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IONOSPHERIC DATA IN JAPAN

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CONTENTS

COMMUNICATIONS RESEARCH LABORATORY
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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

MAY 1995

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	38	38	30	38	29	N	A	A	56	A	A	A	A	A	A		56	50		60	68	57		69
2			41	37	38	31	A	66	56		A	A	A	A	A	58	68	66	73	68	72	56	59	46
3	58		39	30	30		A	A	A	A	A	A	A	A	A		57	57	55	61	57	60	42	40
4		37	33		34	A	A	A	A	A	A	A	A	A	A	A	A		A		A	29		44
5	40	35	37	30	28	30	A	A	A	A	A	A	A	A	70	A	60	60	A	49	57	49		40
6	42	35	29	A	A	A	A	A	A	A	A	A	A	A	A	55	A	44	48	57	35	39	57	43
7	36	38	38	35	38		50	A	A	A	A	A	A	A	A	63	60	56	58	60	70	56	58	47
8	38		34	A	28	38	56	A	A	A	A	A	A	A	61	58	58	62	70	57	57	57	59	58
9	44	37	38	34	30	31	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	41	A	69
10	A	A	35	35		A	A	A	A	A	A	A	A	A	A	A	58	A	A	A	57	57	56	46
11	44	43	38	41		56	64	71	A	A	A	A	A	A	A	57	57	58	A	A	57	57	30	29
12	30	38	35	31	38	58	58	57	62	A	A	A	A	A	A	A	A	A	58	68	71	68	35	35
13	38	43	38	39	A	A	A	A	60	A	A	A	A	A	A	A	A	57	60	57	69	68	48	29
14	A	49	56	51	29		A	60	59	A	A	A	A	A	A	49	64	63	70	58	67	70	59	57
15	57	69	40	38	55	60	58	A	A	A	60	A	A	A	A	60	58	58	56	60	67	69	69	58
16	58	57	57		49	47	A	60	57	62	A	A	A	A	A	A	68	70	80	56	66	59	56	A
17	49	40	32	32	A	A	A	A	A	A	A	A	A	A	A	A	A	A	57	58	57	57	50	57
18	50	38	32	38	32	A	A	A	A	A	A	A	A	A	A	A	51	A	A	56	49	56	57	52
19	56	38	40	50	46	A	52	58	A	A	A	A	A	A	A	A	54	60	62	57	62	A	A	A
20	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	56	A	57	A	68	57
21	36	A	29	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	67	57		A
22		A	A	49		70	59	A	A	A	A	A	A	A	A	56	62	76	74	70	69	70	A	A
23	A	A	A	36	36	38	A	58	57	A	A		A	A	A	A	A	A	A	75	70		70	49
24	49	42	38	36	38	40	A		A	A	A	A	A	A	A	A	A	A	68	A	A	A	42	30
25	47	37	A	A	A	40	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	59	A
26	A	A		A	38	71	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	61	A	34
27		34	38	35	32	A	A	A	A	A	A	A	A	A	A	A	A	A		61	A		48	40
28	23	22	35	37		A	A	A	A	A	A	A	A	A	A	A	A	A	A	60	69	70	56	46
29	38	32	40	30	22	46	A	A	A	A	A	A	A	A	A	A	A	A	A	A	59	A	A	31
30	37				A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	58		60	A	56
31	30	38	37	38	38	A	A	A	A	A	A	A	A	A	A	A	A	A	58	67		71	57	30
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	21	25	22	20	14											14	14	16	21	24	24	21	26
MED	41	38	38	36	35	43											58	59	59	60	64	57	57	46
UQ	49	42	39	38	38	58											62	63	70	64	69	68	59	57
LQ	37	36	33	34	29	38											57	57	56	57	57	56	48	35

HOURLY VALUES OF fEs AT WAKKANAI

MAY 1995

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	26	G	G	G	G	G	24	31	29	29	27	30	30	29	30		34	27	32	G	G	G		G
2	G	G	G	G	G	20	25	30	30	36	30	31	31	30	27	33	32	30	G	27	29	33	44	G
3	G	G	G	G	G	23	39	30	34	38	33	31	46	36	30	29	26	42	33	25	24	24	G	G
4	G	30	27	22	26	38	39	40	41	41	42	39	42	33	82	76	67		58		44	69	G	31
5	33	G	G	G	25	28	39	26	33	42	41	40	36	34	31	51	87	58	153	36	41	38	28	30
6	G	G	29	48	36	44	45	34	35	34	36	32	33	30	30	29	27	35	33	29	38	33	26	G
7	G	G	G	G	G	33	38	66	37	34	36	36	32	30	27	28	32	36	G	G	G	G	G	G
8	G	G	G	33	28	31	42	69	36	36	34	36	35	33	30	29	45	48	64	46	G	G	G	G
9	G	24	G	G	28	38	36	40	44	35	54	36	36	42	41	55	52	62	96	72	38	34	68	45
10	63	38	26	24		49	46	57	70	78	78	44	40	34	33	37	57	92	68	78	43	29	30	26
11	G	G	G	G	24	26	36	32	43	37	42	44	41	73	64	39	38	28	78	60	54	44	34	41
12	60	26	26	G	G	35	43	46	38	40	44	66	92	77	55	65	65	73	155	36	34	28	24	G
13	23	G	G	25	32	35	40	36	54	43	42	38	37	36	58	91	68	70	60	36	37	40	28	29
14	36	G	G	30	G		31	38	42	46	77	65	40	39	33	33	34	34	35	26	G	G	31	59
15	G	30	30	24	G	28	28	46	52	71	30	31	33	33	36	36	30	28	35	26	26	33	28	G
16	G	G	G	G	G	28	32	36	42	31	38	30	29	28	29	29	28	47	39	45	33	G	G	28
17	G	24	30	29	32	39	46	49	66	39	40	63	38	37	30	30	27	30	29	G	G	28	G	26
18	G	28	56	34	33	96	60	79	70	46	44	28	34	30	31	41	48	92	76	31	38	G	29	26
19	27	G	26	G	29	35	41	48	59	57	64	61	70	78	40	59	35	32	42	36	44	65	93	74
20	74	67	87	54	38	29	45	76	86	97	139	70	66	65	76	82	135	142	57	60	62	78	60	G
21	33	64	69	69	64	42	62	76	59	38	40	61	39	54	30	29	38	46	74	54	58	33		56
22	35	48	34	42		33	26	60	80	78	67	64	69	58	29	39	32	45	35	28	26	G	40	39
23	61	47	32	35	34	40	58	42	42	58	36		36	37	34	69	70	69	82	55	65		24	29
24	28	23	G	28	28	45	36	53	96	76	72	68	40	29	95	112	88	136	114	88	62	92	39	36
25	25	40	46	64	47	35	45	61	64	110	91	138	93	93	79	84	77	98	172	72	77	62	94	70
26	54	42		34	25	40	71	82	70	78	71	65	44	36	71	75	64	48	48	78	77	74	62	46
27		32	28	25	27	41	47	70	72	56	43	40	40	36	34	40	36	55		42	50		52	42
28	36	33	33	28		48	52	63	72	100	59	60	45	57	59	42	38	63	46	43	59	38	40	32
29	27	24	G	34	44	42	55	63	91	64	62	37	35	55	40	74	92	58	87	59	74	92	59	50
30	33	G	25	26	52	71	46	49	56	68	36	30	38	68	64	28	32	56	43	38		31	62	28
31	28	26	G	23	32	83	73	82	71	71	60	64	67	57	38	47	60	67	79	72	60	60	66	33
	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	30	31	28	30	31	31	31	31	31	30	31	31	31	30	31	30	30	30	30	29	29	31
MED	26	24	26	25	28	36	42	49	54	46	42	40	39	36	34	40	38	52	58	40	40	33	31	29
U Q	35	33	30	34	33	42	47	66	70	71	64	64	45	57	59	69	67	69	79	60	59	61	59	42
L Q	G	G	G	G	G	29	36	36	38	37	36	32	35	33	30	30	32	35	35	28	26	12	24	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

MAY 1995

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	16	17	18	18	15	16	16	15	18	16	16		16	15	15	15	15	15		15
2	16	16	15	14	15	21	30	18	16	16	16	16	17	15	16	15	15	15	17	16	15	15	15	15
3	15	15	15	15	15	17	17	15	16	16	15	16	16	15	16	16	15	15	16	15	15	15	16	15
4	15	15	16	15	15	15	15	15	15	15	15	17	16	17	16	17	14		15		15	15	15	15
5	15	15	14	15	15	14	17	15	16	16	16	17	17	17	18	16	15	15	15	15	15	15	15	14
6	15	15	15	15	15	15	15	16	15	17	17	18	22	16	17	16	15	15	15	15	15	15	15	15
7	15	15	16	15	15	15	15	15	16	16	18	17	16	17	17	15	18	15	17	15	15	16	15	15
8	15	15	16	16	15	15	17	15	16	16	16	17	15	15	16	16	15	15	16	15	15	15	16	15
9	15	15	14	15	15	15	15	16	16	16	16	16	17	20	16	17	15	15	14	15	14	15	15	14
10	15	15	16	15		15	15	16	17	17	16	16	17	17	17	16	15	15	16	15	15	15	15	15
11	15	15	15	15	15	16	15	15	16	17	16	16	17	17	17	15	16	15	15	15	15	15	14	15
12	15	15	16	15	16	15	15	15	16	17	17	21	17	17	16	16	16	15	16	14	15	15	15	15
13	15	15	15	15	15	14	15	15	16	17	21	18	18	18	16	16	15	15	15	15	15	15	14	14
14	15	16	15	15	16		15	16	16	18	17	16	17	21	17	15	15	15	14	15	15	15	15	14
15	16	15	15	15	15	17	15	16	16	18	21	16	21	20	16	16	15	15	15	17	16	15	14	15
16	15	15	15	15	15	15	15	16	15	16	16	16	17	17	16	16	15	15	15	15	15	16	15	16
17	18	16	15	15	15	15	15	15	16	18	16	20	17	17	16	17	15	15	15	15	15	15	14	14
18	15	15	15	15	15	15	15	15	16	17	17	18	17	18	17	16	15	15	15	15	15	16	16	15
19	15	15	15	15	15	15	15	15	16	22	18	17	18	17	17	16	16	15	15	15	15	14	15	15
20	15	16	15	15	16	15	16	16	16	17	16	18	29	21	18	16	17	15	16	15	15	15	15	14
21	15	15	15	15	15	15	15	15	15	17	18	16	16	16	16	16	17	16	15	16	14	15		14
22	15	15	15	15		14	15	15	17	15	16	17	16	17	16	16		15	15	16	16	15	15	15
23	15	15	15	15	15	15	16	15	17	18	16		17	16	18	17	15	16	16	15	15		15	14
24	15	15	15	15	16	15	16	15	16	16	17	16	18	17	17	18	15	15	15	15	15	15	15	15
25	14	15	15	15	15	14	16	17	16	18	16	17	17	16		16	16	15	15	15	15	15	14	15
26	15	15		15	16	15	15	16	16	16	17	18	17	18	16	16	16	15	15	15	15	15	14	14
27		15	15	15	18	15	15	16	16	16	17	15	16	17	17	16	16	15		14	15		14	15
28	15	15	15	15		15	15	15	16	16	17	17	16	15	17	16	17	15	14	15	15	14	15	15
29	15	15	15	15	15	15	16	16	16	17	17	18		16	21	18	16	15	15	16	14	14	15	15
30	15	15	15	15	15	15	16	15	15	16	17	16	15	16	16	15	16	15	16	15		16	15	15
31	15	15	15	15	15	15	15	15	16	17	16	16	17	16	16	16	15	15	15	15	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	30	31	30	31	28	30	31	31	31	31	31	30	30	31	30	30	30	30	30	30	30	29	29	31
MED	15	15	15	15	15	15	15	15	16	17	16	17	17	17	16	16	15	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	16	16	16	17	17	18	17	17	17	16	16	15	16	15	15	15	15	15
L Q	15	15	15	15	15	15	15	15	16	16	16	16	16	16	16	16	15	15	15	15	15	15	14	14

HOURLY VALUES OF foF2 AT KOKUBUNJI

MAY 1995

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT KOKUBUNJI

MAY 1995

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	71	24	G	24	G	G	30	41	61	56	32	37	36	35	G	95	60	69	55	64	39	61	78	48
2	G	G	G		G	29	31	32	44	46	31	37		29	37	36	97	40	44	44	34	32	G	28
3	57	37	G	G	G	29	72	92	74	60	94	83	72	68	59	28	26	29	46	72	98	43	36	G
4	G	G	21	G	G	24	37	56	52	54	96	68	85	71	G	27	28	30	137	104	118	69	61	61
5	48	46	40	23	G	G	26	42	46	60	57	56	72	53	48	31	46	38	G	27	50	40	30	41
6	44	28	26	G	28	43	36	32	36	34	50	56	54	52	62	30	26	31	40	99	32	G	34	26
7	24	G	G	G	G	26	32	40	28	40	64	48	60	59	34	44	46	115	61	35	24	G	G	G
8	G	G	G	40	G	28	36	49	34	50	50	39	36	35	30	47	48	60	107	84	62	34	34	52
9	41	32	30	30	G	G	36	41	30	46	36	39	30		39	53	85	148	71	70	100	64	58	71
10	53	55	35	42	31	28	34	44	55	47		40	43	50	29	30	46	77	96	43	58	70		41
11	34	30	28	27	26	32	30	33	44	49	50	43	66	60	63	32	26	48	87	53	59	66	50	
12		40	54	58	29	28	41	50	66	90	92	55		96	62	52	38	84	92	120	108	60	72	30
13	29	28	G	29	32	36	48	64	80	84	103	70	66	G	58	65	84	47	83	116	94	92	90	95
14	82	34	G	G	G	G	28	47	51	36	38	60	58	130	99	118	51	30	35		64	61	23	73
15	54	34	37	32	32	29	34	33	91	78	56	52	83	56	154	119	44	31	29	24	27	27	28	34
16	27	27		G	G	29	40	53	64	51	54	54	50	70	43	40	85	114	64	159	118	38	54	125
17	116	108	G	33	51	40	40		79	62	84	105	70	38	42	30	27	30	32	37	28	23	38	28
18	G	G	G	30		49	64		69	96	50	109	54	27	54	56	47	58	92	62	59	48	71	79
19	70	106	98	60	59	31	29	60	83	133	94	131	115	G	32	31	51	68	58		45	45	66	71
20	56	29	43	56	29	39	125	56	59	66	157	137	45	41	30	63	84	73	66	33	32	32	67	43
21	70	41	52	37	42	34	60	56	88	123	78	57	48	47	50		45	61	80	61	61	51	44	33
22	49		58	36	47	36	40	40	60		47	40	36	56	51	48	63	44	55	76	55	26	55	49
23	52	50	50	31	G	34	48	165	62	127	106	68	58	89	104	86			149	134	115		60	55
24	55	40	26	29	G	33	45	47	58	128	94	62	42	66	86	104	93	142	160		87	71		74
25	41	30	28	32	40	30	55	84	62		81	79	71	52	106	63	74	55	50	46	40	32	G	51
26	32	39	36	46	49	34	62	53	60	59	85	84	47	36	32	31	44	52	51	41	28	43	62	60
27	70	46		59	41	34	50	69	72	88	86	71	62	51	61	67	62	58	54	29	71	55		70
28	90	47	41	30	36	33	34	37	61	82	82	69	60	60	50	47	37	31	34		54	54	58	80
29	61	38	41	44		26	67	86	90	69	56	83	70	73	110	62	60	46	33	41	G	38	30	30
30	44	38	51		33	42	74	59	60	70	47			75	94	39	27	51		125	67	69	62	58
31	52	28	G	G	49	36	84		94	74	83	125	92	165	103	82	61	48	59	131	112	65	60	57
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	29	29	31	31	28	31	29	30	30	28	30	31	30	30	30	30	27	31	30	28	30
MED	50	34	28	30	29	31	40	50	61	62	71	61	59	54	51	48	48	52	58	62	59	46	54	52
U Q	61	41	42	41	40	36	60	59	74	86	92	83	70	70	86	65	63	69	87	104	94	64	62	71
L Q	32	28	G	12	G	28	34	40	51	49	50	48	46	38	34	31	38	38	44	41	34	32	32	33

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

MAY 1995

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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

MAY 1995

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	25				59	29	49	A	56	A	71	A	68	A	A	A	65	82		A	82	80		A
2	25	A			27			59	61	A	A	A	A	77	88	85	85	76	85	87	73	A	A	
3	55	A	A	N	N	28	57	A	A	A	A		60		A	62	59	66	78	72	89	59		A
4	A	A	A	A	A	A	A	A	A	A	A	A		A	A	96	100	82	69	68	82	A	A	60
5	69	69	49	25	24	59	A	A	A	A	A	A	A	A	A	85	84	80	72	69	49			69
6	A	55	59	49	49	A	A	A	62	A	A	A	77	92	94	100	84	67	63	68	68	A		60
7						31	32	55	69	71	69	73	74	70	A	75	92	88	85	91	A	A	66	67
8	70		A	A	59	28	39	68	67	A	58	A		86	81	91	85	78	A	86	82	76	67	66
9	69	49	61	26	26	49		72	67	A	A				A	78	77	62	68	A	A	A	A	59
10		28	29	A		28	32	56	70	A	67	A	A	A	66	74	90	90	A	67	49	A	A	A
11	69	89	69	28	30	56	56	62	67	A	A	A	A	67	78	94	94	73	A	72	A	A	A	29
12	A	59	89	A	26	26	A	80	64	64	A	A	A	66	74	81	72	74	81	88	A	A	A	
13	89	31	49	28	89	A	57	67	A	A	A	A	A	A	86	74	A	A	68	A	68	A	29	A
14	A	89	A	26	49	26	49	A	56	A	A	A	A	A	87	92	90	87	77	66	67	N	25	A
15	A	34	A	26	24	69	54	60	57	A	A	A	A	A	76	83	87	82	67	68	67	49	30	28
16	60	26	58	30	24	25	89	A	70	A	A		A	76	78	73	A			93	28	56		59
17	69	26		A	A	A	A	A	A	A	A	A			A	A	A	62	68	A	58		60	A
18	26			41	29	A	A	A	A	A	A	A	A		71	76	80	71	63	66	A	A	A	A
19	A	79		26		25	A	A	A	A	A	65	A	76	85	83	86	83	72	67	82	A	A	31
20	59	48	109	26			A	A	A	A	A	62		A	67	80	78	78	81	73	67		58	
21	A	A		A	32	32	A	56	A	A	A	A	A	A	A	A	82	83	76	74	66	A	31	
22		30	34	26		A	A	A	74	A	A			A	66	62	70	77	88	90	78	A	A	A
23		59		30	69	22	A	A	79	A	A	A			67	71	A	A	A	83	83	73	A	A
24	A	58	A	A	A	25		A	A	79	71	A			76	72	67	96	87		A	A	A	
25	A	32	A	38	A	59	A	A	A	A	A	A	A	A	73	73	81	87		82				58
26	A	25	A	25	A		A	61	56	A	A	A	A	A	A	62	66	A	57	61	69	59		A
27		A	A	A	A	25	26	A	A	A	A	A	A	A	70	75	77	74	A	A	A	A	A	28
28	59	A	A			A	46	A	A	A	A	A	A	A	A	A	70	68	83	80	83	A	A	31
29	A	A			20	31	A	61	A	A	A	A	A	A	A	71	76	72	71		A	A	A	A
30	A			A	A	N	A	A	A	A	A	A	A	A		A	A	A		A	A	A	A	A
31	A	A	A	N	A	30		A	A	A	A	A	65	A	A	A	60	A	A	68	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	13	18	10	15	16	20	12	12	15						18	25	26	25	21	23	20			13
MED	60	48	58	26	30	28	49	61	67						76	76	80	78	72	72	68			59
U Q	69	59	69	30	54	40	56	67	70						85	85	86	83	82	86	82			63
L Q	40	30	49	26	25	25	35	57	57						70	72	70	71	68	68	66			30

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

MAY 1995

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	29	30	27	29	36	50	29	31	32	56	54	53	30	29	37	33	40	56	60	36	39
2	39	40	66	34	33	G	31	30	35	29	33	36	28	38	34	38	27	38	38	39	32	37	34	30
3	30	28	30	G	24	G	34	38	36	68	30		58		59	29	28	29	30	24	G	24		82
4	58	50	70	70	49	40	64	60	71	84	64	66		106	87	30	30	34	36	30	29	30	56	30
5	31	30	G	32	26	G	32	61	54	58	66	59	75	93	76	71	76	51	38	32	29	32	69	36
6	35	29	34	30	G	37	58	51	56	61	59	70	G	92	37	58	51	32	53	40	56	40	G	33
7	23	30	23	33	29	26	28	30	34	59	62	G	66	G	54	G	29	39	39	40	142	113	33	34
8	33	24	33	33	26	G	30	37	35	34	34	48	G	G	54	30	51	77	117	60	68	26	30	G
9	27	G	34	33	30	26	32	38	35	30	80	G		G	29	29	28	38	51	111	55	108	35	67
10	60	36	133	92	27	G	29	37	56	59	61	70	90	83	G	28	56	88	110	40	40	34	82	33
11	31	67	G	30	G	G	G	37	33	50	80	67	78	G	G	29	56	67	97	40	53	85	38	38
12	81	34	32	89	30	G	29	32	36	53	59	60	30	G	30	30	30	29	68	60	130	69	81	93
13	60	29	24	G	G	35	32	36	60	93	67	128	148	85	72	67	80	76	54	38	40	34	30	38
14	59	58	54	32	32	G	24	33	34	76	98	81	63	141	29	30	78	28	38	38	27	31	33	66
15	32	32	34	34	G	28	31	34	37	65	55	68	81	65	29	37	58	58	55	40	30	28	23	34
16	27	32	G	G	G	G	29	38	31	31	29		67	73	G	79	136		37	33	32	26	G	G
17	G	29		51	38	54	39	87	62	52	58	70			29	30	29	25	37	40	25	29	26	33
18	38	28	26	G	25	60	83	78	80	62	134	205	65	G	G	30	66	36	33	65	58	38	39	60
19	38	92	33	34	G	26	39	38	55	33	30	G	68	G	29	37	34	32	38	37	56	39	82	31
20	26	31	31	38	38	70	28	25	30	34	32	29		29	29	30	29	26	G	G	G		G	G
21	37	59	49	39	40	52	56	32	62	58	62	58	83	62	83	80	57	61	34	32	28	58	89	34
22	84	36	39	51	39	77	57	37	32	34	52			57	31	31	29	37	36	34	49	35	39	33
23	25	G	29	34	32	28	31	70	88	36	79	54		G	29	28	71	77	88	72	35	34	50	80
24	92	68	73	59	49	34	28	50	96	91	116	71		G	30	59	69	84	104	123	115	151	93	91
25	39	32	36	24	39	59	40	81	70	150	129	62	55	82	29	59	52	56	54	36	28	G	G	G
26	38	33	27	32	48	31	40	36	32	38	32	33	32	32	30	31	29	61	52	53	34	29		38
27		38	60	39	33	34	32	71	56	60	92	81	102	86	62	64	35	50	73	80	94	76	92	37
28	59	70	35	70	70	84	30	84	112	116	92	81	72	52	64	58	35	38	38	40	36	29	40	39
29	35	38		37	30	33	60	52	72	111	117	73	144	65	61	66	50	48	34	49	40	40	53	68
30	53	53	56	34	33	23	39	33	86	129	61	71	91	82	G	72	104	127		152	163	39	93	59
31	34	33	30	29	48	84	60	58	92	136	152	120	127	112	61	86	67	132	74	31	32	39	49	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	30	31	29	31	31	31	31	31	31	31	31	28	24	29	31	31	31	30	30	31	31	30	29	31
MED	36	33	33	34	30	28	32	38	55	59	62	66	68	57	30	31	51	44	38	40	40	36	39	37
U Q	58	50	51	39	39	52	40	60	71	84	92	72	86	84	61	64	67	67	68	60	56	58	75	66
L Q	30	29	26	30	25	G	29	34	35	34	34	42	55	G	29	30	29	34	36	34	29	29	30	33

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

MAY 1995

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	15	15	14	14	15	15	16	21	23	23	23		23	20	20	18	14	14	15	15	14	14
2	14	14	15	14	14	14	14	15	15	20	21	21		24	20	18	16	14	14	15	14	14	15	14
3	14	14	15	15	15	14	14	15	15	17	22		44			17		15	14	14	14	14		14
4	14	14	14	14	14	14	14	15	15	18	20	46		49	48	21	18	15	15	14	14	14	14	14
5	14	14	14	14	14	14	14	15	15	18	21	42	45	22		20	17	15	14	14	15	15	14	14
6	14	14	14	14	14	14	14	14	17	21	44	61	54	45	23	23	17	16	15	14	14	14	14	14
7	14	15	14	14	14	14	14	14	17	18	45	50	45	54			16	15	15	14	15	14	14	14
8	14	14	14	14	15	15	15	15	15	20	21	66	61	52	23	20	17	15	15	15	14	14	15	15
9	15	16	14	14	14	15	15	14	18	21	22				54	51	49	17	14	14	14	14	14	14
10	14	14	14	14	14	14	14	15	15	20	23	46	45	46	53	20		15	15	15	15	14	14	14
11	14	14	14	14	14	14	15	15	17	20	22	46	49	53	56	51	45	16	15	14	15	15	14	14
12	14	14	15	14	15	15	14	14	15	21	23	45	66	53	52	22	18	15	15	14	14	14	15	14
13	15	14	14	14	16	14	14	16	16	20	23	47	46	48	45	21		15	15	14	14	14	14	14
14	15	14	14	14	14	14	20	15	16	21	23	46	44	48	48	23	22	15	15	14	14	14	14	14
15	15	14	14	14	14	15	15	15	17	20	23	45	48	45	51	51	18	15	15	15	14	14	14	14
16	14	14	14	14	14	15	14	14	15	18	22		48	46	52	21	20		14	14	14	14	14	14
17	15	14		14	14	14	14	14	16	22	23	46			66		18	17	15	14	14	15	14	14
18	15	15	15	14	15	14	14	15	17	21	46	50	46		53	22	20	15	15	14	14	14	15	15
19	14	14	14	14	14	14	14	15	18	20	66	50	44	52	59	21	18	16	14	14	14	15	14	14
20	14	15	14	14	14	14	14	15	15	20	20	50		51	50	50	21	15	15	15	14		14	15
21	14	14	14	15	14	15	15	15	15	20	44	44	45	45	23	22	20	15	14	14	14	14	14	14
22	14	14	14	14	14	14	14	14	14	21	18			71	23	21	21	15	15	15	14	14	14	14
23	15	15	14	14	14	15	15	15	15	18	20			71	20		18	15	14	14	14	14	14	14
24	14	14	15	14	15	15	14	15	15	16	20	23		66	22	17	16	15	15	14	15	14	15	14
25	14	14	14	14	14	14	14	14	18	16	21	22	21		22	17	16	15	14	14	14	14	14	14
26	14	14	15	15	14	15	15	14	15	16	20	21	23	21	22	21	17	14	15	14	14	14		14
27		15	14	14	14	14	14	14	15	16	21	21	45	45	23	22	21	15	15	14	15	14	14	14
28	14	14	14	14	14	14	15	16	16	16	22	22		21	23	21	16	15	14	14	14	14	14	14
29	14	14		14	15	14	14	14	15	16	18	42	45	46	50	21	16	14	14	14	15	14	14	14
30	14	14	14	14	14	14	14	15	15	44	44	21	22				18	16		14	14	14	14	15
31	14	14	14	14	14	15	14	14	15	18	21	22		22	22	18	16	14	14	14	16	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	30	31	29	31	31	31	31	31	31	31	31	26	21	24	27	27	28	30	30	31	31	30	29	31
MED	14	14	14	14	14	14	14	15	15	20	22	45	45	47	45	21	18	15	15	14	14	14	14	14
U Q	14	14	14	14	14	15	15	15	17	21	23	47	48	52	52	22	20	15	15	14	15	14	14	14
L Q	14	14	14	14	14	14	14	14	15	18	21	22	44	45	23	20	16	15	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT OKINAWA

MAY 1995

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	54	56	45	A	46	41	50	A	67	68	68	A	A	83	81	80	86	92	92	96	94	59	A	37
2	37	44					44	55	56	54	56	A	72	92	105	95	115	95	86	89	80	A	48	44
3	38		38	A	43	A	54	62	56	60	A	77	81	66	68	81	78	83	80	82	54	55	57	42
4	49	52	57	38	41	A	A	A	A	A	A	A	A	A	92			101	94	89	86	59	A	48
5	36	A	A	46	46	34	A	A	A	A	A	A	A	A	81	102	110		82	94	94	95	43	63
6	64	81	70	58			46	55	A	A	A		92	115	117	143	127	104	82	94	77	A	70	
7	68	56	50	50	46	89	A	A	81	73	68	72	84	92	91	95	105	94	A	A	82	69	A	A
8	A	70	A	58		59	A	59	A	68	66	A	74		92	91	93	92	93	94	94	A	A	70
9		68	72	57	46	46	62	58	75	64	A	60	A	82	94	88	83	74	81	96	64	A	A	A
10		60	48	39	A	A		65		A	A	A	A	A		A	104	80	A	A		A	69	
11	A	57	47	41	44	37		68	59	A	A	A	70	86	91	94	94	94	A	98	68	56		60
12		47	43	35	A		48	83	67	56	A	A	62	73	82	81	80	86	A	82	76	A	A	A
13	A	A	A	A	A	29	53	83	A	A	56	62	75	115	111	104	93	A	71	A	A	A	59	54
14	69	A	A	A	A	A	A	63	75	67	A	64	65	86	95	102	105	91	82	94	82	61	A	A
15	56	52	51	38		A	47	62	58	67	64	A	71	73	85	92	95	A	81	81	64	A	52	58
16	52		A	A		40	49	79	A	63	A	A	77	A	A	102	102	103	94	A	A	A	60	54
17	50		37	A	A	A	A	A	A	A	A	A	A	57	63		61	62	A	68	44	A	A	A
18	A	48	A	36	41	A		A	A	A	A	67	77	A	A	92	91	92	114	89	76	A	A	
19	A	57	70	56	A	A	A		A	A	A	68	71	92	95	110	128	104	84	83	81	A	A	A
20	43	43	42	41	32	38		69	A	A	58	70	71	76	76	87	91	102	114	95	81	62	70	55
21	69	69	57	39	45	A	A	60	73	58	A	A	A	A	A	84	92	96	114	93	79		A	62
22	A	54	51	44	A	A	46	59	64	A	A	A	66	71	78	72	A	92	N	91	63	A	A	A
23	A	40	A	A	A	A	44	69	A	A	A	A	65	70	77	80	79	A	86	83	90	94	A	
24	58	54	52	38	A	A	A	42	53	92	58	A	A	67	91	82	68		93	A	A	A	A	A
25	A	A	A	A	A	A	48	57	A	A	A	A	A	68	84	92	91	94	105	96	A	41	A	46
26	A	46	38	43			A	A	67	56	56	58	63	71	77	70	68		66	68	70	A	60	52
27	57		57	39	38	38	56	47	79	A	A	A	A	A	A	93			92	A	A	A	A	A
28	A	A	A	A	A	35	A	A	A	A		A	A	A	83	A	115	A	96	A	90	A	A	A
29	43	43	A	A	A	A	A		A	A	A	A		84	92	92	91	91	79	59	40	A	55	A
30	33	A	A		A	69	46	44	A	A	A	A	A	A	A	A	50	A	67	95	A	A	A	A
31	A	A	A	A	A	A	A	A	A		A	A	65			81	110	103	93	82	67	A	A	49
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	20	18	18	11	12	14	20	14	13			18	20	24	26	28	22	25	24	24	10	11	15
MED	52	54	50	41	44	39	48	61	67	64			71	79	88	92	92	93	86	90	78	60	59	54
U Q	61	58	57	50	46	52	53	68	75	68			77	89	93	95	105	101	94	94	84	69	69	60
L Q	40	46	43	38	41	36	46	56	58	57			65	70	79	81	81	91	81	82	65	56	52	46

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

MAY 1995

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	39	33	44	43	32	43	46	44	45	60	77	97	74	69	42	50	52	87	56	47	50	49	70	36
2	31	36		39	36	G	47	42	44	42	37	40	42	42	67	71	55	74	74	46	32	42	G	G
3	G	G	G	25	24	42	48	37	42	49	72	40	G	G	G	G	29	27	32	24	G	G	G	32
4	43	40	35	42	G	43	69	86	91	83	75	68	77	80	77	61	58	53	39	27	45	46	41	48
5	33	56	60	69	60	39	36	49	66	74	60	66	69	74	64	94	67		64	40	78	43	68	38
6	58	G	G	G			48	66	89	64	103		58	43	34	36	46	42	41	G	29	100	G	
7	44	48	42	38	G	G	47	60	43	48	31	37	G	G	G	G	29	80	152	128	112	41	58	68
8	69	42	38	31	G	G	44	44	90	84	37	38	G	42	41	40	30	60	62	66	88	110	73	44
9		44	42	G	G	G	51	44	67	51	74	49	79	63	47	50	38	42	45	43	54	84	67	68
10		49	50	46	45	41		45		61	85	105	85	86		124	83	93	115	108		84	43	27
11	41	71	43	34	G	G		40	52	81	74	85	44	74	76	58	52	78	102	74	66	60		58
12		34	26	28	26		G	43	54	54	49	61	61	62	42	40	66	48	82	116	71	70	85	96
13	73	51	62	46	51	24	35	45	73	69	62	41	60	47	70	58	84	76	73	71	92	178	62	59
14	59	79	43	41	69	66	58	64	50	52	162	56	40	45	49	40	65	69	53	44	30	72	58	66
15	50	G	G	30		60	29	42	54	60	55	69	78	62	73	60	73	111	68	58	39	30	23	G
16	43		74	70		29	33	40	54	59	91	71	68	88	131	68	66	88	72	121	95	48	46	G
17	G		46	26	34	58	73	79	94	88	67	84	51	38	G	G	27	46	66	33	49	39	119	41
18	49	51	36	44	38	85		87	180	61	45	35	58	84	80	53	33	24	G	34	28	44	158	
19	34	58	55	50	54	30	39		72	100	110	63	49	44	G	35	41	36	29	G	26	78	46	40
20	37	35	47	G	G	G	G	31	67	42	39	41	40	G	G	37	32	27	23	G	G	G	24	G
21	G	37	46	46	38	38	50	60	40	50	56	140	79	130	86	74	68	81	91	59	57		98	48
22	65	54	49	39	66	70	68	66	119	41	42	48	56	38	48	56	80	67	70	80	55	76	69	60
23	62	45	78	65	41	56	32	60	84	75	71	41	44	50	41	52	53	73	53	54	60	68	66	
24	49	41	51	59	76	82	114	40	43	66	42	69	40	53	39	42	36	30	41	92	133	82	90	107
25	112	97	60	67	50	42	50	57	71	72	119	76	50	40	62	68	86	78	87	41	47	27	43	34
26	40	29	25	G		36	37	44	43	34	36	38	40	53	33	38	43	50	44	33	40	60	38	35
27	48		G	G	G	24	34	35	89	135	102	98	96	122	117	69	150		158	117	116	89	86	92
28	84	77	80	70	66	34	32	60	62	128		152	99	131	70	107	117	118	90	96	59	48	81	98
29	42	40	54	46	49	71	59	122	113	150	180	170		70	68	78	79	83	32	48	34	72	69	67
30	91	69	41	32	33	34	73	68	88	49	120	127	113	90	124	50	37	88	54	45	88	92	78	44
31	36	50	46	43	70	38	35	42	60		135	120	157			40	50	44	38	27	40	46	100	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	30	31	27	29	28	30	30	30	30	30	30	30	29	31	31	29	31	31	30	30	30	28
MED	44	44	45	41	38	38	46	45	66	61	72	67	58	58	49	52	53	69	62	47	52	60	66	44
U Q	60	55	54	46	54	57	54	64	89	81	102	97	78	80	74	68	73	82	82	80	78	82	81	66
L Q	36	35	36	28	G	24	34	42	50	50	45	41	42	42	36	40	37	43	41	33	34	43	43	33

