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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

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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	36	35	28	32	29	25	A	A	92	70	81	87	84	81	A	73	73	50	A	A	A	24	29	A
2	A	A	35	30	35	A	22	80	73	91	80	98	77	71	68	70	63	45	A		28	A	A	A
3	A	29	35		31	36	31	57	68	92	81	61	82	68	70	70	61	28	38	59	59		A	35
4	38	36	36	32	41	28	38	57	69	82	81	71	81	66	72	60	68	30	A	A	A	A	30	37
5	36	56	35	35	34	43	29	57	68	72	75	76	88	71	82	71	61	44	38	50	55	38	55	56
6	57	57	40	38	43	38	42	58	68		65	81	82	68	76	78	68	40	A	36	A	36	59	36
7	37		36	35	59	35	35	68	68	82		82	69	68	64	70	59	A	59	A	36	35	A	35
8	29	38	38	28	31	49	36	68	73	59	70	66	91	60	A	66	58	A	A	A	A	A	A	34
9	35	30	A	37	30	29	35	56	56	66	60		66	62	58	56	51	40	37	35	A	37	59	30
10	35	35	A	A	29	A	35	58	69	65	79	71	74	72	67	56	70				26	59	38	37
11	35		37	40	35	35	A	56	70	60	66	76	69	70	68	77	64	30	38	38	43	38	38	38
12	36	40	37	36	24	29	49	57	57	68	67	70	70	67	57	67	68	37		A	58	36	38	40
13	59	40	41	38	22	57	37	68	67	69	77	81	70	68	68	81	56	A	40	38	35	40	30	25
14	37	38	30	35	41	57	59	57	57	65			71	71	58	64	60	34	25	59	35		31	
15	37	38	36	38	36	40	A	29	69	82	77	72	68	68	76	71	69	58		A		35	38	A
16	A	38	A	35	40	32	38	35	58	67	80	74	71	69	60	58	50	36	A	34		35	A	57
17	56	49	43	39	40	35	38	35	57	68	70	76	70	62	62	57	32	41	A		A	56	29	55
18	57	41	43	32	31	37	54	68	68	68	71	71	72	61	60	60	57		34	A		36	43	38
19	57	48	37	37	44	40	59	38	68	83	91	88	71	70	60	83	67		A	A	A	31	34	
20	37	29	34		30	29	32	57	70	68	87	59	80	68	81	76	66	48	35	34	A	A	A	
21	A	35	36	59	34	A	32	A	69		68	77	70	61	60	56	56	41	A	31	38	34	A	37
22	A	34	A	29	29	35	38	39	69	67	69		76	69	56	61	48	59	35	A		35	36	36
23	40	35	28	31	29	29	28	40	58	62	66	77	72	61	65	56	60	38	29	A	35			40
24		37	35	36	35	29	37	49	58	58	60	61	62	64	60	58	50	29	37	48		31	37	41
25	35	36	36	59	34	40	31		68	74	62	72	70	70	66	68		A	A	29	29	35	31	41
26	40	40	32	37	32	35	35	59	60	68	60		A	A	58	A	67	40	38	36		32		A
27	35	A	A		A	A	A	56	71	70	58	67	68	71	70	58	44	44	22	A	A	A	A	35
28	A	28	31	38		59	35	37	57	70	61			73	70	68	61	A	35	29	59	40	57	55
29	56	54	57	51	50	36	31	A	59	60	56	66	61	67	63	58	38	59		A	A	28	28	29
30			40	59	34	59	36	58	58	55	65	71	58	67	66	58	31		A	40	37	A	38	38
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	25	25	26	28	26	26	26	30	28	28	25	28	29	28	29	29	21	15	15	14	21	20	23
MED	37	38	36	36	34	36	36	57	68	68	70	72	71	68	66	66	60	40	37	36	36	35	38	37
U Q	56	40	39	38	40	40	38	58	69	73	79	79	78	70	70	71	67	46	38	48	55	38	40	41
L Q	35	35	34	32	30	29	32	40	58	65	63	68	69	65	60	58	50	35	34	34	35	33	30	35

HOURLY VALUES OF fEs AT WAKKANAI

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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	42	24	28	G	25	34	28	46	47	56	69	47	44	71	32	25	46	62	46	43	44	44	56
2	61	41	33	31	36	33	G	34	34	37	40	60	30	44	26	31	35	30	44	42	36	35	37	37
3	32	29	29		G	G	G	G	35	46	43	55	64	68	34	33	32	33	60	35	34		60	36
4	28	29	29	G	34	G	G	37	43	41	36	30	33	34	45	34	35	38	43	36	31	28	G	G
5	G	G	G	28	G	G	25	G	29	28	34	28	32	34	33	35	32	33	G	32	28	40	G	G
6	G	G	G	G	G	G	G	G	27		33	26	28	34	28	27	46	34	39	27	26	G	G	G
7	G	G	G	G	G	26	24	33	49	54		28	29	26	25	34	54	61	96	60	32	28	25	26
8	32	28	G	33	33	28	26	G	34	40	44	58	35	60	31	28	33	34	49	84	95	44	56	33
9	G	40	30	32	33	26	23	G	24	26	31		31	28	31	26	47	44	G	29	37	G	G	G
10	G	G	34	40	31	26	G	G	23	28	29	28	30	29	26	G	G				33	G	G	G
11	G	G	G	26	26	32	44	35	31	25	26	28	29	30	28	36	28	25	32	G	G	G	G	G
12	G	30	29	33	25	33	28	30	28	26	29	29	29	29	25	G	G	40		39	29	27	G	G
13	G	G	G	G	G	G	G	G	24	36	27	28	31	38	32	33	33	34	58	42	27	27	G	28
14	G	22	27	G	G	G	G	G	30	34			26	N	34	34	39	34	59	38	G	28	28	
15	G	G	G	G	G	33	32	34	25	30	28	28	31	28	30	36	28	27		43		50	44	49
16	55	32	34	33	26	G	G	28	23	29	33	28	30	28	42	30	37	39	33	36	31	34	46	32
17	G	33	34	30	G	G	G	41	29	48	35	33	34	28	28	35	39	32	36	46	38	28	26	36
18	G	G	G	G	G	G	28	G	29	31	28	34	44	36	35	27	32		40	33		25	G	G
19	30	38	35	G	G	24	G	27	34	45	35	35	46	34	30	26	33		43	37	29	26	G	
20	G	G	G	G	G	33	G	36	49	66	51	73	42	34	30	30	26	44	G	34	34	40	29	G
21	28	23	G	28	38	42	66	52	30		33	41	28	44	30	31	26	32	29	30	29	G	41	38
22	33	32	34	23	25	28	24	32	39	54	34		30	35	24	23	29	33	28	35	G	G	G	27
23	G	30	G	G	G	G	24	G	30	28	30	28	27	26	26	G	28	G	42	40	G		G	G
24	G	G	G	G	G	G	32	G	30	36	28	28	32	32	35	33	33	32	30	24		G	30	26
25	26	G	G	G	G	G	G		G	G	35	G	G	G	32	34		56	49	G	32	37	33	28
26	39	29	G	G	G	G	G	G	G	G	37		58	63	55	73	61	30	30	G	G	G	G	41
27	40	28	32	G	38	36	34	26	29	36	38	G	46	48	39	61	60	96	43	33	32	28	24	G
28	30	G	34	61	G	24	28	G	G	38	42			G	G	34	28	39	41	29	26	26	G	G
29	30	26	32	29	G	G	43	34	G	36	34	G	G	G	G	30	41	39		36	29		G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29		29	37	33	44	34	28
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	29	30	28	28	25	29	29	30	30	29	26	26	29	27	28	30	28
MED	G	24	12	G	G	12	24	26	29	36	34	28	31	34	30	32	33	34	40	36	31	28	12	26
U Q	30	30	32	30	26	28	28	34	34	43	37	38	38	41	34	34	39	40	49	41	34	36	34	34
L Q	G	G	G	G	G	G	G	G	24	28	29	28	28	28	26	27	28	32	30	29	26	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

NOV. 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	15	15	15	17	17	15	18	15	16	16	17	17	16	16	15	15	15	14	15	15	15	15	15
2	15	15	14	16	15	15	15	16	15	16	16	16	18	16	16	22	15	15	15	15	15	15	15	14
3	15	17	15		15	15	15	22	15	16	16	16	16	15	16	15	14	15	14	15	15		16	15
4	15	15	15	15	15	15	16	16	16	16	16	16	16	16	15	16	15	14	15	15	15	16	15	16
5	16	15	15	15	15	15	15	21	16	16	17	17	21	17	15	16	15	15	15	16	15	15	15	15
6	15	15	15	14	15	17	17	17	15		16	16	18	17	15	15	15	15	15	16	17	16	16	15
7	15	16	16	16	15	15	15	16	16	18		18	17	16	17	15	15	14	14	15	15	14	15	15
8	15	15	15	15	15	16	16	18	17	22	22	30	26	32	23	17	15	15	15	15	15	15	14	15
9	15	14	14	15	15	15	15	17	15	17	16		16	18	17	15	15	14	15	15	15	15	15	15
10	16	16	15	15	14	16	15	20	16	17	20	21	17	17	16	15	16				15	15	15	15
11	15	15	15	15	14	14	14	15	15	15	16	16	15	16	15	15	16	15	15	16	16	15	15	15
12	15	15	15	15	15	15	15	16	15	18	17	16	16	16	15	23	17	15		15	15	15	14	14
13	15	14	15	14	18	15	15	20	16	15	15	15	16	15	15	15	15	15	15	15	15	14	15	15
14	15	15	15	16	15	15	16	16	15	15			15	18	15	16	15	15	14	15	15	15	15	
15	15	14	15	15	15	15	15	15	26	15	16	18	16	15	15	15	15	15		15		15	15	15
16	15	15	15	15	15	15	15	17	16	17	16	20	17	16	16	15	15	15	15	16	15	15	14	15
17	15	15	15	14	15	15	15	22	14	15	15	16	15	15	15	15	15	14	14	15	15	15	15	15
18	14	15	15	15	15	15	15	18	15	15	14	15	16	16	14	17	14		14	15		15	15	15
19	15	14	15	15	15	15	15	17	15	15	15	15	15	15	15	15	15		15	15	15	17	15	
20	15	15	15	16	15	16	15	15	14	16	15	14	15	15	15	16	15	15	15	15	15	14	15	15
21	15	15	15	14	15	15	15	15	15		15	15	15	15	15	14	15	15	14	15	15	15	15	15
22	15	15	15	15	14	15	15	14	15	15	15		15	15	15	20	14	14	17	15	16	15	15	16
23	15	15	15	15	15	15	15	17	15	15	16	15	15	15	15	22	14	14	14	15	15		15	15
24	15	15	14	15	16	15	15	17	15	15	15	15	15	16	15	15	14	14	15	15		15	16	15
25	15	14	15	15	14	15	16		14	15	16	15	15	15	15	15		15	15	15	15	15	15	15
26	15	14	15	15	15	15	15	20	17	15	16		16	17	16	15	14	15	14	15	16		16	15
27	16	14	15	15	15	15	15	16	15	15	15	16	16	15	16	15	14	15	15	15	14	17	17	17
28	15	15	15	15	15	15	16	17	15	16	16			44	40	17	15	15	15	15	16	16	15	15
29	15	15	15	15	15	15	14	14	15	17	18	18	39	28	21	15	15	15		15	15	20	15	15
30	15	15	15	15	15	15	15	17	21	15	18	16	16	18	15	15	15		15	15	15	14	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	30	30	30	29	30	28	28	25	29	30	30	30	29	26	26	29	27	27	30	28
MED	15	15	15	15	15	15	15	17	15	16	16	16	16	16	15	15	15	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	15	18	16	16	16	17	17	17	16	16	15	15	15	15	15	15	15	15
L Q	15	15	15	15	15	15	15	16	15	15	15	15	15	15	15	15	14	14	14	15	15	15	15	15

HOURLY VALUES OF foF2 AT KOKUBUNJI

NOV. 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	A	38	31	29	28	A	46	70	88	101	85	93	106	92	92	95	76	55	37	A				32
2	32	58	36	49	30		31	68	94	94	116	125	131	118	103	77	66	A	A	46	A	A	A	40
3	56	28	35		31	28	24	66	82	94	98	83	83	93	81	71	51	51	A	A	A	A		35
4	A	A	56	36	29	30	59	74	92	80	85	101	94	77	66	72	68		A			A	A	59
5		32		A	59		25	57	94	84	92	82	82	86	78	83	61	45	37	45		43		46
6	58	44	46	40	42	42		64	74	92	91	85	95	98	91	94	68	57		44	56			47
7	A	58		34		36		70	93	81	94	102	88	73	94	67	68	58	A	A	A	A	A	A
8	A	35	37	37		A	36		67	65	86	100	77		86	77	55		A	A	58	35	A	29
9		28	32	35	59		A	58	69	66	66	76				72	58		31	A		A	A	
10	25	35		A	40			57	68	70	80	80	90	74	94	68	61	54		34	36			N
11	30	35	32	35				72	58	67	63	77	83	82	78	65	64	57	32	43	56	A	35	36
12	32	59	36	31	32	35			94	66	74	67	82	68	67	59	68	61			32	32	A	36
13	A	35	59	38	46			68	66	68	72	94	83	67	68	61	70	34		30	A	A	59	A
14	A		38	34	56	49	69	69	69	68	80	78	81	72	74	52	56	47	A	A		58	35	A
15	A	59		36	35	59		67	69	62	78	74	67	68	81	74			56	A	32	56	34	26
16	35		A	38	35	32	A	69	58	70	92	86	75	72	94	62	48	43	A	A			35	59
17		37	43	35	43	32	34	55	67	60	94	72	74	78	71	64	68	30	45	A	30	32	36	34
18	38		34	32		36	A		58	58	64	66	56	70	54	57	57	32	26	59		36	35	
19	30	58	37	37	22	34		34	69		87	84	80	72		68	57	60	36	59				
20	38		A					72	77	92	70	82	85	83	94	70	71	51	A	31	A		A	35
21	A	A		38	43	38		74	A	66	82	79	88	66	54	63	55	47	36	34			A	A
22	A	35	29	30	34	28	28	A	69	70	71	82	80	80	54	95	57	A	59	A		30	69	36
23		A		31	32	35	35	56	57	68	69	74	71	65	71	70	56	37			59			59
24	35	30	32	59	59	26		57	69	61	80	67	66	63	58	61	57			25	37		59	28
25		59	59		30	35		58	70	55	63	68	58	71	64	68	57	34	A	A	A	A	59	36
26	32	30	25	N	59	A	A	69	74	71	72	66	54	62	68	67	57	56	43		56			32
27		A		N	34	A	A	69	83	86	88		79	77	81	68	51	50	A	A	A	A	A	
28	N	28	A	A	31	26	A	73	67	73	76	73	70	61	75	61	63	57	51			A	35	
29	31	35	35	41	38	37	36	58	59	65	77	70	60	56	63	72	52	38	32	35	56	A	A	A
30	A			N	58	34		57	57	60	71	69	63	66	68	68	52	40	59		58		N	N
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	13	21	19	21	25	19	11	26	29	29	30	29	29	28	28	30	29	23	14	12	12		11	18
MED	32	35	36	36	35	35	35	68	69	68	80	79	80	72	74	68	57	50	37	39	56		35	36
U Q	38	58	43	38	51	37	46	70	82	82	88	85	86	81	88	72	68	57	51	45	57		59	46
L Q	30	31	32	33	31	30	28	57	66	65	71	71	68	66	66	63	55	38	32	32	34		35	32

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT KOKUBUNJI

NOV. 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	55	28	26	G	24	28	25	33	34	28	49	70	46	44	40	39	34	G	G	30	31	28	G	26
2	24	G	G	G	G		G	24	37	42	43	39	32	33	32	54	33	68	55	40	39	52	34	27
3	29	G	G	32	24	26	26	34	31	34	31	32	32	G	28	28	35	37	47	33	28	28	G	38
4	53	55	30	40	26	25	27	29	30	33	34	34	35	44	32	34	41		29			28	33	26
5	24	G	G	27	28	G	G	39	24	31	26	31	30	26	32	37	44	30	G	G	G	28		G
6	G	G	G	G	G	G	G	28	25	27	31	34	30	28	35	54	72	40	G	G	G	G	G	G
7	29	G	G	G		G	G	32	42	44	26	37	31	44	32	37	34	31	30	28	50	40	41	33
8	38	34	28	29	G	35	66		66	34	38	37	48		38	29	39		49	40	34	28	31	G
9	24	G	G	G	G	G	34	29	28	31	30	28				31	G		G	29	G	32	34	G
10	G	G	G	32	28	24	G	26	55	33	29	32	35	35	G	31	G	G	G	G	G		G	G
11	G	G	G	G		G	G	28	25	26	29	G	G	45	44	34	29	G	24	G	G	29	26	24
12	26	G	G	G	G	G	G		31	34	32	32	26	30	26	36	29	33	G	29	30	25	28	G
13	26	G	G	G	G	G	G	29	30	32	44	32	45	41	40	38	33	43	34	30	34	30	36	32
14	30	G	G	G	G	G	G	32	55	34	32	42	34	34	34	30	30	25	29	29		26	24	29
15	25	G	G	G	G	G	G	24	30	30	30	73	30	28	G	37		44	44	46	G	G	G	G
16	G	37	29	26	G	G	34	25	33	43	34	32	32	31	35	39	47	42	59	28	G	G	G	G
17	23	26	26	G	24	G	G	25	30	31	35	28	30	31	33	32	29	30	G	30	G	G	G	G
18	G	G	G	G	G	G	33		32	38	36	35	35	46	57	G	32	29	26	G	G	G	G	G
19	G	G	G	G	G	G	G	26	32		31	34	42	41		35	28	G	G	24			G	G
20	29	G	26	G		G	G	29	29	43	36	50	56	28	32	30	G	G	26	G	52	40	34	25
21	33	29	30	G	G	G	G	G	124	32	54	39	57	40	49	44	40	62	33	G	29	31	41	34
22	30	G	G	G	G	G	23	60	30	28	30	34	28	31	36	42	36	42	G	25		20	G	G
23	24	32	G	G	23	G	G	31	31	29	41	41	33	36	G	33	30	26	27	G	24	G		G
24	G	G	G	G	G	G	G	27	27	30	28	36	35	26	G	G	29	28	32	32	G	G	G	G
25	G	G	G	G	G	G	G	G	38	40	44	41	G	G	44	44	32	36	48	39	37	28	G	G
26	27	26	25	G	G	30	32	48	G	35	G	G	G	G	G	G	G	G	G	G	G	G		G
27	G	24	G	28	31	30	33	39	50	34	46	51	40	38	44	35	31	52	56	46	50	55	49	
28	G	G	26	29	26	54	77	37	33	G	G	G	G	G	36	43	39	27	G	G	35	37	G	29
29	30	G	26	30	27	G	G	27	37	G	G	G	G	G	G	G	G	G	24	29	24	26	31	31
30	31	G		G	G	G	G	26	G	G	43	G	G	G	G	34	28	25	25		G	G	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	30	27	29	30	27	30	29	30	30	29	28	28	30	29	27	30	28	26	28	27	29
MED	24	G	G	G	G	G	G	29	31	32	32	34	32	31	32	34	32	30	26	28	24	28	G	G
U Q	30	26	26	27	24	24	27	33	37	34	41	39	37	40	39	39	37	42	34	31	34	30	34	28
L Q	G	G	G	G	G	G	G	26	29	28	29	31	27	26	13	30	28	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

NOV. 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	39	22	A	A	A	N		60	80	98	93	105	117	126	125	103	94	77	A	A	26	22	49	23
2				29	26		26	69	80	96	113	135	142	151	160	156	120	94	72	28	59	A	A	26
3		26	31		28	59	49	61	84	92	84	96	98	98	104	87	72	66		26	28	37	29	28
4		32	59		26	59		60	68	77	92	105	118	111	97	77	80	62	A	A	A	59	N	A
5	58	49		30		N	24	32	55	66	96	94	84	90	96	92	77	57	28	26	31	32		60
6		56		31	31	59	49	25	67	73	93	77	86	114	113	94	66	66		59			32	24
7				58	31	32	31	22	68	84	101	119	80	84	85	76	66	68	20	49	59	30	31	46
8	A	59	28	42	32	N	69	58	68	65	81	106	106	112	114	101	88	72	30	31	47	A		N
9		28	24	26	25	N	59	42	62	59	66	85	84	82	97	87	66	67	54	30	31	59		A
10	26		28	26	N	49		A	68	70	67	85	90	85	72	78	75	70	A		48		N	
11	28	25	24	26	59	25	49	58	62	61	67	82	76	84	92	74	66	66	57	25		28	59	26
12	30	25	25	30	31	25	59		62	80	72	68	70	66	81		64	70	58	28	49	37	26	30
13	30	30	N	59	25	N	49	30	55	77	77	87	92	87	78	68	67	66	58			A	31	59
14	N	28	N	31	59			N	69	67	72	77	82	91	81	77	66	A	A	A	30		59	
15	30	18	N	28	58			35	60	A	73	77	67	74	93	81	71		60	31	A		28	A
16	35	N	N	A	32	28	32		60	69	81	96	73	77	91	81	66	59	59		A	N	25	59
17	29	26		31			49	35	68	57	68	74	74	81	81	72	57	60	A	A	A	N	59	
18	49	30		30		32	N	49	74	61	58	68	60	68	75	67	53	60	30	49	26	28	A	A
19	A		29	29			A	30	68	68	72	90	80	80	73	73	66	60	39	A	A	A	A	28
20	28			A	A	A		57	67	A	A	88	94		68	90	84	71		49		31	49	32
21	59	30	59	32	58	32	49	70	82	77	77	92	64	74		67	67	58	A	A		30	A	A
22	49	N	N	59	N	30	26	41	68	67	70	88	70	77	68	68	72	66	49	A	28		N	N
23	59	26	29	22	25			59	62	62	68	74	67	80	85	73	66	23	28		A	59	N	
24	N	59	24	59	25	26	38		61	67	80	72	66	72		72	58	56	A		A	26	A	A
25		A	26	24	28	22	25	35	68	94	58	73	66	66	74	70	72	48	A	32				
26	25	29	28	30	N	49	59	38	68	67	67	63	62	68	73	71	74	68	A	31	66	72		
27	49	A	A	A	A	A	A	A	70	83	85	92	84	87	80	69	68	66	43	A		A	A	A
28	32	31	24		25	26	26	69	73	68	74	75	68	72	70	67	66	68		31		24	29	A
29	28		49	26	30		26	25	69	69	71	70	78	60	66	84	94	61	A	60	49		69	29
30	24	24	49	N	23	49	49	32	56	66	71	66	57	71	77	72	60	60	49	38		44		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	20	16	22	20	16	20	24	30	28	29	30	30	29	28	29	30	28	16	17	14	16	14	13
MED	30	28	28	30	29	32	49	42	68	68	73	85	79	81	81	76	67	66	49	31	39	32	32	29
U Q	49	31	40	32	32	49	49	59	69	78	84	94	90	90	96	87	75	68	58	49	49	51	59	52
L Q	28	25	24	26	25	26	26	32	62	66	68	74	67	72	73	70	66	60	30	28	28	28	29	26

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

NOV. 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	36	29	32	38	37	27		32	38	39	38	29	32	36	35	33	25	30	36	35	33	G	33	25
2	30	G	G	G	G		G	G	26	33	30	32	31	32	G	33	26	G	27	32	37	38	29	G
3	27	G	G	G	G	G	G	30	32	29	30	24	31	28	31	29	28	G	G	G	G	G	G	34
4	G	G	G	G	G	G	G	G	30	29	30	38	G	31	30	28	36	32	39	33	29	24	24	32
5	G	G		G	27	G	G	25	30	32	30	29	28	38	G	34	36	27	G	G	G	G	33	24
6	25	G	G	G	G	G	G	34	30	30	31	30	G	31	G	29	23	32	G	G	G	G	26	29
7	29	G	G	G	G	G	G	26	30	36	31	30	28	31	38	31	30	G	30	G	30	G	G	27
8	28	G	26	G	G	G	G	30	29	28	60	33	31	30	29	32	34	G	G	G	G	32	25	G
9	G	G	G	G	32	G	G	G	30	67	30	30	31	29	30	26	25	G	G	G	G	32	33	30
10	G	G	G	G	G	32	29	33	29	29	29	30	30	G	97	28	29	32	30	G	G	G	G	G
11	G	23	G	G	G	G	G	G	30	30	29	30	31	33	31	28	26	26	25	G	G	G	G	G
12	G	G	G	G	G	G	G	24	29	28	30	32	32	34	31		29	G	G	G	27	G	G	G
13	G	G	G	G	G	G	22	G	30	32	33	36	32	31	31	32	50	40	31	23	G	33	37	25
14	29	G	G	G	G	G	G	37	30	32	34	33	32	32	35	36	57	70	91	59	24	G	G	G
15	G	G	G	G	G	G	G	39	28	26	38	30	32	33	32	54	35		27	28	33	G	G	33
16	G	G	G	32	G	G	G	25	29	30	28	50	33	33	32	37	34	G	G	28	29	24	G	G
17	G	G	G	G	G	G	G	G	28	29	30	30	50	38	36	34	44	31	40	33	28	25	G	G
18	G	G	G	G	G	G	G	G	29	28	28	29	31	32	49	33	36	34	33	32	28	29	33	37
19	34	G	G	G	27	G	29	24	28	30	28	28	31	32	28	27	27	27	30	31	37	38	29	G
20	33	29	28	31	32	32		24	36	38	38	49	32		35	32	33	26	27	G	24	28	G	G
21	G	G	G	G	G	28	G	24	24	32	31	32	31	36		56	32	37	37	36	29	30	31	26
22	G	G	G	G	G	G	G	24	30	29	28	38	30	29	29	28	26	G	29	32	G	G	G	G
23	G	G	G	G	G		G	27	31	31	36	34	33	33	34	30	28	24	24	26	32	26	G	
24	G	G	G	G	G	G	G	G	28	31	28	29	29	34	G	35	31	32	40	23	29	G	25	25
25	G	28	G	G	G	G	G	26	31	G	G	G	G	G	54	56	38	32	29	G	32	G	G	
26	G	G	G	27	24	G	G	G	48	G	36	G	G	G	37	G	G	33	48	29	33	29	G	24
27	23	31	35	52	38	33	37	38	37	82	G	G	G	G	G	G	56	38	33	33	34	37	34	38
28	29	26	G	G	26	G	G	G	G	G	G	G	G	G	G	G	32	26		26	26	G	28	26
29	G		G	G	G	G	G	28	G	G	G	G	G	G	G	40	G	26	30	G	G	G	G	G
30	G	G	G	G	G	G	G	26	G	G	G	G	38	G	G	G	G	25	G	G	G	G	G	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	29	30	30	28	28	30	30	30	30	30	30	29	29	29	30	29	29	30	30	30	30	27
MED	G	G	G	G	G	G	G	24	30	30	30	30	31	31	31	32	30	27	29	24	28	G	G	24
U Q	28	G	G	G	24	G	G	30	30	32	33	33	32	33	35	34	36	32	34	32	32	29	29	29
L Q	G	G	G	G	G	G	G	G	28	28	28	28	28	14	G	28	26	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT OKINAWA

NOV. 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		59	A	69		A	A	53	83	93	119	127	124	124	167	130	134	124	81		63	A	44	34
2	A			30				53	94	96	111	144	165	165	170	161	144	132	92	67	60	63	A	62
3	57	70	44	68	A			32	94	92	92	103	122	140	144	122	105	78	53	43	47	49		46
4	48	44	43	36				53	83	92	93	126	150	166	163	128	111	76	60	45		52	A	59
5		43	44	44				49	50	63	93	125	106	133	127	102	92	60	63	A	51	56	43	
6		44	42	59		59			55	67	86	86	84	117	135	91	86	83	95	56	59	46	A	A
7			51	57	46			51	86	91		122	107	92	90	105	70	74	66	61	44		46	43
8	46	43		44				53	62	80	92	105	134	145	170	160	146	150	90	68	53	56	50	44
9	48		69	41	37			42	62	61	72	124	95	124	124	134	117	85	72	50	50	57	45	48
10				56	43	38		45	67	58	88		115	92	82	94	96	90	57	57	43	61		
11	49			59	44	36	79	42	61	60	65	82	92	90	94	85	74	80	64	67	44		46	48
12		59	N	26					63	78	76	80	67	83	83	82		83	78	A		48		
13	46	59	59	43	47			50	49	68	93	100	88	106	102	95	86	82	93		58			A
14		46		37	42		49		65	84	81	81	85	125	92	80	76	83	84	48	48	46	48	41
15			46	17	44		A	43		69	83	88	81	81	125	108	91	117	86	76				49
16	59	A	38	59	32			A	53	82	93	128	92		124	123	112	83	55		46	35		44
17		44			48	N			57	61	68	92	84	86		93	68	64		A				59
18				A		A			A	69	68	67	81	82	81	81		73			A	A	A	A
19	A		35						62	95	93	83	93	95	94	94	82	A	43	45	59	A		A
20	A	43	44						84	94	70	90	123	119	90	93		93	85	59	69		68	55
21	59	68			47	48		49	75	82	103	90	80	80	81	78	88	A	61	A	A	A	A	A
22	64			31		37			51	68	96	86	81	104	105	93	102	96	74	37	41	44		N
23	N			N		27			68	68	93	71	81	94	122	111	98		61	44	A	48	A	
24		44	38			58	46	59	64	60	87	75	85	93	83	80	64	63	67	38	43	52	48	38
25	44		38				A	A		82	82	76	83	73	81	80	96	83	56	44	46	A	A	A
26				N	56	30	A	A	70	94	65	83	80	64	80	82	92	74	80	76				
27	67			A	59	A		A	84	91	95	84	114	122	87	82	81	98	92				A	61
28	A	A	A	59	41	38	A	A	75	73	82	87	80	74	81	83	69	67	72	56	A	34	44	49
29		46	40	35		49		A	63	82	72	87	92	84	82	93	103	91	73	43	69	60		45
30		44	49	28	58	38		32		69	67	82	60	71	105	124	76	73	69	43	59	68	50	69
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	15	15	20	14	11		15	26	30	29	29	30	29	29	30	27	27	28	21	20	17	11	18
MED	49	44	44	44	45	38		49	64	79	87	87	90	94	94	94	92	83	72	50	50	52	46	48
U Q	59	59	49	59	48	49		53	83	91	93	113	114	124	126	122	105	93	84	64	59	58	50	59
L Q	46	44	38	33	42	36		42	61	68	72	82	81	82	82	82	76	74	61	43	45	46	44	44

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

NOV. 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		23	28	25	G	25	75	48	22	34	80	78	57	36	53	44	38	34	11		G	81	38	G
2	26		G	G			G	G	27	38	32	G	37	G	42	39	35	32	40	49	37	28	36	G
3	G	G	29	G	32		G	43	42	28	41	G	34	23	36	G	29	G	G	G	G	G	G	G
4	26	25	G	G	G	G	G	22	24	42	35	39	32	G	31	42	24	G	32	G	G	G	41	G
5	G	25	G	G	G	G		G	68	26	65	30	48	40	59	76	68	74	30	39	24	G	38	G
6	G	G	G	G	G	G	G	45	48	32	26	40	G	30	41	155	35	G	G	G	G	26	45	32
7	48	39	G	G	G		G	33	35	46		58	32	32	31	G	G	G	G	40	G	G	G	G
8	G	G	G	G	G			42	35	35	30	45	57	63	38	26	27	22	11	34	G	G	G	G
9	G	G	G	G	G	G	G	44	42	32	39	40	G	37	G	34	31	28	G	G	34	G	G	G
10	G		G	G	G	G		45	24	32	32		43	31	30	30	27	G	G	G	G	G	G	G
11	G	G		G	G	G	G	G	42	26	36	38	32	76	40	30	36	26	26	G	G	G	G	G
12		G	G	G	G	G	G	G	26	35	36	35	42	40	39	41		36	29	42	G	G		
13	G	G	G	G	G		G	45	29	37	44	36	42	40	43	46	35	G	24	26	42	34	G	34
14	26	G	G	G	G		G	36	48	31	42	45	46	36	47	42	140	29	11	G	G	G	G	G
15	G	G	G	G	G		33	G		39	44	47	40	39	36	35	33	G	G	11	G	G	G	G
16	48	24	G	G	G			39	33	41	43	51	54		43	43	38	28	11		46	G	G	G
17	G	G	G	G	G	G	G		41	44	43	48	48	44		50	41	33		38	43		G	G
18	G	G	G	32	G	34	G	25	34	64	38	50	48	60	63	51		26		G	46	40	37	46
19	41		32	G	G	G	G	45	27	32	35	41	52	46	39	60	72	85	70	29	G	32	G	42
20	33	G	G				G	G	32	40	45	51	56	44	45	37	38	32	33	32	G	24	G	G
21	G	G	G	G	G	G	G	48	30	36	26	32	39	39	47	41	42	68	46	45	98	72	58	45
22	G	G	G	G	G	G	G	G	43	36	43	40	42	40	48	48	44	56	29	G	37	24	G	G
23	G		G	G	G	G	G	24	30	98	46	42	62	47	40	50	66		48	40	33	41	32	G
24	G	G	G	G	G	G	G	G	29	31	23	31	29	35	41	57	43	39	34	22	30	G	G	G
25	G		25	G	G		36	36		38	37	G	G	47	G	40	40	34	61	38	31	33	24	25
26			G	G	28	24	38	37	G	35	40	46	G	G	50	44	41	58	40	G	48	50		48
27	G	48	G	29	24	34	22	35	56	34	42	G	44	44	40	45	41	39	23	57	46	41	72	47
28	34	60	52	G	G	24	30	36	G	74	G	G	G	G	38	45	40	122	G	44	27	38	44	G
29	G	G	G	G		G	G	38	G	G	G	G	G	G	40	40	G	G	G	46	42	40	G	G
30	G	G	G	G	G	G	G	G		G	39	G	G	42	44	G	47	27	27	G	G	G	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	24	29	29	27	20	26	29	27	30	29	29	30	29	29	30	28	29	28	28	30	29	28	29
MED	G	G	G	G	G	G	G	36	32	35	39	40	41	39	40	42	38	29	25	28	26	24	G	G
U Q	26	23	G	G	G	12	G	43	42	40	43	46	48	44	46	48	42	39	33	40	42	40	37	28
L Q	G	G	G	G	G	G	G	G	26	32	32	15	29	30	37	35	32	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT OKINAWA

