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IONOSPHERIC DATA IN JAPAN

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CONTENTS

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INTRODUCTION

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

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

A. IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

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

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

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

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

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

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

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

K Presence of particle *E* layer.

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

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

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

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

Q Range spread present.

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

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

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

V Forked trace which may influence the measurement.

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

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

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

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

B. SOLAR RADIO EMISSION

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

B1. Daily Data at Hiraiso

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

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

0 quiet or no burst,

1 a few bursts,

2 many bursts,

3 very many bursts.

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

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

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

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

B2. Outstanding Occurrences at Hiraiso

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

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

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

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

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

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

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

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

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

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

C. RADIO PROPAGATION

C1. H.F. Field Strength at Hiraiso

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

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

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

C2. Radio Propagation Quality Figures at Hiraiso

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

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

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

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

C	artificial accident,
S	propagational accident,
U	inaccurate.

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

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

N normal,
U unstable,
W disturbed.

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

C3. Phase Variation in OMEGA Radio Waves at Inubo

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

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

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

C4. Sudden Ionospheric Disturbances

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

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

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

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

Types of fade-out are as follows:

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

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

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

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

b. Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

Transmitting Stations

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

HOURLY VALUES OF foF2 AT WAKKANAI

OCT. 1994

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	35	35	31	36	32	37	32	51	58	68	60	59	64	63	61	40	56	56	40	A	20	56	37	35
2	36	36	40	31	38	29	47	68	57	66	65	64	65	58	A	54	59	51	50	38	58	38	56	30
3	36		36	37	35	35	56	24	79	66	67	88	80	76	A	71	66	67	67	60	60	58	41	50
4	36	A	36	38	29		35	A	A	A	A	55	A	56	A	53	69	40		39	36	59	38	A
5	36	56	26	32	30	28	32	38	52	A	60	A	71	67	56	54	55	56		56	58	35	35	28
6	32	A	35	35	A	A	A		50	56	62	75	66	55		51	61	65	55	29	59	A	35	69
7	59	35	31	69	27	A		32	54	55	57	59	A	60	54	60	55	58	41	29	A	A	69	38
8	37	25	32	A	A	A	29	A	69	64	70	67	63	63	56	57	55	47		35	38	59	69	36
9	40	20	A	37	32	28	32	56	64	70	75	A	72	70	63	68	55	46	42	31	38	35	A	36
10	40	36	37	38	36	31	43	57	60	66	66	72	71	65	71	61	71	54	25	40	41	58	58	59
11	38	36		37	35	37	49	57	53	67	67	A	A		A	72	78	61	31	38	36	31	36	35
12	44	37	37	35	35	31	57	57	70	76	74	72	71	60	66	64	67	53	48	30	55	36	43	43
13	58	38	37	36	35	29	28	37	53	A	57	60	63	60	58	66	70	64	61	60	57	26	43	35
14	35	A	35	32	38	29	A	40	68	60	66	61	67		65	61	67	57	38	38	30	35	A	35
15	35	35	36	35	31	32	34	57	57	59	65	71	60	68	68	73	71	67	35	56	58		35	38
16	38	35	34	31	31	29	29	A	60	77	70	68	74	74	64	74		68	38	35	32	58	59	35
17	35	35	36	34	43	38	56	N	67	73	72	72	91	81	70	56	68	63	28	35	A	A	58	89
18	37	34	38	34	46	47	50	60	62	67	74	64	77	68	70	74	59	56		28	58	A	47	58
19	29	57	56	58	69	62	60	68	58	70	72	80	75	68	68	74	67	48	56	56	56	A	57	A
20	57	69	57	57	53	57	56		67	71	82	A	82	70	61	71	66	62	57	69	59	56	58	59
21	A	A	48	39	57	29	36	57	68	71	83	82	81	67	68	68	58	33	32		57	38	56	28
22	44	41	38	52	57	38	56	60	68	78	71	72	80	68	56	60	64	53	39	57	46	35	38	37
23	38	36	40	32	35	35	47	72	80	83	80	78	87	76	68	61	68	74	69	68	57	58	40	36
24	29	34	26	A	A	A	A	A	A	A	A		A	55	58	60	54	41	40	35	35	36	36	29
25	35	29	22	35	30	35	39	58	57	59	80	86	83	67	68	68	60	57	A	35	35	37	38	36
26	34	37	35	29	29	34	35	29	71	75	83	56	68	70	62	60	57	A	A	31	38	58	58	A
27	35	30	35	28	34	30	59	67	69	68	81	69	70	67	68	68	59	28	A	30	A	A	40	36
28	A	A		35	A	35	A	A		73	80		N	70	62	66	60	39	30	35	40	29	59	29
29	A	A	35	32	32	31	28	67	70	68	81	71	74	70	70		63	56	48	38	58	35	37	A
30	25		N	59	A	A	A		88	120	118	93	82	68	69	82	84	39	31	A	A	A	29	35
31	34	A	A	30	28	A	A	55	A	71	A	A	72	68	62	67	66	48	36	40	39	A	41	35
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	22	26	29	26	24	24	22	27	27	28	24	26	29	26	30	30	30	24	28	27	22	29	27
MED	36	36	36	35	35	33	41	57	64	68	72	71	72	68	64	65	64	56	40	38	46	38	41	36
U Q	39	37	38	38	38	37	56	60	69	73	80	76	80	70	68	71	68	62	52	56	58	58	58	43
L Q	35	34	34	32	31	29	32	40	57	66	65	62	67	61	61	60	58	47	33	33	36	35	37	35

HOURLY VALUES OF fEs AT WAKKANAI

OCT. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	26	G	42	28	34	26	29	30	38	36	32	39	33	34	G	30	38	26	G	G	26
2	G	G	G	G	25	G	G	27	27	32	34	33	30	27	28	30	33	28	33	G	29	G	25	G
3	G		G	G	G	G	G	23	28	28	37	40	55	54	39	28	26	31	35	G	G	31	G	G
4	G	29	G	G	G	G	26	24	32	45	38	28	37	36	41	32	28	31	G	33	G	26	27	28
5	G	G	G	G	G	G	30	28	40	44	35	31	31	28	32	30	28	G		G	27	27	30	29
6	30	35	G	23	32	33	38	G	42	45	33	29	35	27	28	30	36	49	57	31	28	33	27	24
7	24	G	G	G	24	24		26	28	38	28	29	29	29	35	36	41	34	38	37	38	37	28	G
8	31	G	26	31	31	30	G	26	29	43	36	32	32	32	54	54	45	26	27	29	34	G	G	G
9	G	G	28	23	G	G	G	27	26	45	33	36	26	27	24	24	G	28	28	25	26	35	37	25
10	25	G	G	G	G	26	32	34	38	28	29	28	38	36	38	35	36	29	26	G	G	G	G	G
11	G	G	G	G	G	G	G	24	26	44	60	74	79		79	59	G	26	33	28	28	G	G	G
12	28	G	G	G	G	G	29	36	48	72	58	42	57	46	41	33	29	28	60	38	G	G	25	G
13	G	24	G	G	26	G	G	23	31	34	38	38	37	31	37	59	60	72	40	30	64	31	27	56
14	36	36	35	65	45	32	37	28	35	30	32	36	35		28	27	32	25	25	35	34	32	40	36
15	28	G	33	30	28	30	G	G	28	30	30	28	29	32	30	25	25	G	29	G	27		24	23
16	G	25	G	41	41	36	34	39	53	38	46	38	56	28	28	28	43	44	32	28	28	29	G	26
17	G	30	35	G	29	24	G	33	27	30	36	36	30	33	42	62	45	45	42	32	39	32	G	G
18	G	G	G	G	G	G	G	28	26	34	34	35	36	29	34	26	34	44		26	30	40	34	33
19	G	G	G	24	G	25	G	46	28	35	34	41	38	38	46	32	30	G	G	35	32	59	45	53
20	29	25	G	27	28	27	34		32	37	65	89	62	46	40	57	37	34	35	G	G	G	G	11
21	54	39	34	40	35	28	35	23	27	35	38	37	52	55	45	56	52	58	46	G	27	G	G	32
22	26	G	G	G	G	G	G	30	38	37	32	33	36	32	27	24	30	27	G	48	G	27	29	34
23	26	G	G	G	G	G	G	38	36	43	33	30	30	29	26	28	28	G	G	G	32	24	24	G
24	30	33	41	45	43	37	26	30	30	35	50		38	42	24	30	G	G	G	29	77	40	G	30
25	G	G	30	G	G	26	27	34	36	37	42	30	44	28	43	25	G	23	38	26	28	G	G	29
26	G	G	G	G	G	G	26	36	39	36	57	76	52	47	40	40	32	41	34	G	26	27	24	30
27	30	G	G	G	G	G	G	G	28	38	38	56	27	25	32	25	34	34	50	60	38	45	34	33
28	39	30	26	28	31	34	36	31		44	38		56	30	25	36	32	39	38	28	28	31	42	31
29	29	35	28	24	G	G	G	26	26	36	33	29	36	35	27		27	27	27	G	G	G	G	26
30	30		G	G	32	25	61		36	35	32	35	35	31	26	38	53	38	36	43	43	28	G	G
31	36	42	40	58	33	41	35	37	55	52	84	86	28	28	33	39	36	38	32	26	26	27	29	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	31	29	31	31	31	31	30	29	30	31	31	29	31	29	31	30	31	31	29	31	31	30	31	31
MED	25	G	G	G	G	24	26	28	30	37	36	36	36	32	34	32	32	29	33	28	28	27	24	26
U Q	30	30	28	28	31	30	34	34	38	44	42	40	52	37	41	39	37	39	38	35	34	32	29	31
L Q	G	G	G	G	G	G	G	24	27	34	33	30	30	28	28	28	28	25	26	G	26	G	G	G

HOURLY VALUES OF fmin AT WAKKANAI

OCT. 1994

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

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

HOURLY VALUES OF foF2 AT KOKUBUNJI

OCT. 1994

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	35	34	59	34	N	35	57		63	62	52	64	63	64	63	64	67	55	46	47	A	47	44	47
2	56	36		36	31	47	37	57	69	63	68	65	54	62	58	60	60	66	57	57	58	47	59	46
3	44	36	36	35	59	32	57	70	74	67	76	88	C	70	87	91	92	83	64	61	69	66	50	
4	47	59	59	37	42	A		60	78	67	74	82	87	70	59	56	72	71	62	56	56			37
5		38		40		A	36	60	71	64	64	92	88	77	71	62	58	60	56	49	58	54	56	57
6	68	38	N	59	29		47	82	75	80	93	99	67	70	65	60	64	68	56	46	A	37	40	A
7	A	58	36	38	N	A	A	48	63	64	80	80	50	66	62	58	61	69	64	67	A	A	A	
8	59	A	A	38	N	34	34	56	71	62	69	98	83	72	70	60	60	61	45	35				35
9	44	59	69	30	N	31	48	60	53	60	81	90	82	76	70	68	68	67	32	37	40	N	36	59
10		37	37	38	59	36	32	69	67	67	66	75	85	81	80	77	66	57	52	A	A	A	40	36
11	38	38	36	38	31	69	57	66		66	81	83	80	78	85	82	82	82	56		41	34	A	59
12	A	46		A	40	A		70	92	83	85	87	76	75	70	75	75	75	56	56		48	40	57
13	38	38	38	40	31	30	46	68	88	72	66	67	84	67	66	73	70	83	94	61	57	58	47	43
14	37	38	40	40	35	26	54	94	72	75	75	88	75	64	82	94	78	58	54	35				
15		39	69	40	37	35	37	61	68	71	77	86	82	81	66	78	82	80	37	A	36	58	40	56
16	46	41	31	35		26	32	68	86	92	72	84		67		77		64	46	38	56			37
17	58	58	59	38	37	37	56	69	95	81	68	70	71	64	72	94	71	57	48	46	69	58	44	43
18		43	43	46	46	44	66		93	64	66	77	80	81	83	88	71	61	A	50	57		41	36
19	A	44	41	56	42	34	57	68	94	64	70	81	75	75	77	76	68	59	A	35	57	44	44	44
20	43	58	59	40	45	47	53	68	61	73	90	100	92	82	77	65	71	68	58	A	68	66	48	
21	42	43	47	46	50	56	32	61	71	77	77	95	101	85	67	67	66	60	56	51	68	47	49	
22	35	N	34	A	59	31	32	57	80	C	C	C	C	C	C	C	59	68	55	38	32	34	59	
23	35	34	35	69	31	28	31	70		89	86	83	84	90	72	60	58	83	59	69	44	63	A	A
24	A	A	A	28	37	36	A	56	78	A	A	80	73	76	70	72	64	50	38	34	43	A	A	A
25	A	A	A	N	29	31	58	83	91	93	82	114	84	82	86	75	67	48	A	49	A	A		
26	36	36	59	A	69	29	69	80	82		82	77	90	86	71	62	55	57	A	43	36	35	58	56
27	A	A	A	A	A	36		68	93	94	80	86	75	73	75	67	72	A	37	40	41	31	A	A
28	A	A	A	A	59	35	23	94	93	80	76	78	84	71	72	66	65	57	A	46		31	A	A
29	A	A	A	29	36	31	37	68	94	C	C	C	C	C	C	C	C	36	41	57	58	57	48	
30	31	38	69	44	29	34		77	125	126	120	122	93	82	73	79	92	58		A	A	A	A	38
31	37		A	59	29		48	67	93	94	86	83	83	96	86	78	73	66		41	58	56	40	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	19	23	20	25	24	25	25	29	29	27	28	29	27	29	28	29	29	30	24	26	21	20	19	17
MED	42	38	42	38	37	34	47	68	78	72	76	83	82	75	72	72	68	62	56	46	57	48	44	44
U Q	47	46	59	45	48	36	57	70	93	83	82	91	85	81	78	78	72	69	57	56	58	58	50	56
L Q	36	37	36	35	31	31	33	60	70	64	68	77	75	68	66	62	62	57	45	38	41	36	40	37

HOURLY VALUES OF fEs AT KOKUBUNJI

OCT. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	28		46	40	50	39	39	36	25	26	30	30	28	30	38	39	G	G
2	G	G	29	G	G	G	G	30	33	28	27	31	30	38	38	34	34	36	24	G	G	G	24	G
3	G	G	G	G	G	G	30	34	30	28	30	G	C	27	28	G	24	29	G	24	G	G	33	G
4	G	G	G	G	39	33		31	28	44	30	G	G	28	27	25	31	G	24	G	G	G	G	G
5	G	G	G	G	G	25	G	31	28	28	29	60	35	37	31	31	35	26	29	G	G	G	G	G
6	G	G	G	G	G	G	28	30	25	26	47	36	35	25	33	30	31	G	42	34	41	33	29	39
7	28	26	G	G	G	33	39	35	29	34	26	25	25	28	26	27	34	34	24	56	53	49	31	28
8	30	24	30	G	G	24	G	32	27	28	27	25	G	G	30	26	G	G	G	G	G	27	G	G
9	G	G	G	G	G	G	31	34	32	33	30	G	32	48	37	36	28	G	G	G	34	29	G	G
10	G	G	26	G	G	G	G	36	34	37	39	56	38	34	44	31	31	36	G	71	34	36	G	27
11	G	42	25	G	G	G	27	34		46	30	89	46	31	47	30	34	36	39	27	47	29	61	70
12	40	40		40	40	34	G	35	27	30	48	48	45	30	27	24	29	55	48	60		31	30	G
13	G	G	G	G	G	G	28	30	27	37	32	30	31	29	28	24	31	33	46	54	27	29	34	30
14	G	G	G	G	G	G	G	52	24	25	28	26	G	G	29	25	27	31	24	G	G		G	
15	G	G	G	G	G	G	G	55	30	29	49	28	30	30	30	32	34	25	G	26	G	28	G	G
16	G	G	G	G		G	26	36	34	47	31	30		28		36	38	33	58	37	30	G	G	G
17	G	G	G	G	G	G	25	45	55	37	29	28	28	39	49	53	40	38	26	28	G	G	G	G
18	G	G	G	G	G	G	G		37	30	28	36	G	35	28	27	41	39	58	56	32	24	36	G
19	30	26	G	G	G	G	G	28	27	33	31	32	25	38	29	28	28	53	55	53	32	30	31	G
20	G	G	G	G	G	G	G	26	32	34	38	31	28	29	28	23	30	34	31	30	G	25	G	
21	G	G	G	G	G	G	34	24	27	34	29	38	30	G	30	30	26	G	34	34	G	G	G	G
22	G	24	G	30	25	G	23	31	37	C	C	C	C	C	C	C	24	32	25	G	G	26	24	G
23	G	G	G	G	G	G	G	73		52	41	31	G	30	27	25	31	G	G	G	G	G	49	40
24	29	27	29	G	G	G	25	38	48	72	85	52	48	50	41	39	G	27	G	28	33	57	63	37
25	29	28	33	29	23	G	26	31	42	40	46	33	40	36	28	26	40	39	40	44	34	33	27	G
26	G	31	G	27	G	G	25	28	38	43	45	53	36	47	28	26	29	30	50	G	G	G	G	G
27	44	51	42	34	37	26		28	37	40	31	33	34	48	40	33	40	43	36	31	G	26	30	30
28	41	58	53	49	30	25	31	38	38	32	55	57	58	44	27	25	29	29	33	G		50	53	56
29	33	27	30	31	33	29	29	30	28	C	C	C	C	C	C	C	C	37	32	G	G	G	G	G
30	G	G	G	G	G	G	G	34	40	31	54	38	60	47	42	50	49	38	30	34	53	61	56	27
31	G		50	36	34	G	G	23	42	60	85	80	70	66	40	59	44	28	G	24	30	G	28	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	31	30	30	31	30	31	29	29	29	29	29	29	27	29	28	29	30	31	31	31	29	30	31	29
MED	G	G	G	G	G	G	25	32	32	34	31	33	32	34	30	28	31	32	29	28	G	26	24	G
U Q	29	27	29	27	23	24	28	36	38	41	47	50	40	41	39	33	35	37	40	37	34	33	33	30
L Q	G	G	G	G	G	G	G	30	27	29	29	28	25	28	28	25	28	26	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

OCT. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	15	15	15	15	15		15	21	15	17	18	17	15	16	15	15	14	15	15	15	15	15
2	15	15	14	15	15	15	17	15	14	15	18	20	16	42	16	16	15	14	15	15	15	15	15	15
3	15	15	15	14	14	17	16	15	15	18	18	16	C	18	18	30	15	15	15	15	17	15	15	15
4	16	16	15	15	14	14		15	15	15	18	43	42	17	15	14	15	15	15	15	16	14	15	15
5	15	15	15	15	16	15	18	14	15	14	17	16	15	21	15	18	15	16	14	16	14	14	16	15
6	15	15	15	16	17	18	16	16	15	17	17	18	16	17	16	16	15	18	14	15	14	14	15	15
7	15	15	15	15	18	15	15	15	16	15	18	15	17	41	15	15	15	15	15	15	15	15	15	14
8	15	15	15	14	17	14	16	15	18	15	17	17	42	42	17	16	14	18	15	20	15	14	15	15
9	14	15	15	14	16	17	15	20	18	16	20	43	21	21	16	14	15	18	15	15	15	14	15	15
10	14	15	15	14	15	15	15	15	15	18	18	30	14	14	15	15	15	16	16	15	15	14	14	14
11	15	14	15	15	15	16	16	14		18	18	32	30	18	16	14	15	14	15	14	15	14	14	14
12	14	15		14	15	14	16	15	18	18	18	20	20	17	15	16	15	14	14	15		15	15	15
13	16	15	15	15	15	15	17	15	15	17	21	20	42	18	17	14	15	15	15	14	15	14	14	15
14	15	14	15	15	15	15	15	15	15	15	18	18	40	38	14	15	15	14	14	14				
15	15	15	15	14	15	15	17	14	15	17	17	42	16	16	16	14	15	15	14	17	14	14	15	15
16	16	16	15	15		16	15	15	15	15	17	17		38		17	15	15	15	15	15	15	15	15
17	16	14	14	15	15	15	16	16	15	15	16	16	18	17	32	15	17	15	15	14	15	15	15	15
18	15	15	15	15	15	15	14		15	21	15	26	42	42	17	15	15	14	15	14	15	14	15	14
19	15	14	15	14	14	15	16	15	15	15	15	21	16	21	15	16	15	15	14	15	15	15	14	15
20	14	16	14	14	15	15	17	17	18	20	41	22	41	15	42	15	14	15	15	15	16	16	17	
21	15	14	14	14	15	15	14	15	15	20	16	29	21	18	36	15	15	15	15	14	15	17	15	
22	15	15	15	14	15	15	16	15	15	C	C	C	C	C	C	C	24	15	14	15	15	15	14	17
23	14	15	14	15	15	18	15	14		15	17	18	18	40	17	16	20	15	15	15	14	15	14	14
24	15	14	15	15	16	15	16	14	15	14	15	17	16	14	15	15	17	16	15	15	15	14	15	15
25	15	14	15	15	15	15	15	15	14	14	15	17	17	14	15	15	15	15	15	15	15	14	15	16
26	15	15	18	15	15	17	15	16	14	16	16	15	15	14	14	15	14	15	14	16	15	14	14	15
27	14	15	15	14	15	15		16	16	15	15	18	18	17	16	17	14	15	15	15	18	17	14	15
28	15	14	16	15	14	15	15	14	17	14	18	20	16	16	15	14	15	15	15	15		16	15	15
29	14	15	14	15	14	14	15	14	14	C	C	C	C	C	C	C	C	15	15	17	17	16	15	15
30	20	14	16	15		14	28	15	16	16	16	17	17	15	14	14	15	15	15	15	14	14	15	15
31	15		15	14	14	16	15	23	14	15	17	18	21	18	15	15	14	14	15	15	14	14	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	30	31	29	31	29	29	29	29	29	29	27	29	28	29	30	31	31	31	28	30	30	28
MED	15	15	15	15	15	15	16	15	15	15	17	18	18	18	16	15	15	15	15	15	15	14	15	15
U Q	15	15	15	15	15	16	16	15	16	18	18	24	30	29	17	16	15	15	15	15	15	15	15	15
L Q	14	14	15	14	15	15	15	14	15	15	16	17	16	16	15	14	15	15	14	15	15	14	14	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

OCT. 1994

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				28	N	26	31	61	60	68	A	70	70	74	74	67	66	60	57	69			32	59
2	32	30	49	31	26	26	59	60	71	75	75	61	68	67	65	68	67	75	78	A	32	58	60	
3		32	43	55	49	30	59	58	83	90	72	73	88	77	90	106	103	91	93	67			58	
4	50	49	48	59	28	25	A	A	92	70	82	94	103	80	66	66	72	82	68	A	31	49		
5		58	59	N		28	59	58	68	75	72	81	107	106	82	68	57	69	76	58	49	58	69	66
6	79	49	N	N	N	23	49	68	67	88	99	98	95	94	80	69	66	67	68	49	59	56		37
7	60	58	40	50	26	N	69	56	70	70	77	93	86	70	72	76	68	68	85	63	A		69	
8	30	A	26	49	N	N	31	89	74	66	73	97	112	108	99	67	67	66	68	49		56	59	
9	61	58	30	N	N	N	31	A	68	66	82	84	88	96	87	74	75	67	57	35	59	32	59	
10	31	34	49		25	69	69	A	67	73	72	74	84	92	92	84	74	67	60	49	69	A	69	49
11	49	49	A	59	26	59		55	70		76	80	78	86	111	107	77	81	75	49	49			
12	49	A	32	A		31		68	81	82	94	98	91	90	82	85	80	80	80	A	A	25	A	
13		69	58	59	26		69	26	68	84	62	72	83	87	85	74	80	83	80	60	69	A	A	30
14	49		28	32	37		69	68	76	78	92	96	85	84	104	101	84	74	60	49	49	56		60
15		57	59		30	N	59	49	70	74	86	85	99	83	75	86	93	81	A	A		A	58	
16	58	29		N	N		49	70	73	77	89	82	82	77	86	91	81	73	69	A	35	25		38
17	58	69				32		68	66	66	84	80	68	67	81	82	75	66	58	26	89	N	30	32
18	69	29	32		N	49	56	69	68	72	72	78	83	104	104	87	74	72	62	59	29	49	44	
19	A	28	38		59		59	69	66	68	72	96	83	86	94	92	76	74	60	A	34		A	59
20		49			31	50		58	68	76	85	105	80	86	86	83	84	66	70	49	69	60	59	A
21	35	48	A	28	59	32		61	94	76	N	107	107	119	102	90	68	70	67	49	69	34	28	23
22	25			58	59	24	49	69	68	72	82	94	90	92	88	91	82	76	60	59	59	28	A	29
23	59	29	49	28	30		59	67	69	80	93	86	86	100	92	69	67	77	72	49	44	49	A	A
24	A	A	28	A	28	69		69	94	93	86	98	C	97	113	100	70	63	A	61		A	A	A
25	A	A	20	N	26	59		68	82	93	91	116	86	82		86	72	60	A		A	A	A	69
26	29		29	28	30	26	49	69	83	78	93	88	85	94	82	64	63	66	A	A		28	28	A
27		26	32	59	A	69	38	70	82	97	97	91	85	90	87	77	66	66	32	A	A	56		A
28	A	A		N	26	26	31	68	81	78	77	88	77	71	88	75	66	66	59	30	59	A	69	A
29	A	A	69	31	28	N	29	52	74	77	81	78	74	94	103	86	66	61	59	61	34	68	72	
30	69	28		23	N	26	30		105	112	125	120	102	105	66	72	87	72	A	A	A	23	26	26
31	A		26	69	25	25		69	87	94	83	91	97	111	114	82	84	82	78	A	49	53	31	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	20	21	17	20	21	22	27	31	30	29	31	30	31	30	31	31	31	26	20	20	19	18	13
MED	50	48	38	49	28	30	52	68	71	76	82	88	86	90	87	82	74	70	68	49	49	49	58	38
U Q	60	57	49	59	34	54	59	69	82	84	91	97	95	97	99	90	81	77	76	60	64	56	69	59
L Q	32	29	28	28	26	26	31	58	68	72	74	80	82	80	81	69	67	66	60	49	34	28	31	29

HOURLY VALUES OF fEs AT YAMAGAWA

OCT. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	25	G	G	G	G	G	33	32	28	29	28	31	G	29	29	26	28	28	25	G	G	G	G
2	G	G	G	G	G	G	G	24	25	28	28	29	27	31	25	30	34	38	31	33	33	28	G	G
3	G	G	G	G	G	G	G	30	30	29	30	30	G	G	30	29	21	25	G	G	G		G	G
4	G	G	G	G	G	G	36	39	38	28	29	64	G	G	30	27	29	29	G	39	34	26	G	G
5	G	G	G	G		G	G	27	26	28	30	29	27	30	29	30	30	25	30	G	G	G	29	G
6	G	G	G	G	G	G	G	26	27	26	29	30	29	31	34	31	26	32	30	G	23	34		30
7	33	30	24	G	G	G	G	30	34	38	G	24	G	25	29	30	26	24	G	G	32	G	G	25
8	27	34	28	G	G	G	23	28	32	29	30	28	29	30	G	29	26	28	G	G	24	G	G	G
9	G	G	G	G	G	G	24	31	31	30	30	30	G	54	39	61	48	32	28	G	24	G	G	G
10	G	G	G		G	G	G	33	29	27	30	G	G	32	30	30	26	32	36	23	32	34	30	G
11	G	G	30	G	G	G	G	33	33		37	29	29	38	31	30	26	48	29	24	24	27	28	26
12	G	34	31	35	25	30	G	24	55	52	36	30	G	32	32	55	53	39	48	39	36	58	60	29
13	G	G	G	G	G		G	32	28	29	28	28	G	27	30	28	29	31	34	32	34	35	31	G
14	G	G	G	G	G		G	29	25	28	30	37	G	G	31	29	25	29	G	25	30	G	G	G
15	G	G	G	G	G	G	G	29	26	28	30	32	32	30	37	34	26	35	38	33	33	31	27	G
16	G	G	G	G	G		G	32	32	36	30	30	27	26	29	35	36	56	51	34	32	33		26
17	G	G	G	G		G	G	32	33	36	30	30	26	28	30	37	33	34	G	26	G	34	29	G
18	G	G	25	26	G	G	G	28	33	31	29	28	29	G	28	29	35	33	G	G	28	30	G	25
19	29	G	G	G	G		G	G	33	33	29	30	30	31	32	30	25	G	G	29	25	34	71	32
20	G	G	G	G	G	G	G	G	29	30	51	36	G	G	30	30	26	38	G	G	G	G	25	32
21	G	23	36	G	G	G	G	38	30	30	30	52	29	30	31	31	28	28	G	G	32	25	G	G
22	G	G	G	G	G	30	26	29	32	32	66	32	26	G	31	30	29	31	G	G	G	25	29	G
23	26	G	G	G	G		G	27	33	34	38	32	33	31	26	30	32	31	31	30	27	31	36	36
24	30	33	27	27	G	23	G	28	31	60	55	38	C	67	30	29	31	G	33	32	26	69	34	36
25	33	29	23	23	G	G	G	38	37	50	32	37	32	81		70	38	47	53	32	36	80	34	35
26	28	29	G	27	26	27	29	39	38	34	31	37	59	30	48	35	31	32	33	37	33	30	33	34
27	31	28	G	G	31	26	33	28	30	30	30	31	31	31	32	34	30	G	25	33	31	G	G	32
28	56	29	G	G	G	G	G	26	29	29	33	33	29	27	30	29	28	G	G	G	27	31	30	26
29	26	32	32	30	32	29	G	G	26	33	34	26	27	30	37	38	66	54	28	31	G	28	25	G
30	G	G	G	30	G	G	28	34	39	28	31	73	71	32	29	34	29	29	34	91	35	29	31	29
31	30	24	G	G	G	G	G	G	31	30	38	67	96	92	62	27	38	31	32	32	G	G	34	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	31	31	31	30	29	26	31	31	31	30	31	31	30	31	30	31	31	31	31	31	31	30	29	31
MED	G	G	G	G	G	G	G	29	31	30	30	30	28	30	30	30	29	31	28	26	27	28	28	25
U Q	28	29	24	G	G	G	G	33	33	34	34	37	31	32	32	34	34	35	33	33	33	34	32	32
L Q	G	G	G	G	G	G	G	26	29	28	29	29	G	25	29	29	26	28	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

OCT. 1994

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	16	16	15	15	15	15	14	14	15	15	21	14	16	48	22	17	18	14	14	14	14	15	15	16
2	15	15	15	15	14	15	14	22	15	17	16	17	15	15	15	18	20	18	14	14	14	14	14	15
3	14	15	14	14	15	14	14	14	14	15	17	47	48	48	18	21	14	15	15	15	15		15	15
4	16	15	15	15	15	14	14	14	14	14	15	18	46	48	18	16	14	17	15	15	14	14	14	14
5	14	14	14	15		15	14	15	15	17	17	23	20	23	20	17	15	15	14	14	14	14	15	15
6	15	15	16	20	17	15	14	14	15	15	15	16	18	16	17	15	15	16	15	14	14	15		14
7	15	15	15	14	15	18	14	14	15	18		15	47	46	20	20	17	15	15	14	15	15	14	14
8	14	14	15	15	16	15	14	15	14	15	18	48	47	47	46	18	15	14	14	14	15	15	15	14
9	14	15	15	15	15	15	14	15	15	15	16	18	46	22	17	16	15	14	14	14	14	15	14	15
10	14	15	15		17	15	14	15	15	15	20	48	48	23	20	16	16	14	15	15	14	14	14	15
11	15	15	14	14	14	14	14	14	14		18	23	48	21	18	16	15	14	14	14	14	14	14	15
12	14	14	15	14	15	14	14	16	14	15	17	21	48	21	21	14	15	16	15	15	15	14	14	14
13	14	15	15	14	14		14	16	14	16	21	22	52	46	22	16	16	14	15	14	14	14	15	15
14	15	15	15	15	14		14	15	14	15	15	18	48	49	20	20	15	14	15	17	15	14	14	14
15	15	15	14	15	15	14	15	14	15	17	17	17	16	16	15	17	15	17	14	16	14	14	14	15
16	15	14	14	14	14		14	15	15	16	16	18	15	18	18	17	16	14	14	14	14	14		15
17	14	15	15	14		14	14	15	15	17	16	20	51	48	46	18	14	15	14	14	15	14	15	14
18	14	14	15	14	15	14	14	15	15	17	15	18	17	47	21	18	15	14	14	14	14	15	15	15
19	14	14	14	15	15		14	22	15	15	16	16	22	22	22	18	15	21	15	14	15	14	14	14
20	14	14	14	14	14	14	14	15	16	21	21	23	46	48	17	15	15	14	14	14	15	15	15	16
21	15	15	15	16	14	14	14	16	18	17	15	23	18	20	46	14	16	20	16	17	14	15	15	15
22	14	14	15	14	15	15	15	15	15	14	17	21	17	46	46	17	15	14	14	14	15	17	15	14
23	15	14	15	14	14		14	14	15	15	16	20	20	20	17	16	14	15	15	14	15	14	14	15
24	15	14	14	14	15	15	15	14	14	15	15	20	C	18	18	15	15	16	15	15	15	14	14	14
25	15	14	14	16	15	14	14	14	15	15	15	28	20	22		18	17	14	15	14	14	14	14	14
26	14	14	15	15	14	14	14	15	14	14	17	20	18	20	16	14	15	14	15	15	14	15	15	14
27	14	15	14	14	15	14	15	14	14	14	14	21	20	20	20	17	16	20	17	18	16	15	15	15
28	15	14	18	15	15	15	14	15	15	16	17	16	20	48	20	15	14	15	15	14	14	14	15	15
29	16	15	14	15	15	15	15	18	16	15	17	17	16	20	47	20	16	14	15	16	16	16	15	15
30	15	14	14	14		15	15	14	15	17	16	20	20	18	16	15	14	14	14	14	14	14	14	15
31	15	15	15	14	14	14	14	14	15	15	16	16	18	17	17	15	14	15	14	14	15	16	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	30	28	26	31	31	31	30	30	31	30	31	30	31	31	31	31	31	31	30	29	31
MED	15	15	15	14	15	14	14	15	15	15	16	20	20	22	20	17	15	15	15	14	14	14	15	15
U Q	15	15	15	15	15	15	14	15	15	17	17	23	47	47	22	18	16	16	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	15	15	17	18	20	17	15	15	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT OKINAWA

OCT. 1994

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		46	41	30		N	79	30	70	89	72	91	92	94	110	95	85	82	66	68	62	46	89	58
2		40	69	69	69	69		56	74	78	71	62	83	115		86	94	96	81	95	A	37	59	59
3	52	48	55	69	58		A	44	82	94	71	76	102	90	94	122	106	118	125	73	95	68	49	42
4		44	26	40		36		A	90	93	94	124	102	95	76	81	92	96	78	89	89	N	48	48
5	46	69	44	56	89			57	70	94	91	92	123	123	125	94	84	94	93	68	69	68	76	82
6	69		69		34	69	A	69	74	90	N	125	94	105	112	82	94	66	67	94	69	65	48	47
7	48	47	A	40	A	A	A	35	69	81	92	105	88	70	81		94	88	93	58	55			69
8	44	A	A	38	A		A	60	59	93	78	95	126	145	150	132	92	92	69	A	44		42	
9	48					A		A	60	63	86	91	107	102	118	111	103	96	70	49	A	A		69
10	43		32				A	A	69	82	80	85	88	94	112	111	110	93	74	49	A	A		A
11	44		47	58	28	30		59	74	72	92	82	75	90	128	124	113	127	82	94	A	A	A	48
12		69	42	38		44		A	69	104	103	94	102	113	114	113	104	124	104	90	A	A	A	48
13	A	30	43	32	44		32	38	100	109	75	72	88	97	96	94	86	96	80	83	95	69	55	
14	65	46	38	48	37			45	84	78	126	120	112	124	127	128	107	131	82	48	A	A	75	A
15	69	57	58	40			A	A	68	71	92	124	97	117	102	103	115	81	68	A	A	A	39	44
16	49	A	43					59	69	76	105	101	78	90	105	112	93	83	70	44	A	A	A	53
17		48	A	69	A		24	A	57	70	92	94	81	70	86	113	98	92	62	46	47	35	44	A
18	69		46		69			51	86	91	74	85	93	114	129	112	92	93	92	59	82	63		44
19	46	A	37	43	40	30		59	70	95	82	114	94	106	123	117	96	111	74		48	A	A	A
20	A	40	41	44	41			56	79	92	88	93	88	93	118	112	92	91	95	94	60	46		38
21	46	43		44	38			A	72	74	93	120	126	145	146	146	114	89	82	95	52		36	69
22	42		38	46	59	59		54			84	116	126	142	144	157	150	123	92	53	43		69	
23	59	59		44	44		A	66	69	70	84	95	94	122	117	104	84	92	80	60	59		46	69
24	38	A			A		A	A	84	115	103		112	116	168	152	118	113		94	48		69	69
25		A	A	43	69	31		A	82	102	102	110	106	92	125	127	83	72	61	61	48	A	A	A
26	A	A	A	A	38	49		59	89	95	103	110	91	110	114	86	77	82	86	57		A		A
27	A	A	A	34	32	30		59	92	93	105	95	123	156	159	153	122	98	92	93	95	82	53	A
28		A	A	A	37	29		70	95	75	81	124	100	123	152	124	118	124	105	93	77	81	52	48
29	46	48	55	59	51	A	A	55	99	95	93	103	91	106	124	102	92	80	69	68	94	92	94	66
30	A	47				A	A	69	93	113	121	128	116	113	91	80	93	88	70	92	62	80	75	A
31	A	48	A	30		56	38	42	74	92	84	118	104	118	108	91	98	93	93	94	95	65	70	51
	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	18	22	18	12		22	30	30	30	30	31	31	30	30	31	31	30	28	22	14	20	20
MED	47	47	43	44	42	40		56	74	92	92	98	97	110	118	112	94	93	80	70	62	66	54	52
U Q	59	52	55	56	59	57		59	86	95	102	118	112	122	128	124	110	111	92	93	89	80	72	69
L Q	44	43	38	38	37	30		45	69	76	81	91	88	94	105	94	92	88	70	57	48	46	47	47