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT OKINAWA

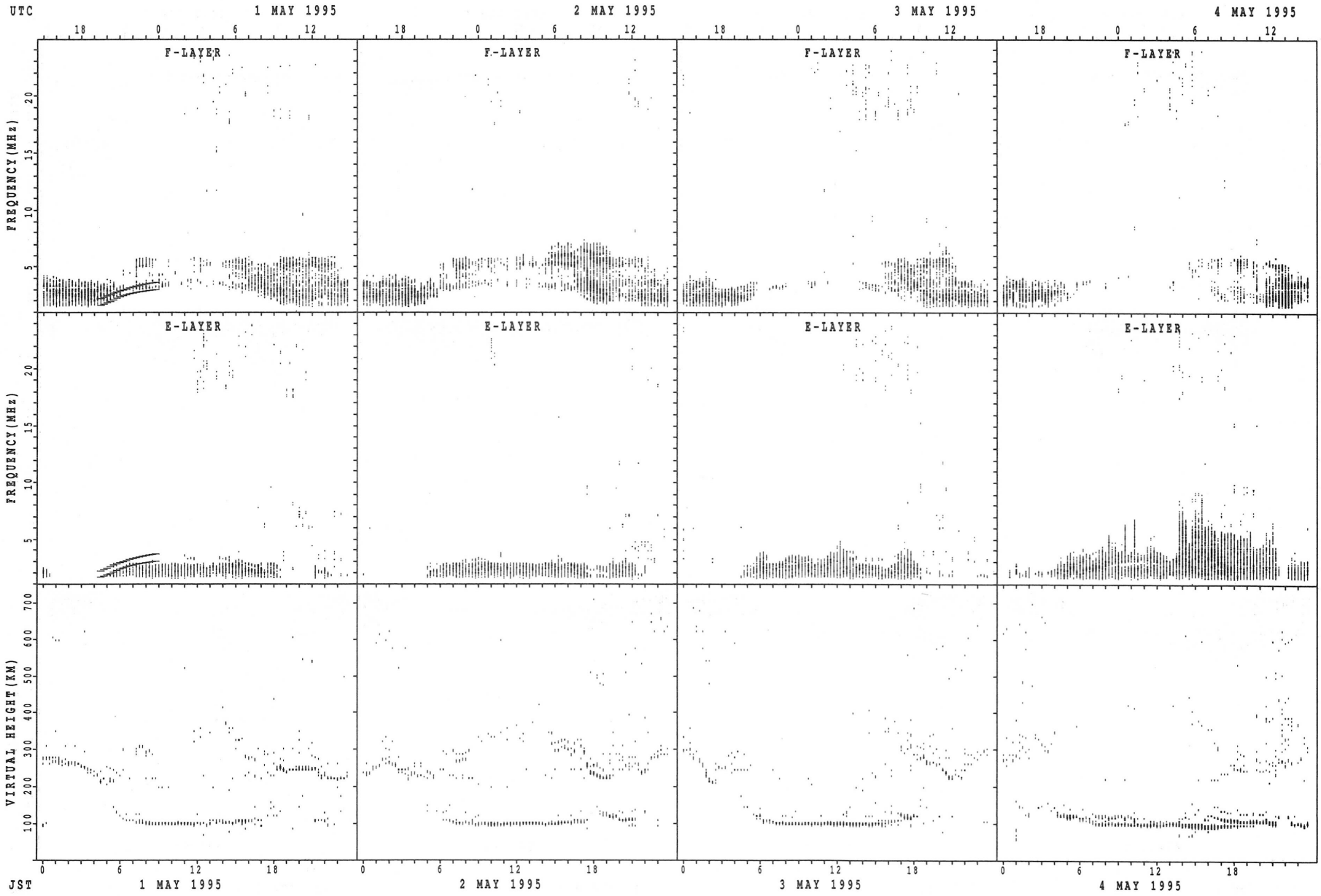
MAY 1995

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

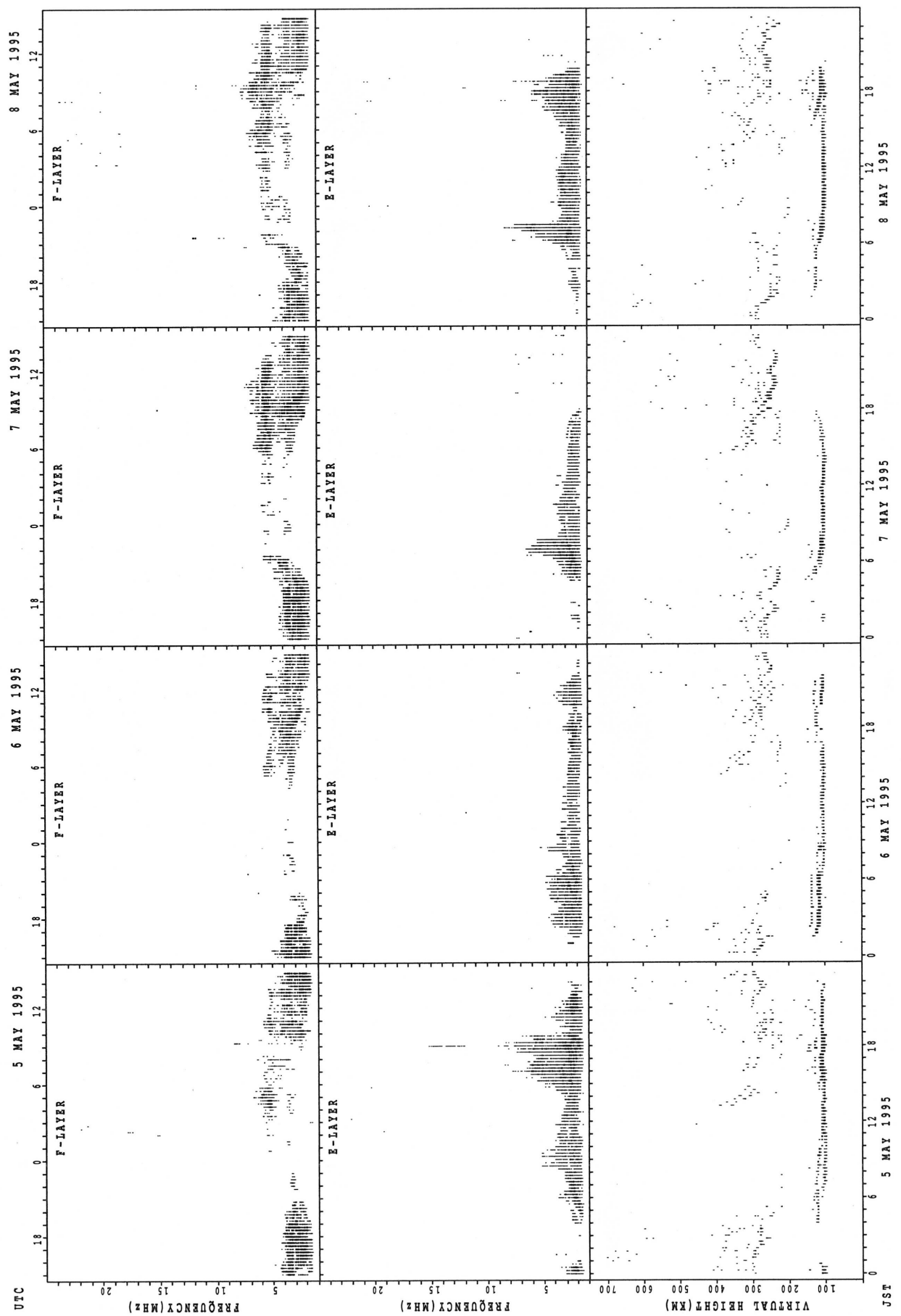
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	14	14	15	15	16	28	29	27	27	23	20	16	16	16	14	14	15	14	14
2	15	15		14	14	18	14	14	15	16	20	24	26	24	22	20	16	14	16	14	14	14	14	15
3	14	14	15	14	14	14	15	14	15	16	17	26	48	48	47	47	17	16	15	18	14	15	15	14
4	14	14	14	14	15	15	14	15	15	17	30	32	32	33	34	23	18	15	18	14	14	14	15	14
5	14	15	14	14	15	14	14	14	15	17	20	28	32	34	33	24	18		16	14	14	15	14	14
6	15	15	15	17			14	14	14	18	32		29	29	49	42	30	18	18	18	15	14	15	
7	14	15	14	14	15	16	15	14	16	17	22	29	50	52	50	48	20	15	17	14	14	14	14	14
8	14	14	14	14	14	16	14	14	14	16	18	28	52	50	28		21	16	15	14	14	14	14	14
9		14	14	14	14	14	14	14	15	20	28	29	32	29	28	34	18	15	18	14	15	15	14	14
10		14	14	14	15	14		14		29	32	33	34	36		34	20	16	15	15		15	14	14
11	14	14	14	14	15	17		16	16	17	27	30	38	38	36	27	32	16	17	14	14	15		14
12		14	14	14	14		16	14	15	18	27	27	28	39	27		17	15	22	15	14	14	14	14
13	14	14	14	14	15	15	14	14	16	18	28	48	38	29	26	28	17	15	17	14	15	14	14	14
14	14	14	14	14	14	16	14	14	15	20	23	27	30	32	39	23	15	15	17	14	14	14	14	14
15	14	14	15	14		16	15	14	15	17	21	29	32	29	29	26	21	15	14	14	14	14	14	14
16	14		14	14		14	14	14	15	20	22	27	32	42	37	35	32	16	16	14	14	14	14	14
17	14		14	14	14	14	14	15	16	26	28	29	29	30	48	45	17	15	17	14	14	14	14	14
18	15	14	15	15	14	14		15	17	18	26	26	32	29	29	30	22	16		14	14	15	14	
19	14	15	15	14	14	15	14		15	17	27	28	29	28		27	22	16	15	17	14	14	14	14
20	15	14	14	14	15	15	16	14	16	17	22	27	29	50	49	28	24	18		18	15	14	14	15
21	15	15	14	14	14	14	14	14	16	23	22	30	32	28	29	26	23	15	16	14	15		14	14
22	15	14	14	14	15	14	14	14	15	16	27	26	26	27	24	24	20	14	14	14	14	14	14	14
23	14	14	14	15	14	15	14	14	15	18	23	28	29	30		23	18	16	18	14	15	14	14	
24	14	14	14	15	14	15	14	14	15	17	21	26	28	26	27	22	16	15	17	15	15	15	14	14
25	14	14	14	14	14	14	14	14	14	16	22	32	27		24	17	16	15	15	16	14	14	14	14
26	14	14	15	15		14	14	14	15	16	18	20	21	34		22	17	15	17	14	14	14	15	14
27	14		14	14	15	14	15	15	16	16	17	28	29	30	27	28	16		15	14	14	14	14	14
28	14	14	15	14	14	14	14	14	14	17		18	27	28	27	24	17	15	14	14	14	14	14	14
29	14	14	14	14	15	14	14	14	15	17	17	26		27	28	24	16	14	15	15	14	14	14	14
30	14	14	14	14	14	14	14	14	14	16	23	30	33	29	30	32	18	15	15	14	15	15	14	15
31	14	14	14	14	15	14	14	14	15		18	26	28			28	26	14	15	15	15	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	28	28	30	31	27	29	28	30	30	30	30	30	30	29	26	29	31	29	29	31	30	30	30	28
MED	14	14	14	14	14	14	14	14	15	17	22	28	30	30	29	27	18	15	16	14	14	14	14	14
U Q	14	14	14	14	15	15	14	14	16	18	27	29	32	37	37	33	22	16	17	15	15	15	14	14
L Q	14	14	14	14	14	14	14	14	15	16	20	26	28	28	27	23	17	15	15	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

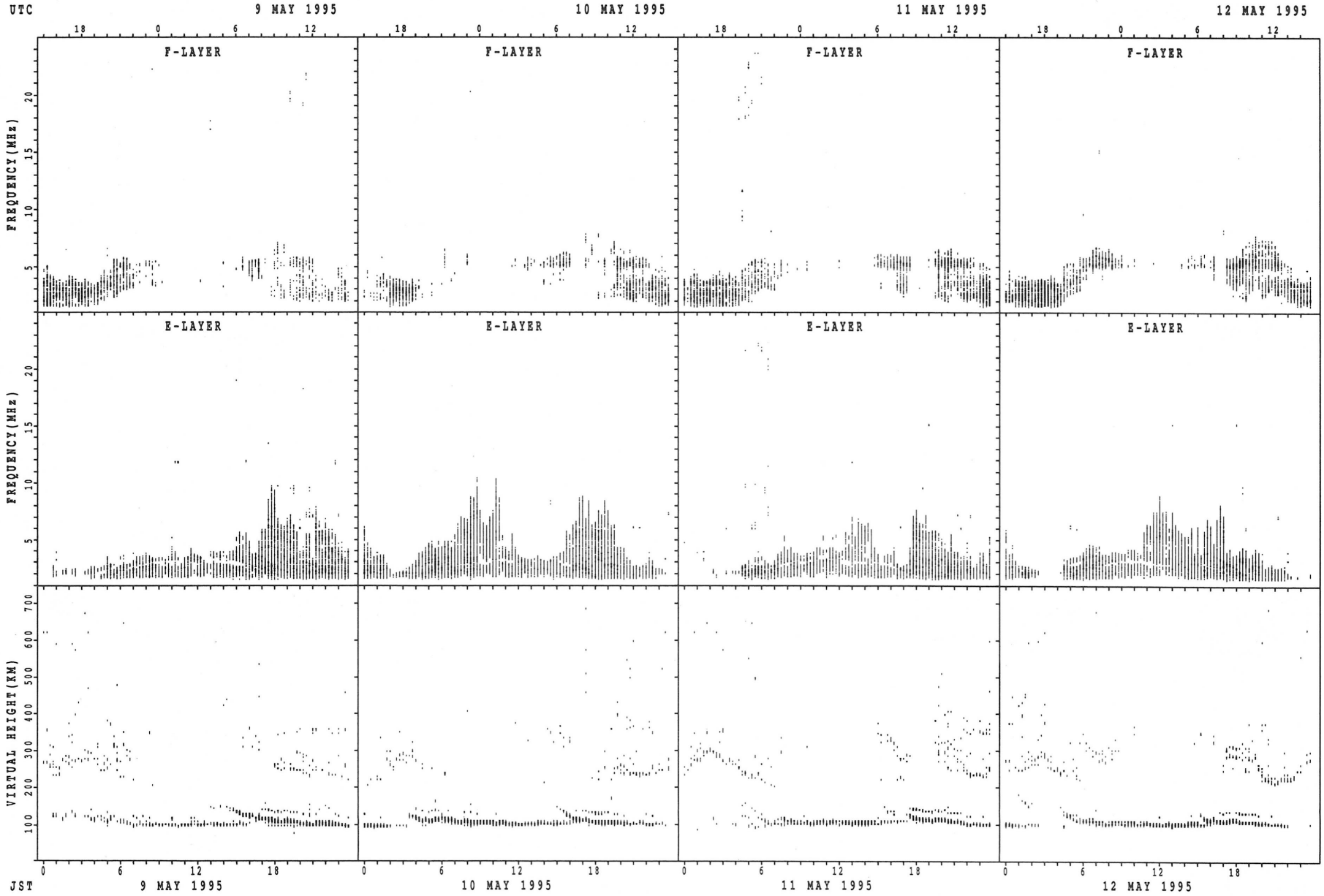
SUMMARY PLOTS AT WAKKANAI



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

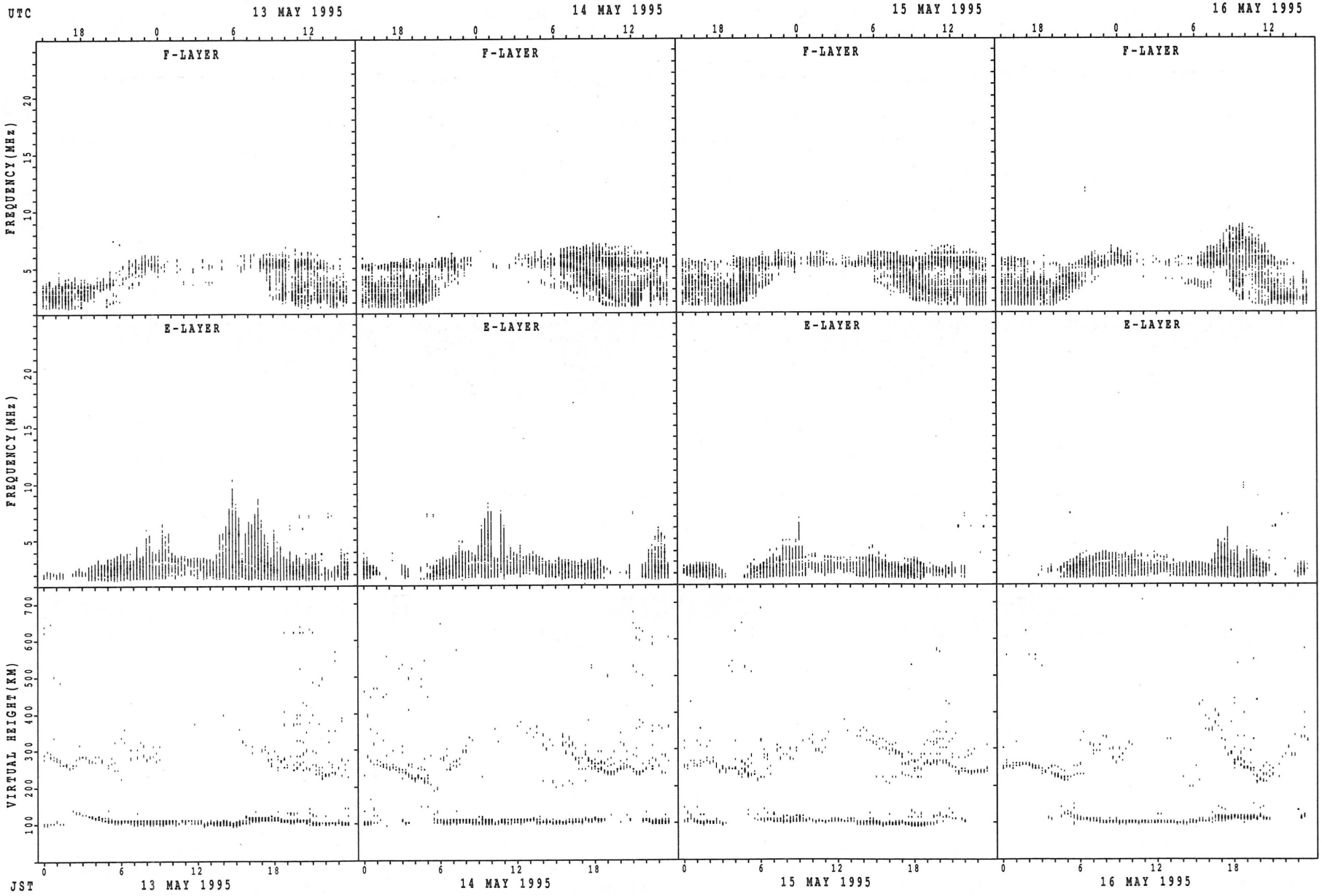

SUMMARY PLOTS AT WAKKANAI
UTC
JST
5 MAY 1995
6 MAY 1995
7 MAY 1995
8 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



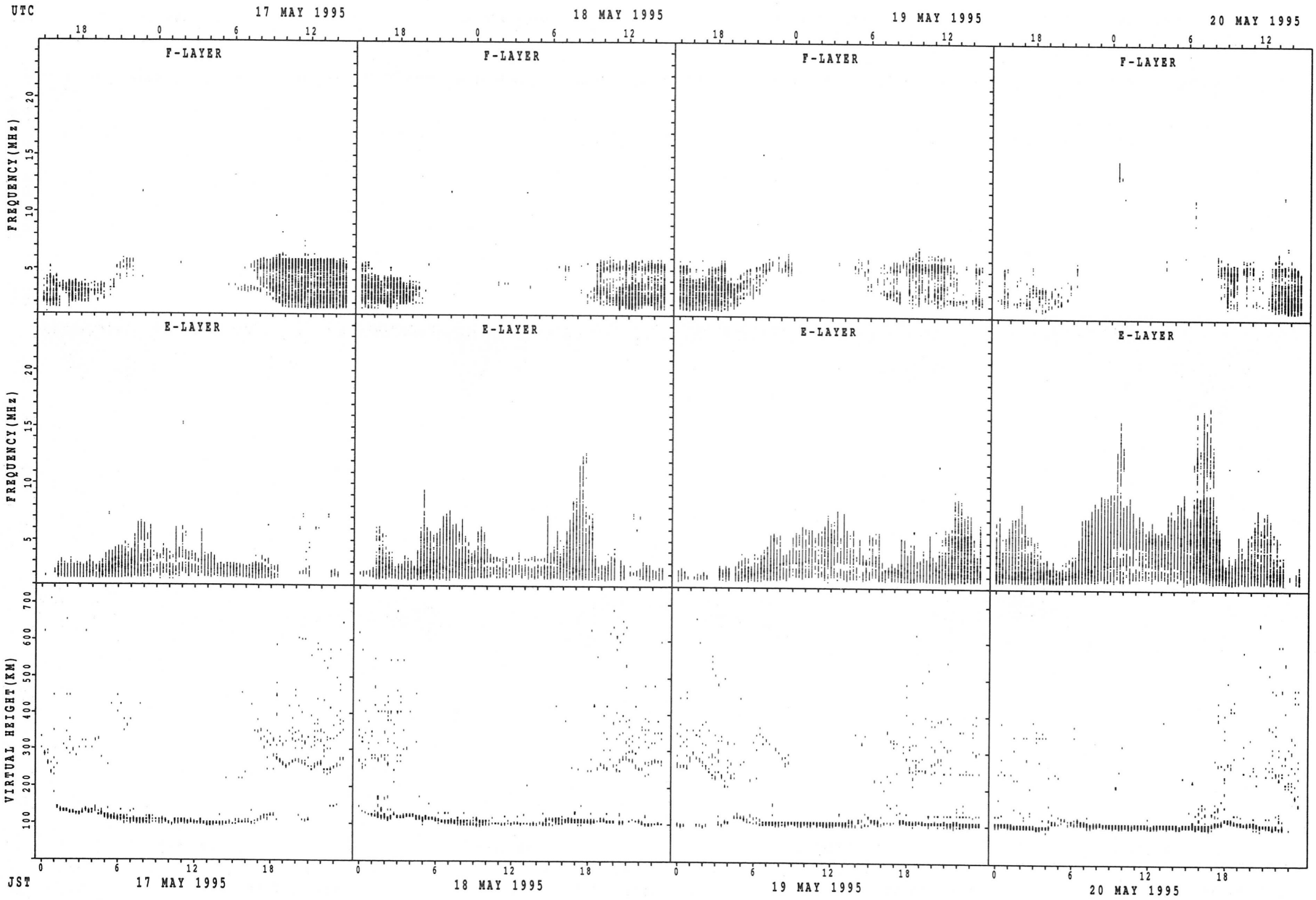
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI

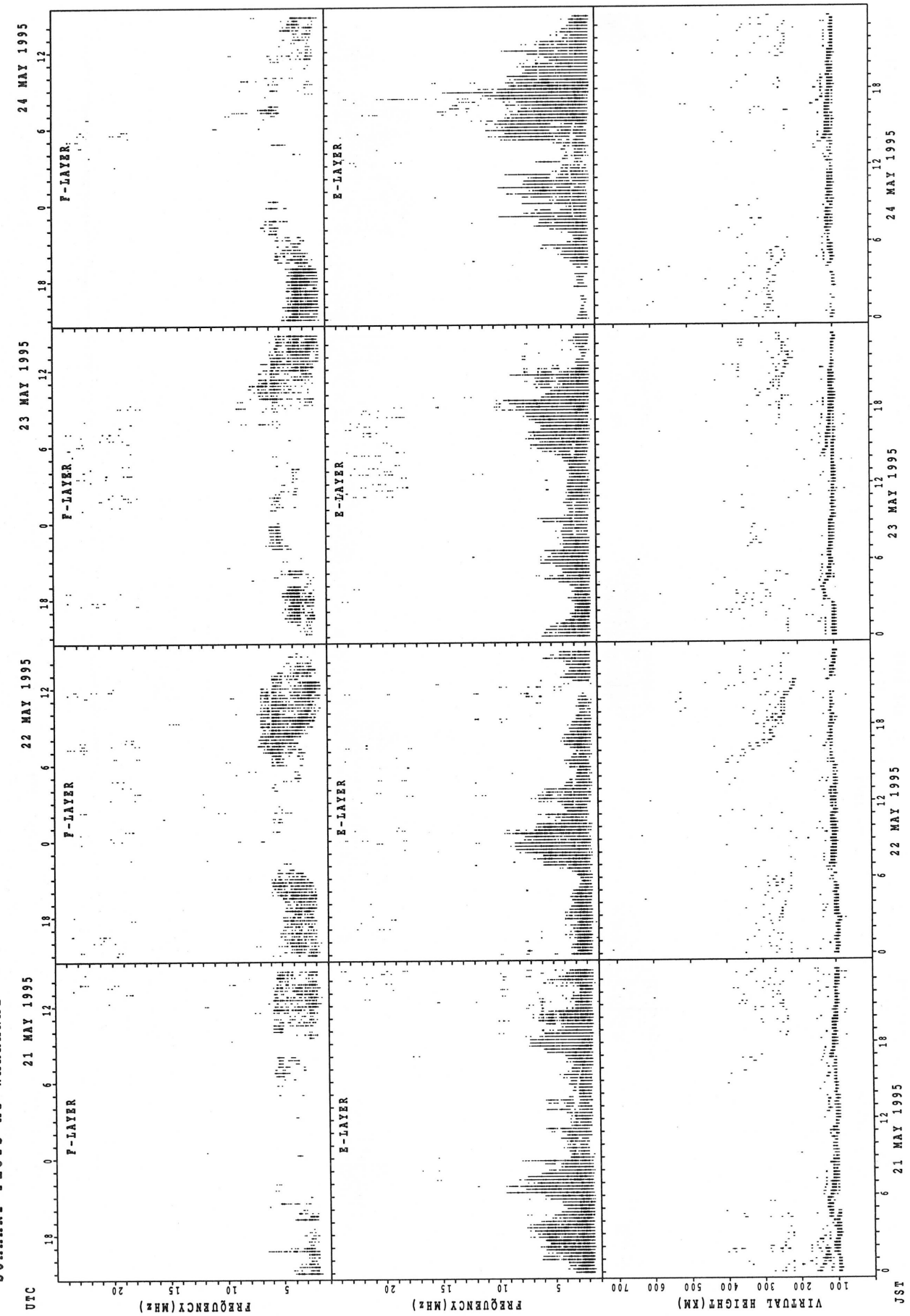


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

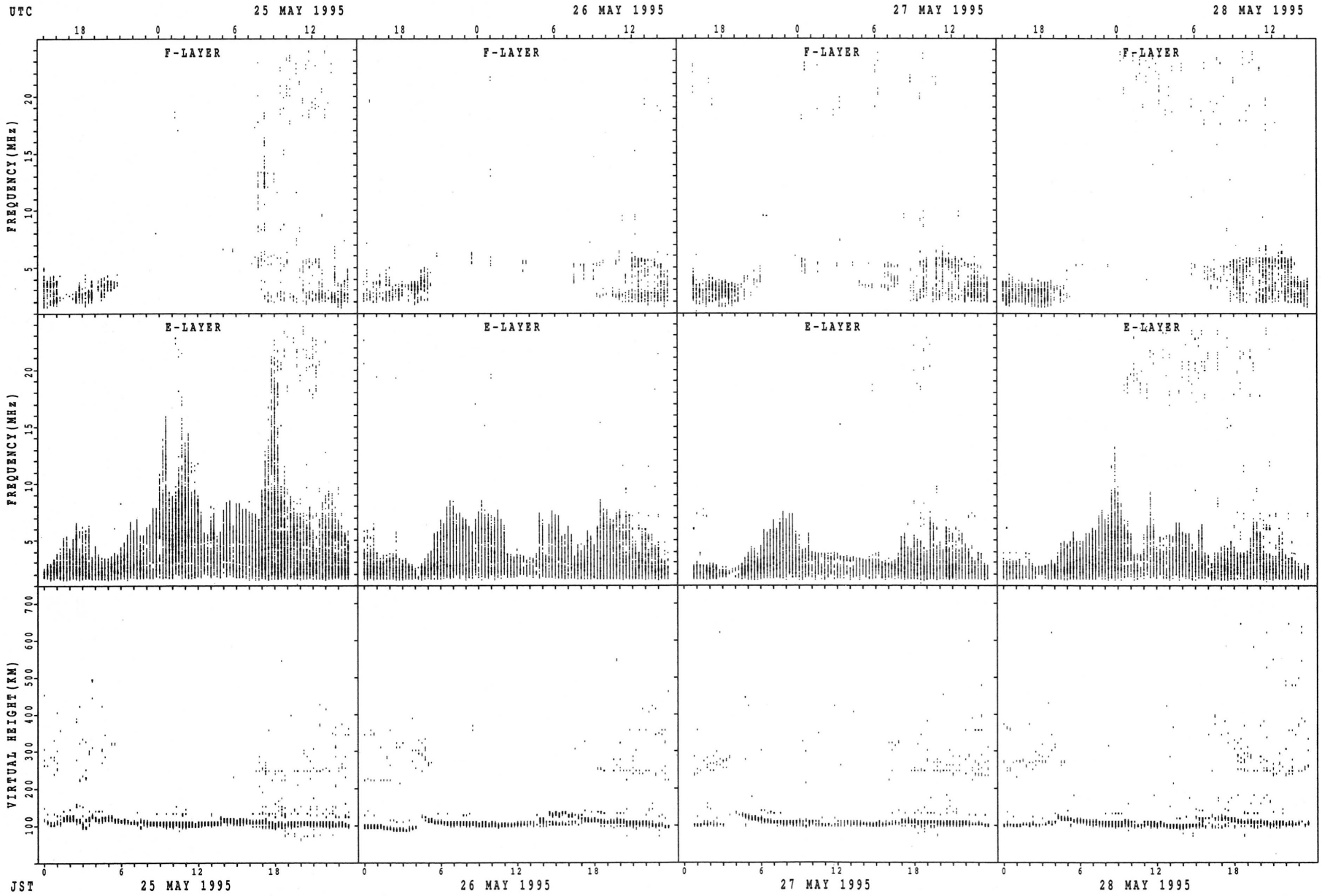
SUMMARY PLOTS AT WAKKANAI



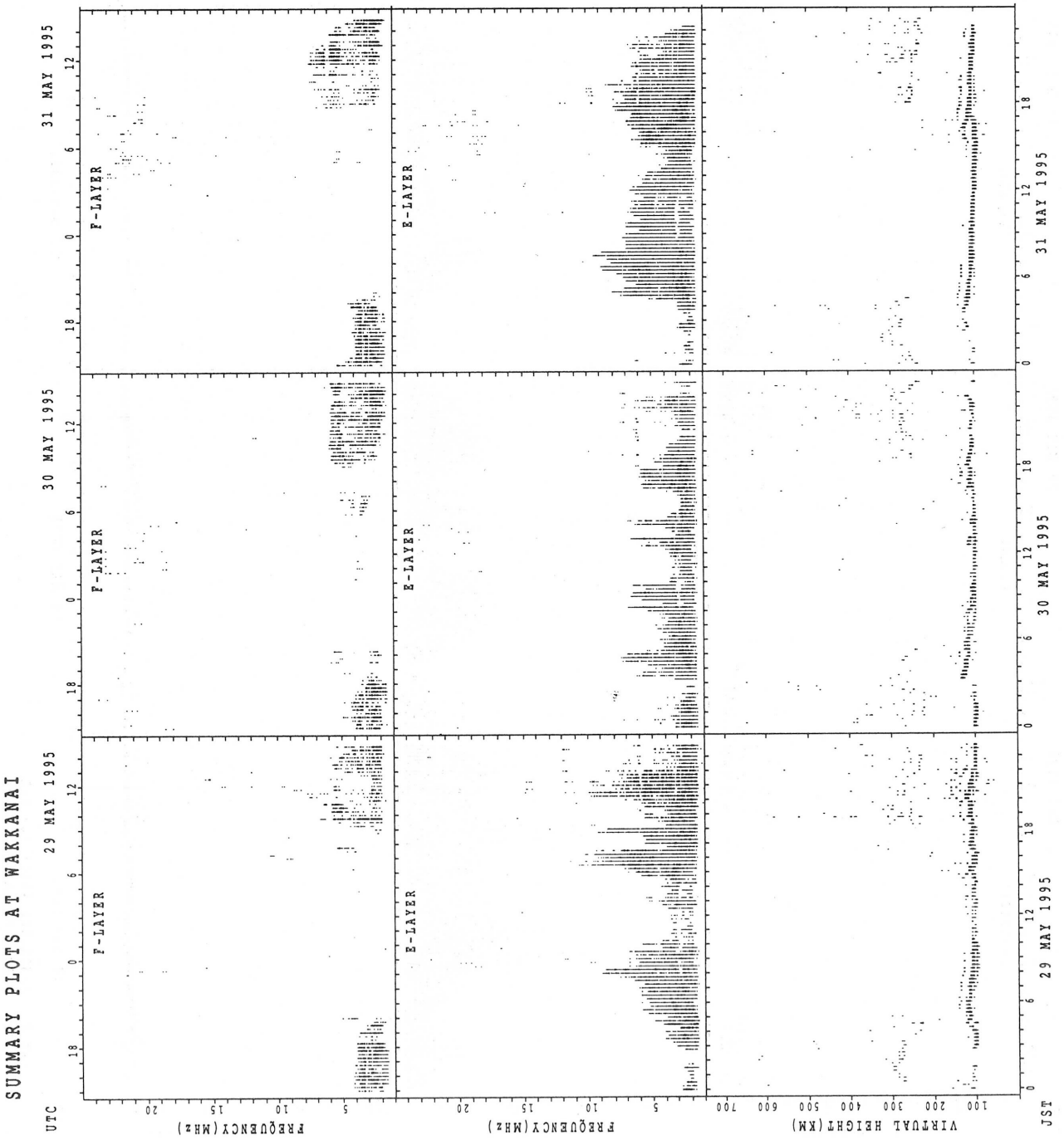
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
21 MAY 1995
22 MAY 1995
23 MAY 1995
24 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

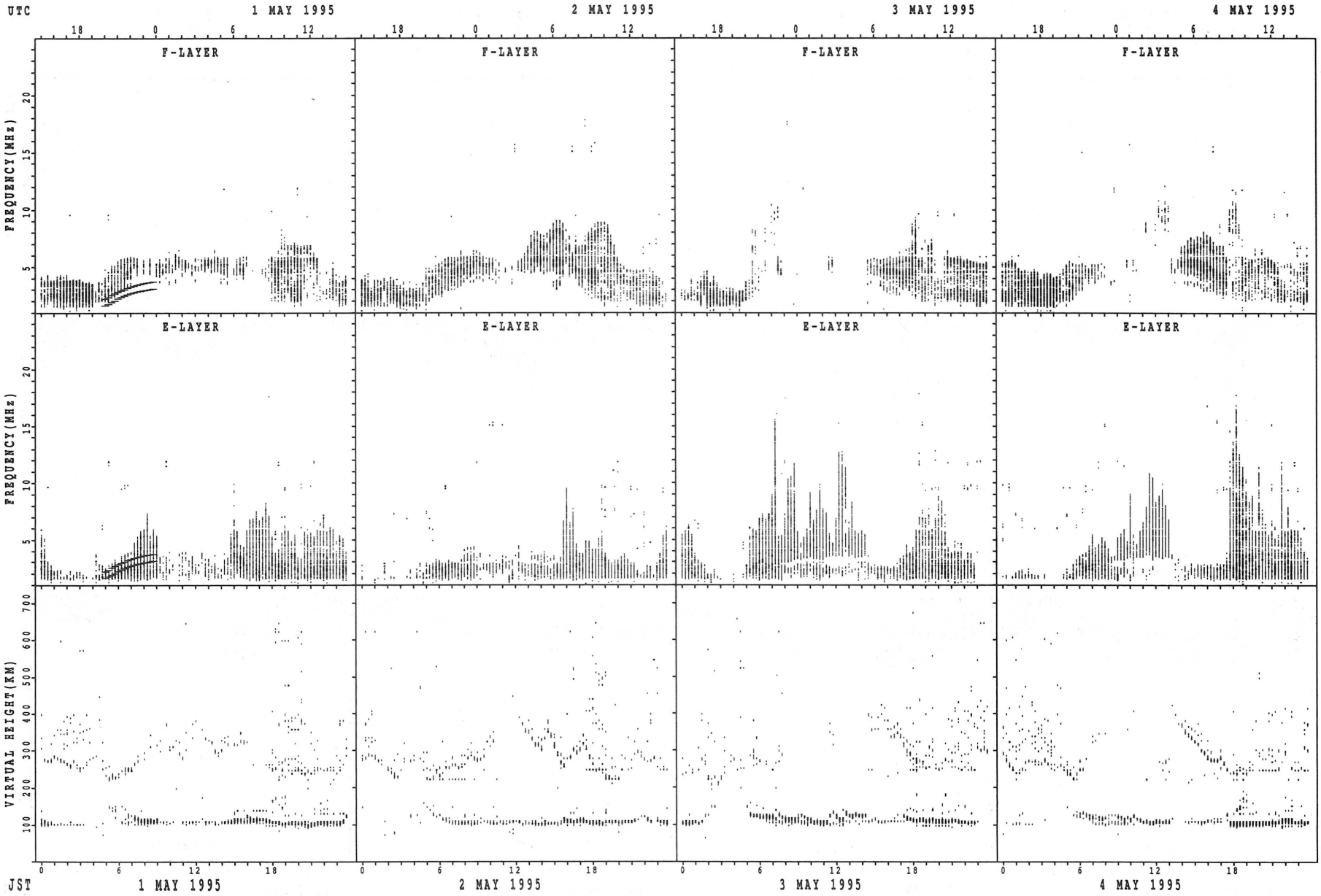
SUMMARY PLOTS AT WAKKANAI



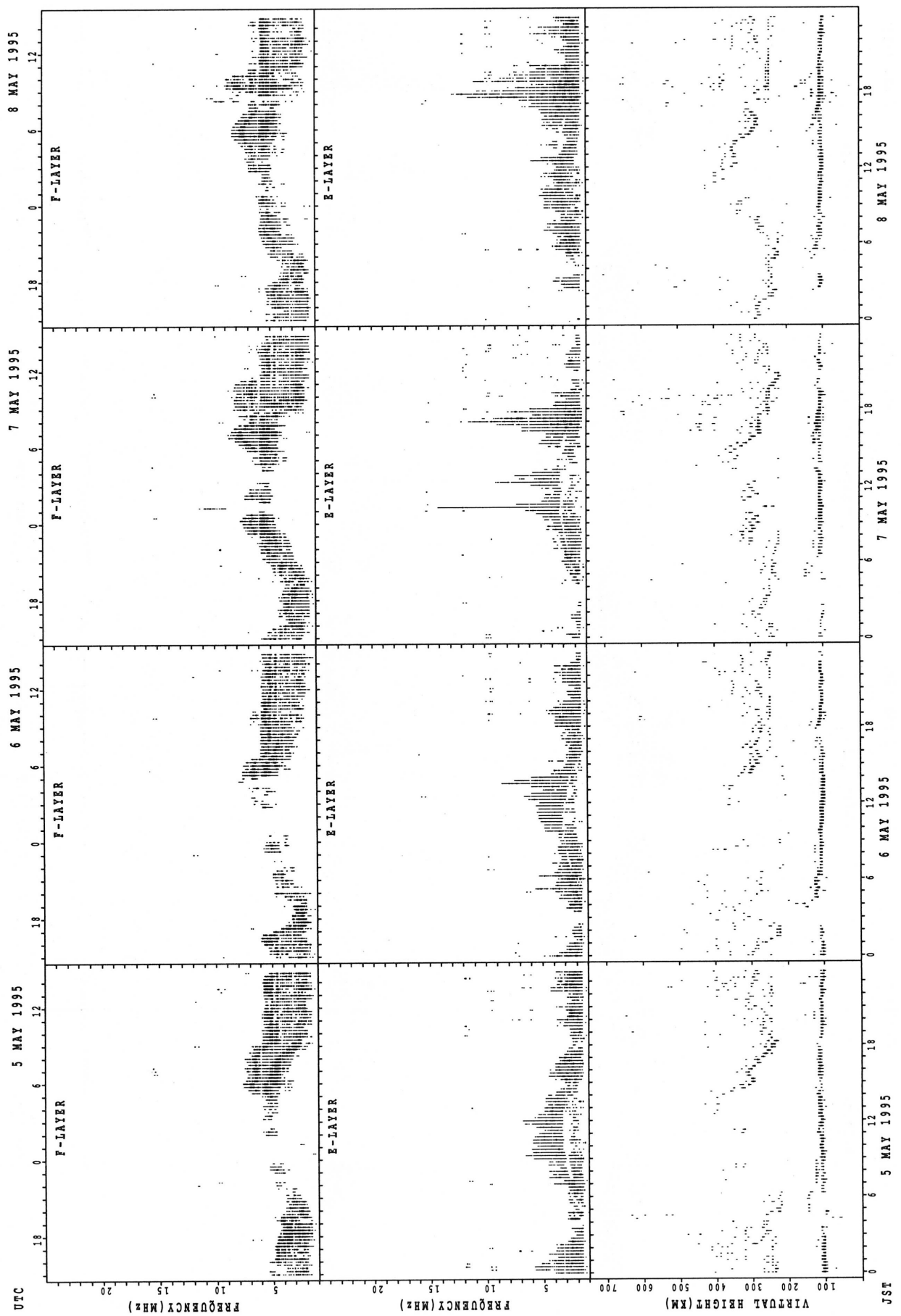
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
29 MAY 1995
30 MAY 1995
31 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

