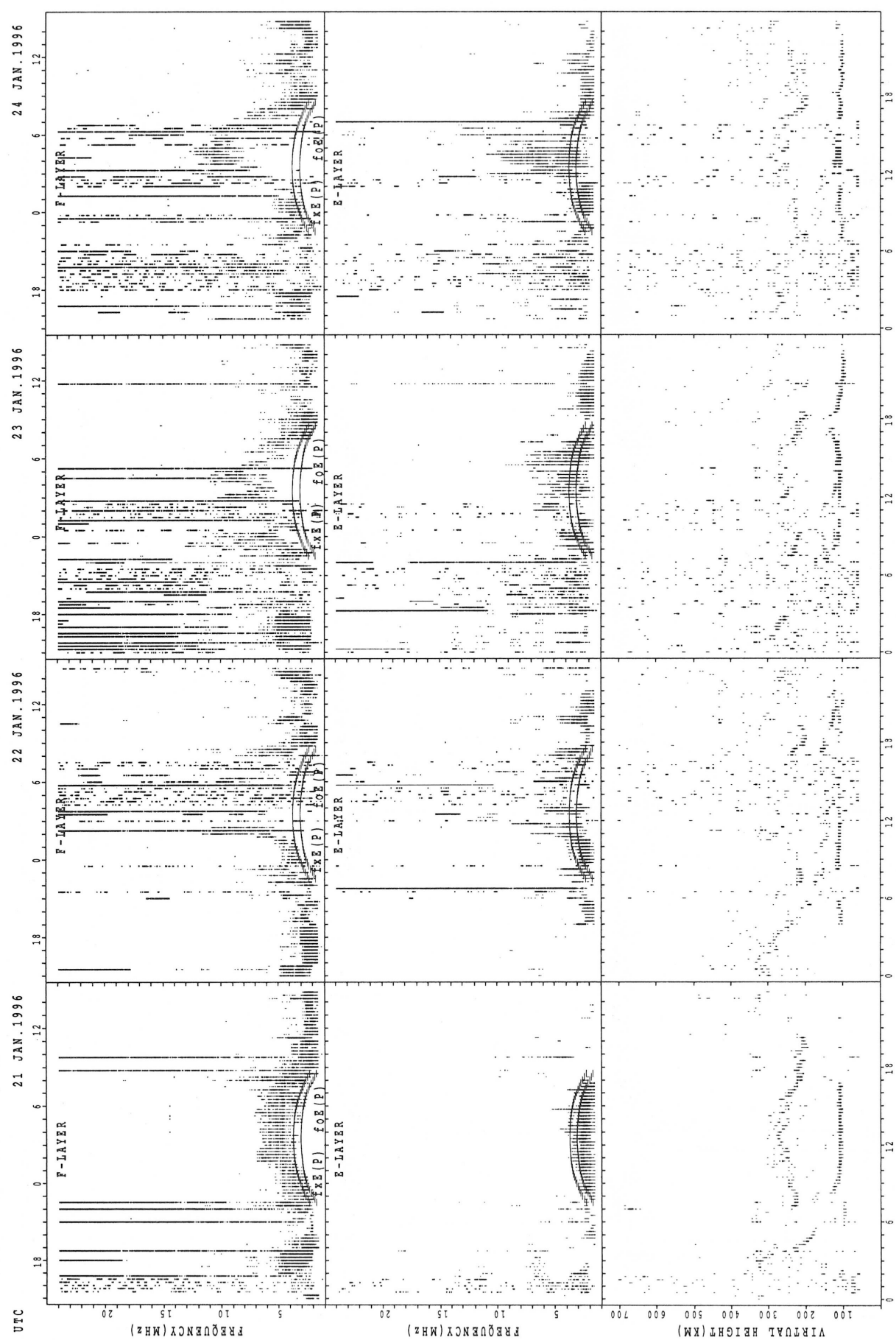
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
5 JAN.1995
6 JAN.1995
7 JAN.1995
8 JAN.1995
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

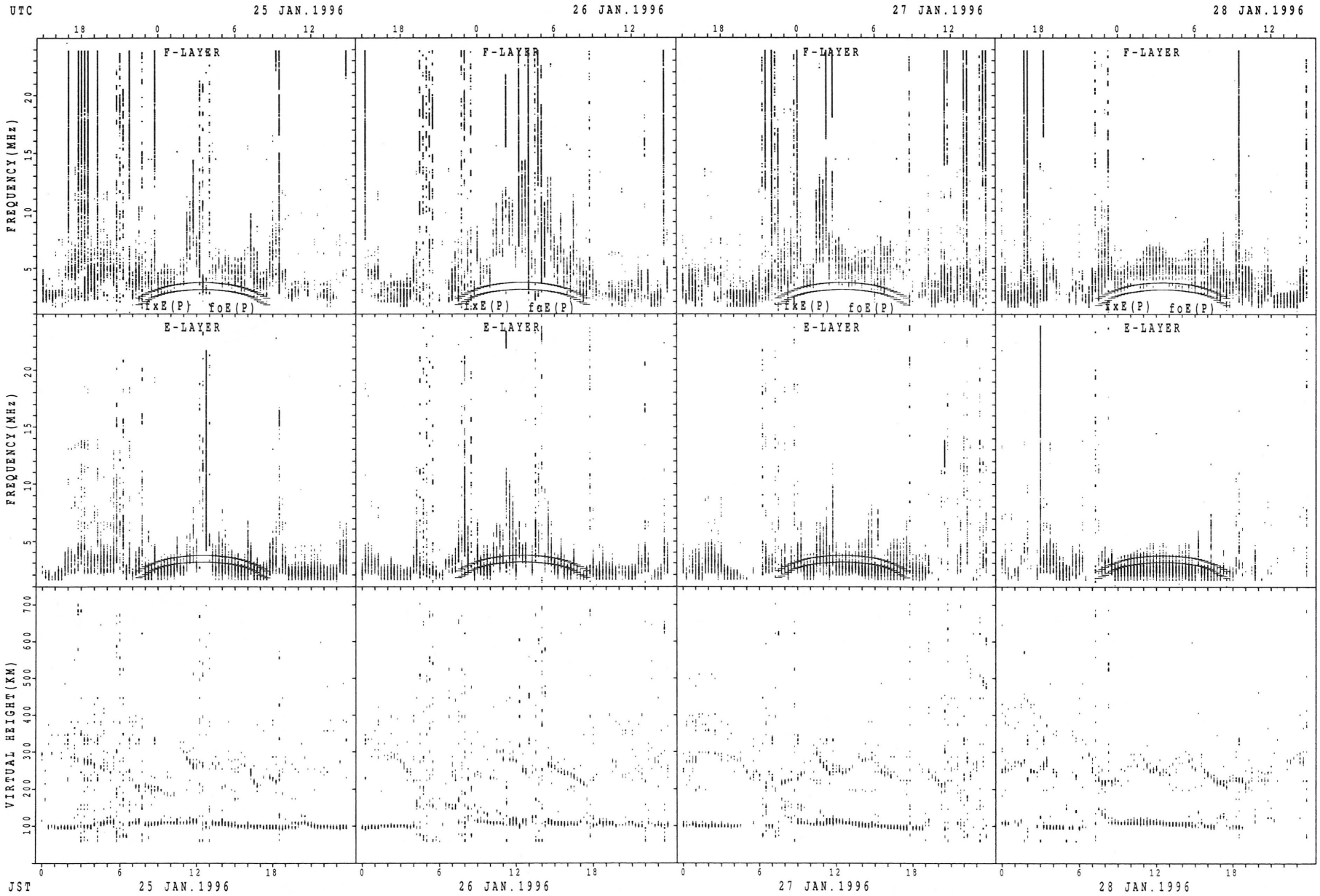

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
9 JAN.1996
10 JAN.1996
11 JAN.1996
12 JAN.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
13 JAN.1996
14 JAN.1996
15 JAN.1996
16 JAN.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

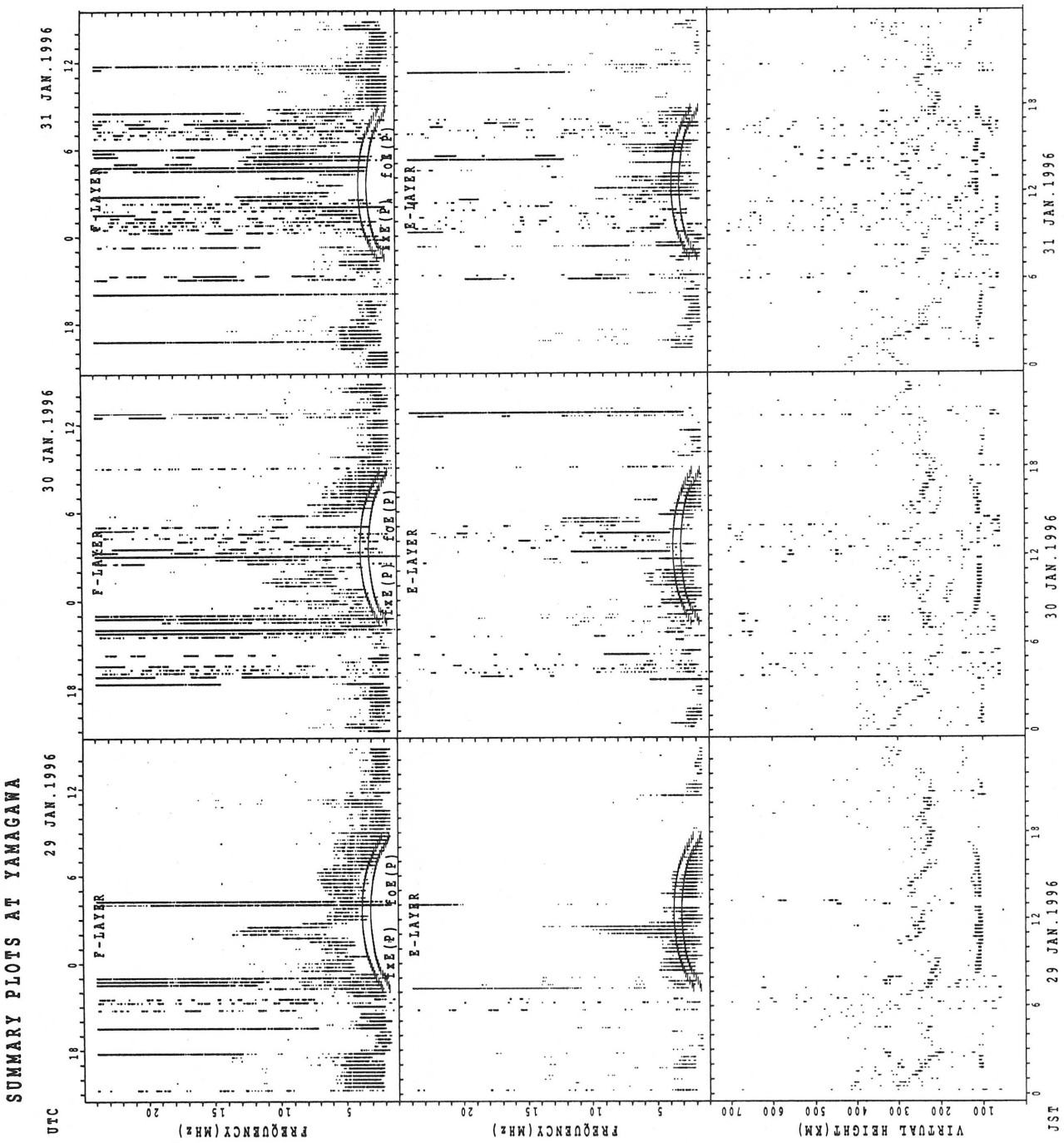

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
17 JAN.1996
18 JAN.1996
19 JAN.1996
20 JAN.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
21 JAN.1996
22 JAN.1996
23 JAN.1996
24 JAN.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

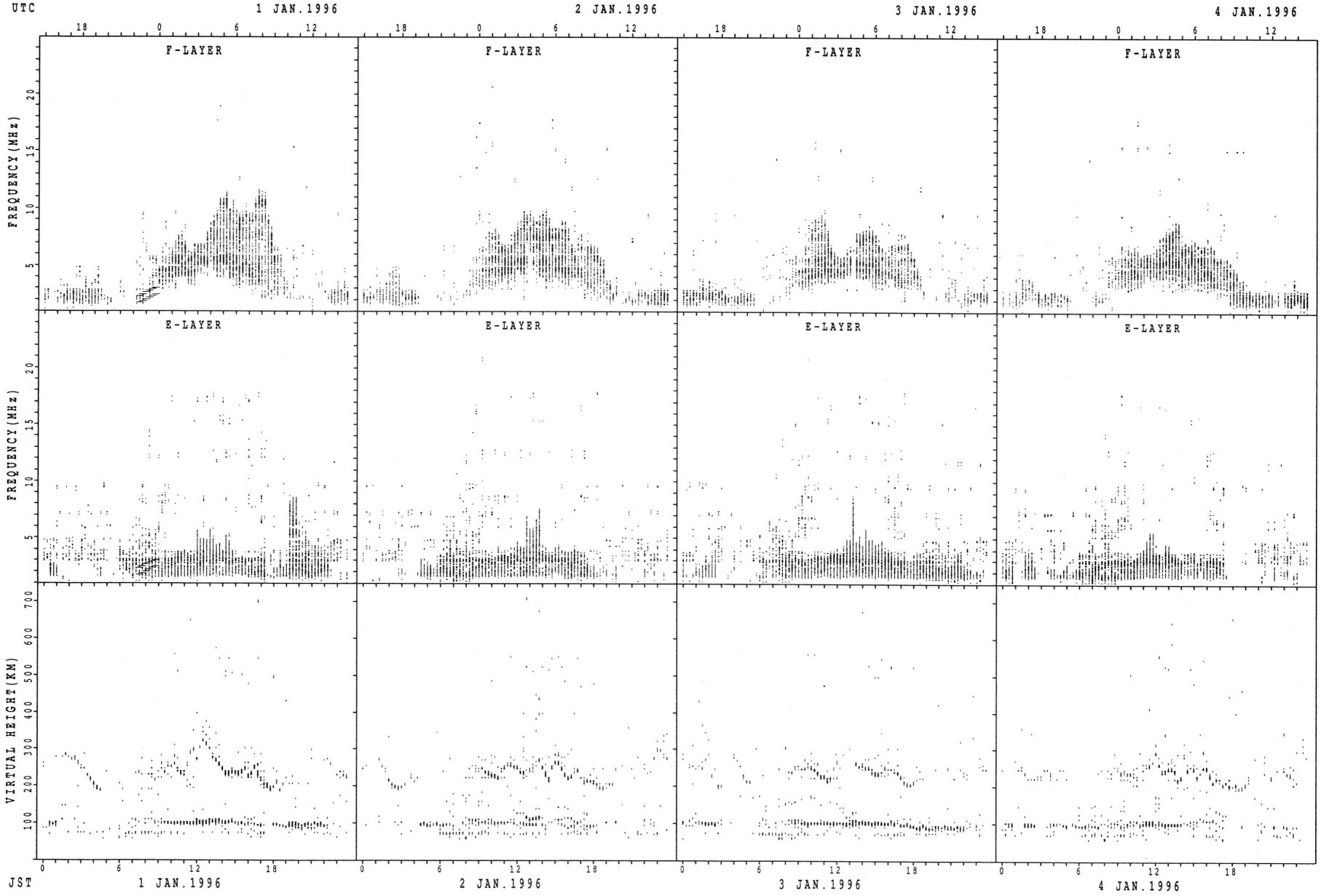
SUMMARY PLOTS AT YAMAGAWA



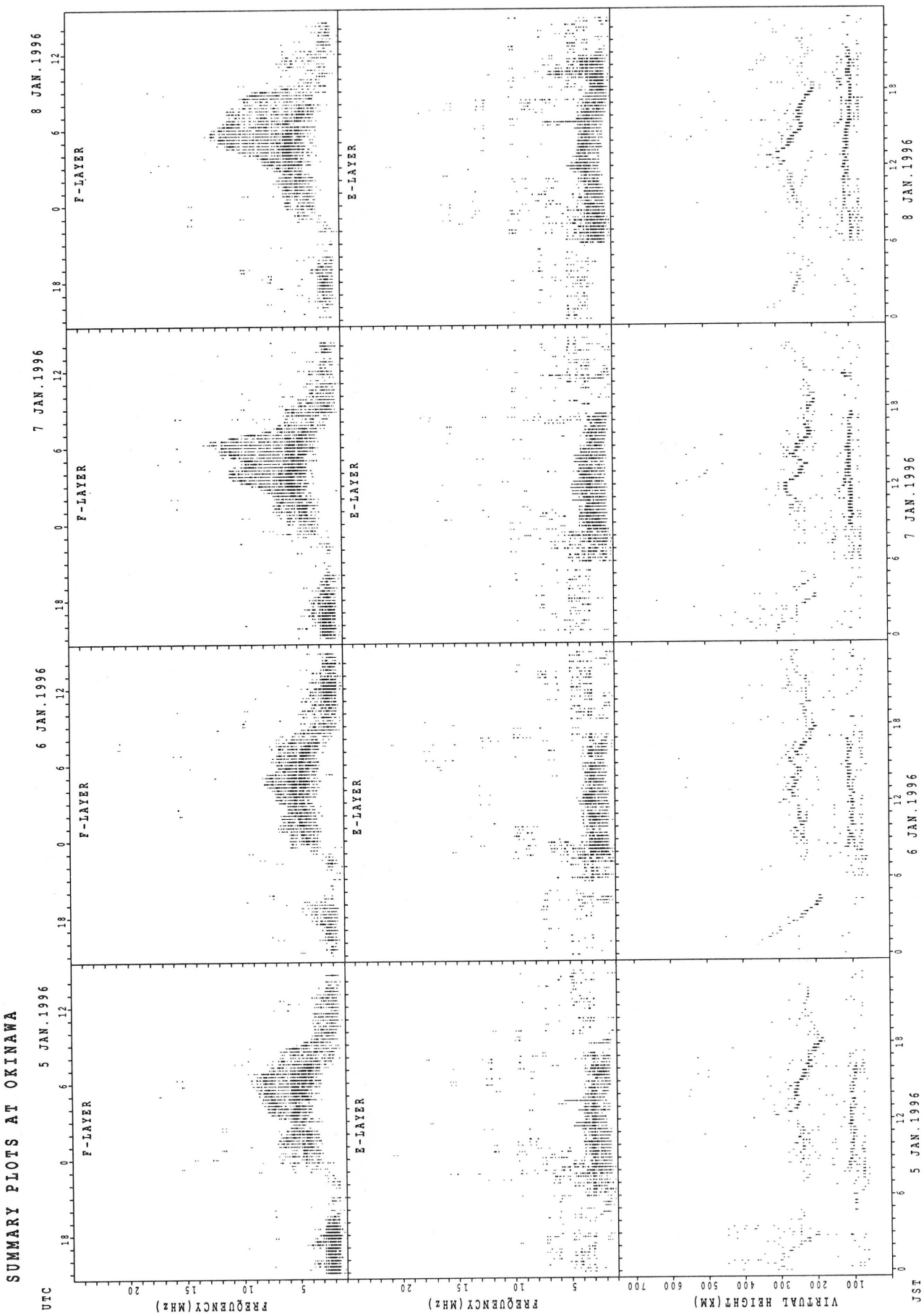
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
29 JAN.1996
30 JAN.1996
31 JAN.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

