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IONOSPHERIC DATA IN JAPAN

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CONTENTS

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INTRODUCTION

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

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

A. IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

The following l etters 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

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	29	35	35	38	45	53	A	A	58	A	A	A	A	A	A	A	A	A	61	58			56	A
2	N	35	34	36	38		A	49	A	A	A	A	A	A	A	A	A	A	58	61	67	57	57	57
3	57	51	50	54	48	A	A	A	49	A	A	A	A	A	58	A	A		A	56	56	58	57	57
4			28	A	38	34	A	A	A	A	A	A	A	A	56	A	A	A	A	28		38		46
5			41	38	38		A	57	A	A	A	A	A	A	A	A	A	A	A	56	A	A	57	56
6		36	35	32	40	38	A	A	A	A	A	A	A	A	A	A	A	A	A	56	57	A	A	56
7	44		A	A	38	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		39		
8		35	29	29	34	35	A	A	A	A	A	A	A	A	A	A	A	A	A	57	A	35	38	38
9	41	36	35	37	37	A	A	A	A	A	A	B	A	A	A	A	89	A	A	60	58	A	A	40
10	40	35	38	31	36	A	60	A	A	A	A	A	A	B	A	A	A	A	55	A	A	A	A	
11	24		29	30	A	A	A	A	A	A	A	A	A	A	A	A	A	68	A	A	61		A	36
12	37	30	32	32	41		59	A	A	A	A	A	A	A	A	A	A	A	63	58		57	A	A
13	A	A	A	28	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	69		A	56	56
14	35	38	32	35	32	A	A	A	A	58	55	A	A	A	A	A	A	A	56	A	67	57	50	A
15	35	40	35	30	A	A	56	A	A	A	A	A	A	A	A	A	A	A	56			39	59	
16	36	35	32	30	A	34	A	A	A	A	A	A	A	A	A	A	49	A	56	58		A	30	A
17	35	38	30	23			A	A	A	A	A	A	A	A	A	A	A	A	40	43	57	57	56	A
18	35	35	30	A	36	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	A	57	53	44
19	A	35	35	A	31	A	A	A	A	A	A	A	A	A	A	A	A	A	A	59	56		57	A
20	40		A	A	32	30	A	A	A	A	A	A	A	A	A	A	A	A	40			57	55	56
21	34		35	32	38	A	A	A	A	A	A	A	A	A	A	A	A	A	A	73	A	56		35
22	A	A	A	A	A	29	A	A	A	A	A	A	A	A	A	A	A	A	A	54	57	58		
23		A	A	A	29	A	A	A	A	A	A	A	A	A	A	A	A	A		56	57	57		57
24	A	25	A	A	37	38	A	A	A	A	A	A	A	A	A	A	A	A		48	A	A	A	A
25	35	35	28	30	34	40	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	A	29	35
26	35	38	35	40	40	A	A	A	A	A	A	A		A	A	49		57	56	57		49	57	35
27	40			38	40	A	57	A	A	64	A	A	A	A	A	A	A	A	A	57	66	58	68	
28	23	A	35	A	35	29	A	A	A	A	A	A	A	A	A	A	A	A	28	57	58	A	A	49
29	A	29	34	A	A	35	A	A	A	A	A	A	A	A	A	A	A	57	58	68	58	56	A	38
30	35		38	38		38	A	A	A	A	A	A	A	A	A	A		A	A	A	69		28	56
31		57			36	38	A	A	A	A	A	A	A	A	A	A	A	A	A	59	49	58	68	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	17	23	20	23	13													12	23	16	17	18	18
MED	35	35	35	32	37	35													56	57	58	57	56	48
U Q	40	38	35	38	40	38													58	59	63	57	57	56
L Q	35	35	30	30	34	32													47	56	57	44	50	38

HOURLY VALUES OF fEs AT WAKKANAI

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	37	36	30	28	31	44		56	60	53	60	72	38	52	72	66	76	70	36	44	34	33	37	39
2	31	34	G	G	29	36	44		55	76	38	69	36	34	30	28	51	95	54	60	56	27	G	G
3	G	G	G	G		33	44	42	42	36	37	42		42	50	40	60		71	64	62	60	38	31
4	31	24		31	28	43		56	56	44	34		40	34		58	42	137	91	38	40	28	31	24
5	24	29	G	G	27	35	57	43	43	42	65	38	37	35	33	38	28	36	30	37	37		32	52
6		38	34	29	28	33	32	60		43	53	38	55	64		72		145		94	62	62	65	61
7	30	34	35	30	35	31		60	130	35	43	53	36	34	34	34	45	51	82	62		38		G
8		34	28	23	G	25	40	46	54	58	55		34	39	37	28	30	36	37	34	71	58	44	28
9	30	G	G	G		35	42	40	60	40	43	B	42	54		57	82	85	84	30	30			28
10	28	38	36	G			60	56	58	73	60	36	32	B	66	36	58	72	44	73	93	76	59	
11	38	44	33	26	48	65	42	60	82	76	57	95	64	58	63	35	43	43	47	61	61		38	34
12	32	28	28	G		33		54	42	75	56	42	41	38	36	43	40		55	39		36	58	62
13	82	96	59	44	70	84	74	73	28	56	40	76	35	43	57		56	74	77	94	40		37	40
14	34	G	28	40	38	62	77	94	62	58	42	43	42	76	34	36	37	40	38	66	57	39	46	
15		34	31	33		57	42		35	87	59	38	32	29	32	36	60	60	46			42	42	40
16	34		36	42	35	57		59	43	39	34	34	33	43		57	28	43	47	38	32	46	38	56
17	34	24	34	27	27		34	45	39	39	41	38	36	34	36	29	34	29	36	29	30	27	33	32
18	32	31	29	28	28		55	71	59	73	82	36	40	39	40	43	31		45	45	60	34	38	42
19	36	28	30	34	40	36	47		32	84	76	64	89		93	94	80	38		66	56	37	42	60
20		28	34	34	38	31	60	30	39	34	44	60	57	64	35	29	28	31	29			G	28	G
21	26	27	34	33	33	41	42	44	60	71	83		96	44		76	57	40		82	70	36	28	35
22			62	42	57	29			65	62	74	64	33	32	39	38	54	62	65	51	55	55		29
23	28		59	29	34		77	66	88	57	58	36	33	41	57	37	41	38		71	40	35		26
24	29	34	39	43	48	36	41	44		56	55	58	76	34	36	35	34	30	34	24	36	63		60
25	38	32	39	40	31	29	61		36	37	71	41	38		94	86	36	33		66			59	34
26	30	29	32	30	28	31	30	33	41	63	38	55	G	32	34	31	26	30	35	28	G	G	G	27
27	24	G	G	G	34	34	29	29	31	33	38	56	45	38	43	32	44	57	65	61	37	32	34	G
28	G	33	41		34	29	36	40	66	44	55	44	65	34	34	74	58	54	37	37	34	63	65	74
29	57	55	38	35	30	28			55	65	63	42	36	42		40	31		44	41	26		37	27
30	32	38	31	G		34	28	31	34	40	66	39	35	34	36	39		42	86	73	74	32	33	26
31	32	40	33	G	24	28	30	33	27		62	77	37	37	34	36	46	56	67	71	38	44	35	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	28	30	30	25	27	24	25	29	30	31	27	30	28	25	30	29	26	26	29	26	25	26	29
MED	32	32	33	29	33	34	42	46	54	56	55	43	38	38	36	38	43	47	46	60	40	37	38	32
U Q	34	37	36	34	38	43	58	60	60	71	63	64	45	43	57	57	57	70	67	68	61	56	44	47
L Q	28	27	28	G	28	31	35	40	37	40	41	38	35	34	34	35	32	38	37	37	34	32	33	26

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

JUL. 1996

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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT KOKUBUNJI

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	45	45	42	41	A	46	56	67	64	A	A	A	A	A	A	A	A	A	73	83		60	58	56
2	47	46	A	34	38		30	A	A	A	A	A	A	A	A		51	62	68		59	57	56	A
3	69		50	47	48	57	56	A	50			A	A	74	83	76	66		42	A		A	50	
4		46	45	47	44	A	A	A	A	A	A	A	A	A	A	48	A	A		A	A		44	
5	A	A	37	A	35	34		56	A	A	A	A	A	A	A	A	A	A	A	56		42	A	A
6	A	44		35	44	A	A	68	A	A	A	A	A	A	A	A	A	A	91	67		A	A	47
7	46	41	38	35		A	43		A	A	A	A	B	A	A	51	A	60	58	72		A		38
8	45	46	38	32	32	A		A		A	A	A	A	A	A	A		A	53	56	61	A	58	A
9	A	A	35	32	37	A	A	A			N	B	A	A	A	A	A	A	55	A	70	68		50
10		69		35	36	43	41	A	66	A	A	A	A			61	58	56	A	45		46	A	A
11	A	A	A		69		A	53	53	63	A	A	A	A	A	A	A	A	A	A	69	A	57	27
12	22	A	59	A	A	41	A	A	49	60	59	A	A	A	A	A	82	A	70				44	
13	A	36	32	38			N	68	64	A	A	A	A	A	A	A	A	50	61	70		57	47	48
14	38	35	38	41	44	38	A	57		66	A	A	99	A		48	53	72	66	68	74	A	A	A
15	A		A	24	A	A	47	A			A	A	A	A	A	A	62	A			68	70	46	
16	47	41	38		34	37	49	58	A		A	A	79	A	A	A	A	63	66	A	A	A	A	
17	41	A	A		A	A	A	57	52	A	A	A	A	A	A	A	A		A	57	57	57		45
18	36		35	30	38	A	57	56	A	A	A	A	A	A	A	A	A		A	A	57	57	57	A
19	A	A	A	A		A	A	54	A	A	A	A	A	A	51	A	A	A	48	54	A	32		32
20	31	31	26		A	39	A	A	A	A	A	A	A		A		A	57	56	63	50	43	A	35
21	38		35	A	A	A	A	58	47	A	A	A	A	A	54	A	50	48	58	54	61			
22	38	34		A			58	56	60	A	A	A	A	A	A		A	A	83		62	A	A	A
23	A	A	A	A	A	69	45	A	A	A	130	A	A	A	A	A	A	A	A	A	57	49	46	50
24	47	38	A	A		A	A	48	A	A	A	A	A	A	A	A	51	46	57	56	51	46	A	46
25		38	34	24		42			48	A	A	A	A	A	62	65	58	51	56	51	45	42	A	A
26	A	35	29	A		A	A	A	A	63	A	A	A	A	A	A	62	A	49	A	50	57	57	A
27	44	A	59	A	38		44	59	68	58	A	A	A	A	A	A	A	41	48	58	63		45	
28	48		32	A	32	37		A	A	A	A	A	A	A	A	A		A	62	68	68	60	57	
29	44	38	35	35	A	A	46		77		A	B	A	A	A	A	A		74	68	57	58		48
30	A	A	46	46	44	A	34	69	A	A	52	A	A	49	A	A	A	56	59	69	61	56	48	56
31	46	N	35	A			47	58	55	A	67	A	A	A	65	66		A	A	A	60	A	68	58
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	16	21	16	15	11	14	16	13								10	12	22	18	20	18	16	14
MED	44	40	37	35	38	41	46	58	55								58	56	58	60	60	57	53	48
U Q	47	45	43	41	44	46	56	63	65								62	61	68	68	65	58	57	50
L Q	38	35	34	32	35	37	43	56	49								51	49	55	56	57	46	46	38

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT KOKUBUNJI

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	38	40	52	28		37	107	72	64	52	33	60	52	54	61	68	83	123	64	62		82		48
2	45	50	36	37	31	35		88	95	74	56	56	60	54	60		50	51	54	59	73	60		59
3	40	29	24	G		26	54	76	56			82	46		55		55		40	54		60	62	
4		39	28	30	32	36	51	58		95	92	58	68	34		62	84	72		171	88	62	54	
5	55	41	28	26	G	G	30	39	60	54	52	54	60	39	44	62	48	52	61	30		66		74
6		59	51		76	36	57	56	94	116	87	54	85	36	89	59	59		106	96	40	43	62	
7	27	37	26	G	G	28			43	38	34	33	B	32	31	31	50	35	34	27		59		50
8	26	28	G	27	G	34		64		61	57	61	51	46	53	55		64	55	54	57		61	48
9	72		41	25	G	59	95	148	150		126	B	59		37	30		62	61	124	118	40	59	32
10		34	54	47		32	37	42	108	121	61		39	G	G	54	61	34	52	60	58		74	56
11	61		37	25	38	33	33	35	35	49	44	46	53	63	48	51	57	59	82	89	73	55	79	56
12		57	123	57	57	30	87	63	54	58		74	51	131	133	106	74	125	65		33	G	G	50
13		41	34	41	88		126	56	51		179	106	55	114	35	51	48	58	35	G	G	60	61	
14	56	32	G	30	26		36	41	60	68	72	73	90	179	G	35	50	54	60	44	35	81	34	33
15	51	41		30	33	34	57	51			125	57	56	69	76	91	34	73	152		34	39	34	
16	G	25	29	30	34	82	49	55	68		70	48	82	62	70	100	171	77	62	68	57	58	52	
17	34	38	29	24	31	35	34	34	50	48	58	57	68	69	69	71	62	82	60	37	37	40	36	35
18		49	39	30	30	27	44	49	54	99	47	59	104	93	50	54	129		89		48	49		109
19	36	37	61	58		68	34	50	72	71	52	50	35	30	32	54	68	42	120	50		55	52	54
20	78	38	45	28			60	61	57	69	52	56	78	114		86	96	30	29	25	36	28	33	G
21	G	28	27	30	31	28	37	32	37	44	39	39	38	40	37	30	34	32	28	38	33	30	34	37
22	27	26	30	53			38	50	54	63	51	56	57	126	70		137	116	108	67	36	37	34	59
23	53	48	38	39	56	30	34	60	55	97	128	72	66	49	29		69	49	60	61		67	35	50
24		54	56	46	G	36	35	32	35	31	39	32	30		49	46	31	37	29	G	G	G	43	30
25	32			33	32	31	28		35	49	34	33	40		33	32	42	39	30	G	58	62	61	54
26	62	48	28	50	G	48	40	43	61	86		78	68	105	62	67	62	76	89	58	44		59	
27	G	43	34	37	40	G	32	33	33	32	52	54	34	44		32	47	33	36	26	32	30	28	
28	48		45	53	45	47		73	100	60	56	55	60		58	72		56	39	34	33	27	32	29
29	29	29	24	25	24	31	40			36	32	B	44	42		89	61		53	54	37	74	29	39
30		79	40	33	35	29	34		33	39	60	40	57	37	46	32	38	40	52	40		G	26	G
31	25	29	44	50		30	34	46	54	46	48	50	42	29	31	30	43	52		68		60	60	60
	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	27	29	30	24	27	27	27	27	25	28	28	30	26	27	27	28	27	29	28	23	28	26	23
MED	38	39	36	30	32	33	38	51	55	60	54	56	56	52	49	54	58	54	60	54	37	55	48	50
U Q	55	48	45	46	39	36	57	63	68	80	71	60	68	93	62	71	71	73	73	64	58	61	61	56
L Q	27	29	28	27	12	29	34	41	43	45	45	49	44	37	33	32	47	39	37	32	33	33	34	33

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	14	14	14	15	15	15	15		20	17	23	21	18	16	15	14	14	15		14	15	15
2	14	14	15	14	15	15	16	15	15	15	15	17	16	16	16		15	17	15	14	15	14	15	15
3	14	14	14	14	14	16	14	14	14			24	21	26	17	15	14	14	15	15		15	14	
4		14	14	14	14	14	14	15	14	17	17		33		20	18	14	15	14	15	15	14	14	
5	15	15	15	15	15	16	14	15	17	18	23	23	21	21	17	17	15	15	15	14		14	15	15
6	14	14	15	14	14	14	14	14	14	18		32	23	17	15	16	14	15	14	15	15	15	14	14
7	15	15	14	16	14	18	15		16	16	24	23	B			17	14	14	14	16	14	14		14
8	14	14	15	14	15	14		15		16	17	20	17	17	23	17		14	15	15	15	15	14	15
9	14	15	15	14	15	14	14	18	16		42	B	26	22	18	21	16	15	14	15	14	14	15	15
10		15	15	15	15	15	14	14	15	15	16	17	18		46	45	15	15	16	14	15	14	14	15
11	15	14	14	15	14	15	14	15	15	17	18	18	17	21	17	16	15	16	14	14	14	14	14	15
12	14	14	15	14	14	15	15	15	14	16	17	18	18	26	18	17	15	15	15	14	14	14	15	15
13	14	14	14	14	15		14	15	15	16	16	23	21	22	15	17	14	14	15	15	15	14	14	14
14	14	14	15	14	15	15	15	16	15	16	17		18	16		16	15	15	14	15	14	14	14	14
15	14	15	14	15	16	15	14	15			15	17		17	15	15	15	15	14		14	15	15	
16	14	14	14	15	15	14	14	14	16		17	22	20	21	18	17	15	15	15	15	15	14	15	
17	15	14	15	15	15	15	14	15	16	15	17		26	16	18	15	15	14	14	14	15	15	15	14
18	14	14	14	15	15	17	15	15	15	16	20	18	22	22	21	18	16		15	15	15	15	15	14
19	14	15	15	15		14	14	15	14	20	17	16	23	23	14	17	15	14	15	17	15	14	15	15
20	15	14	14	14	14	15	15	14	15	16	20	34	26	21	20	15	15	14	15	16	14	15	15	14
21	14	14	15	14	15	14	15	15	15	26	17	21	22	20		15	14	15	14	14	15	15	15	14
22	14	14	15	14			14	14	15	17	17	20	22		22		15	14	14	15	15	15	14	14
23	14	15	14	14	14	14	15	15	16	15	17	18	17	20	17	18	14	15	15	14	15	15	14	15
24	14	14	14	15	15	15	15	15	15	16	17	17	20	21	21	15	17	15	14	14	15	14	14	14
25	14	14	15	14	15	15	14		16	16	20	26	20		21	17	15	15	14	20	15	14	15	15
26	14	15	14	14	14	15	14	14	15	15	18		24	17	17	17	15	14	14	14	14	14	14	15
27	14	14	14	14	15	15	14	14	15	18	18	18		20	17	16	16	15	15	15	15	15	15	
28	15		14	14	15	14		15	15	16	17	18	18	16	16	14		15	15	14	15	14	15	15
29	14	14	15	15	15	15	15	15	14	16	17	B	46			16	15		14	15	15	15	15	14
30	15	14	14	14	14	15	15	14	14	16	16	16	17	16	20	16	15	15	17	14	14	15	15	14
31	15	15	15	14		15	15	14	16	15	16	18		16	23	16	14	15	14	14	15	15	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	31	31	28	29	29	29	29	26	29	25	27	25	27	29	29	29	31	30	28	31	30	26
MED	14	14	14	14	15	15	14	15	15	16	17	18	21	20	18	16	15	15	14	15	15	14	15	14
U Q	15	15	15	15	15	15	15	15	16	17	19	23	23	21	21	17	15	15	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	16	17	17	18	16	17	15	14	14	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15											A	A	A	A	78	83	77	66	A	76			A	A
16	33	32	37	38	36	A		34		A			B	B	B	62	A	A	79	79	N	A		A
17		A	A	A		N	A	A	B	B	B	B	B	B	B			31		53	51	A	52	
18			25		A	40		52	A	55						A	A	A	A	A				
19												B	B	B	B	B	A	A	54	59	51	A	A	A
20	A	32	A	A	79	A	31		A	A			64	A	82	84	85	86	86		60			59
21		50		54	32			53	A	A	B	A	A	66	A	52	A	A	58	A	51	28		
22	38			49	31	N	37	A	50	A	A													
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25											B	B	B	B	63	66	A	52	58	A	24		79	
26		A	54	A	47	30	A	A	A	58	A	A	A	A	A	A	67	A	A	52	A	49	A	41
27		34	42		69	A	69	53	66	60	A	A	A	A	A	60	A	49	A	59	A	34		69
28		A	69		79	A	A	48	49		A	A	B	A	A	49	A	A	A		A	A	69	59
29	A	A	A	36		69	A	53	A	A	A	A	A	A	A	58	70		78	A	A	A	A	
30		34	43	35		A	69	A	48	A	A	A		B	A	A	A	A	85	66		36		
31	42	A	69		49	A	79		70	60	A	A		A	67	84		48		52	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15											140		77		82	39	59	72				93	49	
16	33	29	28	39	38	39		33	40	30	G	G	B	B	B	G	91	152	43	43	42	32	G	30
17	G	30	29	30	31	G	39	28	B	B	B	B	B	B	B			34	44	41			31	30
18	G	29	30	31		34		37		36						42	39	43	105					
19												B	B	B	B	B	27		37	33	30	39		60
20		44	39	34			32	30			G	G	G	68	52	72	36	51	127	56	30		28	G
21	G	30		G	G	G	29	37	48	36	B	49	36	G	35	30	36	33	35	51	34	32	57	G
22		25	G	G	G	G	29	40	49	48	52													
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25											B	B	B	B	30	61	59	67	53	34	28	29	32	
26	37	32				38	59	59	60	50	39	32			87			54	60	49	92	32	32	30
27	29	40	49	40	50	49	29	30	41	44	44	41	32		39	31	50	44	55	30	33	G	32	30
28		49		30	29	30		41	42		56	40	B	44		32	57	88			39	39	30	26
29	39	32	32	32	G	G	45	39	79	69	74			66	55	67	61	40	50	50	69	38	45	37
30		30	34	32		32	33	32	33	55	30	40	G	B	28	29	31	29	48	G	G	G	G	31
31	29		51		30	50	30	32	34	46	57	68	G	52	101	55	58	30		32	93	58	69	48
	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				11		12			10					11	12	13	10	11	11	11	12	11
MED		31				32		35			48					39	54	44	52	41	34	32	32	30
U Q		40				39		39			57					61	59	69	60	50	69	39	47	37
L Q		29				G		31			30					30	36	33	43	32	30	29	29	26

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15											17	18	20	18	20	17	14	15	14	14		14	14	14
16	14	15	14	14	14	14		14	15	17			B	B	B	52			17	16	15	17	18	16
17	16	16	16	15	17	16	20		B	B	B	B	B	B	B			14	14	14	15	14	14	14
18	15	14	14	15	14	14		14	15	17						21	18	16	16	16				
19												B	B	B	B	B	18	16	16	15	15	15	15	15
20	15	15	15	15	15	15	15	15	16	18	24		51	42	21	18	17	16	15	15	15	15	15	15
21	15	16		15	16	16	15	15	17	22	B	36			21	22	21	16	15	16	15	15	15	15
22	15	15	15	15	16	16	15	15	15	17	23													
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25											B	B	B	B	20	18	20	16	16	15	15	15	15	
26	14	14	14	15	15	15	16	16	16	18	21	20	23	20	22	22	18	20	16	15	16	16	15	15
27	14	15	15	15	15	15	18	16	18	22	23	23		24	24	23	30	20	15	16	16	15	15	15
28	15	14	15	15	14	15	16	16	18		22		B	36	24	22	21	23	15		16	15	15	15
29	14	15	15	16	14	15	14	16	21	22		34	33	26	26	23	22	16	16	15	15	15	14	14
30		14	15	15		15	15	15	17	21	22			B	36		23	20	16	16	15	15	15	16
31	14	16	15	15	16	15	15	21	18	32	34	24		38	40	35	20	22	20	16	15	15	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	12	11	12	11	12	10	11	11	10					10	11	12	13	14	13	12	13	13	12
MED	15	15	15	15	15	15	15	15	17	20					23	22	20	16	16	15	15	15	15	15
U Q	15	15	15	15	16	15	16	16	18	22					26	23	21	20	16	16	15	15	15	15
L Q	14	14	14	15	14	15	15	15	15	17					21	18	18	16	15	15	15	15	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT OKINAWA

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	A	A		A		59	57	50	A	A	A	A	63	82	83	91	93	89		41		34
2	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	82	87	90			A	A	A	A
3	38	44	38	43	A	A	A	59		57	58	A	A	66	93	97				A	58	A	A	
4	A	43			35		A	60		57	A	A	A	A	A	111	102		86		38		48	
5	43	38	38	35	A	A	89	59	A	46	A	A	A	A	A	72	88	88		A	58	A	A	A
6	44		A	A	A	69	39	48	A	68		A	A	60	69	73	A	87	79		83	A	A	A
7	A	46	44	36	35			A	72		64	58	A	62	71	80	88	78	85		61		44	38
8	A	37	A	36	N		A	A	A	A	A	A	A	56	A	52	58	71	A	A	71	A	A	A
9		A	29	37	32	B	B			64	A	B	A	A	60	55	64	72	85	66	59	44		48
10	37	43	35	A	32	29		A	A	49	A	57	62	A	60		A	48	A	66	74		50	56
11		48	46	43	37	34			62	46	A	A	A	A		68	64	A	A	88		A	A	A
12	A	A	A	A	A	A	A		59	57	A	A	57	67	A	68			84	A	92	A	A	44
13		38	38	35	28		A	75		63	A	A	61	A	A	A	80	82		A	68		A	
14	36				20	B	A		A	63	A	A		92	100		86			A	A		A	
15	A	A		N		B	38	49	53	56	64			A	93	92	88	80	82	A	83			A
16	A	38	36	34	31	30	36	44		A		A	A	60	68	82	A	A	A	A	A	A	A	A
17	A	43	A	A		B			44	A	A	58	A	A	A	A	A	A	A	A	40	A	56	A
18		44		38	43	41	36		60	57	A	A	A	74	85	80	A	A	A	A	71	A	A	A
19	36		A	59	N	N	B	A	61	A	A	A	61	N	81	68	63			A	A	79		
20	A	A	A			B	35		45	A	A	A	68	81		118	120		87	79	64	69	60	
21	A	32	41			B	A	52	A	54	A	A	A	A	70	A	64			81	59	A	A	
22	A	A	A	A	N	A	B	49		58	A	A	60	59	A	A	A	76	84	A	A	A	A	A
23	44		36			A	B	A		66	A	A	A	A	80	82	65	72	A	A	62	A	A	A
24	A	69		43	A	A	A	A	A	57	A	A	A	57	81		77	68	72	A	51	A	A	79
25				40	32	32	A	44		A	A	A	A	A	67	67	68	67		A				43
26		A		A	A	A	A	A	54		57	A	57	70	A	77	82	74	A	A	67	61	56	50
27	47	A	A	A	A	A	A	58	62	54	A	A	60	64	66	82		69	71		54	45	A	A
28	A		38			A		A	57	64	A	A	A	58	58		79	66	A	A	74	A	A	A
29	A	A	A		N	B	29	83	A	A	A	A	A	A	74		97			A	39	50	A	A
30	A	A		36		A	A	34	57		A	A	A	A	A	A	69	73	85	A	58	59	52	59
31		A			49		58	A	71			B	60	59			92			A	66	A	68	55
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		13	11	13	11			13	14	19				15	18	20	22	18	12		23			10
MED		43	38	37	32			52	58	57				62	70	80	81	74	84		62			49
U Q		45	41	43	37			59	62	63				70	81	82	88	82	85		71			56
L Q		38	36	35	31			46	54	54				59	66	68	65	69	80		58			43

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	42	85		46	34	35	40	56	58	38	45	56	42	51	71		38	45	39	28	24	G	G	44
2	29	34		37		47					71	104	134		75	38	45	39	32		38	37	67	66
3		G	26	41		37	38	29	50	47	55	61		37	60		42			50		46	37	26
4	42	G	G	G	G	G	38	32	46	52	54	60	77		74	33	34	36		43	G	36	G	G
5	48	41	39	38	37	29	G	29	48	39	34	38	65		97	78	52	52		48	57	34	41	33
6	G	G	35	58	42	38	37	35	36	41	43	53	49	53	51	51	82	62	90	G	41	44	34	36
7	32	G	26	30	G	G	G	33	35	37	42	49	34	43	40	40		26	29		G	G	G	G
8	33	38	44	G	26	G		61		162		146	98	42	76	80	51	60	93	42	G	60		59
9	39	40	39	30	G	B	B			51		B	38	41	39	39	44	48	29	38	40	33	G	G
10	G	G	25	34	G	35	G	69	50	62	48	40	40	37	42	44		41	32		G	43	25	30
11	G	G	G	G	G	G	G	35	47	49	44	65	64			65		128			50	70	48	61
12	50	60	64	96	50	36	70	34	36	39	38	41		42	60	46	67	40	39			36	26	28
13	G	G	G	G	25		30	33		59	40	56	83	95	72	95	61	60		33	41	50	38	24
14		33	27	G		B	34		92	66		62	51	41	32	59	38	48	48			G	33	G
15	49	44	G	G	G	B	24		35	43	50			111	46	48	36	34	38	48	45	G	25	38
16	33	30	G		34	26	35		38			39	61	66	33	57	106	174	60		48	56	62	42
17		50	36	40	28	B			41		88	47	86	83	86	69	84	86	74		42	34		
18		G	24	G	G	25	G	27	46	52	66	71	94	67	66	64	62	60	86		56	36	28	66
19	35	33	29	G	G	26	B	48	59	97	82	40	35	48	33		42			55		G	G	47
20	50	56	36	28	G	B	G		51	54	66		57	62	42	61	64	48	34		44	27	G	G
21	30	35	G	G	G	B	36	46		50	70	38	60	81	42	61	44	42	58		41		40	
22	42	50	57	33	24	29	B		61	38	64	39	45	40	39	49	55		32	86	45		32	
23			34		G	27	B	38		61	72	44	44	43	37	38	42	39		40	36	36	41	40
24	42		G	36	48	32	24		32	40	48	49	42	41		41	35	27	27		G	38	36	G
25	G	G		G	G	24	27	26	35	61	38	41	41	34	35	45	49	56	46		G	G	G	G
26	G	33	26	35	38	34	37	38		44	47		52	48	77	38	39	47	70		G	37	40	48
27	46	57		50	34	40	38	38	59	40	32	34	42	38	48	64	35	33	37	G	G	G	28	39
28	38		42	42	29	24	31	48	60	46	48	53	53	50	49	50	76		56			72	82	68
29	39	31	27	26	G	B	G	40	76	96	72	63	36	93	63	43	64		72	72		39	60	49
30	50	35	G	G	26	27	26	49	29	36	40	28		40	38	35	31	34	32		G	24	G	42
31	27	34	G	G	G	G	G	35	40	36	40	B	41	32		34	61		36	42	48	38	32	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	28	27	29	28	23	24	22	24	28	27	26	27	27	28	28	28	25	24	15	25	29	29	27
MED	36	34	26	30	12	27	28	36	46	48	48	49	51	43	48	48	47	47	39	42	40	36	32	38
U Q	42	42	36	39	34	35	37	48	58	60	66	61	65	66	71	62	63	60	65	50	45	43	40	48
L Q	27	G	G	G	G	24	G	33	36	39	40	40	41	40	39	39	38	37	32	33	G	12	G	G

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HOURLY VALUES OF fmin AT OKINAWA

JUL. 1996

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	14	15	14	15	14	14	14	14	14	16	26	22	22	18	16	16	15	14	15	14	16	14	14
2	14	15	14	15	15	15	14	14	15	15	15	21	26	26	24	18	16	14	14	14	14	14	14	14
3	15	14	14	14	14	15	14	14	14	15	18	18	27	23	22	18	16	15		14	14	14	14	14
4	15	16	15	15	14	15	14	14	14	16	16	21	24	23	21	18	17	15	14	17	14	14	15	14
5	14	15	14	15	15	14	16	14	15	16	21	22	24	24	22	17	15	15		14	14	14	15	14
6	14	111	14	14	14	14	14	14	15	16	17	23	26	27	22	21	16	15	14	14	14	15	14	14
7	15	14	15	16	15	15	15	14	14	16	20	18	27	20	20	24	18	15	14	16	15	14	15	14
8	14	14	14	14	15	14	14	14	14	15	15	21	26			24	17	15	14	14	15	15	14	14
9	14	15	14	14	14	B	B			16	28	B	28	30	28		17	17	14	14	14	14	21	18
10	15	15	15	14	14	14	17	14	14	14	16	17	20		22	22	16	14	15	15	14	15	14	14
11	14	14	15	18	15	14	18	14	15	16	16	20	27	29		21	15	15	15	14	14	14	14	14
12	14	15	14	14	14	14	14	14	15	16	18	21	17	21	20	18	16	14	15	14	14	14	18	15
13	15	18	15	14	14	15	15	15		16	20	16	21	17	20	21	16	15		14	14	14	14	14
14	15	14	14	14	15	B		14		14	16	18	18	18	20	18	16	16	15	14	16	15	14	15	16
15	14	15	15	14	14	B		18	14	15	17	15			17	18	18	16	15	15	14	15	15	14	14
16	14	15	14	14	14	14	14	14	14	16		45	21		20	17	15	14	14	14	14	14	14	15
17	15	15	14	15	15	B			14	15	15	16	20	26	22	15	15	14	14	14	14	15	14	14
18		15	17	14	15	15	16	14	15	16	18	20	21	21	17	16	15	14	14	14	15	14	14	15
19	14	14	14	14	14	15	B	14	14	15	17	18	20	22	22	17	16	14		14	14	16	14	15
20	14	14	15	14		B	16		14	16	17	20	22	24	17	17	16	14	14	14	14	15	16	15
21	14	14	14	17		B	14	14	14	16	16	16	28	23	20	18	16	15	14	14	14	14	14	
22	14	14	14	15	15	14	B	14	14	17	16	15	21	18	20	16	14	14	14	14	14	14	15	15
23	15		14		14	14	B	14		15	16	16	17	21	17	16	15	14	15	14	14	14	14	15
24	14	14	14	14	15	14	16	14	14	15	16	20	22	20	18	16	15	14	14	14	16	15	14	14
25	14	14		14	14	14	14	14	15	16	15	17	20	27	22	18	15	15	14	14	14		17	15
26	14	14	14	14	14	14	15	14	14	15	15	16	17	23	18	17	16	14	14	14	14	14	14	14
27	14	14	14	15	14	14	14	14	14	16	16	20	20	22	26	21	16	14	14	14	20	15	14	14
28	14		14	15	14	14	15	14	14	14	16	16	20		15	15		15	14	14	14	14	14	14
29	14	15	14	14	14	B	18	14	14	15	16	18	18	18	18	17	15	14	14	14	14	14	14	14
30	15	14	14	14	14		15	14	14	14	15	17	18		29	20	14	14	14	14	14	15	14	14
31	14	14	23	15	16	15	24	14	14	14	17	B		18	15	15	16	15	14	15	14	14	14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	30	29	23	26	27	28	31	30	28	29	26	29	30	30	31	27	31	31	30	31	30
MED	14	14	14	14	14	14	15	14	14	16	16	18	21	22	20	18	16	15	14	14	14	14	14	14
U Q	15	15	15	15	15	15	16	14	15	16	18	21	26	24	22	20	16	15	14	14	14	15	15	15
L Q	14	14	14	14	14	14	14	14	14	15	16	16	20	20	18	16	15	14	14	14	14	14	14	14

