ISSN 0021-0382

F—546

IONOSPHERIC DATA IN JAPAN

FOR JUNE 1994

VOL. 46 NO. 6

CONTENTS

COMMUNICATIONS RESEARCH LABORATORY
MINISTRY OF POSTS AND TELECOMMUNICATIONS
TOKYO, JAPAN

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. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	57	47	A		35	A	A	A	A	A	A	A	A	A	A	A	60	A	58	62	89	29	A	26
2	35	37	38			A	A	A	A	A	A	A	A	A	A	A	A	48	56	62	57		56	
3	28	36	N	35	35		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	28	A	A
4	A	59	35	35	37	34	A	A	A	A	A	A	A	A	A	A	A	A	A	A	68	57	57	30
5	58	46	58	69	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	56	68	57	57
6	A	A	35	41	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	58
7	58		44	36	A	A	A	A	A	A	A	A	A	A	A	A	A	A	30	A	66	58	56	57
8	57		57	45	49	A	A	A	A	A	A	A	A	A	A	58	A	57	A	60	57	57	59	57
9	57	40	58	37	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	A	67	69	68	57
10	36	59	35	35		A	A	A	A	A	A	A	A	A	A	A	A	A	56	60	60	67	57	58
11	36	32	35	32	35	A	A	A	A	A	A	A	A	A	A	A	A	A	60	A	49	60	57	30
12	57	39	49	35	59	A	A	A	A	A	A	A	A	A	A	A	A	57	A	57	61	A	A	57
13	57	38	59	29	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	57	58	A
14	30	A	59	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	29	29	52
15		35	31	35	37	A	A	A	A	A	A	A	A	A	A	A	34	A	A	56	60	A	57	
16	A	35	38	40	38	38	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	56	61	A
17	49	57	58	42	24		A	A	A	A	A	A	A	A	A	A	A	A	A	56	A	A	A	57
18	57		30	A	32	A	A	A	A	A	A	A	A	A	A	A	54	A	A	A	A	57	57	
19	34	40	59	34	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	62	57	59
20	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	34	A	A	38	69	56	26	57	35
21	37	59	31	38	41	A	A	A	A	A	A	A	A	A	A	A	A	A	A	22	58	58	57	35
22	69	43	40		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	59	26	58	57	57
23	57	50	35	34	32	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	67	60	57
24	35	40	32	30	34	A	A		63	A	A	A	A	A	A	A	A	A	A	56	68	57	57	58
25	57		38	38	35	A		A	A	56	A	A	A	A	A	A	A	A	A		A	69	57	57
26	57	41	38	30	36	A	A	A	A	A	58	A	A	A	56	A	60	56	63	A	59	A	51	57
27	57	57	34	30	31	37	A	A	A	A	A	A	A	A	A	A	A	A	A	A	68	30	57	57
28	A	35		31		59	A	A	A	A	A	A	A	A	A	A	A	A	A	58	55	57	35	A
29	40	47	32	38	31	34	A	A	A	A	A	A	A	A	A	A	57	57	69	57	58	57	57	
30	35	A	59	A	A	30	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	89	A	38
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	22	26	23	17															13	21	24	24	22
MED	57	40	38	35	35															58	58	57	57	57
U Q	57	50	58	38	37															61	66	64	57	57
L Q	35	37	35	32	32															56	56	56	57	38

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT WAKKANAI

JUN. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	29	32	25		G	25	33	76	35	50	35	60	59	60	56	36	36	26	29	G	G	34	54	58
2	29	35	39	24		34	30	36	39	38	59	35	42	32	29	29	27	25	G	G	G		G	G
3	33	27	G	G	G	G	28	39	28	37	28	80	40	28	30	64	37	70	87	78	62	35	54	44
4	35	25	28	26	G	G	50	44	65	38	57	37	38	29	42	59	64	70	42	64	60	36	24	34
5	30	24	G	25	33	36	38	61	87	32	33	68	34	31	67	29	59	34	58	77	32	32	27	30
6	30	32	G	25	38	35	56	58	53	58	65	55	63	134	73	71	113	135	72	77	94	114	92	72
7	76		29	G	28	50	37	40	74	95	84	74	106	95	54	41	50	80	36	95	54	G	G	G
8	G		G	27	27	38	36	36	64	64	41	70	33	78	36	31	27	29	58	52	33	33	27	28
9	36	28	24	26	36	80	51	54	58	42	39	36	36	56	35	32	51	67	42	64	65	62	30	G
10	42	28	G	G	G	34	42	74	40	61	30	38	28	26	32	31	56	40	49	54	40	34	30	30
11	G	G	G	24	G	28	66	43	55	47	38	30	37	37	34	34	39	54	34	38	30	38	28	G
12	23	G	G	G	27	40	52	54	37	37	40	29	65	84	36	60	38	47	60	34	49	62	60	39
13	23	33	62	56	52	62	56	53	42	56	44	46	62	41	37	30	39	76	59	52	47	37	41	56
14	38	38	33	52	28	41	36	40	55	38	41	44	74	58	70	48	62	40	50	70	46	34	38	34
15		G	24	28	G	39	40	75	77	134	62	38	39	57	64	42	30	60	86	36	42	59	41	28
16	40	G	G	G	G	25	61	66	70	123	62	138	40	74	64	95	72	66	71	60	39	59	58	66
17	29	27	27	26	28		35	59	84	84	57	57	55	43	43	66	146	65	30	58	67	72	60	34
18	34		32	71	32	72	67	60	64	62	67	45	38	66	94	77	31	37	39	54	66	49	62	
19	G	32	34	33	33	53	33	60	76	42	66	60	58	45	56	41	65	86	67	83	60	43	55	33
20	34	70	32	50	30	39	60	52	59	39	28	28	38	36	30	30	28	25	23	29	G	24	34	G
21	G	G	G	G	26	25	30	38	37	28	57	67	58	61	62	54	74	38	57	28	G	G	G	G
22	G	G	G	G	29	52	57	58	62	92	41	32	40	39	38	35	54	61	65	47	36	41	38	34
23	41	33	29	35	30	36	58	95	73	52	66	77	62	36	136	38	30	48	58	77	68	39	73	30
24	34	28	33	26	26	33	47		58	60	59	38	58	58	57	66	85	96	87	46	45	94	36	32
25	27		26	G	29	24		58	75	31	36	38	36	35	35	36	35	34	45		62	43	43	30
26	24	28	28	28	30	36	34	40	77	36	40	44	36	34	40	32	42	34	40	68	76	64	59	34
27	38	34	G	G	G	26	34	39	60	70	39	44	53	89	37	56	65	67	70	60	53	38	65	56
28	61	25		37		37	58	76	84	57	65	63	54	38	66	31	68	51	72	55	48	71	65	72
29	64	33	34	28	G	G	32	36	39	39	38	62	65	87	30	29	29	37	31	G	26	34	G	32
30	30	44	64	61	37	23	49	60	57	41	40	65	64	43	70	92	113	78	66	64	35	36	60	34
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	26	29	29	28	29	29	29	30	30	30	30	30	30	30	30	30	30	30	29	30	29	30	29
MED	30	28	26	26	28	36	42	54	60	48	41	46	48	44	42	40	50	52	58	55	46	38	41	33
U Q	38	33	32	34	31	40	56	60	74	62	62	65	62	66	64	60	65	70	67	69	62	60	60	41
L Q	23	24	G	G	G	25	34	40	42	38	38	38	38	36	35	31	35	37	39	37	33	34	28	28

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

JUN. 1994

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

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

HOURLY VALUES OF foF2 AT KOKUBUNJI

JUN. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	48	46		40	A	35	A	A	A	A	A	A		A	64	77	78	86	80	70	A	58	A	34
2	31	42	36	59	A		A	A	58	A	A	A		A	A	58	56	A	69	A	A	A	46	58
3	57	51	47	A		A		A	A	A	A	A	A	A	C	58	A	A	61	69	58	A	47	48
4	50	A	A	45	57	48	47	A	50	A	A		A	A	59	A	A	67		69		70	A	A
5	57	48	47	45	A	41	39	47	A	49	64	66	A	A	A	A	A	A	69	68	77	68	57	50
6	56	45	46	45	A	69	71	53	A	A	A	A	A	A	A	68	A	A	92	73	41	58	57	56
7	A	A	A	46	40	A	A	A	A	52	66	A	A	A	A	67	67	70	70	69	A	38	48	57
8	50	A	46	40	43	47	57		A	63		A	A	A	A	76	81	67	54	66	56	58	57	58
9	58	56	50	A	48	50	69	54	A	A	A	A	A	A	A	A	A	A		A	A	54	58	60
10		58	43	42		A	50	63	76	A	A	A	A	A	A		A	A	A	81	A	A	70	A
11	47	47		44	45	A		A	A	A	A	A	A	A	A	A	A	68	67	68			A	
12	47	50	A	A	A	41	A	A	A	A	A	A	A	A	A	A	55	92	67	69	57	56	57	52
13	A	A	34	A	A	38	A	A	A	A	A	A	A	A	A	65	62	55	56	54		A	A	56
14	54	46	44	A	35	42	A	60	A	A	91	A	A	A		A	59		A	89	68	57	A	A
15	36	41	44	41	45	A	A	A	A	A	A	59	A	A	53	53	57	60	64	68	A	57	A	A
16	57	54	48	45	46	48	60	62	54	A	A	A	A	A	A	A	63	A	60		A		57	A
17	69	A	48	41		50	A	60	A				A	A	A	A	A	70	64	62	57	A	60	A
18	A	A	A	A	A	47	A	52	A	A	A	A	A	A	A	A		A	49	57	A	A	56	56
19	A	A	41	40	59	A	A	A	A	A	A	A	A	A	A	A	49	A	A	61	67		A	
20	57	50	56	A	33	48	50	A	A	A	A	A	A	A	A	A	A	45	66	42	47	46	41	44
21	A	40	40	40	44	49	59	A		A	A	A	54	A	A	A	A	53		A	62		69	50
22		48	46	A	A	28	60	A	72	62	A	71	64	65	A	A	60	A	80		68	57	A	A
23	A	57	47	41	41		A	91	129		A		A	A		A	57	56	60	94	68	57	A	57
24	47	A	37	35	A	37	58	58	A		A	A	A	A	A	54	57	60		A	A	59	A	
25	28		41	40	A	43	56		68	A	A	A	A	A	A	A	A	89	A	48	68	60		58
26	49	A	46	45	38	41	56	A	A	A	A	A	A	64	77	85	85	58	64	73	76		56	52
27	A	56	44	46	46	47	60	67	64	A	63	A		A	A	A	A	102	121	116	A	94	57	56
28	A	A	A	46	41		A	59	A	A	A		A	A	A	A	A	53	57	109	A	A	57	56
29	58	45	A	37	A	A	54	68	57	A	55	A	63	76	76	62	77	74	82	95	67	57	58	57
30	68	46	45	43		46	49	A	A	A	A	A	54	A	A	A				82			A	51
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	19	22	22	15	20	16	13								11	15	18	21	24	15	17	18	20
MED	52	48	46	42	44	46	56	60								65	60	67	66	69	67	57	57	56
U Q	57	54	47	45	46	48	60	65								76	77	74	75	81	68	59	58	57
L Q	47	45	41	40	40	41	50	53								58	57	56	60	64	57	56	56	50

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT KOKUBUNJI

JUN. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	25		36	39	29	40	52	68	54	26	60		49	50	50	61	52	36	33	33	27	62	51
2	60	35	42	28	31		30	54	47	34	34	31		36	34	36	52	132	59	72	59	62	40	G
3	29	33	32	50		40	38	31	36	32	35	44	59	50	C	47	62	137	34	31	29	61	41	54
4	43	50	68	49	26	G	42	32	52	105	88	120	51	56	54	114	133	56		73		56	52	57
5	G	29	30	29	30	28	35	48	48	49	G	40	37	40	61	30	51	69	62	60	58	61	50	31
6	G	G	G	G	33	31	24	45	50	66	101	109	72	95	80	60	75	65	48	41	44	57	54	72
7	52	52	51	33	28	30	52	51	50	51	58	62	52	58	32	51	48	40	43	39	52	25	34	44
8	44	49	33	42	G	32	42	89	72	49		58	63	54	66	31	119	41	64	67	30	53	52	40
9	G	G	24	34	36	G	51	48	100	78	76	51	54	40	52	56	83	88	134	131	143	52	61	79
10		G	29	32		40	41	58	68	70	60	54	39	57	112	134	96	73	104	60	101	124	57	59
11	50	37		58	95	71	88	56	71	73	86	110	68	152	69	47	55	48	55	53			55	
12	84	58	91	134	60	34	71	166	92	56	81	62	82	60	37	32	29	31	37	26	25	G	40	44
13	46	59	70	33	52	50	71	54	60	86	92	58	103	48	32	50	G	50	49	82		62	74	58
14	75	52	71	60	38	36	40	56	73	75	96	67	114	128		154	32	96	72	94	G	57	83	56
15	37	33	30	30	30	40	62	59	87	93	71	54	66	92	35	46	43	33	34	29	84	40	71	60
16	61	56	33	23	G	G	37	42	35	49	57	69	70	73	54	32	44	58	35		83		48	67
17	88	71	30	G		28	74	60	100	93	91	153	86	86	97	80	84	70	41	34	40	80	57	60
18	70	102	61	59	84	36	50	53	80	60	64	38	60	53	55	58		56	64	33	72	70	57	50
19	56	68	33	28	30	31	69	77	130	87	57	54	58	106	41	50	37	86	56	70	77		54	
20	G	40	40	32	90	40	54	56	93	53	40	46	39	37	33	40	36	30	29	28	G	34	26	36
21	43	32	30	24	30	28	24	32		47	33	32	28	53	70	55	132	50		106	34		54	41
22		33	34	41	44	33	50	64	58	59	90	54	46	58	65	120	52	82	136		58	31	88	88
23	54	29	30	52	36		40	106	101		136	G	29	46		31	28	43	55	85	56	54	59	81
24	62	54	56	48	45	38	60	55	58	68	47	53	46	53	37	50	44	55	117	72	90	117	117	
25	57		51	40	57	G	47		46	61	40	57	72	31	59	119	108	61	88	61	73	54		54
26	81	48	43	31	30	28	44	61	58	66	118	52	55	70	37	69	60	35	48	37	29		25	38
27	61	32	29	25	33	34	51	61	70	78	56	56	G	84	38	153	80	134	143	93	88	60	49	40
28	58	43	40	25	72		62	40	81	58	70		76	68	90	56	57	30	32	92	88	58	59	54
29	69	37	103	38	108	49	30	33	39	37	49	44	32	32	30	32	64	61	52	51	32	34	30	32
30	33	35	34	34		25	34	54	74	74	126	27	G	40	30	30		67	110	52			97	37
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	28	30	26	27	30	29	29	29	29	29	28	30	27	30	28	30	28	28	26	24	29	27
MED	53	37	34	34	36	32	46	54	68	61	64	54	56	55	52	50	56	57	55	60	57	56	54	54
U Q	61	53	53	48	57	40	60	60	84	76	90	62	71	73	66	69	81	73	80	77	83	61	61	60
L Q	35	32	30	28	30	28	38	46	50	50	43	44	39	46	35	36	43	43	39	35	32	37	44	40

HOURLY VALUES OF fmin AT KOKUBUNJI

JUN. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15		15	14	16	15	15	15	17	18	34		34	21	17	15	15	15	14	15	14	15	15
2	15	14	14	15	14		15	15	14	15	22	22		29	23	20	15	14	15	15	14	15	15	15
3	15	15	15	14		14	15	15	16	18	24	34	34	34	C	34	16	14	14	14	15	15	15	15
4	14	15	14	14	14	17	17	16	17	23	28	30	38	34	36	34	14	14		15		15	15	14
5	15	14	15	14	14	17	15	14	16	16	47	32	21	18	34	20	16	15	14	15	14	15	15	14
6	15	15	15	15	15	15	26	15	17	21	38	36	34	33	30	18	16	15	14	14	14	15	14	15
7	14	15	15	14	15	15	15	17	18	21	23	33	35	35	22	16	18	15	14	14	15	15	14	15
8	15	15	14	15	14	16	15	14	17	21		35	33	18	26	15	15	15	15	14	15	14	15	14
9	15	15	14	15	14	18	15	15	16	21	23	21	20	46	21	17	29	16	14	14	14	14	14	14
10		15	14	14		15	15	15	16	22	22	35	32	33	20	27	16	14	15	15	15	15	15	15
11	15	14		14	14	15	14	14	18	15	18	33	28	28	37	16	15	15	14	15			15	
12	14	14	15	14	14	15	15	14	15	21	32	33	22	24	26	20	16	15	15	15	15	15	15	14
13	14	15	14	15	14	15	15	15	17	21	29	28	23	17	22	20	16	16	14	15		14	14	14
14	15	15	14	15	15	14	15	14	16	18	22	34	34	24		20	16	15	14	15	14	15	15	15
15	14	14	14	14	16	15	15	15	16	34	34	35	34	24	24	20	17	15	15	14	15	14	14	15
16	14	14	14	15	16	15	23	16	20	24	30	24	33	27	30	15	15	14	15		15		15	15
17	14	15	14	15		20	15	14	15	16	26	22	20	36	21	21	15	15	14	14	15	14	14	15
18	14	14	15	15	15	15	15	15	18	18	33	32	27	32	17	22		15	15	15	15	14	15	14
19	14	14	14	15	14	15	15	15	18	18	20	18	36	35	34	15	14	14	14	14	14		15	
20	15	15	14	14	15	15	15	14	18	22	20	21		20	18	16	15	14	14	14	14	14	14	15
21	14	14	15	14	15	14	15	14		33	26	24	48	39	21	17	17	15		15	15		14	15
22		14	14	15	14	15	14	14	16	16	18	22	22	23	28	24	16	15	15		14	15	15	15
23	15	15	14	14	14		15	14	17		30			30		20	16	15	14	15	15	14	16	14
24	15	15	15	14	15	16	14	15	16	18	18	17	29	27	24	18	17	15	15	15	15	14	15	
25	14		14	15	14	18	14		16	36	23	18	22	24	18	23	17	15	15	14	15	15		15
26	16	14	15	14	15	14	15	17	16	23	22	26	26	17	20	16	15	15	15	15	15		15	14
27	14	14	14	15	15	15	15	15	15	20	28	24	71	32	20	18	14	16	15	15	14	15	14	15
28	15	15	14	15	14		15	15	15	17	23		33	30	17	17	15	15	14	14	14	15	14	15
29	14	14	14	15	14	16	15	14	14	16	20	17	18	17	21	20	16	15	15	15	14	15	15	15
30	15	15	14	15		17	15	14	15	16	18	20	48		20	17		14	15	14			15	15
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	28	30	26	27	30	29	29	29	29	28	26	29	27	30	28	30	28	28	26	24	29	27
MED	15	15	14	15	14	15	15	15	16	20	23	27	32	29	22	19	16	15	15	15	15	15	15	15
U Q	15	15	15	15	15	16	15	15	17	22	29	33	34	34	28	20	16	15	15	15	15	15	15	15
L Q	14	14	14	14	14	15	15	14	15	16	20	21	22	23	20	17	15	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT YAMAGAWA

JUN. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	59	A	29	29	36	A	58	A	A	A	A		76	86	90	100	93	71	62	A	A	A
2	46		34		46	A	A	A	A	A	A	A	A		68	72	68	68	66	69	56	43	A	A
3	N	59	49	52	42	47	46	47	A	A	A	A	67	72	75	74	78	81	76	80	A	A	49	89
4	A	A	A	A		A	57	A	68	A	A	A	A	A	A	64	74	81	A	A	81	A	70	A
5	69	A	59	56	44	A		A	A	A	A	A	A	A	A	A	57	66	71	78	A	A	A	A
6	A	54		37	40	31	46	A	A	A	A	A	67	A	78	A	A	A	78	A	60	89	A	A
7	37		48	47	26	A	A	A	A	A	A	A		A	A	A	78	71	70	60	A	68	A	A
8		A	36	A	A	A	46	57		A	A	A	A		70	81	88	78	59	A	61	A	A	59
9	A	49	49	46	44	38	A	68	72	A	A	A	A	A	A	A	A	66	A	68	68	68	63	A
10		A	A		49	47	A	69	80	A	A		62		99	A	76	83	84	86	75	A	A	A
11	A	A	A	37		37	A	A	89	A	A	A	A	A	71		72	73	61	A	A	A	A	A
12	A	56	A	29	A	29	A	A	A	A		A			A	A	73	76	70	A	49	58	49	109
13	60	A	58		38	37	A	57	A	A	A	A	A	A	A	77	72	72	62	59	70	60	A	A
14	A	69	A	34	34	30	49	A	A	A	A	A	A	A	A	A	A	A	83	A	69	A	A	A
15	69	59	A	26	34	49	57	53	A	A	49	A	139	70	72	80	85	80	78	A	A	53	59	109
16	A	A			34	A	58	76	64	A	A	A	A	A	76	77	67	A	62	60	A	59	57	A
17	34	49	A	69	46	37	A	60	A	A	A	A	69	A	A	A	90	87	72	66	A	A	A	69
18	A	A	A	A	A		A	A	61	A			A	A	56	A	55	56	60	35	35	A	A	A
19	A	59	28	23	37	37	A	A	A	A	A	A	A	139		A	A	A	A	25	59	58	59	A
20	44	A		A	A	A	A	A	A	A					A	A	A	A	A	A	A	A		44
21	69	49	37	30	25	A	48	A	A	A	A				A	A	A	A	A	60		A	A	A
22		29	59	48	N		48	60	A	A	66	A		69	A		74	84	84	81	61	A	A	A
23	A	A	38	58	42	89	58	62	68	A	A		A		A	68	66	60	73	80	68	A	A	A
24	A	A	A	A	A	N	49	A	A	A	A	A		A	A	A	63	71	56	89	58	59		A
25	A		A	40	59	A	44	62	61	A	A	A		A	78	86	85	86	78	A	A	A	A	A
26	A		46	A	29	38	A	A	A	A	A	A	68	67	A	80	68	71	73	A	76	A	A	A
27	44	44	56	A	A	59	63	A	67	72	A		A	A	A	73	70	60	A	74	A	A	A	A
28	A	A	48	A	59	35	A		A	A	A	A	A	A	A	75	76	63	66	70	66	A	50	A
29	A	36			59	28	A	A		A	A	A		67	76	68	77	83	86	96	78	A	109	89
30	34	A		A	49	A	56	44	A	A	A	A		A		A	A	A	29	73	59	A	37	A
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	12	15	15	21	17	15	12	10						12	14	23	23	24	20	19	10	10	
MED	45	52	48	40	42	37	49	60	68						76	76	74	73	72	70	62	59	58	
U Q	69	59	58	52	47	47	57	65	72						77	80	78	83	78	80	70	68	63	
L Q	37	46	37	30	34	30	46	55	61						70	72	68	66	62	60	59	58	49	

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

JUN. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	76	70	32	34	33	24	35	44	52	91	95	117	111		G	42	29	44	45	58	48	53	85	34
2	33	34	26	27	24	33	31	39	40	55	31	40	79	G	G	34	30	24	G	26	23	28	32	43
3	32	32	29	25	G	G	30	30	30	30	31	60	G	G	52	53	30	39	44	32	41	41	58	33
4	40	33	33	56	54	42	33	40	60	43	56	62	77	84	56	55	60	81	82	102	70	40	32	69
5	48	34	34	29	31	78		44	54	104	98	66	40	160	61	32	32	42	57	48	39	40	44	40
6	43	35	29	30	28	33	32	41	51	60	61	91	65	93	70	90	115	161	27	76	32	32	70	34
7	30	32	27	24	G	50	143	44	79	104	61	53		57	66	116	70	56	32	30	91	52	54	32
8	32	34	69	78	59	40	33	45		110	62	42	55	G	G	G	28	29	30	37	30	45	34	33
9	52	G	G	G	G	23	30	42	68	92	116	85	149	112	116	85	68	72	92	51	40	43	83	79
10	58	69	33	53	40	30	61	35	60	68	54		G	G	97	166	30	29	35	49	69	93	40	41
11	54	82	78	59	31	24	33	66	91	94	71	135	107	86	66	G	29	28	23	55	82	87	40	106
12	60	61	86	41	40	30	60	85	79	112		170		G	53	80	64	54	56	34	31	27	28	33
13	33	69	80	37	37	G	40	44	69	66	84	92	86	93	84	59	29	28	27	32	31	38	84	50
14	78	34	79	60	28	23	29	61	32	61	84	122	127	114	144	82	116	79	86	54	33	33	36	40
15	32	94	34	28	28	G	33	40	54	42	31	64	76	96	58	71	64	62	34	71	40	33	30	G
16	46	38	33		58	32	24	32	33	37	80	126	83	60	30	31	57	61	45	43	46	32	30	38
17	48	32	54	84	23	32	92	52	90	76	84	32	96	128	142	84	64	56	56	59	60	133	36	32
18	33	79	101	126	59	38	59	95	66	28			61	84	42	31	29	26	33	G	51	40	38	37
19	77	40	33	32	32	26	48	49	53	28	30	176	58	118		57	74	74	70	34	34	34	33	40
20	92	34	73	82	34	51	44	33	60	40			G		54	33	36	25	40	38	40	33	28	G
21	24	G	32	32	31	32	32	40	40	32	29				56	71	150	82	114	62		70	31	56
22	33	38	26	G	29	G	32	28	30	30	54	106		76	114	139	32	30	31	40	31	56	58	38
23	31	29	33	25	G	G	24	40	59	39	58		53	G	54	31	29	26	31	33	93	82	94	40
24	58	58	72	60	32	92	58	72	85	118	94	62		66	70	72	32	38	44	106	56	34	38	38
25	116	31	41	G	32	44	32	41	59	58	56	76	G	56	52	52	34	36	39	70	40	79	80	59
26	40	48	44	40	31	G	32	40	58	108	94	134	58	G	79	58	81	71	58	36	36	32	27	34
27	32	32	40	39	38	29	32	41	42	73	56		92	30	89	39	34	40	93	60	70	58	40	47
28	34	33	28	32	G	32	69		93	126	77	77	60	73	33	58	37	33	33	33	32	57	27	30
29	38	40	33	58	26	27	60	95		31	62	28		G	G	G	70	58	28	23	G	34	38	32
30	45	70		34	32	41	41	31	30	64	54	123		170	G	62	115	120	34	40	36	32	G	34
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	29	30	30	29	29	28	30	27	24	23	27	29	30	30	30	30	30	29	30	30	30
MED	42	34	33	34	31	31	33	41	58	62	61	81	65	73	56	58	36	43	40	42	40	40	38	38
U Q	58	61	70	58	37	40	58	50	68	94	84	122	92	96	81	80	70	71	57	59	58	57	58	43
L Q	33	32	30	27	26	23	32	39	41	39	54	61	53	G	37	33	30	29	31	33	32	33	31	33

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

JUN. 1994

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

HD \ 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	15	15	15	15	15	14	16	36	37	37	34		48	34	17	15	16	15	14	15	15	15
2	15	15	15	15	15	14	14	15	16	17	23		38		48	21	16	15	23	15	14	15	15	15
3	15	15	15	15	14	14	15	15	16	22		40	50	49	24	24	18	15	15	15	14	14	14	14
4	14	14	14	15	15	14	15	14	16	17	36	43	42	45		38	16	16	14	14	14	14	14	15
5	14	15	14	15	14	15		15	20	20	20	38		33	24	26	16	14	14	15	14	14	15	14
6	14	14	14	14	14	14	15	22	18	18	38	37	36	45	38	23	21	16	16	15	15	15	15	15
7	14	15	14	15	15	14	14	15	15	20	23			42	39	34	18	16	16	14	14	15	15	21
8	15	14	15	14	15	15	15	15		28	42	35	41			50	47	16	15	15	15	15	15	14
9	14	16	15	14	14	14	15	15	16	18	42	35	48	38	41	23	18	16	15	14	15	14	15	14
10	15	15	14	14	15	14	15	15	15	23			53	50	39	21	20	15	15	16	14	14	15	15
11	15	14	15	14	14	15	15	14	15	20	20	24	35	44	45		15	15	18	15	14	15	15	15
12	15	14	15	15	15	14	15	14	18	17		41		71	71	26	17	16	20	15	14	15	15	15
13	15	15	14	14	14	15	15	14	15	21	21	42	44	47	44	23	16	14	14	15	14	15	14	14
14	15	14	14	15	15	15	14	15	15	20	23	40	48	43	45	38	21	16	15	15	14	15	14	14
15	14	14	15	14	15	15	14	15	16	18	21	43	44	41	44	23	17	16	15	15	15	14	14	14
16	14	14	14		15	15	16	15	16	20	38	38	43	43	52	50	20	15	14	15	16	14	15	14
17	16	14	14	15	14	15	14	14	16	22	24		44	42	48	23	21	15	18	14	15	15	14	15
18	15	14	15	14	15	14	16	15	17				34	44	47		16	15	15	15	14	15	66	15
19	15	15	14	15	15	16	15	15	16	15		47	41	44		41	17	16	16	15	14	14	14	15
20	14	14	14	15	15	14	15	15	15	17					36	21	16	15	18	14	14	14	14	14
21	15	15	14	14	14	14	14	15	15	15					44	42	16	16	15	14		14	14	15
22	14	15	15	14	14	14	15	15	15	22	35	35		44	41	45	21	15	15	14	15	15	15	14
23	15	15	14	15	15	14	15	15	17	20	36		71	71	39	52	20	15	17	14	14	14	15	14
24	14	14	14	15	15	15	14	15	20	17	23	44		34	38	42	17	17	15	15	14	15	14	15
25	15	15	15	14	14	15	14	15	16	22	23	36	71	43	26	22	16	15	17	20	15	15	14	14
26	15	14	14	14	15	16	15	15	15	17	26	23	36	64	40	18	18	14	15	14	14	14	15	15
27	15	15	14	15	14	14	14	14	16	18	38		35	66	46	18	23	14	16	15	15	14	14	14
28	15	15	14	15	14	15	14		15	16	20	28	27	26	24	22	15	14	14	14	15	14	15	15
29	15	15	14	14	15	14	14	14		15	18	18		49	52	46	17	14	15	15	14	14	15	15
30	15	14		14	14	14	14	14	15	15	18	23		44		17	16	16	15	15	14	14	16	15
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	29	30	30	29	29	28	29	23	21	21	25	26	28	30	30	30	30	29	30	30	30
MED	15	14	14	15	15	14	15	15	16	18	23	37	42	44	42	25	17	15	15	15	14	14	15	15
U Q	15	15	15	15	15	15	15	15	16	21	37	41	48	49	47	41	20	16	16	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	15	17	21	31	35	42	38	22	16	15	15	14	14	14	14	14

HOURLY VALUES OF foF2 AT OKINAWA

JUN. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A	A	A	A	A	57	A	A	A	A	82	93	88	104	119	116	80	A	A	A	59
2	A	A		39	41	37	41	57	A	A	A	59	62	64	72	100	72	71	74	74	67	70	58	57
3	43	57	58		39	43	43	74	58	55	61	64	77	71	78	84	86	94	93	115	82	A	A	A
4	46	38	A	A	A	A																		
5																								
6												A	A	A	91	A	A	78	96	82	78	62	58	48
7	59	52	57	43	48	A	A	A	A	A	A	A	56	62	74	A	91		94	93	71	70	44	A
8	46		46	A	A	69	41	59	64	A	A	A	A	83	85	95		93	73	57	A	50	52	53
9	59	55	55	A	89	34	48	69	64	58	A	A	A	74	72	68	75	84	81	94	82	77	60	58
10			52	53	50	37	A	A	A	A	A	68	77	78	87	91	96	96	96	89	69	A	A	60
11	60	70		51	47	48		A	82	A		A	A	70	85	94	82	83	72	59	69	A	A	A
12	A	A	56	A	34	A	A	59	A	A	A	A	A	63	A	87	A	A	92	67	63	60	44	44
13	A		A	41	A	41	A	64	A	A	A	A	A	74	A	A	93	94	96	83	66	70	58	
14	A	60	A	50	A	36	53	69	70	58	A	57	A	65	A	83	A	A	A	81		A	A	52
15	A	A	A	39	44	57	57	63	80	A	A	A	A	80	92	A	114	105	92	67	A	A	A	60
16	48		60		43	44	50	64	58	A	A	A	64	77	82	81	76	82	83	A	A	A	54	55
17	A	58	57	A	33	A	A	A	A	A	A	A	A	82	92	104	92	104	94	81	63	60	A	60
18	60	54	60	56	A	89	43	75	A	A	A	A	A	A	64	A	A	A	69	A	A	54	55	A
19	A	42	A	41	42	A	47	42	A	69	A	A	A	A	A	49	61	A	63	49	A	44	A	A
20	54	A	A	46	44			28	75	56	54	A	A	A	A	A	A	59	59	57	41	A	A	46
21		37	44		31	A	46	29	27	56	67	58	A	A	A	68	66	A		68	62		A	49
22	37	A	A	A		59	45	45	57	A		64		71	76	82	84	104	92	80	A	A	A	A
23	A	A	47	46	36	29	46	58	94	A	59	58	58	70	73	73	80	87	89	89	A	A	A	A
24	42	40	44		59		46	28	27	A		68	A	A		63	70	71	72	81	76	60	55	59
25	60	A	37		59	A	A	62	59	58	A	72	84	97	88	105	113	114	114	96	89	90	A	58
26	55	54	44	41	35	38	40	A	A	A	A	A	73	A	82	A	A	87	87	86	44	A	A	A
27	41	48		40	37	38		52	A	A	A	A	A	A	70	A	72	56	63	A	80	A	49	47
28	38	A	46	A	A	A	38	A	70	A	A	A	58	72	69	82	92	83	82	81	68	56	A	A
29	52	56	59	41	37	38	41	41	28	A	A	A	A	65	81	69	74	93	84	115	56	44		A
30	A	A	A	A		40	A	46	75	57	71	A	A	60		61	62	74	73	82	70	A	47	43
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	14	16	14	19	17	16	20	17					20	20	20	21	22	26	25	19	14	12	17
MED	50	54	54	42	42	40	46	58	64					72	82	82	82	87	86	81	69	60	54	55
U Q	59	57	57	50	48	52	47	64	75					79	87	92	92	96	94	89	78	70	58	59
L Q	42	42	45	41	36	37	41	43	57					65	72	68	72	78	73	67	63	54	48	47

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

JUN. 1994

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	27	52	65	38	80	80	45	72	46	125	153	67	82	G	G	45	30	33	62	79	93	84	34	68
2	49	58		G	G	G	G	30	50	82	59	58	87	76	97	70	111	68	46	34	G	24	39	44
3	26	36	30		G	G	42	36	120	49	45	G	38	58	50	48	58	58	62	31	48	48	40	37
4	42	34	37	49	69	43																		
5																								
6												79	69	86	70	96	87	68	67	44	64	37	41	G
7	G	33	G	G	G	30	61	51	84	57	39	50	43	56	57	133	34		G	G	G	G	G	39
8	41		32	42	29	67	41	50	64	67	74	92	82	42	56	57	62	51	54	60	79	35	34	24
9	48	50	41	41	40	G	64	38	34	59	123	85	139	87	46	48	50	65	62	57	59	34	33	25
10			58	80	50	48	94	133	179	148	95	60	185	67	65	74	44	53	48	45	44	69	46	51
11	34	64		56	44	50		68	52	72		84	67	61	59	G	55	27	G	34	34	72	68	72
12	98	67	40	49	34	34	34	42	73	96	93	86	89	74	77	90	102	87	47	41	58	36	28	28
13	40		70	49	48	42	38	46	78	69	130	113	124	80	81	150	70	48	57	99	89	43	34	
14	66	79	66	66	46	38	35	36	40	42	53	58	35	35	118	126	85	112	94	94		67	71	50
15	66	58	66	36	42	32	35	54	56	71	62	89	66	76	85	94	120	73	84	49	78	60	51	42
16	34		72		G	50	42	64	58	56	44	67	48	52	61	52	53	50	50	66	69	34	G	26
17	75	76	32	68	87	67	62	96	68	68	90	87	74	68	42	64	72	59	44	23	61	45	89	102
18	96	78	72	42	61	23	40	80	55	75	39	43	50	48	47	60	76	66	46	60	29	36	68	46
19	40	43	56	44	33	61	40	44	45	48	66	58	58	60	47	42	66	95	100	44	62	39	70	44
20	41	49	59	25	26			38	35	42	54	39	55	42	73	36	64	56	39	42	41	28	44	41
21		34	42		32	41	28	36	43	52	40	36	34	42	48	52	60	65		80	90		67	117
22	50	47	62	48		G	47	31	38	148		88	176	58	44	34	35	43	42	48	42	84	48	60
23	52	41	36	25	G	G	48	36	41	43	45	52	50	51	40	49	35	38	36	41	36	33	31	30
24	31	G	G	G	25	G	32	32	34	39	G	68	50	48		39	49	40	39	35	28	48	59	48
25	83	46	60		32	41	57	62	46	51	71	36	50	50	59	80	69	68	86	102	86	59	65	30
26	42	40	43	G	G	G	42	67	66	92	90	176	73	78	93	100	118	73	44	40	49	36	30	25
27	56	48		42	44	48		41	86	180	111	100	182	72	32	88	51	49	41	95	69	59	48	35
28	67	45	34	49	42	51	86	50	70	177	84	78	50	65	43	46	33	38	33	27	24	24	35	42
29	33	G	30	28	45	G	27	34	50	58	41	30	38	45	G	49	38	39	31	G	G	G	G	43
30	48	49	60	61	45	47	40	31	47	47	67	96	50	35	G	50	44	32	36	46	24	42	42	42
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	24	25	24	27	27	24	27	27	27	25	28	28	28	27	28	28	27	27	28	27	27	28	27
MED	45	48	43	42	40	41	42	44	52	67	66	68	62	58	56	54	59	56	46	44	49	39	42	42
U Q	66	58	63	49	46	50	52	64	70	92	91	87	84	73	73	89	74	68	62	63	69	59	62	50
L Q	34	38	33	26	25	G	35	36	43	49	44	51	50	46	43	47	44	40	39	34	29	34	33	30

