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IONOSPHERIC DATA IN JAPAN

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CONTENTS

COMMUNICATIONS RESEARCH LABORATORY
MINISTRY OF POSTS AND TELECOMMUNICATIONS
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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)
Akita	39°43.5'N	140°08.0'E	29.5°N	205.9°	" (I)
Kokubunji	35°42.4'N	139°29.3'E	25.5°N	205.8°	" (I)
Yamagawa	31°12.1'N	130°37.1'E	20.4°N	198.3°	" (I)
Okinawa	26°16.9'N	127°48.4'E	15.3°N	196.0°	" (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°	" (P)

A. IONOSPHERE

Ionospheric observations are carried out at the above five 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 descriptive letter 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 1-4, 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 transmission by *F2* and *F1* layers, respectively
h'F2 *h'F* *h'E* *h'Es*	Minimum virtual height on the ordinary wave for the *F2*, whole *F*, *E* and *Es* layers, respectively
Types of *Es*	See below b. (iii)

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to replaced a numerical value on the monthly tabulation sheets, if necessary.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.
B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.
C Measurement influenced by, or impossible because of, any non-ionospheric reason.
D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.
E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.
F Measurement influenced by, or impossible because of, the presence of spread echoes.
G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.
H Measurement influenced by, or impossible because of, the presence of a stratification.
K Presence of particle *E* layer.
L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.
M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.
N Conditions are such that the measurement cannot be interpreted.
O Measurement refers to the ordinary component.
P Man-made perturbations of the observed parameter; or spur type spread *F* present.
Q Range spread present.
R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
S Measurement influenced by, or impossible because of, interference or atmospherics.
T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
V Forked trace which may influence the measurement.
W Measurement influenced or impossible because the echo lies outside the height range recorded.
X Measurement refers to the extraordinary component.
Y Lacuna phenomena, severe layer tilt.
Z Third magneto-electronic component present.

(ii) Qualifying Letters

The following letters are entered in the first column before a numerical value on the monthly tabulation sheets, if necessary.

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.
D Greater than.
E Less than.
I Missing value has been replaced by an interpolated value.
J Ordinary component characteristic deduced from the extraordinary component.
M Mode interpretation uncertain.
O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)
T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
U Uncertain or doubtful numerical value.
Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

When more than one type of *Es* trace are present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple trace is indicated after the type letter.

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.
l A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the particle *E* layer minimum virtual height.
c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)
h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *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 100, 200 and 500 MHz are carried out at Hiraiso. The observation equipment consists of two parabolic antennas, one with 10-meter diameter for 100 and 200 MHz measurements and one with 6-meter diameter for 500 MHz measurements, each being equipped with a pair of crossed doublet antennas as a primary radiator, and three appropriate receivers. Each pair of the crossed doublet antennas is used as a polarimeter. 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 at the base-level are tabulated separately for 200 and 500 MHz measurements. Here, the base-level intensity is defined as the intensity recorded during the time when no radio emission burst is taking place. 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 Hiraiso 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.

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 660 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 in 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	influenced 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.

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 per hour from JJY (Japan Standard Wave) station. The conditions are denoted as follows:

N	normal,
U	unstable,
W	disturbed.

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

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 ($\triangle\phi$) 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 1992

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	74	91	73	70	65	71	87	102	130	110	107	109	100	94	110	97	90	85	88	108	101	79	63	66
2	72	67	63	60	60	61	67	76	80	78	A	75	N	77	84	77	77	86	86	90	80	85	73	66
3	63	67	63	62	54	54		60	56	63			65	70	70	77	75	76	78	80	73	65	66	66
4	67	66	62	55	52	48	58	57	A	A	A		59	68		73	72	73	66	67	66	70	70	66
5	63	66	67	67	71	72	82	70	68		67	45	66	67	64	68	66	64	70	85	77	78	72	68
6	60	63	58	55	53	54	56			A		A		72	76	77	76	77	76	83	78	84	66	62
7	60	59	54	51	63	71	82	64	66	68	64		73	82	84	82	84	87	86	84	84	83	83	70
8	66	62	66	54	52	A	A	56		A						65	66	67	67	72	76	76	77	64
9	64	63	68	54	45	53	A	A	67	106	A	A	67	55	77	77	78	76	86	85	72	66	61	62
10	69	66	52	43	51	50	A	A	61	62				67	A	77	76	62	71	77	55	46	A	A
11	38	29	71	71	31						A	A					64	61	67	66	66	72	64	A
12	38	A	A	30	28	52			A		A	A	77	80	72	76	A	76	81	78	79	78	66	77
13	66	66	62	55	51	43	53	52	59	A		70			N	72	73	78	78	73	66	63	63	64
14	52	58	55	42	A	51	35			A	A	A				67	A	A	63	64	66	67	67	66
15	66	66	61	56	53	60	74	89	84	78	A	72	80	80	84	84	84	80	86	90	87	84	83	84
16	77	72	67	63	64	78	86	86	86	87	90	87	86	85	90	90	90	86	86	88	87	87	81	78
17	76	73	71	65	66	80	82	80	78	79	76	80	74	72	78	78	77	81	82	90	86	86	84	77
18	73	72	72	68	72	82	84	87	84	88	88	90	90	98	87	87	87	83	77	86	86	87	84	78
19	74	73	73	60	62	72	73	78	70	66	71	81	73	80	77	87	86	86	90	83	78	78	83	86
20	73	71	65	67	67	72	86	90	88	83	82	79	80	89	90	87	83	86	85	85	87	90	90	84
21	87	71	78	77	78	78	80	A	87	88	88		78	80	77	77	84	80	84	86	84	86	73	77
22	83	72	71	67	72	72	82	84	86	83	76	76	78	77	82	86	84	87	90	88	88	89	87	84
23	76	64	N	62	60	54	60			A	A			66	67	A	68	71	70	72	66	82	78	76
24	64	67	67	67	72	67	71	A	A	A	74	A	A	86	86	87		79	84	93	90	86	66	73
25	71	69	73	66	72	75	87	85	A	A	73	73	80	88	86	87	87	82	77	88	88	88	82	67
26	85	77	78	72	72	72	78	A	78	A	72	75	76	67	75	81	76	76	A	A	87	87	77	78
27	66	74	76	65	66	78	68	A	A	A	A	A	77	74	75	87	82	77	84	A	89	90	90	87
28	80	63	66	60	62	63	63	A	A	A	60	A	A	A	A	58	67	67	A	84	72	66	63	67
29	62	64	58	64	66	66	A	66	66	A	A		60			64	A	66	68	A	73	63	66	66
30	61	49	58	48	40	66	A	A	A	A		A			56	N	63	58	61	67	70	66	72	67
31	65	58	61	45	37	51	A	A	A	A	A					57	61	60	54	66	70	67	65	66
	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	30	29	31	30	29	22	17	18	14	14	13	19	23	22	28	27	30	29	28	31	31	30	29
MED	66	66	66	62	62	66	76	78	78	81	75	76	77	77	78	77	77	77	78	84	78	79	72	68
U Q	74	72	71	67	67	72	82	86	86	88	88	84	80	85	86	87	84	83	86	88	87	86	83	78
L Q	63	63	61	54	52	53	63	62	66	68	71	72	67	68	75	72	68	67	69	72	70	67	66	66

HOURLY VALUES OF FES AT WAKKANAI

MAY 1992

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	42	38	38	29	G	G	G
2	G	G	G	G	G	G	G	G	44	G	52	G	G	G	G	G	60	45	40	28	G	G	G	G
3	G	G	G	G	G	G	G	G	42	G	G		G	G	G	G	G	G	G	G	G	G	G	G
4	G	G	G	G	G	G	G	G	59	60	64	G	G	G	G	G	G	G	35	40	34	G	G	G
5	G	G	G	G	G	G	53	56	54	G	G	G	G	G	G	G	G	G	33	G	G	G	G	G
6	G	G	G	G	G	G	G	G	G	44		46		G	G	G	G	90	47	38	65	G	G	G
7	G	G	G	G	G	31	G	G	47	G	G	G	G	G	G	G	G	41	34	G	G	G	G	G
8	36	G	G	G	G	30	41	46	G	62						G	47	45	44	40	32	G	G	G
9	G	25	28	29	26	32	60	69	58	94	153	60	G	G	G	G	G	G	37	30	40	30	G	29
10	31	30	G	G	G	40	42	47	G	45	G	G	G	G	62	G	G	G	G	G	G	G	28	23
11	23	22	G	G	27	G	G			G	62	51			G	G	G	G	G	G	G	43	37	46
12	30	34	29	34	G	G	G	G	50	G	78	105	55	G	53	63	79	56	40	64	46	G	33	44
13	G	32	G	G	28	34	G	G	G	56		G	G		G	G	G	G	G	G	G	G	30	28
14	G	24	26	33	44	37	G	G	G	45	61	76	G	G	G	G	105	90	39	G	G	28	G	G
15	G	25	26	35	33	G	39	47	G	62	77	G	G	G	G	G	G	G	41	G	G	G	G	G
16	G	G	G	G	G	G	G	47	51	53	60	G	G	G	G	G	58	36	59	40	G	G	G	G
17	G	G	G	G	G	32	46	47	55	55	G	G	G	G	G	G	G	40	40	28	31	26	31	G
18	G	25	G	G	G	36	39	51	42	G	G	G	G	G	G	G	G	47	41	32	31	26	29	32
19	G	24	G	G	G	G	G	G	G	G	G	G	G	G	G	57	60	45	42	39	35	G	G	G
20	G	G	G	G	G	36	43	41	42	G	66	G	G	G	58	G	47	46	64	40	42	46	68	60
21	50	37	32	G	G	38	G	82	57	G	G	G	G	G	G	G	G	44	54	33	37	G	G	32
22	29	23	G	G	G	32	41	48	G	G	G	G	G	G	G	G	G	G	69	G	33	G	G	G
23	G	G	G	23	G	G	G	G		58	56		G	G	63	46	53	54	37	45	58	26	44	28
24	G	33	34	G	G	36	46	77	143	118	69	91	81	68	G	58	135	57	92	59	77	57	78	57
25	89	62	39	G	28	G	G	52	80	108	136	G	G	G	G	G	G	47	54	40	36	49	61	31
26	45	32	G	G	G	39	47	76	69	71	69	79	54	G	44	44	61	56	84	91	49	59	31	60
27	49	53	58	39	G	36	49	78	74	116	170	131	62	G	65	52	58	83	67	95	116	49	40	28
28	G	38	38	24	G	32	46	57	58	75	G	71	78	92	53	63	G	45	129	84	72	110	G	G
29	G	G	G	28	G	37	58	50	64	59	53		G	G		44	85	62	63	81	59	65	40	29
30	G	23	G	G	G	35	53	57	72	52	G	65			G	G	43	59	57	36	42	G	G	41
31	25	G	G	G	G	40	56	58	58	63	57	G			G	G	G	G	35	32	28	G	25	29
	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	30	29	31	28	27	26	26	29	31	31	31	31	31	31	31	31	31
MED	G	23	G	G	G	32	39	47	50	52	54	G	G	G	G	G	G	45	41	36	33	G	G	23
U Q	29	32	26	23	G	36	46	57	58	62	67	65	G	G	22	44	58	56	59	40	46	43	33	32
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	35	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT WAKKANAI

MAY 1992

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	17	15	15	17	17	15	26	33	26	27	26	48	36	49	35	23	26	24	17	15	18	17	16	16
2	17	17	17	17	17	22	26	28	34	28	36	54	49	50	49	36	30	26	17	17	17	18	18	18
3	18	17	17	18	17	32		47	33				28	28	48	34	32	28	26	18	17	17	18	16
4	18	17	16	16	16	23	40		33	35	39			53		27	39	28	17	17	20	17	17	17
5	17	16	18	16	17	18	27	32	39	53	91	52	51	52	27	26	35	28	27	18	17	18	18	16
6	17	17	21	20	20	17	28		49	32		37		56	48	53	38	27	16	16	16	18	16	16
7	17	18	16	16	20	17	32	46	50	34	33		50	50	48	28	24	27	16	18	16	16	17	17
8	16	17	17	16	18	16	26	29	26	29						48	30	20	17	15	14	16	16	17
9	16	16	16	14	16	20	27	29	32	34	33	36	53	52	49	39	41	27	17	16	14	17	18	17
10	17	16	24	16	17	18	27	30		34	34		38		35	26	33	27	22	20	21		17	
11	21				16	16				32	35	33			26		34	28	26	18	17	16	16	16
12	16	15	18	16	18	24		71	33		36	36	40	42	38	35	30	26	18	15	16	16	14	15
13	17	15	15	17	17	18	43	30	35	34		54			49	40	45	18	27	17	15	16	16	18
14	18	17	17	16	15	20	28		34	36	36	39	38	32	40	29	27	20	17	17	16	18	16	17
15	17	16	16	14	17	27	20	30	33	26	28	30	58	50	52	48	22	30	20	23	17	16	17	18
16	18	16	15	17	17	18	27	32	28	29	29	38	56	52	28	26	24	21	17	16	16	16	16	16
17	15	16	15	22	17	26	27	30	26	27	51	49	52	28	30	28	33	27	17	16	16	17	15	17
18	17	17	16	16	17	18	28	33	34	34	50	52	32	30	52	33	24	27	18	16	16	16	17	16
19	17	16	15	16	17	26	29	36	33	53	28	50	37	52	30	26	21	18	17	16	16	17	16	18
20	16	16	17	16	17	20	28	33	26	52	34	52	33	30	29	24	23	28	16	16	16	16	16	15
21	17	16	16	16	17	21	29	32	34	47	37		52	30	52	48	34	27	17	16	16	16	17	17
22	18	16	18	16	17	24	18	24	26	49	49	38	60	60	52	48	35	38	18	21	15	20	17	17
23	16	17	16	16	24	36	20	29		36	28			40	42	27	33	27	18	16	15	16	18	16
24	16	16	15	17	18	20	27	30	35	35	38	43	38	34	33	36	23	28	17	15	15	15	17	16
25	16	16	15	16	15	24	29	24	23	35	34	52	55	32	53	50	45	22	17	17	15	15	17	15
26	16	16	16	16	18	21	28	32	32	35	38	35	29	27	24	24	18	27	20	16	15	15	16	15
27	17	17	16	17	18	20	28	30	26	33	28	35	33	34	28	26	24	21	20	16	15	15	16	16
28	17	17	17	15	17	17	24	32	24	34	36	35	35	32	29	27	47	27	20	17	14	15	16	16
29	17	17	17	16	24	20	27	29	28	32	35		52			34	30	26	17	17	17	14	16	16
30	16	20	16	16	26	18	26	27	28	35	35	33			50		29	18	20	15	15	16	17	15
31	17	15	15	15	18	17	24	30	30	26	33	35			28	24	32	20	17	16	17	15	15	17
	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	30	30	30	31	31	28	27	28	29	27	23	23	24	28	29	31	31	31	31	31	30	31	30
MED	17	16	16	16	17	20	27	30	32	34	35	38	40	41	39	29	30	27	17	16	16	16	16	16
U Q	17	17	17	17	18	24	28	33	34	35	38	52	52	52	49	39	35	28	20	17	17	17	17	17
L Q	16	16	15	16	17	18	26	29	26	30	33	35	35	31	29	26	24	21	17	16	15	16	16	16

HOURLY VALUES OF FOF2 AT AKITA

MAY 1992

LAT. 39.7N LON. 140.1E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

DAY \ HOUR	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	78	76	63	63	63	76	87	101	104	110	106	104	105	112	107	106	103	104	111	124	104	74	54	67
2	61	N	60	54	60	61	67	86	84	98	103	98	103	102	103	97	90	97	104	98	56	63	63	62
3	58	55		64	61	54	52	67	68	62	74	80	82	97	100	92	95	93	96	86	73	61	67	67
4	N	61	67	62	56	52	61	62	A	51	A	67	72	75	81	A	80	81	70	72	A	58	66	54
5	61	60	67	74	66	74	82	A	82	A	A	86	84	81	77	68	76	73	84	90	86	80	74	71
6	67	54	55	52	54	67	62	68	67	55	72	76	83	83	87	90	90	90	91	87	80	54	78	66
7	62	57	54	58	55	64	80	86	90	87	74	78	90	97		96	97	97	119		80	79	84	78
8	77	73	66	57	52	54	54	55	A				A	67	54	70	68	70	67	73	54	67	71	67
9	67	70	68	55	56	54	74	86	74	82	A	79	85	86	84	90	90	90	90	86	67	62	67	67
10	54	54	50	53	50	52	64	55	67	79	77	81	84	80	80	86	85	67	78	90	99	64	52	78
11	49	A	A	35	35	A	A	A	A	A	67			A	62	62	62	64	67	66	62	66	76	62
12	22	44	A	42	47	A	47	44	A	52	79	76	82	92	85	82	78	80	80	83	79	83	57	74
13	75	60	72	57	55	52	55		A	A	77	104	90	86	88	88	90	90	90	87	73	52	62	57
14	54	62	60	37	38	A	A	55	47	A	63	67	65	68	N	73	73	72	66	74	A	65	63	67
15	65	67	66	56	55	60	72	94	96	86	84	A	88	91	90	92	87	86	91	110		84	87	86
16	80	74	67	60	66	81	87	90	90	91	87	92	97	103	103		104	107	108	103	86	82	72	75
17	78	80	52	72	72	83	90	84	86	84	87	86	91	95	96	97	97	96	91	90	92	88	86	77
18	76	73	70	79	82	83	87	93	85	86	88	95	103	108	109	A	106	90	86	90	90	59	83	70
19	76		77	64	66	80	86	80	68	76	77	90	87	92	93	109	112	110	90	80	80	85	83	85
20	84	78	79	67	74	76	86	90	105	90	87	82	88	97	104	96	91	91	93	90	90	87	90	82
21	87	88	88	85	84	87	90	88	98	86	78	80	87	91	91	91	91	90	88	90	71	86	81	77
22	74	74	68	67	67	82	90	86	100	87	97	87	115			96	90	90	100	97	89	86	88	87
23	N	78	71	77	73	60	65	65	40	A	60	72	A	80	78	76	78	77	53	A	77	54	79	56
24	77	68	67	73	75	78	78	83	90	85	86	84	77	94	100	97	90	86	91	100	87	87	82	78
25	79	75	78	69	71	84	86	96	90	83	76	77	90	96	91	94	90	94	87	A	90	90	90	88
26	86	87	86	78	78	86	78	88	85	78	80	85	84	80	78	87	90	84	77	90	79	A	86	81
27	86	84	80	68	67	78	67	A			90	A	94	90	97	106	104	97	96	87	84	86	85	85
28	86	78	72	55	55	80	63	A	68	90	A	A	A	A	70	77	82	84	86	84	A	A	68	75
29	67	65	55	54	56	67	68	A	108	53	A	A	A	A	67	73	A	74	A	A	A	A	A	68
30	70	61	66	51	43	52	61	A	64	A	A	A	A		62	A		A	A	52	72	65	68	55
31	33	51	53	51	43	60	61	A	49	A	A	A	A	A	A	77	A	54	A	51	55	36	54	52
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	28	31	31	28	29	23	25	22	23	23	24	25	27	27	28	30	28	27	26	28	30	31
MED	74	69	67	60	60	70	72	86	85	84	79	82	88	91	88	90	90	90	90	87	80	70	75	71
U Q	78	77	72	69	71	80	86	90	93	87	87	90	92	97	100	96	96	94	94	90	89	85	84	78
L Q	61	60	60	54	54	57	61	65	67	76	74	77	83	80	78	77	81	77	79	80	72	61	66	66

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT AKITA

MAY 1992

LAT. 39.7N LON. 140.1E 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	G	G	G	38	50	54	55	56	G	G	48	G	46	49	60	56	25	32	40	G	28
2	G	G	G	G	G	27	36	45	56	48	G	50	G	55	G	G	61	58	63	56	59	G	24	23
3	G	G		G	G	G	37	47	54	52	49	G	100	G	G	G	G	37	31	32	29	25	G	G
4	G	G	G	G	G	G	G	47	61	56	55	50	77	62	51	85	G	40	50	29	59	28	28	G
5	40	28	G	G	G	30	40	100	72	61	108	58	79	64	72	55	52	87	40	30	29	G	24	G
6	G	G	G	26	G	G	G	G	48	G	G	G	G	G	G	58	53	49	37	52	33	33	37	G
7	G	G	G	G	G	G	34	56	56	50	47	47	G	46		54	57	72	146	150	G	G	G	G
8	G	G	25	G	G	28	38	50	58	G	G		58	G	G	G	53	49	34	32	32	G	G	G
9	G	G	G	24	30	36	50	57	71	78	103	55	G	46	49	48	85	44	39	G	31	28	26	32
10	45	G	33	30	G	G	G	42	G	55	53	G	55	G	50	G	G	G	G	G	G	G	28	28
11	26	26	26	24	27	33	45	57	64	72	88		G	55	G	G	G	G	G	G	G	33	G	23
12	28	30	57	48	43	58	49	40	59	G	62	58	52	54	51	61	G	58	56	61	83	64	27	37
13	33	30	30	34	G	G	38		68	71	50	85	95	57	G	G	58	50	44	37	G	G	36	G
14	G	G	G	G	G	34	40	46	G	54	55	51	49	G	82	56	46	48	49	92	84	60	59	43
15	29	28	30	40	45	38	40	46	54	53	55	77	96	50	G	58	56	40	37	90		G	G	G
16	G	G	G	G	G	41	38	50	51	56	64	55	51	65	48		44	40	33	G	84	26	G	G
17	G	38	30	25	27	31	44	61	60	54	62	74	61	50	54	54	50	54	52	30	G	29	31	28
18	G	G	G	72	34	33	50	58	57	51	50	54	60	62	106	121	54	52	44	34	40	40	G	G
19	26		32	29	G	33	G	G	G	G	55	G	G	G	G	49	46	58	55	55	112	57	G	29
20	26	G	G	30	G	34	46	68	81	84	57	54	76	93	83	G	52	85	64	66	G	28	92	49
21	42	59	66	59	71	44	51	67	75	84	54	G	G	G	50	50	73	73	48	30	G	G	65	37
22	G	28	G	G	G	29	35	46	49	53	G	53	57			G	42	40	77	32	31	29	G	G
23	G	G	G	G	G	G	37	G	G	54	G	G	47	G	45	50	54	46	60	58	36	40	59	38
24	37	35	32	G	G	44	52	45	78	96	84	54	92	60	69	47	88	73	58	44	56	61	49	45
25	49	40	39	35	31	38	50	51	86	78	G	54	52	55	52	73	49	47	55	115	30	59	58	84
26	60	52	34	32	30	55	60	51	55	54	53	51	55	61	69	55	56	36	84	72	116	113	94	94
27	68	40	29	37	29	32	43	74	138	114	136	115	74	83	50	59	48	90	G	37	48	142	84	59
28	81	31	G	25	G	G	41	55	54	77	97	88	87	56	56	G	G	50	85	40	115	83	50	33
29	43	G	G	G	30	38	56	74	84	57	74	61	96	73	71	44	77	73	82	84	125	124	91	60
30	73	27	G	G	32	34	48	73	80	74	85	61	51	G	116	50	90	92	94	46	51	41	34	37
31	34	26	25	30	29	33	48	58	65	61	69	61	51	72	92	84	86	53	51	86	36	37	24	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	30	31	31	31	31	30	31	31	31	29	31	30	29	30	31	31	31	31	30	31	31	31
MED	26	14	G	24	G	33	40	50	58	55	55	54	55	54	50	50	52	50	51	40	34	33	28	28
U Q	42	30	30	32	30	38	49	58	72	74	74	61	77	62	70	58	58	72	63	66	59	59	58	38
L Q	G	G	G	G	G	G	37	46	54	52	49	24	G	G	G	G	44	40	37	30	29	G	G	G

HOURLY VALUES OF FMIN AT AKITA

MAY 1992

LAT. 39.7N LON. 140.1E 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	16	17	17	17	17	18	22	16	22	20	35	28	24	29	22	21	17	16	17	17	15	16	16	17
2	16	18	14	17	16	18	16	17	23	23	48	27	23	22	26	18	18	17	16	16	16	16	16	17
3	16	18		16	17	22	17	18	20	21	21	49	23	23	21	17	21	16	15	15	17	17	16	20
4	18	15	16	16	15	16	16	17	18	20	22	33	21	23	27	18	18	16	16	16	17	21	16	17
5	16	18	17	16	15	17	16	28	35	38	34	29	29	26	22	21	18	17	16	16	17	17	17	16
6	20	17	17	17	17	22	16	21	21	34	49	28	48	40	23	21	20	16	16	17	16	15	16	17
7	16	18	17	18	17	20	16	16	17	21	22	26	26	23		17	20	16	15	15	17	17	17	16
8	15	17	18	17	17	20	16	16	20	20	22		23		23	21	18	15	16	15	16	16	17	15
9	16	16	16	15	15	16	15	16	21	21	23	27	42	23	23	20	18	16	17	15	15	16	17	15
10	16	16	16	15	16	21	15	17	20	20	20	56	36	38	24	17	17	17	21	17	16		16	15
11	17	17	17	16	17	16	18	20	17	20	28		35	26	24	23	17	16	21	16	20	16	17	17
12	16	15	14	15	15	16	15	17	20	20	23	22	36	38	26	23	24	17	16	16	15	15	17	16
13	15	16	17	17	18	18	17		21	24	27	24	32	29	29	38	22	17	16	15	18	17	16	16
14	16	16	15	16	17	17	17	20	23	21	27	36	35	50	26	22	20	17	16	16	16	17	16	15
15	15	16	16	14	15	15	15	17	20	21	23	26	24	27	26	22	18	18	17	16		16	16	16
16	17	18	18	18	17	17	16	16	20	22	27	24	27	34	24		18	17	16	17	15	17	16	16
17	16	15	17	17	17	16	15	18	20	20	24	23	30	24	22	18	18	16	16	15	17	16	16	17
18	17	17	16	16	17	16	16	20	20	23	23	24	23	26	22	23	18	17	17	16	16	16	16	18
19	18		15	15	15	18	15	17	20	23	35	23	35	29	23	20	20	17	15	16	16	16	16	16
20	17	18	17	15	17	17	16	17	17	23	23	34	26	32	26	23	17	17	16	15	16	16	15	15
21	17	16	16	16	16	16	16	16	20	20	22	26	30	28	35	20	18	17	17	15	16	17	16	16
22	17	15	16	17	16	16	15	18	20	20	24	26	32			24	20	17	17	15	15	17	18	17
23	17	18	16	20	17	15	16	17	20	22	21	33	32	50	24	24	17	17	16	17	15	15	17	16
24	15	16	16	17	16	16	14	18	21	22	22	26	29	22	23	20	18	16	16	15	15	17	16	16
25	16	16	17	16	16	16	15	16	20	18	23	28	33	39	24	22	17	17	16	15	18	16	17	15
26	17	15	15	15	15	16	16	18	20	26	23	35	28	27	26	20	20	18	15	15	16	16	16	16
27	16	16	16	16	17	18	17	17	20	21	23	24	27	30	23	21	17	16	16	16	16	15	16	16
28	17	15	17	16	17	21	16	17	21	20	24	22	22	24	24	20	23	17	17	17	16	17	16	16
29	16	17	20	17	16	16	17	18	18	26	23	32	30	26	23	26	20	17	16	15	16	16	16	15
30	16	15	16	17	15	16	15	16	20	21	21	24	28	23	23	22	18	18	15	16	17	15	16	16
31	17	17	16	17	16	16	16	18	21	21	23	26	22	29	21	22	18	18	17	16	15	16	17	18
	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	30	30	31	31	31	31	30	31	31	31	29	31	29	29	30	31	31	31	31	30	30	31	31
MED	16	16	16	16	16	16	16	17	20	21	23	26	29	27	24	21	18	17	16	16	16	16	16	16
U Q	17	17	17	17	17	18	16	18	21	23	27	32	33	33	26	23	20	17	17	16	17	17	17	17
L Q	16	16	16	16	15	16	15	16	20	20	22	24	24	23	23	20	18	16	16	15	15	16	16	16

HOURLY VALUES OF FOF2 AT KOKUBUNJI

MAY 1992

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

DAY \ HOUR	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	85	80	73	68	65	73	96	98	102	110	106	108	121	118	114	116	115	116	126	130	93	79	81	71
2	75	70	69	63	65	73	78	92	96	112	112	112	111	118	120	121	112	109	124	114	80	65	A	66
3	82	67	68	68	62	58	73	78	85	80	88	91	105	112	121	117	114	117	111	86	72	72	67	67
4	74	68	73	68	58	60	69	56	47	63	A	74	81	85	88	90	93	88	82	80	71	69	67	76
5	65	70	74	77	73	70	78	82	86	91	A	94	104	100	97	78	80	86	97	106	84	74	76	81
6	73	70	68	60	55	63	83	87	76	75	77	88	92	94	96	101	98	101	104	98	82	54	73	73
7	71	68	67	66	55	63	82	91	100	85	74	83	94	104	107	110	96	104	96	85	80	84	85	92
8	82	81	74	62	60	66	61	A	62	A	A	43	71	52	73	74	72	73	71	80	76	78	82	72
9	71	73	76	78	72	63	87	102	94	95	97	98	100	94	94	100	143	A	A	101	79	74	76	72
10	71	73	68	61	58	57	74	A	70	98	94	89	98	96	94	97	95	78	81	104	90	76	55	81
11	56	46	37	48	37	41				A			A	A	70	70	64	66	64	70	64	54	76	72
12	57	56	48	48	45	47	A	51	47	A	85	95	82	98	98	88	86	80	84	82	78	84	53	81
13	78	77	77	56	56	62	70	74	80	96	98	A	104		A	A	107	98	96	100	96	76	65	68	55
14	63	64	75	45	42	48	60	58	53	65	66	70	73	78	80	80	75	81	72	A	A	70	66	70
15	69	72	A	57	52	57	73	94	96	81	79	90	98	101	101	102	92	90	88	90	86	86	58	90
16	80	76	74	68	72	76	86	90	97	85	80	93	A	108	109	114	115	123	124	112	91	86	77	80
17	74	80	78	67	71	82	92	86	A	80	86	88	102	102	111	112	112	111	A	102	96	89	86	77
18	77	74	72	76	86	82	90	91	86	82	90	101	105	117	121	A	115	106	101	97	88	92	82	82
19	81	80	80	73	72	91	101	81	75	73	78	91	96	102	111	119	128	114	98	A	80	58	88	88
20	87	84	83	72	76	82	98	99	104	A	97	93	90	102	109	108	102	A	101	85	91	87	83	81
21	81	90	96	83	78	87	93	100	99	A	100	90	101	100	105	N	101	98	95	100	100	A	94	93
22	86	94	78	67	70	80	102	101	97	97	96	104	96	93	101	104	99	106	102	104	95	93	92	98
23	90	85	81	78	73	74	67	74	45	57	77	A	78	87	84	82	83	82	82	A	76	81	80	77
24	83	71	73	72	73	74	82	94	86	94	97	77	83	92	108	105	97	98	102	104	82	78	85	88
25	86	83	82	84	76	86	90	92	90	78	77	81	93	101	104	104	A	123	101	101	88	93	91	88
26	93	84	82	79	72	82	86	92	A	82	86		97	94	147		134	101	N	90	87	82	87	88
27	91	87	82	75	74	70	70	86	85	94	105	105	98	95	106	113	123	117	106	90	86	79	79	80
28	90	83	67	70	67	73	66	55	97	72	75	79	81	86	85	93	93	94	94	85	76	A	72	80
29	79	62	60	56	54	70	79	81	A	74	A	76	81	81	82	86	97	79	A	85	73	A	67	58
30	73	53	52	53	47	57	67	A	87	67	A	A	98	A	150	A	150	137	A	77	54	A	60	A
31	60	66	55	55	51	61	55	A	A	A	A	55	A	66	71	65	A	68	66	50	54	50	70	65
	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	30	31	31	31	29	26	26	25	24	26	28	28	30	27	29	29	26	28	30	27	30	30
MED	78	73	74	68	65	70	79	88	86	82	87	90	96	97	102	102	98	98	98	93	81	78	76	80
U Q	85	83	78	75	73	80	90	94	97	94	97	95	101	102	111	112	115	112	102	103	88	86	85	88
L Q	71	68	68	57	55	60	69	78	75	73	77	79	82	89	88	86	92	81	82	85	76	69	67	72

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT KOKUBUNJI

MAY 1992

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	46	58	51	92	60	G	50	49	75	G	49	49	66	46	40	G	57
2	52	24	G	G	G	G	40	44	50	61	50	G	55	67	48	G	44	40	56	92	59	59	106	30
3	G	G	G	G	G	26	38	51	57	58	47	G	G	G	G	51	59	60	38	25	31	G	G	G
4	G	G	G	G	G	30	G	48	52	55	60	60	56	70	G	76	62	94	86	58	91	82	54	36
5	35	30	26	G	G	G	60	56	90	56	81	72	G	48	G	53	G	61	40	69	50	25	25	G
6	28	G	G	G	G	G	39	45	58	49	54	53	G	G	G	52	52	52	36	36	34	40	57	26
7	G	G	G	G	G	G	G	44	55	G	G	50	56	57	56	62	115	90	72	67	90	94	106	59
8	30	G	G	G	G	29	34	70	79	66	58	G	G	48	54	51	52	55	55	29	24	G	24	G
9	G	G	G	26	41	44	44	49	61	96	57	61	G	52	G	77	96	136	100	59	49	30	G	22
10	G	35	26	23	G	G	G	61	52	53	66	56	55	G	52	58	G	G	G	G	G	G	24	25
11	26	30	32	30	G	36	G	G	G	47	G	G	55	72	G	G	G	G	G	G	G	42	38	36
12	24	G	G	G	26	39	68	43	45	81	53	50	61	52	72	60	76	73	51	58	33	58	65	60
13	31	55	44	26	G	G	G	47	69	57	G	102	50	113	150	45	G	60	50	50	59	38	48	38
14	G	G	36	G	G	32	40	57	56	57	G	56	47	51	60	59	50	50	38	65	98	72	72	41
15	40	80	132	59	33	30	35	49	51	59	56	53	51	50	G	G	54	55	57	58	72	80	37	G
16	G	G	23	30	29	29	37	54	76	58	54	62	94	53	71	69	62	40	36	28	G	40	54	60
17	44	28	G	26	G	G	56	54	82	70	50	54	G	78	48	G	G	54	132	46	28	58	G	28
18	50	G	24	G	24	G	44	73	70	61	58	54	58	74	98	127	95	55	59	68	40	G	40	G
19	G	G	G	G	G	28	39	42	46	G	49	50	G	G	55	84	85	71	54	102	33	56	49	28
20	30	28	24	26	27	34	47	62	62	108	72	58	59	48	78	G	53	138	48	102	76	25	26	58
21	58	58	50	60	68	43	65	58	91	95	102	55	50	49	54	162	73	80	62	58	65	126	50	57
22	58	41	37	32	30	34	42	49	58	72	68	125	104	86	58	81	G	154	97	110	86	33	52	37
23	G	25	29	G	G	G	G	G	48	50	62	74	55	64	66	50	51	53	60	81	59	40	58	59
24	50	54	26	28	G	28	39	50	53	58	61	62	55	95	G	50	G	51	61	G	G	56	59	33
25	49	46	46	28	24	38	45	61	48	55	62	60	G	92	111	G	153	85	73	61	92	81	72	58
26	41	34	36	30	G	51	61	88	111	72	61		56	60	151		110	92	70	89	58	46	67	36
27	78	94	70	70	49	G	45	80	52	92	108	68	52	G	51	55	53	88	58	32	44	60	60	60
28	82	66	41	29	37	G	40	54	82	60	55	50	G	49	G	G	44	52	72	60	40	61	58	52
29	49	54	40	32	35	42	62	78	92	102	94	69	60	65	107	48	82	64	108	57	41	60	53	116
30	60	59	79	32	60	30	65	107	88	87	90	123	93	110	136	96	111	130	95	54	59	92	90	70
31	40	28	29	41	40	30	45	70	77	60	62	64	80	61	57	62	54	38	53	57	78	39	38	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	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	30	31	31	31	31	31	31	31	31
MED	31	28	26	26	G	29	40	54	58	59	58	57	55	53	54	54	53	60	57	58	49	46	52	36
U 0	50	54	40	30	33	34	47	62	79	72	68	64	58	72	72	75	82	88	72	68	72	61	60	58
L 0	G	G	G	G	G	G	34	46	52	55	50	50	G	48	G	45	G	51	48	36	33	33	26	26

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT KOKUBUNJI

MAY 1992

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	16	14	15	14	15	18	17	16	17	20	34	35	34	30	21	18	15	15	15	15	14	15	15	15
2	15	16	15	15	15	20	16	15	20	21	34	35	33	28	32	20	16	16	15	15	15	15	15	15
3	15	14	15	14	15	15	16	17	18	20	26	40	48	23	24	18	16	15	16	16	14	17	15	15
4	16	16	16	14	15	15	21	15	17	22	20	33	34	23	33	18	16	15	17	14	15	15	15	15
5	15	15	15	14	14	20	17	22	35	38	35	34	34	33	39	20	17	15	16	14	14	15	16	17
6	15	15	15	15	16	16	26	18	23	32	30	39	29	30	39	23	17	15	15	15	14	15	14	15
7	14	15	16	14	15	20	16	15	16	21	22	32	35	28	20	20	20	15	15	15	14	14	15	14
8	14	14	14	15	15	15	14	16	17	18	29	32	54	26	28	21	16	16	16	15	15	16	15	15
9	16	15	15	14	14	14	16	16	20	28	37	36	41	39	37	20	16	14	15	14	15	14	16	15
10	15	14	14	15	15	21	28	16	17	20	22	38	38	27	34	20	17	17	21	16	17	15	15	15
11	15	14	14	14	17	15	17	17	22	21	22	38	21	30	22	24	17	16	15	16	15	14	14	15
12	15	15	15	14	14	14	16	16	17	20	22	38	35	36	36	26	21	16	15	14	15	14	15	15
13	15	14	15	15	15	21	18	16	18	27	32	34	34	33	23	22	17	17	14	15	14	15	14	15
14	15	15	14	15	15	16	27	17	21	35	34	33	35	33	33	33	17	16	17	15	16	15	15	15
15	14	14	14	14	14	15	15	16	16	20	38	36	36	32	39	23	17	15	16	14	14	15	14	15
16	15	14	15	14	15	16	16	17	17	21	21	34	36	35	22	20	17	15	16	14	15	15	14	14
17	15	14	15	14	15	15	15	17	17	22	35	33	33	30	30	18	17	15	16	14	14	14	15	15
18	15	16	14	15	15	16	17	18	20	20	34	30	35	32	21	21	18	17	18	15	15	16	15	14
19	15	15	15	14	14	17	16	17	20	22	24	35	42	30	26	22	16	16	15	14	15	14	15	15
20	15	15	15	15	15	15	16	16	17	21	34	34	33	21	29	44	15	16	16	14	15	16	15	14
21	15	14	14	15	14	15	16	16	16	26	22	33	34	34	39	34	20	15	16	14	15	15	15	15
22	15	14	14	14	14	15	16	16	18	20	29	34	34	34	26	24	16	15	16	15	15	14	15	16
23	16	15	15	15	15	21		15	20	28	24	34	38	34	32	20	18	15	16	14	15	15	14	14
24	15	14	15	14	15	15	17	16	18	23	26	28	24	32	50	35	16	16	16	17	15	15	14	14
25	15	14	15	14	16	16	16	16	16	18	35	36	33	36	35	18	17	15	15	17	15	15	15	15
26	14	14	15	14	15	15	16	15	17	23	33		33	27	20		17	16	16	16	16	15	15	15
27	15	14	14	15	14	22	16	16	17	21	32	30	28	50	28	24	17	15	16	14	15	16	15	15
28	16	15	15	15	14	21	15	16	20	18	22	29	33	35	38	17	23	17	15	14	15	16	14	15
29	15	14	14	15	14	14	16	16	18	20	24	29	33	34	21	18	16	16	16	14	14	15	15	15
30	14	14	14	15	15	14	15	16	18	18	23	22	27	29	18	20	16	14	15	16	15	15	15	15
31	15	15	14	14	15	15	16	16	17	20	23	35	35	32	24	20	18	16	14	14	14	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	31	31	31	31	31	31	30	31	31	31	31	30	31	31	31	30	31	31	31	31	31	31	31	31
MED	15	14	15	14	15	15	16	16	18	21	29	34	34	32	29	20	17	15	16	15	15	15	15	15
U Q	15	15	15	15	15	20	17	17	20	23	34	36	36	34	36	24	17	16	16	15	15	15	15	15
L Q	15	14	14	14	14	15	16	16	17	20	22	32	33	28	22	20	16	15	15	14	14	15	14	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT YAMAGAWA

MAY 1992

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

DH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	87	85	72		66	82		108	105		109	122	112	122	125	125	90	141	140	108	90	88	87
2	86		83	65	70	66			106	123	112	109	121	128	137	138	128	134	143	128	103	74	86	84
3	86	79		80	67	60	74	98	112	105	90	102	116	125	127	130	138	136	133	111	83	78	83	86
4	83	83	82	83	66	67	82	85		76	83	85	106	118	120	117	121	117	116	111	86	72	73	
5	80	81	80	82				86	87	90	95	100	116	122	117	110		124	126	131	108	84	82	84
6	81	70	83	68	55		77	90	72	71	78	91	104	108	114	120	120	117	119	117	97	83	85	
7	88	85	88	82	66	66			95	78	80	84	105	118	122	127	123	130	A	111	102	100	88	A
8	86	86	85		81		79		79	A	A					82	80	81	86	90	82	78		76
9	67		67	72	54	51		88	90		114	115	114		106	104	105	A	108	110	104	81	81	80
10	81		78	60		66		61	56	90	94	91	107	120	110	108	112		81	107	108	131	126	111
11	87	A	81	86	64	37	A			A						71			75	70		66	A	66
12	A	56	51		43	32	52	54	56				78	90	101		110	108	97	91	83	83	88	83
13	85		88	A	46	54	66	77	88	102	102	97	117	116	123	122	108	109	118	110	86	78	75	77
14		86	83		48	48		72	82	79			101	110	106		91	97		87		82	80	79
15	80	75	80	66	54		66	90		77	85	92	105	113		104	98	105		105		90	90	86
16	87	88	78	76	71		97	101		81	81	94	107	112	119	132	135	135	145	130	100	90	88	97
17	98	105	98	85	80	80	102			75	84	90	108	114	120	127	127	124	123	116	104	90	87	84
18	86	90		80	80	81	85			82	90	97	107	120	128	128	130	127	128	125	107		80	88
19	88				80	82	87	74	72	71	78	93	98	109	115	123	136	124	111	105	A	87	87	100
20	101	97	88	78	79	77	102	100	100	96	96	100	102	112	116	124	125	116	136	A	84	87	86	87
21		87	86			74	87	101	85	A	A	88		122	131	134	A	117	122	119	108	100		124
22	109	102	87	80		78	100	86	87		95	92	98	107	112	117	114	109	111	104	104	A	109	106
23	107	98	99	85		66	70	71	64		70	A	71	86	91	91	90	91	C	A	85			78
24	78	78	77	74	72	71	82	97	91	101		82	94	101	112	109	116	111	111	110		A	80	81
25	90	88		82	77	84	85	94	86	74	85	123	100	107	114	122	120	124	127	106	90	100	106	98
26	90	84	85	86	86	85	97	86	88	101	A	98	107	117	112	118	123	112	107	A	98	89		
27	101	96	97	86	66	60	67			81	91	98	100	105	109	122	135	135	121	98	86	87	94	86
28		80	85		80	71	72			84	89	90	A		106	108	115	118	108		77	78		79
29	80	77	74	72	61	66	81		A	99	84	A		108	112	111	109	102	111	A	A	78	79	76
30	83	78	83	78		72	77		87	87	86	90	94	A	83	80		82	84	A	82	A	62	
31	66	78	66	63	61		52	60	A	A		63	67	86	A	96	82			80	66		64	77
	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	27	24	24	25	24	20	21	23	22	25	26	26	27	29	27	27	26	25	25	25	25	26
MED	86	85	83	79	66	66	82	86	87	84	88	93	105	112	114	118	120	117	117	110	97	84	86	84
U Q	90	89	87	82	79	77	87	95	93	101	95	100	108	118	122	126	127	124	127	118	104	90	88	88
L Q	81	78	78	72	58	60	71	73	75	77	83	90	98	107	109	106	108	105	108	101	83	78	80	79