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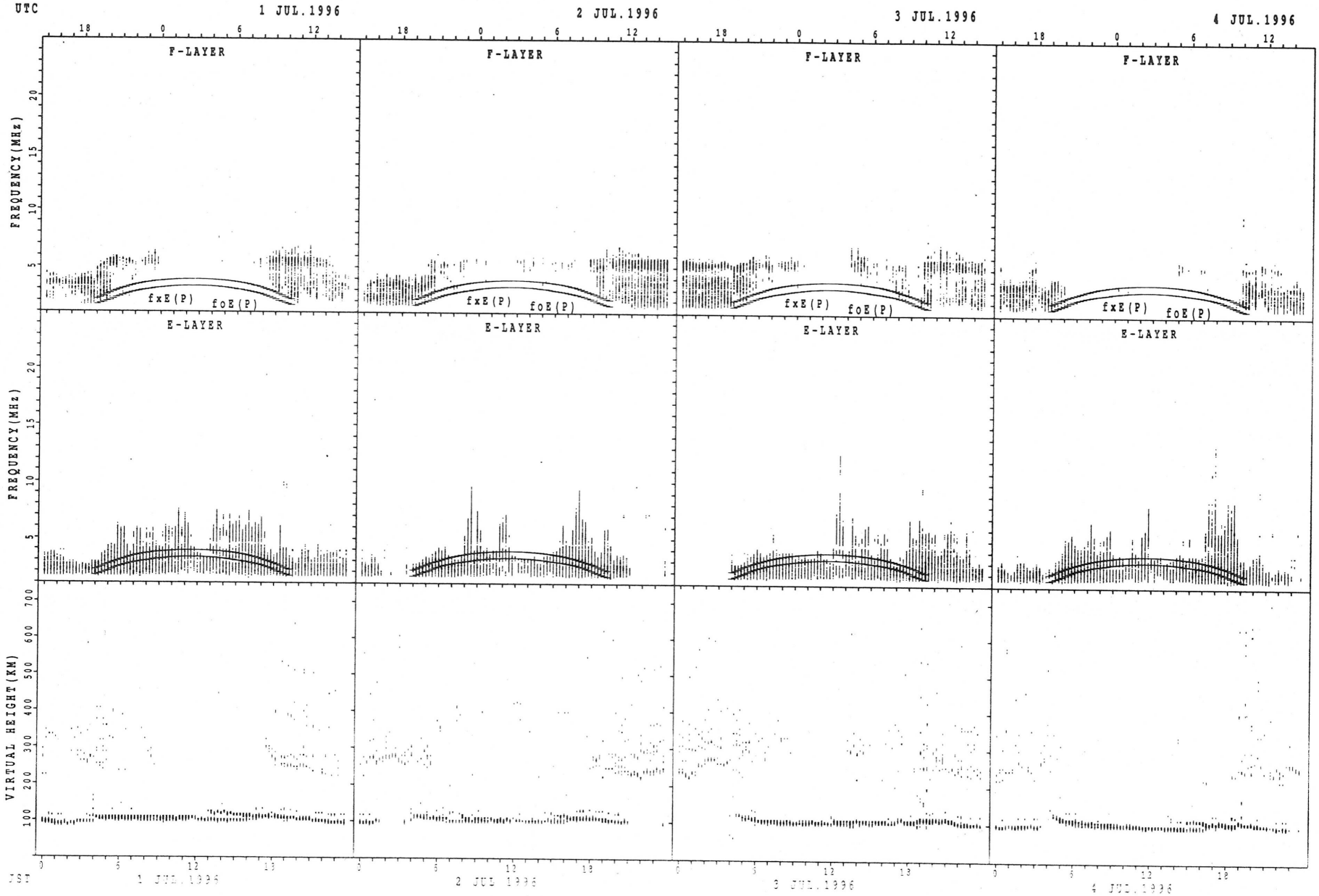
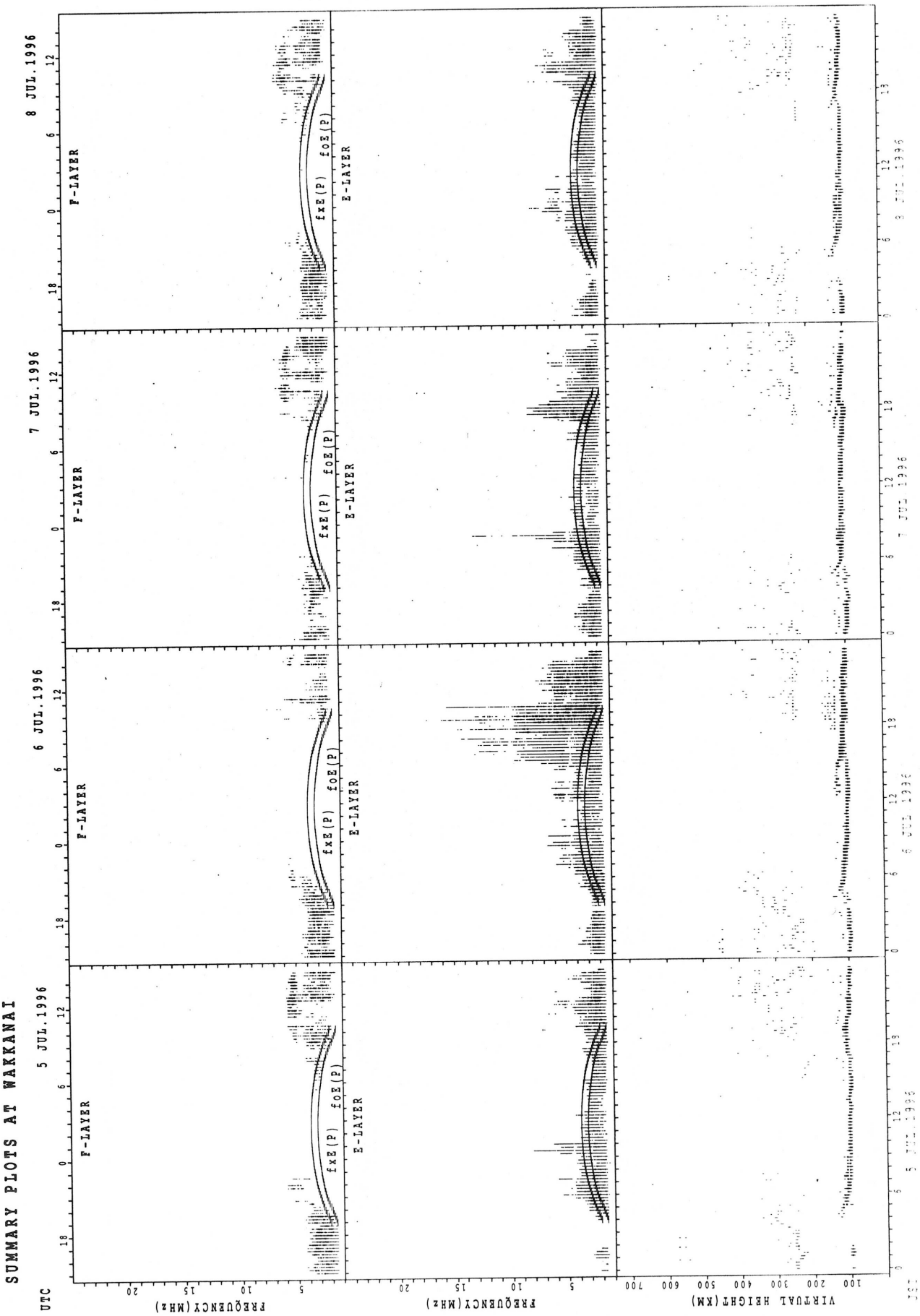
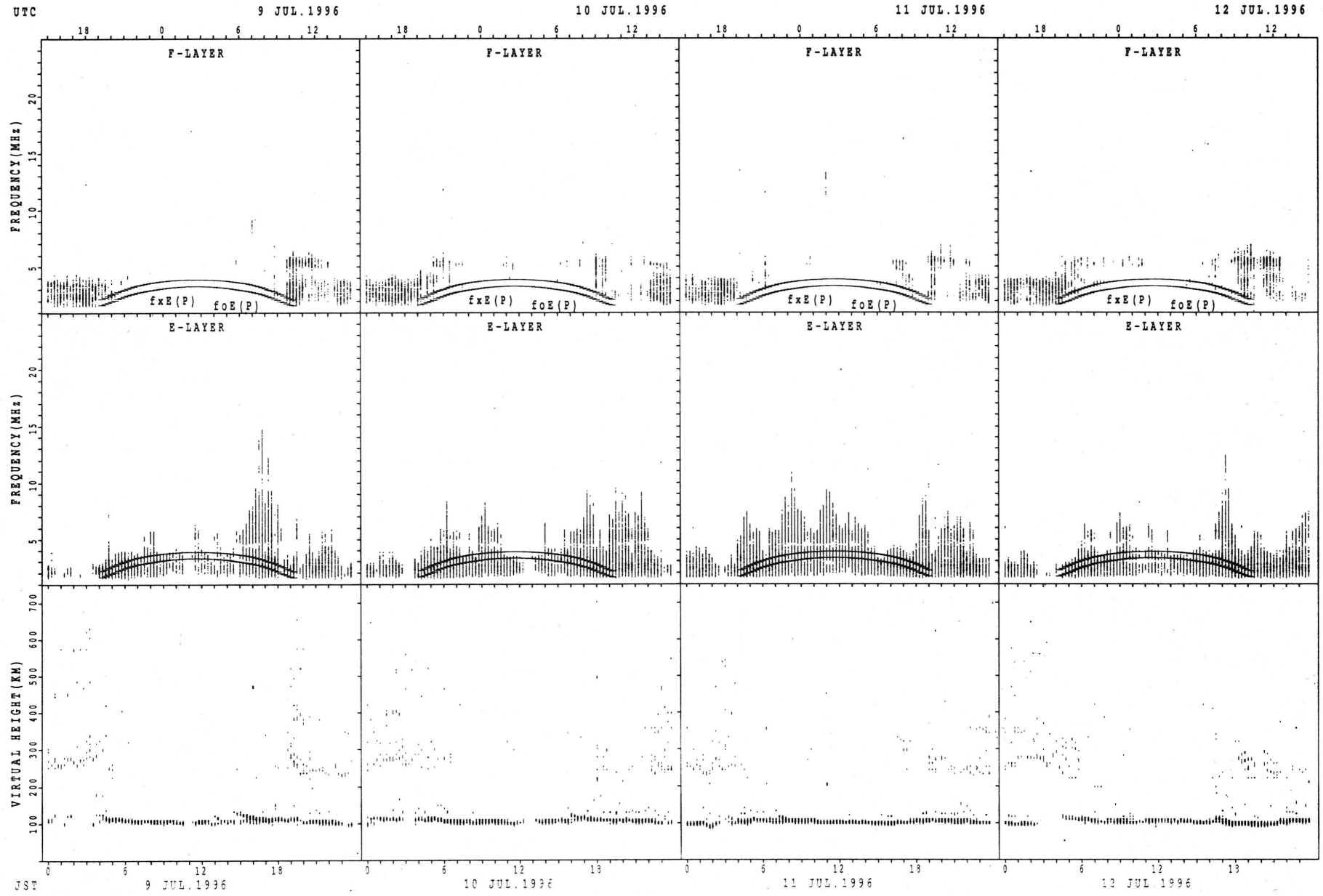
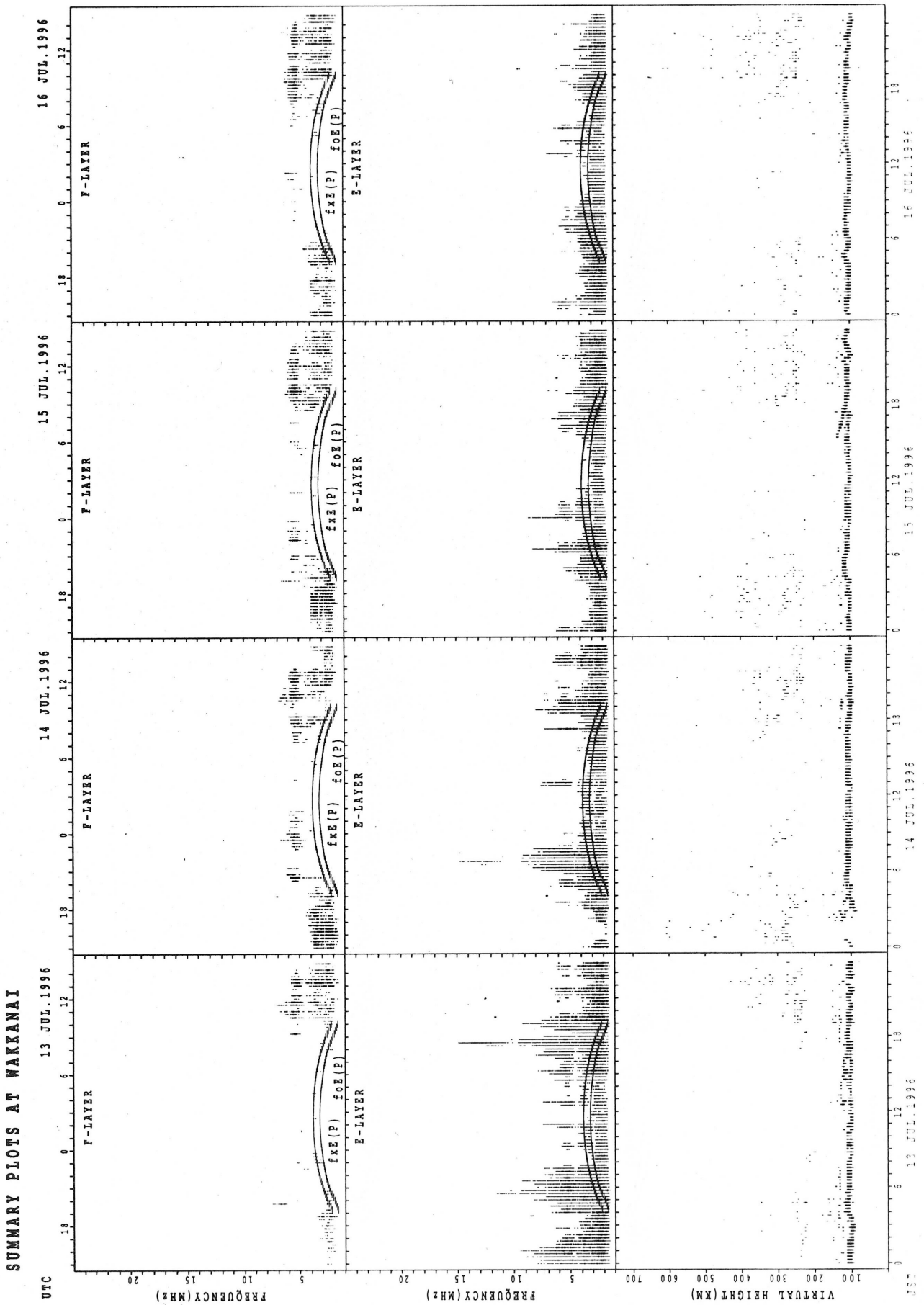
SUMMARY PLOTS AT WAKKANAI



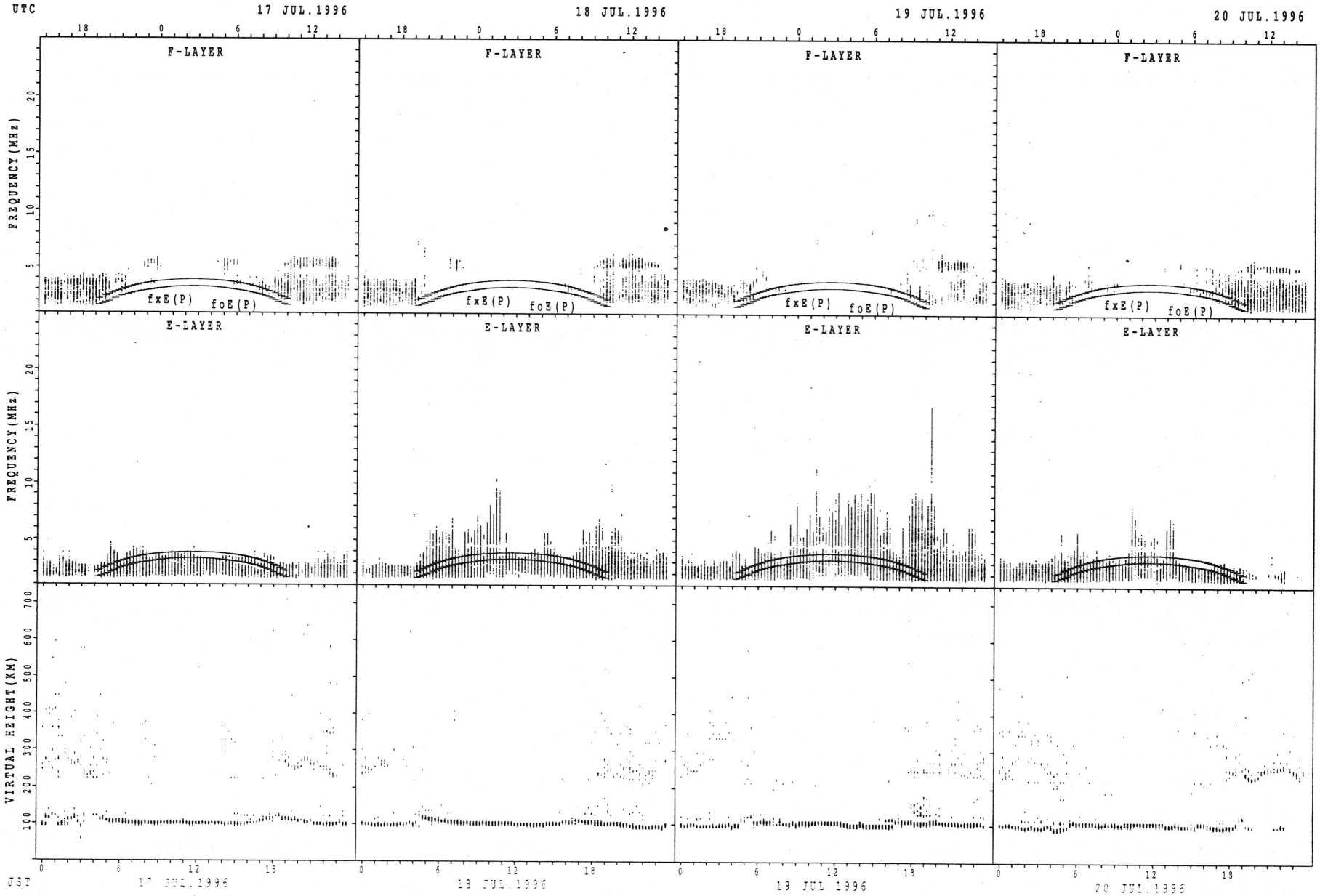

SUMMARY PLOTS AT WAKKANAI
UTC
5 JUL.1996
6 JUL.1996
7 JUL.1996
8 JUL.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

SUMMARY PLOTS AT WAKKANAI

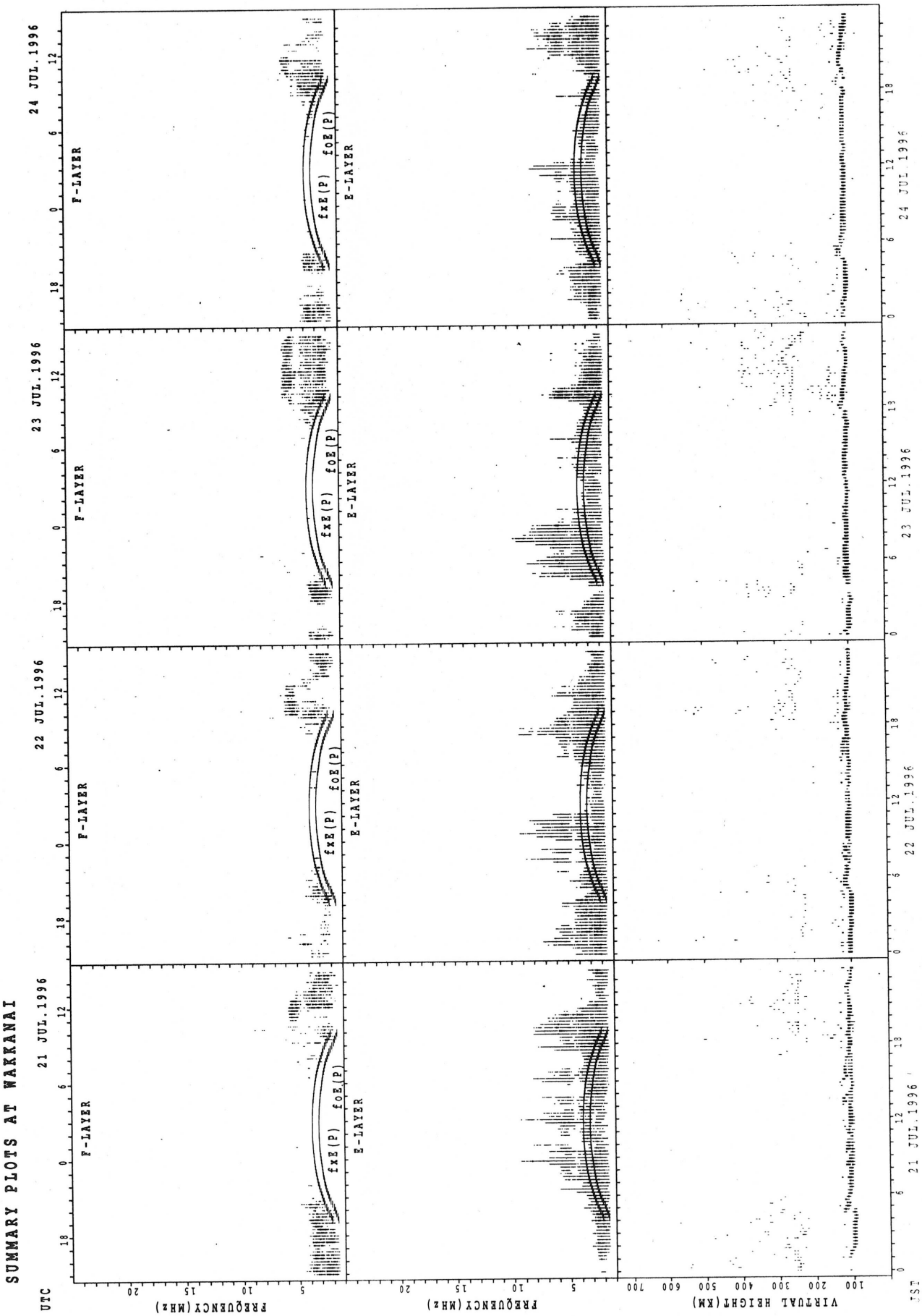



SUMMARY PLOTS AT WAKKANAI
UTC
13 JUL.1996
14 JUL.1996
15 JUL.1996
16 JUL.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

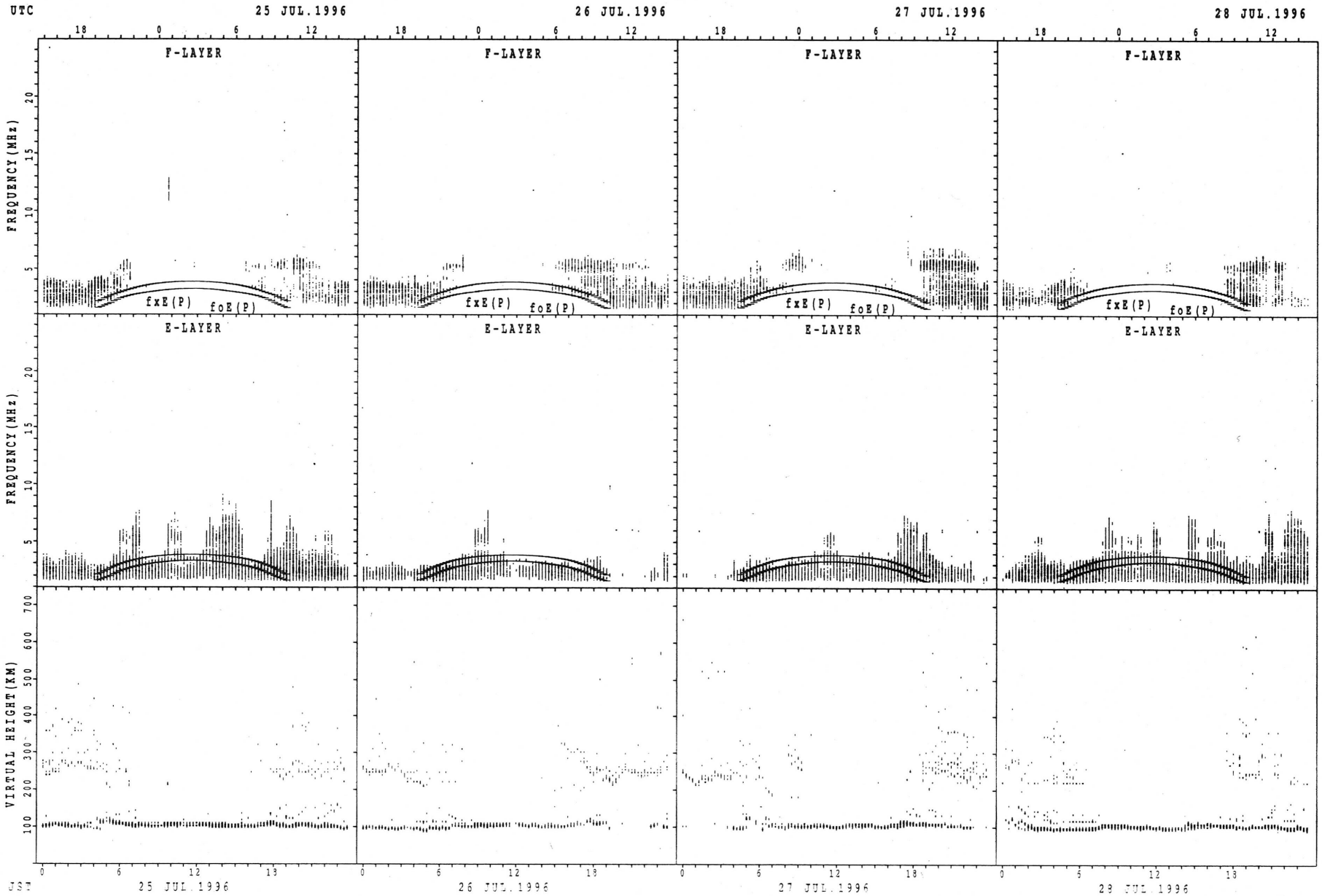
SUMMARY PLOTS AT WAKKANAI



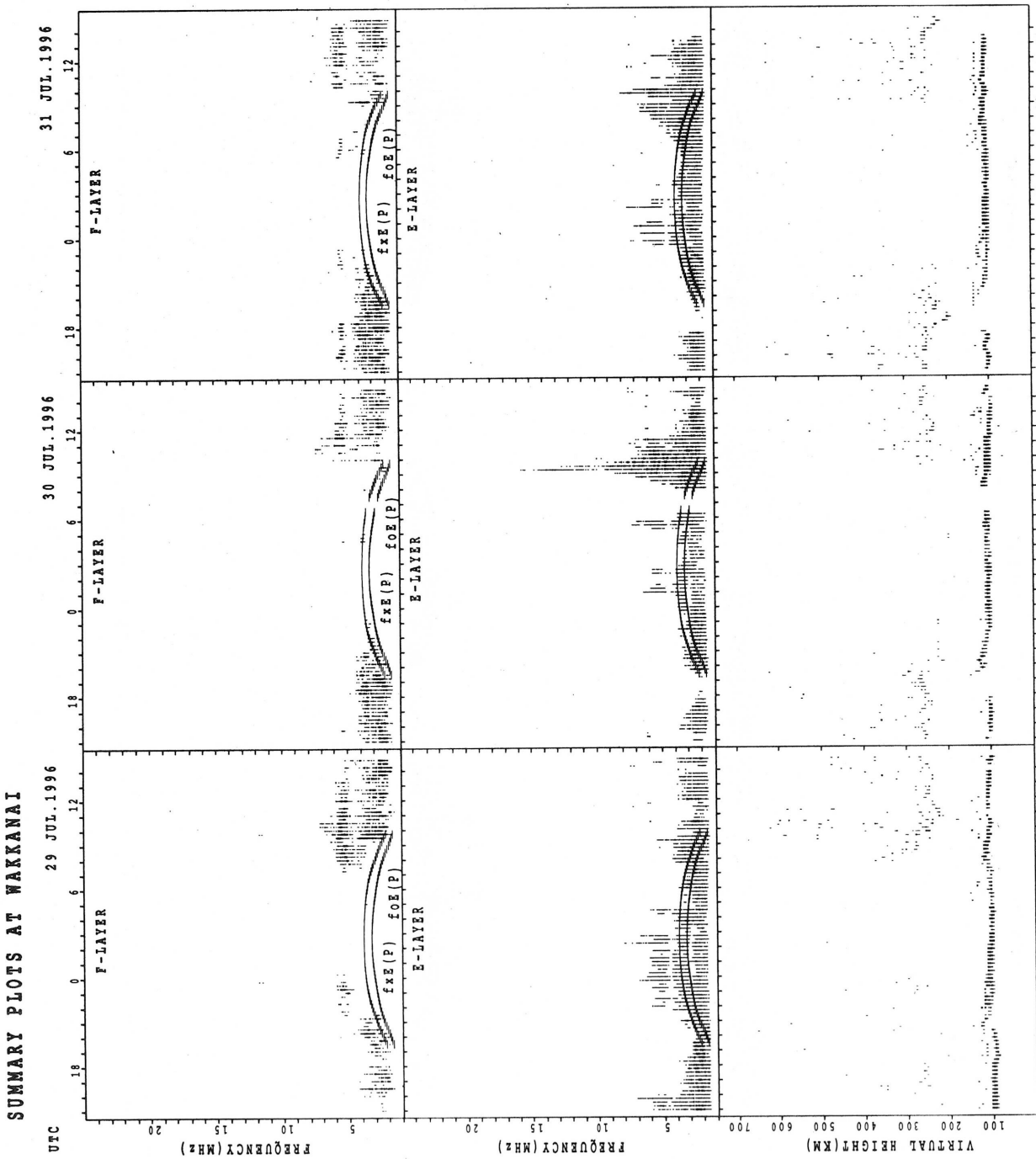
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
21 JUL.1996
22 JUL.1996
23 JUL.1996
24 JUL.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
21 JUL.1996
22 JUL.1996
23 JUL.1996
24 JUL.1996
JST

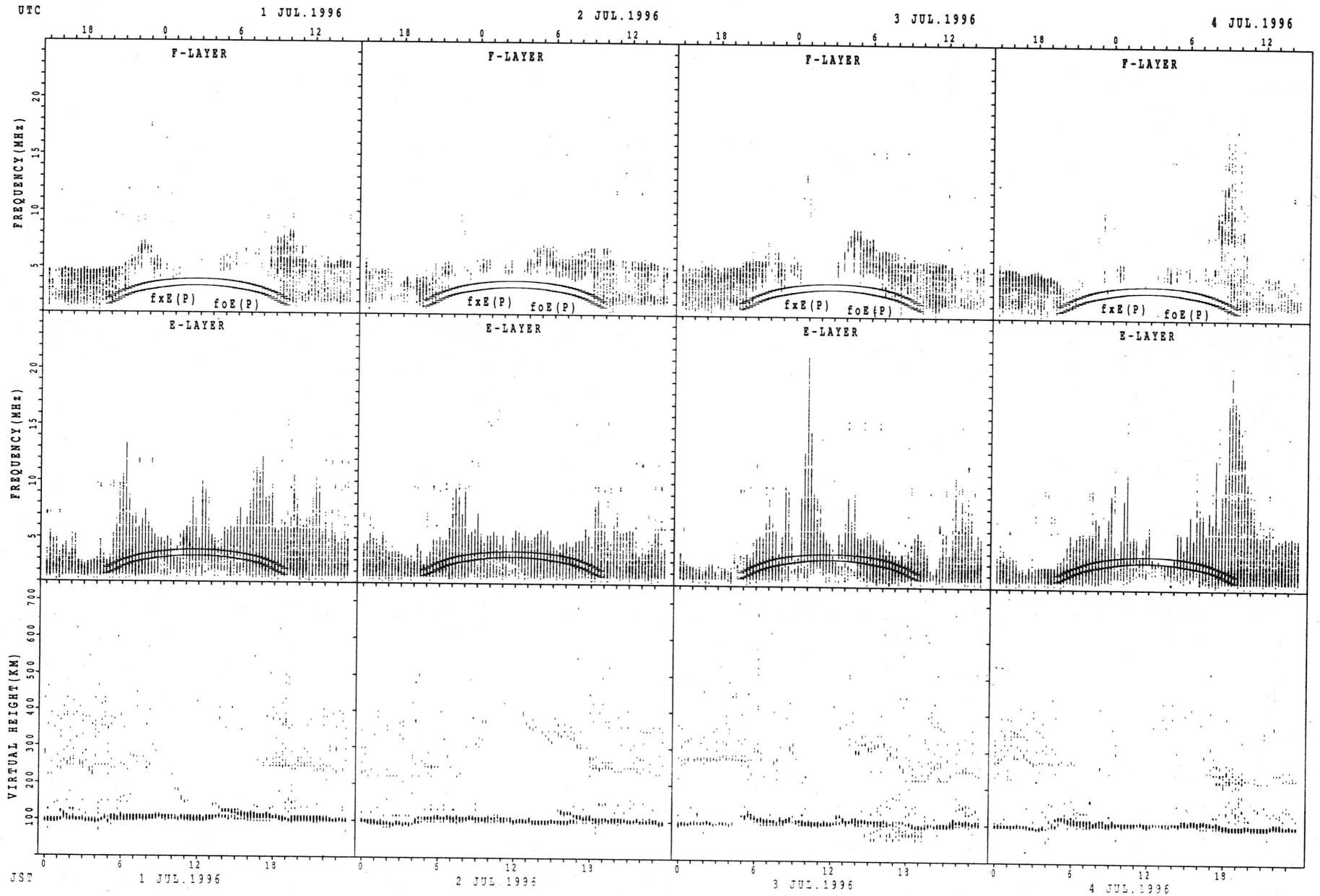
SUMMARY PLOTS AT WAKKANAI



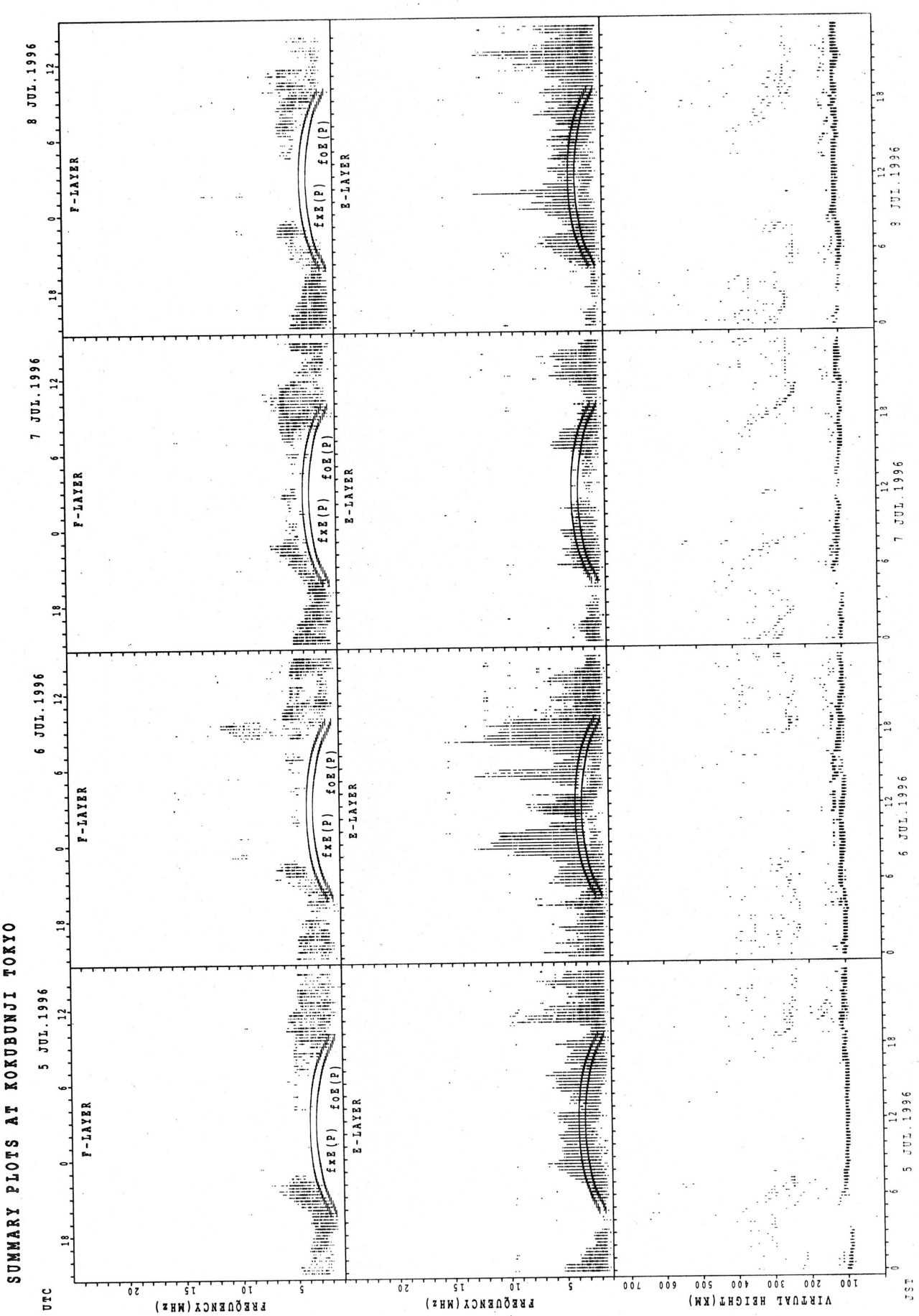
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
29 JUL.1996
30 JUL.1996
31 JUL.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST

