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IONOSPHERIC DATA IN JAPAN

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CONTENTS

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INTRODUCTION

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

Station	Geographic		Geomagnetic		Technical Method
	Latitude	Longitude	Latitude	Longitude	
Wakkanai	45°23.5'N	141°41.2'E	35.3°N	206.5°	Vertical Sounding (I)
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

JUN. 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	63	60	59	57	61	64	64	66	67	64	A		62	A	61	73	80	78	86	78	83	77	72	73
2	66	63	60	61	58	64	61	71	66	A	62	A		62	51	A	65	66	67	84	A	66	66	66
3	66	60	55	57	55	58	66	72	73	A	48	67	69	66	66	65	67	67	68	78	79	78	82	42
4	73	66	63	64	66	70	67	67	A	A	A	68	67	72	74	68	68	68	67	76	86	84	79	73
5	60	66	63	63	62	73	66	63	A	66	71			66	62	60	A	A		76	71	78	66	73
6	66	64	63	62	64	71	77	78	77	A	A	65			64	68	68	69	72	79	81	74	78	73
7	73	68	67	67	66	64	58	A	A	61	A			63	66	67	66	66	61	73	77	73	77	73
8	66	68	64	62	64	63	70	73	67		68		51				66	71	73	66	66	73	74	71
9	71	63	46	57	62	55	58	A	A	A		A	A	A	A	A	50	A	62	A	63	66	64	66
10	57	64	61	56	55	58	A	A	A	A	A	A			A			58	60	64	78	72	64	58
11	72	66	66	55	52	A	A	A	A	A	A			A				60	63	58	55	65	61	61
12	61	57	38	53	45	53	50	60	64	76		A	A	A	76	68	A	A	A	69	82	82	84	74
13	A	62	58	61	63	62	62	A	A	A	A				A	A	A	A	A	A	67	72	67	72
14	67	63	56	53	54	61	80	64	A	A	A	A			A	66	A	A	A	87	90	78	73	72
15	77	73	64	66	62	72	76	A	A	70		A	A	68	A	66	A	A	A	A	91	77	73	72
16	66	61	62	64	70	70	88	A		110	67	A	A	A	A	A	A	A	A	A		A	82	85
17	74	73	62	65	67	71	73	80	A	A	A	A	A	A	A	A	A			66	89	84	83	84
18	78	80	58	73	71	73	78	A	A	A	A	A	A	A	A	A	A	75	79	75	82	84	84	76
19	76	77	68	74	A	A	A	A	A	A	A	A				A	A	A	A	54	58	66	63	57
20	66	62	66	64	60	66	61	A	A	A	N	72	75	73	73	73	66	68	71	71	84	84	78	84
21	76	70	61	71	67	70	60	66	A	66	58	A	73	76	72	70	61	64	65	84	84	87	90	76
22	63	61	61	61	57	60	68	72	78	70	68	73	67	73	A	A	86	73	73	70	A	88	84	78
23	85	72	63	64	61	75	90	79	80		A		A	A	A	79	A	A	68	80	86	86	66	66
24	60	55	57	50	54	67	84	80	A	68	A	A	A	A	A	A	A	A	67	A	A	62	64	66
25	66	54	58	52	56	53	90	A	A		A	A		A	A	A	A	60	A	64	64	62	61	63
26	58	58	57	63	61	63		A	A	A	A	A	A	A		A	57	61	66	66	61	61	A	62
27	50	59	54	50	47	52	A	A	66	61			62	57	66	60	61	61	66	74	78	70	66	63
28	61	54	53	52	54	62	82	86	77	83	84	72				A	70	73	75	84	66	65	59	65
29	62	64	63	53	43	A	A	61		A					87	63	A	A	67	63	A	A	66	64
30	63	54	54	A	51	79	83	A	A	A		A			A	A	105	81	A	54	A	50	A	52
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	29	29	27	24	16	10	11				10	12	14	15	18	20	25	24	28	28	30
MED	66	63	61	61	61	64	69	72	70	68				67	66	68	66	68	67	73	78	74	72	72
U Q	73	68	63	64	64	71	81	78	77	76				73	73	70	70	73	72	78	84	83	80	73
L Q	61	60	57	54	54	60	61	65	66	64				63	63	65	61	61	65	65	66	66	65	63

HOURLY VALUES OF FES AT WAKKANAI

JUN. 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	24	G	33	28	G	39	49	49	51	59	62	G	G	45	56	G	G	77	128	62	32	32	31	34
2	24	57	23	29	G	G	44	52	55	69	G	46	G	G	G	42	72	58	38	52	40	46	29	24
3	G	G	G	G	G	G	46	57	58	62	G	G	G	G	G	G	G	G	42	46	31	27	G	23
4	32	G	G	G	G	G	46	58	67	68	70	54	G	G	G	G	G	39	37	36	59	28	28	28
5	29	58	36	33	G	G	44	47	58	44	54	G		G	G	G	82	138	138	82	60	30	26	G
6	G	26	G	G	G	G	45	54	62	78	73	56		G	G	G	G	47	46	40	31	34	28	G
7	25	G	G	G	G	G	44	65	77	62	54			52	G	G	G	G	G	32	27	G	40	27
8	G	28	24	G	G	G	G	56	51	G	G	G	52	G		G	G	59	37	40	37	32	44	30
9	49	G	26	31	39	40	45	66	51	76	G	57	50	106	70	63	G	82	70	64	44	72	28	G
10	72	25	57	59	45	G	43	55	64	62	54	57	G	G	46		G	42	43	46	36	40	60	G
11	G	23	24	G	G	43	45	50	50	56	54		G	63	G	G	G	G	G	G	G	G	26	G
12	91	G	G	G	G	G	43	G	43	54	G	54	77	70	73	66	83	74	94	92	68	45	56	58
13	71	60	34	36	44	41	48	61	76	112	102				81	74	63	92	103	126	60	90	40	62
14	40	G	33	43	42	36	G	54	126	150	96	66			59	45	107	102	124	94	132	83	79	60
15	G	31	59	40	42	32	44	67	53	46	G	61	81	61	50	56	96	127	111	135	134	47	39	92
16	30	G	32	33	G	32	44	63	90	112	54	60	63	66	94	105	100	92	157	151	145	150	92	57
17	33	33	G	31	G	36	50	72	111	129	77	78	122	62	60	81	140	162	115	73	90	85	69	91
18	71	59	83	72	70	46	48	85	89	96	85	94	144	92	78	84	93	G	40	57	41	59	62	46
19	57	59	59	50	71	40	48	57	72	81	61	58	G	G	G	54	69	95	103	50	41	30	39	G
20	G	G	G	G	G	36	54	68	54	59	G	54	G	G	G	47	59	39	37	50	46	52	G	31
21	G	G	24	G	G	G	G	G	67	53	G	61	53	G	G	G	42	40	37	33	G	32	33	G
22	G	G	G	G	G	33	G	48	G	51	G	G	59	62	66	92	G	54	35	57	69	57	36	54
23	67	36	34	41	G	38	53	52	G	G	53		70	71	152	149	91	97	70	43	45	64	44	27
24	G	G	29	25	G	G	44	55	62	56	74	93	78	136	92	128	72	64	60	72	83	40	46	G
25	G	G	G	G	G	G	G	48	58	G	66	75		66	118	65	60	54	65	33	46	30	53	30
26	G	G	28	G	G	G		64	64	60	88	86	62	58		61	G	G	G	58	38	32	59	30
27	24	G	33	24	36	33	57	60	54	G	G		G	50	G	G	68	90	52	52	48	54	27	24
28	28	29	24	G	G	G	G	G	G	G	54	84		G		71	63	135	70	72	34	64	40	40
29	59	56	33	26	32	56	39	49	G	53	G			G	82	46	83	75	51	55	91	90	58	72
30	41	46	68	56	65	93	96	82	131	175		58		G	60	81	66	95	109	93	86	58	40	24
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	30	30	30	29	24	21	28	27	29	30	30	30	30	30	30	30	30
MED	26	12	27	26	G	32	44	56	58	60	54	58	52	48	56	54	63	69	56	56	46	46	40	29
U Q	49	36	34	36	39	39	48	64	72	78	71	70	73	64	78	77	83	95	103	73	69	64	56	54
L Q	G	G	G	G	G	G	41	49	51	51	G	50	G	G	G	G	G	40	37	43	36	32	28	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT WAKKANAI

JUN. 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	17	17	16	15	16	20	27	23	26	34	33	51	30	29	27	24	22	27	17	17	16	16	17	15
2	16	17	17	17	17	17	26	29	21	26	35	33		26		33	29	22	17	15	16	16	15	16
3	15	15	17	16	18	16	28	29	32	32		54	51	53	50	51	47	27	20	16	15	16	17	16
4	17	17	16	15	18	24	26	30	34	34	35	28		58	28	48	27	23	18	16	14	15	17	15
5	16	16	16	15	18	26	28	27	24	26	36			52	27	26	24	24	18	16	15	17	16	15
6	21	17	15	16	17	26	27	30	30	29	36	38			50	49	46	26	20	16	16	15	17	16
7	17	16	16	17	20	22	28	30	32	34	28			38	52	48	23	29	24	16	17	18	16	17
8	16	17	17	15	18	34	26	26	29		50		39	34		27	27	21	17	16	15	15	15	14
9	16	17	16	15	16	20	26	29	32	34	34	39	36	38	30	28	26	26	17	16	15	16	15	16
10	15	16	16	18	16	24	27	23	33	38	38	38			36			24	18	17	14	15	17	17
11	17	16	16	16	16	21	18	30	28	36	35		37	39	33	30	26	21	24	20	16	17	17	18
12	18	18	20	16	22	17	20	29	27	40		42	38	37	32	29	27	21	16	16	16	16	18	16
13	16	16	16	16	16	16	27	24	34	36	37				41	35	32	27	16	24	16	16	15	16
14	17	16	15	16	15	20	20	34	38	36	39	39			32	32	28	24	17	17	18	15	16	14
15	16	16	17	14	15	18	20	32	33	35	55	38	38	36	34	38	26	21	17	17	14	17	15	18
16	17	16	16	14	17	17	28	32	35	35	38	36	40	30	28	27	24	20	17	17	14	16	16	17
17	17	16	17	15	18	16	28	28	27	33	35	34	35	34	27	36	27	23	16	20	16	15	16	16
18	15	16	16	15	16	17	29	33	35	24	38	38	37	37	33	28	26	20	22	16	16	17	16	17
19	16	17	17	16	15	20	27	30	35	36	36	36		39		35	33	27	17	16	16	15	14	16
20	15	15	15	15	21	18	26	30	36	47	52	36	51	34	27	26	24	26	16	16	15	15	15	15
21	16	16	16	15	20	23	22	21	34	35	38	37	33	33	33	28	24	22	17	18	17	16	17	16
22	16	15	21	15	16	18	29	29	33	34	36	55	33	35	35	28	48	28	17	20	20	17	18	17
23	17	17	17	20	20	22	29	34		55	33		48	49	58	36	28	20	17	16	16	16	15	15
24	15	17	16	15	22	16	20	23	39	45	33	46	44	28	30	27	24	22	17	17	16	16	16	16
25	17	21	16	15	18	26	28	32	42		42	46		44	45	29	45	24	20	18	17	16	15	17
26	15	16	18	20	23	27		46	44	51	45	49	42	42		46	29	26	16	15	15	14	15	14
27	15	15	15	14	15	16	16	20	28	48	32			42	48	33	22	20	15	16	15	14	16	15
28	15	15	17	16	17	15	20	22	24	29	30	29				56	44	29	16	15	14	14	15	15
29	14	15	14	15	14	15	18	26		36					39	27	30	21	16	15	14	14	15	15
30	15	14	15	15	15	15	24	22	20	32		41		38	34	32	24	18	16	14	14	15	14	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	30	28	28	26	22	16	24	25	29	29	30	30	30	30	30	30	30
MED	16	16	16	15	17	19	26	29	32	35	36	38	38	38	33	32	27	24	17	16	16	16	16	16
U Q	17	17	17	16	18	23	28	30	35	37	38	46	43	42	43	37	31	26	18	17	16	16	17	17
L Q	15	16	16	15	16	16	20	24	27	32	34	36	35	34	29	27	24	21	16	16	15	15	15	15

HOURLY VALUES OF FOF2 AT AKITA

JUN. 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	52	60	53	54	54	58	68	84	76	71	A	62	A	A	A	83	96	93	N	A	81	78	86	80
2	72	26	61	56	55	61	68	77	76	A	A	67	68	69	72	54	A	72	81	A	A	77	79	77
3	57	52	52	52	52	55	67	76	78	74	A		74	76	74	74	A	67	70	79	78	41	78	N
4	52	69	62	48	60	68	44	61	A	A			91	86	90	87	78	76	74	81	A	80	81	79
5	29	23	65	45	59	50	67	A	A	A	A	A	A	A	A	88	A	85	54	75	A	78	78	A
6		54	52	54	53	54	82	83	86	86	75	74	A		A	A	77	78	78	96	84	A	76	69
7	52	52	67	23	74	51	52	51	72	68	A	C	A		A	78	80	74	54	52	A	77	56	54
8	72	65	55	63	50	58	61	A	68	A	66	A	63	56	52		68	92	A	87	74	57	A	A
9	51	52	54	66	66	52	72	A	A	A	A	A	A	A	79	A	A	51	52	63	52	51	A	54
10	51	52	A	A	A	54	52	47	56	56	A	A		42		A	119	109	90	102	A	A	66	A
11	54	78	54	52	47	39		52	A	A	A	A	A	A	A	A	A	A	60	A	50	52	A	54
12	A	A	A	50	46	44	51	54	A	70	75	A					69	109	A	110	84	A	78	A
13	A	56	52	55	54	63	47	54	A	A	A	A	A	A	97	A	A	A		A	A	52	72	73
14	A	A	N	A	A	65	81	82	A	A				79	A	91	A	A	N	79	55	A	A	78
15	84	81	72	54	47	A	48	55	71	A	A	A	A	70	75	76	A	81	81	86	70	A	55	A
16	A	67	55	73	67	72	74	50	A	A	A	A	A	71	A	76	A	A	86	86	77	80	A	A
17		74	72	A	A	72	78	86	76	72	97	A	A	A	A	A	86	80	A	84	87	49	85	80
18	A	A	A	A	A	81	86	90	86		A		A		A	A	86	84	87	45	86	A	80	78
19	84	80	72	80	65	57	A	A	A	A	A	A			A	52	54	65	50		A	51	52	54
20	53	54	42	54	51	67	A	72	73	81	78	60	75	82	84	81	A	84	80	N	80	A	80	81
21	75	57	73	72	74	62	45	55	69	72	76	80	78	78	77	74	A	70	75	84	A	86	86	52
22	52	54	53	57	54	54	73	80	76	55	67	72	A	78	91	90	90	82	A	51	72	A	78	A
23	78	54	53	52	54	73	83	75	86		73	A	A	86	87	83	76	86	81	84	87	A	A	77
24	55	A	52	68	A	72	86	A	N	A	A	A	A	A	A	A	A	90	78	66	52	33	A	47
25	56	58	54	46	44	44	40	A	53	A	A	A		A	A	A	N		A	A	54	A	46	54
26	A	51	51	52	52	50	35		A	A	A	A	A	C	C	62	A	68	70	54	54	65	64	A
27	54	53	52	48	47	44	52	A	74	78	A	A	A			66	A	39	A	A	58	32	34	56
28	66	56	48	51	45	51	54	82	74	A	77	77	A	A			70	76	86	87	51	60	34	54
29	52	A	50	56	52	A	52		A	A	A			A	61	A	86	A	36	A	A	A	50	A
30	N	57	53	52	55	52		A		A	A		A		A	A	55	54	A	A	45	A	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	25	26	26	25	28	26	20	17	11				12	12	16	15	24	20	20	21	18	22	19
MED	54	56	54	54	54	56	64	74	74	72				77	78	77	78	79	76	82	72	58	77	69
U Q	72	66	62	57	59	66	74	82	77	78				80	88	85	86	85	81	86	82	78	80	78
L Q	52	52	52	51	48	51	51	54	70	68				69	73	70	69	69	57	64	53	51	55	54

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT AKITA

JUN. 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	30	48	61	64	61	54	53	56	97	54	111	55	59	80	86	52	92	56	33
2	36	32	50	58	45	34	53	56	58	86	73	52	50	50	73	48	57	49	41	50	49	110	114	48
3	G	23	G	31	G	35	50	67	61	60	52	G	G	G	G	44	88	46	48	43	36	36	26	G
4	29	28	24	30	G	34	49	51	75	62	88	140	70	G	54	44	42	G	38	37	47	27	26	23
5	34	36	31	G	33	36	44	61	66	79	61	51	73	57	55	74	132	117	65	90	180	83	144	61
6	92	G	G	30	27	37	47	59	79	60	58	51	61	G	50	49	50	40	37	93	92	40	29	29
7	G	G	30	27	G	G	G	49	56	69	60	C	51	G	49	G	G	G	35	G	62	47	28	45
8	35	39	33	38	31	G	43	58	63	64	55	50	51	50	49	84	92	94	62	38	45	38	74	73
9	108	44	29	40	38	41	40	63	85	58	53	50	59	58	82	51	170	40	35	29	26	126	90	51
10	G	37	92	84	60	44	40	56	54	53	55	68	G	52	G	61	90	86	78	125	58	60	75	91
11	G	G	G	28	G	35	G	G	50	50	52	66	57	74	48	49	83	72	50	60	58	49	37	42
12	92	93	36	G	G	G	G	49	61	62	74	96	114	112	119	102	66	103	150	44	59	109	57	58
13	84	54	109	44	43	40	40	46	70	50	55	96	55	74	83	117	70	116	115	142	84	49	46	37
14	84	60	59	78	79	58	50	79	107	92	102	112	108	86	53	86	126	96	92	52	39	133	85	73
15	60	72	30	30	57	67	53	49	64	86	73	74	73	78	58	54	72	57	54	29	29	57	58	58
16	90	133	90	56	40	39	51	61	76	88	132	150	185	148	50	73	73	68	38	49	40	110	109	62
17	106	40	91	77	59	50	57	57	68	74	85	137	150	128	85	170	46	53	61	41	115	52	32	52
18	134	74	84	103	126	52	G	60	74	90	80	133	108	101	122	94	74	74	43	42	G	133	53	58
19	37	49	51	40	29	45	45	54	53	66	55	49	G	G	53	50	46	44	44	125	111	60	58	41
20	24	30	36	30	G	37	60	51	59	68	55	G	G	46	52	50	74	51	43	43	57	92	34	G
21	32	26	G	52	G	G	G	51	57	58	52	78	59	52	51	53	55	42	34	30	44	28	33	30
22	G	G	G	G	G	29	G	41	52	46	G	G	49	G	48	48	42	54	54	G	48	91	54	58
23	43	41	50	48	37	56	44	47	73	116	50	146	72	56	115	78	61	73	49	44	37	47	91	70
24	52	91	52	55	60	40	45	88	95	88	53	52	92	95	91	96	116	G	50	40	40	39	50	26
25	58	33	24	G	G	G	G	53	54	58	54	51	G	77	72	106	91	148	97	92	46	64	58	48
26	84	38	30	30	28	G	44		57	53	49	51	52	G	G	G	53	G	G	40	33	28	29	57
27	41	44	30	35	G	29	37	108	58	54	51	91	51		G	G	84	50	117	55	56	31	40	32
28	32	30	G	32	G	29	G	43	50	66	52	176	55	98			61	73	44	32	84	41	40	28
29	37	56	43	41	41	50	51	91	150	150	138	141	136	124	78	62	55	73	51	50	57	108	50	48
30	38	40	57	31	29	41	93	147	85	55	50	117	100		55	50	51	73	60	49	30	109	84	73
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	29	30	30	30	29	30	28	29	29	30	30	30	30	30	30	30	30
MED	38	38	32	34	29	36	44	56	64	63	55	68	58	58	54	54	68	58	50	44	48	58	54	48
U 0	84	54	52	52	43	44	50	62	75	86	73	125	92	96	80	90	88	74	65	60	59	108	75	58
L 0	29	28	24	30	G	29	G	49	57	58	52	51	51	23	49	48	53	44	41	38	39	40	34	32

HOURLY VALUES OF FMIN AT AKITA

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT KOKUBUNJI

JUN. 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	66	62	56	50	52	62	73	82	76	68	A	A	A	77	81	91	105	102	84	73	74	78	80	71
2	76	63	56	56	55	63	74	87	78	76	A	A	73	82	80	78	83	92	86	83	78	A	56	77
3	73	62	51	56	56	57	61	A	85	75	A	65	76	88	90	86	82	77	A	77	80	A	67	73
4	70	67	61	63	62	66	67	66	A	70	A	90	76	92	98	101	84	81	81	84	A	79	80	68
5	72	73	66	55	56	62	62	66	85	80	A	76	A	A	77	80	A	82	80	84	79	70	80	81
6	73	75	74	67	65	70	82	73	86	A	82	67	A	78	76	76	82	85	91	87	85	75	78	77
7	72	65	67	70	61	56	62	68	75	A	A	A	70	77	79	88	93	90	82	78	A	77	66	73
8	76	74	70	61	51	57	62	77	77	A	A	51	A	A	67	A	88	100	82	91	80	A	73	A
9	70	54	68	62	66	60	66	A	A	A	A	A	A		45	51	62	67	70	71	68	63	60	55
10	60	A	58	A	55	55	50	56	A	69	65	A	A	45	68	70	67	65	72	79	80	60	66	68
11	63	A	61	51	52	61	63	47	45	A	A	A	A	A	A	94		86	63	A	A	50	60	58
12	58	57	A	49	A	43	53	52	57	61	A	A	A	A			74	74	77	84	87	82	78	81
13	56	71	58	62	64	61	67	68	A	A	54	63	68	72	A	A			87	70	70	66	68	70
14	45	66	A	A	51	58	80	86	A	A	78	82		75	72	81	82	86	85	84	76	68	72	69
15	77	82	A	73	63	66	69	71	81	A	A	A	71	76	A	85	88		91	83	A	76	72	78
16	72	71	72	76	77	73	76	78	76	A	69	A	80	76	78	82	80	84	90	90	86	78	78	78
17	80	80	A	56	50	68	78	91	77	98		A	52	A	80	88	87	84	86	85	87	93	90	86
18	75	68	71	72	64	72	88	94	86	A	101	A	84	88	92	92	94	92	94	87	88	77	86	83
19	74	77	77	80	78	73	A	62	71	A	A	A			61	64	A	54	66	A	A	A	54	64
20	A	72	76	71	53	56	70	72	78	87	87	66	78	87	92	92	91	102	98	86	54	71	77	A
21	73	71	72	76	70	66	61	73	73	74	78	A	A	80	80	80	84	86	84	88	96	90	73	73
22	73	60	62	63	A	70	76	81	68	70	70	75	81	83	94	96	A	91	86	73	78	81	80	78
23	74	75	63	55	55	61	71	78	82	75	A	76	81	92	A	A	92	93	A	90	86	54	77	A
24	A	73	67	67	71	72	82	90	88		A	73	78	80	A	78	87	102	87	57	A	54	54	54
25	55	52	56	51	46	44	39	A	A	A	53	79	A	A		A	67	70	61	64	63	60	A	56
26	59	55	52	51	47	50		33		69	A	70	45		69	74	74	78	77	70	69	54	63	N
27	52	51	50	A	47	50	62	72	82	76	83	71	70	69	56	73	71	81	85	78	67	68	75	70
28	71	60	54	52	50	51	67	87	77	60	71	73	67	67		66	73	84	86	86	69	54	54	62
29	58	58	52	68	54	52	60	55	A	A	A	61	60	70	75	73	91	85	76	56	60	62	61	66
30	66	54	56	60	58	55	64	A	A	A	A	A	A	A	45	A	A	56	A	A	48	A	51	48
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	26	27	28	30	28	26	21	15	12	16	17	20	22	24	24	28	27	27	24	25	29	26
MED	72	66	62	62	56	61	67	72	77	74	74	72	73	78	78	80	84	84	84	83	78	70	72	70
U Q	73	73	70	70	64	66	75	82	83	76	82	76	79	85	81	89	89	91	87	86	85	78	78	78
L Q	59	59	56	55	51	55	62	66	74	69	67	65	67	73	68	73	74	77	77	73	68	60	60	64

HOURLY VALUES OF FES AT KOKUBUNJI

JUN. 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	34	28	24	G	47	62	69	86	78	62	55	54	G	69	60	48	80	50	55	51	92	60
2	59	40	29	60	40	34	56	55	70	61	83	58	60	61	58	55	59	49	34	27	27	83	110	60
3	37	40	28	41	30	G	41	92	72	62	60	51	52	48	G	96	68	74	95	79	61	92	54	38
4	G	34	28	27	26	32	42	55	74	66	72	79	62	80	54	55	60	90	87	64	108	127	77	94
5	92	58	59	58	34	G	47	62	70	68	72	70	150	108	46	55	77	59	110	69	53	58	58	67
6	68	60	59	29	G	59	43	58	80	94	61	66	54	82	68	74	55	52	34	37	72	95	59	58
7	45	30	27	58	54	34	50	54	55	70	68	57	52	55	66	55	64	G	36	55	122	86	39	44
8	60	30	51	G	28	G	42	58	66	62	58	53	110	58	54	100	124	109	62	63	59	54	52	92
9	80	107	52	28	43	43	44	56	82	93	84	66	80	110	G	46	48	41	G	G	24	G	G	70
10	64	85	33	62	66	38	38	47	75	55	49	53	56	G	G	G	52	41	42	58	56	30	60	G
11	67	87	46	31	G	G	40	44	G	52	58	62	68	59	79	79	99	66	44	58	55	34	30	G
12	30	54	82	58	49	37	37	41	50	61	104	79	84	148	103	82	50	54	55	69	84	80	58	69
13	56	72	110	43	37	43	42	58	83	53	46	G	58	54	73	79	127	146	92	53	30	34	44	43
14	49	65	85	72	58	60	39	84	99	81	84	70	104	99	57	G	55	48	43	52	68	54	56	59
15	41	85	76	43	30	30	39	55	54	78	112	138	61	62	96	70	77	128	58	43	58	41	40	54
16	48	42	41	29	25	G	41	52	52	85	56	110	54	51	52	70	71	51	56	57	66	53	59	59
17	51	58	107	61	72	60	38	66	49	86	104	165	104	56	73	68	54	58	62	51	61	43	77	60
18	61	103	60	62	60	52	68	61	71	87	94	105	69	G	51	62	58	54	37	37	37	27	50	72
19	91	56	54	62	55	34	66	60	69	77	59	59	G	G	G	47	68	68	73	59	151	108	92	59
20	92	45	G	G	G	32	55	62	59	61	58	61	71	80	56	70	86	69	47	35	69	41	72	72
21	30	31	40	44	61	56	35	46	56	62	71	94	83	54	57	60	50	38	G	29	G	60	38	29
22	58	56	40	50	60	70	49	60	58	59	62	48	G	51	108	104	110	50	84	25	G	26	149	83
23	54	38	43	37	40	41	G	44	57	84	67	75	68	83	102	109	95	85	110	71	103	59	54	95
24	74	54	38	40	41	46	40	44	107	163	103	49	52	74	108	56	G	G	39	43	55	44	43	72
25	41	54	32	33	25	G	G	55	77	58	50	84	74	75	106	127	58	51	43	43	58	41	59	43
26	57	50	37	29	30	G		G	G	G	59	60	53	G	G	72	61	55	61	51	77	41	32	41
27	59	G	61	55	48	31	G	41	54	67	72	G	G	46	G	G	G	58	44	55	40	32	37	30
28	34	37	38	48	31	G	G	G	48	53	47	G	48	G		G	G	44	44	40	45	38	56	56
29	56	40	30	34	28	35	43	56	66	61	56	51	64	66	G	45	58	58	52	26	28	73	40	61
30	52	41	26	24	44	46	54	133	82	104	80	104	48	53	G	50	59	64	51	53	59	58	33	54
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30
MED	56	52	40	42	38	34	42	56	68	66	68	62	60	57	56	65	60	54	52	52	58	52	55	59
U Q	64	60	59	58	54	46	48	61	75	85	83	79	74	80	76	79	77	68	73	58	69	73	60	70
L Q	41	38	32	29	28	G	38	46	54	61	58	53	52	51	G	50	54	48	42	37	40	38	40	43

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT KOKUBUNJI

JUN. 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	15	14	15	15	15	16	16	15	17	32	21	32	32	30	26	18	17	15	15	15	17	15	16	14
2	15	14	14	14	14	15	15	15	18	21	21	34	36	35	30	17	16	15	15	16	15	15	15	15
3	15	14	14	15	14	23	15	15	16	17	34	33	32	26	51	20	17	16	14	14	14	14	15	15
4	15	14	14	15	15	16	17	16	16	20	28	36	34	23	22	17	16	17	15	15	14	14	15	14
5	15	14	14	14	14	15	16	16	21	20	22	34	32	29	27	20	17	15	16	14	16	15	14	15
6	15	14	14	14	15	15	15	15	17	22	26	35	35	36	20	20	17	16	16	14	16	15	15	14
7	14	14	14	14	14	16	16	18	18	23	21	40	35	32	21	22	17	16	16	15	16	14	15	15
8	15	15	14	14	14	15	16	17	18	20	23	33	23	33	23	20	16	16	17	17	15	15	14	14
9	14	15	14	14	14	15	18	16	18	20	34	28	36	38	34	17	17	17	15	17	15	15	15	15
10	15	14	15	15	14	14	16	15	18	20	35	38	35	36	26	23	18	14	17	15	15	14	15	15
11	15	14	15	14	14	17	17	17	18	24	28	36	32	23	30	17	17	15	14	14	15	14	15	16
12	14	15	14	14	15	15	16	15	16	20	22	39	39	37	35	20	17	16	16	15	15	15	15	14
13	15	15	14	14	14	15	16	15	18	18	21	30	30	30	27	22	17	17	16	14	15	15	15	15
14	15	14	14	15	14	14	17	17	18	21	26	29	39	43	22	21	17	15	16	15	15	14	14	15
15	14	14	14	14	14	17	17	17	21	29	24	32	21	30	35	20	16	16	17	15	14	15	15	15
16	15	15	15	15	15	14	18	16	16	20	36	34	35	36	22	23	17	14	15	16	15	15	15	14
17	15	15	15	14	14	15	16	17	17	18	29	30	39	38	21	22	18	16	15	17	15	14	15	14
18	15	14	14	15	14	15	17	16	16	18	28	29	29	30	26	18	16	15	16	14	15	15	15	16
19	15	15	15	16	15	17	16	17	20	21	20	36	33		30	20	18	16	16	15	15	15	15	15
20	15	14	16	14	15	20	16	16	17	27	20	28	23	27	21	20	21	16	14	15	14	14	14	15
21	15	14	15	15	14	16	16	16	17	20	22	32	34	34	32	22	17	16	16	16	14	14	15	14
22	15	15	15	14	14	15	16	16	16	33	35	33	32	32	24	27	18	15	14	18	15	16	15	16
23	15	14	14	14	14	15	16	16	20	30	33	32	33	30	33	21	18	16	15	15	15	15	15	16
24	15	14	15	14	15	15	16	18	18	24	29	32	30	32	32	26	21	16	18	15	16	14	15	15
25	15	14	16	14	15	16	18	16	20	28	30	34	34	34	33	33	32	20	17	15	15	15	15	15
26	15	14	15	14	14	24		40		34	39	39	39		50	24	20	16	16	15	15	15	15	14
27	15	17	15	18	14	17	17	16	23	27	29	33	34	33	49	26	20	15	16	15	15	15	15	15
28	15	14	15	14	15	20	15	17	17	21	32	36	40	54			43	23	17	14	15	14	15	14
29	15	14	14	15	14	16	16	16	18	29	34	34	33	23	23	24	21	16	15	14	15	14	14	14
30	15	14	15	16	14	14	17	15	18	23	27	23	36	27		34	17	15	16	15	14	16	14	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	30	29	30	30	30	30	28	28	29	30	30	30	30	30	30	30	30
MED	15	14	14	14	14	15	16	16	18	21	28	33	34	32	27	21	17	16	16	15	15	15	15	15
U Q	15	15	15	15	15	17	17	17	18	27	33	36	36	36	33	23	18	16	16	15	15	15	15	15
L Q	15	14	14	14	14	15	16	15	17	20	22	32	32	29	22	20	17	15	15	14	15	14	15	14

HOURLY VALUES OF FOF2 AT YAMAGAWA

JUN. 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	78	72	63	54	50	50	66		67	A	A	A	A	A	102	104	108	118	96	80	76		84	78
2	77		84	78	64	63	80		90		66	74	86		91	101	108		87	91	86	80		83
3	A	86	77	67	57	61	63	70	82		54		81	95	95		91	A	82	75	77	78	71	
4	77	78	52	68		61		64	68	67		A	85	97	104	105	A	99	N	A	87	79	A	84
5	77	87	66	67	66		63	70	81	78	70	A		80	87	91	93	97	98		86	86		85
6		84	84	86	76	72		89	A	A		A		81		91	102	105	100	90	83	78	76	80
7	77		68		50		52		77		84		74	A	A	103	107	105	106		90	82		85
8	87	88	77			53		76	81		74	80		91	85	91		81	87	87	76	75	78	73
9	A	78	A	80	70	61		A	A	68	A		A			51	66		75	76	74	A	64	
10	66		84			46		62	73	A	A	A	63		77	85	85	83	86		86	75		67
11		85		A	52	A		78		78		70		85	91	94	102	97		67			52	63
12	64		A	54	43	A	A		52	63	68	62		77	82	A		74	81		90		75	A
13	72	80	72	78	82	72	A		A	79	A	A		81	78	74	76	70		78		73		69
14		76	73	72	66		81	87	61	A	77			82	85	97	104		87		73		81	81
15	83	82	79	81	76		56	74		A	A	80					A	106		84		81		87
16	90		86			73		82	71	70	A	A	85		104	102	103	108	108	102	90		91	87
17	77		83		66		69	76	76	71		69		78	90	97	94	101	99	87	97	88	91	80
18	78	A			59	65	72	86	84	A	A		90	96	98	100	104	99		101	90	87	90	102
19		87		74	73			68		91	A	A	63	63	71		111		79	66		61	71	A
20	A	54			A	A	54	70	85	86	84		82	94	99	101		116	117	96	83	75	77	82
21		77		77	66		68	68		80	A	74	82	88	91	98	110		105	105	110		78	73
22	77	77		75	78	78	80	76	64	73		75		88	104	111	112	111	110	90	90	86	82	
23	78			75		50	60		73	A	A	A	85	94	92	96	97	104	111	100		81	86	86
24	81	83		81	84		77	77	84	87	74	A	A	106	77	96	112	105	96	A	A	61		72
25		77		53	A		55	77	63	A	72	A	A	A	A	N	A	A	72	67	57	76	62	68
26	67	66		56	52	48	A	62		78	72	62	72	64		85	86	A	A	78	A	77	77	80
27	73	51		52	51	45	51	70	73	78	74	71	85	81	75	85	98	100	87	78	72	66	67	73
28	75	66	60	54	51	53			76	61	63	68	84	81				91	86	88	66	54	61	66
29	63	54	61		55	51		54	62	58	A	A		73	85		97	90	79	66	A	83	63	A
30	A	A		63	63		54	41			A	A	A	60	A	60	67		53	53	A	A	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	21	16	21	23	17	17	22	21	17	13	11	14	22	22	23	23	21	24	23	21	22	21	23
MED	77	78	75	72	64	61	63	72	73	78	72	71	83	82	90	96	102	100	87	84	86	78	77	80
U Q	78	84	83	78	73	68	74	77	81	79	75	75	85	94	98	101	108	105	102	91	90	82	83	85
L Q	72	69	64	55	52	50	54	68	65	67	67	68	74	78	82	85	91	90	81	75	75	75	65	72

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT YAMAGAWA

JUN. 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	23	24	G	G	G	G	32		54	87	124	117	98	92	G	G	54	G	53	62	G		37	G
2	52		90	33	30	24	38		71		63	63	62	G	69	52	63		G	52	32	31		84
3	91	91	46	31	G	G	35	49	72		54		G	55	58		G	149	91	132	111	91	79	
4	28	30	G	24		G		49	66	67		70	G	G	67	G	160	76	94	145	49	82	136	83
5	69	58	59	40	32		58	46	60	71	59	90		50	64	G	G	G	48		30	25		61
6		93	80	56	80	70		96	95	92	116	94		69		50	76	G	79	66	44	83	45	93
7	48		37		30		40		61		76		94	92	104	76	G	G	56		41	28		93
8	91	24	27			34		47	70		61	65	G	65	59	51		50	47	G	31	37	44	33
9	94	114	110	57	36	25		66	56	77	96	172	145			G	45		G	32	82	43	56	
10	G		114			32		58	66	152	86	74	51		75	66	51	G	G		32	32		24
11		G		78	61	59		48		67		66		62	47	53	70	74		55			24	34
12	31		93	90	59	72	70		G	44	52	52		65	61	83		41	34		59		60	58
13	60	54	38	40	23	40	92		98	128	144	142	G	G	54	84	57	42		31		G		26
14		27	40	34	41		32	39	53	79	G	141	80	54	59	67	G		40		40		24	G
15	26	69	72	77	40		33	50		129	116	75		118	143	126	110	89		72		92		48
16	58		59			39		60	69	90	99	129	82		72	G	63	61	74	84	36		111	44
17	38		78		43		54	53	54	50		63		73	59	G	71	133	128	91	58	G	25	70
18	84	95			59	65	36	66	82	92	100		74	74	75	53	61	69		64	44	33	G	65
19		40		45	41			59		100	82	90	55	67	54		119		114	43		26	132	89
20	84	87			70	55	52	61	56	G	76		83	85	G	78		62	94	64	63	67	50	54
21		51		31	31		44	50		78	125	64	71	66	58	65	78		71	G	26	G	33	37
22	46	40		34	30	G	G	55	52	82		82		72	G	74	G	66	G	71	G	30	26	
23	92			91		38	G		50	83	71	92	65	G	71	G	66	G	G	36		34	59	67
24	58	30		31	49		30	49	50	55	58	139	174	131	G	G	46	42	50	76	94	61		58
25		54		37	44		G	46	53	63	50	120	75	92	119	94	106	109	69	47	36	44	32	48
26	48	57		59	45	46	58	G		55	G	53	G	G		72	76	146	136	86	77	50	47	58
27	58	58		31	34	28	45	52	46	48	48	G	G	54	G	G	G	G	39	32	G	G	46	40
28	26	40	25	32	G	G			50	50	51	G	G	G				53	45	G	40	34	48	40
29	38	50	44		55	38		G	40	50	78	73		93	61		64	96	151	58	87	91	58	114
30	93	90		46	25		30	44			62	64	79	71	51	G	50		47	48	48	40	54	58
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	23	18	22	25	20	20	23	24	25	26	26	22	27	26	26	26	24	26	25	25	25	23	27
MED	55	54	52	38	40	36	37	50	56	77	74	74	68	66	59	52	62	57	52	58	41	34	47	58
U Q	84	87	80	57	52	50	53	59	69	91	99	117	82	85	71	74	76	82	91	74	61	64	59	70
L Q	34	30	37	31	30	12	31	46	51	52	54	64	G	50	51	G	45	G	39	34	31	27	32	37

HOURLY VALUES OF FMIN AT YAMAGAWA

JUN. 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	15		17	30	34	34	34	32		36	22		16	16	15		15	15
2	15		15	15	15	15	15		17		24	36	35		34	32	32			15	15	15		15
3	15	15	15	15	15	15	15	15	17		26		33	33	32		20	17	15	15	15	15	14	
4	15	15	16	15		15		15	17	18		34	27	33	30			16	16	15	15	15		15
5	15	15	15	16	15		17	16	17	17	35	34		42	38	35	21		15		15	15		15
6		16	15	15	15	15		16		21	35	39		38		34	18		16	16	15	16	15	15
7	15		15		17		17		18		39		37	37	36	34	18		17		15	15		15
8	15	15	15			15		17	18		24	33		35	36	35		18	16		15	15	15	15
9	15	15		15	15	15		16	17	23	35		39				20		16	15	15	15	15	
10	15		16			15		15	16	23	23	33	36		34	30	24	18	15		15	15		15
11		15		15	15	15		16		23		33		38	33	30	23	17		15			16	16
12	15		15	15	15	15	15		16	22	38			39	39	35		18	15		15		15	15
13	15	15	15	15	15	15	16		18	20		35		55	40	36	35	18		15		15		16
14		15	15	15	15		15	16	18	23	42	36	39	40	39	38	22		15		15		15	16
15	15	15	15	15	15		17	17		24	33	40		42		38	33	17		15		15		15
16	15		15			15		16	21	23	35	35	38		38		22	18	15	15	15		15	15
17	15		15		15		15	17	18	22		39		39	42		20	17	16	15	15		16	16
18	15	15			15	15	15	16	21	36	34		40	39	36	36	20	17		15	15	15		15
19		15		15	15			15		21	35	38	39	36	36		30		16	15		15	15	15
20	15	15			15	15	15	16	20		34		35	37		34		17	15	15	15	15	15	15
21		15		15	15		17	16		26	26	35	35	35	36	28	24		15		17		15	15
22	15	15		15	15	15	15	16	17	22		35		35		34		18		15		15	15	
23	15			15		15	15		20	23	34	36	38		30		20			15		15	15	15
24	15	15		15	15		15	15	17	24	35		35	35		53	23	18	15	15		15		15
25		15		15	15		16	17	23	34	35		34	35	38	35	36		16	15	15	15	15	15
26	15	15		15	15	15	23	36		39	38	36	36			36	35	17	15	15	15	15	15	15
27	15	15		14	15	15	15	15	26	24	33	48	54	35	50	53		17	16	15	15	16	15	15
28	15	15	15	15	15	15			17	23	36	39	55	54				32	20		15	15	15	15
29	15	15	15		15	15		17	20	35	29	39		38	38		22	17	16	15		15	15	
30	15	15		15	15		16	15			35	36	36	38	36		21		15	15	15	15	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	23	17	22	25	20	20	23	23	24	25	22	20	24	21	20	23	18	23	22	22	23	21	26
MED	15	15	15	15	15	15	15	16	18	23	35	36	36	38	36	35	22	17	16	15	15	15	15	15
U Q	15	15	15	15	15	15	16	17	20	25	35	39	39	39	38	36	30	18	16	15	15	15	15	15
L Q	15	15	15	15	15	15	15	15	17	22	31	34	35	35	34	34	20	17	15	15	15	15	15	15