NOV. 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		18	15	14	15	15	14	14	18	15	16	15	17	45	17	18	16	14	16		18	17	15	15
2	15		16	17			16	20	15	15	17	36	36	46	27	24	17	15	15	15	14	14	14	17
3	15	14	16	14	15		17	14	15	15	15	46	36	17	23	30	17	22	17	15	14	15	15	14
4	14	14	15	16	14	17	15	14	16	16	18	18	20	33	33	20	26	21	16	14	14	14	15	16
5	16	15	15	16	15	14		18	14	16	20	40	27	33	32	16	15	14	14	14	15	14	15	14
6	15	14	14	15	14	15	28	14	15	15	36	39	44	45	17	16	15	23	15	16	15	14	14	14
7	15	14	15	15	14		15	16	16	15		22	22	36	17	35	28	20	14	15	15	14	16	14
8	14	14	14	15	14			14	15	16	42	16	15	15	15	15	15	15	15	15	16	14	16	15
9	15	15	16	14	15	15		14	14	15	17	21	42	43	39	26	16	15	15	15	14	16	14	14
10	22		14	15	15	15		17	15	16	14		16	23	15	17	18	17	15	15	16	14	14	16
11	15	16		14	14	15	15	16	14	15	16	35	20	18	20	20	15	14	14	15	15	14	15	15
12		15	15	14	14	14	14	17	15	15	16	17	22	17	16	15		21	15	14	15	15		
13	15	15	15	15	14		17	17	14	15	17	18	18	17	15	16	14	17	15	15	15	16	14	14
14	15	15	15	15	15		18	14	14	14	14	17	22	18	20	16	14	14	15	14	14	15	15	14
15	15	14	14	15	15		15	16		15	15	16	40	16	17	15	15	18	14	15	14	14	15	15
16	15	15	15	15	15			15	14	14	14	16	29		16	16	15	14	14		14	18	16	14
17	15	14	14	14	14	14	18		15	14	16	17	23	21		15	14	14		14	14		15	14
18	15	18	14	14	16	15		15	14	15	16	17	17	18	16	15		14		15	14	15	14	14
19	15		14	15	15	14	15	14	14	15	18	17	18	21	16	15	15	14	14	14	14	14	15	14
20	15	14	15				18	16	14	15	15	17	33	20	15	15	15	14	14	15	15	15	15	20
21	15	15	15	14	14	14	14	15	14	15	16	21	20	17	17	15	14	14	14	14	14	14	14	15
22	16	15	18	15	14	14	14	14	14	14	15	14	16	40	14	15	18	17	14	15	14	15	15	20
23	15			14	14	14	18	17	15	16	17	20	18	20	17	16	14		14	15	14	14	14	71
24	66	15	15	15	14	15	14	14	14	14	15	15	17	14	14	14	14	14	14	15	14	14	15	15
25	66		16	16	15		15	15		15	17	20	18	15	15	14	14	14	14	15	15	14	16	14
26			18	15	15	15	15	15	18	15	15	17	16	17	15	15	15	14	14	15	16	14		14
27	14	14	14	14	15	14	18	14	15	15	17	18	22	17	18	16	14	18	15	14	14	14	14	14
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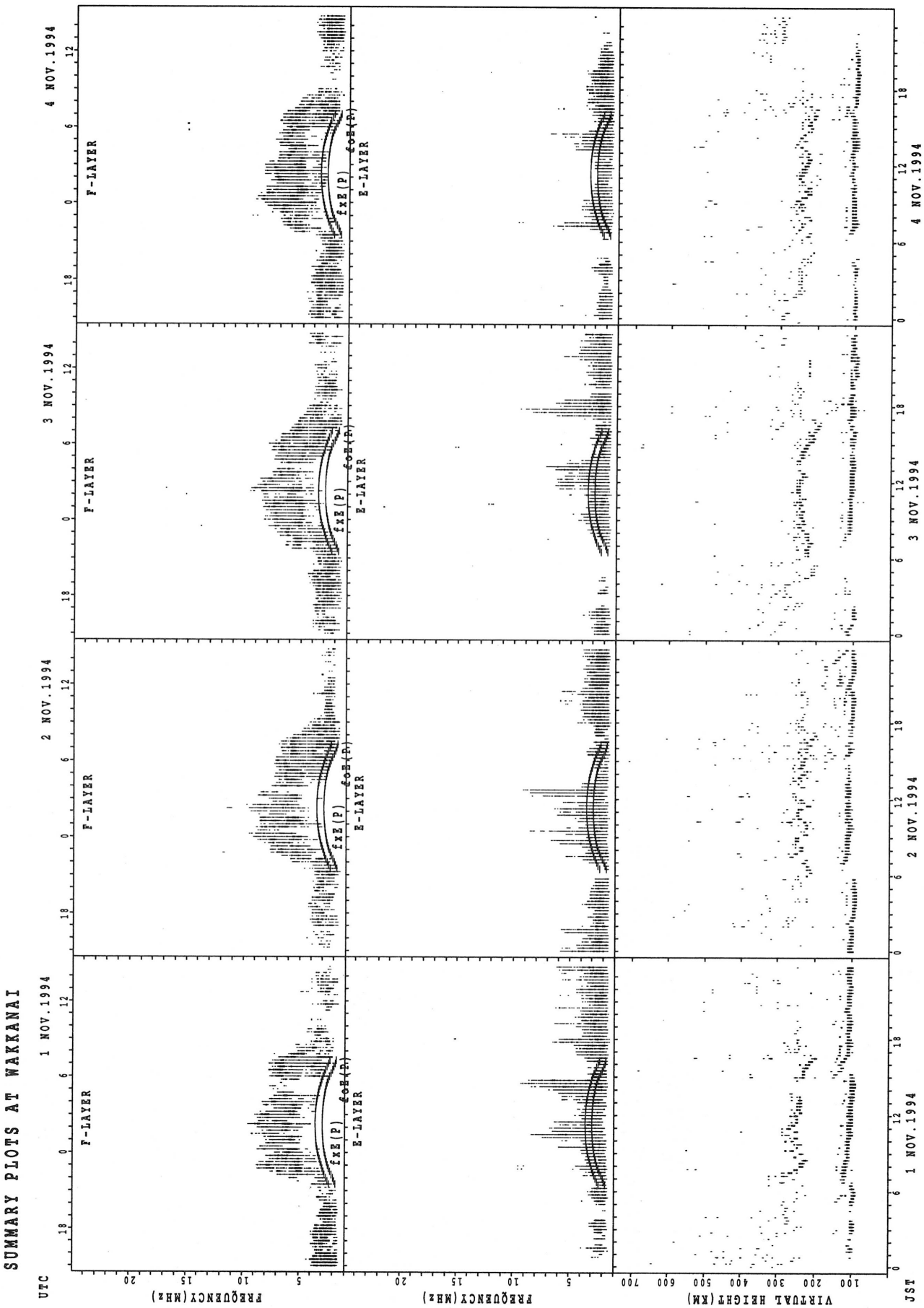
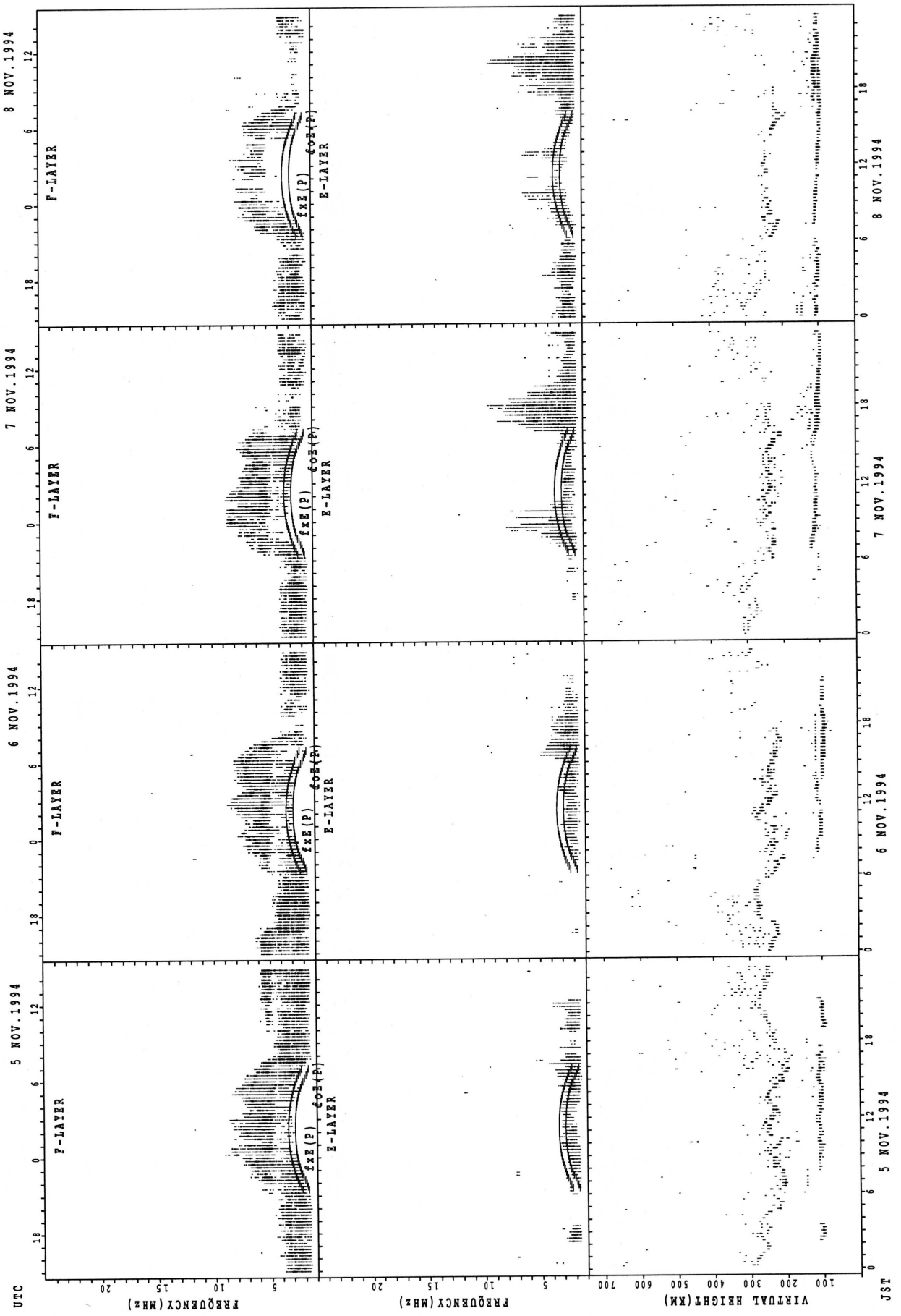
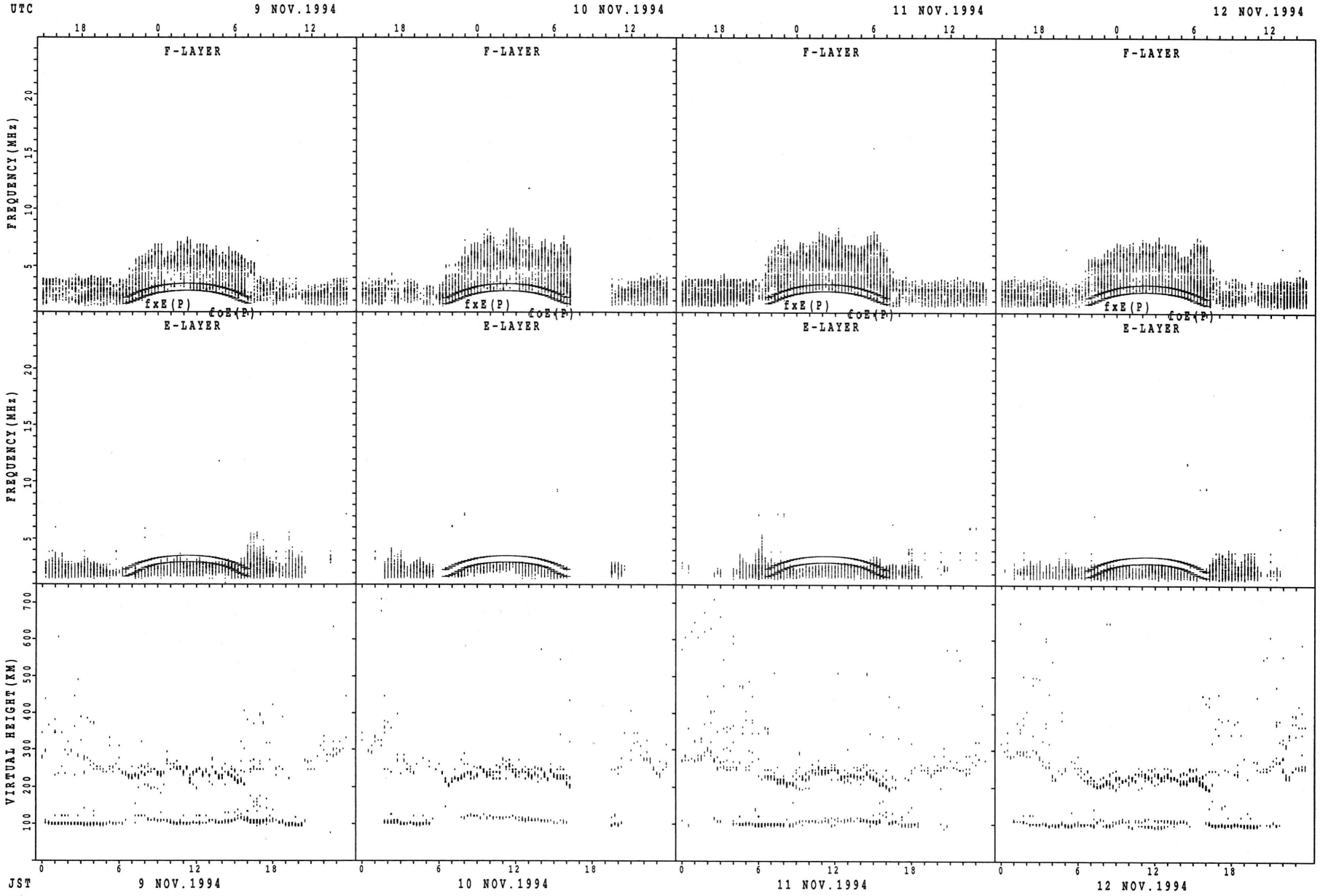
29	18	15	14	15		14	18	14	14	14	15	18	20	18	16	16	15	20	15	14	18	14	15	14
30	15	15	15	15	18	15	14	15		15	15	15	16	16	16	15	14	14	14	15	16	15	15	14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	24	28	29	27	20	24	29	27	30	29	29	30	29	29	30	28	29	28	28	30	29	28	29
MED	15	15	15	15	15	14	15	15	14	15	16	18	20	18	16	16	15	14	14	15	14	14	15	14
U Q	15	15	15	15	15	15	18	16	15	15	17	21	27	33	19	17	16	18	15	15	15	15	15	15
L Q	15	14	14	14	14	14	14	14	14	15	15	16	17	17	15	15	14	14	14	14	14	14	14	14

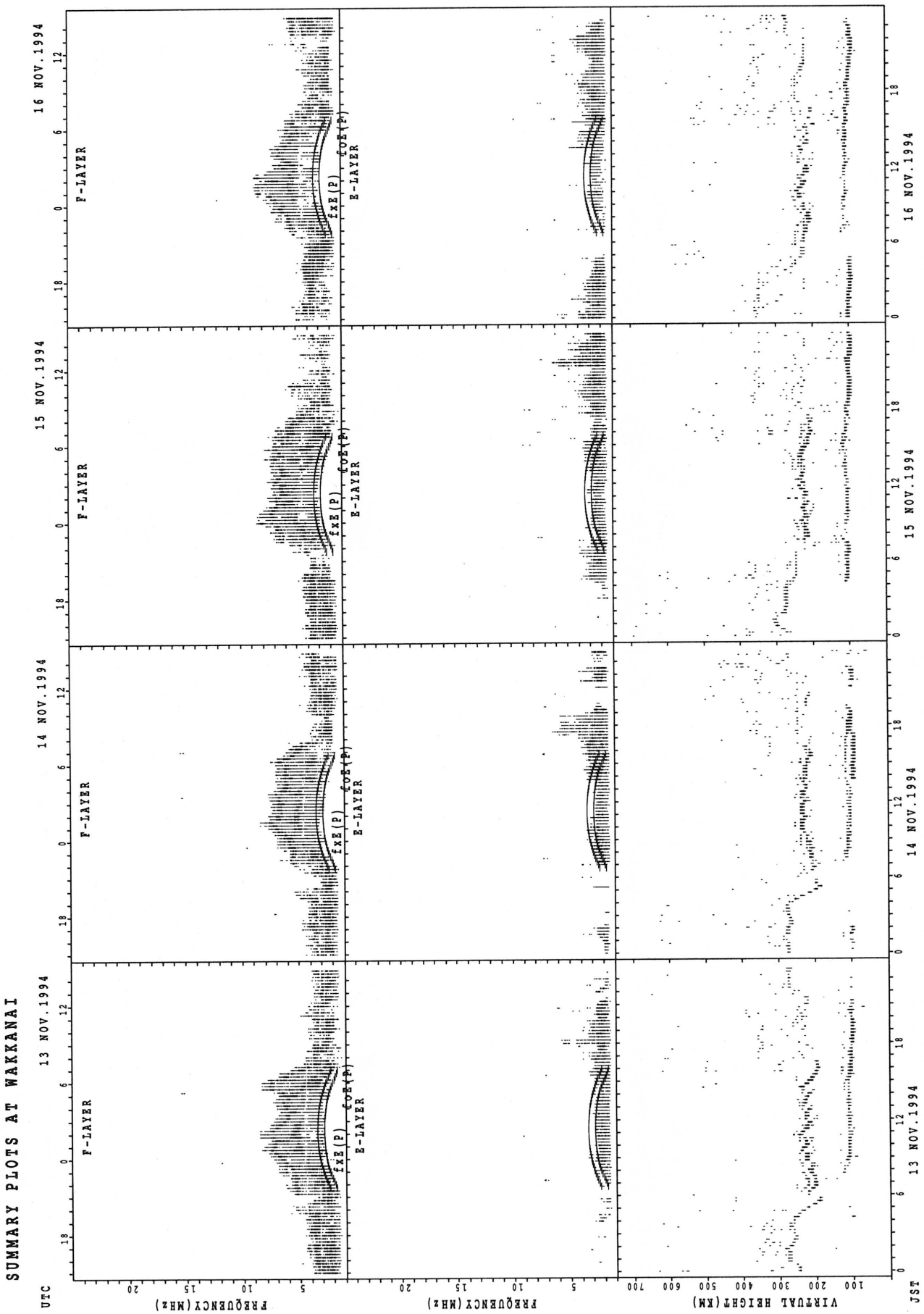

SUMMARY PLOTS AT WAKKANAI
UTC
JST
1 NOV.1994
2 NOV.1994
3 NOV.1994
4 NOV.1994
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

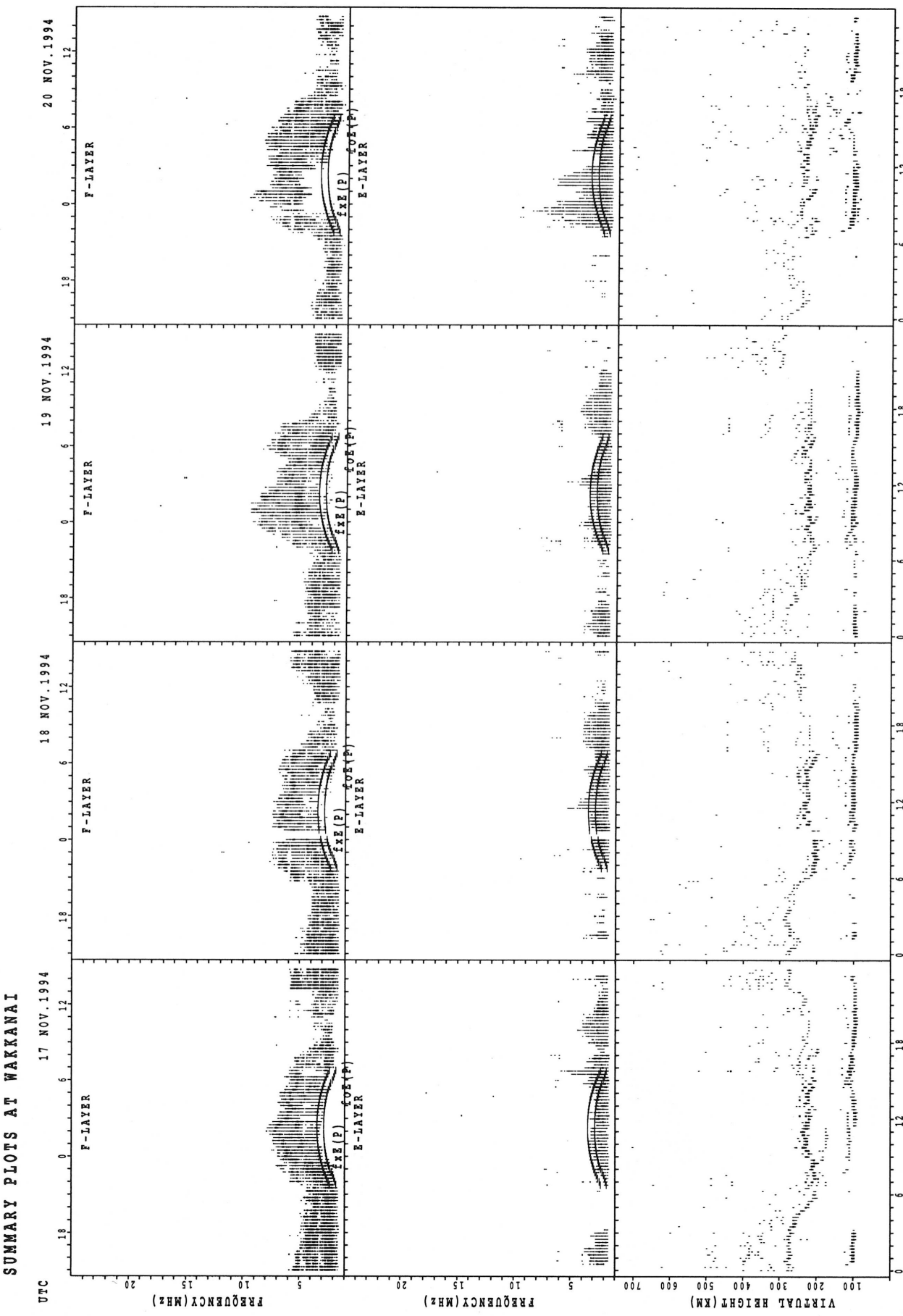

SUMMARY PLOTS AT WAKKANAI
UTC
JST
5 NOV.1994
6 NOV.1994
7 NOV.1994
8 NOV.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

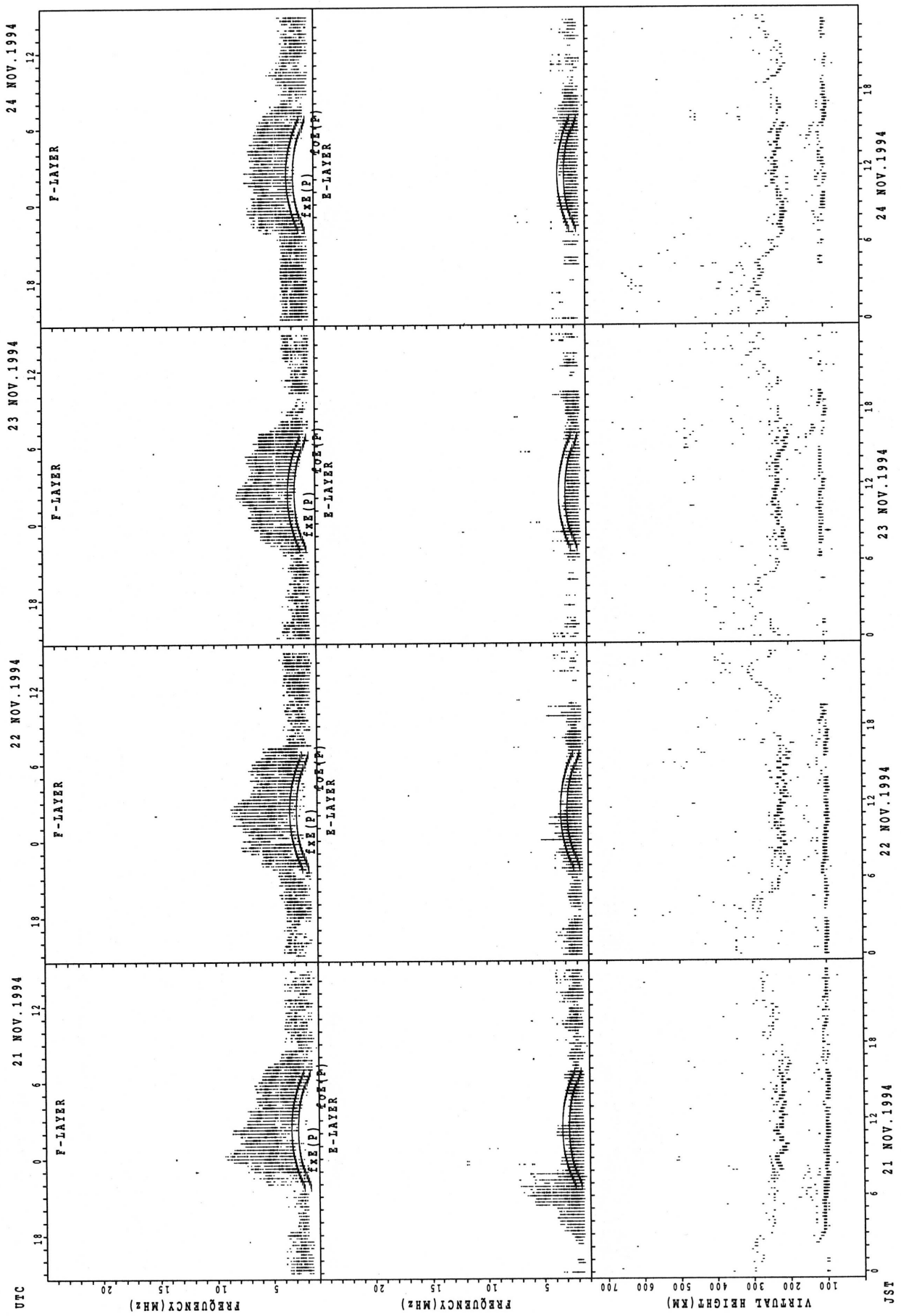
SUMMARY PLOTS AT WAKKANAI



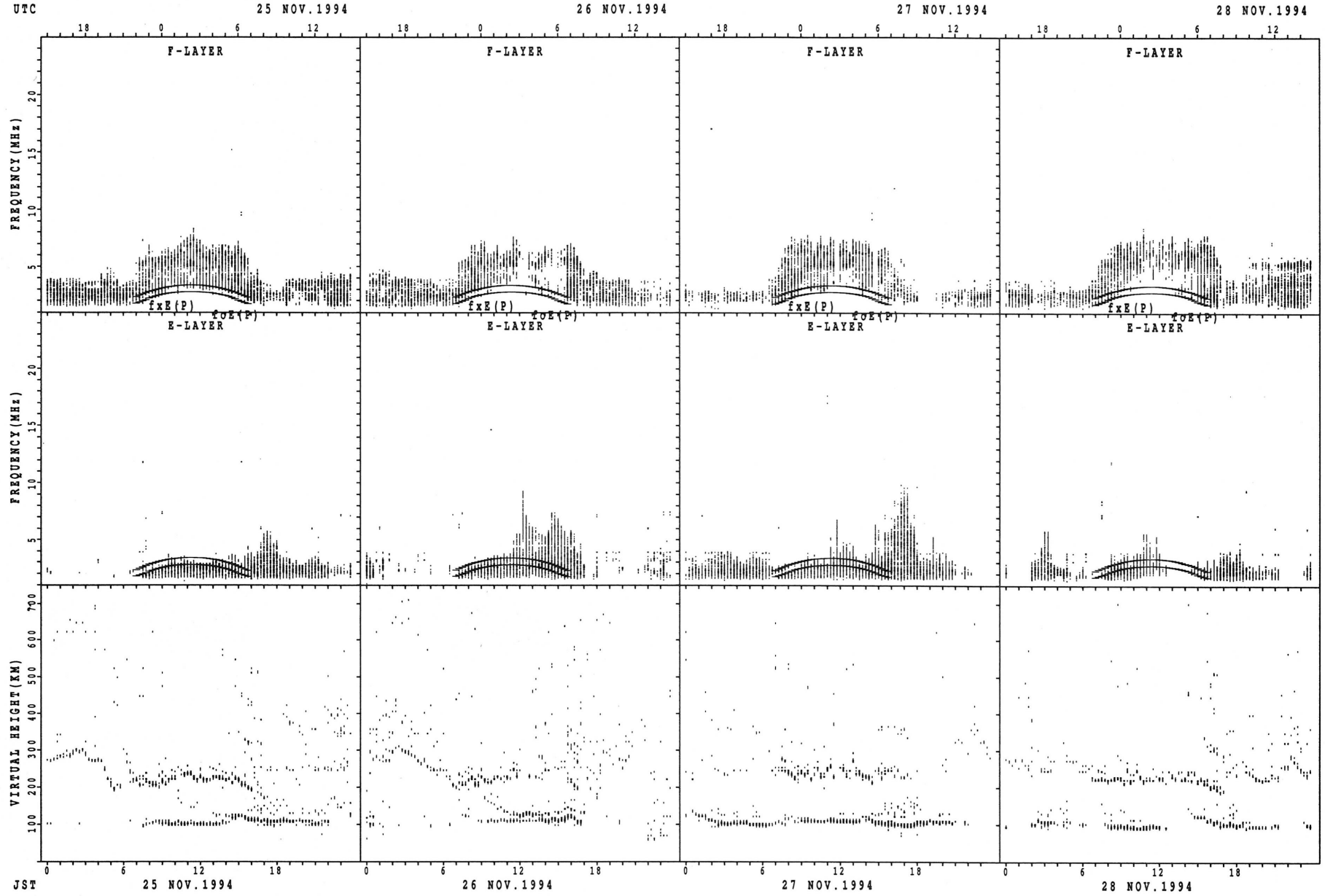
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

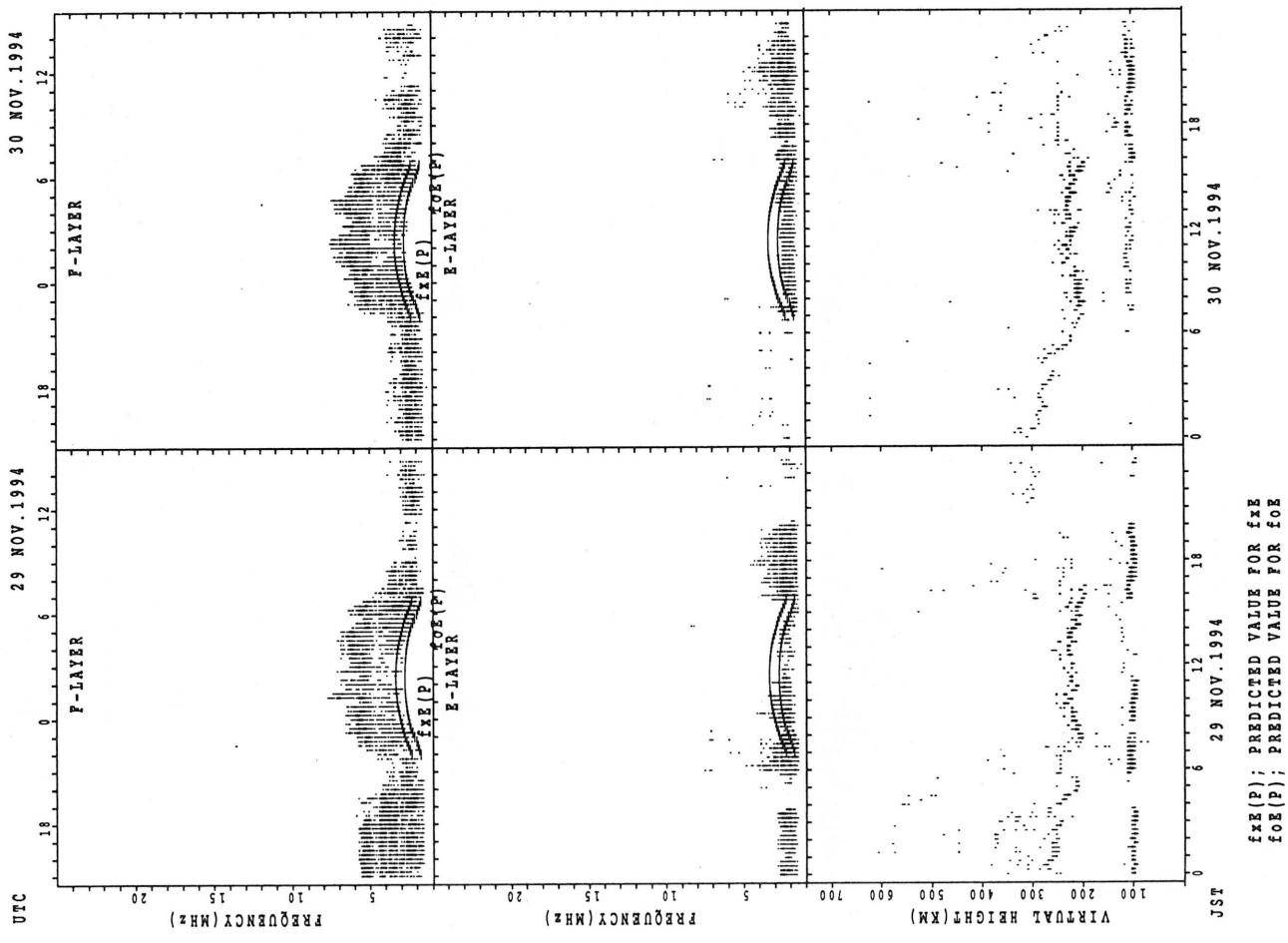

SUMMARY PLOTS AT WAKKANAI
UTC
JST
17 NOV.1994
18 NOV.1994
19 NOV.1994
20 NOV.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
21 NOV.1994
22 NOV.1994
23 NOV.1994
24 NOV.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