HOURLY VALUES OF fEs AT OKINAWA

OCT. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		G	G	G		G	G	33	34	31	G	G	G	26	39	25	33	28	31	32	G	G	G	G
2	G	G	G	G	G	G	G	35	35	28	N	33	34	55		43	36	40	33	43	49	40	27	44
3	34	27	G	G	G		44	34	34	34	25	31	G	G	G	31	31	38	32	45	G	G	G	G
4	G	G	G	G		G	G	48	59	76	44	48	42	30	37	32	41	38	G	42	G	G	40	G
5	G	G	G	G	G		G	31	36	46	24	G	38	24	G	34	34	28	36	36	G	37	G	G
6	24		G		G	G	34	33	50	35	26	33	G	G	32	33	29	24	G	31	48	G	G	G
7	G	36	24	37	29	26	32	32	31	40	G	36	25	G	24		32	48	46	38	G	G	G	G
8	G	45	31	25	26		38	31	40	40	38	G	38	G	G	30	27	24	G	35	G	G	G	G
9	G	G	G		G	23	G	33	38	40	39	62	55	57	53	54	34	34	34	32	39	48	G	G
10	G	G	G		G	G	95	29	55	48	54	47	38	66	82	58	89	50	G	57	34	34	52	49
11	G	G	G	G	G	G	G	48	34	43	50	50	40	37	39	40	40	39	37	G	34	49	39	28
12	G	43	G	43		G		34	39	45	62	62	44	34	78	35	28	36	28	G	49	73	74	44
13	36	32	25	G	G		G	38	32	32	38	42	41	42	33	40	32	36	40	45	71	G	56	G
14	G	G	26	G	24		G	34	48	31	26	G	36	44	37	35	41	46	40	49	60	37	45	43
15	32	33	26	27			33	49	63	25	34	G	34	46	41	39	65	61	59	66	98	60	60	45
16	48	34	G			G		33	58	43	36	48	36	32	G	36	44	40	49	32	39	36	41	38
17		32	35	G	43		G	38	47	63	152	62	G	G	30	58	48	53	32	28	G	35	G	32
18	G	G	G	G	G	G		29	36	43	61	50	40	G	29	G	31	35	31	27	G	30	47	30
19	G	23	G	24	36	G	G	34	31	28	30	32	G	35	37	31	36	34	G	G	G	64	58	38
20	34	G	G	G	G	G	G	63	33	156	G	G	G	G	G	34	33	32	G	G	G	G	G	G
21	G	G	G	30	G	G	G	38	30	35	30	G	G	G	28	36	30	26	27	23	G	G	G	G
22	G	G	G	G	G	G		32			33	31	G	G	25	G	31	34	G	G	G	G	G	29
23	G	G	G	G	G		30	48	34	38	38	G	33	33	34	32	36	48	44	42	21	G	24	G
24	G	24	G	26	34	G	26	34	74	44	50		61	37	G	31	27	G		G	41		48	40
25	34	31	39	G	G	G	G	29	30	43	37	62	71	40	66	50	42	32	32	25	37	59	70	70
26	48	49	42	42	36	G	G	44	46	98	111	68	43	37	59	48	42	22	30	38		30	G	59
27	72	44	26	25	G	G	G	G	72	26	40	38	39	44	39	34	40	44	G	G	G	40	G	47
28	G	26	32	32	G	G	G	99	30	33	38	31	27	42	40	31	41	38	27	99	32	G	G	G
29	G	G	G	26	50	30	48	36	26	40	48	44	52	56	48	60	62	66	29	39	32	98	52	27
30	44	G	G	G		38	33	45	44	42	37	56	51	50	54	67	49	50	37	47	80	58	37	27
31	28	32	25	G	25	24	G	28	32	37	46	47	60	50	43	44	43	50	50	43	25	66	44	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	31	27	25	23	27	31	30	30	30	30	31	31	30	30	31	31	30	31	30	30	31	31
MED	G	12	G	G	G	G	G	34	36	40	38	37	38	35	37	35	36	38	32	35	28	34	27	27
U Q	34	32	26	26	27	G	33	44	48	44	48	50	43	44	43	44	42	48	37	43	41	49	48	43
L Q	G	G	G	G	G	G	G	32	32	33	30	G	G	G	25	31	31	32	G	23	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

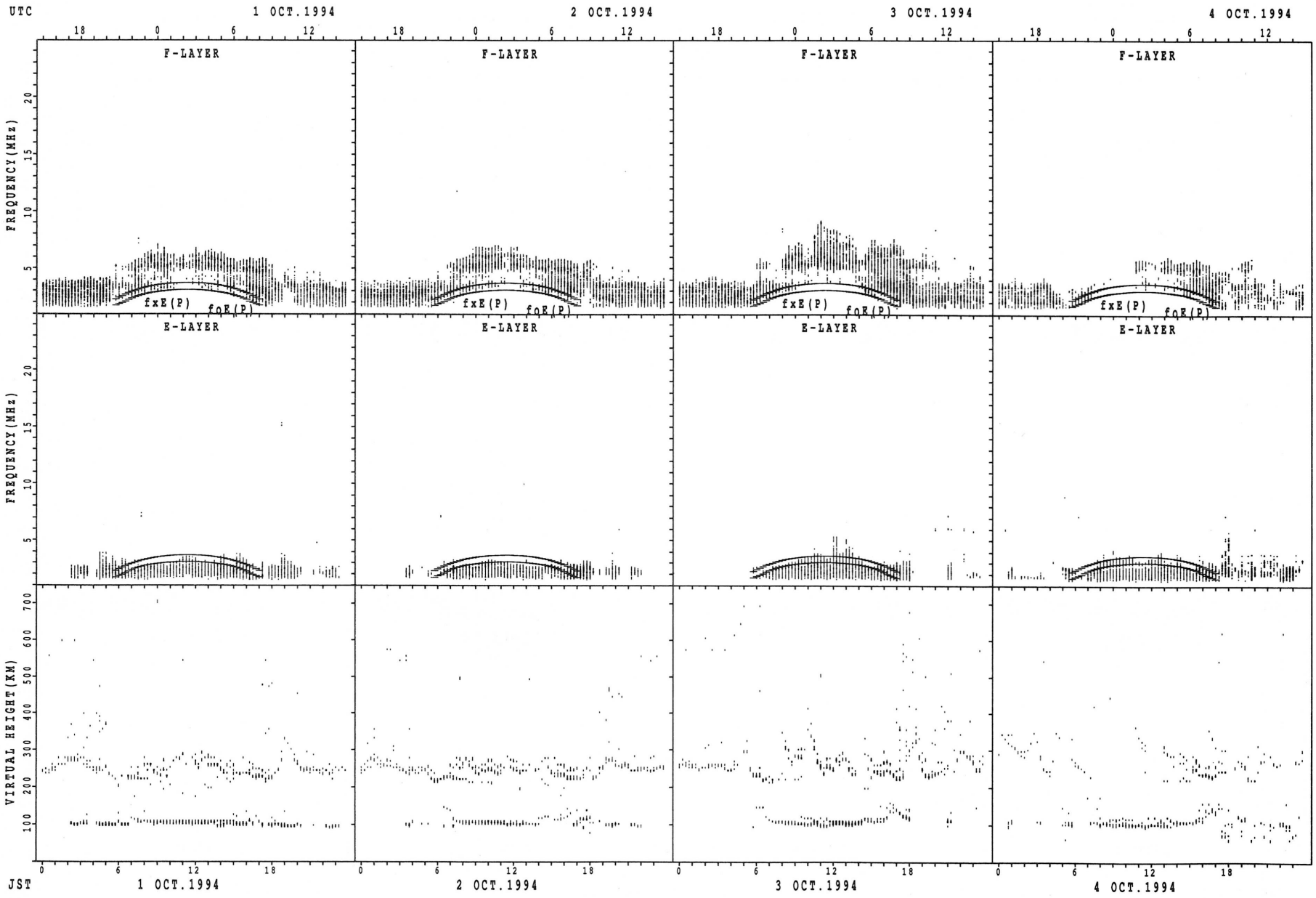
HOURLY VALUES OF fmin AT OKINAWA

OCT. 1994

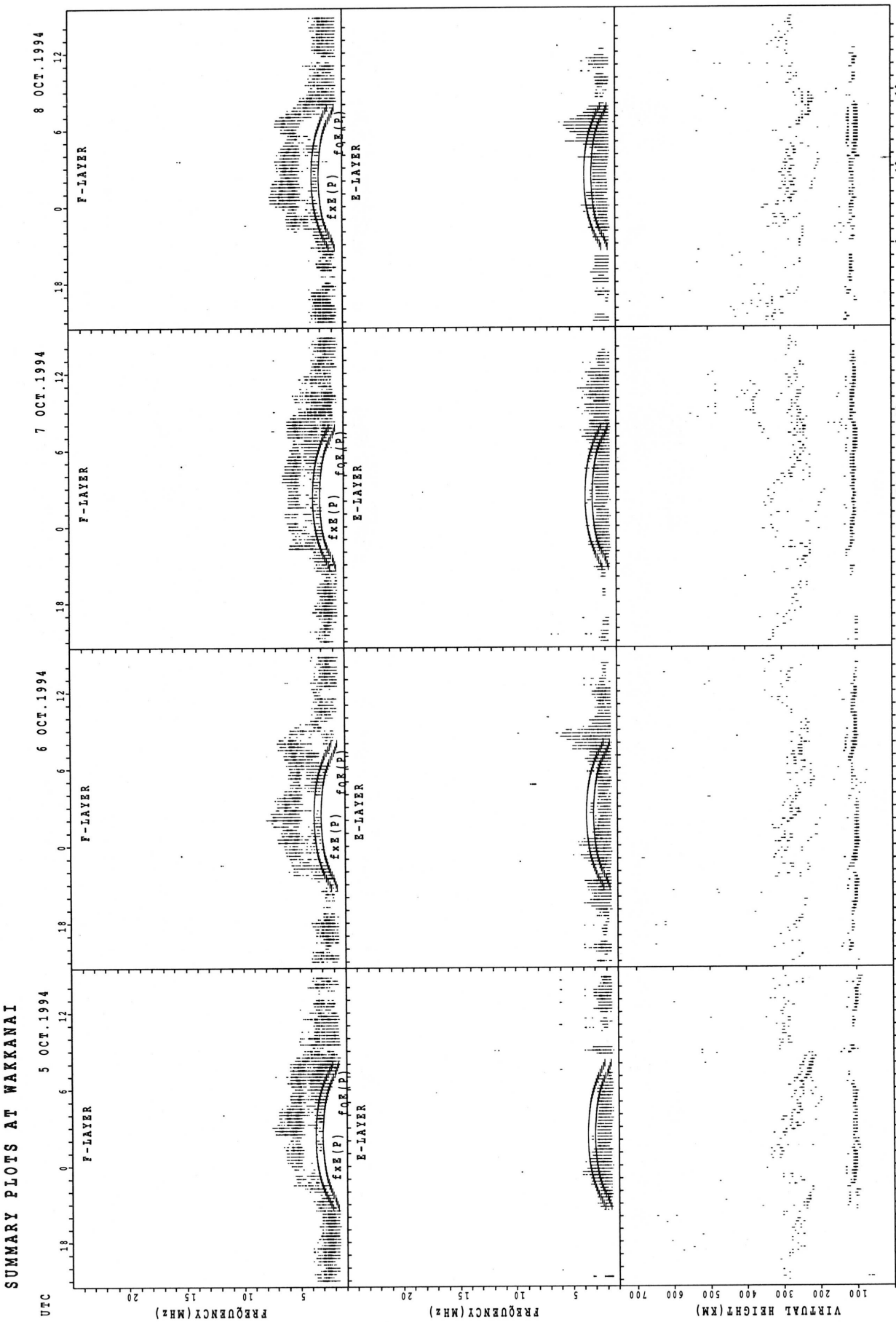
LAT. 26.3N LON. 127.8E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

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		22	14	16		15	14	14	15	16	33	46	44	16	16	16	18	14	14	14	14	14	15	14
2	15	14	14	14	15	14	14	14	15	17	17	27	16	16		27	14	14	16	14	14	14	14	14
3	14	14	16	15	15		18	15	14	15	17	34	45	44	44	16	14	14	14	14	14	14	15	15
4	15	15	14	15		14	15	14	15	14	16	16	16	16	40	29	34	14	16	14	15	14	14	15
5	14	16	15	15	15		18	14	15	16	33	42	31	42	46	26	14	14	14	14	14	14	14	14
6	16		14		20	15	15	15	15	16	18	21	37	40	30	29	17	15	20	14	14	17	15	14
7	16	14	15	14	14	15	14	16	16	20	42	17	36	44	17		14	14	14	14	15		21	15
8	15	14	15	15	14		14	14	14	16	29	20	44	44	44	18	16	14	17	14	14	16	14	28
9	15	14	15		15	15	15	14	16	16	15	32	18	34	33	21	16	15	14	14	16	15	14	15
10	15	15	15		16	15		14	14	17	30	32	30	29	18	28	16	14	20	15	15	15	15	14
11	16	14	15	15	14	14	14	14	15	15	17	23	46	27	27	16	16	14	14	15	14	15	15	14
12	20	15	14	15		15		14	14	16	15	20	29	20	22	16	15	16	15	16	15	14	14	15
13	14	14	14	14				22	14	15	39	24	24	22	17	15	14	14	14	14	15	17	14	15
14	15	15	14	14	15		15	14	14	14	16	34	17	17	15	15	15	14	14	15	15	15	14	14
15	14	14	14	14			14	14	14	16	16	44	46	20	16	17	15	14	14	15	15	15	14	14
16	14	15	14			15		15	14	15	16	32	18	34	46	15	17	15	14	15	14	14	14	14
17		14	14	14	15		15	15	14	15	17	20	44	34	48	20	15	14	14	14	15	16	15	14
18	15	15	14	15	15	15		14	14	17	16	30	32	44	39	29	17	16	14	14	15	14	14	15
19	15	14	16	15	15	14	15	21	14	16	15	26	43	43	27	32	16	15	16	16	14	15	15	14
20	15	16	16	15	15	15	14	14	16	18	38	44	39	45	42	20	16	26	17	16	15	14	16	15
21	15	15	14	14	16			16	14	17	18	44	37	42	34	23	18	14	14	15	14	15	14	14
22	15	17	15	15	16	18		14			16	16	45	46	47	40	17	15	21	16	15	18	16	15
23	14	14	14	14	14		14	14	14	14	18	26	22	22	22	20	16	15	14	14	15	14	14	15
24	14	15	14	14	14	15	14	14	14	15	17		17	26	34	30	16	14		15	14		14	14
25	15	14	14	15	16	16	14	14	14	14	15	16	29	28	29	18	16	15	15	14	14	14	14	15
26	15	14	14	14	14	15	15	14	14	15	16	18	26	28	22	22	17	15	15	15		14	14	14
27	15	14	14	14	14	14	15	20	15	14	15	28	27	16	23	17	16	16	20	20	16	14	15	14
28	15	16	14	14	15	14	15	14	14	15	17	41	38	20	32	17	15	15	14	14	14	15	17	17
29	15	14	18	14	14	14	14	14	14	15	17	17	18	16	16	15	14	14	14	14	15	14	14	14
30	14	15	15	15		14	14	15	15	16	18	23	17	24	21	16	15	14	14	14	15	14	15	14
31	14	14	16	16	14	14	14	14	14	16	16	28	16	18	18	16	17	14	16	15	16	15	15	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	31	27	24	22	24	31	30	30	31	30	31	31	30	30	31	31	30	31	30	29	31	31
MED	15	14	14	15	15	15	14	14	14	16	17	26	30	28	28	19	16	14	14	14	15	14	14	14
U Q	15	15	15	15	15	15	15	15	15	16	18	34	43	42	40	27	17	15	16	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	15	16	20	18	20	18	16	15	14	14	14	14	14	14	14

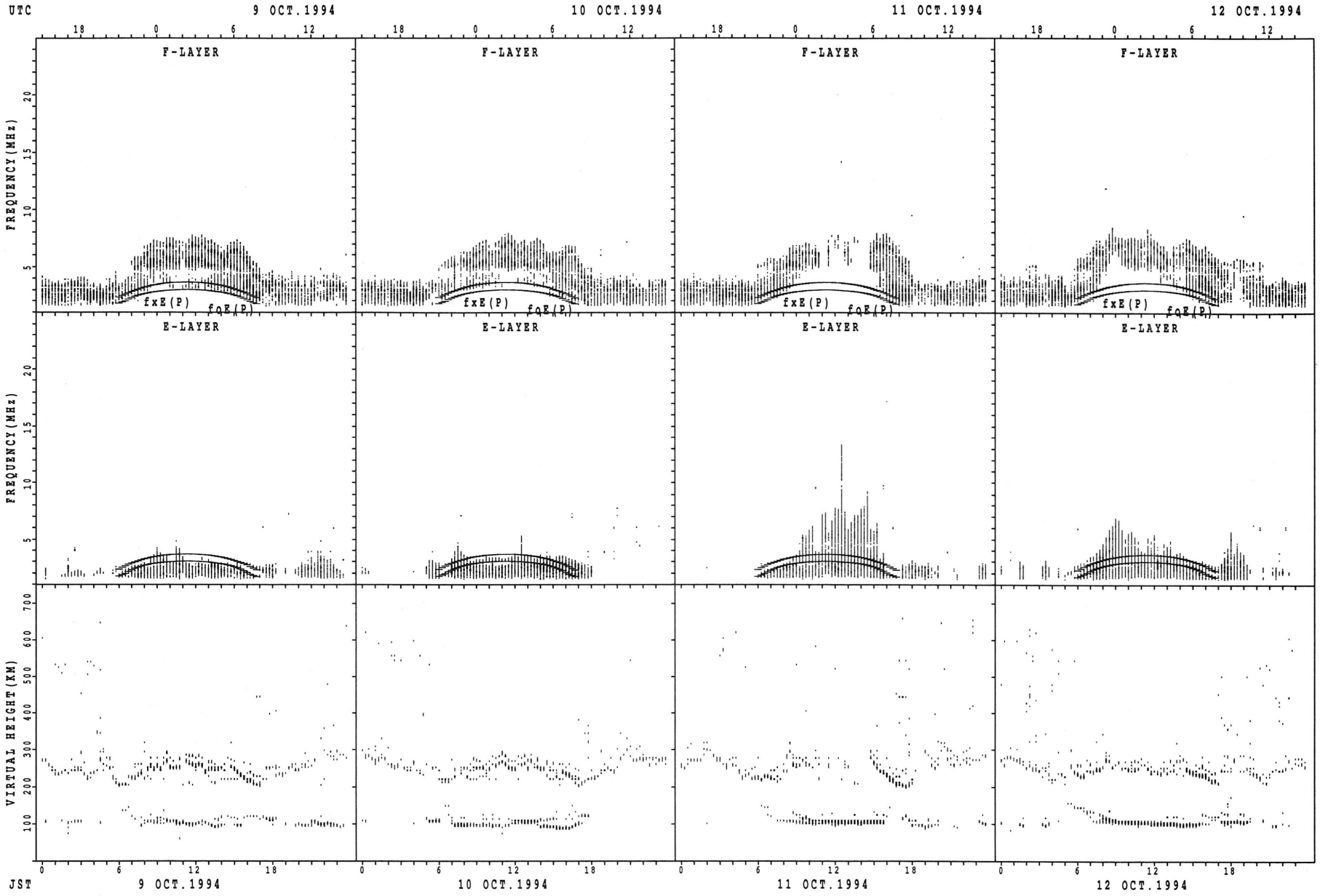
SUMMARY PLOTS AT WAKKANAI



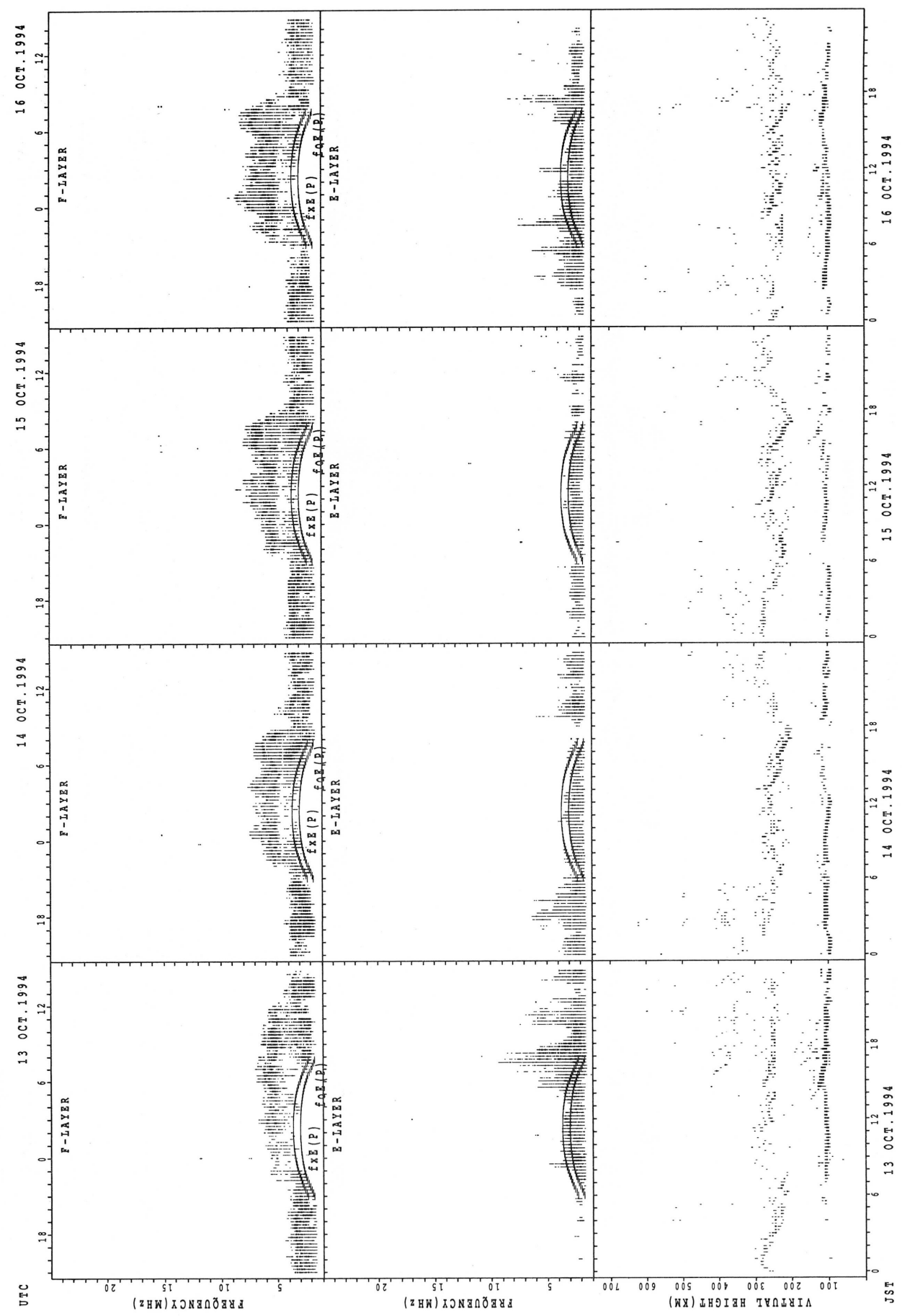
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
5 OCT.1994
6 OCT.1994
7 OCT.1994
8 OCT.1994
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

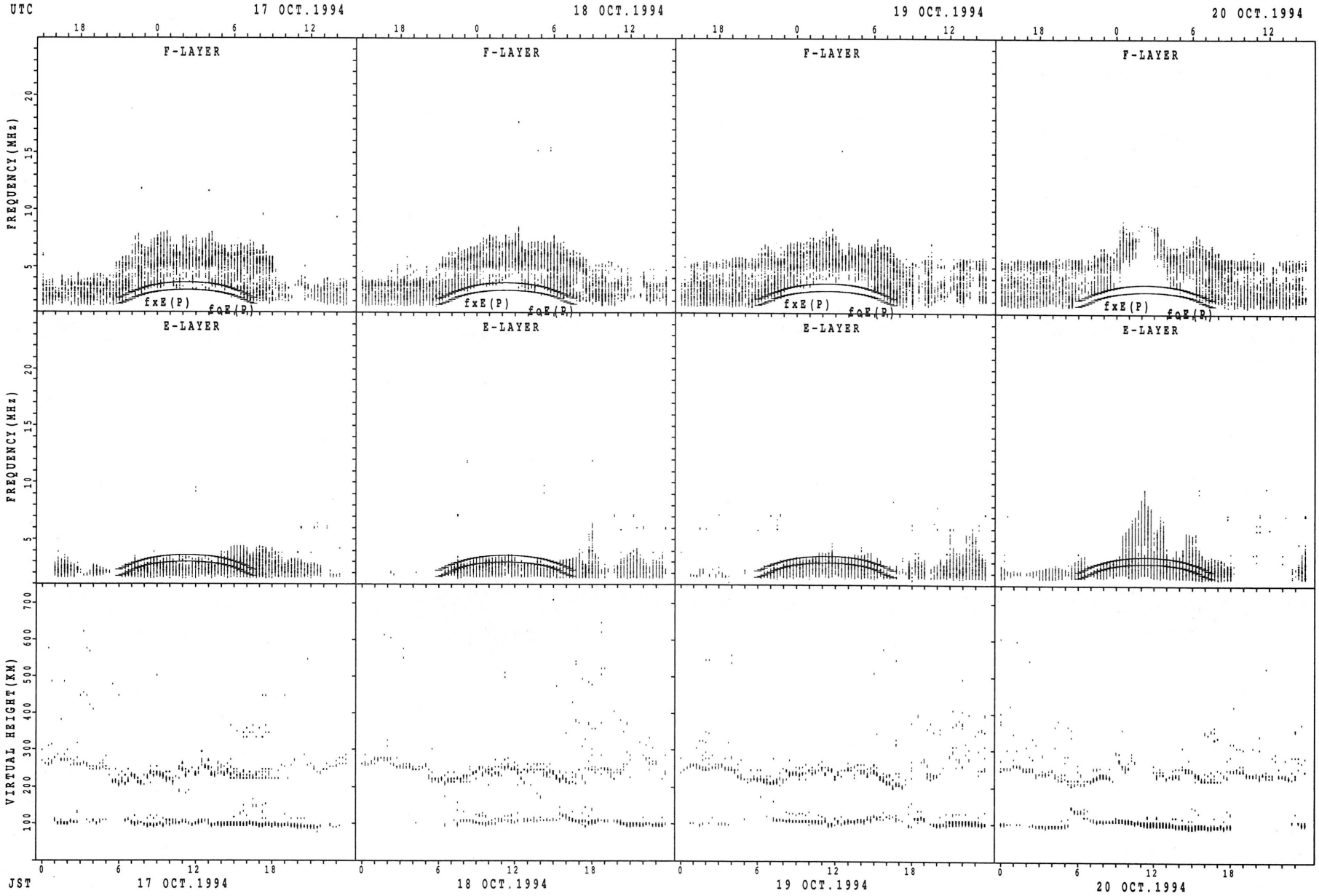
SUMMARY PLOTS AT WAKKANAI



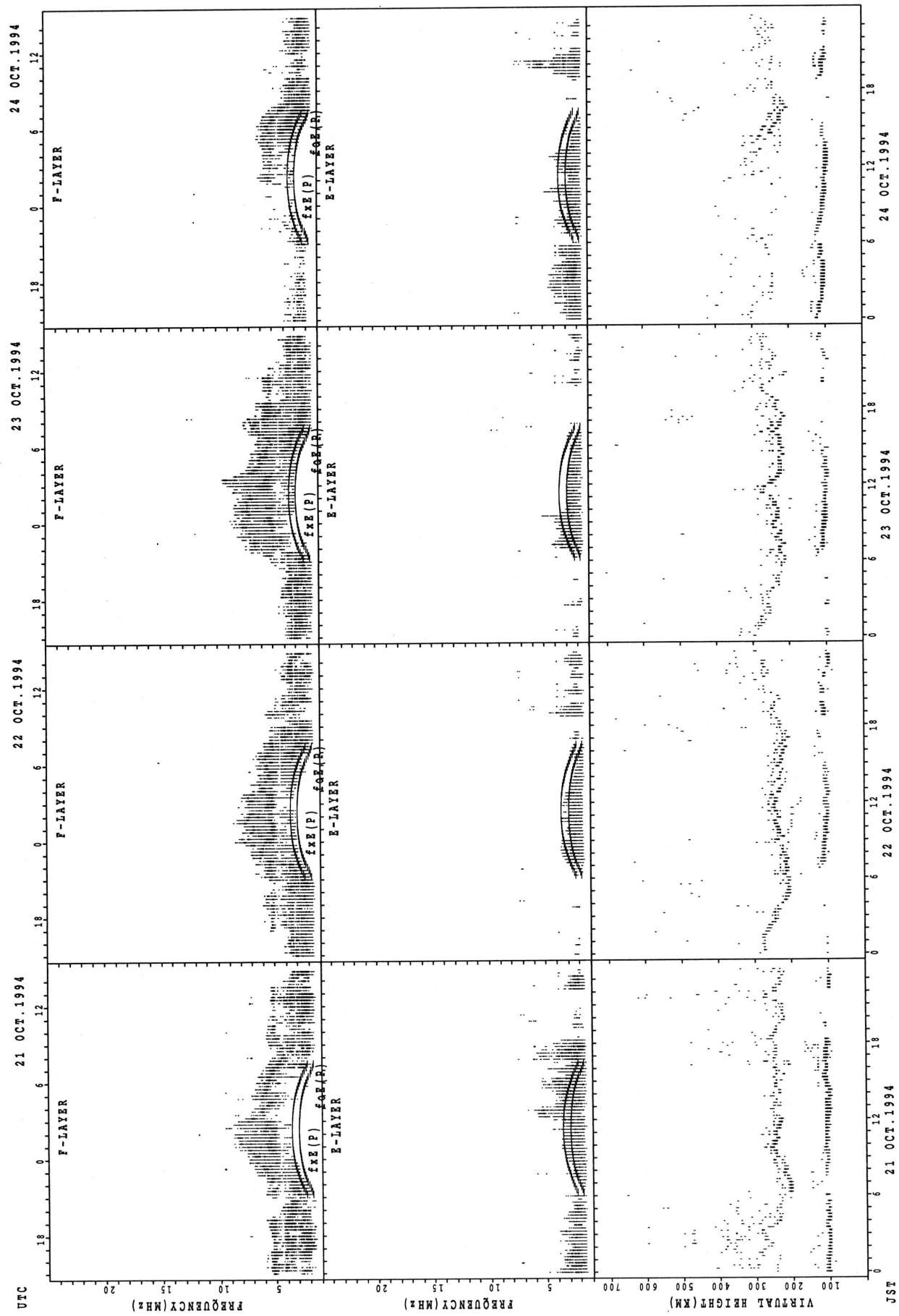
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
13 OCT.1994
14 OCT.1994
15 OCT.1994
16 OCT.1994
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

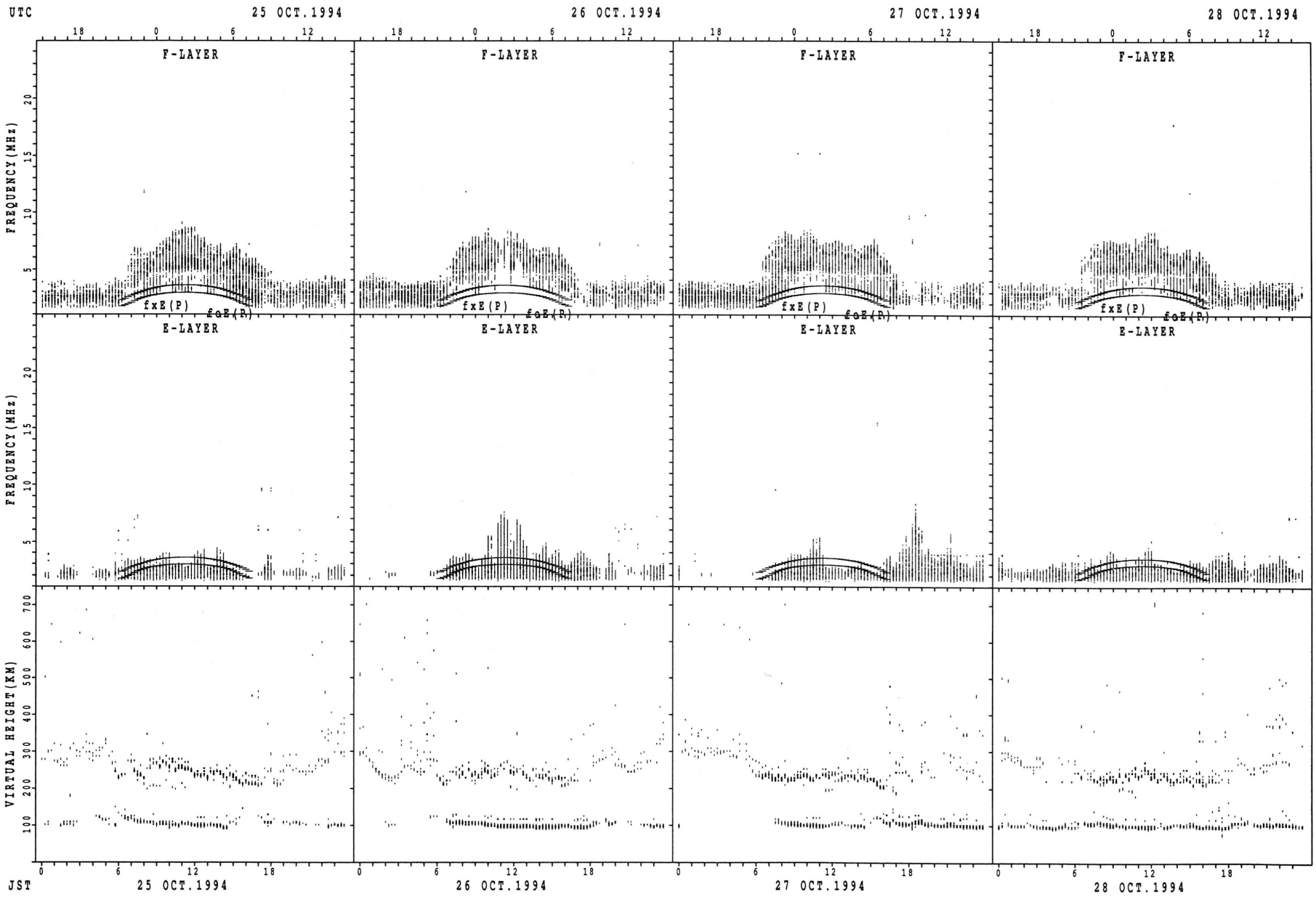
SUMMARY PLOTS AT WAKKANAI



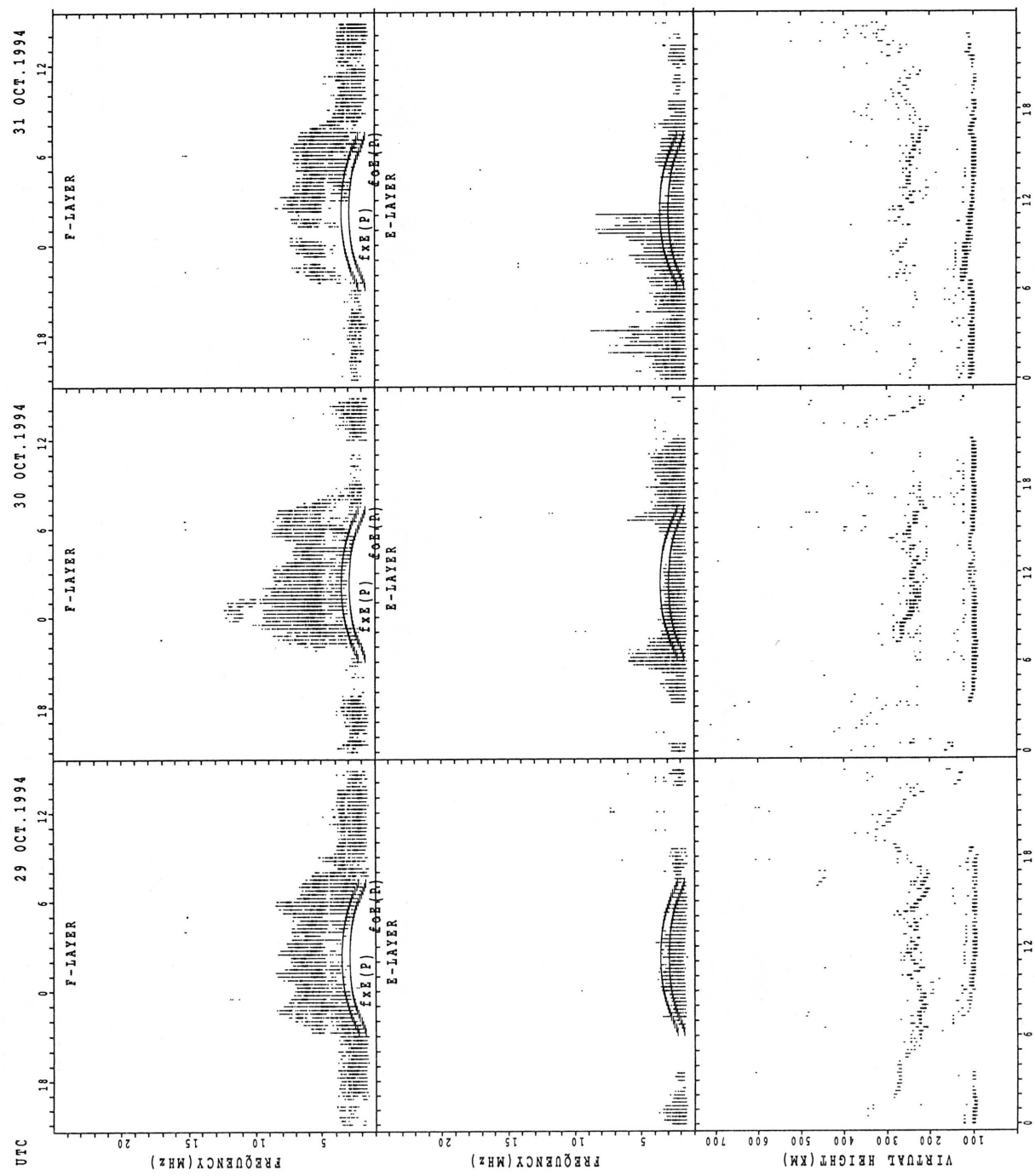
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
21 OCT.1994
22 OCT.1994
23 OCT.1994
24 OCT.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
UTC
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