HOURLY VALUES OF FOF2 AT OKINAWA

JUN. 1992

LAT. 26.3N LON. 127.8E 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	86	87	80	54	50	46	54	66	58		67		81	97	105	112	A	129	90	A	A	79	70	84
2	84	A	A	73	A	A	62	78	76	68	A	74	79	91	96	111	117	110	78	90	85	45	A	78
3	55	84	78	66	72	70	62	72	72	A	58	A	79	101	91	108	94	A	86	86	78	A	A	A
4	A	A	66	66	54	30	A	55	A	A	A	A	A	A	104	108	116	N	A	68	84	A	56	A
5	73	A	67	A	53	38	61	74	A	A	A	A		78	87	90	98	109	102	A	A	85	84	A
6	A	78	67	71	54	52	53	83	86	77	A	A	A	A	83	93	A	A	A	A	A	A	A	A
7	78	A	66	60	52	32	52	80	A	A	A	A	A	A	A	A	A	123	79	101	86	84	78	A
8	76	83	A	72	51	46	52	62	66	A	A	C	C	A	96	101	86	94	A	90	84	38	72	78
9	70	62	A	55	54	32	37	A	A	A	A					61	A	77	83	85	74	67	66	66
10	73	73	72	54	A	A	A	A	73	78	78	A	81	A	A	91	106	104	104	90	85	80	65	66
11	76	79	66	52	43	34	45	70	90	A	A	81	102	111	118	122	111	108	108	87	86	44	62	66
12	62	30	60	55	26	A	44	A	63	65	74	76	75	90	87	91	86	82	86	A	77	A	A	78
13	80	78	86	86	84	78	78	62	51	64	62	75	90	94	95	96	85	A	86	86	A	78	71	77
14	80	78	53	66	72	72	81	59	66	74	76	73	87	91	95	104	105	103	91	81	80	76	77	86
15	87	86	83	66	77	A	62	73	80	A	75	83	103	108	113	118	111	A	A	80	A	78	86	86
16	56	90	87	87	85	80	90	85	72	72	A	78	A	106	110	102	121	111	107	111	90	90	89	108
17	108	103	86	80	66	66	76	78	75	70	77	A	74	81	94	94	102	104	107	90	87	84	A	83
18	84	A	A	A	63	A	66	81	77	A	A	A	95	102	109	111	112	136	137	109	105	86	87	85
19	84	110	87	87	78	33	A	50	80	66	A	A	82	71	85	85	A	85	83	A	A	A	54	55
20	54	66	80	A	A	32	52	66	84	74	68	80	A	89	A	105	111	120	111	90	62	A	66	66
21	71	74	66	32	58	52	66	74	75	78	80	A	A	91	101	A	N	120	111	130	138	90	78	78
22	80	78	52	75	74	67	62	66	70	66	A	A	95	107	111	136	141	146	154	145	129	109	86	87
23	84	86	86	66	66	A	56	66	75	77	A	A	87	91	104	100	104	110	110	88	84	86	86	81
24	72	82	77	76	78	72	66	85	86	87	70	61	84		95	98	112	105	91	66	A	39	A	A
25	A	52	52	A	34	26	52	76	63	A	75	60	73	90	90	100	108	95	85	79	85	83	78	74
26	78	77	66	A	A	43	54	64	A	A	76	70	A	71	82	88	92	87	83	82	80	71	66	66
27	66	72	66	61	30	44	52	60	70	76	77	77	87	86	95	105	112	111	105	84	83	67	66	62
28	73	75	61	54	52	44	58	66	66	70	57	73	90	91		80	94	95	86	78	74	54	34	52
29	66	54	59	67	60	43	50	59	62		A	66	83	95	95	105	95	101	90	78	72	A	37	66
30	62	A	66	A	63	61	38	42	A	A	A	A	A	59	A	A	71	41	34	53	53	36	43	40
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	24	26	24	26	24	27	27	24	16	15	14	19	23	24	27	24	25	26	25	23	23	24	24
MED	76	78	66	66	59	45	56	66	72	73	75	74	84	91	95	101	106	105	90	86	84	78	70	78
U Q	84	85	80	74	72	66	66	78	78	77	77	78	90	101	104	108	112	115	107	90	86	85	81	83
L Q	66	72	66	55	52	33	52	62	66	67	67	70	79	86	90	91	94	94	85	79	77	54	63	66

HOURLY VALUES OF FES AT OKINAWA

JUN. 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	36	40	38	G	G	G	29	G	40	G	G	G	G	G	55	96	106	71	83	91	84	36	24	G
2	31	40	58	51	60	50	39	51	64	75	73	70	68	72	92	117	114	83	125	59	54	39	37	26
3	24	54	50	38	40	40	32	49	66	88	73	63	67	65	57	78	58	114	51	28	38	40	108	81
4	58	90	G	59	37	34	54	53	76	70	88	114	84	184	145	105	53	52	150	70	25	94	83	90
5	37	58	59	65	38	30	52	67	91	92	178	76	G	G	58	52	50	48	59	108	93	69	38	38
6	34	33	24	G	G	G	39	45	66	81	102	152	120	84	77	54	96	122	97	96	80	58	65	80
7	36	40	38	35	28	G	32	56	116	179	96	107	122	82	166	171	150	145	85	54	78	40	48	34
8	70	38	91	54	40	36	38	39	67	62	153	C	C	174	84	72	83	86	152	59	51	40	40	39
9	57	53	68	39	36	32	38	49	58	71	154					G	58	92	66	36	40	34	32	25
10	G	30	G	G	70	61	58	107	70	70	103	96	79	94	86	48	49	50	56	42	48	39	32	29
11	G	G	G	G	G	58	39	45	67	88	91	66	67	64	62	55	52	G	46	65	57	32	39	G
12	G	29	G	41	38	49	40	70	48	G	49	52	58	57	62	60	62	79	85	110	84	91	82	48
13	43	33	32	28	29	23	33	37	50	44	G	G	61	G	67	56	85	94	62	71	87	40	28	32
14	28	24	23	G	G	G	28	40	40	58	59	G	57	57	56	51	G	45	40	31	26	G	58	G
15	G	G	G	44	36	107	38	47	57	84	78	60	58	64	74	84	106	116	94	60	113	33	50	38
16	58	58	67	43	G	27	49	78	64	68	115	94	89	96	61	94	60	58	63	38	38	46	56	84
17	38	54	33	44	41	40	40	68	48	63	57	69	G	60	68	84	66	50	60	39	48	33	72	G
18	G	90	67	82	92	66	40	35	58	111	84	95	66	73	68	61	55	76	96	94	113	42	34	44
19	46	91	59	49	49	69	113	94	144	103	111	104	85	55	53	101	103	61	76	152	56	40	38	40
20	58	57	32	44	58	G	46	59	59	78	78	84	107	88	108	58	56	54	59	61	45	48	58	36
21	59	58	30	40	58	36	41	39	54	72	79	115	88	88	86	89	89	97	147	91	84	58	58	33
22	33	32	23	28	G	G	G	40	48	58	89	90	98	84	92	111	114	114	91	71	69	40	34	28
23	24	33	68	60	66	65	29	48	79	55	87	102	74	51	50	49	G	G	40	42	33	28	49	33
24	34	38	29	23	G	G	28	39	46	75	60	57	75		72	G	46	49	44	36	40	32	49	45
25	72	59	53	39	28	G	30	38	56	80	66	80	66	79	G	81	71	72	59	39	47	34	29	40
26	83	45	58	60	47	60	60	42	82	74	97	51	68	G	G	49	51	45	39	35	28	28	38	39
27	59	58	59	41	26	27	G	G	40	50	G	47	55	55	55	52	45	40	G	G	G	G	G	G
28	43	40	36	33	31	30	G	35	42	50	52	G	G	G		G	58	G	49	45	41	33	41	48
29	40	41	39	44	32	34	60	49	48		78	60	71	51	56	56	58	52	44	43	56	48	32	58
30	84	80	32	65	50	33	41	46	110	63	80	90	62	94	60	65	62	47	40	36	30	24	27	24
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	29	30	28	28	28	28	30	30	30	30	30	30	30	30	30
MED	38	40	37	41	36	34	39	46	58	71	80	73	68	64	64	60	59	60	61	56	50	40	40	37
U Q	58	58	59	51	49	50	46	56	70	82	97	95	84	86	85	89	89	92	91	71	80	46	58	45
L Q	28	33	24	28	26	G	30	39	48	58	60	54	58	53	56	52	52	48	46	38	38	33	32	26

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT OKINAWA

JUN. 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	15	15	15	16	15	15	16	16	17	35	24			55	45	35	22	18	18	15	16	15	17	16
2	17	15	16	15	16	16	15	16	17	20	34	40	46	36	32	22	20	17	17	15	15	15	15	17
3	15	15	16	15	15	15	15	16	17	24	34	33	34	43	46	44	24	18	16	15	15	16	15	15
4	15	15	15	15	15	15	16	17	20	21	23	28	34	35	32	33	21	18	16	15	15	15	15	16
5	15	16	15	15	15	15	16	16	21	22	32	33			46	40	22	20	18	16	15	16	15	15
6	15	15	20	16	16	15	15	15	17	21	35	43	32	45	35	28	21	22	16	15	15	15	15	15
7	15	15	16	16	15	17	17	17	18	27	27	59	48	42	44	23	32	21	16	16	16	15	15	15
8	15	15	15	15	15	15	16	17	16	21	29	C	C	45	46	42	24	17	18	16	16	16	15	15
9	15	15	15	15	15	15	15	17	20	23	53					29	32	15	15	14	16	15	15	15
10	15	15	15	16	15	15	15	18	17	22	29	30	33	32	30	28	24	16	15	15	15	15	16	16
11	16	15	15	15	15	14	15	15	16	24	27	29	32	32	29	28	23	17	16	15	15	15	16	15
12	15	15	15	14	15	15	15	16	17	21	26	28	29	38	28	28	22	15	15	15	15	15	15	15
13	15	14	14	15	15	15	14	15	20	22	27	27	29	52	39	27	23	20	15	15	15	15	15	15
14	15	16	15	15	15	15	15	14	16	26	24	45	27	27	27	26	21	17	14	15	15	15	16	15
15	15	18	15	15	15	14	15	16	20	23	27	29	28	27	29	28	26	24	14	15	15	15	15	15
16	15	15	14	15	15	14	15	15	16	23	27	29	28	38	27	27	24	15	15	15	15	15	15	15
17	15	15	15	15	15	15	15	16	15	22	23	27	29	39	28	38	32	18	16	15	15	15	15	15
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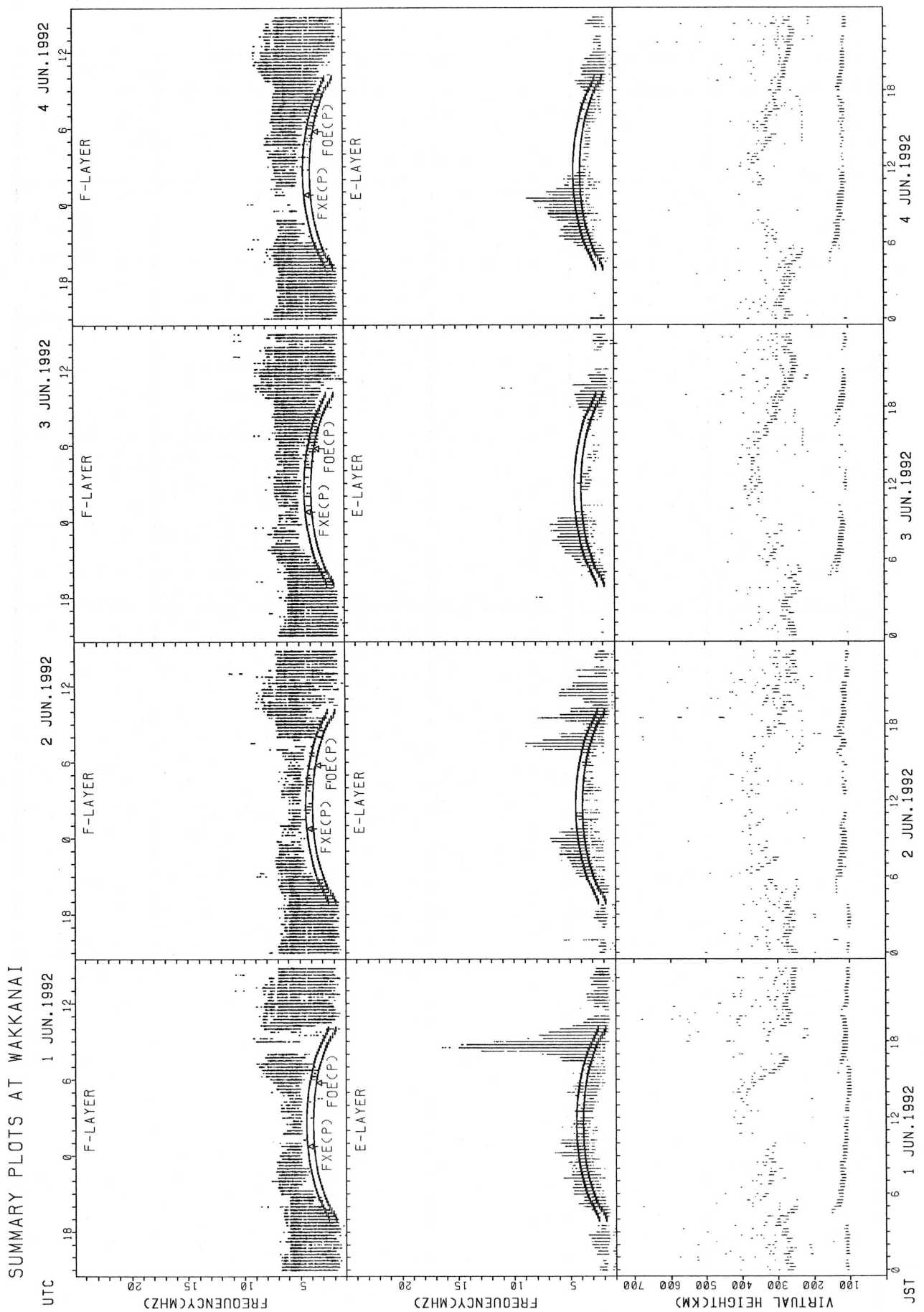
COMMUNICATIONS RESEARCH LABORATORY, JAPAN


SUMMARY PLOTS AT WAKKANAI
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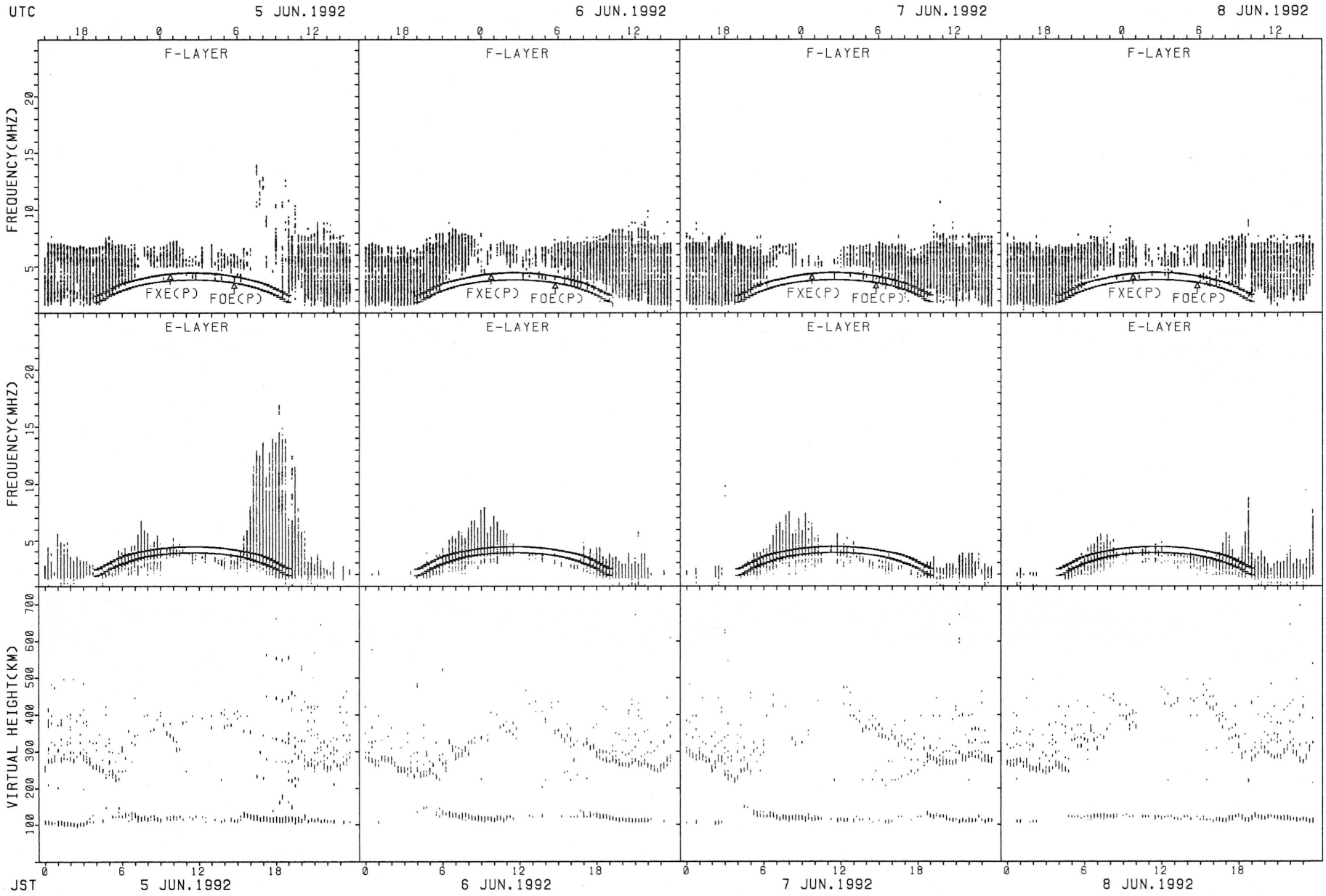
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT WAKKANAI



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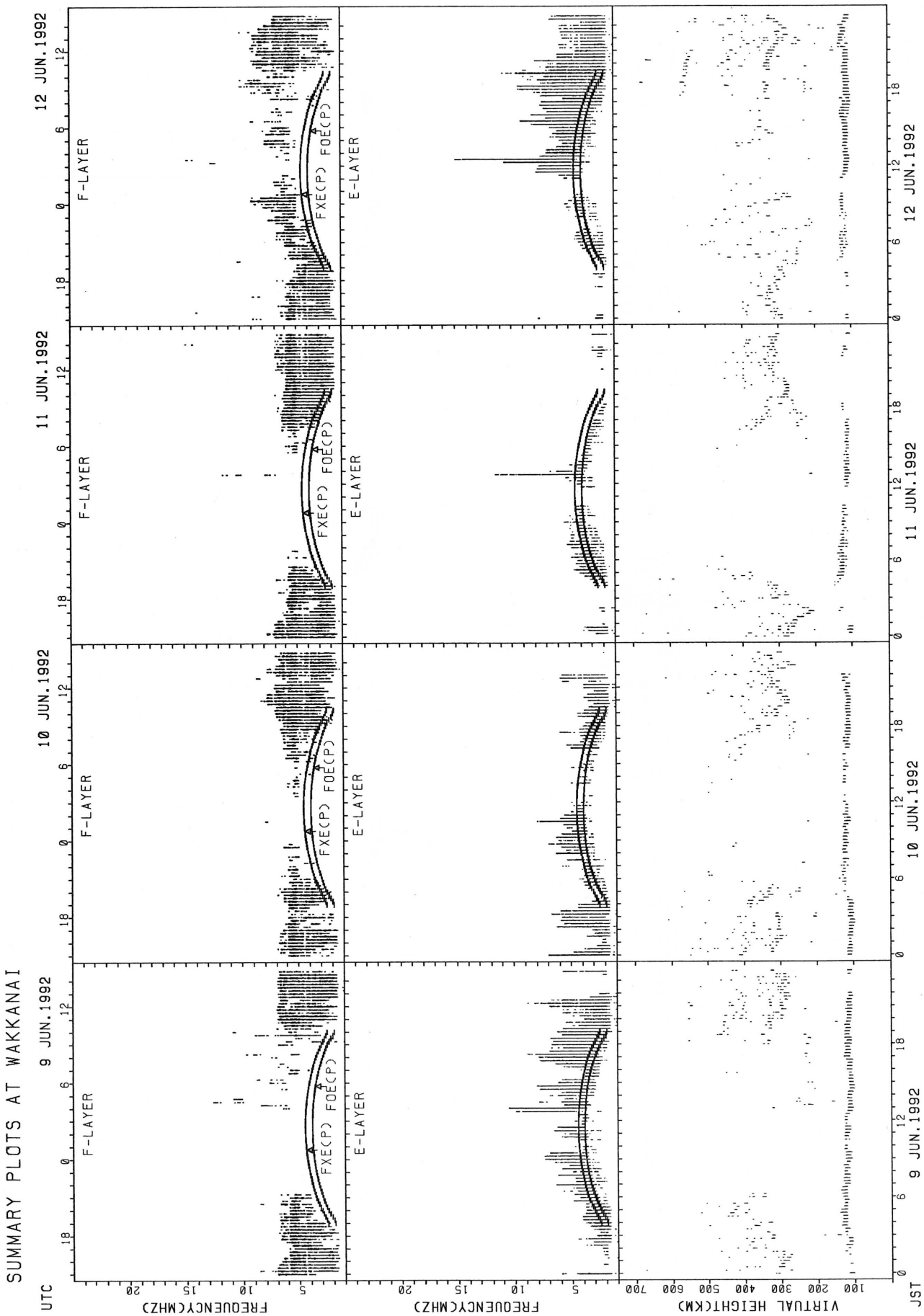
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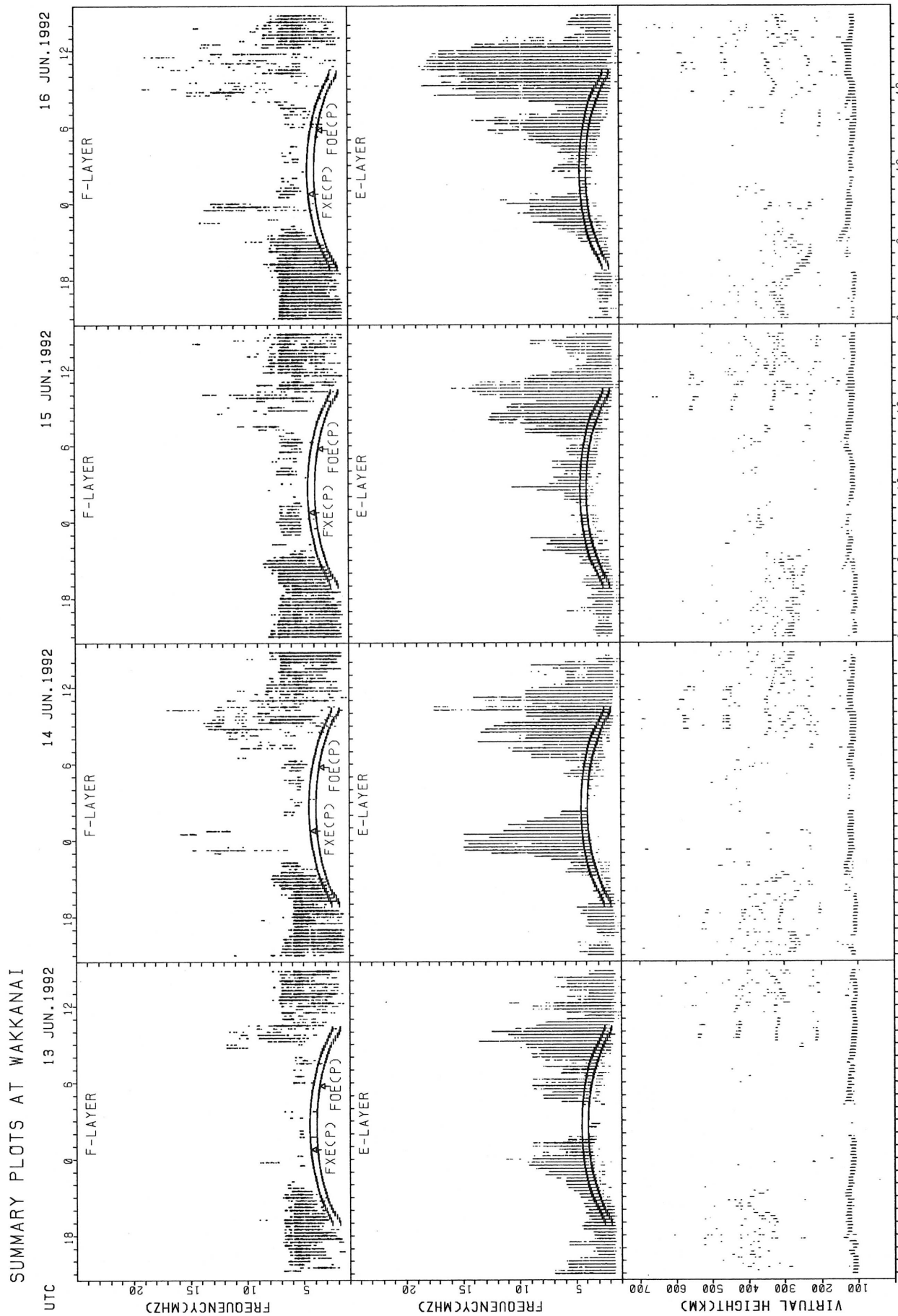
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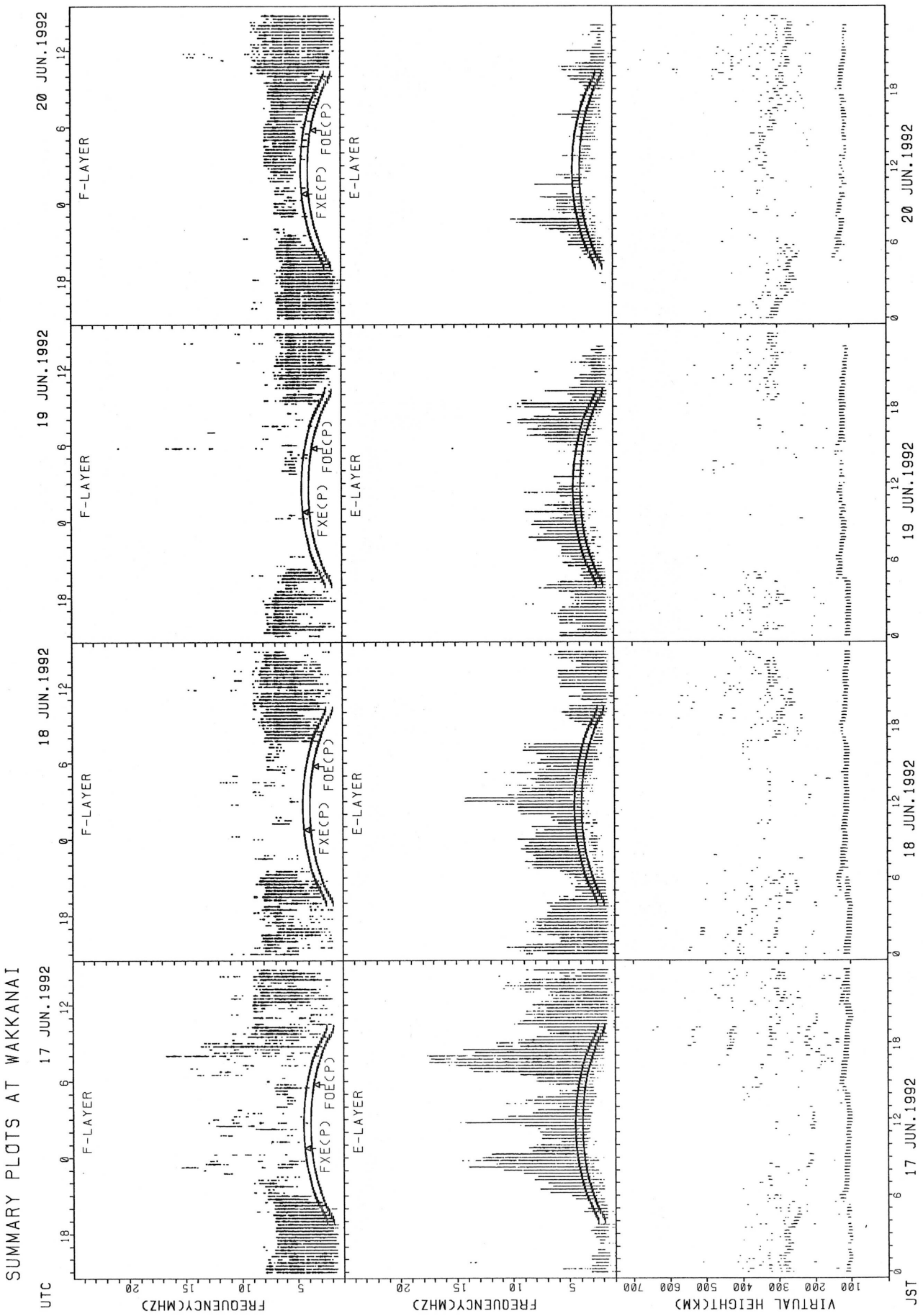
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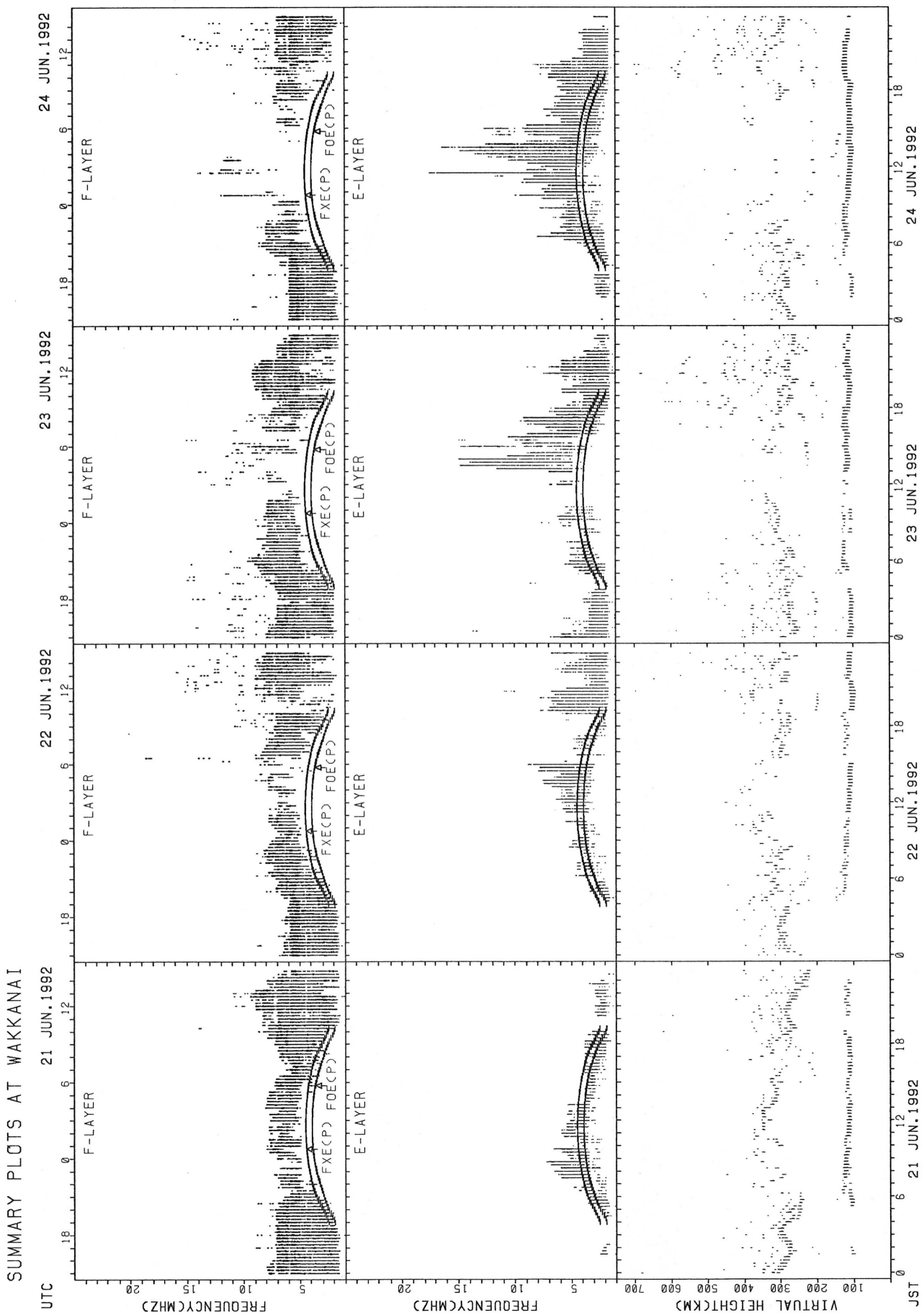
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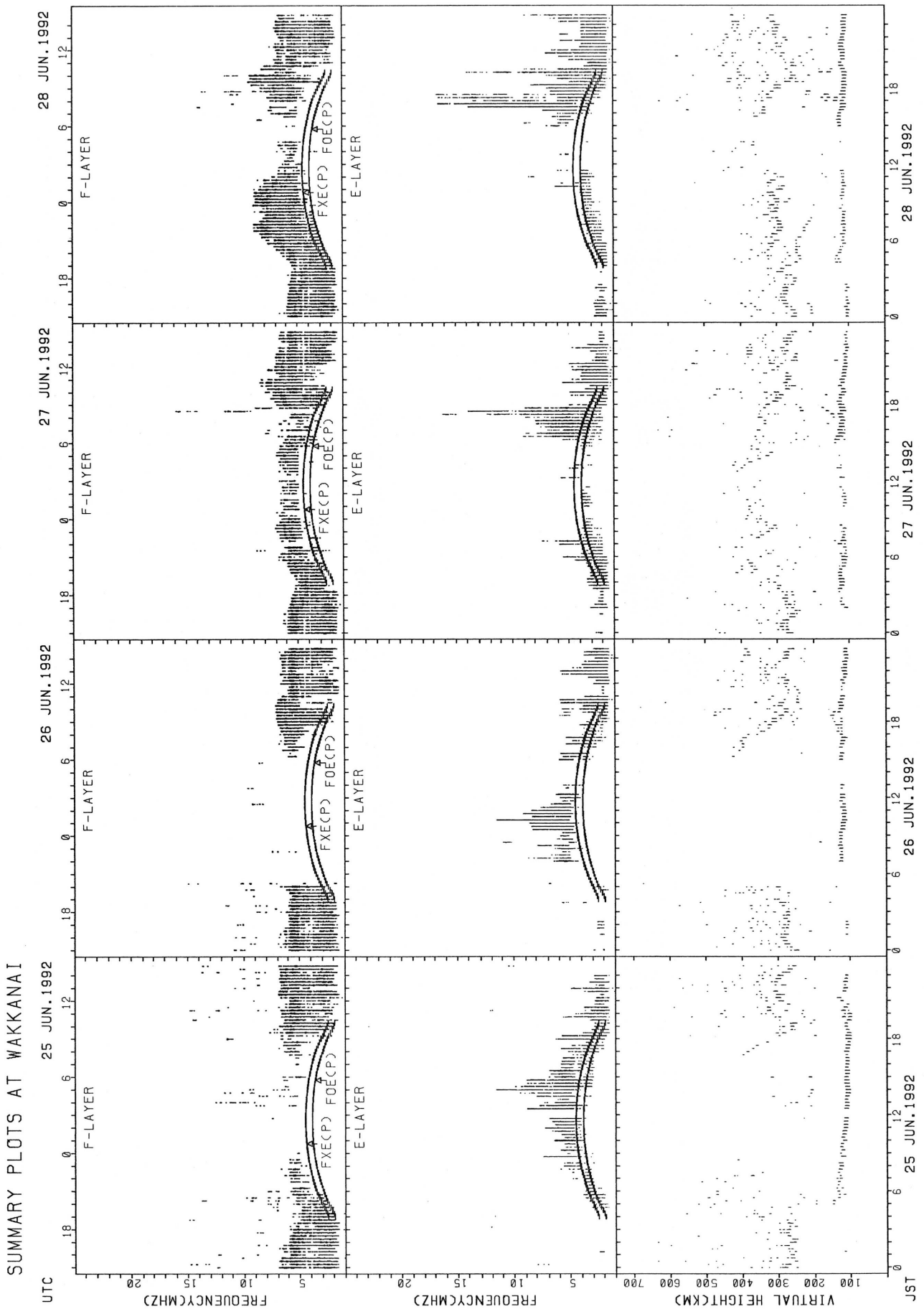
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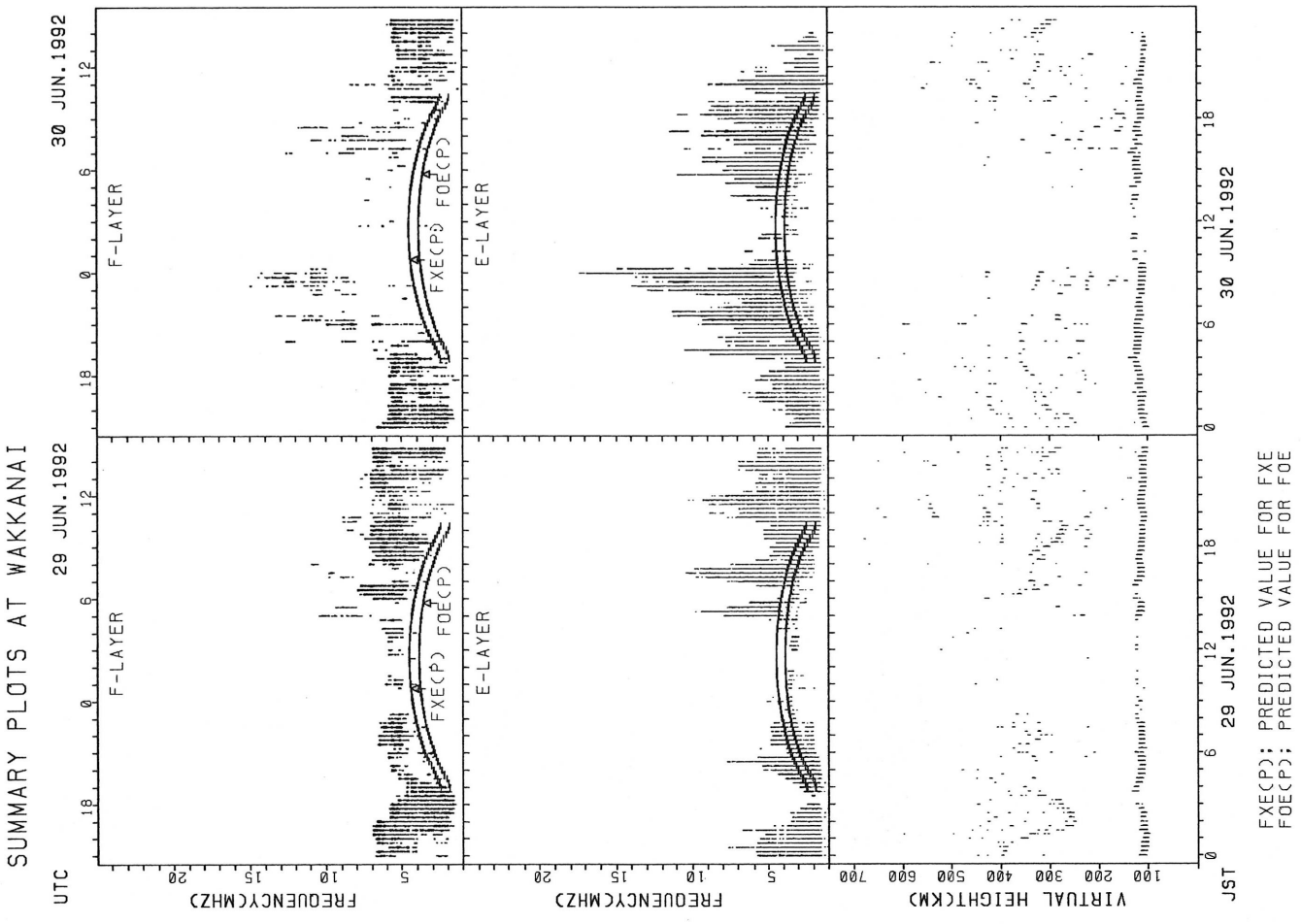
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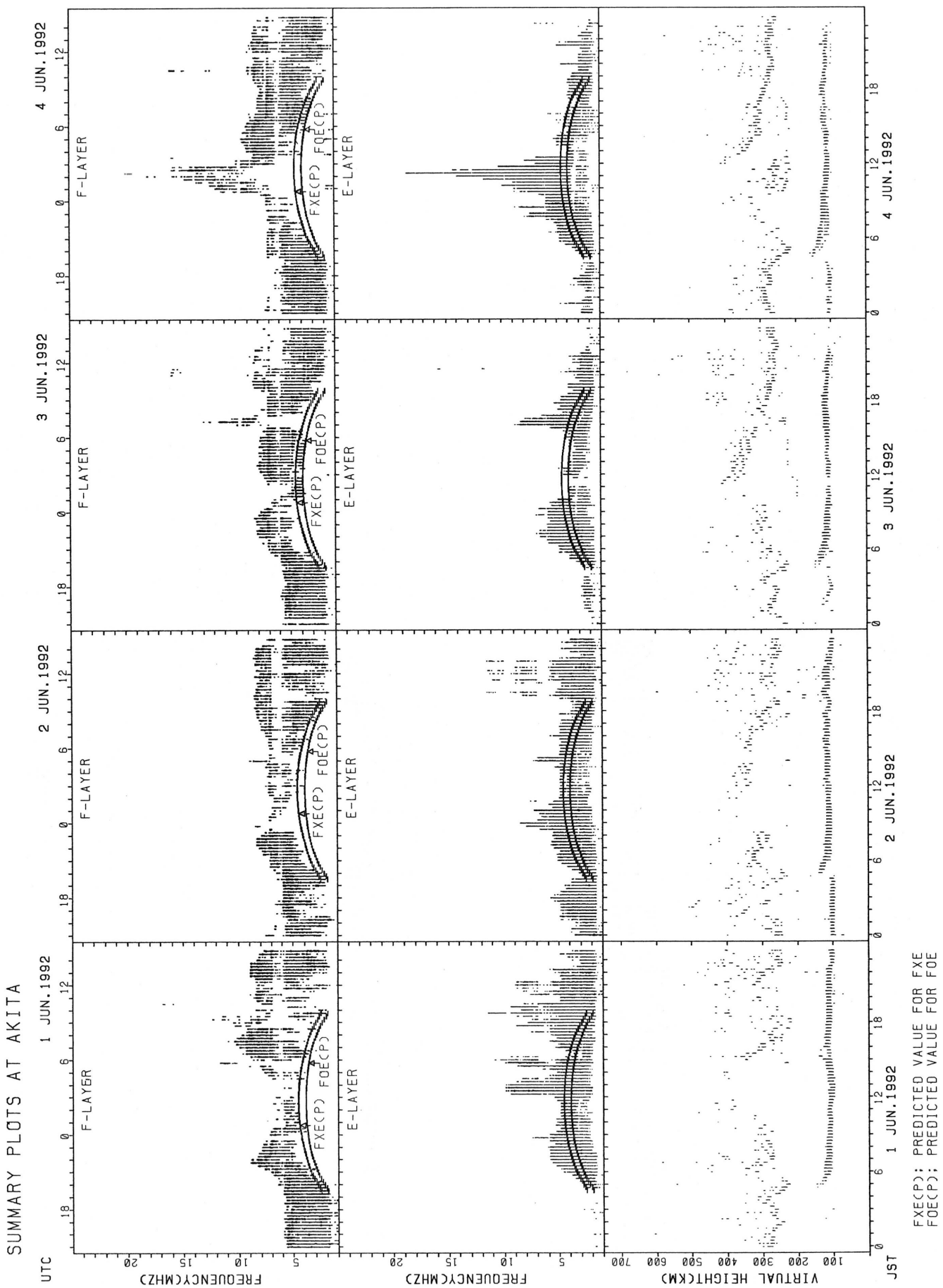
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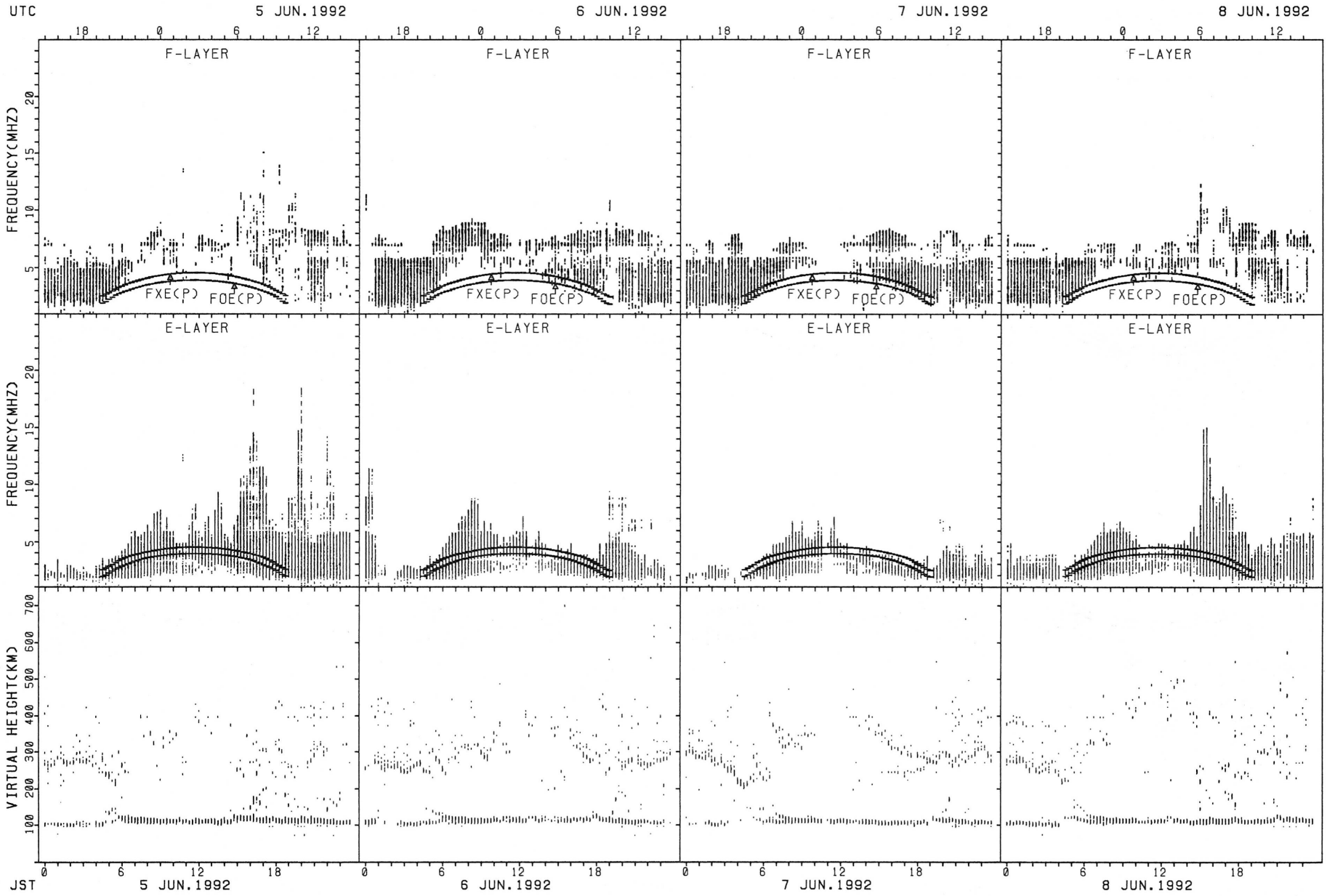
SUMMARY PLOTS AT AKITA