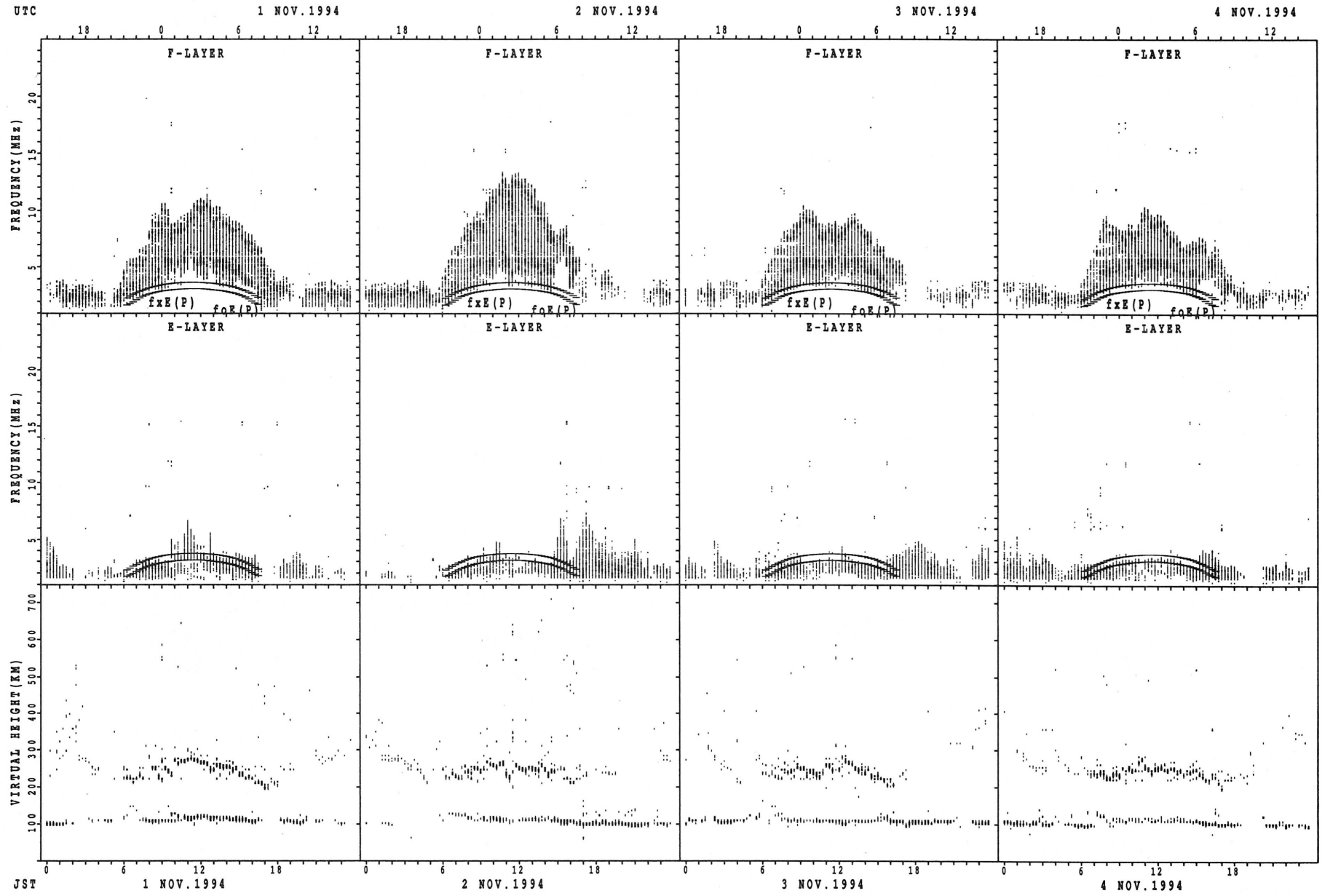
SUMMARY PLOTS AT WAKKANAI



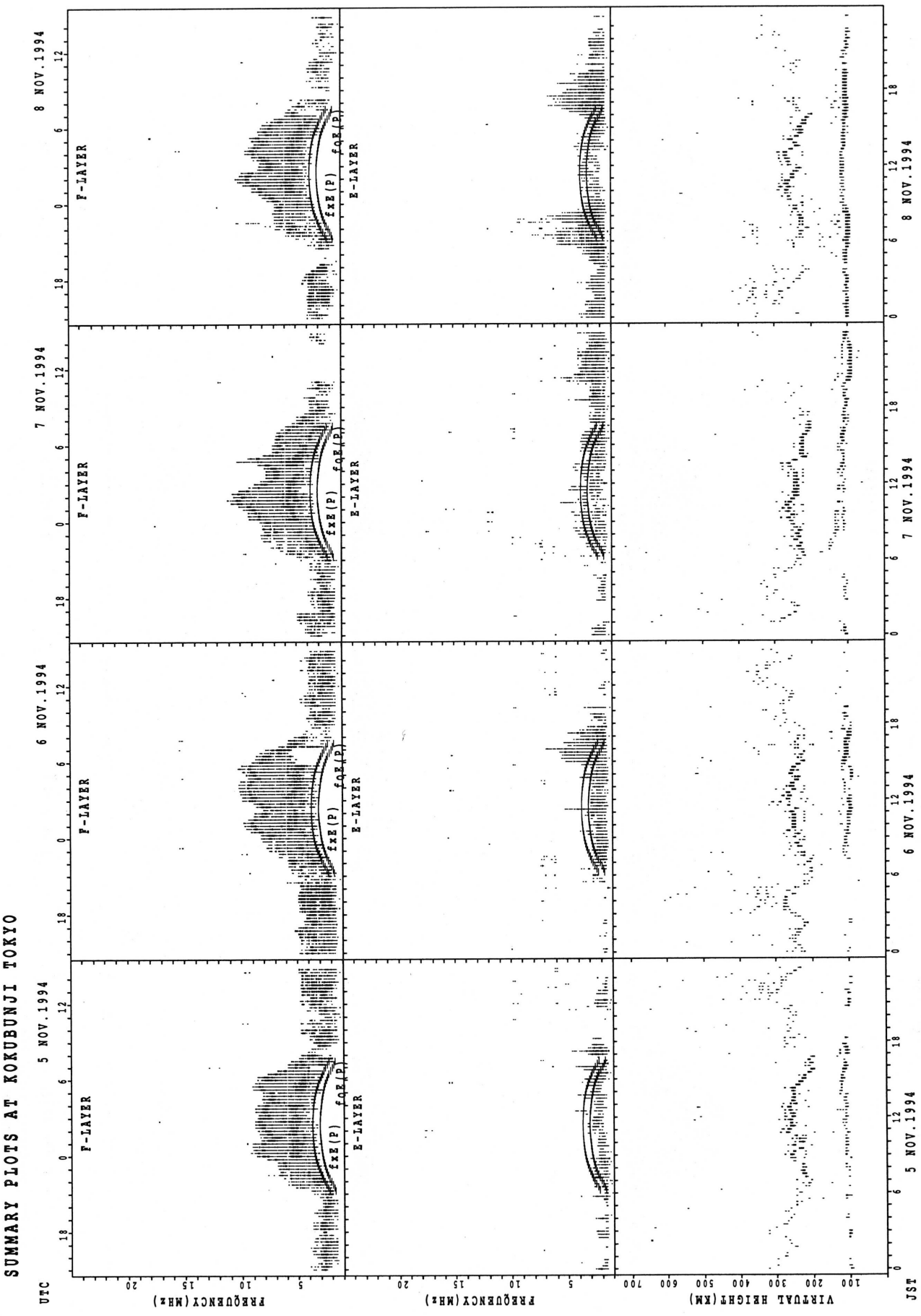
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

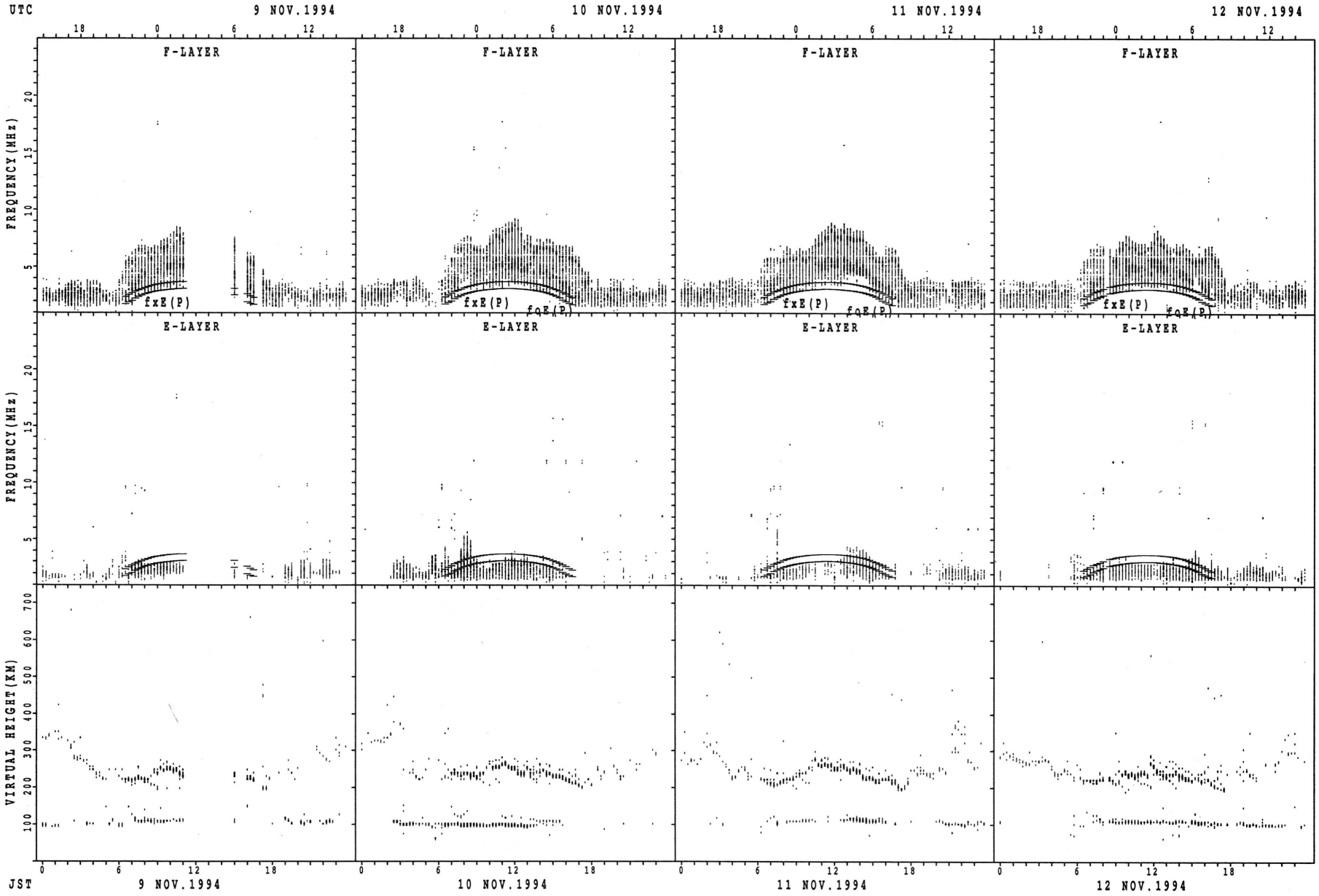
SUMMARY PLOTS AT KOKUBUNJI TOKYO



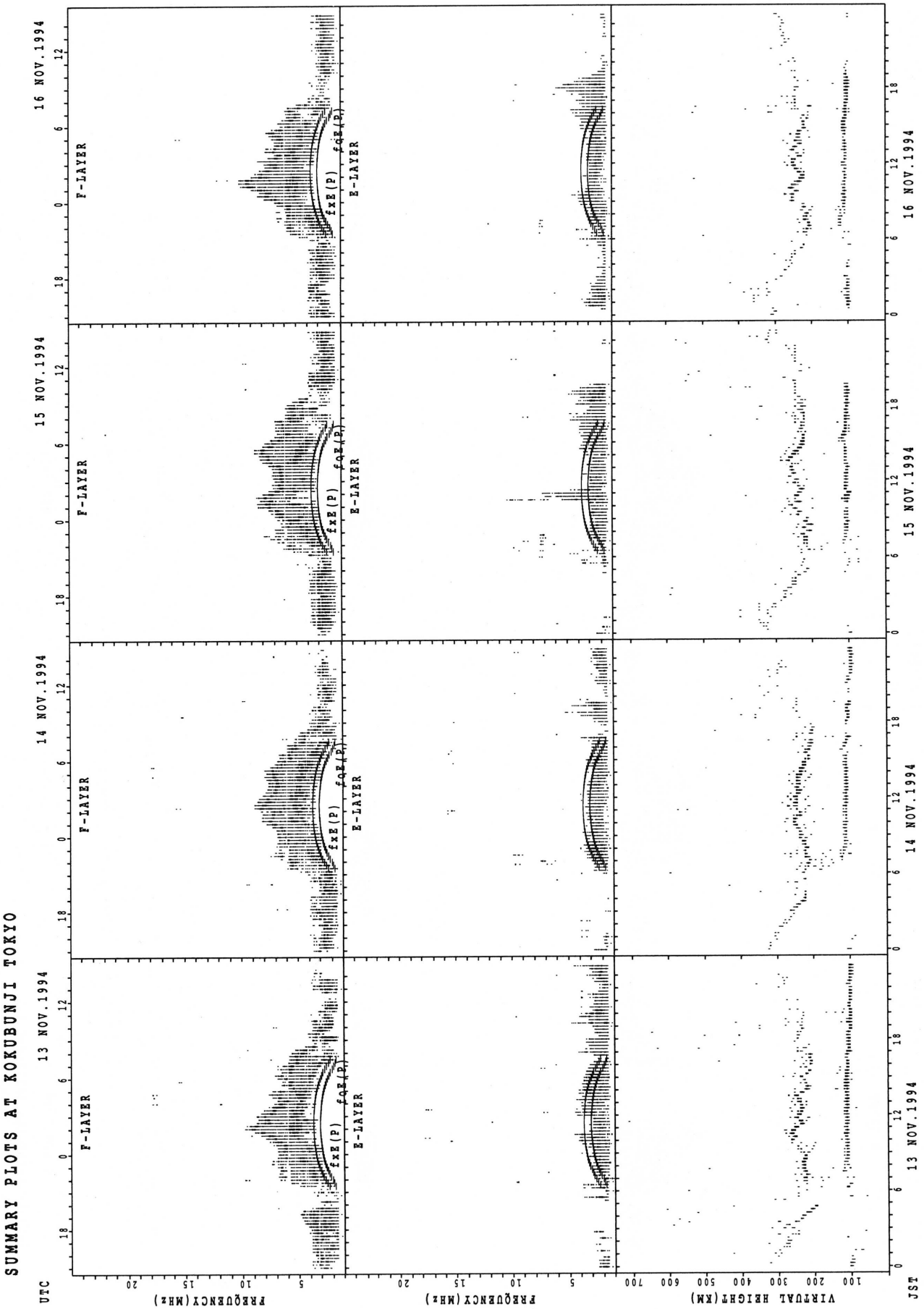
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

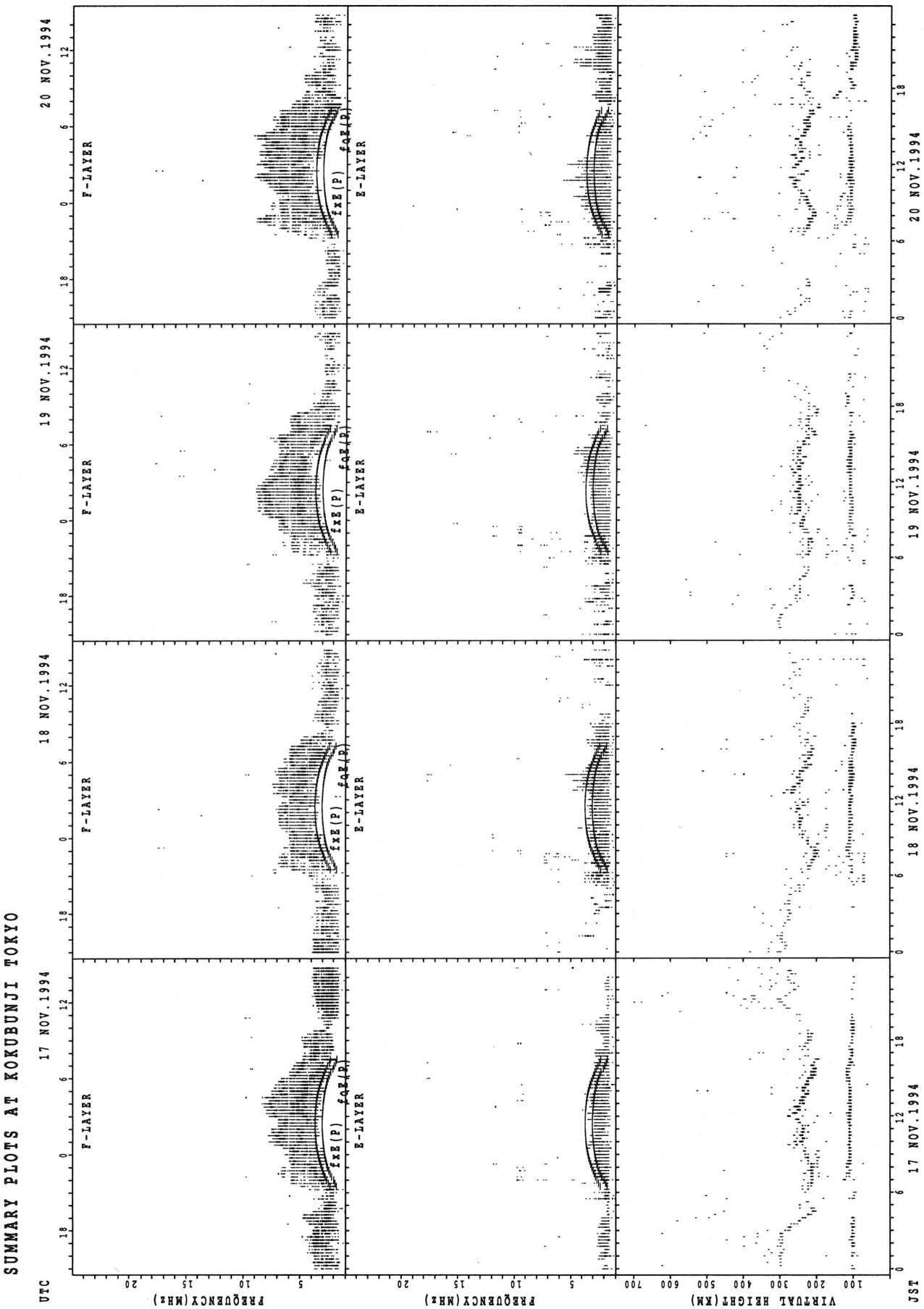

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
5 NOV.1994
6 NOV.1994
7 NOV.1994
8 NOV.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

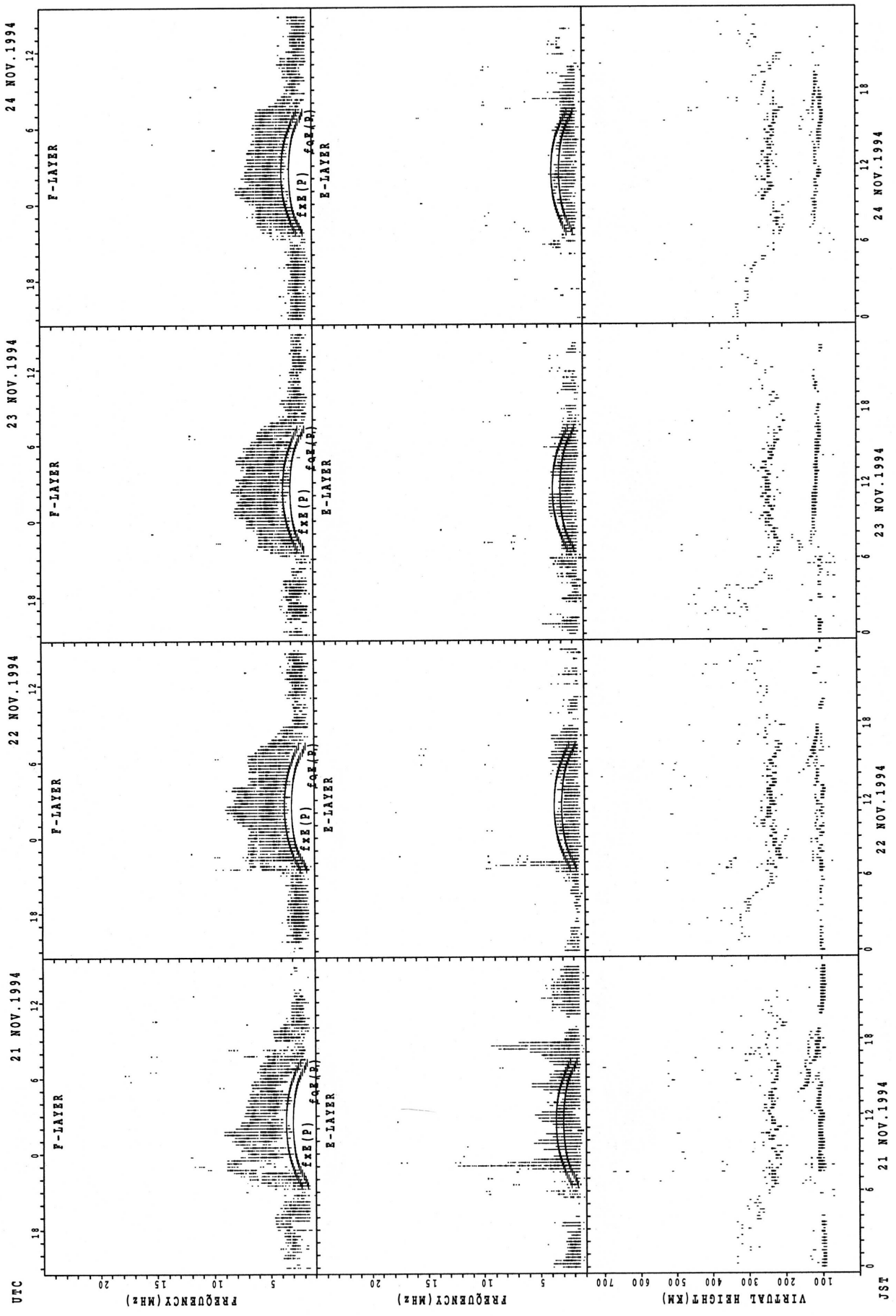
SUMMARY PLOTS AT KOKUBUNJI TOKYO



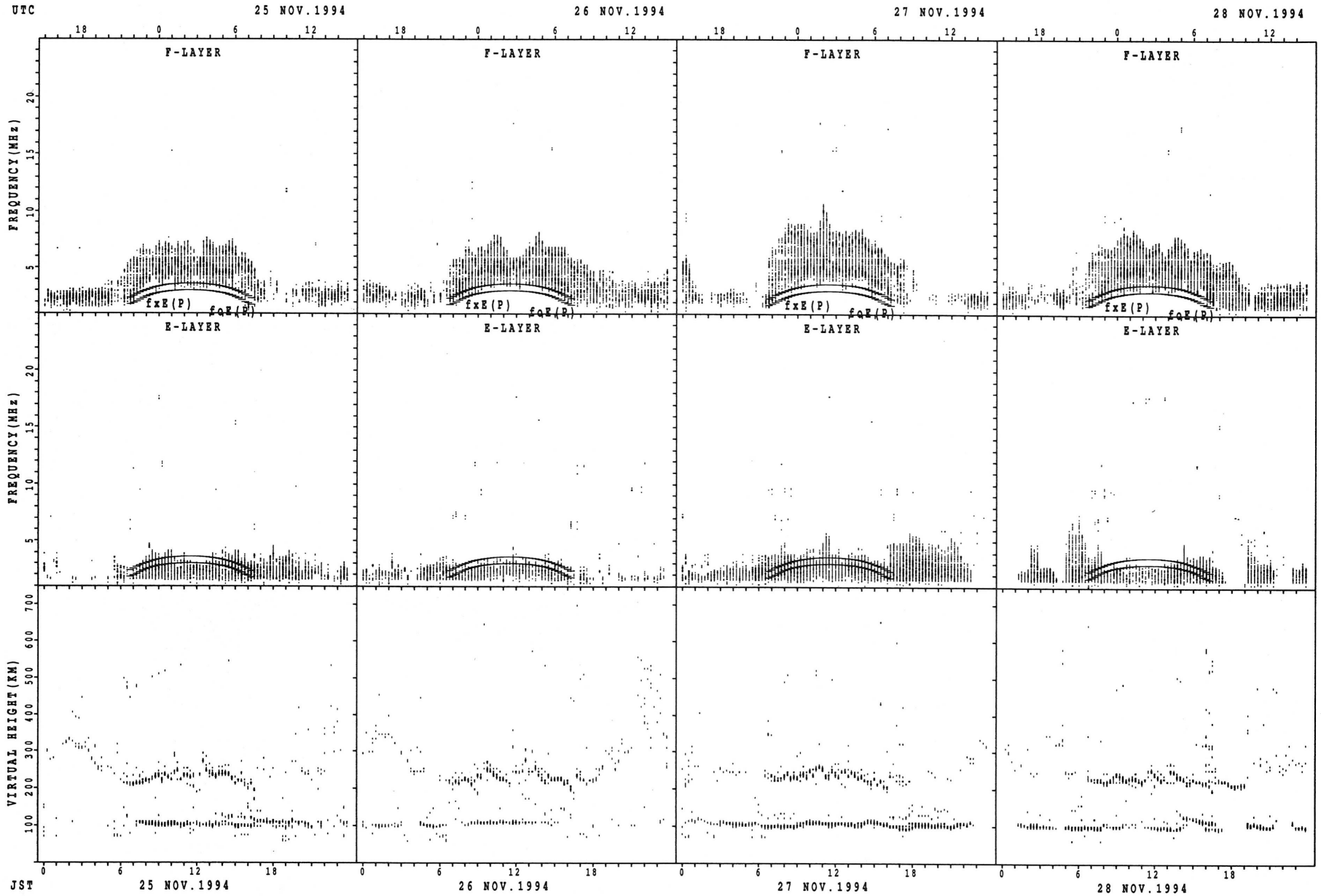
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
13 NOV.1994
14 NOV.1994
15 NOV.1994
16 NOV.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
UTC
JST
17 NOV.1994
18 NOV.1994
19 NOV.1994
20 NOV.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

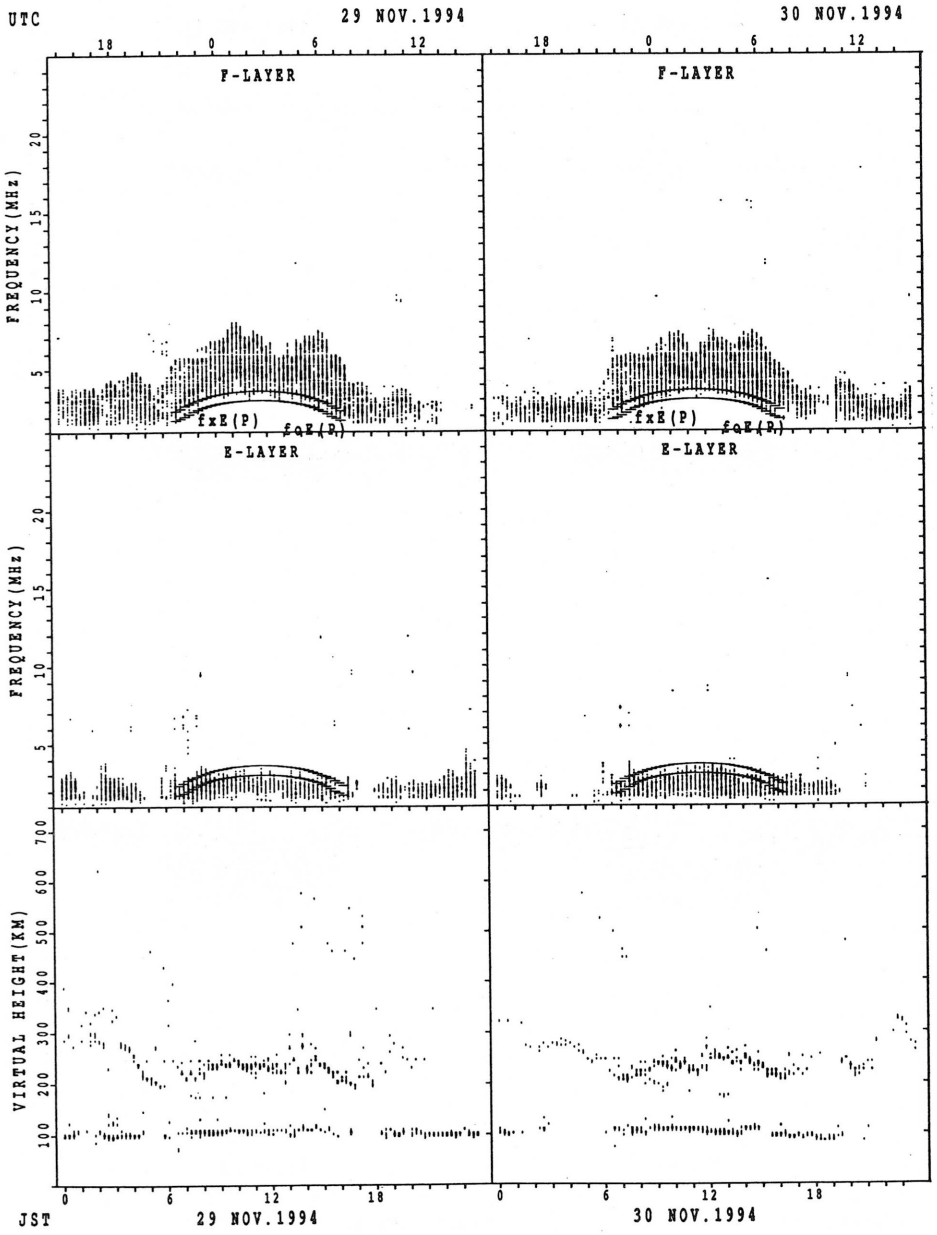

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
21 NOV.1994
22 NOV.1994
23 NOV.1994
24 NOV.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



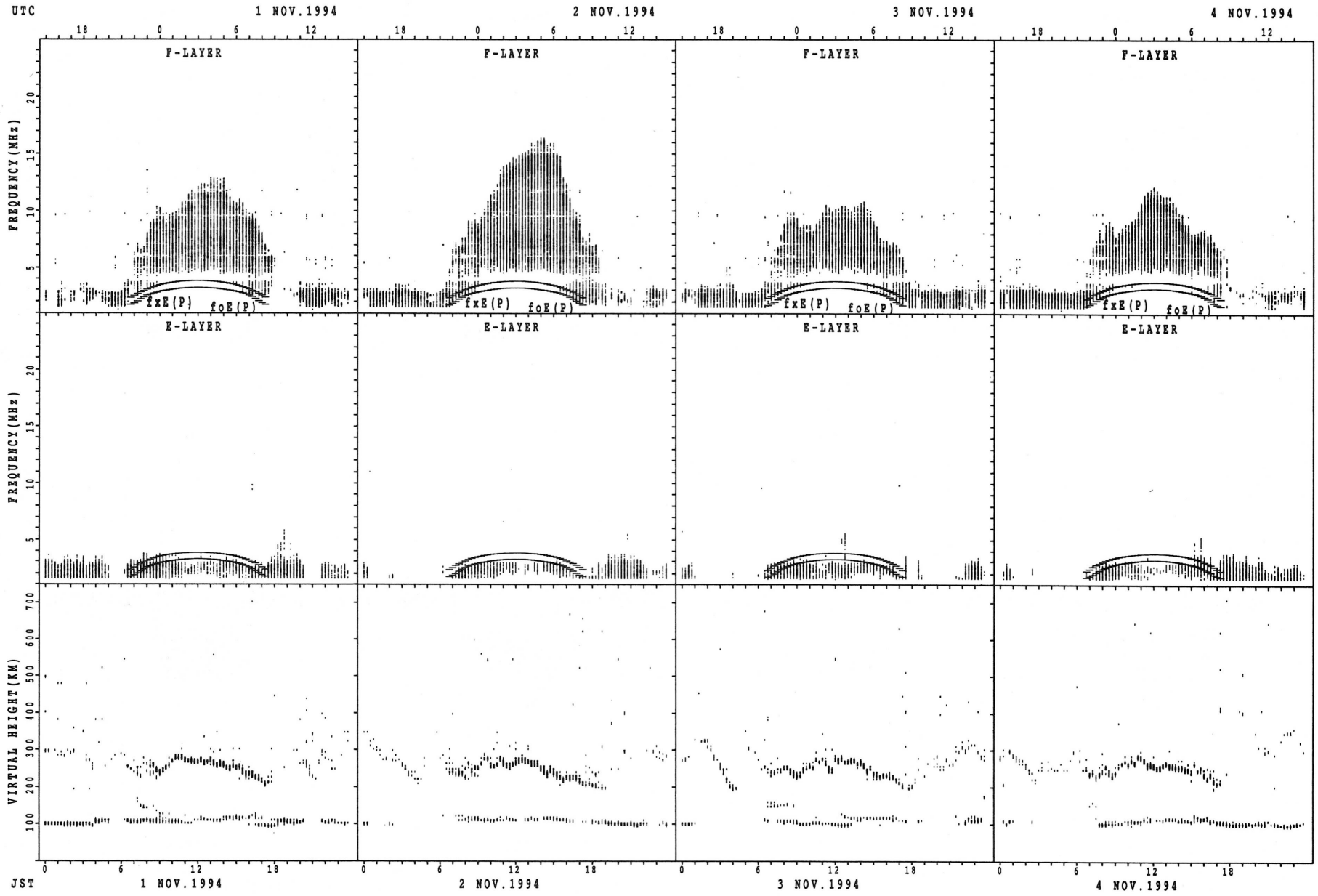
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

