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IONOSPHERIC DATA IN JAPAN

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CONTENTS

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INTRODUCTION

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

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

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	44	37	C	C	41	34	58	57	70	66	87	71	76	72	68	68	62	71	72	68	58	57	48	C
2	38	35	C	C	A	C	A	A	A	A	A	A	A	52	A	47	48	50	48	C	38	35	36	35
3	31	35	28	C	C	41	38	56	54	60	64	58	58	58	62	59	59	C	29	47	40	40	44	31
4	29	35	30	A	35	C	57	57	62	67		64	64	63	67	61	61	58	C	C	58	58	58	C
5	43	35	40	38	38	43	57	58	58	70	N	77	77	66	68	58	58		56	55	C	48	49	47
6	38	38	35	35	36	A	45	C	58	70	67	72	72	72	68	68	58	58	49	57	57	C	44	C
7	38	A	A	A	A	A	57	58	62	62	62	74	73	70	71	70	65	C	58	A	57	57	C	57
8		49	C	C	32	37	57	67	68	71	85	88	77	71	64	60	67	73	60	68	57	38	38	C
9	58	44	37	38	40	38	32	63	57	88	90	78	C	70	69	64	73	74	57	56	56	51	C	35
10	32	C	46	A	28	37	46	C	71	78	88	81	73	73	68	72	66	70	56	69	29	46	38	35
11	32	C	38	40	A	38	32	34	A	52	A	A	A	A	A	56	57	53	51	57	58	40	38	35
12	36	35	40	40	40	30	48	C	C	70	71	76	77	75	71	74	60	58	56	56	36	37	C	A
13	38	37	37	38	37	36	58	70	68	70	80	84	72	70	62	78	54	57	57	C	58	51	56	40
14	40	40	40	35	41	38	57	65	76	76	68	78	77	68	71	74	73	56	37	36	37	23	44	29
15	C	56	40	40	37	31	61	70	67	70	78	86	73	64	57	70	C	68	A	A	58	44	31	56
16	C	C	40	35	42	40	32	67	69	72	81	73	78	81	70	77	68	71	57	C	29	44	40	A
17	56	50	56	42	C	40	60	61	71	66	67	88	77	74	74	70	66	61	C	57	56	57	57	57
18	54	48	51	57	46	C		71	C	63	C	79	79	74	65	71	67	58	57	57	49	58	56	47
19	43	47	C	46	38	32	32		94	60	74	98	78	A	76	68	68	60	50	40	58	57	48	C
20	58	57	57	69	29	40	40	58	C	65	87	87	C	68	64	68	62	58	C	28	38	C	47	C
21	29	23	28	24	29	35	30	57	73	73	78	78	83	70	68	68	67	73	57	38	38	36	A	46
22	C	38	A	32	38	31	57	58	71	75	90	81	81	67	70		68	62	C	A	35	38	32	25
23	23	40	39	47	50	48	43	58	70	75	76		74	72	64	62	76	67	A	A	A	41	40	44
24	46	56	51	37	51	51	48	64	74	73	90	90	87	87	66	66	83	72	58	68	57	40	C	C
25	38	69	68	26	A	35	C	72	80		80	84	C	76	81	78		57	A	A	A	29	40	35
26	32	40	C	41	38	A	28	70	80	88	91	84	91	C	82	C	71	68	C	A	A	35	A	35
27	35	38	40	A	38	40	48	58	70	79	89	102	C	89	77	80	73	C	55	35	38	A	A	36
28	56	48	46	C	51	56	66	70	89	69	87	77	80	90	C	81	81	67	53	C	36	C	C	56
29	57	A	56	A	48	38	43	71	70	72	80	100	A	71	70	70		57	A	A	A	40	57	50
30	A	30	50	56	51	51	53	66	70	70	86	95	84	65	C	70	C	C	A	A	40	34	34	38
31	46	38	38		36	37	A	57	70	75	83	C	88	80	67	71	C	A	38	A	32	38	C	38
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	26	24	20	25	25	27	26	26	29	26	27	24	28	27	29	26	25	21	17	26	27	22	22
MED	38	39	40	39	38	38	48	62	70	70	80	81	77	71	68	70	66	61	56	56	44	40	44	38
U Q	46	48	50	44	44	40	57	70	73	75	87	88	80	74	71	73	71	70	57	62	57	51	49	47
L Q	32	35	37	35	36	35	38	58	67	66	74	76	73	67	65	63	60	57	49	39	37	37	38	35

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT WAKKANAI

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	33	28	29	28	28	30	34	35	33	34	31	42	36	26	G	G	G	G	G
2	G	23	26	C	37	G	28	36	C	35	35	34	39	30	27	28	22	29	40	34	25	26	33	25
3	G	23	G	G	G	G	29	42	38	35	57	38	36	30	28	31	29	38	34	27	G	27	G	G
4	G	G	G	29	26	26	G	32	28	30		30	32	29	30	30	26	28	34	G	G	G	G	G
5	G	G	G	G	G	C	G	27	28	34	32	30	29	29	38	28	28		27	29	G	G	G	G
6	G	27	G	G	G	C	G	28	46	35	32	33	37	28	34	31	32	28	G	G	G	28	35	30
7	38	46	59	C	38	32	G	36	28	36	46	44	34	34	48	34	57	67	89	74	44	41	65	61
8		28	G	G	G	G	G	29	34	32	36	29	30	47	35	30	33	28	27	46	31	G	24	G
9	28	29	G	G	C	29	G	34	29	36	31	31	37	30	32	28	25	30	27	35	29	28	24	24
10	G	G	28	34	31	29	G	28	44	36	36	58	34	37	36	38	25	G	G	C	36	31	G	26
11	G	G	G	G	C	G	28	26	41	30	42	40	37	37	37	36	28	35	G	32	31	G	G	G
12	G	C	G	G	G	G	G	29	24	27	27	31	35	35	28	39	61	32	29	G	G	G	38	37
13	28	G	G	G	G	G	G	28	27	34	29	34	29	32	36	35	24	28	28	30	28	G	G	G
14	G	G	C	G	G	G	30	28	27	64	32	31	30	26	28	28	C	30	G	G	G	29	44	38
15	38	29	28	G	G	G	G	36	33	35	30	30	31	30	28	24	33	28	29	40	28	30	24	25
16	G	G	G	C	28	35	30	34	33	32	30	30	30	32	28	31	35	28	G	G	28	24	33	43
17	32	G	G	G	G	G	25	34	31	28	27	30	28	28	28	24	C	30	G	30	G	G	G	G
18	G	G	G	G	G	G		26	26	28	28	29	28	32	27	29	24	34	33	G	34	41	28	25
19	29	28	29	G	23	G	28		41	C	31	35	31	94	47	37	G	54	38	28	G	29	32	38
20	34	29	31	28	34	G	G	G	31	31	30	40	30	65	34	36	G	G	39	40	34	30	G	34
21	30	28	32	28	34	41	28	C	34	36	58	35	44	43	44	34	29	31	34	31	28	29	30	G
22	33	34	60	40	G	29	29	C	31	34	42	34	28	28	39		59	36	31	36	28	44	28	33
23	30	29	25	25	27	25	28	C	40	31	46		34	36	36	42	35	38	66	C	53	54	43	41
24	27	G	G	C	G	C	32	36	38	39	44	38	30	35	26	31	30	43	G	G	G	G	G	29
25	G	G	28	32	31	26	28	32	39		44	35	30	30	34	37		42	82	87	60	36	G	38
26	32	28	33	42	33	45	36	36	44	44	60	79	31	54	63	60	34	32	27	58	44	34	45	35
27	30	28	30	41	40	34	29	C	34	67	60	84	70	38	29	29	33	42	39	34	28	55	60	38
28	45	41	33	G	28	29	G	21	27	35	46	57	68	92	68	C	90	58	40	34	29	G	28	C
29	80	70	54	50	36	28	G	36	38	36	50	58	96	C	34	75		64	58	63	40	28	C	40
30	60	31	29	32	33	G	28	G	29	31	34	38	38	39	28	47	46	34	58	45	37	28	32	24
31	G	25	36		28	32	30	29	31	26	30	36	38	33	39	34	G	40	27	37	33	28	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	26	29	28	30	26	30	29	30	30	31	30	31	29	27	30	31	29	31	31	30	30
MED	28	26	26	G	26	26	28	29	32	34	34	34	34	33	34	31	30	33	29	32	28	28	26	26
U Q	32	29	31	32	33	30	29	36	38	36	46	40	37	38	38	37	35	40	39	40	34	31	33	38
L Q	G	G	G	G	G	G	G	28	28	30	30	31	30	30	28	29	25	28	26	G	G	G	G	G

HOURLY VALUES OF fmin AT WAKKANAI

OCT. 1997

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

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

HOURLY VALUES OF foF2 AT KOKUBUNJI

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	40	42	40	38	40	A	57	C	70	88	67	91	92	83	69	68	70	84	96	67	66	51	57	48
2	47	56	43	43	38	A	A	73	84	91	91	86	76	70	61	61	61	67	C	51	48	A	48	37
3	37	A	28	29	C	C	58	68	68	78	70	67	70	68	65	62	62	67	51	C	45	45	C	43
4	36	41	34	40	38	40	53	67	C	C	66	72	76	68	66	66	67	74	C	56	66	44	44	A
5	44	43	46	37	C	59	57	71	70	70	69	80	80	72	68	63	66	73	62	56	47	45	44	46
6	A	44	34	40	40	C	52	70	77	70	66	75	77	77	76	68	70	72	72	A	A	A	56	56
7	43	C	44	43	45	46	57	73	64	63	67	65	80	87	81	71	66	74	C		48	A	47	C
8	46	47	48	47	42	44		70	C	76	C	97	96	78	68	74	74	72	70	56	57	A	A	A
9	A	A	89	42	30	30	63	68	73	C	91	107	84	61	64	77	76	80	76	57	50	48	57	45
10	C	A	48	43	C	A	54	68	75	82	81	A	96	80	73	78	C	84	68	A	C	37	43	41
11	46	43	C	40	A	35		63	68	C	70	92	110	67	71	68	83	68	94	60	57	42	C	56
12	57	58	C	47	42	C	61	68	C	71	73	87	87	82	81	81	85	78	61	44	A		34	36
13	C	C	35	40	59	N	57	72	81	77	84	77	76	77	76	71	76	60	56	57	46	46	46	43
14	C	46	C	35	36	46	57	70	93	C	74	78	70	78	91	82	C	70	61	47	43	C	38	C
15	56	43	C	23	23	A	C	94	94	78	74	76	88	76	77	82	68	60	56	A	44	46	44	44
16	41	C	C	41	41	45		70	C	88	76	82	88	74	85	81	C	82	53	45	44	46	44	40
17	41	46	56	C	34	A	47	C	81	73	66	76	101	87	82		63		61	48	57	45	57	46
18	36	38	44	40	39	34	57	C	94	91	78	84	78	76	79	78	68	68	48	46	A	56	C	47
19	47	48	57	47	45	42	46	60	94		76	72	92	82	77	68	71	61	48	42	44	44	C	44
20	C	41	38	40	A	26	48	64	78	88	86	68	77	78	71	72	65	60	C	46	C	43	C	C
21	43	C	42	41	45	31	50	57	C	76	92	84	80	77	86	76	78	57	57	46	B	N	36	38
22	37	38	38	42	35	28	44	66	C	73	78	85	90	77	A	70	C	66	A	A	A	37	C	36
23	37	C	41	38	34	N	48	56	57	74	81	88	76	72	75	87	C	81	35	C	31	28	34	34
24	36	38	34	36	A	32	C	68	C	74	91	92	83	80	82	77	81	C	A	A	A	47	43	46
25	41	45	58	A	A	N	A	68	C	93	84	98	76	80	93	88	66	60	56	A	57	C	48	44
26	A	A	A	44	25	C	C	70	C	93	91	98	96	92	92	78	A	71	A	A	C	31	C	A
27	69	C	A	A	A	59	68	68	68	92	113	117	91	97	87	86	77	67	48	A	A	47	41	C
28	38	35	A	A	59	28	57	70	78	92	77	84	78	74	114	90	78	65	38	36	C	69	58	58
29	36		49	A	37	37	59	73	78	92	92	87	84	78	95	83	68	C	43	A	A	36	C	C
30	A	C	89	35	36	34	C		74	74	78	87	80	87	70	78	71	58	A	A	A	A	36	89
31	59	56	A	38	36	C	44	C	68	76	77	88	82	81	100	74	65	66	56	C	C	58	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	19	22	26	23	18	22	26	22	26	30	30	31	31	30	30	25	28	23	17	17	22	21	22
MED	41	43	44	40	38	36	57	68	76	78	78	84	82	78	77	76	70	68	56	48	48	45	44	44
U Q	47	47	49	43	42	45	57	70	81	91	86	91	91	82	86	81	76	74	68	56	57	47	52	47
L Q	37	41	38	38	35	31	48	67	68	74	70	76	77	74	70	68	66	63	48	45	44	42	39	40

HOURLY VALUES OF fEs AT KOKUBUNJI

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	33	30	G	25	27	29	29	29	30	45	59	45	36	31	28	24	25	34	38	27	44	38	G	G
2	G	25	G	G	G	29	36	38	30	30	31	G	G	28	28	28	45	48	51	41	39	52	30	G
3	G	29	G	G	G	G	23	29	34	30	32	34	42	44	42	35	29	28	23	25	26	28	G	G
4	28	G	G	G	G	G	26	25	28	27	28	41	39	30	30	31	22	29	G	28	33	27	G	44
5	25	26	29	23	G	G	28	24	32	28	28	32	40	27	32	22	30	30	G	G	G	G	G	G
6	33	29	G	G	G	G	27	29	41	58	34	G	G	30	30	30	36	32	34	58	52	50	28	27
7	28	G	G	G	G	G	C	32	29	29	48	51	43	48	36	28	23	27	28		24	36	G	25
8	26	23	23	G	G	G		32	40	31	32	28	38	G	30	28	34	45	51	G	35	31	29	C
9	39	30	G	24	G	G	26	29	34	32	31	33	30	28	35	27	26	28	25	24	G	26	G	29
10	38	26	29	25	30	C	30	41	28	28	59	82	43	51	32	36	32	40	40	29	G	G	49	G
11	G	29	G	G	30	G		26	33	34	26	44	38	G	28	26	56	C	G	28	G	G	G	G
12	G	G	G	G	32	27	24	28	26	G	28	G	G	31	32	30	40	G	28	29	26		G	G
13	G	24	G	26	G	G	G	26	30	27	G	16	39	43	32	30	33	G	29	32	25	26	G	G
14	G	G	G	G	G	G	33	33	28	28	28	26	25	28	35	40	40	44	32	G	C	24	G	G
15	G	G	28	30	26	30	G	30	29	30	31	G	G	31	30	41	40	33	G	37	47	G	G	G
16	G	G	G	G	G	G		35	40	33	G	30	44	49	54	52	31	42	37	51	32	26	G	G
17	G	G	G	G	24	30	24	32	39	32	32	42	25	29	29		G		25	38	27	28	G	G
18	G	G	G	G	G	G	G	36	36	30	32	39	30	32	29	29	28	29	24	33	C	43	37	33
19	50	44	29	32	25	G	29	C	50		31	31	29	31	31	42	42	49	36	G	54	49	G	G
20	G	40	31	30	26	G	G	28	31	32	36	32	C	30	27	38	30	43	50	50	40	29	G	G
21	G	G	G	G	G	G	G	29	26	46	52	54	49	33	49	27	35	31	34	25	B	G	30	40
22	33	31	28	G	29	G	G	31	31	49	46	47	48	57	82	50	31	26	44	49	40	29	26	25
23	26	G	28	G	G	G	C	43	32	31	39	43	40	30	31	28	34	G	G	G	G	G	G	G
24	29	30	G	32	40	27	G	C	46	44	32	42	31	40	34	47	40	54	71	90	C	56	28	G
25	50	31	35	36	24	G	33	35	31	52	30	41	32	44	48	39	52	44	49	50	G	G	G	30
26	35	40	31	31	40	27	28	25	31	27	45	49	44	40	53	C	87	C	51	50	G	G	G	26
27	G	28	31	30	31	G	G	28	32	49	45	57	43	62	52	34	40	40	33	35	32	40	50	27
28	28	33	29	34	33	28	28	32	26	28	26	32	41	46	34	27	30	31	29	G	G	G	G	G
29	G		73	52	28	G	26	20	C	34	52	56	60	47	33	29	44	48	G	85	60	29	G	G
30	38	29	26	33	41	29	40		29	30	30	G	37	28	37	28	38	29	29	29	33	42	33	G
31	G	G	33	G	G	G	G	23	29	43	45	23	48	44	51	40	33	35	G	G	G	G	32	26
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	31	30	26	28	30	30	31	31	30	31	31	29	31	28	31	30	27	30	31	30
MED	25	26	G	G	24	G	26	29	31	31	32	34	38	31	32	30	34	32	29	29	27	28	G	G
U Q	33	30	29	30	30	27	29	32	34	43	45	45	43	44	42	39	40	43	40	49	40	38	29	26
L Q	G	G	G	G	G	G	G	27	29	28	28	26	30	29	30	28	30	28	23	24	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	14	15	15	14	15	15	15	15	15	21	18	20	18	14	15	15	14	15	14	14	15	15
2	15	14	15	14	14	14	14	14	15	17	21	C	43	18	15	14	15	14	15	14	14	14	15	15
3	16	14	15	14	15	15	15	15	14	15	22	22	23	18	18	15	14	14	14	15	15	15	15	14
4	15	15	15	15	14	15	18	26	14	15	18	18	C	16	17	15	15	14	15	15	14	15	16	15
5	15	15	14	15	15	15	14	15	18	17	18	20	18	17	15	14	16	15	14	15	14	15	15	14
6	14	14	15	14	14	15	18	15	14	18	27	C	37	14	15	14	14	16	15	15	15	14	14	15
7	15	15	15	17	15	15	20	14	15	15	16	16	C	17	14	16	16	15	15		15	15	14	14
8	14	14	15	15	15	15		15	15	16	16	17	18	C	16	16	15	15	17	14	15	15	15	15
9	15	14	14	15	16	16	16	16	15	15	16	18	17	14	15	15	15	14	14	15	14	14	16	15
10	15	14	14	15	14	15	14	15	15	16	23	23	18	30	18	16	15	14	14	15	14	15	14	16
11	15	14	15	14	15	15		17	14	14	16	14	22	C	15	14	15	15	14	15	15	21	15	17
12	15	15	16	14	14	14	15	24	16	C	15	C	40	14	14	14	15	15	15	15	16		14	15
13	15	14	15	15	14	15	18	14	18	20	22	C	42	16	17	15	14	16	14	15	15	14	15	14
14	15	14	15	16	16	15	14	14	15	16	17	C	16	16	14	15	15	14	14	15	14	15	15	16
15	14	14	15	14	15	15	16	15	15	15	16	C	39	18	15	15	14	15	15	15	15	15	15	15
16	14	15	15	15	15	15		15	17	15	C	17	15	16	15	16	15	15	14	14	15	14	14	14
17	14	14	14	14	14	14	17	15	15	17	C	34	18	16	17		22		15	14	14	14	14	15
18	16	14	14	14	14	15	16	15	14	16	16	20	C	20	17	15	15	15	15	16	18	15	15	14
19	15	15	14	15	14	15	16	15	15		23	17	17	22	17	14	15	15	16	16	15	15	16	14
20	15	14	14	15	14	15	17	15	16	15	20	14	C	C	16	16	14	15	15	15	15	14	16	16
21	14	17	15	15	15	18	17	15	15	16	15	16	16	16	14	16	17	14	14	16	B	20	15	14
22	14	15	14	16	14	15	16	14	15	15	14	14	16	15	17	14	15	15	14	14	14	14	15	15
23	15	14	14	14	15	14	18	15	16	14	15	16	16	16	18	14	15	15	15	18	18	17	15	15
24	14	14	14	14	14	14	16	14	15	15	16	23	14	20	17	18	16	14	16	14	14	14	15	15
25	14	14	14	14	16	16	14	16	16	16	16	17	17	16	15	15	15	15	14	15	15	15	15	15
26	15	15	14	14	14	14	16	26	C	15	18	15	23	18	18	17	14	15	18	15	17	15	15	16
27	14	15	14	14	14	18	14	15	15	15	15	16	21	17	14	15	14	14	15	14	14	15	14	15
28	14	15	15	14	15	15	15	15	14	16	14	16	18	17	17	14	15	15	14	15	15	14	15	15
29	14		15	14	14	14	15	C	15	15	15	15	15	18	16	17	16	14	15	14	14	15	15	C
30	14	14	14	15	14	14	15		15	14	20	C	21	20	16	16	14	14	14	15	14	15	14	16
31	15	15	14	15	15	15	14	23	15	16	14	14	C	17	23	16	16	15	15	16	17	15	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	31	31	28	29	30	29	29	24	26	28	31	30	31	30	31	30	30	30	31	30
MED	15	14	14	15	14	15	16	15	15	15	16	17	18	17	16	15	15	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	17	15	15	16	20	20	23	18	17	16	15	15	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	15	15	15	15	15	16	16	15	14	14	14	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	33	C	60	C	79	37	32	59	70	80	58	85	105	92	81	75	84	83	86	82	66	68	67	C
2	54	C	59	C	79	C	59	76	96	127	114	102	107	106	78	65	71	80	84	85	69	C	52	C
3	C	34	59	49	C	60	43	69	78	96	76	66	82	85	81	67	70	77	73	C	58	60	C	69
4	41	38	32	C	54	42	43	C	73	72	80	66	78	87	76	72	77	74	72	66	65	C	C	79
5	32	C	59	69	69	59	38	66	72	84	75	71	70	80	82	85	80	82	82	C	C	79	79	C
6	60	60	58	C	C	60	42	69	66	81	72	74	88	88	81	81	90	91	84	58	C	C	34	C
7	C	C	79	N	49	48	50	58	67	68	70	81	85	92	87	85	82	84	86	66	69	C	48	C
8	C	C	C	79	89	C	34	68	C	82	85	83	101	106	86	88	94	84	83	62	71	42	C	32
9	C	32	32	30	C	29	C	68	66	72	78	100	107	72	70	81		80	89	85	C	39	53	C
10	59	C	C	C	59	60	59	60	82	81	72	86	107	104	100	92	86	86	84	C	A	42	C	32
11	C	51	53	49	C	N	31	60	71	63	95	110	130	75	81	78	90	80	92	66	32	C	C	89
12		69	59	53	C	C	38	54	74	73	87	84	92	95	101	88	85	100	72	C	69	C	40	37
13	C	89	C	69	C	C	29	66	C	91	90	91	94	108	96	84	78	74	73	71	C	43	C	38
14	42	40	C	C	C	26	59	62	81	91	97	97	109	105	105	97	76	82	66	39	C	C	79	79
15	C	C	52			49	59	62	83	70	91	77	94	102	91	78	74	59	N	A	43	34		37
16	43	C	C	C	38	32	C	56	66	70		88	87	85	102	107	87	82	60	43	A	C	38	A
17	34	38	32	32	31	C	A	55	76	86	95	88	100	105	100	86	C	64	56	40	53	35	60	60
18	C	34	C	54	54	59	49	56	66	74	87	80	76	81	88	101	82	66	66	C	43	42	C	59
19	34	37	A	69	53	31	C	56	70	97	100	86	88	100	101	85	72	C	58	C	53	C	34	43
20	42	31	42	32	C	C	31	60	67	87	85	83	80	80	101	93	68	66	61	31	43	43	A	62
21	69	32	37	C	C	C	79	C	68	72	81	87	90	99	107	104	87	70	60	61	38	38	C	44
22	C	52	38	48	C	49	C	55	60	75	83	99	95	91	94	97	86	72	61	34	C	C	34	42
23	38	C	58	37	40	48	26	53	57	80	91	95	96	90	94	97	88	66	60	69	32	C	69	38
24	C	C	59	41	C	30	C	60	66	67	83	105	96	91	93	78	78	66	60	52	C	109	A	A
25	69	C	C	A	A	A	26	65	96	86	86	88	76	82	107	85	90	66	62	64	C	42	C	61
26	59	40	C		38	32	C	67	70	75	92	110	104	95	111	105	97	84	73	C	C	C	A	61
27	29	C	30	C	59	N	59	54	67	76	110	110	91	85	90	106	101	72	53	62	60	C	42	C
28	C	34	A	28	38	C	59	67	70	89	86	86	81	82	105	107	87	66	70	79	C	41	C	C
29	C	30	31	32	C	C	C	56	80	81	91	96	101	66	106	96	83	61	60	A	44	C	C	N
30	79	69	C	47	46	C	C	70	68	72	83	98	87	85	87	90	91	77	53	C	38	47	C	C
31	C	69	C	69	C	30	C	55	70	71	94	94	92	76	100	107	80	81	66	64	32	C	C	79
	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	19	19	18	16	18	21	29	29	31	30	31	31	31	31	31	29	30	30	21	19	16	14	19
MED	42	38	53	48	54	45	43	60	70	80	86	88	92	90	94	88	84	77	68	64	53	42	50	59
U Q	59	60	59	69	64	59	59	67	77	86	92	98	101	100	101	97	89	82	83	70	66	53	67	69
L Q	34	34	32	32	39	31	31	56	66	72	80	83	85	82	82	81	77	66	60	47	38	40	38	38

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	C	32	30	32	G	G	G	G	G	G	G	G	G	G	G	28	G
2	G	G	G	G	30	29	33	33	33	30	31	49	G	31	G	30	34	35	35	33	29	28	G	G
3	G	G	G	G	G	G	G	G	33	32	33	31	32	31	G	30	G	36	33	G	C	G	G	G
4	G	G	G	G	G	G	G	G	G	G	30	32	31	31	G	33	31	25	G	G	G	G	G	G
5	G	G	G	G	26	G	G	30	32	G	35	31	G	G	32	35	34	37	33	26	G	G	G	G
6	G	G	G	G	G	G	G	N	32	35	36	G	G	31	32	N	34	38	39	35	26	G	G	G
7	G	G	G	G	G	G	G	23	32	32	G	G	G	G	34	30	32	38	36	34	28	28	27	31
8	25	G	G	G	G	G	G	G	36	36	37	34	G	36	32	30	34	39	36	C	32	30	24	G
9	G	G	G	31	G	G	G	G	32	32	C	36	32	53	G	29		173	90	30	G	G	G	G
10	G	G	G	G	G	G	G	30	32	29	39	G	G	53	57	36	30	35	32	G	33	27	G	G
11	G	G	G	G	G	G	G	11	30	36	C	C	51	G	59	36	90	58	C	32	27	G	G	G
12		G	G	G	G	G	G	G	32	30	32	G	G	G	32	G	26	32	G	G	31	26	26	27
13	G	G	G	G	G	G	G	G	30	30	32	33	32	G	G	35	34	37	33	27	29	G	28	25
14	G	G	G	G	G	G	G	32	30	32	33	31	G	G	G	36	35	39	33	34	32	27	G	G
15	G	G	G			G	G	31	38	31	31	32	G	G	30	34	60	67	105	92	56	30		27
16	26	G	G	G	G	G	G	33	46	38		38	G	G	32	37	34	40	35	32	30	28	29	32
17	32	26	29	29	G	G	28	41	62	C	38	36	31	G	36	32	C	33	C	G	32	G	G	G
18	G	G	G	G	G	G	G	23	G	34	32	G	G	31	30	G	G	G	G	G	C	G	G	G
19	G	G	32	28	G	G	G	26	35	33	32	G	32	32	31	34	34	27	G	29	27	32	C	C
20	G	G	G	G	G	G	G	32	36	33	33	G	33	31	G	G	G	32	G	29	32	33	32	G
21	C	G	G	G	G	B	G	22	33	35	51	61	C	80	81	32	C	26	25	G	G	G	G	G
22	G	G	G	G	G	G	G	32	28	29	38	C	37	29	62	28	38	25	G	G	27	G	30	G
23	G	26	G	G	G	G	G	30	32	38	51	40	59	G	28	61	40	G	G	32	G	G	G	G
24	G	G	G	G	29	G	G	G	29	32	30	30	31	29	39	30	32	G	G	G	G	31	C	32
25	28	G	32	85	28	C	G	32	43	44	62	59	62	54	30	27	39	G	G	G	G	G	G	G
26	G	C	32		32	G	30	28	27	46	36	G	G	38	38	32	44	40	33	32	G	G	32	G
27	G	C	G	26	G	G	G	22	26	31	34	32	G	C	G	46	53	39	25	G	G	26	G	32
28	C	C	32	30	G	25	G	24	25	33	35	36	44	37	G	28	32	45	32	33	G	G	G	G
29	G	G	31	32	G	26	G	G	G	27	28	27	C	G	38	36	38	32	40	C	32	C	25	30
30	G	28	G	G	26	27	G	G	26	31	30	G	G	54	50	58	53	47	59	32	32	26	G	G
31	G	G	G	G	G	G	G	32	28	28	38	38	40	54	52	32	28	40	G	25	24	G	C	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	28	28	31	29	30	29	31	29	31	30	28	29	29	30	31	30	28	31	29	29	29	30	27	30
MED	G	G	G	G	G	G	G	24	32	32	33	31	G	31	32	32	34	36	32	27	27	G	G	G
U Q	G	G	G	13	G	G	G	32	33	35	37	36	32	37	38	36	38	40	35	32	32	28	27	25
L Q	G	G	G	G	G	G	G	G	28	30	31	G	G	G	G	29	30	26	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	15	15	15	15	16	C	C	23	C	46	45	44	44	26	22	16	15	15	14	14	14
2	16	14	14	14	15	15	15	16	18	C	23	27	C	44	44	22	22	23	15	15	15	15	14	14
3	15	15	14	14	15	14	14	20	21	22	23	C	26	C	44	43	42	20	15	14	14	14	14	14
4	15	14	15	14	14	14	15	22	28	C	23	24	C	24	C	44	C	21	15	14	14	14	14	14
5	15	14	14	14	15	15	15	16	23	C	27	C	45	45	44	45	26	20	15	15	14	15	14	15
6	15	14	14	14	14	15	14	15	26	27	27	C	45	24	26	22	20	21	16	14	15	15	16	15
7	15	15	15	15	15	14	14	16	23	C	43	45	45	45	26	C	24	18	15	15	15	14	14	15
8	16	14	14	14	15	14	14	21	24	23	28	C	27	27	24	23	27	16	17	15	15	16	16	14
9	14	16	15	16	15	14	14	22	26	24	24	24	24	22	C	44		16	16	15	15	14	14	14
10	14	14	15	14	14	15	14	16	27	C	23	C	43	41	23	28	22	16	15	15	16	17	15	15
11	15	15	14	15	15	15	14	16	24	28	22	23	C	43	27	24	22	18	18	16	14	14	15	14
12		15	14	14	14	14	14	20	20	22	24	C	45	44	26	C	26	17	14	14	16	15	14	15
13	14	15	15	14	15	15	14	17	22	C	24	23	24	C	43	22	21	15	15	14	15	14	15	14
14	14	14	14	14	14	14	14	22	21	23	27	C	47	45	43	44	26	20	15	18	15	15	15	15
15	14	15	15			14	15	15	21	23	C	23	C	46	23	23	23	17	18	16	14	15		14
16	15	15	14	14	14	15	15	16	16	26		26	C	45	23	21	21	20	15	14	14	15	15	16
17	15	15	14	15	15	15	15	15	18	23	26	28	C	46	22	22	26	16	15	14	15	16	16	15
18	15	14	14	14	14	15	14	16	C	21	26	C	45	45	40	30	27	20	18	18	17	15	14	14
19	14	14	15	14	14	15	14	15	21	23	24	28	24	C	43	24	23	20	17	15	17	17	16	17
20	15	17	15	16	14	16	14	16	18	23	24	C	26	24	C	42	27	18	16	14	15	17	15	14
21	14	15	14	15	15	C	14	22	22	27	23	22	22	21	20	18	28	18	C	20	14	15	14	14
22	14	14	14	14	14	15	14	16	17	17	21	43	C	22	24	38	C	18	16	16	15	14	15	14
23	14	15	14	14	15	14	14	15	16	20	21	21	27	45	C	21	18	17	16	15	17	14	15	15
24	14	14	15	14	16	15	14	21	16	20	21	23	24	21	21	20	16	20	14	14	15	14	15	15
25	14	14	15	15	15	14	14	15	15	20	21	22	22	21	C	C	18	18	16	18	14	14	14	14
26	14	15	14		16	14	15	15	16	C	28	42	45	42	23	20	18	16	15	15	15	16	23	15
27	14	14	14	16	14	16	16	18	18	21	22	24	C	23	C	20	17	16	15	14	17	15	14	15
28	15	15	15	15	14	15	14	16	17	20	23	20	29	23	24	21	18	16	15	16	14	15	14	15
29	14	14	15	15	14	14	15	18	28	17	20	C	C	43	22	22	16	16	16	15	16	17	16	14
30	18	14	14	14	14	15	15	20	24	20	21	C	45	22	21	22	18	16	15	14	15	16	15	15
31	15	14	14	14	15	14	14	15	21	20	21	C	41	36	24	20	18	16	16	15	14	17	14	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	29	30	30	31	31	29	23	29	18	22	28	25	28	28	31	30	31	31	31	30	31
MED	14	14	14	14	15	15	14	16	21	22	23	24	35	42	24	22	22	18	15	15	15	15	15	15
U Q	15	15	15	15	15	15	15	20	24	23	26	28	45	45	43	40	26	20	16	16	15	16	15	15
L Q	14	14	14	14	14	14	14	15	17	20	21	23	24	23	23	21	18	16	15	14	14	14	14	14