HOURLY VALUES OF fmin AT OKINAWA

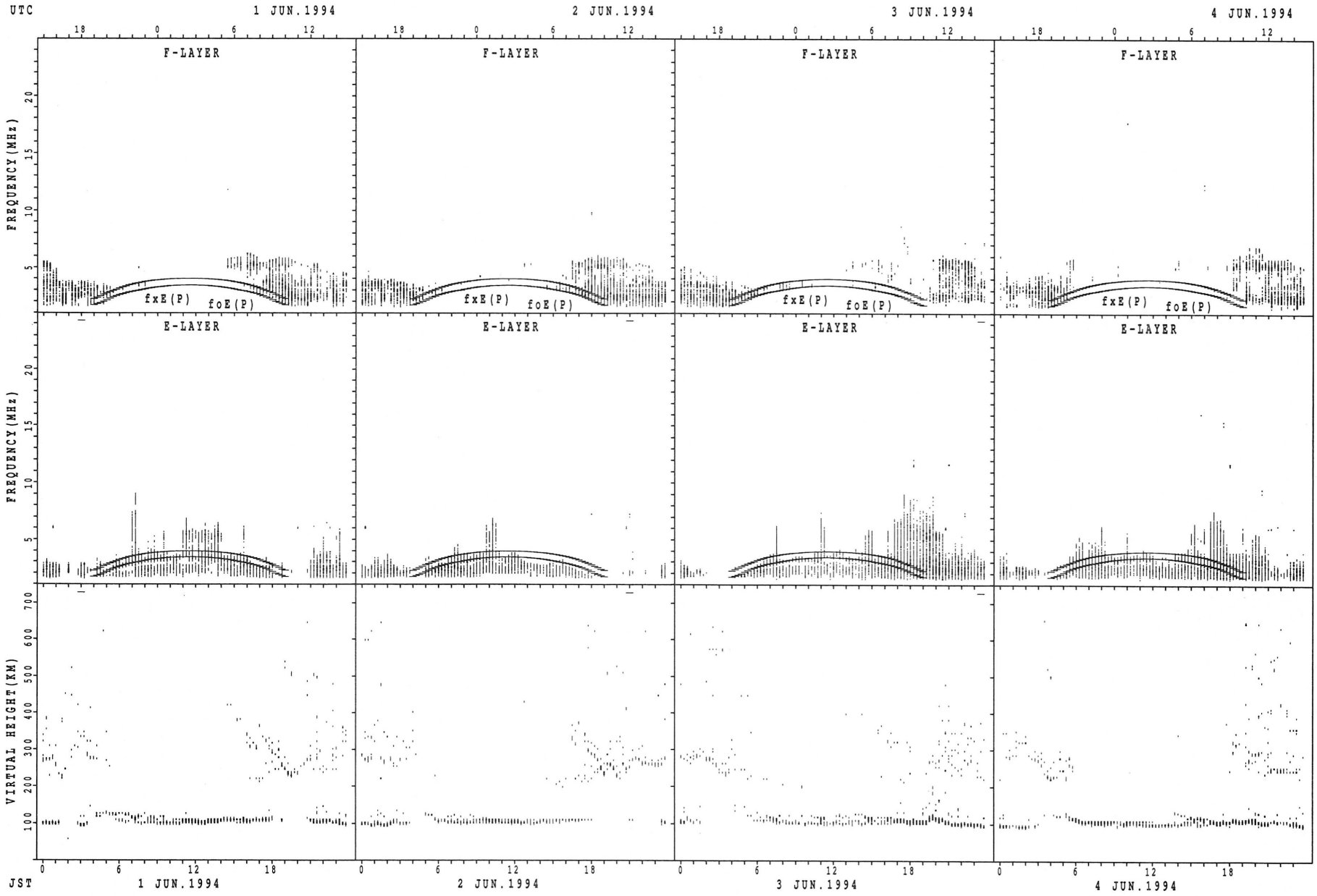
JUN. 1994

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

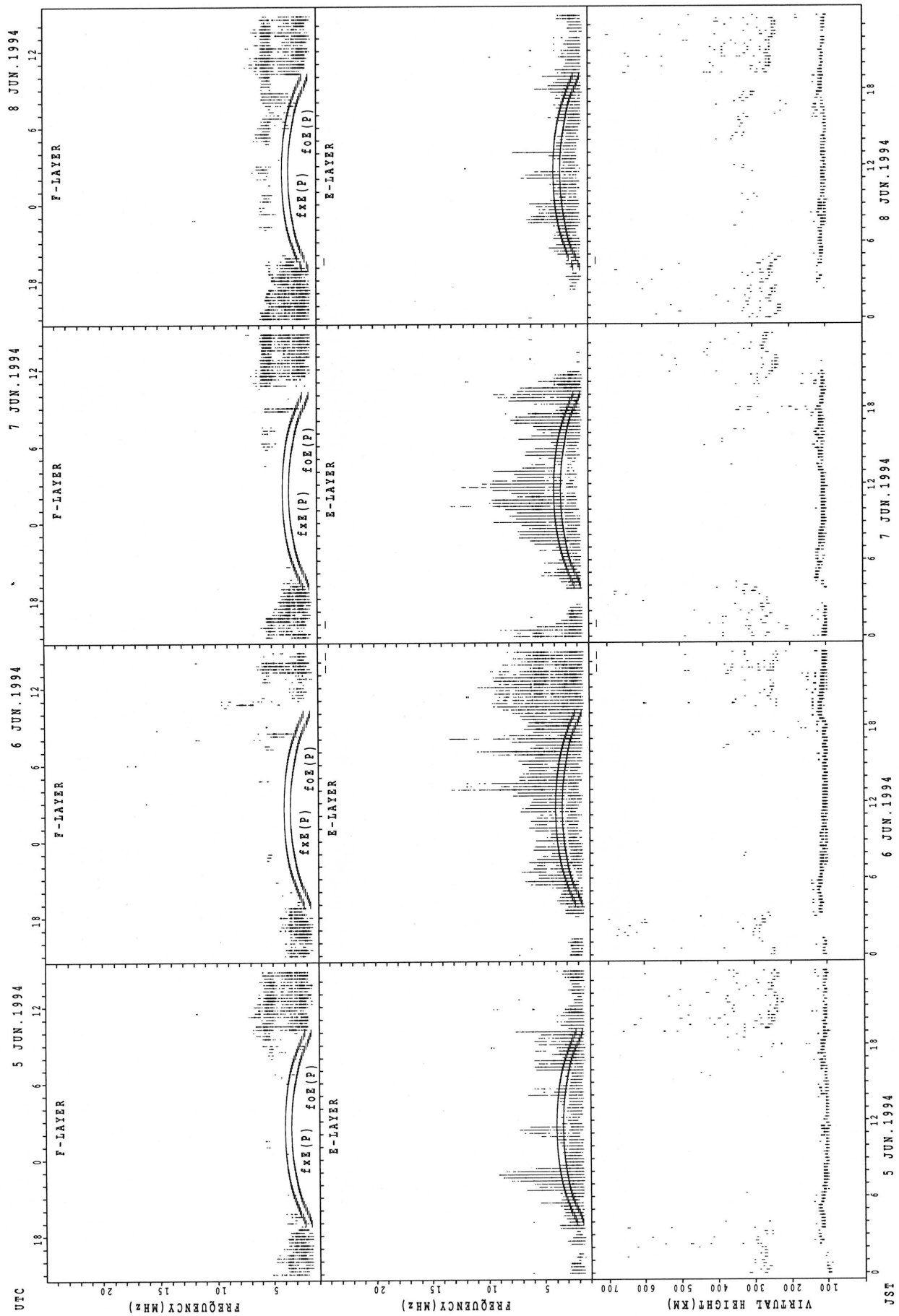
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	14	14	14	15	17	32	34	34	49	50	22	16	14	17	14	14	14	14	14
2	14	14		14	14	15	17	15	16	17	29	30	29	28	21	20	16	14	15	14	15	15	14	14
3	14	15	14		14	14	14	14	16	17	17	44	29	26	26	17	16	15	16	14	14	14	14	14
4	15	14	15	14	14	14																		
5																								
6												28	33	32	33	30	26	17	17	14	14	14	14	14
7	14	14	14	15	15	14	14	14	15	18	22	28	35	26	30	24	17		33	20	14	15	14	15
8	14		14	14	14	14	14	14	15	17	22	32	29	28	27	24	16	15	15	15	15	14	14	14
9	14	14	15	14	15	15	14	15	15	16	18	32	30	29	28	27	18	16	15	14	14	15	14	14
10			14	14	14	14	14	15	15	16	28	29	29	33	34	26	17	15	18	14	15	14	15	15
11	14	15		14	14	15		14	15	17		29	28	41	38	52	17	15	29	15	14	14	14	15
12	14	14	14	14	14	14	14	14	15	16	18	26	29	29	28	27	20	15	15	14	14	14	14	14
13	14		15	14	14	14	14	14	15	16	26	35	32	38	28	21	17	14	15	15	14	14	15	
14	15	14	14	14	14	14	14	15	16	21	33	26			32	27	17	16	17	14		14	14	14
15	14	14	14	14	14	14	14	14	15	20	26	32	32	28	29	29	16	15	14	14	14	15	14	14
16	15		14		14	14	14	14	15	20	22	29	29	32	35	26	17	15	17	14	14	15	15	14
17	14	14	15	15	14	15	14	14	15	18	20	28	29	36	27	26	18	14	14	15	14	15	14	14
18	14	15	14	14	14	16	14	14	16	20	16	29	29	29	23	18	16	14	15	14	14	15	14	14
19	15	14	14	14	14	14	14	14	15	17	20	37	38	38	34	29	17	15	16	14	14	14	14	14
20	14	14	14	15	14			14	15	18	32		34	32	28	18	16	15	14	14	14	14	14	15
21		14	14		14	14	14	14	14	17	18	22	26	27	26	21	16	15		14	14		14	14
22	14	14	14	14		14	14	14	15	17		29	47	29	50	47	18	16	26	15	15	14	14	14
23	14	14	14	14	15	15	14	14	15	16	26	27	29	28	30	21	24	15	15	14	15	14	15	14
24	15	15	14	16	15	14	17	14	15	17	20	48	30	30		26	16	16	21	16	14	14	14	15
25	14	14	14		14	14	14	14	15	16	17	22	27	29	27	22	16	15	16	14	14	14	14	14
26	14	14	14	14	14	16	15	14	15	16	21	29	32	30	27	27	18	15	16	15	15	15	15	14
27	14	14		14	14	15		14	15	16	17	22	32	28	53	32	30	15	27	15	14	14	14	14
28	14	14	14	14	14	14	14	14	15	17	16	27	27	27	27	18	16	14	15	14	14	14	14	14
29	15	15	14	14	14	14	14	14	14	15	16	16	15	50	49	24	48	15	39	17	15	18	15	14
30	15	14	14	14	15	14	14	14	16	16	27	22	40	48		32	28	16	15	15	14	14	14	14
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	24	25	24	27	27	24	27	27	27	25	27	27	27	26	28	28	27	27	28	27	27	28	27
MED	14	14	14	14	14	14	14	14	15	17	21	29	29	29	28	26	17	15	16	14	14	14	14	14
U Q	15	14	14	14	14	15	14	14	15	18	26	32	33	36	34	28	18	15	18	15	15	15	14	14
L Q	14	14	14	14	14	14	14	14	15	16	17	26	29	28	27	21	16	15	15	14	14	14	14	14

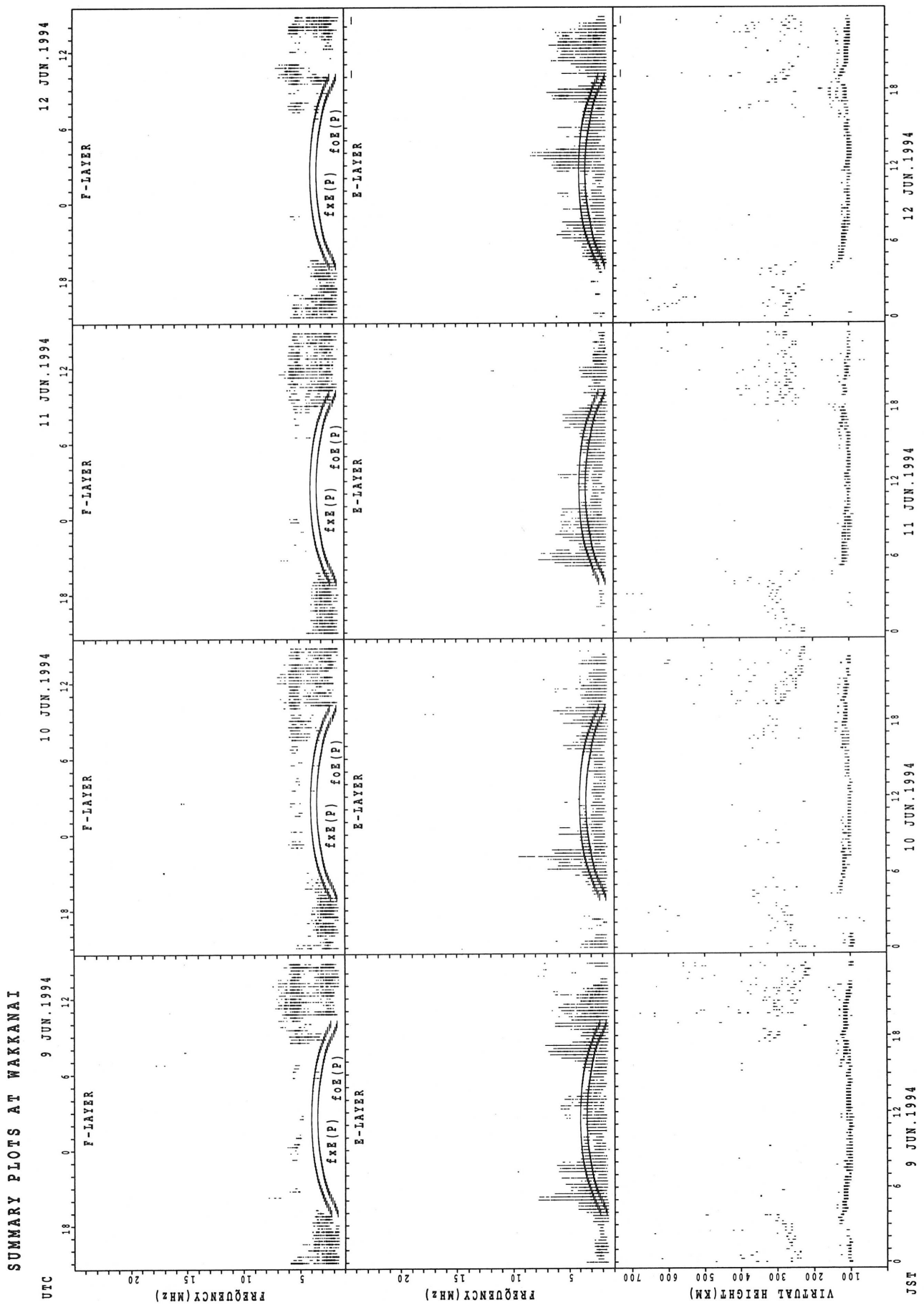
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

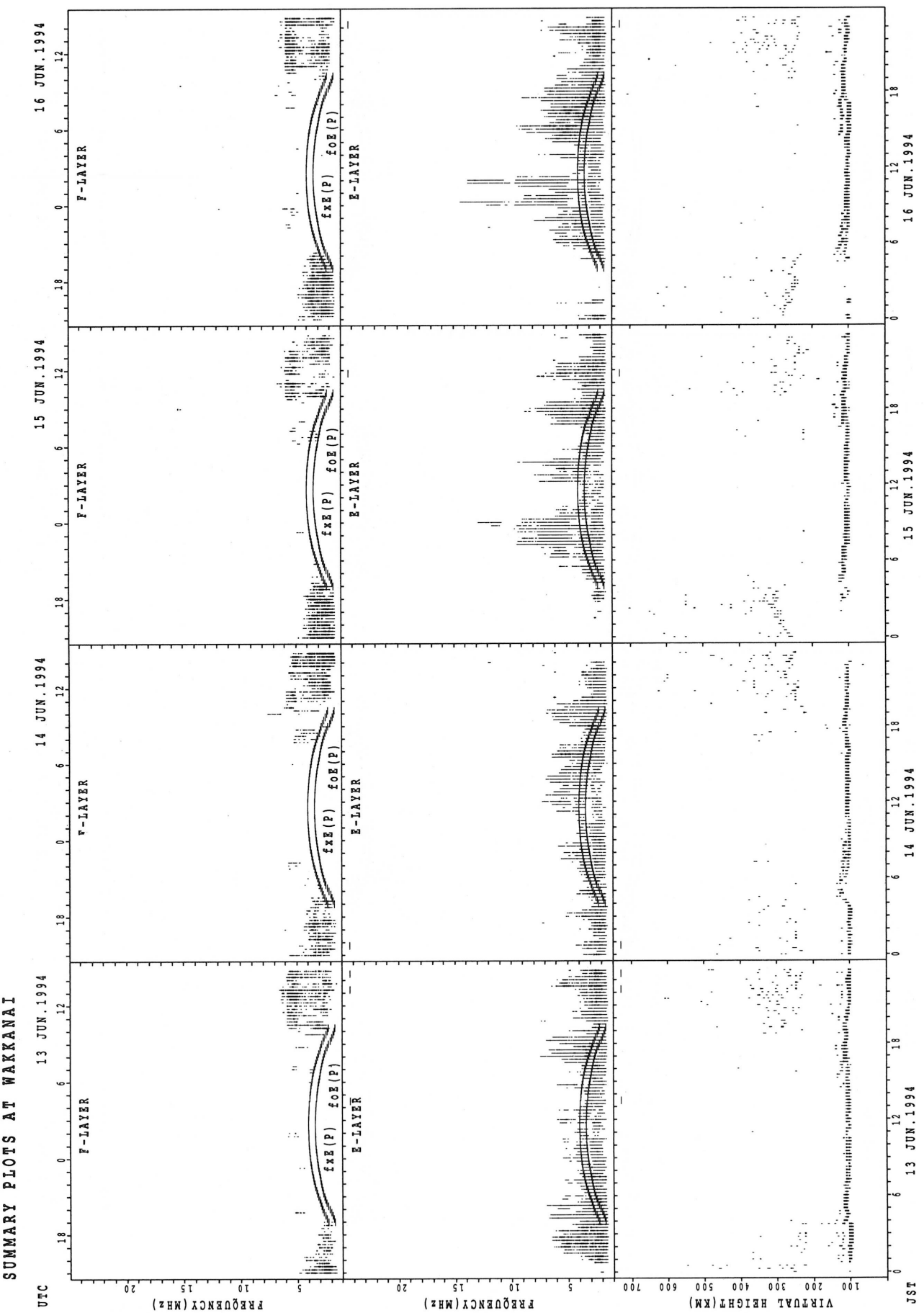
SUMMARY PLOTS AT WAKKANAI



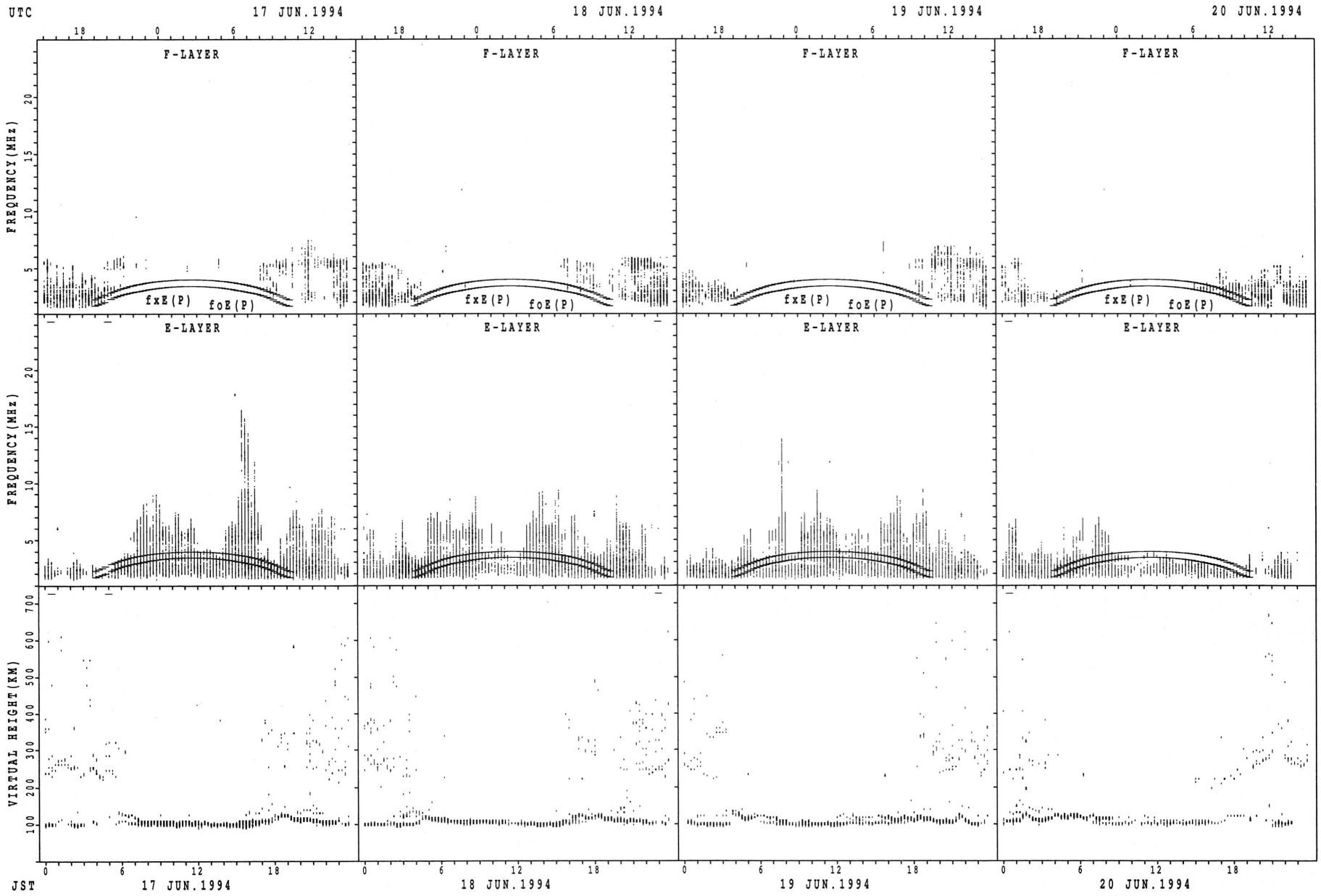
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

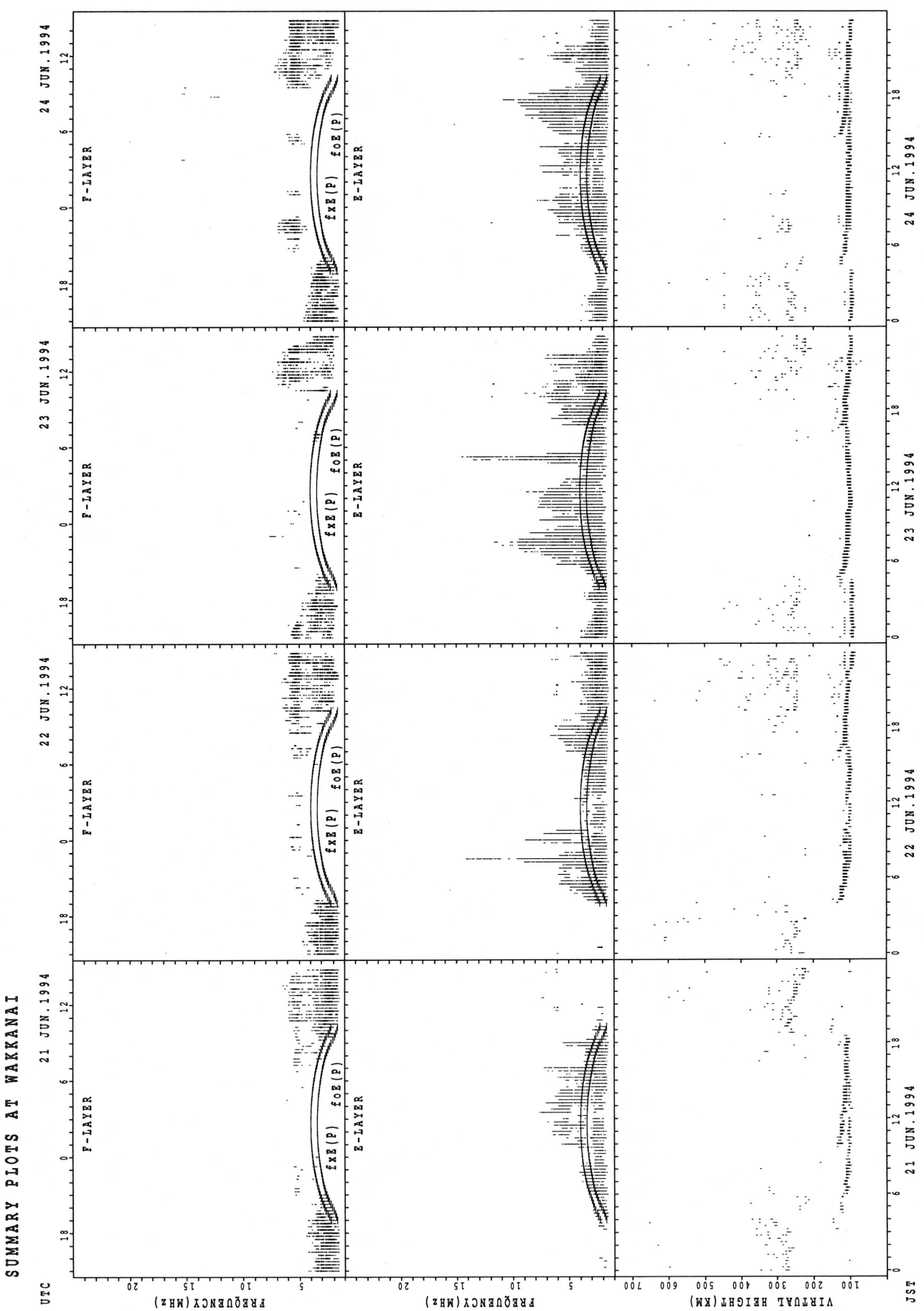

SUMMARY PLOTS AT WAKKANAI
UTC
JST
9 JUN.1994
10 JUN.1994
11 JUN.1994
12 JUN.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

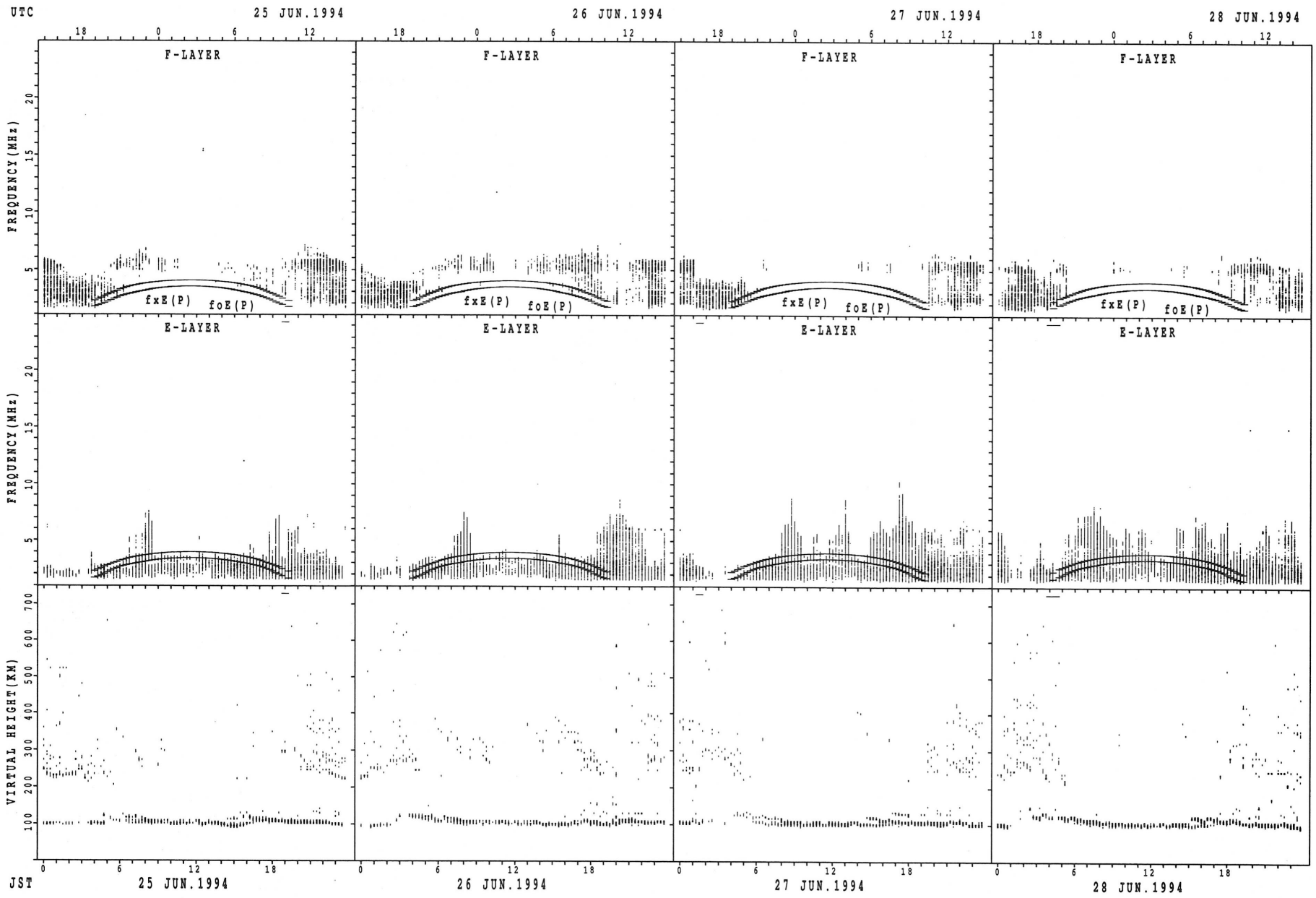
SUMMARY PLOTS AT WAKKANAI



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

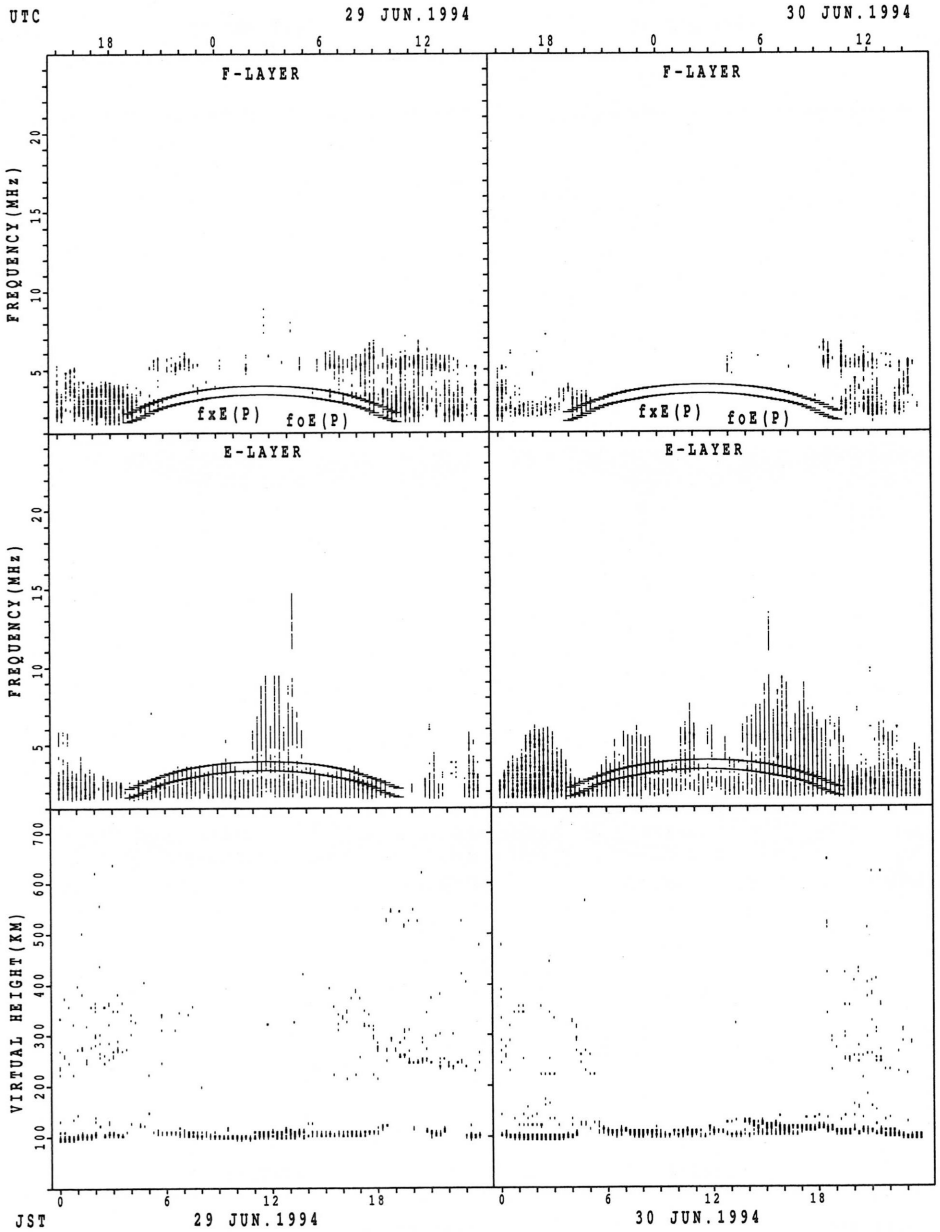

SUMMARY PLOTS AT WAKKANAI
UTC
JST
21 JUN.1994
22 JUN.1994
23 JUN.1994
24 JUN.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