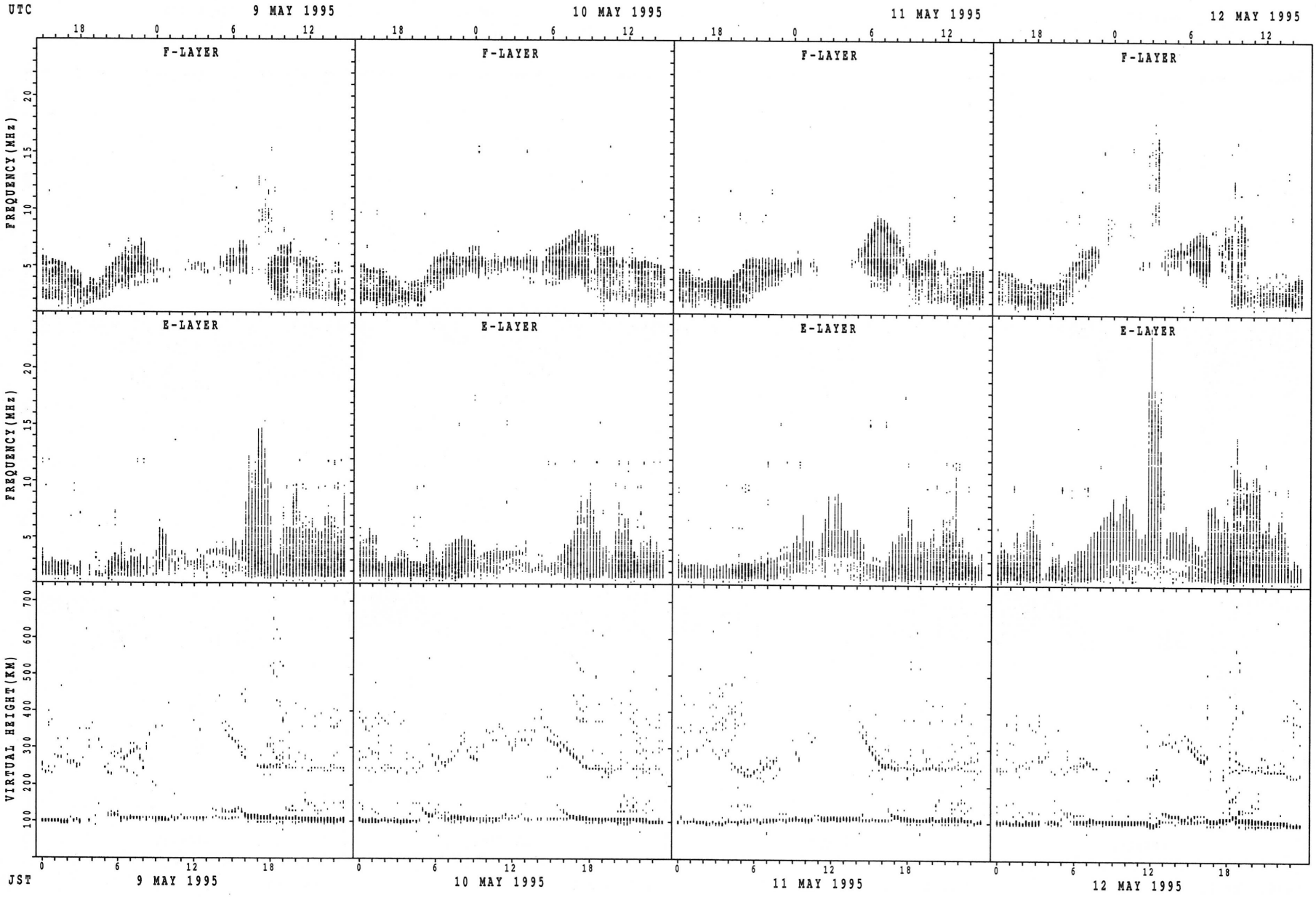
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

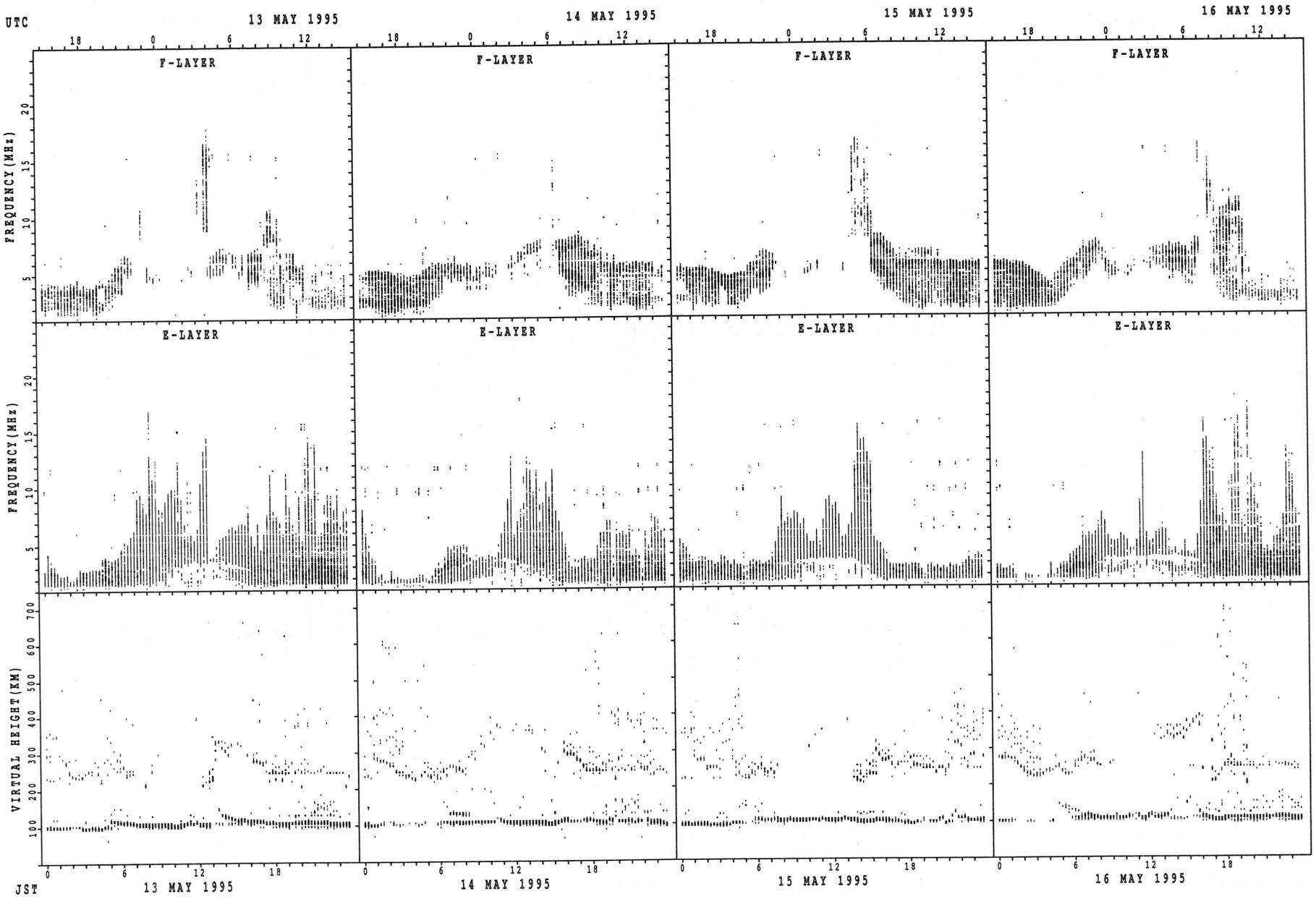

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
5 MAY 1995
6 MAY 1995
7 MAY 1995
8 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



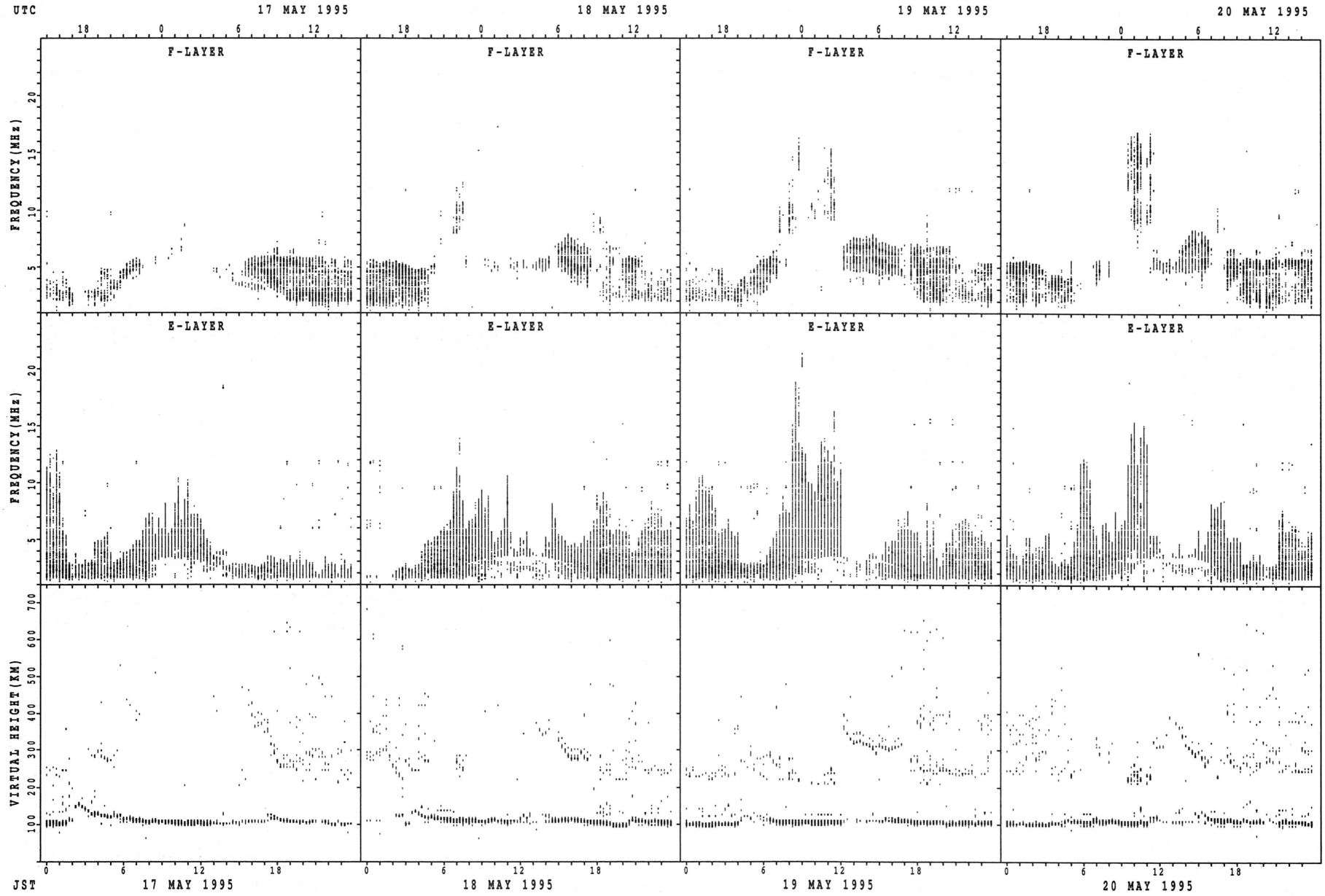
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

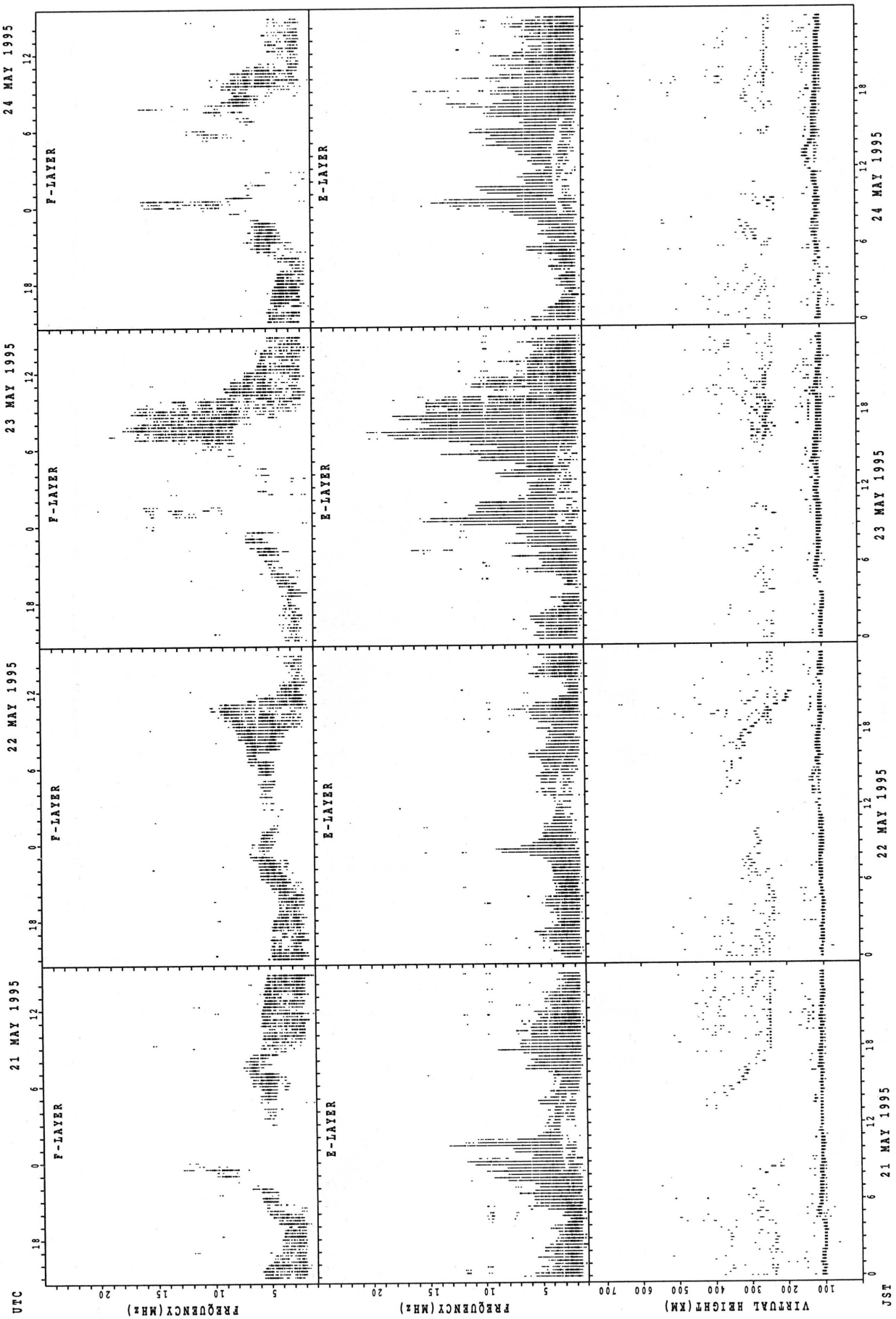


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

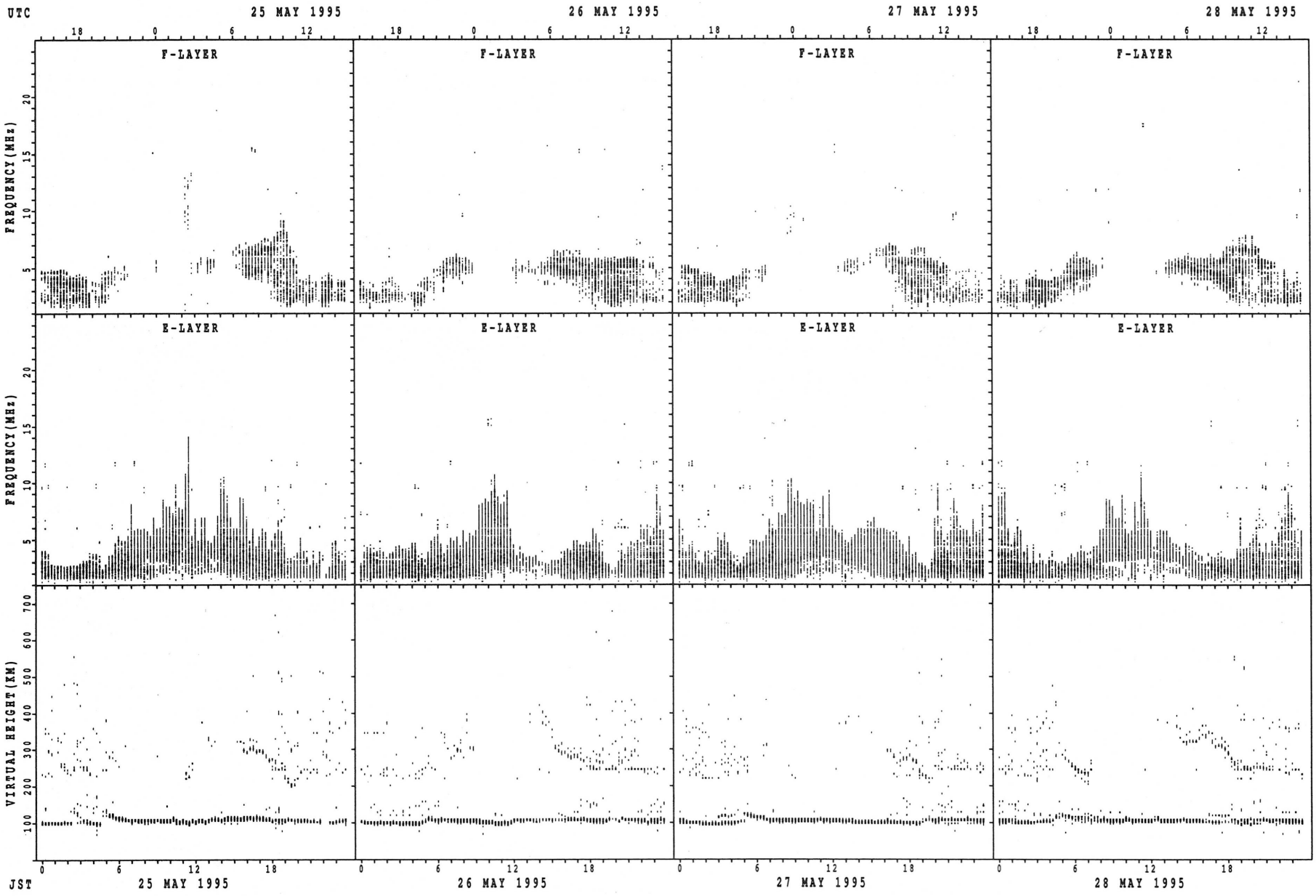
SUMMARY PLOTS AT KOKUBUNJI TOKYO



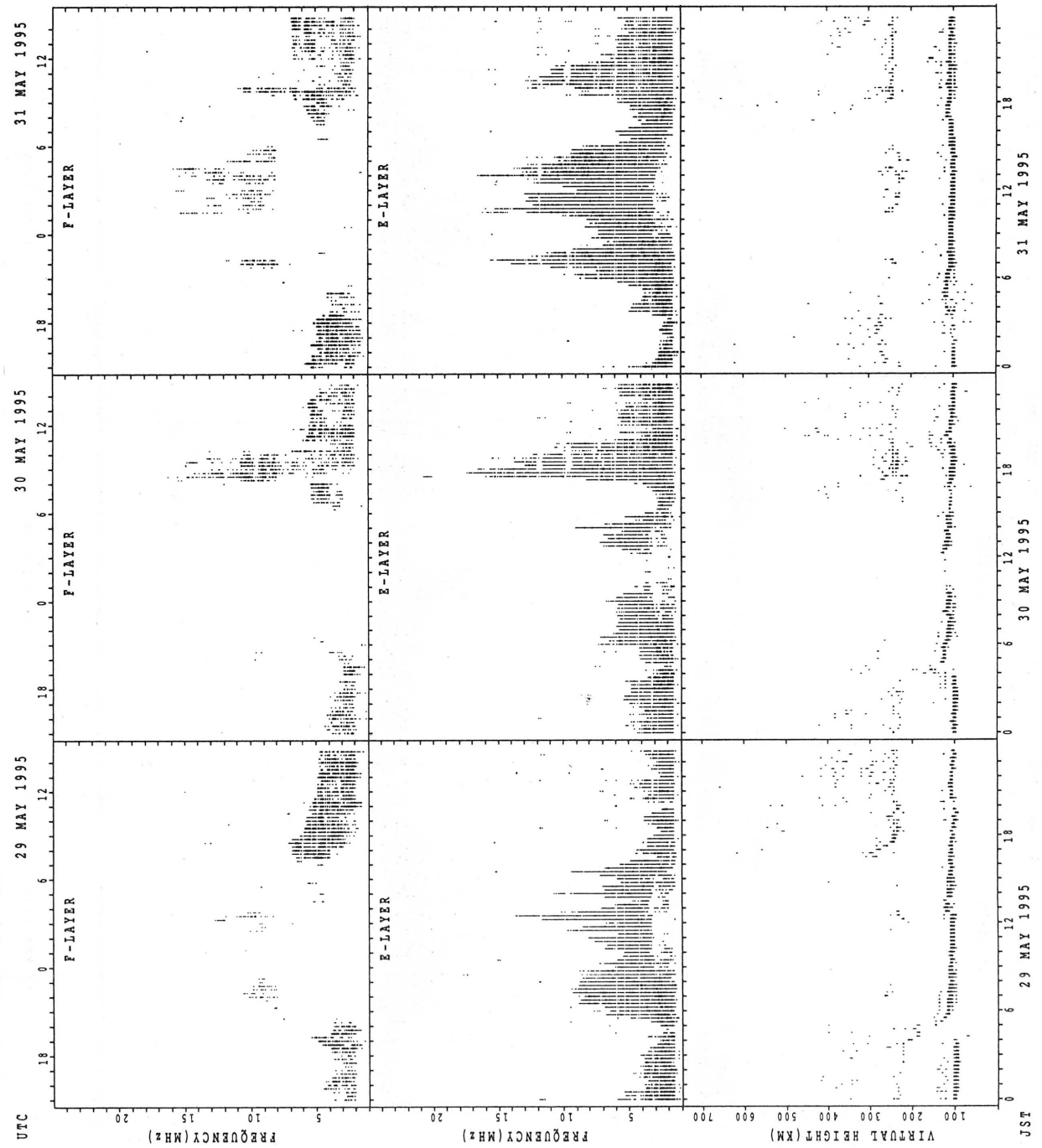
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
21 MAY 1995
22 MAY 1995
23 MAY 1995
24 MAY 1995
F-LAYER
E-LAYER
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

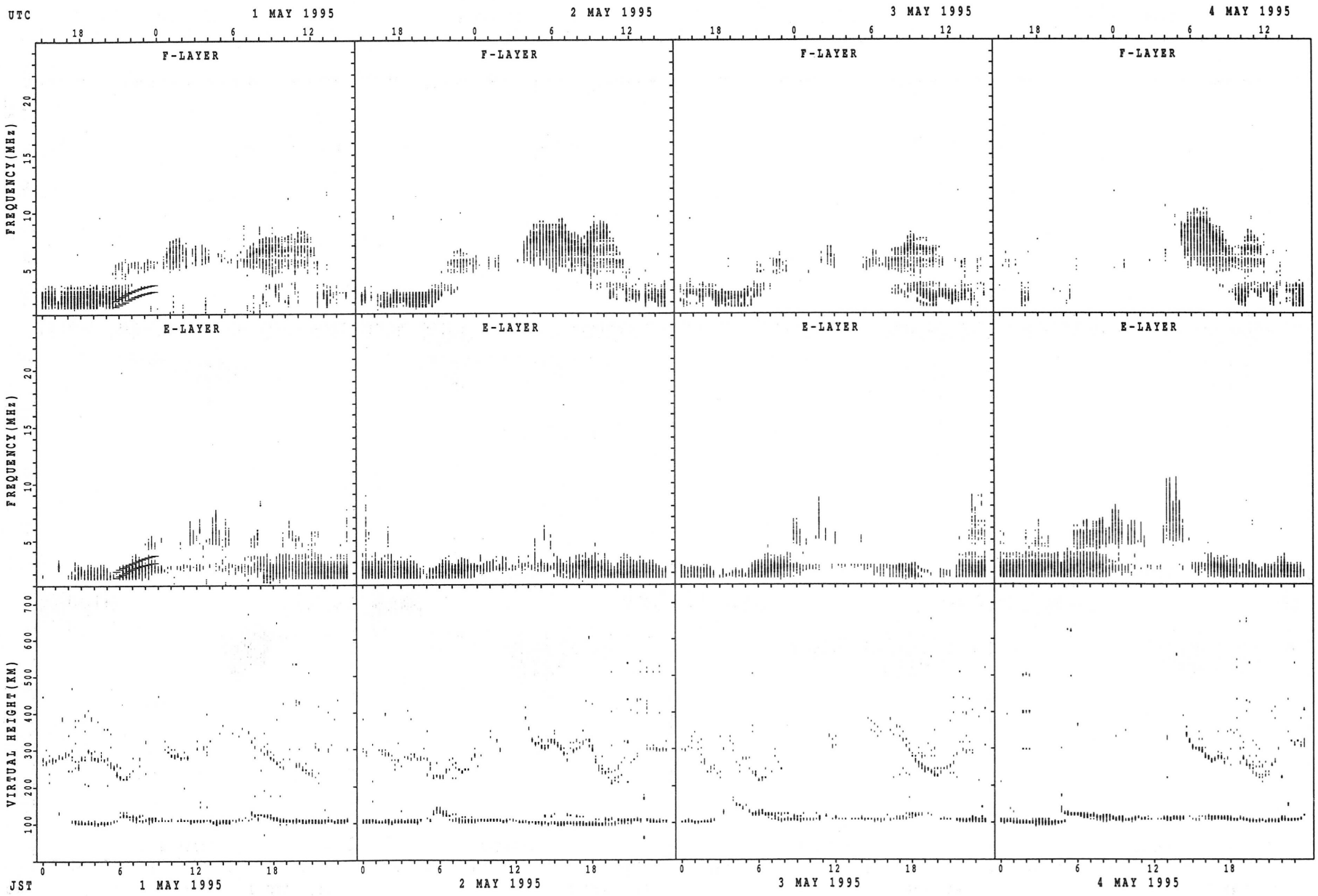
SUMMARY PLOTS AT KOKUBUNJI TOKYO



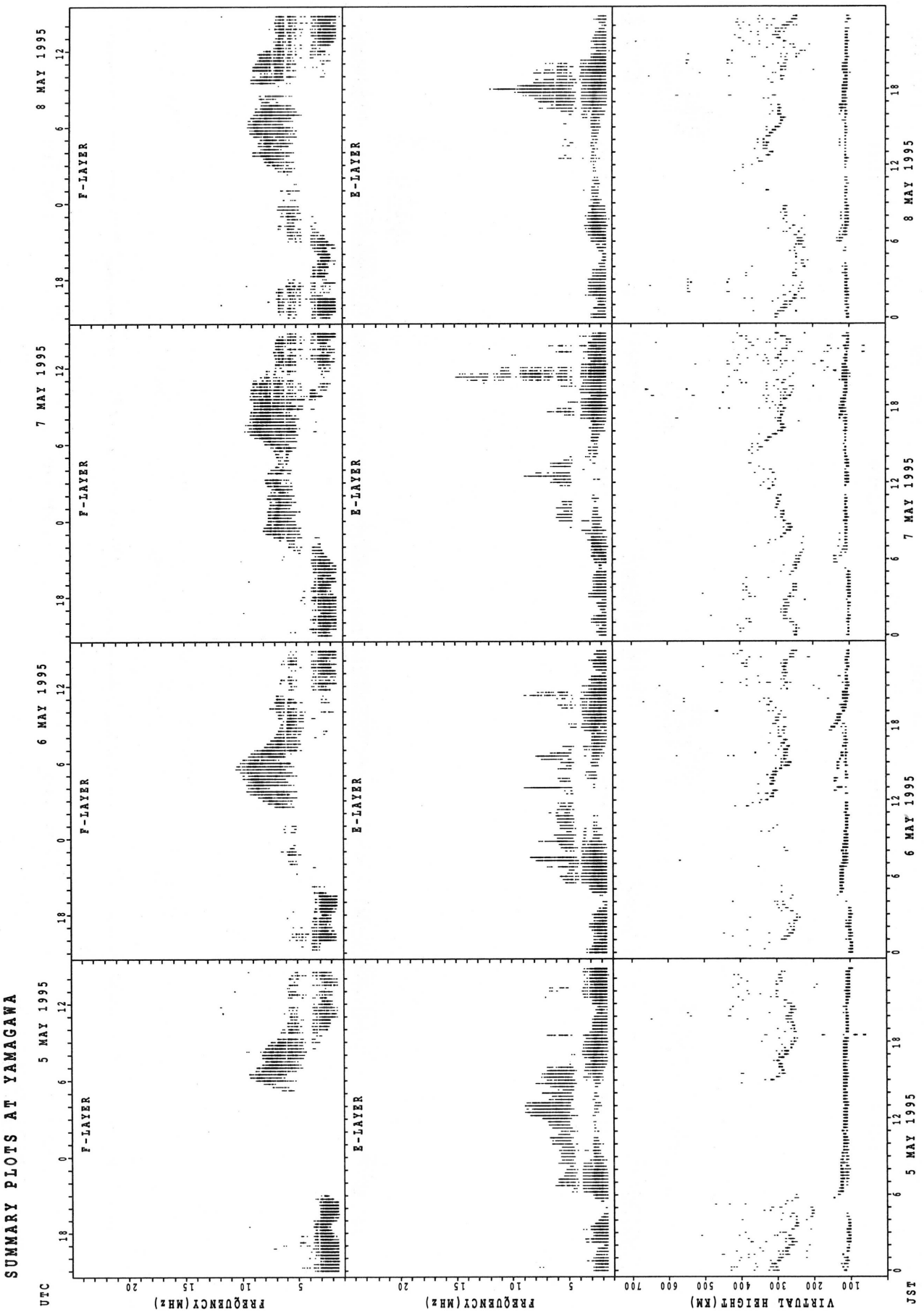
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
29 MAY 1995
30 MAY 1995
31 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

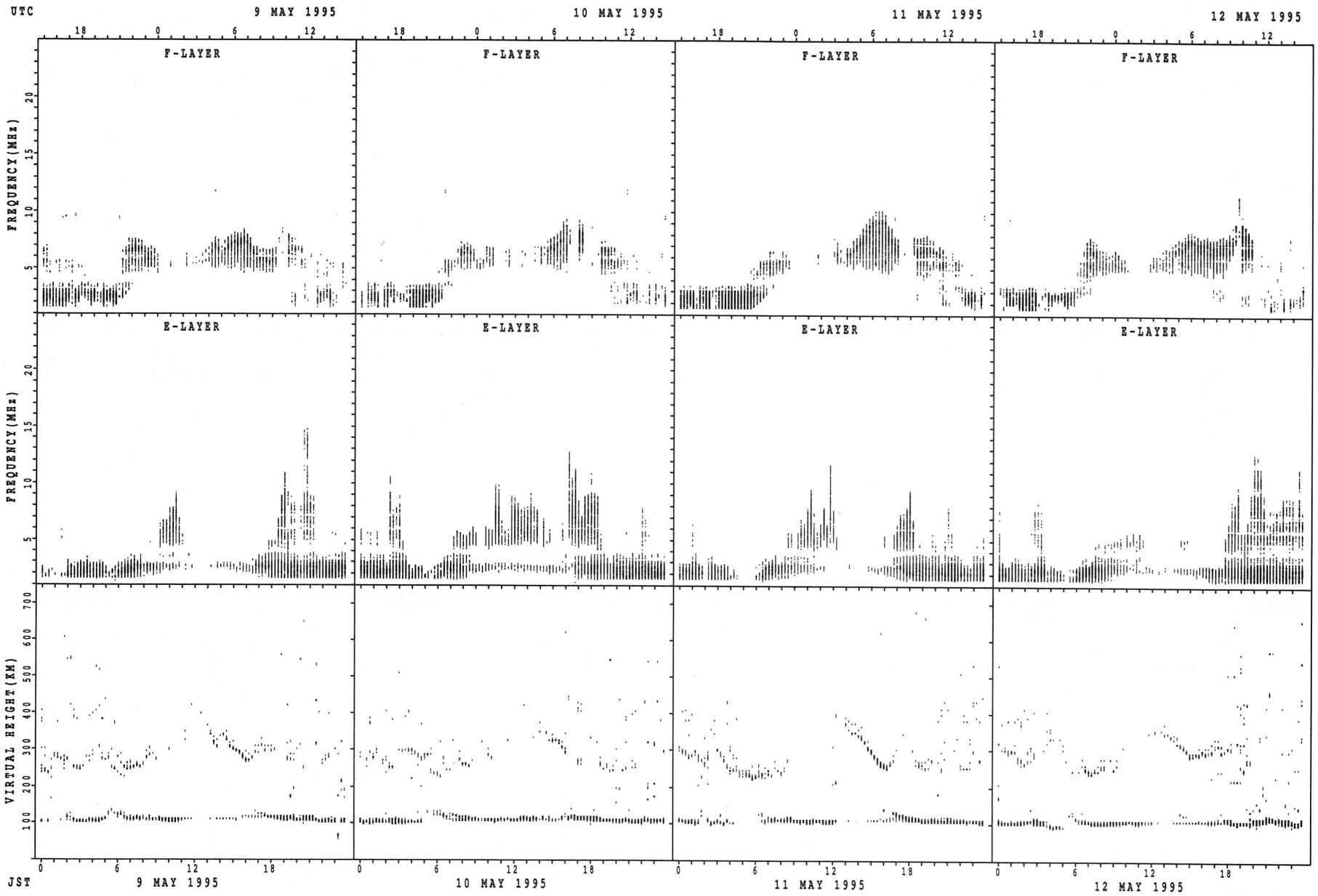
SUMMARY PLOTS AT YAMAGAWA



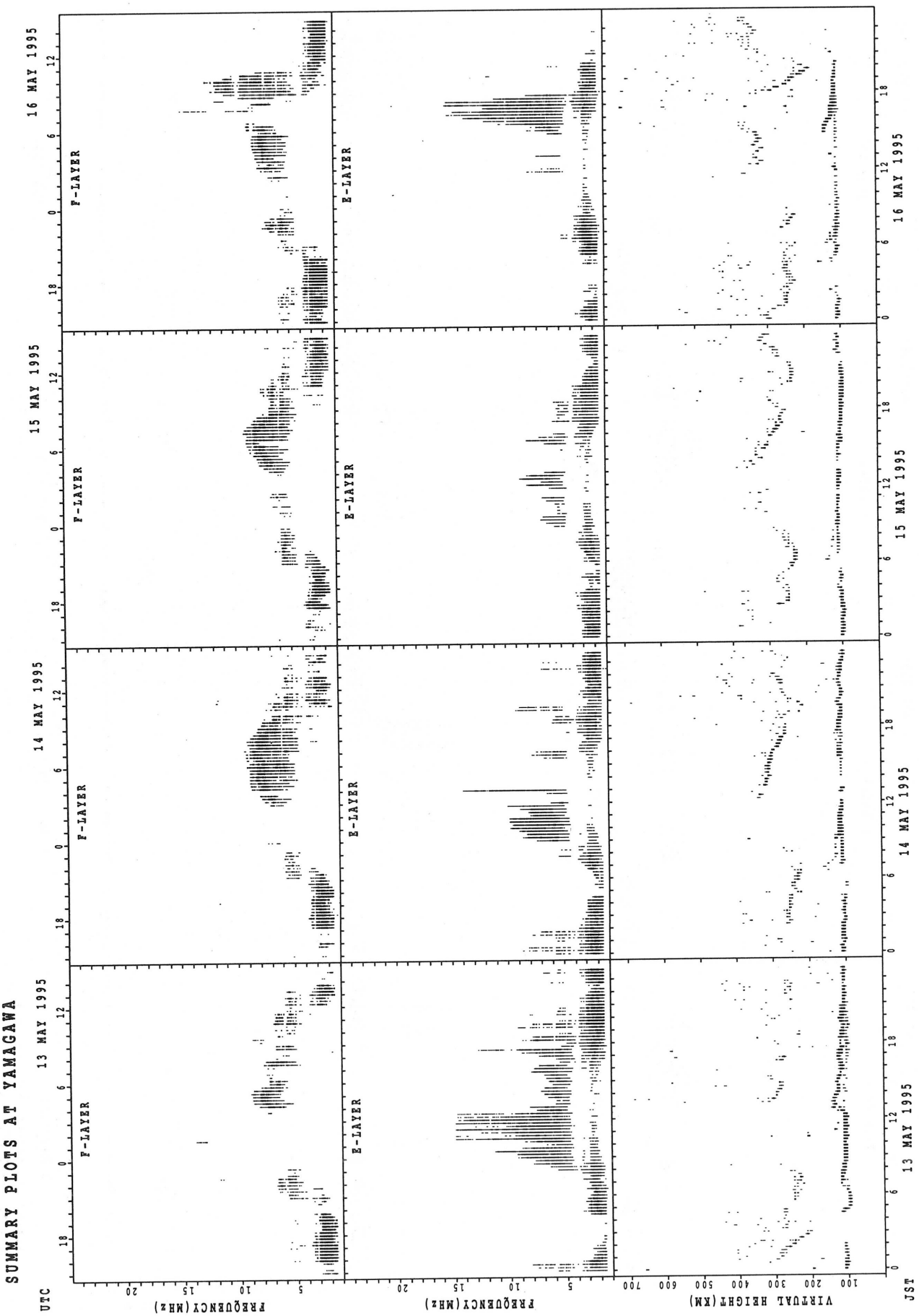
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
5 MAY 1995
6 MAY 1995
7 MAY 1995
8 MAY 1995
F-LAYER
E-LAYER
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