HOURLY VALUES OF foF2 AT OKINAWA

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	43	C 45			49	B	89	61	C	93										A	57	C	78	A
2	A	55	48	48	C	C	43	70	C	C	134	85	89	114	109	89	87	86	86	C	82	A	70	48
3	58	58	56	C	44	27	59	54	92															
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5																								
6																								
7																								
8																								
9														91	96	84	93	82	A	A	35	50	A	A
10	C	38	31	C	40	C	N	44	86	C	72	76	110	126	120	114	111	C	A	A	53	A	A	C
11	58	55	37	B	B	29	26	50	C	55	122	112	115	104	92	88	84	96	C	A	A	A	54	A
12	53	C 48	58	48	38	C	73		77	94	87	91	100	124	112	102	110	A	A	C	49	A	A	
13	46	44	C 37	32	28	C	59	C	94	105	132	132	150	156	147	134	123	69	A	60	C	A	58	
14	49	48	48	37	C	C	C	51	70	96	116	133	151	145	154	143	127	104	A	44	C	46	A	
15	A	44	C	40	C	C	C	59	83	83	94	116	121	133	126	96	93	A	A	47	43	47	39	
16	43	48	44	36	C	89	59		69	C	94	121	116	127	133	C	131	87	59	A	A	A	69	C
17	32	37	57	39	C	C	C	49	70	81	92	126	136	148	150	143	C	82	C	C	A	C	A	43
18	36	37	C 46		42	N	C	59	69	70	84	95	93	112	127	132	105	74	67	A	C	69	57	C
19	43	A 38	43		C	N	C	48	69	92	C	120	104	122	C	133	C	70	54	59	49	C	50	A
20	60	46	31	34	38	C	A	55	64	C	82	102	92	114	124	122	125	A	A	A	44	A	46	C
21	40	A	46	41	38	C	49	52	70	C	80	92	C	116	124	121	120	92	C	59	59	C	41	38
22	43	C	C 38		31	N	N		70	68	96	120	122	122	125	128	102	81		C	68	70	A	52
23	C	C	C	56	35	C	C	37	63	68	86	116	C	111	150	153	124	105	87	A	75	70	66	57
24	45	C	69	69	69	C	37	47	71	C	85	116	110	92	122	105	89	81	55	62	C	C	57	C
25	55	C	69	B	A	B	69	A	89	94	81	86	77	86	104	100	97	76	79	C	58	C	63	50
26	49	C	B	A	37	A	A	64	71	66	100	122	102	94	116	131	125	C	109	111	78	C	73	58
27	48	A	A	35	C	C	B	38	65	87	95	132	91	90	94	116	124	73	64		57	68	69	50
28	A	A	59	31	A	B	A	59	70	C	95		96	92	111	124	105		64	C	68	58	53	62
29	37	A	A	69	C	89	89	58	90	87	93	111	105	93	116	124	104	82	73	C	64	C	A	A
30	A	A	A	A	57	C	A	50	69	C	91	110	112	122	133	133	144	132	97	A	A	60	68	53
31	55	45	N		40	C	C	39		68	88	105	C	87	121	137	115	93	86	66	A	43	46	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	19	12	15	17	14			22	19	16	22	22	20	24	23	23	22	19	14		17	10	18	12
MED	46	46	48	40	40			53	70	82	94	114	108	113	124	124	108	86	71		58	59	57	51
U Q	55	51	57	52	48			59	83	92	96	121	118	124	133	133	125	104	86		68	69	69	57
L Q	43	41	38	36	37			48	69	68	85	95	92	92	111	105	97	81	64		48	49	47	45

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

OCT. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G		G	B	G	22	33	49										53	46	G	45	36
2	44	27	26	G	G	G	G	C	38	61	58	54	C	54	53	58	46	42	C	G	48	48	26	32
3	26	25	C	G	G	G	G	C	52															
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5																								
6																								
7																								
8																								
9														G	G	61	34	42	59	C	58	55	40	50
10	G	G	G	G	G	G	G	27	C	37	35	37	50	51	38	27	89	88	92	41	34	43	36	42
11	26	G	G	C	C	G	G	48	27	41	38	41	42	41	40	48	56	56	59	81	67	49	G	C
12	24	G	G	G	G	G	C	46		30	32	33	G	G	G	35	34	32	59	72	34	29	37	33
13	G	G	G	G	G	G	C	28	36	36	31	G	32	G	39	29	30	32	C	37	60	44	38	G
14	G	G	G	G	G	B	C	27	37	38	36	26	35	46	24	N	40	C		46	C	35	24	34
15	28	25	G	G	C	C	C	C	48	C	33	35	32	29	30	58	72		86	50	57	66	39	42
16	29	24	G	G	C	G	G		48	53	60	51	53	50	36	36	36	36	45	C	84	36	26	26
17	41	28	28	27	34	C	C	33	49	67	52	46	39	43	36	41	42	41	39	60	38	24	34	24
18	29	G	C	G	G	G	B	29	C	27	33	29	G	G	37	G	28	26	24	C	G	48	G	24
19	C	C	G	G	26	32	C	50	31	34	39	30	G	47	50	40	60	42	66	70	57	G	G	35
20	30	34	40	35	G	B	28	28	35	42	42	38	39	34	36	38	38	66	68	C	G	32	45	30
21	C	40	32	G	G	B	G	30	37	41	45	C	39	37	32	26	52	39	30	25	G	54	27	G
22	G	G	G	G	C	G	G		26	40	40	39	67	42	41	49	39	26		G	43	36	38	40
23	39	28	G	G	G	B	C	29	27	45	C	50	38	32	29	42	27	33	G	38	G	G	G	G
24	G	G	G	G	G	G	G	C	35	35	41	40	G	33	38	29	28	25	32	28	24	C	23	G
25	G	29	35	C	34	C	G	34	38	45	48	50	56	53	C	35	30	41	30	C	25	G	G	24
26	G	G	B	30	38	30	34	51	36	33	36	44	38	C	40	40	49	62	38	34	G	G	G	G
27	40	36	33	G	G	G	C	40	29	C	32	34	32	G	37	36	47	37	35		31	30	G	C
28	C	29	G	G	38	C	37	23	25	34	39		G	G	27	25	31		27	35	C	46	38	30
29	32	28	34	26	26	G	G	33	24	39	40	33	28	G	38	34	32	G	25	G	G	48	34	40
30	38	34	40	27	G	B	23	28	30	35	C	43	53	60	39	34	C	G	G	43	45	46	26	G
31	G	32	23		G	G	B	38		26	30	C	47	61	83	57	28	24	G	70	37	28	C	42
	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	24	22	21	21	15	15	19	21	22	21	20	22	23	23	23	23	21	20	19	23	24	24	23
MED	26	25	G	G	G	G	G	30	35	38	39	38	38	37	37	36	38	37	36	41	37	36	26	30
U Q	32	29	32	13	26	G	23	40	38	45	43	45	47	50	40	48	49	42	59	60	57	48	38	40
L Q	G	G	G	G	G	G	G	28	28	34	33	33	28	G	30	29	30	26	26	28	G	26	G	G

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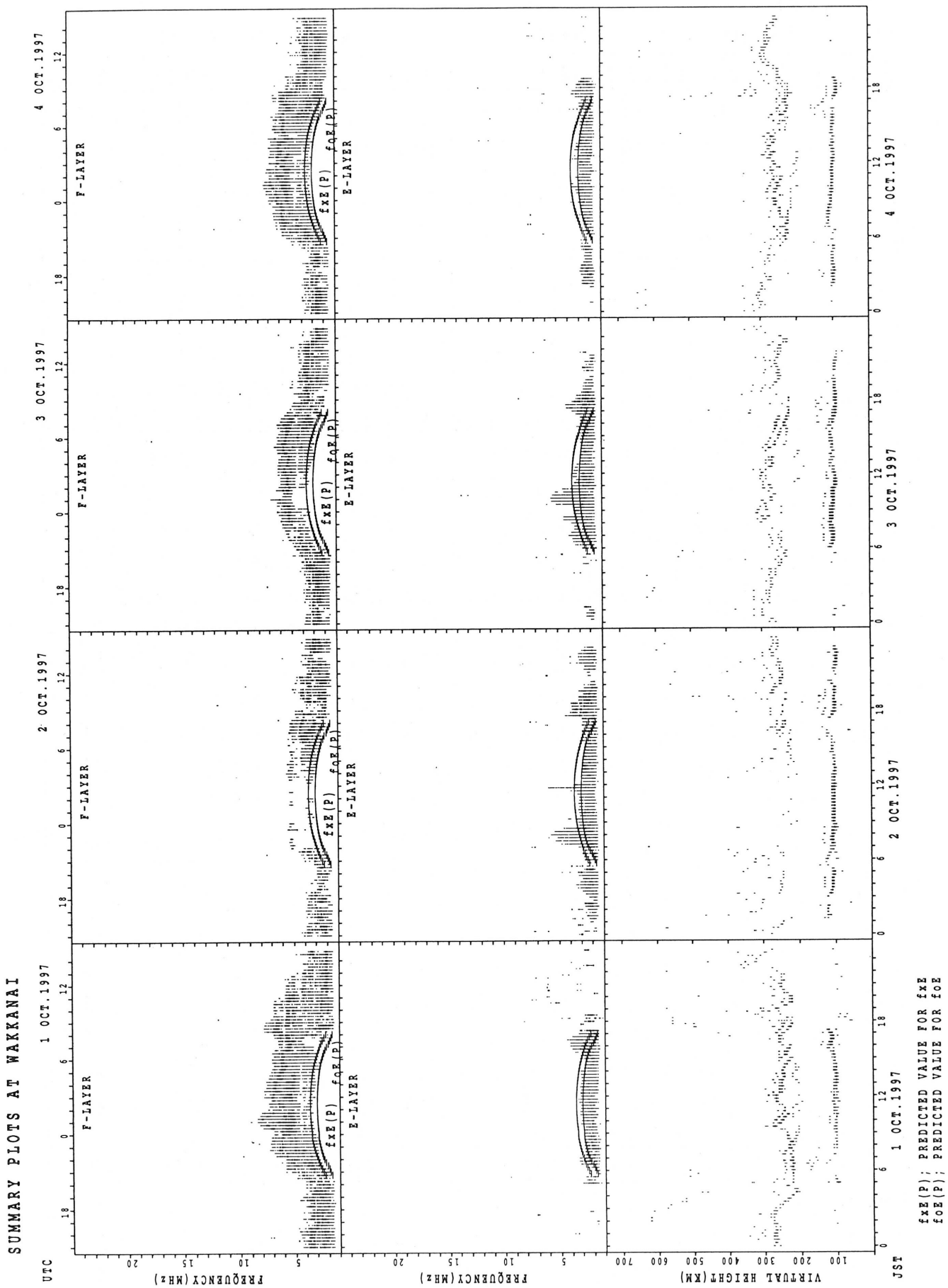
HOURLY VALUES OF fmin AT OKINAWA

OCT. 1997

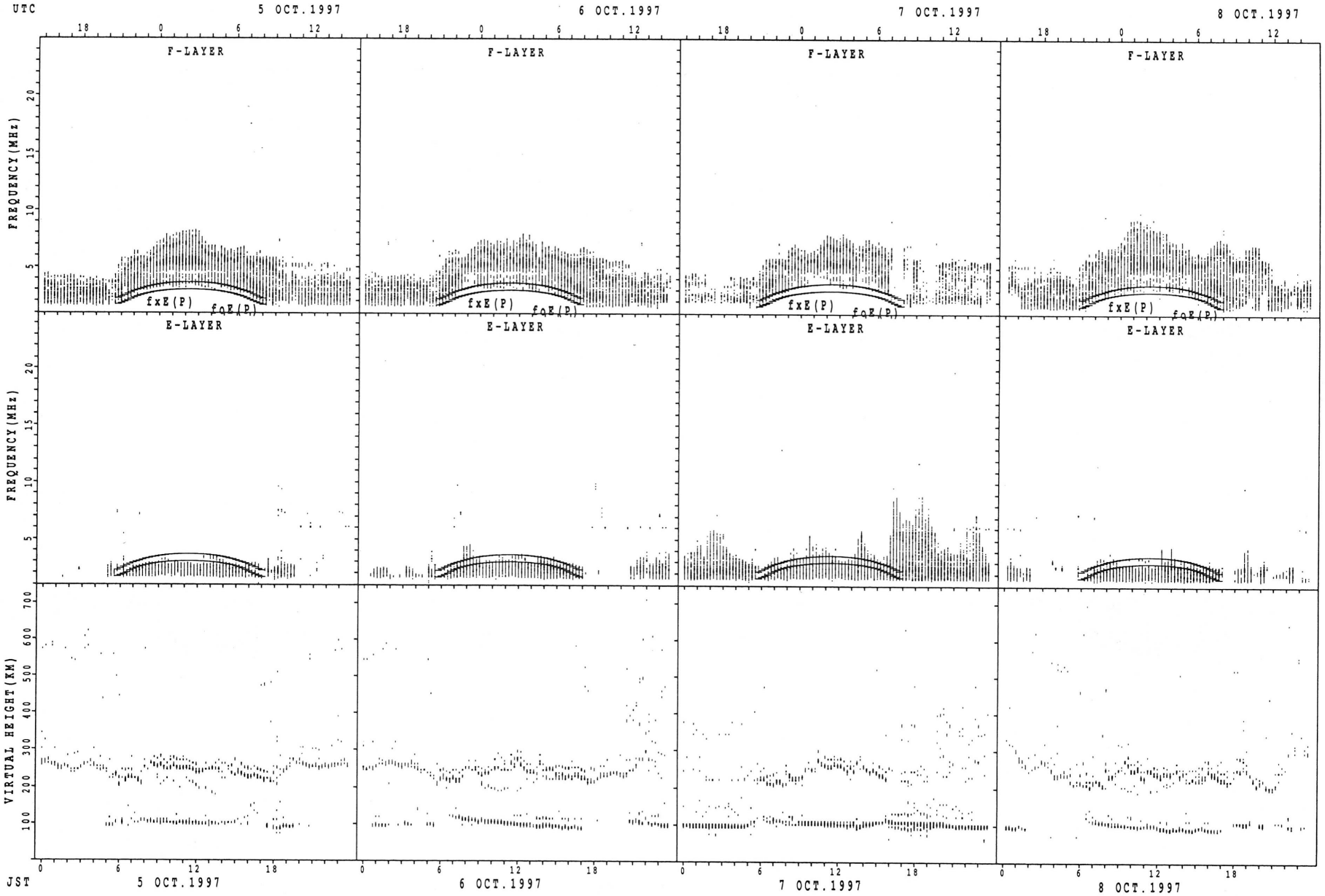
LAT. 26.3N LON. 127.8E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	15		14	C	15	14	15	17										14	14	15	15	14
2	14	15	15	15	15	15	14	15	14	16	18	23	24	20	18	C	14	14	14	15	15	14	15	14
3	15	15	14	15	14	15	15	14	15															
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5																								
6																								
7																								
8																								
9														45	46	C	16	15	15	14	14	14	15	15
10	C	15	15	14	14	15	17	14	14	16	26	28	28	33	23	20	16	14	14	14	14	14	14	15
11	15	14	14	C	C	66	15	14	18	15	15	17	C	34	33	30	16	14	14	14	14	14	15	14
12	15	15	16	14	15	15	C	14		20	20	24	C	48	46	18	16	14	14	14	15	14	14	15
13	15	15	15	14	15	14	C	14	14	16	21	27	C	48	44	22	18	14	14	14	14	14	14	14
14	14	14	14	14	15	C	C	15	15	21	C	16	18	18	C	37	C	14		14	15	14	16	14
15	14	15	14	15	C	C	C	14	14	15	17	20	20	C	44	C	16		14	14	15	15	15	14
16	15	15	15	15	C	15	15		14	15	23	22	34	33	20	16	16	14	14	14	14	15	15	15
17	15	15	14	15	14	C	C	14	14	16	17	28	29	17	16	17	14	14	14	14	15	15	14	14
18	15	14	15	14	14	14	C	15	14	15	18	C	C	48	16	C	C	15	16	14	16	14	15	15
19	15	14	14	15	16	15	C	14	14	15	17	C	46	18	16	16	17	15	14	14	14	14	14	15
20	15	15	15	15	15	C	14	14	14	15	17	15	29	17	15	14	17	14	15	15	16	15	14	14
21	14	14	15	15	14	C	18	15	14	15	15	16	20	18	16	16	14	14	14	14	16	15	16	14
22	15	14	15	14	14	16	16		14	17	16	17	18	16	16	16	14	15		14	14	14	14	14
23	14	14	15	16	14	C	C	14	14	15	16	16	18	20	16	15	14	14	16	15	16	15	15	15
24	14	14	14	15	15	18	14	14	15	C	21	33	C	42	22	20	15	16	14	14	15	14	15	14
25	15	14	14	C	14	C	16	14	14	16	16	20	22	20	18	C	17	16	14	14	14	21	15	15
26	14	81	B	15	14	14	14	14	14	15	16	15	14	15	15	17	17	15	14	15	16	15	15	15
27	14	14	14	16	15	14	C	17	18	15	16	17	44	43	18	18	16	14	14		14	15	18	16
28	15	15	15	14	14	C	15	15	14	15	15		35	18	C	41	14		14	15	14	15	15	14
29	14	15	14	14	14	14	17	14	15	14	17	18	16	C	45	17	16	23	15	14	15	15	14	14
30	14	15	14	14	14	C	18	14	14	17	16	16	33	24	29	20	15	14	15	14	14	14	15	15
31	15	14	15		15	15	C	15		14	15	16	C	32	23	14	14	22	15	14	14	15	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	25	24	21	22	15	15	23	23	23	22	20	17	22	22	19	22	22	22	24	25	25	25	25
MED	15	15	15	15	14	15	15	14	14	15	17	18	24	22	19	17	16	14	14	14	14	15	15	14
U Q	15	15	15	15	15	15	17	15	15	16	18	23	33	42	33	20	16	15	15	14	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	15	16	16	18	18	16	16	14	14	14	14	14	14	14	14

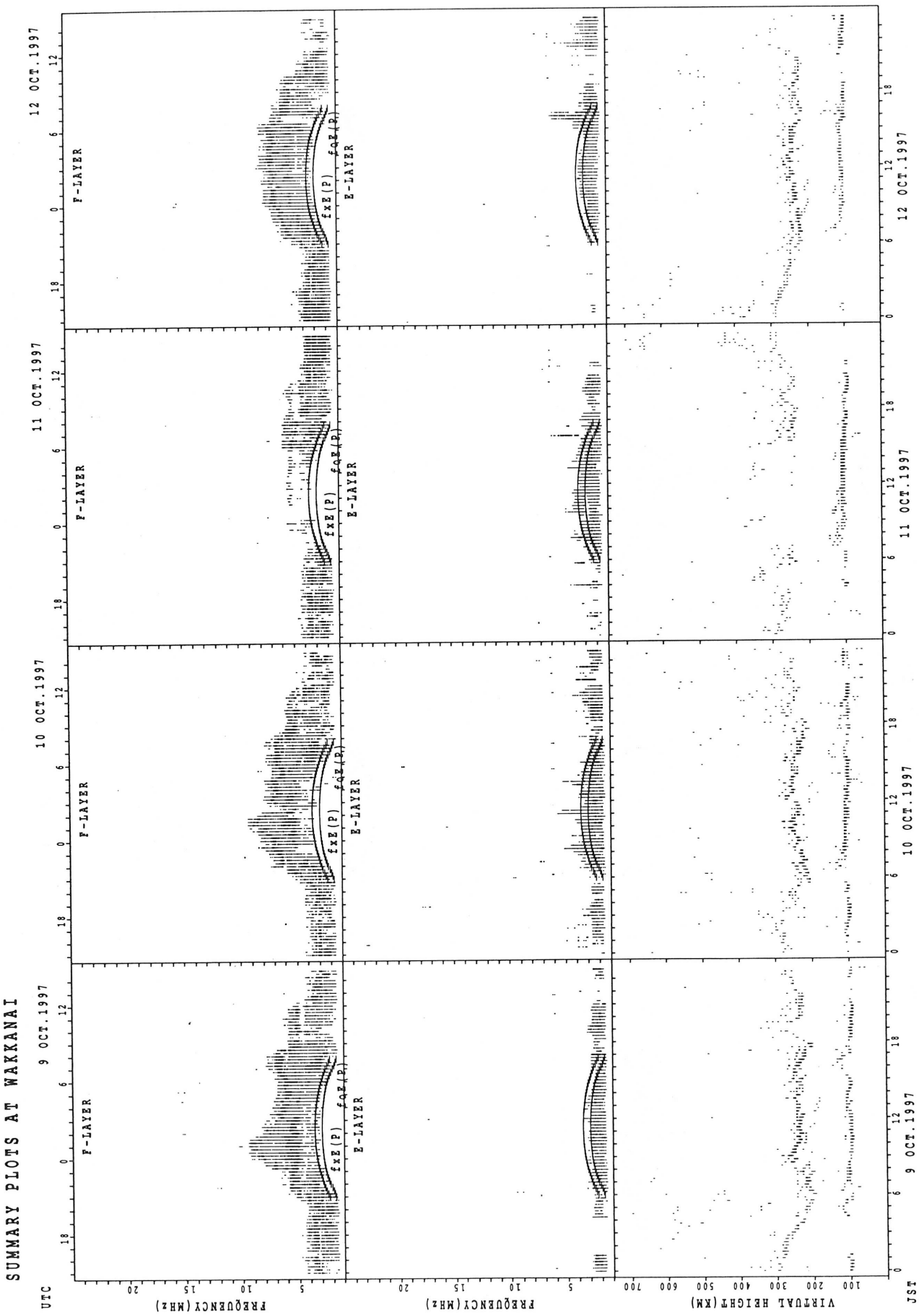
COMMUNICATIONS RESEARCH LABORATORY, JAPAN


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

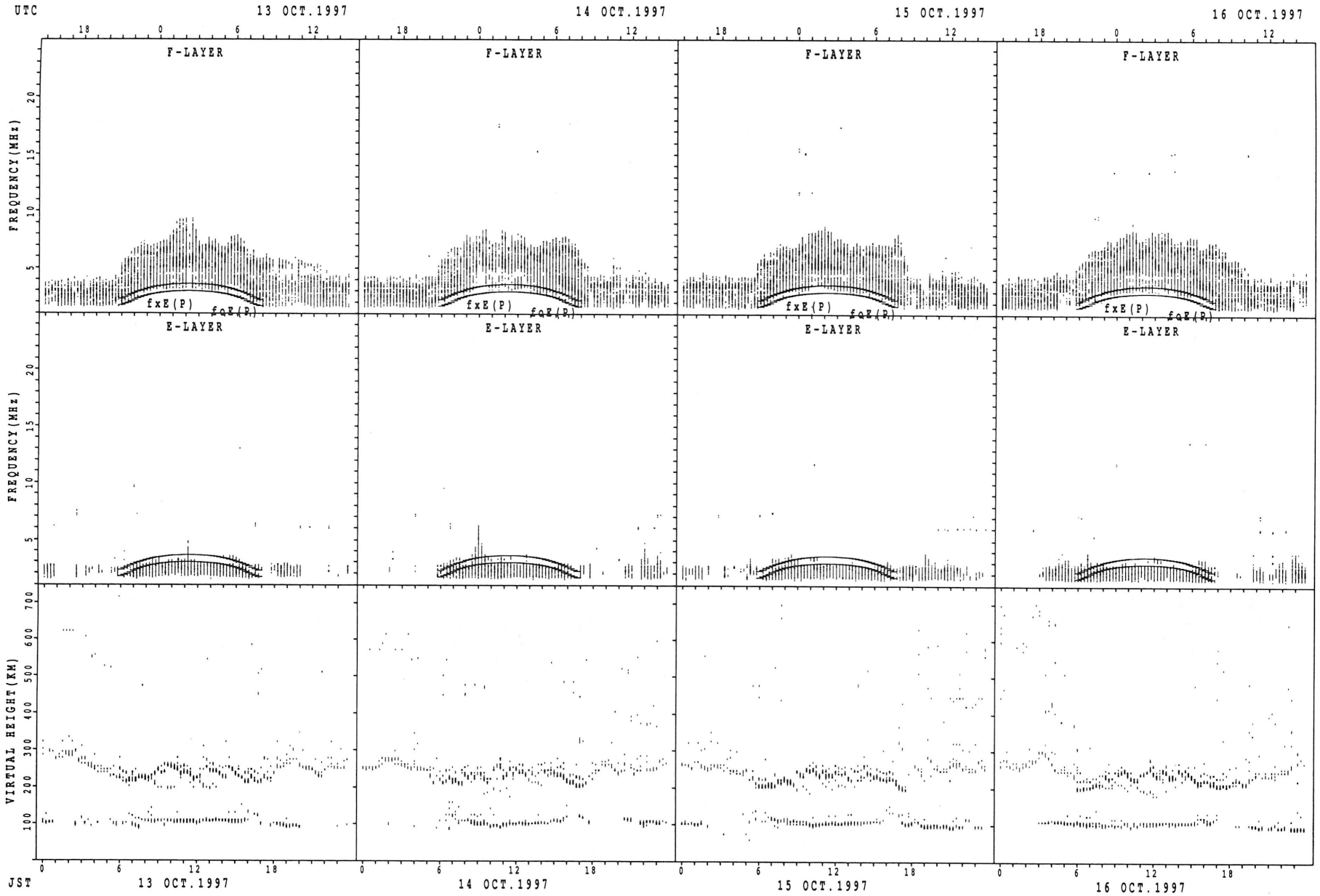
SUMMARY PLOTS AT WAKKANAI



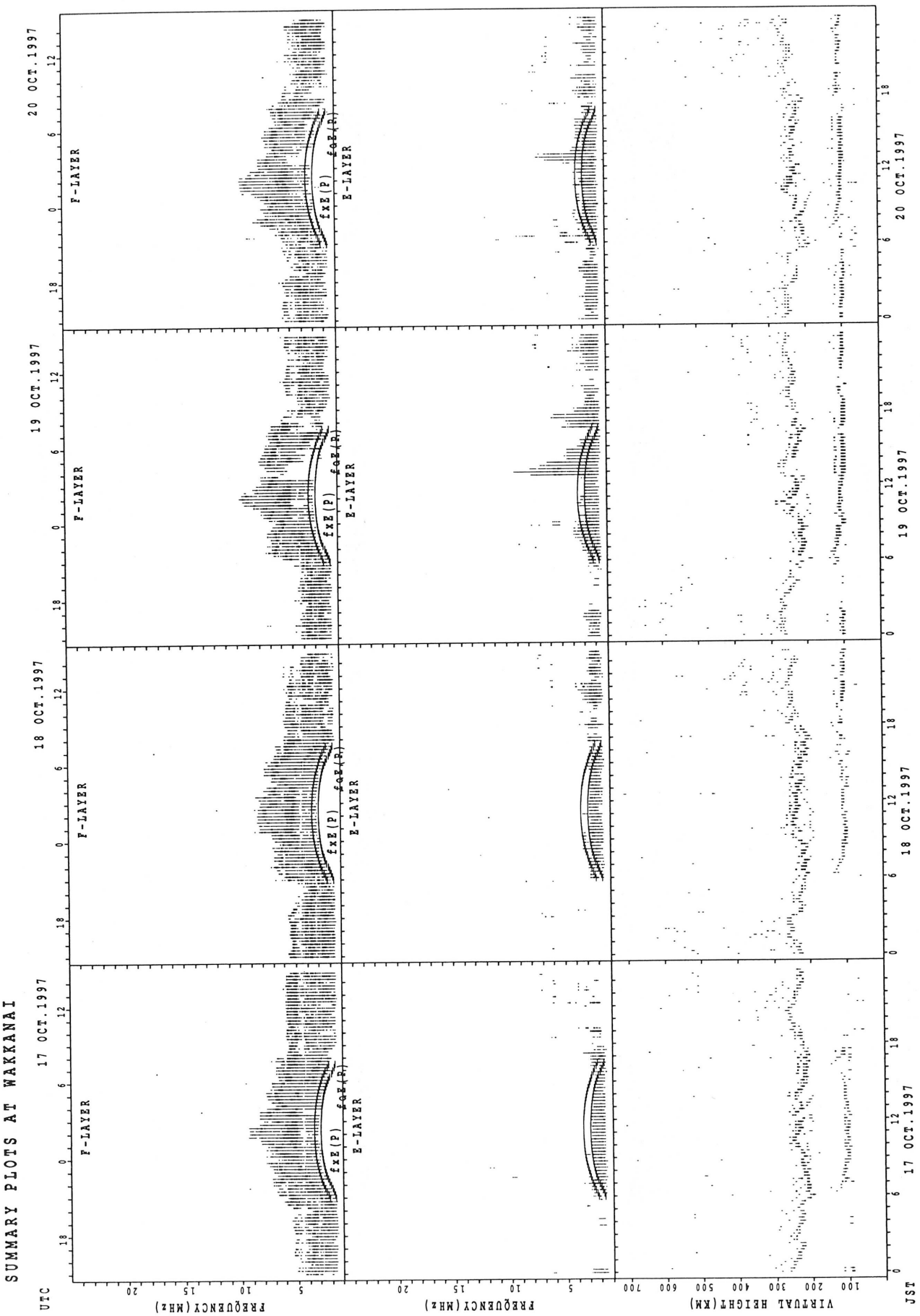
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

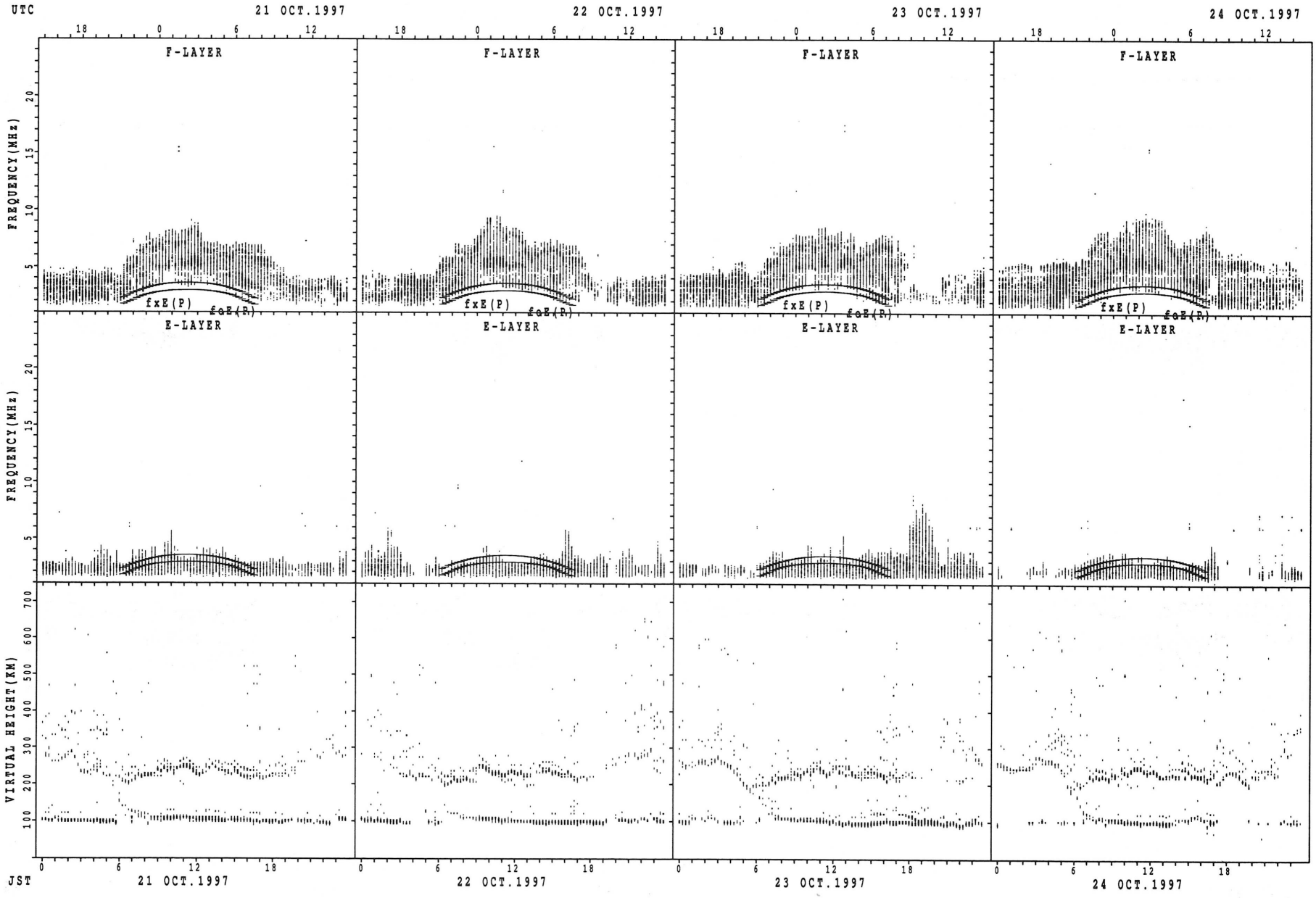
SUMMARY PLOTS AT WAKKANAI



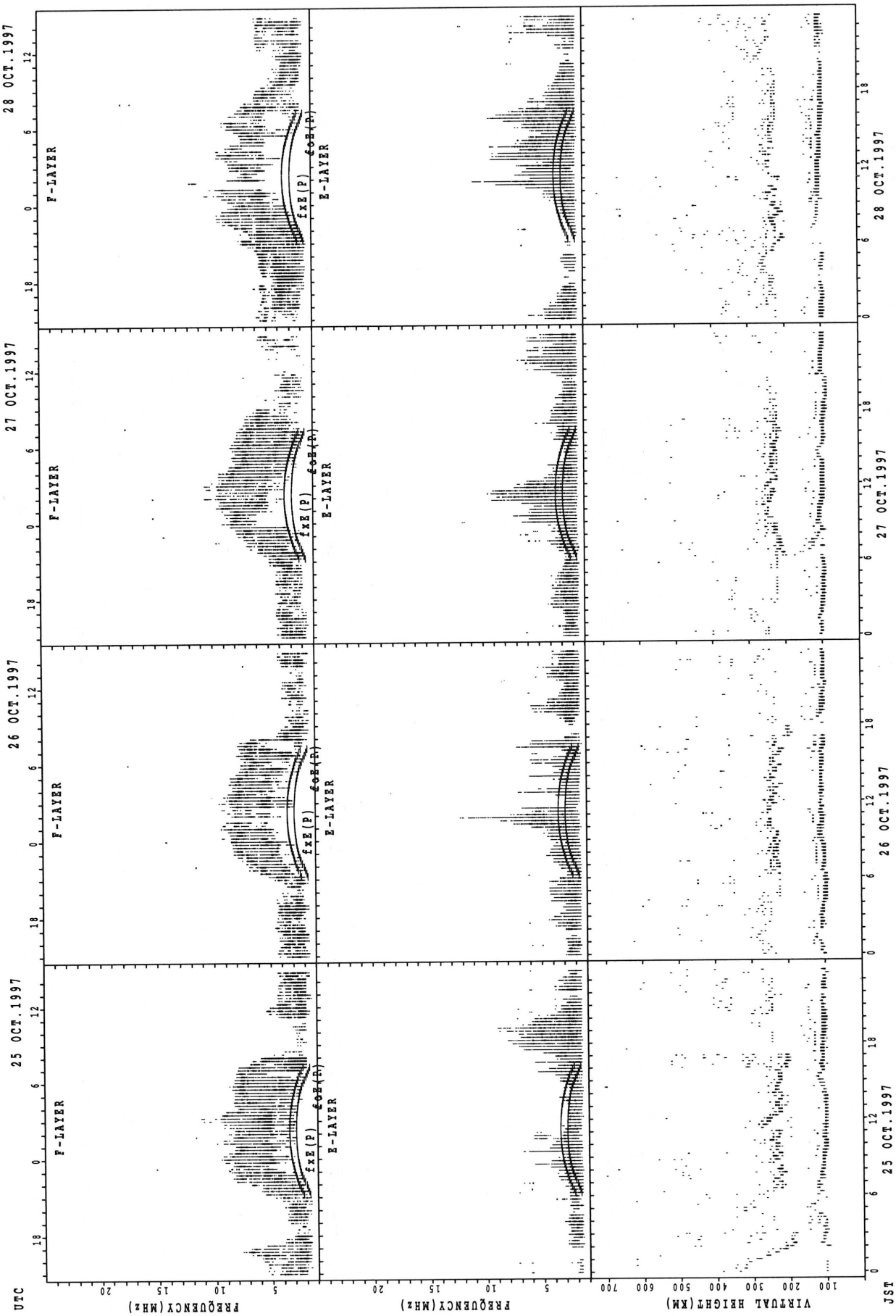
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