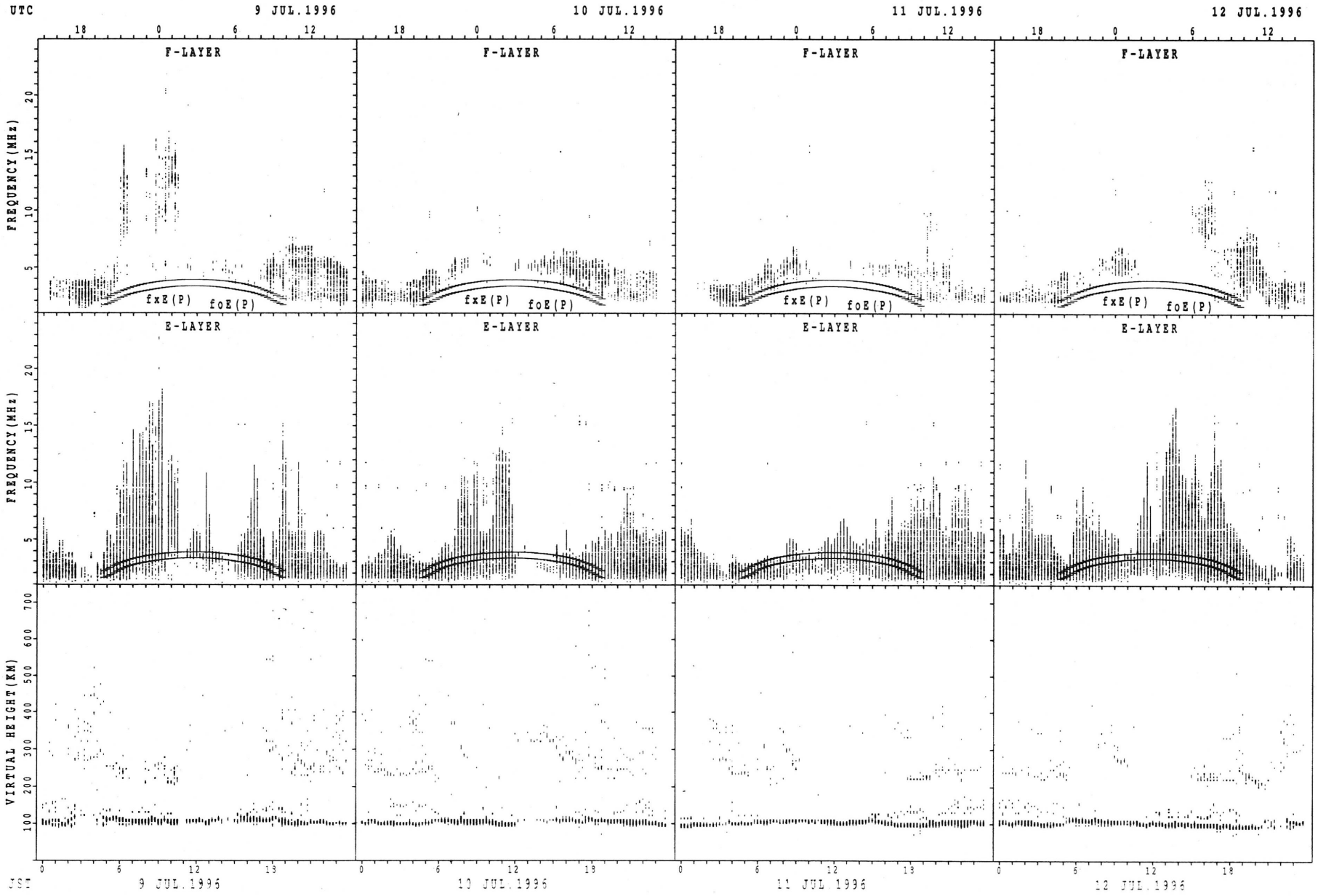
SUMMARY PLOTS AT KOKUBUNJI TOKYO

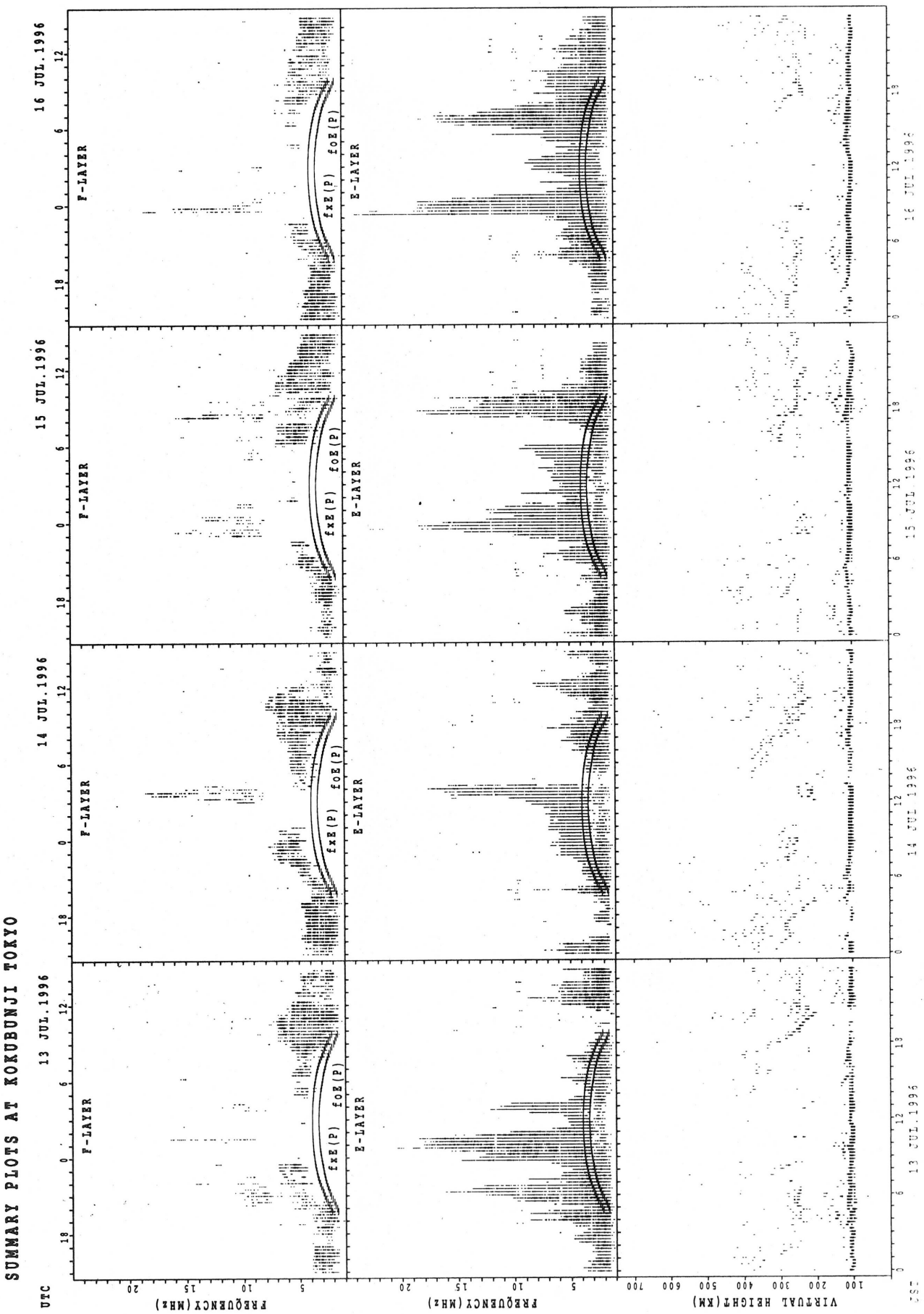


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

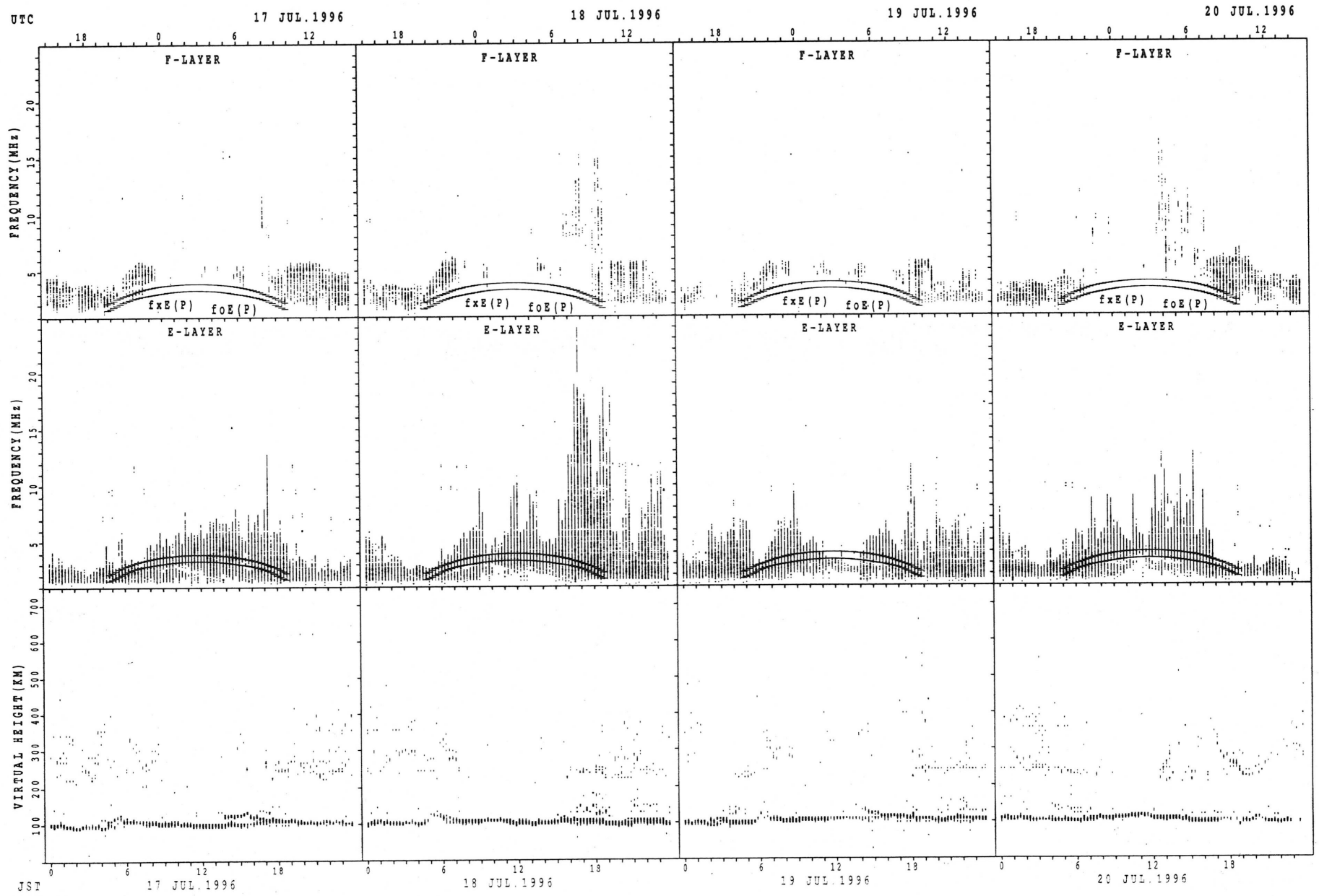

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
5 JUL.1996
6 JUL.1996
7 JUL.1996
8 JUL.1996
9 JUL.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

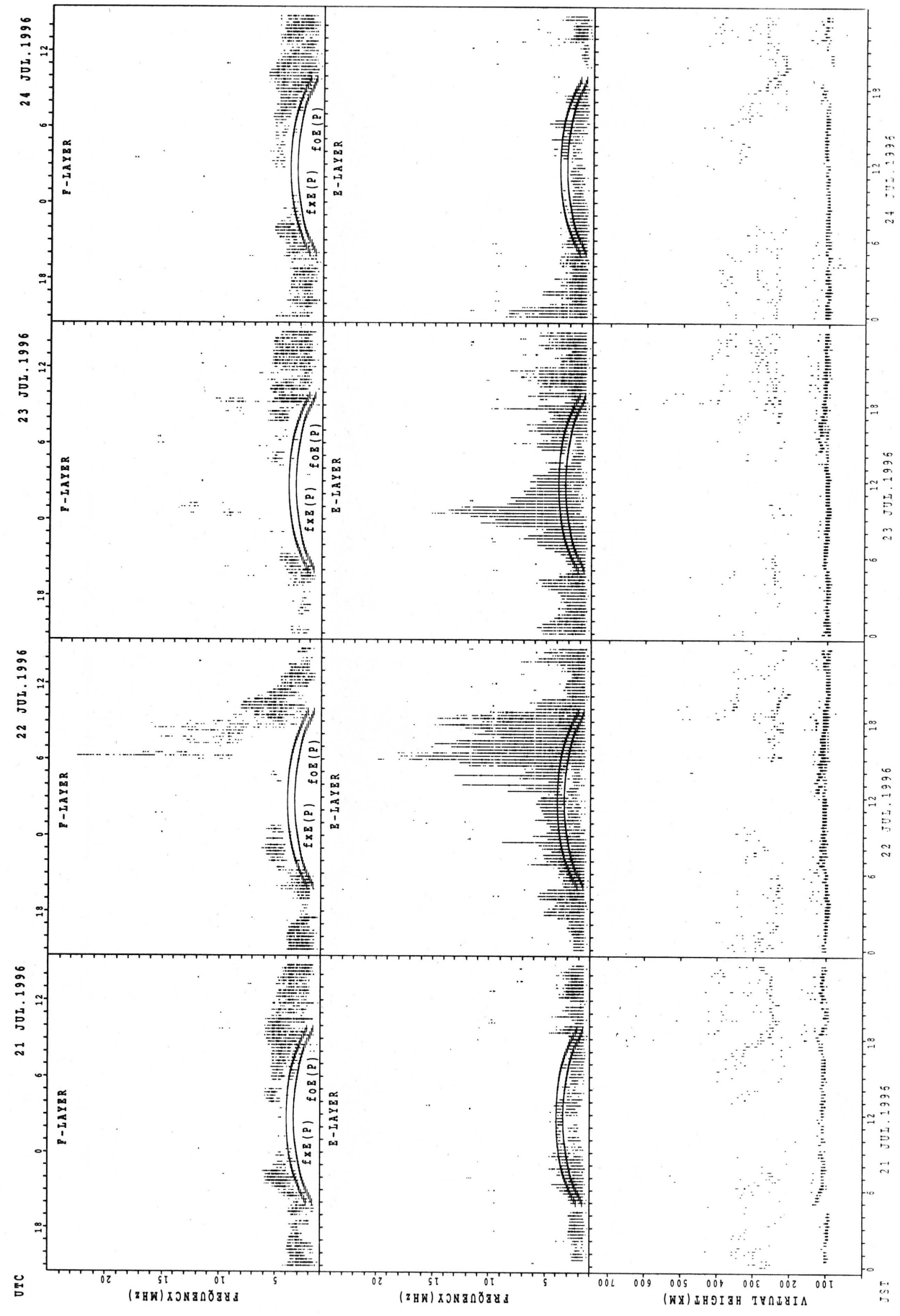
SUMMARY PLOTS AT KOKUBUNJI TOKYO



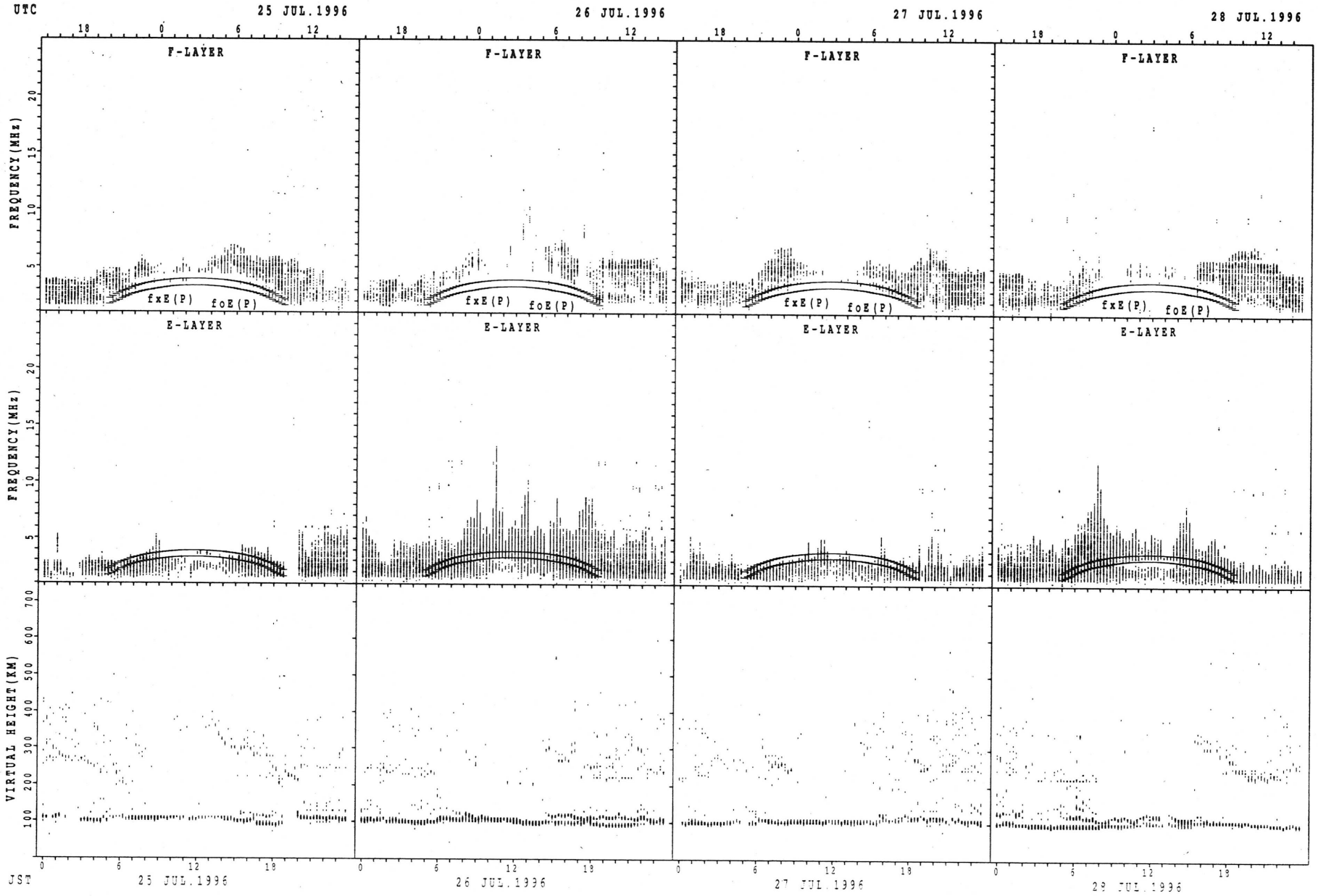

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
13 JUL.1996
14 JUL.1996
15 JUL.1996
16 JUL.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

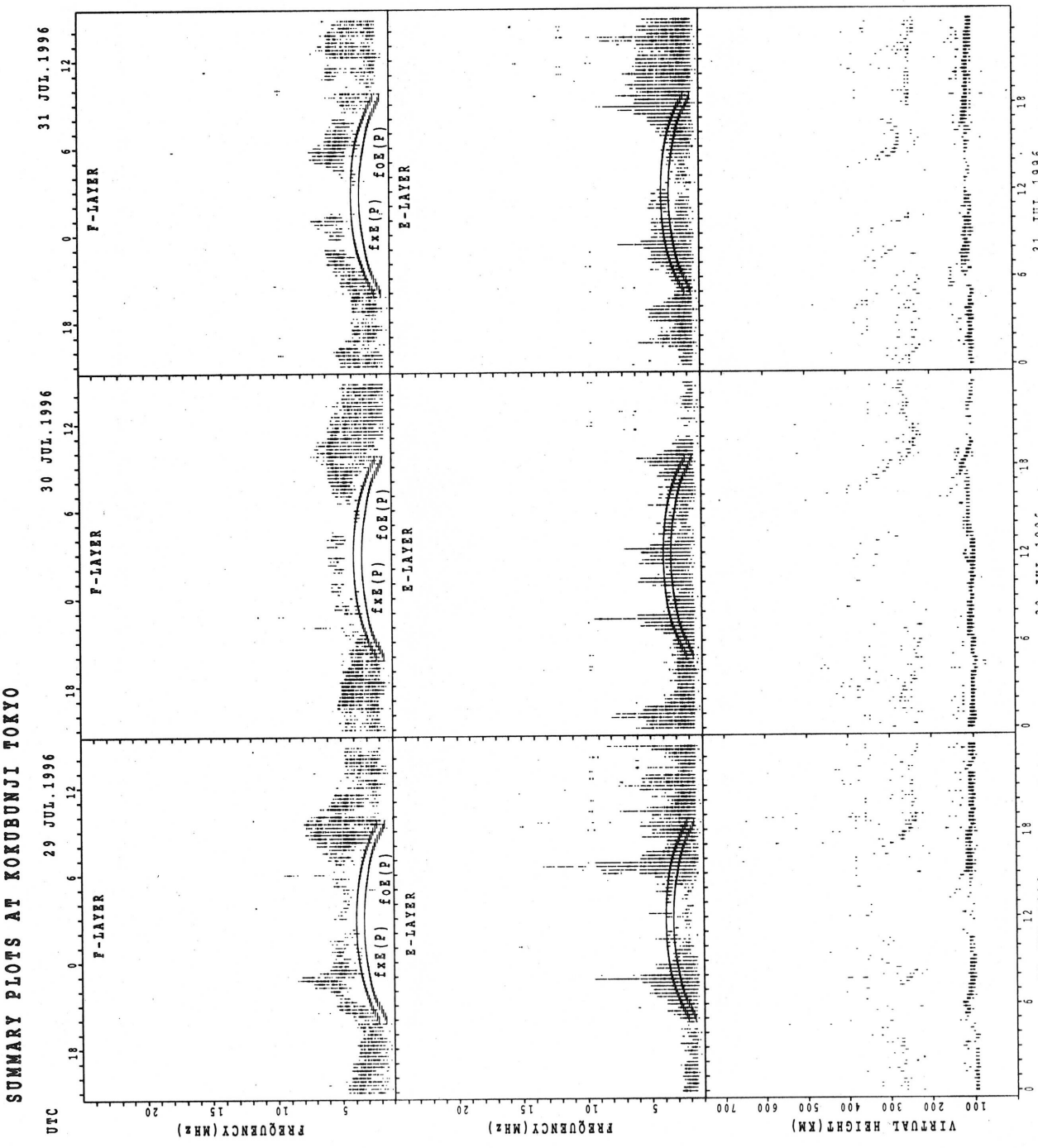



SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
21 JUL.1996
22 JUL.1996
23 JUL.1996
24 JUL.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST

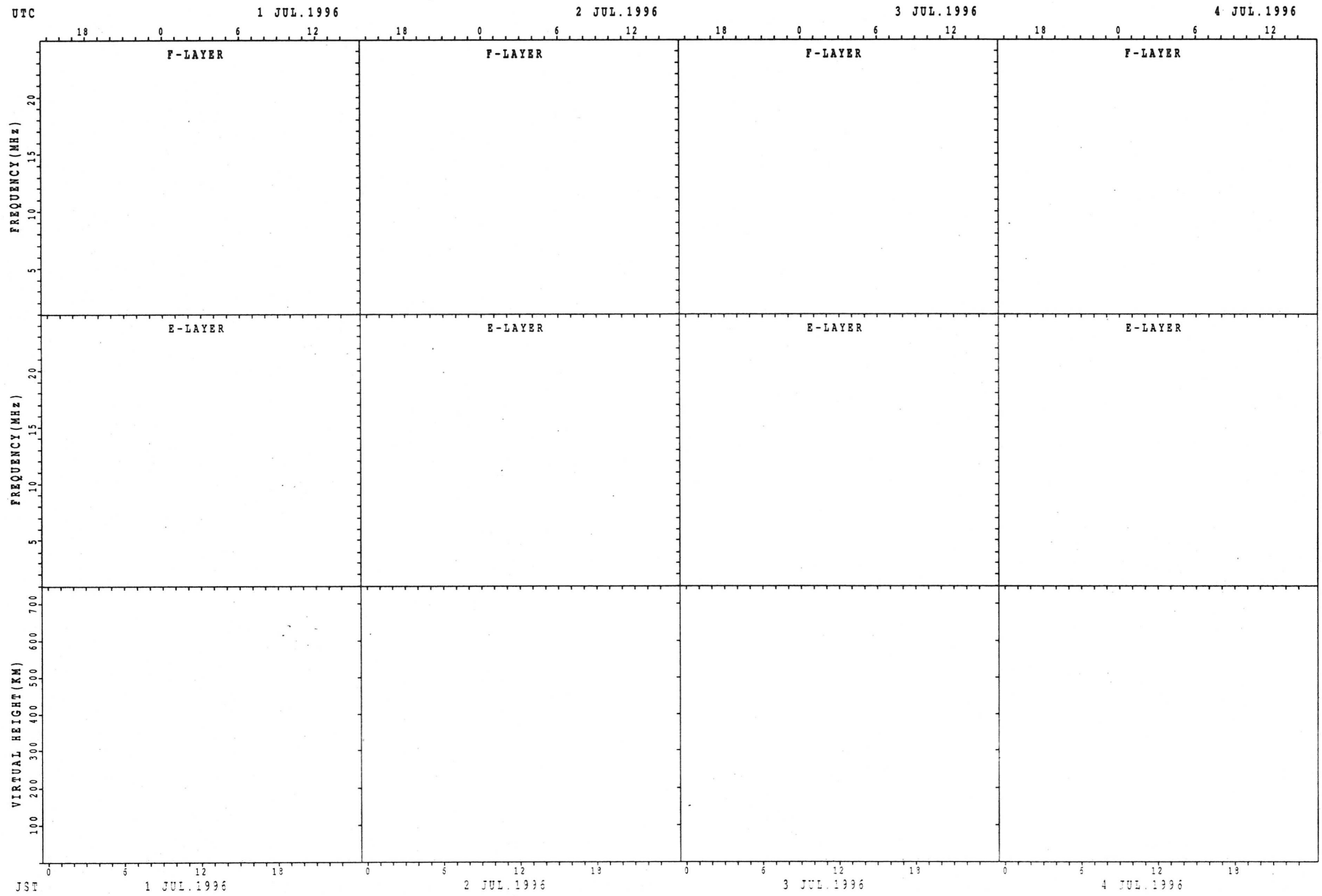
SUMMARY PLOTS AT KOKUBUNJI TOKYO



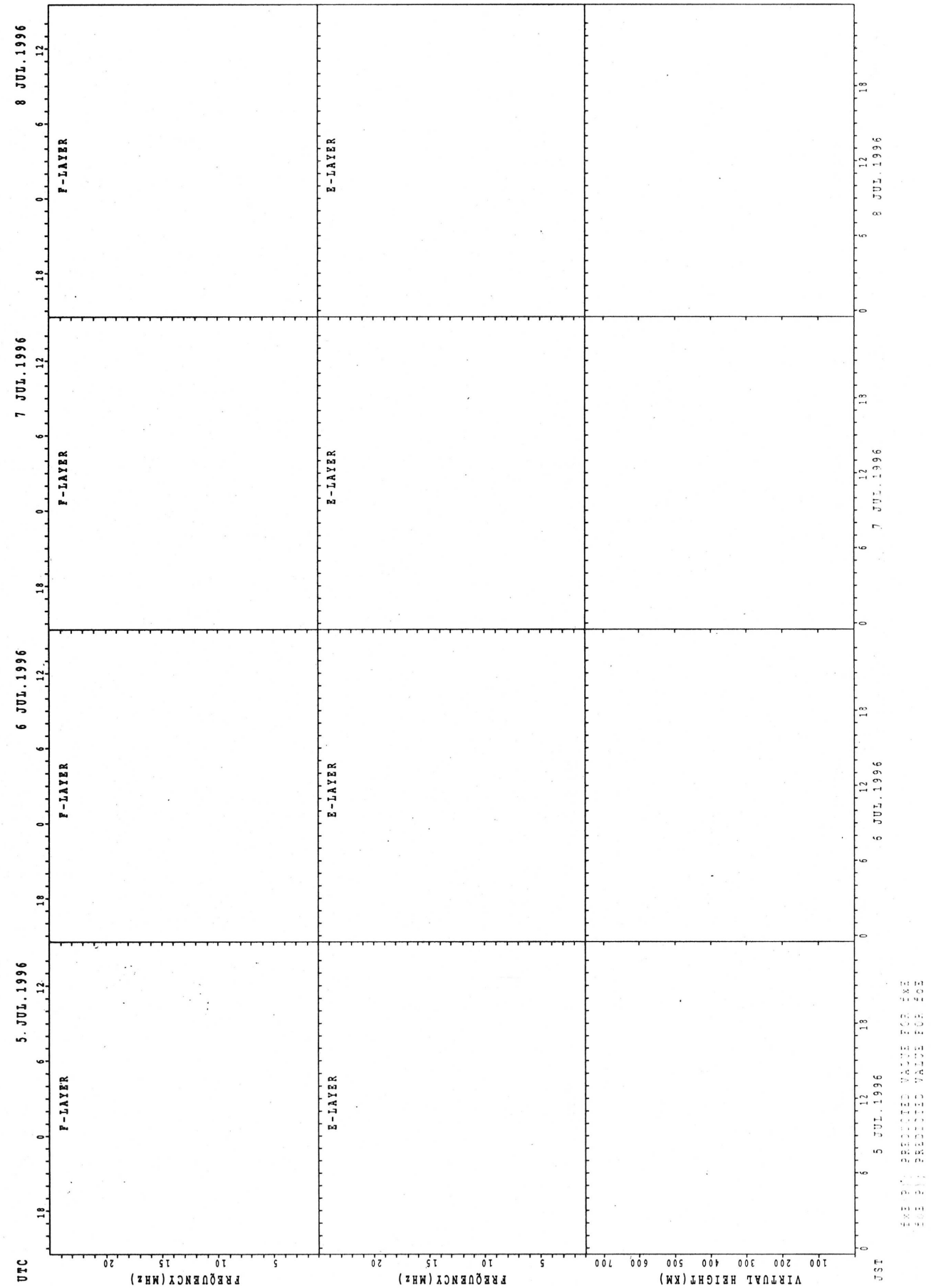
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE


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

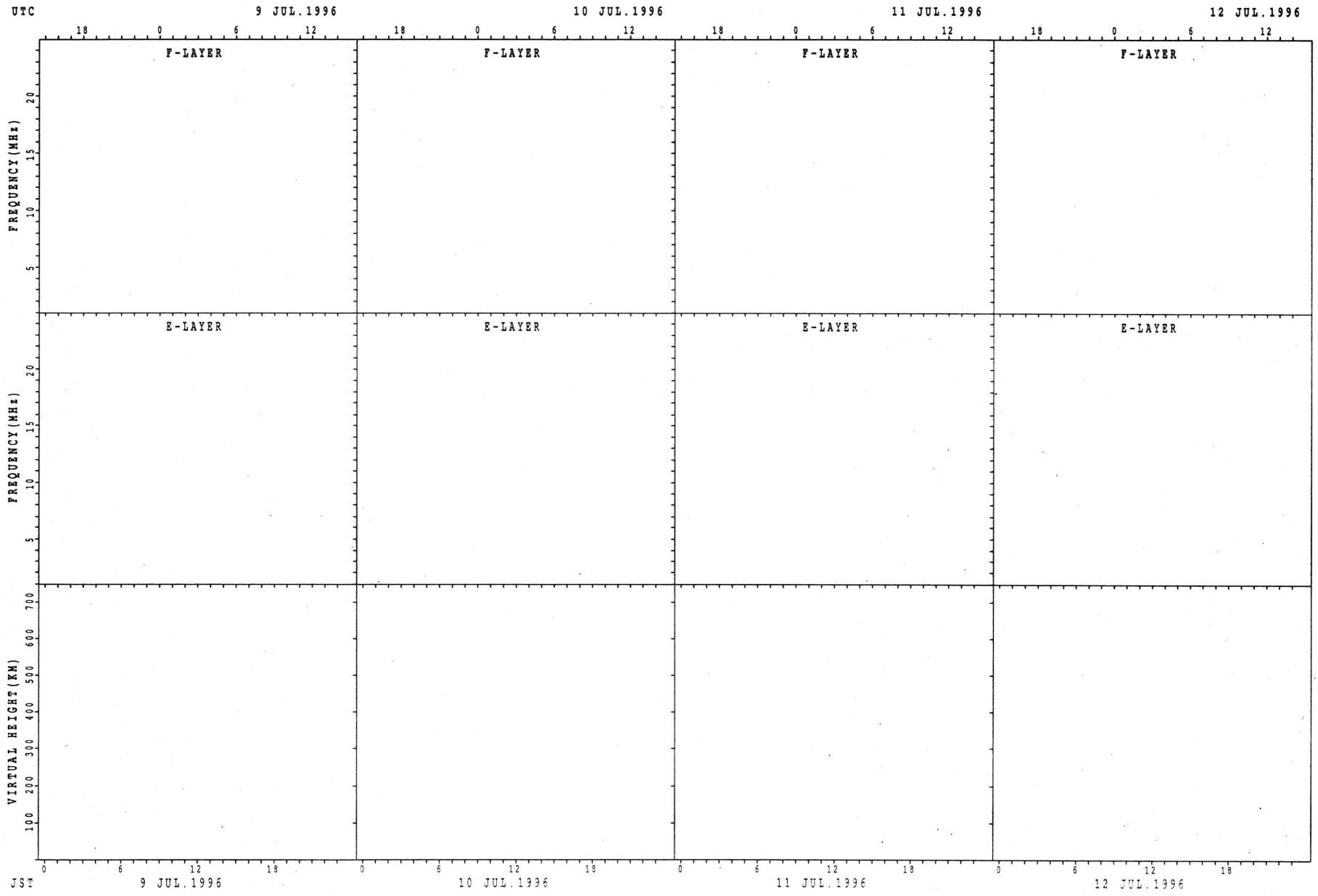
SUMMARY PLOTS AT YAMAGAWA



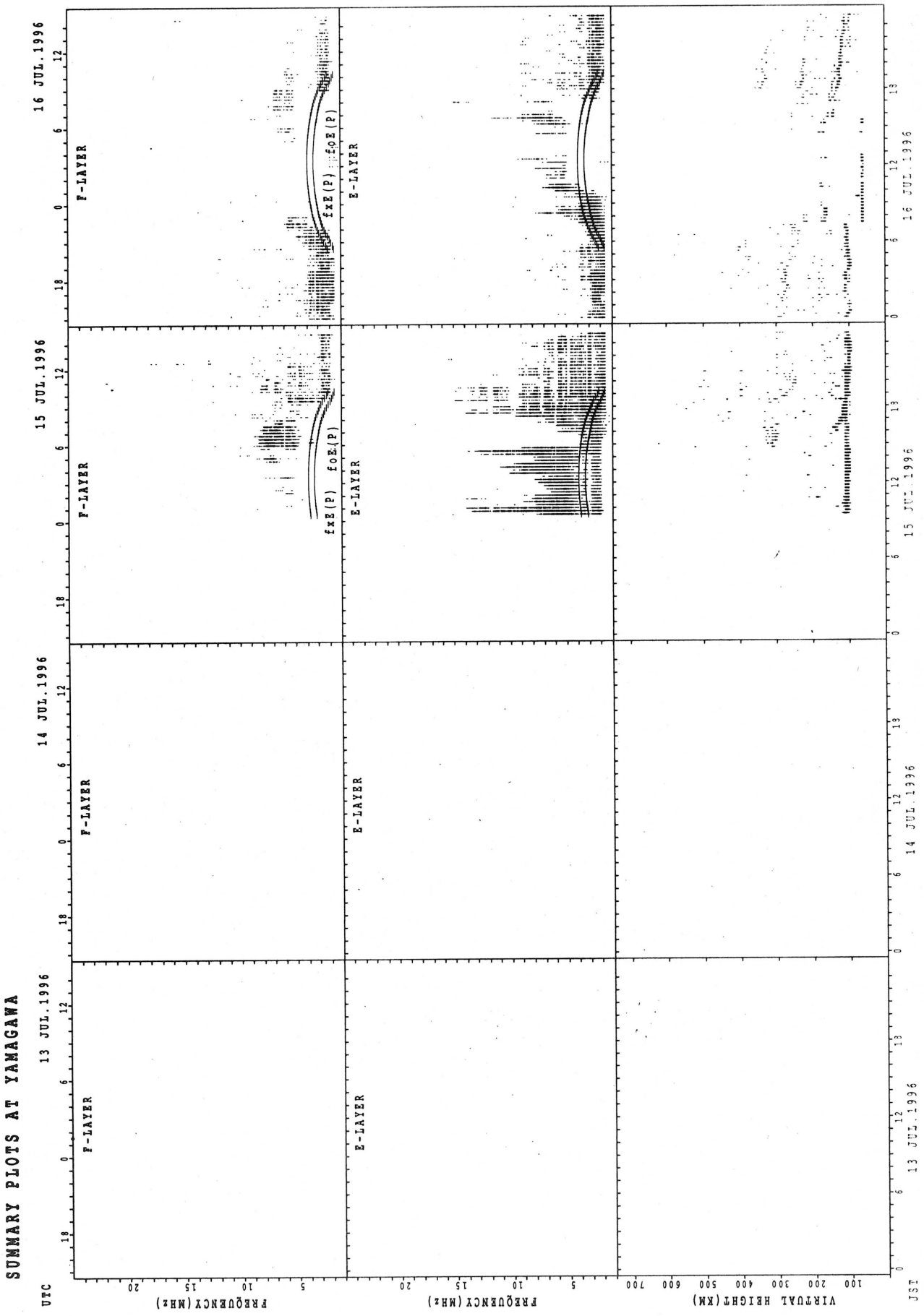
foE(P) : PREDICTED VALUE FOR foE
foE(P): PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
5 JUL.1996
6 JUL.1996
7 JUL.1996
8 JUL.1996
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
5 JUL.1996
6 JUL.1996
7 JUL.1996
8 JUL.1996