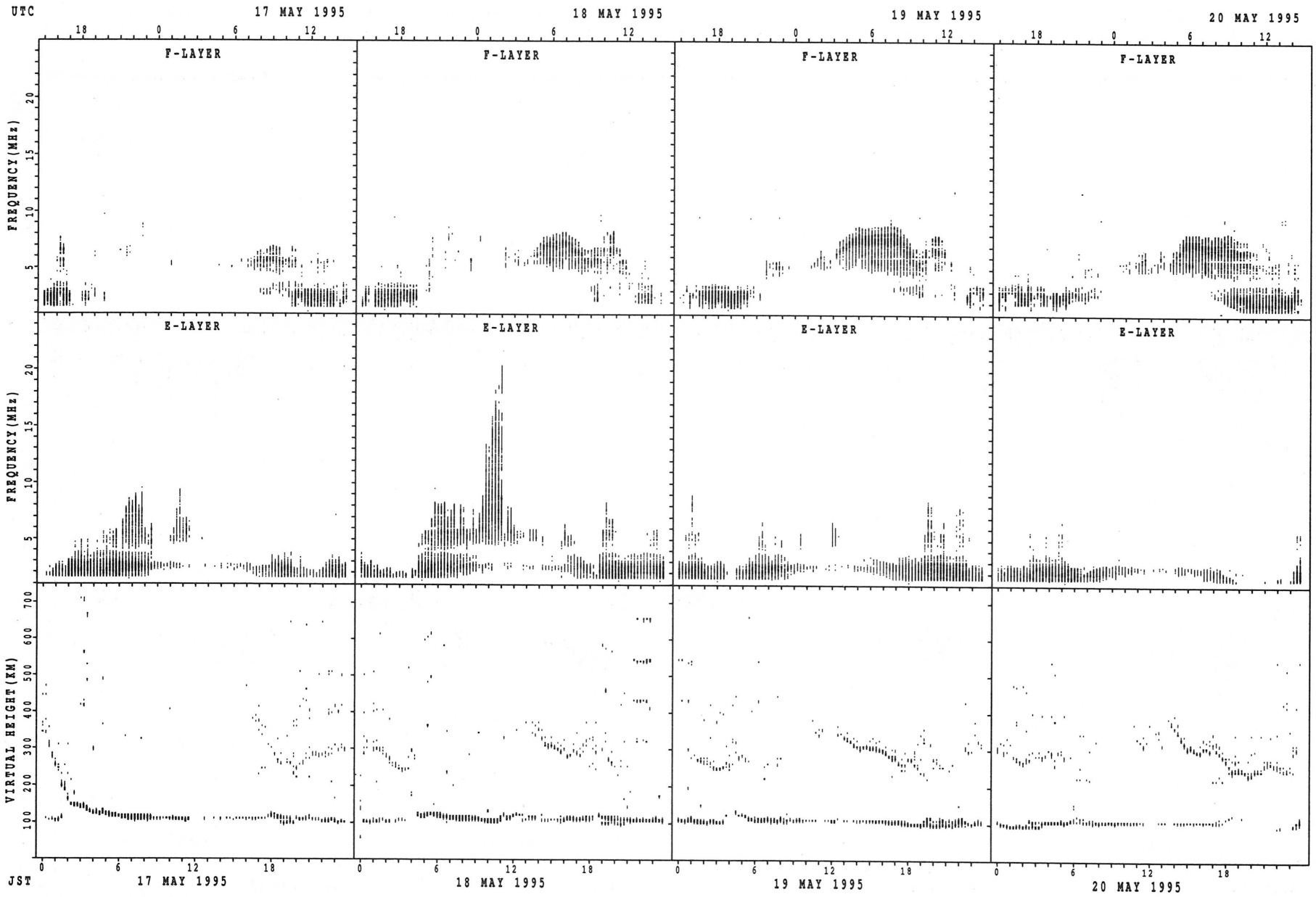
SUMMARY PLOTS AT YAMAGAWA



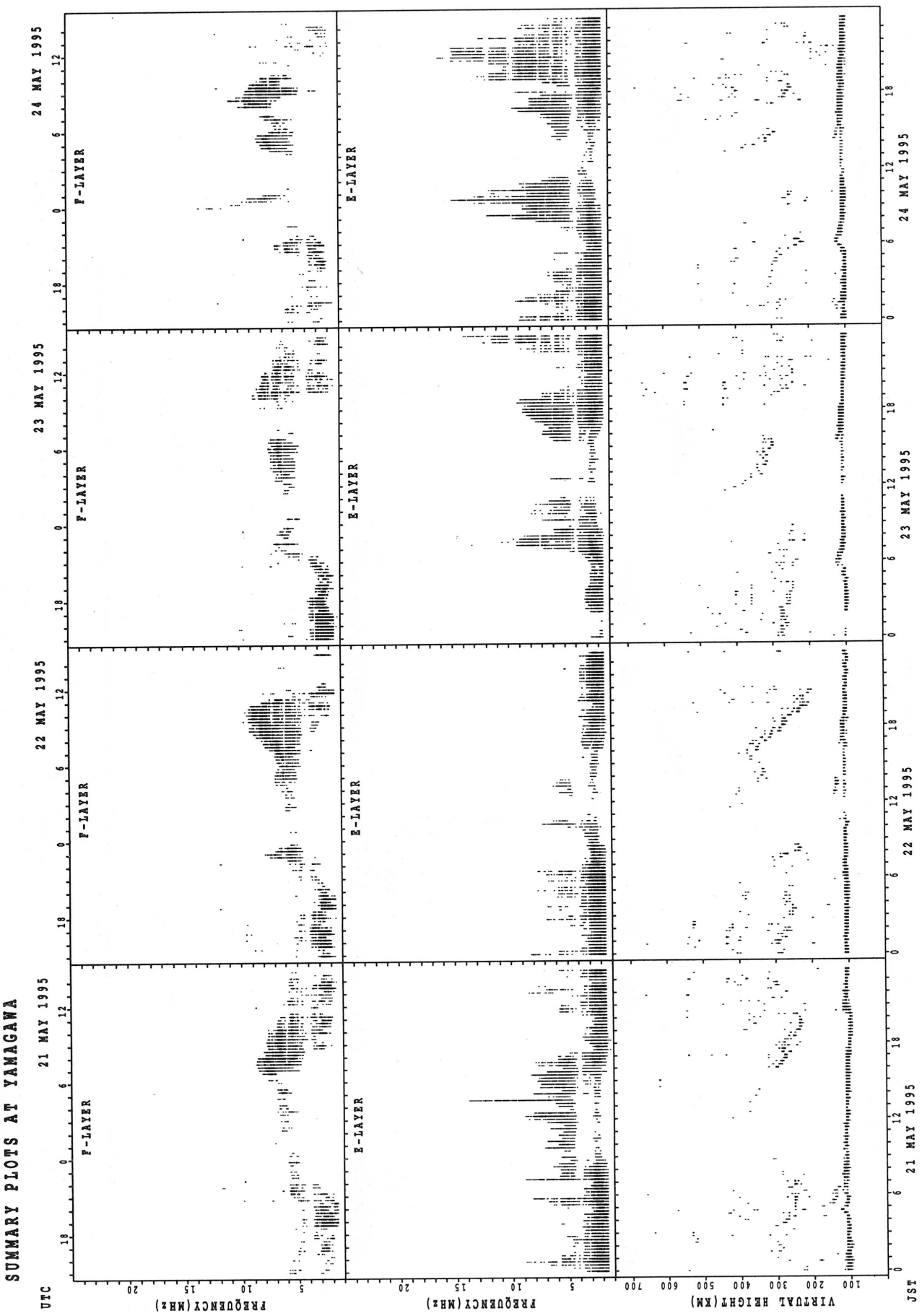
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
13 MAY 1995
14 MAY 1995
15 MAY 1995
16 MAY 1995
F-LAYER
E-LAYER
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

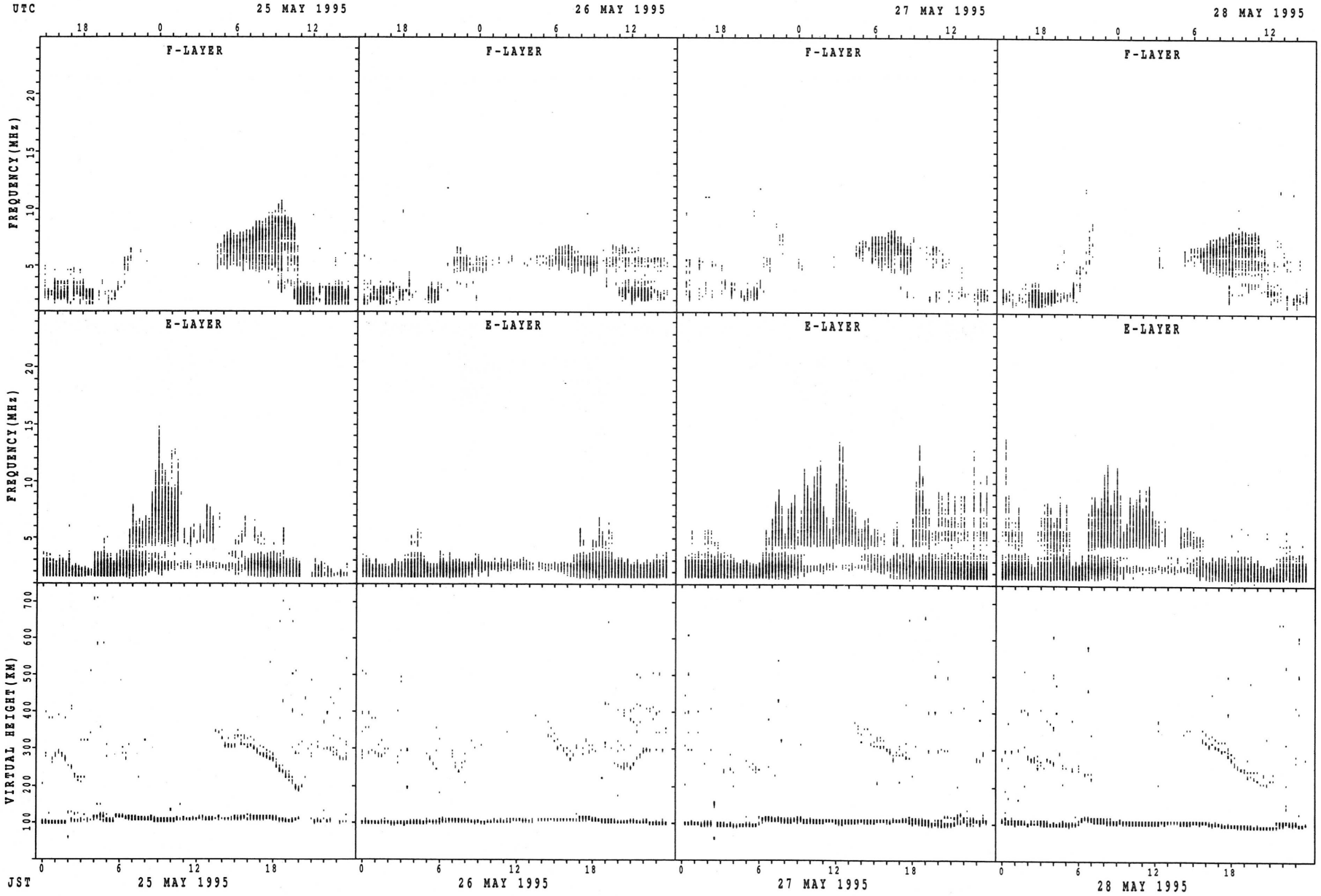
SUMMARY PLOTS AT YAMAGAWA



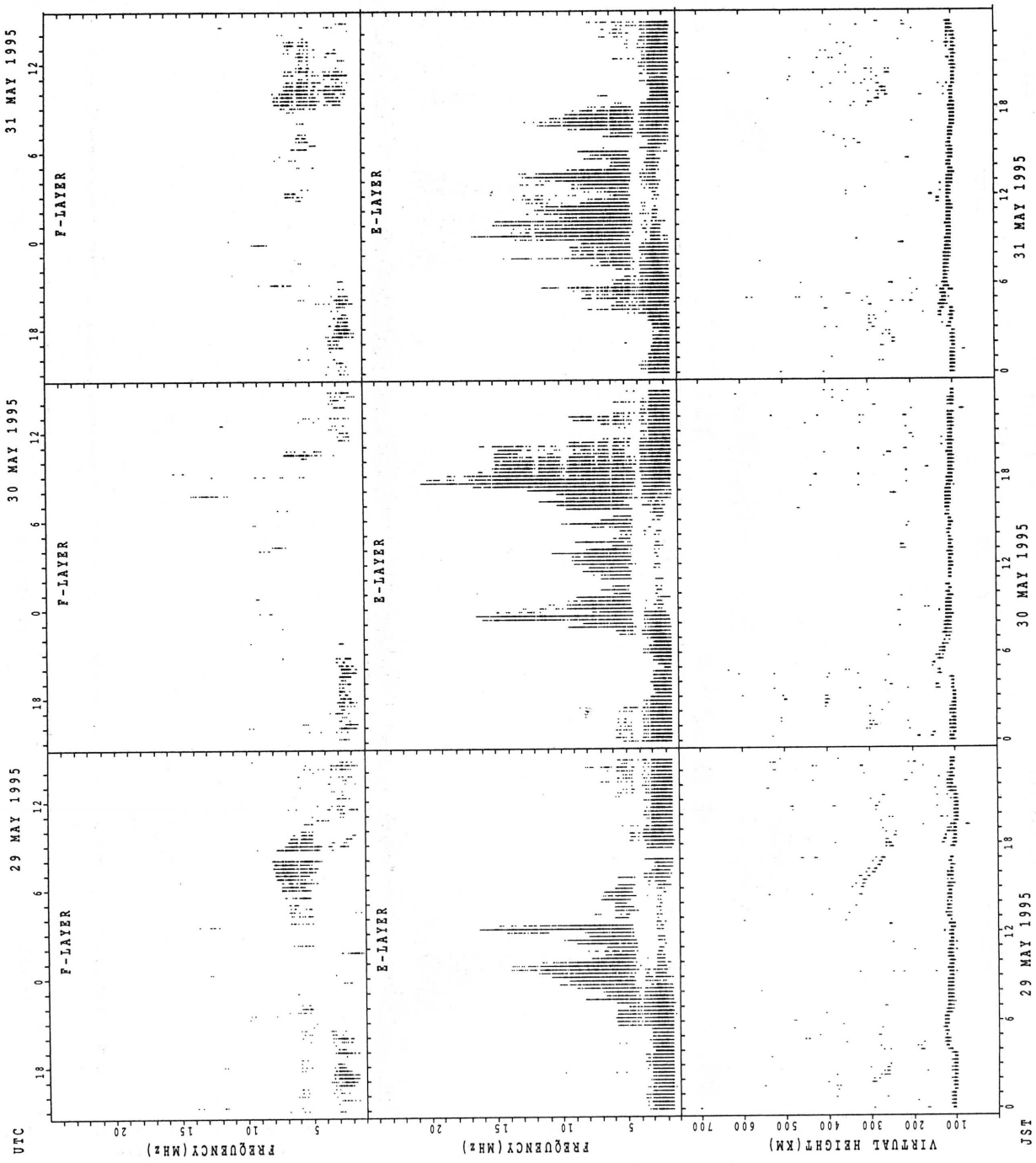
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
UTC
JST
21 MAY 1995
22 MAY 1995
23 MAY 1995
24 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

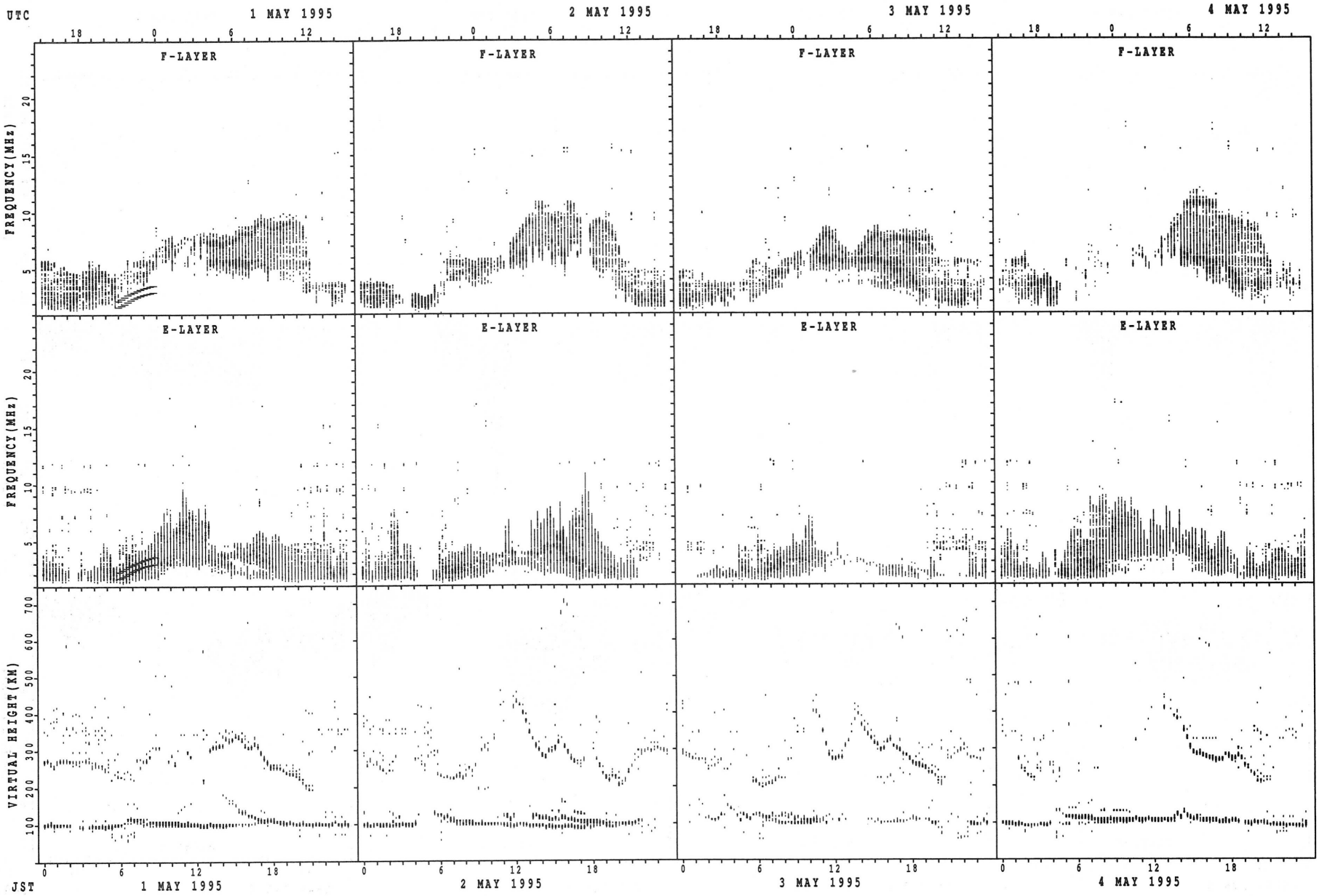
SUMMARY PLOTS AT YAMAGAWA



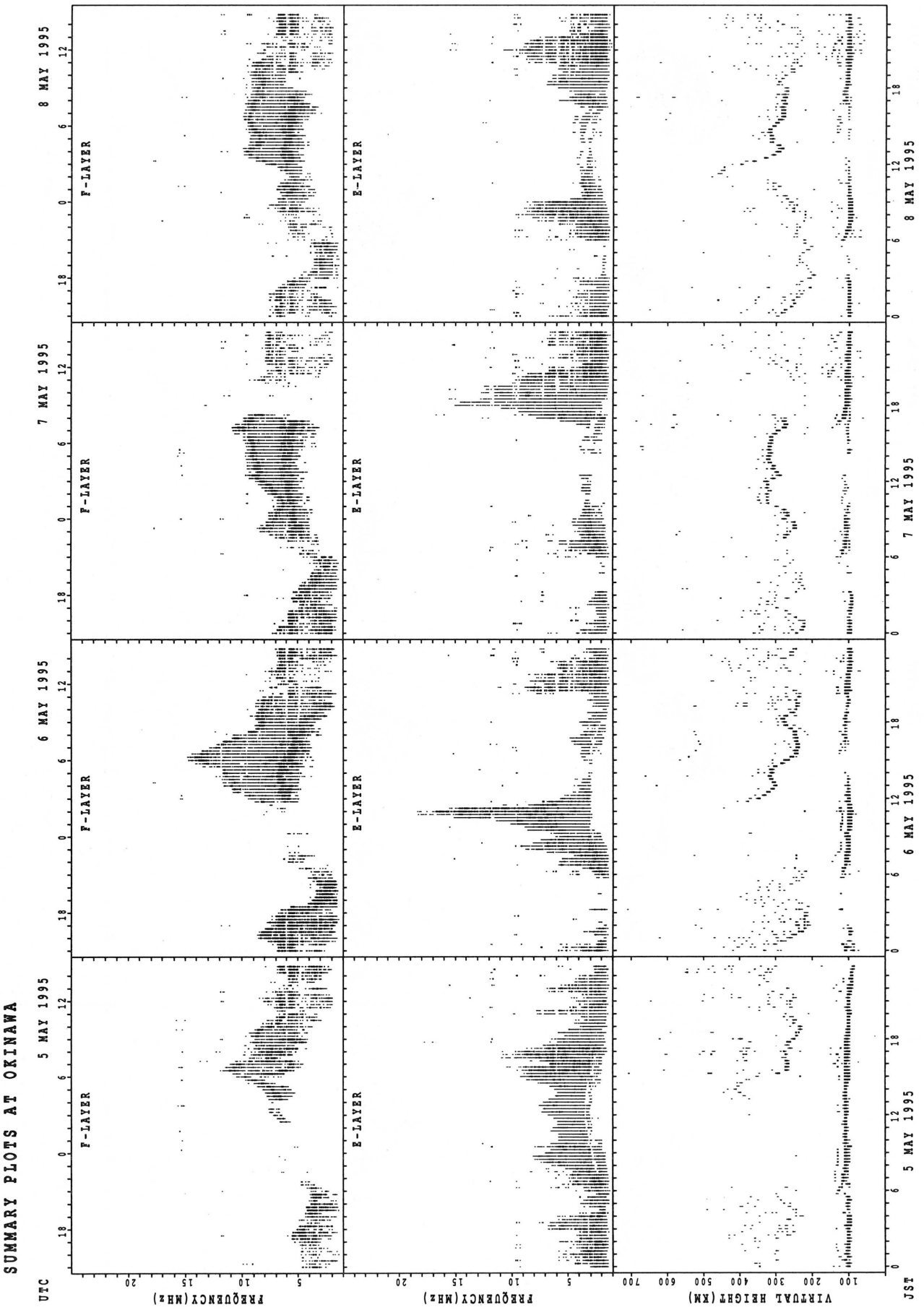
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT YAMAGAWA
29 MAY 1995
30 MAY 1995
31 MAY 1995
UTC
JST
F-LAYER
E-LAYER
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

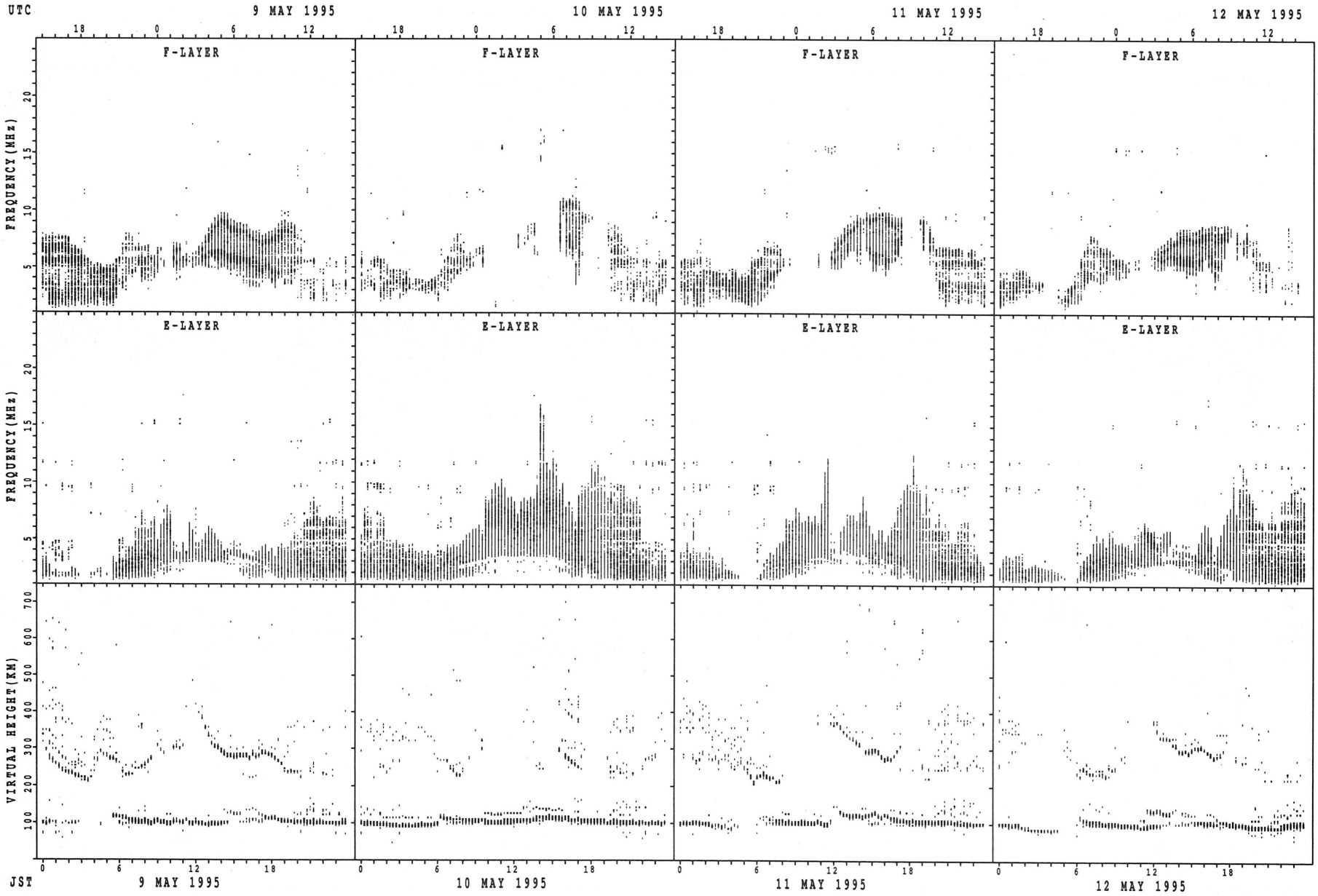
SUMMARY PLOTS AT OKINAWA



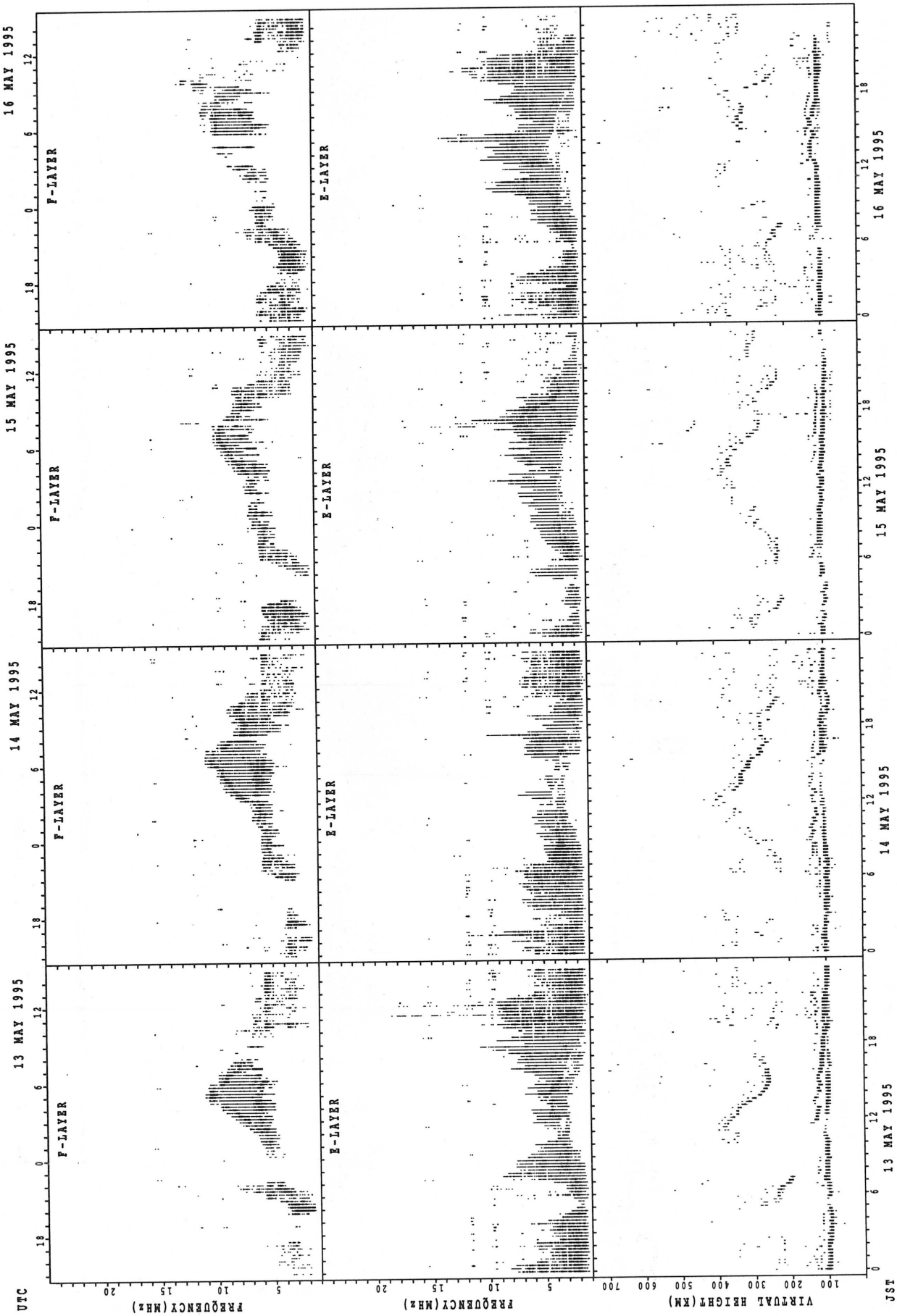
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
5 MAY 1995
6 MAY 1995
7 MAY 1995
8 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

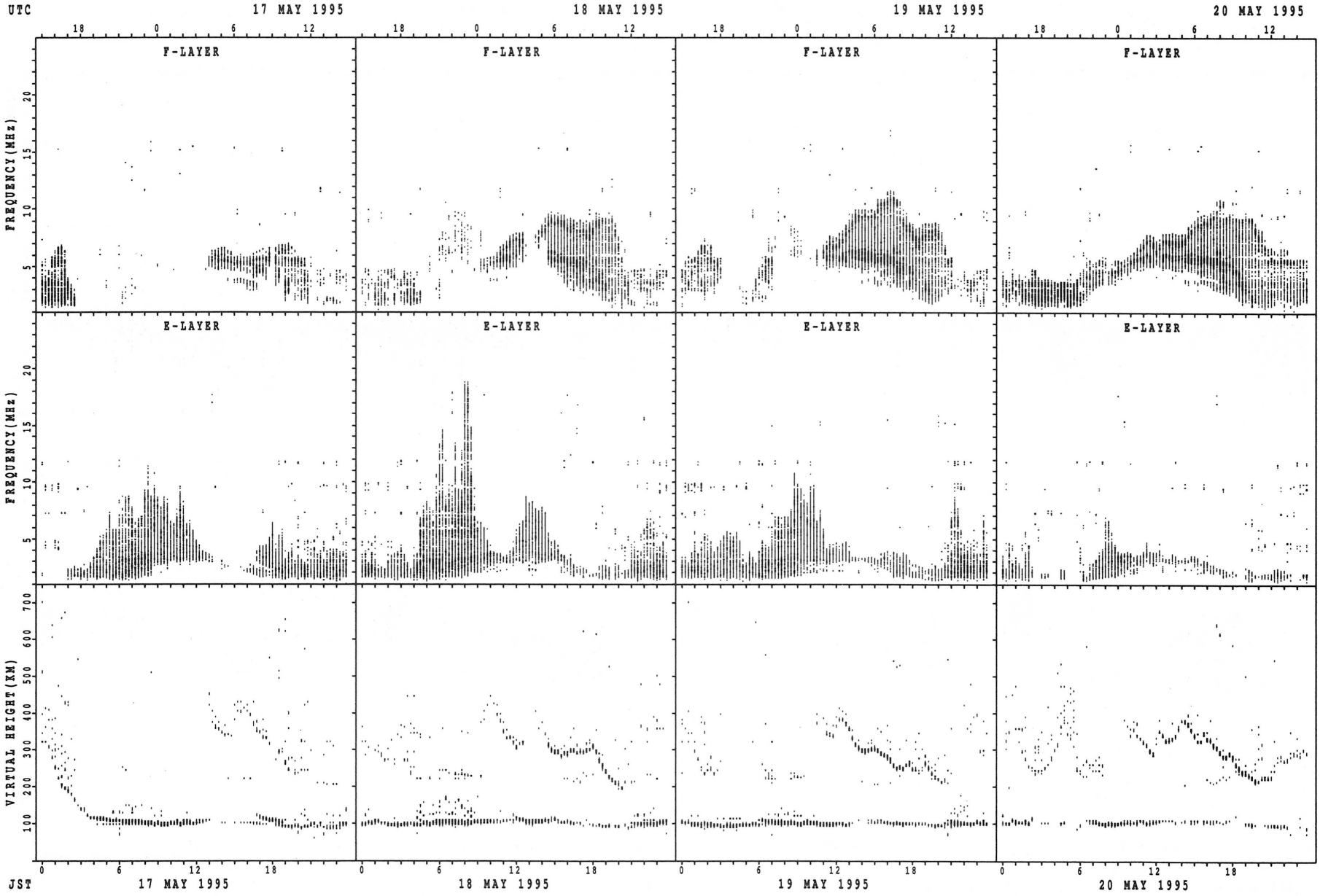
SUMMARY PLOTS AT OKINAWA



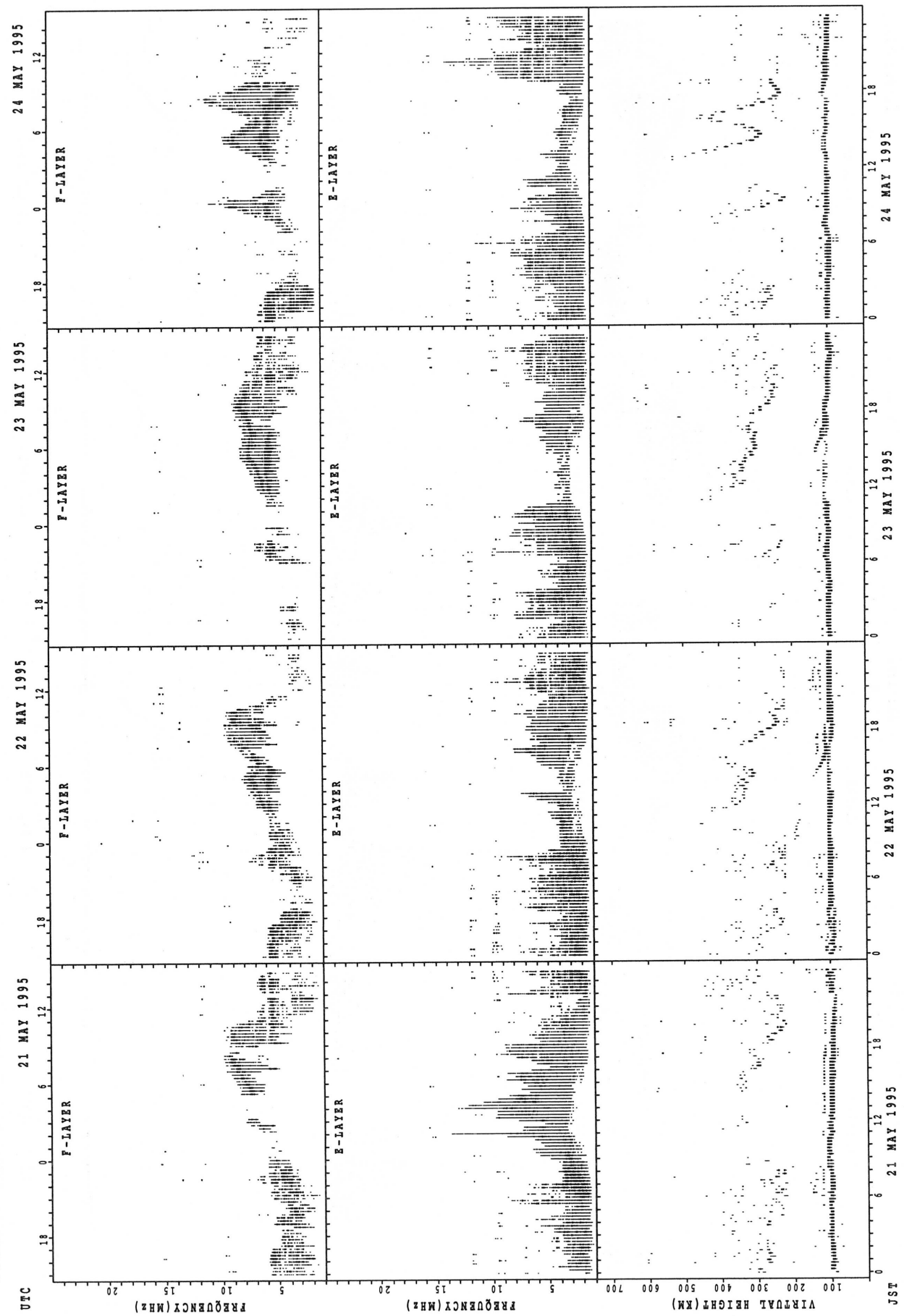
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
13 MAY 1995
14 MAY 1995
15 MAY 1995
16 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
UTC
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

