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IONOSPHERIC DATA IN JAPAN

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CONTENTS

COMMUNICATIONS RESEARCH LABORATORY
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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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT WAKKANAI

AUG. 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	28	27	30	24	34	35			41	61	36	33	41	65	56	51	61		64	40	45	32	40	44
2	42	26	34	34	31	31	40	58	60	44	40	37	43	30	31	29	27	32	44	72	40	34	32	34
3	28	30	26	26	G	37	54	45	74	81	93	63		96	46	40	43	37	37		34	33		30
4	G	G	G	G	G			41	45	36	39	37	35	34	42	38		51	55	28	28		42	40
5	G	40	59	36	G	29	46	55	64	68	55	47	51	30	73	60	46	58	40	39	33		39	
6	29	33	24	26	G	29	45	50	56	60	44	37	34	30	31	32	58	85	82	77	45	64	59	44
7	38	26	28	25	G	30	37	42	55	57	40		63	46	44	36	29		43	45	39	44	45	37
8	29	29	G	27	28	43	44	40	38	58	57	34	40	32	35	30	N	34	32	34	33	30	36	37
9	G	29	G		33		38	43	58	84	131	32	40	37	38	43	40	37	37	29	29	42	31	26
10	G	G	26	G	B	29	36	45	35	35	37	36	40	62		78	57	37	32	35	56		74	
11	41	61	55	31	27	34	84	74	75	130	80	58		71	72	85	77	67	64		59		56	66
12	42	41	32	27	27		45		80	40	62		38	35	32	38	34	36	40	29	42	43	34	29
13	27	29	27	27	G	40	73	42	47	84	40	62	55		66	75	88	63	65	77	41	40	43	39
14	29	30	24	28	G	26	29	40	46	33	41	34	38	31	38				72		72	84	60	44
15		G	G	G	G	28	38	40	61	53	35	34	32	30	38	41	62	50		46	61	64	45	45
16	52	36	26	G	G	37		54		43	33	36	34	32	36	77	70		65	39	37	30	G	33
17	29	36	30	G	G	27	32	53	46	54	60	53	43	62	62	96	79	60			58	37	46	29
18	34	34	32	29	37	G	38	44	54	54	34	32	32	32	31	31	34	30	30	26	46	40	38	28
19	27	34	28	G	24		32	40	34	42	44	40	38	32	35	33		46	44	29	34		29	32
20		27	G	G	29	29	35	43	34	45	35	32	28			28	31	34	G	37	G	G	29	26
21	G	G	G	G	G	28	38	44	30		42	41	37	46	63	55	60	31	G	42	46	41	45	40
22	46		39	31	33	28	43	45	60	63	58	60		64	40	31	33	37	38	35	33	29	31	45
23	40	31	G	30	G	26	34	44	52	96	67	94	64		56	56	82	39	34	G	30	25	G	G
24	30	46	33	26	22	28	30	39	55	62	38	37	35	34	32	36	31	39	32	62		30	40	41
25		39	33	29	30	34	30	37	37	63	37	34	34	39	36	31	34	46	40		58	48	65	62
26	41	40	32	38	32	33	42	46	62	68	47	42	40	34			37	34	32	44	39	34	34	30
27		G	G	24		G	32	33	38	31	37	38	38	38	34	30	33	31	43	29	27	26	33	31
28	60	35	G	G	25	33	38	58	63	60	48	39	37	42	32	42	56	39	71	54	64		59	45
29	41		28	23	31	36	37		52	45	38	33	59		41	34	40	37	39	G	G	G	27	G
30	G	29	35	36	31	36	32	57		44	42	44	43	40		58	46	46	54	32	34	29	31	29
31	28	27	26	28	26	29	28	32	41	34	39	33	30	28	36	29	39	39	37	24		38	34	37
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	31	30	29	27	28	28	29	30	31	29	28	27	27	29	27	27	29	26	29	25	30	29
MED	29	30	27	26	25	29	38	44	52	56	41	37	38	35	38	38	43	39	40	36	39	34	38	37
U Q	41	36	32	29	31	35	43	51	60	63	57	45	43	46	56	57	61	50	59	45	51	42	45	44
L Q	27	26	G	G	G	28	32	40	39	43	37	34	34	32	34	31	34	34	33	29	33	29	31	29

HOURLY VALUES OF fmin AT WAKKANAI

AUG. 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	16	14	15	15	15	15	15	15	16	17	17	16	16	16	17	16	16	16	15	15	16	15	15	15
2	15	16	15	15	16	15	15	15	15	16	16	18	17	18	16	15	15	16	15	15	15	15	15	15
3	15	15	15	15	15	15	15	15	15	16	17	17	17	16	15	15	15	15	15		15	15	15	15
4	15	15	15	16	16	15	15	15	16	15	17	17	16	18	17	17	15	15	16	15	16	15	15	16
5	16	15	15	15	15	16	16	16	16	16	17	18	16	16	17	16	15	15	15	15	15	15	15	15
6	15	15	15	15	15	14	15	15	17	16	17	18	17	17	16	16	16	16	15	15	15	15	15	15
7	16	16	16	15	16	15	15	15	16	17	17	17	16	16	16	16	16	16	17	15	15	15	15	15
8	15	15	16	16	15	15	14	15	16	17	17	17	18	16	15	16	15	15	15	15	15	15	15	15
9	15	15	15	15	15		15	15	16	16	16	17	17	16	16	16	15	15	15	15	15	15	15	16
10	15	16	16	15	B	15	15	15	15	17	16	16	17	17	16	16	15	15	14	15	16	15	16	
11	15	15	15	14	16	16	15	15	15	20	17	17	18	20	16	15	15	15	15		15		15	14
12	15	15	15	16	15	14	15	15	15	16	16	20	17	17	17	16	16	16	15	15	15	15	14	14
13	15	15	16	16	15	15	15	15	16	16	17	16	18	17	17	16	15	15	15	15	15	15	15	15
14	15	15	15	15	15	16	15	15	15	16	16	18	18	16	16	15	16	15	15		16	15	16	15
15	15	14	14	14	15	16	15	15	16	16	16	18	18	16	15	16	16	15		15	15	16	15	15
16	15	15	14	15	15	16	15	15	16	16	17	18	18	16	16	15	15	15	15	15	15	15	15	15
17	15	15	15	16	16	17	14	15	16	16	17	17	18	17	16	16	16	16		15	15	15	15	15
18	15	15	14	15	15	18	15	16	16	16	16	18	16	17	16	16	15	15	15	15	14	15	15	16
19	16	15	15	15	16	15	15	15	15	16	16	18	16	17	16	16	16	15	15	15	15		15	15
20	15	16	15	15	15	15	15	15	16	16	16	17	18	16	16	16	15	15	17	15	15	15	16	16
21	15	15	16	16	15	17	17	15	16	15	16	17	17	16	16	17	16	15	16	15	15	15	16	14
22	15	15	15	16	15	15	15	16	15	16	17	18	17	16	16	16	16	15	15	14	15	15	15	15
23	15	15	15	14	15	16	14	15	15	16	16	16	17		16	15	15	15	15	15	16	16	15	15
24	15	15	15	15	15	15	15	15	16	16	16	18	17	16	18	21	16	15	16	14	15	16	16	15
25	14	15	15	15	15	15	14	15	15	16	16	16	16	16	16	16	16	16	14	14	15	15	15	15
26	15	15	14	15	15	15	15	15	15	15	17	16	16	15	16		15	15	15	14	15	15	15	15
27	15	15	16	16		15	15	15	16	16	15	18	17	17	15	16	16	15	14	15	15	15	14	14
28	15	15	15	16	15	15	15	15	15	16	16	16	16	16	15	16	15	15	15	14	15	15	15	15
29	15		15	15	14	15	16	16	16	16	16	17	18	16	16	15	16	16	15	16	16	15	15	15
30	16	15	15	15	15	15	14	15	16	32	18	21	18	17	16	16	15	15	15	15	15	15	15	15
31	16	15	15	15	17	17	15	16	16	16	16	18	17	16	16	16	15	15	15	15	15	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	29	30	31	31	31	31	31	31	31	30	31	30	31	31	29	28	31	29	31	30
MED	15	15	15	15	15	15	15	15	16	16	16	17	17	16	16	16	15	15	15	15	15	15	15	15
U Q	15	15	15	16	15	16	15	15	16	16	17	18	18	17	16	16	16	16	15	15	15	15	15	15
L Q	15	15	15	15	15	15	15	15	15	16	16	17	16	16	16	16	15	15	15	15	15	15	15	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT KOKUBUNJI

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

HOURLY VALUES OF fEs AT KOKUBUNJI

AUG. 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	29	50	32	G	28	32	32	C	41	49	41	29	32	C	75	58	71	C	40	29		70	52	50
2	54	31	28	32	48	38	58	61	58	57	69	61	59	66	60	51			60	57	59	54	39	29
3	G	29	28	G	36	G		55	60	43	39	57	57	58	40	36		48	G	33			71	58
4	76	54	G		26	35	33		49	39	40	44	41	30	40	32	33	45	41	59	55	54	54	55
5	53		29	G	G	B	48	49	58	44		52	57	40	44	40	33	50	53	59	64		73	49
6	54		44	42	39	50	60	58	84	59	71		106	42	50	43	34	82	103	34			61	50
7	44	40	31	24	G		27	36	40	43	48	49	45	61	32	50	56	88		86	34	60		G
8	86	108		27	27	48	77		38	40	55		30	31	30	41	51	37	32	58	41	29	41	52
9		28	G	G	G	29	82	59	42		46	53	60	58	29	30	32	32	32	34		52		38
10	29	25	28	27	23	27		40		40	56	59	50	56	48			132	162	131	42	46	G	52
11	27	G	27	37	G	29	30	40	32	40	41	G	39		58	47		54	49		40	44		60
12	56	44	47	50	31	32			45	56		83	58	55		82		165		118	86	59	46	46
13	46	43	32	32	30	40	30	39	49	50	44	46	60	48	61	61	51	30		60	36	49	50	57
14	72		42	37	31	28	42	33	38	47	40	B	30	G	43	85	150				69	62	54	
15	87	58		29	G		50	42	38	41	34		40	40	70	73	70	60	68		44	40	42	50
16	41	40	32	28		34	85	60	94		60	59	51	40	43		40		68	67	56	58	54	30
17	28	G	42	30	26	29	33	43		51	60	80	82		63	59	70		92	59	45	40	33	36
18		27	32	42	30	28	34	61	58	68	36	47	46	40	40	32	31	22	32	30	G	G	56	
19	33	32	G	G	G	24	35	55	59	48	60		B	G	29	32	45	61		156		72	72	72
20		26	25	25	G	29	32	32	42	35	30	30	34		40	44	60	84	38	104	64		55	34
21	G	G	G	G	G	G	34	38		51	G	27	39	G	36	43	42	43	42	44	28	28	29	
22		30	32	G	G		31	31	43	87	73	60	52		40	60	71		40	28	29	27	45	58
23	48	40	40	33	G	25	30	30											115		57	73		55
24		30		48	30	39	35	56	81	61	59	61	42	32	39	50	52	51	38		51	41	33	29
25	35	G	G	G	G	G		28	35	40	34	38			56	51	35	31	32	36	G	G	24	G
26	27	G	G	26	33	31	29	32	48	40	30	42	61	58	71	82	97	54			28	27	34	G
27	G	G	G	G	G	G		32	31	31	B	G	40	52	58	30	30	31	34		28	26	G	41
28	32	29	32	31	G	26	32	30	35	31	40	42	50	40	G	43		30	33	50	26	G	57	
29	G	G	G	G	G		33	42	50	47	57	60	71	61	56	50		56			40	41	60	50
30	49	55	54		44	29	51	49	60															
31																			34	C	47	26	49	32
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	27	27	28	29	25	25	26	26	26	25	23	26	22	27	26	21	22	23	21	25	26	26	26
MED	41	30	29	27	23	29	34	41	46	46	44	49	50	41	43	48	51	50	40	58	42	42	50	50
U Q	54	43	32	32	30	34	50	55	58	51	59	60	59	58	58	59	70	61	68	76	56	58	56	55
L Q	27	G	G	G	G	25	31	32	38	40	37	38	40	32	39	40	33	32	33	34	28	27	34	32

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

AUG. 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	15	15	15	15	14	14	14	14	16	18	21	22	C	21	18	16	15	14	15	14	15	14	15	14
2	15	15	14	14	15	15	15	14	16	15	21	17	22	21	15	15	15	15	15	15	15	14	15	14
3	15	15	15	15	15	15	15	14	16	16	20	18	16	16	16	14	14	15	15	14	15		15	15
4	15	14	15	14	15	15	15		16	15	26	16	21	17	15	15	15	15	14	15	14	14	15	15
5	15	15	15	15	14	B	15	14	15	17	22	21	23	18	18	15	16	15	15	15	14		14	14
6	15	14	15	15	15	14	14	15	14	14	17	22	26	22	22	17	14	15	14	15	14		14	15
7	15	15	15	15	15		17	14	14	15	17	21	22	28	18	14	14	14	15	15	14	15	14	14
8	15	14	14	15	15	15	15	15	15	16	21	23	18	21	17	17	15	14	15	15	14	15	15	14
9	14	14	14	15	15	15	15	14	14		17	20	24	21	18	17	15	15	15	15	14	14		14
10	14	14	14	14	14	14	15	15	14	20	22	32	22	21	18	16	14	14	15	15	14	14	14	14
11	15	14	14	15	14	15	14	15	16		20		21	23	18	18	15	15	15		14	15	15	14
12	15	15	14	15	14	14	14		17	16		18				16	15	14	15	15	14	15	15	15
13	14	15	14	14	15	14	15	17	15	17	18	24	16	24	21	18	15	15	15	15	15	15	14	14
14	14		14	15	14	15	15	15	15	20	23	B		49		16	17		15		14	15	14	
15	14	15	15	15	14	15	15	14	14	15	21	17	16	17	20	16	14	15	15		15	14	14	15
16	14	15	14	14	14	16	15	14	15	16	16	20	16	20	16	16	15	14	14	14	15	15	14	14
17	14	15	14	15	16	14	15	14	14	18	20	27	24	23	21	18	16	14	15	15	15	14	15	14
18	14	14	14	15	15	14	15	15	15	16	17	21	17	17	16	15	15	15	14	14	18	16	14	15
19	14	14	14	14	14	15	14	14	15	18	17		B		21	16	15	14	15	14	14	14	14	15
20	14	14	15	15	15	15	14	15	15	15	16	18	26	21	16	15	15	14	15	14	14	14	14	15
21	15	15	15	14	17	15	16	15		18	35	18	17			17	17	15	14	15	15	15	14	15
22	14	15	14	14	14	16	15	15	17	17	15	22	22	21	16	14	15		14	14	14	15	14	15
23	14	14	15	14	14	15	16	15	15										15	14	14	15	14	14
24	14	14		15	14	14	15	15	14	16	17	16	21	18	16	16	18	15	15	15	14	14	14	14
25	15	15	15	14	15	14		15	14	15	15	16		23	27	20	18	15	15	16	14	14	15	15
26	15	15	15	15	14	14	15	15	15	16	18	20	17	15	20	16	15	14	15		14	14	15	15
27	15	15	14	15	18	14	15	15	16	17	B		20	23	33		15	15	14	16	15	15	15	14
28	15	15	14	15	15	15	16	14	16	18	18	20		15			15	14	15	15	15	14	14	
29	15	15	14	14	14		18	14	14	15	17	38		21	21	15	15	15	15		15	14	15	15
30	14	15	14	15	14	15	14	15	14															
31																			15	15	14	15	14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	29	30	30	27	29	28	29	26	26	24	21	25	24	26	28	26	30	25	30	27	29	28
MED	15	15	14	15	14	15	15	15	15	16	18	20	21	21	18	16	15	15	15	15	14	14	14	14
U Q	15	15	15	15	15	15	15	15	16	18	21	22	22	23	21	17	15	15	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	15	17	18	17	17	16	15	15	14	15	14	14	14	14	14

HOURLY VALUES OF foF2 AT YAMAGAWA

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

AUG. 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	32		G	G	G	G	G	39	27	35		32	32	30	30	51	50	52	38	G	G	G	32	32
2	32	33	33		31	B	35			127		79	85	36	38	31	32	80			32	27	29	
3	G	33	G	G	G	G	G	30	30	32	32		34	32	38			26	33	33	31	32	32	
4	53		33		G	G		37	38	35	36	61	36	35	33	36		31	37		32	G	28	G
5	G	G	G	G	B	G		30	36	36		B	B	36	34	G	30		58		33	32	30	32
6	33	32	32	36	58	31	33		50	54	84	80	62	61	80	49	52	50	39	37		32	32	33
7	34	33	32	31	G	G	G		31	36	58	78	54	55	G	G	35	39	46	90		32	G	G
8	32		G	G	30	G	G			32	30	G	G	G	37	30	29	G	30	G	G	G	G	G
9	G	G	G	G	G	G		32	28	29	32	G	34	90	32	30	38	37	38	27	G	G	G	G
10	G	G	G	G	G	29	33	31	30	G	38	30	G	G	32	31			59	40	32	32	31	G
11	G	G	G	G	G	G	G		39	G	56	G	30	G	32	35	31	31	31	35	32	32	33	G
12	33	G		G		26	32	38	36	60	56	61	74		112			32			32		58	
13	G		33	79			24	36	54	58	55	58	55	61	G	61	52		50	G	32		59	G
14		57	82	57	32	33	32	32	31	32	32	G	G	G	G	31	26	28	36	34	G	32	33	
15		32	G	G	G	G	25	32	34	38	32	32	35	32	32	32	51	59	55		32	G	32	32
16	27	29	G	G	G	G	G	29	32	G	G	84	82		60				68		33			
17	28	G	G	G	G		27	28	36	33	33	32	39	38	55	58		33	37	34	26	32	G	32
18	33	G	26	G	G	G			60	91			92	61	G	27	34	37	33		40	G	28	32
19	33	28	G	G	G	G	G	38	48	61	58		60	B	33	38	51	59		38	28	33		32
20	32	33	33	32	G	G	G		33	59	64	36	56	30	30	32	29	33		33	33	32	32	28
21	33	32	28	31	G	G	32	27	35	38	60	61	59	84	58	59	57	47	38	32	32	32	28	33
22	30	32	G	G	33	31	G	33	34	37	68	59	80		32	33		31	G	32	G	G	G	G
23	G	G	28	28	31	G	29	39	34	G	G	53	56	56	92	50	60		34		33	32	33	G
24	31		32	32	25	G	31	37	52	79	84	84	55	56	61		61	38					32	32
25	G			G	G	G		28	33	51	52	59			56	38	36	90	110	56			33	32
26	G	G	G	G	G	G	G		30	30		G	60	60	54	60	78		72	58	50	32	32	G
27	G	27	26		G	G	G	30	31	G	32	G	G	66	80	56	58	58	37	33	28	32	24	28
28	G		24	31	G	G	G		30	30	29	31	B	G	G	33		37	32		33	32	G	24
29	G	G	G	G	G	G	25	33	35	32	32	G	31	35	G	58	30	60	113	G	33	26	G	
30	32	31	27	G	25	G	G	G	32	B	36	34		G	G	32		34	G	33	32	32	32	32
31	30	G	G	G	G		33	56	60	38	36	34	58	31	56	59	54		60	G	32		58	50
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	24	29	28	28	27	26	21	29	30	26	27	27	26	31	27	22	24	26	21	27	25	29	25
MED	30	28	G	G	G	G	12	32	34	36	36	34	55	36	33	35	44	37	38	33	32	32	32	28
U Q	32	32	32	31	25	G	32	37	38	54	58	61	60	60	56	56	54	55	58	37	33	32	32	32
L Q	G	G	G	G	G	G	G	29	31	30	32	G	32	30	30	31	31	31	33	14	28	G	12	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

AUG. 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	15		15	15	14	15	16	16	16	20	23	22	23		22	23	20	20	16	16	14	16	15	16
2	15	16	15	15	15	B	16	16	17	21	23	23	23	23	21	20	17	17	22	17	15	16	15	20
3	16	22	20	15	15	15	18	22	20	17	18	20	23	23	21	21		18	15	15	17	15	15	15
4	14	15	15	14	15	14	15	16	17	18	20	23	24	22	22	20	20	17	17		16	14	16	15
5	15	15	15	15	B	14	16	16	20	24	47	B	B	27	27			21	16	16	16	15	16	16
6	15	17	16	15	18	17	15	18	18	22	23	23		45	24	23	24	18	20	15		15	15	15
7	16	16	15	15	15	14	17	24	22	24	30		42	47	47	48		27	20	17	17	15	15	16
8	15	17	15	14	16	15	17	16	20	23			49	49	22	23		27	21	15	15	14	14	15
9	15	15	14	15	14	15	16	17	21		23		27	27	24	23	22	18	20	16	14	15	15	15
10	14	15	14	14	15	16	16	17	18	26		48	49	49		23	22	23	17	16	16	16	15	16
11	15	14	15	15	14	15	16	18	17	46	41	45		50	21	22			16	15	15	15	15	15
12	16	14	16	14	17	15	15	16	17	21	22		44	48	44	22	20	18	18	14	15	15	16	15
13	14	16	15	16	15	15	18	16	18	26	22	43	45	23		22	21	18	16	16	15	16	16	17
14	16	16	15	17	16	14	15	17	20	22	22		49	50	49	22			17	15	16	14	15	15
15	15	16	15	14	14	14	16	16	18	21	22	22		23	21	22	21	17	17	15	15	15	15	15
16	15	15	16	14	14	14	15	18	22		44	42	45	44	44	45		17	15	15	15		17	16
17	18	15	14	14	14		15	16	17	21	22	24	27	27	23	24	22	20	17	15	15	15	16	15
18	16	15	15	14	15	14	15	20	17	24	27	26	46	22		46	20	18	18	24	18	16	17	15
19	15	16	17	15	15	14	16	16	21	21	22	21		B	22	24	21	18	17	15	15	16	15	15
20	16	15	15	15	14	15	15	16	20	21	21	22	23	22	21	22	20	26	18	17	15	15	15	15
21	15	15	16	17	16	15	16	21	26		27	28		21		45	22	20	17	15	15	16	15	16
22	15	16	14	15	15	15	17	16	20	21	21	22	23	22	22	21	20	17	20	17	16	16	16	15
23	14	16	15	15	15	14	16	18	20		46	46	45	24	24	22	20	18	17	14	15	15	15	14
24	16	16	17	15	15	14	15	21	21	21	22	23	26		45	21	20	22	17	17	17	16	15	15
25	16	17	15	14	15	14		16	20	22		23	22		44	22	21	20	21	17	17	17	18	15
26	14	15	15	15	15	15	15	24	21			48	44	23	23	22	20	18	16	18	15	16	16	14
27	15	16	16	15	18	14	16	18	20	45	23	45		24		23	20	18	15	15	15	15	16	15
28	15	14	16	15	15	16	17	18	21	22	22		B	49	48	23	18	18	18	17	15	15	16	16
29	17	14	14	15	14	15	17	16	20	21	23		23	22		44		22	16	15	17	17	14	
30	15	16	15	14	15	14	16	23	22	B	24	23		45	46	24	20	18	20	17	15	15	16	16
31	16	16	14	14	15		15	20	18	21	21	23	22		44	24		18	17	16	21	18	18	17
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	30	28	30	31	31	25	27	23	22	26	25	30	22	29	31	30	30	30	31	30
MED	15	16	15	15	15	15	16	17	20	21	23	23	27	26	24	23	20	18	17	16	15	15	15	15
U Q	16	16	16	15	15	15	16	20	21	24	27	43	45	47	44	24	21	20	20	17	16	16	16	16
L Q	15	15	15	14	14	14	15	16	18	21	22	22	23	23	22	22	20	18	16	15	15	15	15	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT OKINAWA

AUG. 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	59	45			A	A	58	53	57	67	A	A	55	A	68	72	A	83		68	A	A	A	A
2	32	32	A	30	31		35	A	A	A	A	A	A	A	A	64	62		84	A	69		43	44
3		31		57		29	35		51	51	A	55	B	A	A	67	59	61	63	A	55	54	64	
4	31	30	A	A	A	A	35		A	A	A	A	66		70	70	78	82	53		56	A	A	44
5		37		35	B	B	A	58	68		A		76	92		102	96	86	90		48	A	34	A
6	31	A	A	56	B	A	A	59	A	60	68	A	A	78	86	82	77	79		A	49	43	38	37
7	A	A	A	29		B	35		56	58	A	A	A	A	58		88	A	A	65	A	A	A	A
8	A	34	28	N	B	A			63	58	A	64				94	94	96		63		B	B	B
9	56	B	B		B	B	B	56	66	58	53	B	49	68		82	75	66	70				69	
10		A	B	69			B	61			74	70	66		71	72	69	67	76		60	A	A	A
11	B	B	B	B	B	B	B	56	68	62	59	A	61	71		96	83			63		B	A	A
12	A	A	A	31	A	B	A	67	A	59	A	A	64	70	A	66	81	72	71	66	A	A	36	38
13	A	A	A			B			62		B		A	64	67	68	A	A	A	A	A	A	A	B
14	B	B		A	B	B	A	57	58	A			69	70	71	94	96	93	84		69	A	A	47
15	56	A	A		A	69		60		85	B	A	68	70	72		A	84	84	89	A	A		B
16	A					B	B	69	A	84	A	A	A		61	80		84	A		A	A	A	B
17	69		A																					
18						C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22																						60	57	59
23	56	C	69	C	31	32	C	64	57	58	56	B	B	61	80	A	81	78	C	A	A			A
24	A		68	A	A			57	59	56	A	A		A	93	81	A	86		104	A	A	A	A
25	49	38	A	A	A	A	35	63	57	A	71	A	A	A	A	A	A	95	96	90	93		A	A
26	A	B	A		A	B	B	69	A	57	67	61	61		A	68	72					A	A	A
27	58	A	35	32	31	B	B	56			68	A	B	B	67	71	93	94		84		68	A	68
28				47	A	B		57	B	B	B	B	B	B	B	B	87	93			A		57	A
29	49			53	31	B		57	67	A	A	71	74	67	A	72	88	97		91	70	62		
30	B		89	A	A	49	B	60			63	61	67	64		66	67	70		90	58	A	B	B
31			89			A	A	54	64	68	A	A	A	82	79	71	82	93	87	84		A	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11			10				19	14	14			12	12	13	20	19	20	11	12	10			
MED	56			41				58	60	58			66	70	71	72	81	84	84	84	59			
U Q	58			56				63	66	67			68	74	79	82	88	93	87	90	69			
L Q	32			31				56	57	58			61	65	67	68	72	75	70	65	55			

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

AUG. 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	24	G	G	41		34	30	60	38	37	35	49	49	48	58	80	55	40		68	43	38	57
2		26	41	38	G	G	39		60	68		66	68		72	39	38	40	46		39	28	34	40
3	37	32	G	G	G	G	G	38		31	40	42	B	35	40	38	35	32	37	37	43	44	26	37
4	63	37		66	28	34	25	40	60	50	86		82	40	40	37	50	60	60	30	29		50	25
5	G	G	G	G	B	B	27	36		39	48		41	44	60	46	46	44	35		28	29	25	36
6	37	38	37	39	B	45	38	36	50	44	44	57	61	44	51	40	48	40	40		50	24	G	G
7	34	32	40	26	G	B	G	25	36	62	67	64	64	57	39	47	68	104		40			33	38
8	31	G	31	29	B	35	G		41	47	67	50	38	G	G	30	38	39	37	G	G	B	B	B
9	G	B	B	G	B	B	B	29	32	35	38	B	G	G	G	G	27	30	38	38	G	G	G	G
10	37	32	B	G	G	G	B	32	28	30	G	G	38		G	37	36	42	42	39	G	58		35
11	B	B	B	B	B	B	B	33	42	G	G	41	G	G	G	G	G	29	35	28	G	B	31	
12	29	39	38	G	27	B	28	36	27	39	77	64		G	72	G	31	71		G	35		30	G
13	35	32	29	G	G	B	G	31	28	30	B	G	40	66	42	97	84		76		73	32	36	B
14	B	B	G	35	B	B		38	38	62	G		60	G	G	G	G	G	42	36	29	47	33	41
15	33	36	25	G	29	G	G		29	37	B	55	29		63			107	63	77	84	61	G	B
16	38	G	G	G	G	B	B	92	64		105		74	G	60	G	53	94			74	58	27	B
17	G	G	30	G	G																			
18						C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22																						G	G	G
23	G	G	C	32	G	G	G	33	27	36	43	B	B	60	C	80	66	78	34	88	29	G	G	35
24	31	G	28	30	25	G	G		55	60	64	65	61	88			88	77		58	86	60	67	61
25		36	38			38	30	28		51	51	60		92	78	95	81	52	70		38	46	46	37
26	36	B	34	G	27	B	B	32	30	N	G	G	56	G	86	G	36	28	30	28	30		31	35
27	G	31	G	G	G	B	B	45	35	39	41	44	B	B	G	56	61	71				38	26	G
28	G	G	G	G	27	B	G	G	B	B	B	B	B	B	B	B	35	38	34		26	G	34	29
29	G	G	G	G	G	B	G	28		38	31	G	59	G	56	39	65	38	35	41	28	G	G	G
30	B	G	G	40	31	G	B	38		G	35	30	G	G	G	G	39	41	32	G	33	33	B	B
31	G		G	G	G	26	25	29	32	39	78	65	73	G	G	74	40	41	36	27	33	30	B	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	21	21	21	24	19	12	17	21	19	22	21	18	19	20	22	22	24	24	20	16	23	20	22	20
MED	31	26	25	G	G	G	G	33	36	39	43	47	56	18	41	38	43	42	38	36	33	32	30	35
U Q	36	34	35	31	27	34	29	38	55	50	67	64	64	53	60	56	65	71	44	40	50	46	34	37
L Q	G	G	G	G	G	G	G	29	29	35	33	30	38	G	G	G	35	38	35	27	28	12	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT OKINAWA

AUG. 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	14	15	15	18	14	14	14	14	15	16	18	22	22		27	32	18	14	14	14	14	15	14	15
2	15	15	15	14	14	14	14	14	14	15	18	20	28	21	20	17	17	14	14	14	15	14	14	15
3	15	15	15	16	15	15	16	14	14	15	18	18	B	23	20	17	15	14	14	14	15	14	15	15
4	15	15	15	14	14	14	15	15	14	16	17	21	27	24	30		16	14	14	14	14	14	15	15
5	15	15	15	18	B	B	15	14	15	17	20		24	26	23	20	20	14	14		15	15	15	15
6	15	14	14	14		15	14	14	15	16	18		24	28	23	24	18	15	14	14	14	14	17	14
7	15	14	14	15	15	B	16	16	14	17	20	16	15		17	23	17	15	14	15	16	17	17	16
8	17	20	17	18	B	15			16	23	30	30	28		50	51		15	14	15		B	B	B
9	23	B	B	18	B	B	B	17	15		47	B	49	50	50	49	20	16	15	15		27	17	18
10	15	18	B	20	16	15	B	14	16		50	50			50		18	20	15	15	16	15	17	16
11	B	B	B	B	B	B	B	15	18	50	50			50	49	50	50		16	15		B	21	21
12	18	16	16	20	23	B	18	16	18		21		49	56	46	52	23	22	17	15	18	16	17	21
13	16	14	16	22	21	B		15	18	21	B			32	32	29	21	17	15	14	16	16	16	B
14	B	B		17	B	B	21	15	18	20			32		50	50	46	47		15	16	15	17	17
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16	16		20			B	B	14	18	23	23	32	33		44		18	17	15	15	16	16	15	B
17	20	20	18	17	18																			
18						C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22																						18	29	20
23	18	C	17	15	18	18	C	15	14	17	17	B	B	40	35	22	20	16	15	14	23	20	20	15
24	22	18	17	21	20			14	15	20	21		35	36			20	16		14	18	16	17	17
25	14	15	15	16	16	14	17	14	15		22	36	44	46		30	20	18	14	15	20	17	17	20
26	16	B	15	18	15	B	B	15	16	21		50	51		46	51	22	18	15	14	18	15	15	15
27	22	16	22	16	17	B	B	24	33				B	B	50	26	21	17		14	17	16	16	
28	17		21	18	16	B		16	B	B	B	B	B	B	B	B	20	17	15		16		16	15
29	20	22		20	20	B	66	15	18	22		52	44	50		51		20	15	14	17	21	66	71
30	B	18	18	18	17	17	B	17			50	50	52	52	52	49	21	18	14	14	16	15	B	B
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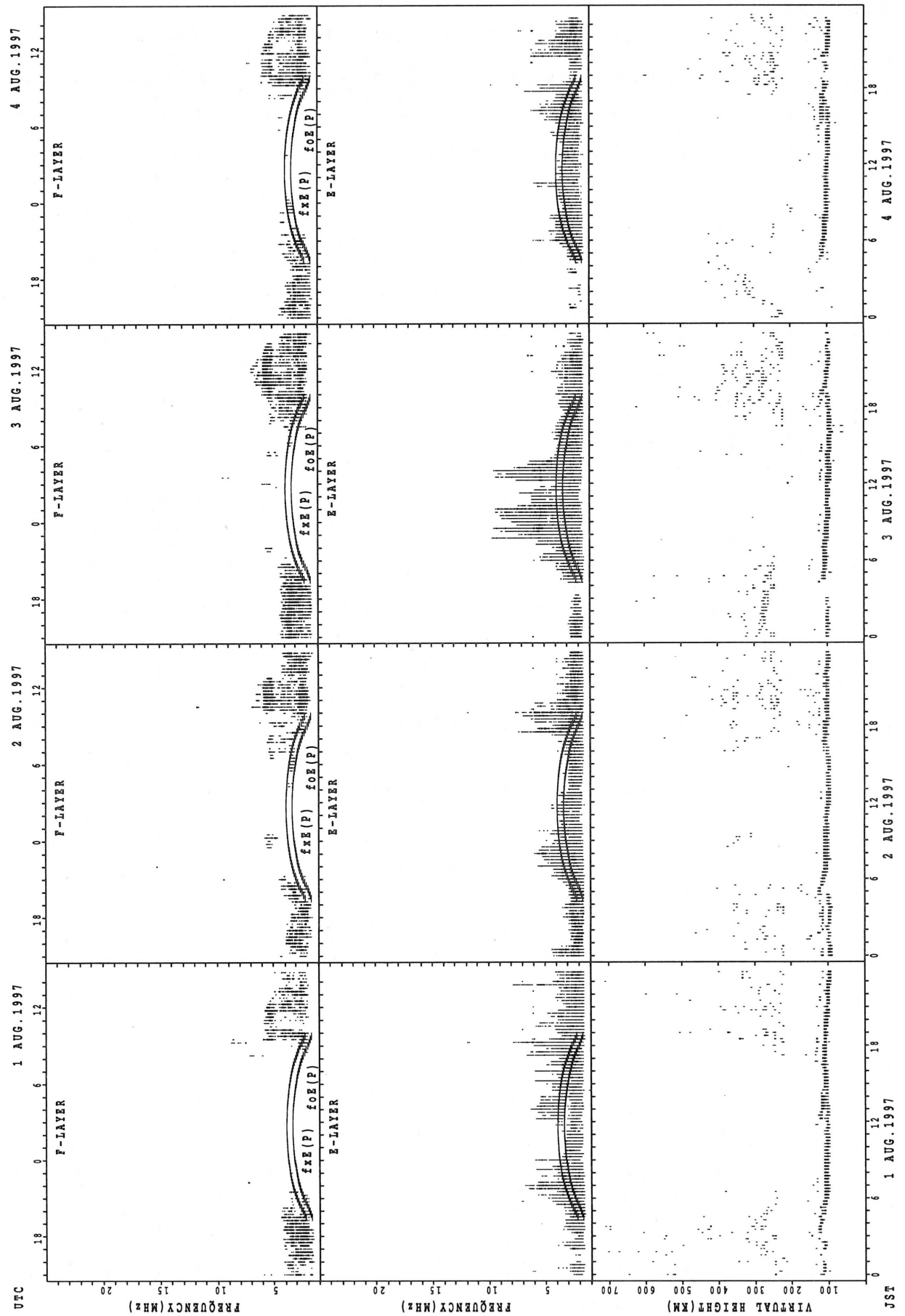
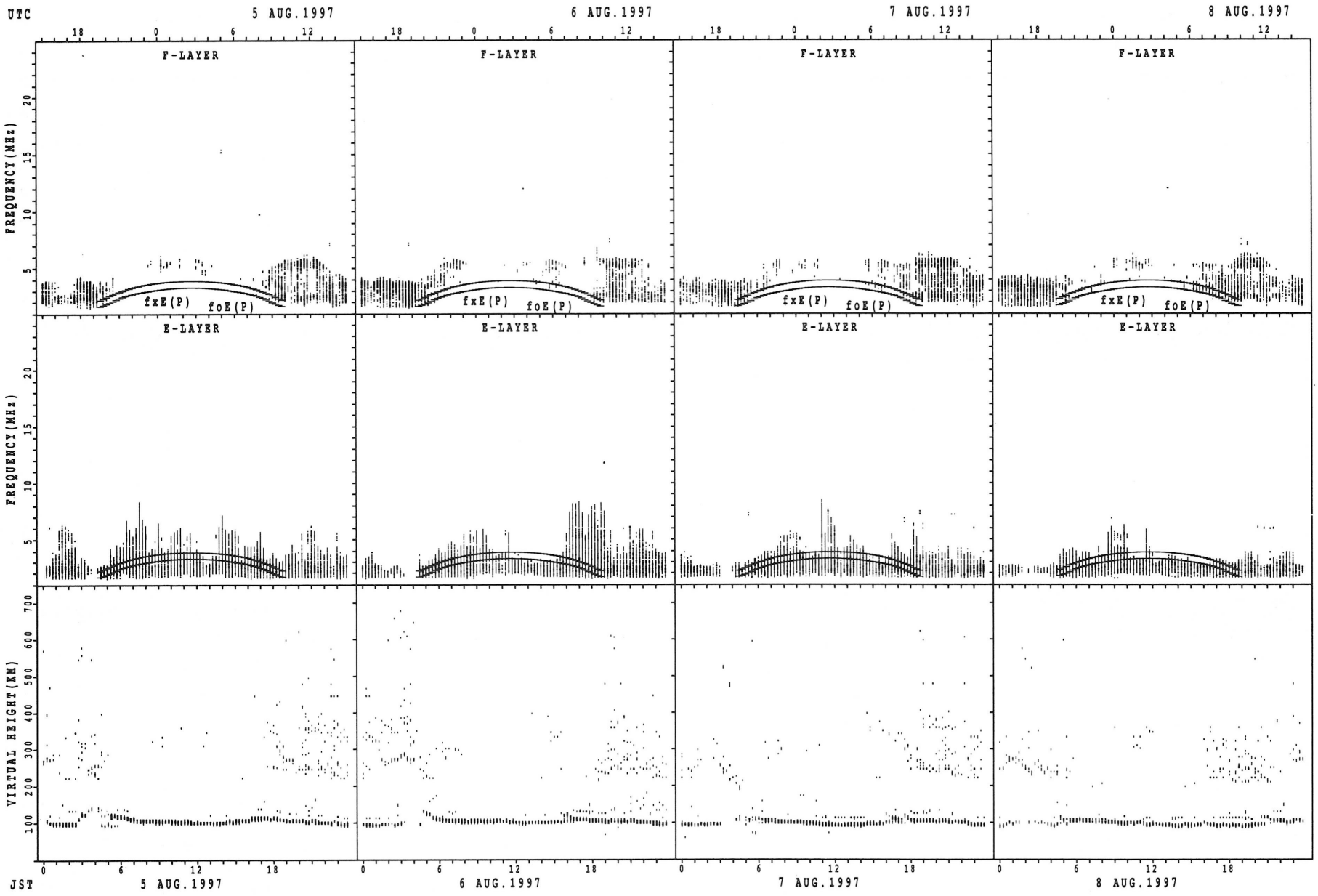
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	18	21	24	19	11	12	24	23	16	18	14	16	16	21	20	23	24	22	23	22	23	23	19
MED	16	16	16	18	16	15	16	15	15	18	21	31	32	43	44	31	20	16	14	14	16	16	17	16
U Q	18	18	18	19	20	16	19	16	18	21	32	50	46	50	50	50	21	18	15	15	18	17	17	20
L Q	15	15	15	16	15	14	14	14	15	16	18	21	25	27	25	22	18	14	14	14	15	15	15	15