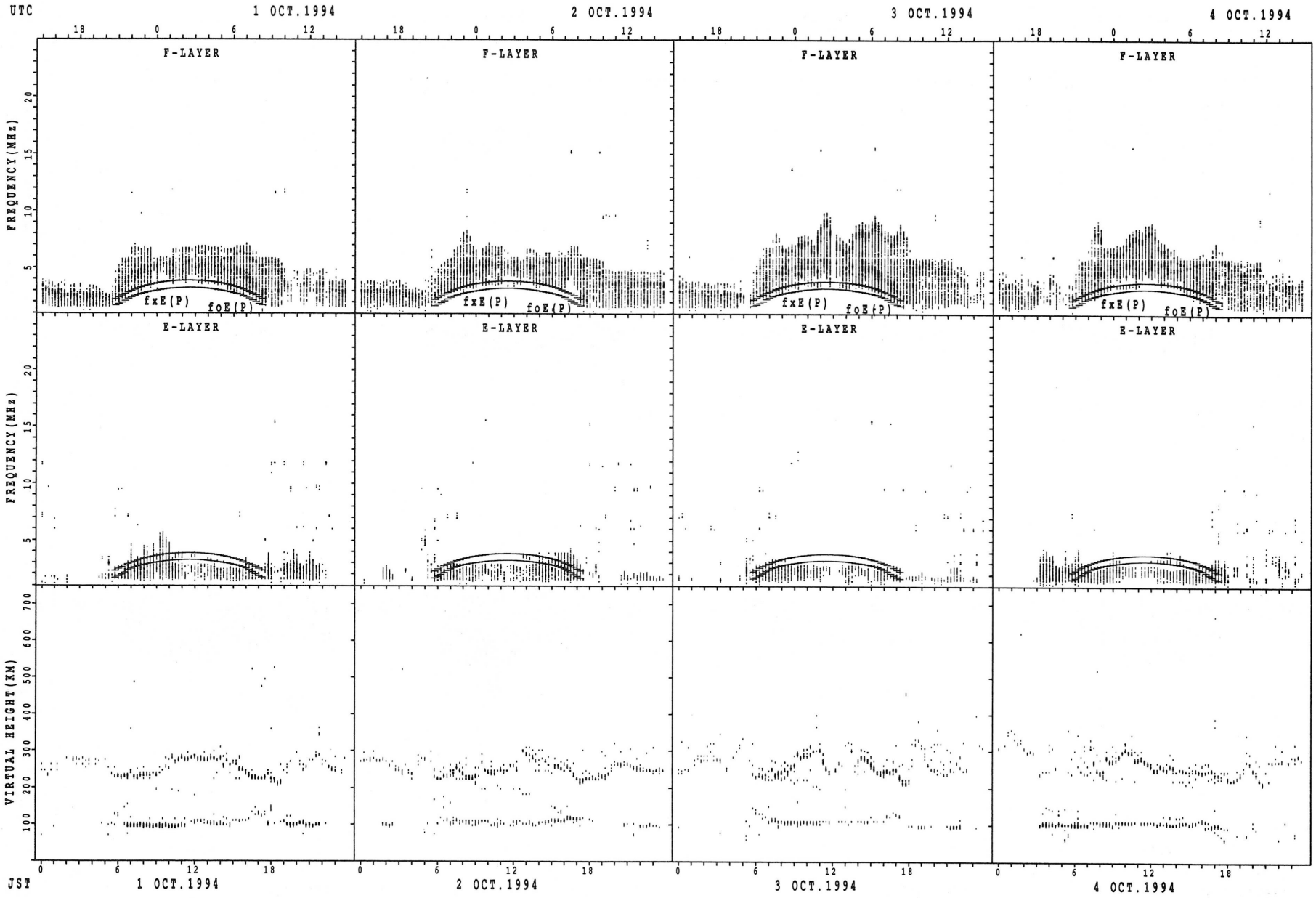
SUMMARY PLOTS AT WAKKANAI



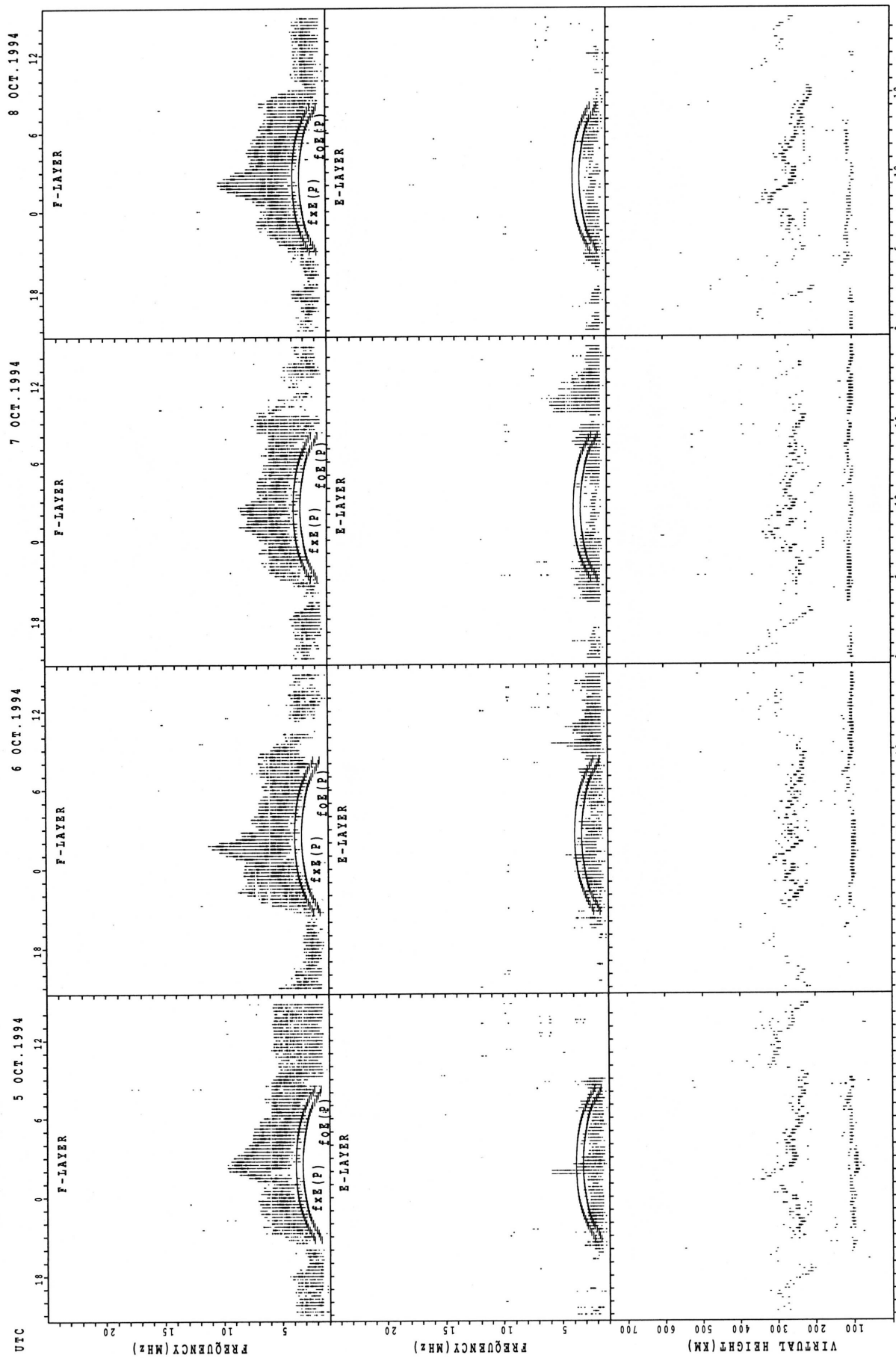
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
29 OCT.1994
30 OCT.1994
31 OCT.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

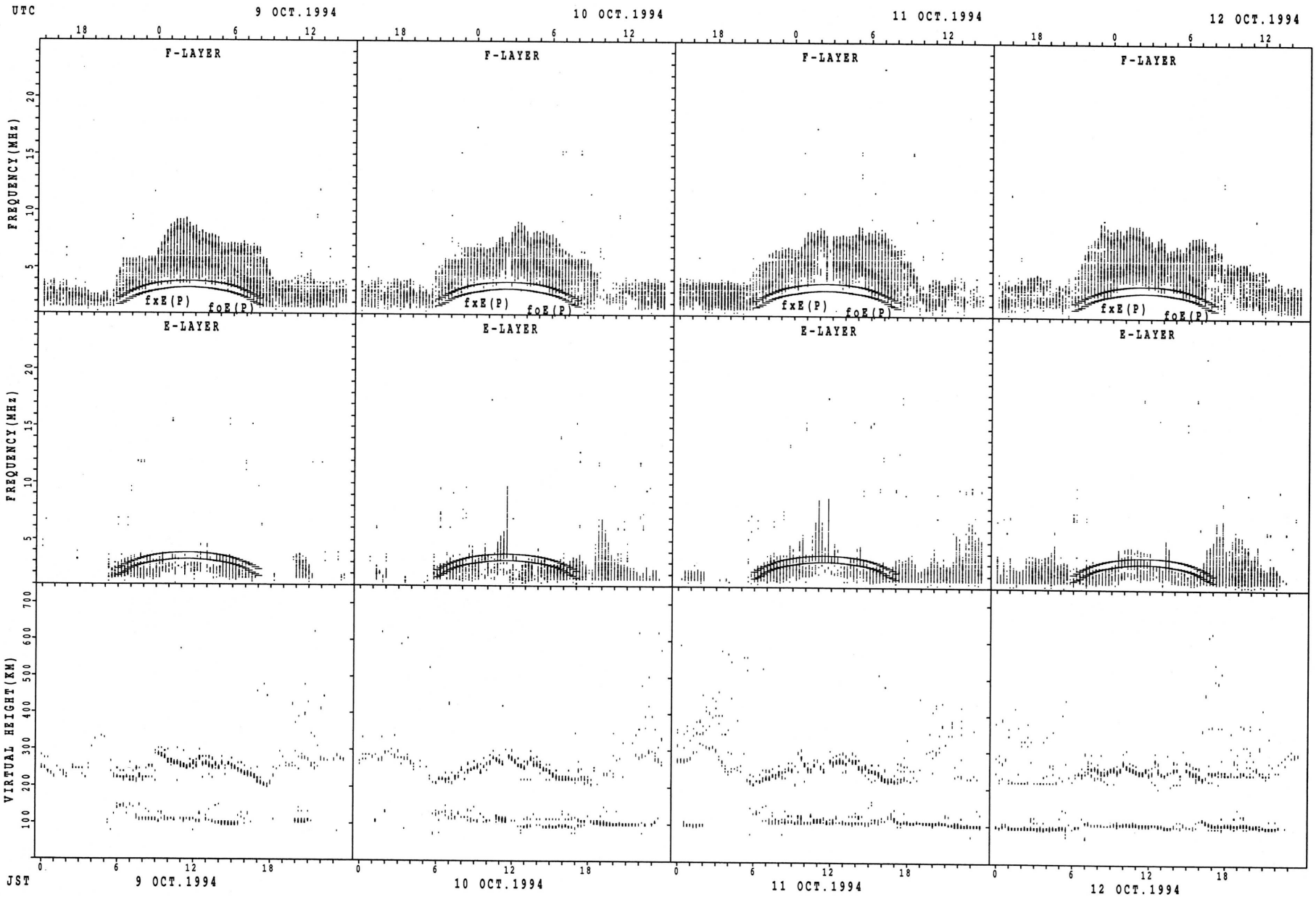
SUMMARY PLOTS AT KOKUBUNJI TOKYO



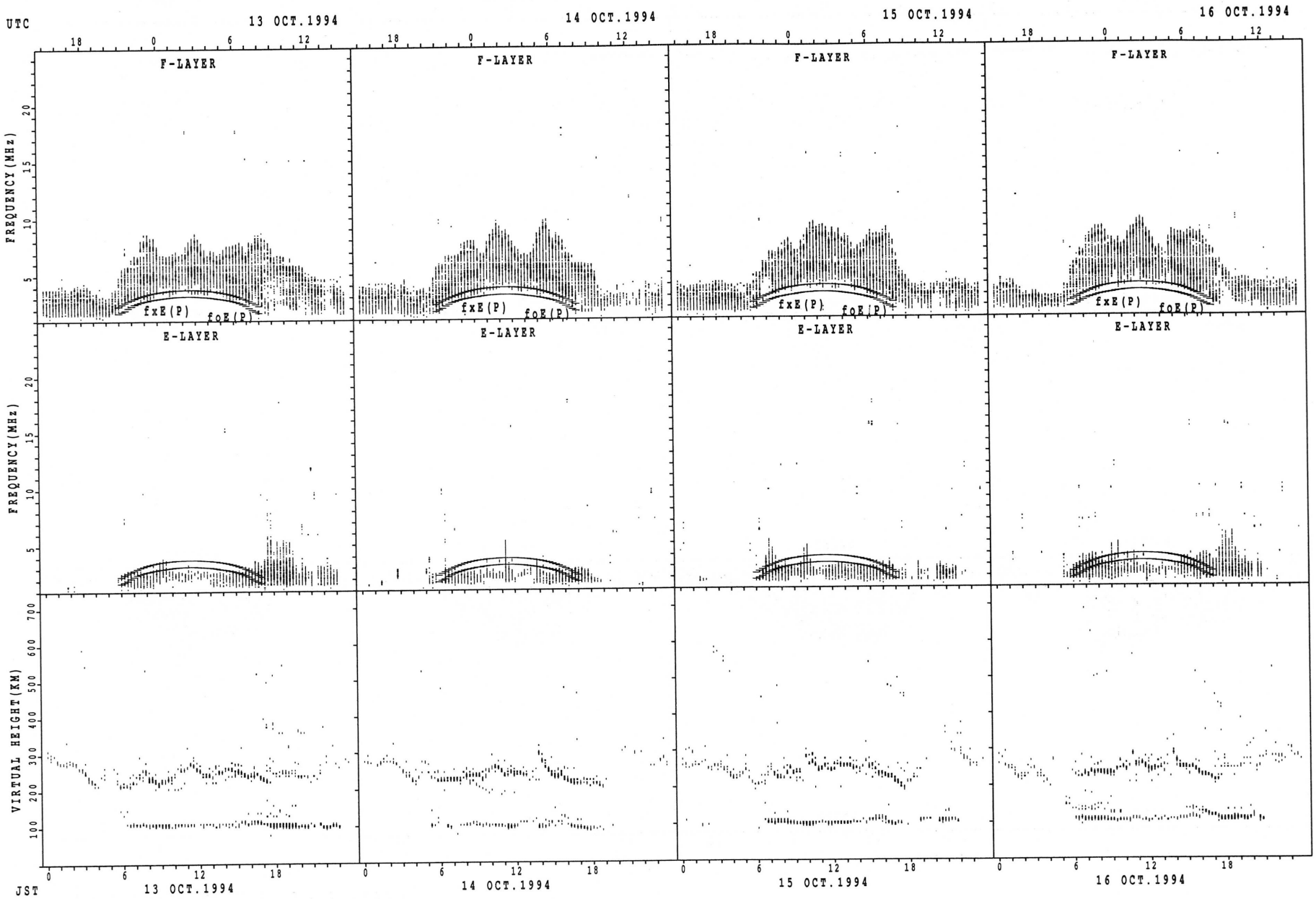
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
5 OCT.1994
6 OCT.1994
7 OCT.1994
8 OCT.1994
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

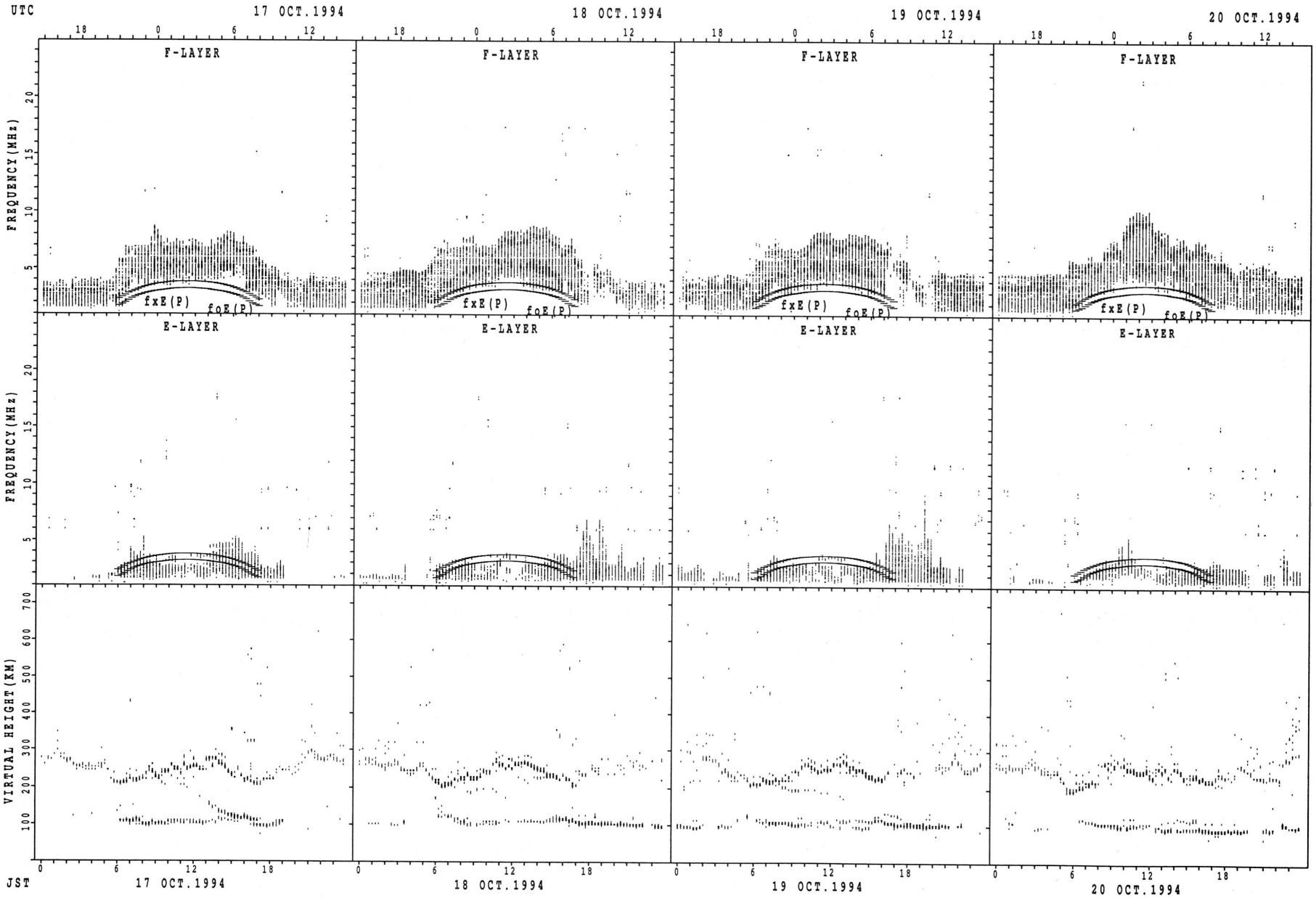
SUMMARY PLOTS AT KOKUBUNJI TOKYO



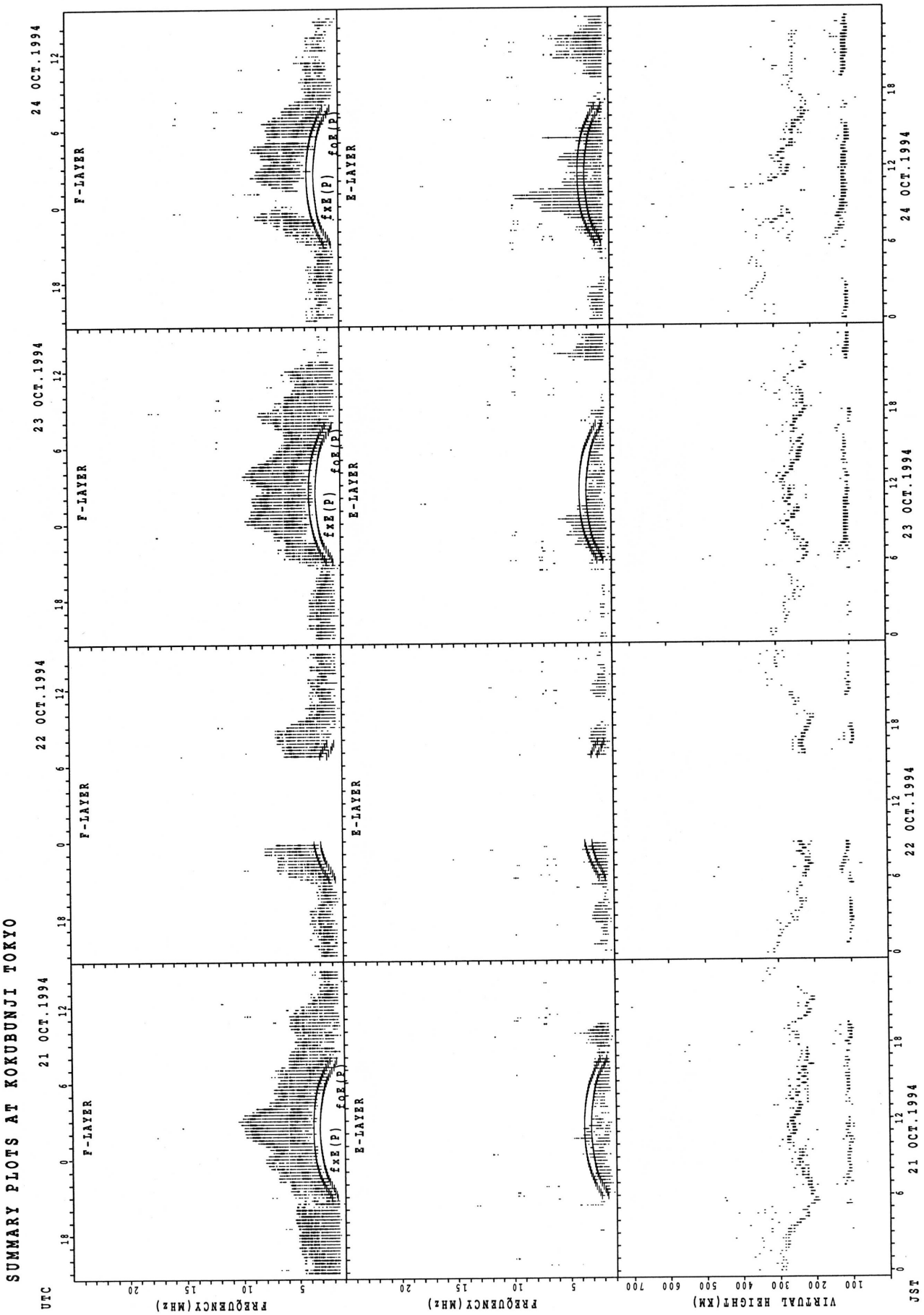
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
13 OCT.1994
14 OCT.1994
15 OCT.1994
16 OCT.1994
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

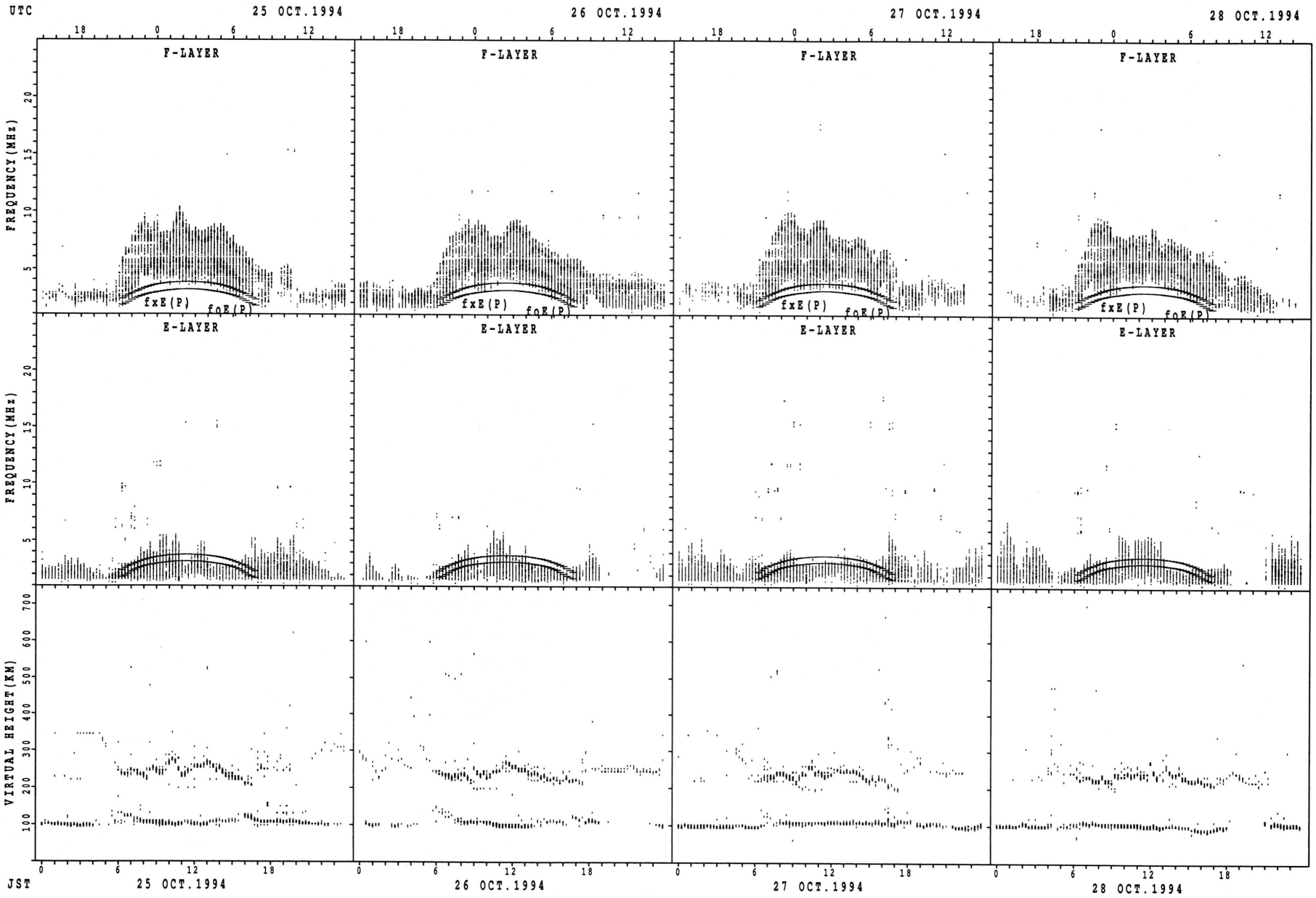
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

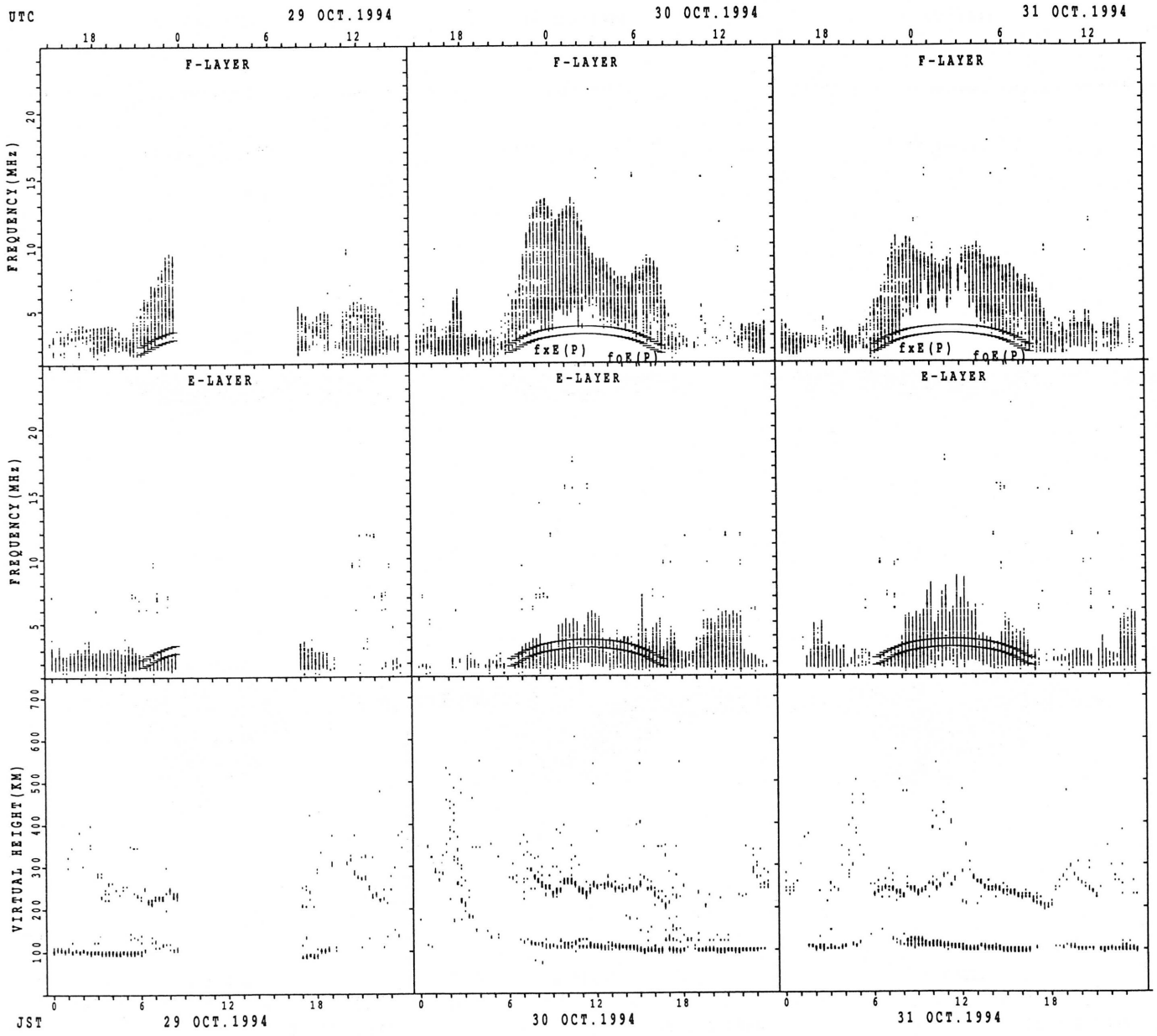

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
21 OCT.1994
22 OCT.1994
23 OCT.1994
24 OCT.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



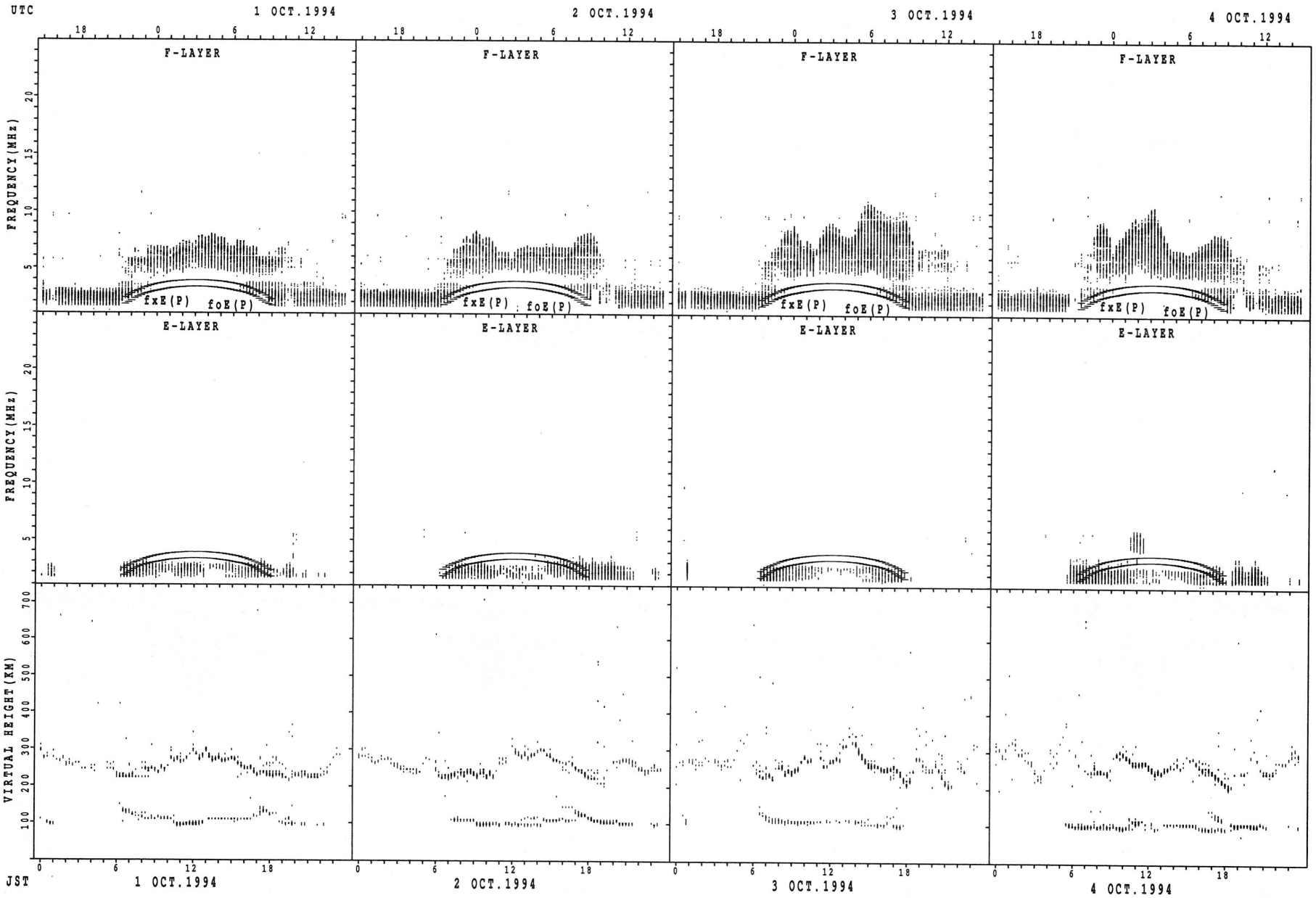
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



