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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

JUN. 1996

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	49		A	38	37	A	A	A	A	A	A	A	A	A	A	A	A	A	46		A	A	57	A
2	59	A	A	A	36	A	A	A	A	A	A	A	A	A	A	A	A	A		59	69	A	57	49
3		38	38	37	41	35	A	A	A	A	A	A	A	A	A	A	A	A	39	57	49	56	57	54
4		35	31	35	35			A	49	A	A	A	A	A	A	54	A	A	51	43	60	60	57	57
5		38	40	34	36	40	A	A	A	A	A	A	A	A	A	A	A	A	28		56	68	62	
6	36	35	37			A	A	A	A	A	A	A	A	A	A	A	52	61	60	72		57		57
7	57	38	35	40	A	35	A	A	A	A	A	A	A	A	A	A	A	A	30	57	A	A	37	A
8	38	A		38	41	A	41	A	A	A	A	A	A	A	A	A	A	A	A	57	56	69		57
9	57	56		A	38	38	A	A	A	A	A	79	A	A	A	A	A	A	A	46	A	57	57	
10	39		28	37	38	41	A	55	61	A	A	A	A	A	A	A	57	57	57		A	56		
11	49	28	A	A	28	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	57		30
12		A	35	35	30	36	A	A	A	A	A	A	A	A	A	A	A	A	A	58	57	57		
13	35	31	35	37	28	A	54	A	A	A	A	A	A	A	A	A	A	A	50	A	60	58	57	57
14				34	38	47	55	A	A	56	A		A	A	A	A	A	A	69		67	59		29
15	A	35	38	A	38	41	A	59	66	A	A	A	A	A	A	A	A	A	A	A	61	59	56	A
16	A	35	34	40	35	36	A	A	A	A	A	A	A	A	A	A	A	A	A	68	A	A	57	58
17	57		38	35	25	A	62	A	A	67	59	A	A	A	A	A	A	A	A	A	29		58	
18	35	44			48	41	A	A	A	A	A	A	A	A	A	A	A	A	A	57	57	67	57	56
19		A	32	48	A	56	A	A	A	A	A	A	A	A	A	A	A	A	A	55	A	57	57	57
20		35	35	35	39	56	A	A	A	57	A	A	A	A	A	55	A	A	A	56	A	57	57	57
21	A	35	36	A	38	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	57	57	51
22		38	A	28	A	46	56	A	A	A	A	A	A	A	A	A	A	A	A	56		56	56	57
23		35	35	36	37	A	A	A	A	A	A	A	A	A	A	A	A	A	29	A	56	57	57	
24		22		34	38	52	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	57	56
25	55		38		44	A	A	58	A	A	A	A	A	A	A	A	A	A	A	40	57	56	57	A
26	56	56		35	43	51	57	A	A	A	A	A	A	A	A	A	A	A	A	A	57	58	A	57
27	57	48		38		54	56	49	A	A	A	A	A	A	A	A	A	A	A	A	59	57	57	56
28	57		38	A	38		A	A	A	A	A	A	A	A	A	A	A	A	A	A	72	67		
29		41	35	38	37	A	A	A	A	A	56	A	A	A	A	A	54	A	A	57	59			
30	35	35	35	32	32		A	A	A	A	A	A	A	A	A	A	A	A	A	A	69	A	57	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	15	20	19	21	25	16													10	15	20	23	21	16
MED	49	35	35	36	38	41													48	57	57	57	57	57
U Q	57	39	38	38	38	51													57	58	60	59	57	57
L Q	36	35	35	34	35	37													30	55	56	57	57	55

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT WAKKANAI

JUN. 1996

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	65	58	80	42	33	72	79	89	40	62	41	41		75		82	73	62	60	66			56	
2	70	63	58	37	31	41	95	85	88	86	71	92	44	60	55	80				81	60	77	34	27
3	33	29	G	33	37	35	47	34	74	63	54	53	56	56	60	40	41		64	34		60	61	G
4	G	25	35	G	31	39	46	50	33	55	38	36	36	36	34	39	27	30	38	45	G	G	33	G
5	25	G	29	28	28	34	58	44	42	36	37	41	38	36	43	36	30	36	34	45	28	G	32	
6	24	G	G	G	32	58	42	54		70	42	37	37	32	34	37	32	41	45	44	42	43	37	23
7	30	G	G	G	24	30	32	42	43	43	30	56	60	70	42	50	34	62	45	40	61	56	34	46
8	36	44		G	G	38	34	47		43		28	37	37	40	36	62	54	59	34	32	G	26	
9	59	55	41	43		36	78	83	107	75	67	73	71	39	36	45	49	48	60	39		34		34
10	30	27	30	G	G	35	40	46	55		54		60	87	59	41	41	34	36		45	46	37	44
11	44	52	49	41	31	30	43	62	95	76	41	36	56		54	61	62	52		54	36	40	34	39
12		45	34	44	36	32	72	97	89	60	66	55	60	58	60	62	136	64	61	65	42	41	44	
13	33	34	33	30	27	35	46			76	62	60	59	64	74	60			64	86	63	40	46	50
14	24	30	26	29	25	34	48	57	60	62	63	64		37	41		95	95		65	42			G
15	38	34	30	42	41	35	58	76	64	74	94	56	54	65	30	32	36	62	66	81		62	60	57
16	65	32	33	40	33	39	61	58	64	42	82	88	86	59	64	44	74	60	66	96	96	61	38	34
17	31	G	38	28	31	37	44	63	86	58	56	50	54	34	30	29	57	71	46	71	40	33	34	26
18	26	G	G	G	G	34	44	55	40	54	42	66	67	40	42	36	64	86	68		54	42	45	34
19	30	43	36	37		42	43	59	55	69	85	75	66	58	31	29	34		55	45	75	60	58	45
20	33	32	26	33	40	44	73	74			72			40	38	31	37	83		43	64	34	34	
21	58	28	25	36	46	60	46	59	58	64	42	63	41	59	83	64	66	114	90	46	59	40	30	41
22	46	34	62	60	45		39	54	59	39	60		58	70	43	56	57	60	57	54		33	64	62
23	35	34	29	G	30	39	47		58	60	83	64	59	89	95	74	55		41	64	40	36	40	43
24	33	37	38	36	29	30	38	42	64	76		58	59	38	56	79	78	110	86	135	146	43	32	28
25	28	38	30	29	24	29	44	44	63	62		60	34	30	38	38	40		45	36	62	42	33	60
26	40	34	30	28	30	34	43	72	72	39	64	40	36	40	37	33	60	81	70	66		40	36	G
27	29	26		24	26	37	42	36	31	66	40	38	38	36		40	35	96	76	73	39		44	32
28	28	30	36		34	36	72	62	91	40	40	33	33	76	44	59	59	66	94	68	62	55	38	26
29	29	26	G	31	27	37	42		60	30	36	58	40	32	62	44	56	44	69	43	34		32	32
30	32	26	G	33	34	44	42	66	70	74	63	58		56		32	34	60	64	80	71	75		46
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	28	29	28	29	30	27	26	28	27	27	26	29	27	29	28	24	25	28	24	26	27	25
MED	33	32	30	31	31	36	45	58	62	62	56	56	55	56	43	41	56	62	60	59	50	42	37	34
U Q	42	38	37	38	34	40	58	72	74	72	67	64	60	64	60	60	63	82	68	72	62	56	45	45
L Q	28	26	25	12	26	34	42	46	55	43	41	40	38	36	37	36	35	50	45	43	39	34	33	26

HOURLY VALUES OF fmin AT WAKKANAI

JUN. 1996

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

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

HOURLY VALUES OF foF2 AT KOKUBUNJI

JUN. 1996

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	30	29	A	32	42	49	A	A	105	A		A	A	A	A	53	A	40	57		60	69	
2	55				A	A	48	A	A	114		A	A	A	A	A	61	A	A	95	68	A	57	56
3	A	23	A	A	34	A	40	A		141	A	A	150		A	A	52	A	A	59	A	A	A	A
4	A	A	41	A	A	44	72	A	A	A	A	A	A	56	66	66		A	A	57	60	A	A	A
5	44	48	A	A	49	38	A	51	A	59	62	A	A	A			A		61		68	63	57	A
6	57	56	48	44	44	42	A	A	56	A	A	A	A	A		A	A	80	83		A	47	A	45
7				34	34		A	A	A	A	A	A	A	A	A	A	A	A		60	46	A	A	A
8	A	38	A	A		38	A	A	A	A		149	A	A	A	54	52	58	59		A			A
9	A	A	39			43	A	A	A		A	A	A	A	A	58	62	57	56		58		57	54
10	50	A	34	31	A	A	58	68	A	A		A	A	A	A	70	71		A	57	58	56		57
11	45			38	46	40	56	A	71	63	A	A	A	A	52	54	A	56	58		68	56	56	A
12	A	A	33		41		70		A	A	A	115	A	A	50	A	A	A	45		69			A
13	A	A	A	A	A	A	A	56	A	A	A	A	A	A	A	A	A	A	60	A	60	57	50	
14	A	38		A	A	70		A	56	A	A	N	A	A	51	A	A	A	A	57	69	69	A	39
15	36			A	A	A	A	74	60	A	A	A	A	A	A	A	58	A	A	59	53		A	46
16	A	A	37	35	A	A	A	56	66	62	A	A	A	A	A	A	61	60	51		A	A	47	
17		33	A	A	50		A	95		A	80	A	156	A	A	N	A	56	56	62	56	59	37	
18		35	32	A	40	40	A					A	A	A	A	50	A	A	96	84		48		A
19	26			A	A	A	A	A	A	A	A	A	A	A	A	76	61		89	69	71		57	56
20	48	46	44	41	46		58	64	A	150	A	A	A	A	A	A	A	A	A	58	57	54	A	A
21	A		34	37	47		A	A	A		A	A	A	A	A	A	A	A	42	50	57	57		35
22	45	47		34		36	57	A	A	A	A	A		A	A	A	A	A	58		58	56	50	57
23	A	A	34	32	A	42	47	A	A	A	A	A	A	A	A	A	55	52	A	60	A	41	43	
24	46	38	34	32	A	37	48	57	A	A	A	A	A	A	A	54	60	61	60	57	58		47	45
25	43	46	38	A	36	37	A	68		A	A	A	A	62	62		54	A	93	47	56		56	57
26	46	A	A	26	A	A	A	68	A	A	A	A	A	A	A	52	48	52			71	69	58	
27	A	A	44	A	A	A	A	A	60	60	A	A		A	A	A	A	A	64	68	71	67	68	58
28	57	48	48	40	46		A	A	A		A	A	A	A	A	A	58	67	64	70	61	57		50
29	57	45	A	35	A	A	46	A	61	62	A	A	A	A	A	54	A	A				49	A	A
30	56	59			A	47	A	A	47	A	A	A	A	A	70	77	76	80			69	58	A	43
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	15	15	15	13	13	14	12	10								11	15	11	18	18	22	18	15	14
MED	46	45	37	35	44	41	52	66								54	58	58	60	59	60	57	56	52
U Q	56	48	44	39	46	43	58	68								70	61	67	64	68	69	60	57	57
L Q	44	35	34	32	35	38	47	56								54	53	56	56	57	57	54	47	45

HOURLY VALUES OF fEs AT KOKUBUNJI

JUN. 1996

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	59	38	25	32	G	30	44	70	79	119	157		122	58	52	76		58	34	40	41	44	56	68
2	71	65			56	41	43	62	77	109	132		84	126	59		57	66		61	68	69	56	53
3	62		58	68	32	26	31	74	89	104	98	79	94	104	87	61		68	71	86	69	82	70	
4	50	58	45	52	57	40	46		90	61	49	47	40	48	40	52	33	47	66	38		50	48	52
5		34	44	54	69	31	44	47	147	50	52	106	102	66			92		72		67	129	43	96
6	71		34	30	28	35	74	60	44	103	70	68	134	99		72	97	75	70	64	65	50	108	71
7				45	53	34	40	68	74	89	70	52	54	72	59	72	62	69		59	48	45		37
8		50	44	38	107		37	51	58	71			55	54	30		26	40	32	92	83	136		64
9	93	112	66			36	62	72			168	172	90	102	40	53	54	39	46	35	31	29	43	60
10	44	70	33	50	49	32	50	57	60	69		80	62	53	57	53	42	39	91	28	27	35		G
11	38			30	G	31	49	40	36	49	54	54	78	54		52	59	53	51		62	43	45	
12	60	59	61		G	G	30	50		66	76	92	87	53	48		54		49		90		72	61
13	103	61	85	55	56	50	45	54	88	143	57	97	109	40	39	54	53	71	58	68	38	53	39	
14	62	44		65	69			73	61	86	122	107	55	69	30	52		60	70	61		34	66	
15	69	88		46	55	45	55	58	60	59		37	61	66	65	69	44	44	54		37		43	36
16	59	53	52	52		35	49	44	54	61	54		122	105	107	74	30	46	57	90		58	37	
17		61	52	55	78	60	77	96	81	112	96	83		180	55	28	60	60	58		59	59	55	
18	61		72	58	104	35		75		132		129	52	73	40	46	83		108	81	72			64
19	60	59		50	39	32	40	56	51	57	70	60	84	79	140	88	45			40	33		34	
20	32	39	30	G	G	32	48	57	62	97	106	82	70	70	77	79	68	77		129	62	94	65	71
21	48		72	54	37	38	47	79	160		72	71	70	60	61	86	78	59	37	56	48	40		32
22	44	34		34		29	44	40	57	128	77	55		102	76	70	57	68	70		32	56		34
23		56	52	37	37	34	34		64	54		86		40	57	61	51	44	53	G	77	40	39	
24	34	G	27	27	31	29	40			48	39	58	57	61	29	50	54	40	44	26	40	33	34	37
25	34	33	34	30	40	38	45	47	34	53	68	50	45	36	50		34		74	89			75	
26	42	35	33	37	28	41	48		79	58	50	58	49	51	68	45	42	39			62	50	74	
27	99	45		38	29	27	38	51	44	47			G	54		64	54	57	40	56		34	33	G
28	G	26	G	G	28		59	74			56	56	64	62	78	61	38		67		37	48		26
29	33	32	42	29	55		35	42	55	58		108		50	77	55	72	128		122				77
30	81	83	57		32	29	73	36	33		50	56	57	51		46	43	44		32	44	41	58	59
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	24	22	26	27	26	28	26	25	26	23	25	26	30	25	25	27	24	22	22	24	24	22	20
MED	59	52	44	42	39	34	45	57	61	68	70	71	67	62	57	61	54	58	58	60	54	49	52	56
U Q	70	61	58	54	56	38	49	72	80	104	98	94	90	79	76	72	62	68	70	86	67	58	66	66
L Q	40	34	33	30	28	30	40	47	52	57	54	55	55	53	40	52	42	44	46	38	37	40	39	35

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

JUN. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	15	14	14	15	15	14	16	16	17		33	20	16	18	14	15	14	15	14	14	14	14
2	14	14		14	14	15	15	15	15	15	21	23		33	18	16	14	15	14	14	14	14	14	14
3	14	14	14	15	14	16	15	16	16	20	17	21	23	20	18	14	15	15	14	15	15	14	15	14
4	15	14	14	14	14	15	14	15	14	15	24	24	20	18	18	15	16	15	16	15	15	14	15	14
5	14	14	14	14	15	15	17	15	21	22	21	17	18	20			15		14		15	14	14	15
6	15	14	14	15	15	15	14	15	15	17	21	24	21	23		16	16	15	14	15	15	14	14	15
7	15	14	14	15	14	15	15	14	15	16	16		22	20	18	17	16	15		14	16	15	15	14
8	14	14	14	14	14	14	14	15	16	16		18	21	22	21	15	15	15	15	15	14	15		15
9	15	15	14			15	14	14	16		20	27	23	28	18	17	14	15	15	15	15	15	15	14
10	15	15	15	14	15	16	15	16	14	18	23	33	35	23	18	14	14	14	15	16	15	14		15
11	15			15	15	16	14	14	16	20	18	22	35	21	18	16	18	14	16		14	14	14	14
12	14	15	15		14	20	15	14	15	16	18	33	23	20	18	17	15	16	15		14	14	15	15
13	14	14	15	14	15	14	14	15	15	15		18	35			18	17	15	15	15	14	14	14	
14	15	14		15	14	15		15	14	16	18	20			15	17	16	15	14	14	14	14	15	14
15	14	14		14	14	15	15	15	16	20	20	17	18	21	17	16	16	16	14	15	15		15	14
16	14	14	14	14	15	15	15	15	16	18	17	20		20	16	20	17	15	14	15	15	14	14	
17		14	14	14	14	15	15	14	14	17	16	22	21	23	20	18	15	15	14	14	15	15	15	14
18	14	14	15	15	14	15	15	15		17		17	16	16	18	15	16	15	14	15	15	15		15
19	15	14		14	14	15	14	15	15	15	16	20	22	28	16	15	15		14	14	14		15	14
20	15	14	14	14	14	14	15	15	14	15	21	18	26	18	18	14	15	15	14	15	15	15	14	14
21	14		15	15	15	14	15	15	15		15	18	21	18	18	15	15	14	15	14	15	15		15
22	14	15		14		15	14	15	14	18	23	16		20	18	16	15	14	15	15	15	14	14	14
23	15	15	15	14	14	15	15	14	17	18	17	21	22	18	16	17	16	14	14	14	15	15	15	
24	15	14	15	15	14	15	15	14	16	17	22	32	35	34	18	18	15	15	14	14	15	14	14	15
25	15	15	14	14	15	14	14	14	15	21	20	18	23		17		15	15	14	14	14		14	14
26	14	14	14	14	15	14	14	14	15	17		18	18	18	16	18	16	14			15	14	15	
27	15	14	15	15	15	15	14	15	15	21	16	32		35	17	18	16	15	14	15	15	14	15	14
28	15	14	15	15	15		15	14	16		20	21	21	20	17	17	15	14	14	14	14	15		14
29	14	14	14	14	15	15	15	15	14	17	18	17	24		22	17	15	14		15		14	15	15
30	14	14	14		14	15	15	16	15	15	18	21	22	18	20	16	14	14	14	15	15	14	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	29	28	24	27	28	29	29	30	29	27	26	28	25	26	27	28	30	28	27	26	29	27	25	26
MED	14	14	14	14	14	15	15	15	15	17	18	20	22	20	18	16	15	15	14	15	15	14	15	14
U Q	15	14	15	15	15	15	15	15	16	18	21	23	25	23	18	17	16	15	15	15	15	15	15	15
L Q	14	14	14	14	14	15	14	14	14	16	17	18	21	18	17	15	15	14	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

JUN. 1996

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		37	33		26	A	31	60	70		A	62	58	A	54	A	58	62	52	53		80	A	A
2	A	42	A	A	A		A	A	A	A	A	A	59	A	A	A	67	66	58		A	A	A	A
3	A	A	A	A		46	A	50	A	A	A	A		A	79	A	A	A	89	A	A	A	A	A
4	A	34	A	109		A	A	67	55	A		A	A	65	68	74	78	A	89	83	A	A	A	59
5	A		A	109		34	A	A	56	A	A	A	A	A	A		89	A	74	A	82	A	A	65
6	59	60		59		34	26	50	A		A	A	62	70	75	83	81	81	82		89		A	A
7	A	59	A	A	A	A	41		55	A	A	A	A	A	A	89	A	83		50		79	A	A
8	A		31	A	A		39	31	49	A	59	A	A	A	68	60	67	58	A			A	A	59
9			43	48	A	31	47	A	58	63	68	A	A	A	A	A	85	66	56			A	A	A
10	A	A	42		34	34	50	50	A		A	62	A	67	75	78	52	46		60	A	A	52	59
11	A	32			A	A	A	53	58	A	A	A	A	A	51	62	62	66	54		A	A	A	
12	32	79	A	109	A		47	53	A	A	A	A	51	A	66	66	64	60	62	65	A	79	59	53
13	63	A	53	A	A	A	A	53	A	A	A	A	A	A	58	55	A	A	A		53	A	A	
14		A	34			49	A	51	A	A	A	A	A	A	55	A	67	58	A	A	A	A	A	A
15	A	A	A	109	A	A	48	61	A		A	A	A	A	A	N	A	A	72	52	60	N	A	A
16	A	A	A	A	A	A	A	48	48		A	A	A	A	A	60	67	69	73	A		60		79
17		A	A	A	54		A		A	A		A	A	A	A	60	66	63	69	60	A	A	49	49
18	A	A	A	A	A	37	A	A	56	66	60	A	A	79	A	A	71	72	60	A	A	A	A	A
19	A	A	A	A	32		46	A	A	A	68		A	A	76	78	71	66	74		84		28	A
20	25	A	43			31		46	A	A	A	A	69	79	N	A	A	A	A	72	76			
21	79		A	A	A	A	34	44																
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31																								

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							10	14							11	11	15	14	14					
MED							44	50							68	66	67	66	70					
U Q							47	53							75	78	78	69	74					
L Q							34	48							55	60	64	60	58					

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

JUN. 1996

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	25	30	24	G	G	27	36	54	60	62	51	58	75	53	50	56	38	31	39	49		58	33	58
2	48	38	80		45	55	50	108	94	142	125	41			91	116	56	52	43			42	69	66
3	68	59	58	38	39	30	38	42		80		76		74	87	141	78	62		93	82	32	116	
4	44	45	59		53	68	90	52	66	76		141		40	78	28	60	94	61	70		32	93	69
5	66	28	33	44	28		46		125	85	94	90	74	136			81	97	60	70	39		69	
6	41	45	48	38	45	27	34	45			168	61	63	52	50	47	42	53	43	33	29	33	91	152
7	90		72		50	30	33	59	50		125	81	89	78	76	104	88	38		57	38	33	25	25
8	29		58		49	54		G	44		77	62	65	39	32	32	41	42	45		32	126	92	30
9	30	33			30	G	31	60	43	53	55	82	143	92	114	94	68	60	40	35	32	33	26	
10	79		49	53		32		40			65	58	40		31	40	60	32	31	41	43	45	38	33
11	59		45		59	65		38	41	40	48	36	35	30	36	52		50	39	39	39	34	33	31
12	79	38	31		72	59		43	55	70		36	51	48	51	51	55	38	40	31			32	39
13		48	79	65		57	54	45	76	91	70	60	64	63		51	58	101	111		59	91	33	58
14	29		56	46	38				76	115	74	58	56	67	64	71	48	50	60	93	127	81	41	70
15			39	41	48	52	43		77	114	112	81	92	62	66	82	59	41	38	32	31	27	58	39
16	41	36		46	37	40	57	40	44	60	51	62	61	55	82	61	59	29	71	77		40	32	33
17	39	36	58	59	52		93		89	114	147		115	53		30	29	28		38		148	32	88
18	59	59	89	59	53		60	50	52	50	54	63	50	87	61	51	57	79	73	82	150	150	68	68
19		90	38	60		28	34	59	69	82	90		99	72	30	37	44	40		58	38	30	29	33
20	38	26	59		28		38	31		79	77	138	72	75	109	150	78	68	70	58		25	84	32
21	37	33	38		48	47	39	35																
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	15	19	12	18	16	16	17	16	16	17	18	17	18	17	19	19	20	16	17	13	18	20	17
MED	42	38	56	46	46	44	41	45	63	80	77	62	65	62	64	52	58	50	44	57	39	37	40	39
U Q	66	48	59	59	52	56	55	56	76	102	118	81	90	75	84	94	68	65	65	73	70	81	76	68
L Q	37	33	38	39	37	29	35	39	47	61	54	58	53	52	43	40	44	38	39	36	32	32	32	32

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

JUN. 1996

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

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

HOURLY VALUES OF foF2 AT OKINAWA

JUN. 1996

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	89	A	44	A		B	A	A	A	A	A	67	66	A	A	A	68	63		A	62	60	A	A
2	A	A	A	A	A	A	34	A	44	A	A	58	66	61	70	80	A	A	A	A	A	39		A
3	A	A	56	43			A	A	61	A	A	A	A	82	83	A	72	69	A	84	A	A	A	A
4	A	A	A	A	89	A	52	A	50		A	A	62	A	96	N	115		86	A	86	83	A	A
5		54	46	38	A	A		A	60		67	A	A	55		77	83	87	90	84	A	A	A	A
6	A	A	69	59	44		38	33	67	57	A	A	75	A	A	92	96	85	83	75	58	62	A	38
7	A	54	47		A	41	A	A	49	A	56		A	74	A	84	A		70	A	A	A	A	A
8	A	A			89		A	A	54	A	A	A	A	A	60		68		64	67	64	A		A
9	A	A	A	A		109	A	A	A	76	58	58	A	A	A	88	96		A	A	A	A	A	A
10		A	A	26	A	A	A	57	66	56	60	67	79	86	96	81	67	71	76	83	77	A	A	A
11	60	A	54	A	A	A		A	54	A	A	61	A	A	59	60	71		57	44	A	A	59	A
12	A	A	A	31	A	109	A	44	A	54	59	A	A	73	81		81	84		67	60	A	A	A
13	A		A	A	A	89	A	54		A	A	A	A	A	62	68	A	65	82		A	A	45	A
14	42	54		A		109	A	A	A	70	A	A	A	A	A	67	64	A	A	53	62	A		A
15	A	A	37		89	A		50	57	A	A	A	76	82	83	73	63	71	71	71	A	A	A	A
16	A	A	A	A	B	A		61	57	A	A	A	A	A	A	A	71	83	90		A	A	A	A
17	A	A		31	A	109	A	A		A	A	A	A	A	53	62	76	83	89		A	149	A	A
18	A	41	34	A	A	A	32	A	A	63	A	A	A	A	73	76	82		83			A	A	48
19	A	A	59	A	A	A		A	A	A	A	A	A	60	81	86		73	80		98	A	A	A
20	A	A	A	A	109		A	40	A	63	A	A	A	A	71		76		80	87	69	A	A	A
21	A	43	A	A	89	A	A		A	A	A	A		A	52	A	A	53	A	A	A	A	A	A
22	A	A	A	A	A	A	A	A	32	A	A	A	A	92	72	72	76	82	81	85	A	A	A	A
23	A	A	N	A	A	A	A	A	A	A	A	A	A	A	A	A	64	66	80	89	42	A		42
24	A	37			A	A	59	57	56	A	A	A	A	A	A	64	76	66	60		A	A	38	A
25	89	A	A	40		89		28	56	63	A	A	A	64	69	57		A	A	59	A	61	A	A
26	A	A		A	35		A	A	54	A	A	A		A	A	A		67	58		A	A	A	A
27	A	A	A	A	A	A	A	54	69	A	A	A	A	A	A	64	A	A	63	68	68	65	56	A
28	A	47	38	40		B	A	53	A	A	A	A	A	A	54	A	N	84	68	A	51		56	A
29	A				89	28	46	A	57	57	A	A	A	58	57	A	67		90		A	A	A	37
30	A	A	A	A		A	A	49	A	A	48	A	A	63	73	85	87	90	86	93	A	A	A	43
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			10					12	17					12	19	18	21	18	22	15	12			
MED			46					52	56					68	71	74	76	72	80	75	63			
U Q			56					55	60					82	81	84	82	84	86	85	73			
L Q			38					42	52					60	59	64	67	66	68	67	59			

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

JUN. 1996

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	29	24		48	G	B	50	38	62	94	87	52	66		80	75	42	77	131	77	58	80	58	37
2	38	39	41	49	41	39	59	68		42	46	42	43	52	42	75	108	90	113	88	78	37		68
3	74	60	58	32	26	37	33	56	69	70	100		71	52	56	69	59	44	60	61	58			68
4	84	94	47		39	52	78		80	74	50	44	42	97	104	83	66		113	93	43		41	86
5		56	41		26	27	34		60	46	58	64	108	60	37	54	62	59	34	36	58	37	48	55
6	58		33	38	25		39	36	46	66	106	179	97	151	97	74	40	42	38	28	G	34	39	43
7	42	25			80	38	38	50		73	66		76	72	81	85	101	80	46	62	45	40	36	32
8					52	38	43	45	42		66	76	62	50	46	44	38	42	35		G	45	40	45
9	36		58	61	34	34	41	68	62	96	43	48	45	62		77	70		82	66	42	44	66	54
10		75		67	61	94	32	37	40	52	48	45	40	39	38	51	48	43	38	42	45	40		28
11	G	83	38	38	50	67		88	61	60	45	50	39	41	51	46	47	53	51	37	38	52		45
12	47	50	42	48	37	59	42	40	42	49	36	51	51	34	59	58	48	50	40	32	32		42	58
13	58		32		74	45	48	57	72	82	87	58	54	60	52	57	70	84	58	86		93	94	43
14		87	G	72	38	34	52		49	50	51	90	80	80	65	52	48	53	62	52	56	65		48
15	46	39	26	38	G	59		40	51	68	66	86	51		70	50	38	60	43	38		41	38	
16	58	48	41	48	B	30	35	39		67	64	40	50	64	69	77	55	34	52	86	56	40	32	
17			G	37	42	30	42	37		82	50	43	43	42	47		36	44	50	49	41	G	28	45
18	41	39		42	36	27		48	92	67	60	44	52	59	54	75			43	28		24		
19	65	70	67	38	29	38	32	66	134	97	117	106	63	35	37		39	34	26		36	40	41	38
20	32		44	33	23	G	47	36	58	48		106	85	96	79	52	43		35	38	66		33	
21	41	65	27		61	51			42	59	52	38		68	40	51	48	46	46	61		48		48
22	56	64	43	43	48	38		59	51	60	58	64	63	55	66	58	61	58	50	52	48	58	49	48
23	49	35	49	50	42	43		57	90	95	63	64	77	54	58	56	49	40	59	48	G	62	G	75
24	40	37	60			28		40	50		66		58	61	70	60	66	60	44		70	34	G	44
25		30	33	26	G	G	29	38		39	38	41	59	41	48		46	34	36	34	37	36		39
26	48	38		42	38	26	48	45		92		83		162	76	80			34		60	56	33	
27	60	76			61	61	83	34			61	41	51	51	57	48	91	88	36	38	28	23	36	37
28	33	42	28	G	G	B	47	56	76	78	81		53	58	68	92		73	38	39			G	52
29			G	24	G	G	G	38	41	50	59	57	48	55	56	101	44	39	35	60	58	71	27	34
30	33	36	38	67	G	39	73	37	71	70		60	50	44	70	62	54	72	55	66	77	83	60	51
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	23	23	23	22	28	27	23	26	23	27	27	26	28	28	29	27	27	25	30	26	25	25	22	25
MED	46	48	41	42	38	38	42	42	60	67	60	54	54	56	58	60	48	53	45	50	45	41	38	45
U Q	58	70	47	49	49	51	50	57	72	82	66	76	68	66	70	77	66	72	58	66	58	60	48	54
L Q	36	37	28	37	24	28	34	38	46	50	50	44	49	47	47	52	43	42	36	38	36	36	32	38