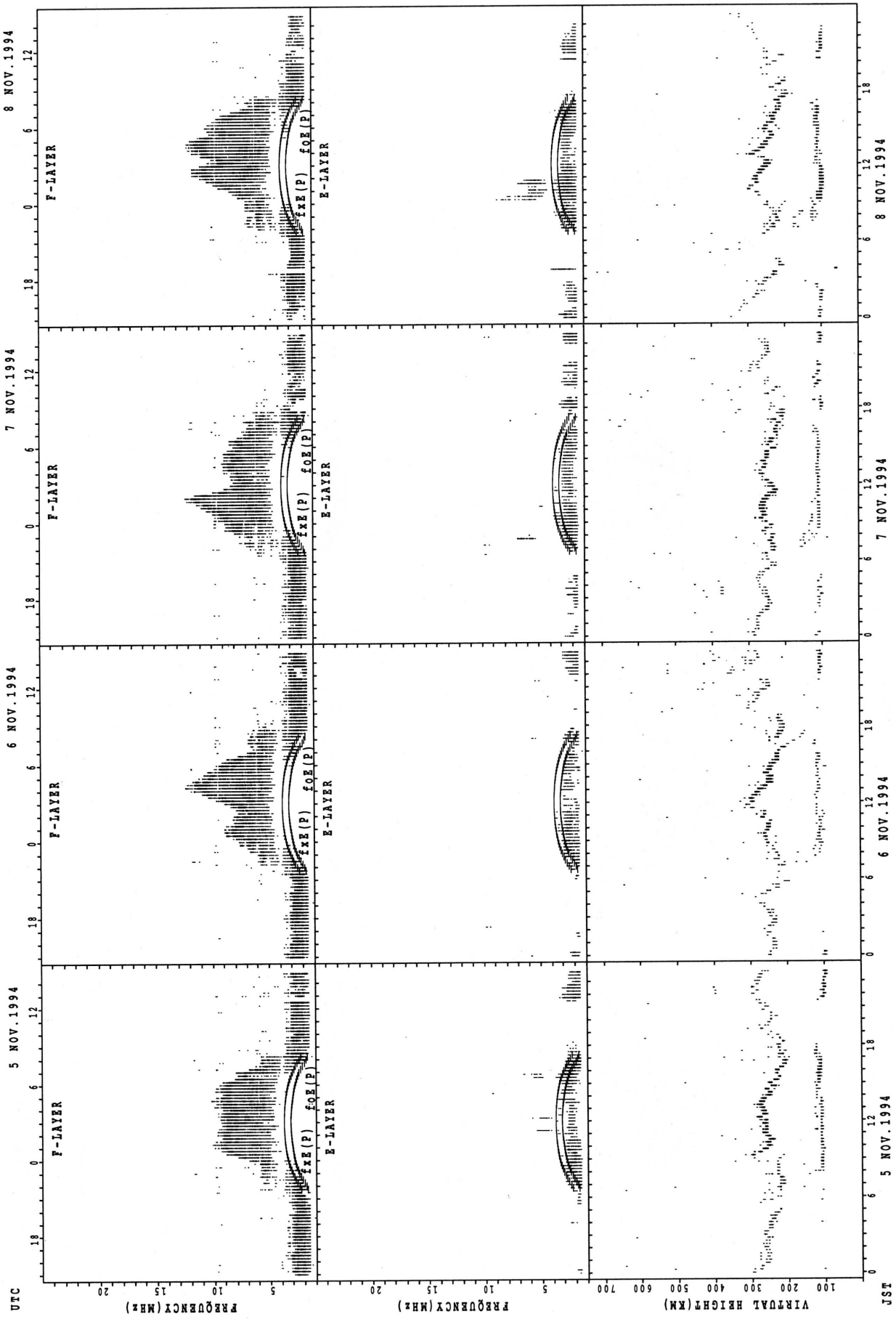


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

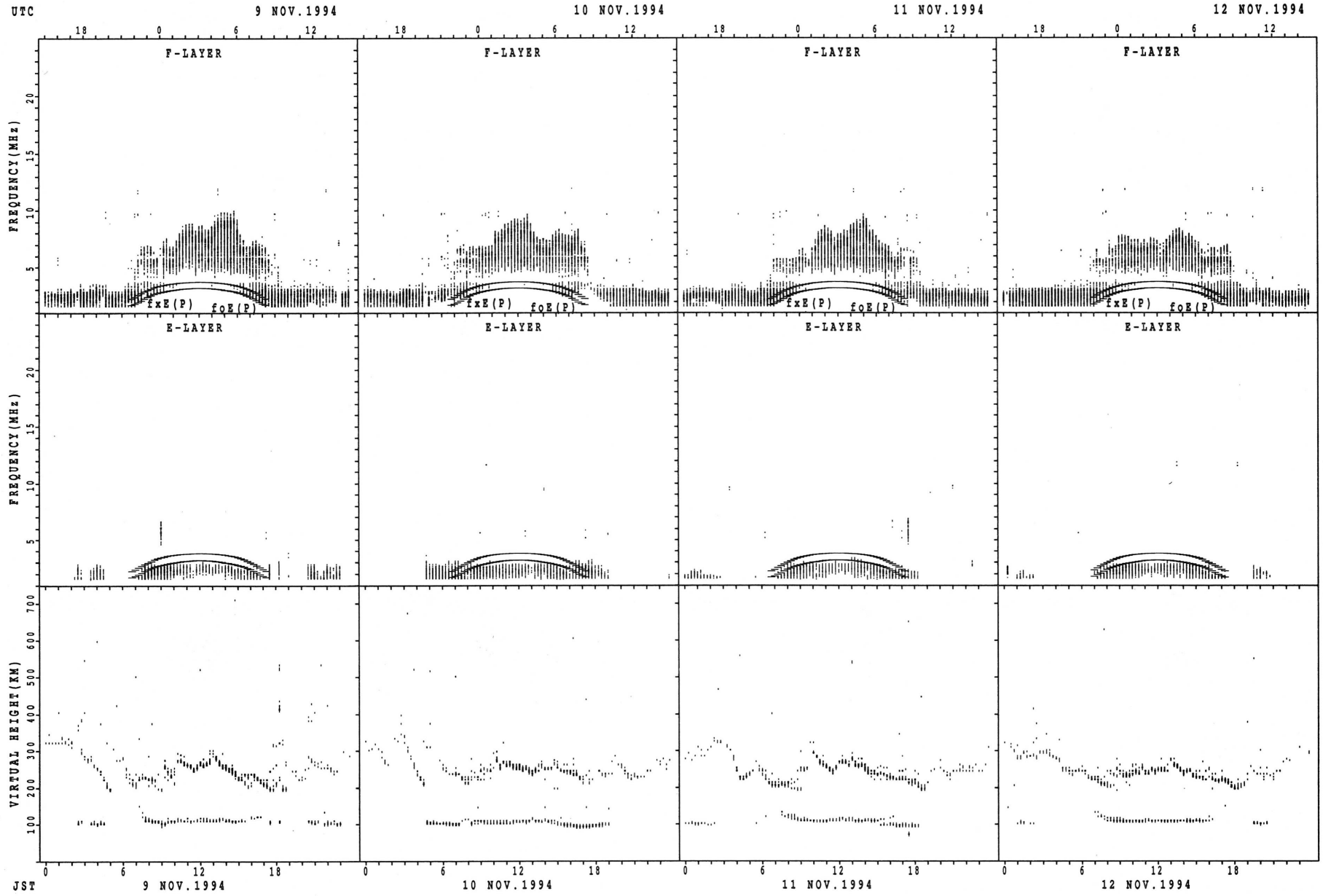
SUMMARY PLOTS AT YAMAGAWA



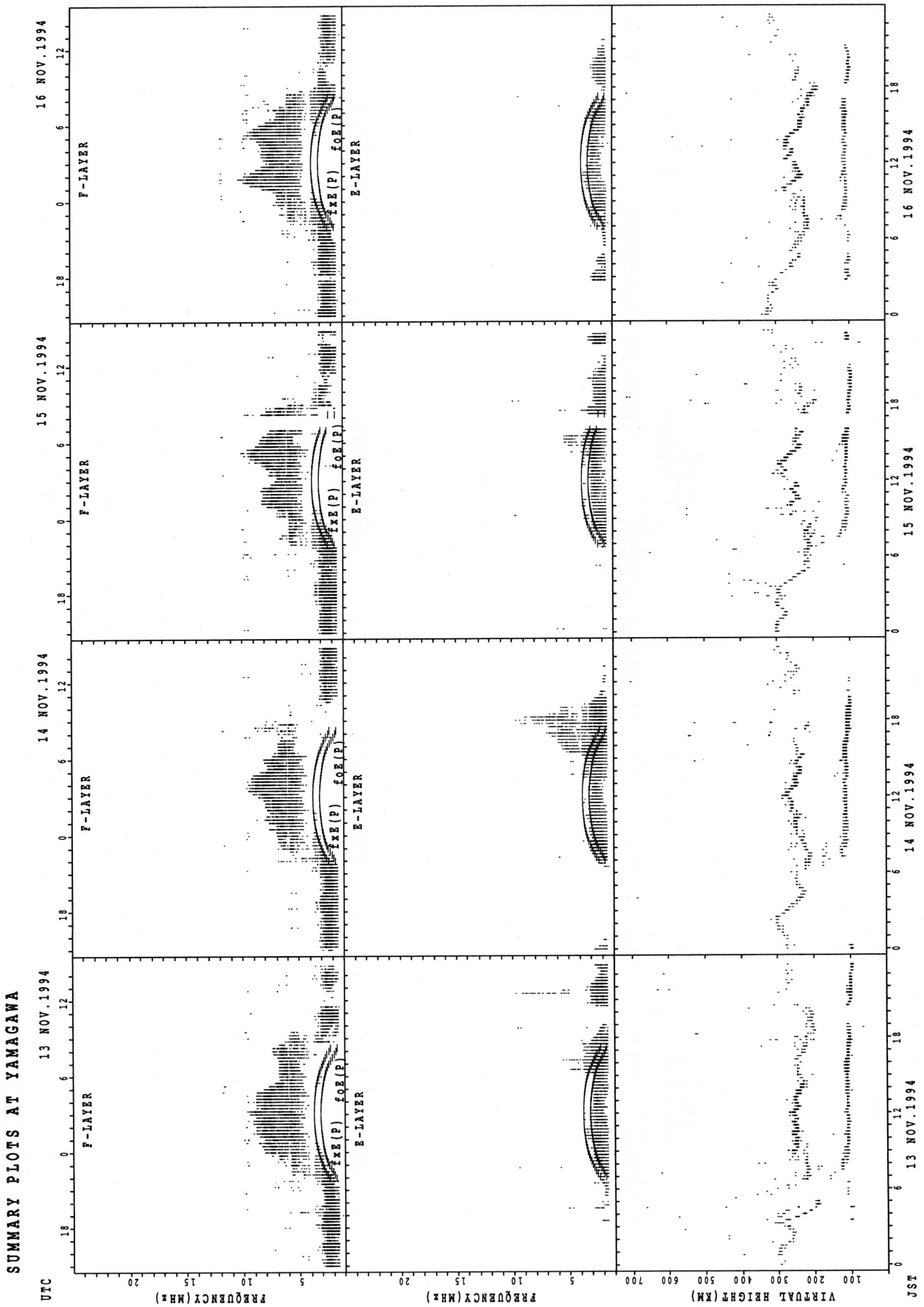
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
5 NOV.1994
6 NOV.1994
7 NOV.1994
8 NOV.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

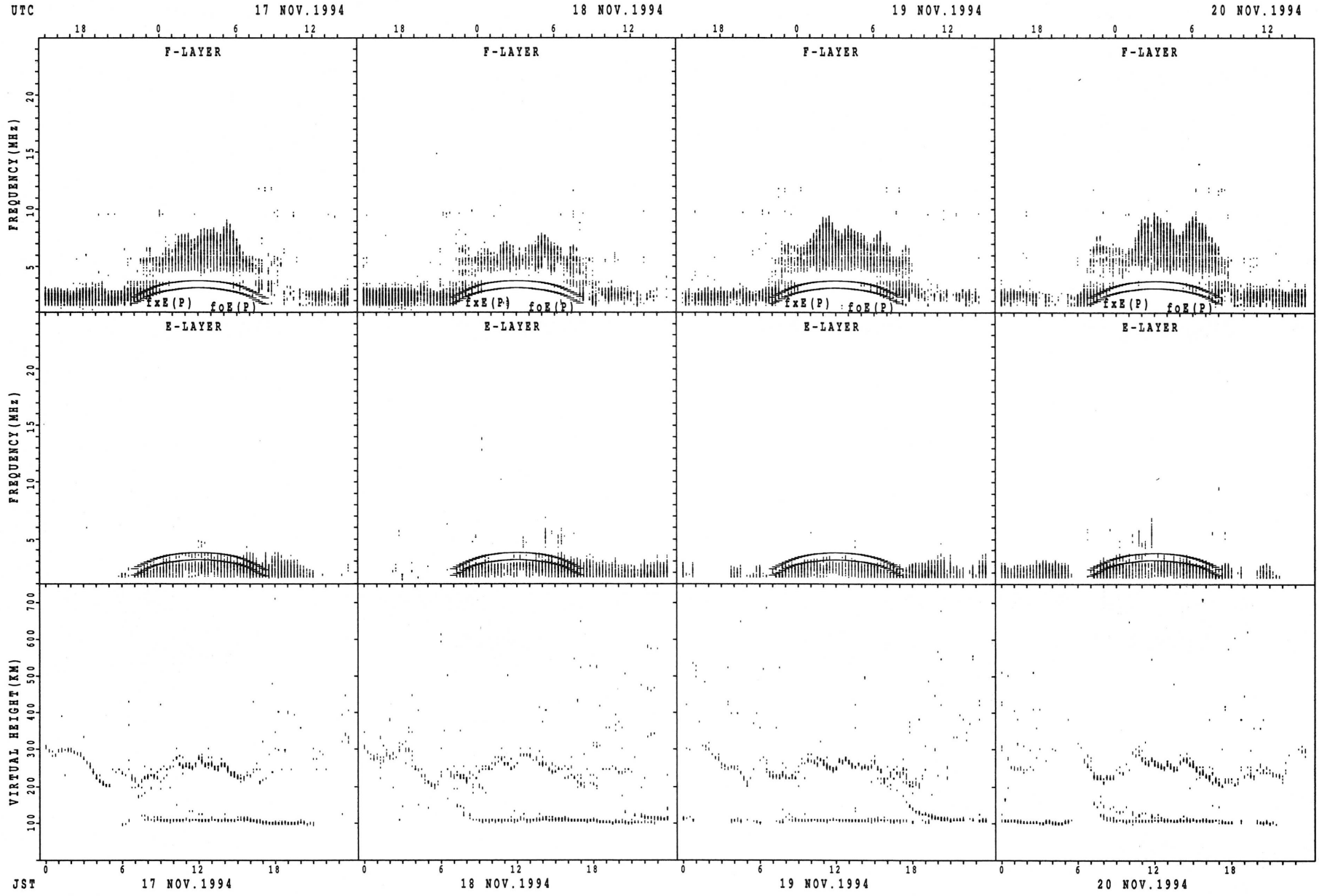
SUMMARY PLOTS AT YAMAGAWA



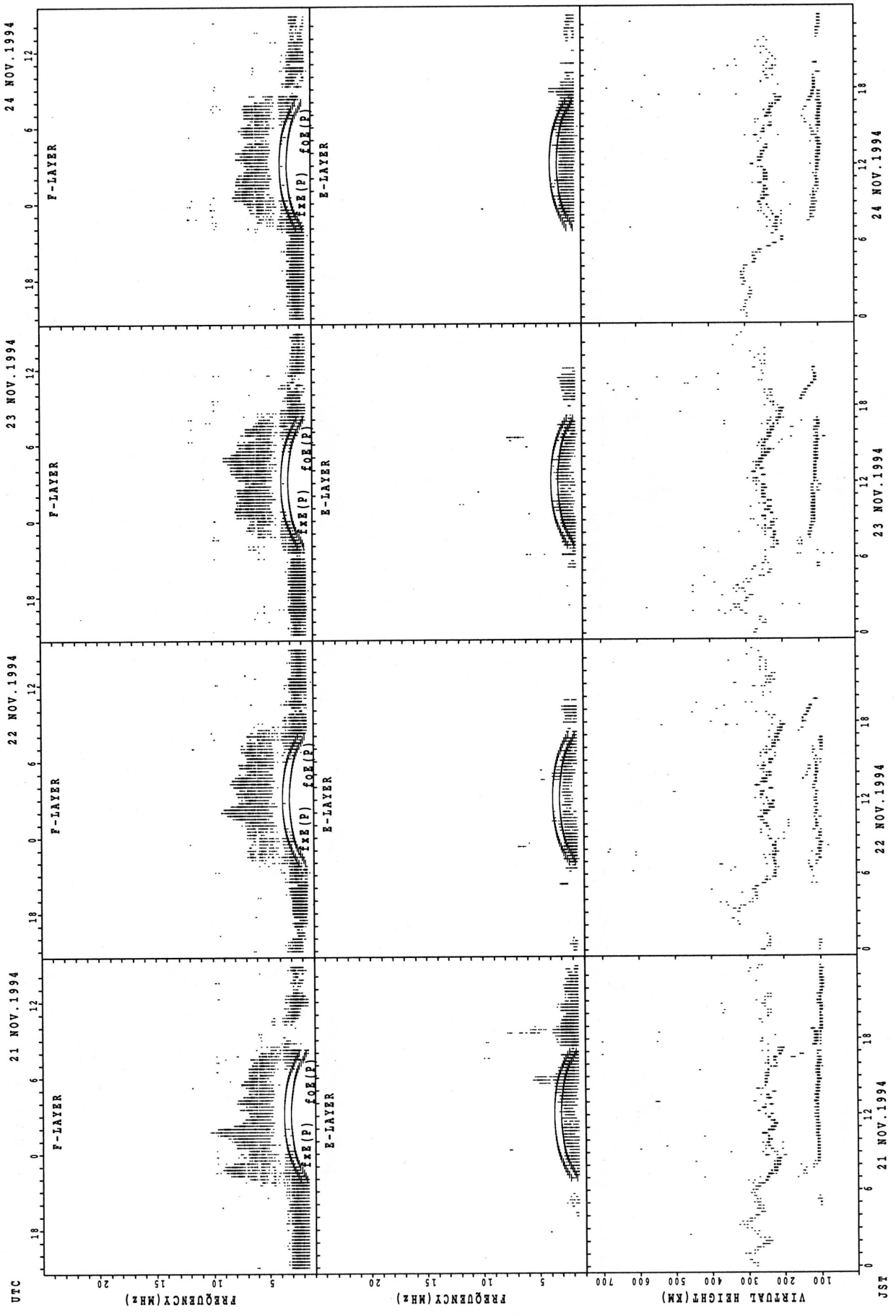
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
13 NOV.1994
14 NOV.1994
15 NOV.1994
16 NOV.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

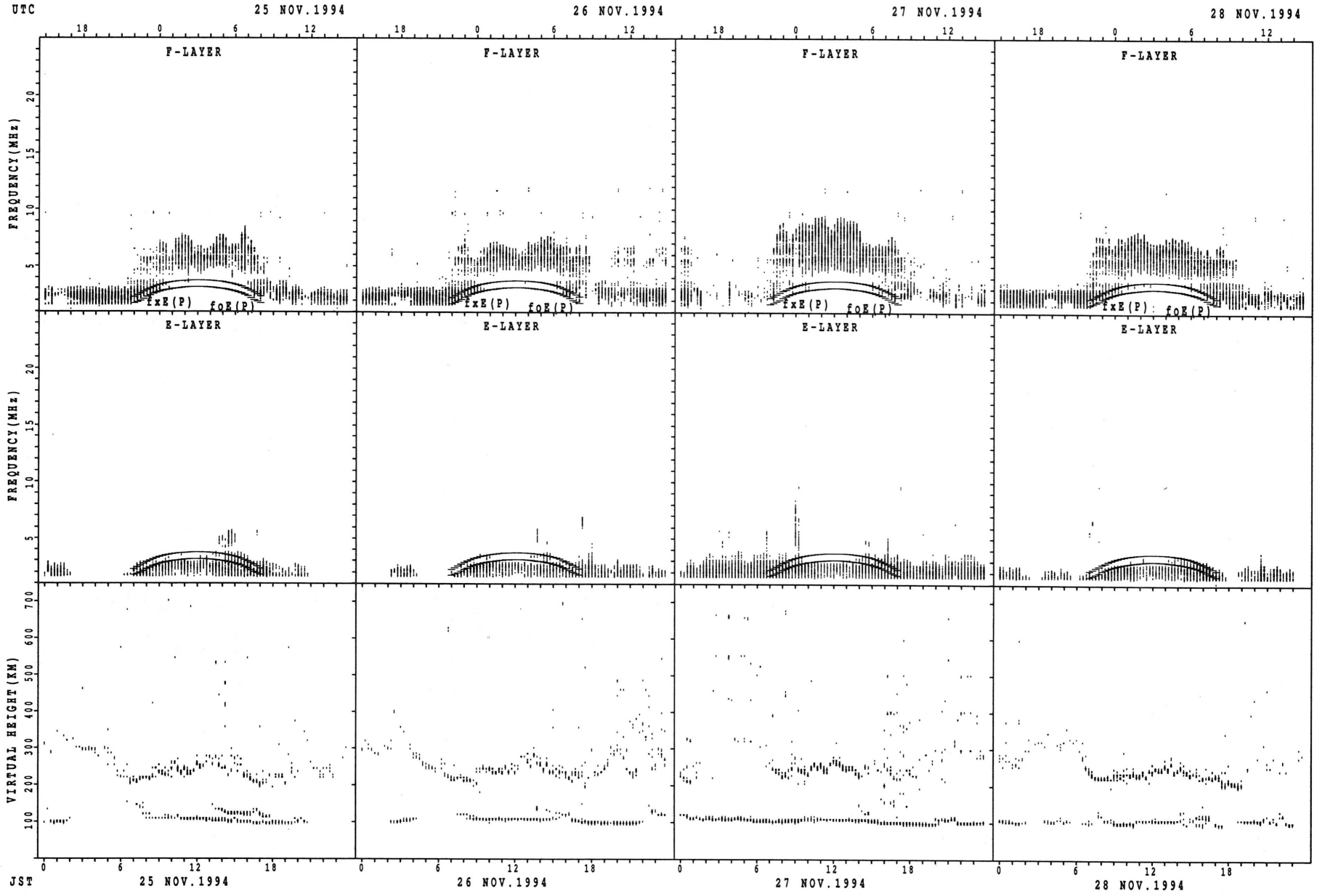
SUMMARY PLOTS AT YAMAGAWA



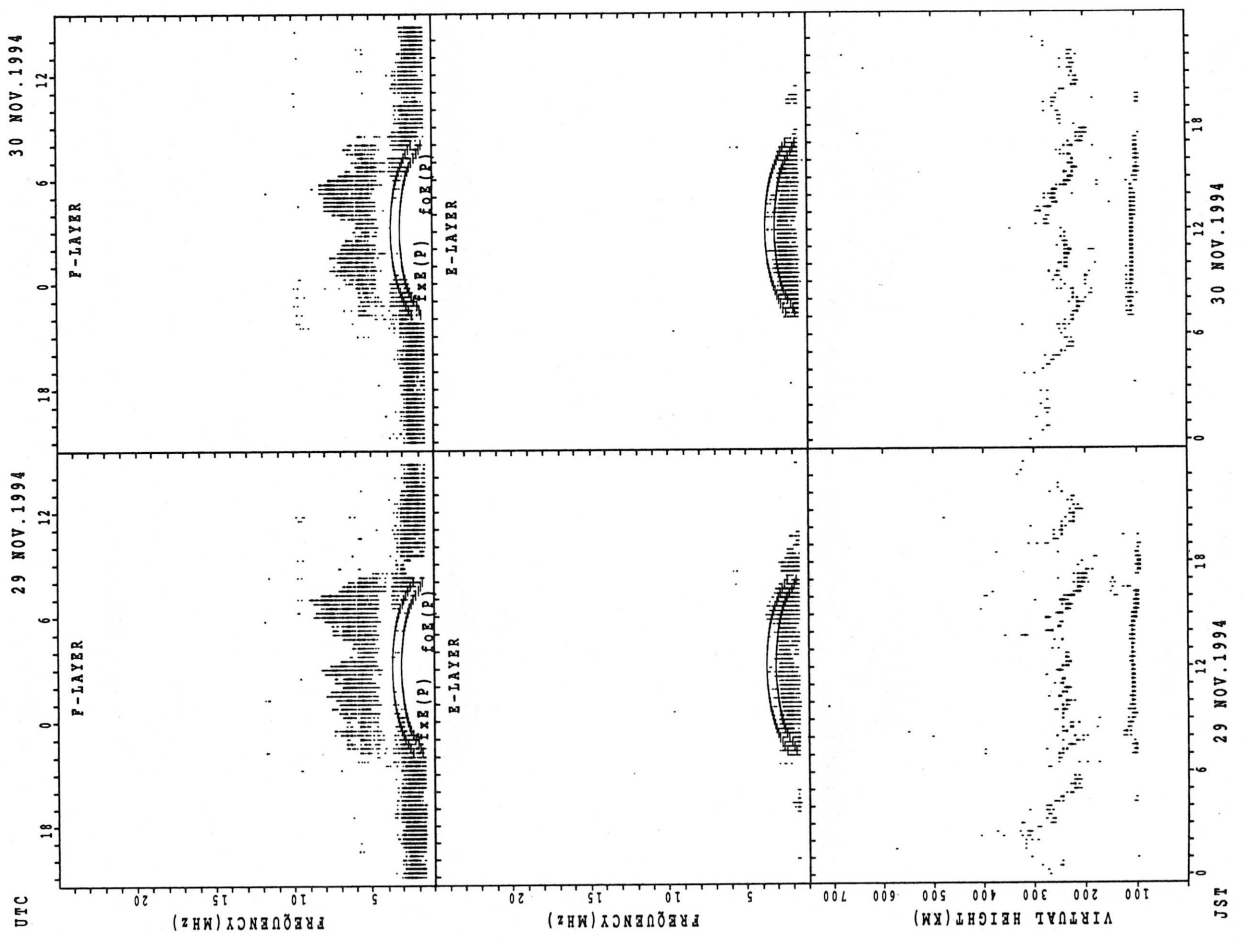
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
21 NOV.1994
22 NOV.1994
23 NOV.1994
24 NOV.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

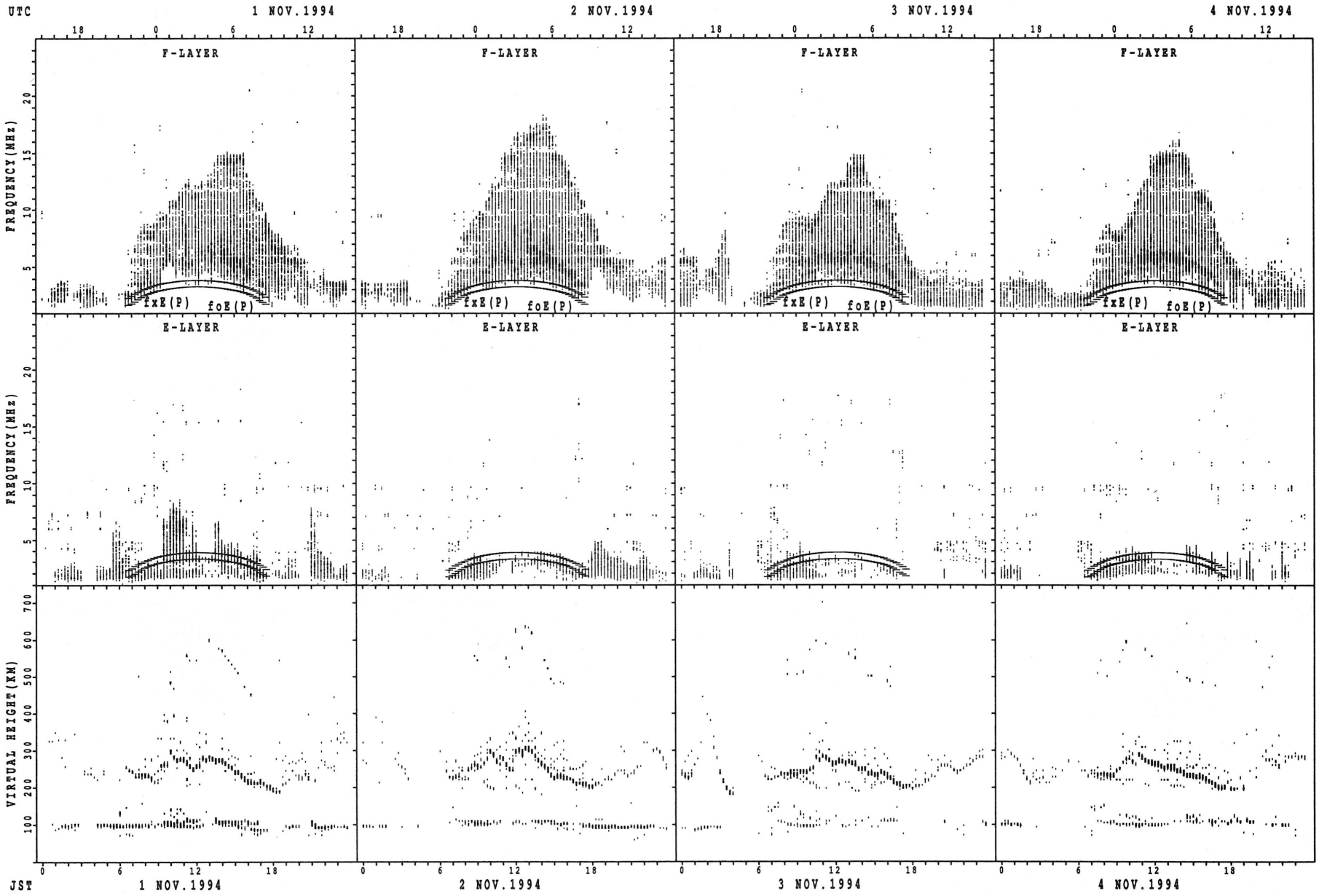
SUMMARY PLOTS AT YAMAGAWA



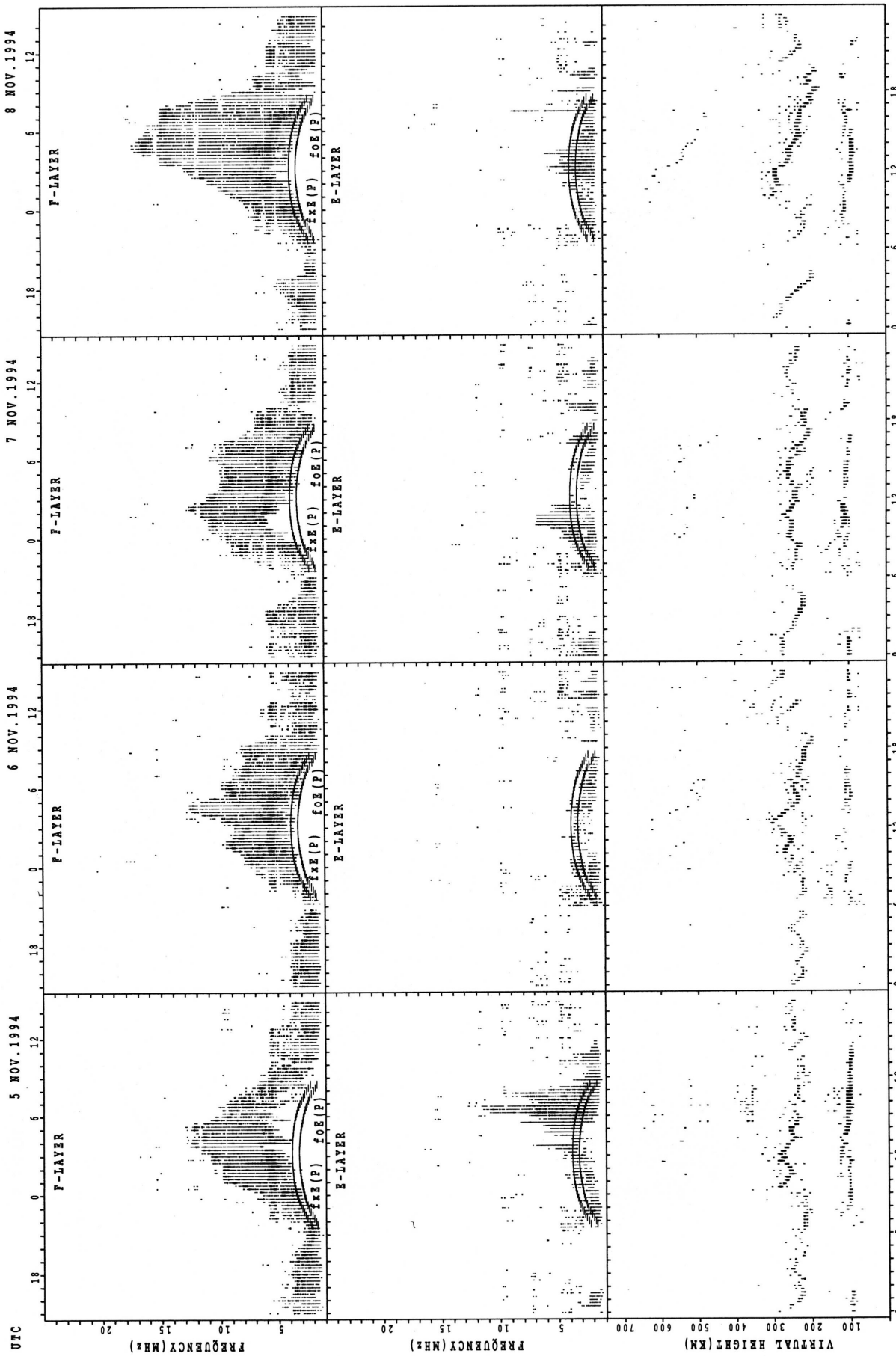
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
29 NOV.1994
30 NOV.1994
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foR(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foR(P); PREDICTED VALUE FOR foR

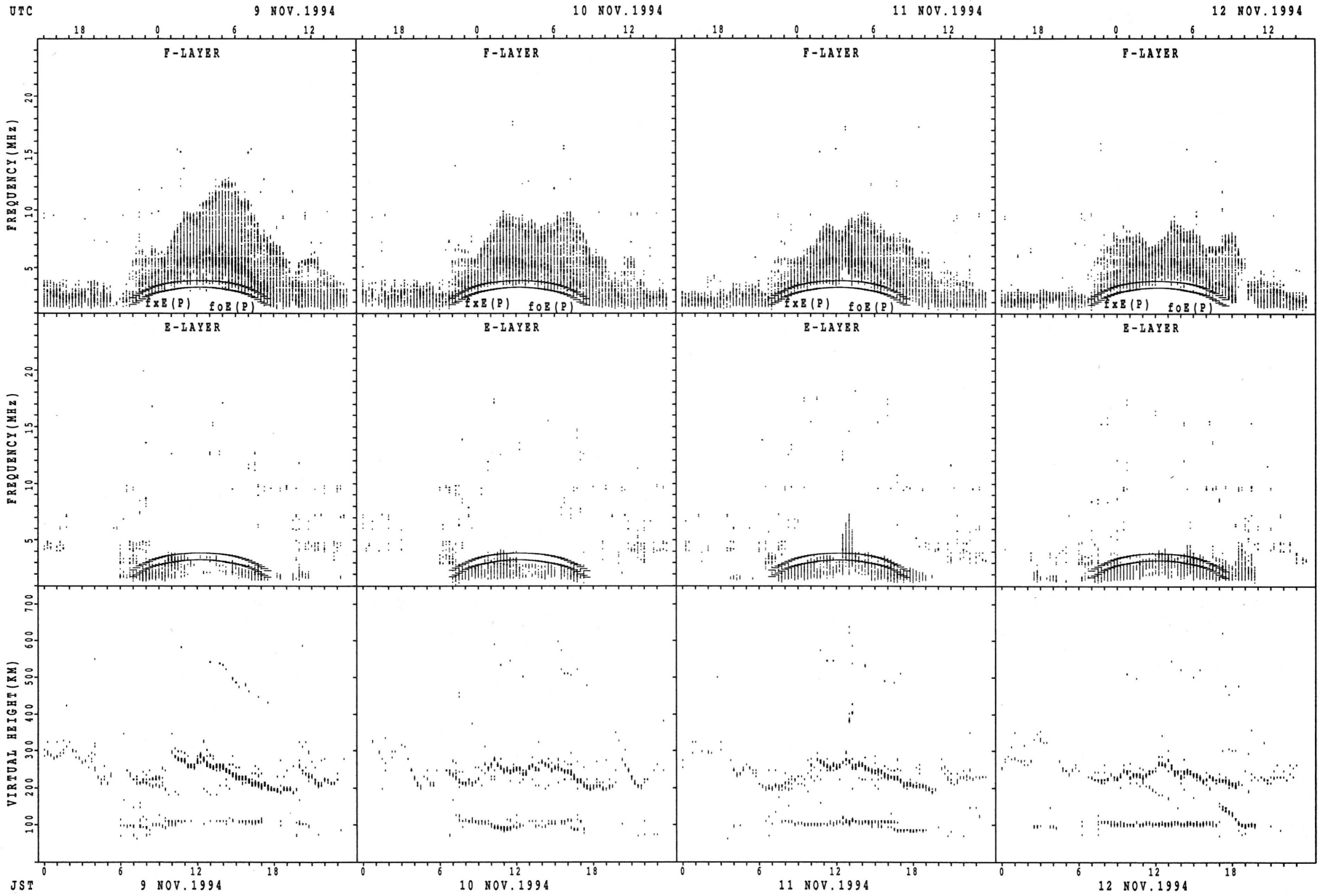
SUMMARY PLOTS AT OKINAWA



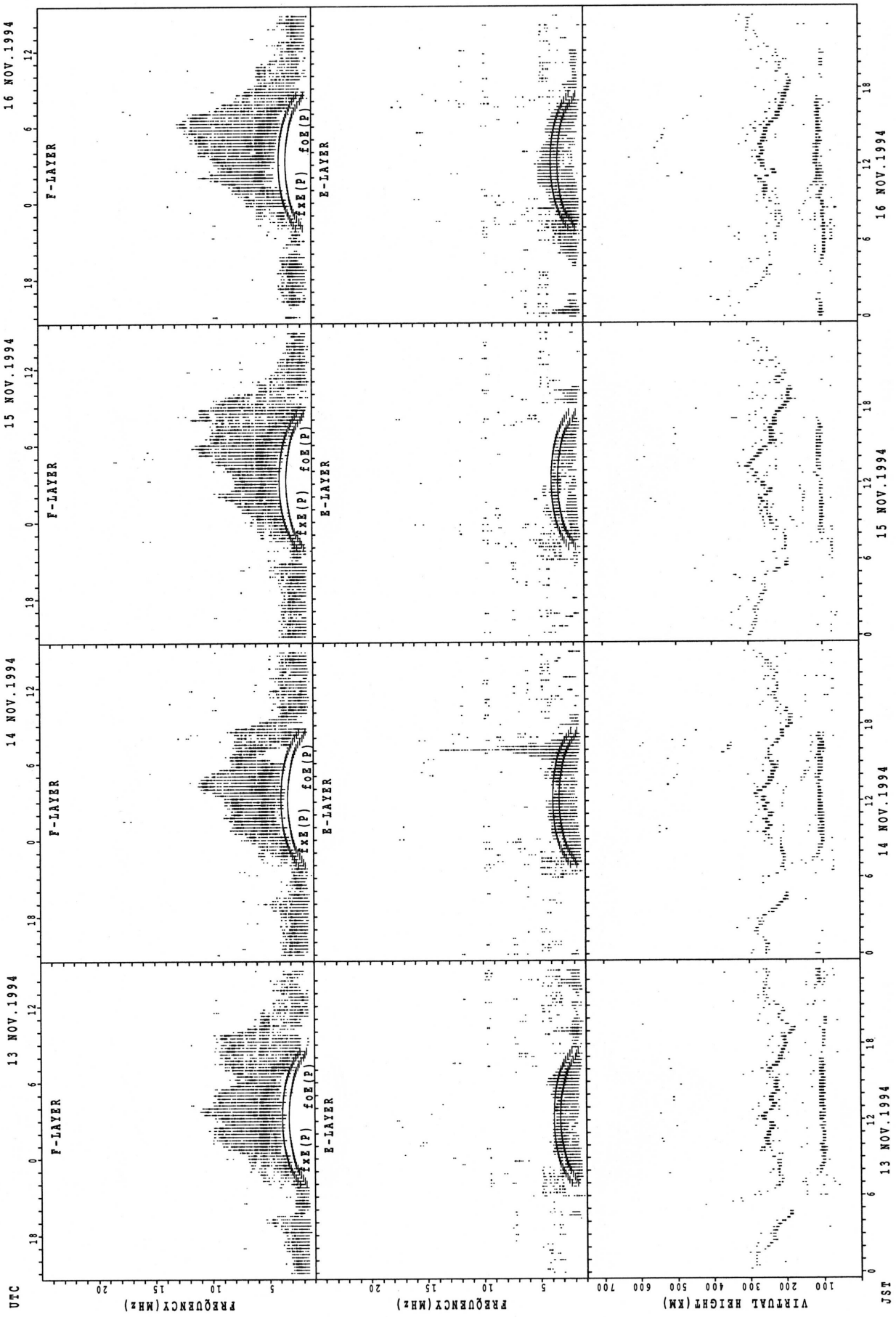
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
5 NOV.1994
6 NOV.1994
7 NOV.1994
8 NOV.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