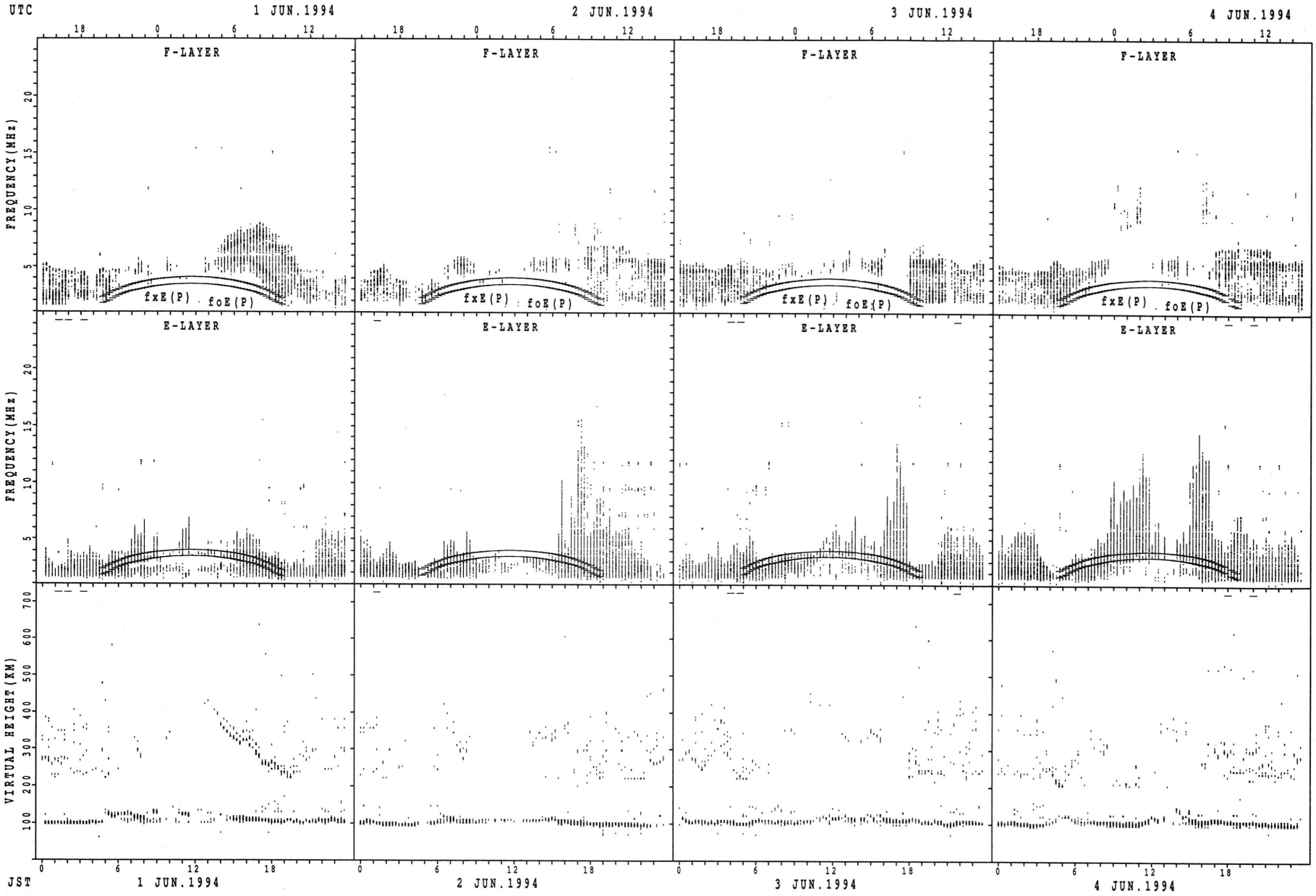
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI

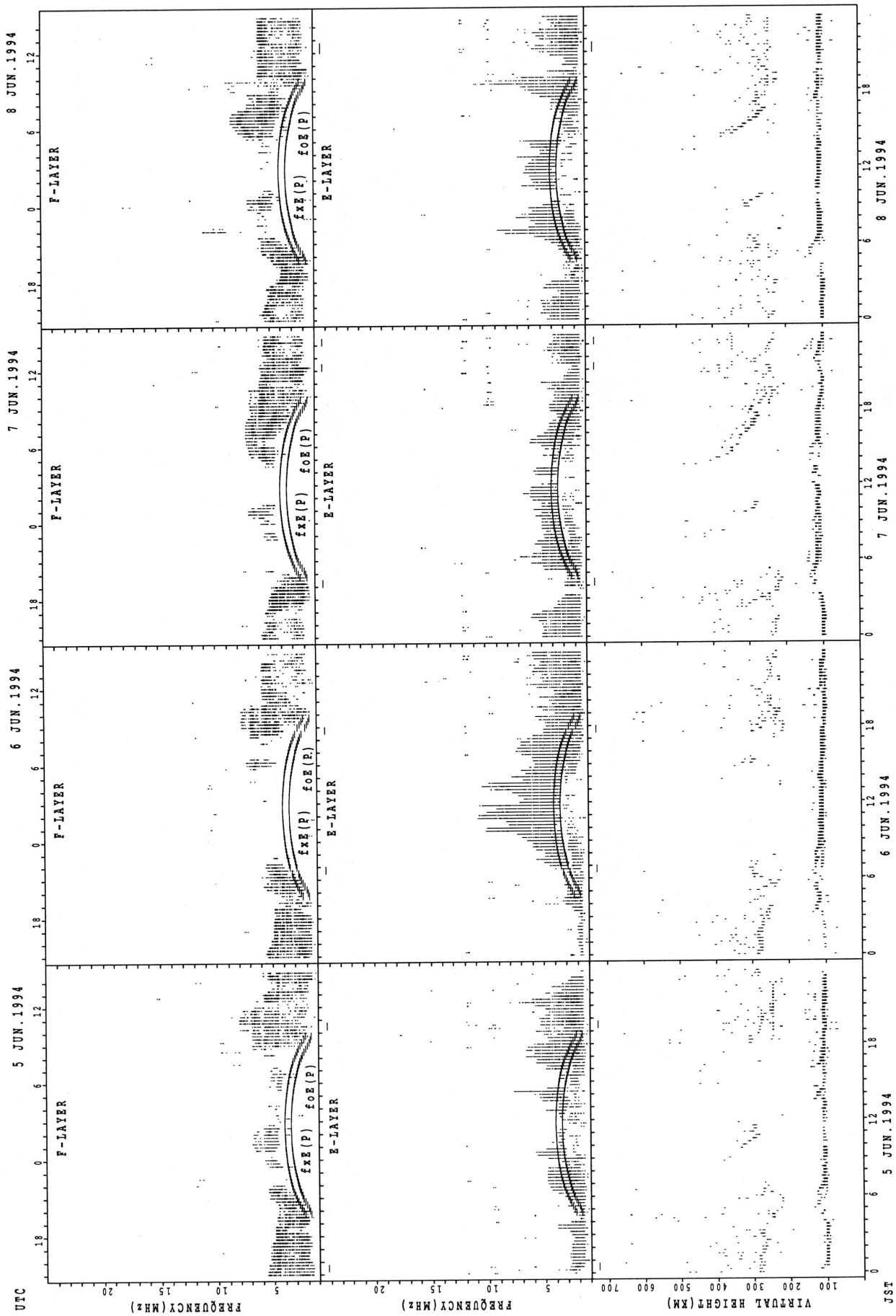


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

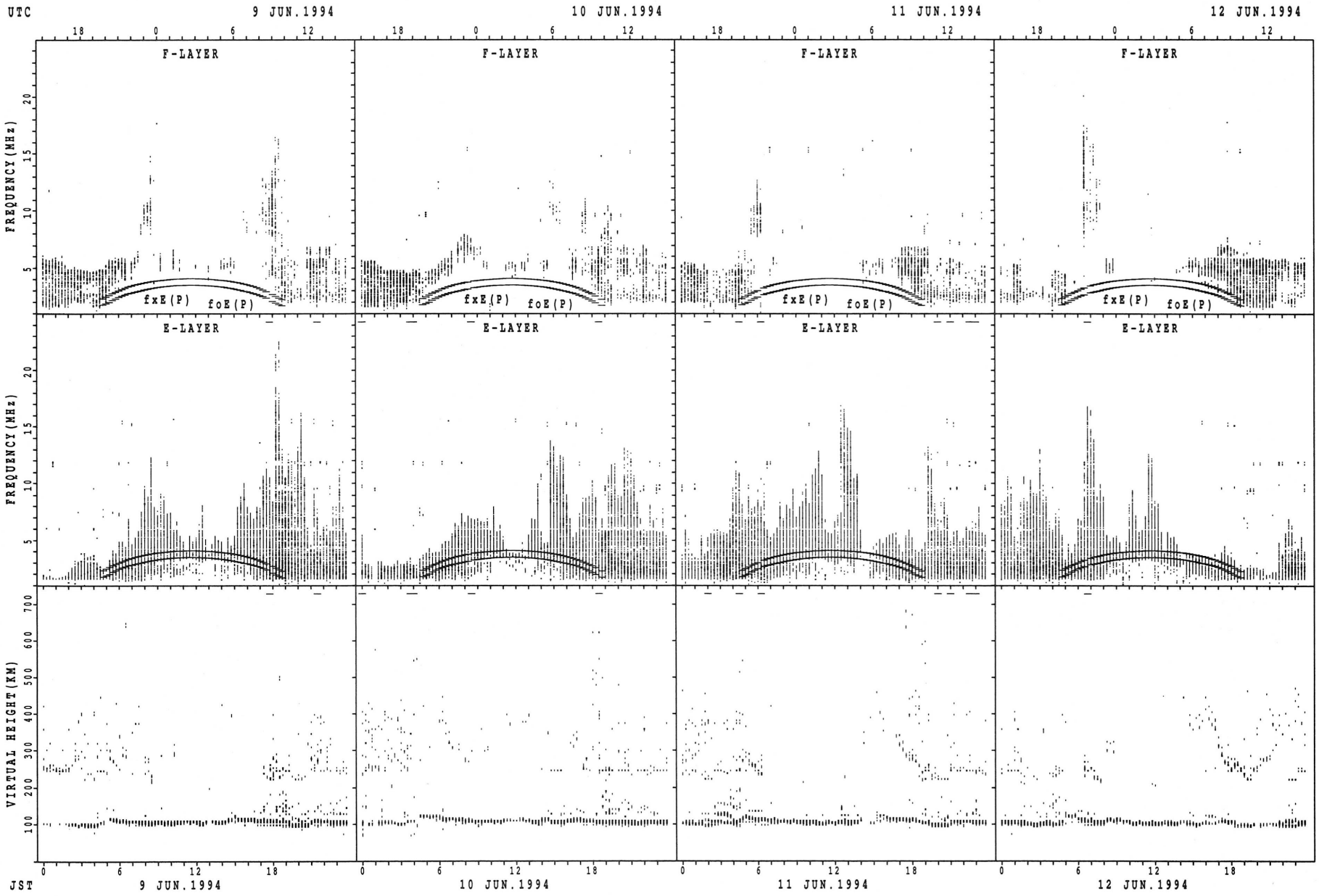
SUMMARY PLOTS AT KOKUBUNJI TOKYO



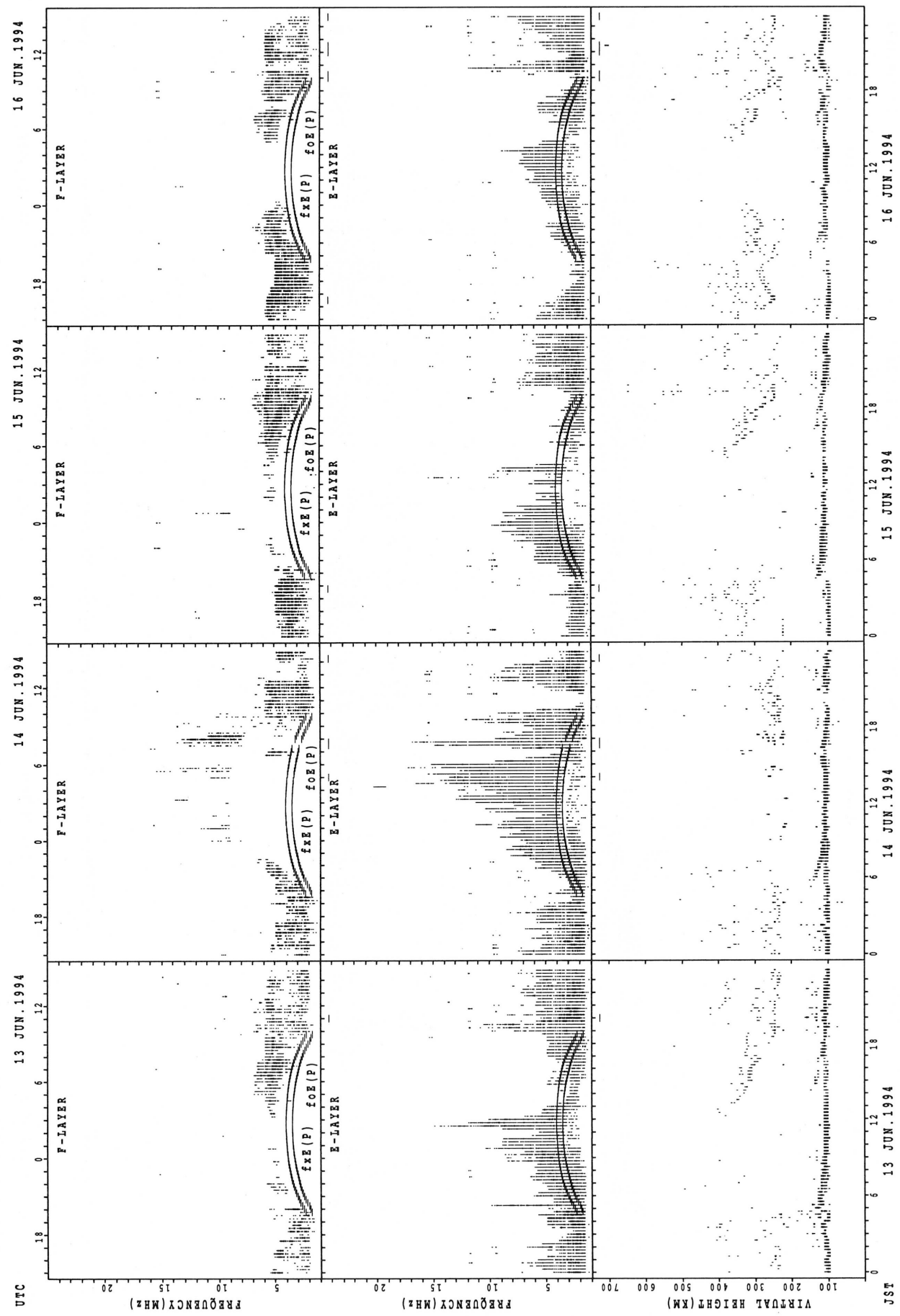
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

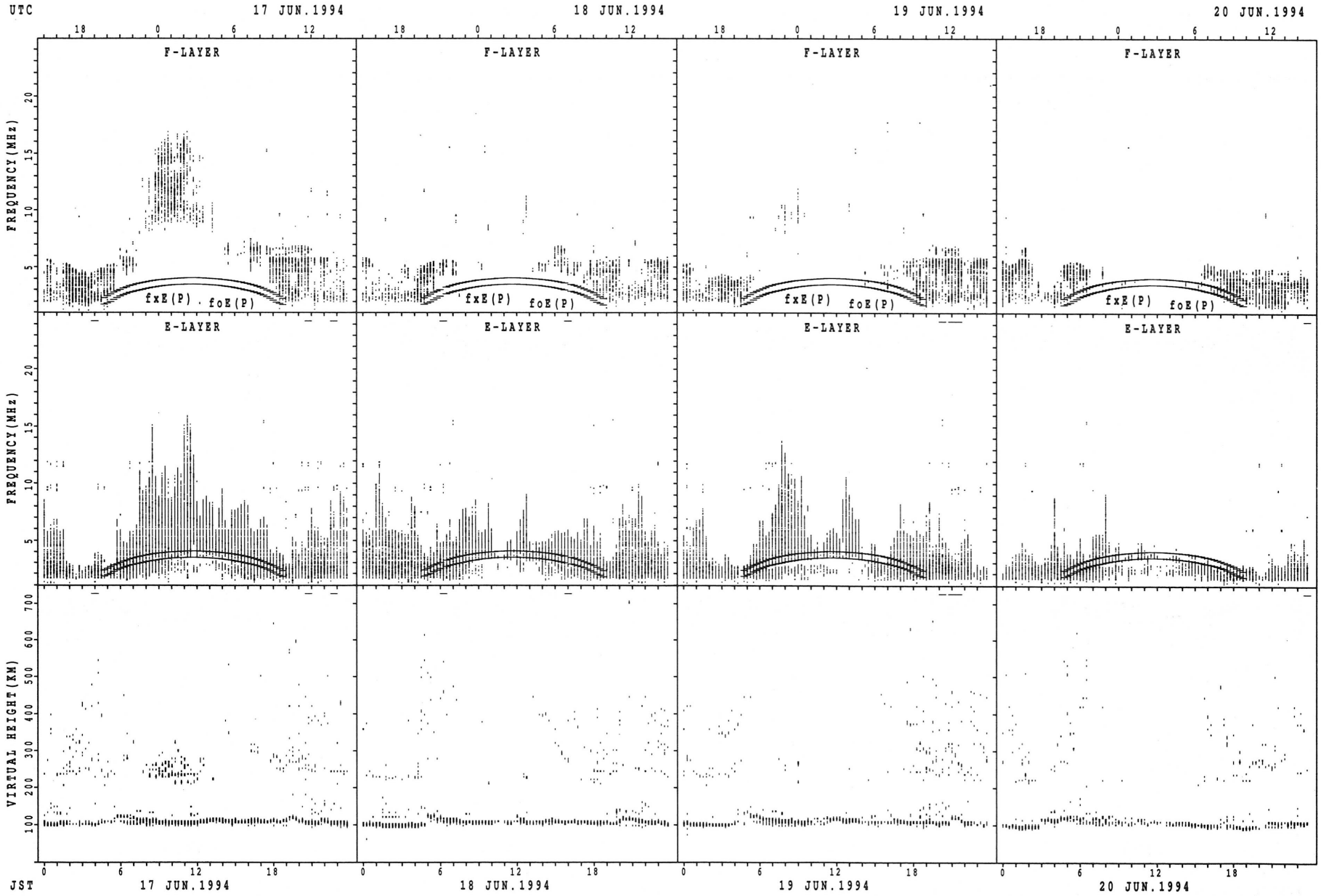
SUMMARY PLOTS AT KOKUBUNJI TOKYO



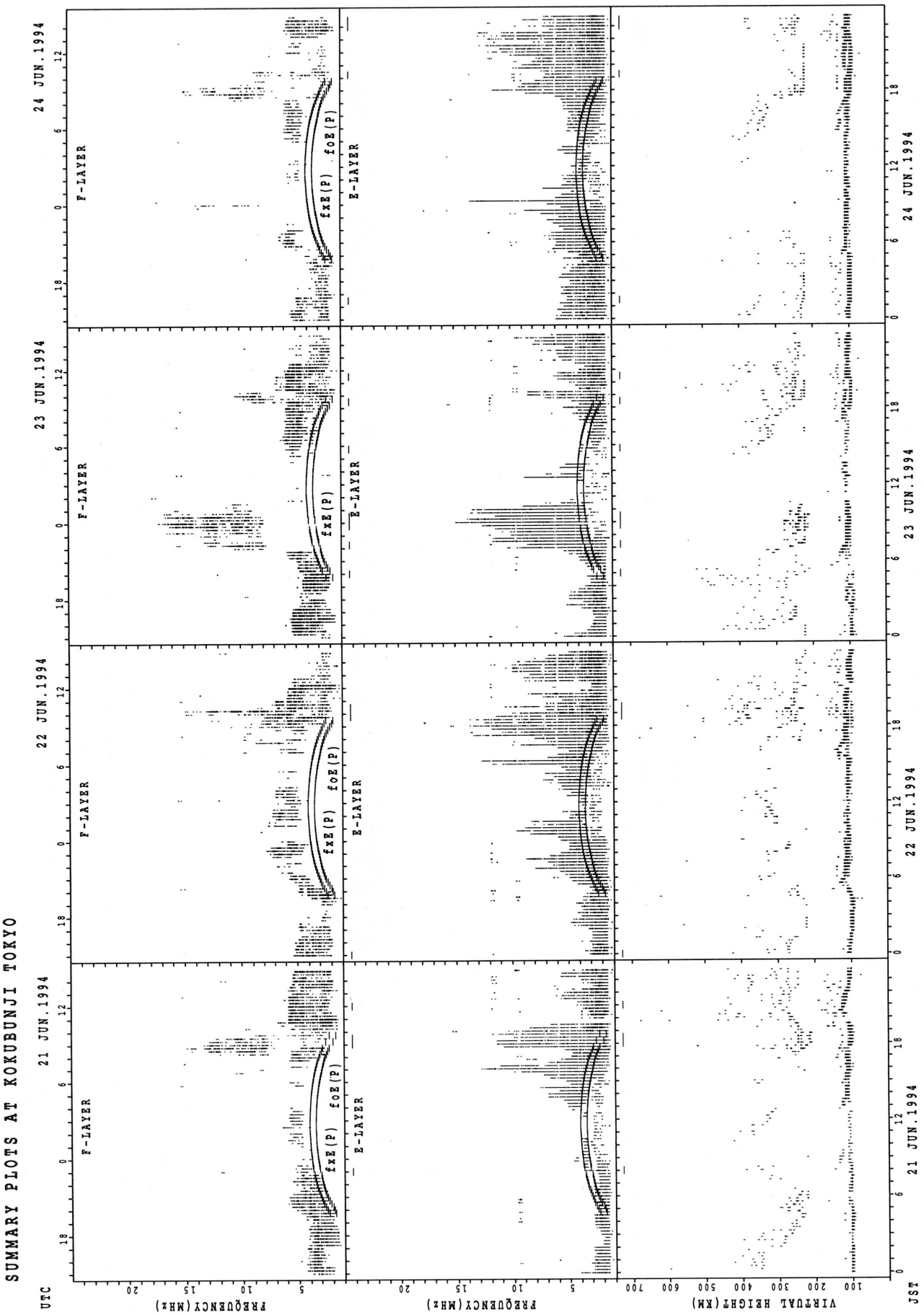
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

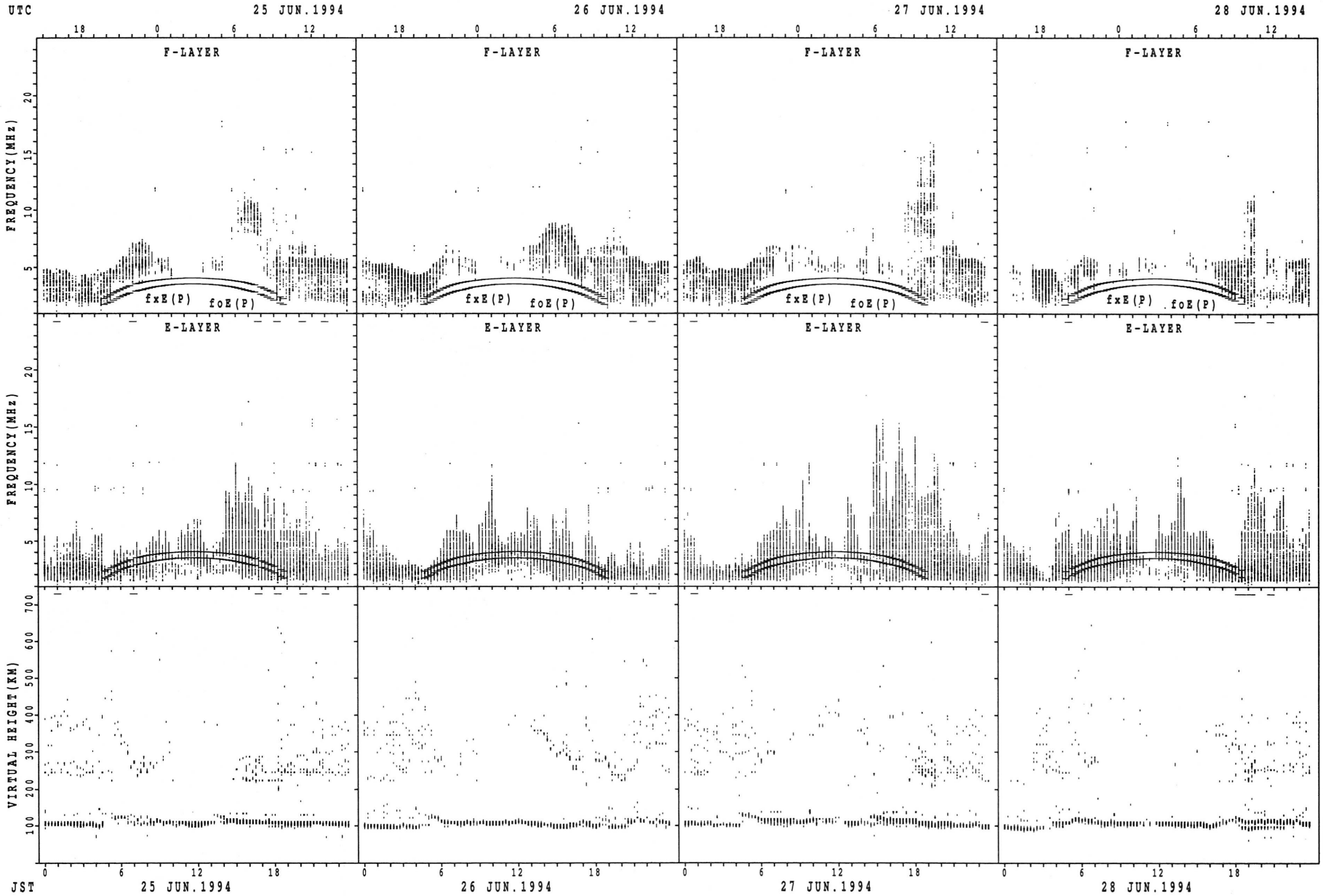
SUMMARY PLOTS AT KOKUBUNJI TOKYO



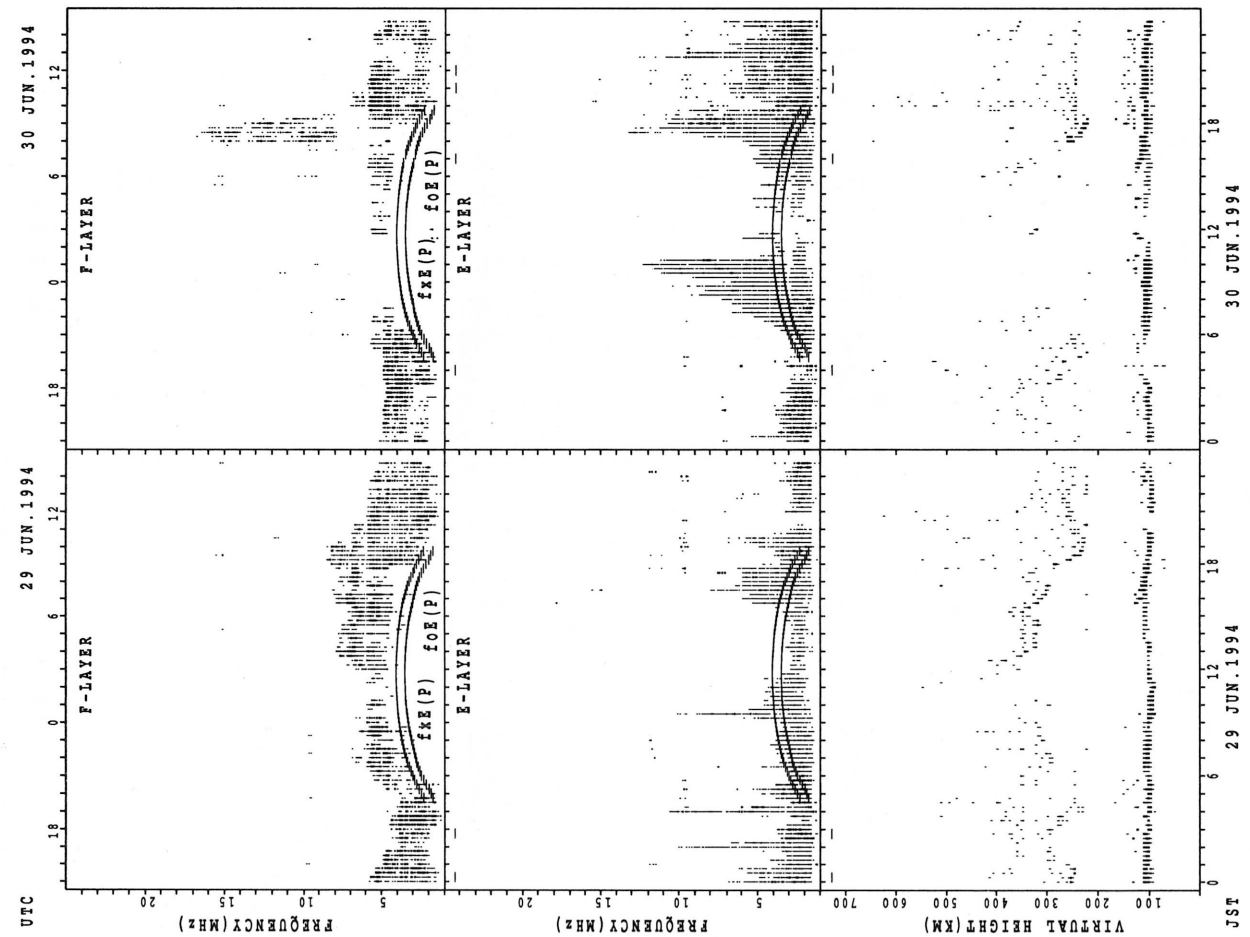
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

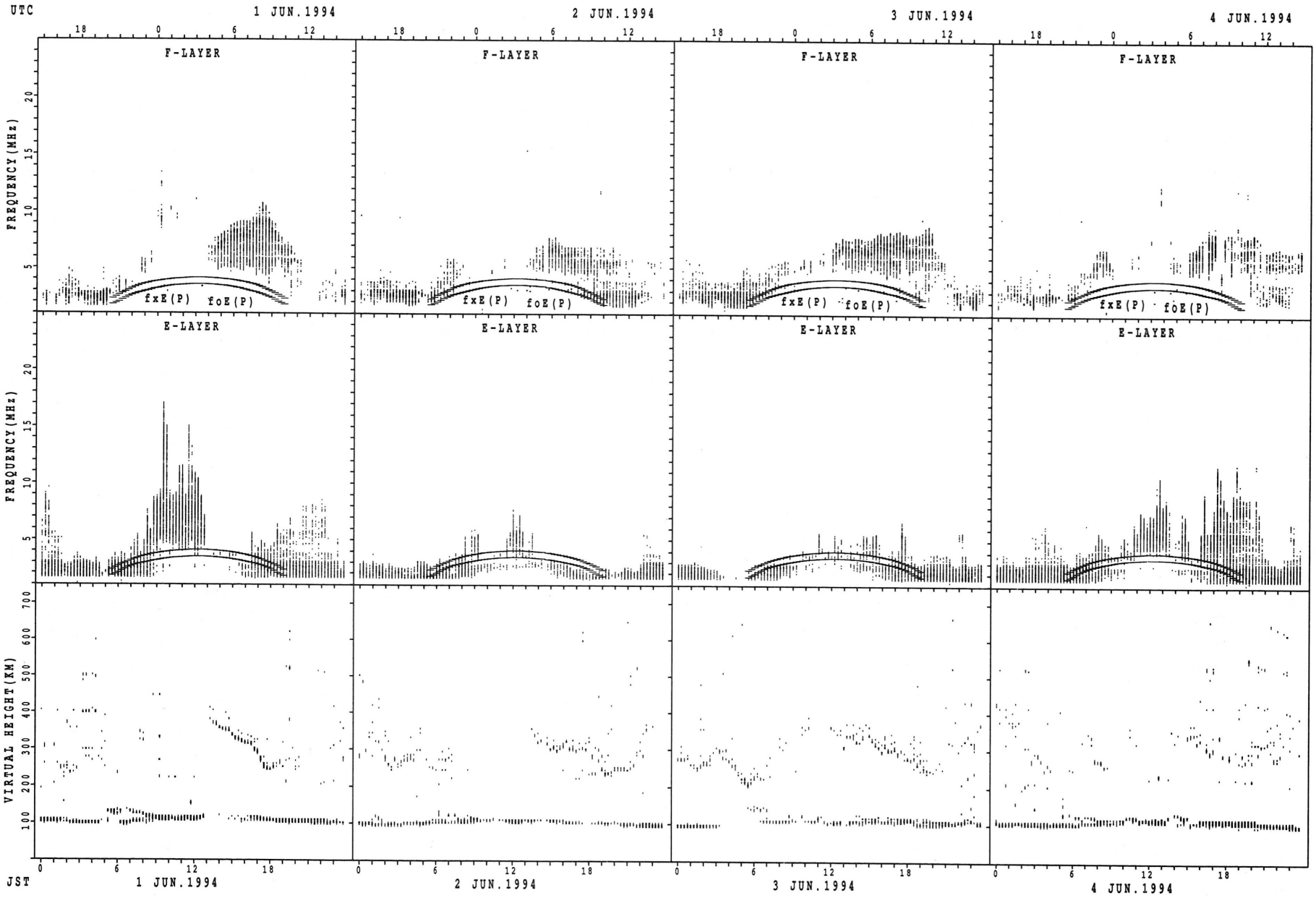
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

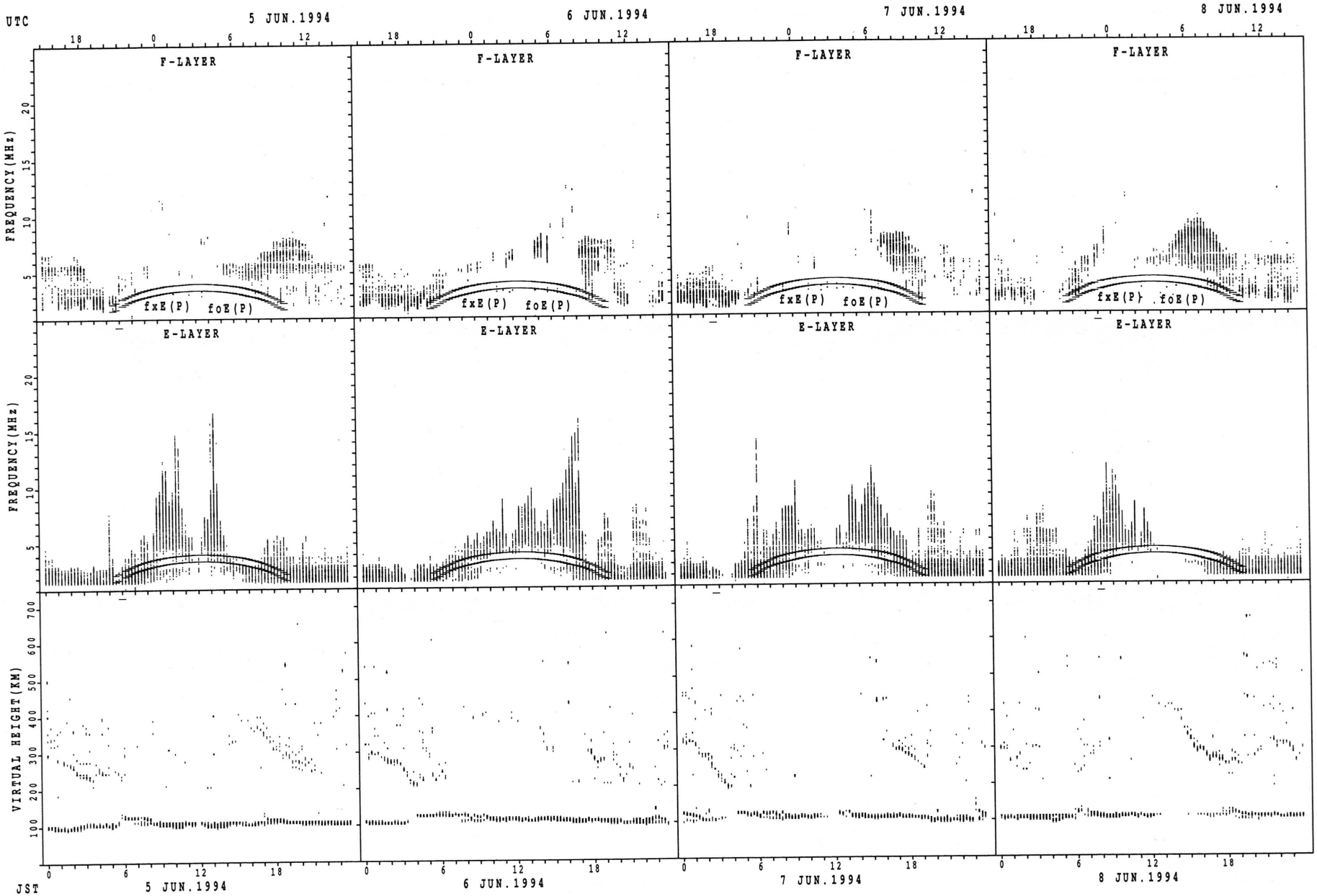

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
29 JUN.1994
30 JUN.1994
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