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT OKINAWA

JUN. 1996

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

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

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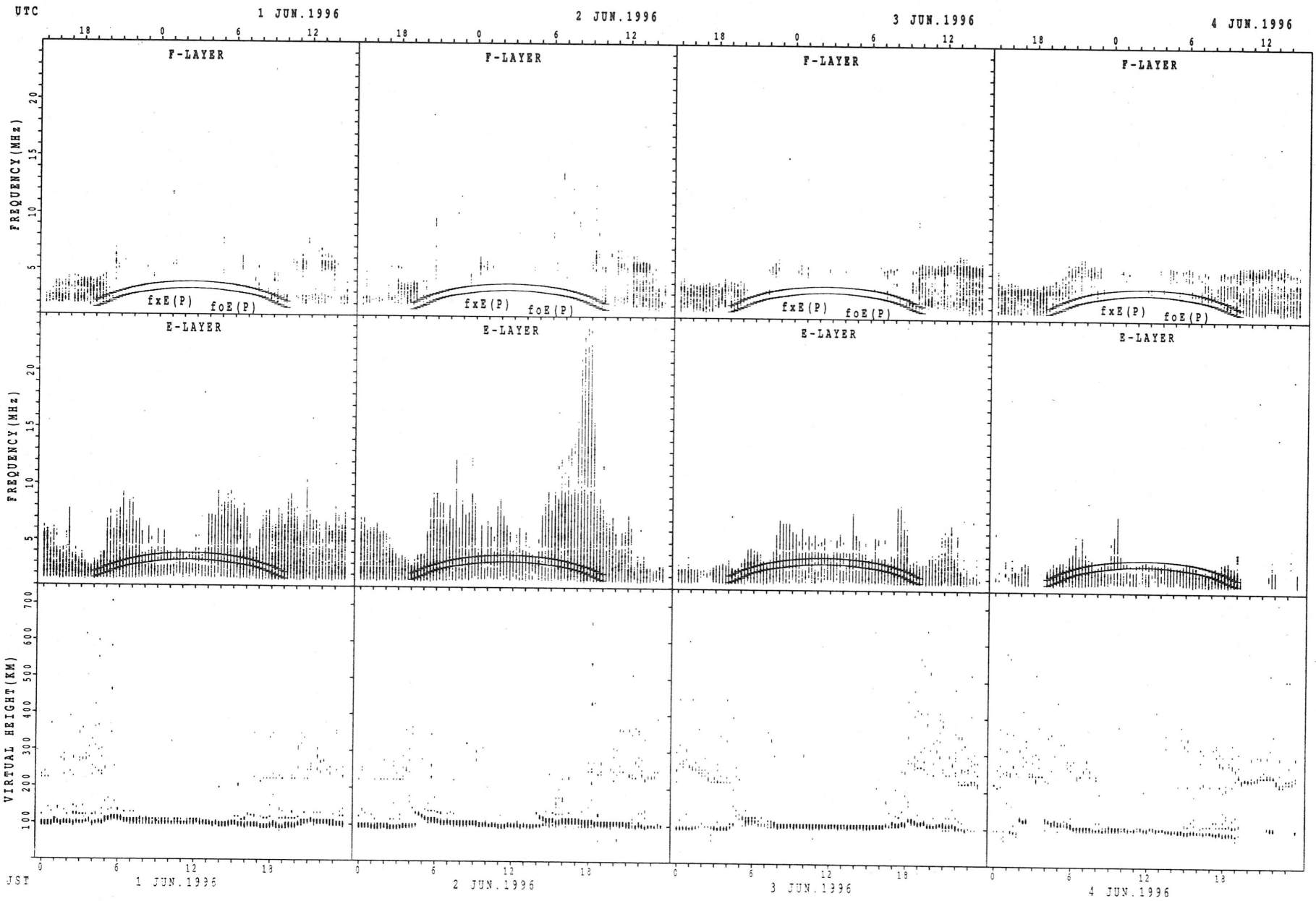
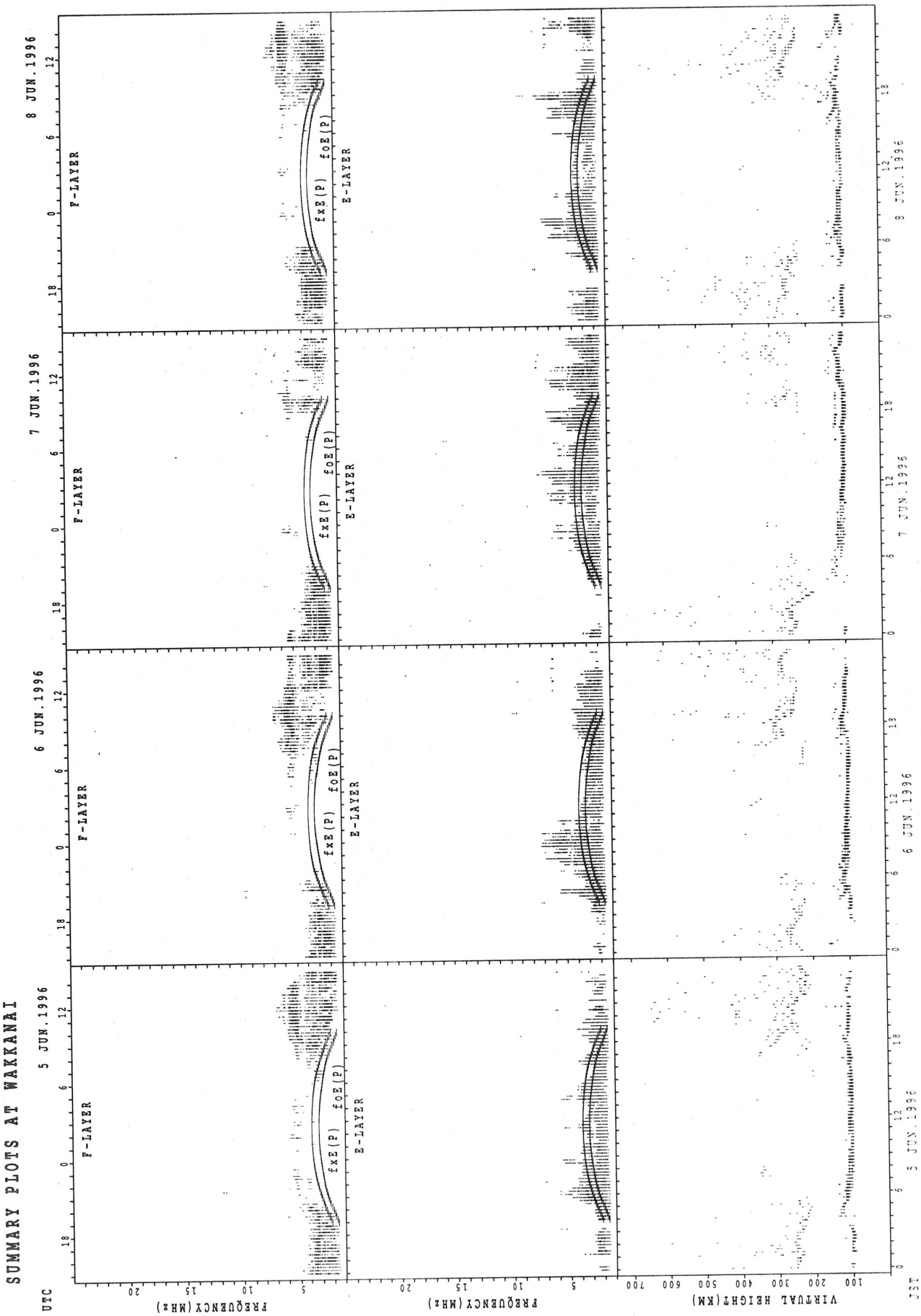
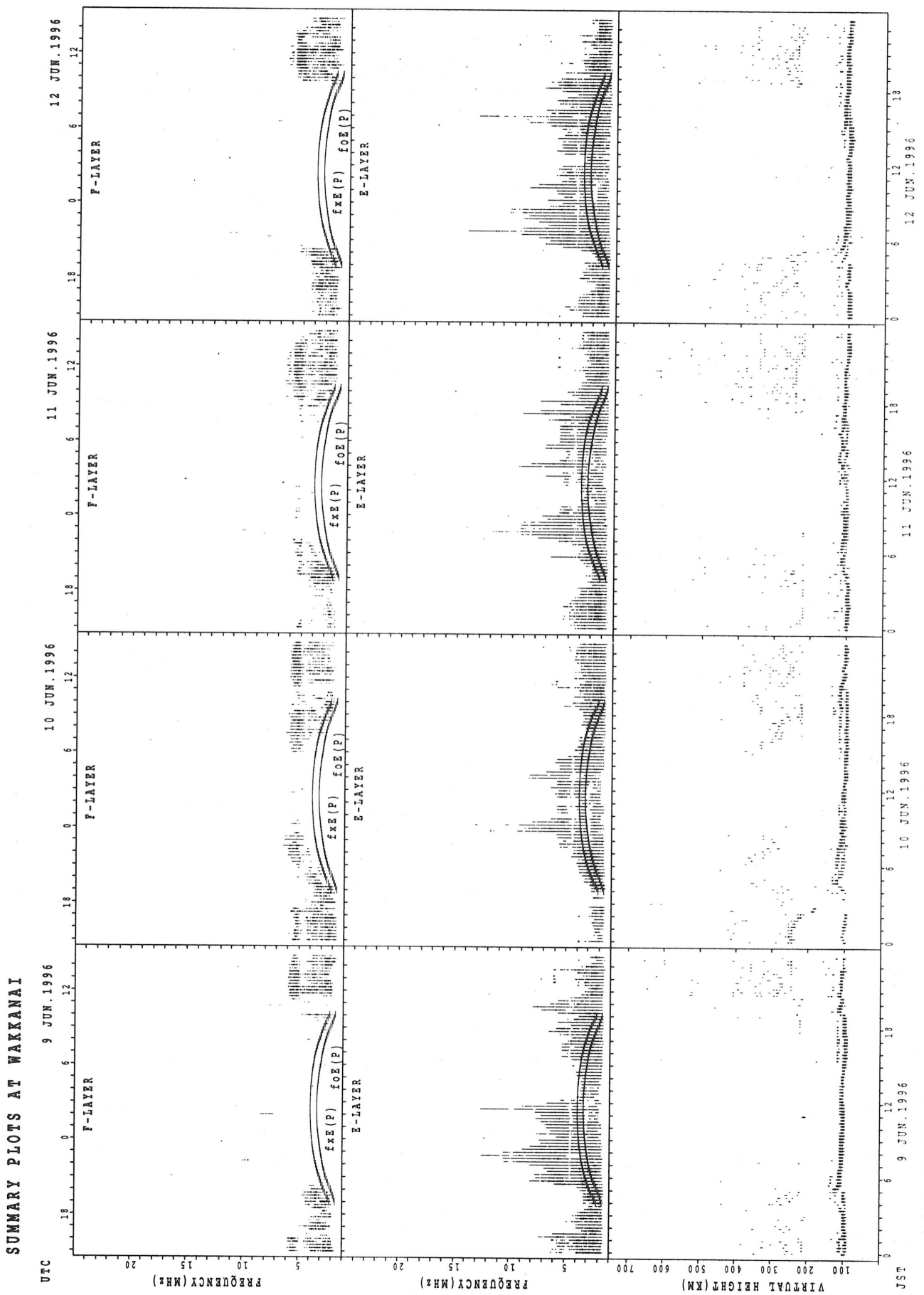
SUMMARY PLOTS AT WAKKANAI

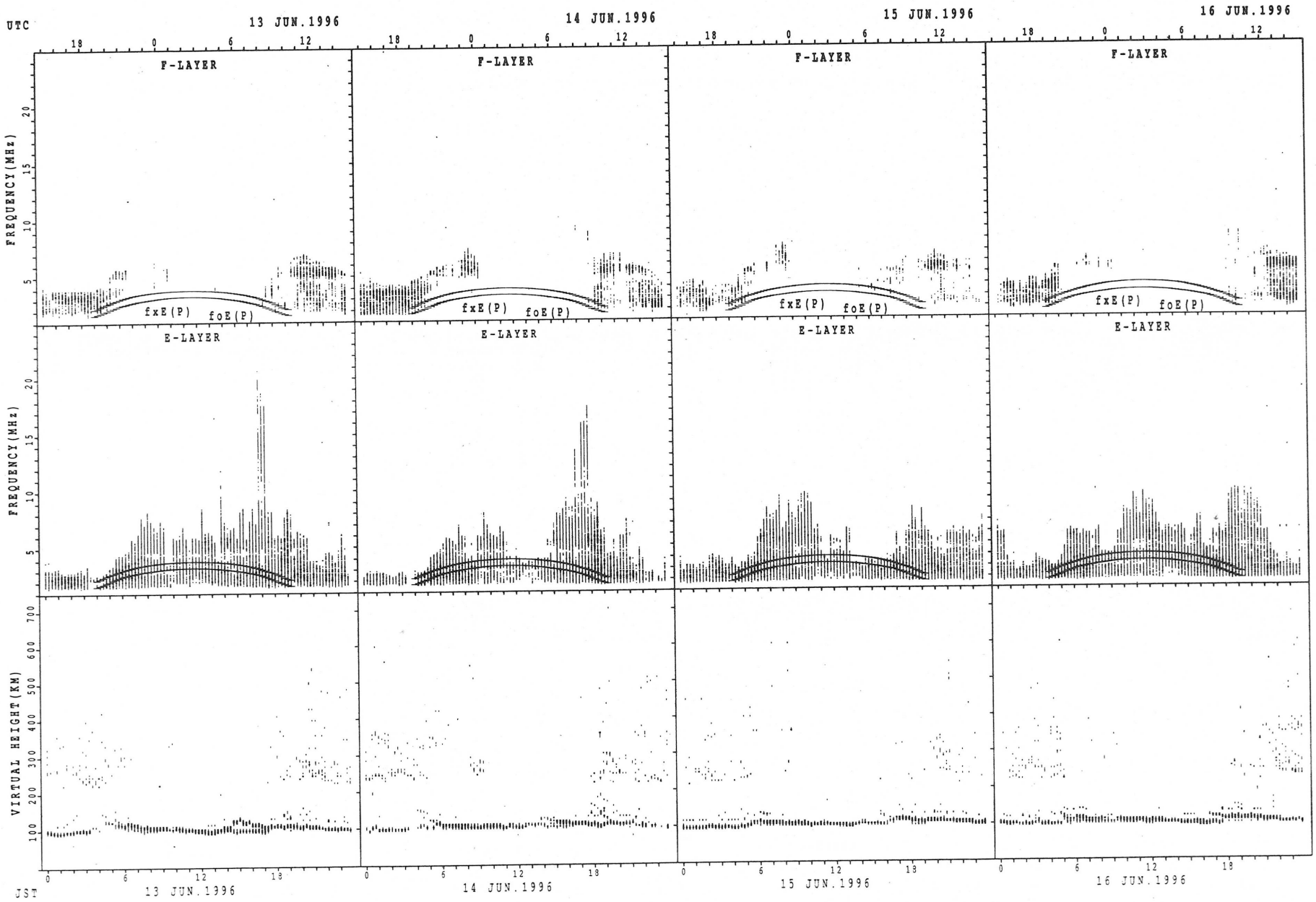


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
5 JUN.1996
6 JUN.1996
7 JUN.1996
8 JUN.1996
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

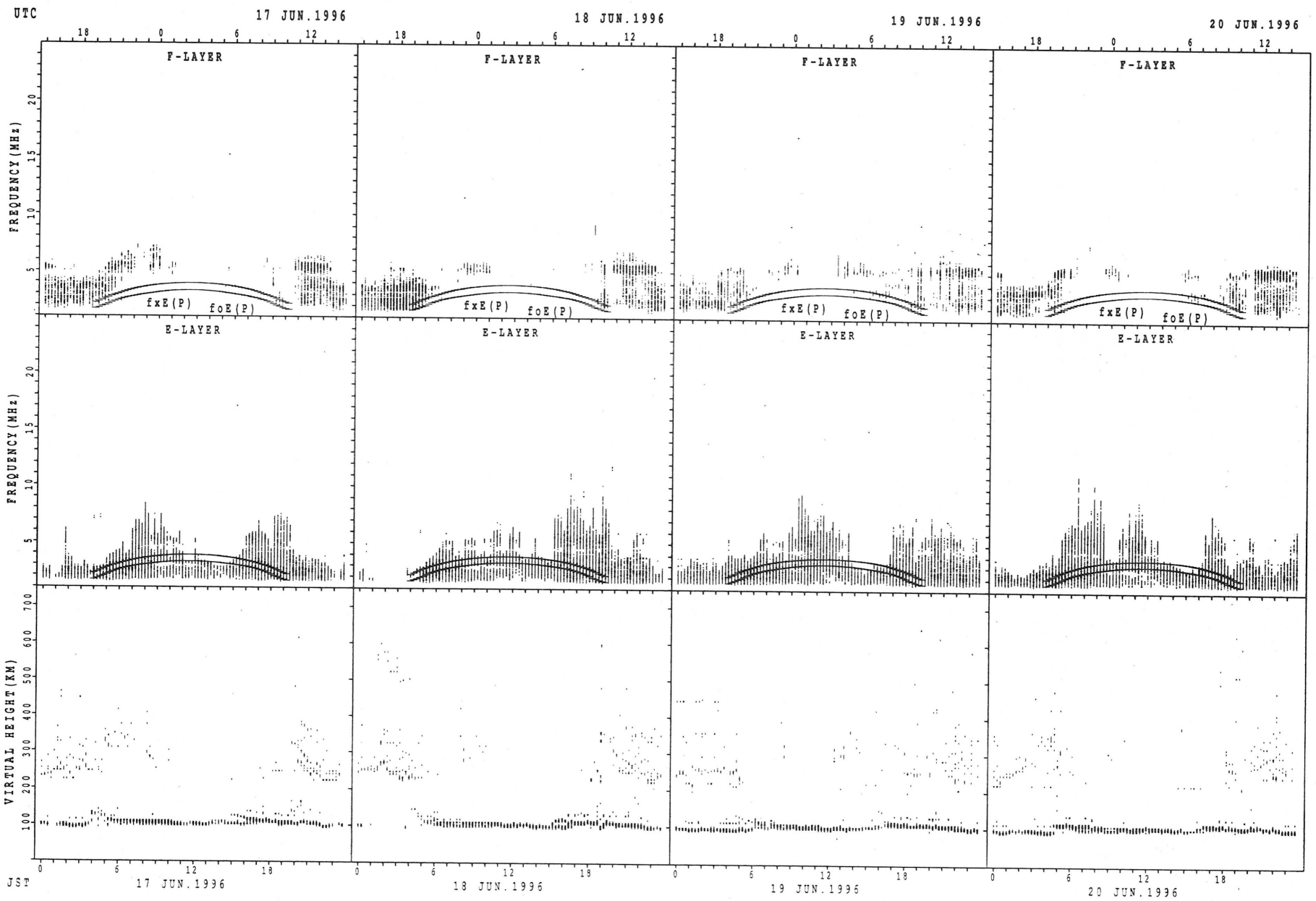

SUMMARY PLOTS AT WAKKANAI
UTC
JST
9 JUN.1996
10 JUN.1996
11 JUN.1996
12 JUN.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI

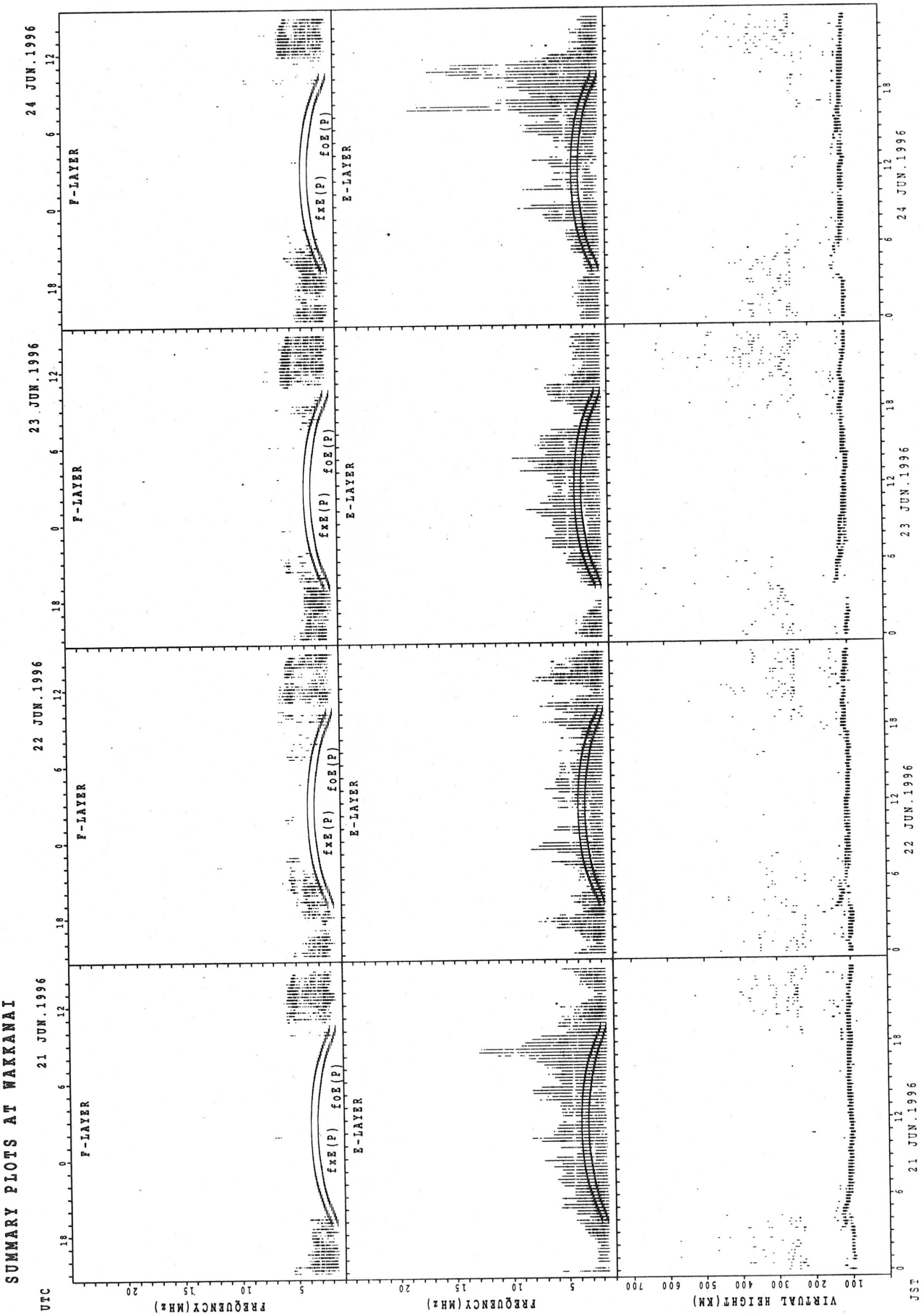


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

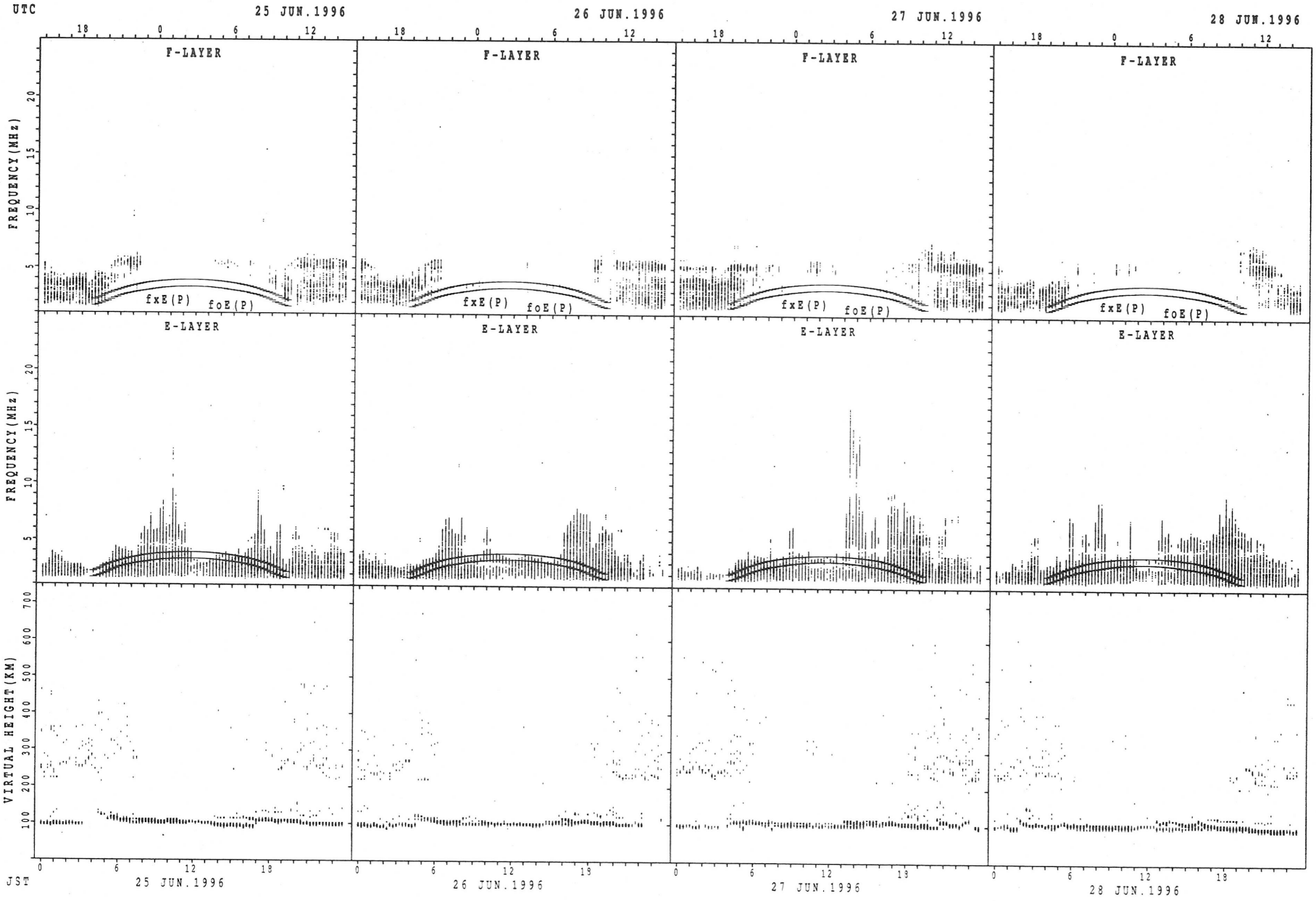
SUMMARY PLOTS AT WAKKANAI



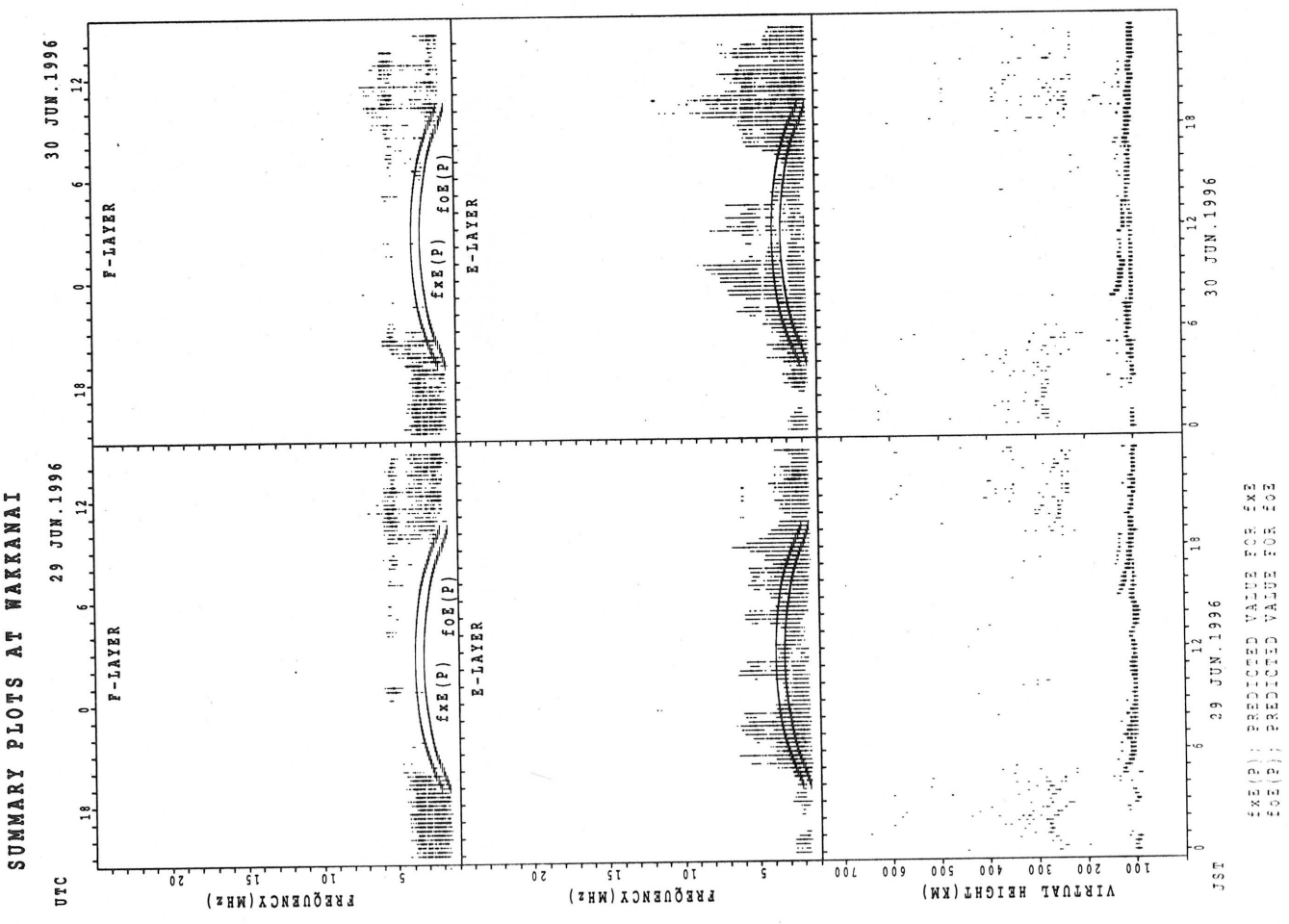
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
21 JUN.1996
22 JUN.1996
23 JUN.1996
24 JUN.1996
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

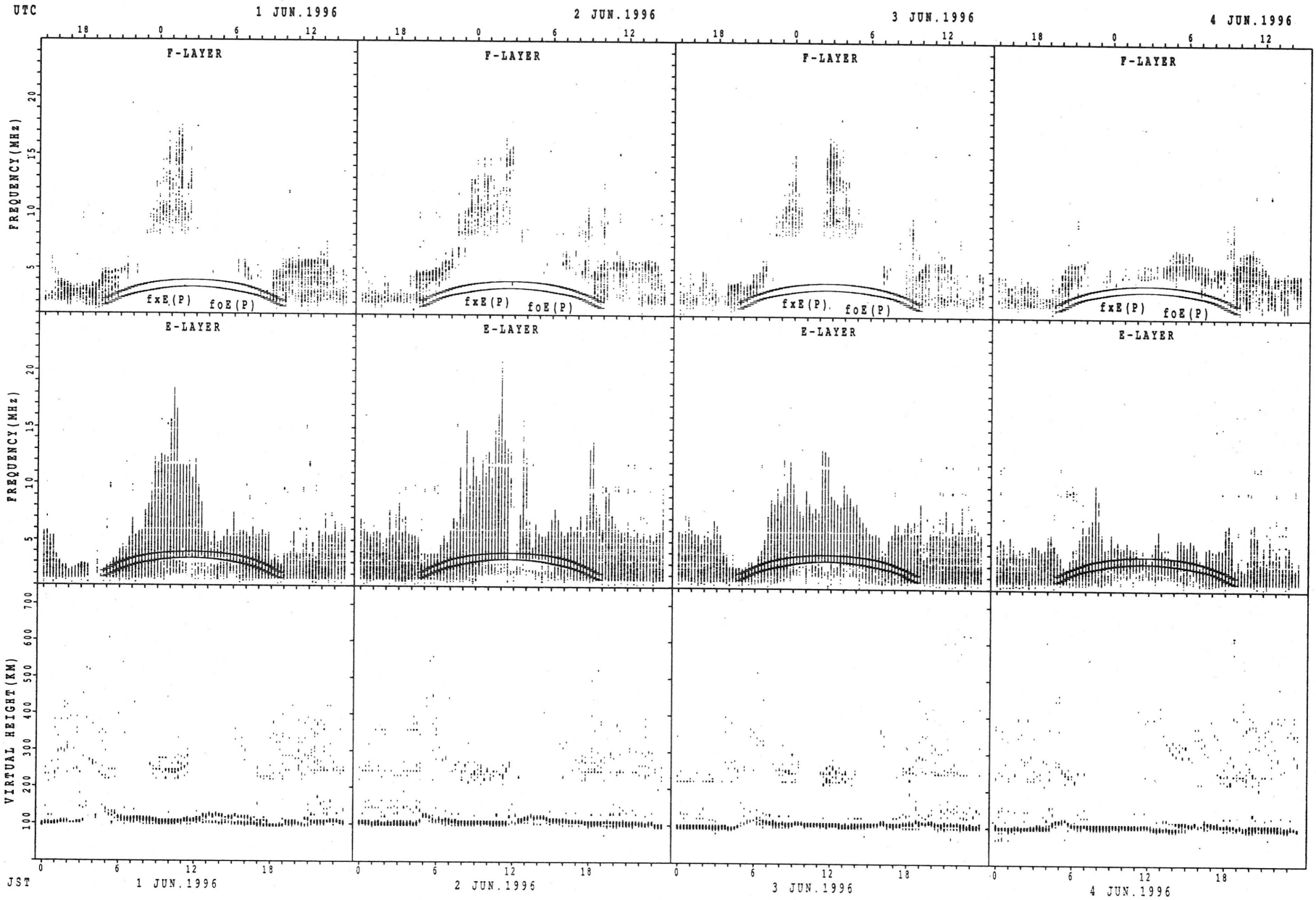
SUMMARY PLOTS AT WAKKANAI



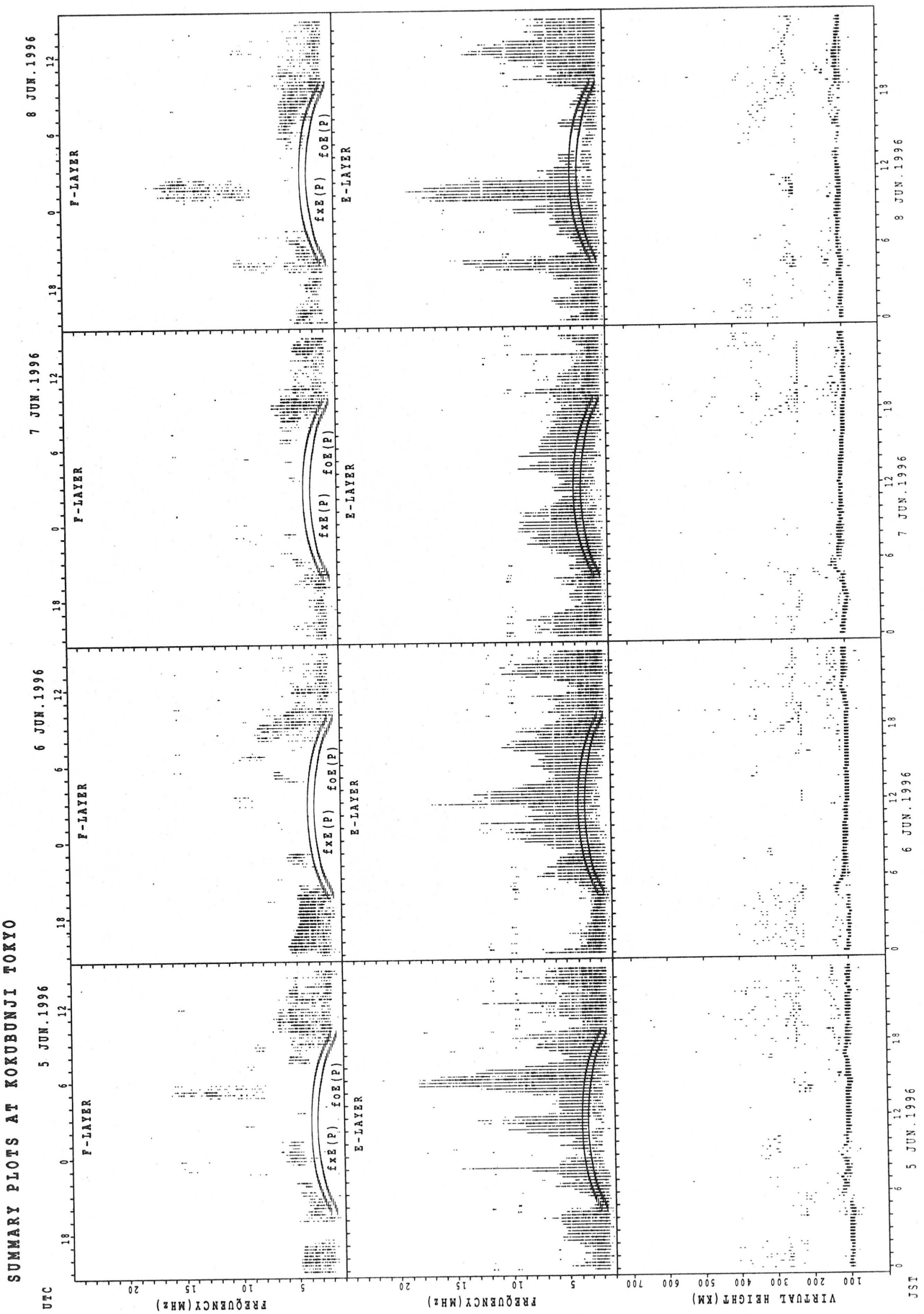
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
29 JUN.1996
30 JUN.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
29 JUN.1996
30 JUN.1996
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

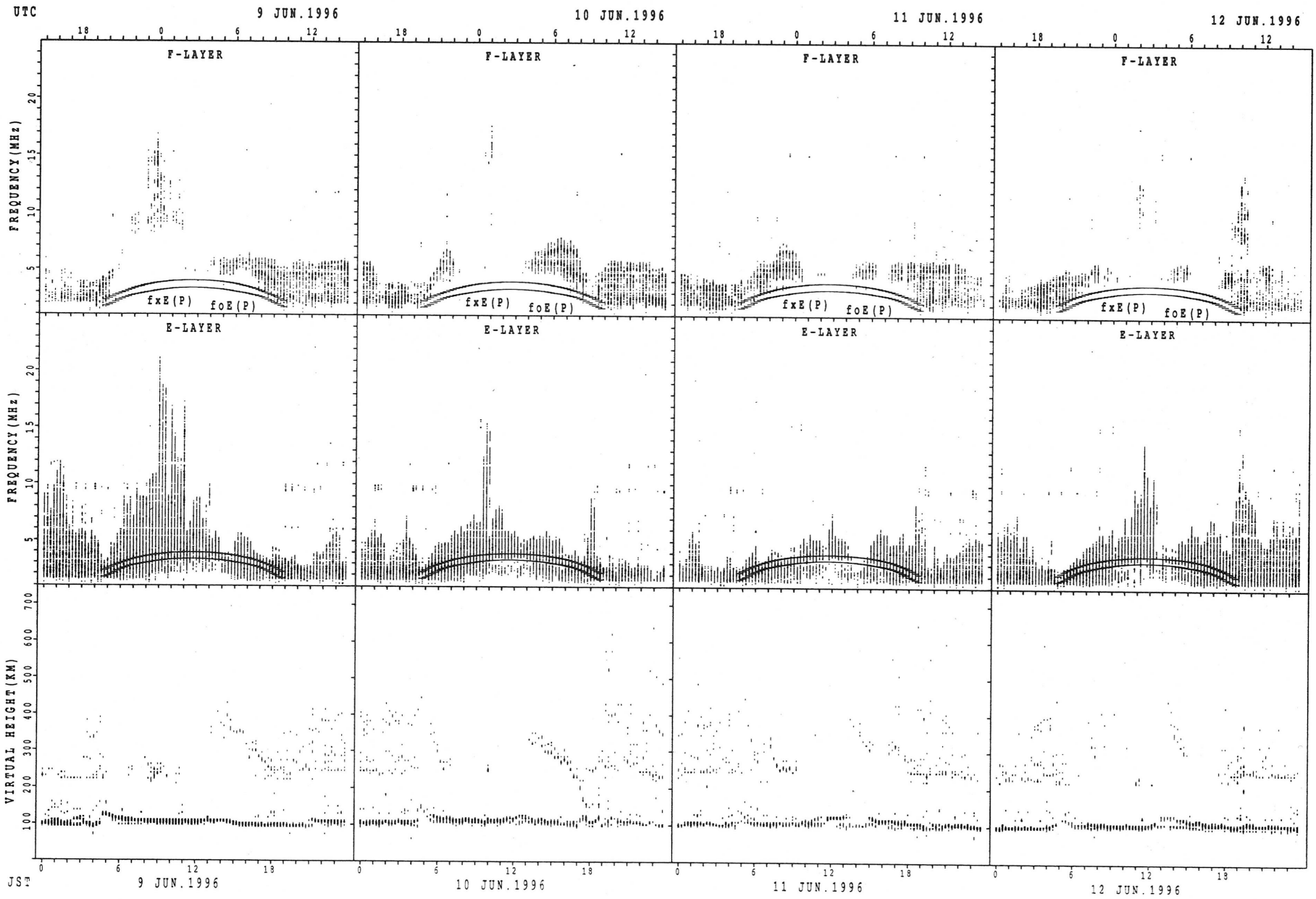
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