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT YAMAGAWA

MAY 1992

LAT. 31.2N LON. 130.6E 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	114	31	G	G		G	32		46	G		70	G	G	55	73	64	95	163	92	92	G	51	29
2	38		28	23	G	G			55	64	49	86	G	G	58	78	110	114	106	76	33	36	65	33
3	G	G		G	G	G	32	40	50	64	57	54	53	G	58	G	44	40	G	40	G	G	G	28
4	G	G	G	G	G	G	32	G		G	G	G	G	G	G	G	G	G	52	39	84	46	40	
5	G	G	G	G				41	56	76	67	96	64	71	56	54		G	G	65	59	70	67	41
6	58	26	30	G	G		G	G	49	56	G	G	G	G	52	G	54	82	60	92	58	30	70	G
7	79	33	32	24	26	26			54	60	59	54	52	G	G	73	98	163	149	92	28	84	110	148
8	90	43	34		30		68		80	147	93					50	G	48	42	44	81	33		G
9	G		G	G	G	32		42	48	G	G	G	48		G	G	51	98	71	93	84	31	34	30
10	29		28	37		G		41	49	52	61	67	68	53	59	60	G		G	G	G	G	24	24
11	56	50	58	25	34	33	31			59						56			G	G		28	37	28
12	40	26	G		G	G	31	G	G				58	67	53		G	G	36	31	38	69	38	64
13	83	G	60	50	47	G	36	43	56	46	56	56	G	G	G	50	50	52	62	27	40	30	38	60
14		39	30		G	G		42	47	55			G	G	G		55	G		37		29	91	27
15	26	G	76	56	35		32	42		58	64	50	G	G		50	64	59		G		26	32	81
16	G	G	G	G	G		32	49		52	70	90	62	77	53	51	91	72	111	60	34	G	G	45
17	44	53	59	40	34	29	34	G		80	76	70	G	71	71	G	G	G	G	65	150	72	35	32
18	25	31		30	G	G	42			72	64	50	70	60	79	G	G	G	37	81	G		41	41
19	G				G	G	G	44	41	54	51	G	50	52	G	56	66	G	74	77	88	24	41	G
20	33	27	24	27	G	G	36	45	61	72	68	96	64	G	76	51	G	107	129	146	91	54	32	27
21		G	G			G	35	45	62	119	147	111	174	48	73	G	141	99	91	151	58	38		95
22	G	50	48	39		51	40	51	61		G	71	62	54	G	G	G	68	71	45	26	65	47	92
23	28	34	40	G		G	32	41	51		50	95	65	G	G	G	64	57	C	118	94			43
24	32	28	G	25	44	43	36	43	51	55		89	62	G	G	G	G	51	48	61		70	46	31
25	33	25		27	26	25	34	51	49	60	58	133	54	G	G	G	58	80	70	80	58	79	G	56
26	G	40	26	G	G	24	G	46	71	90	106	94	108	G	63	82	62	64	72	105	89	40		
27	43	58	90	54	46	40	33			78	72	93	80	50	G	52	48	G	53	58	49	94	68	43
28		92	69		46	59	48			80	82	67	114		56	G	G	77	68		69	51		46
29	91	92	70	35	38	24	40		100	124	98	105		48	G	48	53	48	66	99	90	49	30	32
30	G	38	43	31		54	60		60	55	80	125	117	169	79	50		70	64	150	83	83	31	
31	57	48	36	48	39		50	60	78	81		72	G	69	100	72	78			43	38		91	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	28	27	27	25	24	25	25	21	23	28	25	27	28	27	28	29	28	28	27	30	27	28	26	28
MED	32	31	30	25	14	G	34	42	54	60	64	71	56	G	53	50	52	58	64	65	58	39	39	33
U Q	56	48	58	38	36	32	40	45	61	79	78	95	66	60	61	56	64	81	74	92	88	69	65	51
L Q	G	G	G	G	G	G	32	40	49	54	50	54	G	G	G	G	G	G	37	40	34	28	32	28

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT YAMAGAWA

MAY 1992

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	15	15		15	15		20			38	44	47	39	36	27	17	16		15		15	15
2	15		15	15	15	15			23	34	36	35	35		43	38		16	16	16	15	15	15	15
3	15	15		15	15	15	15	15	17	22	35	38	37		35		17	17		15	15	15	15	16
4	15	15	15	15	16	15	15	15		22	38	40	48	49	47	37	20	16	16	15	15	15	15	
5	15	15	15	15				21	35	36	38	38	39	36	35	34		17		15	15	15	15	15
6	15	16	15	15	15		22		34	36	51	49	48	51	39	44	34	21	17	15	15	15	15	
7	15	16	15	15	15	15			20	23	36	38	38	41		38	35	16	15	15	15	15	15	
8	15	15	15		15		15		17	23	34					29	21	29	17	15	15	15		15
9	15		15	15	15	15		16	18		40	45	48		49	36	21		15	15	15	15	15	15
10	15		15	15		15		16	17	35	38	40	39	40	42	35			15	15		15	15	15
11	15	15	15	15	17	15	16			34						35			16	17		15	15	15
12	15	15	14		15	15	15	17	18				40	39	39		38	20	16	15	15	15	15	15
13	15		15	15	15	15	16	16	23	24	35	35		54	50	36	32	26	15	15	15	15	15	15
14		15	15		15	15		18	33	36				46	50		22	21		15		15	15	15
15	15		15	15	15		17	17		36	39	42		50		34	24	22				15	15	15
16	16	15	15	15	15		16	16		24	38		39	38	38	36	21	17	15	15	15	15	15	15
17	15	16	15	15	15	15	15			24	34	35	34	35	34	29	23		16	15	15	15	15	15
18	15	15		16	18	15	16			33	36	36	36	34	34		23	17	16	15			15	15
19	16				15	15	16	16	23	35	35	39	34	36		39	35		15	15	15	15	15	
20	15	15	15	15	15	15	15	17	17	24	26	35	35		32	30		18		15	15	15	15	15
21		15	15			15	15	16	20	34	34	39	14	49	43		24	16	16	15	15	15		15
22		15	15	15		15	15	16	18			36	44	42		44	26	22	16	15	15	15	15	15
23	15	16	16	15		15	17	15	20		35	36	36		53		35	20	C	15	15			15
24	15	15	15	15	15	15	17	16	20	23		34	38	56	48	39	36	18	16	16		16	15	15
25	15	15		15	15	16	15	15	18	34	36	36	38	48	49		26	16	16	15	16	15		15
26		15	15	16	15	15		18	17	35	35	36	36		39	35	24	18	16	15	16	16		
27	15	15	15	15	15	15	18			20	24	34	35	35		50	35		16	15	15	16	15	15
28		15	15		15	15	16			26	29	36			38	24		16	15		15	15		15
29	15	15	15	15	15	15	16		18	24	35	35		34		24	20	16	15		15	15	15	15
30	15	15	15	15		15	17		20	26	34	35	34		34	45		18	16		15	15	15	
31	15	15	15	15	15		16	18	21	22		36		34		30	18			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	26	25	27	25	24	25	24	19	23	26	24	26	23	21	22	24	24	24	24	26	25	27	25	25
MED	15	15	15	15	15	15	16	16	20	26	35	36	38	41	39	36	24	18	16	15	15	15	15	15
U Q	15	15	15	15	15	15	16	17	23	35	38	39	40	49	48	38	34	20	16	15	15	15	15	15
L Q	15	15	15	15	15	15	15	16	18	23	34	35	35	35	35	32	21	16	15	15	15	15	15	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT OKINAWA

MAY 1992

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	93	110	86	66	A	63		88	104	108	108	108	110	117	131	131	144	145	145	110	94	86	108	104
2	85	86	87	51	66	62	63	79	90	111	107	115	130	132	146	151	152	145	136	A	110	87	108	110
3	110	110	110	86	80	45	63	86	110	90	85	105	121	123	143	146	163	162	145	130	131	128	130	143
4	130	125	110	110	86	79	80	89	86	90	90	90	110	132	134	130	140	142	131	144	91	A	80	83
5	86	66	86	86	67	34	44	86	90	90	90	101	A	A	134	145	146	162	163	135	111	86	87	86
6	86	84	80	67		47	63	85	70	70	81	98	111	125	129	142	131	146	144	146	106	105	86	131
7	121	99	102	110	85	66	84	107	85	84	85	89	111	116	136	146	141	131	131	121	104	110	121	103
8	88	88	86	86	84	85	83	66	69	A	77	82	105	112	109	92	90	91	96	90	83	75	A	
9		66	64	72	23	30	52	54	A	81	105	112	116	118	112	111	111	111	119	108	90	A	85	84
10	85	85	86	66	A	A	54	A	A	72	90	86	106	131	124	121	127	102	81	108	103	146	87	87
11	87	A	A	67	54	A	A			A	A	A	A	A	85	94	96		103	90	66	A	61	64
12	66	66	68	36	43	N	43	50	42	60	75	88	87	94	134	146	159	159	103	145	110	110	80	103
13	110	90	110	63	47	32	53	70	87	98	90	97	125	112	145	147	146	146	127	111	90	83	90	79
14	86	110	86	66	64	63	54	82	90	105	100	104	133	146	127	111	130	108	145	144	111	103	72	104
15	84	86	96	54	50	34	53	81	76	78	84	93	110	111	117	112	117	103	107	106	88	C	83	88
16	87	87	84	74	63	62	80	90	77	74	81	80	85	94	124	A	146	146	159	146	108	108	131	107
17	104	114	130	104	88	86	89	85	77	70	77	90	106	116	138	143	142	142	144	140	111	A	A	90
18	90	90	91	66	84	84	77	78	74	84	81	90	111	105	146	146	146	146	164	145	103	A	A	77
19	86	83	84	86	78	78	70	78	71	70	84	84	102	104	106	107	109	130	108	110	102	90	86	104
20	105	67	86	86	A	35	85	82	90	86	96	112	104	A	N	139	140	128	111	119	87	86	A	A
21	86	87	87	87	68	31	67	82	68	73	78	90	109	139	133	144	145	141	142	145	105	112		110
22		138	111	102	100	86	86	84	84	91	91	94	100	107	109	112	119	118	110	90	A	89	A	107
23	91	A	84	84	67	34	A	A	A	A	A	A	86	93	108	100	104	87	90	86	49	52	A	A
24	77	77	71	77	72	27	66	88	87	88	A	91	107	109	112	112	126	118	111	110	83	86	78	84
25	87	86	70	87	80	80	84	83	81	A	91	102	107	118	130	N	146	146	141	90	A	66	105	75
26	88	67	86	80	85	86	84	81	87	106	90	93	112	129	143	145	141	130	131	111	110	80	85	88
27	90	109	102	33	52	53	51	80	78	78	87	A	A	110	116	117	144	136	110	88	86	78	80	83
28	84	83	54	72	71	60	73	78	A	A	82	78	87	97	105	113	101	130	106	78	84	78		78
29	A	A	77	72	67	A	32	54	73	A	78	101	A	129	133	143	140	131	142	131	105	87	111	102
30	A	109	82	90	78	52	54	72	78	92	A	A	117	72	85	A	96	97	100	85	A	A		A
31	A	72	54	66	50		A	52	A	73	A	76	81	98	112	92	104	112	111	79	84	A	70	45
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	28	30	31	27	26	27	28	25	25	26	27	27	28	30	28	31	30	31	30	28	23	22	27
MED	87	86	86	74	68	61	66	82	81	84	86	93	109	114	128	130	140	131	127	110	102	87	86	88
U Q	93	109	96	86	84	79	83	85	88	91	91	102	112	127	134	145	146	146	144	140	109	108	108	104
L Q	86	80	80	66	54	34	53	75	73	73	81	88	102	104	112	111	111	112	107	90	86	80	80	83

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT OKINAWA

MAY 1992

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	G	G	91	32	38	26	G	43	50	51	91	60	G	57	G	G	58	108	91	60	57	48	G	41
2	36	G	G	G	G	G	G	40	50	71	64	58	70	60	G	53	77	76	144	150	59	28	32	34
3	26	G	24	G	G	G	G	G	45	54	54	G	G	56	58	G	56	101	61	83	34	G	G	G
4	G	G	G	G	G	G	G	G	48	G	G	G	G	G	G	51	55	55	61	57	56	36	33	G
5	G	G	G	G	G	G	31	42	52	87	81	G	126	149	98	59	72	69	58	114	72	34	G	G
6	G	G	G	G	G	G	G	G	48	51	52	52	G	52	G	58	77	76	112	51	49	59	40	33
7	32	33	G	G	G	G	G	G	45	52	65	66	78	64	94	80	108	66	57	42	G	37	40	39
8	80	38	30	38	37	G	29	42	G	76	G	G	75	59	50	G	G	G	48	38	34	29	78	G
9		G	G	G	G	G	G	40	72	59	74	G	G	G	63	61	G	51	42	51	111	151	69	37
10	38	38	44	37	37	38	G	57	51	50	52	58	58	G	79	65	58	45	G	G	G	G	G	11
11	24	38	27	25	38	36	39	G	G	50	59	57	54	62	G	89	G		51	G	G	49	49	43
12	34	30	41	33	28	G	G	39	G	G	G	G	G	G	G	54	54	48	42	36	26	G	84	66
13	38	38	38	38	35	30	40	47	49	60	54	G	G	52	G	G	G	G	G	41	40	G	60	G
14	33	38	29	37	34	27	34	43	58	56	63	60	77	81	86	53	53	52	40	44	58	24	36	26
15	G	56	29	G	G	G	30	37	51	60	54	G	G	G	G	80	58	47	34	35	48	40	38	40
16	40	28	G	G	27	25	32	42	58	54	74	76	78	66	79	122	59	59	64	41	33	33	32	24
17	G	43	37	G	G	G	30	42	54	56	56	84	96	101	79	54	G	G	41	28	40	143	109	38
18	32	40	34	26	G	G	29	40	53	58	73	68	50	56	106	60	G	48	62	53	55	84	92	40
19	38	24	G	G	G	G	28	40	G	52	G	G	G	G	55	50	G	G	G	G	G	G	34	26
20	32	35	28	23	45	30	39	47	61	58	70	82	77	92	47	53	61	51	56	37	40	113	112	109
21	G	26	G	G	G	G	G	G	57	51	57	G	54	57	56	61	57	45	49	58	24	24	G	31
22	93	58	69	56	37	44	58	67	60	66	55	53	G	54	49	62	51	60	58	59	85	36	40	32
23	38	49	69	41	G	28	58	77	84	116	108	83	57	59	65	50	52	55	58	58	62	40	90	89
24	38	37	39	50	36	35	43	44	52	68	80	57	56	G	G	56	62	72	58	54	40	G	G	38
25	G	25	G	G	G	G	32	46	64	118	78	62	G	G	51	G	58	92	84	78	107	57	40	34
26	26	28	G	G	G	G	28	39	G	50	66	G	78	G	G	G	50	48	37	42	60	39	31	29
27	23	G	G	40	33	38	32	58	50	G	58	85	143	146	67	G	49	49	56	49	44	40	32	84
28	40	56	59	52	55	58	45	38	137	140	50	62	55	58	58	54	64	58	46	49	33	25	G	G
29	41	37	40	56	40	57	40	50	76	106	80	78	79	61	53	58	45	46	38	G	25	58	40	39
30	29	G	25	G	G	G	29	40	76	106	118	137	141	85	94	85	G	81	60	79	85	84	40	57
31	57	40	39	30	36		50	50	113	83	111	58	52	57	80	94	75	84	148	114	63	38	G	24
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31
MED	32	33	28	23	G	G	30	42	52	58	63	58	55	57	55	54	55	54	56	49	44	37	38	34
U Q	38	38	39	38	37	30	39	47	61	76	78	68	78	64	79	62	61	72	61	59	60	57	60	40
L Q	G	G	G	G	G	G	G	38	48	51	54	G	G	G	G	50	G	47	41	37	33	24	G	24

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT OKINAWA

MAY 1992

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		17	18	17	16	18		21	22	36	38	45	49	48	49	48	37	23	18	17	16	16	18	18
2	17		46	23	20	26	22	24	24	32	43	46	44	45	48	44	35	30	18	17	16	17	16	18
3	18	23	16	17	20	18	23	18	23	33	44	54	49	46	46	49	29	30	24	18	20	30		
4	24	27	21	18	18	18	21	27	22	46	50	52	55	53	50	49	33	30	18	21	17	17	18	22
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6	18	21	23	17		20	21	30	33	49	44	51	52	51	49	42	35	29	20	17	17	17	17	18
7	17	17		26	18	18		30	30	39	44	48	45	45	44	41	39	24	20	24	16	17	16	16
8	17	17	20	17	22	20	27	26	33	35	48	54	47	44	34	52	48	33	20	20	18	24	17	
9		18	18	17	17	17	27	22	30	34	45	50	52	52	44	44	38	29	20	17	17	18	18	18
10	20	26	20	18	18	16	23	21	30	34	46	45	48	53	45	45	32	22	18	18	17	20		18
11	20	17	17	17	17	16	18	23	29	34	45	45	44	48	55	42	50		16	20	15	15	15	15
12	15	15	18	15	15	16	16	16	18	22	53	55	51	55	52	42	35	21	20	16	16	15	15	15
13	15	15	15	16	16	15	16	23	21	34	42	60	55	44	58	50	56	32	30	17	15	15	15	17
14	15	15	15	15	15	15	15	17	22	27	33	43	35	48	48	38	32	20	17	15	15	15	15	17
15	17	15	16	17	15	15	17	16	21	34	44	54	59	53	53	48	34	22	18	16	15	15	16	15
16	16	16	15	16	15	16	17	15	20	22	28	32	46	46	42	27	26	18	16	16	15	15	15	16
17	16	16	15	17	16	15	15	15	18	23	33	33	36	32	32	29	23	22	24	15	15	15	16	15
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19	15	15	15	18	16	16	15	17	21	28	30	65	55	54	47	28	23	20	16	18	15	15	16	15
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21	16	15	15	16	15	18	16	16	18	26	28	57	55	48	45	44	22	22	17	15	15	16	15	15
22	15	15	15	15	15	15	15	16	21	22	32	36	58	46	29	44	21	18	17	16	16	15	16	15
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26	16	15	16	20	16	15	15	17	18	21	32	57	46	53	46	54	23	28	17	16	16	15	15	15
27	16	15	16	15	15	15	16	18	20	22	32	32	34	33	32	28	22	18	16	16	16	16	15	16
28	16	15	15	15	15	16	15	15	22	24	29	32	32	30	44	38	21	18	16	15	15	16	18	16
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30	16	16	15	16	16	16	15	15	18	21	29	47	40	45	34	32	22	17	16	16	15	15	15	15
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	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	31	30	30	29	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	29	29
MED	16	16	16	17	16	16	16	17	21	27	33	45	46	46	44	42	29	22	17	16	16	16	15	15
U Q	17	17	18	18	17	18	19	23	24	34	44	54	52	53	49	48	35	29	20	18	16	17	16	18
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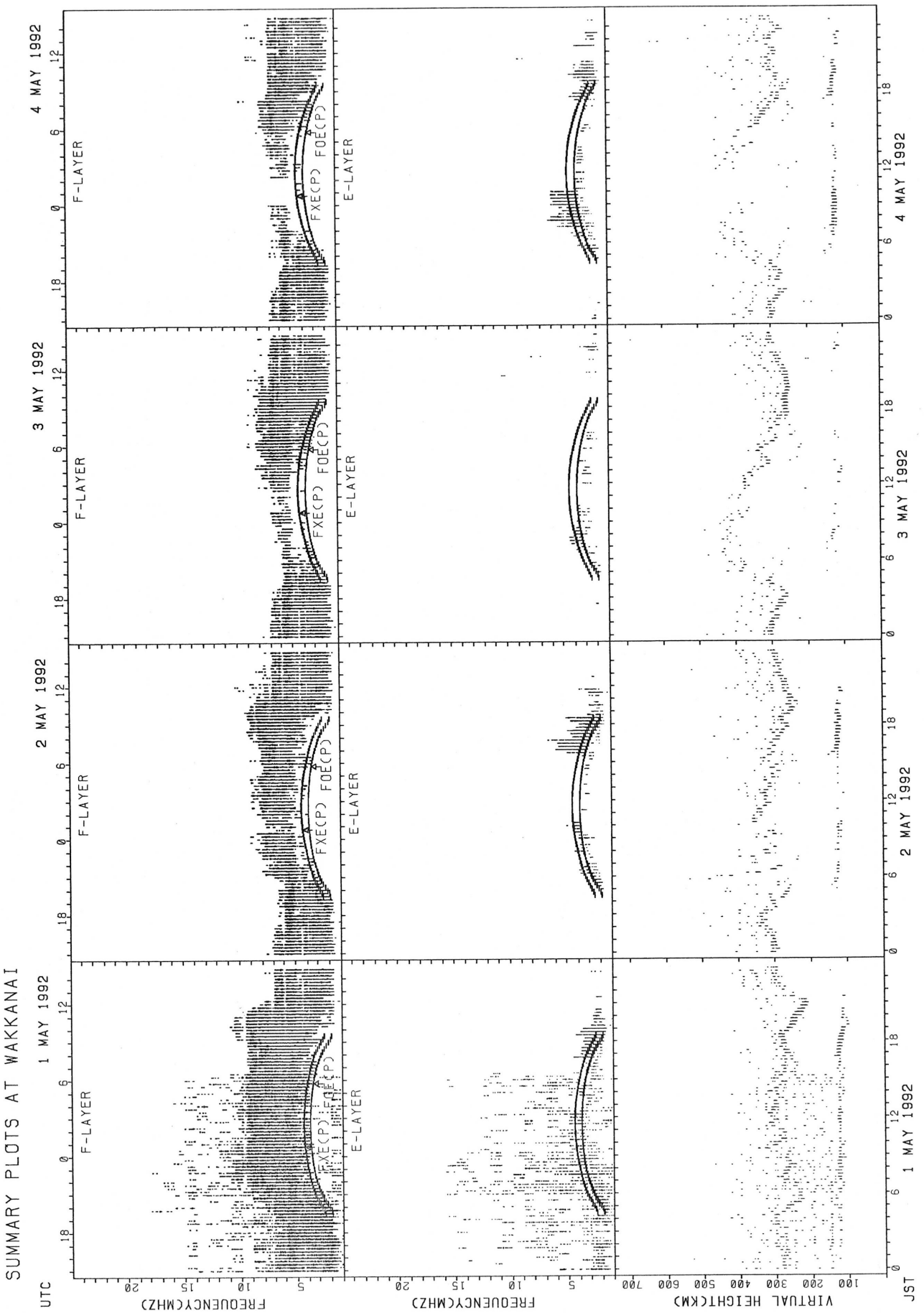
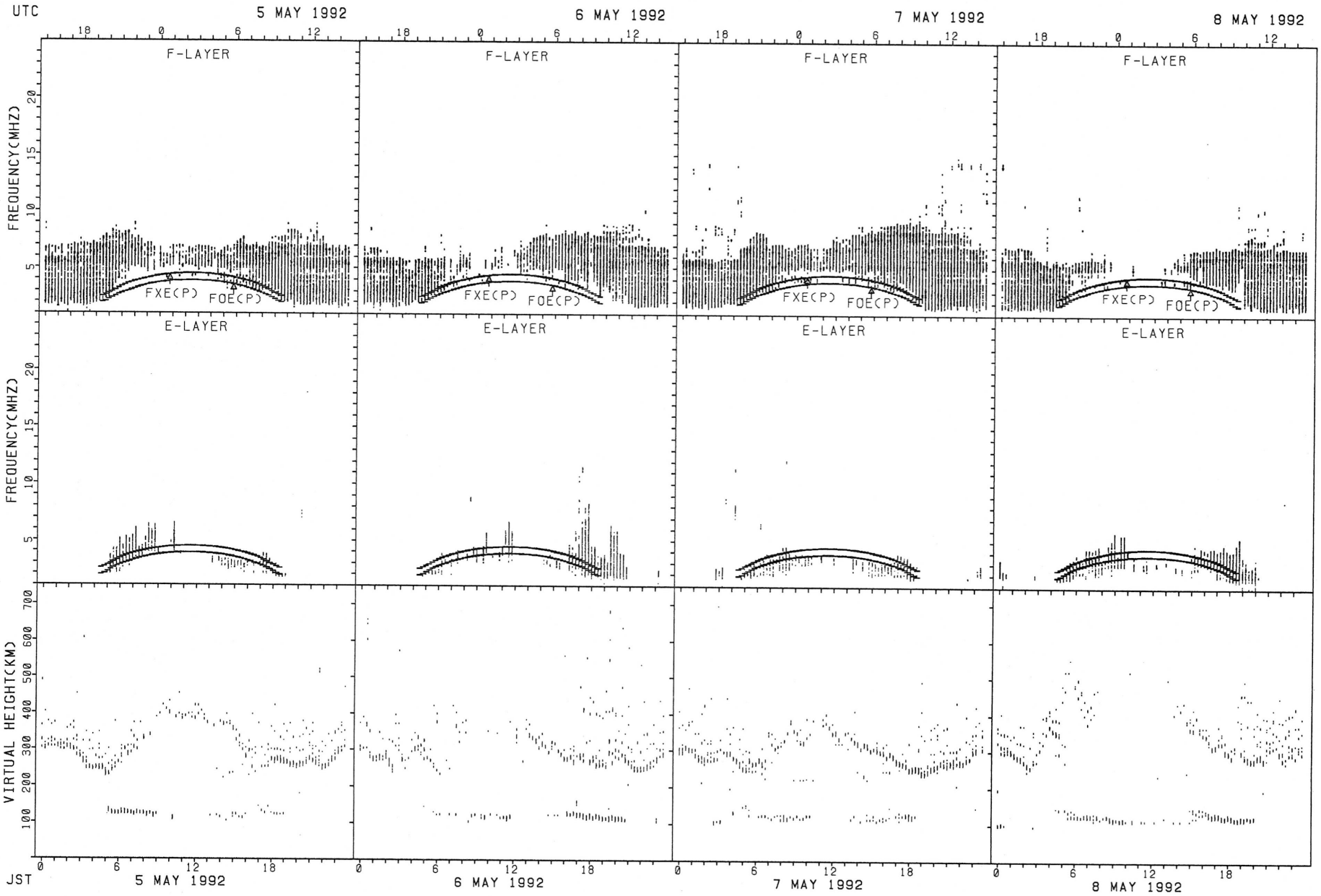
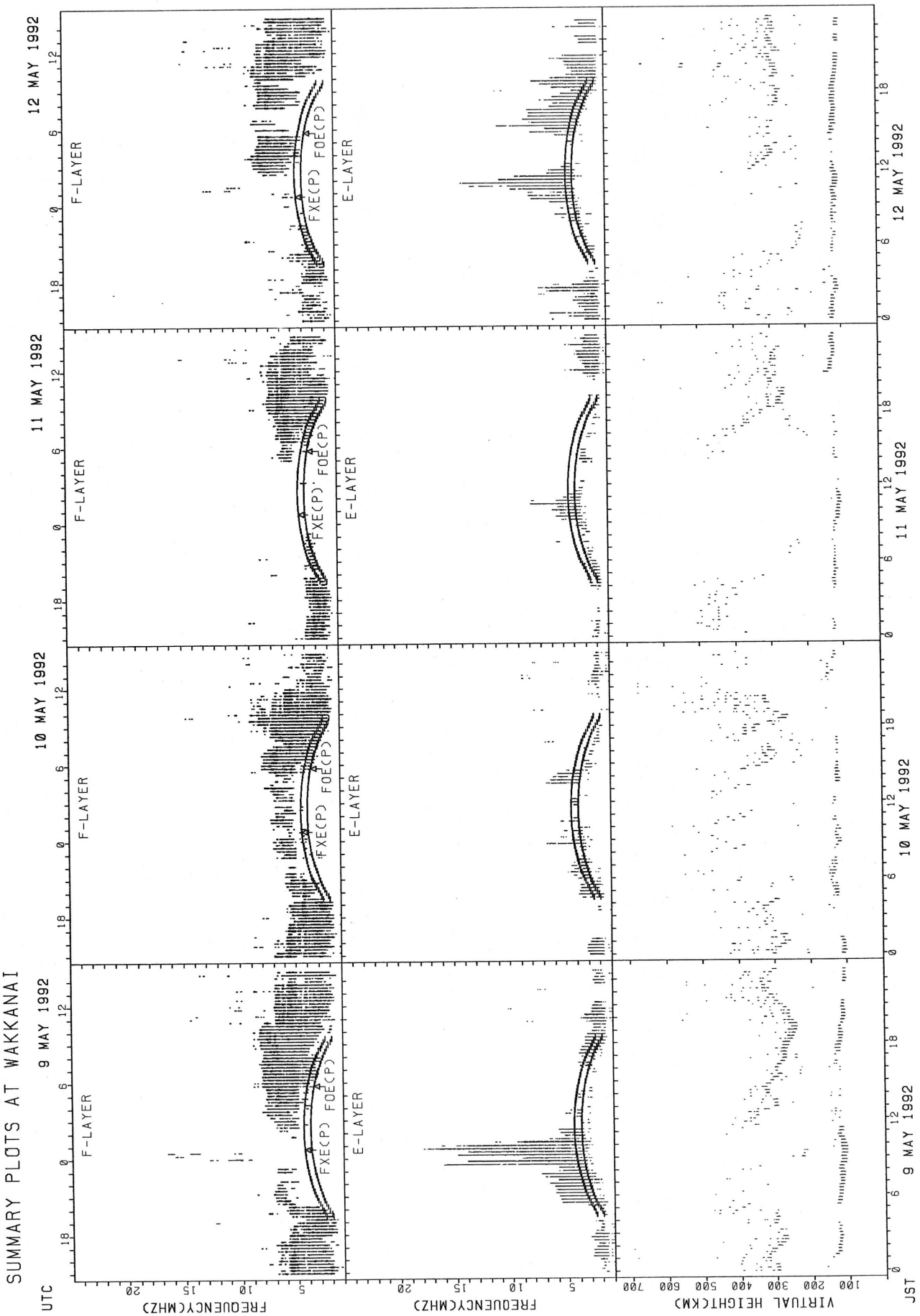

SUMMARY PLOTS AT WAKKANAI
UTC
JST
1 MAY 1992
2 MAY 1992
3 MAY 1992
4 MAY 1992
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE

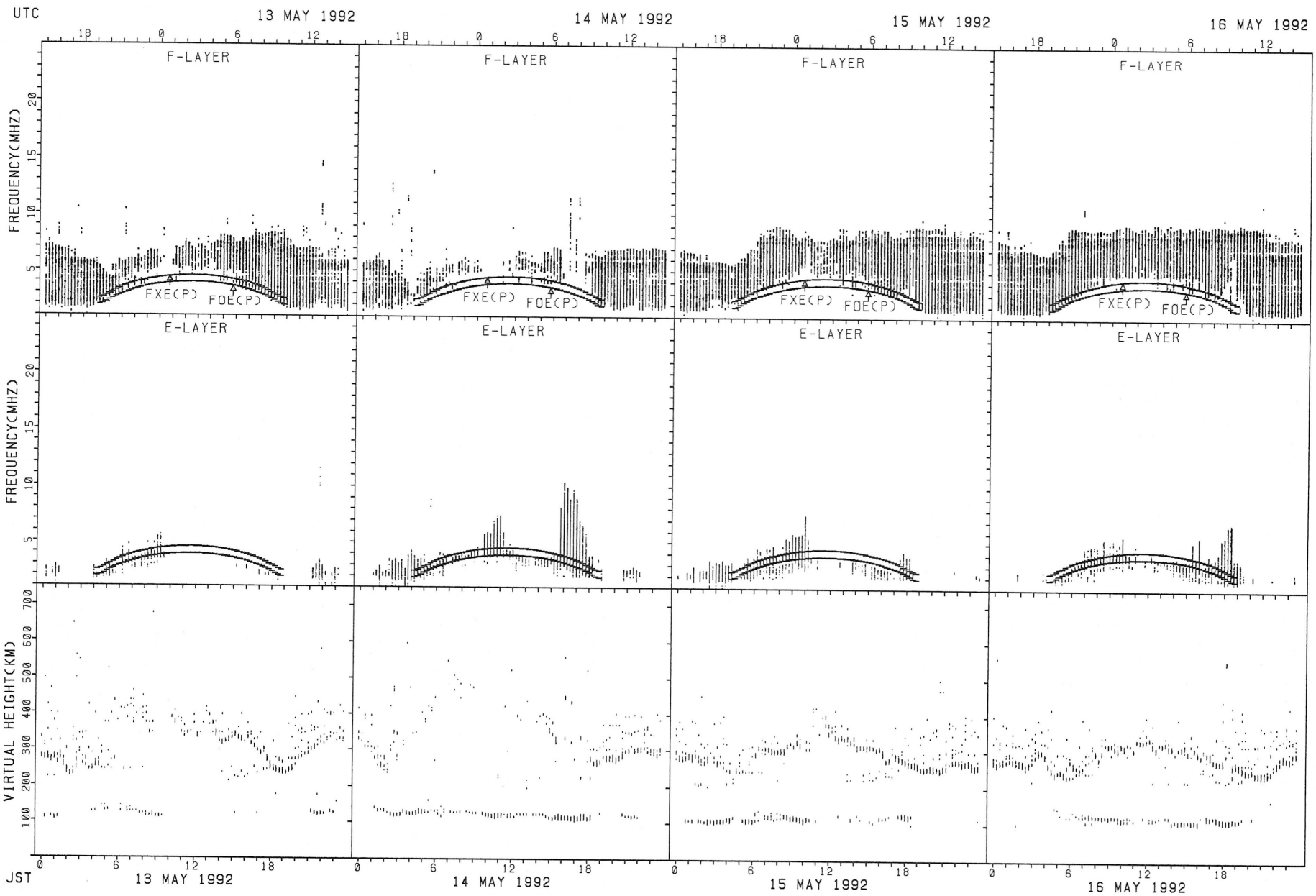
SUMMARY PLOTS AT WAKKANAI



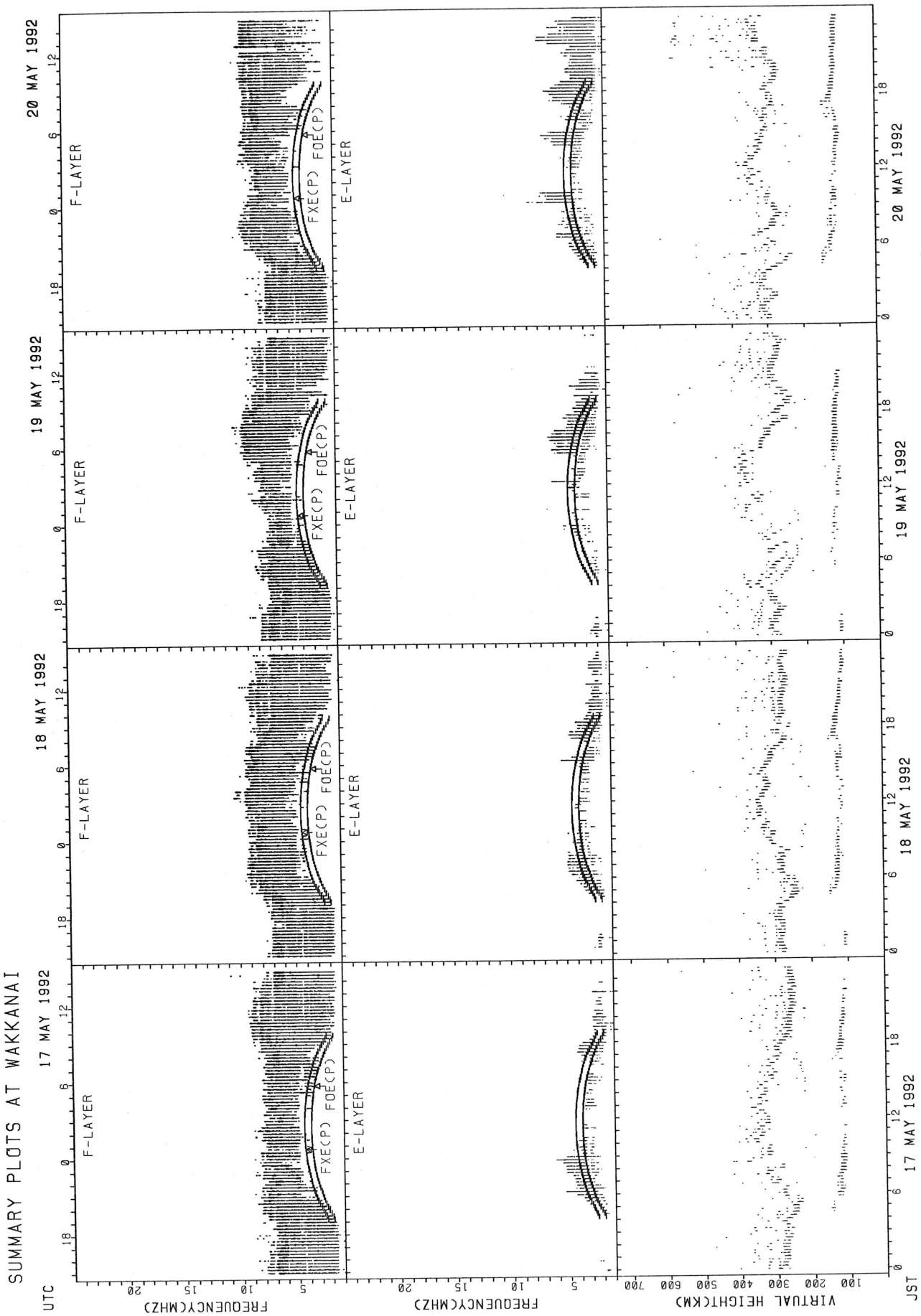
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT WAKKANAI
9 MAY 1992
10 MAY 1992
11 MAY 1992
12 MAY 1992
UTC
JST
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

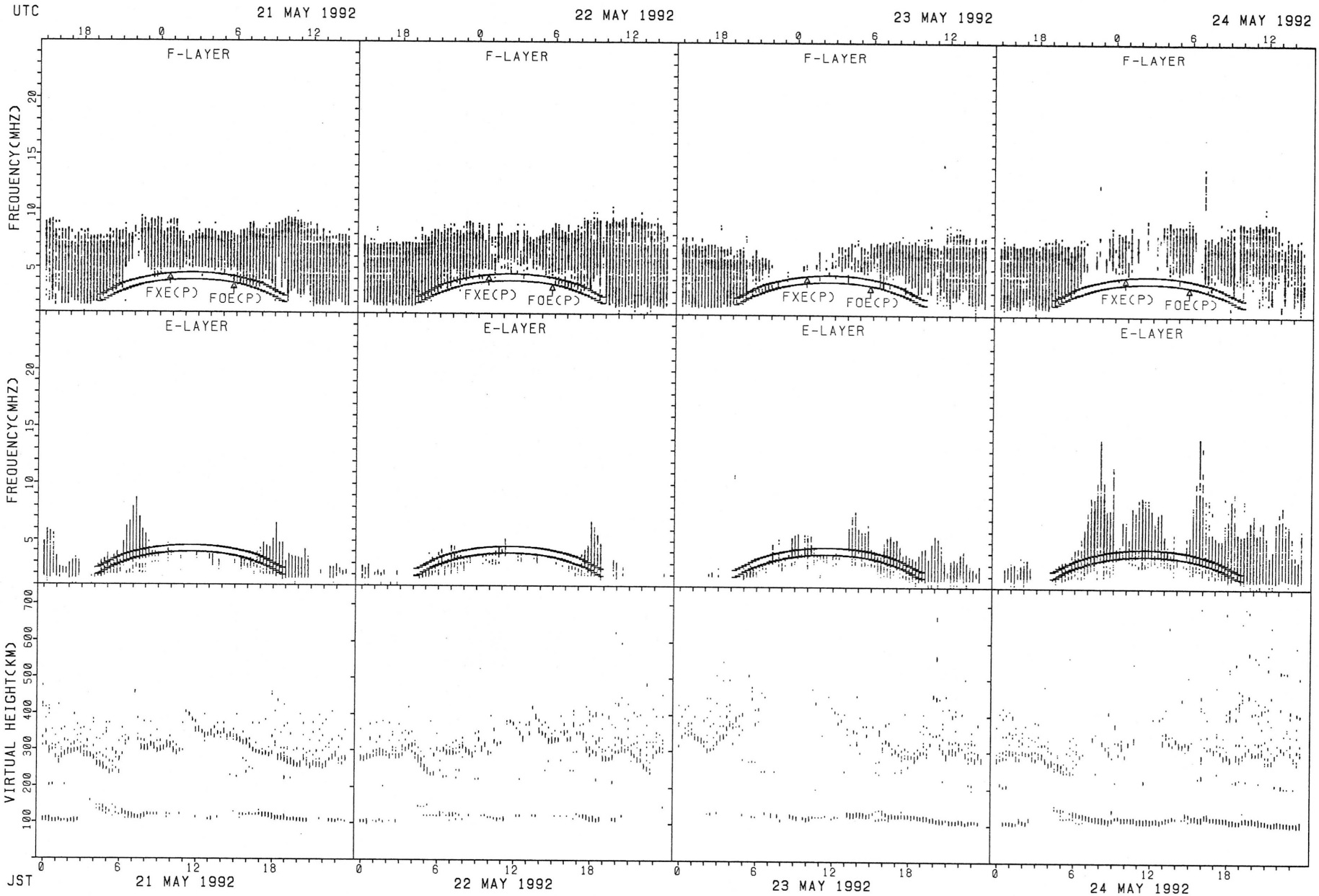
SUMMARY PLOTS AT WAKKANAI



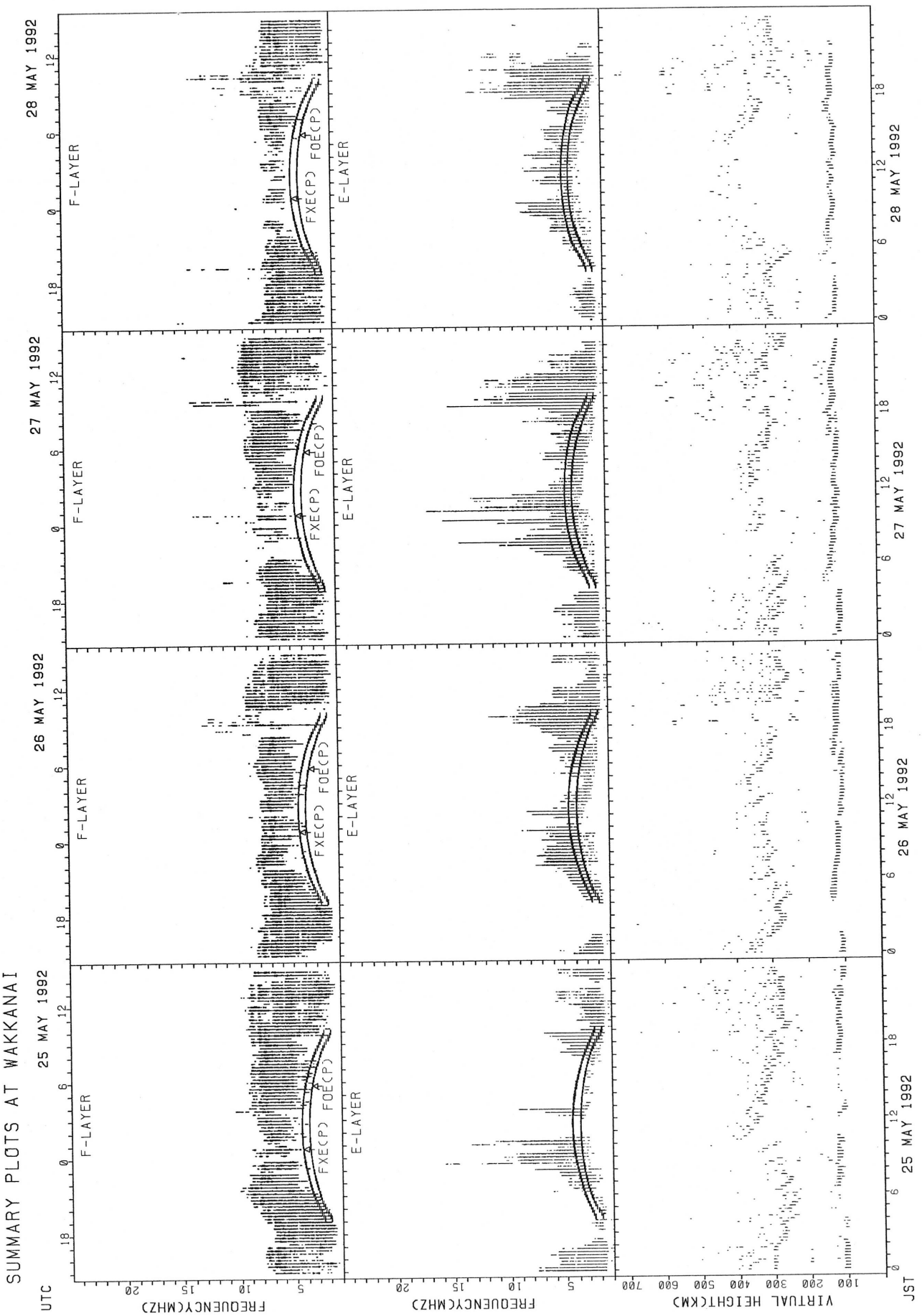
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT WAKKANAI
17 MAY 1992
18 MAY 1992
19 MAY 1992
20 MAY 1992
UTC
JST
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