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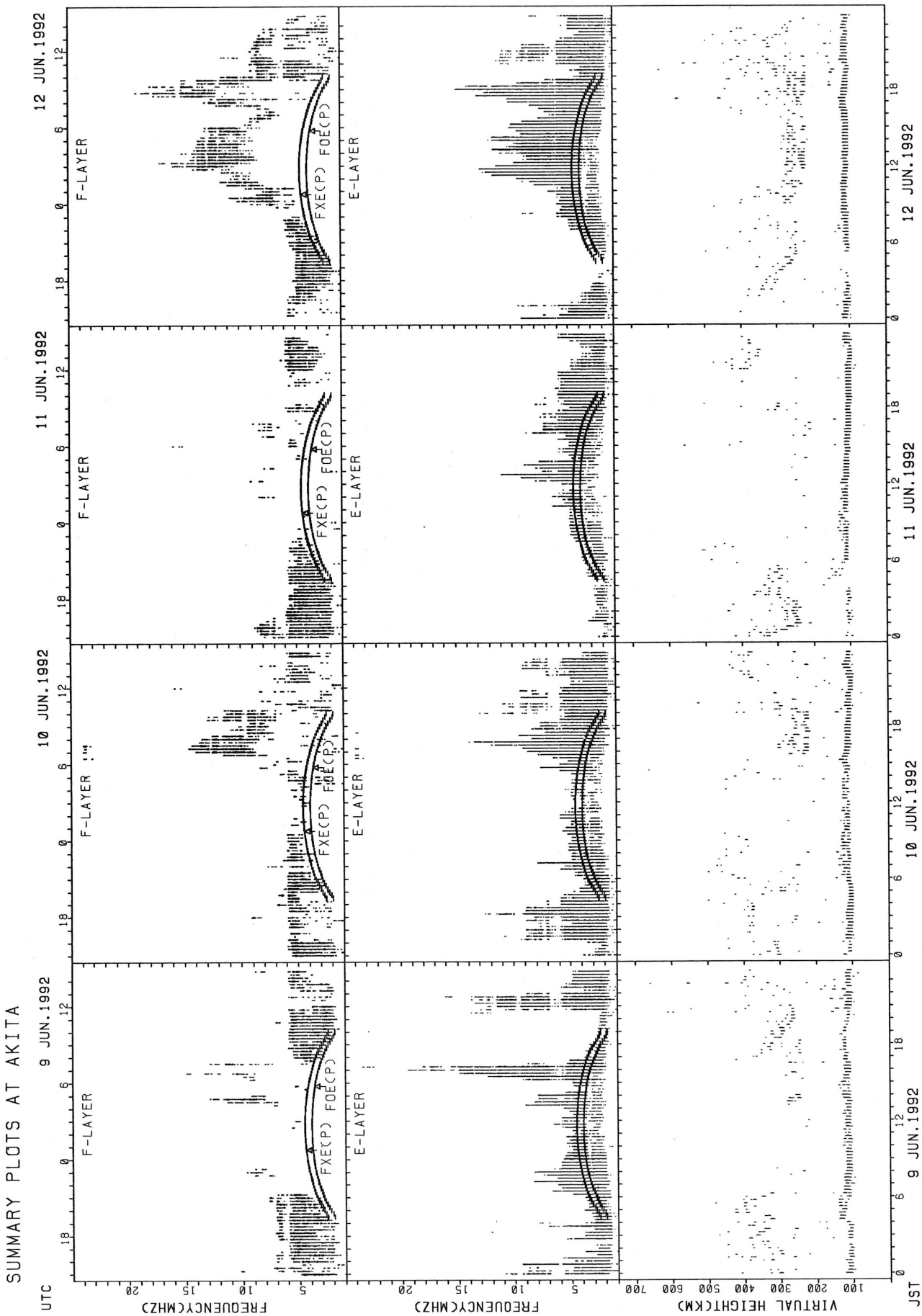
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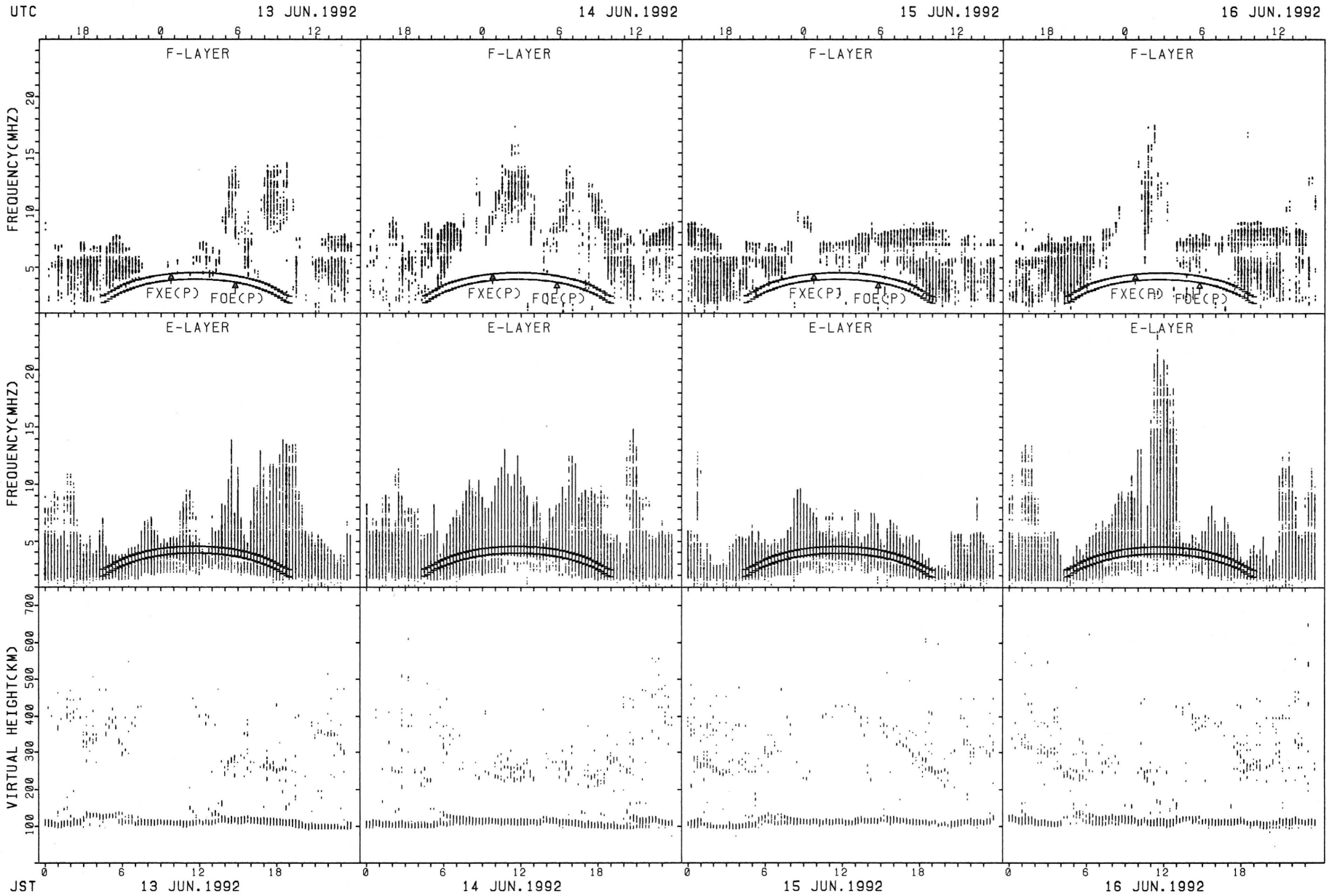
SUMMARY PLOTS AT AKITA