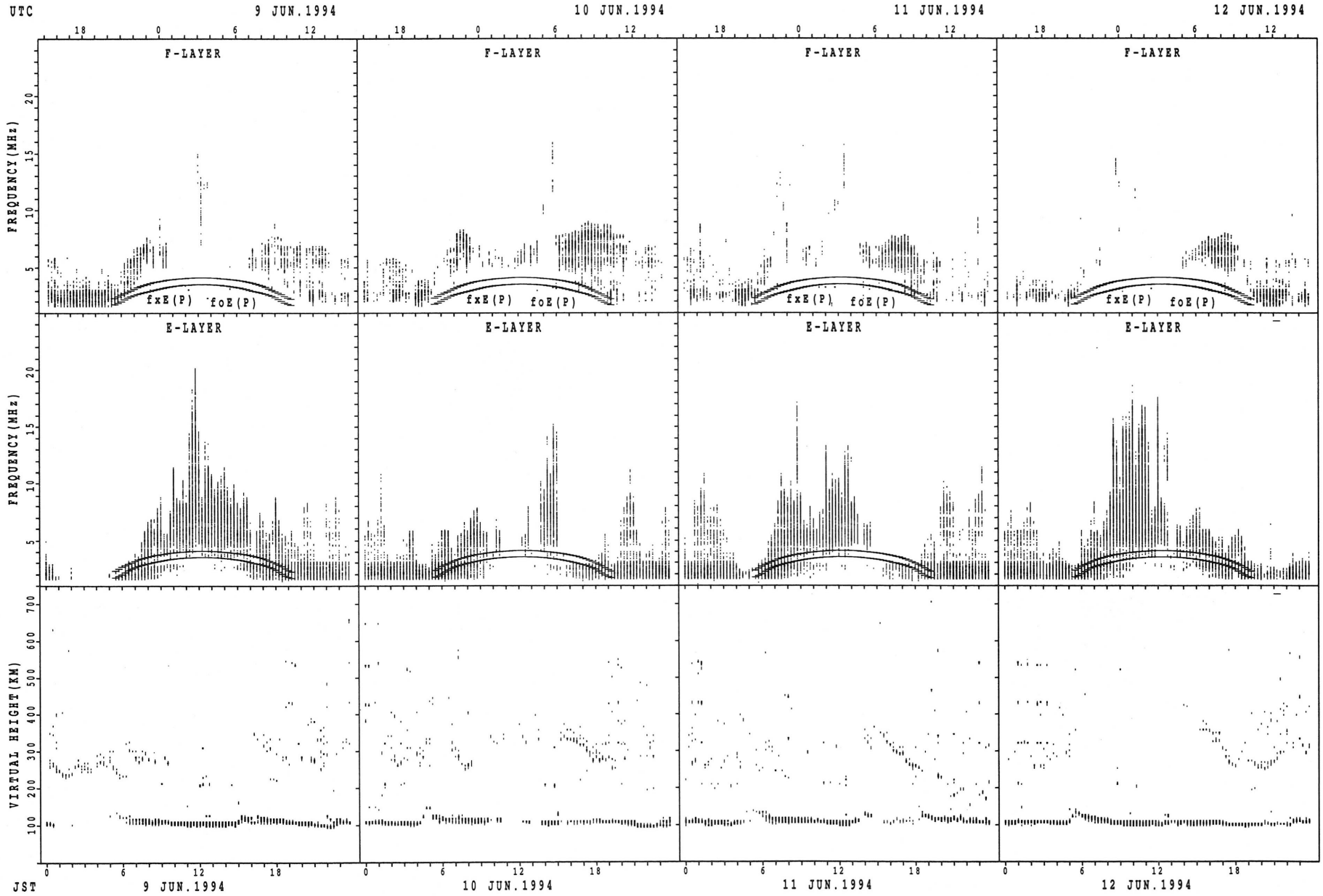
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

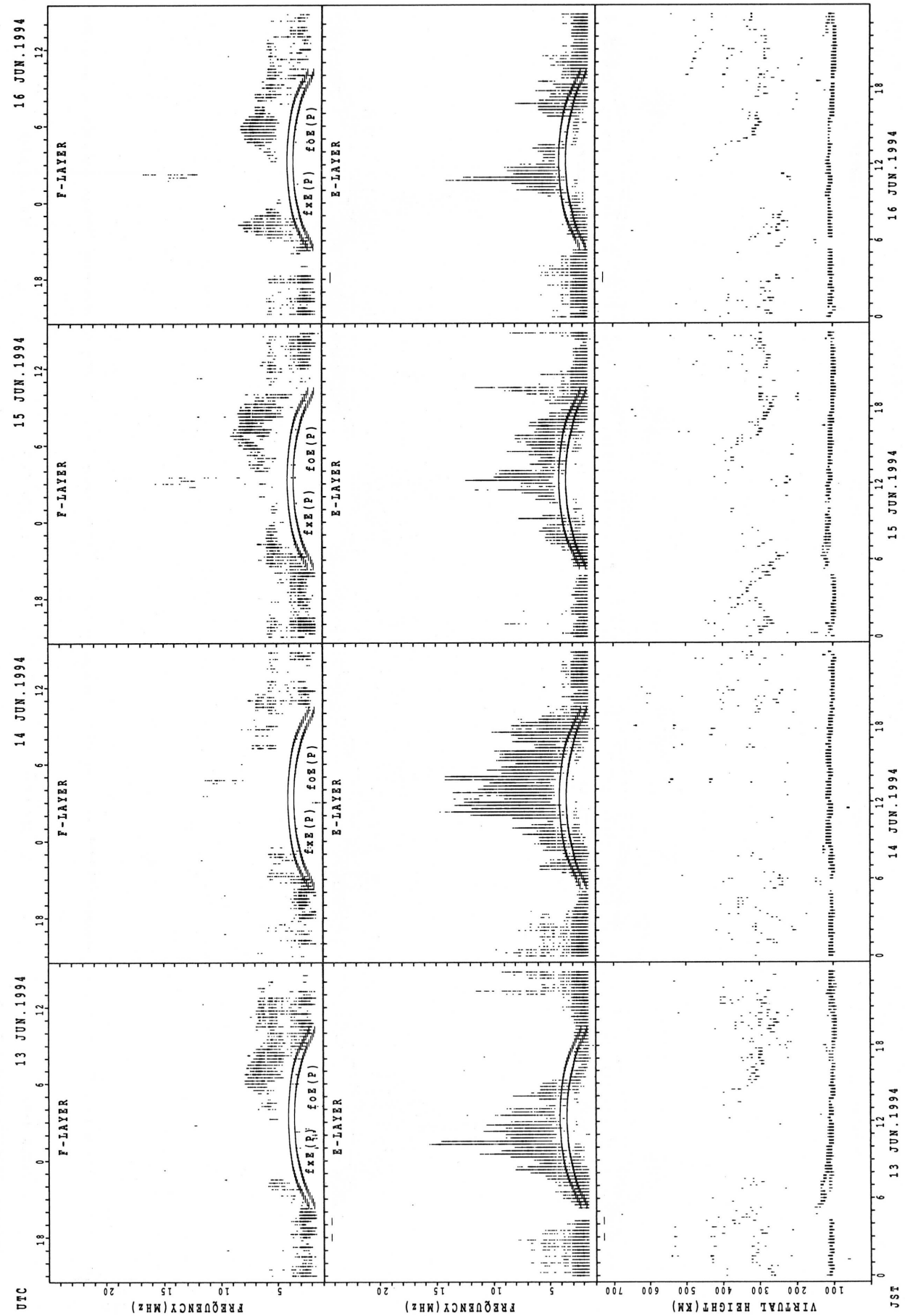


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

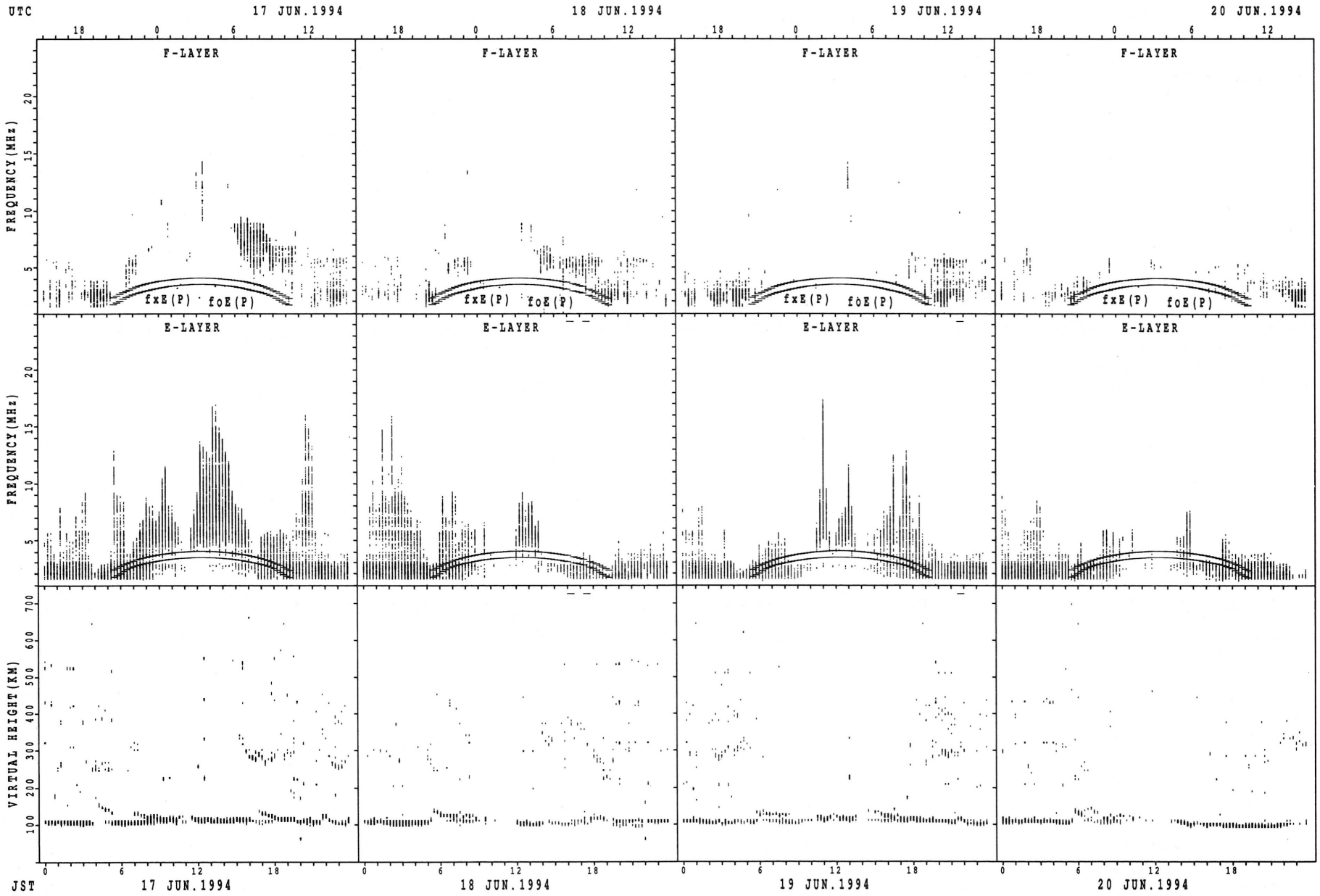
SUMMARY PLOTS AT YAMAGAWA



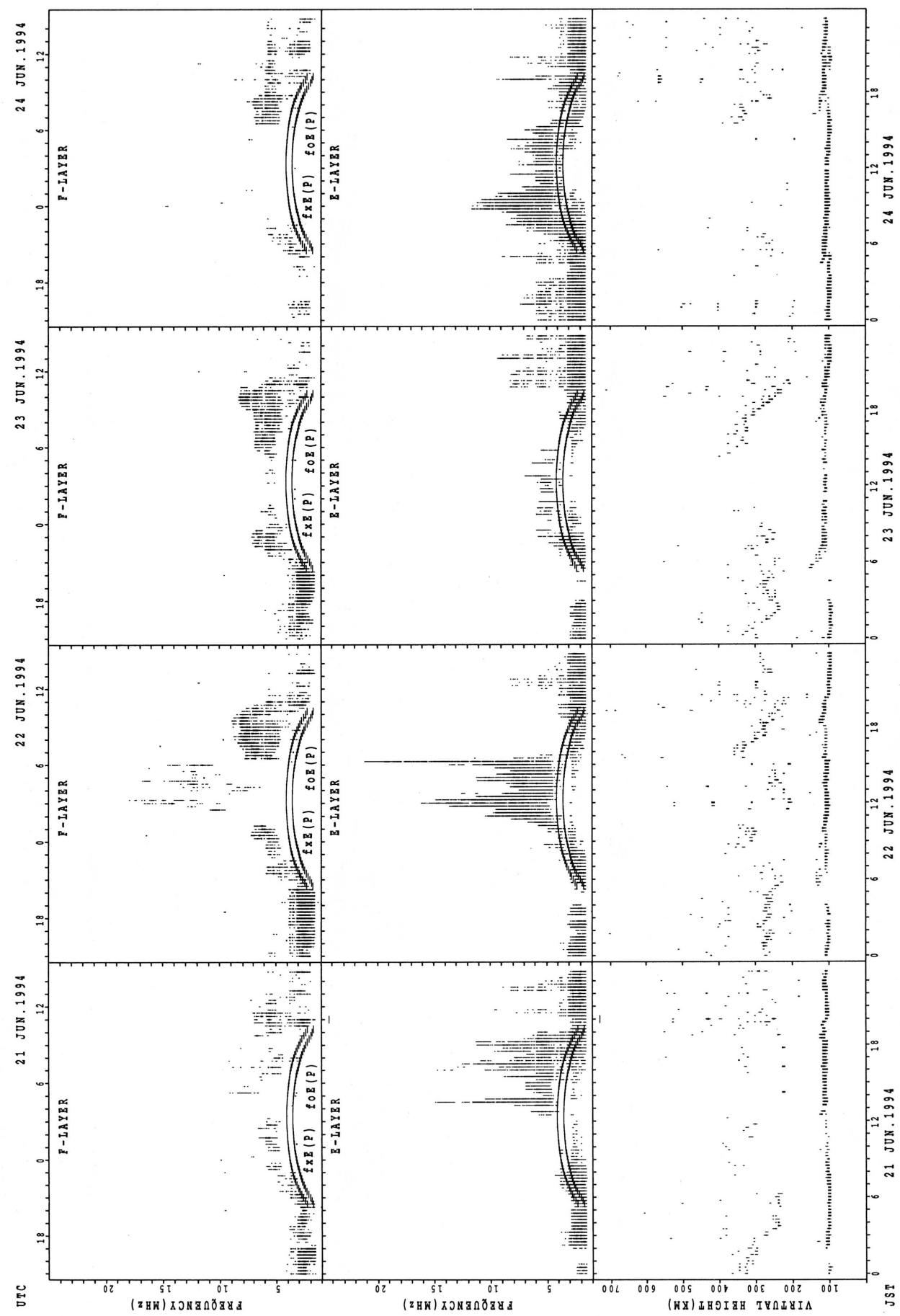
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

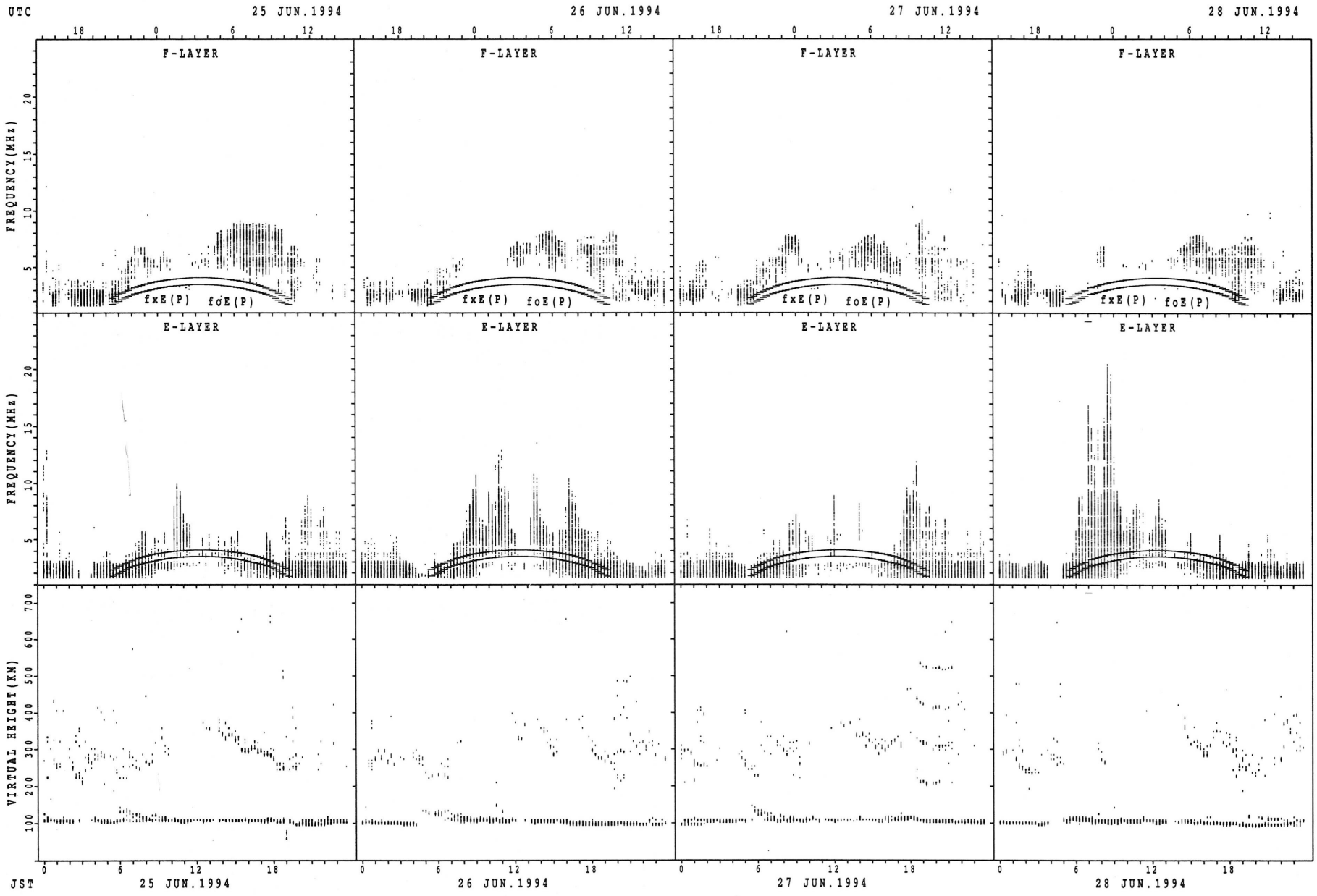
SUMMARY PLOTS AT YAMAGAWA



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

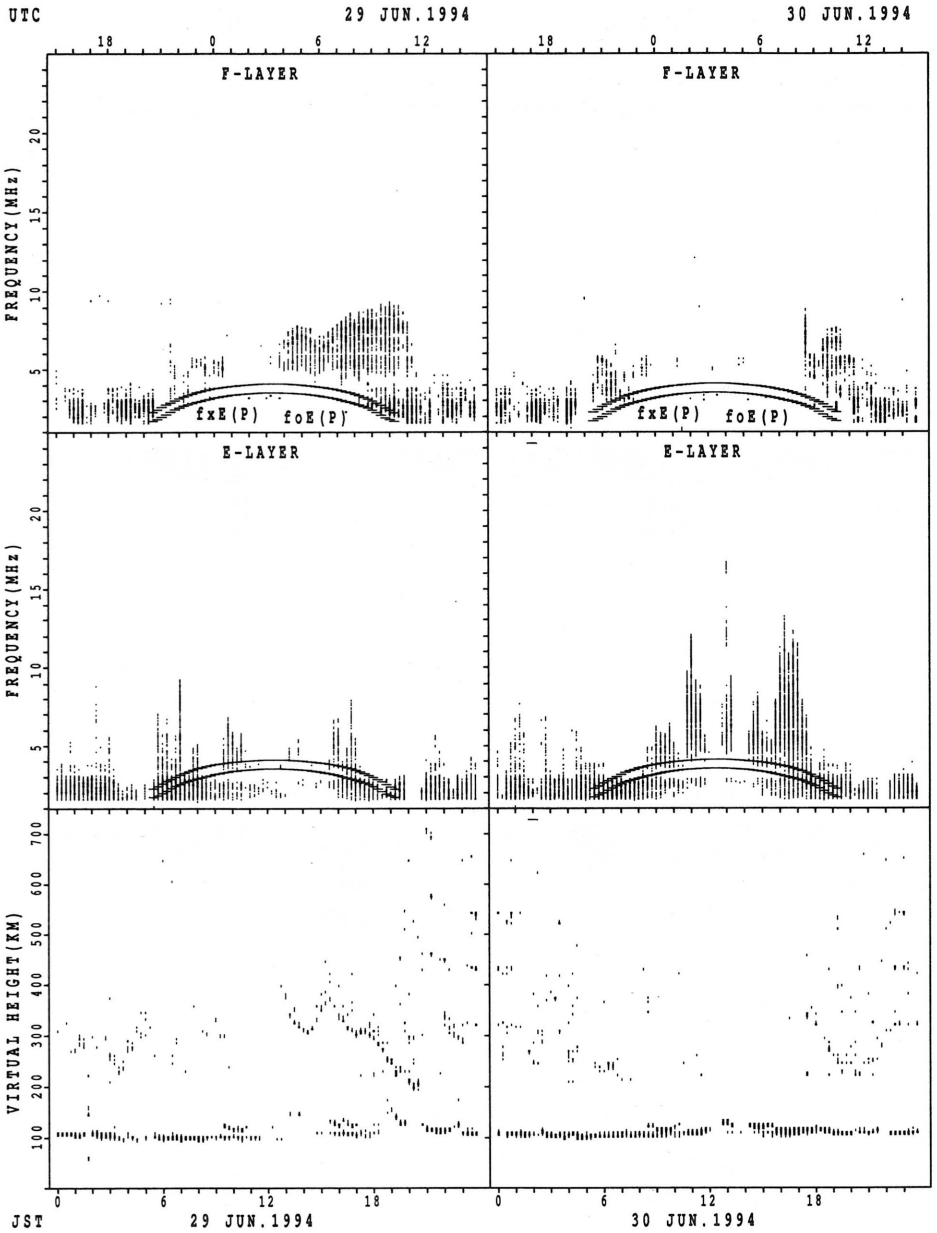

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
21 JUN.1994
22 JUN.1994
23 JUN.1994
24 JUN.1994
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



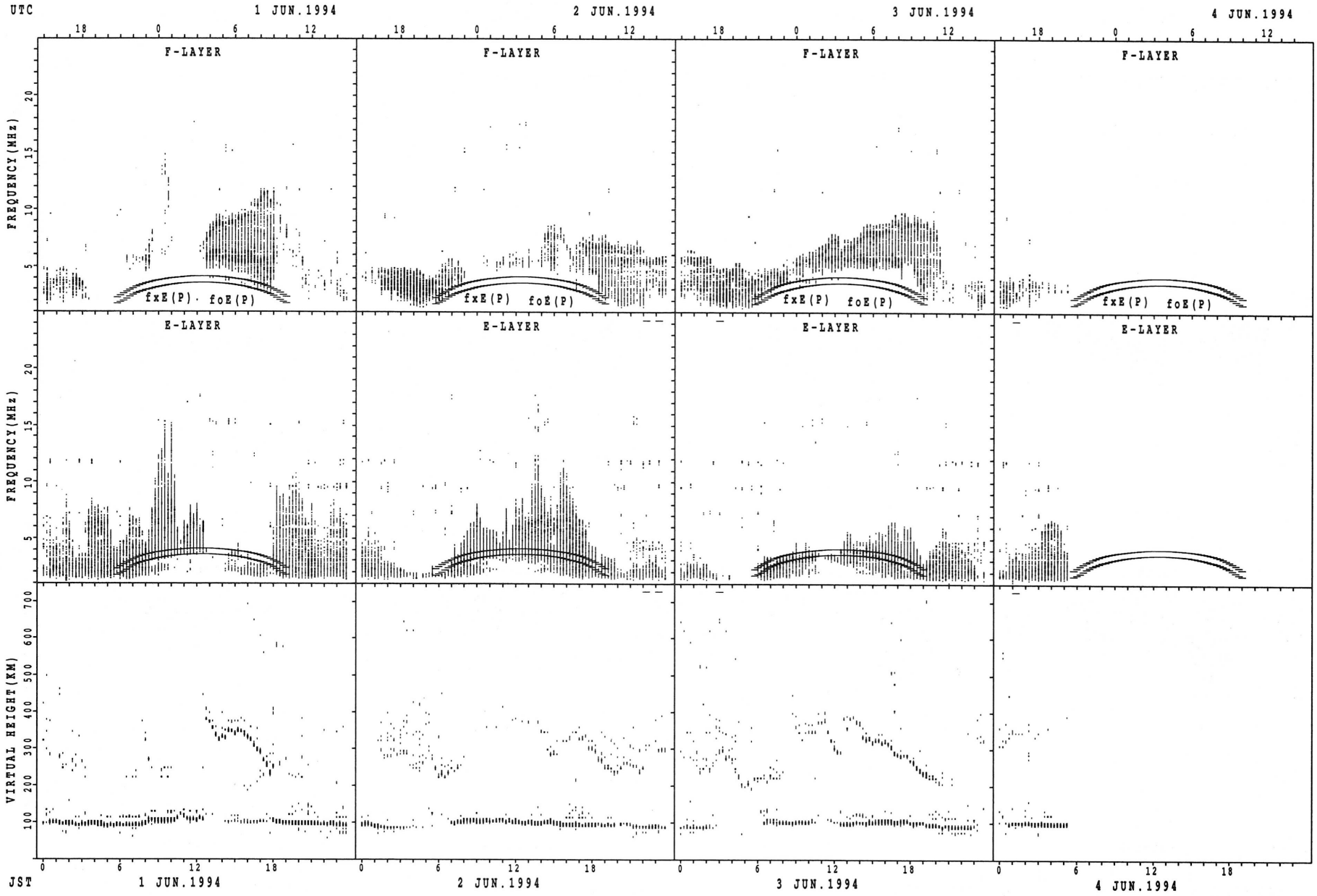
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA

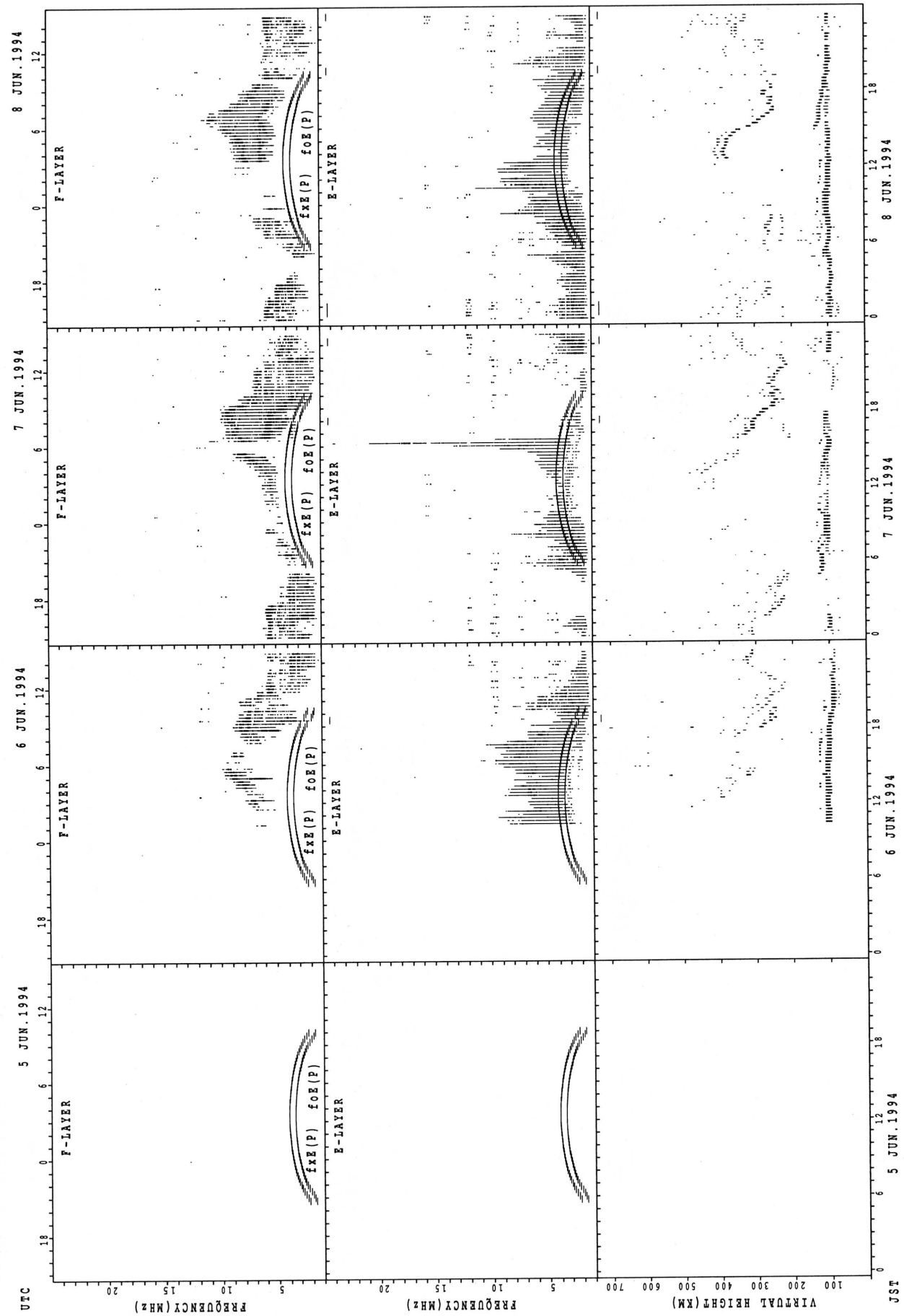


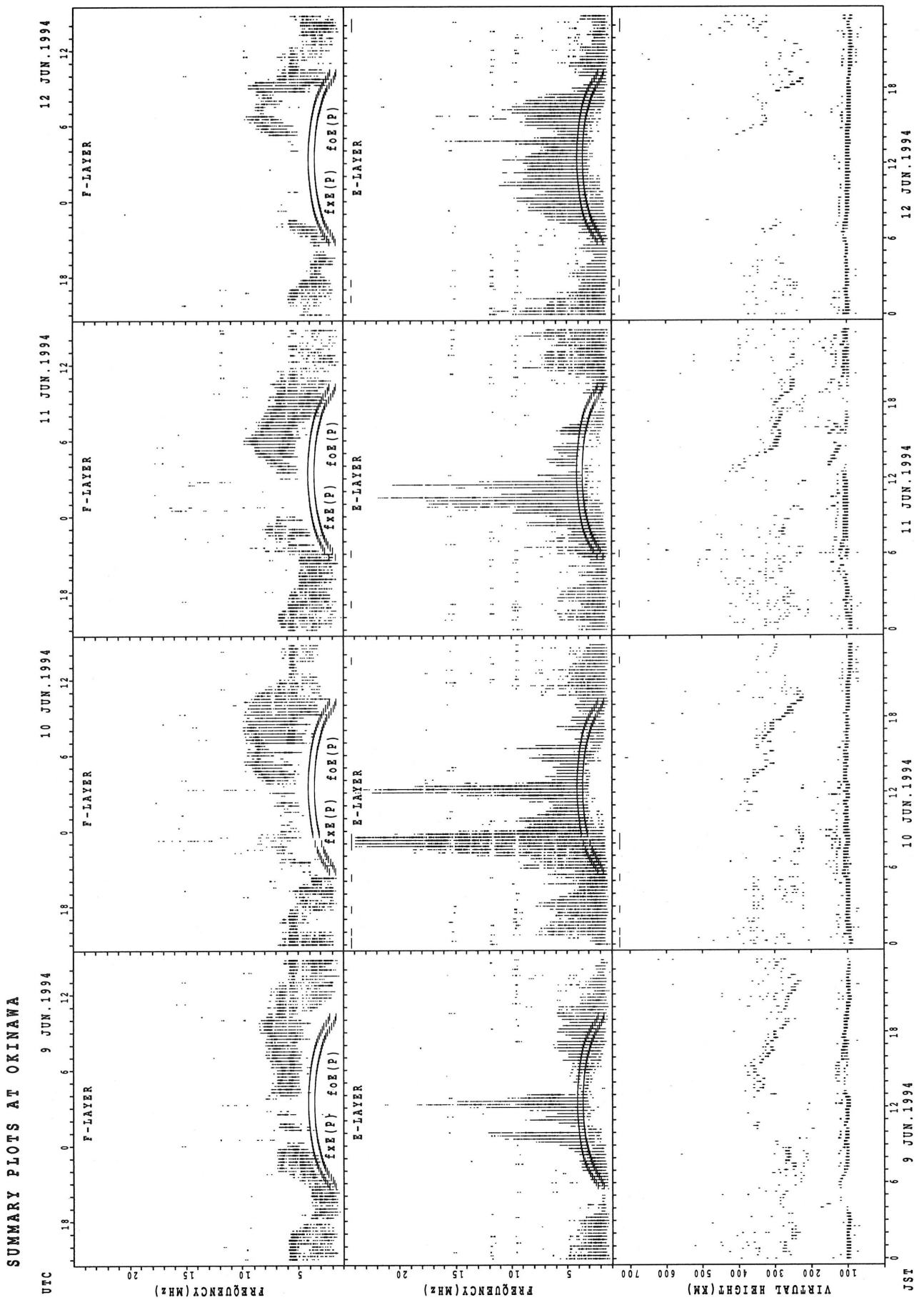
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