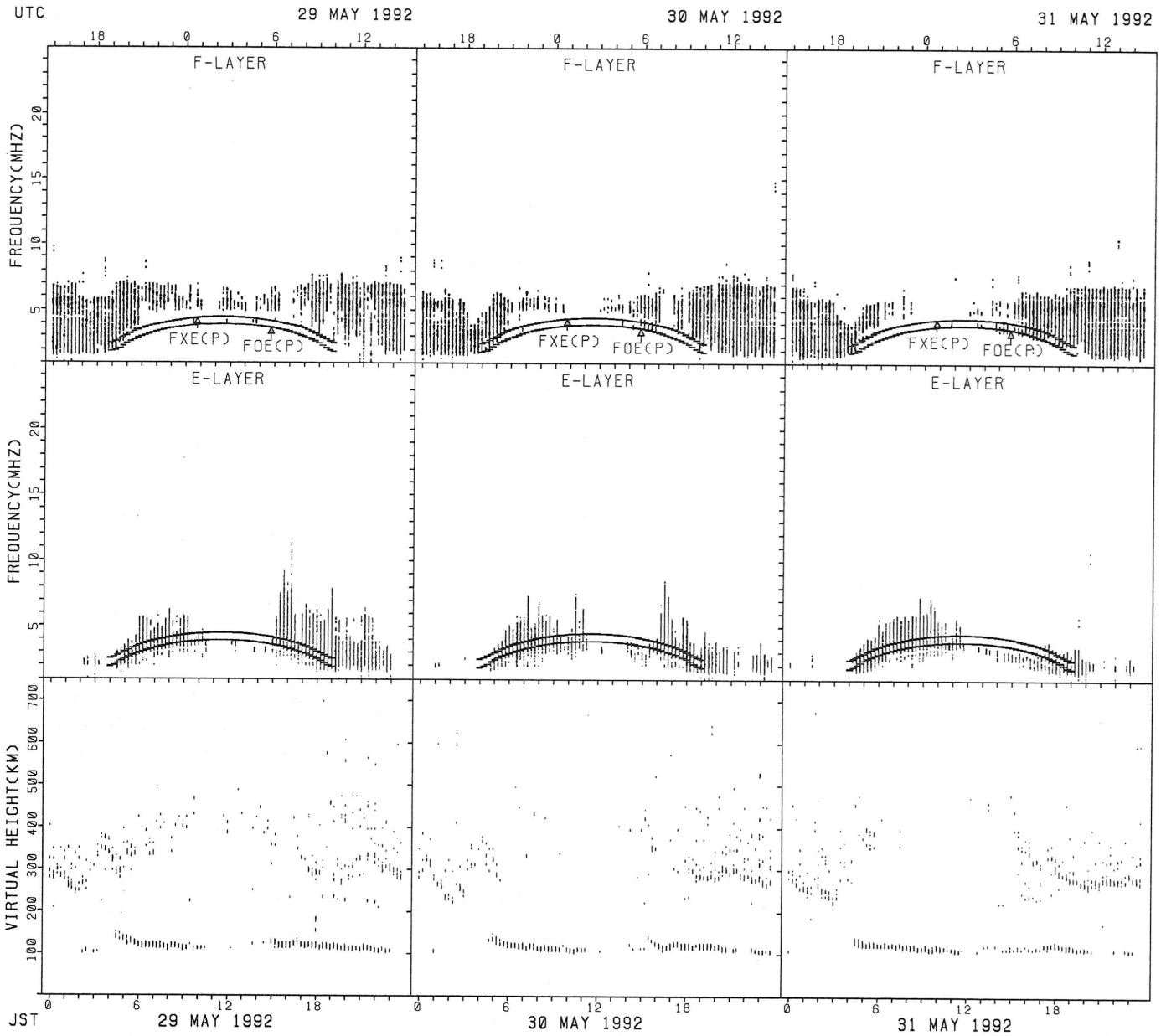
SUMMARY PLOTS AT WAKKANAI



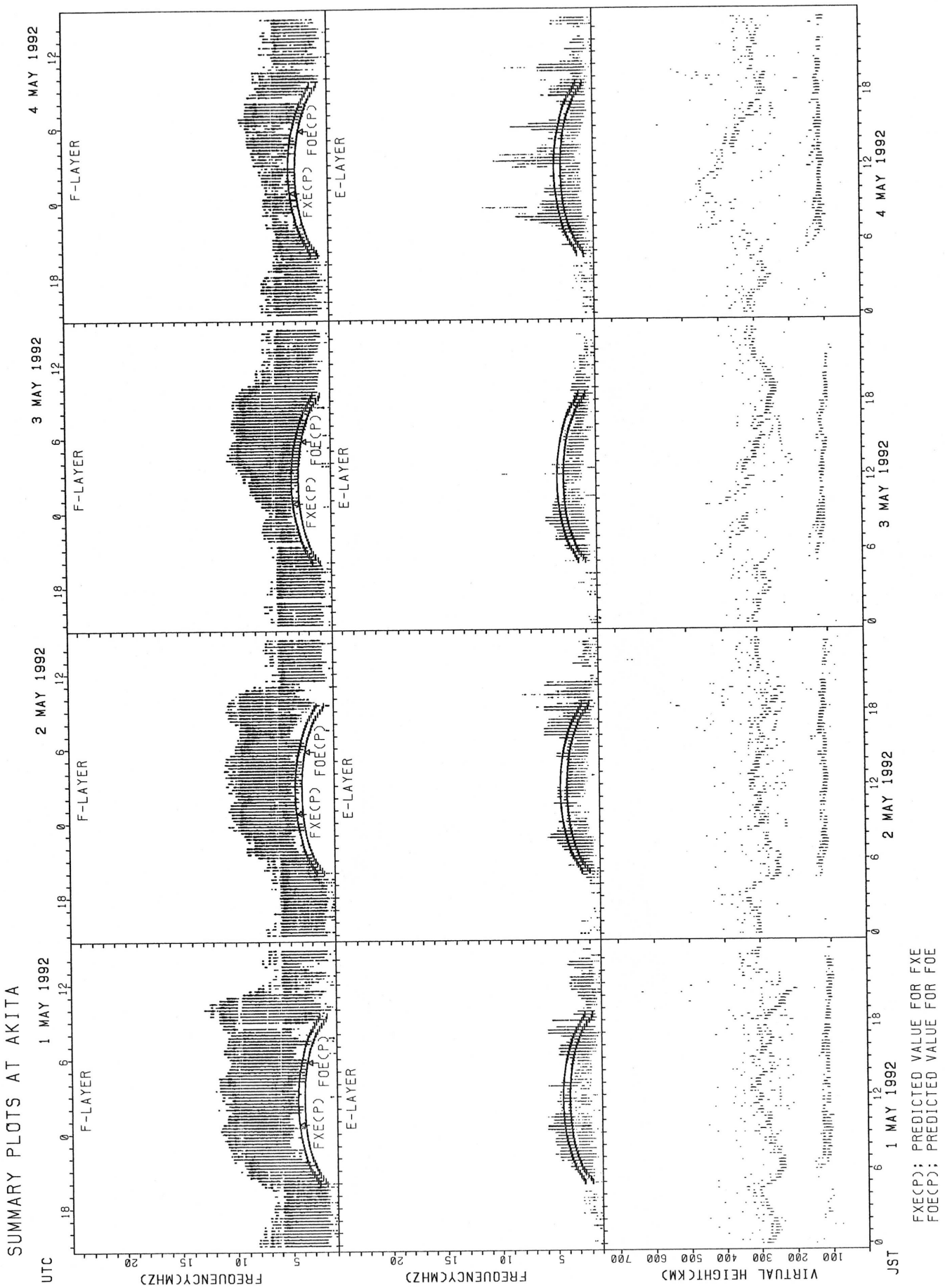
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT WAKKANAI
UTC
25 MAY 1992
26 MAY 1992
27 MAY 1992
28 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

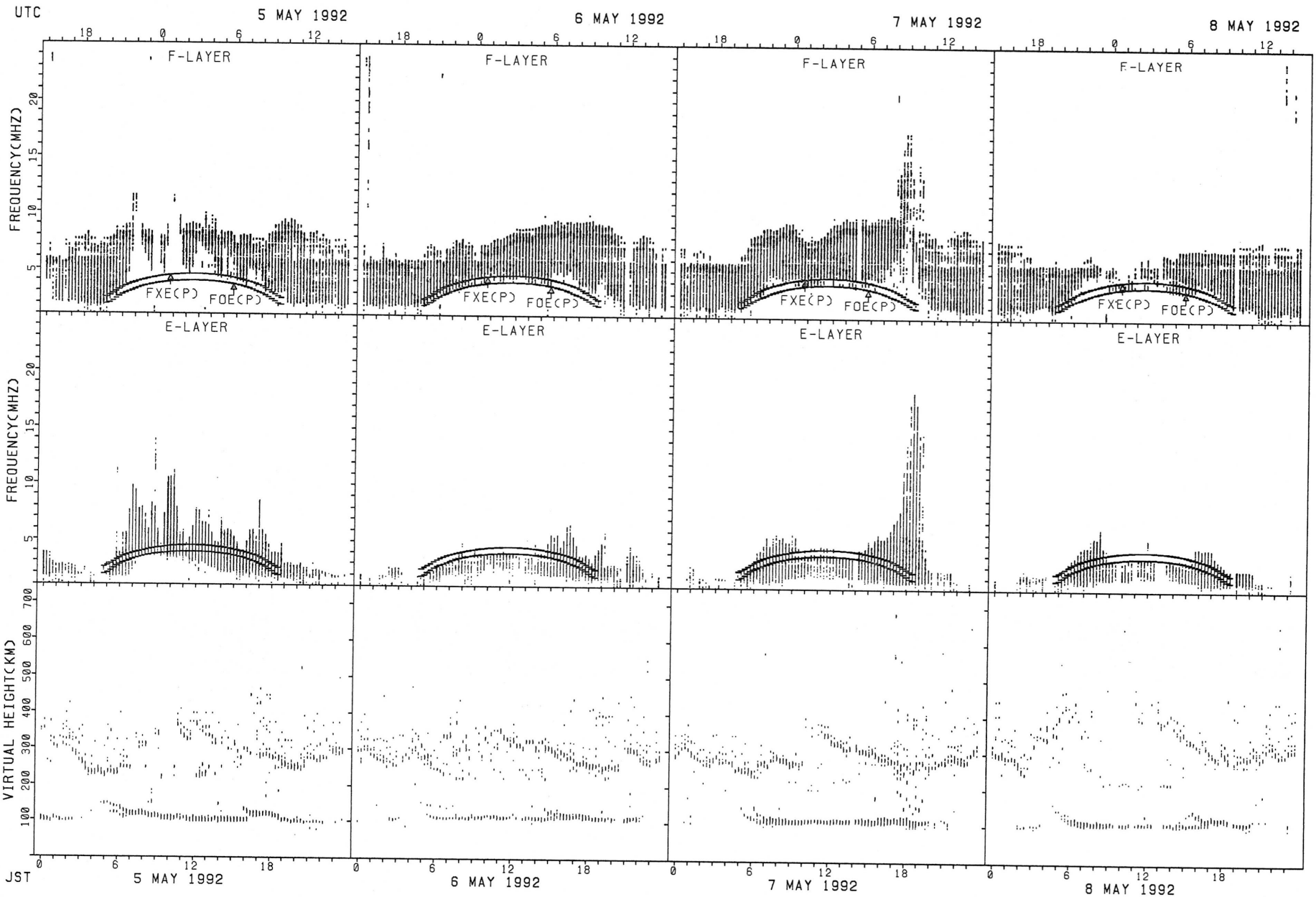
SUMMARY PLOTS AT WAKKANAI



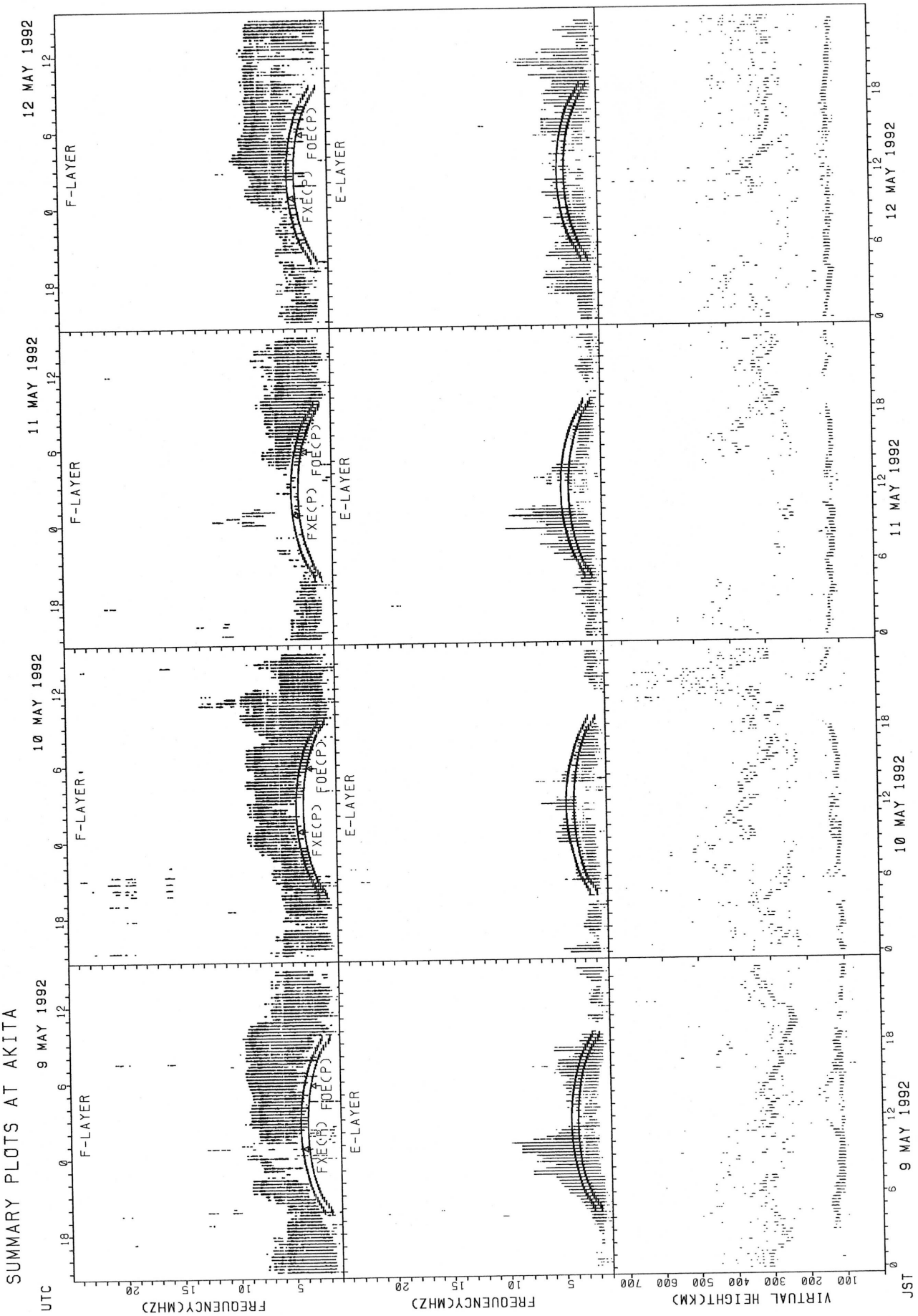
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT AKITA
1 MAY 1992
2 MAY 1992
3 MAY 1992
4 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
UTC
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

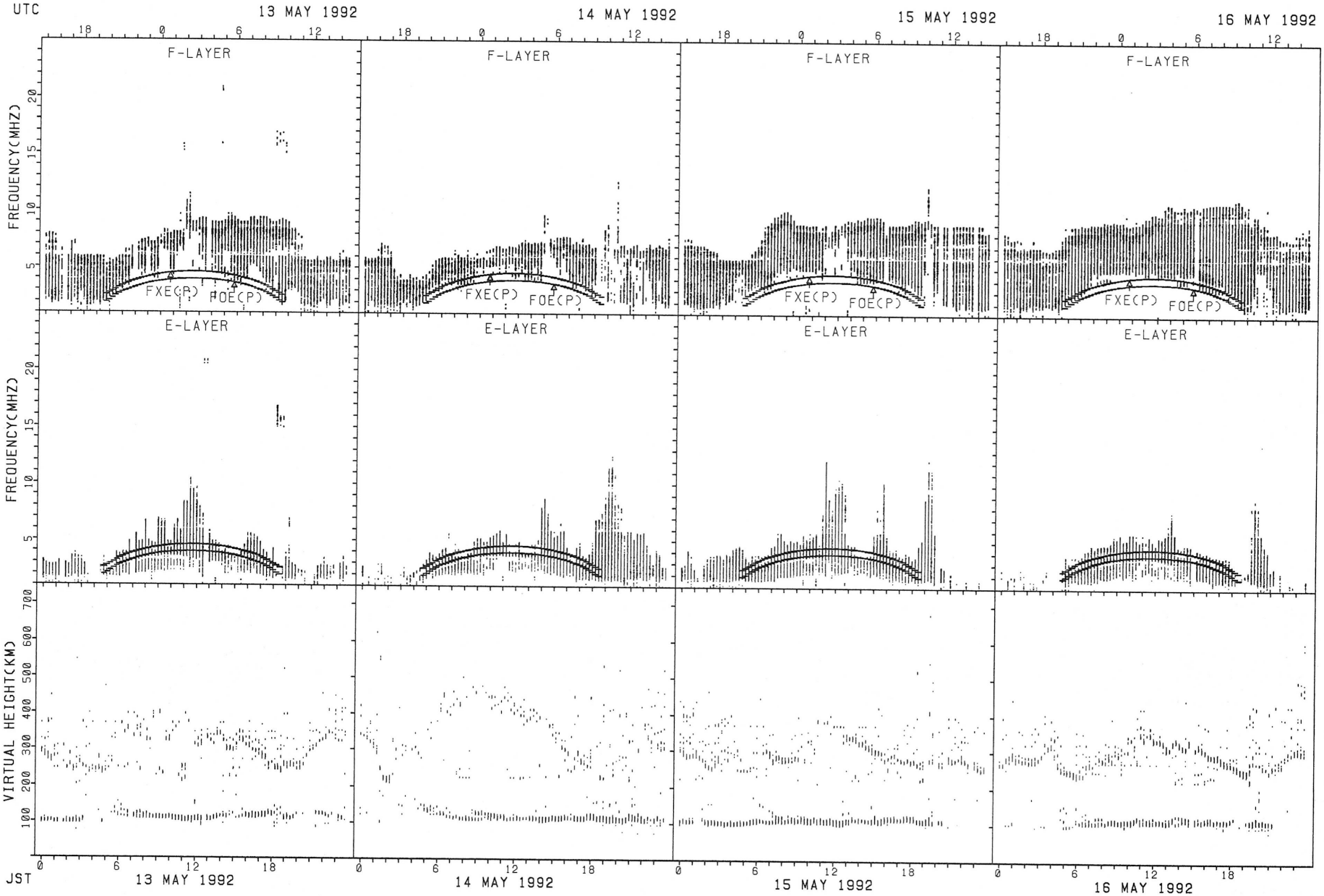
SUMMARY PLOTS AT AKITA



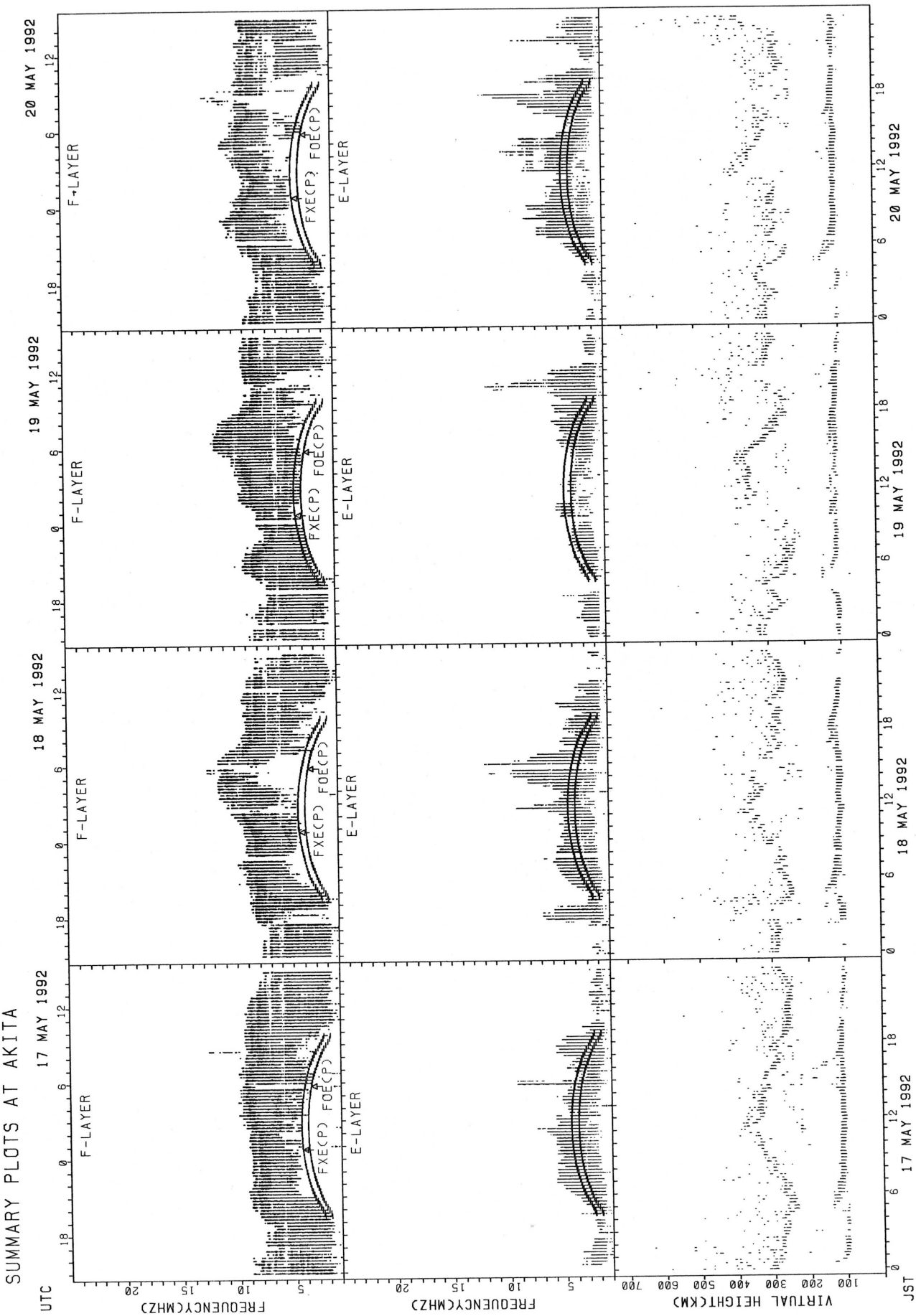
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

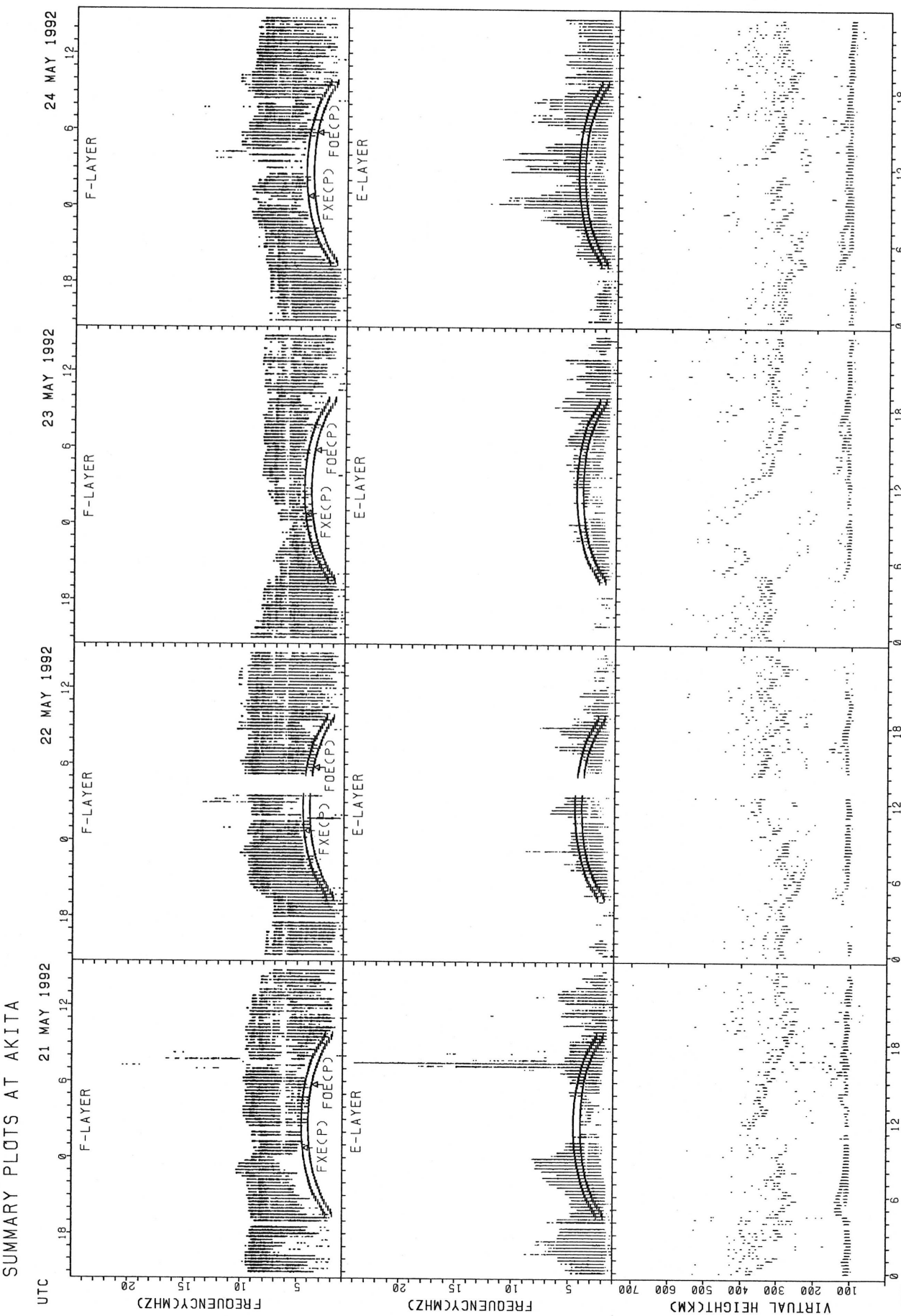

SUMMARY PLOTS AT AKITA
UTC
JST
9 MAY 1992
10 MAY 1992
11 MAY 1992
12 MAY 1992
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

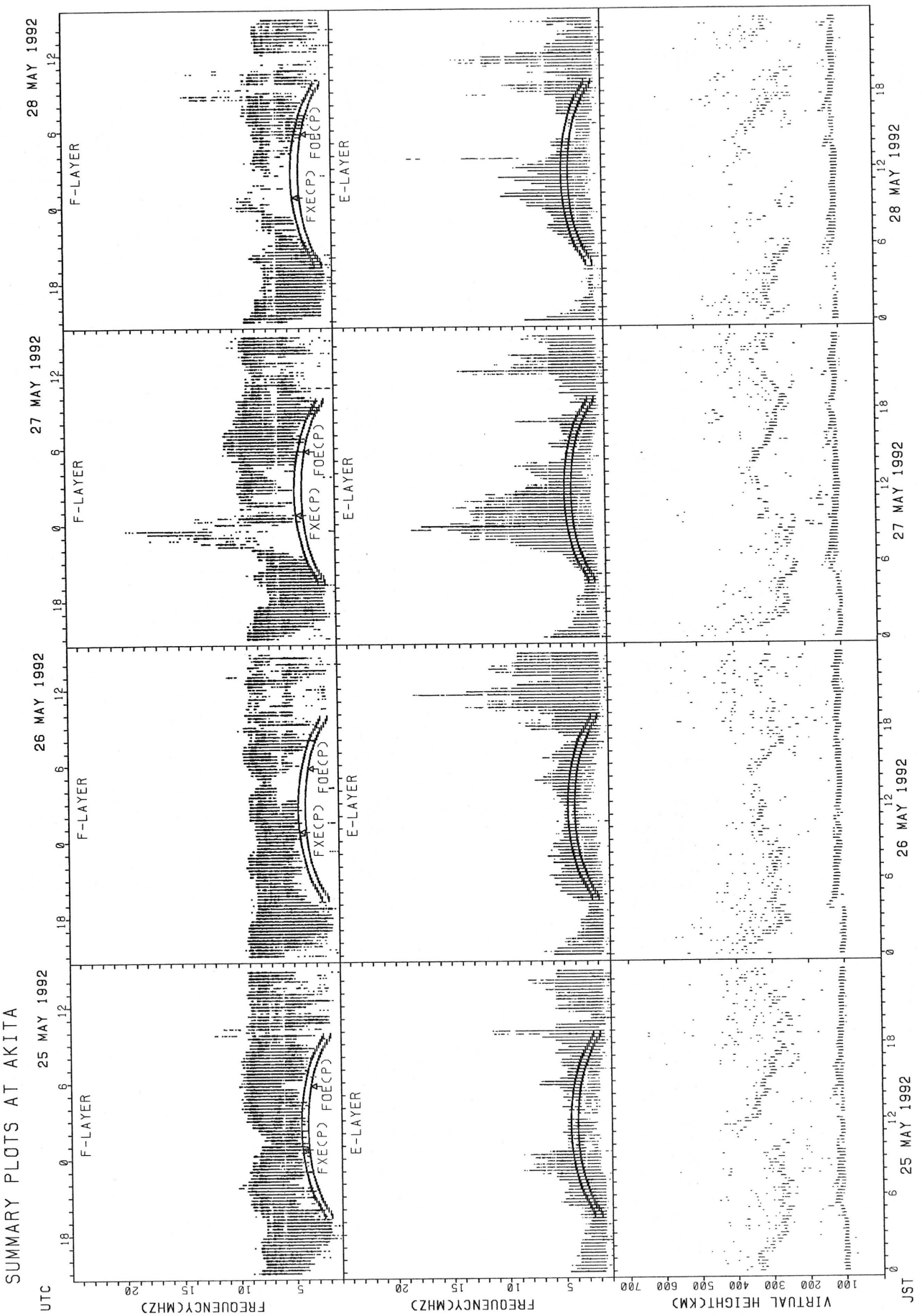
SUMMARY PLOTS AT AKITA



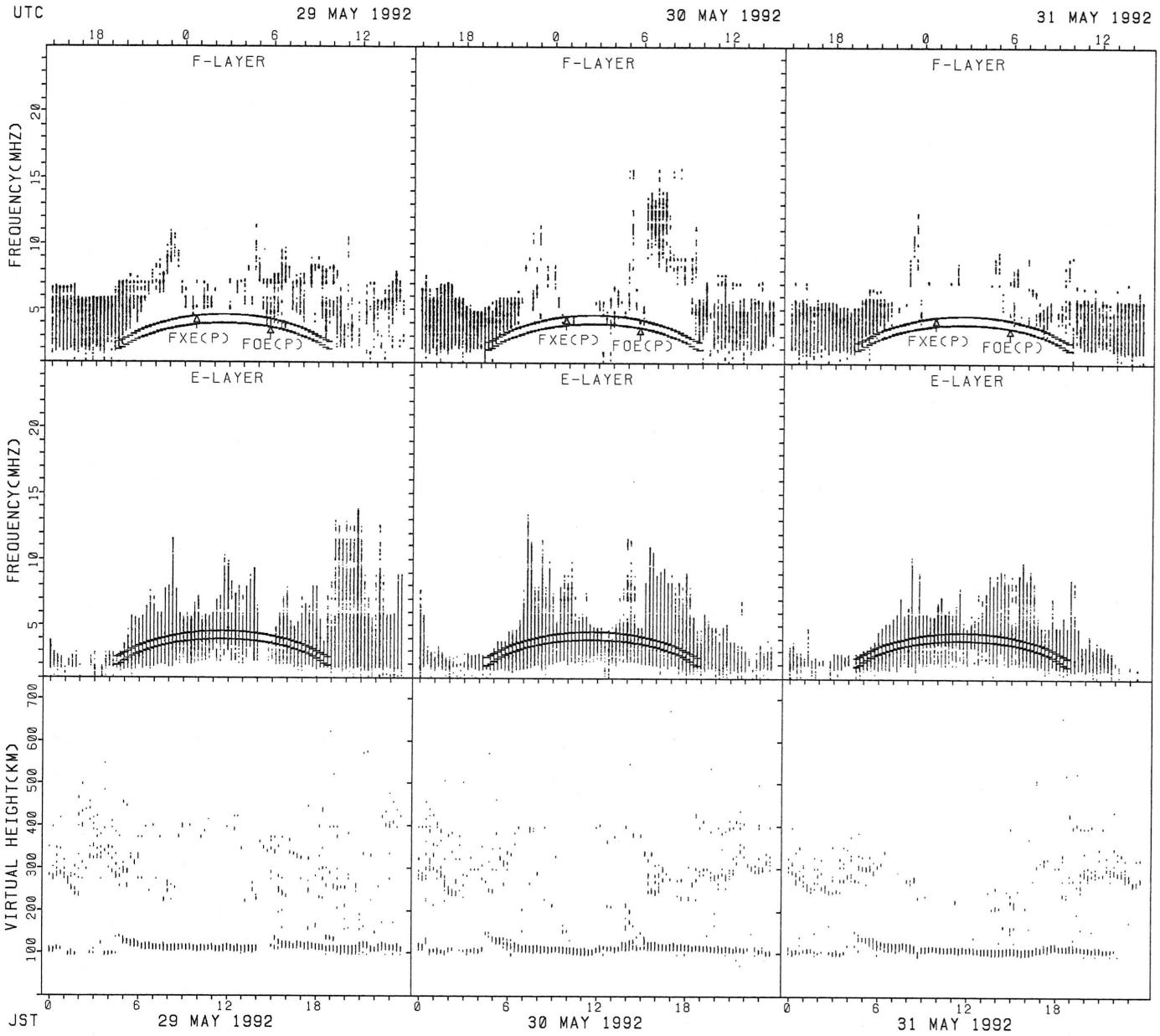
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT AKITA
17 MAY 1992
18 MAY 1992
19 MAY 1992
20 MAY 1992
UTC
JST
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

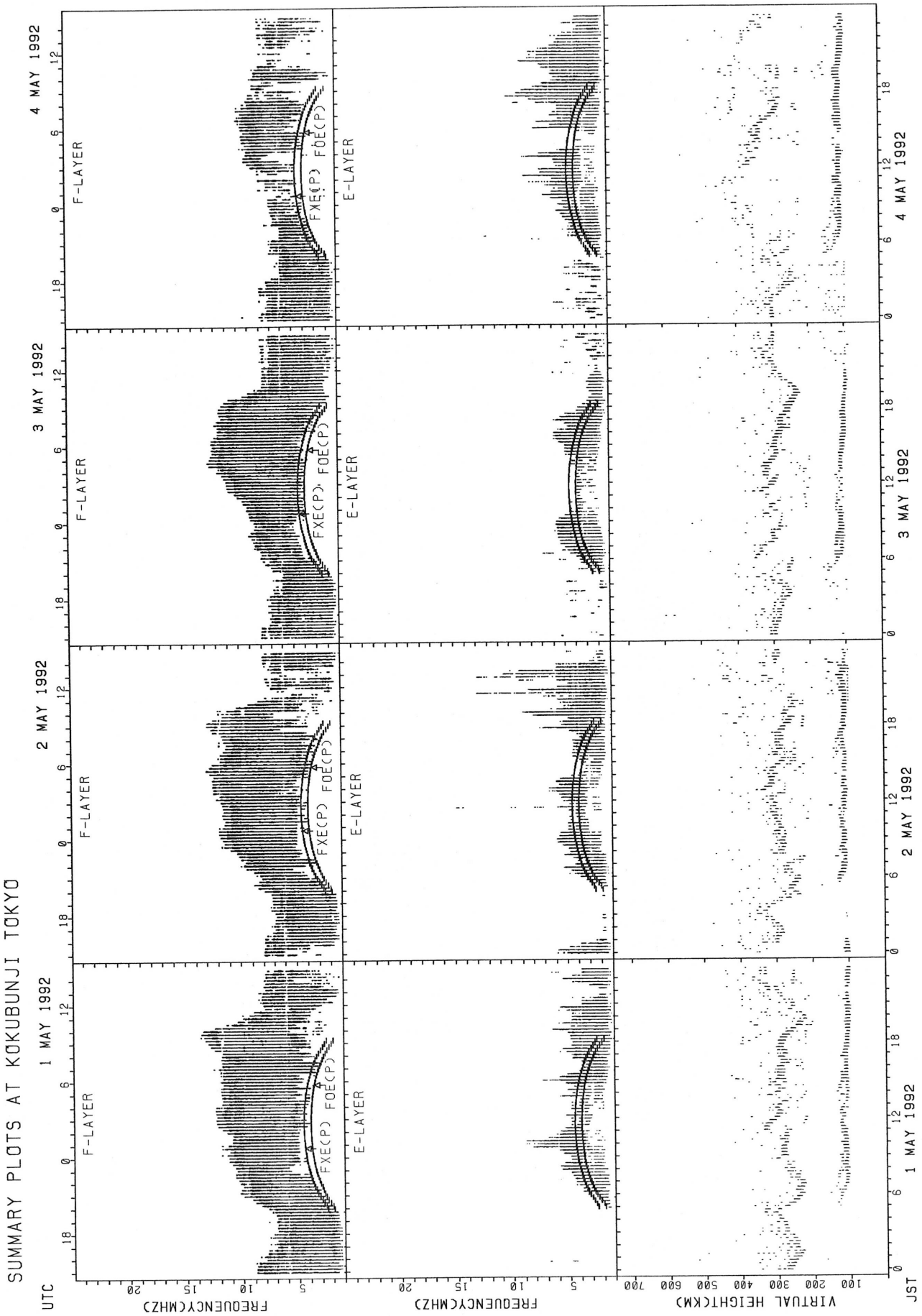

SUMMARY PLOTS AT AKITA
UTC
21 MAY 1992
22 MAY 1992
23 MAY 1992
24 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT AKITA
25 MAY 1992
26 MAY 1992
27 MAY 1992
28 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
UTC
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