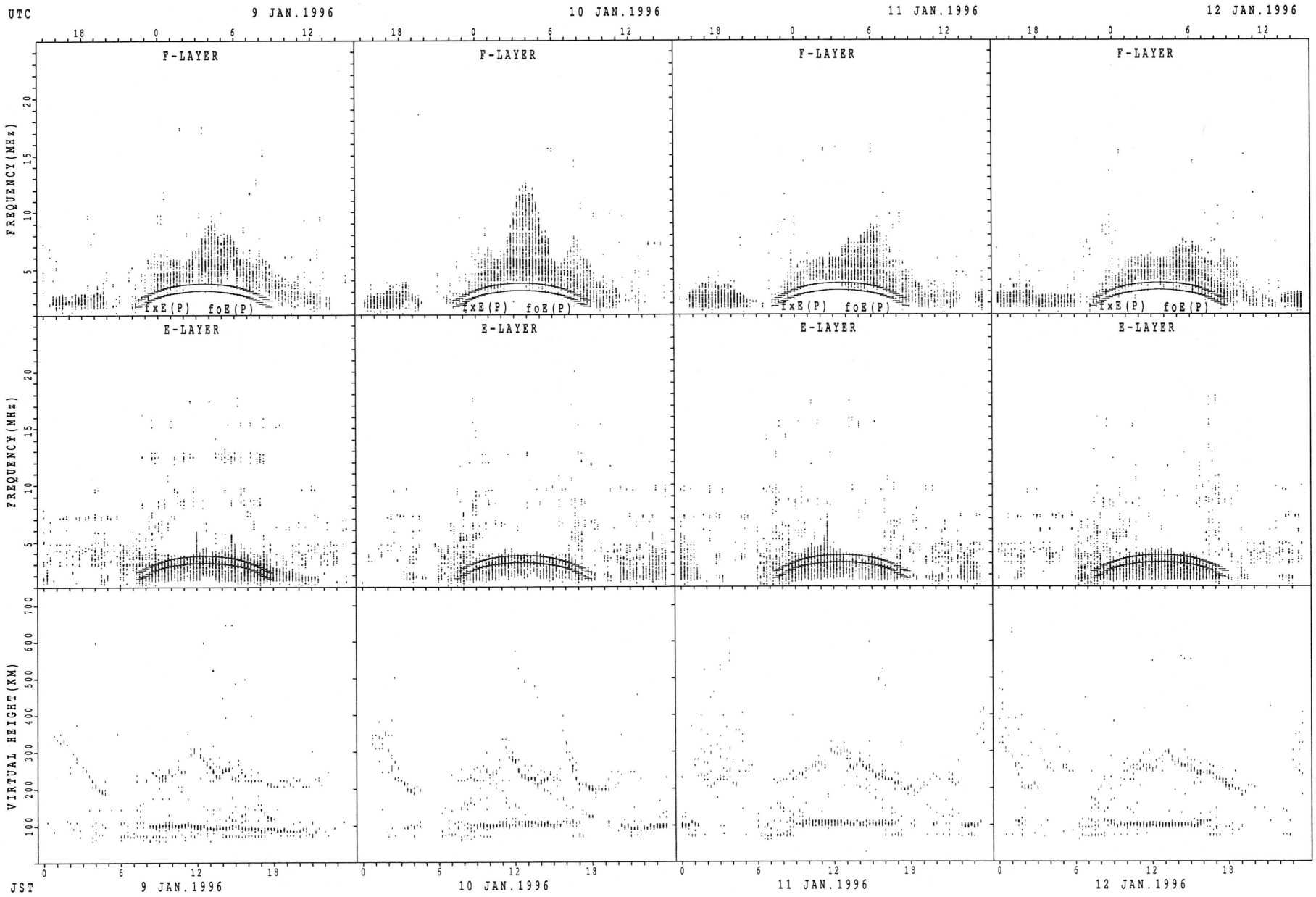
SUMMARY PLOTS AT OKINAWA



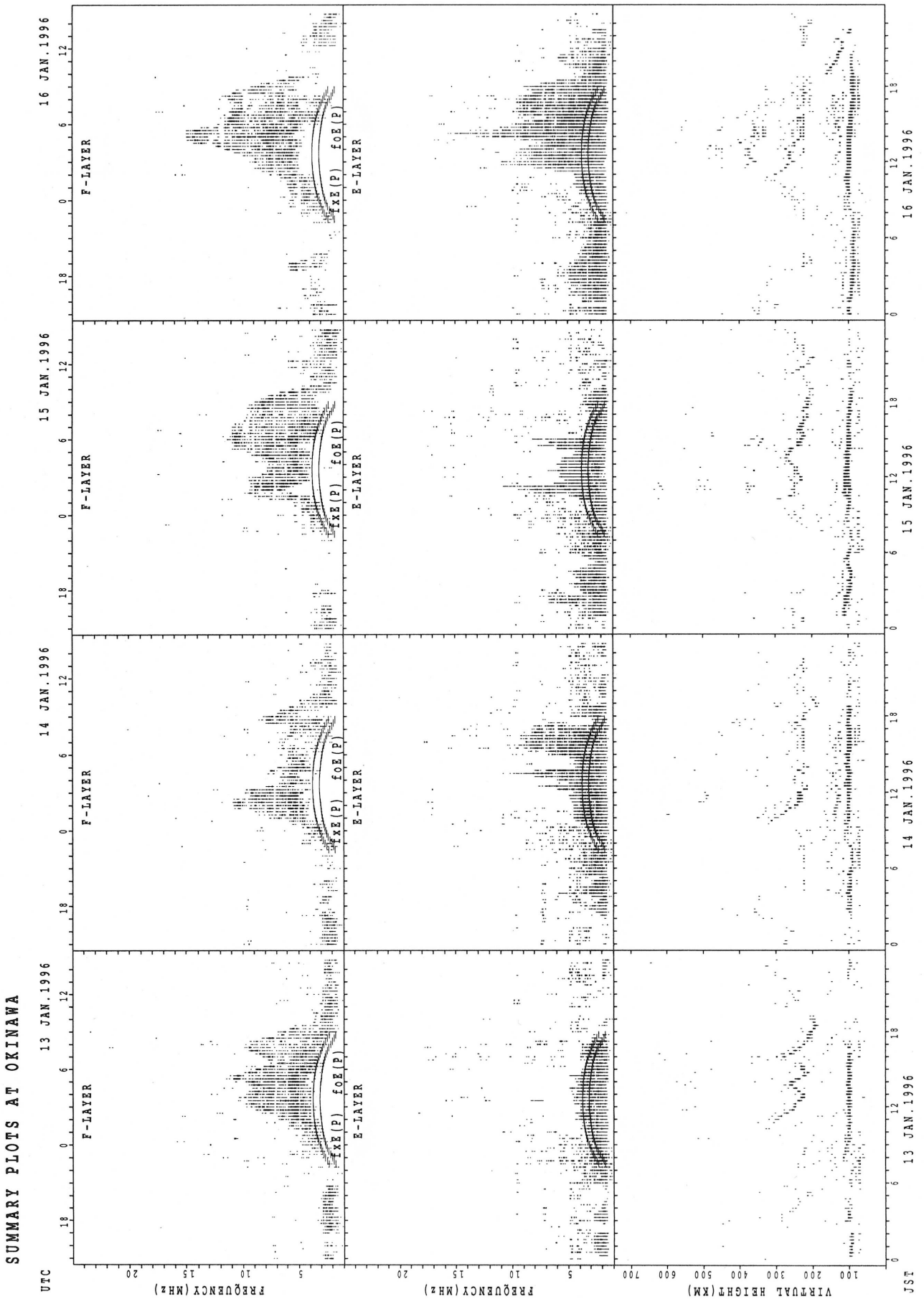
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

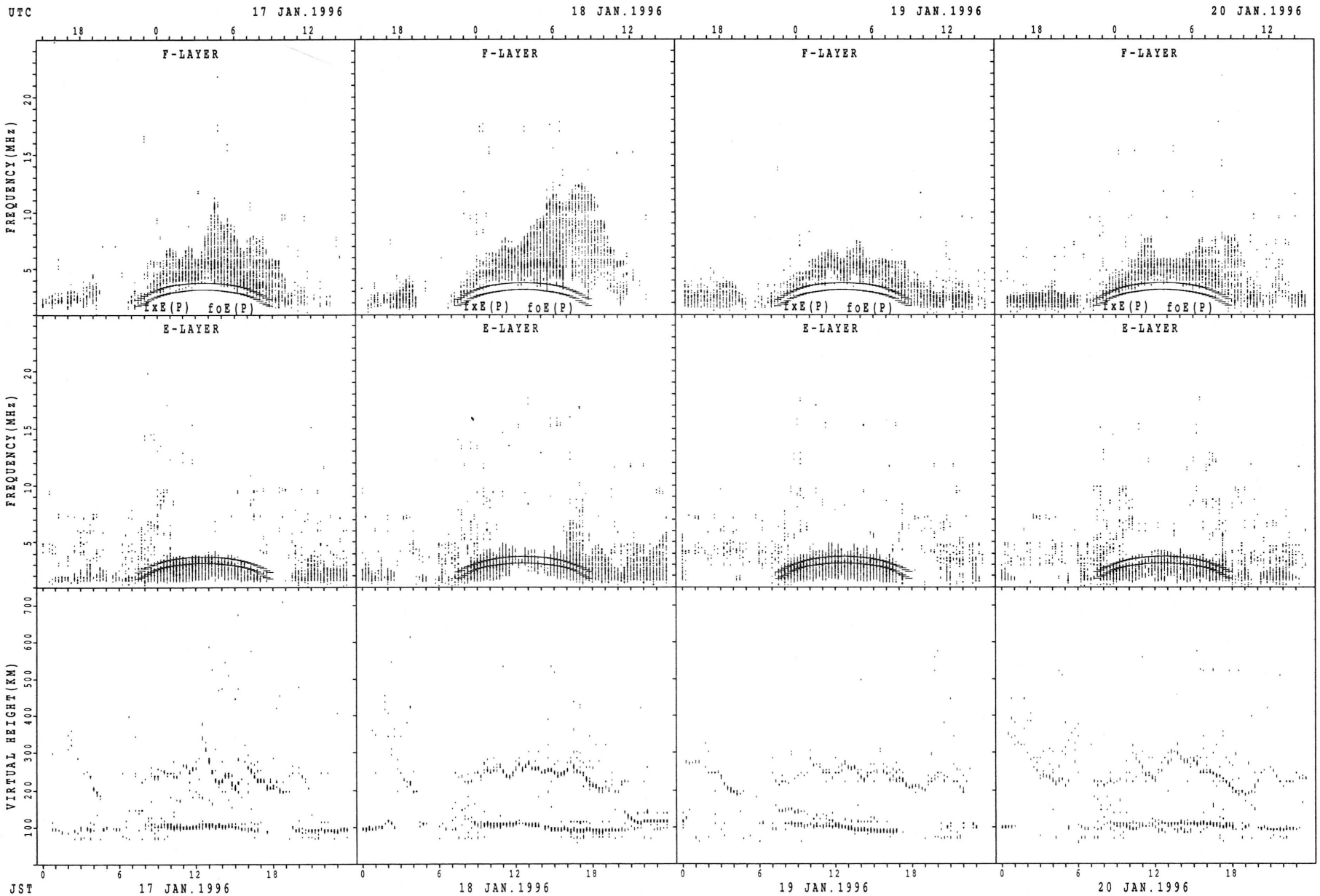
SUMMARY PLOTS AT OKINAWA



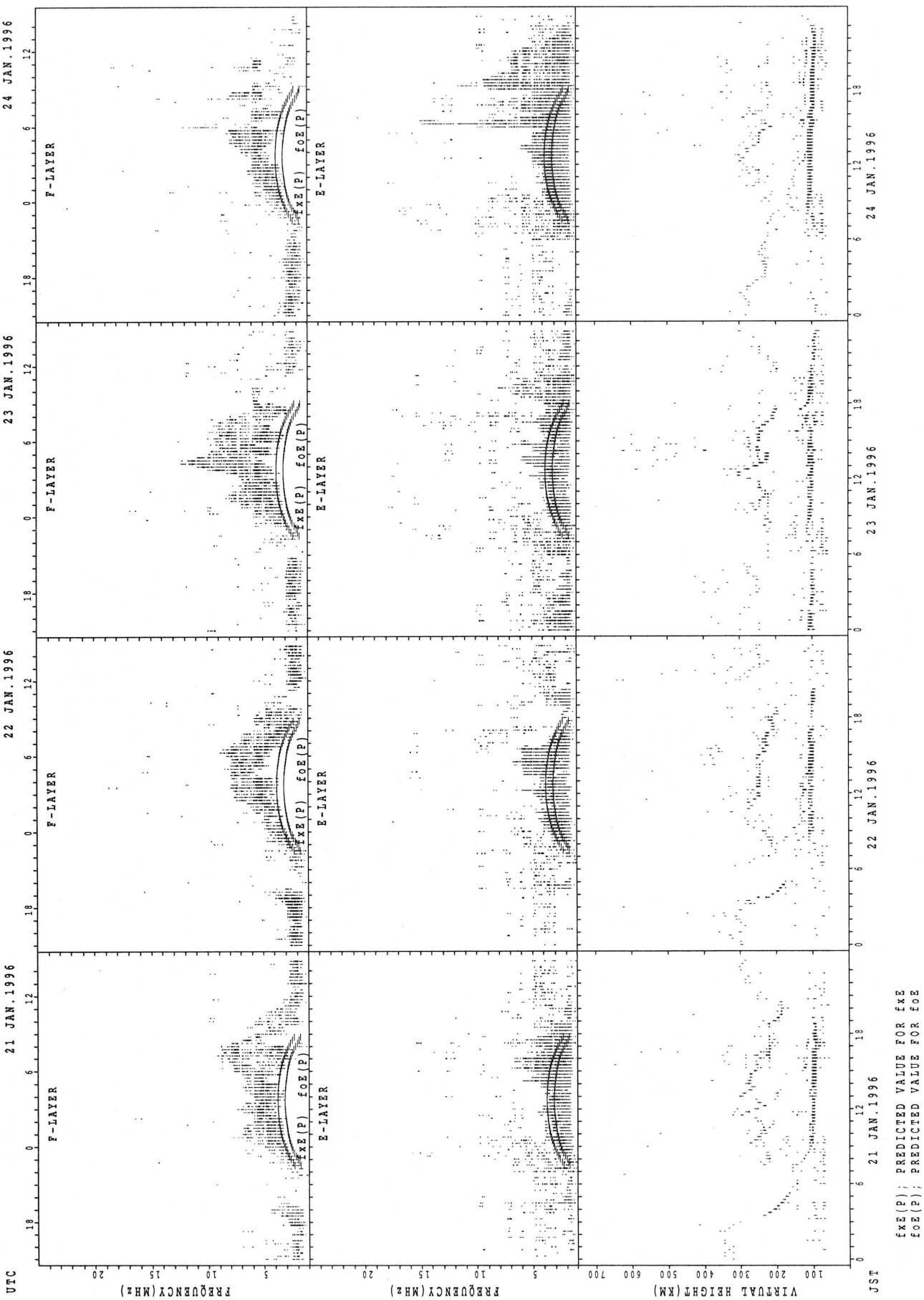
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
13 JAN.1996
14 JAN.1996
15 JAN.1996
16 JAN.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

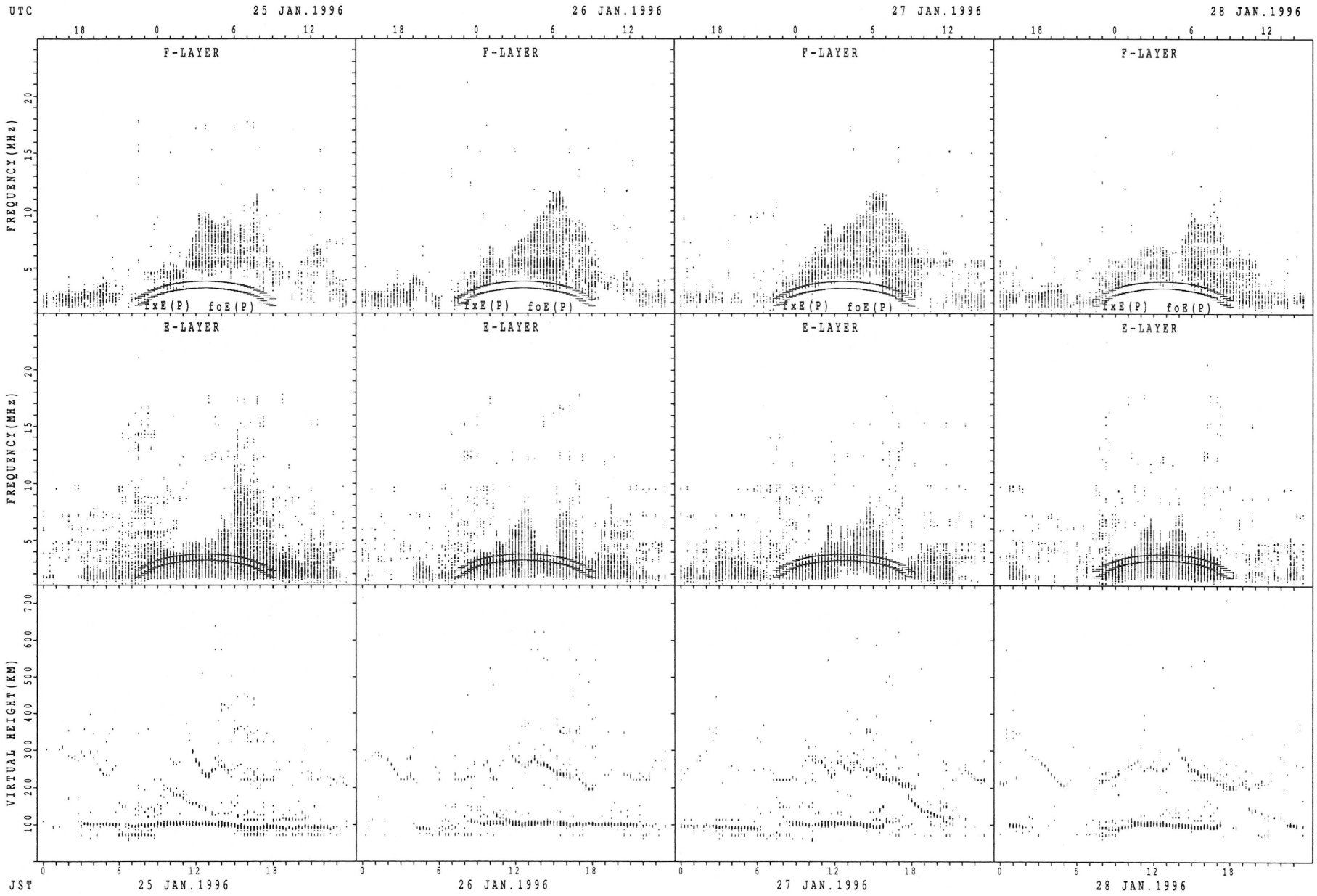
SUMMARY PLOTS AT OKINAWA



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

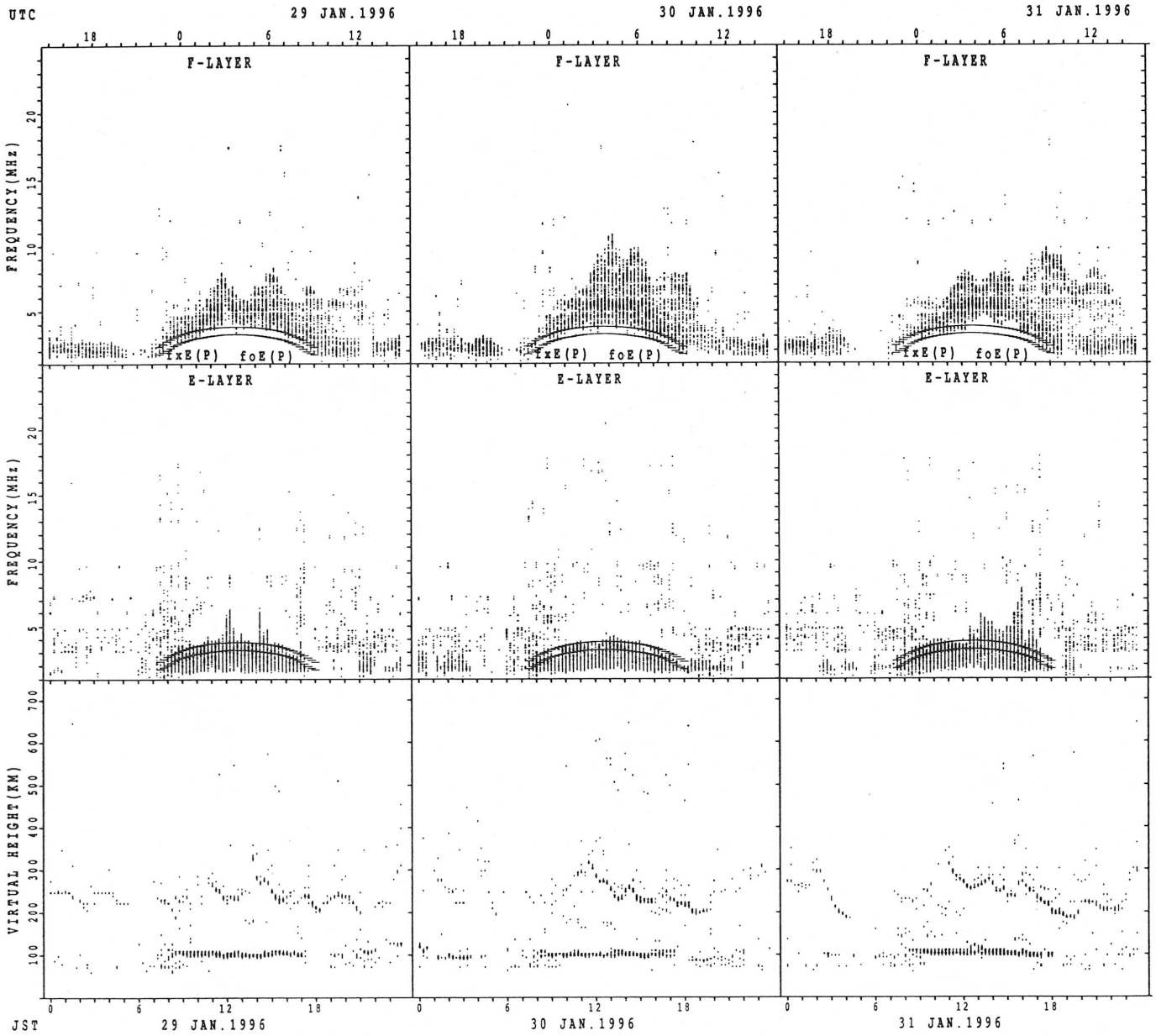

SUMMARY PLOTS AT OKINAWA
UTC
JST
21 JAN.1996
22 JAN.1996
23 JAN.1996
24 JAN.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

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

JAN. 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												12	16											
MED												259	266											
U Q												281	272											
L Q												245	258											

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								17	27	28	27	31	26	29	20	10	13	13	13	11		13	17
MED	113								129	129	127	123	123	121	123	115	111	111	113	111	107		109	111
U Q	115								143	157	140	131	129	125	131	126	113	120	121	117	111		115	114
L Q	111								120	119	122	119	115	117	114	109	101	105	106	108	107		106	109

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												16	16	14		13								
MED												263	263	251		250								
U Q												277	270	284		259								
L Q												248	248	240		239								

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	11	10	10		12	27	28	26	28	30	29	30	28	25	17				10		
MED			103	101	104	101		157	125	114	113	113	113	111	111	111	109	101				104		
U Q			105	103	111	107		172	163	149	131	120	119	116	115	113	131	107				107		
L Q			103	97	99	97		122	115	111	111	110	111	106	105	107	101	99				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												20	20	17	20	18	12							
MED												278	266	250	256	259	257							
U Q												285	280	273	273	276	276							
L Q												264	252	239	239	238	249							

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	12	14	13	13	14	14	12		29	27	29	27	28	27	29	29	30	25	20	19	13	16	12	
MED	105	105	107	105	105	110	110		141	115	137	119	115	113	113	111	112	113	101	101	103	105	105	
U Q	112	111	114	111	107	147	143		167	143	169	137	119	121	115	113	119	133	110	107	105	109	122	
L Q	101	101	103	103	103	105	103		126	113	119	115	111	109	108	107	105	101	99	99	98	103	101	