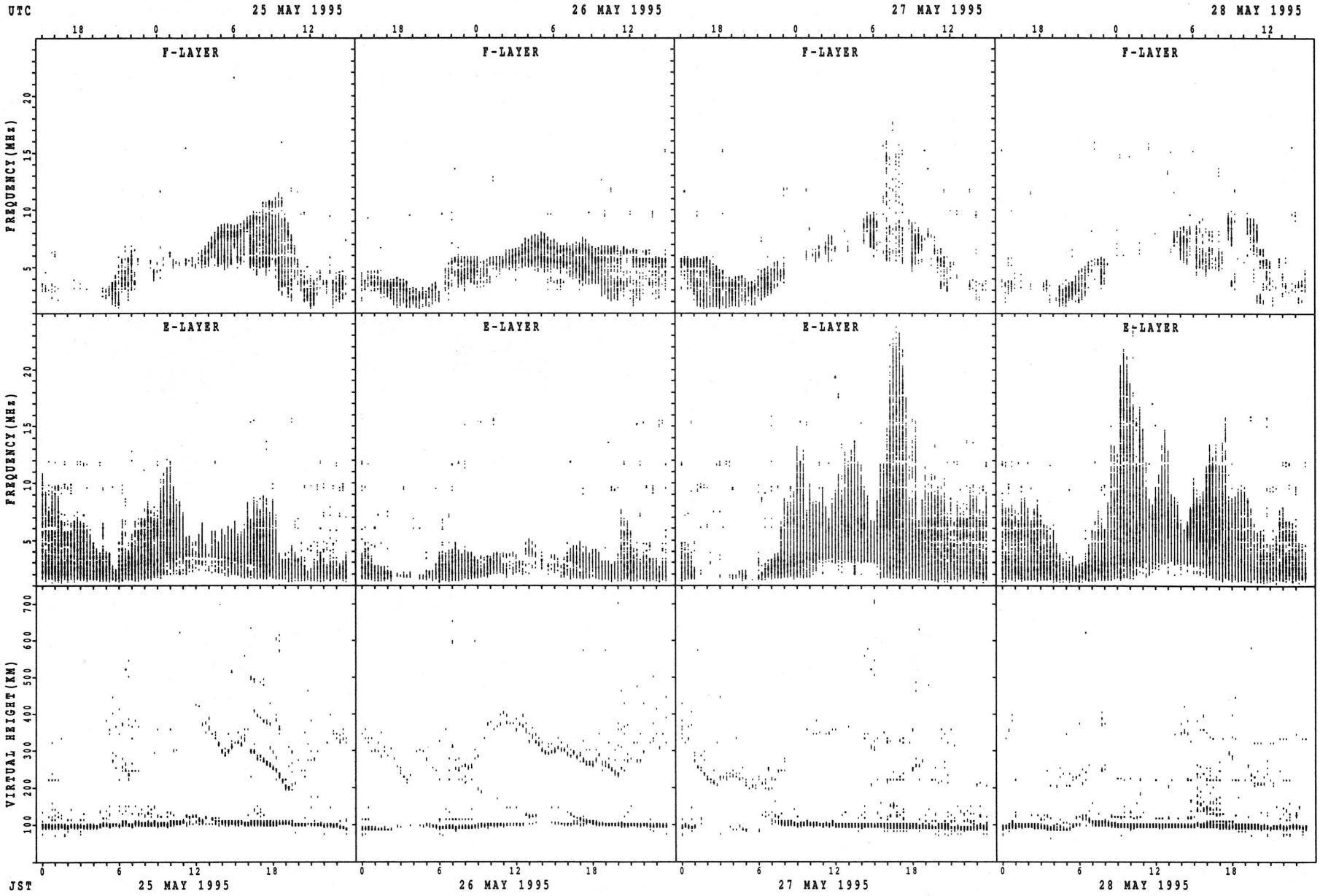
SUMMARY PLOTS AT OKINAWA



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

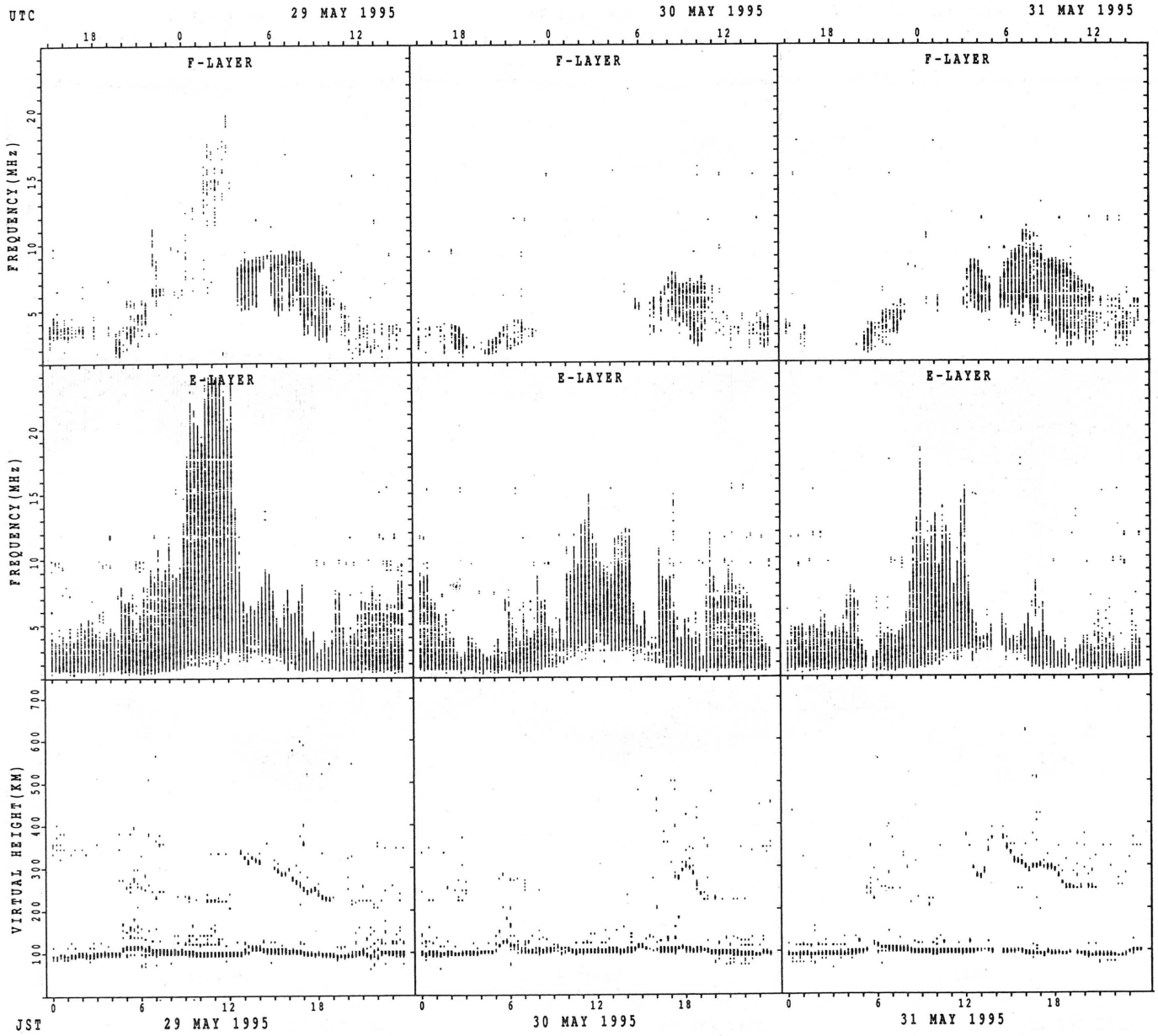

SUMMARY PLOTS AT OKINAWA
21 MAY 1995
22 MAY 1995
23 MAY 1995
24 MAY 1995
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
UTC
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



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

SUMMARY PLOTS AT OKINAWA



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

MONTHLY MEDIANS OF h'F AND h'Es

MAY 1995 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	18	18	16	21	20	29	31	31	31	31	31	30	31	31	31	30	30	30	28	27	25	22	23	22
MED	105	105	106	111	119	119	117	113	111	107	107	105	105	105	105	107	113	115	113	111	111	109	107	105
U Q	107	113	127	128	123	123	121	115	113	111	111	107	107	111	113	119	119	121	118	115	114	113	113	107
L Q	103	101	101	103	112	113	113	109	107	105	105	103	103	103	101	103	107	113	111	111	108	105	105	103

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT															10	14	14	13	16	14				
MED															318	315	296	296	284	252				
U Q															332	352	312	303	302	282				
L Q															304	304	278	256	248	238				

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	25	19	22	17	27	31	28	31	29	30	30	28	28	29	30	30	30	29	27	30	28	25	28
MED	105	105	105	103	105	121	117	114	111	111	109	111	107	113	113	114	116	113	113	109	112	111	111	107
U Q	107	108	107	105	112	137	125	120	115	113	111	113	115	118	120	123	119	117	117	113	113	113	113	110
L Q	103	103	103	99	103	113	113	111	109	107	107	107	106	111	110	111	111	111	108	105	109	107	107	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															16	21	22	22	18	14				
MED															324	308	296	307	287	269				
U Q															339	323	302	322	294	302				
L Q															310	303	286	280	274	250				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	25	27	25	22	30	31	31	31	31	25	22	20	26	30	31	30	29	30	29	29	25	27
MED	110	107	107	107	105	113	122	113	113	113	111	113	112	111	113	113	115	114	113	111	111	111	111	111
U Q	113	111	109	109	113	123	127	119	117	115	115	115	115	117	115	115	121	119	117	113	114	115	115	113
L Q	106	103	103	103	105	105	115	113	109	109	111	107	109	108	111	111	111	113	112	103	104	106	108	105

MONTHLY MEDIANS OF h'F AND h'Es

MAY 1995 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

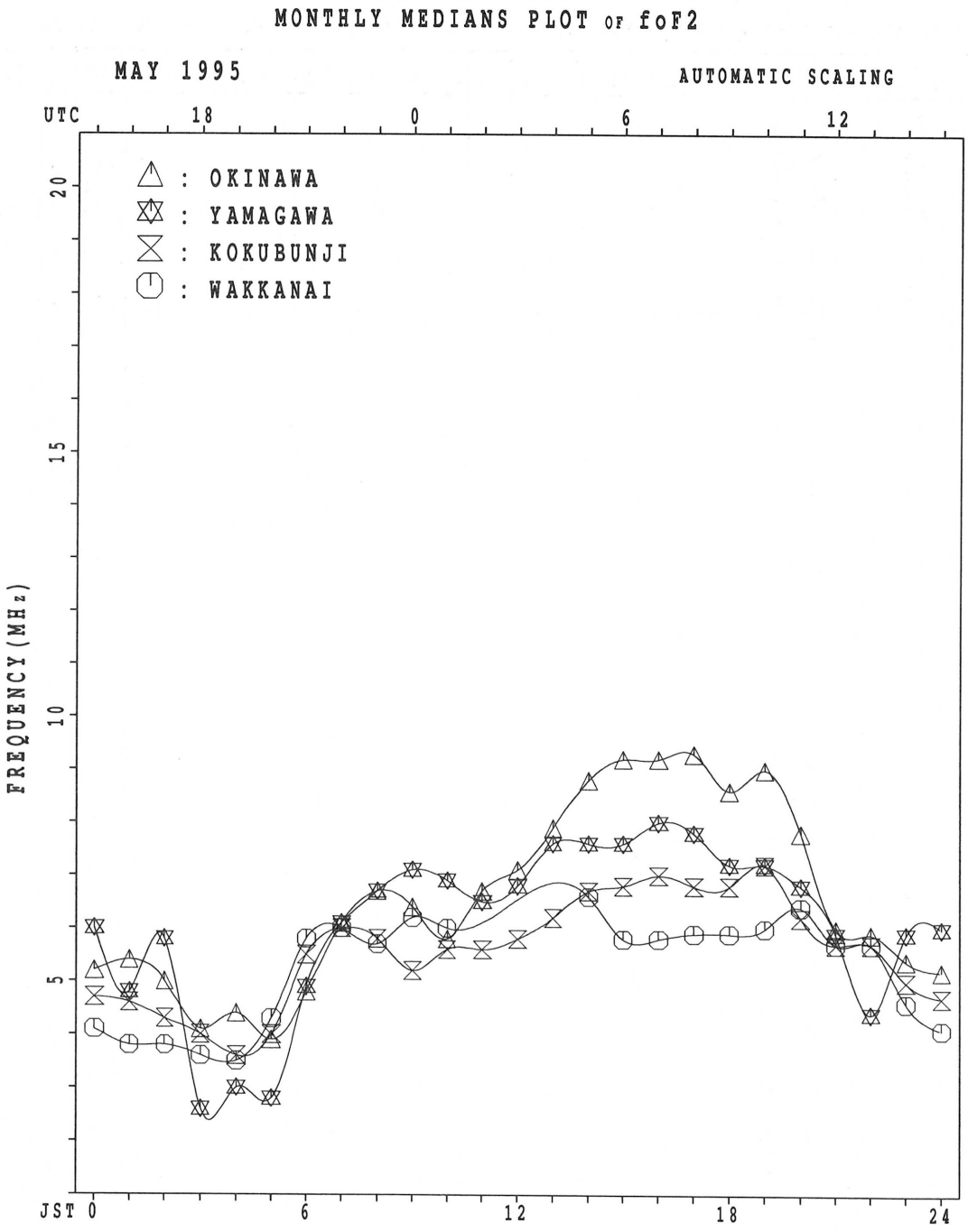
STATION OKINAWA LAT. 26.3N LON. 127.8E

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						16	21	26	27	23	22	22	17			
MED								248						334	312	304	286	288	280	266	256			
U Q								262						342	322	322	308	296	292	274	275			
L Q								232						316	297	294	276	256	254	246	235			

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	25	26	20	23	26	30	30	29	30	30	27	27	24	27	31	29	30	28	28	28	26	24
MED	103	99	99	97	99	103	113	108	108	105	104	106	105	107	110	113	109	109	107	105	103	105	106	103
U Q	107	104	103	103	103	113	121	113	111	110	107	113	117	121	120	127	115	114	111	107	108	111	113	110
L Q	99	95	95	95	96	99	103	105	105	103	103	103	103	103	105	103	105	105	105	99	95	103	103	97


MONTHLY MEDIANS PLOT OF foF2
MAY 1995
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

MAY 1995 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	48	X 44	44	41	38															X 72	74	71	A	45
2	44	X 40	X 41	X 35	X 34															X 91	X 62	X 50	X 52	X 48
3	A	X 40	X 48	X 34	X 31															X 77	X 72	62	62	56
4	54	54	49	46	44															X 65	X 64	60	54	54
5	55	54	50	48	45															X 63	X 63	X 60	X 59	62
6	X 54	X 57	X 51	34	33															X 72	X 67	X 62	X 60	X 61
7	X 58	X 47	X 47	X 45	X 40															X 82	X 83	X 65	X 63	X 60
8	X 57	X 55	X 56	X 49	X 40															X 91	X 68	X 69	X 66	63
9	X 68	X 55	X 51	X 45	X 41															X 78	70	61	55	54
10	54	X 48	X 46	X 44	X 39															X 75	X 65	62	58	55
11	51	47	43	43	42															X 64	X 68	X 56	53	54
12	50	X 46	43	40	X 39															X 91	A	A	A	44
13	44	X 44	X 45	X 45	X 40															A	X 65	X 51	A	A
14	52	54	53	X 52	X 49															X 74	X 67	X 63	X 62	62
15	57	56	X 56	53	48															X 72	X 73	X 63	62	60
16	62	59	58	51	X 46															X 116	X 56	44	A	A
17	A	A	O X 28	X 32	33															X 68	X 64	X 61	X 60	X 58
18	X 58	56	56	54	X 48															X 71	X 67	61	A	55
19	A	A	A	41	39															X 71	X 75	X 60	X 55	56
20	56	56	56	51	46															X 66	X 68	X 62	64	69
21	64	55	42	42	43															X 65	X 64	62	56	56
22	53	X 50	X 47	48	43															X 94	X 98	45	X 38	39
23	A	A	38	X 38	X 39															X 85	88	74	57	52
24	50	49	44	43	40															X 86	X 67	A	52	A
25	50	X 48	X 48	X 45	X 39															X 92	X 56	X 45	X 45	43
26	39	40	39	A	A															X 63	X 63	62	56	57
27	A	53	47	42	X 43																X 61	55	A	52
28	A	42	41	43	40																X 78	60	55	A
29	50	46	42	42	52								A								X 56	X 50	50	49
30	49	44	42	A	30								Y								60	55	56	54
31	56	X 52	X 49	X 52	38																A	70	70	71
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	28	30	29	30															25	29	29	25	27
MED	54	50	47	44	40															X 74	X 67	61	56	55
U Q	X 57	55	51	48	44															X 88	X 72	X 62	62	60
L Q	50	45	42	41	39															X 67	X 63	55	54	52

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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 40	38	F 37	F 32	F 30	38	51	58	54	V 53	R 59	58	53	58	56	56	56	A	62	66	F 66	F 63	A	F 38
2	F 37	34	35	29	28	39	50	56	56	62	54	U R 54	55	69	75	84	78	67	80	85	56	44	46	42
3	A	34	42	28	25	32	A	A	A	41	A	A	A	A	A	54	55	59	65	71	66	F 55	F 52	F 48
4	F 47	F 48	F 40	F 36	F 36	J R 47	49	48	47	A	A	A	A	A	64	71	77	65	50	59	58	F 52	F 48	F 48
5	F 47	F 46	F 41	F 40	F 37	35	35	R 43	47	A	52	58	A	54	60	74	70	70	62	57	57	54	53	F 54
6	49	51	44	F 26	F 25	42	44	39	R 45	51	A	50	63	63	71	71	58	55	57	66	61	56	54	55
7	52	41	41	39	34	41	51	55	62	70	63	70	U R 65	58	61	70	83	76	79	76	77	59	57	54
8	51	49	50	43	34	46	50	56	54	56	56	58	68	69	74	81	72	67	80	85	62	63	60	F 54
9	62	49	45	39	35	46	56	64	67	52	50	E G 45	55	49	54	63	68	U A 54	56	72	F 62	F 52	F 48	F 47
10	F 46	42	40	38	33	39	61	60	57	66	56	57	R 62	63	U R 56	64	72	80	73	69	59	F 52	F 48	F 46
11	F 43	F 40	F 36	F 36	F 36	50	55	56	57	60	R	50	A	56	64	82	90	77	56	58	62	50	F 44	F 46
12	F 44	V 40	F 36	F 33	33	41	60	66	61	A	A	55	A	67	69	73	79	A	74	85	A	A	A	F 36
13	F 36	38	39	39	34	40	60	61	A	56	A	56	J R 60	64	70	67	67	69	A	A	60	45	A	A
14	F 44	F 48	F 46	47	43	47	54	58	55	50	58	61	62	72	74	A	75	81	73	68	61	Z 55	56	F 51
15	F 51	F 50	50	F 45	F 41	46	54	66	U A 60	A	57	60	A	60	A	A	79	64	61	66	68	57	F 53	F 52
16	F 52	F 53	F 51	F 44	40	45	56	65	72	56	A	54	J R 62	66	69	69	77	79	101	109	50	F 36	A	A
17	A	A	22	26	F 27	34	44	54	A	58	A	68	A	52	50	U R 50	55	58	62	61	58	55	54	52
18	52	F 50	F 49	F 44	42	F 47	A	A	A	A	54	A	56	54	60	67	72	67	61	65	61	F 52	A	F 50
19	A	A	A	F 29	F 28	40	54	60	A	A	A	A	A	73	74	70	66	67	70	65	69	54	50	F 48
20	F 48	F 49	F 48	F 43	F 36	38	A	53	53	A	A	A	60	55	73	81	66	60	58	60	62	R 56	F 58	F 60
21	F 57	F 48	F 37	F 34	F 36	47	56	64	A	A	A	54	51	54	55	61	66	66	58	59	58	F 53	F 48	F 49
22	F 46	44	41	40	F 36	40	50	54	64	62	55	46	52	56	56	60	66	70	76	88	92	37	32	F 31
23	A	A	F 31	32	33	42	46	54	66	A	A	51	A	57	A	A	A	A	A	79	F 81	F 64	F 50	F 44
24	F 43	F 40	F 37	F 35	F 31	39	61	59	61	A	J R 86	R 56	48	A	A	A	72	84	83	79	62	A	F 45	A
25	42	42	42	39	33	42	46	A	A	53	A	A	55	61	A	62	68	68	72	86	50	39	39	F 36
26	F 34	F 32	F 32	A	A	38	44	58	56	57	A	A	52	54	50	57	61	60	55	57	57	F 53	F 49	F 50
27	A	F 44	F 37	F 36	37	42	44	A	A	A	A	52	A	54	54	60	64	65	60	66	55	F 48	A	F 42
28	A	F 35	F 32	F 35	F 32	42	58	58	53	A	A	A	49	A	57	58	55	57	66	72	72	F 54	F 47	A
29	F 43	F 36	F 34	F 34	F 45	33	A	A	A	A	A	A	A	A	50	A	53	68	60	53	50	44	F 42	F 41
30	F 38	F 37	F 34	A	F 24	A	A	A	A	A	A	E G 42	Y	A	A	E G 40	49	50	A	A	F 52	F 48	F 49	F 46
31	F 49	45	43	46	F 32	F 37	A	A	A	A	A	A	A	A	A	A	A	50	61	A	A	F 60	F 60	F 61
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	28	30	29	30	30	25	24	20	16	12	21	18	24	24	25	29	28	28	28	29	29	25	27
MED	F 46	F 43	F 40	F 36	F 34	41	51	58	56	56	56	55	56	58	60	67	68	67	62	67	61	53	F 49	F 48
U Q	51	F 48	44	F 42	36	46	56	60	62	61	58	58	R 62	65	70	72	76	70	74	79	66	56	54	F 52
L Q	F 42	38	F 36	32	F 31	38	46	54	54	52	54	50	52	54	56	59	60	60	59	60	57	48	F 46	F 42

MAY 1995 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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							L	U L 380	U A 412	U A 412	R 440	436	R 440	452	416	420		A	A					
2								L 380	408	L 420	440	R	U R 452	R 448	440	R 424		A	368					
3							A	A	A	A	A	A	A	A	A	R 400	400	360						
4							L	A	408	A	A	A	A	A	428	400	392	L 360						
5								368	408	A	A	U A 440	A	U A 440	U A 440	420	404	L 360	L					
6							348		392	424	A	A	U A 448	U A 444	A	420	U L 412	L	A					
7								U L 424	440	440	A	460	A	A	452	440	412	A						
8							L	A	L 428	U L 448	U L 456	456	R 468	452	440	432	L 420	A	A					
9							U L 380	400	428	436	440	U R 448	440	L	U R 448	U A 440	A	A	A					
10							U L 364	400	U L 468	428	U L 460	L 468	444	440	L 452	432	L 420	A	A					
11						L	L	L 400	L 428	R 448	444	U L 460	A	A	A	428	400	U A 340						
12							L	U A 412	A	A	A	U A 460	A	444	A	U A 440	400	A	A					
13							U A 384	A	A	A	A	464	A	U R 456	A	A	A	A	A					
14						L	L	A	A	U L 436	456	A	464	U A 472	U A 452	A	R 440	L 400	A					
15							L	L 404	A	A	U A 436	468	A	U A 488	A	A	L 420	380	L					
16							L	U A 412	A	444	A	480	U Y 472	U A 484	452	440	A	A						
17							340	U A 412	A	A	A	A	A	444	U R 432	400	400	372	L					
18						A	A	A	A	A	436	A	R 460	U R 440	U A 456	A	400	A						
19							L	404	A	A	A	A	A	448	444	420	412	388						
20						U L 280	A	L 400	U A 420	A	A	A	U A 444	U R 460	432	A	A	A						
21						L	A	A	A	A	A	U A 440	440	440	U A 440	424	400	A						
22							U L 380	400	U A 416	U A 424	440	436	R 440	A	440	U A 420	A	U L 384	312					
23							A	404	A	A	A	A	A	A	A	A	A	A	A					
24						L	A	L 388	L 504	A	A	A	432	A	A	A	A	A						
25							A	A	A	A	A	A	A	U A 440	A	A	384	U A 372						
26							A	A	408	A	A	A	A	U Y 424	R 420	420	392	360						
27						A	A	A	A	A	A	U A 440	A	U A 440	A	A	A	A	A					
28						L	360	372	A	A	A	A	U A 432	A	428	400	380	360	320					
29						L	A	A	A	A	A	A		A	U A 440	A	A	360	U L 300					
30						A	A	A	A	A	A	424	Y	A	A	R 396	384	352	A	A				
31							A	A	A	A	A	A	A	A	A	A	A	U A 364	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						1	7	17	14	11	10	15	14	19	19	20	19	16	3					
MED						U L 280	U 364	400	418	436	440	456	444	U 444	440	420	400	362	312					
U Q							U 380	U A 408	L 428	444	U L 456	464	460	U A 456	452	432	L 412	376	320					
L Q							348	L 384	408	424	440	440	440	U 440	432	410	392	360	U L 300					

MAY 1995 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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						160	224	272	A 320	324	A	A	A	A	R	A 284	296	228	A					
2						B	252	284	304	324	340	A 344	A	A	A	328	288	260	B					
3						156	212	260	300	320	A 336	U A 336	348	344	340	312	264	228	156					
4						156	208	268	296	312	A	R	U A 336	U R 328	R	300	284	252	B					
5						156	H 224	264	284	308	328	A 336	340	A	A	312	276	244	B					
6						B	A	260	300	A 336	U A 340	A	A	A	A	A	272	244	A					
7						168	232	268	296	328	A 336	A	A	A 344	A	324	292	252	B					
8						A	228	272	300	A	A	A	352	348	332	320	288	236	A					
9						A	228	280	300	324	U A 332	U A 356	376	356	336	316	284	232	U A 168					
10						A	224	280	308	A 324	A	A	A	340	R 328	316	296	244	B					
11						A	220	A 272	308	A	U A 344	360	360	352	332	312	292	256	A					
12						152	A 224	A	308	U A 332	A	A	A	352	340	336	292	244	U A 172					
13						A	236	280	U A 308	A	A	A	U A 352	R 356	340	316	284	248	B					
14						168	236	A 288	320	348	A	A	A	A	A	A	A	256	A					
15						A	264	292	A 308	U A 332	A	A	A	A	A	A	A	A	A					
16						A	228	292	320	336	U A 348	A	352	348	352	328	292	A	A					
17						U A 164	216	280	A 312	B	A	A	A	A 356	U R 344	312	280	252	U A 168					
18						A	232	280	A 316	A 332	348	A	U A 352	R 344	336	316	276	A 244	A					
19						A	248	276	A 308	A	A	A 344	A	R	344	324	284	244	160					
20						A	A 236	284	320	A	A	A	A	360	R 336	316	288	248	A					
21						A	A 244	A 272	308	U A 328	U A 348	A	A	A	340	A	A	240	A					
22						A	A	A	A	A	A	A	A	352	336	312	284	244	160					
23						A	228	268	296	A	A 316	A	A	A 336	340	312	288	240	A					
24						A	A	276	300	316	336	A 352	356	352	336	296	288	240	A					
25						A 184	240	U A 272	A	U A 312	U A 324	A	A	A	A 324	332	292	A 256	A					
26						A	A	A 264	A	A	A	A	A	R	R	316	A 288	A	A					
27						A	A 248	A	U A 312	U A 328	U A 336	A	A	A	A	A	A	A	A	B				
28						A	A	A	304	324	A	A	A	A	A	A	A 284	232	168	B				
29						A	240	A 284	A	A 324	U A 336	A		A 344	336	312	280	U A 232	B	B				
30						U A 180	232	264	288	316	328	352	R	348	A 328	304	288	A 236	A	B				
31						A 180	A 232	U A 268	U A 296	U A 316	A	A	A	A	A	A	A	248	A	B				
	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	26	27	27	22	16	8	10	18	19	24	26	27	7					
MED						164	232	272	308	324	A 336	A 348	352	348	336	316	288	244	168					
U Q						A 180	240	280	A 312	A 332	U A 342	A 354	356	352	340	322	292	252	U A 168					
L Q						156	224	268	300	316	A 330	A 340	348	344	332	312	284	236	160					

MAY 1995 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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	J A 50	23	19	24	18	G	28	36	J A 54	J A 49	34	37	36	34	G 31	J A 62	J A 54	68	54	66	J A 51	J A 51	72	J A 43
2	19	16	18	E B 14	17	J A 20	28	31	36	40	38	G 30	36	36	38	37	J A 90	J A 33	42	32	32	32	22	26
3	J A 52	J A 33	J A 32	E B 13	16	24	72	89	J A 67	J A 54	92	J A 82	J A 66	J A 60	58	G	G	29	45	70	J A 86	J A 37	J A 33	E B 14
4	E B 15	J A 20	21	20	E B 14	G	30	J A 49	J A 45	48	J A 90	66	85	70	G	G	G	G	J A 130	93	J A 112	59	60	59
5	J A 40	J A 43	J A 39	22	E B 13	G	G	36	40	J A 53	J A 51	J A 50	J A 68	J A 46	46	G	J A 40	32	19	J A 21	J A 46	J A 34	28	36
6	J A 37	27	24	E B 15	J A 22	44	J A 30	34	38	36	50	J A 48	J A 47	J A 46	62	29	G 25	28	39	J A 35	31	21	35	25
7	24	19	21	E B 13	E B 14	J A 18	27	33	34	40	J A 58	48	59	J A 52	36	38	40	J A 109	60	32	22	22	22	19
8	19	E B 12	E B 15	J A 37	J A 12	20	29	J A 42	34	J A 44	J A 46	39	36	G	40	40	38	J A 56	J A 101	J A 80	J A 54	33	J A 28	J A 46
9	J A 35	J A 26	J A 23	J A 23	18	22	J A 30	34	32	39	36	39	40	43	41	J A 46	J A 79	J A 142	J A 66	J A 65	J A 96	J A 60	J A 52	J A 67
10	J A 48	J A 48	J A 29	J A 34	J A 25	23	29	38	J A 48	J A 40	38	40	42	44	36	G	40	J A 71	J A 89	42	J A 52	J A 64	J A 42	J A 40
11	J A 31	J A 25	27	J A 22	25	J A 26	27	33	37	J A 42	42	42	61	J A 54	J A 56	G	G	J A 42	80	J A 47	J A 52	J A 60	J A 45	J A 34
12	38	J A 32	J A 48	J A 51	J A 22	J A 23	33	J A 43	66	88	92	48	J A 242	40	J A 56	46	38	83	69	J A 118	J A 108	59	J A 65	24
13	28	26	18	29	J A 26	J A 30	J A 41	J A 57	J A 74	J A 77	100	J A 64	65	41	51	J A 59	J A 77	J A 42	81	J A 112	J A 89	J A 86	J A 83	94
14	J A 77	J A 29	18	20	19	G	27	39	44	36	36	J A 54	J A 51	J A 124	70	J A 112	J A 44	30	J A 29	59	J A 53	J A 54	22	J A 67
15	J A 48	J A 28	J A 31	J A 25	30	23	32	33	89	77	J A 51	J A 45	J A 78	J A 49	154	118	J A 36	25	28	J A 20	25	25	27	33
16	25	26	E B 14	E B 16	18	22	32	J A 48	J A 57	45	53	J A 50	48	J A 65	43	40	83	118	J A 52	J A 155	J A 112	J A 32	J A 52	J A 124
17	115	J A 104	J A 27	J A 26	50	39	34	J A 46	74	61	J A 77	J A 104	J A 67	43	42	G 24	G	30	26	37	27	22	28	27
18	19	S 17	18	J A 24	J A 22	49	64	115	J A 63	J A 90	J A 46	J A 103	45	40	46	J A 50	J A 40	J A 51	69	J A 56	58	J A 40	J A 63	J A 74
19	J A 64	J A 101	J A 89	J A 56	J A 51	24	28	J A 54	74	133	91	131	114	G	G	35	J A 44	J A 65	57	J A 50	39	44	J A 61	J A 52
20	J A 50	J A 22	J A 38	J A 50	J A 25	J A 32	J A 118	J A 49	J A 54	J A 61	J A 152	136	45	44	G	J A 57	J A 78	J A 68	J A 47	32	31	J A 27	62	J A 46
21	J A 54	J A 35	J A 46	J A 32	J A 36	J A 27	59	54	J A 84	J A 117	J A 72	53	42	39	44	35	39	J A 55	J A 67	J A 54	J A 51	J A 45	40	30
22	33	39	J A 51	J A 29	J A 41	34	J A 34	34	J A 54	J A 53	J A 43	39	35	J A 50	44	42	J A 56	J A 38	J A 50	57	J A 48	25	J A 48	J A 45
23	52	50	J A 43	31	19	J A 28	J A 41	164	J A 57	117	J A 98	J A 63	57	87	J A 96	86	184	J A 168	132	J A 128	J A 110	J A 63	J A 51	50
24	J A 48	41	J A 22	28	22	J A 27	J A 40	J A 41	J A 51	J A 122	86	56	42	J A 60	84	J A 101	J A 89	J A 136	159	J A 109	J A 80	71	J A 53	74
25	J A 36	28	J A 22	J A 27	J A 34	24	J A 48	J A 77	60	J A 55	80	75	J A 66	J A 46	J A 104	J A 56	J A 68	J A 48	50	J A 47	39	J A E B 23	15	51
26	30	J A 32	J A 29	J A 40	J A 42	J A 28	J A 50	J A 46	J A 53	J A 52	85	82	47	G 34	G 31	G	38	J A 48	J A 46	41	J A 21	J A 39	60	J A 54
27	68	J A 42	J A 35	J A 52	J A 36	34	J A 43	68	72	J A 83	J A 80	J A 76	63	J A 46	60	J A 60	J A 58	J A 52	J A 47	J A 23	J A 74	J A 49	59	J A 66
28	J A 84	J A 41	40	36	J A 33	26	30	35	60	J A 76	J A 83	J A 64	58	62	J A 44	J A 42	32	26	26	J A 54	J A 48	J A 47	J A 50	J A 74
29	61	J A 35	J A 41	43	J A 22	J A 22	J A 61	84	91	J A 65	55	82	J A 65	72	J A 110	62	59	J A 39	J A 26	J A 35	E B 15	J A 34	27	28
30	J A 40	J A 30	J A 45	50	J A 25	42	73	58	J A 54	J A 64	J A 42	37	G	J A 70	J A 87	38	G	40	166	J A 119	59	J A 62	54	J A 52
31	J A 45	26	18	S 22	J A 42	J A 29	83	J A 136	J A 87	73	J A 76	123	92	J A 158	J A 97	81	59	J A 42	J A 53	94	112	J A 59	59	J A 50
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A 40	J A 29	J A 27	27	J A 22	24	33	46	54	J A 55	J A 58	54	57	46	46	42	40	J A 48	53	J A 54	J A 52	J A 44	50	J A 46
U Q	J A 52	J A 41	J A 40	J A 37	J A 34	30	50	58	72	J A 77	86	82	J A 66	62	J A 70	60	J A 68	J A 68	80	J A 93	J A 86	J A 59	60	J A 66
L Q	30	25	19	E B 22	18	22	29	35	44	44	43	42	42	40	G 38	G 29	G 36	32	42	J A 35	32	32	28	30

MAY 1995 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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	15	16	E B 13	E B 14	E B 13	G	25	31	41	41	34	U Y 37	35	U Y 34	U G 30	35	49	A A 68	46	26	20	31	A A 72	21
2	E B 14	E B 13	E B 12	E B 14	16	E B 17	G	30	36	38	36	G 29	36	36	37	35	53	G 22	26	E B 16	32	21	17	17
3	A A 52	21	E B 14	E B 13	E B 13	20	A A 72	A A 89	A A 67	36	A A 92	A A 82	A A 66	A A 60	A A 58	G	G	25	34	62	56	18	17	E B 14
4	E B 15	E B 14	16	16	E B 14	G	28	40	39	A A 48	A A 90	A A 66	A A 85	A A 70	G	G	G	G	27	33	25	24	17	44
5	22	26	24	E B 13	E B 13	G	G	34	36	A A 53	49	44	A A 68	44	44	G	32	28	18	18	17	17	E B 15	18
6	E B 15	16	23	E B 15	16	34	29	30	34	35	A A 50	47	45	44	56	U Y 29	G 22	26	31	25	22	16	29	17
7	E B 15	E B 14	16	E B 13	E B 14	G 11	G	32	34	U Y 40	55	42	48	47	36	36	38	43	50	21	17	E B 14	16	16
8	E B 13	E B 12	E B 15	23	E B 14	17	G	41	32	36	38	35	G 32	G	U Y 39	38	36	41	42	50	18	23	18	28
9	21	19	E B 14	17	16	17	26	30	U Y 32	36	35	38	U Y 40	41	U Y 40	44	41	U A 44	31	19	28	39	20	17
10	16	E B 14	E B 14	E B 15	18	18	26	32	41	39	38	39	38	42	36	G	35	44	64	34	28	36	20	26
11	20	16	16	15	16	19	26	32	36	40	40	40	A A 61	51	56	G	G	34	42	29	18	36	18	20
12	17	20	18	16	17	18	31	41	57	A A 88	A A 92	46	A A 242	39	54	44	34	A A 83	60	62	A A 108	A A 59	A A 65	17
13	17	19	E B 14	18	16	21	38	51	A A 74	49	A A 100	44	56	40	50	56	64	38	A A 81	A A 112	30	23	A A 83	A A 94
14	18	19	14	E B 14	E B 14	G	26	39	42	G 34	36	49	44	47	45	A A 112	34	28	26	55	29	18	E B 14	18
15	27	19	20	19	20	21	30	33	U A 47	A A 77	44	43	A A 78	49	A A 154	A A 118	36	25	20	E B 14	18	E B 14	19	E B 14
16	16	16	E B 14	E B 16	E B 14	20	31	41	54	42	A A 53	44	U Y 48	48	40	37	62	65	34	55	32	19	A A 52	A A 124
17	A A 115	A A 104	18	22	23	25	27	41	A A 74	55	A A 77	49	A A 67	41	38	G 23	G	29	22	21	18	E B 14	E B 15	E B 15
18	E B 12	E B 13	E B 14	17	17	40	A A 64	A A 115	A A 63	A A 90	36	A A 103	39	U Y 39	46	48	36	46	46	35	26	23	A A 63	45
19	A A 64	A A 101	A A 89	19	E B 14	20	25	38	A A 74	A A 133	A A 91	A A 131	A A 114	G	G	34	34	30	22	26	20	40	40	26
20	18	18	20	22	16	22	A A 118	35	42	A A 61	A A 152	A A 136	44	39	G	47	54	53	44	18	21	E B 13	44	28
21	23	19	23	22	18	20	44	54	A A 84	A A 117	A A 72	44	42	39	44	35	36	54	46	23	17	25	28	16
22	22	28	16	20	23	20	24	30	42	42	40	38	35	44	40	42	56	36	28	43	E B 14	17	17	19
23	A A 52	A A 50	18	20	E B 13	19	37	30	54	A A 117	A A 98	47	A A 57	47	A A 96	A A 86	A A 184	A A 168	A A 132	43	32	46	18	16
24	18	23	18	17	E B 15	19	37	36	47	A A 122	81	51	40	A A 60	A A 84	A A 101	62	54	64	29	50	A A 71	35	A A 74
25	27	17	E B 12	E B 14	E B 14	20	31	A A 77	A A 60	46	A A 80	A A 75	48	44	A A 104	48	34	37	43	34	32	18	E B 15	26
26	E B 14	20	22	A A 40	A A 42	24	34	44	35	47	A A 85	A A 82	46	U G 34	U G 31	G	35	32	22	22	16	22	37	27
27	A A 68	22	26	21	20	31	41	A A 68	A A 72	A A 83	A A 80	44	A A 63	44	48	51	52	44	35	18	30	20	A A 59	31
28	A A 84	18	24	E B 14	E B 13	24	28	30	51	A A 76	A A 83	A A 64	43	A A 62	36	35	30	26	24	44	22	21	36	A A 74
29	33	20	23	24	E B 14	20	A A 61	A A 84	A A 91	A A 65	A A 55	A A 82	A A 65	A A 72	44	A A 62	47	34	22	30	E B 15	20	18	18
30	32	20	26	A A 50	15	A A 42	A A 73	A A 58	A A 54	A A 64	A A 42	37	G	A A 70	A A 87	36	G	33	A A 166	A A 119	36	32	44	24
31	30	14	E B 12	E S 18	26	23	A A 83	A A 136	A A 87	A A 73	A A 76	A A 123	A A 92	A A 158	A A 97	A A 81	A A 59	36	49	A A 94	A A 112	48	47	44
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	20	19	16	17	16	20	30	39	47	49	A A 55	46	48	44	44	37	36	36	35	30	25	22	20	21
U Q	A A 32	21	23	21	18	23	A A 41	A A 54	A A 67	A A 77	A A 85	A A 75	A A 66	A A 51	A A 56	A A 51	53	46	49	50	32	36	A A 44	31
L Q	E B 15	E B 16	E B 14	E B 14	E B 14	G 17	26	32	36	40	40	40	40	39	G 36	G 29	G 32	28	26	21	18	18	17	17