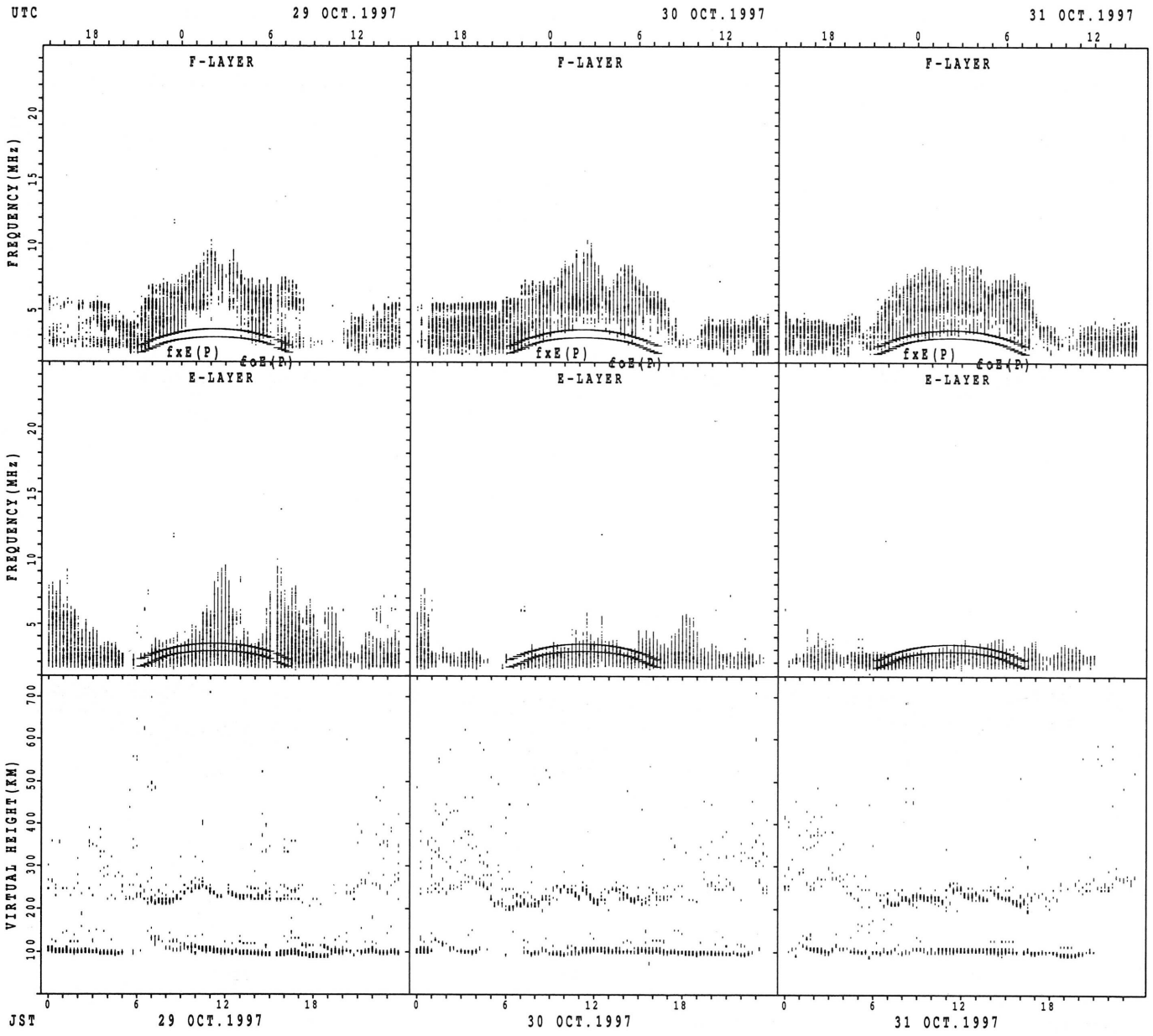
SUMMARY PLOTS AT WAKKANAI



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

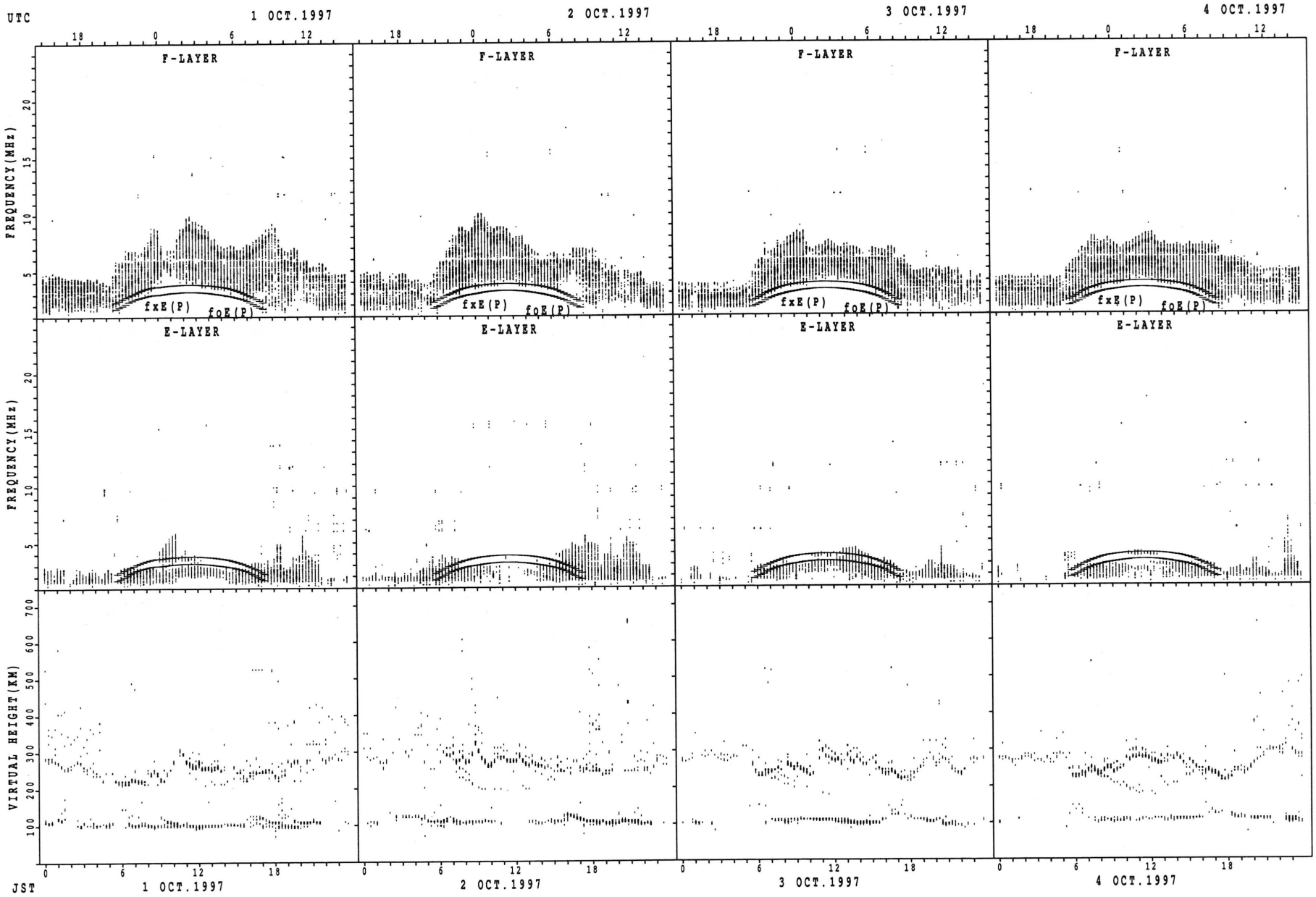

SUMMARY PLOTS AT WAKKANAI
UTC
JST
25 OCT.1997
26 OCT.1997
27 OCT.1997
28 OCT.1997
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



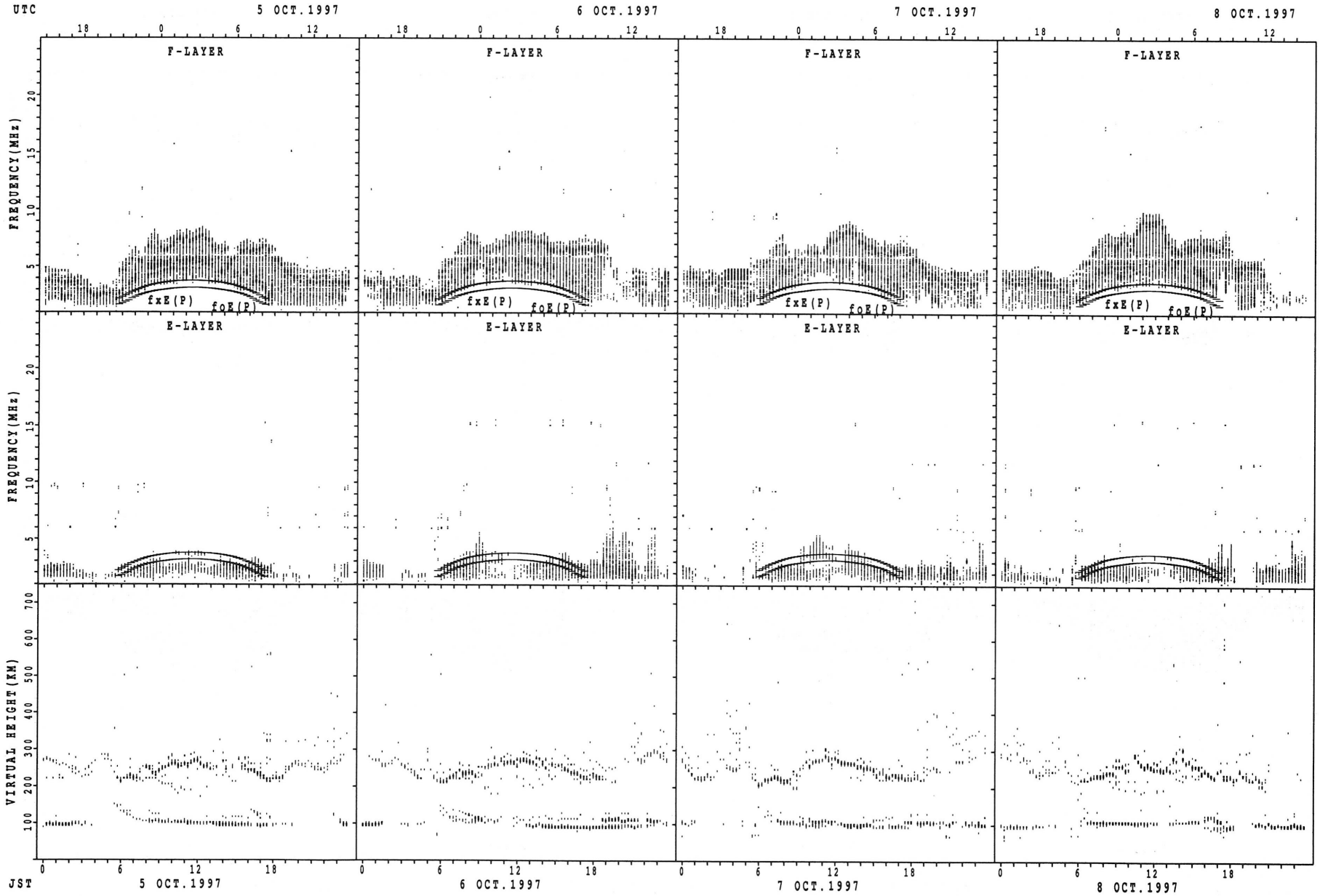
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



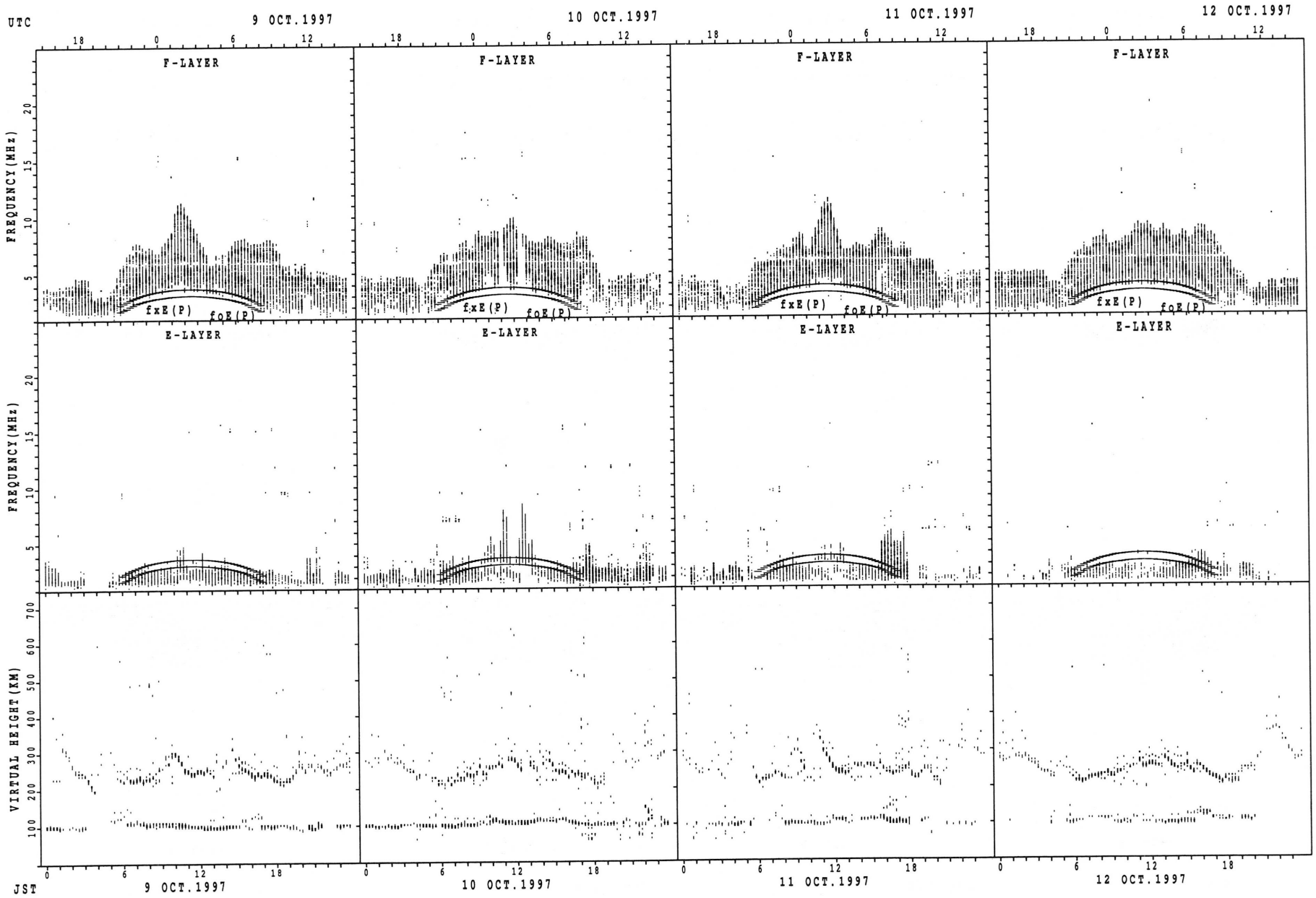
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



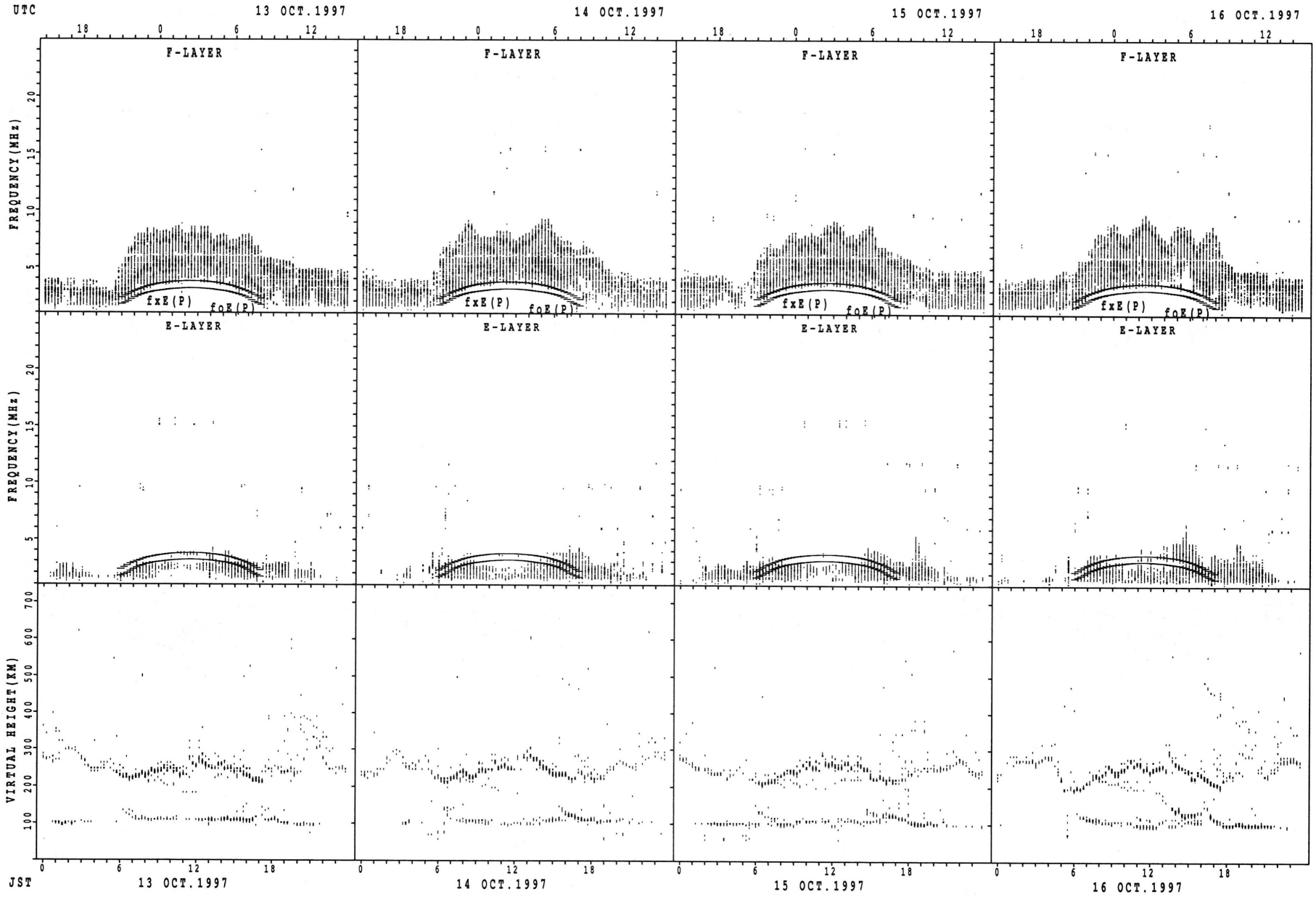
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



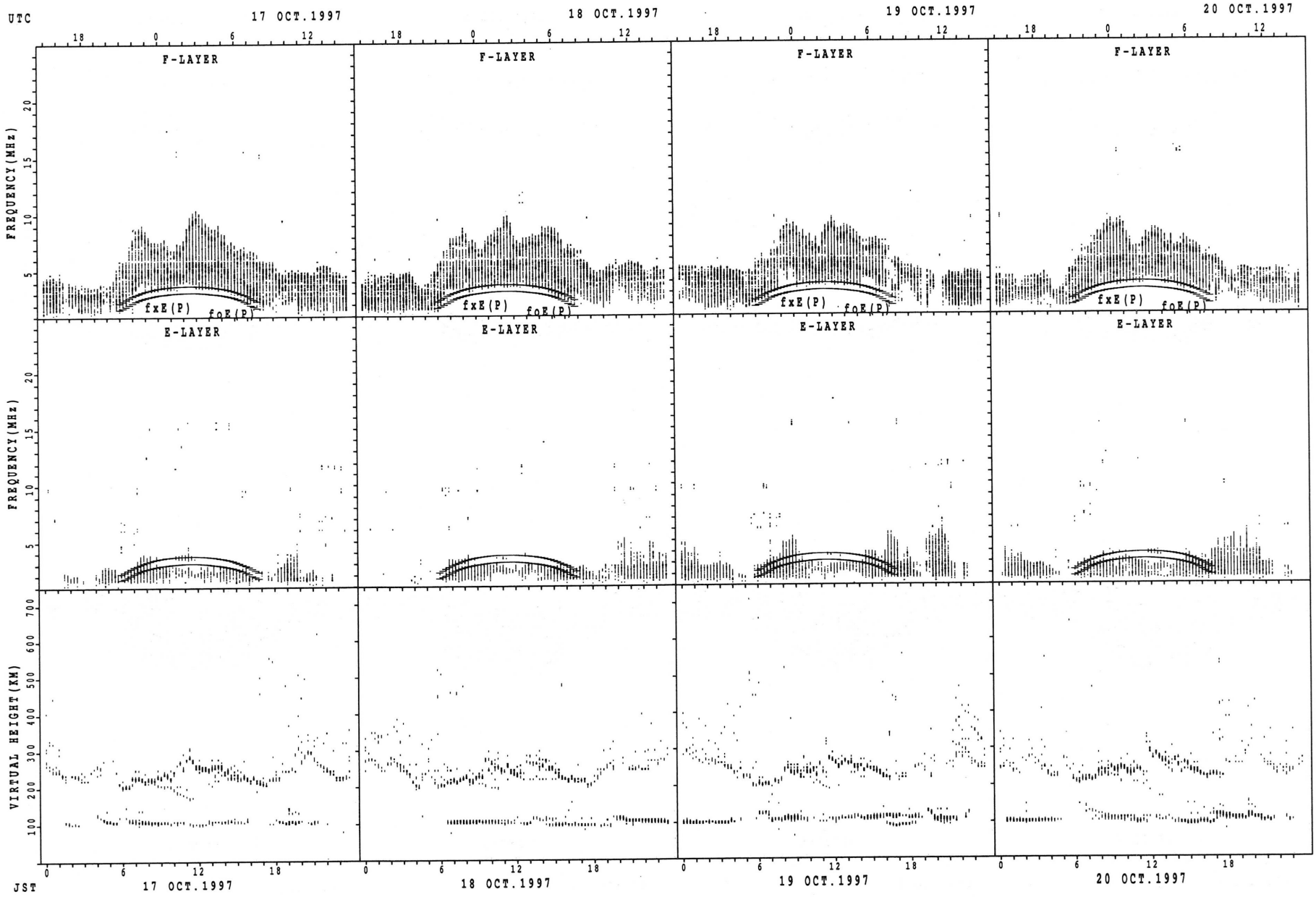
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

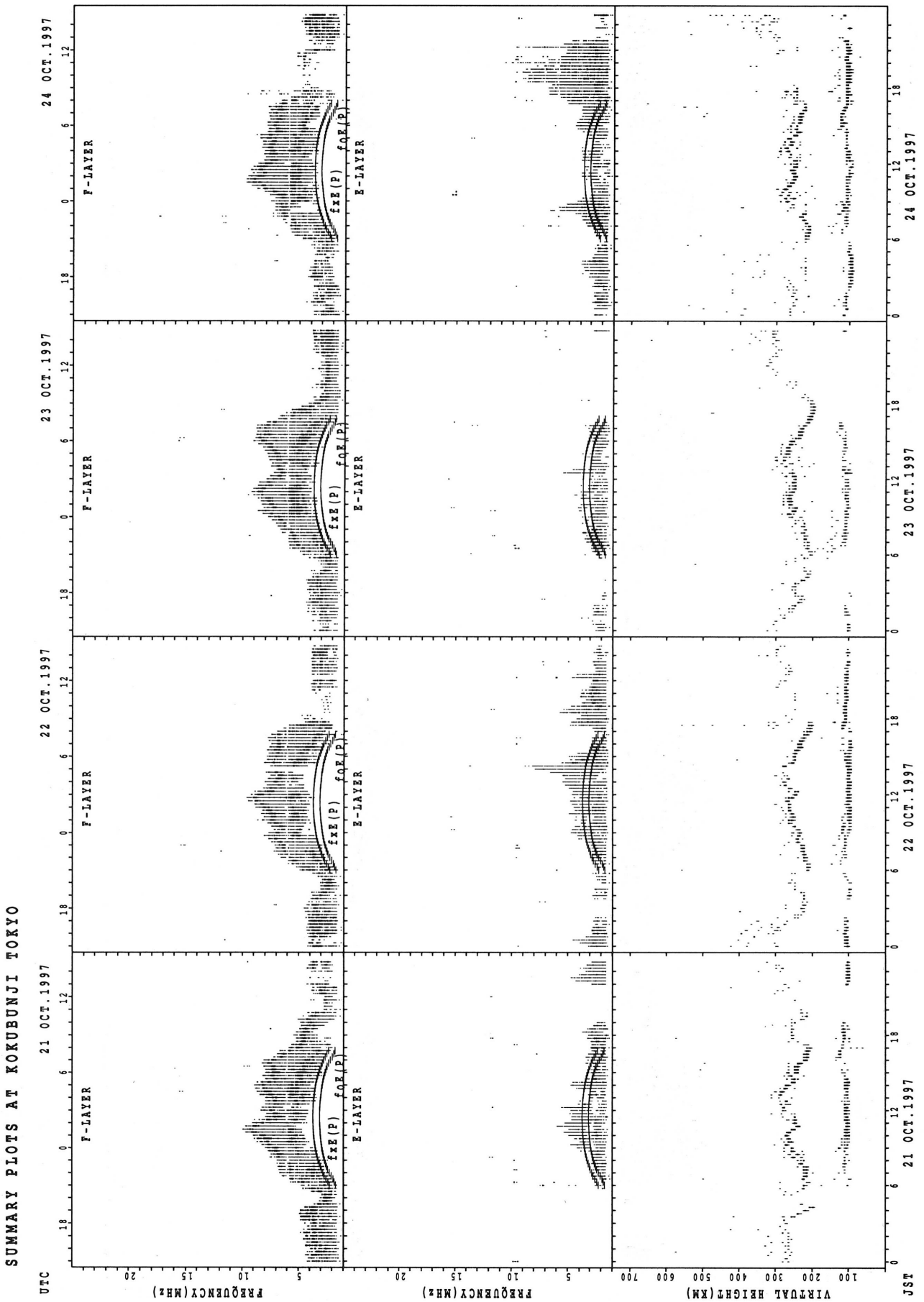


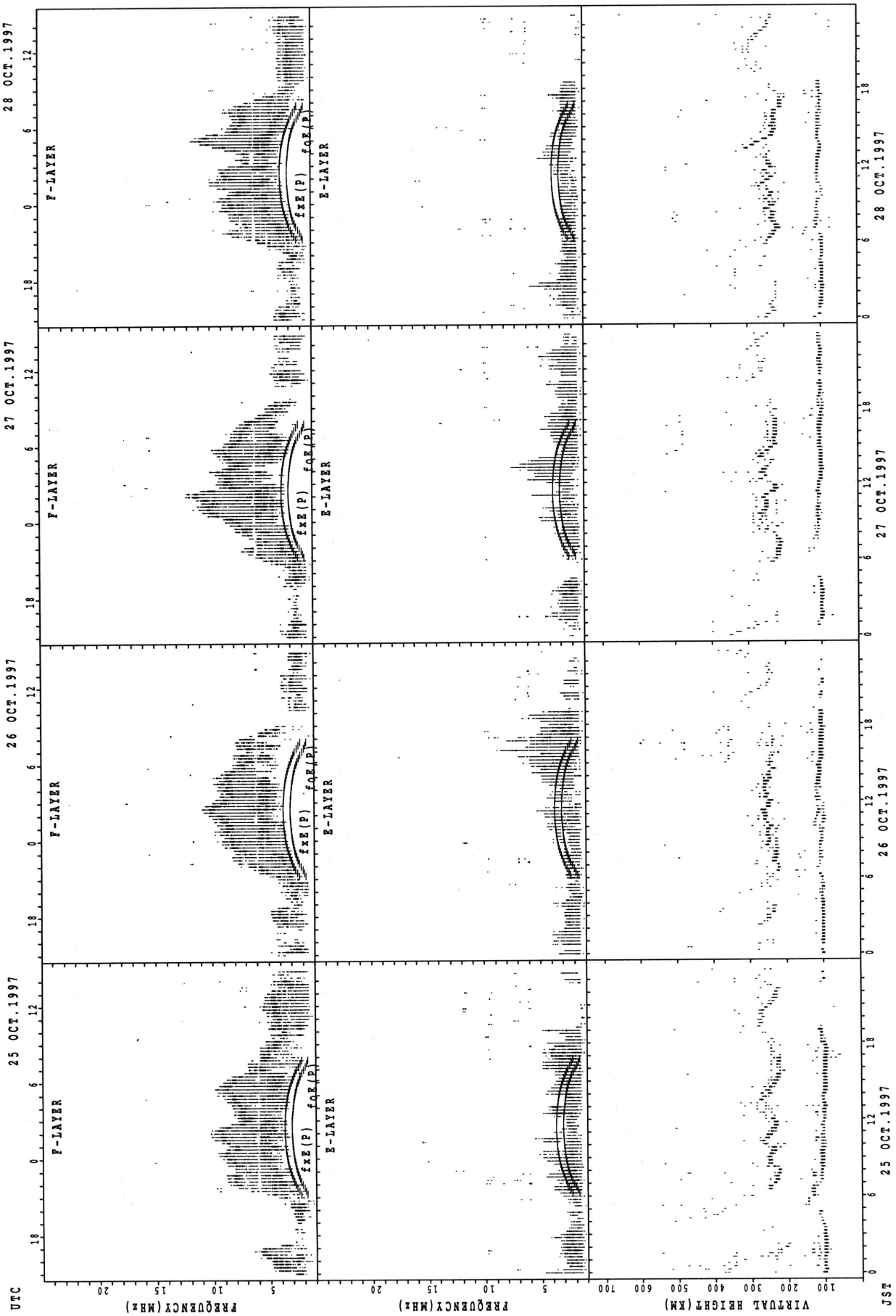
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

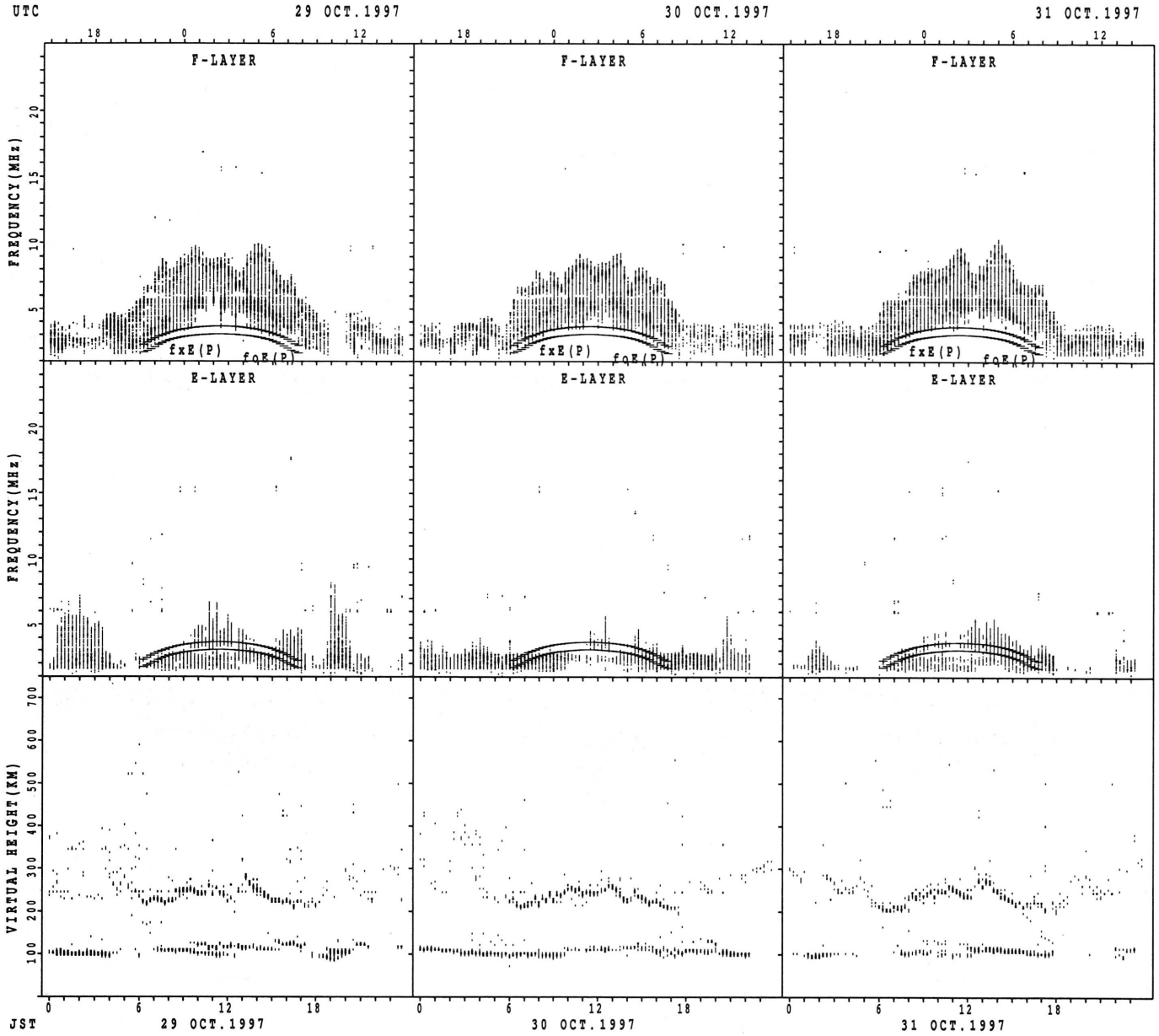


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
21 OCT.1997
22 OCT.1997
23 OCT.1997
24 OCT.1997
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