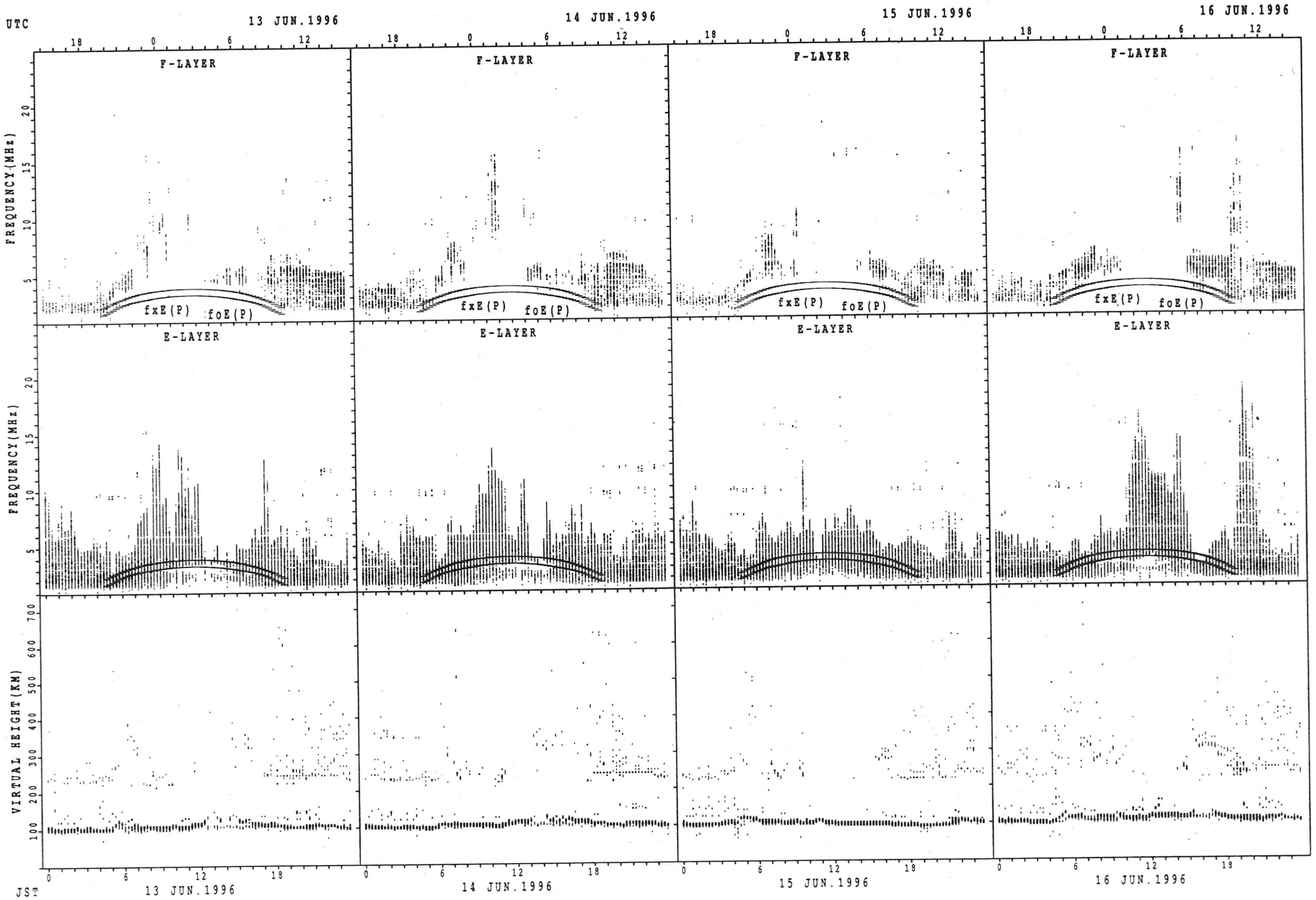

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
5 JUN.1996
6 JUN.1996
7 JUN.1996
8 JUN.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



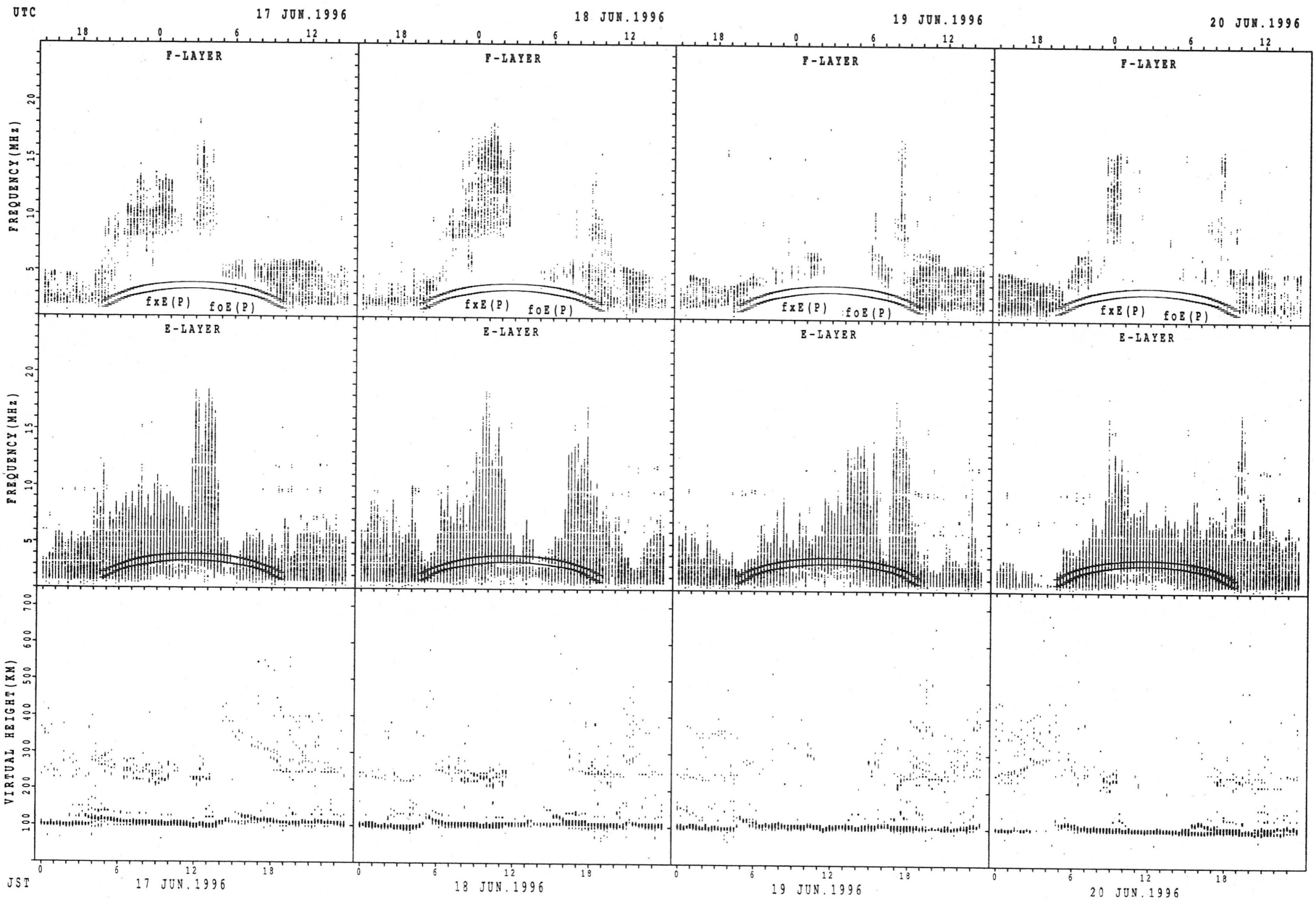
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

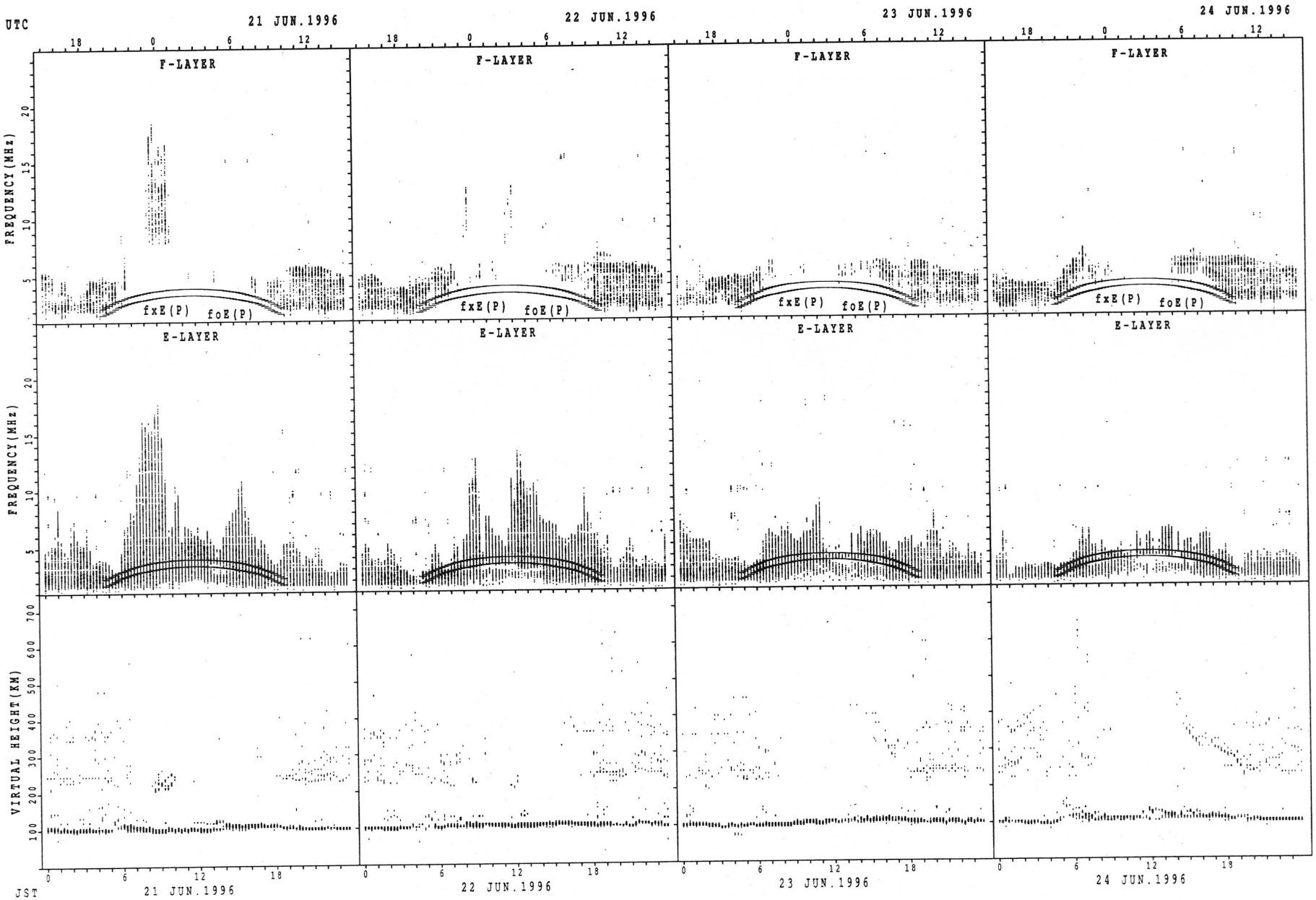


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

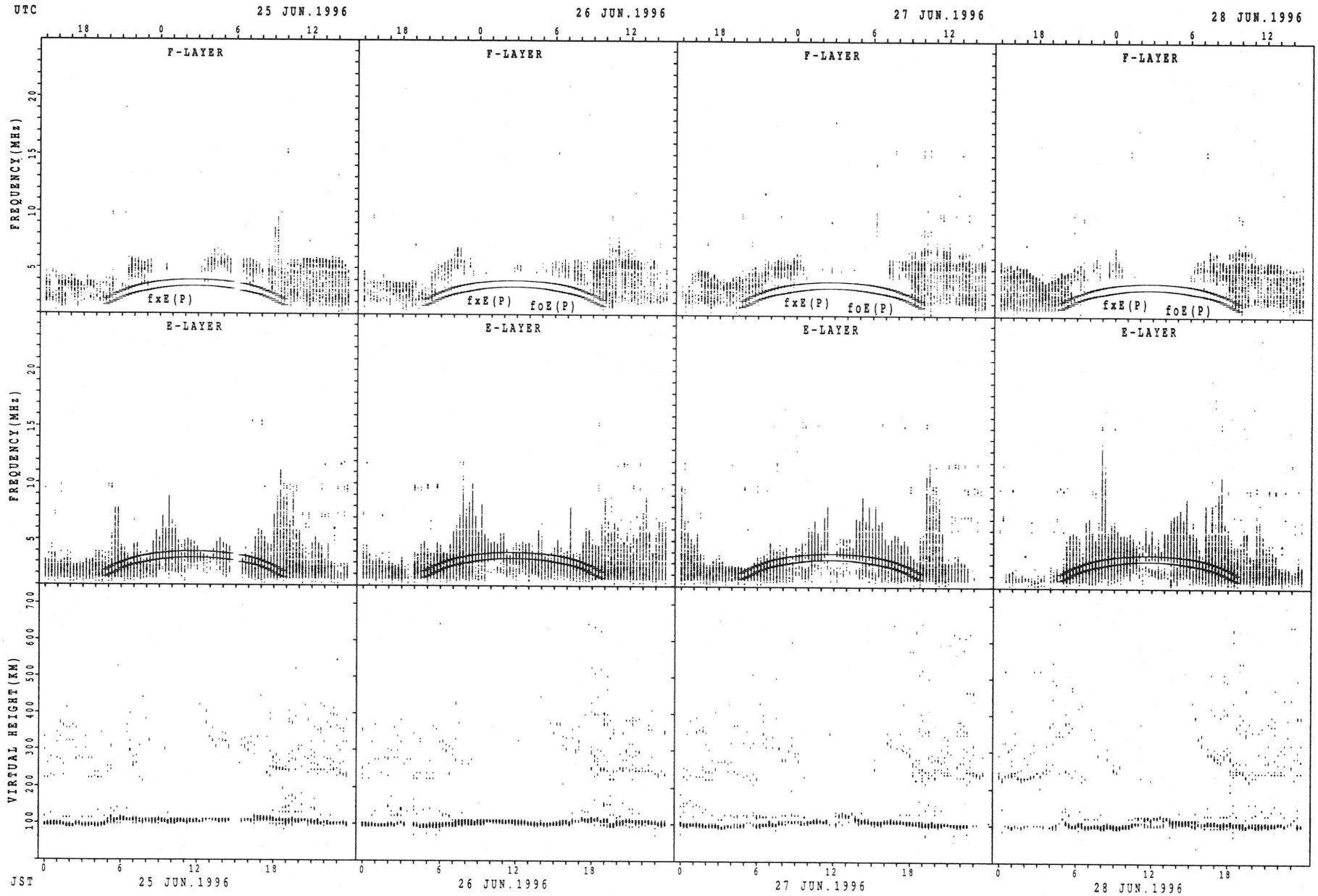


SUMMARY PLOTS AT KOKUBUNJI TOKYO



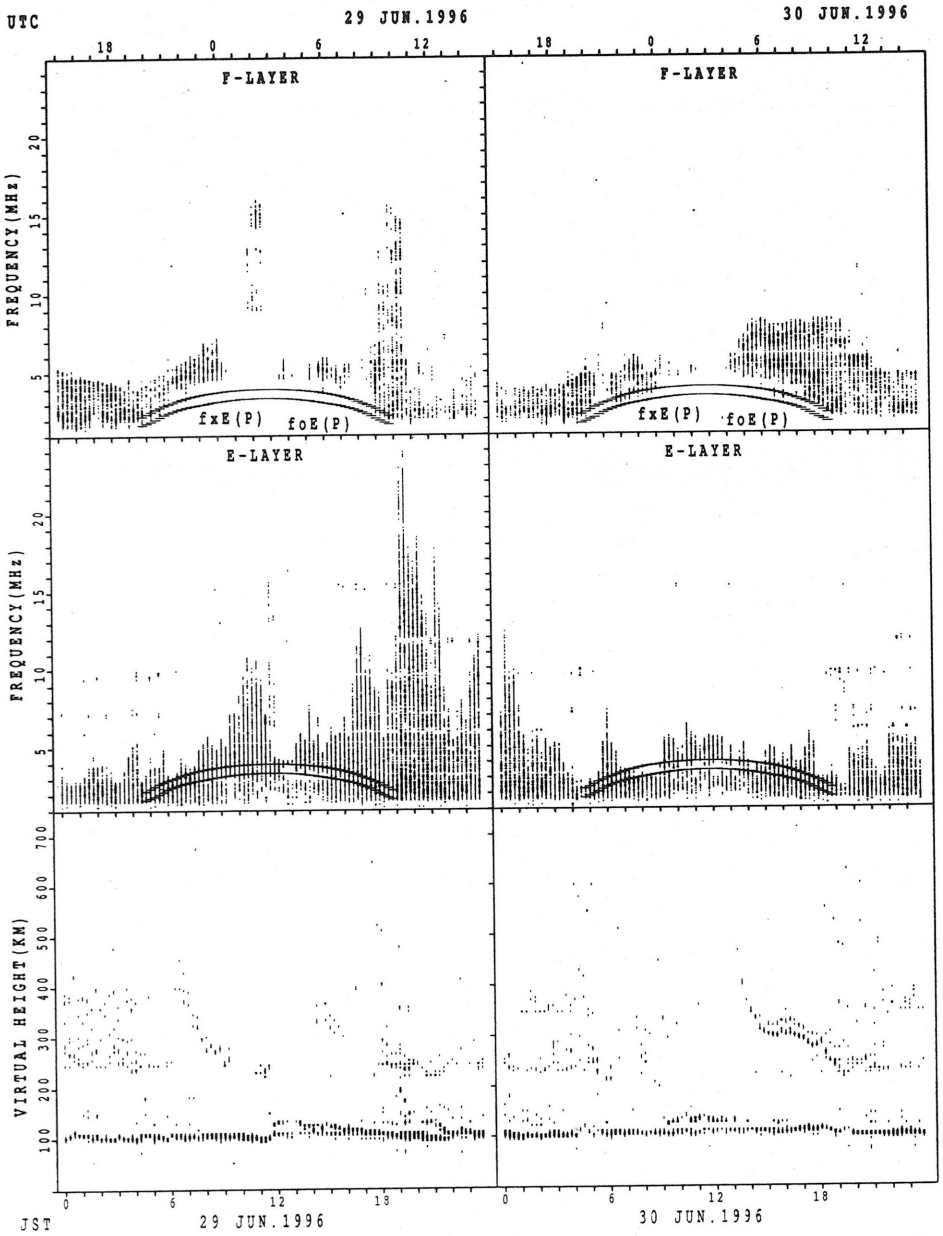
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



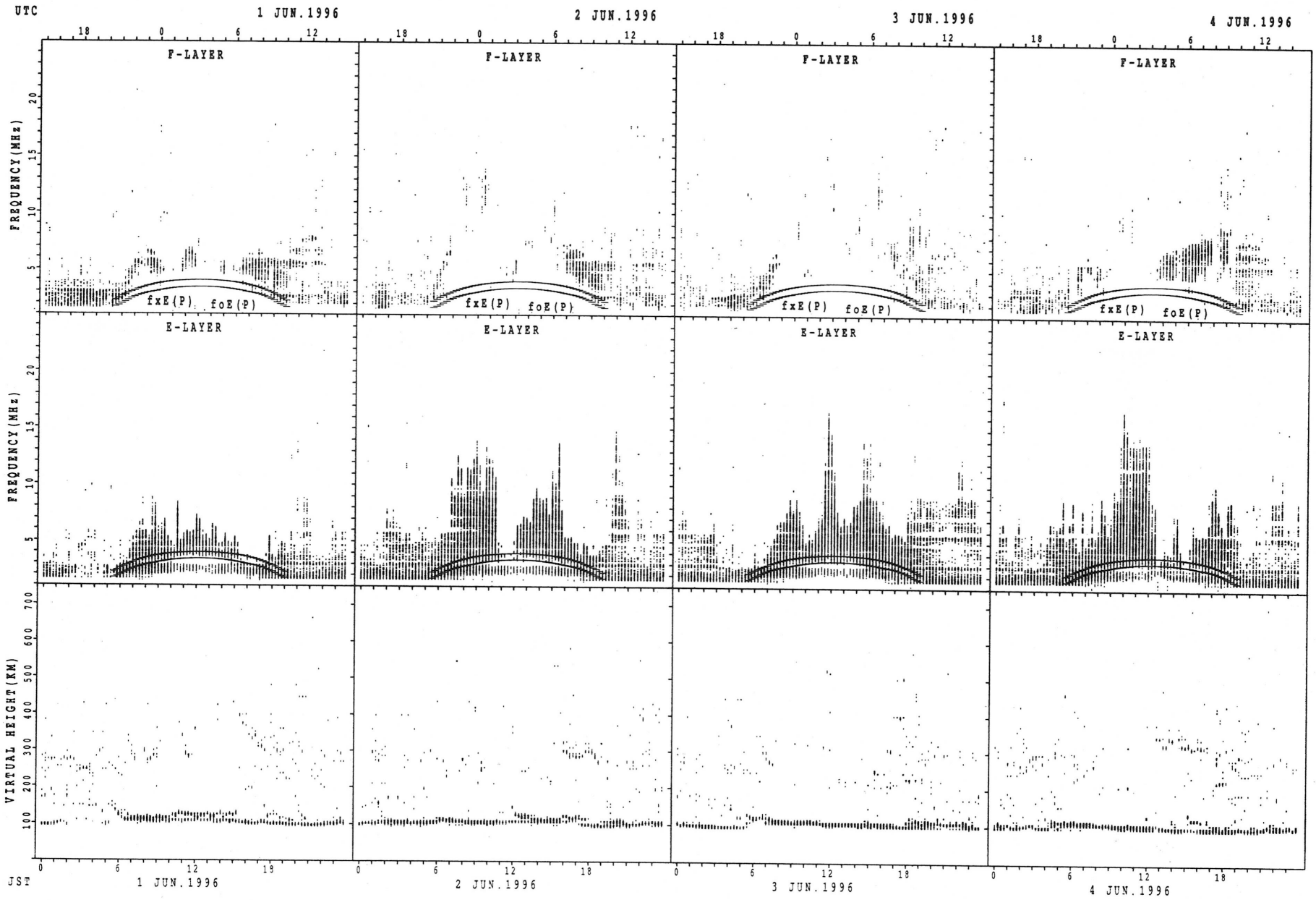
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



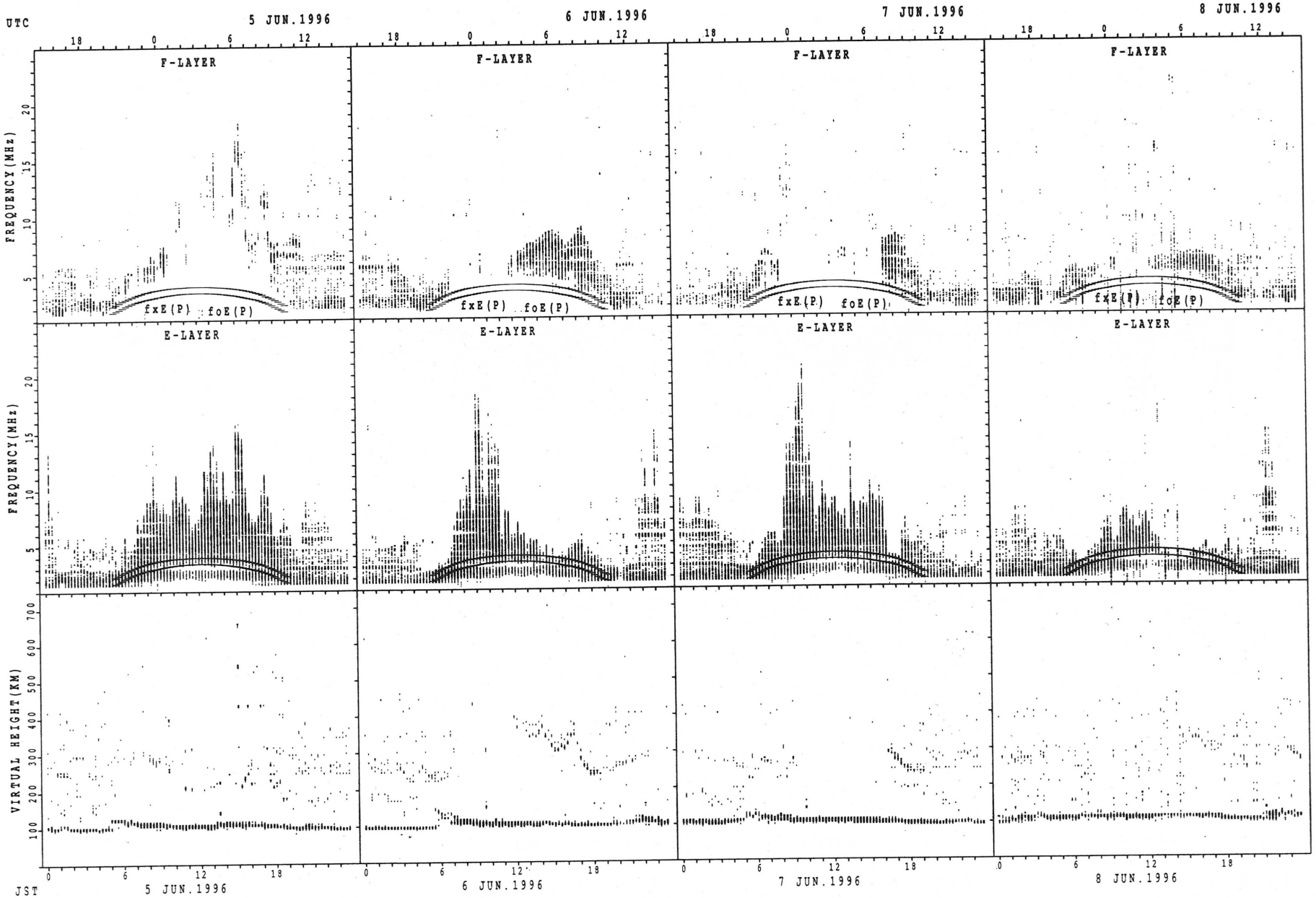
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



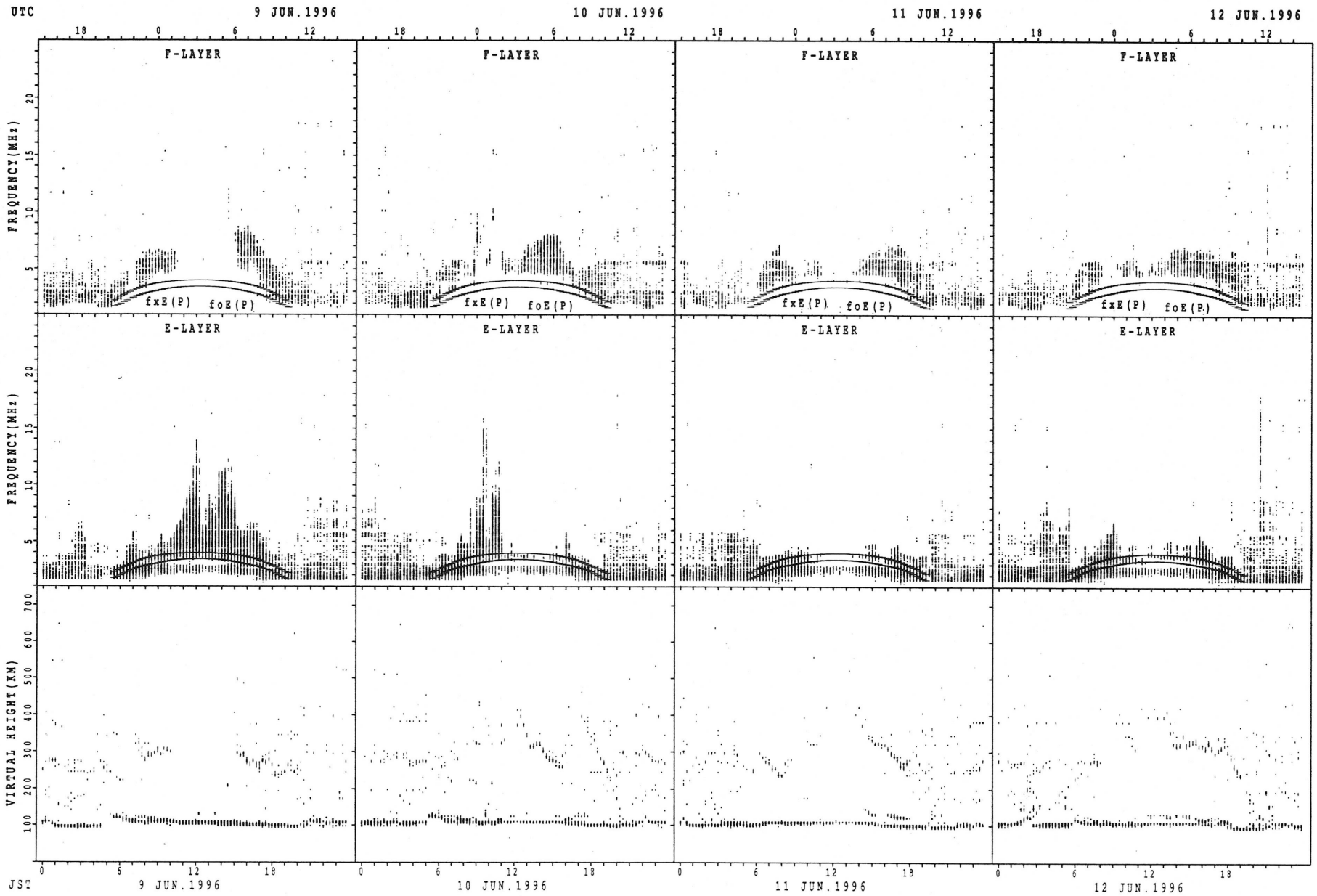
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



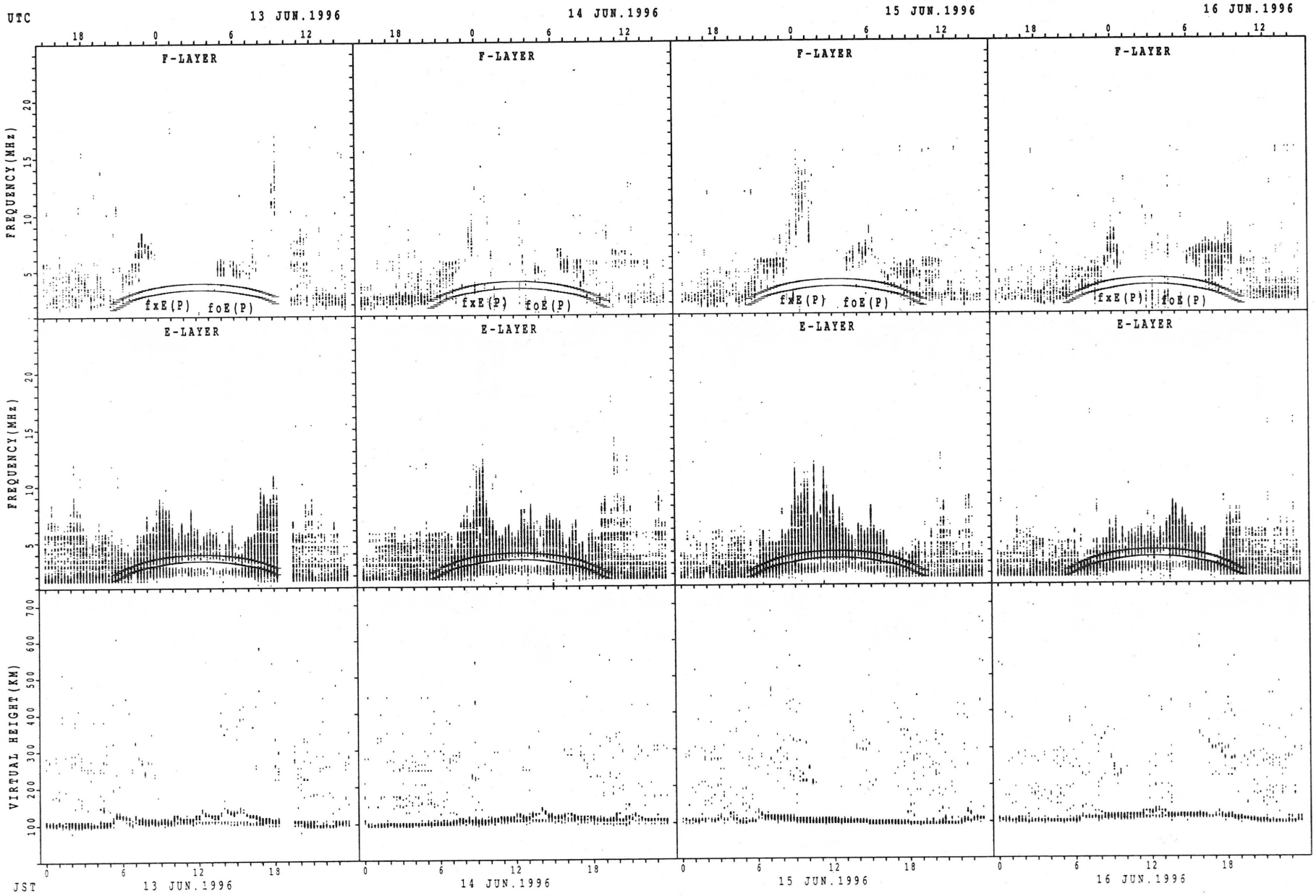
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