MAY 1995 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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	13	14	13	15	15	16	15	16	14	16	17	21	16	16	16	14	14	16	15	15	16	15
2	14	13	12	14	13	17	14	14	16	17	18	18	20	17	16	14	14	14	15	16	15	14	14	15
3	15	15	14	13	13	12	14	14	15	16	20	16	16	17	22	16	14	14	13	15	14	14	14	14
4	15	14	12	13	14	12	16	14	14	17	31	22	21	24	21	16	15	14	16	15	14	14	14	14
5	16	15	14	13	13	14	15	14	17	15	20	16	18	22	24	17	14	14	14	15	15	14	15	15
6	15	14	15	15	14	13	15	15	14	15	19	18	18	17	17	14	15	13	15	16	15	13	15	14
7	15	14	14	13	14	14	15	14	14	16	17	18	18	27	16	17	14	16	15	13	13	14	13	13
8	13	12	15	14	14	15	16	15	14	17	17	24	22	16	16	16	15	15	14	16	16	16	13	13
9	15	14	14	12	14	15	13	14	19	16	15	21	20	20	17	16	14	14	13	14	14	15	15	16
10	14	14	14	15	14	14	14	15	15	15	17	18	17	19	18	16	16	15	14	17	14	14	14	14
11	15	14	12	14	12	12	13	15	19	20	19	20	30	23	19	15	15	13	15	16	15	14	15	14
12	16	13	13	12	14	12	15	14	16	16	18	18	14	21	18	15	15	14	14	14	15	14	16	14
13	13	15	14	14	12	16	14	14	16	14	21	26	17	20	21	17	13	15	16	14	14	13	14	14
14	14	14	12	14	14	13	15	14	16	20	16	21	21	19	20	16	15	14	13	15	14	14	14	15
15	14	12	13	13	15	15	14	14	15	15	17	18	22	18	19	15	14	14	12	14	14	14	13	14
16	12	13	14	16	14	15	16	13	15	18	17	20	17	19	15	16	14	15	14	15	15	14	14	14
17	14	15	14	15	13	13	15	15	14	34	28	23	27	19	18	17	17	14	14	15	15	14	15	15
18	12	13	14	13	12	12	13	15	17	16	20	18	18	20	19	19	16	15	13	15	15	14	12	13
19	15	13	14	14	14	15	14	14	14	16	18	22	19	21	19	16	15	14	12	14	15	13	12	16
20	13	13	12	14	13	14	16	15	16	18	18	17	24	22	19	17	14	14	13	15	14	13	13	14
21	13	13	14	12	14	13	14	14	15	17	18	16	18	21	21	16	15	16	14	16	16	15	15	15
22	14	14	14	13	14	13	14	14	15	18	18	20	18	20	22	17	15	13	12	15	14	14	14	15
23	15	13	15	15	13	15	14	15	14	17	18	20	17	20	16	16	15	14	15	16	14	15	15	12
24	15	14	15	16	15	12	14	14	14	15	16	20	24	18	19	15	14	15	13	15	16	15	16	14
25	14	13	12	14	14	15	14	15	19	14	18	18	16	16	18	16	14	13	16	15	16	13	15	14
26	14	16	14	14	15	14	16	14	15	17	18	20	20	18	17	18	14	14	14	16	14	13	14	13
27	14	13	14	13	14	12	14	15	14	16	16	16	17	18	19	18	14	13	13	13	13	14	14	15
28	14	16	14	14	13	16	14	14	14	14	14	18	24	20	17	16	15	14	12	15	14	16	13	15
29	14	14	12	13	14	15	14	13	15	15	16	22	33	17	18	14	15	14	16	14	15	14	14	12
30	14	12	14	13	13	13	16	14	14	17	16	32	27	16	16	14	15	14	13	15	14	15	15	13
31	14	14	12	E S 18	14	14	15	15	16	15	15	27	22	23	18	16	17	14	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	31	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	14	14	14	14	15	16	18	20	19	20	18	16	15	14	14	15	14	14	14	14
U Q	15	14	14	14	14	15	15	15	16	17	19	22	22	21	19	17	15	15	15	16	15	15	15	15
L Q	14	13	12	13	13	13	14	14	14	15	16	18	17	18	17	15	14	14	13	14	14	14	14	14

MAY 1995 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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 316	308	F 329	F 338	F 304	341	352	367	354	V 320	R 331	355	301	317	337	317	327	A	312	323	F 319	F 348	A	F 322
2	F 307	312	332	333	315	359	362	348	347	350	330	U R 265	277	285	303	299	317	293	314	349	326	307	302	288
3	A	300	363	372	332	331	A	A	A	367	A	A	A	A	A	294	295	291	306	A 304	A 312	F 310	F 298	F 296
4	F 308	F 341	F 305	F 308	F 316	J R 370	360	320	317	A	A	A	A	A	275	293	321	322	302	310	314	F 333	F 295	F 290
5	F 304	F 294	F 297	F 315	F 324	348	362	294	313	A	307	319	A	287	281	314	305	327	339	306	305	288	277	F 293
6	284	318	354	F 308	F 303	351	321	368	R 280	332	A	273	310	293	313	329	324	330	320	314	307	296	284	306
7	325	313	299	317	315	344	327	318	312	338	341	326	U R 324	307	304	301	320	312	306	310	322	290	290	304
8	297	297	319	334	342	365	367	346	344	314	311	296	293	295	297	314	318	299	308	333	317	290	292	F 291
9	322	294	303	316	293	325	331	322	370	317	284	G	303	301	281	307	336	A	301	330	F 321	F 329	F 308	F 314
10	F 305	300	324	323	307	317	329	340	314	337	304	303	R 329	307	U R 309	308	308	329	A 327	335	353	F 315	F 315	F 307
11	F 309	F 307	F 294	F 301	F 309	348	362	359	364	323	R	284	A	A 293	288	304	334	339	325	314	325	346	F 309	F 311
12	F 303	V 312	F 337	F 302	307	310	334	341	A 347	A	A	310	A	313	307	308	324	A	296	328	A	A	A	F 306
13	F 312	294	326	335	330	314	340	369	A	341	A	310	J R 269	302	312	315	A 315	332	A	A	331	303	A	A
14	F 285	F 297	F 309	326	329	351	346	345	357	329	301	308	293	299	308	A	313	315	312	319	310	Z 318	301	F 314
15	F 289	F 298	327	F 316	F 306	344	341	361	A	A	323	308	A	291	A	A	333	337	310	314	327	301	F 284	F 309
16	F 304	F 309	F 325	F 341	331	346	348	355	366	358	A	274	J R 296	305	296	278	271	A	323	352	346	F 277	A	A
17	A	A	401	316	F 354	308	254	281	A	A	A	309	A	274	270	U R 264	278	277	321	306	285	284	287	286
18	293	F 284	F 323	F 307	315	F 300	A	A	A	A	300	A	301	291	304	302	324	325	316	315	327	F 297	A	A 289
19	A	A	A	F 345	F 321	325	320	343	A	A	A	A	A	299	301	302	311	303	312	308	316	318	285	F 292
20	F 291	F 308	F 292	F 287	F 289	295	A	313	350	A	A	A	321	283	307	308	325	318	327	302	285	R 315	F 288	F 299
21	F 322	F 304	F 313	F 296	F 309	343	327	341	A	A	A	319	290	288	294	303	309	331	317	312	313	F 300	F 307	F 307
22	F 310	304	310	334	F 332	342	326	326	340	347	348	222	293	296	298	299	304	287	300	317	380	320	301	F 313
23	A	A	F 328	329	354	343	306	319	335	A	A	A 279	A	297	A	A	A	A	A	290	F 327	F 324	F 319	F 315
24	F 298	F 310	F 337	F 331	F 304	304	362	317	263	A	J R 332	R 301	279	A	A	A	278	312	310	329	352	A	F 271	A
25	303	291	331	323	303	323	335	A	A	351	A	A	305	309	A	304	312	307	307	348	362	303	300	F 275
26	F 301	F 296	F 294	A	A	343	314	329	346	324	A	A	296	302	294	306	327	331	322	309	310	F 318	F 307	F 283
27	A	F 327	F 307	F 324	331	348	A 335	A	A	A	A	312	A	303	306	308	316	337	304	328	336	F 315	A	F 318
28	A	F 307	F 322	F 332	F 351	311	361	366	A	A	A	A	290	A	302	318	304	311	306	324	346	F 316	F 301	A
29	F 302	F 315	F 309	F 321	F 358	376	A	A	A	A	A	A	A	A	284	A	279	319	347	329	329	314	F 283	F 308
30	F 315	F 298	F 304	A	F 324	A	A	A	A	A	A	G	Y	A	A	G	280	288	A	A	F 310	F 292	A 311	F 289
31	F 313	307	283	315	F 336	F 319	A	A	A	A	A	A	A	A	A	A	A	280	295	A	A	F 307	F 299	F 305
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	28	30	29	30	30	25	24	18	15	12	21	18	24	24	25	29	26	28	28	29	29	25	27
MED	F 304	F 306	F 320	F 323	F 318	342	335	341	345	337	317	303	296	298	302	304	315	316	312	316	322	310	F 299	F 305
U Q	F 312	311	329	334	F 332	348	360	357	354	350	332	311	305	304	307	311	324	330	322	329	334	F 318	F 307	F 311
L Q	F 298	297	F 304	F 312	F 307	317	326	320	314	323	302	274	290	291	291	299	304	299	306	310	311	296	286	F 290

MAY 1995 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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							L	U L 383	A	A	R 395	422	R 404	371	379	361	A	A						
2								L 379	402	A	383	R	U R 383	R 361	363	R 364	A	350						
3							A	A	A	A	A	A	A	A	A	R 375	334	H 328						
4							L	A	A	A	A	A	A	A	365	379	353	L 357						
5								A 356	A 373	A	A	A	A	A	A	351	348	L 350	L					
6							350		379	387	A	A	A	A	A	374	H 356	L	A					
7								U L 364	361	370	A	375	A	A	367	339	A 358	A						
8							L	A	L 372	U L 389	U L 378	373	R 376	366	Y 355	A 353	A 353	A	A					
9							U L 358	370	H 361	400	394	U R 379	Y	L	Y	A	A	A	A					
10							U L 370	371	A 338	A	U L 379	L 377	392	A 356	L 364	365	L 348	A	A					
11						L	L	L 370	L 384	R 387	A 343	U L 365	A	A	A	370	H 367	A						
12							L	A	A	A	A	A	A	394	A	A	A 361	A	A					
13							A	A	A	A	A	A	A	U R 364	A	A	A	A	A					
14						L	L	A	A	U L 381	403	A	A 327	A	A	A	R 349	L 334	A					
15							L	L 384	A	A	A	A	A	A	A	A	L 363	359	L					
16							L	A	A	A	A	A 330	Y	A	377	364	A	A						
17							A 271	A	A	A	A	A	A	A	U R 378	398	342	331	L					
18						A	A	A	A	A	377	A	R 372	A	A	A	A 368	A						
19							L	396	A	A	A	A	A	372	367	369	363	334						
20						U L 361	A	A 348	A	A	A	A	A	U R 366	374	A	A	A						
21						L	A	A	A	A	A	A	A	375	A	366	377	A						
22							U L 344	393	A	A	A 369	418	R 407	A	A 342	A	A	A	A					
23							A	374	A	A	A	A	A	A	A	A	A	A	A					
24						L	A	A 386	A	A	A	A	A 361	A	A	A	A	A						
25							A	A	A	A	A	A	A	A	A	A	388	A						
26							A	A	371	A	A	A	A	Y	R 386	356	360	370						
27						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
28						L	368	398	A	A	A	A	A	A	381	371	384	359	348					
29						L	A	A	A	A	A	A		A	A	A	A	A	U L 379					
30						A	A	A	A	A	A	408	Y	A	A	R 339	346	A	A	A				
31							A	A	A	A	A	A	A	A	A	A	A	A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	6	14	9	6	9	9	8	9	13	17	19	10	2					
MED						U L 361	354	376	372	387	379	377	R 380	366	367	365	358	350	364					
U Q							368	386	382	389	394	413	R 398	374	378	372	367	359						
L Q							344	370	361	381	A 373	369	A 366	R 362	364	354	348	334						

MAY 1995 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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							250	250	280	318	310	286	384	332	304	320	A 318	A						
2								264	266	276	316	496	430	354	308	316	A 286	306						
3							A	A	A	A 258	A	A	A	A	A	364	364	338						
4							256	A 324	348	A	A	A	A	A	370	326	286	286						
5								370	360	A	A	330	A	390	388	298	308	274	246					
6							312		458	322	A	A	336	364	316	286	290	286	270					
7								300	322	282	A 284	304	310	348	344	324	278	282						
8							234	278	282	336	328	378	352	348	338	292	290	314	E A 278					
9							290	290	248	336	422	G	374	392	412	328	272	A	A 314					
10							260	268	318	276	340	368	302	328	352	324	310	278	A					
11						258	240	260	256	330	350	L	A	A	A 384	306	260	256						
12							260	272	A	A	A	350	A	330	328	316	280	A	E A 326					
13							268	244	A	A 296	A	346	A	348	310	E A 314	A	272	A					
14						266	258	268	246	300	358	350	364	336	314	A	296	276	246					
15							256	246	A	A	314	358	A	384	A	A	274	258	282					
16							260	260	250	268	A	442	344	334	338	360	E A 376	A						
17							486	376	A	A	A	320	A	446	476	460	400	354	272					
18						A	A	A	A	A	378	A	366	414	352	332	282	284						
19							274	266	A	A	A	A	A	322	320	318	310	316						
20						344	A	318	274	A	A	A	322	430	322	288	A 288	A						
21						262	306	E A 278	A	A	A	342	416	400	372	340	314	E A 284						
22							310	300	276	272	278	690	394	372	362	348	E A 338	326	292					
23							E A 328	316	280	A	A	A	A	376	A	A	A	A	A					
24						U L 314	240	284	446	A	A	A	434	A	A	A	E A 396	296						
25							A 270	A	A	288	A	A	366	334	A	338	296	298						
26							E A 312	276	284	A 308	A	A	388	370	398	340	296	284						
27						272	A	A	A	A	A	344	A	374	A 366	A 332	A 308	260	290					
28						290	248	234	A	A	A	A	422	A	364	330	346	314	294					
29						238	A	A	A	A	A	A		A	406	A	A	286	248					
30						A	A	A	A	A	A	G	Y	A	A	G	408	374	A	A				
31							A	A	A	A	A	A	A	A	A	A	A	388	E A 336	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						8	21	23	17	15	11	17	17	23	24	25	27	25	13					
MED						269	260	274	280	296	328	350	366	364	352	326	293	286	277					
U Q						302	308	300	335	322	358	469	405	390	378	340	338	315	A 304					
L Q						260	253	260	261	276	310	336	340	334	321	315	286	277	259					

MAY 1995 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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	270	278	268	256	278	238	236	A 254	A	A	204	192	206	H 182	224	240	A	A	A	260	254	236	A	A 270
2	274	278	252	244	272	230	236	222	220	A 198	Y	206	228	A 236	228	A	A 262	260	222	A 226	A 276	280	306	
3	A 326	A 224	216	258	254	A	A	A	A	A	A	A	A	A	224	234	228	H E 278	A	A	A	278	294	308
4	294	234	266	264	250	242	248	A	A	A	A	A	A	A	226	212	232	232	A 286	A 286	274	A 278	A 298	A
5	318	314	A 348	262	258	234	236	A	E A 250	A	A	A	A	A	A	234	A 246	A 246	244	260	260	286	A 326	292
6	296	266	228	280	316	E A 276	246	220	222	216	A	A	A	A	A	230	H 210	254	A	262	250	276	A 330	258
7	238	240	280	254	254	238	244	236	222	236	A	A 236	A	A	230	252	A	A	A	252	234	232	278	258
8	282	280	240	242	236	230	226	A	216	202	198	216	228	220	Y	A	E A 268	A	A	A 246	252	284	286	A 308
9	256	276	264	256	298	248	244	236	H 232	202	H 194	234	Y	A	Y	A	A	A	A	248	A 266	A 284	274	278
10	268	286	268	244	302	262	246	244	A	A	220	214	204	A	222	224	A 260	A	A	238	238	A 290	276	292
11	276	280	298	286	290	228	232	210	214	234	A	A 254	A	A	A	H 194	H 200	A	A	A 270	246	A 254	270	280
12	274	282	264	284	292	250	A 250	A	A	A	A	A	A	220	A	A	A 246	A	A	A 278	A	A	A	286
13	298	290	244	230	254	268	A	A	A	A	A	A	A	A 254	A	A	A	A	A	A	232	264	A	A
14	300	286	262	242	226	240	234	A	A	210	196	A	A	A	A	A	A 232	230	A	E A 288	A 274	250	252	288
15	326	286	254	252	280	230	236	232	A	A	A	A	A	A	A	A	A 258	218	254	250	236	248	312	288
16	282	276	240	224	240	242	242	A	A	A	A	A	A	A	232	240	A	A	254	A 242	A 242	340	A	A
17	A	A 228		A	A 296	E A 274	A	A	A	A	A	A	A	A	240	212	238	254	270	262	274	294	268	288
18	284	290	254	270	240	A	A	A	A	A	226	A	A 236	A	A	A	A	A	A	A 268	248	292	A	A
19	A	A	A	242	286	258	238	A 244	A	A	A	A	A	232	222	224	A 242	A 252	268	262	248	E A 272	A	A 338
20	306	278	288	298	316	A 268	A	E A 280	A	A	A	A	A	232	202	A	A	A	E A 264	270	258	268	A	308
21	250	256	A 286	A 290	276	264	A	A	A	A	A	A	A	236	A	226	A 260	A	A	A 272	248	300	A 310	278
22	A 286	A 312	284	254	A 280	240	228	216	A	A	A	H 184	H 194	A	A	A	A	A	A	A 256	208	216	272	A 338
23	A	A	A 282	A 284	242	246	A	210	A	A	A	A	A	A	A	A	A	A	A	A 290	262	A	252	266
24	290	304	262	256	298	250	A	A	A	A	A	A	A	A	A	A	A	A	A	242	A 242	A	E A 400	A
25	A 318	292	248	254	300	246	A	A	A	A	A	A	A	A	A	A	A 240	A	A	228	A 222	266	294	A
26	320	338	338	A	A	A 260	A	A	A 234	A	A	A	A	240	242	236	234	A 256	256	262	248	284	A	A 338
27	A	A 282	A 320	254	260	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A 234	A 242	266	A	A 328
28	A	274	A 324	258	246	A 260	234	212	A	A	A	A	A	A	A 232	A 244	226	248	A E 242	A 268	236	268	E A 342	A
29	A	A 318	A 334	A 322	206	192	A	A	A	A	A	A	A	A	A	A	A	A	218	A 248	232	272	306	292
30	A	A 324	A 314	A	A 278	A	A	A	A	A	A	220	Y	A	A	A	224	A	A	A	E A 312	A 338	A	A 352
31	A 306	274	284	276	A 288	A 274	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E A 342	A 338
	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	28	30	28	30	28	17	13	8	6	7	8	6	9	11	15	17	11	12	27	28	27	21	24
MED	286	282	267	256	277	246	236	227	222	213	198	218	206	232	230	228	A 236	248	256	258	248	276	286	292
U Q	306	298	A 288	278	292	A 261	245	A 244	A 233	234	220	A 235	228	238	236	240	A 252	A 254	269	A 270	259	286	A 319	A 318
L Q	274	276	252	244	250	238	234	214	218	202	196	203	204	220	222	224	229	230	249	246	236	264	273	279

MAY 1995 h'F (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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						156	120	116	114	112	A	A	108	A	A	114	A 128	132	A					
2						B	126	110	110	110	120	A 120	110	110	A	110	110	A 130	B					
3						150	116	112	114	114	112	108	110	112	120	118	118	116	122					
4						132	130	112	120	110	A	114	112	120	118	114	116	116	B					
5						B 162	118	110	112	108	110	110	110	114	122	116	116	116	B					
6						B	A	112	112	114	114	114	110	110	110	A	A 124	120	122					
7						140	124	112	110	108	110	110	A	122	110	112	114	114	B					
8						A	116	112	106	A	110	A	A 128	106	112	106	112	110	A					
9						A	122	114	114	108	108	114	114	110	118	114	118	120	118					
10						A	118	A 124	112	108	108	110	114	110	114	114	114	118	B					
11						A	132	A	118	112	112	116	B 126	116	116	116	114	120	A					
12						B 140	A	A	112	110	110	110	106	112	116	116	114	116	128					
13						A	116	114	116	110	A	112	114	A	A 130	116	114	114	B					
14						114	120	A	A 124	A 144	A	116	110	A	A	A	114	112	114					
15						A	132	120	110	112	112	112	114	114	A	108	A	A	A					
16						A	A 132	112	112	112	110	A	116	114	124	114	114	A	A					
17						128	114	110	112	B	A	A	A	A	112	116	116	112	126					
18						130	114	114	110	110	116	112	112	110	114	112	120	116	A					
19						A	116	110	108	112	108	114	112	118	112	112	114	112	120					
20						A	116	114	112	112	112	112	A	114	114	116	114	114	A					
21						A	114	110	110	112	110	112	112	A	116	112	A	124	A					
22						A	A	A	A	108	A	A	A	116	116	116	112	116	B 120					
23						A	114	112	110	110	108	110	114	114	114	114	112	112	A					
24						A	116	112	110	108	112	112	112	114	114	108	118	118	A					
25						132	116	112	112	112	112	110	A	A	110	114	112	114	A					
26						A	A 110		A	A	A	A	A	A	A	112	110	A	A					
27						A	120	112	106	110	108	110	114	114	110	A	A	A	A	B				
28						A	116	114	112	108	112	108	112	110	A	A	A	A 136	A 124	B				
29						A	122	108	112	112	112	116		112	112	108	112	114	B	B				
30						130	134	114	108	108	110	B 124	126	112	114	114	114	116	A	B				
31						122	118	116	114	108	110	A	A	110	A	A	A	114	A	B				
	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	27	27	29	28	24	24	23	24	24	26	26	27	9					
MED						132	118	112	112	110	110	112	112	113	114	114	114	116	122					
U Q						145	124	114	114	112	112	114	114	114	117	116	116	120	125					
L Q						129	116	110	110	108	110	110	110	110	112	112	112	114	119					

MAY 1995 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 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	122	108	106	108	110	G	148	128	116	116	120	118	120	114	114	114	128	120	114	108	122	108	116	108
2	112	112	116	B	114	154	146	148	128	124	136	110	118	124	120	154	114	114	110	110	112	112	124	118
3	110	110	128	B	118	150	126	124	120	122	114	112	124	124	126	G	G	132	118	116	116	116	114	B
4	B	110	110	130	B	G	130	124	122	124	116	112	112	114	G	G	G	G	110	108	110	112	118	114
5	108	110	112	112	B	G	G	128	126	116	116	122	114	118	122	G	120	116	118	116	122	110	112	112
6	114	106	112	B	158	126	128	126	126	124	112	108	106	106	106	108	110	138	120	110	110	114	108	114
7	114	114	106	B	B	106	136	124	126	118	110	112	110	114	128	144	124	116	112	112	120	116	120	118
8	114	B	B	108	S	130	124	116	122	114	112	110	106	G	132	136	122	114	110	112	110	108	108	106
9	104	104	102	102	100	126	122	120	126	116	120	124	156	142	138	130	122	114	114	116	112	110	108	108
10	110	106	108	108	106	138	134	122	116	116	118	120	120	122	180	G	132	116	110	110	108	110	112	106
11	104	104	106	100	110	110	144	132	126	118	112	126	118	116	118	G	G	122	114	112	116	114	114	114
12	106	106	122	106	110	118	126	116	114	110	108	110	102	136	124	128	128	114	118	142	116	114	112	106
13	106	104	108	100	100	122	116	112	106	108	102	110	112	160	130	120	116	118	114	110	114	114	112	108
14	108	106	112	110	112	G	158	138	130	114	114	114	110	114	108	114	120	124	116	110	114	112	112	108
15	100	100	102	100	104	148	138	132	110	110	112	114	106	114	106	106	108	110	102	114	108	104	116	110
16	106	110	B	B	100	140	130	120	114	112	114	120	120	118	162	164	116	106	110	112	112	114	112	110
17	108	104	118	146	130	124	120	114	110	112	108	108	108	144	132	108	G	136	122	114	114	116	110	108
18	114	124	132	108	134	122	120	114	114	112	118	108	120	134	122	114	120	110	110	106	100	114	110	110
19	106	104	100	104	108	118	142	112	108	108	108	106	108	G	G	144	120	114	112	106	110	106	110	110
20	106	108	104	104	110	118	114	122	114	112	110	110	128	130	G	124	120	114	114	112	112	128	114	112
21	106	116	108	104	106	124	118	118	112	108	110	110	114	116	130	112	134	116	112	114	112	112	108	110
22	108	106	106	104	106	108	106	112	110	106	108	110	116	124	130	122	114	118	114	108	112	110	114	106
23	106	106	106	98	104	114	116	110	112	108	108	112	116	112	120	118	112	110	110	116	112	108	106	106
24	108	106	110	108	122	114	110	118	116	114	108	118	140	136	122	116	118	116	136	112	112	110	108	108
25	104	106	106	120	104	136	116	112	110	112	112	108	106	126	110	116	114	114	110	108	110	110	B	106
26	108	102	106	102	100	108	110	114	110	108	104	102	110	110	110	G	114	112	110	110	114	112	110	110
27	108	104	102	118	124	130	120	110	110	108	110	112	108	108	104	102	104	106	104	110	114	114	112	112
28	110	112	104	126	110	124	124	122	116	112	114	110	108	108	112	112	142	126	120	114	114	114	110	108
29	106	102	100	100	112	140	120	116	114	114	114	108	108	122	116	118	116	112	110	104	B	112	110	110
30	106	104	102	106	124	130	124	118	118	114	120	130	G	120	114	124	G	116	106	104	114	110	108	106
31	100	104	108	128	118	122	116	108	110	110	108	106	106	116	116	106	108	120	112	118	114	110	110	110
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	26	27	27	30	31	31	31	31	31	30	29	28	25	26	30	31	31	30	31	30	30
MED	108	106	106	107	110	124	124	118	114	112	112	110	112	118	121	118	119	116	112	112	112	112	112	110
U Q	110	110	112	112	118	136	134	124	122	116	116	118	120	128	130	129	122	120	116	114	114	114	114	112
L Q	106	104	104	102	104	118	116	114	110	110	108	108	108	114	113	112	114	114	110	108	110	110	110	108

IONOSPHERIC DATA STATION Kokubunji

MAY 1995 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

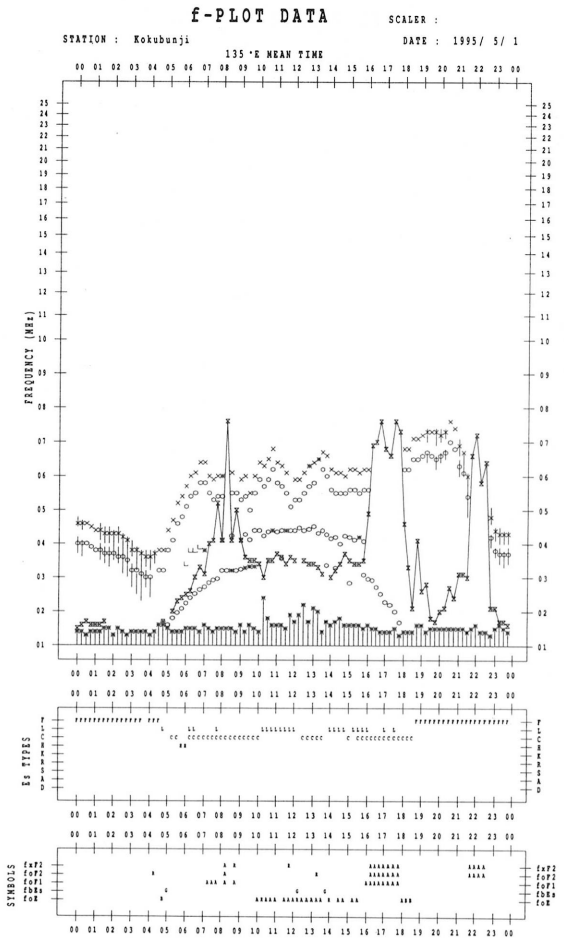
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

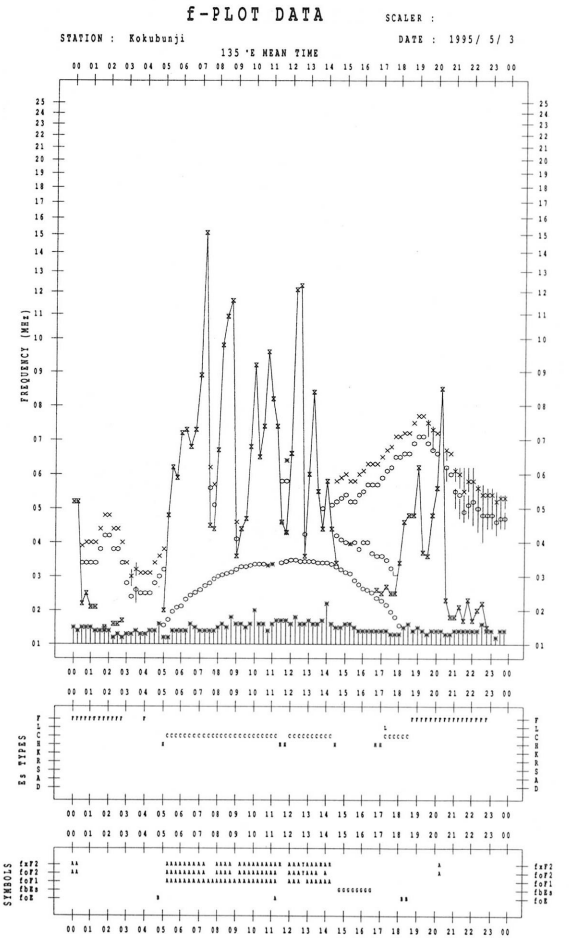
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	FF 21	F 1	F 1	F 1	F 1		H 1	C 1	C 2	C 2	C 1	L 1	L 1	C 1	L 1	C 1	CL 21	CL 41	C 6	F 4	FF 13	FF 22	FF 53	F 4
2	F 1	F 1	F 1		F 1	HL 11	C 1	H 1	C 1	C 1	HL 11	L 1	C 1	C 1	CL 11	H 1	C 3	L 2	L 4	FF 21	F 5	F 2	F 1	F 2
3	F 4	F 4	F 1		F 1	H 1	C 3	C 4	C 3	C 1	C 2	C 2	C 2	C 2	C 2			H 1	C 4	F 5	F 4	F 4	F 3	
4		F 1	F 2	FF 11			C 2	C 2	CL 21	C 2	C 2	C 3	C 3	C 3					C 3	F 3	F 3	F 4	F 5	F 5
5	F 4	F 6	F 5	F 2				H 2	C 1	C 2	C 2	C 1	C 2	C 1	C 1		C 2	C 2	L 1	F 2	FF 12	F 2	F 2	FF 21
6	F 2	F 2	F 2		FF 11	L 3	CL 21	C 2	C 1	C 1	C 1	C 2	C 2	C 2	C 2	L 1	L 1	H 1	C 3	F 5	F 4	F 2	F 5	F 2
7	F 2	F 2	F 2			L 1	C 1	C 2	C 1	C 1	C 2	C 1	C 1	C 2	C 1	H 1	C 2	L 3	C 4	F 4	F 1	F 1	F 2	F 1
8	F 1			F 5	F 1	C 1	C 1	C 2	C 1	C 1	C 1	L 1	L 1		C 1	H 1	C 2	C 3	C 3	F 4	F 3	F 5	F 3	F 5
9	F 3	F 2	F 1	F 3	F 1	C 1	CL 31	C 2	C 1	C 1	C 1	C 1	H 1	H 1	H 1	C 1	C 2	C 3	C 3	F 4	F 3	F 5	F 4	F 3
10	F 3	F 2	F 2	F 2	F 3	C 2	C 1	CL 11	C 2	C 2	C 1	C 1	C 1	C 1	H 1		C 1	C 3	C 3	F 3	F 3	F 4	F 4	F 3
11	F 4	F 1	F 2	F 2	F 2	L 2	CL 12	CL 12	C 1	C 1	C 1	C 1	C 2	C 1	C 2			C 2	C 3	F 3	F 3	F 4	F 4	F 3
12	F 4	F 3	FF 13	F 3	F 2	LC 12	CL 21	L 2	C 2	C 3	C 2	C 2	C 4	H 1	C 2	C 1	C 1	C 3	C 4	FF 25	F 4	F 6	F 6	F 2
13	F 4	F 2	F 2	F 3	F 3	CL 31	C 3	C 2	C 3	C 2	C 3	L 1	C 2	HL 11	HL 11	C 3	C 2	C 2	C 5	F 4	F 2	F 3	F 3	F 4
14	F 2	F 5	F 1	F 1	F 1		HL 11	HL 22	CL 22	L 1	L 1	C 2	C 1	C 2	C 1	LL 32	C 1	C 1	C 3	F 3	F 3	F 3	FF 11	F 2
15	F 3	F 2	F 2	F 3	F 2	CL 11	CL 12	CL 11	C 2	C 2	C 2	C 2	C 2	C 2	C 4	C 4	C 2	L 2	L 2	F 1	F 2	F 3	F 2	F 3
16	F 1	F 2			F 1	C 1	CL 21	C 2	C 3	C 2	C 2	C 1	C 2	C 1	HL 11	H 1	C 2	C 3	L 4	F 4	F 3	F 3	F 3	F 3
17	F 4	F 4	F 2	F 3	F 5	C 3	C 2	C 2	C 3	C 2	C 2	C 1	C 2	CL 11	C 1	L 1		H 1	C 2	F 5	F 3	F 2	F 3	F 2
18	F 2	F 1	F 1	F 2	F 2	C 4	C 4	C 3	C 2	C 2	C 1	C 2	C 1	H 1	C 1	C 2	C 2	C 2	L 4	F 4	F 3	F 4	F 4	F 4
19	F 5	F 4	F 4	F 4	F 2	L 2	C 1	C 2	C 3	C 3	C 3	C 4	C 2			H 1	C 1	C 2	C 3	F 4	F 3	F 3	F 5	F 4
20	F 4	F 3	F 4	F 2	F 2	L 2	C 4	C 2	C 2	C 2	C 4	C 2	C 1	C 1		C 2	C 2	C 3	C 3	F 3	F 2	FF 11	F 3	F 5
21	F 3	FF 23	F 5	F 3	F 2	C 2	C 3	C 2	C 2	C 2	C 2	C 1	C 1	C 1	C 1	L 1	CL 12	CL 32	C 5	F 4	F 2	F 5	F 4	F 3
22	F 5	F 5	F 2	F 5	F 4	L 2	LC 21	L 2	L 2	L 1	L 1	L 1	L 1	C 1	C 1	C 2	C 2	C 2	C 5	F 5	F 3	F 2	F 2	F 3
23	F 5	F 5	F 3	F 1	F 1	L 2	C 3	LC 11	C 2	C 2	C 2	C 1	C 1	C 2	C 2	C 3	C 3	C 4	C 4	F 4	F 4	F 3	F 3	F 3
24	F 3	F 3	FF 11	F 3	F 2	L 2	L 3	C 2	C 2	C 3	C 2	C 2	C 1	C 2	C 2	C 3	C 3	C 3	CC 14	F 3	F 3	F 4	F 5	F 4
25	F 4	F 2	F 2	FF 11	F 2	C 1	C 3	C 3	C 3	C 2	C 2	C 2	C 2	CL 11	C 2	C 2	C 2	C 2	L 3	F 3	F 3	F 3		F 4
26	F 2	F 3	F 5	F 5	F 3	L 3	C 2	C 2	C 2	L 2	L 2	L 2	L 1	L 1	L 1		C 1	C 2	C 4	F 4	F 1	F 5	F 5	F 4
27	F 4	F 5	F 5	FF 13	FF 12	CL 31	C 4	C 3	C 3	C 3	C 2	C 1	C 2	C 1	C 2	C 3	C 3	L 3	L 3	L 2	F 3	F 5	F 5	F 4
28	F 5	F 2	F 4	FF 23	F 2	C 3	C 2	C 1	C 2	C 2	C 1	C 1	C 1	C 1	C 2	C 1	CL 11	CL 22	CL 21	CL 52	FF 42	F 5	F 5	F 3
29	F 5	F 3	F 3	F 4	FF 12	C 1	C 5	C 3	C 3	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 3	C 2	C 3	C 5		F 5	F 4	F 6
30	F 6	F 4	F 4	F 4	F2 F	C 5	C 4	C 3	C 3	C 2	C 1	H 1		C 2	C 2	C 1		C 2	L 4	L 6	F 4	F 4	F 5	F 4
31	F 3	F 2	F 1	FF 11	FF 31	C 3	C 4	C 3	C 2	C 2	C 2	C 2	C 2	CC 22	CC 23	C 2	C 2	C 2	C 5	L 6	F 3	F 4	F 6	F 5
	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																								

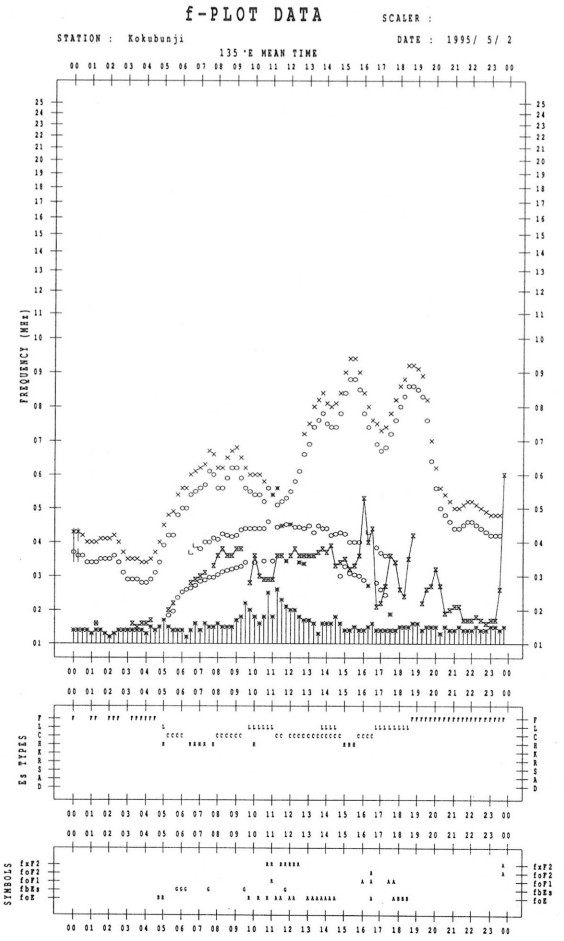
MAY 1995 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

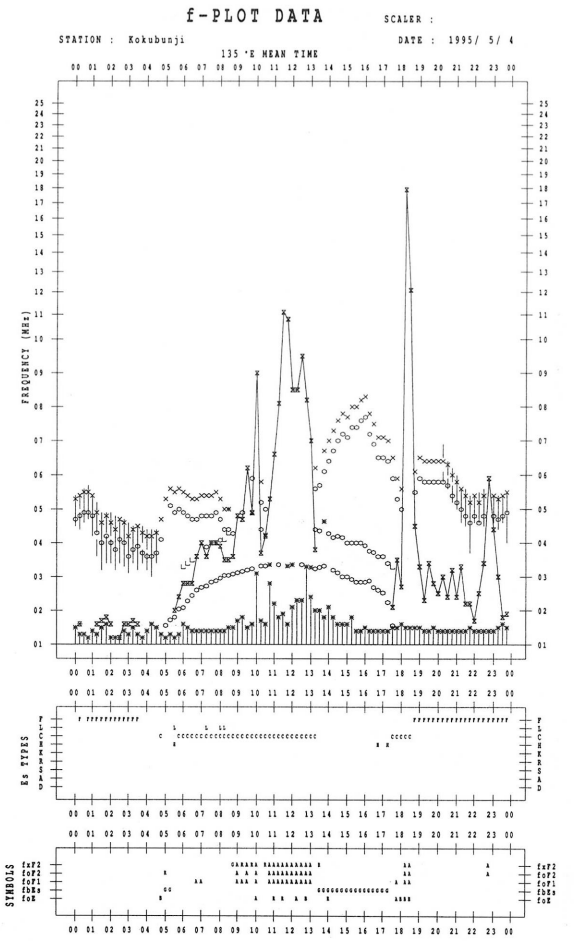
f-PLOTS OF IONOSPHERIC DATA

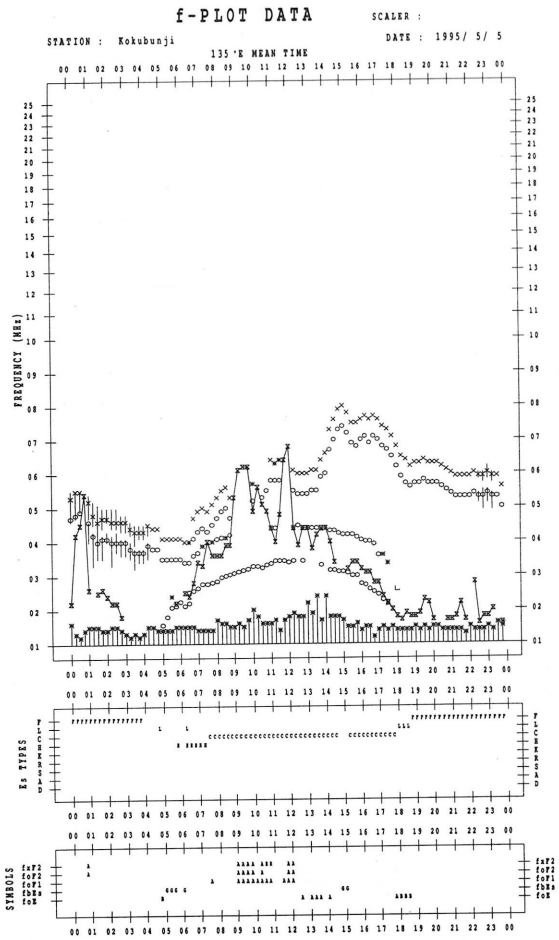
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

