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IONOSPHERIC DATA IN JAPAN

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INTRODUCTION

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

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

A. IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

A Measurement influenced by, or impossible because of, the presence of a lower thin layer,for example *Es*.
B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.
C Measurement influenced by, or impossible because of, any non-ionospheric reason.
D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.
E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.
F Measurement influenced by, or impossible because of, the presence of spread echoes.
G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.
H Measurement influenced by, or impossible because of, the presence of a stratification.
K Presence of particle *E* layer.
L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.
M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.
N Conditions are such that the measurement cannot be interpreted.
O Measurement refers to the ordinary component.
P Man-made perturbations of the observed parameter; or spur type spread *F* present.
Q Range spread present.
R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
S Measurement influenced by, or impossible because of, interference or atmospherics.
T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
V Forked trace which may influence the measurement.
W Measurement influenced or impossible because the echo lies outside the height range recorded.
X Measurement refers to the extraordinary component.
Y Lacuna phenomena, severe layer tilt.
Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.
D Greater than.
E Less than.
I Missing value has been replaced by an interpolated value.
J Ordinary component characteristic deduced from the extraordinary component.
M Mode interpretation uncertain.
O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)
T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
U Uncertain or doubtful numerical value.
Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.
l A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the particle *E* layer minimum virtual height.
c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)
h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normnal *E* trace. (Usually a daytime type.)
q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.
r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.
a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.
s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.
d A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin*.
n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.
k The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

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

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

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

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

B. SOLAR RADIO EMISSION

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

B1. Daily Data at Hiraiso

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

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

* Measurement impossible because of interference.
B Measurement impossible because of bursts.

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

B2. Outstanding Occurrences at Hiraiso

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

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

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

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

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

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

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

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

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

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

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

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

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

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

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

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

C2. Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

Transmitting Stations

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

HOURLY VALUES OF foF2 AT WAKKANAI

JAN. 1998

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	56	57	58	51	39	40		47	63	71	74	77	71	64	60		50		38	25	A		35	35
2	A	A	A	37	35	29	B	37	68	68	67	80	68	74	68	60	55	A	A	29	40		40	43
3	37	38	35	34	34		A	36	39	71	76	67	66	77	71	57	42	A	A	A		A	A	26
4	38	36	35	35	37	29	A	30	57	92	77	78	63	74	72	66	44	30	31	25	A	A	A	A
5	29		34	35	36	38	35	41	68	67	70	71	68	70	68	58	48	41	41	40	26	36	40	
6	41	37	36	36	34		32	29	70	71	78	63	61	81	72	54	58	32	29		A	25	A	A
7	36	A	A	N	34	29	A	29	57	57	90	90	92	88	78	87	73	40	N	37		47	38	A
8	56	38	38	40	40	41	38	47	71	68	68	77	74	68	64	60	57	42	40	A	A	A	A	30
9	A	34	34	32	34	35	N	38	58	79	80	73	70	79	58	57	57	A	A	A	A		49	59
10	35	A	A	29	35	30	31		70	70	70	67	63		61	60	50	29	23	A	31	A	59	30
11	32	38		34	A			34	58	69	81	77	70	64	58	57		A	A	A	29	31	32	
12	25	36	38	30	32	A	A	38		70	66	76	66	61	58	58	58	28		36	40	A	37	37
13	44	37	38	43	40	32	A	40	56	69	83	73	72	68	67	57	60			41	41	46		48
14	47	48	46	48	37	42		36	58	56	72	86	67	58		60	41	A	A	26	A	A	A	38
15	32	28	31	31	34	29	29	38	57	56	76	75	59	62	58	60	52	31	31	38	29	A	38	
16	A	31	32	32	31	32	37	46	64	70	68	61	78	68	58	60	57	24	25	28	40	35	A	35
17	35		35	38	30	34	32	35	69	94	87	95		76	67	68	58		35	40	41	35		
18		38		34	38	B		38		81	82	74	82		58	56	72	60	36		32		40	43
19	50	46	51	50	41	35	A	46	71	71	87	87	74	67	60	69	53	31	32	38	32	B	59	37
20		59	28		37	36	35	43	54		68	77	71	69	71	62	52	40	35	35		38	38	41
21	35		38	37	22	30	28	41		60	86	86	95	71	67	59	74	55	A	46	29	40	48	59
22	52	57	57	57	52	42	40	46	72	68	79	81	78	72	67	60	62	42	40	40	38	38	41	43
23	35	36	37	38	38	46	40	38	67	79	60	76	81	63	68	78	58	42	32	36	38	38		37
24		35	38	40	38	38	38	30	58		56	72	77	67	63	61	54	A	22	36	41	41	41	47
25	48	48	50	50	49	43	40	39	58	60	59	72	72	63	72	68	58	48	A	26	35	37	43	
26	44	41	40	41	38	30	30	30	57	56	71	75	80		74	68	58	51	42	47	45	44	57	47
27	57	57	56	56	59	57	58	56		70	71	62	72	72	73	60	60	52	40	28	38	36	42	42
28	38	41	38	48	40	41	38	48	58	58	70	66	80		67	57	60		40	A	40	30	55	56
29	58	48	51	57	51	50		60	60	58	68	73	67	61	64	60	46		25	A	38	A	A	A
30	37	36	A	37	30	31	A	50	71	71	80	82	74	64	72	68	67	54		35	35	37	38	40
31	37	38		38	31	26	30	A	58	78	82	78	79	71	69	78	66	58	41	38	A	58	41	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	24	28	30	26	17	29	27	29	31	31	30	27	30	30	30	20	20	22	21	18	21	21
MED	38	38	38	38	37	35	35	38	58	70	74	76	72	68	67	60	58	42	35	36	38	38	41	41
U Q	49	48	48	48	40	41	39	46	69	71	81	80	78	74	71	68	60	51	40	40	40	41	48	47
L Q	35	36	35	34	34	30	30	35	57	60	68	72	67	64	60	58	52	31	30	28	31	35	38	36

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT WAKKANAI

JAN. 1998

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	27	G	28	G	32	29	40	46	48	39	31	34	34	35		40	41		33	39	60		28	35
2	44	48	36	33	29	G	B	24	N	30	30	31	28	31	42	G	G	38	44	34	28		28	30
3	30	G	G	G	34	58	30	33	35	38	35	44	56	48	48	40	58	39	52	47	38	34	39	56
4	33	G	29	30	G	28	25	28	47	53	30	30	N	26	32	G	30	28	G	44		44	36	32
5	32	26	G	G	G	G		29	G	25	29	30	29	25	26	G	G	G	G	29	41	36	38	
6	33	33	29	32	35		G	29	31	31	32	28	30	27	31	31	26	31	G	37	30	23	29	45
7	33	31	31	25	G	G	30	29	50	34	30	32	30	26	30	30	33	28	G	G	G	G	G	29
8	G	G	G	24	28	35	28	N	29	32	31	30	33	33	25	30	G	G	G	33	45	30	32	G
9	32	28	G	G	G	G	G	G	22	31	32	32	39	32	32	29	40	58	94	74	58		41	33
10	32	30	31	G	G	G	G	28	37	35	36	31	33		32	31	27	29	36	40	39	33	G	G
11	G	29		24				30	G	35	30	29	27	29	32	40		42	41	56	31	G	G	28
12	G	G	G		38	33	33	G		28	34	32	28	30	30	26	36	44	36	31	39	49	46	34
13	33	29	27	G	G	31	40	46	60	48		27	28	27	29	23	27	40		29	39	38	G	G
14	G	G	G	G	29	36		G	32	35	30	27	30	30		36	40	60	66	46	35	62	60	32
15	33	31	G	G	32	46	40	33	29	32	46	38	37	32	30	G	32	G	29	40	48	43	42	28
16	32	G	G	28	24	36	44	37	36	32	34	31	34	33	33	31	34	41	40	34	27	32	33	28
17	28	27	25	G	30	32	31	30	32	41	45	34	30	28	34	27	G	G	27	G	G	G	G	G
18	G	G	G	G	G	B	G	28		34	33	32	32	36	34	30	29	28	32	36	38	24	G	G
19	G	G	G	G	G	G	27	G	30	31	30	31	29	28	28	37	G	G	G	G	G	B	G	G
20	G	G	G	G	G	G	G	G	32		31	31	30	34	32	31	G	G	26	G	G	24	G	
21	G	G	30	G	G	G	G	G		28	31	29	28	28	30	26	G	34	38	G	33	29	29	29
22		G	29	31	G	G	G	G	30	36	28	30	29	32	G	G	28	G	G	G	G	G	G	
23	25	29	G	G	G	G	G	G	27	G	34	G	G	G	G	G	G	G	G	G	G	G	G	G
24	G	32	30	23	G	G	G	G	G	G	G	G	G	44	33	G	25	30	34	G	27		34	G
25	G	G	G	28	G	G	G		G	G	48	G	G	G	G	G	30	26	37	42	31	G	G	G
26	29	G	G	G	G	G	27	28	32	G	G	36	G		G	G	G	G	G	G	G	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	35	G	G	G	G	G	G	G	G	G	G	24	G
28	G	G	G	G	G	G	G	28	G		34	35	37		G	G	G	G	35	47	G	33	42	30
29	28	30	25	29	G	G		26	43	34	G	G	G	G	G	G	G		32	42	30	30	29	34
30	30	29	28	G	G	G	40	29	G	G	G	G	G	G	G	G	G	33	33	G	G	G	G	G
31	G	G	G	G	G	G	G	38	G	G	G	G	G	G	G	G		33	28	30		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	31	30	30	30	28	26	29	27	29	30	31	30	28	29	31	29	29	30	31	29	26	31	28
MED	28	G	G	G	G	G	13	28	30	32	31	31	29	28	30	26	26	28	32	33	30	26	28	28
U Q	32	29	29	25	29	31	31	30	36	35	34	32	33	32	32	31	32	38	37	42	39	34	36	32
L Q	G	G	G	G	G	G	G	G	G	13	29	27	G	25	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

JAN. 1998

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	15	15	15	15	15	15	14	14	15	15	14	16	15	16	15		15	15	15		15	15
2	15	16	14	14	15	14	B	16	18	15	15	18	18	16	15	21	16	15	14	15	15		15	15
3	15	15	14	14	15	15	17	15	15	15	16	17	17	17	15	15	15	15	15	15	15	15	15	15
4	15	14	15	14	14	15	17	15	16	16	18	17		18	18	22	15	15	16	14	15	14	14	15
5	15	15	15	14	15	15	14	15	20	17	18	17	17	16	15	22	17	16	15	15	15	15	16	
6	14	15	15	15	14		16	15	15	15	15	15	15	15	16	16	17	14	22	15	16	16	15	14
7	14	15	15	15	15	17	18	15	14	15	15	14	16	15	15	17	15	15	20	17	16	16	16	16
8	17	16	15	15	14	15	15	15	14	14	15	16	15	15	15	15	17	15	15	14	15	16	15	15
9	15	16	14	15	15	15	17	15	20	15	15	15	15	15	15	21	14	15	15	15	14		14	14
10	15	15	18	17	16	15	16	15	15	14	15	15	15		15	14	17	15	15	15	15	14	15	15
11	14	14	14	16	14			15	17	16	17	20	20	17	17	15	15	15	14	14	15	15	16	15
12	16	14	15	14	15	15	15	15		15	16	16	17	17	15	18	15	15	15	15	14	15	15	15
13	14	15	15	15	15	15	15	15	15	14	15	16	16	15	16	23	17	15		14	15	15	15	17
14	15	14	15	15	15	14		16	15	15	16	15	16	16		15	14	14	16	15	14	15	15	15
15	15	14	15	15	14	15	15	15	15	16	16	16	15	15	16	22	16	15	15	15	15	15	15	15
16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	14	15	15	15	15	15
17	15	15	15	15	14	15	16	15	15	15	15	15	15	15	16	20	17	15	15	16	14	15	15	15
18	15	16	15	15	15	B	20	15		15	15	15	15	15	14	15	18	15	15	15	15	15	15	15
19	14	15	15	17	15	15	15	16	15	15	15	16	15	15	16	17	18	17	14	15	15	B	16	16
20	16	15	16	15	15	15	16	15	15		15	15	16	15	15	15	20	16	15	16	16	14	15	15
21	16	15	14	15	15	15	15	15		15	16	16	16	16	16	16	18	15	15	15	15	16	15	15
22	15	15	16	15	16	14	15	14	17	16	16	17	16	16	18	16	20	16	15	15	15	15	15	14
23	15	15	15	15	15	14	16	16	22	17	16	17	20	20		26	20	15	15	15	15	16	15	16
24	16	15	15	15	17	16	15	15	18	17	18	17	18	16	17	20	16	16	15	15	15	15	14	14
25	15	15	16	16	16	15	15	15	16	18	18	18	17	18	17	15	15	16	15	14	15	16	15	14
26	15	15	15	15	15	15	15	16	15	24	32	14	37		23	20	20	15	15	15	15	15	15	15
27	15	15	15	15	15	14	15	16	23	29	20		35	33	29	18	17	15	15	15	15	15	15	15
28	15	15	15	15	15	14	16	16	17	24	18	18	18		18	18	22	15	16	15	15	14	15	15
29	15	14	14	15	14	15		16	15	17	20		17	17	15	18	17		17	15	15	15	16	15
30	15	15	15	15	15	15	15	15	22	17		20	18	18	17	17	15	16	15	15	16	16	15	16
31	15	16	16	15	15	15	15	15	15	17	20	20	18	20	16	26	16	15	15	15	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	31	31	31	31	28	27	31	28	30	30	29	30	28	29	31	31	29	30	31	31	27	31	30
MED	15	15	15	15	15	15	15	15	15	15	16	16	16	16	16	17	17	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	16	16	17	17	18	17	18	17	17	21	18	15	15	15	15	16	15	15
L Q	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15

HOURLY VALUES OF foF2 AT KOKUBUNJI

JAN. 1998

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	44	44	48	44	38	36	35	48	69		80	78	72	64	56	66	54	46	40	A	89	A	A	A
2	N	B	35	29	N	29	N	48	63	72	82	80	70	62	78	66	48	A	A	A	69	A	A	A
3	28	29	A	A	A	A	A	48	57	68	76	85	73	67	80	91	57	35	38	A	A		49	N
4	A	N	N	35	31	A	A	A	51	70	92	93	80	78	72	80	66	47	A	69	31	B	B	35
5		N	35	34	N	28	28	44	49	70	80	71	66	68	70	72	60	48	42	42	A		A	34
6	35		35	32	35	28	35	A	58	70	92	77	77	55	60	69	60	38			A	A	A	31
7	A	A	59		26	30	B	45	69	96	100	97	81	87	81	83	71	46	59	109	40	40	46	56
8	38	28		N	N	34	35	47	71		95	86	72	67	72	70	61	47		38		A	N	A
9	A	A	36	29	B		59	46	46	68	95	103	68	61	73	62	52		42	42		35	35	B
10	58	34		30	N	26	A	56	70	82	76	86	68	62	67		56	42	30	31		37	24	26
11	31	27		32	N	59	B	46	70	67	93	106	81	58	70	66	56	46	A	A	A	32	N	59
12	23	N	35	41	A	A	23	46	56	67	86	74	73	76	68	58	54	A	B	35	A	37	A	36
13		58	B	59	A	31	37	47	56	56	67	96	66		60	60	50	43	A	42	A	A	36	38
14	N	28	34	38	42	36	A	A	47	67	83	116	107	94	65	60	55	46		A	A	A	A	A
15	58	59	29	59	35	A	A	42		69	66	67	66	63					A	A	89	A	A	N
16	N	B	B	35	A	A	A	57					B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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		10		13	14	13	15	15	15	14	14	13	14	11						
MED				35		30		47	58	69	83	86	72	66	70	66	56	46						
U Q				42		36		48	69	71	93	97	80	76	73	76	60	47						
L Q				31		28		45	51	67	76	77	68	62	65	61	54	42						

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT KOKUBUNJI

JAN. 1998

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	26	26	G	G	26	G	32		40	40	40	30	31	30	30	G	26	44	37	34	29	29
2	G	B	G	G	G	G	G	G	45	47	29	29	30	30	28	42	44	47	49	53	34	49	33	33
3	29	G	56	52	36	40	49	G	29	30	38	33	34	42	29	48	28	G	50	56	58	36	28	40
4	31	G		29	36	52	56	44	48	55	55	52	61	53	28	30	42	35	34	G	G	B	B	G
5	G	G	G	G	G	G	G	G	50	31	42	32	30	27	27	25	G	G	G	28	50	29	44	29
6	29	G	G	G	G	G	G	40		28	29	30	29	29	28	26	32	29	26	G	32	56	41	27
7	31	29	25	G	G	G	B	27	34	38	87	47	30	38	40	40	40	32	G	G	G	G	G	G
8	G	G	G	G	G	G	G	G	30	38	35	41	30	32	30	26		27	G	G	G	28	26	34
9	30	29	29	G	B	G	G	G	28	30	32	33	34	42	34	31	G	G	G	G	G	G	G	B
10	G	G	G	G	24	28	29	28		34	47	42	38	34	53	44	40	G	G	G	29	G	G	G
11	G	G	26	26	G	G	B	G	28		82	42	50	40	36	31	G	28	53	51	61	G	34	28
12	25	G	G	G	24	28	34	25		27	30	32	34	36	32	27	34	33	B	53	50	30	31	G
13	G	G	B	30	34	G	38	28	49	43	50		32		30	30	G	G	29	28	28	29	G	G
14	30	G	G	30	G	G	48	49	33	34	28	26	40	36	29	31	G	28	G	24	59	40	33	29
15	G	G	G	G	G	38	48	66		52	45	40	44	36		G	G		29	28	24	29	29	G
16	G	B	B	30	38	49	45	32	32		30		B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	14	13	16	15	16	14	16	12	13	16	14	15	14	14	15	14	14	14	15	15	14	14	14
MED	G	G	G	G	G	G	32	26	32	34	39	36	34	36	30	30	29	28	26	28	32	29	29	28
U Q	29	G	26	29	34	33	48	36	46	45	48	42	40	40	34	40	40	32	34	51	50	36	33	29
L Q	G	G	G	G	G	G	G	G	29	30	30	32	30	30	28	26	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT KOKUBUNJI

JAN. 1998

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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

JAN. 1998

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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	B	B	96	100	83	56	40		A		N	25
4	A	N	69	31	36	A	25	32	61	68	81	100	110	132	128	123	120	83		43	48	44	N	
5	69	28	32		30	29	37		62	73	66	77	77	74	80	77	75	56	55	43	60	60		
6	28	A	30		32			59	61	57	74	90	97	85	80	84	83	61	A			59	N	32
7	42	36	A	69	N	30			60	80	87	96	85	82	80	76	80	63	54		49		C	C
8	C	C	C	C	C	C	C	C	C	78	78	84	81	74	65	68	70	65	38	43			34	59
9	49		31		B	59	25	37	52	59	70	93	86	69	71	71	74	53	49	52		59	59	31
10	32		N	23	N	29	25	31	61	69	87	89	75	67	65	71	62	54	32		59		32	59
11		69	38		59	25	37	35	50	83	97	104	102	74	70	74	60	66			69	34		49
12	32			59	69	C	C	C	C	71	83	70	70	81	72	68	55	56	A	N	39			59
13	43	34	31	44	35		32	N	70	61	72	75	81	74	66	66	72	65	42	34	32			59
14	69	29	32		54	B		59	60	84	80	96	108	106	110	78	57	70		28		79	79	30
15	N		26		30		B	27	60	74	75	72	67	71	66	63	67	67		69		41		
16	69	C	C	C	C	C	C	C	C	84	73	74	70	82	75	66	57	54	48	42			44	32
17		59	42	34	34	29		43		84	94	110	98	97	105	104	80	52	54	28	N	34	59	29
18			56	60				59	60	59	78	80	74	91	85	67	58	57		49		31	35	69
19	A	28		26	28	30		59	70	87	106	101	95	77	73	71	67	55	53	30		N	89	N
20	30	28		40	89	34	26		67	87	67	67	74	87	82	74	72	61	54	55	32		31	49
21	49		30	30		32		49	67	71	89	86	88	91	97	72	66	72	67	42		69	79	89
22			79	79	79		23		66	67	73	73	86	95	94	74	70	65	60	43		24	49	
23	79	36	56	60	64		38	43	62	67	72	85	90	81	81	74	82	88	74	42		43		
24	69	42			43	36		79	73	66	73	60	76	87	75	70	72	75	60		44		59	
25			53	59		34	37		69	70	76	77	97	101	71	70	83	85	53		29			79
26	37		59	56				79	61	72	78	67	72	80	76	74	70	65	39	31	44		79	
27		37		69		60	43	45	66	72	66	82	71	75	84	81	82	83	55	38	43	49	42	32
28	32	32		59	59	36	31		70	73	71	82	71	91	78	78	72	66		40	43			69
29		49	32	42		26	37		69	63	66	67	78	97	C	C	C	C	50	60	59	39		
30	37		59			34		59	69	73	86	87	92	87	70	74		86		36			26	69
31	69					30	26	N	54	68	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	13	17	17	15	16	14	16	24	28	27	27	27	27	27	27	26	27	19	20	14	14	15	18
MED	43	36	38	56	43	31	32	47	62	72	76	82	81	82	78	74	72	65	53	42	44	44	49	54
U Q	69	45	57	60	64	35	37	59	69	79	86	93	95	91	85	78	80	72	55	46	59	59	79	69
L Q	32	28	31	32	32	29	25	36	60	67	72	73	74	74	71	70	66	56	42	35	39	34	34	32

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

JAN. 1998

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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	B	B	32	32	29	G	G	G	25	G	G	29
4	28		G	G	G	25	G	G	23		36	31	51	88	61	51	39	32	G	G	G	24	G	G
5	G	G	G	G	G	G	G	G	24	28		38	31	31	30	29	24	G	28	G	G	G	27	28
6	29	27	G	G	28	G	G	G	26	30	50	39	44	44	38	40	40	38	33	G	25	G	G	G
7	G	G	32	G	G	G	G	G	25	40	50	50	32	33	40	45	30	32	32	G	G	G	C	C
8	C	C	C	C	C	C	C	C	C	25	31	32	31	31	43	32	31	G	G	G	G	G	G	G
9	G	G	G	26	B	G	G	G	22	27	30	32	30	32	32	33	30	G	G	G	G	G	G	G
10	G	G	G	G	G	G	G	G	G	32	38		32	32	32	29	G	38	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G	27	26	32	G	39	50	50	33	27	G		G	G	G	G	G
12	G	G		32	26	C	C	C	C	32	30	28	G	G	G	30	58	32	41	43	32	30	G	G
13	G	30	29	G	G	28	G	G	26	32	38	G	44	46	31	28	26	25	G	G	G	G	G	G
14	G	G	G	G	G	B	G	G	24	25	27	G	31	30	32	29	25	32	G	28	G	G	27	G
15		G	G	G	G	G	B	G	31	32	33		66	45	47	60	41	G	G	G	G	G	28	G
16	G	C	C	C	C	C	C	C	C	32	28	30	32	37	32	29	28	27	G	27		30	G	G
17	G	31	26	31	26	G	G	G	28	32	59		54	43	30	28	26	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	30	30	32		40		45	36	45	26	32		31	27	30	26
19	32	28	32	30	G	G	G	G	G	G	32	26	31	28	26	45	28	26	G	G	G	G	G	G
20	G	G	G	G	G	G	G	G	G	26	28	29	28	32	32	30	32	G	G	G	G	G	G	G
21	G	G	G	G	G	G	G	24	22	44	31	30	32	29	30	29	29	22	G	G	G	G	G	G
22	G	G	G	G	G	G	G	G	G	26	28	32	32	32	G	35	G	G	G	G	G	G	G	G
23	G	G	G	G	G	G	G	G	G	G	G	G	38	G	G	G	57	G	G	G	G	G	G	G
24	G	G		G	G	G	G	G		G	G	N	40	G	G	G	G	28	G	30	G	G	G	G
25	G	G	G	G	G	G	G	G		G	G	37	39	38	G	G	G	G	25	G	28	G	G	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
27	G	G	G	G		G	G	G	G	G	G	N	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G		G	G	G	G	G
29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	C	C	C	C	G	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	51	51	G	G	38	G	G	G	G	G	27	G
31	25	G	G	G	G	G	G	24	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	25	24	26	24	24	24	25	22	27	26	21	27	26	27	27	27	27	26	27	27	28	27	27
MED	G	G	G	G	G	G	G	G	22	26	30	29	32	32	31	29	28	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	26	32	33	32	40	43	38	35	38	28	G	G	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	30	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

JAN. 1998

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	B	B	17	17	16	16	14	15	15	14	15	15
4	18	14	16	14	14	17	17	14	17	18	17	18	17	17	18	17	17	16	17	15	16	16	16	16
5	14	14	15	14	14	14	14	14	20	18	17	20	21	21	20	18	24	17	15	15	15	14	14	15
6	14	14	15	14	14	14	15	15	17	18	17	18	18	18	18	18	17	18	16	15	15	14	15	15
7	15	14	15	16	15	14	16	14	16	17	17	17	18	18	17	17	15	15	16	17	14	14	C	C
8	C	C	C	C	C	C	C	C	C	16	16	17	18	18	18	18	16	16	14	14	14	14	14	14
9	15	15	14	16	B	14	14	14	20	28	18	18	18	18	17	16	16	16	16	14	14	14	14	14
10	14	14	15	14	14	15	15	14	18	16	18	21	18	18	18	17	22	21	14	14	14	14	14	14
11	14	14	15	14	14	14	14	14	20	18	17	41	18	18	18	17	16	15		16	14	15	15	14
12	14	14		14	15	C	C	C	C	17	18	18		43	40	18	17	16	14	16	16	15	14	14
13	14	15	15	14	14	14	14	14	18	17	18		20	18	18	18	17	18	14	15	14	15	15	14
14	14	14	15	14	15	B	20	14	16	16	18		15	21	20	18	18	17	14	14	14	17	15	16
15	17	14	14	15	16	15	B	14	20	20	21		23	20	20	17	17	18	14	16	14	14	16	15
16	17	C	C	C	C	C	C	C	C	18	20	18	18	21	20	18	17	15	14	15	15	15	14	14
17	15	17	15	15	15	14	14	14	15	18	17	18	18	18	20	17	17	18	16	15	14	16	14	14
18	14	14	14	15	14	14	14	14	15	16	21	18	18	23	18	18	16	15	14	15	14	14	14	16
19	15	16	15	15	14	15	14	14	18	23	18		42	20	20	18	17	16	14	14	14	14	14	16
20	14	14	14	15	14	14	14	14	18	18	18	20	21	20	18	20	17	17	14	14	14	14	15	18
21	17	14	15	14	15	14	14	16	15	17	22	18	20	18	20	18	18	20	14	15	14	14	15	14
22	14	14	14	14	14	15	14	14	20	20	18	20	20	21		18	29	23	14	15	14	16	15	15
23	14	14	14	14	14	15	14	14	21	17		33	40	43	23	29	18	18	16	14	14	14	15	15
24	15	14	14	14	14	14	14	14	17	24		22	20	21	20	20	26	16	15	15	15	14	15	14
25	14	14	14	14	14	14	15	14	22	18	21	20	21	23	20	20	18	18	16	15	15	15	14	15
26	14	14	14	14	14	14	14	14	20	18		21		22	23	20	18	17	14	14	14	14	14	15
27	14	14	14	14	14	14	14	14	20	24	20	20	20	21	20	18	28	20	14	15	16	15	14	14
28	14	14	14	14	14	14	14	14	18		36	41	20		20	18	17	22		14	14	14	15	15
29	14	14	14	14	14	14	14	14	16	17	18	21	21		C	C	C	C	14	14	14	15	14	14
30	14	14	15	14	14	14	14	14	16	20	18	20	21	21	18	20	17	20	15	14	14	14	16	15
31	15	15	14	14	15	14	14	14	18	18	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	26	25	26	25	24	24	25	25	27	24	23	25	25	26	27	27	27	26	28	28	28	27	27
MED	14	14	14	14	14	14	14	14	18	18	18	20	20	20	20	18	17	17	14	15	14	14	15	15
U Q	15	14	15	15	15	14	14	14	20	20	20	21	21	21	20	18	18	18	16	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	16	17	17	18	18	18	18	17	17	16	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT OKINAWA

JAN. 1998

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		59	35	41	43			A	A	66	70	A	91	116	84	93	77		61	A	A	47		B
2	35	B	A	31	A	A	B	59		83	95	96	116	132	116		92	83	69	A	58	46	A	B
3	B	A	A		40	A	A	A	51	80	94	86	95	120	124	133	121	99	A		48	68	N	59
4		30	A	A	31	A	B	32	53	68	87	102	127	154	133	121	118	133	83		A	48	46	46
5		38		69	38		59	37	65	69	67	71	92	116	117	125	133	87	67	A	A	A	43	48
6	32	A	A	38	30	45	57	63		70	69	94	123	155	133	125	131	126	83	A	67	42		A
7	69	A	A		24	28				94	95	95	93	80	82	72	82	82			58	44		44
8	A	A	A	B	A	B	B		71	76	86	84	97	86	82	75	83	93			51	43	37	
9	69	48	49	B	B	A	A	A	49	69	70	64		83	81	82	70		56	A	53	44		69
10		N	59	69	N	B		A	A	59	69	100	91	66	63	60	62	59	A	A		42		B
11	30				B	B	A	A	52	77	111	124	116	105	96	80	62	61	A	A	A	54		A
12	56		37		A	A	A		A	81		90	86	104	91	66	57	56	A	A	A	36	A	69
13	37	35		A	59	A	A		70	69	89	78	95		121	85	62	53	A	32			44	
14	B	B	N	69	69	69	A		A	65	91	94	130	125	120	115		69		A		46	A	B
15	B	A	A	A	49		B		A		103	70	88	116	116	101	83	66	70	A	50	57	69	B
16	B	B	B	30		69	35	35		76		90	91	112	N	74	61	63		A		58	47	
17	B	30		35	37	B	B		A	74	83		122		109	126	114		70	A		47	46	
18		34	44		B	B	59		61	69	83		78	92	112	82	65	66	51	A	A	44	44	47
19	B	55	41	B	A	A	A	A	60	83	124	124	104	116	116	121	82	58	69	A	69	58	47	44
20	A				B	B	56		52	82	86		80	94	92	110	110	61	64	A	59	43	43	
21		B	B	35		B			A	84	81	93	90	93	127	106		80		A	44	30	43	B
22	B	69	36		43	B	69	40	43	81	83	79	85	95	111	117	95	71	63		43	37	B	
23	A	89		34	35			37	60	69		94	78	110	96	93	90	94	88	A	60	68	72	
24	35			37		N	B	69	38	61	68	69	70	96	91	82	82	73		139	44	35		89
25				58		69		49	42	65	88	93	104	120	124	116	124	106	86	A	53	59	50	
26	B	89		59	38			42	52		78	80	68	77	86	94	86	83		A	58	55	52	
27	69			38		46		49	60	68		70	74	75	91		87	93	87		44	43	44	39
28		59	49	35			29		40	67	70	72	88	73	121	95	94	71	64	64	60	55	69	
29	B	B	58	42			A		51	70	68		78	114	116	107	92	81	66		55	58		44
30	47		35	36			38		62	75	81			96	86	87	105	98	85	A	69	86		47
31		59	58	34	A	29	38	59	63	70	85	82	86	92	85	76	80	79		A	44	47	43	
	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	13	11	18	13			12	20	29	27	25	29	29	30	29	29	28	18		20	29	17	12
MED	42	55	44	38	38			46	52	70	83	90	91	104	110	94	86	80	69		54	47	46	47
U Q	69	64	58	58	46			59	61	80	91	94	104	116	120	116	107	93	83		59	57	51	64
L Q	35	34	36	35	33			37	50	68	70	75	82	89	86	81	73	64	64		46	43	43	44