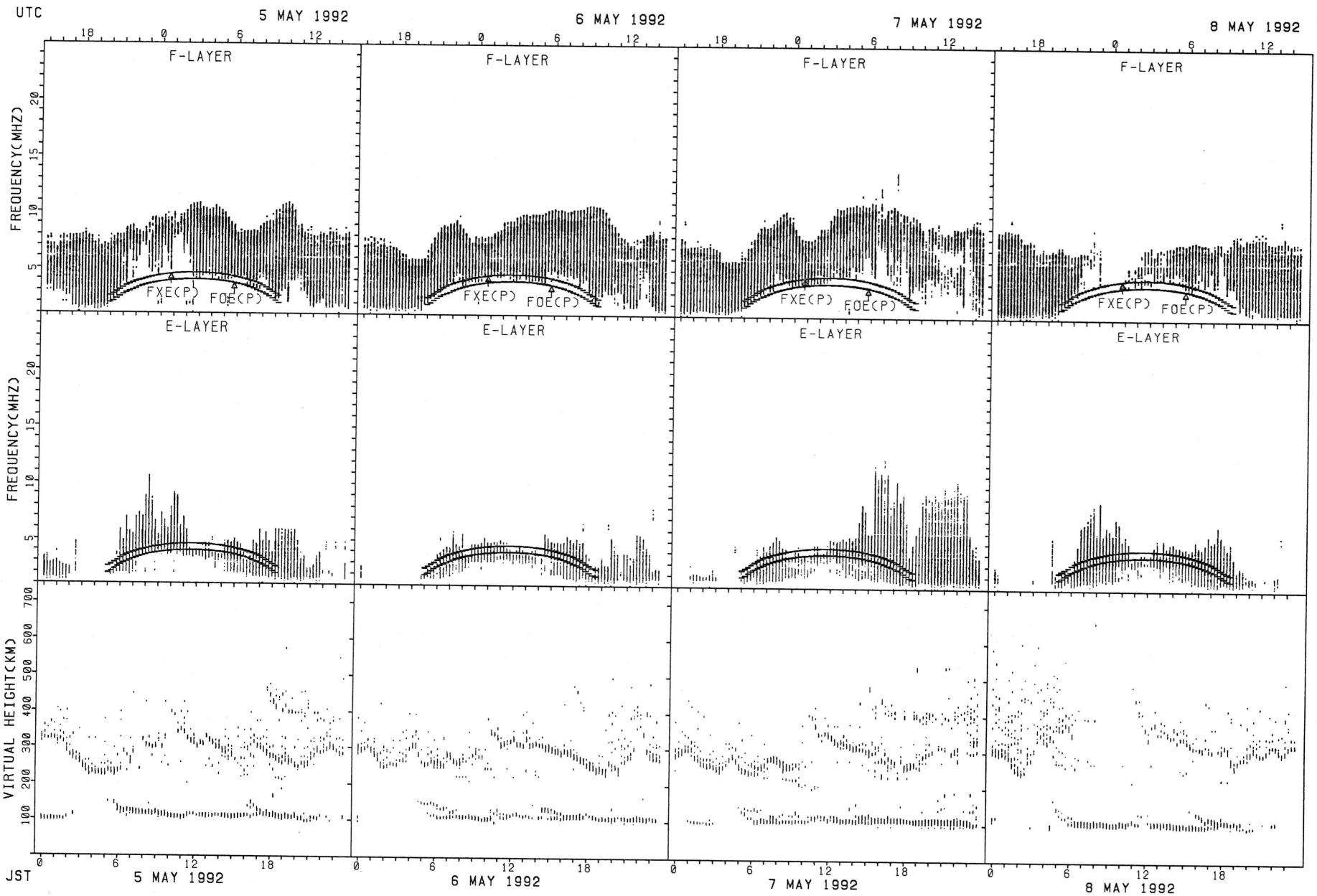
SUMMARY PLOTS AT AKITA



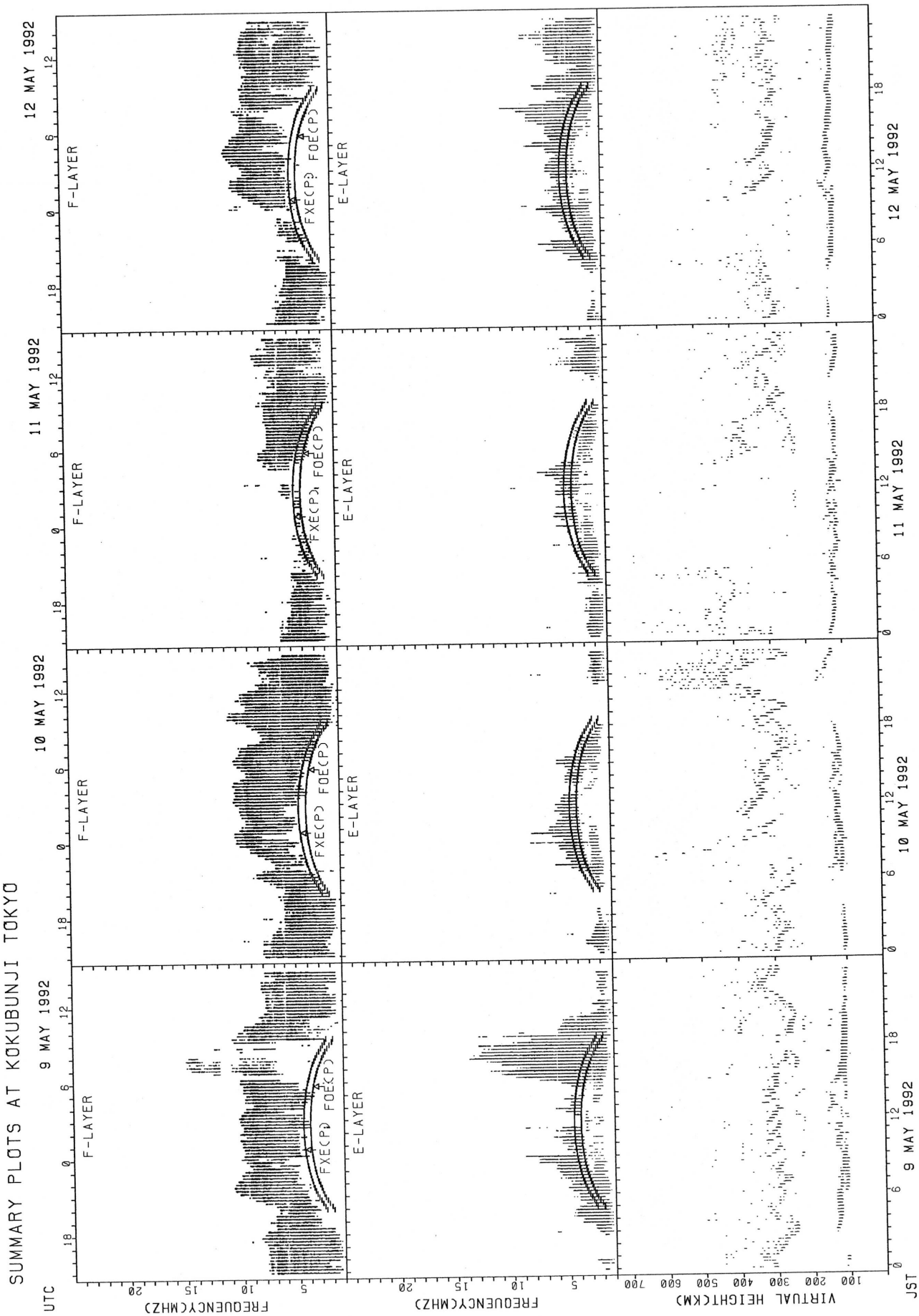
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

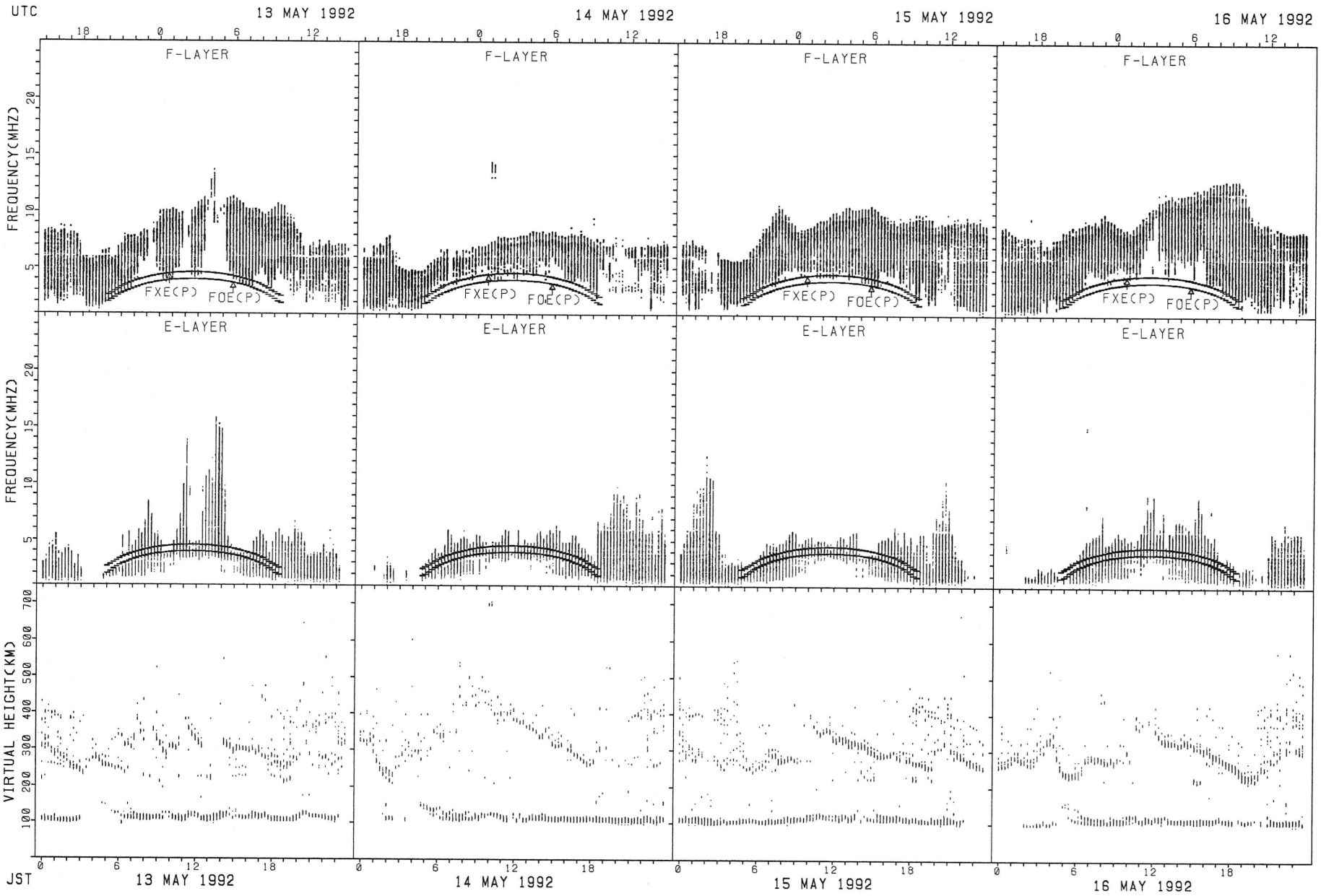

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
1 MAY 1992
2 MAY 1992
3 MAY 1992
4 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

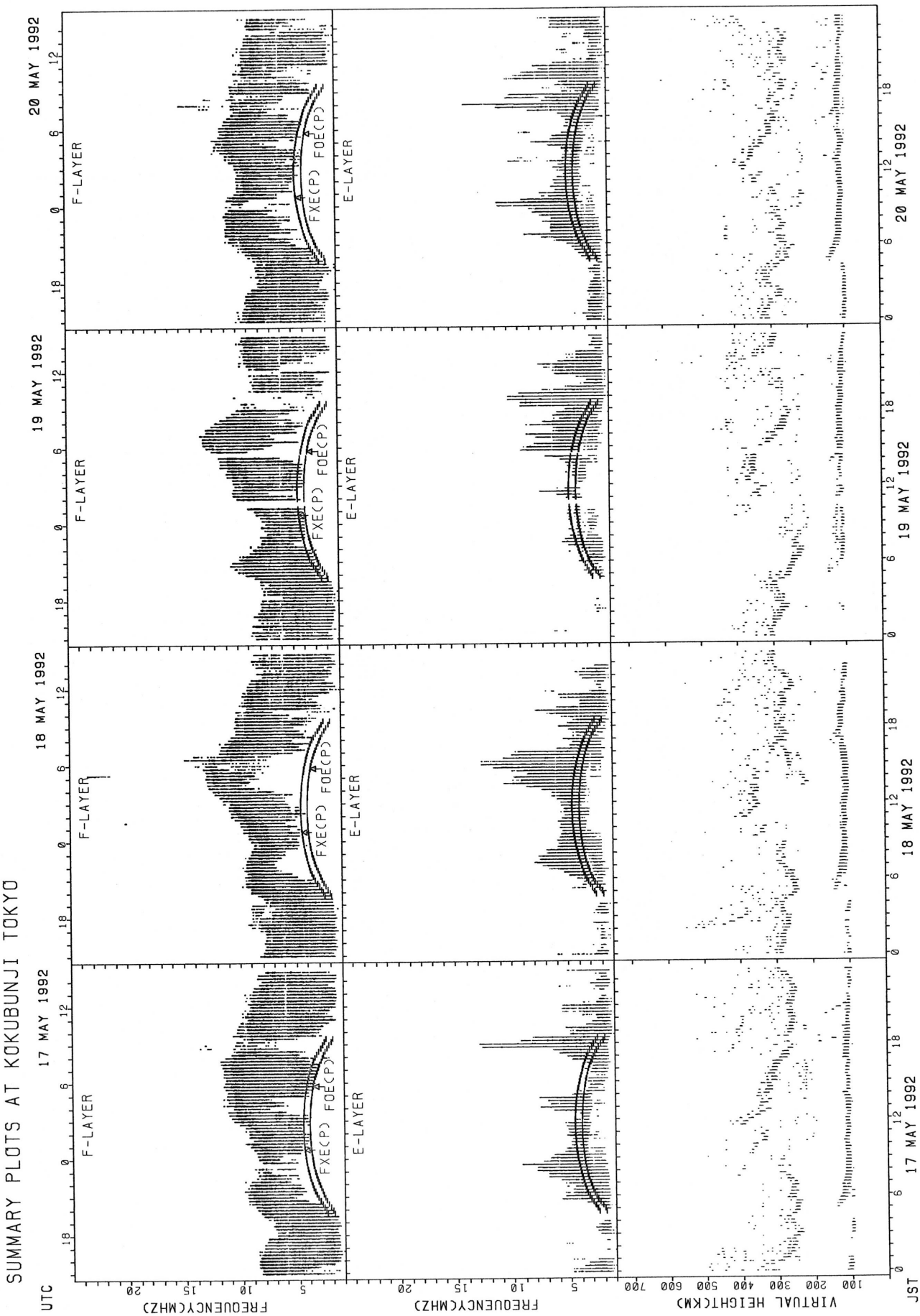


FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

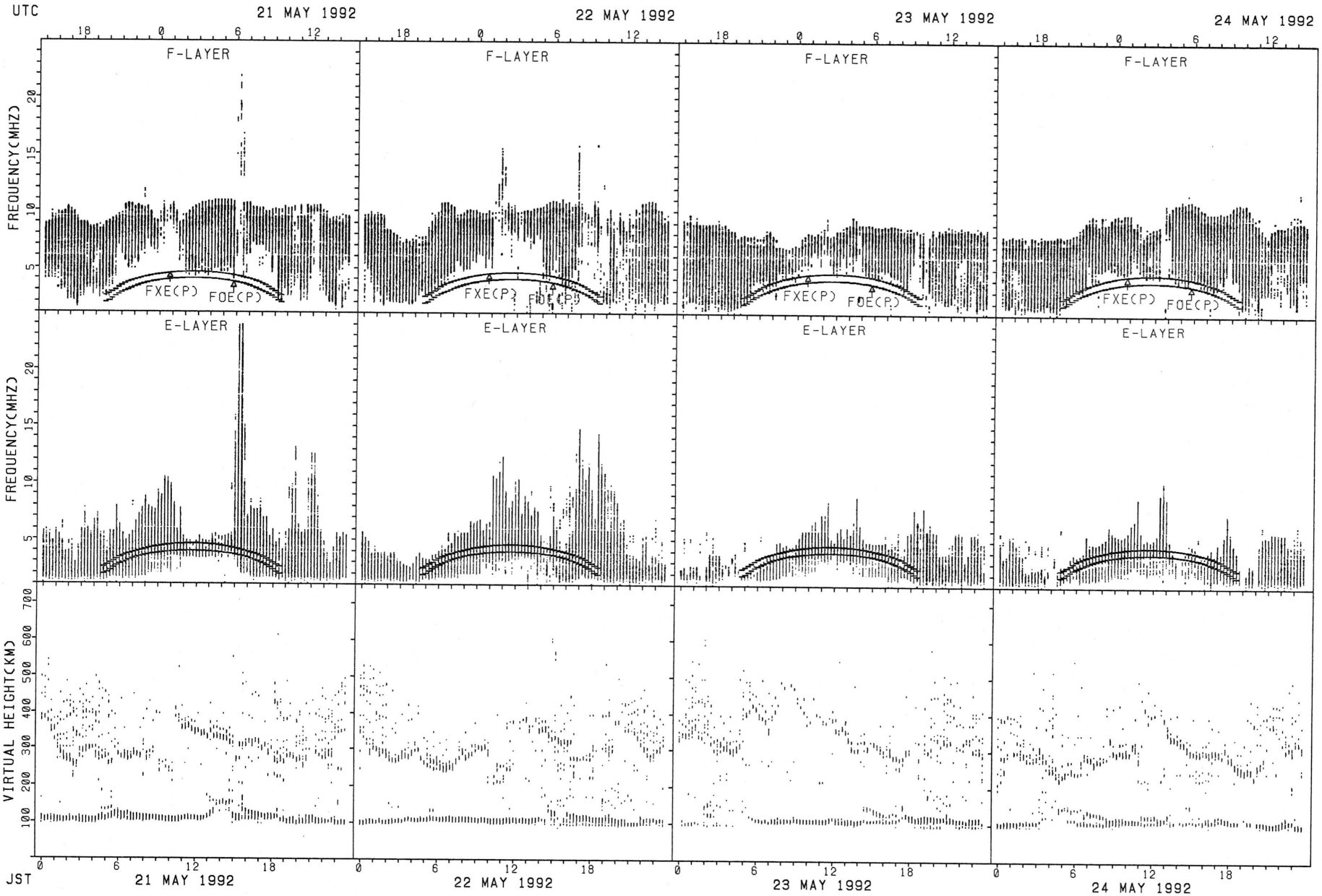

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
9 MAY 1992
10 MAY 1992
11 MAY 1992
12 MAY 1992
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE



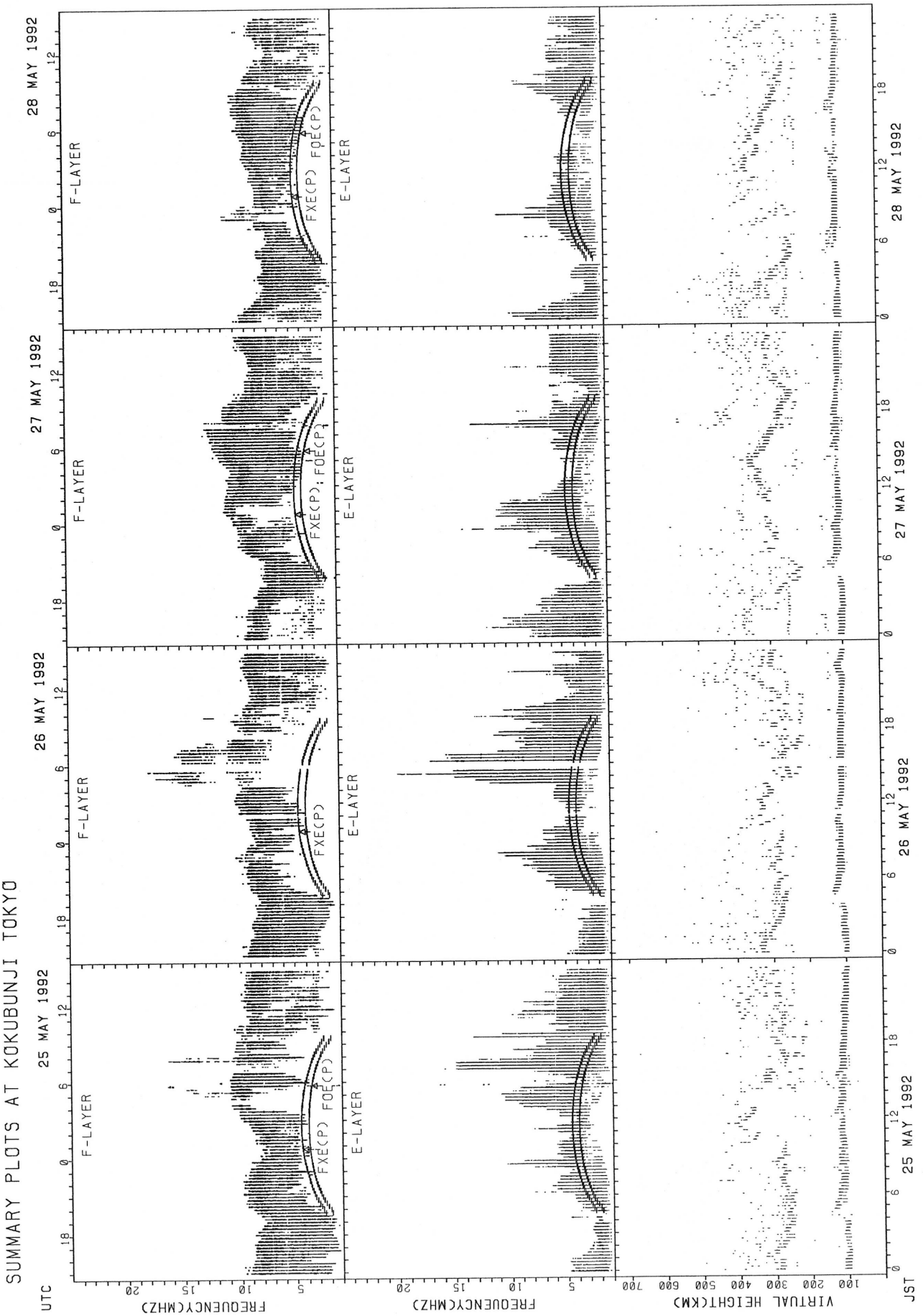
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
17 MAY 1992
18 MAY 1992
19 MAY 1992
20 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

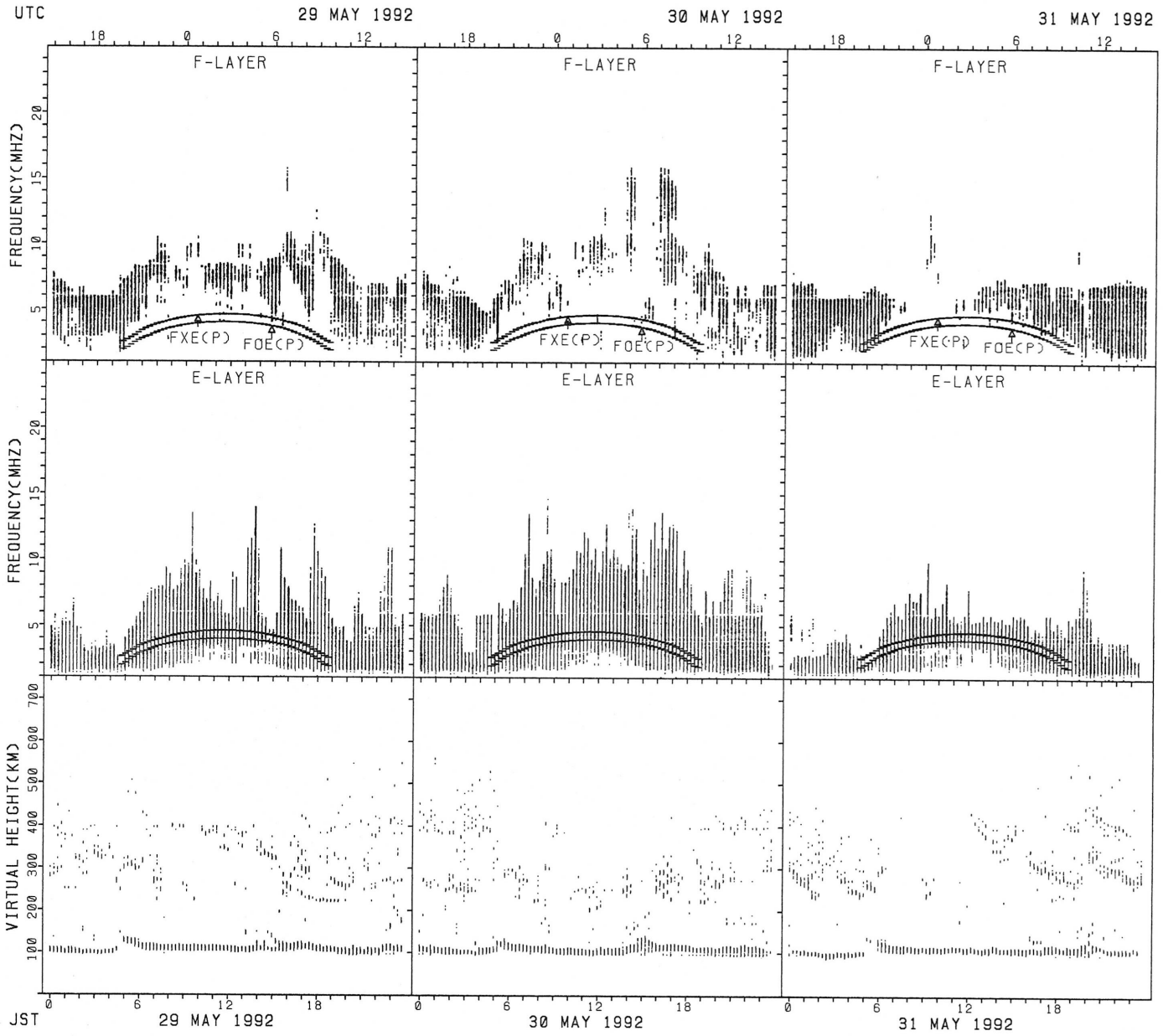
SUMMARY PLOTS AT KOKUBUNJI TOKYO



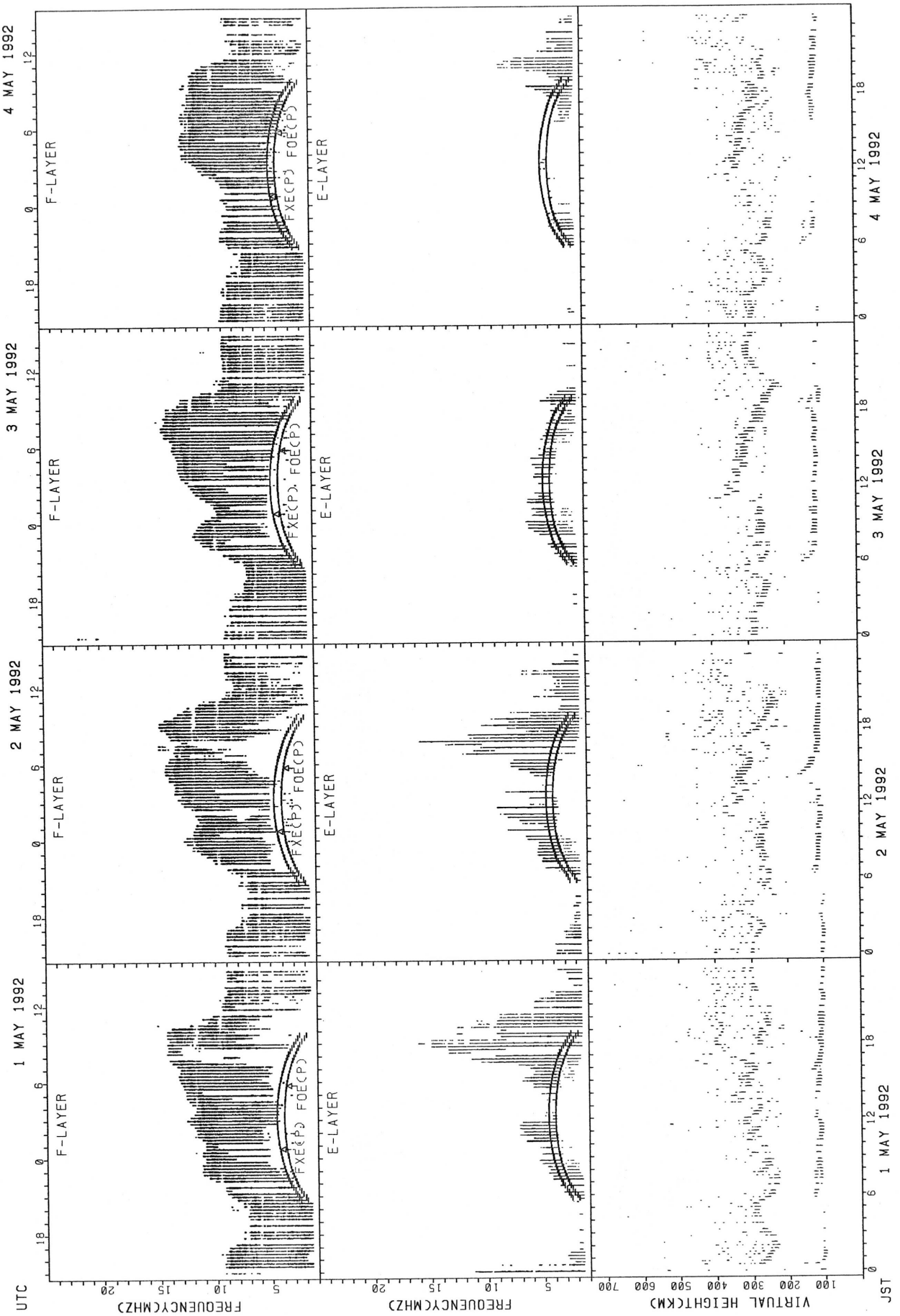
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
25 MAY 1992
26 MAY 1992
27 MAY 1992
28 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
UTC
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

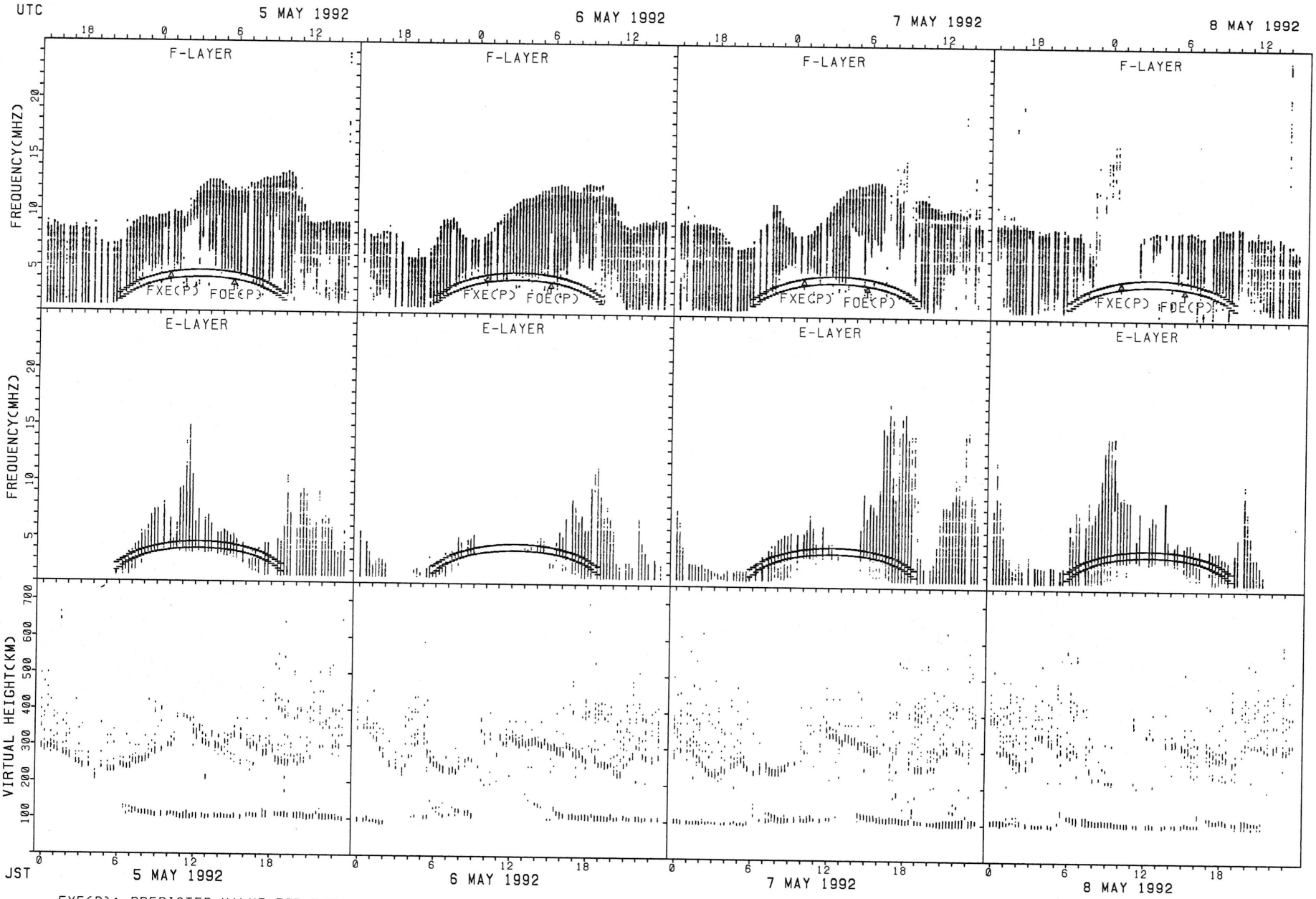
SUMMARY PLOTS AT KOKUBUNJI TOKYO



FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

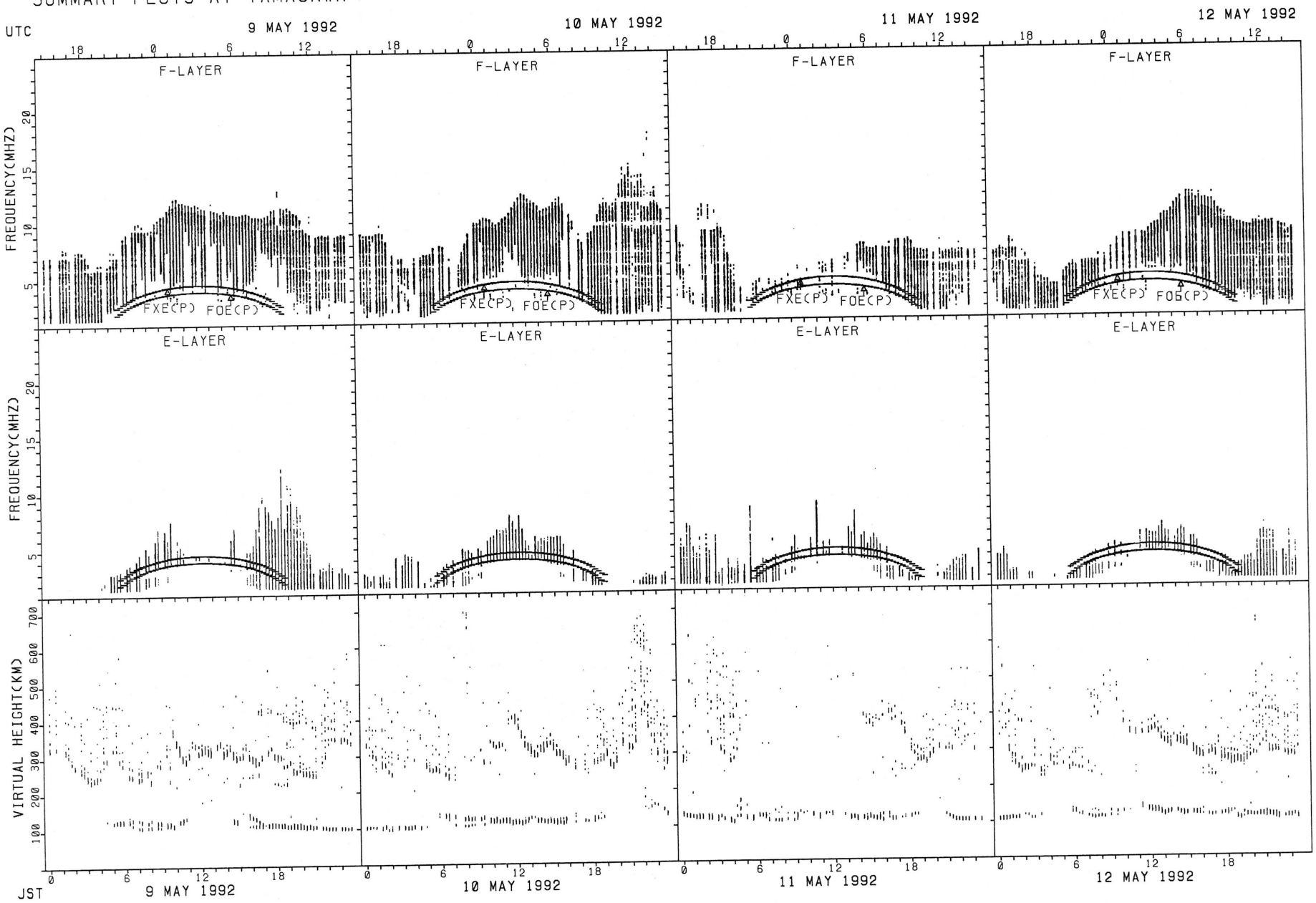

SUMMARY PLOTS AT YAMAGAWA
UTC
1 MAY 1992
2 MAY 1992
3 MAY 1992
4 MAY 1992
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT YAMAGAWA



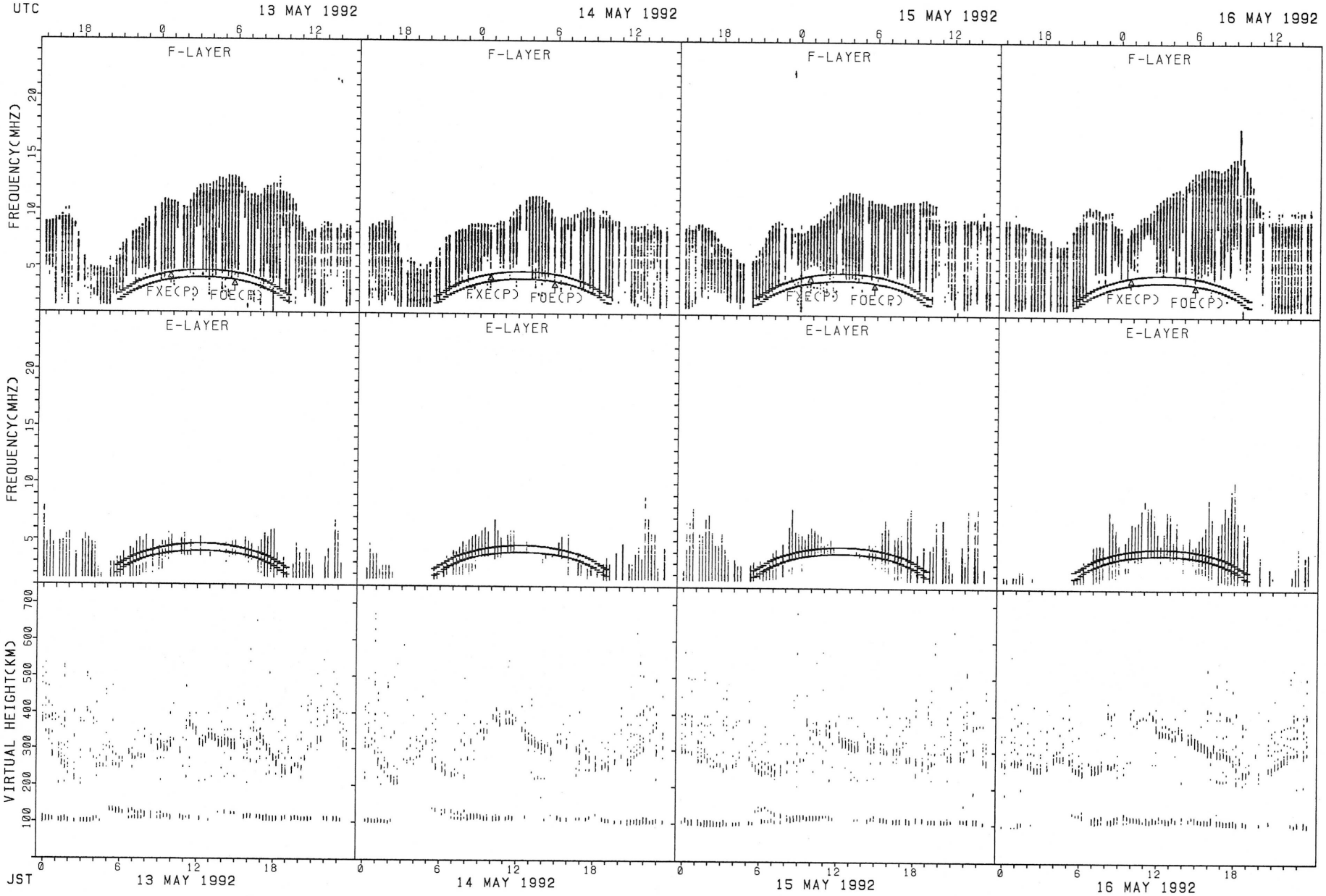
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT YAMAGAWA