MONTHLY MEDIANS OF h'F AND h'Es

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

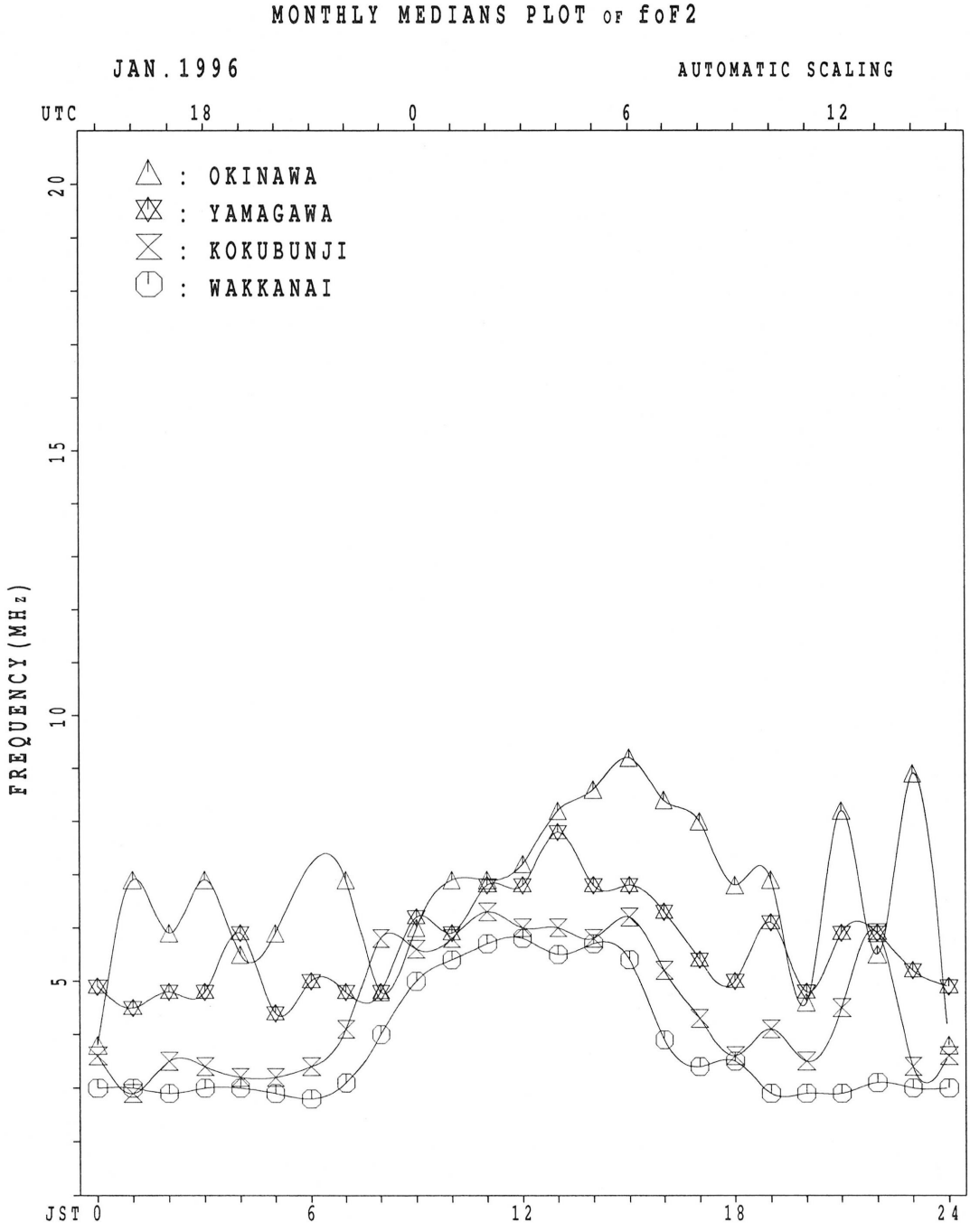
STATION OKINAWA LAT. 26.3N LON. 127.8E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										10	14	19	25	23	28	27	24	19	10					
MED										260	254	262	270	262	249	242	242	238	225					
U Q										268	264	274	286	278	259	250	256	260	242					
L Q										242	246	250	249	240	240	232	225	226	218					

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									20	25	27	28	28	26	30	28	28	21	16	15	13	15		
MED									131	107	103	109	113	106	105	103	101	99	98	103	97	97		
U Q									146	134	113	125	125	109	113	112	108	104	105	107	128	107		
L Q									111	101	97	104	107	103	103	99	95	91	95	91	86	89		


MONTHLY MEDIANS PLOT OF foF2
JAN.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

JAN. 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	X 33	X 34	X 34	X 36	X 30	X 24	X 25											X 34	X 30	O X 32	X 34	O X 31	X 34	X 34
2	X 34	X 34	X 34	X 36	X 26	X 23	X 23											X 53	X 30	X 31	X 32	X 32	X 32	X 31
3	X 31	X 31	36	X 36	X 26	X 22	X 24											X 44	X 28	X 35	X 33	X 34	X 31	X 33
4	X 34	X 36	X 36	X 36	X 30	X 29	X 29											X 36	X 34	X 35	40	41	40	37
5	X 33	35	38	32	X 28	A	X 32											X 41	X 33	X 37	X 33	X 32	32	33
6	34	33	34	X 42	X 40	26	X 25											X 36	X 40	X 40	X 28	X 29	X 29	X 34
7	X 36	X 36	38	X 36	X 33	X 33	X 32											X 42	X 36	X 36	X 35	X 32	X 30	X 34
8	X 34	X 37	X 38	X 40	X 34	X 31	X 33												X 37	X 41	X 34	X 28	X 27	X 31
9	X 32	X 32	X 34	X 34	X 32	X 29	X 27											X 45	X 50	X 31	X 31	X 28	X 28	32
10	X 30	31	X 32	X 35	X 39	X 24	X 25											X 41	X 34	A	X 33	X 31	33	34
11	36	35	37	34	X 23	X 21	X 23												X 41	X 31	X 31	X 30	X 28	30
12	32	33	34	32	31	X 26	X 26											X 44	X 39	X 39	33	X 28	32	34
13	34	35	46	53	46	40	39												X 44	X 32	X 36	X 35	35	36
14	43	X 42	X 39	X 40	33	X 23	X 27		C	C	C	C	C	C	C	C	C	C	C	A	36	33	31	32
15	32	32	X 35	35	31	X 24	X 24												X 34	X 33	X 38	X 29	X 30	X 31
16	X 31	A	X 32	X 36	31	X 24	X 24												X 32	X 34	X 36	X 30	X 30	X 30
17	X 32	X 32	36	X 36	X 34	X 25	28												X 36	X 40	40	X 34	X 34	X 34
18	37	38	40	X 43	X 39	31	X 31												X 54	X 44	X 44	X 40	X 26	X 30
19	X 33	X 34	41	45	38	29	X 27												X 48	51	50	42	37	35
20	37	40	41	44	40	43	40												X 44	X 48	X 45	X 32	X 27	X 28
21	31	35	40	40	44	X 39	X 34												X 45	X 52	X 38	X 33	X 30	X 29
22	X 30	34	X 34	X 33	X 33	X 34	X 33												X 41	X 37	41	44	43	44
23	45	44	40	43	40	37	39												X 43	X 42	46	X 28	X 31	X 33
24	34	34	34	32	32	X 31	X 26												A	38	A	A	A	A
25	X 33	X 36	35	34	33	X 31	X 30												37	X 40	X 44	X 32	X 30	X O X 28
26	34	X 33	33	36	35	X 30	X 27												X 34	X 40	X 40	X 33	X O 34	X 33
27	X 33	X 36	X 39	40	42	40	39												X 38	X 46	X 35	X 35	X 36	X 35
28	X 34	36	39	X 39	X 36	X 33	X 35												X 38	X 37	X 30	X 27	34	34
29	34	33	36	X 36	X 28	X 24	X 24												X 42	X 48	47	41	X 28	X 30
30	X 35	38	X 38	X 34	X 36	X 37	X 28												X 32	X 35	X 34	X 32	X 32	32
31	X 32	X 33	X 34	X 36	X 35	X 26	X 24												X 39	46	X 43	X 31	X 29	30
	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	31	31	30	31											10	29	29	30	30	30	30
MED	X 34	34	36	X 36	X 33	X 29	X 27											X 42	X 38	X 38	X 36	X 32	X 31	X 33
U Q	34	36	39	40	39	33	33											X 44	X 42	X 43	41	34	34	34
L Q	X 32	33	34	34	X 31	X 24	X 25											X 36	X 34	X 34	X 33	X 30	X 29	X 30

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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	27	R 28	28	30	24	H 18	19	35	54	52	46	53	77	V 78	61	H 70	51	28	24	26	28	U R 25	28	28
2	28	28	28	30	20	17	R 17	36	48	54	52	56	54	R 58	49	64	46	47	24	25	26	26	26	25
3	25	25	F 29	30	20	16	18	39	51	H 52	54	52	63	72	60	54	50	38	22	29	27	28	25	27
4	28	30	30	30	24	23	23	43	50	54	53	68	58	54	56	64	52	31	28	29	F 33	F 34	F 33	F 31
5	27	F 26	F 31	F 22	22	A	26	45	49	47	52	64	68	61	67	66	48	35	27	31	27	26	F 24	F 24
6	F 27	F 26	F 29	36	34	18	19	42	47	48	57	70	60	62	56	60	45	30	34	34	22	23	23	28
7	30	30	F 30	30	27	26	V 26	39	48	56	54	61	63	57	55	58	48	36	30	30	29	26	24	28
8	28	31	32	34	28	25	27	43	50	51	56	58	60	63	51	55	58	28	31	34	28	22	21	25
9	26	26	28	28	26	23	21	38	58	47	44	72	56	60	58	57	46	39	43	25	25	22	22	F 26
10	24	F 24	26	29	32	18	19	37	42	48	56	66	58	58	51	50	52	34	28	A	27	25	F 25	F 27
11	F 28	J F 28	F 28	F 27	17	J R 15	17	38	J R 46	48	53	47	60	63	56	51	51	48	35	25	25	24	22	F 23
12	F 25	F 26	F 27	F 26	F 22	20	20	34	42	46	50	52	58	56	J R 51	59	54	38	33	33	F 28	22	25	F 26
13	F 26	F 28	F 35	J F 46	F 40	F 33	F 26	R 39	J R 45	46	50	66	58	73	62	61	56	51	38	26	30	29	F 28	F 27
14	F 36	36	33	34	F 24	J R 17	21	42	C	C	C	C	C	C	C	C	C	C	C	A	F 28	F 28	24	F 24
15	F 24	F 25	29	F 26	F 22	18	18	44	52	58	J R 73	60	72	71	54	76	53	38	28	28	32	23	24	25
16	25	A	26	30	F 24	J R 18	17	36	47	50	60	77	68	72	55	55	61	50	26	28	30	24	24	24
17	26	26	F 27	30	28	18	F 20	39	48	48	58	56	60	64	J R 52	58	52	33	30	34	33	28	28	28
18	F 30	F 31	F 33	36	33	F 23	25	R 42	50	51	60	54	57	57	H 54	64	58	51	48	38	38	34	R 20	24
19	27	R 28	F 35	F 35	F 31	F 22	21	34	42	44	54	56	73	60	55	58	48	41	42	F 44	43	F 36	F 31	F 27
20	F 31	F 34	F 34	F 35	F 34	F 35	F 31	44	47	54	65	59	59	49	56	54	55	50	38	42	39	26	21	22
21	F 23	F 26	F 32	F 31	F 37	33	28	38	47	49	57	69	58	55	58	57	48	42	39	46	32	27	24	23
22	25	F 26	28	27	26	28	27	36	47	46	52	64	74	78	64	50	52	47	35	31	F 33	F 36	F 34	F 38
23	F 36	F 34	F 33	F 32	J F 30	J F 29	F 30	47	61	54	66	68	58	52	54	52	54	39	37	36	F 38	22	25	26
24	F 25	F 26	F 26	F 25	F 25	25	20	39	58	50	53	57	58	61	58	50	64	A	A	F 33	A	A	A	A
25	27	30	F 26	F 26	F 24	25	24	J R 46	55	52	56	65	61	53	55	52	54	39	F 31	34	38	26	24	22
26	26	27	F 25	F 26	F 24	24	20	41	44	46	64	57	54	57	66	A	56	43	28	34	34	27	28	27
27	27	30	33	F 33	F 34	F 32	F 30	40	R 45	50	56	82	54	52	60	55	58	43	33	40	29	29	30	29
28	28	30	F 31	33	29	27	29	44	48	50	56	66	67	59	50	61	54	42	32	31	24	21	F 35	F 25
29	F 26	J F 25	F 26	30	22	18	18	41	49	50	57	62	52	54	64	60	54	42	36	42	F 34	34	22	24
30	29	F 30	32	28	30	31	22	39	49	54	61	60	65	66	59	61	51	40	27	29	28	26	26	J F 26
31	26	27	28	30	J R 29	20	R 18	40	46	45	49	56	64	59	52	67	58	47	33	F 38	37	25	23	F 24
	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	31	31	30	31	31	30	30	30	30	30	30	30	29	30	29	29	29	30	30	30	30
MED	27	28	F 29	30	26	23	21	39	48	50	56	60	60	60	56	58	52	40	32	33	30	26	24	26
U Q	F 28	30	F 32	33	F 31	27	26	43	50	52	58	66	65	64	60	62	56	47	36	37	34	28	F 28	27
L Q	25	F 26	F 27	F 27	24	18	19	38	46	47	52	56	58	56	54	54	50	36	28	28	27	24	23	24

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

IONOSPHERIC DATA STATION Kokubunji

JAN.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	L		424	420	392	L 392	U L 384								
2										324	L	L 408	L	L 444	U L 380	L								
3										L	L	L	A	L 408	U L 392	U L 348	U L 252							
4									L 280	L	U L 388	U L 412	412	U L 412	L	L								
5									L 280	L	U L 400	L 400	A	L	U L 400	L 360	L							
6										L	L 436	L 420	L 416	L 408	L	L								
7										L	U L 412	U L 412	L 424	U L 408	L	U L 356	L							
8										L	L	U L 420	L 420	L 412		U L 360								
9									L	L	L	L 412	U L 416	L 420	U L 404	L 344	L 244							
10								U L 192	L 272	L	U L 404	L 420	L 416	L 408	L	308								
11											L 364	L	L 428	L 408	U L 420	U L 352	U L 244							
12											U L 340	U L 396	396	392	L	U L 352								
13										320	L	L 404	420	400	U L 388	U L 364	U L 268							
14									C	C	C	C	C	C	C	C	C	C						
15										356	U L 400	L 420	L 404	L 400	U L 404	U L 356	U L 256							
16									L	L	412	408	L 412	400	U L 400	U L 360								
17										L	L 400	L 400	416	380	L 456	L	L							
18										L	U L 400	L 404	L 416	U A 392	A	U A 352	L							
19										A	U L 404	L 412	400	L 404	L	U L 356	U L 228							
20										U L 384	400	L	L 404	L	L 400	L	L							
21									U L 284	L	L 420	404	U L 420	L	L	U L 360	U L 260							
22											388	412	416	404	392	U L 360								
23									L	L 352	400	U A 404	L 416	L	A	L	L							
24										L	U L 400	L 416	U A 400	L 420	A	L	A	A						
25								L	L	A	U L 420	412	420	412	L 396	U L 380								
26											400	L 412	L 408	416	A	A	L 284							
27										L	L	420	U L 420	L 404	404	L	L							
28									L		U L 408	L 420	420	412	L 396	L	L							
29										L	U L 420	L 416	U L 408	400	400	L	L							
30									L	L	L 400	L 432	436	424	L 408	360								
31									L	L 336	U L 408	L 420	L 420	L 420	L 408	U L 388	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	4	6	23	27	27	26	18	19	8							
MED								U L 192	L 280	L 344	U L 400	L 412	L 416	L 408	U L 400	U L 360	U L 254							
U Q									L 282	356	L 412	L 420	L 420	L 412	U L 404	U L 360	U L 264							
L Q									L 276	324	400	L 404	L 408	400	U L 392	U L 352	U L 244							

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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	A	A	A	A 292	A	A	A	244	A							
2								184	208	252	288	300	292	288	268	252	188							
3								B	224	A 252	288	304	300	A	276	240	184							
4								B	212	268	296	A 304	A	A	272	248	A							
5								A	208	H 272	296	300	300	296	A	232	188							
6								B	216	260	292	300	A	A	280	248	U A 188							
7								B	H 236	A	280	296	300	292	272	248	A							
8								B	216	276	A	A	A	A 296	A	232	180	B						
9								B	228	268	296	304	308	296	272	240	164							
10								B	A	260	292	300	304	296	280	244	196							
11								A	208	284	276	A 296	300	292	272	240	192	B						
12								160	220	268	292	300	A	296	280	248	196							
13								B	A	272	A	A 292	A	300	280	244	A	B						
14								A	C	C	C	C	C	C	C	C	C	C						
15								A	A	A	A	292	A	A	264	232	188	B						
16								B	A	A	A	A	A	A	A	A	196	B						
17								B	A	264	A	A	292	276	268	244	A	B						
18								B	224	280	284	296	304	A 296	A	A	A	B						
19								H 176	212	260	292	296	296	300	280	248	196	B						
20								B	212	264	296	A	304	292	280	260	A	B						
21								B	H 224	260	292	304	304	A 300	A	A	A	B						
22								184	224	264	296	308	308	300	A 292	A	A	B						
23								B	216	280	300	304	312	304	A 284	252	228	B						
24								176	224	260	288	304	308	A 300	A	260	200	B						
25								A	A	A	A	A 300	308	A	A	A	A	B						
26								176	224	284	296	A 308	308	300	A	A	A	B						
27								184	220	280	296	308	312	A	292	268	A	B						
28								B	A	A	296	A	304	300	284	268	212	B						
29								176	248	H 292	A	312	312	A 304	296	272	A	B						
30								152	R 216	272	304	304	308	300	276	268	212	B						
31								A	224	268	296	308	312	304	A	A	A	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								9	22	24	22	25	22	22	20	23	16							
MED								176	220	268	294	300	304	298	280	248	194							
U Q								184	224	278	296	304	308	300	282	260	198							
L Q								168	212	260	288	296	300	296	272	240	188							

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 15	E B 14	E B 14	E B 16	E B 13	E B 14	E B 16	29	J A 30	J A 34	J A 48	J A 40	J A 38	J A 40	J A 36	J A 25	E B 17	E B 14	J A 19	E B 14	E B 14	E B 14	E B 14
2	E B 15	E B 14	J A 22	J A 27	J A 22	J A 17	E B 13	G	G	30	34	36	37	34	30	30	25	E B 15	E B 14	E B 14	16	20	18	E B 15
3	19	J A 22	J A 24	E B 14	19	E B 15	E B 16	E B 15	G 20	27	32	35	J A 52	31	G 23	G	G	J A 22	J A 23	E B 15	E B 14	E B 16	E B 15	E B 14
4	17	E B 14	E B 13	J A 25	J A 24	J A 24	23	E B 16	G .	G	G	J A 52	J A 63	36	32	26	J A 47	E B 16	E B 15	E B 15	E B 15	E B 15	22	E B 14
5	20	E B 14	E B 13	J A 39	J A 21	J A 31	J A 24	J A 23	26	31	31	36	61	J A 46	35	26	24	J A 41	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14
6	18	E B 14	E B 12	E B 14	J A 25	16	E B 14	E B 17	25	30	34	34	34	32	G 20	25	24	J A 22	22	20	E B 15	E B 16	E B 14	E B 14
7	E B 14	E B 14	E B 14	18	E B 14	E B 13	E B 15	E B 15	G	34	G 27	35	33	G 23	G	29	J A 23	J A 23	20	E B 14	E B 15	E B 13	E B 14	E B 15
8	E B 14	E B 14	E B 14	E B 14	E B 14	E B 12	E B 15	E B 14	26	G	J A 32	38	J A 34	34	S 30	G 23	G	48	23	E B 14	18	24	S 17	E B 14
9	E B 14	E B 16	E B 13	E B 13	E B 15	17	E B 15	E B 15	G 20	G	31	34	34	31	G 22	J A 24	J A 25	J A 24	E B 15	E B 14	E B 15	E B 14	E B 15	E B 14
10	E B 15	E B 14	18	E B 13	E B 14	E B 14	E B 14	E B 13	J A 23	32	32	G 24	G 28	G 26		G	G	G 20	E B 14	29	J A 44	J A 26	J A 25	J A 26	19
11	E B 14	E B 13	E B 14	E B 14	E B 11	E B 11	20	19	26	37	35	J A 34	34	34	32	G	26	22	E B 13	E B 14	E B 13	E B 15	J A 49	28
12	23	21	21	18	E B 12	E B 13	19	G	26	31	32	33	34	30	31	27	22	J A 17	E B 14	E B 13	E B 15	E B 14	E B 19	19
13	E B 15	E B 12	18	E B 12	E B 12	E B 13	E B 15	J A 17	J A 27	31	J A 34	34	J A 34	33	G 26	G 24	J A 22	J A 24	19	23	22	24	J A 20	18
14	19	19	E B 12	E B 14	E B 14	20	18	J A 20	C	C	C	C	C	C	C	C	C	C	C	J A 52	J A 61	J A 34	J A 48	J A 32
15	J A 22	E B 13	J A 23	J A 26	E B 12	E B 14	E B 14	19	26	J A 34	J A 33	34	J A 47	31	G	G	J A 23	J A 24	20	E B 13	20	22	22	18
16	E B 14	J A 40	J A 30	29	J A 24	J A 28	J A 18	E B 14	J A 23	J A 35	J A 41	J A 42	J A 41	J A 45	32	J A 28	J G 19	28	J A 20	18	18	E B 14	17	E B 13
17	E B 14	E B 14	E B 19	J A 14	E B 14	E B 14	17	J A 18	J A 24	36	J A 34	J A 39	G 27	32	30	27	J A 35	J A 37	J A 20	E B 15	J A 18	J A 22	J A 19	18
18	J A 22	J A 24	J A 21	J A 22	J A 22	23	20	19	25	G	32	36	39	J A 42	J A 52	50	J A 35	J A 27	J A 20	E B 14	19	18	22	E B 15
19	E B 14	E B 13	J A 32	30	21	19	17	G J A 28	38	40	37	38	G 25	J G 27	28		G	E B 16	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14
20	E B 15	E B 12	J A 27	J A 27	J A 25	J A 18	E B 14	E B 16	G	28	G 22	34	G 30	32	29	G 24	29	21	E B 13	E B 13	E B 14	19	J A 22	16
21	E B 14	19	E B 13	E B 14	E B 13	E B 13	E B 15	E B 14	G	28	G 26	35	34	36	J A 48	J A 46	25	J A 33	J A 22	E B 15	21	18	24	20
22	E B 16	E B 14	E B 14	17	J A 21	J A 28	J A 19	20	G 21	31	G	36	38	J A 47	J A 44	J A 44	J A 50	J A 37	J A 23	J A 23	31	J A 26	19	24
23	20	J A 20	22	E B 13	20	E B 16	E B 13	J A 19	25	G	32	J A 44	J A 41	J A 45	J A 59	J A 29	J G 22	19	J A 15	J A 26	J A 46	J A 40	J A 48	J A 28
24	J A 42	E B 12	E B 12	E B 13	J A 24	J A 22	25	18	27	J A 33	33	36	J A 44	J A 46	J A 49	G 24	J A 42	60	39	J A 39	J A 60	J A 88	J A 64	J A 32
25	J A 26	28	20	24	22	E B 13	33	J A 23	J A 33	J A 48	J A 34	34	34	J A 46	38	J A 31	J A 36	J A 51	J A 34	E B 15	E B 14	18	J A 28	J A 34
26	J A 28	J A 18	J A 21	J A 16	20	17	E B 13	G	29	34	38	J A 39	J A 52	35	J A 52	74	J A 50	J A 27	J A 23	E B 13	E B 14	19	J A 35	J A 48
27	29	J A 28	J A 20	18	19	23	J A 22	G	28	32	40	37	G 28	36	J A 30	G 24	J A 29	J A 24	J A 26	24	E B 15	J A 19	J A 25	28
28	J A 24	J A 22	J A 26	30	J A 23	J A 19	17	E B 16	J A 26	J A 32	J A 36	J A 34	G 30	G 29	G 27	G 26	G	J A 22	J A 24	J A 19	22	21	18	E B 13
29	E B 16	E B 14	J A 16	18	J A 18	E B 13	20	G	G 24	31	J A 42	37	36	33	32	J A 31	J A 26	J A 23	18	J A 22	E B 15	19	22	21
30	20	19	19	22	E B 13	17	E B 15	G	G	33	J A 34	J G 30	J G 28	34	34	28	25	16	E B 14	E B 14	E B 14	E B 15	E B 14	15
31	E B 14	E B 12	E B 12	23	20	J A 17	18	18	25	29	33	34	40	J A 42	33	J A 36	J A 23	J A 23	20	E B 14	J A 26	J A 25	J A 16	J A 20
	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	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31
MED	† B 16	† B 14	18	18	19	17	17	G	25	31	33	36	35	34	32	27	J 25	J A 23	20	† B 15	† B 15	19	19	18
U Q	J A 22	J A 20	J A 22	J A 25	J A 22	J A 20	20	19	26	34	34	J A 37	J A 41	J A 42	J A 38	J A 31	J A 29	J A 28	J A 23	J A 22	J A 22	J A 24	J A 25	J A 24
L Q	E B 14	E B 14	E B 13	E B 14	E B 14	E B 13	E B 14	E B 16	G	G 28	G 32	G 34	G 34	31	G	G 26	G 22	E B 19	E B 15	E B 14	E B 14	E B 15	E B 15	E B 14