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

JAN. 1998

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	25	G	G	27	40	49	34	37	72	62	47	51	82	66		26	41	29	27	G	B
2	G	B	35	30	33	24	B	G	31	36	45	33	36	36	38		36	32	27		G	G	34	B
3	B	26	28	24	G	35	34	24	38	50	45	66	51	64	48	44	39	33	48		24	32	28	G
4	24	G	40	34	31	26	B	33	47	35	34	38	41	56	53	84	62		50	44	32	24	25	27
5	G	G	G		G	G	G	G	29	36	52	61	50	59	50	37	34	29	28	49	41	40	40	27
6	G	40	31	26	32	25	25	48	43	30	50	57	42	58	41	40	43	42	44	49	39	43	G	
7	28	30	24	G	28	29	G	G		35	50	49	44	39	30	36	34	30		G	G	G	G	G
8	29	32	29	B	25	B	B	G	38	31	33	42	42	38	43	36	35	34		G	G	G	G	G
9	G	G	G	B	B	26	24	34	27	30	34	35	50	53	44	35	38	40	39	38	G	G	G	G
10	G	G	G	G	G	B			44	51	40	42	44	50	64	42	37	37	36	33	G	G	G	B
11	G	24	G	G	B	B	24	41	26	33	42	40	48	53	48	58	36	34	34	36	43	31	G	34
12	G		G	28	26	48	27	G		33	38	36	34	34	40	40	50	34	64	35	42	25	26	G
13	G	G	G	38	38		32	G	51	39	43	39	47		65	45	41	29		37		33		G
14	B	B	G	G	G	G	40	G	45	32	35	30	35	34	38	32	29			48	G	G	29	B
15	B	27		31		G	B	G	43		50	45	49	76	80	50	33	29	33		G	G	G	B
16	B	B	B	27	G	24	28	41	38		38	37	34	40	42	36	35	30		32	G	G	G	G
17	B	34		25	G	B	B		34	41	38	66	60	67	65	41	40		66	36	G	G	G	28
18	G	G		G	B	B	24	G	48	38	39	46	45	49	43	69	39	32	24	24	24	32	G	G
19	B	G	G	B	32	40	29	28	26	32	34	42	34	38	36	33	34	42	32	36	G	G		G
20	25	G	G	G	B	B	G	G	22	27	35		31	49	39	37	38	28	26	28	35	27	G	G
21	G	B	B	G	G	B	G	G	27	35	38	42	44	39	44	37		40		30		G	G	B
22	B	G	G	G	G	B	G	G	27	33		44	42	43	38	G	42	36	33	35	G	G	B	G
23	29	G	G	24	G	G	G	G	G	G	36	G	43	40	46	43	40		32		G	G	G	G
24	G	G	G	G	G	G	B	G		38	36	38	G	39	40	38	G	37		G	G	G	G	G
25	G	G	G	G	G	G	G	G		34	38	G	47	46	40	G	34	30		34	G	G	G	G
26	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	33			G	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	N	40	50	38	41	37	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G		33	36	44	52	57	G	38	G	G	G	G	G	G	G	G
29	B	B	G	G	G	25	24		33	38	36	38	44	44	42	G	G	32	33	G	G		36	G
30	G	G	G	G	G		G		28		40	40	46	39	39	38	38	39	32		G	G	G	G
31	G	G	G	G	25	G	G		32		52	63	52	56	40	37	G	32		39			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	22	25	26	27	26	21	24	26	26	27	30	29	31	30	31	30	30	26	21	25	28	29	28	24
MED	G	G	G	G	G	G	12	G	32	34	38	42	44	46	42	38	36	32	33	35	G	G	G	G
U Q	G	25	G	26	26	26	27	28	43	38	43	47	49	56	48	43	40	37	41	38	26	27	13	G
L Q	G	G	G	G	G	G	G	G	27	31	35	36	36	39	38	36	34	30	26	12	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

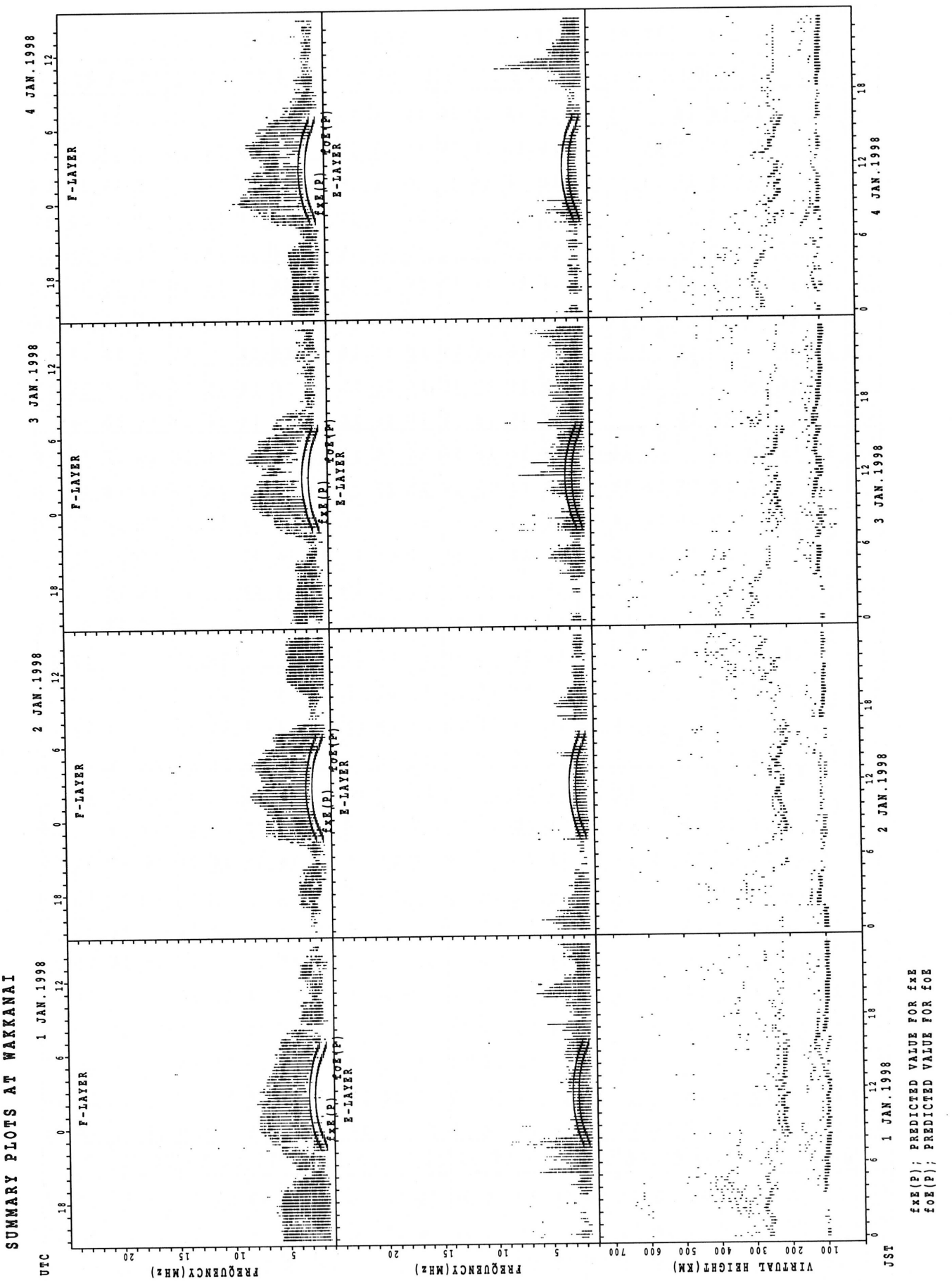
HOURLY VALUES OF fmin AT OKINAWA

JAN. 1998

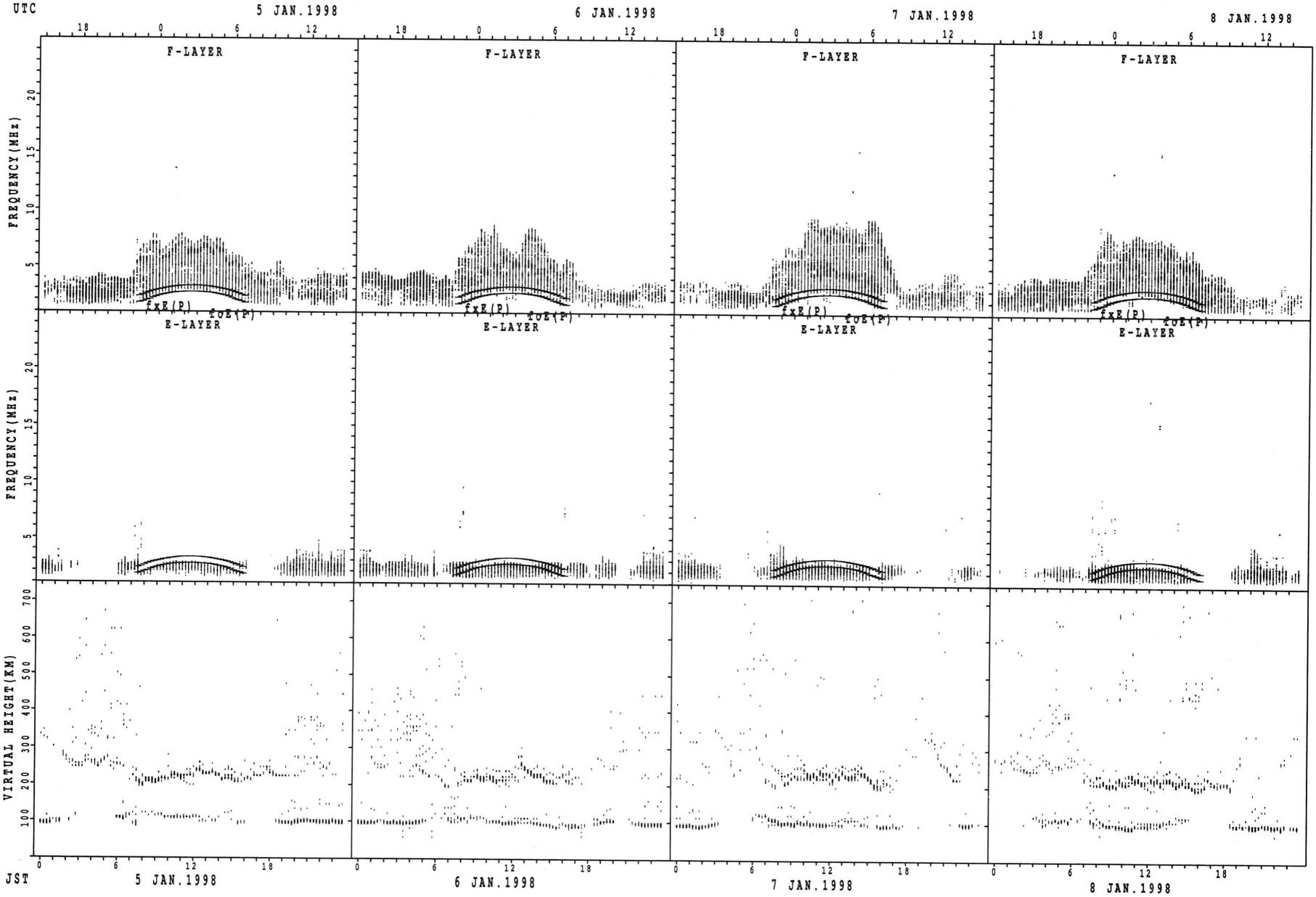
LAT. 26.3N LON. 127.8E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

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

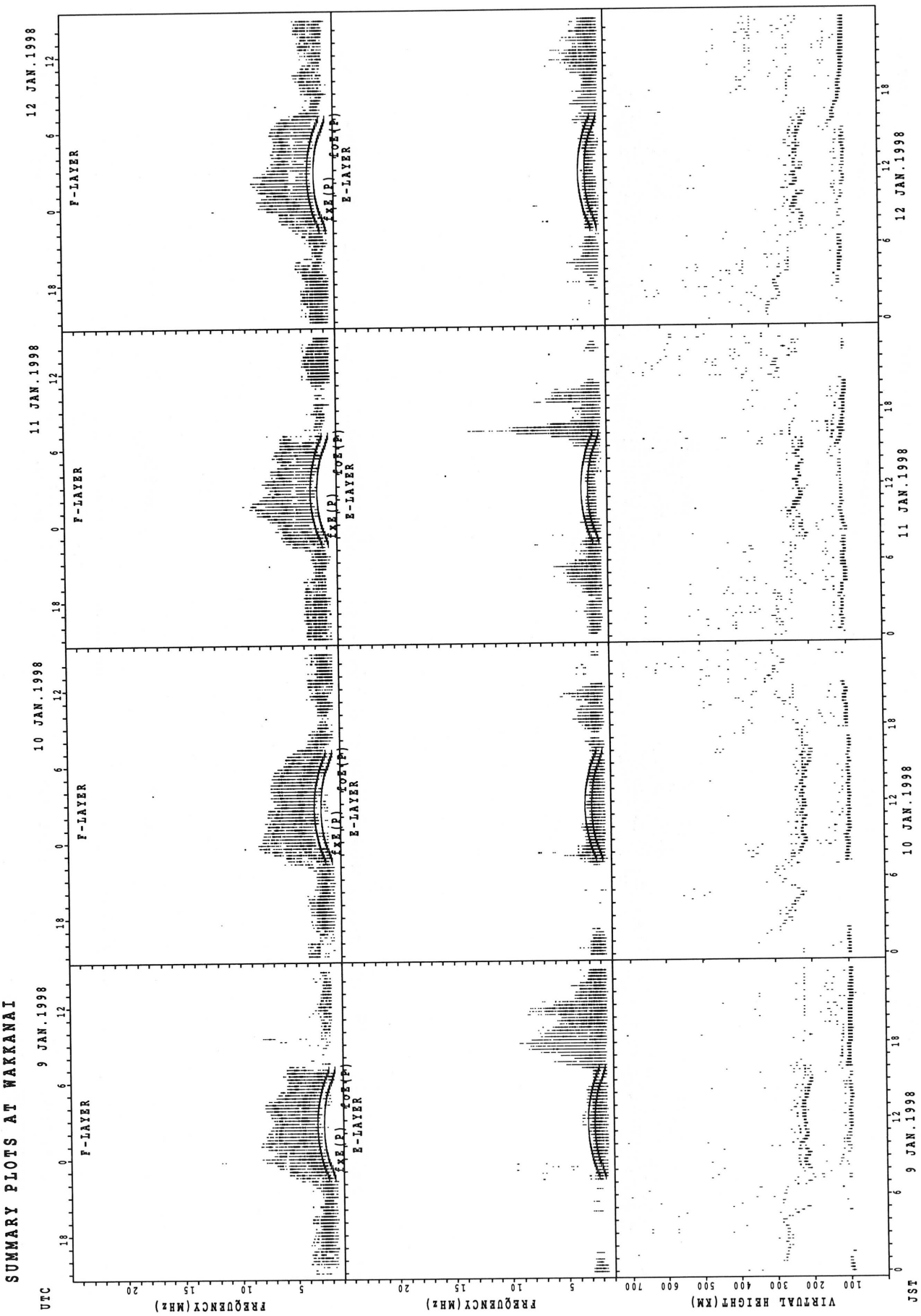
COMMUNICATIONS RESEARCH LABORATORY, JAPAN


SUMMARY PLOTS AT WAKKANAI
UTC
JST
1 JAN.1998
2 JAN.1998
3 JAN.1998
4 JAN.1998
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

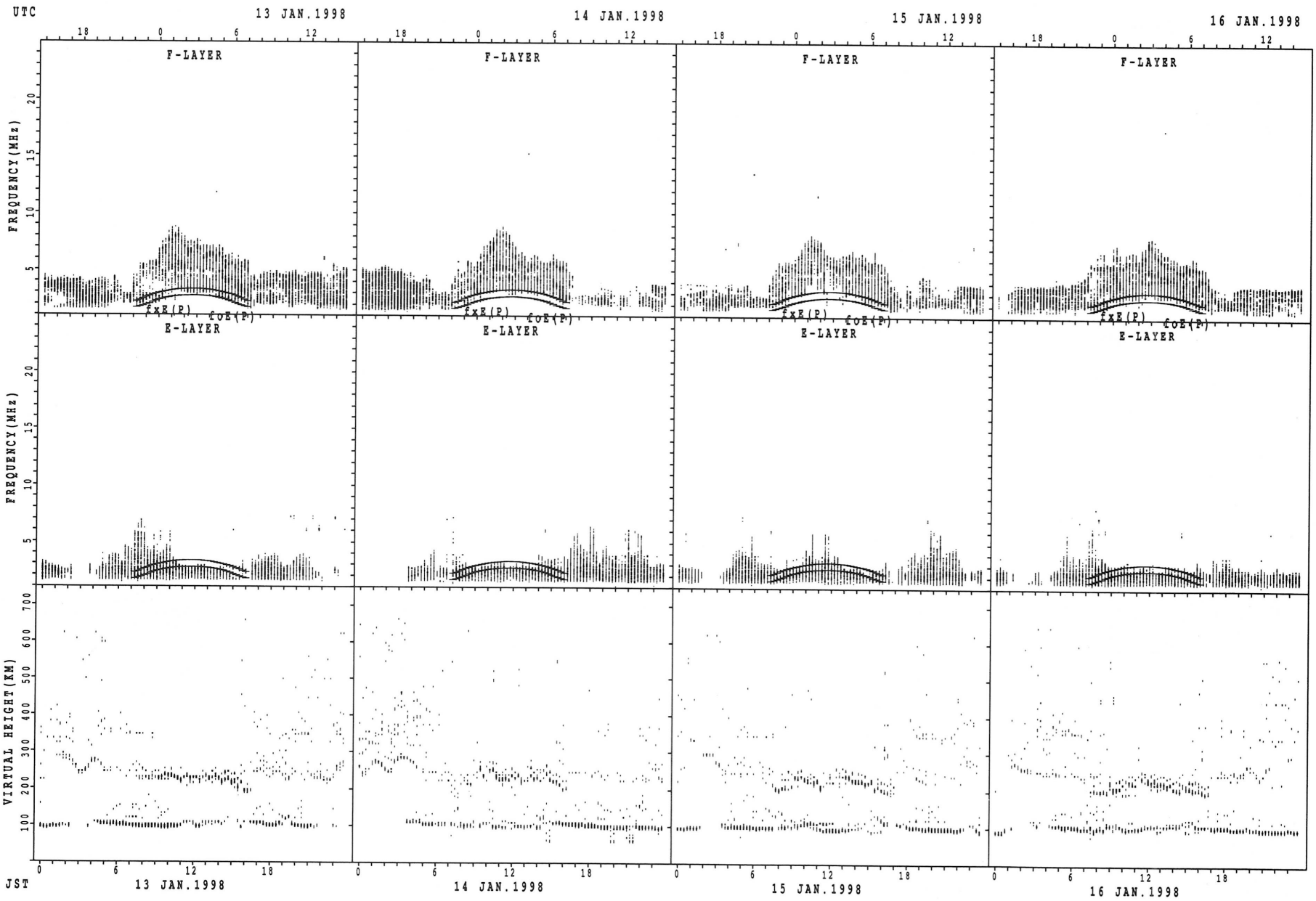
SUMMARY PLOTS AT WAKKANAI



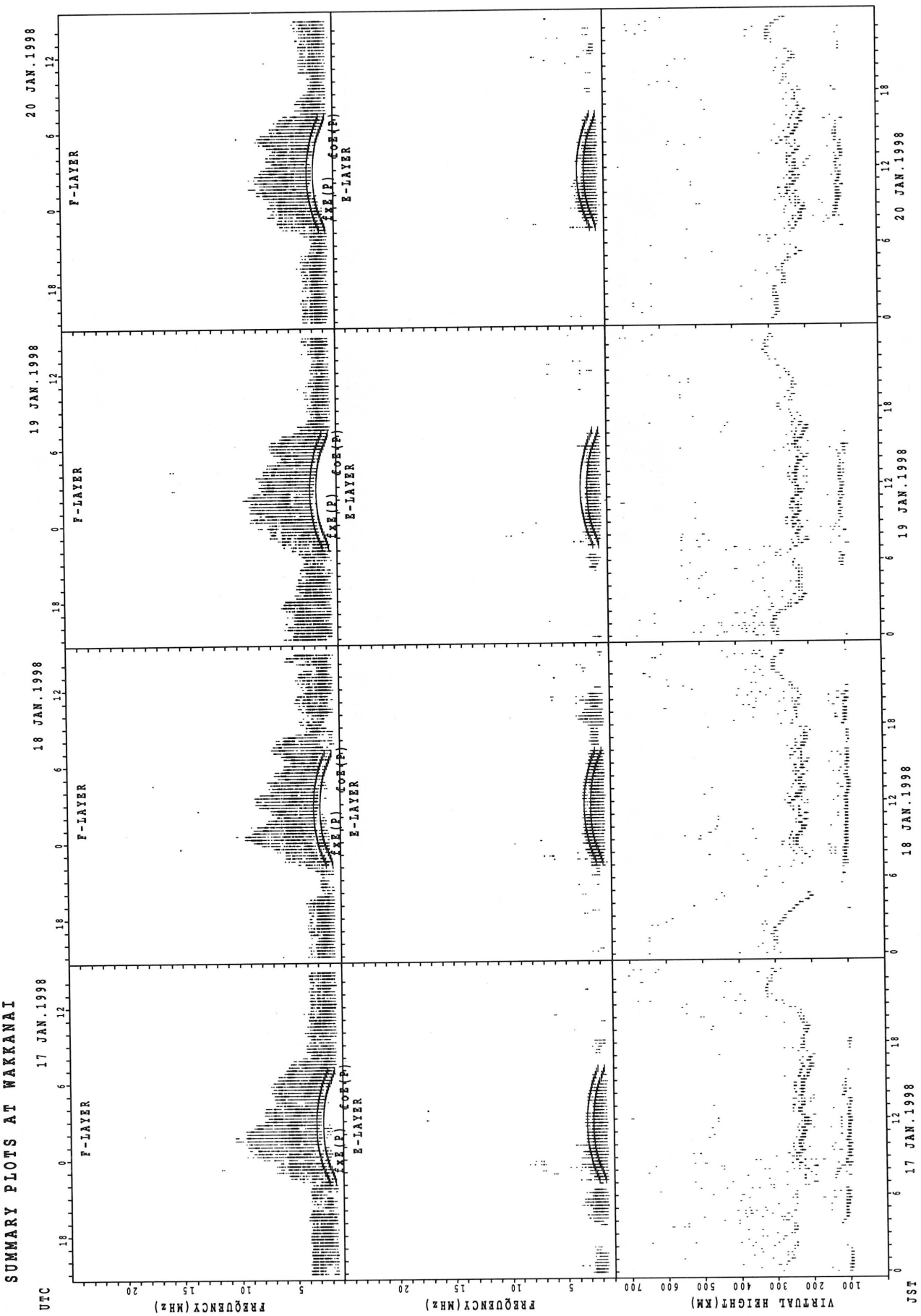
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
9 JAN.1998
10 JAN.1998
11 JAN.1998
12 JAN.1998
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P), foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

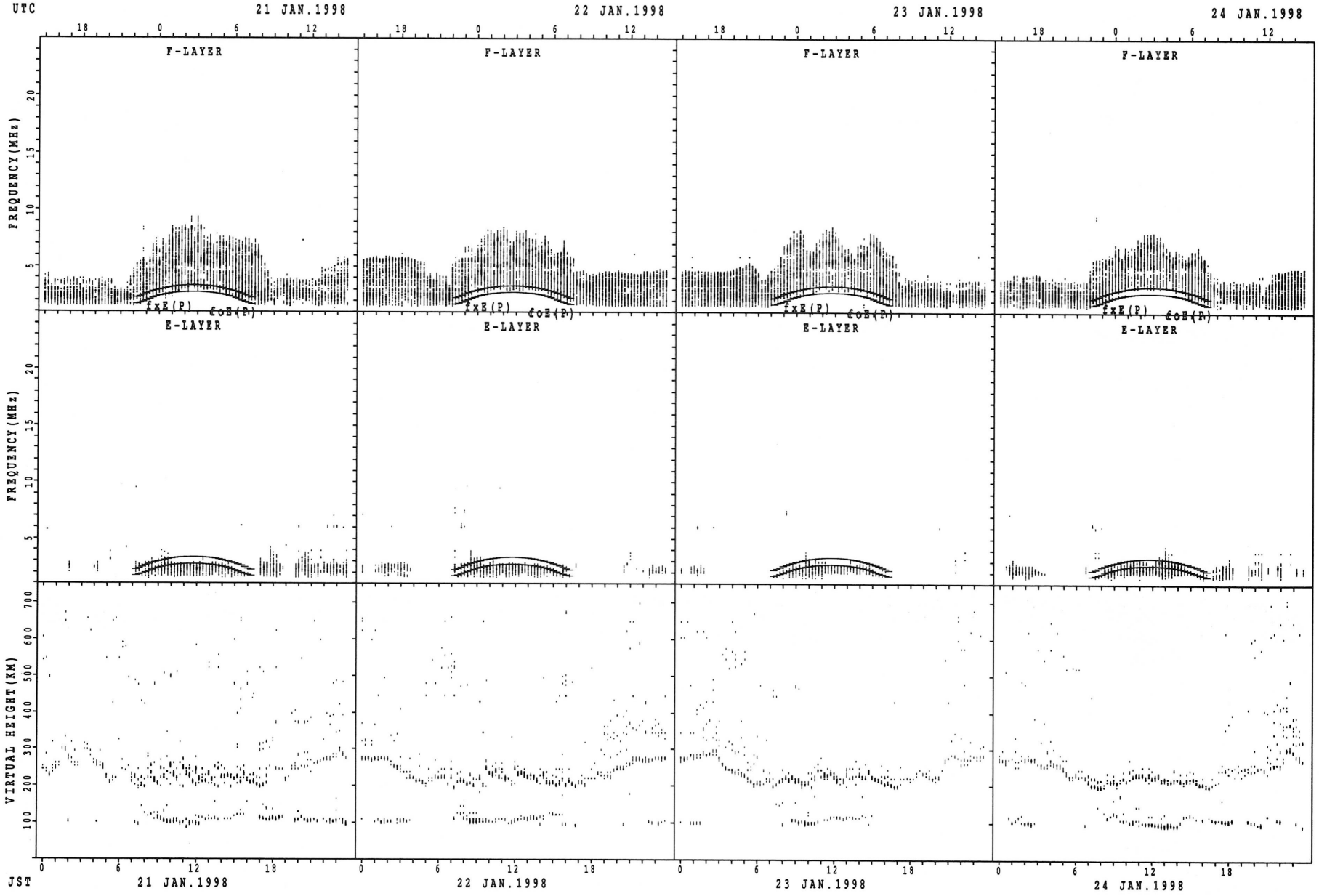
SUMMARY PLOTS AT WAKKANAI



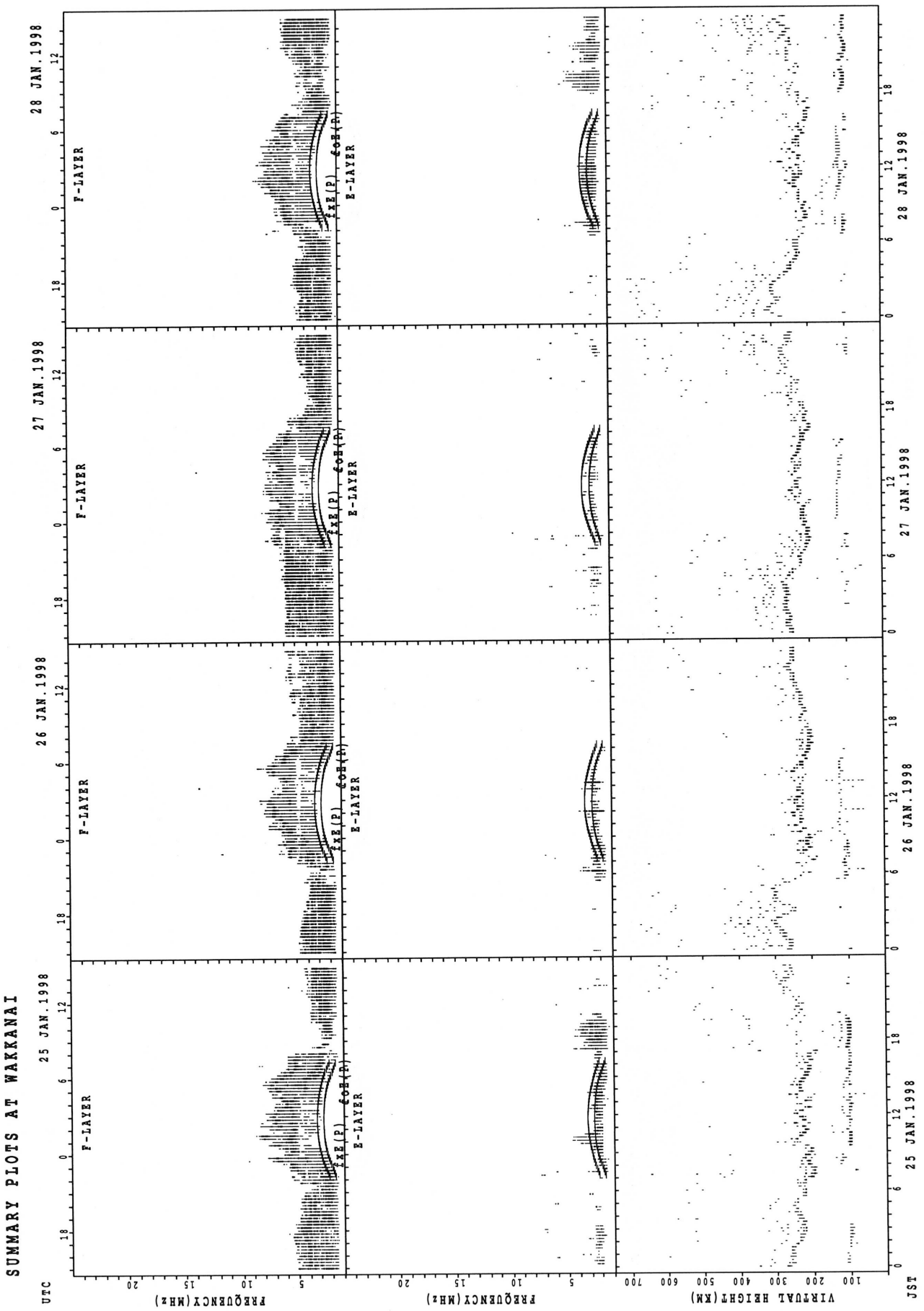
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
17 JAN.1998
18 JAN.1998
19 JAN.1998
20 JAN.1998
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