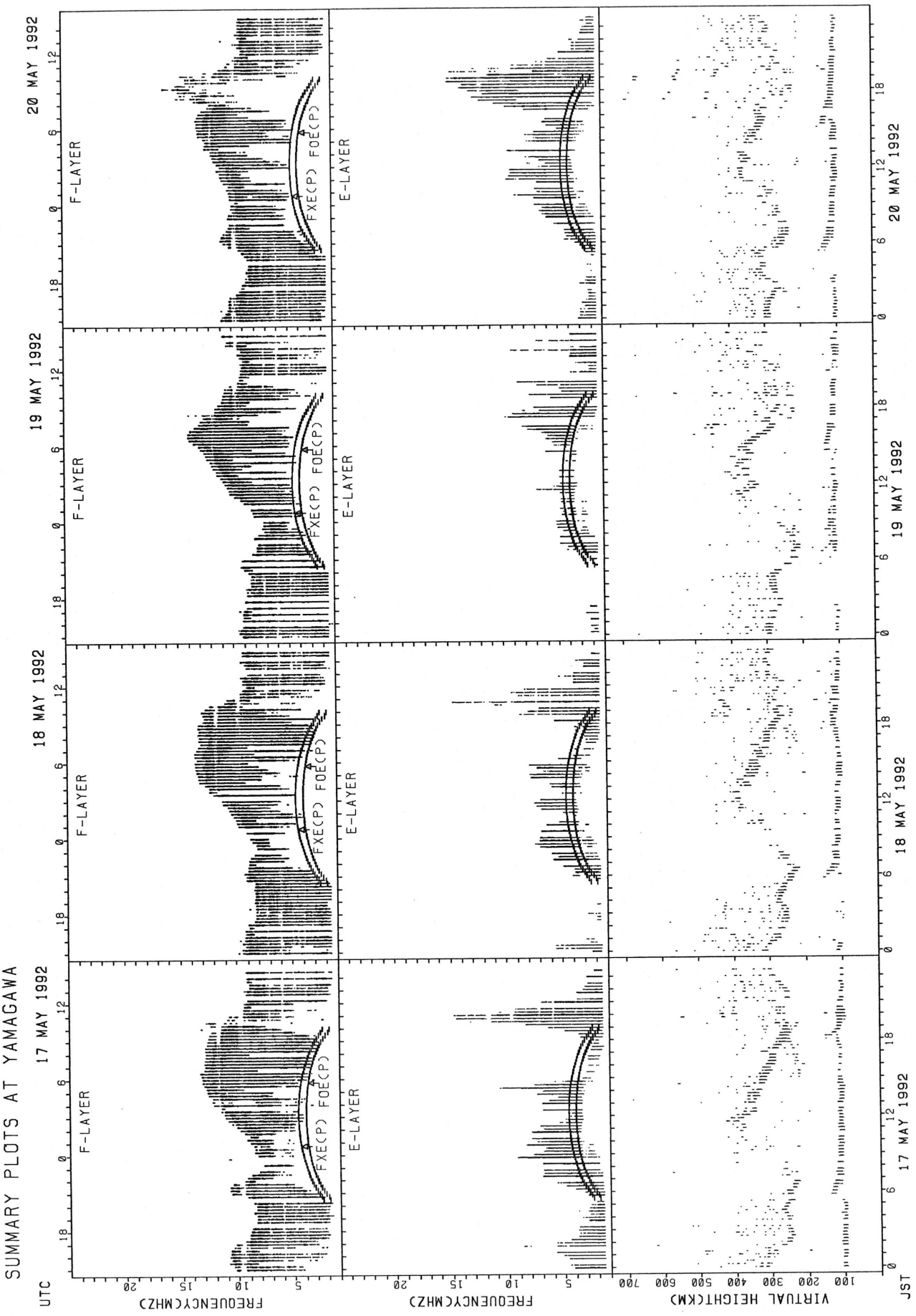


FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

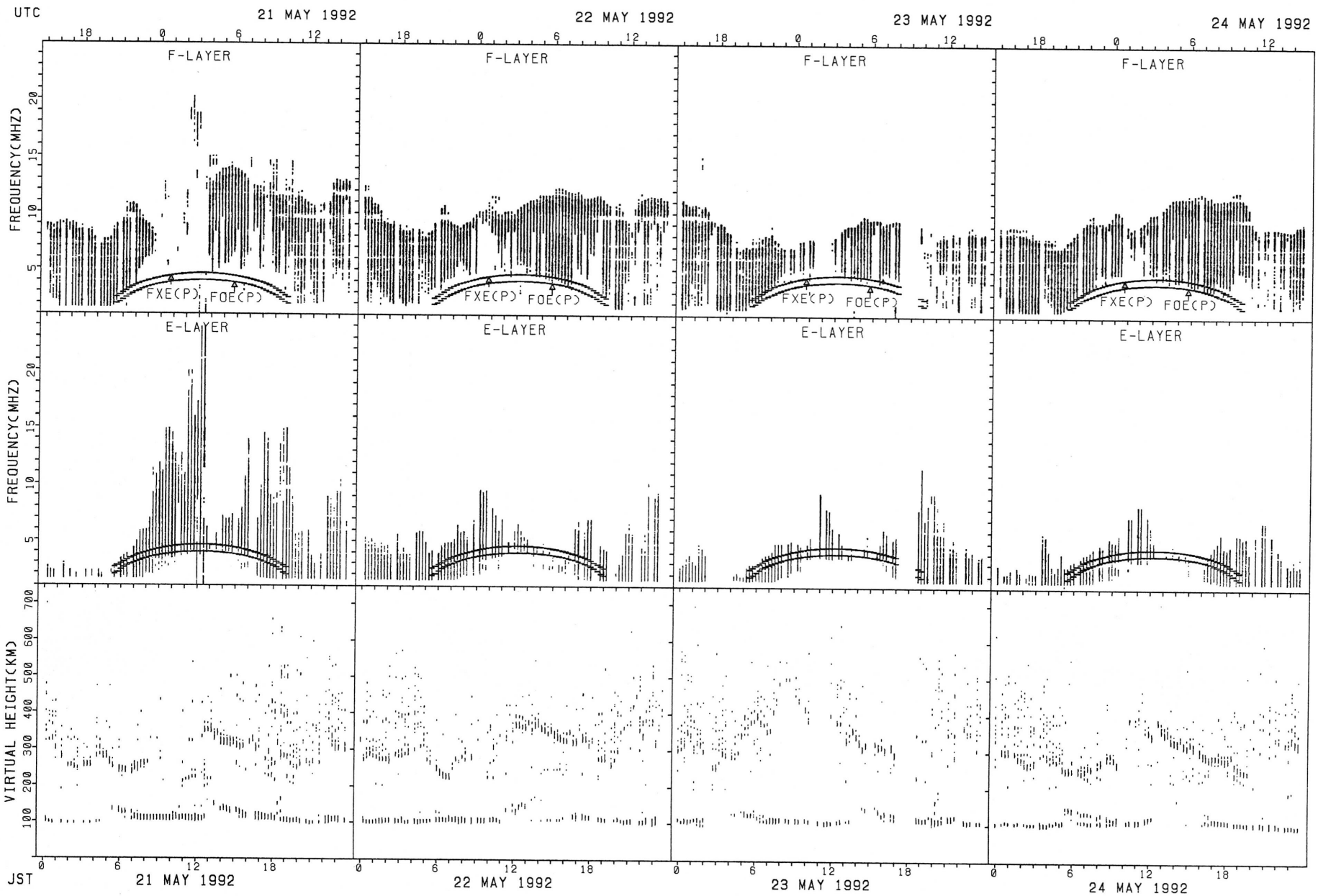
SUMMARY PLOTS AT YAMAGAWA



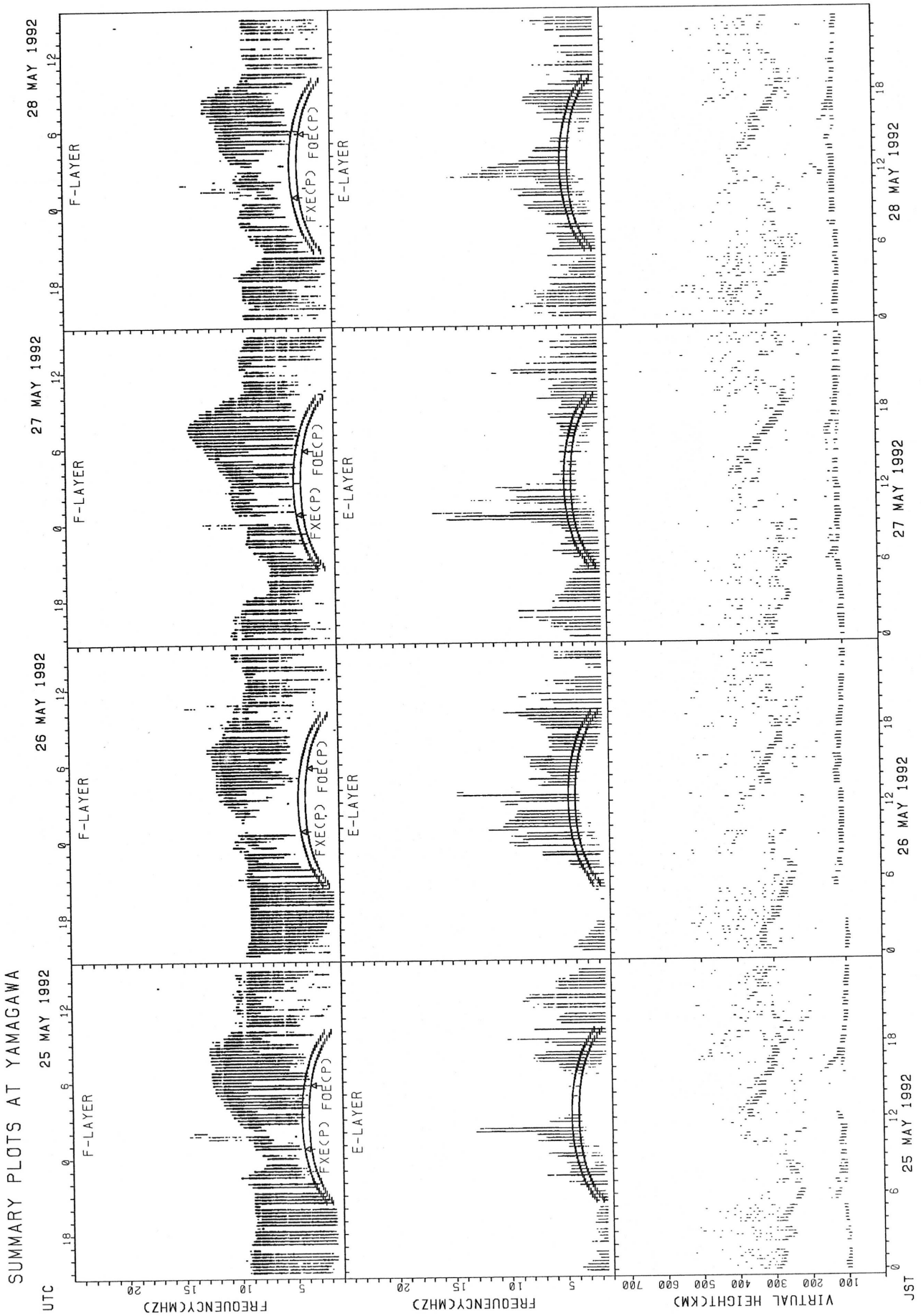
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

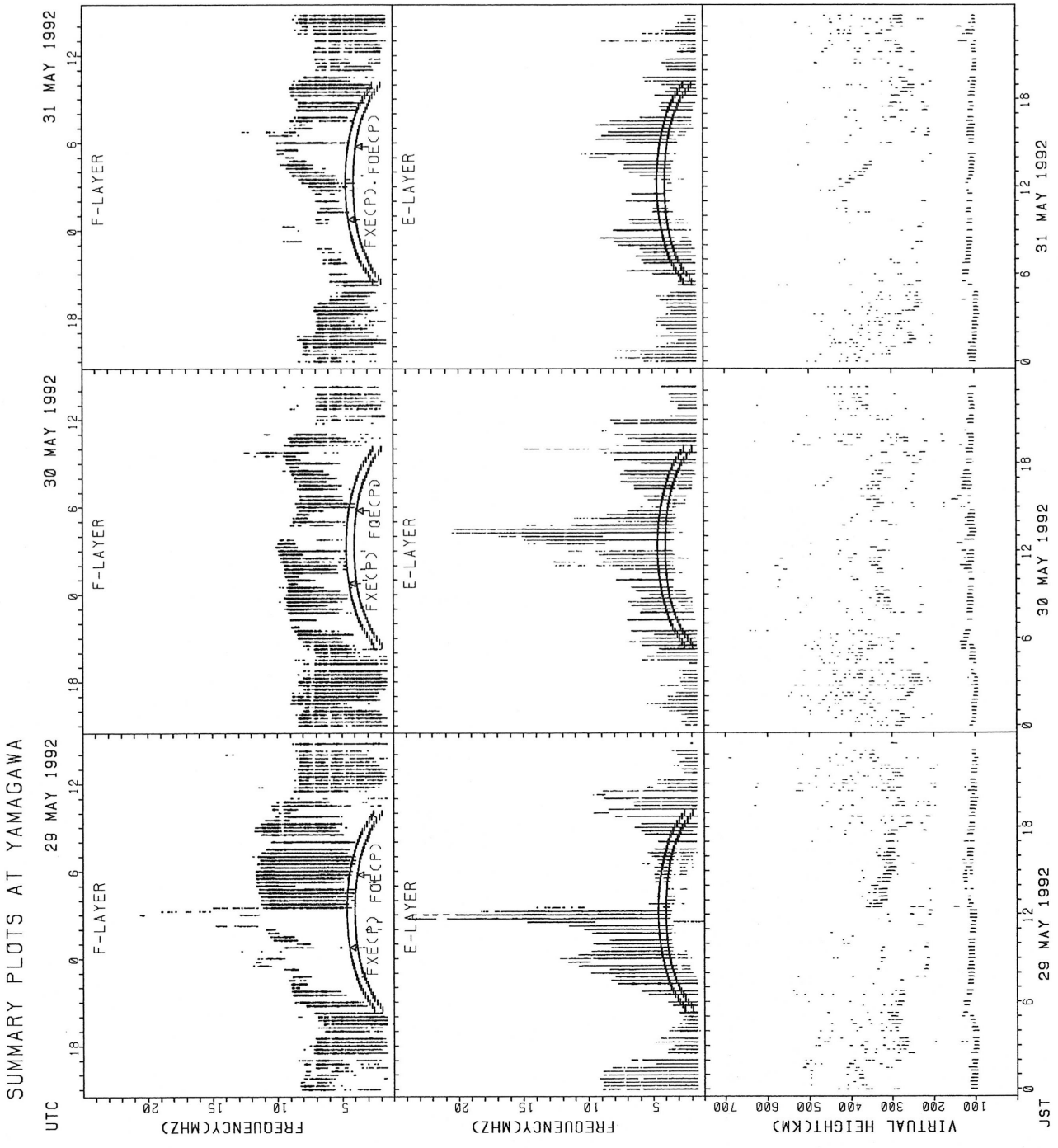

SUMMARY PLOTS AT YAMAGAWA
17 MAY 1992
18 MAY 1992
19 MAY 1992
20 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
UTC
JST
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE

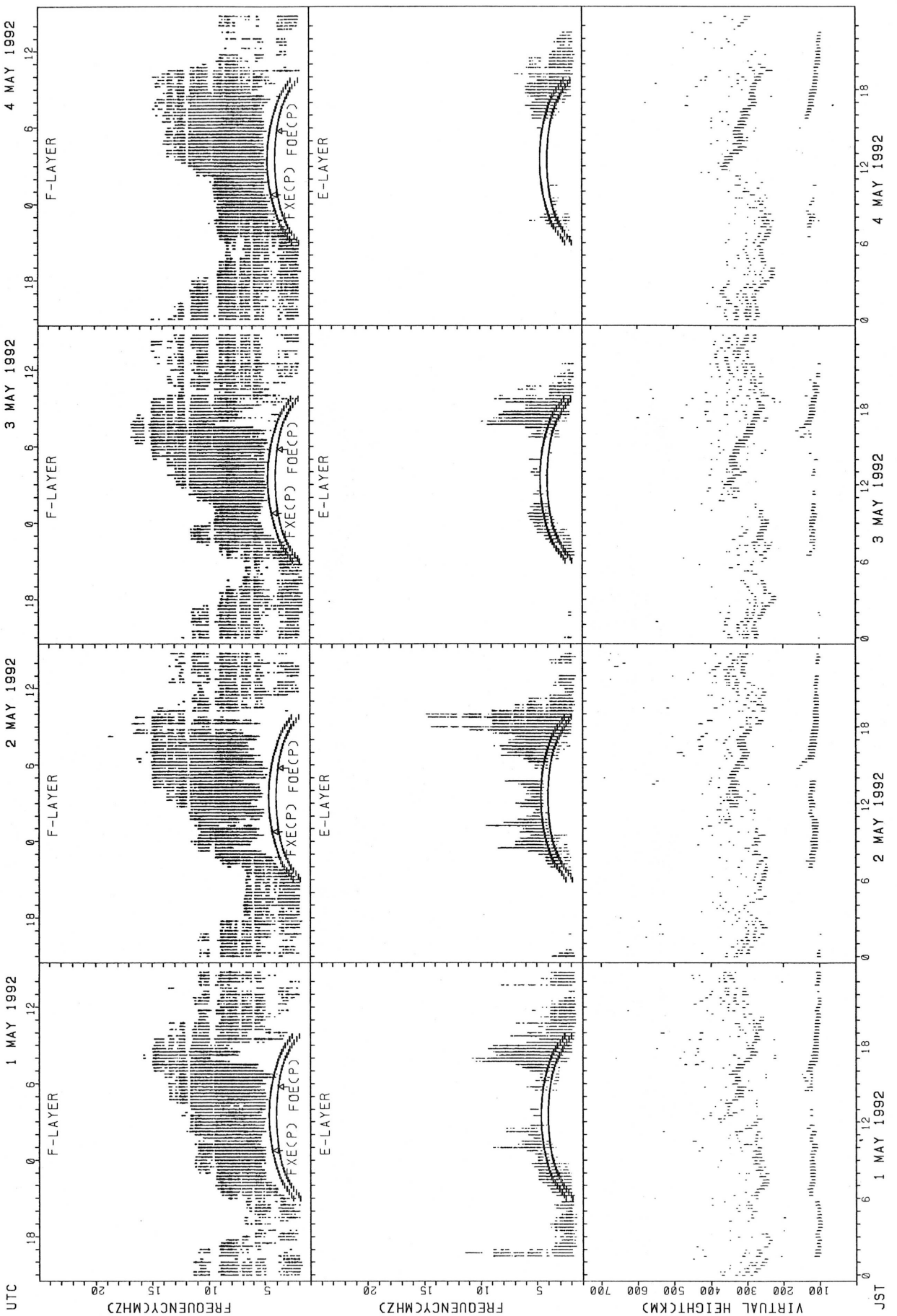
SUMMARY PLOTS AT YAMAGAWA



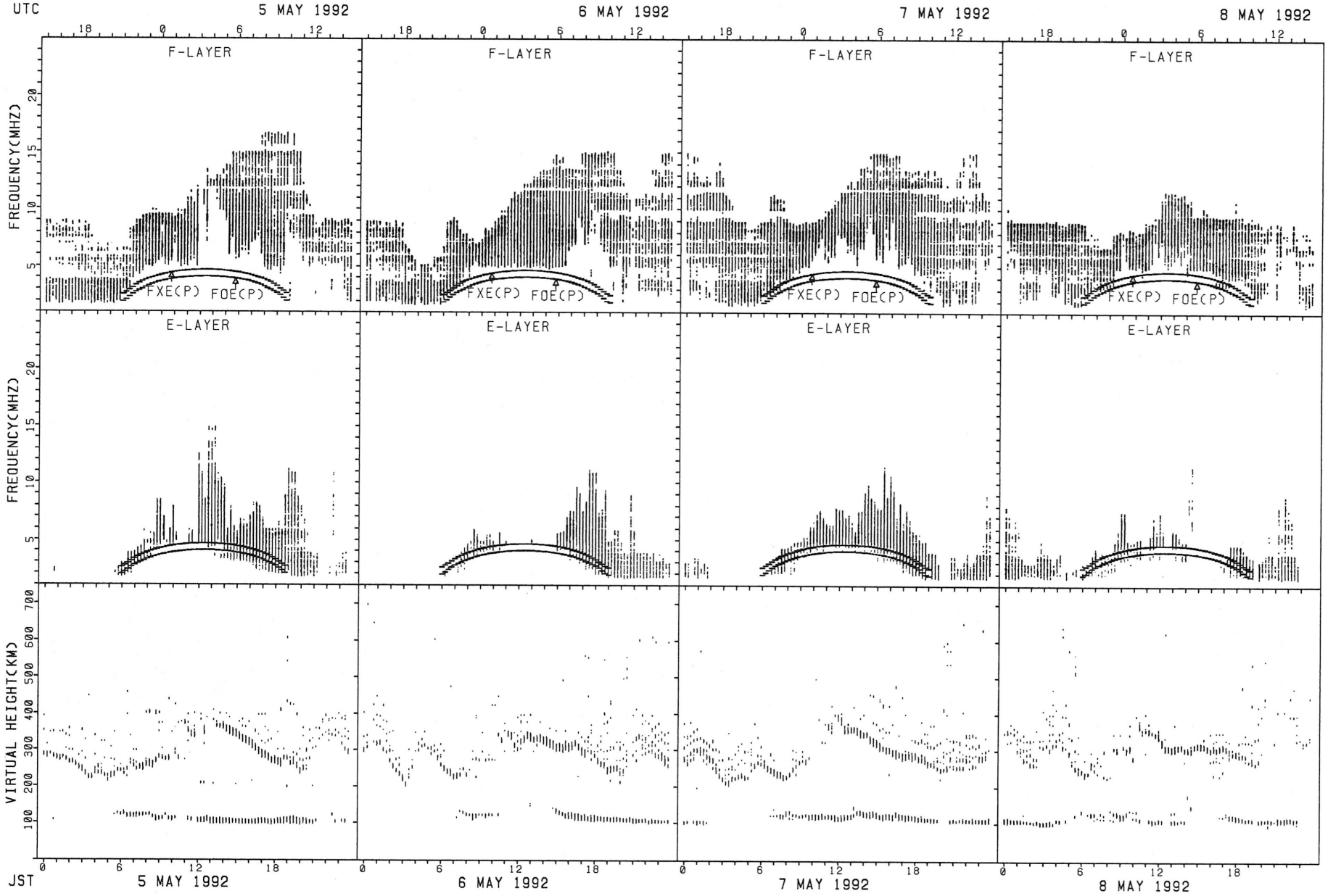
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT YAMAGAWA
UTC
25 MAY 1992
26 MAY 1992
27 MAY 1992
28 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

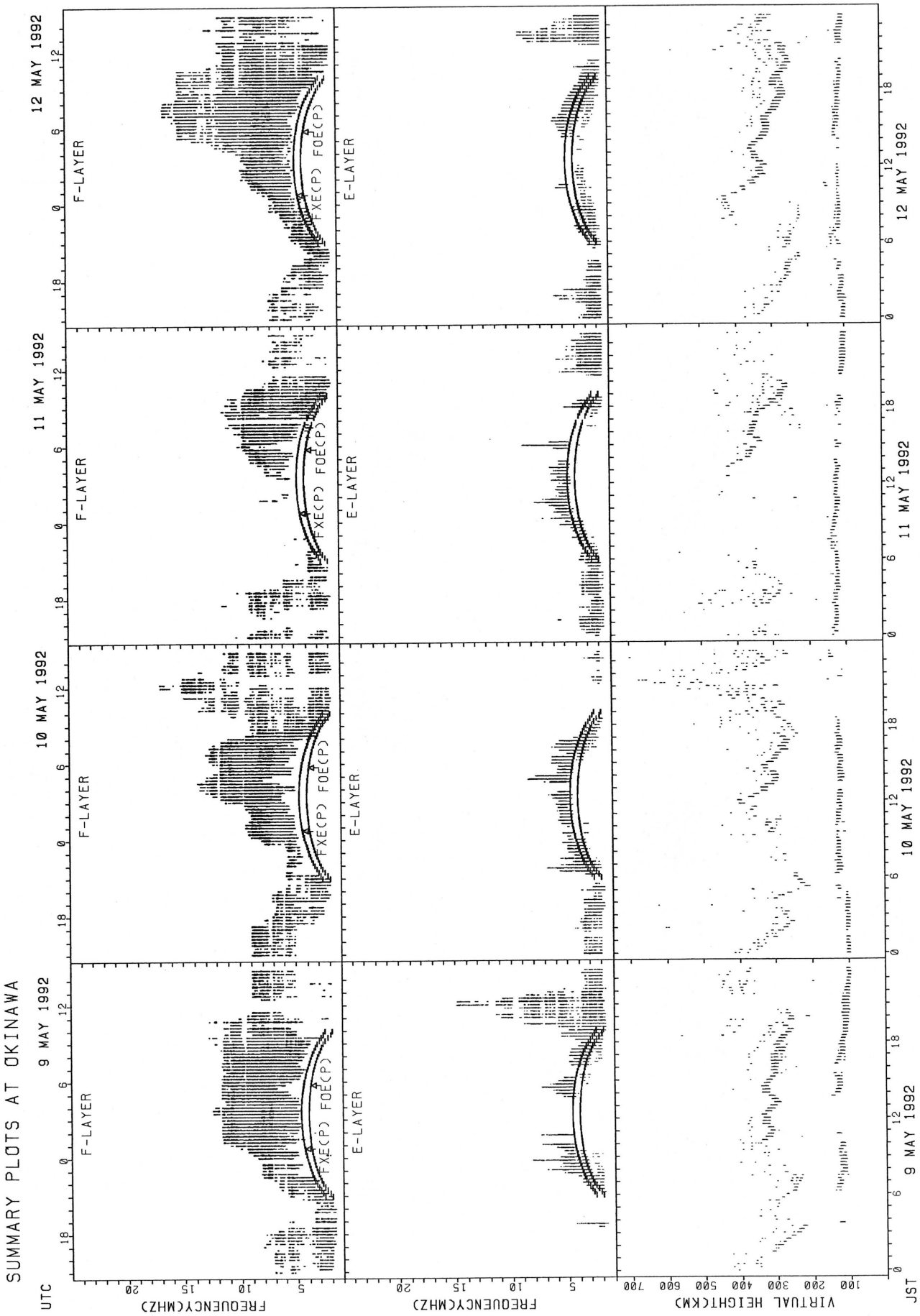

SUMMARY PLOTS AT YAMAGAWA
29 MAY 1992
30 MAY 1992
31 MAY 1992
UTC
JST
F-LAYER
E-LAYER
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P)
FOE(P)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT OKINAWA
1 MAY 1992
2 MAY 1992
3 MAY 1992
4 MAY 1992
UTC
JST
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

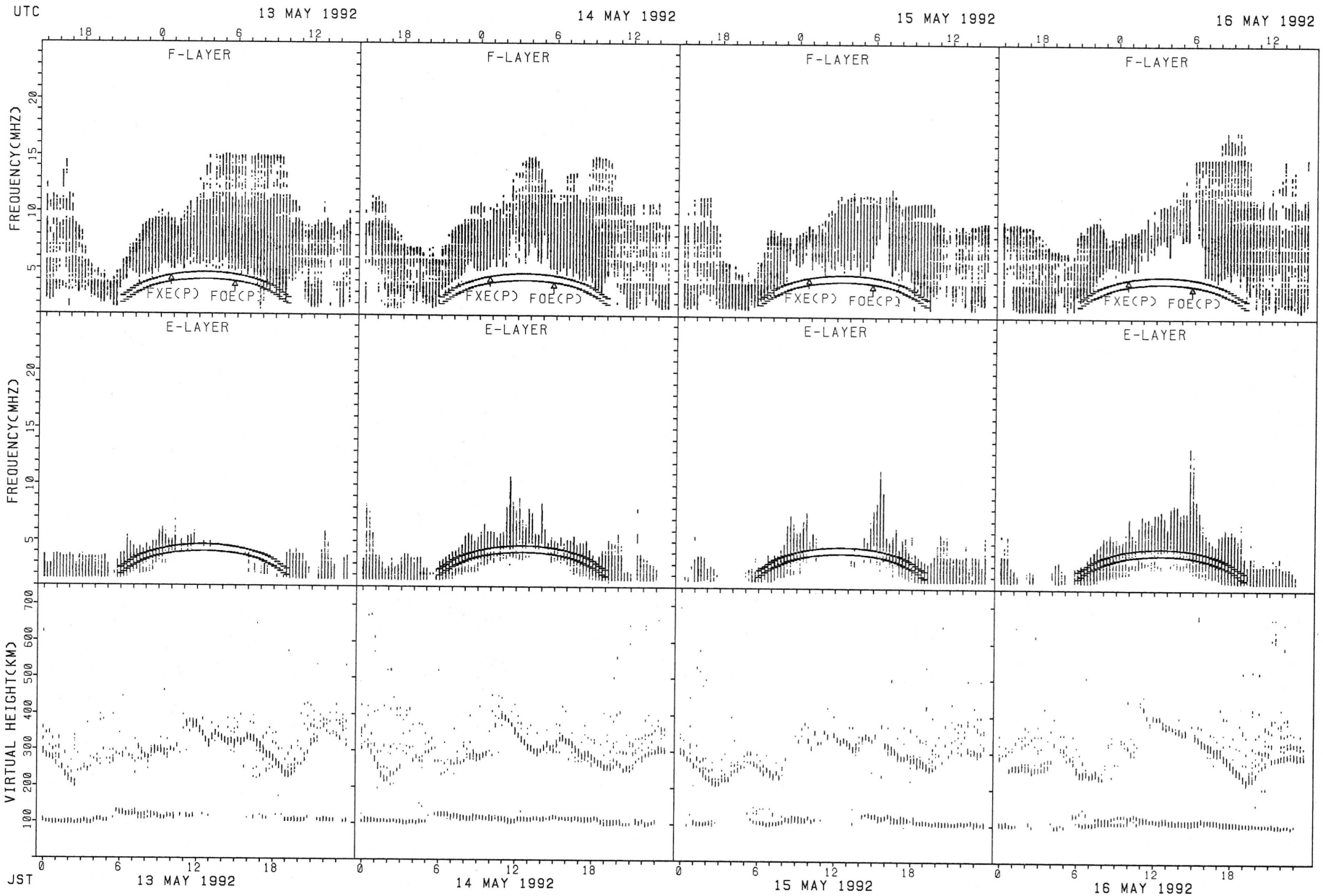
SUMMARY PLOTS AT OKINAWA



FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE

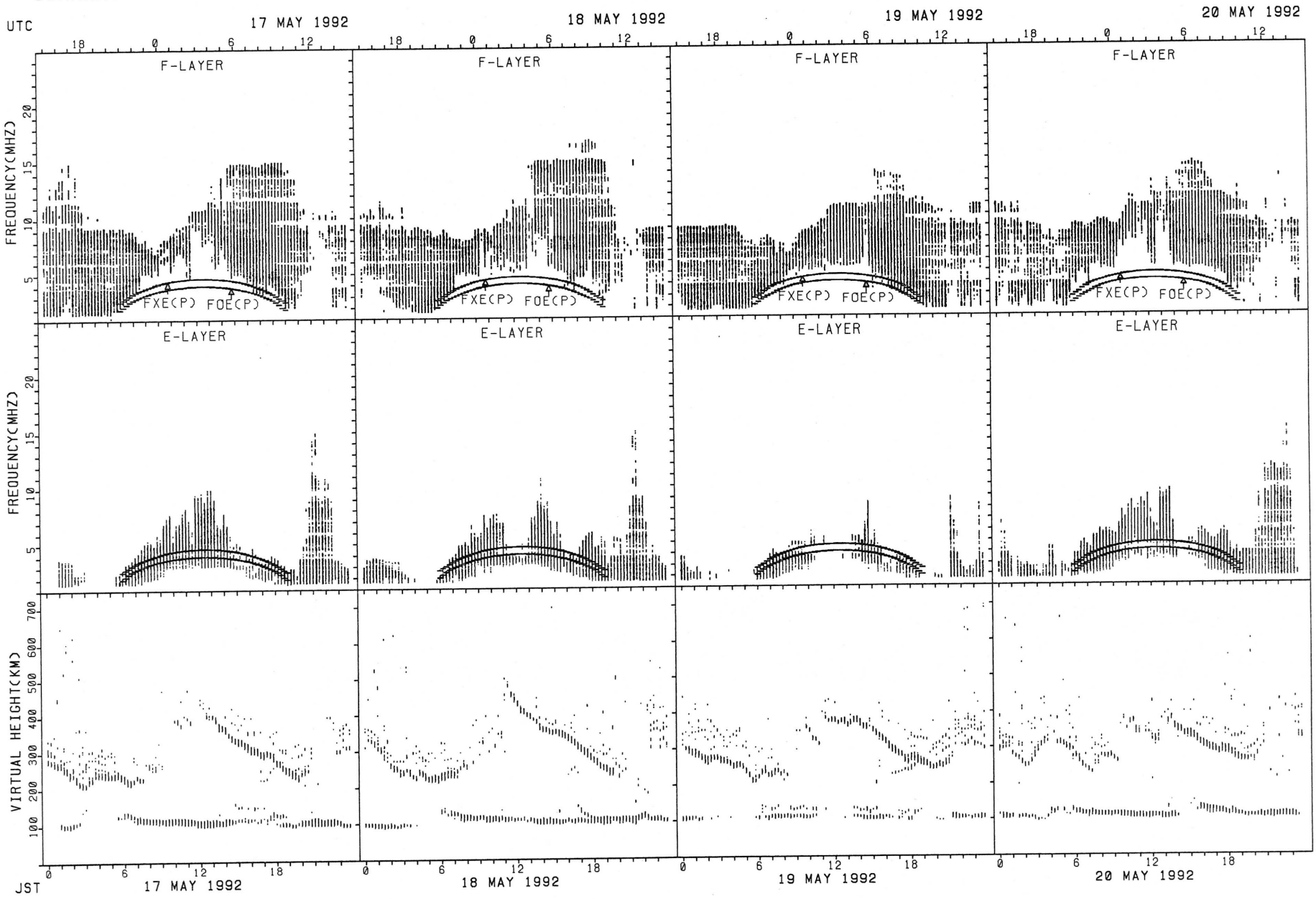

SUMMARY PLOTS AT OKINAWA
9 MAY 1992
10 MAY 1992
11 MAY 1992
12 MAY 1992
UTC
JST
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT OKINAWA



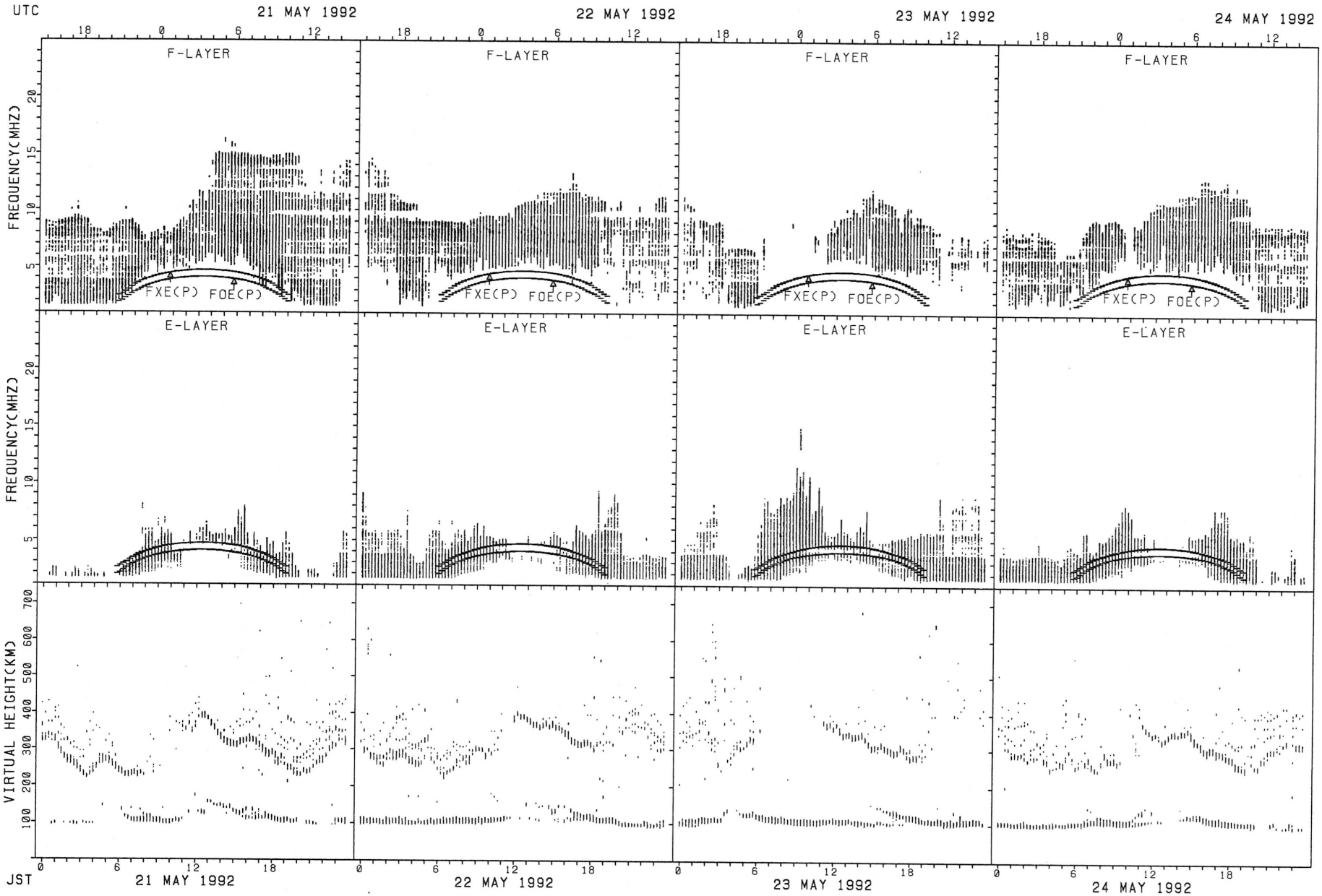
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT OKINAWA

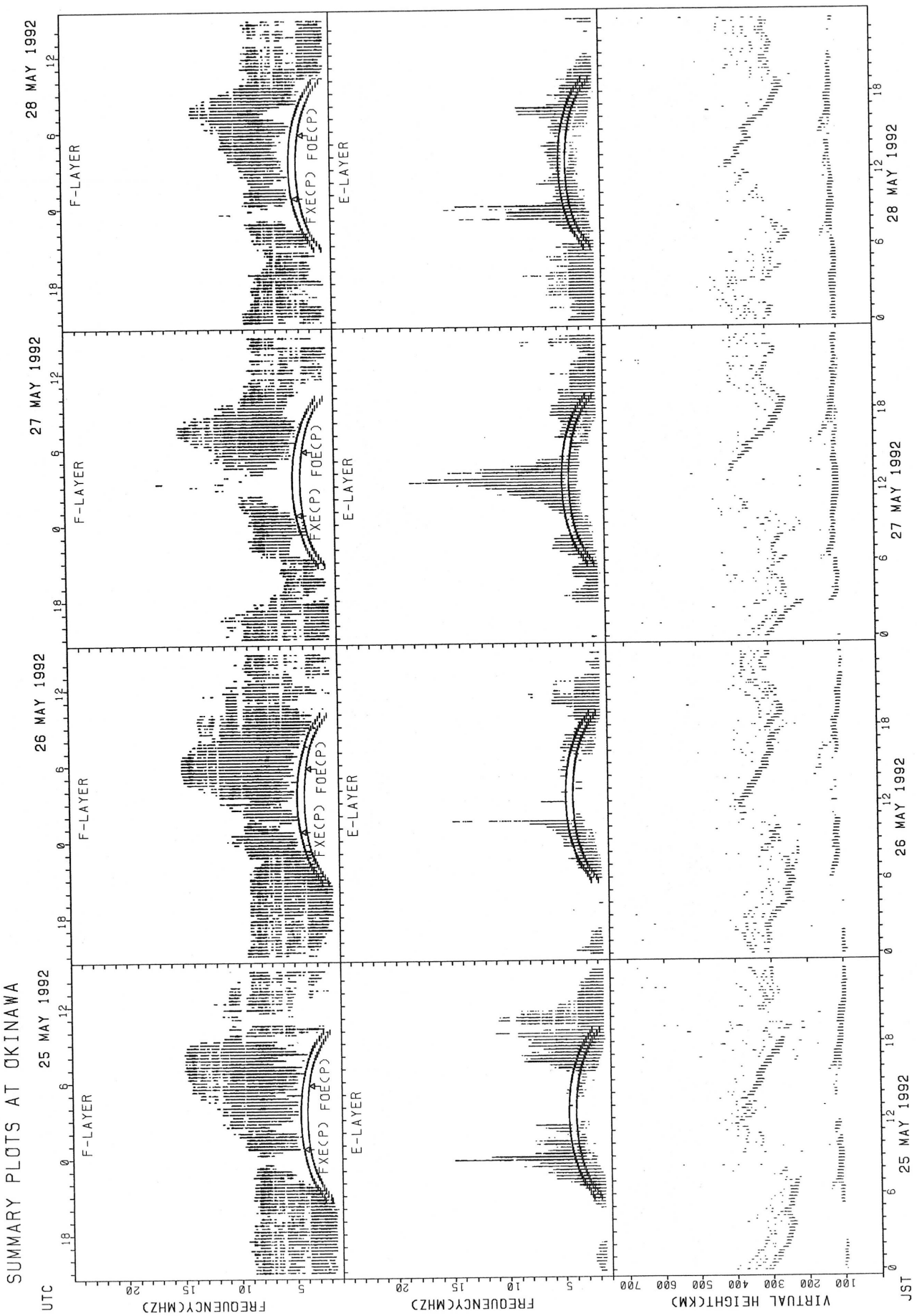


FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE

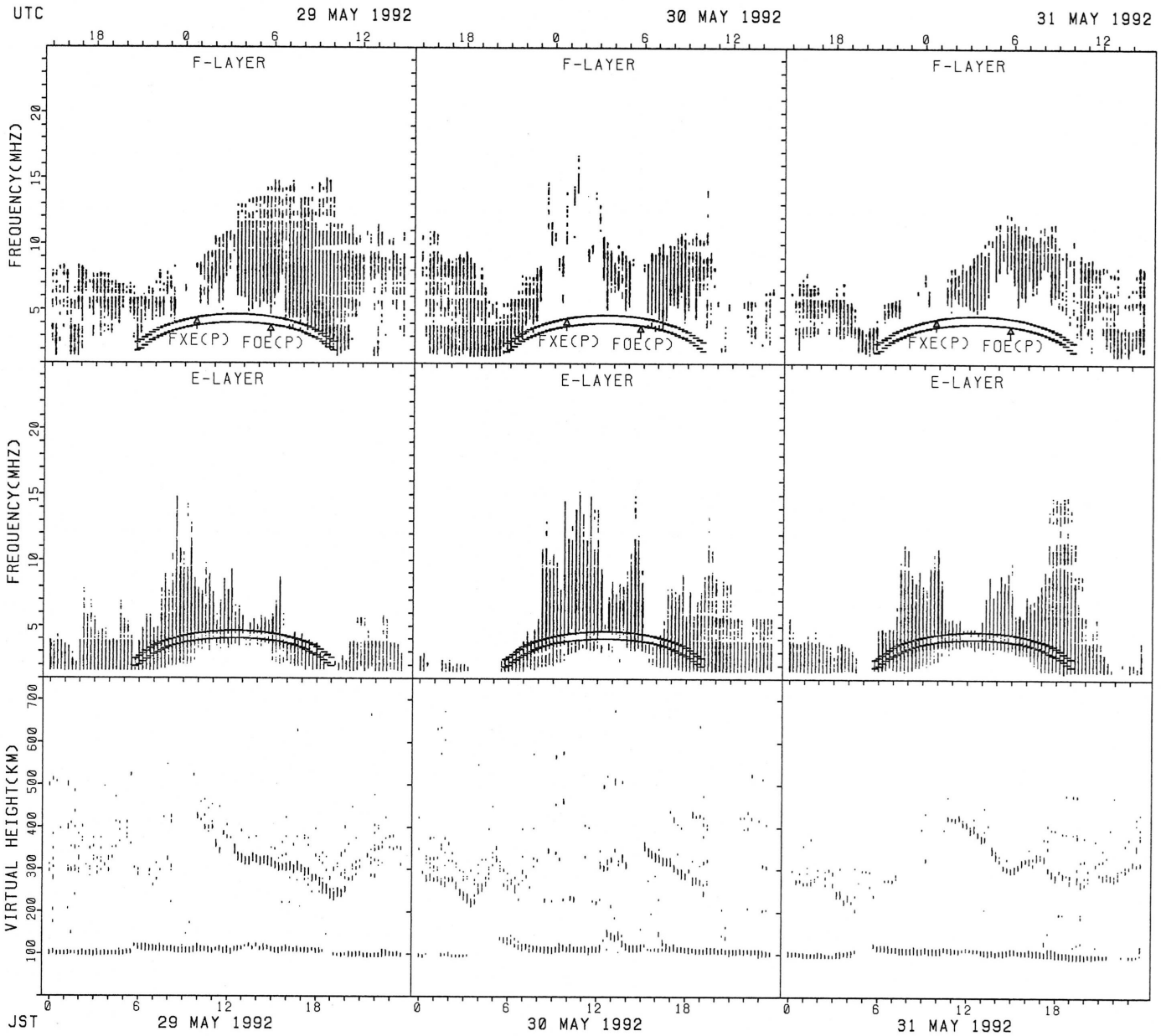
SUMMARY PLOTS AT OKINAWA



FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT OKINAWA
25 MAY 1992
26 MAY 1992
27 MAY 1992
28 MAY 1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
UTC
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT OKINAWA



FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE

MONTHLY MEDIANS OF H'F AND H'ES

MAY 1992 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							14	11									23	20	20	16	22	18	13	13
MED							296	296									308	302	294	290	328	331	338	380
U Q							312	322									330	324	306	302	342	360	358	392
L Q							282	280									298	292	284	284	300	316	326	337

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	10	17				18	16	19	20	19	16	10					13	21	27	22	21	13	14	16
MED	113	109				137	126	125	120	119	117	113					127	125	121	119	117	121	114	110
U Q	127	118				141	128	127	123	121	119	117					130	132	125	121	118	133	125	122
L Q	109	109				131	123	121	119	115	113	109					119	121	117	115	114	117	111	109