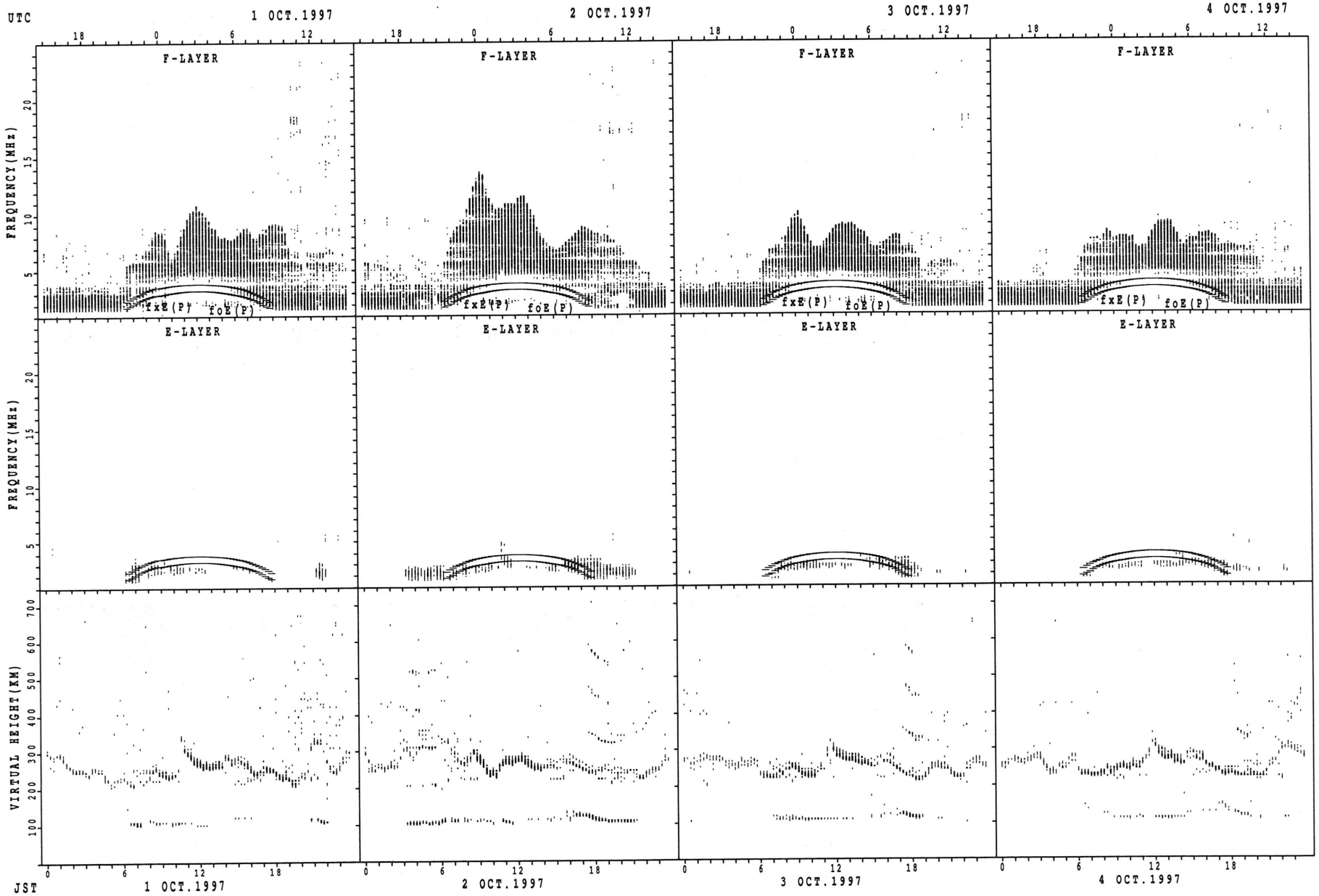

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
25 OCT.1997
26 OCT.1997
27 OCT.1997
28 OCT.1997
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



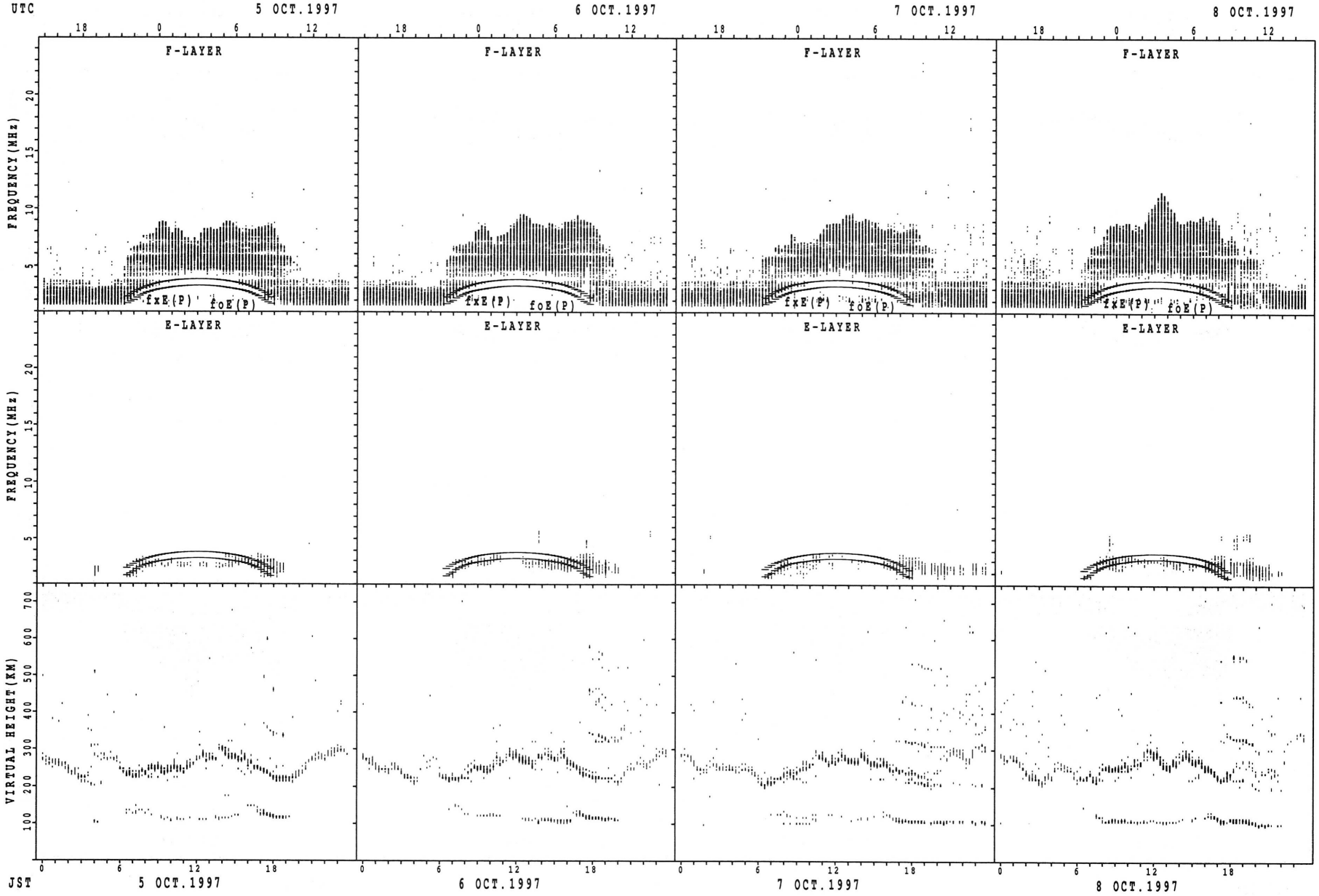
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



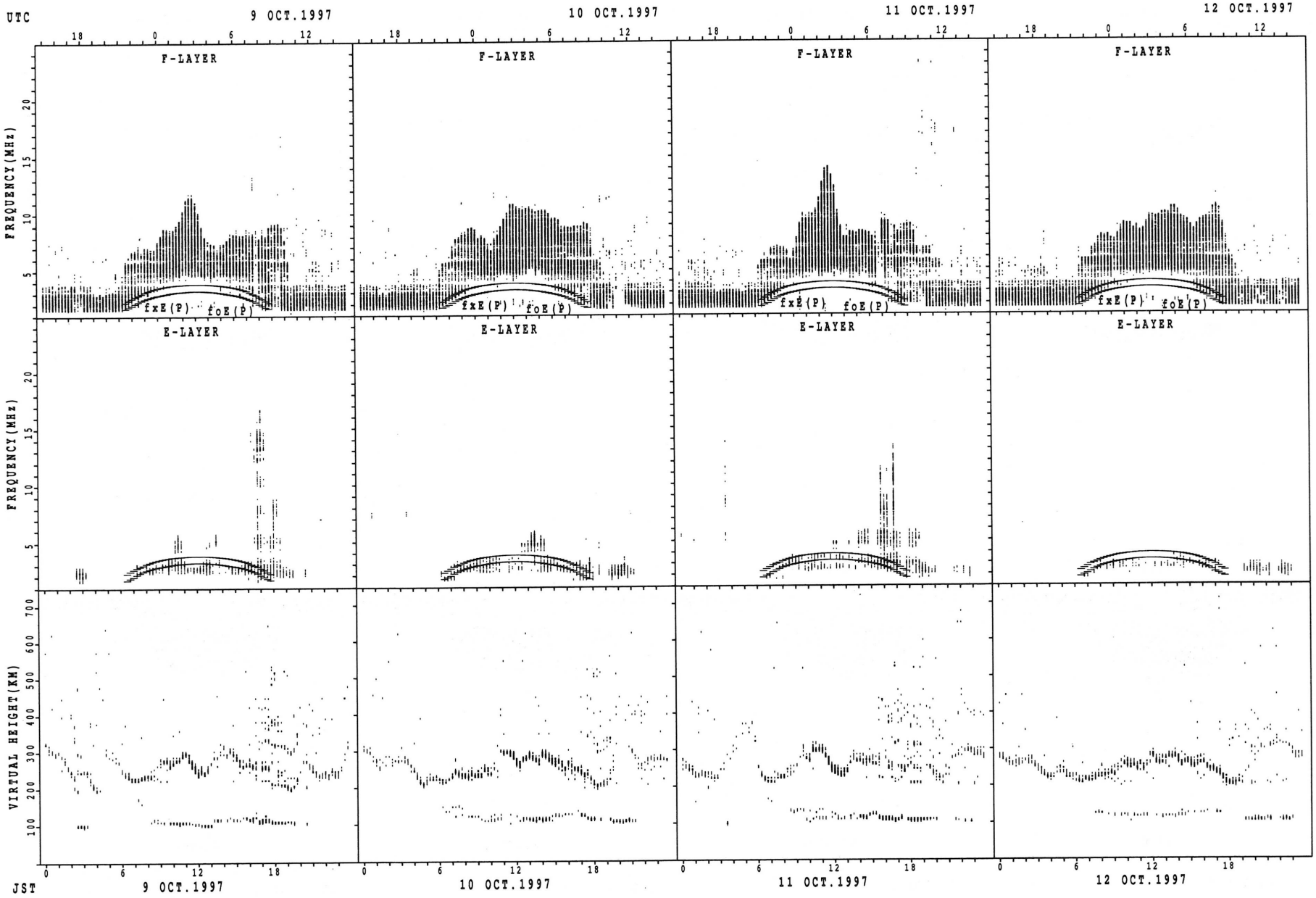
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



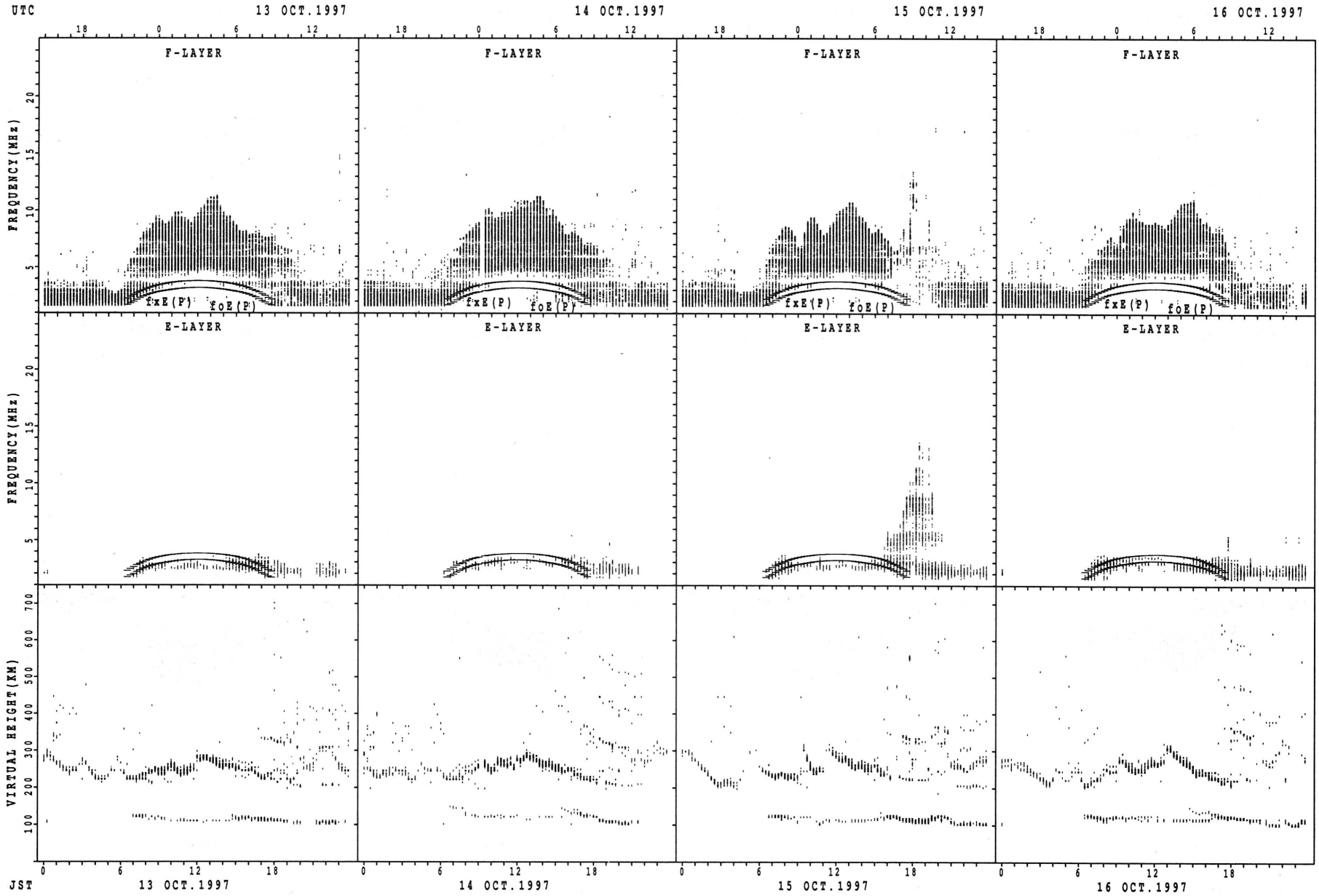
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



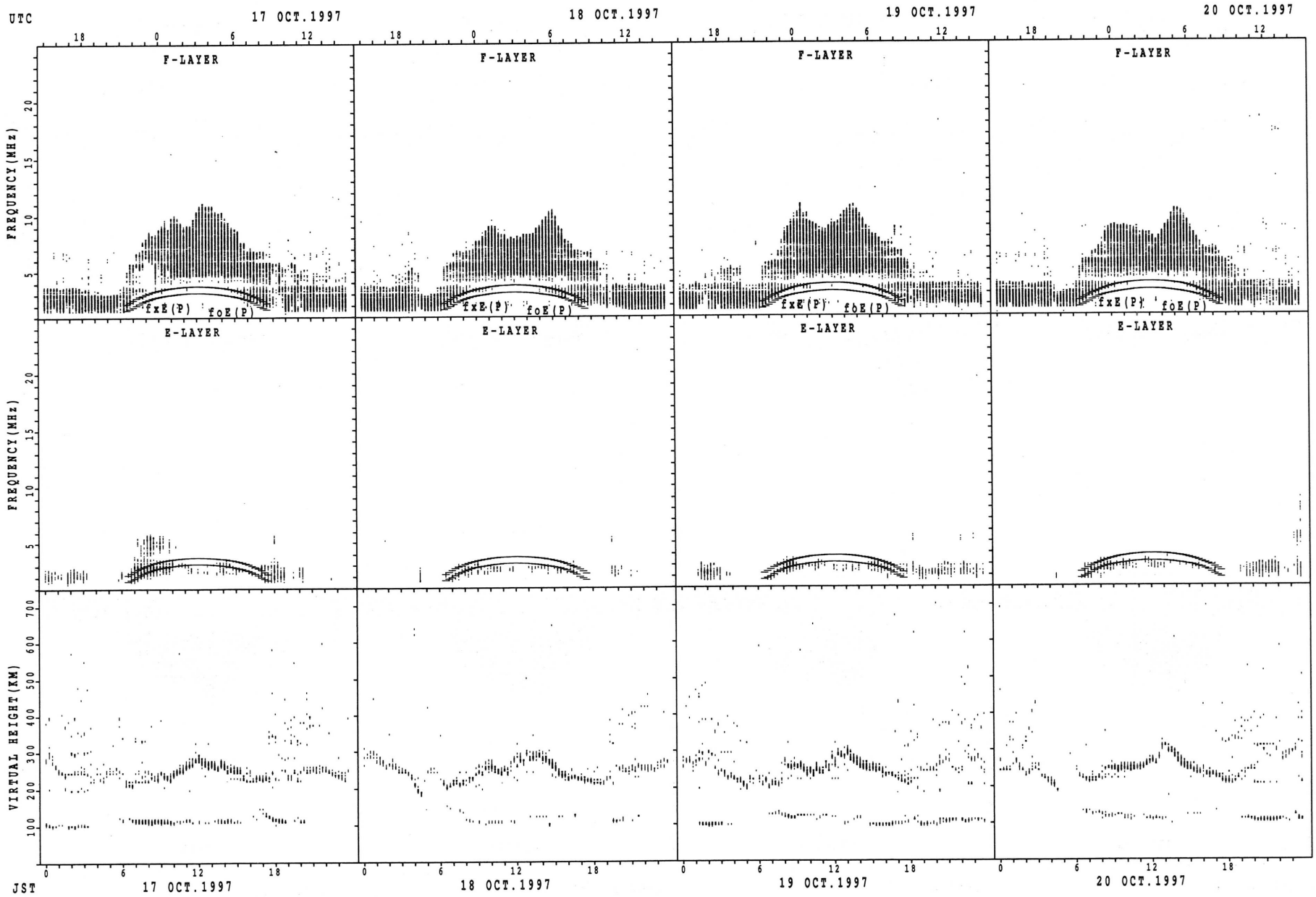
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



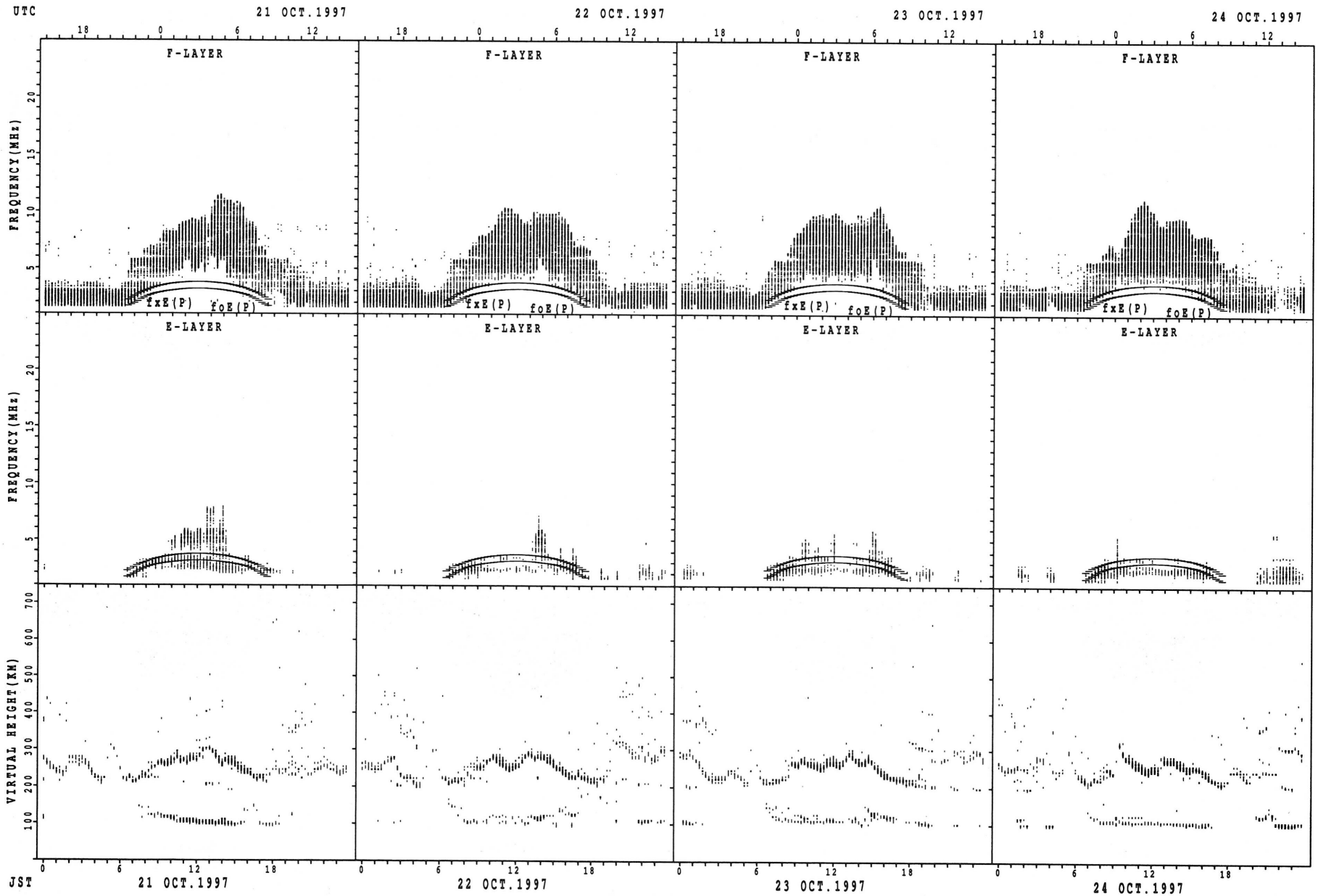
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

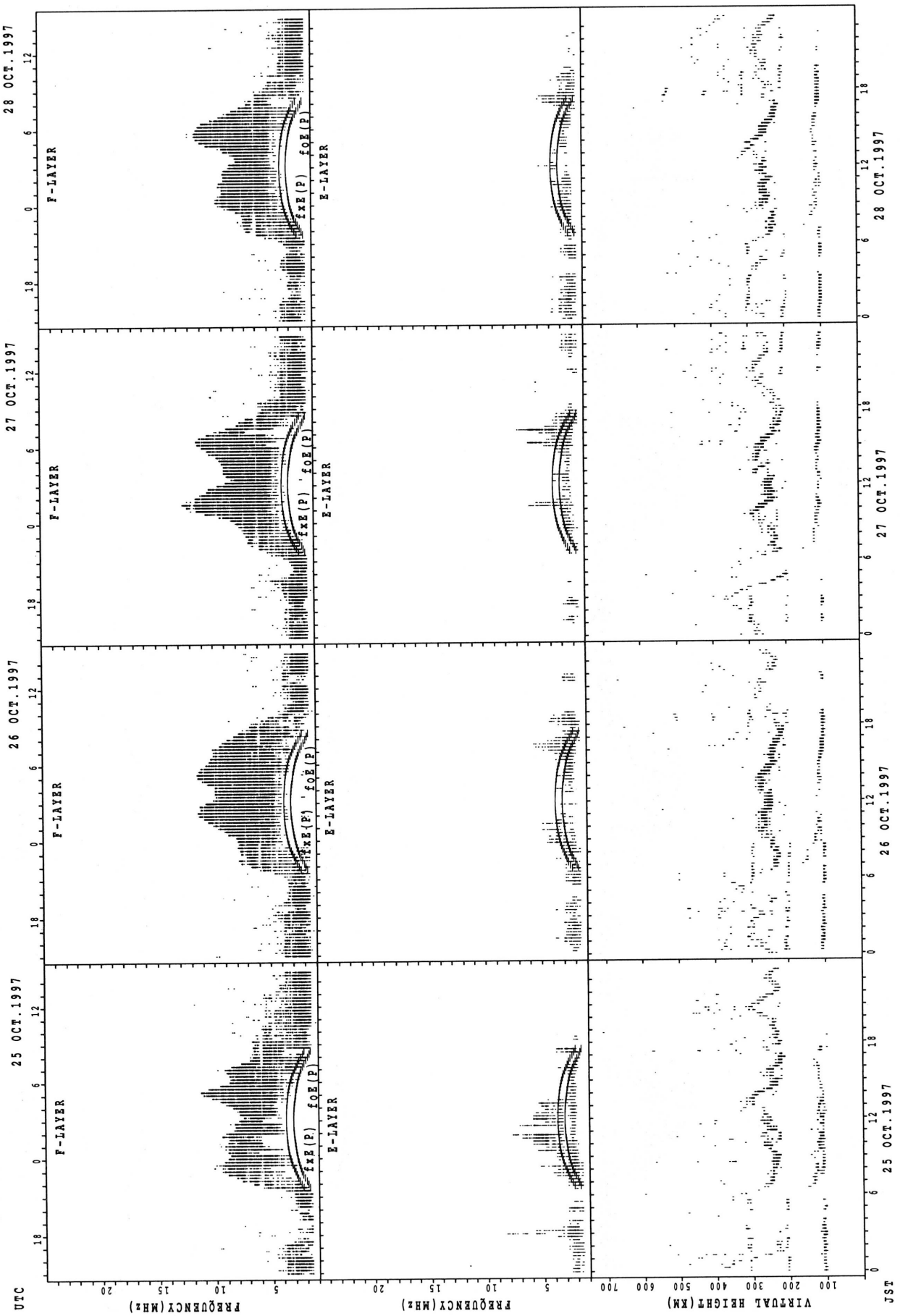


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

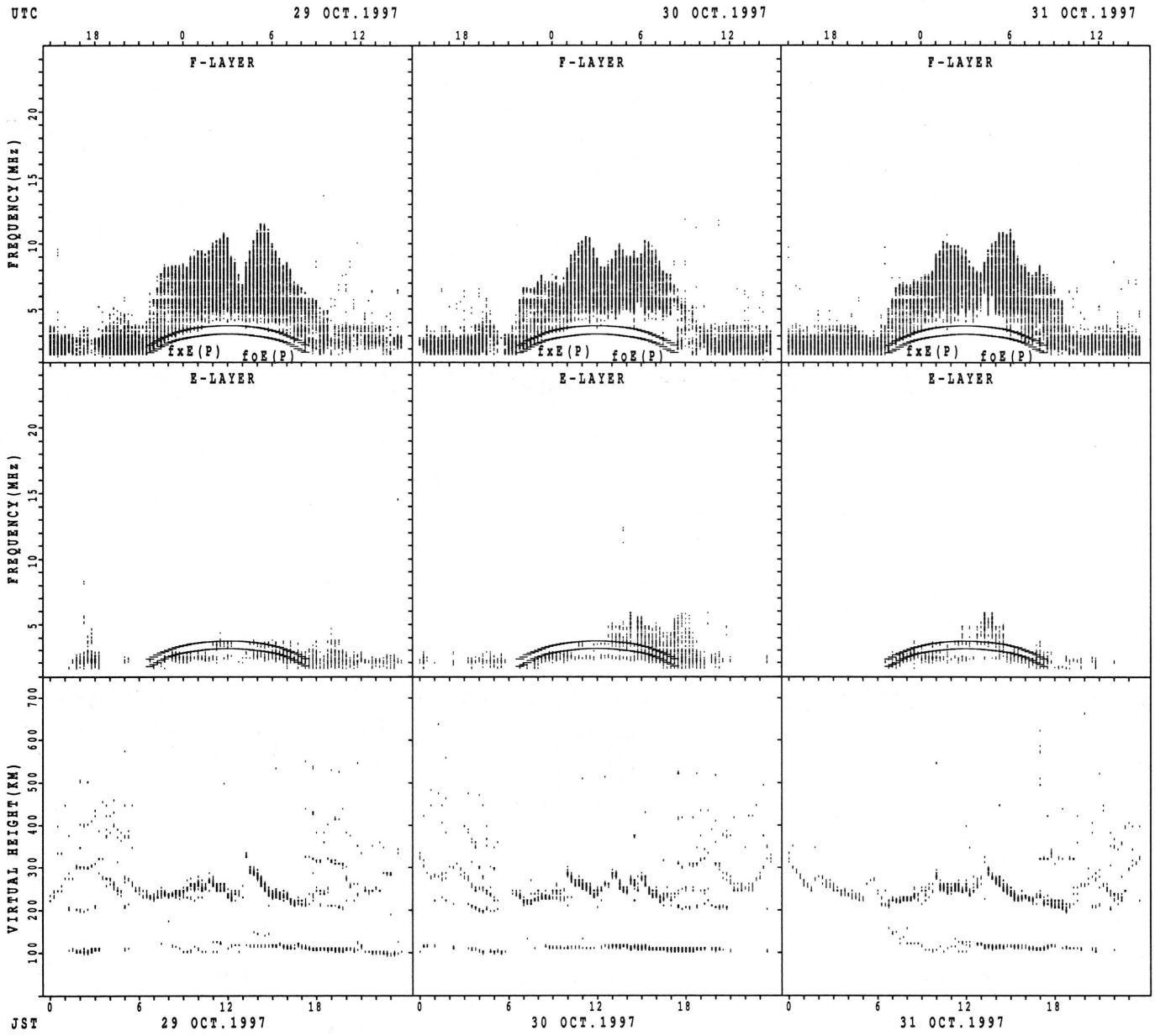
SUMMARY PLOTS AT YAMAGAWA



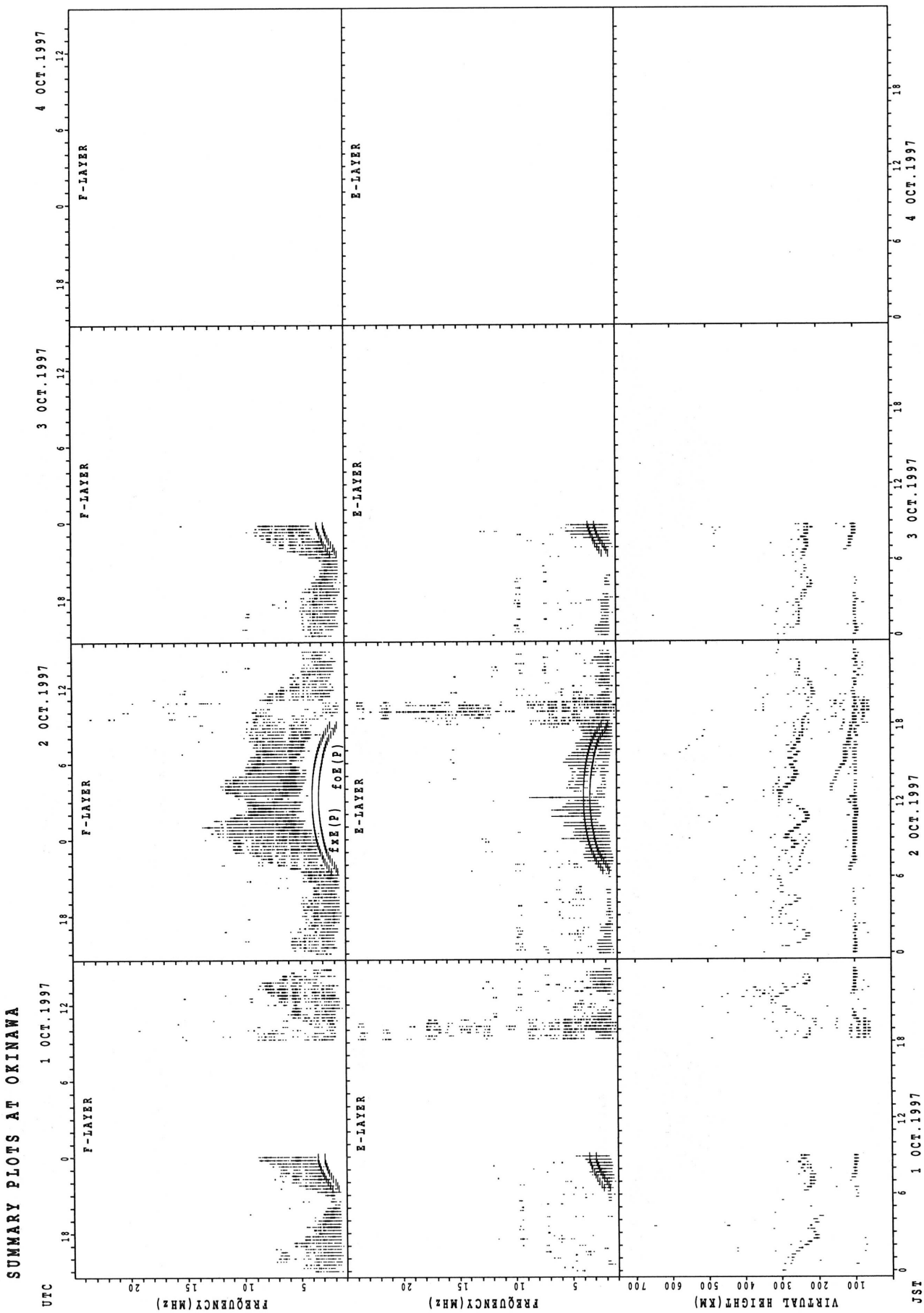
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