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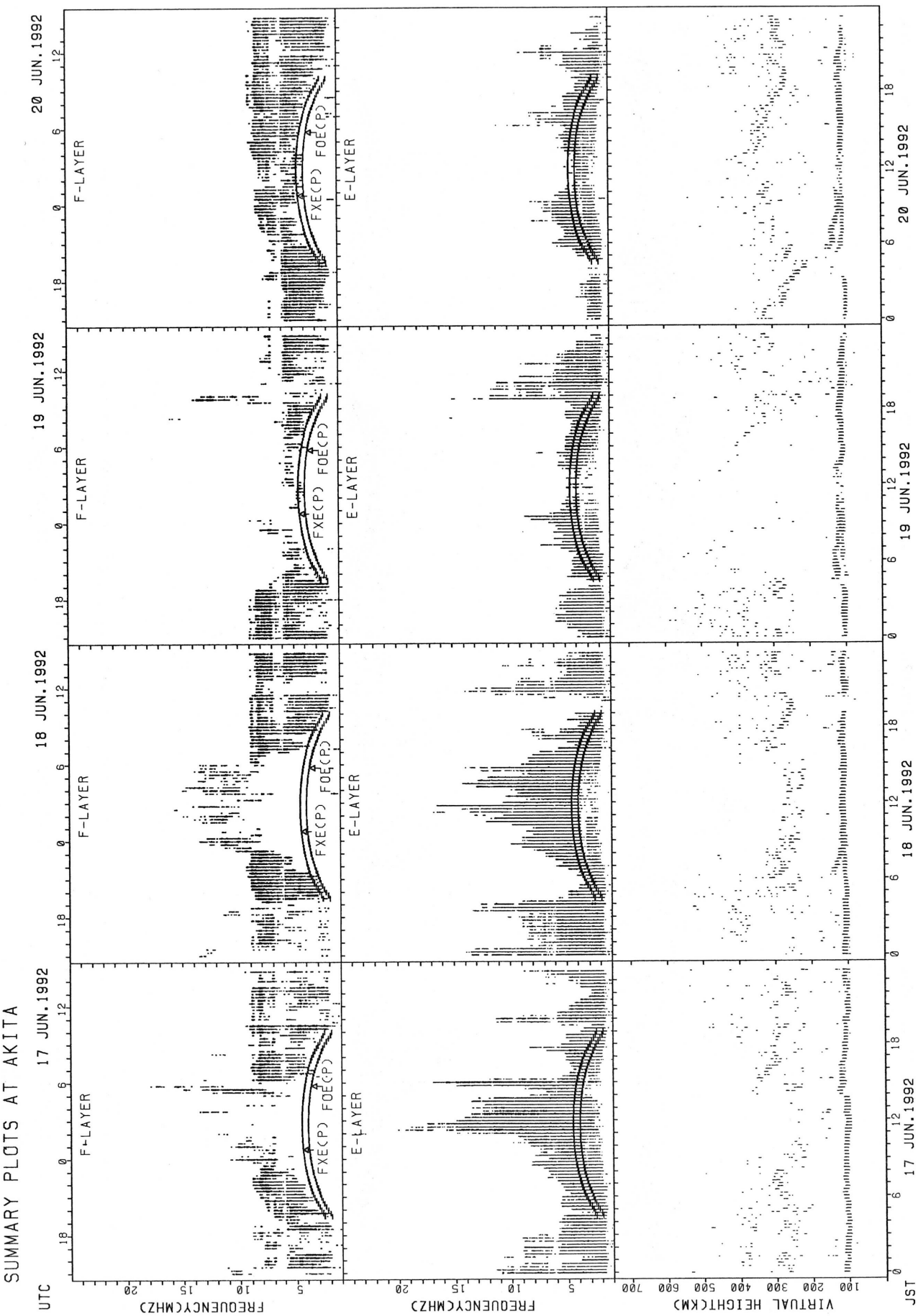
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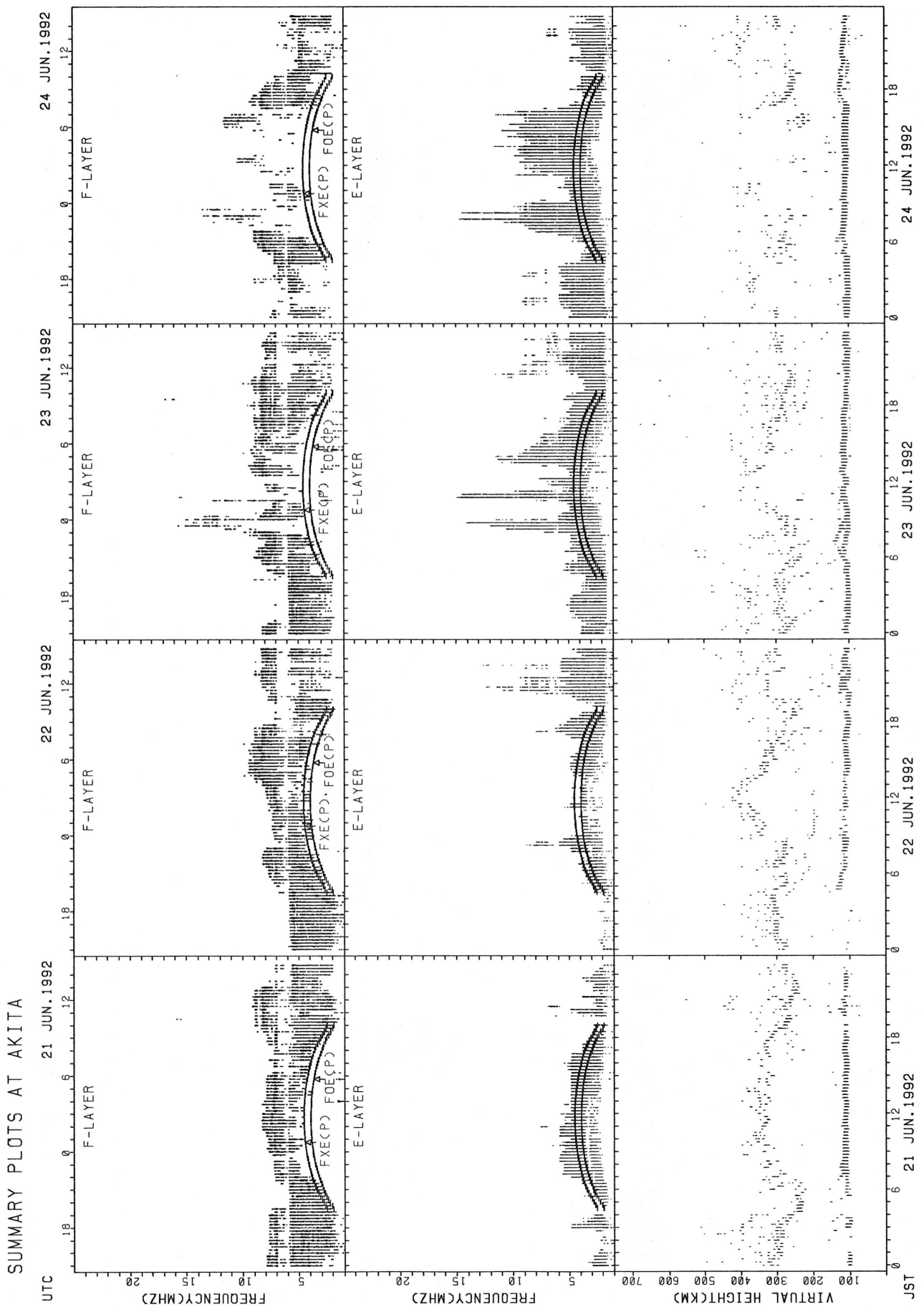
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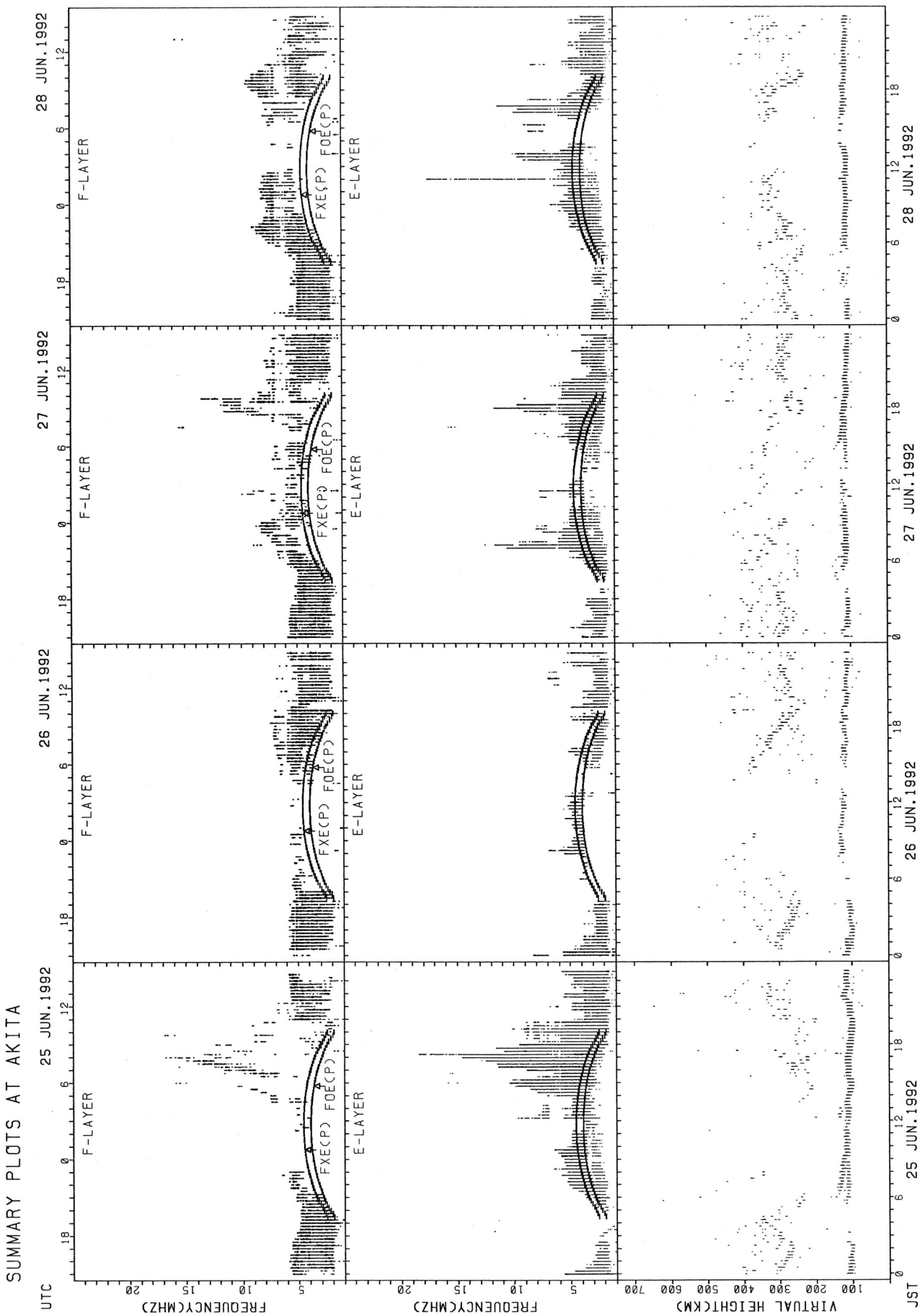
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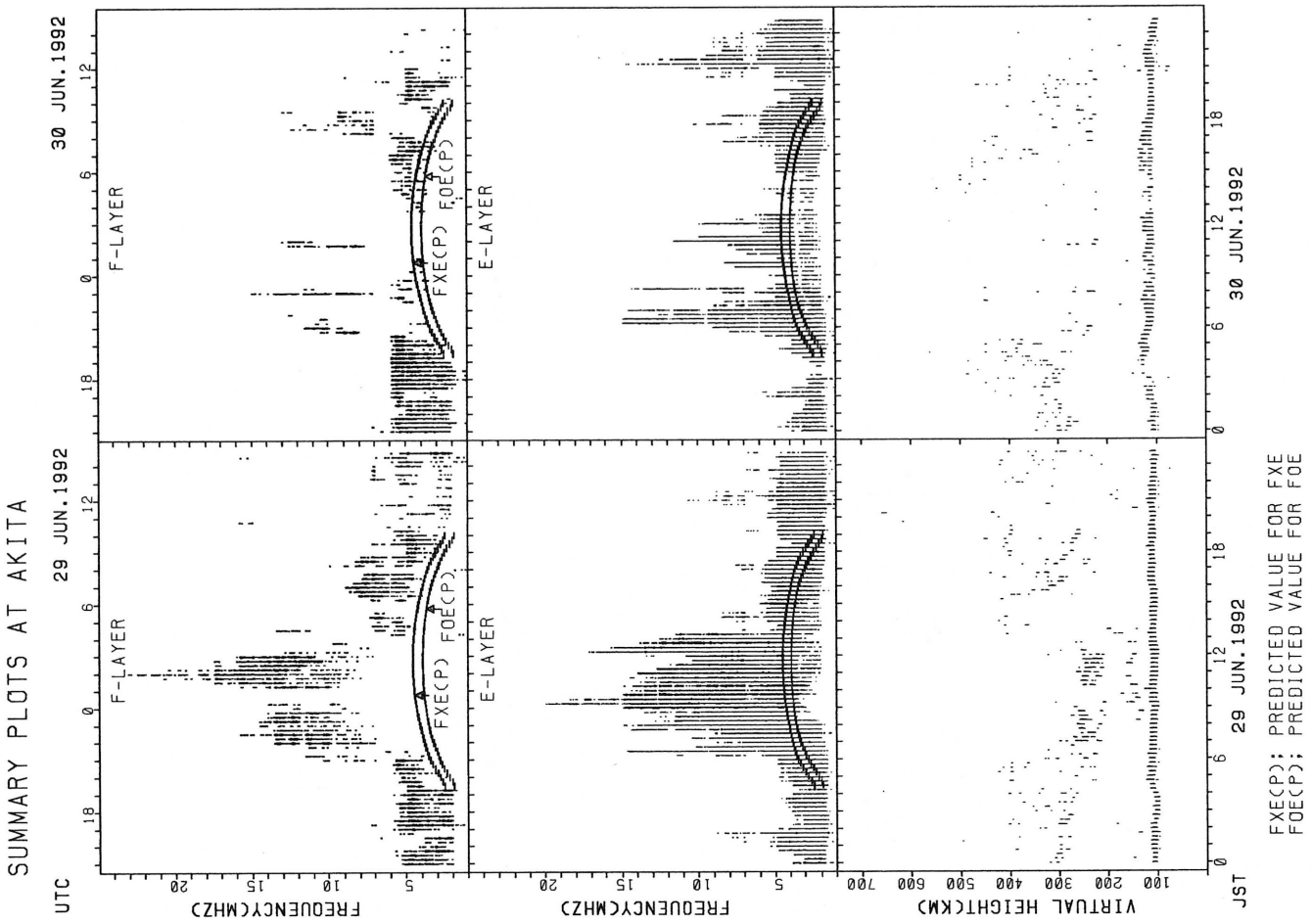
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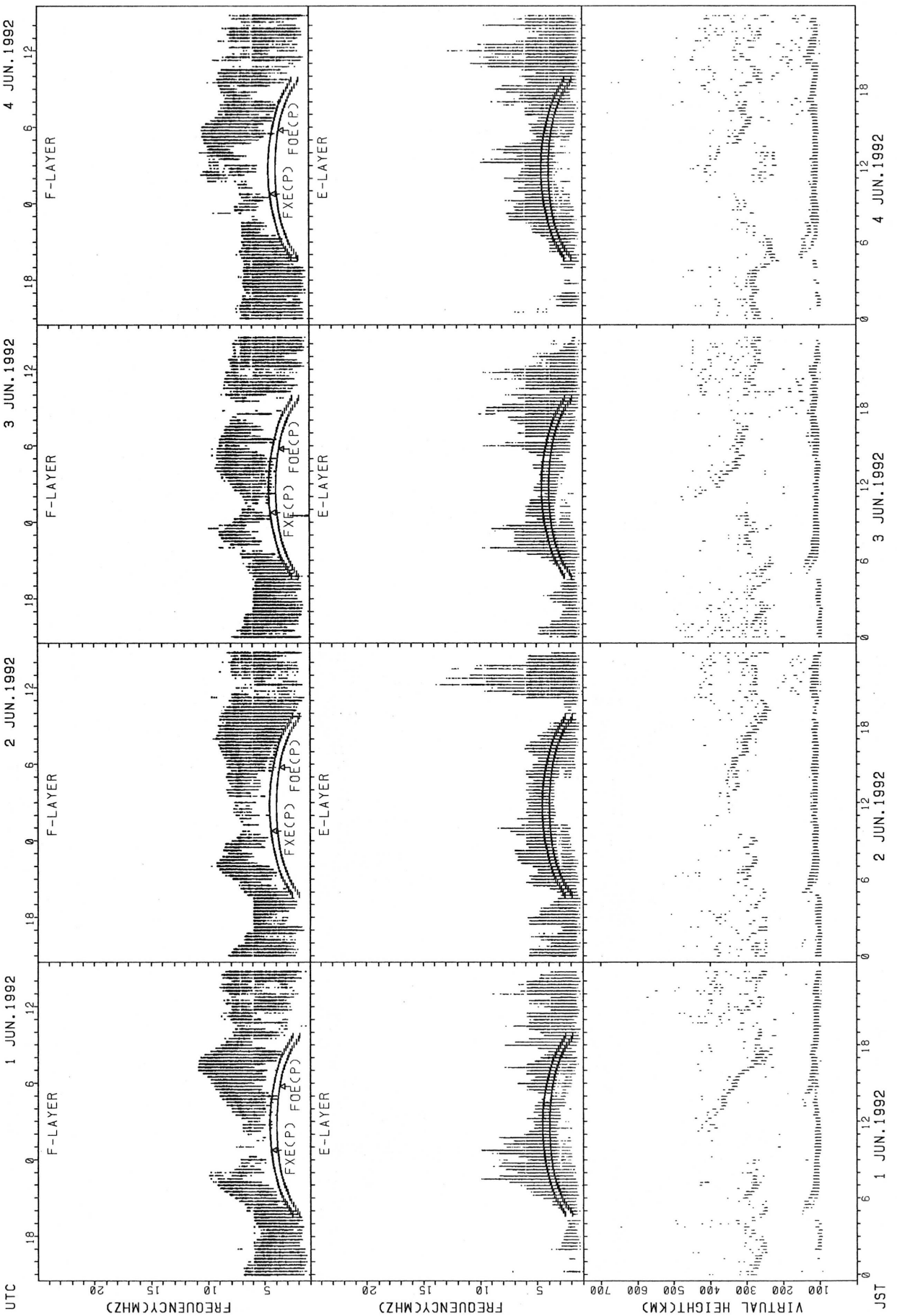
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4 JUN.1992
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E-LAYER
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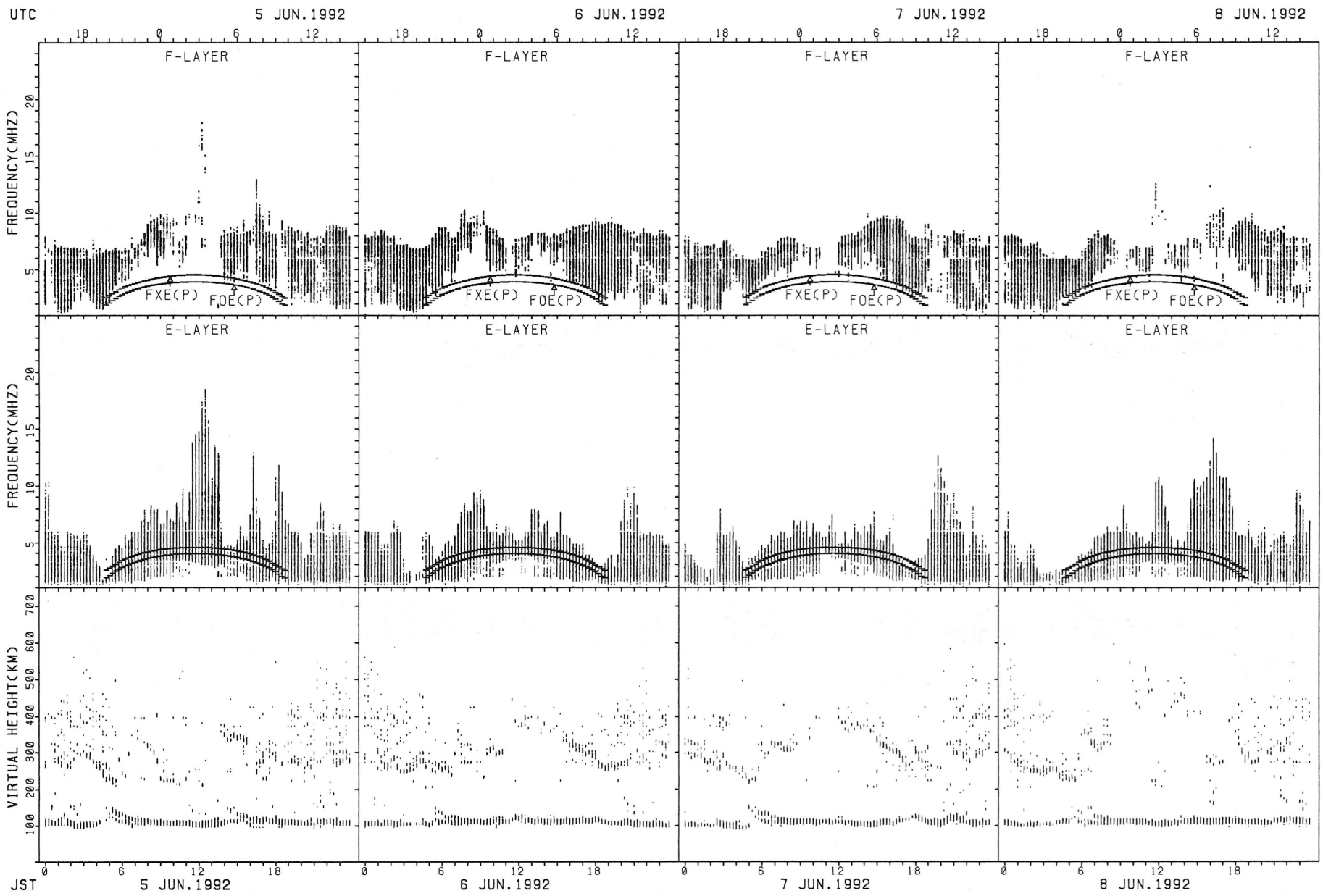
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FOE(P)
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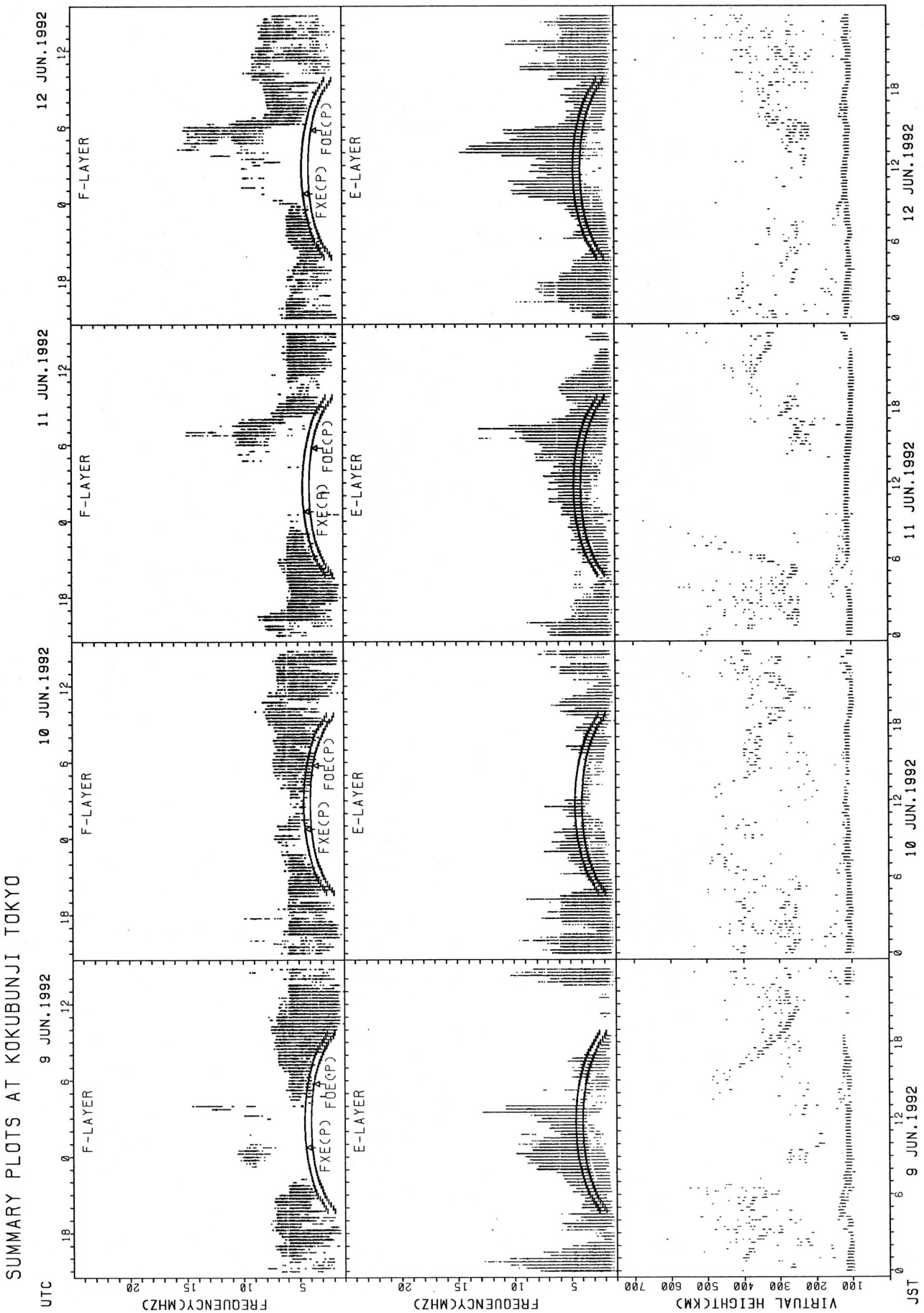
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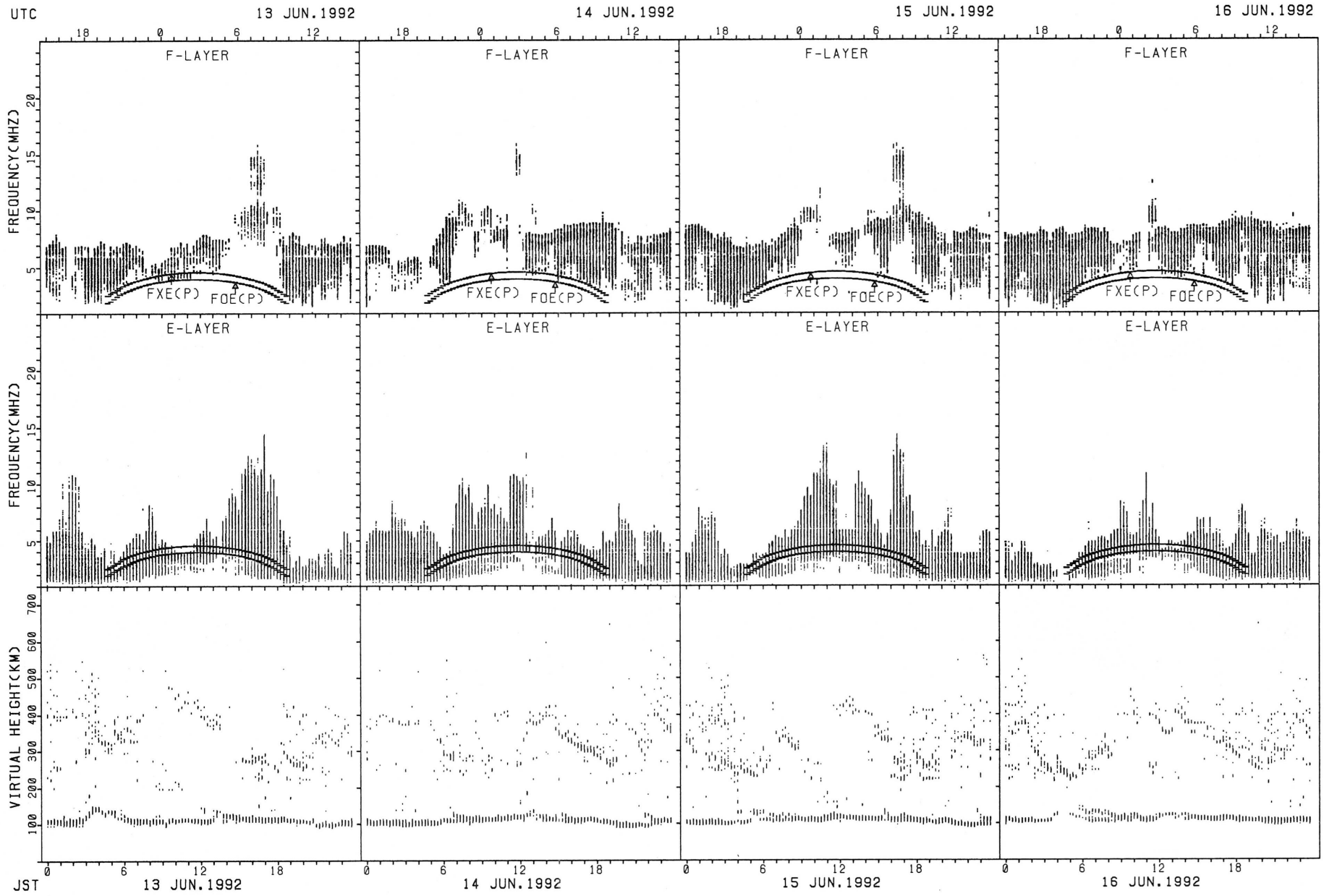
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FOE(P)
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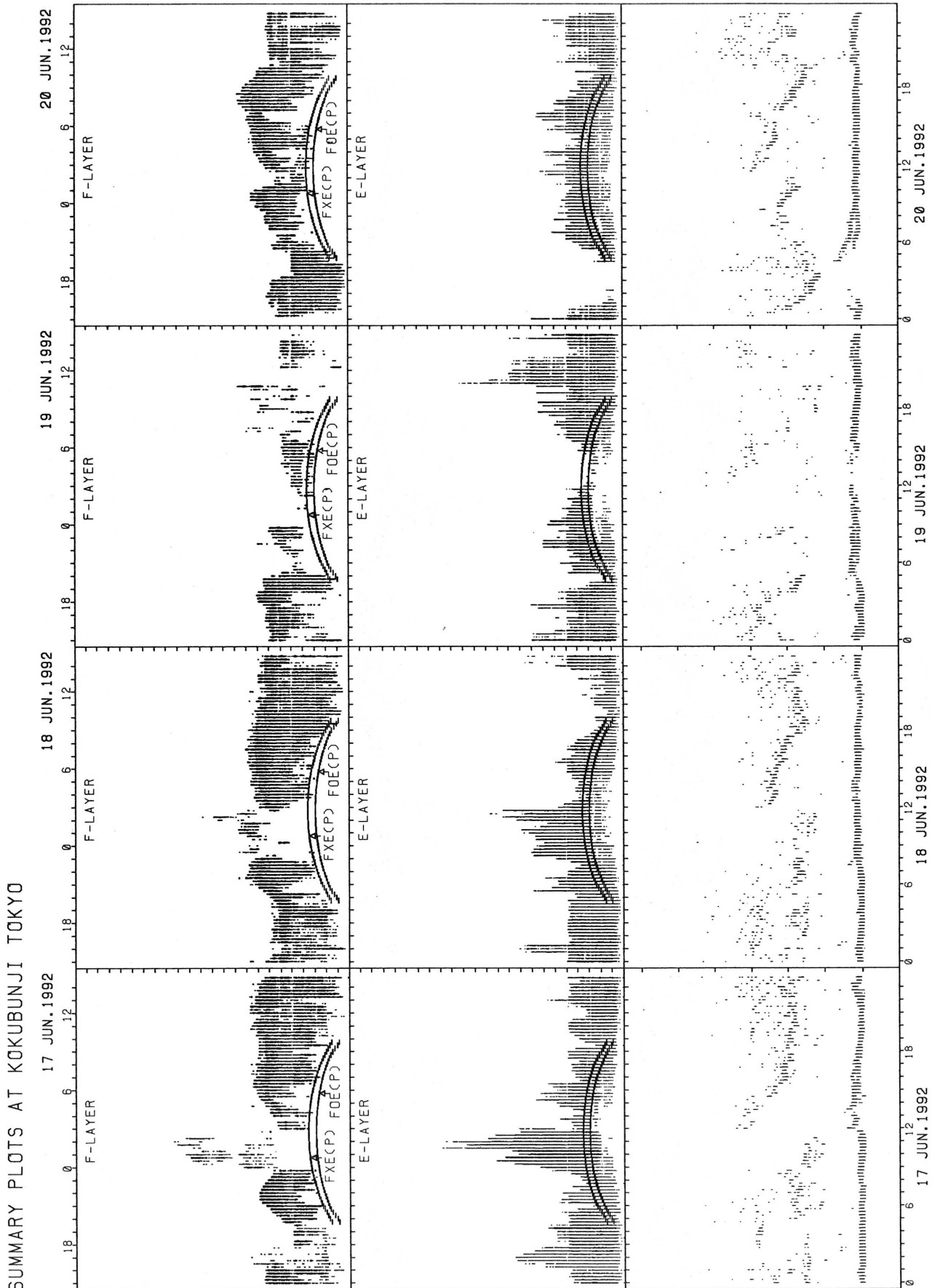
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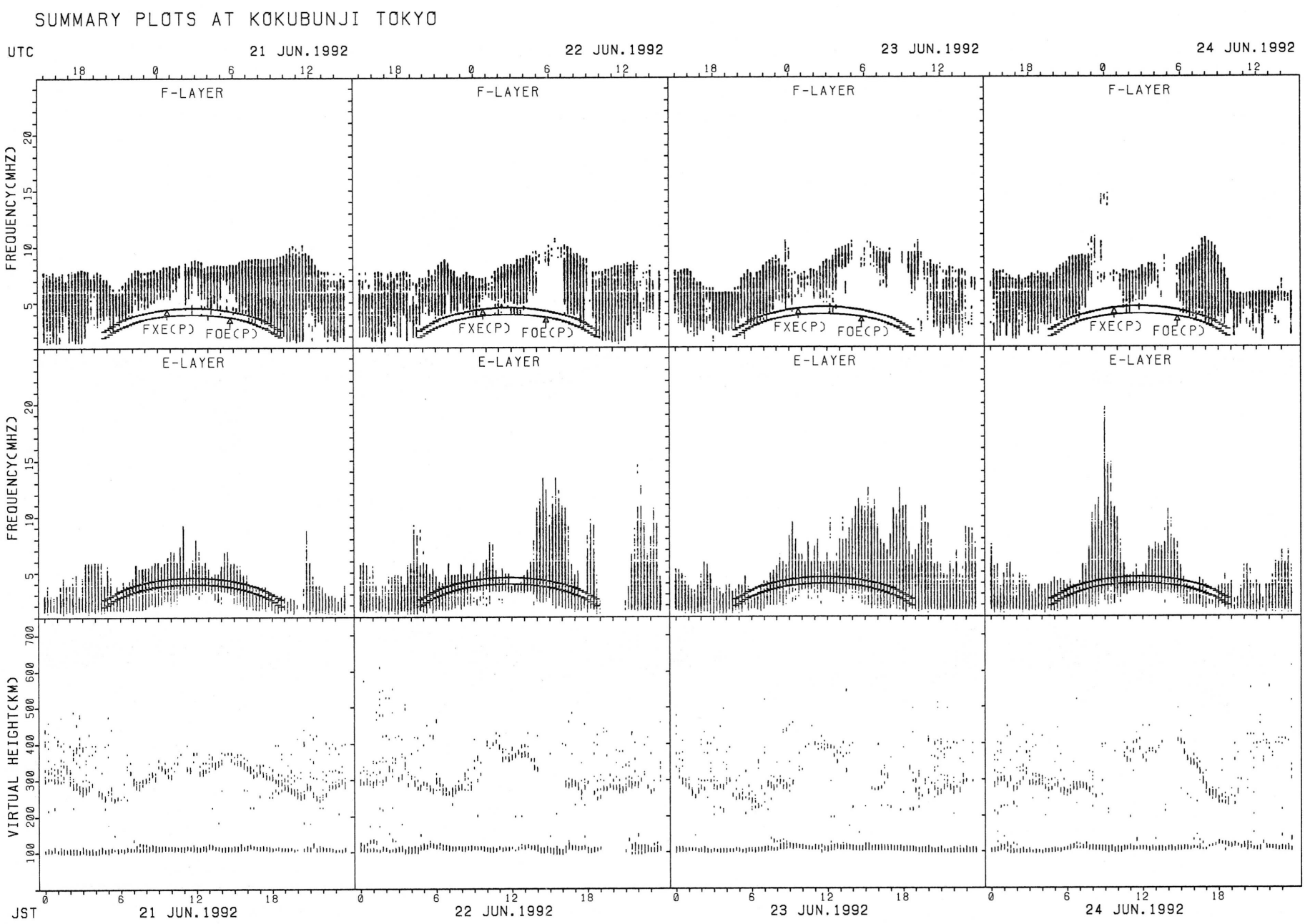
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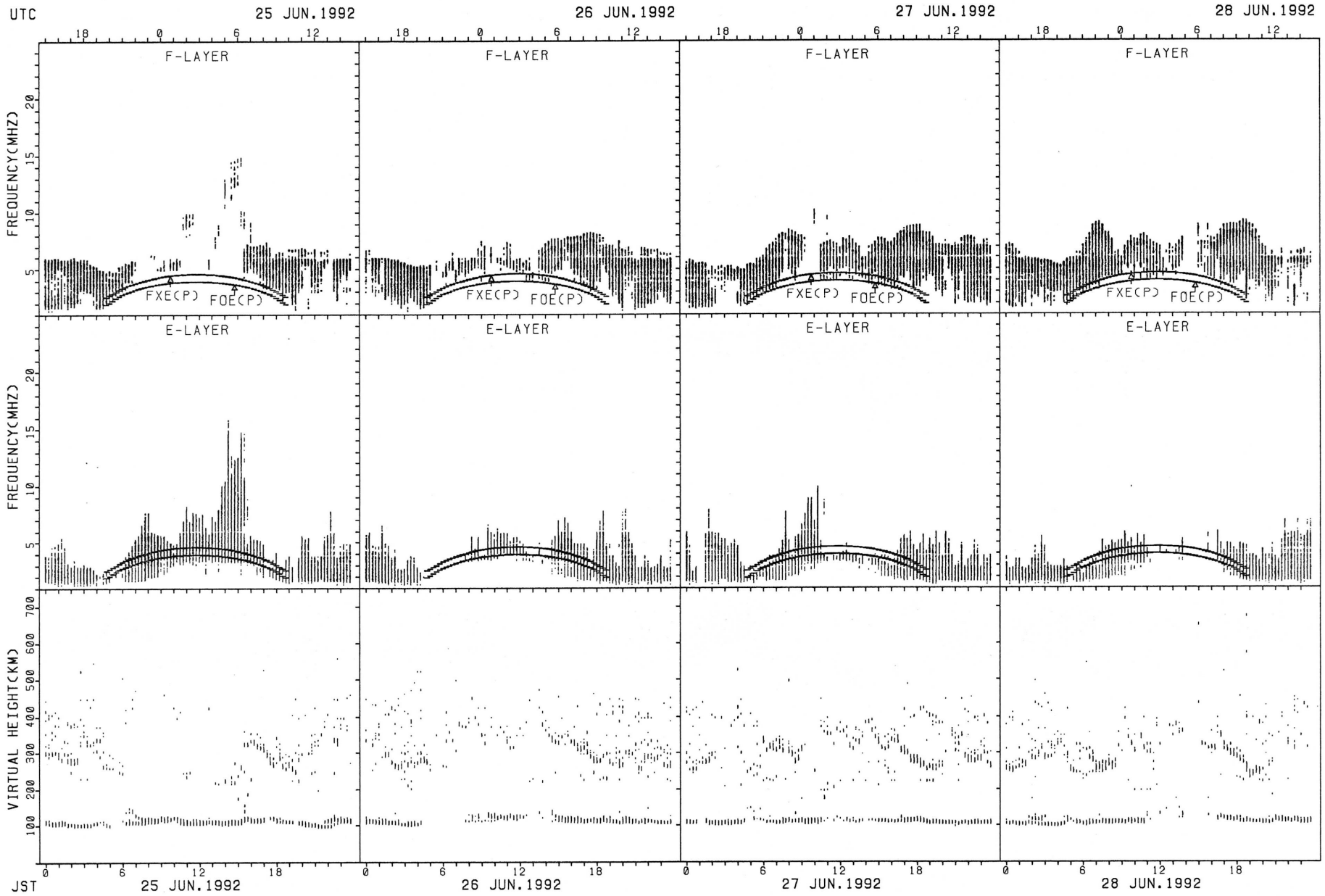
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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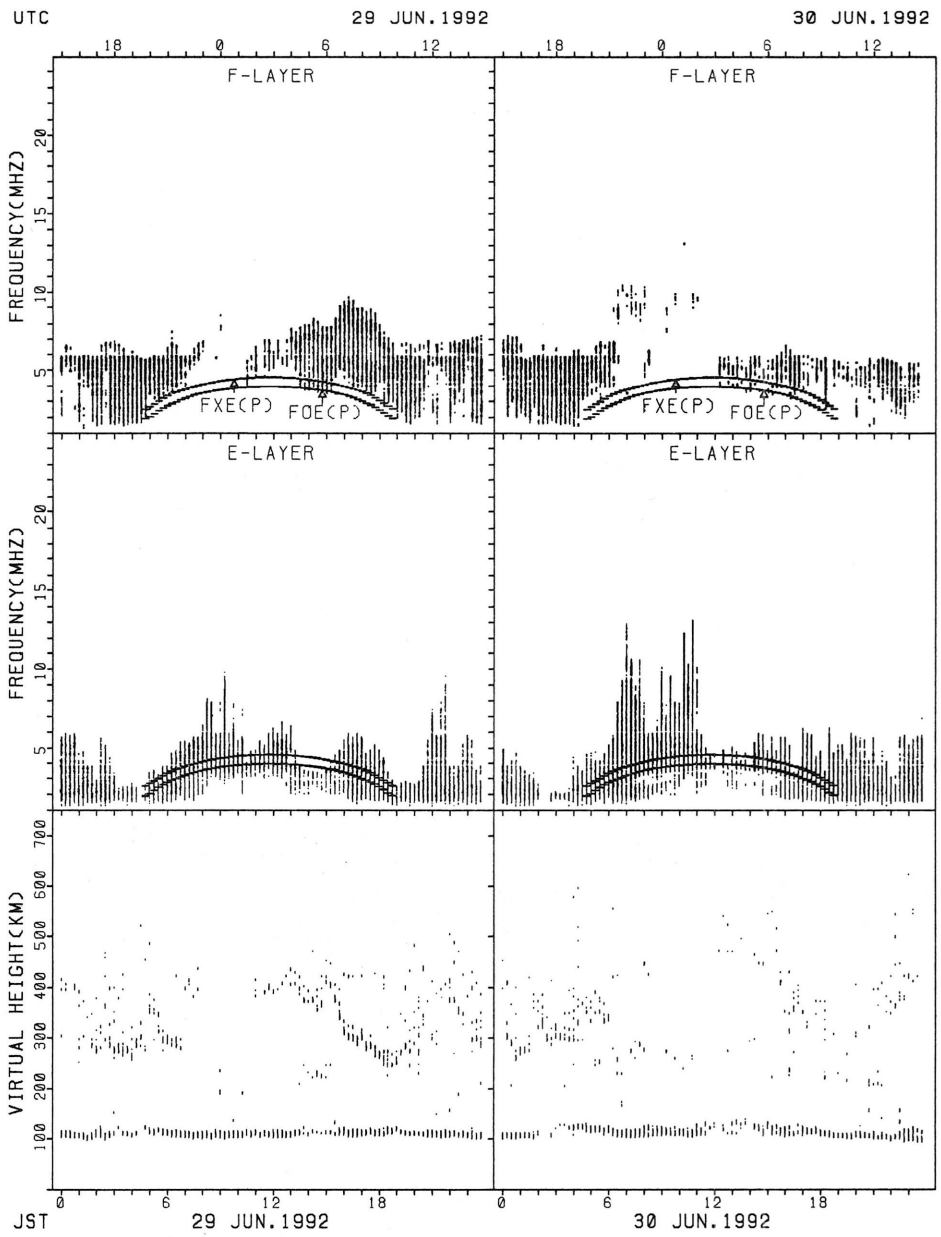
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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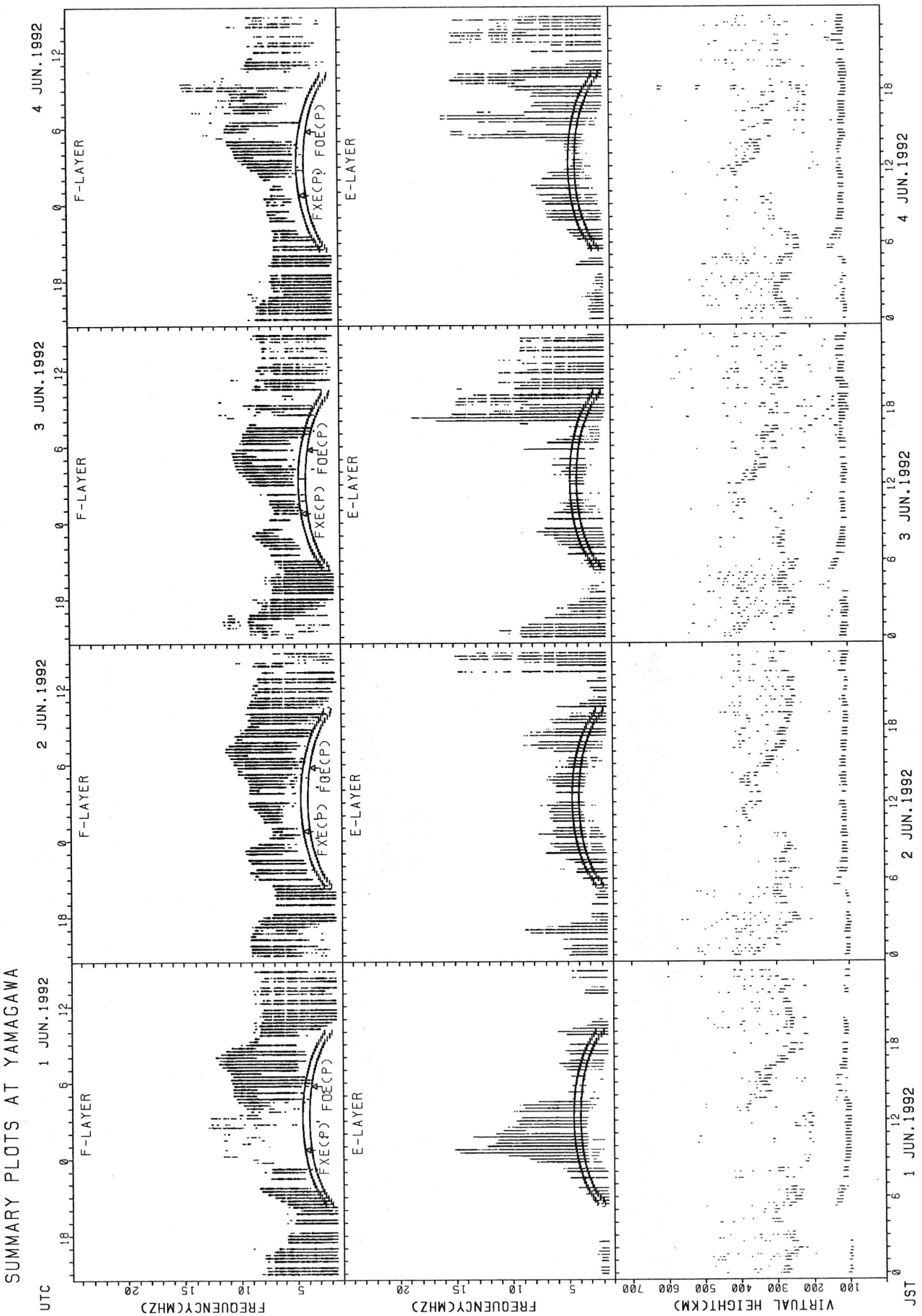
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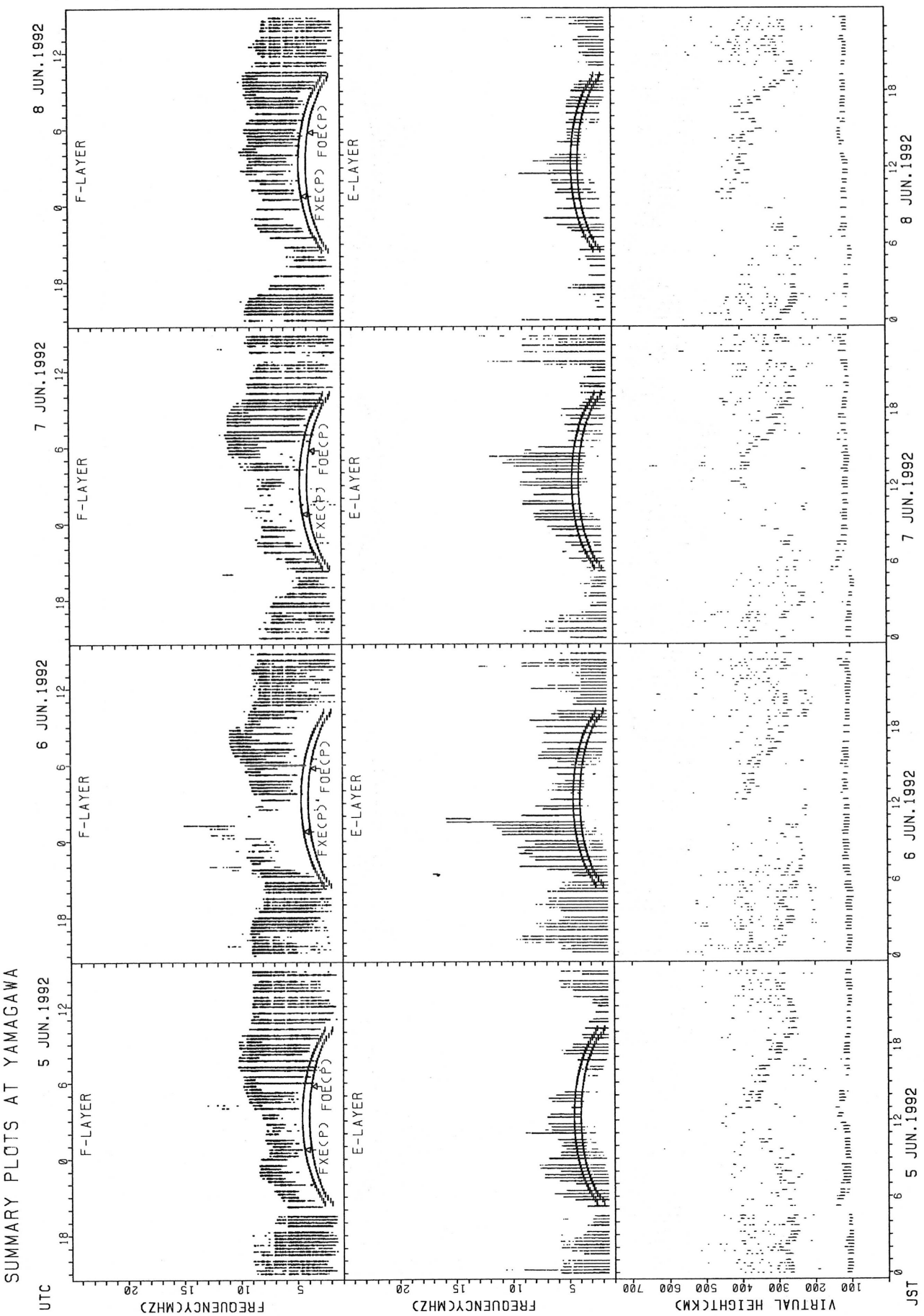
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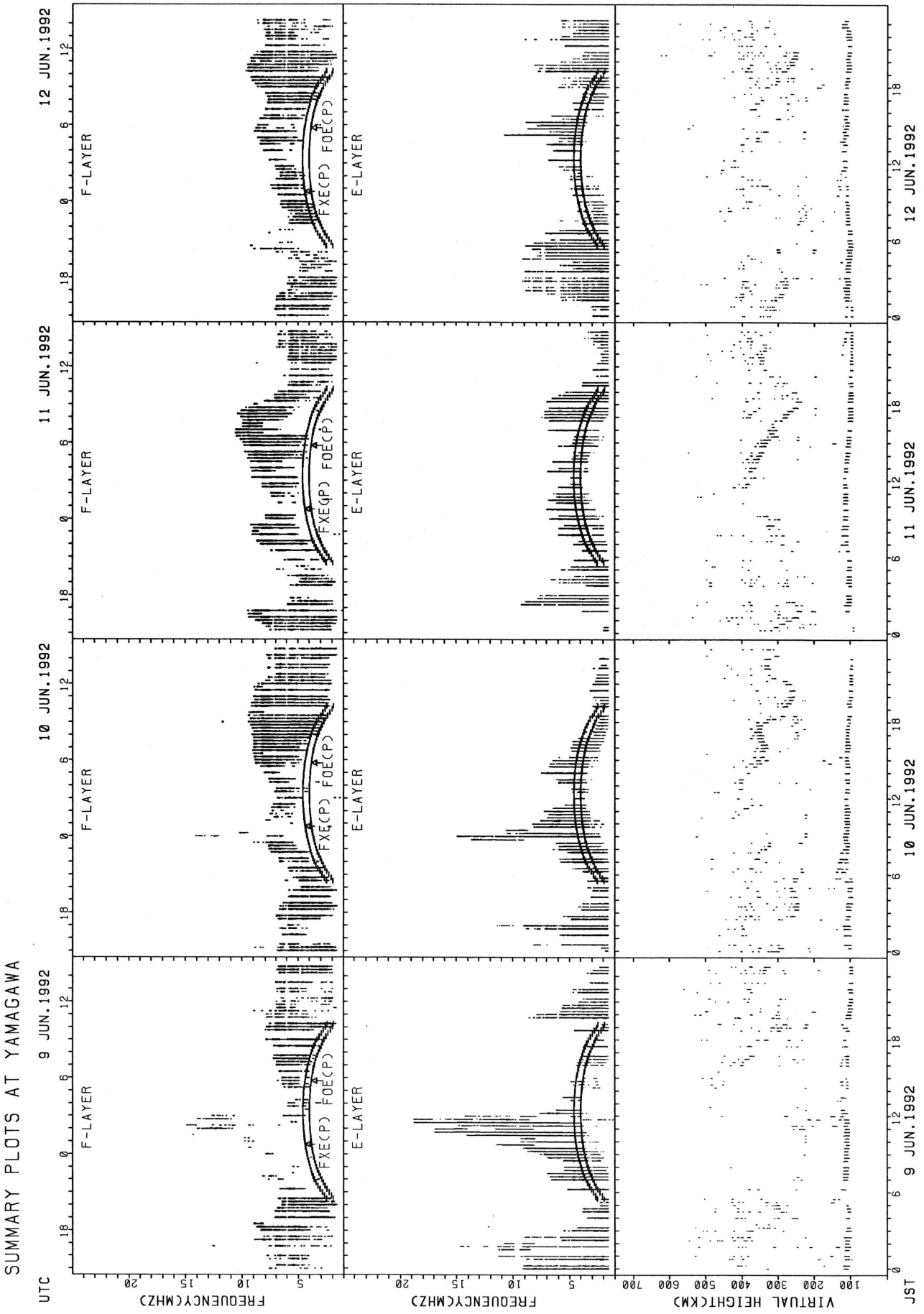
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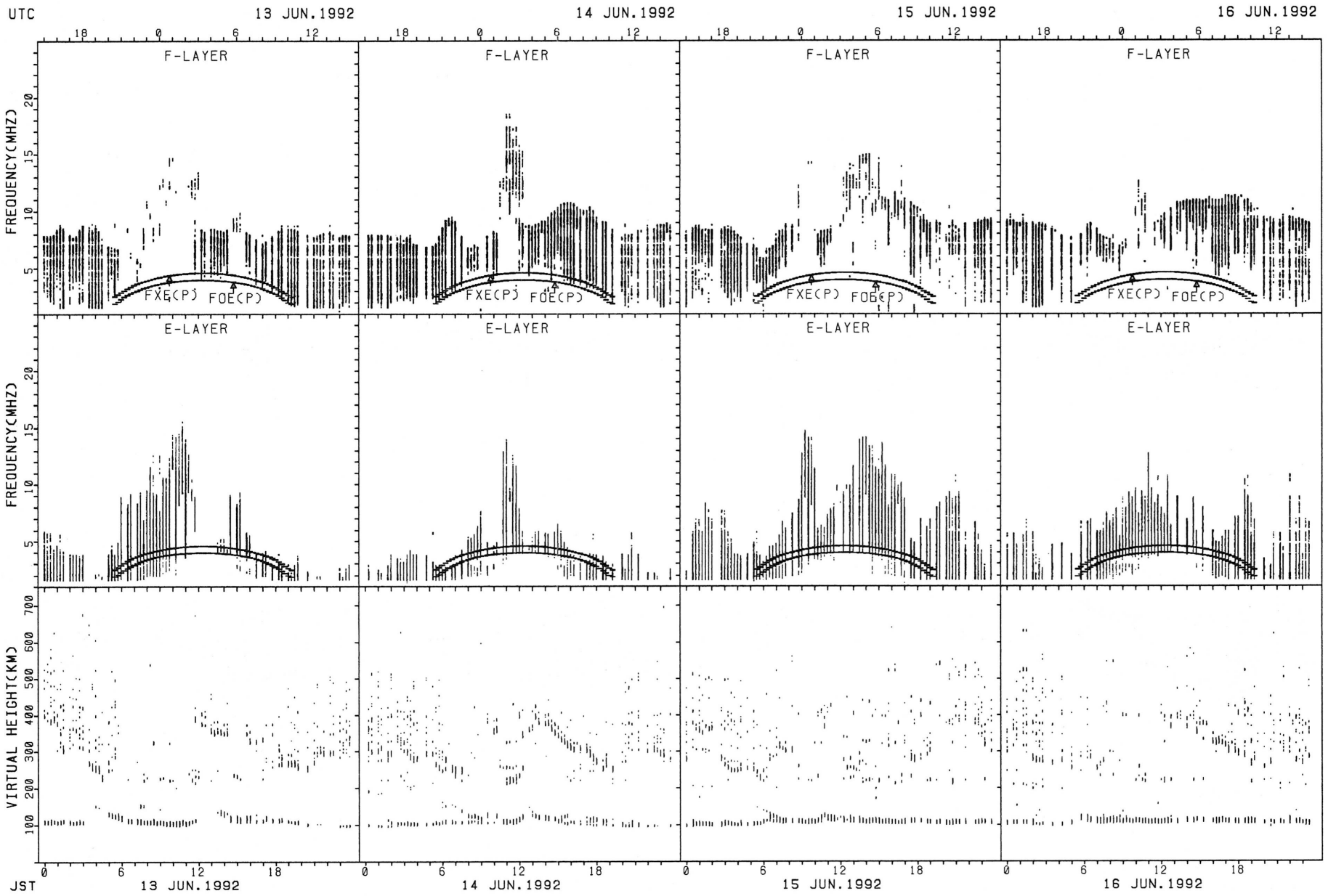
SUMMARY PLOTS AT YAMAGAWA



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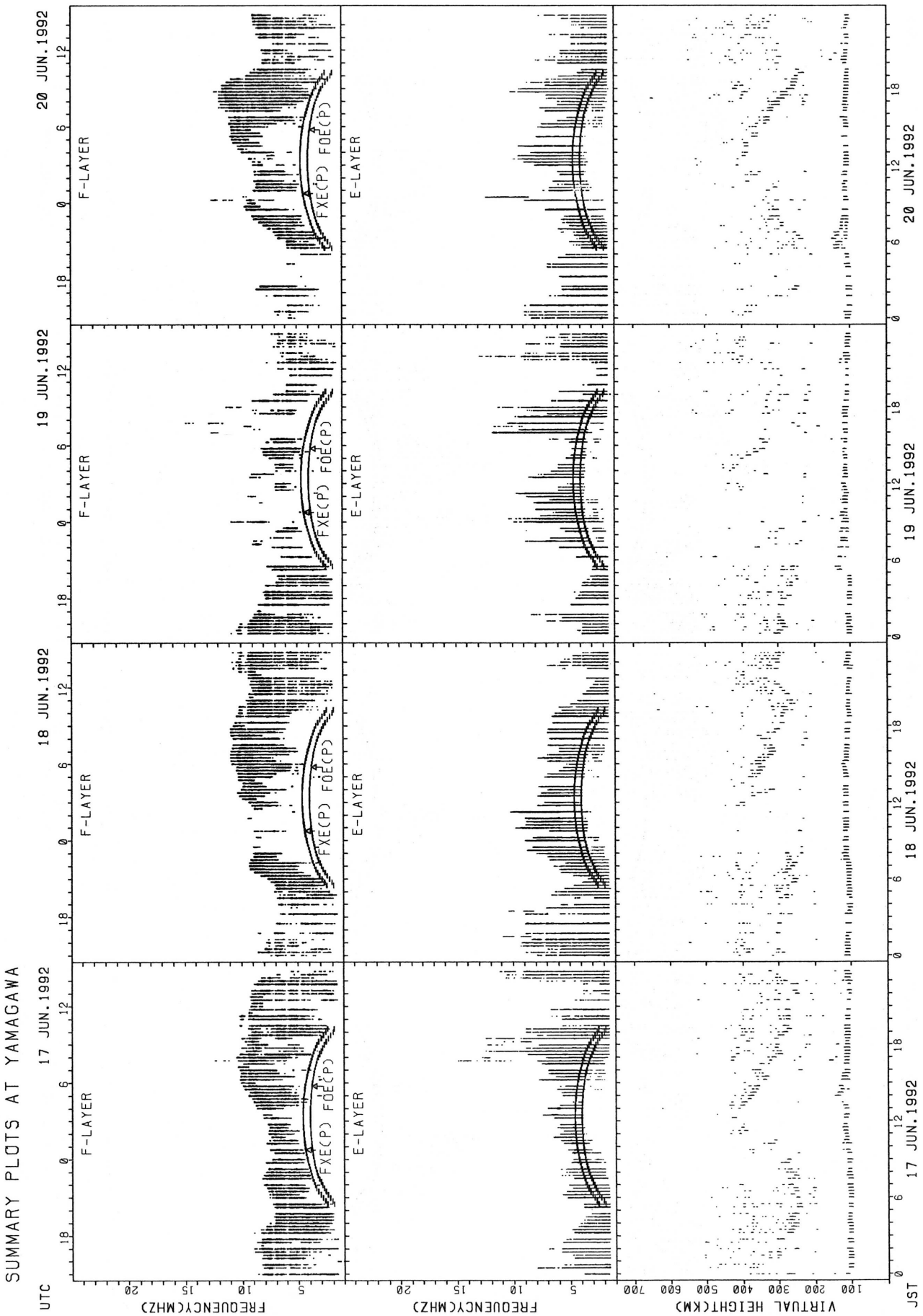
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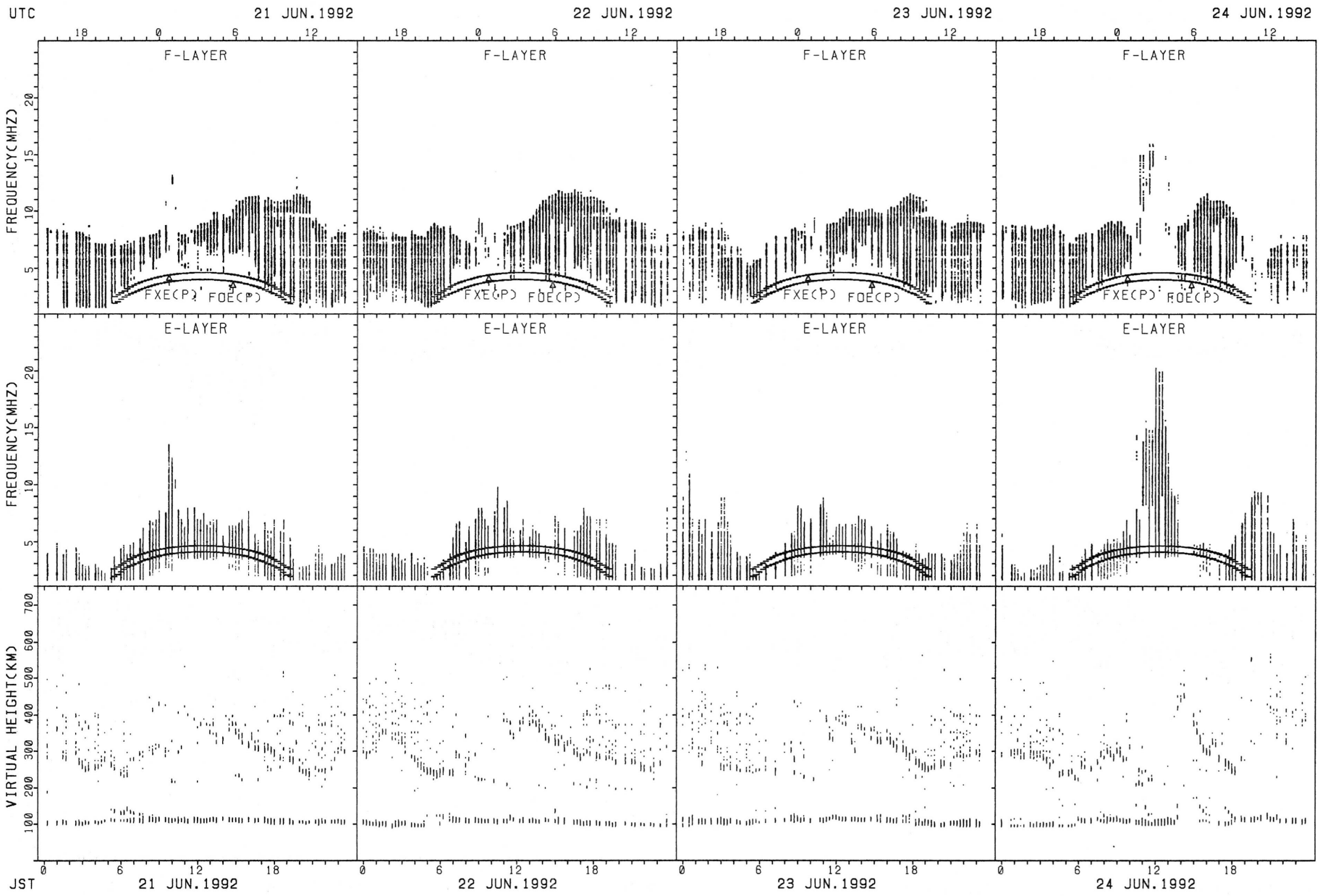
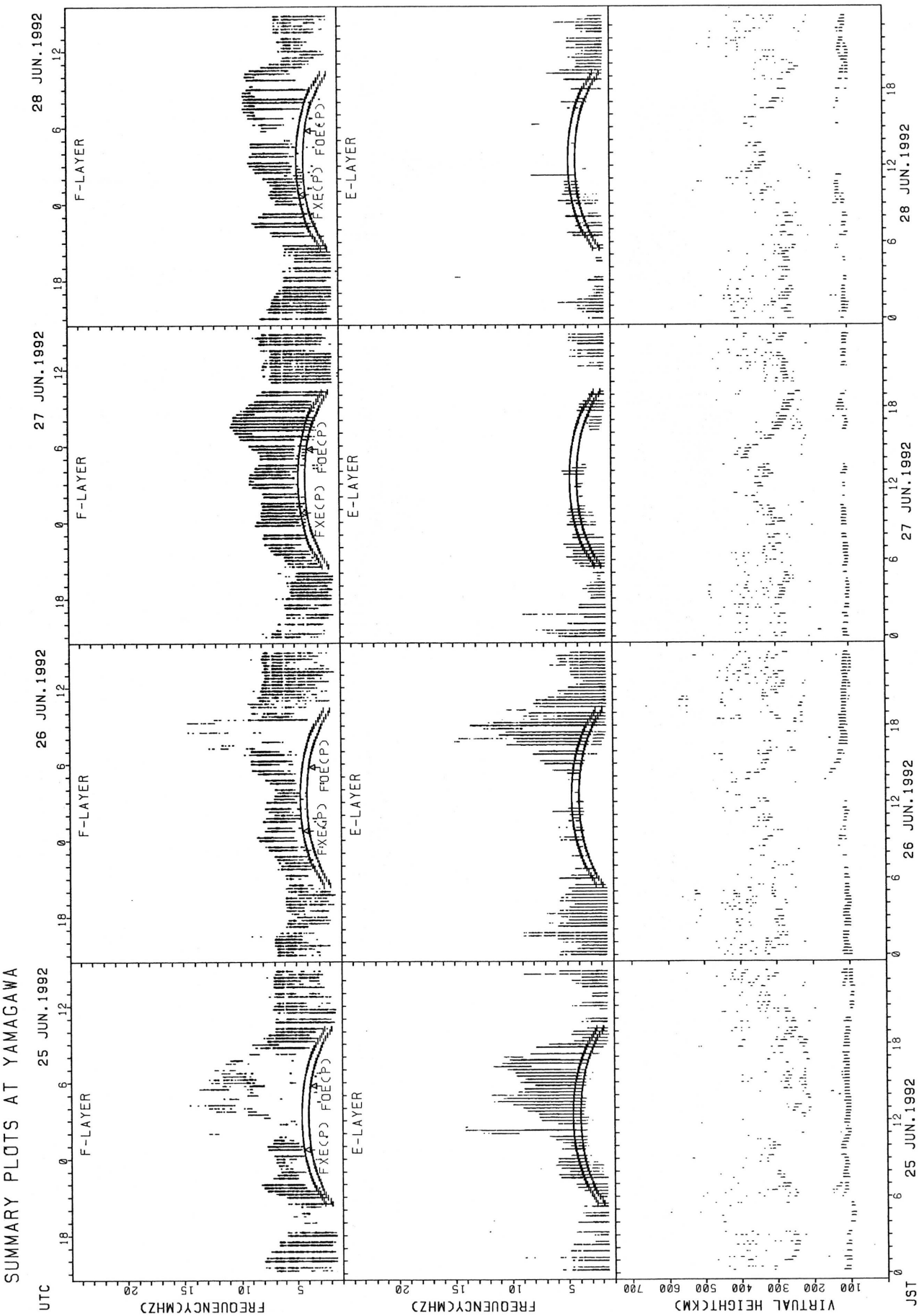
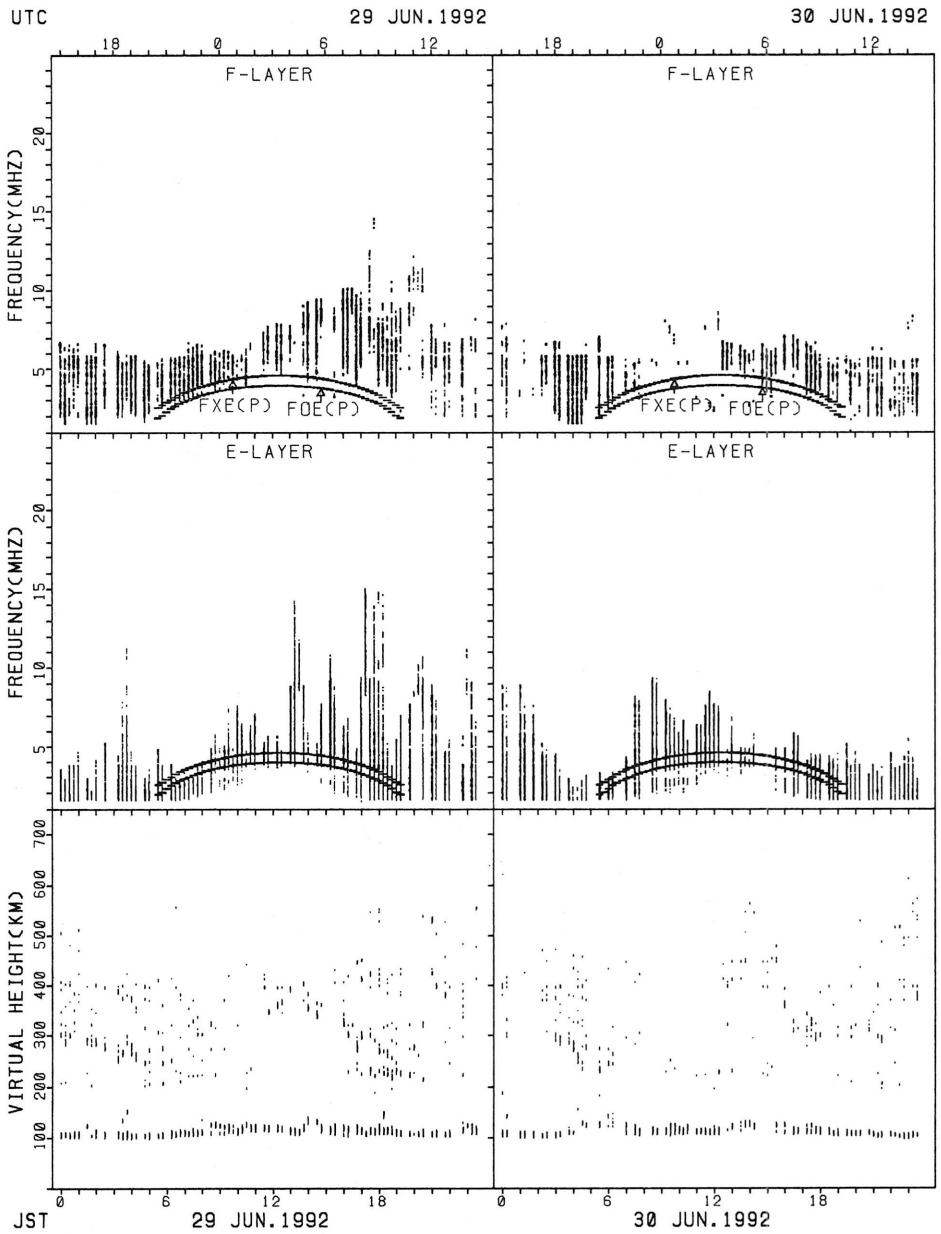
SUMMARY PLOTS AT YAMAGAWA