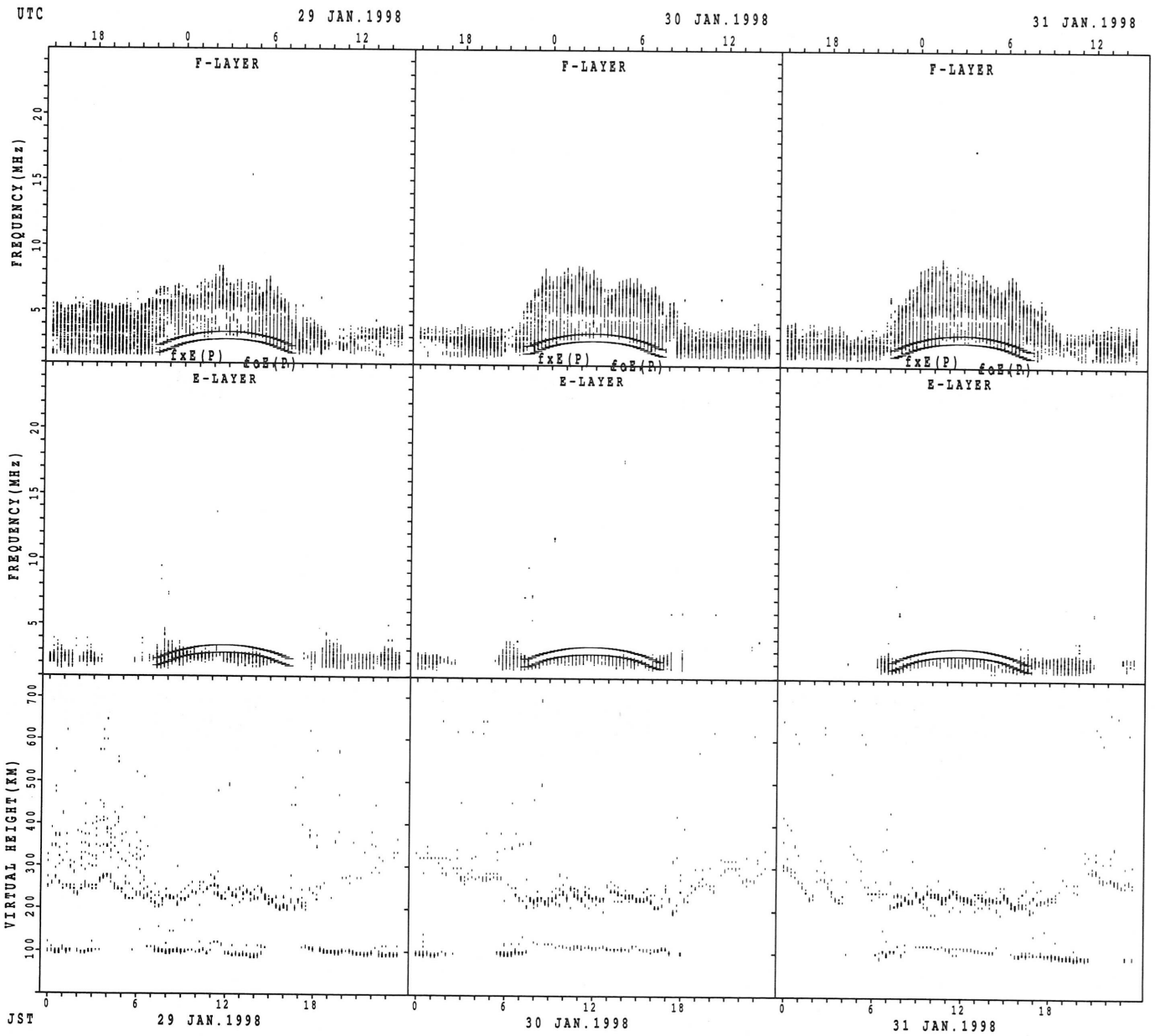
SUMMARY PLOTS AT WAKKANAI



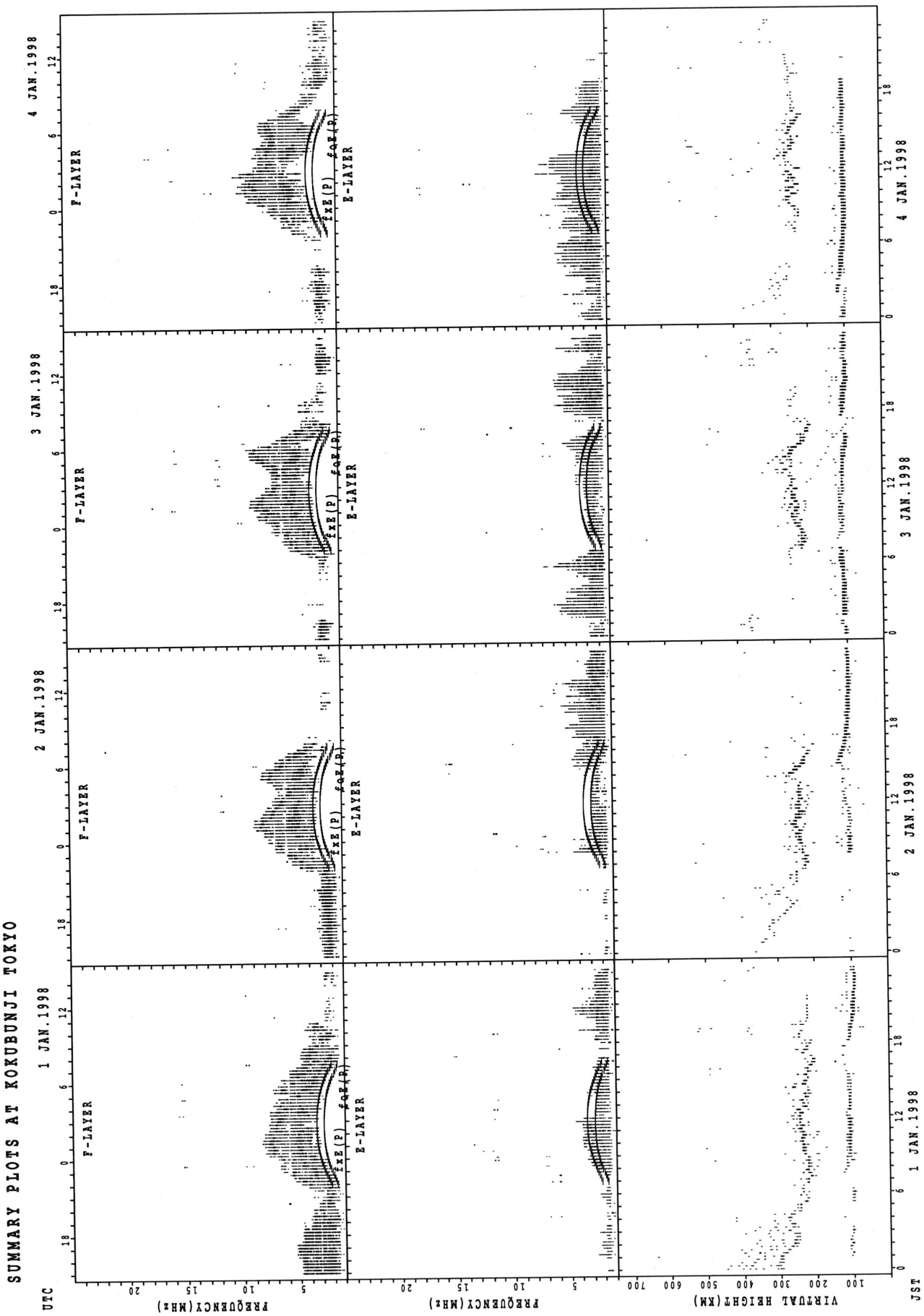
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
25 JAN.1998
26 JAN.1998
27 JAN.1998
28 JAN.1998
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

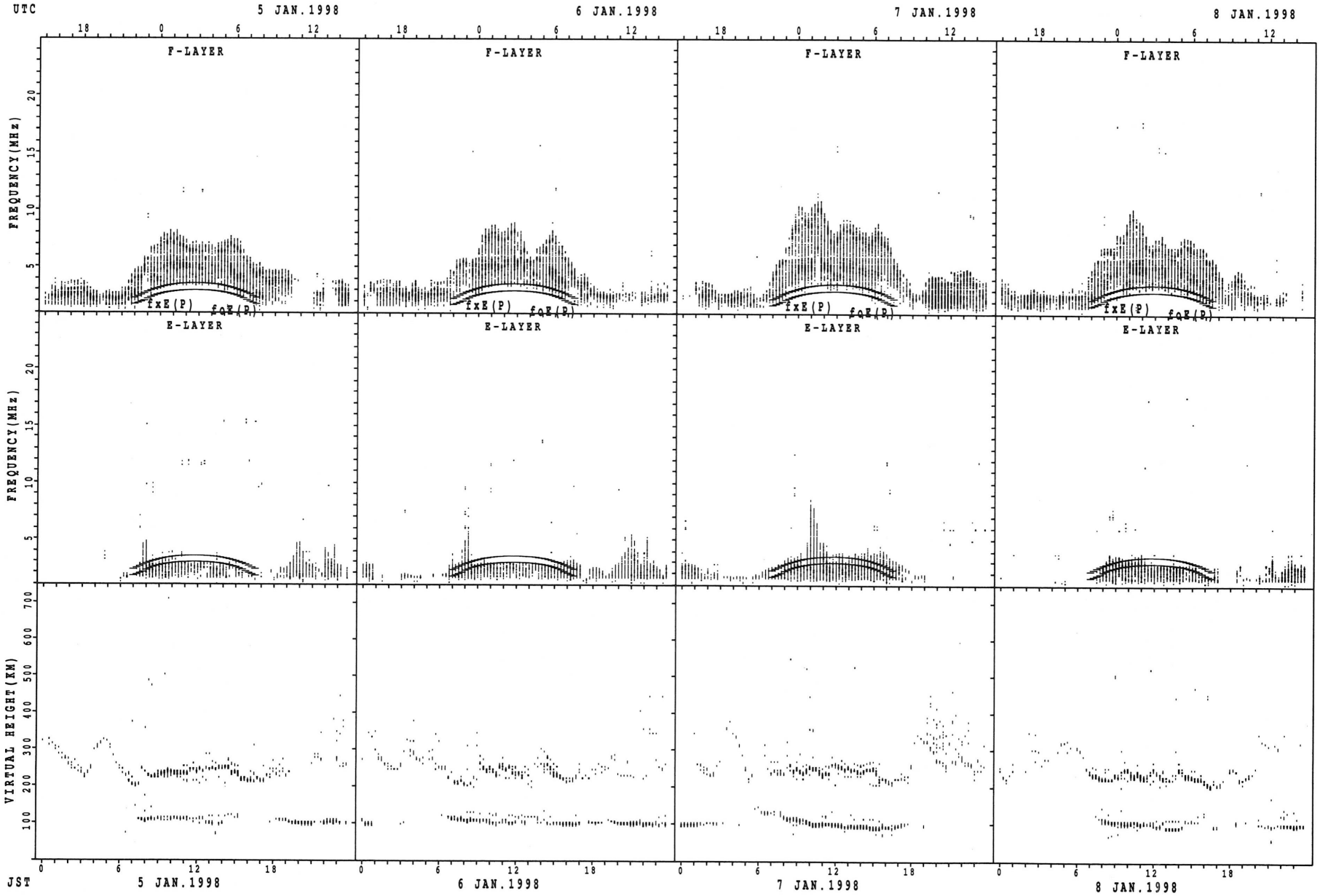
SUMMARY PLOTS AT WAKKANAI



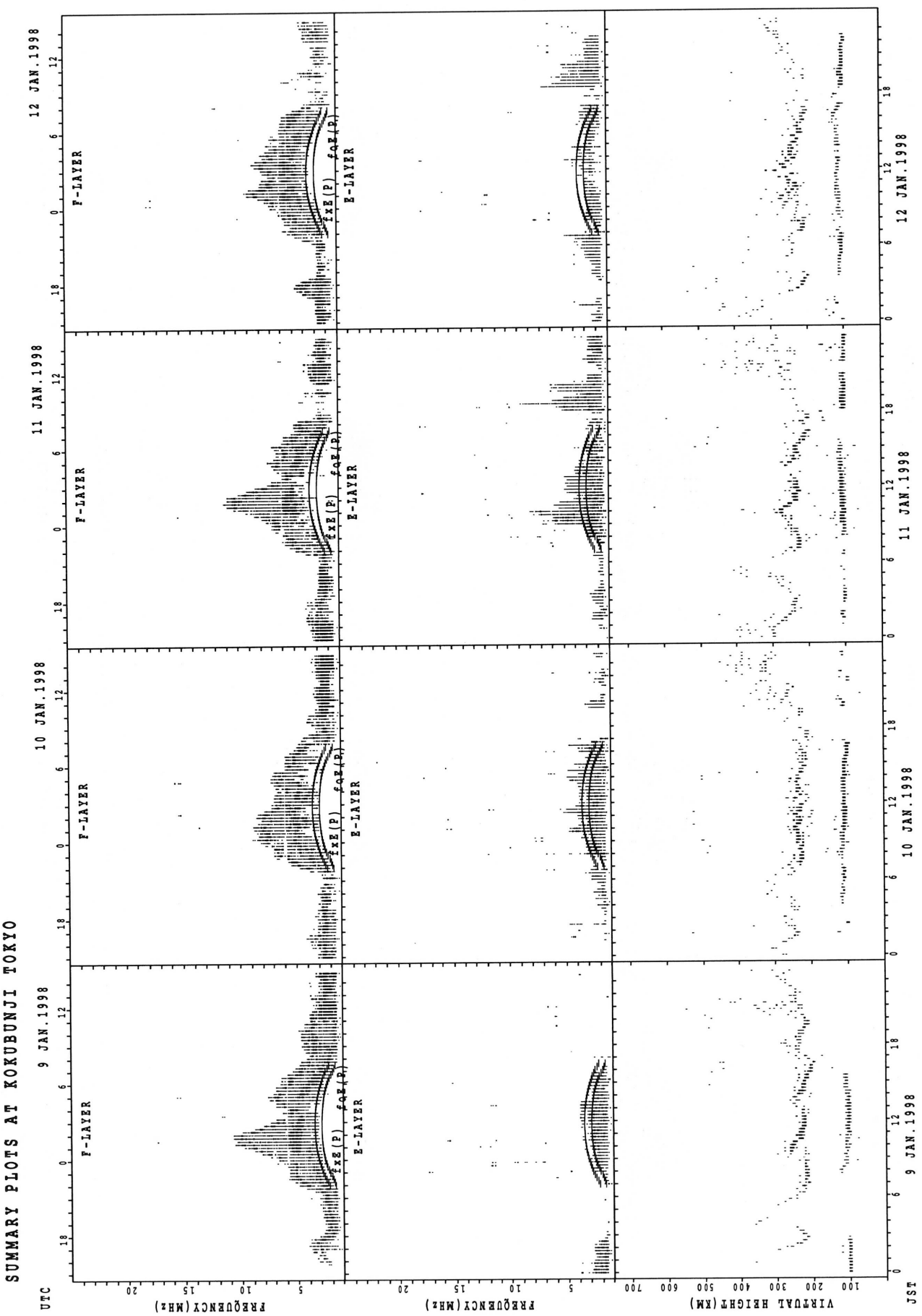
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
1 JAN.1998
2 JAN.1998
3 JAN.1998
4 JAN.1998
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

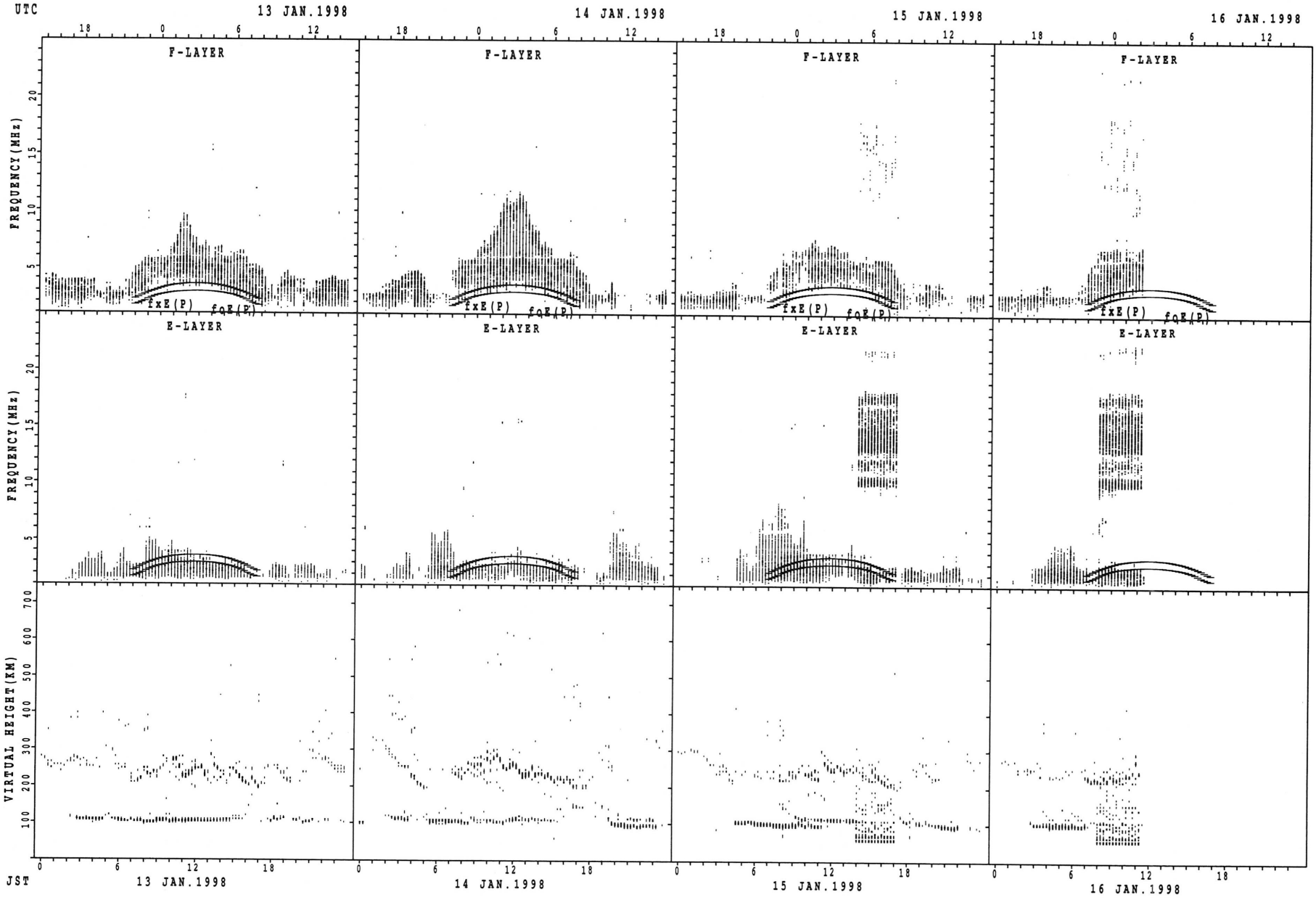
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

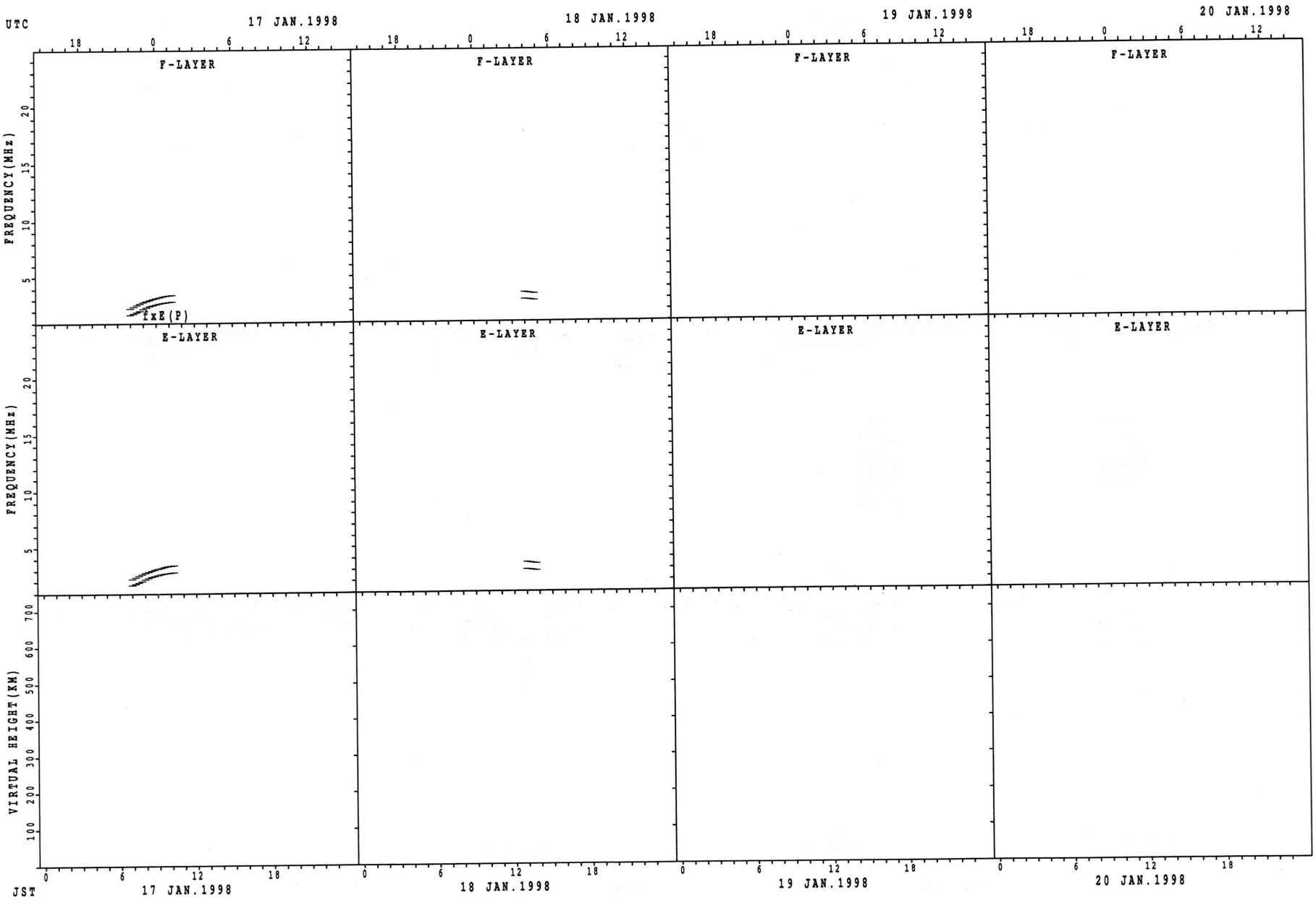

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
9 JAN.1998
10 JAN.1998
11 JAN.1998
12 JAN.1998
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



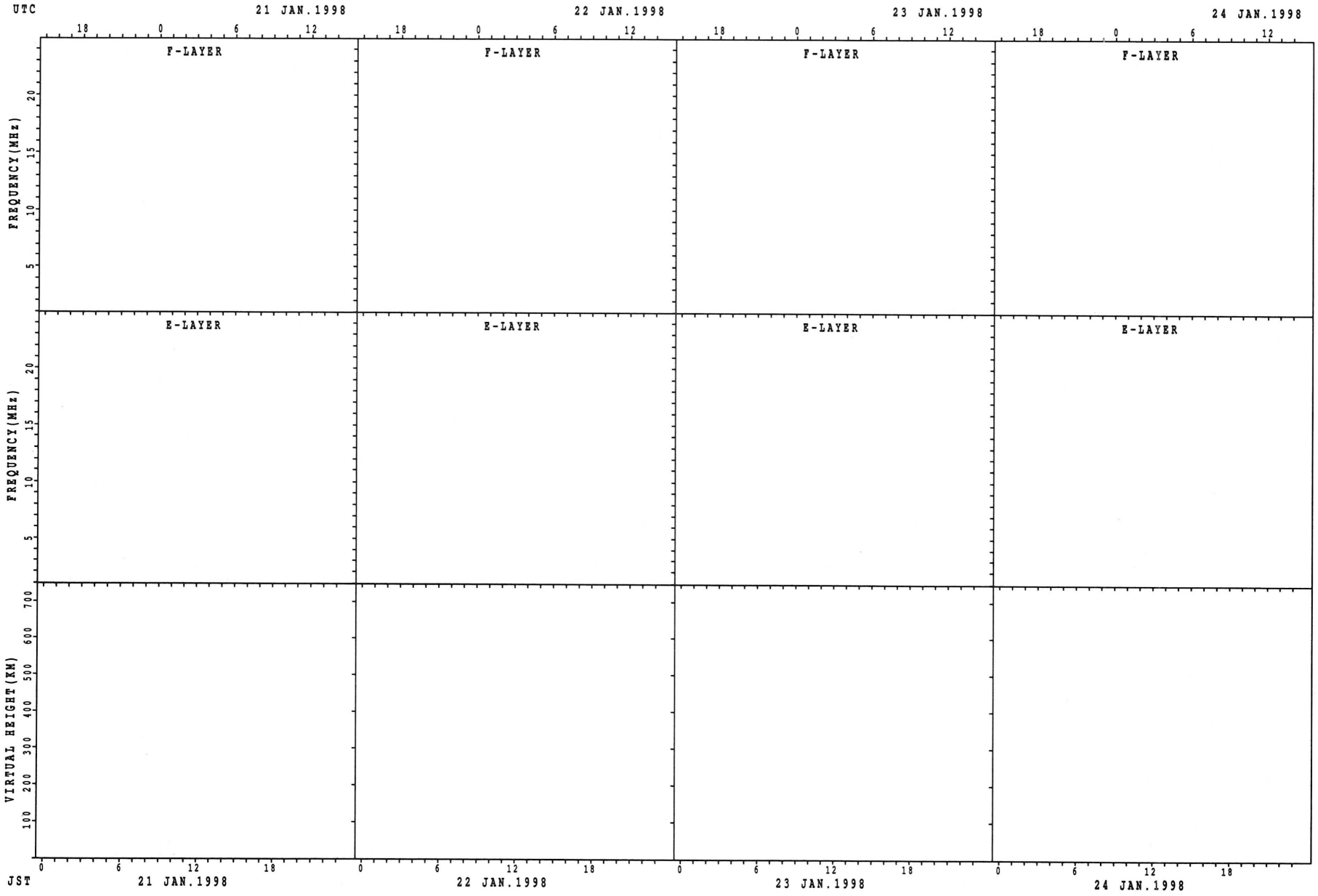
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



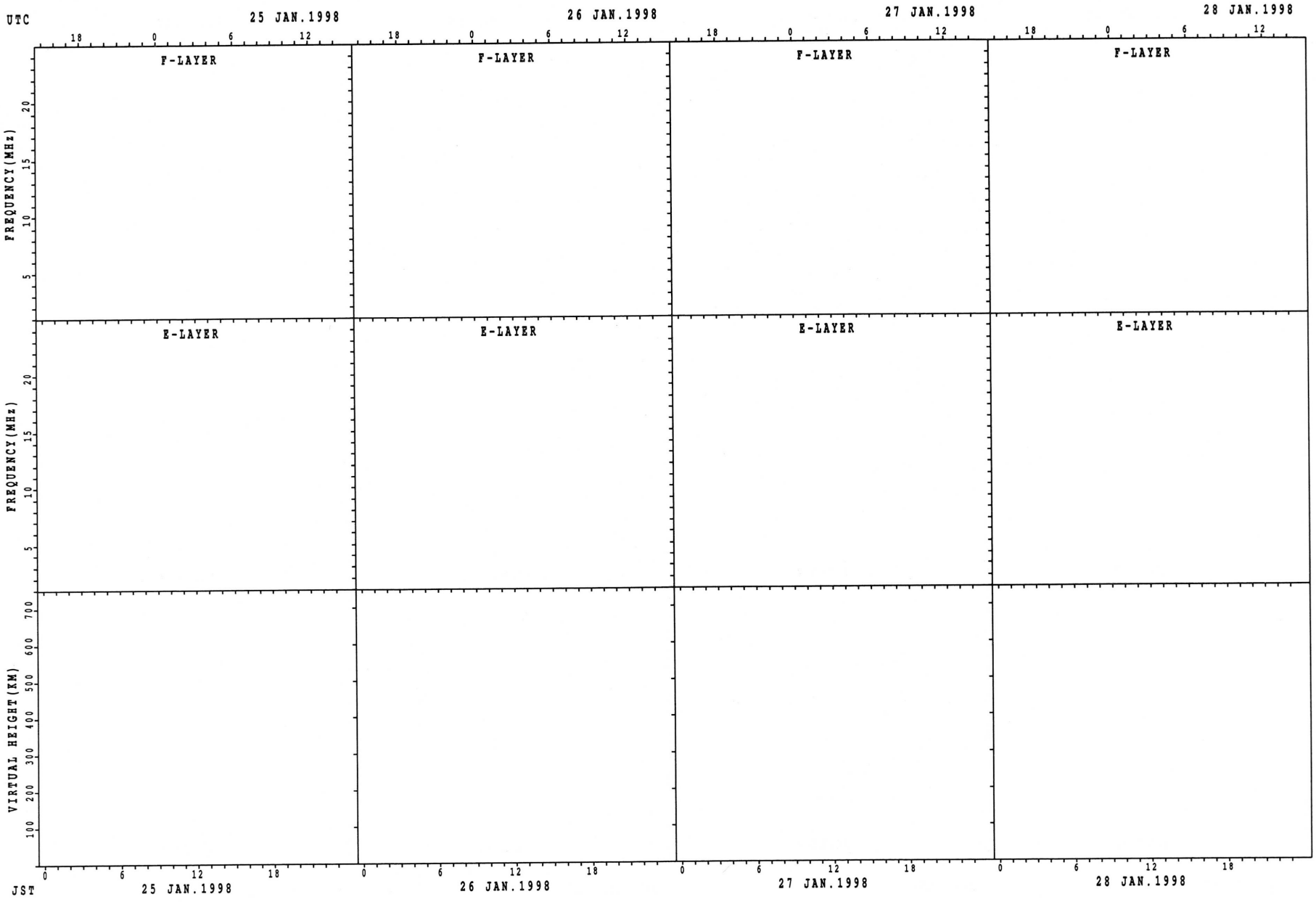
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



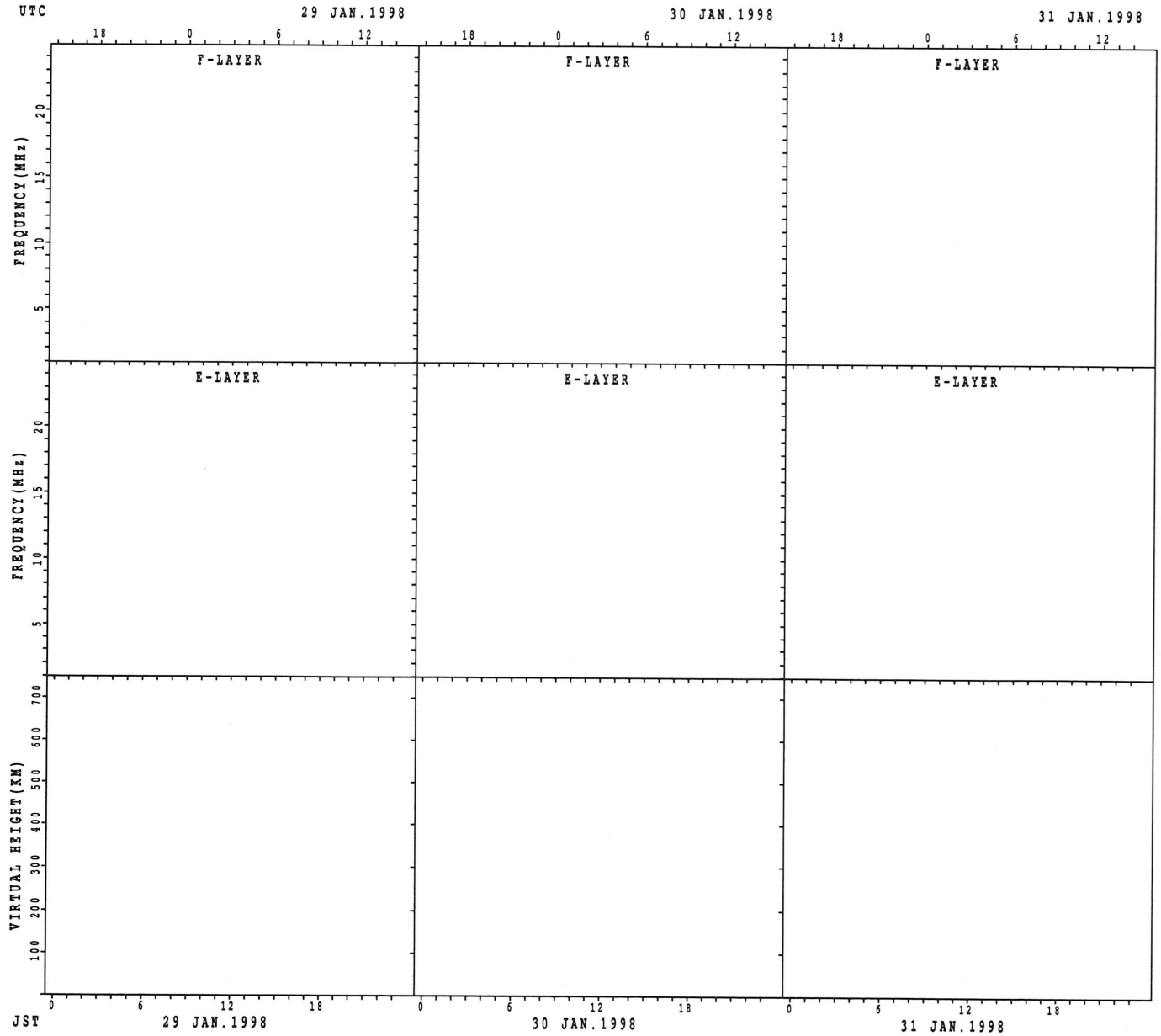
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