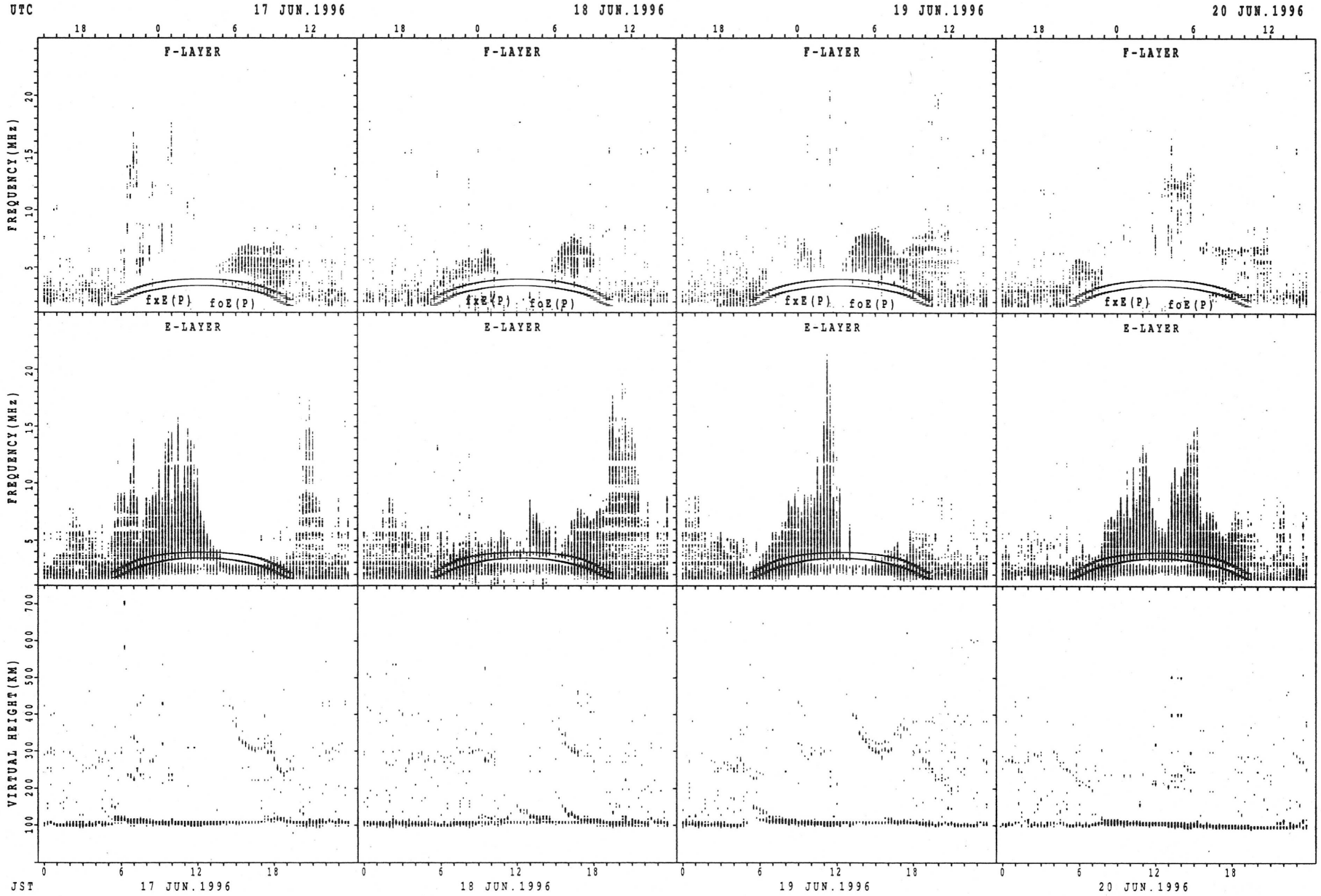
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

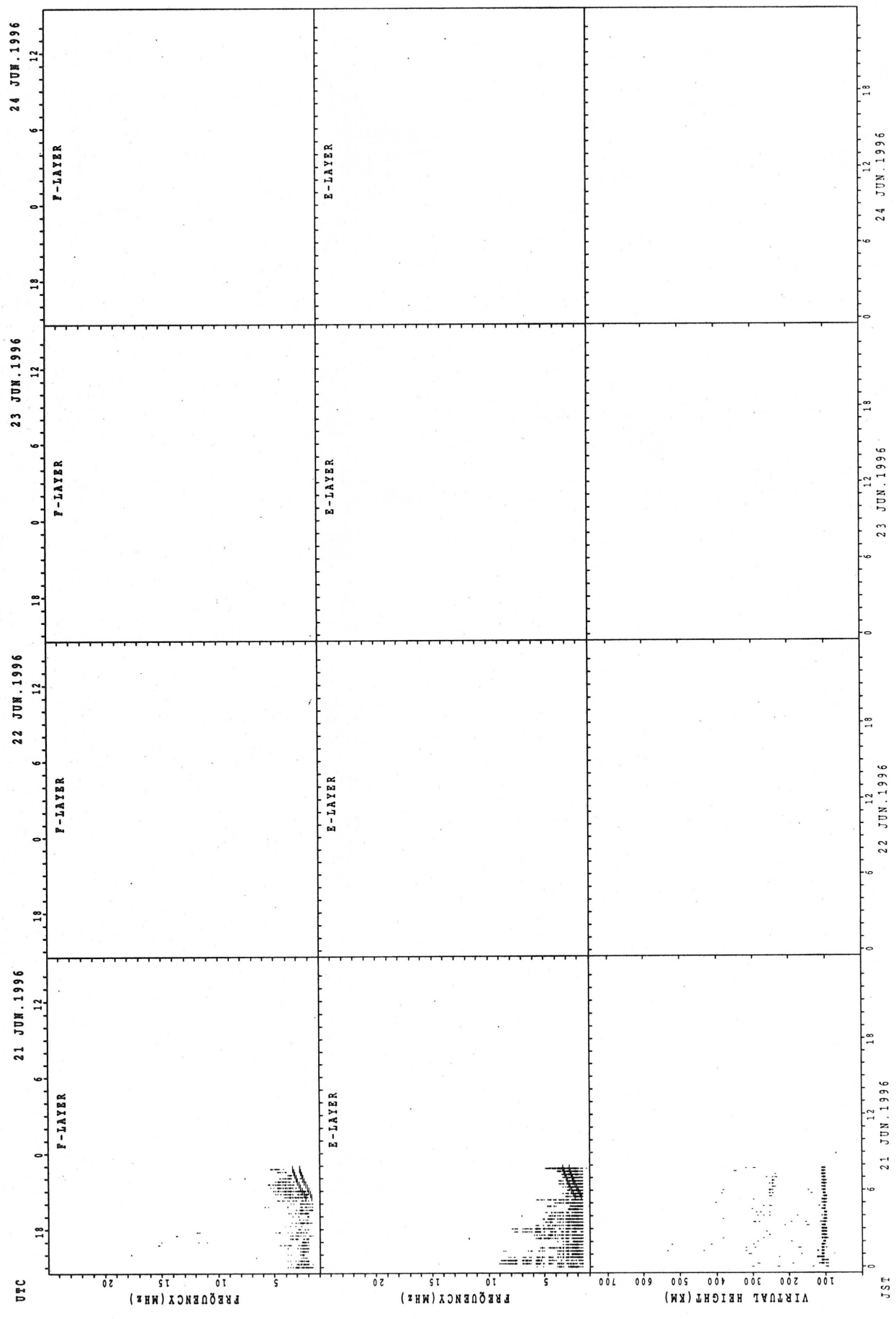


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

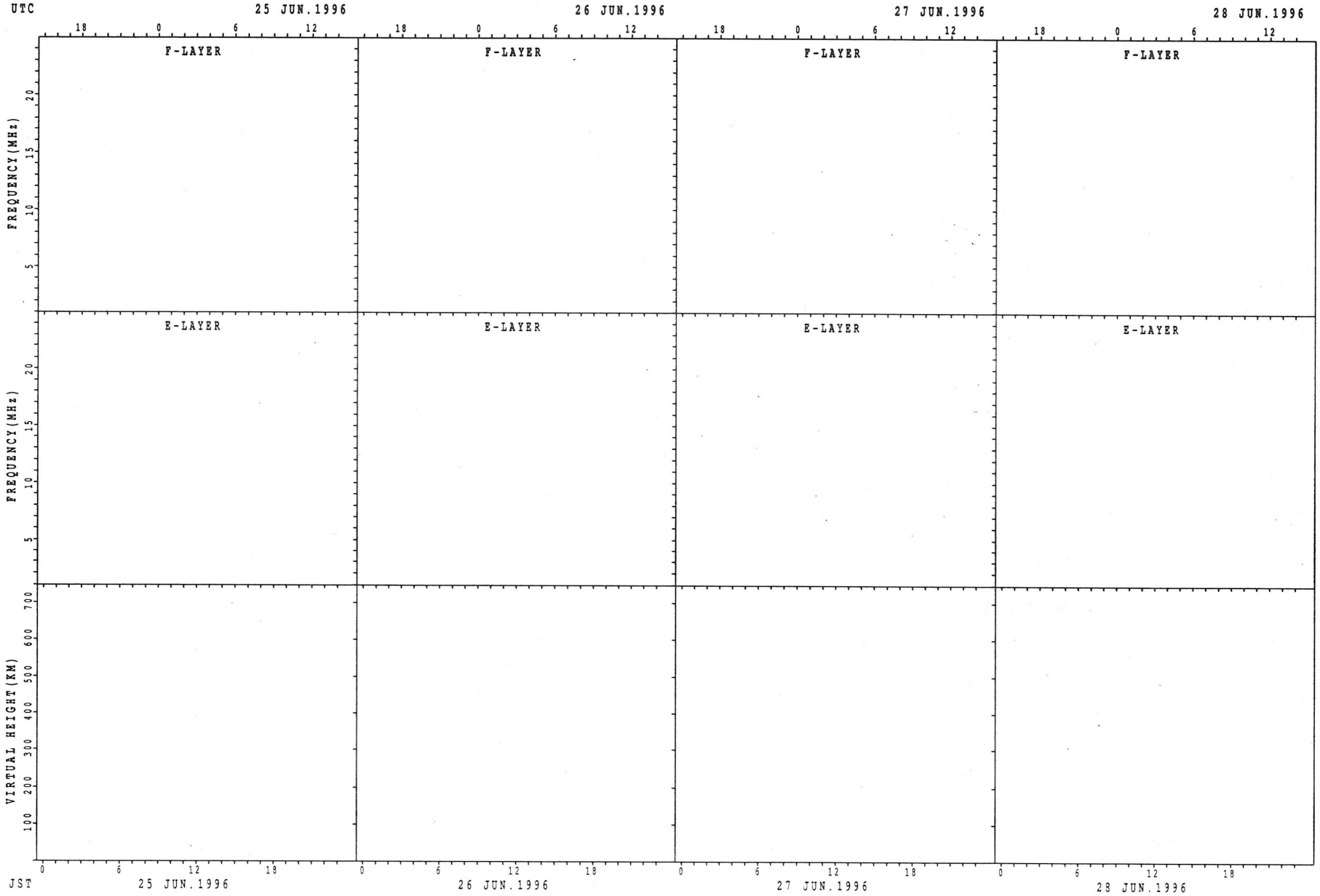
SUMMARY PLOTS AT YAMAGAWA



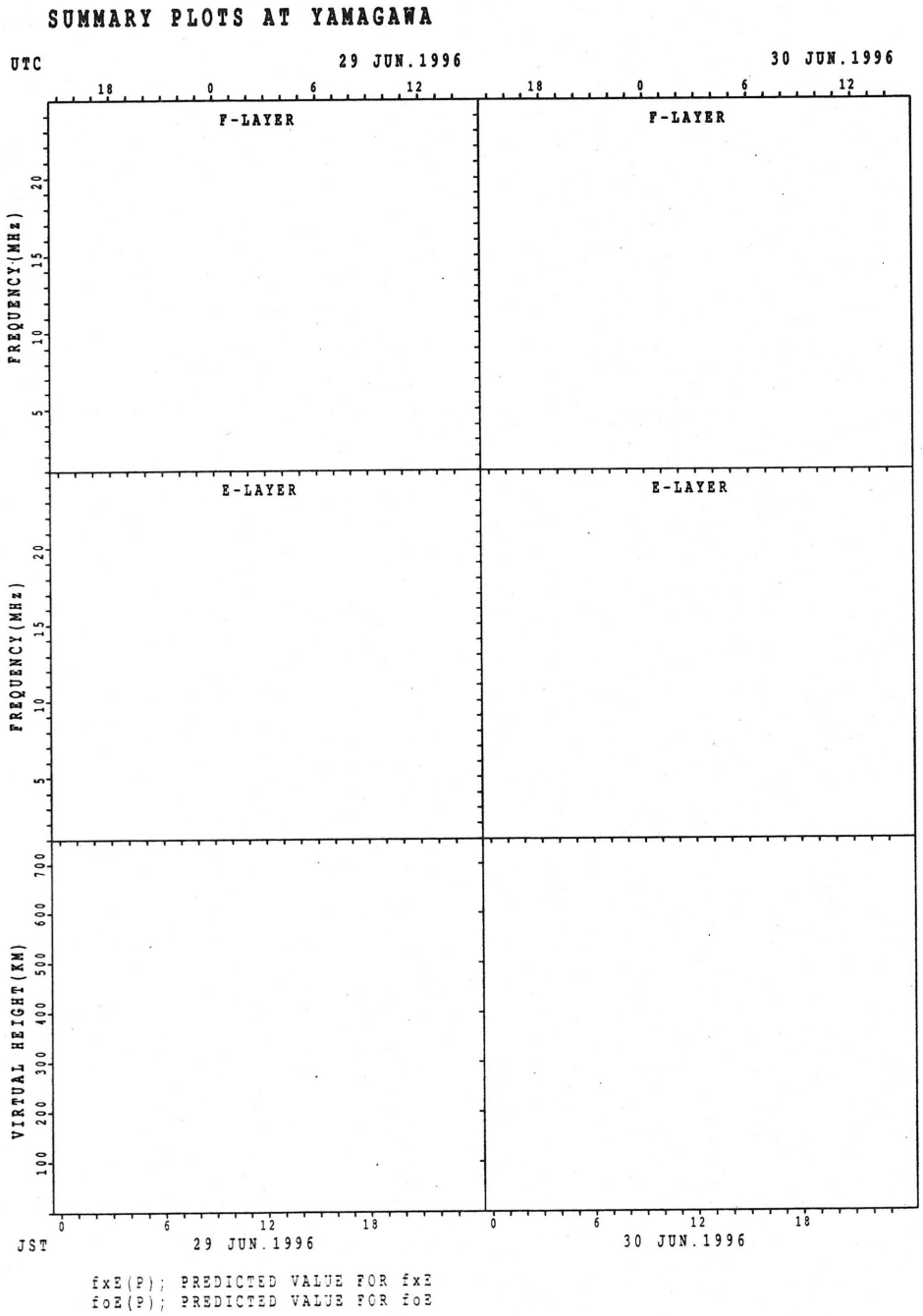
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
21 JUN.1996
22 JUN.1996
23 JUN.1996
24 JUN.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

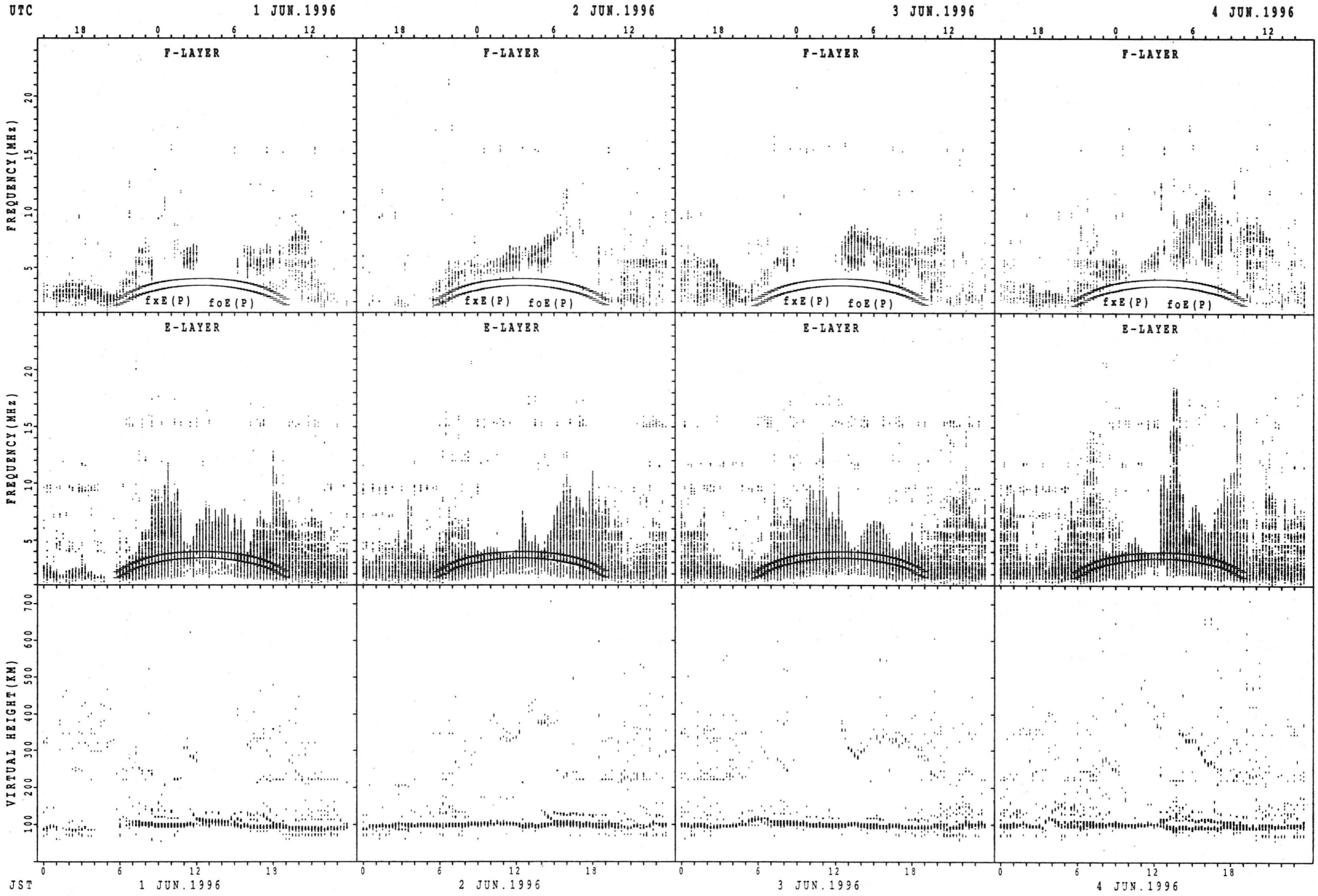


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE



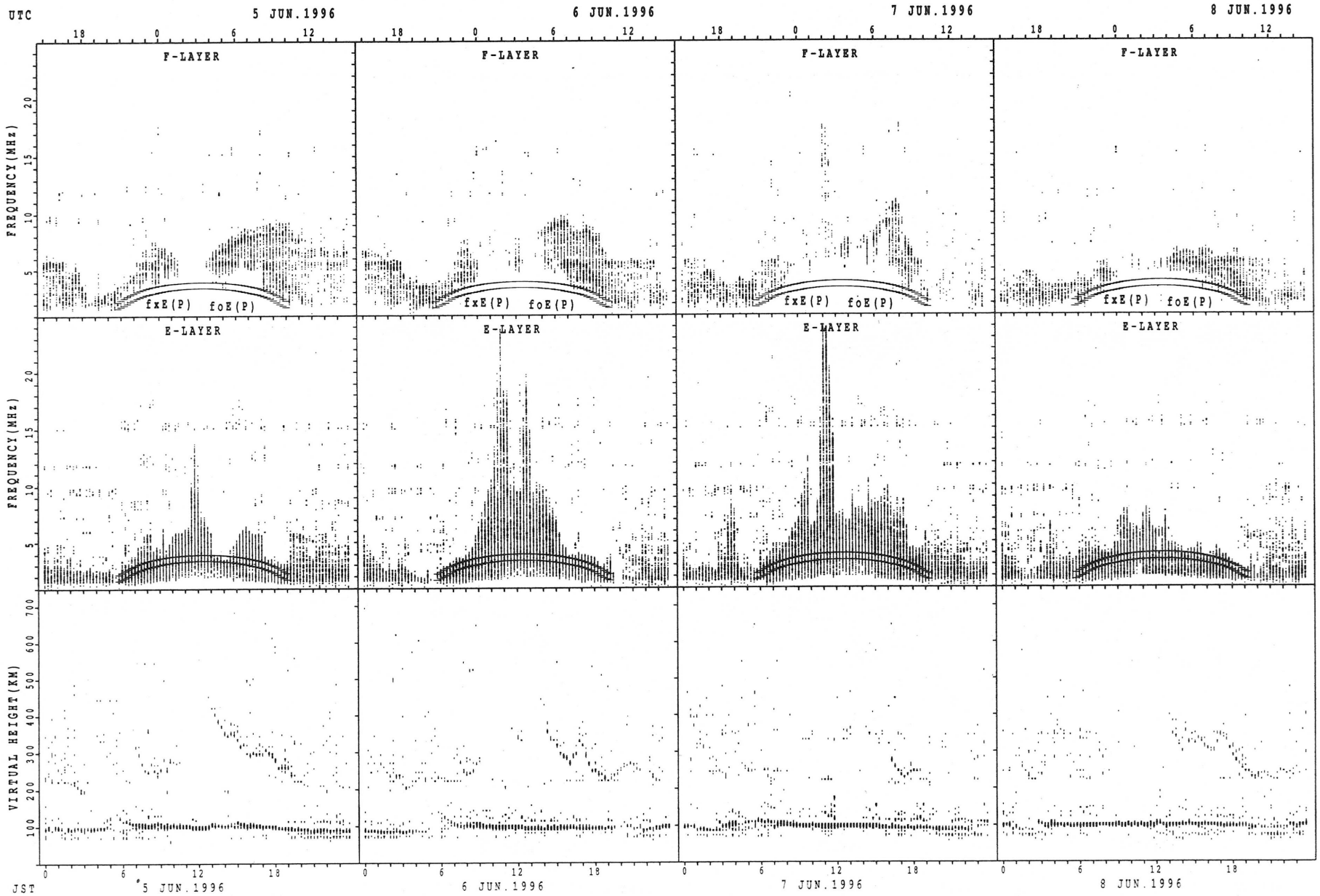
NOTE: SUMMARY PLOTS AT YAMAGAWA from 21 June 1996 to 30 June 1996 were not available.

SUMMARY PLOTS AT OKINAWA



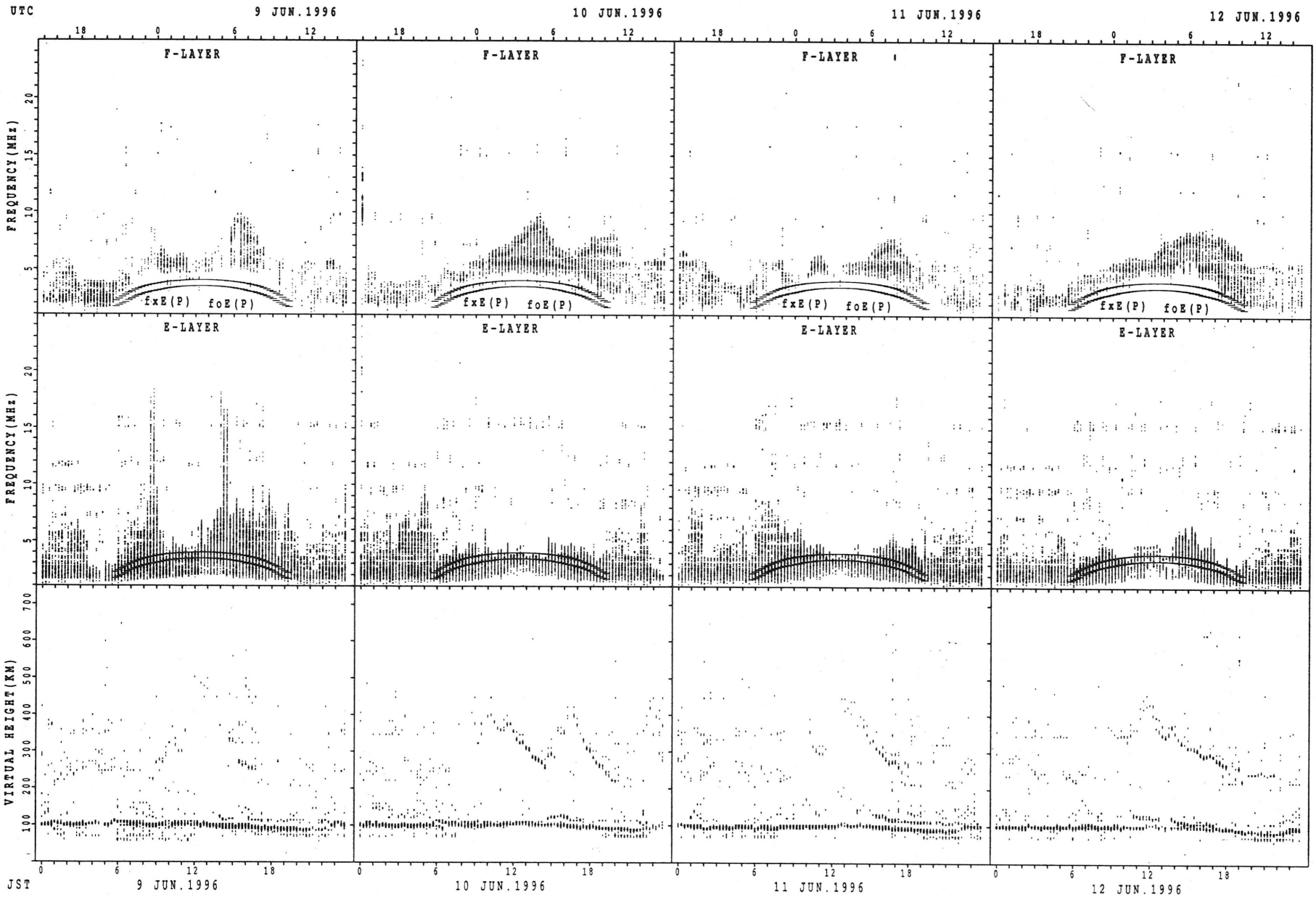
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA

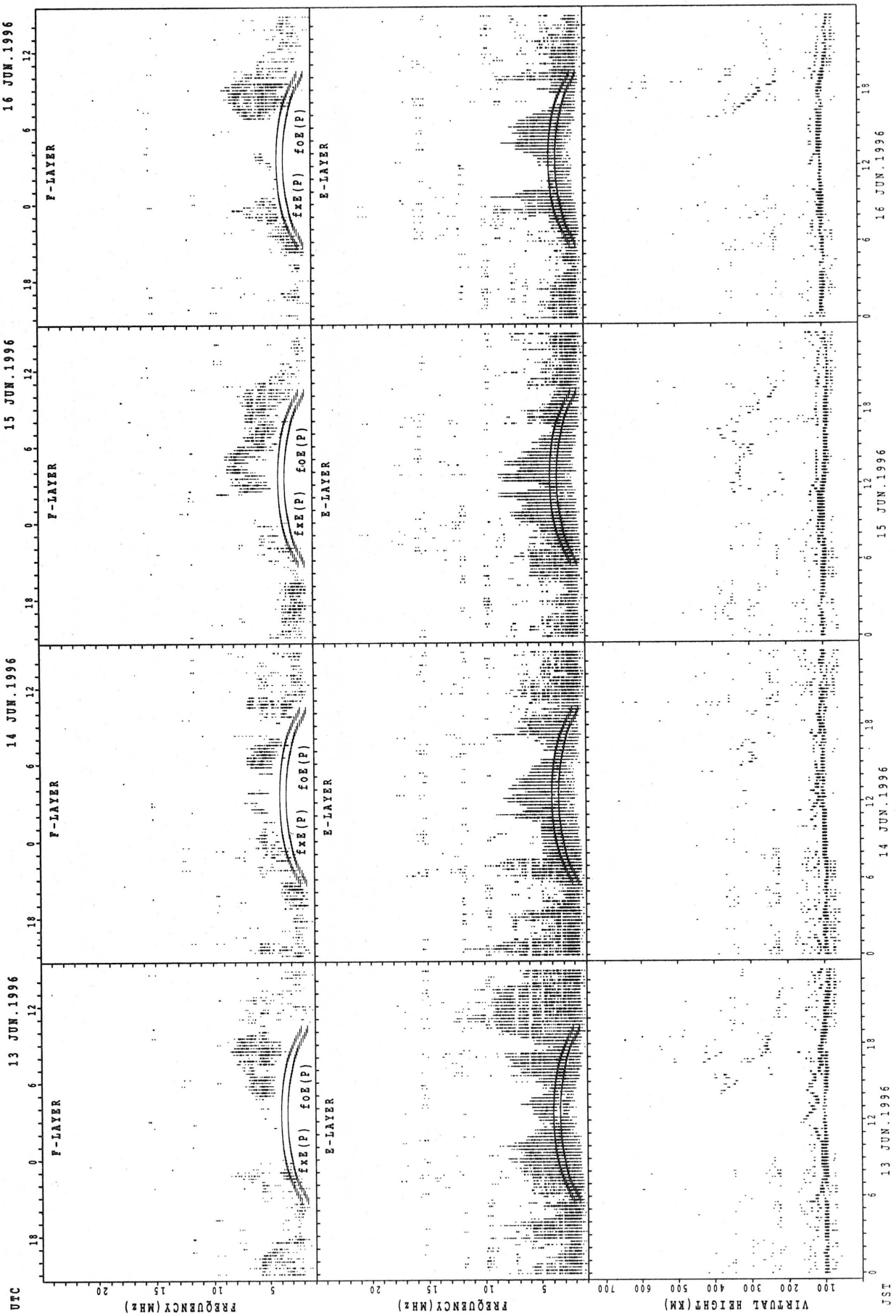


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

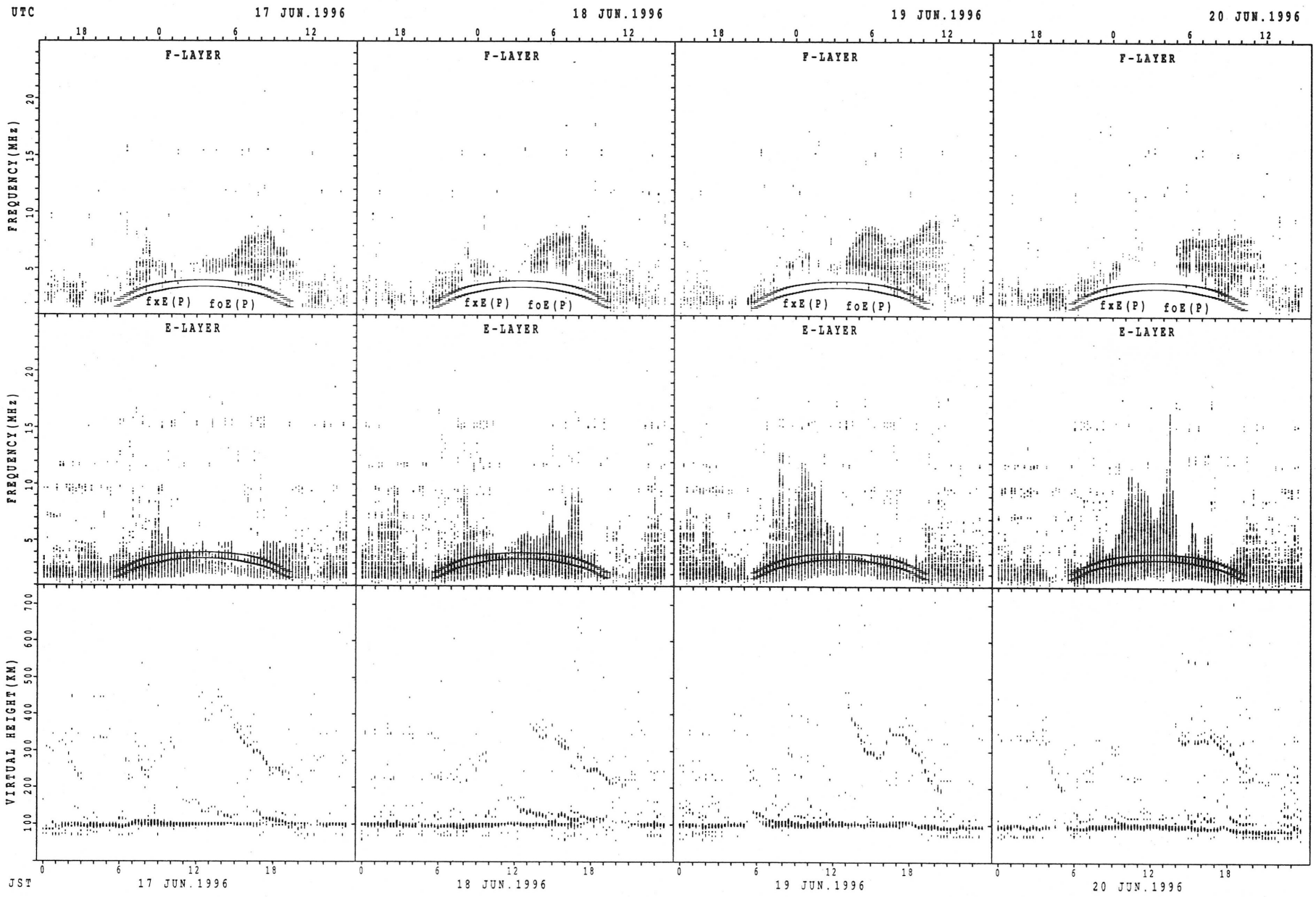
SUMMARY PLOTS AT OKINAWA



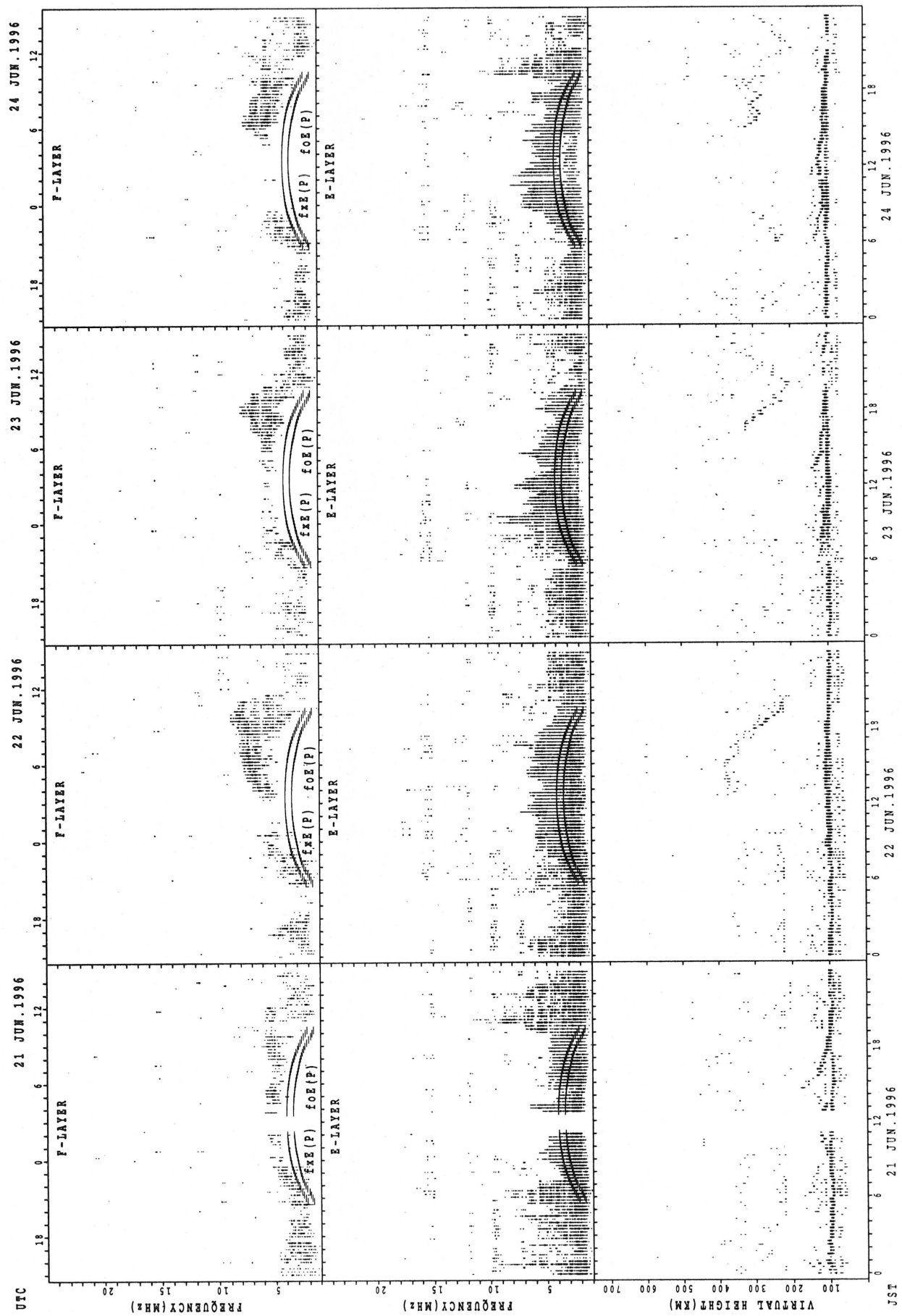
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
13 JUN.1996
14 JUN.1996
15 JUN.1996
16 JUN.1996
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