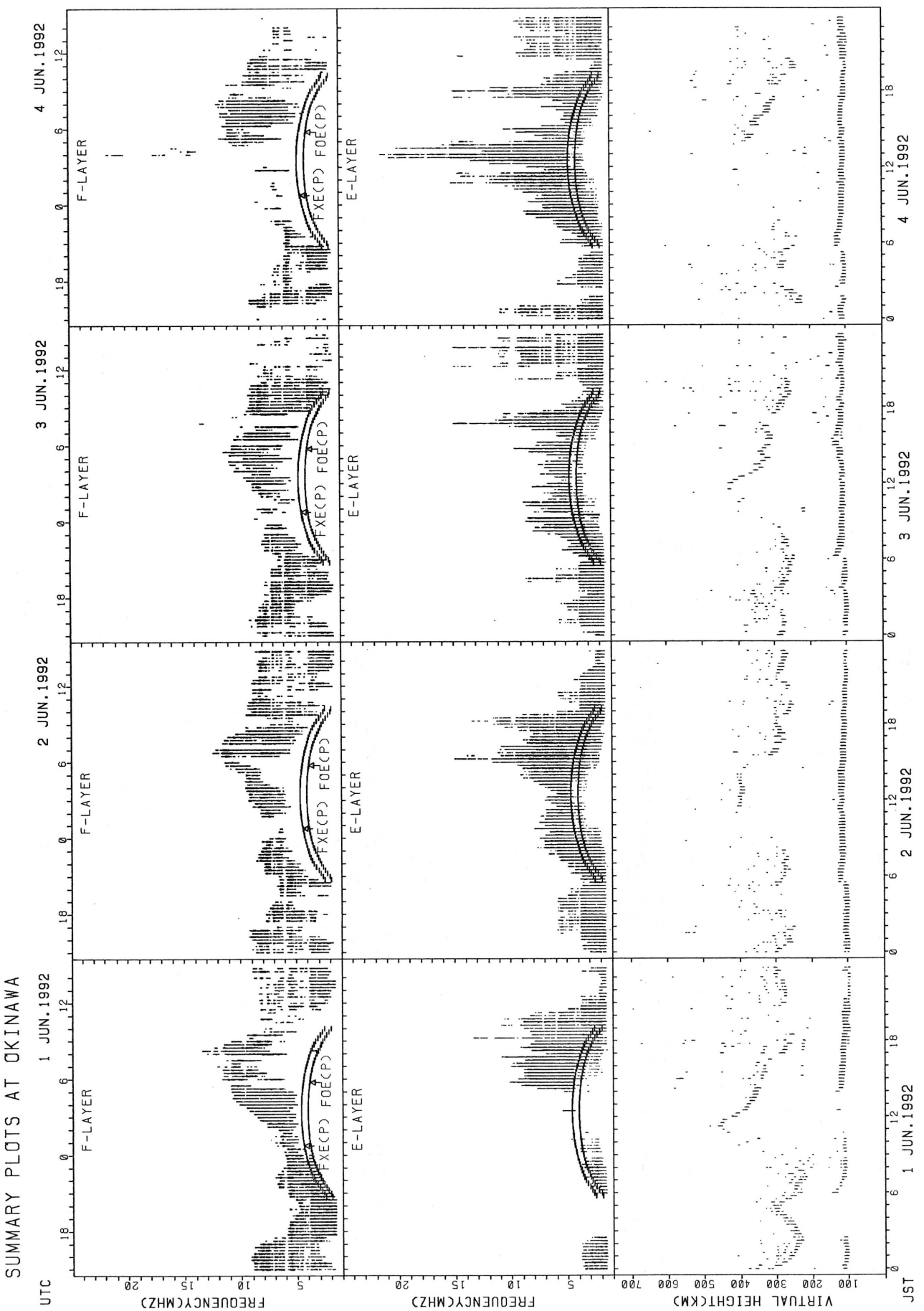
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE

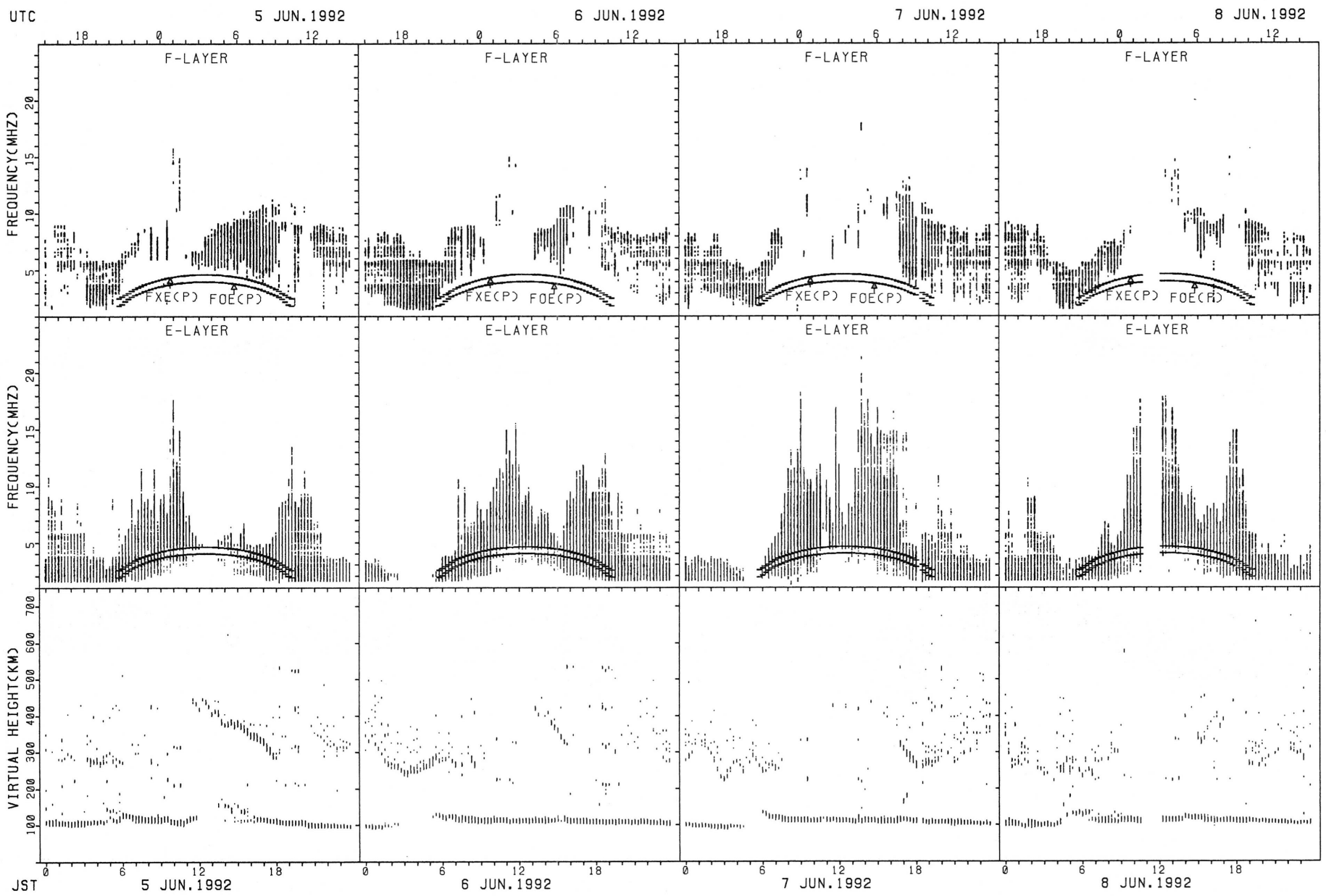

SUMMARY PLOTS AT YAMAGAWA
UTC
JST
25 JUN.1992
26 JUN.1992
27 JUN.1992
28 JUN.1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

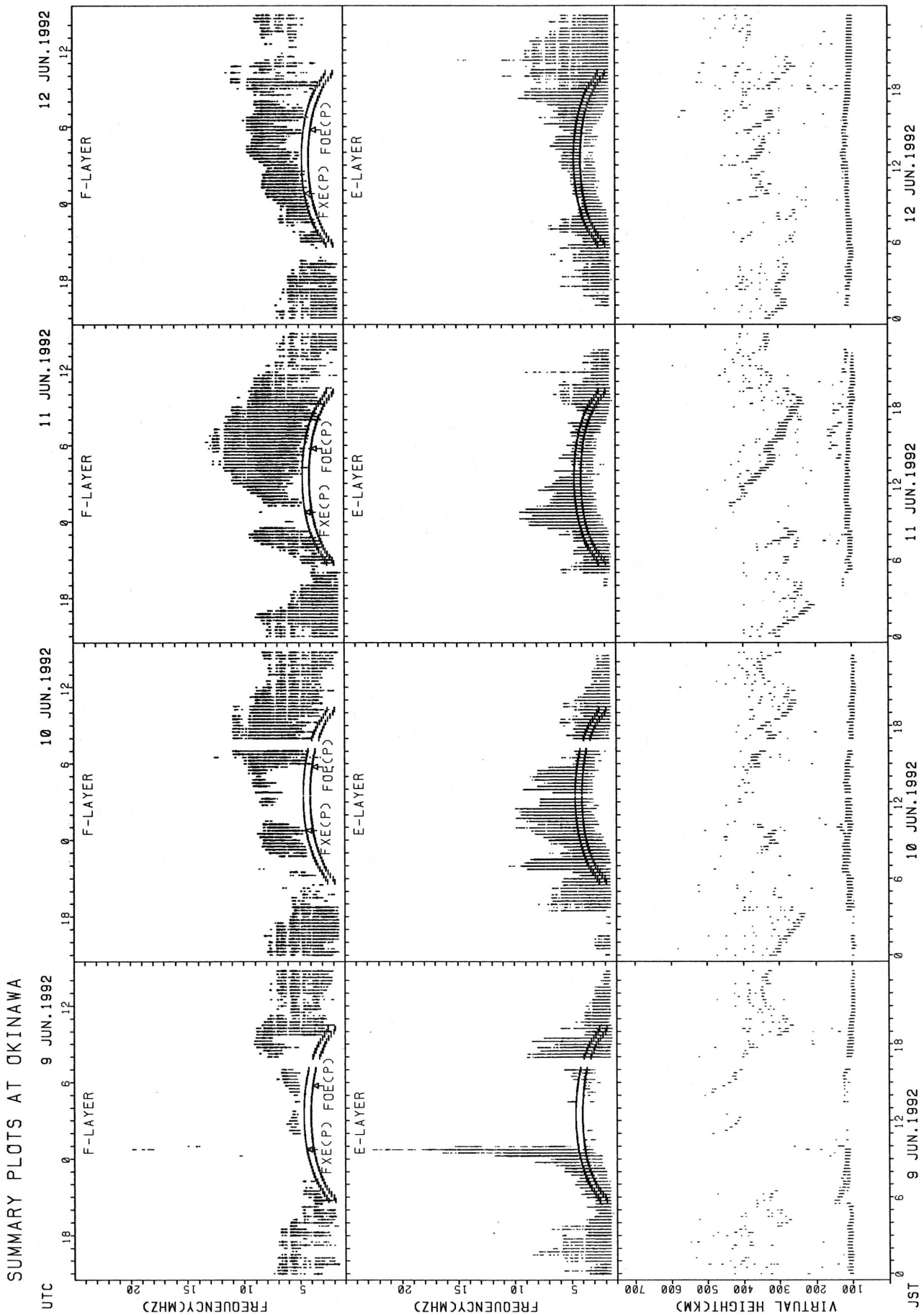
SUMMARY PLOTS AT YAMAGAWA



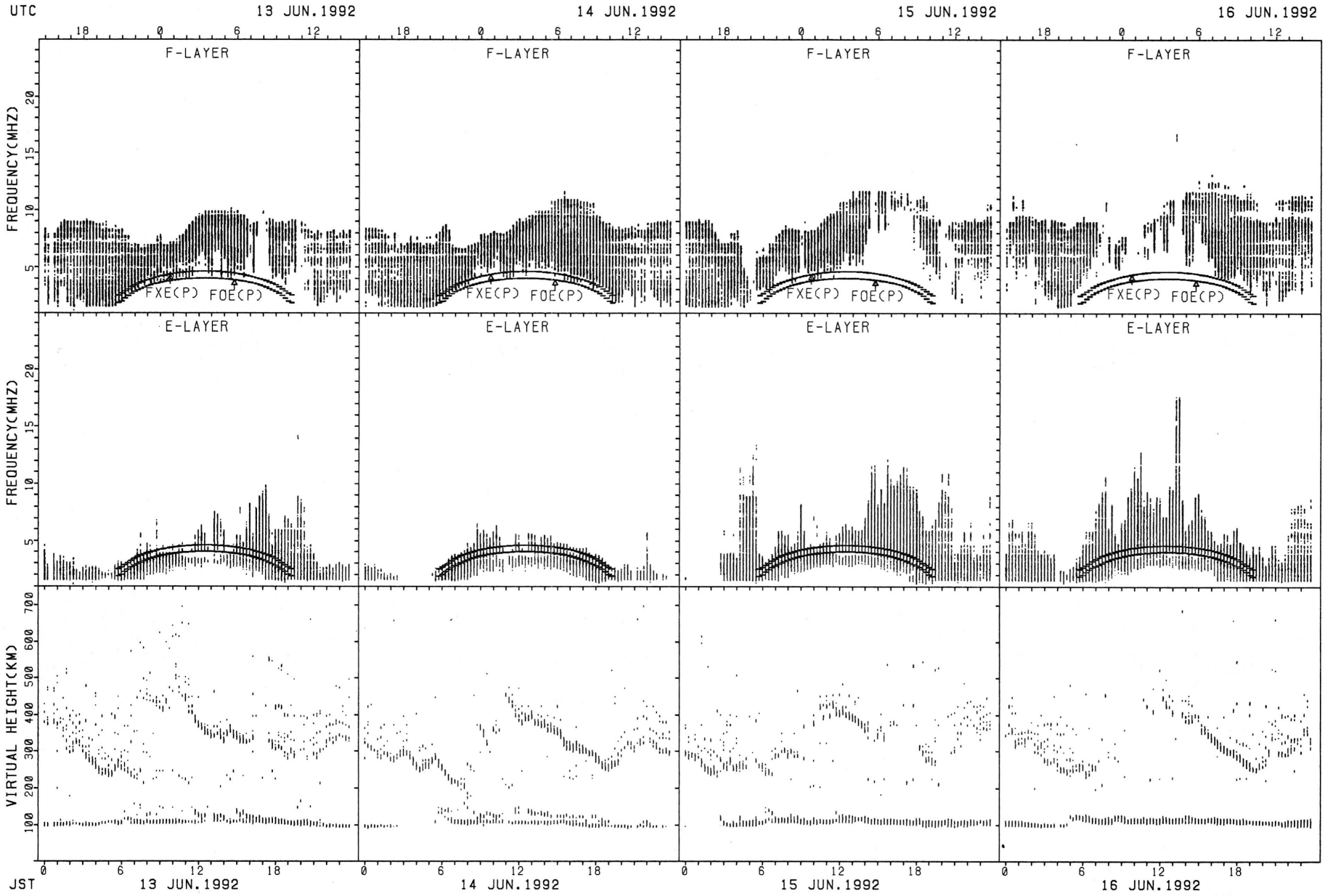
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT OKINAWA
UTC
JST
1 JUN.1992
2 JUN.1992
3 JUN.1992
4 JUN.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

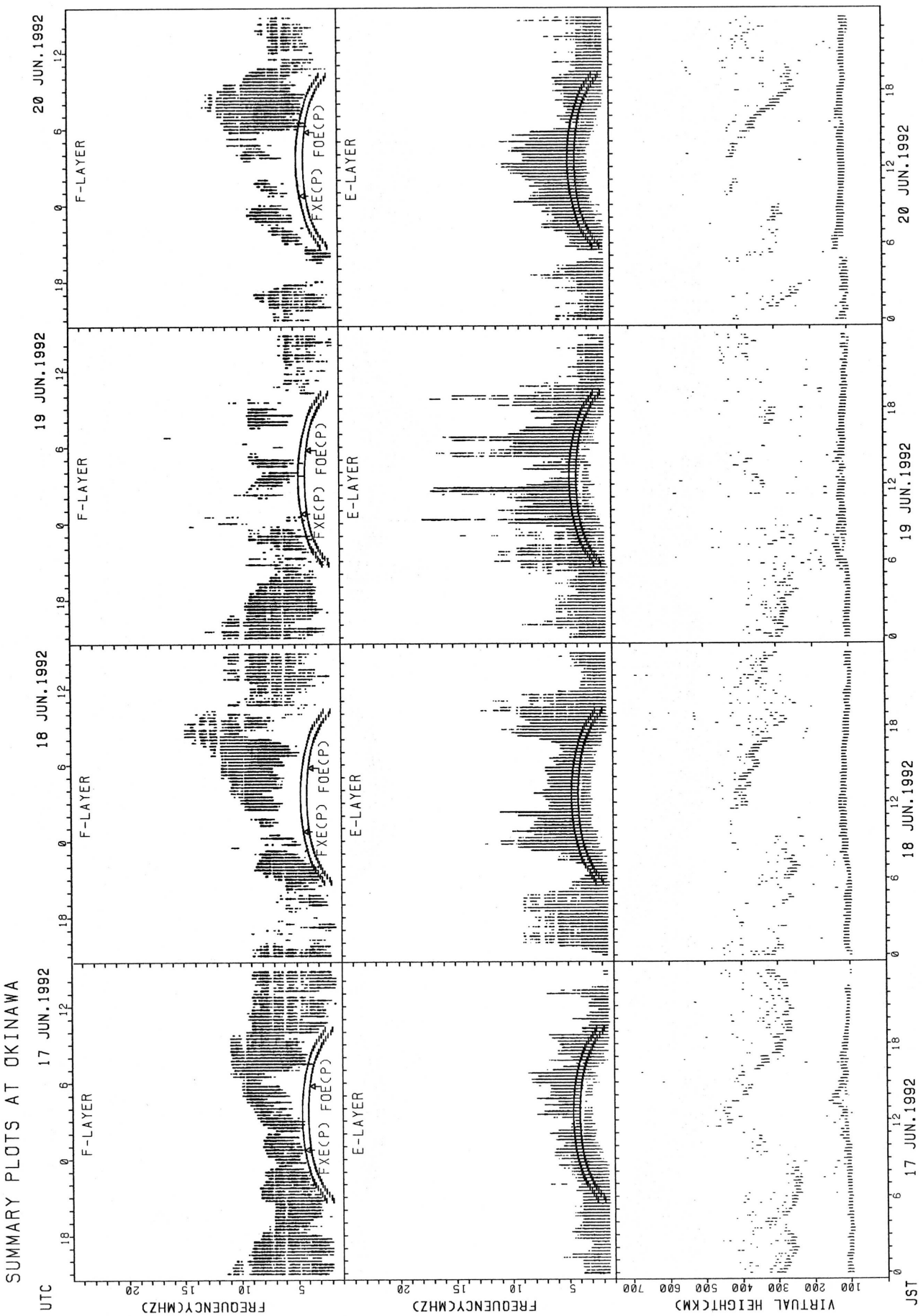

SUMMARY PLOTS AT OKINAWA
UTC
5 JUN.1992
6 JUN.1992
7 JUN.1992
8 JUN.1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT OKINAWA
UTC
JST
9 JUN.1992
10 JUN.1992
11 JUN.1992
12 JUN.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

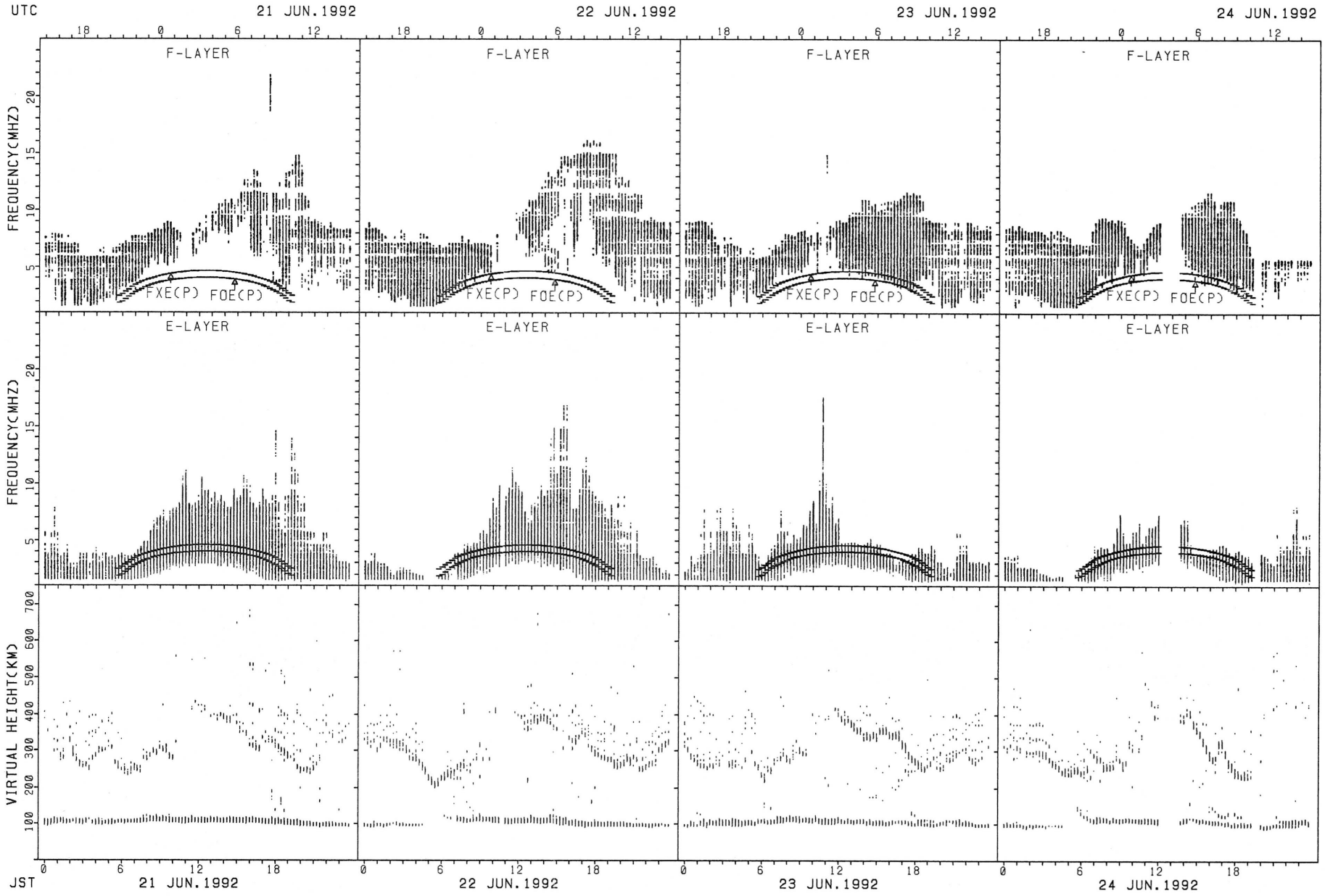
SUMMARY PLOTS AT OKINAWA



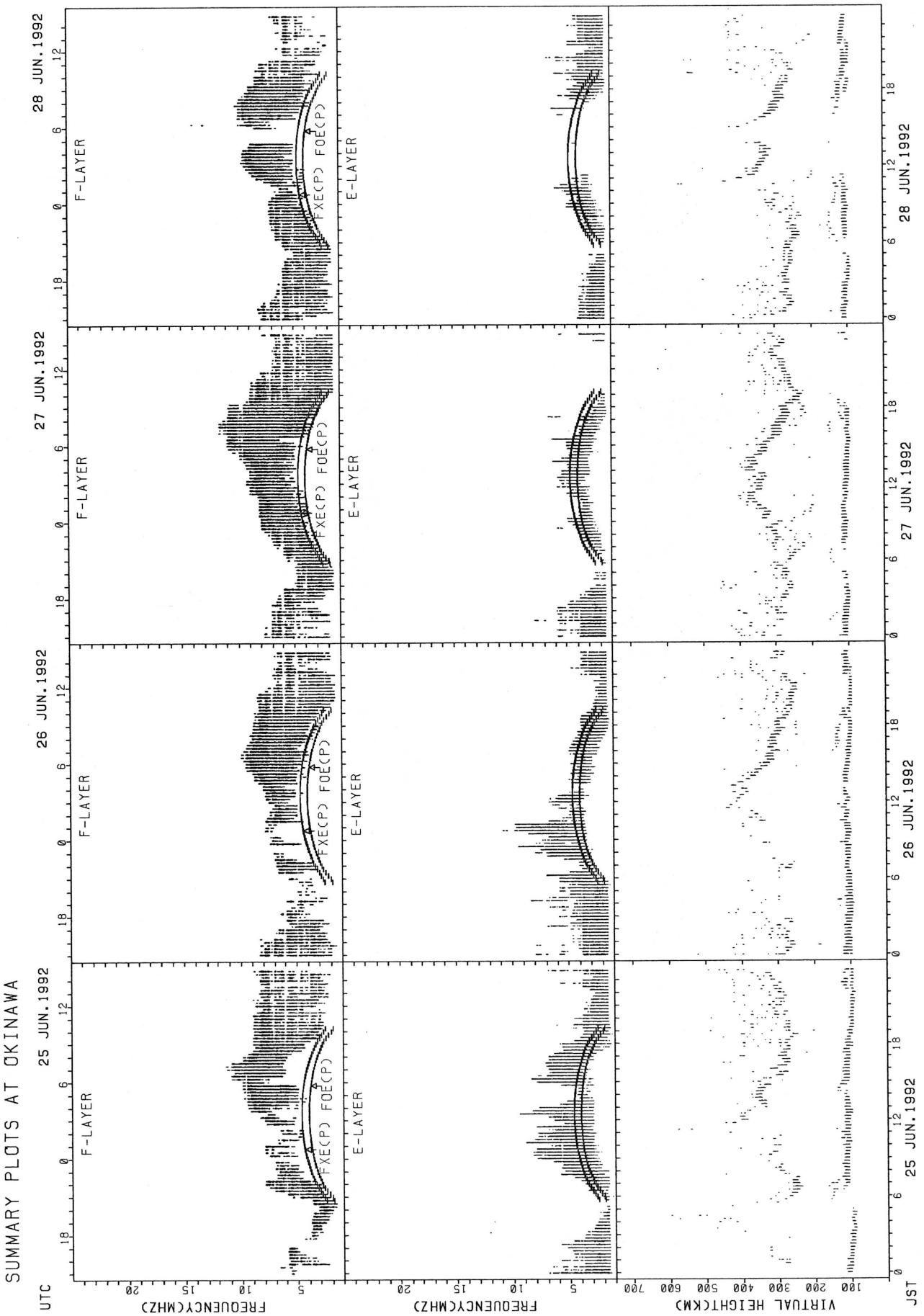
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT OKINAWA
17 JUN.1992
18 JUN.1992
19 JUN.1992
20 JUN.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

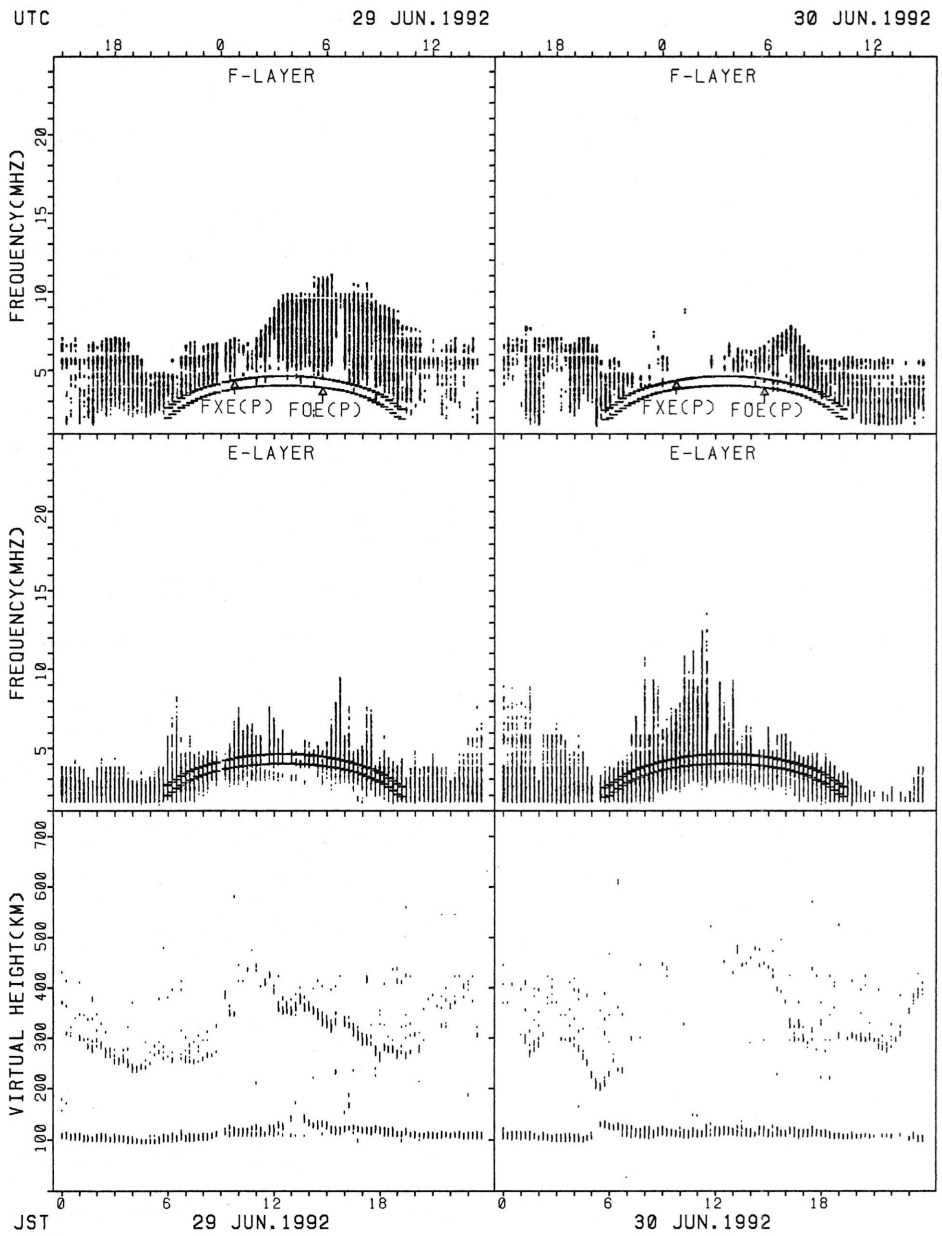
SUMMARY PLOTS AT OKINAWA



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


SUMMARY PLOTS AT OKINAWA
UTC
JST
25 JUN.1992
26 JUN.1992
27 JUN.1992
28 JUN.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 OKINAWA



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

MONTHLY MEDIANS OF H'F AND H'ES

JUN. 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	10						13	11											11	13	13	12	13	
MED	353						294	308											310	302	306	309	314	
U Q	390						329	348											344	318	332	344	332	
L Q	314						280	288											230	280	287	269	287	

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	20	16	22	18	11	17	24	28	27	26	19	20	13	16	17	20	20	26	28	30	29	29	29	23
MED	111	110	111	107	119	127	127	123	121	118	117	116	113	111	115	121	120	119	117	119	117	115	115	113
U Q	114	113	117	119	125	135	131	126	123	121	121	121	118	115	121	125	126	121	125	123	122	120	123	121
L Q	109	107	107	105	105	120	123	121	119	115	115	114	109	109	111	112	115	115	115	113	113	113	111	111

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	17	11					
MED																	320	302	288					
U Q																	332	338	342					
L Q																	304	249	234					

H'ES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	24	26	19	25	23	29	31	31	30	27	26	22	26	27	30	27	30	29	30	31	31	29
MED	109	107	107	106	107	127	125	119	117	115	115	115	113	115	113	117	115	115	113	113	113	115	115	113
U Q	113	111	110	113	115	146	131	125	123	119	121	123	119	119	119	123	121	119	115	117	115	121	119	115
L Q	105	105	104	103	105	111	119	115	113	113	111	113	111	111	111	111	109	111	111	110	107	109	111	109

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10						10	14									23	26	20	18	11	10	11	
MED	389						312	292									312	298	295	306	294	355	374	
U Q	412						338	320									330	320	322	336	344	368	398	
L Q	374						284	270									288	272	279	268	286	342	356	

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	29	29	30	29	28	22	26	29	29	30	31	28	28	26	21	27	28	29	29	30	29	30	30	29
MED	111	107	107	105	107	117	122	119	117	114	113	113	113	113	113	115	115	115	113	109	109	110	116	109
U Q	113	113	109	114	111	137	129	126	121	117	115	116	119	119	121	121	118	119	114	115	114	117	121	115
L Q	107	104	105	103	104	105	111	113	113	111	111	109	109	109	111	109	112	111	109	107	107	105	107	108

MONTHLY MEDIANS OF H'F AND H'ES

JUN. 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	10	12		10				14	18								21	16	22	15	17	10		15
MED	342	337		336				277	286								314	289	272	294	316	320		350
U Q	368	367		364				322	326								326	317	298	310	349	350		376
L Q	332	316		320				254	270								298	273	254	264	294	314		324

H'ES

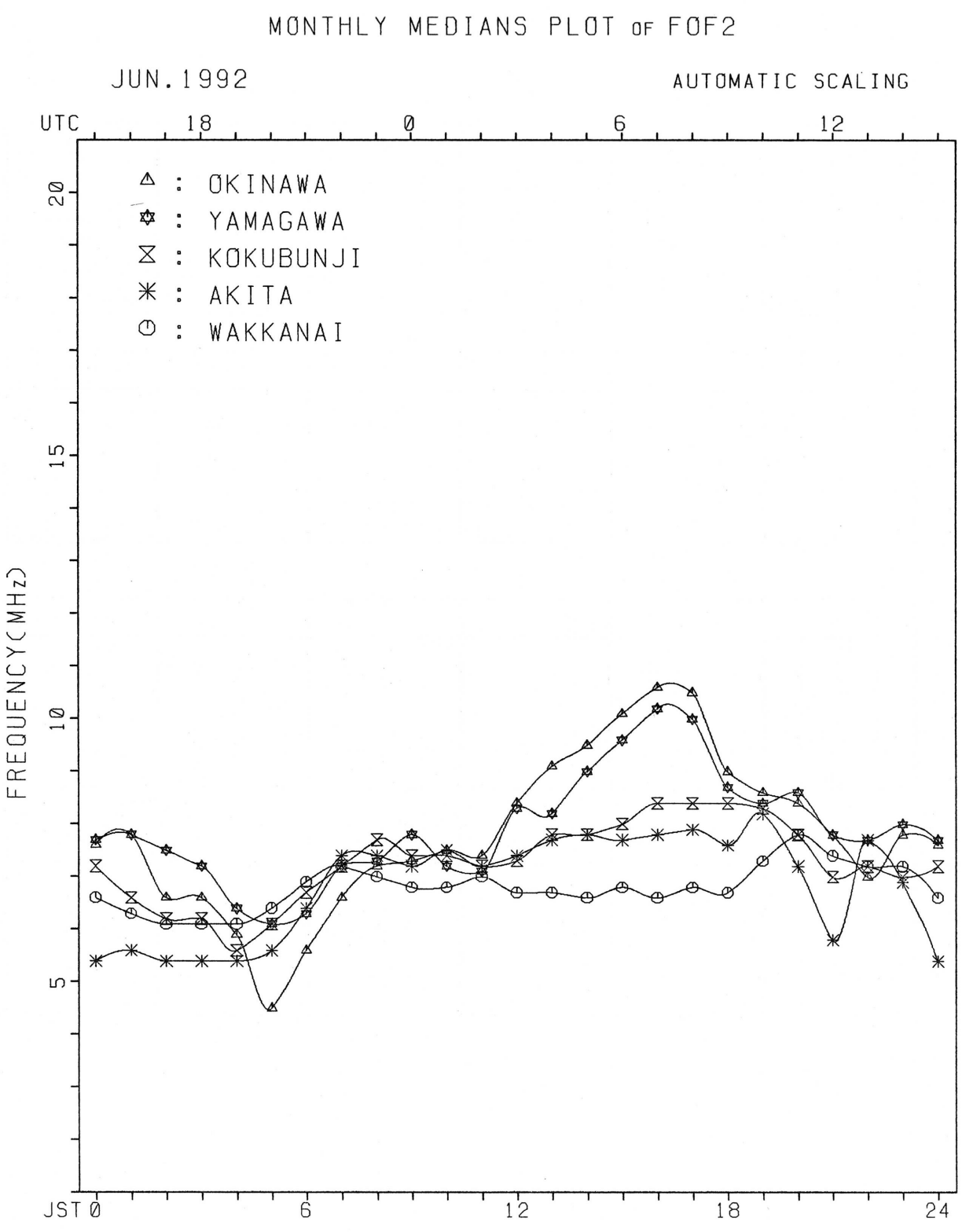
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	23	17	22	23	16	18	22	24	25	25	25	16	22	22	17	21	18	22	23	23	22	23	26
MED	111	107	113	107	105	107	126	119	117	113	111	111	114	113	116	115	113	113	113	111	109	109	109	111
U Q	114	111	114	111	109	110	131	125	120	117	116	114	117	117	129	135	121	123	121	113	113	113	117	119
L Q	107	103	108	103	101	105	107	117	113	112	110	109	109	111	111	111	110	109	111	107	107	107	105	107