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 15	E B 14	E B 14	E B 16	E B 13	E B 14	E B 16	24	28	30	32	33	32	34	G 22	21	E B 17	E B 14	18	E B 14	E B 14	E B 14	E B 14
2	E B 15	E B 14	16	17	16	E B 13	E B 13	G	G	30	33	34	36	32	29	28	24	E B 15	E B 14	E B 14	16	E B 15	E B 15	E B 15
3	16	14	E B 13	E B 14	16	E B 15	E B 16	E B 15	G 18	27	32	34	46	30	G 22	G	G	17	E B 14	E B 15	E B 14	E B 16	E B 15	E B 14
4	17	E B 14	E B 13	E B 14	E B 15	E B 14	16	E B 16	G	G	G	37	35	31	29	G 18	28	E B 16	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14
5	17	E B 14	E B 13	17	16	A A 31	17	19	24	30	30	35	52	38	31	26	22	23	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14
6	15	E B 14	E B 12	E B 14	17	E B 12	E B 14	E B 17	25	28	33	34	32	32	G 18	G 18	22	17	E B 14	16	E B 15	E B 16	E B 14	E B 14
7	E B 14	E B 14	E B 14	16	E B 14	E B 13	E B 15	E B 15	G	28	G 24	33	32	G 19	G	27	22	E B 15	16	E B 14	E B 15	E B 13	E B 14	E B 15
8	E B 14	E B 14	E B 14	E B 14	E B 14	E B 12	E B 15	E B 14	23	G 30	33	30	32	U S 30	G 20	G	22	E B 14	E B 14	E B 14	16	E B 14	E B 14	
9	E B 14	E B 16	E B 13	E B 13	E B 15	12	E B 15	E B 15	G 18	G	G 26	32	33	30	G 20	G 20	G 15	E B 15	E B 15	E B 14	E B 15	E B 14	E B 15	E B 14
10	E B 15	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14	E B 13	22	28	30	G 22	G 19	G 23	G	G	G 17	E B 14	E B 15	A A 44	14	E B 14	17	E B 15
11	E B 14	E B 13	E B 14	E B 14	E B 11	E B 11	15	18	26	29	32	G 28	34	33	G 21	G	G 14	18	E B 13	E B 14	E B 13	E B 15	16	17
12	16	18	16	E B 13	E B 12	E B 13	E B 14	G	24	30	31	32	33	30	30	26	22	E B 13	E B 14	E B 13	E B 15	E B 14	16	E B 14
13	E B 15	E B 12	E B 14	E B 12	E B 12	E B 13	E B 15	E B 16	20	29	30	33	32	G 24	G 24	G 20	18	17	16	E B 16	16	17	16	E B 13
14	16	16	E B 12	E B 14	E B 14	15	E B 14	18	C	C	C	C	C	C	C	C	C	C	C	A A 52	17	16	18	17
15	E B 13	E B 13	17	E B 13	E B 12	E B 14	E B 14	17	24	29	30	G 25	33	29	G	G	G 15	E B 16	17	E B 13	16	16	E B 14	16
16	E B 14	A A 40	16	26	16	19	14	E B 14	21	26	29	28	32	30	28	24	G 16	E B 14	16	16	13	E B 14	E B 13	E B 13
17	E B 14	E B 14	16	E B 14	E B 14	E B 14	16	E B 16	22	30	29	32	G 25	32	28	26	22	24	E B 14	E B 15	E B 14	17	16	15
18	E B 13	18	17	17	17	E B 14	16	18	24	G 32	35	36	39	46	35	23	16	E B 15	E B 14	E B 14	E B 14	16	E B 15	
19	E B 14	E B 13	23	18	E B 13	E B 12	16	G	G 17	35	37	36	35	G 21	G 21	26	G	E B 16	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14
20	E B 15	E B 12	17	E B 14	16	E B 14	E B 14	E B 16	G	28	G 19	32	G 22	32	29	G 18	20	E B 15	E B 13	E B 13	E B 14	E B 14	17	16
21	E B 14	E B 13	E B 13	E B 14	E B 13	E B 13	E B 15	E B 14	G	26	G 23	33	34	33	34	25	21	28	17	E B 15	16	E B 13	16	17
22	E B 16	E B 14	E B 14	16	16	18	17	G	G 20	30	G	36	36	36	33	28	25	33	17	17	20	21	18	19
23	17	17	16	E B 13	E B 14	E B 16	E B 13	E B 16	23	G 32	40	37	40	44	27	G 19	E B 15	E B 13	16	33	18	18	E B 14	
24	16	E B 12	E B 12	E B 13	16	17	18	E B 14	25	31	31	35	40	37	46	G 22	36	A A 60	A A 39	18	A A 60	A A 88	A A 64	A A 32
25	18	18	17	E B 14	E B 13	E B 13	20	16	21	42	30	32	34	39	35	27	24	18	20	E B 15	E B 14	E B 14	17	18
26	E B 13	16	17	E B 14	E B 13	16	E B 13	G	28	33	37	G 30	36	34	48	A A 74	23	18	16	E B 13	E B 14	17	24	18
27	E B 14	E B 14	E B 13	16	E B 13	E B 14	18	G	26	30	36	36	G 25	32	G 23	G 20	22	17	21	E B 14	E B 15	16	18	14
28	16	16	E B 13	17	20	16	E B 14	E B 16	23	27	G 20	30	G 28	G 24	G 24	G 24	G	18	20	17	18	E B 15	16	E B 13
29	E B 16	E B 14	15	E B 14	E B 14	E B 13	E B 13	G	G 21	30	32	34	34	32	32	G 24	24	17	E B 13	E B 14	E B 15	E B 14	17	E B 16
30	E B 15	E B 12	E B 14	17	E B 13	16	E B 15	G	G	G 30	G 27	G 29	G 25	34	31	28	22	16	E B 14	E B 14	E B 14	E B 15	E B 14	E B 12
31	E B 14	E B 12	E B 12	E B 13	17	E B 15	14	16	24	28	31	32	34	38	31	32	21	20	17	E B 14	16	20	16	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	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31
MED	† B 15	† B 14	† B 14	† B 14	† B 14	† B 14	† B 15	† B 16	22	28	30	33	34	32	29	G	22	17	† B 15	† B 15	† B 15	† B 15	16	† B 15
U Q	16	16	16	16	16	16	16	16	24	30	32	35	36	34	33	27	23	18	17	16	16	16	17	17
L Q	E B 14	E B 13	E B 13	E B 13	E B 13	E B 13	E B 14	E B 15	G	G 27	G	G 32	G 32	G 30	G 24	G 22	G	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14

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

IONOSPHERIC DATA STATION Kokubunji

JAN.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	16	15	14	14	16	13	14	16	16	14	14	14	15	16	16	14	15	17	14	14	14	14	14	14
2	15	14	14	14	13	13	13	13	14	15	14	16	14	14	14	16	16	15	14	14	14	15	15	15
3	12	11	13	14	14	15	16	15	14	14	14	14	15	14	17	15	15	14	14	15	14	16	15	14
4	14	14	13	14	15	14	14	16	14	15	15	15	17	16	15	14	14	16	15	15	15	15	14	14
5	14	14	13	12	14	14	14	13	13	14	15	16	16	16	18	15	14	15	15	15	14	14	14	14
6	13	14	12	14	13	12	14	17	14	15	16	17	16	14	15	14	14	15	14	13	15	16	14	14
7	14	14	14	13	14	13	15	15	17	14	15	14	14	15	15	14	13	15	13	14	15	13	14	15
8	14	14	14	14	14	12	15	14	14	14	14	13	14	15	15	15	14	16	14	14	14	14	14	14
9	14	16	13	13	15	12	15	15	15	13	14	14	14	14	14	14	14	15	15	14	15	14	15	14
10	15	14	14	13	14	14	14	13	14	16	16	14	14	14	15	14	14	14	15	14	14	14	14	15
11	14	13	14	14	11	11	13	14	12	14	13	16	15	13	16	14	14	16	13	14	13	15	14	14
12	13	15	13	13	12	13	14	12	14	15	14	13	14	14	15	14	14	13	14	13	15	14	14	14
13	15	12	14	12	12	13	15	16	14	14	14	15	14	14	14	13	14	15	14	16	14	14	14	13
14	13	14	12	14	14	13	14	14	C	C	C	C	C	C	C	C	C	C	C	14	13	14	14	13
15	13	13	14	13	12	14	14	15	16	15	13	14	14	14	16	13	13	16	14	13	13	12	14	14
16	14	14	14	13	13	14	13	14	15	15	14	14	13	13	15	13	12	14	14	12	12	14	13	13
17	14	14	14	14	14	14	13	16	14	16	14	14	15	14	16	13	14	15	14	15	14	13	14	15
18	13	12	14	14	14	14	12	15	15	15	17	18	17	16	18	14	14	13	15	14	14	14	14	15
19	14	13	13	15	13	12	14	15	15	13	14	15	14	16	13	14	14	16	14	14	13	14	14	14
20	15	12	14	14	14	14	14	16	14	14	15	15	13	13	15	14	13	15	13	13	14	14	12	14
21	14	13	13	14	13	13	15	14	17	14	15	14	14	14	14	14	13	14	14	15	12	13	13	12
22	16	14	14	14	13	14	14	14	16	14	15	14	15	15	15	15	14	14	14	12	14	14	15	14
23	14	14	12	13	14	16	13	16	14	15	14	15	14	15	14	15	14	15	13	13	14	15	13	14
24	14	12	12	13	13	14	14	14	16	14	14	16	13	15	14	14	15	16	14	15	14	13	15	14
25	14	15	14	14	13	13	15	14	16	16	15	14	13	15	15	15	15	14	13	15	14	14	15	14
26	13	16	14	14	13	14	13	13	12	14	15	14	16	14	14	14	13	15	13	13	14	13	13	12
27	14	14	13	13	13	14	12	14	14	13	15	14	15	14	13	12	14	13	15	14	15	15	14	14
28	13	14	13	14	14	14	14	16	13	15	14	14	14	14	16	14	16	16	16	14	14	15	13	13
29	16	14	13	14	14	13	13	15	13	14	14	13	15	15	15	16	15	15	13	14	15	14	15	16
30	15	12	14	14	13	14	15	12	14	17	12	13	15	14	15	14	14	13	14	14	14	15	14	12
31	14	12	12	13	14	15	12	13	13	14	14	15	14	14	15	15	14	16	13	14	13	14	14	13
	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	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31
MED	14	14	14	14	14	14	14	14	14	14	14	14	14	14	15	14	14	15	14	14	14	14	14	14
U Q	15	14	14	14	14	14	15	16	15	15	15	15	15	15	16	15	14	16	14	15	14	15	14	14
L Q	13	13	13	13	13	13	13	14	14	14	14	14	14	14	14	14	14	14	13	13	14	14	14	13

JAN.1996 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 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	289	317R	325	351	364	319H	328	338	352	376	372	303	341	356V	389	337H	372	382	349	327	362	331UR	308	292
2	312	311	325	346	391	293	306R	368	358	357	368	369	346	323R	365	385	393	395	347	290	322	328	324	301
3	302	342	326F	378	389	326	321	350	369	313H	370	344	355	364	370	368	357	362	331	327	352	332	298	298
4	303	324	347	359	342	345	339	354	369	378	346	347	340	359	351	368	371	333	340	306	324F	324F	343F	311F
5	364	321F	348F	381F	333	A	323	362	376	370	347	338	341	363	372	377	375	367	329	347	351	340	307F	298F
6	301F	302F	313F	346	384	319	303	350	389	356	347	362	365	386	361	362	388	346	340	370	391	332	295	302
7	323	311	330F	331	350	350	358V	358	351	360	346	332	343	352	336	369	377	339	347	353	335	340	337	307
8	320	299	309	358	345	384	333	366	385	357	337	358	357	356	361	355	364	376	346	358	375	338	334	298
9	294	302	310	318	367	354	373	363	389	375	373	356	363	371	332	374	383	338	368	342	348	319	312	286F
10	338	303F	325	349	402	387	347	366	376	361	355	337	358	372	355	366	356	366	351	A	347	340	305F	298F
11	319F	JF 304	325F	391F	409	JR 456	346	384	JR 403	364	374	380	333	358	349	373	368	367	375	354	332	336	306	313F
12	313F	324F	342F	348F	372F	325	361	361	366	367	357	363	361	341	JR 333	360	371	370	348	361	372F	351	325	321F
13	303F	340F	351F	JF 454	343F	339F	304F	370R	JR 374	365	345	368	316	356	330	349	361	348	372	308	324	294	291F	312F
14	321F	332	328	343	360F	JR 315	322	348	C	C	C	C	C	C	C	C	C	C	C	A	358F	321F	299	310F
15	311F	311F	355	327F	361F	282	266	335	386	320	JR 311	330	350	371	350	352	372	359	321	328	351	346	304	291
16	303	A	316	377	353F	JR 314	294	360	375	366	338	353	355	357	379	340	361	375	354	323	346	351	294	294
17	316	327	322F	363	382	364	311F	371	370	374	351	358	336	377	JR 299	355	388	371	320	360	313	322	328	308
18	324F	317F	321F	363	384	301F	316	350R	375	353	356	368	338	352	H 357	364	352	346	349	335	360	372	305R	311
19	306	319R	329F	358F	406F	325F	346	369	370	345	332	341	367	376	316	365	387	332	321	320F	321	380F	344F	315F
20	315F	318F	330F	333F	330F	339F	337F	351	368	329	351	336	368	375	336	353	358	346	352	342	340	355	336	310
21	295F	290F	303F	300F	322F	375	370	372	372	340	332	364	362	329	349	377	369	347	333	368	359	333	314	298
22	292	306F	326	305	344	327	369	387	382	366	335	336	354	362	388	376	359	368	360	347	333F	335F	330F	312F
23	326F	307F	322F	335F	JF 305	JF 296	337F	347	370	381	370	346	374	325	340	349	379	371	331	353	377F	332	321	316
24	322F	329F	329F	315F	333F	350	364	358	384	394	392	375	358	356	379	366	356	A	A	265F	A	A	A	A
25	317	316	300F	321F	295F	329	357	JR 459	397	377	338	354	359	347	362	370	364	344	352F	325	356	350	323	308
26	303	305	292F	295F	298F	370	366	376	366	368	354	360	356	337	361	A	373	378	319	337	335	348	252	285
27	312	316	327	323F	306F	323F	360F	383	R 366	363	324	370	361	361	332	357	367	370	322	351	328	317	314	317
28	304	304	302F	335	380	318	318	373	368	359	352	358	361	385	362	351	374	353	375	336	335	334	206F	328F
29	310F	JF 332	326F	383	360	293	338	366	381	320	336	360	372	352	344	370	380	374	349	333	319F	351	322	294
30	292	318F	318	309	323	341	377	361	362	359	355	348	317	343	362	349	373	373	301	324	333	337	293	JF 294
31	291	302	330	331	JR 359	373	327R	375	384	379	347	339	354	342	340	371	361	359	320	339F	357	340	325	310F
	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	31	31	30	31	31	30	30	30	30	30	30	30	29	30	29	29	29	30	30	30	30
MED	311	316	325F	346	359	328	337	363	373	364	349	355	356	356	353	365	371	366	347	337	346	336	313	308
U Q	320	324	330F	363	382	354	360	372	384	374	357	363	361	371	362	370	377	372	352	353	358	348	325	312F
L Q	302	304	316F	323F	333F	318	318	351	368	356	338	339	341	347	336	352	361	346	326	324	332	331	299	298

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JAN. 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		365	341	382	L 396	U L 346								
2										409	L 394		L	L 335	U L 408	L								
3										L	L	L	A	L 381	U L 372	U L 394	U L 405							
4									L 413	L	U L 396	A	379	U L 389	L	L								
5									L 403	L	H 385	L 391	A	L	A 346	L 381	L							
6										L	L 349	L 388	L 385	L 402	L	L								
7										L	U L 395	U L 395	L 378	U L 367	L	U L 393	L							
8										L	L	U L 388	L 372	L 363		U L 364								
9									L	L	L	L 358	U L 379	L 372	U L 384	H 394	L 434							
10								U L 405	L 424	L	U L 374	L 377	L 370	L 387	L	410								
11											A 412	L	L 348	L 365	L	L	U L 419							
12											U L 404	U L 399	383	418		L U L 370								
13										420	L	L 377	388	H 386	U L 391	U L 368	U L 389							
14									C	C	C	C	C	C	C	C	C	C						
15										378	U L 378	L 359	L 381	L 369	U L 382	U L 376	U L 414							
16									L	L	354	364	L 385	382	U L 387	U L 376								
17										L	L 370	L 391	H 370	416	L 340	L	L							
18										L	U L 375	L 383	L 377	A	A	A	L							
19										A	A 362	A 370	388	L 369	L	U L 380	U L 402							
20										H 373	371	L	L 368	L	L 361	L	L							
21									U L 421	L	H 359	369	U L 374	L	L	U L 375	U L 400							
22											383	374	370	A	385	U L 412								
23									L	L 400	376	A	A 389	L	A	L	L							
24										L	U L 402	L 381	A	A 353	A	L	A	A						
25								L	L	A	U L 385	391	379	A	A 383	U L 390								
26											A	L 381	L 401	403	A	A	L 393							
27										L	L	A 363	H 385	L 390	383	L	L							
28									L		U L 381	L 369	370	L 386	L 388	L	L							
29										L	U L 358	L 379	U L 408	399	L 369	L	L							
30									L	L	L 401	L 365	H 366	373	L 409	390								
31									L	L 435	U L 377	L 368	L 368	A	U L 380	A 375	L							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	4	6	22	25	26	22	17	17	8							
MED								U L 405	L 417	404	L 378	L 377	L 378	L 382	L 383	U L 380	U L 404							
U Q									L 422	420	U L 395	L 390	L 385	390	L 390	U L 394	U L 416							
L Q									L 408	378	370	L 366	370	L 369	L 370	U L 372	U L 396							

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JAN. 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									246	236		350	274	254	222	250								
2										248	250	238	258	306	H 236	224								
3										L 248	234	268	258	240	240	236	218							
4									226	232	264	260	254	250	246	236								
5									218	236	266	258	266	260	240	220	214							
6										242	274	244	238	224	252	238								
7										246	258	246	260	242	288	230	208							
8										240	256	248	262	252		248								
9									216	226	220	252	246	248	258	224	212							
10								226	222	240	254	282	256	242	230	222								
11											236	238	292	254	258	226	218							
12											242	246	262	280	L 262	252								
13										236	270	240	306	244	246	250	226							
14									C	C	C	C	C	C	C	C	C		C					
15										310	236	288	244	236	244	236	212							
16									224	230	294	252	246	240	236	258								
17										232	246	250	286	238	336	226	216							
18										242	256	248	286	256	A 234	244	244							
19										A 258	294	272	238	234	L 286	230	214							
20										276	256	264	236	238	284	252	232							
21									228	252	290	252	248	L 278	256	240	220							
22											276	278	252	244	228	230								
23									234	228	240	258	238	L	A 278	248	222							
24										226	222	240	266	268	A 234	228	242		A					
25								224	208	A 232	274	258	254	262	256	238								
26											264	258	250	298	248	A	222							
27										240	308	238	250	252	276	248	228							
28									228		254	260	252	232	246	252	224							
29										L	274	248	236	272	254	234	228							
30									238	258	246	274	288	274	234	256								
31									224	232	278	290	262	276	260	246	226							
	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	12	24	29	30	30	29	29	29	19							
MED								225	225	240	256	255	255	252	248	238	222							
U Q									231	248	274	268	266	270	261	249	228							
L Q									220	232	244	246	246	240	236	229	214							