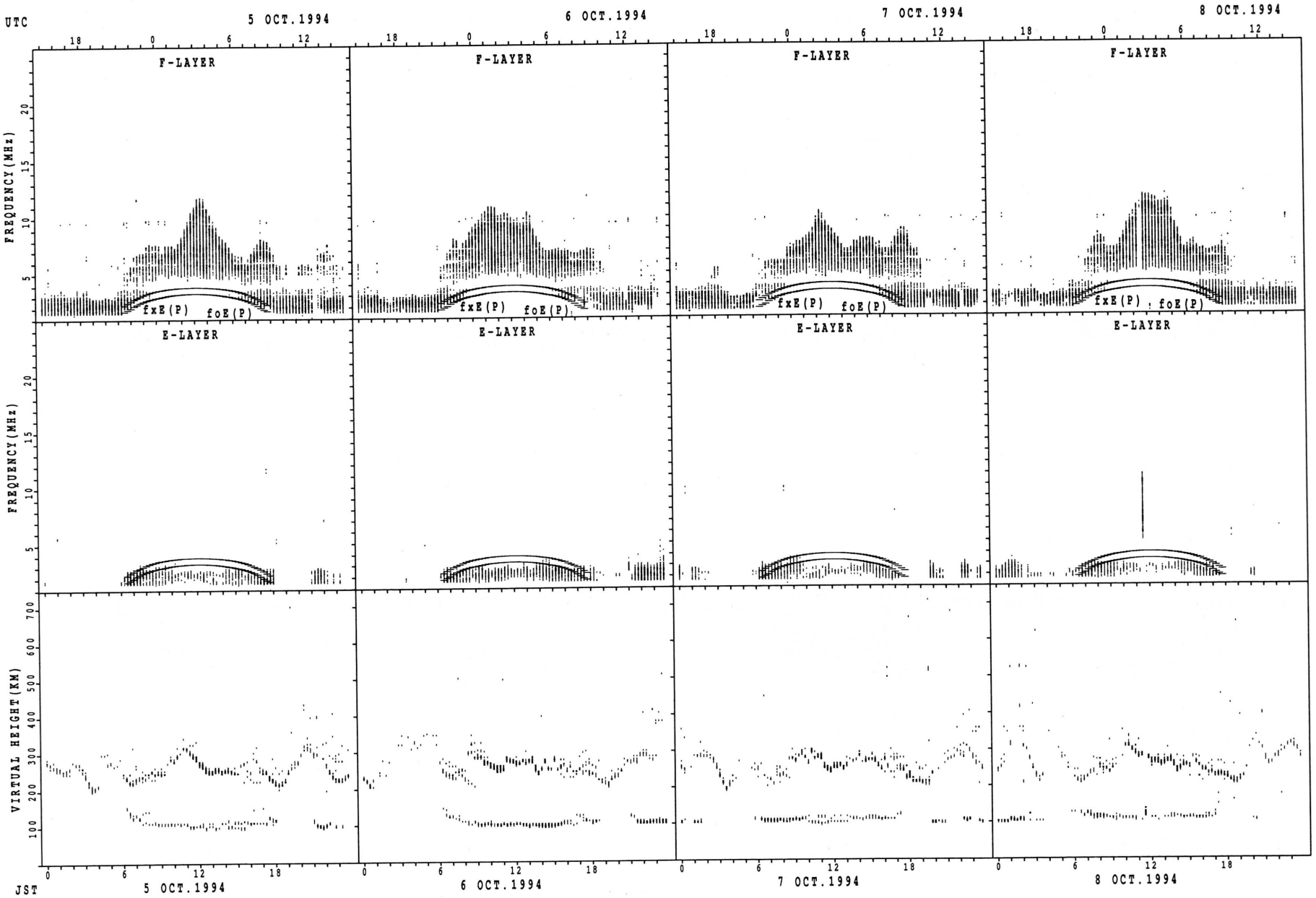
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



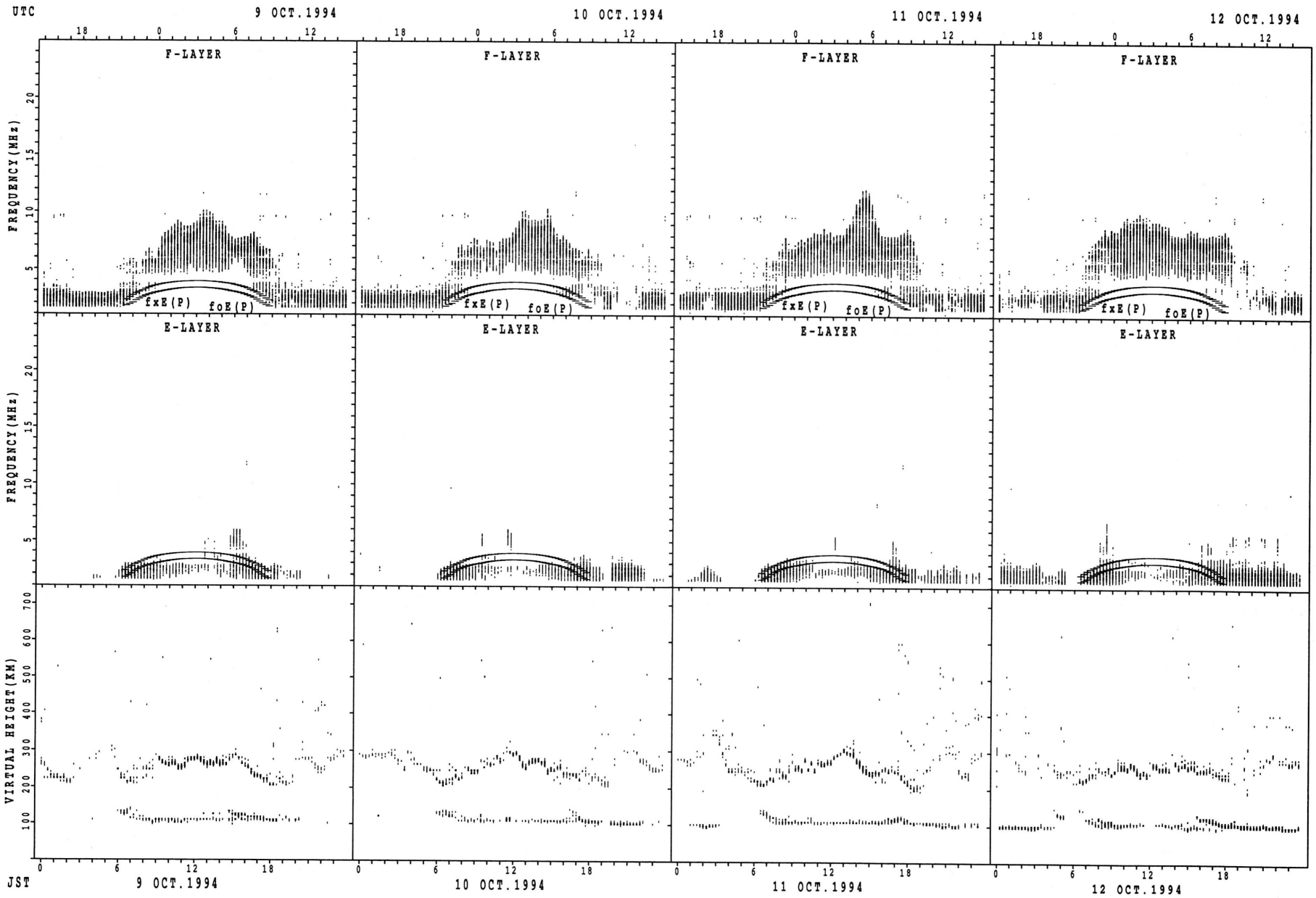
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

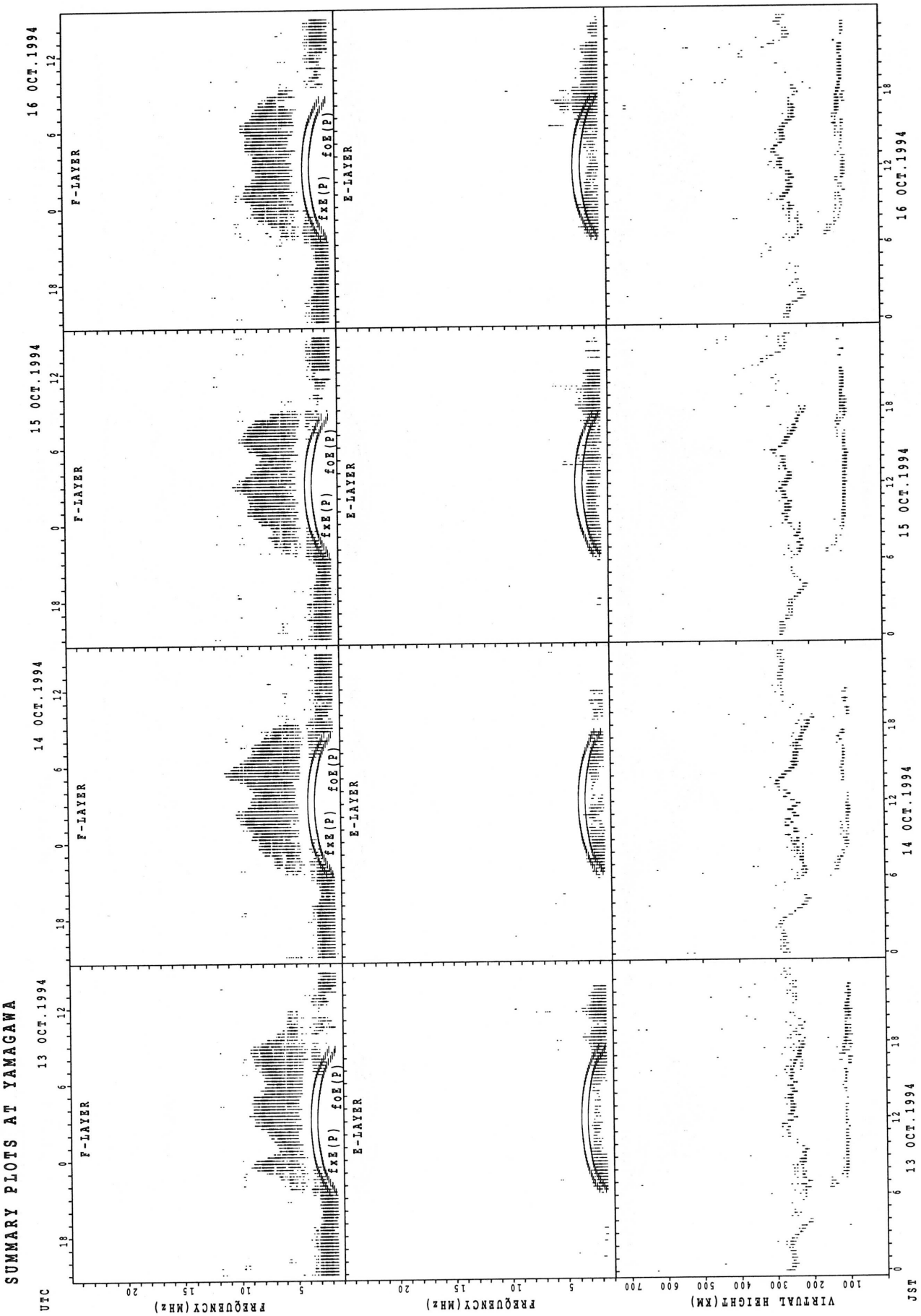


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

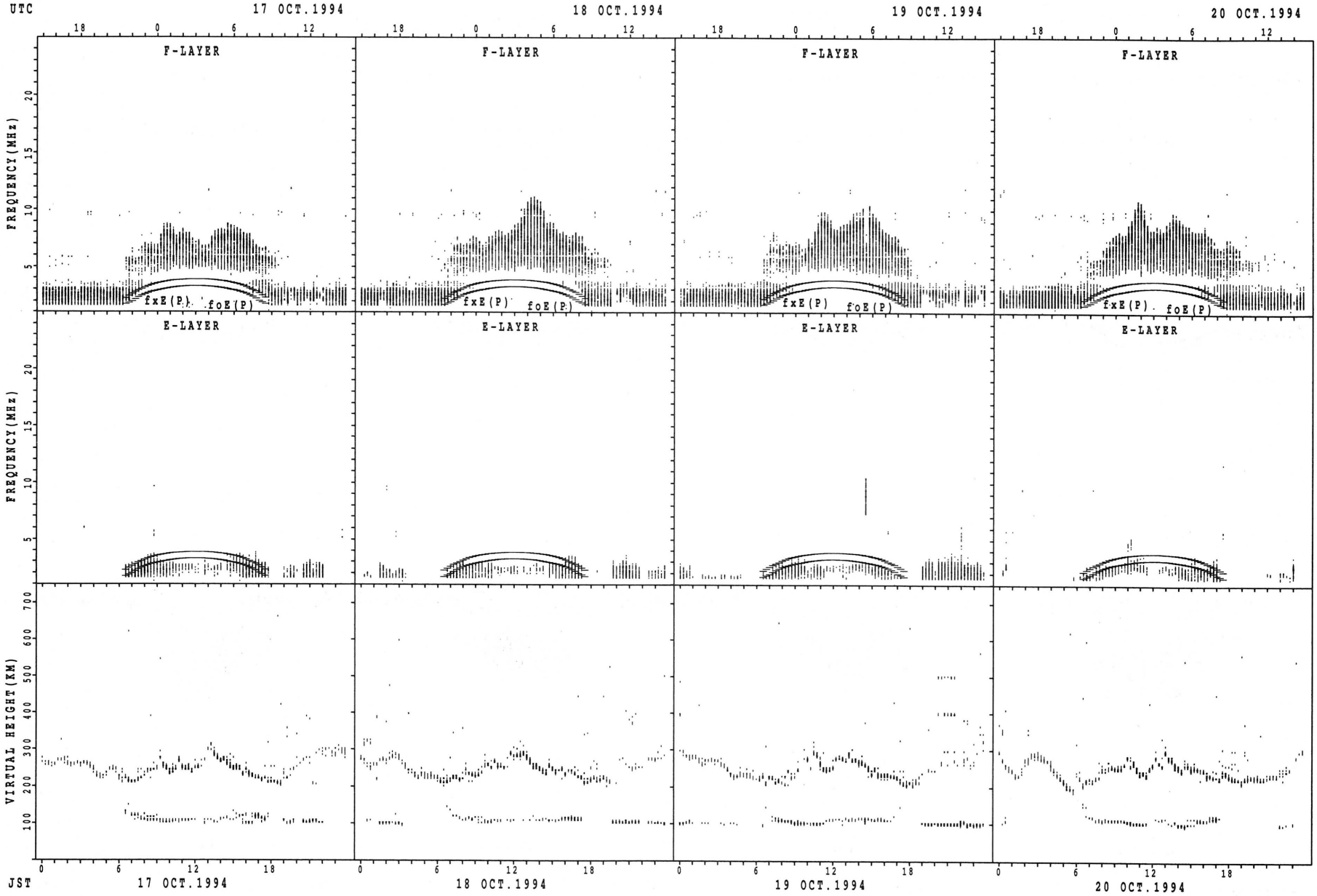
SUMMARY PLOTS AT YAMAGAWA



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

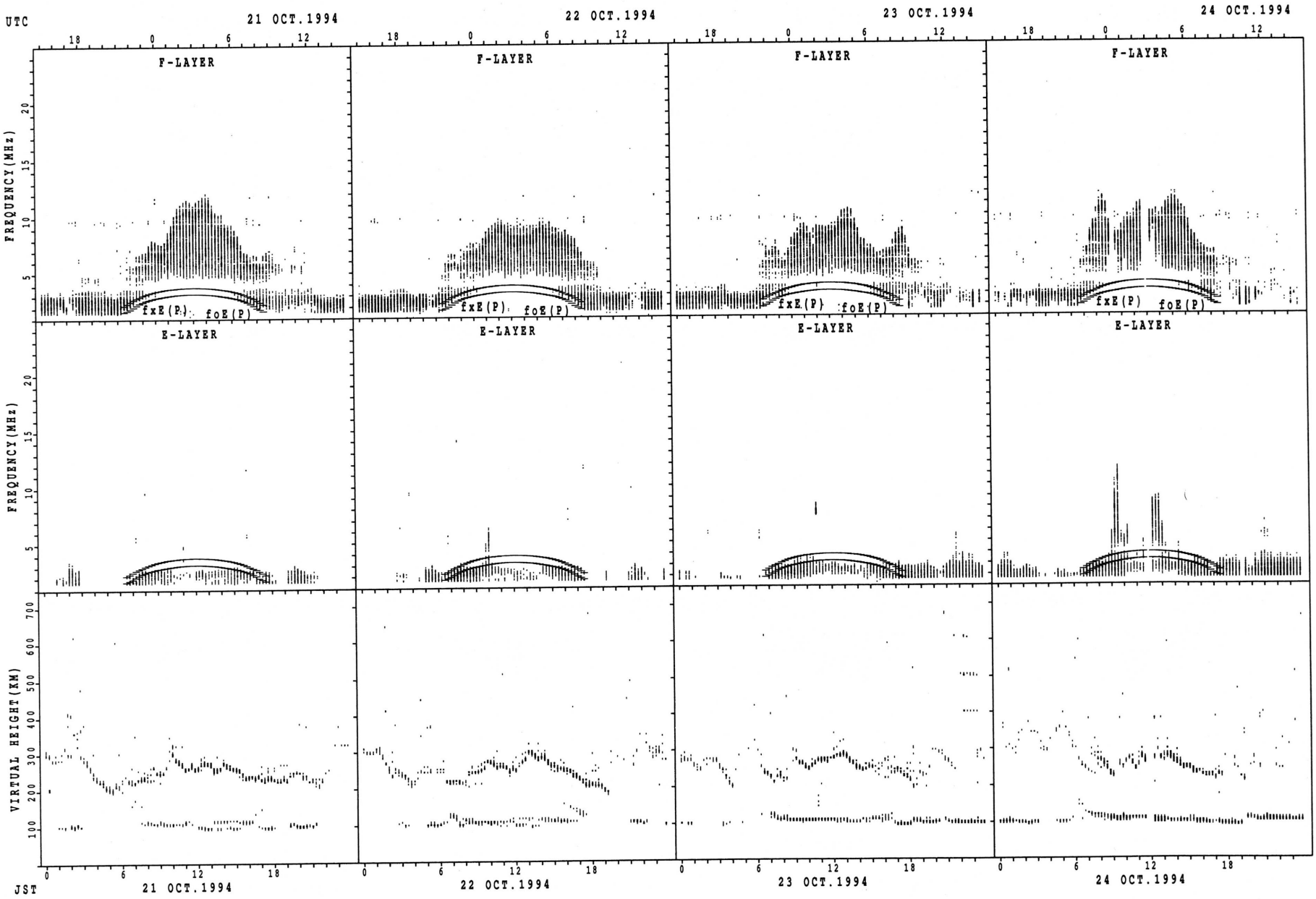

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
13 OCT.1994
14 OCT.1994
15 OCT.1994
16 OCT.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



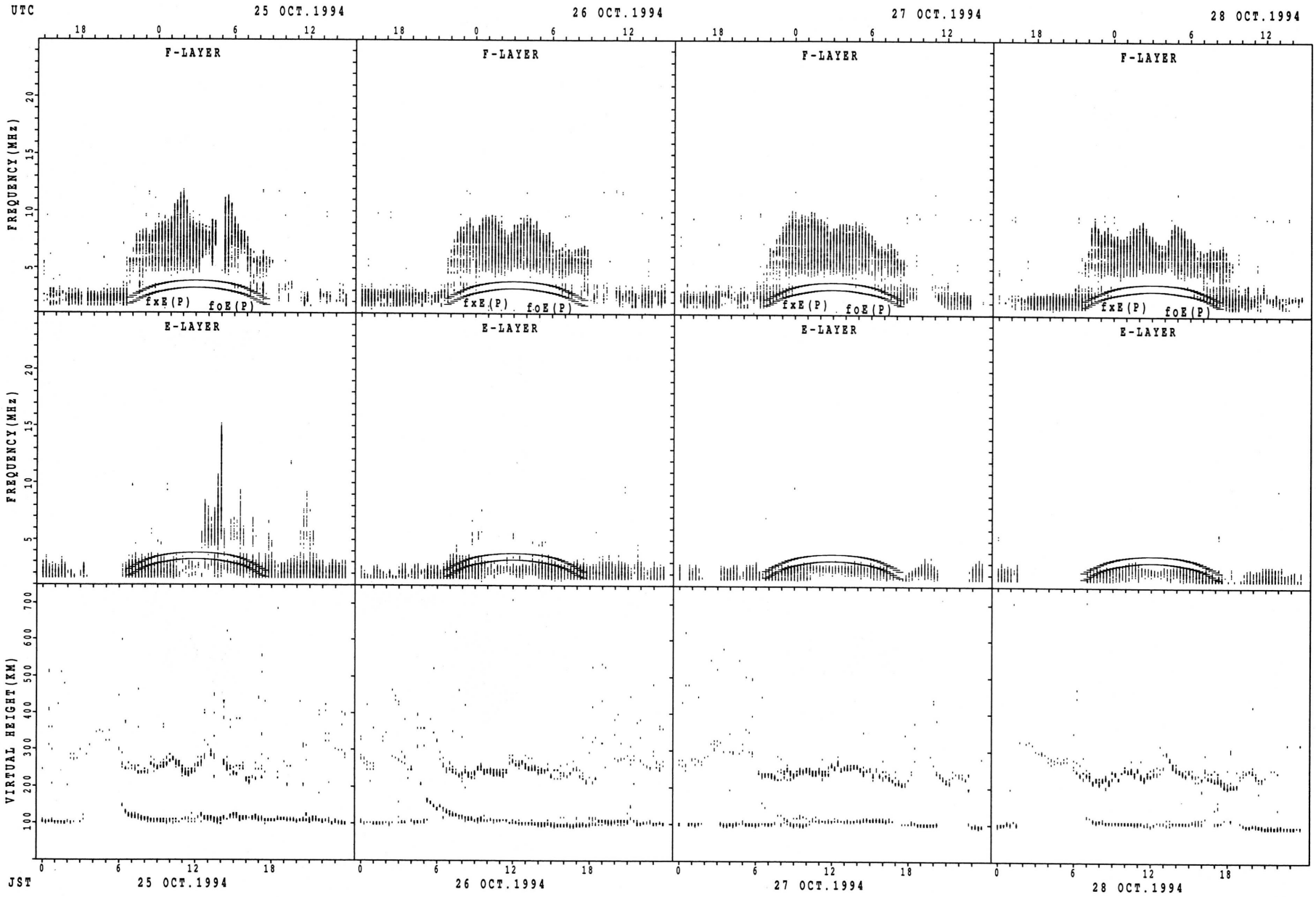
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



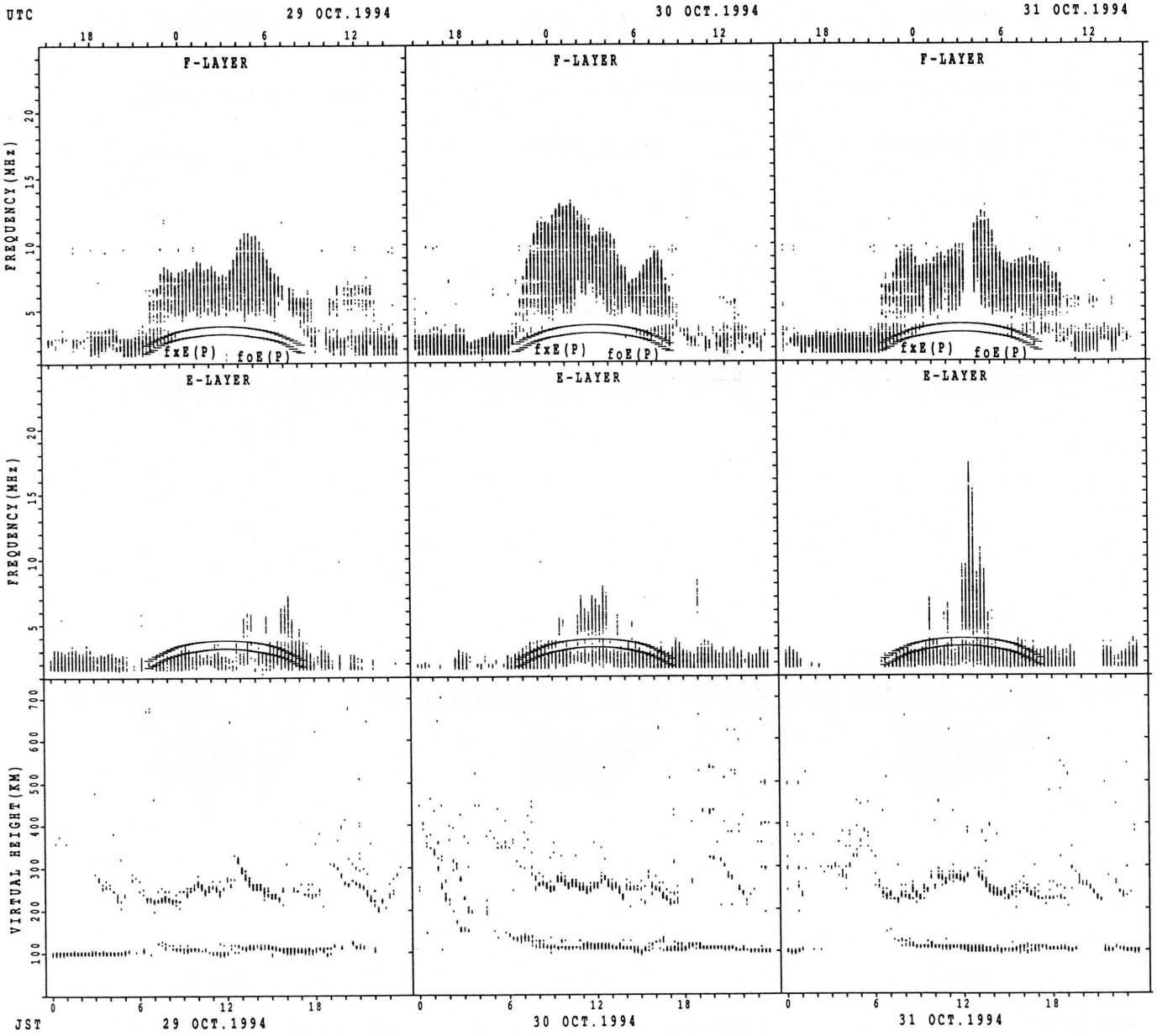
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



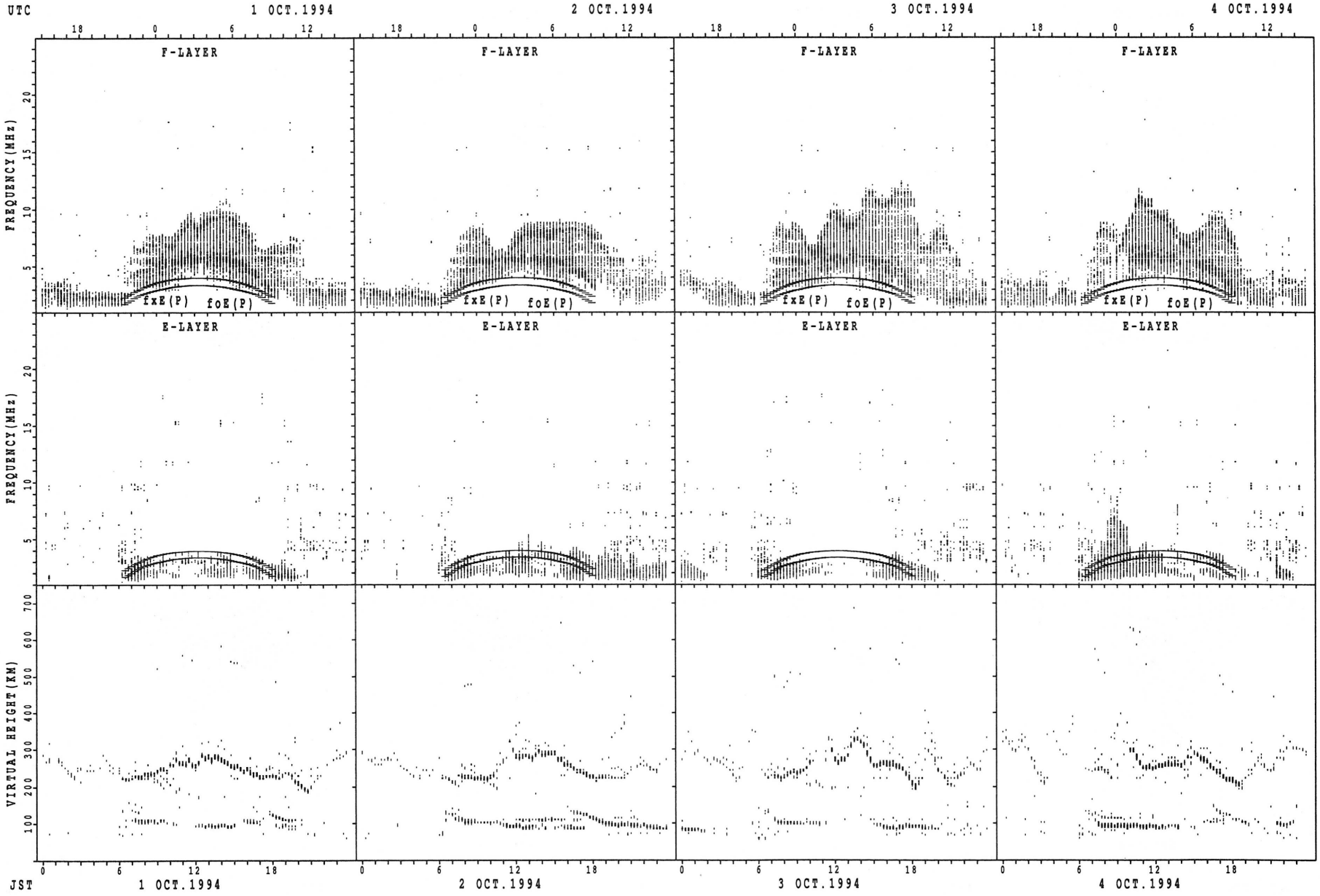
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

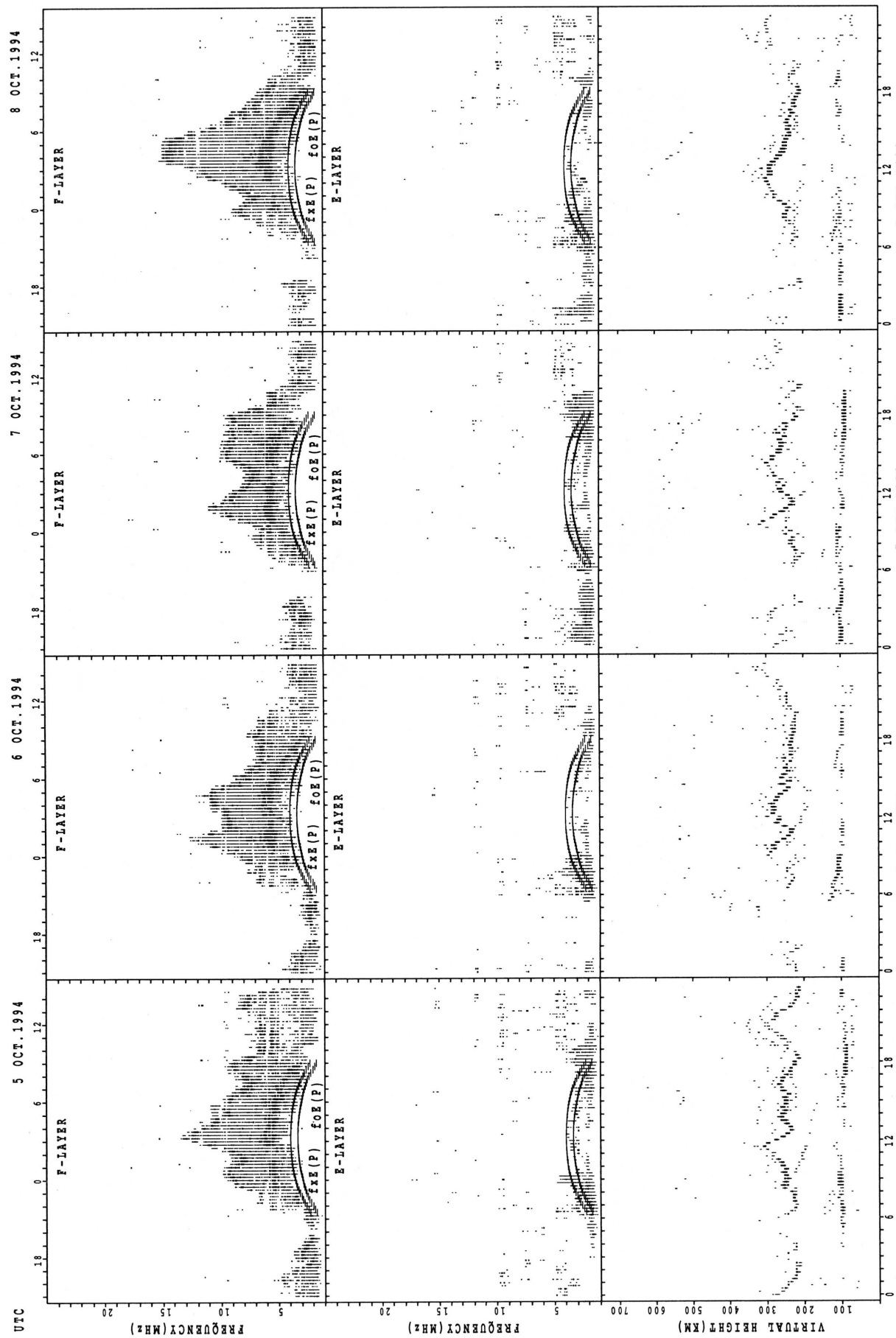


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

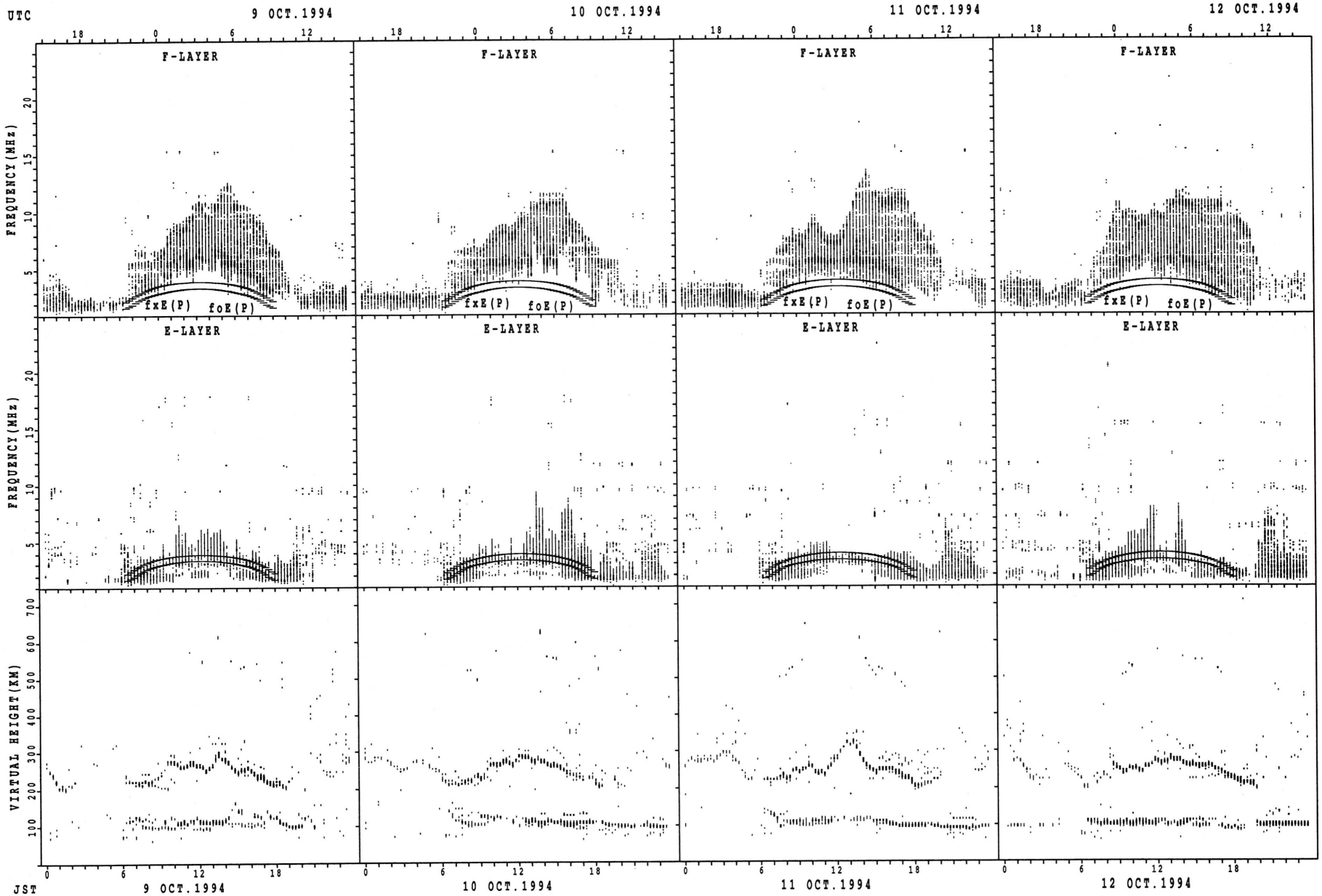
SUMMARY PLOTS AT OKINAWA



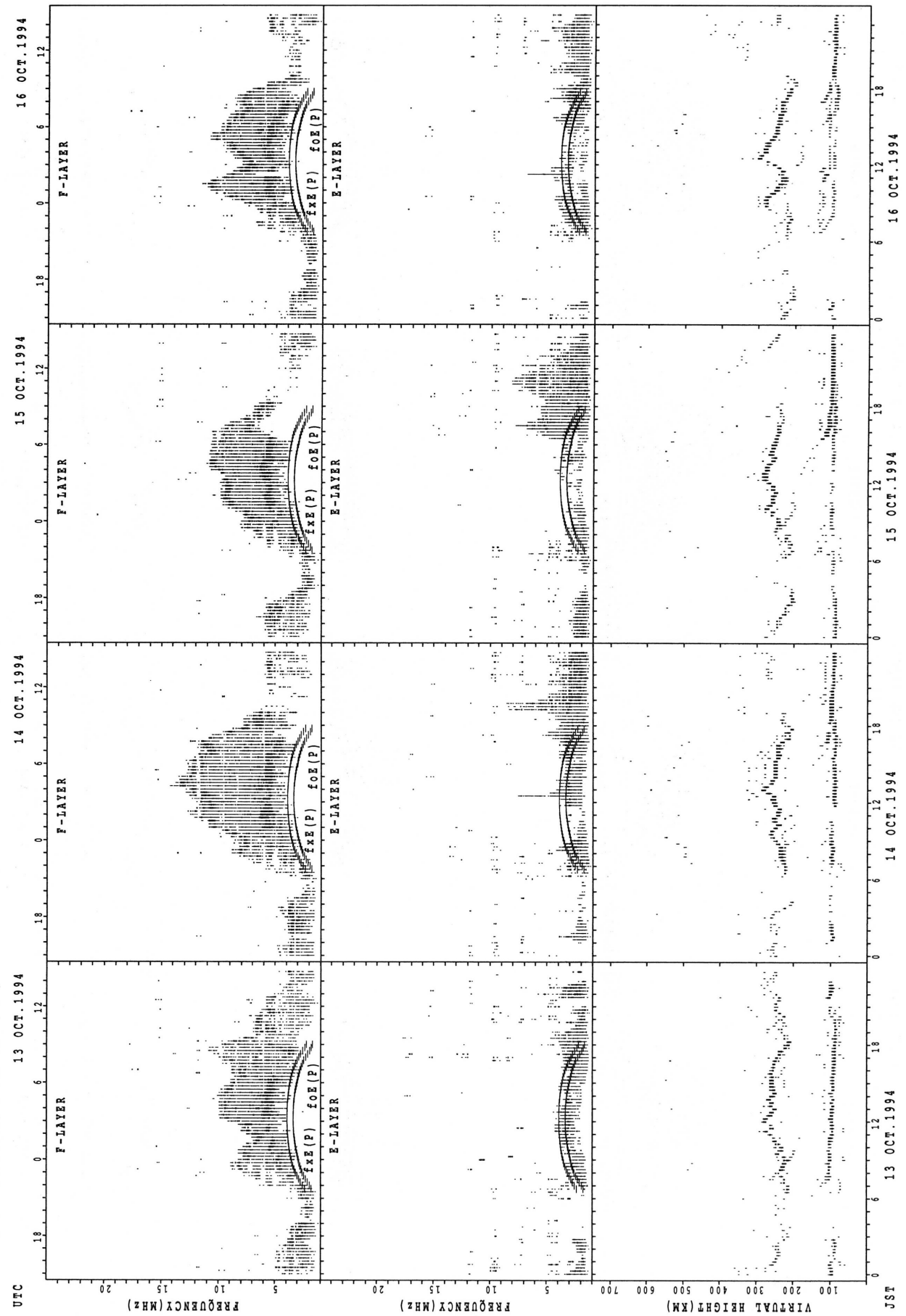
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