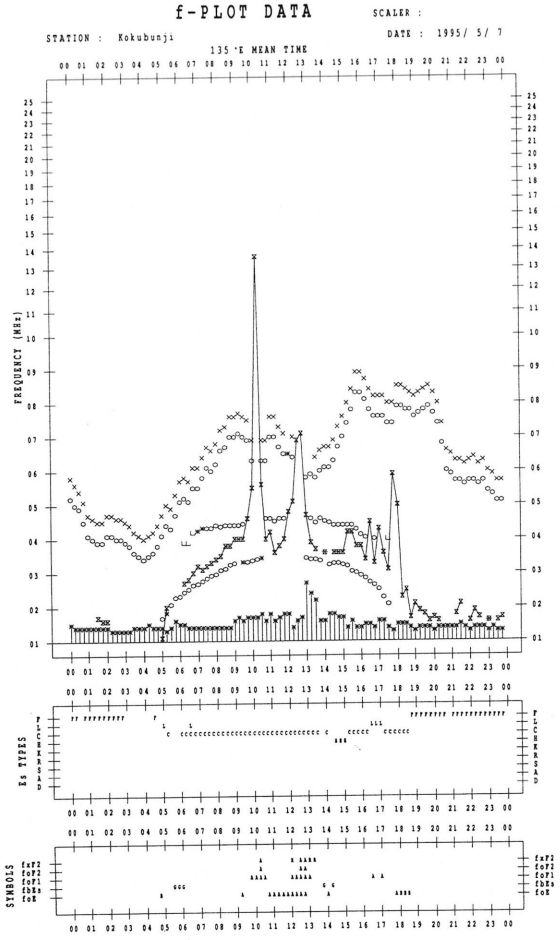

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

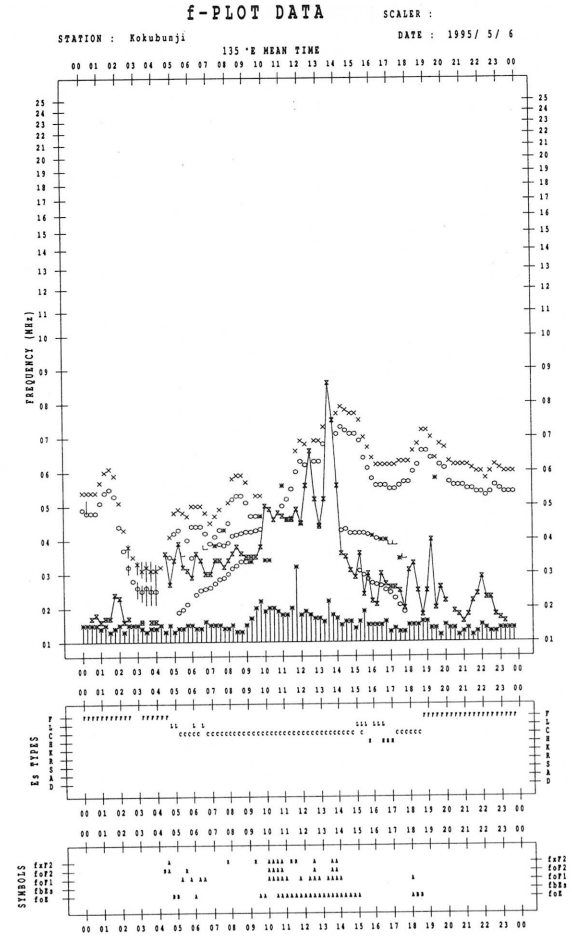

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

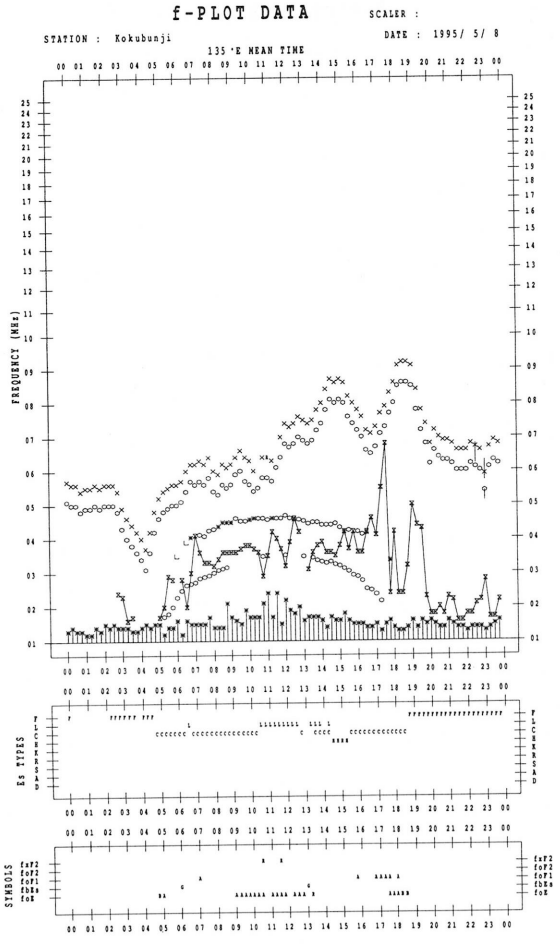

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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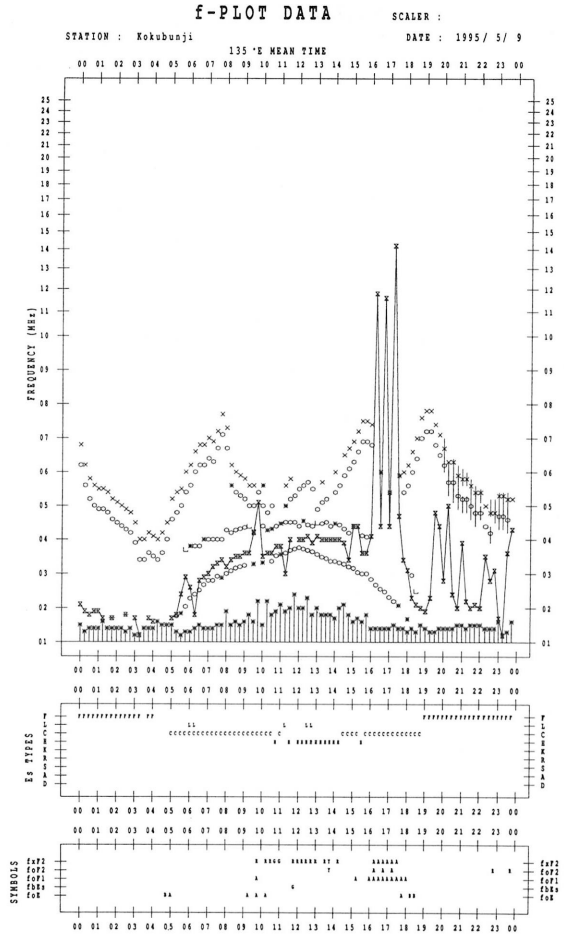
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
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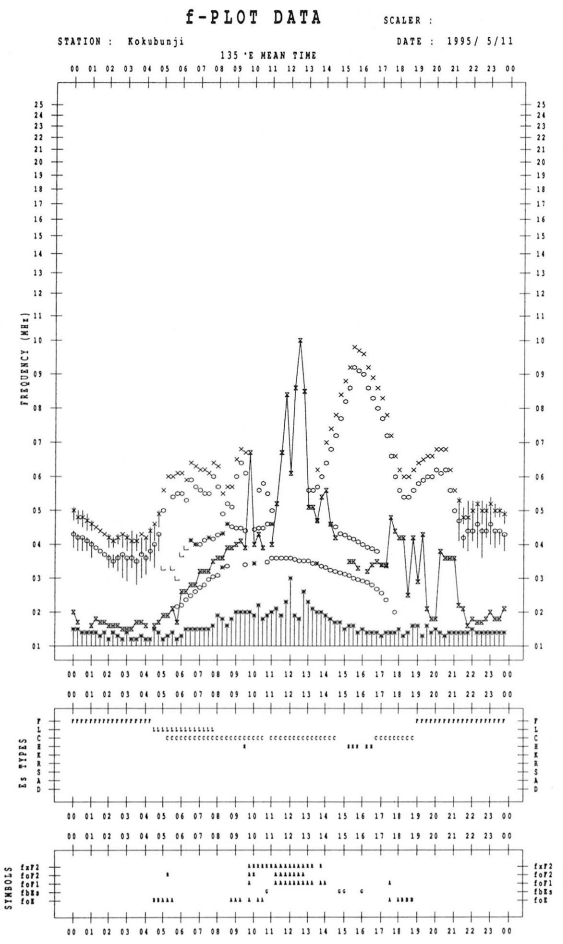
STATION : Kokubunji
DATE : 1995/ 5/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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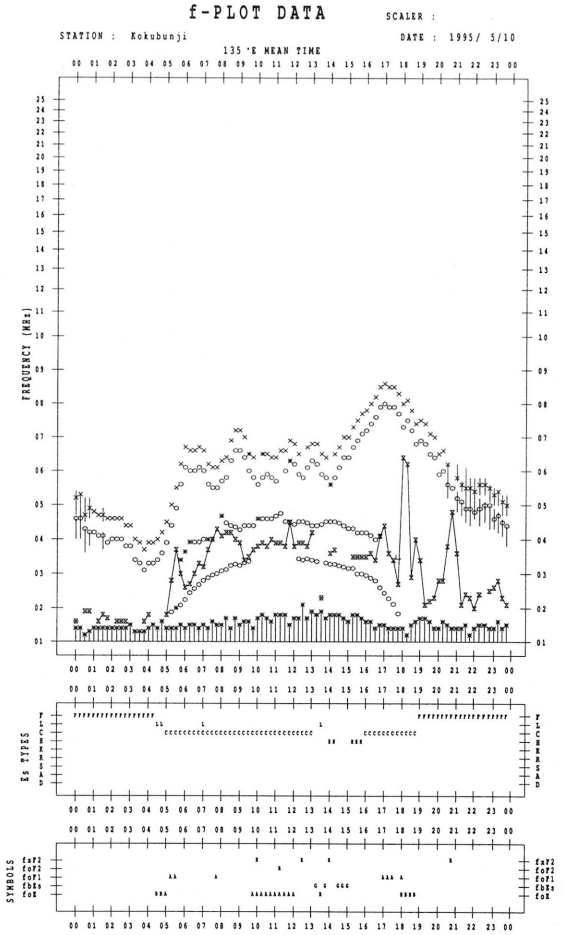
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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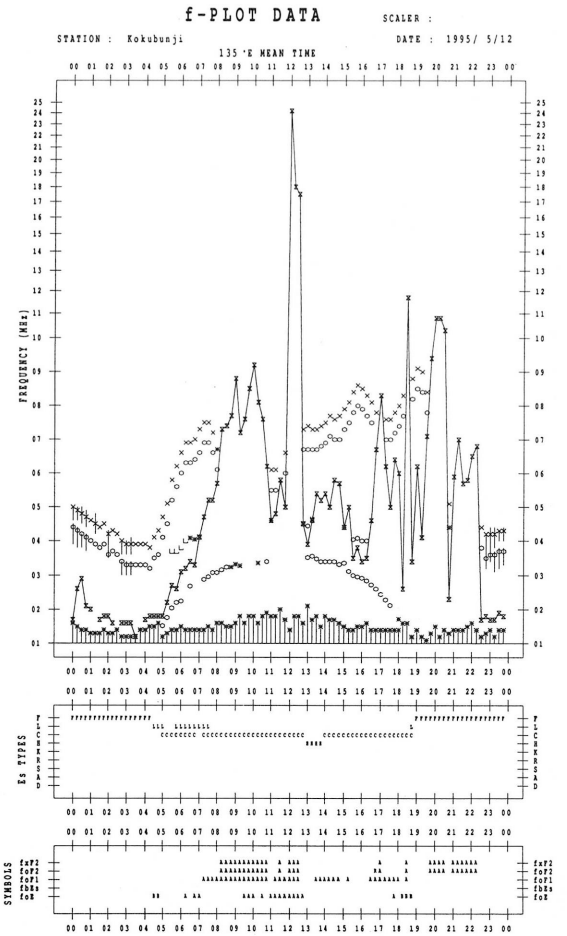
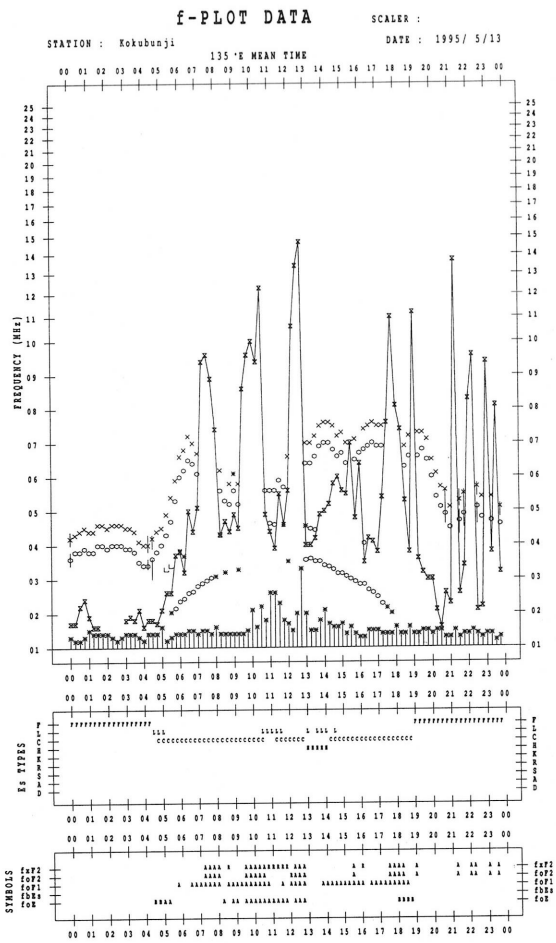
STATION : Kokubunji
DATE : 1995/ 5/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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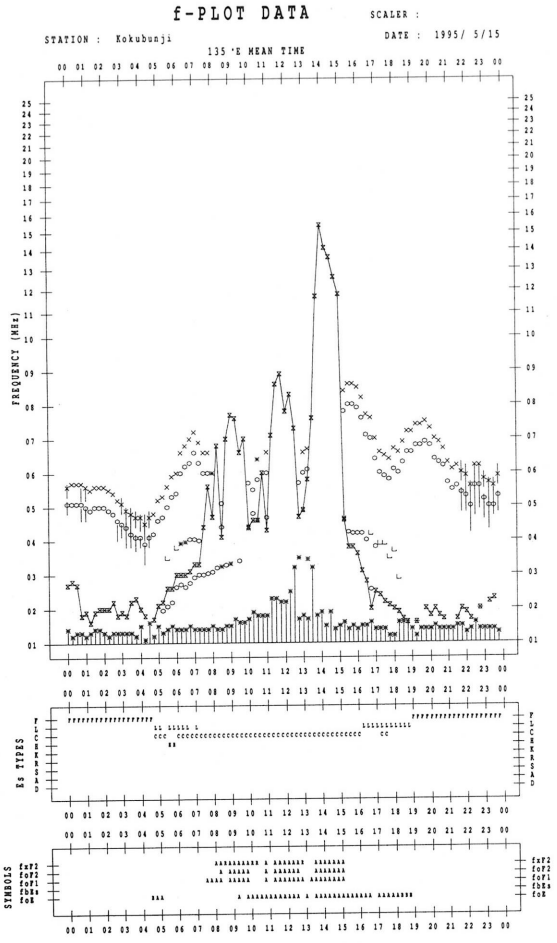
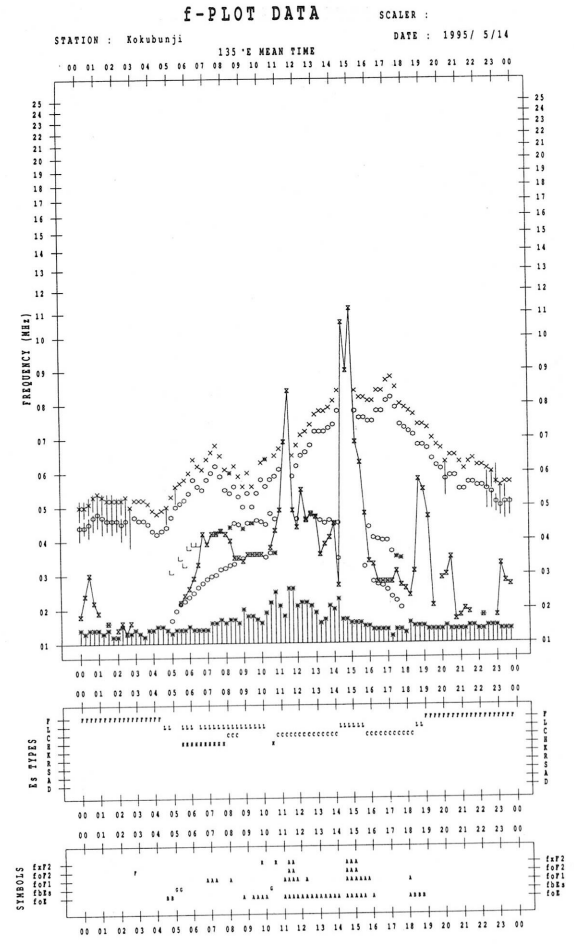
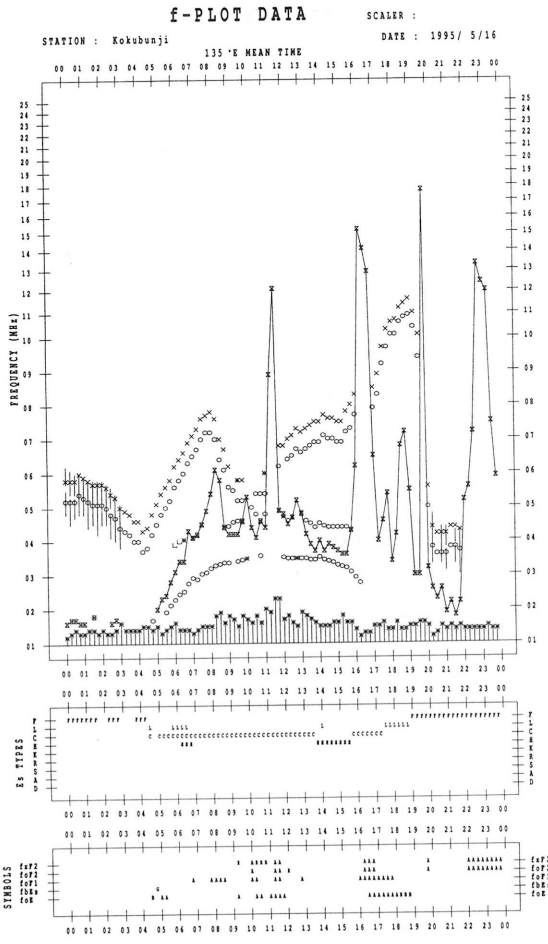
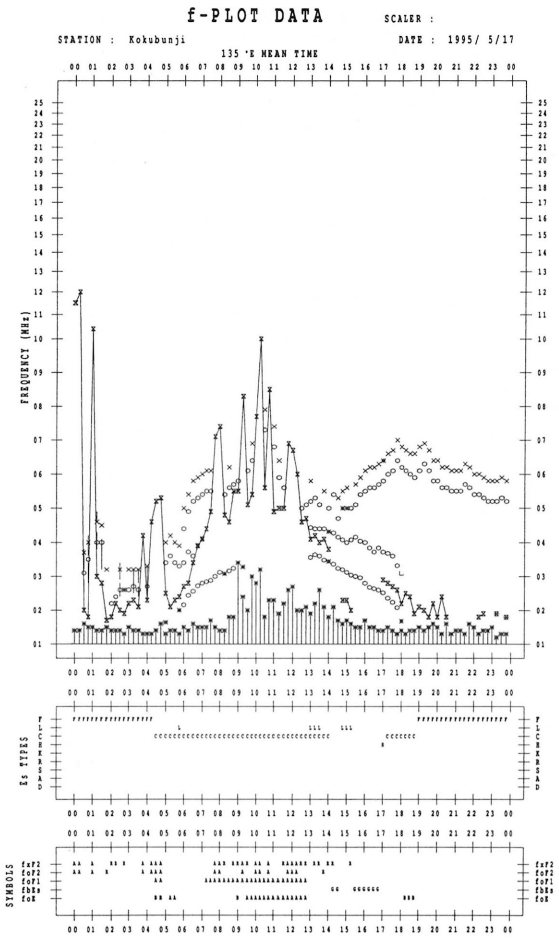
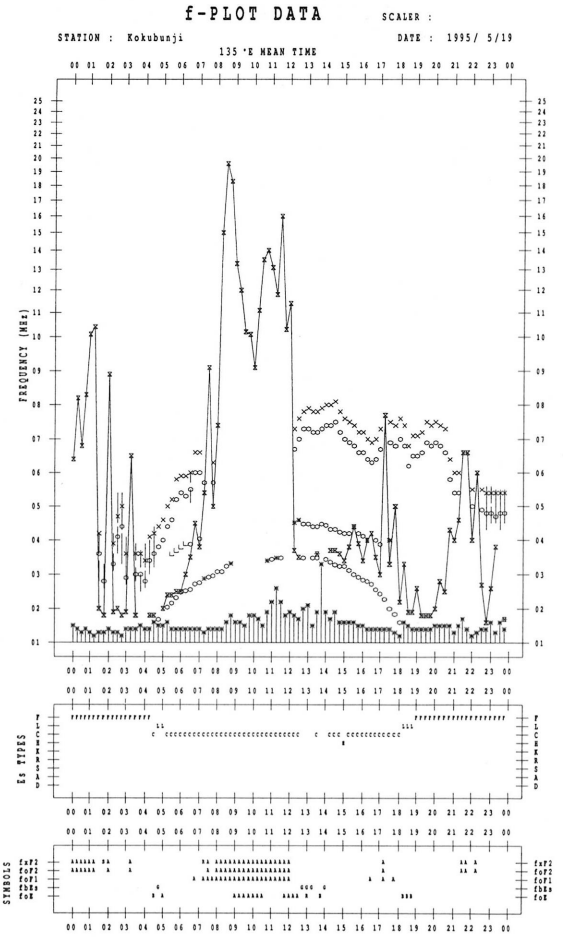
STATION : Kokubunji
DATE : 1995/ 5/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