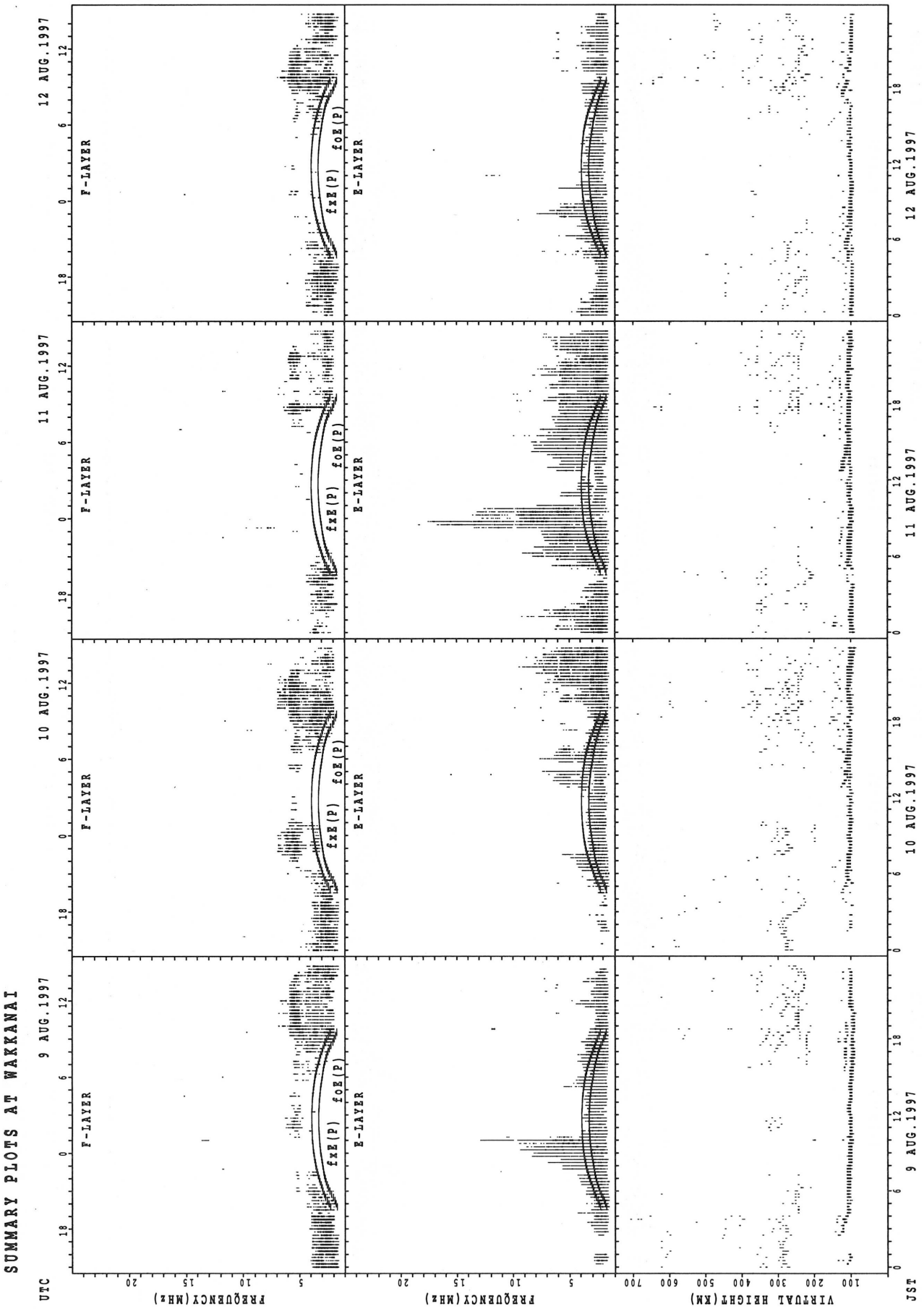
COMMUNICATIONS RESEARCH LABORATORY, JAPAN


SUMMARY PLOTS AT WAKKANAI
UTC
JST
1 AUG.1997
2 AUG.1997
3 AUG.1997
4 AUG.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

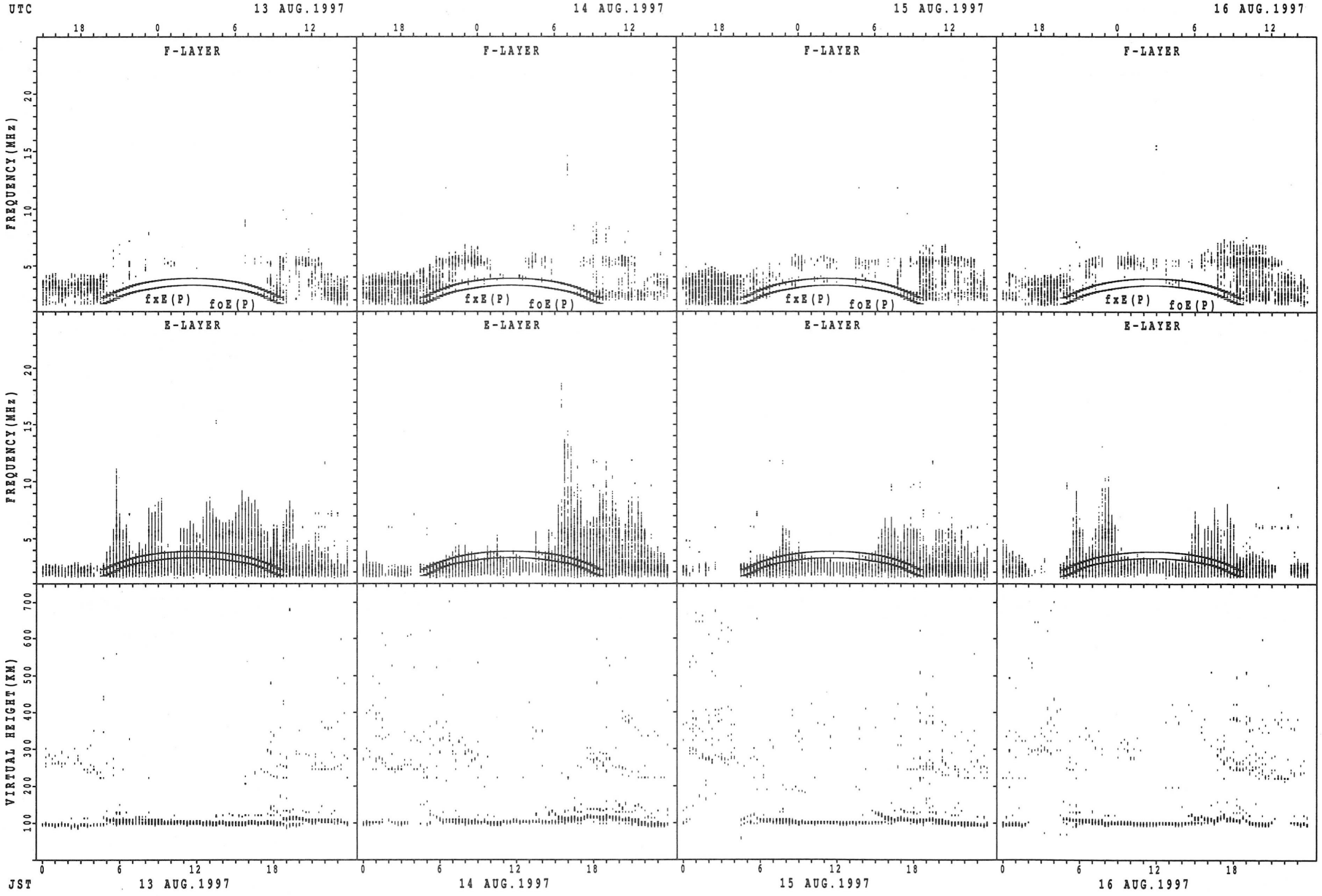
SUMMARY PLOTS AT WAKKANAI



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


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



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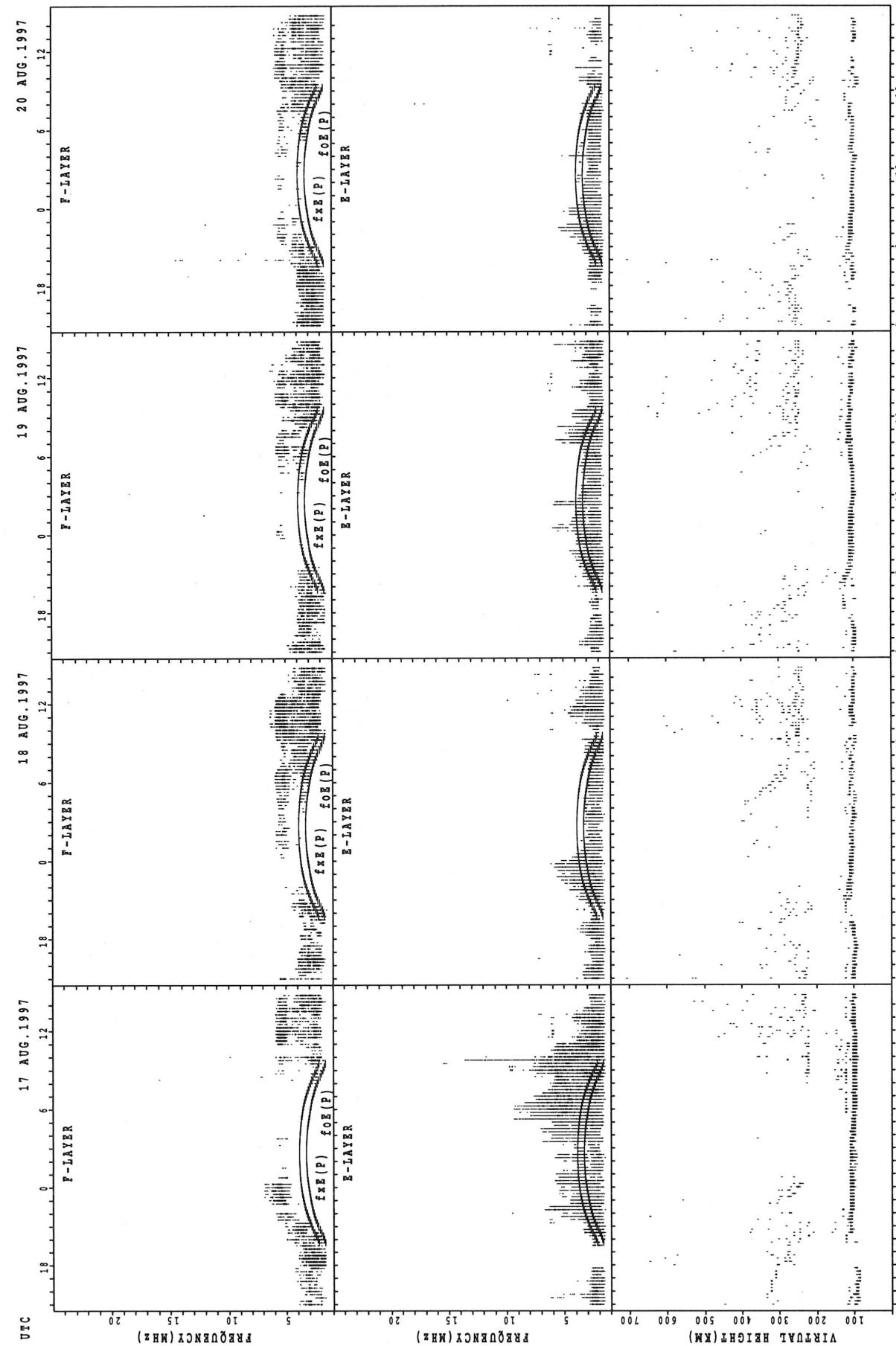
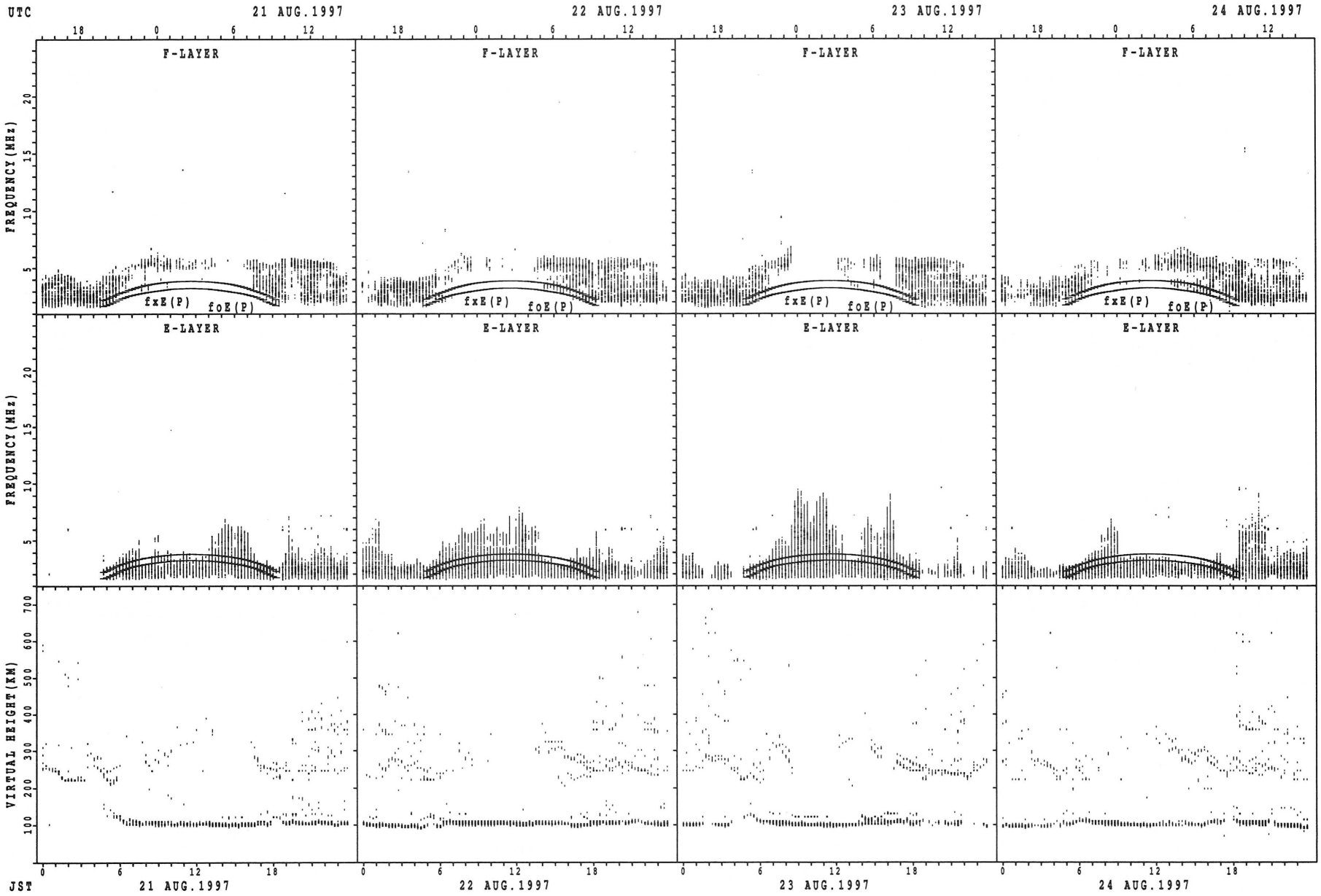
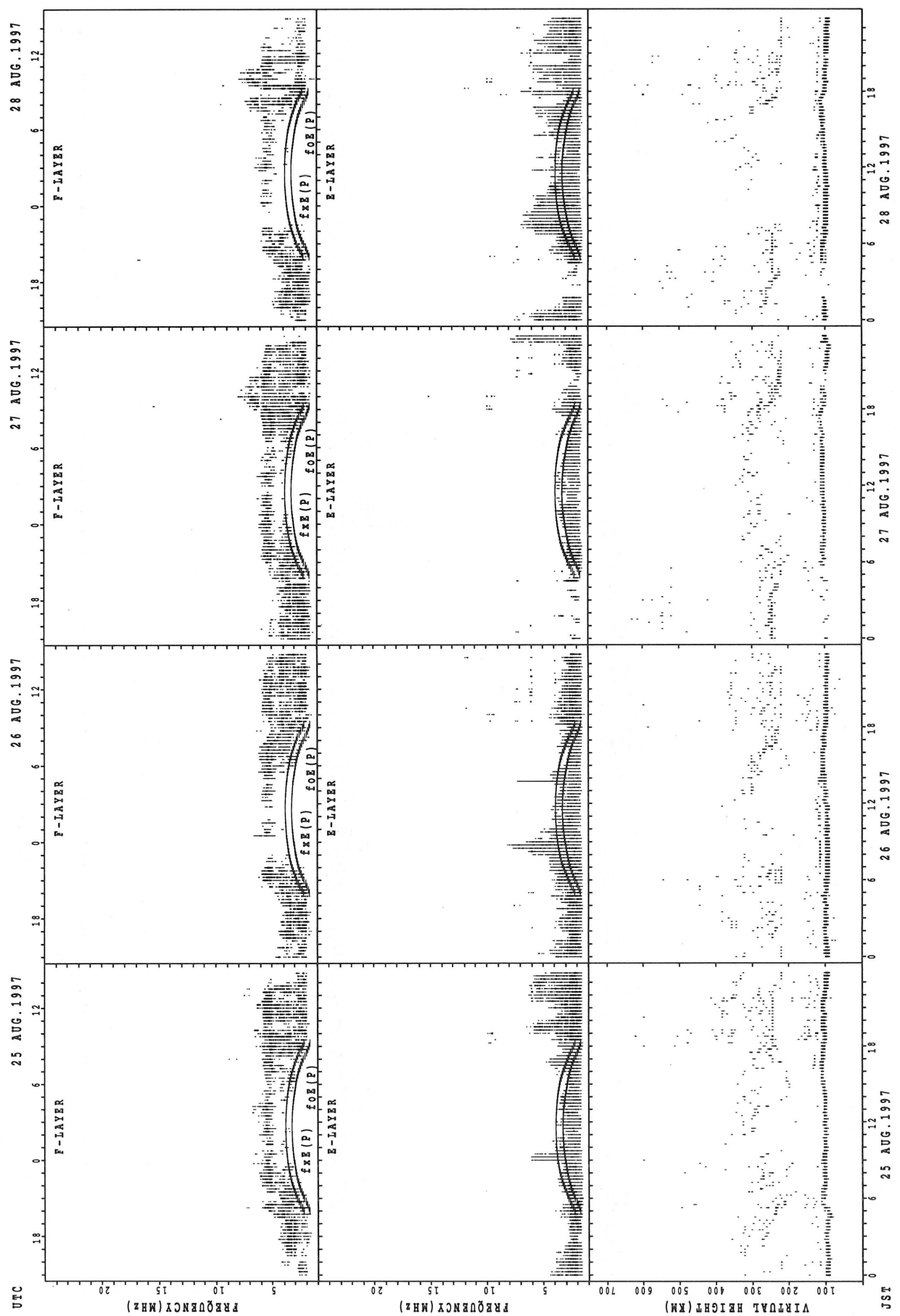
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
17 AUG.1997
18 AUG.1997
19 AUG.1997
20 AUG.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

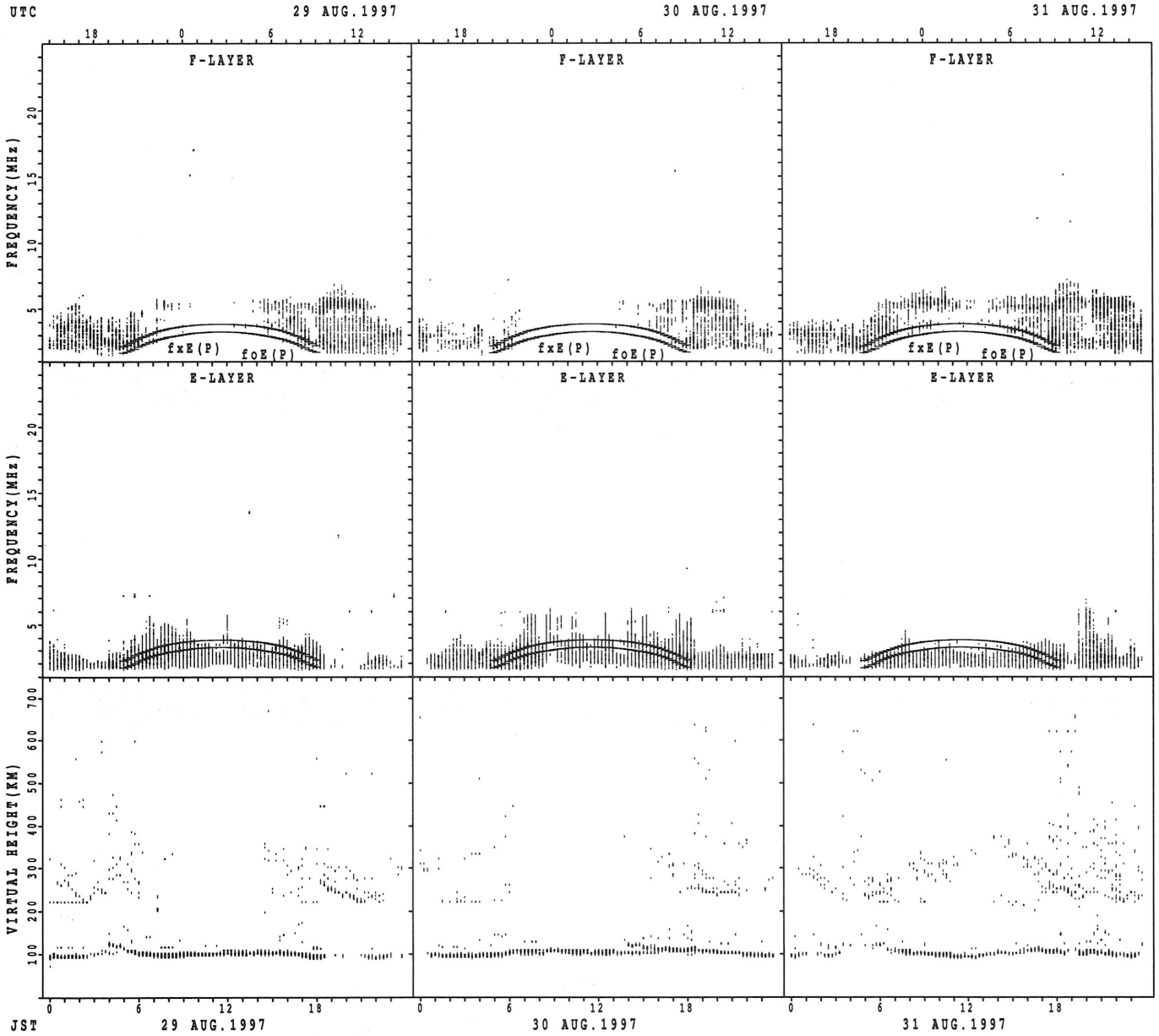
SUMMARY PLOTS AT WAKKANAI



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

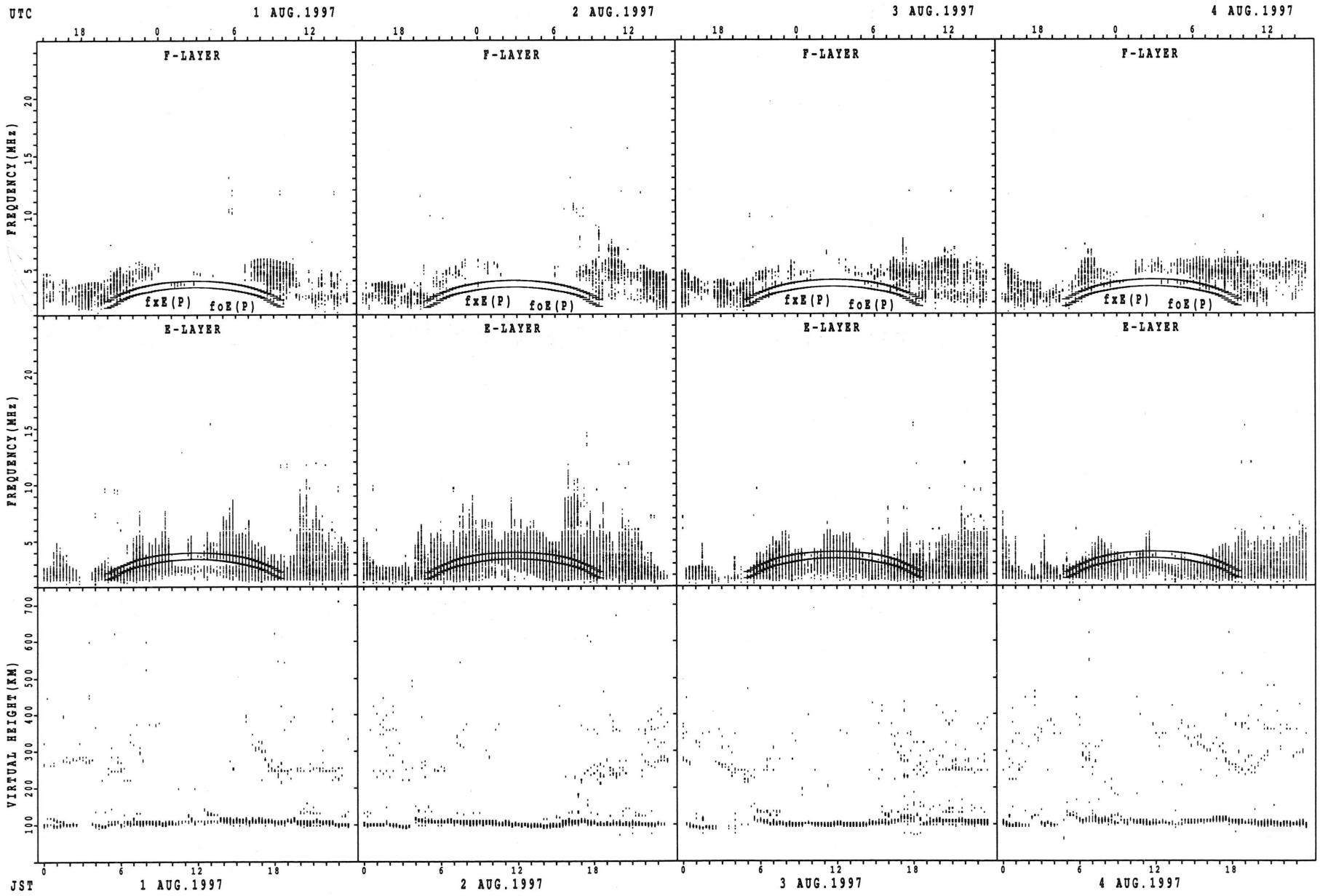

SUMMARY PLOTS AT WAKKANAI
UTC
JST
25 AUG.1997
26 AUG.1997
27 AUG.1997
28 AUG.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



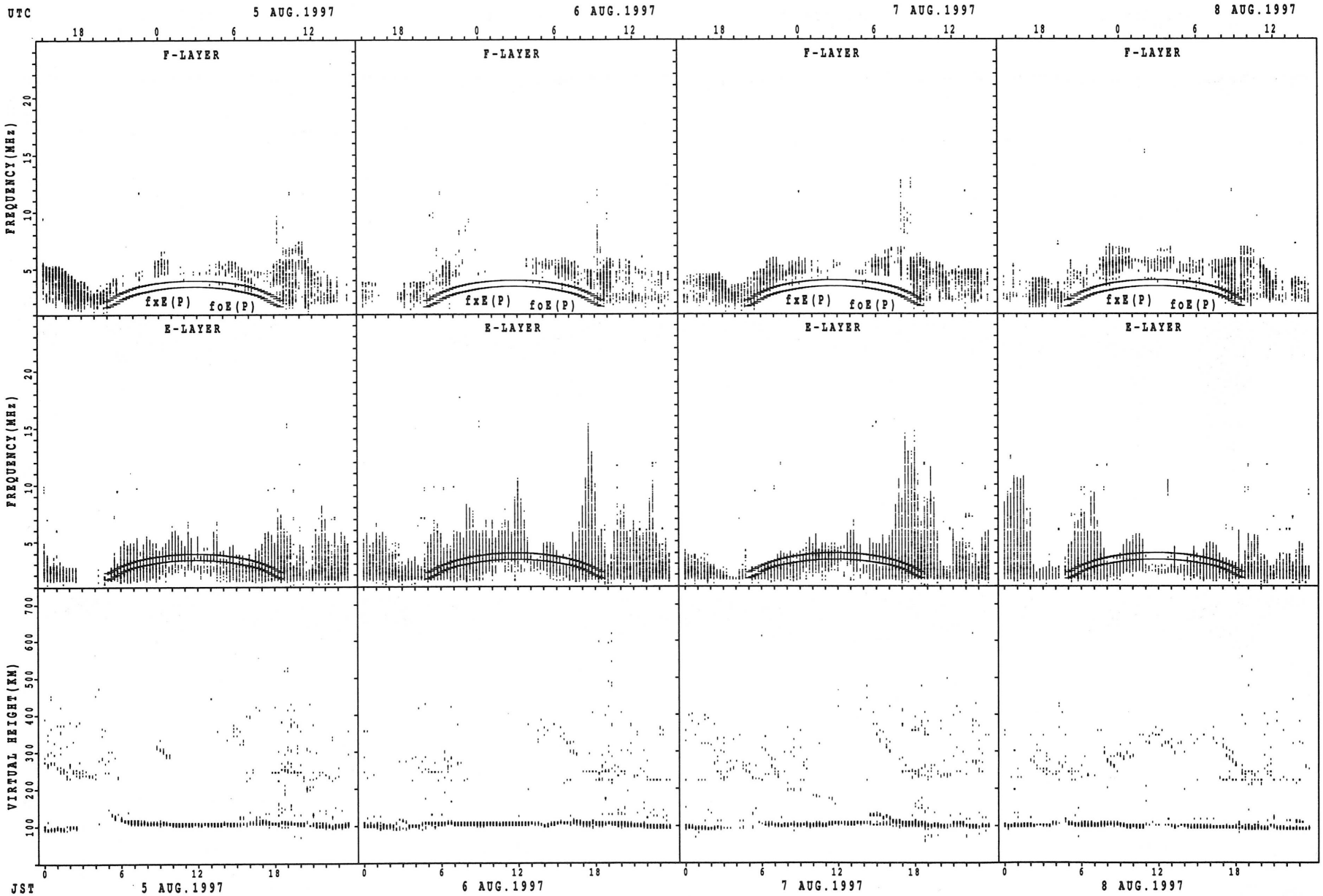
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