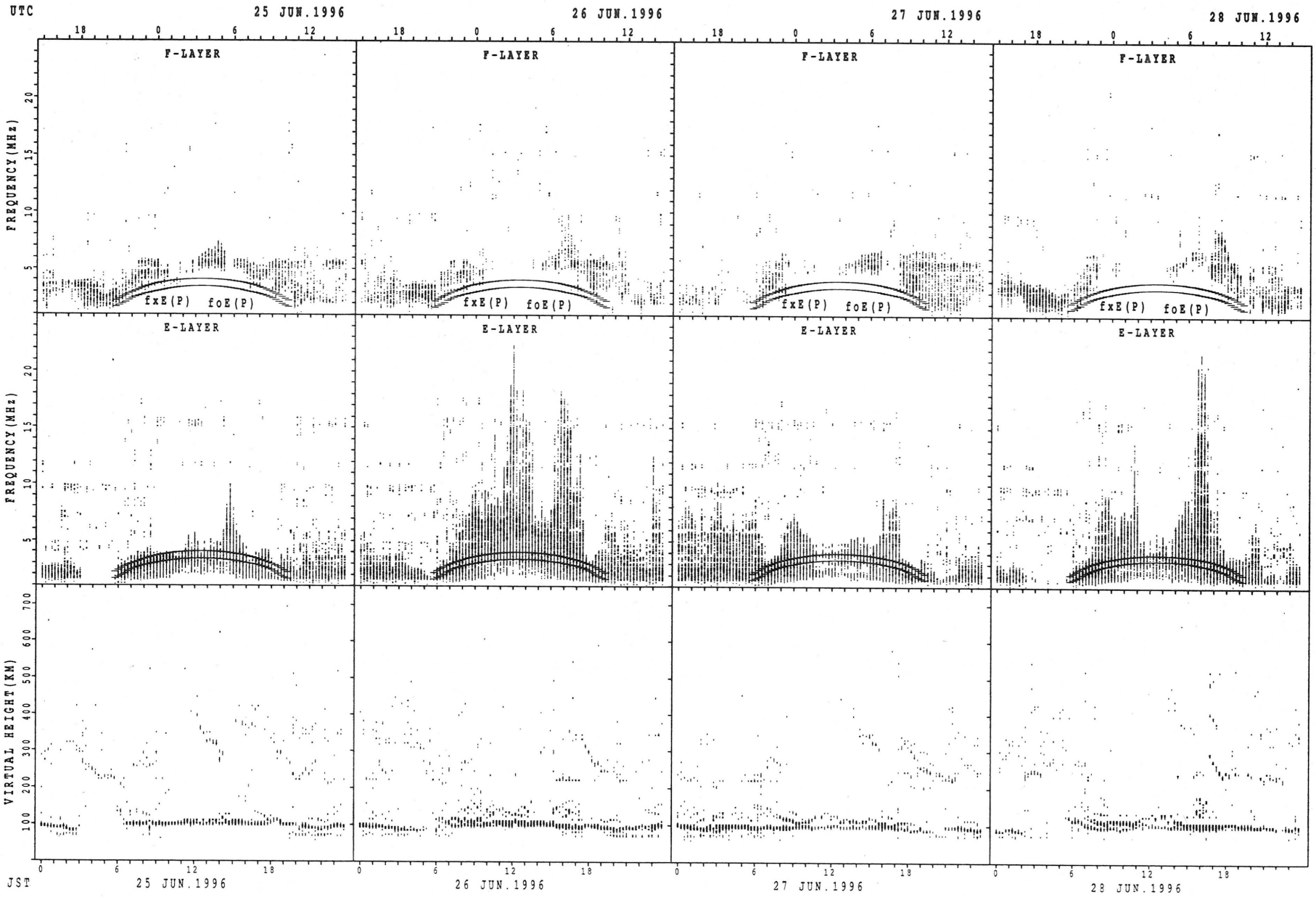
SUMMARY PLOTS AT OKINAWA



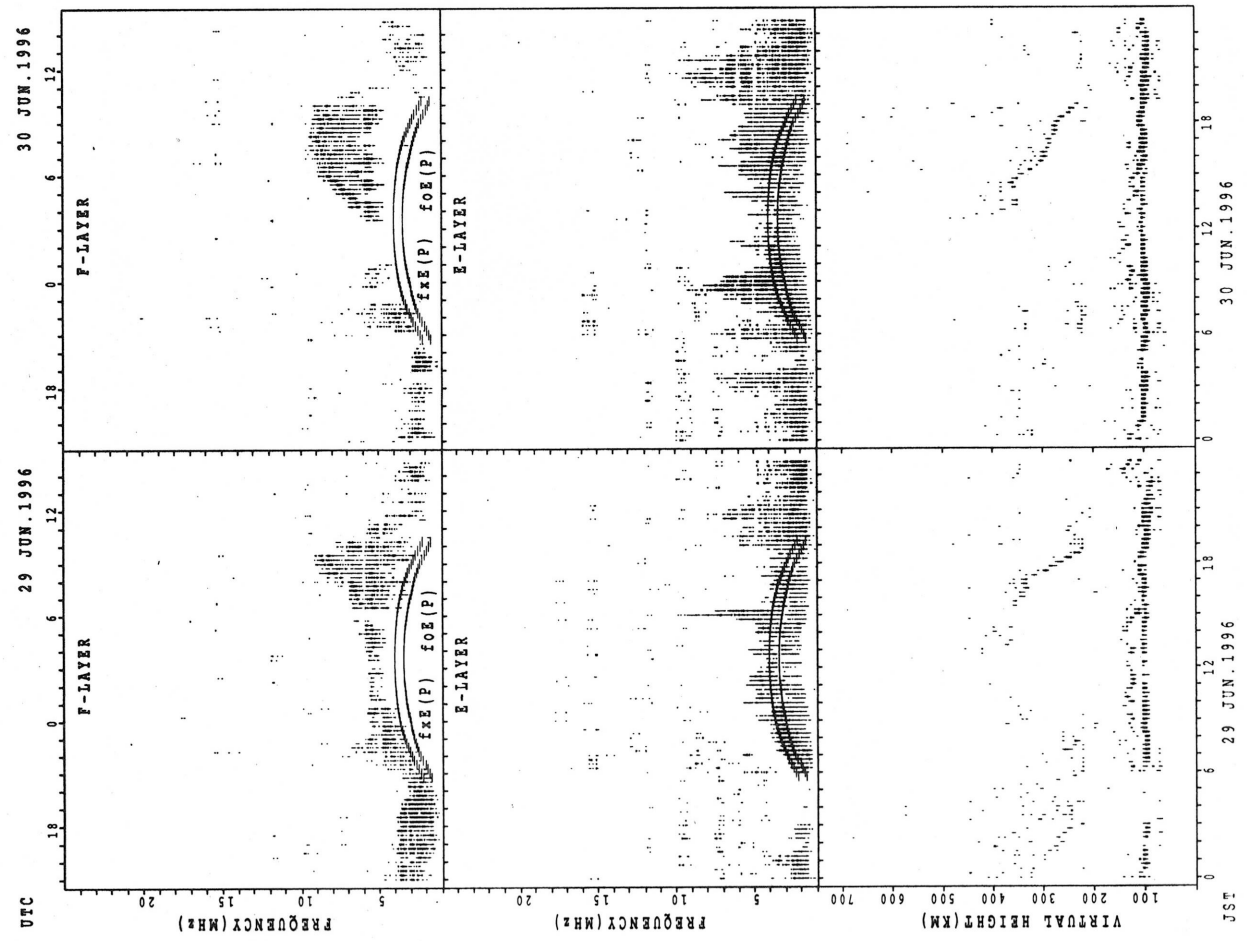
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
21 JUN.1996
22 JUN.1996
23 JUN.1996
24 JUN.1996
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 JUN.1996
30 JUN.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
fxE(P) foE(P)
VIRTUAL HEIGHT(KM)
JST
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

MONTHLY MEDIANS OF h'F AND h'Es

JUN. 1996 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

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

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	25	22	23	27	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	28	26	30	24
MED	103	99	99	99	107	119	115	113	111	107	107	105	105	105	105	112	112	113	111	107	111	107	105	103
U Q	104	103	103	103	121	125	119	115	113	111	109	107	107	107	109	117	115	115	114	111	113	111	113	105
L Q	99	97	99	97	99	113	113	111	109	107	105	103	103	103	103	103	107	107	107	105	107	107	103	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				
MED																				245				
U Q																				275				
L Q																				230				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	23	25	24	28	29	30	29	27	28	29	28	30	27	28	30	28	27	25	29	27	25	24
MED	105	105	103	103	104	116	113	113	113	111	109	107	112	117	113	113	113	113	111	107	107	107	109	107
U Q	107	107	105	106	106	129	119	117	115	113	113	111	121	121	119	119	119	115	113	112	113	113	111	113
L Q	103	101	101	98	95	105	107	111	109	105	106	105	107	105	107	110	109	108	107	102	105	105	103	105

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																								
MED																								
U Q																								
L Q																								

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	21	21	20	20	20	21	19	20	18	19	19	19	20	20	19	20	20	20	17	19	20	20	20
MED	109	107	105	105	104	107	119	115	113	112	111	111	119	110	111	113	115	113	107	105	101	107	113	111
U Q	112	111	113	108	107	113	125	117	115	115	119	119	131	122	118	127	123	119	113	112	119	112	119	117
L Q	103	103	103	103	102	105	107	111	111	111	109	107	107	105	107	105	106	104	102	102	99	101	103	102

MONTHLY MEDIANS OF h'F AND h'Es

JUN. 1996 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

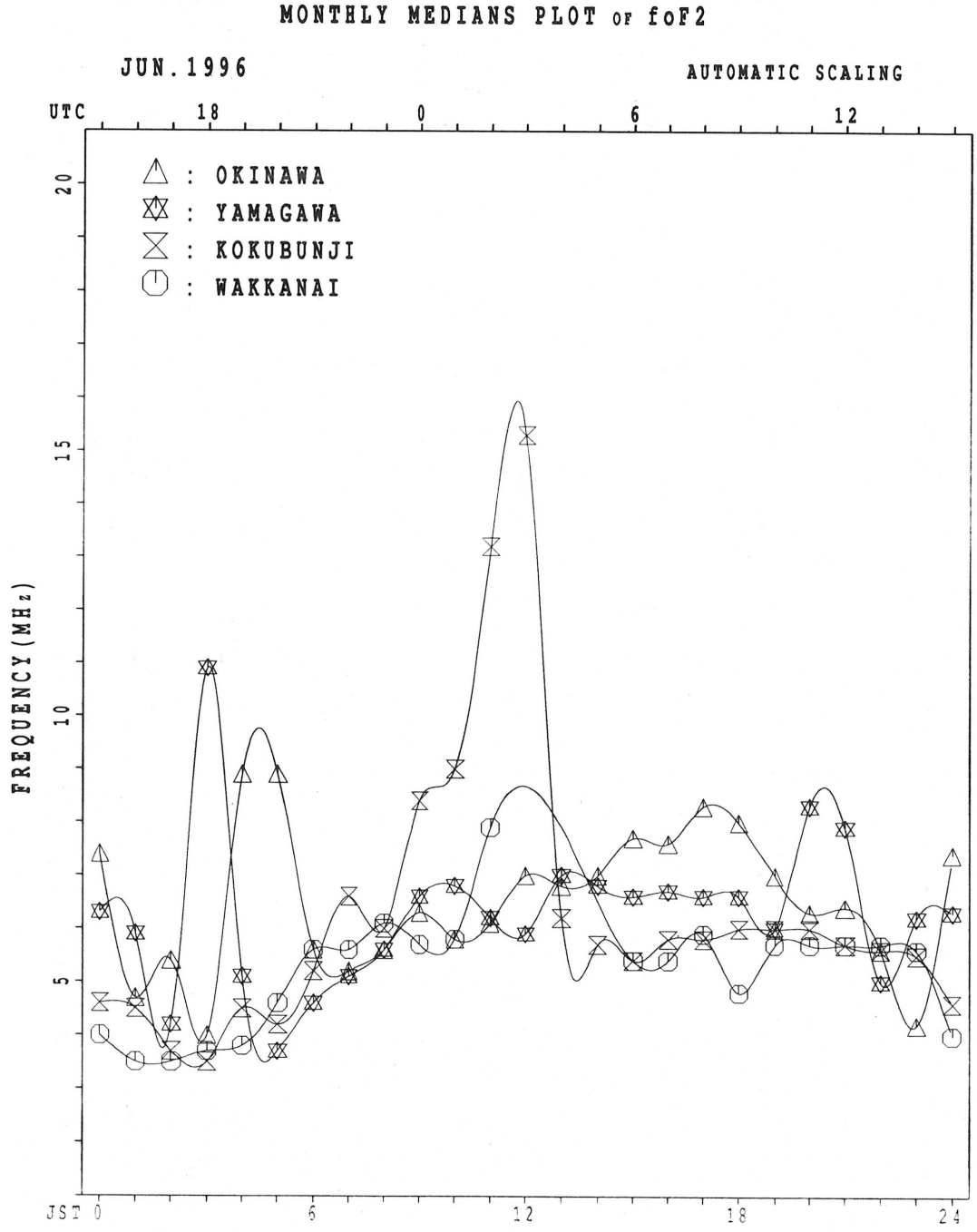
STATION OKINAWA LAT. 26.3N LON. 127.8E

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															11	14	17	17	18	10				
MED															350	333	296	322	283	255				
U Q															370	354	341	338	328	272				
L Q															298	300	278	290	266	250				

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	27	28	25	27	23	25	27	29	29	30	30	29	28	30	30	30	29	27	30	27	26	28	25	30
MED	99	97	97	99	99	99	101	107	107	107	106	113	110	112	113	111	113	107	107	103	95	92	91	98
U Q	107	107	103	103	103	104	115	113	114	115	113	132	125	127	127	117	117	111	111	105	103	100	100	103
L Q	91	94	89	89	95	95	95	98	103	103	103	103	105	105	105	107	105	105	97	95	89	87	89	95


MONTHLY MEDIANS PLOT OF foF2
JUN. 1996
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

JUN. 1996 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	40	37	36	39															X 59	X 63	62	67	A
2	A	38	44	40	46															X 66	X 71	62	62	62
3	X 48	A 51		A 40																X 61	X 66	A	55	A
4	51	44	46	X 40	41															X 68	X 73	X 58	50	54
5	52	50	48	A	A																X 75	61	62	61
6	57	58	53	50	50								A								X 52	55	A	A
7	A	52	X 38	X 39	X 38																X 49	50	X 47	49
8	46	45	X 40	38	A																X 68	A	A	A
9	A	A	50	48	42																X 59	X 56	58	58
10	58	A	39	40	40																X 61	X 61	X 61	X 56
11	50	49	44	41	43																X 68	X 66	X 58	X 50
12	X 49	X 46	43	44	X 44																A	X 60	A	X 56
13	A	A	A	38	A																X 68	58	56	55
14	46	42	42	40	A																71	68	X 60	A
15	A	A	X 40	O X 37	39																X 58	X 52	46	48
16	A	48	46	40	45																X 58	55	55	54
17	C	A	49	46	A																65	64	A	A
18	A	A	X 48	A	A																O X 62	55	54	51
19	A	50	49	45	41																X 75	X 64	61	56
20	54	54	51	46	45																X 62	X 60	52	A
21	56	A	48	40	52																X 66	X 63	X 59	X 54
22	51	53	44	40	40																X 68	62	56	57
23	52	45	A	47	49																A	52	52	48
24	46	44	41	39	38																X 61	X 55	X 53	51
25	X 48	X 46	45	44	X 41											C					61	62	61	X 57
26	51	43	X 40	40	40																X 78	67	61	56
27	A	51	50	X 43	45																80	74	X 69	X 67
28	X 61	X 55	55	46	45																66	60	X 58	X 54
29	55	52	48	46	43																X 67	A	A	52
30	52	X 44	44	44	50																X 72	X 62	51	52
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	22	28	27	24															4	28	27	25	23
MED	51	47	46	40	42															X 64	X 66	61	58	54
U Q	55	52	49	46	45															X 67	X 71	63	61	57
L Q	48	44	42	40	40															X 60	X 61	55	52	51

JUN. 1996 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	F 32	J F 30	F 27	F 27	F 40	45	47		A	A	A	A	A 55	48	A	53	47	44	53	58	F 55	F 62	A
2	A	F 28	J F 38	R 33	F 39	F 42	48	64	65		A	A	A	E G 44	A	A	A	62	60	U A 54	60	65	F 51	F 54	F 53
3	42	A	F 43	A	F 32	35	44	A	A	A	A	A	A	A	A	A	51	A	A	55	60	A	F 48	A
4	F 41	F 38	F 38	34	F 32	F 42	60	R 58	A	A	51	51	53	55	66	65	54	50	A	62	67	52	44	F 46
5	F 44	F 40	F 40	A	A	36	44	50	A	60	60	A	A	A	A	A	A	58	58	66	69	53	F 54	F 53
6	F 48	F 50	F 45	F 41	F 42	42	A	45	54	56	65	A	A	A	64	67	A	77	79	65	46	F 47	A	A
7	A	J F 44	32	33	J S 32	35	43	A	57	A	A	A	48	52	57	A	58	58	60	58	43	43	41	F 41
8	F 38	F 37	34	F 29	A	F 38	41	47	A	A	A	A	U R 49	J R 52	53	54	52	54	49	53	62	A	A	A
9	A	A	F 44	F 39	F 34	43	A	A	A	A	A	53	A	58	55	58	61	57	54	48	53	50	F 49	F 51
10	F 50	A	F 30	F 31	F 29	38	54	59	54	A	57	A	A	58	64	71	71	57	A	49	55	55	55	50
11	F 43	F 40	F 36	F 34	F 36	38	52	54	70	63	50	53	A	R 54	52	58	54	56	59	60	62	60	52	44
12	43	40	F 35	F 36	S 38	46	46	46	A	A	A	A	A	48	55	58	50	A	51	52	A	54	A	50
13	A	A	A	F 31	A	37	44	54	72	A	A	A	A	49	51	52	52	A	54	U A 61	62	F 52	F 48	F 47
14	F 38	F 37	F 32	F 32	A	A	44	70	61	A	A	A	47	51	57	52	50	U A 41	R 54	J R 52	F 65	F 60	54	A
15	A	A	J R 34	R 31	F 32	S 36	49	73	60	U R 58	50	E G 43	A	49	R 52	59	58	47	44	51	52	46	F 38	F 42
16	A	F 38	F 38	F 33	F 35	37	45	55	F 64	62	50	A	A	A	A	A	61	58	55	U A 55	52	F 50	F 46	F 45
17	C	A	F 42	F 40	A	A	A	A	75	A	A	A	A	A	51	53	54	52	54	59	F 57	F 55	A	A
18	A	A	42	A	A	F 38	A	A	A	A	A	A	A	A	J R 47	50	55	U A 55	U A 54	A	U A 56	F 47	J F 47	F 43
19	A	F 42	F 40	F 35	F 34	F 37	45	47	48	58	66	62	A	66	A	75	56	A	61	69	69	58	F 54	F 50
20	F 47	F 46	F 42	F 38	F 38	38	57	66	56	A	A	A	A	A	A	A	62	57	A	U A 58	56	54	F 44	A
21	F 48	A	F 38	F 34	F 45	42	45	A	A	A	A	A	A	A	A	A	U A 51	A	41	50	60	56	53	48
22	F 43	F 45	F 35	F 32	F 32	38	50	50	48	51	A	51	A	A	58	61	54	51	55	65	62	F 54	F 47	F 51
23	F 44	F 37	A	F 38	F 42	42	45	50	50	48	52	A	E G 44	50	51	53	55	50	49	57	A	F 44	F 43	F 39
24	F 39	F 37	F 33	F 30	F 32	38	48	63	47	50	E G 40	A	A	A	53	59	60	56	54	62	55	50	46	F 43
25	42	F 40	F 37	F 37	35	39	46	J R 58	R 52	50	51	A	E G 44	60	61	C	54	51	A	48	55	F 53	F 53	51
26	F 43	F 36	34	FJ 34	J S 34	38	50	60	59	49	47	E G 44	56	49	50	54	54	52	55	66	72	F 58	F 54	J F 50
27	A	F 44	F 42	37	F 39	R 39	49	55	59	60	A	R 51	55	Y	A	A	55	55	63	68	F 73	F 67	F 61	60
28	54	49	F 47	F 39	F 37	F 42	49	A	61	67	A	A	A	A	A	50	60	66	63	72	F 59	F 53	52	48
29	F 48	F 43	F 40	F 38	F 36	F 38	R 45	51	R 60	68	48	A	50	54	A	58	51	A	62	67	U R 62	A	A	F 44
30	F 43	38	F 33	F 36	F 38	F 45	A	44	56	54	48	54	51	54	69	78	74	78	79	79	66	56	F 42	F 43
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	22	28	27	24	28	25	23	21	15	14	9	11	17	20	20	28	24	25	29	28	27	25	23
MED	F 43	F 40	F 38	F 34	F 35	38	46	54	59	58	50	51	49	54	54	58	54	56	54	59	60	F 53	F 49	F 48
U Q	F 48	F 44	F 42	F 38	F 38	42	50	60	62	62	57	54	53	56	60	63	60	58	60	66	65	56	F 54	F 51
L Q	F 42	F 37	F 34	F 32	F 32	38	44	47	53	50	48	E G 48	E G 44	50	51	53	52	51	52	52	55	50	F 45	F 43

JUN. 1996 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							U A 352	A	A	A	A	A	A	A	U A 420	A	U A 388	A	L 320					
2						A 356		A	A	A	A	A	440	A	A	A	A	A	A					
3							L 368	A	A	A	A	A	A	A	A	A	400	A	A					
4							L 368	A	A	A	432	436	440	452	432	A	408	A	A					
5							A	400	A	436	U A 440	A	A	A	A	A	A	A	A					
6							A	U L 416	420	A	A	A		A	A	A	A	A						
7							368	A	A	A	A	A	436	A	A	A	A	A	A					
8								A	A	A	A	A	U A 432	A	U R 436	428	408	384	L					
9							A	A	A	A	A	R 448	A	U A 440	432	U A 416	U A 420	372	U L 324					
10							A	A	A	A	A	A	A	U A 444	U A 460	U A 444	388	U L 380	A					
11							344	408	420	424	U A 440	A	A	A	Y 432	U A 424	A	A	A					
12							L	L	A	A	A	A	A	A	428	A	A	A	A					
13							A	U A 392	A	A	A	A	A	Y 436	U R 428	A	A	A	A	A				
14						A 360		A	A	A	A	A	A	A	428	416	412	U A 376	A					
15						A	A	L 456	A	420	A	432	A	A	A	A	392	A	332					
16							A	380	A	A	A	A	A	A	A	A	396	U A 360	A					
17						A	A	A	A	A	A	A	A	A	432	408	A	U A 372	U A 328					
18						284	A	A	A	A	A	A	A	A	R 436	412	A	A	A	A				
19								388	U A 408	A	A	A	A	A	A	A	400	A	A					
20						280	U A 368	U A 384	A	A	A	A	A	A	A	A	A	A	A	A				
21						L 308	U A 348	A	A	A	A	A	A	A	A	A	A	A	324	A				
22						L	356	U L 412	U A 400	U A 440	A	A	A	A	A	A	404	A	332					
23							380	U A 404	A	U A 428	A	A	440	R	A	U A 436	U A 420	372	A					
24							392	376	428	416	404	A	A	A	440	U A 420	A	364	328	L				
25						300	388	U A 380	424	A	U A 432	A	440	432	U A 424	C	400	A	A					
26							360	A	A	424	U A 412	444	444	A	A	420	U A 396	376	336					
27						L	L	368	408	440	A	A	436	Y	A	A	A	A	332					
28						U L 316	A	A	A	U A 428	A	A	A	A	A	U A 424	392	U A 376	340					
29							L 376	R 384	U A 408	U A 432	440	A	440	A	A	420	444	A	U A 340					
30							A	404	416	440	A	U A 460	A	U A 448	440	424	404	372	L 344					
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						5	15	15	9	11	7	5	9	6	14	13	17	11	12					
MED						300	368	392	416	428	U A 432	444	440	442	432	420	400	372	332					
U Q						L 312	376	L 408	422	440	U A 440	454	440	448	436	U A 426	410	U 376	338					
L Q						282	356	380	U A 408	424	412	434	436	436	428	416	394	372	326					

JUN. 1996 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						U A 176	228	268	308	A 332	A 340	U A 348	U A 348	336	324	312	280	A	A					
2						180	A	280	A 304	A 312	A 324	A	R 352	332	332	312	276	244	A					
3						172	248	276	A 308	A 320	U A 336	A	U A 340	A	A	A	288	U A 228	A 192					
4						A	A 224	A	312	A	A	R 360	A 356	A	A 332	308	288	248	184					
5						A	232	284	A 308	328	U A 332	A	A	A	A	A	268	A 256	A	B				
6						208	228	A	A	A	A	A		A	A	A	A	A	A	B				
7						A	248	288	308	A 336	A	A	A	A	A	A	A	A	A	B				
8						A	A	A	A	A	A	A	A	R 336	328	316	280	252	196	B				
9						168	U A 248	280	308	A	A	A	A	A	A	A	A	A	200	B				
10						188	260	288	316	A 332	U A 348	A 356	356	348	340	316	280	232	A	B				
11						180	240	A	A	332	A 348	352	356	352	R 348	324	288	244	188	B				
12						192	252	A	A 312	A 332	A	U A 340	A	348	340	316	284	248	196	B				
13						A	240	A	U A 308	A 324	340	R 344	352	R 352	336	316	292	248	A	B				
14						A	232	A 288	U A 312	U A 332	A	U A 336	A	344	R 332	320	292	256	A 188	B				
15						164	224	264	304	A	A	A	A	A	A	A	A	A	A	B				
16						A	232	272	296	316	A	A	A 348	A 340	U A 336	312	292	252	A	B				
17						A	220	A 272	A 300	U A 320	A	A	A	A	A	312	284	256	U A 204	B				
18						A	228	U A 276	A 300	A	A	A	A	332	R 340	316	288	252	192	B				
19						148	A	264	304	A 316	U A 324	A	A	A	A	A	A	A	A	B				
20						A	A 232	A	A 304	A 312	A	A	A	A	A	A	A	A 252	A	B				
21						A	240	A	A	A	A	A	A	A 344	332	316	280	252	A	B				
22						A 180	A	268	300	A	A	A 336	A	A	A 332	312	A 288	A	A	B				
23						A	A	A	A	A	A	A	A	340	332	316	288	248	A 188	B				
24						A 172	256	264	300	320	A	A	356	344	336	320	292	A 252	A	B				
25						A	A	A	296	320	A	A	A	A	A	C	296	256	196	B				
26						A	A	A	A	A	A 324	A	A	A	A	A	A	252	A	B				
27						A	232	A	A	328	A 340	U A 348	R 352	348	344	320	276	248	A	B				
28						A	A	276	A	A	A	348	352	344	332	316	288	U A 248	A	B				
29						A	A	A	300	U A 316	A	A	A 364	352	340	320	300	256	A 188	B				
30						A	A	A	308	332	352	364	368	352	344	320	292	A 256	200	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						12	20	16	22	19	11	11	13	17	19	20	23	23	13					
MED						178	232	276	306	A 324	A 340	A 348	352	344	336	316	288	252	192					
U Q						184	248	282	A 308	332	A 348	356	356	350	340	320	292	256	198					
L Q						170	228	268	300	A 316	A U 324	A 340	A 350	338	332	312	280	248	188					

JUN. 1996 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	JA 56	JA 32	25	JA 25	EB 12	23	JA 38	JA 63	78	JA 115	JA 152	117	122	57	JA 46	JA 69	JA 50	56	32	JA 32	JA 33	JA 41	51	JA 64
2	70	JA 63	JA 52	JA 84	JA 51	36	JA 39	56	80	108	JA 126	JA 208	JA 90	JA 121	52	67	57	JA 59	JA 126	JA 54	JA 63	JA 64	JA 52	JA 47
3	JA 56	JA 54	JA 51	JA 61	JA 25	22	29	JA 67	JA 82	103	JA 91	76	94	103	86	JA 54	JA 41	67	JA 63	JA 80	JA 62	80	JA 61	JA 80
4	JA 44	JA 52	JA 39	JA 47	JA 54	33	JA 40	62	JA 84	JA 55	JA 44	42	40	JA 42	40	JA 46	32	JA 41	66	JA 31	JA 63	39	JA 41	JA 47
5	JA 27	JA 32	JA 38	JA 50	JA 62	24	JA 37	41	147	38	JA 47	JA 98	101	JA 60	106	JA 218	91	JA 51	JA 82	53	JA 63	122	JA 38	86
6	JA 64	34	JA 34	JA 24	JA 20	29	JA 70	54	JA 39	97	JA 64	JA 64	JA 128	JA 98	56	70	JA 90	JA 68	JA 62	60	JA 55	42	JA 105	JA 63
7	JA 51	JA 61	JA 46	JA 38	JA 47	30	JA 34	63	JA 69	JA 82	JA 63	JA 46	JA 49	JA 69	JA 53	70	JA 57	JA 55	50	JA 52	JA 42	44	28	JA 27
8	JA 45	JA 45	JA 42	JA 32	JA 100	JA 63	30	JA 44	JA 52	JA 64	158	JA 126	JA 48	JA 47	37	35	34	32	25	JA 88	JA 77	129	JA 92	JA 56
9	JA 88	JA 110	JA 62	JA 80	JA 48	JA 30	63	72	88	JA 210	JA 160	JA 168	JA 84	JA 101	JA 38	JA 47	JA 47	JA 32	JA 40	JA 28	JA 25	30	JA 39	JA 53
10	JA 38	JA 64	JA 29	JA 44	JA 44	25	JA 44	JA 50	JA 60	JA 64	150	JA 73	JA 55	49	JA 51	JA 46	35	JA 33	JA 84	27	JA 22	JA 28	JA 22	18
11	JA 32	JA 54	JA 29	29	JA 28	JA 26	JA 43	JA 34	34	41	JA 48	JA 48	JA 72	48	40	JA 45	JA 53	51	50	50	JA 44	JA 37	44	JA 46
12	JA 54	JA 51	JA 53	32	JA 33	G	28	JA 43	JA 62	JA 60	JA 70	92	85	45	42	JA 53	JA 48	JA 69	48	94	JA 84	52	JA 64	JA 56
13	JA 98	JA 55	JA 78	JA 49	JA 50	JA 44	JA 39	48	85	JA 137	JA 51	96	108	40	39	48	JA 47	JA 65	58	66	38	JA 49	JA 33	JA 28
14	JA 48	JA 39	JA 41	JA 58	JA 62	JA 53	28	JA 67	JA 54	JA 81	122	106	JA 50	JA 64	G	JA 48	JA 70	JA 56	69	59	JA 28	33	JA 59	JA 82
15	JA 63	JA 82	JA 55	JA 40	JA 49	JA 38	JA 47	JA 51	JA 53	56	60	JA 41	JA 54	JA 61	JA 60	JA 62	JA 40	JA 41	JA 48	JA 44	JA 32	JA 42	JA 36	JA 32
16	JA 56	JA 47	JA 45	JA 46	39	JA 29	JA 42	38	JA 48	JA 55	50	JA 136	JA 121	JA 97	JA 114	JA 67	32	JA 40	JA 50	JA 87	JA 158	JA 51	31	JA 30
17	C	JA 60	JA 48	JA 48	JA 74	61	JA 70	JA 89	80	111	95	82	JA 179	JA 181	JA 49	36	JA 53	JA 54	JA 51	73	JA 52	JA 54	54	JA 65
18	JA 56	JA 89	JA 67	57	JA 96	30	JA 55	74	86	131	JA 179	128	JA 45	JA 66	41	40	JA 76	JA 137	JA 101	80	JA 65	JA 34	JA 32	JA 61
19	JA 55	JA 51	JA 34	JA 44	JA 34	26	33	JA 49	JA 47	51	JA 68	JA 54	JA 80	JA 73	JA 134	88	JA 35	JA 170	JA 126	34	32	JA 50	32	JA 109
20	JA 26	JA 32	JA 24	22	20	24	JA 42	JA 51	JA 56	97	86	JA 76	JA 66	69	JA 71	JA 72	JA 63	JA 70	JA 86	JA 119	JA 56	89	JA 58	JA 65
21	JA 43	JA 80	58	JA 48	32	37	JA 40	JA 74	JA 156	JA 179	JA 65	71	JA 64	JA 54	JA 54	JA 79	JA 72	JA 54	31	54	46	39	JA 26	JA 27
22	JA 38	JA 27	JA 47	JA 23	22	22	JA 40	33	JA 51	JA 124	JA 70	JA 49	JA 95	JA 98	JA 73	JA 63	JA 50	JA 61	JA 64	JA 47	30	JA 50	32	32
23	JA 70	JA 50	50	JA 31	JA 31	JA 29	33	JA 58	JA 60	JA 48	JA 70	JA 80	42	40	JA 50	JA 55	JA 45	JA 37	JA 50	JA 44	JA 72	JA 40	JA 34	JA 33
24	32	19	26	JA 22	JA 25	23	JA 33	JA 49	37	JA 45	37	JA 54	52	JA 55	36	43	JA 48	JA 35	JA 37	25	JA 38	JA 30	32	33
25	JA 26	JA 30	JA 28	JA 25	JA 35	JA 32	JA 40	JA 41	34	JA 46	JA 62	50	38	37	JA 42	C	36	JA 57	JA 67	JA 82	JA 53	JA 49	28	24
26	JA 34	JA 28	JA 26	JA 32	26	JA 37	JA 41	JA 55	JA 74	JA 51	JA 44	JA 53	JA 43	50	JA 62	JA 39	42	33	JA 51	JA 80	JA 55	JA 42	JA 63	JA 50
27	JA 87	JA 46	JA 25	JA 34	JA 22	22	JA 31	JA 44	JA 38	40	JA 59	55	40	46	JA 67	64	JA 48	JA 52	JA 32	JA 51	JA 82	JA 27	34	20
28	EB 15	26	20	JA 24	JA 23	JA 33	58	73	JA 138	JA 65	56	56	JA 57	JA 56	JA 71	JA 54	JA 38	JA 67	59	JA 48	JA 32	JA 44	30	25
29	JA 28	31	JA 39	29	JA 49	JA 37	JA 30	41	JA 48	JA 52	JA 82	JA 104	JA 128	44	JA 70	JA 50	JA 65	JA 120	JA 76	JA 111	JA 165	JA 102	JA 75	JA 77
30	JA 76	JA 84	JA 50	JA 48	JA 31	28	70	35	34	40	45	JA 50	JA 51	45	40	40	39	JA 41	26	30	44	JA 38	JA 51	JA 51
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	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30
MED	JA 51	JA 50	JA 42	JA 39	JA 34	JA 30	JA 40	JA 51	JA 60	JA 64	JA 66	JA 74	JA 65	JA 56	JA 52	JA 54	JA 48	JA 54	JA 54	JA 54	JA 52	JA 43	JA 38	JA 48
U Q	JA 64	JA 61	JA 51	JA 48	JA 50	JA 37	JA 44	JA 63	82	JA 108	95	JA 104	JA 95	JA 73	JA 70	JA 68	JA 57	JA 67	JA 69	JA 80	JA 63	JA 52	JA 58	JA 64
L Q	JA 33	JA 32	JA 29	JA 29	JA 25	24	33	43	48	51	JA 51	JA 53	49	46	40	46	39	JA 41	JA 48	44	JA 33	JA 38	32	30