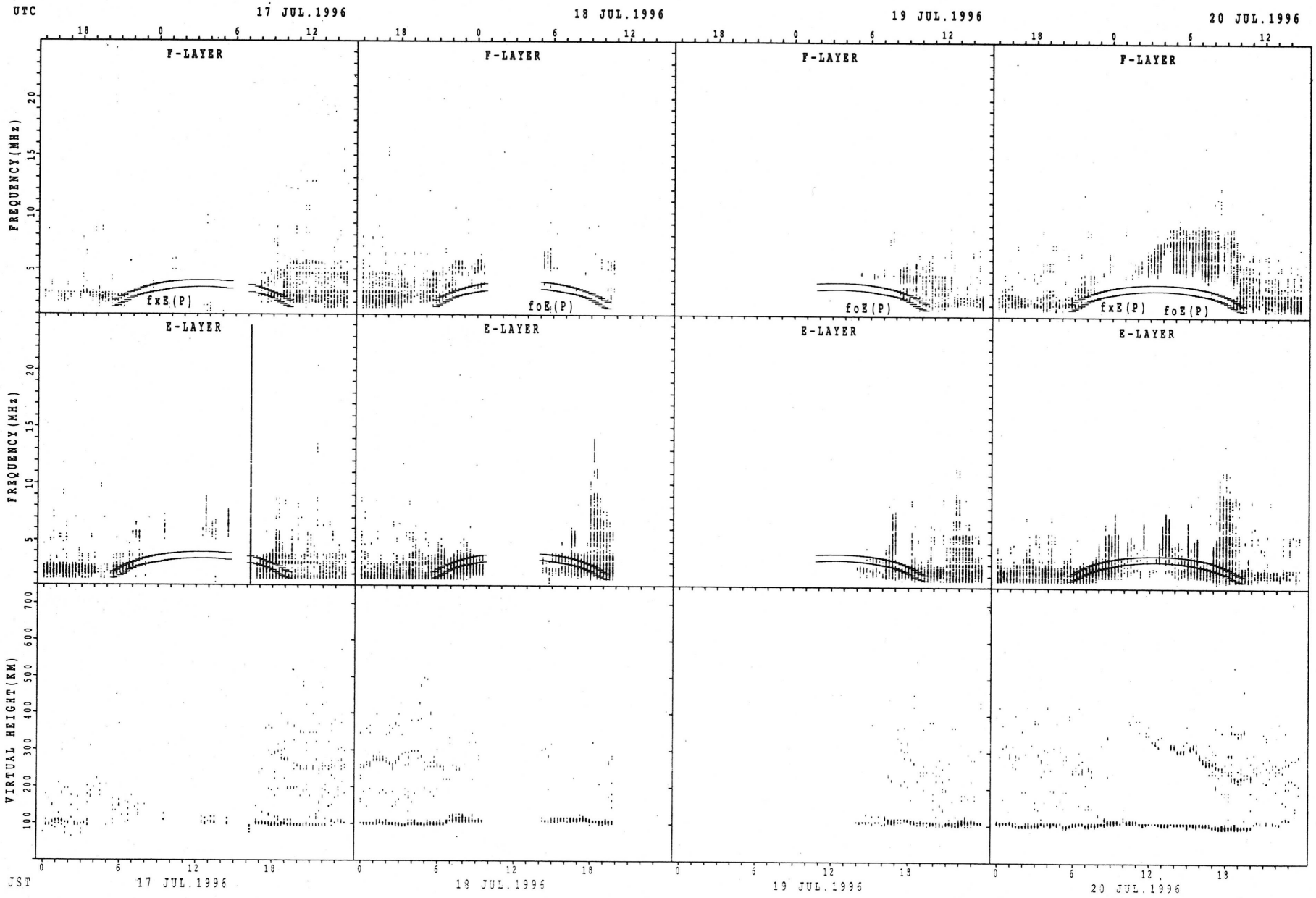
SUMMARY PLOTS AT YAMAGAWA

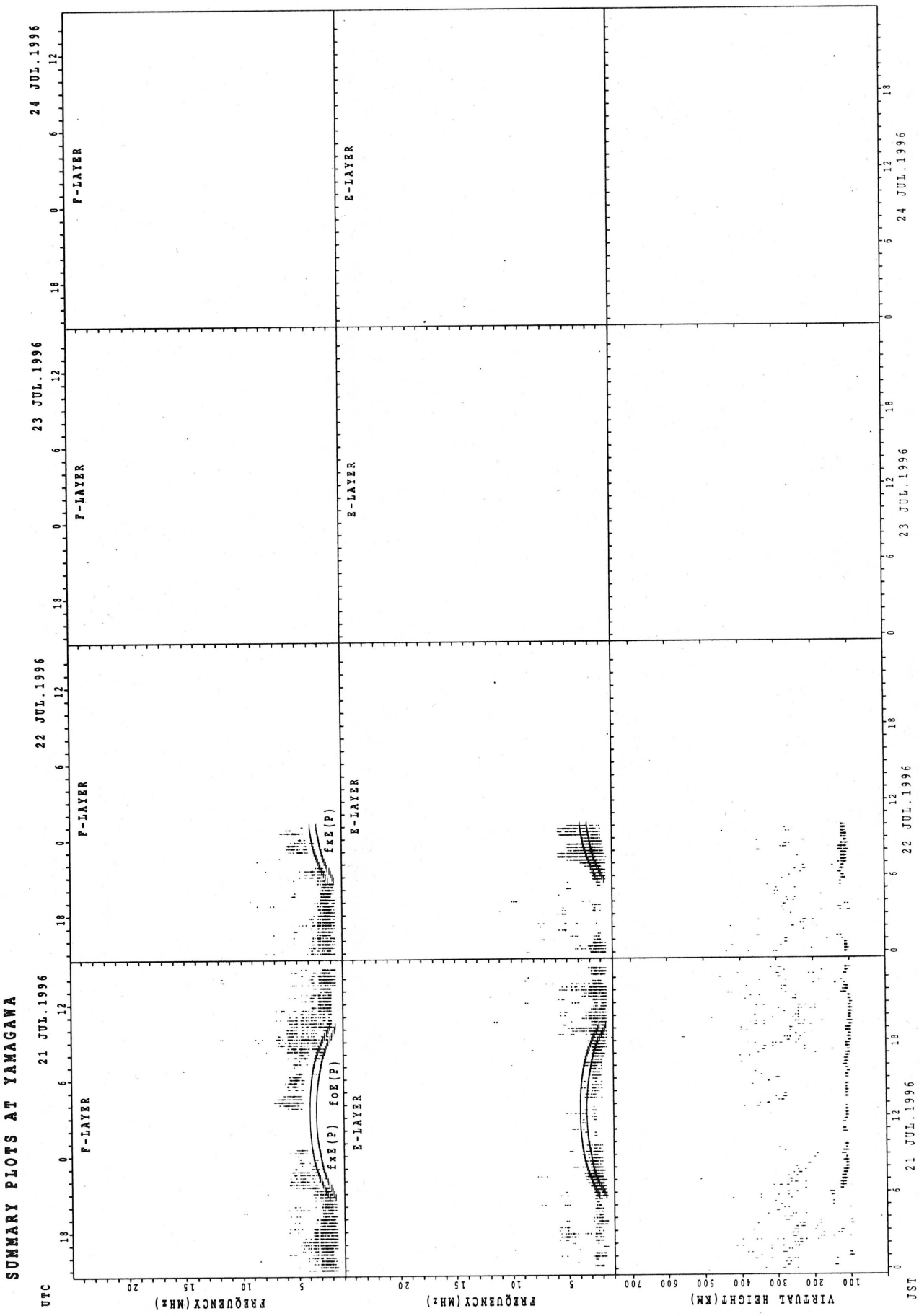


fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

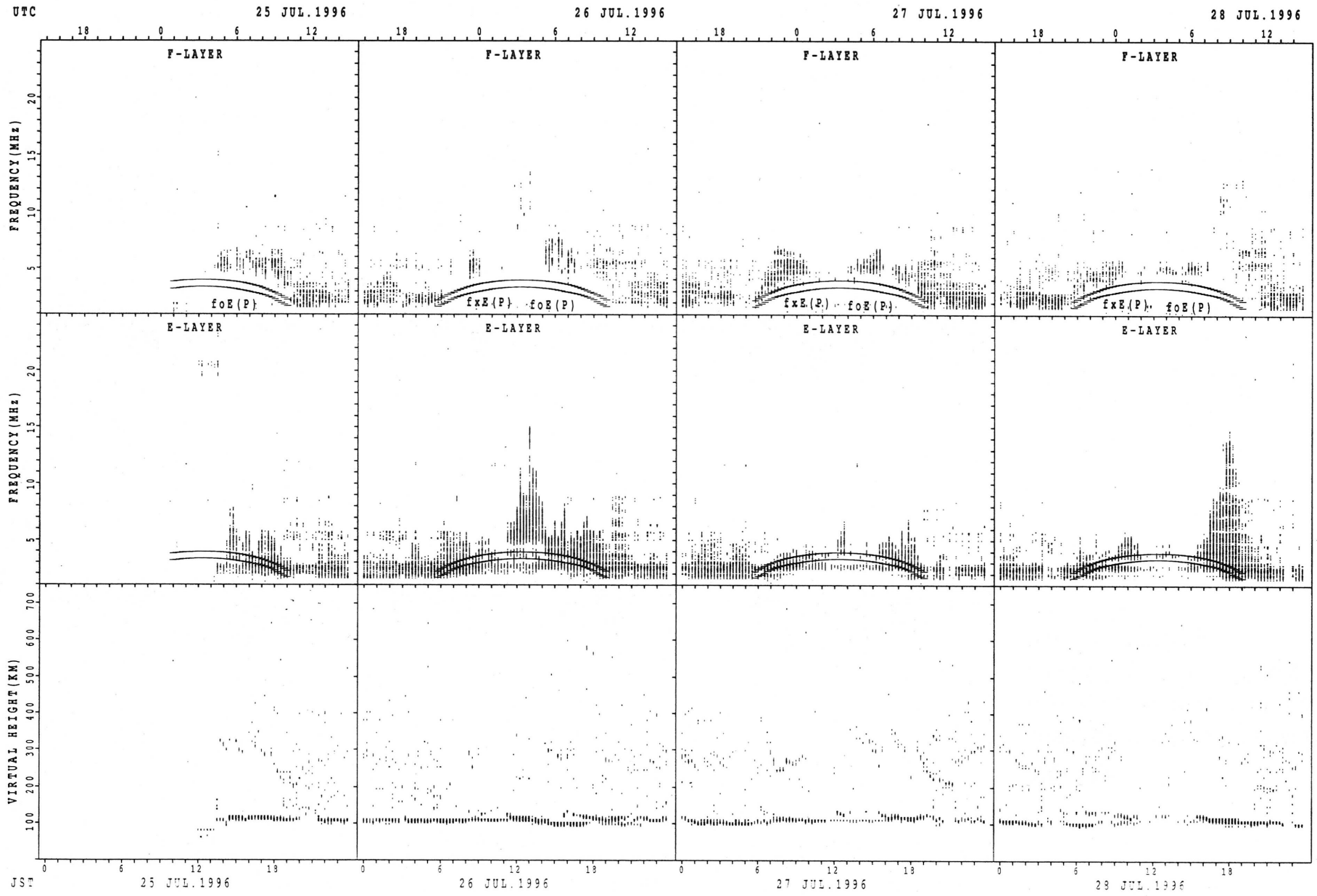

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
13 JUL.1996
14 JUL.1996
15 JUL.1996
16 JUL.1996
F-LAYER
E-LAYER
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
fxE(P)
foE(P)

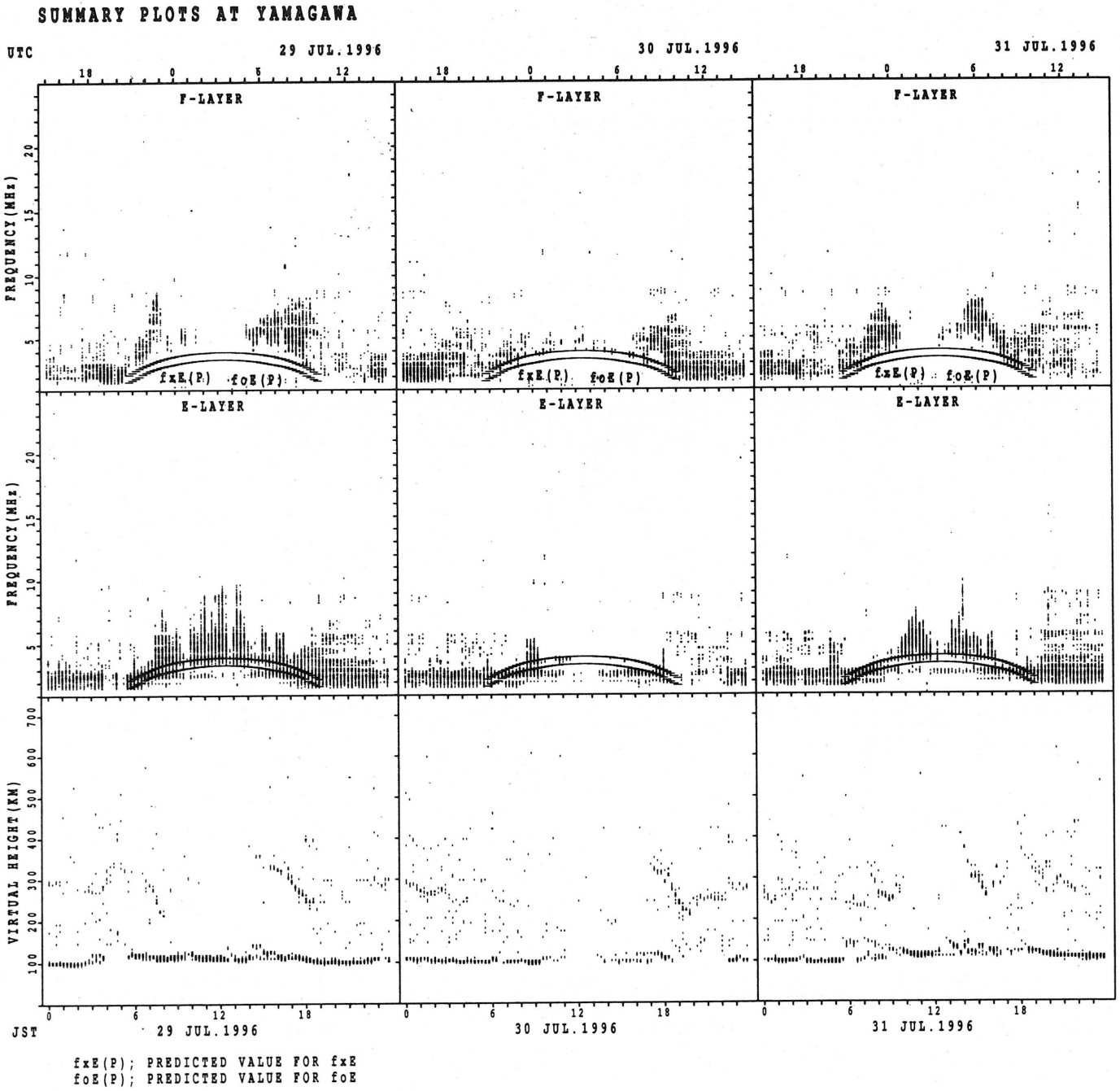
SUMMARY PLOTS AT YAMAGAWA




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

SUMMARY PLOTS AT YAMAGAWA

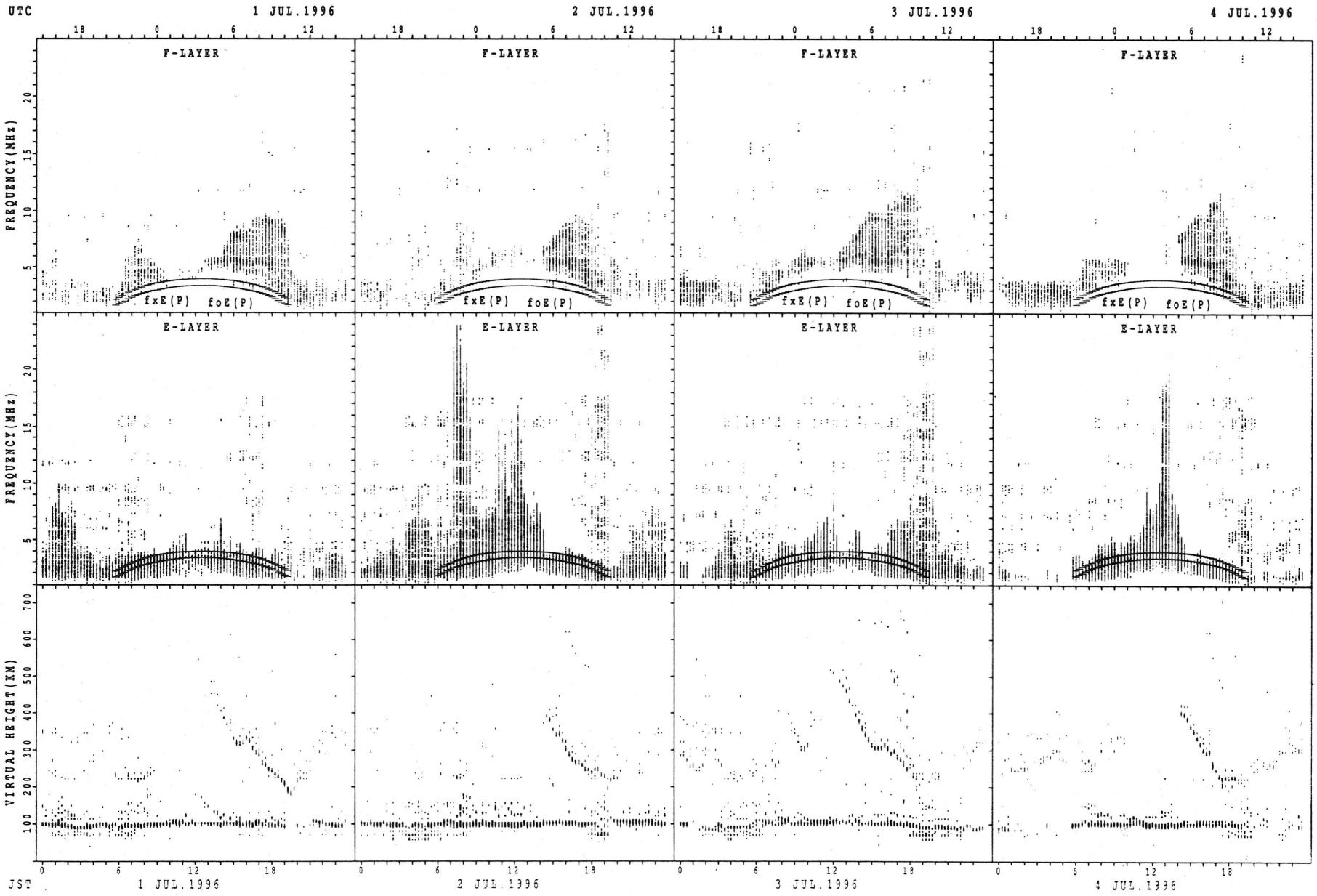




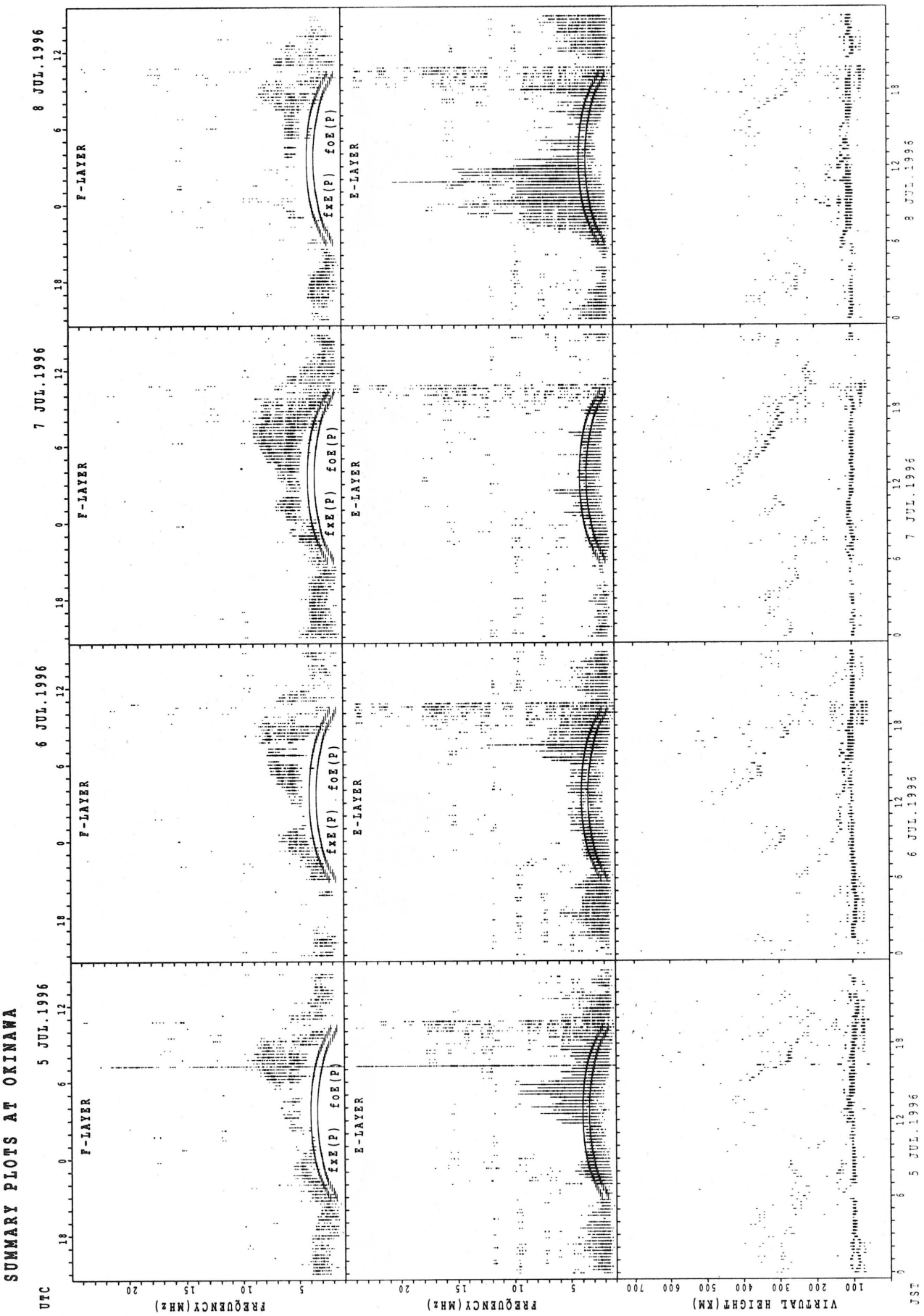
NOTE:

SUMMARY PLOTS AT YAMAGAWA
during 1 July 1996 ~ 14 July 1996
and 23 July 1996 ~ 24 July 1996
were not available.

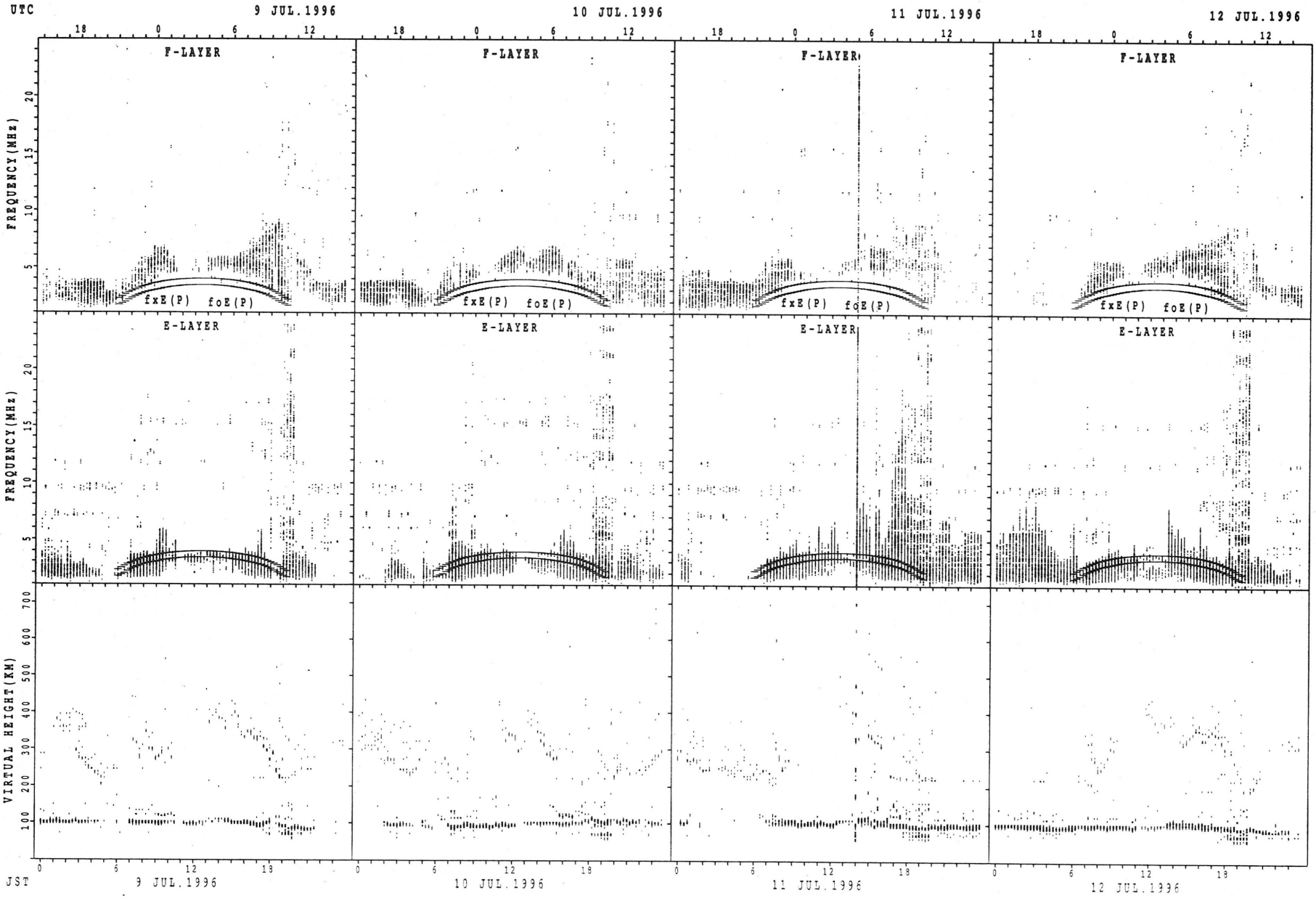
SUMMARY PLOTS AT OKINAWA



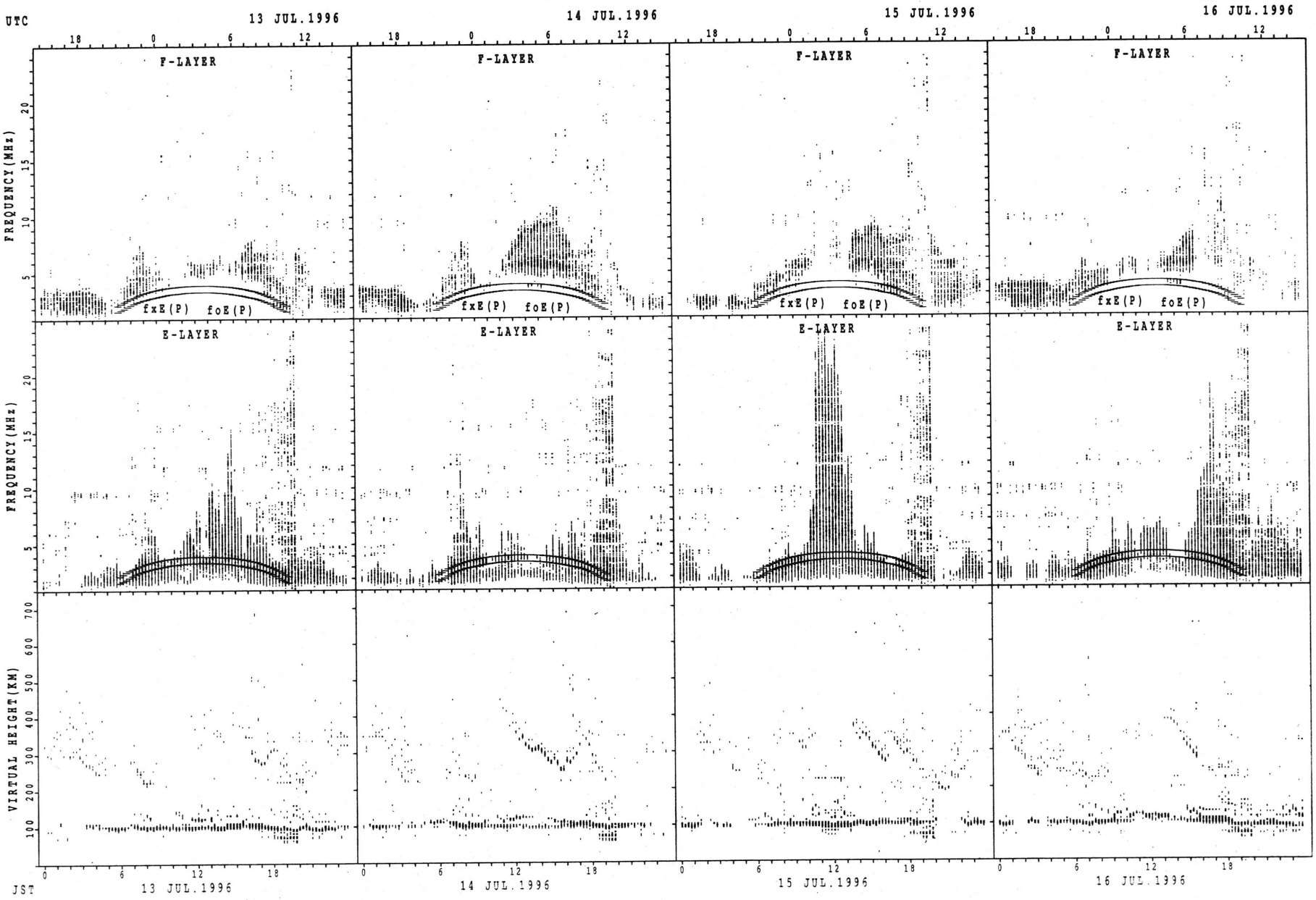
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE