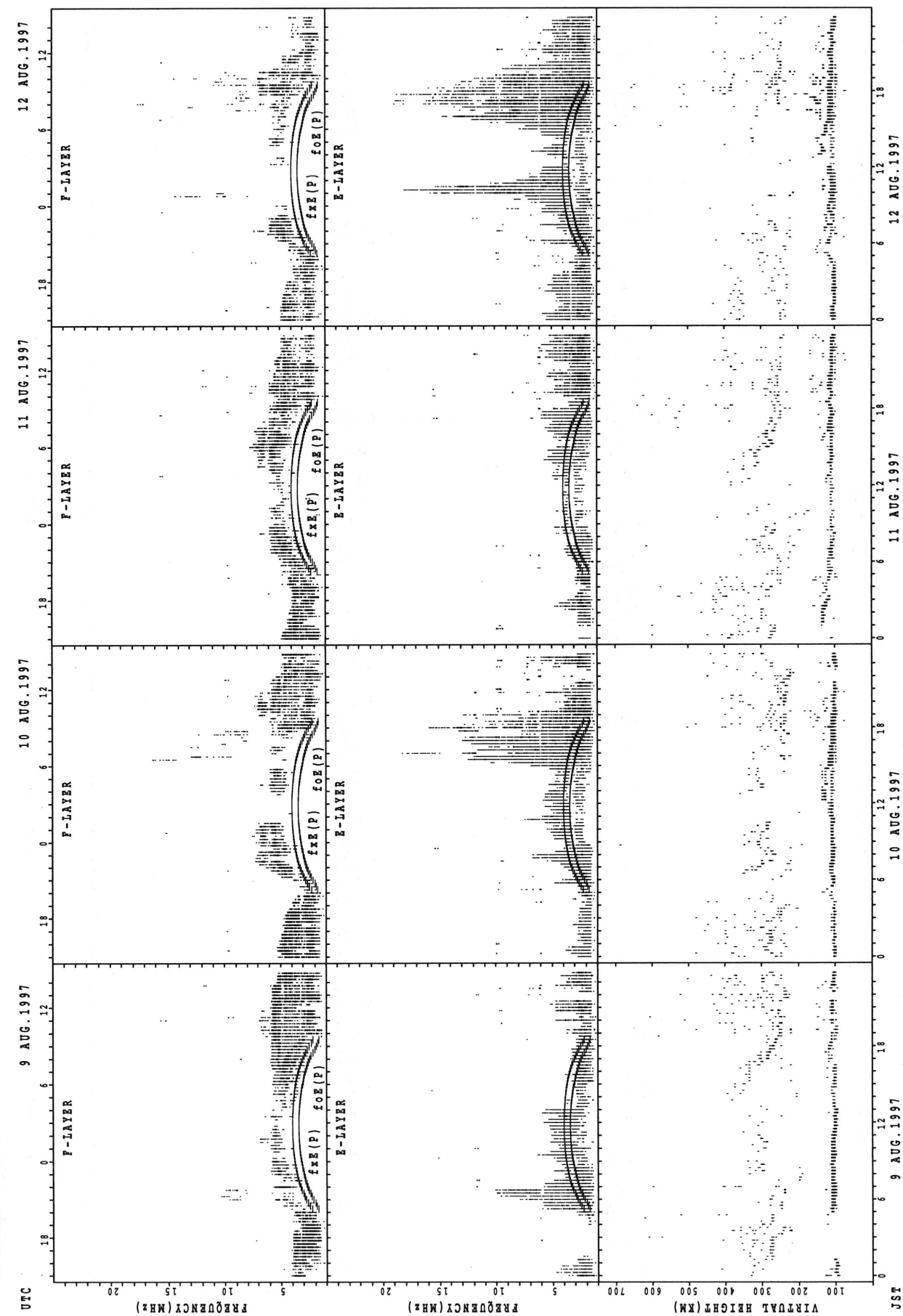


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

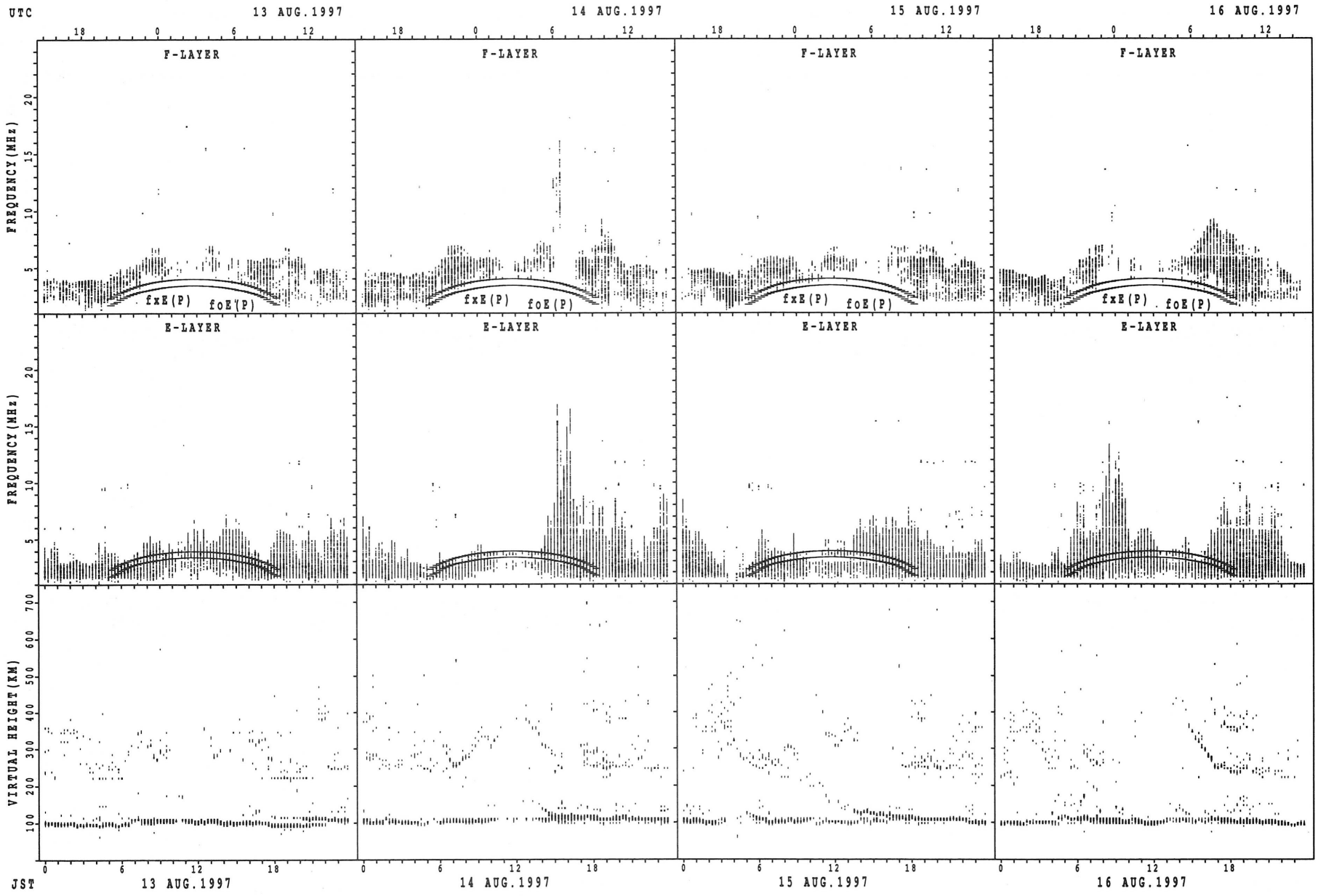
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
9 AUG.1997
10 AUG.1997
11 AUG.1997
12 AUG.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 KOKUBUNJI TOKYO



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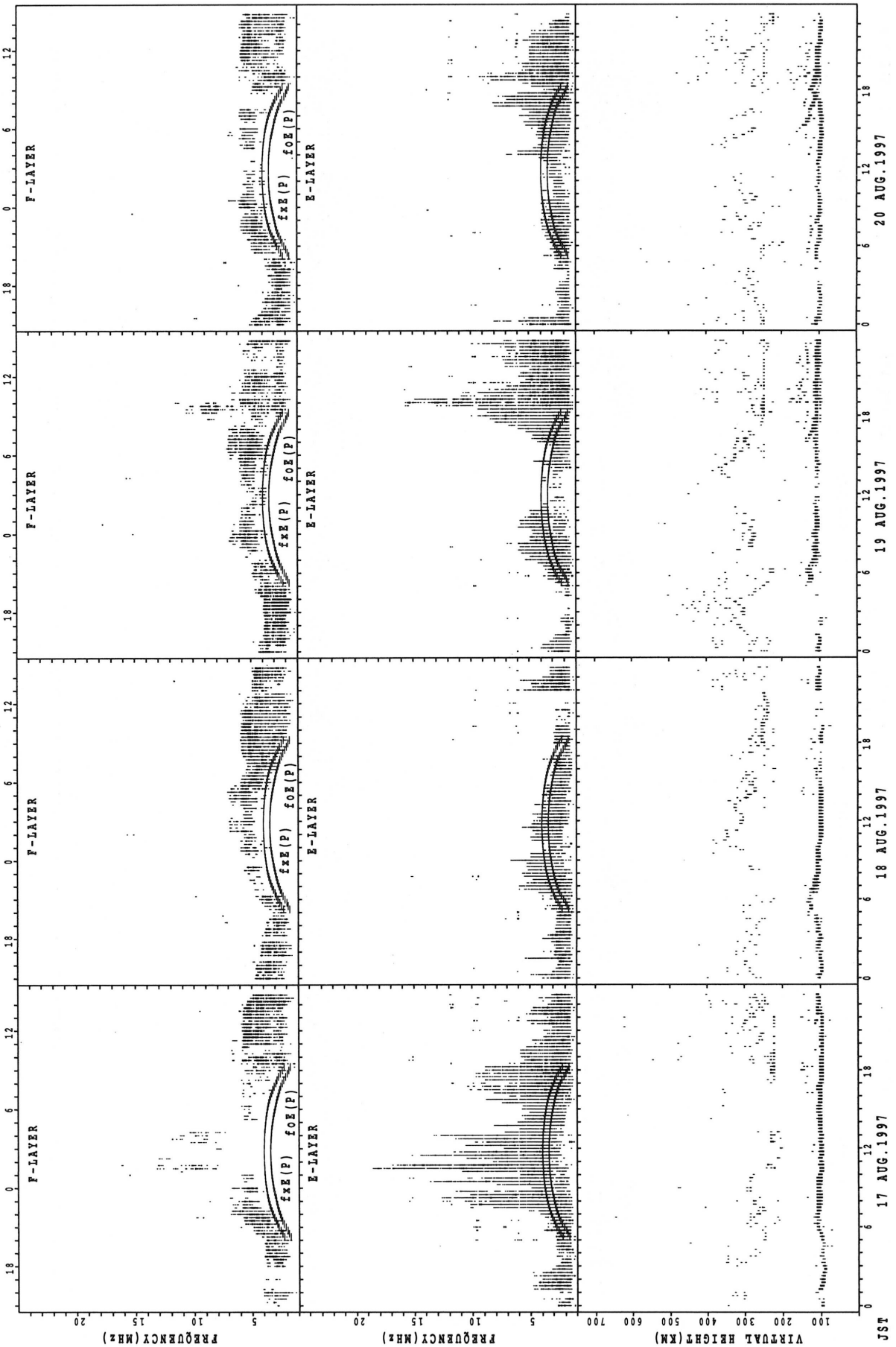
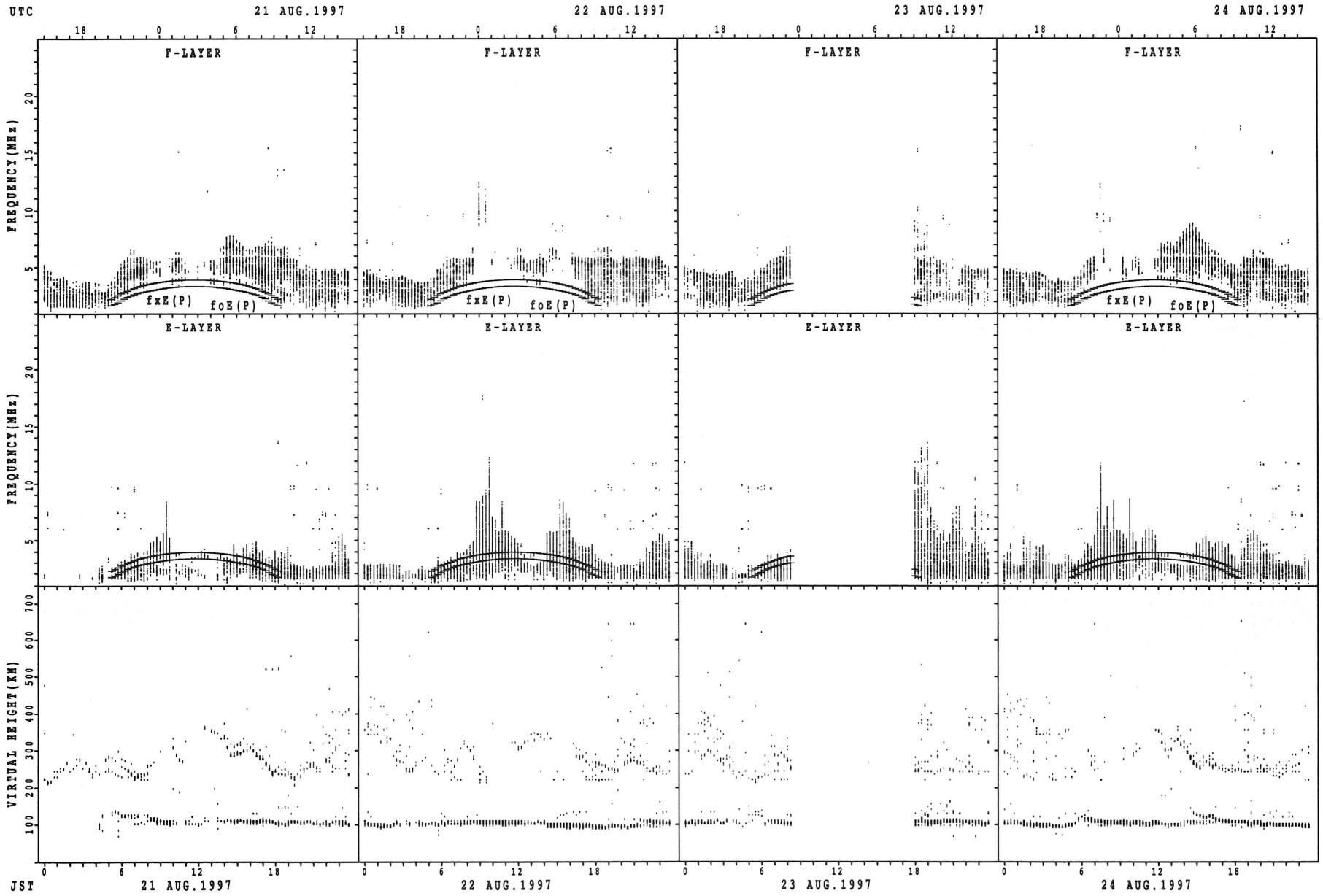
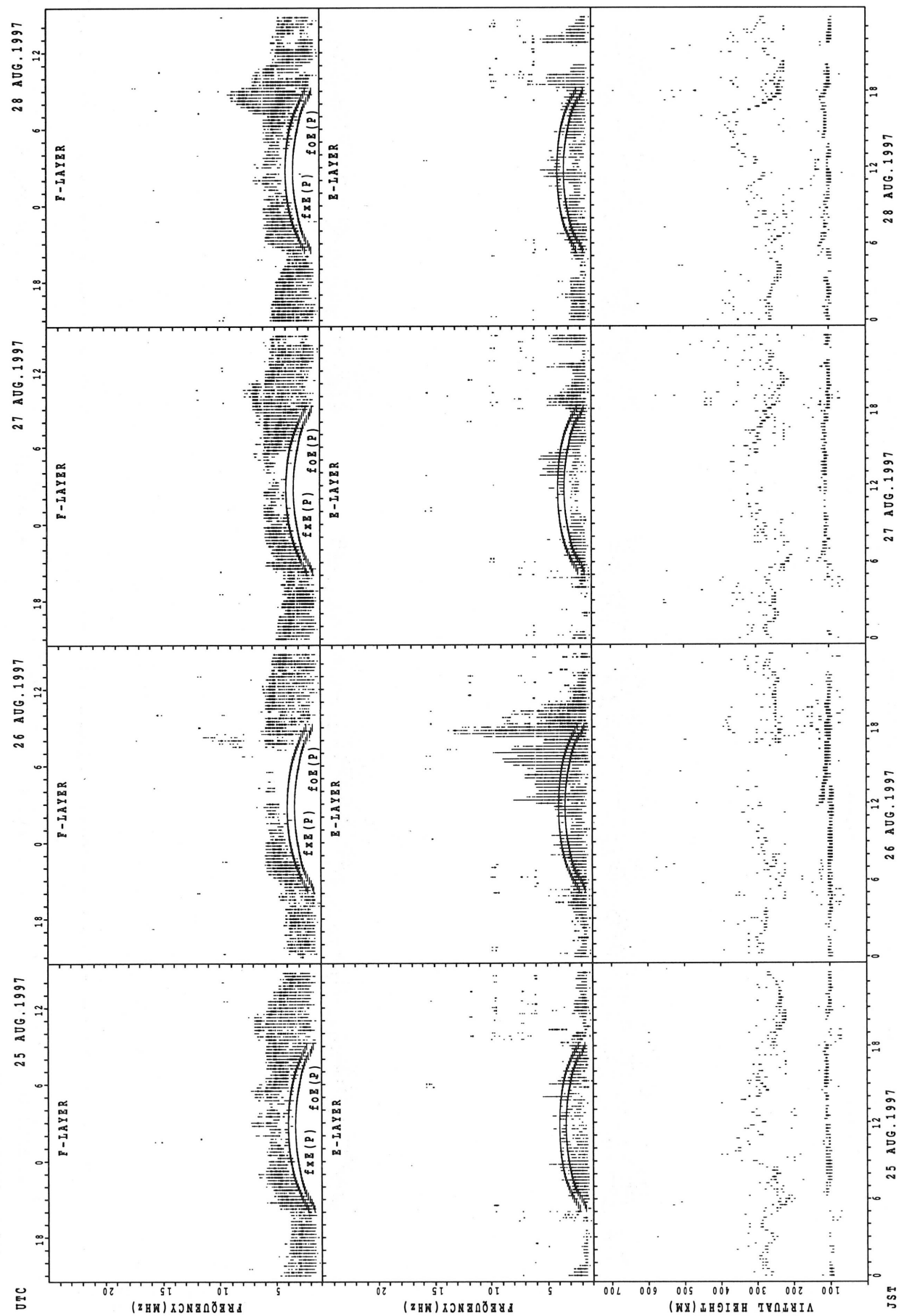
foE(P); PREDICTED VALUE FOR foE

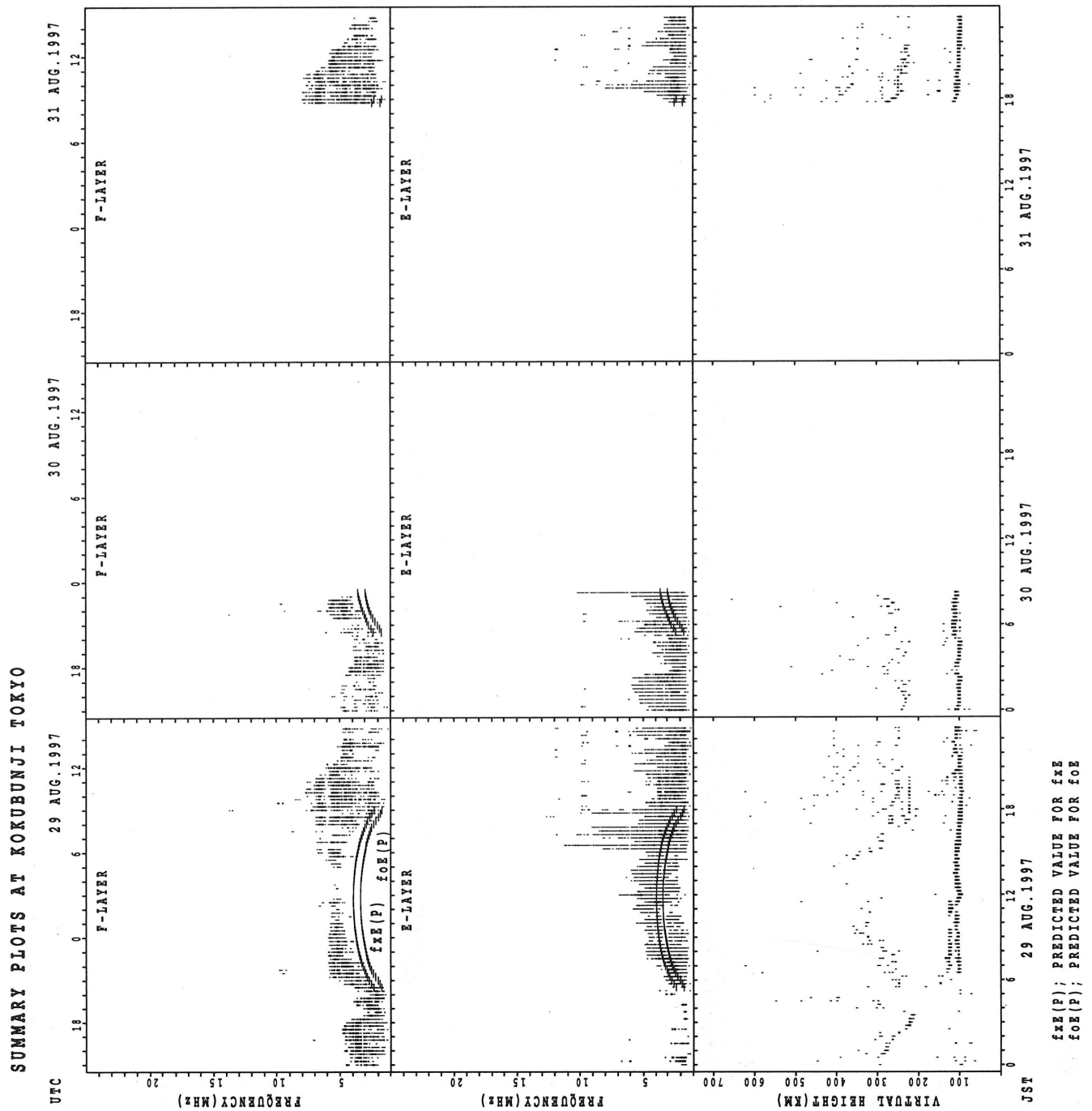

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
17 AUG.1997
18 AUG.1997
19 AUG.1997
20 AUG.1997
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

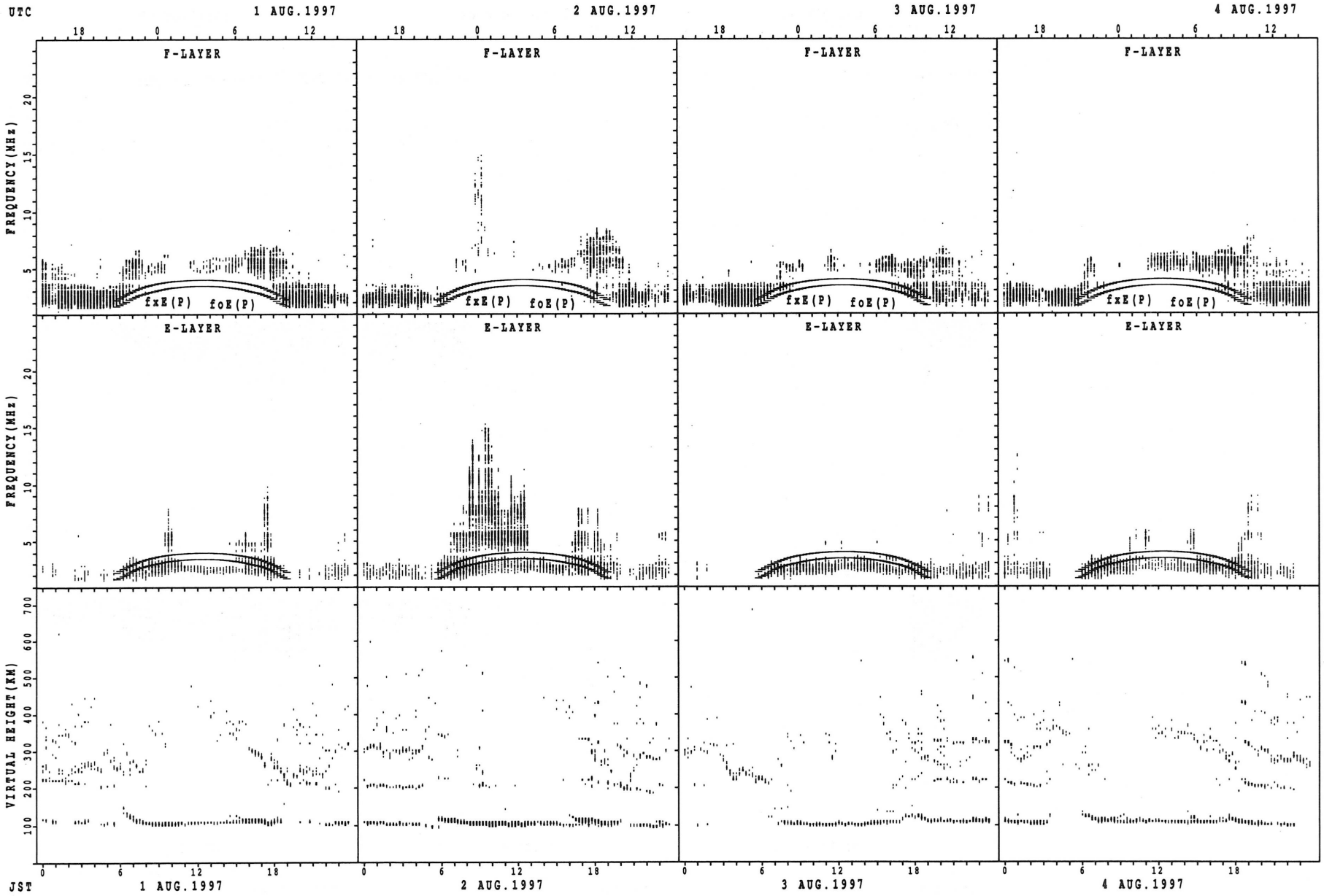


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
25 AUG.1997
26 AUG.1997
27 AUG.1997
28 AUG.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

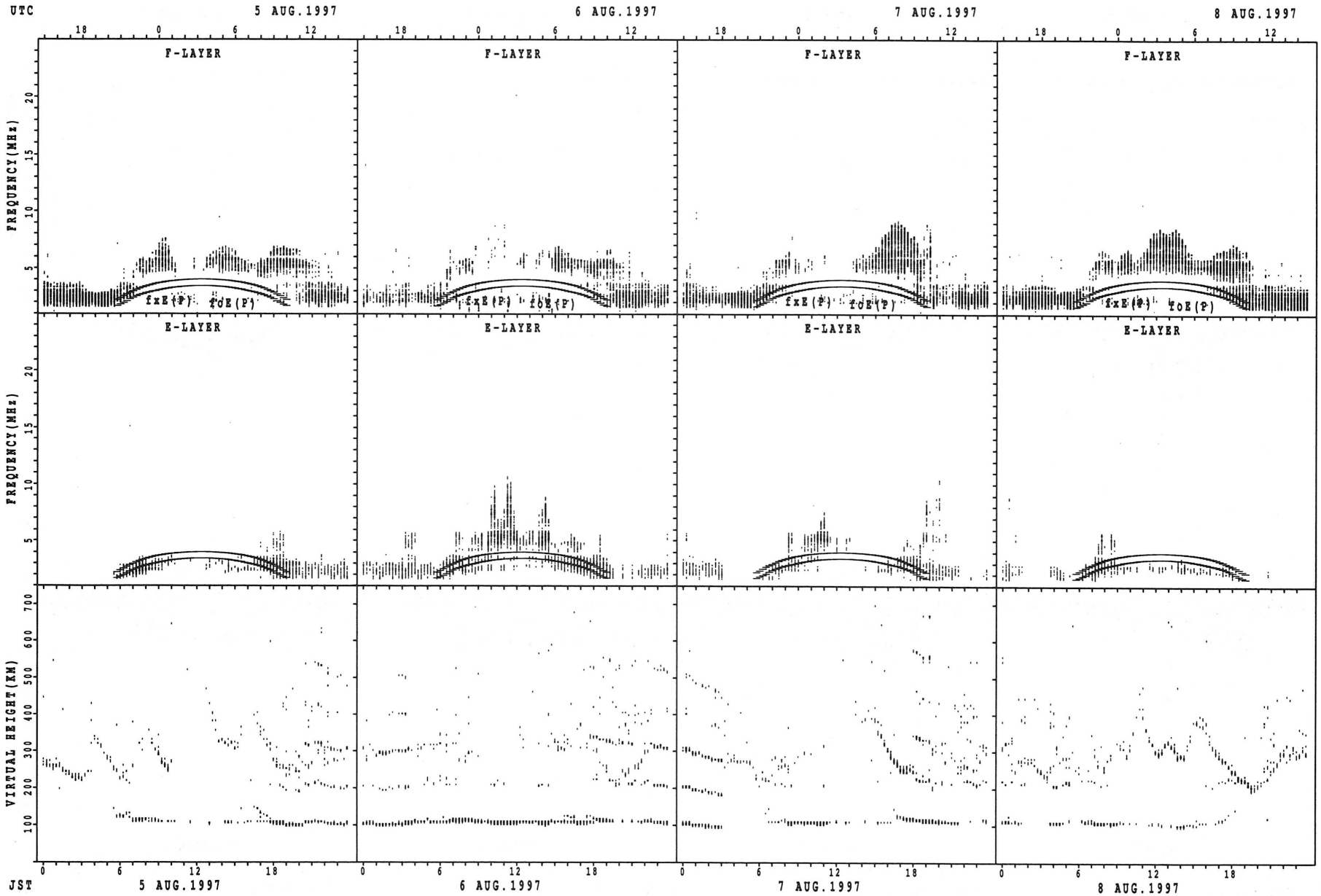

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
29 AUG.1997
30 AUG.1997
31 AUG.1997
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

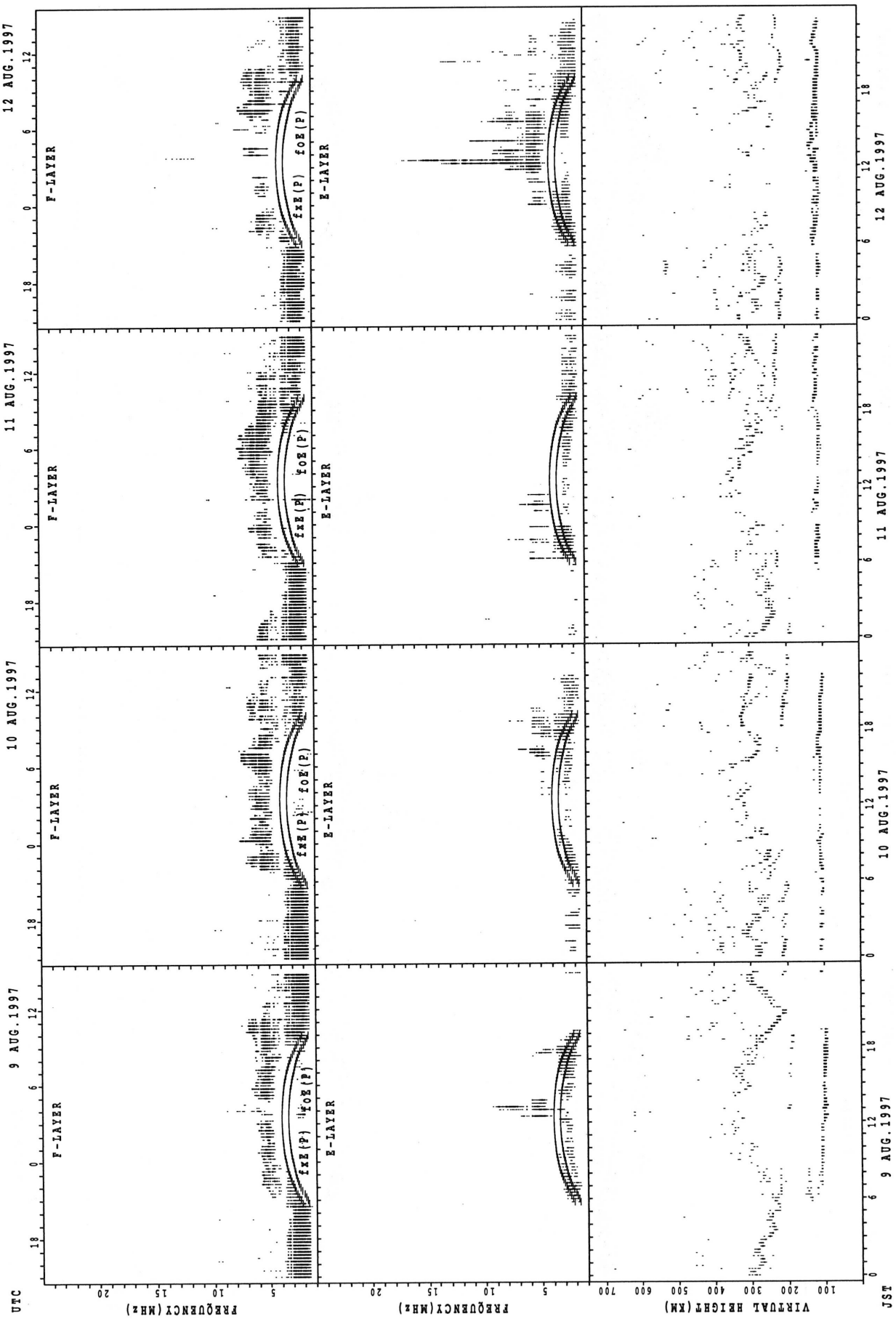


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

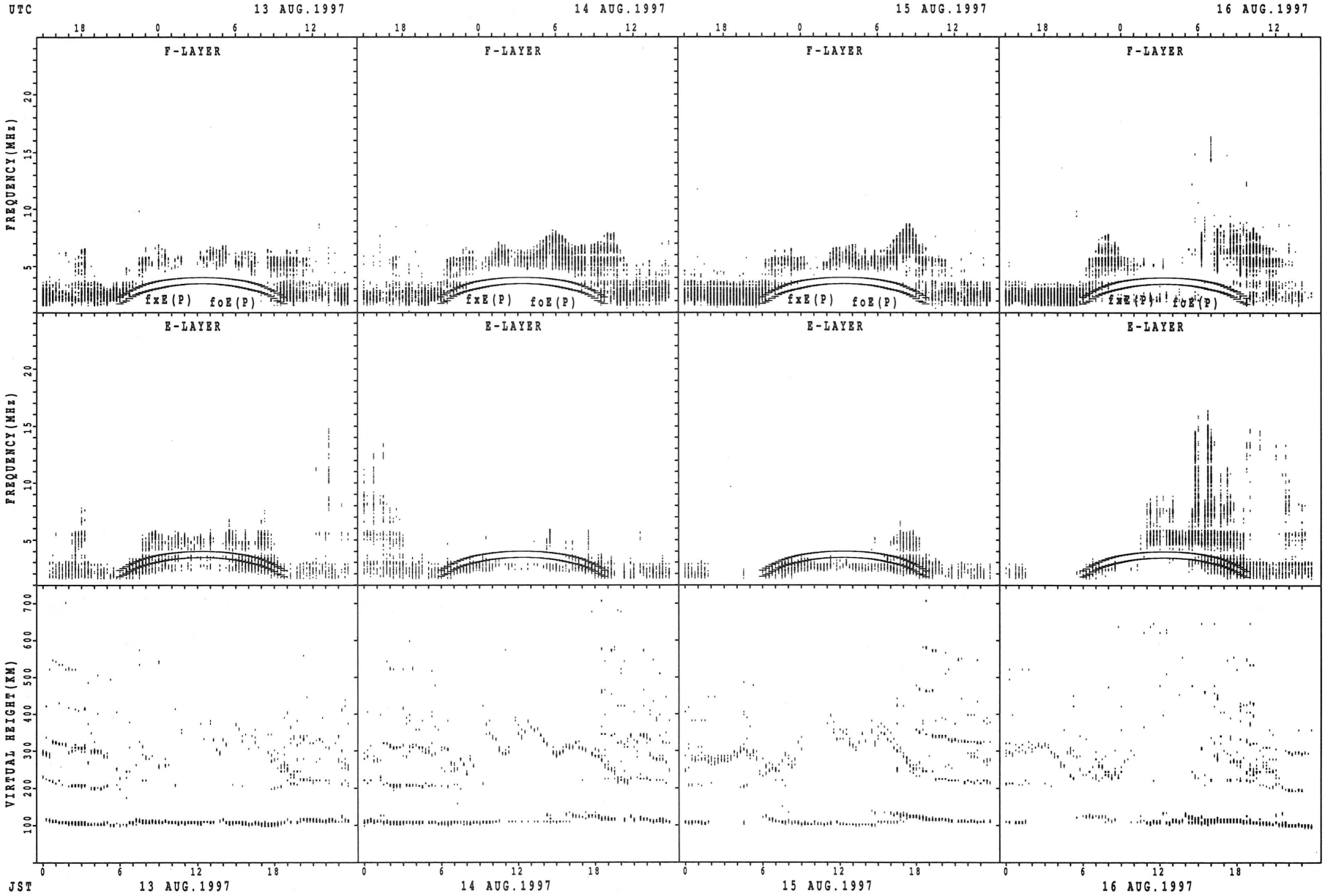
SUMMARY PLOTS AT YAMAGAWA



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


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
9 AUG.1997
10 AUG.1997
11 AUG.1997
12 AUG.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 YAMAGAWA