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JAN. 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	330	290	270	226	226	E B 256	306	238	238	226	220	192	A 238	222	A 220	H 192	206	204	234	A 292	238	264	282	322
2	306	270	274	240	218	E B 380	348	224	222	224	226	226	A 226	244	208	242	208	206	H 222	284	258	254	264	306
3	316	304	244	218	214	E B 382	350	236	230	216	220	228	A	234	232	214	204	214	238	260	232	250	302	310
4	294	246	242	244	240	248	294	236	206	230	206	A	A 222	H 200	H 210	H 200	222	H 194	252	262	260	254	232	252
5	242	258	252	238	268	A	280	228	H 198	218	H 202	216	A	A	A 246	230	220	226	252	230	232	252	B 306	336
6	308	318	290	236	208	304	318	228	222	H 174	234	236	208	216	H 186	240	210	222	248	226	212	252	292	286
7	256	286	276	242	238	242	238	214	226	236	H 200	230	200	212	H 194	220	218	208	242	224	250	230	234	292
8	294	298	284	228	232	214	248	224	214	202	H 190	224	206	212	224	216	228	A 222	234	230	202	246	S 282	298
9	314	B 304	292	264	218	246	220	222	H 206	H 198	H 178	206	234	218	204	H 180	206	224	214	218	242	264	304	318
10	272	306	286	236	206	B 218	270	214	190	224	226	210	212	214	200	198	222	208	222	A	234	244	312	282
11	282	292	270	208	B 212	170	326	216	214	224	A 222	216	236	A 232	222	220	200	216	210	214	254	254	322	298
12	294	268	228	268	238	B 266	242	226	218	234	224	224	212	190	228	H 208	224	210	226	216	214	248	270	276
13	292	240	248	222	250	280	240	218	212	200	210	A 242	196	H 182	222	216	218	228	214	252	256	304	326	328
14	278	238	256	236	218	432	286	238	C	C	C	C	C	C	C	C	C	C	C	A	256	278	A 346	344
15	288	310	248	252	230	E B 408	E B 404	258	210	204	236	224	222	214	214	222	220	212	256	242	240	270	302	324
16	324	A	280	E A 238	270	E A E B 380	338	220	222	220	204	H 206	220	206	196	200	228	210	228	244	238	212	306	316
17	282	284	282	228	208	E B 272	320	222	224	214	212	220	H 174	204	206	226	A 226	214	230	226	248	240	264	278
18	286	292	274	236	206	B 328	280	238	224	224	240	A 230	232	A	A	A	A 236	216	220	220	214	218	318	298
19	292	298	260	212	190	B 274	260	208	218	A	A	A 248	234	222	196	222	194	224	232	236	236	208	220	272
20	278	264	258	264	250	238	224	216	220	H 202	224	216	190	220	212	236	226	232	214	218	230	216	272	280
21	316	322	290	298	254	204	218	214	202	212	H 186	A 244	230	226	A 240	216	218	A 232	236	214	226	250	262	330
22	324	308	282	286	262	286	218	224	222	228	208	246	A 242	A	218	200	236	A 232	212	224	252	240	254	260
23	254	280	282	242	226	270	266	242	234	216	236	A	A 228	A	A	H 206	224	208	228	228	A 248	276	298	272
24	310	286	290	298	282	258	A	224	226	A 220	220	216	A	A	A	218	A	A	A	A 342	A	A	A	A
25	290	288	326	296	292	270	E A 276	198	200	A	186	182	212	A	A 240	200	224	234	A 246	246	220	230	266	A 330
26	304	300	A 326	314	288	218	236	216	A 220	226	A	238	A 232	206	A	A	220	204	246	242	234	244	A	E A 350
27	256	292	272	272	258	284	210	216	216	212	E A 284	A	H 196	200	204	220	232	212	A 252	236	252	268	274	272
28	300	316	296	254	220	280	260	214	206	226	H 210	216	206	220	204	240	228	214	224	242	244	254	316	296
29	308	292	264	214	230	402	300	226	222	226	242	234	216	192	204	232	210	218	222	240	238	226	288	308
30	300	296	280	290	252	226	212	224	H 194	242	H 206	212	H 172	234	H 198	194	226	212	236	250	260	254	300	318
31	322	306	272	246	228	230	286	H 216	206	184	220	H 182	236	A	218	A 244	218	210	242	250	210	A 298	284	324
	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	31	31	30	30	31	30	28	28	27	27	23	26	28	29	29	29	29	30	30	29	30
MED	294	292	274	242	230	U 258	266	224	218	220	218	224	220	214	211	217	220	214	232	236	238	251	288	300
U Q	310	304	286	268	254	304	306	228	222	226	226	234	232	222	222	228	226	224	244	250	252	264	306	324
L Q	282	280	258	228	218	238	238	216	206	208	H 205	212	206	204	204	200	210	209	222	224	230	240	265	280

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IONOSPHERIC DATA STATION Kokubunji

JAN. 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	A	A	A	112	A	A	A	A 136	A							
2								162	126	134	124	114	118	120	138	126	138							
3								B	A 134	118	116	118	116	A	124	120	128							
4								B	124	118	118	114	116	A	134	130	A							
5								A	132	120	122	116	118	118	A	128	132							
6								B	128	138	118	124	A	A	120	120	130							
7								B	120	A	128	A 142	126	118	116	124	A							
8								B	128	118	A	A	A	114	A	A 136	126	B						
9								B	130	120	A 142	130	130	126	118	128	E A 150							
10								B	A	142	E A 148	122	120	120	118	120	140							
11								A	130	142	146	A	118	116	A 126	118	B 134	B						
12								110	122	118	122	A 136	A	120	118	124	132							
13								B	A	116	A	112	A	136	A 132	A 142	A	B						
14								A	C	C	C	C	C	C	C	C	C	C						
15								A	A	A	A	126	A	110	114	116	124	B						
16								B	A	A	A	A	A	A	A	A	E A 152	B						
17								B	A	122	A	A	A 122	A	E A 140	142	A	B						
18								B	128	122	120	126	118	118	A	A	A	B						
19								B	142	E A 150	A	A 134	128	124	A 138	118	130	B						
20								B	126	122	120	116	A 130	118	118	120	A	B						
21								B	136	122	128	E A 152	A 144	110	A	A	A	B						
22								B 166	A	122	124	116	122	116	116	A	A	B						
23								B	130	118	A 130	116	A 126	A 128	114	114	E A 148	B						
24								166	A	118	A 122	120	A 124	112	116	124	124	B						
25								A	A	A	A	A	A	A	A	A	A	B						
26								160	120	A 128	118	A	A 134	A 130	A	A	A	B						
27								162	120	120	136	A 136	A 126	A	A 128	A 122	A	B						
28								B	A	A	A 138	A	A 146	A 128	128	A	112	B						
29								148	A 142	142	A	126	116	112	118	A	A	B						
30								132	118	A 138	A	A	A 130	A 126	116	126	118	B						
31								A	122	132	132	136	126	114	A	A	A	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								8	20	24	20	22	22	22	21	21	16							
MED								161	128	122	124	122	125	118	118	124	129							
U Q								164	131	136	134	A 134	A 130	A 126	A 130	A 129	E A 139							
L Q								140	122	118	120	116	118	114	116	120	125							

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	B	B	116	108	122	118	116	116	108	110	104	B	B	98	B	B	B	B
2	B	B	110	110	116	112	B	G	G 168	168	132	120	120	182	150	134	B	B	B	162	138	140	B
3	126	116	116	B	110	B	B	B	118	122	190	156	114	114	112	G	G	112	108	B	B	B	B	B
4	122	B	B	110	112	112	110	B	G	G	G	116	112	114	158	112	106	B	B	B	B	B	130	B
5	116	B	B	110	106	102	102	110	164	186	146	126	116	116	110	144	136	106	B	B	B	B	B	B
6	108	B	B	B	116	130	B	B	166	166	136	130	122	114	102	100	132	94	98	96	B	B	B	B
7	B	B	B	106	B	B	B	B	G	114	110	162	154	108	G	132	102	100	104	B	B	B	B	B
8	B	B	B	B	B	B	B	B	162	G	114	126	118	120	116	112	G	108	112	B	106	100	104	B
9	B	B	B	B	B	110	B	B	118	G	112	174	168	176	102	108	100	100	B	B	B	B	B	B
10	B	B	112	B	B	B	B	B	120	160	158	110	104	104	G	G	114	B	118	106	108	106	104	114
11	B	B	B	B	B	B	154	146	148	156	144	102	146	132	100	G	100	98	B	B	B	B	104	108
12	116	116	112	116	B	B	106	G	164	164	180	162	110	148	168	154	168	108	B	B	B	B	168	140
13	B	B	128	B	B	B	B	172	114	172	120	120	116	112	112	110	108	106	112	108	104	104	114	114
14	114	118	B	B	B	156	130	122	C	C	C	C	C	C	C	C	C	C	C	110	116	110	108	110
15	110	B	106	118	B	B	B	156	120	112	118	114	112	114	G	G	104	94	104	B	100	100	102	104
16	B	104	106	104	104	104	114	B	124	114	110	108	110	108	108	106	112	110	106	102	144	B	120	B
17	B	B	108	B	B	B	176	124	116	130	116	108	110	158	154	188	102	104	116	B	116	104	114	110
18	108	108	106	104	104	104	106	146	174	G	132	124	122	114	112	108	108	114	110	B	106	108	102	B
19	B	B	100	104	102	98	130	G	132	146	142	140	130	102	108	E G 200	G	B	B	B	B	B	B	B
20	B	B	112	116	112	110	B	B	G	172	112	126	104	150	182	98	90	94	B	B	B	112	108	146
21	B	106	B	B	B	B	B	B	G	172	112	152	156	126	110	112	148	104	106	B	106	102	98	98
22	B	B	B	106	116	106	110	122	124	168	G	142	128	120	118	112	110	110	110	118	104	106	116	128
23	130	124	110	B	118	B	B	164	150	G	154	124	120	120	116	122	120	106	142	120	116	110	114	108
24	120	B	B	B	114	110	110	118	160	142	132	126	120	118	112	116	126	114	110	108	104	106	102	102
25	102	100	102	100	106	B	112	114	106	106	100	138	136	110	110	104	98	98	100	B	B	108	106	102
26	108	106	102	104	108	112	B	G	166	154	140	110	132	136	128	116	130	112	108	B	B	108	100	104
27	104	100	106	122	114	108	104	G	172	160	146	142	108	108	100	100	98	102	102	104	B	116	110	110
28	110	104	104	104	102	106	106	B	122	120	108	112	114	108	112	108	G	104	102	100	98	100	100	B
29	B	B	112	112	112	B	104	G	116	180	126	124	124	120	172	110	132	124	102	112	B	112	108	138
30	130	112	134	108	B	104	B	G	G	180	108	108	108	146	130	134	124	102	B	B	B	B	B	128
31	B	B	B	112	114	106	108	104	132	138	158	156	132	120	116	108	112	108	116	B	112	106	110	114
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	12	18	18	18	17	16	12	24	25	28	30	30	30	27	26	26	25	20	12	15	19	23	18
MED	114	107	109	109	112	108	110	123	128	156	129	126	119	117	112	112	111	106	108	107	106	106	108	110
U Q	122	116	112	112	114	112	122	151	163	170	146	142	130	126	130	132	130	110	112	111	116	110	114	128
L Q	108	104	106	104	106	104	106	116	118	121	112	114	112	112	108	108	102	100	103	101	104	104	102	104

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

IONOSPHERIC DATA STATION Kokubunji

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

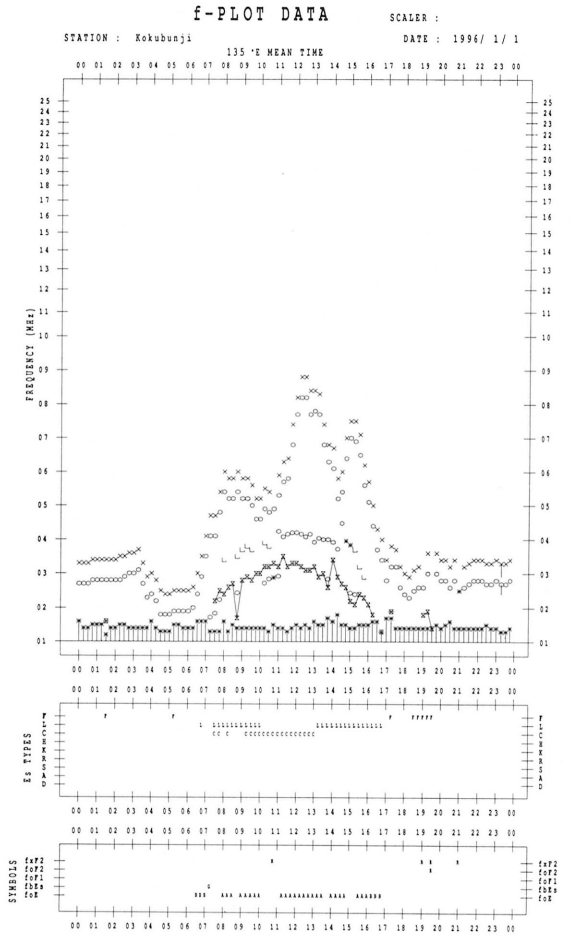
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