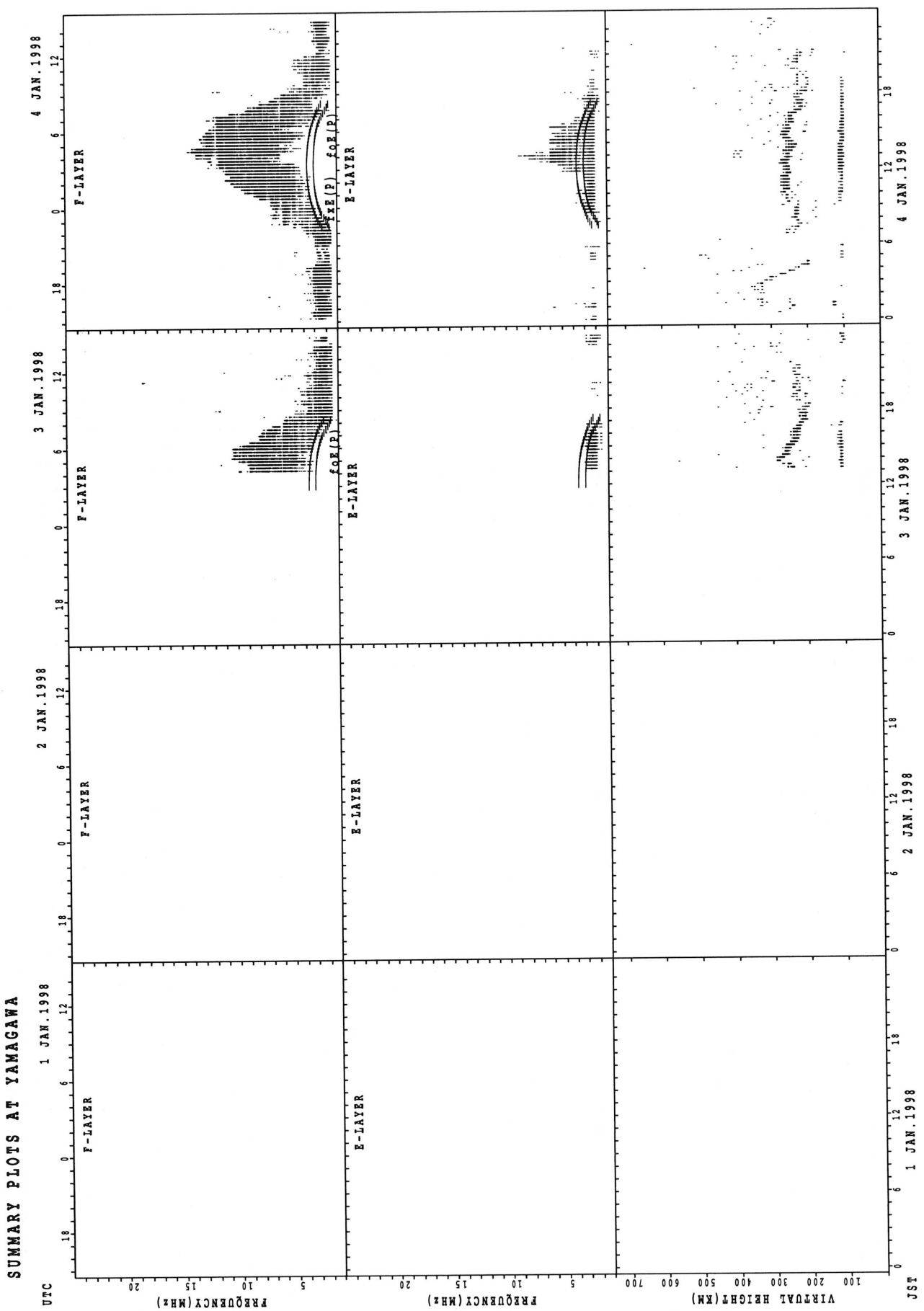


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

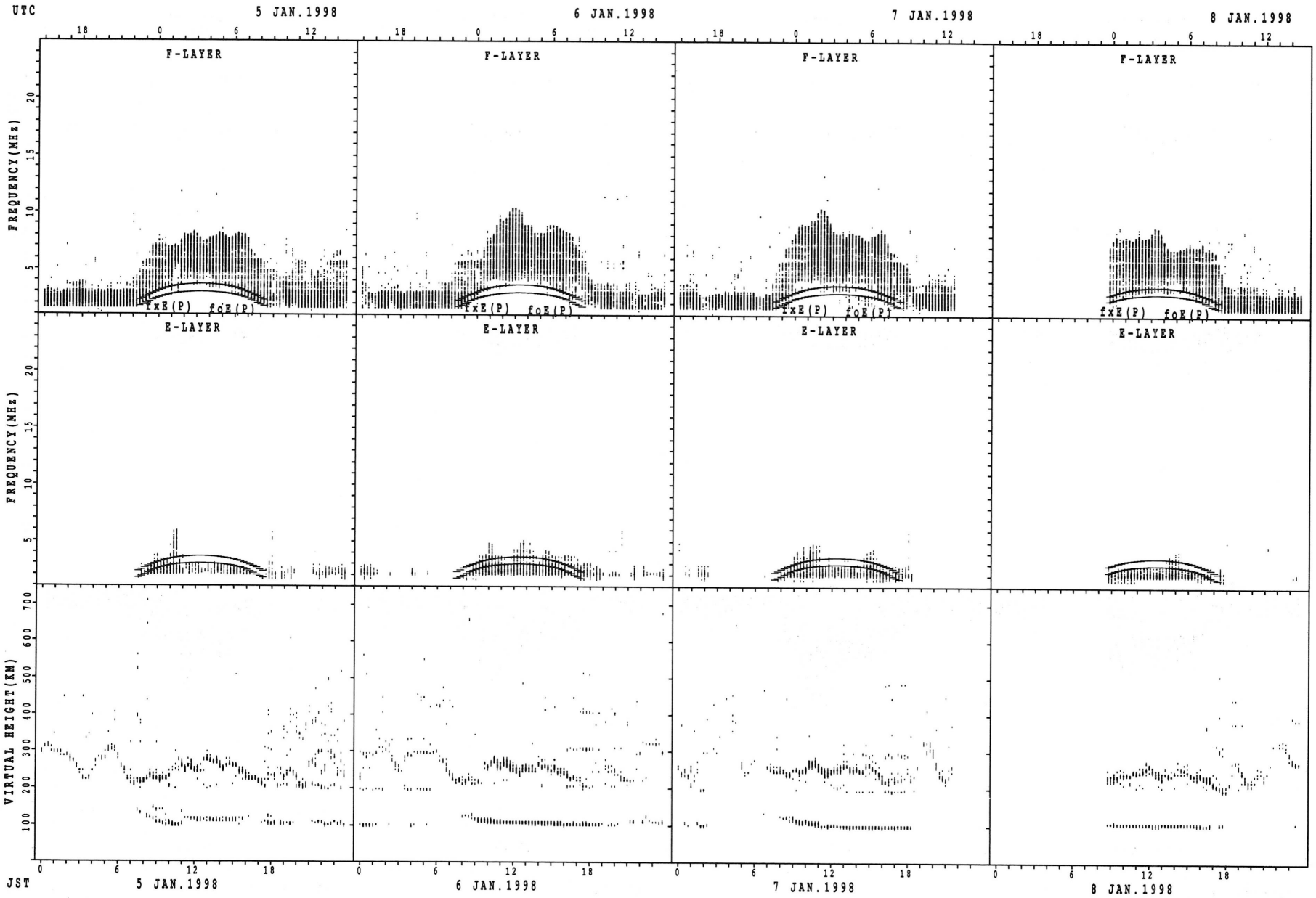
SUMMARY PLOTS AT KOKUBUNJI TOKYO



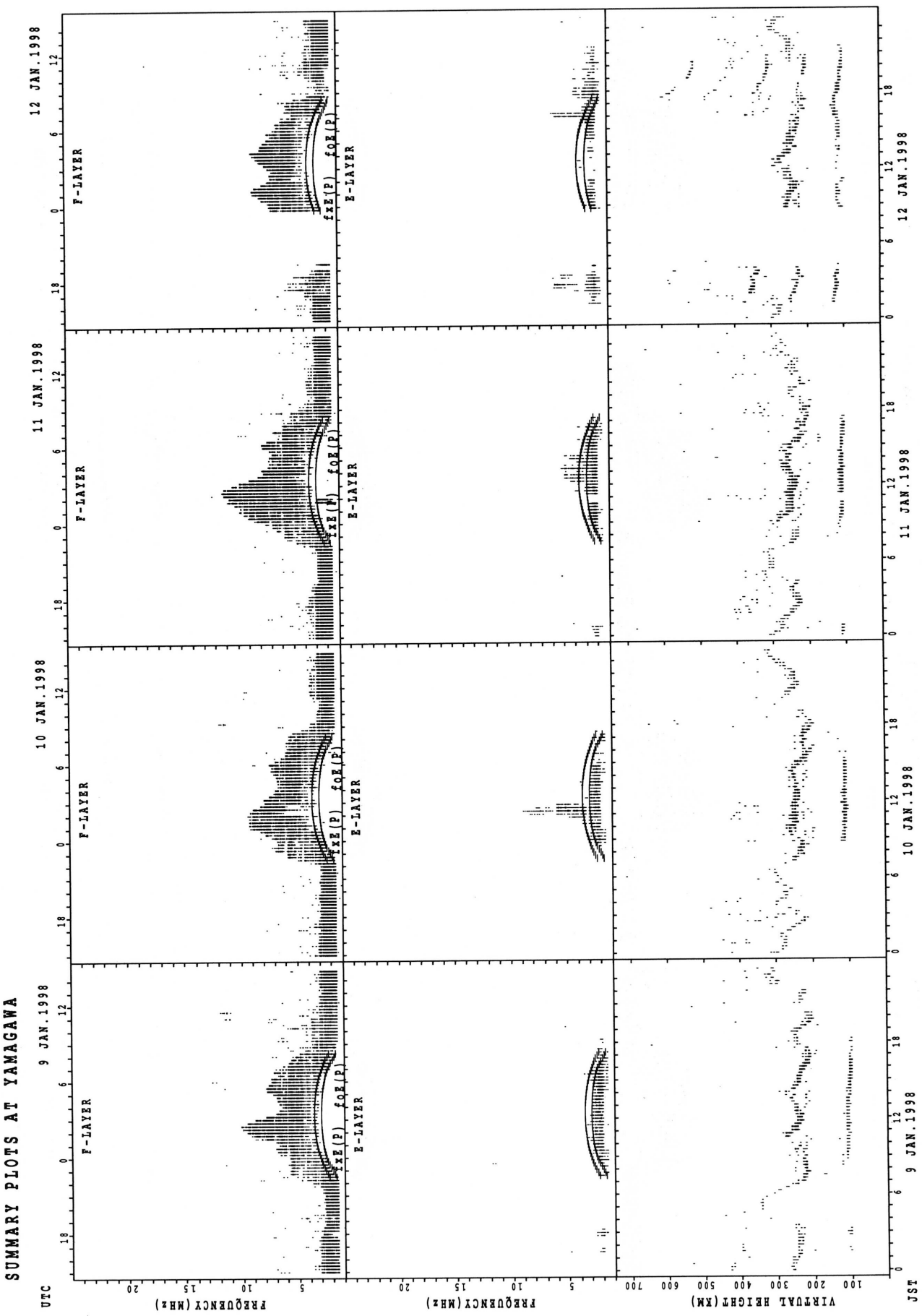
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
1 JAN.1998
2 JAN.1998
3 JAN.1998
4 JAN.1998
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

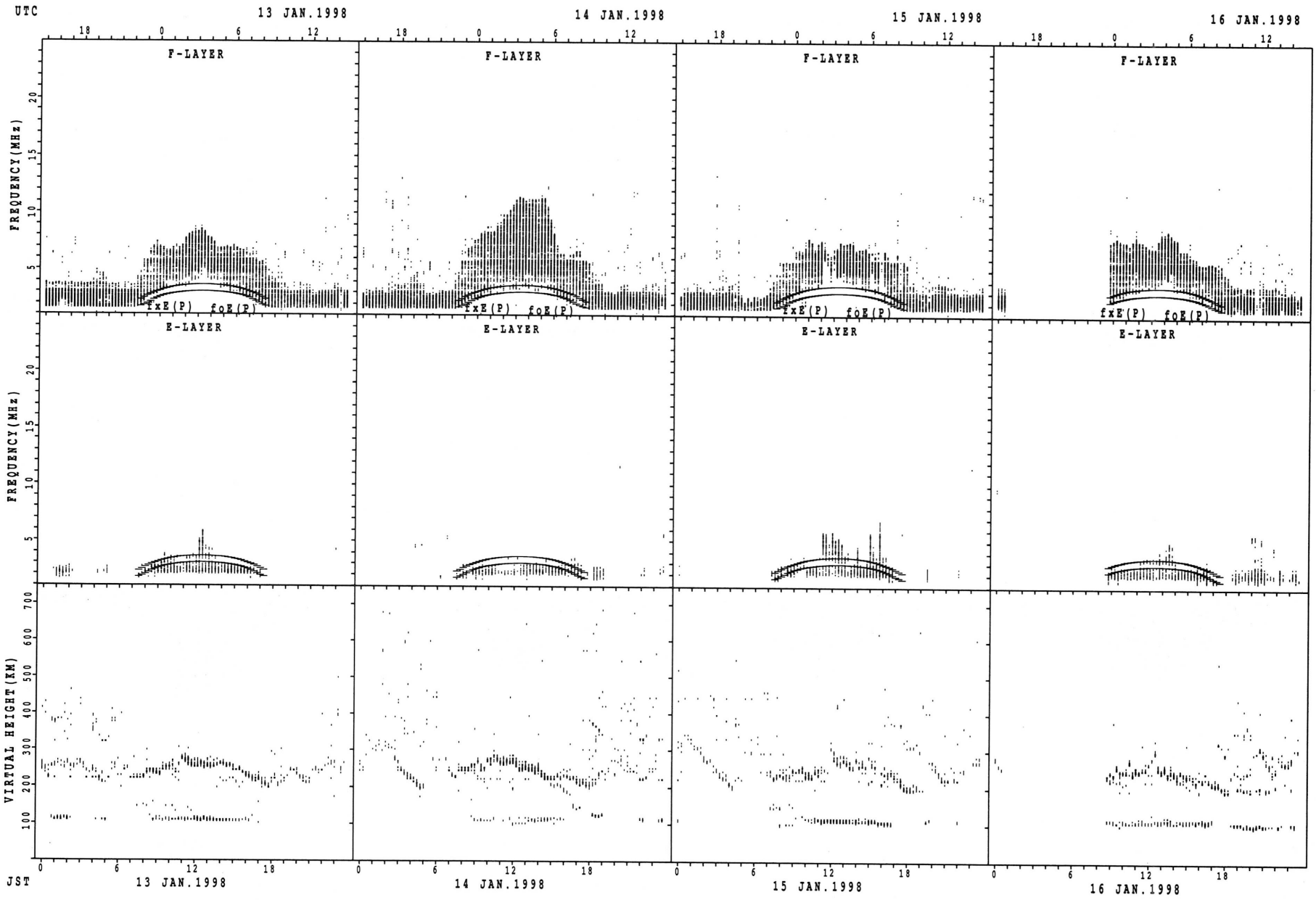
SUMMARY PLOTS AT YAMAGAWA



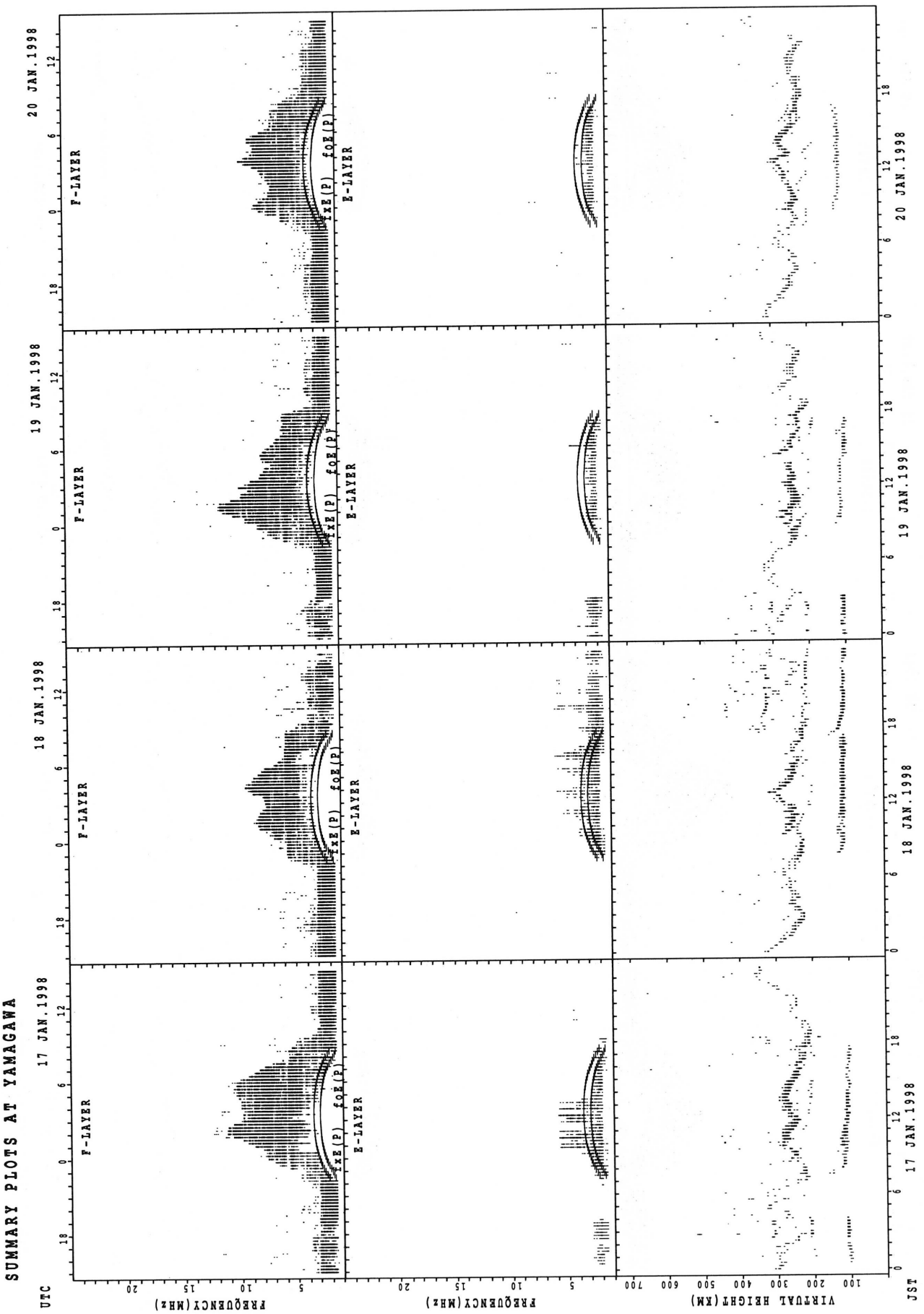
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
9 JAN.1998
10 JAN.1998
11 JAN.1998
12 JAN.1998
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

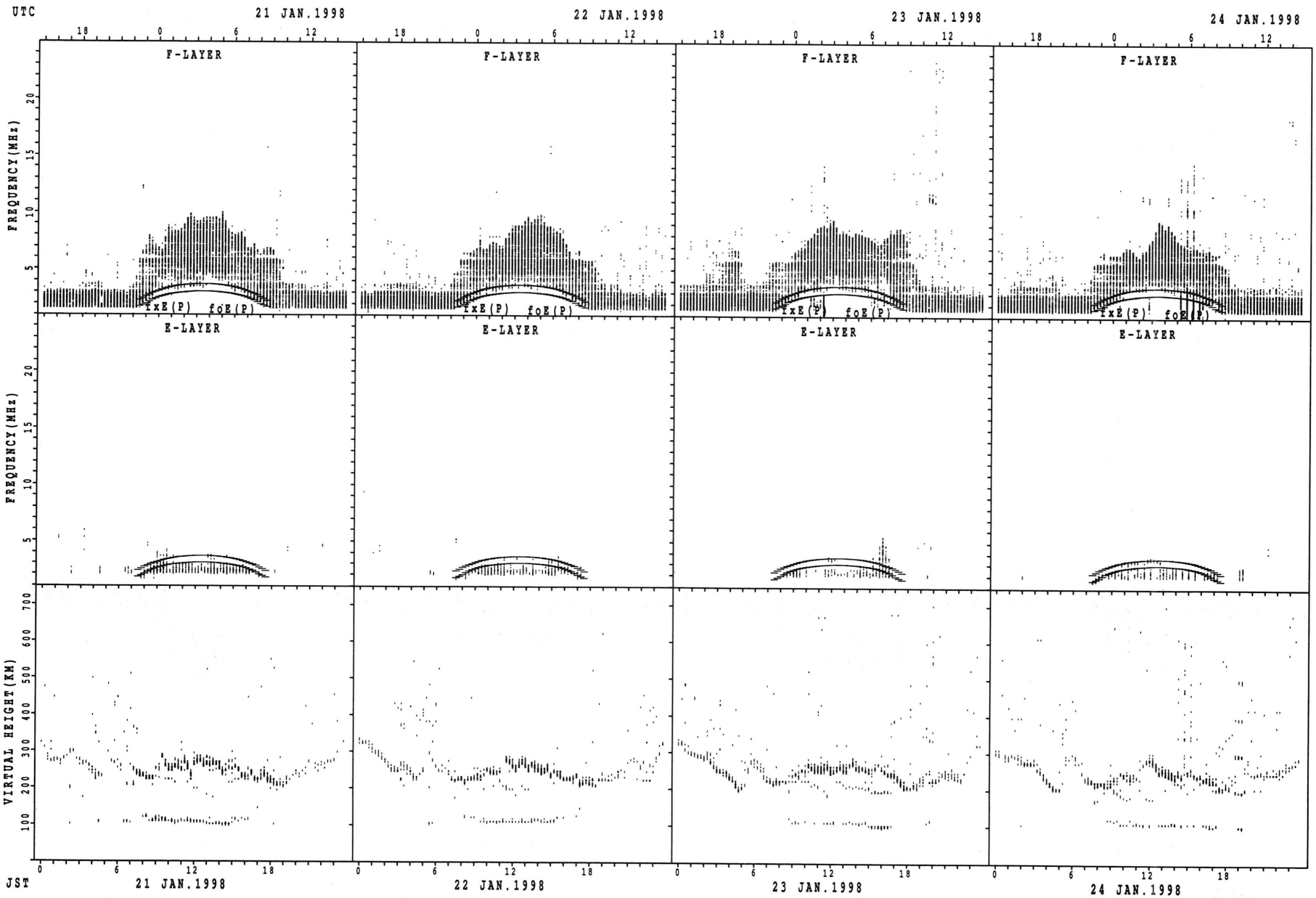
SUMMARY PLOTS AT YAMAGAWA



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

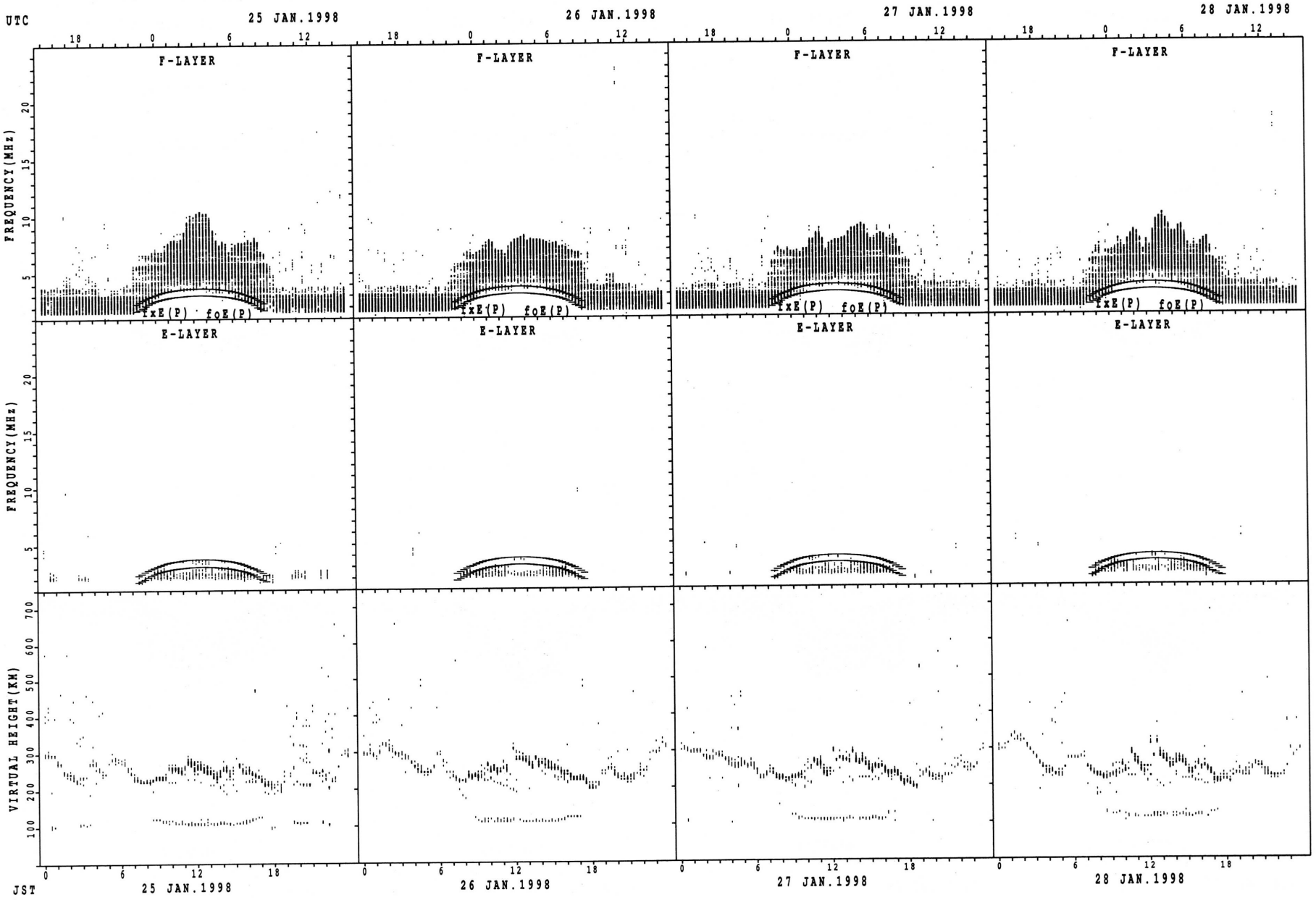

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
17 JAN.1998
18 JAN.1998
19 JAN.1998
20 JAN.1998
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

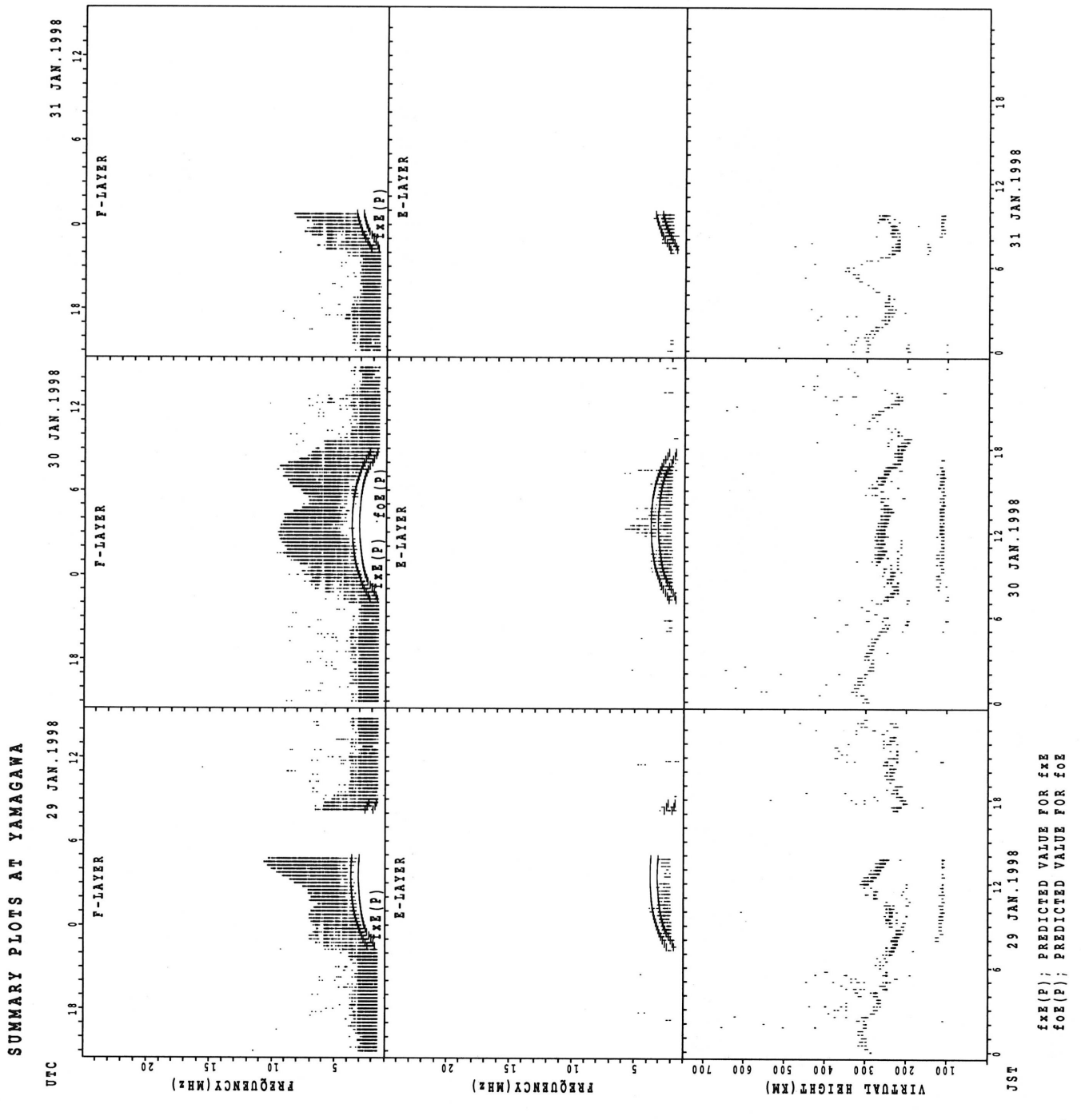


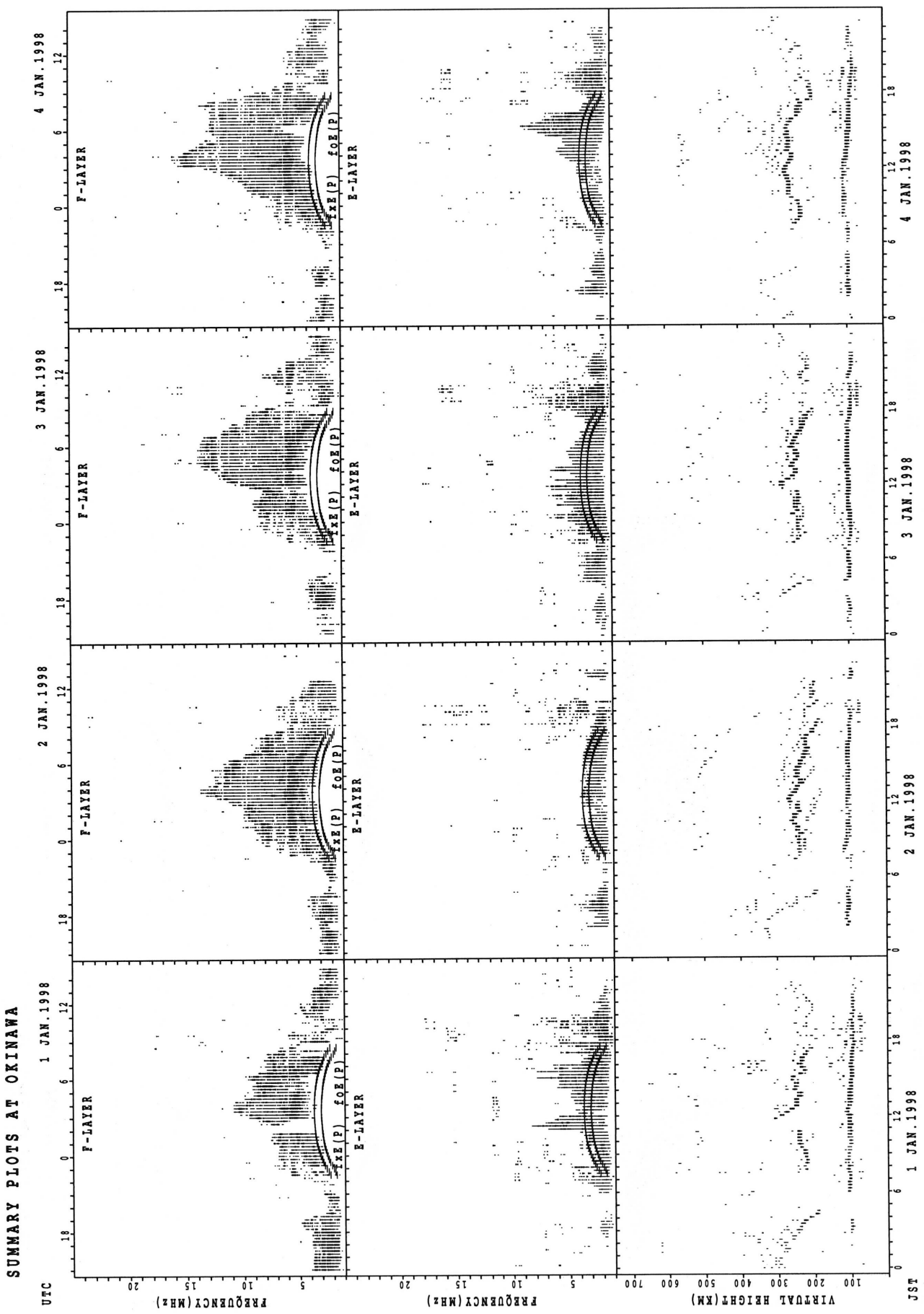
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