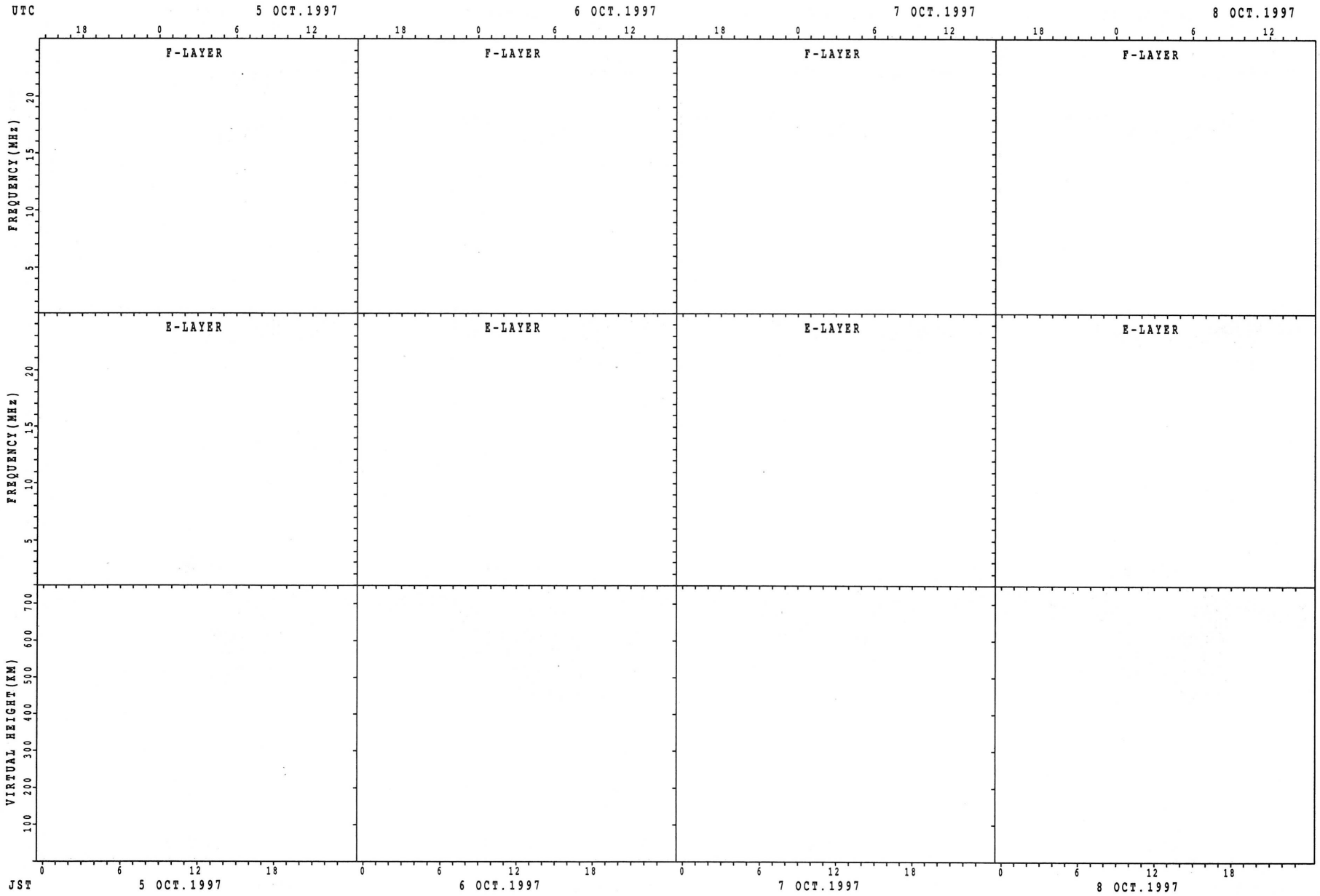
SUMMARY PLOTS AT YAMAGAWA



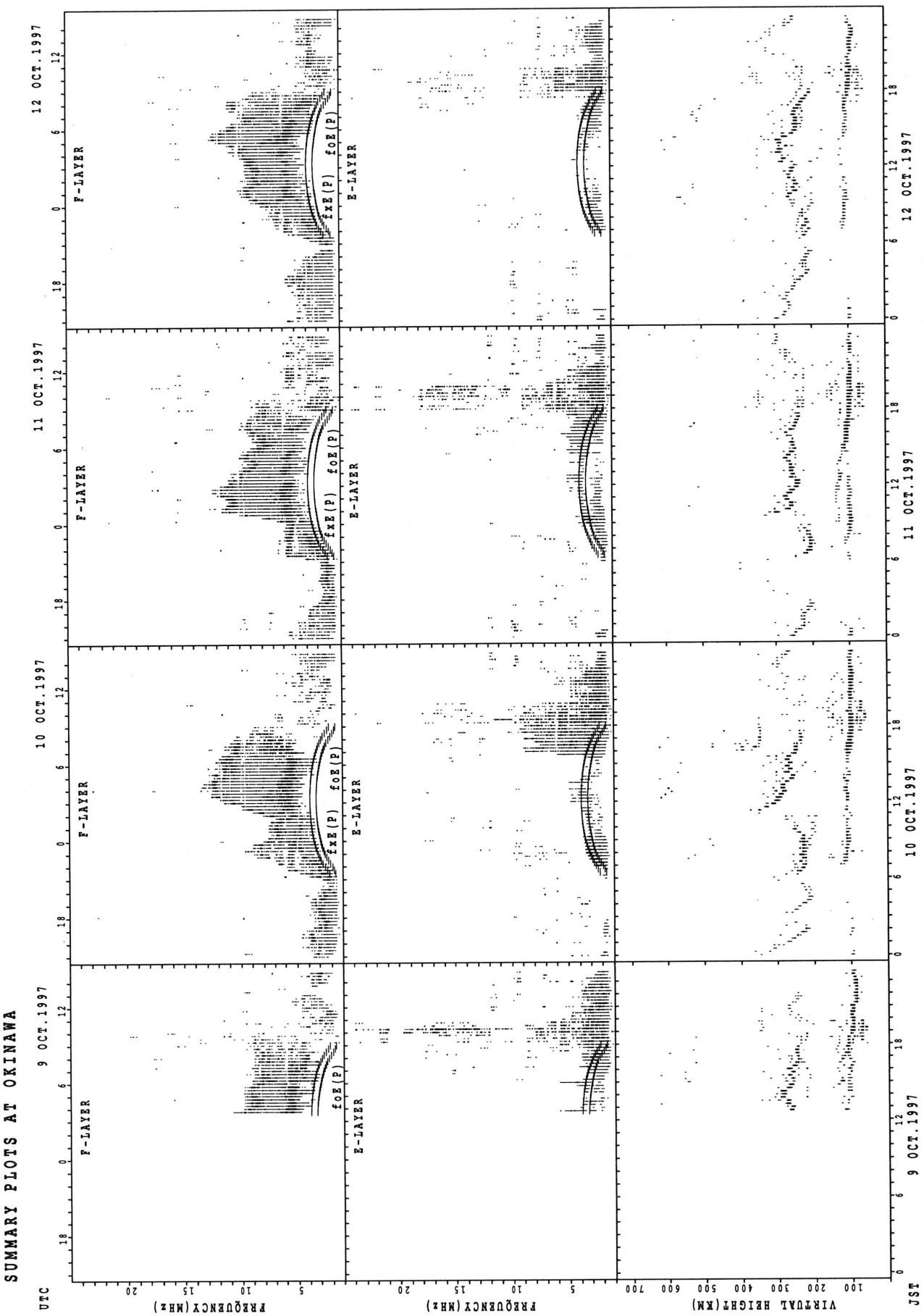
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

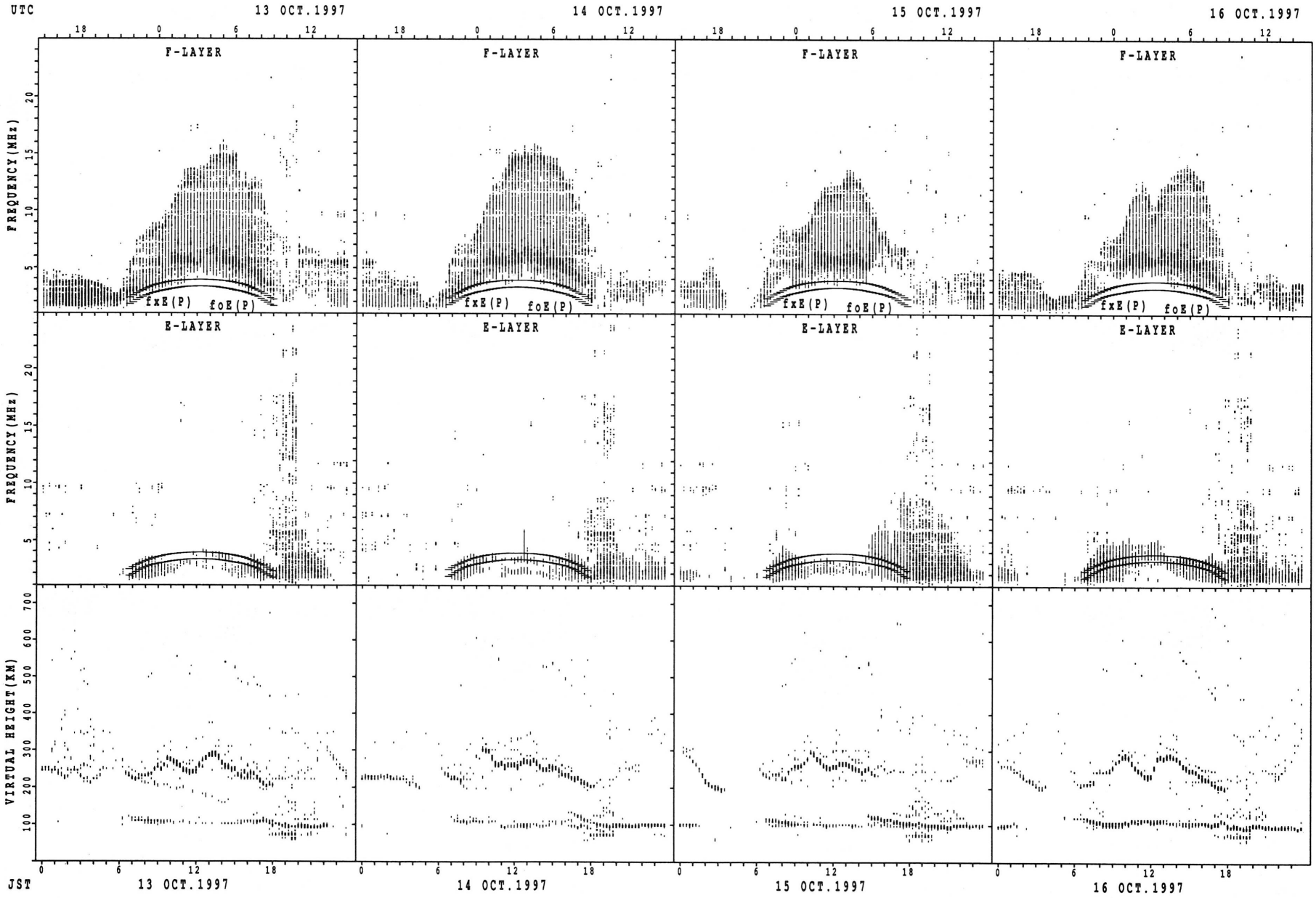
SUMMARY PLOTS AT OKINAWA



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

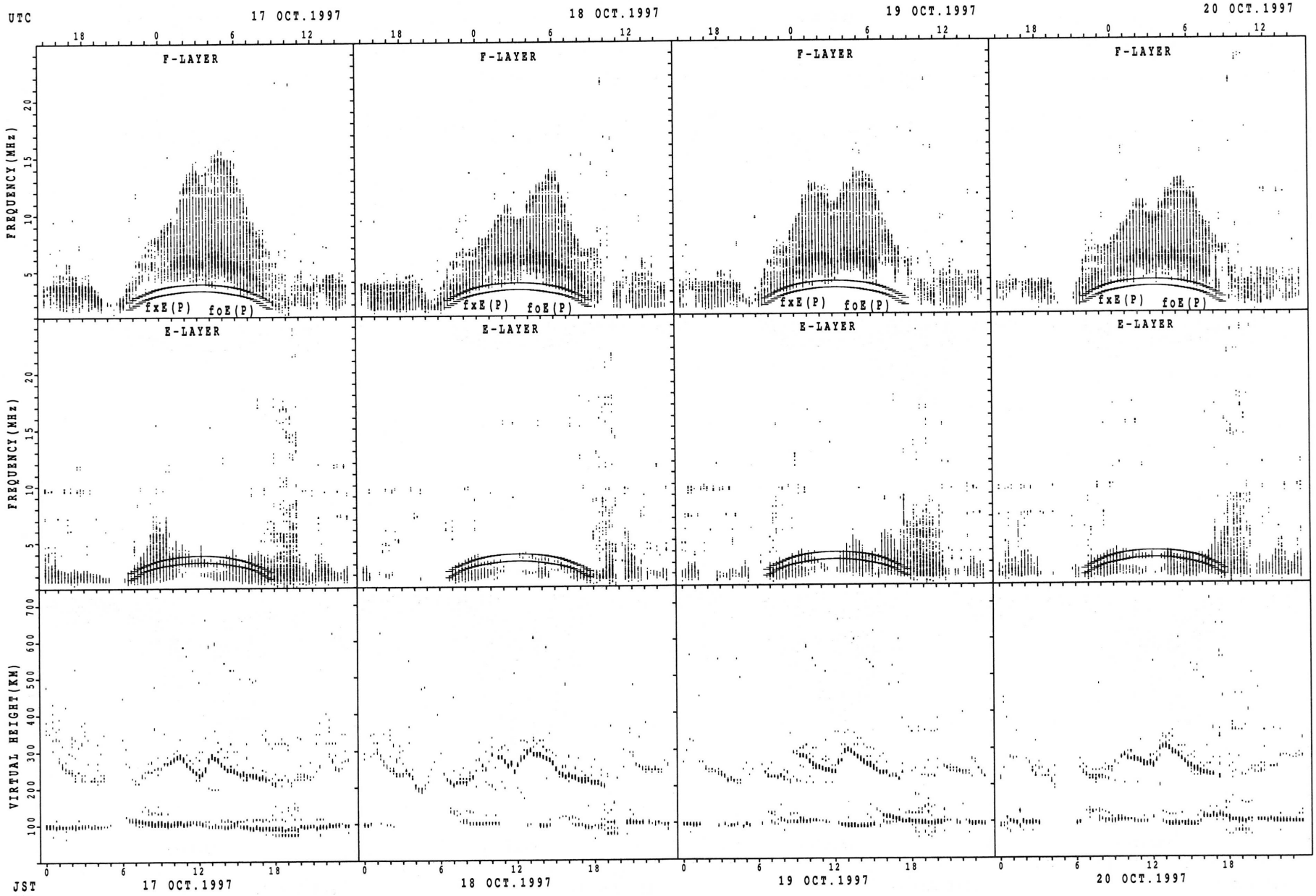

SUMMARY PLOTS AT OKINAWA
UTC
JST
9 OCT.1997
10 OCT.1997
11 OCT.1997
12 OCT.1997
F-LAYER
E-LAYER
foE(P)
fxE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



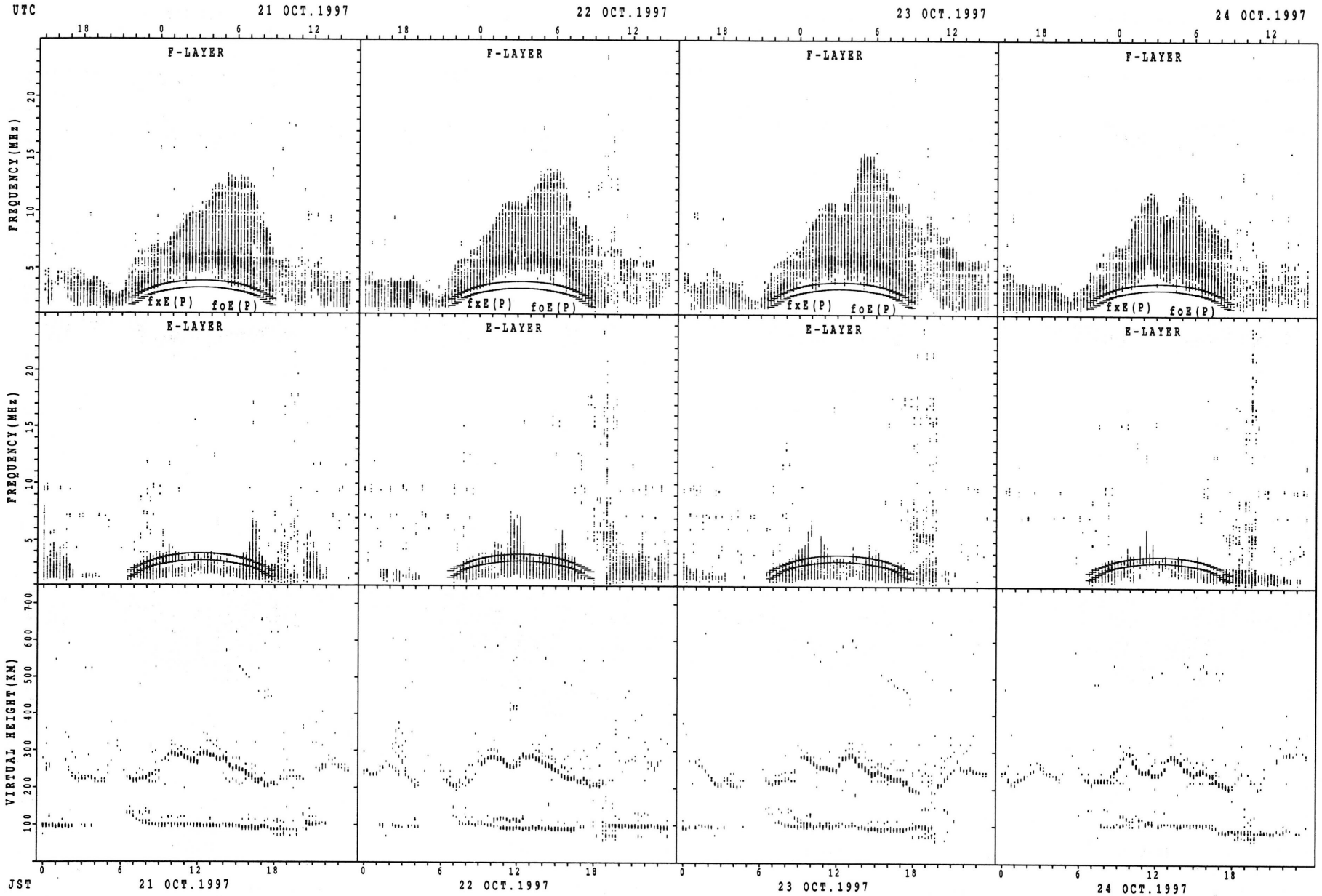
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA

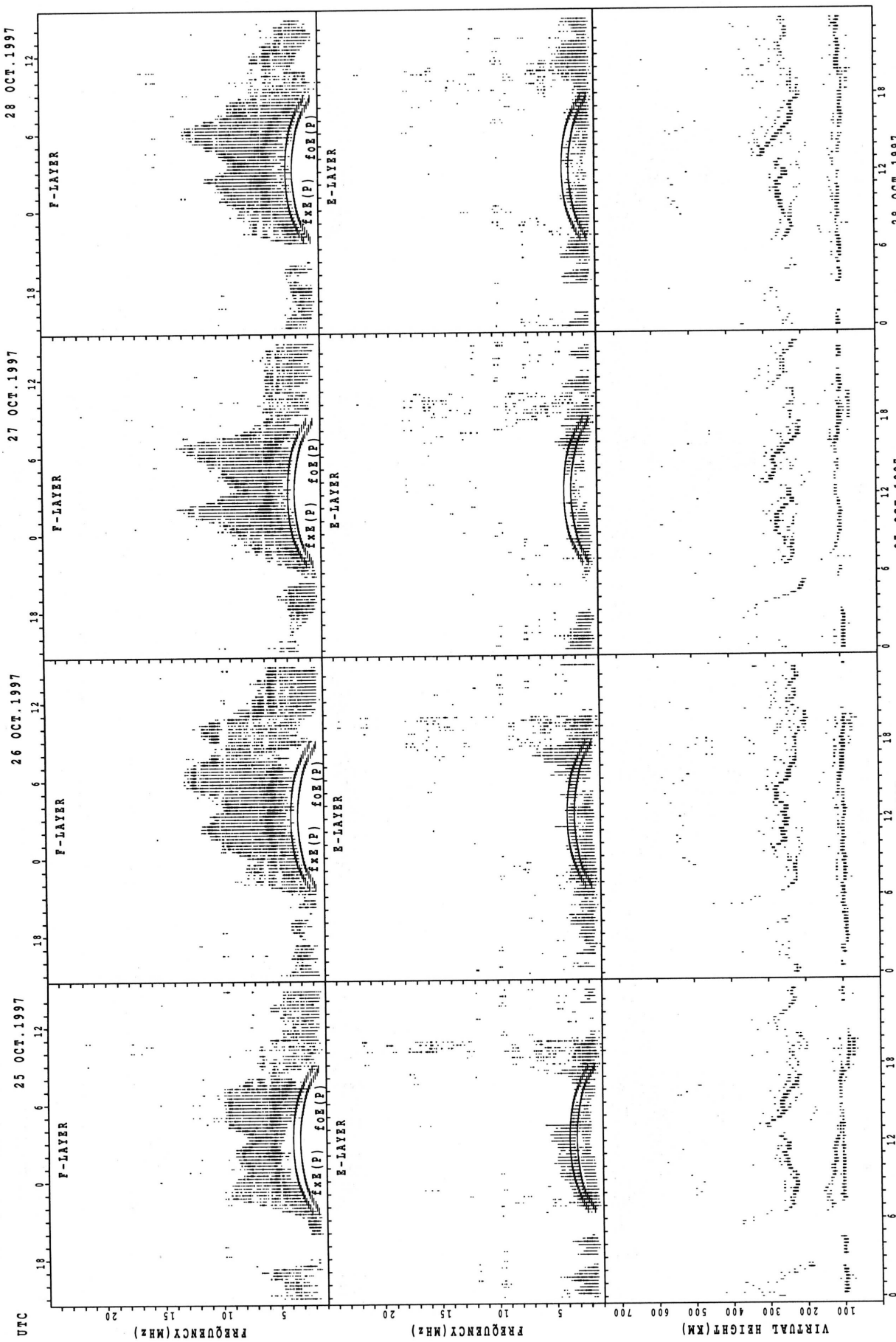


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

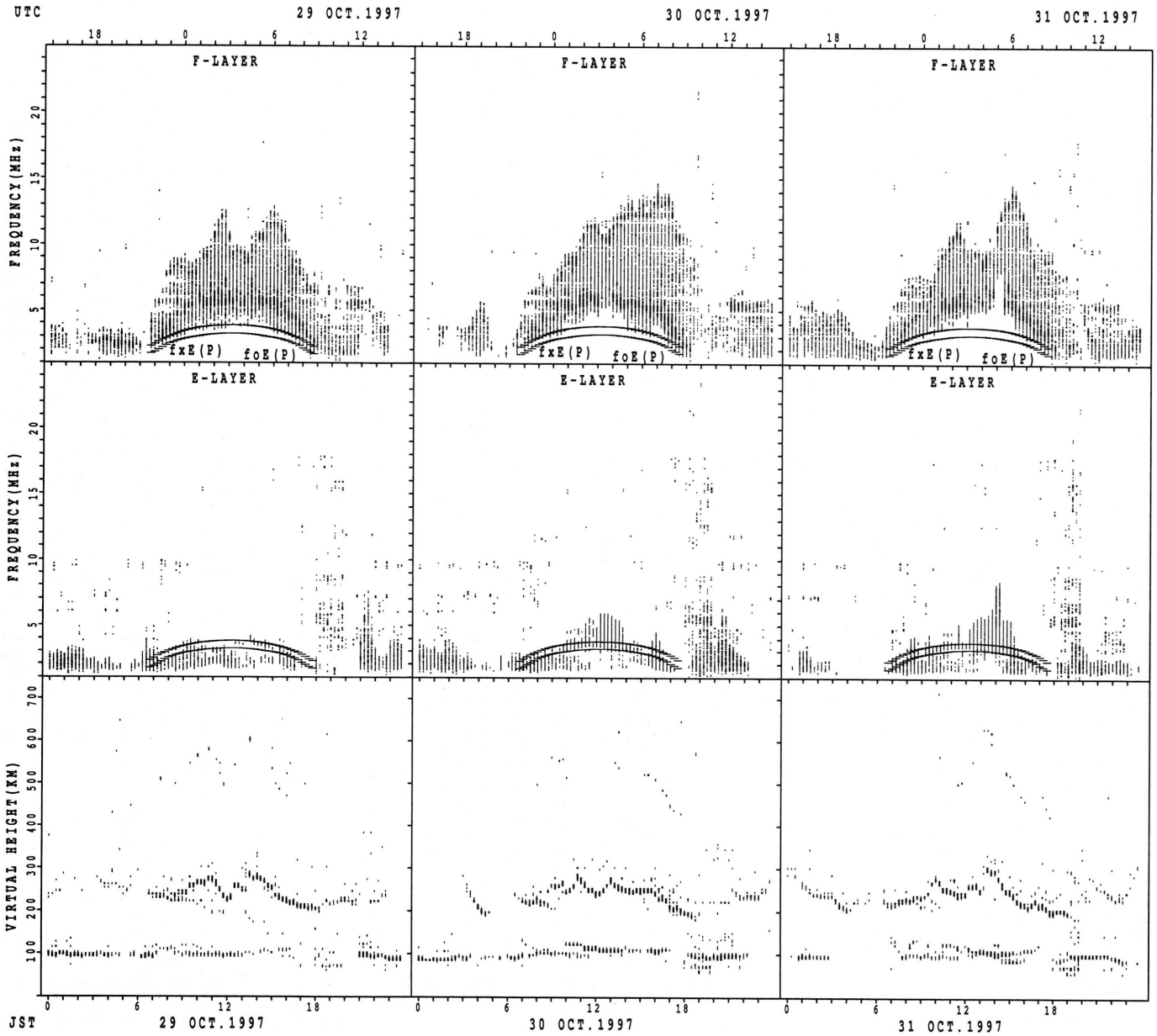
SUMMARY PLOTS AT OKINAWA



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


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

SUMMARY PLOTS AT OKINAWA



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

MONTHLY MEDIANS OF h'F AND h'Es

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

STATION WAKKANAI LAT. 45.4N LON. 141.7E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								12	24	25	28	26	28	23	22	23	14	10						
MED								240	240	248	247	238	246	248	258	250	244	252						
U Q								249	253	264	257	252	263	268	274	260	252	266						
L Q								232	232	241	240	234	240	240	256	244	238	236						

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	16	19	17	14	18	18	17	27	31	30	30	30	31	31	30	30	26	28	24	23	21	21	19	21
MED	104	105	105	103	102	102	103	123	113	107	109	107	105	105	107	105	112	103	104	97	101	105	103	105
U Q	107	111	112	105	107	107	123	137	119	113	113	109	107	109	113	113	123	115	108	109	107	107	107	109
L Q	100	99	101	99	99	99	100	105	111	105	105	105	103	101	103	99	103	98	98	95	95	99	97	101

STATION KOKUBUNJI LAT. 35.7N LON. 139.5E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								22	28	29	26	26	30	28	25	23	25	15						
MED								242	240	248	257	262	262	267	264	246	248	254						
U Q								258	253	263	270	278	270	287	273	260	261	260						
L Q								234	233	239	246	248	244	262	255	236	241	236						

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	16	19	15	15	16	10	19	30	31	29	29	25	27	29	30	29	30	27	24	23	21	20	11	12
MED	104	105	103	103	103	105	135	119	113	111	109	107	111	107	109	111	120	111	109	109	109	107	105	105
U Q	111	113	105	105	105	107	149	131	119	117	113	115	119	113	113	131	125	119	113	111	112	111	109	107
L Q	103	101	99	99	98	97	103	115	107	107	107	105	105	104	105	104	107	103	100	105	106	101	103	104

STATION YAMAGAWA LAT. 31.2N LON. 130.6E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	25	30	30	30	30	29	31	31	29	26	14					
MED								251	246	253	256	260	267	278	268	258	252	242	247					
U Q								260	254	260	264	270	282	289	282	272	262	248	254					
L Q								242	240	246	244	248	248	269	258	250	236	234	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								20	28	29	29	21	16	19	21	25	25	25	20	19	20	14	13	
MED								137	121	119	115	115	114	117	117	119	123	119	115	113	112	111	111	
U Q								150	133	124	123	119	117	119	121	129	131	127	119	115	114	111	112	
L Q								130	118	115	113	112	113	113	115	113	111	111	109	111	109	109	108	

MONTHLY MEDIANS OF h'F AND h'Es

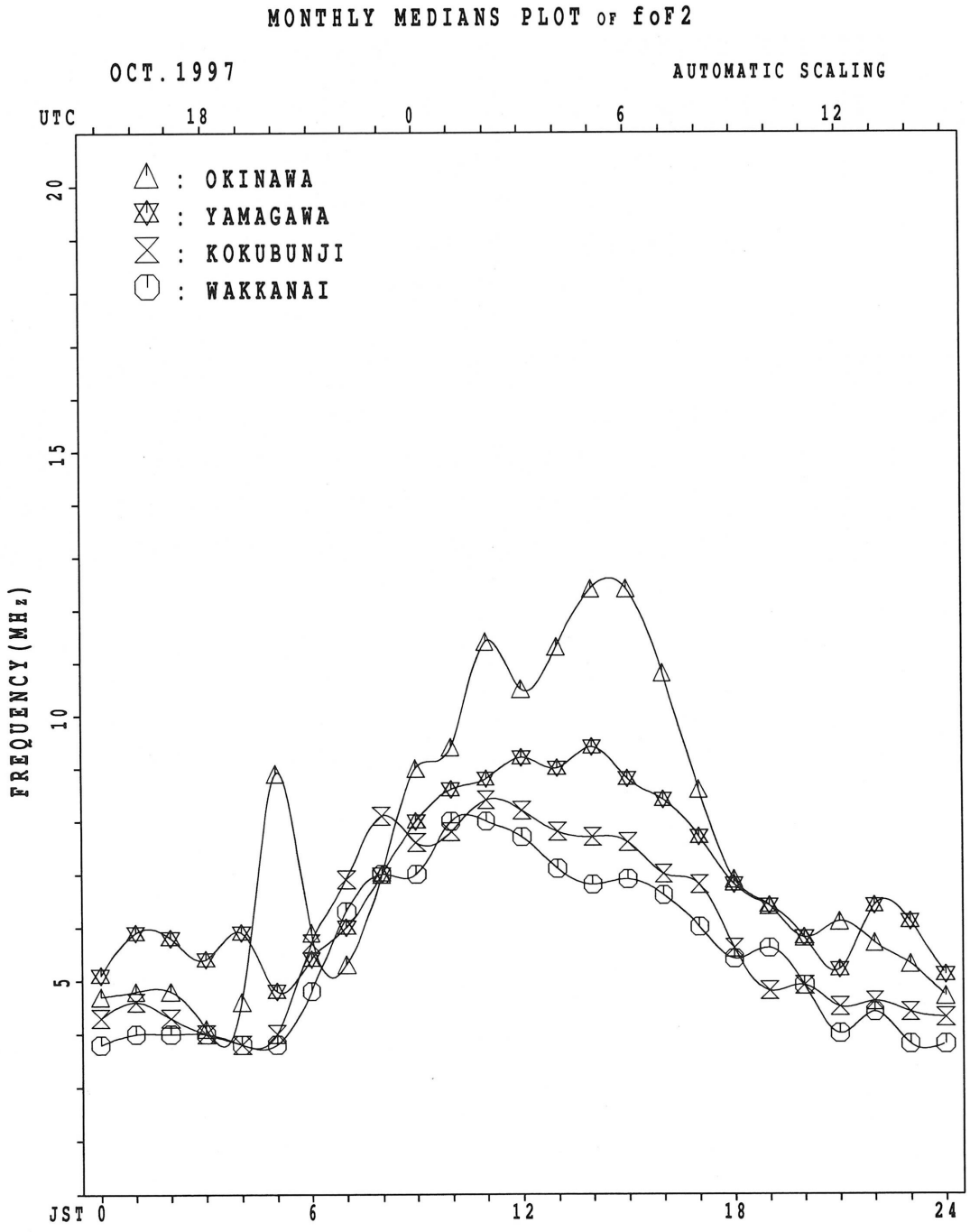
OCT.1997 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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									16	21	23	22	22	24	24	24	24	21						
MED									239	264	270	262	249	286	270	249	234	226						
U Q									250	283	286	270	260	286	278	255	243	238						
L Q									232	245	254	250	238	267	257	244	228	218						

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	15	11					23	23	24	23	21	18	17	22	20	24	20	19	21	19	20	18	19
MED	97	97	97					123	111	107	109	107	111	111	107	108	111	105	95	95	101	99	97	97
U Q	99	101	99					137	131	118	115	123	113	115	131	123	120	113	103	107	103	100	99	101
L Q	95	95	97					109	105	106	105	103	103	101	99	100	101	96	89	89	97	97	95	95


MONTHLY MEDIANS PLOT OF foF2
OCT. 1997
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

OCT. 1997 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 1997 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 39	F 40	F 38	F 38	38	35	54	64	69	84	65	90	91	84	68	68	69	77	88	63	R 65	50	52	46
2	45	44	41	44	40	39	49	72	82	F 89	F 87	84	74	68	60	62	60	67	66	56	48	F 44	43	36
3	34	33	33	34	32	32	50	62	66	78	70	66	70	68	64	63	62	R 65	50	45	47	47	44	42
4	41	41	39	40	37	39	53	65	69	69	66	72	76	68	66	65	64	68	56	55	48	44	44	F 44
5	44	43	40	36	30	32	50	R 63	71	69	73	80	80	72	68	64	68	71	62	50	48	46	44	43
6	43	41	38	39	40	30	50	R 63	77	68	70	74	78	77	76	68	69	71	71	66	40	42	42	44
7	44	47	43	41	F 43	F 44	56	65	68	63	66	70	80	87	76	70	67	71	64	54	49	F 45	45	45
8	46	46	47	46	41	40	50	69	76	74	76	97	96	77	68	73	74	72	71	58	58	F 30	28	34
9	35	36	40	42	30	30	52	J R 72	70	68	91	106	83	61	64	76	76	74	76	55	53	51	49	46
10	42	40	42	43	42	39	62	V 61	R 74	82	81	A	96	78	73	78	72	77	71	37	41	42	F 41	44
11	42	43	38	38	35	33	53	62	66	74	70	90	104	66	71	69	83	68	69	58	57	40	42	44
12	44	43	43	46	41	36	54	67	73	71	72	87	87	81	R 76	79	86	78	60	44	R 33	31	F 33	34
13	33	F 32	32	34	33	29	50	73	80	76	82	75	76	76	75	70	76	60	54	50	43	F 42	F 44	41
14	41	37	34	37	37	34	58	67	86	75	72	78	72	78	90	77	71	64	61	46	42	41	38	38
15	40	41	40	40	32	34	56	65	69	77	74	H 78	88	R 76	77	84	67	57	58	48	R 44	44	43	44
16	40	37	38	40	40	45	49	63	78	88	76	89	88	73	83	82	77	78	52	F 42	F 44	F 41	F 38	F 38
17	F 39	F 40	37	36	33	35	51	77	82	72	66	76	100	86	81	69	63	58	56	46	F 46	45	F 49	43
18	F 36	43	F 38	F 39	F 38	34	52	76	84	71	78	88	77	76	78	83	68	64	48	49	52	51	F 48	46
19	47	46	45	V 45	F 45	41	51	S 60	81	89	H 74	73	93	83	77	72	67	57	48	48	42	41	F 35	F 43
20	F 40	40	37	39	40	30	48	64	78	89	85	66	78	78	70	71	64	59	46	43	F 42	42	44	40
21	38	38	40	40	44	30	47	63	66	74	86	86	79	76	84	75	77	55	50	46	31	32	36	36
22	F 36	F 36	F 36	40	34	27	43	R 64	66	73	78	85	89	76	A	74	73	66	40	A	34	36	36	35
23	36	37	39	37	V 38	26	43	57	62	74	79	88	76	72	74	88	84	64	40	31	30	30	33	33
24	35	36	R 33	F 35	F 34	32	44	57	68	R 73	85	92	84	80	82	76	74	R 63	A	A	F 46	46	39	F 40
25	F 38	F 42	54	A	22	28	41	82	79	91	84	98	R 76	80	87	88	65	60	54	U A 44	49	53	50	42
26	39	39	R 37	43	34	33	40	64	77	87	90	100	95	92	92	77	U R 73	72	41	A	33	36	35	28
27	30	34	30	30	30	30	50	66	70	82	105	118	92	96	87	86	79	66	48	38	40	42	39	R 38
28	39	35	29	F 29	F 32	F 27	52	79	78	86	82	89	78	73	112	79	79	67	37	34	34	36	38	41
29	34	36	32	42	F 39	F 35	F 55	73	R 77	87	92	84	84	74	95	81	69	53	42	A	41	41	33	R 32
30	35	R 34	31	F 32	F 35	33	44	66	73	74	78	86	82	87	67	79	70	53	35	38	34	36	36	34
31	36	34	36	37	35	33	43	57	67	76	76	88	82	80	100	76	65	66	37	30	34	34	30	30
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	30	31	31	31	31	31	31	31	30	31	31	30	31	31	31	30	27	31	31	31	31
MED	39	40	38	39	37	33	50	65	73	75	78	86	82	77	76	76	70	66	54	46	43	42	41	41
U Q	42	43	40	42	40	36	53	72	78	86	85	90	91	81	84	79	76	71	64	55	48	45	44	44
L Q	36	36	34	36	33	30	47	63	68	72	72	76	77	73	68	69	67	60	46	42	34	36	36	35