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									L 1	LQ 11	CL 11	C 1	C 1	C 2	L 2	L 1	L 2			F 1				
2			F 2	F 1	F 1	F 2				HL 11	HL 12	C 1	CL 21	CL 11	HL 11	HL 11	C 2				F 1	F 1	F 1	
3	F 2	F 3	F 1		F 1				L 1	CL 11	H 1	H 1	C 2	L 1	L 1			F 1	F 1					
4	F 1			F 2	F 2	F 1	F 2					C 2	C 2	L 1	HL 11	L 1	L 2						F 1	
5	FR 21			F 2	F 2	F 4	F 2	L 1	HL 11	H 1	HL 11	C 1	C 3	C 2	L 2	H 1	CL 11	F 2						
6	F 1				F 1	F 1			H 1	HL 11	H 1	C 1	C 1	CL 11	L 1	L 1	CL 11	F 2	F 2	F 1				
7				F 1						LHQ 11	L 1	HL 11	HL 11	L 1		CL 11	L 2	FF 11	F 1					
8									H 1		L 1	C 2	C 1	C 2	C 1	L 2		L 4	F 1		F 1	F 2	F 1	
9						F 1			L 1		L 2	HL 11	HL 12	HL 12	L 2	L 1	L 1	F 1						
10			F 1						L 2	HL 22	HL 12	L 2	L 1	L 1			L 1		F 2	F 4	F 2	F 2	F 2	F 1
11							F 1	C 1	HL 11	HL 11	HL 22	LH 21	HL 11	HL 12	LH 21		L 1	L 1					F 2	F 2
12	F 1	F 2	F 1	F 1			F 1		H 1	H 1	HL 11	HL 11	L 2	H 1	H 1	HL 11	H 1	F 1					F 1	F 1
13			F 1					H 1	L 2	H 1	C 1	C 1	C 2	L 1	L 2	L 2	L 2	L 2	F 1	F 1	F 3	F 2	F 1	F 1
14	F 1	F 1				FF 11	FF 11	C 1												F 5	F 6	F 2	F 4	F 3
15	F 2		F 3	F 1				C 1	L 2	LC 11	L 2	L 2	C 2	C 2			L 1	L 1	F 1		F 2	F 1	F 1	F 1
16		F 5	F 2	F 3	F 2	F 3	F 2		C 1	L 2	C 2	L 2	L 2	L 2	L 2	L 2	L 1	LQ 11	F 1	F 1	FF 11		F 1	
17			F 1				F 1	C 1	L 1	CL 11	C 2	L 2	L 2	HL 12	HL 11	HL 11	L 3	L 2	F 1		F 1	F 2	F 1	F 1
18	F 1	F 2	F 2	F 2	F 1	F 1	F 1	C 1	H 1		C 2	CL 11	C 1	C 2	L 3	L 3	L 2	L 1	F 1		F 1	F 1	F 1	
19			F 2	F 2	F 1	F 2	F 1		LL 11	HL 22	HL 22	CL 22	CL 22	L 2	L 1	H 1								
20			F 2	F 2	F 2	FF 11				HL 11	L 1	C 1	L 2	HL 11	H 1	L 1	L 2	L 1				F 1	F 4	F 1
21		F 1								H 1	L 1	HL 11	CL 11	C 1	C 2	L 2	HL 12	L 3	F 2		F 1	F 1	F 2	F 1
22				F 1	F 2	F 3	F 1	L 1	L 1	H 1		H 1	CL 21	C 2	C 2	C 2	L 3	L 5	F 1	FF 11	F 3	F 4	F 1	FF 21
23	F 1	F 1	F 2		F 1			H 1	C 1		HL 11	C 2	CL 21	CL 21	C 3	C 1	L 2	L 1	F 1	F 3	F 3	F 2	F 3	F 2
24	FF 12				F 2	F 5	F 3	L 1	HL 11	HL 22	CL 12	CL 22	CL 22	C 2	L 3	L 2	C 3	C 6	F 5	F 5	F 5	F 4	F 4	F 4
25	F 3	F 4	F 3	F 2	F 2		F 3	L 1	L 2	L 3	L 3	HL 12	CL 12	CL 22	C 2	L 2	L 2	L 4	F 2			F 1	F 2	F 2
26	F 2	F 2	F 2	F 2	F 1	F 1			H 1	HL 11	H 2	LH 21	CL 11	CL 21	CL 22	CL 42	CL 12	L 2	F 2			F 1	F 3	F 3
27	F 2	F 2	F 2	F 1	F 2	F 2	F 1		H 1	H 1	HL 11	CL 12	L 1	L 2	L 2	L 3	L 2	L 2	F 3	F 1		F 3	F 2	F 2
28	F 2	F 2	F 2	F 2	F 3	F 2	F 1		C 2	C 2	L 2	L 1	L 1	L 1	L 2	L 2		L 2	F 1	F 2	F 2	F 2	F 1	
29			F 1	F 1	F 1		F 1		L 1	HL 11	CL 11	CL 12	C 1	C 1	H 1	L 1	CL 11	L 1	F 1	F 2		F 1	FF 31	F 2
30	F 2	FF 11	F 1	F 1		F 1				HL 11	LH 21	L 1	L 1	HL 11	CL 11	CL 11	C 1	L 1						F 1
31				F 2	F 1	F 2	F 1	L 1	CL 11	CL 11	HL 11	HL 11	CL 11	C 3	C 2	L 3	L 3	L 4	F 1		F 1	F 3	F 1	F 1
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JAN. 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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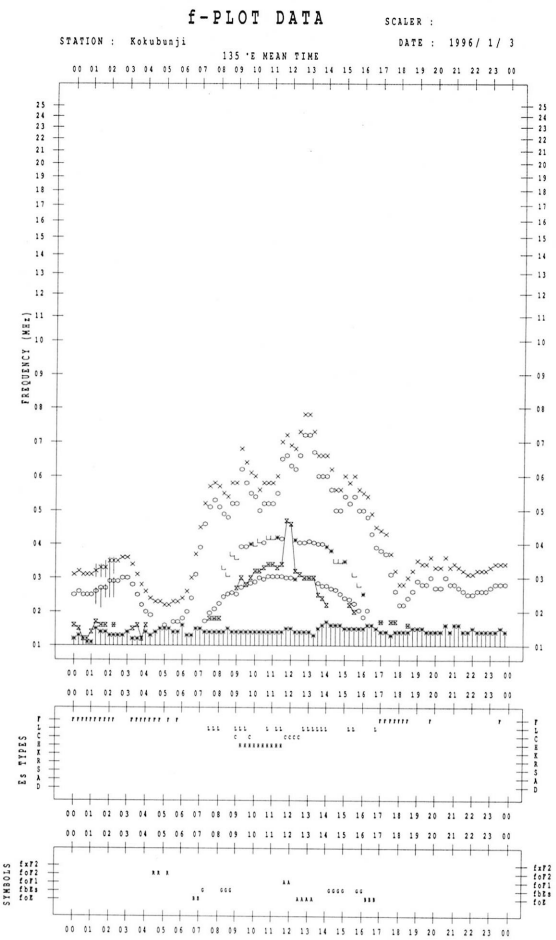
STATION : Kokubunji
DATE : 1996/ 1/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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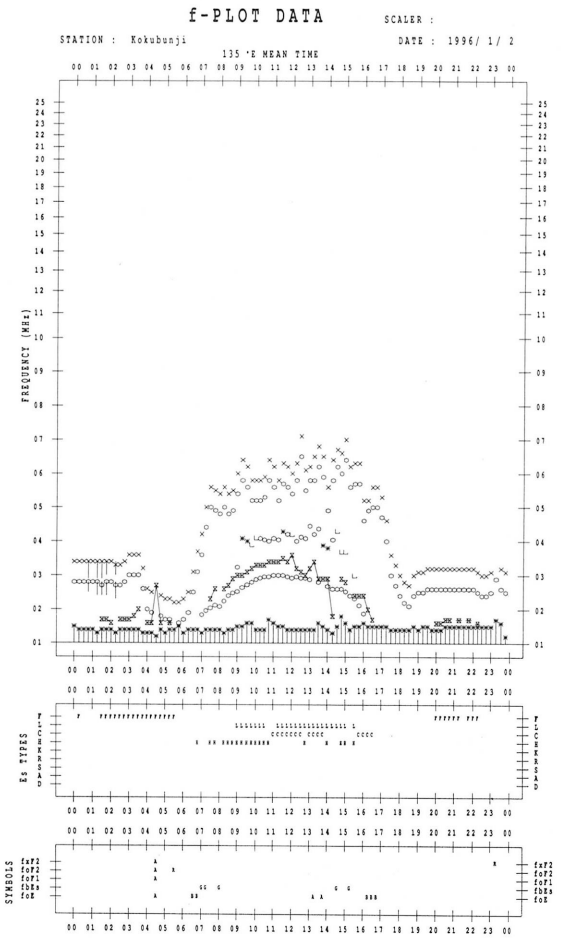
STATION : Kokubunji
DATE : 1996/ 1/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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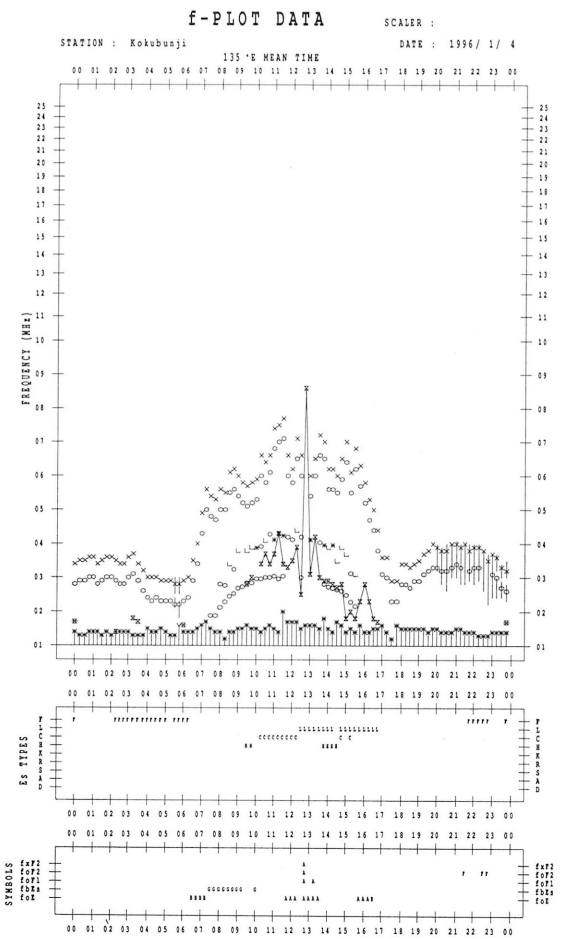
STATION : Kokubunji
DATE : 1996/ 1/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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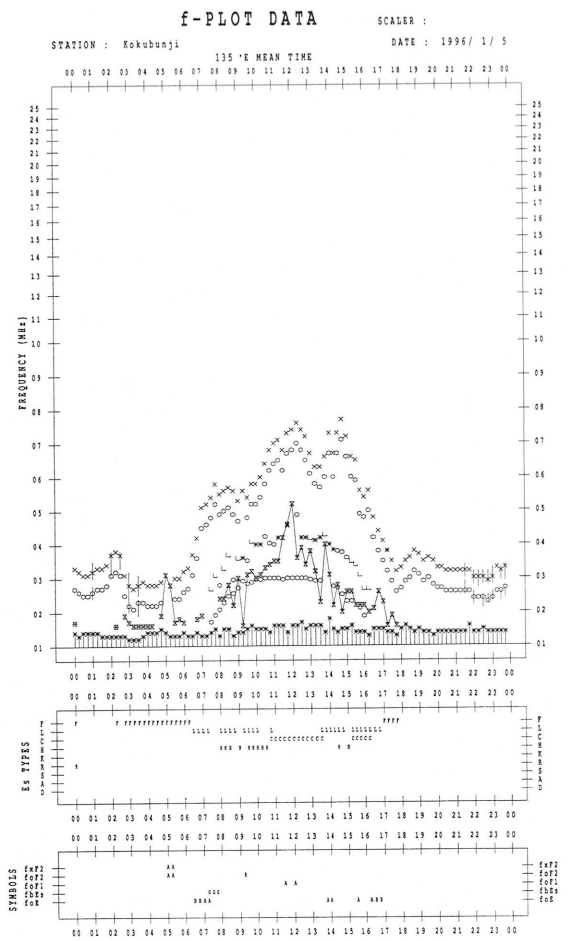
STATION : Kokubunji
DATE : 1996/ 1/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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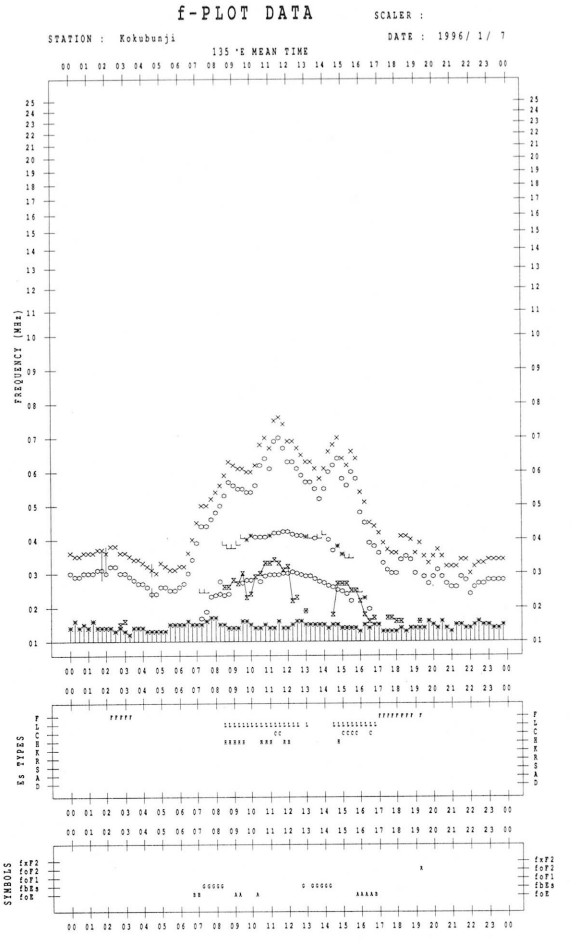
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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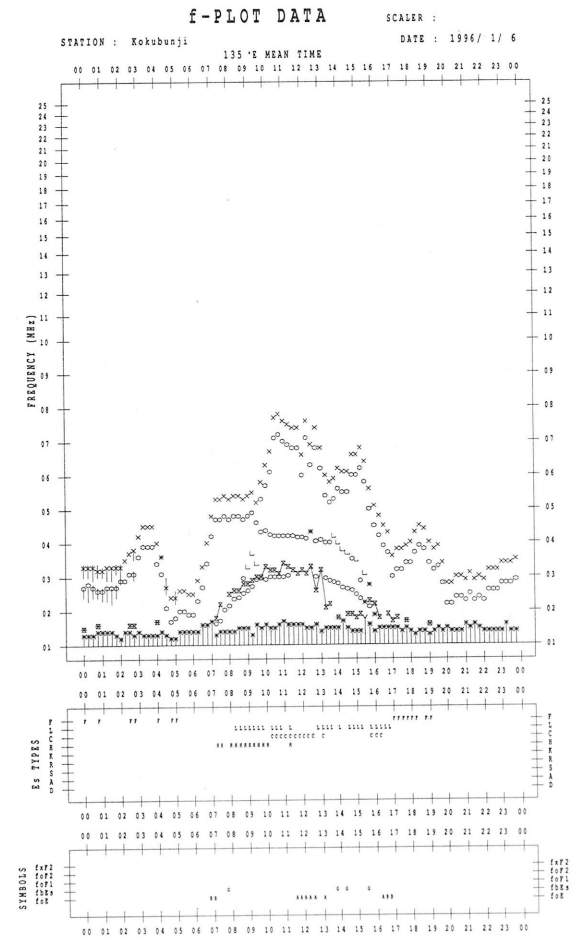
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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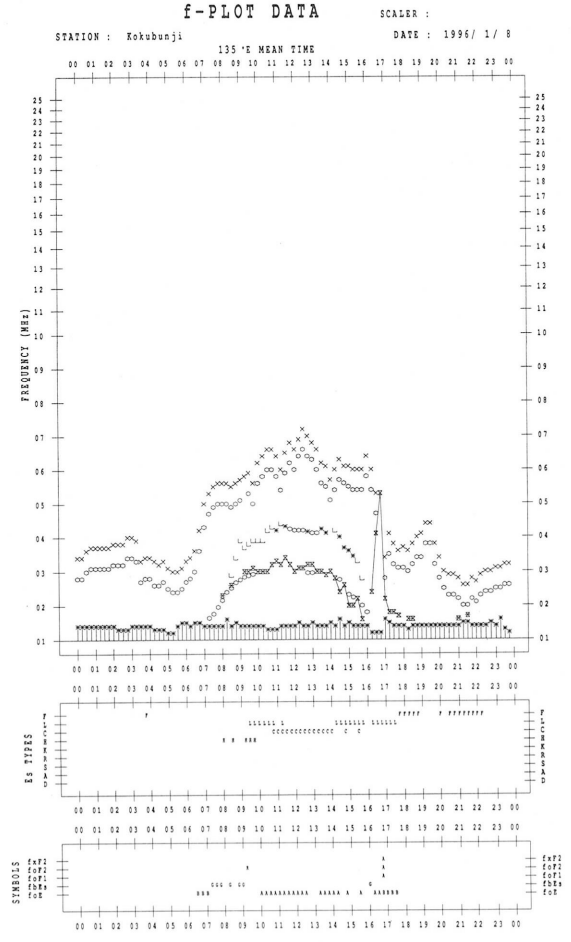
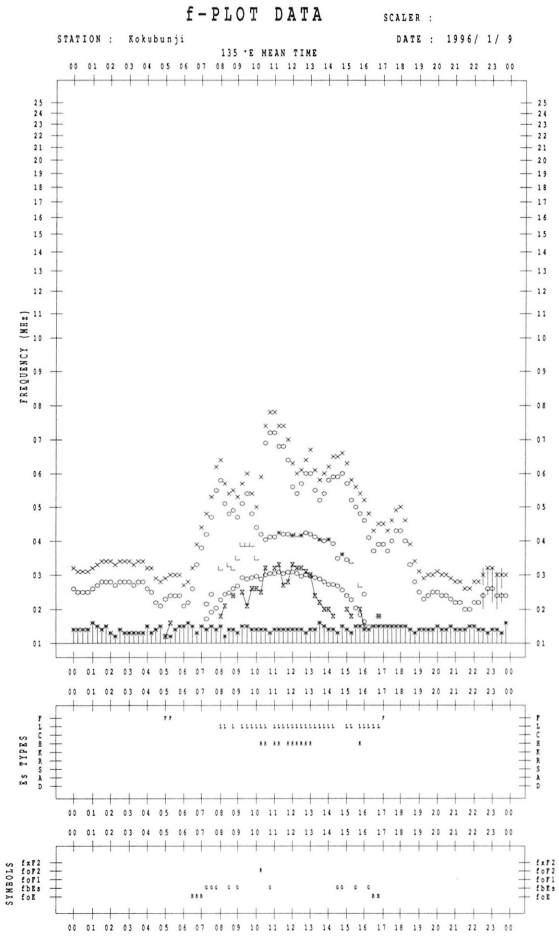
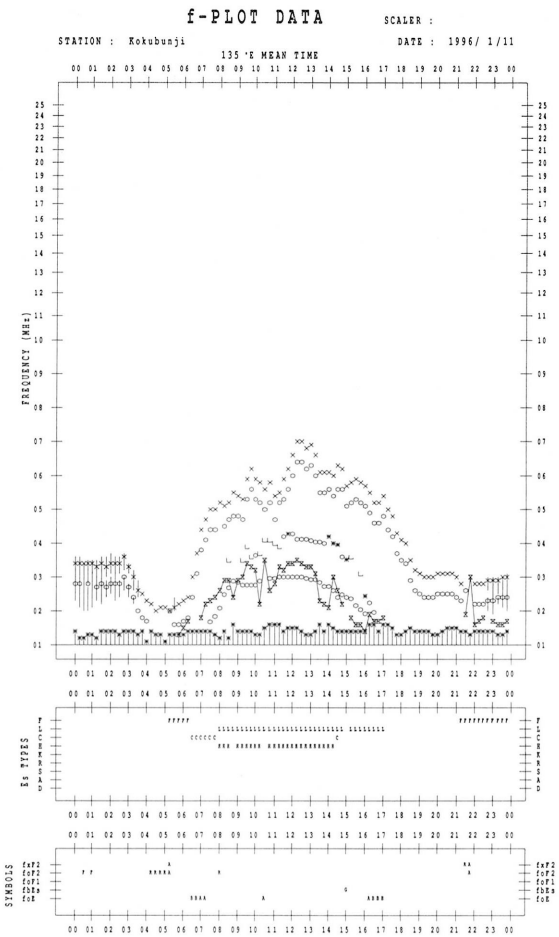
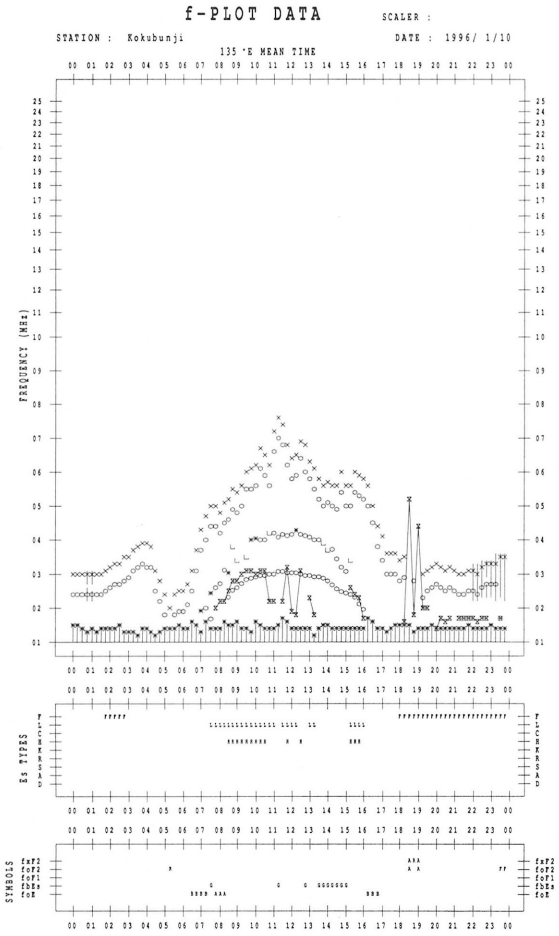
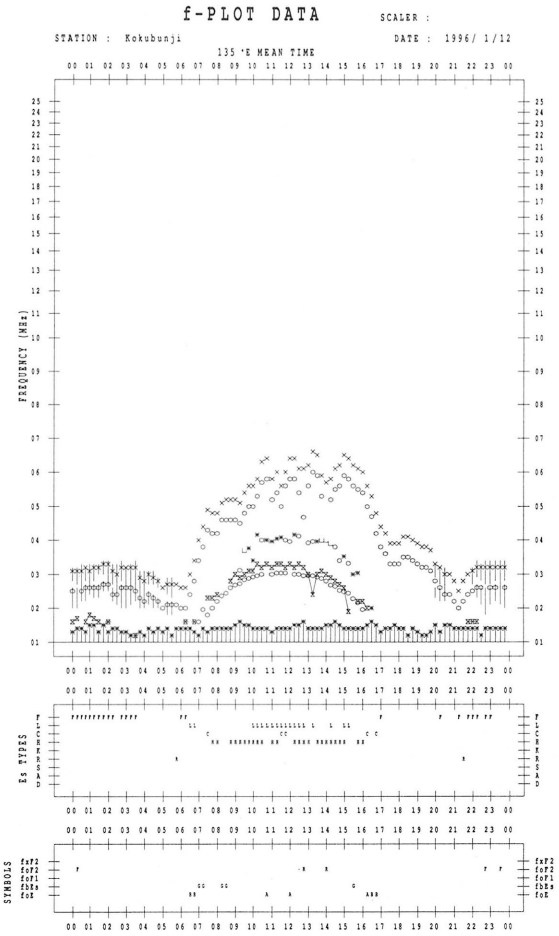
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