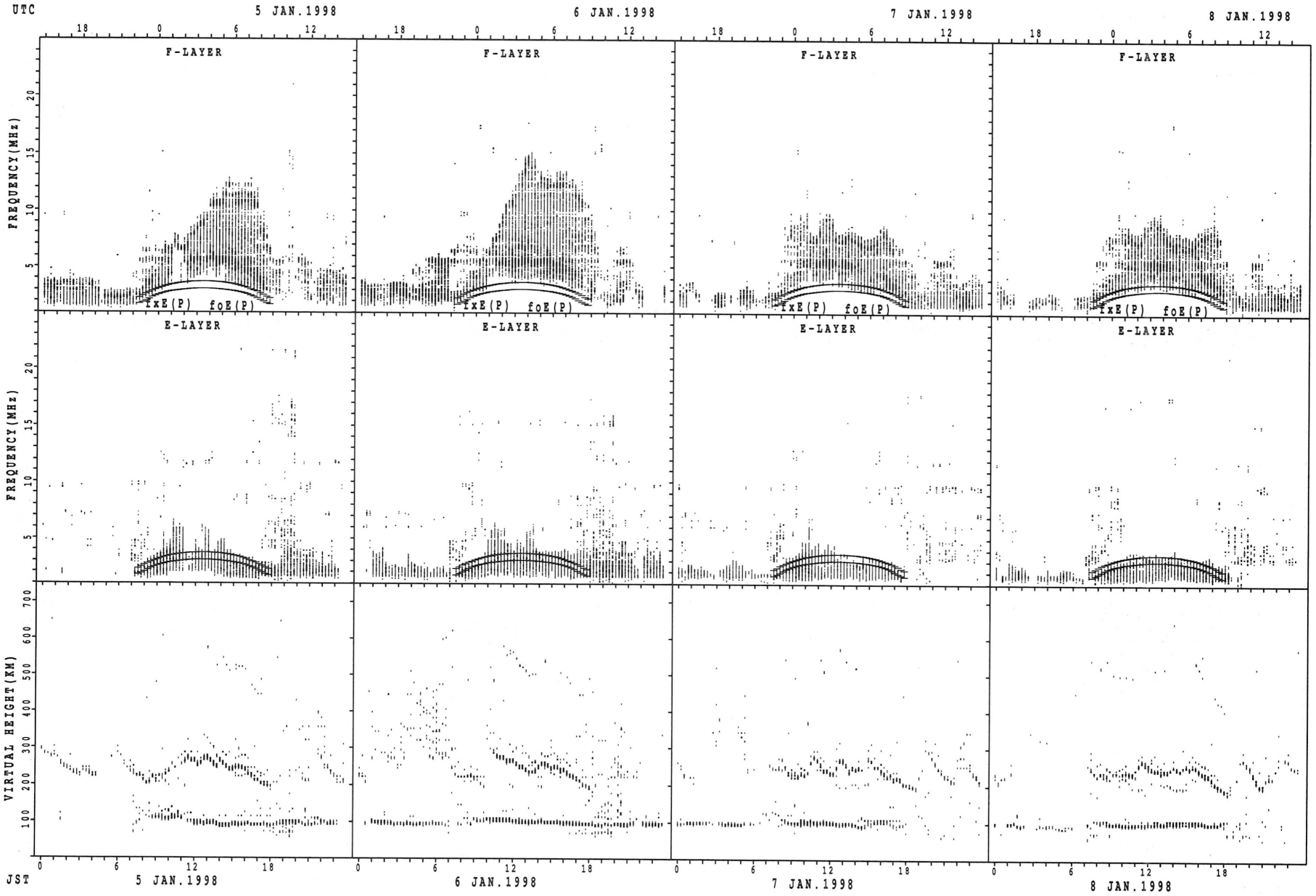


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
29 JAN.1998
30 JAN.1998
31 JAN.1998
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

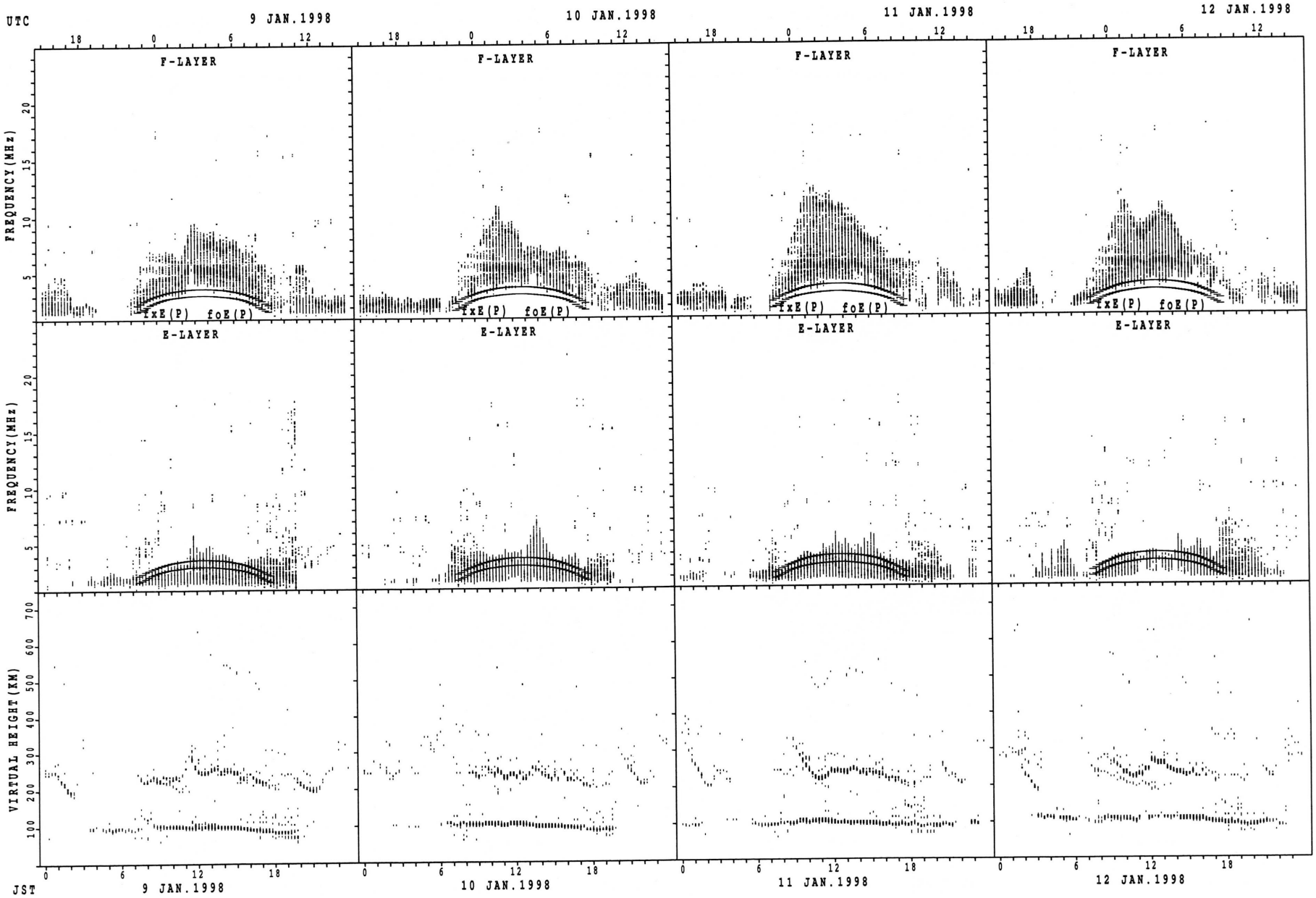

SUMMARY PLOTS AT OKINAWA
UTC
JST
1 JAN.1998
2 JAN.1998
3 JAN.1998
4 JAN.1998
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



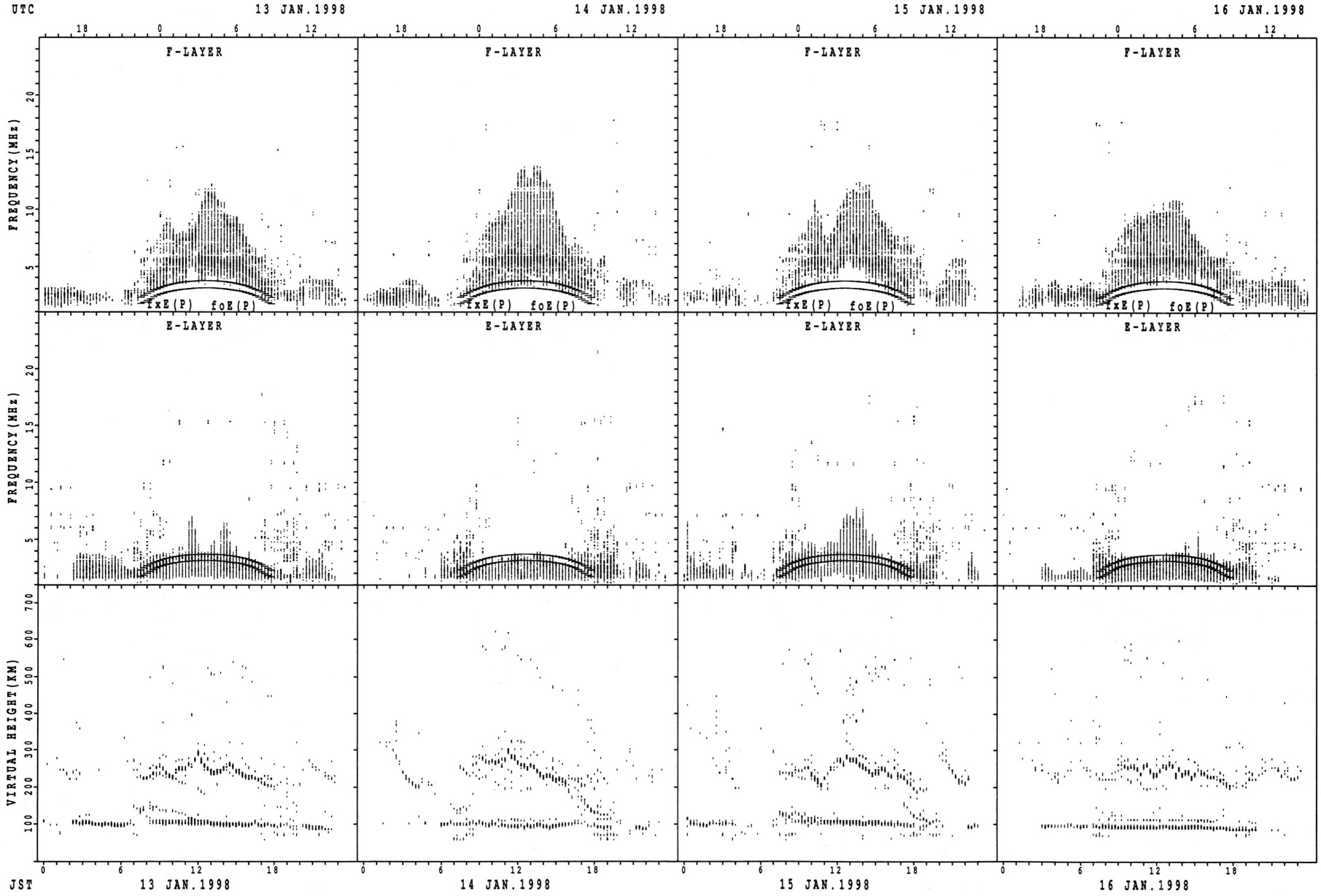
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA

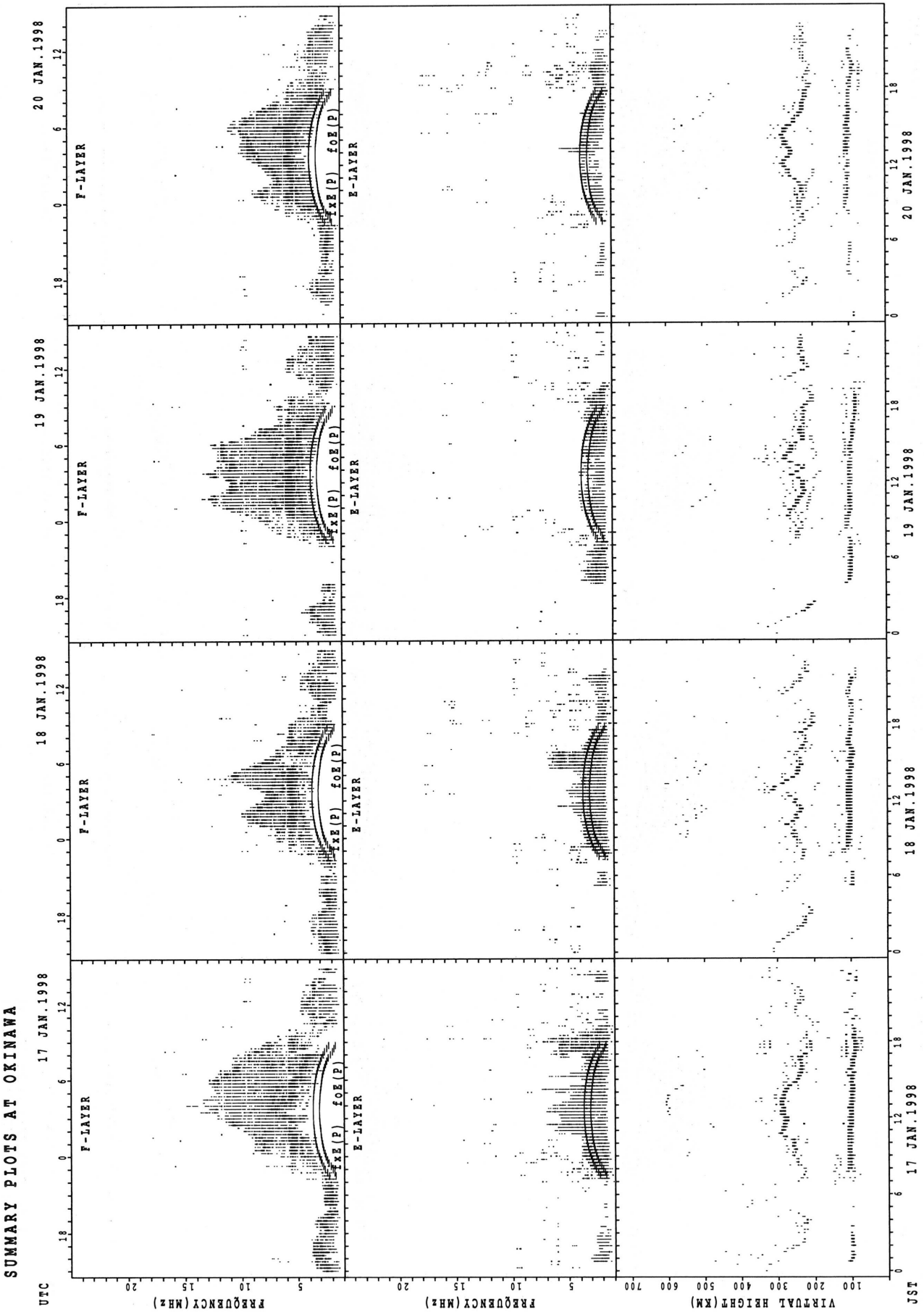


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

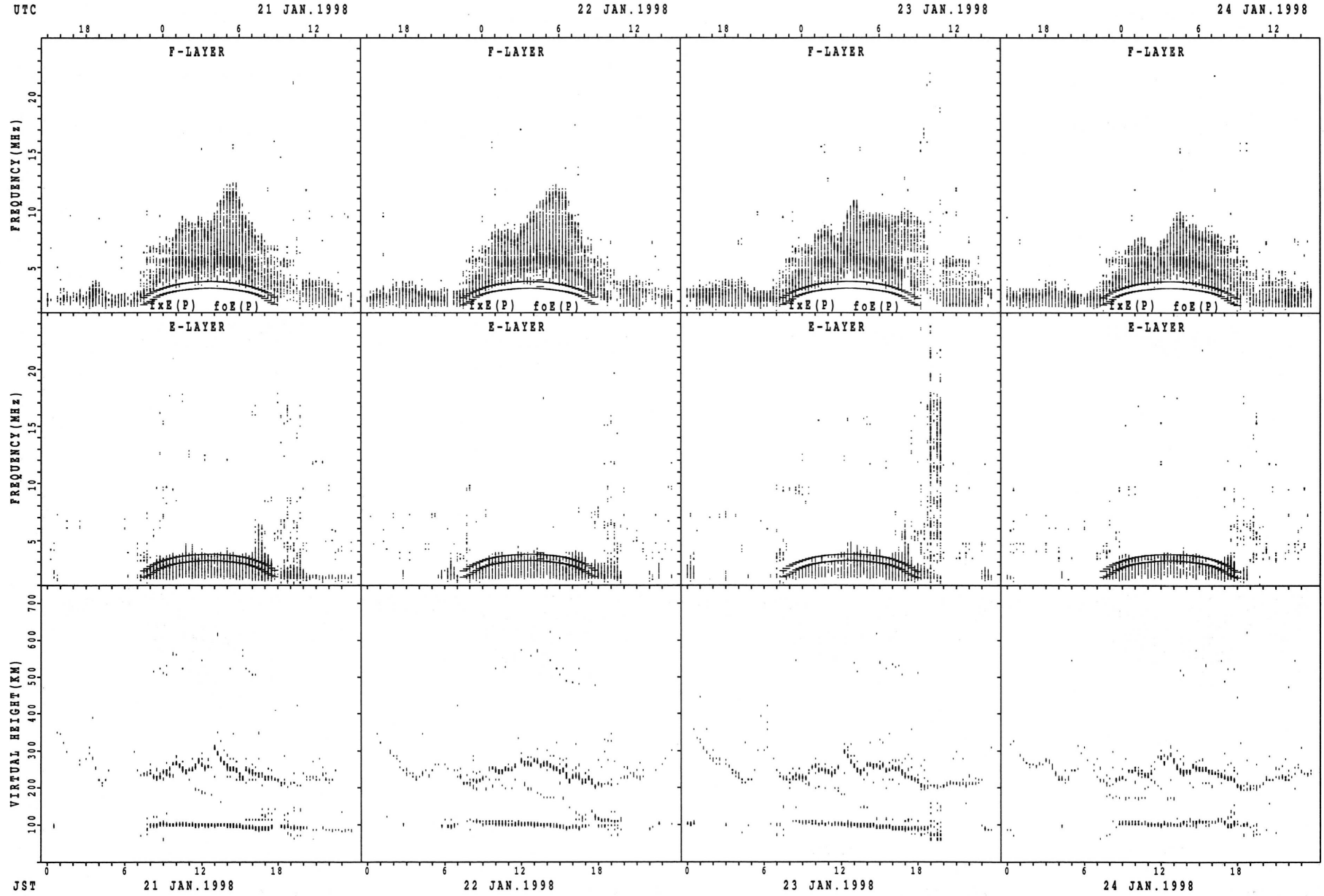
SUMMARY PLOTS AT OKINAWA



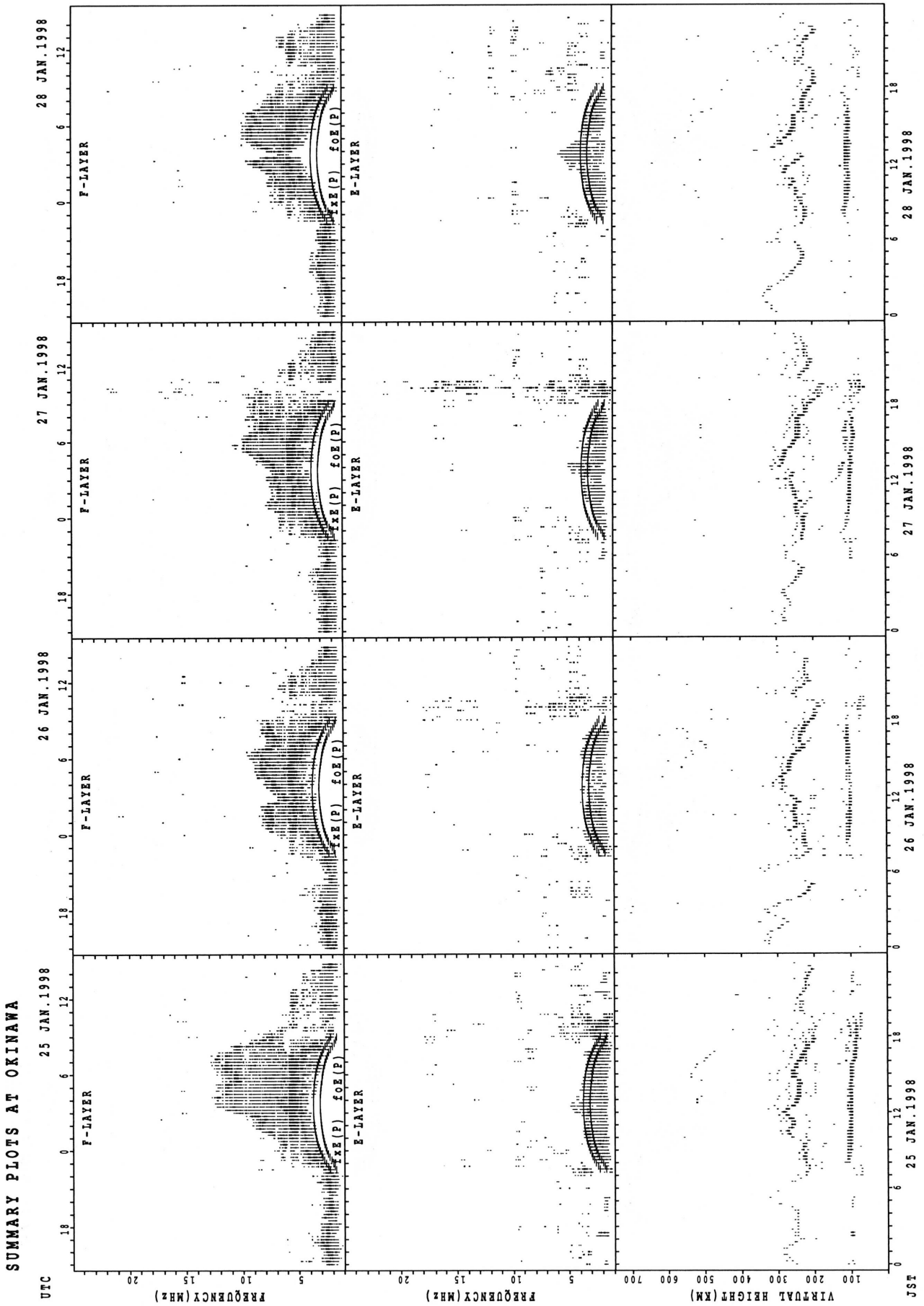
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
17 JAN.1998
18 JAN.1998
19 JAN.1998
20 JAN.1998
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

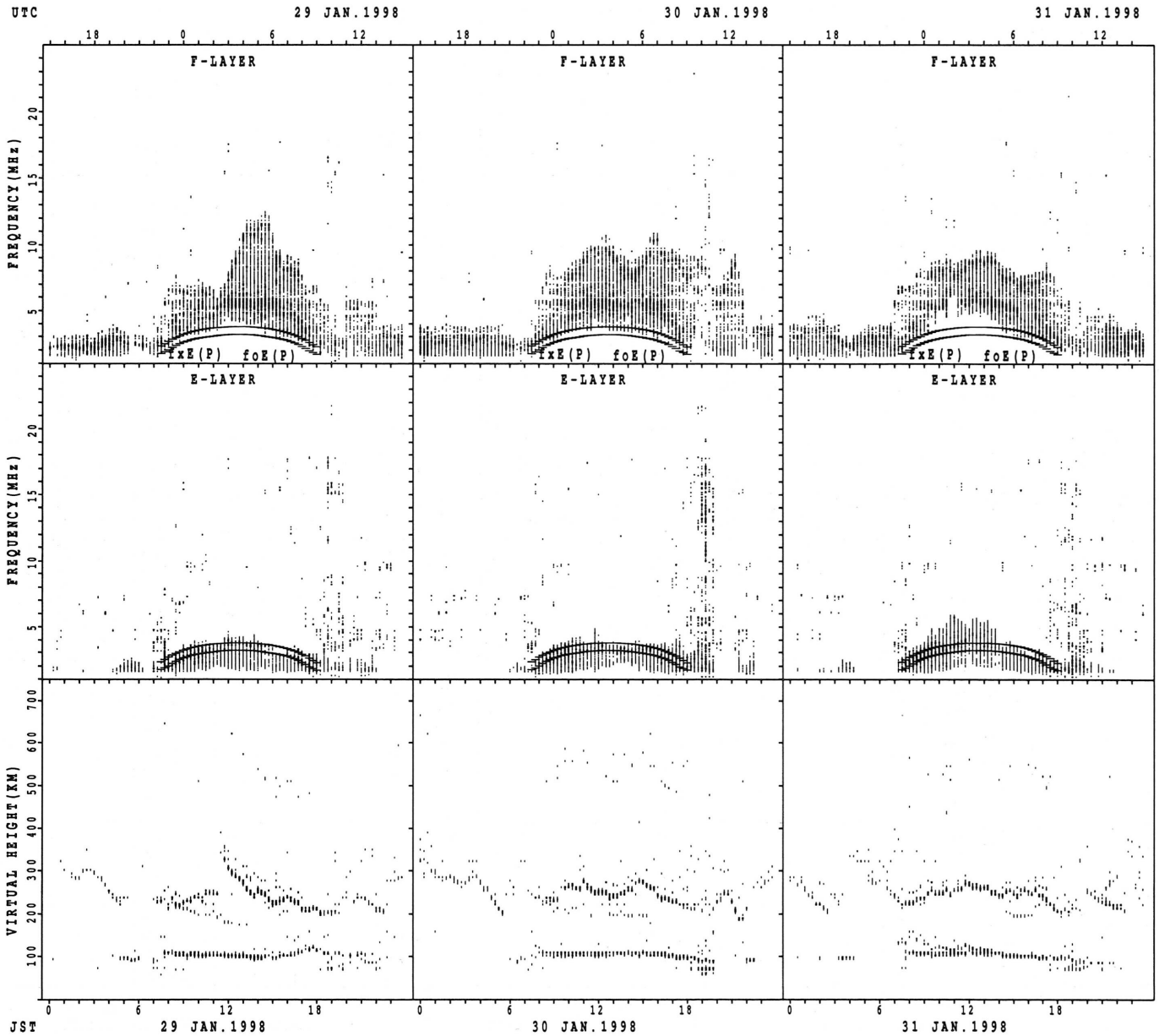
SUMMARY PLOTS AT OKINAWA



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


SUMMARY PLOTS AT OKINAWA
UTC
25 JAN.1998
26 JAN.1998
27 JAN.1998
28 JAN.1998
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

MONTHLY MEDIANS OF h'F AND h'Es

JAN. 1998 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									10	21	27	29	28	25	23	16								
MED									237	236	240	232	245	246	248	239								
U Q									250	240	250	245	250	251	252	247								
L Q									228	224	232	224	238	237	236	232								

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	14	14	12	11	10	14	20	19	23	25	25	21	21	21	17	18	18	20	20	21	17	17	17
MED	98	99	103	112	111	108	107	108	107	113	113	111	113	111	113	117	105	106	105	103	103	103	99	99
U Q	103	105	107	117	117	111	119	120	125	125	123	125	119	116	127	122	113	113	108	103	105	107	105	105
L Q	97	97	99	102	109	105	105	103	103	103	104	105	107	103	101	98	99	103	103	100	99	99	98	96

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											15	14	13		12	11								
MED											250	236	258		257	248								
U Q											254	246	269		264	260								
L Q											244	232	252		246	240								

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									15	14	16	15	15	14	14	14					11	10	10	
MED									111	113	113	109	113	108	107	109					105	102	101	
U Q									119	115	116	113	115	119	115	125					105	103	105	
L Q									107	105	107	107	107	105	105	107					103	99	97	

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										19	25	18	16	19	17	26	18	10						
MED										252	252	253	249	256	268	252	250	233						
U Q										262	264	258	265	266	271	266	258	256						
L Q										246	247	246	245	252	246	240	238	228						

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									15	18	19	17	22	20	18	20	20	12						
MED									151	119	115	113	113	113	113	113	113	112						
U Q									173	125	119	117	117	115	113	115	117	135						
L Q									127	115	113	111	111	111	111	109	106	104						