OCT. 1997 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 1997 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	L 428	U L 460	L 500	L 480	L 476	U L 452	L	280							
2								L 404	420	460	464	472	464	L 444	L 432	L	A							
3								U L 384	U L 428	L 464	L 456	496	452	464	L 456	U L 440								
4								L 364	L 424	452	468	464	468	U L 460	L 456	U L 424	L							
5								L	L 440	L 448	460	464	L 484	L 460	U L 448	L	L							
6								L	L 428	L 444	L 452	L 476	L 464	L 460	L 464	L								
7								L	L	L 440	L	L 460	U L 484	U L 456	L 452	L	U L 352							
8									U L 416	L 452	L 464	460	L 448	L	L	U L 444	L							
9								L	U L 416	L 456	460	L 464	U L 464	U L 436	L 440	400								
10								A	U L 424	L 460	A	A	L 492	U L 472	L 460	U L 420								
11										L 460	L 476	L 492	U L 468	U L 452	L	L	L							
12								L	L	L 428	U L 480	L 492	U L 472	L 480	L	U L 416	L							
13								L	U L 424	L 436	L 468	L 452	L 460	L	L	L	L							
14								L	U L 432	L 448	L 460	L 460	U L 444	U L 484	L 460	U L 420								
15								L	L	L 440	L 456	L 448	U L 496	L 480	L 444	U L 424								
16									L	L 448	L 468	L 472	460		U L 456	U L 412								
17								L	L	U L 444	L 460	452	U L 500	L 460	U L 440	U L 400								
18								L	L	U L 448	U L 508	L 452	U L 460	L 488	L 456	L	L							
19									L	U L 448	U L 456	444	L 472	U L 464	U L 444	L								
20								L	U L 432	L 456	L 464	L 464	L 500	L 460	L	L								
21									L	U L 460	U L 488	U L 464	L	L	U L 456	L	L							
22									L	U L 440	L 448	L 448	L 460	A	A	L								
23									L	L	U L 456	L 456	L 456	L 460	L 424	L	U L 340							
24										U L 452	L 464	L 460	L 440	L 452	L 448	L								
25								L	L	432	L 464	L 464	L 440	U L 452	L	L 376	U L 288							
26											L U 468	U L 460	U L 464	U L 452	A	A								
27									L	U L 472	U L 476	L 456	L	L	L 480	U L 380								
28									L	L	L 440	L	U L 448	L	L	U L 388	L 260							
29									L 324	U L 464	U L 460	L	L	L	U L 448	U L 400								
30								U L 336	U L 344	U L 432	U L 472	L 452	L 452	L 460	L	U L 412								
31								U L 308	L 384	L	U L 476	L 464	L	U L 452	A	L 368	288							
	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								5	14	27	29	28	27	23	20	16	6							
MED								U L 364	U L 424	L 448	L 464	L 462	L 464	L 460	L 452	U L 412	L 288							
U Q								L 394	U L 428	L 460	U L 470	L 468	L 480	L 472	L 456	U L 422	U L 340							
L Q								U L 322	L 416	L 440	L 458	L 454	L 452	U L 452	L 444	L 394	L 280							

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 1997 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							156	252	292	R 312	328	A	U R 348	R	320	296	248	168						
2							A	A 232	R	R 324	U R 332	R	R	336	320	292	236	164						
3							160	244	280	324	R 340	U R 344	A	A	A	A	244	168						
4							A	236	280	304	R 332	R 340	U R 348	R	320	276	232	B						
5							184	236	288	308	R 332	U R 344	U R 344	R 320	300	272	224	B						
6							184	240	284	312	A	R 344	R 348	R	312	280	A	B						
7							156	236	292	312	324	A	A	A	288	276	240	B						
8							180	244	A	R 336	R 340	R 344	R 344	332	R 316	284	240	B						
9							184	244	288	A	R	R	R	328	308	276	232	A						
10							B	A	284	304	A 324	A	U A 328	A	R	A	A	B						
11							B	224	276	304	R 324	R 332	U A 336	A	288	268	A	B						
12							A	224	272	308	R 320	B	U R 340	A	308	304	232	B						
13							164	228	280	304	324	R	U R 344	A	324	A 276	224	148						
14							B	216	280	300	R	324	R 332	R 320	308	292	224	B						
15							B	236	280	312	R 332	U R 340	U R 340	332	R 316	276	236	B						
16							B	A	A 280	U A 304	320	U A 332	336	344	336	292	228	B						
17							B	A	A	R 308	336	R 340	R	U R 328	308	272	220	B						
18							B	A	A	R	R	R 328	U R 332	R 328	R 308	272	228	B						
19							A	A	A 268	A 300	316	R 336	R 340	R 328	R	A	228	B						
20							B	236	A	312	A	A	U R 328	324	308	276	A 220	B						
21							B	228	272	304	312	A	A	A	A	268	H 228	B						
22							B	228	280	300	A	A	A	A	A	A	224	B						
23							B	236	276	312	320	A	A	324	304	272	216	B						
24							B	232	280	A	A	A	U R 324	A	300	264	212	B						
25							B	224	276	A	R 320	R	U R 332	R 324	292	272	A	B						
26							B	H 236	264	296	316	A 328	A 328	A	A 296	A	A	A						
27							B	212	272	U A 292	A	A	A	A	A	260	A							
28							B	212	272	292	328	U R 336	A	A	A	260	A							
29							B	H 240	276	A 312	320	316	R 332	304	296	264	204							
30							B	208	260	300	316	R 320	A	A 308	308	268	A							
31							B	204	256	292	R 312	R 328	R 328	312	288	A	A							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							8	26	26	26	23	17	20	16	24	25	22	4						
MED							172	234	280	304	324	R 336	U R 336	326	308	276	228	166						
U Q							184	236	280	312	R 332	U R 340	U R 344	330	316	282	236	168						
L Q							158	224	272	300	320	328	R 330	320	298	268	224	156						

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 1997 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 30	J A E 23	E B 14	J A 22	26	J A 23	22	J G 22	J G 23	J A 38	J A 53	J A 39	G 33	G 30	G 26	34	G	J A 28	36	J A 21	J A 37	J A 32	J A E 16	E B 15
2	20	25	21	21	20	28	J A 30	J A 31	G 25	G	G	G	G	G	G	32	J A 39	47	49	41	J A 33	J A 46	J A 25	J A 16
3	18	J A E 22	E B 15	19	17	E B 14	22	27	34	G	G 30	G 33	J A 34	J A 38	J A 36	36	30	21	J A 16	J A 19	24	J A 24	J A 20	20
4	J A 21	E B 14	E B 14	E B 14	E B 14	E B 14	20	25	29	G	G	G	G	G 29	G 29	31	26	J A 24	J A 17	J A 21	J A 27	J A 22	18	J A 39
5	23	25	28	22	17	18	J A 21	26	32	34	34	G 28	G 27	G 25	J G 26	31	29	J A 25	21	20	E B 15	18	E B 15	E B 14
6	33	J A 24	E B 14	21	18	E B 15	20	28	35	J A 51	34	G 32	G	G 25	G 28	29	J A 30	J A 27	J A 29	J A 50	J A 48	J A 44	J A 24	27
7	27	21	E B 14	E B 14	E B 14	E B 16	20	G 20	31	34	J A 41	J A 46	J A 38	J A 43	J A 31	G 19	G 23	26	27	27	22	J A 29	20	23
8	J A 22	22	21	J A 20	18	E B 15	20	27	J A 34	G 30	G	G	G	G	G	31	J A 30	J A 42	J A 44	A E B 14	J A 29	J A 26	27	J A 41
9	J A 34	28	20	25	E B 14	19	G	G 22	G 27	34	25	G 32	G 27	G 25	J A 35	G 20	26	J A 23	26	22	20	26	18	J A 22
10	24	24	28	J A 22	24	29	J A 22	J A 35	31	G 24	J A 53	81	J A 38	J A 45	G 31	29	J A 25	J A 27	J A 32	J A 23	A E S 19	E B 15	J A E 55	E B 15
11	E B 14	J A 23	20	22	J A 24	A E B 14	E B 15	G	32	34	36	38	38	35	30	G 25	J A 50	J A 39	A E B 14	J A 22	J A 19	J A 17	E B 16	20
12	E B 14	E B E 14	B E B 14	E B 14	J A 22	A E B 14	22	G	G 24	G 20	G E B 22	35	36	33	J G 26	32	32	21	J A 23	J A 24	A J A 22	21	E B 14	E B 14
13	E B 16	22	J A 21	J A 20	A E B 13	E B 13	19	G 20	30	32	36	G	G	J A 37	G 30	30	J A 26	G	J A 22	31	24	23	18	E B 13
14	E B E 14	B E B 14	E B 15	E B 14	E B 16	E B 15	J A 20	25	31	32	G 28	G	35	G 21	35	33	33	43	32	J A 21	23	23	20	E B 15
15	E B 15	E B 13	22	J A 23	25	22	J A 20	28	34	32	G	G	G 19	G	G	35	J A J 33	A 26	26	J A 34	A J A 21	20	19	20
16	18	18	E B 15	E B 16	20	E B 16	E B 16	J A 30	33	33	G	36	37	42	J A 47	J A 49	J A J 33	A 36	38	J A 44	27	26	18	E B 15
17	E B E 13	B E B 14	21	20	22	J A 25	22	J A 26	J A 33	G 30	G 26	G	G 24	G	G	29	G	E B 15	24	J A 31	26	26	E B 15	E B 14
18	E B 14	E B E 14	B E B 14	E B 14	E B 15	E B 13	E B 15	J A 31	J A 30	G 28	G 31	G 30	G 26	G 31	G 21	J G 22	26	J A 22	J A 20	A J A 29	A J A 47	J A 36	J A 33	A J A 26
19	J A 44	J A J 42	A J A 22	A J A 26	24	18	J A 22	J A 50	J A 43	A J A 45	G	G 24	G 28	G	G 30	J A 36	A J A 36	A J 44	A J A 28	19	J A J 49	A 44	E B 14	E B 12
20	E B 14	J A J 28	A J 28	A J A 24	25	20	J A 20	29	30	34	J A 35	34	G 20	36	G 27	J A 34	30	J A 37	J A 43	A J 44	J A 34	28	E B 14	J A 20
21	E B E 14	B E B 13	E B 14	E B 14	20	E B 15	J A 20	26	G 25	J A 39	J A 45	J A 47	A J A 44	33	J A 44	30	29	J A 24	J A 28	24	E B 15	E B 14	J A J 23	A 31
22	J A 27	J A J 26	A J A 21	E B 13	J A 22	21	E B 14	G 20	30	J A 42	J A 40	J A 40	J A 42	J A 51	80	J A 44	24	J A 23	J A 38	A J A 44	J A 33	28	25	24
23	J A E 20	B J A 15	21	20	18	E B 14	19	31	31	34	38	36	33	G 20	34	32	27	J A E 16	B E B 15	E B 16	E B E 14	B E B 14	E B E 15	B E B 15
24	J A J 22	A 24	20	J A 27	J A J 35	A 21	E B 15	26	J A 40	J A 39	32	J A 36	35	J A 35	33	J A 40	J A 34	53	70	J A 85	J A J 102	A 50	J A 23	22
25	J A 45	32	J A 30	35	J A 20	18	32	30	33	J A 49	35	40	G 32	40	J A 42	A J 32	A J A 46	J A 38	A J A 41	A J A 46	E B E 14	B E B 14	E B J 14	A 24
26	34	J A J 33	A J A 25	A J A 25	A J 34	26	J A 23	G	30	34	38	J A 42	38	J A J 35	A J A 46	A J 65	A J A 80	J A J 87	A J A 45	A J 45	J A J 23	A 19	E B J 15	A 19
27	24	J A J 22	A J A 26	A J 26	J A E 25	B E B 14	E B 15	25	31	J A 42	J A J 41	A J 50	A J 37	A J 60	A J 46	A J 28	A J A 34	J A 34	A J A 26	A J 29	A J 26	34	J A J 45	A J 22
28	J A J 22	A J A 26	A J 22	A J 27	A J 28	A J 22	A J 22	25	G	G	G 22	G 19	J A 35	J A 40	34	G 26	30	J A 23	J A 22	A E B 14	E B E 15	B E B 14	E B E 16	B E B 16
29	20	J A J 51	A J A 66	A J 46	25	20	22	G 20	G 26	34	J A J 45	A J 50	A J 53	A J 41	32	30	J A J 37	A 42	19	J A 82	J A J 53	A 22	E B 15	23
30	J A J 32	A J 22	A J 19	A J 27	A J A 37	A 22	28	25	J G 22	G 28	34	34	37	34	36	31	J A J 31	A 24	A J 23	A J 23	A J A 26	A 37	E B 27	A 14
31	E B 14	20	J A 30	21	19	E B 14	E B 14	G	G 24	36	39	G 23	J A 41	J A J 38	A J 44	A J 34	A J A 26	J A 29	A J 22	A E B 14	E B E 16	B E B 14	J A 28	25
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	21	22	21	21	20	18	20	26	31	34	34	E G 34	34	34	31	31	J A J 30	A 27	J A 26	A J A 24	J A 24	24	18	20
U Q	J A J 27	A 26	J A 25	A J A 25	J A 25	22	J A J 22	A 29	33	J A 38	J A 39	J A 40	A J 38	A J 40	A J 36	A J 34	A J A 34	J A 39	J A 38	A J 44	J A J 33	A 32	J A 25	A J 24
L Q	E B 14	B E B 15	E B 15	E B 16	E B 17	E B 14	G	G	G 27	G	G	G 33	G 32	G 31	G 30	G 29	26	23	22	21	E B 19	B E B 18	E B 15	B E B 15

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 1997 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	E B 14	E B 14	17	17	18	20	G 19	G 20	37	42	37	G 33	U G 30	G 24	32	G	21	26	17	32	28	E B 16	E B 15
2	E B 15	16	E B 14	E B 14	E B 15	24	21	28	G 24	G	G	G	G	G	G	32	34	29	36	22	19	36	20	E B 15
3	E B 14	16	E B 15	E B 14	E B 14	E B 14	21	26	G 22	G	G 30	G 33	34	36	33	30	27	19	E B 14	16	17	18	17	16
4	17	E B 14	E B 14	E B 14	E B 14	E B 14	19	25	29	G	G	G	G	U G 29	G 28	31	25	20	15	14	17	17	E B 14	17
5	18	18	19	16	16	16	G 17	26	30	34	34	G 26	G 26	G 24	G 22	30	28	20	16	E B 15	E B 15	E B 14	E B 15	E B 14
6	26	21	E B 14	E B 15	E B 14	E B 15	G 18	26	32	37	34	G 30	G	G 22	G 22	G 22	27	21	22	36	21	22	17	18
7	18	E B 15	E B 14	E B 14	E B 14	E B 16	18	G 18	30	33	38	40	35	37	G 20	G 19	G 19	20	17	E B 14	E B 15	19	E B 16	E B 15
8	E B 15	E B 14	E B 13	E B 14	E B 15	E B 15	G	26	31	U G 30	G	G	G	G	G	30	28	26	41	E B 14	18	17	19	21
9	23	20	16	17	E B 14	E B 14	G	G 20	G 24	U Y 34	24	U G 32	G 26	G 24	G 25	G 19	26	19	19	E B 16	16	20	14	19
10	18	17	18	17	E B 13	22	19	32	30	G 21	50	A A 81	36	40	U G 31	28	23	21	18	E B 14	E S 19	E B 15	E B 15	E B 15
11	E B 14	E B 16	E B 14	E B 14	17	E B 14	E B 15	G	30	34	35	36	36	34	30	G 23	23	20	E B 14	17	E B 14	17	E B 16	17
12	E B 14	E B 14	E B 14	E B 14	16	E B 14	E B 16	G	G 24	G 18	G E B 20	35	36	U Y 33	G U Y 23	32	30	19	20	17	18	E B 14	E B 14	E B 14
13	E B 16	17	E B 14	E B 14	E B 13	E B 13	G	G 18	29	32	35	G	G	35	G 26	29	G 19	G	17	18	17	17	E B 14	E B 13
14	E B 14	E B 14	E B 15	E B 14	E B 16	E B 15	E B 17	24	29	U Y 32	U G 28	G	35	G 21	34	33	31	33	23	E B 14	E B 14	E B 15	E B 15	E B 15
15	E B 15	E B 13	E B 15	17	19	17	17	26	32	32	G	G	G 18	G	G	34	28	23	18	19	17	17	E B 13	16
16	E B 15	E B 14	E B 15	E B 16	E B 15	E B 16	E B 16	27	32	33	G	35	36	40	36	33	27	32	28	24	20	18	14	E B 15
17	E B 13	E B 14	E B 14	E B 15	E B 13	21	E B 16	24	29	G 27	G 26	G	G 24	G	G	28	G E 15	B E B 14	19	18	17	E B 15	E B 14
18	E B 14	E B 14	E B 14	E B 14	E B 15	E B 13	E B 15	24	30	U G 28	U G 31	G 27	G 25	G 24	G 18	G 19	24	18	18	18	23	20	18	19
19	21	21	17	18	16	16	19	24	36	34	G	G 23	G 22	G	G U G 30	30	32	18	24	E B 14	25	21	E B 14	E B 12
20	E B 14	17	18	18	E B 13	E B 14	E B 16	27	30	33	35	U Y 34	G 20	35	G 26	G 20	27	33	29	20	24	16	E B 14	18
21	E B 14	E B 13	E B 14	E B 14	E B 13	E B 15	E B 15	26	G 22	36	43	44	40	33	35	28	28	20	24	18	E B 15	E B 14	21	20
22	20	17	18	E B 13	15	E B 15	E B 14	G 19	29	36	38	36	37	50	A A 80	30	G 22	E B 14	34	A A 44	21	18	17	17
23	16	E B 15	16	E B 15	E B 14	E B 14	17	27	30	33	35	34	U Y 33	G 19	32	31	26	16	E B 15	E B 16	E B 14	E B 14	E B 15	E B 15
24	E B 16	E B 14	E B 14	19	25	16	E B 15	25	32	33	32	36	35	32	32	39	30	46	A A 70	A A 85	34	23	E B 14	15
25	19	16	28	A A 35	E B 15	E B 16	29	26	32	36	34	36	G 23	34	G 22	G 21	22	22	22	21	E B 14	E B 14	E B 14	20
26	25	29	22	19	18	17	G	G	29	33	36	38	36	33	43	40	42	37	E B 16	A A 45	18	E B 15	E B 15	16
27	E B 14	E B 14	17	18	18	E B 14	E B 15	24	29	34	34	36	34	41	34	G 21	26	27	20	26	21	19	26	18
28	17	18	19	24	18	17	E B 15	23	G	G	G 20	G 18	34	38	32	G 21	22	17	16	E B 14	E B 15	E B 14	E B 16	E B 16
29	17	17	19	34	17	16	E B 15	G 18	G 25	32	41	42	42	39	32	28	28	32	E B 14	A A 82	21	19	E B 15	20
30	23	17	E B 14	17	18	18	E B 15	G 18	G 19	G 21	33	U Y 34	35	33	35	30	22	18	18	17	22	21	17	E B 14
31	E B 14	E B 14	22	16	17	E B 14	E B 14	G	G 22	34	38	G 22	38	35	44	29	23	25	E B 15	E B 14	E B 16	E B 14	21	18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 15	E B 16	E B 15	E B 15	17	24	29	33	34	E G 34	34	33	G	30	26	20	18	17	18	17	E B 15	16
U Q	18	17	18	18	17	17	18	26	30	34	36	36	36	36	34	32	28	27	24	22	21	20	17	18
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	G	G 24	G	G	G 33	G 26	G 30	G 25	G 22	G 22	18	E B 16	E B 14	E B 15	E B 15	E B 14	E B 15

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 1997 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 300	F 310	F 304	F 302	331	343	361	370	347	375	334	328	337	348	335	344	337	332	343	299	R 307	277	290	293
2	283	289	278	279	267	275	302	314	315	F 311	F 333	321	321	336	346	317	344	348	335	339	292	F 297	318	308
3	304	296	298	304	303	299	346	347	335	351	372	329	340	331	339	324	338	R 347	339	303	314	317	318	314
4	299	307	298	311	307	295	346	340	366	373	328	333	331	312	328	333	343	353	333	334	298	288	284	F 294
5	302	308	323	329	299	318	365	R 364	355	362	331	341	329	348	340	319	339	352	345	319	297	314	329	294
6	303	315	302	312	328	321	367	R 350	367	371	327	337	327	336	340	330	341	344	339	359	328	306	302	295
7	316	345	320	300	F 316	F 317	374	360	385	369	347	317	320	331	343	343	347	336	331	327	311		299	296
8	297	296	309	323	302	308	329	344	362	335	315	324	325	342	325	336	342	338	358	320	349	F 357	295	270
9	286	286	312	331	283	302	351	J R 383	362	307	300	349	357	336	316	336	344	336	347	323	299	302	315	312
10	300	294	302	307	328	329	338	V 344	R 351	342	335	A	339	339	329	346	327	338	354	330	296	303	F 278	303
11	309	308	307	332	284	277	359	320	303	301	288	313	347	356	334	321	344	330	326	297	330	281	275	287
12	299	293	300	316	327	310	364	355	369	356	341	335	337	333	R 332	354	352	361	361	333	R 334	289	F 281	300
13	301	F 313	302	320	336	320	352	355	364	352	354	340	326	350	335	339	351	358	331	326	313	F 291	F 300	312
14	324	341	313	293	305	315	350	361	355	362	339	337	308	323	344	356	353	342	348	351	304	313	295	295
15	302	318	323	349	349	331	356	366	354	364	337	H 294	335	R 334	341	372	366	357	345	316	R 305	318	303	324
16	314	300	301	311	301	354	348	361	350	355	342	329	349	339	332	359	352	365		F 298	F 297	F 334	F 310	F 305
17	F 311	F 320	331	338	327	322	373	355	359	362	343	314	339	333	349	365	358	355	347	316	F 296	301	F 334	351
18	F 286	316	F 315	F 328	F 373	319	364	371	365	375	339	309	351	334	336	334	362	347	340	304	322	330	F 323	308
19	296	312	308	V 306	F 324	314	371	S 353	351	363	H 347	327	337	336	346	345	352	351	330	327	319	321	F 308	F 308
20	F 332	322	307	319	349	309	362	359	359	361	365	356	327	337	341	351	362	361	345	319	F 301	320	317	313
21	313	311	301	299	350	311	352	365	346	338	333	349	311	312	338	346	367	364	339	331	339	306	310	303
22	F 296	F 293	F 306	348	367	320	347	R 357	359	360	340	329	337	331	A	344	346	356	367	A	284	302	319	287
23	290	315	331	322	V 355	351	357	367	353	338	340	348	348	334	329	338	358	358	356	311	299	293	288	286
24	315	332	R 324	F 317	F 311	309	348	366	356	R 331	323	341	332	328	334	351	360	R 363	A	A	F 287	317	294	F 279
25	F 271	F 287	387	A	257	274	315	357	343	345	330	345	R 339	314	321	352	347	329	315	A	292	320	335	306
26	294	310	R 316	338	322	305	334	346	347	343	339	321	336	329	340	363	U R 338	362	366	A	288	326	327	303
27	284	316	290	295	307	281	344	378	344	323	345	348	321	345	325	354	358	361	328	296	286	312	329	R 315
28	324	354	309	F 295	F 312	F 316	330	372	358	329	308	344	358	301	346	360	342	366	314	310	294	292	301	325
29	328	319	293	A 272	F 305	F 305	F 321	338	R 346	348	354	356	343	303	343	371	351	353	344	A	306	325	320	R 305
30	291	R 314	307	F 286	F 326	362	350	357	355	359	337	354	318	347	366	352	357	368	339	320	316	312	307	299
31	291	296	301	320	320	313	364	385	334	353	347	346	353	328	353	367	368	360	360	310	297	337	334	303
	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	30	31	31	31	31	31	31	31	30	31	31	30	31	31	31	29	26	31	30	31	31
MED	300	311	307	314	320	314	351	357	355	353	339	336	337	334	338	346	351	353	343	320	301	312	308	303
U Q	313	318	316	328	331	321	364	366	362	362	345	346	343	339	343	356	358	361	351	330	316	320	320	312
L Q	291	296	301	300	303	305	344	347	346	338	330	324	326	328	332	336	342	342	332	310	296	297	295	294

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 1997 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	L 392	A 380	H 364	L 362	L 359	U L 365	L	393							
2								L 326	366	362	357	H 373	367	L 385	L 373	L	A							
3								L	U L 377	L 365	L 386	366	384	369	L 357	U L 357								
4								L 382	L 378	369	388	396	H 381	U L 381	L 360	U L 369	L							
5								L	L 363	L 384	390	390	L 384	L 371	U L 370	L	L							
6								L	L 375	L 390	L 406	L 374	L 385	L 374	L 355	L								
7								L	L	L 397	L	L 376	U L 368	U L 356	L 355	L	U L 391							
8									U L 377	L 372	L 380	382	L 393	L	L	U L 364	L							
9								L	U L 377	L 372	394	L 386	U L 379	U L 384	L 361	373								
10								A	U L 387	L 374	A	A	L 344	A	L 356	U L 362								
11										L 355	L 362	L 338	U L 355	L	L	L	L							
12								L	L	L 397	U L 369	L 366	U L 368	L 364	L	L	L							
13								L	U L 399	L 372	L 372	L 396	L 387	L	L	L	L							
14								L	U L 378	L 393	L 383	L 385	U L 388	U L 350	L 351	L								
15								L	L	L 378	L 382	L 382	U L 349	L 364	L 371	L								
16									L	L 370	L 382	L 378	384		U L 355	U L 363								
17								L	L	U L 395	L 398	418	U L 364	L 361	L	U L 390								
18								L	L	U L 401	U L 359	L 384	U L 369	L 365	L 365	L	L							
19									L	U L 384	U L 377	417	L 365	U L 355	U L 368	L								
20								L	U L 378	L 373	L 372	L 383	L 356	H 375	L	L								
21									L	U L 372	A 363	A	L	L	U L 358	L	L							
22									L	U L 382	L 382	L 387	L 367	A	A	L								
23									L	L	U L 371	L 381	L 370	L 361	L 367	L	L							
24										U L 368	L 353	L 351	L 369	L 372	L 353	L								
25								L	L	373	L 384	L 375	L 389	U L 365	L	L 383	U L 407							
26										L	U L 374	U L 369	U L 357	U L 364	A	A								
27									L	U L 362	U L 366	L 368	L	L	L 341	L								
28									L	L	L 380	L	H 392	L	L	U L 377	L 409							
29									L 403	U L 360	A 386	L	L	L	U L 359	L								
30								U L 383	U L 409	U L 391	U L 363	L 379	L 373	L 353	L	U L 362								
31								U L 412	L 403	L	U L 373	L 363	L	U L 359	A	L 396	440							
	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								4	14	27	29	27	27	21	19	11	5							
MED								L 382	U L 378	L 373	L 380	L 379	L 369	L 364	L 359	U L 369	L 407							
U Q								U L 398	L 399	L 391	385	386	L 384	L 373	L 367	L 383	424							
L Q								L 354	L 377	L 369	L 368	L 368	L U 364	U L 359	L U 355	L 362	392							

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OCT. 1997 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								230	250	230	280	280	270	258	268	252	246							
2								300	274	306	266	288	282	268	266	278	254							
3								248	256	260	236	306	274	290	274	282								
4								248	236	240	282	286	272	284	286	274	250							
5								226	256	246	268	264	276	250	274	276 L	252							
6								238	240	230	270	268	262	272	268	262								
7								232	218	242	266	280	290	274	266	252	238							
8									242	264	260	268	258	266	278	268	252							
9								234	236	270	304	252	252	248	282	272								
10								222	240	264	262	A	268	272	274	252								
11										304	308	304	250	244	264	264	250							
12								230	230	228	260	270	262	278	252	246	246							
13								228	234	244	248	238	260	256	262	248	228							
14								228	242	234	248	258	252	282	266	238								
15								220	238	242	256	254	270	268	266	232								
16									238	254	254	270	248		270	250								
17								236	226	234	242	282	262	258	248	236								
18								224	230	234	268	252	238	272	262	246	220							
19									246	244	240	244	266	264	258	246								
20								222	242	240	236	244	278	268	256	238								
21									242	256	270	250	284	292	270	248	224							
22									236	240	260	268	248	278	A	252								
23									242	264	266	258	252	278	272	256	232							
24										276	280	252	250	276	270	250								
25								240	228	256	264	248	246	268	256	238	220							
26										250	246	264	246	266	252	240								
27									258	274	252	252	274 L	260	270	230								
28									234	242	248	238	244	312	254	236	230							
29									226	252	246	248	232	328 L	258	228								
30								218	224	234	260	242	248	260	228	238								
31								218	238	246	254	258	242	266	252	228	222							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								19	28	31	31	30	31	30	30	31	15							
MED								230	238	246	260	258	260	268	266	248	238							
U Q								238	242	264	268	270	272	278	270	262	250							
L Q								222	232	240	248	250	248	260	256	238	224							

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OCT. 1997 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	286	272	262	264	246	250	222	228	216	216	E A 258	H 194	234	224	214	236	220	252	238	256	266	A 318	282	286
2	296	288	280	320	334	366	280	252	230	210	214	H 198	H 196	H 200	240	228	A	A 246	262	240	274	E A 356	258	264
3	274	288	288	278	270	288	238	226	210	210	194	188	180	228	212	218	238	232	222	258	266	270	240	268
4	270	266	274	268	268	288	230	212	220	212	200	186	H 186	214	206	234	232	238	222	238	260	290	290	304
5	284	270	258	236	266	278	222	228	220	218	208	194	188	184	234	220	244	236	222	238	262	262	248	264
6	296	280	258	266	240	272	218	228	224	218	190	200	H 178	212	208	232	246	234	232	A 230	238	292	278	296
7	282	228	232	268	254	272	214	222	232	204	H 214	A 222	204	220	222	238	230	234	222	218	252	304	274	288
8	292	286	266	242	246	266	220	234	228	218	202	190	H 180	H 186	232	240	238	234	A 234	242	226	212	324	376
9	350	326	266	242	B 242	280	228	230	230	222	H 186	H 202	210	200	202	220	246	246	226	222	260	260	250	266
10	276	278	292	272	236	274	212	A	216	216	A	A	212	A	214	222	232	240	218	216	284	256	286	280
11	300	256	246	238	320	344	218	232	228	236	220	232	A 236	230	212	230	H 234	238	232	250	220	270	306	302
12	284	282	278	254	234	252	222	218	218	208	200	190	190	210	234	A 244	A 244	222	220	224	240	324	340	286
13	274	270	284	280	244	254	238	224	226	212	208	186	182	H 202	232	226	242	218	232	242	236	288	290	246
14	236	234	260	284	254	262	230	226	230	206	202	190	196	224	252	A 238	236	232	228	220	258	252	264	286
15	282	260	250	236	228	244	218	216	214	214	214	200	192	228	224	E A 248	226	220	234	248	252	258	268	246
16	240	258	276	266	284	230	200	216	226	218	210	204	200	260	A 248	A 242	242	216	228	A 296	A 296	234	260	282
17	268	252	230	226	238	274	208	226	222	212	198	184	H 186	210	244	220	222	214	228	256	280	286	252	230
18	254	266	266	254	208	252	210	228	218	214	202	190	208	224	224	226	236	218	212	254	254	242	244	266
19	286	286	266	272	230	226	210	206	A 232	A 234	214	204	188	H 192	224	234	230	212	250	246	266	262	278	256
20	252	240	262	264	220	278	216	224	224	222	210	208	188	H 174	240	242	226	230	244	260	294	248	242	238
21	268	262	264	270	226	240	224	222	H 208	232	E A 264	A	A 248	200	A 250	242	236	212	244	246	220	262	278	286
22	296	312	274	230	218	244	220	222	224	236	222	208	226	A	A	242	236	212	A 254	A	A 340	282	264	302
23	286	274	250	238	232	208	214	220	222	230	210	H 182	222	216	228	254	232	208	204	252	258	304	294	306
24	268	246	252	276	322	282	222	218	230	214	208	H 218	208	204	234	A	238	A 228	A	A	A 362	270	298	330
25	374	318	214	A	420	348	A 292	244	224	A 228	218	234	208	230	248	H 216	208	230	244	A	272	252	236	286
26	292	A 304	296	252	254	292	228	226	232	230	224	242	218	240	A	A	242	224	210	A	308	266	242	258
27	326	258	312	326	304	306	230	218	226	236	230	218	202	A	222	228	228	220	228	A 312	308	270	270	278
28	236	240	290	E A 368	266	268	250	218	232	228	204	H 202	H 180	240	264	218	220	212	214	260	278	300	282	246
29	240	256	340	A	288	258	240	232	232	234	A 252	A 250	A 240	240	240	234	224	224	212	A	302	246	234	296
30	318	252	300	326	272	228	232	216	222	226	208	212	194	198	234	226	228	212	228	264	296	282	276	290
31	300	284	306	266	256	258	218	208	206	222	A 230	H 186	A 242	220	A	222	192	220	204	246	262	240	A 278	298
	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	29	31	31	31	30	31	31	30	29	31	28	28	29	30	31	30	26	31	31	31	31
MED	284	270	266	266	254	268	222	224	224	218	209	200	200	215	232	231	233	224	228	246	266	268	274	286
U Q	296	286	288	277	272	282	230	228	230	230	220	215	218	228	240	241	238	234	234	256	294	290	286	296
L Q	268	256	258	242	234	250	216	218	218	212	202	190	H 188	200	218	222	226	216	220	238	252	252	250	264

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OCT. 1997 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B 150	A 138	124	116	112	112	A 128	A	122	A 128	124	B 132						
2							A	118	124	114	116	116	118	116	116	116	116	B 132						
3							B 150	122	A 132	112	126	A 130	A	A	A	A	120	124						
4							A	124	120	114	112	114	114	A	A 132	A 138	A 136	B						
5							E A 164	124	118	124	120	120	116	120	A 122	122	122	B						
6							A 154	A 132	A 128	114	114	A 136	126	116	A 122	A 126	A	B						
7							154	132	A 134	116	122	120	A	A	122	120	A 138	B						
8							160	E A 148	A	A	116	116	114	114	118	116	118	B						
9							140	132	A 138	A	120	A	118	122	124	120	122	A						
10							B	A	128	122	118	A	116	112	A	116	A	B						
11							B	124	A 124	118	116	116	118	120	116	A 134	A	B						
12							A	124	134	118	118	B	116	A	124	A 120	124	B						
13							B 166	132	A 130	130	118	122	120	A	132	A	A 136	128						
14							B	122	118	122	A	112	116	116	116	A 136	120	B						
15							B	A 146	A 118	118	116	116	116	116	116	116	116	B						
16							B	128	122	114	116	A 126	122	118	120	132	130	B						
17							B	A	A	A 134	122	120	126	116	118	118	118	B						
18							B	A	A	A	A	A 128	122	A 124	120	A 122	126	B						
19							A	A	116	116	116	120	A 124	120	A	A	124	B						
20							B	A 132	118	128	A	A	114	126	E A 132	A 124	A	B						
21							B	124	138	118	120	A	116	116	A	118	128	B						
22							B	136	A 136	116	A	A	A	A	A	106	A 126	B						
23							B	A 140	136	114	114	118	122	120	120	118	130	B						
24							B	130	124	A	A	A	A	A	132	128	122	B						
25							B	122	A 130	A	122	120	126	126	A 126	A 130	A	B						
26							B	120	116	114	116	116	118	A	122	A	A							
27							B	126	122	116	A	116	A	A	A	A 132	A							
28							B	E A 152	120	120	116	120	A	A	A	A 134	A							
29							B	E A 162	A	A	120	126	120	120	120	122	128							
30							B	126	122	122	116	118	118	118	120	120	A							
31							B	118	128	128	120	118	116	128	124	122	A							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							8	27	27	25	25	24	25	20	24	27	21	4						
MED							153	126	124	118	116	119	118	119	122	122	124	130						
U Q							162	A 136	A 132	122	120	A 121	122	121	124	A 130	129	B 132						
L Q							B 150	124	120	114	116	116	116	116	119	118	120	126						