JUN. 1996 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A A 56	22	E B 15	17	E B 12	21	35	44	A A 78	A A 115	A A 152	A A 117	A A 122	52	42	A A 69	39	42	21	23	24	23	28	A A 64
2	A A 70	18	22	26	33	33	30	51	59	A A 108	A A 126	A A 208	40	A A 121	A A 52	A A 67	50	54	U A 49	24	47	36	36	32
3	26	A A 54	35	A A 61	18	21	28	A A 67	A A 82	A A 103	A A 91	A A 76	A A 94	A A 103	A A 86	A A 54	38	A A 67	A A 63	26	45	A A 80	41	A A 80
4	32	21	19	25	23	22	32	48	A A 84	A A 55	39	42	U Y 40	U Y 42	U Y 40	46	31	38	A A 66	26	38	31	26	25
5	21	17	21	A A 50	A A 62	20	34	32	A A 147	36	44	A A 98	A A 101	A A 60	A A 106	A A 218	A A 91	46	46	35	25	22	24	27
6	43	21	18	18	E B 15	G 18	A A 70	34	35	51	49	A A 64	A A 128	A A 98	52	63	A A 90	61	45	51	37	22	A A 105	A A 63
7	A A 51	19	24	23	19	25	29	A A 63	53	A A 82	A A 63	A A 46	41	47	48	A A 70	54	40	38	41	24	31	E B 12	20
8	E B 15	20	24	18	A A 100	28	28	43	A A 52	A A 64	A A 158	A A 126	43	U Y 45	35	35	30	30	22	26	30	A A 129	A A 92	A A 56
9	A A 88	A A 110	23	19	E B 14	25	A A 63	A A 72	A A 88	A A 210	A A 160	39	A A 84	44	34	42	42	30	G 18	17	19	17	24	21
10	22	A A 64	17	17	18	23	41	43	49	A A 64	51	A A 73	A A 55	44	46	44	34	G 19	A A 84	18	E B 14	18	18	17
11	20	27	E B 14	18	21	22	31	30	34	38	44	45	A A 72	U Y 48	U Y 39	42	50	42	42	20	22	20	41	21
12	22	26	25	18	17	G	28	36	A A 62	A A 60	A A 70	A A 92	A A 85	45	42	50	45	A A 69	38	22	A A 84	40	A A 64	46
13	A A 98	A A 55	A A 78	18	A A 50	19	36	39	64	A A 137	A A 51	A A 96	A A 108	U Y 40	38	46	44	A A 65	42	U A 46	25	22	18	20
14	22	20	20	21	A A 62	A A 53	27	62	50	A A 81	A A 122	A A 106	44	46	G	35	36	U A 33	44	20	19	25	26	A A 82
15	A A 63	A A 82	19	20	19	26	43	43	48	39	46	38	A A 54	46	46	51	32	37	27	23	27	17	27	20
16	A A 56	24	20	22	22	22	39	32	46	46	46	A A 136	A A 121	A A 97	A A 114	A A 67	31	36	39	U A 50	46	28	19	22
17	C	A A 60	30	22	A A 74	A A 61	A A 70	A A 89	66	A A 111	A A 95	A A 82	A A 179	A A 181	35	34	49	37	33	41	22	26	A A 54	A A 65
18	A A 56	A A 89	18	A A 57	A A 96	20	A A 55	A A 74	A A 86	A A 131	A A 179	A A 128	A A 45	A A 66	39	36	46	U A 48	U A 49	A A 80	U A 43	22	19	24
19	A A 55	22	22	23	20	23	28	37	41	46	57	48	A A 80	64	A A 134	49	32	A A 170	37	21	17	22	20	24
20	18	17	17	16	16	20	37	38	49	A A 97	A A 86	A A 76	A A 66	A A 69	A A 71	A A 72	49	48	A A 86	U A 44	22	20	34	A A 65
21	27	A A 80	20	23	25	26	35	A A 74	A A 156	A A 179	A A 65	A A 71	A A 64	A A 54	54	A A 79	U A 45	A A 54	25	43	37	36	17	18
22	22	17	21	18	E B 15	19	24	31	40	44	A A 70	46	A A 95	A A 98	55	53	34	43	27	27	22	21	19	18
23	25	20	A A 50	22	18	18	27	40	47	43	47	A A 80	40	U Y 39	47	44	42	31	42	28	A A 72	21	20	22
24	22	E B 14	17	16	18	19	30	34	34	36	36	A A 54	A A 52	A A 55	35	42	46	30	27	E B 14	18	16	17	24
25	20	18	18	18	20	19	32	38	33	46	43	A A 50	38	36	42	C	36	45	A A 67	26	29	21	17	E B 14
26	18	19	16	E B 12	16	22	31	48	52	38	41	39	39	46	46	37	40	30	28	18	19	20	44	34
27	A A 87	31	18	18	17	20	27	32	35	38	A A 59	49	39	U Y 46	A A 67	A A 64	47	44	25	18	20	19	20	E B 13
28	E B 15	16	E B 14	E B 14	E B 13	21	40	A A 73	54	43	A A 56	A A 56	A A 57	A A 56	A A 71	42	36	38	28	19	23	21	18	E B 15
29	22	21	24	18	17	28	26	32	41	43	41	A A 104	40	43	A A 70	35	38	A A 120	34	36	17	A A 102	A A 75	22
30	E B 14	18	20	16	27	17	A A 70	30	32	36	44	46	47	45	38	36	34	31	G 17	28	34	19	20	22
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	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30
MED	25	21	20	18	19	22	32	42	51	53	A A 56	A A 72	A A 56	48	46	46	41	42	38	26	24	22	24	23
U Q	A A 56	A A 54	24	23	A A 27	25	A A 40	A A 62	A A 66	A A 103	A A 91	A A 98	A A 94	A A 66	A A 67	A A 66	47	A A 54	A A 46	41	37	31	A A 41	A A 46
L Q	20	18	18	18	E B 17	19	28	34	41	43	44	46	41	45	39	40	34	33	27	20	20	20	19	20

JUN. 1996 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JUN. 1996 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A 311	F 307	J F 294	F 322	F 307	F 330	298	A	A	A	A	A	A	A 280	280	A	327	A 301	303	300	314	F 302	F 334	A
2	A	F 346	J F 366	R 306	F 305	F 292	299	331	348	A	A	A	G	A	A	A	326	329	A	313	317	F 309	F 309	F 328
3	311	A	F 342	A	F 327	327	308	A	A	A	A	A	A	A	A	A	306	A	A	308	307	A	F 301	A
4	F 298	F 315	F 310	310	F 334	F 344	356	R 364	A	A	320	297	289	285	317	318	303	290	A	311	324	337	289	F 293
5	F 311	F 307	F 327	A	A	371	334	333	A	327	322	A	A	A	A	A	A	322	309	309	325	313	F 295	F 311
6	F 340	F 322	F 324	F 320	F 336	356	A	291	317	314	316	A	A	A	301	A 307	A	312	324	339	297	F 302	A	A
7	A	J F 358	316	303	J S 346	328	265	A	A 271	A	A	A	250	A 295	304	A	A 314	309	329	343	313	297	299	F 294
8	F 298	F 302	334	F 311	A	F 369	344	A 316	A	A	A	A	U R 282	J R 257	311	324	305	324	313	312	289	A	A	A
9	A	A	F 295	F 300	F 332	349	A	A	A	A	A	300	A	304	296	306	316	329	346	318	303	313	F 309	F 315
10	F 314	A	F 315	F 326	F 321	296	324	342	A 317	A	303	A	A	293	295	317	324	354	A	305	292	301	306	328
11	F 332	F 318	F 310	F 332	F 323	317	328	299	345	367	315	309	A	R 257	298	322	318	319	326	313	314	323	327	308
12	305	326	F 308	F 311	S 326	340	340	316	A	A	A	A	A	285	303	329	313	A	314	325	A	303	A	A 315
13	A	A	A	F 317	A	332	278	325	344	A	A	A	A	273	295	A 312	338	A	322	A	321	F 314	F 309	F 313
14	F 341	F 304	F 315	F 315	A	A	276	359	347	A	A	A	262	298	321	305	300	A	A	J R 274	F 325	F 324	334	A
15	A	A	J R 368	R 341	F 315	S 282	309	341	363	U R 356	362	G	A	A 287	R 307	318	337	310	300	318	325	359	F 317	F 302
16	A	F 344	F 336	F 331	F 336	347	287	312	F 323	331	345	A	A	A	A	A	310	315	330	A	A 344	F 303	F 302	F 292
17	C	A	F 318	F 340	A	A	A	A	348	A	A	A	A	A	294	305	312	314	311	324	F 305	F 314	A	A
18	A	A	327	A	A	F 322	A	A	A	A	A	A	A	A	J R 258	285	310	A	A	A	A	F J 304	F 295	F 309
19	A	F 309	F 306	F 320	F 315	F 326	330	312	288	317	316	298	A	A	A	326	311	A	305	306	322	F 314	F 312	F 291
20	F 301	F 316	F 333	F 293	F 310	312	341	358	321	A	A	A	A	A	A	A	312	296	A	A	316	338	F 294	A
21	F 298	A	F 284	F 281	F 302	320	310	A	A	A	A	A	A	A	A	A	A	A	281	A 298	303	324	302	305
22	F 313	F 325	F 333	F 306	F 326	327	335	315	326	326	A	322	A	A	A 305	314	310	306	309	319	334	F 305	F 302	F 305
23	F 279	F 283	A	F 311	F 323	376	340	336	A 335	319	352	A	G	300	A 294	298	307	315	329	339	A	F 291	F 285	F 297
24	F 317	F 322	F 311	F 315	F 305	258	288	359	296	314	G	A	A	A	282	307	318	320	322	322	313	297	315	F 303
25	322	F 303	F 316	F 316	314	320	265	J R 346	R 321	A 305	327	A	G	312	314	C	333	349	A	294	287	F 302	F 305	323
26	F 327	F 315	313	F J 311	S 309	278	321	331	342	320	309	G	317	279	288	318	318	319	310	301	339	F 321	F J 311	F 290
27	A	F 300	F 328	316	F 329	R 303	299	332	344	333	A	A	314	Y	A	A	309	309	317	292	F 329	F 322	F 309	326
28	333	313	F 332	F 331	F 315	F 293	298	A	323	363	A	A	A	A	A	285	309	319	308	336	F 344	F 314	322	295
29	F 296	F 314	F 308	F 321	F 306	F 299	R 288	296	R 343	368	302	A	259	292	A	313	260	A	312	312	U R 318	A	A	F 304
30	F 319	289	F 281	F 293	F 326	F 339	A	241	382	313	284	306	A 260	262	286	306	307	303	305	322	319	335	F 287	F 282
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	22	28	27	24	28	25	22	21	15	14	8	11	16	20	20	27	22	22	26	27	27	25	23
MED	F 313	F 314	F 316	F 315	F 322	326	309	331	335	326	316	299	260	286	297	312	312	315	312	312	317	F 313	F 306	F 305
U Q	F 327	F 322	F 332	F 322	F 328	342	334	342	346	356	327	308	289	296	306	318	318	322	324	322	325	323	314	315
L Q	F 298	F 304	F 309	F 306	F 310	301	288	312	319	314	303	G	G	276	291	306	307	309	308	305	305	F 302	F 297	F 294

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JUN. 1996 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	A	A	A	A	A	A	A	A	A	L 367					
2						A 353		A	A	A	A	A	403	A	A	A	A	A	A					
3							L 366	A	A	A	A	A	A	A	A	A	A 344	A	A					
4							L 392	A	A	A	419	A	Y 365	Y	A	A	371	A	A					
5							A	365	A	375	A	A	A	A	A	A	A	A	A					
6							A	U L 356	381	A	A	A		A	A	A	A	A						
7							353	A	A	A	A	A	334	A	A	A	A	A	A					
8								A	A	A	A	A	A	A	U R 381	368	374	354	L					
9							A	A	A	A	A	R 385	A	A	375	A	A	359	L					
10							A	A	A	A	A	A	A	A	A	A	385	L	A					
11							A 364	375	386	384	A	A	A	A	Y	A	A	A	A					
12							L	L	A	A	A	A	A	A	A	A	A	A	A					
13							A	A	A	A	A	A	A	A	A 311	A	A	A	A	A				
14						A 365		A	A	A	A	A	A	A	378	371	365	A	A					
15						A	A	A	A	398	A	416	A	A	A	A	371	A	344					
16							A	361	A	A	A	A	A	A	A	A	356	A	A					
17						A	A	A	A	A	A	A	A	A	357	387	A	A	A					
18						374	A	A	A	A	A	A	A	A	R 375	361	A	A	A	A				
19								A	A	A	A	A	A	A	A	A	361	A	A					
20						357	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
21						L 349	A	A	A	A	A	A	A	A	A	A	A	A	352	A				
22						L	362	U L 358	A	A	A	A	A	A	A	A	366	A	A 345					
23							360	A	A	A	A	A	376	R	A	A	A	359	A					
24							375	380	381	407	459	A	A	A	404	A	A	366	362	L				
25						362	349	A	385	A	A	A	398	405	A	C	377	A	A					
26							359	A	A	406	A	407	397	A	A	381	A	365	A 351					
27						L	L	356	389	413	A	A	401	Y	A	A	A	A	350					
28						U L 361	A	A	A	A	A	A	A	A	A	A	A 362	A	359					
29							L 337	R 394	A	A	A 359	A	385	A	A	390	331	A	A					
30							A	370	380	392	A	A	A	A	370	355	374	360	L 344					
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						5	12	9	6	7	3	3	8	1	8	7	13	6	9					
MED						361	361	365	383	398	419	407	391	405	375	371	366	360	351					
U Q						368	366	378	386	407	459	416	400		380	387	374	365	360					
L Q						353	353	U L 357	381	384	A 359	R 385	370		364	361	358	359	344					

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JUN. 1996 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							374	A	A	A	A	A	A	A	418	A	306	A	324					
2						364	348	282	A 278	A	A	A	G	A	A	A	290	E A 316	A					
3							346	A	A	A	A	A	A	A	A	A	366	A	A					
4							244	250	A	A	346	402	398	410	312	324	348	A 358	A					
5							A 268	306	A	300	314	A	A	A	A	A	A	E A 308	E A 310					
6							A	408	316	E A 348	316	A		A	A 344	A	A	A 310						
7							468	A	A	A	A	A	538	A	354	A	A	310	272					
8								E A 340	A	A	A	A	442	A	346	322	344	306	L 276					
9							A	A	A	A	A	370	A	354	378	328	308	290	258					
10							308	268	E A 328	A	E A 362	A	A	378	344	300	282	236	A					
11							294	346	258	248	358	358	A	530	380	314	E A 336	320	268					
12							L 282	L 320	A	A	A	A	A	E A 426	360	A 304	A	A	E A 304					
13							E A 386	310	E A 286	A	A	A	A	462	394	A	292	A	A 292	A				
14						A	428	A 274	266	A	A	A	A 508	394	326	342	378	A	A					
15						A 374	A 350	268	A	280	278	G	A	E A 428	E A 362	A 322	284	E A 336	352					
16							A 376	318	284	300	312	A	A	A	A	A	308	306	294					
17						A	A	A	A 282	A	A	A	A	A	390	362	E A 356	316	292					
18						352	A	A	A	A	A	A	A	A	526	404	A 338	A	A	A				
19								358	414	328	A 328	A 330	A	A	A	286	314	A	302					
20						340	264	240	A 322	A	A	A	A	A	A	A	A 308	E A 360	A	A				
21						330	340	A	A	A	A	A	A	A	A	A	A	A	400	A				
22						274	280	L 310	342	330	A	342		A	A	A 330	320	E A 346	304					
23							316	306	E A 338	354	294	A	G	390	E A 396	366	332	326	E A 306					
24							H 340	256	400	342	G	A	A	A	420	344	306	306	284	248				
25						322	432	262	334	E A 382	328	A	G	340	330	C	298	A 290	A					
26							314	A 288	A 278	340	388	G	334	E A 450	416	330	310	310	300					
27						344	L 316	294	280	296	A	A	342	Y	A	A	A 340	312	296					
28						348	A 350	A	312	260	A	A	A	A	A	418	324	296	300					
29							410	368	280	252	408	A	474	380	A	326	482	A	294					
30							A	Y 558	250	336	A 416	362	A	470	350	306	306	296	286					
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	23	22	20	15	14	8	10	13	19	18	25	21	21	1				
MED						344	340	303	282	U 314	332	366	491	U 395	361	327	311	308	294	248				
U Q						358	376	340	331	342	388	G	G	456	396	344	342	A 323	305					
L Q						326	294	268	278	280	314	350	398	379	344	314	306	301	285					

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JUN. 1996 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A					A	A	A	A	A	A	A	A	A	A	A	A						
		328	314	310	258	230													226	286	264	284	250	A
2	A		A	A	A	A	A	A	A	A	A	A		A	A	A	A	A	A		E A	E A	A	A
		258	288	322	338		256						216						272		288	322	304	272
3	A	A	A	A				A	A	A	A	A	A	A	A	A	A	A	A	A	E A	A	A	A
	292		270		264	246	232													288	308			
4	A			A				A	A	A		A	Y	A	A	A		A	A		A		A	A
		274	292	338	276	272	222				204						224			258	268	240	336	300
5				A	A		A		A		A	A	A	A	A	A	A	A	A	E A				A
	274	266	264			208		204		200										270	260	256	310	286
6	E A						A	A		A	A	A	A	A	A	A	A	A	A	A	A		A	A
	338	250	262	268	208	224		254	212										256	254		300		
7	A		E A	A		A		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
		262	298	328	270	266	258													252	272	352	288	292
8				A	A			A	A	A	A	A	A	A		A					E A	A	A	A
	280	288	284	296		232	228								228	240	220	242	232	278	348			
9	A	A					A	A	A	A	A		A	A		A	A							
			334	282	252	244						216			226			230	228	252	272	254	302	286
10		A					A	A	A	A	A	A	A	A	A	A		A		A				
	280		308	276	300	250											230	230		276	256	276	264	236
11		A					A			A	A	A	A	A	Y	A	A	A	A				A	
	248	292	256	256	278	250		208	216	238										254	260	254		280
12	A	A	A					A	A	A	A	A	A	A	A	A	A	A	A			A	A	A
	320	292	300	282	260	230	228	246												256		310		
13	A	A	A		A		A	A	A	A	A	A	A	A	A	A	A	A	A	A				
				292		256															258	264	266	280
14				E A	A	A		A	A	A	A	A	A	A			A		A					A
	262	284	278	288			234								214	230	240			264	244	246	252	
15	A	A			A	A	A	A	A		A		A	A	A	A			A					
			250	260	310					238		194					238		264	266	244	212	326	300
16	A						A	A	A	A	A	A	A	A	A	A		A	A	A				
		266	262	260	298	232		248									228					308	296	288
17	C	A	A		A	A	A	A	A	A	A	A	A	A				A	A	A			A	A
			290	270											236	226					268	280		
18	A	A		A	A		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
			254			256									240	260						284	288	292
19	A			A				A	A	A	A	A	A	A	A	A		A						A
		298	276	330	282	240	246										232		A	268	238	248	272	348
20							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
	246	266	268	294	284	272															268	250		
21	A	A					A	A	A	A	A	A	A	A	A	A	A	A		A	A	A	A	
	322		336	338	294	254													246		284	262	268	254
22									A	A	A	A	A	A	A	A	A	A	A					
	282	254	266	264	250	236	232	214									238			246	236	266	284	272
23			A					A	A	A	A	A	E A	A	A	A	A	A	A	A		A	A	
	324	328		296	250	210	228						256					248		248		302	312	312
24						H		A		H	H	A	A	A		A	A	A	A	A				
	298	266	294	282	298	248	226	252	202	190	174				198			238	246	242	232	260	266	306
25								A		A	A	A			A	C		A	A	A	A	A		
	266	280	286	286	282	238	258		208				218	200			244			286	308	290	252	248
26							A	A	A		A			A	A				E A				E A	A
	246	282	284	270	266	246	264			216		214	212			238		246	274	262	228	272	310	308
27	A		A					E A			A	A		Y	A	A	A	A	A					
		324	254	266	260	238	240	264	212	194			210						256	260	236	244	268	242
28							A	A	A	A	A	A	A	A	A	A	E A	A	A					
	236	246	232	240	260	260											272		256	242	220	282	254	274
29			A			E A		H	A	A	A	A		A	A		E A	A	A	A				
	282	262	290	262	282	302	238	194					228			224	286			272	258		A	A
30			A				A					A	A	A		A			A					A
	252	336	336	286	276	234		204	216	204					242	246	234	264	228	234	230	242	314	334
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	18	22	28	27	24	26	15	10	6	7	2	3	6	1	7	7	12	7	11	24	25	27	22	22
MED	278	277	282	282	276	244	234	220	212	204	189	214	216	200	228	238	234	242	246	260	258	265	282	287
U Q	A 298	292	296	A 296	289	256	256	A 252	216	238		216	228		240	A 246	242	A 248	A 256	272	A 272	A 290	310	A 300
L Q	252	262	263	266	260	232	228	204	208	194		194	212		214	226	229	230	228	252	237	250	266	272

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JUN. 1996 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						140	118	112	110	110	108	110	112	112	A 120	A 128	A 126	A	A					
2						B 140	114	112	112	108	112	A	114	114	120	A 122	116	118	A					
3						142	A 128	114	110	116	112	112	114	112	112	108	114	112	120					
4						A	112	A	108	108	A	A 128	A	A		114	114	112	B 124					
5						A	116	118	114	114	114	112	112	114	112	A	112	116	118	B				
6						144	116	110	A	108	A	A		A	A	A	A	A	A	B				
7						A	118	112	110	112	110	114	A	A	A	A	A	A	A	B				
8						A	A 110		A	108	112	110	110	112	110	110	A 124	120	A 124	B				
9						126	116	114	112	112	112	A	A	A	A	A	A	A	E A 136	B				
10						140	120	112	110	116	116	114	112	114	114	110	A 120	114	A	B				
11						134	A 122	A	A	110	110	110	116	112	112	112	120	114	120	B				
12						140	122	112	110	110	110	116	A	A 124	A	A 132	122	122	118	B				
13						A	A 120	A	110	108	110	110	110	122	116	A 122	A 122	114	120	B				
14						A	A 130	110	112	112	108	108	112	114	112	114	114	114	116	B				
15						124	114	108	108	108	A	A	A	A	A	A	A	A	A	B				
16						A	112	A 122	112	110	110	110	112	114	114	114	118	114	114	B				
17						A	A 126	110	110	108	110	110	110	A	A	116	112	114	120	B				
18						A	112	112	108	108	108	108	108	110	114	110	118	116	118	B				
19						140	118	112	110	108	110	110	A	112	108	108	A	A	A	B				
20						A	114	112	108	108	110	A	108	108	108	A	A	A	A	B				
21						A	124	A	A	110	A	A	A	A	120	112	112	114	114	B				
22						132	A	A 136	A 132	106	A	108	108	110	114	110	108	112	A	B				
23						A	A	A	110	A	A	A	112	112	110	114	116	114	112	B				
24						140	116	A 128	110	110	A	112	110	114	112	114	112	110	114	B				
25						A	112	110	110	110	108	A	110	A	A	C	112	112	116	B				
26						A	A	A	A	108	112	112	A	A	A	A	A	114	114	B				
27						A	A 134	A	A	A 124	112	112	116	110	112	112	114	114	A	B				
28						A	AE A 136		A	106	A	A	A 122	112	116	112	114	112	112	B				
29						A	A	A	108	108	110	A	A	A 132	116	116	114	114	116	B				
30						A	A	A	112	110	A 126	112	114	114	114	A 130	A 132	110	A 132	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						12	23	21	23	29	22	20	20	21	21	22	23	23	20					
MED						140	118	112	110	110	110	111	112	112	114	114	114	114	118					
U Q						140	A 122	A 116	112	111	112	112	114	114	116	A 116	A 120	114	120					
L Q						133	114	110	110	108	110	110	110	112	112	110	112	112	114					

JUN. 1996 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	104	108	112	108	B	136	124	114	116	110	110	112	114	122	126	120	118	118	100	116	108	118	110	112
2	110	104	128	106	108	132	120	118	112	108	108	110	156	122	124	118	116	112	110	110	112	108	108	108
3	100	100	102	98	100	162	142	116	112	110	110	110	110	106	106	110	116	108	114	120	116	114	112	106
4	108	104	106	104	122	122	114	112	110	108	110	148	142	102	124	120	122	118	112	108	112	110	110	104
5	104	118	108	102	98	102	120	126	110	128	114	108	106	106	106	112	110	116	112	112	108	108	104	114
6	110	100	118	94	98	134	114	114	116	108	106	106	116	100	104	100	100	100	104	102	106	146	110	108
7	108	106	102	96	106	126	134	116	114	110	112	110	114	112	108	104	102	102	102	98	100	100	100	112
8	104	112	102	102	104	118	112	122	116	114	104	108	112	118	146	126	128	128	122	114	112	116	110	106
9	104	112	110	120	98	132	118	114	110	106	106	110	108	116	112	106	100	102	102	102	100	114	112	108
10	110	106	112	112	108	144	122	122	118	116	124	116	120	126	116	116	124	106	112	106	122	116	110	114
11	104	110	110	108	110	126	126	108	114	122	118	126	126	128	E 192	G 128	120	118	114	110	114	108	112	106
12	104	104	104	106	106	G	142	120	114	110	110	110	112	134	132	124	120	114	114	108	116	112	114	110
13	106	104	108	114	104	106	122	118	112	110	114	112	118	148	136	126	120	116	112	108	108	112	110	108
14	106	106	104	102	104	102	132	116	110	110	108	110	122	122	G	130	124	120	110	110	108	112	110	118
15	106	104	102	104	108	122	112	108	106	110	104	112	104	102	102	100	100	98	98	96	98	114	110	108
16	106	106	104	102	102	118	116	122	116	116	112	118	118	114	116	114	146	122	110	108	122	108	110	108
17	C	104	102	104	122	122	114	112	110	110	104	106	102	100	114	154	126	120	116	114	112	112	118	110
18	106	106	104	106	100	110	118	112	110	108	106	106	114	114	174	150	124	142	112	110	108	120	110	110
19	106	108	104	108	102	132	122	114	120	114	112	110	106	112	108	112	112	108	108	108	108	106	108	112
20	106	102	104	110	110	118	118	114	112	108	108	106	104	106	102	114	124	116	144	108	106	112	112	116
21	106	104	104	106	108	108	120	110	106	102	104	122	102	120	118	112	114	114	114	108	106	104	108	104
22	104	104	100	104	110	132	102	134	116	110	110	110	108	106	110	112	116	108	108	124	110	128	114	112
23	104	106	106	108	102	102	102	102	104	106	108	104	118	124	116	116	116	116	110	106	112	110	108	106
24	108	112	104	102	98	150	130	122	124	118	112	114	124	122	142	126	114	116	108	110	106	106	104	102
25	100	102	96	98	98	104	114	118	120	110	106	108	110	114	112	C	132	118	114	110	110	108	108	106
26	100	100	102	142	106	96	96	116	108	108	112	110	110	104	116	104	108	126	112	114	116	112	110	106
27	104	104	102	98	96	130	130	112	126	126	116	116	152	128	118	114	114	112	110	114	104	106	104	106
28	B	104	104	106	104	124	104	102	102	104	108	126	118	122	120	118	126	116	112	108	108	108	112	118
29	108	114	106	110	106	108	114	108	114	108	108	102	130	138	122	126	122	112	110	108	108	126	114	114
30	110	104	104	106	120	106	106	108	134	138	136	136	130	130	130	132	126	114	116	110	108	104	104	114
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	28	30	30	30	29	29	30	30	30	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30
MED	106	104	104	106	104	122	118	114	113	110	110	110	114	117	116	116	119	116	112	109	108	112	110	108
U Q	108	108	108	108	108	132	124	118	116	114	112	116	122	124	128	126	124	118	114	112	112	114	112	112
L Q	104	104	102	102	100	107	114	112	110	108	106	108	108	106	109	112	114	108	108	108	106	108	108	106

JUN. 1996 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 1996 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

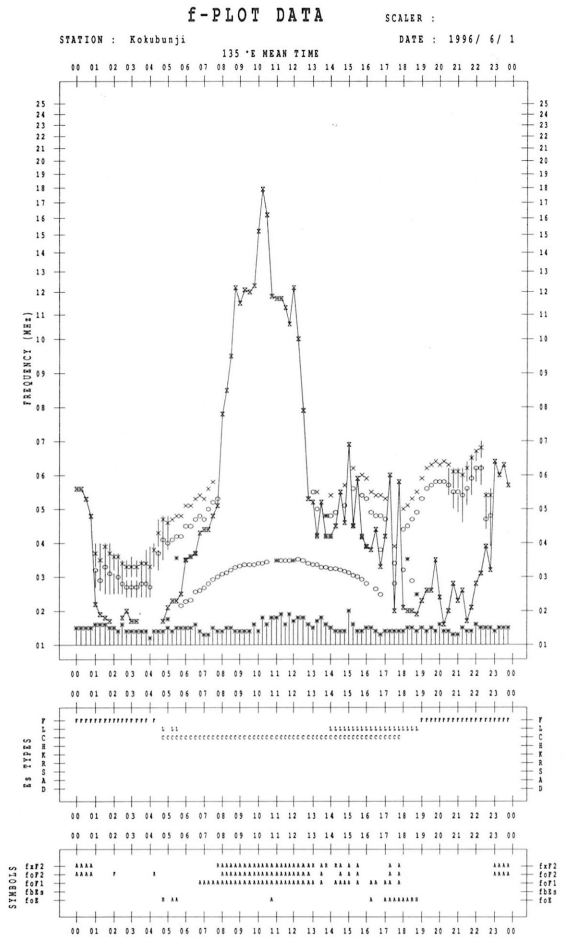
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

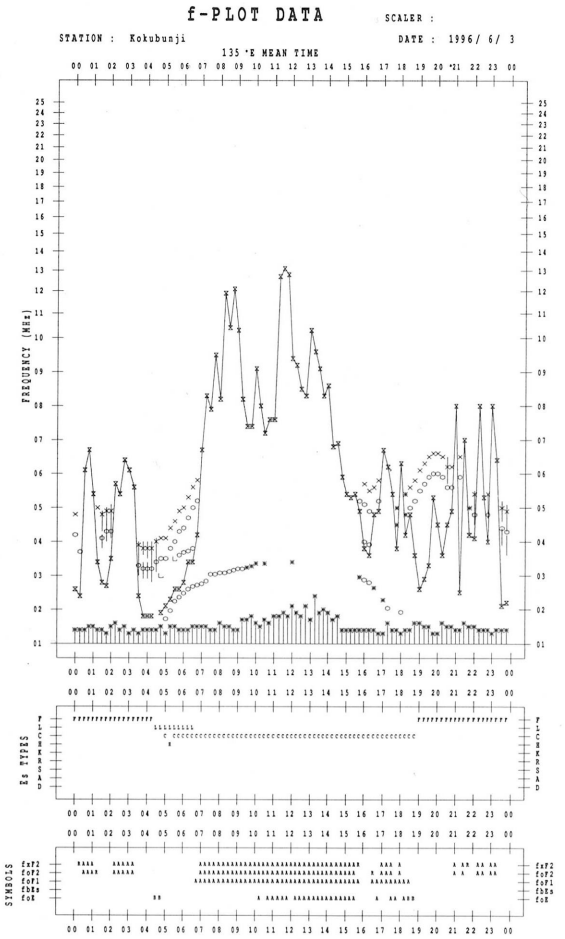
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 3	F 3	F 2	F 2		C 2	C 2	C 2	C 3	C 3	C 3	C 3	C 2	C 2	CL 11	CL 21	CL 21	CL 32	L 3	FF 24	F 3	FF 32	F 3	F 5
2	F 6	F 3	FF 23	F 3	F 5	C 4	C 3	C 4	C 2	C 3	C 2	C 3	H 1	C 1	CL 11	CL 21	CL 31	C 3	L 4	F 3	F 3	F 3	F 4	F 5
3	F 4	F 3	F 4	F 5	F 2	CL 11	CL 21	C 3	C 3	C 2	C 2	C 2	C 3	C 2	C 3	C 2	C 3	C 3	C 5	FF 23	F 6	F 4	F 4	F 3
4	F 4	F 3	F 5	F 5	FF 24	L 3	C 5	L 3	C 2	C 2	L 2	HL 11	HL 11	L 2	CL 22	CL 21	CL 11	C 3	C 3	F 3	FF 32	F 4	F 5	F 3
5	F 4	FF 12	FF 23	F 3	F 3	L 2	C 3	C 2	C 2	C 1	CL 21	C 3	C 2	C 2	C 3	C 3	C 3	C 3	C 5	C 6	F 4	F 3	F 4	FF 15
6	F 3	F 3	FF 12	F 2	F 1	L 1	CL 41	C 1	C 2	C 2	C 1	C 2	CL 23	L 3	L 3	L 3	L 3	L 3	L 4	L 5	F 3	FF 14	F 5	F 4
7	F 6	F 4	F 3	F 3	F 3	C 2	C 2	C 3	C 2	C 2	C 1	C 1	C 1	L 1	L 2	L 2	L 3	L 3	L 4	L 4	F 4	F 3	F 2	FF 22
8	F 2	F 3	F 3	F 4	F 4	LL 23	C 2	C 2	L 2	C 2	L 3	L 2	L 1	C 1	H 1	C 1	CL 11	CL 11	CL 31	CL 62	F 4	F 6	F 5	F 4
9	F 5	FF 23	FF 23	FF 23	F 2	C 3	C 4	C 3	C 3	C 3	C 3	C 2	C 2	C 1	L 1	L 2	L 3	L 3	LC 21	L 2	F 2	FF 22	F 4	F 4
10	F 5	F 4	F 4	F 2	F 2	C 3	C 3	C 3	C 2	C 2	C 2	C 2	C 2	C 1	C 2	C 1	CL 11	LC 31	C 3	LC 21	F 1	F 2	F 2	F 1
11	F 4	F 4	F 2	F 3	F 4	C 3	CL 21	L 2	C 1	C 2	C 2	C 1	C 2	C 1	H 1	C 1	CL 21	CL 31	C 5	C 6	FF 21	F 6	F 6	F 3
12	F 4	F 4	F 4	F 3	F 2		CL 21	C 2	C 3	C 2	C 2	C 2	C 2	CL 11	CL 11	CL 21	CL 21	CL 41	C 6	C 4	F 5	F 6	F 6	F 6
13	F 4	F 4	F 5	FF 24	F 5	L 2	LC 21	C 2	C 2	C 4	C 2	C 2	C 2	HL 11	C 1	CL 11	CL 21	C 3	C 4	L 5	F 5	F 4	F 6	F 6
14	F 4	F 4	F 3	F 5	F 5	L 3	CL 12	C 3	C 2	C 2	C 2	C 3	C 1	C 2		C 1	C 1	C 2	C 3	L 4	F 3	F 4	F 3	FF 25
15	F 4	F 4	F 3	F 4	F 2	C 3	C 4	C 2	C 3	C 2	C 2	C 1	C 2	L 2	L 2	L 2	L 3	L 3	L 3	L 4	F 2	FF 23	F 5	F 4
16	F 4	F 4	F 4	F 5	F 5	L 3	C 3	CL 21	C 2	C 2	C 1	CC 22	C 1	C 1	C 2	C 2	H 1	C 2	C 3	L 5	FF 14	F 4	F 5	F 5
17		F 4	F 3	F 5	FF 53	C 5	CL 41	C 5	C 3	C 3	C 2	C 2	C 3	L 3	CL 11	H 1	C 2	C 3	C 3	C 5	F 3	F 5	F 6	F 5
18	F 5	F 5	F 3	F 5	F 4	L 2	C 4	C 4	C 3	C 2	C 3	C 3	C 1	C 2	H 1	H 1	C 3	HC 14	C 4	C 5	F 4	F 3	F 4	F 5
19	F 3	F 4	F 4	F 4	F 3	C 3	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 3	C 2	C 1	C 3	L 2	L 5	F 4	F 4	F 3	F 3
20	F 2	F 3	F 2	F 1	F 1	C 3	C 4	C 2	C 3	C 3	C 2	C 2	C 2	C 3	L 2	CL 22	CL 22	CL 32	HCL 14	C 5	FF 52	FF 32	FF 32	F 5
21	F 5	F 5	F 4	F 4	F 3	L 3	CL 31	C 3	C 3	C 3	C 3	CL 12	LC 21	CL 21	CL 21	C 2	C 3	C 3	C 3	L 6	F 6	F 6	F 5	F 4
22	F 6	F 3	F 3	F 2	F 2	CL 21	LC 32	CL 12	CL 21	C 2	C 2	C 2	C 2	C 2	C 3	C 3	C 2	C 2	L 2	CL 12	F 3	FF 23	F 6	F 4
23	F 3	F 5	F 6	FF 23	F 3	L 3	LC 41	L 3	C 3	C 2	L 2	L 2	C 2	C 1	C 1	C 2	C 2	C 2	C 4	L 4	FF 41	F 3	F 3	F 4
24	F 6	F 2	F 2	F 2	F 2	CL 11	C 2	CL 32	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 2	C 2	C 3	L 1	F 2	F 3	F 3	F 4
25	F 4	F 2	F 2	F 2	F 3	LC 11	C 2	C 3	C 1	C 1	C 2	C 1	L 1	CL 11	L 1		C 1	C 2	C 5	C 4	F 3	F 5	F 2	F 2
26	F 2	F 3	F 2	FF 11	FF 21	L 2	L 2	CL 22	C 2	C 1	C 2	C 1	C 1	C 1	CL 11	L 1	L 2	C 2	L 3	L 5	FF 11	F 5	F 4	F 5
27	F 5	F 4	F 3	F 2	F 2	CL 11	CL 22	CL 22	C 1	CL 11	C 2	C 1	H 1	C 1	C 2	C 3	C 2	C 2	C 5	LL 24	F 3	F 4	F 4	F 1
28		F 2	F 1	F 1	F 1	L 1	L 3	L 3	C 2	C 2	L 1	CL 11	CL 21	C 2	C 3	C 2	C 2	C 2	L 3	L 2	F 3	F 3	F 3	F 2
29	F 3	F 3	F 3	F 2	F 2	L 4	L 2	L 2	C 2	C 2	C 2	C 2	CL 11	CL 11	C 2	C 1	C 2	C 3	C 3	L 4	F 4	FF 13	F 2	F 5
30	F 3	F 3	F 3	F 3	FF 12	LC 11	C 3	C 1	CL 11	C 1	CL 11	C 1	C 2	C 1	C 1	CL 11	CL 11	C 2	L 2	L 3	F 4	F 4	F 3	FF 13
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																								