MONTHLY MEDIANS OF h'F AND h'Es

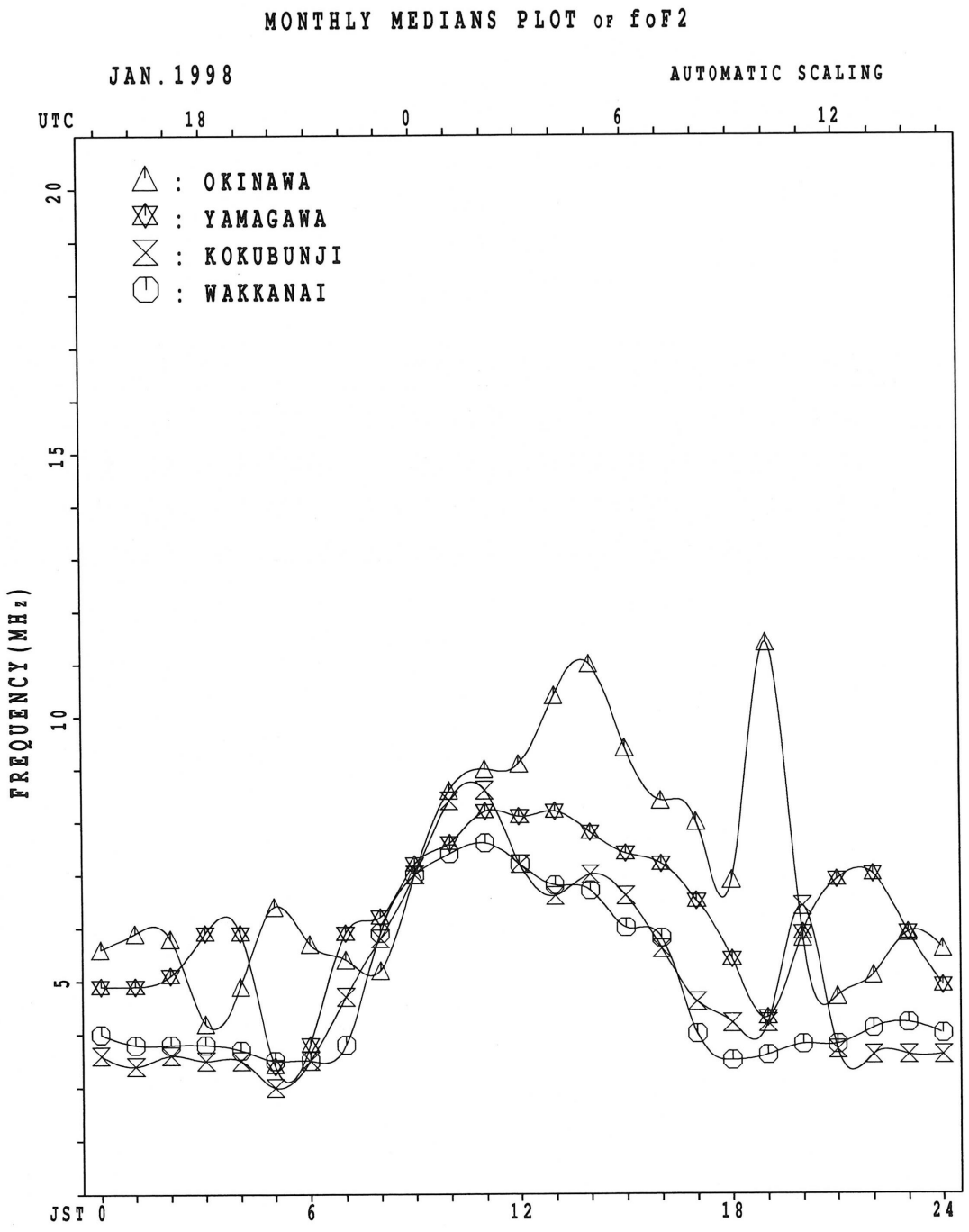
JAN. 1998 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										26	29	20	22	20	20	28	28	19	13					
MED										247	248	251	264	257	252	246	239	232	250					
U Q										262	256	271	278	271	261	255	246	242	453					
L Q										238	239	234	250	241	238	240	234	224	227					

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	10	11	12	11	27	27	29	26	29	28	29	26	26	27	21	24	12	12		
MED				105	102	99	97	95	115	107	107	107	107	105	103	102	101	101	95	95	95	95		
U Q				109	113	107	101	145	131	131	116	109	113	109	107	107	107	107	100	100	100	100		
L Q				97	97	97	96	85	111	105	104	103	105	102	101	99	97	95	88	87	88	92		


MONTHLY MEDIANS PLOT OF foF2
JAN. 1998
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. 1998 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	50	52	56	50	42	X 41	X 35											X 52	X 44	X 43	X 38	A	A	X 27
2	X 30	X 32	X 34	X 33	X 33	33	X 31											A	A	A	X 34	O X 31	O X 31	X 35
3	34	36	A	X 38	A	A	X 33											X 43	X 47	X 42	A	X 32	X 34	35
4	O X 35	X 36	X 36	X 35	X 34	O X 32	X 35											X 51	X 41	X 39	X 38	X 31	O X 33	X 36
5	X 33	X 37	X 39	X 38	X 32	X 32	X 34											X 54	X 49	X 48	X 43	X 35	X 38	41
6	X 37	X 40	X 41	X 38	40	X 37	X 40											X 47	X 38	X 34	X 38	A	X 34	X 36
7	X 35	X 38	X 38	X 29	X 32	X 37	X 28											X 51	X 34	X 42	45	46	51	X 45
8	X 44	X 34	X 35	X 34	X 33	X 34	X 37											X 52	X 45	X 46	X 31	X 32	X 33	O X 35
9	X 36	X 35	X 40	X 33	X 29	X 32	X 34											X 46	X 48	X 50	X 42	38	X 38	X 34
10	X 34	X 40	X 38	X 36	X 35	X 32	X 30												X 36	X 40	35	36	36	36
11	36	37	X 39	X 37	30	30	X 26												A	X 37	A	37	34	34
12	29	31	37	X O 46	X O 28	X 27	X 32												X 29	X 41	X 40	X 37	X 38	X 41
13	X 46	X 43	X 40	40	X 36	X 34	X 38												X 37	X 48	X 40	36	42	44
14	X 37	X 37	X 39	44	49	X 36	A												X 32	X 32	X 41	A	O X 36	X 36
15	X 36	X 35	X 34	X 35	X 36	A	A												X 30	X 37	X 42	X 33	O X 30	X 36
16	X 35	X 35	X 37	X 36	X 39	A	X 34													C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	15	16	15	13	14											8	13	14	13	12	14	15
MED	X 36	X 36	X 38	X 36	X 34	X 33	X 34											X 51	X 38	X 42	X 40	X 36	X 35	X 36
U Q	X 37	X 39	X 40	39	39	X 36	X 35											X 52	X 46	X 46	X 42	37	38	41
L Q	X 34	X 35	X 36	X 34	X 32	X 32	X 31											X 46	X 33	X 37	X 36	X 32	O X 33	35

JAN. 1998 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 39	F 42	F 46	F 42	F 35	35	29	46	63	68	78	77	71	68	61	61	57	46	38	R 37	32	A	A	21
2	24	26	28	27	27	F 26	25	43	59	71	82	78	69	62	78	67	53	A	A	A	28	25	25	F 26
3	26	F 29	A	R 32	A	A	27	49	58	68	75	84	71	67	81	87	57	37	41	36	A	26	F 26	F 28
4	29	F 27	30	29	28	26	29	45	57	69	88	90	79	80	71	73	64	45	35	33	32	25	R 27	30
5	27	31	33	32	26	26	28	43	62	72	75	70	66	67	67	70	54	47	43	42	U R 37	29	32	F 32
6	31	34	35	32	F 32	31	34	50	56	66	83	77	R 78	57	68	74	55	41	32	28	32	A	28	29
7	U R 29	32	32	23	26	31	22	44	64	R 100	R 100	96	81	87	80	82	72	45	28	36	F 40	F 39	F 42	39
8	37	28	F 29	28	27	28	31	45	68	76	94	85	72	66	71	70	62	46	39	40	25	25	27	29
9	30	29	34	27	23	26	28	45	54	64	94	102	70	60	72	62	51	40	42	44	36	F 30	32	28
10	28	34	32	30	29	26	24	44	66	79	82	82	64	61	68	59	52	41	30	34	F 27	F 28	F 27	F 26
11	F 26	F 28	33	31	F 24	F 24	20	44	57	66	89	106	82	58	66	62	53	47	A	31	A	F 29	F 26	F 25
12	F 23	F 24	F 29	40	22	J R 21	26	49	50	63	85	74	73	72	68	57	54	37	23	34	34	30	32	35
13	40	37	34	F 32	30	28	32	47	54	56	68	92	64	56	59	60	49	43	31	42	34	F 29	F 35	F 37
14	31	31	33	F 36	F 42	30	A	44	52	64	74	102	107	94	68	58	55	46	26	26	J R 35	A	30	30
15	30	29	28	28	30	A	A	41	62	R 62	66	62	67	62	57	57	56	40	24	31	37	27	24	30
16	29	29	31	30	33	A	28	48	71	69	66	68	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	15	16	15	13	14	16	16	16	16	16	15	15	15	15	15	14	13	14	13	12	14	15
MED	29	29	32	30	28	26	28	45	58	68	82	83	71	66	68	62	55	44	32	35	34	28	28	29
U Q	31	33	34	F 32	F 32	30	29	48	64	72	88	94	79	72	72	73	57	46	40	40	36	F 30	32	32
L Q	26	F 28	29	28	26	26	25	44	55	64	74	76	67	60	66	59	53	40	27	31	30	26	26	F 26

JAN. 1998 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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 372	U L 436	L	L 452	L 424	L									
2										L	U L 448	L 452	L 452	L	L 428									
3										L	U L 440	U L 452	U L 452	412	L 440	L 388	L							
4										L	L 432	L 448	A	L 448	L									
5										L	U L 440	U L 440	L 440	L 448	U L 440	L								
6										L	L	L 448	L 452	U L 428	U L 432	U L 388								
7										U L 452	L 452	L 452	U L 444	L 452	L		L							
8									L	L	U L 452	L	L 440	U L 440	U L 416	L	L							
9											L 440	L 444	U L 448		U L 436	L	L 244							
10									L	L	L 460	L 432	L	L 440	L									
11									268	L	U L 460	L 428	L 432	L	U L 416	L								
12										U L 416	L 412	L 424	L 460	L 428	U L 416	L								
13									A	A	L	L 424	416	U L 428	U L 420	L								
14									L	U L 412	L 416	448	440	L 440	U L 420	U L 376								
15									L	U L 404	L 444	U L 440	L 436	U L 436	U L 416	L								
16										U L 416	L	L 456	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C						
18								C	C	C	C	C	C	C	C	C	C	C						
19								C	C	C	C	C	C	C	C	C	C	C						
20								C	C	C	C	C	C	C	C	C	C	C						
21								C	C	C	C	C	C	C	C	C	C	C						
22								C	C	C	C	C	C	C	C	C	C	C						
23								C	C	C	C	C	C	C	C	C	C	C						
24								C	C	C	C	C	C	C	C	C	C	C						
25								C	C	C	C	C	C	C	C	C	C	C						
26								C	C	C	C	C	C	C	C	C	C	C						
27								C	C	C	C	C	C	C	C	C	C	C						
28								C	C	C	C	C	C	C	C	C	C	C						
29								C	C	C	C	C	C	C	C	C	C	C						
30								C	C	C	C	C	C	C	C	C	C	C						
31								C	C	C	C	C	C	C	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	6	13	14	13	12	11	3	1							
MED									268	U L 414	L 440	L 446	L 444	L 438	U L 420	U L 388	L 244							
U Q										U L 416	L 452	L 452	L 452	L 444	U L 436	U L 388								
L Q										L 404	L 434	L 432	438	L 428	U L 416	U L 376								

JAN. 1998 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN.1998 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	236	A	296	A	A	308	292	252	196							
2								B	A	A	300	316	316	R 304	292	260	A							
3								B	216	272	300	A	U A 324	A	A 288	A	188							
4								A	A	284	A	A	A	A	288	256	A							
5								B	A	272	304	320	R 324	312	296	264	184							
6								A	A	272	300	316	324	R 312	296	260	A							
7								B	A	U A 240	A	A	A	A	A	A	A							
8								B	220	A	A	A	316	300	284	252	196							
9								B	212	268	292	304	300	A	A	252	192							
10								A	A	A	A	A	A	A	A	A	A	B						
11								B	224	264	A	A	A	A 300	292	252	188	B						
12								B	212	260	288	A	A	312	296	268	212	B						
13								B	A	A	304	320	324	300	284	256	200	B						
14								B	A	276	296	320	A	316	288	272	200	B						
15								A	A	A	A	A	A	A	A	A	R	B						
16								A	A	A	300	320	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C						
18								C	C	C	C	C	C	C	C	C	C	C						
19								C	C	C	C	C	C	C	C	C	C	C						
20								C	C	C	C	C	C	C	C	C	C	C						
21								C	C	C	C	C	C	C	C	C	C	C						
22								C	C	C	C	C	C	C	C	C	C	C						
23								C	C	C	C	C	C	C	C	C	C	C						
24								C	C	C	C	C	C	C	C	C	C	C						
25								C	C	C	C	C	C	C	C	C	C	C						
26								C	C	C	C	C	C	C	C	C	C	C						
27								C	C	C	C	C	C	C	C	C	C	C						
28								C	C	C	C	C	C	C	C	C	C	C						
29								C	C	C	C	C	C	C	C	C	C	C						
30								C	C	C	C	C	C	C	C	C	C	C						
31								C	C	C	C	C	C	C	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									6	9	10	7	7	9	11	11	9							
MED									218	272	300	320	324	308	292	256	196							
U Q									224	274	300	320	324	312	296	264	200							
L Q									212	262	296	316	316	300	288	252	188							

JAN.1998 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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	19	20	26	25	19	18	26	18	27	J A 31	J A 34	34	J A 34	34	G	29	25	J A 16	J A 19	J A 38	J A 30	34	28	28
2	20	19	E B 14	18	E B 15	E B 14	E B 14	E B 16	J A 40	J A 42	G 22	G 28	G 30	G 24	G	J A 36	J A 37	J A 41	48	J A 46	J A 29	J A 43	34	J A 33
3	28	J A 22	J A 51	J A 44	35	J A 34	J A 45	E B 16	G 22	30	32	31	34	J A 36	32	J A 40	27	J A 18	J A 44	J A 50	J A 52	J A 30	J A 22	J A 35
4	J A 25	20	J A 44	J A 23	J A 35	J A 45	J A 52	J A 39	46	J A 50	J A 50	J A 47	61	J A 48	G 28	28	J A 36	J A 31	J A 31	20	E B 14	E B 14	E B 16	E B 15
5	E B 15	E B 14	E B 14	E B 15	E B 14	E B 15	E B 14	E B 15	J A 42	32	34	G	G	G 25	G 25	G 19	G	21	21	J A 21	J A 46	J A 22	J A 38	J A 22
6	J A 22	E B 14	E B 14	20	18	E B 14	E B 14	J A 34	49	28	G 28	34	G 27	G	G 21	G 23	J A 26	J A 23	25	18	32	J A 52	J A 30	27
7	32	28	J A 19	18	18	18	19	J A 20	J A 28	31	J A 84	J A 42	J A 35	J A 32	J A 36	39	39	31	E B 16	20	E B 14	E B 13	E B 15	E B 15
8	E B 15	E B 13	E B 14	E B 13	E B 15	E B 15	E B 14	E B 15	J A 23	J A 33	34	J A 35	G	G 30	29	28	23	J A 23	E B 13	E B 14	18	19	J A 21	J A 28
9	J A 25	J A 23	J A 22	18	E B 14	E B 15	E B 12	E B 16	25	G	32	34	34	J A 36	33	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15
10	E B 14	E B 16	18	E B 14	24	27	27	J A 22	35	32	J A 42	J A 36	J A 34	32	J A 46	J A 38	39	20	E B 14	J A 18	28	E B 14	20	E B 14
11	E B 14	20	24	24	21	18	19	E B 14	28	J A 64	80	J A 39	J A 44	34	30	30	G	21	J A 48	J A 44	J A 52	18	J A 29	26
12	23	19	E B 14	E B 14	24	28	J A 27	J A 19	G	G	31	32	34	35	34	30	28	J A 27	J A 18	J A 46	J A 45	J A 24	J A 26	E B 15
13	E B 16	E B 14	E B 17	28	J A 28	20	J A 31	J A 22	J A 44	J A 37	49	J A 35	G 31	G 30	G	G 23	22	E B 13	J A 22	J A 22	J A 22	22	22	E B 14
14	J A 23	22	22	J A 25	J A 22	18	J A 45	J A 44	J A 26	G	31	G 26	34	36	32	30	23	J A 22	E B 14	22	J A 54	40	32	28
15	E B 13	E B 14	E B 14	E B 14	E B 14	J A 34	J A 45	J A 62	J A 78	J A 47	J A 39	36	37	36	33	29	G	J A 22	J A 23	J A 22	24	J A 23	J A 24	20
16	19	E B 14	E B 15	J A 24	J A 31	J A 42	J A 40	J A 34	J A 26	31	G 28	G	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	16	16	16	16	16	16	16	16	16	16	15	15	15	15	15	15	15	15	15	15	15	15
MED	20	19	18	19	20	18	26	J A 20	28	32	34	34	34	34	30	29	25	J A 22	21	J A 22	J A 29	22	24	22
U Q	J A 24	21	J A 23	J A 24	J A 26	J A 31	J A 42	J A 34	J A 43	J A 40	J A 46	J A 36	35	J A 36	33	J A 36	36	J A 27	J A 31	J A 44	J A 46	34	30	J A 28
L Q	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15	E B 14	E B 16	26	G 29	G 31	G	G	G 30	G	G	G	18	E B 14	18	E B 18	E B 14	E B 20	E B 15

JAN. 1998 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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 13	E B 14	16	17	E B 14	E B 14	17	E B 15	27	28	G 30	32	34	32	G	26	23	E B 16	16	19	17	A A 34	A A 28	16
2	E B 13	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	E B 16	31	30	G 19	G 18	G 28	G 22	G	32	34	A A 41	A A 48	A A 46	18	21	22	22
3	18	E B 14	A A 51	22	A A 35	A A 34	20	E B 16	G 19	29	G 27	31	33	34	32	32	21	E B 15	20	23	A A 52	17	16	18
4	20	E B 14	17	16	16	22	21	23	24	G 20	31	35	53	38	G 21	27	31	22	23	E B 14	E B 14	E B 14	E B 16	E B 15
5	E B 15	E B 14	E B 14	E B 15	E B 14	E B 15	E B 14	E B 15	28	29	32	G	G	G 22	G 22	G 18	G	E B 15	E B 15	17	31	18	26	E B 14
6	E B 14	E B 14	E B 14	17	E B 14	E B 14	E B 14	27	32	G 25	G 25	33	G 21	G	G 20	G 19	22	18	18	E B 14	21	A A 52	17	16
7	21	19	E B 15	16	E B 14	E B 14	E B 14	18	20	26	30	30	31	31	28	32	24	19	E B 16	E B 15	E B 14	E B 13	E B 15	E B 15
8	E B 15	E B 13	E B 14	E B 13	E B 15	E B 15	E B 14	E B 15	G 19	26	32	32	G	G 20	29	28	22	E B 16	E B 13	E B 14	E B 14	E B 15	16	20
9	20	18	16	E B 14	E B 14	E B 15	E B 12	E B 16	24	G	31	32	32	32	28	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15
10	E B 14	E B 16	E B 14	E B 14	17	18	17	17	23	26	28	30	31	30	36	30	28	E B 14	E B 14	E B 15	17	E B 14	E B 14	E B 14
11	E B 14	E B 13	E B 15	16	E B 15	E B 13	E B 14	E B 14	G 17	G 20	32	33	36	32	G 27	28	G	18	A A 48	26	A A 52	A E B 14	16	17
12	16	E B 13	E B 14	E B 14	18	20	18	E B 15	G	G	31	31	34	34	32	28	26	24	E B 14	24	21	18	16	E B 15
13	E B 16	E B 14	E B 17	18	20	17	17	E B 14	40	35	G 26	G 26	G 25	G 26	G	G 20	21	E B 13	20	E B 13	17	E B 14	E B 13	E B 14
14	18	E B 15	E B 13	17	E B 14	17	A A 45	30	23	G	30	G 24	34	34	31	30	21	17	E B 14	14	27	A A 40	23	20
15	E B 13	E B 14	E B 14	E B 14	E B 14	A A 34	A A 45	23	25	29	32	35	34	34	31	26	G	E B 15	18	E B 15	E B 14	18	18	17
16	13	E B 14	E B 15	16	22	A A 42	21	18	25	29	G 26	G	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	16	16	16	16	16	16	16	16	16	16	15	15	15	15	15	15	15	15	15	15	15	15
MED	E B 15	E B 14	E B 14	16	E B 15	16	17	E B 16	24	26	30	31	32	32	28	28	22	E B 16	16	E B 15	17	17	16	16
U Q	18	E B 14	16	17	18	A A 21	20	20	28	29	32	32	34	34	31	30	26	19	20	23	27	A A 21	22	18
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	G	G	G 26	G	G	G 26	G 27	G	G	E B 15	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15

JAN. 1998 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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	13	14	13	14	14	14	14	15	14	15	16	16	14	16	16	15	15	16	15	16	16	14	14	14
2	13	14	14	14	15	14	14	16	15	14	15	16	18	15	16	17	15	17	13	14	14	14	14	16
3	14	14	14	14	14	14	14	16	15	16	18	16	17	15	15	14	13	15	14	14	15	14	14	14
4	14	14	14	14	13	13	16	14	14	14	14	15	15	15	15	16	15	15	14	14	14	14	16	15
5	15	14	14	15	14	15	14	15	14	14	15	16	16	14	14	15	15	15	15	14	14	13	14	14
6	14	14	14	14	14	14	14	14	14	15	16	16	16	16	16	17	15	16	14	14	14	14	14	15
7	14	14	15	15	14	14	14	14	15	14	15	16	14	15	14	14	15	16	16	15	14	13	15	15
8	15	13	14	13	15	15	14	15	16	14	16	16	16	16	14	16	16	16	13	14	14	15	15	15
9	15	15	14	14	14	15	12	16	15	14	15	15	14	14	15	14	16	14	14	14	14	14	14	15
10	14	16	14	14	15	15	13	16	16	14	17	15	14	14	15	16	15	14	14	15	15	14	14	14
11	14	13	15	14	15	13	14	14	15	14	15	16	16	14	16	17	15	15	14	14	16	14	14	14
12	14	13	14	14	15	14	15	15	14	15	15	16	19	20	20	16	14	16	14	14	15	13	14	15
13	16	14	17	14	15	14	13	14	16	15	15	14	15	14	14	15	15	13	14	13	14	14	13	14
14	15	15	13	14	14	14	16	15	14	15	14	16	15	15	14	14	14	14	14	14	13	14	14	13
15	13	14	14	14	14	13	14	15	15	16	15	15	18	17	17	16	16	15	15	15	14	14	14	14
16	13	14	15	15	15	16	16	14	14	17	17	22	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	16	16	16	16	16	16	16	16	16	16	15	15	15	15	15	15	15	15	15	15	15	15
MED	14	14	14	14	14	14	14	15	15	14	15	16	16	15	15	16	15	15	14	14	14	14	14	14
U Q	15	14	14	14	15	15	14	16	15	15	16	16	17	16	16	16	15	16	15	15	15	14	14	15
L Q	14	14	14	14	14	14	14	14	14	14	15	15	14	14	14	14	15	14	14	14	14	14	14	14

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 280	F 296	F 318	F 306	F 308	338	335	356	355	338	357	356	354	343	328	348	377	335	356	R 350	378	A	A	315
2	281	285	288	309	327	F 326	343	356	347	350	344	361	362	345	348	365	379		A	A	A	365	352	302	F 308
3	280	F 272	A	R 334	A	A	357	360	362	343	348	353	340	338	337	377	399	338	326	365	A	284	F 310	F 265
4	333	F 305	312	330	333	311	331	361	349	341	348	359	341	349	341	344	369	362	331	335	326	316	R 301	312
5	312	304	320	348	F 312	298	335	384	351	354	354	366	350	346	339	353	362	349	326	348	A 317	324	323	F 296
6	307	301	329	313	F 321	314	327	356	379	311	349	343	R 354	359	328	371	379	329	337	338	330	A	285	333
7	U R 338	310	340	305	278	340	293	330	314	R 338	R 325	351	321	343	341	336	363	339	315	284	F 290	F 295	F 306	329
8	342	337	F 314	302	312	307	297	339	360	346	355	376	349	353	349	367	357	365	313	348	325	298	303	322
9	317	295	333	347	280	302	346	363	365	333	337	366	377	330	357	369	374	328	330	338	361	F 349	334	316
10	305	320	328	341	336	304	324	338	338	353	358	359	353	371	362	371	363	362	318	359	F 318	F 331	F 312	F 295
11	F 324	F 337	342	369	F 361	F 296	298	352	345	338	322	341	350	337	366	365	383	362	A	303	A	F 328	F 308	F 319
12	F 295	F 305	F 328	389	406	J R 266	332	381	357	340	353	350	341	350	378	376	358	358	355	341	342	318	306	294
13	305	315	315	F 332	336	308	339	367	363	371	323	370	357	354	358	340	383	367	317	347	357	F 302	F 303	F 320
14	345	290	292	F 328	F 345	376	A	365	354	350	322	322	335	343	339	369	363	358	333	296	R	A	349	325
15	305	310	314	333	356	A	A	364	366	R 367	352	373	355	350	343	330	368	388	340	321	344	340	322	323
16	315	318	324	332	336	A	329	355	370	368	355	338	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	15	16	15	13	14	16	16	16	16	16	15	15	15	15	15	14	13	14	12	12	14	15
MED	310	305	320	332	333	308	332	358	356	344	348	358	350	346	343	365	369	358	330	340	336	321	307	316
U Q	328	316	329	344	345	332	339	364	364	354	354	366	355	353	358	371	379	362	338	348	359	336	322	323
L Q	300	296	314	311	312	300	324	354	348	338	331	346	341	343	339	344	363	338	318	321	322	300	303	F 296

JAN. 1998 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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 400	U L 375	L	L 357	L 380	L									
2										L	U L 371	L 372	L 377	L	L 362									
3										L	U L 374	U L 368	U L 371	408	L 356	L 399	L							
4										L	L 358	L 386	A	A 370	L									
5										L	U L 377	U L 383	L 377	L 369	U L 357	L								
6										L	L	L 368	L 362	U L 395	U L 347	L								
7										U L 350	L 356	L 366	U L 370	L 347	L		L							
8									L	L	U L 352	L	L 372	U L 373	U L 355	L	L							
9											L 349	L 373	U L 370		U L 348	L	L 428							
10									L	L	L 378	L 380	L	L 361	L									
11									440	L	U L 350	L 374	L 376	L	U L 383	L								
12										U L 361	375	L 385	L 349	L 385	U L 388	L								
13									A	A	L	L 365	415	U L 398	U L 387	L								
14									L	U L 378	L 385	382	358	L 375	U L 385	U L 396								
15									L	U L 383	H 383	U L 378	H 396	U L 378	U L 383	L								
16										U L 373	L	L 364	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C						
18								C	C	C	C	C	C	C	C	C	C	C						
19								C	C	C	C	C	C	C	C	C	C	C						
20								C	C	C	C	C	C	C	C	C	C	C						
21								C	C	C	C	C	C	C	C	C	C	C						
22								C	C	C	C	C	C	C	C	C	C	C						
23								C	C	C	C	C	C	C	C	C	C	C						
24								C	C	C	C	C	C	C	C	C	C	C						
25								C	C	C	C	C	C	C	C	C	C	C						
26								C	C	C	C	C	C	C	C	C	C	C						
27								C	C	C	C	C	C	C	C	C	C	C						
28								C	C	C	C	C	C	C	C	C	C	C						
29								C	C	C	C	C	C	C	C	C	C	C						
30								C	C	C	C	C	C	C	C	C	C	C						
31								C	C	C	C	C	C	C	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	6	13	14	13	12	11	2	1							
MED									440	U L 376	L 374	L 374	L 371	L 376	U L 362	L 398	L 428							
U Q										L 383	L 378	L 382	377	L 390	U L 385									
L Q										U L 361	L 354	L 368	L 360	L 370	U L 355									

JAN. 1998 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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										238	244	250	250	240	232									
2										244	254	236	236	248	262									
3										246	240	246	250	268	268	232	212							
4										248	254	240	242	258	250									
5										242	240	240	244	252	256	240								
6										274	252	258	236	240	276	232								
7										254	258	236	268	254	248		224							
8									230	236	256	232	256	240	254	234	220							
9											260	238	230		246	228	212							
10									236	242	246	248	246	236	234									
11									236	266	280	240	236	252	240	242								
12										268	248	248	264	244	234	220								
13									230	238	278 L	232	250	242	246	254								
14									228	258	280	278	264	236	244	236								
15									238	238	246	232	256	250	264	290 L								
16											246	256	282	C	C	C	C	C	C	C				
17								C	C	C	C	C	C	C	C	C	C	C	C					
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	C	C	C	C	C	C	C					
20								C	C	C	C	C	C	C	C	C	C	C	C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	C	C	C	C	C	C	C					
23								C	C	C	C	C	C	C	C	C	C	C	C					
24								C	C	C	C	C	C	C	C	C	C	C	C					
25								C	C	C	C	C	C	C	C	C	C	C	C					
26								C	C	C	C	C	C	C	C	C	C	C	C					
27								C	C	C	C	C	C	C	C	C	C	C	C					
28								C	C	C	C	C	C	C	C	C	C	C	C					
29								C	C	C	C	C	C	C	C	C	C	C	C					
30								C	C	C	C	C	C	C	C	C	C	C	C					
31								C	C	C	C	C	C	C	C	C	C	C	C					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										6	15	16	16	15	14	15	10	4						
MED										233	246	254	240	250	246	248	235	216						
U Q										236	258	259	249	256	252	262	242	222						
L Q										230	238	246	236	236	240	240	232	212						

JAN. 1998 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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	298	302	268	270	268	248	232	226	222	200	224	H 196	202	212	H 206	232	220	244	220	246	220	A	A	340
2	332	322	310	284	268	272	248	220	226	H 196	228	226	216	212	232	230	216	A	A	A	248	264	E A 376	A 378
3	362	352	A	264	A	A	A 270	228	224	224	218	204	216	H 186	254	A 228	226	210	256	246	A	332	298	378
4	270	334	298	256	260	E A 336	A 284	224	228	224	228	228	A	A 250	210	240	220	224	262	234	242	244	B 308	294
5	294	304	270	240	270	314	242	210	238	226	230	220	218	210	208	240	218	218	234	232	E A 342	272	E A 308	278
6	260	290	260	256	286	276	252	232	212	H 204	H 200	228	222	208	208	240	222	216	234	238	274	A	340	288
7	A 294	298	248	274	350	252	322	246	244	230	222	214	212	212	228	250	224	206	226	312	276	262	284	250
8	256	240	254	274	266	300	294	246	230	220	H 198	230	222	210	198	234	238	212	256	220	236	294	300	304
9	304	338	266	220	330	304	242	218	224	226	H 208	236	226	222	210	230	206	220	246	236	220	236	242	278
10	262	276	252	258	242	296	A 320	242	216	218	214	206	H 200	196	A	220	216	216	242	226	262	254	304	318
11	304	286	242	236	252	316	346	236	196	H 198	244	214	230	218	224	234	216	218	A	E A 388	A	262	306	298
12	270	312	276	214	242	314	274	218	212	H 190	H 212	200	208	230	238	224	216	224	226	264	250	264	270	294
13	274	246	264	274	274	296	250	224	A	A	234	220	200	222	216	H 206	216	204	268	228	218	254	282	252
14	246	294	310	256	236	204	A	232	234	H 216	212	206	230	240	216	224	220	208	206	254	A 316	A	276	306
15	284	280	282	242	230	A	A	236	234	228	H 198	216	H 178	230	218	224	226	208	256	244	238	252	290	276
16	284	272	256	256	270	A	A 332	244	230	H 194	214	206	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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	15	16	15	13	14	16	15	15	16	16	14	15	14	15	15	14	13	14	13	12	14	15
MED	284	296	266	256	268	296	272	230	226	218	216	215	216	212	216	230	220	216	242	239	245	262	293	294
U Q	301	317	282	272	274	314	320	239	234	226	228	227	222	230	228	240	224	220	256	254	275	268	308	318
L Q	266	278	254	241	242	262	248	222	216	H 198	H 210	206	202	210	208	224	216	208	226	232	228	253	282	278