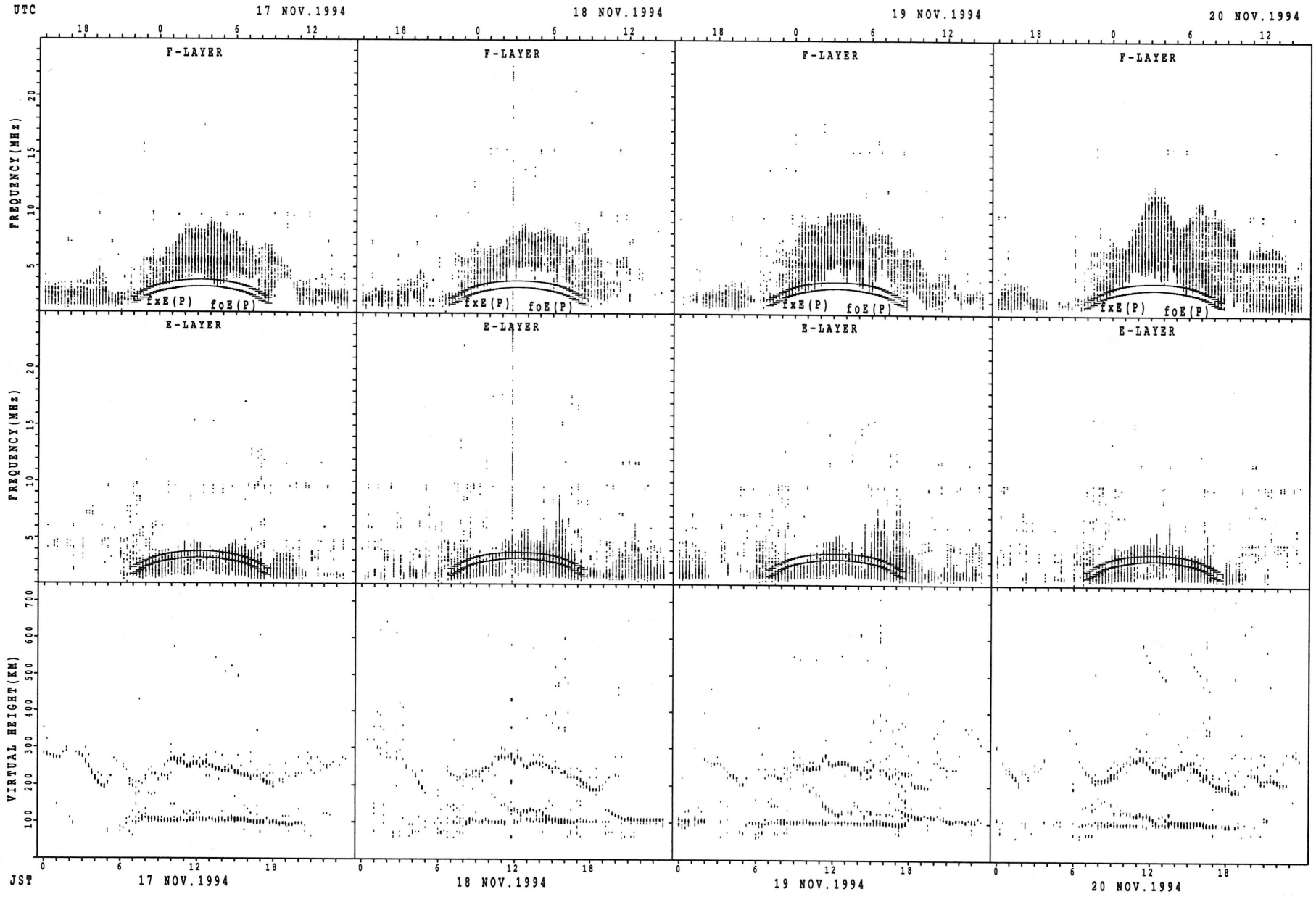
SUMMARY PLOTS AT OKINAWA



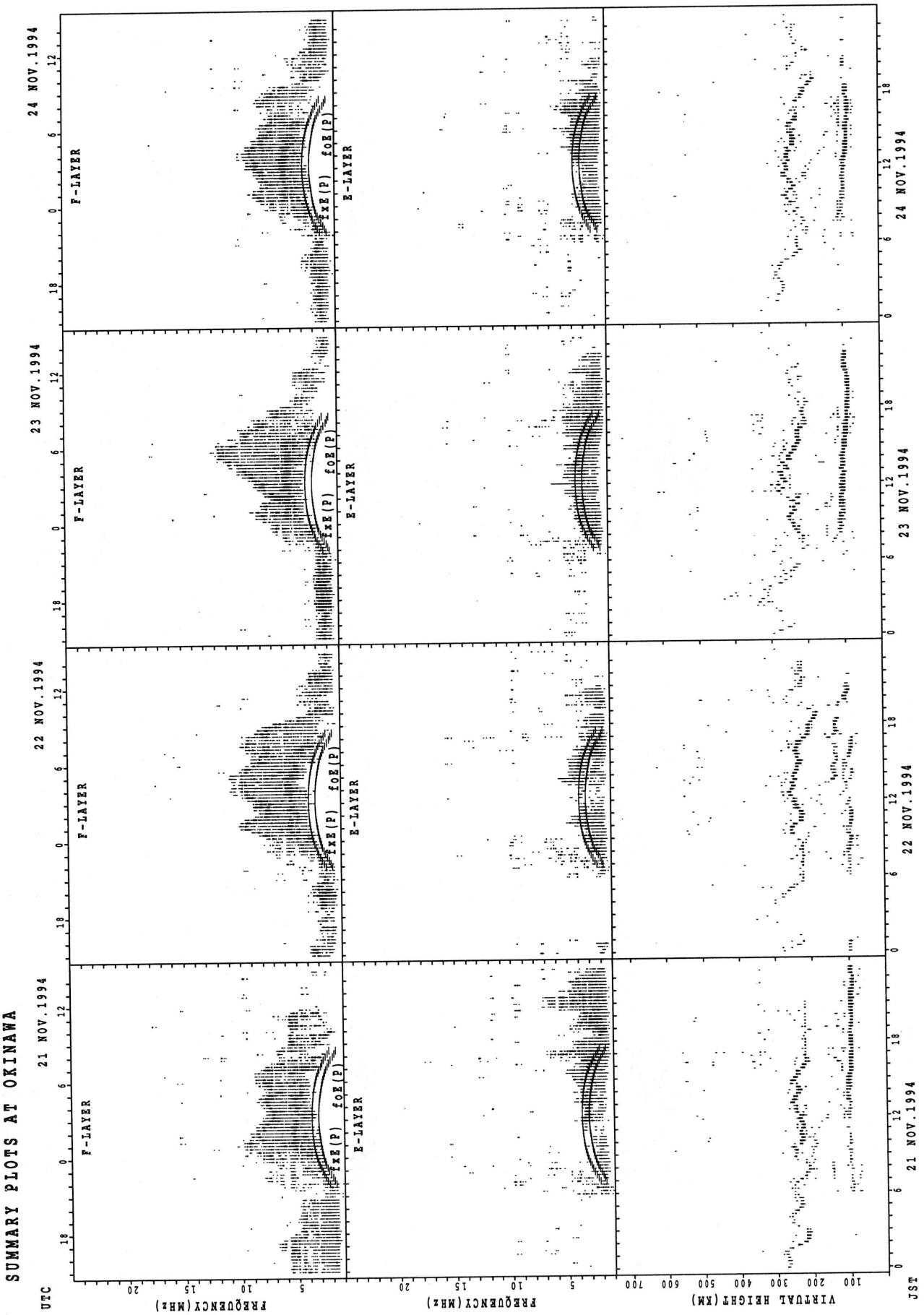
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
13 NOV.1994
14 NOV.1994
15 NOV.1994
16 NOV.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

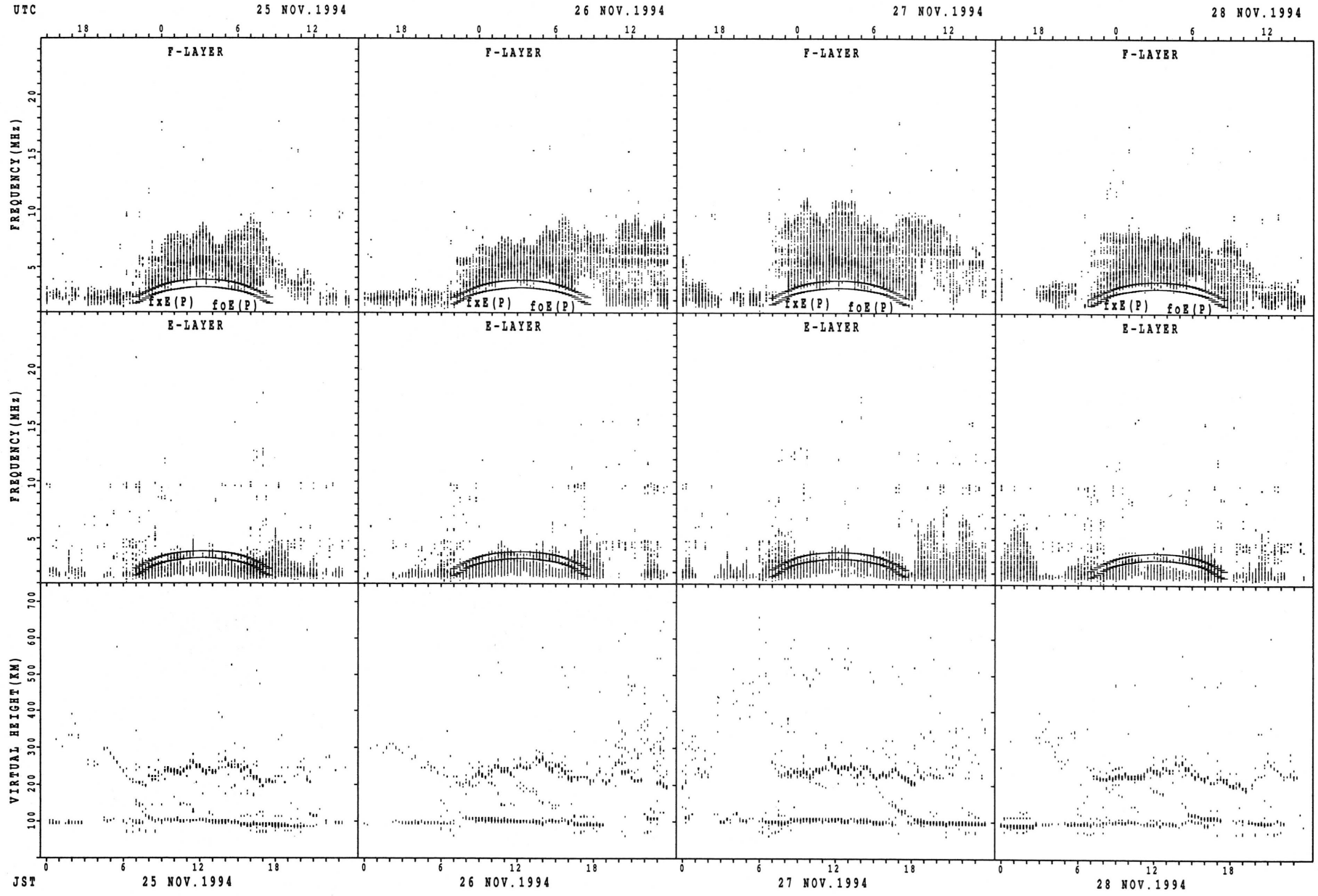
SUMMARY PLOTS AT OKINAWA



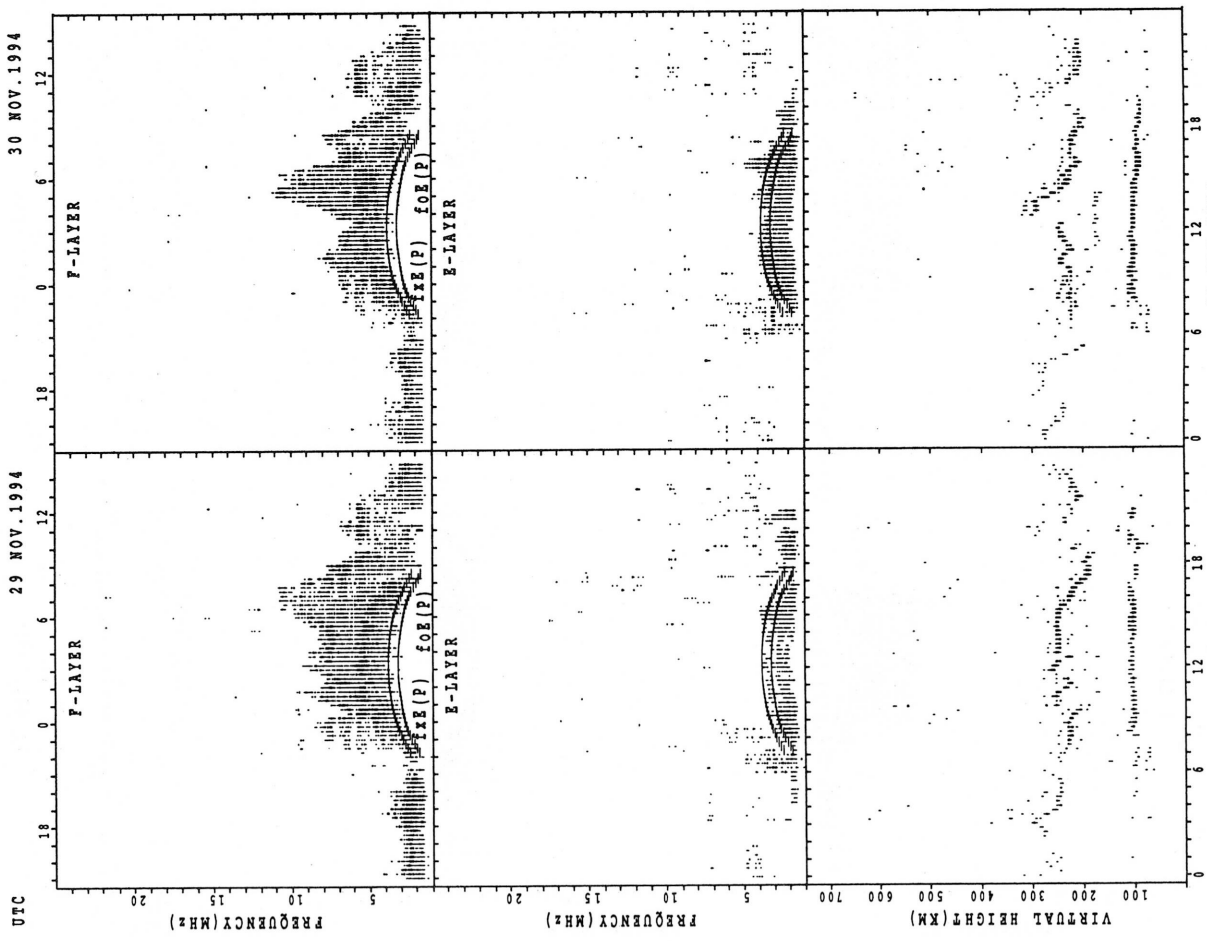
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

MONTHLY MEDIANS OF h'F AND h'Es

NOV. 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									21	26	22	23	26	21	19	19								
MED									240	246	245	248	242	250	244	240								
U Q									251	258	260	264	246	262	252	248								
L Q									228	238	234	240	236	243	240	234								

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	13	16	15	14	11	15	16	15	25	25	27	21	26	25	27	26	27	25	23	26	22	19	15	15
MED	105	103	105	105	103	103	105	111	115	111	109	113	110	111	111	113	107	107	107	103	103	103	105	105
U Q	111	111	107	111	105	107	109	123	120	113	119	121	119	119	113	119	117	109	111	107	109	107	111	113
L Q	100	103	101	99	101	101	103	107	112	106	105	107	105	107	105	109	97	96	99	99	97	99	99	103

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								12	23	22	28	26	23	23	23	22								
MED								248	240	251	250	255	250	254	248	240								
U Q								249	248	258	265	264	264	262	256	248								
L Q								237	232	242	241	240	248	248	236	232								

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20		10		10		11	25	28	26	27	25	23	22	20	26	24	20	19	18	14	19	13	12
MED	104		103		106		107	129	113	113	115	113	113	113	114	113	107	106	107	107	107	105	103	104
U Q	105		105		115		119	155	117	119	125	115	117	115	124	119	109	110	111	111	111	105	104	105
L Q	101		99		103		103	115	107	111	111	109	111	111	111	111	105	102	105	103	107	103	100	100

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									20	21	26	24	22	23	27	29	24	13						
MED									241	256	254	262	265	266	254	248	248	246						
U Q									264	266	270	264	272	278	262	257	258	258						
L Q									227	248	242	249	256	258	246	236	234	234						

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							20	27	24	25	24	23	22	20	24	27	21	21	17	19	14	14	15
MED	107							156	119	117	113	111	113	113	115	114	113	107	105	107	105	106	105	105
U Q	117							167	131	128	125	113	115	115	119	118	119	115	110	114	109	111	107	109
L Q	103							111	115	113	111	108	109	113	113	111	107	105	101	104	105	103	103	103

MONTHLY MEDIANS OF h'F AND h'Es

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

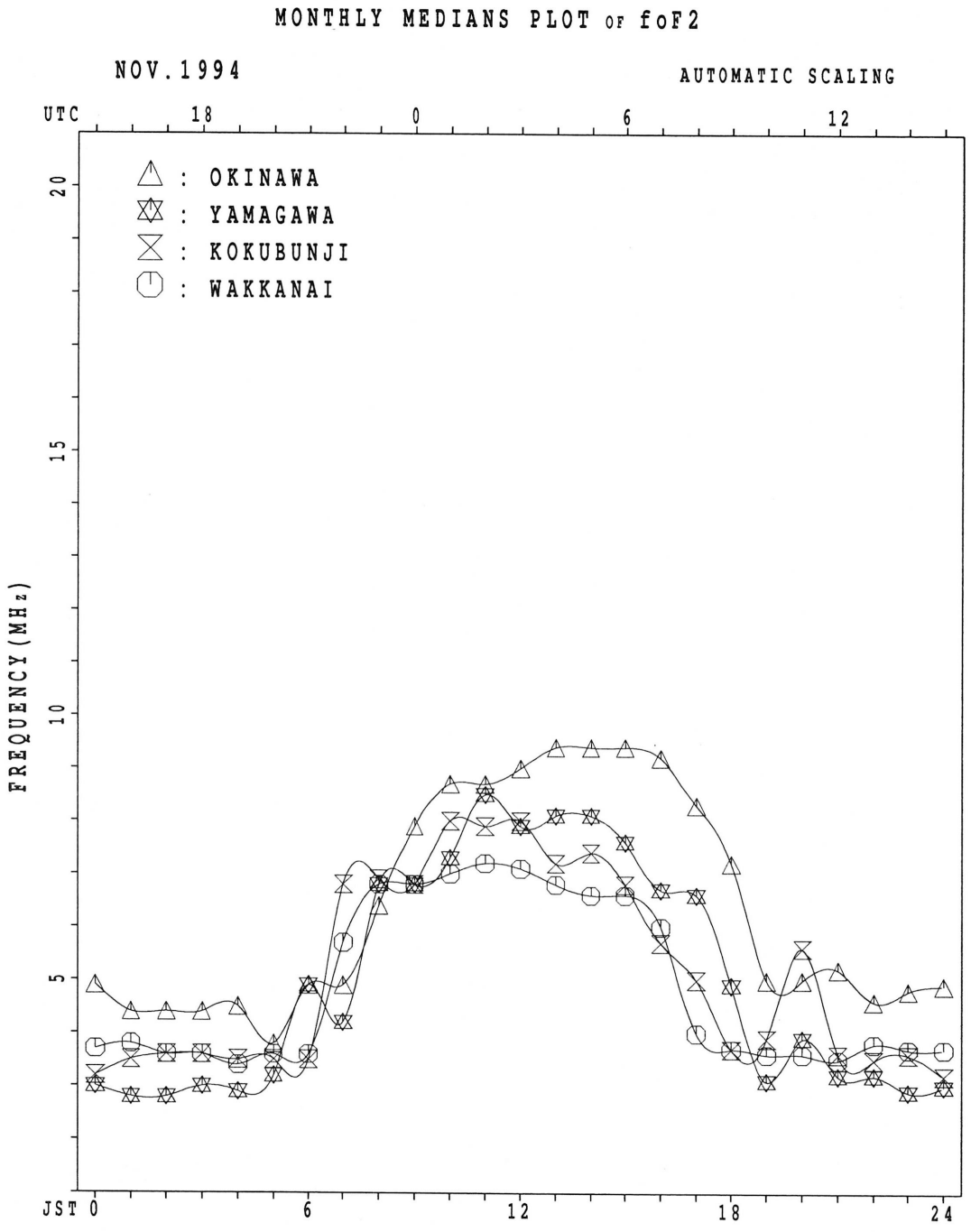
STATION OKINAWA LAT. 26.3N LON. 127.8E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									16	25	28	23	24	23	27	29	28	26	13					
MED									239	254	252	258	260	256	254	238	233	231	224					
U Q									244	258	271	276	265	270	262	252	244	242	242					
L Q									231	238	239	246	255	250	240	231	223	218	213					

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								20	24	28	27	22	23	24	27	26	26	21	18	17	16	16	11	
MED								140	112	123	113	113	113	114	111	107	106	109	101	101	99	103	99	
U Q								151	145	160	151	143	121	157	149	127	111	136	113	108	104	111	103	
L Q								97	107	107	107	107	107	107	105	105	99	95	95	92	95	100	95	


MONTHLY MEDIANS PLOT OF foF2
NOV.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

NOV. 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	A				X	X												X	X	X	X	X	X	X
		46	37	38	31	29												62	43	42	35	38	39	37
2	X	X	X	X	X	X												A	X	X	X	O X		X
	36	39	38	39	38	32													48	51	32	30	36	39
3	X	X	X	X	X	X												X	A	X	X	X	X	
	36	37	38	42	38	32												56		38	36	38	38	40
4		X	X	X	X	X												X	X	X	X	X	X	X
	40	40	40	39	33	33												57	40	31	32	35	34	35
5	X	X	X	X	X	X												X	X	X	X	X		
	37	39	38	37	37	36												51	41	46	50	47	51	53
6	X	X																X	X	X	X	X	X	X
	51	47	53	46	52	48												57	40	43	51	41	43	50
7	X	X	R	X	X	X												X	X	X	X	O X	A	
	43	48		37	36	40												53	39	42	35	34		37
8	X			X		X												A	X	X	X	X	X	X
	39	42	44	44	35	26													35	40	39	32	34	33
9	X	X		X	X	X												C	X	X	X	X	X	X
	35	37	38	38	39	32													37	39	34	32	38	36
10	X	X	X		X	X												X	X	X	X	X	X	X
	36	36	36	40	43	33												60	40	32	41	35	34	38
11	X	X	X	X	X	X												X	X	X	X	O X		X
	36	39	36	39	42	39												62	36	45	40	40	39	39
12	X	X	X	X	X	X												X	X	X	X	X	X	X
	38	38	39	39	40	38												61	36	41	44	35	34	39
13	X	X	X	X	X	A												X	X	X	X		X	X
	39	40	42	41	49													58	41	42	34	37	38	38
14	X	X	X	X	X	X												X	X		X	X	X	X
	38	38	38	38	45	36												53	38	40	32	34	39	36
15	X			X	X	X												X	X	X	X	X	X	X
	38	41	40	38	40	37												68	62	42	39	37	37	38
16	X	X		X	X	X	O X											X	A	X	X	X	X	X
	38	38	40	38	38	38	43											43		34	36	35	36	40
17	X				X	X	O X											X	X	X				
	38	44	47	45	46	34	43											49	49	35	36	42	40	45
18			X	X	X	X	O X											X	X	X	X	X	X	X
	43	43	37	38	36	37	46											48	36	38	34	33	39	38
19	X	X	X	X		X	X											X	X	X	X	X	X	X
	35	38	41	42	52	39	42											64	42	40	30	30	35	37
20	X	X	X	X	X	S	O X											X	X	X	A	X	X	X
	40	41	34	29	30		43											57	43	49		39	35	39
21	X	X	X	X	X	X	X											X	X	X	X	X	X	X
	38	41	42	45	48	43	45											65	48	48	36	34	34	36
22	X	X		X		X	O X											X	O X	O X	X	X		X
	37	37	36	35	38	36	40											46	35	31	35	34	35	34
23	X	X				X	O X											X	X	X	X	X	X	X
	35	32	33	36	39	32	39											43	39	31	33	29	29	32
24	X	X	X	X	X	X	X											X	X	X	X	X		X
	34	33	36	33	33	31	37											44	35	37	42	30	34	30
25	X	X	X		X	X	X											X	A	A	A	X		
	35	35	37	37	34	36	44											42				41	38	43
26	X			X	X	X	S											X	X	X	X	X	X	
	38	39	38	35	35	31												58	49	43	42	40	38	41
27		X	X			X												X		A	A			
	64	33	32	35	39	35	40											46	50			46	42	38
28	X	X	X	X	X	A	A											X	X	X	X		X	X
	37	39	34	36	34													56	57	39	36	46	39	39
29		X	X			X	X											X	X	X	X	X	X	X
	41	39	39	45	48	48	40											45	35	34	39	30	33	33
30	X	O X	X	X	X	X	X											X	X	X	X	X	X	X
	35	35	37	35	35	34	37											46	40	42	50	37	32	34
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	30	30	27	13											27	27	28	27	30	29	30
MED	X	X	X	X	X	X	X											X	X	X	X	X	X	X
	38	39	38	38	38	36	42											56	40	40	36	35	37	38
U Q				X	X	X	X											X	X	X	X	X	X	
	40	41	40	41	43	38	44											60	48	42	41	40	39	39
L Q	X	X	X	X	X	X	X											X	X	X	X	X	X	X
	36	37	36	36	35	32	40											46	36	36	34	33	34	36

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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	A	F 38	F 29	F 30	25	23	45	57	82	103	86	95	106	100	92	88	76	56	37	36	29	32	33	31
2	30	33	32	33	32	26	J S 36	J S 65	J R 88	93	115	126	130	117	101	75	70	A	42	45	26	24	28	33
3	30	31	32	36	32	26	J S 39	J R 64	88	93	97	83	81	93	81	68	60	49	A	32	30	J R 32	32	F 33
4	F 34	34	34	33	27	27	S 38	S 69	95	77	85	101	92	79	66	72	60	51	34	25	26	29	28	29
5	31	33	32	31	31	30	J S 33	52	63	85	87	82	85	83	78	82	58	45	35	40	44	41	F 41	F 43
6	45	41	F 46	F 37	J F 46	F 38	44	55	J S 71	80	93	84	96	99	93	89	R 75	51	34	37	45	35	S 37	43
7	37	42	R	31	J S 30	34	J S 43	70	80	82	93	103	84	71	90	68	66	47	33	36	29	28	A	F 28
8	33	33	F 31	38	F 24	20	S 33	64	68	66	86	98	78	91	86	78	54	A	29	34	33	26	28	27
9	29	31	F 31	32	33	26	42	57	68	65	76	75	C	C	C	71	59	I C 50	31	33	28	26	32	30
10	30	S 30	30	32	37	27	J S 27	59	J S 73	69	73	77	89	74	70	68	65	54	34	26	35	29	28	U S 32
11	30	33	30	33	36	33	J S 35	J R 63	60	62	63	76	83	81	78	65	62	56	30	39	34	34	F 33	33
12	S 32	32	33	33	J S 34	J S 32	J S 38	J S 62	U S 69	J R 64	73	66	76	67	66	59	63	J R 55	30	35	38	29	28	33
13	33	34	36	S 35	43	A	33	J S 64	69	64	72	93	83	70	70	65	61	52	35	36	28	F 30	32	32
14	32	32	32	32	39	30	S 36	S 61	U S 63	66	74	77	80	72	76	66	59	47	32	F 32	26	28	32	30
15	32	F 32	31	32	34	30	S	J S 60	U S 74	64	77	77	66	68	81	S 73	66	62	56	36	33	31	31	32
16	32	32	F 33	S 32	32	32	37	58	61	67	86	86	75	J R 73	69	60	52	37	A	28	30	29	30	34
17	32	35	F 38	F 35	41	28	U S 37	61	U S 68	58	72	71	75	81	70	62	51	43	43	29	F 25	F 30	F 31	F 30
18	F 33	F 31	31	S 32	30	31	40	J S 67	60	57	65	66	59	69	66	61	58	42	30	32	28	27	S 33	J S 32
19	U S 29	32	35	36	J R 38	32	S 36	62	U S 64	71	82	84	81	71	66	67	57	58	36	34	24	24	J S 29	31
20	J S 34	J S 35	27	23	J S 24	S	S 37	S 62	76	J R 70	68	89	85	81	85	70	S 65	51	37	43	A	32	29	33
21	32	35	36	39	42	37	J S 39	S 63	A	70	79	78	69	J R 65	62	57	56	59	42	42	30	28	28	30
22	31	31	30	29	F 31	30	U S 34	J S 65	68	65	70	85	80	79	56	66	56	40	29	25	29	S 28	F 28	28
23	29	J S 26	F 23	F 28	F 29	26	U S 33	J R 55	59	69	76	74	71	71	71	61	54	38	33	25	27	23	23	26
24	28	27	S 30	27	27	S 26	J S 31	J S 52	59	60	73	68	65	64	58	59	57	38	29	31	36	25	F 24	24
25	U S 28	U S 29	31	F 28	28	30	S 38	J R 59	66	69	60	71	58	70	66	66	53	S 36	A	A	A	35	F 28	F 33
26	32	F 28	F 29	S 29	S 29	S 25	S	56	J S 72	65	71	66	59	65	71	66	61	53	43	38	36	S 34	J S 32	F 30
27	F 52	27	S 26	F 26	F 29	F 25	F 32	65	79	S 85	79	102	80	76	81	68	57	40	F 41	A	A	S 37	F 34	29
28	31	33	28	30	28	A	A	60	S 68	72	75	74	70	65	76	62	62	50	51	33	30	F 35	33	33
29	F 33	33	33	F 36	F 41	42	J S 34	53	59	66	77	70	63	62	60	R 74	53	39	29	28	33	24	27	28
30	29	29	J R 31	29	29	S 28	U S 31	57	56	61	71	63	61	65	68	68	52	40	34	36	44	31	26	28
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	30	30	27	27	30	29	30	30	30	29	29	29	30	30	28	27	28	27	30	29	30
MED	32	32	31	32	32	30	S 36	61	68	68	76	78	80	72	71	68	59	50	34	34	30	29	30	31
U Q	33	34	33	35	37	32	39	J S 64	75	77	86	89	84	81	81	72	63	54	41	36	35	32	32	33
L Q	30	31	30	29	29	26	S 33	57	62	64	72	71	68	68	66	62	56	40	30	30	28	27	28	29

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	U L 445	L	U L 480	L	L 430	L								
2									L	L	L 430	U L 470	415	L	L 420									
3									L	L	U L 445	L 445	U L 445	445	U L 440	U L 390	L							
4									U L 420	L	U L 460	U L 480	U L 440	U L 455	L	L								
5								L	L 305	U L 420	L 415	U L 470	U L 445	U L 445	L 430	L								
6									L	L	L	U L 445	L 470	L 420	L									
7									L	L	L	U L 465	U L 455	L	U L 420	L								
8										L	U L 480	U L 445	L	L 455	U L 405	L								
9									L	L	U L 440	L 415				L								
10									L	L	U L 440	U L 445	U L 440	L	L	L								
11								L		U L 350	L	L 415	U L 440	L	L	L								
12									L	L	U L 420	U L 420	U L 455	L	L									
13									L		U L 440	L 445	L	U L 420	L									
14										L	U L 430	L	L 440	U L 415	U L 390									
15								U L 250	U L 340	L	L		L	L	L	L								
16									L	L	L	U L 420	L	U L 430	L									
17										L	U L 395	U L 430	U L 445	U L 430	U L 390	L								
18									L	L		L	L	L 420	L	L								
19										L	U L 420	U L 430	U L 440	L	L									
20											L	L		U L 415	U L 395									
21										L		U L 420	L	L										
22										L	L	U L 430	U L 430	U L 395										
23									L	L	U L 405	U L 440	U L 415	L	L	L								
24									L	L	L	U L 420	U L 420	L	L									
25										U L 405	L	U L 415	U L 440	L 420										
26									L	L	U L 405	U L 420	U L 440		L									
27									U L 365	L	L	U L 415	U L 430	U L 415	L	L								
28										L	L	U L 440	U L 445	L										
29										L	U L 415	L	L	L	U L 380	L								
30									L	L	L 405	L 395	L 405	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	4	3	17	24	21	14	10	1								
MED								U L 250	U L 352	U L 405	U L 430	U L 430	U L 440	U L 420	U L 412	U L 390								
U Q									U L 392	U L 420	U L 442	U L 445	U L 445	L 445	L 430									
L Q									L 322	U L 350	U L 410	U L 420	U L 430	U L 415	U L 390									