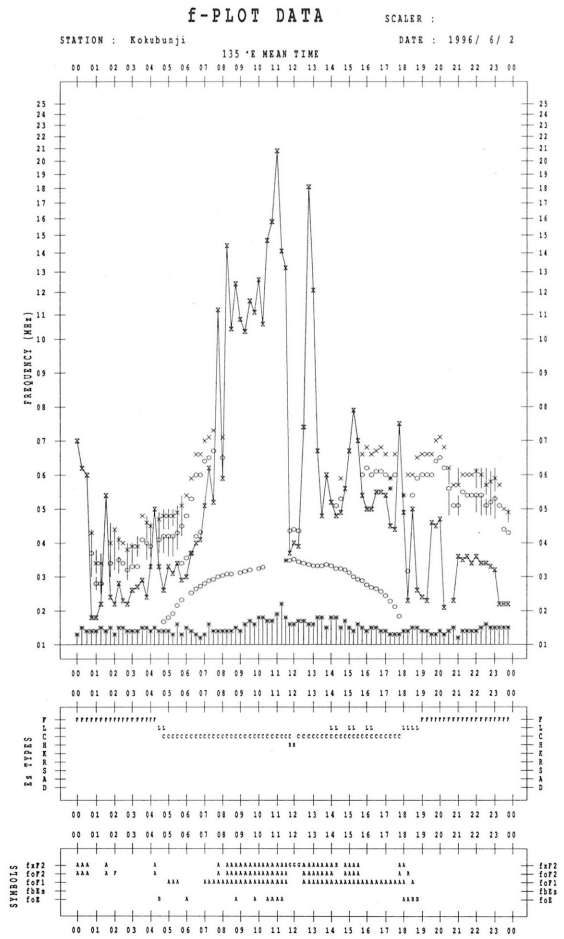
JUN. 1996 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

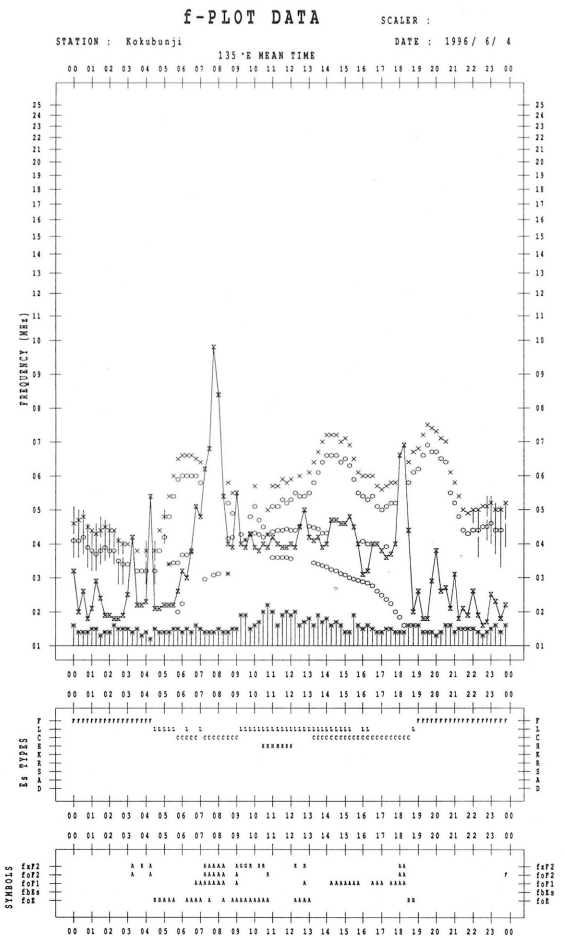
f-PLOTS OF IONOSPHERIC DATA

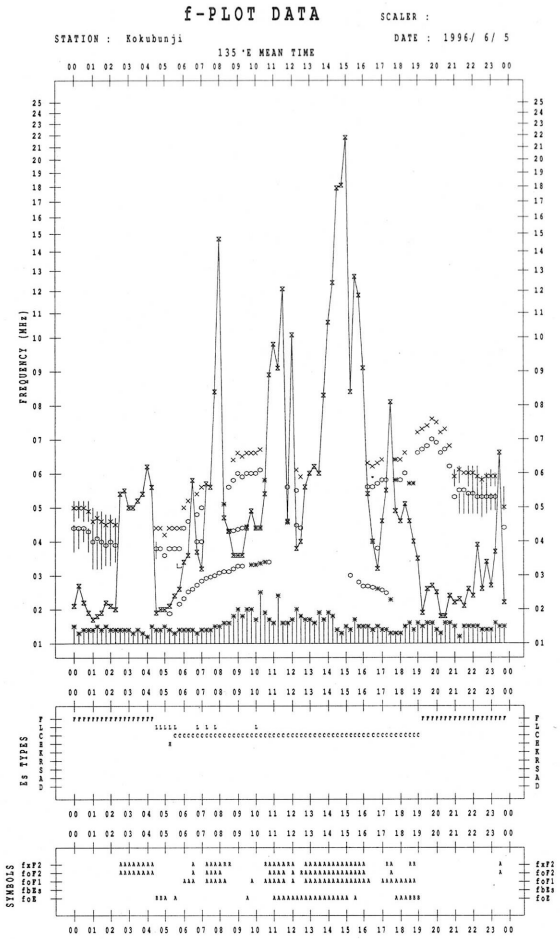
KEY OF f-PLOT	
|	SPREAD
⬡	foF2, foF1, foE
×	fxF2
✳	DOUBTFUL foF2, foF1, foE
⧖	fbEs
⌊	ESTIMATED foF1
↑, ↑	fmin
∧	GREATER THAN
∨	LESS THAN

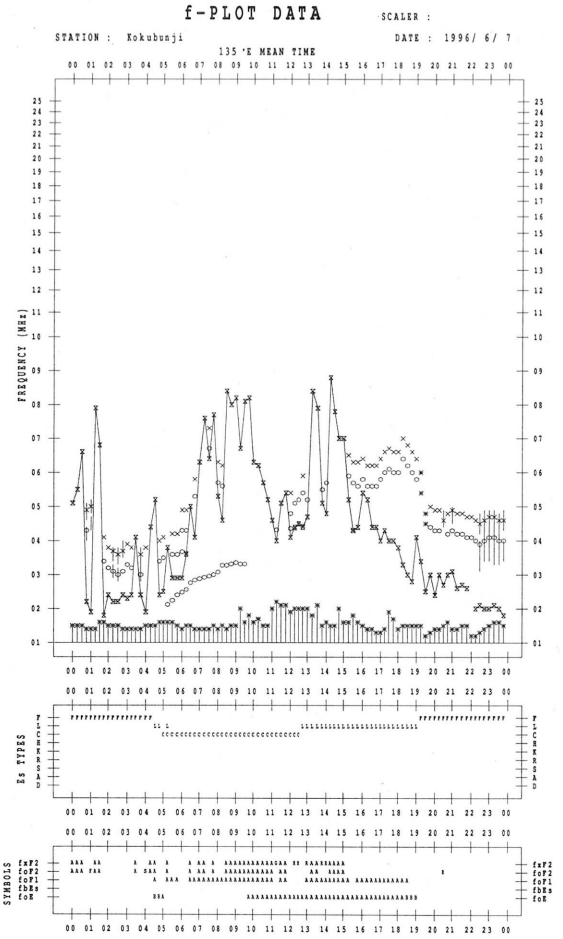

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

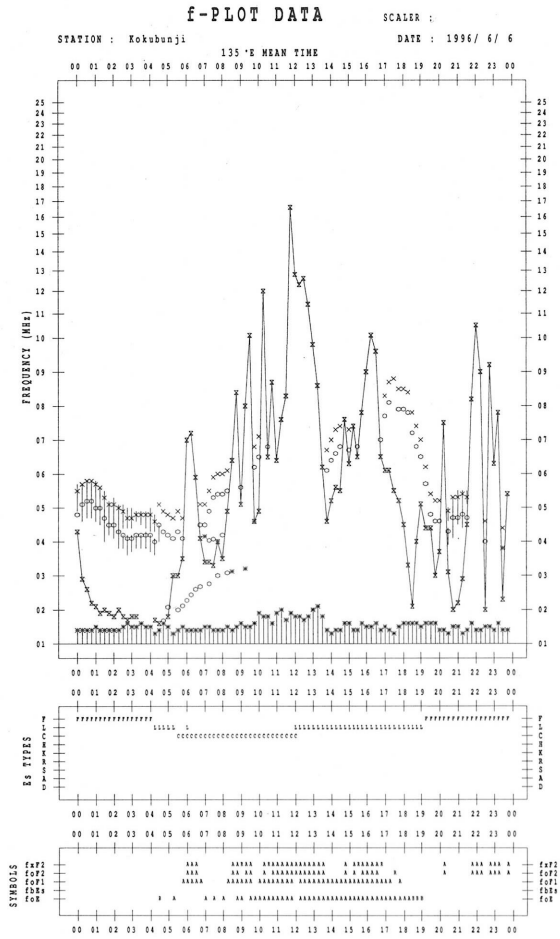

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

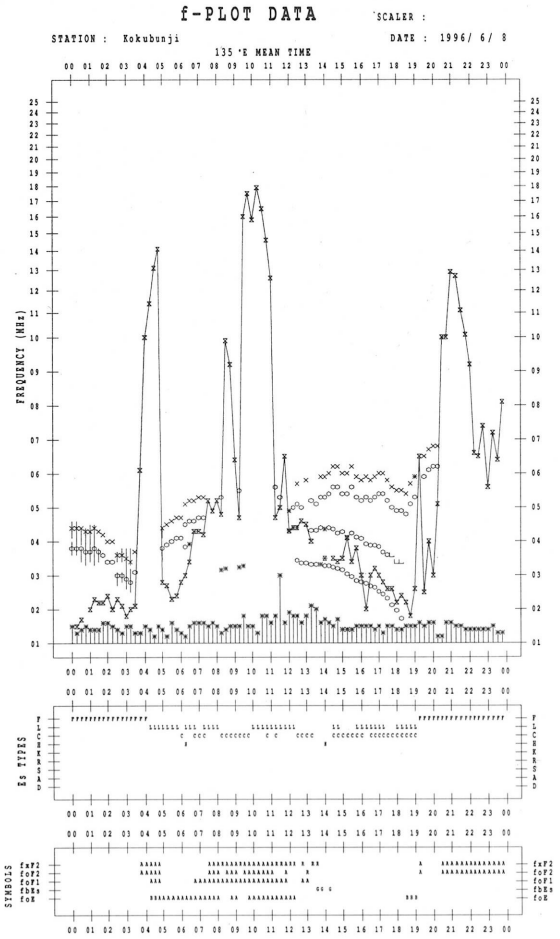

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

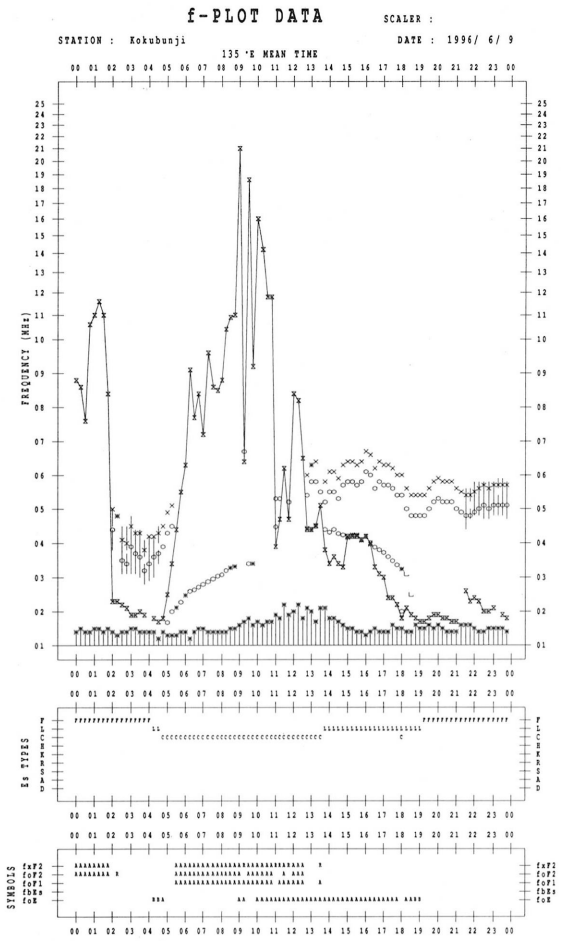

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

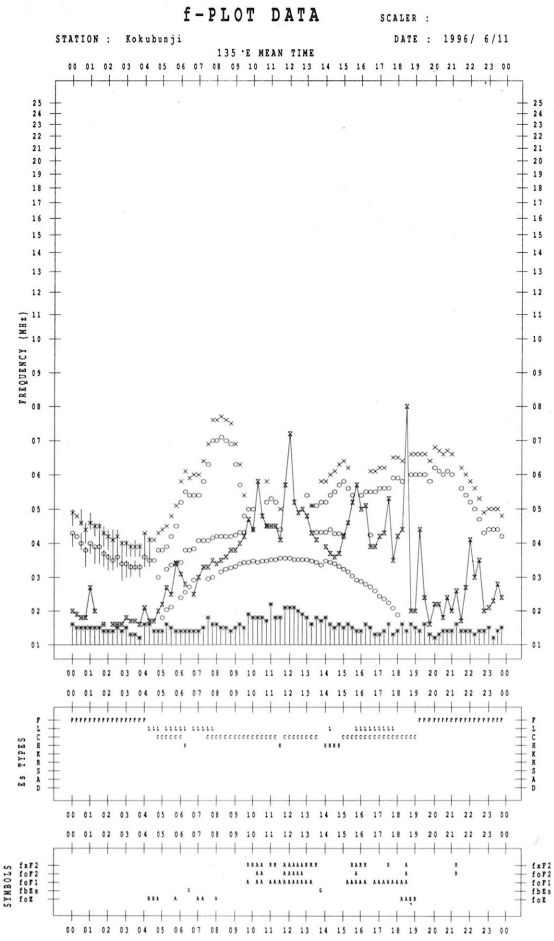

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE
foEs
foF1
foF2
fxF2

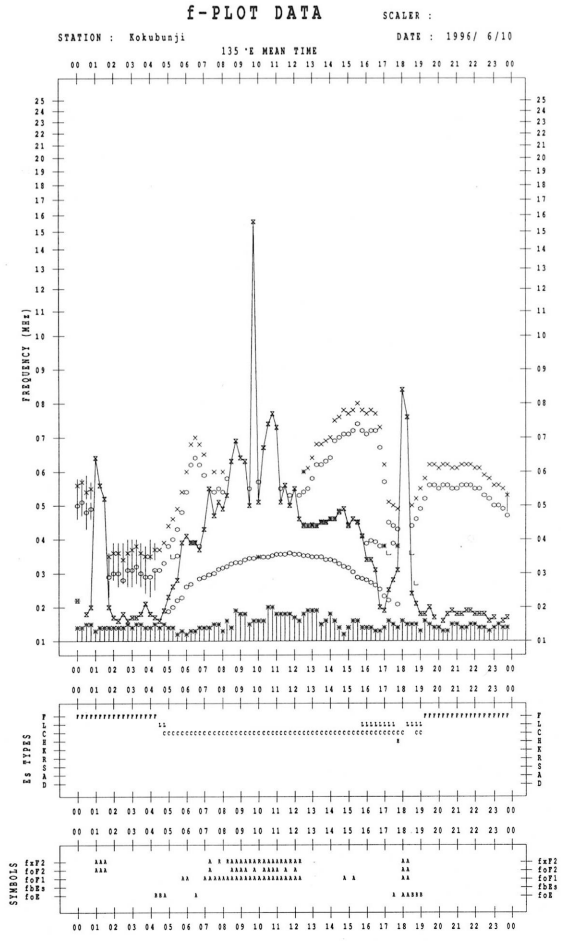

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE
foEs
foF1
foF2
fxF2

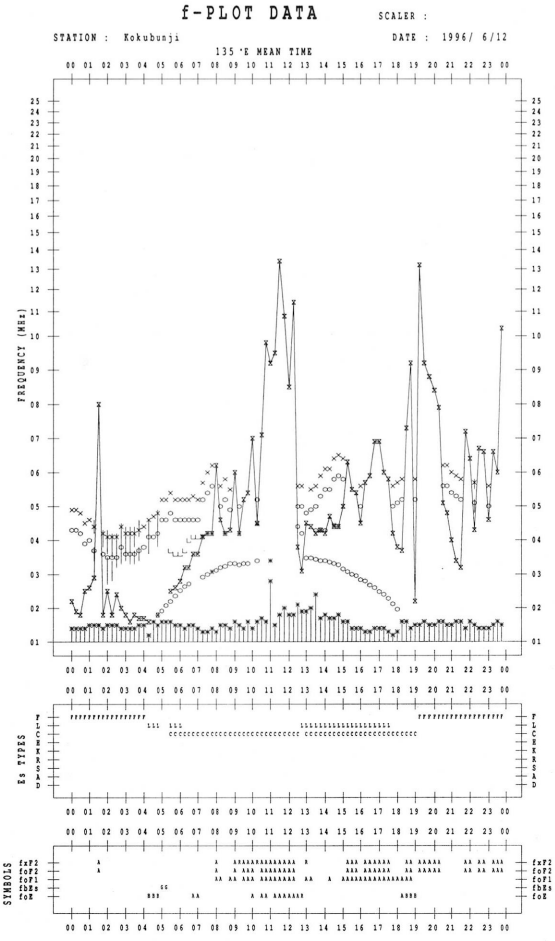

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE
foEs
foF1
foF2
fxF2

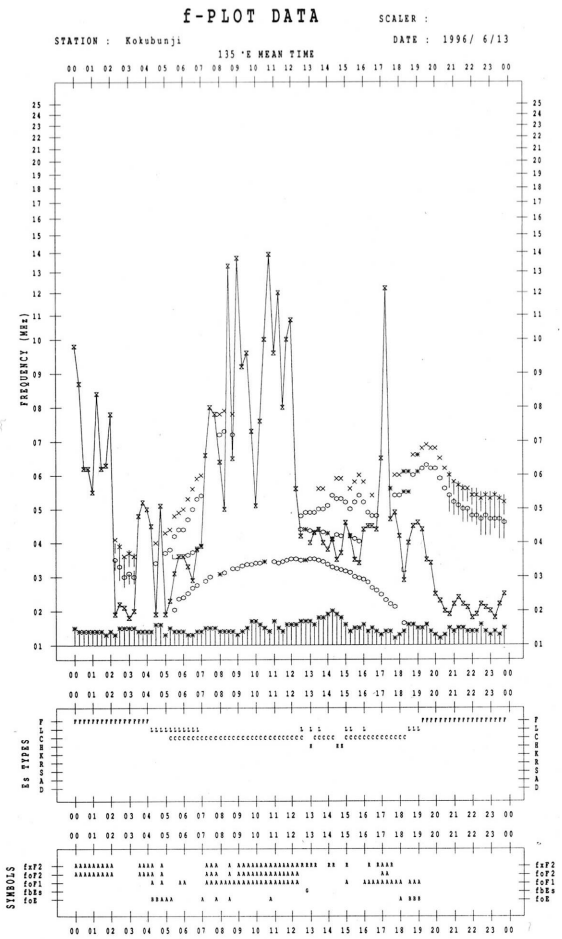

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE
foEs
foF1
foF2
fxF2

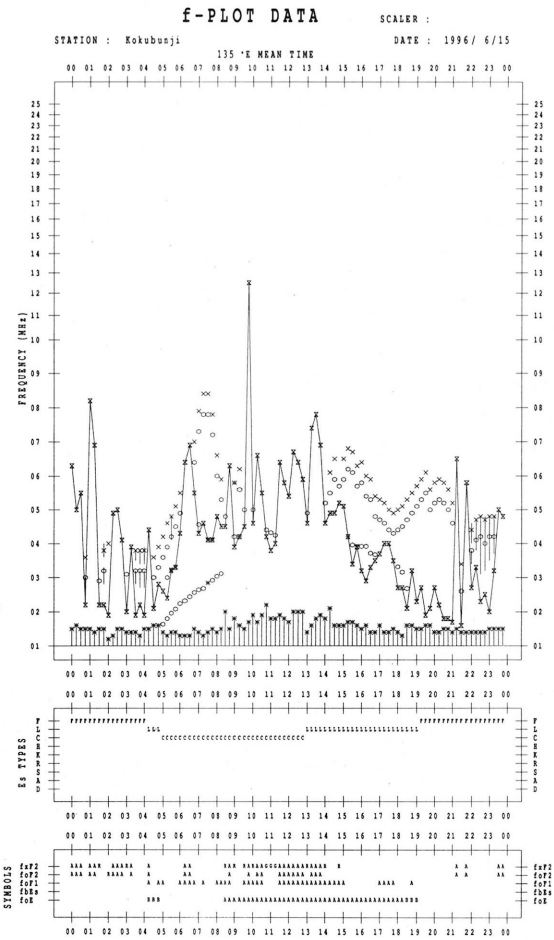

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

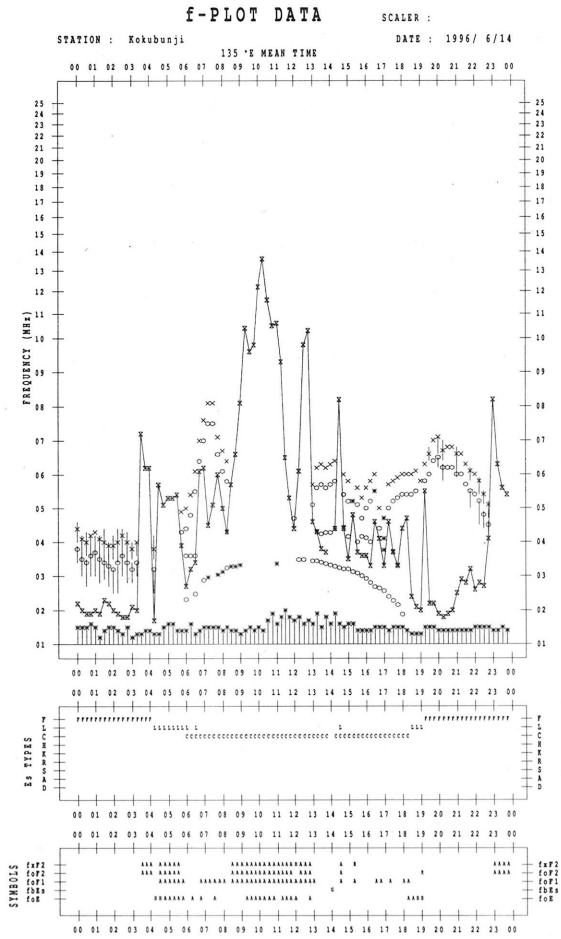

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

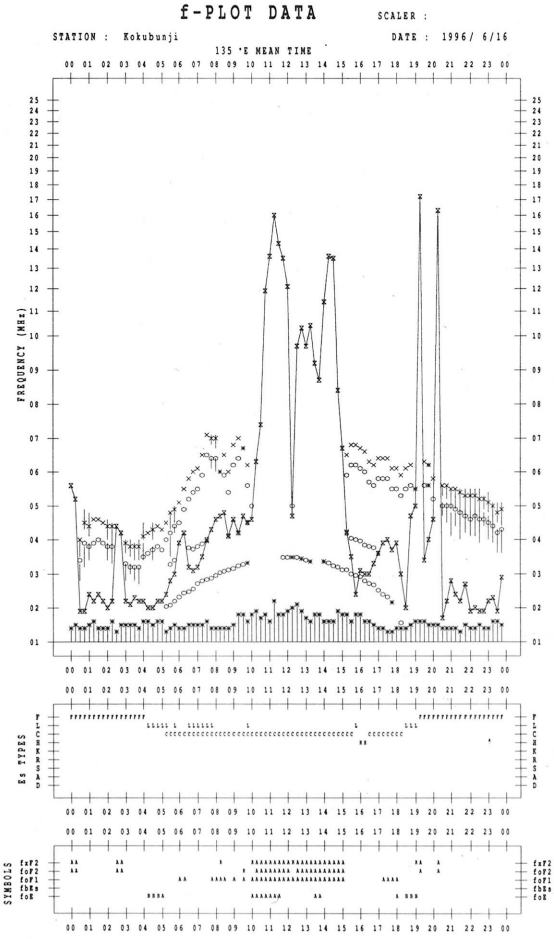

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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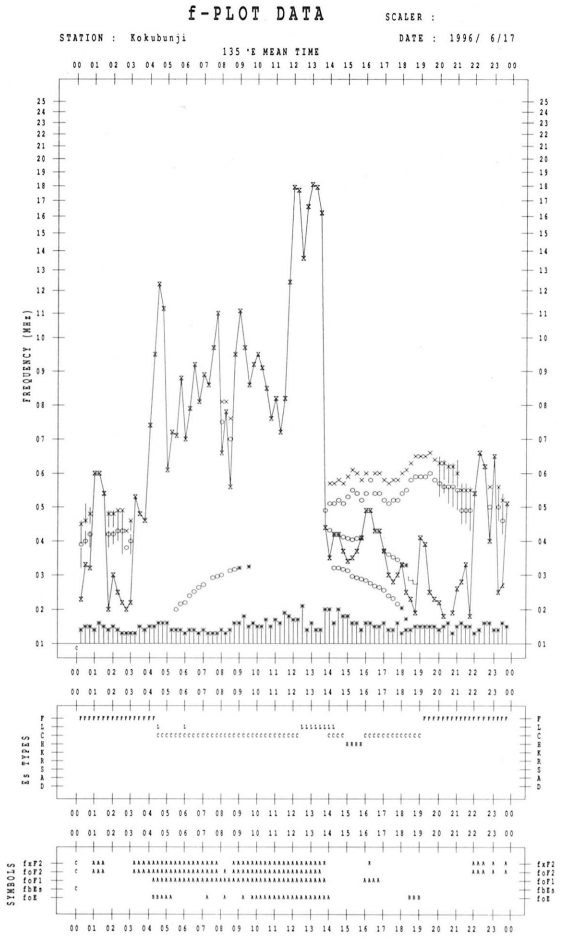
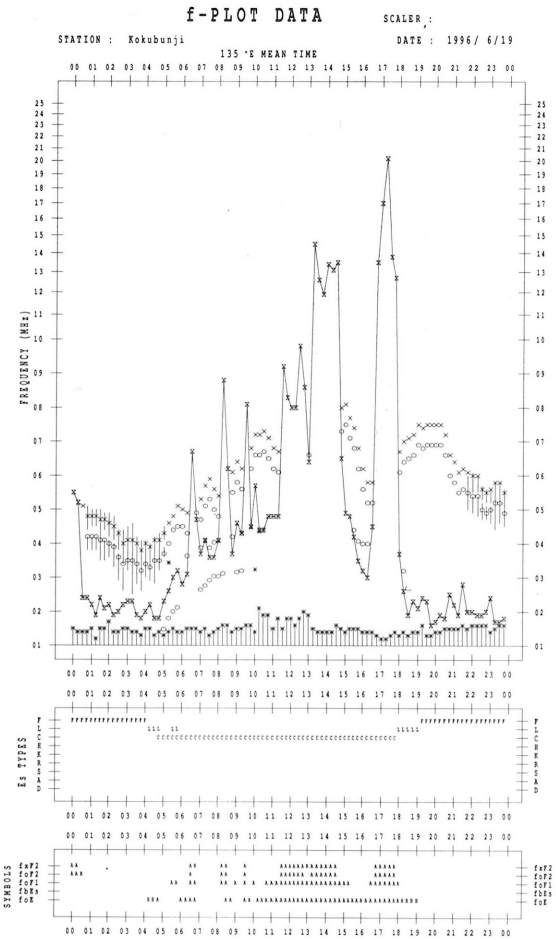
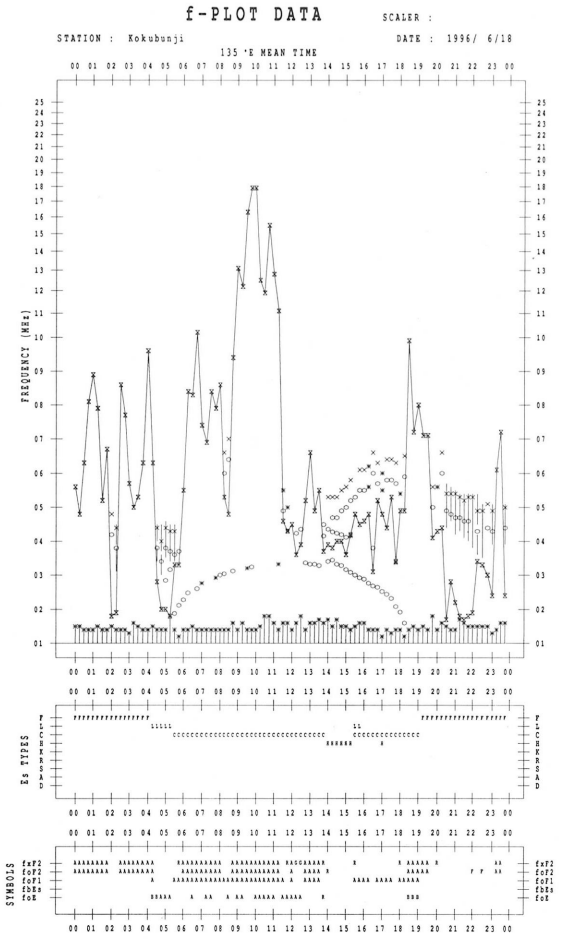
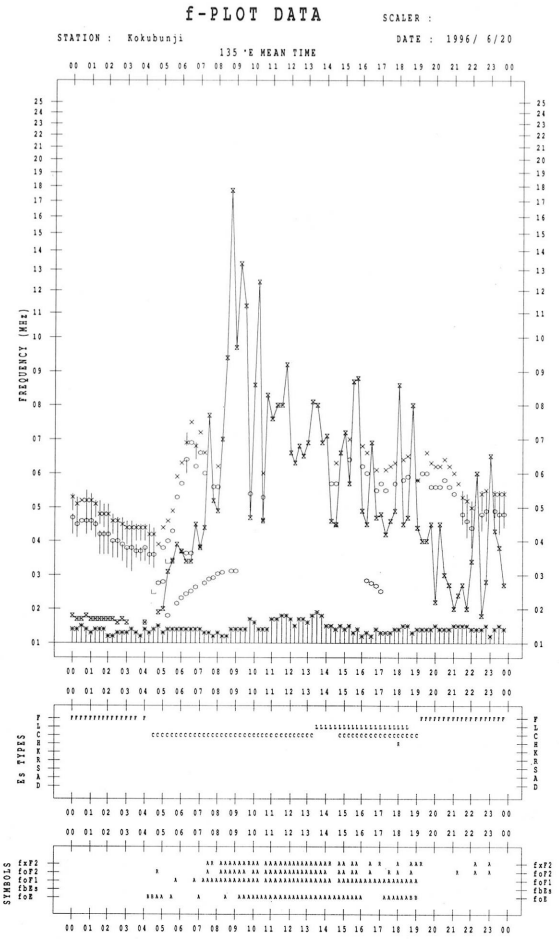
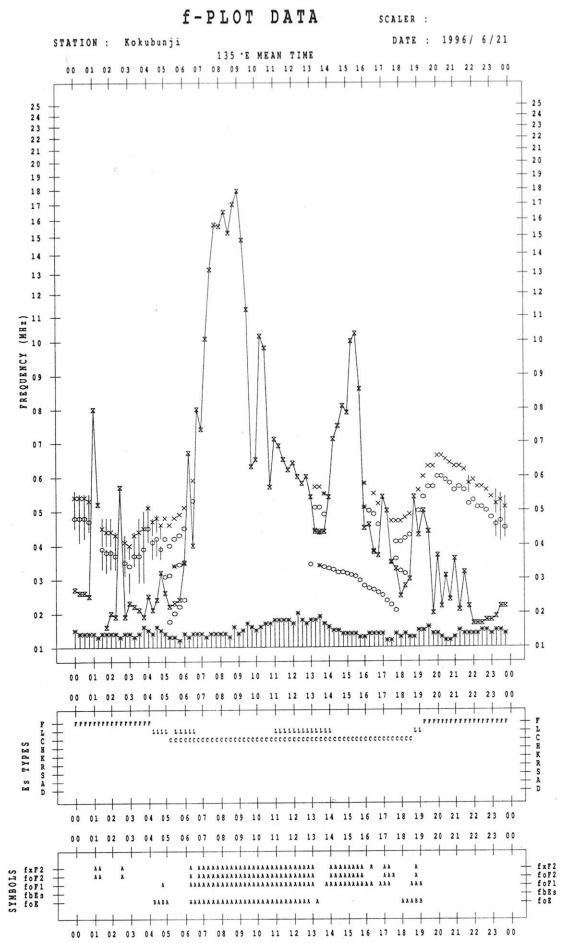
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