H'F STATION AKITA LAT. 39.7N LON. 140.1E

	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	12	15									27	21	20	21	11		10	
MED						305	280	288									298	304	289	286	310		349	
U Q						315	295	304									306	315	308	300	338		378	
L Q						294	276	266									284	289	274	262	298		334	

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	17	15	14	17	13	22	27	27	27	27	25	22	23	21	20	21	25	29	28	27	23	23	21	19
MED	107	107	105	107	111	134	127	119	117	117	113	113	113	113	120	125	121	119	115	115	113	113	113	111
U Q	112	109	105	111	116	143	137	123	121	121	117	119	119	122	126	134	132	125	118	119	117	117	118	117
L Q	105	105	103	101	104	127	123	117	115	113	111	107	109	109	109	115	118	117	115	113	111	111	110	107

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	15	13	16			10	15	21	15								26	25	22	23	15		12	15
MED	376	356	339			307	270	280	288								291	284	283	268	294		354	350
U Q	386	361	363			330	278	293	292								302	299	294	286	328		370	370
L Q	344	335	324			294	262	263	270								272	268	262	256	286		336	340

H'ES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	19	20	18	14	19	24	29	30	29	27	26	21	26	22	23	23	29	29	28	27	27	27	26
MED	107	105	105	107	105	129	124	119	115	113	113	114	113	109	118	119	115	115	113	109	111	111	111	108
U Q	113	107	108	111	111	147	130	125	119	118	117	117	119	117	125	129	123	122	115	114	115	117	115	113
L Q	103	103	103	103	103	113	120	115	111	111	109	109	111	109	111	111	113	113	111	109	109	107	107	107

MONTHLY MEDIANS OF H'F AND H'ES

MAY 1992 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	17	20	23	16			17	14	16								26	26	25	23	19	17	14	16
MED	350	346	336	332			268	258	263								298	291	266	262	274	344	353	355
U Q	361	360	358	363			295	274	291								308	312	278	284	338	357	370	380
L Q	331	320	304	305			248	250	255								290	276	250	246	262	323	338	347

H'ES

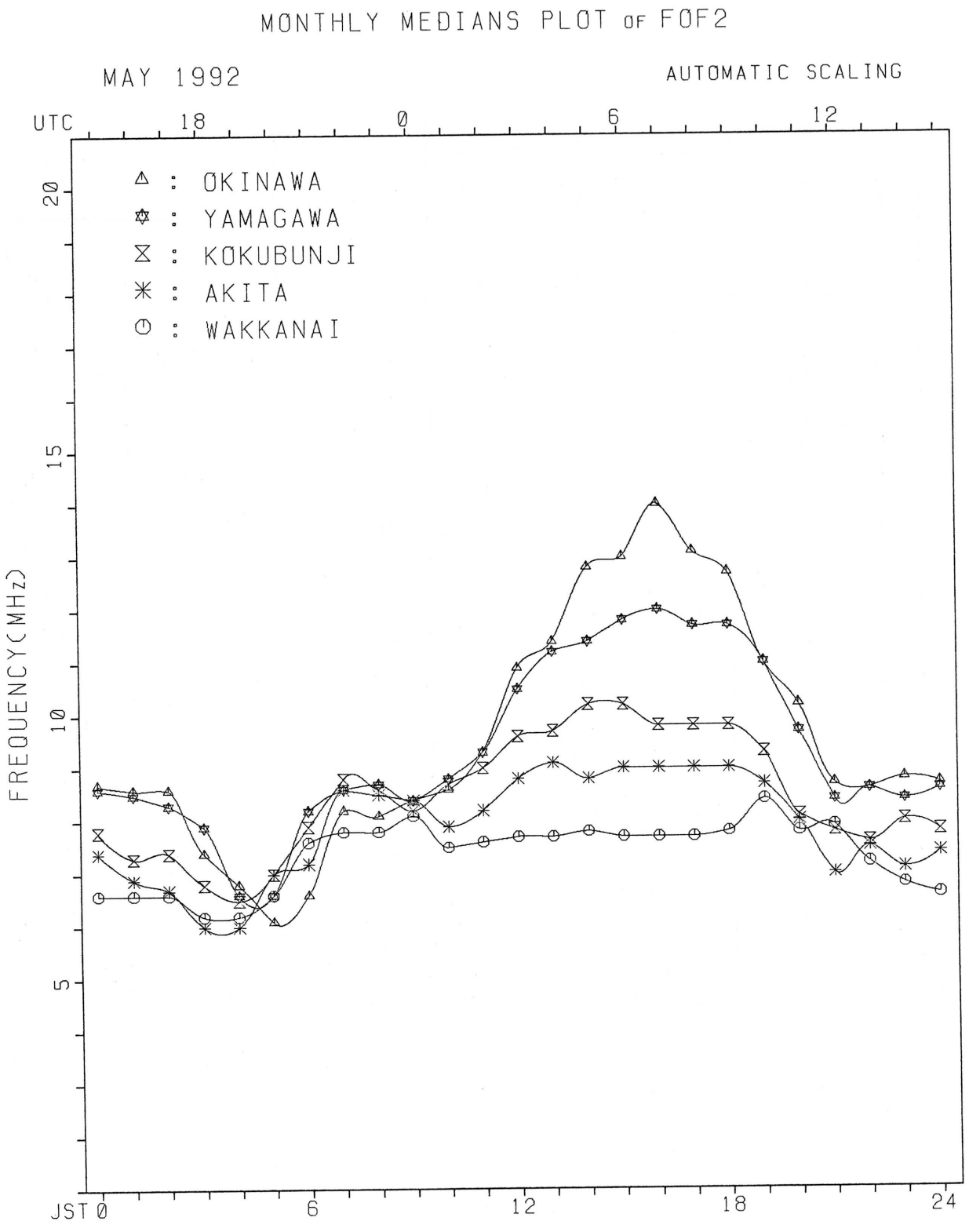
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	20	19	16	12	12	22	17	22	25	21	23	19	13	16	17	18	20	23	27	24	24	23	25
MED	109	105	103	105	105	109	127	123	117	113	113	111	115	113	118	121	118	119	113	111	111	109	109	109
U Q	113	111	107	108	106	119	135	126	123	118	115	115	129	123	124	121	123	123	115	113	114	111	113	113
L Q	105	103	101	100	100	107	121	118	113	111	109	107	109	110	107	110	115	115	111	109	107	107	107	105

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	20	22	16			12	18	15	13							31	30	30	29	22	16	13	16
MED	343	311	297	292			280	247	274	270							304	291	280	272	278	326	336	346
U Q	356	334	328	313			289	286	294	294							322	304	288	287	296	339	350	360
L Q	314	286	270	263			253	238	256	267							300	282	272	247	264	315	319	331

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	22	22	19	16	15	13	21	25	26	28	27	20	20	22	21	24	23	27	28	27	27	25	23	23
MED	105	107	107	104	107	107	123	121	117	117	113	117	114	119	113	125	123	117	115	111	111	107	109	107
U Q	107	109	111	108	113	123	132	123	123	121	119	121	119	125	125	136	135	125	118	113	115	115	113	109
L Q	103	101	103	101	103	105	109	117	115	113	111	109	110	111	109	114	117	113	112	109	109	103	103	103


MONTHLY MEDIANS PLOT OF FOF2
MAY 1992
AUTOMATIC SCALING
UTC
18
0
6
12
△ : OKINAWA
✡ : YAMAGAWA
⧖ : KOKUBUNJI
✳ : AKITA
◷ : WAKKANAI
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 FXI (0.1MHZ) 135° E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 90	X 85	X 77	X 72	X 71															X 136	X 99	X 86	X 83	X 82
2	X 81	X 78	X 75	X 70	X 74															X 116	X 86	X 74	X 80	X 80
3	X 81	X 77	X 74	X 74	X 68															X 98	X 78	X 78	X 79	X 81
4	X 78	X 75	X 78	X 72	X 65															X 84	X 79	X 78	X 76	X 81
5	X 78	X 77	X 80	X 82	X 75															X 112	X 90	X 82	X 83	X 84
6	X 79	X 77	X 73	X 67	X 61															X 104	X 86	X 78	X 80	X 85
7	X 79	X 75	X 73	X 69	X 62															X 96	X 90	X 89	91	99
8	91	X 90	X 80	X 72	X 71	73														X 84	X 84	X 84	X 81	X 79
9	X 78	X 79	X 82	X 83	X 73							104						A		X 105	X 84	X 80	X 81	X 83
10	X 80	X 79	X 70	X 65	X 62															X 114	X 101	94	72	89
11	62	X 56	X 51	X 54	X 47	49					55										X 71	X 74	X 82	X 77
12	X 72	X 62	X 54	X 54	50		A													X 87	X 86	X 90	X 90	X 87
13	83	X 82	X 83	X 62	X 61															X 100	X 82	X 72	X 76	X 74
14	X 69	X 72	X 79	51	X 46															X 75	A	X 76	73	75
15	X 75	X 76	X 70	63	58															X 100	X 92	X 92	X 96	X 96
16	X 91	X 84	X 79	X 77	X 77															X 118	X 95	X 91	X 86	85
17	86	86	X 83	X 75	X 75															X 107	X 101	X 98	X 93	X 85
18	X 83	X 81	X 79	99	99	91														X 105	X 101	X 96	X 87	X 87
19	X 87	X 87	X 83	X 80	X 78															A	X 88	X 87	X 97	X 99
20	X 96	X 93	X 91	X 83	X 83															X 101	X 97	X 95	X 93	X 88
21	87	100	102	91	87																106	109	X 102	94
22	101	100	X 84	X 76	X 75							A									X 101	X 104	X 110	X 107
23	X 100	X 96	X 90	X 90	X 84																X 84	X 85	X 86	X 85
24	X 84	X 81	X 80	X 79	X 79																X 94	X 87	X 91	95
25	X 94	X 90	X 89	X 89	X 81												A				X 99	X 100	X 99	X 99
26	98	90	X 87	X 86	X 84							C			A	C					X 93	X 88	95	98
27	95	97	89	82	X 79																X 92	X 87	X 87	95
28	98	93	77	76	76	77															X 83	X 77	X 77	X 84
29	X 77	X 68	68	X 63	X 63																X 78	X 74	X 73	73
30	75	68	76	61	54	63		A				A	A	A	A		A	A	A		X 82	X 71	X 70	75
31	74	X 73	X 62	X 60	X 62				A												X 70	74	X 74	X 74
	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	5					1	1								18	30	31	31	31
MED	X 83	X 81	X 79	X 74	X 73	73					55	104								X 102	X 89	X 86	X 83	X 85
U Q	91	90	X 83	X 82	X 79	84														X 112	X 97	X 92	X 93	95
L Q	X 78	X 75	X 73	X 63	X 62	56														X 96	X 83	X 77	X 77	X 80

MAY 1992 FXI (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 FOF2 (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	84	79	71	66	65	73	97	97	101	109	109	110	120	118	115	116	118	116	125	130	93	80	77	76
2	75	72	69	64	68	73	77	91	99	111	111	112	114	120	120	120	111	112	124	109	80	68	74	74
3	74	R 71	68	68	62	61	72	78	H 84	V 80	86	96	105	113	120	117	112	115	111	92	72	72	73	75
4	72	69	72	66	59	59	62	57	62	64	64	73	82	86	89	90	93	87	83	78	73	72	69	75
5	72	71	74	76	69	70	77	80	85	91	89	98	103	100	97	79	80	85	97	106	84	76	77	78
6	73	71	67	61	55	62	83	87	77	74	77	88	91	93	95	100	97	100	103	98	80	72	74	79
7	73	69	67	63	56	62	81	86	98	84	75	84	96	104	106	108	106	103	94	90	84	83	F 83	U F 89
8	F 84	84	74	66	65	65	63	65	60	54	55	61	72	69	72	72	71	71	71	78	78	78	74	73
9	72	73	76	77	67	65	91	102	94	95	R 98	F 95	98	93	95	97	93	A	101	99	78	74	75	77
10	74	73	64	59	56	57	73	65	79	98	94	92	99	98	93	96	94	76	83	108	95	Z 86	F	U F 80
11	F 54	50	45	48	41	F 40	40	E G 40	E G 43	E G 45	46	50	58	55	70	68	64	65	69	69	65	68	76	71
12	66	56	48	48	F 44	49	I A 54	51	51	62	84	93	85	98	97	87	84	80	83	81	80	84	84	81
13	F 77	76	77	56	55	61	69	73	79	93	98	93	103	102	103	107	97	97	99	94	76	66	70	68
14	63	66	73	45	41	48	60	60	62	65	70	72	73	77	78	78	74	76	71	69	I A 66	70	F 65	F 65
15	69	70	64	F 55	F 50	57	72	93	95	81	83	90	98	101	100	101	89	88	94	94	86	86	90	90
16	85	78	74	71	71	81	84	88	96	85	82	92	103	110	111	116	118	122	123	112	89	85	80	F 77
17	F 75	F 79	77	69	69	81	92	90	82	83	90	89	103	109	111	112	112	110	105	101	95	92	87	79
18	77	75	73	68	66	F 80	90	91	85	84	93	103	110	120	125	126	116	107	100	99	95	90	81	81
19	81	81	77	74	72	89	100	78	74	72	81	96	97	106	111	122	127	115	99	I A 76	82	J S 81	91	93
20	90	87	85	77	77	82	98	104	104	99	97	93	95	104	112	109	100	96	99	95	91	89	87	82
21	V 81	F 90	F 96	F 83	F 78	87	95	99	98	84	89	96	102	104	106	104	101	98	98	99	F 100	100	96	86
22	F 81	80	78	70	69	81	100	99	98	96	96	I A 96	95	97	101	108	103	U S 97	104	97	95	98	105	101
23	94	Z 91	V 84	84	78	76	71	73	63	69	77	77	79	87	84	83	82	82	80	I A 76	77	79	80	79
24	78	75	74	73	73	75	81	92	87	95	96	81	84	98	109	105	97	98	101	104	88	81	85	85
25	88	84	83	83	75	85	91	92	89	H 80	80	83	94	102	105	104	A	100	100	99	V 93	94	93	93
26	87	F 79	81	80	78	81	86	91	91	82	85	I C 90	97	93	A	C	103	101	95	94	87	82	85	90
27	87	86	81	73	73	69	70	85	90	96	105	104	101	99	108	114	118	115	106	92	86	81	V 81	F 84
28	F 89	F 76	F 66	F 69	F 67	71	65	67	74	72	74	78	82	86	84	91	92	93	93	84	77	71	71	78
29	71	62	F 58	57	57	68	78	82	78	76	78	79	81	80	80	84	84	80	88	85	72	68	67	F 64
30	J F 68	F 57	67	F 53	F 47	F 56	66	A	I A 73	67	69	A	A	A	A	62	A	A	A	77	76	65	V 63	F 65
31	F 67	67	56	54	56	59	Z 60	56	I A 54	53	55	58	57	64	70	65	66	65	65	U S 66	64	F 65	68	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	31	31	31	31	31	31	31	30	31	31	31	30	30	30	29	30	29	29	30	31	31	31	30	31
MED	75	75	73	68	66	69	77	86	84	82	84	91	96	98	101	102	97	97	98	94	82	80	78	79
U Q	84	80	77	74	72	81	91	92	95	95	96	96	103	104	111	112	112	108	103	99	91	86	85	85
L Q	72	69	67	57	56	59	66	67	73	69	75	79	82	87	86	84	84	81	83	78	76	71	73	74

MAY 1992 FOF2 (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 FOF1 (0.01MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L		U L 570	L	U L 640	L 550	U L 560	L 530	L	L							
2									U L 530		L	U L 600	U L 600	560	U L 560	L	L	L						
3							U L 480	L 480	L 500	L	U L 570	U L 600	L 540	U L 600	L 550	L	L	L						
4							L 390	440	470	500	520	510	535	530	540	L 510	U A 470	L						
5									U L 560	L			520	L 550	520		L	L	L					
6							L	L 480	L 480	U L 510	L	540	560	530	530	U L 530	L	L	L					
7								L	L 490	L 490	L	560	550	L	510									
8						L	370		470		500	510	500	510	510	480	L 460							
9							L	L			L 550	L 540	560	L 580	530	U L 530								
10							L		500	U L 590	U A 510	550	540	550	520	U L 550	U L 460	U L 450	L					
11							340	400	430	450	450	465	U A 480		470	490	460	L 430	L					
12						L		430	460	510	520	520	L	530										
13							U L 490	L 480		520	L 540		540			460	L 500							
14							L	480	500	510	510	525	520	520	530	U A 500	L							
15								U L 560	L		L	570	530	540	540	H 510	L	L						
16								L	L	U L 510	510	L		540		U L 560	U L 500	U L 480	L					
17								L				U L 550	560		530	520	480	L						
18							L			L	L 530	550	540											
19							L	L	L	L	U L 580	L 580	L	L 550	560									
20							L					L 580	L 600	L 580		U L 530	L							
21												570	540	550	H 540									
22							L	L			L		U L 600	U A 610	L 540	530	U L 530							
23						U L 370	370	430	480	510	U A 530		550	U A 550	L	L	L	L						
24							L	L	L	530	550	L	570	550	540	L 520	U L 600	L						
25						L		L	U L 550	500	580	U L 570	540			520								
26											U A 520	I C 540	560											
27									L 490	L			540	550	530	480	L 490							
28								L		510	510	L 520	530	510	500	470	460	U L 430						
29										U A 500		510	490	U A 530	500	480								
30						L				L						480								
31												470		475	U A 465	470	425	L 410						
	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	9	14	15	18	23	26	23	22	20	12	5						
MED						U L 370	380	480	490	510	525	550	540	550	530	510	L 475	U L 430						
U Q							U L 480	L 480	U L 500	520	L 550	U L 570	560	L 560	540	U L 530	U L 500	U L 465						
L Q							370	430	470	500	510	520	530	530	510	480	460	L 420						

MAY 1992 FOF1 (0.01MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 FOE (0.01MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						165	250	300	335	355	370	380	390	385	365	345	320	255	A					
2						155	240	290	335	365	375	A	A	A	370	350	325	275	A					
3						H 170	255	305	340	355	360	A	R	A	365	A	A	A	A					
4						A	240	305	330	350	360	375	A	A	385	330	305	U A 250	A					
5						170	255	310	345	U B 375	A	A	A	A	370	A	315	295	A					
6						155	255	315	A	A	A	A	395	380	365	340	315	270	A					
7						175	255	295	335	350	A	U A 385	A	A	A	345	330	A 270	A					
8						170	250	290	A 315	U A 340	A	A 380	395	A 400	A	A	A 320	260	A					
9						180	245	310	340	355	375	380	400	375	U B 355	340	310	A 260	A					
10						180	245	285	320	340	360	375	380	365	360	345	315	275	195				J K 180	J K 185
11	K 175					A	235	285	325	345	365	380	385	370	R 350	330	305	255	200	B				
12						A	A 240	290	325	350	370	390	375	375	355	345	315	270	A					
13						175	260	310	330	U A 360	A	A	A	A	A	355	325	275	A					
14						A	255	305	340	350	370	A	A	A	365	U A 340	U A 310	A	A					
15						A	A	A	340	A 370	375	375	A	375	370	350	330	A 275	A					
16						185	255	310	340	U A 370	385	380	380	380	360	340	A	A	A					
17						190	270	310	A 335	U A 355	A	A	385	A	A	345	320	270	B 180					
18						A	260	310	340	360	A	A	A	A	A	A	A	305	195					
19						185	255	310	340	360	360	370	395	400	375	350	330	275	A					
20						U A 185	265	310	345		A	A	A	A	A	360	320	270	U A 190					
21						A	265	310	345	U A 360	A	A	A	A	395	365	335	280	A 190	B				
22						A	255	A 310	A	A	A	A	A	A	A	365	S 335	A	A	B				
23						185	255	310	345		A	A	A	A	A	350	325	275	210					
24						200	265	310	335	375	385	A 375	385	385	370	350	320	290	A	B				
25						170	260	305	340	360	A	385	395	385	365	350	320	U A 270	A	B				
26						180	260	300	345	370	U A 375	C	A	A	U A 345	I C 330	A	A	A	B				
27						185	260	305	U A 340	A	A	A	A	380	365	345	315	265	A	B				
28						200	H 250	295	U A 340	U A 350	A	365	A	395	365	340	R 325	270	A	B				
29						185	265	300	325	A	A	A	A	A	A	345	315	270	A	B				
30						A 195	260	300	A	A	A	A	A	A	A	355	305	270	U A 200	B				
31						A	260	305	330	345	355	365	A	A	A	A	A	A	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	1					22	30	30	28	24	15	15	12	14	20	26	26	25	8				1	1
MED	K 175					180	255	305	340	355	370	380	388	380	365	345	320	270	195				J K 180	J K 185
U Q						185	260	310	340	362	375	380	395	385	370	350	325	275	200					
L Q						170	250	300	330	350	360	375	382	375	360	340	315	268	A 190					

MAY 1992 FOE (0.01MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 FOES (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 14	E B 15	E B 13	E B 13	E B 14	G	28	38	J A 53	44	J A 87	J A 55	43	42	43	J A 69	G	J A 42	48	65	47	J A 35	20	J A 50
2	J A 45	23	19	20	E B 15	G	J A 34	37	J A 43	J A 54	43	42	J A 50	J A 61	42	G	39	J A 33	56	J A 85	J A 51	J A 52	J A 100	21
3	19	E B 13	E B 13	E B 13	E B 14	G	30	43	J A 50	J A 52	40	39	G 38	38	G 36	J A 45	54	57	37	24	J A 24	22	E S 19	E B 15
4	E B 14	E B 13	E B 14	E B 13	E B 14	21	31	J A 40	J A 44	J A 48	J A 53	J A 54	J A 51	J A 64	G	J A 70	J A 57	61	J A 80	J A 51	J A 69	J A 76	J A 48	J A 30
5	J A 28	J A 24	25	E B 15	E B 13	19	J A 53	J A 50	J A 85	49	J A 78	71	40	42	G	J A 46	G	J A 55	J A 33	J A 54	J A 42	J A 20	J A 19	E B 13
6	J A 22	E B 14	E B 13	E B 14	E B 16	21	31	41	J A 52	43	J A 47	46	G	G	39	45	J A 45	48	22	J A 29	33	J A 33	J A 51	J A 19
7	E B 13	20	20	19	E B 13	G	28	36	J A 49	40	40	44	48	J A 51	51	J A 55	J A 109	84	J A 65	J A 62	84	J A 79	J A 102	J A 52
8	J A 22	E B 13	E B 13	20	E B 13	22	29	J A 65	J A 64	J A 59	J A 52	41	43	46	J A 47	J A 42	J A 45	J A 49	J A 48	21	23	19	J A 17	20
9	21	E B 13	E B 14	J A 19	J A 33	J A 38	37	J A 44	J A 54	95	50	54	42	49	E B 36	J A 71	J A 92	J A 131	J A 97	J A 54	J A 42	J A 23	21	21
10	20	J A 28	J A 20	21	22	20	28	J A 54	J A 45	46	J A 59	J A 49	48	G	46	J A 51	36	G	G	E B 15	E B 16	E B 14	J K 18	G 19
11	K 18	J A 22	J A 26	J A 23	J A 21	J A 32	27	33	34	40	42	42	48	J A 66	G	G	G	28	G	E B 14	E B 14	B J A 35	33	J A 28
12	J A 17	20	19	E B 13	J A 21	J A 33	J A 60	35	40	J A 75	Z 47	43	J A 55	J A 46	J A 65	J A 53	J A 69	J A 67	J A 48	J A 51	J A 26	J A 51	J A 58	J A 52
13	29	J A 49	J A 37	J A 19	E B 14	20	G	J A 40	67	J A 51	39	100	43	113	J A 146	39	36	J A 54	49	49	J A 52	36	J A 42	32
14	E B 15	E B 13	26	E B 13	J A 14	25	33	J A 51	J A 49	50	43	J A 50	43	44	J A 53	J A 52	J A 45	J A 44	J A 32	65	J A 96	J A 65	J A 65	J A 36
15	39	J A 73	J A 126	J A 55	J A 26	J A 23	30	J A 42	44	J A 53	48	47	44	44	G	40	J A 48	J A 48	J A 50	J A 52	J A 66	J A 75	J A 30	22
16	E B 14	E B 13	21	J A 22	J A 22	22	30	J A 48	J A 70	J A 50	47	J A 56	92	J A 48	J A 64	60	J A 56	37	29	J A 21	J A 16	J A 21	J A 46	J A 55
17	J A 33	24	E B 15	25	22	21	J A 50	J A 50	J A 75	J A 62	42	J A 48	40	71	J A 43	G	G	J A 48	J A 129	44	25	J A 50	E B 14	26
18	J A 43	J A 16	J A 16	E B 14	J A 17	22	37	J A 67	J A 63	J A 54	J A 51	J A 48	J A 51	73	98	J A 121	J A 90	J A 48	J A 52	65	39	23	J A 32	E B 13
19	E B 13	E B 13	22	J A 19	E B 13	23	31	36	41	40	42	43	G	44	48	J A 77	J A 79	J A 65	52	101	33	J A 49	J A 42	27
20	J A 22	27	23	J A 19	J A 21	27	J A 40	J A 55	J A 56	108	70	J A 52	J A 52	J A 43	J A 71	39	J A 46	J A 130	38	J A 96	J A 70	18	J A 19	J A 51
21	J A 53	J A 51	J A 37	J A 54	J A 61	J A 35	63	J A 52	J A 85	J A 88	J A 94	48	44	47	46	J A 156	J A 65	78	60	42	J A 57	J A 121	J A 42	J A 50
22	J A 51	J A 37	J A 30	J A 26	J A 24	J A 28	35	J A 42	J A 52	67	67	124	J A 97	J A 79	J A 51	J A 66	37	J A 150	96	J A 120	J A 78	J A 27	J A 47	J A 31
23	E B 13	21	J A 22	E B 13	E B 15	21	27	G	41	42	J A 56	74	J A 50	J A 56	J A 59	42	44	J A 34	60	80	J A 52	33	J A 51	J A 51
24	J A 42	J A 47	J A 19	J A 21	E B 13	23	32	J A 44	45	J A 52	J A 55	J A 55	48	J A 88	42	41	G	J A 44	J A 53	E B 17	E B 13	J A 50	J A 53	J A 27
25	J A 37	J A 42	20	J A 21	J A 18	32	38	J A 55	J A 42	J A 49	J A 57	J A 54	43	J A 85	109	39	J A 147	J A 78	70	60	J A 55	J A 74	J A 65	J A 51
26	J A 35	J A 28	J A 29	J A 24	E B 13	J A 44	J A 55	J A 83	J A 104	J A 66	J A 54	C	50	J A 53	149	C	110	85	70	J A 84	57	45	J A 60	J A 31
27	J A 66	J A 87	60	J A 63	J A 42	G	39	J A 73	J A 45	J A 93	J A 102	J A 64	49	G 35	44	J A 49	J A 46	90	J A 52	J A 25	J A 37	J A 55	J A 52	J A 55
28	J A 75	J A 58	J A 33	J A 22	J A 30	G	32	43	81	J A 54	J A 49	44	41	46	G	G	37	J A 48	70	J A 52	40	J A 56	J A 51	J A 47
29	J A 38	J A 47	J A 34	33	J A 29	J A 35	J A 54	76	J A 85	J A 96	80	J A 62	J A 53	J A 58	J A 103	40	J A 76	63	J A 103	56	41	J A 53	J A 47	J A 116
30	J A 54	J A 52	J A 73	31	J A 53	26	J A 58	107	86	J A 82	J A 84	J A 116	92	J A 104	98	J A 92	J A 105	J A 124	94	51	J A 54	79	84	J A 62
31	22	J A 21	J A 21	J A 34	J A 32	J A 23	J A 39	68	77	60	J A 57	J A 57	J A 74	J A 54	J A 50	J A 59	J A 46	J A 37	J A 48	J A 51	J A 72	J A 32	J A 30	J A 23
	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	30	31	31	31	30	31	31	31	31	31	31	31	31
MED	J A 22	J A 23	21	20	J A 18	22	33	J A 44	J A 52	J A 53	J A 52	51	48	J A 49	47	J A 48	J A 46	J A 54	52	52	J A 42	J A 45	J A 46	J A 31
U Q	J A 42	J A 47	J A 30	J A 25	J A 26	J A 28	J A 40	J A 55	J A 75	J A 67	J A 67	57	J A 51	J A 66	65	J A 66	J A 76	J A 78	70	65	J A 57	J A 56	J A 53	J A 51
L Q	E B 17	E B 14	E B 16	E B 14	E B 14	G 20	30	40	44	48	43	44	43	44	G 39	40	G 37	J A 44	38	29	26	23	21	21

MAY 1992 FOES (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 FBES (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 14	E B 15	E B 13	E B 13	E B 14	G	27	37	50	43	45	44	42	41	41	45	G	34	40	58	37	27	E B 15	35
2	27	E B 13	E B 14	E B 14	E B 15	G	30	37	37	51	42	42	40	45	39	G	34	30	40	70	40	18	47	E B 13
3	E B 13	E B 13	E B 13	E B 13	E B 14	G	30	40	45	49	39	U Y 39	U G 38	U Y 38	G 35	43	40	35	32	17	23	E B 15	E S 19	E B 15
4	E B 14	E B 13	E B 14	E B 13	E B 14	18	30	34	36	40	50	43	44	45	G	46	47	34	46	23	40	50	33	16
5	22	17	E B 14	E B 15	E B 13	19	35	43	43	47	74	64	40	41	G	43	G	35	23	21	20	E B 14	E B 14	E B 13
6	15	E B 14	E B 13	E B 14	E B 16	21	30	38	36	40	41	44	G	G	38	43	41	37	22	25	32	17	25	E B 15
7	E B 13	E B 13	E B 13	E B 13	E B 13	G	28	33	41	38	39	41	47	47	49	52	80	63	26	39	40	35	31	20
8	E B 13	E B 13	E B 13	15	E B 13	20	27	52	41	51	44	40	42	G 40	44	36	39	39	34	20	E B 13	E B 15	E B 13	E B 14
9	E B 15	E B 13	E B 14	16	31	32	34	36	51	61	49	50	42	46	E B 36	48	70	A A 131	89	31	22	20	E B 15	E B 15
10	E B 14	25	18	E B 14	E B 14	20	27	52	43	43	51	43	46	G	45	43	34	G	G	E B 15	E B 16	E B 14	K 18	K 19
11	K 18	20	20	20	16	29	26	31	34	39	39	39	48	52	G	G	G	27	G	E B 14	E B 14	25	23	26
12	E B 13	E B 15	E B 14	E B 13	14	27	A A 60	34	36	42	45	43	53	43	62	51	68	52	38	32	25	17	32	31
13	19	23	34	16	E B 14	20	G	39	58	44	39	87	43	95	65	38	G	50	40	37	29	31	38	21
14	E B 15	E B 13	24	E B 13	E B 14	24	31	36	41	48	43	41	40	42	49	50	40	41	30	59	A A 96	40	31	26
15	27	17	53	17	19	21	28	34	41	51	46	44	43	42	G	38	44	33	40	34	46	49	19	E B 13
16	E B 14	E B 13	E B 13	E B 13	18	20	30	40	41	43	43	55	85	43	61	43	41	32	26	18	E B 14	16	26	29
17	19	15	E B 15	15	E B 13	20	46	37	62	55	42	40	G 36	69	41	G	G	40	90	39	18	18	E B 14	17
18	16	E B 15	E B 14	E B 14	17	21	34	62	59	47	46	43	49	63	90	114	52	46	51	55	30	E B 14	18	E B 13
19	E B 13	E B 13	E B 14	E B 14	E B 13	22	30	34	38	39	41	42	G	42	45	76	70	61	39	A A 101	23	17	33	18
20	18	E B 14	E B 13	17	E B 13	23	36	50	50	96	64	43	42	43	59	38	42	77	31	53	50	17	16	E B 13
21	16	34	21	27	35	29	57	47	74	66	87	44	44	46	46	52	61	69	57	25	21	49	25	28
22	36	29	20	20	20	25	34	39	50	58	51	A A 124	50	61	43	46	36	77	85	63	44	22	17	19
23	E B 13	E B 14	E B 13	E B 13	E B 15	20	27	G	40	40	53	63	44	55	46	42	43	34	57	A A 80	36	21	18	E B 13
24	33	20	17	16	E B 13	22	31	40	44	46	50	44	44	43	42	40	G	40	36	E B 17	E B 13	30	35	17
25	21	19	E B 15	17	16	28	34	48	37	44	42	45	41	80	81	38	A A 147	44	60	52	43	27	44	33
26	29	18	25	19	E B 13	38	53	64	66	52	52	C	47	51	A A 149	C	87	85	61	62	47	29	32	17
27	51	57	44	43	17	G	33	71	40	44	65	52	44	G 35	43	45	42	66	46	23	32	34	19	41
28	60	46	20	E B 13	24	G	31	40	71	40	45	44	39	41	G	G	34	33	57	29	21	54	25	31
29	28	37	20	18	21	33	52	63	71	50	66	45	48	53	43	40	72	58	85	46	27	45	34	38
30	41	37	29	21	22	24	55	A A 107	A A 86	44	61	A A 116	A A 92	A A 104	A A 98	38	A A 105	A A 124	A A 94	51	29	29	E B 13	29
31	E B 14	15	17	26	20	21	35	54	A A 77	51	54	42	56	44	47	41	38	31	37	30	21	20	17	17
	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	30	31	31	31	30	31	31	31	31	31	31	31	31
MED	16	15	E B 15	15	E B 15	21	31	40	43	46	46	44	44	44	44	43	41	40	40	34	29	22	23	18
U Q	27	23	20	18	19	25	35	52	59	51	53	50	48	53	59	46	68	63	57	55	40	34	32	29
L Q	E B 14	E B 13	E B 13	E B 13	E B 13	G 19	28	36	40	42	42	42	40	41	G 38	38	G 34	34	31	23	E B 21	E B 17	E B 17	E B 15

MAY 1992 FBES (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 FMIN (0.1MHZ) 135°E MEAN TIME (G.M.T. + 9H)

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

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

MAY 1992 FMIN (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	280	290	285	270	265	270	310	310	295	295	290	280	290	285	285	285	290	285	295	325	290	265	265	270
2	270	275	265	255	270	290	300	285	275	290	290	280	275	285	285	290	285	280	310	315	315	255	255	275
3	270	R 270	275	290	280	260	275	290	H 290	V 280	300	275	290	285	300	290	300	305	315	320	270	265	265	270
4	270	265	280	295	285	275	315	280	280	280	270	290	275	290	290	280	295	305	295	285	275	270	265	270
5	265	270	280	300	300	310	315	325	295	285	290	275	290	275	295	295	290	285	295	305	315	275	275	275
6	275	275	295	275	270	280	305	315	335	310	290	300	295	285	290	295	295	300	305	310	305	275	265	275
7	275	270	285	305	280	300	315	315	315	325	285	270	275	280	290	290	300	310	305	305	290	280	F 285	U F 275
8	F 270	270	290	270	255	265	275	285	290	A	275	255	285	295	290	295	290	290	280	285	265	265	260	260
9	260	260	275	300	270	245	265	290	285	280	285	F 295	305	295	290	305	310	A	310	315	280	275	255	265
10	275	275	290	275	265	305	295	A 250	230	265	280	265	280	280	290	295	305	290	250	290	240	Z 230	F	U F 295
11	F 275	220	225	250	255	F 250	240	G	G	G	265	205	265	225	270	280	275	270	285	275	260	260	275	285
12	280	285	265	285	F 285	285	A	245	215	260	295	320	285	305	320	320	310	305	305	290	270	270	290	275
13	F 260	280	305	320	280	305	285	295	295	285	285	A	285	A	285	290	290	285	290	305	295	260	255	255
14	260	265	335	265	270	280	285	270	265	265	265	275	280	290	300	305	295	305	295	295	A	270	F 260	F 270
15	275	285	295	F 305	F 290	300	300	295	315	315	265	280	285	285	295	300	305	295	295	295	275	270	280	285
16	290	280	280	270	265	315	305	300	315	310	290	265	270	280	280	280	285	295	305	330	285	285	270	F 265
17	F 275	F 285	295	290	280	310	315	310	290	260	270	265	260	270	280	285	290	295	280	300	290	285	285	275
18	270	275	285	280	280	F 305	315	315	305	270	265	255	265	270	275	A 280	280	285	285	295	290	285	275	265
19	270	270	285	280	270	315	345	340	330	300	270	270	255	270	265	280	300	295	305	A	265	J S 280	255	270
20	275	275	280	265	270	265	290	300	290	A	295	280	265	265	280	285	295	290	295	290	285	275	280	255
21	V 250	F 280	F 290	F 280	F 280	295	305	300	305	285	A	260	270	270	280	285	295	290	295	295	F 285	285	265	265
22	F 275	285	285	285	275	280	310	320	295	290	280	A	270	265	270	275	275	U S 315	275	270	270	245	255	275
23	255	Z 240	V 240	260	270	245	250	270	240	240	280	275	275	285	290	290	295	305	305	A	260	260	265	265
24	270	270	275	270	285	290	290	305	300	295	310	305	260	270	285	295	285	290	290	305	300	265	270	270
25	280	275	280	285	285	295	305	310	315	H 305	270	260	260	265	275	280	A	295	290	295	V 285	270	280	280
26	270	F 270	270	280	280	290	305	305	300	295	300	I C 295	290	290	A	C	300	305	295	300	285	270	265	270
27	280	290	300	300	300	315	290	285	295	280	285	285	280	270	275	285	295	305	300	295	280	280	V 270	F 280
28	F 285	F 275	F 275	F 285	F 300	300	330	270	A	280	290	275	275	295	285	300	295	305	315	300	275	270	265	280
29	295	275	F 285	270	270	285	285	285	A 285	275	A 265	270	290	290	295	295	295	285	A	300	285	280	265	F 260
30	J F 280	F 255	F 315	F 305	F 275	F 290	325	A	A	285	285	A	A	A	A	295	A	A	A	300	305	265	V 260	F 275
31	F 275	290	280	290	315	320	Z 300	A	A	A	A	280	A	285	295	295	300	305	305	U S 315	270	F 285	280	290
	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	30	29	28	28	29	28	29	29	29	30	29	29	29	29	30	31	30	31
MED	275	275	285	280	280	290	302	295	295	285	285	275	275	285	285	290	295	295	295	300	285	270	265	270
U Q	280	280	290	295	285	305	315	310	305	295	290	282	288	290	292	295	300	305	305	308	290	280	275	275
L Q	270	270	275	270	270	275	285	282	282	272	270	265	268	270	280	285	290	288	290	292	270	265	260	265

MAY 1992 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L		U L 345	L	U L 325	L 360	U L 345	L 355	L	L							
2									U L 335		L	U L 325	U L 325	350	U L 325	L	L	L						
3							U L 310	L 335	L 355	L	U L 350	U L 330	L 360	U L 325	L 350	L	L	L						
4							L 345	350	350	360	A	375	A 315	A 320	H 335	A	A	L						
5									U L 340	L	A	A	360	L 330	365		L	L	L					
6							L	L 345	L 370	U L 360	L	365	335	345	335	U L 335	L	L	L					
7								L	L 360	L 380	L	355	A 330	L	A	A	A	A						
8						L	330	A	340	A	A 345	375	375	A 335	A 325	345	L 335	A	A					
9						A	L	L	A	A	A	A	340	L 335	345	A	A	A	A					
10							L	A	A 325	U L 320	A	360	A 330	340	A 340	U L 345	U L 330	U L 315	L					
11						A	325	335	355	A 320	395	385	A	A	365	340	325	L 320	L					
12						L	A	355	380	350	355	370	L	385	A	A	A	A						
13							U L 300	L 345	A	350	L 350	A	360	A	A	385	L 330	A	A					
14							L	330	340	A 315	375	360	360	360	A	A	L	A						
15								U L 350	L	A	L	365	370	360	345	H 350	L	L						
16								L	L	U L 380	390	L	A	355	A	U L 320	U L 340	U L 330	L					
17								L	A	A	345	U L 350	345	A	345	345	325	L	A					
18							L	A	A	L	L 345	355	A	A	A	A	A	A						
19							L	L	L	L	U L 335	L 330	L	L 340	325	A	A	A						
20							L	A	A	A	A	L 350	L 325	L 325	A	U L 335	L	A						
21							A		A	A	A	345	380	A 330	H 325	A	A	A	A					
22							L	L	A	A	L	A	U L 310	A	L 325	A 320	U L 330	A	A					
23						U L 275	320	345	345	350	A	A	345	A	L	L	L	L	A					
24							L	L	L	A 350	A 335	L	350	350	330	L 345	U L 335	L						
25						L		L	U L 335	380	H 340	U L 345	345	A	A	340	A	A	A	A				
26							A	A	A	A	A	C	A 335	A	A	C	A	A	A					
27								A	L 355	L	A	A	360	335	335	A	A	A						
28								L	A	370	A 335	L 335	365	370	365	355	355	L						
29							A	A	A	A	A	350	A	A	340	345	A	A	A					
30						L	A	A	A	L	A	A	A	A	A	340	A	A	A					
31								A	A	A	A	380	A	A	A	345	365	L 340	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	9	14	14	13	21	23	19	19	16	10	4						
MED						U L 275	322	345	348	350	345	355	345	340	340	345	L 332	L 325						
U Q							330	350	L 355	370	365	368	360	355	350	345	340	L 335						
L Q							U L 310	335	340	345	338	L 340	330	L 330	325	U L 338	330	L 318						

MAY 1992 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 H'F2 (KM) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								260		285	275	340	305	300	300	300	295							
2									290		290	310	315	320	305	285	290	290						
3							350	325	305	325	305	315	300	320	300	295	270	275						
4							290	355	375	405	410	375	360	340	330	340	290	290						
5									320	305	A	A 345	310	335	300		315	305	280					
6							270	285	260	285	305	335	325	310	320	305	290	280	260					
7								265	275	260	L 275	370	350	330	310	305	A 310	285						
8						360	370	A 355	370	A	455	490	370	360	355	345	320	315	310					
9						A 300	L 320	265	290	A 310	320	300	310	330	320	305	A 310	A	A					
10							310	A	480	355	310	370	335	340	330	315	270	290	L 365					
11						450	575	G	G	G	L 505	765	460	E A 630	405	360	370	360	300					
12						365	A	500	690	460	330	290	345	300	280	275	E A 305	290						
13							340	310	A 320	325	310	A	330	A	330	295	300	300	290					
14							360	385	415	420	430	405	395	365	335	320	325	290						
15								305	270	275	L 375	345	335	330	315	300	290	285						
16								300	275	270	300	365	A	325	320	320	305	290	260					
17								255	A 325	A 290	365	340	375	A 340	330	310	310	280	A					
18							255	A 270	A 290	350	330	370	355	350	A 345	A	305	290						
19							240	250	275	270	365	340	L 365	350	355	335	300	A 260						
20							L 280	270	280	A	A 290	345	375	360	325	305	295	A						
21							A 280		E A 290	A	A	360	350	335	335	320	310	A	A 300					
22							260	255	295	A 295	305	A	360	360	355	335	320	A	A					
23						390	420	355	495	475	370	A 400	385	355	310	320	295	285	A 300					
24							L 300	280	270	300	300	280	405	355	330	295	305	300						
25						280		280	285	270	380	380	380	E A 380	E A 360	320	A	275	A 300	A 280				
26							A 255	A 300	A 310	275	335	I C 335	335	310	A	C	A	A	A 290					
27								A	280	330	335	310	330	335	335	305	295	280						
28								410	A	360	340	335	360	325	345	320	315	275						
29							A 300	A 340	A	370	A	370	350	350	345	320	E A 350	A 335	A					
30						L 325	E A 290	A	A	340	E A 380	A	A	A	A	355	A	A	A					
31								A	A	A	A	430	A	395	350	355	330	295	285					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						7	19	24	26	26	27	28	28	29	29	28	28	24	12	1				
MED						360	300	300	292	318	330	345	350	338	330	318	305	290	295	A 280				
U Q						390	350	355	370	360	375	372	372	358	345	328	315	298	300					
L Q						300	270	268	280	285	305	335	330	325	312	302	295	280	282					