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

SUMMARY PLOTS AT OKINAWA

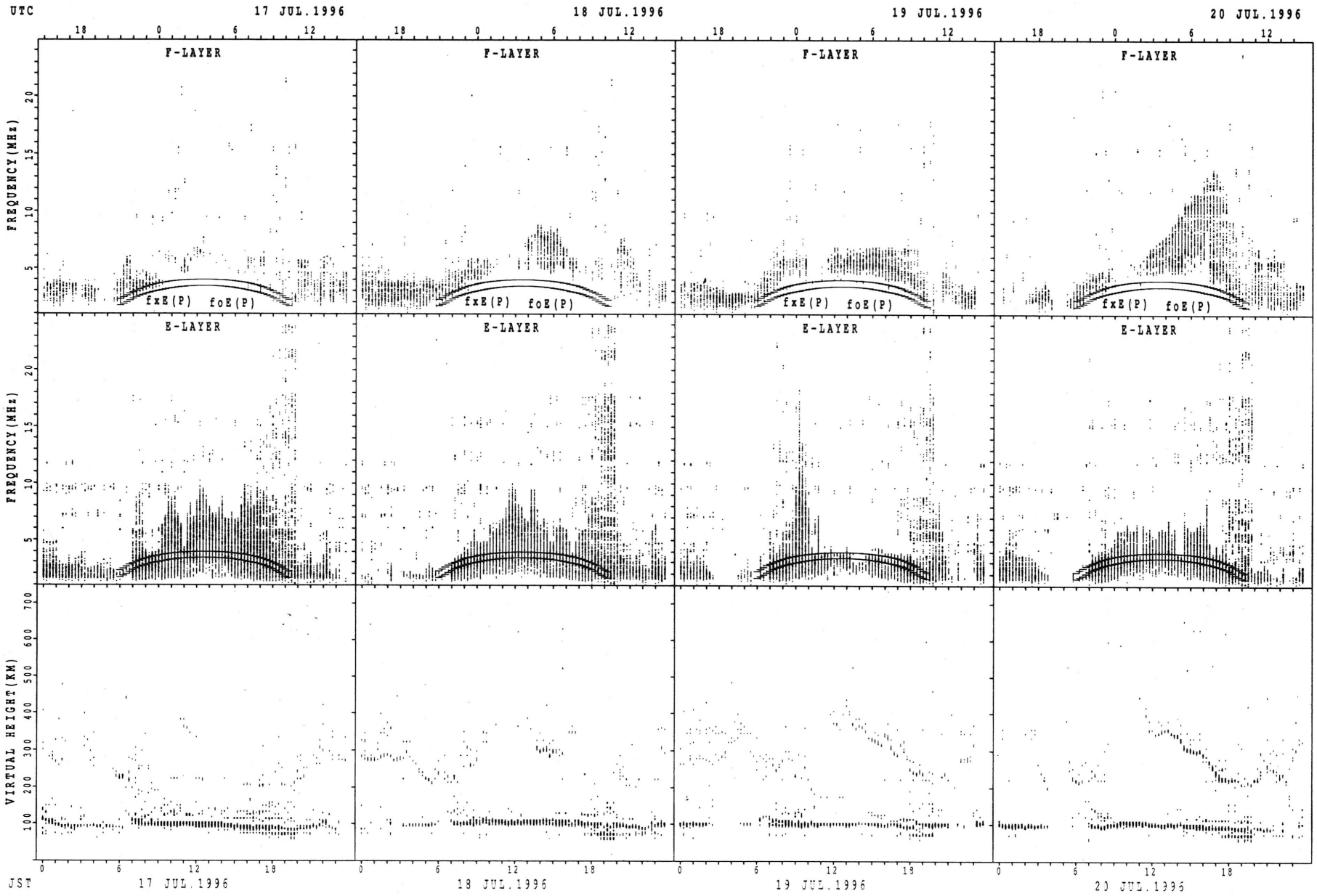


SUMMARY PLOTS AT OKINAWA

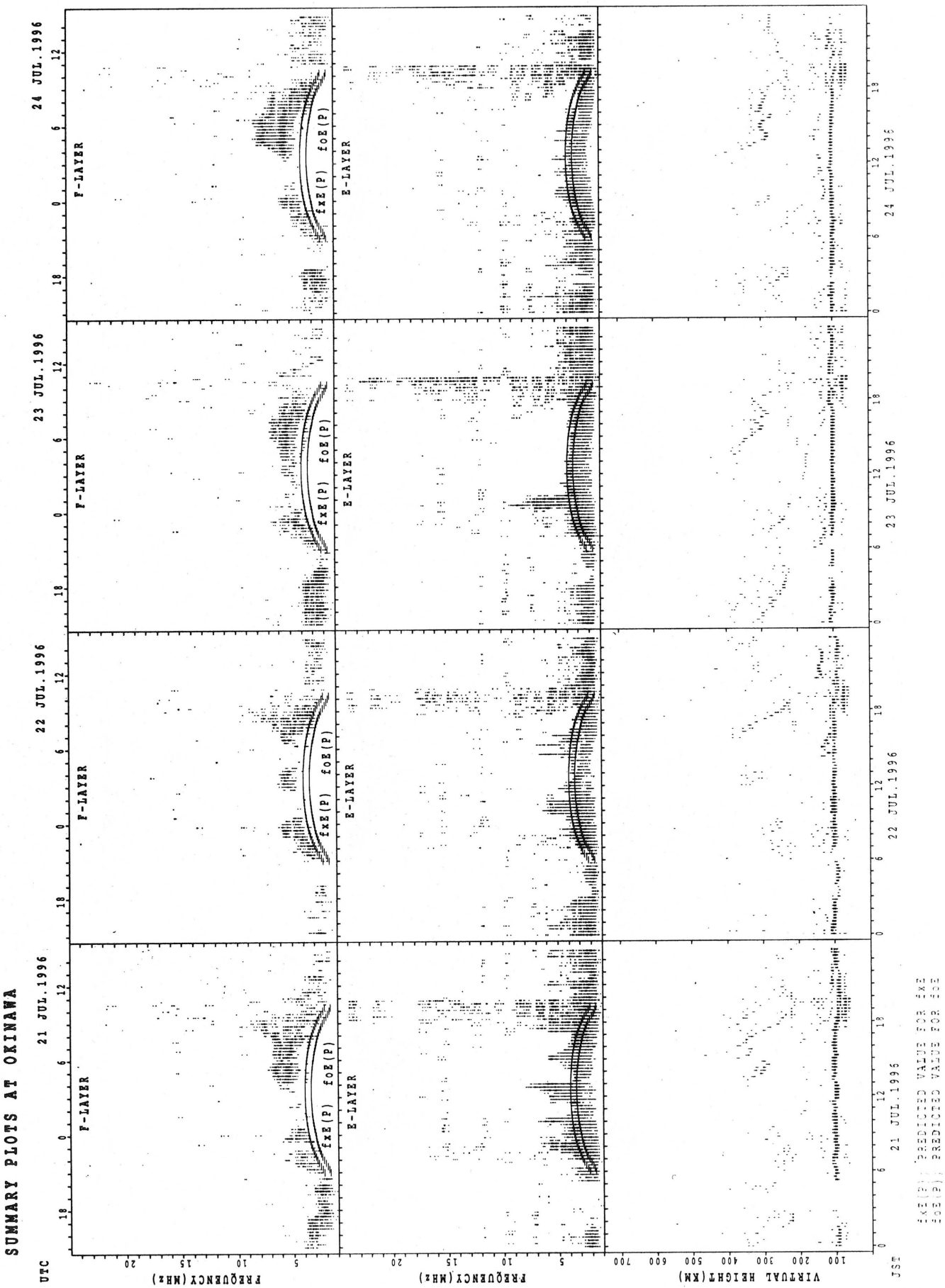


fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

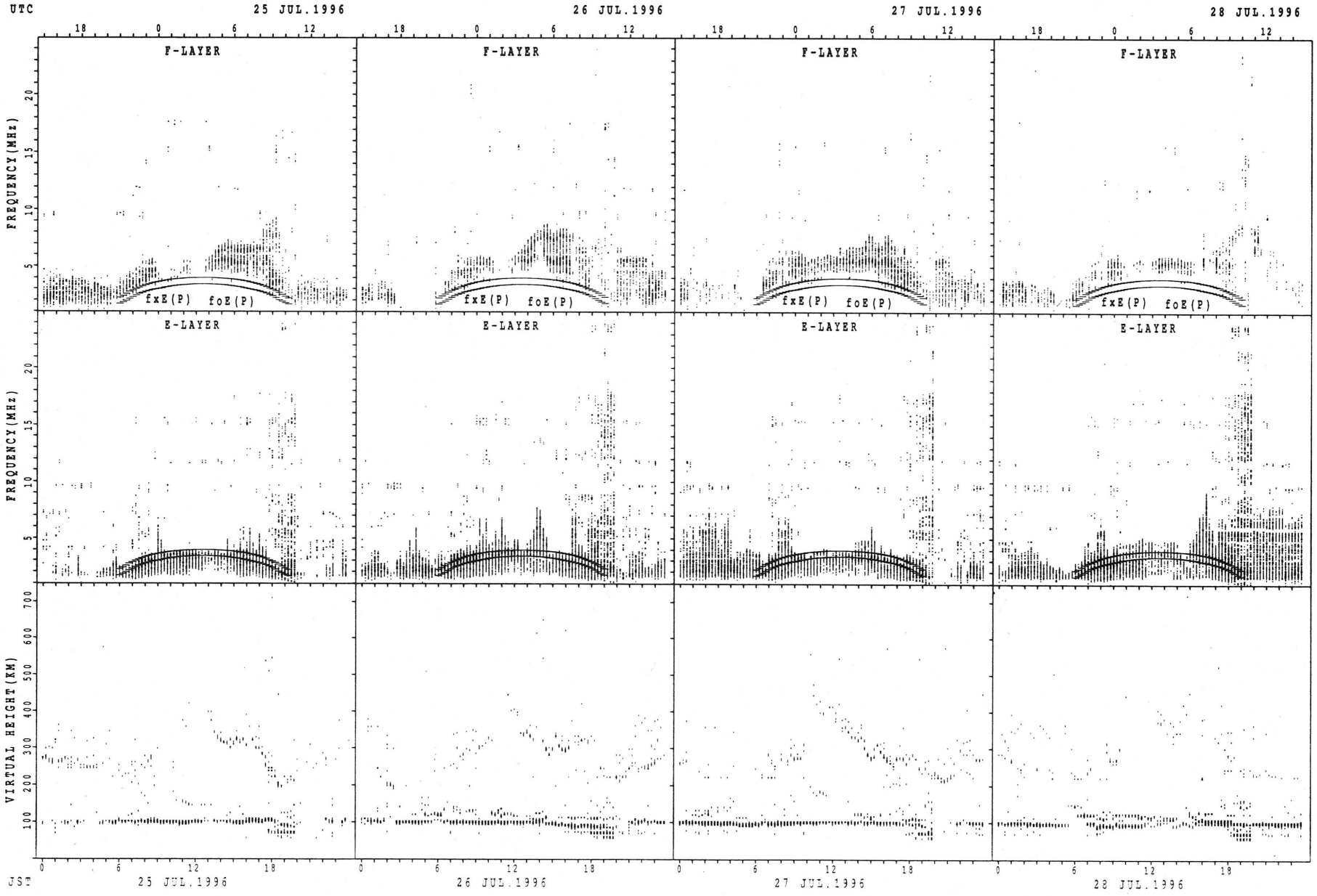
SUMMARY PLOTS AT OKINAWA



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

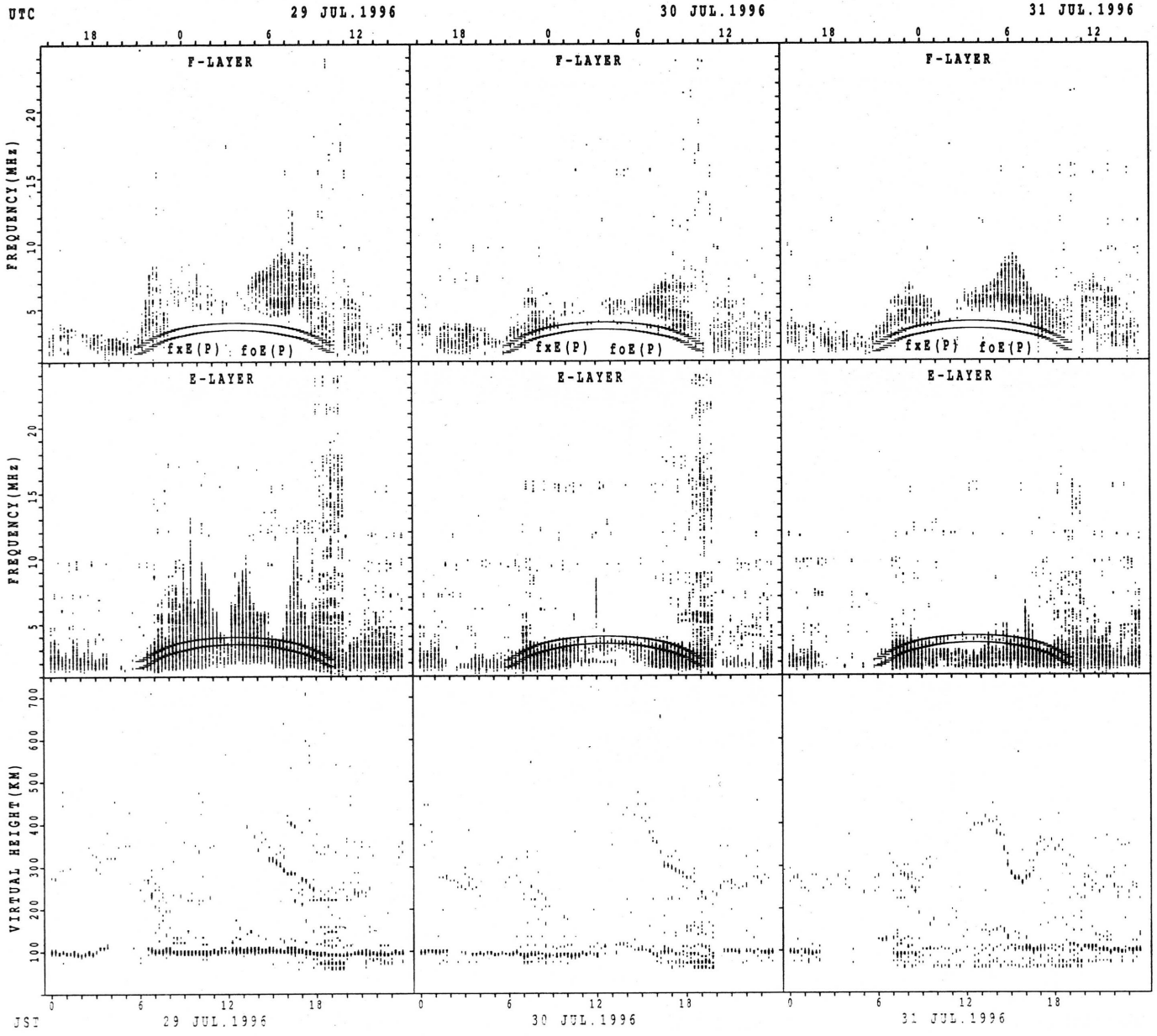

SUMMARY PLOTS AT OKINAWA
UTC
21 JUL.1996
22 JUL.1996
23 JUL.1996
24 JUL.1996
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



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

SUMMARY PLOTS AT OKINAWA



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

MONTHLY MEDIANS OF h'F AND h'Es

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

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

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

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	26	22	29	30	31	31	31	31	31	30	30	30	31	31	30	30	30	29	26	28	28	25
MED	103	101	101	99	105	115	111	111	111	107	107	105	105	106	107	107	113	113	113	111	111	108	105	105
U Q	105	109	105	103	111	119	115	113	113	111	111	107	107	107	111	115	119	117	113	113	113	111	108	110
L Q	99	99	99	97	98	111	107	107	107	105	105	103	103	103	103	103	105	111	109	106	107	105	103	102

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	26	30	28	29	22	27	29	29	28	27	30	29	30	30	29	29	29	29	31	27	26	28	29	24
MED	107	104	103	103	104	105	113	111	112	111	107	107	107	108	111	113	115	113	111	113	107	107	107	107
U Q	113	107	105	105	111	115	118	115	115	113	111	113	111	111	119	123	121	118	115	113	113	111	112	110
L Q	103	101	101	100	95	101	108	107	106	105	105	105	103	105	105	106	111	110	107	105	105	105	105	105

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

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

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		12	10	10			10	12	11	10					10	11	13	14	14	12	11	11	11	10
MED		107	105	106			115	115	121	119					112	113	119	115	114	111	107	109	111	110
U Q		109	107	111			137	126	139	127					113	127	128	119	117	119	121	113	115	111
L Q		102	99	101			109	109	113	113					111	105	114	107	113	105	105	107	105	107

MONTHLY MEDIANS OF h'F AND h'Es

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

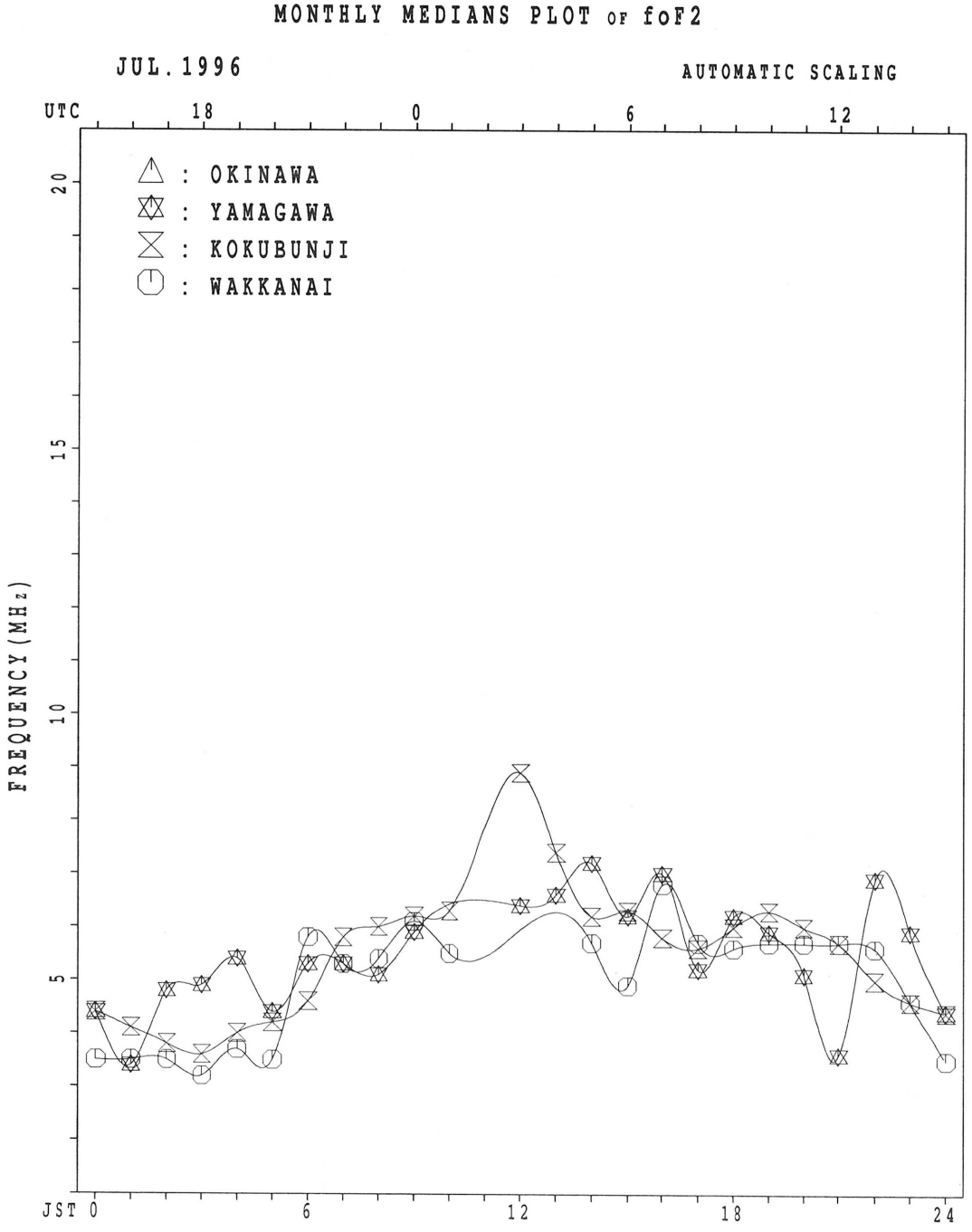
STATION OKINAWA LAT. 26.3N LON. 127.8E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT															10	19	18	19	16					
MED															334	308	302	288	258					
U Q															344	332	330	328	311					
L Q															296	286	282	264	229					

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	21	18	17	19	18	27	28	31	30	28	29	30	31	31	31	31	27	28	22	24	23	23
MED	103	99	103	99	97	97	103	107	110	111	105	107	103	111	111	113	109	105	99	95	97	97	99	101
U Q	105	103	107	103	101	103	107	125	119	117	113	122	122	123	119	125	113	111	105	112	103	103	107	105
L Q	98	97	95	95	95	95	97	101	102	103	101	103	101	101	105	107	103	101	95	84	95	91	91	93


MONTHLY MEDIANS PLOT OF foF2
JUL. 1996
AUTOMATIC SCALING
UTC
18
0
6
12
: OKINAWA
: YAMAGAWA
: KOKUBUNJI
: WAKKANAI
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	51	50	48	50	49																72	62	61	59
2	56	51	50	46	44																A	X 61	60	58
3	X 56	X 52	X 55	X 54	X 56																X 59	58	56	56
4	C	55	52	53	50																A	X 50	52	50
5	50	44	44	40	40																X 61	54	52	A
6	51	50	46	44	X 39																X 58	55	A	54
7	51	46	44	X 40	38																X 65	X 45	44	44
8	51	48	X 42	38	X 36																X 71	X 57	X 51	48
9	A	42	41	41	44							Y									X 74	73	63	57
10	C	X 42	A	40	40																X 54	X 50	51	52
11	X 47	X 40	X 39	37	38							Y									X 66	X 55	A	A
12	A	A	X 39	38	42																X 81	X 49	X 41	X 39
13	39	40	41	41	38																X 73	X 62	56	53
14	45	46	45	46	X 51																X 80	X 58	X 36	33
15	X 34	35	A	34	X 35																71	X 61	52	51
16	46	46	44	X 38	39																X O 56	X 55	X 50	48
17	48	46	44	X 40	37																X 64	X 65	X 54	X 50
18	X 47	40	41	38	X 36																X 60	62	62	X 50
19	35	36	X 36	X 36	A								Y								48	50	50	40
20	37	41	41	40	37																X 55	X 47	X 45	X 42
21	43	42	40	X 41	36								Y							X 60	X 56	X 50	X 46	45
22	43	41	X 38	A	34															X 84	X 74	X 42	41	A
23	40	X 39	36	A	A															X 57	X 57	55	55	56
24	54	X 44	42	41	X 38							Y								X 61	X 56	X 49	48	47
25	43	41	X 37	40	46															X 56	X 54	50	45	A
26	A	41	41	38	A															O X 64	X 64	X 62	63	X 55
27	X 49	43	X 41	X 38	X 38															X 66	X 69	54	52	54
28	52	52	47	A	X 41															X 75	X 75	X 67	X 54	X 50
29	X 47	46	X 45	X 40	X 36															X 78	X 60	X 54	X 54	X 51
30	52	A	53	52	50															X 73	X 67	X 58	X 55	X 52
31	X 50	53	43	41	X 38															X 56	X 64	A	66	X 59
	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	29	29	28	28															11	29	30	29	27
MED	48	44	42	40	38															X 64	X 64	X 55	52	51
U Q	51	49	46	42	44															X 75	X 72	X 61	56	55
L Q	43	41	X 40	38	37															X 57	X 56	X 50	47	47

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 43	F 43	F 40	F 42	F 42	F 42	48	64	64	51	U R 48	A	J R 52	A	58	J R 59	A	R 72	72	78	F 64	F 53	F 52	F 51
2	F 50	F 42	F 40	F 37	F 36	34	J R 47	A	R 54	58	R 50	54	R 55	63	69	64	57	61	67	66	A	55	52	F 50
3	50	46	49	48	F 48	F 54	55	U A 59	54	58	A	A	R 54	R 76	83	75	65	62	59	56	53	F 51	F 50	F 50
4	C	F 47	F 45	F 45	F 42	34	A	A	A	A	A	A	A	54	54	53	A	61	A	A	AJ R	44	F 44	F 42
5	F 39	F 38	F 35	F 32	F 32	40	55	F 64	51	A	A	A	A	48	52	57	V 49	48	47	R 53	55	F 44	F 43	A
6	F 44	F 41	F 38	F 37	33	F 32	A	61	A	A	A	54	A	50	A	51	52	A	58	64	52	F 48	A	F 46
7	F 45	F 40	F 36	34	F 28	33	42	55	R 58	52	48	55	52	E G 42	48	50	R 51	54	57	63	59	39	F 36	F 34
8	F 42	F 40	36	F 30	S 30	34	R 48	52	56	A	48	A	E G 44	U Y 47	51	52	58	57	52	57	65	51	44	F 40
9	A	F 34	F 34	F 35	F 35	A	A	A	A	A	A	Y	50	A	51	48	47	47	59	70	68	F 62	F 54	F 50
10	C	36	A	F 31	S 33	43	39	50	65	A	61	A	61	60	58	61	60	55	53	U A 49	48	44	F 43	F 44
11	40	34	33	F 30	F 31	36	41	51	54	64	49	Y	48	A	R 52	50	50	50	53	A	60	49	A	A
12	A	A	33	F 30	F 32	R 45	40	J R 46	56	63	59	A	A	A	A	A	A	A	65	78	75	43	35	34
13	F 33	F 32	F 33	F 32	F 31	F 36	53	61	62	55	A	A	52	A	51	51	50	48	60	69	68	56	F 50	F 44
14	F 37	F 38	F 37	F 38	45	32	E G 40	56	70	65	R 59	A	A	50	52	54	55	62	65	71	74	52	30	26
15	F 26	F 27	A	F 27	29	34	47	43	A	A	A	59	55	59	A	65	62	A	56	R 61	F 64	V 54	F 44	F 42
16	F 38	F 36	F 34	32	F 32	34	48	50	50	A	A	E G 42	A	A	A	A	60	62	62	57	50	49	44	F 39
17	F 40	39	F 37	34	F 30	32	40	54	54	45	J R 47	50	A	64	A	52	47	A	47	51	58	59	48	44
18	41	F 30	F 34	F 30	30	34	48	59	50	A	48	50	A	A	58	48	A	A	U A 43	48	54	F 52	F 54	44
19	F 26	F 30	30	30	A	U A 30	40	54	54	A	53	50	Y	U R 46	50	J R 46	A	R 44	47	59	F 39	F 41	F 43	F 33
20	F 31	F 30	F 33	F 31	F 28	38	A	A	A	A	49	50	A	A	68	A	A	56	57	66	49	41	39	36
21	F 36	F 34	F 33	F 34	F 30	29	43	H 59	47	R 48	45	J R 46	Y	55	R 56	48	49	48	54	54	50	R 44	40	F 37
22	F 36	F 34	32	A	F 25	28	H 39	50	59	54	49	A	53	A	55	A	A	A	U A 62	78	68	36	F 34	A
23	F 32	33	F 30	A	A	35	J R 44	A	49	A	A	A	A	49	54	50	47	48	U A 49	51	51	F 48	F 47	F 49
24	F 46	38	F 36	F 32	J S 32	F 37	40	48	44	E G 41	Y	E G 42	50	54	49	47	51	46	50	55	50	43	F 39	F 39
25	F 36	F 34	31	F 30	F 34	38	38	F 43	48	J R 47	48	52	50	57	63	64	57	53	54	50	48	F 40	R 38	A
26	A	F 34	F 33	F 29	A	33	40	44	53	R 62	A	A	A	A	A	67	66	U A 57	54	58	R 58	56	F 54	49
27	43	F 37	35	32	32	33	42	60	64	51	49	R 51	47	J R 46	54	51	49	44	48	J R 60	63	F 48	F 44	F 45
28	F 43	F 42	F 38	A	J S 35	36	A	A	A	48	57	54	A	52	48	A	56	55	60	69	68	61	48	44
29	41	F 38	38	34	30	37	50	59	78	54	57	46	55	U R 49	52	A	58	66	72	72	54	48	48	45
30	F 42	A	F 46	F 43	F 42	36	40	R 45	46	E G 44	52	56	56	60	E G 45	E G 41	50	54	58	67	61	52	49	46
31	44	46	F 32	F 32	32	36	45	53	56	53	67	41	A	48	64	64	54	49	44	U A 50	58	A	F 60	53
	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	29	29	28	28	30	26	25	25	19	20	17	16	21	25	25	24	25	30	29	29	30	29	27
MED	F 40	F 37	F 35	F 32	F 32	34	42	54	54	53	49	50	52	52	54	52	53	54	56	60	58	48	F 44	F 44
U Q	F 43	F 40	F 38	F 36	F 35	37	48	59	60	58	57	54	55	60	58	62	58	61	60	69	64	53	F 50	F 49
L Q	F 36	F 34	33	F 30	F 30	33	40	49	50	48	48	46	50	48	51	49	50	48	50	54	50	44	40	F 39

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							372	A	A	A	448	A	U R 440	A	A	A	A	A	A					
2							368	A	A	U A 436	U A 444	U A 448	A	436	U A 464	432	U A 408	U A 400	A					
3						L 288	A	A	L 428	436	A	A	U A 444	A	444	432	U A 416	384	L					
4							A	A	A	A	A	A	A	412	436	U A 440	A	A	A	A				
5						L	360	392	U A 424	A	A	A	A	428	U A 432	A	U A 400	U A 356	U L 372					
6						284	A	U A 392	A	A	A	U A 444	A	A	A	U A 432	A	A	A					
7						288	368	U A 380	412	412	U R 440	440	448	420	U R 412	412	A	368	340					
8							A	A	408	A	A	A	440	U A 432	432	U A 420	U A 396	U A 372	U L 344					
9						A	A	A	A	A	A	Y	A	A	R 420	408	396	376	332					
10						L		376	A	A	U A 448	A	448	U Y 468	436	424	408	384	A					
11						L	U L 356	380	408	428	R 440	Y	A	A	U A 428	424	416	U A 380	A	A				
12						L	A	A	U A 436	440	432	A	A	A	A	A	A	A	A					
13						L 312	A	400	U A 424	A	A	A	A	A	424	U A 424	400	364	320	L				
14							396	392	U A 404	U A 424	U A 440	A	A	432	424	420	U A 408	U A 360	344					
15							L		A	A	A	A	A	A	A	A	396	A	L 332					
16							340	U A 388	A	A	A	424	A	A	A	A	A	380						
17							336	380	U A 400	416	R 444	A	A	A	A	A	A	A	A					
18						L	368	U A 384	A	A	436	A	A	A	A	A	A	A	A					
19							336	A	U A 432	A	A	420	Y	416	416	A	A	392	L 328					
20							A	A	A	A	A	R 432	A	A	A	A	A	368	L 324					
21							U L 360	L 380	400	440	416	408	Y	432	420	404	380	364	L 324					
22								372	U A 412	R 424	U A 416	A	U A 440	A	A	A	A	A	A					
23							U L 344	A	A	A	A	A	A	U A 424	R 420	A	408	U A 372	A					
24							L 332	368	396	412	Y	420	U Y 436	440	U A 420	412	392	372	320					
25								380	396	R 440	420	428	432	428	420	400	392	364	U L 280					
26							A	L	A	A	A	A	A	A	A	A	392	A	A					
27							344	380	416	432	448	444	436	428	424	424	404	420	332					
28							A	A	A	A	440	U A 436	A	440	A	A	400	A	344					
29						L	U L 384	A	404	424	444	U L 436	444	436	Y 436	A	404	360	L 320					
30							340	A	400	440	R 436	R 444	A	R 440	R 448	408	404	360	A					
31								U A 384	U A 440	424	436	A	A	416	428	412	400	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	16	16	18	15	17	13	10	17	20	17	20	20	15					
MED						288	358	380	410	428	440	436	440	432	426	420	400	372	L 332					
U Q						L 300	368	390	U A 424	440	444	444	444	438	436	U A 428	408	382	344					
L Q						286	340	380	400	424	434	422	436	422	420	410	396	364	320					

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A	A	U A 300	A	U R 348	A	A	A	344	320	288	A 256	A 212	B				
2						A	A	A 284	A 312	A 328	A	A	A	A	A	A	288	252	192	B				
3						192	224	A 272	288	320	A	A	A	344	A	A	A	A	A	B				
4						A	A	A	308	A 324	A	A	A	A	336	A	292	256	A	B				
5						164	236	A	A	A	A	A	A	348	A	A	A	A	A	B				
6						A	U A 236	A 272	A	A	A	A	A	A	340	316	288	256	A	B				
7						188	A	280	304	324	A 336	A	352	R	328	324	A	A	A	B				
8						A	A	A	316	A 336	A 340	U A 348	A 348	A	A	A	300	A	A	B				
9						A	A 240	A	U A 304	A 324	B	B	236	A	328	332	296	284	A	B				
10						A	244	A	A	A	A	A	A	B	R	A	308	A 252	196	B				
11						A	A 204	A	308	A	A	A	A	A	A	348	A	A	A	B				
12						A	220	276	312	A	A 340	A	A	A	A	A	A	A	A	B				
13						A	A	A	304	A 320	A	A	U A 352	A	A	320	296	260	A	B				
14						B	A 228	276	292	A	A	A	A	A	324	320	288	A	A	B				
15						A	A 220	A	A 288	A	A	R 340	A	U A 336	A	A	288	244	A	B				
16						A	A	A	A	A	A	A	A	A	332	312	U A 268	A	A	B				
17						B	212	300	A	A	A	A	A	A	A	R 320	284	240	A	B				
18						168	212	244	284	A 300	A	A	A	A	A	A	A	A	A	B				
19						B	A	A	A	A	A	A	352	344	340	308	284	244	A	B				
20						B	A	A	A	A 328	A	344	A 348	A	A	A	A	252	180	B				
21						A	A	264	288	A 308	U A 336	352	A	A	A	R	A	244	A					
22						B	A	280	296	A 324	A 332	A	A	348	332	320	A 284	A 240	A					
23						B	A	A	A	A	A	A	A	A	340	312	284	236	U A 176					
24						B	196	A	A	A	U R 332	R 348	R	A	A	A	A 288	252	196					
25						B	216	260	A 292	A	R 336	352	R	344	336	316	288	240	172					
26						B	R 224	A	308	324	A	A	A	A	A	312	284	240	A					
27						B	212	276	312	A	A	A	R	A	R 328	316	284	260	188					
28						A	A	A	A	A 320	336	R 352	356	344	340	316	304	256	A					
29						A	220	260	292	A	332	A	352	352	344	320	A	A	A					
30						B	A	A 248	296	324	A	U R 356	A	A	A 328	312	296	256	192					
31						B	216	260	300	A	A	A	A	U R 352	336	324	288	A	A 196					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	17	15	21	14	10	8	8	9	16	19	22	20	10					
MED						178	220	272	300	A 324	336	350	352	344	336	320	288	252	192					
U Q						190	A 232	280	308	A 324	A 340	R 352	352	350	340	320	296	256	A 196					
L Q						166	212	260	292	A 320	332	R 346	A 348	344	328	312	284	242	180					

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	32	J A 36	J A 45	J A 21	29	J A 30	J A 102	J A 66	J A 58	51	G	J A 56	52	55	J A 56	J A 63	J A 78	J A 117	J A 55	61	J A 62	J A 78	59	J A 48
2	J A 41	J A 47	35	J A 32	J A 25	J A 30	J A 48	88	J A 89	J A 68	J A 54	J A 50	J A 54	J A 48	J A 54	J A 39	J A 44	J A 44	40	J A 52	J A 69	J A 53	J A 36	J A 51
3	J A 43	J A 22	24	17	23	J A 20	53	J A 68	J A 52	39	J A 210	J A 78	45	J A 66	J A 50	61	J A 48	32	S 28	J A 48	22	J A 54	J A 58	J A 78
4	C	J A 33	J A 22	29	J A 23	J A 30	J A 46	J A 52	J A 67	J A 89	J A 85	J A 52	J A 61	36	38	J A 56	J A 80	J A 66	J A 114	J A 172	J A 82	J A 53	J A 48	J A 51
5	J A 49	J A 34	J A 20	J A E B 22	14	20	26	J A 34	J A 53	54	52	53	59	40	44	J A 54	J A 40	J A 44	J A 55	J A 23	J A 82	J A 62	J A 40	J A 68
6	J A 45	J A 53	J A 46	J A 35	J A 70	J A 30	55	J A 49	96	J A 110	87	J A 52	J A 79	39	J A 82	J A 54	J A 53	J A 143	J A 100	J A 83	J A 34	J A 38	J A 56	J A 25
7	J A 22	J A 33	J A 19	J A 20	19	G	J A 52	J A 40	J A 38	38	38	37	G 29	G 30	34	33	50	32	33	J A 22	J A 23	J A 54	46	J A 44
8	J A 20	28	18	26	19	J A 28	54	J A 60	J A 41	J A 54	J A 52	58	J A 44	47	J A 46	J A 50	J A 45	J A 58	54	J A 47	56	J A 68	J A 63	J A 42
9	J A 68	J A 40	J A 34	22	24	J A 53	94	J A 143	J A 144	J A 168	J A 125	43	59	J A 94	38	G	J A 68	J A 55	J A 54	J A 116	J A 113	34	52	26
10	C	J A 30	J A 48	J A 42	J A 26	J A 27	J A 34	J A 38	J A 125	J A 116	J A 54	J A 128	40	41	G	J A 50	J A 54	33	J A 45	60	J A 53	J A 82	J A 52	J A 50
11	J A 54	J A 45	J A 30	J A 24	J A 32	J A 27	J A 28	J A 30	34	J A 44	37	40	J A 46	J A 57	J A 43	J A 46	J A 50	J A 52	J A 79	J A 81	J A 68	J A 48	J A 76	J A 51
12	J A 64	J A 51	J A 117	J A 50	J A 50	28	J A 80	J A 60	54	J A 52	41	J A 73	50	J A 124	J A 130	J A 100	70	J A 123	J A 60	J A 41	J A 28	J A 19	24	J A 40
13	J A 31	31	J A 27	J A 35	J A 81	J A 41	J A 124	J A 51	J A 44	J A 130	J A 179	J A 102	J A 48	J A 108	36	44	40	J A 51	29	J A E B 18	J A 13	58	J A 54	44
14	J A 50	J A 26	E B 14	J A 24	26	J A 104	30	34	J A 53	J A 62	J A 66	J A 66	88	J A 173	G	35	J A 43	J A 47	J A 54	J A 39	30	J A 74	J A 31	32
15	J A 42	J A 35	J A 50	J A 24	J A 26	J A 28	J A 50	J A 44	94	J A 160	J A 118	57	55	J A 62	J A 68	J A 84	33	J A 66	J A 158	65	J A 30	J A 32	J A 28	J A 22
16	19	23	J A 24	J A 23	J A 27	J A 74	J A 44	J A 48	J A 63	J A 177	69	J A 42	81	61	J A 64	J A 93	J A 165	J A 71	60	J A 61	J A 50	58	J A 46	28
17	33	J A 33	28	22	J A 26	J A 33	29	J A 30	J A 45	J A 41	J A 53	J A 50	J A 62	J A 64	J A 62	J A 66	56	82	J A 52	J A 32	J A 32	J A 34	J A 31	J A 28
18	J A 55	J A 45	J A 34	J A 23	28	22	J A 38	J A 42	53	J A 92	J A 41	59	J A 100	J A 87	48	J A 48	126	J A 177	88	J A 158	J A 44	44	67	J A 110
19	J A 30	J A 30	J A 55	J A 51	60	J A 61	28	48	J A 66	J A 66	51	J A 45	38	37	39	J A 49	J A 62	J A 36	J A 116	J A 44	J A 76	J A 47	J A 46	J A 49
20	J A 73	J A 32	J A 39	28	J A 38	J A 50	J A 55	J A 56	J A 50	J A 62	52	J A 50	J A 72	112	J A 84	85	94	27	22	24	J A 31	27	J A E B 26	14
21	E B 14	J A 22	J A 20	29	J A 24	22	J A 32	34	37	38	37	G	39	39	38	G 28	28	27	26	J A 30	J A 26	J A 23	J A 29	J A 30
22	26	26	J A 26	J A 48	J A 54	34	38	J A 44	J A 48	J A 57	J A 46	54	55	J A 118	J A 64	J A 195	J A 131	J A 109	92	J A 61	J A 31	J A 30	J A 28	J A 54
23	J A 46	J A 41	J A 31	39	J A 50	J A 25	J A 28	60	54	96	J A 123	70	J A 59	48	36	J A 83	J A 62	48	59	J A 54	J A 104	J A 61	J A 29	J A 47
24	J A 86	J A 47	J A 50	J A 39	22	32	J A 30	33	J A 32	32	38	G	G	40	J A 43	J A 40	31	31	29	J A 15	19	19	J A 38	J A 24
25	J A 27	J A 48	19	J A 26	J A 26	J A 30	G	31	35	47	G	38	G 30	38	36	34	36	J A 33	24	18	J A 52	J A 48	J A 53	J A 48
26	61	J A 43	26	J A 43	J A 40	J A 42	32	J A 41	J A 54	J A 80	58	J A 72	67	J A 100	61	67	J A 56	75	J A 83	56	J A 41	J A 48	J A 54	J A 41
27	21	J A 40	J A 31	J A 30	J A 25	20	J A 26	G 26	33	34	J A 46	53	G 34	G J A 38	36	35	J A 42	29	J A 24	J A J A 20	J A 26	24	27	J A 35
28	J A 44	J A 39	J A 44	J A 47	J A 40	J A 41	60	J A 66	J A 92	J A 54	J A 50	J A 49	J A 53	39	J A 52	J A 66	40	J A 49	38	32	33	27	J A 28	J A 24
29	J A 24	J A 22	24	23	24	J A 23	34	J A 48	J A 67	37	G	38	J A 48	42	41	88	J A 55	J A 34	J A 44	J A 48	J A 30	J A 66	J A 25	J A 31
30	J A 61	J A 76	J A 34	J A 26	J A 30	J A 25	33	58	G 30	38	J A 54	G 32	56	37	39	34	38	34	J A 45	J A 33	21	E B 12	J A 19	22
31	24	24	J A 40	J A 44	J A 41	29	26	41	J A 48	40	J A 42	J A 44	45	G	G	G	39	J A 45	J A 62	J A 61	J A 68	59	J A 54	J A 54
	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 42	J A 34	J A 31	J A 28	J A 26	J A 30	J A 38	J A 48	J A 53	J A 54	J A 52	J A 52	53	48	43	J A 50	J A 50	J A 48	J A 54	J A 48	J A 34	48	J A 46	J A 42
U Q	J A 54	J A 45	J A 44	J A 39	J A 40	J A 41	54	J A 60	J A 67	J A 92	J A 69	J A 59	J A 61	J A 87	J A 61	J A 67	J A 68	J A 71	J A 79	J A 61	J A 68	59	J A 54	J A 51
L Q	25	28	24	23	24	25	29	34	41	40	41	42	44	39	36	35	40	33	33	J A 30	28	30	J A 28	J A 28