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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								S 200	255	290	315	305	A 325	305	290	A	A							
2								B 190	255	290	A	315	330	315	295	245	A							
3								B 225	255	A	315	R	305	A	280	255	A							
4								B 205	A	290	315	A	315	305	275	A	A							
5								S B	240	290	305	325	R	290	265	A	A							
6								B 225	255	275	305	330	320	305	A	A	A							
7								S 190	240	290	300	315	325	300	275	A 240	A							
8								B A	A	295	315	A	A	A	A	A	A							
9								B S	A	275	305	315	C	C	C	A	B							
10								B A	A	A	305	315	A	300	A	A	S							
11								B 180	S	275	R 305	A	315	A 305	280	A	A							
12								S B	A	A	A	305	315	300	A	A	A							
13								S S	250	290	A 300	315	A	A	A	A	A							
14								B A	255	A	A	A	A	A	290	255	S							
15								S A	250	A	300	A	305	290	A	240	A							
16								A	A	A 255	290	315	A	295	S 280	A 240	A							
17								A	A	295	305	315	A	300	290	A	A							
18								A	A	280	300	A	315	305	A	A	A							
19								B	225	275	305	305	A	A	A	A	A							
20								S	250	300	315	A	A	315	280	A	S							
21								A	A	A	A	325	A 315	A	280	240	A							
22								A	225	275	A	325	315	290	A 275	225	A							
23								A	255	290	A	A	300	A	A	A	A							
24								A	250	255	300	305	315	290	A	A	180							
25								A	A	A	A	A	A	290	275	A	A							
26								190	250	290	300	315	A	300	280	250	A							
27								A	A	275	A	A	A	A	A	A	A							
28								A	A	265	295	295	305	290	250	225	A							
29								A	A	A	280	305	305	290	265	230	A							
30								155	A	290	290	305	305	290	265	230	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								9	15	22	22	19	17	21	18	12	1							
MED								190	250	290	305	315	315	300	280	240	180							
U Q								215	255	290	305	315	318	305	280	248								
L Q								185	240	275	300	305	305	290	275	230								

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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

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	J A 59	26	26	23	26	28	E S 14	27	31	G 28	J A 51	J A 65	40	39	35	33	J A 27	16	E B 11	J A 25	J A 28	27	22	23
2	23	22	22	E B 11	E B 11	E S 14	J A 30	26	30	37	38	39	G	G	32	J A 47	33	65	J A 55	J A 44	42	J A 48	J A 29	26
3	29	27	E B 10	J A 32	25	J A 27	E B 13	G 18	31	34	37	G 31	35	37	G	32	J A 31	J A 34	J A 42	J A 44	27	28	E B 11	J A 32
4	J A 46	J A 52	J A 22	J A 38	J A 22	23	J A 41	30	31	33	35	35	35	37	31	33	J A 38	29	28	E B 11	E B 11	30	34	27
5	24	J A 29	17	26	27	18	E S 15	E B 18	G 24	34	G	G 28	G 28	33	32	31	J A 41	J A 32	J A 21	E B 13	E B 11	28	27	J A 36
6	E B 10	17	18	J A 31	E B 11	J A 30	E B 12	G	G 23	G 23	35	35	G 29	G	37	54	72	41	22	23	E B 12	20	17	E B 10
7	J A 44	22	J A 37	19	23	22	J A 34	24	35	37	35	38	G	37	31	37	27	J A 34	30	J A 37	J A 45	J A 38	40	35
8	J A 36	J A 36	27	28	21	39	J A 90	J A 49	J A 70	37	38	39	J A 41	33	31	28	J A 36	J A 60	50	J A 42	J A 30	J A 23	30	J A 19
9	24	22	22	J A 36	21	J A 38	35	31	31	29	G 26	G	C	C	C	25	E B 19	C	E S 14	31	28	J A 26	33	18
10	E B 11	E B 11	J A 25	32	27	21	25	J A 35	J A 49	34	32	G 31	38	37	27	J A 23	E S 17	E B 14	E B 10	E B 11	E B 12	J A 22	E B 10	E B 10
11	18	21	28	S 18	E B 10	E B 10	E B 13	G	E S 23	G	G	34	G 31	38	38	J A 27	J A 23	E B 10	24	21	J A 37	28	28	22
12	24	18	17	E B 11	E B 10	E B 12	J A 32	E B 18	33	33	32	G 28	G	G	28	29	30	J A 31	26	J A 36	J A 37	26	28	24
13	25	19	18	E B 13	23	31	36	E S 19	G 22	G	38	G	37	35	J A 36	36	J A 26	J A 37	J A 34	32	28	28	23	J A 39
14	J A 29	23	19	E B 10	E B 10	E B 10	J A 33	27	G 24	33	32	37	36	35	G 24	31	29	26	J A 24	J A 33	J A 42	26	J A 25	29
15	27	J A 21	E B 11	E B 10	E B 11	18	J A 46	25	G 22	31	G	J A 68	G 28	G	28	31	38	J A 47	43	J A 43	E S 14	E B 12	18	J A 36
16	E B 11	J A 36	J A 27	23	21	E B 10	J A 27	23	33	J A 38	33	36	33	G	37	33	J A 41	43	60	28	23	19	E B 11	18
17	21	30	27	27	23	18	S 28	28	28	32	34	G 28	35	35	G	32	J A 26	27	21	J A 32	18	J A 33	E B 10	E B 10
18	E B 10	J A 35	J A 33	E B 10	18	E B 11	E S 14	J A 36	J A 27	33	37	34	36	44	J A 51	28	31	J A 30	J A 35	E B 10	E B 13	E S 14	33	E S 13
19	J A 41	E S 14	E B 10	E S 14	J A 22	E B 11	J A 32	E B 18	31	35	34	37	36	40	43	34	28	J A 32	E B 10	25	19	J A 20	E B 12	24
20	J A 32	20	E B 10	E B 12	28	33	S 38	E S 17	G 22	38	42	J A 49	J A 51	G	G	29	E S 19	E B 11	24	28	J A 50	J A 34	34	24
21	J A 40	J A 36	J A 33	26	22	E B 10	E S 14	28	126	29	52	J A 36	J A 51	42	J A 43	J A 40	J A 36	J A 69	J A 29	23	29	J A 34	J A 39	J A 31
22	32	25	20	18	E B 11	21	32	J A 65	26	31	31	G 28	G 28	30	37	34	J A 31	42	22	26	23	28	J A 26	23
23	26	34	E B 10	26	J A 30	24	J A 34	J A 33	G	G	35	J A 37	J A 31	39	38	J A 31	32	J A 22	28	J A 20	J A 23	J A 25	E B 13	20
24	17	E B 10	16	J A 21	E S 13	23	E B 13	J A 37	G	28	36	35	36	35	33	27	23	30	33	J A 31	E B 10	17	E B 12	E B 10
25	17	21	J A 26	E B 11	J A 40	25	E S 16	26	J A 33	39	J A 40	40	35	34	37	42	28	J A 23	J A 42	J A 46	37	35	J A 33	J A 29
26	27	27	25	J A 26	E B 11	J A 36	J A 41	J A 34	31	G	34	G 28	37	34	31	G	J A 23	J A 24	20	E B 10	J A 41	J A 34	J A 38	24
27	E B 13	25	J A 29	J A 29	30	J A 24	J A 36	41	52	J A 32	39	J A 44	J A 38	J A 38	J A 38	J A 31	31	50	J A 51	46	50	54	J A 39	J A 28
28	18	E B 11	25	27	J A 33	J A 48	J A 73	J A 45	34	30	33	G	G 29	34	37	J A 37	39	28	E B 10	E B 10	32	36	E B 10	29
29	J A 31	J A 41	23	30	J A 33	21	E S 14	29	38	28	34	G	35	34	32	31	J A 27	20	23	28	J A 25	28	29	J A 30
30	J A 25	J A 31	E B 12	E B 11	29	E B 11	E B 12	27	28	35	G 24	G	G 29	34	31	28	28	29	26	27	20	27	20	E B 10
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	30	30	29	30	30	30	30	30	30
MED	25	24	22	23	22	22	31	27	31	32	34	35	35	35	32	31	30	30	26	28	28	28	26	24
U O	J A 32	J A 31	J A 27	J A 28	27	28	J A 36	J A 34	33	35	38	38	37	38	37	34	J A 36	42	J A 35	J A 36	J A 37	J A 34	33	J A 29
L O	E B 18	20	E B 17	E B 12	E B 11	E B 12	E B 14	E 19	G	G 28	G 32	G	G	G 32	30	28	26	24	E 21	E B 21	E B 18	23	E B 13	E B 18

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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

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	A A 59	E B 12	14	13	13	15	E S 14	23	G 18	G 22	36	41	36	37	33	27	22	16	E B 11	18	14	13	E B 10	13
2	E B 10	13	14	E B 11	E B 11	E B S 14	15	23	29	33	34	36	G	G	32	37	26	A A 65	22	20	15	17	E B 11	E B 13
3	E B 12	E B 10	E B 10	18	E B 12	E B 10	E B 13	G 15	28	33	33	U G 31	33	32	G	29	20	27	A A 42	18	14	28	E B 11	23
4	E B 11	15	13	E B 11	E B 10	14	E B 14	24	28	33	34	34	33	34	29	28	21	E B 14	E B 12	E B 11	E B 11	16	18	E B 11
5	15	E B 10	12	E B 10	E B 10	E B 11	E S 15	E B 18	G 20	33	G	G 21	U G 28	33	31	28	37	14	16	E B 13	E B 11	E B 12	E B 10	E B 11
6	E B 10	15	13	E B 10	E B 11	E B 10	E B 12	G	G 17	G 18	32	G 20	G 19	G	32	36	51	19	14	E B 10	E B 12	14	14	E B 10
7	17	E B 10	E B 12	E B 11	17	E B 11	E S 14	23	32	35	33	35	G	33	30	28	26	14	16	E B 11	13	14	A A 40	20
8	18	13	E B 10	13	14	13	14	22	30	32	36	35	39	33	29	26	21	A A 60	17	18	E B 11	E B 11	14	E B 12
9	E B 10	18	E B 10	E B 11	E B 10	E B 11	E B 13	25	23	G 18	G 22	G	C	C	C	24	E B 19	C	E S 14	16	17	14	20	E B 11
10	E B 11	E B 11	12	E B 11	E B 10	E B S 14	18	22	27	29	32	G 23	32	G 21	26	23	E S 17	E B 14	E B 10	E B 11	E B 12	E B S 14	E B 10	E B 10
11	13	14	14	13	E B 10	E B 10	E B 13	G	E S 23	G	G	32	G 28	37	34	23	20	E B 10	E B 12	E B 10	E B 12	E B 11	13	E B 10
12	14	E B 10	13	E B 11	E B 10	E B 12	E S 14	E B 18	25	26	30	G 25	G	G	28	23	18	14	E B 10	E B 10	E B 12	14	E B 11	E B 11
13	13	E B 12	E B 11	E B 13	E B 11	A A 31	E S 15	S 19	G 18	G	33	G	36	32	32	23	23	E B 13	E B 10	18	12	15	E B 11	13
14	E B 11	E B 10	13	E B 10	E B 10	E B 10	E B 14	23	G 16	29	32	34	33	32	G 21	G 23	19	15	13	16	15	E B 10	13	15
15	16	E B 10	E B 11	E B 10	E B 11	14	20	23	G 18	29	G	46	G 26	G	27	27	14	33	33	27	E S 14	E B 12	12	E B 13
16	E B 11	19	12	14	12	E B 10	E B 13	19	25	33	G 23	34	31	G	30	26	23	18	A A 60	16	E B 12	E B 10	E B 11	E B 10
17	12	15	E B 11	E B 11	E B 10	13	E S 15	23	27	G 22	34	G 25	32	32	G	25	18	23	E B 11	18	E B 10	E B 10	E B 10	E B 10
18	E B 10	E B 12	E B 11	E B 10	12	E B 11	E S 14	23	24	G	33	32	33	G 22	26	26	18	15	E B 12	E B 10	E B 13	E B S 14	E S 14	E S 13
19	20	E S 14	E B 10	E S 14	E B 10	E B 11	E B 13	E B 18	28	32	33	33	33	32	33	30	18	E B 12	E B 10	14	E B 11	E B 11	E B 12	14
20	23	E B 11	E B 10	E B 12	14	S 21	17	E S 17	G 19	35	33	39	49	G	G	24	E S 19	E B 11	E B 12	E B 10	A A 50	13	14	12
21	12	14	13	13	13	E B 10	E S 14	18	A A 126	28	44	G 26	G 19	32	41	34	33	U A 20	13	E B 13	17	16	17	16
22	19	14	13	11	E B 11	E B 11	E B 13	38	G 14	29	30	G 22	G 18	G	32	32	26	24	14	15	E B 14	E B 10	E B 10	S 18
23	14	15	E B 10	E B 10	12	14	16	20	G	G	33	33	G 22	30	30	24	18	E B 10	E B 12	E B 11	13	15	E B 13	13
24	12	E B 10	13	E B 12	E S 13	12	E B 13	19	G	G 22	33	33	33	32	29	22	22	16	15	15	E B 10	E B 11	E B 12	E B 10
25	E B 11	E B 11	E B 10	E B 11	E B 11	E B 10	E B S 16	20	25	27	30	31	33	33	34	23	S 19	18	A A 42	A A 46	A A 37	17	E B 12	E B 10
26	16	13	13	13	E B 11	14	20	G	27	G	31	G 25	35	33	30	G	18	14	13	E B 10	E B 10	14	13	E B 10
27	E B 13	18	17	15	14	18	18	18	26	G 16	31	37	28	32	31	23	21	17	18	A A 46	A A 50	21	19	15
28	14	E B 11	14	13	E B 11	A A 48	A A 73	20	22	G 16	G 21	G	G 21	G	32	30	24	16	E B 10	E B 10	E B 10	15	E B 10	15
29	14	E B 14	E B 11	E B 10	E B 10	E B 11	E S 14	20	27	28	33	G	33	33	28	25	20	E B 10	13	14	E B 10	13	16	18
30	E B 12	15	E B 12	E B 11	13	E B 11	E B 12	G	25	32	G 18	G	G 24	32	29	27	18	16	18	17	E B 13	E B 10	14	E B 10
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	30	30	29	30	30	30	30	30	30
MED	13	E 13	12	E B 11	E B 11	E B E 12	14	20	25	28	32	32	32	32	30	26	20	16	13	14	E B 12	14	E 12	E B 12
U Q	16	15	13	13	13	14	16	23	27	32	33	34	33	33	32	28	23	20	17	18	14	15	14	15
L Q	E B 11	E B 11	E B 11	E B 11	E B 10	E B 11	E B 13	G 18	G 20	G	G 30	G 26	G 27	G	28	23	18	E B 14	E B 12	E B 11	E B 11	E B 11	E B 11	E B 10

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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

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

NOV. 1994 FMIN (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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	A	F	F	F																				
		320	270	315	350	305	355	340	320	335	320	310	335	325	340	365	365	365	355	350	300	310	310	300
2							J S	J S	J R									A						
	305	300	320	325	330	345	335	360	345	345	330	350	340	335	340	355	370		365	325	340	290	285	310
3							J S	J R											A			J R		F
	315	285	305	325	390	330	320	365	345	340	350	330	350	350	370	360	370	380		350	320	360	285	275
4	F						S	S																
	280	310	325	345	320	360	330	350	365	355	350	350	345	340	340	345	360	375	360	360	290	285	285	310
5							J S																F	F
	320	325	325	300	350	325	350	375	365	335	365	340	335	355	325	370	360	335	305	325	330	305	295	300
6			F	F	J F	F			J S								R						S	
	350	330	350	300	275	325	355	410	345	325	340	345	320	325	335	355	365	345	305	310	310	300	285	310
7			R				J S																A	F
	300	300		290	285	335	350	365	345	325	340	350	360	355	370	370	360	335	310	355	315	270		295
8			F		F		S											A						
	310	310	270	370	360	285	290	365	355	380	340	355	340	335	345	360	385		330	340	345	340	315	305
9			F										C	C	C			I C						
	305	295	300	325	360	365	340	370	365	360	355	365				370	345	345	340	320	335	315	310	305
10		S					J S		J S														U S	
	320	305	285	295	360	350	295	355	360	365	335	345	350	355	360	355	360	355	385	340	345	315	295	310
11							J S	J R															F	
	325	335	305	305	350	335	355	400	360	355	345	340	355	345	360	370	345	355	345	325	340	340	295	340
12	S				J S	J S	J S	J S	U S	J R								J R						
	315	320	330	305	330	325	310	380	365	330	365	375	355	370	360	360	345	365	300	320	380	315	305	315
13				S		A		J S														F		
	320	310	310	305	345		360	360	375	365	335	350	375	360	380	355	360	375	325	330	350	290	315	305
14							S	S	U S											F				
	305	305	325	350	360	320	360	355	385	345	350	340	355	355	350	375	365	350	370	350	300	320	320	315
15		F					S	J S	U S							S								
	305	275	310	345	340	340		385	410	320	360	360	350	340	340	375	380	355	370	305	305	330	330	300
16			F	S										J R					A					
	310	295	275	325	345	350	395	395	375	350	325	365	335	340	340	360	365	305		330	335	300	315	320
17			F	F			U S		U S												F	F	F	F
	310	320	275	320	340	350	385	400	380	380	365	365	325	365	380	390	360	325	360	385	350	255	310	310
18	F	F		S				J S															S	J S
	295	335	335	310	330	360	375	365	375	365	355	350	350	345	360	370	390	360	350	375	370	300	300	310
19	U S				J R			S	U S														J S	
	330	320	315	340	340	350	345	380	360	340	350	340	350	360	375	345	365	350	355	365	325	275	285	290
20	J S	J S			J S	S	S	S		J R							S				A			
	310	325	340	350	315		350	360	375	360	335	335	350	365	345	345	375	360	330	365		320	285	315
21							J S	S	A					J R										
	310	305	305	305	305	310	350	355		370	375	375	360	350	375	365	365	375	330	375	355	320	285	305
22					F		U S	J S														S	F	
	320	300	280	305	310	350	385	390	375	355	350	340	355	375	375	350	375	365	400	340	340	305	315	320
23		J S	F	F	F		U S	J R																
	350	300	315	240	335	355	350	370	375	350	355	340	365	350	370	375	375	365	335	345	345	330	285	310
24			S			S	J S	J S															F	
	300	315	315	315	340	325	395	350	365	350	370	375	370	345	350	365	355	345	355	355	355	335	310	350
25	U S	U S		F			S	J R										S	A	A	A		F	F
	320	325	295	270	340	305	345	380	380	385	385	360	350	355	350	380	370	330				350	310	285
26		F	F	S	S	S	S		J S													S	J S	F
	320	300	270	305	360	350		385	375	370	360	385	370	350	380	360	355	360	350	300	285	315	255	270
27	F		S	F	F	F	F			S									F	A	A	S	F	
	345	360	340	355	330	390	275	365	345	360	350	350	350	340	360	375	360	355	365			300	360	275
28						A	A		S													F		
	300	345	315	285	295			370	375	370	375	390	360	330	365	355	370	335	375	345	305	325	325	310
29	F			F	F		J S									R								
	305	300	315	320	325	360	325	365	365	355	360	365	355	330	380	370	375	350	345	335	350	330	325	325
30			J R			S	U S																	
	295	315	340	335	320	350	320	370	385	360	365	370	350	355	345	375	360	350	320	320	345	355	305	315
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	30	30	27	27	30	29	30	30	30	29	29	29	30	30	28	27	28	27	30	29	30
MED	310	310	315	315	340	345	S 350	368	365	355	350	350	350	350	360	365	365	355	350	340	340	315	305	310
U Q	320	325	325	335	350	350	S 360	380	S 375	365	365	365	358	355	372	370	370	365	365	355	350	330	315	315
L Q	305	300	F 290	305	320	325	J S 325	S 360	358	340	340	340	342	340	342	355	360	345	330	325	310	300	285	300

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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	L	U L 405	L	U L 360	L	L 395	L								
2									L	L	L 385	U L 360	410	L	L 370									
3									L	L	U L 375	L 400	U L 370	370	L	L	L							
4									L	L	U L 380	U L 350	U L 375	U L 385	L	L								
5								L	L 430	U L 375	L 410	U L 360	U L 385	U L 350	L 365	L								
6									L	L	L	U L 370	L 375	L 380	L									
7									L	L	L	U L 360	U L 385	L	U L 385	L								
8										L	U L 350	U L 375	L	L 365	U L 380	L								
9									L	L	U L 370	L 400	C	C	C	L								
10									L	L	U L 370	U L 365	U L 370	L	L	L								
11								L		U L 430	L	L 380	U L 370	L	L	L								
12									L	L	U L 375	U L 400	U L 370	L	L									
13									L		U L 380	L 365	L	U L 385	L									
14										L	U L 395	L	L 380	U L 375	U L 380									
15								U L 425	U L 390	L	L	A	L	L	L	L								
16									L	L	L	U L 400	L	U L 360	L									
17										L	U L 405	U L 370	U L 380	U L 355	U L 375	L								
18									L	L		L	L	L 365	L	L								
19										L	U L 375	U L 370	U L 385	L	L									
20											L	L	A	U L 365	U L 355									
21									A	L	A	U L 385	L	L										
22										L	L	U L 375	U L 400	U L 395										
23									L	L	U L 400	U L 385	U L 380	L	L	L								
24									L	L	L	U L 375	U L 375	L	L									
25										U L 390	L	U L 405	U L 395	L 385										
26									L	L	U L 380	U L 410	U L 390		L									
27									U L 375	L	L	A	U L 370	U L 380	L	L								
28										L	L	U L 385	U L 385	L										
29										L	U L 370	L	L	L	U L 380	L								
30									L	L	L	L 390	L 400	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	3	3	17	23	21	14	9									
MED								U L 425	U L 390	U L 390	U L 380	U L 375	U L 380	U L 372	U L 380									
U 0									L 430	U L 430	U L 398	U L 400	U L 388	U L 385	U L 382									
L 0									U L 375	U L 375	U L 372	U L 365	U L 370	U L 365	L 368									

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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									290	270	275	280	265	250	250	230								
2									240	240	255	230	250	240	240									
3									240	250	240	255	240	255	235	225	210							
4									225	230	240	250	250	250	235	240								
5								220	220	255	225	265	255	250	255	220								
6									255	250	250	255	265	250	255									
7									235	255	260	235	240	245	215	220								
8										220	265	240	265	265	250	230								
9									215	240	250	225	C	C	C	230								
10									230	230	265	260	250	250	240	230								
11								205		230	255	255	245	245	240	225								
12									220	H 225	235	235	260	230	230									
13									225		260	250	240	240	215									
14										235	255	245	250	240	235									
15								215	205	U L 310	255	230	250	255	250	225								
16									215	250	255	220	255	255	240									
17										220	240	230	280	230	235	215								
18									200	225		255	240	265	245	230								
19										235	245	245	250	250	230									
20											250	270	255	240	255									
21									A	225	230	215	245	240										
22										230	255	245	230	225										
23									225	240	230	250	240	255	225	220								
24									225	L 265	230	235	240	250	235									
25										230	215	230	240	245										
26									225	235	240	225	245		220									
27									225	230	250	255	240	230	230	225								
28										240	225	215	240	250										
29										240	240	235	230	240	225	230								
30									215	235	240	225	250	245	250									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	19	28	29	30	29	28	25	15	1							
MED								215	225	235	250	242	250	248	235	225	210							
U Q								220	235	250	255	255	255	250	250	230								
L Q								205	215	230	238	230	240	240	230	220								

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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

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 265	345	270		225	300	225	215	220	210	210	A 265	230	215	225	210	220	195	200	240	275	280	260	275
2	300	280	260	250	245	210	240	225	225	210	200	220	190	230	200	230	210	A	230	230	255	315	380	285
3	260	305	290	250	215	250	240	225	225	225	220	200	205	220	235	215	200	215	A	250	265	A	295	A 355
4	325	285	255	230	270	240	225	235	220	225	205	210	200	220	205	225	205	195	200	210	285	310	A 370	325
5	305	265	250	295	240	225	230	195	205	210	200	200	H 210	235	205	225	210	215	250	240	235	285	280	270
6	210	250	215	235	265	235	215	200	205	H 190	205	210	205	220	245	225	230	220	245	265	260	295	330	245
7	325	290	235	290	330	260	235	230	235	225	225	225	220	220	225	205	210	205	A 230	230	280	365	A	355
8	330	285	270	230	210	365	245	220	225	210	235	220	230	200	190	225	200	A	285	250	215	260	295	305
9	320	350	315	270	230	220	230	215	210	200	200	195	C	C	C	215	220	I C 205	220	230	230	280	285	280
10	295	310	315	305	220	230	S	225	220	220	205	195	225	225	225	225	220	205	200	220	235	250	270	270
11	250	250	300	270	220	240	225	215	215	200	210	210	225	A 250	A 240	215	225	195	215	230	230	230	285	240
12	270	280	265	265	250	240	230	215	210	190	195	210	H 200	225	215	220	215	200	250	240	225	250	285	280
13	280	285	265	265	225	A	225	225	225	215	215	205	A 240	215	A 230	230	210	210	250	235	220	280	280	275
14	300	290	270	250	215	265	230	200	215	210	205	210	210	205	215	215	210	210	205	225	285	265	280	290
15	310	305	300	265	245	215	240	205	200	210	200	A	215	H 200	235	225	215	220	220	A	265	225	240	305
16	300	A 330	310	280	250	230	215	205	200	A 230	200	220	225	215	210	220	210	235	A	250	245	280	265	270
17	285	295	290	275	215	245	220	210	210	200	210	210	200	225	215	215	210	220	210	215	235	290	255	265
18	300	280	285	265	270	235	215	210	185	185	240	200	225	225	230	230	210	200	235	215	210	270	255	255
19	E A 310	285	275	250	245	215	245	210	225	230	210	200	210	230	A 240	230	205	215	195	215	240	E B 330	320	315
20	A 330	230	230	225	300	330	255	230	200	225	220	A 260	A	210	220	225	215	205	220	220	A	265	A 335	270
21	275	295	295	285	260	260	250	230	A	210	A	210	230	230	225	215	215	220	250	205	235	240	290	280
22	285	285	325	295	290	245	220	215	210	200	H 195	220	215	H 185	215	235	210	A 235	210	250	255	265	270	280
23	245	265	295	310	255	240	250	205	210	225	215	210	200	H 195	225	220	205	200	230	210	230	240	290	300
24	310	295	285	285	270	255	200	205	195	185	245	H 205	210	215	220	225	210	215	245	255	220	H 235	270	265
25	280	280	320	305	265	245	215	205	215	215	220	210	195	230	235	200	200	220	A	A	A	225	255	280
26	280	315	325	285	240	275	265	215	225	H 190	210	215	205	240	230	225	210	215	210	280	265	285	380	380
27	230	240	260	245	255	240	330	225	205	225	220	A	215	200	A 230	225	200	230	230	A	A	330	250	310
28	290	250	280	310	305	A	A	225	215	215	210	H 195	215	215	230	225	215	220	210	210	255	260	240	280
29	280	280	270	280	250	200	280	215	215	H 180	230	H 195	215	200	225	230	200	205	210	270	220	250	A 300	315
30	310	280	265	265	260	240	230	210	210	215	185	185	180	235	235	225	205	210	255	270	230	230	280	300
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	28	28	30	29	30	29	28	28	29	29	30	30	28	27	27	27	29	29	30
MED	292	285	282	270	250	240	230	215	215	210	210	210	212	220	225	225	210	212	220	230	235	265	280	280
U Q	310	295	300	285	265	258	245	225	222	225	220	218	225	230	232	225	215	220	245	250	265	288	298	305
L Q	278	265	265	250	225	230	222	205	205	200	200	200	202	208	215	215	205	205	210	215	230	245	262	270

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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

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							S		A	A							A							
								120	125	125	100	110	110	115	115	110								
2							B					A					A							
								115	110	115	110	125	110	110	110	110								
3							B	A		A		A	A	A			A							
								140	115		100		135		110	115								
4							B	A	A							A	A							
								125		115	110	110	110	110	110									
5							S	B	A				A			A	A							
									135	105	105	125		110	115									
6							B								A	A	A							
								140	135	125	120	120	115	110										
7							S									A	A							
								145	125	115	105	110	110	110	110	135								
8							B	A	A			A		A	A	A	A							
										105	115		110											
9							B	S	A				C	C	C	A	B							
										125	115	110												
10							B	A	A	A			A	A	A	A	S							
											115	115		115										
11							B	B	S			A	A			A	A							
										110	110		140	110	110									
12							S	B	A	A	A				A	A	A							
												130	110	110										
13							S	S						A	A	A	A							
									125	110	110	110	110											
14							B	A		A	A	A	A	A	A		S							
									120						125	105								
15							S	A		A		A	A		A		A							
									120		110		120	105		110								
16								A	A		A	A	A				A							
										110	125	125		110	110	110								
17								A	A	A		A	A			A	A							
										125	125	130		110	110									
18								A	A			A			A	A	A							
										125	120		130	125										
19								B						A	A	A	A							
									110	110	115	115	115											
20								S					A			A	S							
									125	115	110	110		110	110									
21								A	A	A	A	A	A	A			A							
												135	125		125	115								
22								A			A				A		A							
									115	115		115	110	115		115								
23								A			A	A		A	A	A	A							
									115	110			135											
24								A		A					A	A								
									110	130	110	120	110	110			110							
25								A	A	A	A	A	A				A							
														125	105									
26																	A							
								125	115	115	120	120	110	125	110	110								
27								A	A			A	A	A	A	A	A							
										125	105													
28								A	A		A						A							
										120	125	110	125	115	115	115								
29								A	A	A						E S	A							
											125	110	125	110	115	150								
30									A	A						E A	A							
								125		125	130	110	125	125	135	140								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								8	15	22	24	21	21	21	17	13	1							
MED								125	120	115	112	115	115	110	110	112	110							
U Q								140	125	A 125	120	A 125	125	115	115	125								
L Q								122	115	110	110	110	110	110	110	110								

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

IONOSPHERIC DATA STATION KOKUBUNJI

NOV. 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

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	100	100	100	110	110	110	S	150	110	105	120	115	115	110	115	110	105	100	B	110	105	105	105	100
2	100	150	100	B	B	S	100	125	115	125	115	125	G	G	165	110	105	95	115	100	100	95	100	105
3	100	100	B	105	110	115	B	115	130	110	135	105	180	105	G	150	110	105	100	135	110	110	B	105
4	115	105	100	105	110	100	100	150	125	120	120	120	125	120	115	115	105	100	100	B	B	100	95	105
5	100	100	100	100	110	105	S	B	105	160	G	110	110	140	125	120	110	130	120	B	B	100	105	125
6	B	100	100	100	B	120	B	G	110	110	155	100	95	G	95	110	105	100	95	115	B	125	105	B
7	110	120	110	105	105	120	115	150	135	130	145	125	G	120	160	135	110	105	105	110	95	90	95	105
8	105	105	105	95	105	105	120	110	90	155	160	115	110	115	110	110	100	100	105	105	105	115	95	110
9	95	95	135	110	105	100	100	130	110	105	105	G	C	C	C	105	B	C	S	110	115	105	105	140
10	B	B	105	100	100	100	95	110	95	95	125	100	95	95	100	100	S	B	B	B	B	135	B	B
11	115	140	100	105	B	B	B	G	S	G	G	125	125	115	115	110	110	B	110	110	110	100	100	95
12	105	105	115	B	B	B	110	B	110	110	110	105	G	G	115	110	100	100	115	100	100	100	100	95
13	100	110	115	B	100	125	115	S	110	G	125	G	115	115	110	110	110	105	105	95	100	100	100	100
14	100	95	100	B	B	B	105	115	105	115	115	115	115	110	110	110	100	115	110	105	110	110	120	90
15	100	110	B	B	B	110	155	115	100	110	G	100	110	G	110	115	105	105	100	100	S	B	135	110
16	B	95	100	100	110	B	115	125	135	115	110	E G 180	115	G	120	115	110	105	105	105	105	110	B	100
17	100	100	95	125	100	100	110	90	110	110	170	110	110	165	G	115	105	100	105	105	100	105	B	B
18	B	110	135	B	115	B	S	130	110	120	170	115	170	105	100	100	100	110	100	B	B	S	110	S
19	115	S	B	S	120	B	110	B	120	180	165	115	115	115	110	110	110	110	B	120	120	110	B	110
20	135	115	B	B	95	105	105	S	110	150	140	115	110	G	G	115	S	B	100	120	110	105	100	100
21	115	100	100	100	100	B	S	115	105	110	100	110	100	110	155	140	135	115	110	110	105	105	100	95
22	95	100	105	115	B	100	100	100	100	125	110	105	100	90	150	125	115	105	120	100	95	100	110	150
23	100	100	B	100	95	95	95	110	G	G	110	110	110	105	110	105	100	100	100	100	115	105	B	95
24	125	B	135	135	S	105	B	115	G	110	E G 180	170	155	150	100	140	115	115	110	110	B	110	B	B
25	115	110	110	B	105	125	S	120	105	100	100	100	100	140	125	95	95	110	110	110	105	100	100	120
26	105	100	120	100	B	100	100	115	130	G	170	110	120	170	155	G	100	125	95	B	110	115	90	110
27	B	115	125	115	110	105	110	100	100	100	110	110	105	105	110	115	100	100	115	110	100	100	110	115
28	100	B	105	100	115	115	95	110	110	95	115	G	95	100	135	125	115	90	B	B	110	95	B	100
29	120	105	100	95	100	105	S	115	105	105	180	G	E G 170	E G 185	155	170	120	115	110	100	100	95	95	100
30	100	105	B	B	105	B	B	105	110	E G 190	110	G	100	170	165	150	95	95	90	90	90	110	120	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	24	20	21	21	19	23	27	26	27	25	26	23	26	29	27	26	25	24	23	28	22	24
MED	100	105	105	102	105	105	105	115	110	110	120	110	110	115	115	115	105	105	105	108	105	105	100	105
U Q	115	110	115	110	110	115	115	125	115	125	160	118	120	140	150	125	110	110	110	110	110	110	110	110
L Q	100	100	100	100	100	100	100	110	105	105	110	105	100	105	110	110	100	100	100	100	100	100	100	100

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

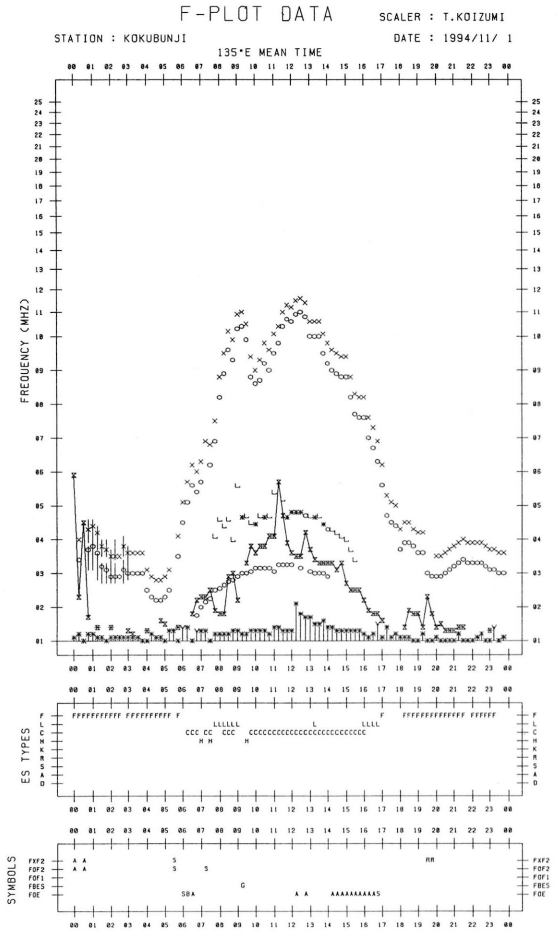
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHZ TO 25.0MHZ IN 24.0SEC IN MANUAL SCALING