MAY 1992 H'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 H'F (KM) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	270	240	250	270	290	275	235	230	A 250	A 225	A 240	235	220	205	215	A	240	A 270	A 280	A 255	220	255	300	A 340
2	A 320	300	290	330	290	255	240	250	220	A 270	220	215	205	A 255	220	235	250	255	260	A 270	A 250	290	A	300
3	295	285	285	260	265	260	250	E A 275	E A 280	E A 265	210	210	210	210	H 185	E A 265	A	A	250	225	260	290	315	300
4	300	310	275	235	270	265	265	230	230	220	A	225	A	A	H 230	A	A	A 260	E A 275	270	E A 315	A	A 350	310
5	310	310	290	260	230	225	230	250	A 250	A	A	A	220	245	230	E A 275	H 230	A 275	275	260	235	255	285	295
6	290	295	250	255	300	265	250	A 250	220	205	210	220	210	220	230	270	A	A	A 255	240	255	270	A 340	280
7	280	300	265	255	270	255	240	230	A 255	225	210	205	E A 270	A	A	A	A	A	255	A 260	A 295	A 300	A 300	310
8	310	300	250	285	340	275	270	A	A 260	A	A	220	225	A	E A 290	245	A 270	A	A	265	290	300	325	305
9	310	310	280	250	A 300	A	A 255	235	A	A	A	A	240	A 260	210	A	A	A	A	250	235	280	330	305
10	295	290	265	300	335	265	260	A	A	E A 260	A	230	E A 285	230	E A 270	E A 280	230	H 240	285	285	350	390	410	290
11	300	420	440	380	360	A	280	250	230	E A 310	225	225	A	A	235	230	235	245	275	260	300	335	310	280
12	H 275	265	290	290	300	E A 310	A	235	215	240	A 255	230	A	230	A	A	A	A	A 260	A 260	290	300	285	A 305
13	310	285	265	235	270	255	250	A 250	A	A 255	H 210	A	215	A	A	225	230	A	A	A 250	260	E A 350	E A 375	A 345
14	325	300	240	260	290	A 260	270	240	A 270	A	215	220	210	225	A	A	E A 260	A	A 260	A	A	A 330	A 350	A 335
15	325	280	A	265	280	260	245	235	245	A	240	200	215	240	220	H 220	A	A 240	A 275	A 255	E A 300	E A 345	285	260
16	255	270	270	285	315	240	230	A 240	A 260	225	215	A	A	225	A	E A 260	E A 265	240	A	230	225	250	295	A 330
17	310	280	260	240	265	245	A 250	A 240	A	A	220	205	205	A	240	210	220	A	A	260	255	260	250	265
18	290	280	275	265	290	240	255	A	A	A	E A 265	220	A	A	A	A	A	A	A	E A 290	280	250	270	310
19	305	300	275	275	300	255	245	215	230	210	210	220	H 205	230	A 270	A	A	A	A 250	A	275	290	A 345	305
20	300	300	275	300	290	260	A 245	A	A	A	A	210	205	235	A	250	A 270	A	270	E A 285	A 300	270	260	310
21	345	320	270	290	305	270	A	270	A	A	A	220	220	E A 275	A	A	A	A	A	265	270	A 300	280	A 310
22	330	310	285	270	285	260	250	A 240	A	A	A	A	E A 270	A	265	A	250	A	A	A	A 315	345	310	285
23	330	340	345	300	300	285	270	260	260	230	A	A	240	A	A	A 245	A	A 260	A	A	A 345	320	310	290
24	A 310	315	290	280	255	235	245	A 245	A 260	E A 265	A	230	220	210	A 245	240	230	A 265	280	250	240	300	A 335	300
25	285	300	280	270	250	250	A 250	A	215	230	H 205	H 225	220	A	A	230	A	A	A	A	280	290	A 310	310
26	310	300	300	275	270	A 290	A	A	A	A	A	I C 220	A	A	A	C	A	A	A	A	A 280	315	340	300
27	E A 320	E A 320	A 290	295	235	220	250	A	225	A 275	A	A	A 240	225	A 250	A	A	A	A 260	240	285	A 305	305	A 315
28	E A 340	E A 330	310	290	265	240	240	A 250	A	205	A	E A 270	210	210	H 220	230	235	260	A 275	A 260	250	A	A 350	315
29	280	A 335	300	320	325	A 295	A	A	A	A	A	E A 275	A	A	E A 270	275	A	A	A	A 275	250	E A 325	A 360	E A 410
30	A 350	A	275	260	335	275	A	A	A	E A 270	A	A	A	A	A	A 250	A	A	A	A	A 260	A 290	330	A 340
31	300	270	235	A 300	250	245	A 270	A	A	A	A	225	A	A	A	E A 260	A 250	A 250	A	E A 260	A 330	305	290	270
	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	30	30	31	31	29	26	21	18	18	15	23	22	17	18	19	15	12	17	24	30	29	30	31
MED	305	300	275	275	290	260	250	240	243	228	215	220	216	228	228	238	238	A 258	A 265	260	272	295	310	305
U Q	320	310	290	295	300	272	260	A 250	A 260	E A 265	A 240	230	A 240	A 242	E A 265	E A 265	A 260	A 262	A 275	A 268	A 300	322	A 340	A 315
L Q	290	285	265	260	265	245	245	235	225	225	210	215	210	215	220	230	230	242	258	250	250	275	290	290

MAY 1992 H'F (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 H'E (KM) 135°E MEAN TIME (G.M.T. + 9H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						130	125	110	110	110	110	110	115	120	110	110	110	110	A					
2						135	120	110	110	110	115	B 125	B 115	A	115	110	110	115	A					
3						145	120	110	110	110	115	A		A	A 130	A	A	A	A					
4						A	120	110	110	110	110	110	110	110	B 125	110	110	110	A					
5						B 145	120	115	115	B	A	A	A	A	115	A	115	120	A					
6						B	120	115	A	A	A	A	120	120	120	120	115	115	A					
7						E B 140	115	110	A 115	110	110	115	120	120	115	110	115	115	A					
8						150	115	110	110	110	115	A	120	A	A	A	E A 130	A 120	A					
9						B 140	115	110	110	115	E S 130	B 125	115	130	B	115	110	110	A					
10						B 140	120	110	110	110	115	E B 140	B 130	115	B	115	115	120	130				K 165	K 150
11	K 130					A	115	115	110	115	115	120	A 120	115	110	115	115	115	125	B				
12						120	115	115	110	110	110	125	B 125	B 130	B 130	120	120	120	A					
13						145	125	115	110	115	120	A	A	A	115	115	115	115	A					
14						A	120	115	115	115	120	120	A	A	120	120	115	A	A					
15						A	A	A	A 125	110	110	115	B 135	120	110	115	110	110	A					
16						140	115	110	110	110	110	115	B 125	110	110	110	110	110	A					
17						140	115	110	110	110	A	A	E A 135	A	A	110	110	110	125					
18						A	120	110	110	110	120	120	120	A	110		110	120	125					
19						140	115	110	110	110	115	120	130	120	115	115	115	115	A					
20						135	120	110	110	110	110	A	A	110	A	120	110	115	B 120					
21						A	115	110	110	110	110	A	A	A	135	B 130	115	110	125	B				
22						A	A	A	110	110	115	115	A	A	115	115	115	115	A	B				
23						140	115	110	110	110	115	B 120	A	A	115	115	115	115	125					
24						150	115	110	110	110	115	115	110	110	120	115	110	110	A	B				
25						120	115	110	110	110	B 125	B 120	120	120	115	115	115	115	120	B				
26						135	115	110	110	115	120	I C 120	A	115	115	I C 115	115	A	A	B				
27						135	120	110	110	110	A	A	110	A 135	115	115	110	110	A	B				
28						140	115	110	110	110	110	110	120	110	120	115	115	120	120	B				
29						130	120	110	115	110	110	115	115	110	110	110	110	110	A	B				
30						A	115	110	110	A	110	A	A	A	A	115	110	115	120	B				
31						A	120	110	110	110	110	B 125	A	A	115	110	110	A	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	1					21	29	29	30	28	27	21	20	18	25	27	30	27	10				1	1
MED	K 130					140	115	110	110	110	115	120	120	118	115	115	114	115	125				K 165	K 150
U Q						142	120	110	110	110	115	B 122	B 125	120	120	115	115	115	125					
L Q						135	115	110	110	110	110	115	115	110	112	110	110	110	120					

MAY 1992 H'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 H'ES (KM) 135°E MEAN TIME (G.M.T. + 9H)

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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	G	150	130	120	120	115	115	125	130	130	115	G	115	110	105	105	105	115	105
2	105	105	110	110	B	G	125	115	120	110	120	115	115	110	135	G	135	130	115	110	110	115	110	115
3	110	B	B	B	B	G	140	120	115	115	115	115	120	115	110	110	100	100	105	100	95	100	S	B
4	B	B	B	B	B	145	140	135	120	125	120	115	110	110	G	120	115	115	110	110	110	105	105	105
5	100	100	105	B	B	160	130	125	120	120	110	110	115	110	G	110	G	130	120	110	115	115	120	B
6	110	B	B	B	B	155	145	135	110	115	110	125	G	G	150	135	120	115	120	110	110	115	110	110
7	B	110	105	105	B	G	145	125	120	120	125	120	115	115	135	120	115	115	115	110	110	110	110	110
8	120	B	B	105	B	150	135	115	110	110	110	140	140	110	110	105	105	120	120	115	100	120	115	115
9	115	B	B	140	130	130	130	125	120	120	130	130	170	145	B	130	120	115	110	110	110	110	115	110
10	110	110	110	110	115	170	150	120	125	120	120	125	120	G	120	120	145	G	G	B	B	B	K 165	K 150
11	K 130	125	120	115	120	120	140	140	140	135	135	140	120	115	G	G	G	140	G	B	B	120	110	110
12	125	125	135	B	125	115	110	125	120	110	145	130	120	130	125	120	115	110	120	115	115	115	110	110
13	110	110	110	115	B	160	G	125	115	110	125	110	120	110	110	130	130	120	110	110	110	120	115	110
14	B	B	115	B	155	140	135	130	125	120	125	120	120	110	115	115	110	110	110	110	110	110	110	110
15	110	110	105	105	110	110	110	110	130	115	115	120	120	120	G	145	125	115	110	110	110	110	105	110
16	B	B	105	105	105	150	145	120	110	120	115	115	115	120	110	110	110	120	110	110	115	110	110	110
17	110	105	B	100	105	150	120	120	110	110	110	110	110	110	115	G	G	115	110	110	110	115	B	105
18	120	110	110	B	105	140	130	120	115	115	115	110	110	105	105	105	110	130	120	120	115	120	110	B
19	B	B	115	140	B	150	135	140	130	130	120	120	G	155	135	115	115	115	115	110	110	110	110	110
20	105	105	100	100	105	135	120	115	115	110	110	110	110	115	105	E G 195	130	115	115	110	110	110	110	110
21	110	110	110	120	110	130	125	120	115	110	110	110	115	170	150	120	135	120	115	110	100	115	105	105
22	105	105	105	110	115	110	125	120	115	110	110	105	110	110	115	125	155	115	115	110	110	100	115	110
23	B	105	145	B	B	150	E G 160	G	120	120	115	110	120	110	110	140	125	130	120	115	120	120	110	110
24	105	105	110	110	B	155	145	135	130	120	120	115	125	120	190	150	G	125	115	B	B	105	115	110
25	100	100	105	105	115	130	120	115	135	120	115	120	150	120	115	140	115	115	110	110	110	105	105	105
26	105	100	110	110	B	125	120	120	115	115	115	C	110	110	110	C	110	110	110	110	110	110	120	110
27	105	100	100	100	100	G	125	115	120	110	120	110	120	120	130	120	125	115	115	115	115	110	110	110
28	110	110	110	110	110	G	130	120	115	115	115	115	120	135	G	G	150	130	110	110	110	110	110	110
29	110	105	105	130	105	130	120	115	115	110	110	110	110	110	115	135	115	120	110	110	110	105	105	110
30	110	105	105	105	110	140	120	115	115	105	105	105	105	105	115	120	120	115	115	110	125	110	115	110
31	110	105	105	95	100	105	125	120	115	115	110	110	110	105	110	110	105	130	115	110	115	115	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	24	22	24	22	18	25	30	30	31	31	31	30	29	29	25	26	26	30	29	28	28	30	29	28
MED	110	105	110	110	110	140	130	120	120	115	115	115	120	115	115	120	118	115	115	110	110	110	110	110
U Q	110	110	110	115	115	150	140	125	120	120	120	120	120	120	132	135	130	125	115	110	115	115	115	110
L Q	105	105	105	105	105	128	120	115	115	110	110	110	110	110	110	115	110	115	110	110	110	110	110	110

IONOSPHERIC DATA STATION KOKUBUNJI

MAY 1992 TYPES OF ES 135°E MEAN TIME (G.M.T. + 9H)

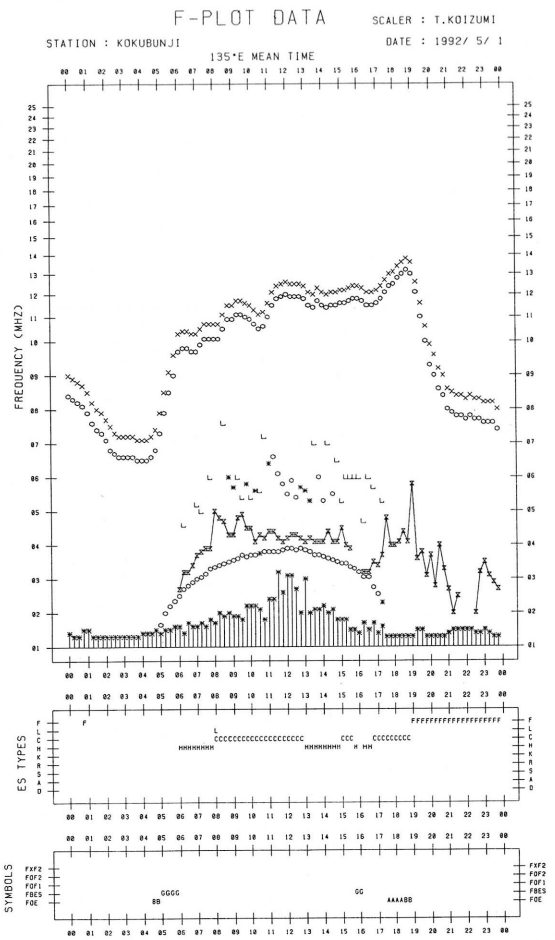
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHZ TO 25.0MHZ IN 24.0SEC IN MANUAL SCALING

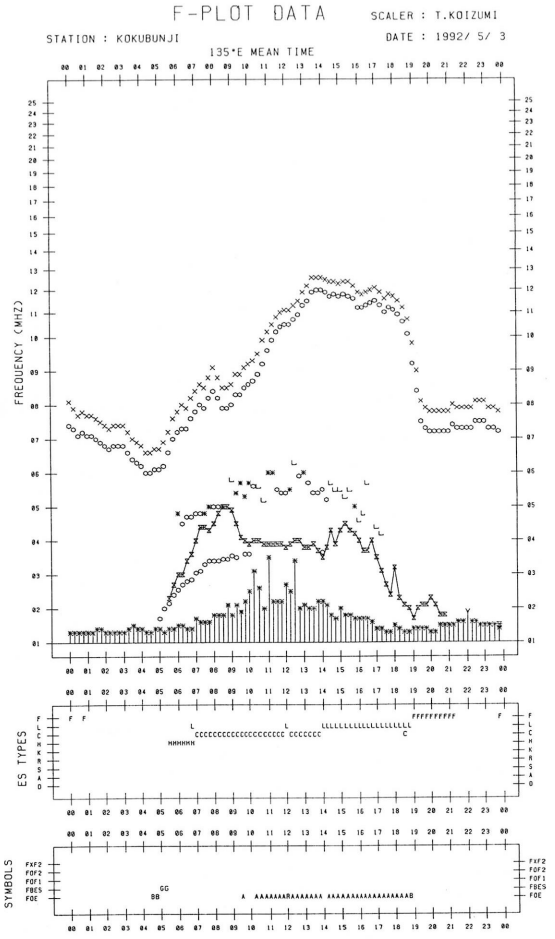
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							H 1	H 2	CL 21	C 1	C 2	C 1	C 1	H 1	H 1	C 3		C 3	C 4	F 4	F 5	F 5	F 1	F 4
2	F 4	F 2	F 1	F 1			C 2	C 3	C 1	C 2	C 1	C 1	C 1	L 2	H 1		H 1	C 1	C 4	F 4	F 4	F 2	F 4	F 2
3	F 1						H 1	C 2	C 2	C 3	C 2	C 1	L 1	C 1	L 1	L 3	L 3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

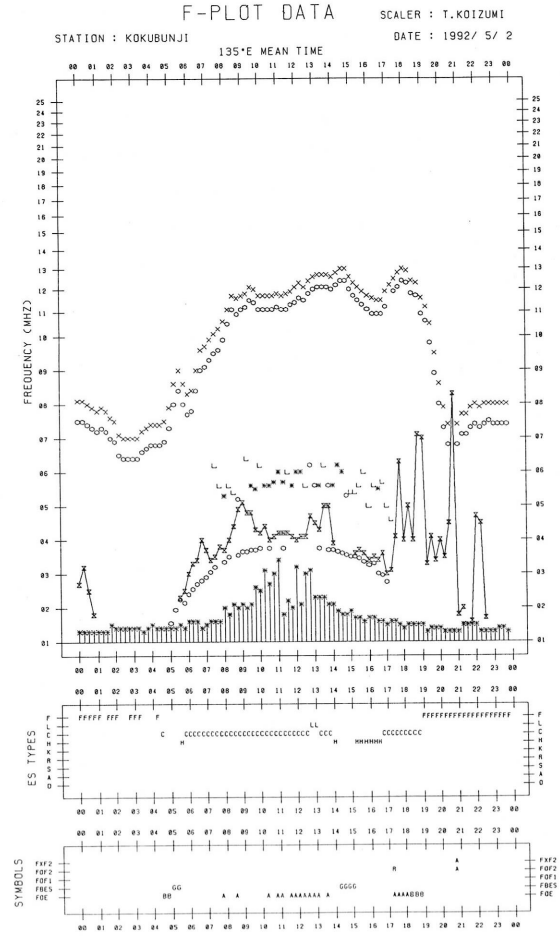
MAY 1992 TYPES OF ES COMMUNICATIONS RESEARCH LABORATORY, JAPAN

f-PLOTS OF IONOSPHERIC DATA

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


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/ 1
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/ 3
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
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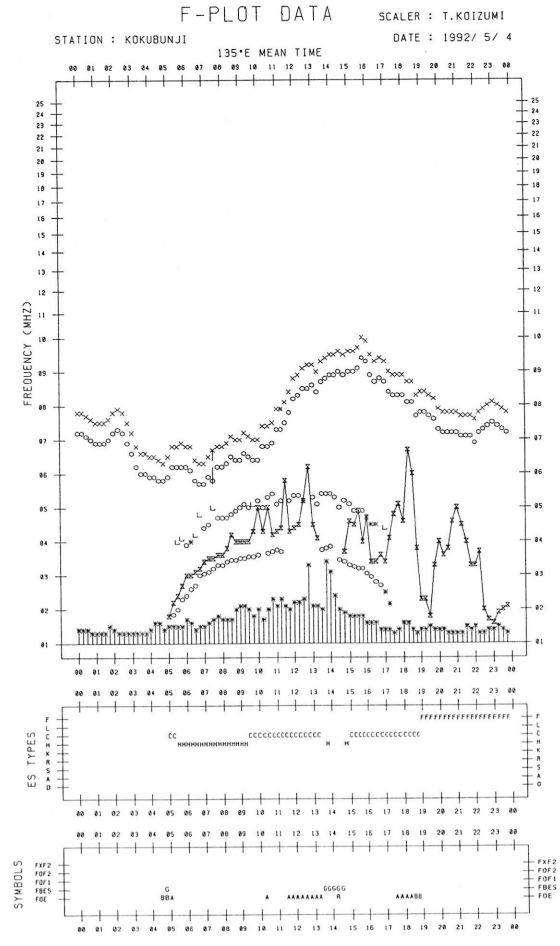
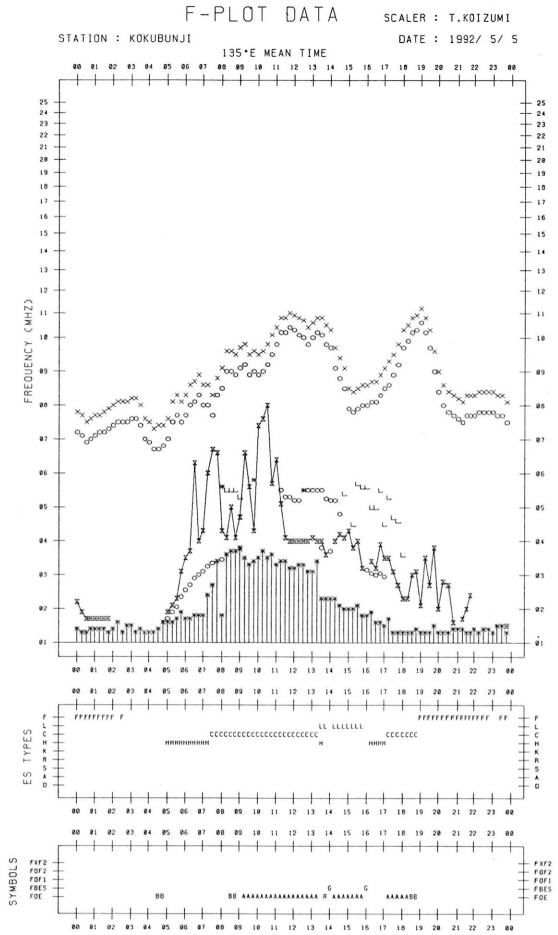
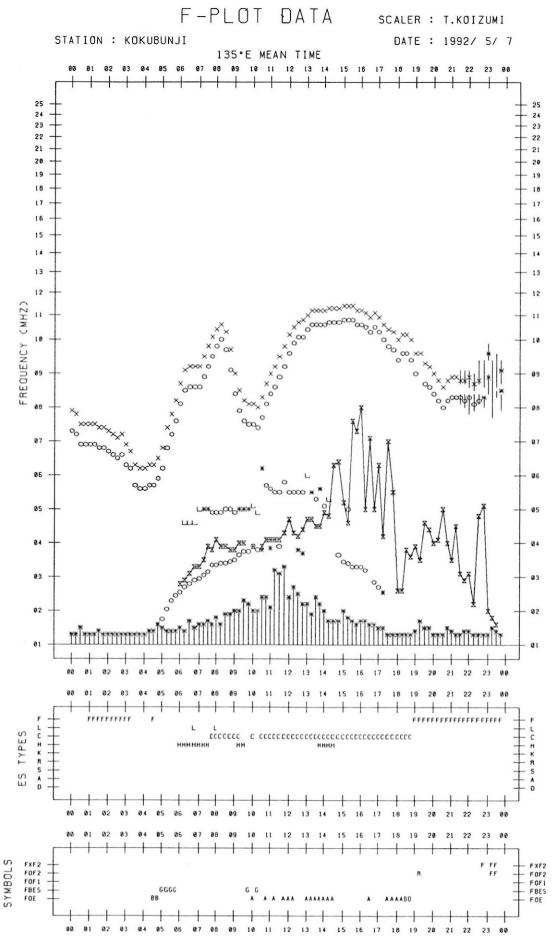
STATION : KOKUBUNJI
DATE : 1992/ 5/ 2
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/ 4
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/ 5
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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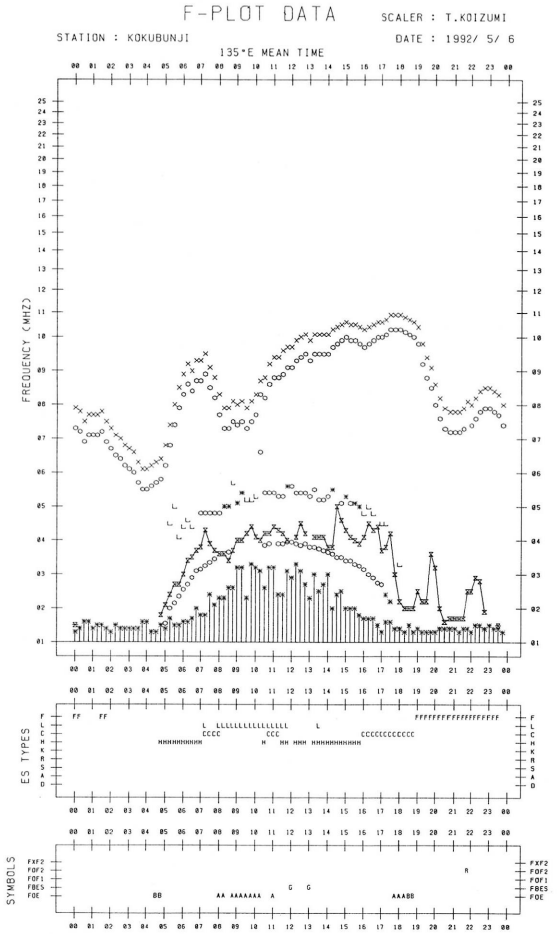
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/ 7
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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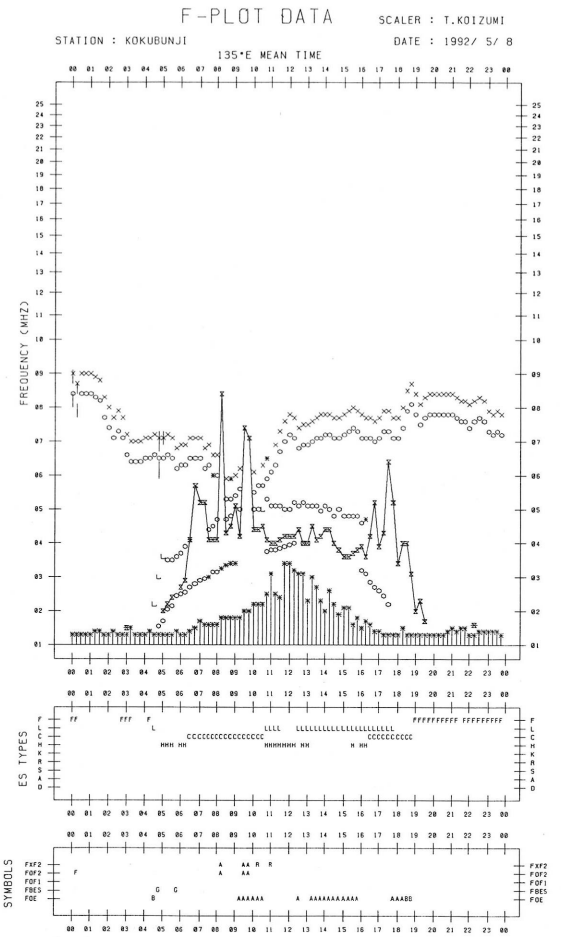
STATION : KOKUBUNJI
DATE : 1992/ 5/ 6
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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STATION : KOKUBUNJI
DATE : 1992/ 5/ 8
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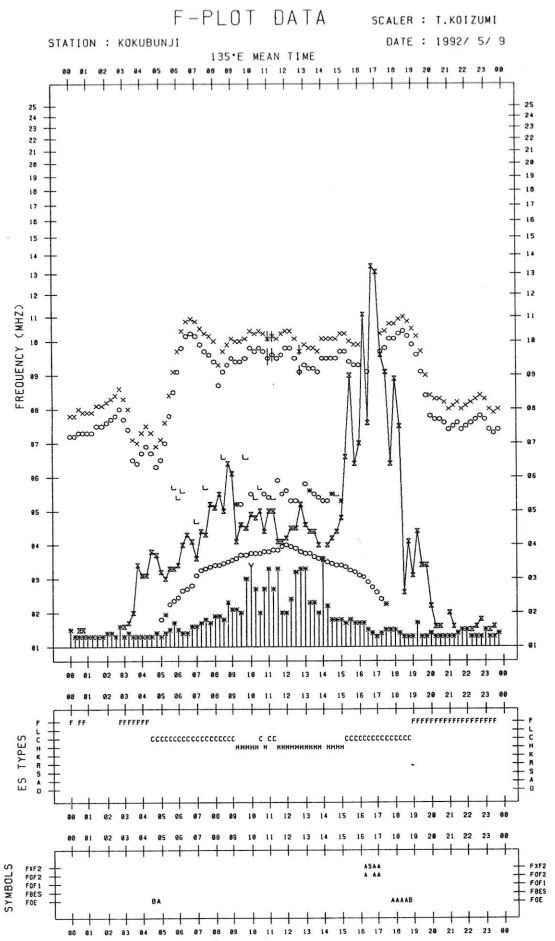
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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STATION : KOKUBUNJI
DATE : 1992/ 5/ 9
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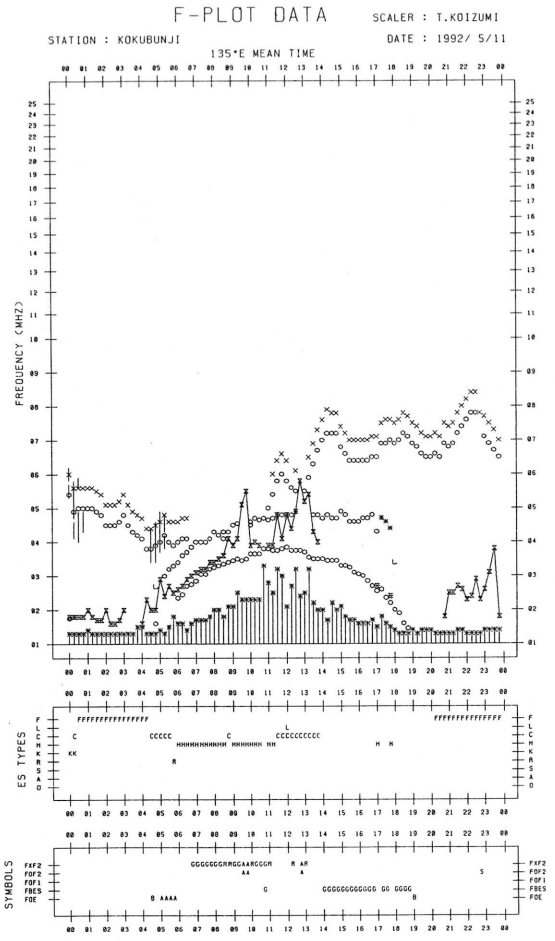
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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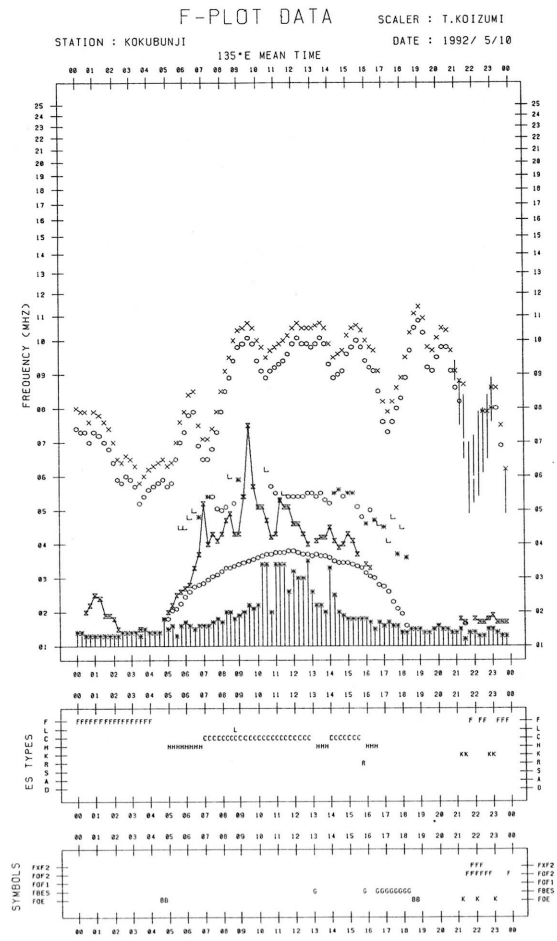
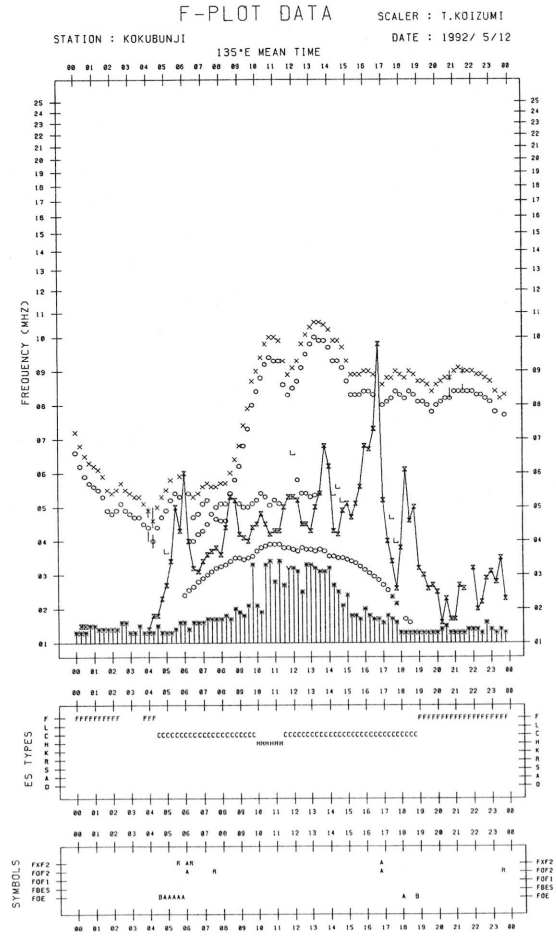
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/11
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/10
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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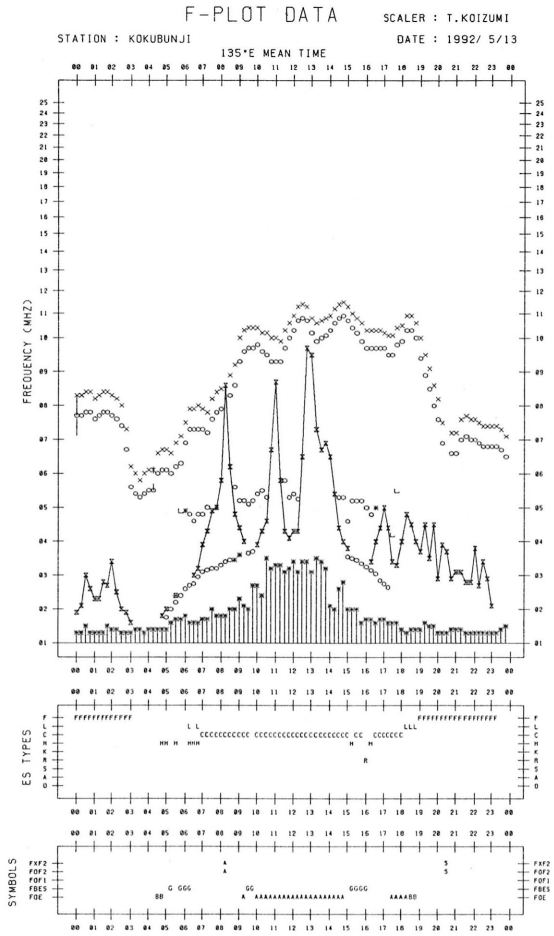
STATION : KOKUBUNJI
DATE : 1992/ 5/12
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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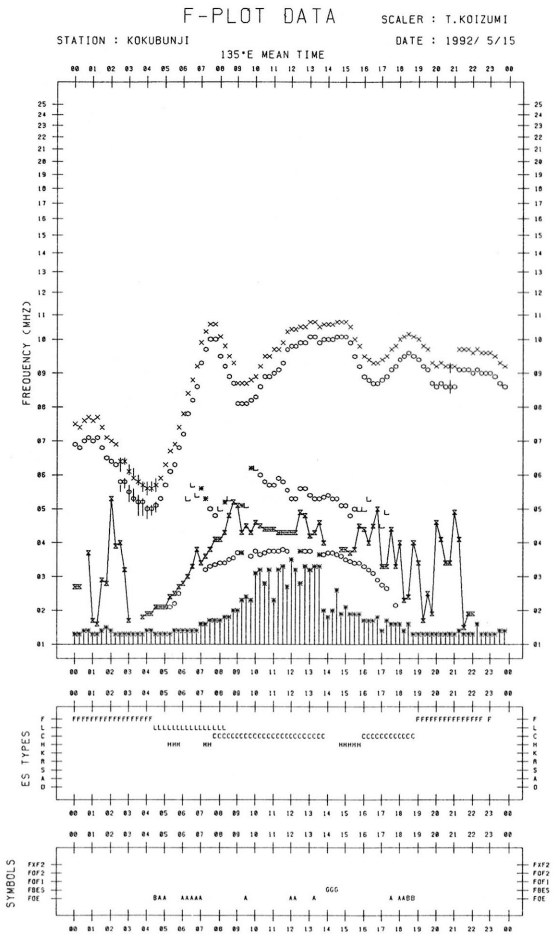
STATION : KOKUBUNJI
DATE : 1992/ 5/13
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FQE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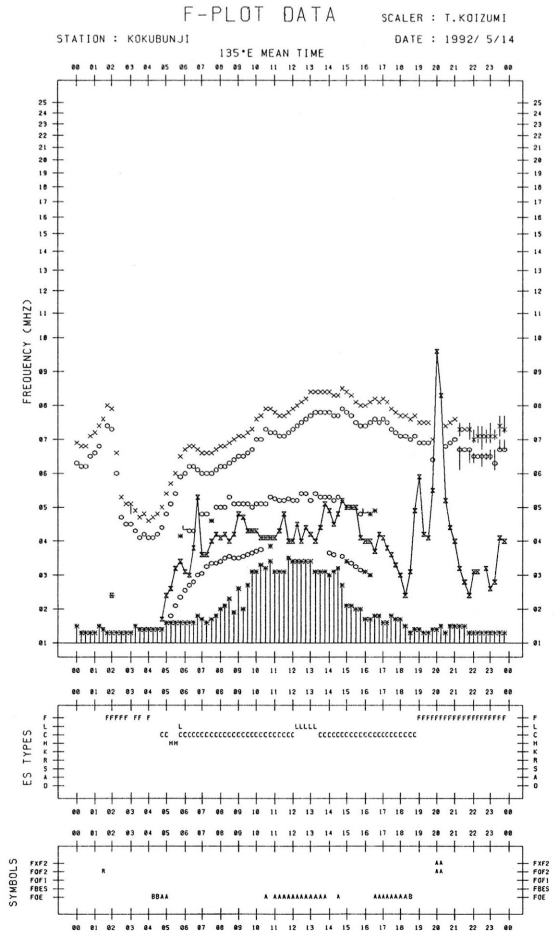
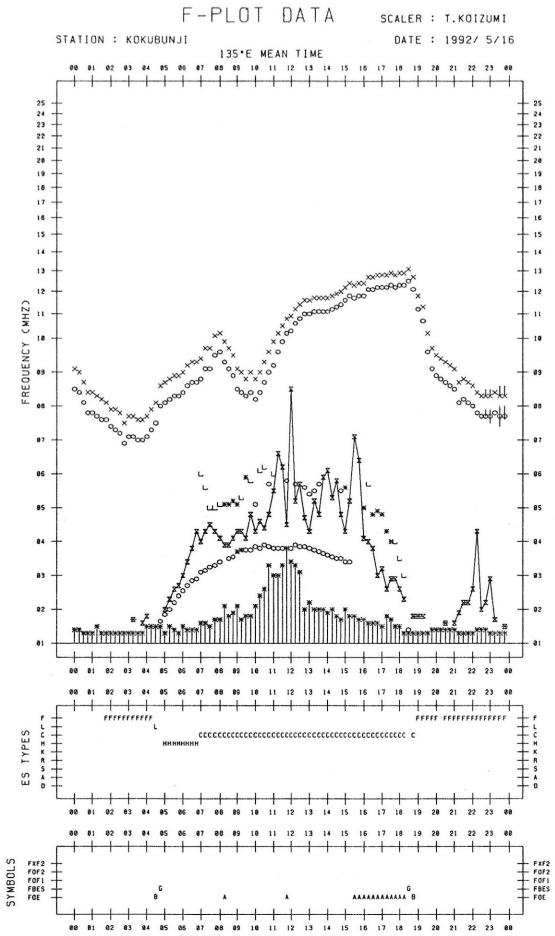
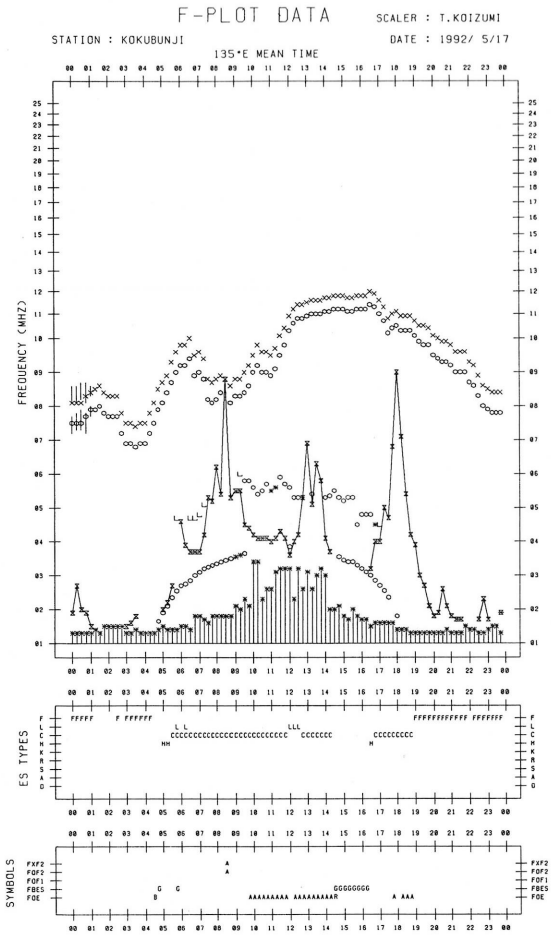
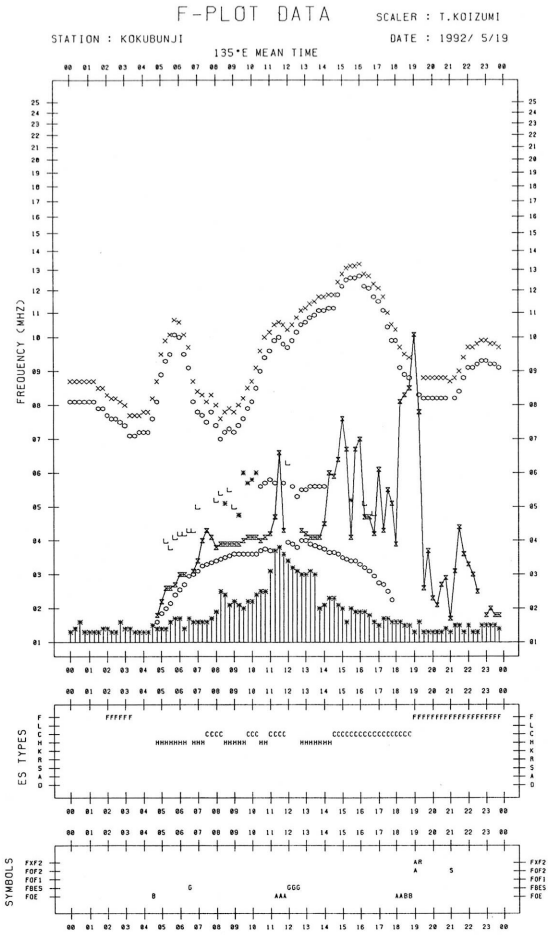
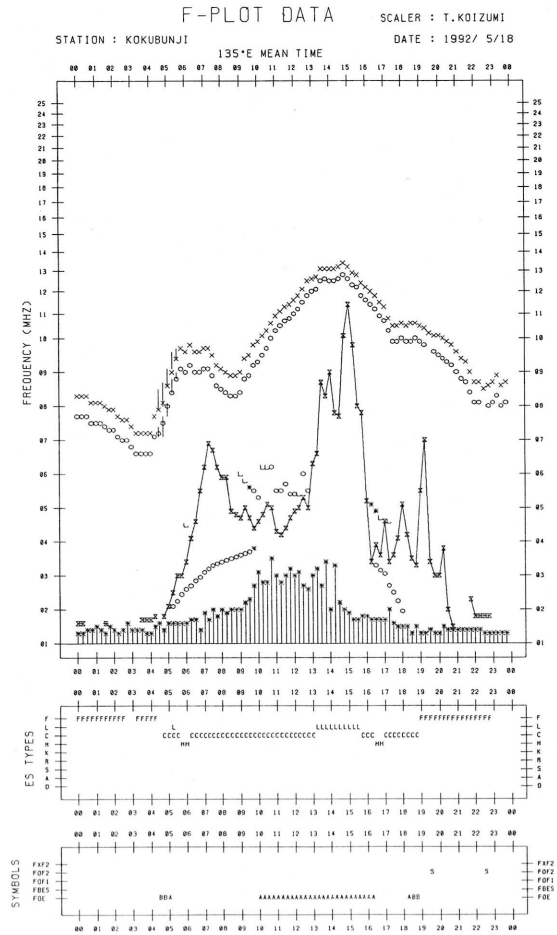
STATION : KOKUBUNJI
DATE : 1992/ 5/15
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FQE