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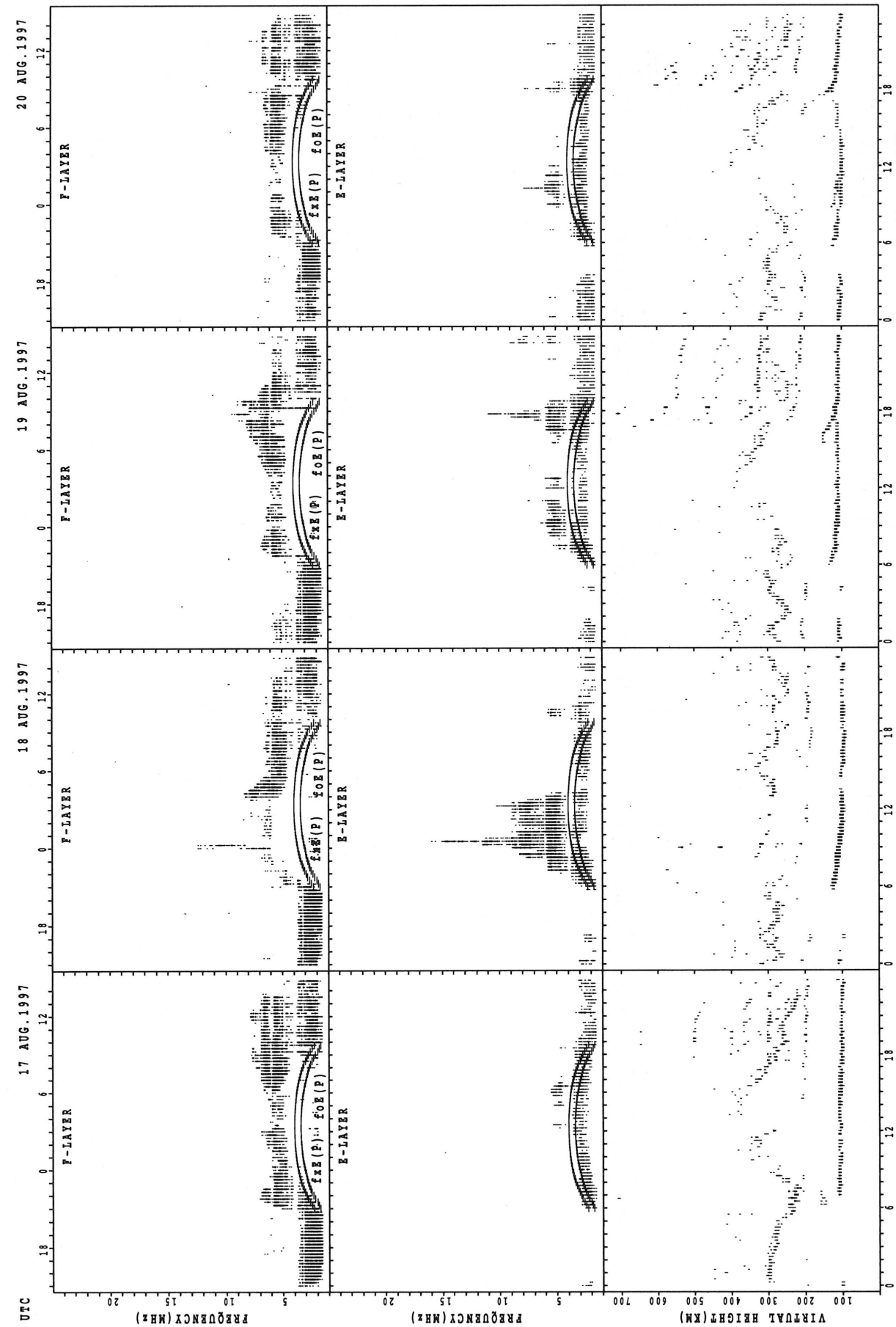
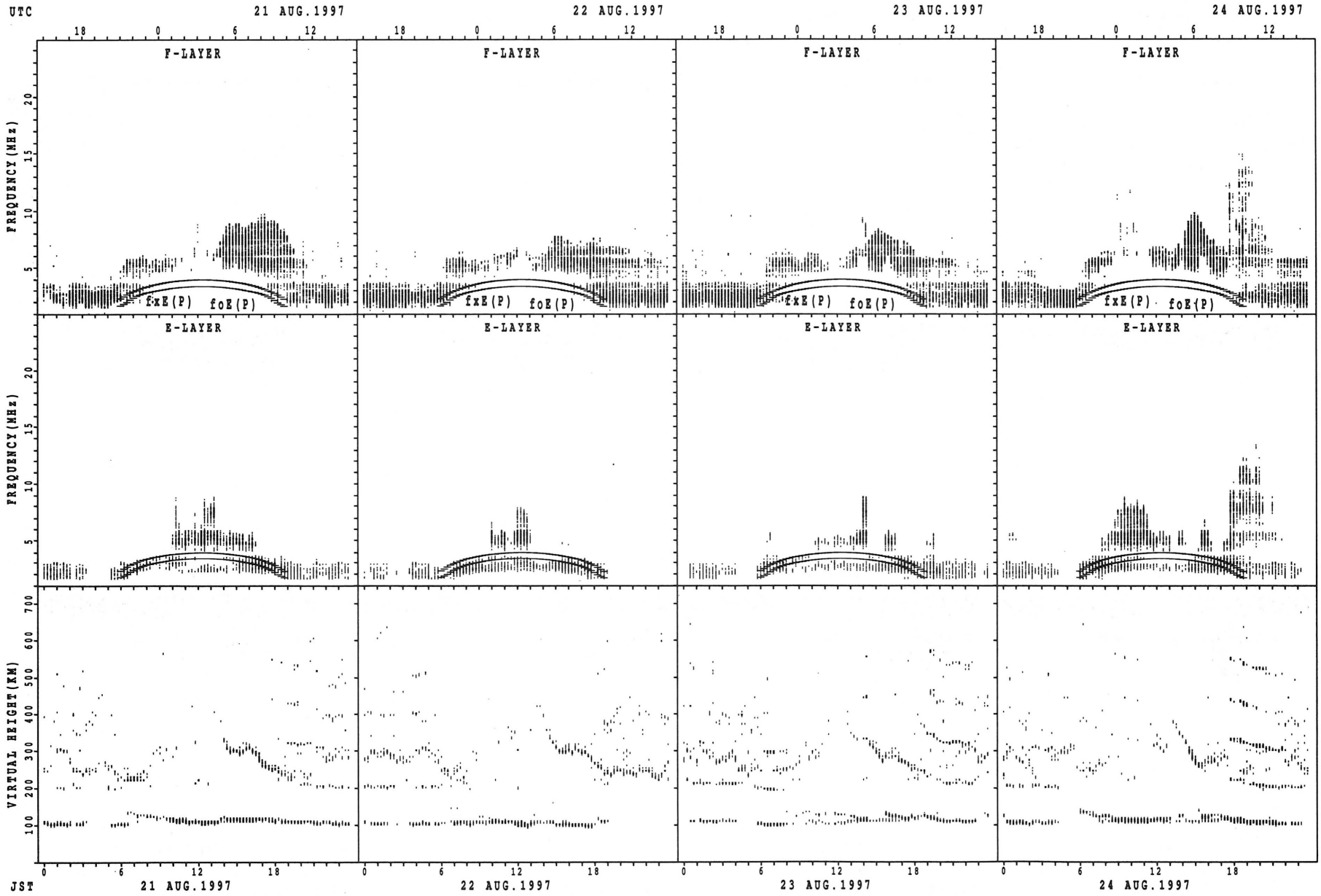
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
17 AUG.1997
18 AUG.1997
19 AUG.1997
20 AUG.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
JST
17 AUG.1997
18 AUG.1997
19 AUG.1997
20 AUG.1997

SUMMARY PLOTS AT YAMAGAWA



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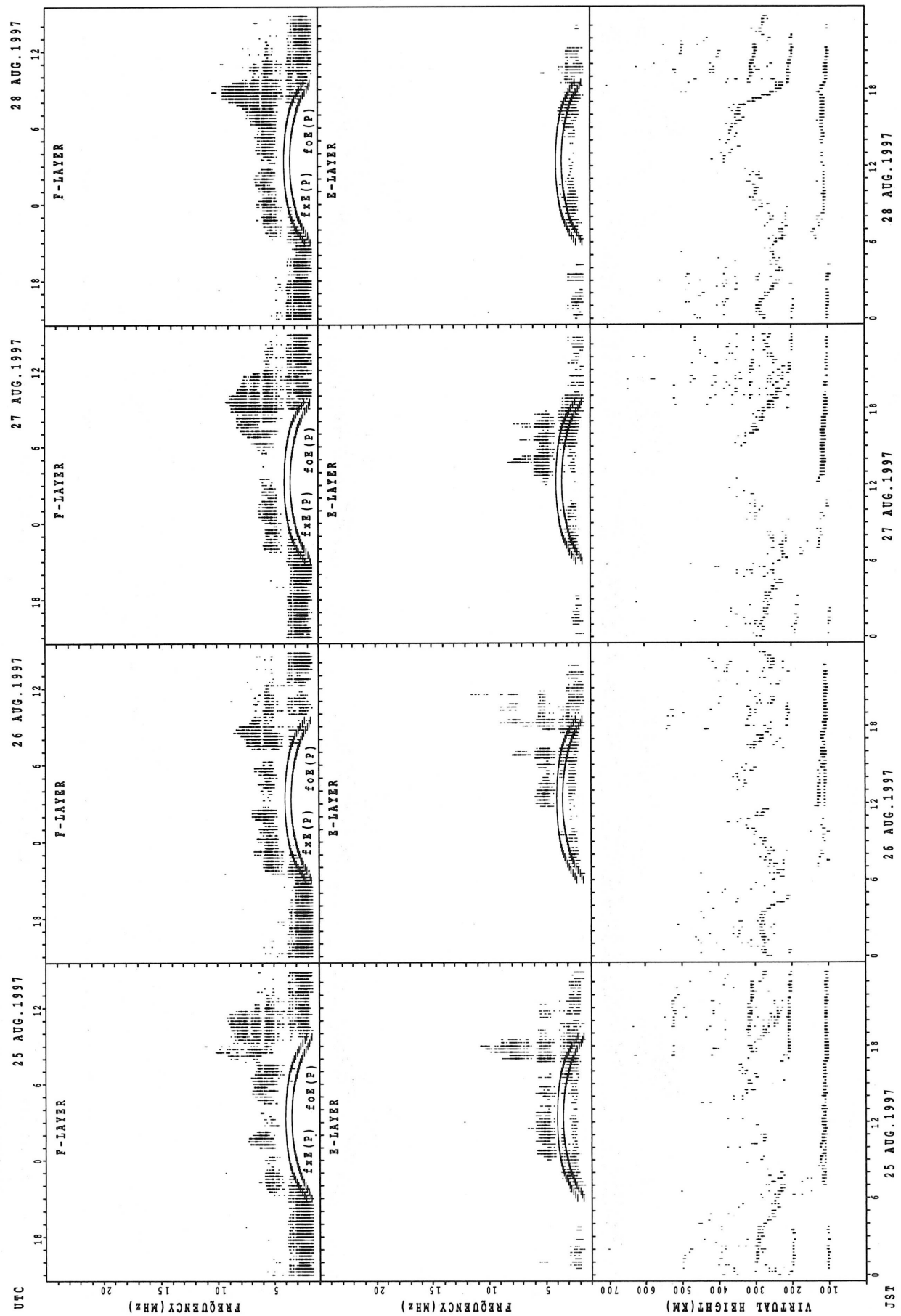
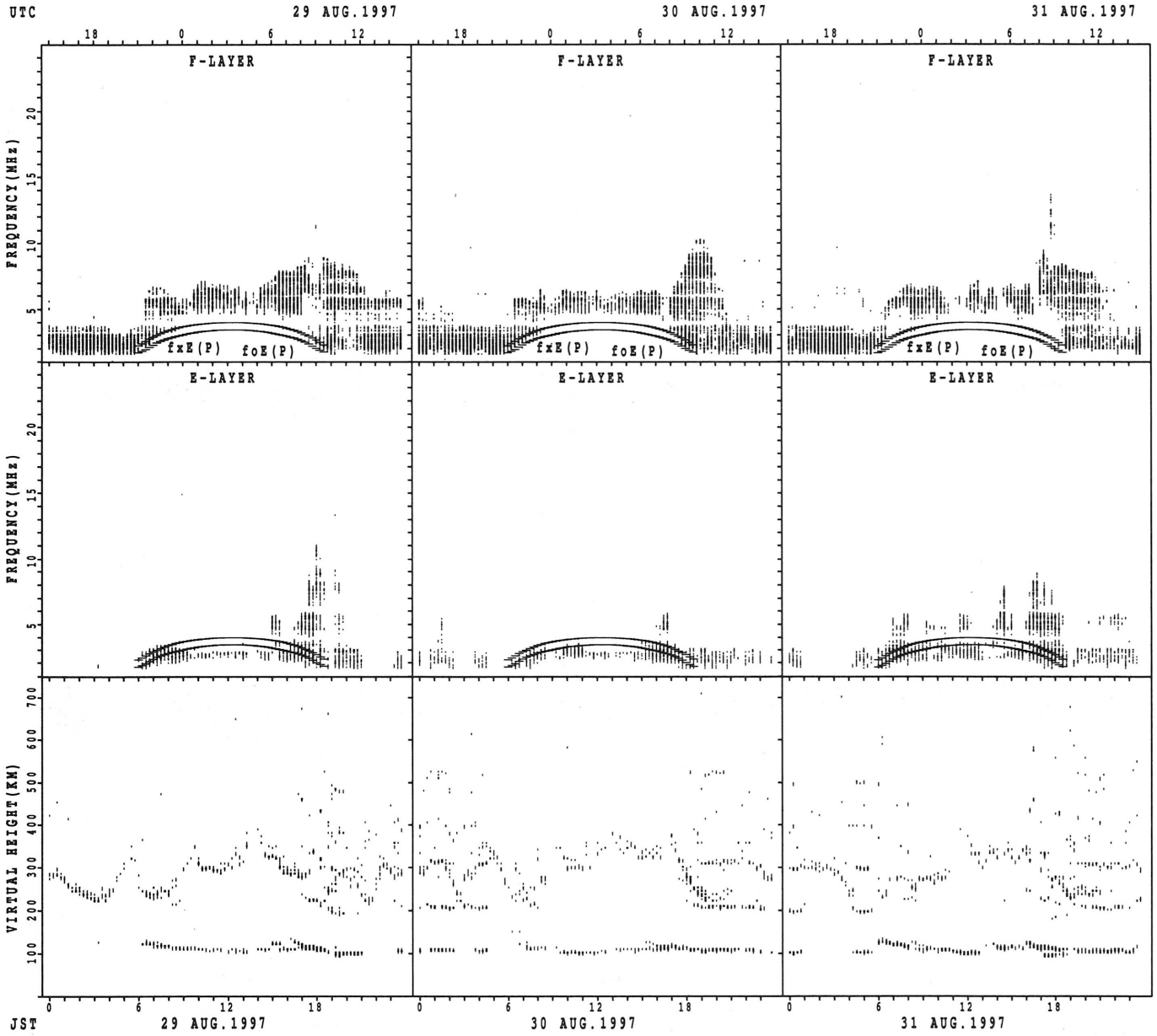
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
25 AUG.1997
26 AUG.1997
27 AUG.1997
28 AUG.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 YAMAGAWA



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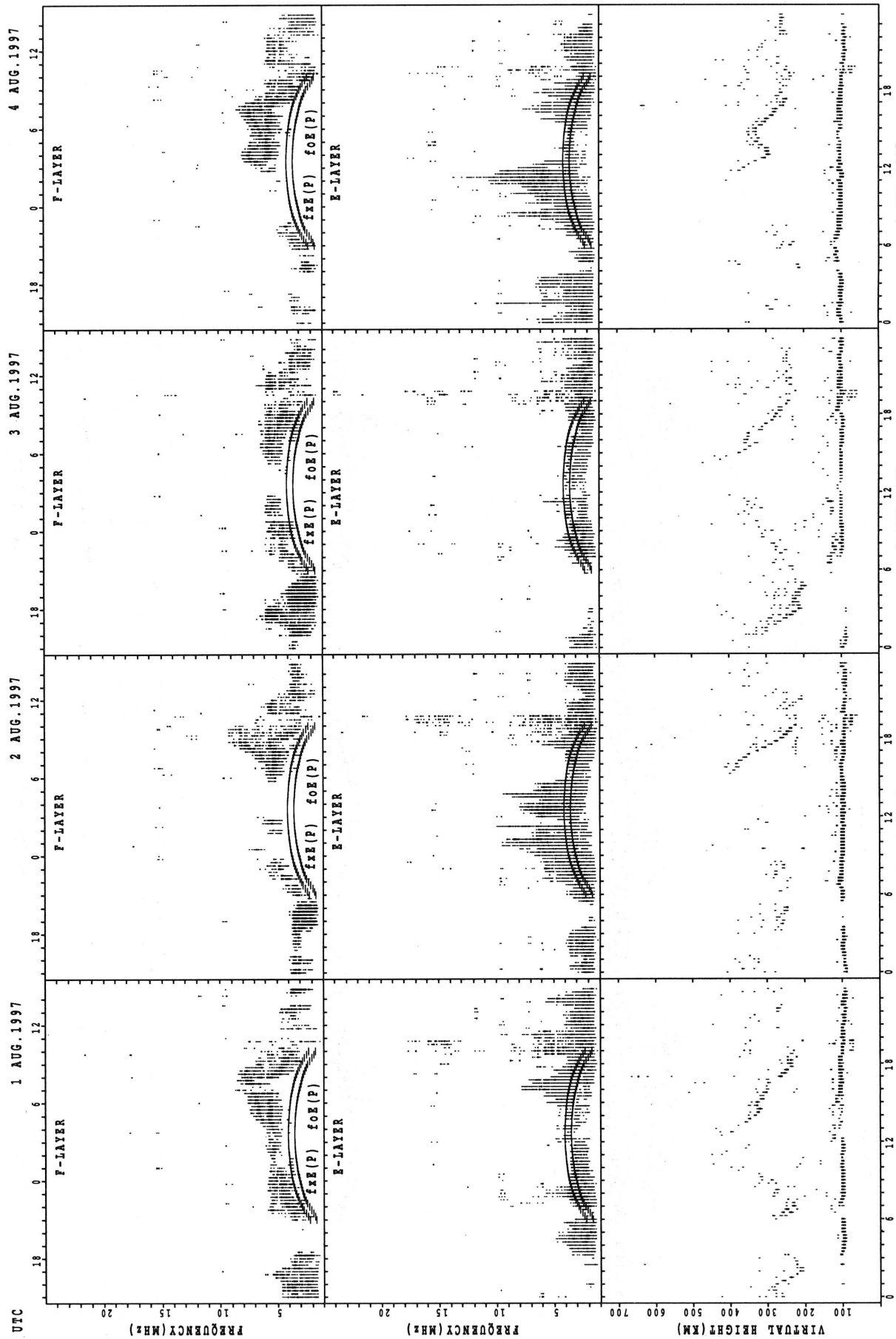
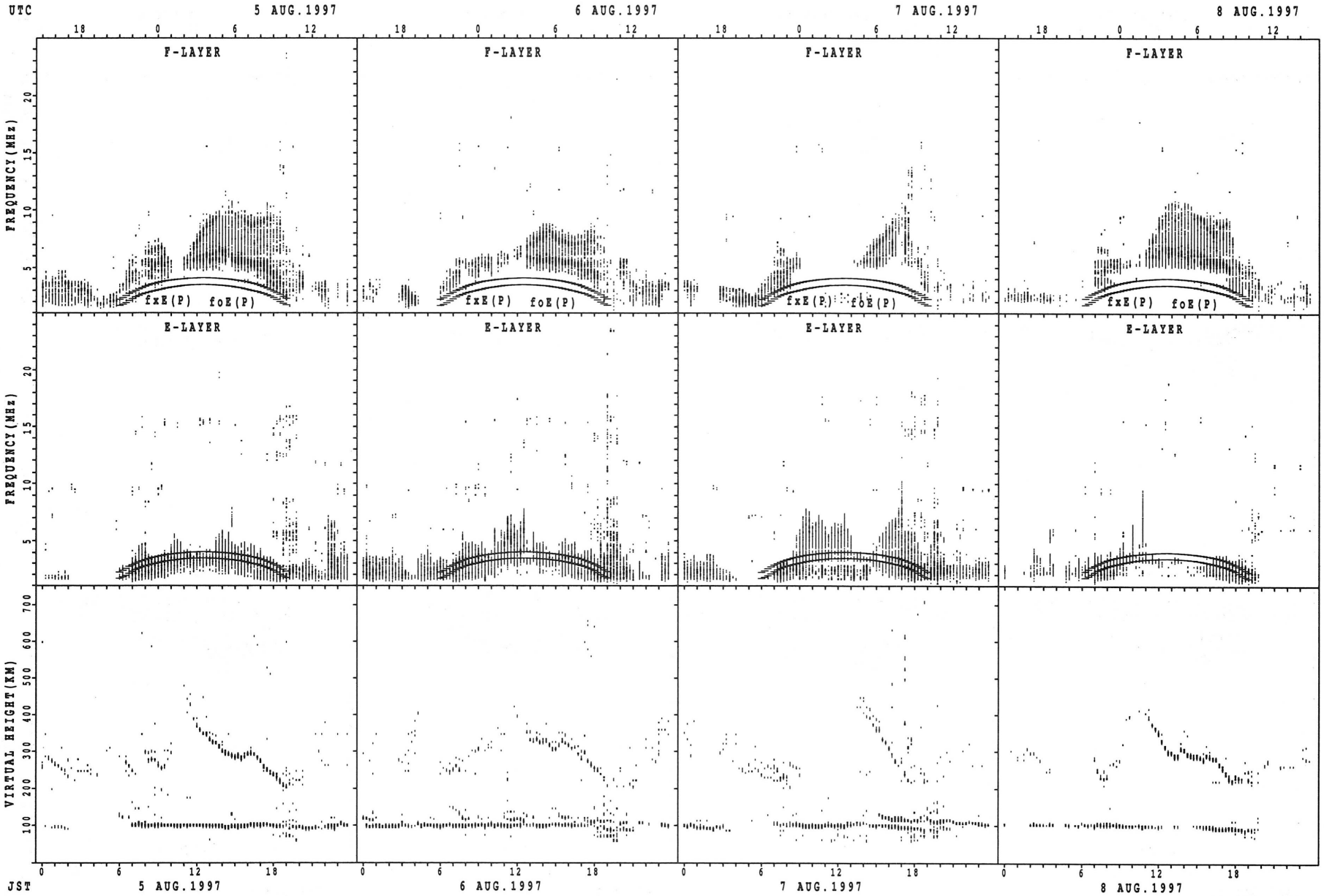
foE(P); PREDICTED VALUE FOR foE

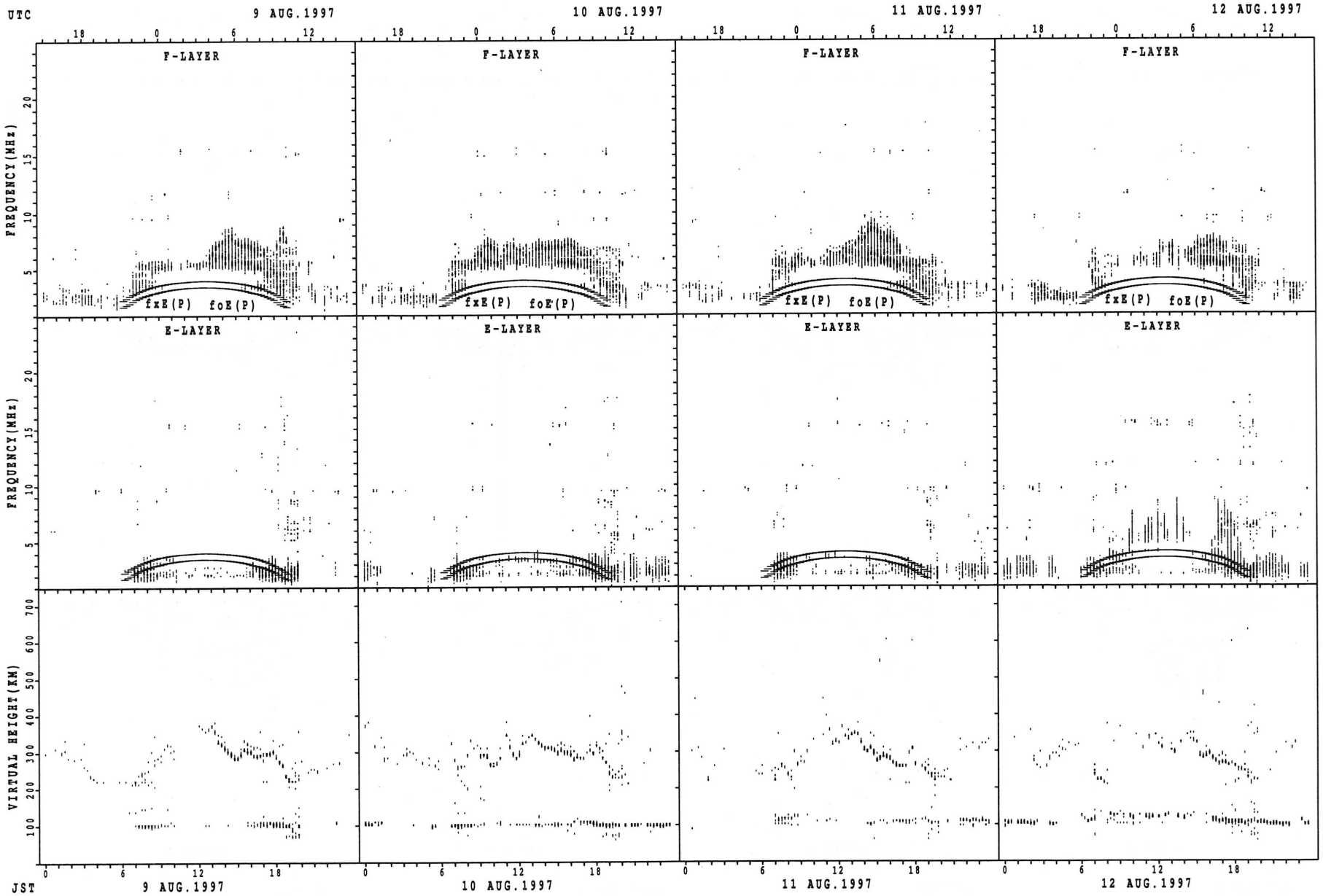

SUMMARY PLOTS AT OKINAWA
UTC
1 AUG.1997
2 AUG.1997
3 AUG.1997
4 AUG.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



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

SUMMARY PLOTS AT OKINAWA



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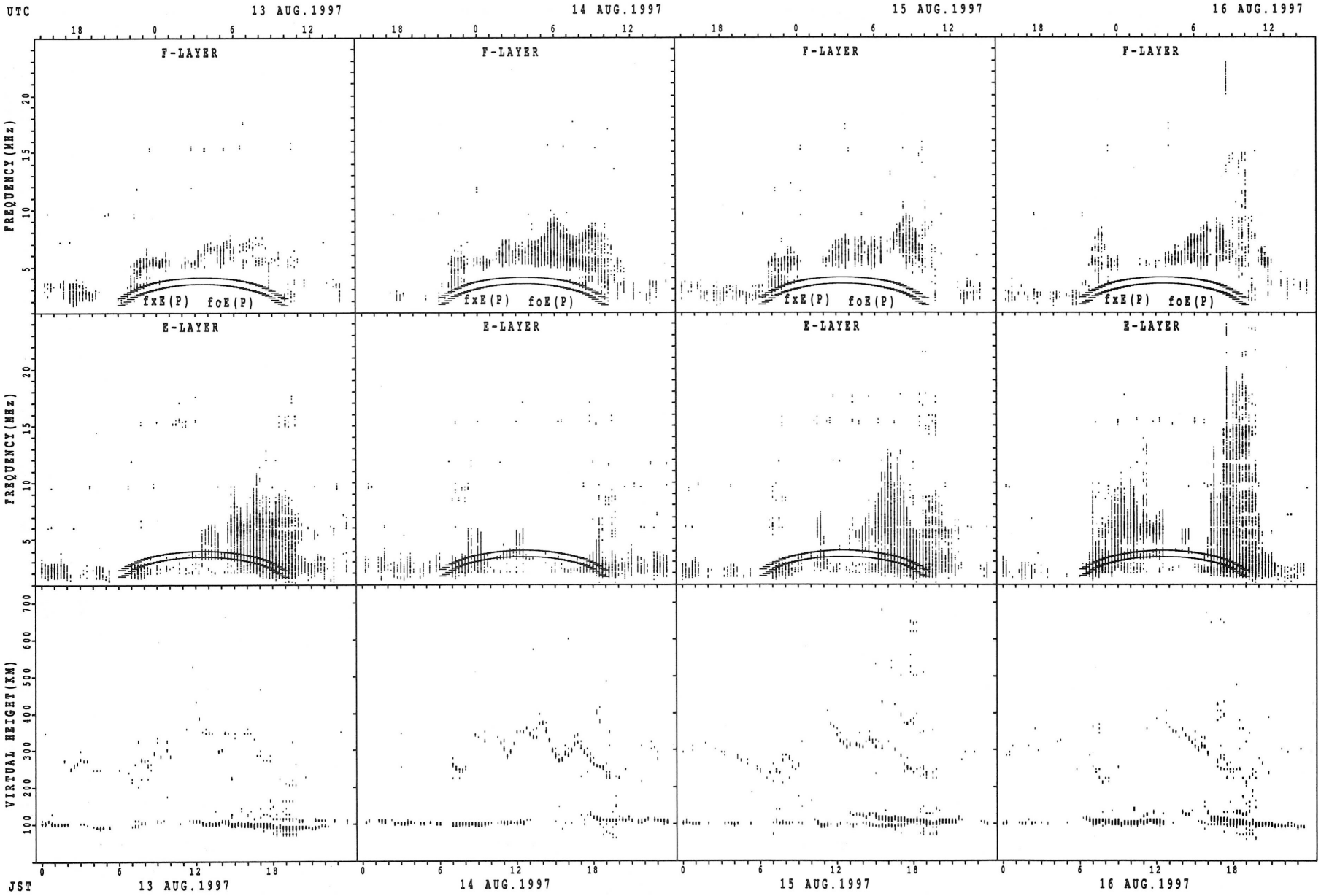
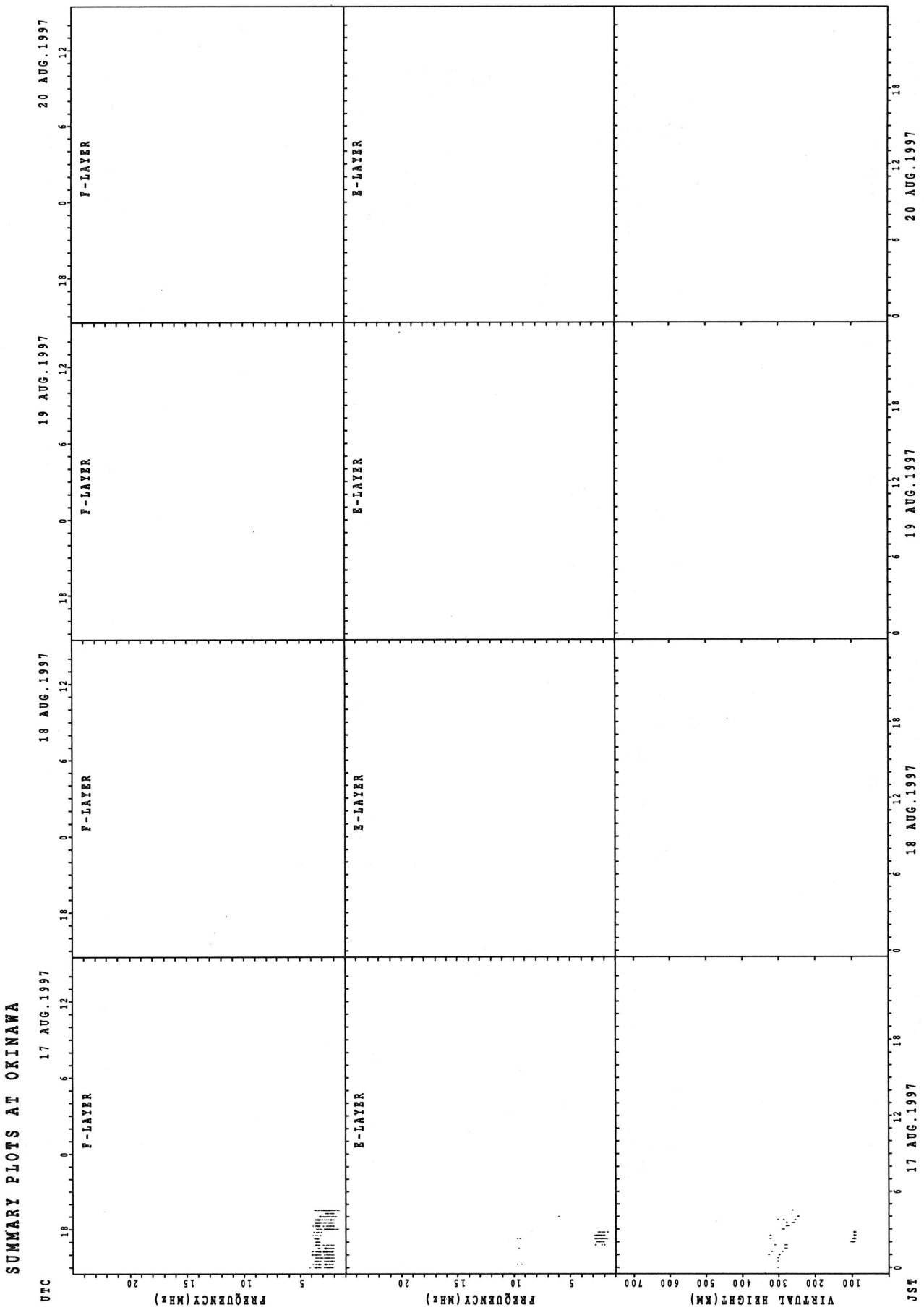
foE(P); PREDICTED VALUE FOR foE