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IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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	124	A	A	A	A	122	120	120	126							
2								B	A	A	120	120	A 136	124	120	122	A							
3								B	132	A 146	A 136	A	124	A	A	A	A 132							
4								A	A	132	A	A	A	A	126	A 128	A							
5								B	A	132	124	120	118	120	A 120	124	134							
6								A	A	A 134	A 132	128	128	124	124	122	A							
7								B	A	116	A	A	A	A	A	A	A							
8								B	E A 146	A	A	A	116	124	A 122	126	126							
9								B	130	120	116	126	A 142	A	A	118	144							
10								A	A	A	A	A	A	A	A	A	A	B						
11								B	126	A 148	A	A	A	128	A	124	132	B						
12								B	126	116	116	A	A	122	A 140	122	130	B						
13								B	A	A	A 140	128	A 132	A 128	118	A 134	136	B						
14								B	A	124	118	132	A	122	122	120	128	B						
15								A	A	A	128	A	A	A	A	118	126	B						
16								A	A	A	A 128	126	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C						
18								C	C	C	C	C	C	C	C	C	C	C						
19								C	C	C	C	C	C	C	C	C	C	C						
20								C	C	C	C	C	C	C	C	C	C	C						
21								C	C	C	C	C	C	C	C	C	C	C						
22								C	C	C	C	C	C	C	C	C	C	C						
23								C	C	C	C	C	C	C	C	C	C	C						
24								C	C	C	C	C	C	C	C	C	C	C						
25								C	C	C	C	C	C	C	C	C	C	C						
26								C	C	C	C	C	C	C	C	C	C	C						
27								C	C	C	C	C	C	C	C	C	C	C						
28								C	C	C	C	C	C	C	C	C	C	C						
29								C	C	C	C	C	C	C	C	C	C	C						
30								C	C	C	C	C	C	C	C	C	C	C						
31								C	C	C	C	C	C	C	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									6	9	10	7	7	9	9	12	10							
MED									127	132	126	126	128	124	122	122	131							
U Q									132	A 140	A 132	128	A 136	126	125	125	134							
L Q									126	118	118	120	118	122	120	120	126							

JAN. 1998 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 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	120	110	112	108	128	110	104	110	130	122	116	116	116	166	G	194	156	142	116	110	102	100	102	98
2	100	106	B	130	B	B	B	B	106	104	102	108	116	102	G	132	120	114	108	108	106	106	108	104
3	110	118	110	112	112	114	118	B	116	176	118	118	126	118	162	106	126	124	114	110	104	106	110	108
4	110	108	120	118	112	108	106	104	104	102	102	106	104	108	102	188	106	108	108	120	B	B	B	B
5	B	B	B	B	B	B	B	B	110	160	152	G	G	104	102	106	G	108	108	114	106	102	106	112
6	112	B	B	108	104	B	B	118	114	114	110	174	108	G	110	106	104	104	108	114	106	104	104	108
7	104	104	106	108	106	106	150	130	128	118	106	102	118	100	98	96	106	100	B	104	B	B	B	B
8	B	B	B	B	B	B	B	B	118	114	110	108	G	96	132	138	138	100	B	B	114	106	110	104
9	106	106	106	110	B	B	B	B	198	G	138	132	132	114	112	G	G	B	B	B	B	B	B	B
10	B	B	124	B	122	116	114	120	126	120	112	112	116	118	112	110	106	110	B	124	120	B	106	B
11	B	112	110	106	108	112	116	B	110	112	108	112	110	114	116	192	G	158	106	108	106	116	106	104
12	106	162	B	B	114	110	108	116	G	G	136	120	124	152	150	148	130	114	124	108	106	102	104	B
13	B	B	B	116	114	122	112	110	108	108	108	106	108	110	G	116	162	B	112	118	112	108	116	B
14	108	110	130	120	130	122	110	112	110	G	188	110	114	166	162	166	174	152	B	156	106	100	100	118
15	B	B	B	B	B	110	110	106	104	102	120	122	122	122	118	124	G	118	114	110	108	104	100	100
16	102	B	B	112	110	110	110	110	118	118	116	G	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
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24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
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28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
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	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	9	8	11	11	11	11	10	15	13	16	14	13	14	12	14	11	13	10	13	12	11	12	9
MED	107	110	111	112	112	110	110	111	114	114	114	112	116	114	114	128	126	114	110	110	106	104	106	104
U Q	110	115	122	118	122	116	116	118	126	121	128	120	123	122	141	166	156	133	114	119	110	106	109	110
L Q	104	106	108	108	108	110	108	110	108	106	108	108	109	104	106	106	106	106	108	108	106	102	103	102

JAN. 1998 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1998 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

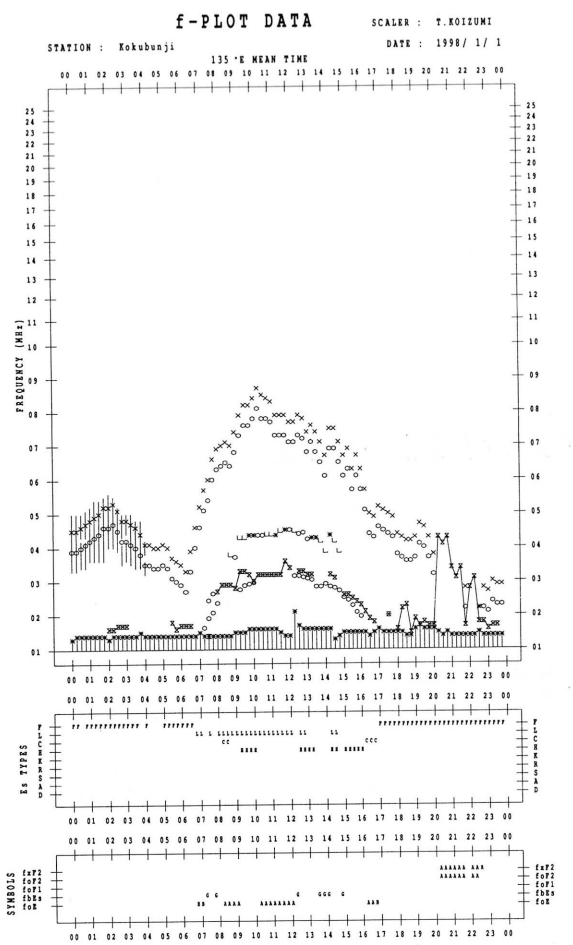
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

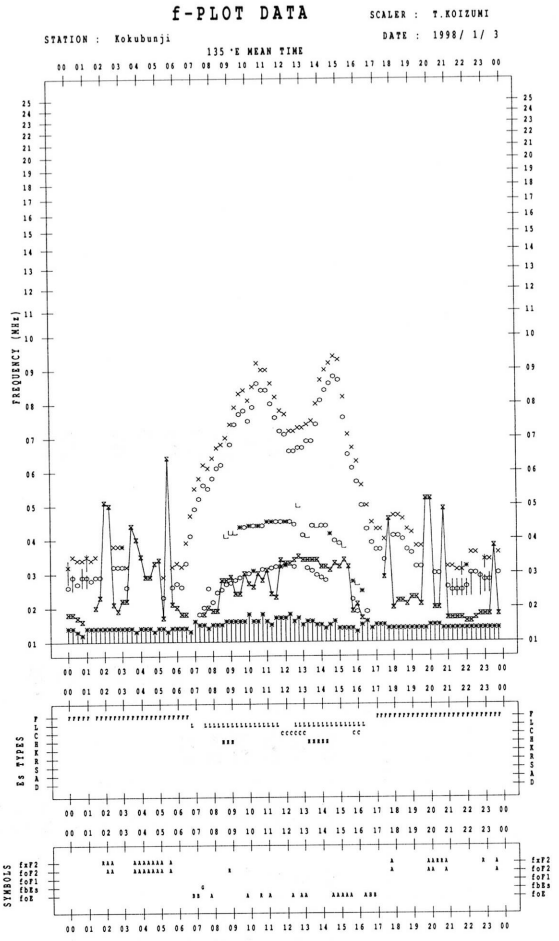
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 1	F 1	F 2	F 2	F 1	F 1	F 2	L 1	L 1	L 2	LH 21	L 1	L 1	H 1		H 1	H 1	F 1	F 1	F 3	F 3	F 3	F 3	F 3
2	F 2	F 1		F 1					L 3	L 2	L 1	L 1	L 1	L 1		C 1	CL 21	F 3	F 4	F 3	F 2	F 1	F 2	F 1
3	F 2	F 1	F 2	F 3	F 3	F 3	F 3		L 1	HL 11	L 1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

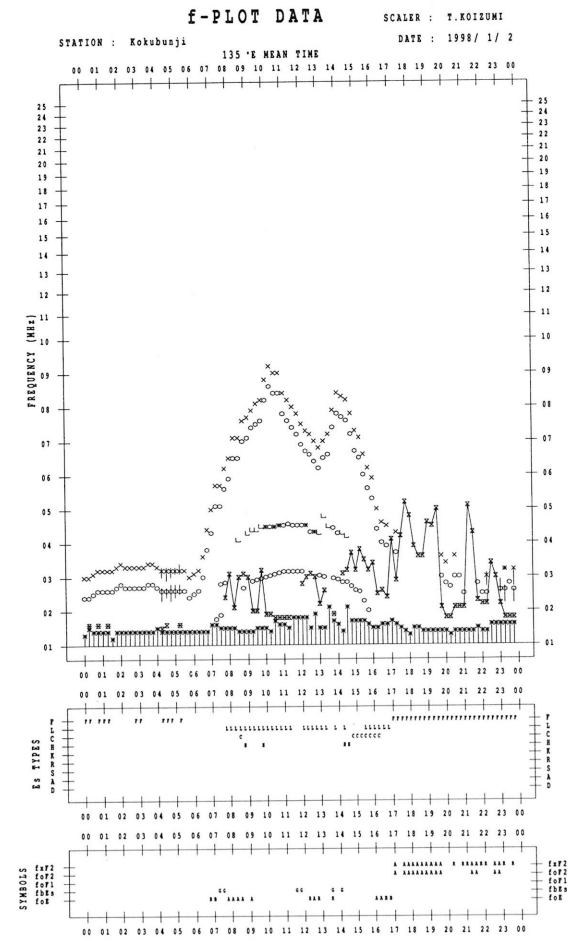
JAN. 1998 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

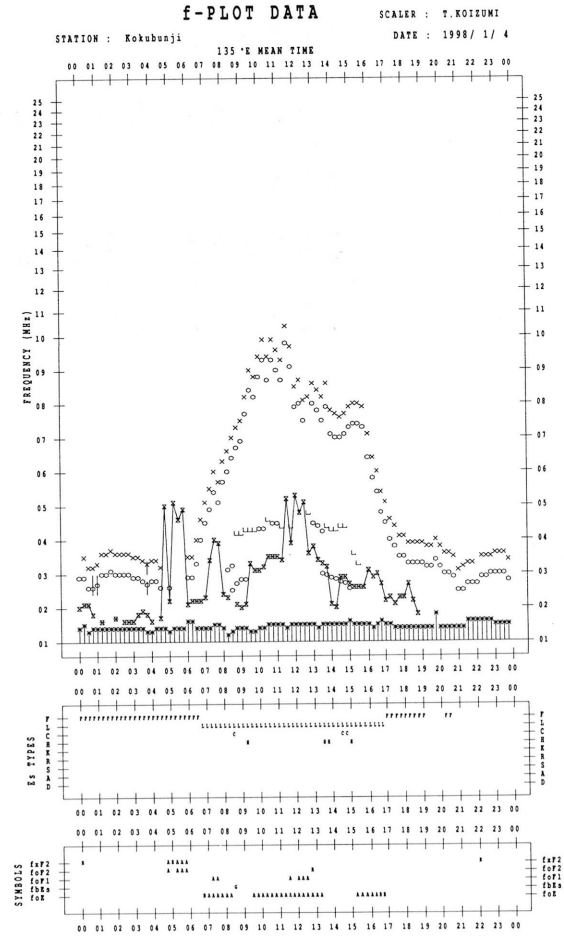
f-PLOTS OF IONOSPHERIC DATA

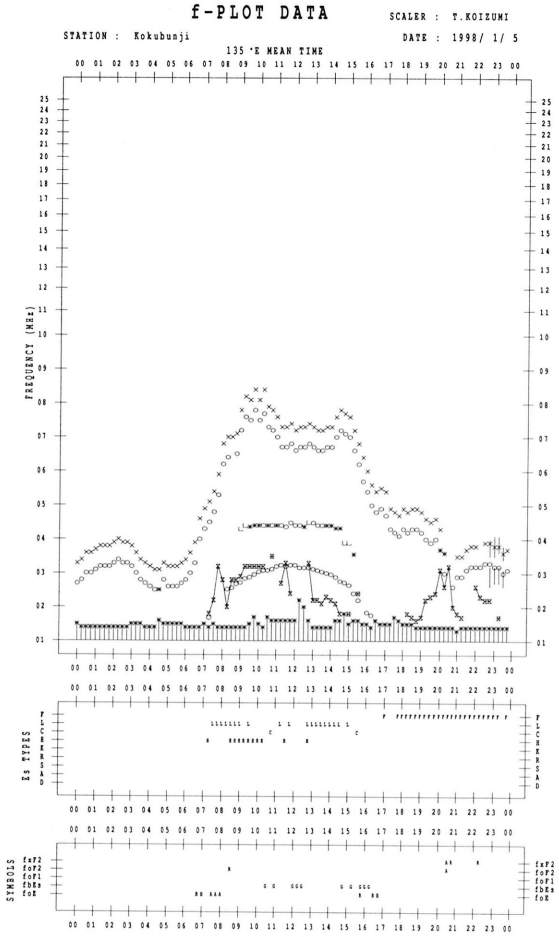
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

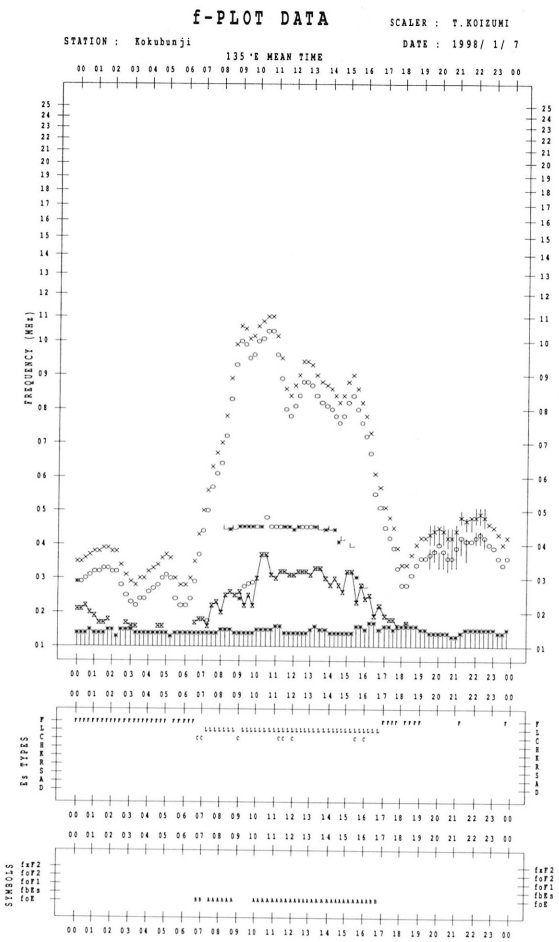

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

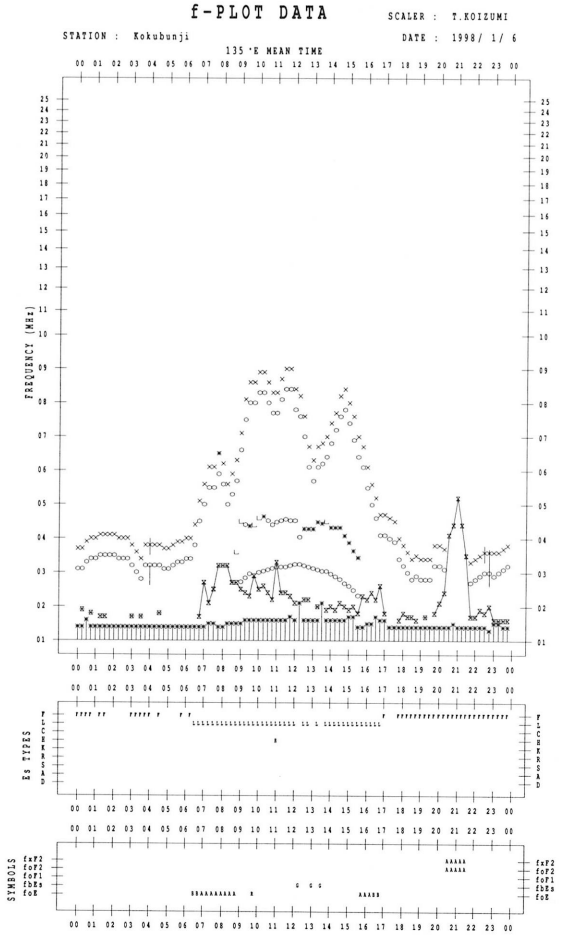

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

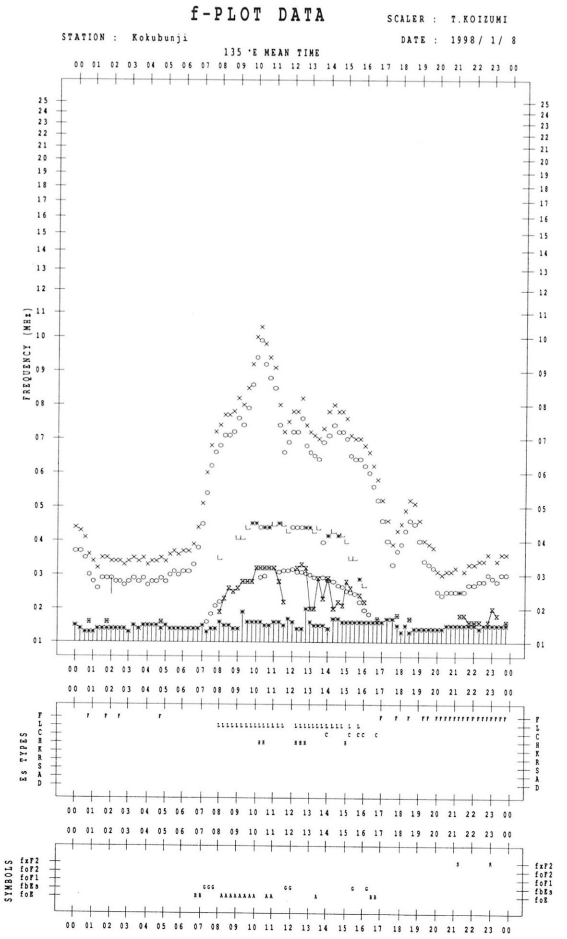

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

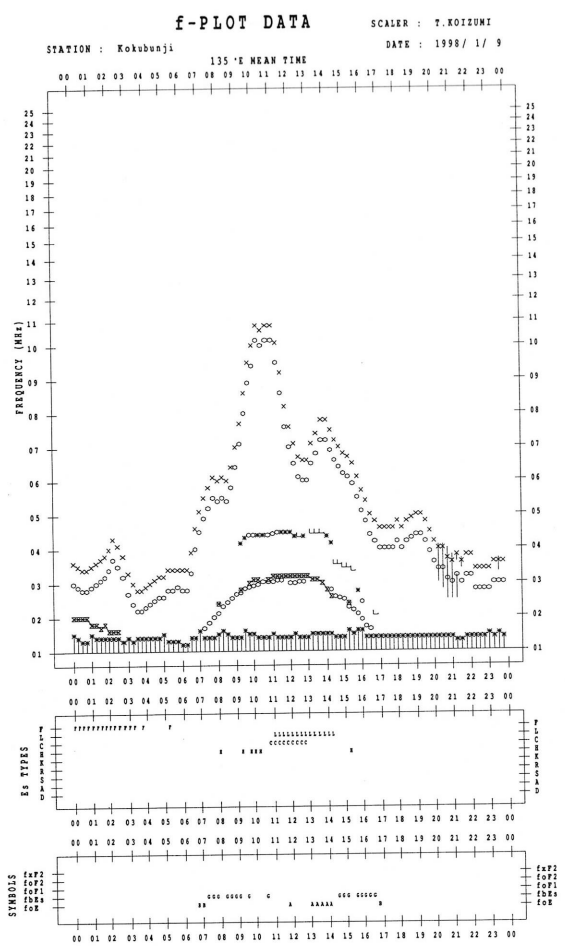

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

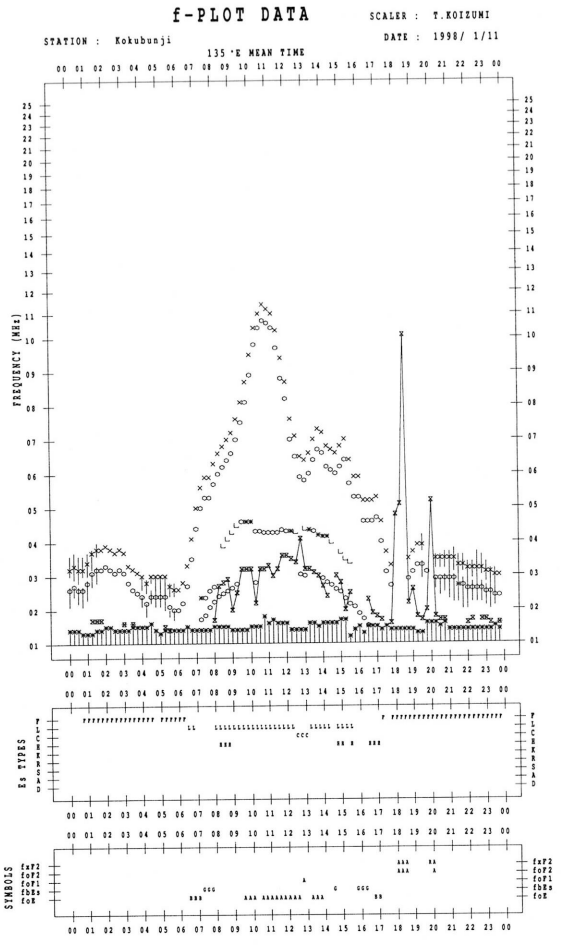

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

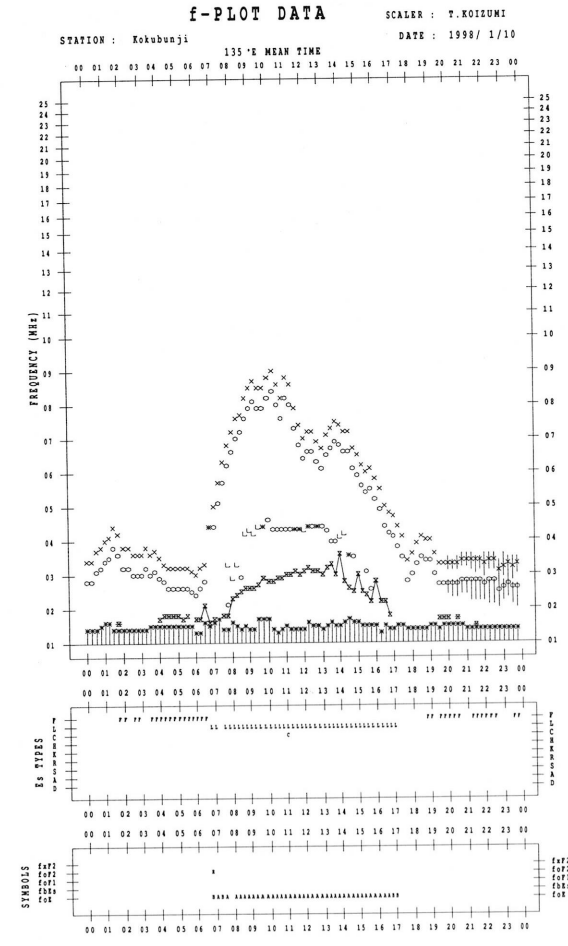

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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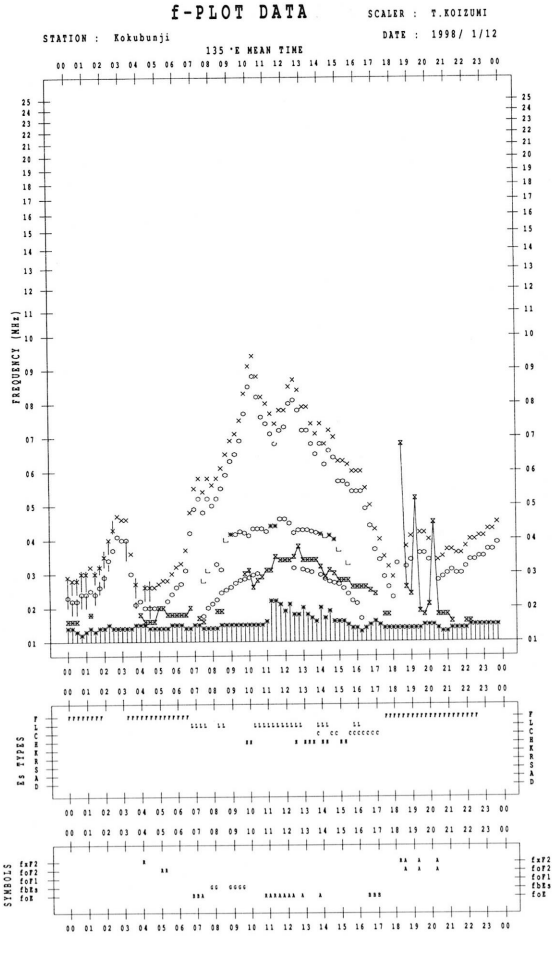
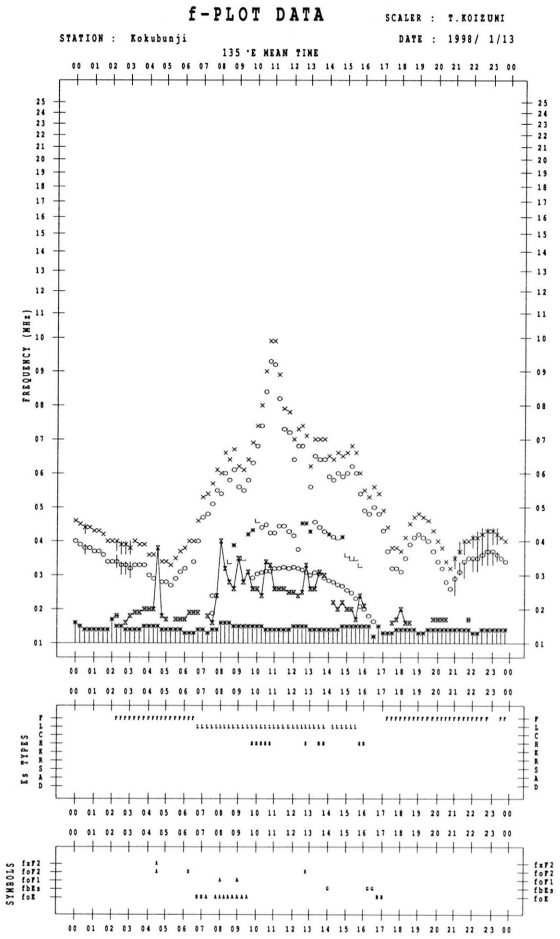
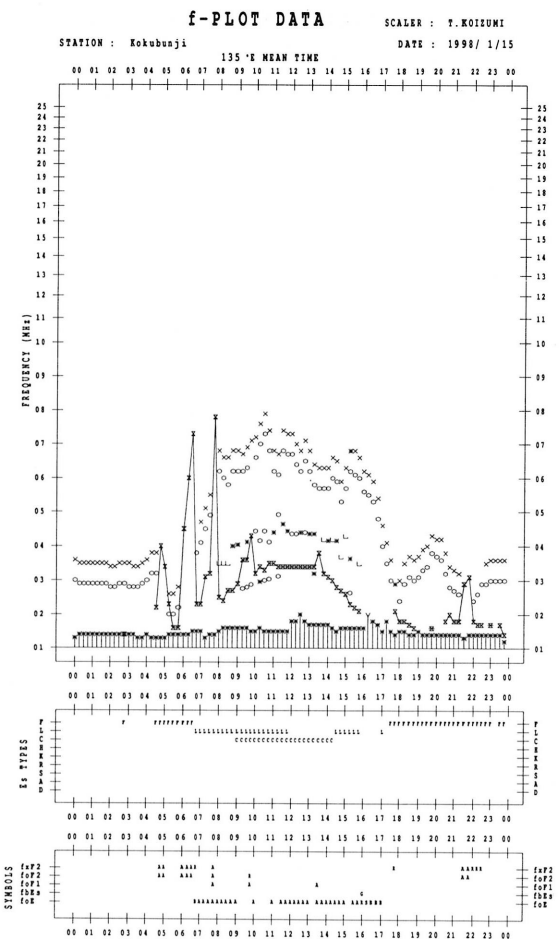
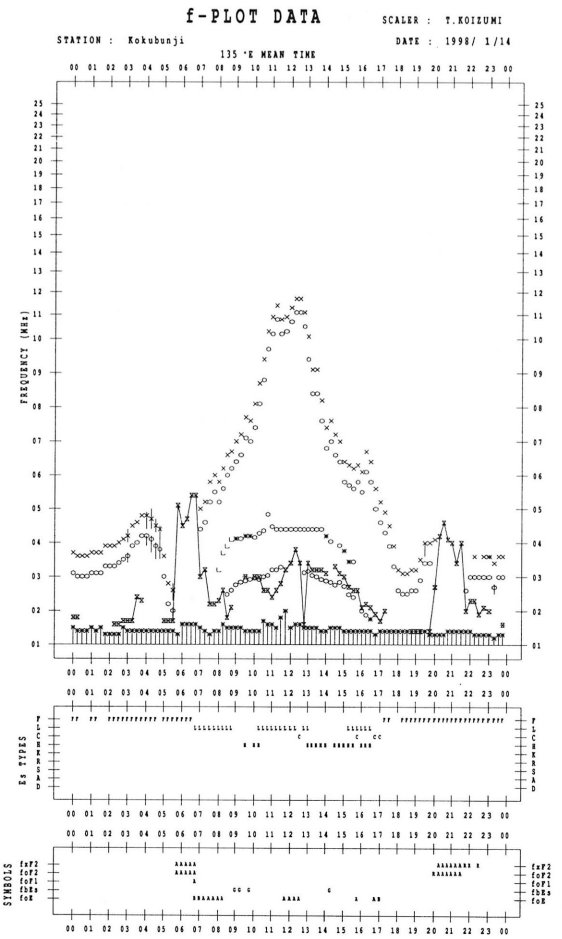
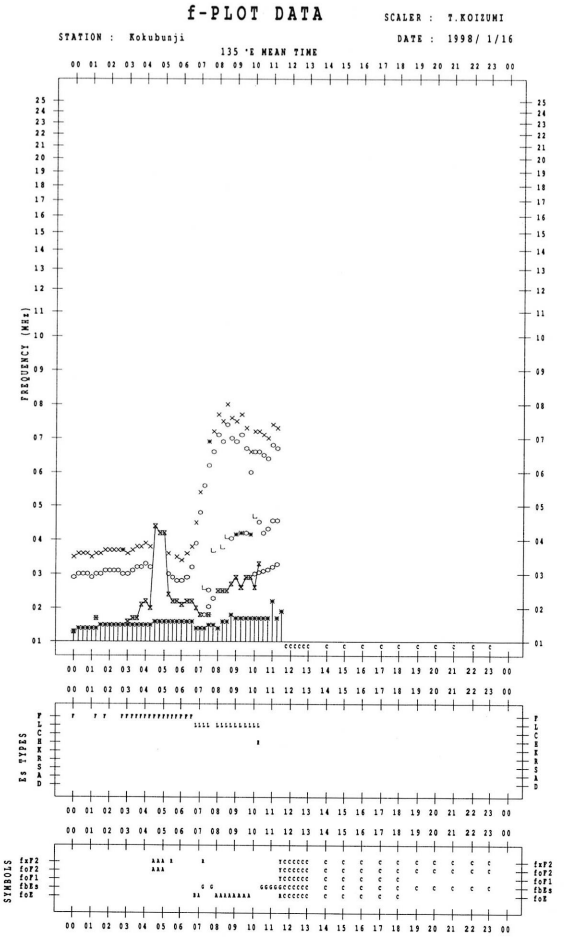
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