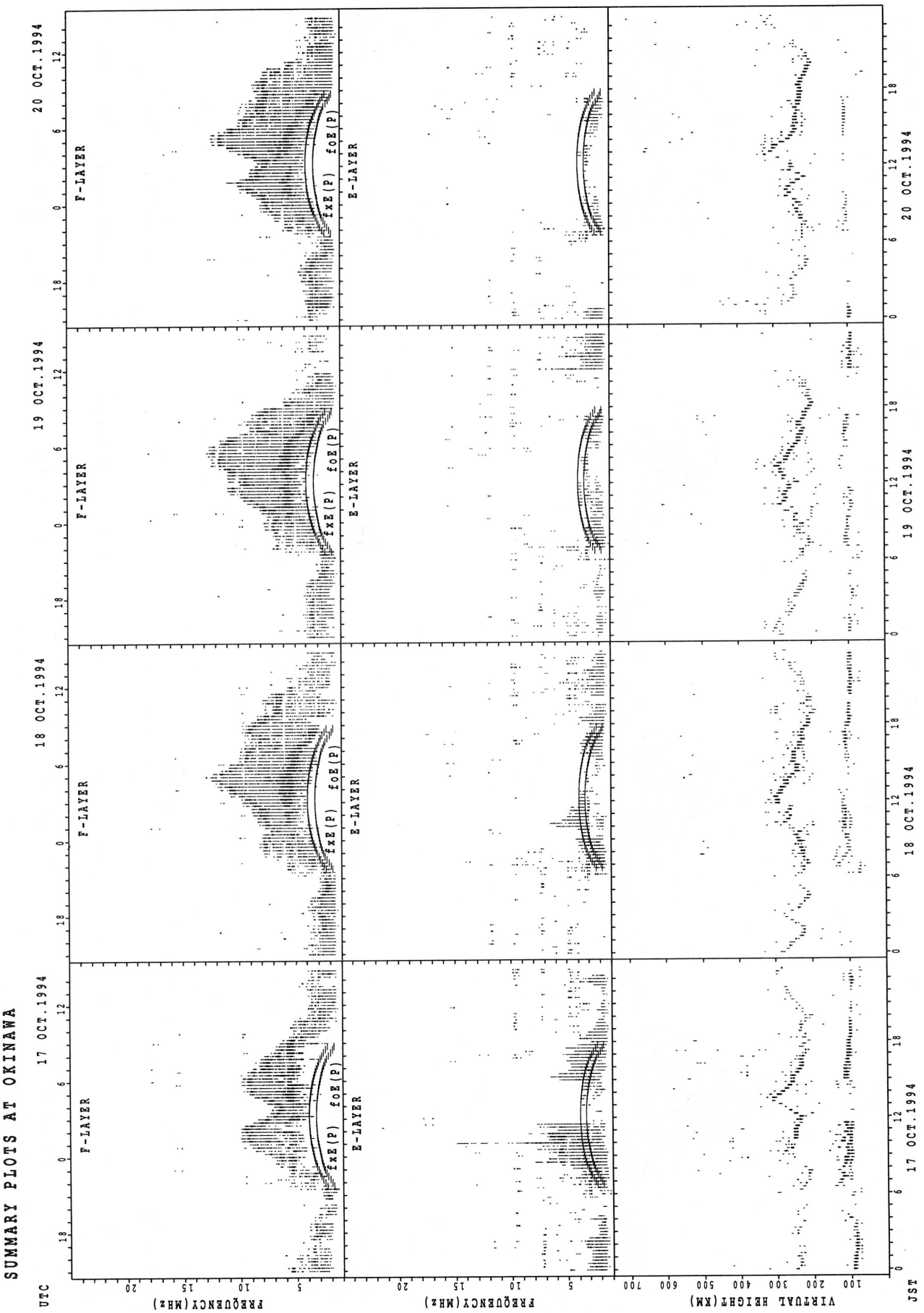

SUMMARY PLOTS AT OKINAWA
UTC
JST
5 OCT.1994
6 OCT.1994
7 OCT.1994
8 OCT.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

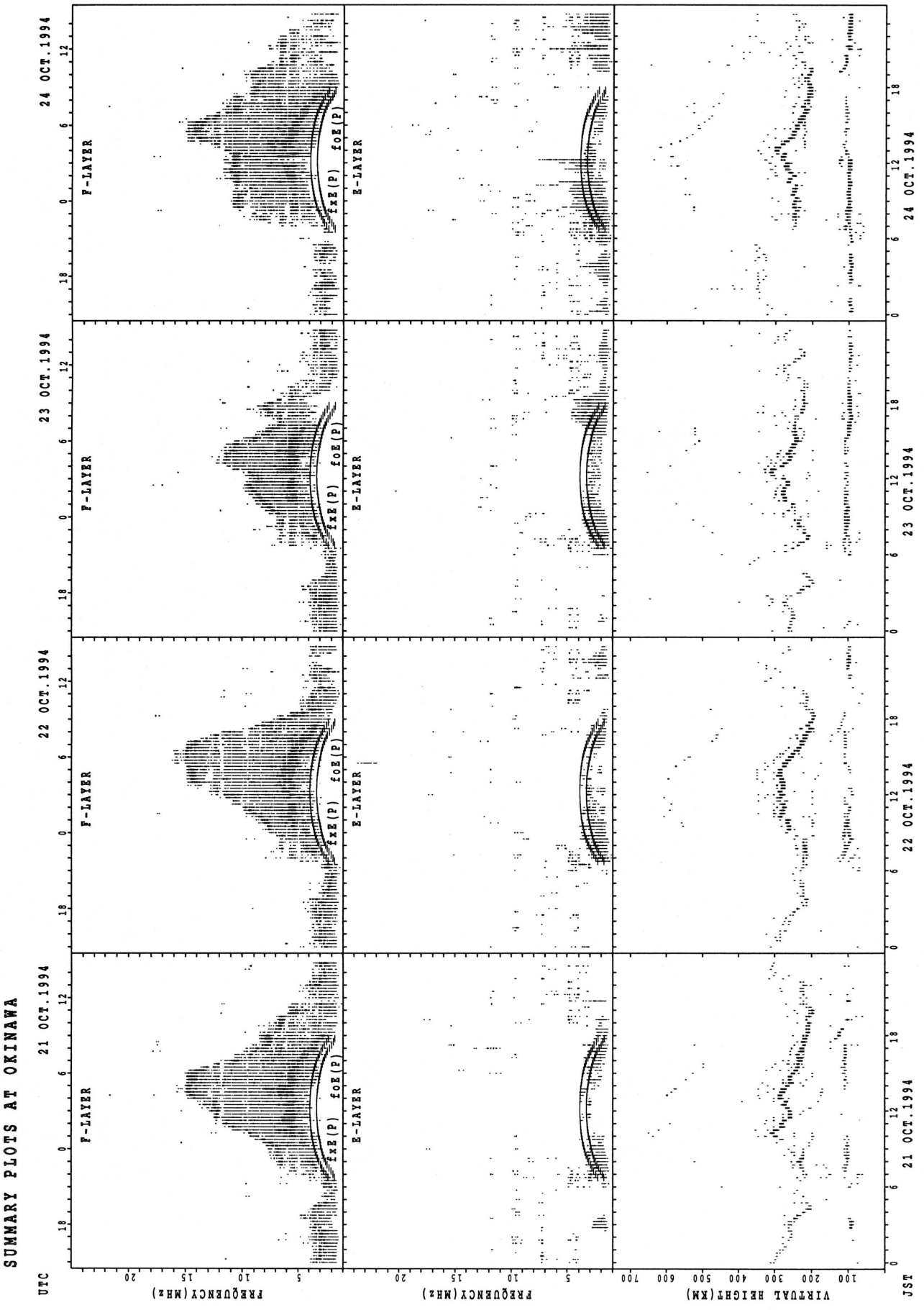
SUMMARY PLOTS AT OKINAWA



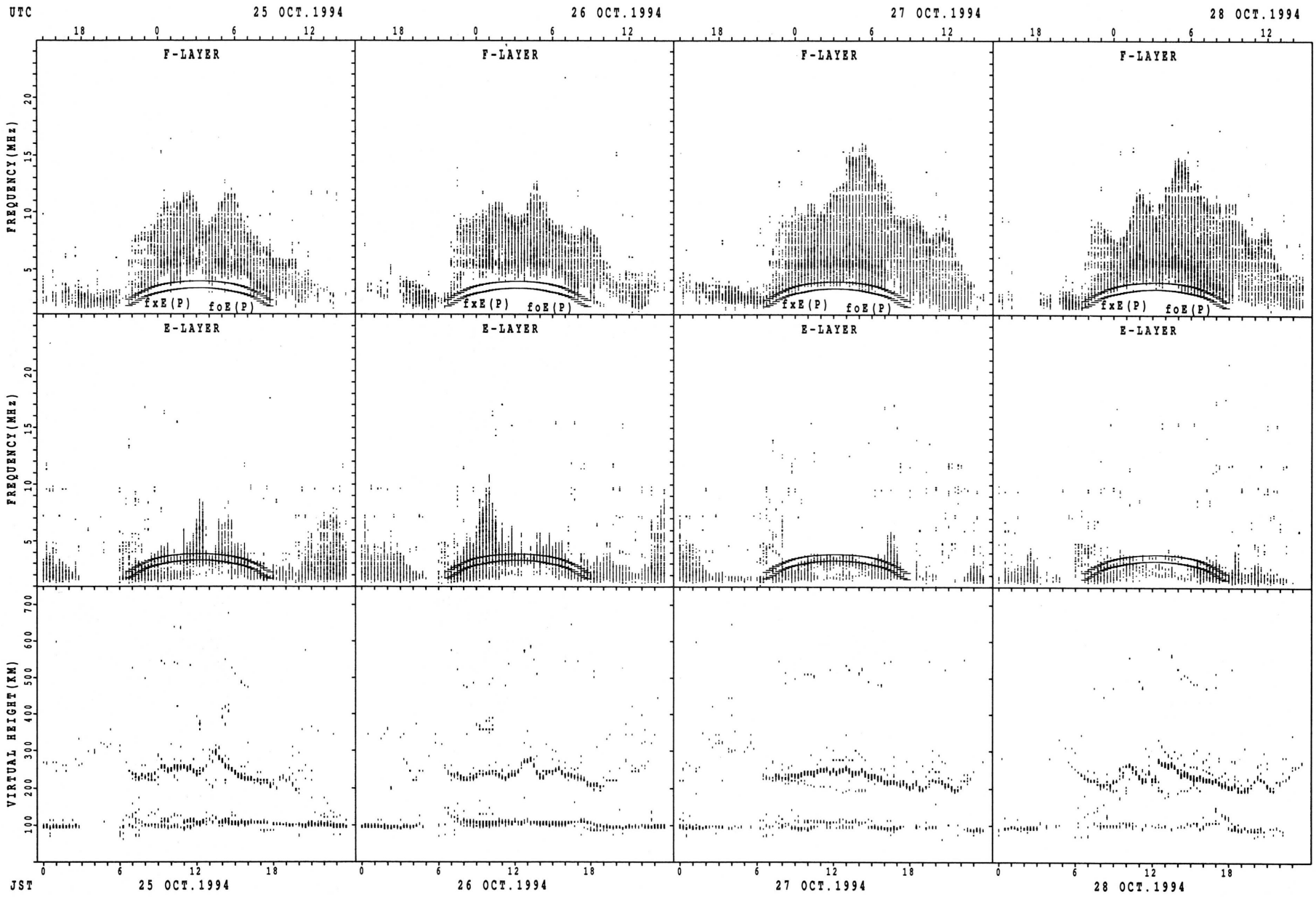
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
13 OCT.1994
14 OCT.1994
15 OCT.1994
16 OCT.1994
UTC
JST
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
17 OCT.1994
18 OCT.1994
19 OCT.1994
20 OCT.1994
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
UTC
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

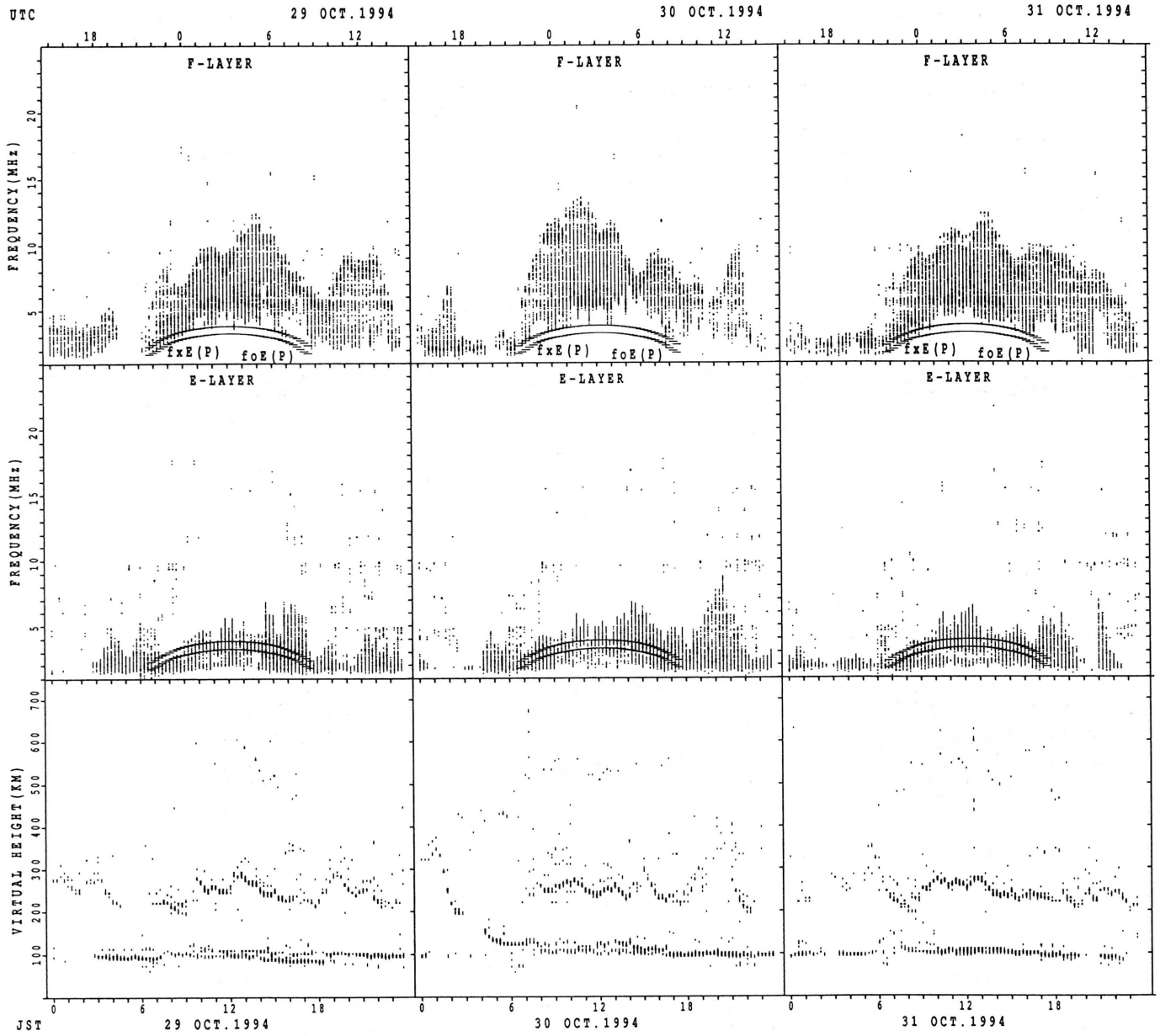

SUMMARY PLOTS AT OKINAWA
21 OCT.1994
22 OCT.1994
23 OCT.1994
24 OCT.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
UTC
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



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

SUMMARY PLOTS AT OKINAWA



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

MONTHLY MEDIANS OF h'F AND h'Es

OCT.1994 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									14	22	25	20	26	23	17	19	14							
MED									250	257	254	260	262	260	260	264	244							
U Q									272	274	274	272	270	280	281	268	248							
L Q									240	244	245	254	240	246	256	250	240							

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	12	11	14	15	17	16	26	29	31	31	29	31	29	31	30	27	25	24	21	24	20	18	21
MED	105	106	103	107	105	105	109	121	113	107	107	107	105	107	107	111	113	111	106	107	107	105	105	101
U Q	112	111	109	113	109	114	131	145	119	113	107	107	109	109	117	121	127	123	113	113	111	110	107	105
L Q	100	99	101	105	99	103	106	111	107	107	103	104	105	100	99	101	99	100	98	103	102	103	101	98

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								21	25	23	25	27	25	23	24	24	20	12						
MED								252	246	250	266	258	258	262	267	256	246	244						
U Q								268	258	272	287	284	273	278	281	272	255	256						
L Q								240	236	230	255	246	248	256	253	241	236	235						

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		12	10				16	29	29	29	29	26	22	25	28	27	28	25	23	20	14	19	17	11
MED		103	103				135	119	111	111	109	108	107	111	112	113	119	111	111	108	105	107	105	103
U Q		105	105				141	136	117	121	113	111	113	117	123	123	125	116	115	112	107	113	107	105
L Q		100	101				113	110	107	106	105	105	105	103	107	105	111	103	103	107	103	103	103	103

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	29	27	30	30	29	30	29	29	24	23	16					
MED								255	250	246	263	262	266	275	262	256	251	248	245					
U Q								262	263	262	278	272	276	296	273	264	259	256	265					
L Q								240	238	236	254	250	259	256	253	245	242	240	241					

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	12						27	30	29	30	30	21	24	29	30	31	27	19	20	23	21	18	16
MED	105	105						131	119	111	111	109	107	109	113	113	115	119	109	104	107	107	105	105
U Q	105	105						143	131	113	113	113	115	113	115	119	125	125	115	111	109	112	107	107
L Q	103	103						123	113	109	107	105	103	104	104	111	113	111	103	101	105	105	105	103

MONTHLY MEDIANS OF h'F AND h'Es

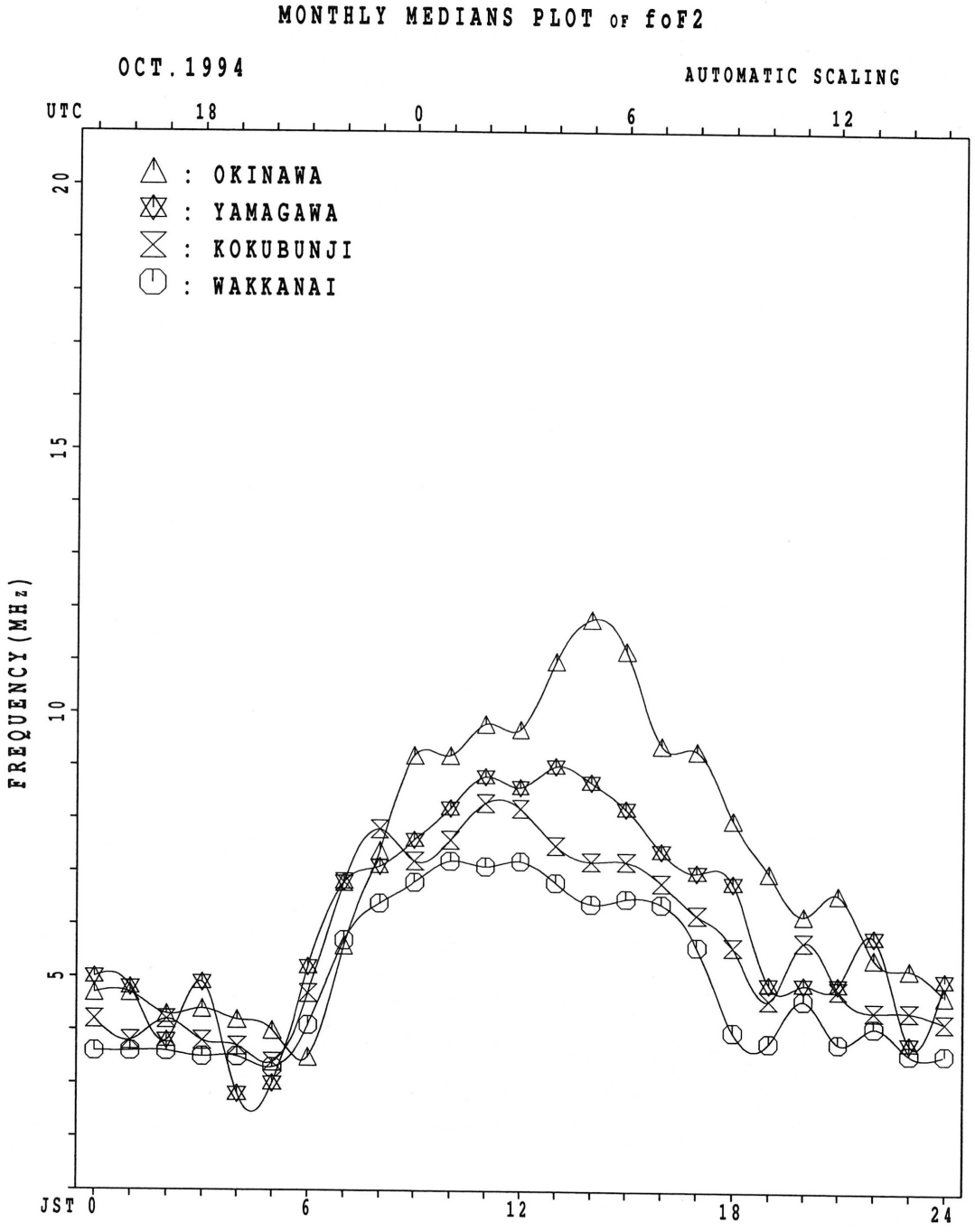
OCT.1994 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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									21	28	29	27	31	30	30	30	31	30	24	14				
MED									238	246	264	256	264	278	258	249	242	238	225	239				
U Q									248	258	272	272	278	286	272	258	258	250	236	258				
L Q									224	236	249	234	252	266	248	242	232	226	222	230				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	15	11	11				30	30	30	27	22	23	22	24	28	31	30	22	24	17	18	17	17
MED	97	97	97	95				123	107	107	107	110	109	110	108	109	105	107	97	101	95	98	99	97
U Q	99	99	99	99				129	121	115	113	113	115	115	123	116	117	119	105	103	100	105	104	99
L Q	89	93	91	91				113	105	105	103	99	101	97	101	103	99	93	93	93	90	95	95	96


MONTHLY MEDIANS PLOT OF foF2
OCT.1994
AUTOMATIC SCALING
UTC
18
0
6
12
△ : OKINAWA
✡ : YAMAGAWA
⧖ : KOKUBUNJI
◯ : WAKKANAI
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 FXI (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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 44	X 40	X 37	X 37	X 35	X 38													X 63	X 51	X 50	X 52	X 48	X 46
2	X 41	X 42	X 40	X 40	X 36	O X 43													X 62	X 56	X 50	X 51	X 51	X 48
3	X 44	X 42	X 40	X 39	X 38	X 36													X 67	X 64	X 62	X 60	X 55	O X 39
4	X 50	X 46	X 44	X 44	X 45	X 37													X 66	X 58	X 61	X 45	X 47	X 46
5	X 43	X 43	X 42	X 45	X 30	X 33													X 61	X 52	X 57	X 58	X 61	X 57
6	X 55	X 46	X 34	X 34	X 34	X 31													X 62	X 50	X 44	X 46	X 43	X 44
7	X 38	X 41	X 40	X 42	X 30	X 31													X 75	X 68	X 49	X 46	X 46	X 37
8	X 37	X 35	X 34	X 43	X 28	X 33													X 50	X 40	X 41	X 41	X 39	X 42
9	X 44	X 38	X 36	X 34	X 28	X 31													X 43	X 38	45	X 45	44	X 43
10	X 41	X 42	45	44	X 40	X 39													X 57	A	X 41	X 43	X 43	46
11	45	45	44	43	44	40													X 60	X 38	45	45	44	A
12	46	45	47	52	X 45	40													X 64	67	55	X 51	X 41	X 40
13	X 41	X 42	X 41	X 42	X 37	X 32													X 76	X 68	X 65	X 53	50	X 48
14	X 42	X 42	X 43	X 45	X 39	X 41													X 61	X 37	X 39	X 41	X 42	X 43
15	X 43	X 43	X 43	X 43	X 41	X 35													X 48	X 39	X 40	X 41	X 43	X 45
16	X 42	X 45	X 37	X 36	X 29	X 31													X 52	X 43	X 45	X 40	X 43	X 41
17	X 41	X 40	X 43	X 42	X 41	X 41													X 54	X 48	X 46	X 44	X 47	X 46
18	X 43	X 47	X 48	52	53	52													A	X 53	X 44	X 40	X 43	X 44
19	X 44	X 45	X 44	X 45	X 45	X 44													X 55	X 48	X 50	X 50	50	50
20	X 48	X 48	X 48	X 48	X 48	X 49													X 66	X 55	X 57	X 57	X 53	47
21	48	48	X 52	54	55	54													X 55	X 57	X 62	X 53	X 37	X 34
22	X 36	X 36	X 38	X 38	X 36	X 34				C	C	C	C	C	C	C		X 73	X 61	X 41	X 39	X 38	X 38	X 40
23	X 39	X 38	X 38	X 39	X 35	X 29													X 74	X 61	X 52	X 60	A	A
24	X 40	X 39	X 38	X 39	X 37	X 34													X 43	X 47	X 48	A	X 41	X 35
25	X 33	X 34	X 37	X 35	X 34	X 36													X 48	X 52	X 34	X 35	X 37	X 37
26	X 39	X 40	X 36	X 36	X 34	39												X 63	X 50	X 48	X 47	X 45	X 48	X 43
27	X 39	X 41	X 43	X 42	A	X 40												X 55	X 40	X 45	X 47	X 40	X 41	X 36
28	A	A	X 37	A	X 39	X 35												X 59	X 46	X 49	X 45	X 35	A	A
29	X 36	X 37	X 39	X 38	X 41	X 36					C	C	C	C	C	C	C	C	X 45	X 54	X 51	X 57	X 56	X 40
30	X 35	X 45	41	54	X 33	X 38				133	129							X 58	X 36	X 35	X 45	A	A	X 43
31	X 41	X 32	X 34	A	38	X 34												X 72	X 44	X 43	X 47	X 43	X 44	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	30	30	31	29	30	31				1	1							6	30	30	31	29	28	27
MED	X 42	X 42	X 40	X 42	X 38	X 36				133	129							X 61	X 56	X 50	X 47	X 45	X 44	X 43
U O	X 44	X 45	X 44	45	X 41	X 40												X 72	X 63	X 56	X 52	X 52	X 49	X 46
L O	X 39	X 39	X 37	X 38	X 34	X 33												X 58	X 48	X 43	X 44	X 41	X 42	X 40

OCT. 1994 FXI (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 FOF2 (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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	38	34	31	31	29	S 32	49	J R 64	66	61	58	63	64	64	62	64	65	54	57	45	44	46	42	40
2	35	36	34	34	30	S 37	J R 46	S 60	77	61	67	65	60	63	59	57	58	67	56	50	44	45	45	42
3	38	36	34	33	32	30	47	64	69	67	76	89	87	70	87	89	83	82	61	58	56	54	49	33
4	44	40	J R 38	38	39	31	J S 42	58	81	65	72	80	86	69	60	56	59	68	60	52	56	J S 39	J S 41	40
5	U S 37	37	J S 36	39	24	28	44	62	67	R 63	S 64	91	89	78	70	61	59	56	55	46	51	J S 52	55	51
6	49	40	28	28	28	25	J S 42	J R 78	75	75	93	99	71	69	66	61	65	S 70	56	44	38	40	37	38
7	32	35	34	36	24	25	J R 45	61	62	65	82	79	70	65	61	56	58	61	69	62	43	F 37	41	31
8	31	29	28	J R 37	22	27	J R 38	53	66	60	75	100	81	71	70	60	57	J R 62	44	34	35	35	33	36
9	38	32	30	28	22	25	48	56	52	65	83	90	82	76	69	68	67	J R 66	37	32	F 39	S 39	F 35	S 37
10	35	S 36	S 35	F 35	34	33	J S 50	J R 55	68	69	65	71	85	79	78	77	63	58	51	A	35	37	S 37	F 37
11	F 39	F 37	J F 37	F 34	F 35	F 32	J S 50	J S 65	66	65	81	84	79	77	86	82	81	66	54	32	F 37	F 35	F 38	A
12	F 37	F 37	F 37	F 41	39	F 33	U S 45	68	89	81	86	86	74	74	70	75	75	75	58	56	F 45	45	36	34
13	35	36	35	S 36	31	26	J R 46	62	82	71	65	68	84	66	67	73	70	81	70	62	59	47	F 44	42
14	36	36	37	39	33	35	51	J R 69	72	74	75	89	75	63	81	83	75	61	55	32	33	35	36	37
15	37	37	37	37	35	29	44	61	70	70	77	85	82	81	66	78	81	J R 78	42	33	34	35	37	39
16	36	39	31	30	23	25	48	U S 73	85	73	71	86	86	66	82	76	80	S 67	46	37	39	34	37	35
17	35	J S 34	37	36	35	35	J R 55	65	66	80	67	70	70	65	71	76	70	56	48	42	40	38	41	S 40
18	S 37	41	42	45	F 44	43	J S 65	66	J R 74	69	64	78	80	79	82	76	69	S 60	A	47	38	34	37	38
19	S 39	39	38	39	39	38	56	J S 67	65	63	71	81	74	75	76	76	69	55	49	42	44	44	F 38	F 40
20	42	42	42	42	42	43	J S 56	61	60	73	91	100	92	79	74	69	70	61	60	49	51	51	47	F 41
21	F 41	F 41	46	46	F 46	F 46	U S 50	61	68	76	77	96	102	V 84	67	J R 66	70	55	49	51	56	46	31	S 28
22	30	30	32	32	30	28	44	J S 71	76	C	C	C	C	C	C	C	59	67	55	36	33	32	32	34
23	33	32	32	33	29	23	43	U S 65	66	89	86	83	82	91	73	61	58	75	68	56	46	54	A	A
24	34	33	32	33	31	28	J R 36	56	79	R 61	A	79	75	74	71	71	64	48	37	41	42	A	S 35	29
25	S 28	S 28	31	29	28	S 30	J S 48	J R 77	U R 94	89	80	94	84	82	86	75	61	47	42	46	28	29	31	31
26	33	34	30	30	28	F 31	J S 42	J R 74	82	87	80	78	91	84	72	61	55	57	44	42	41	39	42	38
27	33	35	37	36	A	34	J S 44	S 69	92	94	79	91	74	73	76	65	65	49	34	39	41	34	36	U S 30
28	A	A	31	A	33	29	42	J R 76	89	78	74	78	85	70	70	65	63	53	40	43	39	29	A	A
29	30	31	33	32	35	30	U S 45	U S 64	88	C	C	C	C	C	C	C	C	C	39	48	45	51	50	34
30	29	39	F 28	F 49	27	32	40	75	124	F 125	F 119	122	90	82	73	79	88	52	30	29	39	A	A	37
31	35	26	28	A	F 30	28	J R 46	72	90	93	89	84	82	93	85	79	73	66	38	37	41	37	38	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	30	30	31	29	30	31	31	31	31	29	28	29	29	29	29	29	30	30	30	30	31	29	28	27
MED	36	36	34	36	31	30	J 46	65	74	71	76	84	82	74	71	71	66	61	50	44	41	39	38	37
U Q	38	39	37	39	35	34	J S 50	J 71	85	80	82	91	86	80	80	76	73	67	57	50	45	46	42	40
L Q	33	33	31	32	28	28	J 43	61	66	65	69	78	74	68	67	61	59	55	42	37	38	35	36	34

OCT. 1994 FOF2 (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 FOF1 (0.01MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	UL 405	L	UL 430	L 440	L 445	UL 430	L 430	UL 420	L							
2								L	UL 415	L 415	440	440	L 445	L 445	L	L								
3								L	UL 395	420	440	L 445	415	L 470	UL 460	L	L							
4								L	UL 390	L 405	L 420	L 440	430	L 430	UL 395	L								
5								L	UL 415	415	L	430	445	UL 460	L 430	L	L							
6								L	UL 420	UL 420	445	L 460	L 440	420	U L 420	L	L							
7								L	UL 420	UL 460	445	UL 460	445	430	L	UL 365	L							
8									L	405	440	440	445	445	420	L								
9										UL 455	L 445	430	U L 460	L 440	L	L	L							
10								L	L	L	L		L	L 455	L	UL 380	L							
11									L	UL 440	UL 470		L 445	UL 440	L	UL 420	L							
12									UL 415	L 420	UL 465	UL 440	UL 440	UL 430	UL 415	L	L							
13									UL 415	L	UL 420	L	U L 445	L	L	L	L							
14								L	L	UL 420	415	440	U L 440	L	L 430	L	L							
15									L	UL 440	L	UL 455		U L 445	L	UL 440	L							
16									L	L	UL 440	445	L 455	L	L	UL 415								
17										UL 440	UL 440	L 445	UL 460	UL 460	L									
18									L	UL 440	440	U Y 455	L	UL 445	UL 440	L								
19									L	L	L 445	L 445	UL 465	UL 480	UL 440	L								
20									L	L	L	L 445	U L 445	L	L	L								
21										L	L	UL 455	L 485	L	UL 405	L								
22								L	L															
23										L	L	U L 480	UL 470	UL 460	L	L								
24								L	L 405			430	U L 440	UL 455	UL 420	UL 380								
25								L	L	UL 445	L 430	UL 430	L 440	UL 495	L 430	L								
26								L	L	UL 460	UL 440	L 440	U L 455	UL 445	L									
27								L	L	UL 440	L	L 460	L	U L 440	L	L								
28								L	UL 405	UL 430	L	L 420	U L 480	L	L	L								
29								L	L															
30								L	UL 430	UL 460	L	UL 470		440		L	L							
31									L 370	L					UL 430	L 380								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									13	19	18	25	23	22	14	8								
MED									UL 415	UL 440	L 440	L 445	L 445	UL 445	UL 430	UL 398								
U Q									UL 418	UL 445	L 445	UL 455	U L 460	UL 460	UL 430	UL 420								
L Q									L 400	420	L 430	440	L 440	440	UL 420	UL 380								