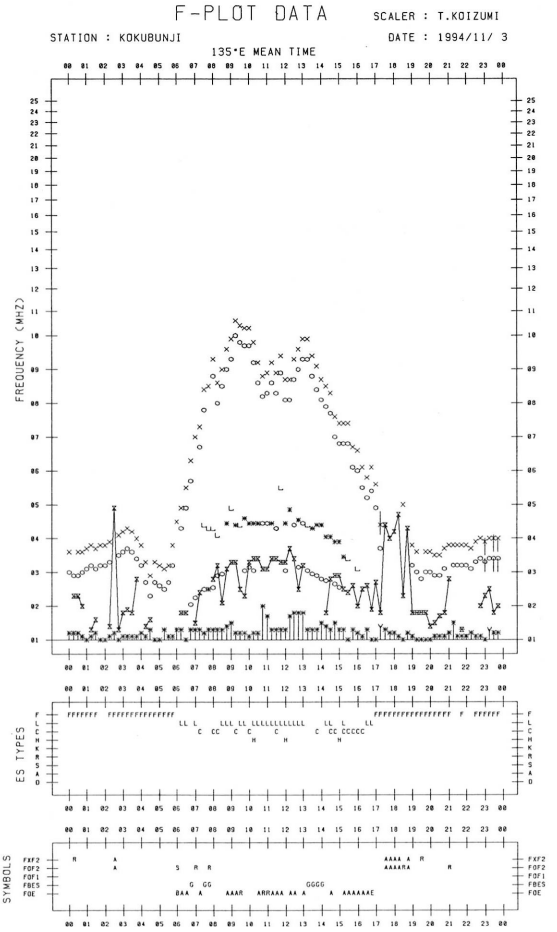
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 4	F 2	F 2	F 2	F 2	FF 22		H 1	L 1	L 1	C 1	C 2	C 2	C 2	C 1	C 2	LC 21	F 1		F 3	F 2	F 1	F 1	F 2
2	F 1	F 1	F 2				L 2	C 1	C 1	C 1	C 1	CL 11			H 1	C 2	L 2	F 4	FF 13	FF 21	FF 21	FF 21	F 2	FF 11
3	F 2	F 2		F 3	F 1	F 1		L 1	C 1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

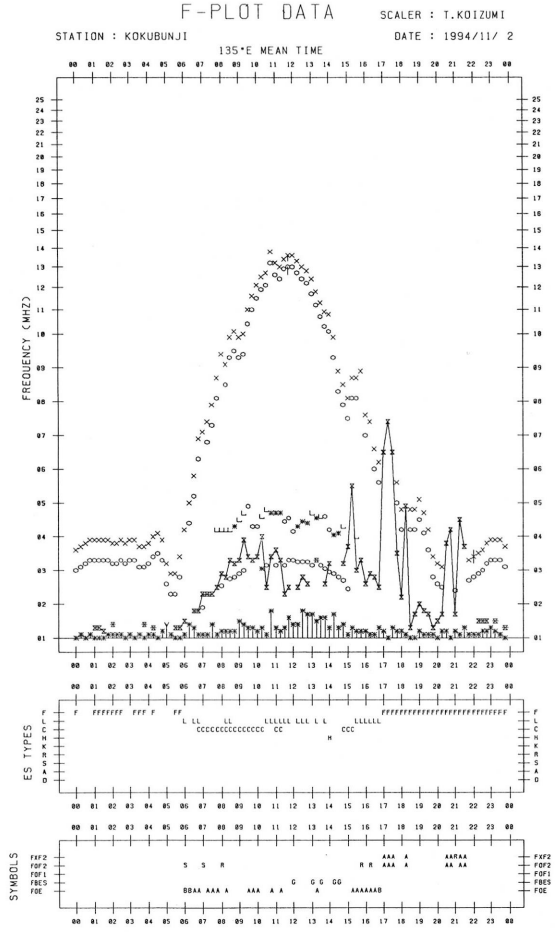
NOV. 1994 TYPES OF ES COMMUNICATIONS RESEARCH LABORATORY, JAPAN

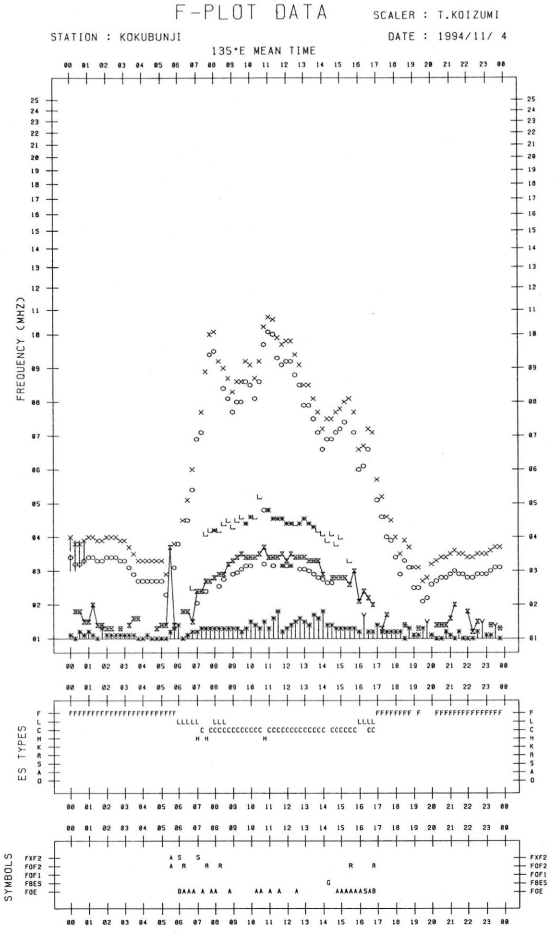
f-PLOTS OF IONOSPHERIC DATA

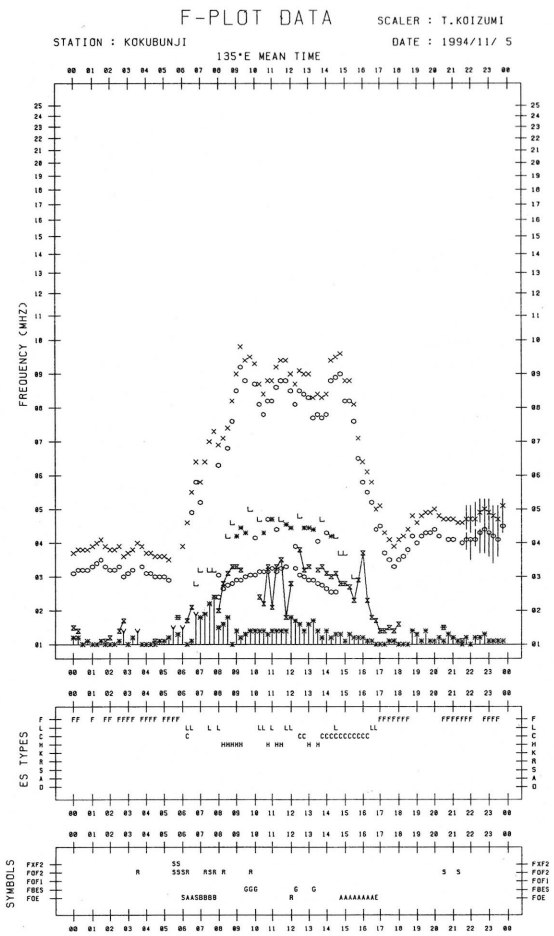
KEY OF F-PLOT	
I	SPREAD
○	FOF2, FOF1, FOE
×	FXF2
✳	DOUBTFUL FOF2, FOF1, FOE
⧖	FBES
⌊	ESTIMATED FOF1
↑, Y	FMIN
∧	GREATER THAN
∨	LESS THAN

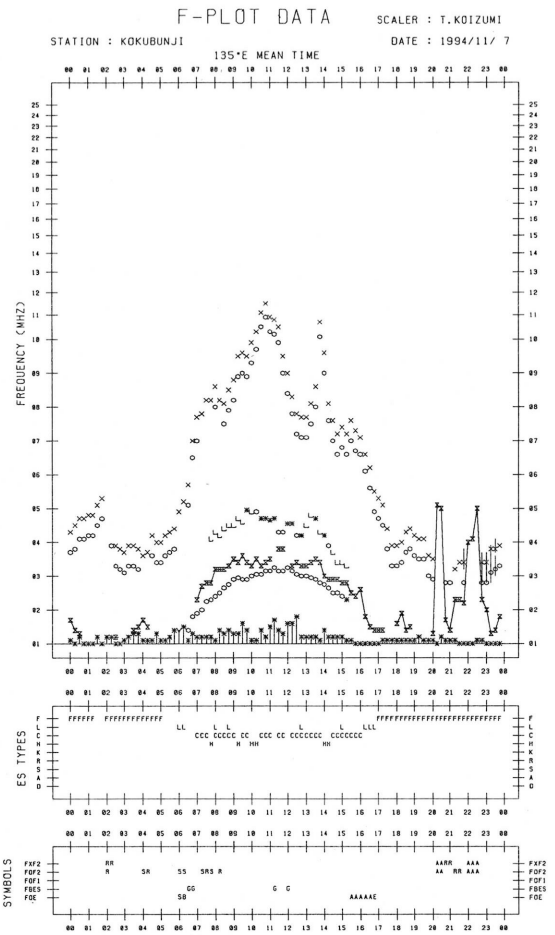

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 1
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FOE

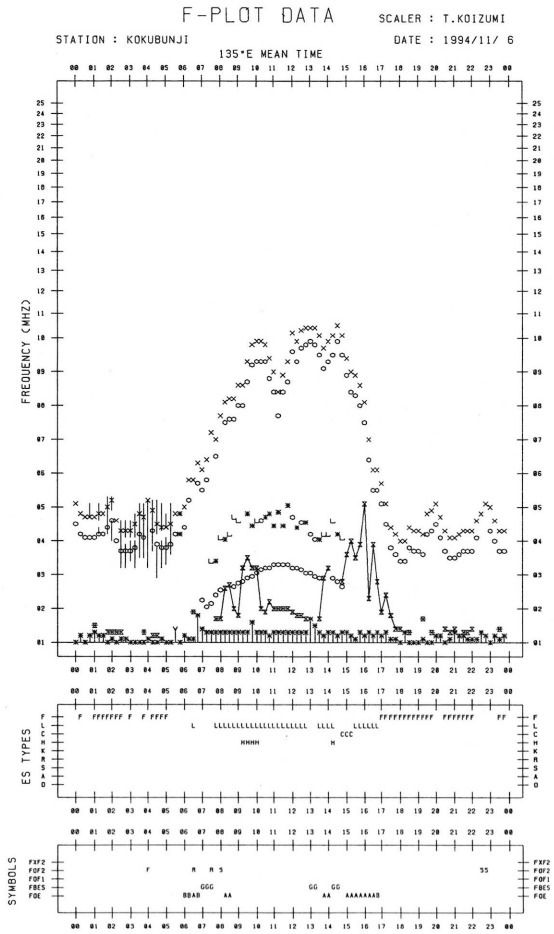

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 3
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FOE

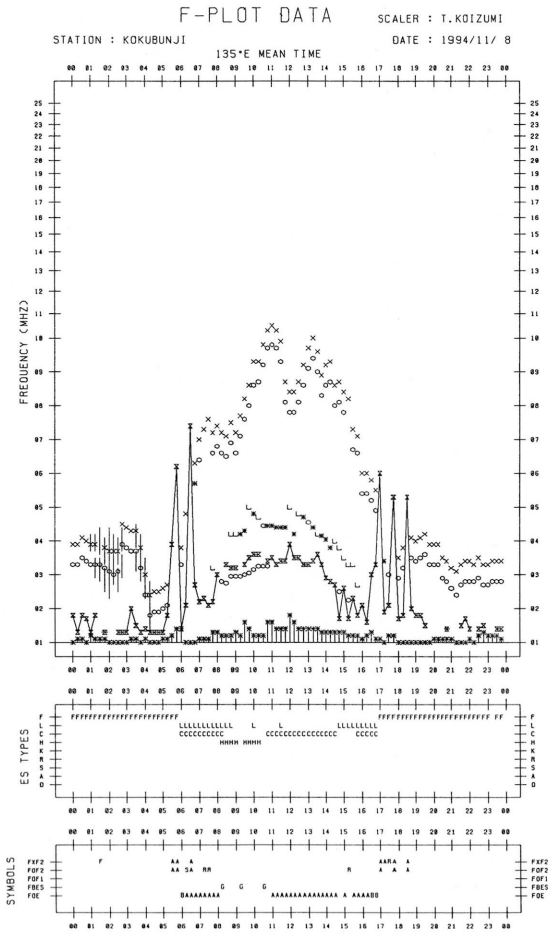

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 2
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FOE

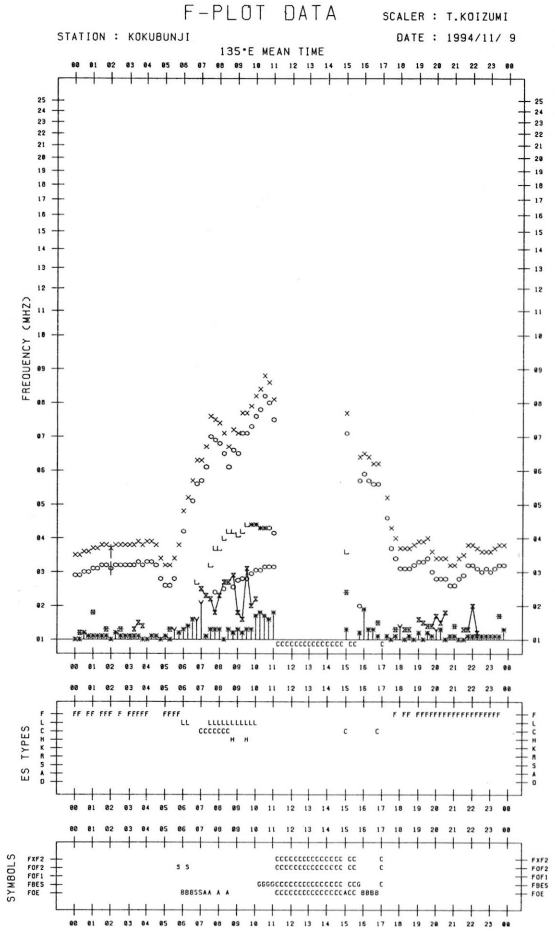

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 4
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 5
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 7
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 6
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 8
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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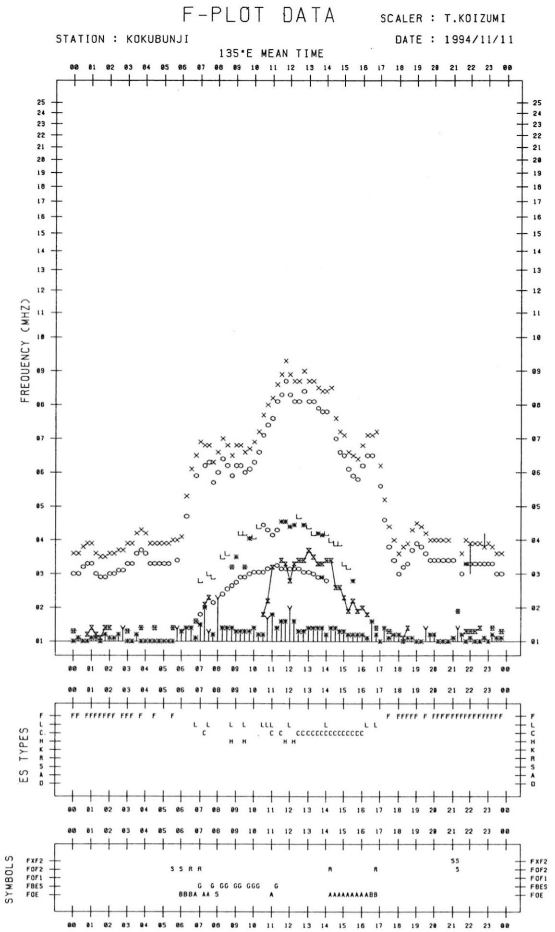
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/ 9
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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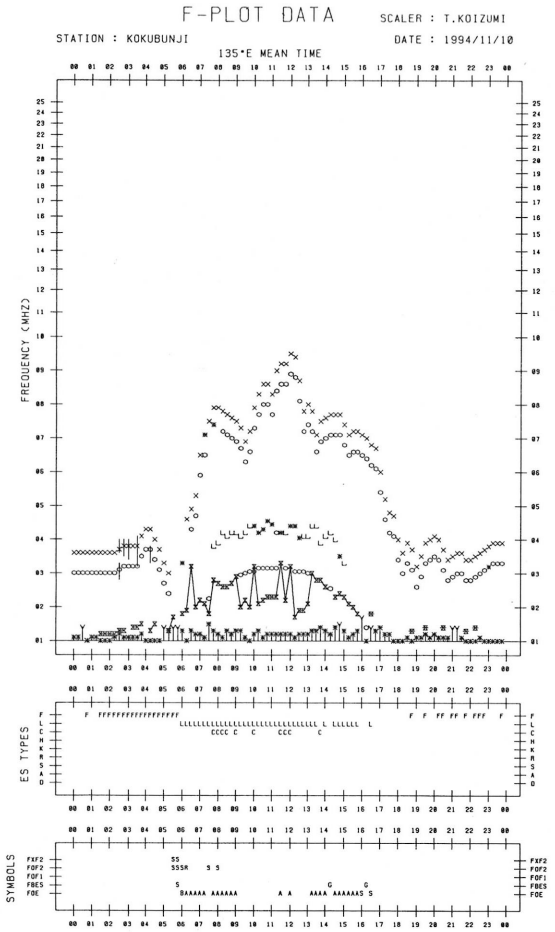
STATION : KOKUBUNJI
DATE : 1994/11/11
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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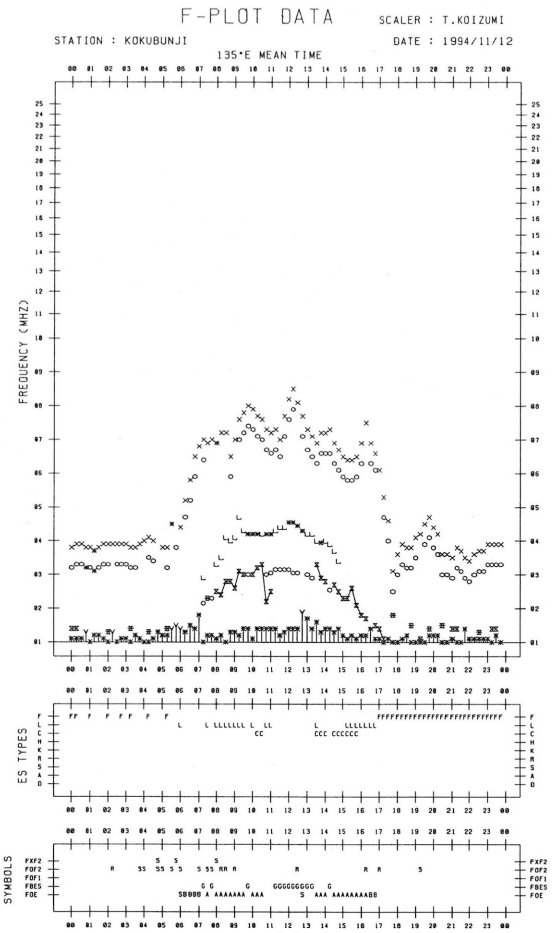
STATION : KOKUBUNJI
DATE : 1994/11/10
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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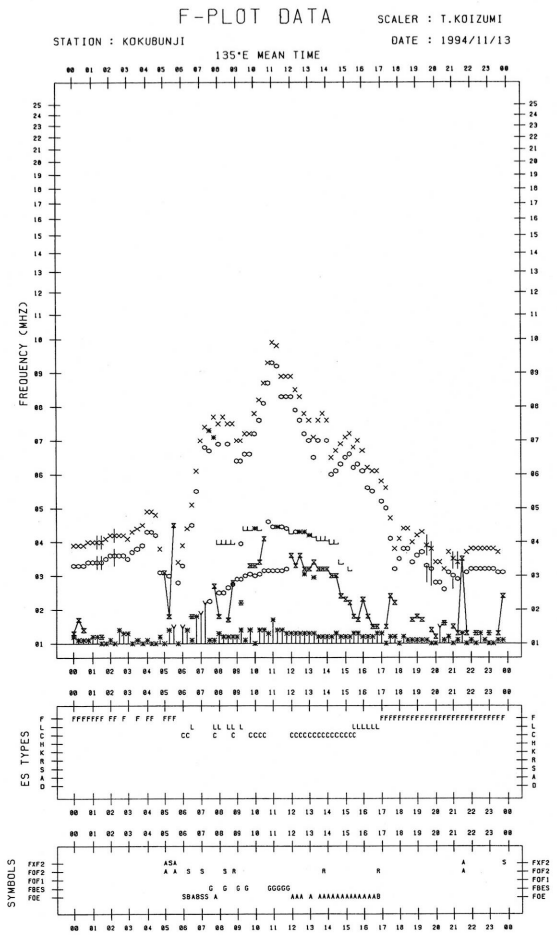
STATION : KOKUBUNJI
DATE : 1994/11/12
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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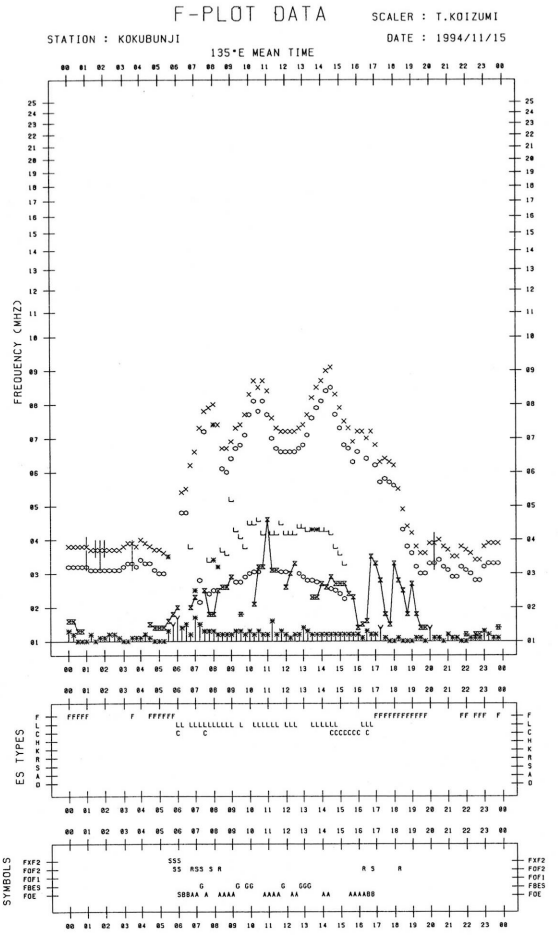
STATION : KOKUBUNJI
DATE : 1994/11/13
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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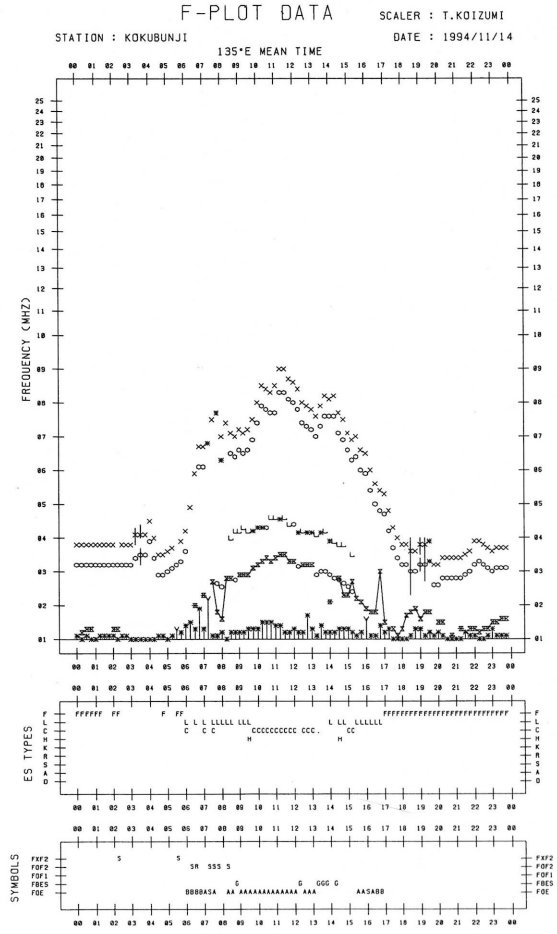
STATION : KOKUBUNJI
DATE : 1994/11/15
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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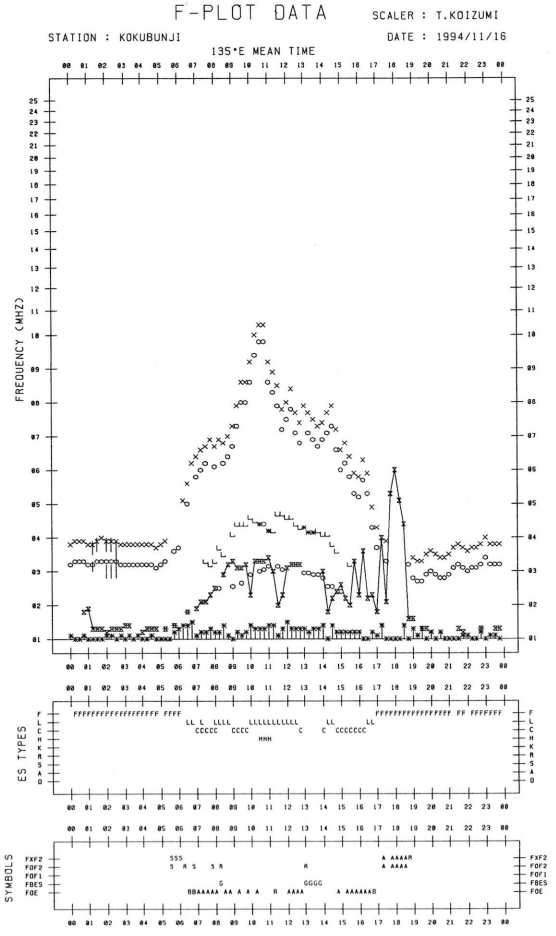
STATION : KOKUBUNJI
DATE : 1994/11/14
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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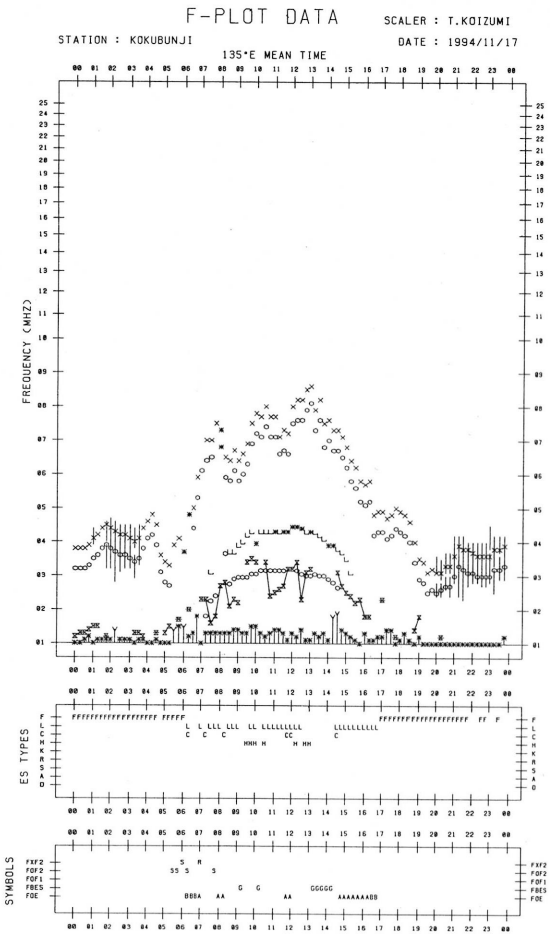
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/16
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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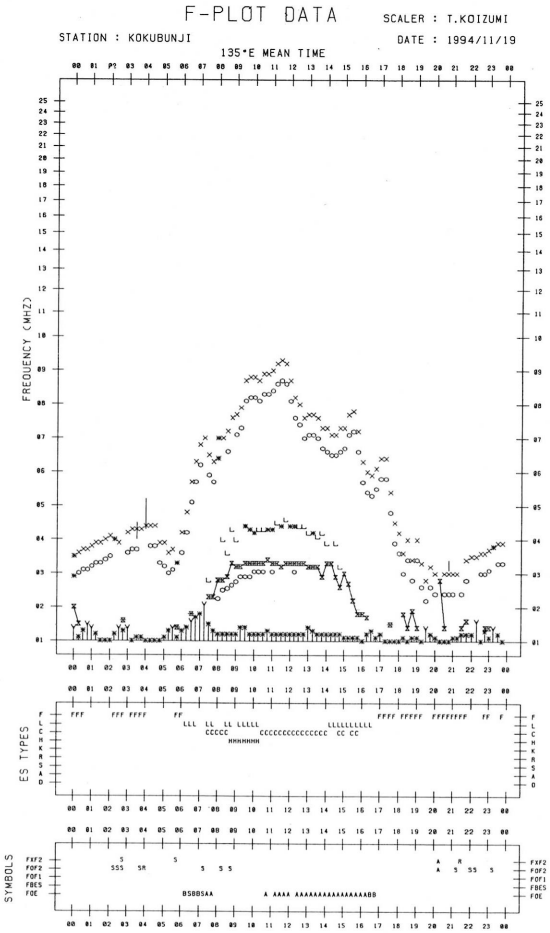
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/17
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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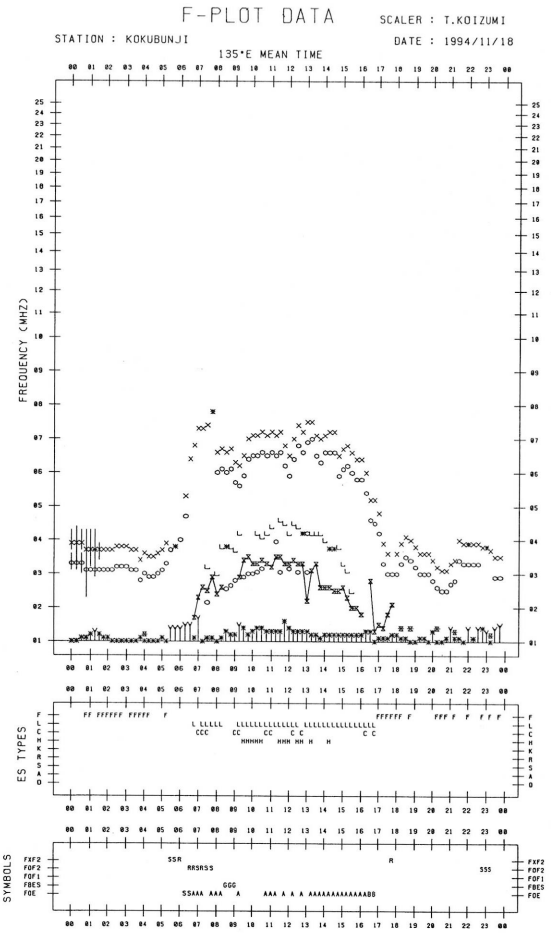
STATION : KOKUBUNJI
DATE : 1994/11/19
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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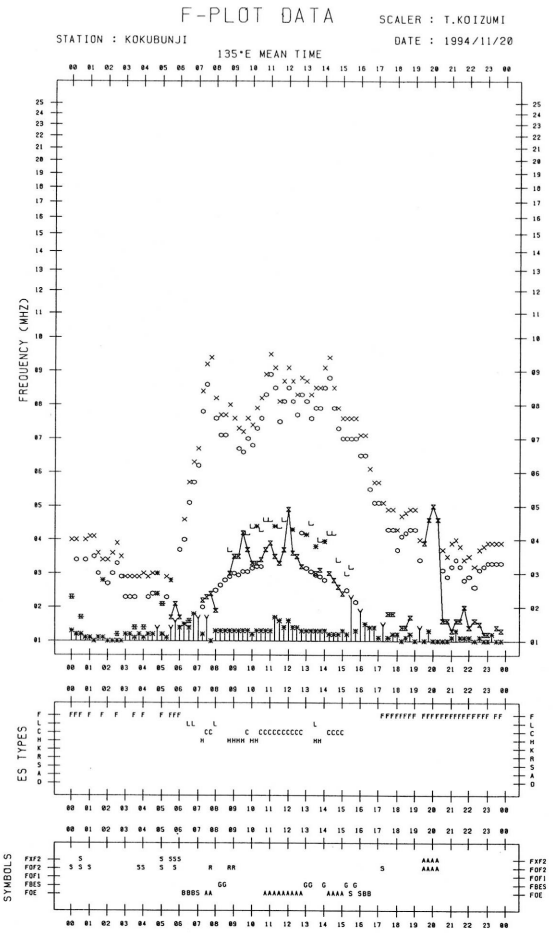
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/18
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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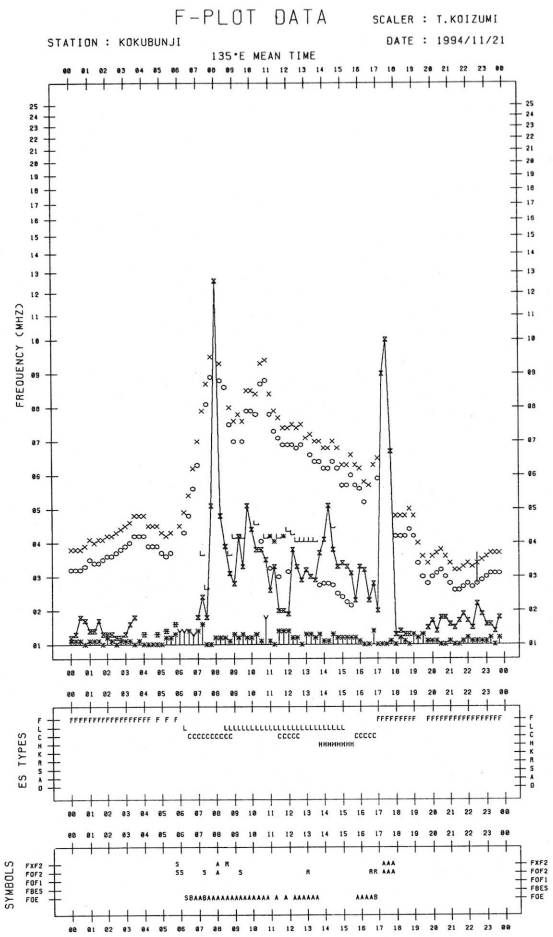
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/20
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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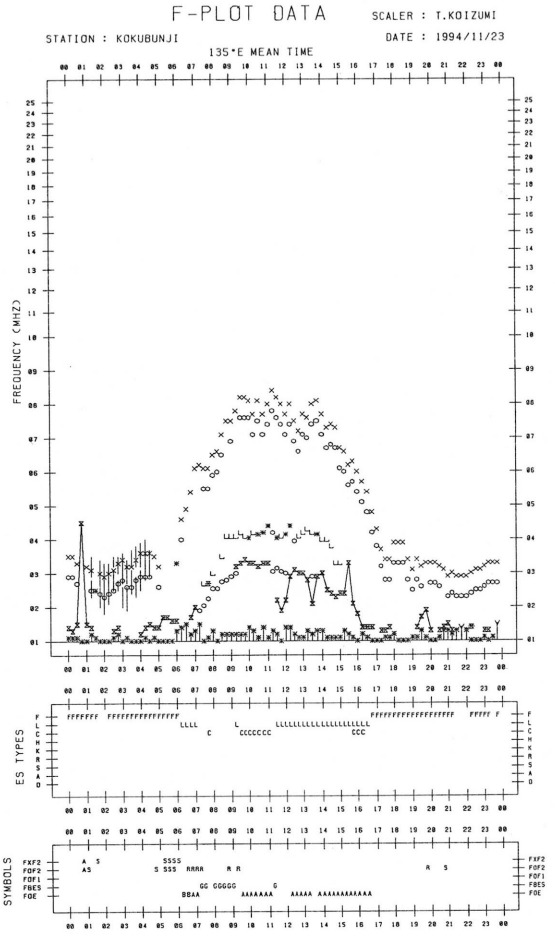
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/21
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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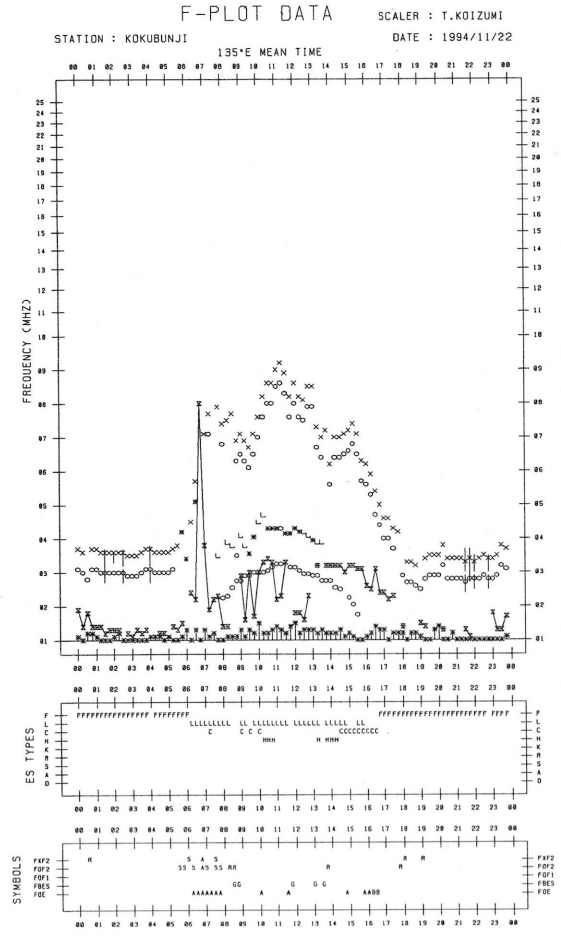
STATION : KOKUBUNJI
DATE : 1994/11/23
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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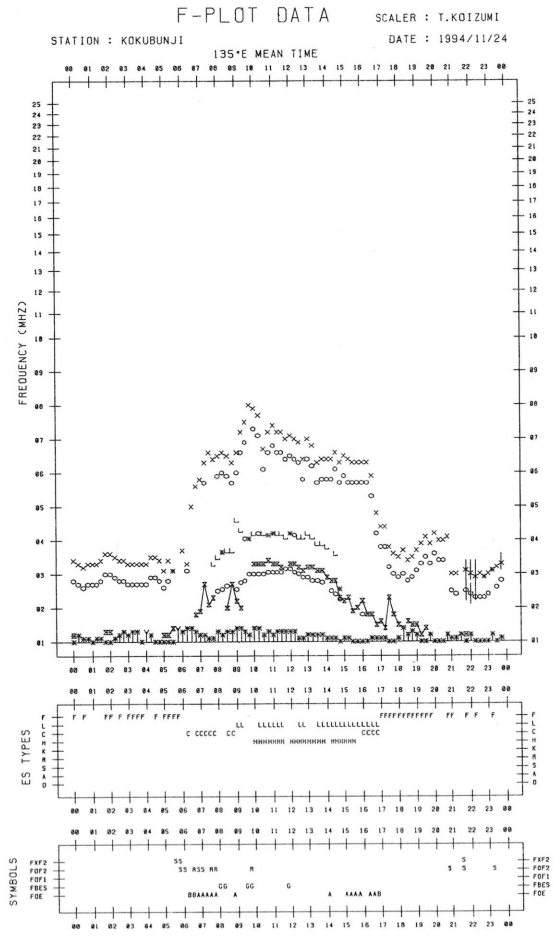
STATION : KOKUBUNJI
DATE : 1994/11/22
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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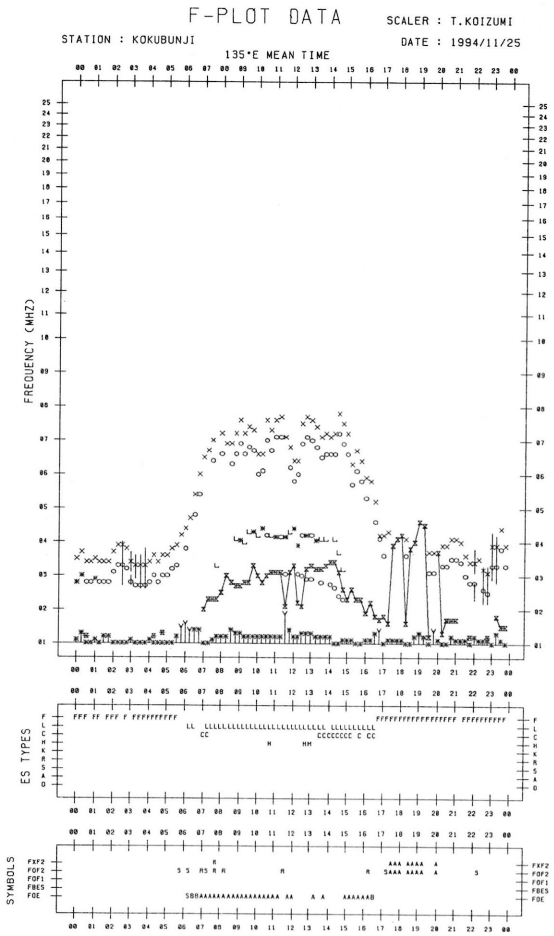
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/24
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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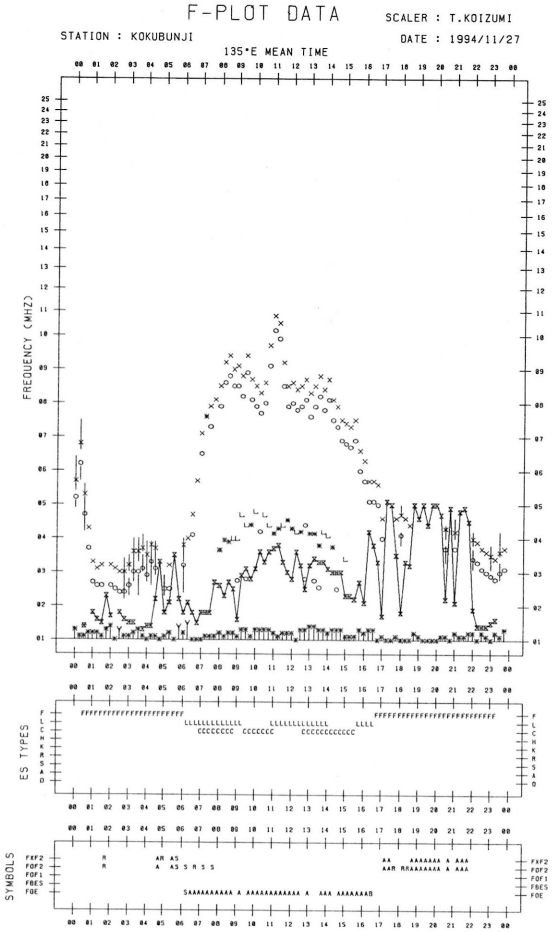
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/25
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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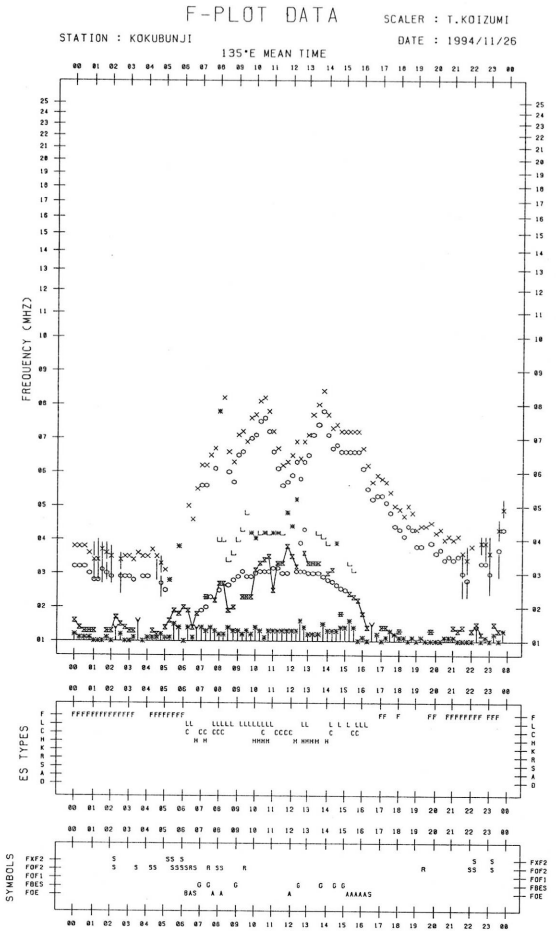
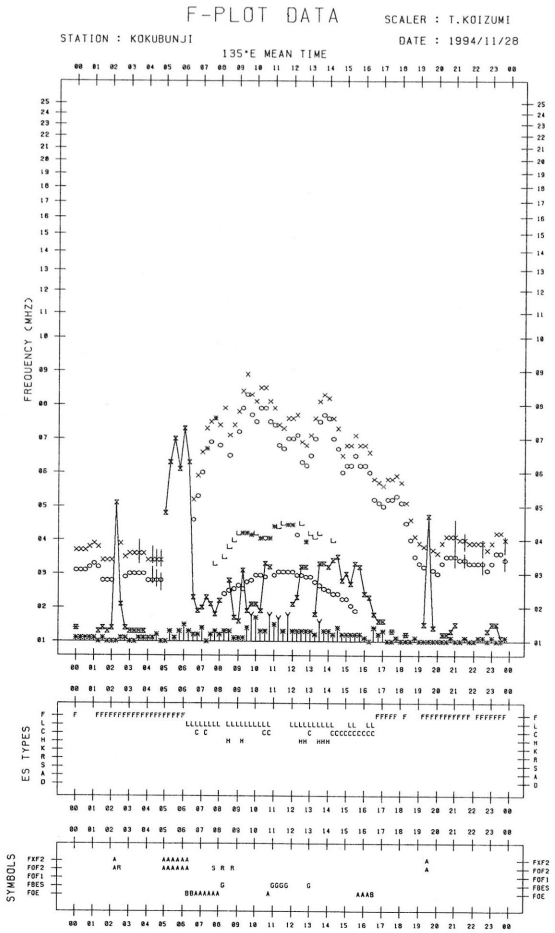
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/27
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/26
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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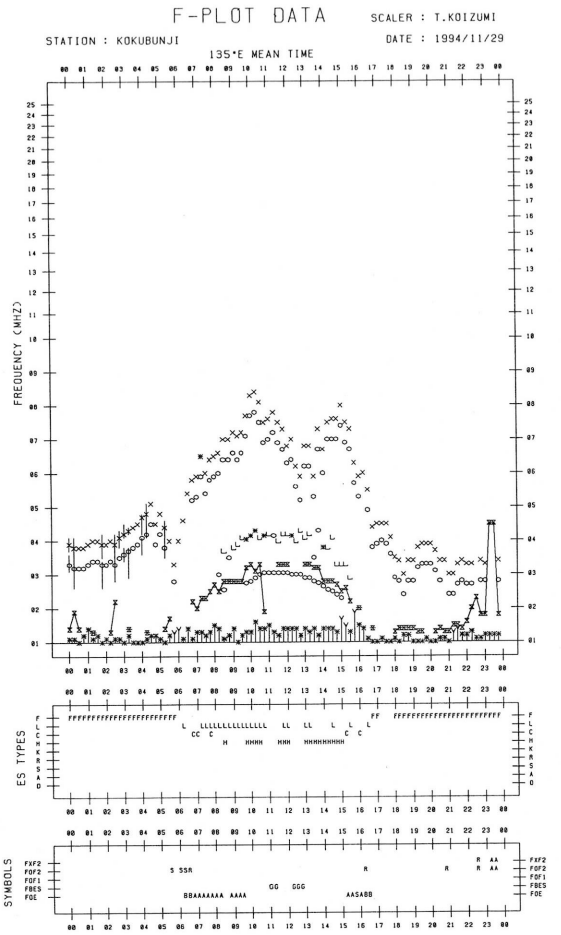
STATION : KOKUBUNJI
DATE : 1994/11/28
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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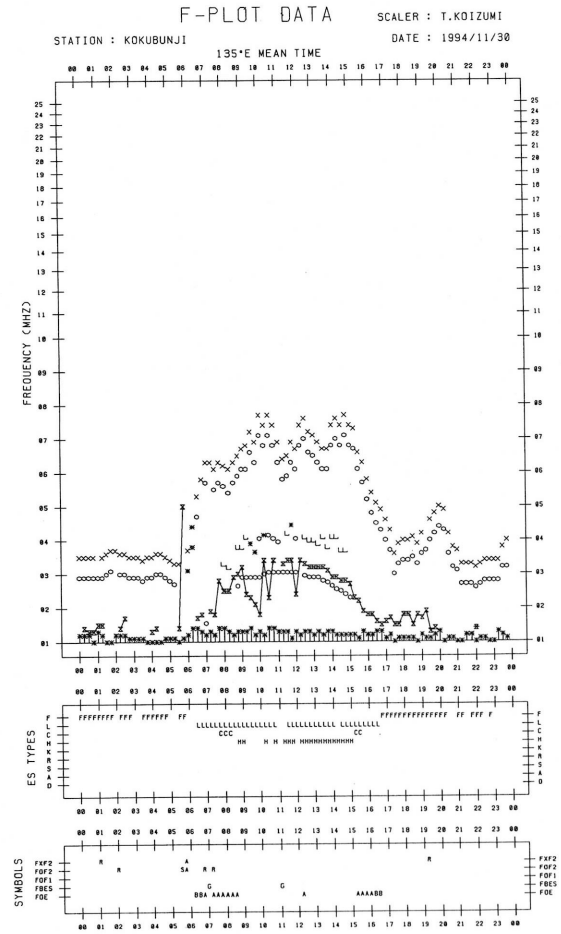
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/29
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/11/30
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