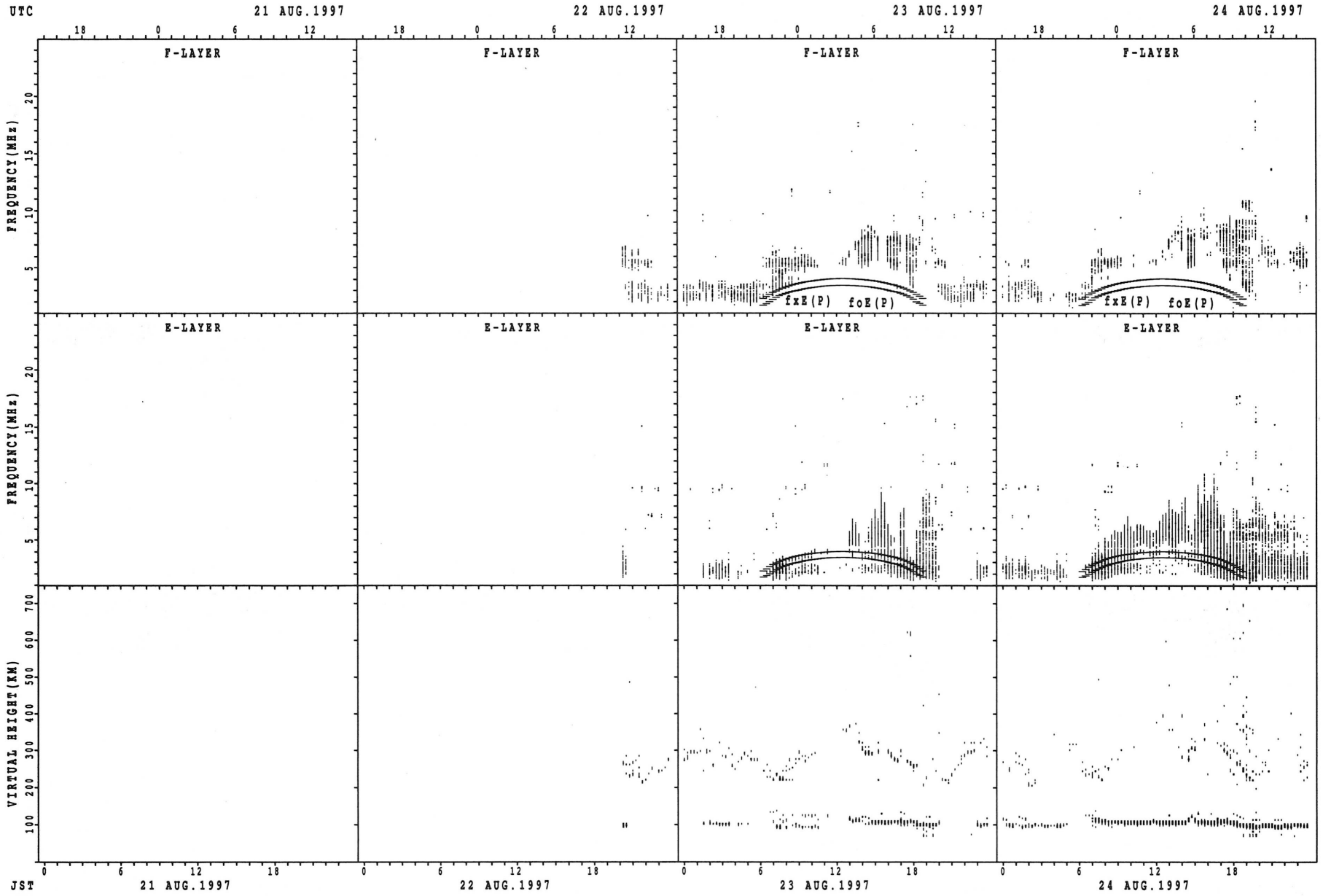
SUMMARY PLOTS AT OKINAWA



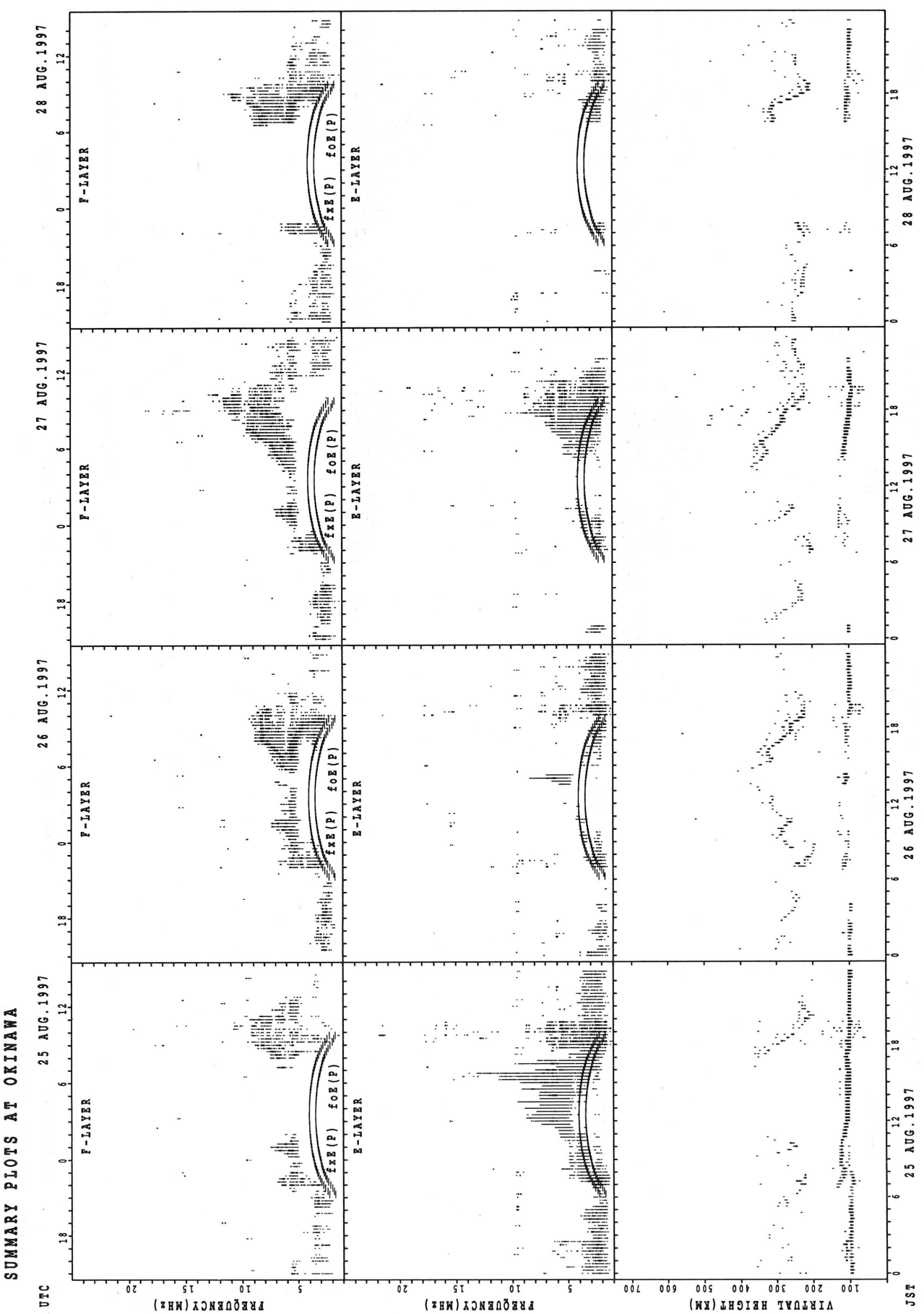
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

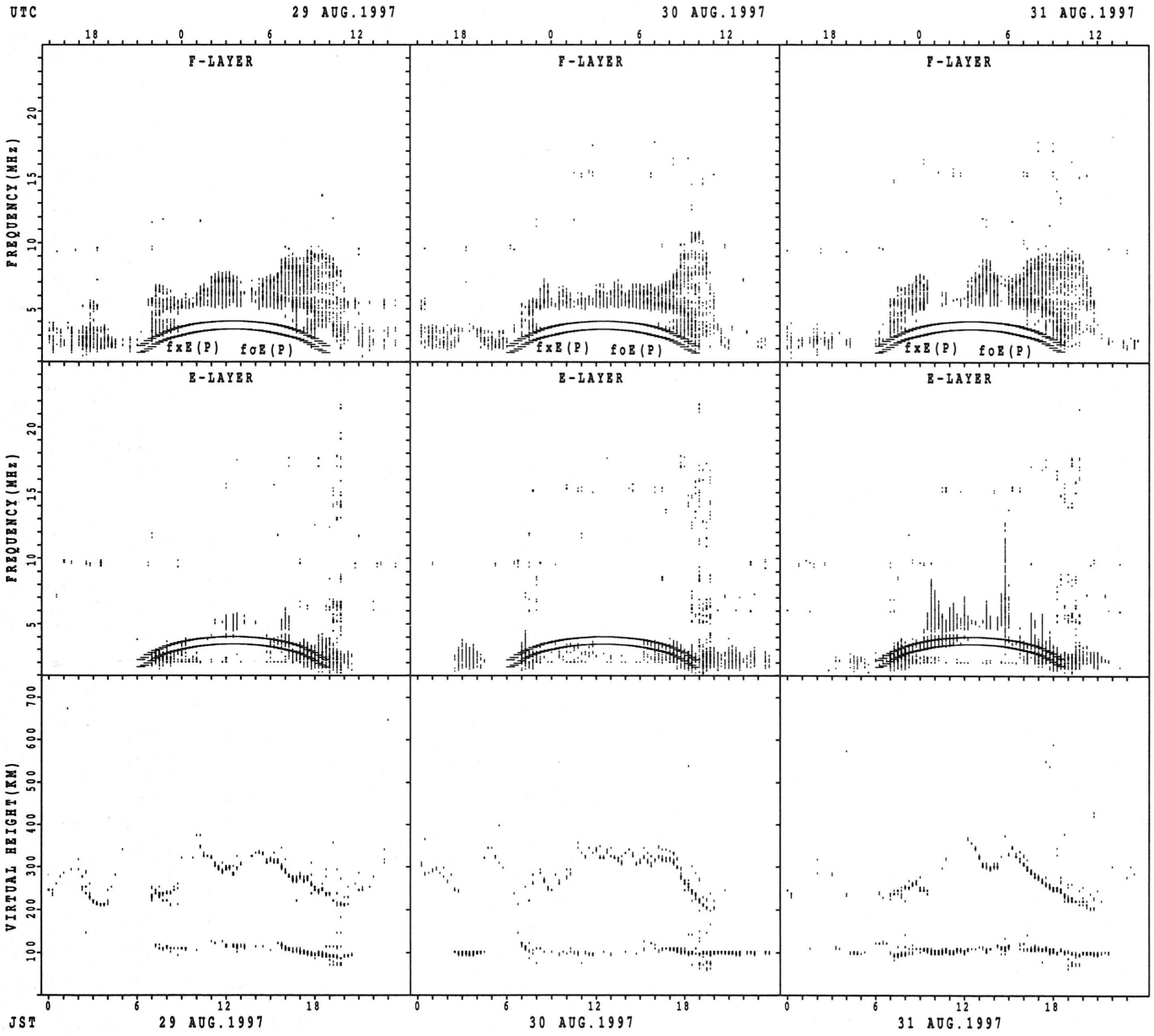
SUMMARY PLOTS AT OKINAWA



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


SUMMARY PLOTS AT OKINAWA
UTC
JST
25 AUG.1997
26 AUG.1997
27 AUG.1997
28 AUG.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

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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

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	21	24	22	21	17	25	28	28	29	30	31	29	28	27	25	29	27	27	27	24	27	23	28	27
MED	97	99	100	99	103	107	112	108	107	106	103	105	105	105	105	107	109	109	109	107	105	105	103	99
U Q	104	102	107	107	112	124	117	111	111	109	107	107	107	113	118	114	115	113	113	110	109	107	107	103
L Q	95	96	97	97	97	103	106	107	104	103	101	102	102	103	103	103	105	103	105	101	105	103	99	97

h'F STATION KOKUBUNJI LAT. 35.7N LON. 139.5E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

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	21	20	19	18	15	21	25	26	25	26	24	21	26	19	26	26	21	22	22	21	23	23	24	23
MED	105	103	101	103	101	111	113	111	107	109	107	105	106	109	109	111	113	113	110	105	107	107	107	107
U Q	107	105	105	105	107	115	124	113	113	113	114	110	115	129	115	115	121	117	111	113	111	113	111	109
L Q	102	99	97	99	97	104	107	107	106	105	105	103	103	103	103	105	106	111	105	101	101	103	103	101

h'F STATION YAMAGAWA LAT. 31.2N LON. 130.6E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									12							15	18	18	19	15				
MED									264							336	308	291	268	260				
U Q									276							348	338	304	288	276				
L Q									244							298	278	280	264	256				

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	17	13	14				13	20	28	25	24	20	23	20	24	25	22	23	24	16	22	18	22	15
MED	111	107	106				119	119	115	113	113	110	111	111	112	113	115	115	113	113	112	112	110	107
U Q	114	111	109				131	124	121	115	114	113	115	115	117	116	125	121	121	114	115	113	113	111
L Q	107	104	103				107	111	113	111	110	107	107	107	108	108	113	111	111	110	109	105	105	105

MONTHLY MEDIANS OF h'F AND h'Es

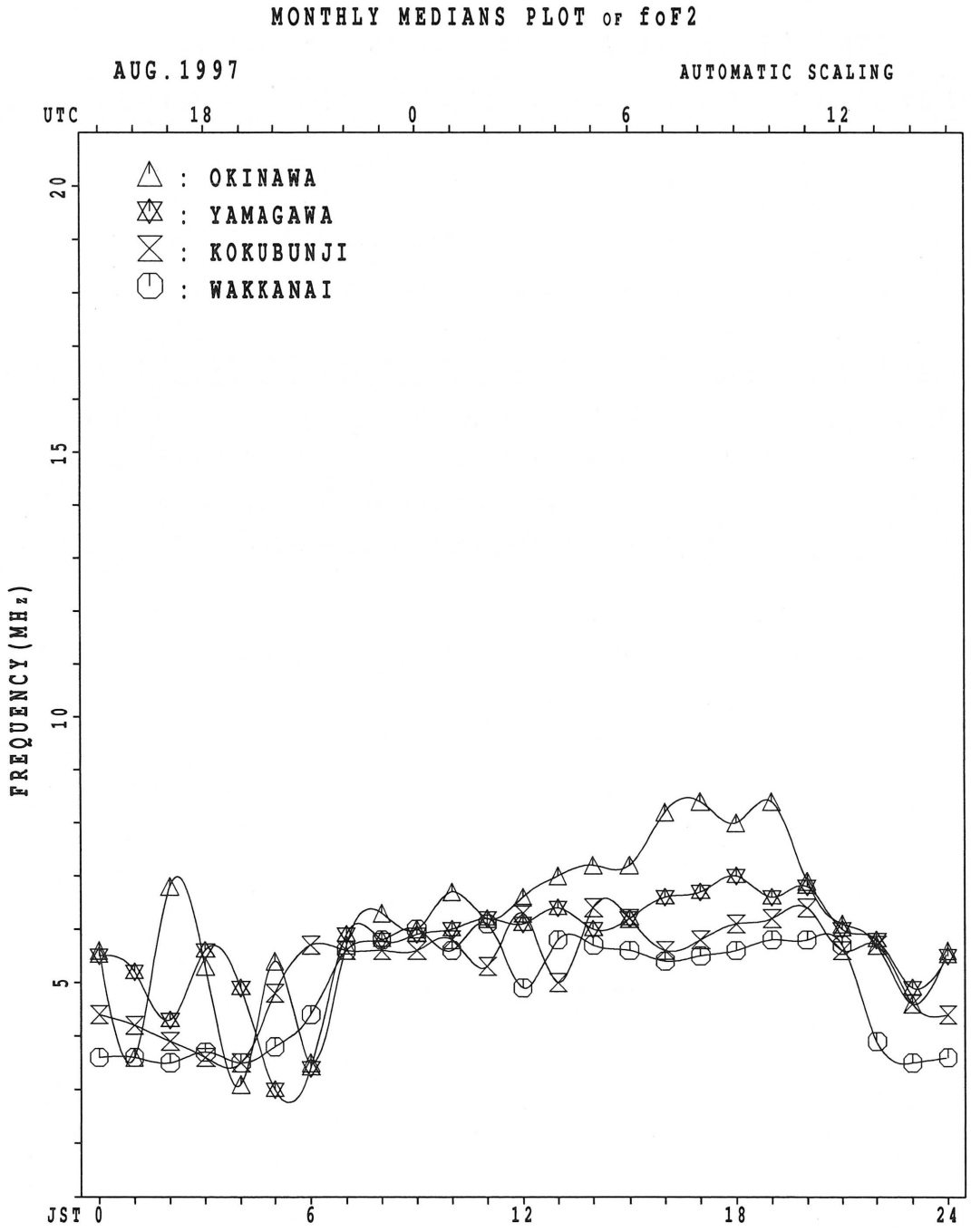
AUG.1997 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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														11	13	19	17	18	15	14				
MED														326	310	312	294	282	254	244				
U Q														332	326	332	309	302	274	268				
L Q														306	303	288	287	270	238	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	12	12	11					20	19	19	17	14	16	10	14	15	22	23	20	13	19	15	16	13
MED	105	103	99					117	107	107	105	105	105	107	108	107	107	109	105	103	105	103	102	103
U Q	107	105	105					128	115	119	125	121	116	119	117	115	113	111	110	108	109	107	105	106
L Q	102	98	97					108	103	103	103	103	102	103	103	101	105	105	102	98	97	95	96	98


MONTHLY MEDIANS PLOT OF foF2
AUG.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

AUG. 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	X 47	X 48	X 42	X 42	X 40															X 58	X 47	A	50	A
2	A	41	40	39	36															O X 72	74	54	55	50
3	50	44	X 41	42	39															X 59	X 64	X 67	61	56
4	A	50	X 38	X 39	35															X 62	X 56	X 54	56	58
5	57	55	48	X 40	X 32															X 68	X 77	X 56	A	45
6	42	42	42	X 40	X 39															X 62	X 62	A	X 58	52
7	48	47	49	44	X 36															X 62	X 56	X 48	52	54
8	51	A	X 40	44	X 37															X 72	X 61	45	X 42	44
9	44	42	42	41	36															X 68	X 71	65	64	56
10	53	54	50	48	X 40															X 70	X 72	X 64	X 56	51
11	50	47	44	41	43															X 55	X 59	X 56	55	52
12	51	49	49	45	X 40															X 78	A	X 43	44	42
13	X 40	44	41	40	X 39															X 68	X 66	49	52	51
14	X 42	46	46	X 44	X 44															X 82	65	X 52	X 52	X 50
15	A	51	51	47	44															X 72	X 69	X 55	X 56	X 54
16	49	50	46	43	41															X 73	X 70	X 58	X 54	X 45
17	X 40	X 42	X 42	X 38	X 40															X 68	X 66	X 62	X 60	56
18	50	X 46	X 42	X 43	X 39															X 65	X 66	X 60	X 51	51
19	46	43	40	41	42															X 67	X 69	56	A	X 59
20	54	X 41	X 38	X 36	X 35															X 56	X 62	61	59	X 61
21	X 58	X 45	X 42	X 40	X 39															X 68	X 55	X 52	X 50	51
22	X 46	44	43	45	39															X 70	X 62	X 62	X 65	X 64
23	X 50	49	46	46	X 45					C	C	C	C	C	C	C	C	C		X 60	X 61	A	54	51
24	51	50	48	46	X 39															X 64	X 68	X 60	X 53	X 50
25	X 48	X 45	X 43	X 42	X 40	X 42														X 74	X 74	X 60	X 55	X 48
26	X 43	X 44	X 43	44	X 41	X 47														X 62	X 64	X 64	X 58	X 53
27	X 52	X 49	X 46	X 44	X 41	X 44														X 79	X 74	X 59	X 56	55
28	55	54	X 52	X 50	X 42	X 41														X 75	X 62	X 52	X 55	51
29	X 46	X 46	X 46	X 46	34	X 34														X 80	X 77	59	X 50	50
30	51	A	X 46	44	X 40	38				C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		X 78	X 71	X 65	X 47	X 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	27	28	30	30	30	6														30	29	27	28	29
MED	50	46	43	43	X 40	X 42														X 68	X 66	X 58	X 55	51
U Q	51	50	46	45	X 41	X 44														X 73	X 71	X 62	X 57	56
L Q	X 46	44	42	X 40	37	38														X 62	X 62	X 52	X 52	50

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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	41	42	R 36	35	34	36	46	45	48	49	U R 45	Y	49	48	A	A	A	54	56	52	41	A	F 41	A
2	A	F 33	F 32	F 32	F 28	29	A	50	55	57	A	R 44	A	59	A	47	48	48	54	66	F 68	F 44	F 47	F 42
3	F 41	F 37	35	F 36	F 31	37	42	45	45	U R 51	U R 46	A	52	50	47	47	50	54	48	53	58	61	F 54	F 50
4	A	F 41	32	33	F 29	23	44	62	E G 44	U R 45	E G 42	R 53	56	47	55	56	55	54	60	56	50	48	F 50	F 51
5	F 50	F 47	F 39	34	26	30	A	41	A	60	61	48	J R 50	52	54	51	45	44	50	62	72	50	A	F 37
6	F 35	F 36	F 34	F 34	33	A	45	52	A	51	51	A	A	Y	55	53	54	48	A	56	56	A	52	F 42
7	F 40	F 39	F 38	F 34	30	38	R 46	57	50	57	R 51	49	J R 51	A	49	58	63	68	61	56	50	42	F 45	F 44
8	F 42	A	34	F 36	31	A	A	A	R 64	64	62	60	62	65	56	54	50	54	58	66	55	F 37	36	F 35
9	F 36	F 34	F 34	F 34	F 27	32	51	54	56	57	R 63	R 61	R 62	60	R 52	52	52	57	57	62	65	F 57	F 56	F 48
10	F 45	F 46	F 40	F 39	34	31	41	61	69	68	70	54	R 51	68	60	U A 54	58	A	54	64	66	58	50	F 42
11	F 40	F 39	F 36	F 32	F 33	37	44	57	59	57	58	49	55	59	63	72	68	60	54	J S 49	53	50	F 47	F 44
12	F 42	F 41	F 42	F 38	34	31	45	62	55	50	A	55	54	52	58	54	56	61	66	72	A	37	F 36	F 34
13	35	F 38	F 33	F 34	33	F 35	45	47	V 55	64	46	50	53	69	56	A	53	52	54	62	60	F 43	F 41	F 42
14	U S 36	F 37	F 38	38	38	40	48	66	64	56	63	54	56	U R 61	70	R 65	A	62	62	76	F 56	46	46	44
15	A	F 42	F 43	F 40	F 36	38	52	55	51	53	50	58	64	55	A	A	A	62	61	66	64	50	50	48
16	F 42	F 41	F 39	F 36	F 34	S 35	U A 45	62	67	A	51	53	47	R 50	55	62	78	85	78	67	64	52	47	39
17	34	36	36	32	34	34	49	64	V 64	63	62	A	A	A	A	55	54	55	54	62	60	56	54	F 49
18	F 43	40	36	37	33	31	V 39	A	54	A	58	61	66	59	67	58	50	53	54	59	60	54	44	F 42
19	F 38	F 36	F 32	F 31	F 32	38	44	48	61	62	60	54	51	57	58	63	64	62	A	61	F 60	F 48	A	F 50
20	F 46	35	32	30	29	31	48	53	R 54	R 55	58	54	U R 48	A	57	62	57	A	45	51	56	F 54	F 51	55
21	52	39	36	34	33	32	47	R 62	54	52	57	51	54	59	68	71	61	66	66	62	49	46	44	F 42
22	41	F 37	F 36	F 37	F 31	F 32	45	56	56	A	59	61	64	58	58	R 62	61	58	59	64	56	56	59	58
23	44	F 40	F 39	F 38	39	37	J R 44	54	64	C	C	C	C	C	C	C	C	C	U A 54	54	55	A	F 48	F 44
24	F 42	F 41	F 39	F 38	33	34	44	58	A	54	61	A	R 62	69	78	82	67	55	48	58	62	54	47	44
25	42	39	37	36	34	35	48	51	63	52	56	64	69	57	65	61	54	55	55	68	68	54	49	42
26	U R 37	F 37	37	F 36	F 35	S 41	45	56	55	58	58	54	R 60	60	63	A	A	60	60	S 56	58	58	52	47
27	46	43	40	38	35	38	54	50	57	56	60	56	54	55	J R 61	60	58	63	66	74	68	53	50	F 48
28	F 47	F 46	46	44	36	35	R 50	52	57	52	54	66	61	58	56	54	59	81	84	69	56	46	49	F 43
29	40	40	40	40	F 26	R 28	48	56	57	56	56	U R 60	U R 60	A	54	R 64	64	68	70	74	71	F 52	44	F 43
30	F 44	A	40	F 36	R 34	F 30	42	64	51	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	75	72	65	59	41	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	27	28	30	30	30	28	27	28	27	25	26	23	25	23	24	24	24	26	28	30	29	27	28	29
MED	F 42	F 39	F 36	F 36	33	34	45	56	56	56	58	54	55	58	58	58	56	58	58	62	60	52	48	F 44
U Q	F 44	F 41	39	F 38	34	37	48	62	63	59	61	60	62	60	63	62	62	62	64	67	65	56	50	F 48
L Q	38	F 37	F 34	34	31	31	44	50	54	52	51	51	R 51	52	55	54	52	54	54	56	56	46	44	F 42

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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							UL 332	L	392	416	424	420	432	UA 424	A	A	A	UA 356	L 316					
2							A	A	396	416	A	436	A	A	A	UA 424	A	L 396	A					
3							A	400	412	436	420	A	A	UA 448	424	412	392	A	A					
4							308	364	436	416	420	432	440	428	424	412	388	A	A					
5							A	A	A	416	A	436	UA 460	440	428	424	L 412	A	A					
6						A	UA 348	A	A	448	A	A	A	444	R 444	416	404	A	A					
7							L	388	416	432	440	444	R 452	A	428	412	UA 396	A	L					
8						A	A	A	416	432	440	444	448	452	436	436	A	368	L 316					
9							A	404	428	432	444	UA 440	A	UA 448	440	428	400	376	UL 344					
10							348	396	UA 424	432	448	448	R 448	UA 464	444	A	A	A	UL 328					
11							L	L 400	424	440	460	L 448	R 456	456	UA 444	424	408	A						
12							360	396	L 432	436	A	UA 464	A	A	448	UA 452	UA 420	A						
13							UL 368	L	UA 416	432	L 420	452	R 452	UA 460	A	A	416	L 392	A					
14							UL 392	L 404	416	440	460	464	460	448	440	A	A	380	L					
15							L	L 392	424	444	452	444	456	444	A	A	A	A	A					
16							A	388	UA 432	A	452	464	464	452	436	432	400	376						
17							L	396	UA 432	436	444	A	A	A	A	A	A	A	A					
18								A	A	A	448	448	448	440	R 436	424		L	L					
19								UL 408	UA 432	420	432	452	448	448	440	420	404	A	A					
20							L	404	436	432	436	440	452	A	444	428		A	A					
21								L 384	408	436	440	460	444	448	440	424	404	380	A					
22							L	L 396	428	A	A	UA 460	456	448	440	A	A	L 384	L					
23							L	L 404	416	C	C	C	C	C	C	C	C	C	A					
24								A	A	A	452	A	460	456	440	UA 420	408	A						
25							L 248	UL 380	412	L 444	460	452	456	444	444	436	412	UL 384						
26							L	L 384	L 420	432	448	456	UA 456	A	A	A	A	A						
27								L	424	436	452	452	460	456	A	440	L 416	L 364	L					
28							L	L	440	L	448	452	460	472	460	444	424	L 376	L					
29							L	404	412	432	A	UA 460	A	A	UA 472	424	A	L 348	A					
30							A	380	A	C	C	C	C	C	C	C	C	C	C					
31							C	C	C	C	C	C	C	C	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							8	20	25	23	22	24	21	21	21	20	16	13	4					
MED							348	396	424	432	446	450	456	448	440	424	406	L 376	L 322					
U Q							UL 364	404	432	436	452	458	460	456	444	434	414	L 384	UL 336					
L Q							L 320	386	414	432	436	442	448	444	436	420	400	366	L 316					

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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							B 232	284	A	A	R 352	360	360	348	340	320	288	U A 248	A					
2							B U A 216	A	A 300	A	A	A	A	A	A	A	A 292	248	A					
3							B A 220	A	A	A	A 352	A	A	A	A 340	328	296	252	A					
4							B A	268	A	320	A	A	A	R	324	R 320	288	244	168					
5							B 220	U A 276	A 300	U A 324	A	A	A	A	A	A	292	A 248	A					
6							B	A	A	A	A	A	A	A	A	A	280	A	A					
7							B 204	264	A	A	A	A	A	A	U R 336	320	284	A 236	A					
8							B	A	A	A	A	R	R 360	R	R	A	A	A 240	A					
9							B	A	A	A	A	A	A	A	348	316	288	248	A					
10							B	A	A 264	292	U A 316	A	A	U A 356	352	336	328	288	A	A				
11							B	A	A	296	A	R	R	360	348	A	312	288	244	B				
12							B	A	260	296	320	336	A	356	348	344	324	288	232	A				
13							B	A 216	248	A 288	A	A	A	A	A	A	A	A 288	248	A				
14							B	A	272	A 304	A 336	360	R 360	R 364	360	352	328	276	240	A				
15							B	A 184	A	A	A	A	A 360	360	356	340	316	276	236	B				
16							B	A	A	288	A	A	A	A	A	340	312	280	224	A				
17							B	244	A 284	A	A	A	A	A	A	A	A	A	A	A				
18							B	212	268	A	A	A	A	A	A	344	324	284	236	A				
19							B	212	268	296	U A 328	U A 336	A	B	R	336	316	288	252	A				
20							B	A	248	292	A	U R 336	R	R	A	A	A	288	A 224	A				
21							B	A	272	300	320	A	352	A	A	A	320	A	A	A				
22							B	A	264	288	A 320	A	A	A	348	A	A	A	A	B				
23							B	200	272	A 292	C	C	C	C	C	C	C	C	C	B				
24							B	A	268	296	A 320	A	A	A	U R 344	340	324	280	228	B				
25								200	268	308	A	328	A	R	A	A	A	284	A 220	B				
26								212	264		A	R	A 356	360	348	328	300	A 264	A	B				
27								212	280	316	R 340	R 352	356	R 356	348	U A 332	304		A 236	A				
28								204	264	312	A	R 348	364	364	360	344	320	284	228	B				
29								196	268	304	336	352	R 360	A	A 356	U A 344	A	A	A	A				
30								A 264	296		C	C	C	C	C	C	C	C	C	C				
31								C	C	C	C	C	C	C	C	C	C	C	C	B				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							16	22	19	11	10	8	10	12	17	18	22	21	1					
MED							212	268	296	A 320	350	360	360	348	340	320	288	240	168					
U Q							218	272	304	336	R 352	R 360	R 360	356	344	324	288	248						
L Q							202	264	292	320	336	356	356	348	336	316	280	230						

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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 22	J A 44	31	E B 14	28	J A 27	J A 28	J A 50	42	J A 43	G 35	38	40	J A 46	J A 69	J A 52	J A 65	J A 45	40	J A 22	J A 92	J A 64	J A 47	J A 45
2	J A 50	30	27	31	J A 42	J A 34	J A 51	J A 55	J A 52	J A 52	J A 61	J A 54	J A 56	J A 61	58	J A 44	J A 119	J A 86	58	57	J A 54	J A 47	J A 34	29
3	J A 19	28	28	18	19	20	J A 38	J A 49	J A 54	42	40	J A 50	55	J A 51	38	36	J A 74	J A 42	40	32	J A 45	J A 44	J A 68	J A 52
4	J A 77	J A 46	20	J A 39	25	J A 22	J A 27	J A 42	J A 49	38	35	J A 39	40	G 29	37	G	33	44	J A 35	J A 53	J A 49	J A 48	J A 48	J A 50
5	J A 47	J A 27	J A 23	18	E B 14	J A 20	J A 42	J A 44	J A 51	J A 42	J A 59	J A 46	J A 50	40	J A 38	J A 37	34	J A 43	J A 46	J A 53	J A 45	J A 45	J A 76	J A 43
6	J A 49	J A 62	J A 40	J A 43	J A 33	50	J A 52	57	J A 77	J A 52	J A 64	J A 75	105	42	48	42	34	J A 77	J A 100	32	J A 74	J A 65	J A 55	J A 44
7	J A 38	J A 35	30	24	18	E B 15	25	32	J A 34	J A 37	J A 43	48	40	61	G	J A 44	J A 49	J A 83	J A 153	J A 82	32	J A 52	J A 40	30
8	J A 79	J A 101	J A 74	26	J A 22	J A 42	75	J A 98	35	43	J A 49	G 32	G 26	G 30	G 29	J A 34	49	36	J A 26	56	J A 35	J A 23	J A 37	J A 46
9	J A 36	28	E B 16	E B 14	20	28	J A 75	J A 52	J A 36	J A 41	J A 42	J A 46	J A 53	58	G 28	G 30	32	30	24	J A 28	J A 48	J A 46	E B 14	J A 33
10	28	24	24	26	22	J A 25	J A 44	J A 34	64	40	J A 51	60	J A 48	J A 51	44	J A 67	J A 179	J A 126	J A 157	J A 126	J A 38	39	E B 14	J A 49
11	26	J A 21	J A 21	J A 31	21	J A 24	29	33	32	39	G	37	40	J A 44	J A 53	J A 40	J A 43	J A 48	48	J A 38	J A 36	J A 38	J A 50	J A 54
12	J A 51	J A 38	46	J A 48	J A 26	J A 26	54	34	J A 41	J A 49	J A 164	J A 78	J A 53	J A 50	42	J A 75	J A 165	112	J A 145	J A 118	J A 81	J A 78	J A 45	J A 46
13	J A 39	J A 35	J A 28	30	J A 27	J A 34	29	33	J A 42	J A 44	45	40	J A 54	46	J A 54	J A 64	J A 46	30	45	J A 52	34	J A 45	J A 45	J A 51
14	J A 66	J A 38	J A 36	J A 30	J A 24	J A 22	J A 36	30	34	40	40	40	40	40	44	J A 79	J A 144	J A 66	J A 78	55	J A 74	J A 44	J A 47	61
15	J A 82	J A 52	J A 36	27	E B 16	27	J A 46	J A 36	J A 36	J A 39	40	39	40	40	J A 64	J A 66	J A 64	J A 54	J A 68	49	J A 36	J A 32	J A 38	J A 44
16	J A 38	J A 34	32	26	J A 36	J A 22	J A 78	J A 54	J A 87	J A 128	J A 53	J A 60	J A 45	39	43	38	34	J A 65	J A 62	J A 54	J A 51	J A 53	J A 48	29
17	26	J A 21	J A 36	J A 24	J A 21	26	J A 26	J A 37	J A 158	50	62	79	74	J A 125	61	J A 52	J A 63	J A 62	J A 87	J A 53	J A 37	J A 34	36	J A 31
18	J A 44	26	J A 28	J A 36	J A 23	J A 21	29	J A 55	J A 52	J A 62	35	46	J A 42	40	40	35	29	28	32	J A 24	J A 19	24	J A 50	J A 32
19	J A 32	31	20	E B 14	E B 15	J A 18	J A 28	J A 49	J A 53	J A 42	J A 54	J A 41	E B 36	G	G 28	G	J A 38	61	94	134	J A 80	J A 52	72	J A 67
20	J A 50	25	24	22	J A 18	28	31	30	J A 36	36	G	G 30	G 32	71	39	42	J A 53	J A 78	38	J A 97	J A 57	J A 47	J A 48	J A 32
21	20	E B 14	E B 14	E B 13	19	E B 14	J A 28	30	37	J A 44	36	G	39	37	36	J A 38	J A 39	J A 37	J A 36	J A 45	22	28	J A 24	J A 49
22	J A 28	28	32	J A 23	23	23	J A 25	29	35	86	J A 68	J A 54	J A 48	38	J A 38	J A 53	J A 65	J A 41	J A 34	28	28	J A 26	J A 38	J A 52
23	J A 43	J A 35	J A 33	J A 27	22	24	25	31	36	C	C	C	C	C	C	C	C	C	J A 110	J A 128	J A 51	J A 65	J A 42	J A 50
24	J A 34	J A 25	J A 44	J A 42	29	J A 33	J A 30	J A 50	J A 73	J A 54	J A 54	62	38	G 30	38	42	J A 46	J A 44	J A 31	J A 52	J A 48	J A 36	J A 26	28
25	J A 30	18	20	E B 13	E B 14	E B 15	G	G 21	G 30	J A 36	G 32	38	G	38	J A 50	J A 44	32	31	J A 26	E B 16	19	J A 22	22	21
26	25	20	19	20	J A 27	29	J A 24	G 21	J A 42	38	G 30	42	J A 55	J A 52	J A 65	J A 75	J A 92	52	J A 126	J A 86	27	27	19	E B 15
27	E B 14	E B 15	E B 14	E B 14	E S 20	20	J A 22	33	G	G	37	37	38	J A 47	58	33	30	30	J A 27	J A 45	27	25	19	J A 37
28	J A 25	J A 22	J A 26	J A 24	E B 14	24	27	30	35	35	G 25	42	43	40	36	36	32	29	J A 27	47	24	E B 15	J A 50	30
29	20	E B 15	E B 15	17	E B 15	E B 16	26	34	J A 46	40	J A 51	J A 54	70	J A 55	J A 50	J A 44	J A 82	J A 50	J A 79	36	J A 39	J A 41	J A 52	J A 38
30	J A 42	54	55	J A 38	J A 37	J A 24	J A 46	J A 43	J A 55	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J A 28	J A 79	J A 41	25	J A 42	J A 28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	28	28	28	28	28	28	28	28	28	30	30	30	30	30	30
MED	J A 37	J A 28	28	25	22	24	J A 29	35	J A 42	J A 42	42	44	42	43	42	J A 42	J A 48	J A 46	J A 46	J A 52	J A 40	J A 42	J A 44	J A 44
U Q	J A 49	J A 38	J A 36	J A 31	J A 27	28	J A 46	J A 50	J A 53	J A 50	J A 54	J A 54	54	J A 52	J A 54	J A 52	J A 70	J A 66	J A 87	J A 79	J A 51	J A 48	J A 50	J A 50
L Q	26	22	20	E B 18	E B 18	20	26	31	35	38	G 35	38	40	38	38	36	34	36	J A 32	36	32	27	34	30