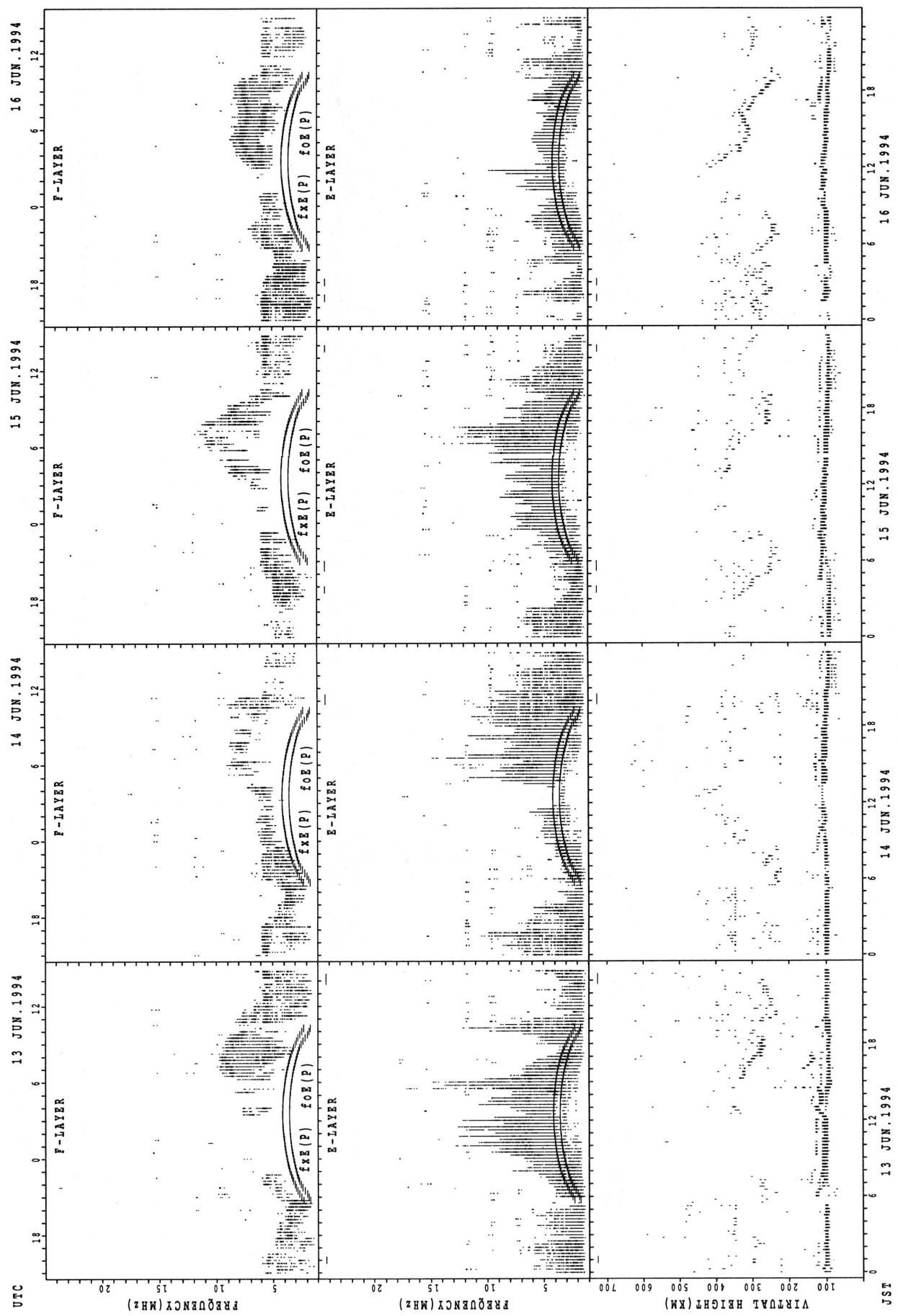
SUMMARY PLOTS AT OKINAWA



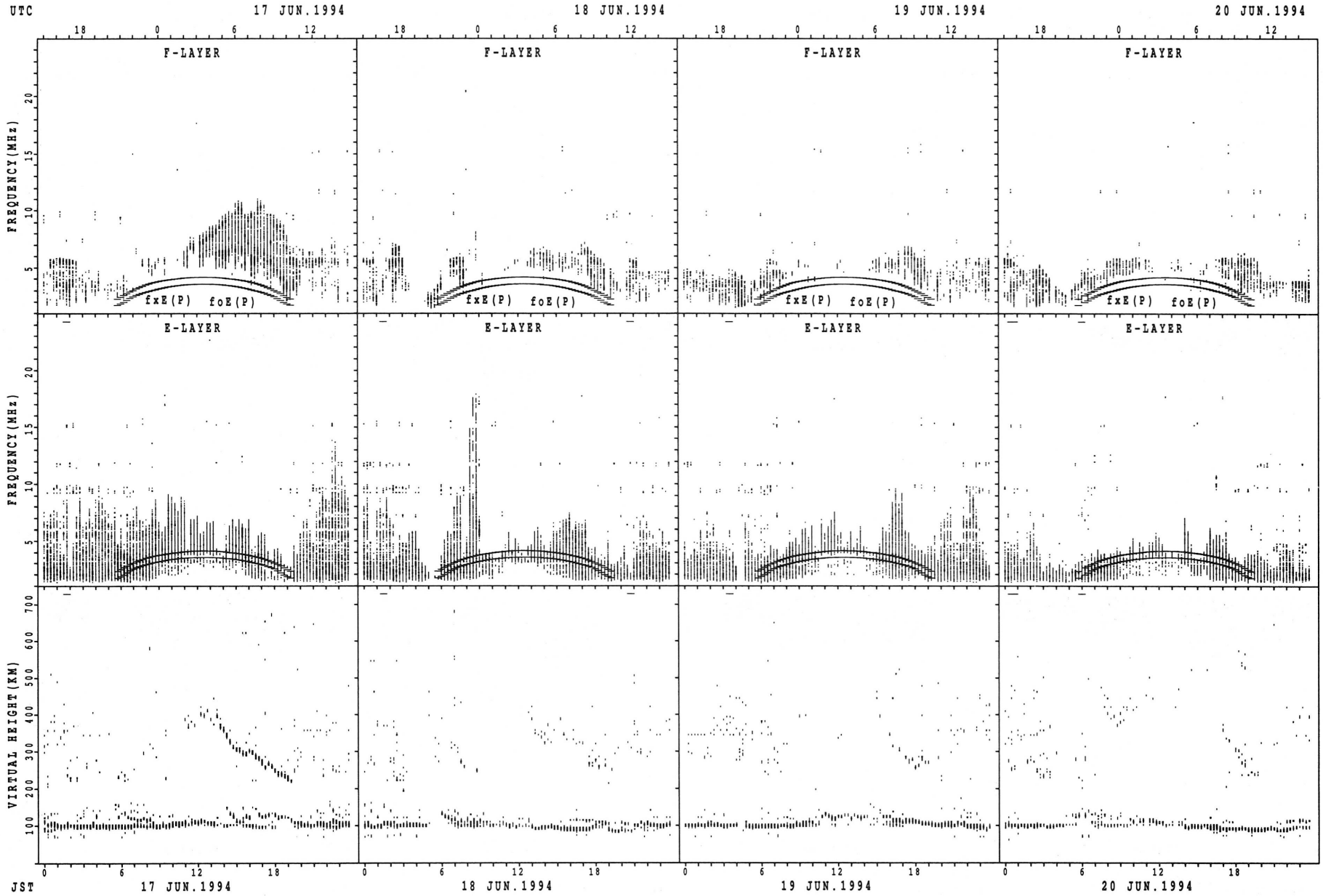
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

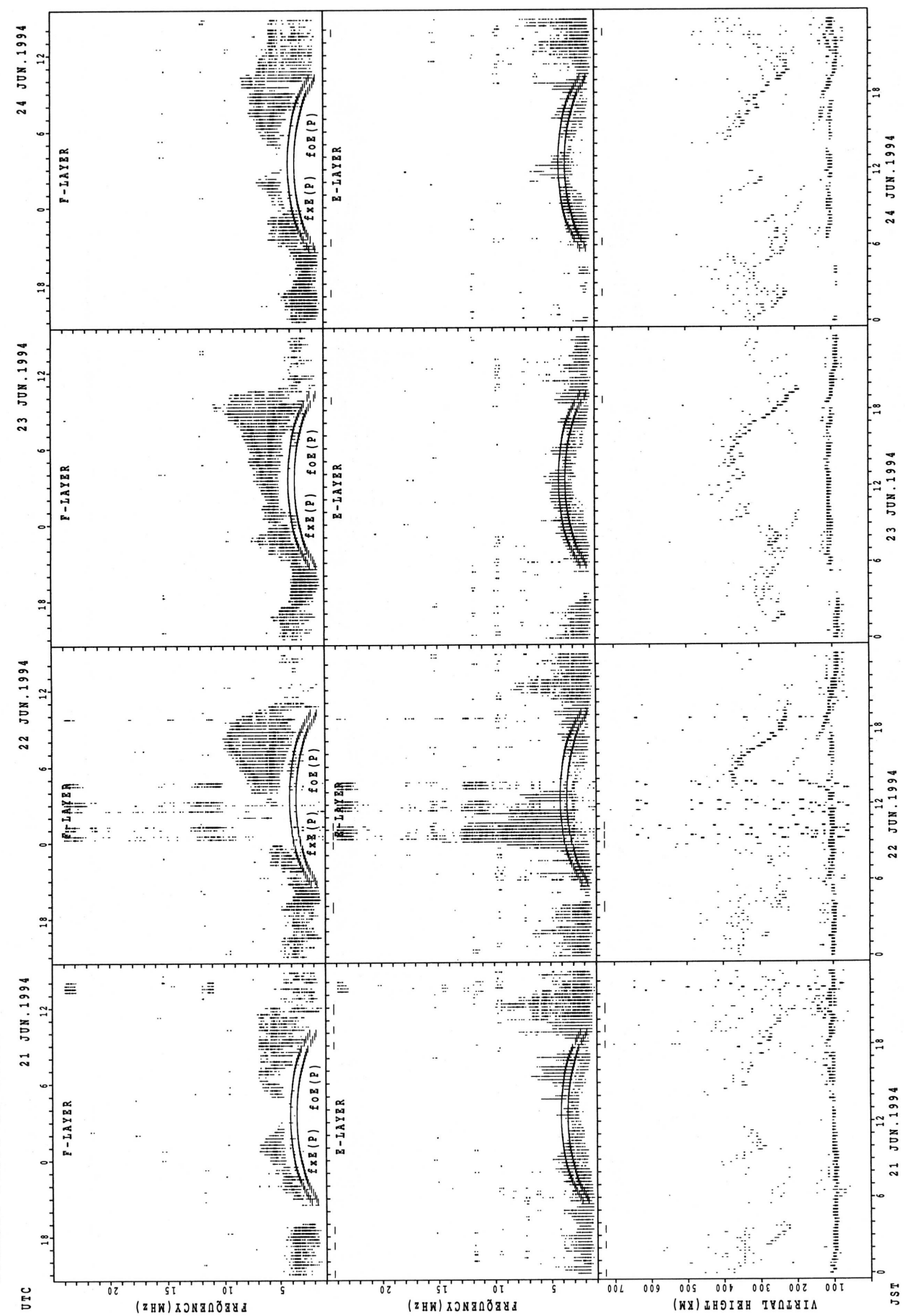

SUMMARY PLOTS AT OKINAWA
UTC
JST
9 JUN.1994
10 JUN.1994
11 JUN.1994
12 JUN.1994
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

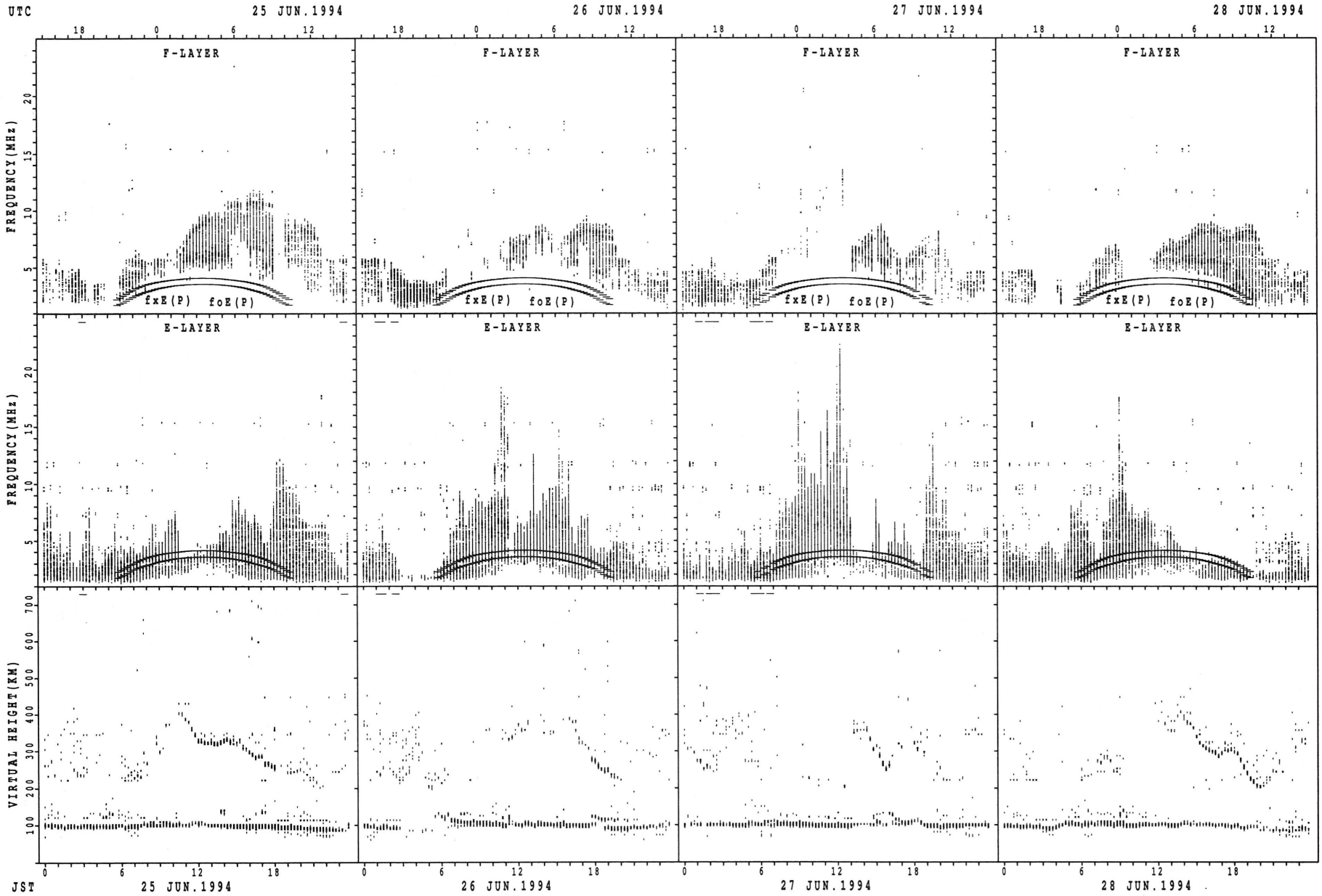
SUMMARY PLOTS AT OKINAWA



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

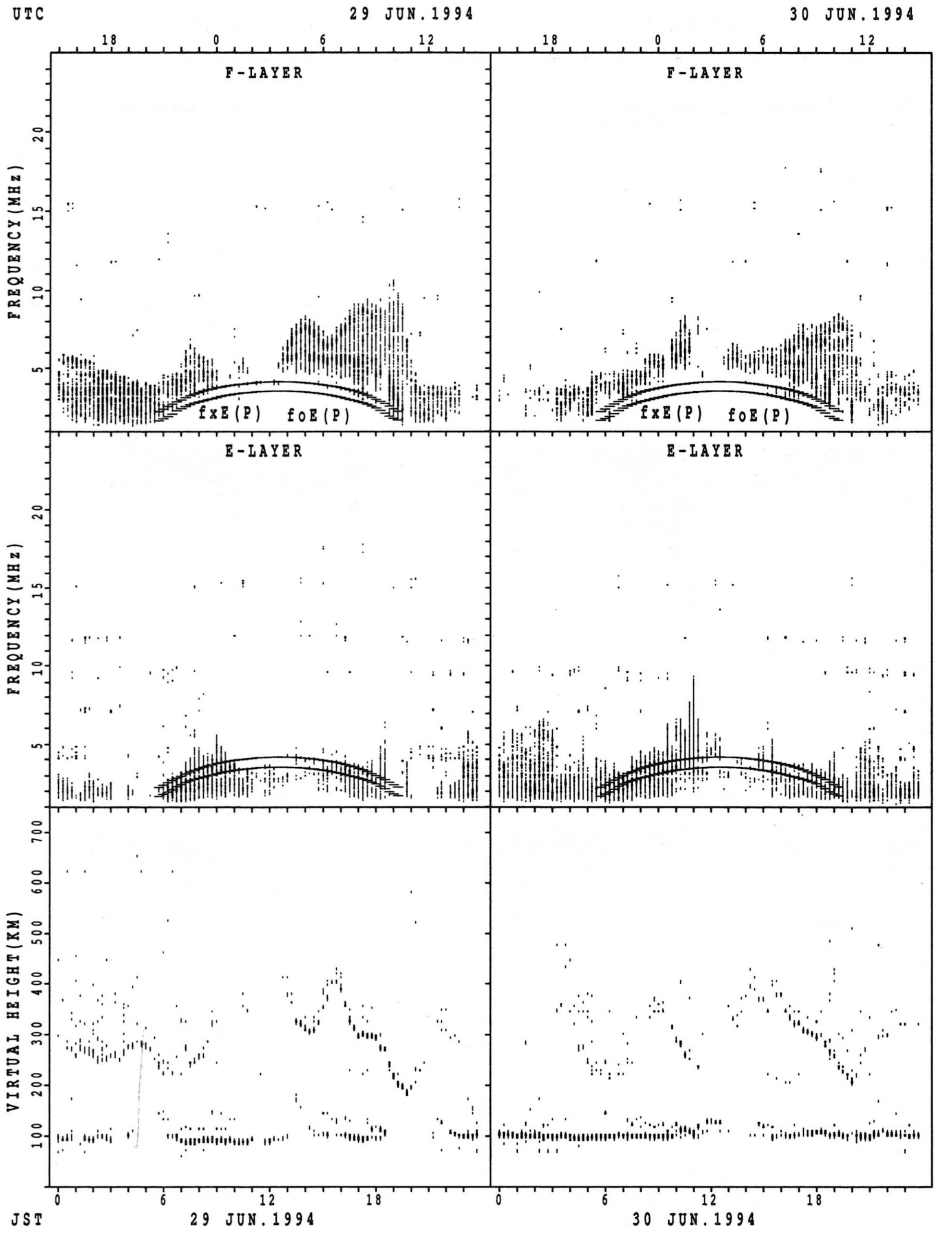

SUMMARY PLOTS AT OKINAWA
UTC
JST
21 JUN.1994
22 JUN.1994
23 JUN.1994
24 JUN.1994
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



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

SUMMARY PLOTS AT OKINAWA



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

MONTHLY MEDIANS OF h'F AND h'Es

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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
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	24	20	18	20	19	26	29	29	30	30	30	30	30	30	30	30	30	30	29	26	26	27	26	23
MED	104	102	101	107	115	121	115	115	111	108	106	107	107	106	107	110	114	114	113	114	112	107	108	105
U Q	107	108	105	121	127	123	119	117	115	113	107	113	111	111	113	115	119	119	119	117	115	113	113	107
L Q	101	100	97	101	107	117	113	112	107	107	105	105	105	105	105	105	107	111	111	111	107	107	105	101

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

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

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	26	27	28	24	23	30	29	29	29	28	28	26	30	27	30	27	30	28	28	24	23	29	26
MED	105	104	103	103	105	123	119	117	113	111	110	113	109	111	111	115	115	113	111	108	111	113	111	107
U Q	111	105	107	105	109	131	123	119	115	118	113	115	113	117	115	121	119	115	116	113	115	113	113	111
L Q	103	103	101	101	99	109	115	113	109	109	107	107	107	107	107	111	111	111	107	105	106	105	107	107

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																11	14	16	16					
MED																320	316	307	296					
U Q																342	338	324	313					
L Q																304	294	293	278					

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	30	28	28	26	25	24	29	29	28	30	27	24	19	19	24	27	30	29	29	29	28	30	29	28
MED	111	108	107	107	107	109	127	119	118	113	113	110	111	111	111	113	111	113	113	111	107	107	109	107
U Q	113	113	111	111	109	120	131	126	121	115	117	115	113	113	116	121	115	119	118	114	112	113	113	111
L Q	105	105	105	103	103	107	118	112	113	111	109	107	109	109	106	107	107	110	109	103	103	103	103	103

MONTHLY MEDIANS OF h'F AND h'Es

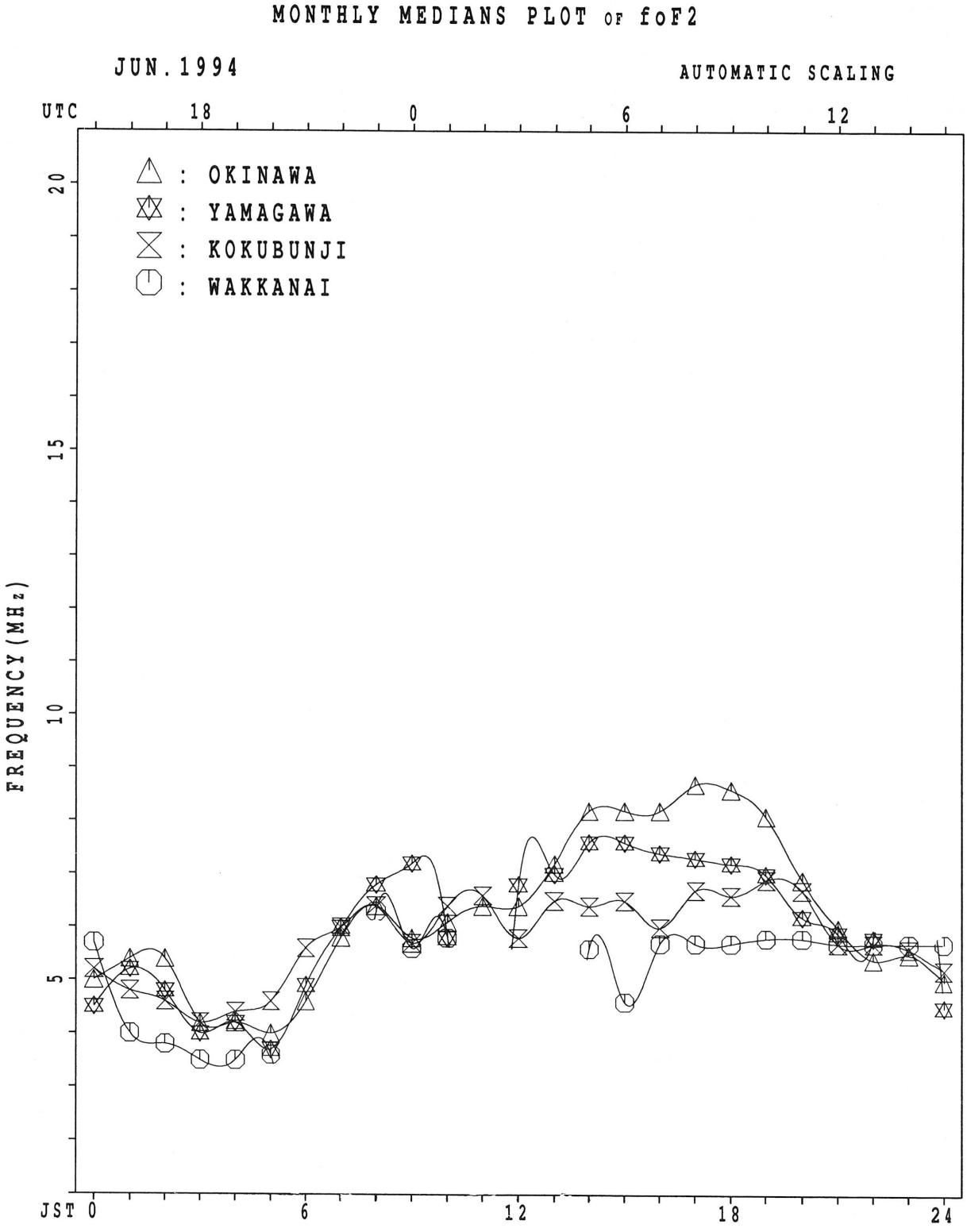
JUN. 1994 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION OKINAWA LAT. 26.3N LON. 127.8E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT															11	16	18	16	19	17	12			
MED															322	331	314	290	272	254	266			
U Q															332	346	328	303	278	272	291			
L Q															318	307	302	279	254	237	251			

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	25	22	23	20	21	19	23	27	27	27	24	27	28	27	24	27	28	27	25	26	24	25	25	26
MED	99	100	103	102	103	101	107	109	107	107	106	105	107	107	107	105	105	107	103	102	99	95	95	98
U Q	109	103	105	103	107	107	129	117	113	113	111	109	109	115	113	119	120	113	111	105	105	104	104	105
L Q	94	95	97	95	97	99	99	97	103	105	103	101	103	103	102	103	102	101	100	97	94	91	92	91


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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	55	X 49	49	47	X 42																X 55	X 48	X 50	46
2	46	48	50	X 41	X 34																X 69	X 67	X 61	X 62
3	58	X 56	X 52	X 48	52																X 65	A	X 51	X 53
4	X 52	X 51	X 51	X 49	X 54																X 74	X 74	X 60	X 60
5	X 58	54	56	51	51																X 83	X 76	X 62	X 56
6	X 56	56	51	51	O X 50																X 71	X 65	X 59	X 59
7	X 57	56	56	53	X 45																O X 62	X 61	X 56	56
8	X 54	55	55	44	X 40																X 66	X 67	63	X 65
9	X 64	X 61	X 53	X 50	X 50																O X 69	75	75	X 68
10	61	58	50	51	48																X 85	X 74	X 69	X 55
11	57	56	55	56	A																X 55	X 61	62	A
12	X 57	54	A	A	O X 51	47															X 61	X 60	X 61	61
13	56	50	50	X 42	O X 40																X 67	X 64	65	X 60
14	A	50	51	A	45																X 68	69	A	52
15	51	51	52	51	51																X 70	X 63	X 55	65
16	63	64	57	53	53																63	63	64	A
17	A	A	53	46																	X 77	X 70	70	A
18	65	A	A	X 57	X 52			59													59	X 57	61	65
19	57	X 52	X 44	45	45	45															X 71	72	X 59	62
20	63	56	X 60	X 34	A	55	56														X 52	X 50	50	50
21	46	X 45	46	X 43	X 49																X 69	X 63	X 62	X 55
22	X 53	X 51	X 49	X 46	X 42																75	61	A	A
23	S	54	56	48	46																X 74	64	A	A
24	58	54	50	45	44		63														A	X 65	A	X 60
25	54	49	50	46	50	47															74	66	65	65
26	61	54	54	50	47	47															X 80	65	56	56
27	56	62	51	50	51	54															O X 66	X 75	64	63
28	A	51	55	51	49																A	77	65	65
29	64	52	51	47	45																X 71	X 65	X 60	X 59
30	X 53	X 48	X 49	X 48	52		54														X 67	62	A	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	26	28	28	28	27	6	3	1													28	29	25	25
MED	57	54	51	48	49	47	56	59													X 69	X 65	X 61	60
U Q	61	56	55	51	51	54	63														X 74	X 71	64	64
L Q	54	50	50	46	X 45	47	54														X 64	X 62	X 58	56

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 46	43	F 40	F 38	S 36	44	44	I A 48	A	I A 50	55	I A 52	53	53	67	75	76	84	S 74	69	49	42	44	F 38
2	F 37	F 41	F 42	35	28	29	41	50	60	43	47	E G 42	46	Y	57	58	56	S 68	S 63	I S 63	63	61	S 55	56
3	F 51	50	46	42	F 46	J R 44	J R 45	E G 42	47	50	U R 46	50	54	60	I A 62	57	63	A	59	62	59	I A 54	J S 45	J S 47
4	J S 46	J S 45	S 45	43	48	43	46	47	54	A	A	A	54	56	58	I A 55	57	64	66	I S 70	S 68	68	54	54
5	52	F 46	F 46	F 44	F 42	43	50	46	47	54	65	J R 67	47	52	I A 54	49	48	I A 54	64	70	77	S 70	56	50
6	50	F 46	F 42	F 43	U S 44	44	48	51	A	A	A	A	A	A	65	68	I A 63	J R 62	73	73	J S 65	59	S 53	53
7	51	F 47	F 48	F 45	J S 39	A	A	R 42	50	53	67	A	A	44	57	65	66	67	61	S 61	56	55	50	F 48
8	48	F 50	F 42	F 38	J S 34	45	52	I A 55	56	62	53	55	57	51	65	74	79	66	63	S 54	61	S 61	F 53	59
9	58	55	47	44	J S 44	J R 48	56	53	I A 67	69	I A 64	50	53	53	J R 53	56	A	A	S 65	U S 68	63	J F 67	F 64	J S 62
10	F 51	F 51	F 41	F 40	J S 39	42	49	63	76	65	59	A	54	68	61	I A 58	59	I A 62	66	S 74	79	68	63	S 49
11	F 48	F 44	F 40	F 38	A	A	I A 54	56	A	A	A	A	A	A	60	J R 51	55	61	66	70	49	55	F 51	I A 50
12	51	F 46	A	A	U S 45	S 39	A	A	A	U R 49	A	A	A	A	52	57	54	65	S 66	61	56	54	J S 55	F 50
13	F 47	F 42	F 41	S 36	U S 34	40	A	J R 57	54	R 52	A	A	A	61	64	65	62	57	56	57	J R 61	S 58	F 56	54
14	I A 54	J F 43	F 42	I A 40	F 34	39	43	58	A	A	A	A	A	A	A	A	58	A	A	59	62	F 60	A	F 43
15	F 40	F 40	F 43	J F 44	J F 44	40	51	52	56	A	A	60	I A 58	63	58	59	58	59	65	S 64	U S 64	57	49	F 52
16	F 54	F 53	F 46	F 45	J S 43	46	58	63	60	49	A	A	A	A	60	J R 62	63	57	60	53	55	F 53	F 53	I A 54
17	I A 53	I A 48	J F 47	F 38	40	45	I A 56	58	A	A	A	A	A	A	I A 64	71	J R 71	70	63	66	71	J S 64	F 61	I A 59
18	F 56	A	A	51	U S 46	U S 45	49	51	U R 64	57	A	E G 44	A	A	56	64	R 60	51	A	51	J F 51	51	F 51	F 54
19	F 48	46	38	F 38	F 36	S 36	A	A	A	A	A	A	A	A	U R 43	A	50	A	55	59	65	J S 63	U S 54	F 51
20	F 51	F 50	54	28	A	F 46	F 46	R 48	A	46	R 43	E G 43	45	R 46	E G 43	E G 44	50	43	44	J R 41	46	44	F 40	F 40
21	F 37	39	F 39	37	S 42	47	55	47	J R 49	47	50	57	60	52	I A 54	54	I A 52	53	I A 51	I A 60	63	57	56	S 49
22	47	45	43	40	S 36	41	54	65	70	60	69	70	63	65	61	61	59	S 66	77	J S 73	F 65	F 52	A	A
23	S	F 46	F 45	F 37	F 37	34	47	A	A	A	A	49	U R 48	49	51	56	57	56	56	A	J S 68	J F 58	A	A
24	F 50	F 46	F 42	J R 38	J S 36	S 37	F 56	53	49	A	A	51	53	I A 48	52	58	56	57	A	A	A	I A 59	54	54
25	F 46	F 42	J F 43	F 37	J S 42	F 41	52	68	69	58	50	A	I A 50	U R 51	56	A	A	59	A	I A 64	F 66	F 54	J F 56	F 52
26	J F 55	F 47	J F 47	F 41	J F 42	J F 40	52	60	54	A	A	57	58	67	76	85	84	60	61	S 71	75	56	F 48	F 49
27	J F 50	F 56	F 41	F 43	S 43	F 44	59	66	62	66	62	54	56	I A 56	60	A	56	I A 52	A	59	U S 60	69	F 53	F 51
28	A	F 44	F 46	F 42	F 42	42	A	54	I A 50	51	R 53	56	I A 52	I A 55	A	61	J R 52	J R 51	53	U S 67	A	F 61	F 56	F 53
29	F 53	F 42	F 39	F 40	J F 39	40	52	60	61	61	J R 56	51	64	75	73	68	76	73	80	78	65	59	54	53
30	47	42	43	42	J F 45	43	F 45	J R 52	I A 51	50	A	50	59	54	51	49	56	51	I A 58	S 65	61	F 54	I A 50	F 50
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	29	28	29	28	28	25	27	21	20	15	18	20	21	28	26	28	26	25	28	28	30	27	28
MED	F 50	F 46	F 43	F 40	S 42	42	51	53	56	52	55	52	54	54	58	58	58	60	63	64	63	58	54	52
U Q	52	F 49	F 46	F 43	44	44	54	60	63	60	64	57	58	62	63	65	63	66	66	70	66	61	F 56	54
L Q	F 47	F 42	F 41	38	S 36	40	46	48	50	50	50	E G 50	51	51	54	56	56	54	57	59	58	54	50	F 49

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											430		440	U R 440	U A 430	U A 405		345	U L 330					
2							L 340		U A 390	415	415	R 415	U R 405		420	U Y 420	U A 390							
3								415		405		U A 415		U A 440		415			U L 315					
4							U L 345	U L 405	U A 405				U A 420		440				L					
5							U L 345			420	U A 430	430	L 420				395							
6						L	345	U A 365																
7										U A 420					430	U A 415	U A 395	370	L					
8							L			420	440			U A 445		440	390	390						
9						L								440										
10							380						455	455										
11																R 445		U A 355						
12															440	440	420	370	U L 315					
13															Y 445	440	420							
14							345										405							
15												470			440	445	405	380	340					
16							L	405	430	440					440	440	415		L					
17																								
18							U A 330	U A 395				440			U A 420	U A 430								
19						L											405			L				
20												430		420	U R 430	440	395	370	L					
21						U L 305	U L 355		420	440	430	445	445			U A 440		L 415						
22												R 445	U A 420				440							
23						200							440	430	420	440	395	370	L					
24												445	445		420	430	U A 395							
25							345	380	415		430			430	440									
26							L							U A 445	445	U A 440	U A 390	L	L					
27							L						430		430		415							
28								390		445		R 440				U A 420		365	330					
29							L 370	395	405	440	U A 415	U A 440	430	430	430	420								
30													R 445	445	405									
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						2	10	8	6	9	7	11	12	11	17	18	16	10	5					
MED						252	345	395	410	420	430	440	435	440	430	440	400	370	U L 330					
U Q							L 355	405	420	440	430	445	445	U A 445	440	440	415	380	335					
L Q							345	385	405	418	415	430	U 420	430	420	U A 420	395	365	U L 315					

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	S				R				A		A	A	A	B				
							225	255	290	320	340	345	340	330		295								
2						A	A		A	A		U R		A	A	A	A	A	A	B				
								275			345	345	340											
3						A	A				A	A	A	A	A			U A	A	B				
								275	305	340					320	305	275	240						
4						A	U A		A	A	A	A	A			A			A	S				
							225	265						340	320		265							
5						A	A	A	A	A	A	A	A	A	A				A	B				
								255	295							290	265	240						
6						A					U A		A	A	A		A	A	A	B				
							215	275	305	320	345	345	345	330	320	305								
7						A					A	A	U A						A	S				
							215	275	295	320	340	345	355	340	330	315	280	240						
8						A	A	A	A	A	A	A	U A	A	A				A	B				
								255					345	340		315	255	240						
9						A				A	A	A	U A	A	A			A	A	S				
							230	265					340			330	290	250						
10								A		U A	A	A	A	A	A		A	A	A	B				
					190	240			320	330						315								
11						A	A	A	A	U A	A	A	A	A	U A				U A	B				
										325					340	330	300	255	200					
12						A		A	U A	A	A	A	A	A	A	A	A		A	B				
							230	280	295	330						320	275	240						
13						A	A	U A	A		A	A	A	A	R			A		B				
							250	290	315							315	290	230	190					
14						A		A	A	A	A	A	A	A	A	U A			A	B				
							225	275	320							330	305							
15						A	A	A	A	U A		A		A	R	A				B				
									320	340		355					295	250	205					
16						A			A	A	A	A	A	A	A				A	B				
							230	275								330	295	255						
17						A	A		A	A	U A	A	A	A				A	A	B				
								280		345	355				330	320	295	250						
18					U A	U A	U A			U A	A	A		A	U A				A	B				
					190	240	295		305	320			355		345	320	275							
19						A			A	A	A	A	A	A					A	B				
							230	265	295	330			345	340	340	315	295							
20						A	A			A		A	A	A		A				B				
							205	280	295	330	345	340			340		A	215	190					
21						A		A				R	R				A	A	A	B				
							225		305	330	340			355	330	315	290							
22						A			A		A	A	A	A	A	A			A	B				
							225	265	315	325							295	255						
23						A		A	A	A	A	R		A				A	A	B				
							250	275	275				355		340	320	295	250	180					
24						A	U A	A	A		A	A	A	A	A			A	A	B				
							205			320						320								
25						S	A				A	A	A	A	A	U A			A	B				
								265	305					345	340	330	290							
26										A	U A	A	A	A	A	A	A	A	A	B				
					190	215	265				325													
27						A	A		A		A	A	A	A	A				A	B				
								280	305						320	320	305							
28						A	U A	A	A	A	A	R	A	A	A	A	A			B				
							230	255										240						
29						A	A	A	A		A	A	R						A	B				
										320			355	345	330	330	295	250						
30						A	A	A		U A	A		R						A	B				
									290	320		345		330	330	320	290	255						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	19	23	19	18	7	7	10	10	15	23	22	17	5					
MED						190	225	275	305	A 325	345	345	345	340	330	320	290	250	190					
U Q						U A 190	A 230	280	A 315	A 330	U A 345	345	355	345	340	330	295	252	202					
L Q						190	215	265	295	320	340	345	340	330	A 320	315	275	240	185					