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 1997 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	116	124	B	114	106	110	148	104	108	126	114	120	102	104	108	192	G	124	118	104	116	114	B	B
2	114	112	134	128	130	120	116	120	110	G	G	G	G	G	G	146	130	120	114	110	108	110	108	130
3	110	110	B	106	110	B	156	152	108	G	112	114	112	108	104	102	140	128	118	114	110	102	98	96
4	106	B	B	B	B	B	136	146	184	G	G	G	G	112	112	168	156	128	114	118	114	114	114	110
5	104	102	102	102	106	106	138	140	152	130	130	110	104	106	100	168	150	126	102	102	B	100	B	B
6	100	102	B	104	108	B	138	142	128	116	118	118	G	100	100	96	94	96	96	112	116	114	128	114
7	112	112	B	B	B	B	160	116	162	136	120	112	118	104	102	102	122	106	114	112	112	108	120	112
8	108	102	100	104	104	B	118	174	110	114	G	G	G	G	G	162	138	120	102	B	110	114	106	110
9	104	104	110	104	B	120	G	116	108	118	106	110	106	102	102	104	162	108	104	104	98	100	102	104
10	104	104	104	110	108	106	104	102	140	110	120	110	118	110	118	118	116	110	108	110	S	B	146	B
11	B	110	108	104	102	B	B	G	144	142	136	122	120	120	124	116	110	106	B	110	126	98	B	102
12	B	B	B	B	102	B	102	G	112	104	100	B	134	100	98	148	128	118	110	110	110	110	B	B
13	B	108	106	108	B	B	122	120	140	136	130	G	G	118	116	152	112	G	114	106	102	102	108	B
14	B	B	B	B	B	B	166	142	138	136	112	G	136	104	172	150	136	122	118	110	114	112	110	B
15	B	B	112	106	108	108	106	148	130	158	G	G	100	G	G	142	132	126	114	108	110	110	104	102
16	102	102	B	B	130	B	B	124	122	122	G	130	124	170	144	134	138	128	122	110	106	110	112	B
17	B	B	110	106	130	118	126	118	116	112	112	G	106	G	G	180	G	B	118	110	120	110	B	B
18	B	B	B	B	B	B	B	108	110	110	110	108	110	104	108	102	140	100	98	116	122	112	110	114
19	108	106	106	104	108	116	128	110	114	118	G	110	108	G	116	118	122	118	114	110	112	112	B	B
20	B	108	102	104	106	108	124	142	120	134	116	110	100	168	104	96	132	118	116	112	114	110	B	108
21	B	B	B	B	102	B	106	192	114	124	114	108	114	114	108	158	138	126	118	118	B	B	112	106
22	108	118	108	B	102	102	B	114	142	122	118	114	108	108	102	110	164	96	114	114	110	112	110	108
23	106	B	114	98	100	B	158	164	150	144	124	116	118	110	148	144	130	104	B	B	B	B	B	B
24	120	118	110	102	102	110	B	156	134	126	110	108	134	108	156	128	128	118	110	110	112	106	128	138
25	106	122	106	102	114	128	140	144	136	112	140	126	104	134	106	100	102	98	116	114	B	B	B	108
26	104	106	104	104	106	110	106	G	160	140	126	122	122	122	114	112	110	108	110	108	118	112	B	108
27	112	116	106	104	106	B	B	148	128	112	116	114	114	102	104	108	108	110	112	110	108	110	106	110
28	118	104	102	100	100	102	100	150	G	G	104	106	112	108	114	110	142	108	110	B	B	B	B	B
29	112	106	104	104	104	118	102	118	114	150	126	120	120	120	124	152	126	120	104	104	110	128	B	122
30	120	118	114	106	108	106	104	108	110	100	128	134	118	128	152	134	112	108	112	112	130	106	104	B
31	B	106	102	110	106	B	B	G	110	138	130	102	122	124	116	114	110	108	150	B	B	B	120	118
	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	21	23	21	23	25	16	23	27	30	27	25	23	26	26	27	31	29	29	29	27	24	25	19	19
MED	108	108	106	104	106	110	124	140	125	124	118	114	114	109	112	128	130	118	114	110	112	110	110	110
U Q	113	116	110	106	108	118	140	148	140	136	127	120	120	120	124	152	139	123	117	112	116	112	120	114
L Q	104	104	103	104	102	106	106	116	110	112	112	110	106	104	104	108	112	107	109	108	110	106	106	106

IONOSPHERIC DATA STATION Kokubunji

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

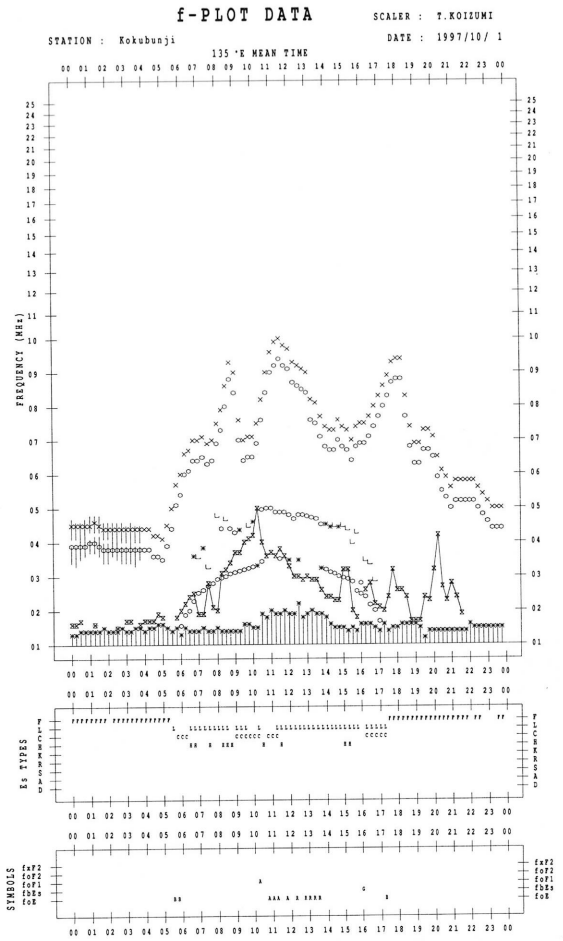
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

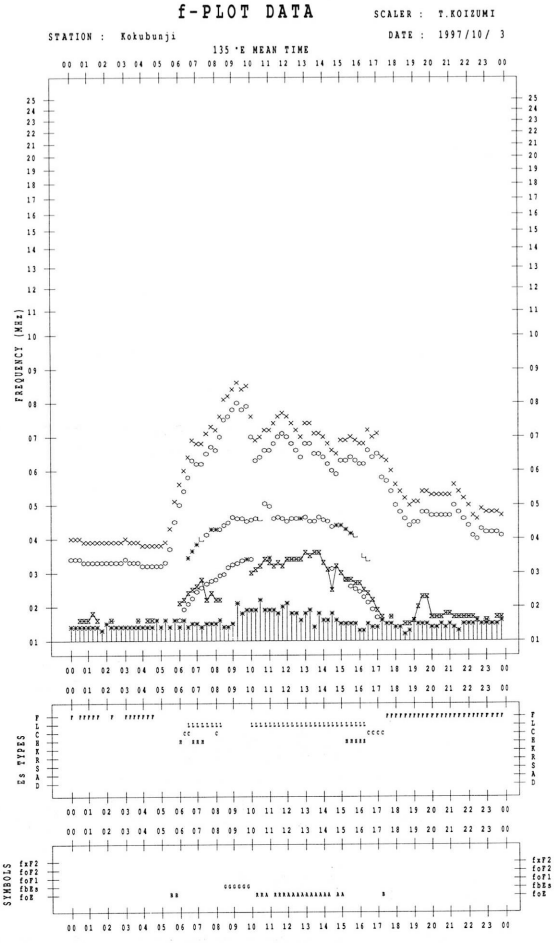
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 3	F 2		F 1	F 2	F 3	C 1	L 2	L 2	CL 11	C 2	C 2	L 2	L 1	L 1	HL 11		CL 21	F 5	F 2	FF 31	F 4		
2	F 1	F 2	F 1	F 2	F 2	F 3	L 4	C 3	L 1							H 1	C 3	C 4	F 6	FF 51	FF 31	F 4	F 3	F 1
3	F 1	F 2		F 1	F 1		H 1	HL 11	LC 21		L 1	L 1	L 1	L 1	L 2	L 3	HL 12	C 2	F 1	F 2	F 2	F 1	F 2	F 2
4	F 2						C 2	H 1	HL 11					L 1	L 1	HL 11	HL 11	C 2	F 1	F 1	F 3	F 2	F 1	F 2
5	F 2	FF 22	F 2	F 2	F 1	F 1	L 1	C 1	H 1	CL 11	CL 11	L 1	L 1	L 1	L 2	HL 12	HL 21	CL 22	F 1	F 1		F 1		
6	F 2	F 2		F 1	F 1		L 1	CL 11	CL 21	C 1	C 1	L 1		L 1	L 2	L 2	L 3	L 3	F 2	FF 22	FF 12	FF 21	FF 11	F 1
7	F 1	F 1					C 1	L 1	HL 11	H 1	CL 11	CL 11	CL 21	L 2	L 2	L 1	LL 11	LC 11	FF 11	F 1	F 1	F 2	FF 11	F 1
8	F 1	F 2	F 1	F 1	F 2		L 1	HL 11	L 1	L 1						H 1	C 1	CL 31	F 2		F 3	F 1	F 2	F 3
9	F 4	F 4	F 1	F 1		F 1		L 1	L 2	L 1	L 1	L 1	L 1	L 2	L 2	L 1	HL 11	L 2	F 1	F 1	F 1	F 1	F 1	F 1
10	F 2	F 2	F 2	F 2	F 1	F 3	L 3	L 3	HL 12	L 1	C 2	C 2	C 1	C 2	L 1	C 1	L 2	L 3	F 1	F 1			FF 11	
11		F 1	F 1	F 1	F 3				HL 12	HL 11	HL 11	CL 12	C 1	CL 11	C 1	L 1	L 2	L 2		F 1	F 1	F 1		F 1
12					F 1		L 1		L 1	L 1	L 1		CL 11	L 1	L 2	HL 11	C 2	C 2	F 2	F 1	F 1	F 1		
13		F 2	F 2	F 1			L 1	L 1	CL 11	CL 11	C 1			CL 11	L 1	HL 11	LH 11		F 1	F 2	F 1	F 2	F 1	
14							H 1	C 1	H 1	CL 11	L 1		CL 11	L 1	HL 11	HL 11	C 3	C 4	F 3	F 1	F 2	F 1	F 1	
15			F 1	F 2	F 2	F 2	LC 11	CL 11	CL 11	HL 11			L 1			H 1	C 2	C 4	FF 32	F 3	F 1	F 1	F 1	F 1
16	F 1	F 1			F 1			C 2	C 2	C 1		CL 11	CL 11	HL 11	HL 11	CL 11	CL 21	C 4	FF 13	F 6	F 3	F 1	F 1	
17			F 1	F 1	F 1	F 4	L 1	L 2	L 2	L 1	L 1		L 1			H 1			F 1	FF 42	F 1	F 2		
18								L 3	L 2	L 1	L 1	L 1	L 1	L 1	L 1	L 2	CL 11	L 2	F 1	F 1	FF 11	F 2	F 1	F 1
19	F 2	F 2	F 1	F 2	F 2	F 1	L 2	LC 11	C 2	C 2		L 1	L 1		L 1	L 2	CL 31	CL 23	FF 11	F 1	F 2	F 2		
20		F 1	F 2	F 2	F 1	F 1	L 1	CL 21	C 1	CL 11	C 1	CL 11	L 1	HL 11	L 1	LH 21	HL 23	CL 21	FF 32	F 2	F 3	F 1		F 1
21					F 1		L 1	H 1	L 1	CL 11	CL 21	CL 21	CL 21	CL 11	CL 21	H 1	C 2	C 2	F 2	FF 11			F 2	F 4
22	F 2	F 1	F 1		F 3	F 2		L 1	CL 11	CL 11	CL 22	CL 11	CL 21	CL 22	C 3	CL 11	HL 13	L 1	F 3	F 3	F 4	F 3	F 1	F 1
23	F 1		F 1	F 1	F 1		C 1	HL 11	HL 11	H 1	C 1	C 1	C 1	L 1	H 1	H 1	CL 21	L 1						
24	F 2	F 1	F 1	F 2	F 5	F 1		HL 11	CL 12	CL 11	L 1	L 2	CL 11	L 1	HL 11	C 2	C 3	C 4	F 6	F 3	F 2	F 3	F 1	FF 11
25	F 3	FF 23	FF 32	F 3	F 1	F 1	C 5	C 2	CL 12	L 2	CL 11	CL 11	L 1	CL 12	L 1	L 2	L 2	L 2	FF 21	F 2				F 3
26	F 3	F 3	F 2	F 2	F 2	F 2	LC 11		H 1	H 1	CL 11	CL 21	C 1	C 1	C 2	C 3	L 3	F 3	F 1	F 2	F 1	F 2		F 1
27	F 1	F 2	F 2	F 3	F 2			C 1	C 2	C 2	C 1	L 1	L 1	L 3	L 2	LH 21	L 3	F 3	F 2	FF 11	F 2	F 3	F 3	F 1
28	F 1	F 2	F 2	F 4	F 2	F 2	L 2	HL 21			L 1	L 1	L 1	L 2	L 1	L 1	CL 12	F 2	F 1					
29	F 1	F 5	F 4	F 6	F 2	F 1	L 1	L 1	L 1	HL 11	CL 21	CL 21	CL 41	C 1	C 1	HL 11	C 2	F 5	F 1	FF 23	F 2	F 2		F 2
30	F 4	F 2	F 2	F 2	F 3	F 2	L 2	LC 11	L 1	L 1	CL 11	C 1	C 1	C 1	HL 11	C 1	L 2	F 1	F 1	F 1	FF 31	F 2	F 2	
31		F 1	F 3	F 1	F 1				L 2	CL 11	CL 11	L 1	CL 11	CHL 11	C 2	C 2	L 2	F 3	F 1				FF 32	FF 21
	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																								

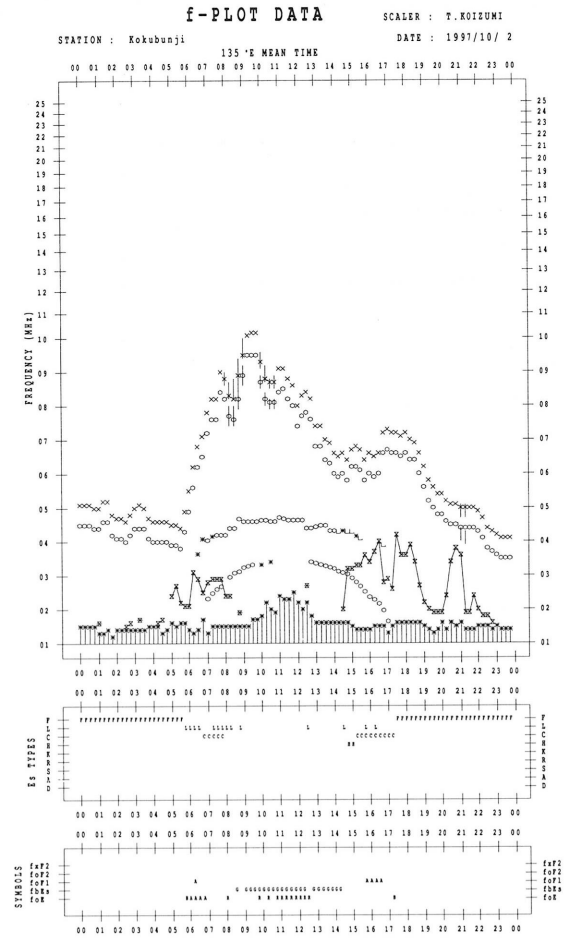
OCT. 1997 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

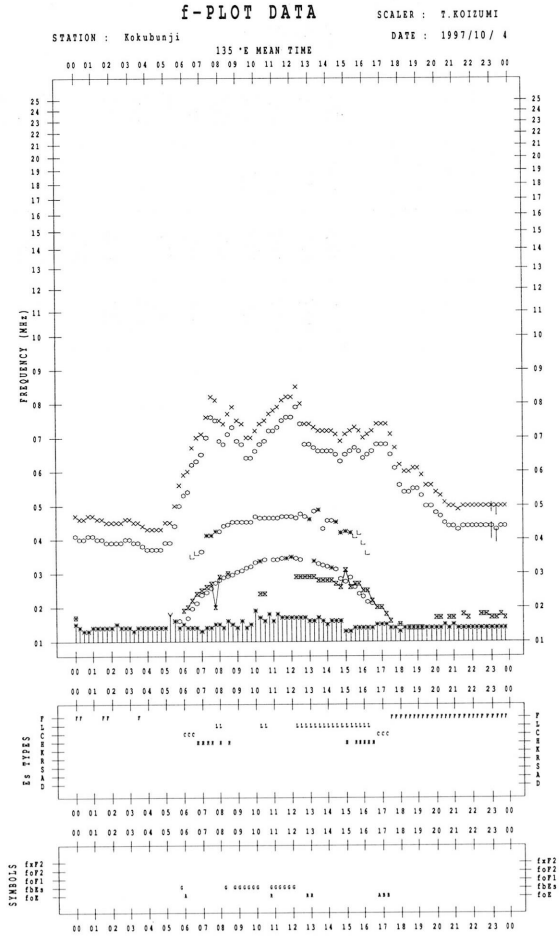
f-PLOTS OF IONOSPHERIC DATA

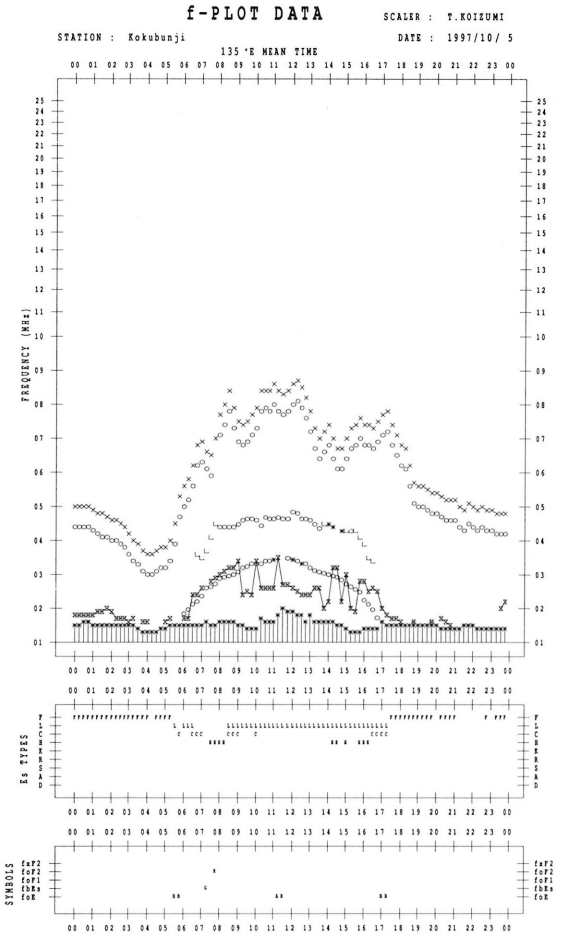
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