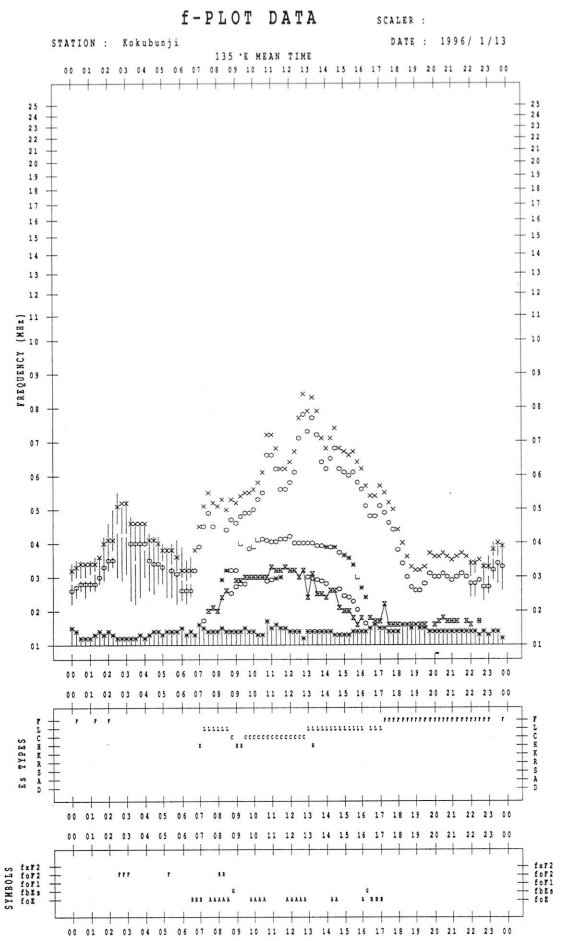

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

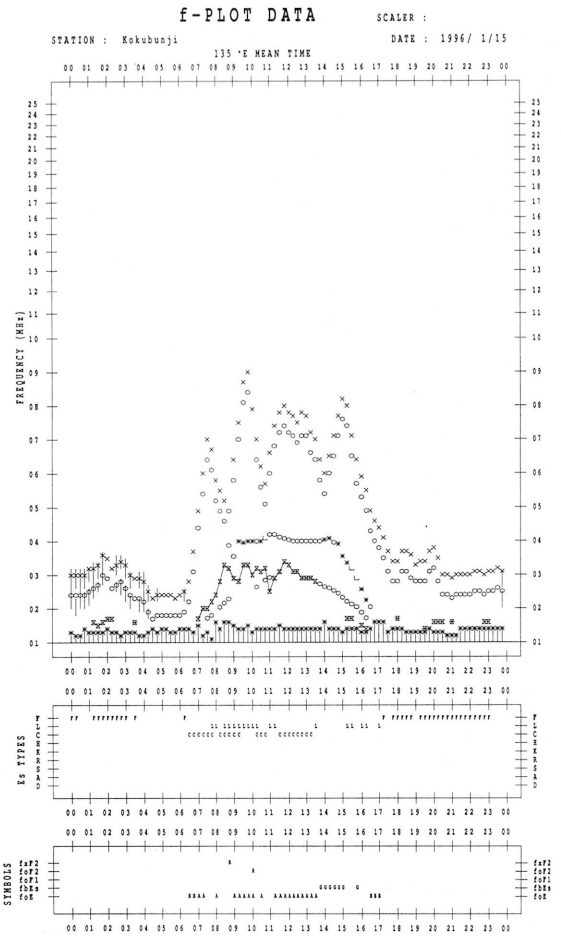

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

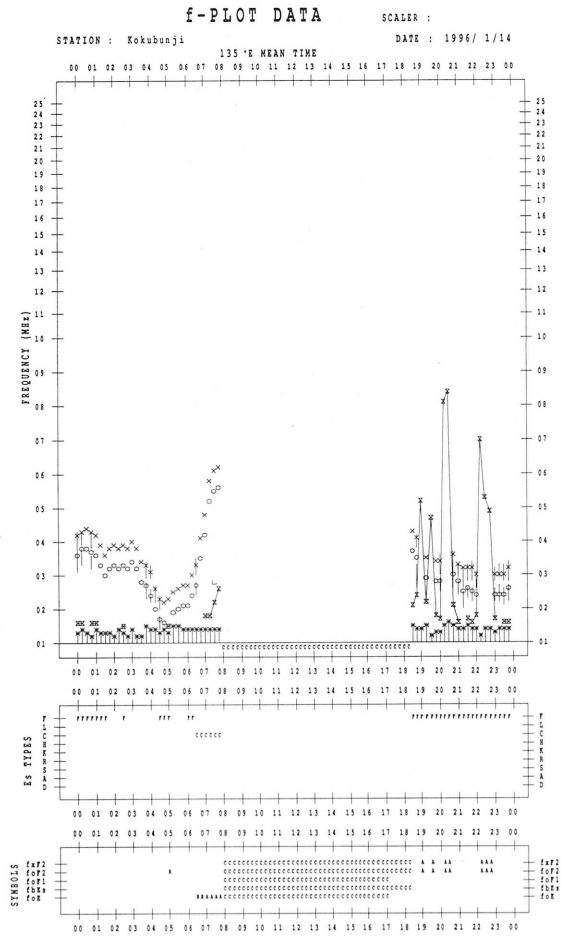

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

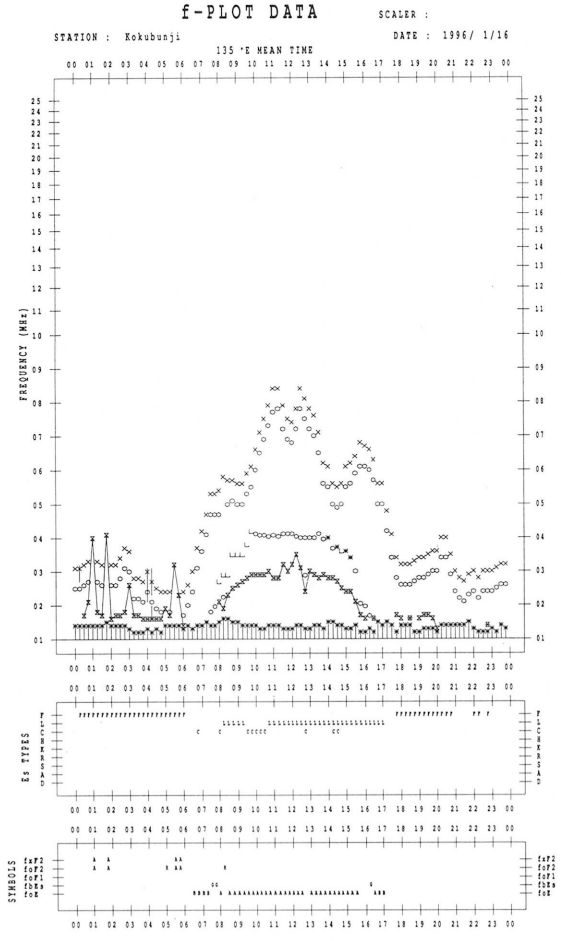

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

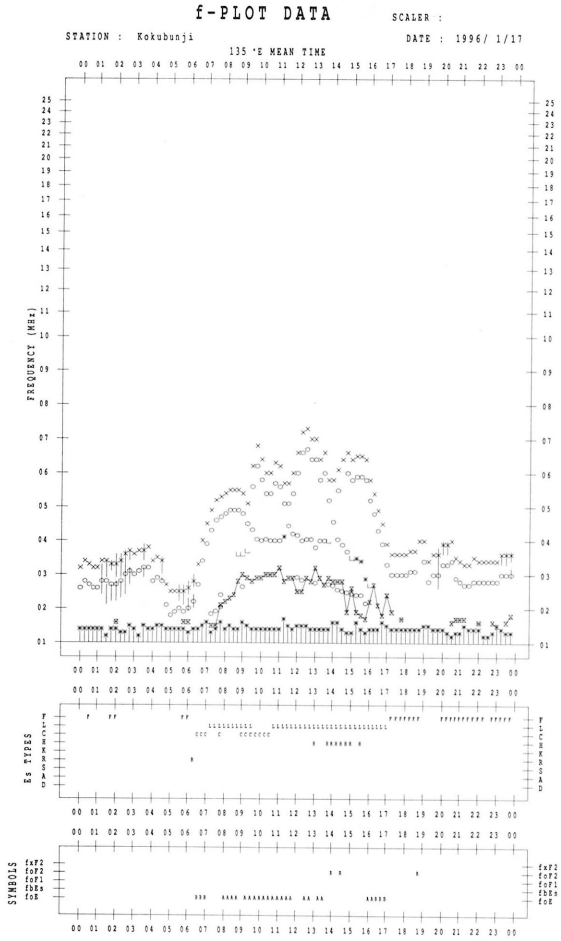

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

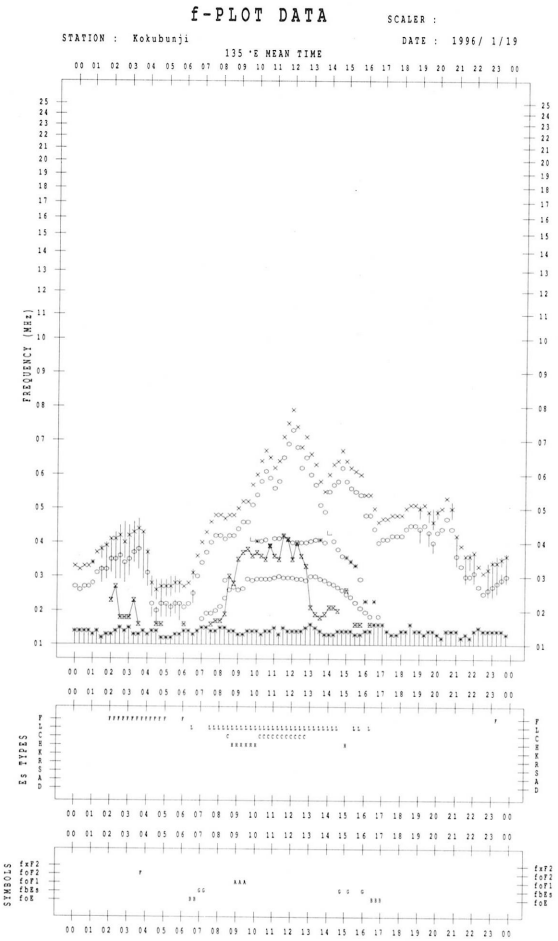

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

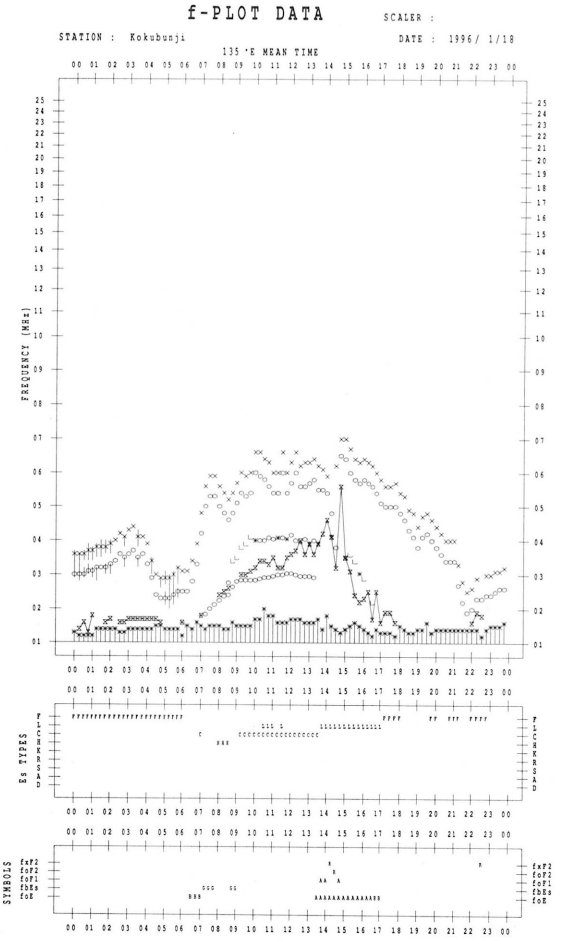

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

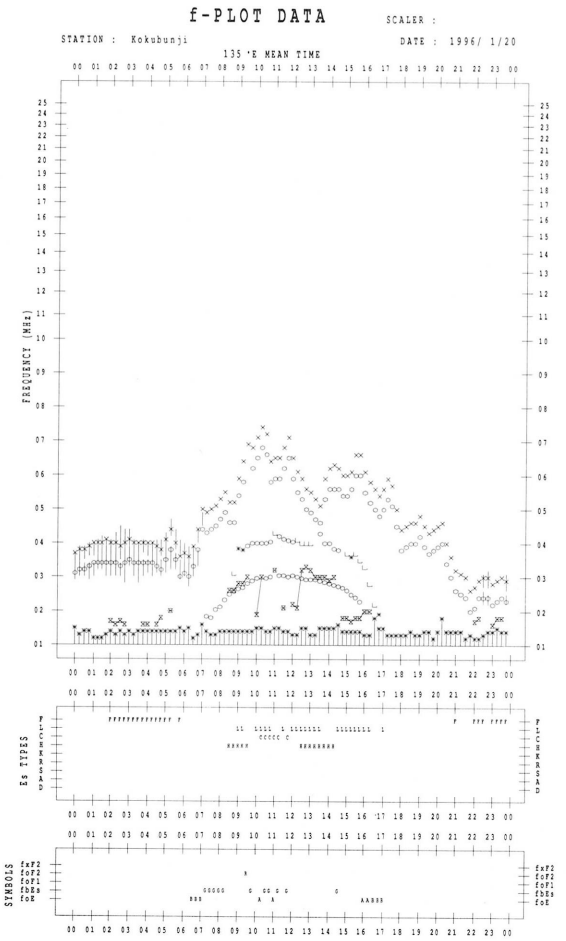

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

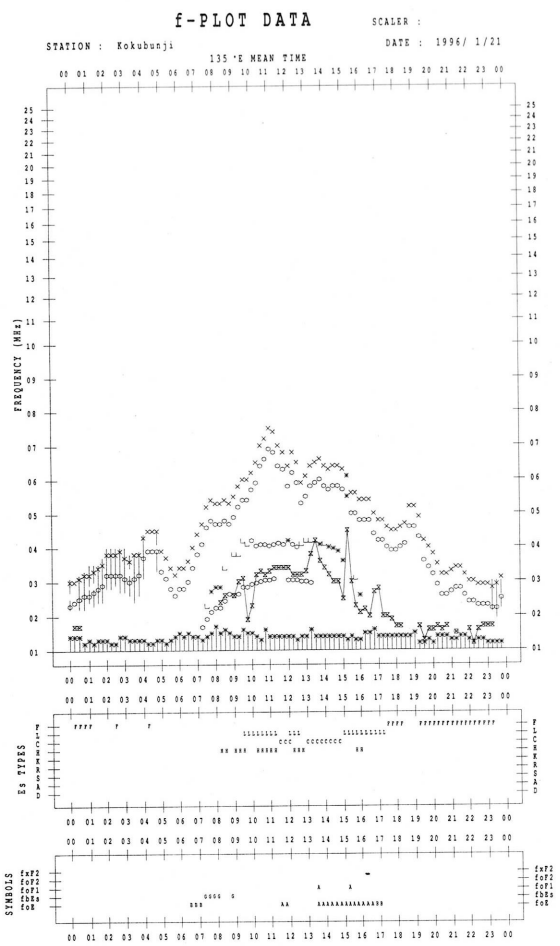

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

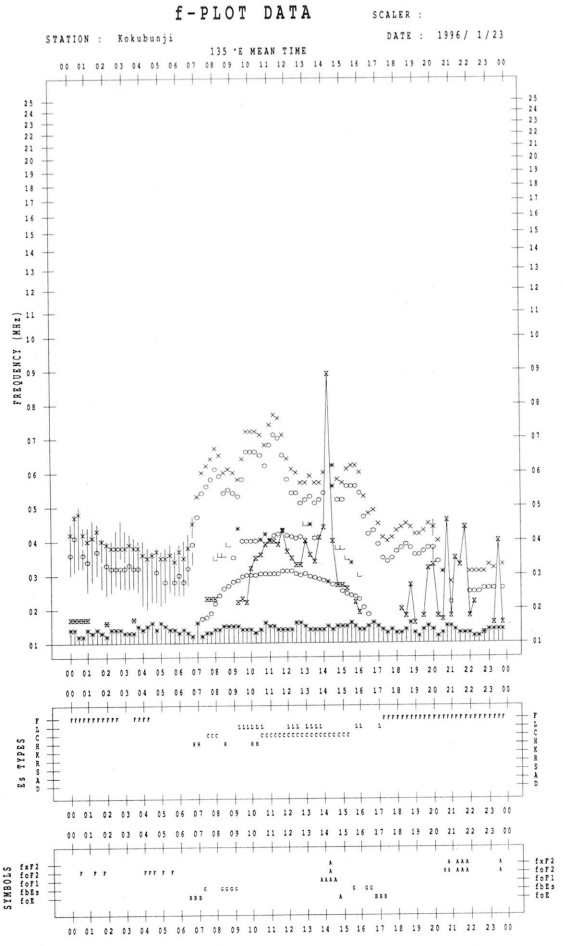

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

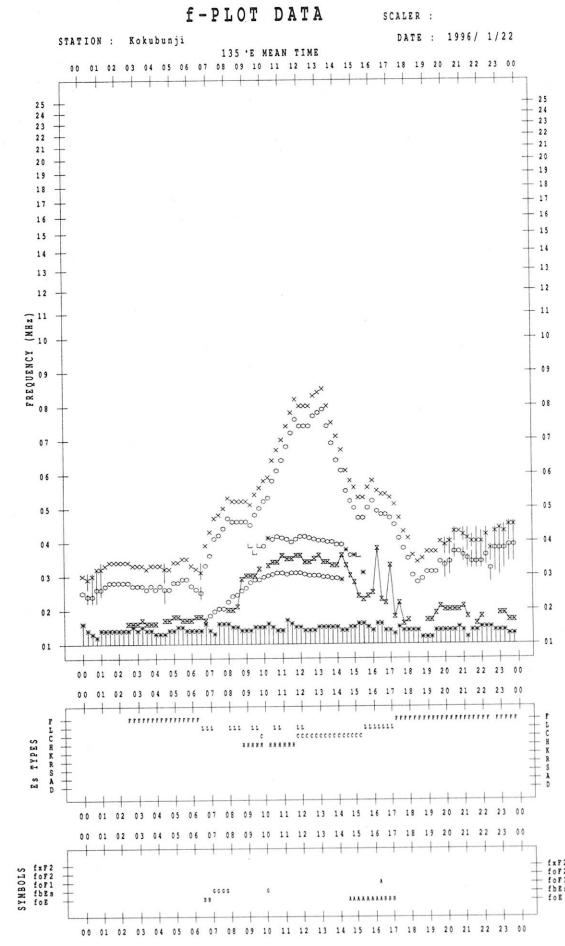

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

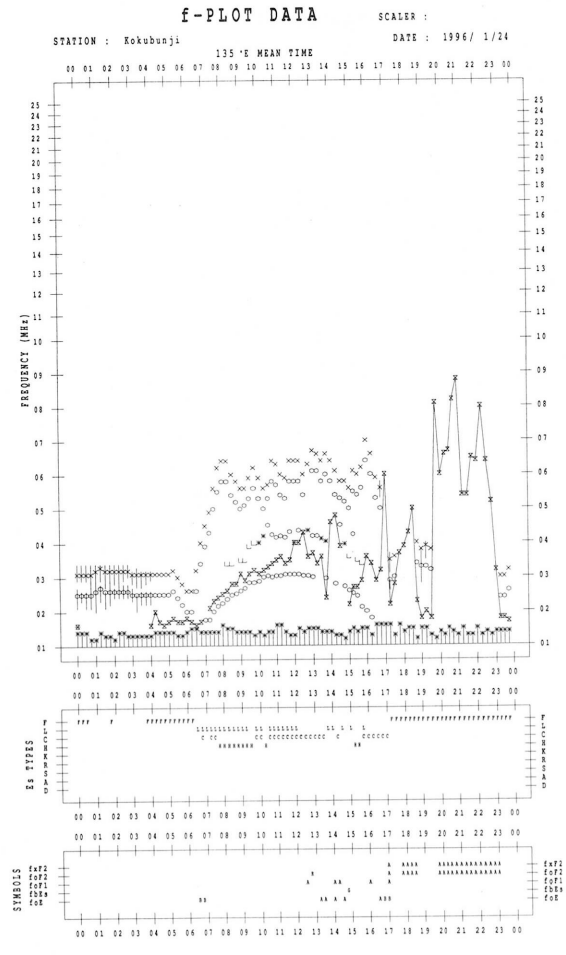

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

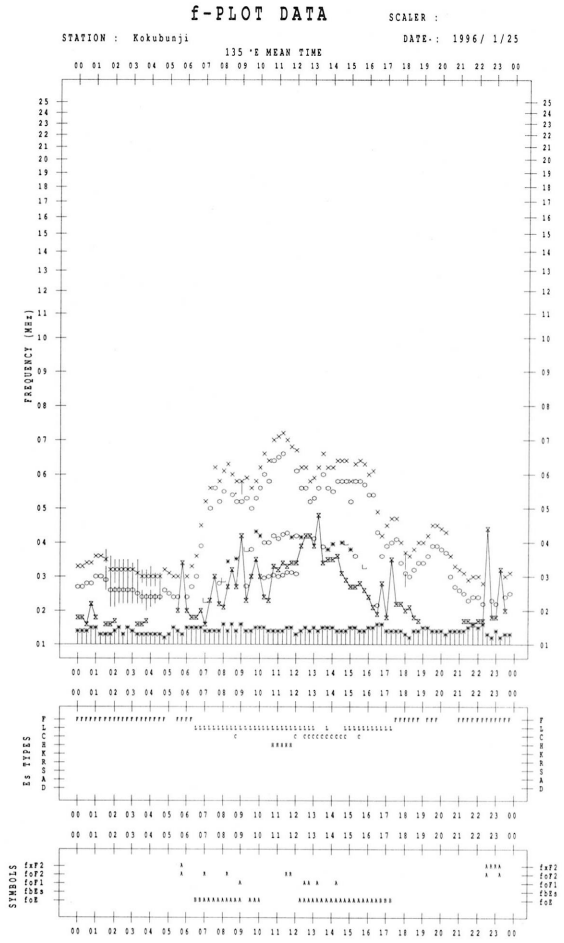

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

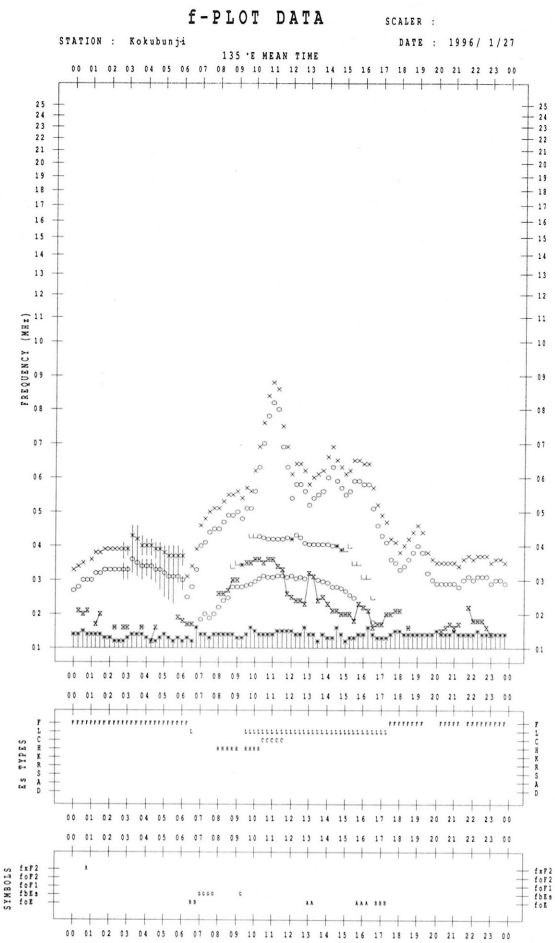

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

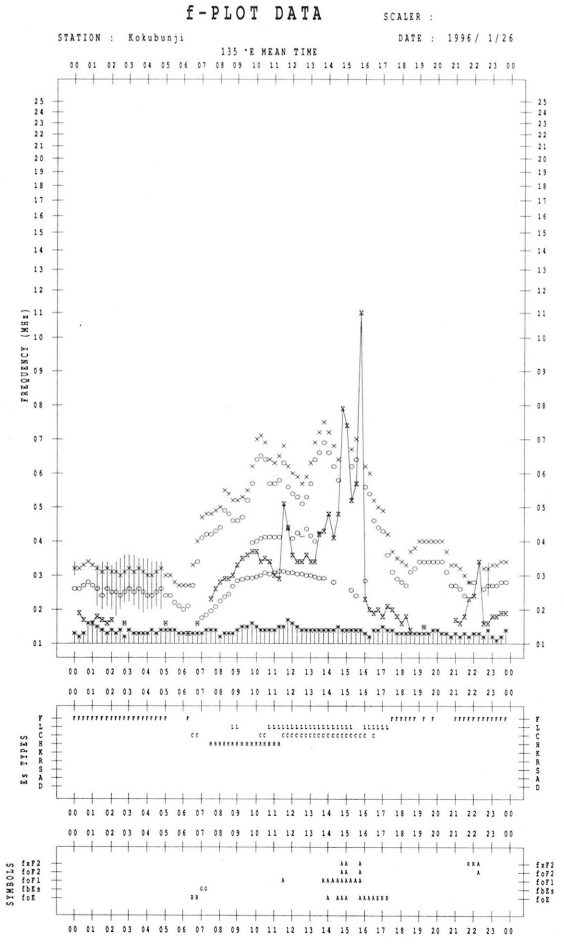

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

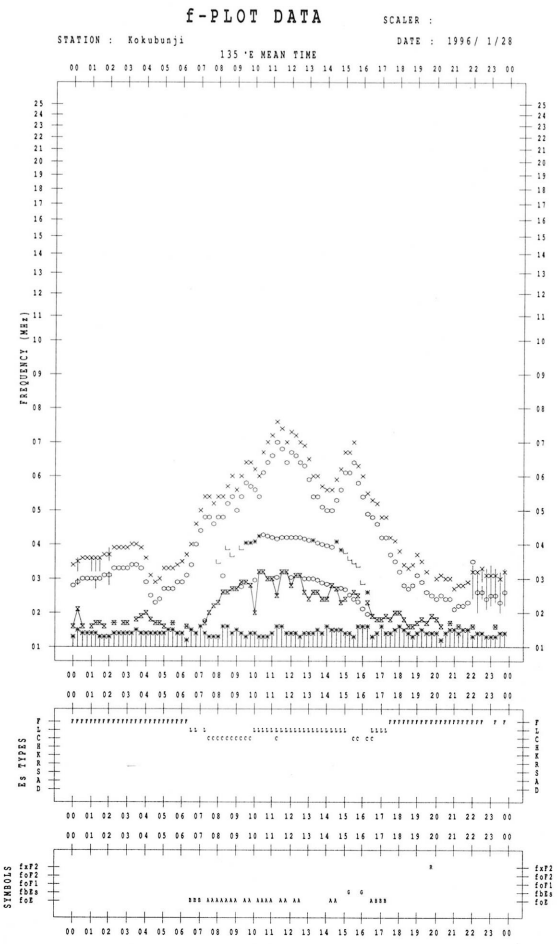

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

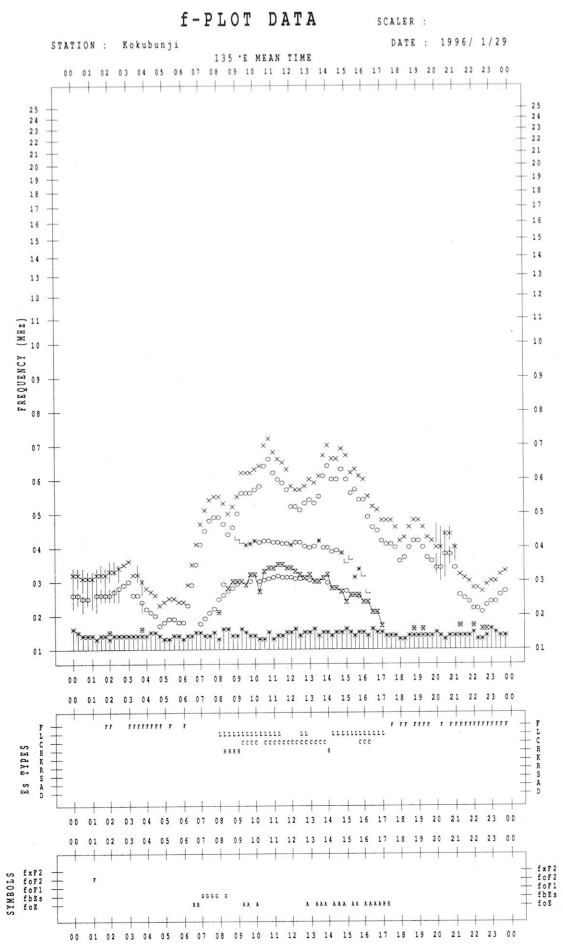

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

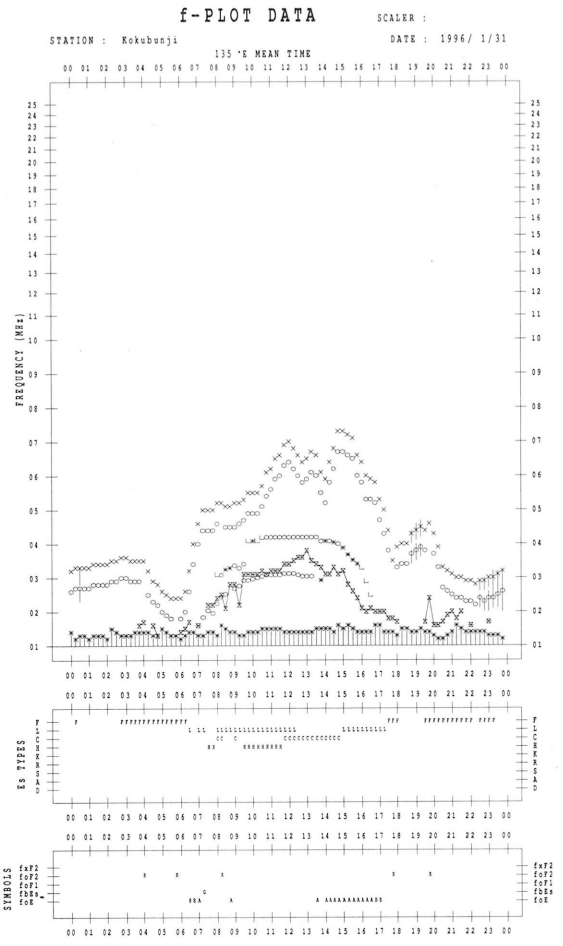

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

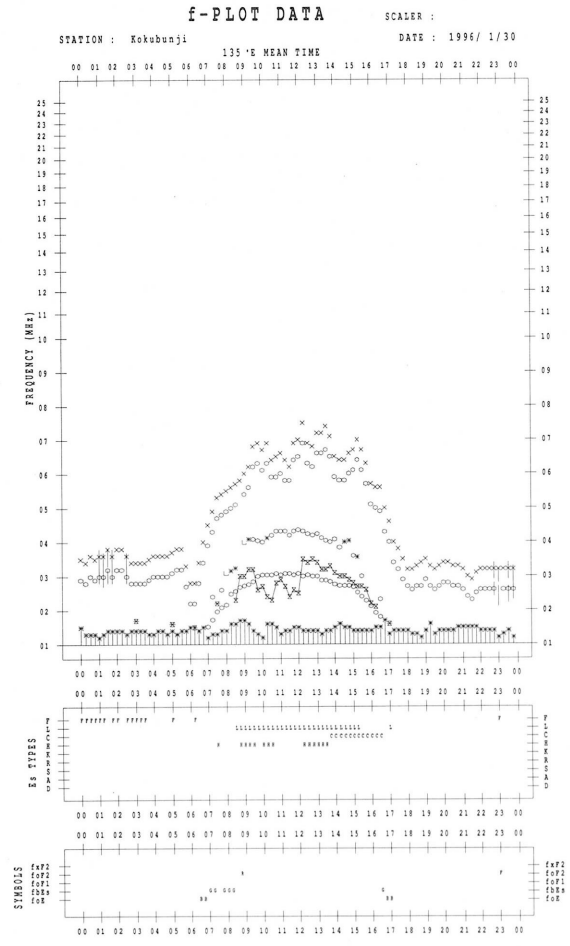

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 1/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Not available until system improvement is completed.