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 13	23	J A 48	J A 33	J A 33	24	32	50	67	J A 53	39	J A 57	38	43	43	J A 44	J A 59	J A 45	J A 36	J A 26	J A 31	26	J A 56	J A 50
2	J A 55	J A 33	J A 42	J A 23	J A 28	21	23	J A 48	J A 41	34	G	G	G	36	36	38	52	J A 127	55	J A 78	J A 63	60	37	S 22
3	28	J A 32	J A 26	J A 43	J A 33	38	J A 39	35	39	40	45	46	J A 70	49	73	39	62	J A 133	J A 31	34	J A 26	61	J A 50	J A 40
4	J A 41	J A 46	J A 51	J A 41	24	19	J A 35	37	J A 45	104	87	J A 129	J A 50	55	46	J A 115	J A 129	55	J A 56	75	53	J A 49	J A 47	J A 50
5	E B 12	27	29	28	J A 27	20	J A 29	J A 43	J A 45	J A 43	44	40	36	48	J A 56	32	44	J A 65	J A 65	J A 59	J A 52	62	52	J A 47
6	S 21	23	20	22	J A 36	25	G	38	51	65	99	108	73	94	78	J A 54	J A 70	65	48	37	45	J A 50	J A 50	J A 49
7	51	J A 44	50	32	J A 45	41	51	42	42	J A 44	J A 54	J A 59	45	J A 50	40	43	J A 41	33	J A 37	J A 32	50	25	J A 31	42
8	44	J A 45	32	J A 40	32	J A 35	J A 36	93	J A 67	J A 42	41	57	62	J A 51	J A 63	G 28	32	33	68	67	29	55	J A 52	41
9	29	E S 13	22	35	J A 29	22	J A 44	47	J A 96	J A 75	76	51	53	41	53	55	84	J A 89	88	108	J A 139	J A 48	J A 55	J A 80
10	J A 58	E B 12	28	31	29	41	35	J A 52	J A 63	J A 64	J A 55	55	40	56	112	J A 130	99	76	J A 99	J A 73	94	J A 126	J A 53	J A 51
11	J A 49	J A 34	J A 50	J A 53	J A 93	J A 75	88	55	73	73	86	110	J A 66	J A 153	J A 64	42	J A 48	J A 41	J A 49	52	J A 75	52	J A 51	J A 64
12	J A 80	J A 52	J A 92	J A 142	J A 57	J A 29	J A 65	J A 167	98	56	82	63	82	J A 59	45	40	34	31	J A 34	27	J A 37	21	42	J A 47
13	J A 43	J A 55	J A 64	J A 29	J A 45	J A 49	J A 77	J A 48	J A 54	J A 83	J A 87	58	J A 98	55	G 30	44	36	J A 43	J A 42	J A 83	J A 66	J A 56	J A 69	J A 52
14	78	J A 47	J A 67	63	J A 49	41	33	54	J A 69	79	100	65	114	J A 136	132	J A 148	36	98	73	100	E B 12	J A 56	J A 82	J A 54
15	37	33	J A 31	J A 26	28	J A 34	J A 57	J A 51	J A 88	J A 88	J A 68	48	68	J A 93	G 33	39	36	33	31	J A 24	J A 83	J A 45	J A 59	J A 59
16	J A 52	J A 51	34	25	33	21	30	36	34	44	J A 51	J A 63	J A 64	J A 70	J A 47	37	37	J A 54	33	23	J A 81	J A 35	48	69
17	J A 87	J A 66	J A 33	22	J A 37	25	63	J A 55	100	93	J A 87	J A 162	85	85	97	79	84	J A 65	J A 38	J A 28	J A 44	J A 75	56	J A 62
18	J A 64	J A 98	62	J A 58	J A 82	37	J A 44	J A 49	79	59	J A 69	40	J A 53	55	J A 49	J A 57	J A 54	J A 50	63	32	J A 65	J A 65	J A 52	J A 59
19	J A 48	J A 72	32	27	27	25	72	75	J A 125	89	56	56	58	107	43	50	37	86	J A 50	J A 66	J A 73	J A 41	53	35
20	22	40	39	33	J A 83	J A 35	J A 48	56	J A 93	46	42	J A 46	44	39	39	39	35	30	22	28	23	J A 30	J A 28	37
21	J A 40	J A 28	29	23	28	27	G 20	31	38	44	39	40	G 29	49	J A 65	J A 50	133	J A 44	J A 126	J A 105	J A 44	J A 42	J A 47	J A 37
22	J A 41	J A 29	33	J A 43	J A 40	J A 27	J A 47	J A 58	J A 55	J A 56	J A 83	54	43	J A 55	J A 63	J A 116	J A 48	81	J A 137	96	J A 51	J A 28	89	89
23	56	28	31	J A 47	J A 31	25	32	J A 100	101	J A 150	137	G 33	40	40	G	38	G	37	J A 48	85	J A 50	J A 47	58	80
24	J A 59	J A 49	J A 51	J A 41	J A 50	42	J A 55	J A 47	J A 50	68	47	54	46	53	39	44	41	53	117	74	J A 95	J A 112	J A 118	J A 81
25	J A 49	J A 51	J A 44	J A 44	J A 55	27	J A 40	37	39	60	42	56	J A 69	41	J A 54	J A 115	110	62	86	J A 72	J A 69	J A 48	J A 46	53
26	J A 80	J A 43	J A 43	28	J A 27	24	J A 37	61	58	66	J A 112	J A 51	55	J A 69	44	J A 63	J A 56	35	48	J A 36	J A 23	J A 36	24	J A 39
27	J A 64	J A 31	28	25	J A 30	J A 31	J A 45	J A 56	J A 64	J A 71	54	54	39	85	42	J A 153	J A 74	J A 130	145	104	J A 94	65	J A 49	J A 45
28	65	45	J A 40	J A 25	J A 66	J A 83	61	J A 35	J A 76	57	J A 65	G 35	75	68	88	J A 58	J A 54	G	32	89	88	58	J A 59	J A 49
29	J A 78	40	J A 126	40	J A 102	49	30	31	39	36	47	46	G 30	G 31	G	G	J A 59	60	54	J A 46	J A 32	J A 48	32	J A 30
30	32	J A 32	J A 31	32	J A 44	23	27	53	74	73	J A 121	41	G	43	G	41	J A 49	J A 63	112	J A 44	J A 88	J A 59	J A 104	J A 48
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A 49	J A 40	J A 36	32	J A 34	28	40	50	64	62	60	54	53	55	46	44	50	54	52	62	J A 52	J A 50	J A 52	J A 50
U Q	J A 64	J A 49	J A 50	J A 43	J A 50	41	55	56	79	75	87	59	69	70	64	J A 63	70	76	86	83	J A 81	60	J A 58	J A 59
L Q	37	29	31	26	29	24	32	38	45	44	45	46	40	43	G 39	39	37	37	37	32	J A 37	J A 41	47	41

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E S 13	E B 11	14	21	17	18	28	A A 50	A A 67	A A 53	37	A A 57	35	U Y 41	43	41	43	24	17	15	12	15	26	13
2	13	17	15	14	23	18	23	42	39	33	G	G	G	U Y 36	34	U Y 37	39	56	36	U S 29	21	32	27	E S 13
3	S 13	E B 10	E B 13	15	14	17	21	33	37	37	39	42	46	44	A A 73	37	57	A A 133	14	13	15	A A 61	23	17
4	26	32	24	19	16	17	28	30	41	A A 104	A A 87	A A 129	42	51	41	A A 115	45	41	23	22	23	17	28	17
5	E B 12	14	16	15	17	18	24	37	42	32	43	37	32	43	A A 56	31	35	A A 65	42	18	22	22	19	20
6	13	E B 13	E S 14	13	14	16	G	37	A A 51	A A 65	A A 99	A A 108	A A 73	A A 94	59	47	A A 70	59	32	18	30	29	37	31
7	37	31	32	15	E B 10	A A 41	A A 51	32	40	42	50	A A 59	A A 45	36	37	42	40	32	25	19	30	16	15	22
8	22	31	18	18	15	21	28	A A 93	51	37	37	51	54	45	46	G 26	32	28	54	46	20	23	16	20
9	13	E S 13	13	18	16	18	41	41	A A 96	51	A A 76	46	48	39	46	47	A A 84	A A 89	34	42	43	28	32	23
10	20	E B 12	14	14	17	20	29	43	56	54	48	A A 55	37	38	48	A A 130	52	A A 76	38	21	20	28	14	28
11	17	17	18	21	A A 93	A A 75	A A 88	50	A A 73	A A 73	A A 86	A A 110	A A 66	A A 153	51	39	46	36	33	18	35	21	26	A A 64
12	41	19	A A 92	A A 142	14	19	A A 65	A A 167	A A 98	43	A A 82	A A 63	A A 82	A A 59	41	39	32	28	22	E B 12	13	13	18	16
13	25	27	23	14	17	22	A A 77	45	50	46	A A 87	A A 58	A A 98	52	U G 30	39	32	40	37	42	20	20	18	27
14	A A 78	14	13	A A 63	15	19	25	46	A A 69	A A 79	A A 100	A A 65	A A 114	A A 136	A A 132	A A 148	34	A A 98	A A 73	44	E B 12	18	A A 82	14
15	21	20	13	11	E B 11	25	42	42	51	A A 88	A A 68	42	A A 68	53	U G 33	36	33	27	27	18	24	13	21	32
16	21	18	17	E B 10	13	19	26	34	33	39	A A 51	A A 63	A A 64	A A 70	41	36	34	50	23	E B 12	23	17	29	A A 69
17	A A 87	A A 66	11	E B 10	14	18	A A 63	45	A A 100	A A 93	A A 87	A A 162	A A 85	A A 85	A A 97	65	71	56	34	14	19	41	22	A A 62
18	18	A A 98	A A 62	21	29	26	33	40	56	50	A A 69	38	A A 53	A A 55	42	43	48	43	A A 63	19	15	40	23	24
19	24	38	16	17	14	18	A A 72	A A 75	A A 125	A A 89	A A 56	56	A A 58	A A 107	39	A A 50	34	A A 86	32	14	27	19	24	19
20	13	28	15	17	A A 83	19	36	39	A A 93	42	40	37	42	37	38	32	28	26	21	13	13	14	14	22
21	E S 13	14	13	14	14	18	G 14	25	37	38	38	39	G 29	47	A A 65	44	A A 133	28	A A 126	A A 105	17	17	14	18
22	13	17	18	23	18	16	42	56	46	46	56	39	42	48	54	50	41	42	40	43	46	16	A A 89	A A 89
23	31	15	E B 12	18	13	15	28	A A 100	A A 101	A A 150	A A 137	U G 33	39	38	G	37	G	32	23	A A 85	20	21	A A 58	A A 80
24	17	18	16	27	22	23	46	42	43	A A 68	A A 47	41	38	A A 53	37	40	40	46	A A 117	A A 74	A A 95	23	A A 118	16
25	18	14	13	E B 12	15	18	28	35	38	52	39	A A 56	A A 69	38	41	A A 115	A A 110	53	A A 86	A A 72	21	16	15	25
26	16	18	18	E B 10	15	22	27	52	48	A A 66	A A 112	50	55	45	35	44	39	27	28	15	15	E B 11	E B 11	21
27	17	16	E B 10	E B 10	13	18	28	42	51	58	47	39	38	A A 85	37	A A 153	41	A A 130	A A 145	32	37	25	17	15
28	A A 65	25	25	13	28	23	A A 61	30	A A 76	42	49	G 35	A A 75	A A 68	A A 88	42	42	G	27	28	A A 88	44	21	16
29	13	14	19	14	15	25	26	26	33	35	42	44	G 30	G 28	G	G	43	55	28	18	16	E B 10	14	14
30	14	15	18	22	13	17	26	42	A A 74	42	A A 121	U Y 39	G	37	G	39	44	38	A A 112	17	15	16	A A 104	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	18	17	16	15	15	18	28	42	51	50	A A 54	48	47	48	41	42	41	42	34	19	20	20	22	20
U Q	25	27	18	21	17	22	A A 46	A A 50	A A 74	A A 68	A A 87	A A 59	A A 68	A A 68	A A 54	A A 50	48	A A 59	A A 54	42	30	28	A A 29	A A 28
L Q	13	E 14	13	E B 13	14	18	26	35	41	42	42	39	38	38	G 37	37	34	28	25	15	15	16	16	16

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

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

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 310	300	F 305	F 315	S 320	355	335	A	A	A	315	A	290	285	280	295	300	320	S 325	330	320	305	275	F 285
2	F 280	F 280	F 335	315	320	325	260	325	345	305	270	G	255	Y	320	315	300	S 320	S 330	S	295	310	S 315	310
3	F 310	315	305	280	F 285	J R 340	J R 355	G	300	320	U R 285	290	285	320	A	300	A 305	A	310	320	320	A	J S 265	J S 295
4	J S 290	J S 290	S 280	305	330	355	345	270	330	A	A	A	310	305	320	A	310	315	300	I S 300	S 305	325	300	300
5	295	F 300	F 315	F 295	F 345	300	335	360	285	310	310	J R 325	315	295	A	290	285	A	305	305	315	S 330	315	295
6	315	F 320	F 325	F 315	U S 330	335	360	340	A	A	A	A	A	A	A	320	A	A	320	330	J S 315	315	S 300	310
7	290	F 290	F 310	F 315	J S 370	A	A	R 295	280	285	335	A	A	A	290	310	320	315	320	S 315	315	300	305	F 295
8	285	F 310	F 330	F 330	J S 320	310	345	A	300	325	340	275	A 310	275	285	310	340	340	A	S 315	300	S 305	F 290	295
9	315	325	315	300	J S 320	J R 320	310	310	A	325	A	310	310	335	J R 290	310	A	A	S 310	U S 295	315	J F 315	F 290	J S 310
10	F 305	F 310	F 300	F 310	J S 270	300	305	310	335	310	320	A	310	275	310	A	295	A	315	S 305	290	295	320	S 290
11	F 320	F 285	F 275	F 305	A	A	A	320	A	A	A	A	A	A	330	J R 275	305	315	320	330	300	290	F 260	A
12	305	F 300	A	A	U S 300	S 280	A	A	A	U R 325	A	A	A	A	270	305	275	305	S 335	315	285	285	J S 295	F 265
13	F 305	F 280	F 275	S 315	U S 295	295	A	J R 290	320	R 300	A	A	A	295	315	325	310	315	295	285	J R 305	S 290	F 300	280
14	A	J F 285	F 310	A	F 270	305	295	320	A	A	A	A	A	A	A	A	320	A	A	300	315	F 300	A	F 295
15	F 275	F 310	F 285	J F 285	J F 295	325	320	285	305	A	A	300	A	295	295	315	325	325	330	S 335	U S 320	335	285	F 300
16	F 275	F 300	F 310	F 280	J S 305	315	310	330	335	345	A	A	A	A	310	J R 290	330	310	315	325	275	F 275	F 300	A
17	A	A	J F 295	F 305	305	340	A	320	A	A	A	A	A	A	A	265	J R 300	320	325	315	300	J S 280	F 270	A
18	F 280	A	A	265	U S 255	U S 280	305	265	U R 300	310	A	G	A	A	295	315	R 345	325	A	320	J F 280	310	F 300	F 285
19	F 290	325	285	F 275	F 255	S 280	A	A	A	A	A	A	A	A	U R 300	A	285	A	300	295	280	J S 300	U S 295	F 285
20	F 295	F 300	395	310	A	F 270	F 270	R 240	A	295	R 250	G	270	R 260	G	G	315	275	295	J R 330	305	315	F 285	F 285
21	F 290	285	F 295	330	S 350	350	360	320	J R 315	275	270	305	320	320	A	320	A	320	A	A	290	295	315	S 310
22	310	320	310	340	S 330	365	305	325	310	285	320	315	305	325	315	315	300	S 305	315	J S 340	F 320	F 300	A	A
23	S	F 295	F 320	F 315	F 295	345	290	A	A	A	A	325	U R 250	285	295	315	330	315	330	A	J S 350	J F 280	A	A
24	F 295	F 305	F 315	J R 285	J S 260	S 300	F 360	345	335	A	A	290	285	A	295	315	310	310	A	A	A	330	A	340
25	F 310	F 295	J F 290	F 310	J S 300	F 305	310	335	370	360	340	A	A	U R 295	305	A	A	320	A	A	F 325	F 320	J F 305	F 300
26	J F 290	F 310	J F 280	F 315	J F 270	J F 305	335	345	310	A	A	305	A 260	280	290	310	325	280	315	S 315	355	285	F 270	F 285
27	J F 285	F 330	F 300	F 295	S 315	F 285	340	315	290	300	300	280	290	A	305	A	305	A	A	300	U S 315	335	F 315	F 320
28	A	F 285	F 315	F 315	F 330	345	A	345	A	305	R 270	315	A	A	A	325	J R 290	J R 305	305	U S 345	A	F 290	F 275	F 300
29	F 320	F 310	F 295	F 310	J F 245	280	295	330	310	315	J R 325	255	295	290	310	300	300	305	310	345	335	305	305	310
30	295	310	285	275	J F 280	310	F 345	J R 320	A	290	A	275	330	315	280	355	310	290	A	S 345	325	F 300	F A	F 300
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	28	28	28	28	28	23	25	18	19	14	17	17	17	23	24	26	22	22	25	28	29	25	25
MED	F 295	F 300	F 305	F 310	S 302	310	320	320	310	310	312	290	295	295	295	310	308	315	315	315	315	300	300	F 295
U Q	F 310	310	F 315	F 315	S 325	340	345	332	335	325	325	312	310	318	310	315	320	320	325	S 330	320	315	305	310
L Q	F 290	F 290	F 288	290	J F 275	298	305	292	300	295	270	G 265	278	282	290	298	300	305	305	302	298	290	F 280	F 285

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	375	A	380	R	A	A	A	365	U L 350					
2							L 375	A	A	395	395	R 430	U R 465	Y	400	Y	A	A						
3								365	A	370	A	A	A	A	A	370	A	A	L					
4							U L 370	U L 355	A	A	A	A	A	A	A	A	A	A	L					
5							U L 365	A	A	330	A	420	L 345	A	A	A	415	A	A					
6						L	380	A	A	A	A	A	A	A	A	A	A	A						
7						A	A	A	A	A	A	A	A	A	355	A	A	350	L					
8							L	A	A	A 320	415	A	A	A	A	345	365	385	A					
9						L	A	A	A	A	A	A	A	360	A	A	A	A						
10							370	A	A	A	A	A	420	395	A	A	A	A						
11						A	A	A	A	A	A	A	A	A	A	R 355	A	A	A					
12							A	A	A	A	A	A	A	A	A	380	345	350	L					
13							A	A	A	A	A	A	A	A	Y	A 350	365	A	A					
14							345	A	A	A	A	A	A	A	A	A	375	A	A					
15							A	A	A	A	A	A 335	A	A	390	385	365	375	370					
16							L	385	405	415	A	A	A	A	A	360	375	A	L					
17							A	A	A	A	A	A	A	A	A	A	A	A	A					
18						A	A	A	A	A	A	405	A	A	A	A	A	A	A					
19						L	A	A	A	A	A	A	A	A	A	A	370	A	A	L				
20							A	A	A	A	A	395	A	385	U R 365	420	360	375	L					
21						U L 335	U L 405		395	410	420	385	355	A	A	A	A	L 350	A	A				
22							A	A	A	A	A	R 400	A	A	A	A	A	A						
23						460		A	A	A	A	Y	400	415	360	360	395	380	L	A				
24							A	A	A	A	A	360	395	A	A	A 370	A	A	A	A				
25							350	A 395	A 365	A	375	A	A	405	A	A	A	A	A	A				
26							L	A	A	A	A	A	A	A	390	A	A	L	L					
27							L	A	A	A	A	A	410	A	A 330	A	A 335	A	A					
28							A	390	A	A 325	A	R 390	A	A	A	A	A	385	355					
29						A	L 365	375	395	385	A	A	405	405	385	370	A	A	A					
30								A	A	A	A	Y	R 360	385	410	A	A	A	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						2	9	6	4	8	5	9	10	7	9	11	11	9	3					
MED						398	L 370	380	395	378	395	395	398	395	385	370	365	375	355					
U Q							L 378	390	400	402	418	412	410	405	395	380	375	382	370					
L Q							358	365	380	A 328	375	372	360	385	358	355	360	350	U L 350					

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	340	A	400	425	365	330	315	280	260					
2							U L 450	A 345	275	U L 400	455	G	Y	Y	345	325	330	A						
3								G	375	345	455	420	405	345	A	350	A	A	275					
4							280	425	305	A	A	A	370	A 360	330	A	330	305	295					
5							275	255	E A 440	355	325	305	360	385	A	345	425	A	A 300					
6						305	270	290	A	A	A	A	A	A	A	300	A	A						
7						A	A	360	E A 395	420	285	A	A	A	380	335	305	285	290					
8							275	A	A	300	315	A	A	435	365	315	270	275	A					
9						305	325	335	A	300	A	E A 350	365	335	390	350	A	A						
10							360	310	275	A 315	320	A	365	390	345	A	E A 375	A						
11						A	A	A 340	A	A	A	A	A	A	320	410	350	315	280					
12							A	A	A	335	A	A	A	A	450	360	405	310	250					
13							A	A 365	A 350	A	A	A	A	A 385	330	310	310	300	305					
14							420	315	A	A	A	A	A	A	A	A	320	A	A					
15							330	375	E A 365	A	A	380	A	365	370	360	310	305	275					
16							295	295	300	320	A	A	A	A	360	350	300	A 350	275					
17							A	A 300	A	A	A	A	A	A	A	A	A	A 285	A 275					
18						355	340	430	E A 400	345	A	G	A	A	390	325	285	A 320	A					
19						410	A	A	A	A	A	A	A	A	E A 390	A	400	A	335	300				
20							420	550	A	A	E A 540	G	E A 490	525	G	G	365	440	U L 320					
21						275	245		350	490	475	370	330	A 355	A	340	A	305	A	A				
22							330	E A 305	305	A 385	315	315	330	305	E A 355	325	345	295						
23						225		A	A	A	A	A 305	520	430	415	345	315	325	285	A				
24							E A 280	A 255	A	A	A	395	405	A	400	330	325	325	A	A				
25							325	270	250	A 285	330	A	A	415	365	A	A	E A 340	A	A				
26							265	A 285	E A 345	A	A	A 355	A	360	355	290	280	285	280					
27							275	300	A 355	E A 345	345	A	400	A	350	A	365	A	A					
28							A	275	A	370	E A 450	345	A	A	A	300	330	365	315					
29						385	330	290	305	320	295	535	355	345	325	335	310	315	285					
30								315	A	400	A	455	325	365	410	285	330	355	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						7	19	24	16	17	14	15	14	17	23	23	24	21	17	1				
MED						305	325	312	U 325	345	328	380	366	365	365	335	325	308	285	300				
U Q						385	340	362	E A 370	392	455	G 535	405	420	390	350	358	332	302					
L Q						275	275	290	302	318	315	345	355	350	345	315	310	290	275					

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	270	260	280	255	255	220	245	A	A	A	215	A	220	A	A	A	A	245	240	230	210	275	320	290
2	315	305	225	255	E A 320	250	235	A	A	215	215	205	190	Y	230	Y	A	A	E A 265	A 270	275	285	A 305	260
3	270	270	245	315	260	230	240	235	A	250	A	A	A	A	A	270	A	A	235	225	225	A	A 350	275
4	330	A 335	335	280	245	205	245	235	A	A	A	A	A	A	A	A	A	A	A 275	250	280	235	A 300	305
5	270	275	260	270	220	220	225	A	A	A	A	190	A	A	A	A	225	A	A	270	265	235	235	300
6	275	270	275	255	265	245	210	A	A	A	A	A	A	A	A	A	A	A	A 270	230	240	A 275	E A 345	A 290
7	E A 330	330	A 315	265	215	A	A	A	A	A	A	A	A	A	240	A	A	E A 255	E A 280	255	A 300	240	270	315
8	330	A 300	240	240	S 285	240	255	A	A	A	210	A	A	A	A	215	220	235	A	A	260	275	305	290
9	250	235	240	285	270	235	A	A	A	A	A	A	A	A 265	A	A	A	A	A 265	A	A	265	300	235
10	245	250	265	275	265	295	245	A	A	A	A	A	175	215	A	A	A	A	A	255	270	A 275	240	A
11	270	285	315	320	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	235	A	295	A 370	A
12	A	275	A	A	285	275	A	A	A	A	A	A	A	A	A	235	235	230	235	230	255	275	315	320
13	320	355	A 340	235	A 310	280	A	A	A	A	A	A	A	A	Y	A	255	A	A	A	260	300	285	340
14	A	260	255	A	A 320	245	245	A	A	A	A	A	A	A	A	A	230	A	A	A	230	250	A	270
15	A 320	310	290	275	285	260	A	A	A	A	A	A	A	A	230	195	245	245	A 245	235	270	230	335	350
16	325	270	255	265	270	235	235	220	205	220	A	A	A	A	A	245	245	A	230	225	310	300	320	A
17	A	A	220	255	260	230	A	A	A	A	A	A	A	A	A	A	A	A	A	250	270	E A 290	315	A
18	295	A	A	330	A	A	A	A	A	A	A	205	A	A	A	A	A	A	A	260	300	A	290	305
19	315	A	305	310	330	260	A	A	A	A	A	A	A	A	A	A	240	A	A	255	310	300	330	335
20	260	330	195	310	A	360	A	A	A	A	A	210	A	230	A	210	205	215	245	240	265	260	275	345
21	325	315	305	260	240	225	215	195	215	215	195	230	Y 280	A	A	A	A	225	A	A	265	270	225	280
22	270	265	275	280	A 285	215	A	A	A	A	A	225	A	A	A	A	A	A	A 265	A 245	E A 295	225	A	A
23	A	280	245	255	280	185	230	A	A	A	A	A	220	210	260	250	215	A 255	250	A	240	280	A	A
24	310	270	270	A 330	330	A 295	A	A	A	A	A	255	215	A	A	A	A	A	A	A	A	255	A	245
25	285	260	250	255	255	240	265	A	A	A	A 250	A	A	225	A	A	A	A	A	A	255	260	255	310
26	300	280	285	245	285	255	245	A	A	A	A	A	A	A	185	A	A	215	A	260	220	240	300	320
27	A 330	230	240	275	270	290	A 270	A	A	A	A	A	225	A	A	A	A	A	A	A	E A 340	240	255	240
28	A	330	275	260	250	A 280	A	215	A	A	A	Y 245	A	A	A	A	A	225	250	A 250	A	A 330	285	265
29	250	255	295	280	A 310	A	230	210	215	220	A	A	195	205	230	250	A	A	A	225	225	250	265	255
30	265	285	310	A 330	265	225	235	A	A	A	A	Y	Y	205	215	A	A	A	A	240	255	260	A	270
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	27	28	28	27	26	17	6	3	5	5	8	8	7	7	8	10	10	14	21	26	28	25	24
MED	290	275	272	272	270	242	240	218	215	220	215	218	218	215	230	240	232	230	248	245	262	265	300	290
U Q	322	310	300	298	A 285	275	245	235	215	235	232	238	222	230	240	250	245	A 245	A 265	255	280	282	320	318
L Q	270	260	245	255	255	225	230	210	205	215	202	205	192	205	215	212	220	225	240	230	240	245	268	268

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A 110	110		105	100	105	105	110	115	105	105	A	A	A	B				
2						A	A 105		A	100	105	110	110	A	A	A	A	A	A	B				
3						A	A 110		A 125	115	A	A	110	110	110	110	110	110	A	B				
4						A	115	105	A	105	A	A	A	105	110	A	100	110	A	S				
5						A	115	105	105	105	105	A	A	A	105	130	120	105	A	B				
6						A	115	110	110	110	105	105	105	105	110	105	A	A	A	B				
7						A	110	105	105	A 125	110	105	110	105	110	110	110	110	110	S				
8						A	A	100	100	A	A	105	105	105	A	A 115	110	110	A	B				
9						A	110	105	A	105	A	A	100	100	A	100	110	110	A	S				
10						120	110	A	110	110	110	A	A	A	110	105	A	A	A	B				
11						A	A	100	A	105	105	A	A	A	105	105	110	110	110	B				
12						A	105	105	100	105	100	A	A	A	A	A 130	A	105	A	B				
13						A	110	110	105	A	A	A	A	A	A	105	A	130	110	B				
14						A	125	A 120	105	105	105	105	105	105	A	110	110	A	A	B				
15						A	110	110	110	100	110	110	110	A	A	A	A 125	110	110	B				
16						A	110	105	A	A	A	A	A	A	A	110	115	110	A	B				
17						A	110	105	105	105	105	105	105	110	110	100	100	105	A	B				
18					115	105	105		105	105	A	A	A 125	A	105	105	105	105	A	B				
19						A	110	110	110	100	100	100	100	105	105	105	105	A	110	B				
20						A	110	110	105	105	105	110	A	110	100	A	A	110	115	B				
21						A	A 125	A	120	110	A 135	A	A	110	110	110	105	105	A	B				
22						A	110	105	105	105	100	100	100	105	A	105	105	100	A	B				
23						A	125	95	95	100	A	A	115	110	115	115	110	110	A	B				
24						A	110	110	100	100	A	100	A	A	A	A 125	A	A	A	B				
25						S	110	100	105	A	A	105	A	A	110	110	110	A	A	B				
26						115	110	110	100	100	A	A	A	A	A	A	A	A	A	B				
27						A	110	105	105	105	A	105	105	A	105	105	105	A	A	B				
28						A	105	110	100	A	A	A	A	A	A	A	A	110	A	B				
29						A	A	A	A	135	A	A	110	A 125	110	105	105	105	A	B				
30						A	A 105		105	105	105	100	110	110	110	105	105	105	A	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						3	24	27	24	25	16	15	17	16	18	24	20	20	6					
MED						115	110	105	105	105	105	105	110	108	110	105	110	110	110					
U Q						120	112	110	108	108	108	105	110	110	110	110	110	110	110					
L Q						115	110	105	102	100	105	100	105	105	105	105	105	105	110					

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S 105	100	105	100	100	125	120	120	110	125	130	120	135	130	120	115	110	110	105	100	105	105	105	110
2	105	105	95	95	95	105	100	115	115	115	G	G	G 110	110	110	110	110	100	95	95	95	95	95	115
3	100	100	100	100	105	95	105	130	135	130	125	115	115	115	110	120	115	110	110	105	110	100	110	105
4	105	100	100	105	120	120	110	115	105	100	100	115	115	115	140	140	110	110	125	105	110	105	100	100
5	B 95	100	100	105	130	125	110	110	105	115	110	115	110	125	E G 160	135	110	110	100	105	100	100	100	100
6	110	105	105	105	120	115	G	125	120	110	110	110	110	110	110	110	105	105	105	100	100	110	110	100
7	100	100	100	100	115	125	115	115	115	115	110	110	120	115	130	115	115	115	110	100	100	105	115	105
8	100	100	100	95	100	130	110	105	105	110	105	110	110	110	105	100	170	115	110	105	110	105	105	105
9	125	S 100	100	100	95	125	110	110	105	100	100	110	105	115	105	120	110	110	105	110	110	110	110	105
10	100	B 105	95	105	115	115	115	110	110	110	110	110	115	110	110	100	110	115	105	105	100	100	100	100
11	110	105	110	125	115	120	115	110	105	105	105	100	100	100	110	135	120	115	110	100	95	115	105	105
12	100	110	100	100	100	115	115	105	110	110	110	100	100	100	105	130	125	115	110	100	115	100	100	110
13	100	100	100	110	100	125	115	115	115	150	105	105	110	125	100	130	135	115	110	105	105	105	100	100
14	100	115	100	100	115	100	135	125	115	110	110	110	100	130	105	110	130	105	100	100	B	110	110	110
15	95	95	100	100	105	115	115	115	110	105	105	110	105	120	110	110	130	125	115	115	110	110	100	100
16	100	110	95	95	105	145	125	115	105	115	110	100	105	100	105	130	125	115	120	100	115	115	110	110
17	100	100	110	105	100	105	125	125	115	110	110	105	105	115	110	110	110	110	110	110	115	110	115	105
18	100	100	100	100	100	115	120	110	105	105	105	110	120	115	115	110	110	110	105	105	110	115	110	110
19	100	100	100	95	100	125	115	115	110	110	110	115	115	110	125	120	140	110	110	105	100	120	100	100
20	100	100	95	115	110	120	115	115	115	115	115	115	115	110	140	105	100	120	125	90	95	110	130	110
21	100	100	100	105	100	100	100	115	140	130	125	180	105	125	115	115	110	110	100	105	150	120	110	105
22	140	100	95	95	95	110	120	110	115	110	105	110	110	105	105	105	135	110	110	115	110	125	105	100
23	100	95	90	105	95	95	150	110	105	100	100	105	175	120	G	190	G 115	110	110		110	105	105	100
24	100	100	100	100	125	125	110	105	105	105	110	110	110	110	110	125	125	115	105	105	110	110	110	105
25	105	110	105	105	105	115	125	115	115	110	110	110	100	125	120	110	110	110	110	105	105	105	105	100
26	100	100	100	100	95	125	115	110	110	100	105	105	110	105	100	100	105	110	95	110	100	110	115	110
27	105	105	100	100	100	130	120	115	110	110	115	115	120	110	110	115	115	115	110	105	105	100	115	115
28	95	95	95	95	120	115	115	120	110	105	100	110	105	105	100	100	95	G 115	110		110	110	110	110
29	105	105	110	100	100	95	100	100	100	150	95	95	100	100	G	G	115	110	115	95	105	95	100	110
30	105	105	100	95	140	120	110	110	110	110	105	135	G	130	G	125	115	115	110	135	110	110	110	120
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	30	30	30	30	29	30	30	30	29	29	28	30	27	29	29	29	30	30	29	30	30	30
MED	100	100	100	100	102	118	115	115	110	110	110	110	110	110	110	115	115	110	110	105	110	110	108	105
U Q	105	105	100	105	115	125	120	115	115	115	110	115	115	120	120	128	128	115	110	110	110	110	110	110
L Q	100	100	100	95	100	110	110	110	105	105	105	105	105	110	105	110	110	110	105	100	100	105	100	100

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

IONOSPHERIC DATA STATION KOKUBUNJI

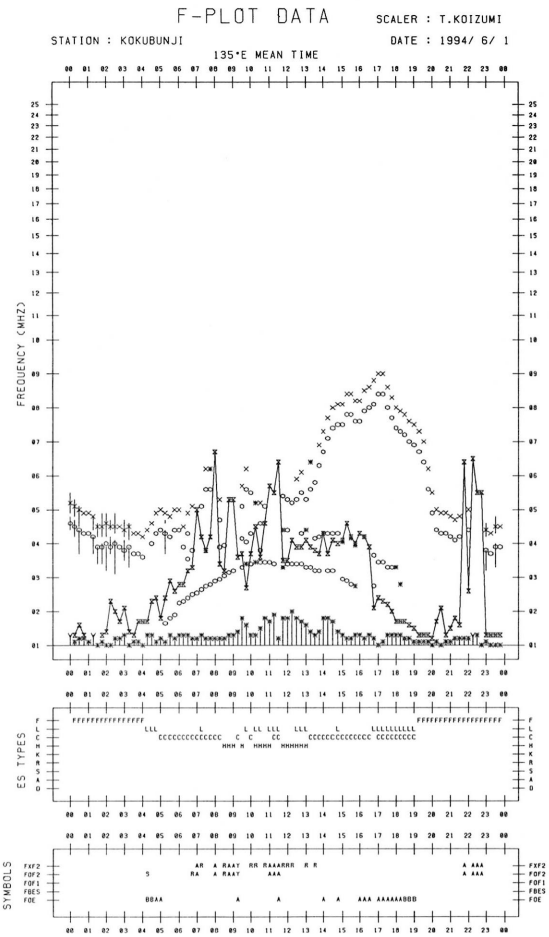
JUN. 1994 TYPES OF ES 135°E MEAN TIME (G.M.T. + 9H)

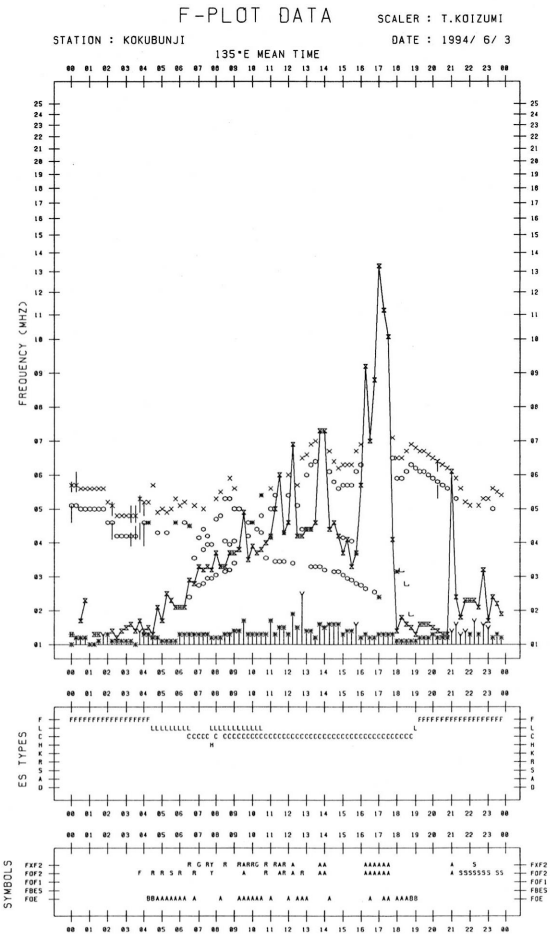
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHZ TO 25.0MHZ IN 24.0SEC IN MANUAL SCALING