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

Note: No observations during the following periods.

12th 2300-14th 0001 15th 0502-2305 16th 2150-17th 0035
17th 2150-18th 0045 22nd 2100-24th 0150 24th 2300-26th 0007
26th 2100-2355 27th 2100-28th 0003 28th 0300-2357
29th 2100-30th 0715

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso November 1994

Single-frequency observations

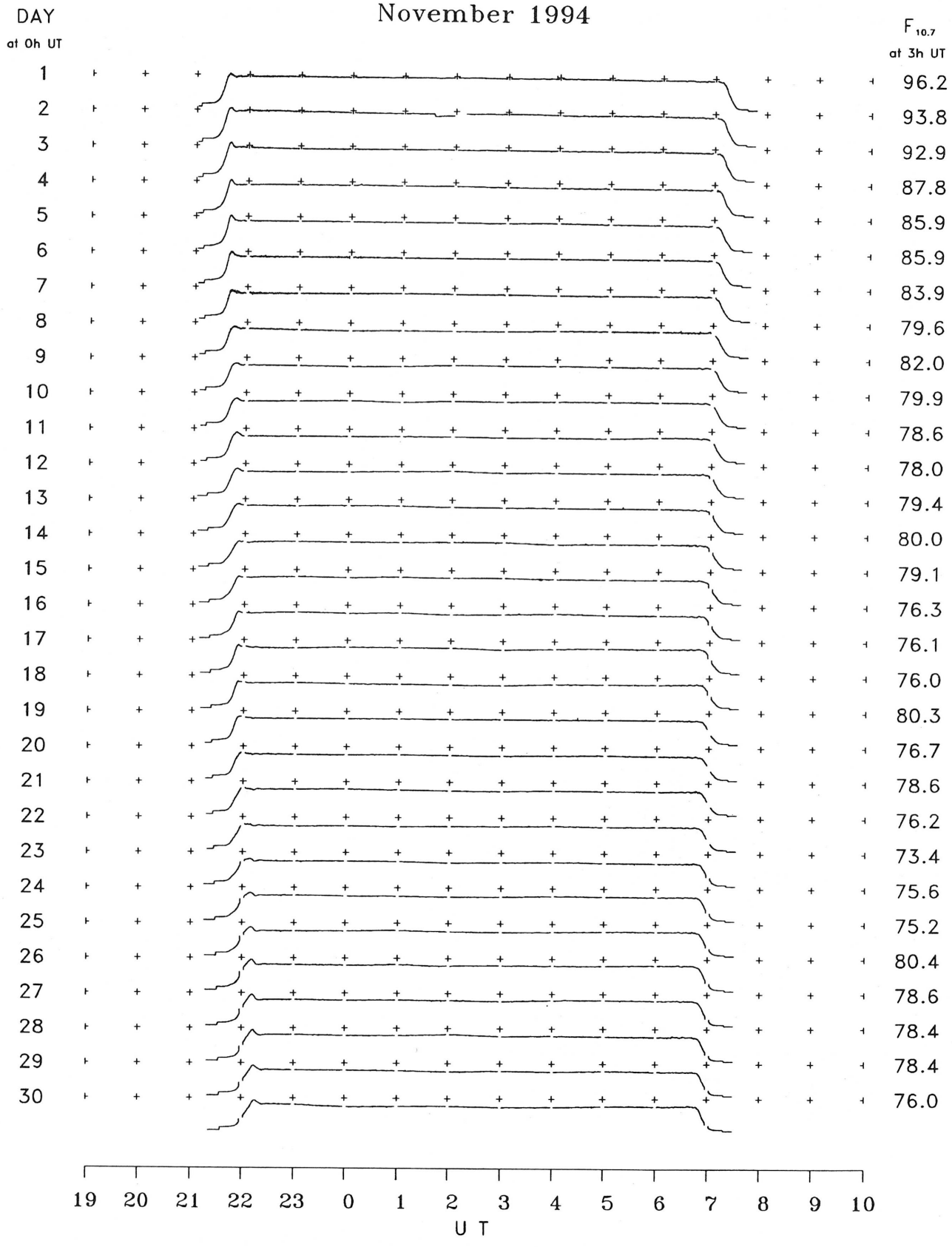
Normal observing period: 2120 - 0730 U.T. (sunrise to sunset)

NOV. 1994	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
1	500	8 S	0356.0	0356.2	0.2	13	-	0
	500	42 SER	0610.9	0611.4	2.0	4	-	0
4	2800	1 S	0009.2	0010.6	2.0	7	3	0
27	2800	8 S	0209.4	0209.5	0.8	5	-	0
	500	42 SER	0209.4	0218.4	11.5	70	-	ML
	2800	1 S	0216.3	0217.5	2.0	4	3	0
	500	8 S	0356.0	0356.6	0.6	20	-	WL
	500	46 C	0411.2	0413.8	4.0	50	20	ML
	2800	20 GRF	0411.6	0415.3	5.5	3	1	0
	500	42 SER	0544.8	0545.4	4.0	6	-	WL

B. Solar Radio Emission

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

November 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)

NOV 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	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	-2	2	-6
2	-13	-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	ES -28	-4	-7	-13
3	ES -28	ES -28	ES -24	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	-7	-7
4	-4	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	-7	-7
5	C	C	ES	ES	C	C	C	C	C	C	C	C	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-7	-8	-7
6	-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 -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-10
7	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	ES -28	ES -28	ES -28	ES -28	-7	-4	-13
8	-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	ES -28	ES -28	ES -28	-13	-13	-13
9	-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	ES -28	ES -28	ES -28	-7	-7	-8
10	-10	-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	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-7	-8	3
11	-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	ES -28	ES -28	-4	-10	-7
12	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	ES -28	ES -28	ES -28	-13	-13	-7	-7	-7	-4	-7
13	-7	-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	-7	-4	-13
14	-20	ES -19	-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	ES -28	ES -28	ES -28	ES -28
15	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	ES -28	ES -28	ES -28	ES -28	ES -28	-19	ES -28	-19	ES -28
16	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	-7	-3	-4
17	-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	-13	-2	1	0
18	-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	0	3	0
19	4	ES -28	ES -28	-1	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	-4	3	-2
20	-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	-7	-4	0	2
21	-4	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	-7	-4	-5	1	1
22	-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	-5	-2	-4
23	-4	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	-7	-2	-4
24	-4	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	-7	-2	-2
25	-4	ES -28	-10	ES -28	ES -28	ES -28	ES -28	-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	-2	1
26	-4	-7	-7	ES -28	-7	-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	-13	-2	-10
27	ES -28	ES -7	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	ES -28	-5	-5	-7
28	ES -28	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	ES -28	ES -28	ES -28	ES -28	ES -28	-19	ES -28	-9
29	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	-19	-19	-13
30	ES -28	ES -28	ES -28	ES -28	-19	-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	-9	-19	-5
CNT	29	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	-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	-7	-4	-7
UD	-4	-7	ES -10	ES -28	ES -27	ES -27	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 -27	ES -27	-7	-2	2	1
LD	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	-13

C. RADIO PROPAGATION

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

NOV 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	4	7	4	14	13	0	-8	-9	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	ES -27	2	-8	-2	-3	-2	9	-2	7
2	8	8	5	8	8	17	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	-2	6	0
3	3	2	2	6	7	-8	-15	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	9	1	7
4	5	-1	8	20	9	-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	ES -28	2	7	8	8
5	C	C	C	C	C	C	C	C	C	C	C	C	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	3	13	8	-2
6	-1	6	8	8	13	6	-4	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	3	1	5	-2
7	-2	6	9	6	8	-13	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-3	ES -28	-19	-4	17	6	2
8	8	3	13	9	8	1	-19	-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	4	16	3
9	9	9	8	10	16	-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	-19	8	11	5	8
10	13	8	3	8	8	8	-5	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	13	2	13
11	6	5	5	10	2	-13	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	-2	8	8	3
12	3	2	1	9	-2	-9	-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	3	9	5	2
13	-2	6	8	17	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	-2	ES -28	10	8	3	-2
14	-7	-1	8	13	13	-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	8	8	6	6
15	4	10	1	3	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	ES -28	ES -28	3	7	3	3
16	3	8	9	8	13	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	6	9	3	6
17	4	13	14	7	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	ES -28	4	8	9	8
18	4	11	6	10	7	-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	-9	-5	16	8	13
19	8	10	8	10	15	7	10	-22	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-2	3	5	14	6
20	5	6	15	13	13	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	ES -28	14	18	15	8
21	9	6	-2	9	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	-19	-4	9	3	3	8
22	6	6	8	8	-7	-4	-4	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	8	8	8	6
23	3	6	8	13	1	-2	-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	2	6	6	6
24	3	11	10	9	-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	ES -28	ES -28	-1	15	8	8
25	6	16	14	12	6	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	1	-6	4	13
26	3	10	6	8	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 -28	ES -28	ES -28	2	3	10	8
27	8	3	8	8	13	-7	-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	-2	1	10	8	3
28	4	6	4	4	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 -28	ES -28	ES -28	1	8	9	8
29	3	10	16	3	3	-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	15	9	-4	8
30	16	1	3	0	3	-2	-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	6	8	3	16
CNT	29	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	4	6	8	9	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 -28	ES -28	ES -28	3	8	6	6
UD	9	11	14	14	13	8	-4	-13	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	ES -28	-19	-3	13	16	14	13
LD	-2	1	1	3	-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	ES -28	ES -28	-4	1	1	-2

C. Radio Propagation

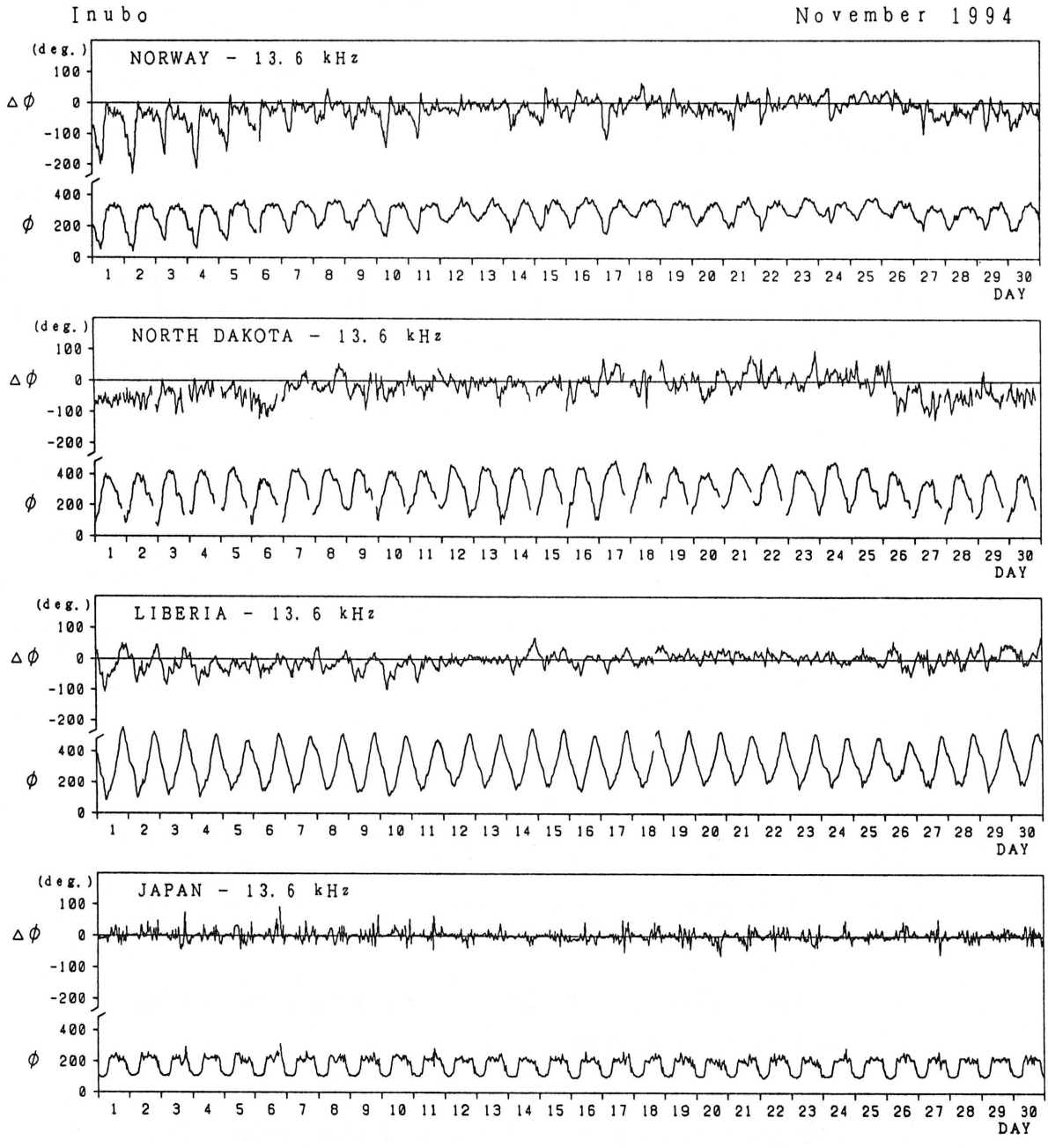
C2. Radio Propagation Quality Figures at Hiraiso

Hiraiso — Time in U.T.

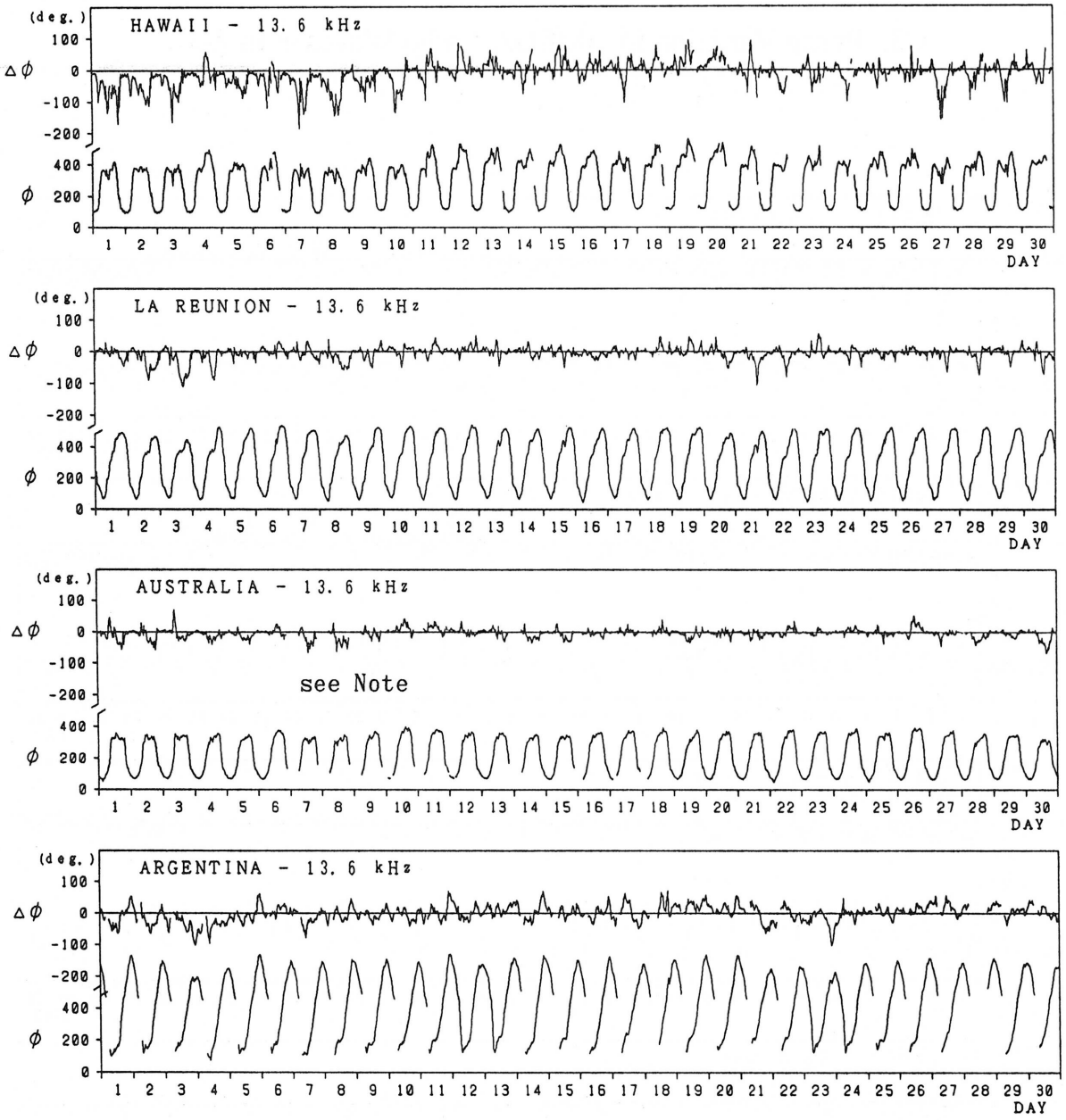
NOV. 1994	Whole Day Figure	WWV 00-06	WWV 06-12	WWV 12-18	WWV 18-24	WWVH 00-06	WWVH 06-12	WWVH 12-18	WWVH 18-24	Condition 00-06	Condition 06-12	Condition 12-18	Condition 18-24	Principal Geomagnetic Storms Start h m	Principal Geomagnetic Storms End h	Storms RaPge nT
1	4+	-	-	-	4	4	5U	5U	4	U	U	U	U			
2	4-	4U	-	-	3U	4	-	-	4	U	N	N	N			
3	4o	-	-	-	4	4	4	-	4	N	N	N	N			
4	4-	-	-	-	3U	4	-	-	4	N	N	N	N			
5	4oUC	C	C	-	4	C	C	-	4	N	N	N	N			
6	4-	4U	-	-	2U	4	5U	-	4	N	N	N	N			
7	3+	3U	-	-	3	4	-	-	4	N	N	N	N			
8	4o	-	-	-	3	4	5U	-	4	N	N	N	N			
9	4o	-	-	-	4	4	-	-	4	N	N	N	N			
10	4o	4U	-	-	4	4	-	-	4	N	N	N	N			
11	4+	-	-	-	4	4	-	-	4	N	N	N	N			
12	4+	-	-	-	5U	4	-	-	4	N	N	N	N			
13	4o	5U	-	-	3	4	-	-	4	N	N	N	N			
14	3+ U	4U	-	-	2U	4	-	-	4	N	N	N	N			
15	3+	3U	-	-	3U	3	-	-	4	N	N	N	N			
16	4o	-	-	-	4	4	-	-	4	N	N	N	N			
17	4o	-	-	-	4	4	-	-	4	N	N	N	N			
18	4+	-	-	-	5	4	-	-	4	N	N	N	N			
19	4+	5U	-	-	4	4	-	-	4	N	N	N	N			
20	5-	-	-	-	5	4	-	-	5	N	N	N	N			
21	4o	-	-	-	5	3	-	-	4	N	N	N	N			
22	4o	-	-	-	4	4	-	-	4	N	N	N	N			
23	4o	-	-	-	4	4	-	-	4	N	N	N	N			
24	4-	-	-	-	4	3	-	-	4	N	N	N	N			
25	4+	5U	-	-	4	4	-	-	4	N	N	N	N			
26	4o	5U	-	-	3	4	-	-	4	N	N	N	N	05.9	--	219
27	4-	-	-	-	3	4	-	-	4	N	N	N	N	--	03	
28	4-	-	-	-	3U	4	-	-	4	U	U	U	U			
29	3+	-	-	-	2U	4	-	-	4	U	N	N	N			
30	4-	4U	-	-	3U	4	-	-	4	N	N	N	N			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo



Inubo November 1994



Note : As for AUSTRALIA 13.6 kHz, Gaps in the record are due to transmitter maintenance.

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

NONE

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso Time in U.T.

NOV. 1994	S W F							Correspondence	
	Drop-out Intensities(dB)					Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS	BBC						
NONE											

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

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Nov. 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
8			25				0646	0745	0655
27			25	11			0411	0453	0422

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