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		13	15					17	15	10							22	24	25	20	14			
MED		332	294					290	278	285							326	307	282	290	323			
U Q		359	344					335	302	308							338	320	299	306	340			
L Q		290	282					264	272	230							306	288	245	276	280			

H'ES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	29	26	26	24	23	28	29	31	29	28	25	25	24	27	28	29	28	30	30	30	29	30	26
MED	109	107	107	104	105	109	122	119	117	115	114	113	113	114	119	116	115	113	111	109	108	107	107	107
U Q	115	117	109	107	107	123	134	125	121	117	118	116	125	120	131	127	130	117	113	111	111	109	113	115
L Q	101	102	101	101	101	105	108	115	113	111	109	111	109	110	113	111	113	109	109	107	103	100	101	101


MONTHLY MEDIANS PLOT OF FOF2
JUN. 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

JUN. 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

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	X 69	X 68	X 64	X 56	57															X 79	X 81	X 82	X 83	91
2	84	X 68	65	62	62						A										X 83	X 79	86	87
3	79	68	65	X 59	X 58														A		X 84	X 86	X 81	X 79
4	X 75	X 72	X 67	X 69	68																A	O X 82	81	X 83
5	80	76	72	69	68	69							A								X 84	X 79	86	88
6	81	82	80	X 72	X 69																X 90	X 84	83	X 81
7	X 77	X 73	X 72	75	X 67																A	X 84	X 79	X 77
8	X 81	81	X 74	X 66	X 61								A					A			X 85	X 86	X 79	X 75
9	X 75	X 70	X 72	X 69	X 72				A	A			A								X 76	X 69	X 66	68
10	67	O X 65	65	63	64	62															X 82	X 70	73	75
11	71	84	66	57	X 56						A	A	A		A	A	A				X 61	X 62	X 66	X 64
12	X 64	X 63	X 59	X 59	X 53						A	A	A	A	A						X 92	X 88	86	85
13	X 73	77	68	69	71				A								A	A			X 77	X 74	X 77	X 76
14	X 74	X 71	X 63	61	61				A												X 82	X 78	78	80
15	87	89	80	81	69						A										X 81	X 82	X 83	X 83
16	80	X 77	X 79	X 82	X 83							A									X 93	X 90	X 84	85
17	X 84	86	A	67	64	75	84				A	A									X 99	X 97	95	93
18	84	76	80	78	73	80	97				A	A									X 94	X 89	91	88
19	86	82	85	91	85					A	A								A		A	A	72	73
20	A	X 77	X 81	79	60	63		79													X 76	79	86	83
21	79	78	78	82	78	72						A									X 102	X 93	X 79	X 77
22	X 77	81	X 70	79	X 76																X 84	X 87	87	86
23	81	X 81	X 70	67	62																X 92	X 81	X 83	X 81
24	78	80	X 71	X 75	X 75																X 61	X 63	X 64	X 64
25	62	X 62	X 63	X 56	X 53							A	A	A	A	A					X 70	X 70	X 69	X 63
26	69	64	X 64	X 56	X 52	56															X 76	X 70	X 70	X 69
27	X 63	X 56	55	X 53	X 52	56															X 74	X 76	X 81	X 75
28	X 75	X 66	X 61	X 57	X 55																X 75	X 65	X 68	X 67
29	X 64	X 64	X 64	X 70	64	59															X 70	69	X 68	X 74
30	X 72	X 68	X 66	X 68	65			A		A	A	A									X 56	X 60	X 57	55
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	30	30	9	2	1												1	27	29	30	30
MED	77	X 74	X 68	68	64	63	90	79												X 79	X 82	X 79	X 80	X 78
U 0	81	81	76	75	71	74															X 90	X 86	84	85
L 0	70	X 68	X 64	X 59	X 58	58															X 75	X 70	X 70	X 73

JUN. 1992 FXI (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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	63	62	58	50	47	60	72	86	75	67	61	63	67	77	85	92	104	V 102	83	73	75	J R 76	77	J F 82
2	77	62	F 57	F 56	F 54	62	73	86	78	75	I A 68	71	73	80	78	77	82	88	86	84	77	73	U F 76	F
3	F 66	F 60	F 58	53	52	57	61	U A 75	83	74	65	65	78	88	89	84	81	76	A	77	78	80	75	73
4	69	66	61	63	F 62	65	64	64	67	69	68	72	81	93	98	99	85	80	84	86	I A 78	U S 76	F 75	U S 77
5	J F 74	F 68	64	J F 62	J F 60	F 59	62	64	84	79	70	75	I A 77	77	77	78	78	76	79	83	78	73	F 75	F 79
6	F 72	F 75	F 72	66	63	69	81	73	85	88	81	68	73	77	77	77	81	84	88	87	84	78	F 75	75
7	71	67	66	F 68	61	55	62	67	74	68	64	67	71	78	83	91	91	88	75	77	I A 76	79	S 73	71
8	75	72	68	60	55	V 57	62	76	V 76	59	65	64	I A 67	69	69	76	74	A	84	91	I A 78	80	73	69
9	69	64	66	63	66	67	68	52	A	A	54	56	I A 56	55	58	58	R 61	66	70	71	70	63	60	F 61
10	F 58	59	F 57	F 55	F 55	F 54	55	58	61	68	64	H 56	57	60	67	69	67	66	73	77	76	64	F 65	67
11	F 62	F 77	F 57	F 49	50	59	62	54	52	51	A	A	A	56	I A 58	A	A	69	63	53	55	56	60	58
12	58	57	54	53	47	43	53	58	58	63	A	A	A	A	A	83	72	73	76	85	86	82	F 79	76
13	67	F 69	F 60	F 61	61	64	68	66	I A 58	57	65	67	71	70	68	71	A	A	68	75	71	68	71	70
14	68	65	V 57	F 56	F 52	60	81	86	I A 81	80	80	82	84	75	73	80	82	84	84	84	76	72	69	F 70
15	F 75	F 81	F 73	F 69	62	65	68	69	80	78	I A 76	74	75	80	87	88	88	88	91	85	75	75	77	77
16	F 73	71	73	76	77	74	75	76	75	69	72	I A 76	81	78	80	82	81	84	91	90	87	84	78	F 77
17	79	F 77	A	F 58	F 58	F 65	F 76	V 84	76	73	A	A	69	73	82	88	88	86	85	87	93	91	87	F 86
18	77	F 65	F 71	F 69	F 64	F 73	88	91	88	73	I A 73	I A 76	84	89	91	93	94	92	93	89	88	83	F 84	79
19	F 76	F 74	J F 79	82	F 77	72	53	63	70	A	A	J R 50	58	60	62	64	64	61	I A 60	62	I A 62	I A 66	F 66	F 65
20	A	71	75	F 72	J F 54	F 56	69	F 70	77	86	88	H 69	79	87	91	92	93	102	98	91	70	F 72	F 77	J F 77
21	F 73	F 70	F 70	F 74	F 69	F 66	61	73	71	73	78	I A 80	83	80	81	81	84	84	85	89	96	87	73	71
22	71	66	64	64	69	68	75	81	69	V 69	70	76	82	87	94	96	99	91	85	R 74	78	81	78	F 78
23	F 73	75	64	F 59	F 55	62	71	V 77	82	75	71	76	83	95	96	90	92	93	93	95	86	75	77	75
24	F 72	F 72	65	69	69	71	85	89	82	77	73	72	78	79	70	82	92	102	86	61	55	57	58	58
25	F 55	56	57	50	47	45	49	R 53	59	55	58	A	A	A	A	A	67	69	62	63	64	64	63	57
26	F 61	F 56	58	50	46	F 49	U R 53	R 55	62	69	66	69	61	E G 50	68	73	73	77	77	69	70	64	64	63
27	57	50	F 47	47	46	F 49	62	71	81	76	63	70	70	70	64	71	70	80	84	78	68	70	75	69
28	69	60	55	52	49	56	66	88	77	H 63	72	74	66	68	I B 73	76	74	83	86	87	69	60	62	V 61
29	58	58	58	64	F 57	F 52	62	V 60	64	59	54	62	65	68	76	74	91	84	76	61	64	62	62	68
30	66	62	60	62	F 57	58	64	I A 55	59	I A 52	I A 49	I A 48	53	55	55	52	60	56	53	H 53	50	54	51	F 47
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	30	30	30	30	30	29	28	26	26	27	28	28	28	28	28	29	30	30	30	30	29
MED	69	66	61	62	57	60	65	70	75	69	68	70	73	77	77	80	82	84	84	80	76	73	74	71
U Q	74	F 72	F 69	F 68	63	66	73	81	81	76	73	75	81	80	86	89	91	88	86	87	78	80	77	F 77
L Q	62	60	57	53	52	56	62	60	63	63	64	64	66	68	68	74	72	74	74	71	69	64	64	64

JUN. 1992 FOF2 (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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						520	490	490		U A 480	410						
2												L 520	U A 510	U A 520	510	480	450	410	U L 370					
3												510	500	500	480									
4															490	470	L 470	440						
5															500	480		410	L					
6							L				520		500	U A 570	U A 495	U A 505	480	U L 440	L 370					
7							U L 450	L	U A 460		U A 500		515	510		U A 490	470	420	U L 400					
8							L 470	U A 440			U A 505	480		510	480	U A 510								
9						U A 340	370				U A 470			480	470	460	445	430	L 370					
10							L 400	430		U A 510	490	500	H 500	500	500	460	460	430	L 390					
11							390	420	435	460				U A 490					L					
12							350	U L 480		L 540							L 470	U L 470						
13						320	400	440		510	510	510	510	500	U A 540									
14							L 430					U A 550		520	540	500	480	440	L					
15							L	U A 470	500				520	520		U A 510								
16								L	480	540	520		510	540	520			460						
17							L		U L 540				530	540	520	U A 480	470	L 440						
18								L						500	520	500	L 490	U A 420	L					
19							U A 390	U A 450					510	500	470	490								
20									U A 510	U A 500	500	L 510	510	U A 520	520	490								
21							U L 460	460	U L 480		U A 500		510	510	L U L 530	510	480	450	L 405					
22							L 430			550		520	510	500	490			U L 430						
23							L	L				U A 520	520											
24							L	U L 450			U A 510	H 500	490		U A 490	480	440	410	L 325					
25							420			U A 460	460							410						
26								420	460	460		U A 510	490	500	460	U A 500		420	L					
27							L 440	440	460			490	480	480	470	470	480	410	360					
28							L	430	460	U L 480	460	500	500	470			L 470	430						
29						320	400	U L 460			U A 490	480	U A 505	500	470	475	450	L 420						
30						U A 300	U A 350		U A 430				450	450	440	430	430	410						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						4	15	13	11	10	13	14	21	24	23	20	17	22	8					
MED						320	400	440	460	505	500	510	510	500	490	485	470	425	L 370					
U Q						330	L 440	U 460	U 500	540	510	520	512	520	520	U A 500	480	440	L 395					
L Q						310	390	430	460	460	480	500	500	495	470	472	450	410	L 365					

JUN. 1992 FOF1 (0.01MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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						185	255	285	320		A	A	A	A	375	355	340	310	270	U A 200					
2						205	260	290	320	340	U A 355	A	A	A	A	355	U A 330	A	A	A	B				
3						190	260	300	325		A	A	A	A	A	365	A	305	270	200	B				
4						170	260	305	335	350	U A 360	A	A	A	A	A	U A 330	A	A	A	B				
5						170	260	305	335	A 340	U A 350	A	A	A	A	360	340	320	280	A	B				
6						A	A 265	305	340	A 350	A 370	370	380	375	365	340	315	A	A	B					
7						205	255	310	340	A 355	A 370	B	U A 365	A	A	A	A	280	215	B					
8						A	255	305	330	A 355	U A 370	A	A	A	A	U A 340	U A 320	U A 270	U A 210	B					
9						200	245	305	330	U A 355	365	A 380	A	365	360	340	320	275	225	B					
10					B	A	A	310	340	355	365	365	U A 370	A	360	350	325	U A 260	A	B					
11						190	260	305	340	360	370	380	A 385	A 375	A	A	A	A	A	B					
12						A	A	A	350	360	385	A	A	U A 365	350	325	325	285	A	B					
13						200	260	290	U A 315	A	A	400	A 405	395	385	365	325	280	A	B					
14						A	A	315	345	365	A 380	385	390	385	370	360	340	A 275	A	B					
15						205	H 260	310	345	365	A 380	A	385	375	360	350	330	A 280	A	B					
16						180	265	310	340	360	B	A	U A 370	385	375	355	325	280	A	B					
17						A	A	A	A 335	A	A	A	395	385	375	355	335	285	A	B					
18						A	A	A	340	365	375	385	380	375	365	335	325	U A 270	A	B					
19						200	255	295	330	350	360	A	390	R	370	A	330	275	A	B					
20						205	265	300	340	360	370	A	A	A	U A 365	A	A 305	A	A	B					
21						A	A	300	330	350	U A 365	A	A	A	A	A	A	A	A	B					
22						A	255	295	325	330	A	A	385	A	A	A	A	A	A	B					
23						A	275	310	335	360	A	A	A	A	U A 365	A	305	A	A	B					
24						A	A	310	U A 335	A	A	A	A	A	A	A	320	275	220	B					
25						A	260	310	B 345	365	365	A	A	A	A	A	A 330	A	A	B					
26						190	B	B	370	A	A	395	395	375	360	345	315	A 260	A	B					
27						180	250	300	325	A	A	A	A	A	355	A	315	275	A 200	B					
28						180	245	A 300	A	A	A	370	395	B	B	B	B	300	U A 235	B					
29						A	A 250	U A 295	A	A	U A 365	A	A	A	360	340	315	285	U A 210	B					
30						A	250	275	315	340	350	U A 365	355	365	350	335	315	270	U A 205	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						16	22	26	28	21	19	10	15	13	21	18	23	21	10					
MED						190	260	305	335	355	A 365	380	385	375	360	340	320	275	A 210					
U Q						202	260	310	340	360	A 370	385	395	385	368	350	325	280	220					
L Q						180	255	295	328	350	U A 360	370	U A 370	370	358	335	315	270	A 200					

JUN. 1992 FOE (0.01MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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

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	19	20	J A 29	J A 21	J A 18	22	39	J A 54	J A 62	56	J A 72	61	J A 48	J A 47	39	J A 62	J A 54	J A 43	J A 73	48	54	44	J A 88	60
2	J A 52	J A 35	J A 22	J A 53	J A 33	27	J A 50	J A 48	J A 64	J A 54	J A 76	J A 54	J A 53	J A 54	J A 51	J A 49	J A 53	J A 42	J A 30	18	J A 21	J A 76	J A 120	J A 51
3	28	J A 35	J A 22	J A 34	J A 24	24	36	91	J A 65	60	J A 53	43	J A 44	J A 42	G 33	J A 91	J A 61	J A 67	94	J A 73	J A 57	J A 71	J A 43	22
4	E B 14	J A 27	J A 22	J A 20	J A 19	24	35	J A 48	J A 68	J A 61	J A 65	78	62	78	J A 49	J A 49	J A 54	J A 65	J A 80	61	J A 102	J A 119	J A 37	J A 85
5	J A 86	J A 51	J A 52	J A 56	J A 27	22	39	J A 54	J A 65	67	J A 65	71	149	J A 105	J A 42	48	J A 70	J A 50	J A 103	67	52	36	J A 46	J A 60
6	J A 54	J A 53	J A 54	J A 31	20	J A 51	36	J A 51	J A 73	J A 87	J A 55	J A 58	J A 48	J A 75	J A 62	J A 54	J A 48	J A 44	J A 28	J A 31	J A 66	J A 89	J A 52	J A 52
7	J A 43	J A 24	J A 20	J A 52	J A 47	28	J A 43	J A 48	48	J A 63	J A 61	56	45	J A 48	J A 59	J A 49	J A 54	30	28	54	J A 121	74	J A 34	J A 38
8	J A 54	J A 22	J A 44	23	J A 21	21	35	J A 52	65	J A 56	J A 51	42	109	J A 51	J A 47	J A 94	J A 117	108	J A 55	62	J A 53	53	J A 44	J A 86
9	J A 73	J A 101	40	23	J A 33	J A 36	J A 36	J A 49	82	92	J A 79	J A 60	78	107	42	38	45	35	G	E B 16	24	E B 14	E B 15	J A 69
10	J A 58	84	J A 27	J A 58	J A 59	28	J A 30	39	J A 68	54	42	45	J A 50	39	38	G	J A 45	35	J A 35	J A 52	J A 49	J A 24	J A 56	E B 13
11	J A 60	J A 80	J A 35	J A 24	E B 13	22	32	36	39	45	51	J A 54	J A 62	J A 51	68	75	J A 92	J A 60	J A 37	J A 51	J A 48	J A 29	27	J A 20
12	J A 22	42	J A 75	J A 52	J A 41	J A 31	J A 31	J A 35	43	J A 54	J A 96	79	84	J A 141	102	79	42	J A 48	54	J A 62	J A 80	J A 75	J A 51	J A 63
13	J A 49	J A 64	J A 104	J A 37	J A 29	J A 36	34	J A 52	J A 77	J A 47	J A 43	42	J A 53	46	J A 66	74	J A 122	J A 139	J A 85	35	28	33	J A 37	J A 37
14	J A 41	J A 58	J A 80	60	J A 51	J A 54	J A 34	J A 78	J A 94	81	J A 77	J A 65	J A 99	100	48	38	J A 48	J A 42	J A 36	51	60	J A 47	J A 50	J A 53
15	J A 35	J A 78	J A 71	J A 36	27	24	31	49	J A 47	J A 72	J A 105	129	J A 54	J A 54	95	J A 62	74	127	J A 52	41	J A 51	J A 33	36	J A 48
16	J A 37	41	J A 35	28	J A 19	G	34	J A 46	J A 47	J A 79	48	J A 104	J A 48	44	J A 45	64	J A 64	J A 45	J A 49	J A 50	60	J A 46	J A 52	J A 53
17	J A 47	J A 53	J A 100	J A 57	J A 64	J A 55	J A 35	J A 58	42	85	102	J A 161	J A 97	J A 50	J A 67	J A 65	J A 47	J A 50	J A 54	49	J A 53	J A 36	J A 71	J A 53
18	J A 54	J A 96	J A 53	J A 58	J A 53	51	J A 62	J A 54	J A 64	84	94	105	J A 63	44	43	J A 54	J A 51	J A 47	J A 31	35	J A 30	J A 21	J A 44	J A 64
19	J A 84	J A 50	J A 46	J A 55	J A 51	27	J A 60	J A 53	J A 64	77	59	J A 52	45	G	40	39	J A 62	J A 59	73	J A 54	J A 153	J A 101	J A 87	J A 61
20	J A 87	J A 37	E B 14	E B 13	E B 13	26	J A 48	60	J A 53	J A 54	J A 51	J A 54	J A 64	J A 73	J A 49	J A 64	J A 79	67	46	34	60	J A 36	59	J A 76
21	J A 24	J A 23	J A 34	J A 43	J A 55	J A 50	30	38	J A 49	J A 55	J A 65	93	J A 76	J A 49	J A 51	J A 53	J A 43	31	25	21	21	J A 54	J A 33	28
22	J A 51	J A 50	J A 34	J A 44	J A 55	J A 63	J A 42	59	J A 52	J A 55	J A 57	J A 47	G 37	J A 48	J A 102	91	108	49	J A 78	J A 19	E B 14	J A 19	J A 123	J A 76
23	J A 47	J A 34	J A 37	J A 32	J A 35	J A 34	30	34	J A 50	J A 79	J A 61	J A 69	J A 73	J A 77	104	J A 103	J A 88	84	J A 103	70	J A 100	J A 53	J A 53	J A 92
24	J A 67	J A 46	J A 34	J A 36	J A 36	J A 40	J A 35	37	J A 102	J A 192	J A 97	J A 43	J A 44	J A 67	J A 103	J A 50	38	34	32	42	J A 52	J A 37	J A 37	J A 65
25	J A 36	J A 50	J A 26	J A 26	J A 18	22	30	J A 50	J A 71	J A 52	43	J A 77	73	75	106	126	J A 51	J A 47	J A 36	J A 36	J A 52	J A 35	J A 53	J A 37
26	J A 53	J A 47	36	27	28	21	E B 42	E B 35	43	40	55	54	47	40	41	J A 65	J A 54	J A 48	J A 69	J A 48	J A 73	J A 38	J A 28	J A 38
27	J A 53	J A 23	J A 57	J A 49	J A 42	24	29	36	J A 48	67	J A 71	38	42	40	G 35	37	34	J A 54	J A 36	54	38	J A 26	J A 30	J A 23
28	J A 34	J A 29	J A 30	J A 41	J A 24	20	G 24	32	J A 42	47	42	J A 41	47	E B 41	B	J A 88	41	38	43	J A 36	44	J A 30	J A 52	40
29	J A 49	J A 34	J A 24	J A 30	J A 21	28	J A 37	J A 49	J A 61	56	J A 50	45	J A 57	J A 55	G	40	J A 51	J A 52	50	J A 20	J A 21	J A 66	J A 35	J A 54
30	J A 46	J A 36	J A 21	22	J A 40	J A 42	J A 48	J A 128	J A 76	J A 100	80	J A 96	41	45	38	43	J A 53	J A 61	50	51	J A 54	J A 52	J A 26	J A 47
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30
MED	J A 49	J A 44	J A 35	J A 36	J A 31	28	35	J A 49	J A 63	J A 60	J A 61	57	J A 54	J A 50	49	J A 58	J A 54	J A 48	J A 50	48	J A 52	J A 41	J A 45	J A 53
U Q	J A 54	J A 53	J A 53	J A 52	J A 47	J A 40	J A 42	J A 54	J A 68	J A 79	J A 77	78	73	75	68	75	J A 70	61	J A 73	54	J A 60	J A 66	J A 53	J A 64
L Q	J A 36	J A 34	J A 26	26	J A 21	22	31	38	48	54	51	45	47	44	40	48	47	42	35	35	38	J A 33	J A 35	38

JUN. 1992 FOES (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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 13	E B 13	E B 13	17	E B 13	21	38	48	51	50	55	54	43	G 38	38	59	48	32	62	40	43	40	31	33
2	27	22	16	36	22	26	44	47	61	50	A A 76	42	51	52	50	40	37	30	22	17	14	56	43	34
3	18	24	17	20	17	22	32	U A 64	61	54	48	41	40	40	G 32	64	58	65	A A 94	47	30	51	31	E B 13
4	E B 14	19	E B 13	E B 14	E B 14	23	33	41	57	55	64	70	55	70	44	45	35	42	58	47	A A 102	45	16	27
5	17	15	16	24	16	21	39	51	61	62	62	55	A A 149	64	G 36	46	69	30	31	58	45	21	37	15
6	23	33	32	15	E B 13	32	34	47	70	81	51	55	44	57	50	51	40	34	23	24	29	50	19	25
7	19	17	15	31	34	24	40	44	46	60	50	56	43	45	54	49	40	30	26	52	A A 121	22	E B 14	E B 13
8	17	16	15	E B 13	E B 13	21	34	44	57	56	51	41	A A 109	44	41	51	71	A A 108	53	55	45	45	39	29
9	50	24	30	E B 13	22	34	34	44	A A 82	A A 92	47	55	A A 78	41	39	37	34	G	G	E B 16	E B 14	E B 14	E B 15	18
10	44	50	18	39	20	20	29	36	56	51	41	44	44	39	37	G	43	30	25	31	30	21	E B 13	E B 13
11	44	65	28	E B 13	E B 13	21	31	34	36	40	A A 51	A A 54	A A 62	49	A A 68	A A 75	A A 92	51	25	34	36	20	17	17
12	E B 13	29	39	35	24	26	28	33	38	47	A A 96	A A 79	A A 84	A A 141	A A 102	79	38	43	40	55	58	44	33	36
13	35	44	32	16	22	23	32	40	A A 77	39	40	42	G 41	44	54	66	A A 122	A A 139	53	21	18	26	27	16
14	17	36	38	36	37	42	31	74	A A 94	78	68	55	73	41	45	G	43	34	35	35	48	36	18	27
15	24	59	27	20	E B 13	24	31	47	46	69	A A 105	67	47	48	63	51	63	80	43	33	51	22	28	38
16	24	31	20	17	E B 13	G	33	36	43	47	44	A A 104	43	42	43	58	51	34	45	40	50	19	35	38
17	35	35	A A 100	42	44	40	30	45	38	69	A A 102	A A 161	44	46	49	48	37	34	53	41	32	25	45	20
18	43	15	43	29	21	44	60	40	57	72	A A 94	A A 105	61	42	42	40	43	42	29	25	26	15	24	59
19	16	26	20	41	23	27	39	45	50	A A 77	A A 59	A A 52	41	G	39	37	51	43	A A 73	41	A A 153	A A 101	41	31
20	A A 87	18	E B 14	E B 13	E B 13	24	43	50	51	50	41	42	46	52	42	43	76	61	40	29	47	29	16	32
21	18	17	16	16	35	29	29	36	45	52	50	A A 93	44	41	43	44	35	30	23	21	E B 13	54	20	17
22	18	16	17	20	28	41	32	53	47	41	55	40	G 37	40	41	79	76	37	60	18	E B 14	17	29	31
23	27	21	24	25	24	31	29	33	45	50	54	52	44	58	73	79	62	79	79	60	44	19	21	29
24	37	31	16	21	30	35	29	36	61	55	51	40	41	62	49	39	36	30	29	34	30	17	33	39
25	16	17	16	21	15	21	30	45	48	46	42	A A 77	A A 73	A A 75	A A 106	A A 126	50	32	33	30	34	30	36	30
26	37	27	21	19	18	U Y 21	E B 42	E B 35	41	40	U Y 54	51	44	39	40	50	50	34	31	25	15	30	20	30
27	20	E B 13	16	31	27	20	28	34	43	56	58	U Y 38	42	40	G 34	35	33	35	32	43	24	E B 14	18	18
28	17	19	25	19	19	20	G 23	31	38	46	40	41	44	E B 41	B	E B 64	41	36	38	27	36	25	30	27
29	20	15	E B 13	E B 14	15	26	32	39	53	47	49	42	51	45	G	G	42	40	41	18	18	22	17	34
30	26	22	E B 13	E B 14	18	30	35	A A 128	43	A A 100	A A 80	A A 96	41	40	37	37	34	37	35	43	20	35	16	24
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30
MED	22	22	18	20	20	24	32	44	50	53	52	54	44	44	43	48	43	36	36	34	33	26	26	28
U Q	35	31	28	31	24	31	38	47	61	69	A A 64	A A 70	A A 61	52	52	64	62	43	53	43	47	44	33	33
L Q	17	17	E B 16	E B 15	E B 14	21	30	36	43	47	48	42	43	40	38	39	37	32	29	25	20	20	17	18

JUN. 1992 FBES (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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	13	13	13	13	13	15	16	14	16	26	20	32	32	27	26	19	18	14	13	13	17	14	14	13
2	13	14	13	13	14	13	13	16	19	21	21	33	33	34	20	17	17	14	14	13	14	14	13	13
3	14	13	13	14	13	14	14	14	16	17	34	33	23	26	24	20	16	15	13	13	14	14	13	13
4	14	13	13	14	14	13	16	16	17	20	24	36	32	21	20	17	17	17	13	15	13	13	13	13
5	14	13	13	13	13	13	15	16	21	20	20	23	32	27	20	19	17	15	15	13	17	15	13	13
6	14	13	13	13	13	15	14	16	16	22	23	33	26	29	20	19	18	16	13	13	14	15	13	13
7	13	14	13	14	14	13	17	18	18	19	20	41	33	21	21	22	15	16	14	13	15	13	14	13
8	13	13	13	13	13	14	15	17	17	18	22	31	21	33	22	20	16	16	16	17	13	15	13	13
9	13	14	13	13	13	13	18	16	17	20	20	26	32	24	21	16	17	17	15	16	14	14	15	13
10	13	13	13	14	13	13	15	15	19	19	24	26	33	32	25	22	20	13	17	13	14	13	13	13
11	13	13	13	13	13	13	16	17	18	24	22	23	31	23	25	18	17	14	13	13	13	13	14	14
12	13	13	13	13	13	13	16	16	17	18	21	37	38	25	34	18	18	15	15	15	14	13	14	14
13	13	13	13	13	13	13	16	16	18	18	20	29	22	25	23	19	17	16	16	13	13	14	14	13
14	14	13	13	14	13	13	17	17	18	20	24	26	27	26	20	18	17	14	14	14	14	13	13	14
15	13	14	13	13	13	18	17	17	21	24	22	23	20	27	27	20	17	16	17	16	13	13	14	13
16	15	14	13	13	13	13	16	15	16	19	37	27	31	33	20	22	17	13	14	15	14	14	14	13
17	14	13	15	13	13	15	17	15	17	17	24	27	30	31	20	20	19	16	16	16	13	13	13	13
18	14	13	13	14	13	14	17	17	17	18	24	26	27	21	24	17	17	16	14	13	14	13	15	16
19	13	13	13	15	14	15	16	17	17	16	18	36	21	34	25	19	17	14	13	13	15	14	13	14
20	13	14	14	13	13	15	14	16	17	21	18	24	20	20	19	17	18	16	13	15	13	13	13	13
21	13	13	13	14	13	13	15	16	17	18	19	29	30	33	20	22	17	16	16	15	13	13	13	14
22	13	15	14	13	13	14	14	15	17	19	20	19	30	32	20	26	18	14	13	13	14	13	14	15
23	14	14	14	13	13	13	16	16	18	23	28	24	32	25	25	20	18	16	14	13	14	14	13	13
24	13	14	14	13	14	13	15	16	16	22	26	28	31	32	31	24	18	16	15	15	15	13	14	13
25	13	13	14	13	13	16	17	14	17	23	30	31	31	33	32	33	25	19	17	13	13	13	14	14
26	14	13	13	13	13	14	42	35	33	34	35	34	31	33	27	19	20	14	16	16	13	13	13	13
27	13	13	13	17	13	13	16	17	18	21	23	31	33	32	26	23	20	14	15	13	14	14	13	13
28	13	13	13	13	13	13	14	17	16	20	22	34	35	41	B	64	37	20	17	13	14	13	15	13
29	13	13	13	14	13	13	15	16	18	26	30	24	25	20	20	21	19	15	14	13	13	13	13	13
30	13	13	13	14	13	13	13	14	16	20	24	20	30	22	23	22	16	14	13	14	13	15	13	13
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	13	13	13	13	13	13	16	16	17	20	22	28	31	27	23	20	17	16	14	13	14	13	13	13
U Q	14	14	13	14	13	14	17	17	18	22	24	33	32	33	26	22	18	16	16	15	14	14	14	14
L Q	13	13	13	13	13	13	15	15	17	18	20	24	26	24	20	18	17	14	13	13	13	13	13	13

JUN. 1992 FMIN (0.1MHZ) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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	285	290	305	290	280	295	295	330	315	345	335	265	275	280	270	285	300	V 305	320	290	270	J R 290	275	J F 300
2	285	295	F 310	F 290	F 280	285	295	305	310	325	A	285	290	295	295	290	305	305	305	305	290	280	U F 285	F
3	F 280	F 300	F 310	295	305	320	310	A	310	325	300	255	255	275	295	305	300	305	A	285	280	275	290	290
4	285	290	285	280	F 290	335	325	315	305	320	A	A	260	275	290	305	290	295	275	305	A	U S 290	F 300	U S 280
5	J F 305	F 285	290	J F 285	J F 305	F 320	335	280	300	325	290	285	A	285	285	285	A 295	300	290	290	295	275	F 270	F 285
6	F 280	F 285	F 310	300	305	290	325	285	305	A 315	300	300	290	290	280	280	295	295	300	295	300	280	F 280	280
7	280	280	290	F 305	345	320	300	295	305	A 305	295	270	275	275	270	280	295	315	290	290	A	265	S 285	275
8	265	295	300	310	295	V 305	280	295	V 290	A	255	240	A	260	250	280	A	A	270	285	275	270	265	270
9	260	260	255	275	260	245	275	230	A	A	245	245	A	240	265	265	R 275	280	285	290	285	275	270	F 280
10	F 270	310	F 285	F 290	F 300	F 315	275	250	A 260	295	290	H 260	255	255	285	290	280	270	275	280	285	270	F 255	270
11	F 250	F 300	F 315	F 275	290	300	290	245	255	235	A	A	A	255	A	A	A	320	305	290	255	250	260	260
12	270	275	A 275	280	290	315	300	305	295	255	A	A	A	A	A	A	295	285	280	275	290	295	F 255	270
13	240	F 270	F 240	F 280	275	260	275	290	A	230	265	265	275	290	295	A 290	A	A	290	285	285	265	265	270
14	265	275	V 265	F 275	F 265	285	290	305	A	A	280	270	295	280	265	280	295	295	290	290	275	265	265	F 270
15	F 280	F 290	F 285	F 265	300	330	315	285	295	290	A	275	265	260	275	280	290	A 290	295	290	275	265	265	280
16	F 265	255	265	300	300	310	290	310	330	280	270	A	280	270	270	280	280	285	290	290	280	275	280	F 265
17	265	F 290	A	F 280	F 285	F 305	F 310	V 320	305	A 300	A	A	270	265	270	285	295	285	280	275	290	290	275	F 265
18	280	F 285	F 300	F 285	F 285	F 275	310	305	330	A	A	A	275	285	280	285	280	290	285	280	290	275	F 285	270
19	F 275	F 280	J F 265	275	F 280	310	240	255	290	A	A	A	250	265	285	280	290	290	A	290	A	A	F 250	F 260
20	A	285	320	F 355	J F 290	F 300	310	F 280	305	305	320	H 295	280	285	285	280	285	295	315	320	290	F 260	F 290	J F 270
21	F 270	F 275	F 285	F 285	F 285	F 295	290	315	305	290	310	A	295	285	280	280	285	285	280	280	300	310	280	280
22	280	275	270	275	290	295	315	330	300	V 285	280	270	275	270	280	280	295	295	300	R 270	275	285	290	F 320
23	F 280	290	295	F 300	F 285	325	325	V 290	305	315	285	265	265	275	285	A 285	285	290	295	295	295	280	280	270
24	F 285	F 285	290	290	290	285	310	300	300	280	295	285	280	280	245	245	270	310	345	310	265	255	270	270
25	F 270	285	290	270	265	275	260	R 265	295	260	275	A	A	A	A	A	295	315	285	290	275	265	275	270
26	F 295	F 280	295	290	295	F 315	U R 350	R 315	270	305	275	310	295	G	290	290	295	295	295	290	295	295	275	295
27	300	285	F 290	275	280	F 285	300	305	310	315	A 280	285	295	310	285	305	285	305	310	320	280	265	285	285
28	295	300	300	285	280	310	290	330	325	H 295	310	305	320	300	B	305	290	295	295	320	300	270	275	V 270
29	265	275	290	290	F 300	F 285	300	V 275	315	295	235	290	285	270	270	255	295	295	315	295	265	260	260	275
30	280	290	255	275	F 270	275	280	A	260	A	A	A	250	260	260	250	305	290	285	H 275	270	270	270	F 270
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	30	30	30	30	28	27	24	21	20	24	28	26	27	27	28	28	30	27	29	30	29
MED	280	285	290	285	290	300	300	298	305	298	285	272	275	275	280	280	295	295	290	290	285	275	275	270
U Q	285	290	F 300	290	300	315	310	312	310	315	300	288	290	285	285	290	295	305	302	295	290	282	285	280
L Q	265	275	272	275	280	285	290	280	295	282	272	265	265	262	270	280	285	290	285	285	275	265	265	270

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

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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

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							L	A	A	A	A	A	340	365	H 360	A	A	375	A					
2							A	A	A	A	A	L 360	A	A	A	360	345	350	U L 345					
3								A	A	A	A	375	375	370	365	A	A	A	A					
4									A	A	A	A	A	A	A 360	A	L 330	A	A					
5								A	A	A	A	A	A	A	355	A	A	360	L					
6							L	A	A	A	A	A	395	A	A	A	A 335	U L 345	L 340					
7							U L 340	L	A	A	A	A	375	A 370	A	A	A 335	355	U L 340					
8							L 330	A	A	A	A	380	A	335	370	A	A	A	A	A				
9						A	A 335	A	A	A	A	A	A	385	380	360	350	320	L 325					
10							L 330	355	A	A	380	395	H 390	380	355	385	A	H 330	L 315					
11							330	340	365	395	A	A	A	A	A	A	A	A	L					
12							390	U L 340		L 295	A	A	A	A	A	A	L 355	A	A					
13						330	335	370	A	370	390	370	360	390	A	A	A	A	A					
14						A	L 345	A	A	A	A	A	A	365	A 325	360	A 335	340	L					
15							L	A	A 330	A	A	A	360	A 345	A	A	A	A	A					
16								L	A 370	340	375	A	380	335	360	A	A	325	A					
17						A	L		U L 345	A	A	A	350	345	A	A	355	L 335	A	A				
18						A	A	L	A	A	A	A	A	390	345	340	L 340	A	L					
19							A	A	A	A	A	A	350	385	365	340	A	A	A	A				
20								A	A	A	385	L 380	380	A	345	350	A	A	A					
21							U L 330	345	A	A	A	A	360	L 365	U L 335	340	335	335	L 315					
22							L 355	A	A	340	A	375	380	375	355	A	A	U L 360	A					
23							L	L	A	A	A	A	385	A	A	A	A	A	A					
24							L	U L 370	A	A	A	H 395	385	A	A	335	340	330	A					
25							340	A	A	A	380	A	A	A	A	A	A	335						
26								350	340	385	A	A	370	365	400	A	A	335	L					
27							L 325	360	A 330	A	A	395	400	390	380	360	H 335	A 335	380					
28							L	365	385	U L 370	435	390	355	395	B	B	L 340	335	A					
29						330	360	U L 350	A	A	A	400	A	A 330	380	350	A	A	A					
30						A	A	A	A	A	A	A	375	385	385	375	355	A 330	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	13	10	7	7	6	11	19	20	18	12	14	18	7					
MED						330	L 335	352	345	370	382	380	375	370	360	355	340	335	L 340					
U Q							350	365	370	385	390	395	385	385	380	360	350	350	345					
L Q							L 330	345	A 330	340	380	375	360	355	355	340	335	330	L 315					

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

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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							305	270	295	260	E A 310	A 435	415	370	365	330	295	260	E A 260					
2							305	285	E A 285	275	A	385	350	335	330	340	300	295	280					
3								A	A 295	280	325	440	385	345	320	A 315	320	E A 330	A					
4									E A 330	305	A	A	400	A 360	320	300	310	300	A 340					
5								380	A 320	280	A	375	A	380	350	340	A	290	310					
6							250	A 290	E A 315	A	315	A 310	365	375	355	355	320	305	285					
7							325	320	305	A	365	E A 405	405	380	375	335	310	275	305					
8							355	320	A 330	A	465	530	I A 420	430	455	355	A	A	A 345	A 290				
9						390	310	A 555	A	A	550	A	A	545	470	450	415	350	315					
10							350	455	A	370	390	L 475	505	480	385	365	360	360	325					
11							340	500	495	590	A	A	A	A 505	A	A	A	310	270					
12							275	330		470	A	A	A	A	A	A	330	340	325					
13						310	330	360	A	625	450	440	395	365	370	A	A	A	E A 345					
14						A 355	295	A	A	A	E A 375	385	E A 360	380	400	355	330	305	295					
15							305	355	325	A 370	A	A	390	405	365	345	330	A	280					
16								280	280	395	405	A	375	360	375	355	340	325	295					
17						285	300		305	A	A	A	420	420	370	340	310	310	A 320	A 295				
18						A 305	A 280	270	265	A	A	A	370	335	345	335	325	300	280					
19							500	455	355	A	A	A	520	460	395	400	355	300	A	A 310				
20								A 290	305	315	280	H 290	360	350	330	330	A	290	270					
21							335	295	300	340	310	A	330	335	345	340	335	330	310					
22							300	260	280	350	400	390	360	370	330	A	E A 330	290	A					
23							245	330	280	290	A 330	400	390	335	A 340	A	A 330	E A 350	A					
24							270	280	A 305	360	335	355	360	A 360	455	400	345	275	240					
25							475	A 430	370	460	430	A	A	A	A	A	335	310						
26								310	385	350	E Y 455	340	370	G	365	330	335	315	275					
27							330	310	305	310	A	350	360	315	385	330	340	300	275					
28							320	260	270	H 305	305	305	325	350	B	B 340	320	315	290					
29						350	295	385	320	365	575	385	390	410	375	415	315	305	260					
30						340	340	A	440	A	A	A	525	470	485	490	350	360	330	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						7	24	25	25	21	19	18	25	28	26	24	25	27	25	3				
MED						340	308	320	305	350	370	385	385	372	368	340	330	305	292	A 295				
U Q						355	338	382	330	382	450	435	410	425	385	360	340	330	A 322	A 310				
L Q						305	295	282	290	298	315	350	360	350	345	332	318	295	275	A 290				

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

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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