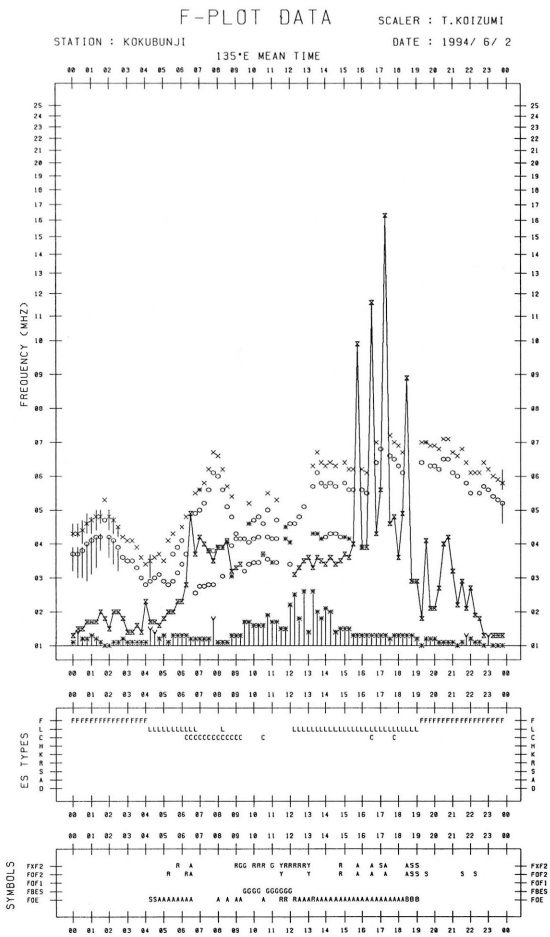
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		F 3	FF 22	F 6	F 4	C 1	C 2	C 2	C 2	H 2	C 1	HL 11	H 1	HL 11	C 1	C 1	C 2	LC 21	LC 31	LC 21	F 2	F 3	F 3	F 2
2	FF 32	FF 32	FF 42	FF 21	FF 21	L 1	L 3	C 3	C 1	C 1				L 1	L 1	L 1	L 2	L 4	L 3	L 3	F 4	F 5	F 3	F 1
3	FF 11	F 3	F 3	F 2	F 2	L 4	L 3	C 1	CL 11	CL 11	CL 11	C 1	C 2	C 2	C 2	C 1	C 3	C 3	C 2	L 3	F 3	F 3	F 3	F 2
4	F 4	F 4	F 3	F 2	FF 21	C 1	C 3	C 1	C 2	C 3	C 3	CL 23	C 1	C 1	H 1	HC 12	C 2	C 3	CL 24	L 4	F 4	F 5	F 4	F 4
5		F 2	F 3	F 3	F 3	C 1	CL 11	C 2	C 2	C 1	C 1	C 1	C 2	C 1	C 2	HL 11	HL 11	C 3	C 4	L 4	F 4	F 4	F 5	F 4
6	F 2	F 2	F 1	F 2	F 2	C 1		C 2	C 1	C 2	C 2	C 3	C 2	C 3	C 2	C 2	C 3	L 4	L 3	L 5	F 4	FFF 42	FFF 42	F 6
7	F 5	F 5	F 5	F 3	F 1	C 2	C 3	C 2	C 2	CL 11	C 2	C 2	C 1	C 2	C 1	C 2	C 2	C 1	C 3	C 5	F 4	F 1	F 5	F 8
8	F 7	F 4	F 6	F 6	F 2	C 1	C 2	C 2	C 3	C 2	L 1	C 1	C 2	C 1	C 1	L 1	H 1	C 1	C 4	CL 52	F 3	F 6	F 2	F 4
9	FF 11		F 2	F 5	F 4	C 2	C 4	C 3	C 3	C 2	L 2	L 1	C 2	C 1	C 2	C 2	C 3	C 3	C 4	LC 42	FF 23	F 2	F 4	FF 41
10	FF 32		F 2	F 3	F 2	C 2	C 2	C 2	C 3	C 2	C 2	C 2	L 1	L 1	L 2	C 3	C 2	L 4	L 4	L 4	F 3	F 4	F 3	F 5
11	FF 23	F 4	FF 22	FFF 34	FFF 34	C 4	C 4	C 2	C 2	C 2	C 3	L 2	L 2	LC 21	C 2	H 1	C 2	C 2	C 3	C 5	FF 42	FF 34	F 4	FF 43
12	FF 52	F 5	F 4	F 4	F 4	L 3	C 3	C 4	C 3	C 2	C 2	L 2	L 2	L 1	L 1	CL 11	CL 12	C 1	C 3	L 2	FF 12	F 2	F 3	FF 23
13	F 4	F 6	F 5	FF 21	FF 32	L 2	C 3	C 3	C 3	HL 11	C 2	C 3	L 1	CL 12	L 1	H 1	CL 11	CL 21	C 3	C 4	FF 32	F 5	F 3	F 4
14	F 5	FF 33	F 3	F 4	FF 24	L 4	CL 22	CL 32	C 2	C 2	C 2	C 2	C 2	CL 22	L 3	C 3	H 1	C 3	L 4	L 4		F 3	F 5	FF 24
15	F 5	F 3	F 2	F 2	F 2	C 2	C 2	C 2	C 3	C 2	C 2	C 1	C 2	CL 11	L 1	HL 11	CL 11	C 1	C 3	C 2	F 4	FF 21	F 3	F 4
16	F 4	FF 23	FF 31	F 2	FF 21	C 1	H 1	C 1	L 1	C 1	C 2	C 2	C 2	C 3	L 1	C 1	CL 11	C 2	CL 11	L 2	F 4	FF 42	F 7	F 7
17	F 6	F 4	FF 11	F 2	F 2	L 1	C 3	C 2	C 3	C 3	C 2	C 3	C 2	C 3	C 3	C 2	C 2	C 4	C 4	C 5	F 4	F 3	F 5	F 6
18	F 3	F 5	F 4	F 4	F 4	C 2	C 3	C 2	C 3	C 2	L 1	C 1	CL 21	C 2	C 1	C 2	C 2	C 2	C 4	C 4	F 3	F 6	F 4	F 4
19	F 4	F 4	FF 32	F 3	F 3	CL 11	C 3	C 3	C 3	C 3	C 1	C 1	C 2	C 2	C 1	C 2	H 1	C 2	C 4	L 3	F 4	F 3	F 4	F 4
20	F 2	F 4	F 4	F 3	F 3	C 3	CH 21	C 2	C 3	C 1	C 1	C 1	C 1	C 1	C 1	L 2	L 2	C 1	CL 22	L 2	F 1	F 2	FF 11	F 4
21	F 3	F 2	F 2	F 2	F 2	L 1	L 1	CL 12	HL 11	H 1	CL 11	HL 11	L 1	H 1	C 2	C 2	C 3	C 2	L 4	L 5	FF 12	FF 52	F 2	FF 41
22	FFF 13	F 2	F 3	F 4	F 3	L 1	C 3	C 3	C 2	C 2	C 2	C 1	C 1	C 2	C 2	C 3	C 2	C 3	C 4	C 4	F 5	F 1	F 4	F 4
23	F 4	F 2	F 2	FF 22	FF 21	LL 11	HL 11	C 4	C 3	C 3	L 2	L 1	H 1	C 1		H 1		C 2	CL 32	CL 52	FF 32	F 4	F 5	F 6
24	F 5	F 5	FF 42	FF 42	FF 24	CL 22	C 3	C 3	C 2	C 3	C 1	C 2	L 1	L 1	L 1	CL 22	CL 12	CL 22	CL 42	CL 43	FF 34	FF 23	F 3	F 3
25	F 4	F 4	F 5	F 3	F 2	L 2	C 2	C 1	C 2	C 3	C 2	C 2	L 2	CL 11	C 2	C 3	C 3	C 3	C 5	C 4	F 4	F 6	F 6	F 6
26	F 3	F 5	F 3	F 2	F 2	CL 11	C 4	C 3	C 3	C 2	C 2	C 2	L 1	L 1	L 1	L 2	LL 22	L 1	L 4	LL 22	FF 11	F 2	F 1	F 2
27	F 4	F 4	F 2	FF 22	FF 32	C 1	C 3	C 3	C 3	C 2	C 1	C 1	C 1	C 3	C 2	C 2	C 3	C 2	C 3	L 4	F 3	F 4	FFF 13	FFF 12
28	F 4	F 3	FF 32	F 2	FF 13	C 3	C 3	C 1	C 2	C 2	LC 21	L 1	L 2	L 2	L 2	L 2	L 2		C 3	CL 42	FF 42	FF 52	F 4	F 4
29	F 3	F 2	FF 12	FF 22	F 3	L 3	L 1	L 2	L 2	HL 12	L 2	L 2	L 1	L 1			C 2	C 2	CL 24	L 3	F 2	F 2	F 3	FF 21
30	FF 22	FF 21	F 4	F 4	F 2	C 1	LC 11	C 3	C 3	C 3	C 3	C 1		H 1		H 1	C 2	C 3	C 4	CL 43	F 3	F 5	F 5	FF 32
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																								

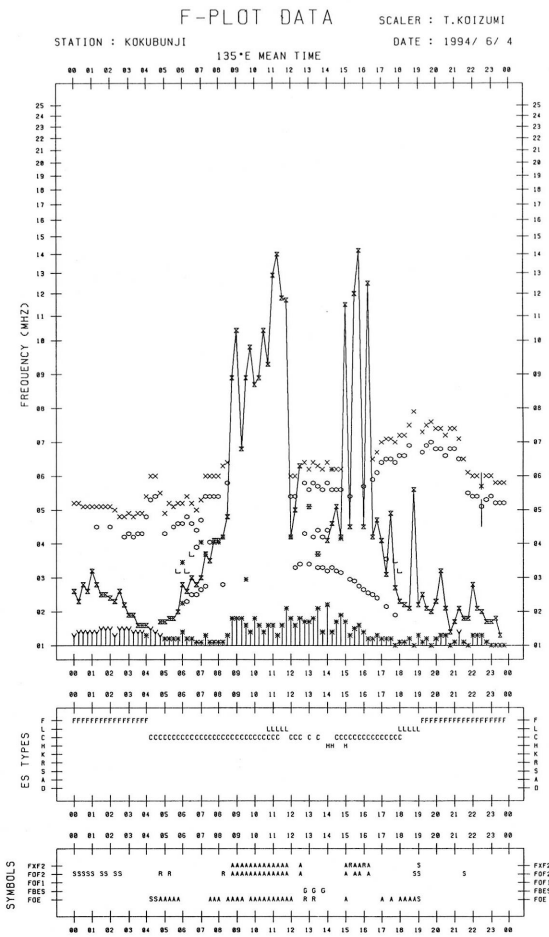
f-PLOTS OF IONOSPHERIC DATA

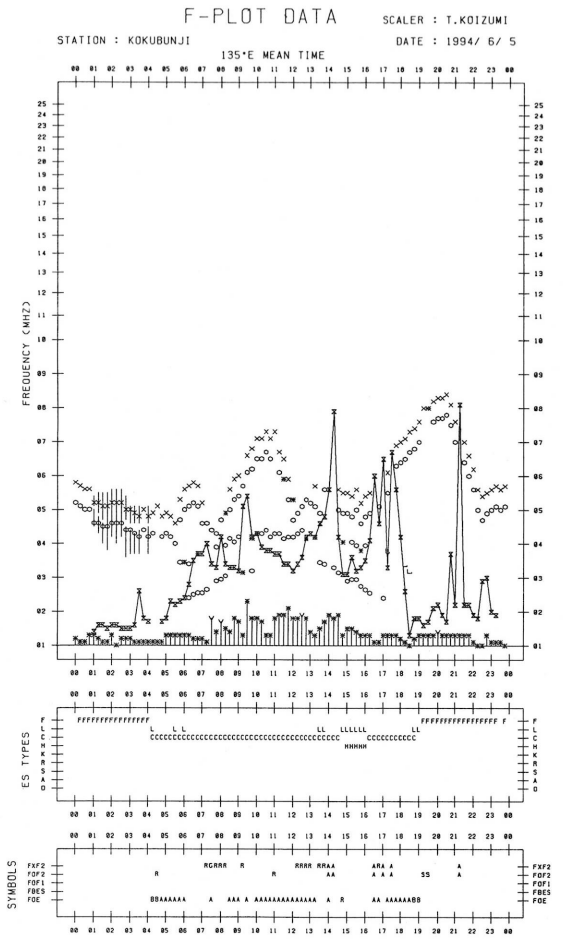
KEY OF F-PLOT	
	SPREAD
	FOF2, FOF1, FOE
	FXF2
	DOUBTFUL FOF2, FOF1, FOE
	FBES
	ESTIMATED FOF1
	FMIN
	GREATER THAN
	LESS THAN

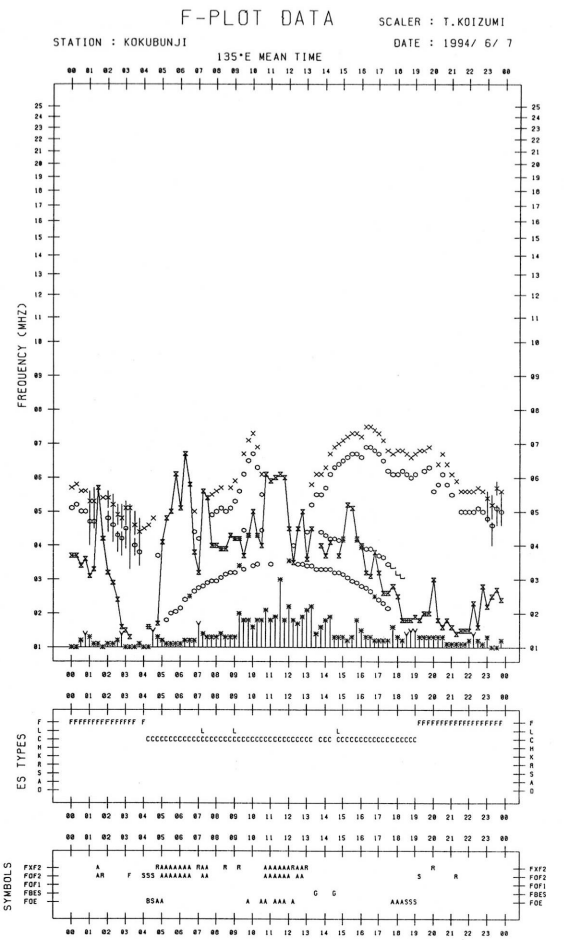

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/ 1
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FQE

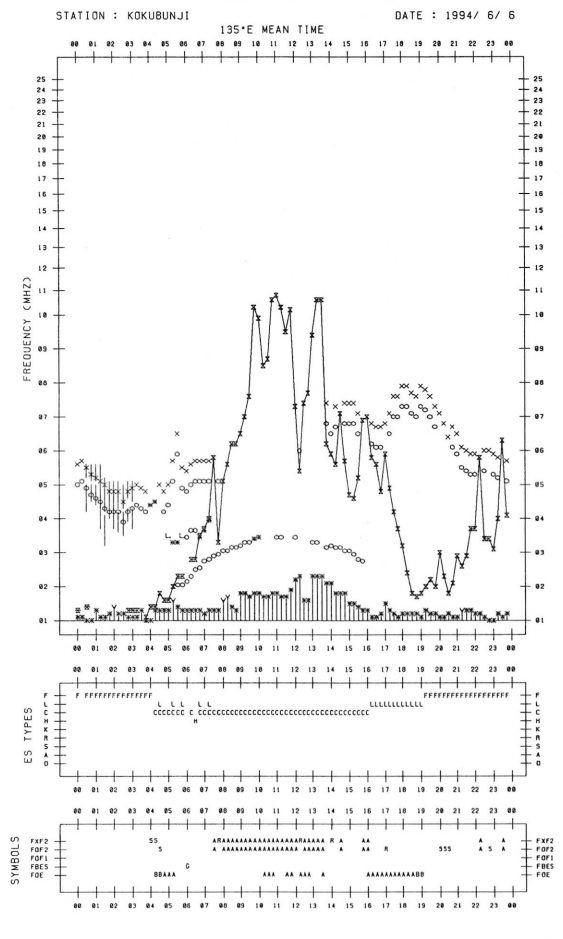

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/ 3
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FQE

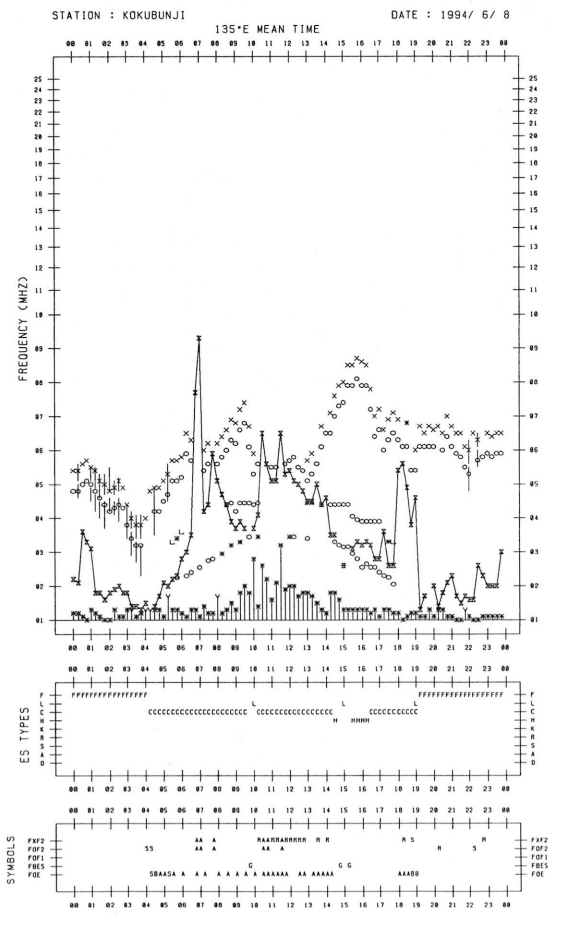

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/ 2
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FQE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/ 4
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FQE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/ 5
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/ 7
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/ 6
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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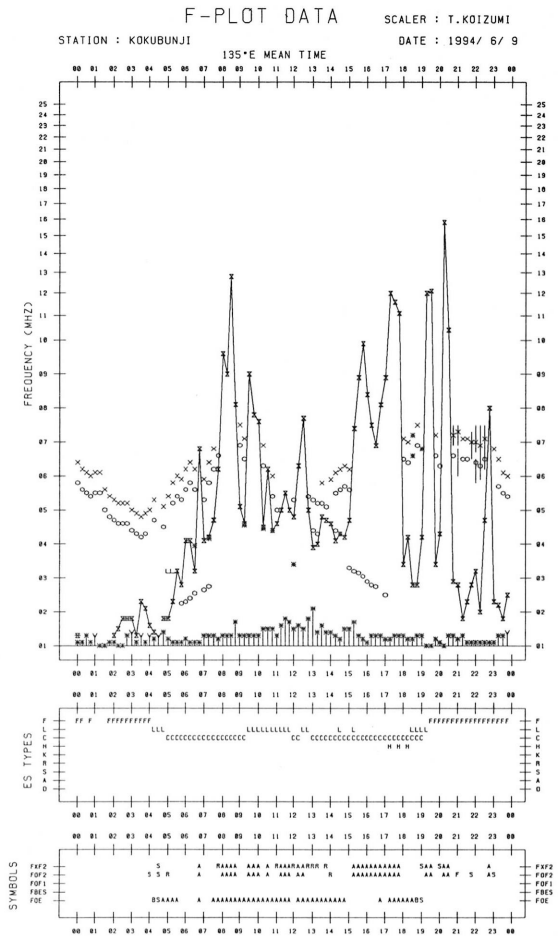
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/ 8
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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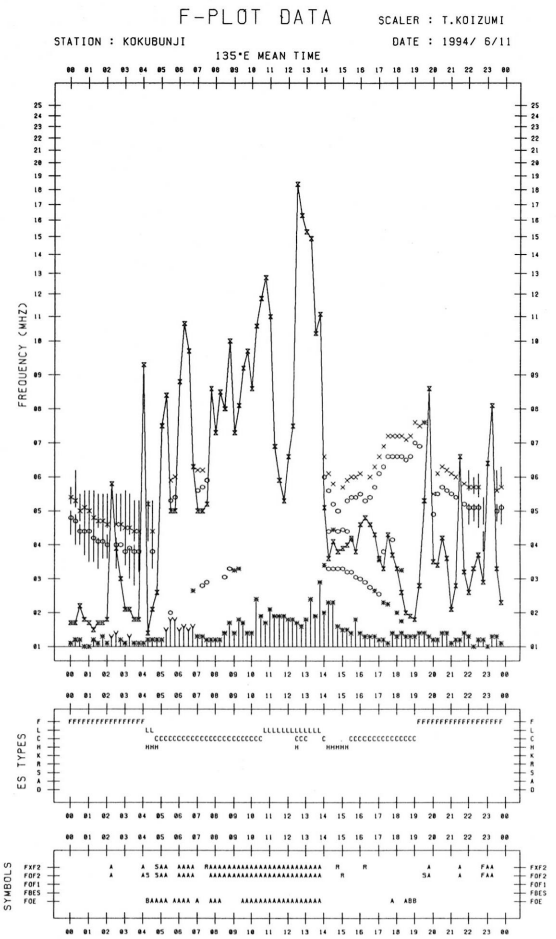
STATION : KOKUBUNJI
DATE : 1994/ 6/ 9
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS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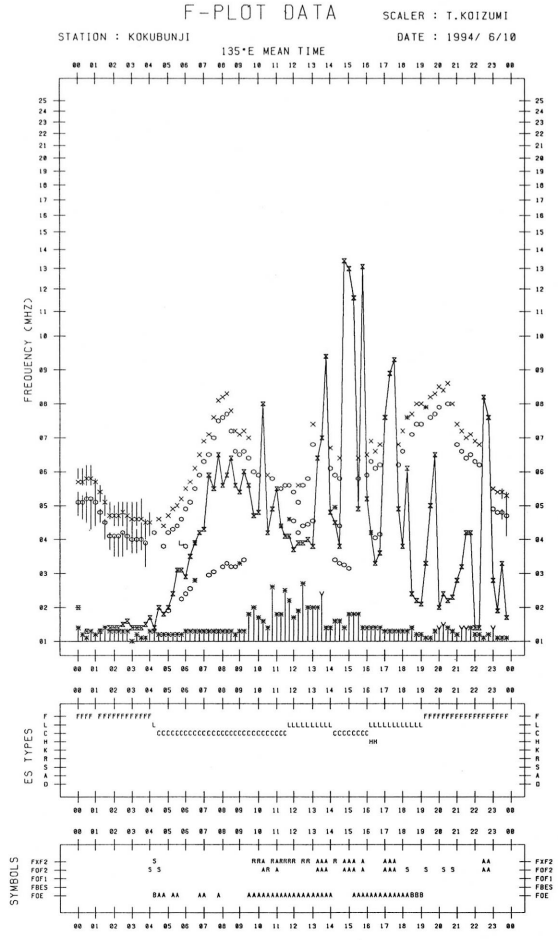
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/11
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS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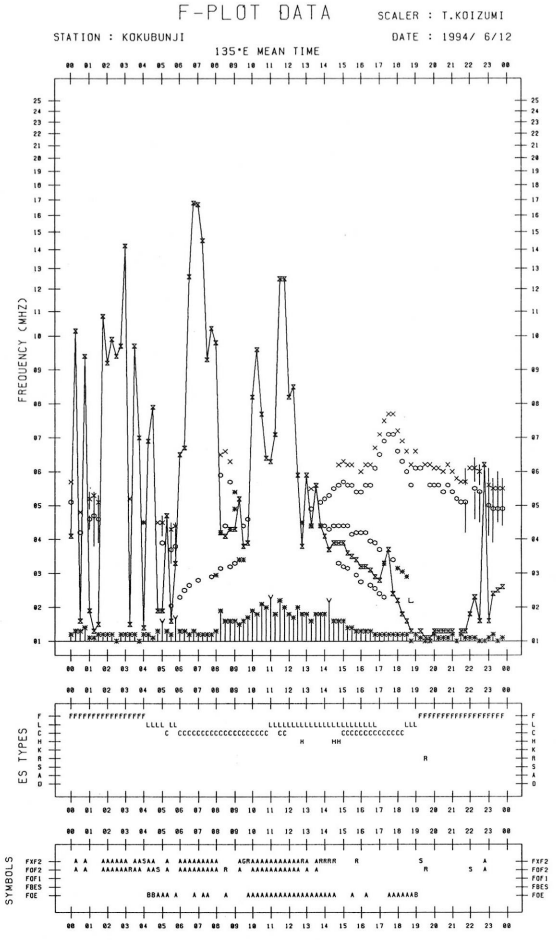
STATION : KOKUBUNJI
DATE : 1994/ 6/10
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS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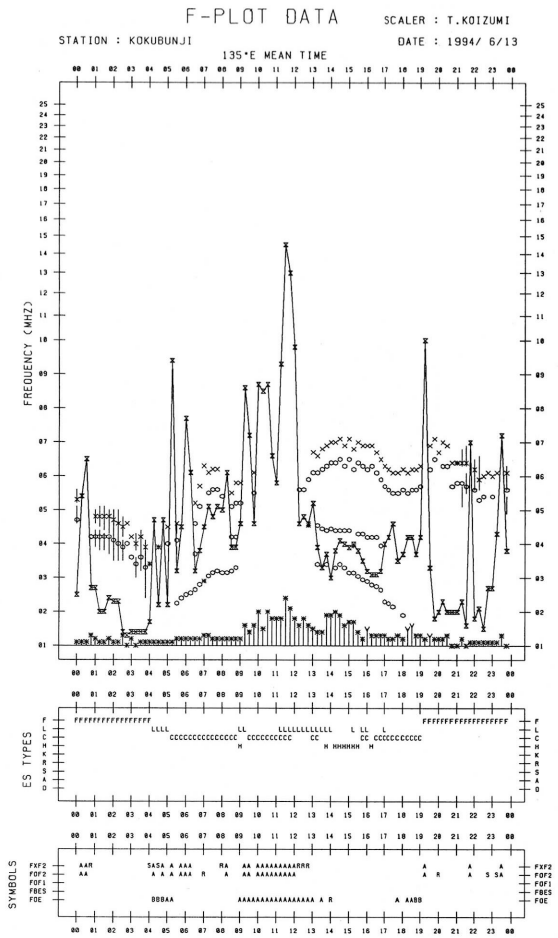
STATION : KOKUBUNJI
DATE : 1994/ 6/12
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS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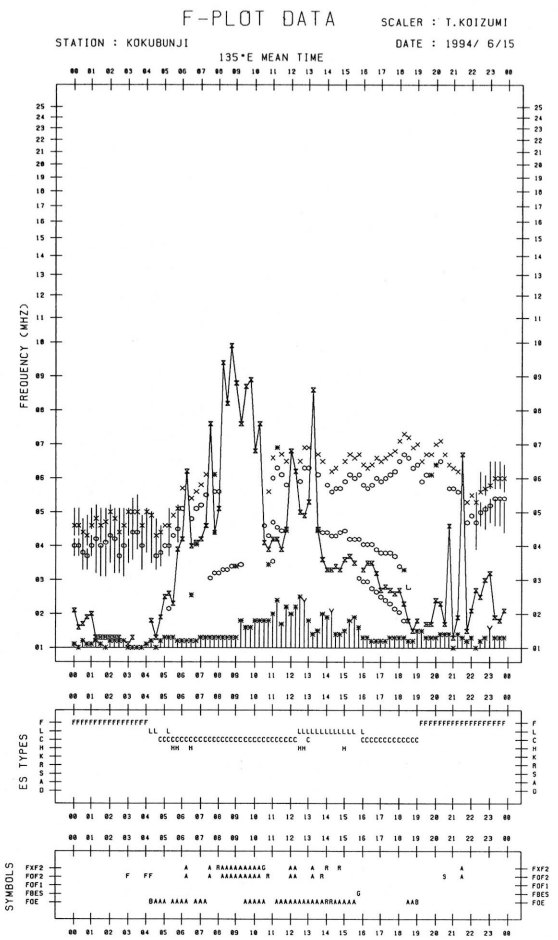
STATION : KOKUBUNJI
DATE : 1994/ 6/13
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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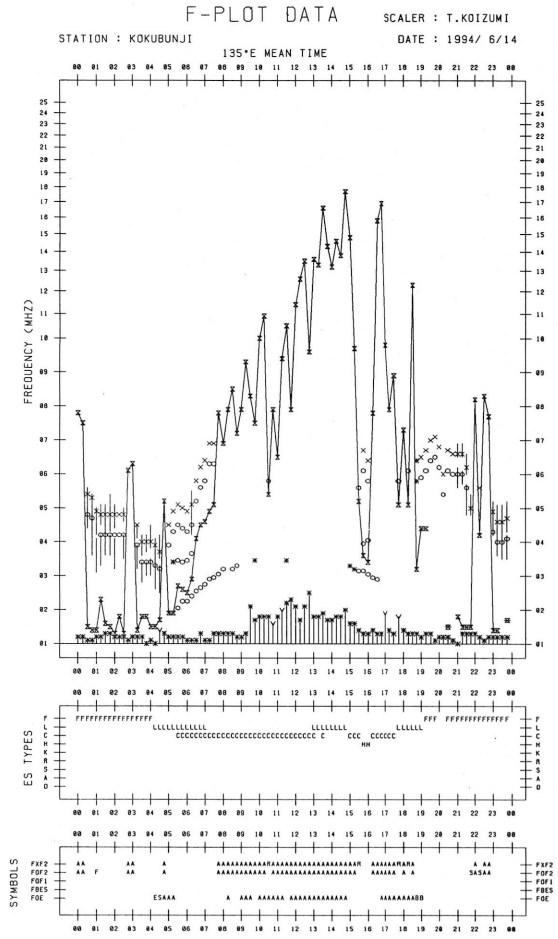
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/15
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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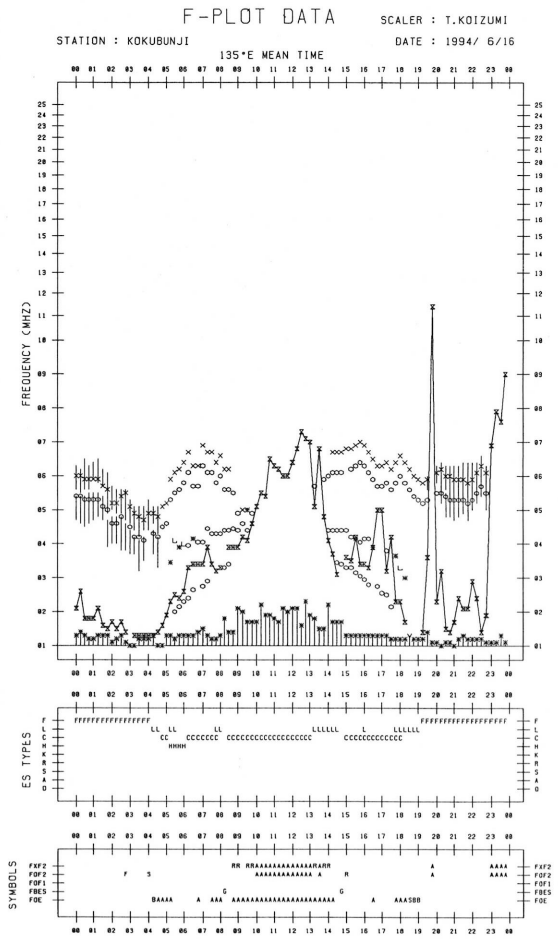
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/14
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
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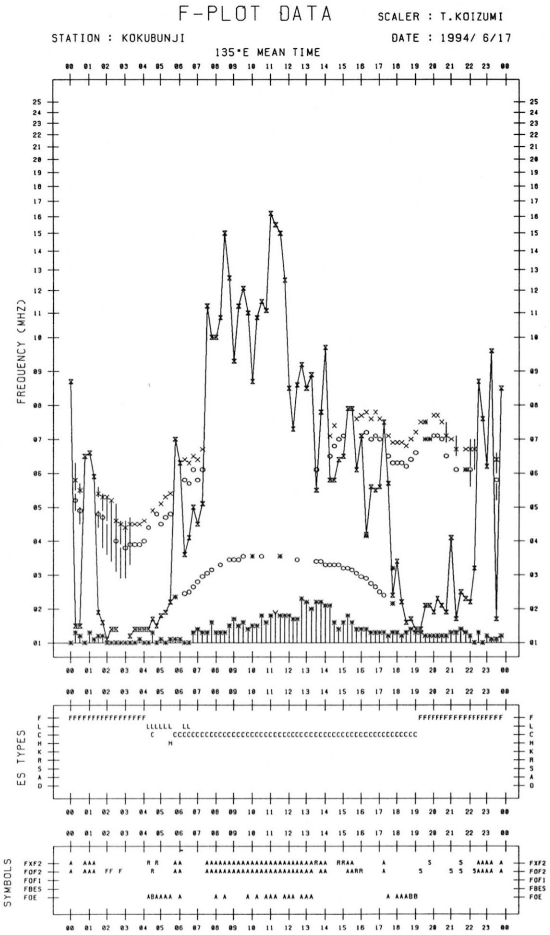
STATION : KOKUBUNJI
DATE : 1994/ 6/16
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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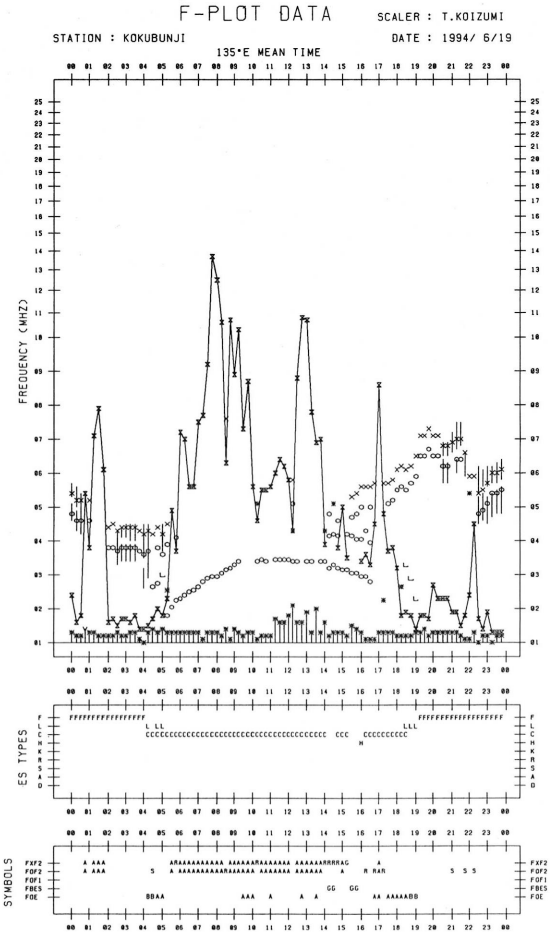
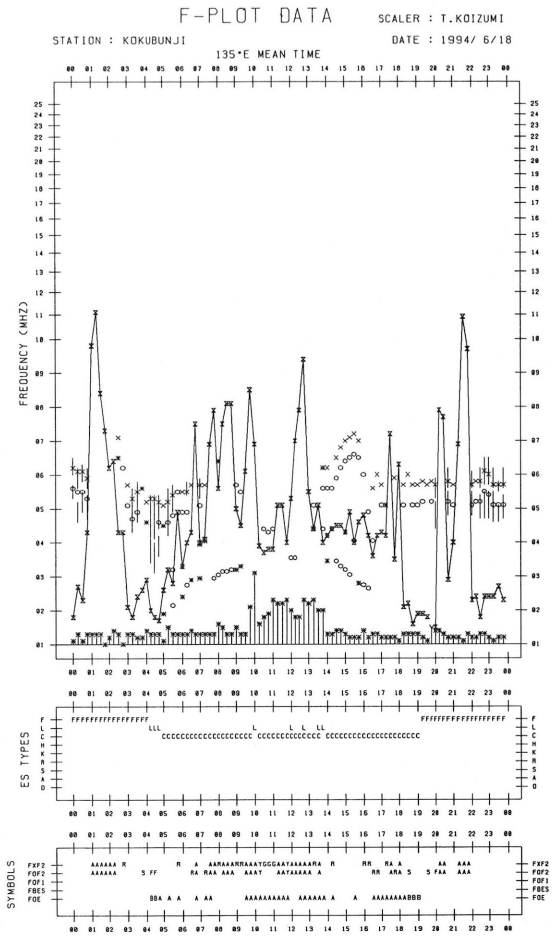
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/17
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/19
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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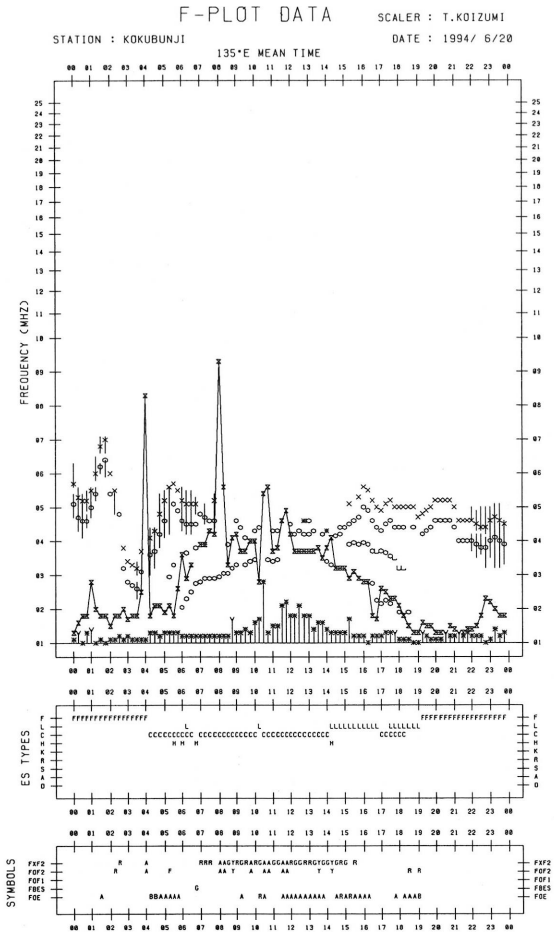
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/18
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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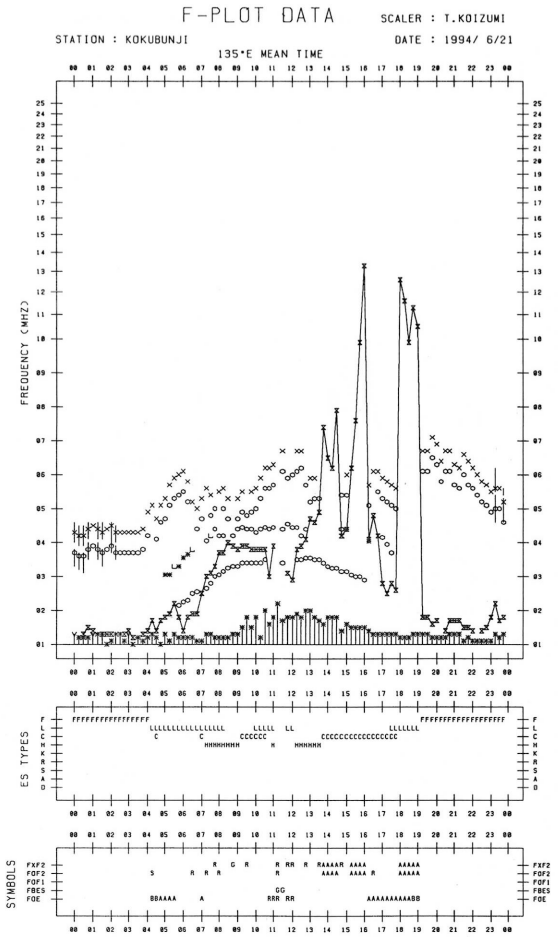
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/20
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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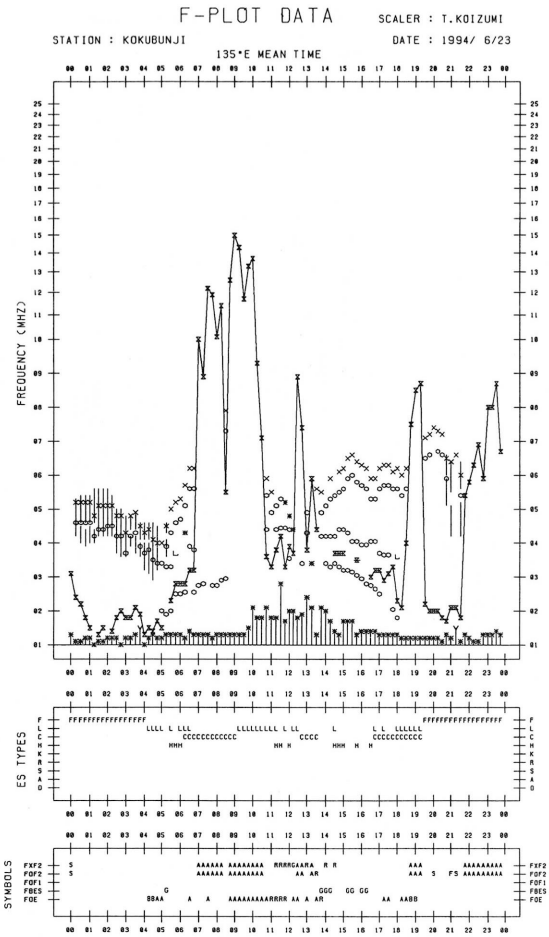
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/21
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS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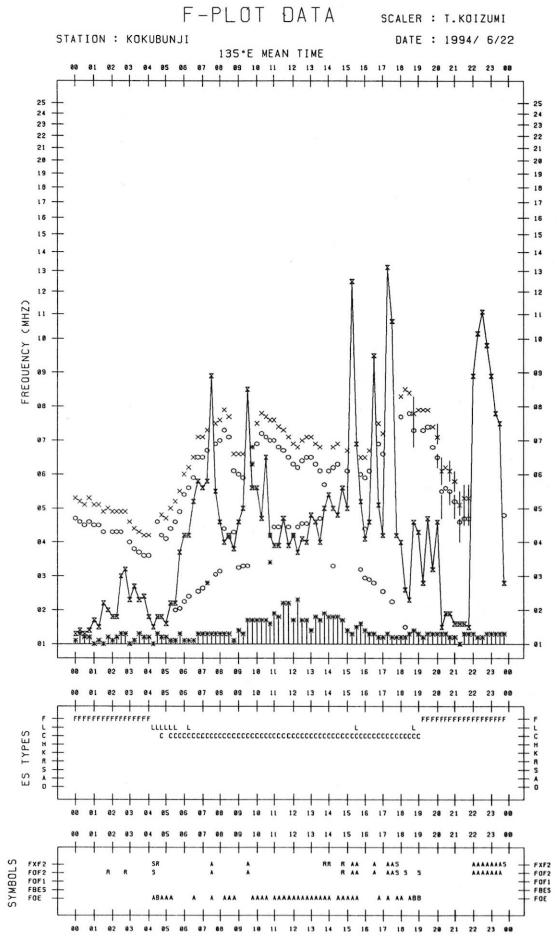
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/23
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS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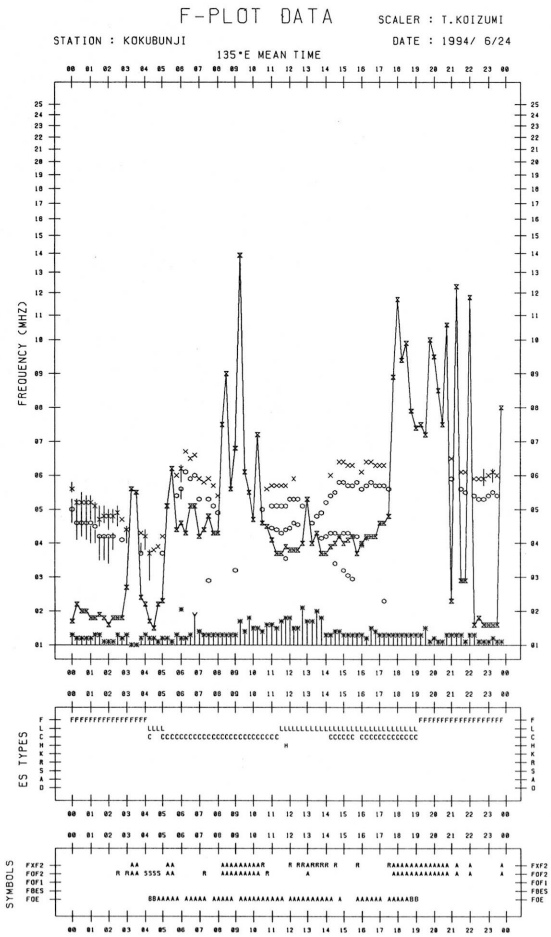
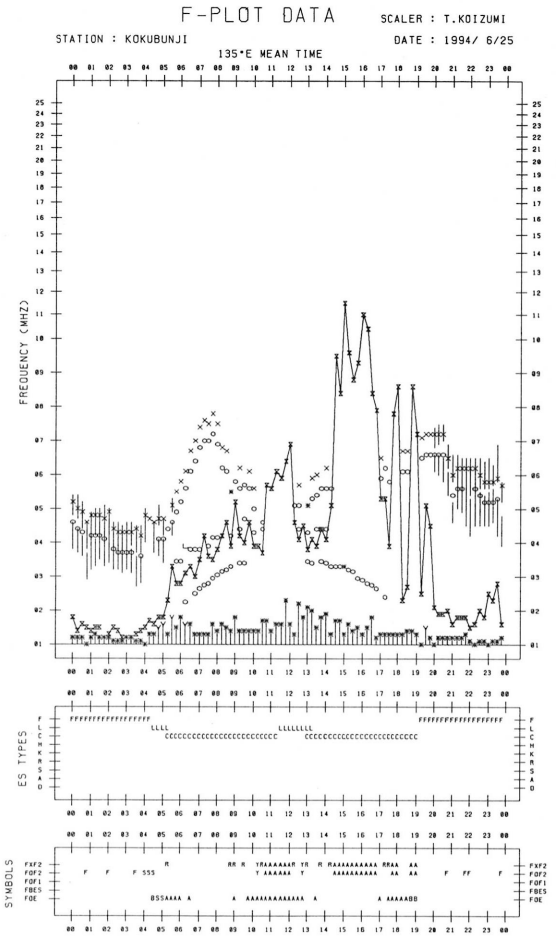
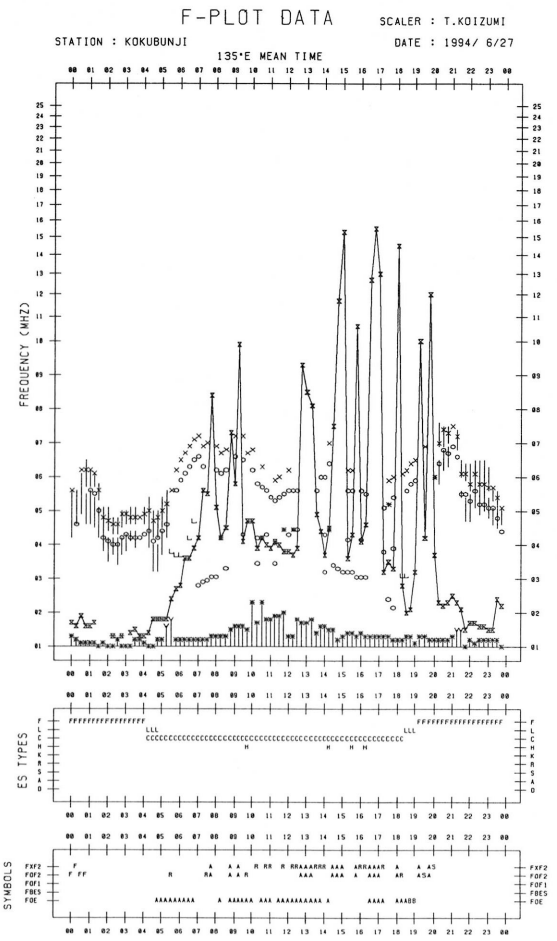
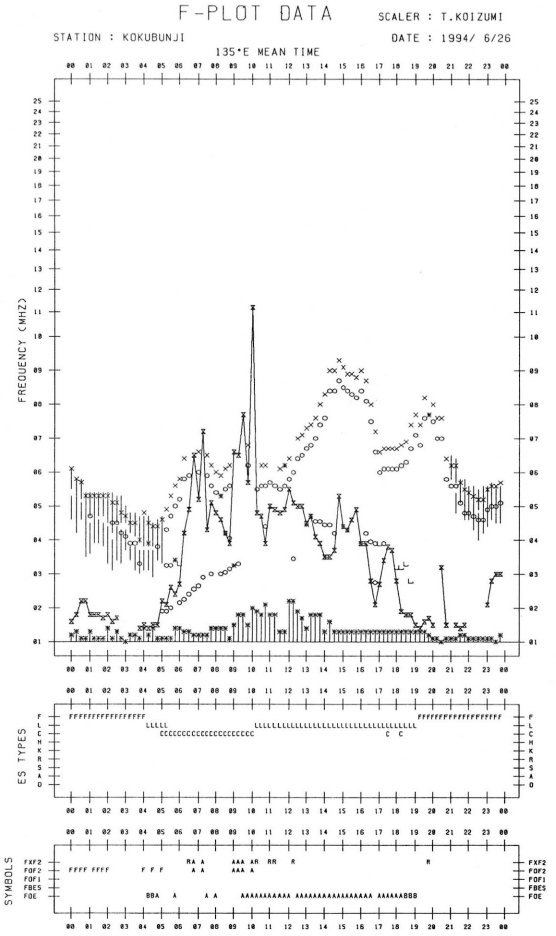
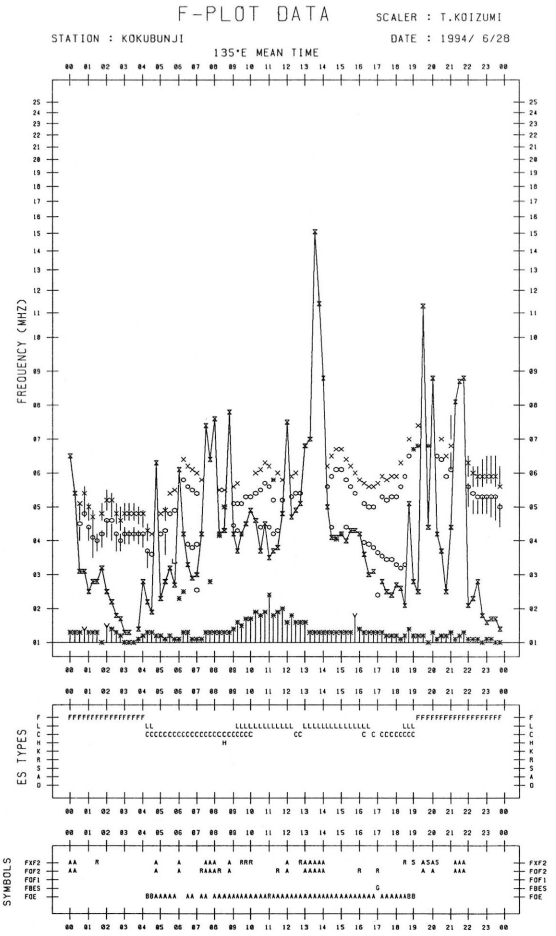
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/22
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