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	20	17	17	23	20	25	50	48	46	G	A A 56	44	A A 55	49	46	A A 78	67	36	45	32	20	40	21
2	25	30	26	26	20	28	30	A A 88	46	44	44	45	46	38	46	38	41	40	36	30	A A 69	39	22	36
3	18	E B 14	E B 14	E B 13	18	G 16	44	U A 48	36	37	A A 210	A A 78	44	52	39	36	42	30	25	23	13	26	21	42
4	C	22	E B 13	19	E B 16	23	A A 46	A A 52	A A 67	A A 89	A A 85	A A 52	A A 61	36	37	44	A A 80	51	A A 114	A A 172	A A 82	32	25	36
5	23	27	18	20	E B 14	19	26	30	42	A A 54	A A 52	A A 53	A A 59	38	43	49	40	36	27	E B 12	25	21	24	A A 68
6	34	E B 14	26	22	19	22	A A 55	39	A A 96	A A 110	A A 87	44	A A 79	U Y 38	A A 82	43	43	A A 143	49	25	18	25	A A 56	E B 13
7	E B 14	18	17	E B 14	17	G	28	38	36	37	36	36	G 28	U G 30	33	33	44	28	22	18	20	30	22	18
8	E B 13	16	16	16	E B 14	22	46	42	36	A A 54	46	A A 58	39	43	38	42	40	37	26	32	48	43	21	32
9	A A 68	23	E B 14	E B 14	E B 14	A A 53	A A 94	A A 143	A A 144	A A 168	A A 125	U Y 43	46	A A 94	37	G	36	G 26	23	21	21	17	40	18
10	C	21	A A 48	24	18	19	27	31	45	A A 116	45	A A 128	40	U Y 41	G	38	36	30	42	U A 29	21	22	20	21
11	24	24	21	E B 14	E B 15	18	26	28	34	40	37	U Y 40	45	A A 57	43	38	33	38	41	A A 81	44	22	A A 76	A A 51
12	A A 64	A A 51	22	24	18	18	31	47	44	35	U Y 40	A A 73	A A 50	A A 124	A A 130	A A 100	A A 70	A A 123	40	26	22	17	E B 15	20
13	17	17	20	20	17	24	42	34	42	51	A A 179	A A 102	48	A A 108	U Y 36	42	37	28	21	E B 14	E B 13	18	18	18
14	22	17	E B 14	16	E B 14	20	28	33	40	42	44	A A 66	A A 88	39	G	34	41	36	26	24	21	38	20	21
15	18	20	A A 50	16	17	22	32	34	A A 94	A A 160	A A 118	50	50	52	A A 68	52	32	A A 66	23	55	19	21	22	E B 15
16	E B 12	E B 12	E B 14	18	17	22	26	39	45	A A 177	A A 69	39	A A 81	A A 61	A A 64	A A 93	44	29	50	52	22	32	27	18
17	22	18	22	17	17	22	27	G 24	40	36	38	46	A A 62	52	A A 62	45	43	A A 82	36	26	25	19	18	18
18	18	18	19	19	E B 15	18	32	38	46	A A 92	38	45	A A 100	A A 87	45	45	A A 126	A A 177	U A 36	32	22	20	21	24
19	18	17	18	20	A A 60	U A 27	25	42	43	A A 66	50	38	U Y 38	36	37	43	A A 62	34	25	E B 15	24	23	24	20
20	19	18	19	17	22	18	A A 55	A A 56	A A 50	A A 62	46	40	A A 72	A A 112	50	A A 85	A A 94	27	21	17	E B 14	17	22	E B 14
21	E B 14	E B 15	18	21	18	17	24	31	33	36	36	G	U Y 39	38	37	U G 28	27	27	20	25	20	E B 15	19	E B 14
22	17	E B 14	17	A A 48	18	17	28	G 23	41	38	42	A A 54	44	A A 118	47	A A 195	A A 131	A A 109	U A 44	21	20	20	19	A A 54
23	19	22	20	A A 39	A A 50	20	24	A A 60	43	A A 96	A A 123	A A 70	A A 59	42	36	47	38	37	U A 40	40	22	18	19	20
24	E B 14	17	22	17	18	22	26	29	31	32	U Y 38	G	G	38	42	39	31	28	22	E B 14	17	17	13	17
25	18	17	E B 14	E B 14	16	18	G	29	34	41	G	37	U G 30	36	36	34	34	G 19	21	U Y 18	E B 14	19	23	A A 48
26	A A 61	21	17	20	A A 40	21	31	30	49	48	A A 58	A A 72	A A 67	A A 100	A A 61	64	34	U A 52	46	49	32	34	29	38
27	E B 13	28	19	E B 13	E B 16	E B 16	24	G 22	33	32	39	39	U G 34	36	35	U Y 34	32	29	21	E B 14	E B 15	E B E B 14	19	18
28	19	19	17	A A 47	26	24	A A 60	A A 66	A A 92	46	40	44	A A 53	38	46	A A 66	36	45	28	24	20	18	25	17
29	18	16	17	E B 14	E B 14	20	26	42	35	34	G	36	38	40	U Y 41	A A 88	35	28	25	E B 14	17	18	18	17
30	17	A A 76	20	E B 15	18	18	26	43	G 28	37	39	G 31	50	36	39	34	35	34	29	18	E B 14	E B 12	16	17
31	E B 14	E B 14	18	19	18	20	26	38	44	38	39	38	A A 45	G	G	G	34	41	34	U A 47	41	A A 59	18	20
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	18	18	18	18	18	20	28	38	43	46	44	45	46	41	41	43	40	36	28	25	21	20	21	20
U Q	22	22	21	21	19	22	A A 42	A A 48	A A 48	A A 89	A A 69	A A 58	A A 61	A A 61	A A 49	A A 52	A A 44	A A 52	40	40	25	30	25	36
L Q	E B 15	E B 16	E B 17	E B 15	E B 16	18	26	30	36	37	38	38	39	38	36	34	34	28	23	E B 18	E B 17	18	19	17

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

IONOSPHERIC DATA STATION Kokubunji

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

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

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 300	F 312	F 314	F 320	F 333	F 307	287	344	371	322	U R 235	A	J R 303	A	295	J R 293	A	A	328	337	F 326	F 326	F 308	F 293
2	F 313	F 307	F 303	F 285	F 311	348	J R 296	A	R 341	326	R 300	292	R 280	289	290	304	296	310	327	326	A	306	301	F 309
3	307	303	305	303	F 295	F 314	320	A	327	339	A	A	R 273	R 287	301	310	303	308	314	322	296	F 319	F 308	F 302
4	C	F 298	F 294	F 310	F 316	324	A	A	A	A	A	A	A	290	283	292	A	326	A	A	A	J R 310	F 304	F 309
5	F 355	F 321	F 331	F 302	F 301	296	321	F 340	341	A	A	A	A	268	280	307	299	313	R 326	310	F 317	F 278	A
6	F 310	F 291	F 298	F 317	320	F 272	A	332	A	A	A	302	A	285	A	280	302	A	317	332	310	F 300	A	F 302
7	F 304	F 318	F 336	331	F 303	294	284	321	R 344	310	261	307	332	G	267	301	R 317	300	307	327	346	302	F 291	F 299
8	F 301	F 322	333	F 321	S 318	301	A	312	356	A	A 300	A	G	U Y 293	304	293	316	318	315	296	327	316	315	F 293
9	A	F 316	F 323	F 313	F 319	A	A	A	A	A	A	Y	283	A	301	284	305	276	307	303	304	F 325	F 305	F 303
10	C	314	A	F 310	S 292	329	362	307	334	A	325	A	308	305	315	309	329	337	325	A	323	324	F 307	F 318
11	325	333	306	F 315	F 343	354	346	349	321	362	298	Y	289	A	R 313	298	296	303	300	A	324	337	A	A
12	A	A	314	F 319	F 305	R 367	281	J R 284	309	335	356	A	A	A	A	A	A	A	302	317	361	326	334	309
13	F 301	F 295	F 336	F 338	F 313	F 299	311	331	317	A 315	A	A	A 302	A	297	291	300	294	306	317	339	339	F 339	F 294
14	F 289	F 302	F 310	F 330	364	326	G	313	349	356	R 361	A	A	293	306	316	302	321	328	302	352	368	321	306
15	F 320	F 293	A	F 333	319	335	349	352	A	A	A	320	305	310	A	315	309	A	312	A 316	F 320	V 333	F 307	F 314
16	F 306	F 319	F 315	338	F 303	341	336	334	347	A	A	G	A	A	A	A	314	325	341	A 335	310	316	312	F 294
17	F 299	318	F 322	346	F 324	330	299	339	335	336	J R 272	A 302	A	325	A	324	310	A	323	300	313	315	318	319
18	332	F 332	F 287	F 312	324	293	319	338	326	A	304	304	A	A	341	A 287	A	A	A	292	337	F 301	F 335	334
19	F 345	F 296	322	310	A	A	285	339	324	A	291	304	Y	U R 264	308	J R 271	A	R 278	322	335	F 348	F 312	F 321	F 332
20	F 319	F 316	F 326	F 329	F 351	359	A	A	A	A	317	276	A	A	311	A	A	311	331	343	338	316	302	296
21	F 311	F 290	F 300	F 323	F 324	337	322	H 333	372	R 310	281	J R 293	Y	303	R 342	308	325	310	326	337	341	R 339	323	F 312
22	F 301	F 303	334	A	F 327	328	H 314	305	347	330	314	A	318	A	331	A	A	A	A	337	361	356	F 299	A
23	F 308	317	F 318	A	A	J R 350	365	A	311	A	A	A	A	297	323	A 311	319	314	A	A	306	F 311	F 313	F 299
24	F 329	320	F 314	F 312	J S 343	F 315	293	335	301	G	Y	G	290	307	310	289	336	337	334	326	327	314	F 327	F 302
25	F 312	F 328	324	F 316	F 347	363	387	F 290	328	J R 312	281	308	268	296	307	313	322	333	332	339	359	F 321	R 304	A
26	A	F 340	F 336	F 339	A	290	299	291	299	R 364	A	A	A	A	A	A 319	347	A	A 314	326	R 321	311	F 318	331
27	347	F 305	330	314	324	321	308	344	353	364	301	R 311	274	J R 266	316	332	307	266	312	J R 322	348	F 304	F 301	F 301
28	F 310	F 332	F 321	A	J S 320	345	A	A	A	A	330	330	A	316	268	A	316	311	313	313	343	344	327	313
29	312	F 310	344	317	308	296	291	300	362	322	324	335	303	U R 305	300	A	295	318	330	338	321	312	295	298
30	F 292	A	F 310	F 322	F 337	308	292	R 299	292	G	306	313	310	345	G	G	281	308	313	317	305	308	317	298
31	305	342	F 326	F 326	327	320	307	301	335	308	360	A	A	259	313	335	339	344	288	A	282	A	F 331	335
	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	29	29	28	28	29	25	24	25	18	20	16	16	21	25	25	23	23	27	26	29	30	29	27
MED	F 310	F 316	F 321	F 318	F 320	324	308	332	335	324	302	304	296	293	306	304	310	311	315	326	326	316	F 312	F 303
U Q	F 320	F 322	330	F 330	F 330	343	329	339	348	339	324	312	306	306	314	314	322	325	328	335	344	326	F 322	314
L Q	F 301	F 302	F 308	F 312	F 310	300	292	303	319	310	286	292	277	276	292	290	302	300	312	316	310	311	F 303	F 298

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							340	A	A	A	407	A	U R 398	A	A	A	A	A	A					
2							362	A	A	A	A	A	A	381	A	365	A	A	A					
3						L 357	A	A	L 396	411	A	A	A	A	A 355	366	A	370	L					
4							A	A	A	A	A	A	A	425	380	A	A	A	A	A				
5						L	353	H 390	A	A	A	A	A	403	A	A	A	A	U L 338					
6						336	A	A	A	A	A	A	A	A	A	A	A	A	A					
7						327	351	A	394	413	U R 389	401	401	410	U R 406	389	A	357	330					
8							A	A	382	A	A	A	388	A	383	A	A	A	U L 350					
9						A	A	A	A	A	A	Y	A	A	R 411	393	A 355	366	351					
10						L		411	A	A	A	A	396	Y	379	A 383	381	373	A					
11						L	U L 379	388	386	A	R 390	Y	A	A	A	388	366	A	A	A				
12						L	A	A	A	395	A	A	A	A	A	A	A	A	A					
13						L 331	A	377	A	A	A	A	A	A	H 380	A	A 348	377	343	L				
14							329	413	A	A	A	A	A	371	408	395	A	A	354					
15							L		A	A	A	A	A	A	A	A	367	A	L 337					
16							371	A	A	A	A	383	A	A	A	A	A	361						
17							385	393	A	413	R 409	A	A	A	A	A	A	A	A					
18						L	372	A	A	A	401	A	A	A	A	A	A	A	A					
19							354	A	A	A	A	423	Y	415	382	A	A	L 346	L 362					
20							A	A	A	A	A	R 403	A	A	A	A	A	358	L 361					
21							U L 372	L 388	377	379	435	449	Y	392	407	391	399	376	L 352					
22								368	A	R 403	A	A	A	A	A	A	A	A	A					
23							U L 389	A	A	A	A	A	A	A	R 397	A	367		A	A				
24							L 367	386	391	395	Y	413	Y	384	A	A	383	354	339					
25								372	373	R 437	410	416	416	404	381	390	392	376	U L 391					
26							A	L	A	A	A	A	A	A	A	A	385	A	A					
27							368	381	371	401	391	437	430	391	400	374	382	348	350					
28							A	A	A	A	407	A	A	410	A	A	376	A	357					
29						L	U L 335	A	402	394	398	U L 405	416	A 355	Y	A	375	371	L 371					
30							366	A	401	355	R 376	R 399	A	R 386	R 384	407	360	A	A					
31								A	A	383	A 372	A	A	410	375	371	381	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	16	11	10	12	12	10	7	14	15	12	15	13	15					
MED						334	366	388	388	398	400	409	401	398	383	388	376	366	L 351					
U Q						346	U L 372	393	396	412	408	423	416	410	406	392	383	374	L 361					
L Q						329	352	377	377	388	R 390	401	396	384	380	372	366	356	339					

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							374	274	240	E A 330	570	A	412	A	A 372	370	A	A	256					
2							410	A	290	320	390	386	E A 414	374	334	322	348	314	278					
3						274	A 306	A	318	296	A	A	450	350	304	310	328	294	270					
4							A	A	A	A	A	A	A	380	402	392	A	A 312	A	A				
5						L 340	302	248	312	A	A	A	A	470	412	A 344	422	358	318					
6						406	A	284	A	A	A	376	A	A 408	A	414	358	A	E A 312					
7						420	410	320	260	Y 350	498	346	322	G	466	384	342	346	296					
8							A	A 322	266	A	E A 394	A	G	440	380	380	316	312	294					
9						A	A	A	A	A	A	Y	A 442	A	390	410	370	432	308					
10						272		346	288	A	318	A	348	350	322	330	294	272	A 288					
11						240	282	252	318	248	406	Y	E A 404	A	352	394	372	348	A 326	A				
12						236	E A 352	A	334	290	266	A	A	A	A	A	A	A	A 312					
13						362	A 324	284	302	A	A	A	A 388	A	386	390	360	374	308	256				
14							G	346	260	256	258	A	A	402	372	336	358	298	278					
15							264		A	A	A	320	E A 380	A 344	A	308	322	A	300					
16							282	276	A 286	A	A	G	A	A	A	A	326	292						
17							398	282	280	L 326	520	E A 396	A	304	A	A 326	A 360	A	A 312					
18						L 378	316	278	A 328	A	382	A 386	A	A	294	A	A	A	A					
19							424	272	316	A	A	376	Y	Y	358	E A 458	A	L 412	296					
20							A	A	A	A	E A 378	448	A	A	314	A	A	314	264					
21							308	266	268	380	E Y 454	430	Y	362	294	364	326	336	278					
22								342	268	318	356	A	346	A	308	A	A	A	A					
23							262	A	E A 354	A	A	A	A	398	324	A	350	338	A					
24							L 362	302	406	G	Y	G	406	354	356	414	298	298	284					
25								432	298	406	434	362	454	362	328	304	308	282	252					
26							E A 310	L	A 392	258	A	A	A	A	A	A	260	A	A					
27							384	272	264	278	398	376	468	U L 450	338	314	362	L	304					
28							A	A	A	A	312	318	A	358	E A 480	A	334	A 318	298					
29						L 328	374	334	236	328	314	326	360	384	380	A	334	300	254					
30							396	A 384	406	G	372	334	E A 352	286	G	G	406	332	292					
31								332	286	340	254	A	A	504	318	278	290	A 290	A 360					
	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	21	21	25	17	19	16	16	20	25	22	24	22	25	1				
MED						334	352	284	289	323	377	376	400	377	354	360	338	314	295	256				
U Q						378	397	338	323	365	434	413	446	424	388	394	360	346	A 310					
L Q						272	304	273	267	284	314	340	356	352	320	322	319	298	278					

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	286	278	266	248	232	254	216	A	A	A	192	A	A 240	A	A	A	A	A	A	A 256	262	266	E A 338	308
2	282	A 310	308	A 340	268	A 262	254	A	A	A	A	A	A	228	A	A 252	A	A	A	248	A	E A 324	272	A 336
3	270	272	272	278	282	260	A	A	H 206	182	A	A	A	A	E A 264	226	A	230	232	262	238	286	276	A
4	C	294	302	276	278	246	A	A	A	A	A	A	A	196	226	A	A	A	A	A	A	278	332	A
5	254	A 306	276	302	288	246	232	H 196	A	A	A	A	A	208	A	A	A	A	244	262	278	272	A 362	A
6	A 334	286	A 328	280	290	258	A	A	A	A	A	A	A	A	A	A	A	A	A	236	238	306	A	268
7	280	278	246	250	282	268	224	A	222	200	210	194	182	204	182	212	A	228	238	248	220	A	356	A 344
8	268	262	244	278	266	A 262	A	A	A 230	A	A	A	220	A	228	A	A	A	A 256	E A 290	A 282	E A 314	266	E A 364
9	A	280	294	260	276	A	A	A	A	A	A	Y	A	A	222	228	E A 286	230	244	280	246	250	A 316	274
10	C	286	A	A 352	272	224	220	188	A	A	A	A	216	Y	234	A 242	A 236	222	A	A	264	268	300	284
11	A 300	292	300	278	250	224	228	210	222	A	216	Y	A	A	A	226	232	A	A	A	A 268	244	A	A
12	A	A	326	A 334	284	224	A	A	A	H 188	A	A	A	A	A	A	A	A	A	246	218	224	254	296
13	310	322	A 270	272	286	258	A	A 242	A	A	A	A	A	A	212	A	A	220	260	254	216	222	252	280
14	A 354	288	284	264	208	270	236	208	A	A	A	A	A	240	198	210	A	A	A 254	272	222	234	A 284	A 328
15	322	A 374	A	288	274	258	A 256	236	A	A	A	A	A	A	A	A	A 242	A	A 248	A	232	234	262	248
16	256	272	256	256	276	262	244	A	A	A	A	A 250	A	A	A	A	A	238	E A 272	A	A 252	A 288	A 282	296
17	A 292	278	A 296	242	282	254	A 236	216	A	202	200	A	A	A	A	A	A	A	A	A 276	262	264	234	252
18	252	258	A 308	304	294	248	A 258	A	A	A	206	A	A	A	A	A	A	A	A	E A 320	238	272	236	A 250
19	274	288	282	310	A	A	246	A	A	A	A	192	Y	202	226	A	A	E A 272	A 248	236	A 260	314	304	264
20	A 294	298	288	256	A 262	222	A	A	A	A	A	A 236	A	A	A	A	A	214	228	232	222	258	292	292
21	268	296	286	292	278	244	236	230	218	210	190	170	Y	222	210	228	218	226	H 214	236	240	232	264	264
22	278	284	234	A	A 302	264	234	226	A	210	A	A	A	A	A	A	A	A	A	238	214	234	280	A
23	A 312	A 342	A 318	A	A	248	A 228	A	A	A	A	A	A	A	212	A	E A 266	A	A	A	266	280	286	296
24	252	264	A 298	296	286	256	240	220	196	192	Y	222	Y	224	A	A	210	242	226	H 254	222	240	254	280
25	262	268	272	266	258	220	210	220	A 230	206	202	198	178	H 176	234	238	222	218	218	238	220	276	A 320	A
26	A	280	230	A 272	A	A	A	220	A	A	A	A	A	A	A	A	222	A	A	A	A	A 272	A 294	A 298	E A 272
27	222	E A 316	228	278	252	242	236	H 206	218	216	A 232	186	178	234	206	246	226	228	H 196	248	226	236	282	276
28	286	276	256	A	250	260	A	A	A	A	214	A	A	210	A	A	A 264	A	A 266	254	232	228	246	264
29	266	278	244	262	302	262	238	A	218	214	194	192	190	A	A	A	252	220	240	230	220	250	258	280
30	296	A	270	266	256	298	224	A	H 186	A 240	A 242	H 186	A	216	240	196	A 246	A	A	242	230	242	262	270
31	266	236	262	276	276	270	228	A	A	A 232	A	A	A	218	214	234	A 236	A	A	A	A 352	A	262	246
	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	29	29	28	28	28	21	13	10	12	11	10	7	13	15	12	14	13	17	23	29	29	29	25
MED	279	282	276	277	276	257	236	220	218	208	206	193	190	216	218	228	232	227	242	248	238	257	278	278
U Q	A 296	A 297	299	294	285	262	242	228	A 222	215	A 216	A 222	220	226	234	240	A 252	234	A 255	262	263	283	302	A 296
L Q	266	274	256	263	260	245	226	207	H 206	196	194	186	178	203	210	219	222	220	227	238	222	235	260	264

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IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A	108	108	112	112	A	A	110	116	112	112	110	118	B				
2						A	118	114	112	110	108	110	A	A	A	A	A 122	A 120	116	B				
3						E A 176	116	108	110	110	110	A	A	112	A	A	A	A	A	B				
4						114	118	A	112	110	110	112	A	A	112	112	110	114	A	B				
5						A	A	114	108	A	A	A	A	A	A	A	A	A	A	B				
6						A	118	116	110	110	110	A	A	A	116	114	118	118	118	B				
7						128	A	120	116	112	A	A	120	A	A 126	126	A	A	A	A				
8						A	A	A	A 124	112	108	110	106	106	A	A	A 124	A	120	B				
9						A	116	116	112	108	B	B	A	A	112	116	116	A 128	A	B				
10						A	122	A	A	A	106	A	A	B	118	112	118	A	A 126	B				
11						A	A	A	110	A	A	A	110	A	A	114	A	A	A	B				
12						A	116	116	112	A	A	112	A	A	A	A	A	A	A	B				
13						A	A	112	112	110	110	A	112	108	A	A 126	116	114	A	B				
14						B	130	114	112	116	108	108	A	108	114	114	A 134	116	A	B				
15						A	114	A	110	108	108	112	110	112	110	108	114	116	A	B				
16						A	A	A	110	110	108	A	A	A	112	112	110	A	A	B				
17						B	114	A 130	112	108	110	A	A	A	A	118	A 124	A 122	118	B				
18						128	120	A 128	116	A	110	110	A	110	A	A	A	A	A	B				
19						B	A	112	A	A	A	A	A	A 132	114	114	114	114	A	B				
20						B	A	A	A	110	112	116	114	A	110	A	A	124	E A 124	B				
21						A	A	120	112	112	112	118	112	A	A	A	A	A	A					
22						B	A	E A 140	112	110	108	A	A	110	116	112	112	112	A					
23						B	A	110	108	A	A	A	110	A	A 122	112	112	116	122					
24						B	106	A	A	A	112	106	114	114	112	112	110	122	122					
25						B	122	A 138	A	A	114	112	A	116	A 128	124	120	A 120	120					
26						B	A 136	A	106	110	110	112	A	A	A	A 116	120	118	A					
27						B	120	A 134	A 126	A	A	108	A	A	116	A 122	114	114	120					
28						A	A	A	A	A	110	108	110	110	120	112	112	112	A					
29						A	120	114	110	A	110	112	116	116	118	112	112	A	A					
30						B	A	A	A 132	A 124	A	122	A	A	116	112	116	116	124					
31						B	124	114	108	A	108	106	106	118	116	116	116	116	114					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	17	20	25	18	22	17	12	14	20	23	23	20	13					
MED						124	118	114	112	110	110	112	111	111	116	114	116	116	120					
U Q						152	122	A 124	112	112	110	112	114	116	118	116	A 120	A 120	123					
L Q						121	116	113	110	110	108	108	110	110	112	112	112	114	118					

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	114	104	128	106	102	106	112	108	108	116	G	150	108	110	130	122	116	112	112	108	110	110	106	104
2	104	100	98	94	96	110	114	112	110	112	114	114	102	104	102	104	126	118	114	112	108	108	106	104
3	124	104	104	102	106	124	120	112	118	176	104	104	104	116	116	114	108	110	112	96	104	104	112	110
4	C	104	104	100	100	124	128	120	116	110	110	112	108	116	120	118	114	114	108	114	104	102	110	104
5	102	96	94	92	B	154	170	112	104	104	102	104	100	134	106	102	102	108	108	114	112	114	112	106
6	106	104	102	104	110	108	114	112	108	106	112	112	124	104	124	130	122	112	112	120	110	104	106	108
7	104	104	106	100	102	G	120	126	126	122	132	116	110	112	138	132	100	106	100	104	100	110	110	108
8	114	104	144	102	102	98	98	96	124	118	112	112	114	110	106	134	128	120	120	108	112	116	108	110
9	106	112	110	138	126	116	114	110	108	108	106	106	112	104	124	G	124	114	118	110	106	110	110	106
10	C	110	106	104	102	108	126	110	128	108	106	102	106	118	G	116	114	132	116	112	112	106	106	110
11	98	104	104	104	108	102	114	110	118	110	110	110	108	104	110	130	116	100	102	114	108	112	114	110
12	106	104	112	102	110	108	118	112	116	112	164	104	106	102	104	104	100	98	98	98	96	122	100	110
13	112	108	110	108	150	122	112	118	116	110	112	108	116	104	118	126	124	116	110	114	B	112	112	108
14	110	124	B	104	120	112	122	118	112	110	108	108	108	110	G	152	130	112	112	112	106	106	108	106
15	124	110	104	110	116	120	114	112	108	106	108	120	116	110	108	108	170	122	116	110	108	100	100	112
16	106	108	130	112	108	106	110	106	110	104	102	102	100	108	116	120	118	108	104	108	108	106	100	106
17	104	106	96	102	96	120	116	112	108	108	110	104	100	102	126	124	122	116	112	114	108	106	110	110
18	114	112	106	106	104	118	118	114	116	112	112	110	106	102	104	126	112	112	106	120	102	112	106	106
19	102	106	112	108	104	102	124	122	104	106	108	110	172	154	142	126	118	118	124	112	110	110	112	110
20	112	108	108	108	106	108	104	110	114	114	116	120	110	108	108	100	100	142	132	102	112	102	96	B
21	B	106	104	102	98	132	118	138	120	120	122	G	126	118	116	108	110	146	162	112	110	116	114	116
22	112	110	106	100	106	106	124	122	118	112	110	110	108	120	122	116	114	112	108	110	102	102	104	108
23	116	110	106	108	106	106	112	110	110	104	102	104	104	110	152	124	122	122	114	114	110	112	110	112
24	110	118	108	108	118	110	114	112	108	108	186	G	G	116	112	114	122	128	126	124	102	104	124	114
25	116	116	114	106	106	104	G	154	150	108	G	160	110	154	170	144	124	94	126	104	120	112	112	110
26	108	106	108	106	102	102	170	112	116	112	112	106	106	104	102	118	122	116	114	118	120	116	120	106
27	114	108	102	106	108	108	134	112	168	112	108	108	112	110	172	154	122	132	118	126	124	114	120	114
28	132	108	104	100	100	102	124	122	116	120	124	118	122	134	124	114	124	112	112	112	110	110	104	104
29	102	98	102	124	106	122	126	116	114	114	G	128	126	162	140	118	116	120	112	110	108	112	120	110
30	110	104	104	104	98	104	102	114	112	156	104	102	98	114	116	136	154	144	124	110	114	B	118	104
31	102	104	106	112	104	100	140	124	116	118	116	114	114	G	G	G	134	118	114	114	114	114	110	106
	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	31	30	31	30	30	30	31	31	31	28	29	30	30	28	29	31	31	31	31	30	30	31	30
MED	110	106	106	104	106	108	118	112	116	112	110	110	108	110	117	120	122	116	112	112	109	110	110	108
U Q	114	110	110	108	108	120	124	120	118	116	115	115	114	118	128	130	124	122	118	114	112	112	112	110
L Q	104	104	104	102	102	104	114	110	108	108	107	104	106	104	108	114	114	112	108	108	106	106	106	106

IONOSPHERIC DATA STATION Kokubunji

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

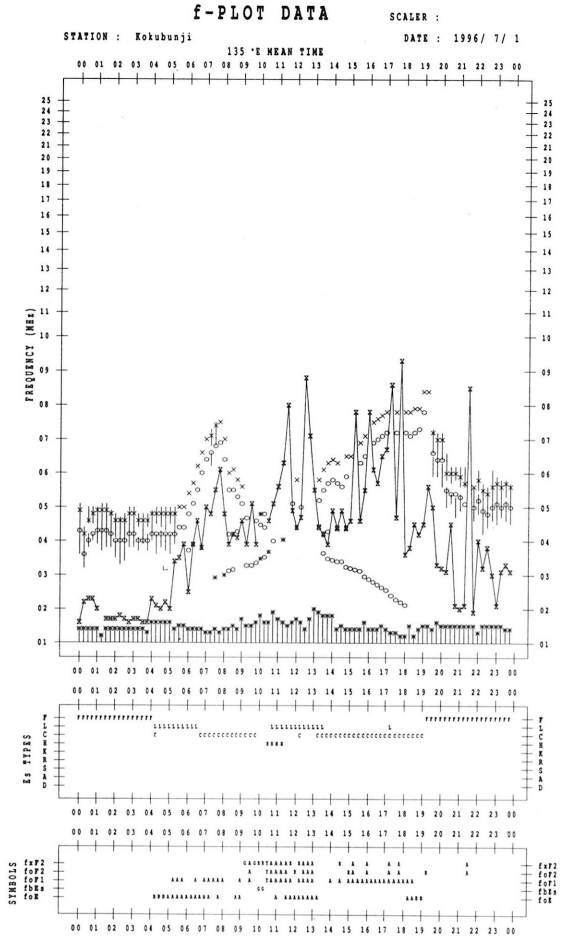
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

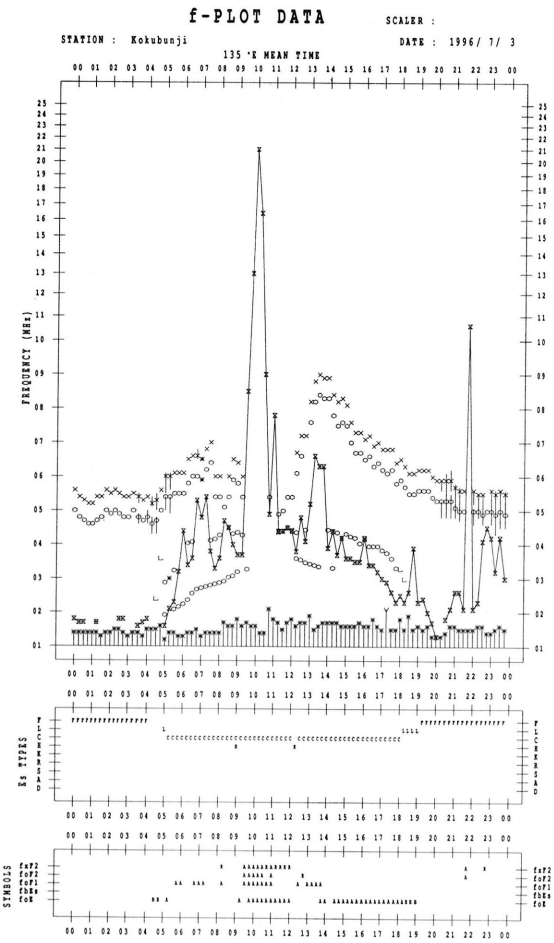
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	FF 12	F 4	FF 22	F 2	F 3	L 4	L 3	C 3	C 3	C 2		HL 11	L 2	L 1	C 2	C 2	C 3	C 3	C 4	C 5	F 3	F 4	F 5	F 3
2	F 4	F 4	F 2	F 4	F 2	C 5	C 3	C 3	C 2	C 2	C 1	C 1	C 2	L 1	L 2	L 2	CL 22	CL 32	C 4	L 4	F 5	F 4	F 3	F 3
3	FF 13	F 2	FF 21	F 1	F 1	L 1	C 3	C 3	C 1	HC 11	C 3	C 2	C 1	C 2	C 1	C 1	C 1	C 2	C 1	L 3	F 1	F 2	F 3	F 5
4		F 5	F 2	F 3	F 2	C 2	C 4	CL 21	C 3	C 2	C 2	C 1	C 2	C 1	C 1	C 2	C 2	C 4	L 4	LL 25	F 4	F 4	F 3	F 4
5	F 4	F 3	F 2	F 1		CL 11	HC 11	C 1	C 2	L 2	L 2	L 2	L 2	CL 12	L 2	L 2	L 2	L 2	L 3	L 3	F 3	F 3	F 6	F 4
6	F 4	F 3	F 5	F 2	FF 22	L 5	C 3	C 3	C 3	C 2	C 3	C 1	CL 11	L 1	CL 21	C 1	C 2	C 2	C 3	CL 13	F 2	F 2	F 4	F 2
7	F 1	F 2	F 1	F 1	F 1		LC 21	C 2	C 2	C 1	CL 11	L 1	L 1	L 1	HL 11	CL 11	L 3	L 2	L 3	L 2	F 3	F 3	F 6	F 4
8	F 3	F 3	F 1	F 2	F 2	LC 31	L 4	L 2	CL 12	C 2	C 2	C 2	C 2	C 1	L 2	CL 11	CL 22	LL 22	L 3	L 3	F 5	FF 23	F 3	F 4
9	F 2	FF 21	F 2	FF 11	F 1	C 3	C 4	C 3	C 3	C 2	C 2	C 1	C 1	C 1	C 1		C 2	LC 21	L 2	L 3	F 3	F 6	F 4	F 2
10		F 3	F 6	F 3	F 2	L 2	CL 21	C 2	CL 12	L 2	C 2	C 2	C 1	C 1		C 1	L 2	CL 22	C 3	C 4	F 3	F 3	F 2	F 2
11	F 2	F 2	F 2	F 1	F 2	L 2	CL 22	L 2	C 1	C 1	C 1	C 1	C 2	C 2	L 2	C 1	CL 12	L 3	L 4	LL 24	FF 43	F 2	FF 34	F 3
12	F 3	F 3	FF 24	F 3	FF 23	L 3	C 3	C 2	C 2	C 1	HL 11	L 2	L 1	L 2	L 2	L 2	L 3	L 3	L 5	L 4	F 2	F 1	F 1	F 2
13	F 2	F 2	F 3	F 2	FF 12	L 3	C 3	C 2	C 2	C 2	C 2	C 2	C 2	C 4	C 1	CL 11	C 1	C 1	L 3	L 1		F 1	F 3	F 2
14	F 4	F 1		F 3	F 1	L 2	C 3	C 2	C 2	CL 21	C 2	C 2	C 2	C 2		H 1	CL 21	C 3	C 3	LC 31	F 4	F 4	F 5	F 4
15	FF 33	F 3	F 3	F 2	F 2	L 2	C 3	C 2	C 3	C 3	C 2	C 2	C 2	C 2	C 3	C 2	H 1	C 3	C 3	C 3	F 3	F 2	F 2	F 2
16	F 1	F 1	FF 11	F 2	F 3	L 3	L 4	L 3	C 2	C 3	C 3	L 2	L 2	L 2	C 2	C 3	CC 22	L 2	L 6	L 4	F 4	F 4	F 5	F 2
17	F 4	FF 21	F 4	F 1	F 2	L 3	C 3	L 1	C 2	C 2	C 2	C 2	L 2	L 2	CL 21	CL 21	CL 21	CL 31	C 3	C 4	F 3	F 4	F 3	F 3
18	FF 13	F 2	F 3	F 4	F 2	C 1	C 4	CL 32	C 2	CL 21	C 2	C 2	C 1	C 2	L 2	CL 22	CL 32	CL 22	L 4	LL 23	F 4	F 3	F 2	F 3
19	F 2	F 2	FF 22	F 2	F 3	L 4	C 1	CL 21	C 3	C 1	C 1	C 1	HL 11	H 1	H 1	C 2	C 3	C 2	C 3	L 2	F 3	F 3	F 5	F 5
20	F 3	F 2	F 4	F 2	F 2	L 2	L 3	CL 31	C 3	C 2	C 1	C 2	C 2	C 2	C 2	C 3	L 3	HL 12	CL 11	L 1	F 1	F 2	F 1	
21		F 1	F 1	F 2	F 2	C 2	C 2	C 2	C 1	C 1	C 1		C 1	C 1	C 1	L 1	L 2	CL 11	CL 12	F 4	FF 21	FF 11	F 2	F 3
22	F 2	F 2	F 2	F 2	F 2	L 4	CL 12	L 1	C 3	C 1	C 2	C 2	C 1	C 2	C 2	C 3	C 3	C 3	L 4	F 3	F 2	F 2	F 2	FF 22
23	FF 22	F 3	F 3	FF 41	FF 51	L 3	L 3	C 3	C 3	C 2	C 2	C 2	C 2	L 1	HL 11	C 2	C 1	C 2	C 3	F 4	F 2	F 2	F 4	F 3
24	F 3	FF 12	F 4	F 2	F 1	L 2	C 3	L 2	L 2	L 1	H 1			C 1	C 2	C 2	C 1	CL 21	C 1	F 1	F 2	F 1	FF 11	F 2
25	F 2	F 2	F 1	F 2	F 2	L 1		HL 11	HL 11	L 2		H 1	L 1	H 1	HL 11	HL 11	CL 22	LC 21	CL 22	F 1	F 1	F 4	F 3	F 4
26	F 4	F 4	F 3	F 4	F 5	L 4	HL 13	L 2	C 2	C 2	C 2	C 2	C 2	C 2	L 2	CL 21	CL 21	CL 32	CL 42	FF 32	FF 15	FF 23	F 4	F 6
27	F 1	F 2	F 2	F 2	F 1	L 1	CL 11	L 1	HL 11	L 1	L 2	L 1	L 1	L 1	H 1	HL 11	C 1	C 1	C 2	F 1	F 3	F 2	F 3	F 3
28	FF 22	F 3	F 4	F 5	F 6	L 4	CL 54	CL 22	CL 22	CL 21	C 1	C 1	C 2	C 1	CL 11	C 2	C 2	C 3	C 4	L 3	F 3	F 2	F 5	F 2
29	F 2	F 2	F 2	FF 11	F 1	C 2	C 3	C 3	C 1	C 1		C 1	C 1	HC 11	H 1	C 2	C 2	C 1	L 2	L 3	F 1	F 2	F 1	F 2
30	F 3	F 3	F 4	F 2	F 2	L 2	L 3	CL 33	L 1	HL 11	L 2	L 1	L 2	C 1	C 1	H 1	H 2	H 2	C 3	F 3	F 1		F 1	F 3
31	F 3	F 2	F 4	FF 12	F 2	L 3	C 2	C 2	C 2	C 1	C 1	C 1	C 1				H 1	C 3	C 5	F 5	F 4	F 6	F 3	F 3
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