OCT. 1994 FOF1 (0.01MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 FOE (0.01MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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							A	A	A	A	A	330	330	315	290	255	225	165						
2							S	215	280	305	330	R	340	330	315	265	240	A						
3							U A 165	230	275	305	330	R 330	330	315	295	290	225	A						
4							A	A	275	295	315	R 330	340	305	275	255	A	A						
5							B	230	275	305	315	A	A	A	290	275	230	B						
6							S	A	A	295	A	A	A	R 315	U S 305	S 265	190	B						
7							A	A	A	305	R	U R 330	A	305	290	275	225	B						
8							A	A	A	305	R	330	330	325	290	A	215	B						
9							A 175	215	265	295	R 330	R	340	315	280	A	215	B						
10							A	230	290	315	320	325	S 330	315	290	255	A	B						
11							B	240	280	315	320	U A 330	330	315	305	265	215	A						
12							S	A	265	A	A 315	A	A	R	275	250	205	A						
13							B	A	250	300	315	R	R 340	305	A	255	215	B						
14							B	225	255	300	305	325	U R 325	305	300	265	225	B						
15							155	A	A	R 315	A	R	325	A	290	275	215	B						
16							A	A	A	315	325	340	R 330	315	305	275	215	B						
17							A	A	U A 250	A 295	320	R 330	330	330	295	275	205	B						
18							B	A	A	305	320	A	R 330	315	290	265	A 205	A						
19							B	A	A	295	330	340	330	315	A	265	A	B						
20							B	255	A	290	A	330	330	315	A	265	215	B						
21							B	225	275	A	R	A	340	305	290	265	225	B						
22							B	A	A 255	C	C	C	C	C	C	C	190							
23							B	A	A 250	A	A	320	330	315	295	265	205	B						
24							A	A 225	265	305	U A 320	A	A	A	305	A	A	B						
25							B	A	A	A	315	A	330	330	295	265	200	B						
26							S	A	240	A	A	A	A	A	280	A	A							
27							B	A	255	280	R	A	A	A	A	A	215							
28							B	A	A	A	A	A	A	A	280	240	A							
29							B	A	265	C	C	C	C	C	C	C	C	C						
30							B	A 205	A	305	320	320	A 330	315	A 280	250	A							
31							B	215	265	305	A 315	A	A	A	A	A	A							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							3	12	19	22	18	14	20	21	24	23	22	1						
MED							A 165	225	265	305	320	330	330	315	290	265	215	165						
U Q							A 175	230	275	305	325	330	335	315	298	275	225							
L Q							155	215	255	295	315	325	330	310	285	255	205							

OCT. 1994 FOE (0.01MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 FOES (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 12	21	J A 19	18	26	J A 18	21	J A 43	50	38	J A 44	G 25	38	36	G 24	31	30	21	J A 24	J A 31	36	J A 38	24	E B 10
2	E B 11	20	28	17	E B 11	E S 13	S 24	31	G 25	35	G	G 31	G 28	37	G	36	40	J A 29	21	E B 12	23	J A 39	25	25
3	19	19	E B 10	E B 12	17	E B 12	23	G	G	G	G	G	G 22	33	G	G	G	22	21	23	19	22	27	J A 21
4	E B 11	25	E S 13	28	J A 36	34	42	29	G	37	G	G	G	37	35	G	26	37	E B 13	E B 10	E S 14	E S 15	E B 12	J A 40
5	E B 13	E B 11	15	E B 13	E B 11	J A 37	26	31	31	35	G	J A 59	35	37	34	G	28	E B 13	J A 28	E B 13	E B 11	E B 13	E B 10	E B 10
6	E B 12	E B 12	E B 10	E B 12	E S 15	24	26	J A 34	28	35	46	37	35	G 24	35	40	28	20	40	J A 31	J A 44	34	28	38
7	26	27	22	J A 22	18	32	39	J A 30	32	34	G 27	G 29	37	37	35	31	30	J A 31	E B 11	J A 51	J A 48	J A 43	J A 34	28
8	35	26	J A 24	19	E B 11	24	18	26	28	G	G	G	G	G	G 28	29	G	E B 15	E B 12	E B 13	E B 14	28	22	E B 10
9	E B 11	E B 12	16	18	E B 12	E B 13	29	30	32	34	G	G	G 33	J A 42	37	36	G	E B 14	E B 13	E B 12	J A 38	32	E B 12	E B 10
10	18	E B 12	J A 22	E B 11	E B 11	E B 11	28	28	36	37	40	55	G	33	36	31	37	38	27	78	33	27	22	27
11	18	25	24	E B 10	E B 12	E B 12	J A 46	34	37	41	42	J A 85	38	G 29	41	31	30	J A 31	38	25	J A 41	29	J A 54	72
12	J A 43	42	33	J A 51	41	J A 39	S 29	J A 31	32	33	42	J A 44	38	G 28	32	32	27	54	J A 46	61	J A 44	29	31	E B 11
13	E B 12	E B 11	E B 11	18	17	18	E B 15	28	28	J A 31	34	G	G	G	31	G 20	30	33	J A 44	J A 49	27	28	37	31
14	E B 10	E B 11	E B 12	E S 14	18	E B 12	E B 14	G	32	G 24	G 25	38	G 26	37	G	G 22	24	28	24	18	E S 15	20	J A 28	19
15	29	16	18	18	E B 11	S 18	20	54	31	G 29	48	G 27	G 28	39	35	G	28	27	41	25	24	J A 35	26	E B 13
16	E B 11	E B 12	E B 11	E B 11	J A 41	18	J A 30	33	32	38	40	38	35	35	32	37	32	J A 29	J A 52	J A 38	33	17	E B 10	E B 11
17	18	E B 11	E B 10	J A 37	17	J A 32	24	45	53	37	G 28	G	G 27	39	42	J A 46	J A 36	J A 36	27	28	22	E B 10	E B 13	19
18	J A 35	19	18	19	E B 10	19	24	30	30	G	G	35	37	35	G	33	J A 37	J A 35	58	54	41	25	J A 35	J A 37
19	34	J A 33	23	E B 11	E B 11	23	27	32	29	35	G 30	G 20	G 22	40	28	G	27	52	J A 51	J A 49	31	29	32	E B 12
20	24	24	J A 40	22	18	E B 11	20	G	32	34	40	G 32	G 28	G 27	31	G 25	28	37	31	34	23	23	16	24
21	24	J A 24	E B 10	J A 27	E B 10	E B 11	24	J A 48	G 26	35	G 28	37	G 31	G	G 18	G	26	28	J A 36	J A 44	E B 10	E B 10	E B 11	E S 14
22	E B 12	22	22	J A 27	24	19	23	30	29	C	C	C	C	C	C	C	24	30	J A 24	16	E B 11	23	23	18
23	22	E B 11	18	18	18	E S 16	27	28	J A 44	J A 44	42	G 28	G 24	G 20	G	G	27	23	19	20	16	17	50	40
24	30	28	J A 28	18	E B 11	E B 11	22	J A 32	J A 40	J A 73	86	J A 49	J A 41	J A 43	J A 38	39	28	27	E B 11	28	35	J A 56	64	41
25	28	28	32	28	22	18	S 38	37	44	42	J A 46	33	G 32	34	G	G	32	39	39	46	J A 32	34	J A 23	18
26	E B 13	28	E B 11	28	18	E B 11	35	24	32	37	46	53	37	50	G	28	24	J A 27	J A 48	E B 10	E B 10	E B 10	E B 11	E B 11
27	J A 42	J A 45	43	33	41	27	J A 48	27	35	42	G 30	34	36	J A 42	32	J A 31	J A 38	J A 52	J A 31	29	20	23	27	30
28	42	J A 54	J A 48	48	J A 28	23	J A 35	31	31	30	56	J A 50	J A 59	42	G 26	28	31	32	J A 27	E B 11	E B 11	J A 54	53	55
29	J A 28	J A 21	32	31	32	28	29	29	G 23	C	C	C	C	C	C	C	C	C	J A 26	J A 19	E B 11	E B 36	J A 11	E B 18
30	20	18	E B 10	E B 12	20	J A 17	28	27	32	37	J A 50	42	J A 53	42	37	J A 44	J A 45	J A 34	34	J A 35	J A 48	62	56	26
31	17	E B 12	J A 44	35	33	28	E B 13	G	34	J A 55	J A 81	J A 76	69	66	39	J A 51	43	25	E B 10	23	28	J A 19	28	61
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	30	30	31	31	31	31	31	31
MED	19	21	19	18	18	18	26	30	32	35	40	34	G	37	32	31	28	30	27	28	24	28	26	21
U O	29	27	28	28	26	27	30	33	35	38	46	J A 46	38	41	36	36	32	36	J A 40	44	J A 36	J A 35	34	37
L O	E B 12	E B 12	E B 11	E B 13	E B 11	E B 12	22	27	G 28	G 32	G	G	G 28	G	G	G	26	25	E B 21	E B 16	E B 14	E 19	E B 13	E B 12

OCT. 1994 FOES (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 FBES (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 12	E B 10	13	13	E S 13	12	18	18	30	32	35	G 21	36	35	G 22	31	28	G 13	14	E B 12	21	19	14	E B 10
2	E B 11	13	14	12	E B 11	E S 13	E S 16	28	G 23	32	G	U G 31	G 28	35	G	29	31	19	E B 11	E B 12	E B 10	13	14	14
3	E S 14	E B 10	E B 10	E B 12	E B 13	12	18	G	G	G	G	G	G 22	33	G	G	G	16	E B 10	13	E B 10	14	17	19
4	E B 11	13	E S 13	E B 12	14	17	20	23	G	34	G	G	G	33	33	G	24	18	E B 13	E B 10	E S 14	E S 15	E B 12	E B 11
5	E B 13	E B 11	12	E B 13	E B 11	14	17	G 14	G 19	32	G	32	35	37	32	G	25	E B 13	14	E B 13	E B 11	E B 13	E B 10	E B 10
6	E B 12	E B 12	E B 10	E B 12	E S 15	E B 10	19	19	27	34	39	37	35	G 23	32	31	26	18	28	18	23	18	17	23
7	16	16	E B 13	E B 11	14	14	21	22	28	34	G 23	G 22	33	34	33	31	28	23	E B 11	24	21	17	13	19
8	18	13	18	E B 10	E B 11	E B 10	14	21	28	G	G	G	G	G	G 23	26	G	E B 15	E B 12	E B 13	E B 14	17	E B 12	E B 10
9	E B 11	E B 12	E B 10	E B 10	E B 12	E B 13	21	26	29	33	G	G	G 31	39	34	32	G	E B 14	E B 13	E B 12	E B 12	13	E B 12	E B 10
10	13	E B 12	E B 11	E B 11	E B 11	E B 11	18	26	32	33	39	50	G	G 19	34	G 18	22	16	E B 11	A A 78	16	13	E B 11	E B 10
11	13	E B 10	E B 11	E B 10	E B 12	E B 12	E B 17	26	31	35	34	64	37	G 23	38	29	26	21	23	14	14	14	23	A A 72
12	17	14	15	18	16	14	S 18	S 21	31	33	40	39	35	G 23	29	29	23	42	32	15	13	13	15	E B 11
13	E B 12	E B 11	E B 11	E B 10	E B 12	E B 11	E B 15	23	G 19	G 23	33	G	G	G	31	G 17	G 15	18	28	15	16	E B 10	14	17
14	E B 10	E B 11	E B 12	E S 14	E B 10	E B 12	E B 14	G	29	G 21	G 22	36	G 22	32	G	G 17	G 14	14	E B 12	E S 13	E S 15	18	E S 15	14
15	E B 10	E B 10	13	E B 10	E B 11	12	18	42	30	G 23	37	G 24	G 18	33	31	G	G 15	13	E B 10	13	13	E B 10	E B 11	E B 13
16	E B 11	E B 12	E B 11	E B 11	E B 12	14	16	27	30	36	37	35	G	35	G 23	30	27	19	23	14	13	E B 11	E B 10	E B 11
17	13	E B 11	E B 10	E B 10	E B 11	E B 11	14	35	27	34	G 26	G	G 24	37	35	38	28	24	E B 13	14	13	E B 10	E B 13	E B 10
18	E B 13	E B 11	12	E B 10	E B 10	E B 10	17	23	27	G	G	U Y 34	36	33	G	31	32	20	A A 58	22	17	E B 10	E B 10	E B 11
19	16	14	E B 11	E B 11	E B 11	E B 13	E B 13	23	29	G 24	G 21	G 19	G 18	37	27	G	23	43	26	17	E B 11	E B 11	E B 10	E B 12
20	E B 12	13	E B 12	12	13	E B 11	17	G	30	G 22	37	G 28	G 26	G 23	30	G 19	G 16	17	20	18	E B 10	13	13	13
21	E B 11	E B 10	E B 10	E B 12	E B 10	E B 11	E B 14	G	G 22	32	G 28	36	G 24	G	G 16	G	24	15	13	16	E B 10	E B 10	E B 11	E S 14
22	E B 12	14	12	13	15	13	E B 13	21	29	C	C	C	C	C	C	C	23	18	13	E B 11	E B 11	16	14	14
23	13	E B 11	E B 12	E B 11	13	E S 16	17	25	37	35	34	G 27	G 21	G 18	G	G	24	E B 13	12	E B 11	E B 11	15	A A 50	A A 40
24	16	14	16	E B 11	E B 11	E B 11	16	G	28	52	A A 86	39	37	37	G 23	27	21	14	E B 11	16	19	A A 56	18	17
25	22	16	19	16	13	E B 10	E B 14	23	31	28	G 23	33	G 25	G 21	G	G	30	21	23	24	E B 12	16	E B 12	E B 10
26	E B 13	13	E B 11	E B 12	E B 11	E B 11	E S 15	23	29	33	39	39	33	34	G	27	20	16	19	E B 10	E B 10	E B 10	E B 11	E B 11
27	14	21	21	22	A A 41	16	18	24	32	32	U G 30	33	34	32	32	27	G 17	17	E B 11	18	17	E B 11	19	19
28	A A 42	A A 54	22	A A 48	E B 10	E B 10	E B 13	24	29	U Y 30	35	35	34	34	G 20	G 17	23	15	18	E B 11	E B 11	13	A A 53	A A 55
29	E B 11	14	E B 10	E B 11	15	15	17	26	G 17	C	C	C	C	C	C	C	C	C	21	18	E B 11	14	E B 11	E B 10
30	E B 11	E B 11	E B 10	E B 12	17	15	E B 11	25	30	34	46	36	49	36	37	G 20	23	21	18	18	31	A A 62	A A 56	16
31	E B 11	E B 12	21	A A 35	18	E B 12	E B 13	G	30	38	51	65	61	54	32	25	23	17	E B 10	14	20	E B 11	17	A A 61
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	30	30	31	31	31	31	31	31
MED	E B 13	E B 12	E B 12	E B 12	E B 12	E B 12	17	23	29	32	33	33	G	33	29	25	23	17	13	14	E 13	13	13	E 13
U Q	14	14	14	13	14	14	18	26	30	34	38	36	35	36	32	30	26	20	23	18	17	16	17	19
L Q	E B 11	E B 11	E B 11	E B 11	E B 11	E B 11	E B 14	G 18	G 27	G	G	G	G 24	G	G	G	G	15	E B 11	E B 12	E B 11	E B 11	E B 11	E B 10

OCT. 1994 FBES (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 FMIN (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9H)

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	325	325	315	335	330	S 320	360	J R 390	375	390	340	340	335	350	340	345	370	355	360	330	300	330	315	330
2	330	315	335	335	330	S 335	J R 370	S 355	370	390	380	360	340	325	335	345	340	350	340	345	315	325	325	340
3	335	315	325	320	310	305	365	350	365	340	320	290	325	290	310	325	345	335	335	285	310	315	320	310
4	310	275	J R 300	295	295	270	J S 315	295	350	335	315	330	350	355	355	355	355	360	350	315	320	J S 315	J S 305	285
5	U S 320	310	J S 315	350	280	290	370	380	360	R 350	S 290	310	340	335	355	375	345	345	350	295	300	J S 275	315	315
6	330	350	320	290	310	280	J S 320	J R 340	330	340	320	335	350	360	345	345	345	S 350	350	325	305	310	305	310
7	300	300	305	355	315	345	J R 345	380	350	305	345	325	365	345	345	355	350	330	335	345	330	F 310	335	335
8	320	295	305	J R 400	295	325	J R 355	320	335	345	310	340	340	320	335	355	370	J R 370	355	295	275	300	320	315
9	335	325	370	360	330	290	370	390	370	320	345	340	350	340	340	345	350	J R 370	375	345	F 310	S 310	F 315	S 335
10	340	S 335	S 335	F 320	320	330	J S 370	J R 365	350	355	335	335	330	330	345	360	350	340	370	A	320	285	S 310	F 305
11	F 290	F 305	J F 265	F 290	F 300	F 325	J S 375	J S 360	360	345	345	350	330	335	325	340	360	360	360	320	F 285	F 290	F 310	A
12	F 310	F 305	F 285	F 330	330	F 310	U S 340	335	350	350	330	345	365	355	345	340	360	350	340	315	F 310	335	325	310
13	300	310	310	S 355	350	345	J R 360	350	365	380	350	315	355	330	330	340	340	355	340	325	320	325	F 290	290
14	300	330	315	325	360	325	365	J R 375	350	370	335	365	365	335	340	370	370	355	345	320	310	315	305	300
15	330	320	325	335	340	345	365	345	360	365	330	340	330	350	340	340	355	J R 365	345	300	295	300	325	305
16	315	350	335	340	340	290	355	U S 360	360	350	345	325	360	345	335	350	360	S 365	360	335	315	320	330	310
17	325	J S 320	315	325	330	330	J R 360	380	360	370	365	350	360	330	350	365	380	380	340	320	315	310	300	S 310
18	S 335	310	300	310	F 325	305	J S 360	375	J R 375	390	370	330	330	335	350	355	355	S 340	A	340	325	345	345	315
19	S 315	310	300	320	345	330	370	J S 365	375	330	330	355	345	335	355	360	360	360	355	295	310	305	F 290	F 320
20	330	335	310	320	320	350	J S 370	365	345	325	325	340	360	335	345	335	360	345	340	295	325	335	330	F 305
21	F 290	F 290	305	300	F 345	F 350	U S 350	360	350	355	325	325	325	V 340	350	J R 360	365	350	320	300	345	365	360	S 270
22	320	320	310	370	355	370	360	J S 390	365	C	C	C	C	C	C	C	350	360	375	335	365	310	305	295
23	295	335	320	340	345	335	355	U S 385	345	340	350	335	310	350	365	355	330	335	345	320	295	350	A	A
24	285	315	295	285	295	285	J R 310	305	340	A	A	325	345	330	360	365	360	370	305	315	335	A	S 355	295
25	S 300	S 300	305	285	295	S 280	J S 335	J R 350	U R 370	360	330	360	335	335	360	375	380	345	335	350	395	300	305	305
26	300	320	310	310	315	F 290	J S 325	J R 365	360	325	380	330	345	355	355	380	370	355	320	325	340	315	325	340
27	320	320	280	290	A	325	J S 355	S 355	345	365	350	355	365	350	345	355	345	355	315	310	315	340	330	U S 355
28	A	A	330	A	330	320	355	R 365	365	350	350	355	320	340	355	370	370	355	335	345	345	345	A	A
29	290	300	290	325	335	345	U S 360	U S 365	355	C	C	C	C	C	C	C	C	C	320	290	300	305	335	325
30	275	320	F 285	F 340	275	275	295	280	330	F 345	F 330	350	345	355	335	345	350	375	345	275	355	A	A	325
31	355	285	310	A	F 335	265	J R 330	335	370	365	355	330	320	340	350	365	355	360	335	305	340	355	295	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	30	30	31	29	30	31	31	31	31	28	28	29	29	29	29	29	30	30	30	30	31	29	28	27
MED	318	315	310	325	330	325	J 360	360	360	350	338	340	345	340	345	355	355	355	342	320	315	315	318	310
U Q	330	325	320	340	340	335	365	375	365	365	350	350	358	350	355	365	365	360	355	335	335	335	330	325
L Q	300	305	300	305	310	290	J S 340	345	350	340	328	328	330	332	338	345	350	345	335	300	305	305	305	305

OCT. 1994 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	U L 395	L	U L 405	L 390	L 390	U L 390	L 375	U L 355	L							
2								L	U L 360	L 420	420	410	L 405	L 375	L	L								
3								L	L	400	395	L 390	420	L 355	U L 350	L	L							
4								L	L	L 370	L 400	L 355	365	L 370	U L 385	L								
5								L	U L 380	410	L	330	375	U L 355	L 380	L	L							
6								L	U L 355	U L 400	A	L 385	L 405	405	U L 370	L	L							
7								L	U L 355	U L 330	390	U L 370	385	360	L	U L 365	L							
8									L	395	380	380	390	375	370	L								
9										U L 385	L 385	405	U L 385	A	L	L	L							
10								L	L	L	L	A	L	L 365	L	U L 380	L							
11									L	L	U L 355	A	L 375	U L 370	L	L	L							
12									U L 360	L 390	U L 350	A	U L 390	U L 380	U L 365	L	L							
13									U L 375	L	U L 415	L	U L 375	L	L	L	L							
14								L	L	U L 395	420	395	U L 395	L	L 360	L	L							
15								A	L	U L 395	L	U L 385		U L 355	L	U L 360	L							
16									L	L	U L 395	390	L 390	L	L	U L 375								
17										U L 380	U L 395	L 395	U L 390	U L 390	L									
18									L	U L 385	435	Y	L	U L 375	U L 365	L								
19									L	L	L 400	L 410	U L 385	U L 365	U L 370	L		A						
20									L	L	L	L 385	U L 395	L	L	L								
21									L	L	L	U L 385	L 360	L	U L 390	L								
22								L	L	C	C	C	C	C	C	C								
23										L	L	U L 370	U L 365	L	L	L								
24								L	L 360	A	A	400	A	U L 355	U L 370	L								
25								L	L	L	L 400	U L 390	L 415	U L 365	L 340	L								
26								L	L	U L 395	U L 385	415	U L 395	U L 370	L									
27								L	L	U L 380	L	L 380	L	U L 370	L	L								
28								L	U L 385	U L 410	L	L 410	U L 370	L	L	L								
29								L	L	C	C	C	C	C	C	C	C	C						
30								L	U L 370	L	L	U L 385	A	375		L	L							
31									L 405	L	A	A	A	A	U L 385	L 350								
	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	16	17	23	22	20	14	6								
MED									U L 370	U L 395	L 395	L 390	L 390	U L 370	U L 370	U L 362								
U Q									U L 385	L 400	410	400	L 395	U L 375	U L 380	U L 375								
L Q									U L 360	U L 382	U L 385	L 380	L 375	L 362	L 365	L 355								

OCT. 1994 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 H'F2 (KM) 135°E MEAN TIME (G.M.T. + 9H)

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								240	230	230	260	280	285	270	275	265	240							
2								240	230	225	240	250	255	295	L 285	270								
3								250	240	260	285	300	250	325	270	270	245							
4								L 290	240	270	305	280	265	255	250	245								
5								240	250	255	L 370	290	255	270	260	240	250							
6								250	260	255	285	235	250	250	265	265	250							
7								225	265	305	265	290	245	265	270	250	260							
8									265	265	310	255	250	275	260	240								
9										290	265	255	255	260	250	255	230							
10								215	245	250	270	260	275	250	260	240	225							
11									240	250	260	265	270	275	275	250	225							
12									255	260	275	255	245	250	260	260	240							
13									225	225	240	265	250	240	265	255	235							
14								220	235	235	260	235	240	L 260	275	230	215							
15								A 245	245	240	265	250		260	250	260	230							
16									235	235	245	260	235	265	265	250								
17										225	245	240	260	275	265									
18									225	225	240	265	255	265	250	235								
19									215	L 240	270	240	250	275	250	230								
20									255	270	270	250	235	255	255	240								
21									235	235	265	255	255	240	250	250								
22								210	235	C	C	C	C	C	C	C								
23										265	240	255	280	250	230	240								
24								330	280	A	A	290	260	280	250	240								
25								245	230	235	265	230	255	265	255	225								
26								235	240	255	225	245	255	250	240									
27								235	240	225	240	245	240	245	245	225								
28								235	220	220	235	245	275	255	245	225								
29								225	240	C	C	C	C	C	C	C	C	C						
30								L 310	265	230	260	230	245	250		255	225							
31									225	225	255	A 270	E 280	A 255	240	225								
	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	28	28	28	29	28	29	28	27	13							
MED								240	240	240	262	255	255	260	258	245	235							
U Q								250	252	260	270	268	262	272	265	255	248							
L Q								225	230	228	242	245	248	250	250	235	225							

OCT. 1994 H'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 H'F (KM) 135°E MEAN TIME (G.M.T. + 9H)

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

H / D	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	240	240	270	255	265	250	225	220	210	225	200	185	200	225	225	235	230	215	215	215	290	260	260	230
2	265	260	265	240	225	270	215	230	H 195	210	195	195	190	H 215	H 190	220	240	225	220	225	245	250	250	245
3	240	255	255	270	250	300	225	220	225	215	215	200	185	200	H 205	250	220	245	210	305	240	240	255	330
4	295	345	310	300	280	360	250	230	240	230	200	210	240	215	225	215	240	230	225	230	250	240	265	275
5	265	265	270	225	280	295	230	215	225	200	H 200	A 250	225	A 240	210	230	240	230	220	300	305	305	265	255
6	220	235	265	280	315	345	270	245	215	230	A	H 215	225	200	225	230	230	230	235	250	E A 305	280	290	325
7	245	305	280	230	260	250	230	225	185	225	215	205	210	230	240	215	230	245	230	225	240	315	240	240
8	265	315	A 325	205	370	275	230	235	220	210	210	200	H 210	205	215	215	225	220	200	285	315	295	285	285
9	240	215	220	230	265	310	215	215	215	205	200	200	H 215	A	215	A 240	230	215	210	250	255	270	270	270
10	265	275	270	270	255	250	210	215	215	235	E A 245	A	H 185	215	A 240	210	A 225	215	215	A	285	310	280	285
11	265	275	300	300	240	250	210	225	235	225	205	A	225	200	A 260	230	235	220	225	225	305	320	A 295	A
12	285	295	310	275	265	230	230	240	230	220	A 250	A	220	205	215	240	235	A 240	A 245	250	245	245	250	275
13	295	280	275	250	210	235	215	225	225	210	205	245	H 200	220	230	250	225	225	230	240	235	220	275	260
14	265	265	270	250	210	240	220	235	230	205	195	190	190	205	205	245	230	210	210	220	290	310	290	265
15	265	260	250	250	225	245	205	A	220	210	210	220	245	205	235	215	230	210	205	H 225	295	310	295	260
16	250	245	220	220	280	320	230	220	225	220	215	200	H 205	230	250	230	225	210	240	240	240	250	260	285
17	265	275	255	245	245	255	210	225	220	220	205	205	H 190	A 235	A 265	230	220	210	220	225	235	285	275	270
18	260	255	245	245	235	250	215	205	220	195	190	Y	210	215	225	230	230	205	A	240	225	260	255	275
19	265	280	280	260	235	235	210	215	225	H 200	200	190	185	240	H 185	230	225	A	225	250	265	255	270	245
20	265	255	255	260	245	230	195	215	210	215	240	200	195	220	230	215	230	220	230	260	240	230	230	270
21	285	280	270	270	240	215	210	215	215	225	205	195	210	235	210	215	230	220	230	270	225	215	225	315
22	305	295	270	240	220	240	220	220	210	C	C	C	C	C	C	C	220	230	205	215	230	270	310	285
23	295	270	260	230	225	265	225	215	240	A 245	225	215	200	240	235	220	245	240	210	215	255	225	A	A
24	310	300	355	310	330	335	250	250	A 260	A	A	240	A	A 240	225	225	215	210	255	250	275	A	250	300
25	E A 325	320	A 315	315	330	300	250	230	230	220	210	200	210	225	210	215	210	230	250	250	210	280	280	295
26	285	255	240	270	235	285	240	230	210	200	215	215	185	225	210	215	215	220	245	240	240	255	240	230
27	265	305	325	335	A	280	235	225	225	210	200	195	210	215	225	215	215	205	250	270	235	235	240	A
28	A	A	A 315	A	250	260	240	210	200	200	200	185	200	H 200	210	200	225	210	230	240	215	230	A	A
29	310	310	300	270	225	245	225	210	225	C	C	C	C	C	C	C	C	C	280	305	305	270	225	245
30	350	285	355	200	A 340	330	270	230	240	225	A	230	A	220	240	250	A 240	215	260	A 380	A 255	A	A	270
31	235	300	A 340	A	290	315	230	240	200	240	A	A	A	A	230	210	210	205	200	265	250	220	300	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	30	30	31	29	30	31	31	30	31	28	25	24	26	27	29	29	30	29	30	30	31	29	28	26
MED	265	275	270	255	250	260	225	225	220	218	205	200	208	220	225	225	230	220	225	245	248	260	265	270
U Q	295	300	310	272	280	300	235	230	230	225	215	215	215	230	235	232	230	230	240	265	290	290	282	285
L Q	260	255	255	235	235	245	215	215	210	208	200	195	190	205	210	215	220	210	210	225	235	238	250	255

OCT. 1994 H'F (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 H'E (KM) 135° E MEAN TIME (G.M.T. + 9H)

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							A	A	A	A	A													
												115	125	110	120	110	115	135						
2							S		A			A	A					A						
								125	135	110	105		135	110	110	140	135							
3																		A						
							130	115	115	110	110	110	110	115	110	115	120							
4							A	A									A	A						
									110	115	110	110	110	110	105	110								
5								A	A			A	A	A				B						
							95	125	125	115	115				110	110	110							
6							S	A	A		A	A	A					B						
										115				115	140	110	110							
7							A	A	A				A					B						
										105	125	115		110	115	115	110							
8							A	A	A							A		B						
										105	105	105	110	110	110		110							
9										A			E A			A		B						
							130	115	110	125	110	110	140	100	125		135							
10							A										A	B						
								115	125	110	110	105	110	115	110	115								
11							B							A				A						
								115	110	110	110	110	110	135	120	120	120							
12							S	A	A		A			A	A			A						
									120		105	105			130	105	125	120						
13							B	A			A							B						
									125	120	125	110	110	110	110	120	135							
14							B		A									B						
								130	115	115	115	115	120	110	105	120	120							
15								A	A	A	A			A				B						
							140			125		120	110	110	125	110	120							
16							A	A	A									B						
										125	120	110	105	110	120	110	110							
17							A	A		A	A							B						
									105		125	110	120	105	110	110	110							
18							B	A				A						A						
									105	105	105		125	110	110	110	110							
19							B	A	A	A														
										120	125	110	115	115	A	115	A	B						
20							B		A	A	A	A												
								115		125		130	115	115	A	115	130	B						
21							B		A									B						
								115	135	A	A	110	125	110	110	110	110							
22							B	A																
									100	C	C	C	C	C	C	C	110							
23							B	A										B						
									105	105	A	A	115	115	110	110	110							
24							A																	
								115	105	105	105	A	A	A	A	A	A	B						
25							B	A	A	A														
											A	A	A	125	120	110	110	B						
26							S	A																
									110	100	A	A	A	A	110	A	A							
27							B	A																
									130	115	A	A	A	A	A	A	135							
28							B	A	A	A	A	A	A	A	A	A	A							
															140	115								
29							B	A																
									115	C	C	C	C	C	C	C	C	C						
30							B																	
								110	110	110	110	110	110	110	110	125	A							
31							B																	
								115	110	110	110	A	A	A	A	A	A							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							4	12	21	23	20	19	20	23	25	23	22	1						
MED							130	115	110	110	110	110	114	110	110	115	112	135						
U Q							135	120	125	A 120	120	115	125	115	120	120	120							
L Q							112	115	108	105	108	110	110	110	110	110	110							

OCT. 1994 H'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 H'ES (KM) 135°E MEAN TIME (G.M.T. + 9H)

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B 110	110	135		100	100	125	95	95	95	95	95	180	170	100	155	130	125	145	105	100	100	110	B
2	B 110	95	100		B	S 100	160		110	155	G	100	110	180	G	145	135	115	110	B	120	105	95	100
3	100	100	B	B	140	B 135	G		G	G	G	G	100	130	G	G	G	135	105	100	100	95	95	100
4	B 110	S	115		105	100	95	100	G	130	G	G	G	130	125	G	110	100	B	B	S	S	B	110
5	B	B 145	B		B	105	105	100	100	120	G	90	90	115	130	G	115	B	105	B	B	B	B	B
6	B	B	B	B	S 115	115	105		105	135	100	100	95	100	170	155	125	110	100	100	100	105	105	100
7	100	105	105	125	125	110	100	105	115	175	100	100	110	185	E G 180	E G 175	125	105	B	105	100	100	110	100
8	100	100	100	105	B	115	110	110	110	G	G	G	G	G	110	110	G	B	B	B	B	105	110	B
9	B	B	100	100	B	B 145	140		150	135	G	G	105	120	145	95	G	B	B	B	110	110	B	B
10	115	B	130	B	B	B	135	130	150	135	120	115	G	95	125	95	120	110	115	105	100	100	100	100
11	115	100	95	B	B	B	115	155	125	125	125	110	115	110	125	145	120	120	110	110	105	105	105	95
12	115	95	95	95	95	95	115	110	140	130	115	110	105	105	155	155	140	110	110	110	110	105	100	B
13	B	B	B 105		135	110	B	110	105	105	150	G	G	G	120	105	110	115	105	105	105	105	95	100
14	B	B	B	S	105	B	B	G	135	100	105	155	105	155	G	95	100	90	90	95	S	105	110	105
15	110	115	100	110	B	95	145	105	105	95	95	105	95	110	175	G	110	100	110	110	115	135	115	B
16	B	B	B	B	110	115	130	110	140	140	140	145	120	110	110	135	130	115	105	110	120	140	B	B
17	105	B	B 105		125	105	120	105	105	125	105	G	105	155	135	125	120	105	95	105	100	B	B 115	
18	110	100	100	100	B	115	115	125	115	G	G	105	165	165	G	130	115	110	105	100	125	100	110	100
19	100	100	100	B	B	110	115	115	110	105	110	100	100	170	115	G	120	105	110	100	100	100	100	B
20	105	115	105	95	100	B	110	G	110	105	125	110	105	95	110	100	95	95	90	95	100	95	100	100
21	110	110	B	100	B	B	110	105	110	110	110	115	110	G	100	G	145	110	115	105	B	B	B	S
22	B	100	100	100	100	100	100	115	110	C	C	C	C	C	C	C	145	95	100	100	B	105	100	110
23	100	B	100	100	100	S	125	120	105	110	105	105	105	105	G	G	130	100	100	100	115	105	100	105
24	100	105	100	100	B	B	145	125	125	110	110	110	110	100	100	100	125	100	B	110	100	110	100	100
25	100	100	100	95	95	100	110	110	110	105	100	105	100	100	G	G	120	110	110	110	110	105	100	110
26	B	95	B	95	100	B	105	125	115	110	110	100	95	95	G	110	105	120	110	B	B	B	B	B
27	100	100	100	100	95	100	115	125	170	110	105	105	105	110	110	110	110	115	110	100	100	100	100	100
28	100	100	110	100	100	105	105	110	110	110	105	105	95	100	100	100	95	95	100	B	B	110	110	105
29	100	100	100	100	100	95	95	125	105	C	C	C	C	C	C	C	C	C	100	105	B	100	B	135
30	160	110	B	B	150	140	100	120	115	130	115	130	110	115	105	100	100	135	135	120	100	100	100	100
31	110	B 100	100		105	110	B	G	125	115	110	110	100	100	100	110	95	100	B	110	100	115	100	110
	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	21	21	22	19	20	28	27	29	26	22	23	25	26	22	21	27	27	25	24	22	26	23	21
MED	102	100	100	100	100	105	115	110	110	112	110	105	105	110	115	110	120	110	105	105	100	105	100	100
U Q	110	110	105	105	125	112	125	125	125	130	115	110	110	155	135	145	130	115	110	110	110	105	110	110
L Q	100	100	100	100	100	100	105	105	105	105	105	100	100	100	105	100	110	100	100	100	100	100	100	100

OCT. 1994 H'ES (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

OCT. 1994 TYPES OF ES 135° E MEAN TIME (G.M.T. + 9H)

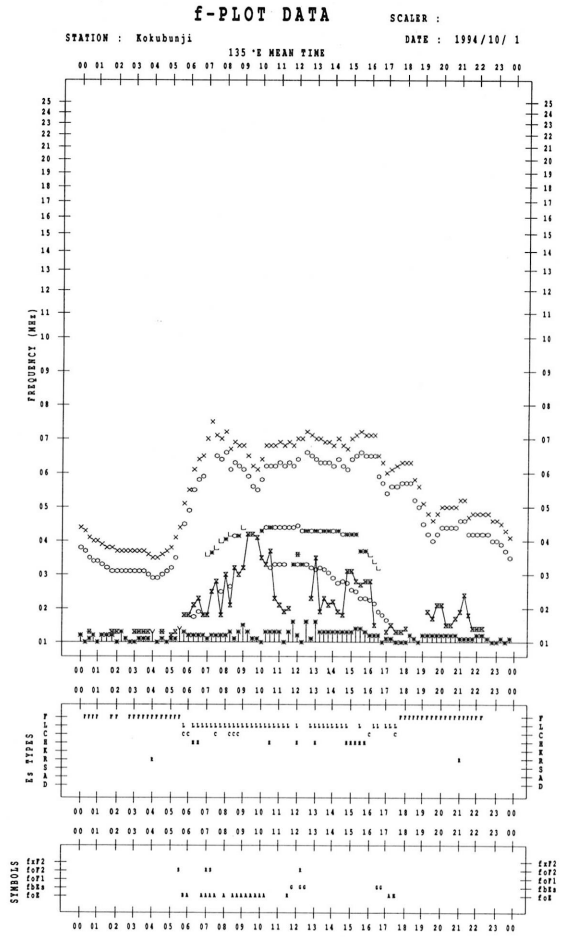
LAT. 35° 42.4' N LON. 139° 29.3' E SWEEP 1.0MHZ TO 25.0MHZ IN 24.0SEC IN MANUAL SCALING