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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	17	35	20	E B 14	17	18	G 19	30	34	36	G 31	G 36	39	42	A A 69	A A 52	A A 65	36	25	17	33	A A 64	22	A A 45
2	A A 50	18	18	18	21	19	A A 51	42	35	36	A A 61	39	A A 56	52	A A 58	42	44	37	39	39	26	28	21	17
3	17	20	19	E B 14	E B 14	E B 15	33	32	36	36	38	A A 50	47	45	37	35	34	37	32	20	20	19	27	23
4	A A 77	20	16	17	17	19	22	30	33	37	34	36	38	G 28	36	G	33	38	30	43	16	21	36	22
5	23	18	18	E B 14	E B 14	E B 16	A A 42	38	A A 51	38	54	39	46	37	35	35	32	38	39	26	23	21	A A 76	20
6	18	21	22	18	20	A A 50	35	48	A A 77	37	47	A A 75	A A 105	37	38	36	31	43	A A 100	18	42	A A 65	42	25
7	20	23	21	18	16	E B 15	23	30	33	35	38	38	39	A A 61	G	39	40	43	22	28	17	22	22	18
8	27	A A 101	17	17	E B 14	A A 42	A A 75	A A 98	34	36	39	U G 31	G 25	U G 30	G 28	32	48	29	20	34	26	18	26	21
9	17	17	E B 16	E B 14	E B 14	18	42	36	34	37	39	44	51	45	G 25	G 28	31	29	22	22	35	28	E B 14	20
10	E B 14	E B 16	17	17	17	E B 16	26	32	42	36	40	42	42	46	42	47	44	A A 126	23	24	E B 14	24	E B 14	17
11	16	E B 13	17	20	18	18	24	32	32	U Y 38	G	37	38	38	44	38	38	42	23	23	18	18	20	22
12	22	26	19	19	17	18	32	31	35	38	A A 164	46	48	48	38	45	42	53	45	51	A A 81	18	18	19
13	E B 15	23	18	21	18	19	G 21	31	42	38	37	38	44	46	50	A A 64	G 26	27	32	39	24	31	20	20
14	22	17	17	21	19	E B 15	32	29	34	G 33	39	39	39	39	37	50	A A 144	32	24	52	40	18	19	37
15	A A 82	24	21	18	E B 16	E B 15	21	26	32	34	36	38	39	38	A A 64	A A 66	A A 64	52	48	36	19	30	20	21
16	30	19	18	17	17	18	U A 36	32	43	A A 128	38	40	40	37	38	34	33	26	33	25	18	21	21	21
17	20	E B 16	24	19	18	E B 16	G 21	33	43	40	39	A A 79	A A 74	A A 125	A A 61	50	45	48	42	30	28	28	20	20
18	20	19	E B 15	24	21	18	25	A A 55	50	A A 62	34	39	38	37	38	34	G 23	26	19	18	17	18	28	23
19	18	16	16	E B 14	E B 15	E B 16	26	34	43	36	39	38	E B 36	G	G 27	G	36	54	A A 94	42	20	20	A A 72	22
20	17	E B 14	E B 16	E B 15	E B 15	E B 14	22	28	34	35	G	U G 30	G 32	A A 71	36	U Y 41	42	A A 78	22	19	24	24	20	20
21	16	E B 14	E B 14	E B 13	E B 14	E B 14	25	30	36	40	35	G	37	37	35	G 24	30	25	31	16	18	17	E B 14	17
22	18	18	18	E B 15	E B 14	17	22	28	34	A A 86	49	46	39	36	35	44	45	28	20	17	25	19	19	24
23	32	17	17	16	17	18	24	29	34	C	C	C	C	C	C	C	C	C	U A 37	18	22	A A 65	17	24
24	22	17	20	23	19	19	24	40	A A 73	49	36	A A 62	38	G 28	37	42	35	38	22	24	20	20	18	19
25	18	E B 15	E B 15	E B 13	E B 14	E B 15	G	G 18	G 22	34	G 30	U Y 38	G	37	37	32	31	26	22	E B 16	E B 14	19	17	18
26	19	17	17	E B 14	19	18	G 17	G 19	32	37	U G 30	G 35	46	49	56	A A 75	A A 92	41	21	20	17	17	14	E B 15
27	E B 14	E B 15	E B 14	E B 14	E B E S 20	E B 15	G	31	G	G	36	37	36	40	55	U Y 33	29	28	20	20	18	20	16	18
28	18	E B 14	19	E B 14	E B 14	E B 15	23	29	34	U Y 34	G 24	40	41	39	36	36	30	26	19	27	22	E B 15	17	18
29	E B 14	E B 15	E B 15	E B 13	E B 15	E B 16	24	33	37	38	47	46	58	A A 55	47	40	50	24	47	27	21	20	22	18
30	35	A A 54	36	18	22	17	40	32	40	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	21	27	31	18	24	20
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	28	28	28	28	28	28	28	28	28	30	30	30	30	30	30
MED	18	18	18	17	17	17	24	32	34	37	38	39	39	39	38	38	37	37	24	24	22	20	20	20
U Q	23	21	19	18	19	18	33	34	42	38	40	45	46	47	48	46	45	43	39	34	26	28	24	22
L Q	17	E B 16	E B 16	E B 14	E B 14	E B 15	G 22	29	34	36	G 34	G 37	38	37	36	34	31	28	22	19	18	18	17	18

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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	15	15	14	14	14	15	14	14	14	18	18	20	18	18	17	16	15	14	15	12	15	15	16	15
2	14	15	14	15	16	16	16	15	16	16	18	17	22	20	14	14	14	16	15	15	16	16	15	14
3	14	15	14	14	14	15	13	14	16	14	15	19	18	16	16	16	14	15	14	13	17	16	16	13
4	14	13	14	14	15	16	16	14	15	16	21	15	22	16	16	15	16	14	14	15	14	14	16	14
5	16	15	14	14	14	16	16	15	15	18	20	19	20	19	17	16	15	14	13	16	13	15	14	15
6	15	16	15	16	18	15	16	14	16	16	18	18	22	22	20	17	16	15	15	15	16	15	14	16
7	13	15	16	16	15	15	15	16	14	16	18	18	23	24	19	14	14	13	14	17	14	14	15	15
8	16	15	14	15	14	15	13	14	16	16	20	20	18	20	17	17	16	13	14	16	16	15	16	14
9	16	15	16	14	14	14	16	14	15	18	16	20	19	18	18	18	15	15	15	17	15	14	14	14
10	14	16	15	15	14	16	14	15	13	17	21	26	16	19	18	15	15	14	14	16	14	15	14	14
11	13	13	14	14	14	16	16	15	17	34	17	23	20	20	18	17	16	13	14	16	15	15	15	14
12	14	15	14	16	15	14	14	13	17	15	15	18	19	19	21	16	15	14	14	15	14	14	15	13
13	15	15	16	14	15	15	14	16	15	17	19	22	16	21	17	20	15	15	14	16	16	14	15	14
14	14	15	15	15	14	15	16	15	15	18	20	22	19	19	18	16	15	15	14	15	14	15	15	15
15	12	16	15	14	16	15	14	14	14	15	16	16	17	18	16	15	14	14	16	13	14	16	15	16
16	16	16	16	14	14	16	15	15	16	16	14	16	16	22	16	17	15	16	16	15	15	14	15	15
17	16	16	16	16	14	16	14	15	15	15	16	15	24	18	18	15	17	15	15	16	15	15	15	15
18	14	16	15	14	14	16	14	14	15	15	17	20	18	17	16	16	16	14	15	15	15	14	14	15
19	16	14	14	14	15	16	15	12	15	15	15	20	36	25	19	16	15	14	16	16	15	15	15	16
20	14	14	16	15	15	14	15	14	14	15	15	19	22	21	14	16	15	13	14	16	13	15	12	15
21	12	14	14	13	14	14	14	14	15	18	15	18	18	34	19	16	17	15	15	16	13	15	14	16
22	14	15	14	15	14	15	16	16	15	15	16	20	18	21	18	16	14	15	16	15	15	14	15	15
23	14	14	15	15	14	15	16	16	14	C	C	C	C	C	C	C	C	C	16	16	15	15	14	15
24	16	15	15	14	15	16	16	13	14	16	17	14	20	18	16	14	14	13	15	16	15	15	15	15
25	15	15	15	13	14	15	16	15	16	15	16	16	18	20	18	19	18	16	16	16	14	14	14	14
26	14	14	14	14	15	16	15	13	14	16	17	18	14	14	14	14	15	13	16	15	14	14	14	15
27	14	15	14	14	E S 20	15	15	15	15	16	20	21	18	19	19	16	14	14	16	16	16	14	15	14
28	14	14	12	14	14	15	14	17	16	18	18	18	17	17	14	16	15	12	16	16	16	15	14	14
29	14	15	15	13	15	16	15	14	14	16	17	25	21	19	20	16	15	14	14	16	14	15	16	14
30	16	15	16	14	14	16	17	15	15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	16	14	13	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	30	30	30	30	30	30	30	30	30	28	28	28	28	28	28	28	28	28	30	30	30	30	30	30
MED	14	15	15	14	14	15	15	14	15	16	17	19	18	19	18	16	15	14	15	16	15	15	15	15
U Q	16	15	15	15	15	16	16	15	16	18	18	20	22	21	18	16	16	15	16	16	15	15	15	15
L Q	14	14	14	14	14	15	14	14	14	15	16	18	18	18	16	15	14	14	14	15	14	14	14	14

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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	319	323	R 321	315	306	350	354	344	292	297	U R 236	Y	288	287	A	A	A	319	340	334	344	A	F 302	A
2	A	F 299	F 302	F 311	F 334	317	A	326	305	313	A	R 265	A	320	A	285	A 271	297	298	330	F 330	F 297	F 312	F 295
3	F 299	F 310	310	F 309	F 325	350	342	320	235	U R 304	U R 339	A	297	318	252	300	296	324	307	289	302	322	F 305	F 301
4	A	F 301	307	282	F 296	323	297	346	G	U R 246	G	R 295	308	267	302	308	302	317	322	335	298	286	F 292	F 303
5	F 314	F 319	F 315	337	336	326	A	267	A	326	328	247	J R 277	275	314	313	291	298	313	287	351	345	A	F 317
6	F 293	F 303	F 311	F 298	344	A	328	349	A	316	A 317	A	A	Y	313	322	331	330	A	314	324	A	348	F 300
7	F 292	F 299	F 305	F 328	323	338	R 325	355	310	327	R 339	281	J R 275	A	274	298	319	339	340	346	330	296	F 319	F 314
8	F 306	A	317	F 319	341	A	A	A	R 330	333	329	315	300	321	333	314	A 308	308	331	333	365	F 359	305	F 290
9	F 306	F 307	F 313	F 307	F 316	320	350	361	313	313	R 321	R 329	R 326	341	R 293	314	316	323	318	303	309	F 303	F 318	F 306
10	F 306	F 293	F 298	F 320	325	301	269	309	340	315	326	319	R 316	298	327	A	328	A	314	291	315	315	328	F 286
11	F 295	F 308	F 307	F 295	F 321	338	325	335	325	362	325	326	297	287	307	330	332	343	324	J S 312	311	304	F 290	F 285
12	F 289	F 294	F 296	F 315	321	305	312	345	329	332	A	323	305	318	319	321	318	311	327	348	A	301	F 291	F 281
13	307	F 295	F 288	F 304	317	F 314	326	325	V 325	322	409	287	262	315	293	A	317	307	327	313	336	F 274	F 278	F 322
14	U S 273	F 301	F 316	325	314	315	296	333	334	317	322	273	296	U R 296	318	R 333	A	309	303	328	F 336	288	291	305
15	A	F 290	F 300	F 286	F 285	323	328	357	328	349	253	285	331	310	A	A	A	322	322	317	326	293	297	318
16	F 278	F 293	F 278	F 267	F 297	S 277	A	333	348	A	338	296	281	R 277	274	294	316	334	333	324	322	330	343	301
17	298	297	297	300	333	323	V 334	345	V 336	334	340	A	A	A	A	314	316	314	310	306	313	306	310	F 321
18	F 310	315	302	309	325	312	V 312	A	350	A	316	308	325	319	328	340	319	310	321	308	318	313	292	F 310
19	F 325	F 318	F 297	F 302	F 291	341	352	315	330	341	340	331	279	291	301	308	315	322	A	324	F 316	F 296	A	F 311
20	F 322	319	324	315	316	320	368	310	R 332	R 316	342	333	U R 285	A	310	344	329	A	326	299	300	F 318	F 297	323
21	348	313	313	324	334	336	347	R 370	380	337	332	320	295	301	300	318	318	322	348	338	319	310	300	F 289
22	348	F 283	F 297	F 313	F 300	F 311	298	342	312	A	290	325	321	309	313	R 317	326	323	318	326	316	300	320	336
23	322	F 291	F 294	F 307	339	357	J R 325	336	340	C	C	C	C	C	C	C	C	C	A	322	322	A	F 320	F 293
24	F 305	F 296	F 311	F 321	310	299	314	349	A	A 314	333	A	R 299	315	309	332	352	350	330	296	316	315	313	319
25	311	304	306	323	307	318	366	344	359	333	313	340	334	338	332	335	332	319	314	315	340	331	327	313
26	U R 308	F 299	301	F 310	309	S 330	307	345	357	352	348	317	R 332	318	323	A	A	329	344	S 310	314	317	322	308
27	308	311	327	327	317	311	384	346	344	355	344	316	318	308	R	317	321	326	322	319	339	319	312	F 296
28	F 311	F 317	321	336	352	331	R 346	348	338	332	328	335	316	317	301	285	274	316	347	321	345	294	301	F 304
29	287	298	318	358	F 330	R 317	335	346	349	322	322	U R 304	U R 356	A	292	R 313	323	330	314	317	328	F 326	287	F 290
30	F 288	A	311	F 294	R 276	F 278	310	352	302	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	321	321	332	342	323	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	27	28	30	30	30	28	26	28	27	25	26	23	25	23	23	23	24	26	27	30	29	27	28	29
MED	F 306	F 301	F 307	F 312	319	320	327	344	330	326	328	316	300	310	309	314	318	322	322	318	322	310	308	F 304
U Q	314	312	315	323	333	334	347	348	344	336	339	326	323	318	319	330	327	329	331	328	336	322	320	316
L Q	F 293	F 296	F 298	F 302	F 307	312	312	330	312	314	317	287	286	291	293	308	312	311	314	308	314	296	294	F 294

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IONOSPHERIC DATA STATION Kokubunji

AUG.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							U L 385	L	391	361	391	400	388	A	A	A	A	A	L 361					
2							A	A	383	401	A	419	A	A	A	A	A	A	A					
3							A	375	381	376	410	A	A	A	403	398	369	A	A					
4							349	375	361	421	418	385	380	406	406	372	367	A	A					
5							A	A	A	425	A	388	A	387	389	378	L 355	A	A					
6						A	A	A	A	386	A	A	A	374	R 372	368	377	A	A					
7							L	385	410	413	425	432	R 437	A	404	A	A	A	L					
8						A	A	A	H 385	388	406	H 418	401	402	408	362	A	394	L 374					
9							A	A 382	404	410	411	A	A	A	403	384	376	351	U L 343					
10							363	374	A	412	396	398	A 342	A	A	A	A	A	U L 360					
11							L	L 374	382	367	411	L 408	R 393	387	A	368	380	A						
12							353	366	L 379	376	A	A	A	A	383	A	A	A						
13							U L 375	L	A	412	L 426	417	A	A	A	A	363	L 348	A					
14							A 348	L 378	399	376	357	375	383	377	384	A	A	A 341	L					
15							L	L 364	389	383	395	412	382	379	A	A	A	A	A					
16							A	375	A	A	404	377	385	380	367	371	369	363						
17							L	359	A	A 363	383	A	A	A	A	A	A	A	A					
18								A	A	A	390	381	379	378	R 372	376	L	L	L					
19								U L 355	A	397	384	381	392	396	373	364	A 359	A	A					
20							L	363	373	404	396	393	404	A	392	Y	A	A						
21								L 381	392	A 385	411	393	420	384	389	373	361	343	A					
22							L	L 376	377	A	A	A	367	391	381	A	A	L 348	L					
23							L	L 356	370	C	C	C	C	C	C	C	C	C	A					
24								A	A	A	389	A	396	H 399	394	A	373	A						
25							L 422	U L 393	368	L 384	378	374	405	408	392	371	363	U L 349						
26							L	H 361	L 383	395	399	Y	A	A	A	A	A	A						
27								L	385	399	396	420	412	424	A	365	L 355	L 368	L					
28							L	L	379	L	401	A 345	A 346	354	368	358	355	L 335	L					
29							L	359	A 373	390	A	A	A	A	A	A	A	L 328	A					
30							A	394	A	C	C	C	C	C	C	C	C	C	C					
31							C	C	C	C	C	C	C	C	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	20	20	23	22	19	18	16	18	14	14	11	4					
MED							363	374	382	390	398	393	390	387	389	371	365	L 348	L 360					
U Q							L 385	380	390	410	411	417	404	400	403	376	373	363	L 368					
L Q							349	362	375	376	390	381	380	378	373	365	359	L 341	U L 352					

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AUG. 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							258	300	396	370	600Y	Y	416	438	A	A	A	306	258					
2							A	330	342	334	A	502L	A	A322	A	436	A	368	322					
3							274	320	604	374	344	A	374	346	534	390	366	284	306					
4							376	258	G	550	G	380	350	502	354	340	310	316	266					
5							A	A470	A	316	A308	576	466	450	342	354	406	374	A312					
6						A	310	A284	A	352	A	A	A	Y	346	330	308	EA326	A					
7							292	262	370	316	314	444	418	A	466	354	304	262	254					
8						A	A	A	280	292	296	336	346	318	304	340	A	318	270					
9							EA278	266	342	318	298	314	302	290	388	352	332	290	274					
10							478	314	272	314	290	332	386	332	310	A	308	A	294					
11							280	276	302	270	318	336	388	390	340	288	294	278						
12							334	264	290	324	A	350	A378	352	330	332	322	316						
13							332	L276	314	302	236	428	496	316	EA384	A	340	308	264					
14							342	262	280	328	308	Y444	386	374	314	290	A	314	292					
15							270	266	310	282	532	406	316	356	A	A	A	AE310	A284					
16							A	272	270	A	314	404	424	436	432	354	302	244						
17							272	272	280	292	284	A	A	A	AE352	A	336	A326	314					
18								A	A304	A	326	350	308	328	292	282	L322	312	256					
19								334	286	280	284	324	440	380	366	326	298	EA310	A					
20							236	340	316	354	284	320	Y446	A	350	276	304	A						
21								230	246	302	318	326	392	360	340	298	314	288	250					
22							L326	268	318	A	EA376	312	312	352	340	298	296	290	274					
23							286	294	278	C	C	C	C	C	C	C	C	C	A					
24								264	A	EA338	296	A	362	306	316	266	268	252						
25							222	250	244	312	354	292	290	312	304	292	296	292						
26							254	266	264	280	294	350	296	326	A318	A	A	290						
27								242	278	282	294	342	324	352	368	332	302	282	270					
28							264	256	294	268	316	292	342	340	366	380	390	278	242					
29							264	280	272	326	326	338	302	A	412	320	298	274	A278					
30							A	248	298	C	C	C	C	C	C	C	C	C	C					
31							C	C	C	C	C	C	C	C	C	C	C	C						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							20	28	27	25	25	23	25	23	24	23	22	26	19					
MED							279	270	294	315	311	342	374	352	342	331	308	294	272					
U Q							329	297	318	336	335	406	417	380	376	354	332	316	294					
L Q							264	262	278	287	294	324	314	322	317	292	298	282	258					

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AUG. 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	268	A 294	282	282	278	236	H 210	242	A 264	240	216	210	236	A	A	A	A	A	244	242	A 270	A	282	A
2	A 326	298	276	E A 312	290	A	A	A 230	208	A	210	A	A	A	A	A	A	A	A	A 270	234	A 326	276	268
3	282	300	298	268	242	222	A	236	228	238	196	A	A	A	212	218	E A 276	A	A	286	276	266	268	272
4	A 296	300	338	330	308	252	242	220	194	190	228	230	204	208	214	A 240	A	A	A	A 266	262	330	A 338	294
5	284	270	242	246	236	244	A	A	A 194	A	A 244	A	202	204	218	234	A	A	A	A 284	236	230	A	260
6	294	338	298	274	258	A	A	A	A 208	A	A	A	224	230	258	A 222	A	A	A	256	A 288	A	A 276	312
7	332	338	294	234	252	246	224	224	208	192	192	180	170	A 206	A	A	A	A	226	238	232	288	282	264
8	A 336	A	290	264	236	A	A	A	H 206	188	202	H 176	206	194	202	220	A	228	230	238	216	224	A 326	326
9	278	294	282	270	302	258	A	A 236	196	196	200	A	A	A	210	206	212	236	244	254	278	288	236	302
10	264	290	284	276	230	276	250	236	A	206	208	A 234	A	A	A	A	A	A	250	272	248	252	226	274
11	298	270	288	326	276	246	232	224	202	248	H 174	210	220	206	A	A 256	A 260	A	260	258	260	276	302	A 346
12	A 358	A 344	290	278	272	268	E A 272	224	224	A 250	A	A	A	A	222	A	A	A	A 262	A 256	A	268	288	A 342
13	284	306	308	284	252	258	220	214	A	192	196	172	A	A	A	A	240	230	A	A 278	240	A 370	334	252
14	324	284	256	272	282	250	A	210	202	H 206	A 234	226	214	226	212	A	A	A	A 258	A 270	262	258	284	E A 364
15	A 348	302	294	324	266	242	232	H 192	214	186	200	226	228	A	A	A	A	A	A	270	250	A 280	288	262
16	A 362	306	316	316	256	274	A	A 250	A	A	214	222	224	220	242	212	226	236	246	240	252	248	238	264
17	310	296	322	326	274	262	232	A 248	A	E A 274	226	A	A	A	A	A	A	A	A	274	266	288	290	258
18	266	292	286	290	268	294	226	A	A	A	H 182	228	234	240	230	226	224	H 220	242	254	244	242	A 338	316
19	246	274	304	312	312	254	236	E A 264	A	214	236	220	210	198	H 198	228	A	A	A	A 270	276	298	A	294
20	250	248	266	280	274	270	212	190	192	210	H 186	204	212	A	202	A	A	A	244	286	288	290	300	250
21	222	240	252	260	246	254	242	226	222	A 244	206	198	204	196	202	234	226	226	A	236	224	264	278	314
22	232	328	310	268	262	264	232	218	214	A	A	A	A 244	190	212	A	A	238	250	248	272	280	264	250
23	A 292	312	300	276	234	234	234	230	224	C	C	C	C	C	C	C	C	C	A	244	252	A	268	318
24	306	290	290	278	282	282	234	A	A	A	192	A	194	H 190	214	A	A 238	A	246	298	252	252	250	272
25	272	278	280	254	288	258	196	H 190	244	206	188	Y 246	196	204	206	H 200	220	220	256	254	232	234	236	242
26	270	292	286	276	286	238	214	H 188	H 218	218	192	Y	A	A	A	A	A	A	248	266	256	254	252	268
27	262	276	240	258	254	264	220	208	226	H 190	H 192	194	178	178	A	250	228	242	258	252	228	236	258	290
28	268	264	262	234	234	252	240	212	218	202	180	A	A	228	228	H 210	218	250	246	254	226	272	266	278
29	288	284	262	224	286	282	252	A E 238	A 260	214	A	A	A	A	A	A	A	240	A	256	242	242	302	318
30	A 390	A	E A 370	286	A 384	328	A	A 254	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	258	242	234	224	A 270	328
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	30	30	30	28	21	24	20	24	22	18	16	16	18	14	14	11	18	30	29	27	28	29
MED	284	293	290	276	272	260	232	226	218	208	194	210	213	204	211	219	226	236	247	256	252	266	277	276
U Q	310	309	300	286	286	275	242	A 240	227	228	208	228	228	225	222	234	A 240	240	258	270	268	288	295	317
L Q	266	277	280	264	252	248	220	213	204	195	188	198	200	195	204	212	222	226	244	248	234	242	261	263

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AUG. 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	E A 154	A 136	A	A	A 136	122	112	112	112	112	112	112	A					
2						B	116	116	112	A	112	A	A	A	A	A	116	116	A					
3						B	A	A	A	A	A	A	A	A	126	132	128	120	A					
4						B	A	124	116	128	A	A	A	A 126	118	118	118	118	116					
5						B	128	124	116	116	116	116	A	116	A	116	120	122	A					
6						B	A	A	114	110	110	A	A	A	A	A	A	112	A					
7						B	122	120	A	A	A	A	A	A	114	114	114	114	A					
8						B	A	A	A	A	A	A	116	A	122	A	A	A	A					
9						B	A	116	A	112	A	A	A	A	122	A 128	A 126	122	A					
10						B	A	116	114	112	112	112	112	112	116	116	112	116	A					
11						B	A	A	116	A	116	A	118	118	120	116	A 132	116	B					
12						B	120	114	122	114	112	112	112	120	116	116	116	116	A					
13						B	A	A 130	A	A	A	A	A	A	A	A	A	120	A					
14						B	A	A	A	A	A 130	120	116	118	A	116	124	120	A					
15						B	120	A	A	A	A	114	116	116	118	A 128	E A 138	124	B					
16						B	A	114	114	114	108	A	A	A	126	114	120	122	A					
17						B	A	118	118	114	A	A	A	A	A	A	A	A	A					
18						B	122	118	114	A	A	A	A	A	A 124	120	A 130	116	A					
19						B	124	A 126	114	114	114	116	B	118	122	116	120	120	A					
20						B	A	124	124	A	108	A	116	A	A	A	A 124	A	A					
21						B	128	124	126	122	122	114	A	A	114	A 132	A	A	A					
22						B	A	E A 134	A	A 128	114	A	A	114	A	A	A	A	B					
23						B	126	122	A	C	C	C	C	C	C	C	C	C	B					
24						B	A	116	112	112	112	A	A	120	108	114	116	114	B					
25							124	118	126	A	124	112	114	A	118	A	A 132	A	B					
26							A 130	128	A	A	A	A	114	120	116	116	112	112	B					
27							134	134	120	118	118	118	118	118	120	120	A	A	A					
28							124	118	E A 146	116	116	A	118	120	120	118	114	120	B					
29							134	A 130	A 132	A 136	116	114	A	A	114	A	A	A	A					
30							A	118	118	C	C	C	C	C	C	C	C	C	C					
31							C	C	C	C	C	C	C	C	C	C	C	C	B					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							15	24	19	15	18	11	12	14	20	19	20	20	1					
MED							124	120	116	114	115	114	116	118	118	116	120	117	116					
U Q							130	A 127	124	122	118	118	117	120	122	A 120	A 127	120						
L Q							122	117	114	112	112	112	113	116	115	116	115	115						

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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	108	114	108	B	108	108	106	122	112	108	106	140	136	130	118	118	114	116	114	114	112	116	112	104
2	104	106	104	100	120	114	114	114	112	112	108	108	106	98	98	122	116	112	108	106	106	106	106	102
3	106	96	98	102	98	132	138	108	104	102	156	100	106	100	178	170	124	124	122	108	116	112	112	108
4	108	104	104	126	106	132	120	132	114	182	114	108	108	106	116	G	130	120	112	106	108	106	104	106
5	106	104	104	100	B	144	126	118	116	118	112	112	112	112	112	122	136	122	112	114	112	134	108	106
6	110	108	106	118	104	112	110	112	110	110	110	110	110	112	106	120	132	112	112	116	108	106	104	102
7	100	98	96	98	96	B	122	144	104	108	104	108	112	108	G	128	124	112	116	104	104	110	112	104
8	104	106	106	110	110	108	106	106	108	192	106	106	108	104	104	100	100	102	98	108	108	130	96	114
9	122	98	B	B	122	114	110	106	110	112	108	106	104	102	112	108	158	132	120	112	116	116	B	110
10	104	110	110	110	110	112	122	116	110	114	116	110	116	136	130	118	116	110	120	120	106	104	B	118
11	116	134	138	126	126	118	120	118	116	114	G	118	126	120	114	116	130	118	114	116	116	116	114	112
12	106	110	106	106	108	118	122	132	120	118	122	112	116	142	144	126	118	118	116	124	112	124	118	108
13	108	104	106	98	114	110	100	116	122	114	112	114	106	110	104	102	104	132	98	98	96	116	118	112
14	108	106	110	104	106	104	106	172	156	110	144	146	148	180	144	120	114	116	114	110	114	114	114	112
15	108	108	106	110	B	128	114	104	126	114	112	170	160	148	128	126	120	118	116	116	114	112	112	110
16	104	104	106	106	124	120	112	114	112	108	110	108	106	114	144	134	136	114	106	106	108	104	104	98
17	100	114	100	94	100	102	110	116	112	110	108	104	104	102	104	106	106	104	104	100	98	102	120	112
18	122	102	114	106	110	130	132	120	110	108	110	102	102	104	146	146	116	134	104	98	112	98	108	108
19	110	106	104	B	B	128	128	120	116	118	110	114	B	G	110	G	138	122	112	112	110	112	110	110
20	112	104	102	104	116	114	142	122	122	108	G	106	106	104	156	156	128	118	124	138	112	110	104	102
21	106	B	B	B	110	B	134	126	126	116	128	G	116	122	118	116	112	114	108	106	112	110	112	112
22	110	104	102	128	112	108	110	126	118	110	108	106	108	158	108	100	102	100	96	96	102	114	116	110
23	110	108	108	108	110	128	138	134	128	C	C	C	C	C	C	C	C	C	114	126	110	114	112	110
24	110	116	110	102	104	104	126	116	112	108	112	108	108	104	156	130	128	116	114	110	110	108	104	104
25	102	108	102	B	B	B	G	108	108	108	110	112	G	114	114	116	126	128	114	B	110	110	108	104
26	104	106	108	106	104	102	104	104	100	100	102	100	124	122	116	114	110	110	108	108	108	106	106	B
27	B	B	B	B	S	106	110	174	G	G	154	142	122	116	116	126	120	122	110	108	106	104	114	110
28	104	116	104	110	B	106	126	156	166	128	104	146	138	150	178	132	134	124	114	106	108	B	104	104
29	98	B	B	104	B	B	150	130	128	126	120	126	104	116	114	112	102	104	104	120	120	110	114	114
30	112	104	104	116	104	106	116	120	118	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	114	108	108	106	106	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	27	26	24	23	26	29	30	29	27	26	27	26	27	27	26	28	28	30	29	30	29	28	29
MED	108	106	106	106	110	113	120	119	114	112	110	110	109	114	116	120	120	117	113	108	110	110	111	108
U Q	110	110	108	110	114	128	127	130	122	118	116	118	122	130	144	128	130	122	114	116	112	115	114	112
L Q	104	104	104	102	104	106	110	114	110	108	108	106	106	104	110	114	113	112	108	106	108	106	105	104

AUG. 1997 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

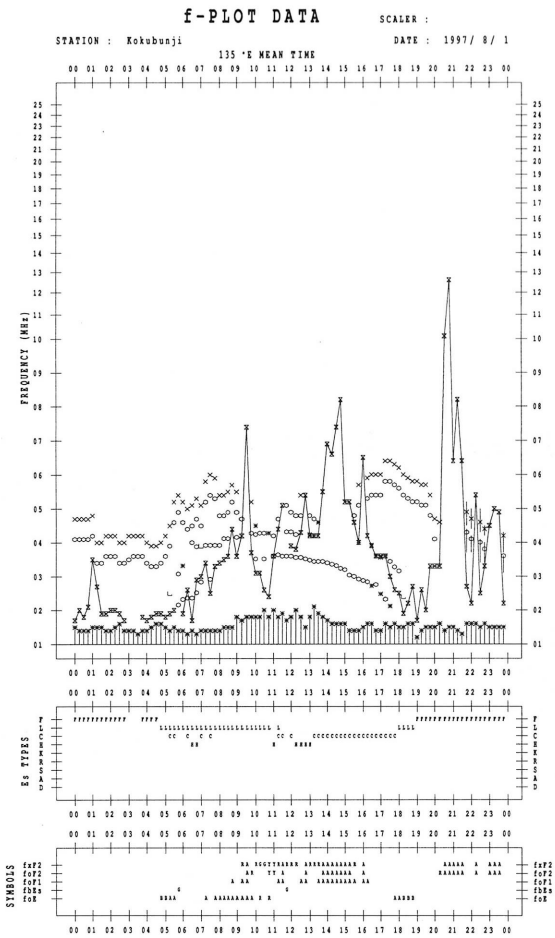
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