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	275	270	245	260	305	250	E A 270	A	A	A	A	A	A 255	225	H 220	A	A	A 235	A	A 260	A 335	A 300	A 310	295
2	260	270	250	E A 320	275	250	A	A	A	A	A	230	A	A	A	A 240	A 250	240	250	250	250	A	E A 305	A 305
3	260	285	250	285	265	260	240	A	A	A	A	210	205	210	220	A	A	A	A	A	A 290	A	280	280
4	265	285	275	280	250	230	240	A 260	A	A	A	A	A	A	E A 265	A	A 245	A	A	A 270	A	A	245	A 305
5	250	270	265	A 315	260	230	240	A	A	A	A	A	A	A	230	A	A	240	280	A	280	280	A 325	270
6	290	300	275	235	265	A 270	A 250	A	A	A	A	A	220	A	A	A	A	230	240	245	270	A	280	310
7	300	295	270	A 290	240	220	E A 280	A	A	A	A	A	220	E A 245	A	A	E A 280	230	A 240	A	A	300	280	300
8	310	270	245	240	240	225	240	A	A	A	A	220	A	E A 280	240	A	A	A	A	A	E A 310	E A 320	A 325	A 310
9	A	A 350	A 350	300	345	A	A	A	A	A	A	A	A	220	220	235	245	240	250	280	265	275	280	305
10	A	E A 350	270	A	270	250	255	A 260	A	A	230	220	230	240	220	215	A	H 235	A 245	A 290	270	290	320	300
11	A	A	250	265	290	255	A 270	255	240	235	A	A	A	A	A	A	A	A	A 250	A	E A 375	355	330	325
12	305	A 330	A	E A 345	A 290	A 245	205	220	250	A	A	A	A	A	A	A	240	A	A	A	A	A 295	A 320	A 345
13	E A 395	A 365	E A 410	290	330	285	A 255	E A 255	I A 230	200	205	210	A 250	230	A	A	A	A	A	275	250	A 320	A 330	310
14	285	A 330	E A 375	E A 345	A	A	240	A	A	A	A	A	A	220	E A 285	230	A	250	A	A 265	E A 305	A 320	290	A 350
15	A 315	E A 330	A 290	270	240	240	245	A	A	A	A	A	E A 260	A	A	A	A	A	A	A 260	E A 340	295	330	A 320
16	310	A 355	315	265	H 240	225	240	230	E A 260	E A 280	235	A	230	A 255	230	A	A	255	A	E A 270	E A 305	270	A 300	A 345
17	A 330	A 295	A	A	E A 350	A	H 225	E A 260	225	A	A	A	255	E A 275	A	A	225	A 255	A	A	280	290	A 320	A 320
18	A 320	270	A 325	A 285	280	A	A	E A 250	A	A	A	A	A	215	A 255	A 255	A	A	A 245	260	275	270	315	A
19	290	330	310	A 330	280	260	A	A	A	A	A	A	255	210	240	245	A	A	A	A	A	A	A	A 380
20	A	295	240	220	250	235	A 260	A	A	A	205	A 230	A 240	A	A 240	E A 275	A	A	A	250	A	A 350	285	A 320
21	300	300	290	265	A 290	A 245	230	245	A	A	A	A	235	220	A 260	E A 270	235	235	240	280	260	A 275	235	285
22	290	290	305	305	A 305	A 280	A 240	A	A	H 200	A	200	210	210	230	A	A	E A 260	A	250	280	275	280	255
23	325	275	280	280	290	A 250	240	215	A	A	A	A	220	A	A	A	A	A	A	E A 290	A 260	260	265	A 300
24	A 325	300	275	290	290	A 285	230	230	A	A	A	200	225	A	A	A 250	250	265	A	250	E A 335	330	A 370	E A 365
25	305	295	275	320	310	260	245	A	A	A	230	A	A	A	A	A	A	A 245	A 265	A 270	A 295	A 310	A 335	A 350
26	A 330	325	270	265	270	255	265	B 260	E A 300	240	A	A	A 260	220	H 210	A	A	A 260	A 265	260	260	275	290	A 290
27	270	270	290	E A 335	E A 340	H 255	225	235	A	A	A	H 200	210	215	205	210	H 220	A	A 240	A 255	270	310	280	280
28	260	260	A 285	285	305	255	235	230	235	A	195	H 195	A 265	215	B	B	B	E A 260	A	235	A 250	A 315	A 325	A 340
29	305	280	275	260	260	E A 280	A 235	E A 255	A	A	A	215	A	A	H 210	220	A	A	A	255	285	A 305	335	A 335
30	310	265	325	310	290	A	A	A	A	A	A	A	A 250	230	220	225	A 250	A	A	A	310	A 350	320	A 390
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	29	28	28	29	25	25	15	7	5	6	11	19	18	18	12	10	16	12	21	25	25	29	29
MED	301	292	275	280	278	250	240	240	235	U 218	218	210	232	219	225	233	244	241	A 248	260	272	298	310	310
U Q	A 315	A 330	308	A 312	305	A 260	A 255	A 260	E A 260	260	230	220	A 255	E A 240	A 240	A 252	A 250	A 258	A 258	272	E A 308	A 320	A 325	A 342
L Q	275	270	268	265	260	238	235	230	230	200	205	200	220	215	220	222	235	235	240	250	262	275	280	298

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

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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	110	110	110	110	110	A	A	A	115	110	110	115	B 120					
2						A 140	110	110	110	110	110	A	B 130	B 130	110	115	115	A	A	B				
3						135	115	110	110	110	A	A	A	A	A 120	A	E A 130	120	120	B				
4						130	120	110	110	110	110	A	120	110	A	110	110	120	A	B				
5						125	115	110	110	110	110	110	A	A	A	110	110	110	A	B				
6						A	A 110		110	110	110	B 130	115	B 115	110	110	110	110	A	B				
7						E A 150	115	110	110	110	110	B	B 125	110	A	A	A	110	120	B				
8						A	110	110	110	110	110	A	A	A	A	110	110	110	B 120	B				
9						B 140	115	110	110	110	115	110	120	115	115	110	110	120	120	B				
10					B	A	A 110		105	110	115	120	B 120	A	115	115	110	110	A	B				
11						120	115	110	110	110	110	115	115	110	A	A	A	A	A	B				
12						A	A	A 110	110	110	115	A	A	110	B	115	115	115	A	B				
13						135	115	110	110	A	110	120	A	115	A 120	115	110	115	120	B				
14						A	A 110		110	110	115	120	120	120	120	115	110	110	A	B				
15						A	A 130	110	110	115	115	115	110	115	120	115	110	110	A	B				
16						130	115	110	110	115	B	115	125	B 125	115	115	110	110	A	B				
17						A	A	A	A	A	115	A	115	115	110	115	115	115	A	B				
18						A	A	A 110	110	115	115	115	115	115	115	115	115	110	A	B				
19						115	115	110	110	110	110	A	115	125	120	110	115	115	A	B				
20						145	120	110	110	110	110	115	110	115	110	110	115	115	A	B				
21						A	A	A 130	110	110	110	110	A	A	115	120	115	A	A	B				
22						A	120	115	110	110	110	A	A 130	A	A	A	A	115	A	B				
23						A	A 130	A 130	A 130	115	A	115	A	115	115	115	110	115	A	B				
24						A	A	115	110	115	A	A	A	A	A	A	A 130	A 120	125	B				
25						A	E A 140	115	110	120	120	B 120	B 120	A	A	A	120	120	A	B				
26						120	B	B	A	A	A	B 130	120	125	120	115	110	110	A	B				
27						115	115	110	115	A	A	A	A	A	A 130	A	110	110	110	B				
28						E A 145	A 125	A	110	110	115	B 120	125	B	B	B	B	120	120	B				
29						A	110	110	110	A	115	110	110	115	115	115	115	110	120	B				
30						A	120	110	110	110	110	115	B 120	115	115	115	110	115	120	B				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						15	21	25	28	25	24	18	20	19	20	22	26	27	11					
MED						130	115	110	110	110	110	115	120	115	115	115	110	115	120					
U Q						140	A 120	110	110	110	115	B 120	122	120	120	115	115	115	B 120					
L Q						120	115	110	110	110	110	115	115	115	115	110	110	110	120					

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

IONOSPHERIC DATA STATION KOKUBUNJI

JUN. 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

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	110	115	115	100	100	150	125	115	110	110	105	105	105	110	150	115	120	115	110	110	110	110	115	110
2	105	100	100	100	100	135	120	120	115	115	110	120	115	115	110	120	110	110	115	120	110	115	130	110
3	100	100	100	105	105	165	130	115	115	110	110	110	110	110	110	125	120	115	120	110	110	120	105	110
4	B	105	110	115	110	150	140	125	120	115	115	110	110	110	110	110	120	120	115	110	120	120	115	105
5	115	110	105	110	105	135	130	115	110	110	110	110	105	115	110	130	120	115	115	110	110	105	110	110
6	105	105	105	130	105	105	130	120	115	110	110	115	120	115	110	110	115	115	115	110	110	105	105	105
7	105	105	105	105	105	150	130	120	120	110	110	110	110	110	105	105	105	150	120	110	105	120	130	105
8	110	105	105	110	110	110	130	125	120	115	115	110	105	105	110	110	110	110	110	110	110	115	115	110
9	110	105	105	110	110	125	130	115	115	115	110	110	110	110	140	130	120	120	G	B	120	B	B	110
10	110	105	105	105	105	110	110	125	115	115	120	115	120	120	E G 140	G	110	115	110	105	100	100	120	B
11	105	105	105	110	B	155	135	125	125	115	110	110	110	110	110	105	100	100	100	100	100	100	95	105
12	120	110	110	105	105	110	105	100	130	125	115	115	115	110	110	110	130	115	110	105	105	105	115	110
13	110	105	110	120	145	135	125	110	110	110	115	170	110	135	125	120	115	110	110	115	115	100	95	110
14	110	105	105	100	105	105	110	125	120	120	115	115	120	135	120	155	115	110	115	105	95	95	120	110
15	110	105	105	100	135	135	130	120	120	115	110	110	120	120	110	115	115	125	110	110	110	110	95	120
16	110	110	110	110	130	G	140	130	130	120	120	110	120	125	125	115	115	115	110	110	110	110	110	110
17	110	110	105	105	105	105	110	105	120	110	105	105	135	120	125	120	130	120	110	105	110	110	110	120
18	110	110	110	105	105	105	105	110	120	120	115	115	115	130	120	110	110	110	115	110	110	110	115	110
19	110	110	105	100	120	130	125	120	120	120	120	120	125	G	130	115	120	115	110	110	110	110	130	115
20	110	130	B	B	B	160	135	130	125	115	120	115	110	110	115	110	110	110	110	110	115	115	115	115
21	105	105	110	105	105	105	110	130	120	120	115	110	110	115	110	110	115	115	110	110	110	110	110	110
22	125	130	110	115	105	115	120	115	115	120	110	115	115	115	115	105	100	115	105	115	B	110	115	110
23	110	110	110	110	105	110	165	150	125	120	115	115	110	115	110	110	110	110	110	110	115	105	105	105
24	110	110	120	105	100	105	110	140	110	110	120	110	115	110	110	110	140	140	130	120	120	110	115	110
25	115	110	105	105	110	105	165	130	120	120	120	110	110	110	105	110	115	115	110	110	105	100	115	115
26	110	110	110	105	105	170	B	B	130	115	125	120	120	140	180	120	120	110	110	115	110	110	110	105
27	110	150	105	105	110	140	135	130	115	115	110	115	115	115	120	110	160	110	110	110	110	110	105	105
28	110	105	120	125	100	170	110	E G 150	110	110	115	130	135	B	B	125	135	120	115	110	110	115	115	110
29	110	105	110	110	110	115	115	110	110	110	110	110	110	110	G	135	120	115	115	120	115	110	110	110
30	110	110	115	110	125	120	120	115	115	120	115	130	130	135	155	130	120	125	115	110	110	110	105	115
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	29	28	29	29	29	30	30	30	30	30	28	28	29	30	30	29	29	29	29	29	29
MED	110	108	105	105	105	125	125	120	120	115	115	112	115	115	111	115	115	115	110	110	110	110	115	110
U Q	110	110	110	110	110	150	132	130	120	120	115	115	120	120	125	122	120	120	115	110	112	112	115	110
L Q	110	105	105	105	105	108	110	115	115	110	110	110	110	110	110	110	110	110	110	110	110	105	105	108

JUN. 1992 H'ES (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION KOKUBUNJI

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

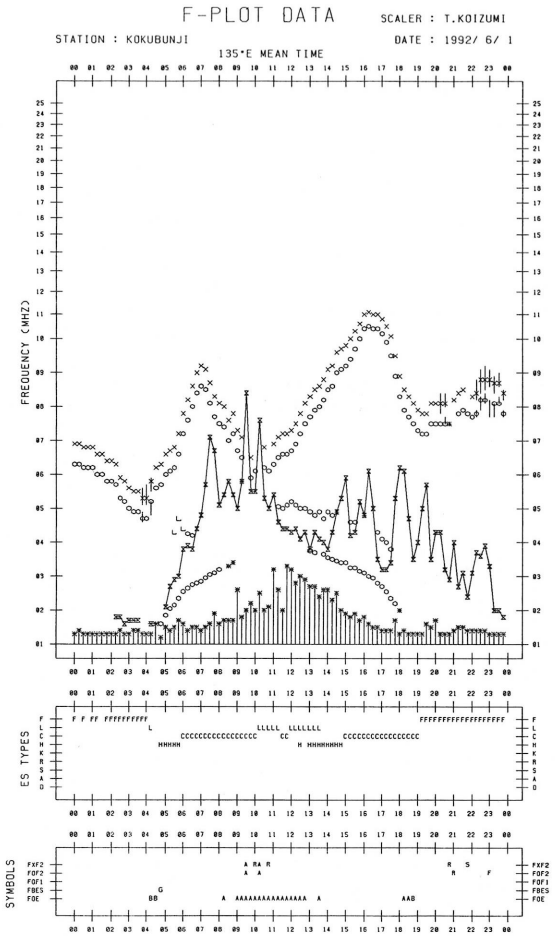
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHZ TO 25.0MHZ IN 24.0SEC IN MANUAL SCALING

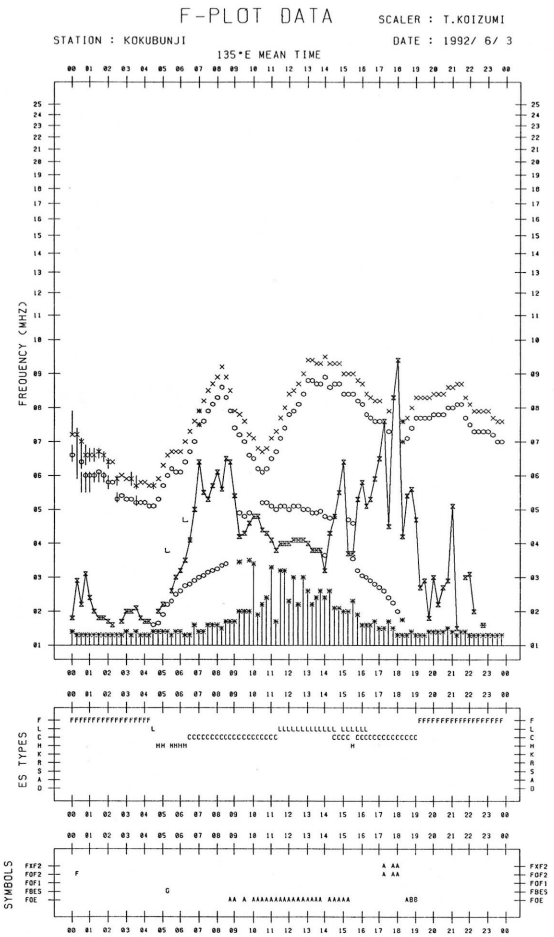
H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 1	F 1	FF 11	F 2	FF 11	H 1	C 2	C 4	C 4	C 2	C 3	L 3	L 2	LH 11	H 1	C 3	C 4	C 3	C 4	C 3	F 4	F 4	FF 14	F 5
2	F 6	F 4	F 3	F 4	F 3	CL 21	C 4	C 3	C 4	C 2	C 3	C 1	C 2	C 2	C 2	C 2	C 2	C 2	C 2	C 1	F 2	F 5	FF 14	F 4
3	F 3	F 4	F 2	F 3	F 2	H 2	H 1	C 4	C 4	C 3	C 2	C 2	L 2	L 2	L 1	CL 13	CL 42	C 4	C 6	C 5	F 3	F 5	F 4	F 2
4		F 3	F 1	F 1	F 1	H 1	H 2	H 3	C 3	C 3	C 3	C 3	C 2	C 2	C 2	C 2	C 2	C 3	C 4	C 4	FF 35	F 5	F 2	F 3
5	FF 13	F 3	F 3	FF 24	F 2	H 2	H 3	C 4	C 3	C 3	C 3	C 2	L 3	CL 22	LH 11	H 2	CL 41	C 3	C 3	L 5	F 4	F 3	F 5	F 3
6	F 4	F 4	F 5	FF 12	F 2	L 2	HL 22	C 4	C 3	C 3	C 2	C 2	C 1	C 2	C 3	C 3	C 2	C 2	L 2	L 4	F 4	F 4	F 3	F 4
7	F 2	F 2	F 3	F 4	FF 33	HL 21	H 2	H 3	C 3	C 3	C 2	C 1	C 2	C 2	L 3	L 3	L 2	H 1	C 2	L 5	F 5	F 3	FF 21	F 2
8	F 3	F 3	F 2	R 1	F 2	L 2	H 2	H 3	C 4	C 3	C 2	C 2	C 3	L 2	C 2	C 2	C 3	C 4	C 3	C 4	F 4	F 5	F 4	F 3
9	F 6	F 4	F 6	F 2	F 5	C 3	C 2	C 3	C 3	C 3	C 2	C 3	C 2	C 3	H 1	H 1	C 1	C 1			F 1			F 3
10	F 6	F 5	F 2	F 5	C 3	L 1	L 2	H 2	C 4	C 2	C 1	C 1	C 2	C 1	H 1		C 2	C 2	C 2	L 2	F 3	F 4	FF 21	
11	F 4	F 4	F 4	F 1		H 1	H 1	H 1	H 1	C 2	C 2	C 2	C 2	C 2	C 3	C 4	L 4	L 4	L 3	L 3	F 3	F 2	F 2	F 1
12	F 2	F 5	F 3	F 5	F 4	L 2	L 2	L 2	H 1	H 2	C 3	C 2	C 2	C 2	C 3	C 3	H 2	C 4	C 3	L 4	F 4	F 6	F 6	F 4
13	F 5	F 4	F 3	F 2	F 3	C 2	C 2	C 3	C 3	C 2	C 1	HL 11	LH 11	H 1	HL 21	C 3	C 3	C 3	C 4	C 3	F 2	F 4	F 3	F 2
14	F 2	F 3	F 4	F 3	F 5	L 4	L 2	C 3	C 4	C 3	C 3	C 2	C 2	H 1	C 2	H 1	C 3	C 2	C 3	L 3	F 4	F 3	FF 22	F 3
15	F 5	F 5	F 5	F 5	FFF 21	CL 12	CL 11	C 3	C 2	C 2	C 3	C 2	C 2	C 2	C 2	C 3	C 3	HC 24	C 4	C 3	FF 45	F 3	F 5	FF 24
16	F 3	F 4	F 4	F 3	F 1		H 2	H 2	H 2	C 3	C 2	C 2	C 2	C 1	C 1	C 2	C 3	C 2	C 3	C 4	F 3	F 3	F 3	F 4
17	F 5	F 5	F 5	F 5	F 5	L 3	L 2	L 4	CL 22	C 3	L 3	L 3	HH 11	C 2	H 2	C 2	C 1	C 2	C 4	C 4	F 4	F 5	F 5	F 4
18	F 5	F 3	F 6	F 4	F 5	L 4	L 4	L 3	C 2	C 2	C 3	C 3	C 2	C 1	C 2	C 2	C 3	C 3	C 3	L 5	F 4	F 3	F 3	F 4
19	F 3	FF 33	F 3	F 5	FF 12	C 2	C 3	C 2	C 3	C 3	C 2	C 2	C 1		H 1	C 2	C 3	C 3	C 4	C 4	F 5	F 5	FF 15	F 4
20	F 4	FF 12				H 2	H 3	H 4	H 3	C 2	C 2	C 2	C 2	C 2	C 2	C 3	C 4	C 4	C 3	C 3	F 4	F 5	F 3	F 4
21	F 4	F 4	FF 22	FF 22	F 4	L 2	L 2	CL 21	C 3	C 3	C 2	C 3	C 2	C 1	C 2	C 2	C 2	L 2	L 3	L 3	F 1	F 4	F 3	F 2
22	FF 22	FF 12	F 2	FF 23	F 3	L 3	C 2	C 3	C 3	C 2	C 3	C 1	L 1	L 1	CL 11	L 3	L 3	C 3	L 4	L 2		F 1	FF 21	F 3
23	F 2	F 2	F 3	F 5	F 5	L 3	HL 12	HL 12	HL 21	C 2	C 2	C 2	C 3	CL 21	C 3	C 3	C 4	C 4	C 4	C 5	FF 15	F 4	F 4	F 5
24	F 4	F 5	FF 22	F 4	F 5	L 3	L 2	C 2	C 3	C 3	CL 12	L 1	L 2	L 3	L 2	L 2	HL 11	HL 12	C 3	C 3	F 5	F 3	F 7	F 5
25	F 2	F 2	F 2	F 3	F 2	L 2	HL 11	H 2	C 3	C 2	C 1	C 2	C 2	C 3	C 3	C 3	C 2	C 2	C 2	L 3	F 4	F 4	FF 54	F 5
26	F 6	F 7	F 5	F 3	F 3	H 1			CL 11	L 1	CL 11	C 1	C 1	H 1	H 1	C 2	C 3	C 3	CL 22	C 4	F 3	F 3	F 4	F 4
27	F 3	FF 11	F 3	F 4	F 5	H 1	H 2	H 2	C 2	CL 31	C 2	L 1	L 1	L 1	L 1	L 1	H 1	C 2	C 2	C 3	F 4	F 2	F 3	F 2
28	F 3	F 4	FF 44	FF 23	F 2	HL 11	L 2	HL 12	C 2	C 2	C 1	C 1	H 1			C 1	H 1	C 2	C 3	C 4	F 4	F 4	F 5	F 5
29	F 2	F 3	F 2	FF 11	F 3	L 2	C 2	C 4	C 3	C 2	C 2	C 2	C 2	C 2		H 1	C 2	C 3	C 4	C 2	F 2	F 3	F 3	F 5
30	F 3	F 4	F 2	F 2	FF 31	C 3	C 2	C 3	C 2	C 3	C 2	CC 22	C 1	H 1	H 1	C 1	C 2	C 2	C 2	C 4	F 3	F 5	F 2	FF 23
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

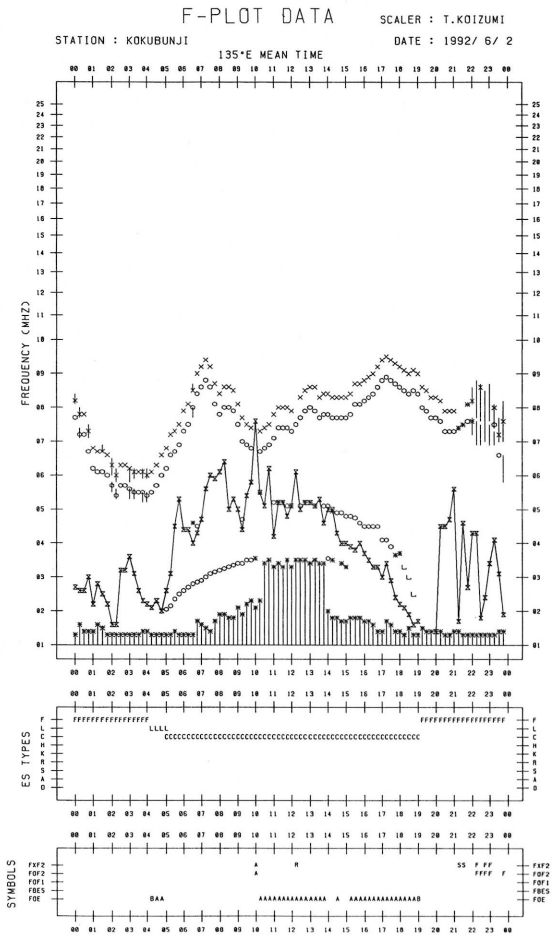
JUN. 1992 TYPES OF ES COMMUNICATIONS RESEARCH LABORATORY, JAPAN

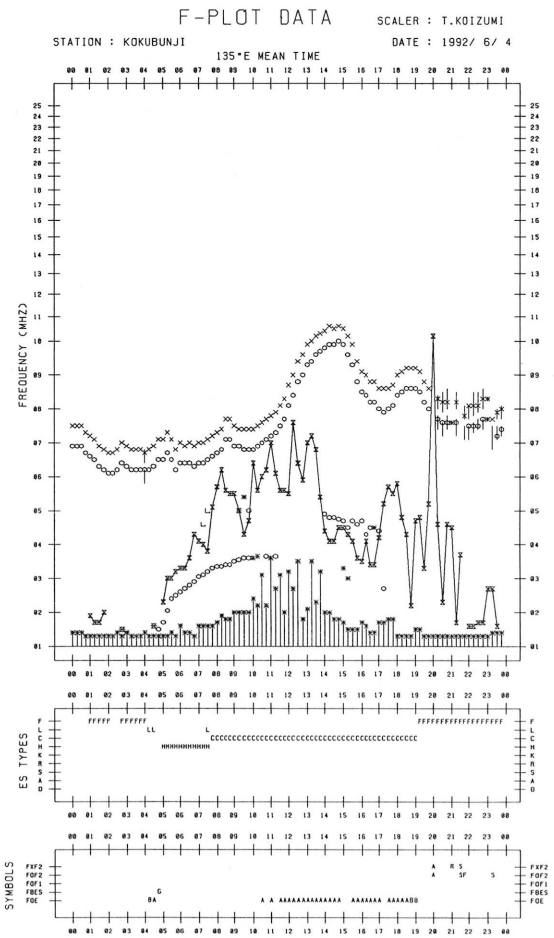
f-PLOTS OF IONOSPHERIC DATA

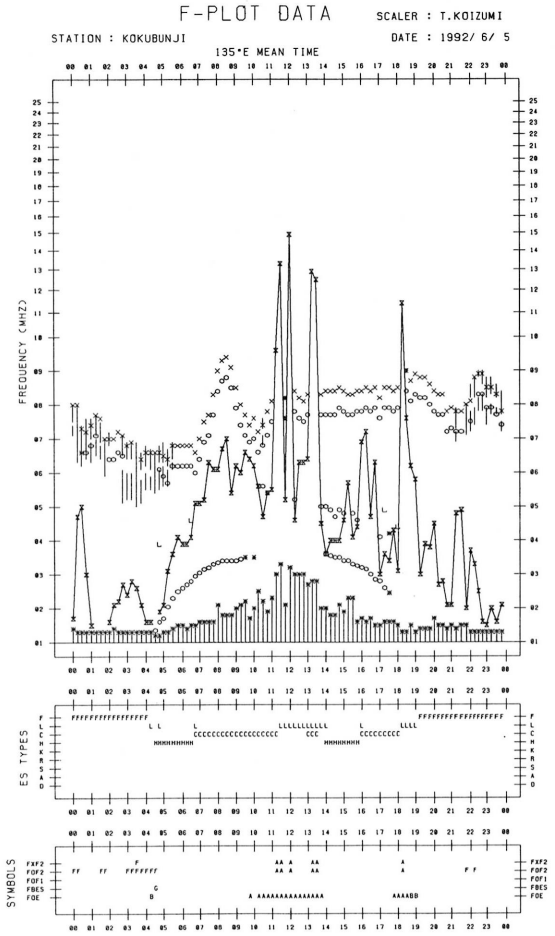
KEY OF F-PLOT	
I	SPREAD
○	FOF2, FOF1, FOE
×	FXF2
✳	DOUBTFUL FOF2, FOF1, FOE
⧖	FBES
⌊	ESTIMATED FOF1
↑, Y	FMIN
∧	GREATER THAN
∨	LESS THAN

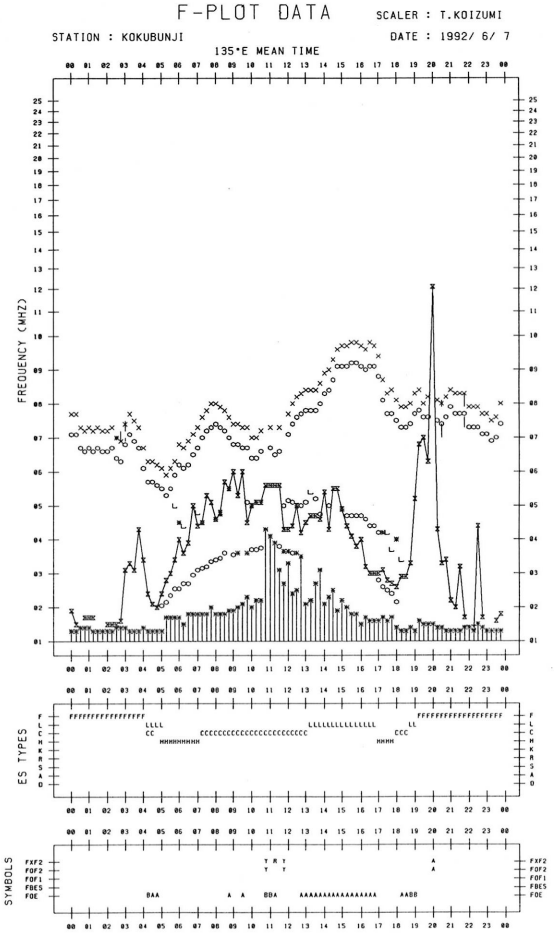

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/ 1
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

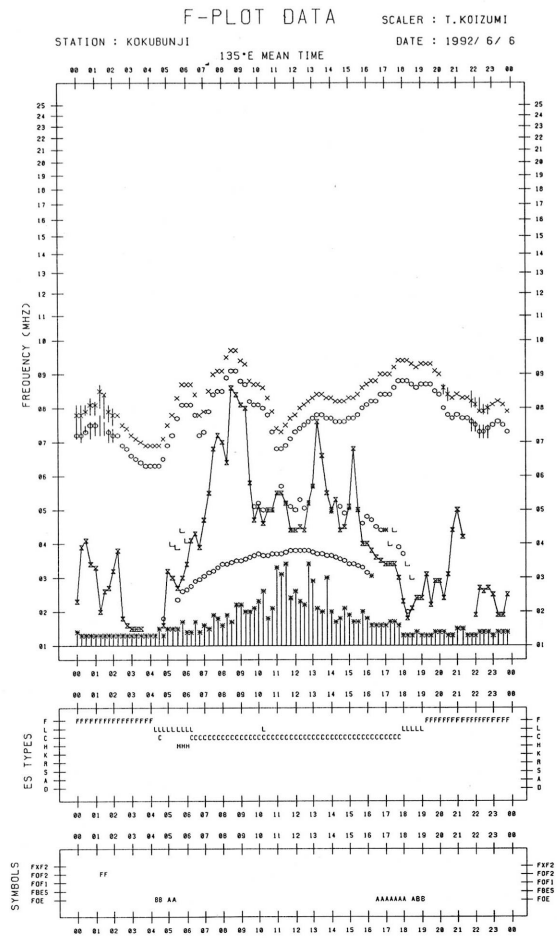

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/ 3
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/ 2
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/ 4
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


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


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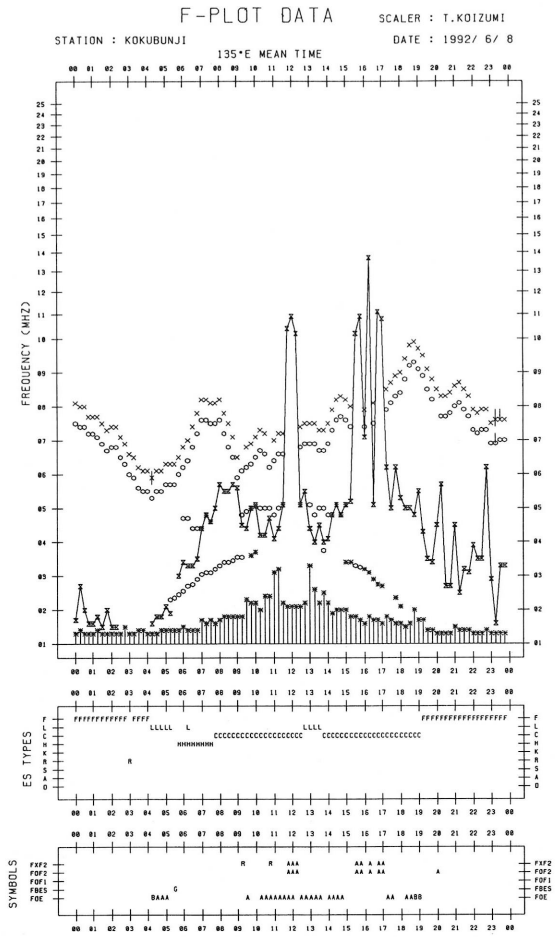
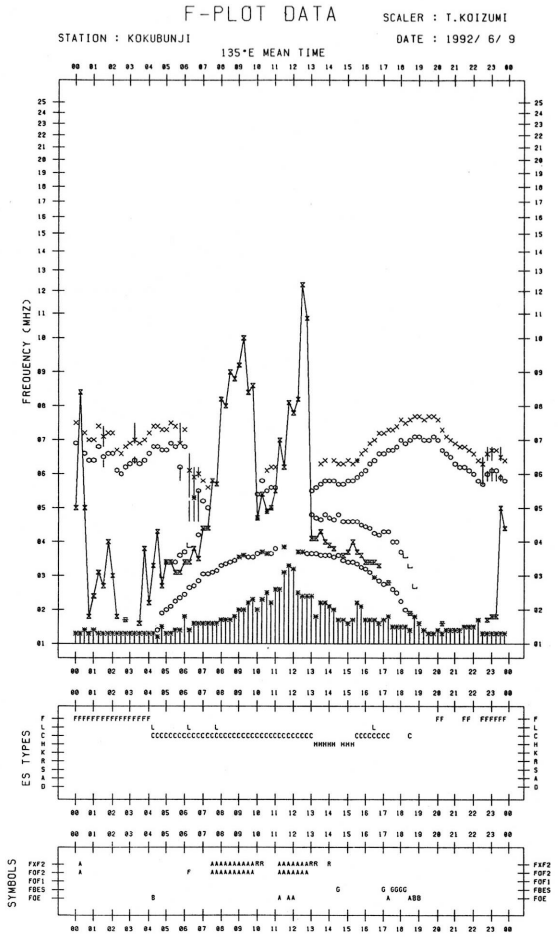
STATION : KOKUBUNJI
DATE : 1992/ 6/ 6
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


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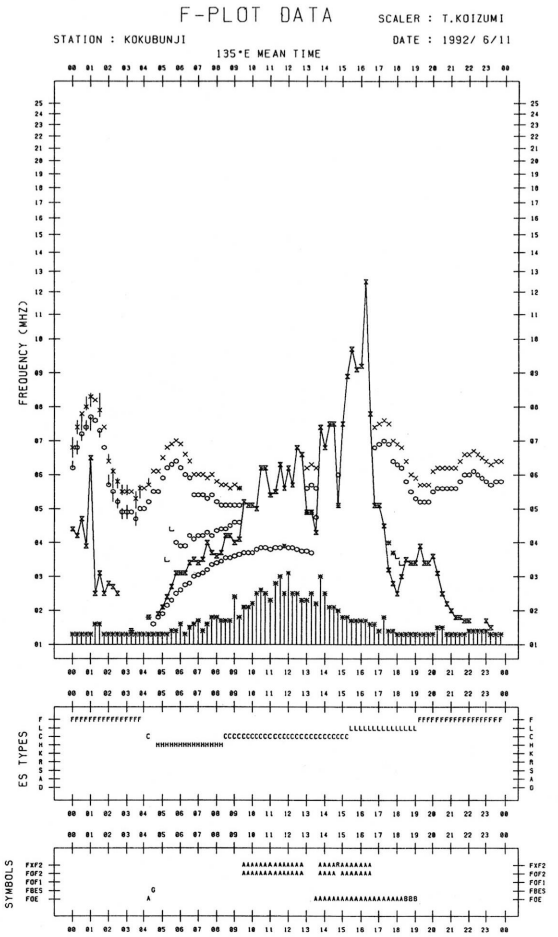
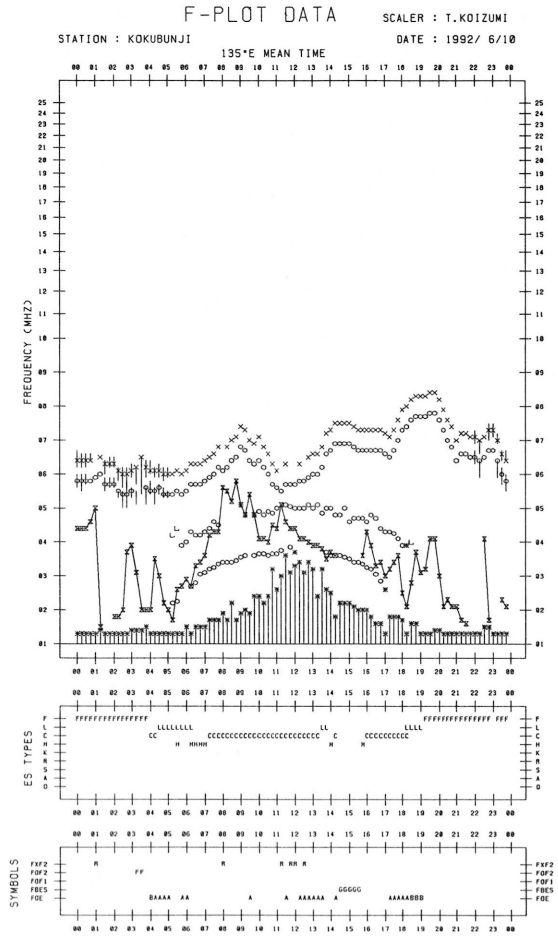
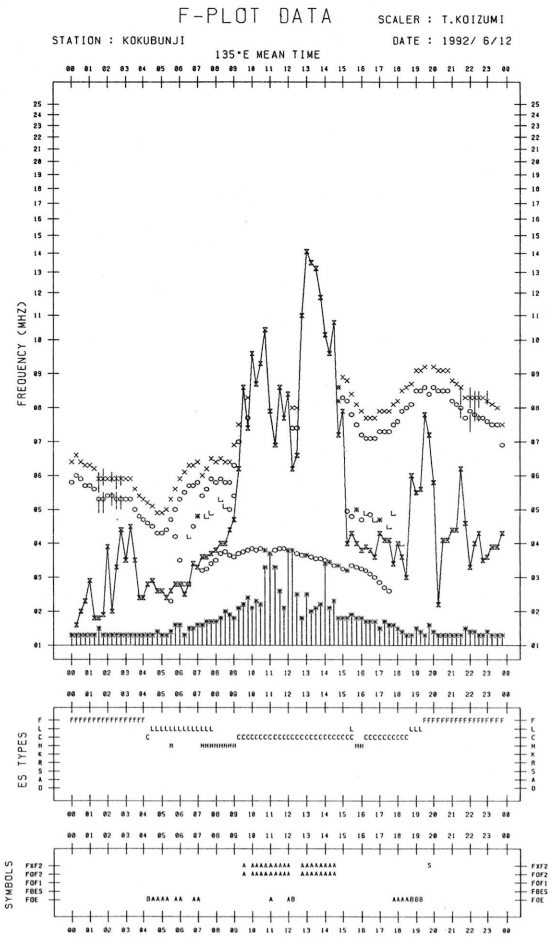
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/ 9
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