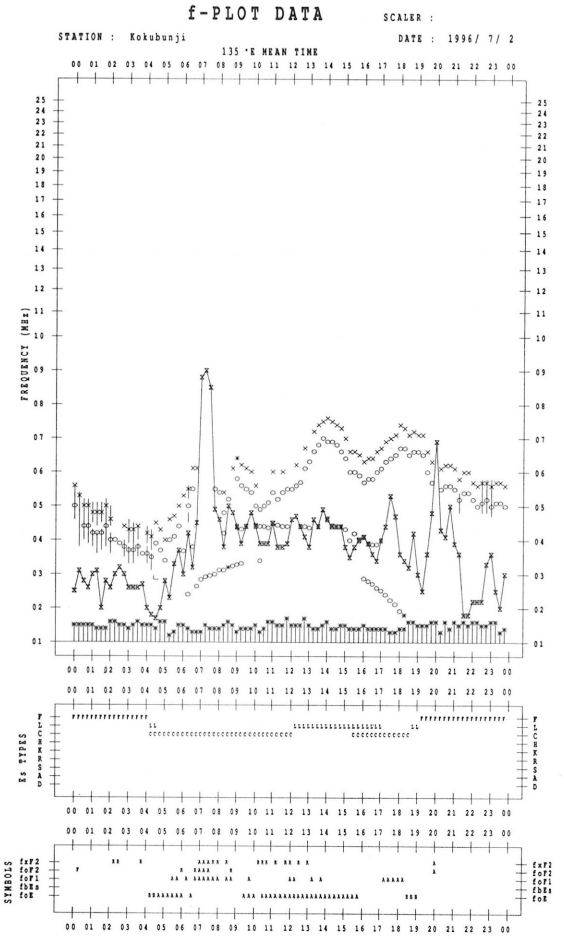
JUL. 1996 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

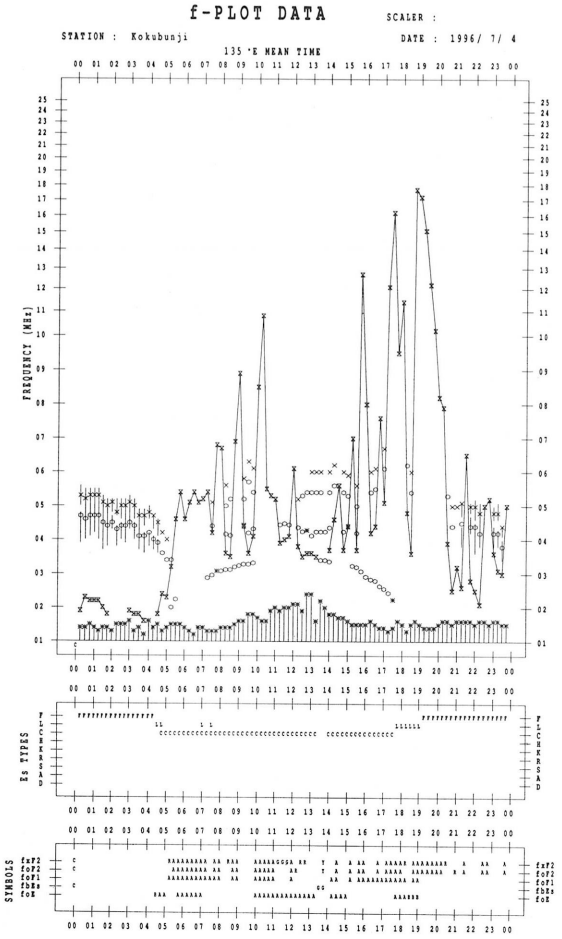
f-PLOTS OF IONOSPHERIC DATA

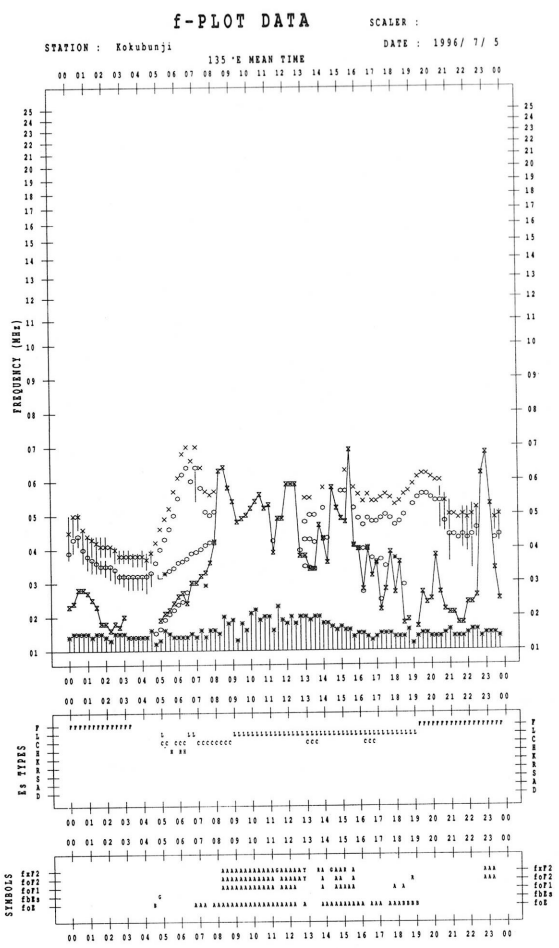
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

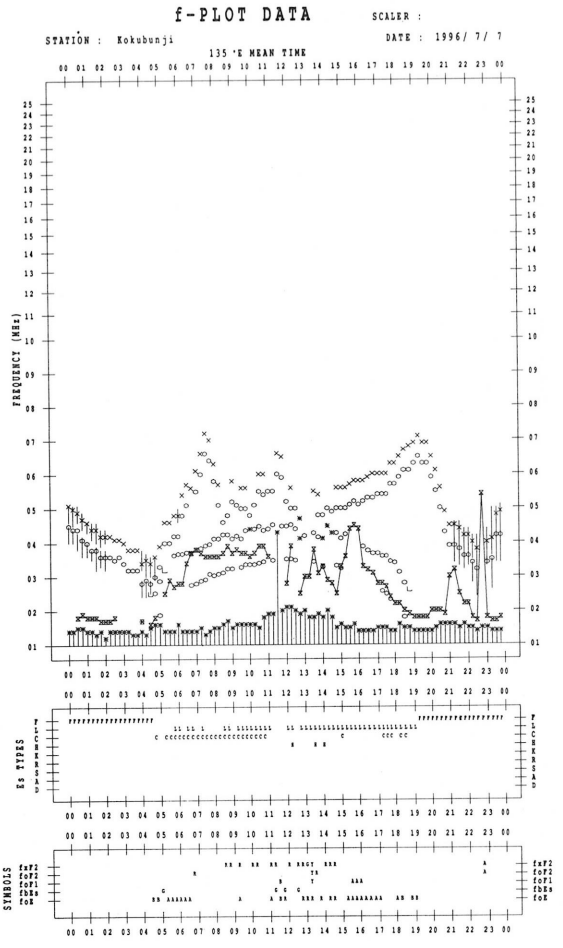

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

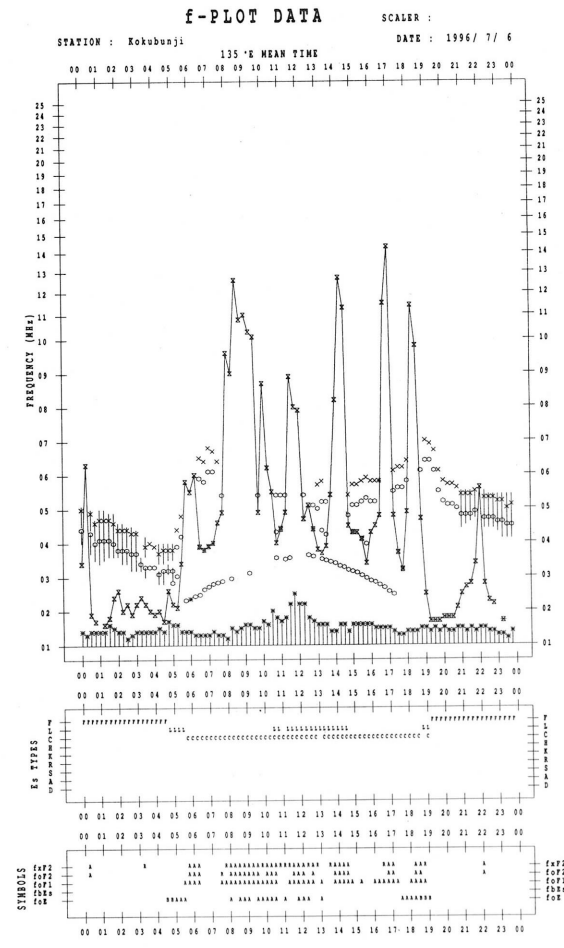

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

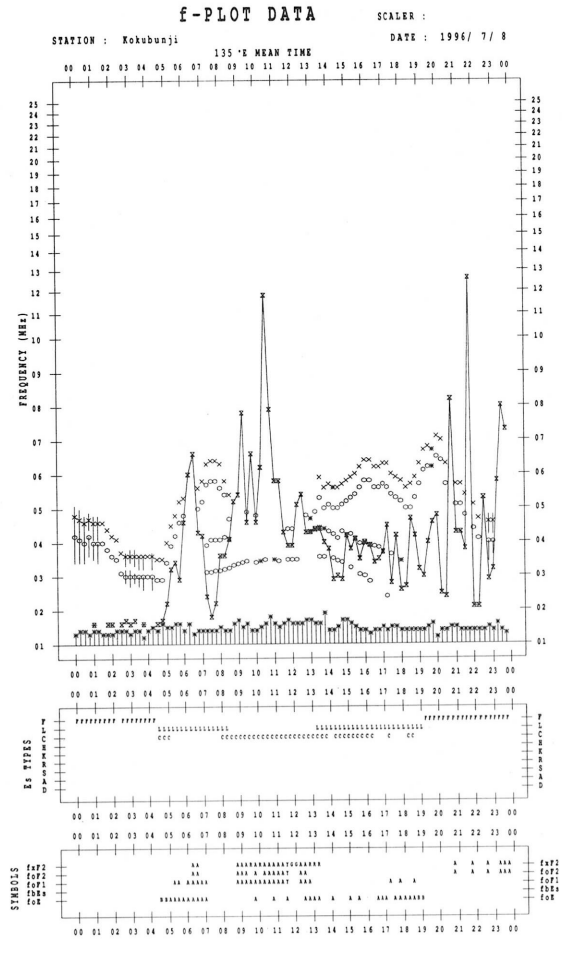

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

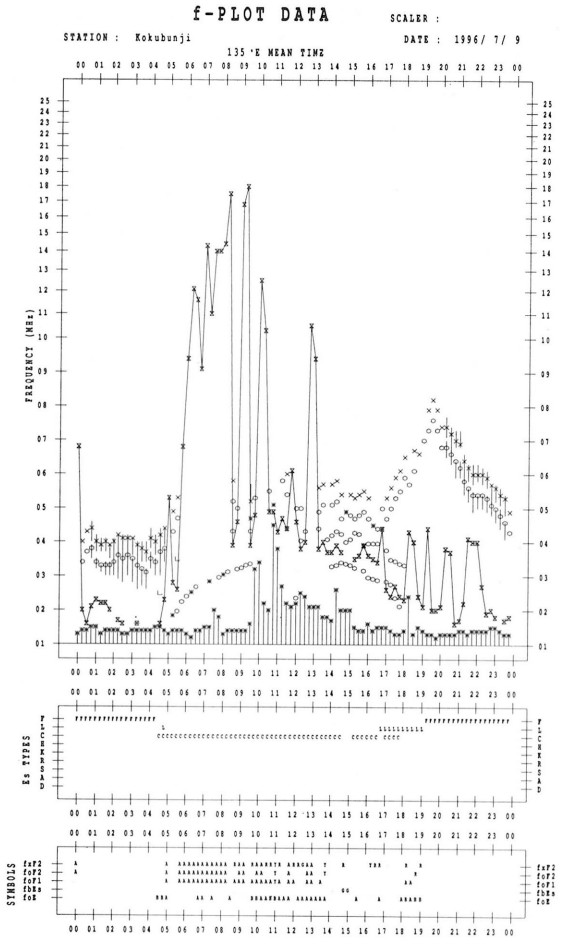

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

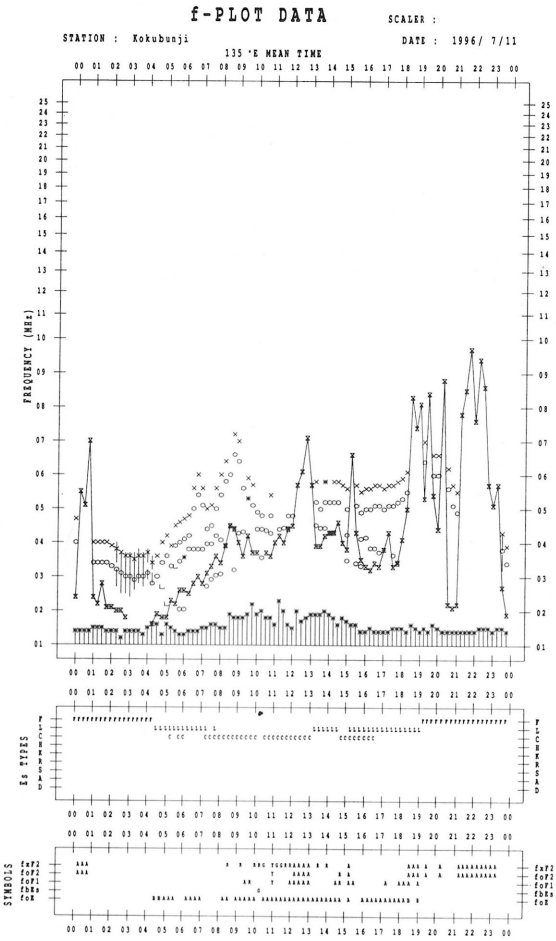

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

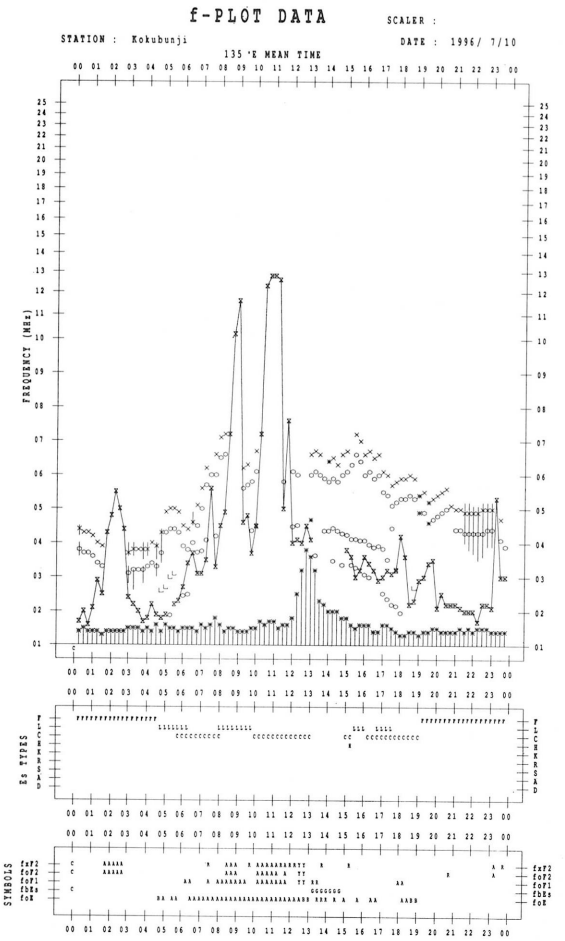

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

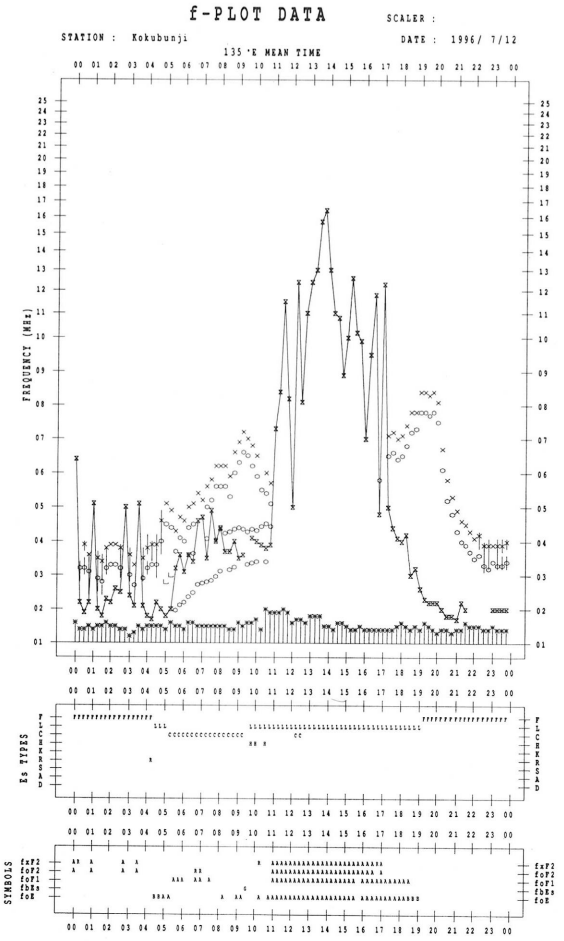

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/ 9
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/11
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/10
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE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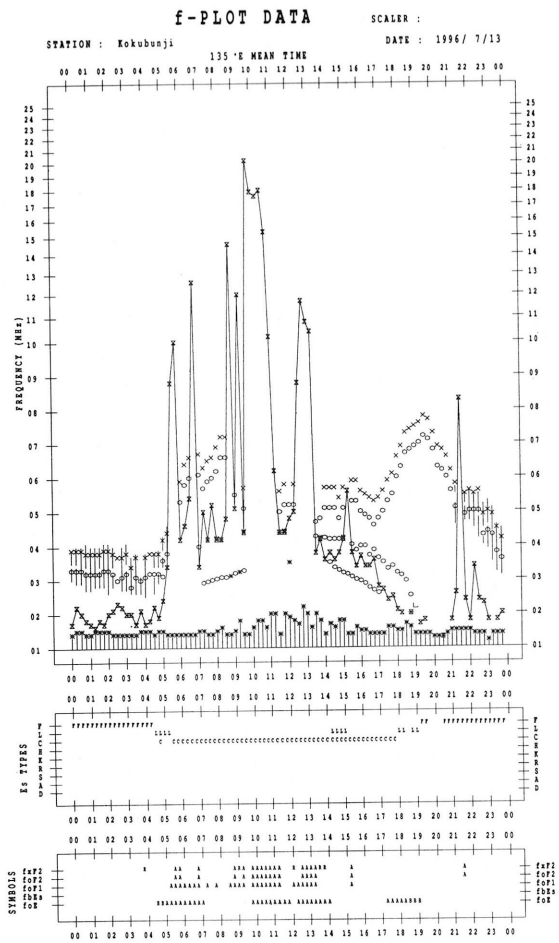
STATION : Kokubunji
DATE : 1996/ 7/12
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF2
foF1
fbEs
foE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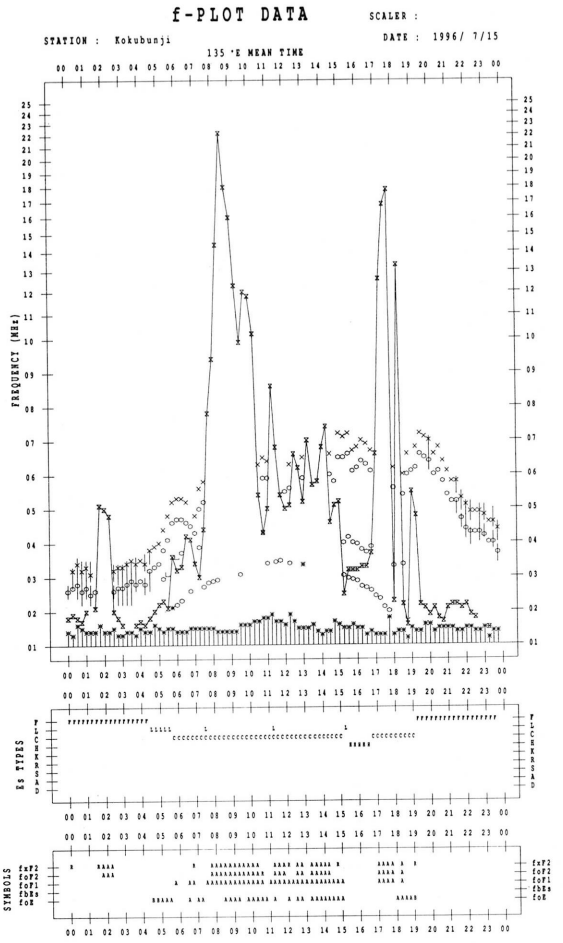
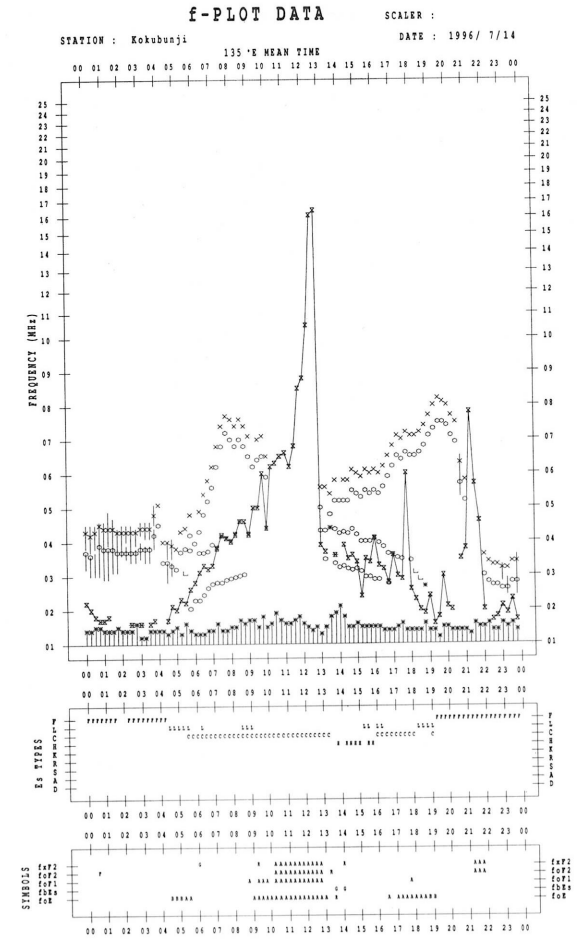
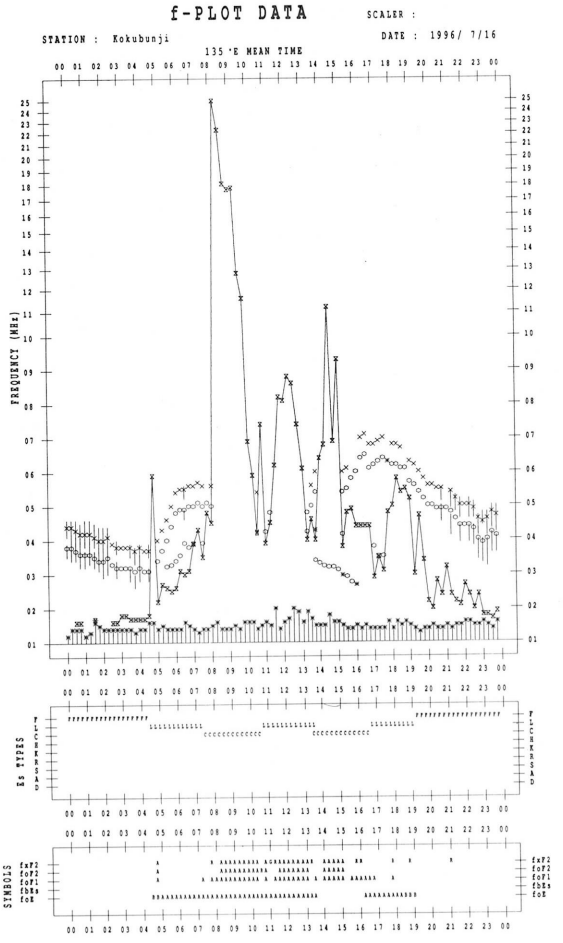
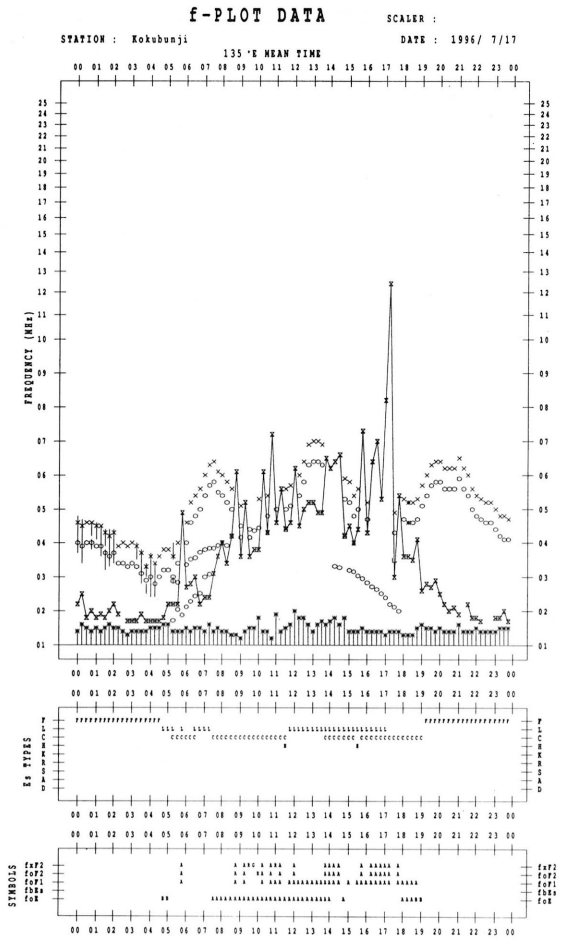
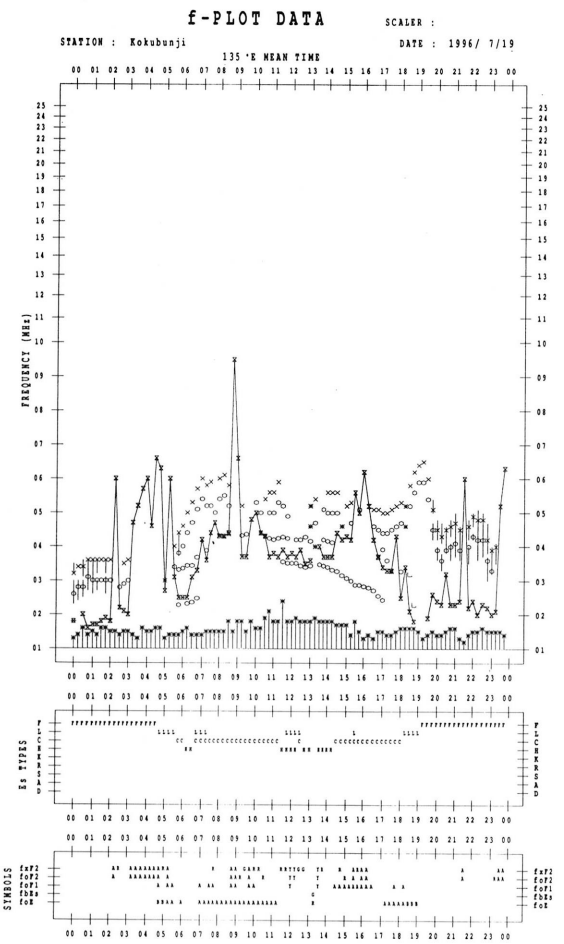
STATION : Kokubunji
DATE : 1996/ 7/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