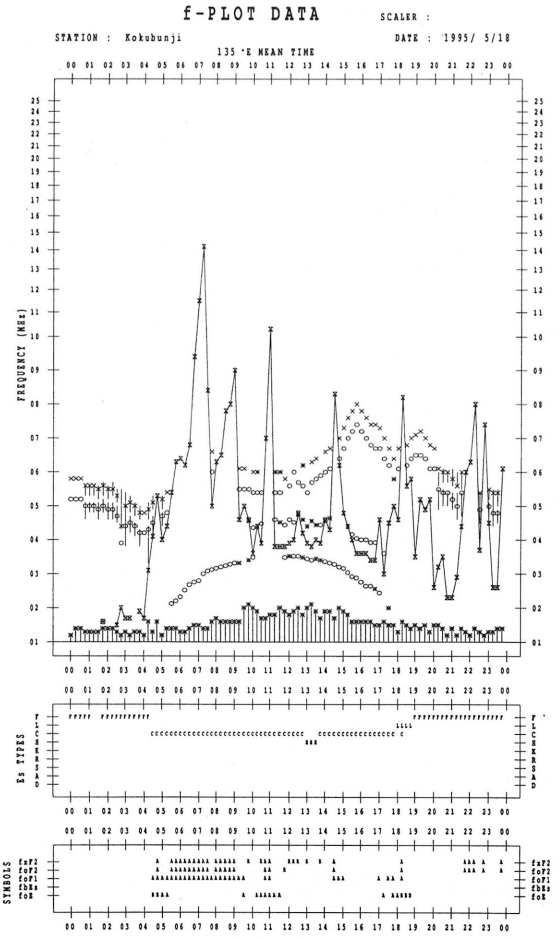

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

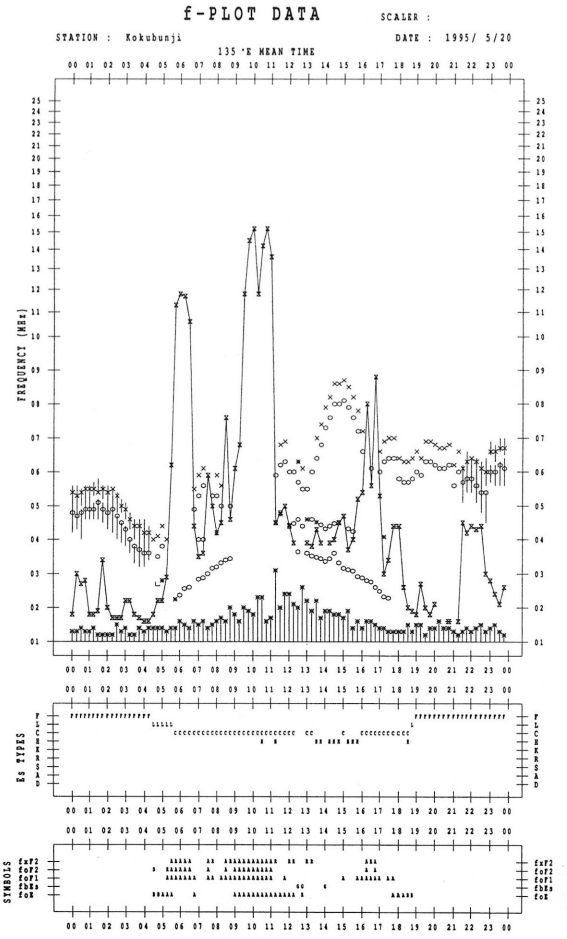

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

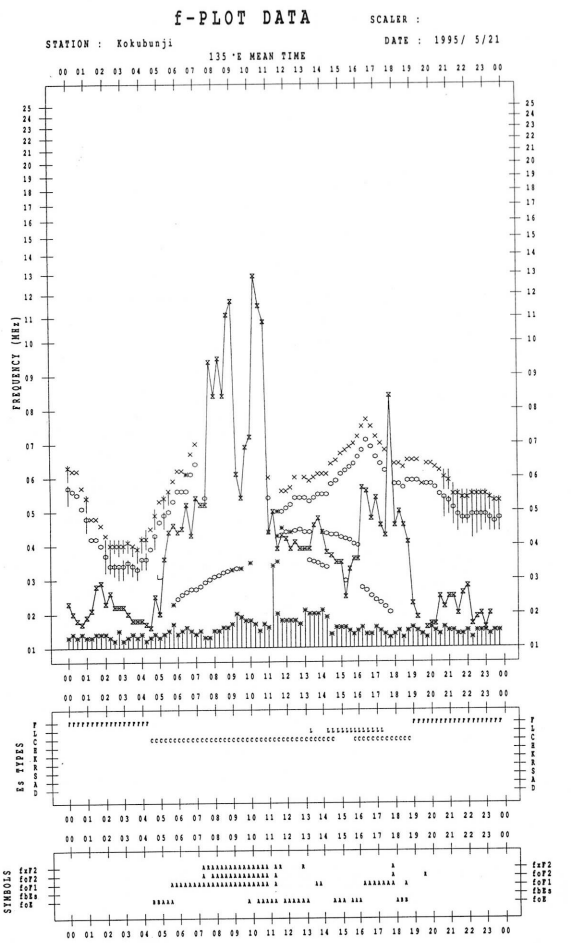

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

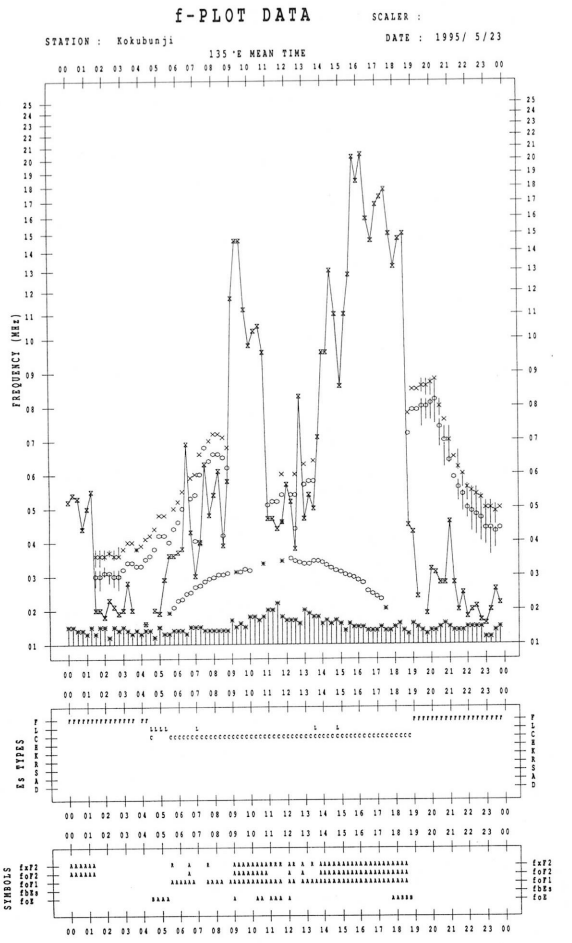

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

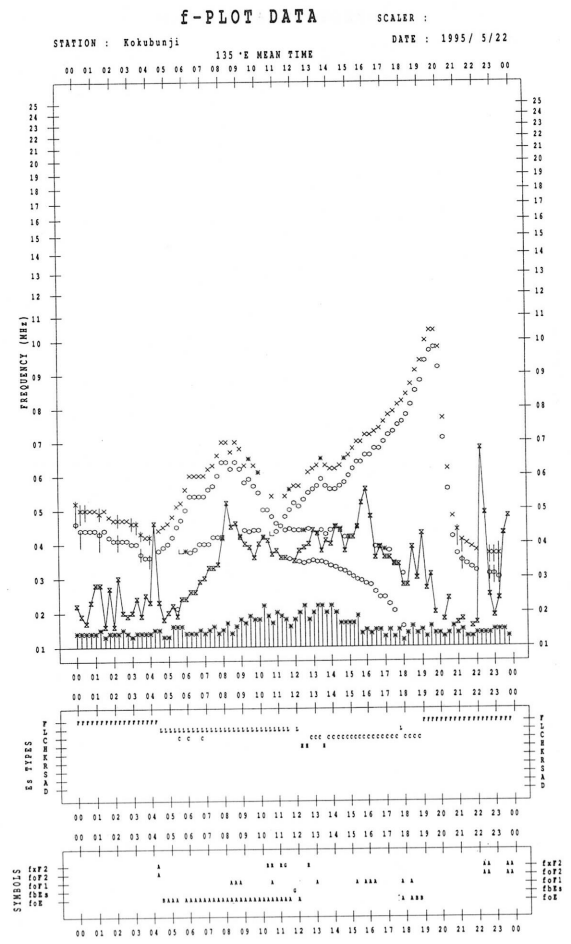

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

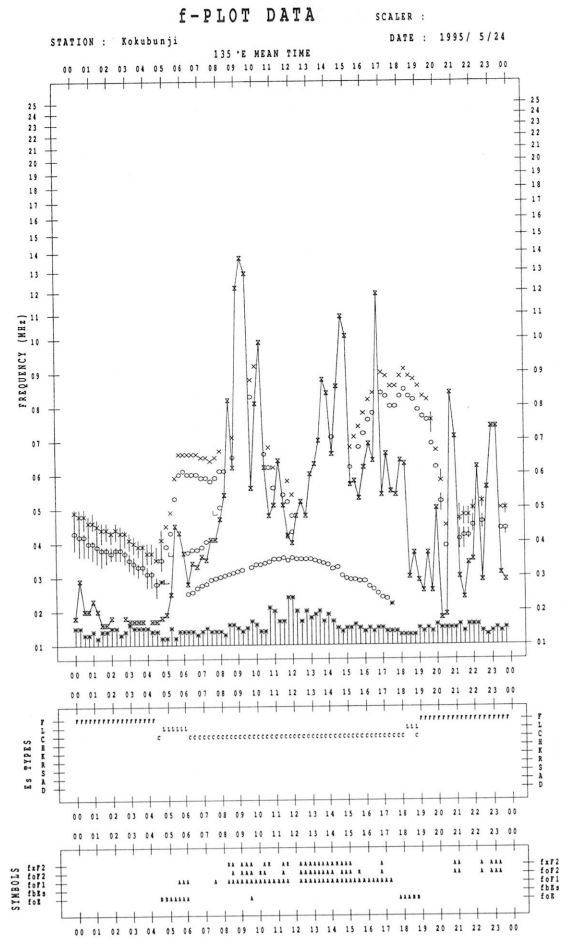

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

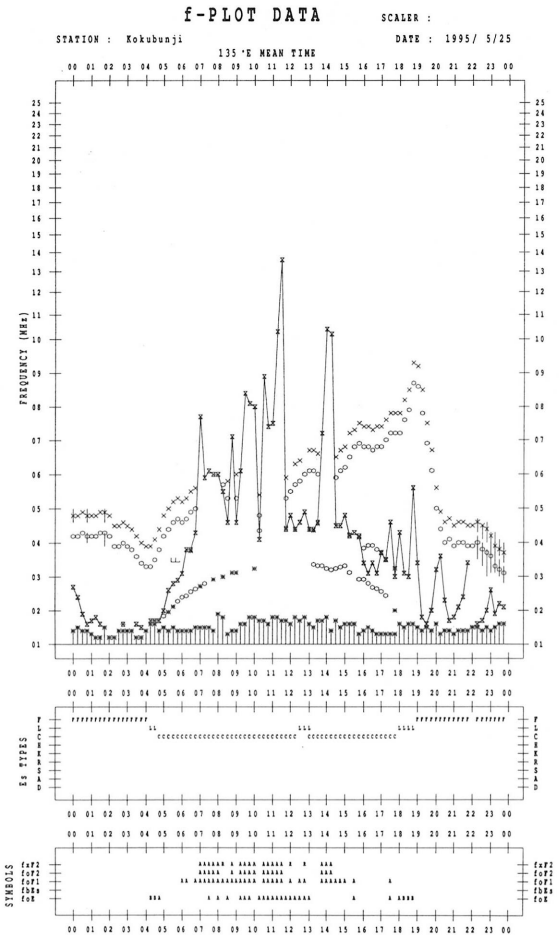

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

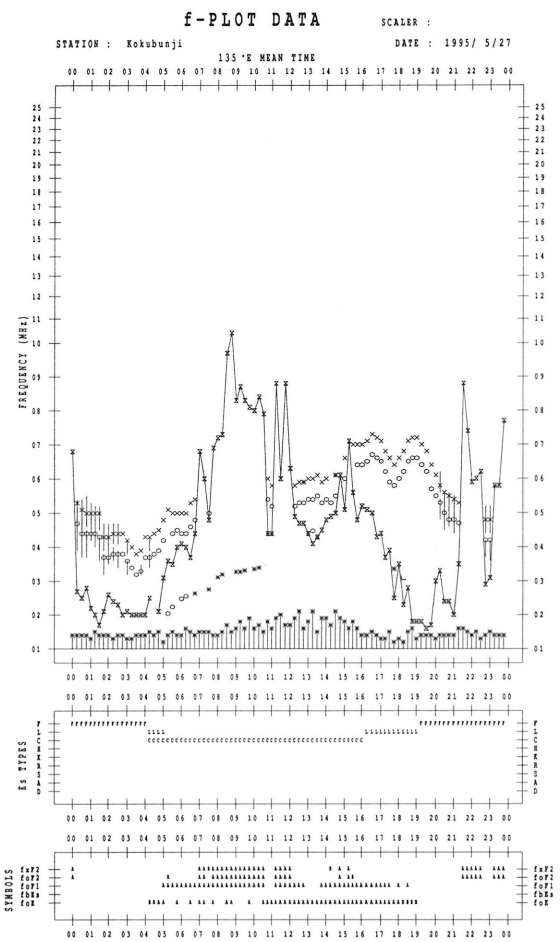

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

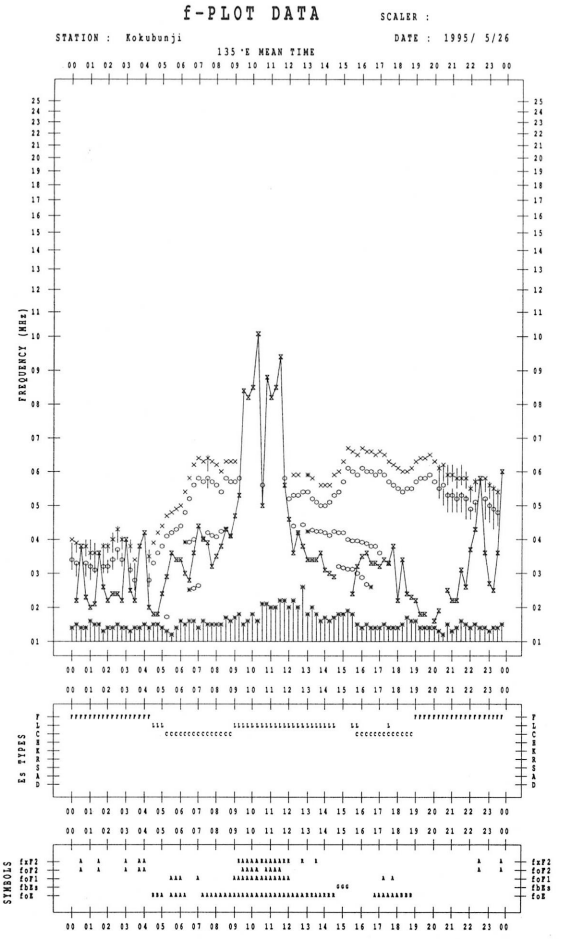

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

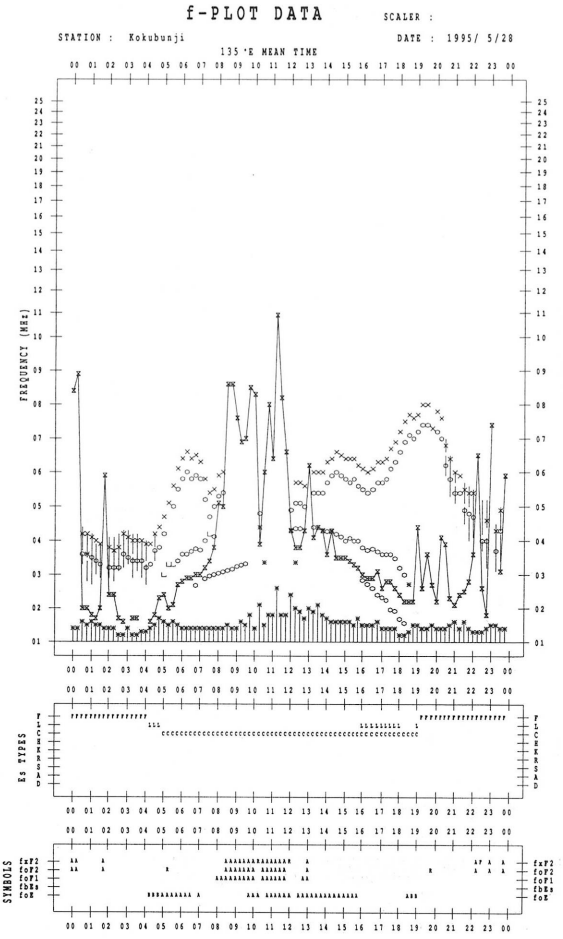

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

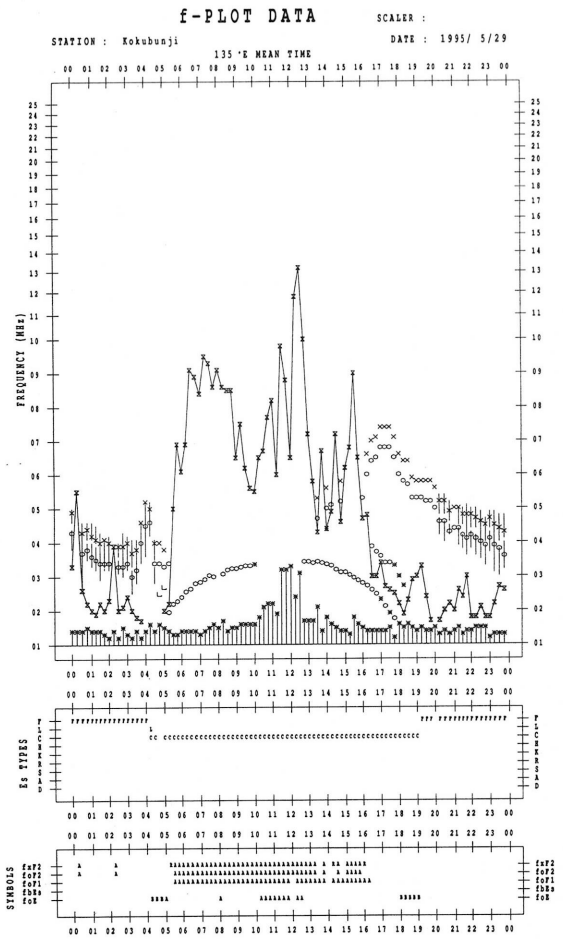

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

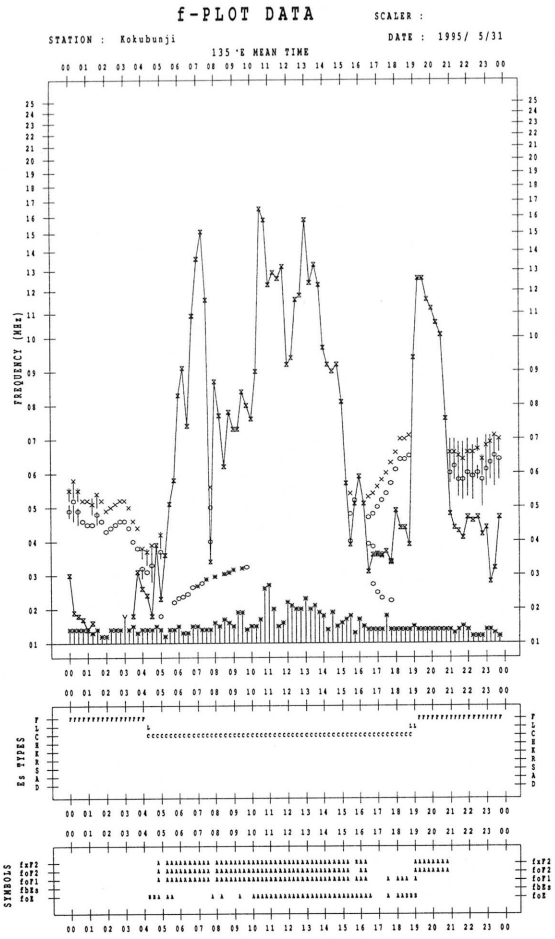

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foEs
foE

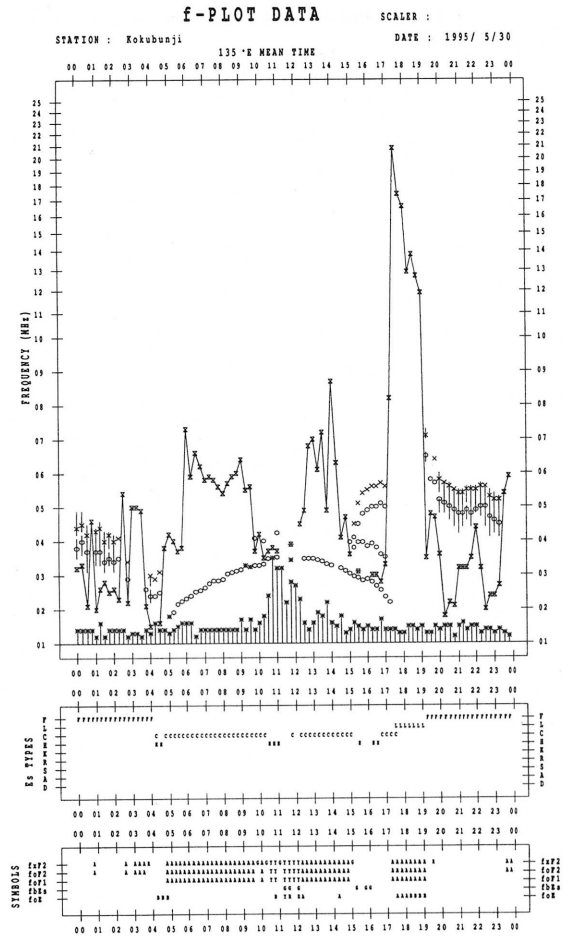

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foF2
foF1
foEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1995/ 5/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Not available until system improvement is completed.

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso May 1995

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	25	24	24	25	25
2	25	25	25	25	25
3	25	25	25	25	25
4	26	25	25	25	25
5	26	26	26	26	26
6	26	26	26	27	26
7	26	27	26	26	27
8	26	26	26	26	26
9	26	26	26	27	26
10	27	26	27	27	27
11	27	27	27	27	27
12	27	27	28	27	27
13	27	27	27	28	27
14	27	27	27	27	27
15	27	28	28	29	27
16	29	28	28	32	28
17	34	32	34	28	33
18	27	26	26	30	27
19	29	27	28	28	28
20	26	26	27	26	27
21	25	25	25	26	25
22	25	25	25	26	25
23	26	24	25	25	25
24	25	24	24	25	24
25	25	24	25	24	25
26	24	23	24	24	24
27	24	23	23	24	23
28	24	24	24	23	24
29	24	23	24	25	23
30	24	24	23	24	24
31	24	24	24	25	24

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso May 1995

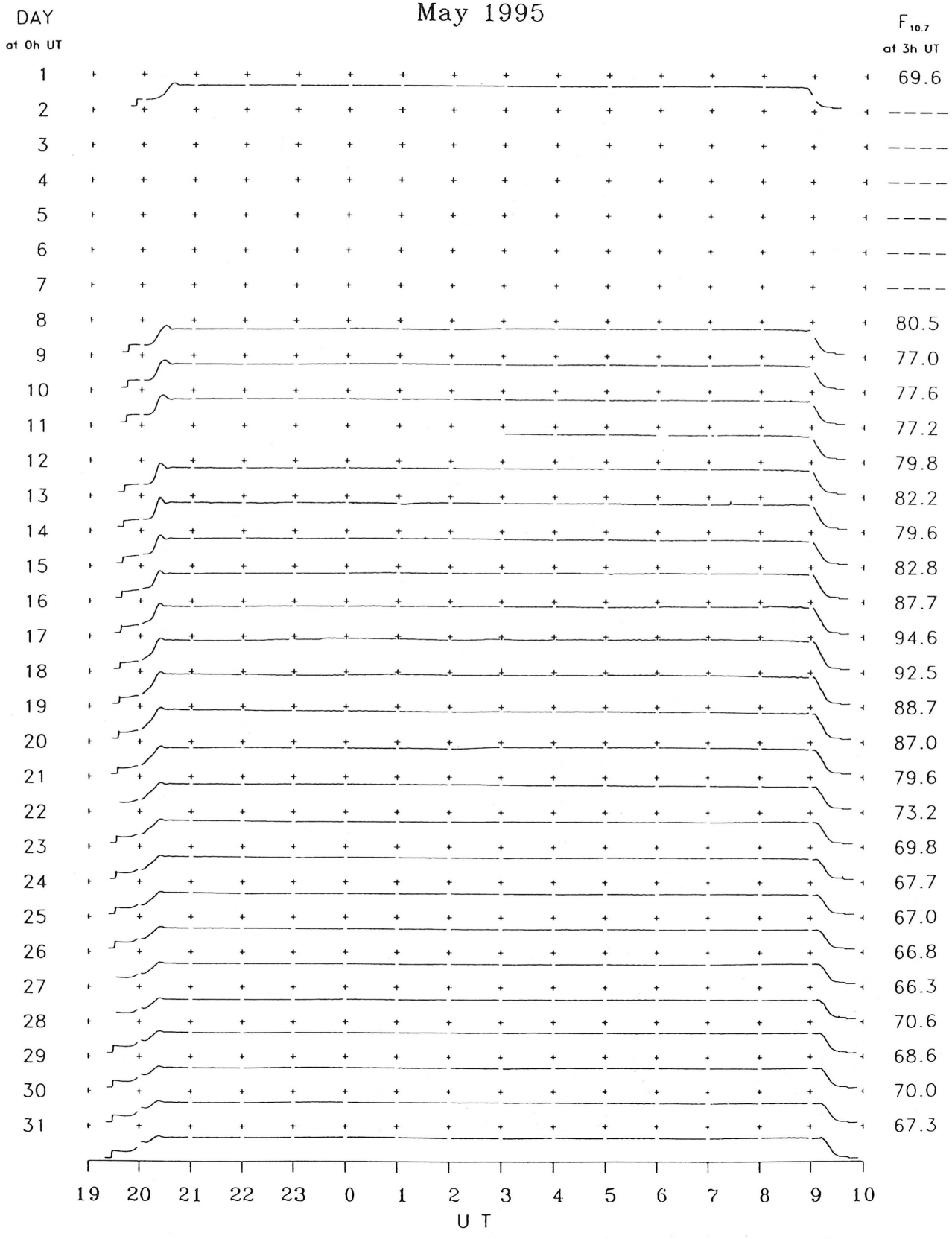
Single-frequency observations

Normal observing period: 1930 - 0940 U.T. (sunrise to sunset)

MAY	FREQ.	TYPE	START TIME	TIME OF MAXIMUM	DUR.	FLUX DENSITY (10^{-22} Wm^{-2}Hz^{-1})		POLARIZATION
1995	(MHz)		(U.T.)	(U.T.)	(MIN.)	PEAK	MEAN	REMARKS
2	500	8 S	0731.0	0731.0	0.1	43	-	WL
7	500	8 S	0228.2	0228.5	0.4	15	-	0
13	2800	1 S	0724.7	0725.1	1.0	12	8	0
14	500	46 C	0129.7	0130.0	1.0	18	12	0
	2800	8 S	0130.0	0130.4	0.5	8	-	0
	500	42 SER	0406.0	0406.6	4.0	42	-	0
	500	42 SER	0503.9	0503.9	1.5	11	-	0
	500	8 S	0717.7	0717.7	0.1	79	-	0
	500	42 SER	0813.5	0814.3	6.5	24	-	0
17	2800	1 S	0358.0	0358.2	1.5	4	2	0
	500	8 S	0358.0	0358.3	0.5	5	-	0
21	500	42 SER	0114.8	0117.1	3.0	54	-	WR

B. Solar Radio Emission

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



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)

MAY 1995 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
1	-26	-26	-26	-26	-26	-26	-10	-8	-6	2	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-8	-26	-26	-26
	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
2	-26	-26	-26	-26	-26	0	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	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	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	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	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
5	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
6	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
7	-25	-25	-25	-25	-25	-25	-25	-4	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES
8	-25	-25	-7	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-6	-25	-25	-25	-25	-25	-25
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
9	-25	-25	-25	-25	-25	-25	-25	-25	-25	-24	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES	ES	ES			ES				ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
10	-25	-25	-25	-25	-7	-7	-25	0	3	-4	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES	ES	ES			ES	ES	ES	ES	ES	ES	ES	ES	ES			ES	ES		ES		ES	ES
11	-25	-25	-25	-25	-7	-7	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15	-7	-25	-25	-7	-25	-7	-25	-25
	ES	ES	ES	ES			ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES
12	-25	-25	-25	-25	-15	-15	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15	-25	-25	-25
	ES	ES	ES	ES			ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES		
13	-25	-25	-25	-25	0	-2	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15	-25	-9	-9
	ES	ES	ES								ES	ES	ES	ES	ES	ES	ES	ES	ES					ES
14	-25	-25	-25	-4	1	2	5	-1	-9	-15	-25	-25	-25	-25	-25	-25	-25	-25	-21	-2	3	-7	1	-25
	ES	ES	ES	ES	ES				ES		ES	ES	ES	ES	ES	ES		ES					ES	ES
15	-25	-25	-25	-25	-25	-7	-7	1	-25	-7	-25	-25	-25	-25	-25	-25	3	-25	-4	-4	-6	-9	-25	-25
	ES	ES	ES	ES		ES	ES			ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
16	-25	-25	-25	-25	-15	-25	-25	0	-9	-25	-1	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	
17	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-15
	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
18	-25	-25	-25	-25	-25	-25	-25	-25	-25	-4	-25	-25	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
19	-26	-26	-26	-5	-26	-26	-26	-26	-26	-26	-26	-26	-26	-10	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
20	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-16	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
21	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES					ES	ES	ES	ES	C	C	C	C	C	C	C	C	C	C	C	C
22	-26	-26	-26	-26	-6	3	0	2	-26	-26	-26	-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
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																								
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
25	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES	ES	ES	ES			ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
26	-26	-26	-26	-26	-26	-26	-26	-26	-7	-2	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
27	-26	-26	-26	-16	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
28	-26	-26	-26	-26	-26	-10	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES		ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
29	-26	-26	-26	-26	-26	-16	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
30	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-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
31																								

CNT	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	27	27	27	27	27	27	27
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
MED	-26	-26	-26	-25	-26	-25	-25	-25	-25	-25	-26	-26	-25	-25	-26	-26	-26	-26	-26	-26	-25	-26	-26	-26
	ES	ES	ES								ES	ES	ES	ES	ES	ES	ES	ES	ES				ES	ES
UD	-25	-25	-25	-16	-6	0	-7	0	-7	-4	-25	-25	-25	-25	-25	-25	-25	-25	-25	-7	-8	-9	-25	-25
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
LD	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26

C. RADIO PROPAGATION

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

MAY 1995 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
														ES	ES	ES	ES	ES	ES					ES
1	1	-5	-1	9	11	17	12	12	6	5	1	10	-8	-26	-26	-26	-26	-26	-26	-9	-3	-5	-3	-26
														ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
2	-2	-8	0	3	10	17	21	12	12	2	-8	0	-12	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
	ES													ES	ES	ES	ES	ES	ES			ES	ES	ES
3	-26	5	-2	-1	-2	17	7	8	12	6	6	8	4	-26	-26	-26	-26	-26	-26	-10	-10	-26	-26	-26
	ES													ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
4	-26	-10	-5	4	7	12	14	11	6	6	-4	0	-8	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
															ES		ES	ES	ES		ES			
5	-2	5	7	2	12	11	17	17	13	7	4	2	-7	-15	-25	-1	-25	-25	-25	-12	-25	-12	-15	3
	ES													ES		ES	ES	ES	ES					
6	-25	-2	13	6	9	11	16	15	8	1	2	1	-2	-25	7	-25	-25	-25	-25	2	-3	-3	2	1
															ES	ES	ES	ES					ES	
7	-1	8	3	7	18	12	18	18	13	21	19	12	2	-3	-25	-25	-25	-25	-3	-3	-7	-9	-25	1
		ES										ES	ES	ES	ES	ES	ES	ES	ES		ES	ES	ES	
8	-2	-25	8	1	11	15	21	6	11	3	-15	-25	-25	-25	-25	-25	-25	-25	-25	-7	-25	-25	-25	-15
															ES	ES	ES	ES	ES	ES		ES	ES	ES
9	-7	-7	-3	3	15	15	17	17	11	11	2	8	12	0	-25	-25	-25	-25	-25	-25	-4	-25	-25	-25
	ES												ES	ES	ES	ES	ES	ES	ES			ES	ES	ES
10	-25	-2	14	11	16	7	15	16	13	9	9	0	-25	-25	-25	-25	-25	-25	-25	-15	6	-25	-25	-25
	ES	ES																ES					ES	ES
11	-25	-25	0	-4	8	18	19	18	19	11	11	1	1	-1	-1	1	-7	-25	-7	-7	-5	-2	-25	-25
	ES													ES	ES	ES	ES	ES	ES	ES			ES	ES
12	-25	-7	-2	6	8	13	18	18	16	18	14	4	-15	-25	-25	-25	-25	-25	-25	-25	-15	-9	-25	-25
	ES														ES	ES	ES							
13	-25	-4	-2	9	12	16	20	17	19	12	2	1	3	3	-25	-25	-25	3	-4	3	5	2	1	1
												ES	ES		ES	ES			ES					
14	1	1	2	6	12	19	20	20	19	21	16	-25	-25	-7	-25	-25	1	-7	-21	9	2	3	-1	3
																ES			ES					
15	-15	-4	3	3	8	12	21	16	15	11	12	1	-9	-15	-15	-25	7	-15	-25	-4	-2	-6	-2	-7
	ES															ES	ES	ES	ES	ES	ES	ES	ES	ES
16	-25	-15	-7	1	13	13	18	19	19	19	8	12	-1	7	1	-25	-25	-25	-25	-25	-25	-25	-25	-25
	ES	ES														ES	ES							
17	-25	-25	-4	-7	-4	2	7	12	16	15	8	21	13	7	-7	-25	-25	3	4	1	-7	-15	7	-15
											ES	ES	ES	ES	ES				ES	ES	ES	ES	ES	ES
18	-2	2	-15	-2	11	15	16	15	6	-2	-25	-25	-26	-26	-26	-16	6	-5	-26	-26	-26	-26	-26	-26
19	6	1	7	10	8	12	22	12	11	8	11	7	0	-8	-10	4	3	-8	4	-4	2	2	3	0
																			ES					
20	-16	-6	5	10	11	10	10	10	2	-3	-1	-1	8	15	8	-8	-8	-8	-26	-2	0	-3	-8	-8
										ES							ES							
21	-10	-5	-3	10	11	17	15	9	-5	-26	-10	-5	-10	-10	-2	-8	-26	-16	-3	2	-3	7	3	2
									ES	ES	ES	ES	C	C	C	C	C	C	C	C	C	C	C	C
22	2	-2	-2	6	14	12	16	17	-26	-26	-26	-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
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																								
																	ES							
25	-10	-10	-10	5	10	10	17	15	13	7	-4	-2	-2	-3	-6	-16	-26	-7	0	0	-6	-2	-6	-10
																ES	ES	ES	ES					
26	-10	-4	3	-4	10	12	8	6	9	7	6	5	8	-2	-10	-26	-26	-26	-26	2	5	-4	-7	-10
27	-1	-8	-8	3	10	17	17	7	7	9	7	2	3	-1	-8	-5	-8	-10	-10	0	-5	4	-1	-1
																	ES							
28	-3	-16	-6	5	10	14	10	19	17	15	6	-2	-3	-8	-10	-16	-26	-16	-16	0	-8	-5	-10	-10
	ES	ES													ES	ES	ES	ES	ES					
29	-26	-26	-16	-3	0	13	13	14	17	14	4	5	-1	-1	-26	-26	-26	-26	-26	-4	-16	-16	-16	-16
	ES	ES	ES													ES	ES	ES				ES	ES	ES
30	-26	-26	-26	-7	-1	5	12	12	14	12	14	7	9	0	3	-26	-26	-26	4	0	1	-26	-26	-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
31																								
CNT	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	27	27	27	27	27	27	27
															US	ES	ES	ES	ES					
MED	-10	-6	-2	4	10	13	16	15	12	8	5	1	-2	-8	-25	-25	-25	-25	-25	-4	-5	-9	-15	-15
UD	1	5	8	10	15	17	21	19	19	19	14	12	9	7	3	-1	3	-5	4	2	5	3	3	2
	ES	ES										ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
LD	-26	-25	-15	-4	-1	7	8	7	2	-3	-15	-25	-25	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26

C. Radio Propagation

C2. Radio Propagation Quality Figures at Hiraiso

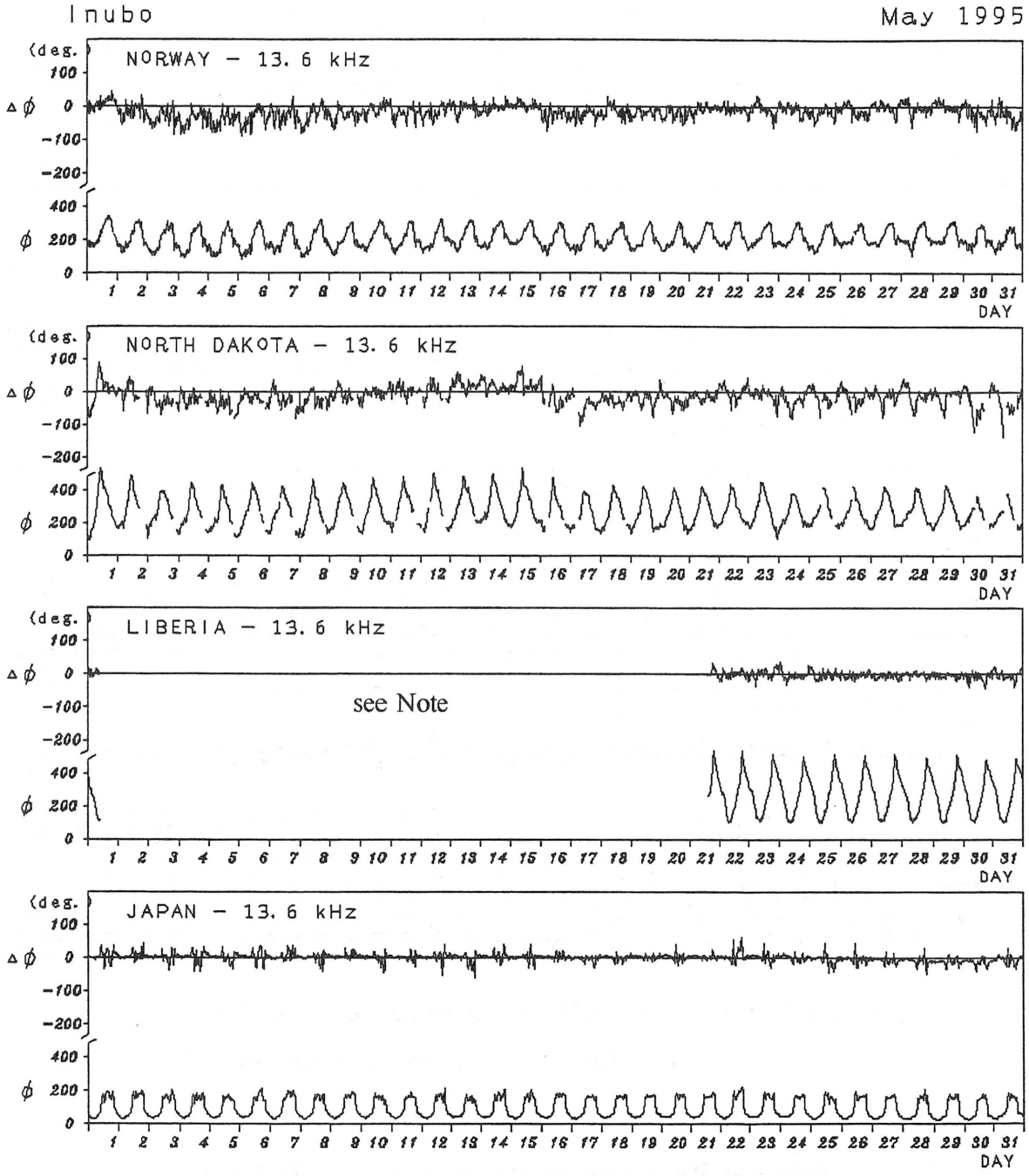
Hiraiso

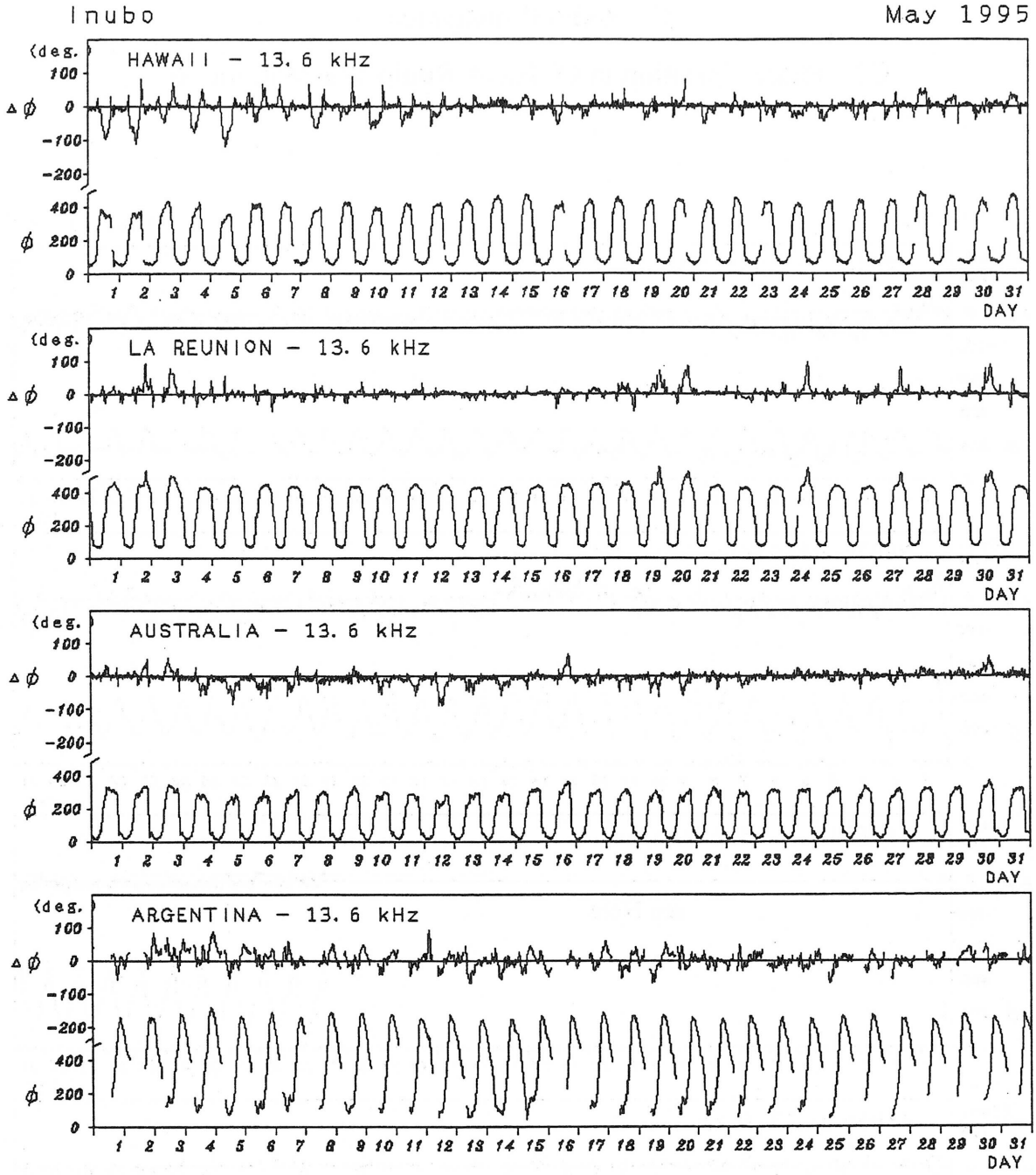
Time in U.T.

MAY 1995	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	4o U	- 5U - -	4 4 3U 4	N N N N			
2	3+ U	- - - -	4 4 3U 2U	N N N N			
3	3+ U	- - - -	3 4 3U 3U	N U U U			
4	3+ U	- - - -	4 4 3U 2U	U U U U			
5	3+ U	- - - -	4 4 3U 3	U U U U			
6	4+ U	- - - -	4 4 4U 5	U U U U			
7	4o U	- - - -	4 4 4U 4	U U U U			
8	3+ U	- - - -	4 3 3U 3U	U N N N			
9	4o U	- - - -	4 4 5U 3U	N N N N			
10	4o U	5U 5U - -	4 4 3U 3U	N N N N			
11	4+ U	5U - 5U 5U	3 4 5U 4U	N N N N			
12	4- U	5U - - -	4 4 3U 3U	N N N N			
13	4+ U	5U - - 5U	4 4 4U 5	N N N N			
14	4+ U	5U 5U - 5U	4 3 4U 5	N N N N			
15	4+ U	- 5U - 5U	4 4 4U 4	N N N N			
16	4- U	- 5U - -	3 4 5U 2U	N N N N	02.1	----	124
17	4o U	- - - -	3 4 5U 4	N N N N	----	13	
18	3+ U	- - - -	4 3 4U 3U	N U U U			
19	5- U	- - - -	5 4 5U 5	U U U U			
20	4o U	- - - -	4 3 5U 4	U U U U			
21	4o U	- - - -	4 3 4U 5	U U U U			
22	4o UC	5U 5U C C	4 2U C C	U 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	4+ U	- - - -	4 4 5U 4	N U U U			
26	5- U	- 5U - -	4 4 5U 5	U U U U			
27	4+ U	- - - -	4 4 5U 5	U N N N			
28	4+ U	- - - -	4 4 5U 4	N N N N			
29	3+ U	- - - -	3 4 4U 3	N N N N			
30	4- U	- - - -	3 4 5U 3U	N N N N			
31	C	C C C C	C C C C	N U U U			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo





Note : As for LIBERIA-13.6kHz, no record during 1 May 0900 UT - 21 May 1500 UT, due to the maintenance of transmitter.

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

NONE

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso Time in U.T.

MAY 1995	S W F						Correspondence	
	Drop-out Intensities(dB)				Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS BBC						
None										

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

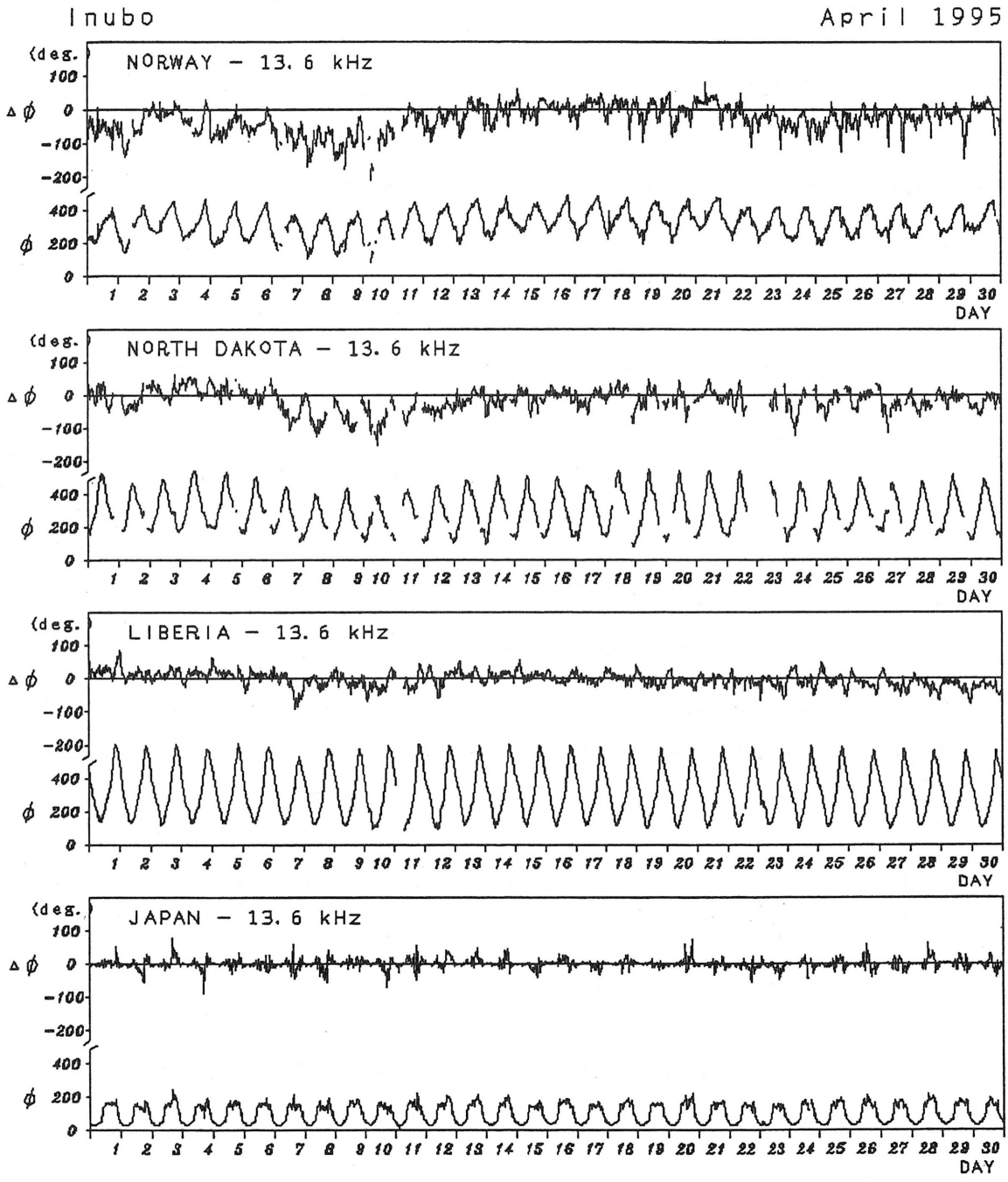
(b) Sudden Phase Anomaly (SPA) at Inubo

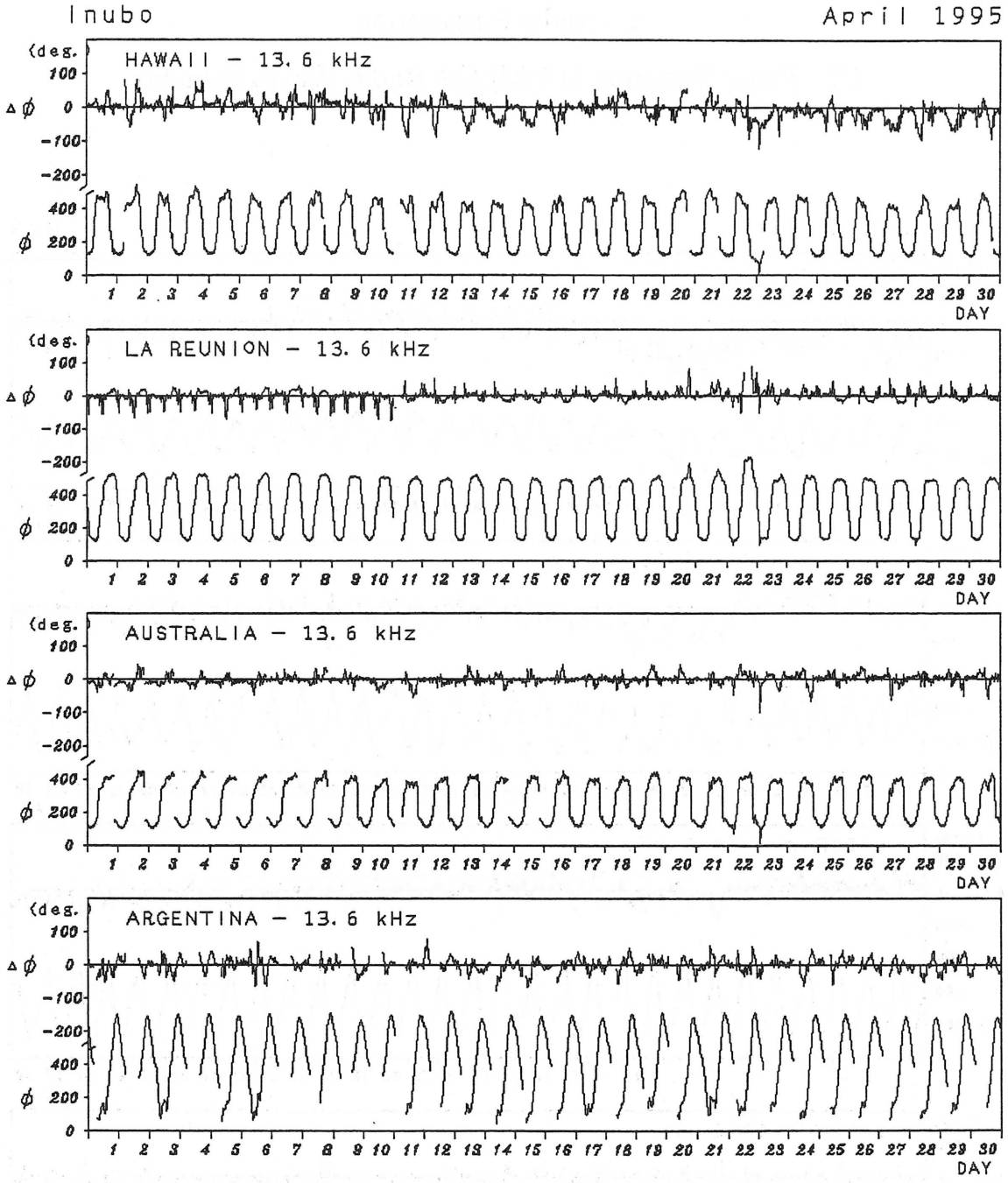
Inubo

May 1995	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
13		–	11				0724	0759	0730
14		–	14	18	18		0131	0200	0136
15		–			11		2102	2130	2112
16		–	7				0604	0640	0611
16		–	14				0809	0900	0815
16		–	14				0915	0952	0923
16		–	65				0958	1032	1010
16		–		22	25		2330	0040	2347
17		–	7			–	0533	0600	0545
18		–	7	7			0501	0522	0506

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo





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

NONE

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Apr. 1995	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
12		51	17				1022	1124D	1035
12		62					1124E	1221	1153
12		26					1421	1459	1438
13				17	14		0138	0230	0157
19			7	18	11		0341	0416	0346
19		24	7				1142	1222	1150
21		69					1335	1427	1348
22		15	14	25	11	16	0404	0422D	0414
22	40	83	66	66	32	29	0425E	0543	0441
22	47	–	67				1144	1250	1156
23	52	77	86	115	85	–	0200	0346	0220
23				12	8		2336	0005	2344

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