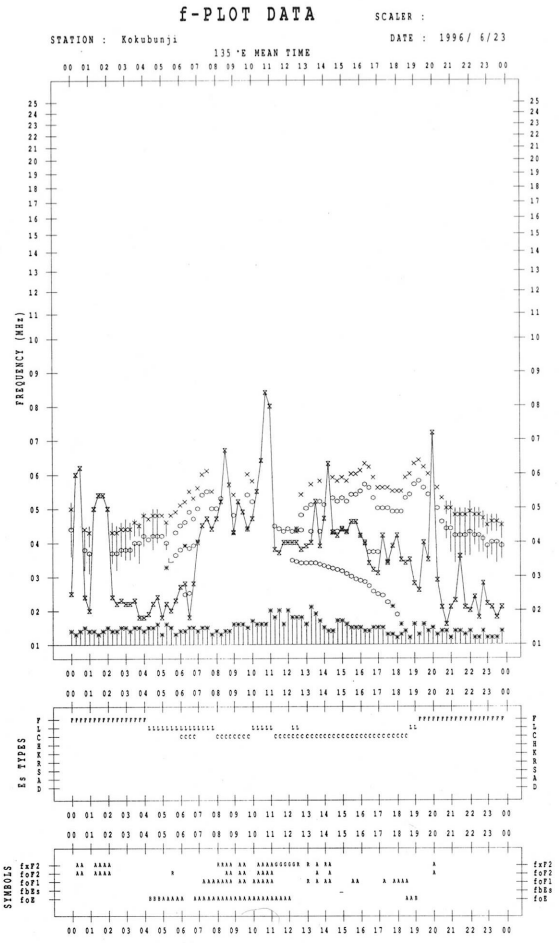

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

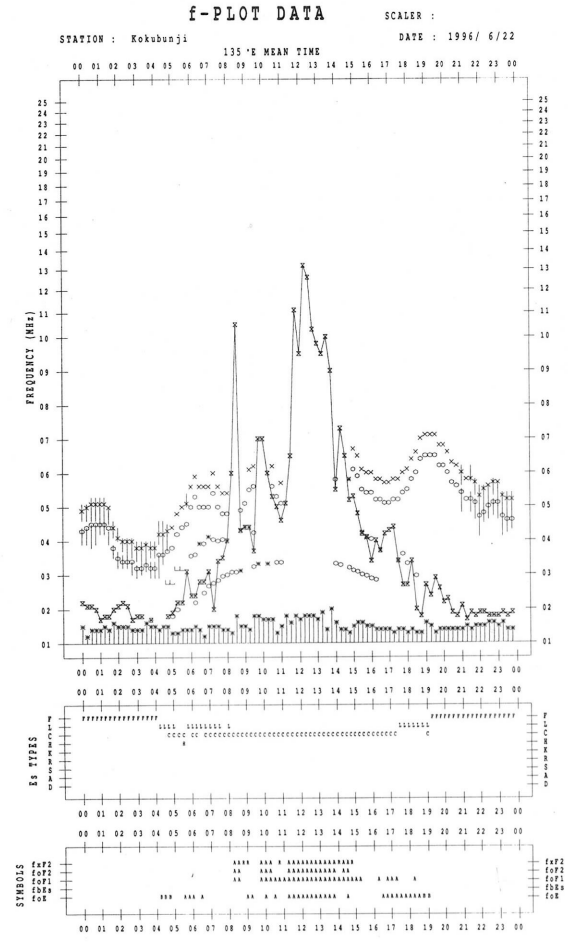

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

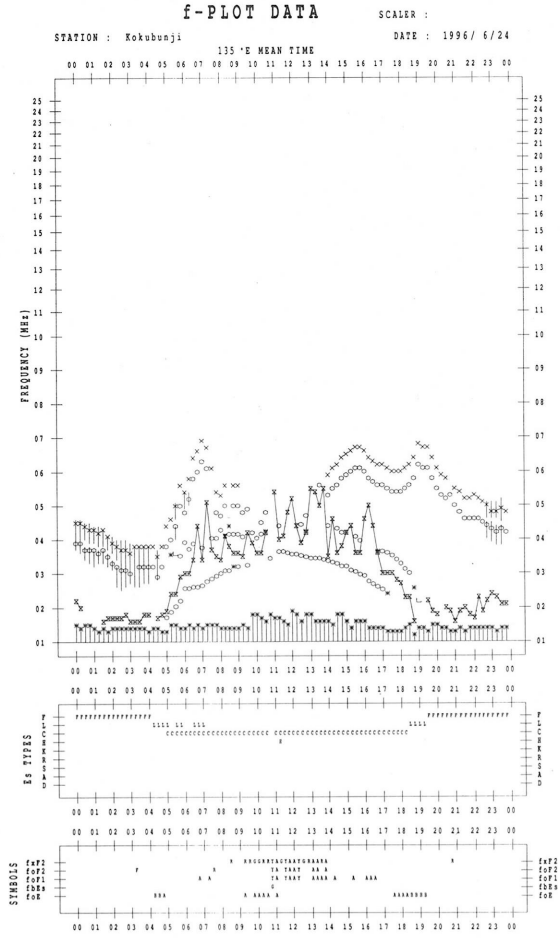

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

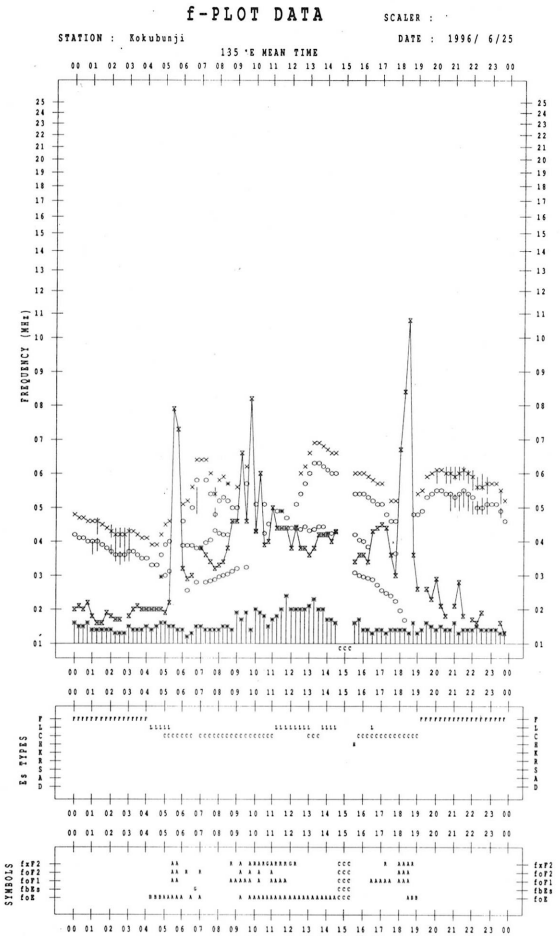

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

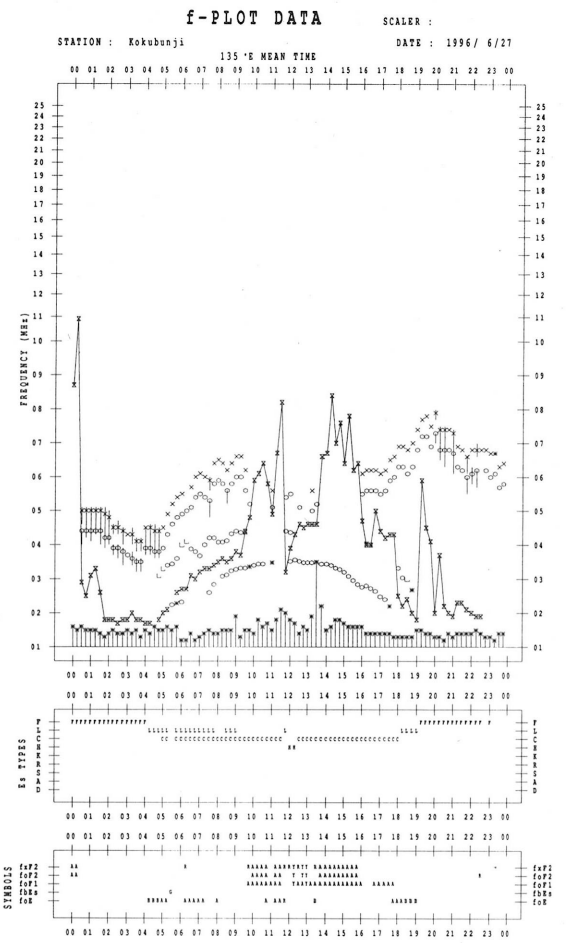

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/21
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

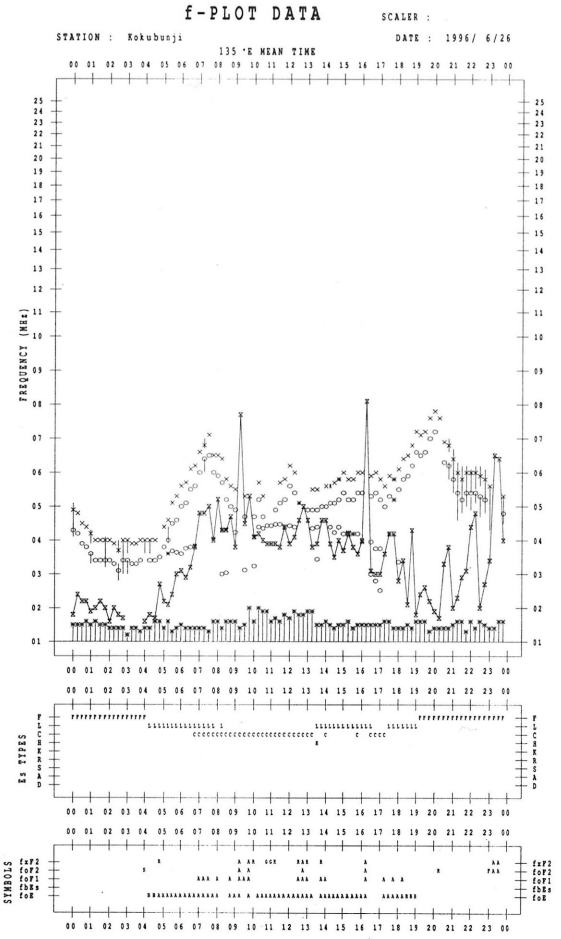

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/23
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

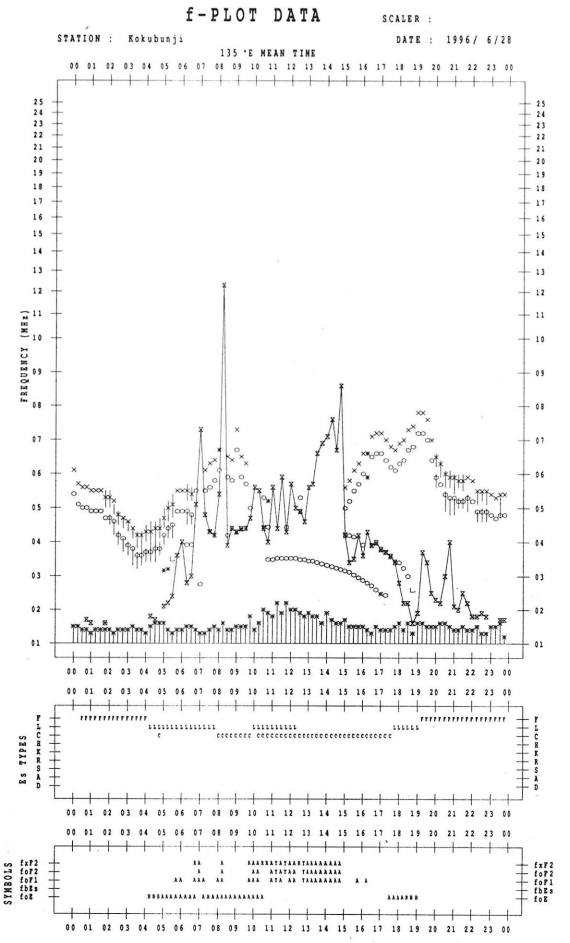

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/22
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

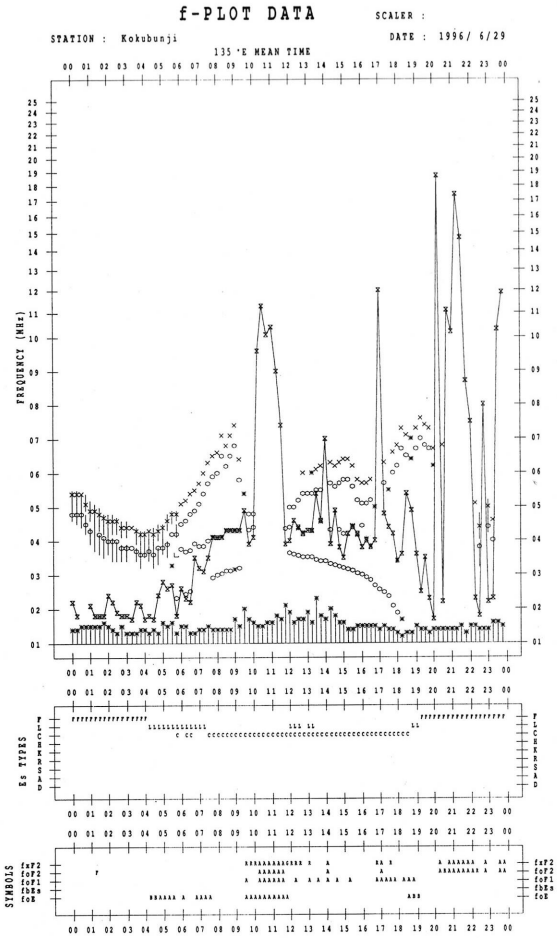

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/24
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

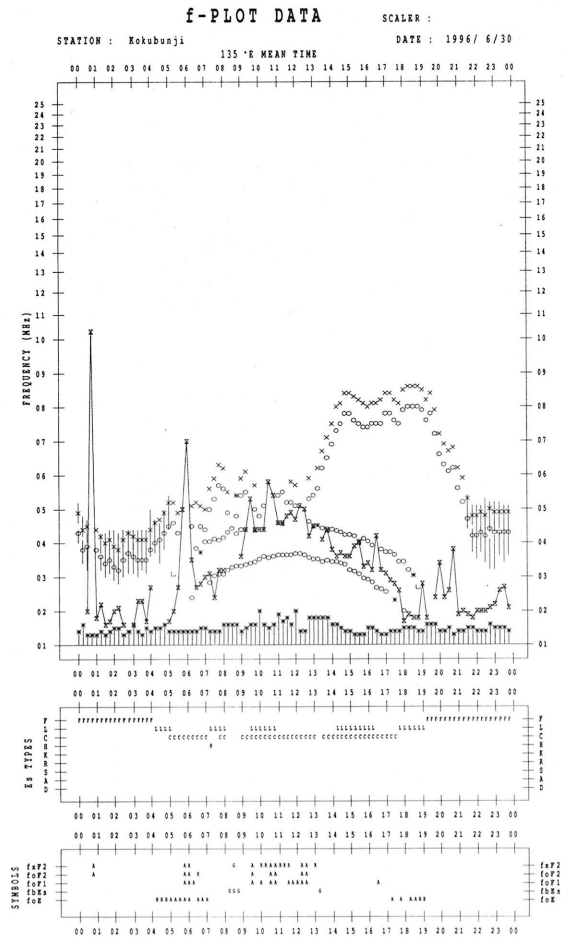

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 6/30
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

Hiraiso June 1996

Not available until system improvement is completed.

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso June 1996

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

Note: No observations during the following periods.

1st 2220 - 2nd 0050 2nd 2220 - 2400 3rd 2220 - 2400
6th 2220 - 7th 0020 7th 0540 - 0630 7th 2220 - 9th 2350
19th 2220 - 20th 0020 20th 0700 - 21st 0010 22th 2220 - 23rd 2400

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso June 1996

Single-frequency observations

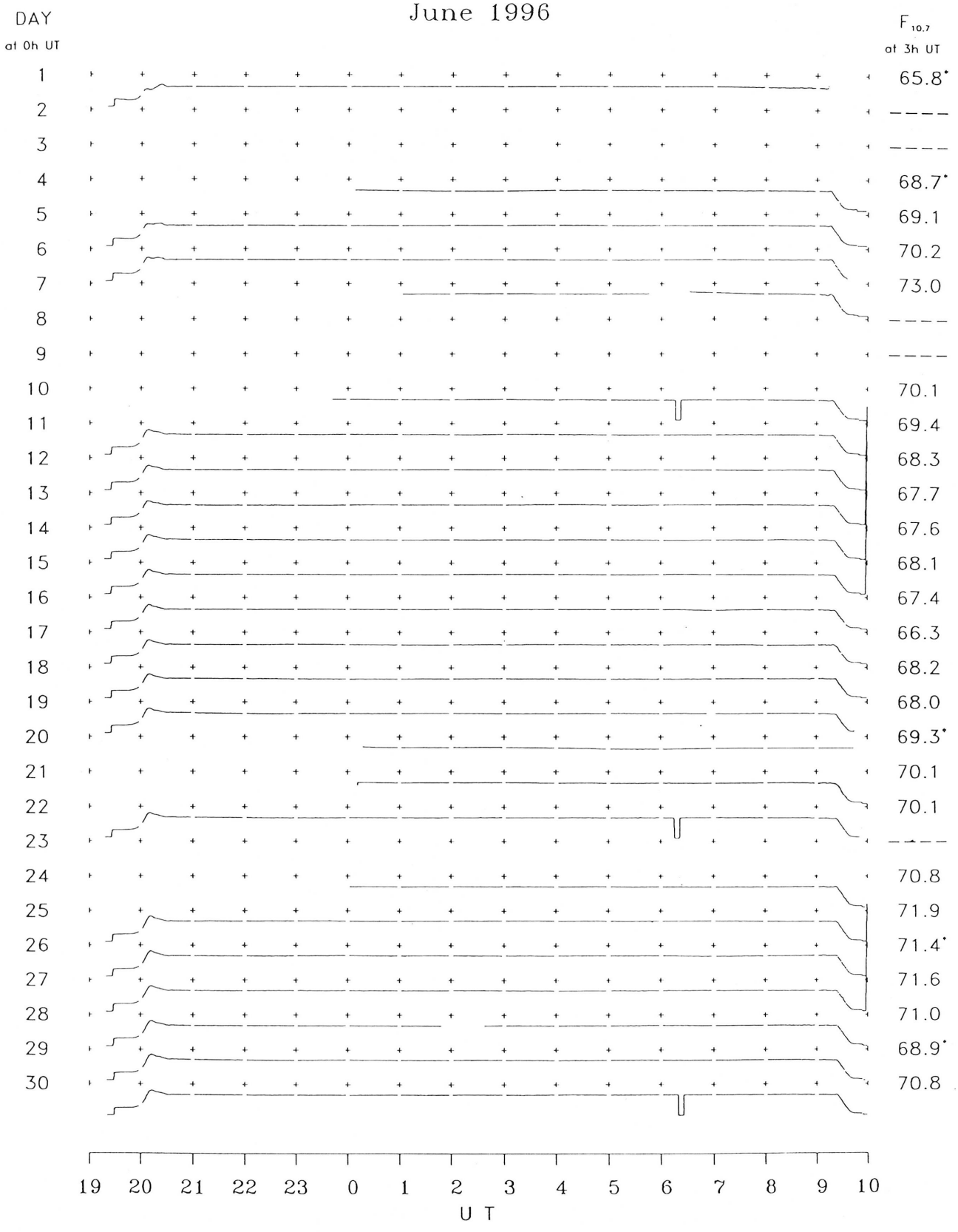
Normal observing period: 1920 - 0950 U.T. (sunrise to sunset)

JUN	FREQ.	TYPE	START TIME	TIME OF MAXIMUM	DUR.	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1})		POLARIZATION
1996	(MHz)		(U.T.)	(U.T.)	(MIN.)	PEAK	MEAN	REMARKS
17	200	42 SER	0101.5	0102.7	6.0	157	-	0
	200	8 S	0219.5	0219.5	0.6	113	-	WR
	200	8 S	0841.7	0842.2	0.7	8	-	0
	200	46 C	0914.0	0914.0	1.7	5	2	0
21	200	8 S	0828.7	0828.7	0.1	2	-	0

B. Solar Radio Emission

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

June 1996



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)

JUN 1996 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

C. RADIO PROPAGATION

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

JUN 1996 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	0	0 S	1	2 ES	2	6	15	13	15	9	11	11	8	6	-1	-1	ES -25	ES -25 ES	-15	-3	-3	-4	-3	-2
2	1		0 ES	1	11	16	16	27	25	12	7	11	8	3	-2	-4	1 ES	-25 ES	1 ES	-2	-2	-2	-2	-4
3	3 ES	3 ES	-9	2	1	9	16	13	14 S	9	13	16	5	2	-4	2	-25 ES	-25 ES	-25 ES	4 ES	3	-2	-2	-9
4	-25 ES	,1	6	13	14	16	12	6		13	10	8	9	1	-4 ES	-2	-25	-25	-25	-25	-2	-2	-4	-4 ES
5	-25 S	3	6	6 ES	6	8	15	16	9	13	12	11	5	1	-25	-9	-15 ES	-9	1	4 ES	-1	-2	-1	-25
6	ES	6 S	3	1	6	16	14	16	26 C	12 C	5 C	1 C	13 C	5 C	1 C	-5 C	-25 C	3 C	-1 C	-25 C	-2 C	-4 C	-4 C	6 C
7	-24 C	C	4 C	3 C	7 C	13 C	15 C	17 C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C																				
9					4	6	13	14	15	9	8	-2	2	2	2	-3	-5 ES	-1	3 ES	3	5	-8	-3	-3
10	3	-2	ES -25	3	9	16	11	11	7	12	6	7	8	5	3	-9 ES	-25 ES	-4	-25	-4	4	10	12 ES	3
11	-3	-2	0	-1	3	1	13	12	6	5	8	12	1	-1	-3	-25	-25	0	-3	2	-3	8	-25	2
12	-1	-4 ES	1 ES	1 ES	5	7	9	7	12	13	5	7	7	3	4	1 ES	6 ES	1	3 ES	13	-2	1	-1	2
13	-2 S	-25	-25	-25	4	6	11	14	14	15	7	1	-1	-2	1	-25	-25	5	-25	1	-1	3	2	-4
14		1	5	3	10	12	13	16	13	14	13	17	5	6	7 ES	-1 ES	-15 ES	-1 ES	-1	2	2	6	2	-1
15	2	-4	-4 ES	-2 ES	-6	5	18	14	3	2	12	3	5	-1	-25	-25 ES	-25	-25	-2	1	6	5	5	5
16	-9	-5	-4	-25	0	3	-1	9	16	16	8	11	-1	-4	-5 ES	-25 ES	0 ES	-3	-4	-2	0	5	2	1
17	-2	3	1	-1	-1	7	12	11	8	3	6	6	8	3	-25 ES	-25 ES	-25 ES	2 ES	-1	-1	5	2	0	1
18	-2	-1	-2	-4	-11	-3	8	8	8	6	1	-2	-1	-4	-25 ES	-25 ES	-25 ES	-25 ES	2 ES	2	3	-1	-1 ES	-2
19	0	-2	5	6	5	12	9	7	9	12	6	12	1	-1 ES	-25 ES	-25	-25	-25	-25	-1	-3	1	-25	-9
20	-2 ES	-4	-4	1	-2	0	4	9	12	8	4	1	3	-25 ES	-25 ES	-1 ES	1 ES	-15 ES	-15 ES	-1	-1	-2	-1	-2 ES
21	-25	-2	4	2	11	1	9	15	16	13	9	8	-1	-25	-25 ES	-25 ES	-25	-25	-25	-1	-7	-2	1 ES	-25 ES
22	0 ES	-2 ES	-2 ES	-1 ES	5	3	2	9	18	5	6	3	-2	-2	-25	-25 ES	1 ES	-2 ES	-2 ES	-2 ES	0	-2	-25	-25
23	-25 ES	-25 ES	-25	-25	-1	5	6	13	1	12	9	1	-1	-1	-9	-25	-25	-25 ES	-25 ES	-25 ES	-1	3	-2	-2
24	-25	-25	-9	-9	1	6	7	6	8	4	7	11	6 ES	1 ES	-2 ES	3 ES	-15 ES	-25 ES	-25 ES	-25	-2	1	1	1
25	-2 ES	-4	-4	-4	14	7	16	13	1	11	9	2	-25	-25 ES	-25 ES	-25 ES	-25 ES	-25	-25	-3	6	1	-15	-15
26	-25	-3	1	3	1	3	13	6	12	5	7	3	1	-25	-25	-25	-25	1 ES	0	6	-1	3	3	2
27	4	2	-1	-2	6	8	5 C	19 C	14 C	11 C	15 C	13 C	6 C	6 C	6 C	6 C	3 C	-25 C	5 C	-2 C	-2 C	5 C	3 C	-4 C
28	1 C	3 C	-9 C	-4 C	15 C	0 C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30																								
CNT	24	24 US	26	26 US	27	27	26	26	24	25	25	25	25	25	25	25	25 ES	25	25	25	25	25	25	25
MED	-2	-2	0	1	5	6	12	13	12	11	8	7	5	1	-4	-9	-25	-15	-3	-1	-1	1	-1	-2
UD	3 ES	3 ES	5 ES	6 ES	14	16	16	17	25	14	13	13	8	6 ES	4 ES	2 ES	1 ES	2 ES	3 ES	4 ES	5	6	3 ES	3 ES
LD	-25	-25	-25	-25	-2	0	4	6	1	4	5	1	-1	-25	-25	-25	-25	-25	-25	-25	-3	-4	-25	-25

C. Radio Propagation

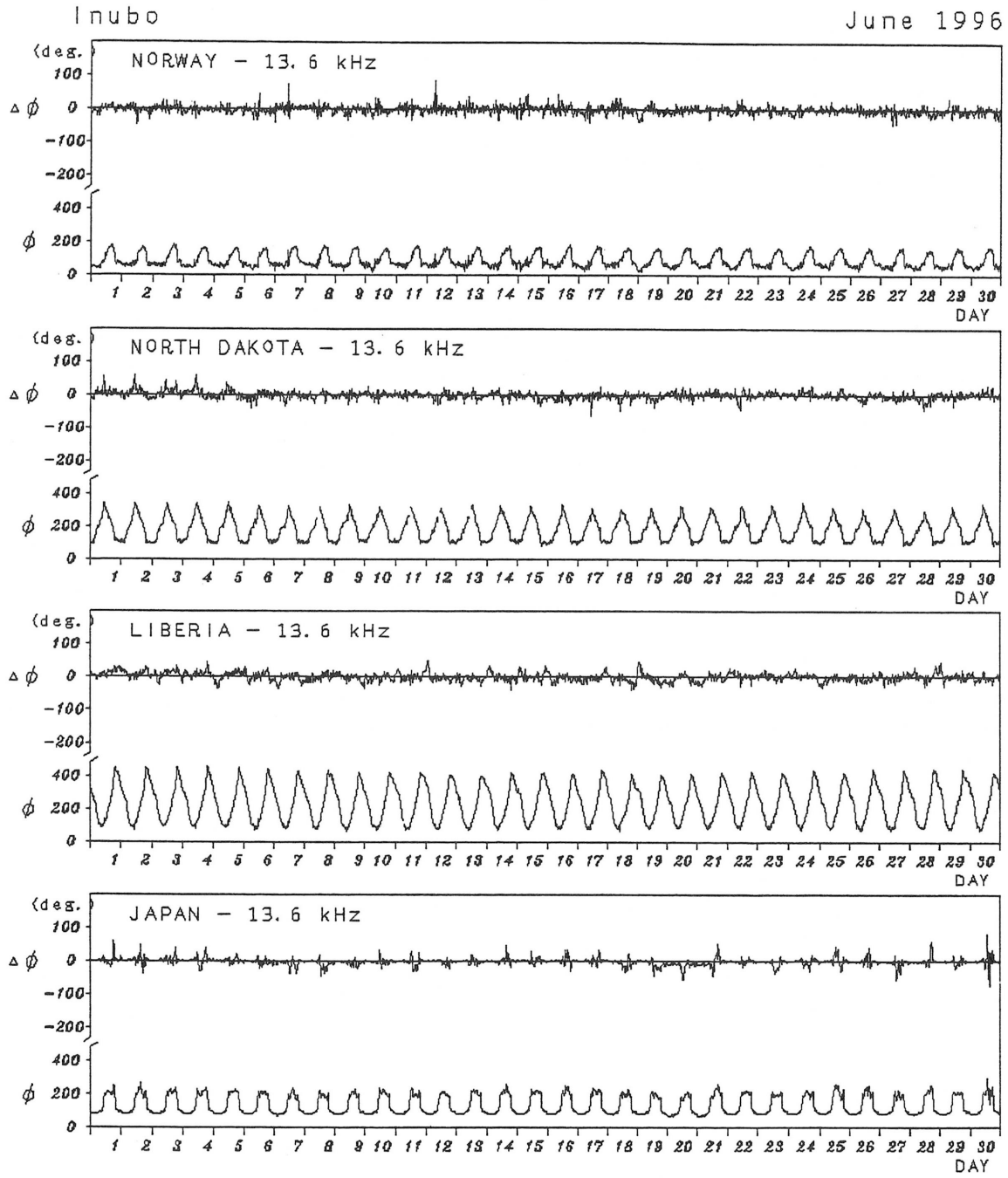
C2. Radio Propagation Quality Figures at Hiraiso

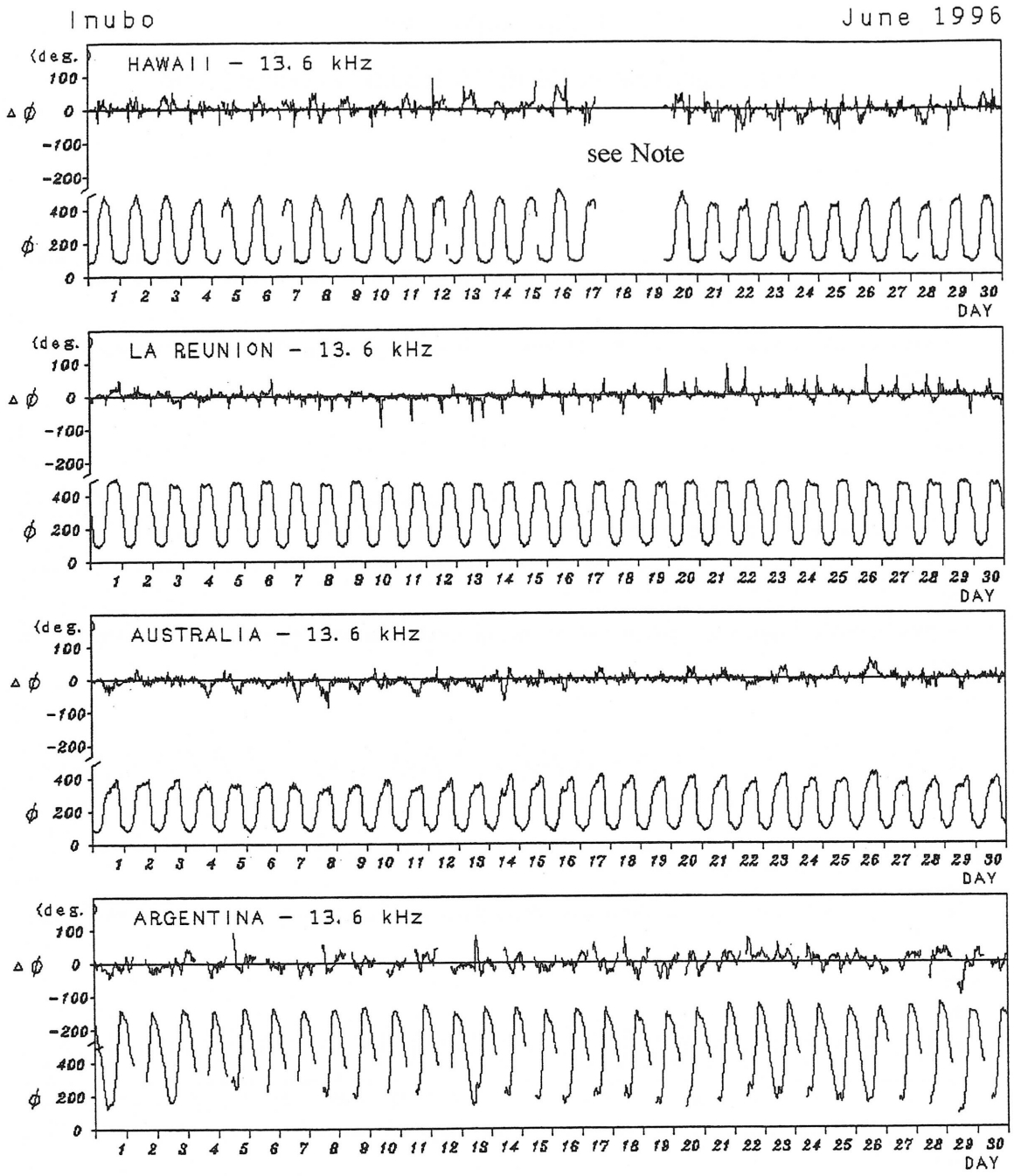
Hiraiso — Time in U.T.

JUN. 1996	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Condition 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start h m	End h	Range nT
1	4-	- 3U - -	4 4 4 4	N N N N	None		
2	4-	- 2U - -	4 4 4 4	N N N N			
3	4-	- 3U - -	4 4 4 3	N N N N			
4	4o	5U - - -	4 4 4 3	N N N N			
5	4o	- 4U - -	4 4 4 4	N N N N			
6	4-	- 3U - -	4 4 4 4	N N N N			
7	4o UC	- C C C	4 4 C C	N N N N			
8	4o UC	C C C C	4 4 C C	N N N N			
9	4+	5U 5U - -	4 4 4 4	N N N N			
10	4o	- 4U - -	4 4 4 4	N N N N			
11	4+	- 5U - -	4 4 4 4	N N N N			
12	4+	- 4U - -	4 4 5 4	N N N N			
13	4o	- 5U - -	3 4 4 4	N N N N			
14	5-	5U 5U 5U -	4 4 5 4	N N N N			
15	4-	- 4U - -	4 4 3 4	N N N N			
16	3+	- 2U - -	3 4 4 4	N N N N			
17	4+	5U 4U - -	4 4 4 4	N N N N			
18	3+	- 2U - -	4 3 3 4	N N N N			
19	3+	- 2U - -	4 4 3 3	N N N N			
20	3+	- 2U - -	4 4 3 4	N N N N			
21	4- U	- 5U - -	4 4 2U 3	N N N N			
22	4-	- 4U - -	4 4 4 3	N N N N			
23	3- U	- 2U - -	2U 3 3 3	N N N N			
24	4-	- 4U - -	3 4 4 3	N N N N			
25	3+ U	5U 4U - -	4 3 2U 3	N N N N			
26	4o U	5U 4U - -	4 4 3U 4	N N N N			
27	4o	- 4U - -	4 4 4 4	N N N N			
28	4+ UC	5U C C C	4 C C C	N N N N			
29	C	C C C C	C C C C	N N N N			
30	C	C C C C	C C C C	N N N N			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo





Note : As for HAWAII-13.6 kHz, no record during 12 June 1700 UT to 2000 UT, and 17 June 1700 UT to 19 June 2205 UT due to the maintenance of transmitter.

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.

JUN. 1996	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

Jun. 1996	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
23					4		2210	2230	2218

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