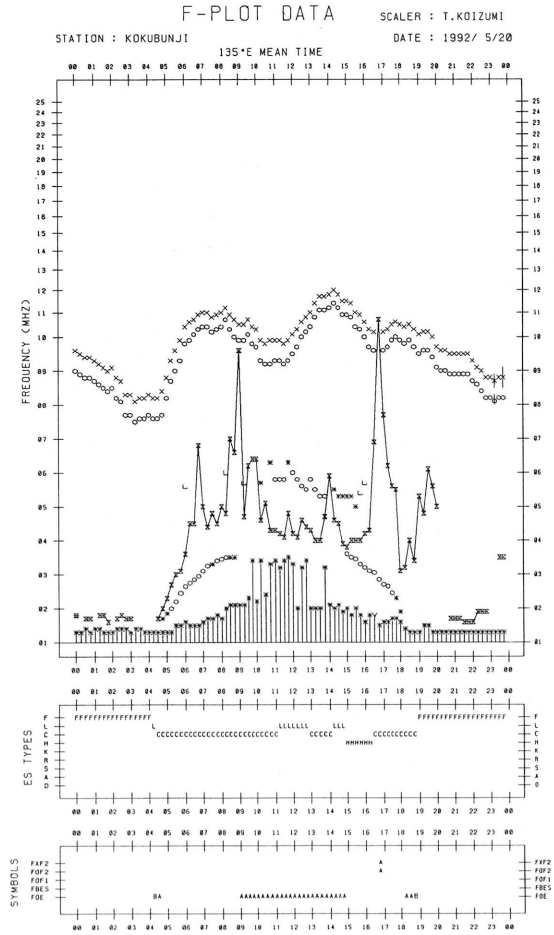

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/14
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FQE

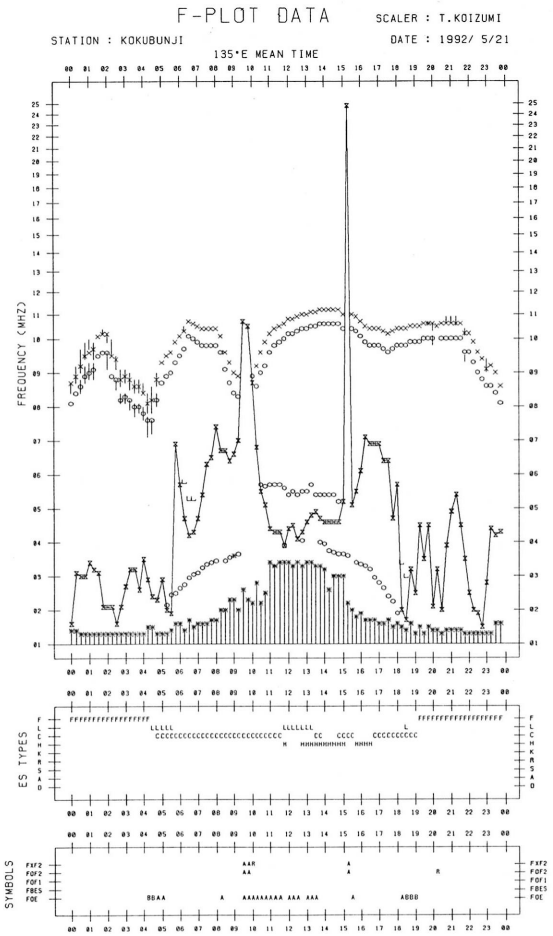

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/16
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FQF2
FQF1
FBES
FQE

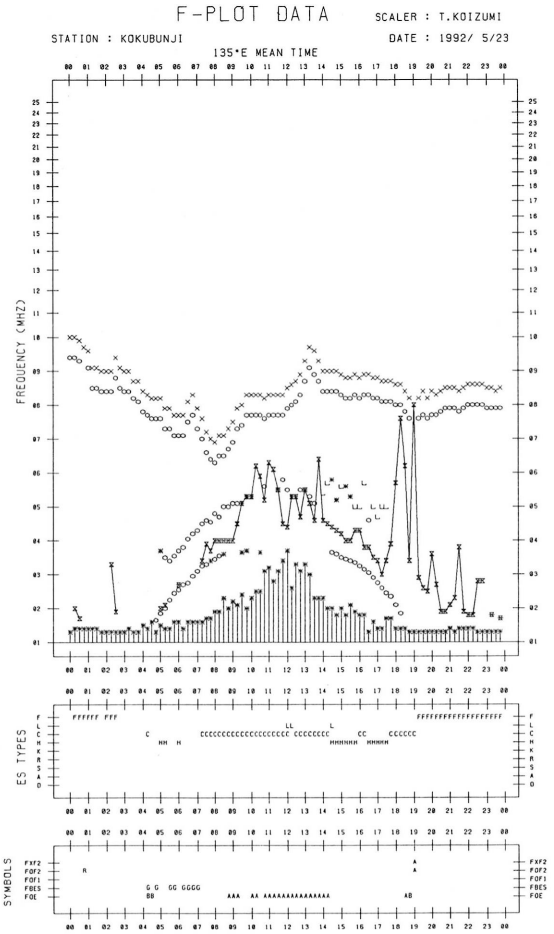

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/17
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

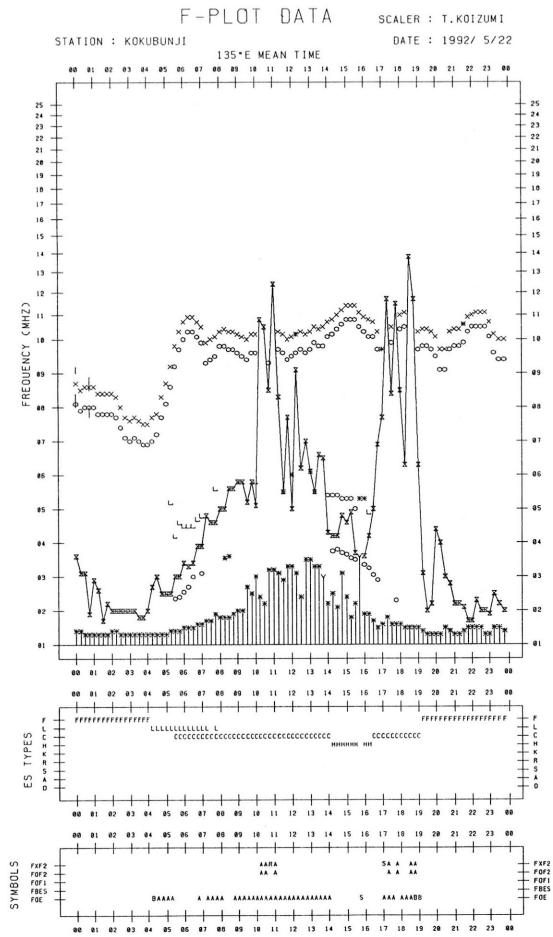

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/19
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

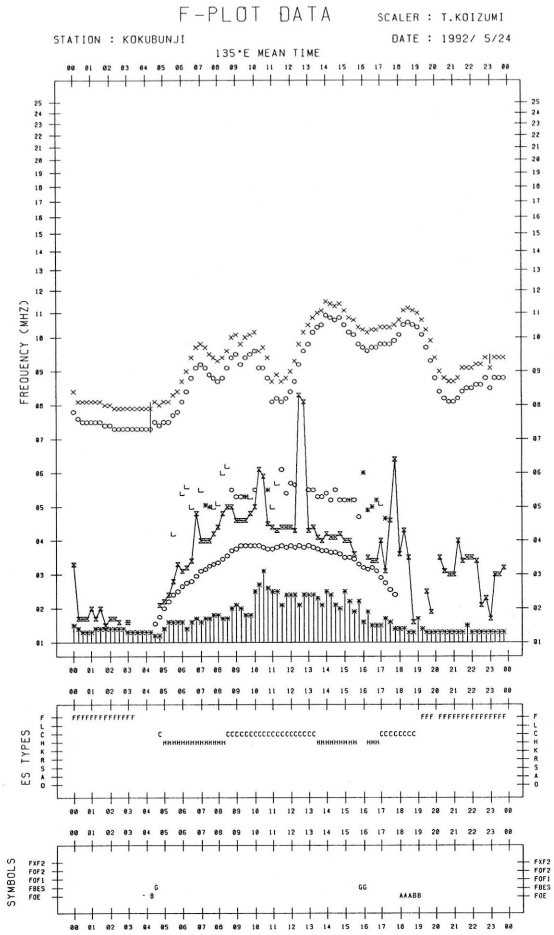

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/18
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

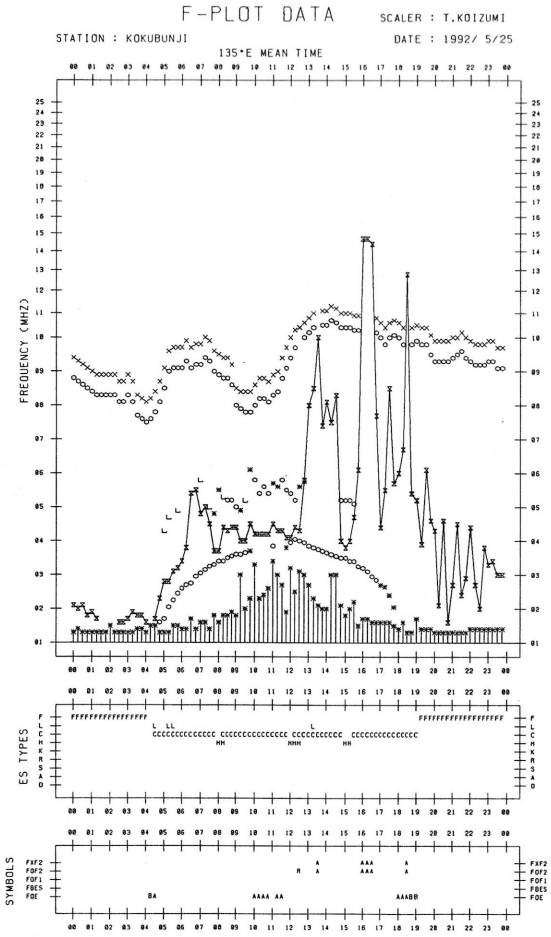

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/20
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

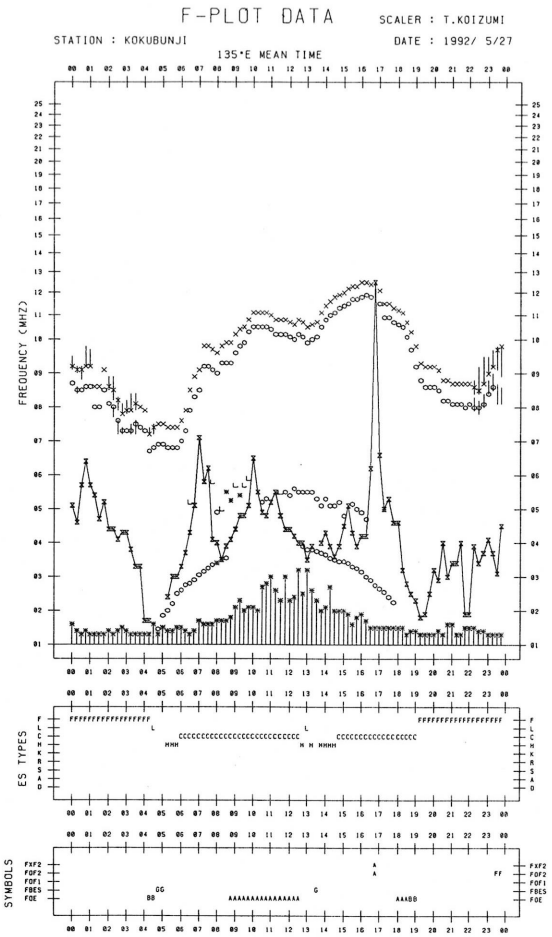

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/21
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

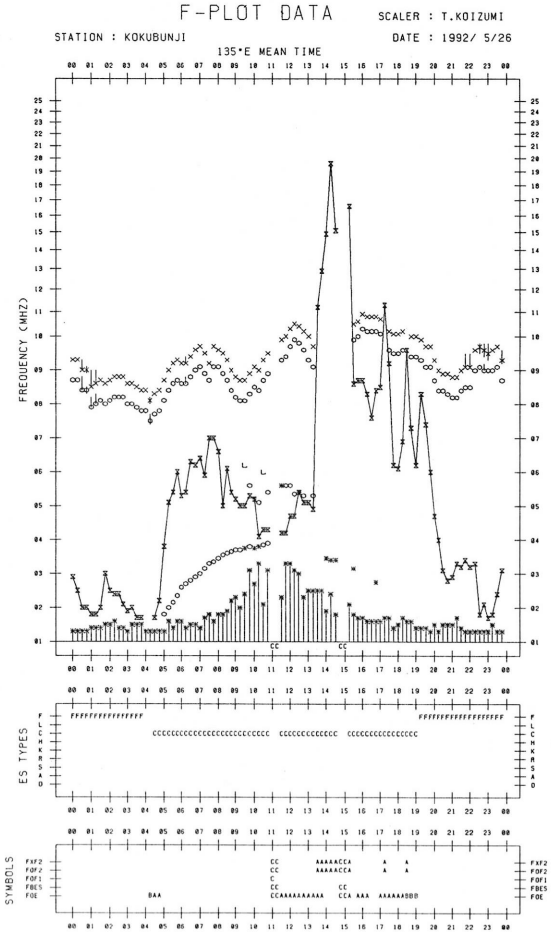

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/23
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

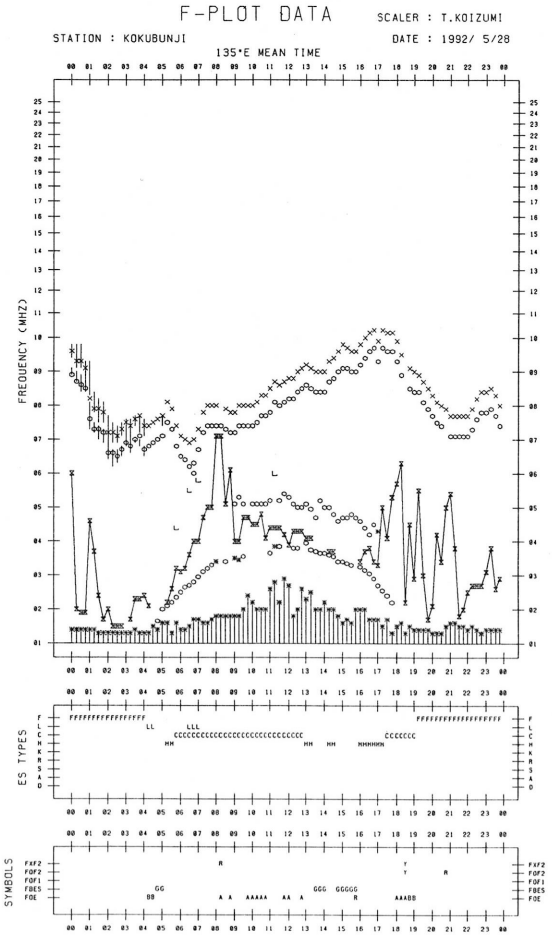

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/22
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

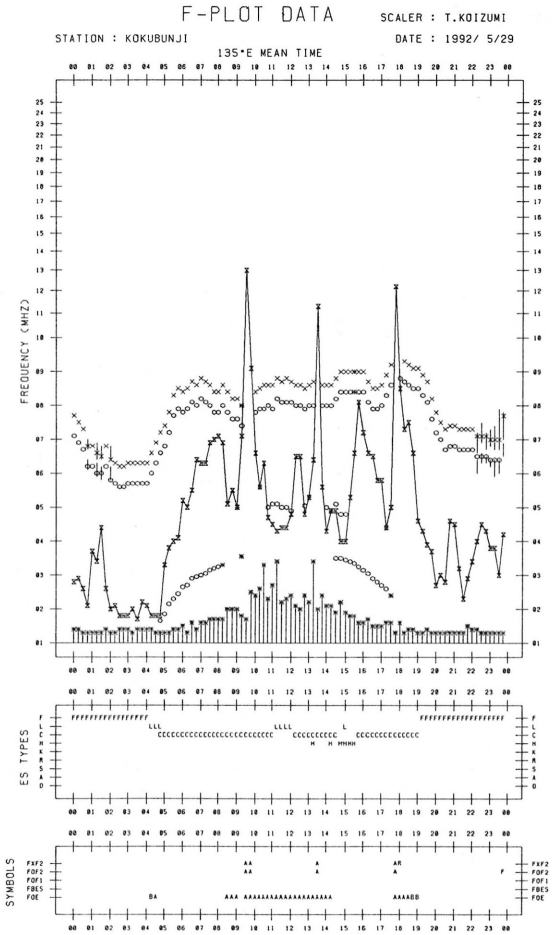

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/24
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/25
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/27
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/26
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/28
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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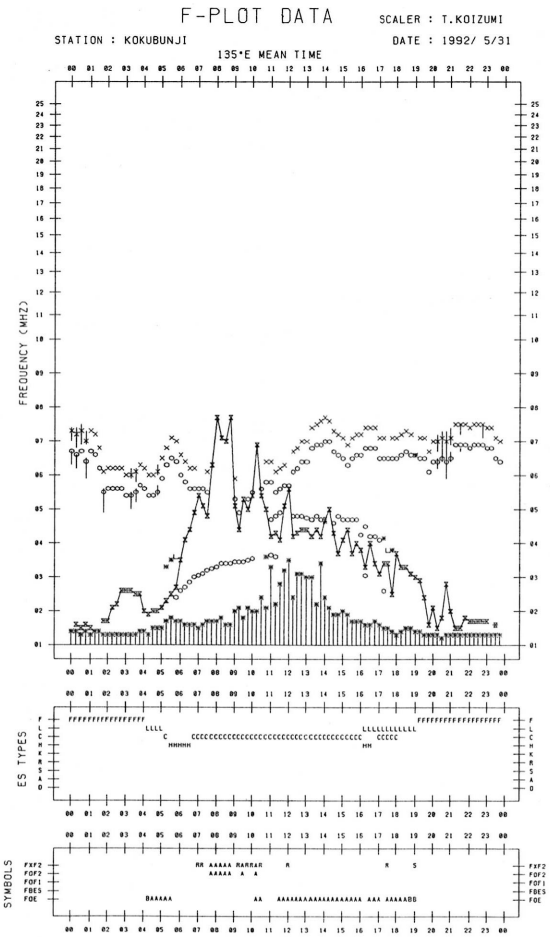
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/29
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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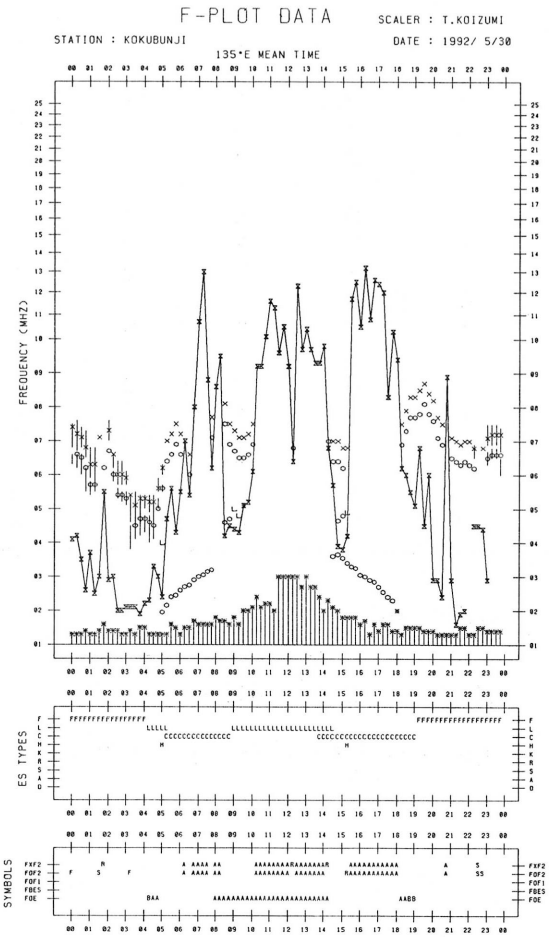
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/31
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 5/30
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Hiraiso May 1992

Single-frequency total flux observations at 200 MHz										
	Flux density: $10^{-22}Wm^{-2}Hz^{-1}$					Variability: 0 to 3				
UT Date	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
1	B	B	B	B	B	1	1	1	2	1
2	B	B	*	B	B	2	2	*	1	2
3	B	B	B	*	B	1	1	1	*	1
4	*	*	*	*	*	*	*	*	*	*
5	*	*	*	*	*	*	*	*	*	*
6	15	14	20	11	17	0	0	0	0	0
7	*	-	*	B	*	*	-	*	0	*
8	B	10	11	12	11	1	0	0	0	0
9	11	10	13	10	12	0	0	0	0	0
10	10	*	*	11	*	0	*	*	0	*
11	11	11	11	-	11	0	0	0	-	0
12	11	*	*	*	*	0	*	*	*	*
13	*	*	*	*	*	*	*	*	*	*
14	*	11	11	10	11	*	0	0	0	0
15	*	*	*	-	*	*	*	*	-	*
16	11	11	*	*	11	0	0	*	*	0
17	*	*	*	10	*	*	*	*	0	*
18	10	10	*	*	10	0	0	*	*	0
19	10	10	11	-	10	0	0	0	-	0
20	11	11	11	11	11	0	0	0	0	0
21	10	11	*	*	11	0	0	*	*	0
22	*	*	*	*	*	*	*	*	*	*
23	*	*	*	9	*	*	*	*	0	*
24	9	*	*	-	9	0	*	*	-	0
25	*	*	*	10	*	*	*	*	0	*
26	10	10	*	9	10	0	0	*	0	0
27	-	-	*	*	9	-	-	*	*	0
28	*	*	*	9	*	*	*	*	0	*
29	*	*	*	10	*	*	*	*	0	*
30	10	11	*	10	10	0	0	*	0	0
31	*	*	*	*	*	*	*	*	*	*

Notes: No observations during the following periods.

7th	0300 - 0600	11th	1940 - 2400	15th	1940 - 2400
19th	1930 - 2400	24th	1930 - 2400	27th	0128 - 0723

No observations for 500 MHz due to equipment failure by lightning.

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso May 1992

Single-frequency observations

Normal observing period: 1940 - 0935 U.T. (sunrise to sunset)

MAY 1992	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22}Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22}Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
1	200	44 NS	2000E	0145	780D	200	40	ML
2	200	44 NS	2000E	0200	780D	60	10	ML
3	200	48 C	0849.6	0852.1	3.5	45000	2000	SLWR
4	100	46 C	2126.6	2206.1	86	1000	350	SL
	200	46 C	2132	2150.4	36	150	40	ML
5	200	46 C	2115	2132.5	29	110	35	WR
7	200	43 NS	2300	0012	240	60	30	WL

Note: No observations for 500 MHz due to equipment failure by lightning.

C. RADIO PROPAGATION

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

MAY 1992 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

C. RADIO PROPAGATION

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

MAY 1992 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

UT DAY	00H 46M	01H 46M	02H 46M	03H 46M	04H 46M	05H 46M	06H 46M	07H 46M	08H 46M	09H 46M	10H 46M	11H 46M	12H 46M	13H 46M	14H 46M	15H 46M	16H 46M	17H 46M	18H 46M	19H 46M	20H 46M	21H 46M	22H 46M	23H 46M
1	4	10	10	9	19	20	27	23	29	33	25	23	4	10	ES -7	-1	27	24	ES 4	11	11	15	ES 4	1
2	-1	2	2	9	17	18	29	24	32	28	23	26	24	12	23	23	16	16	14	6	14	8	1	-1
3	-1	-1	1	13	10	19	21	24	25	27	24	13	24	26	24	4	24	23	-7	13	7	3	-7	-1
4	-1	1	6	9	11	21	23	24	19	23	29	18	21	19	14	17	5	15	8	10	-1	-1	-5	ES -22
5	-13	-10	1	9	11	21	20	18	24	24	23	23	26	24	17	24	23	20	1	-1	1	-1	-22	-7
6	-10	-3	7	0	12	20	24	28	24	26	22	17	22	17	12	17	24	23	8	6	4	2	-1	-7
7	-22	4	7	11	18	22	23	24	23	29	26	23	26	24	23	24	24	21	-1	4	-13	-9	-4	-9
8	-7	-5	9	5	13	18	19	19	23	29	23	23	25	19	18	19	19	27	19	12	1	1	2	-1
9	-7	-22	3	4	13	18	19	23	23	24	12	2	-13	-3	-1	13	19	1	-16	21	21	13	11	2
10	3	0	8	9	11	18	23	28	23	13	-1	0	ES -22	-13	ES -22	ES -22	ES -22	ES -22	ES -22	-10	-18	-10	-18	-18
11	-16	-16	-7	4	12	24	17	27	12	18	17	25	19	24	11	14	21	9	-3	-1	-1	-1	-6	-6
12	-9	-6	0	5	10	14	21	21	24	23	20	14	19	22	12	20	13	22	7	5	5	-5	0	-14
13	-11	-5	6	7	10	15	20	24	24	26	28	17	22	-5	-11	-13	17	18	-2	10	8	5	5	0
14	-2	2	-5	5	11	15	20	25	23	25	24	21	19	18	20	19	21	25	15	9	6	10	0	0
15	-4	1	7	7	10	19	21	21	24	28	27	25	25	25	19	10	10	14	7	15	10	7	5	-6
16	2	0	7	13	11	18	25	25	24	29	28	26	25	20	20	18	20	25	15	13	7	10	-6	5
17	-4	0	10	10	10	16	25	29	25	25	25	24	25	25	22	25	25	18	24	17	12	10	5	2
18	5	-6	0	7	10	20	21	25	25	27	28	25	27	20	22	25	27	23	14	8	3	6	5	7
19	-4	7	7	12	15	20	27	25	24	25	25	24	24	19	20	19	19	22	9	13	14	9	-2	10
20	0	5	5	6	10	15	22	25	20	22	22	27	24	20	15	20	20	20	12	14	13	6	4	-5
21	-6	-6	4	0	20	16	20	22	22	25	22	27	24	21	21	20	19	16	18	14	0	3	14	3
22	0	0	-2	5	9	18	21	25	22	22	24	24	21	24	25	21	14	-6	8	-7	12	2	-11	-17
23	-2	-15	-3	0	10	7	20	25	22	25	25	17	25	18	16	15	6	22	10	7	7	6	-3	5
24	-6	13	4	5	15	12	19	20	26	18	12	22	19	20	20	7	21	24	19	9	10	8	2	0
25	0	3	3	5	10	20	20	24	24	25	25	24	24	20	23	15	20	24	15	10	4	3	-1	0
26	-9	-6	0	7	8	15	24	25	23	24	21	22	24	24	20	24	25	24	13	12	12	2	2	6
27	0	0	2	8	9	11	29	24	22	30	24	22	24	21	25	19	-2	13	10	10	10	5	4	5
28	-1	1	9	7	15	18	20	24	25	25	22	24	19	20	24	20	18	21	12	7	7	2	0	0
29	-3	2	0	2	15	17	17	17	17	24	24	20	14	14	12	-2	19	9	7	21	5	4	2	-2
30	-5	5	0	10	9	15	9	23	24	26	25	20	22	20	14	5	-17	12	7	21	5	-11	ES -5	ES -5
31	ES -5	0	5	8	9	10	21	19	26	20	15	19	20	15	12	14	16	18	16	20	12	-2	7	0
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	-4	0	4	7	11	18	21	24	24	25	24	23	24	20	19	18	19	20	9	10	7	3	US 0	0
UD	3	7	9	12	18	21	27	28	26	29	28	26	26	25	24	24	25	25	19	21	14	10	7	6
LD	ES -13	-15	-3	0	9	11	17	19	19	18	12	13	4	-3	ES -7	-2	-2	1	ES -7	-1	-1	-9	ES -11	ES -17

C. Radio Propagation

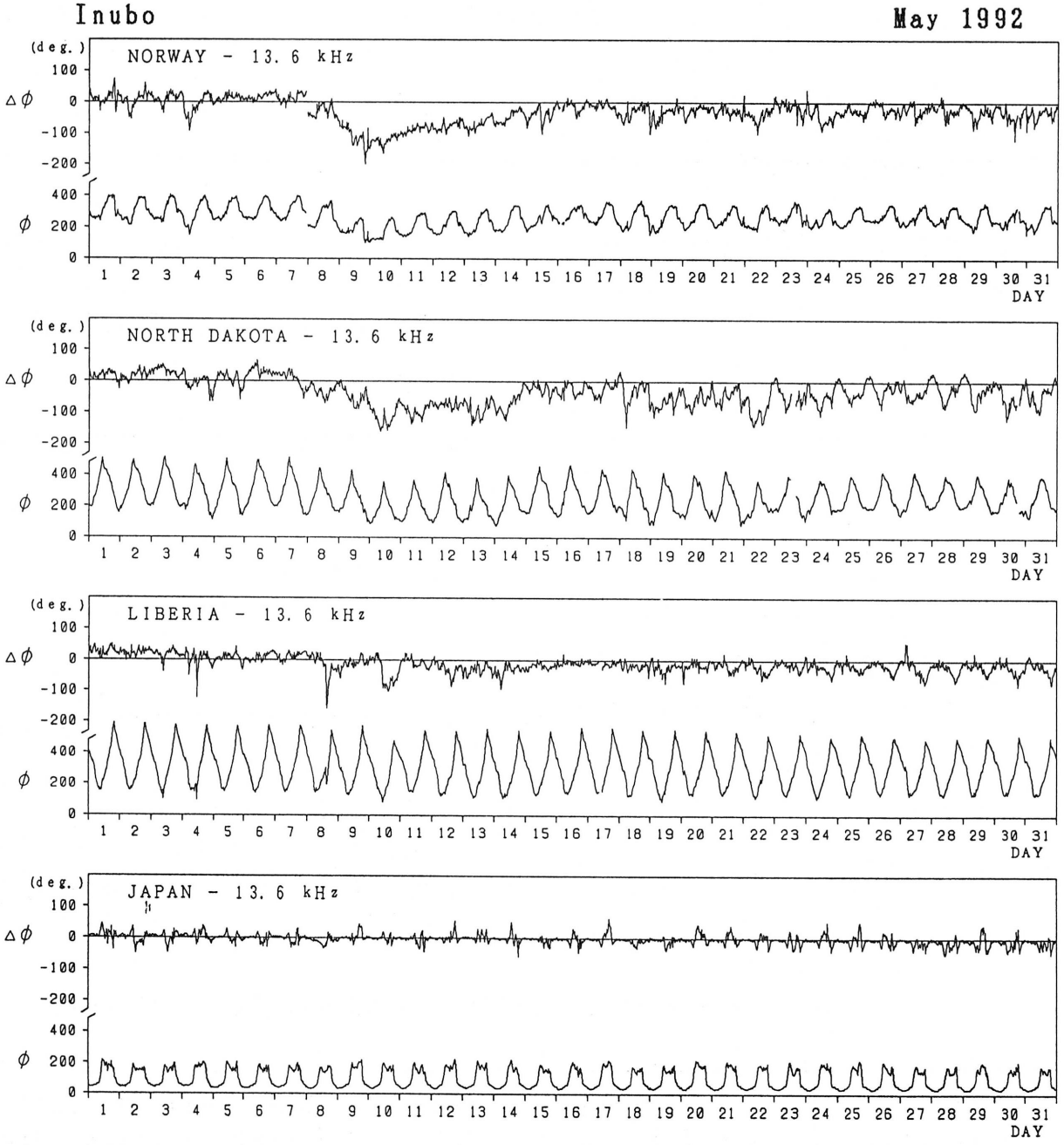
C2. Radio Propagation Quality Figures at Hiraiso

Hiraiso — Time in U.T.

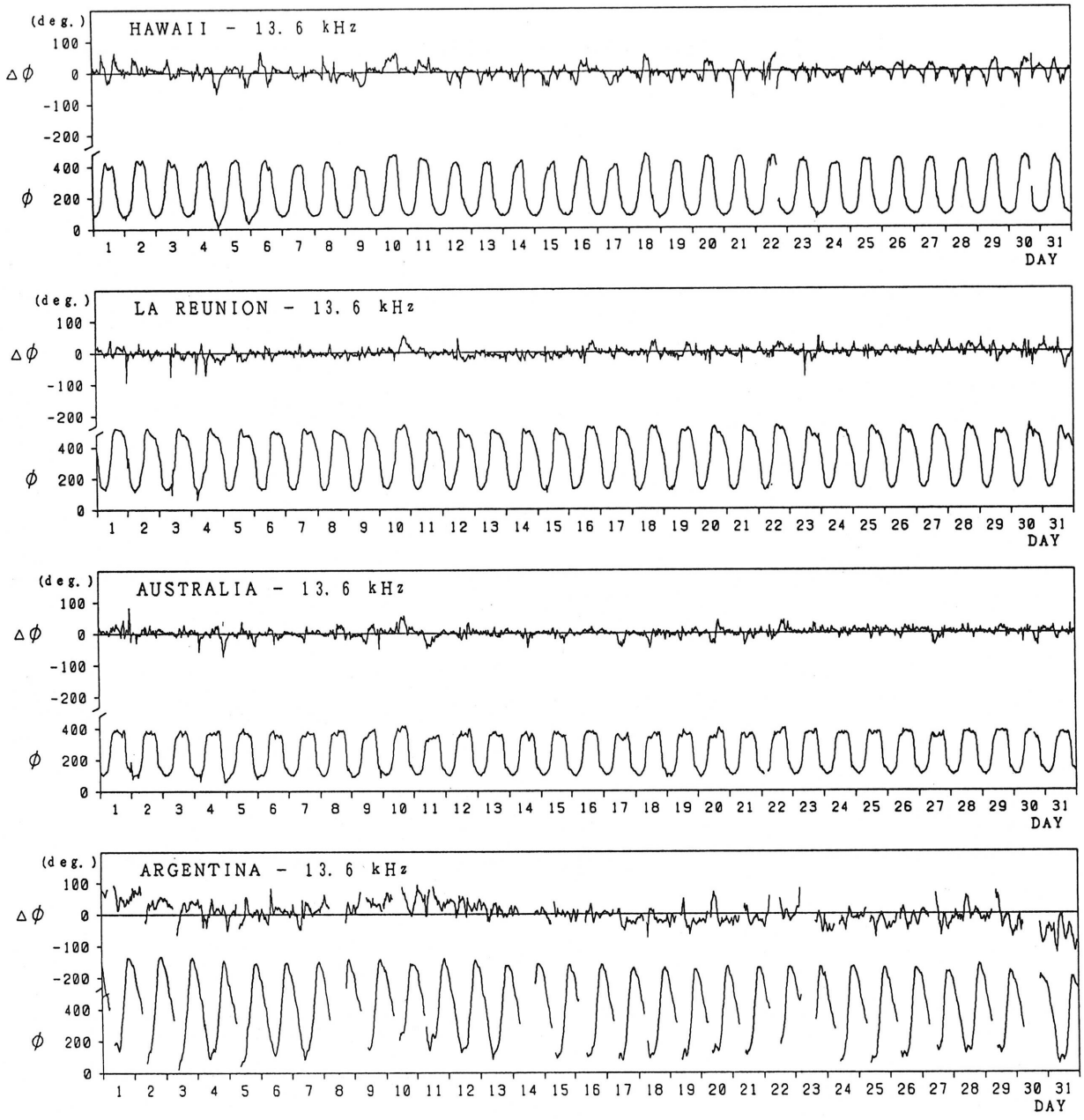
May. 1992	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Conditions 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start h m	End h	Range nT
1	4+	5 4 4 5	5 4 3 4	N N N N			
2	4+	4 5 5 5	4 4 4 4	N N N N			
3	4o	5 5 3 4	4 4 4 4	N N N N			
4	4o	5 4 4 4	4 4 4 3	N N N N			
5	4-	4 4 4 3	4 4 4 3	N N N N			
6	4o	4 4 4 5	4 4 4 4	N N N N			
7	4o	5 4 3 4	4 4 4 3	N N N N			
8	4-	4 3 3 3	4 4 4 4	U U U U			
9	3o	2 3 3 4	4 3 2 4	U U U U	1958	---	426
10	3-	4 3 2 3	4 3 1 2	U U U U	---	---	
11	3o	3 3 2 3	4 3 3 3	U U U U	---	---	
12	4-	3 3 4 3	4 4 4 4	U U U U	---	07	
13	3o	3 3 3 3	4 4 1 4	N N N N			
14	3+	2 3 3 4	4 4 4 4	N N N N			
15	4o	4 5 4 3	4 4 4 4	N N N N			
16	4o	4 5 4 4	4 4 4 4	N N N N			
17	4o	4 4 4 4	4 4 4 4	N N N N			
18	4o	4 5 4 4	4 4 4 4	N N N N			
19	4-	3 4 3 4	4 4 4 4	N N N N			
20	4o	3 3 5 4	4 4 4 4	N N N N			
21	4o	3 4 5 4	4 4 4 4	N N N N			
22	4-	4 4 3 3	4 4 4 3	N N N N			
23	4o	4 5 4 4	3 4 4 4	N N N N			
24	4o	4 4 4 4	4 4 4 4	N N N N			
25	4o	4 4 5 4	4 4 4 4	N N N N			
26	4o	4 4 5 4	4 4 4 4	N N N N			
27	4+	4 4 5 5	4 4 4 4	N N N N			
28	4o	5 4 4 4	4 4 4 4	N N N N			
29	4-	4 3 3 4	4 4 3 4	N N N N			
30	4-	3 4 3 4	4 4 3 4	N N N N			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo



Inubo May 1992



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

Start (U.T.)	End (U.T.)	Max. (U.T.)	Max. Phase Deviation (negative value, deg.)
May.08/2140	May.14/1820	May.09/2010	144
May.24/0700	May.25/0610	May.24/1140	65

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso

Time in U.T.

May 1992	S W F								Correspondence	
	Drop-out Intensities(dB)					Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS	BBC						
3				x	9	0850	17	1	1-	-	x
4			8			0439	39	1	1-	x	-
4			x		17	1119	59	2	1	x	-
5					8	2122	13	2	1-	x	-
5					12	2140	16	2	1-	x	-
5			9			2319	16	2	1-	x	-
8					18	1520	25	2	1+	x	-
8					8	1545 E	53	1	1-	x	-
27					7	1436	12	2	1-	x	

NOTE CO:Colorado(WWV) HA:Hawaii(WWVH) Aus:Australia Mos:moscow BBC:London

* Optical and X-ray Flares

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

May. 1992	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
1	14			17	19	15	2254	2342	2301
2	18	23	17	34	28	27	0038	0200	0054
2	14	17	32	22	12		0449	0534	0456
3			11				0626	0654	0630
3			15				0711	0728	0716
3		33	18				0742	0822	0800
3	31	80	113				0853	0950	0902
4				6	10		0010	0038	0018
4	40*	68*	84*	51*	35*	24	0439	0629	0506
4		88	33				1126	1226	1150
4					61	70	2015	2132D	2038
4	31			66	73	82	2132E	0124	2238
5					31	47	1916	2000D	1940
5					77	96	2000E	2110D	2018
5				23*	45*	55	2110E	2314D	2231
5			7	25	30	35	2314E	0006	2324
6			9				0431	0453	0439
6	17	37	29				0727	0804	0749
6		31	17				1002	1040	1009
7	13	24	12	9		24	0651	0740	0708
8			9	9			0346	0452	0408
8		137				31	1515	1714	1540
9				12	6		0016	0104	0030
18					18		1930	2017	1944
18	32			31*	25*	54*	2256	0026D	2314
19				18	9	24	0026E	0104	0041
19			14	11	6		0316	0350	0322
19		44	17				1134	1230	1146
20				9			0214	0300	0230
20		31	18				0909	0945	0921
21				9	5		0152	0226	0158
21			20	14			0612	0651	0618
21			16	12			0708	0756	0718
21				7	8		2304	2342	2310
27				6	6		0102	0130	0112
28			12	12	10		0448	0537	0510
29			11	9			0518	0556	0534
30			7	6	8		0438	0510	0442
30					7		2214	2239	2222
31				9	7		2356	0022	0005

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☎ (0423) (21) 1211(代)

Queries about "Ionosperic Data in Japan" should be forwarded to:
Communications Research Laboratory, Ministry of Posts and Telecommunications,
2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184 JAPAN.