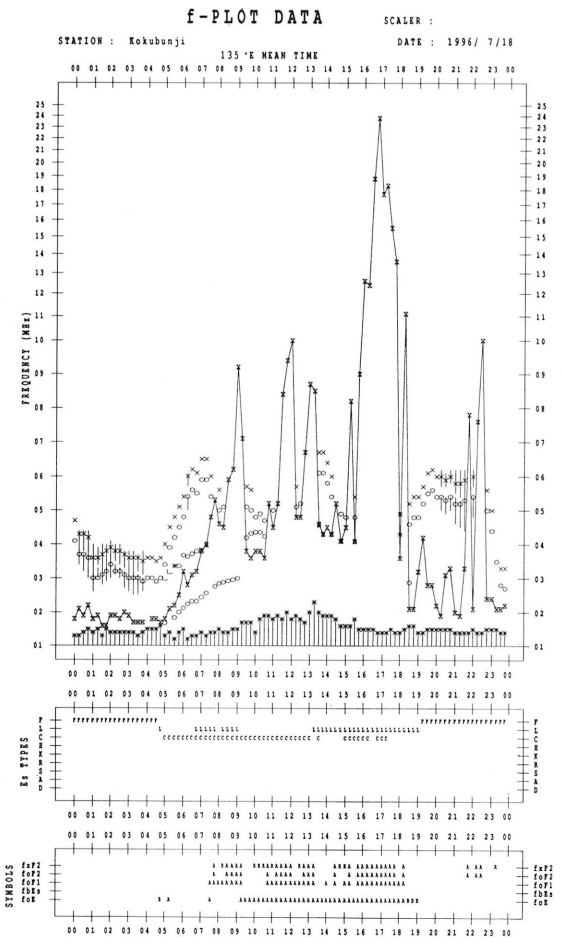

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

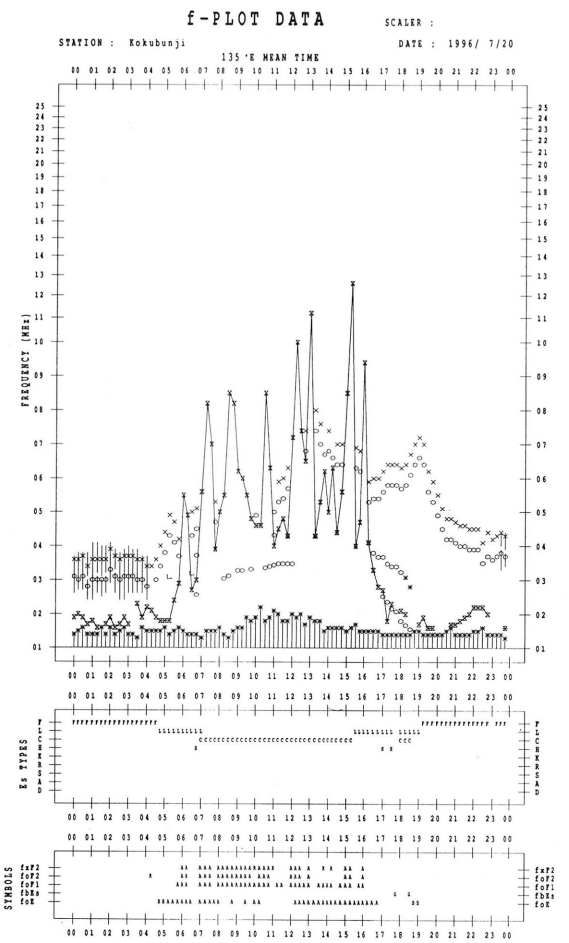

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

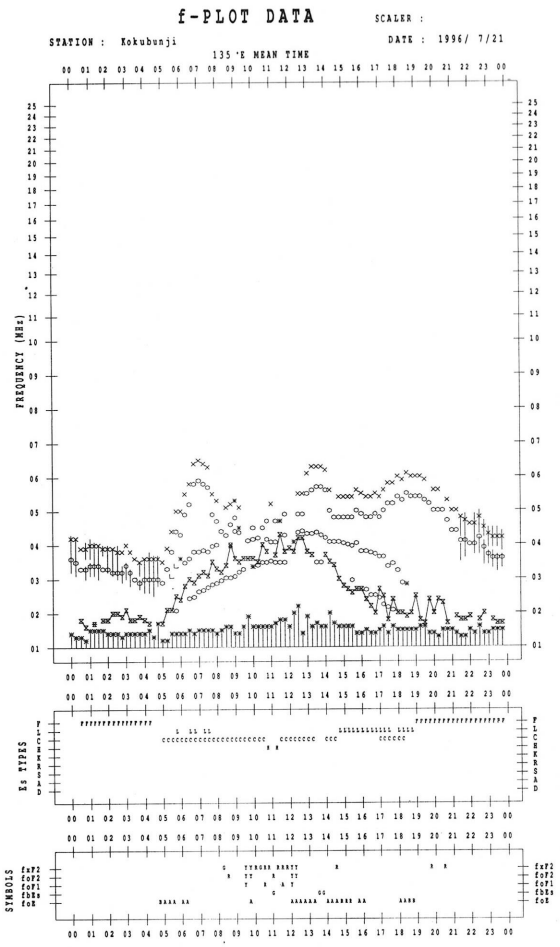

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

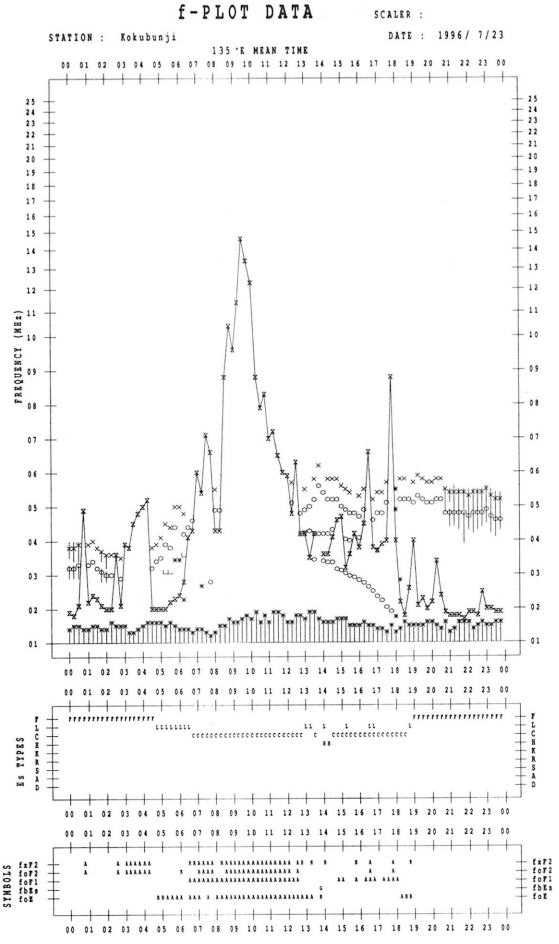

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

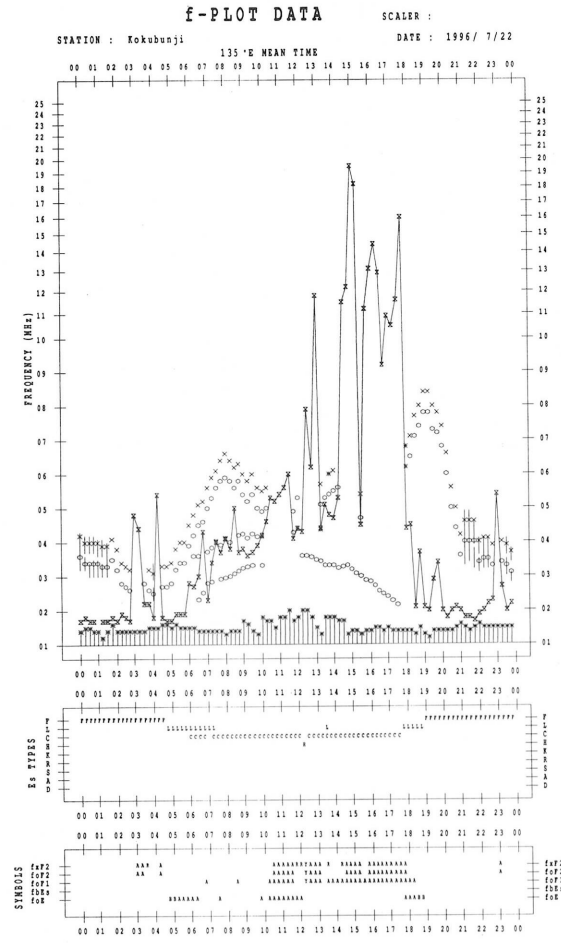

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

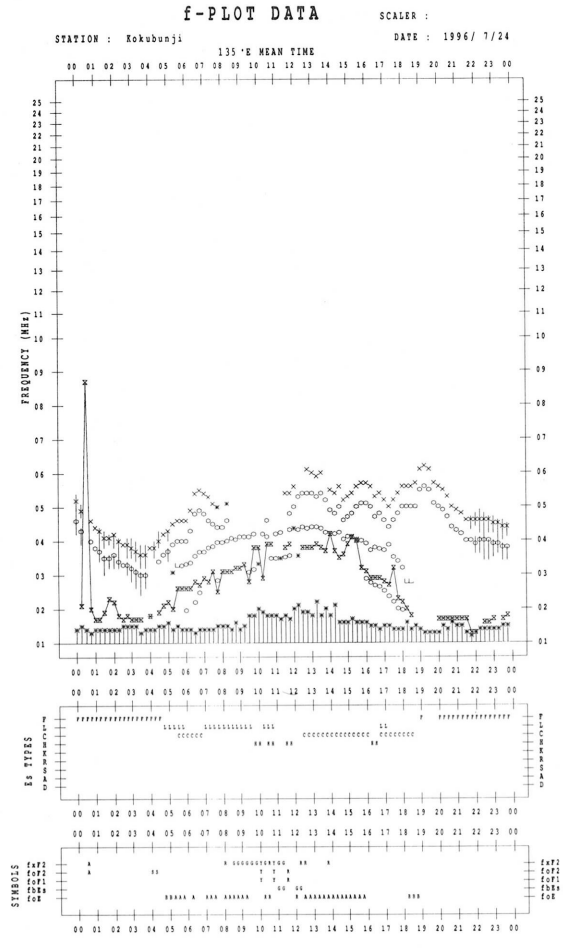

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

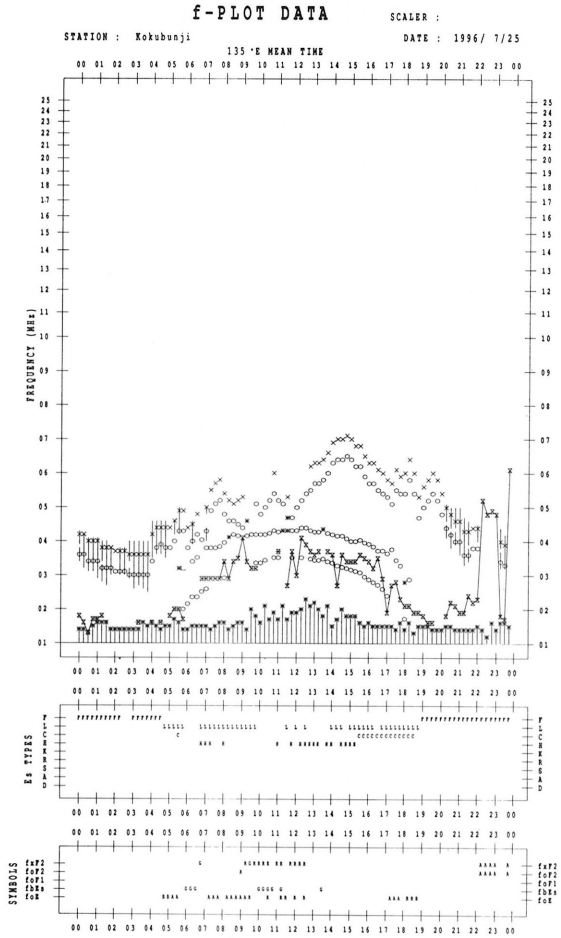

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

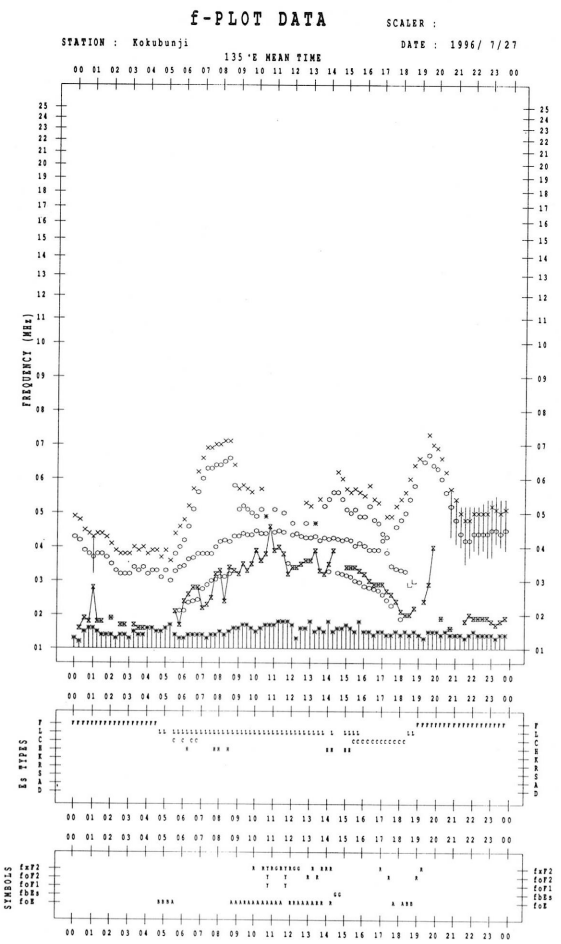

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/21
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

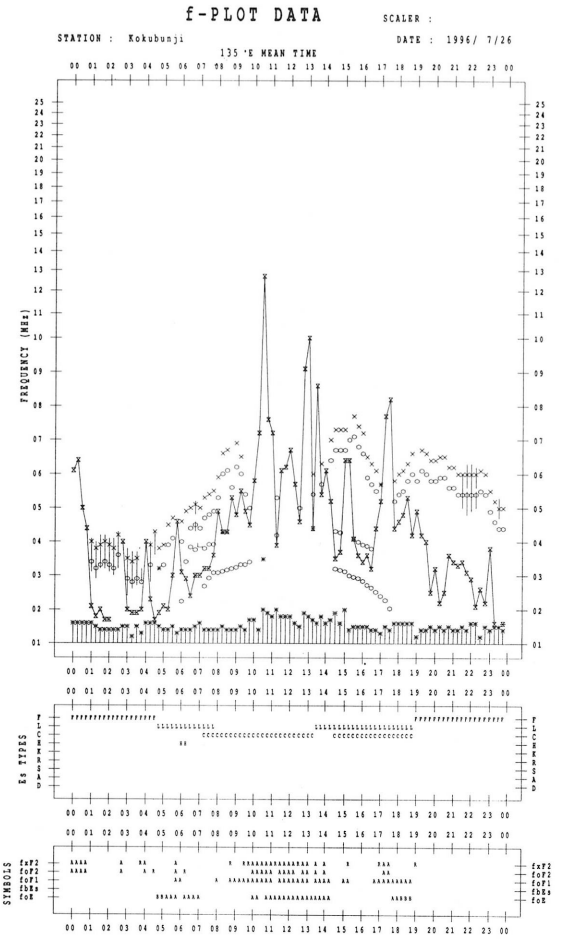

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/23
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

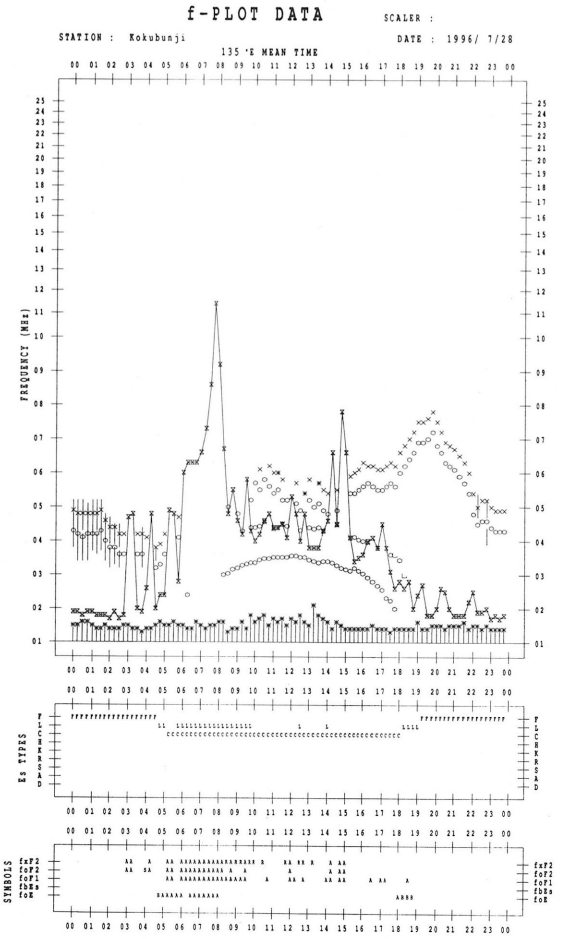

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/22
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

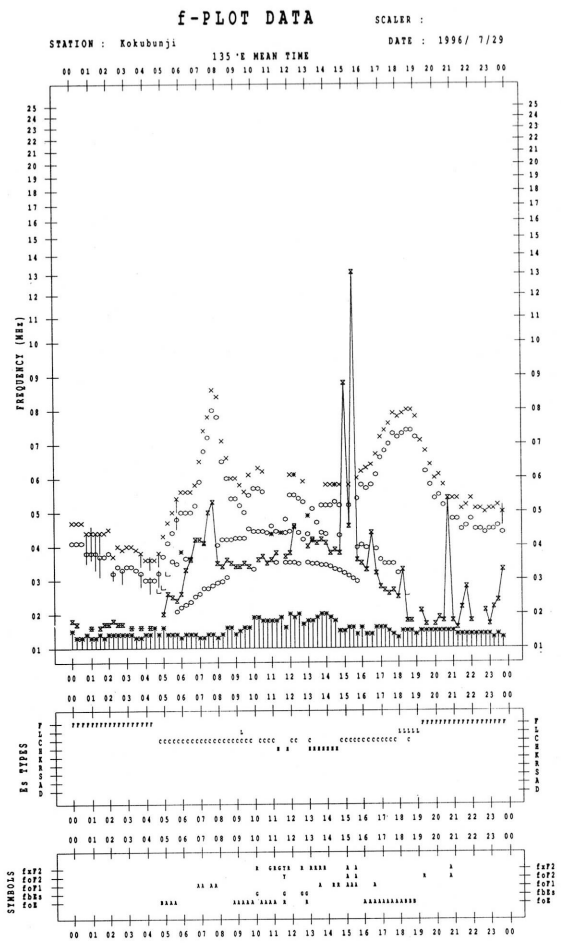

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/24
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

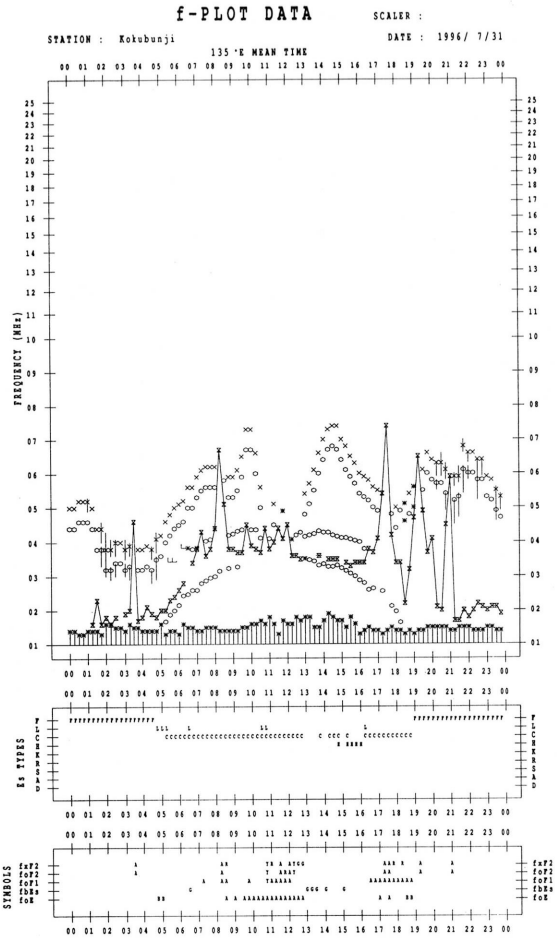

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

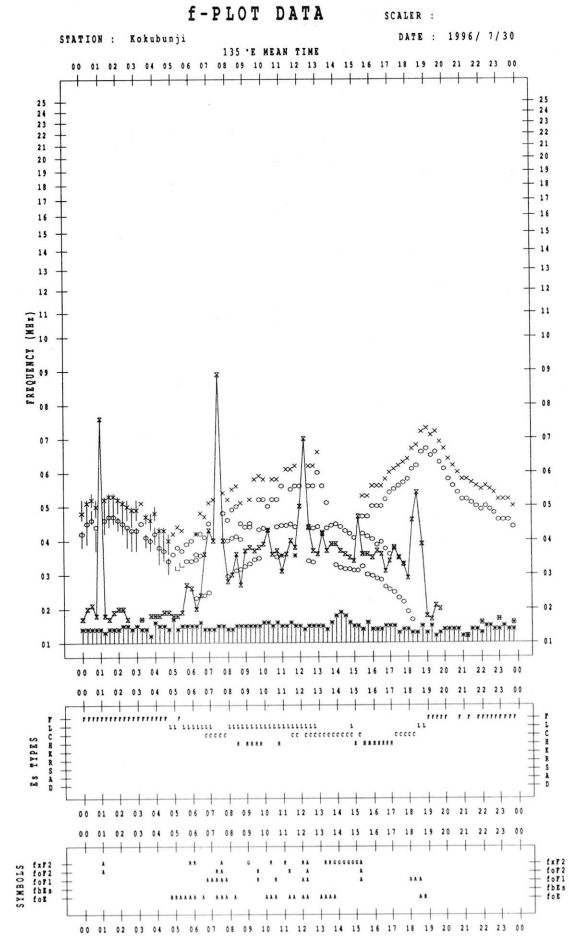

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1996/ 7/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Hiraiso July 1996

Not available until system improvement is completed.

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso July 1996

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

Note: No observations during the following periods.
25th 2330 - 26th 0800

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso July 1996

Single-frequency observations

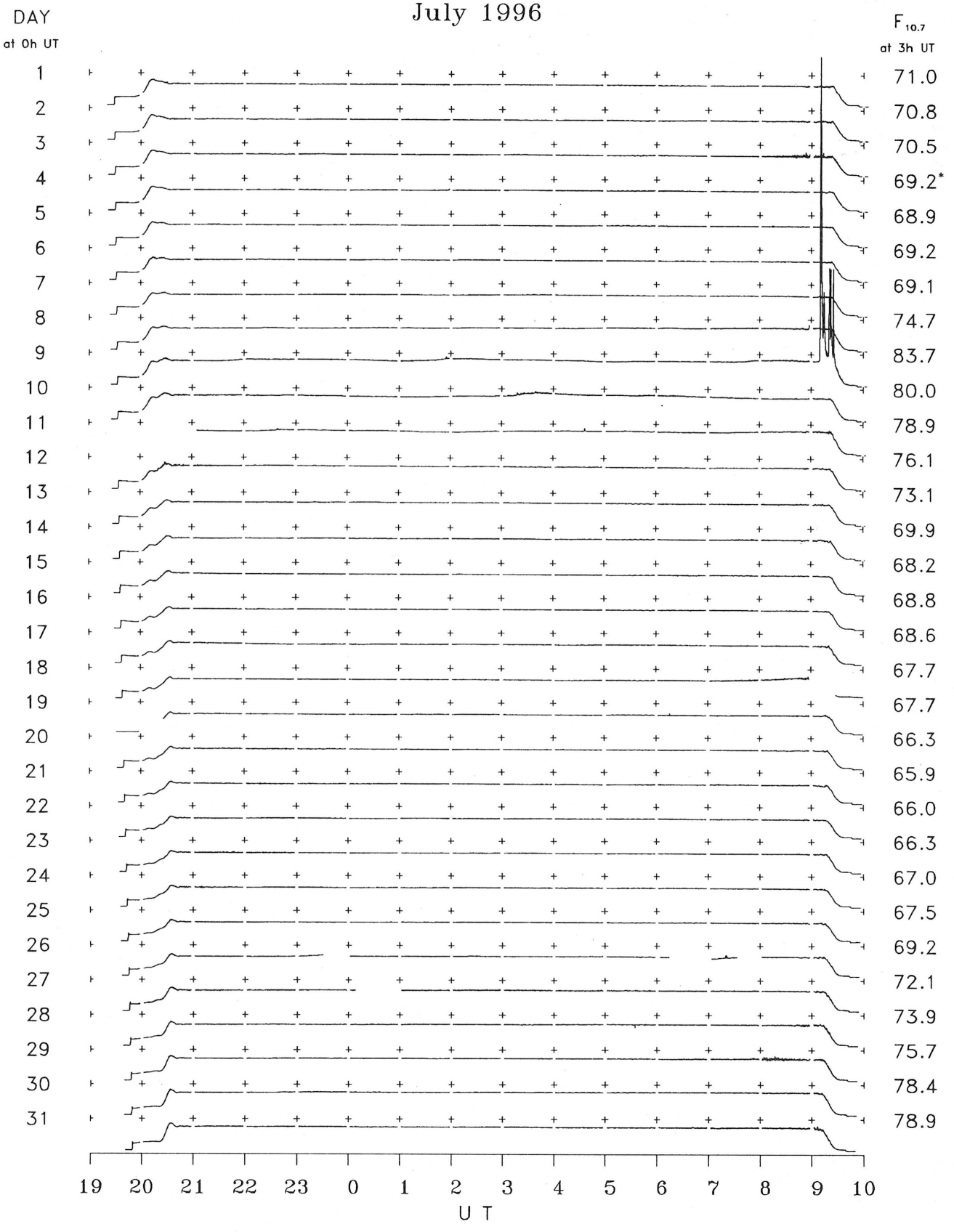
Normal observing period: 1930 - 0945 U.T. (sunrise to sunset)

JUL	FREQ.	TYPE	START TIME	TIME OF MAXIMUM	DUR.	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1})		POLARIZATION
1996	(MHz)		(U.T.)	(U.T.)	(MIN.)	PEAK	MEAN	REMARKS
8	500	8 S	0608.2	0608.5	0.5	11	-	0
	200	8 S	0608.3	0608.5	0.7	43	-	0
9	500	41 F	0749.5	0755.0	17.0	78	-	WR
	2800	46 C	0909.0	0910.0	7.0	782	52	0
	500	46 C	0910.7	0911.0	1.2D	1027	-	WR
	200	46 C	0911.8	0912.2	1.2	1352	-	0
	500	45 C	0912.0E	0913.5	5.0D	156	21	WR
	200	41 F	0914.1	0932.2	30.0	134	-	WR
	500	46 C	0917.0E	0922.2	7.8	506	43	WR
	2800	46 C	0919.1	0920.5	4.7	227	37	MR
	2800	45 C	0924.7	0925.2	1.6	217	28	MR
	500	46 C	0925.1	0925.5	6.8	452	32	WR
	500	46 C	0934.6	0937.2	3.5	223	28	WR
10	200	8 S	0031.8	0031.8	1.2	248	-	0
	2800	20 GRF	0253.0	0339.4	95.0	8	3	0
	500	46 C	0338.7	0342.3	7.5	29	3	WR
	500	45 C	0348.2	0348.7	1.2	9	2	WR
	200	42 SER	0545.6	0546.6	1.6	34	-	0
	2800	1 S	2237.8	2238.1	1.0	2	1	0
	500	42 SER	2238.5	2239.2	2.2	58	-	WR
11	2800	1 S	0436.3	0436.8	1.0	5	2	0
	500	46 C	0436.6	0437.1	1.7	4	2	0
31	200	8 S	0907.7	0908.0	0.7	181	-	0

B. Solar Radio Emission

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

July 1996



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

C. RADIO PROPAGATION

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

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

MEASURED AT HIRAISO

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

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

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

MEASURED AT HIRAISO

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

C. Radio Propagation

C2. Radio Propagation Quality Figures at Hiraiso

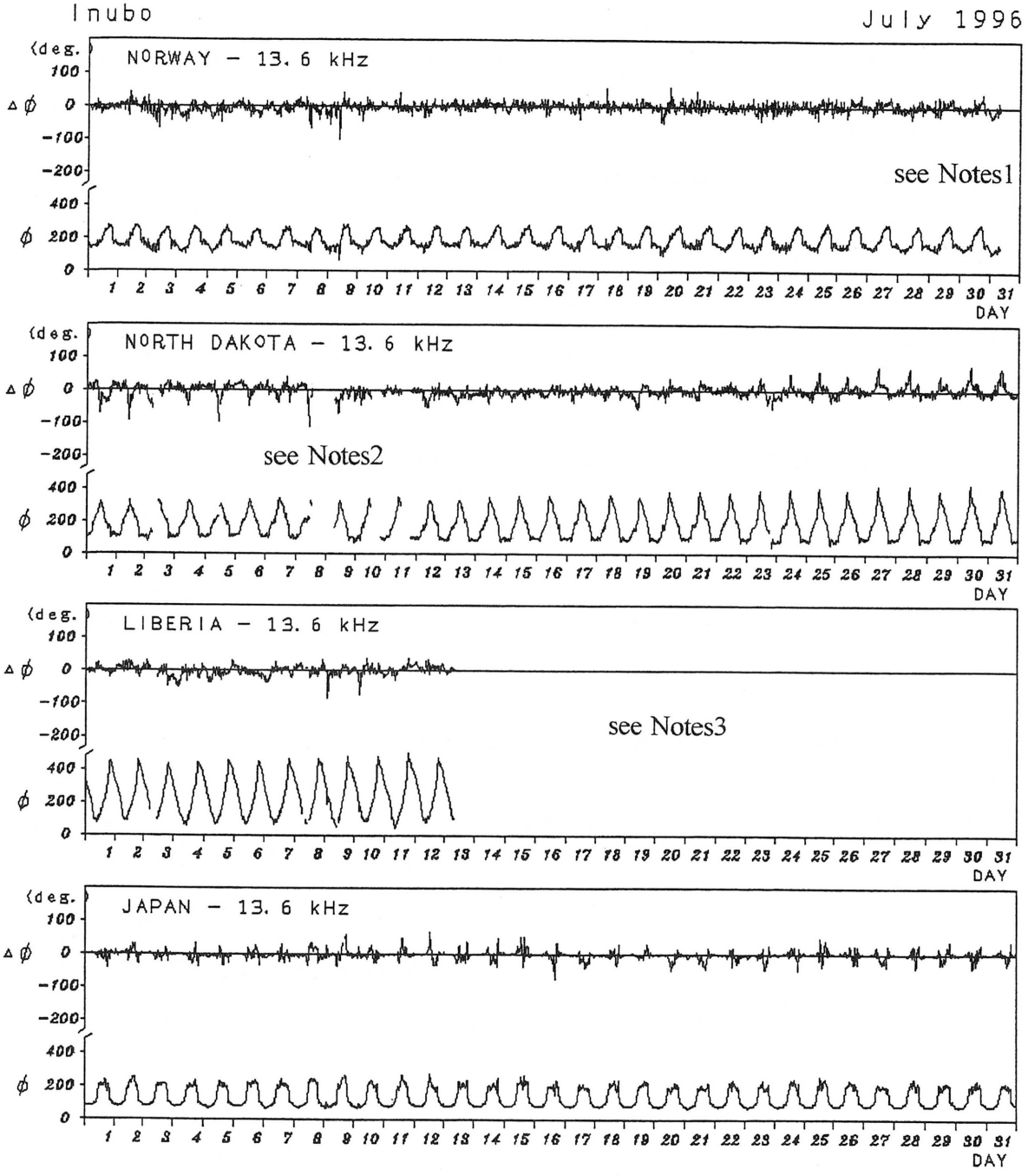
Hiraiso

Time in U.T.

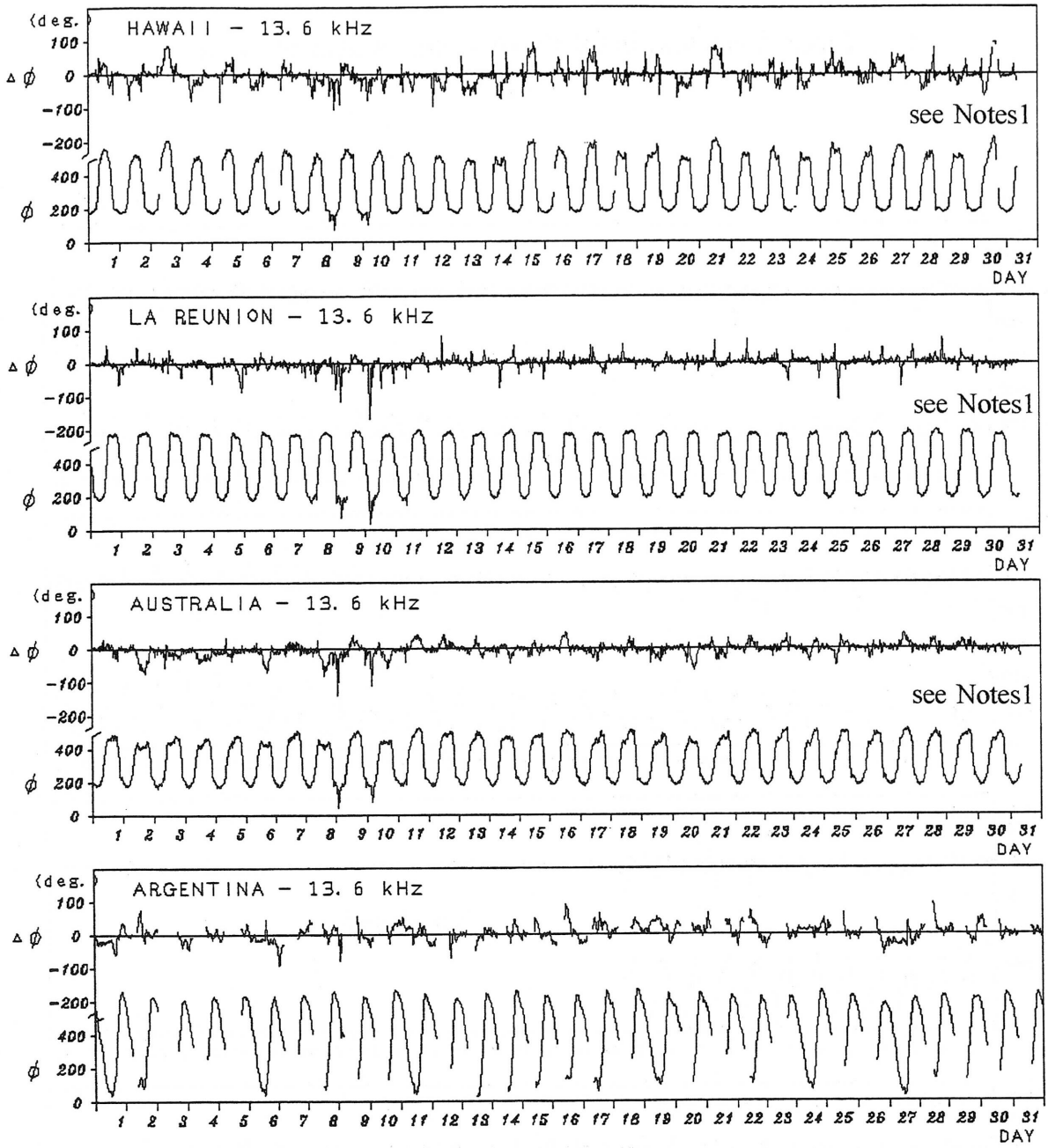
JULY 1996	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Condition 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start h m	End h	Range nT
1	C	C C C C	C C C C	N N N N	None		
2	C	C C C C	C C C C	N N N N			
3	C	C C C C	C C C C	N N N N			
4	C	C C C C	C C C C	N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

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo



Inubo July 1996



Notes1 : As for NORWAY-13.6 kHz, HAWAII-13.6 kHz, LA REUNION-13.6 kHz and AUSTRALIA-13.6 kHz, no record during 31 July 0810 UT to 1 August 0050 UT, due to the receiver trouble.

Notes2 : As for NORTH DAKOTA-13.6 kHz, Gaps in the record during 08 July 1230 UT to 11 July 1930 UT are due to transmitter maintenance.

Notes3 : As for LIBERIA-13.6 kHz, no record during 13 July 0733 UT to 31 July 2400 UT, due to transmitter maintenance.

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

NONE

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso

Time in U.T.

July 1996	S W F								Correspondence	
	Drop-out Intensities(dB)					Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS	BBC						
9		x	>48			0132	68	SL	3+	x	C
9			15			0503	37	SL	1	x	C
9			>50	x	>53	0908	47	S	3+	x	C
10		x	>47	x		0308	97	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

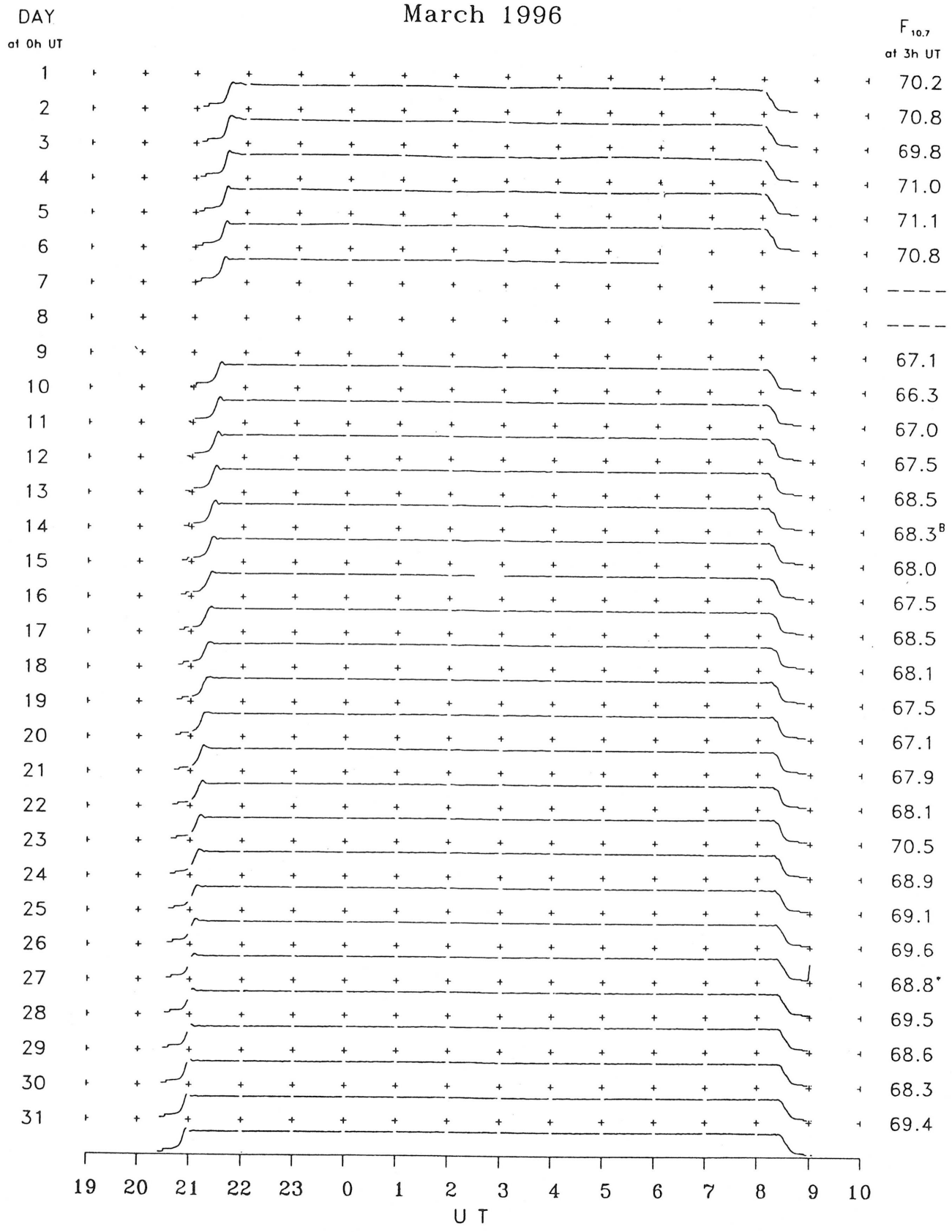
Inubo

Jul. 1996	S P A								
	Phase Advance (degrees)						Time (U.T.)		
Date	Ω/N	Ω/L	Ω/LR	Ω/AU	Ω/H	Ω/ND	Start	End	Maximum
7					4		2220	2250	2225
8			14				0500	0525	0510
8			43				0610	0638D	0622
8			22				0638E	0656	0644
8			7				0900	0926	0904
8				36	58	–	2138	2310	2210
9				54	29	–	0020	0130D	0054
9	47	69	58	140	94	–	0130E	0330	0155
9			94	36		–	0508	0534D	0522
9			137	50		–	0534E	0640	0544
9			50			–	0752	0900	0818
9	144	–	371	32		44	0904	1130	0914
9				50	50	34	2238	2330	2252
10	11	10	7	11	11	10	0252	0306D	0259
10	40	64	151	97*	54	54*	0306E	0502	0344
10			58	22			0544	0640	0600
11			14				0520	0548	0528
11			65				0812	0910	0832
11					11		2224	2250	2233
12		10					1535	1552	1538

B. Solar Radio Emission

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

March 1996



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

Remarks: Summary Plots of $F_{10.7}$ at Hiraiso appeared in the issue of March 1996 (Vol.48 No.3) were not calibrated. The corrected summary plots are shown above.

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