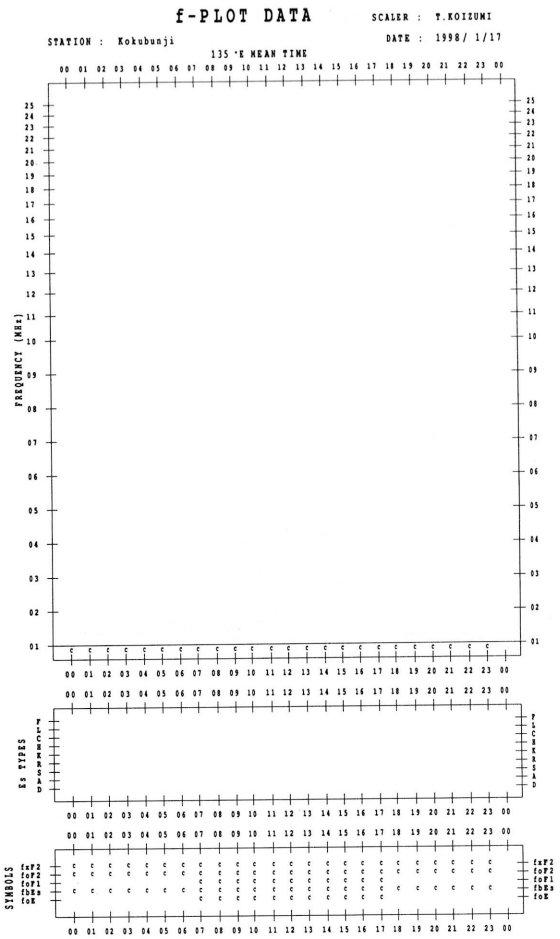

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

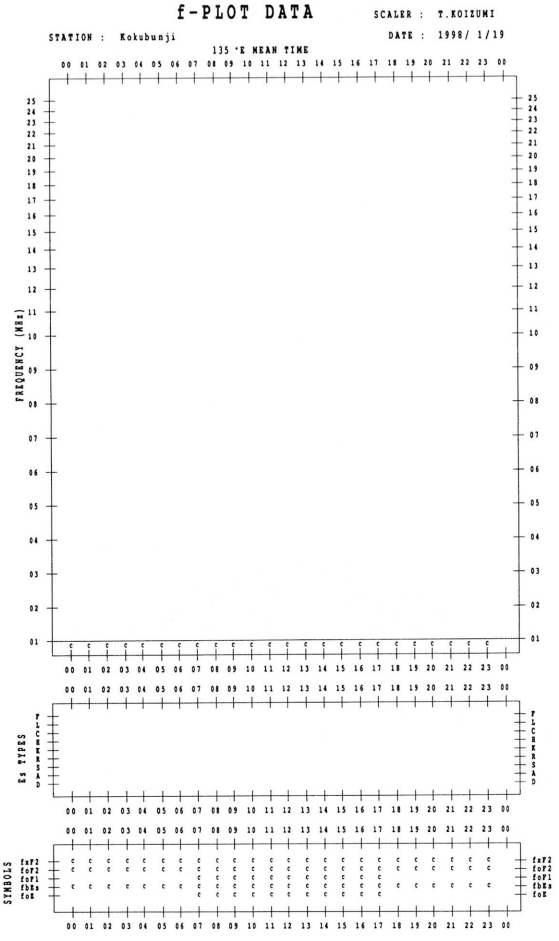

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

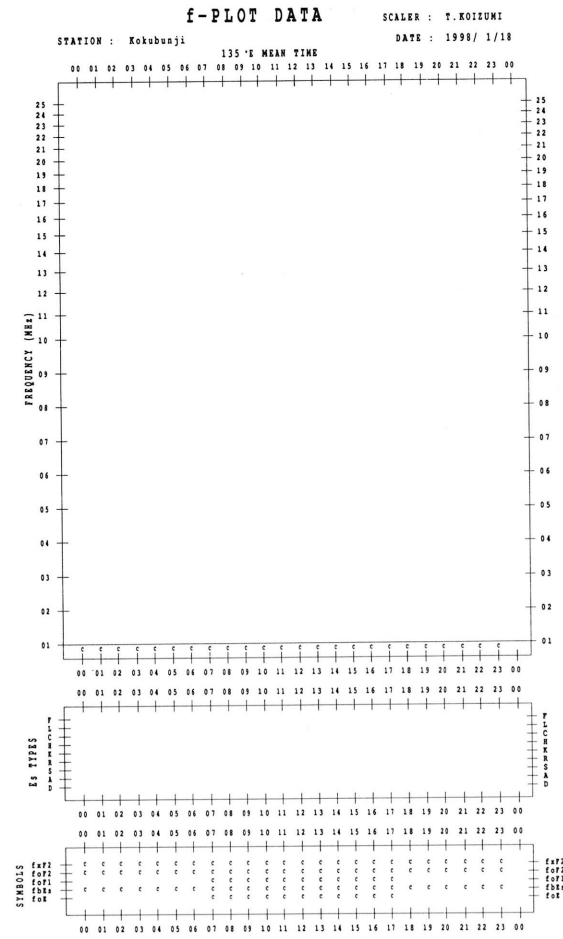

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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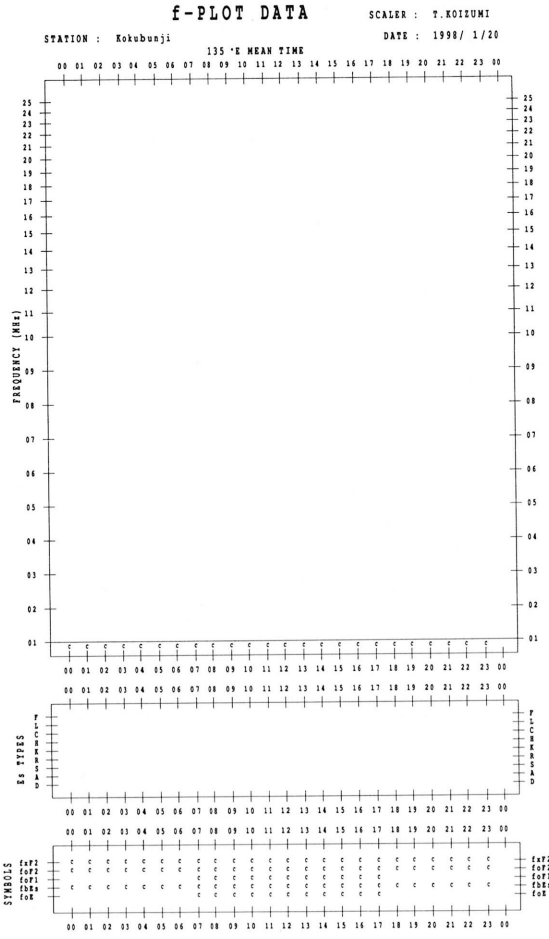
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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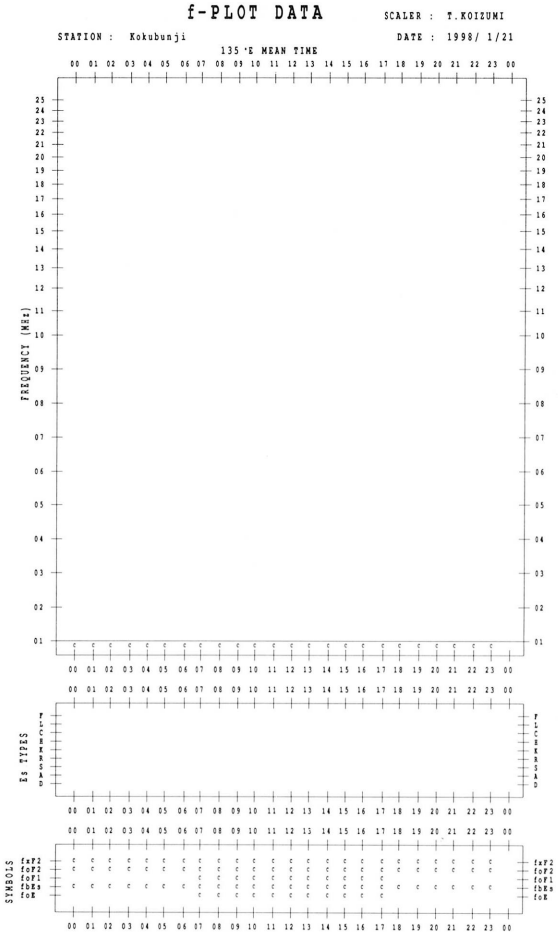
STATION : Kokubunji
DATE : 1998/ 1/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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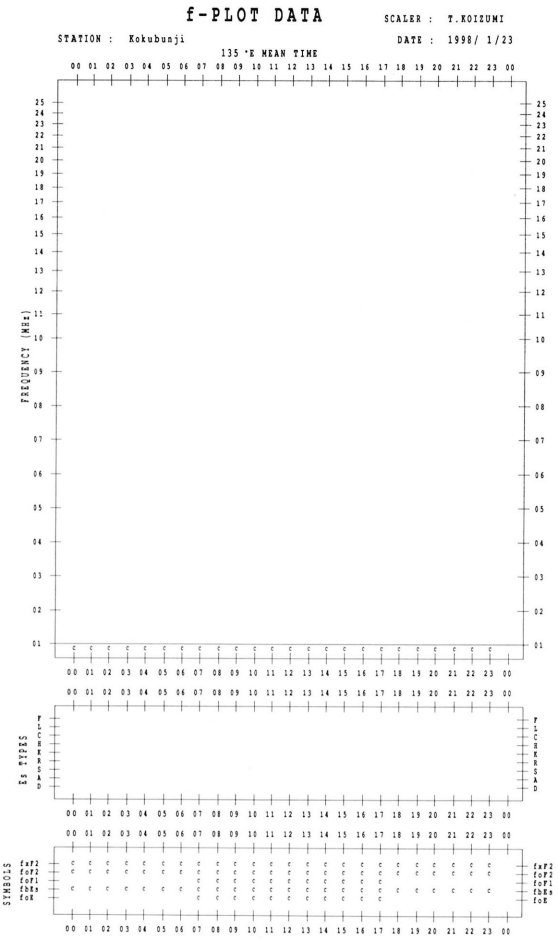
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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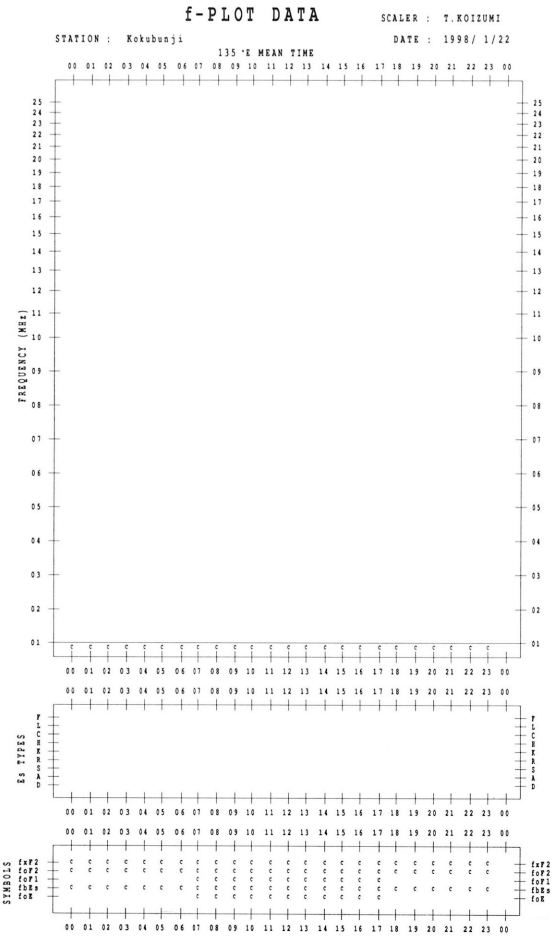
STATION : Kokubunji
DATE : 1998/ 1/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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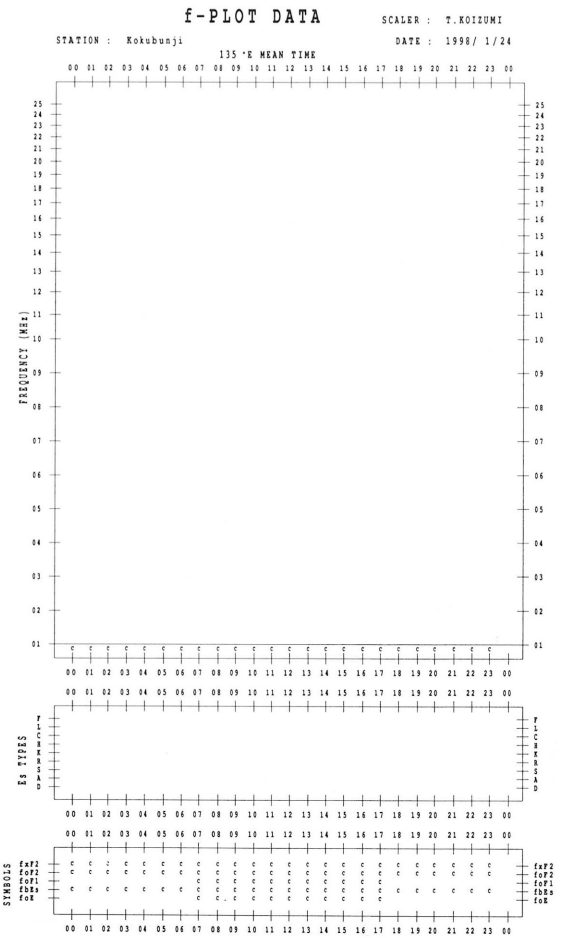
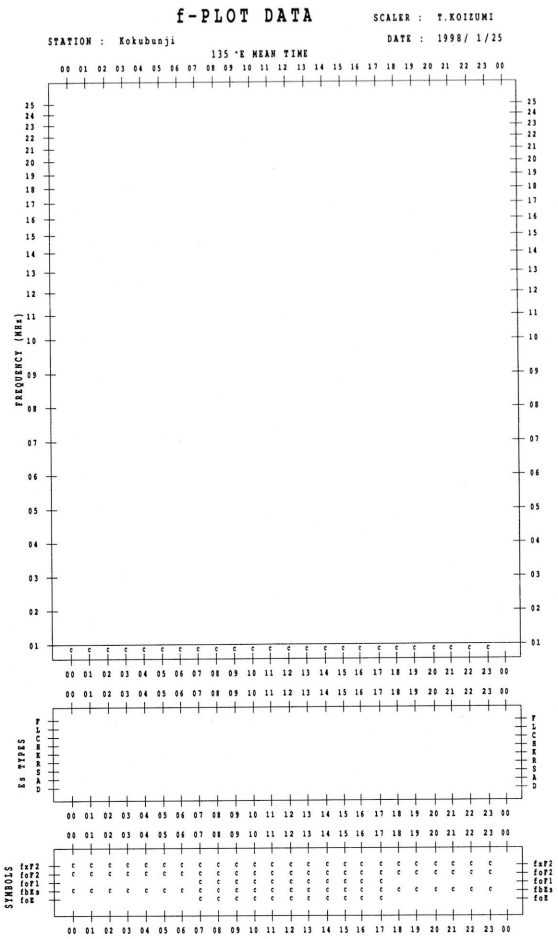
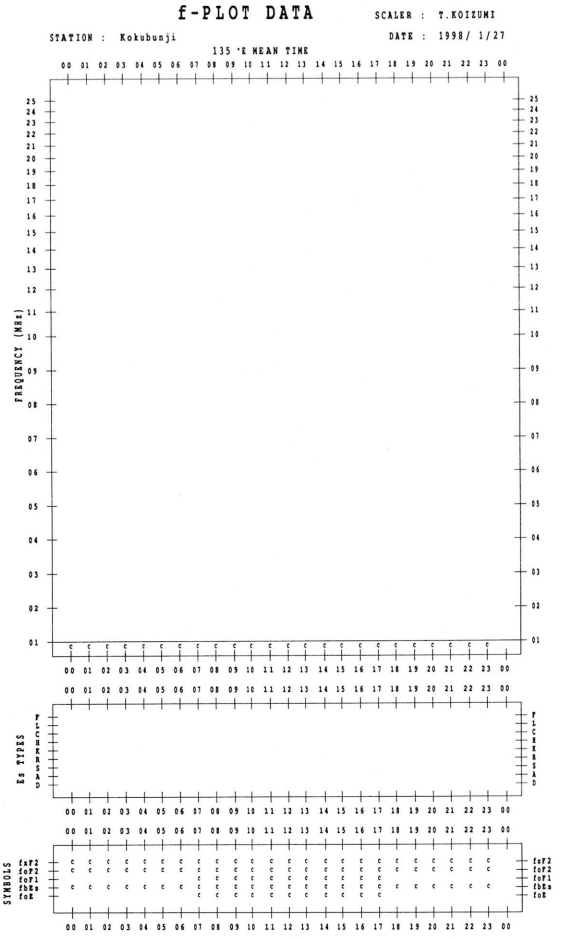
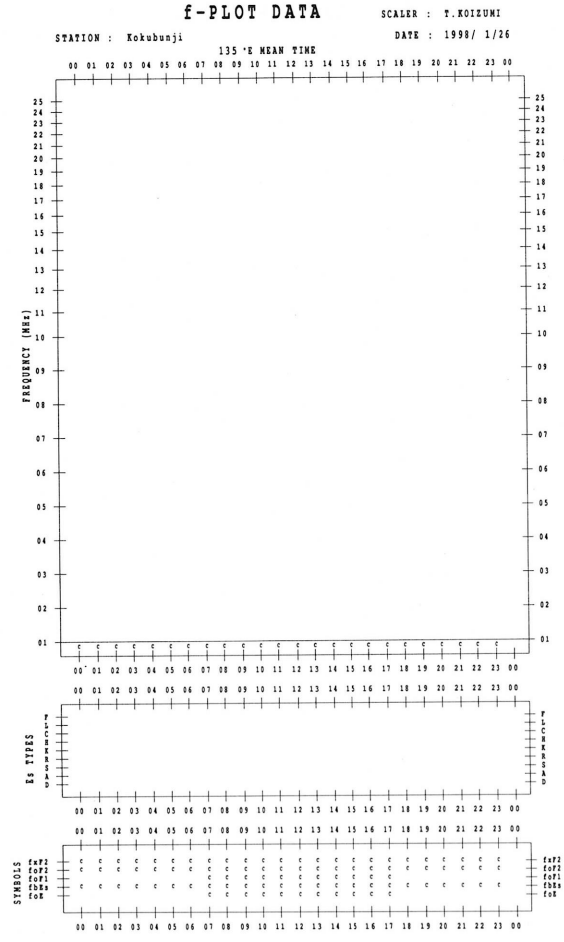
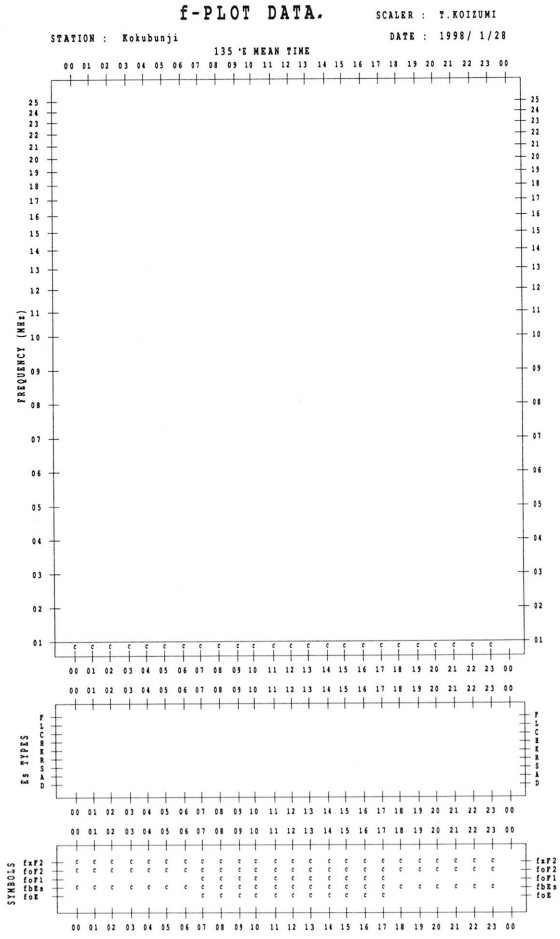
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

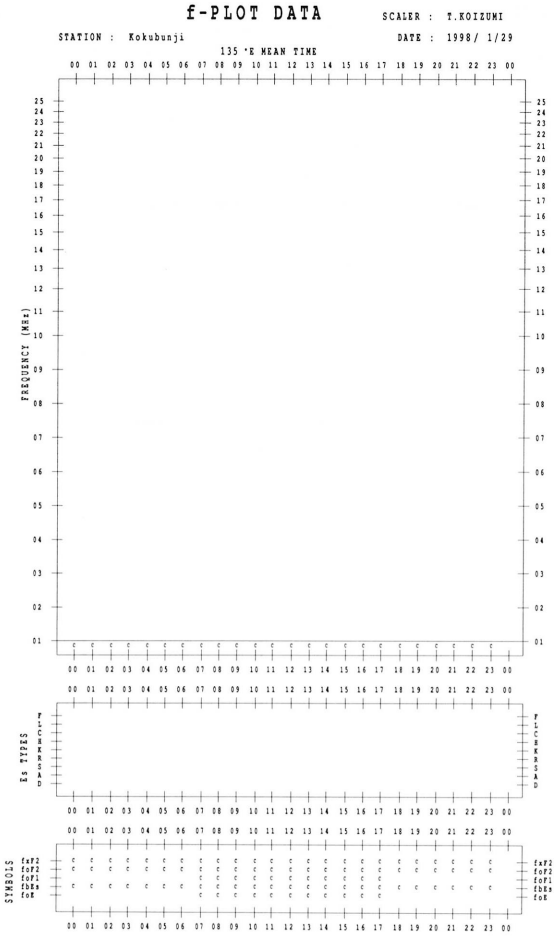

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

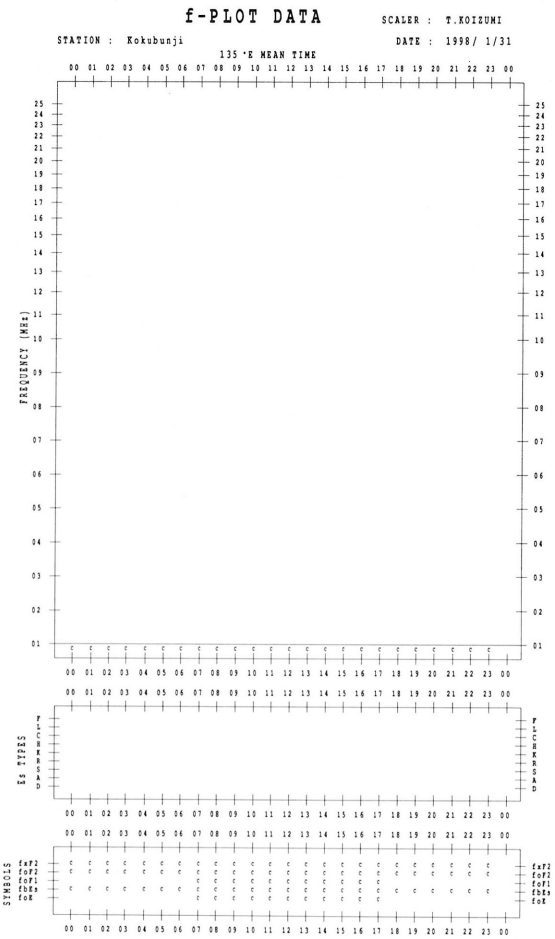

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

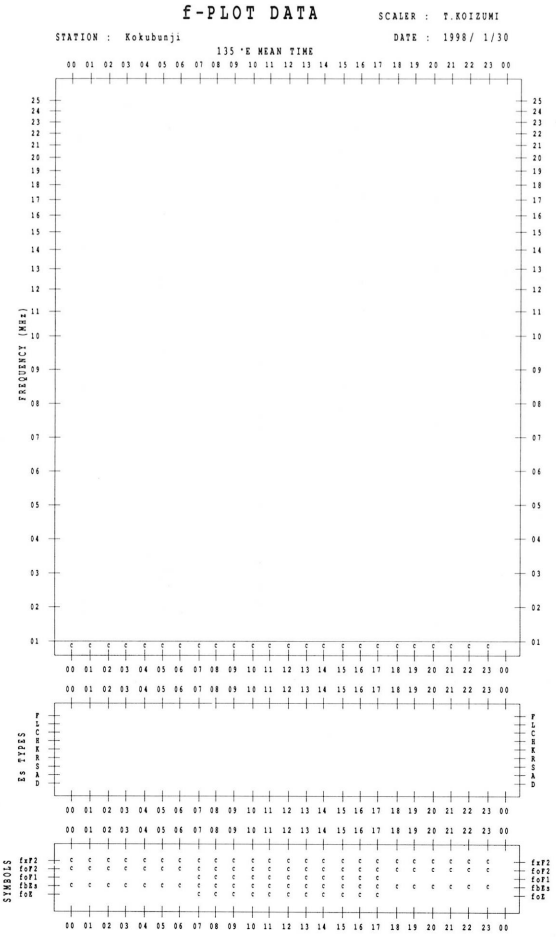

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA.
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 1/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso January 1998

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	33	32	(32)	32	32
2	32	32	(32)	33	32
3	33	31	(30)	33	32
4	32	31	(30)	33	31
5	32	31	(31)	33	31
6	32	30	(30)	33	31
7	31	31	(30)	32	31
8	31	31	(30)	32	31
9	31	29	(29)	32	30
10	30	29	(29)	32	30
11	30	29	(29)	30	29
12	31	31	(31)	32	31
13	32	30	(29)	32	31
14	31	30	(30)	30	30
15	30	30	(30)	31	30
16	31	31	(30)	31	31
17	31	30	(30)	31	30
18	31	30	(29)	31	30
19	31	31	(30)	32	31
20	31	30	(29)	32	30
21	31	29	(29)	32	30
22	32	30	(30)	32	31
23	32	31	(31)	32	31
24	32	31	(32)	32	31
25	32	31	(30)	33	31
26	33	32	(31)	33	32
27	33	32	(31)	34	32
28	34	32	(32)	34	33
29	33	32	(31)	33	32
30	32	31	(30)	33	31
31	32	30	(30)	31	31

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso January 1998

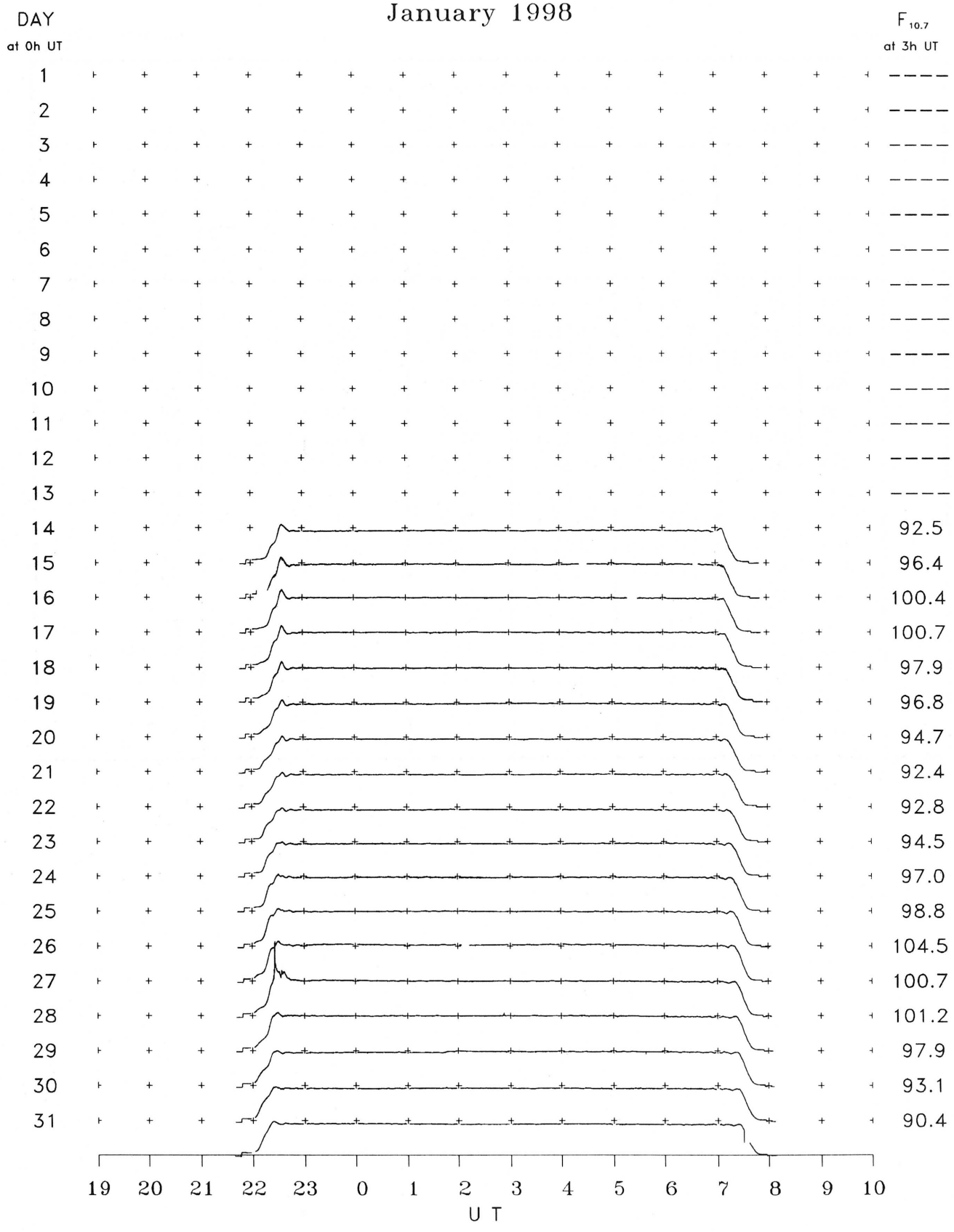
Single-frequency observations

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

JAN. 1998	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
2	200	42 SER	2228.7	2229.0	3.7	90	-	0
3	200	8 S	0123.6	0123.9	0.5	23	-	0
12	500	42 SER	0208.7	0208.7	14.0	18	-	0
	200	46 C	0227.7	0242.5	21.0	30	6	0
	500	46 C	0231.6	0232.0	3.7	30	8	WR
	500	46 C	0236.5	0243.5	10.0	140	25	MR
	500	46 C	0444.2	0448.7	9.0	120	23	0
	200	46 C	0448.5	0450.0	4.5	24	5	0
	500	8 S	0457.7	0458.0	0.7	40	-	WL
26	2800	46 C	2222.0U	2225.6	19.0	90	12	0
	500	46 C	2222.0U	2226.5	18.0	30	6	0
	200	46 C	2229.5	2236.0	8.0	60	7	0
	200	42 SER	2333.0	2333.4	2.7	15	-	WL
28	200	46 C	0109.8	0111.0	2.0	90	10	WR
	500	42 SER	0111.0	0111.2	1.2	4	-	0
	200	42 SER	0239.5	0239.7	13.0	50	-	0
	2800	8 S	0252.1	0252.2	0.2	4	-	0

B. Solar Radio Emission

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



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

IONOSPHERIC DATA IN JAPAN FOR JANUARY 1998
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2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184-8795 JAPAN