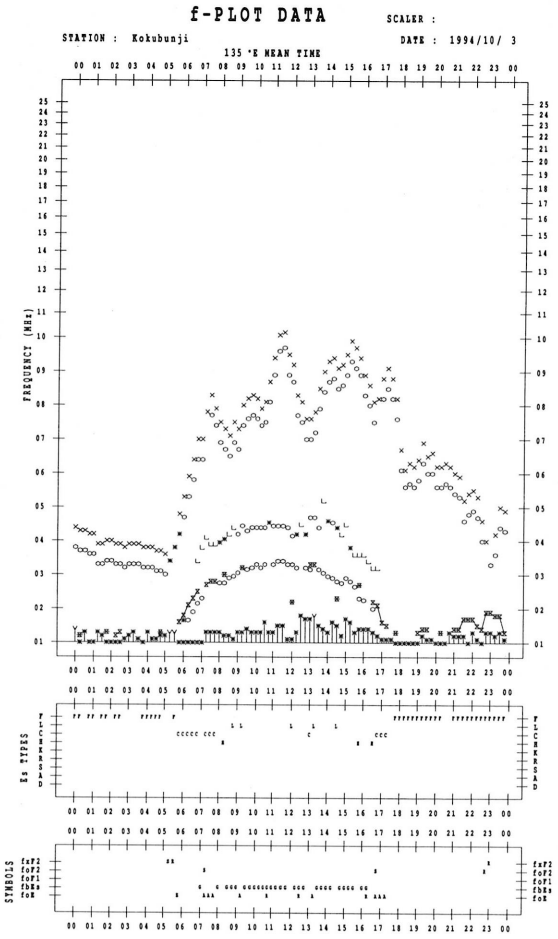
H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		F 1	F 1	F 1	FR 11	F 2	C 1	L 3	L 3	L 2	L 2	L 1	HL 11	HL 11	L 1	H 1	C 1	L 1	FF 22	FF 21	FF 22	FR 21	F 2	
2		F 1	F 4	F 1			L 1	HL 12	L 1	H 1		L 1	L 1	H 1		HL 11	CL 21	L 2	F 1		F 1	F 2	F 1	F 1
3	F 1	FF 11			F 1		C 1						L 1	C 1				C 1	F 1	F 2	F 1	F 1	F 2	F 1
4		F 1		F 2	FF 41	F 4	LL 31	LC 21		CL 11				C 1	C 1		L 2	L 2						F 1
5			F 1			F 2	L 1	L 2	L 2	CL 11		LC 21	L 2	C 1	C 1		C 1		F 2					
6						F 2	C 1	L 2	L 1	HL 12	L 3	L 2	L 1	L 2	HL 11	H 1	C 1	C 1	F 3	FF 21	FF 32	F 3	FF 21	F 4
7	F 3	F 2	F 1	FF 11	FF 11	F 4	L 2	L 2	C 1	H 1	L 1	L 1	L 1	H 1	HL 11	HL 11	C 1	C 3		F 3	F 3	FF 32	F 2	F 4
8	F 3	F 2	F 3	F 1		F 2	C 2	L 2	L 1						L 1	L 1						F 2	F 2	
9			F 1	F 1			C 1	C 2	H 1	CL 11			L 1	C 1	HL 11	L 2					F 2	F 2		
10	F 1		FF 11				CL 11	C 1	HL 11	C 1	CH 11	C 1		L 1	CL 11	L 1	CL 21	CL 22	F 1	F 5	F 4	F 2	F 2	F 2
11	F 1	F 3	F 2				C 1	H 1	C 1	C 1	C 1	C 2	C 1	L 1	CL 21	HL 11	C 1	CH 21	F 4	F 2	F 3	F 2	FF 41	FF 42
12	FF 24	F 4	FF 42	FF 42	FF 42	FF 32	L 1	C 1	HL 11	CL 11	C 2	C 1	L 2	L 1	H 1	HL 11	C 1	CL 32	F 3	F 3	F 2	FF 21	FF 21	
13				F 1	F 1	FF 11		C 2	L 1	L 2	HL 11				L 1	L 1	LC 21	LC 21	FF 32	FF 32	F 2	F 1	F 2	F 1
14					F 1				HL 11	L 1	L 1	HL 11	L 1	H 1		L 1	L 1	L 2	F 1	F 1		F 1	F 1	F 1
15	F 2	F 2	F 1	F 2		F 2	C 1	L 4	LC 11	L 2	L 3	L 1	L 1	CL 11	HL 11		L 2	L 2	FF 11	F 1	FF 21	FF 11	F 2	
16					F 1	F 2	CL 11	LC 21	CL 22	HL 11	CL 12	HL 12	C 1	C 1	L 1	C 1	CL 21	C 3	F 4	F 3	F 1	F 1		
17	F 1			F 2	F 1	F 1	C 1	L 2	LC 11	CL 11	L 1		L 1	H 1	CL 11	CL 31	C 3	LL 21	F 1	F 2	F 2			F 1
18	F 2	F 1	F 1	F 1		F 1	CL 11	C 1	C 1			L 1	H 1	H 1		H 1	C 2	C 2	F 5	F 4	FF 12	F 2	FF 23	F 2
19	FF 22	F 2	F 1			F 1	L 1	CL 21	L 2	L 2	L 1	L 1	L 1	HL 11	CL 11		C 1	C 4	F 3	F 3	FF 21	F 2	F 2	
20	F 1	F 1	F 1	F 2	F 1		L 1		L 1	L 1	CL 11	L 1	L 1	L 1	L 1	L 1	L 2	L 3	F 2	F 2	F 1	F 1	F 1	F 1
21	F 1	F 1		F 1			L 1	L 1	L 1	L 1	L 1	C 1	L 1		L 1		H 1	LC 11	F 1	FFF 21				
22		F 2	F 2	F 2	F 1	F 1	L 1	C 1	C 2								H 1	L 3	F 1	F 1		F 2	F 2	F 1
23	F 1		F 1	F 1	F 2		CL 11	CL 21	C 3	C 2	L 1	L 1	L 1	L 1			C 1	LC 11	F 1	F 1	FF 11	F 1	F 3	FF 52
24	F 2	F 2	FF 32	F 1			C 1	CH 11	C 2	C 3	C 2	C 2	CL 21	L 2	L 3	L 2	C 1	L 1		F 2	F 3	F 4	F 3	F 3
25	F 3	F 3	F 5	FF 42	F 2	F 1	L 2	LC 11	CH 21	LC 21	L 2	L 2	L 2	L 1			C 3	C 4	F 4	FF 42	FF 11	FF 42	F 2	F 1
26		F 3		FF 21	F 1		L 2	C 1	C 2	C 2	L 1	LC 21	L 2	LC 21		L 1	L 2	F 2	F 3					
27	F 3	F 4	F 4	FF 41	F 3	F 2	CL 22	CL 11	HL 11	LC 21	L 1	L 1	L 1	L 1	L 2	L 1	LC 21	FF 21	F 1	F 2	F 1	F 1	F 1	F 1
28	F 3	F 3	FF 31	FF 42	F 2	F 2	L 1	C 2	C 2	CL 21	L 2	L 2	LC 21	L 2	L 2	L 2	L 1	F 1	F 2			F 1	FF 31	F 2
29	F 2	F 1	F 2	FF 32	F 4	F 3	L 2	C 1	L 1										FF 21	F 2		F 1		F 1
30	F 1	F 1			F 2	F 1	LC 11	C 1	C 1	C 1	C 2	C 1	C 2	C 1	C 2	LH 31	LH 21	FF 32	FF 23	FF 23	F 3	FF 42	FF 42	F 2
31	F 1		F 3	FF 42	F 4	F 2			CH 11	C 3	C 2	C 2	C 3	L 3	L 2	LL 13	LC 21	F 1		F 1	F 3	F 1	F 2	FF 23
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

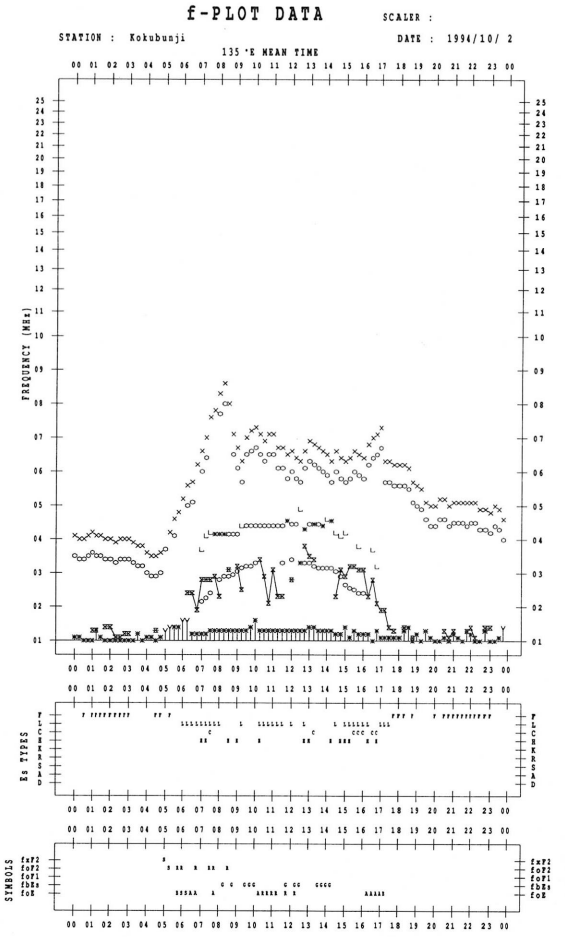
OCT. 1994 TYPES OF ES COMMUNICATIONS RESEARCH LABORATORY, JAPAN

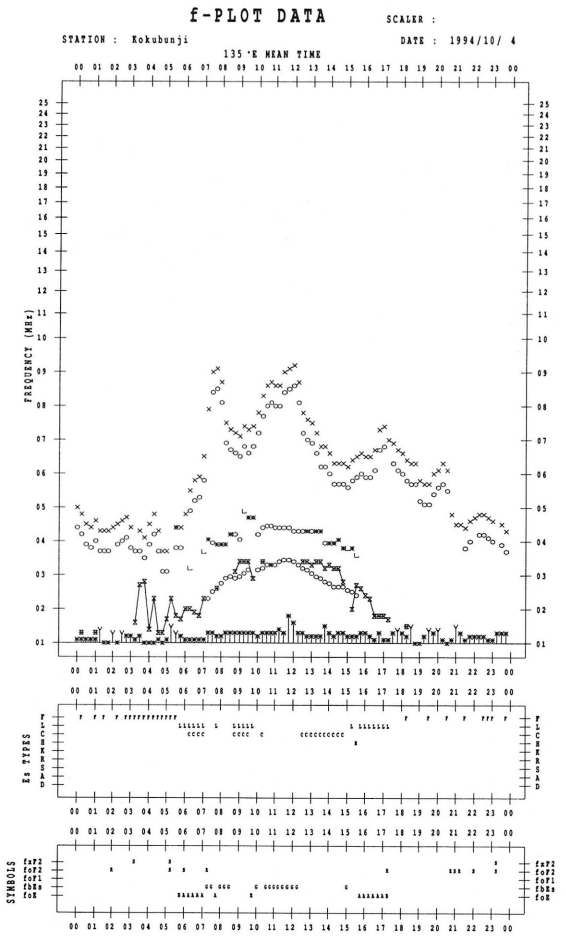
f-PLOTS OF IONOSPHERIC DATA

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 : 1994/10/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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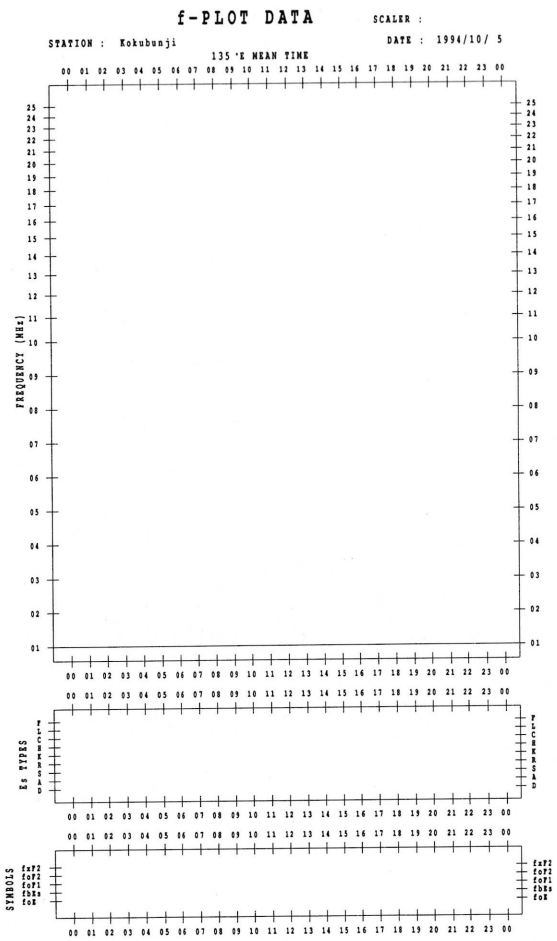
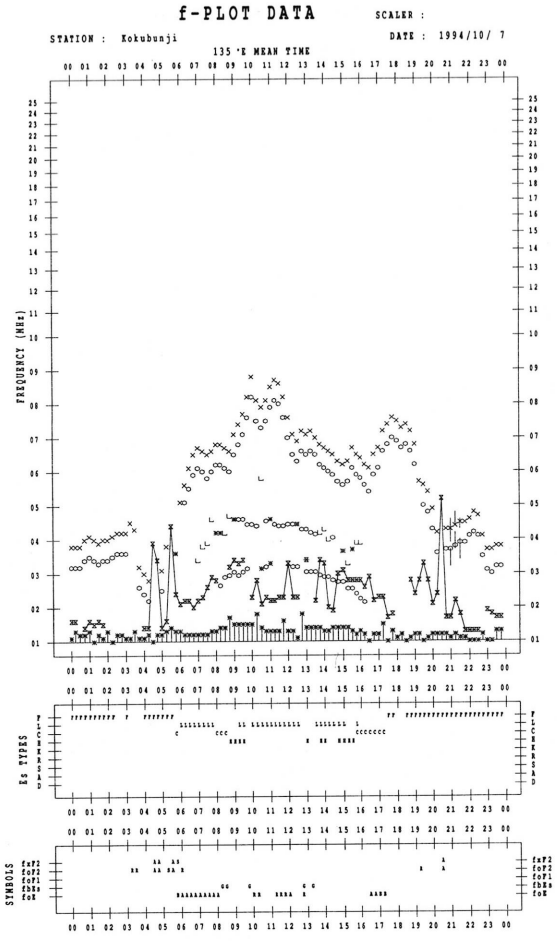
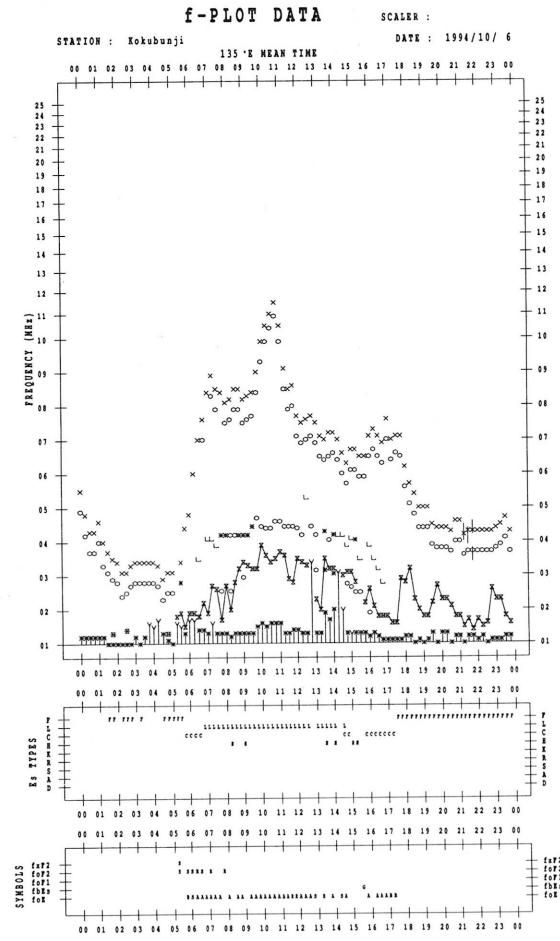
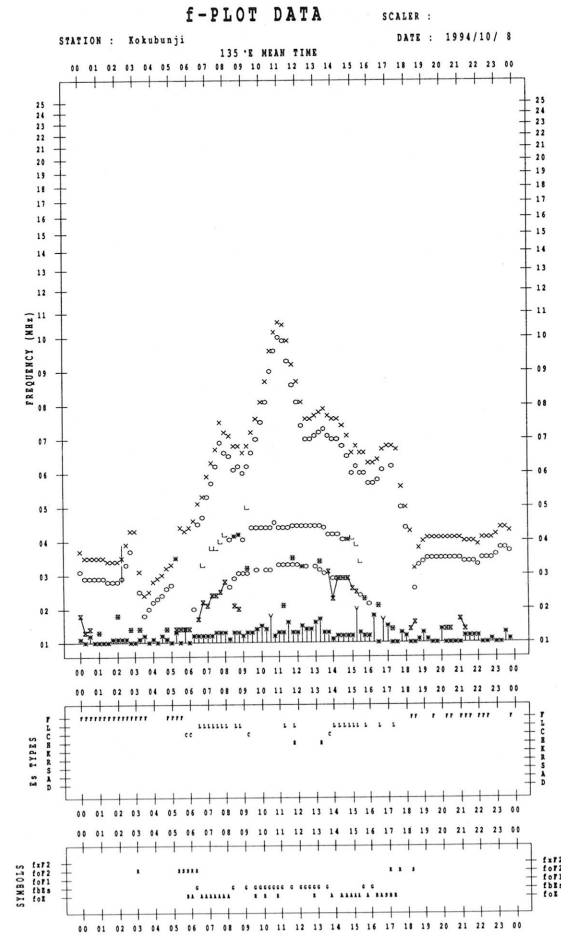
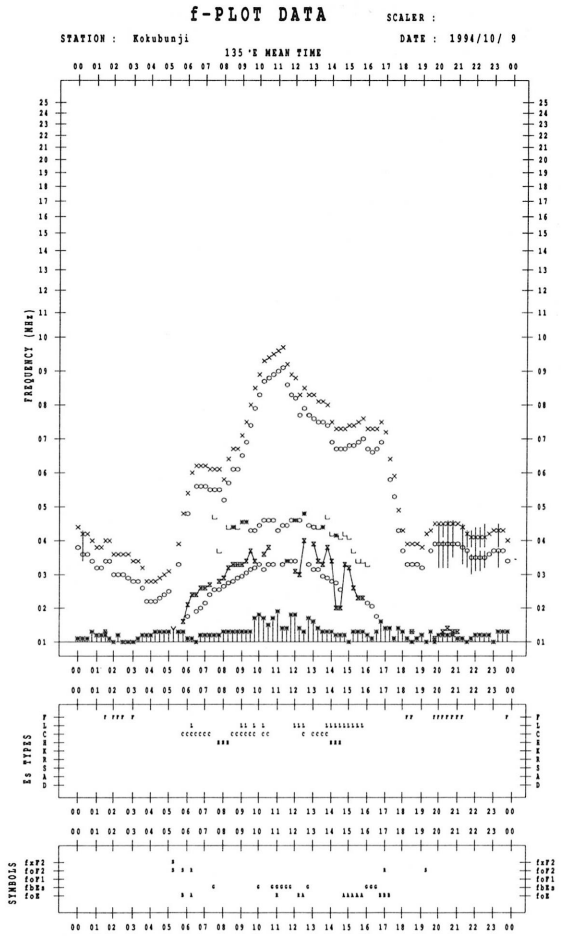
SCALER :
STATION : Kokubunji
DATE : 1994/10/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