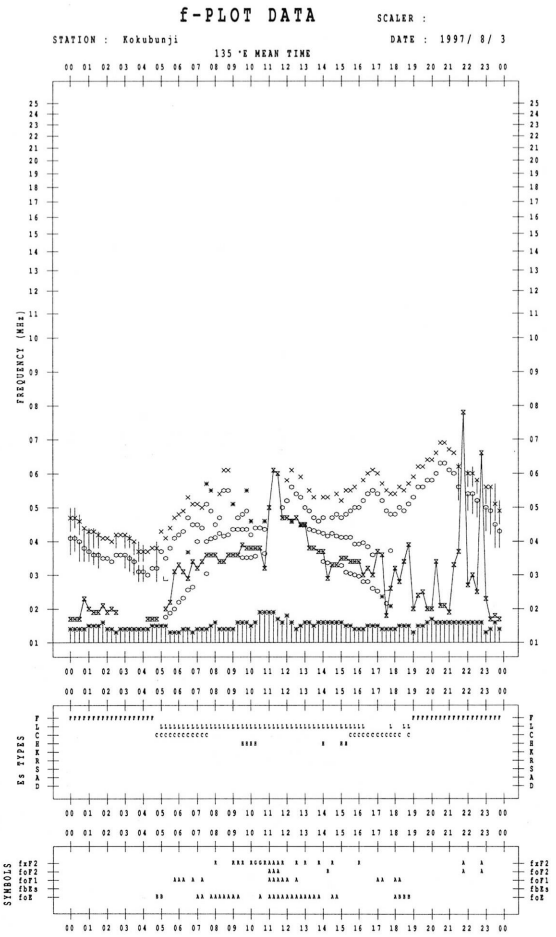
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 1	FF 21	F 3		F 2	L 2	L 1	CL 12	L 1	L 2	L 1	H 1	C 1	H 1	C 2	C 2	C 3	C 3	L 5	F 4	F 3	F 6	F 5	F 7
2	F 3	F 3	F 3	F 3	F 4	L 5	C 5	C 3	C 2	C 1	L 2	L 1	L 2	L 2	L 2	CL 22	C 3	C 3	L 4	L 3	F 3	F 3	F 3	F 1
3	F 1	F 2	F 1	F 1	F 1	CL 11	CL 32	LC 32	L 2	L 2	HL 11	L 2	L 2	L 2	HL 11	HL 11	CL 21	C 2	C 2	F 3	F 2	F 5	F 3	F 3
4	F 4	F 2	F 2	FF 12	F 2	L 2	C 2	CL 11	C 1	HCL 11	L 1	L 1	L 1	L 1	C 1		CL 11	C 3	C 3	F 4	F 3	F 4	F 2	F 3
5	FF 22	FF 11	F 1	F 1		C 1	C 3	C 2	C 2	C 1	C 2	C 2	L 2	C 1	L 1	C 1	C 1	C 3	L 4	F 5	F 3	FF 13	F 3	F 3
6	F 2	FF 22	FF 22	FF 11	F 3	L 4	L 4	C 3	C 3	C 2	C 2	C 2	L 2	L 1	L 2	CL 11	CL 11	C 3	C 3	F 3	F 5	F 5	F 3	F 2
7	F 2	F 3	F 3	F 1	FF 11		CL 11	HL 13	L 3	L 1	L 2	L 1	L 1	L 2		C 2	C 2	C 3	CL 23	F 3	F 4	F 3	F 3	F 4
8	F 3	F 4	F 3	F 2	F 1	L 3	L 4	L 3	L 2	HL 11	L 1	L 1	L 1	L 1	L 1	L 2	L 3	LC 31	L 3	FF 35	FF 13	FF 12	F 4	FF 23
9	FF 12	F 2			F 1	L 2	L 3	L 4	L 1	C 2	L 1	L 2	L 2	L 2	L 1	L 1	HL 12	C 2	C 4	FF 31	F 3	F 3		F 5
10	F 3	F 2	F 3	F 3	FF 21	L 1	CL 11	C 1	C 3	C 1	C 1	C 1	C 1	C 2	C 1	C 2	C 2	C 3	CL 22	FF 13	F 2	F 3		FF 12
11	F 1	F 1	F 2	F 4	F 2	C 2	C 2	C 2	C 1	L 1		L 1	C 1	C 1	C 2	C 2	CL 22	C 3	C 5	F 5	F 3	F 2	F 5	F 5
12	F 4	F 5	F 4	F 4	F 3	L 2	C 2	C 1	CL 11	CL 21	CC 23	C 1	C 2	HL 11	H 1	C 2	C 2	C 2	C 3	FF 24	F 4	FF 21	F 2	F 3
13	F 2	F 2	F 2	F 3	FF 22	L 2	LH 11	CL 12	CL 22	L 2	L 1	L 1	L 2	L 2	L 2	L 2	LC 21	CL 11	L 4	F 4	F 4	FF 32	FF 42	F 3
14	F 3	F 2	F 3	F 2	F 2	L 1	L 4	HL 12	HL 12	LH 11	HL 11	H 1	H 1	H 1	CL 11	CL 21	C 2	C 2	C 5	F 6	F 2	F 3	F 3	F 5
15	F 3	F 3	F 2	F 2		C 1	C 2	L 3	CL 11	CL 11	L 1	H 1	HL 11	HL 11	CL 21	CL 21	CL 21	C 5	C 6	F 6	F 5	F 6	F 5	FF 24
16	F 6	F 2	F 2	F 2	FF 12	L 1	L 4	C 2	C 2	C 3	C 1	L 1	L 1	L 1	HL 11	H 1	CL 11	C 2	L 3	F 3	F 3	F 3	F 4	F 2
17	F 1	F 1	F 2	F 2	F 1	L 1	L 2	C 2	C 2	C 2	L 2	L 2	L 3	L 3	L 2	L 3	L 3	L 3	L 3	F 4	F 3	F 3	FF 32	F 2
18	FF 12	F 1	F 1	F 2	F 1	C 2	C 2	C 4	C 2	L 2	L 1	L 2	L 1	L 1	HL 12	HL 11	L 1	H 2	L 2	F 2	F 1	F 1	F 4	F 2
19	F 3	F 4	F 2			C 1	C 2	C 3	C 2	C 1	C 2	C 1			L 1		C 2	C 4	C 4	F 4	F 3	F 3	F 5	F 4
20	F 2	F 2	F 2	F 1	F 1	L 1	CL 11	CL 22	CL 12	L 2		L 1	L 1	L 2	HL 12	HL 12	CL 22	CL 32	L 2	FF 13	F 2	F 4	F 3	F 2
21	F 1				F 1		C 2	CL 11	CL 11	CL 21	CL 11		CL 11	C 1	C 1	L 1	L 2	L 2	L 3	F 3	F 1	F 2	F 2	F 2
22	F 1	F 3	F 2	FF 11	F 1	L 1	L 2	CL 11	CL 12	CL 31	C 2	C 1	C 1	HL 11	L 1	L 2	L 2	L 2	L 3	F 4	F 3	FF 12	FF 32	FF 42
23	FF 41	F 3	F 2	F 3	F 1	CL 11	C 1	CL 21	CL 12										L 4	FF 23	F 2	F 4	F 3	F 5
24	F 5	F 2	FF 13	F 4	F 3	L 4	L 2	C 3	C 3	C 2	C 1	L 2	L 1	L 1	HL 11	C 1	C 2	C 2	L 3	F 5	F 5	F 3	F 2	F 3
25	F 4	FF 11	F 2					L 1	L 1	L 1	L 1	C 1		L 1	C 1	L 1	CL 11	CL 12	L 5		F 1	F 1	F 1	F 2
26	F 3	F 2	F 2	F 2	F 3	F 2	L 1	L 2	L 3	L 2	L 1	LH 21	CL 11	CL 22	CL 21	C 2	C 3	C 4	L 2	F 3	F 2	F 1	F 1	
27						F 1	L 1	HL 11			H 1	H 1	C 1	C 2	C 2	C 1	L 1	CL 22	L 1	F 2	F 2	F 2	F 1	F 2
28	F 2	F 1	F 2	F 2		FF 11	C 2	HL 11	HL 11	C 1	L 1	HL 12	HL 11	HL 11	HL 11	C 1	C 1	C 1	L 2	F 5	F 2		F 2	F 3
29	F 2			F 1			C 1	CL 22	CL 22	CL 11	C 2	C 1	C 2	CL 21	C 2	C 3	L 3	L 5	L 5	FF 23	FF 22	F 3	FF 12	F 3
30	F 6	F 4	F 5	FF 21	F 5	F 2	L 5	C 2	C 3															
31																			L 3	F 3	F 4	F 3	F 3	F 3
	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																								

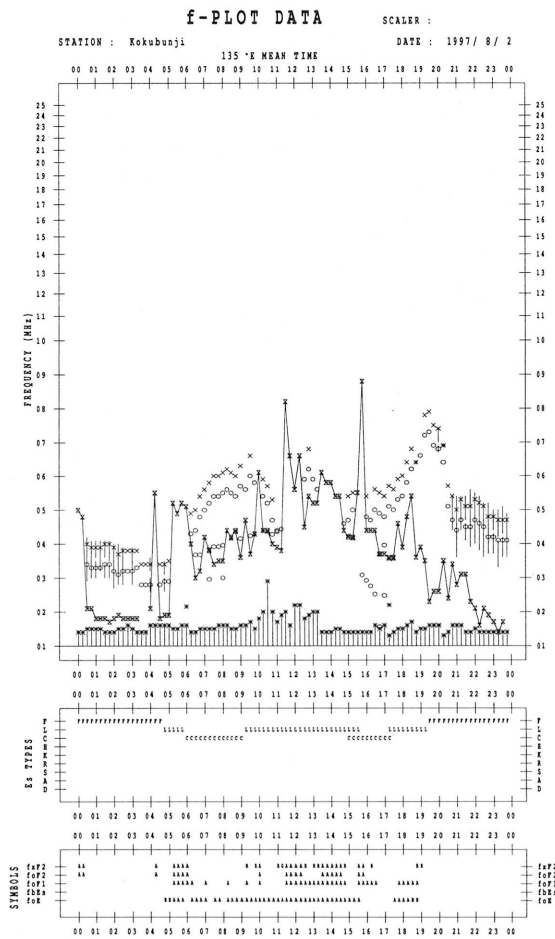
AUG. 1997 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

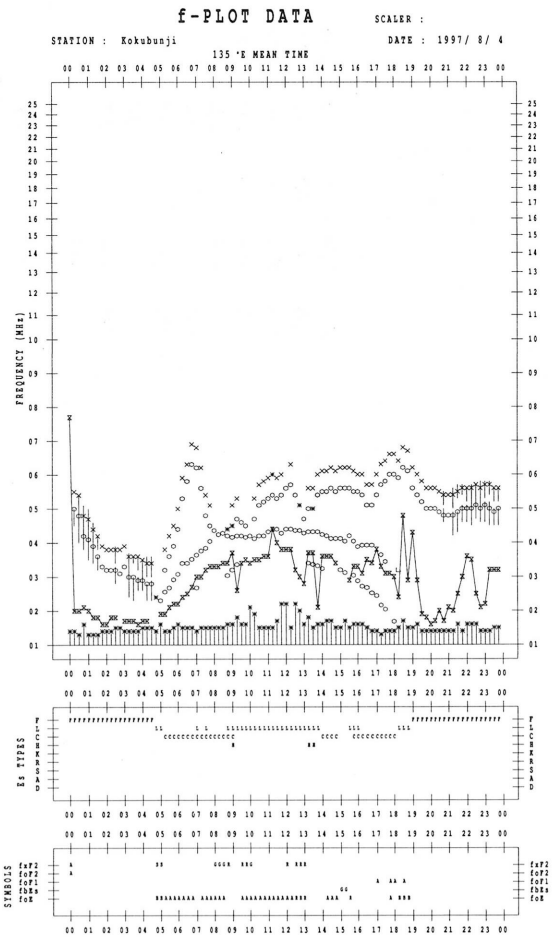
f-PLOTS OF IONOSPHERIC DATA

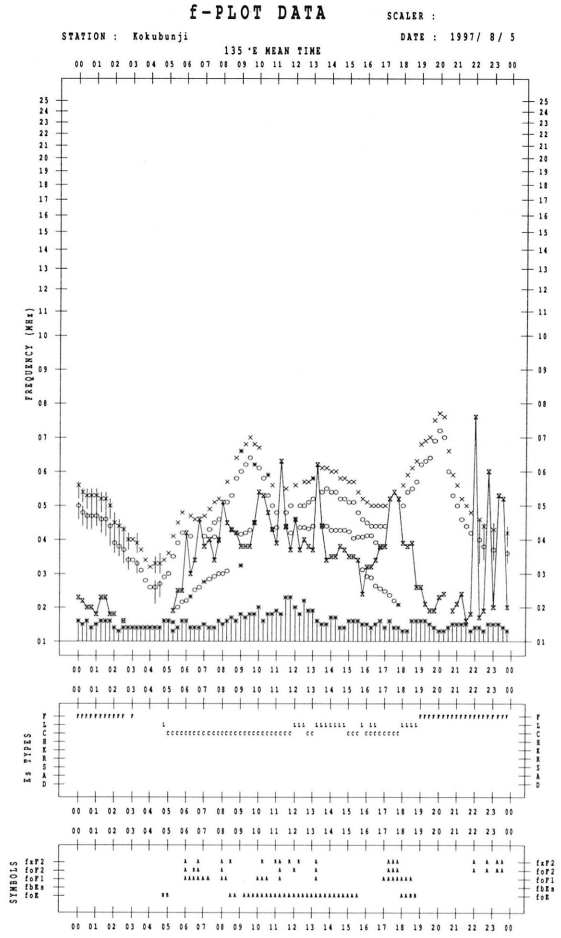
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