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

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

Note: No observations during the following periods.

10th 2347 - 11th 0427 17th 0630 - 0655

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso January 1996

Single-frequency observations

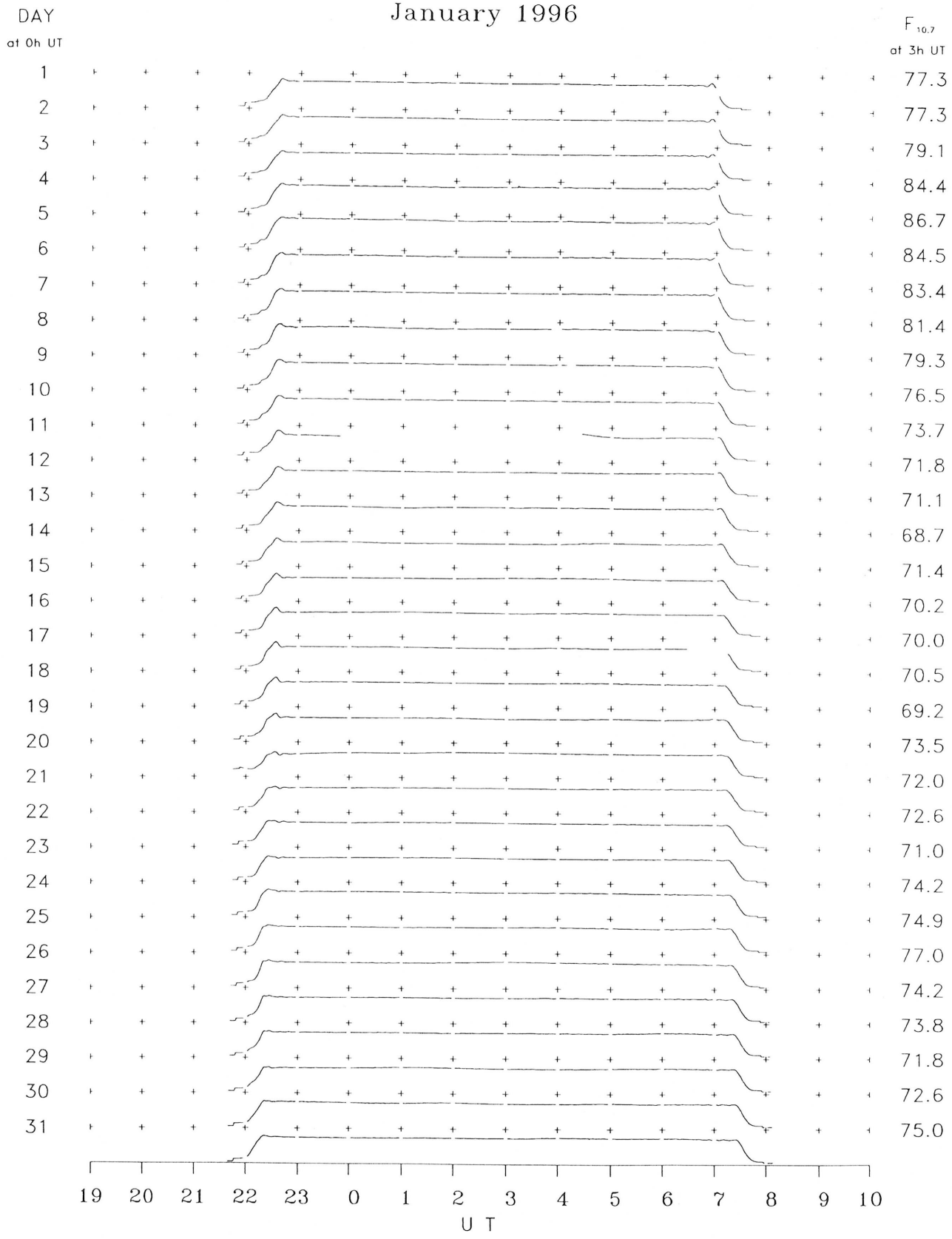
Normal observing period: 2150 - 0750 U.T. (sunrise to sunset)

JAN. 1996	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
3	200	44 NS	2150E	0510	570D	4	1	ML
4	500	41 F	0310.5	0310.8	1.0	5	-	O
	200	8 S	0310.5	0311.0	0.6	29	-	O
	2800	1 S	0311.0	0311.3	1.5	7	3	O
	200	44 NS	2150E	0055	570D	12	5	ML
	200	6 S	2239.9	2240.7	1.0	12	10	ML
	500	42 SER	2240.7	2245.6	6.0	80	-	ML
	200	8 S	2348.0	2348.3	0.4	1400	-	WL
	500	42 SER	2348.0	2348.6	3.0	10	-	WL
5	200	8 S	0003.7	0003.8	0.3	44	-	WL
	200	8 S	0100.2U	0100.3	0.2	29	-	O, CALB
	500	8 S	0100.3	0100.5	0.2	13	-	WL
	500	8 S	0115.0	0115.1	0.2	25	-	O
	200	44 NS	2150E	0006	570D	6	2	ML
7	200	44 NS	2150E	0330	570D	11	3	MR

B. Solar Radio Emission

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

January 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)

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

MEASURED AT HIRAISO

UT	00H	01H	02H	03H	04H	05H	06H	07H	08H	09H	10H	11H	12H	13H	14H	15H	16H	17H	18H	19H	20H	21H	22H	23H
DAY	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M	17M
		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES
1	1	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	1	-25
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		
2	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	4	-15
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		
3	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	3	3
	C	C	C	C	C	C	C	C	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
4									-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	2
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		
5	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-2	-1
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	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	-24	-24	-24	-24	-24	-24	-24	-24	-24	-14	-11
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		
7	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-14	-1
	ES	ES	ES	ES	C	C	C	C	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
8	-24	-24	-24	-24					-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-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
9	-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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	-24	-24	-24	-24																				
	C	C	C	C	C	C		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		
11							-3	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-14	2	2
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
12	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	C	C	C	C	C	C	C
13	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26							
	C	C	C	C	C	C	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
14							-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
15	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-1
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
16	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-2
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
17	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15	-9
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
18	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES
19	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15	-25
				ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
20	-2	-9	-15	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
21	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	C	C	C	C	C	C	C	C	C	C	C	C
22	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25												
	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	ES	ES	ES
23																							-25	-25	-25
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
24	-24	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
				ES	ES	ES	ES	ES	ES	ES	ES	ES	C	C	C	C	C	C	C	C	C	C	C	C
25	-4	-15	5	-25	-25	-25	-25	-25	-25	-25	-25	-25												

C. RADIO PROPAGATION

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

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

MEASURED AT HIRAISO

UT DAY	00H 46M	01H 46M	02H 46M	03H 46M	04H 46M	05H 46M	06H 46M	07H 46M	08H 46M	09H 46M	10H 46M	11H 46M	12H 46M	13H 46M	14H 46M	15H 46M	16H 46M	17H 46M	18H 46M	19H 46M	20H 46M	21H 46M	22H 46M	23H 46M
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
1	6	6	6	15	8	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	3	1	13
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		
2	10	10	3	8	15	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	7	4
								ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
3	7	8	8	8	12	8	-15	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	6	2	16
	C	C	C	C	C	C	C	C	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
4									-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	8	8	6
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
5	5	8	7	7	1	-25	-25	-25	-25	-25	-25	-25	-24	-24	-24	-24	-24	-24	-24	-24	-24	12	0	4
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
6	4	-8	-8	5	7	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	11	4	5
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES				
7	9	8	5	2	8	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	2	5	4	10
					C	C	C	C	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
8	7	7	5	14					-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-14	0	7
								ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
9	5	8	8	15	9	-14	8	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	10	2	5
					C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	9	7	2	12																				
	C	C	C	C	C	C		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
11							2	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	5	7	7
						ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
12	0	2	8	5	5	-26	2	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	2	2	2
									ES	ES	ES	ES	ES	ES	ES	ES	ES	C	C	C	C	C	C	C
13	18	17	5	2	4	4	-3	2	-26	-26	-26	-26	-26	-26	-26	-26	-26							
	C	C	C	C	C	C		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
14							2	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	1	4	1
									ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
15	-1	8	6	4	3	13	3	-1	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15	-9	3
							ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
16	7	4	5	4	2	-4	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-4	-1	9
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
17	-1	3	3	1	-9	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15	5	11
							ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES				
18	9	2	5	5	11	-15	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	1	1	1	2
							ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
19	3	8	13	6	5	-15	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-4	4	5
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
20	6	3	6	6	-4	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-4	1	4
				ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
21	9	9	-4	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	6	6	7
								ES	ES	ES	ES	ES	C	C	C	C	C	C	C	C	C	C	C	C
22	11	11	3	4	9	2	2	-25	-25	-25	-25	-25												
	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
23																						8	8	6
				ES	ES		ES	ES	ES	ES	ES	ES						ES	ES	ES	ES	ES	ES	ES
24	9	6	8	-25	-25	1	-25	-25	-25	-25	-25	-25	-1	3	9	9	6	-25	-25	-25	-25	-25	-25	-25
					ES	ES	ES	ES	ES	ES	ES	ES	C	C	C	C	C	C	C	C	C	C	C	C
25	6	5	9	9	-25	-25	-25	-25	-25	-25	-25	-25												
	C	C	C	C	C	C	C	C	C	C	C	C	ES	ES	ES	ES	ES	ES	ES	ES	ES			
26													-25	-25	-25	-25	-25	-25	-25	-25	-25	6	7	5
							ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
27	9	9	10	8	6	2	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	1	26	17
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
28	16	8	16	11	11	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-1	4	9
								ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
29	8	7	6	9	11	11	1	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	9	8	8
						ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
30	8	11	11	15	14	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	3	7	7
							ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES				
31	4	8	16	11	16	-15	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	13	9	5	5
CNT	26	26	26	26	24	24	26	26	28	28	28	28	27	27	27	27	27	26	26	26	26	27	27	27
						US	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
MED	7	8	6	6	6	-20	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	3	4	6
								ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
UD	11	11	13	15	15	11	2	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	1	10	8	13
					ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES			
LD	0	2	2	1	-25	-25	-25	-25	-26	-26	-26	-26	-26	-26	-26	-26	-26	-25	-25	-25	-25	-15	-1	2

C. Radio Propagation

C2. Radio Propagation Quality Figures at Hiraiso

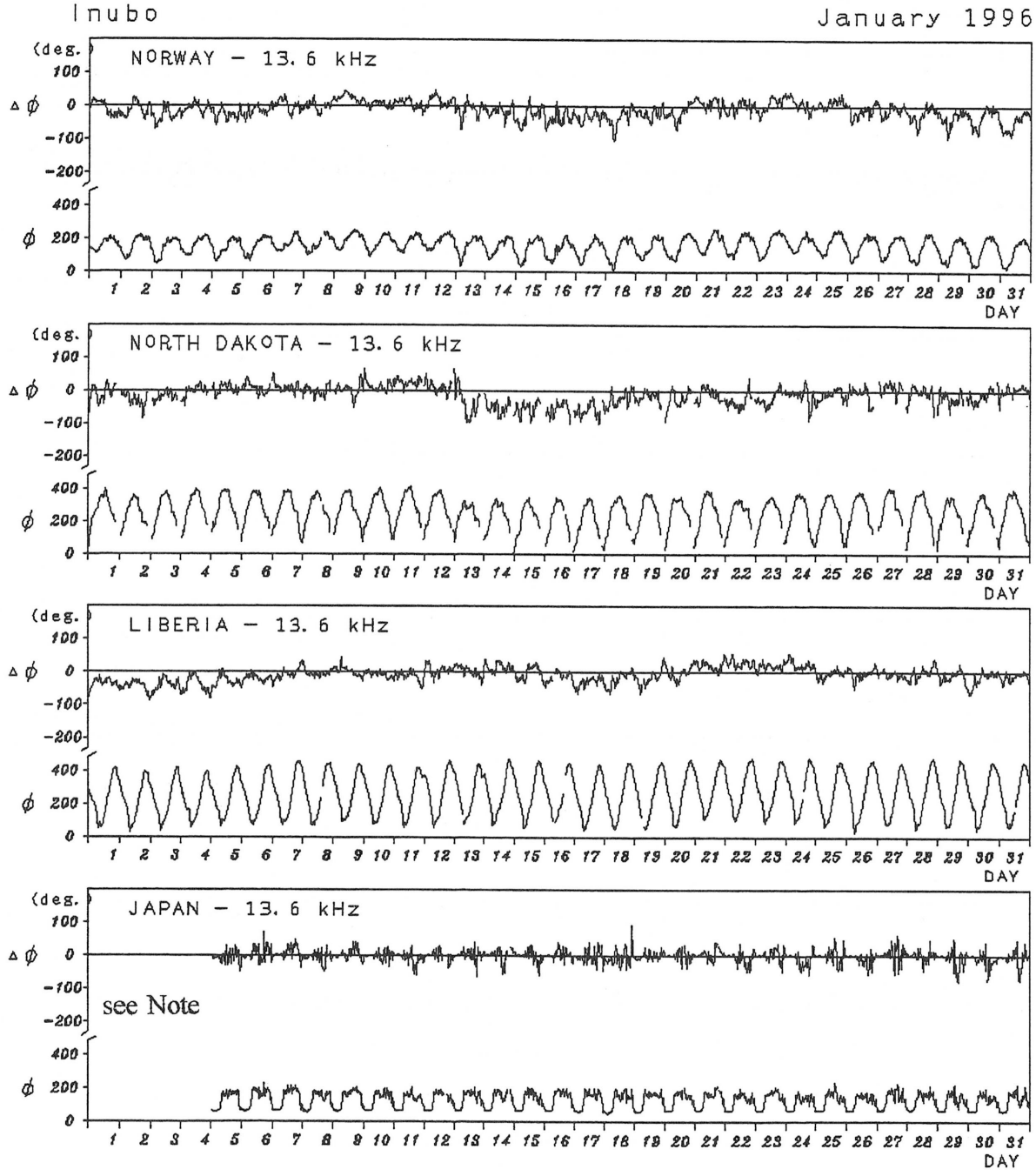
Hiraiso

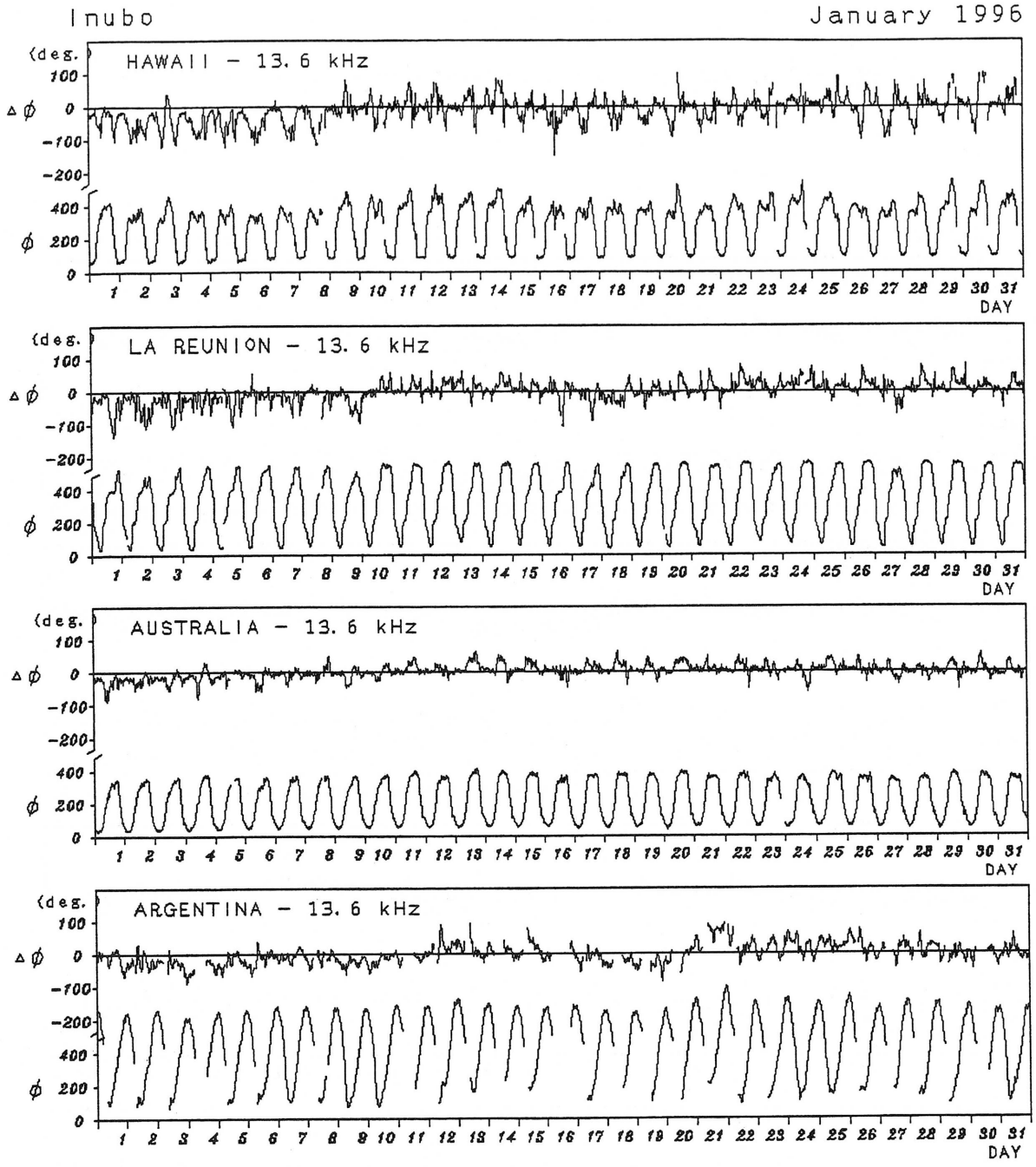
Time in U.T.

Jan. 1996	Whole Day Figure	WWV 00 06	WWV 06 12	WWV 12 18	WWV 18 24	WWVH 00 06	WWVH 06 12	WWVH 12 18	WWVH 18 24	Condition 00 06	Condition 06 12	Condition 12 18	Condition 18 24	Principal Geomagnetic Storms Start h m	End h	Range nT
1	4o U	-	-	-	4U	4	-	-	4	N	N	N	N			
2	4- U	-	-	-	4U	4	-	-	3U	N	N	N	N			
3	4+ U	-	-	-	5U	4	-	-	4U	N	N	N	N			
4	4o U	C	C	C	4U	C	-	-	4	N	N	N	N			
5	4+ U	-	-	-	5U	4	-	-	4	N	N	N	N			
6	4- U	-	-	-	4U	3	-	-	4	N	N	N	N			
7	4o U	-	-	-	4U	4	-	-	4	N	N	N	N			
8	4- U	-	-	-	4U	4	-	-	3	N	N	N	N			
9	4- U	-	-	-	3U	4	-	-	4	N	N	N	N			
10	C	-	C	C	C	4	C	C	C	N	N	N	N			
11	4+ U	-	-	-	5U	C	-	-	4	N	N	N	N			
12	4- U	-	-	-	3U	4	-	-	4	N	N	N	N	22.8	--	140
13	S	-	-	-	C	5	-	-	C	N	N	N	N	--	20	
14	3o U	C	-	-	3U	C	-	-	3	N	N	N	N			
15	4- U	-	-	-	4U	4	-	-	3	N	N	N	N			
16	4- U	-	-	-	4U	4	-	-	3	N	N	N	N			
17	3+ U	-	-	-	4U	3	-	-	3	N	N	N	N			
18	4- U	-	-	-	3U	4	-	-	4	N	N	N	N			
19	4o U	-	-	-	4U	4	-	-	4	N	N	N	N			
20	3+ U	-	-	-	3U	3	-	-	4	N	N	N	N			
21	3+ U	-	-	-	3U	3	-	-	4	N	N	N	N			
22	C	-	-	C	C	4	-	C	C	N	N	N	N			
23	3- U	C	C	C	3U	C	C	C	4	N	N	N	N			
24	3+ U	-	-	-	3U	3	-	5U	2	N	N	N	N			
25	4+ U	5U	-	C	C	4	-	C	C	N	N	N	N			
26	4+ U	C	C	-	5U	C	C	-	4	N	N	N	N			
27	5- U	-	-	-	5U	4	-	-	5	N	N	N	N			
28	4+ U	-	-	-	5U	4	-	-	4	N	N	N	N			
29	4+ U	-	-	-	5U	4	-	-	4	N	N	N	N			
30	4o U	-	-	-	4U	4	-	-	4	N	N	N	N			
31	4- U	-	-	-	5U	4	-	-	4	N	N	N	N			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo





Notes 4 : As for JAPAN-13.6kHz, no record during 11 December 0310 UT 1995 to 5 January 0100 UT 1996, due to the receiver trouble.

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

NONE

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso

Time in U.T.

JAN. 1996	S W F						Correspondence	
	Drop-out Intensities(dB)				Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS BBC						
None										

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

Jan. 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
5			14	7			0356	0420	0406

Additional Contents for the Issue of December 1995

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