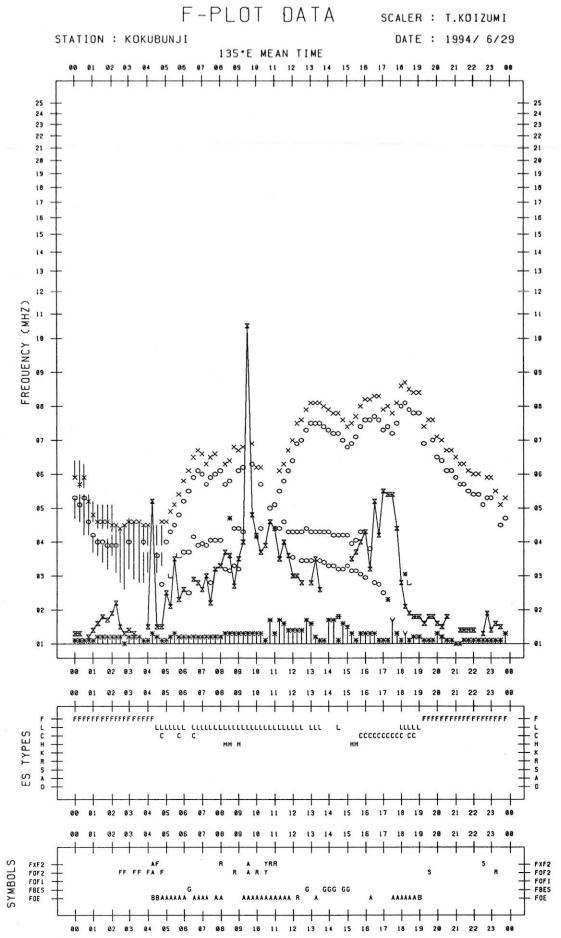

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/24
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/25
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/27
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/26
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/28
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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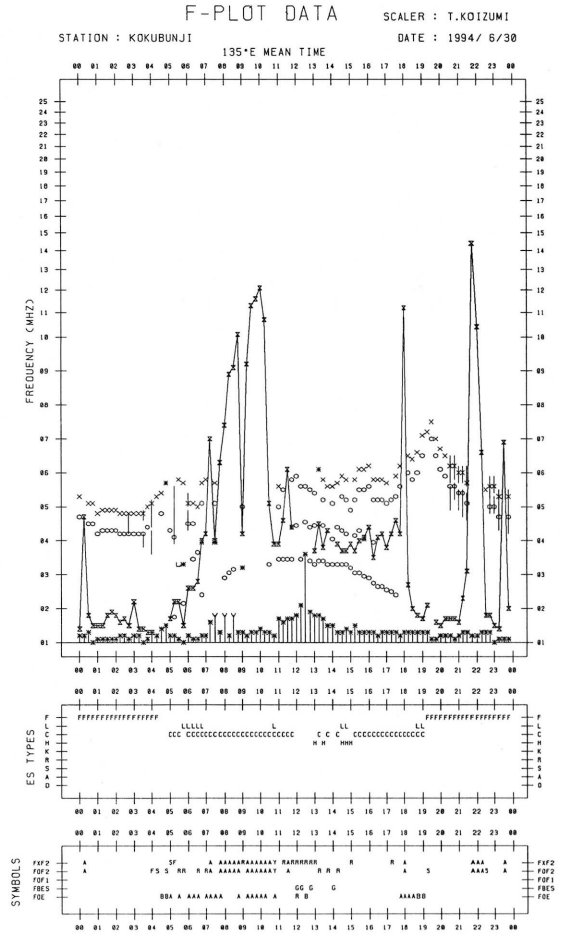
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/29
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1994/ 6/30
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Not available until system improvement is completed.

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso June 1994

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

Note: No observations during the following period.

27th 0803 - 27th 0842

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso June 1994

Single-frequency observations

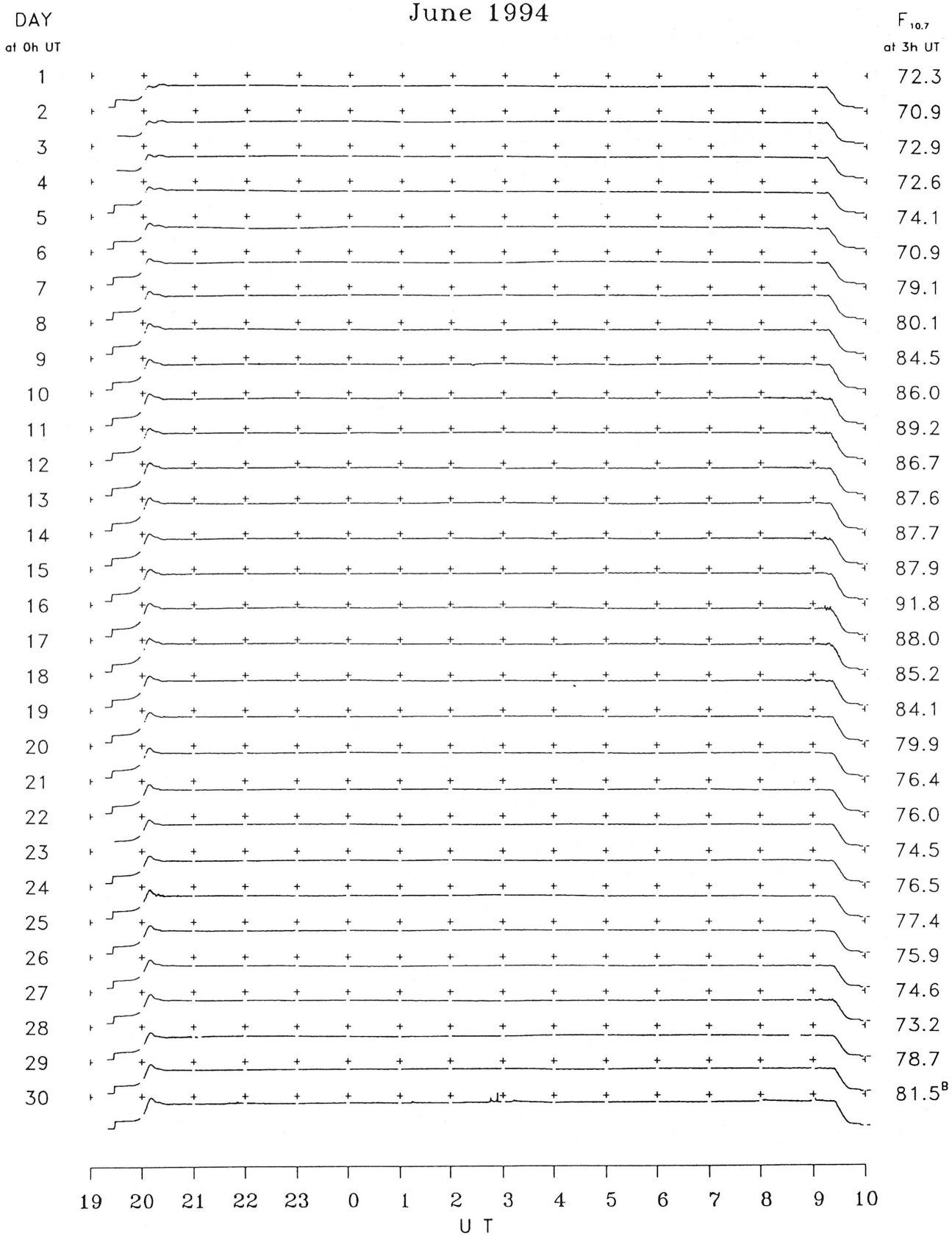
Normal observing period: 2000 - 0955 U.T. (sunrise to sunset)

JUNE 1994	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
6	500	42 SER	2332.7	2333.0	3.0	55	-	WR
7	500	42 SER	0123.5	0127.2	9.0	110	-	0
	500	42 SER	0219.4	0220.6	2.0	100	-	0
	500	42 SER	0633.1	0633.3	10.0	53	-	0
14	500	42 SER	0324.0	0326.2	3.0	3	-	0
24	500	46 C	0227.6	0228.5	4.5	34	10	0
	500	46 C	0735.5	0735.9	3.5	6	4	0
29	500	42 SER	0822.5	0823.1	4.5	8	-	0
	500	42 SER	2138.5	2138.9	6.0	58	-	0
30	500	46 C	0114.5	0115.7	3.5	72	34	WL
	2800	1 S	0115.1	0115.6	1.5	7	4	0
	500	42 SER	0244.8	0246.1	10.0	150	-	WL
	2800	1 S	0246.4	0246.7	4.0	11	4	0
	500	46 C	0309.5	0313.6	7.5	57	9	WL
	2800	1 S	0311.6	0313.5	3.0	4	3	0
	2800	1 S	0758.7	0800.5	2.0	7	4	0
	500	46 C	0857.8	0901.6	5.0	41	15	WL
	2800	45 C	0858.1	0858.7	4.5	22	18	0
	2800	47 GB	2118.0	2120.6	13.5	309	152	0
	500	48 C	2118.1	2120.6	13.5	800	70	WL
	500	42 SER	2150.6	2153.3	19.0	8	3	WL

B. Solar Radio Emission

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

June 1994



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

C. RADIO PROPAGATION

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

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

MEASURED AT HIRAISO

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

C. RADIO PROPAGATION

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

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

MEASURED AT HIRAISO

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

C. Radio Propagation

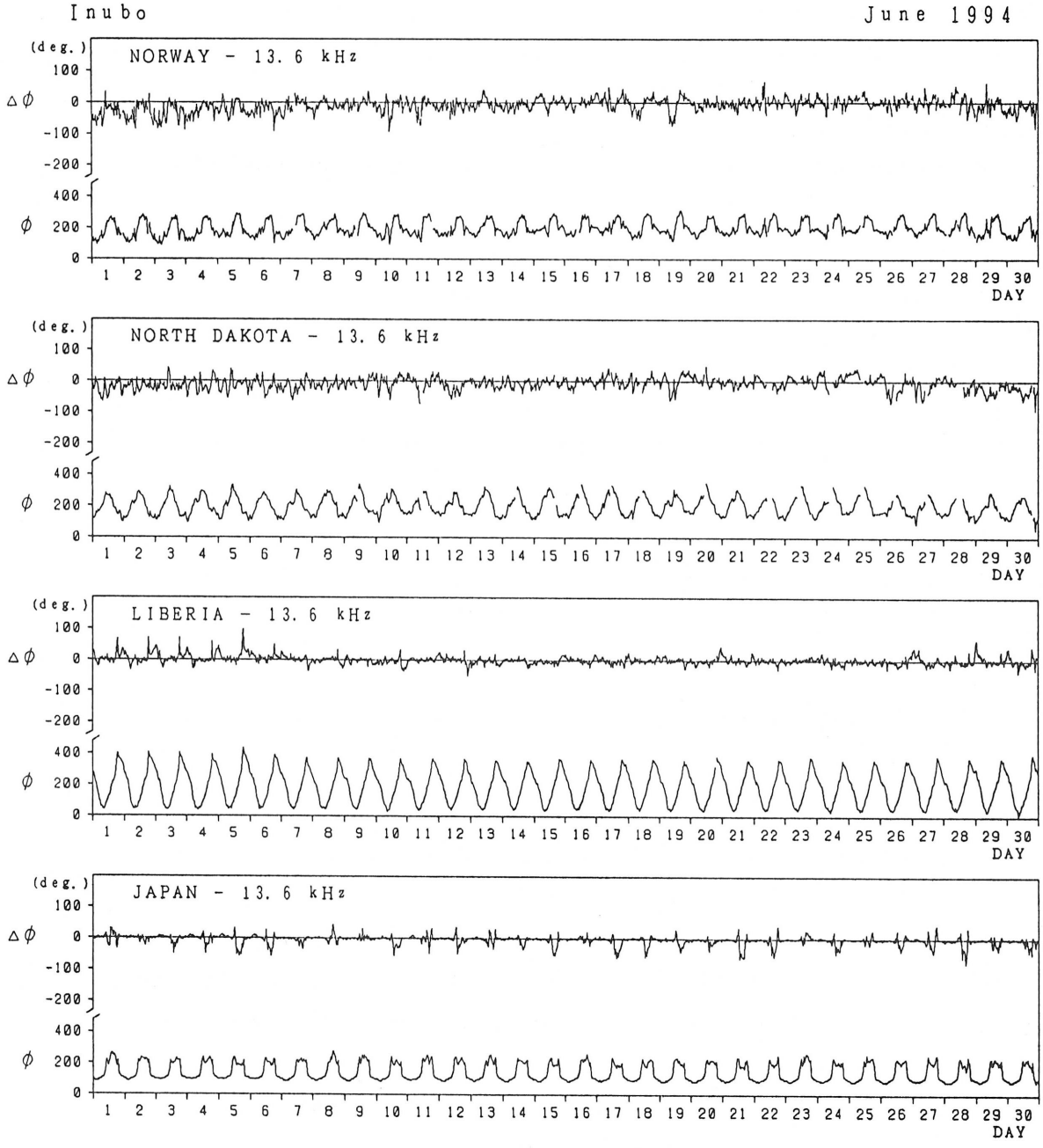
C2. Radio Propagation Quality Figures at Hiraiso

Hiraiso — Time in U.T.

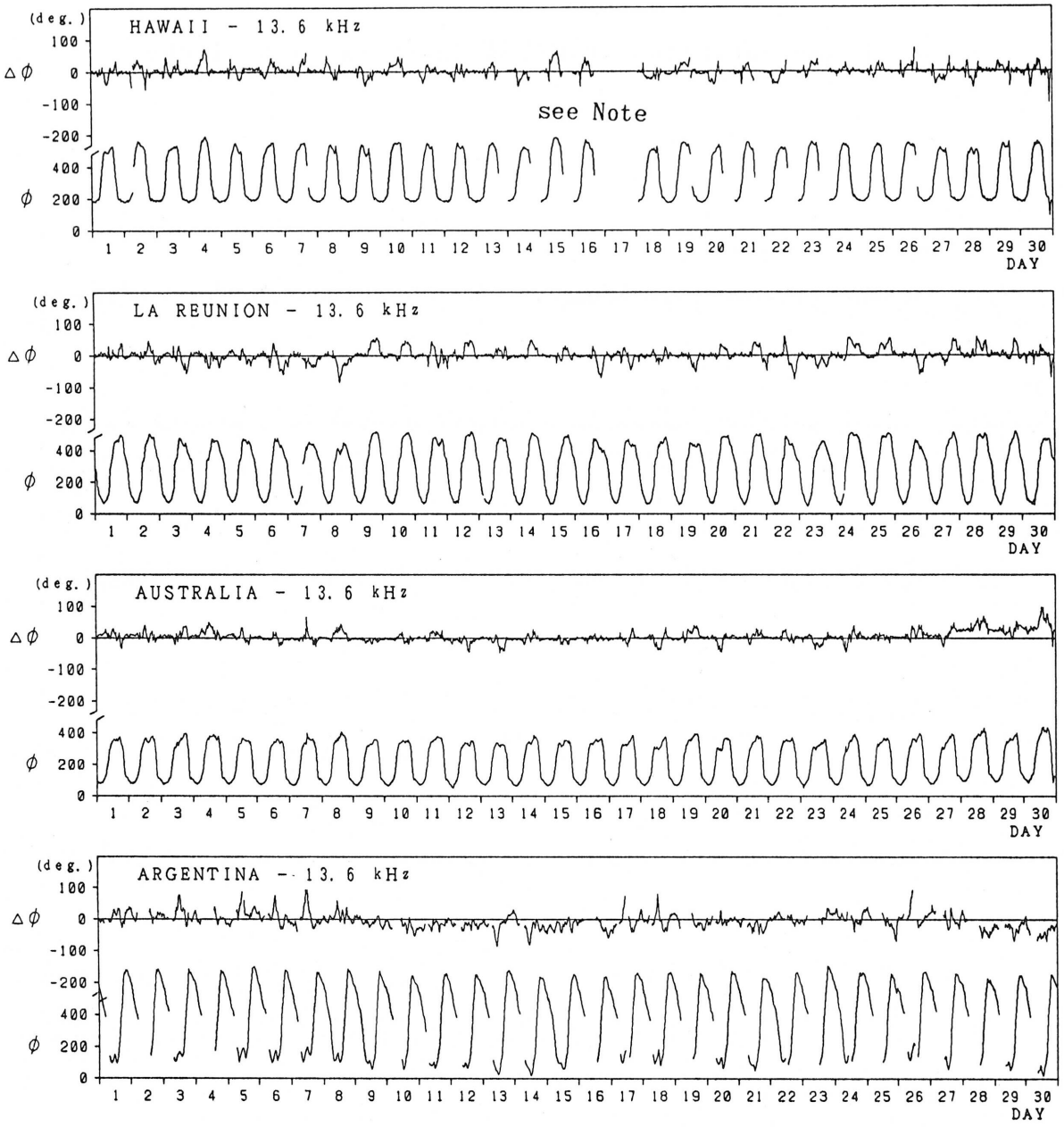
JUNE 1994	Whole Day Figure	W W V 00 06	W W V 06 12	W W V 12 18	W W V 18 24	W W V H 00 06	W W V H 06 12	W W V H 12 18	W W V H 18 24	Condition 00 06	Condition 06 12	Condition 12 18	Condition 18 24	Principal Geomagnetic Storms Start h m	Principal Geomagnetic Storms End h	Principal Geomagnetic Storms RaPge nT
1	4+	3U	-	-	-	4	3	3	3	U	U	U	U	None		
2	3-	3U	-	-	-	4	2	2	3	U	U	U	U			
3	3o U	2U	-	-	-	4	3	3U	3	U	U	U	U			
4	3o U	2U	-	-	-	4	3	3U	3	U	U	U	U			
5	4-	3U	-	-	5U	3	4	4	4	U	U	U	U			
6	4-	4U	-	-	-	3	4	4	4	N	N	N	N			
7	4+	4U	5U	4U	5U	4	5	5	4	N	N	N	N			
8	4o	4U	-	4U	5U	4	4	4	4	N	N	N	N			
9	4+	4U	-	5U	5U	4	4	4	4	N	N	N	N			
10	4o	3U	4U	5U	5U	3	4	5	4	N	N	N	N			
11	4+	5U	5U	-	-	3	4	4	4	N	N	N	N			
12	3+	2U	-	4U	-	3	4	4	4	N	N	N	N			
13	4-	3U	-	-	-	4	4	4	4	N	N	N	N			
14	4-	4U	-	-	-	3	4	4	4	N	U	U	U			
15	4o	5U	5U	4U	-	4	4	5	4	U	U	U	U			
16	4+	4U	5U	5U	5U	4	4	5	4	N	N	N	N			
17	4+	5U	5U	-	-	3	4	5	4	N	N	N	N			
18	4o	5U	-	-	-	4	4	4	3	N	N	N	N			
19	3+	2U	-	-	-	3	4	4	3	N	N	N	N			
20	3+ U	2U	-	-	5U	3	2	3U	4	N	N	N	N			
21	4+	5U	5U	4U	-	3	4	5	5	U	U	U	U			
22	4+	5U	5U	5U	5U	4	4	4	4	N	N	N	N			
23	4o	4U	5U	5U	5U	3	4	3	4	N	N	N	N			
24	5-	5U	5U	5U	5U	4	4	5	4	N	N	N	N			
25	4+ U	5U	5U	5U	5U	4	4	3U	4	N	N	N	N			
26	4-	5U	-	4U	-	4	4	3	3	N	N	N	N			
27	4- U	4U	-	-	-	4	3	2U	3U	N	N	N	N			
28	4+	5U	-	-	5U	4	4	3	4	U	U	U	U			
29	3+ U	-	-	-	-	4	4	3U	3	U	U	U	U			
30	4+	4U	-	5U	-	4	4	4	4	U	U	U	U			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo



Inubo June 1994



Note : As for HAWAII-13.6kHz, intermittent record during 13 June 1700 UT - 24 June 0100 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. 1994	S W F								Correspondence	
	Drop-out Intensities(dB)					Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS	BBC						
30			10			0316	17	SL	1-	-	C
30		>38				2106	26	G	3+	x	C

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

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Jun. 1994	S P A								
	Phase Advance (degrees)						Time (U.T.)		
Date	Ω/N	Ω/L	Ω/LR	Ω/AU	Ω/H	Ω/ND	Start	End	Maximum
29	14				7		2150	2212	2154
30			16	11	7		0249	0314D	0302
30			25	23	11		0314E	0347	0327
30		62	77				0759	0900	0814
30	54	37	37	65	102	97	2118	2257	2126

IONOSPHERIC DATA IN JAPAN FOR JUNE 1994
F-546 Vol.46 No.6 (Not for Sale)

電離層月報 (1994年6月)
第46巻 第6号 (非売品)
1994年9月24日 印刷
1994年9月30日 発行
編集兼 郵政省通信総合研究所
発行所 〒184 東京都小金井市貫井北町4丁目2－1
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