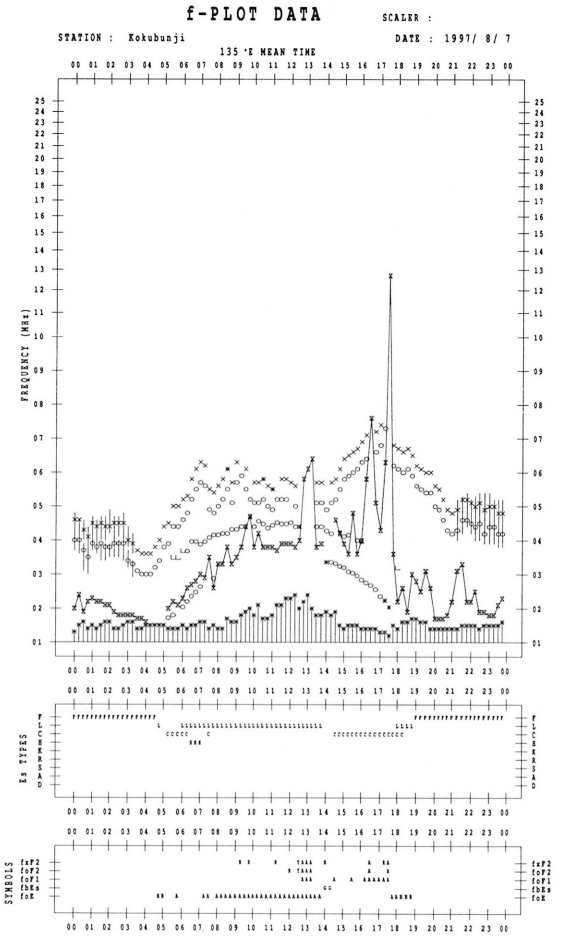

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

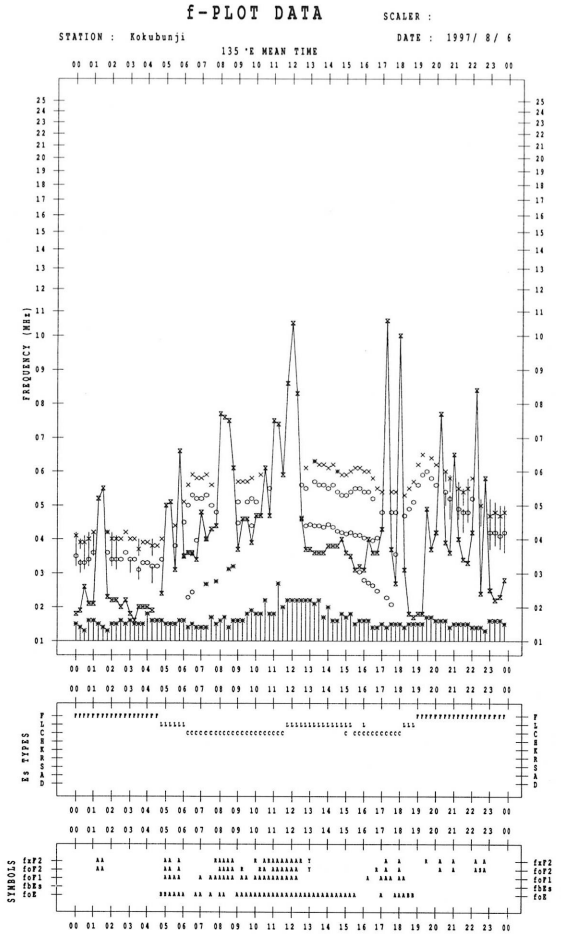

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

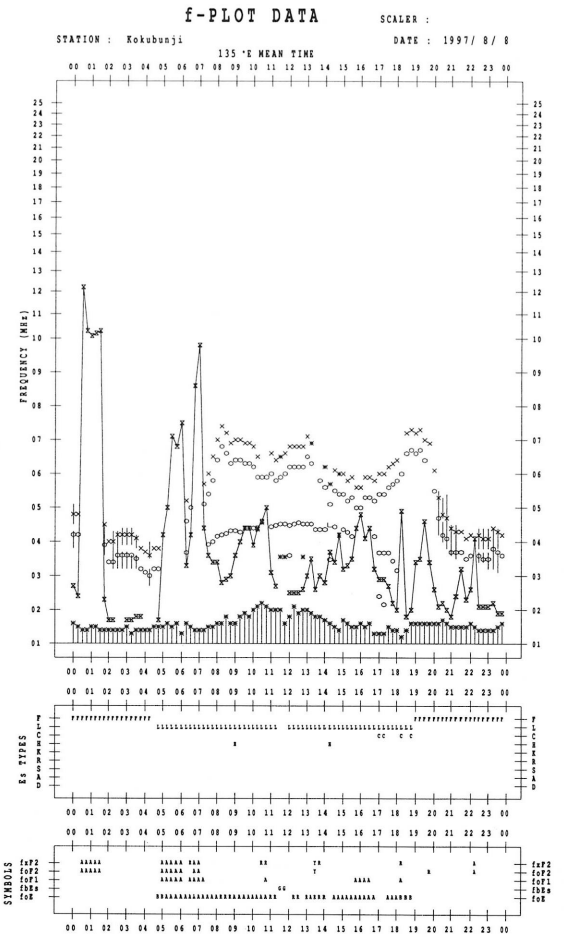

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

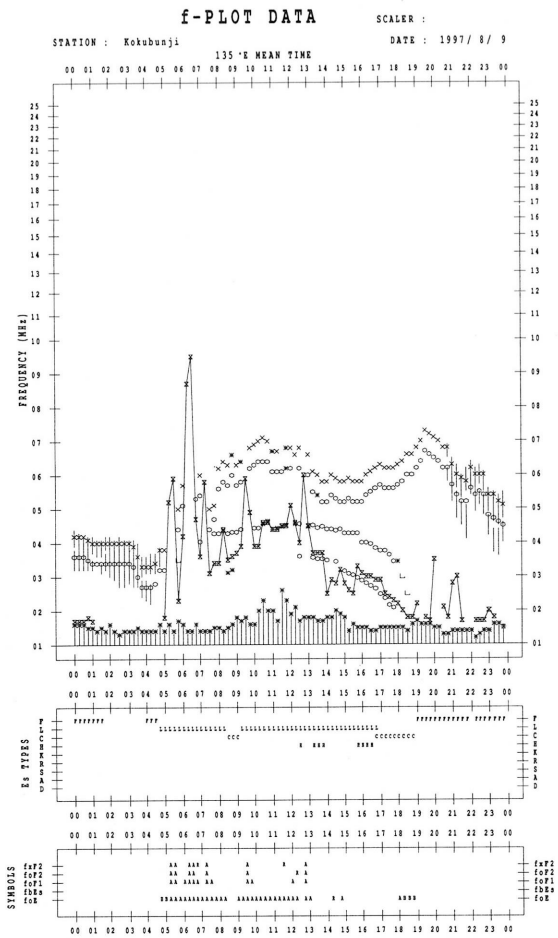

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

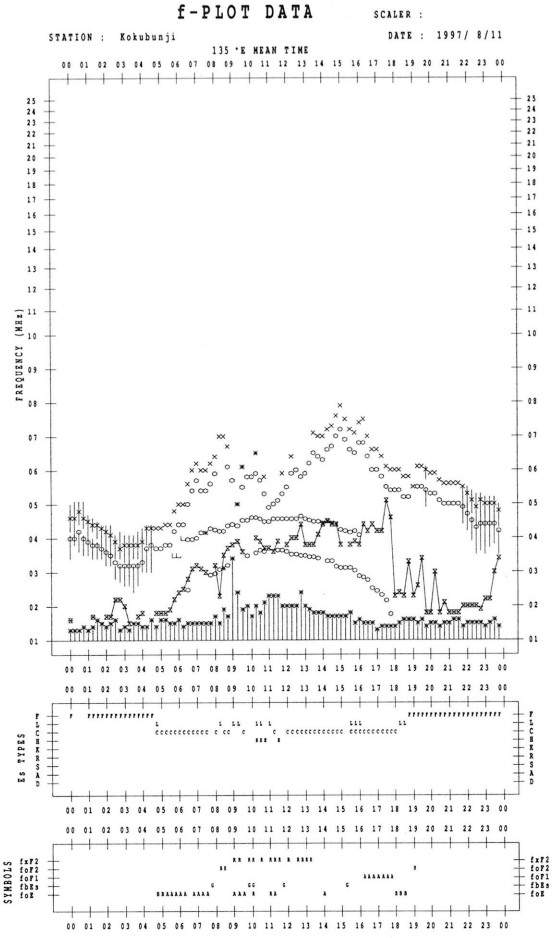

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE

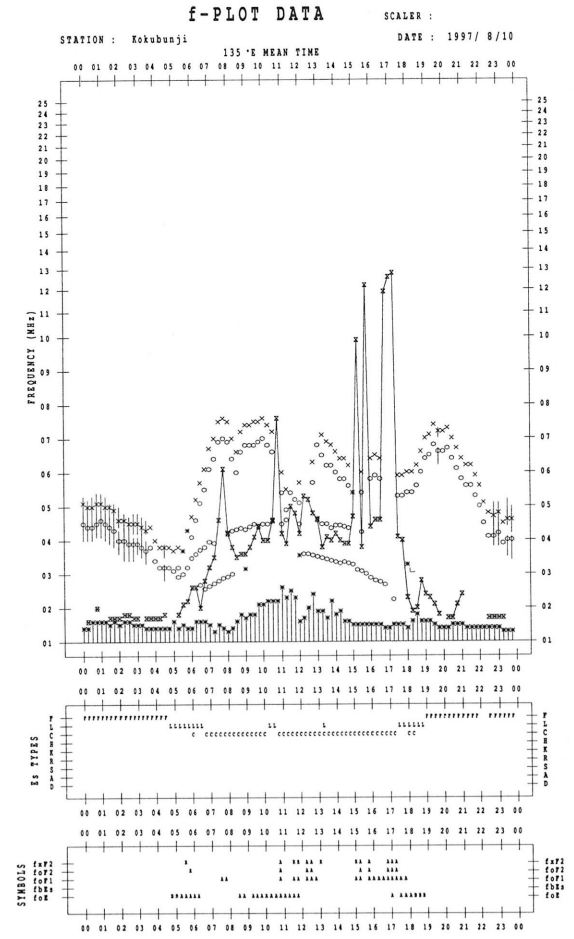

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE

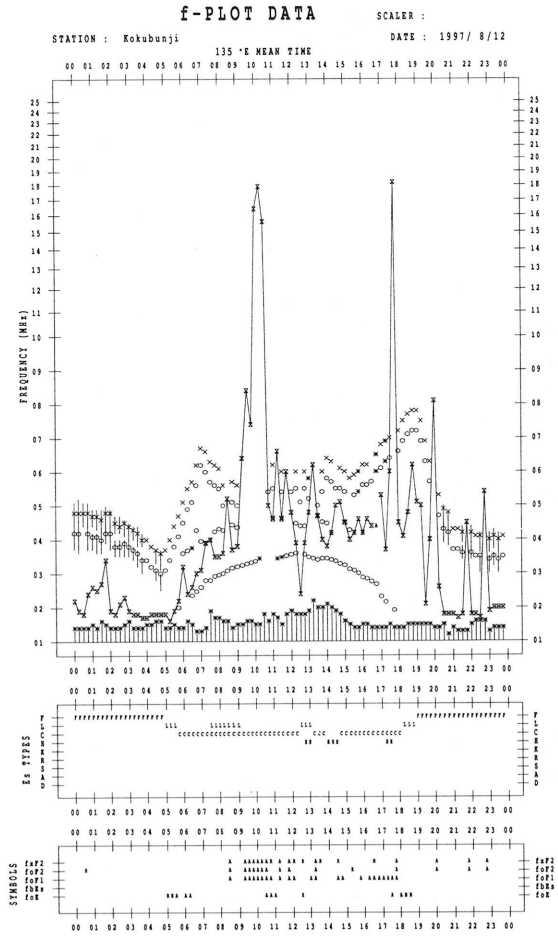

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE

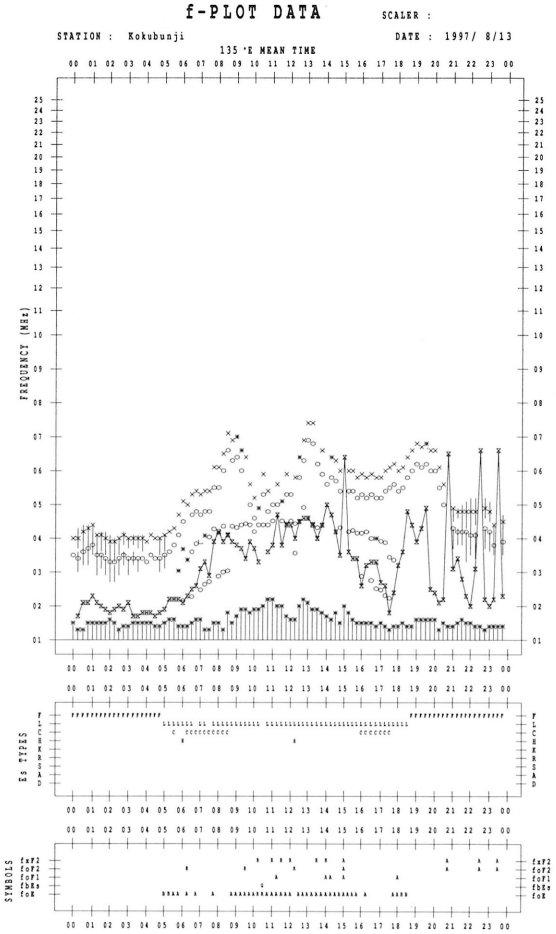

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE

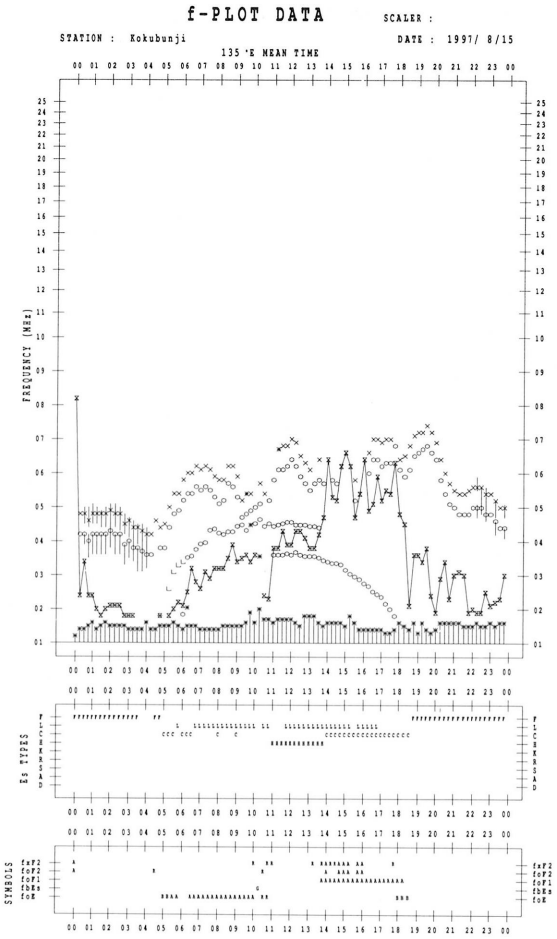

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

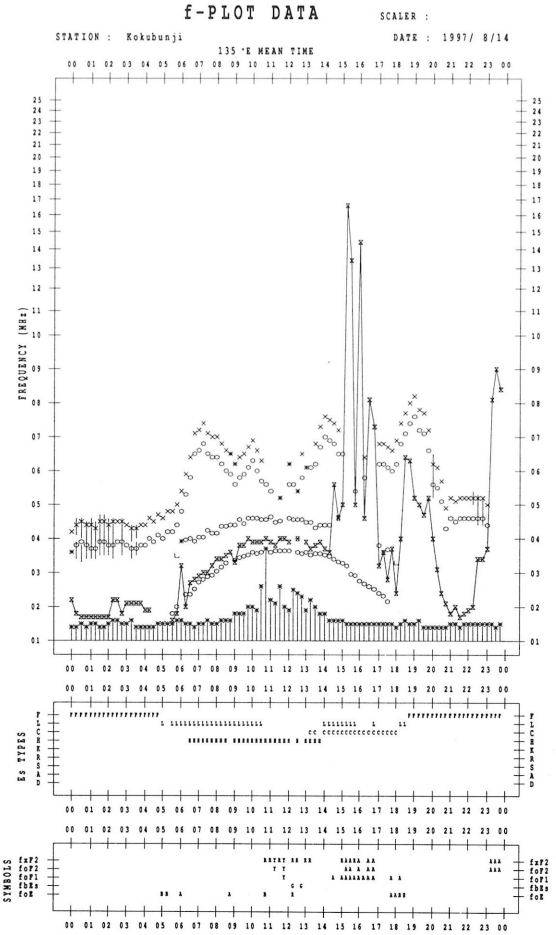

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

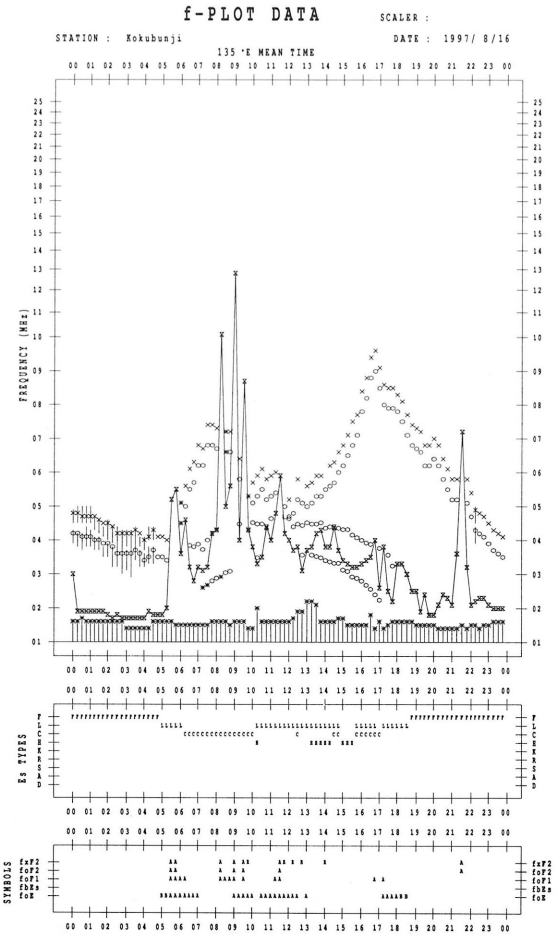

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

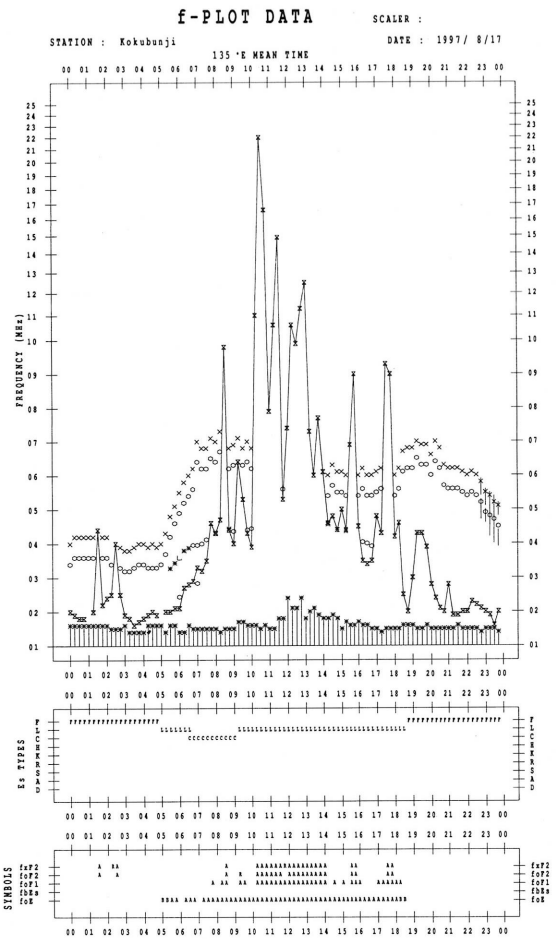

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

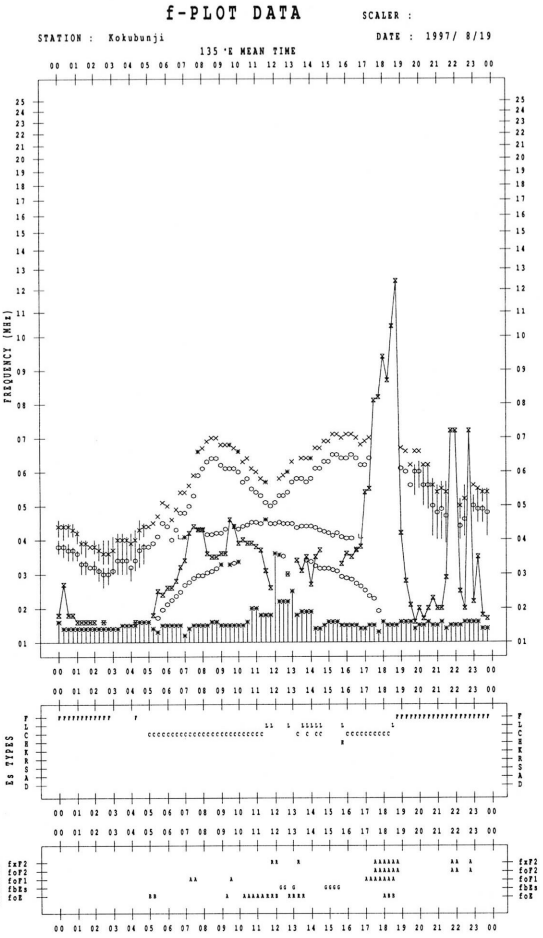

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

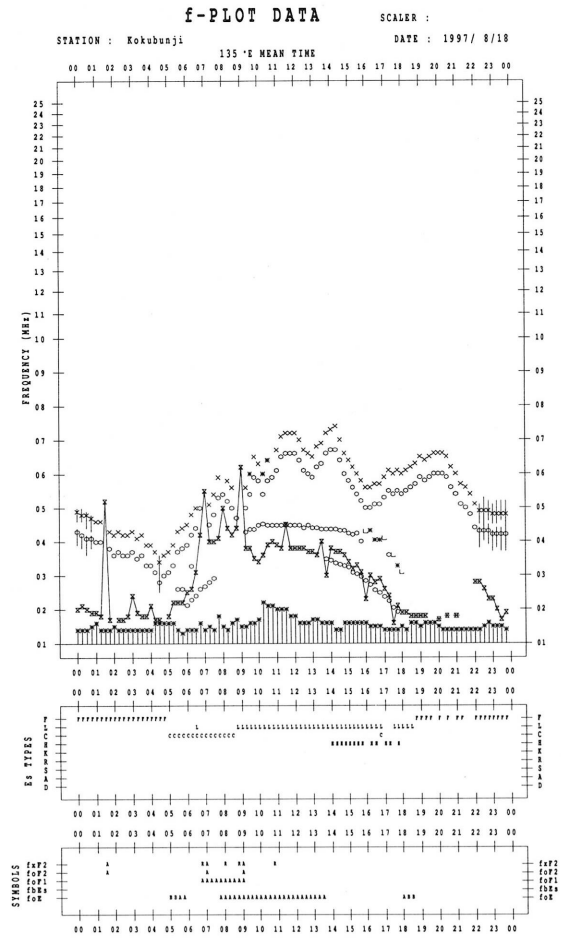

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

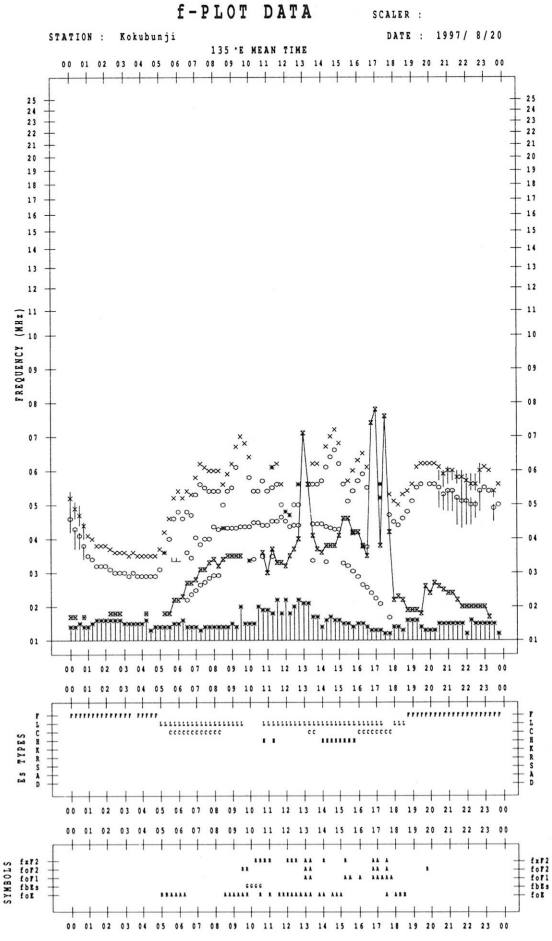

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

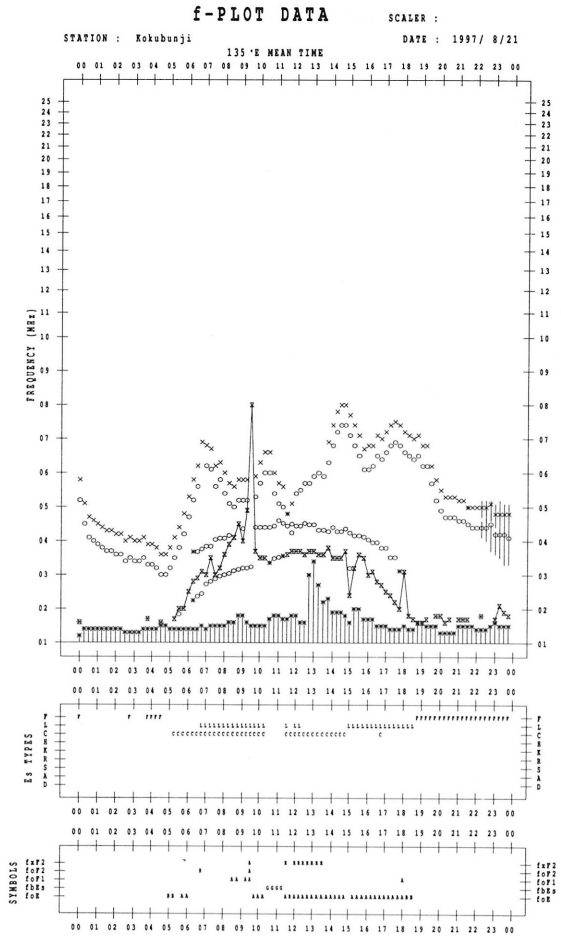

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

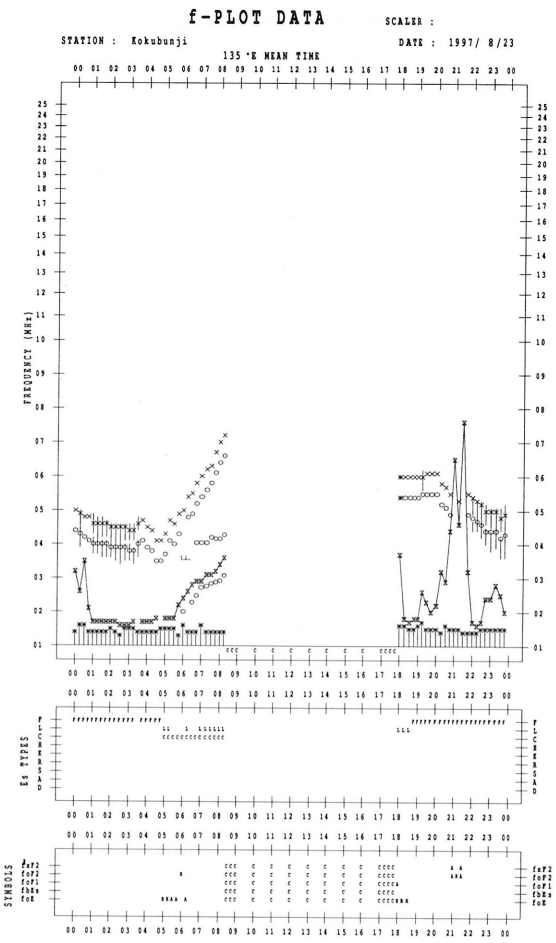

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

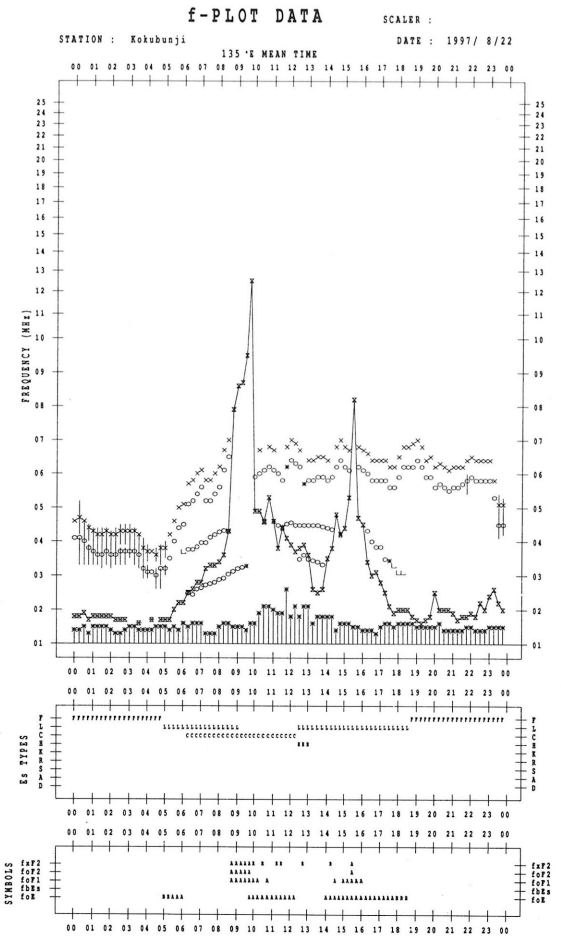

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE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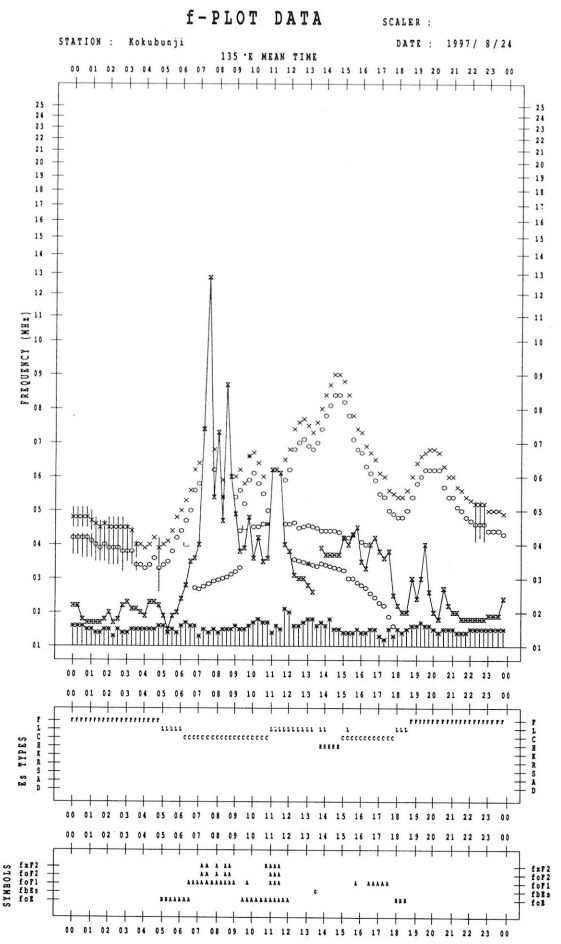
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE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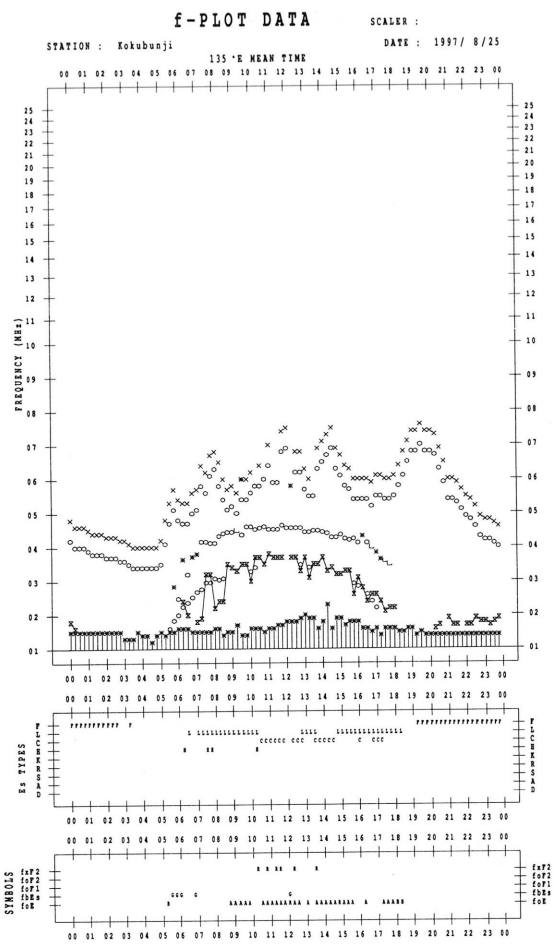
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foE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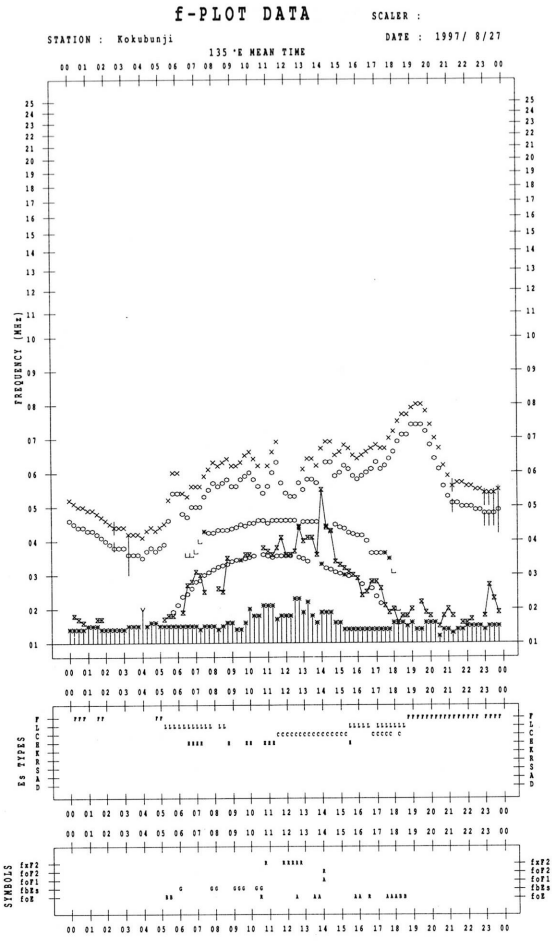
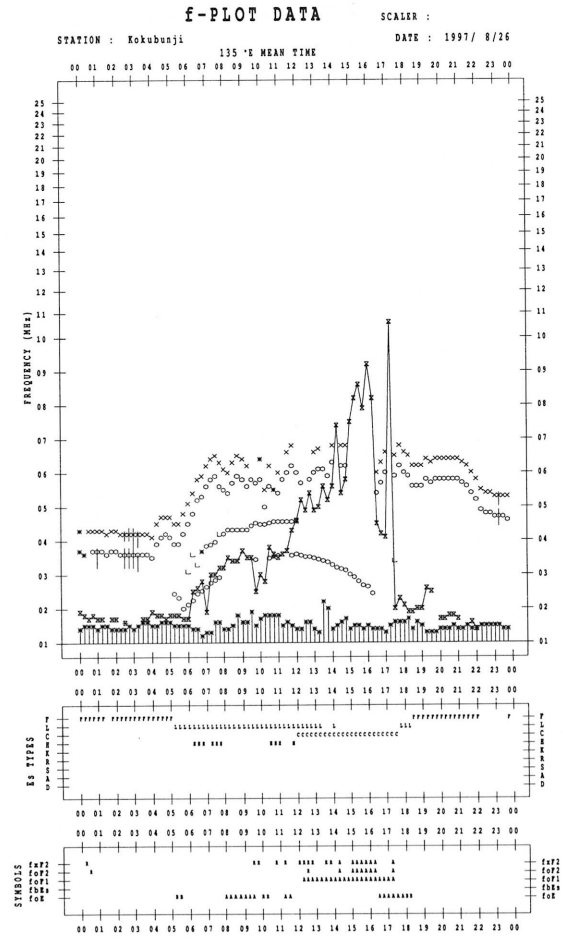
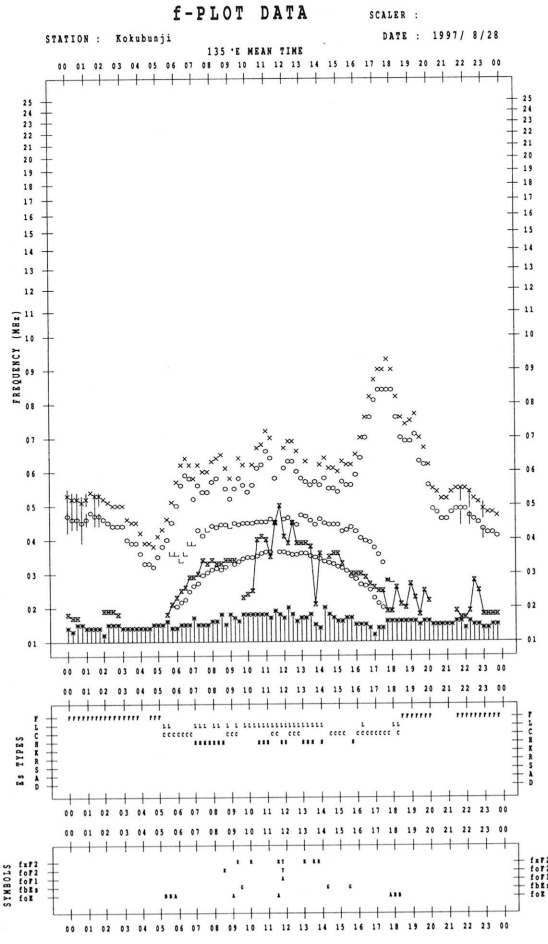
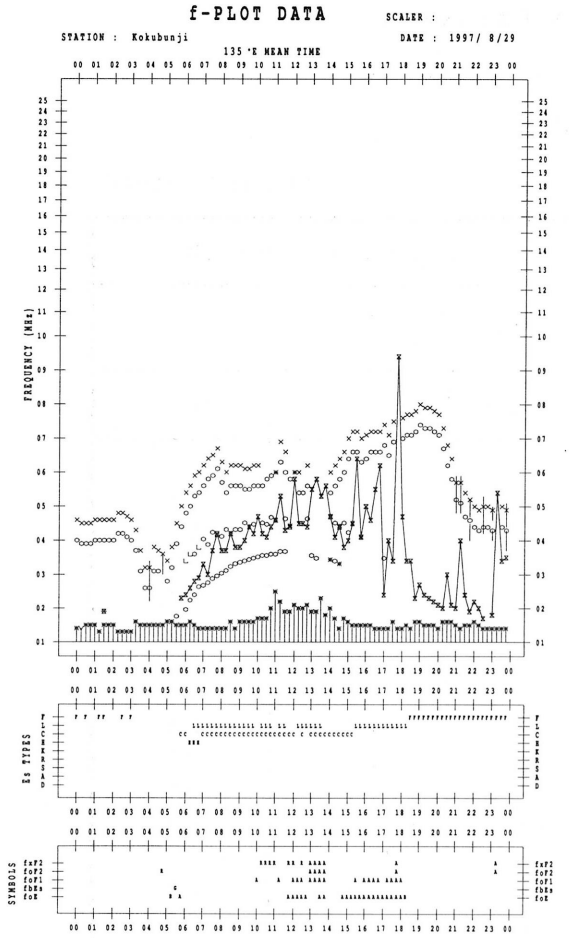
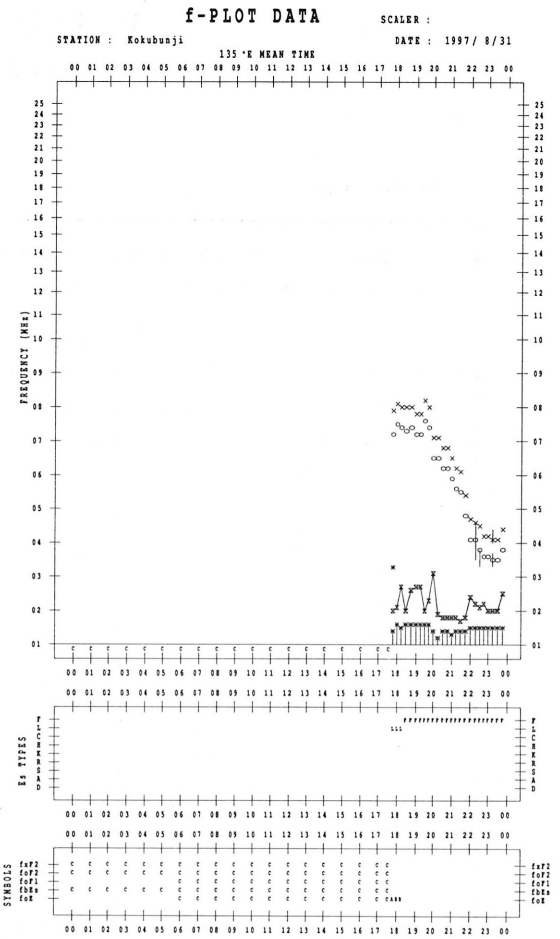
STATION : Kokubunji
DATE : 1997/ 8/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

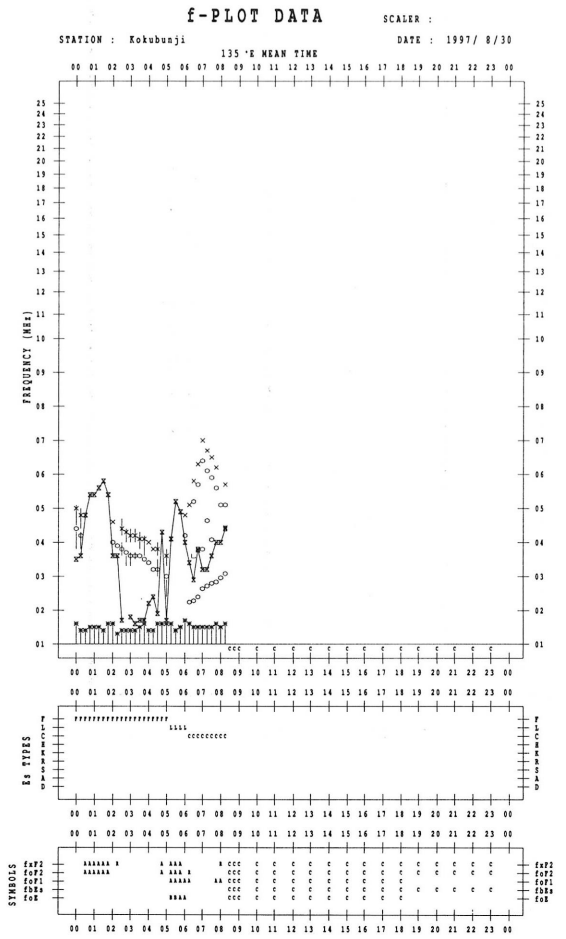

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 8/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

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

Note: No observations during the following periods.
13th 2100 - 18th 0020

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso August 1997

Single-frequency observations

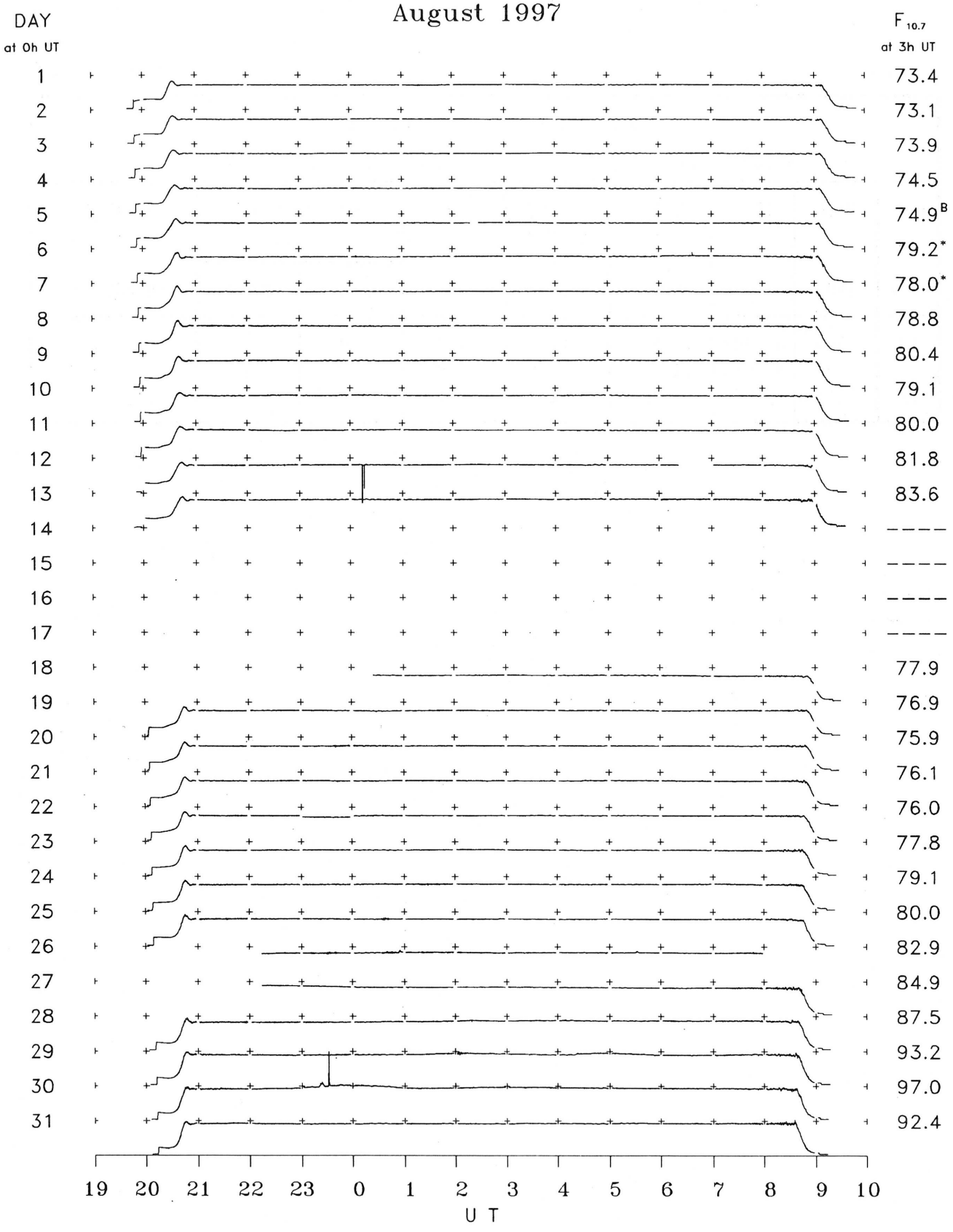
Normal observing period: 1950 - 0930 U.T. (sunrise to sunset)

AUG. 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
12	500	42 SER	2122.7	2123.0	2.0	16	-	0
	200	42 SER	2122.7	2123.2	2.0	34	-	0
18	200	42 SER	2102.5	2103.1	1.0	46	-	WL

B. Solar Radio Emission

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

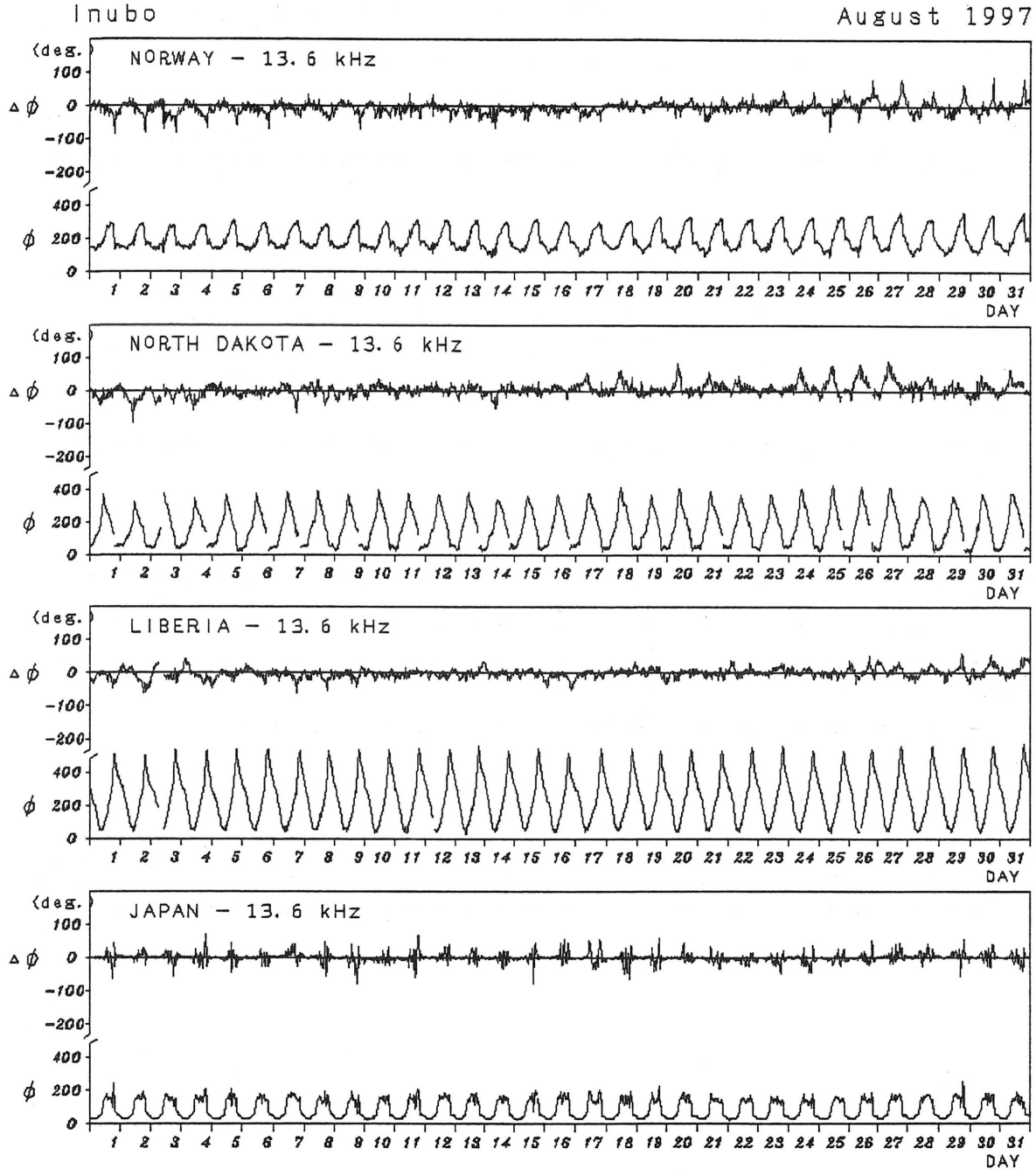
August 1997

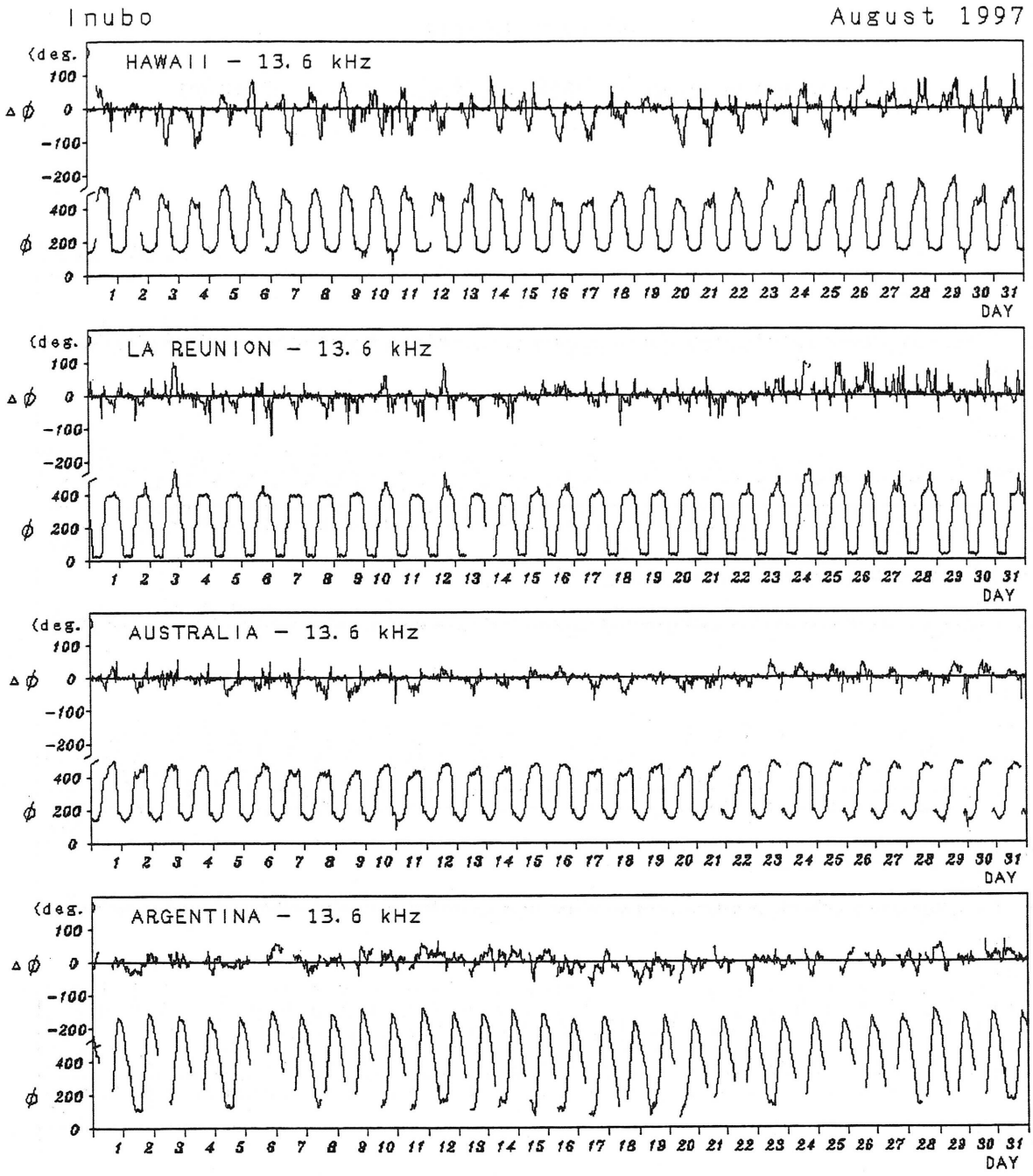


Note: A vertical grid space corresponds to a 100 sfu.
Elevation angle range ≧ 6°.

C. Radio Propagation

C1. Phase Variation in OMEGA Radio Waves at Inubo




Inubo
August 1997
HAWAII – 13.6 kHz
LA REUNION – 13.6 kHz
AUSTRALIA – 13.6 kHz
ARGENTINA – 13.6 kHz
(deg.
Δφ
φ
100
0
-100
-200
400
200
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
DAY

C2. Sudden Phase Anomaly (SPA) at Inubo

Inubo

Aug. 1997	S P A								
	Phase Advance (degrees)						Time (U.T.)		
Date	Ω/N	Ω/L	Ω/LR	Ω/AU	Ω/H	Ω/ND	Start	End	Maximum
9		39					1630	1730	1644
9	11			38	43	24	2347	0100	2352
10			14				0725	0830	0733
10	29				32	44	2010	2104	2026
10	36	39	18	90	79	51	2348	0200	0003
26				36	36	24	0053	0200	0058
26			31	32	25		0530	0630	0540
29	25		22	32	34		0419	0538	0433
29	43		86	112	97	54	2304	0110	2340

IONOSPHERIC DATA IN JAPAN FOR AUGUST 1997
F-584 Vol.49 No.8 (Not for Sale)

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1997年11月28日 発行
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☎ (0423) (27) ７４７８(直通)

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Communications Research Laboratory, Ministry of Posts and Telecommunications,
2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184 JAPAN