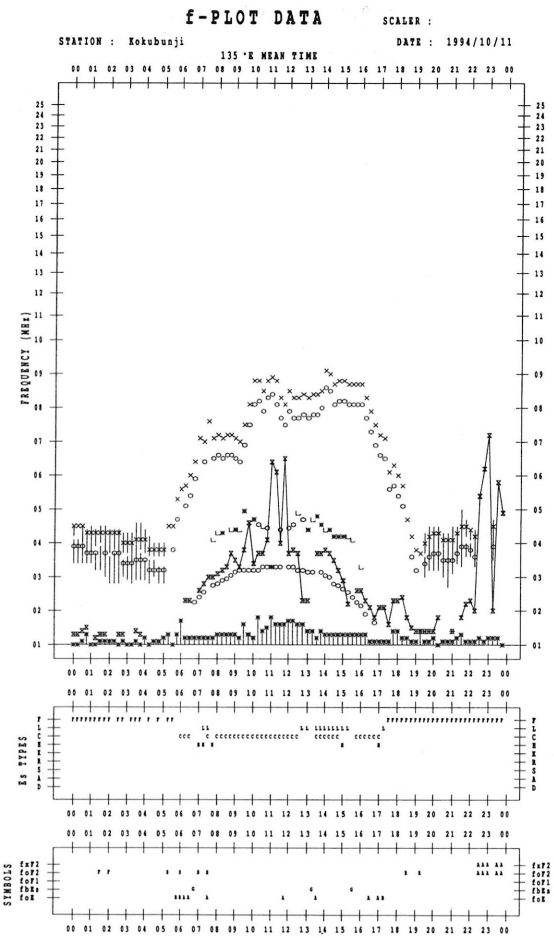

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

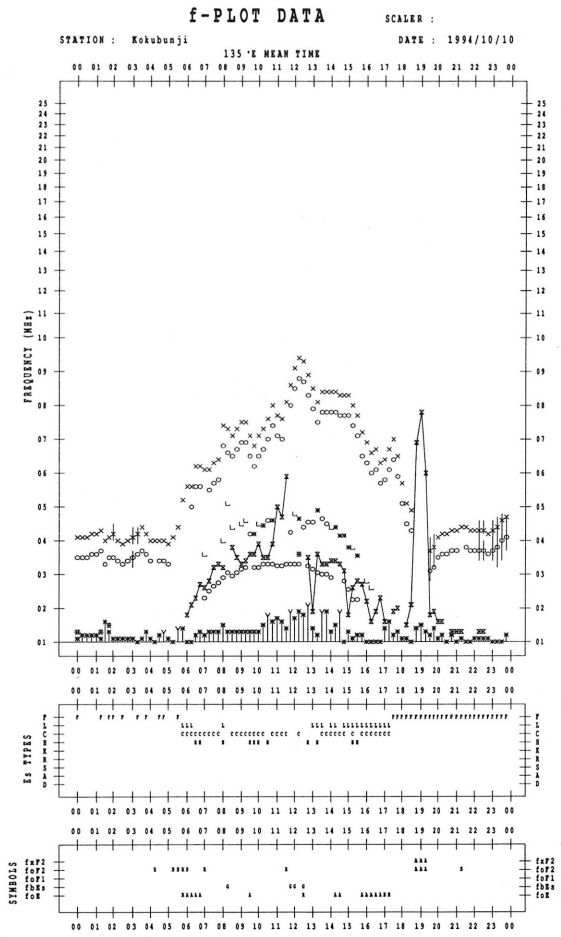

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

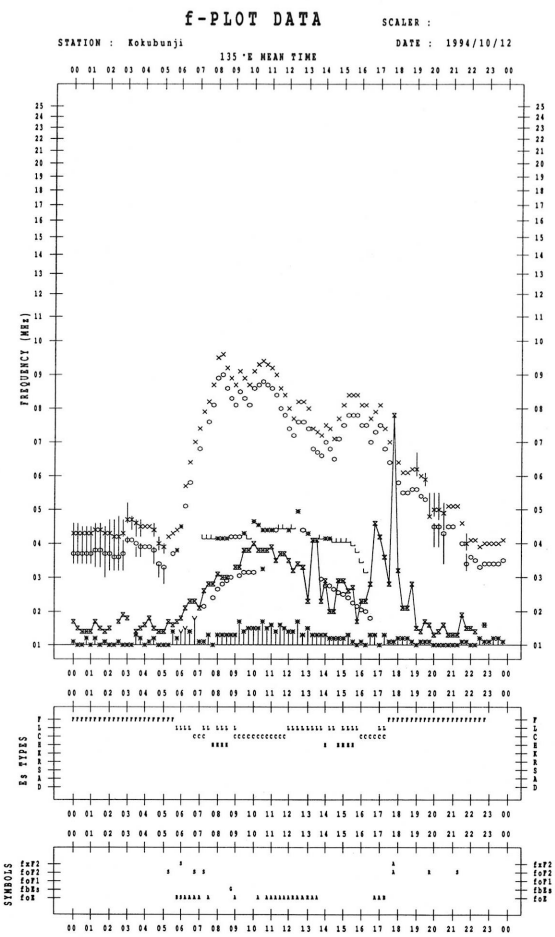

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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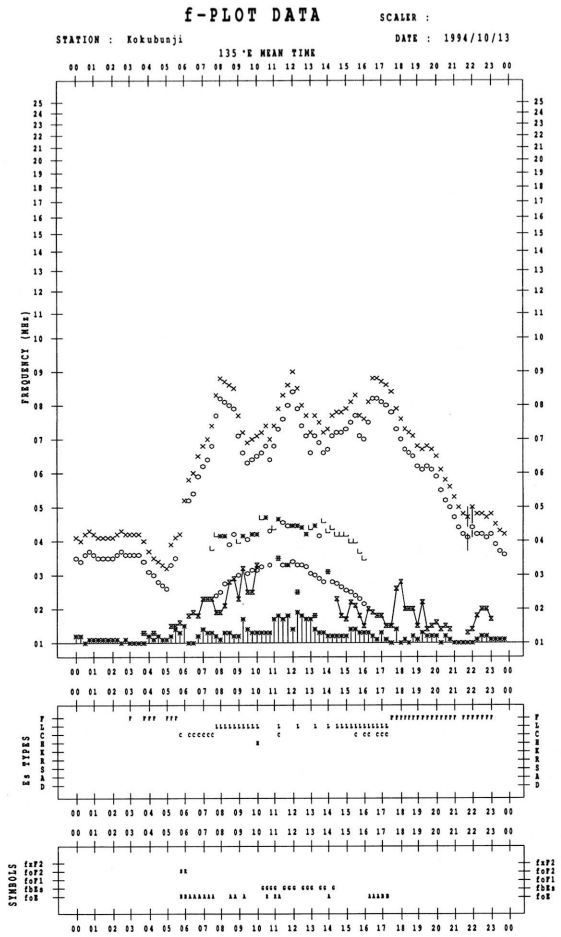
DATE : 1994/10/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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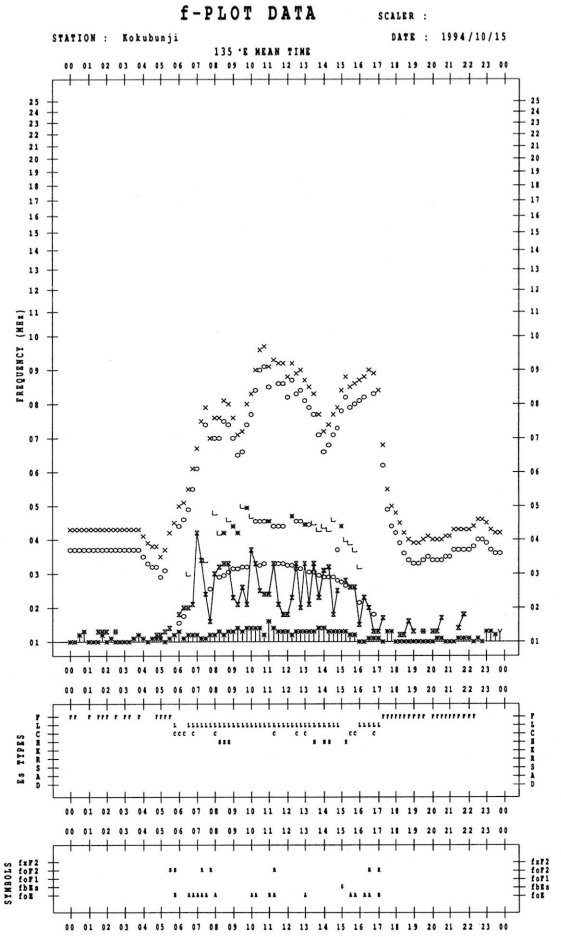
STATION : Kokubunji
DATE : 1994/10/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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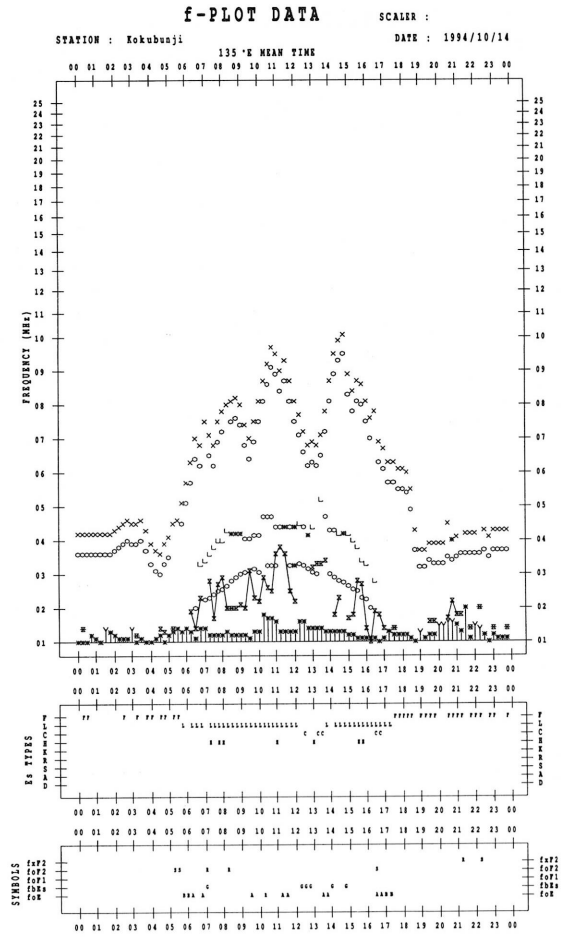
STATION : Kokubunji
DATE : 1994/10/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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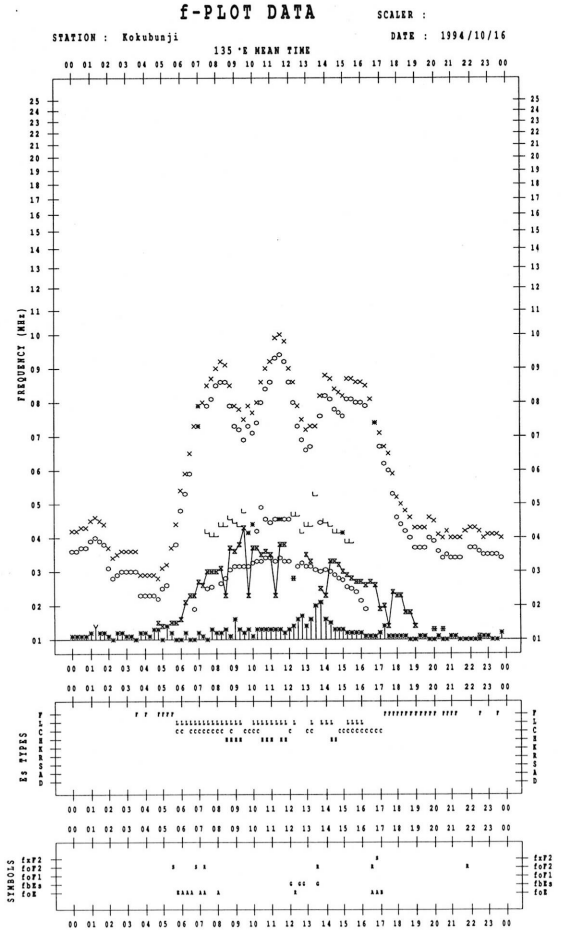
SCALER :
STATION : Kokubunji
DATE : 1994/10/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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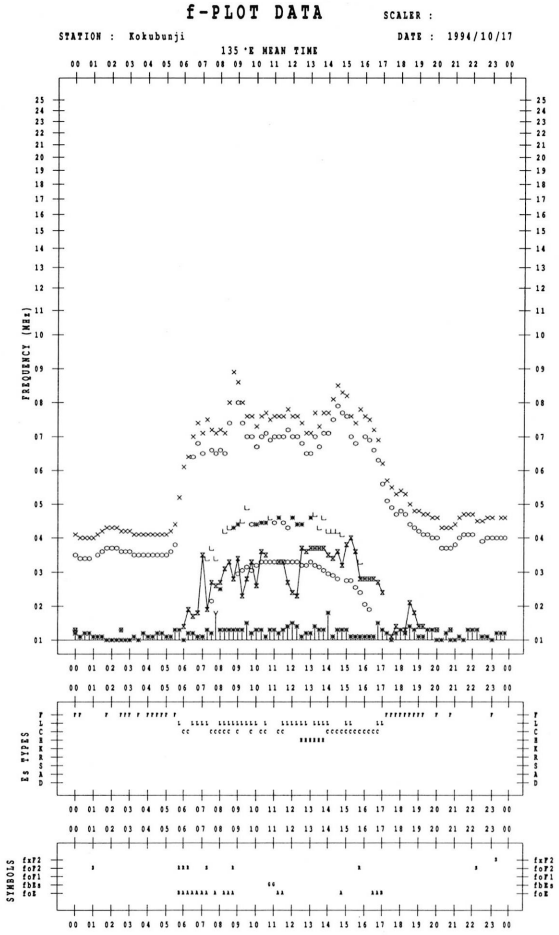
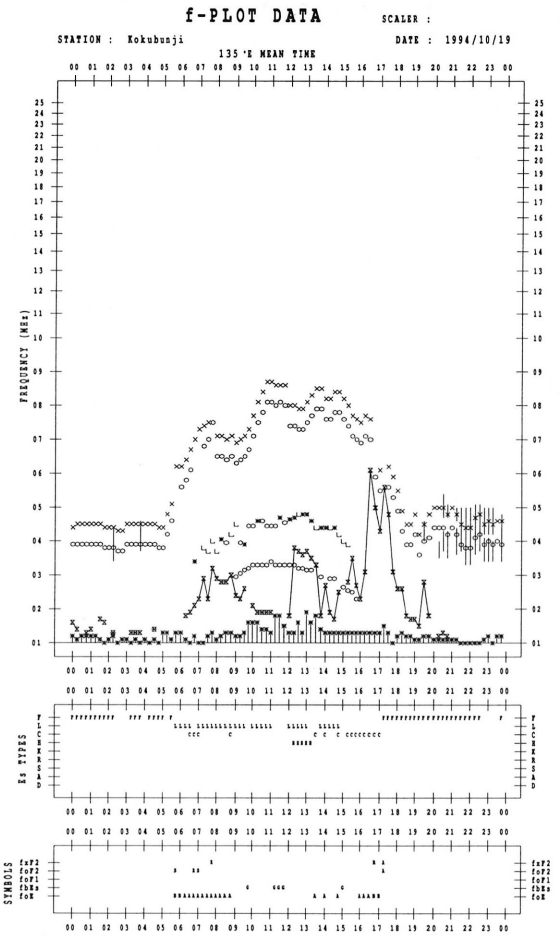
STATION : Kokubunji
DATE : 1994/10/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE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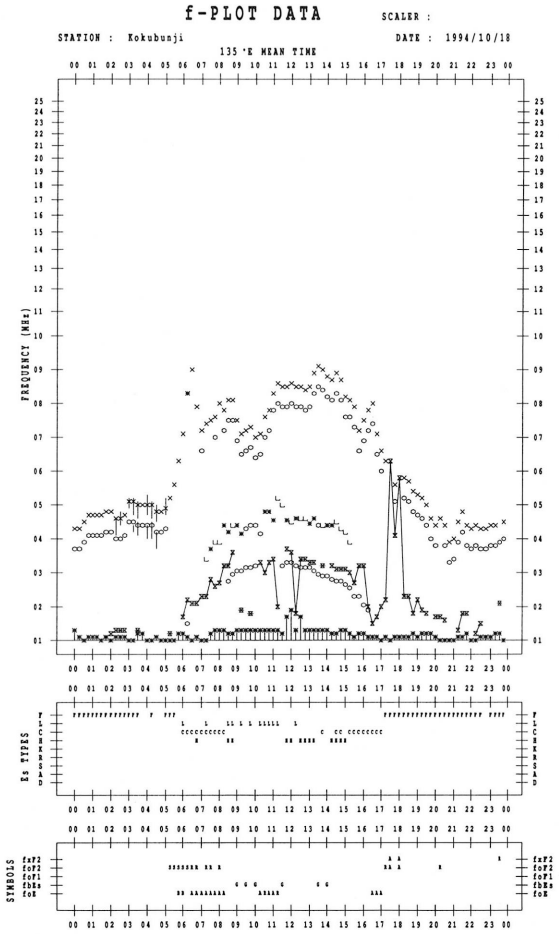
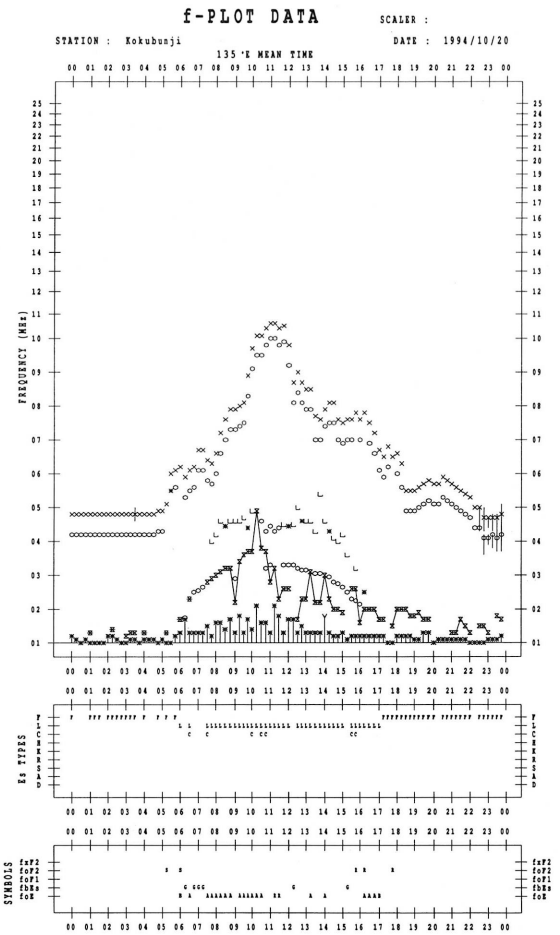
SCALER :
STATION : Kokubunji
DATE : 1994/10/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE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STATION : Kokubunji
DATE : 1994/10/20
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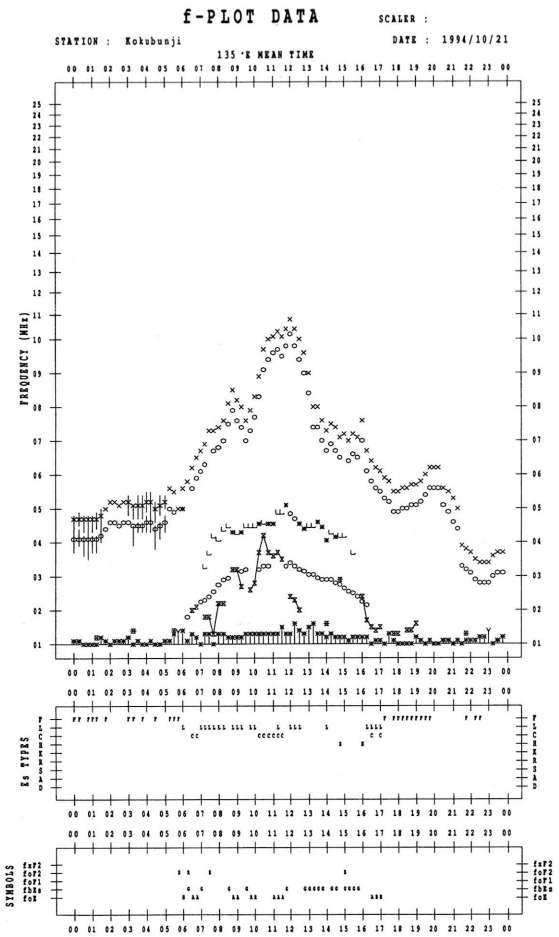
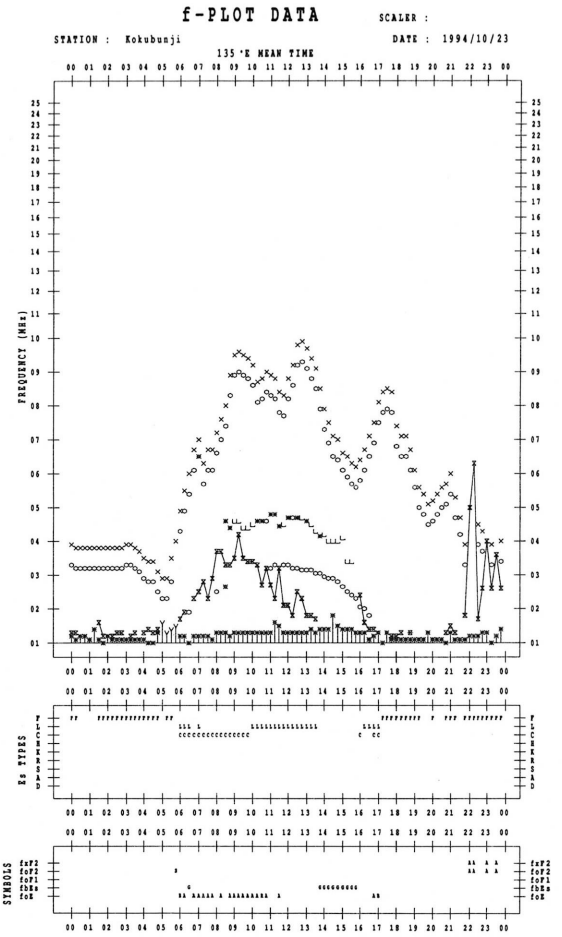
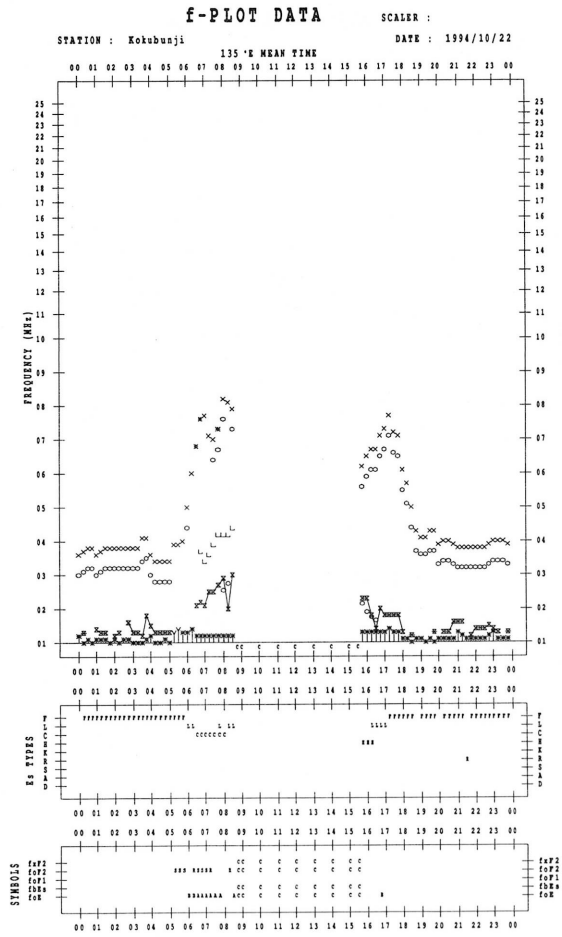
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE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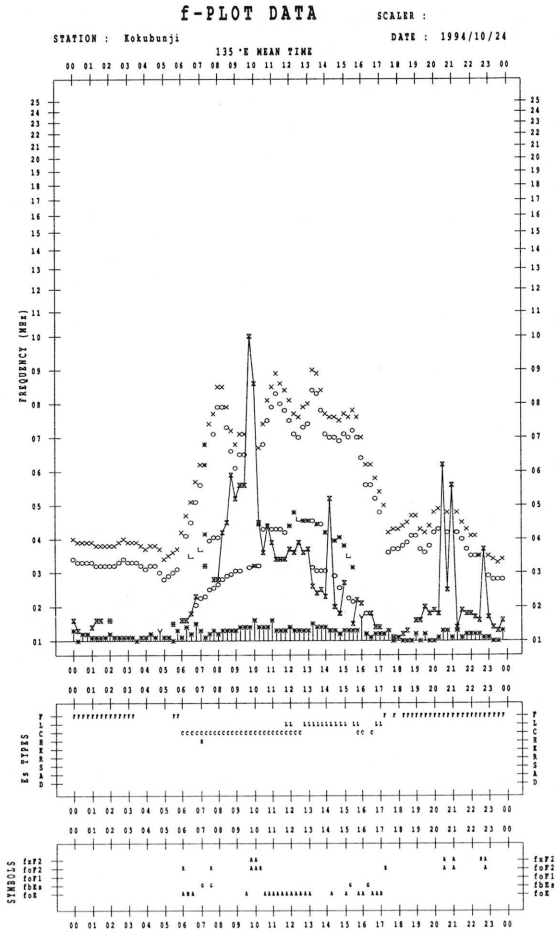
SCALER :
STATION : Kokubunji
DATE : 1994/10/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE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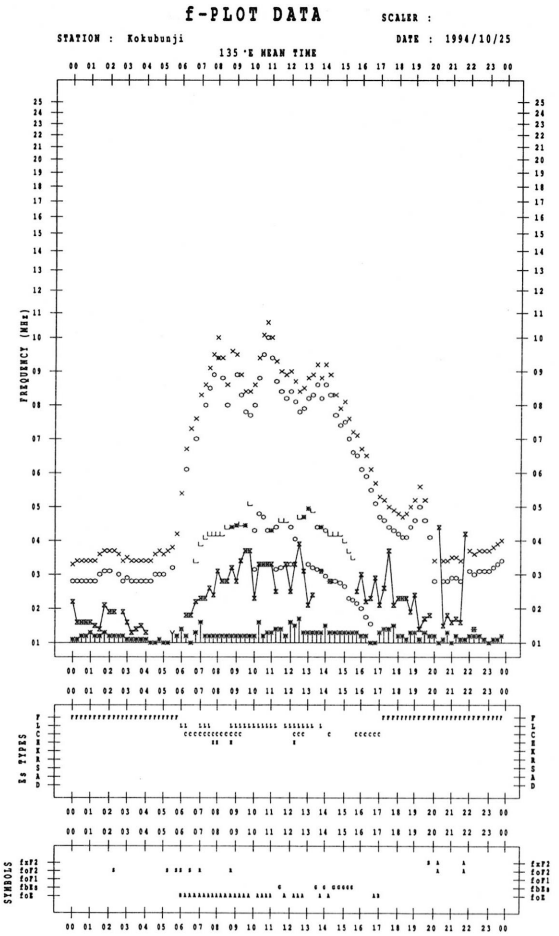
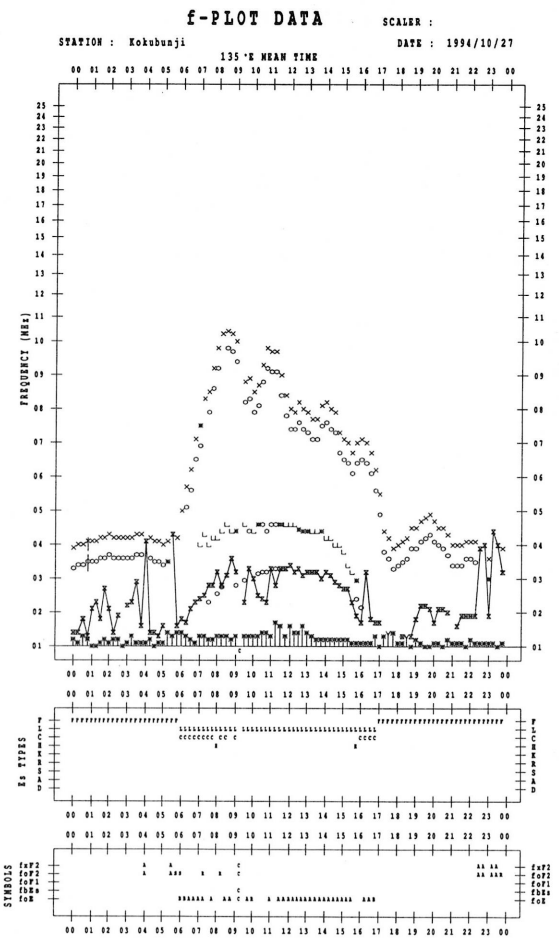
STATION : Kokubunji
DATE : 1994/10/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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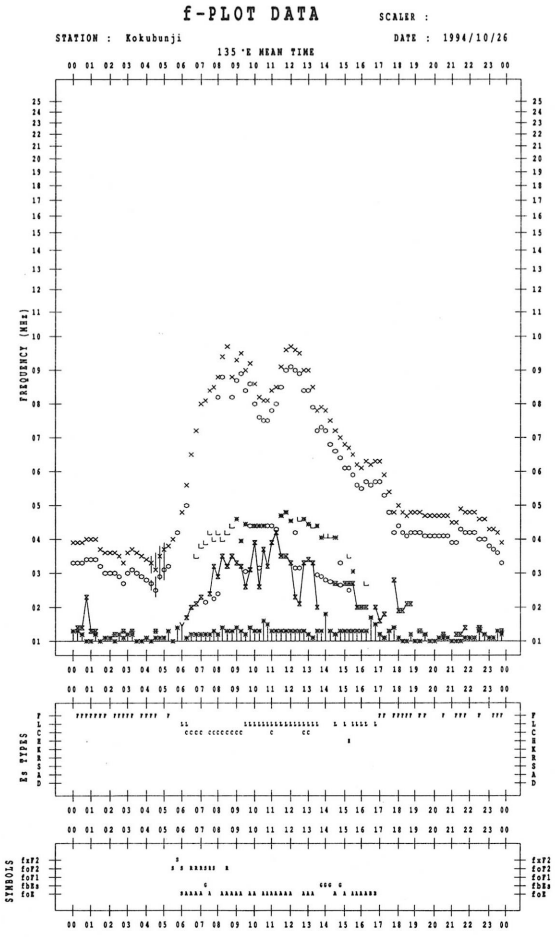
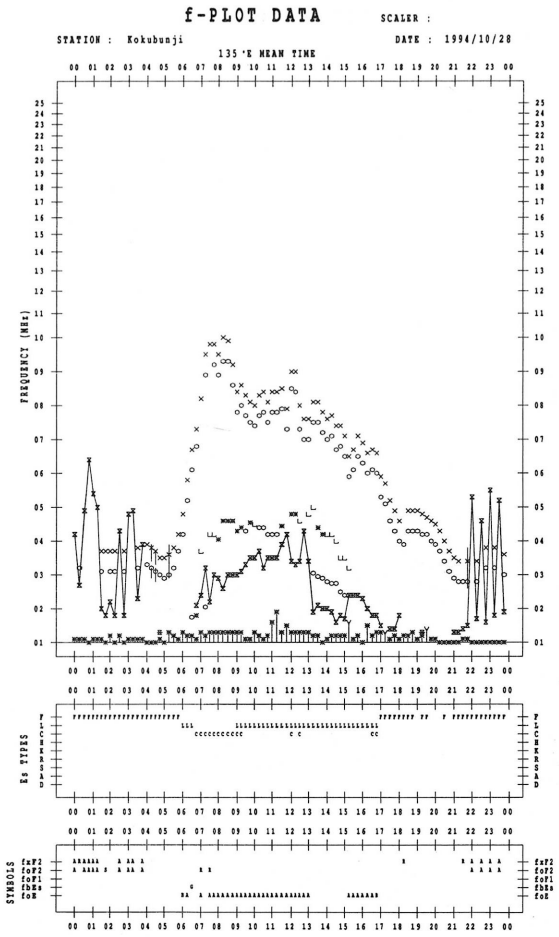
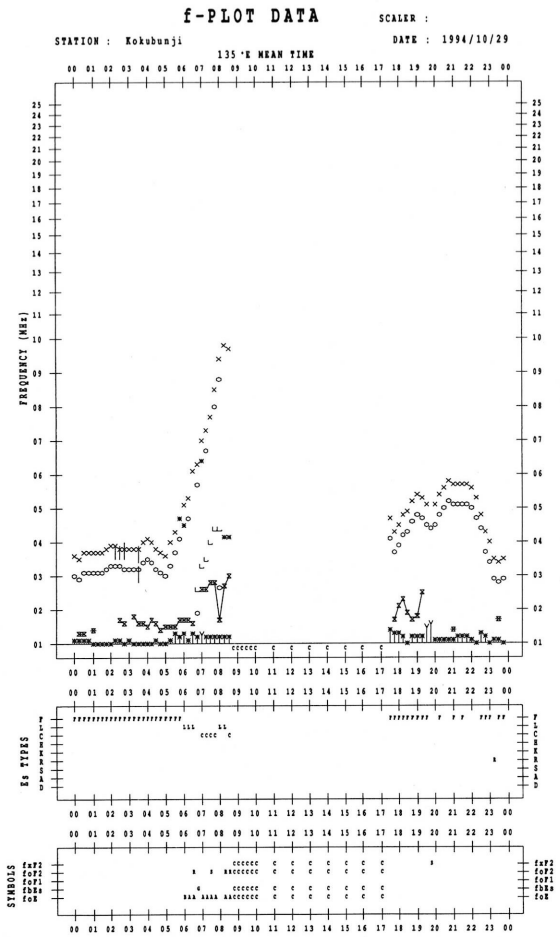
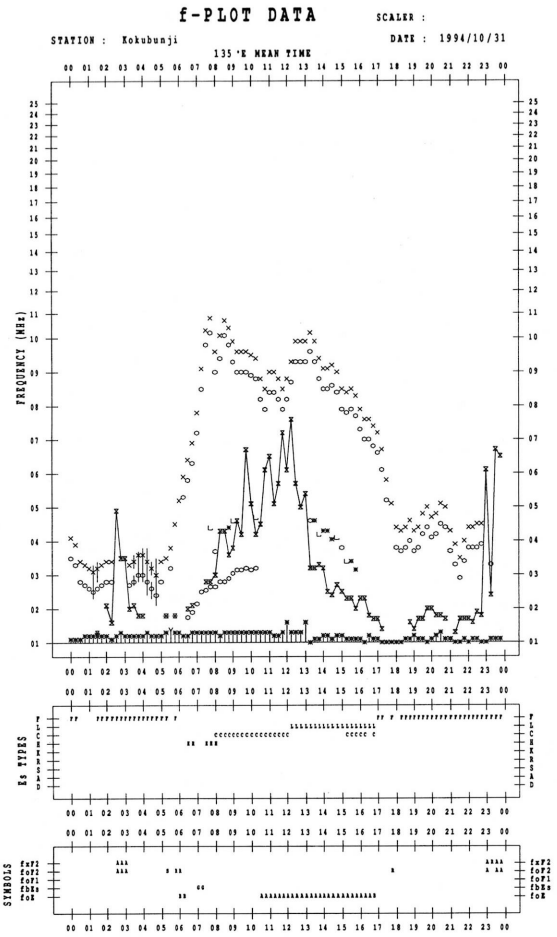
STATION : Kokubunji
DATE : 1994/10/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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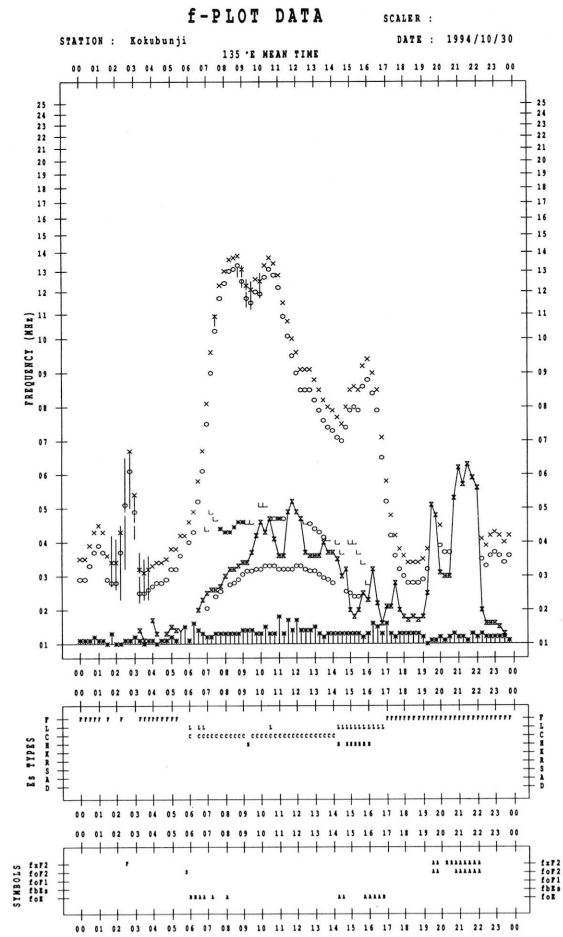
STATION : Kokubunji
DATE : 1994/10/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1994/10/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Not available until system improvement is completed.

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso October 1994

Single-frequency total flux observations at 500 MHz					
Flux density: 10^{-22} $Wm^{-2}Hz^{-1}$					
UT	00-03	03-06	06-09	21-24	Day
Date					
1	26	26	26	26	26
2	26	26	25	26	26
3	27	26	26	26	26
4	26	26	26	26	26
5	26	26	26	27	26
6	26	26	26	28	26
7	27	26	26	28	27
8	28	28	28	26	28
9	26	27	27	27	27
10	27	27	27	27	27
11	28	28	28	28	28
12	28	26	28	27	28
13	28	27	(27)	29	27
14	29	29	(29)	29	29
15	29	29	(29)	30	29
16	30	31	(29)	30	30
17	31	31	(30)	33	31
18	32	31	(31)	35	32
19	33	32	(31)	31	33
20	31	30	(31)	29	31
21	29	29	(29)	29	29
22	29	29	(29)	29	29
23	29	29	(28)	31	29
24	31	30	(30)	29	31
25	30	30	(30)	32	30
26	31	31	(31)	30	31
27	30	29	(29)	29	30
28	29	29	(29)	30	29
29	31	32	(33)	32	31
30	32	31	(31)	32	32
31	32	32	-	32	32

Note: No observations during the following periods.

31st 0600 - 0652

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso October 1994

Single-frequency observations

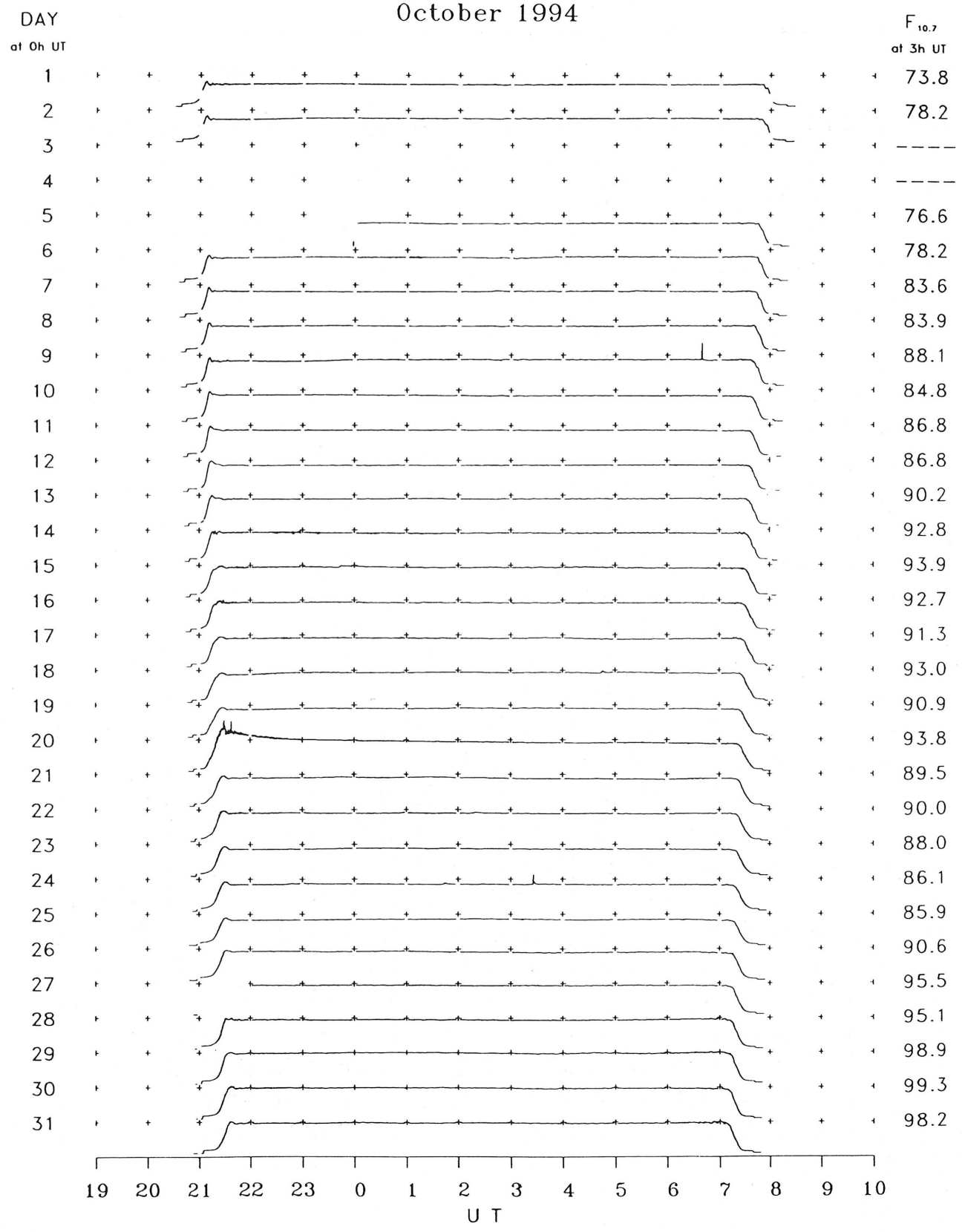
Normal observing period: 2045 - 0805 U.T. (sunrise to sunset)

OCT.	FREQ.	TYPE	START TIME	TIME OF MAXIMUM	DUR.	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1})		POLARIZATION
1994	(MHz)		(U.T.)	(U.T.)	(MIN.)	PEAK	MEAN	REMARKS
4	500	1 S	0239.5	0239.6	1.5	2	1	0
5	500	45 C	0712.6	0714.2	4.5	16	12	0
8	500	8 S	2126.0	2126.0	0.5	7	-	0
9	500	46 C	0639.1	0640.6	2.5	23	10	0
	2800	45 C	0639.6	0640.4	2.0	50	37	WR
14	500	46 C	0219.5	0220.4	2.0	6	4	0
	2800	20 GRF	2343.5	2344.0	30	6	4	0
18	500	46 C	0417.2	0417.9	1.5	13	6	0
	2800	20 GRF	0442.5	0445.2	30	10	4	0
19	500	21 GRF	2100E	2119.5U	90D	30U	-	0, SUNRISE
	2800	46 C	2128.6	2129.0	2.0	25	16	SR, SUNRISE
22	2800	1 S	0218.9	0220.7	5.0	5	2	0
23	2800	1 S	0418.4	0419.5	1.5	5	2	0
	2800	1 S	2258.5	2300.8	2.5	6	3	0
24	2800	1 S	0143.7	0145.4	2.0	5	3	0
	2800	3 S	0325.9	0326.8	3.0	30	13	WR
	500	46 C	0326.0	0326.7	7.5	10	5	0
	500	42 SER	0509.0	0509.1	3.0	15	-	0
27	500	46 C	0035.5	0035.5	1.0	11	5	WR
29	500	22 GRF	0308.0	0412.9	108	7	3	WL

B. Solar Radio Emission

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

October 1994



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

C. RADIO PROPAGATION

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

OCT 1994 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

C. RADIO PROPAGATION

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

OCT 1994 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

C. Radio Propagation

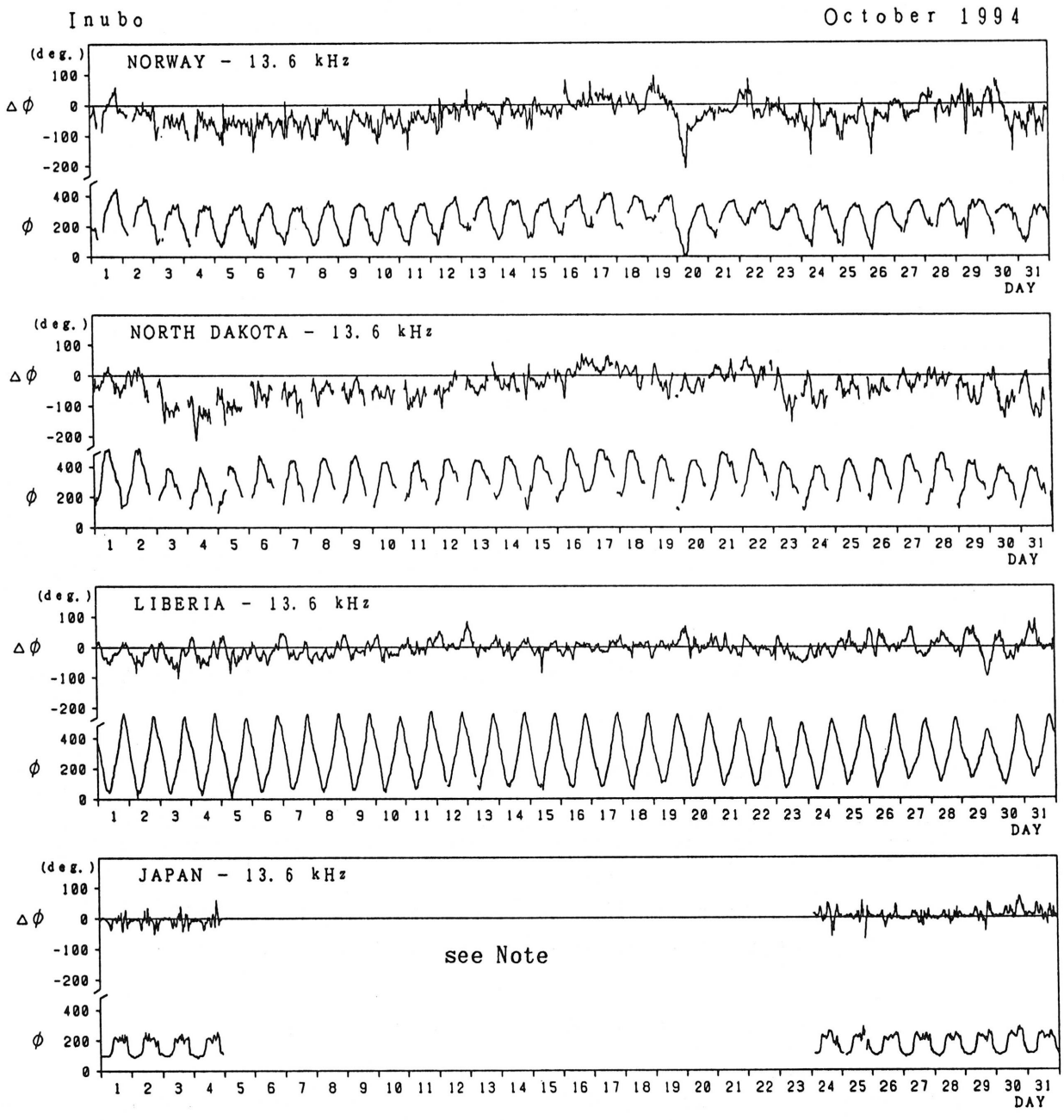
C2. Radio Propagation Quality Figures at Hiraiso

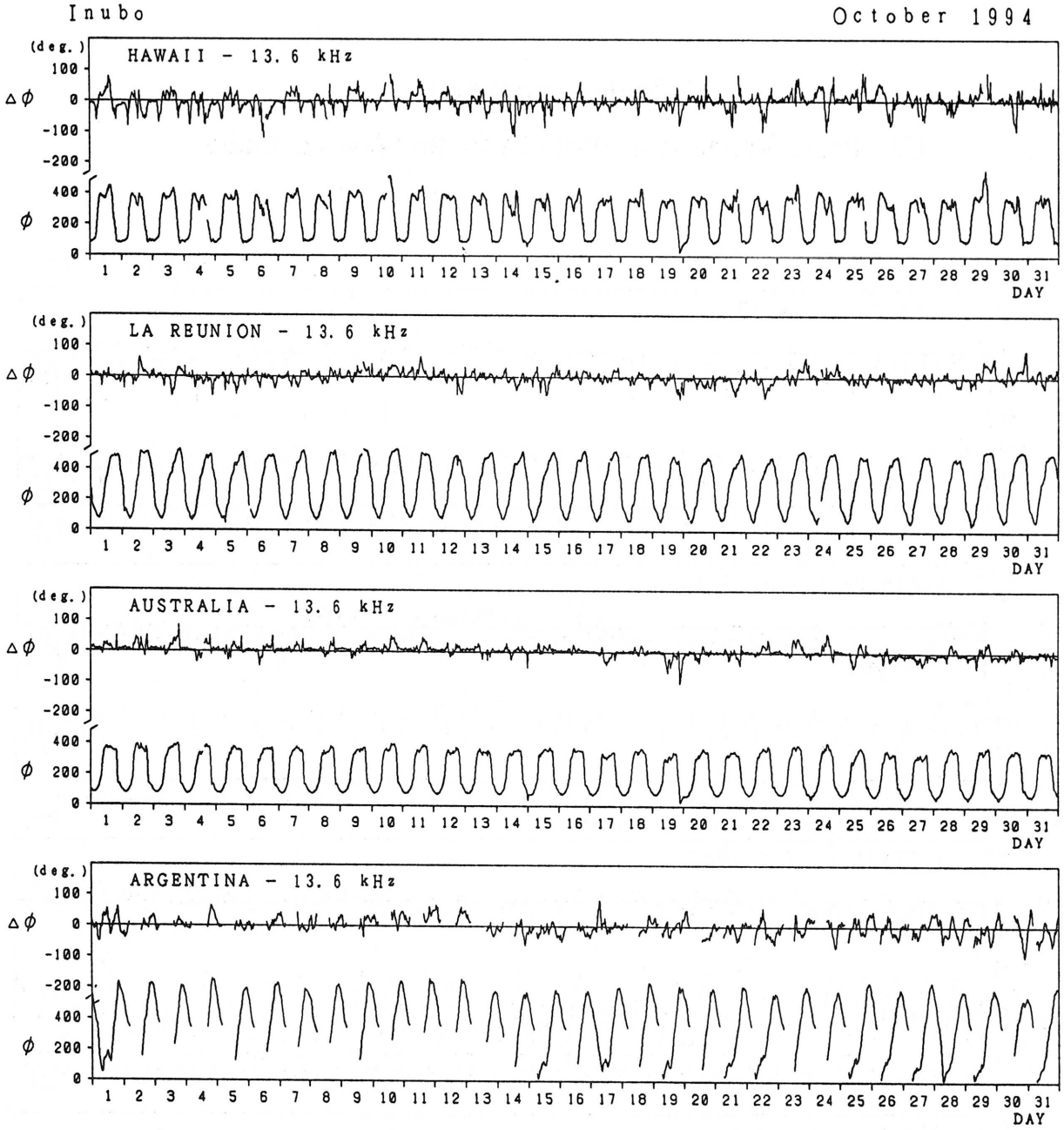
Hiraiso — Time in U.T.

OCT. 1994	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Condition 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start h m	End h	RaPge nT
1	4-	4U - - 4	3 - - 4	N N N N			
2	4-	4U - - 4	4 - - 3	N N N N	17.2	--	154
3	4- U	4U - - 2U	3 5U - 4	U U U U	--	21	
4	3+ U	2U - - 3U	4 5U - 2	U U U U			
5	3-	2U - - 2U	3 - - 4	U U U U			
6	3+	2U - - 4	3 - - 4	U U U U			
7	3+ U	4U - - 4U	2 3U - 4	U U U U			
8	3+	3U - - 3U	4 - - 4	U U U U			
9	4-	2U - - 4	4 5U - 4	U U U U			
10	4+	4U - - 4	4 5U - 4	U U U U			
11	4o U	4U - - 3U	4 5U - 4	N N N N			
12	4-	3U - - 4	4 3U - 4	N N N N			
13	4+	4 - - 4	4 5U - 4	N N N N			
14	4o	4 - - 4	4 - - 4	N N N N			
15	4o	4 - - 4	4 4U - 4	N N N N			
16	3+	3U - - 4	3 - - 4	N N N N			
17	4-	3U - 5U 4	3 - - 4	N N N N			
18	4o	4U 5U - 4	3 4U - 4	N N N N			
19	4o U	4U - 5U 4U	4 4U - 4	N N N N			
20	4+	5U - - 4	5 - - 4	N N N N			
21	4+	5U - - 4	4 - - 4	N N N N			
22	4+	4 - 5U 5	4 4U - 4	N N N N	08.2	--	116
23	4o U	5U - - 3U	4 5U - 3	N N N N	--	21	
24	4+	4U - - 4	5 - - 4	N N N N			
25	4o	4U - - 4	4 - - 4	N N N N			
26	4+	5U - - 4	4 - - 4	N N N N			
27	4+	4U - 5U 4	4 - - 4	N N N N			
28	4o	- - - 4	4 - - 4	N N N N			
29	4-	4 - - 3U	4 - - 4	N N N N	0025	--	175
30	4- U	2U - - 4U	4 5U - 4	N U U U	--	--	SSC
31	4-	2U - - 4	4 5U - 4	U U U U	--	24	

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo





Note : As for JAPAN-13.6kHz, no record during 5 October 0000 UT - 24 October 0230 UT, due to the maintenance of transmitter.

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

Start (U. T.)	End (U. T.)	Max. (U. T.)	Max. Phase Deviation (negative value, deg.)
Oct. 20/0200	Oct. 20/2030	Oct. 20/0700	210

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso — Time in U.T.

OCT. 1994	S W F							Correspondence	
	Drop-out Intensities(dB)					Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS	BBC						
14			6			2342	22	2	1-	x	C
19	>33	>44				2058	126	3	3+	-	C

NOTE CO:Colorade(WWV) HA:Hawaii(WWVH) AUS:Australia MOS:Moscow BBC:London
* Optical and X-ray Flares

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Oct. 1994	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
4				7	7	–	2314	2332	2318
5		44	83	18		–	0710	0810	0722
9			14				0744	0812	0756
9		15					1622	1635	1626
11			11				0624	0634	0630
12			14				0624	0640	0626
14	14			43	32	29	2344	0050	2355
15			11			54	0258	0410D	0334
15			25	11		44	0410E	0446	0416
15		34	25				1020	1104	1028
19				50	76	–	2051	0106	2132
23		39					1136	1220	1143
23				14	14		2300	2346	2311
24			7	14	7	15	0136	0204	0150
25		29	22				0958	1055	1014
29			29	7			0432	0517	0440
31			7				0654	0721	0700

IONOSPHERIC DATA IN JAPAN FOR OCTOBER 1994
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