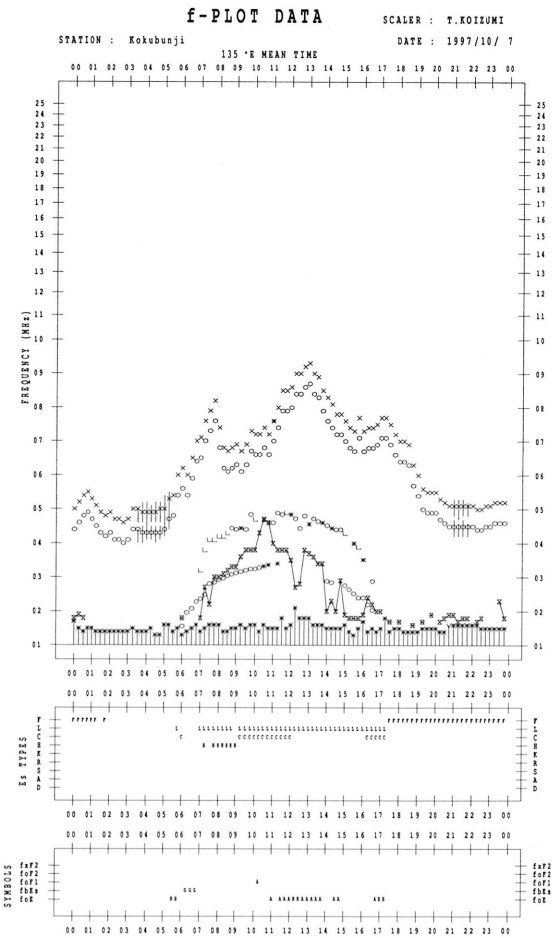

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

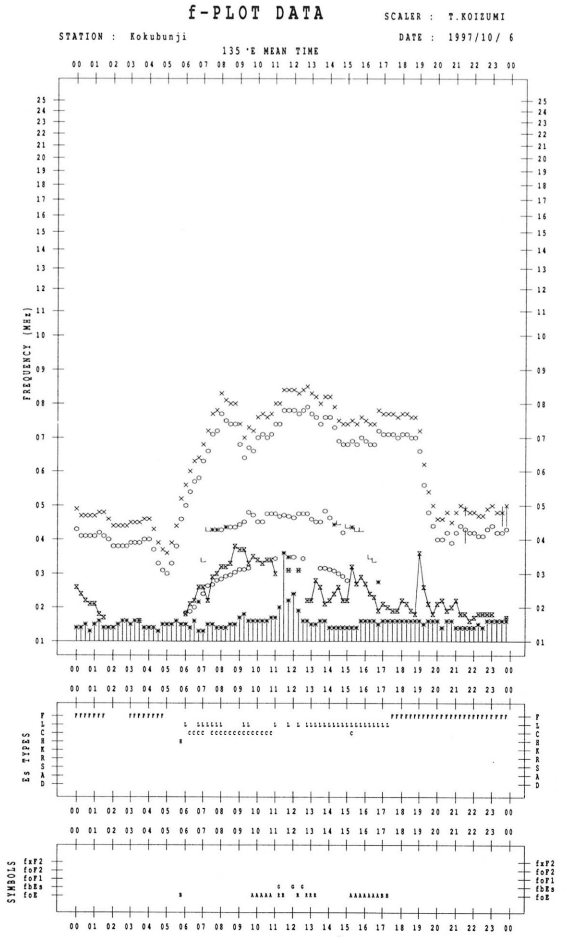

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

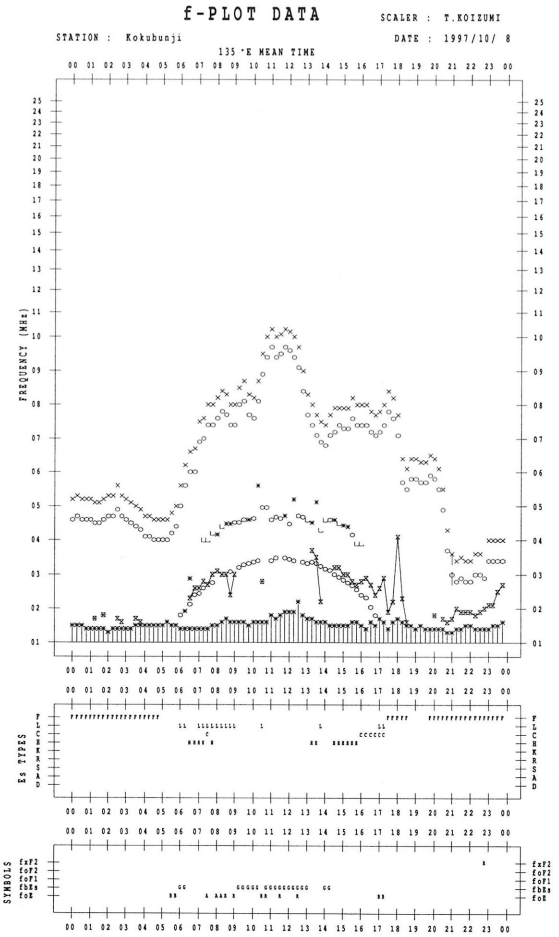

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

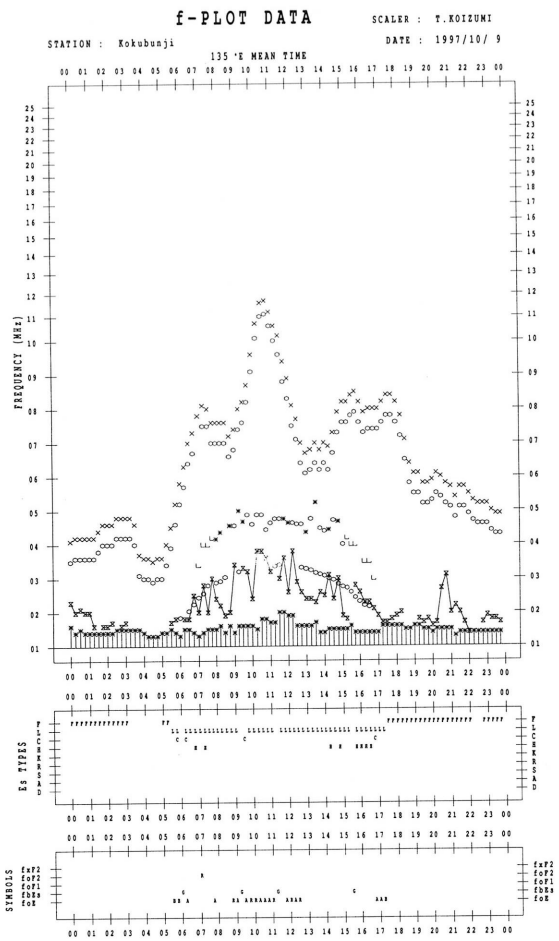

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

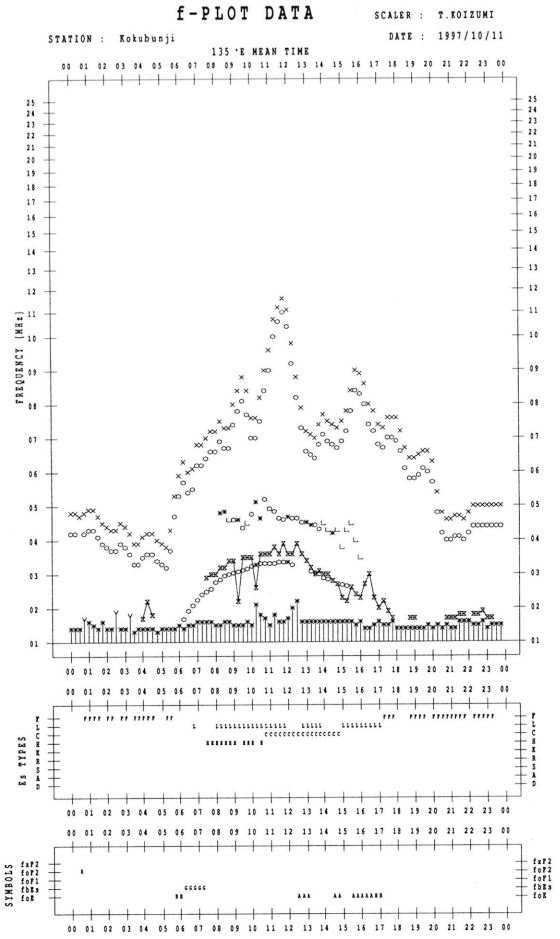

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

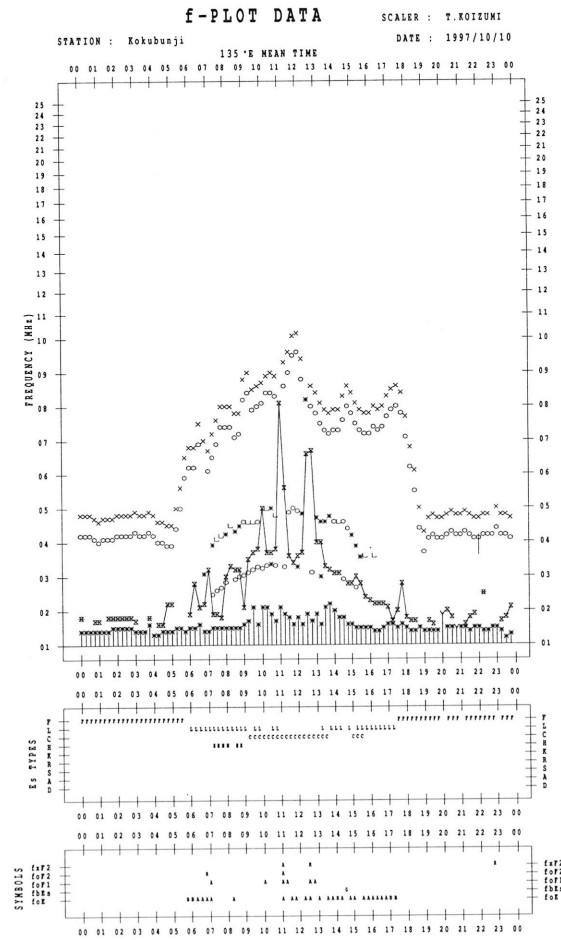

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

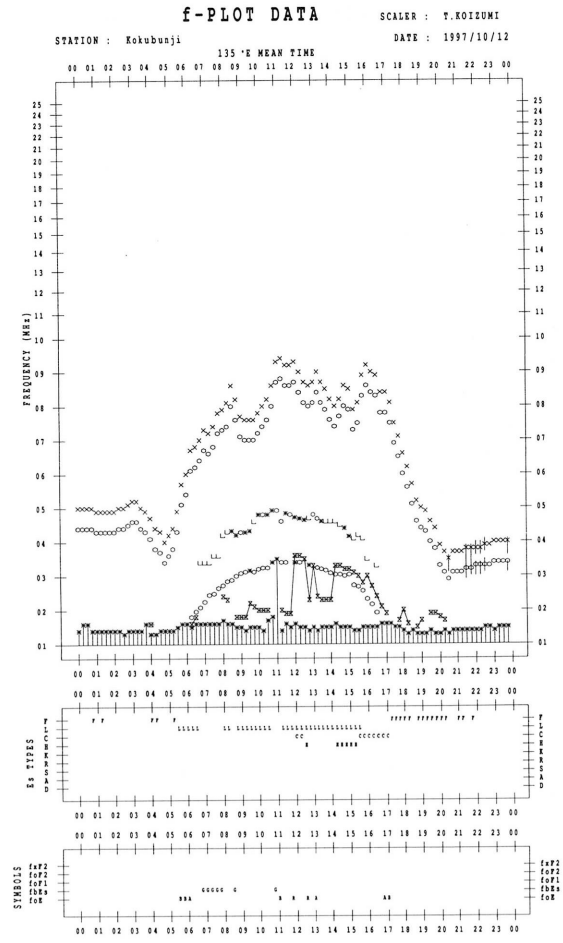

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

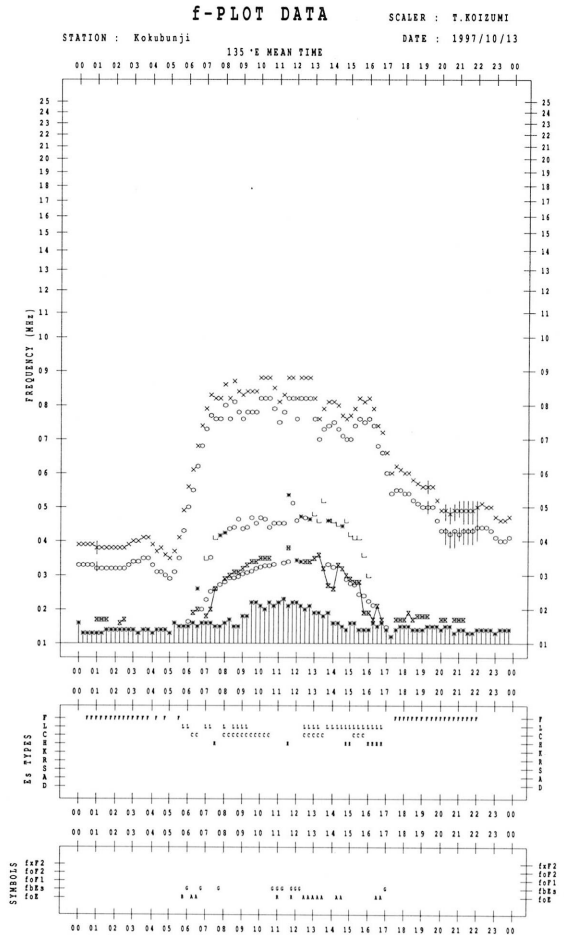

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

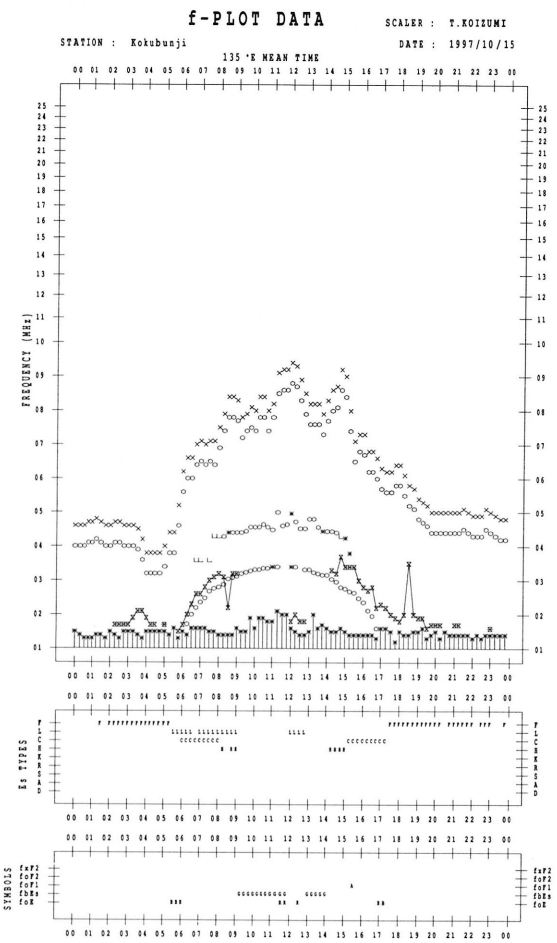

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

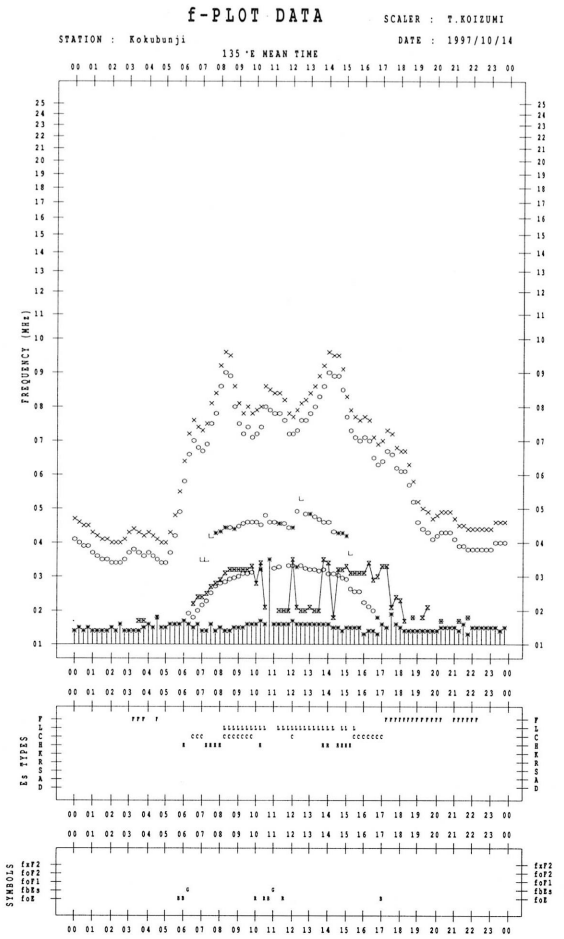

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

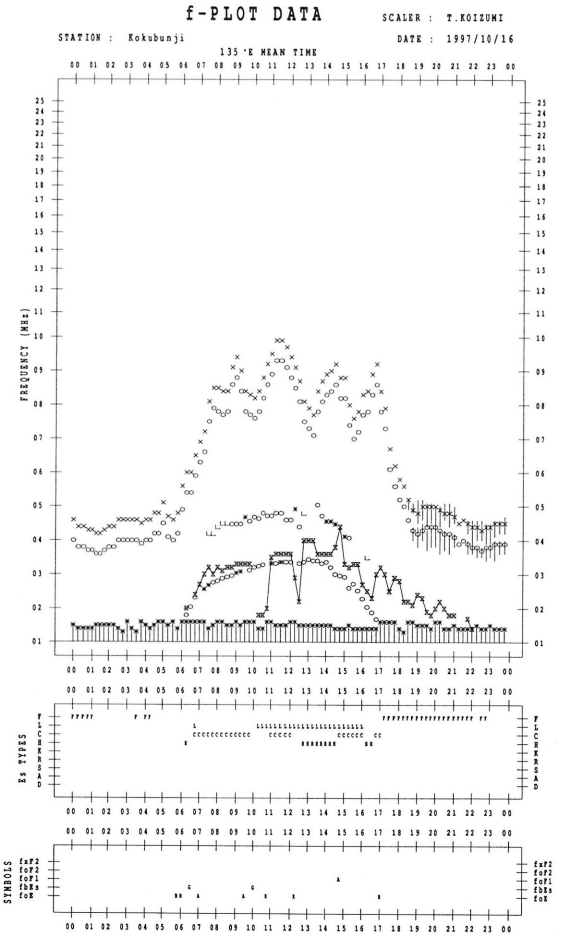

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

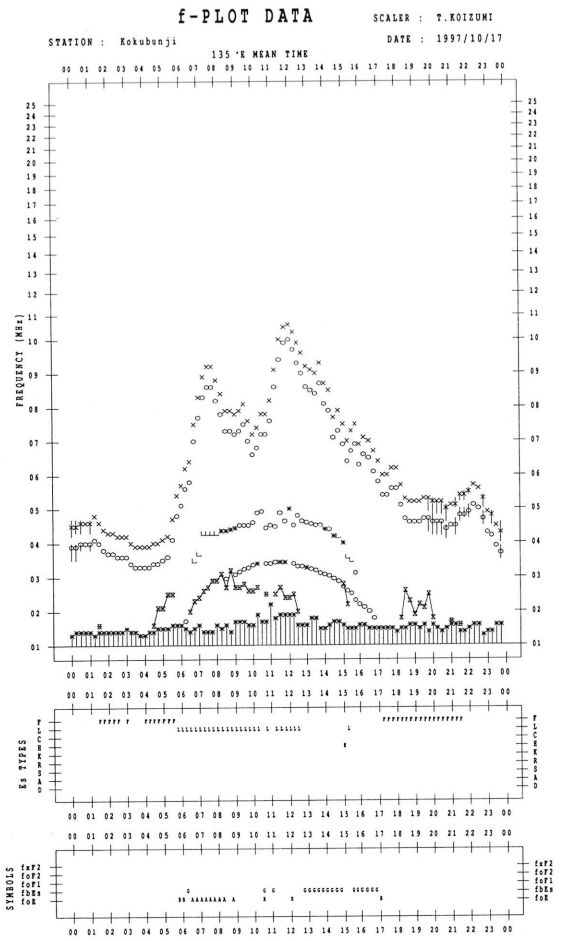

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

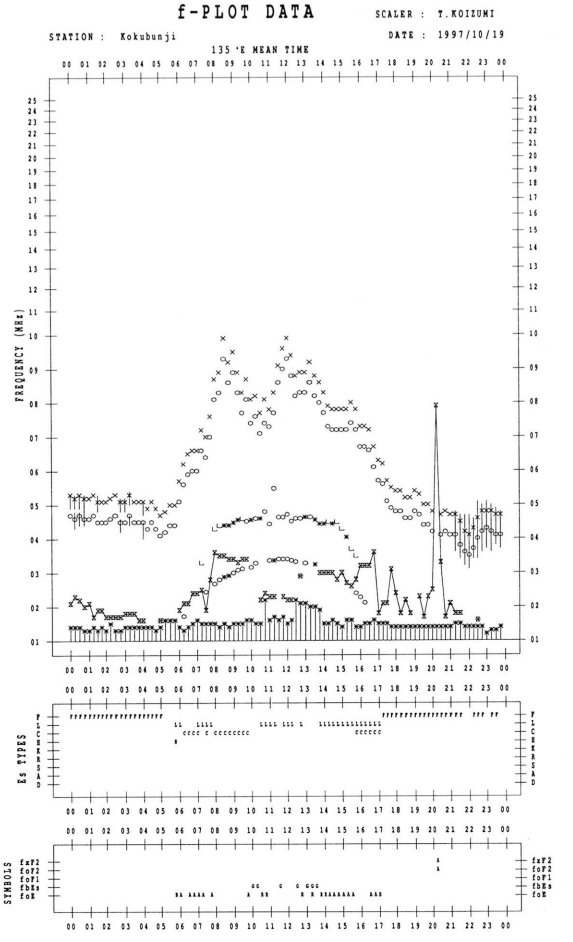

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

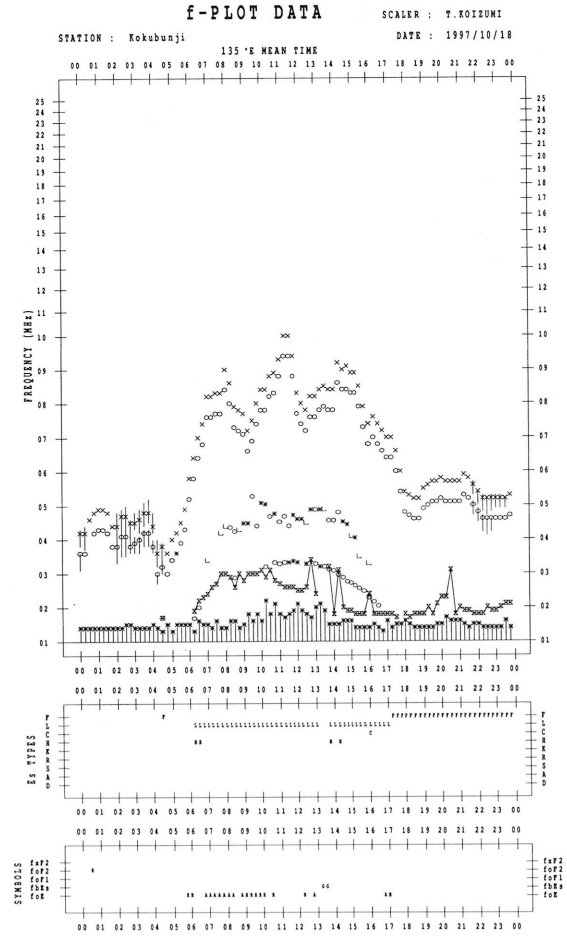

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

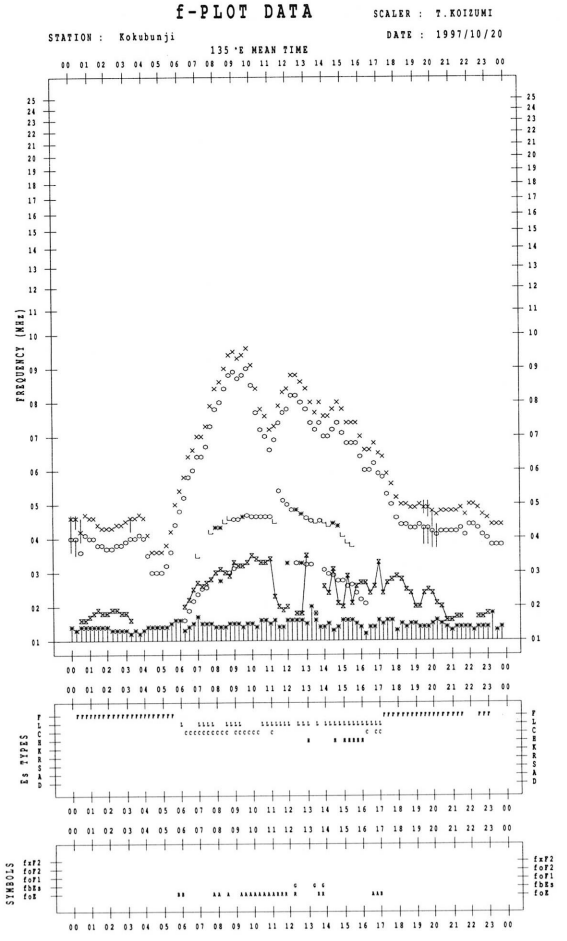

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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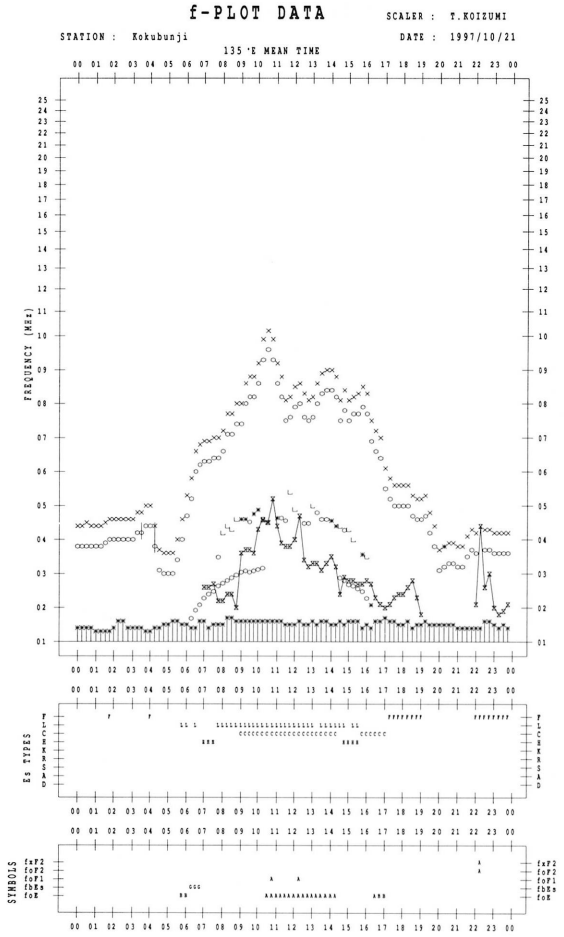
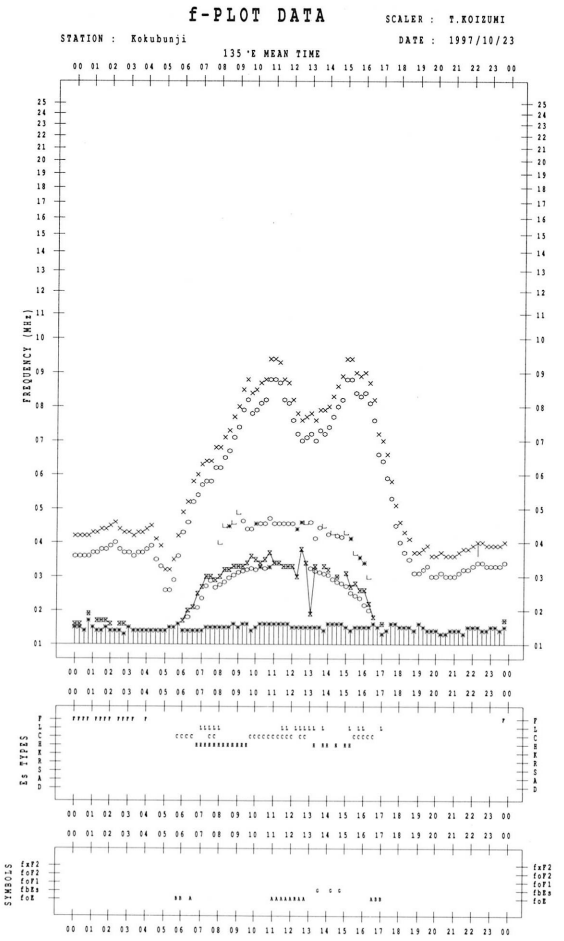
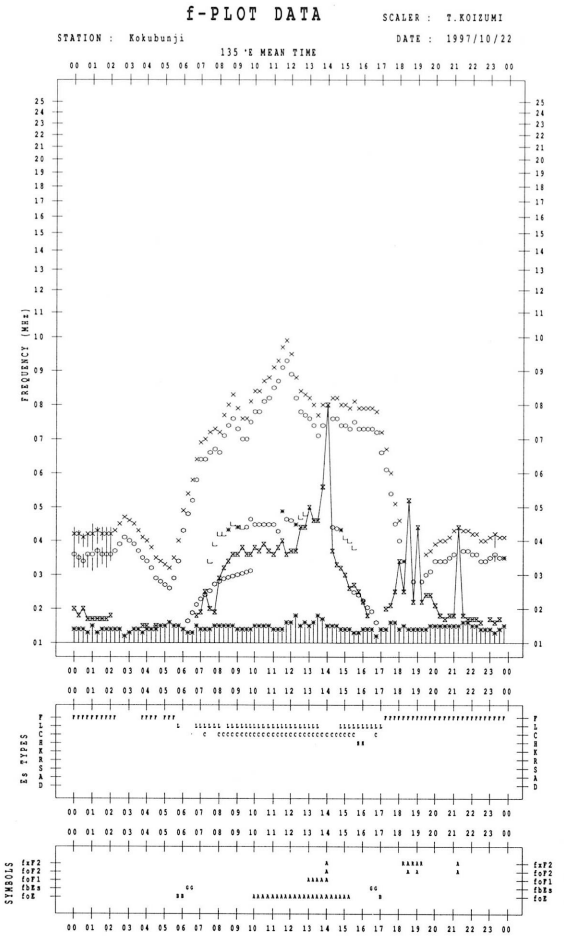
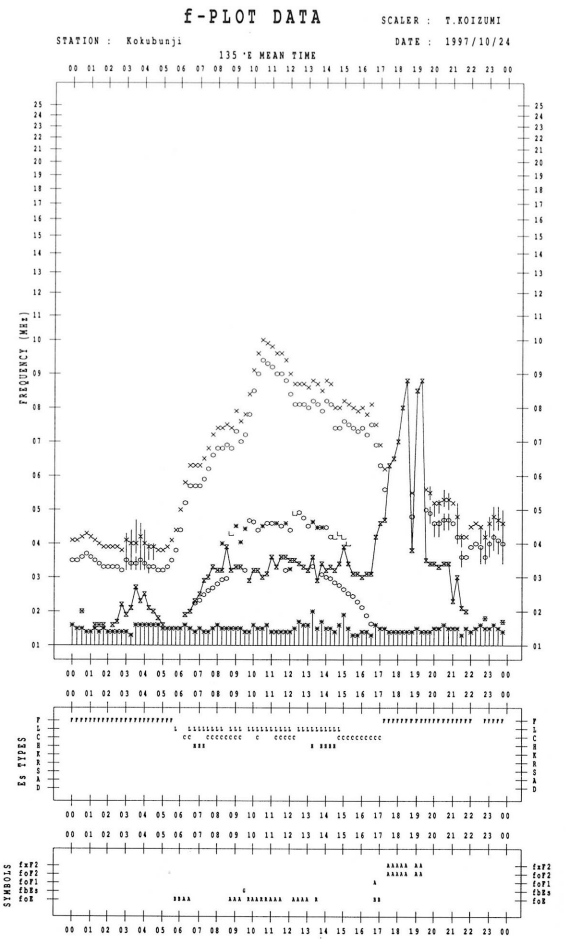
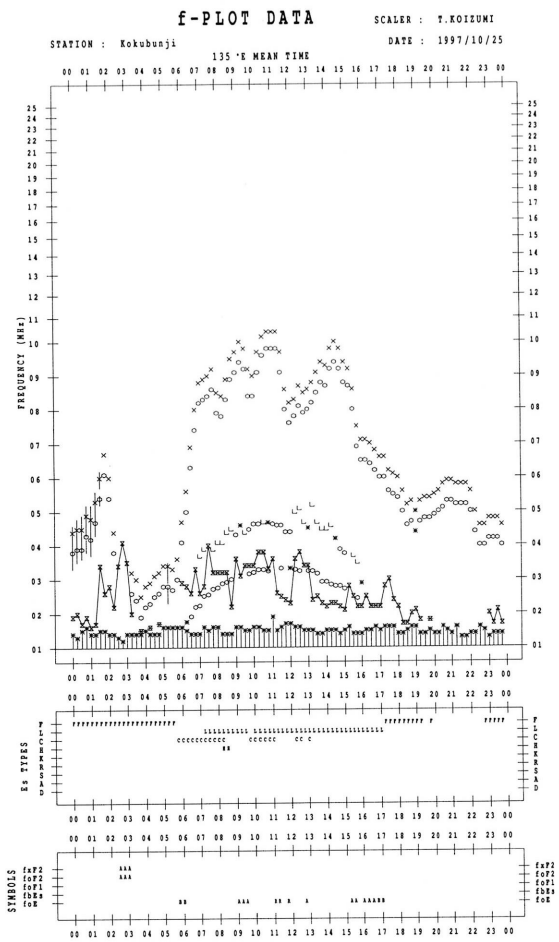
STATION : Kokubunji
DATE : 1997/10/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

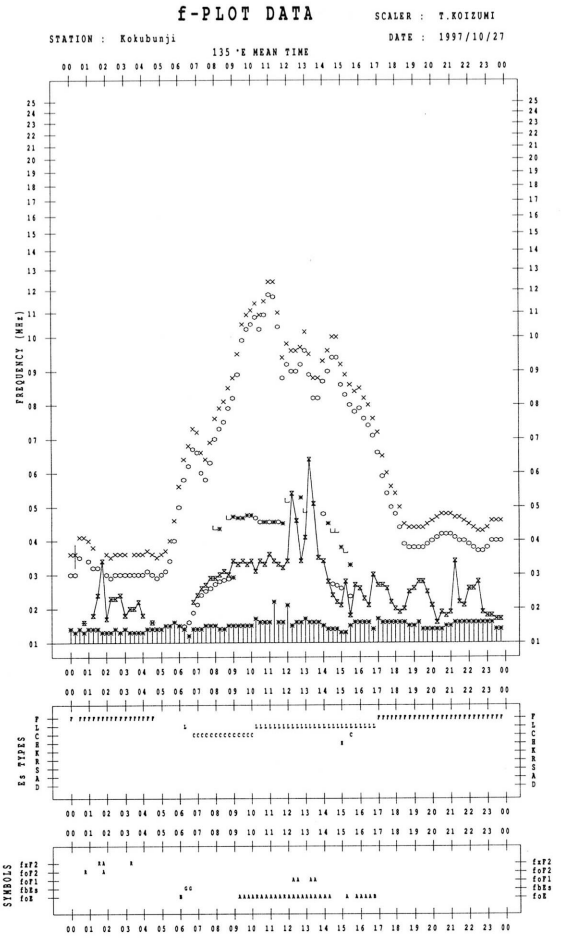

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/21
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

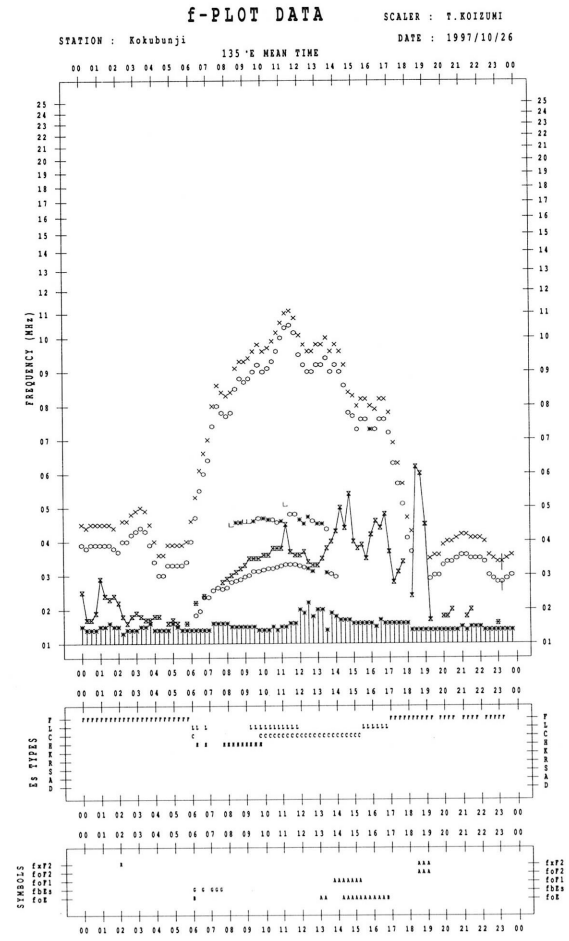

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/23
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

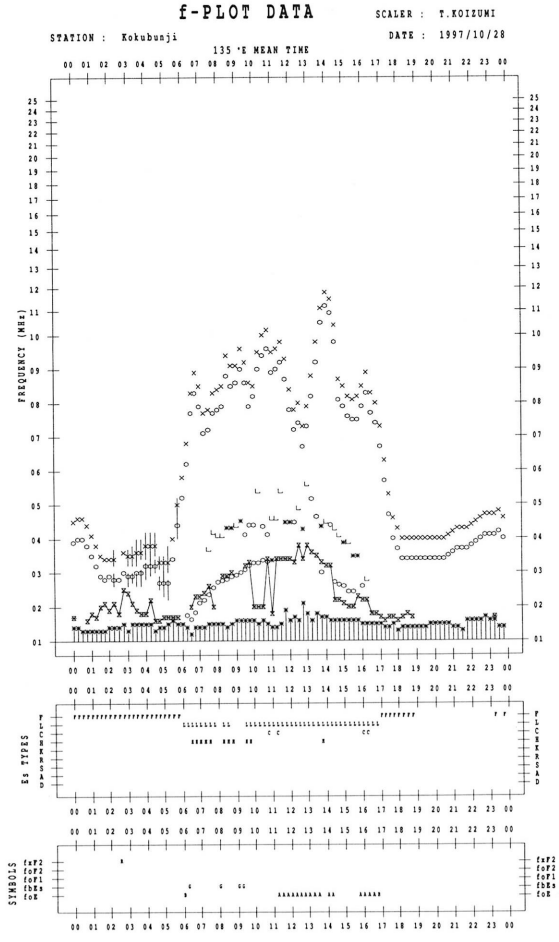

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/22
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

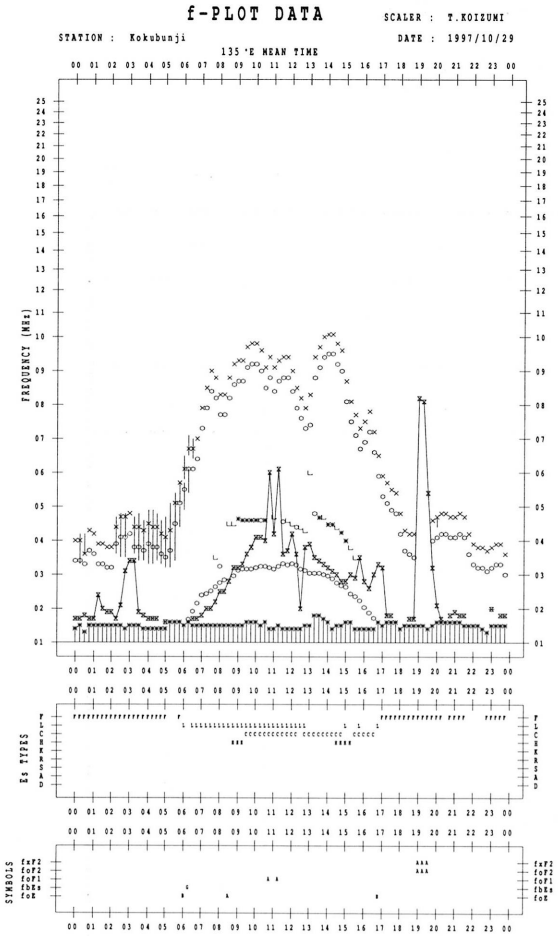

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/24
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

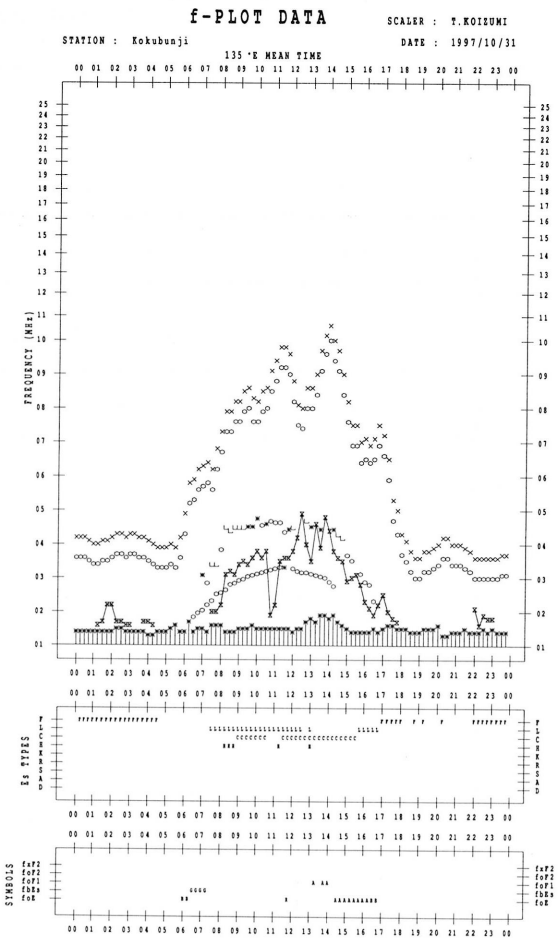

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

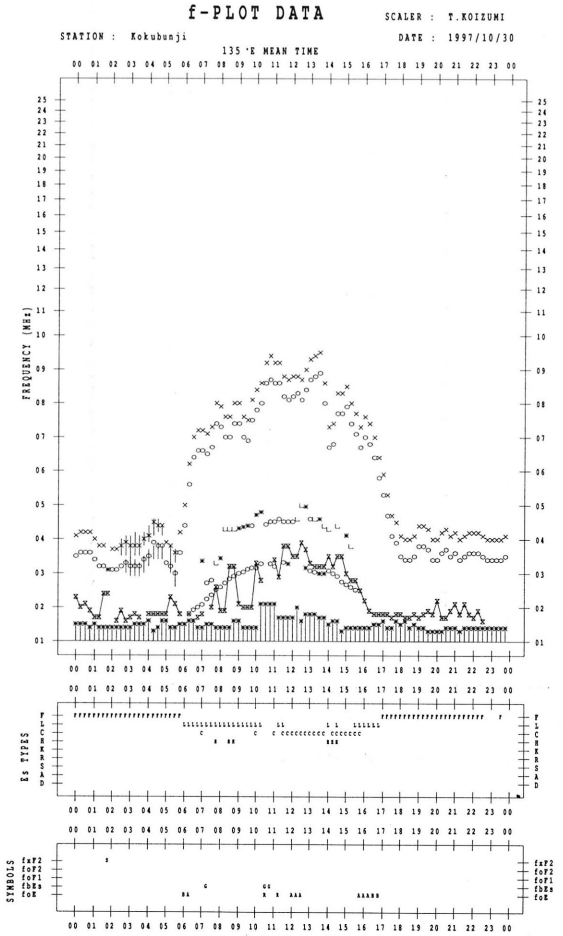

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1997/10/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso October 1997

Single-frequency total flux observations at 500 MHz					
Flux density: 10^{-22} Wm^{-2} Hz^{-1}					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	28	27	(27)	27	27
2	27	26	(26)	28	27
3	28	27	(27)	30	28
4	28	28	(-)	-	28
5	-	-	(-)	-	-
6	-	-	(-)	-	-
7	28	28	(27)	30	28
8	30	29	(28)	30	29
9	30	29	(29)	30	29
10	29	29	(28)	29	29
11	29	29	(29)	30	29
12	30	28	(28)	30	29
13	28	28	(27)	-	28
14	30	28	(27)	30	29
15	30	28	(28)	30	29
16	29	28	(28)	30	29
17	29	28	(27)	30	29
18	29	28	(27)	30	29
19	29	28	(27)	-	28
20	-	-	(-)	(28)	28
21	28	27	(26)	28	27
22	27	27	(27)	28	27
23	27	27	(27)	28	27
24	27	26	(26)	28	27
25	27	26	(26)	28	27
26	28	27	(27)	29	28
27	29	28	(28)	30	29
28	29	27	(27)	30	28
29	29	28	(28)	31	29
30	30	29	(29)	29	29
31	29	29	(28)	31	29

Note: No observations during the following periods.
4th 0500 - 7th 0000 13th 2130 - 14th 0000
19th 2130 - 20th 2300

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso October 1997

Single-frequency observations

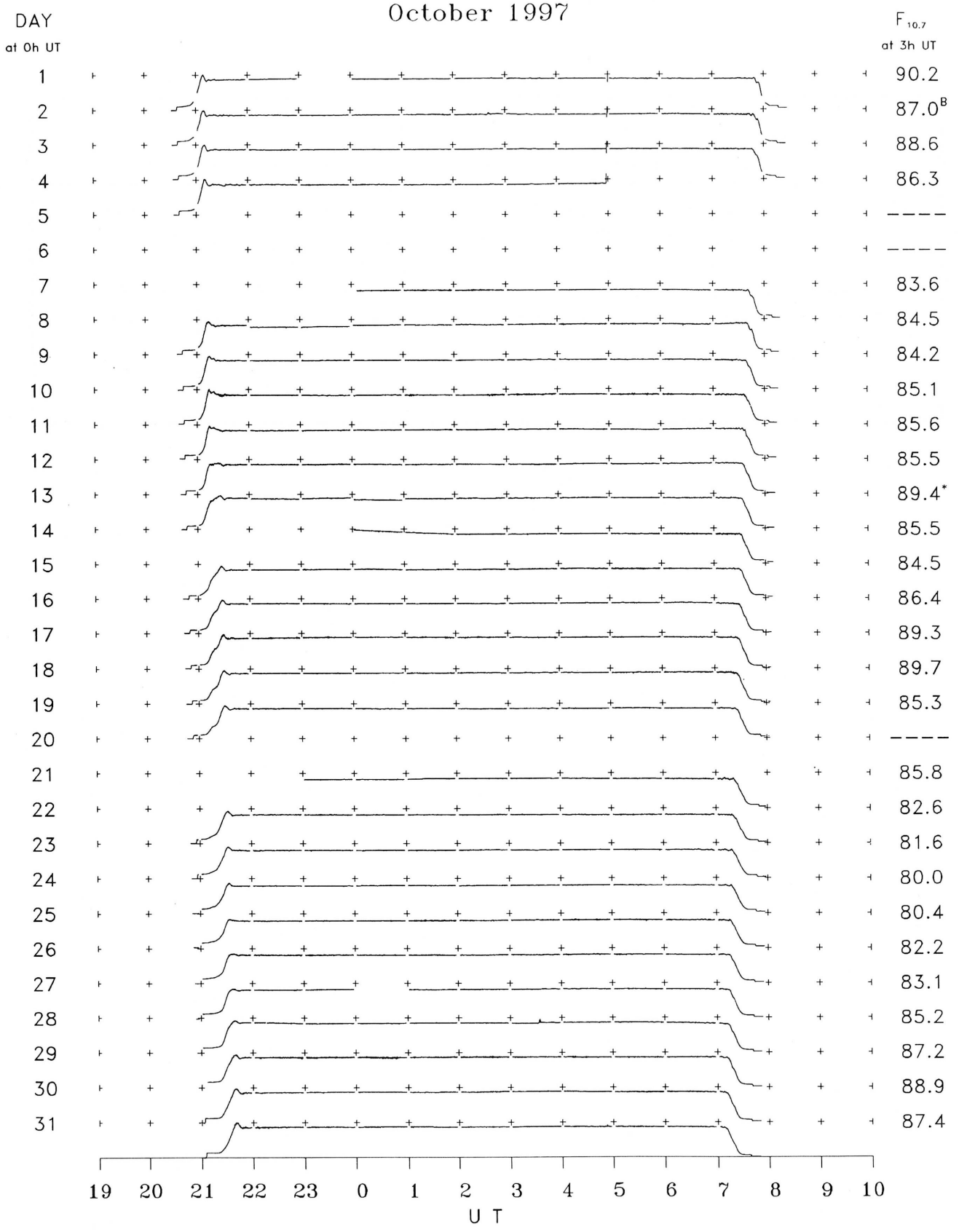
Normal observing period: 2040 - 0810 U.T. (sunrise to sunset)

OCT. 1997	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
	(N o n e)							

B. Solar Radio Emission

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

October 1997



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

IONOSPHERIC DATA IN JAPAN FOR OCTOBER 1997
F-586 Vol.49 No.10 (Not for Sale)

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☎ (0423) (27) 7478 (直通)

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2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184 JAPAN