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


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/10
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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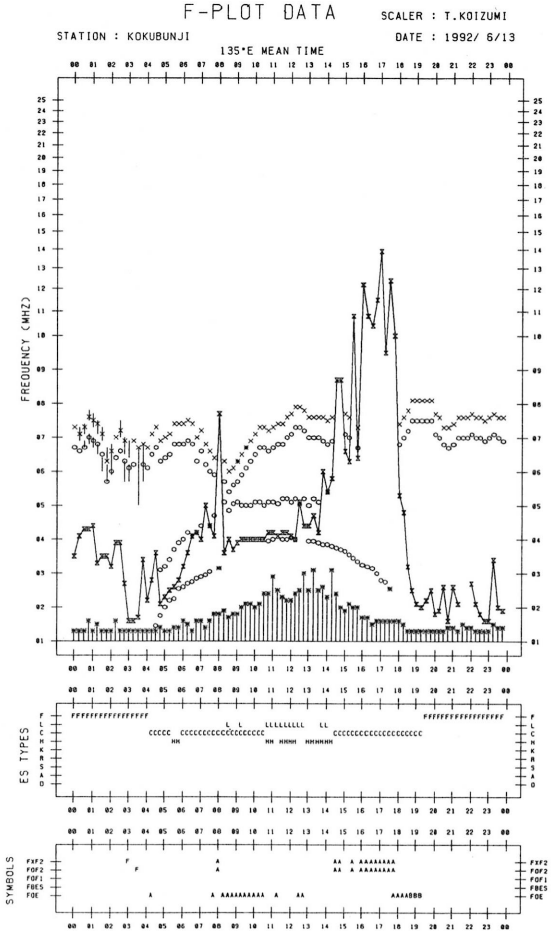
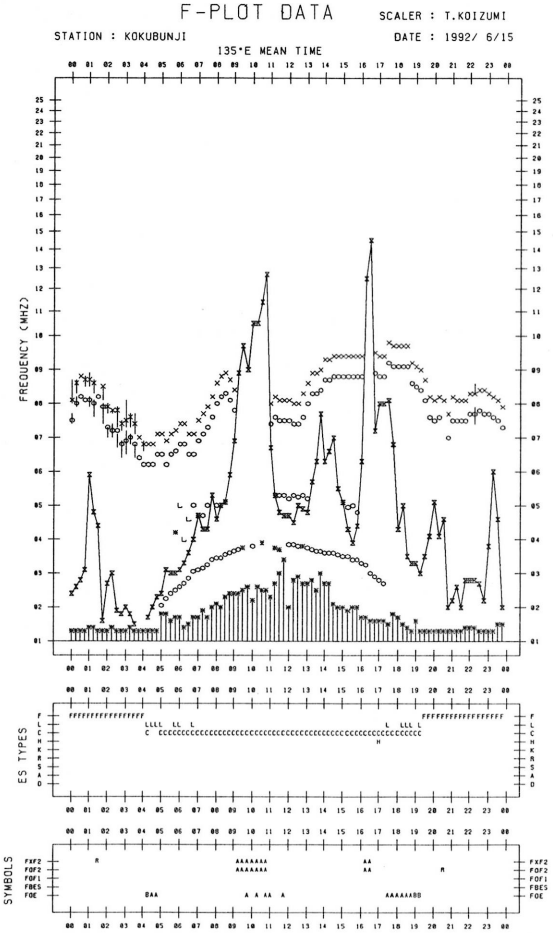
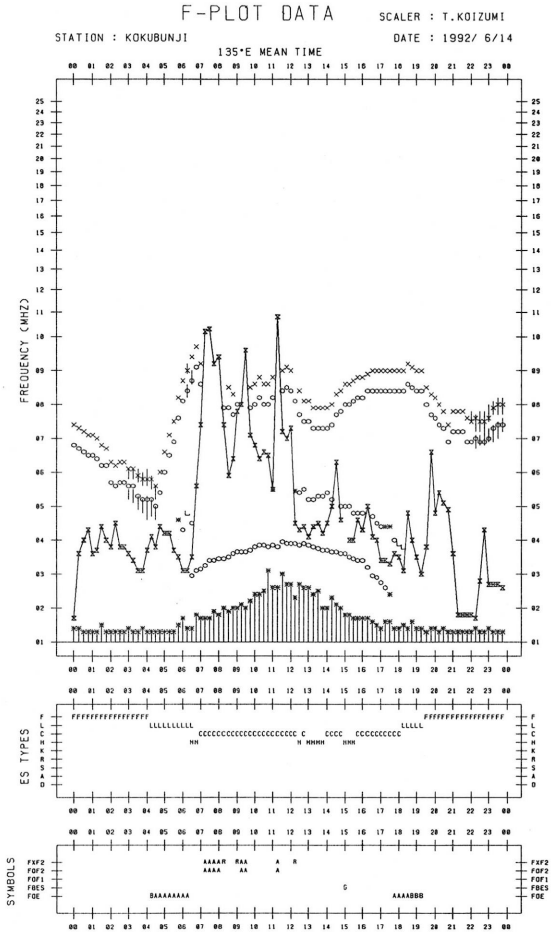
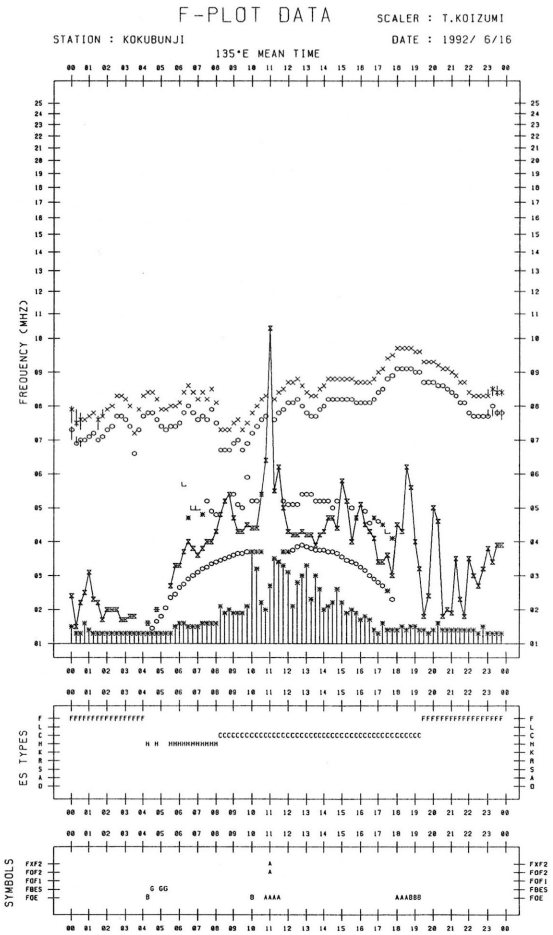
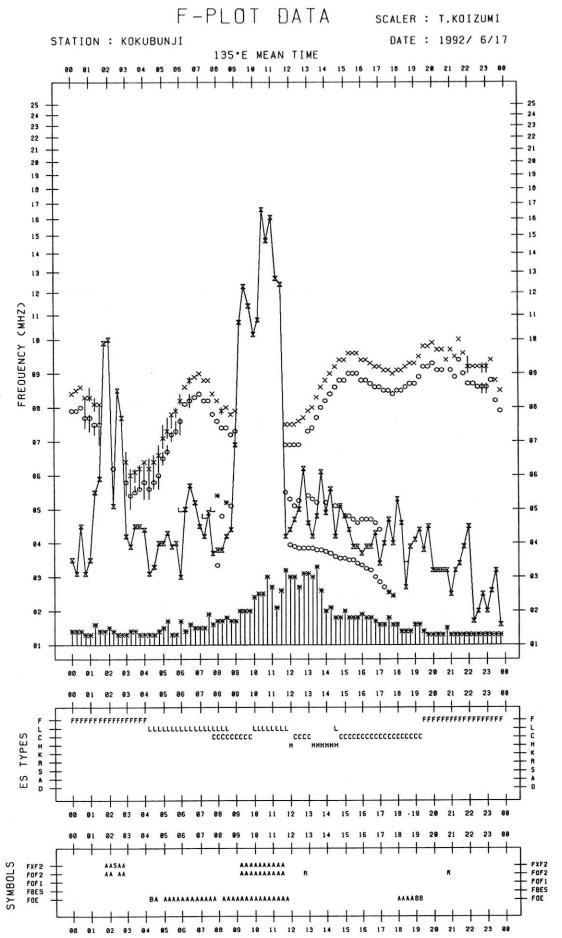
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/12
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

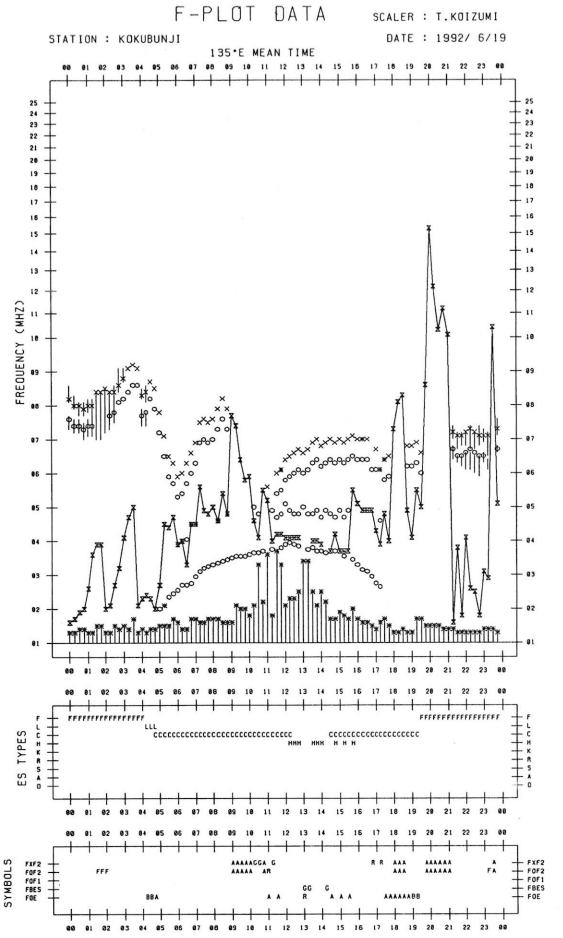

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/13
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

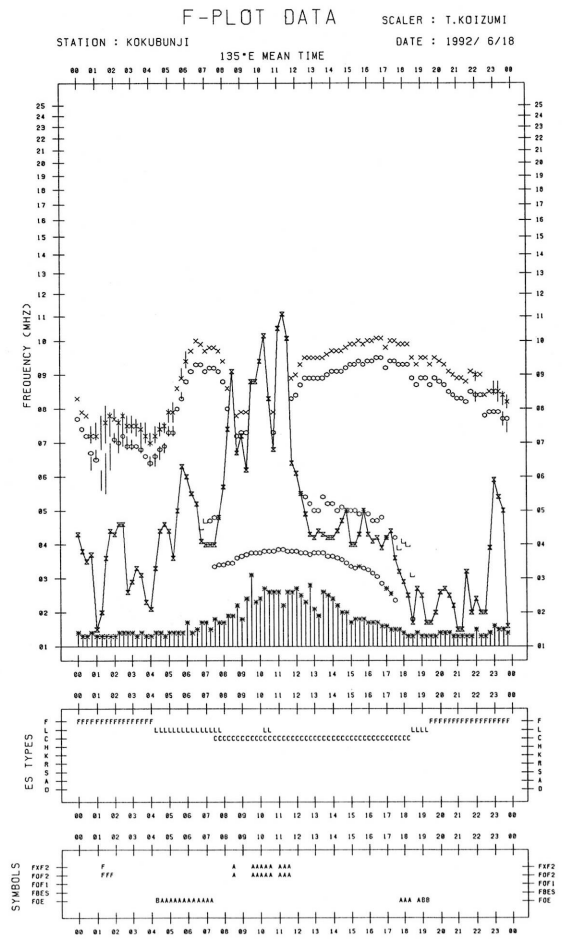

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/15
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

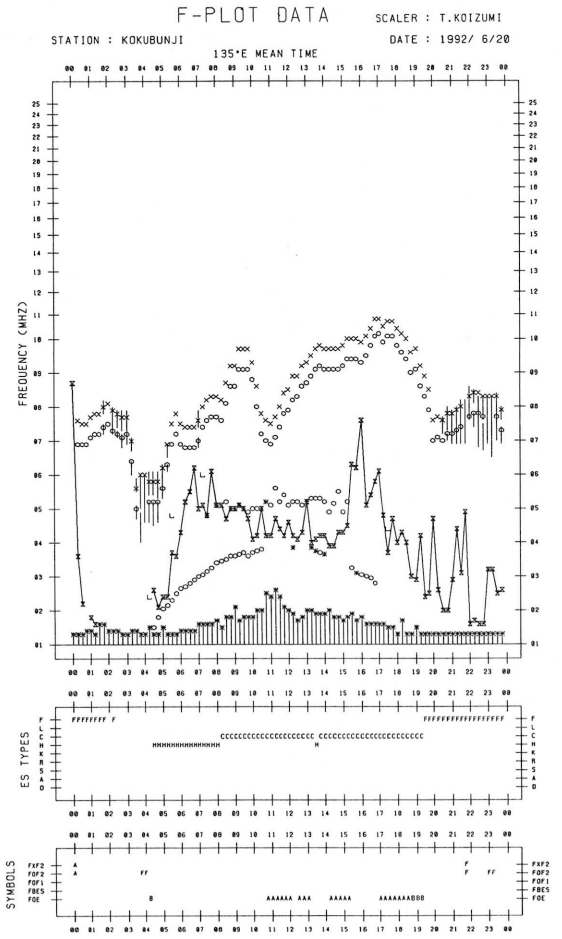

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/14
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

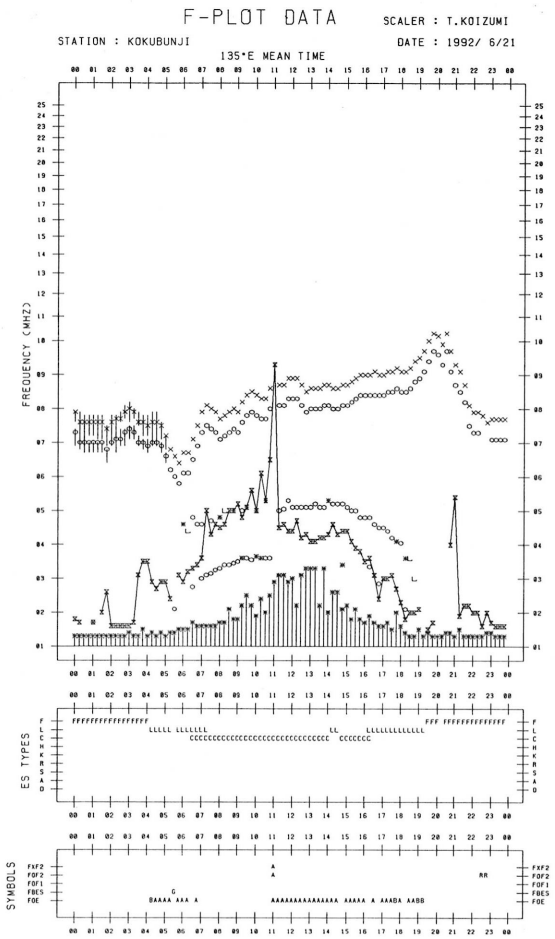

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/16
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

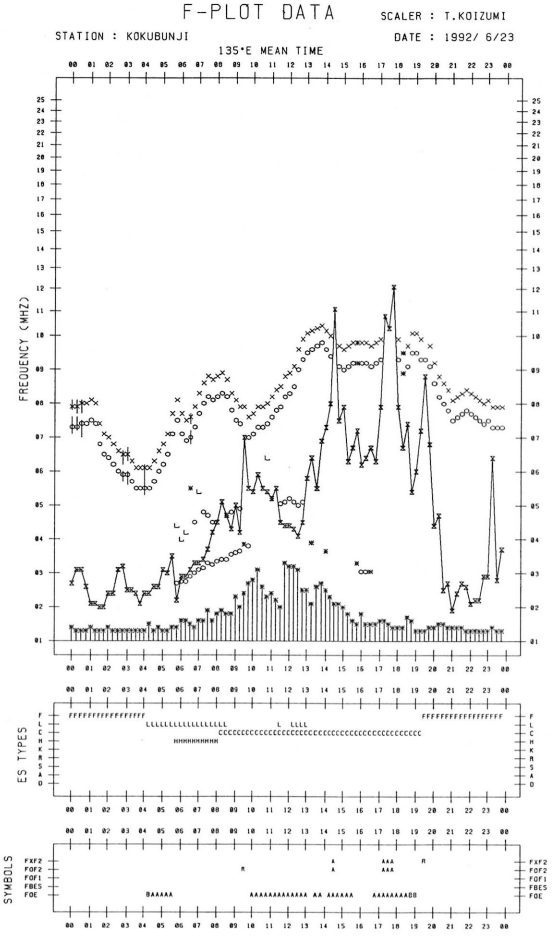

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/17
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

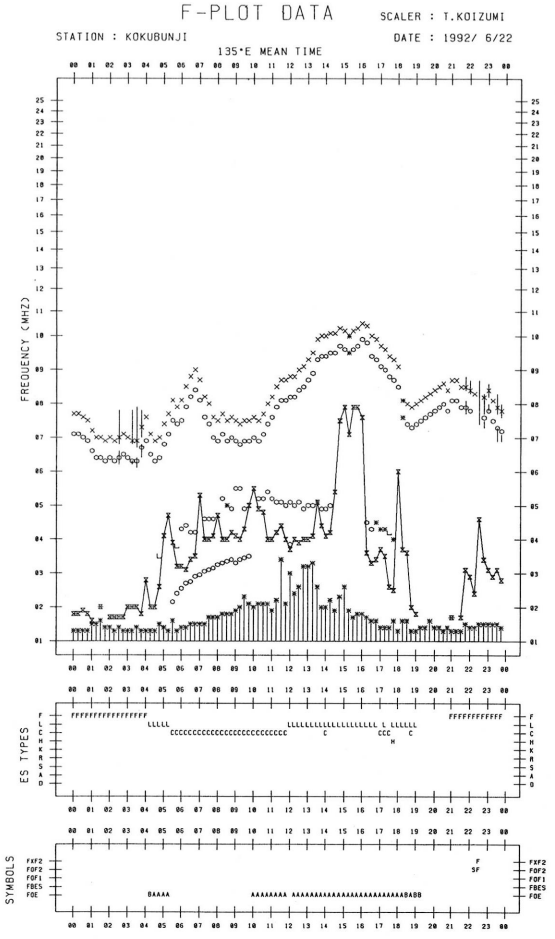

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/19
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

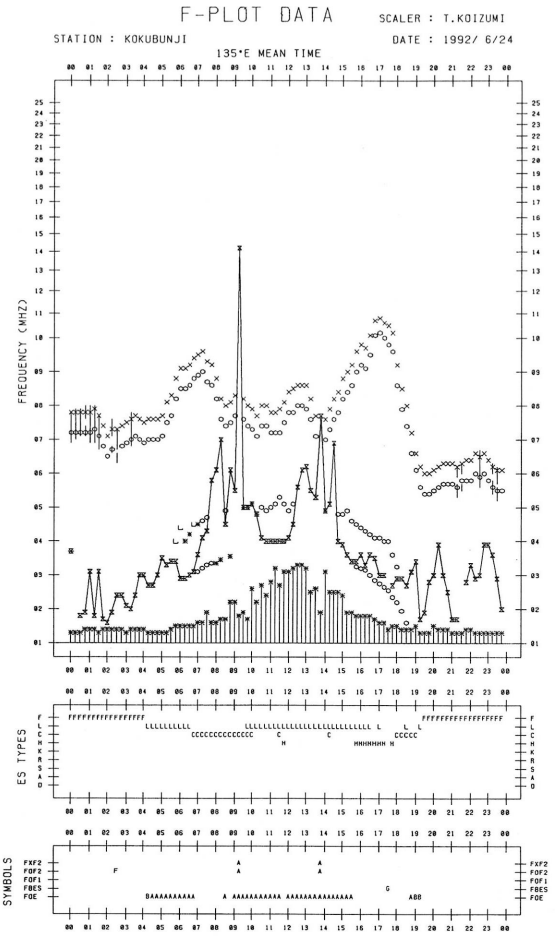

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/18
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

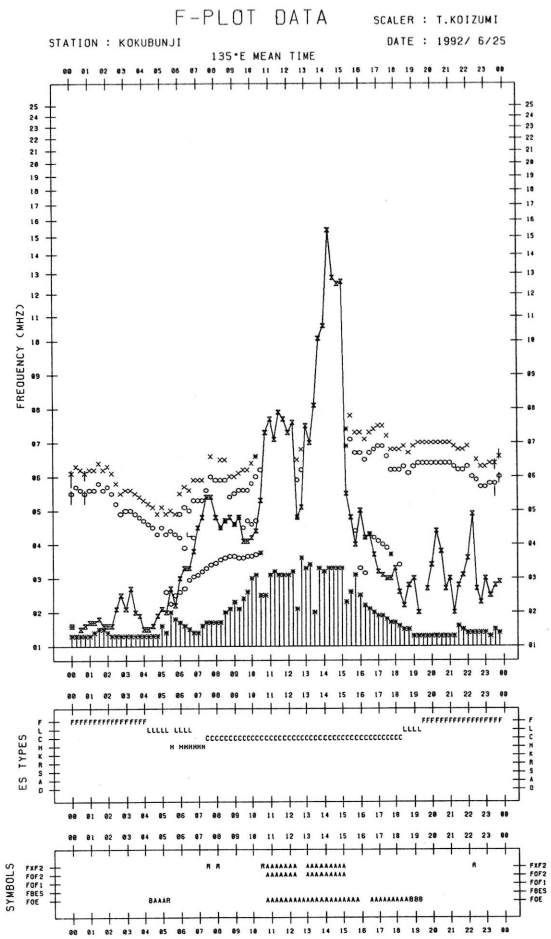

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/20
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

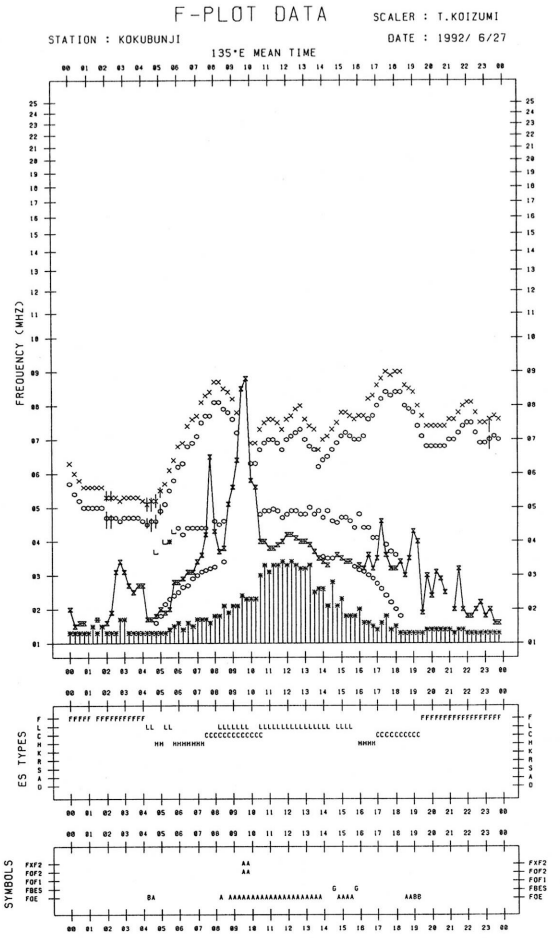

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/21
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

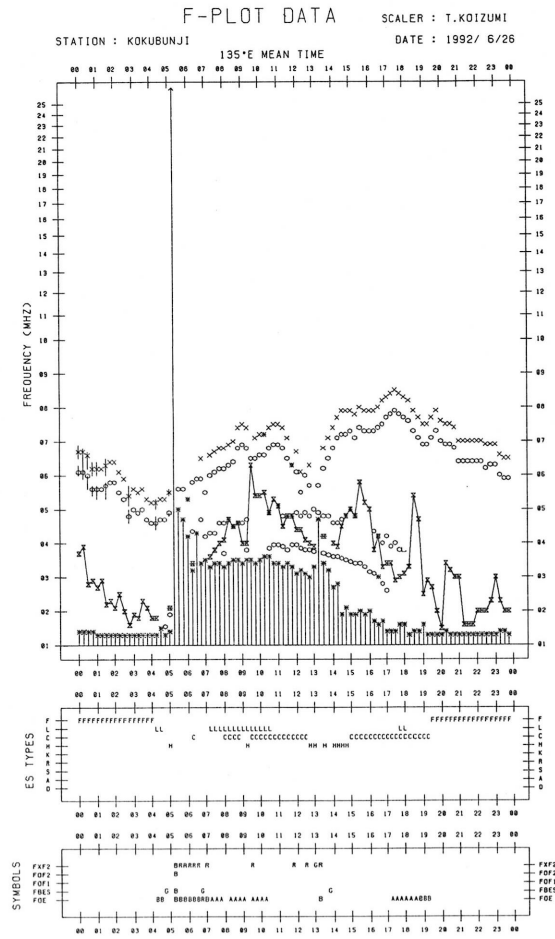

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/23
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

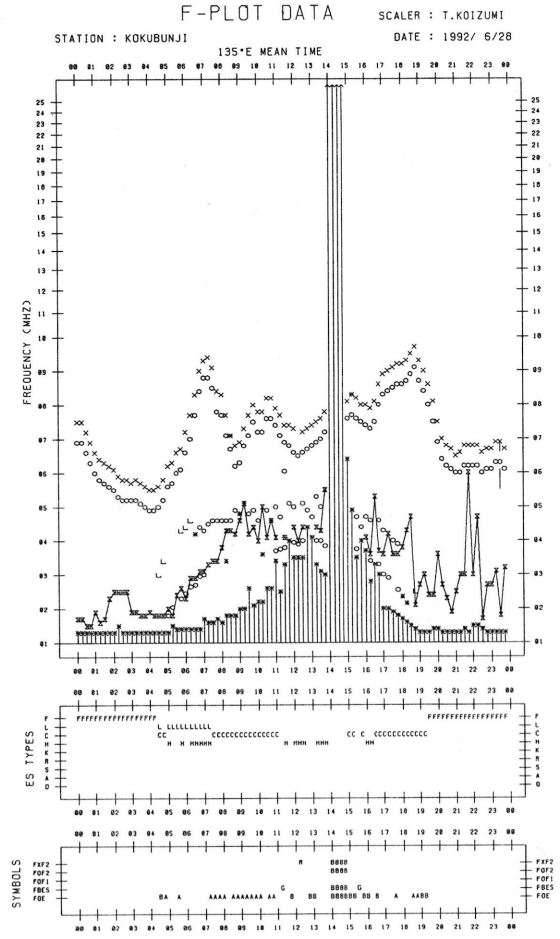

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/22
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/24
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/25
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/27
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/26
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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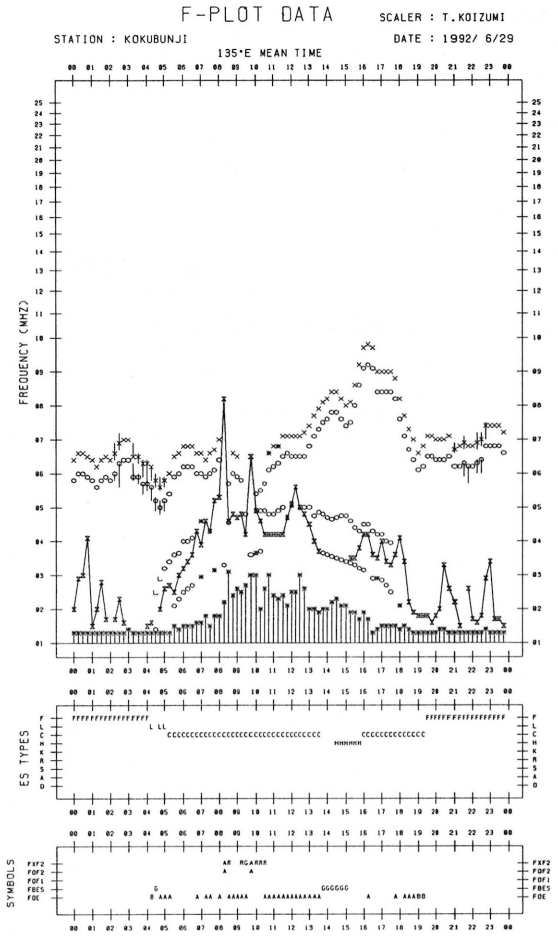
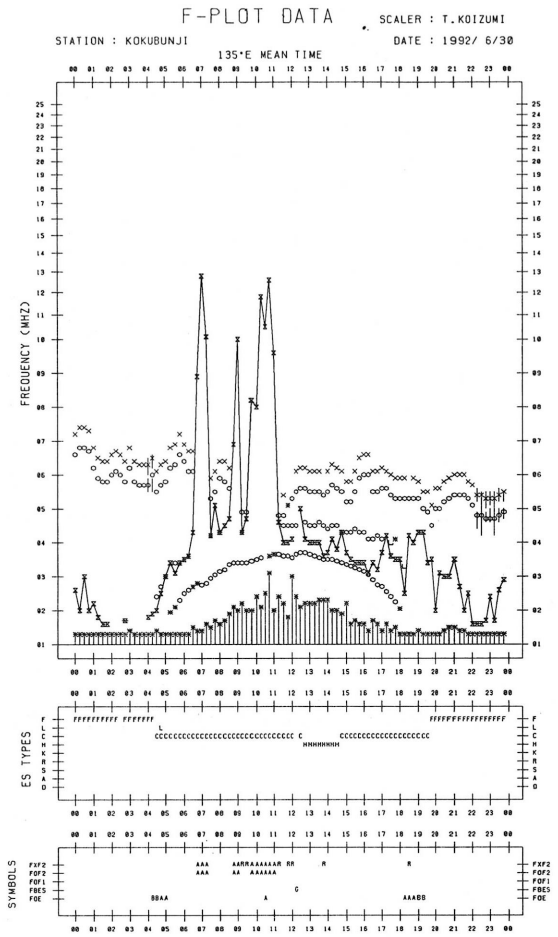
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/28
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/29
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 6/30
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Hiraiso June 1992

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

Notes: No observations during the following periods.

30th 1940 - 2400

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

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso June 1992

Single-frequency observations

Normal observing period: 1930 - 0950 U.T. (sunrise to sunset)

JUN. 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
4	100	42 SER	0406.5	0416.0	10	1000	-	ML
	200	46 C	0406.7	0407.7	2.3	300	80	0
	200	27 RF	0426	0541.5	123	40	20	MR
7	200	46 C	0140.0	0142.0	36	1000	200	WL
	100	46 C	0140.0	0148.4	16	1500	400	WL
	100	46 C	0522.2	0522.8	2.3	1000	-	WL
	200	46 C	0522.3	0522.6	5.6	450	60	WR
8	100	42 SER	0018.5	0019.2U	6.6	1000D	-	-
	200	42 SER	0018.7	0022.7	6.7	370	-	SR
	100	42 SER	0400.0	0400.0U	9	1000D	-	-
	200	42 SER	0400.0	0406.0	8.0	1200	-	WR
	100	42 SER	0846.6	0908.6	62D	270	-	WL,SUNSET
	200	46 C	0852.2	0912.1	55D	250	40	ML,SUNSET
	200	46 C	2047.5	2048.0	2.0	180	70	WR
9	200	46 C	0228.0	0228.5	2.0	56	35	0
	200	46 C	0625.3	0629.9	10	24	10	0
	200	42 SER	0701.3	0702.4	23	58	-	MR
	100	46 C	0701.5	0702.2	1.6	120	80	WL
	100	46 C	0714.3	0715.3	15	360	200	WR
	200	44 NS	1930E	0808	840D	80	30	MR
16	200	42 SER	0255.5	0258.1	4.0	86	-	WL
17	200	46 C	0224.6	0225.8	1.3	350	100	WL
	200	42 SER	0428.1	0429.5	10	2100	-	WL
	100	46 C	0429.2	0429.5	2.0	450	350	WL
	100	8 S	2107.3	2107.3	0.8	230	-	WL
	200	8 S	2107.3	2107.3	0.8	120	-	0
23	100	44 NS	1930E	2137	450D	400	10	ML
	200	44 NS	1930E	2141	450D	80	30	ML
25	200	27 RF	0446	0558	127	200	120	WR
	100	46 C	0635.2	0639.4	11	440	300	WL
	200	48 C	1952.6	2000	87	250	70	ML
				2052.5		130		WL
	100	48 C	1954.2	2006.0U	40	1000D	-	WL
				2017.5		610		SL
27	100	46 C	0005.5	0006.4U	2.3	1000D	-	WL
	200	46 C	0005.7	0006.1	2.0	2500	500	WR
28	100	46 C	0450.8	0454.4	8.7	1000	450	WL
	200	46 C	0451.3	0451.6	17	250	40	0
29	100	46 C	0140.0	0140.0	1.0	1100	700	0
	200	42 SER	0140.7	0140.7	2.7	300	-	0

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)

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

C. RADIO PROPAGATION

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

JUN 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	-1	3	10	10	13	20	24	25	25	25	21	25	21	23	21	16	16	22	15	19	15	9	9	-2
2	5	2	3	4	10	19	20	27	24	23	20	25	20	14	9	8	25	10	19	12	17	1	0	-7
3	5	3	13	10	14	20	23	22	24	20	21	20	20	20	8	6	8	15	23	19	15	5	1	-2
4	4	2	11	16	16	23	22	26	27	21	27	22	21	23	18	17	15	23	16	26	16	9	7	7
5	4	7	9	15	15	20	21	23	23	26	27	19	17	21	19	22	6	16	22	18	21	9	7	3
6	-7	-12	6	1	13	19	26	26	29	23	23	23	20	21	20	22	21	23	17	13	10	4	1	-1
7	7	ES -25	7	10	19	17	23	22	23	23	22	20	22	24	23	22	25	22	19	22	20	11	7	3
8	4	4	0	4	11	17	23	22	27	27	29	19	28	25	24	24	23	23	-1	7	4	-16	ES -25	-16
9	ES -24	-15	-9	-6	2	19	14	24	19	24	25	23	25	24	24	21	18	15	1	19	11	17	13	0
10	6	-1	-4	1	21	20	24	26	27	27	28	27	29	23	21	21	21	9	9	4	-4	-12	ES -25	-12
11	ES -25	ES -25	ES -25	3	11	11	28	24	23	13	19	20	20	21	18	11	ES -25	10	11	17	8	9	13	7
12	4	-4	4	11	16	18	19	19	24	29	29	35	23	14	-12	-16	2	7	22	3	10	4	5	3
13	-1	4	7	9	7	11	19	20	24	21	29	21	20	24	21	20	-10	17	9	10	15	13	4	-4
14	ES -25	-10	-1	3	11	15	18	22	25	23	22	25	24	24	22	20	24	15	18	22	16	18	6	-4
15	-16	2	1	4	15	23	24	26	27	23	27	28	23	14	17	25	9	28	19	21	18	14	4	3
16	4	-1	10	14	14	19	23	23	24	30	25	24	25	24	29	20	29	23	24	10	13	9	3	0
17	-2	-4	8	14	11	19	21	23	27	28	25	26	29	28	23	27	23	25	20	18	14	11	1	-4
18	-6	-3	9	11	26	23	23	27	27	34	27	27	21	21	26	26	21	28	16	17	10	15	3	5
19	-10	-3	1	3	16	15	22	21	21	21	23	22	17	24	19	22	19	34	21	23	11	11	6	-4
20	1	5	10	10	13	17	22	23	33	28	23	22	23	27	21	19	20	28	18	15	12	16	12	10
21	-2	2	7	14	17	17	22	23	21	32	25	23	27	11	11	-7	23	21	13	14	14	6	13	15
22	4	8	15	13	19	19	23	23	26	27	22	27	28	19	23	25	21	22	19	16	16	8	3	-3
23	2	1	5	9	12	20	21	21	20	20	20	25	27	25	19	15	7	11	8	18	16	8	-4	1
24	2	0	6	10	8	24	24	25	24	19	14	10	15	15	0	5	-5	-22	ES -26	6	7	1	0	5
25	ES -21	-9	-2	4	10	14	20	25	21	18	21	24	23	20	17	8	-7	20	8	16	ES -26	-22	-11	-17
26	-7	0	-2	0	17	7	23	25	26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	20	13	24	4	0	20	20	7	2	6
28	4	6	7	10	11	-4	20	20	24	30	20	22	22	18	20	20	15	21	14	13	16	5	4	-13
29	0	-2	0	15	14	20	19	25	24	22	20	20	19	14	19	19	9	11	4	0	0	0	-8	ES -26
30	-17	-11	-17	-5	7	10	10	ES -26	-11	-5	5	10	8	0	-8	-8	4	9	-17	27	7	7	7	7
CNT	29	29	29	29	29	29	29	29	29	28	28	28	28	28	29	29	29	29	29	29	29	29	29	29
MED	0	0	6	10	13	19	22	23	24	23	23	23	22	21	20	20	18	20	16	17	14	8	4	0
UD	5	6	11	15	19	23	24	26	27	30	29	27	28	25	24	25	25	28	22	23	20	16	13	7
LD	ES -24	-15	-9	0	7	10	18	20	20	18	19	19	17	14	0	-7	-7	7	-1	4	0	-12	-11	-16

C. Radio Propagation

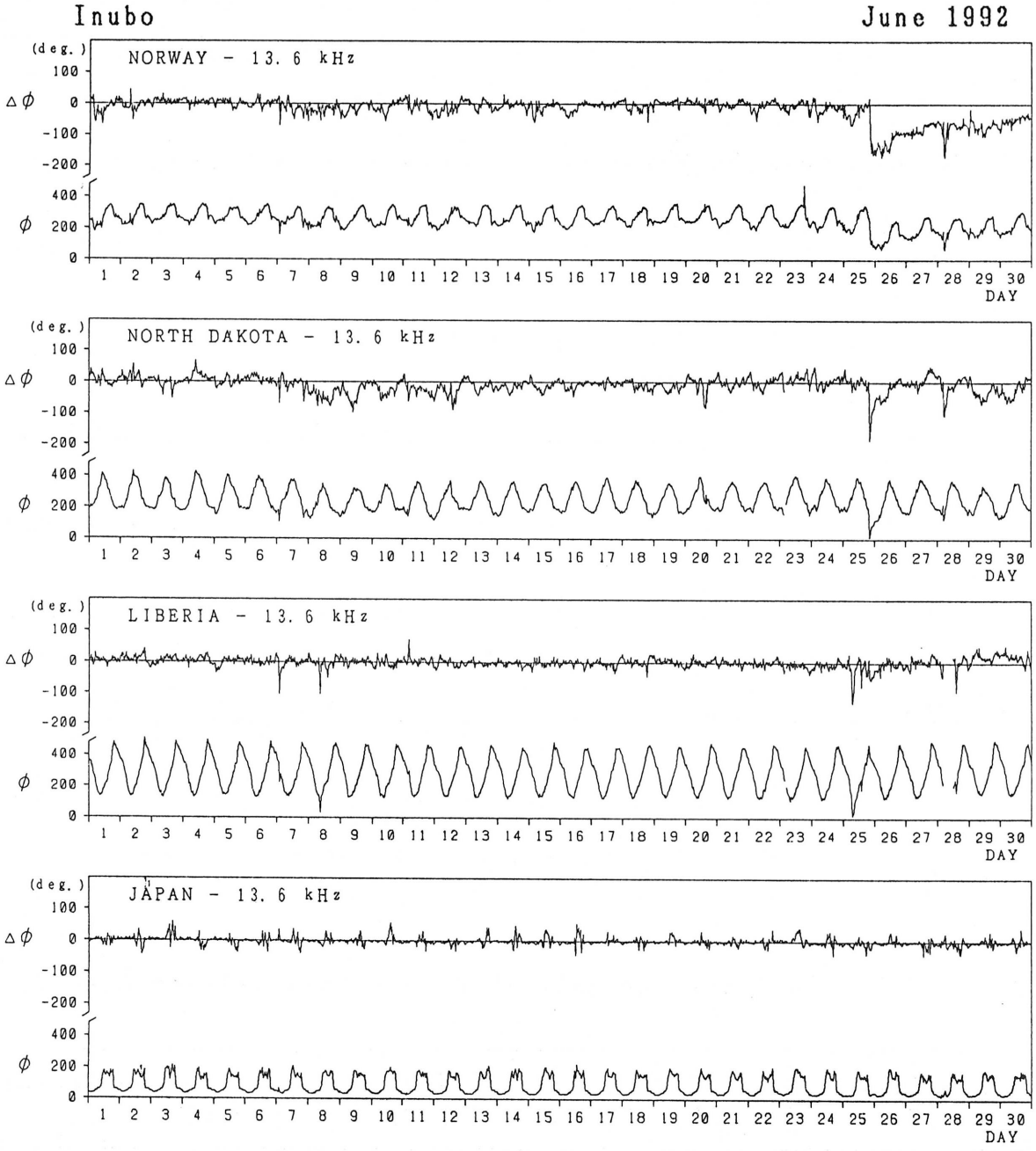
C2. Radio Propagation Quality Figures at Hiraiso

Hiraiso — Time in U.T.

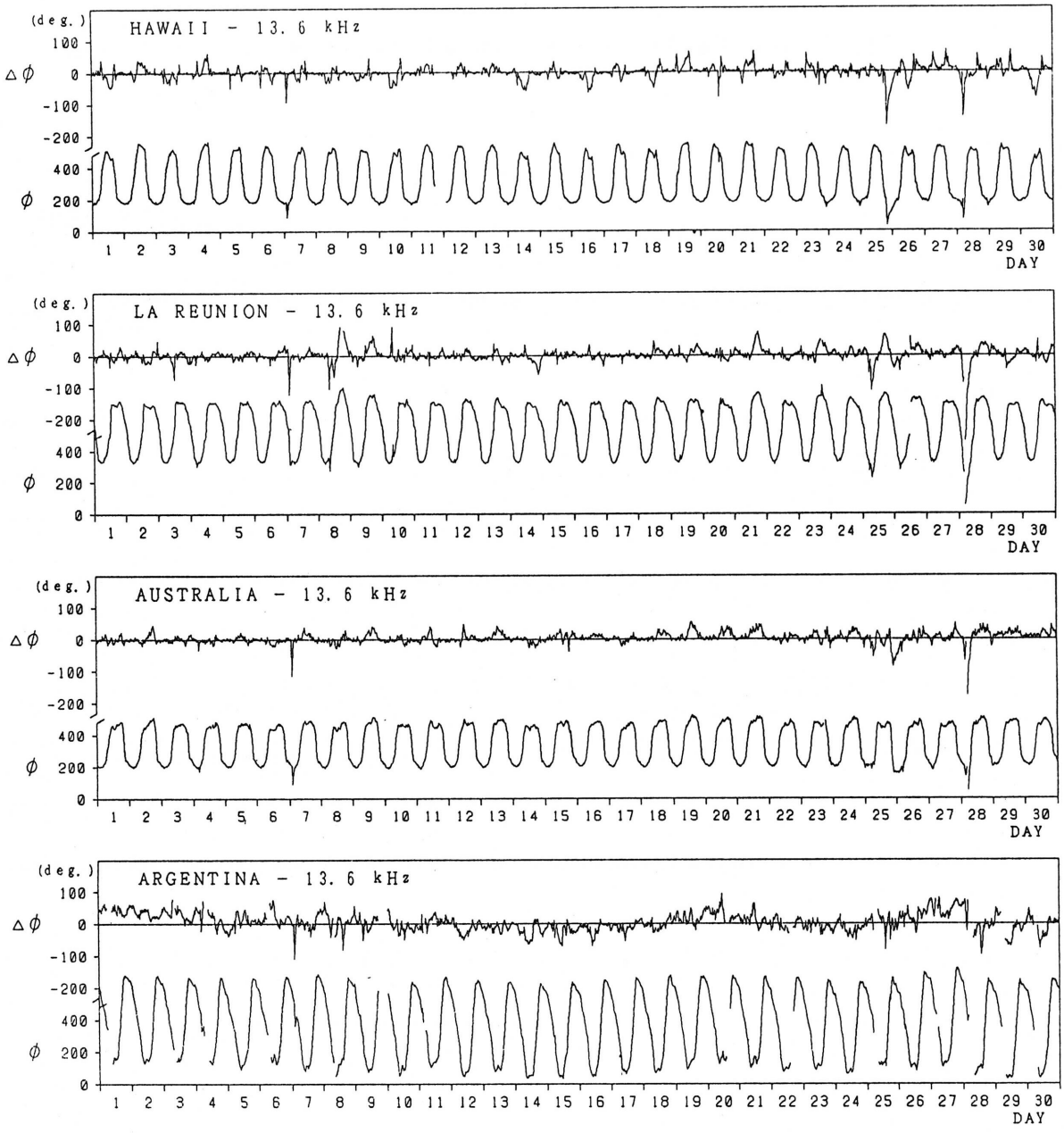
JUN. 1992	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Conditions 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start h m	End h	Range nT
1	4o	5 3 4 4	4 4 4 4	N N N N	none		
2	4o	4 4 4 4	4 4 4 4	N N N N			
3	4+	5 5 4 5	4 4 4 4	N N N N			
4	4+	4 5 5 4	4 4 4 4	N N N N			
5	4o	4 4 4 4	4 4 4 4	N N N N			
6	4+	4 5 5 4	4 4 4 4	N N N N			
7	4+	4 5 4 5	4 4 4 4	N N N N			
8	3+	4 4 3 2	4 4 4 2	N N N N			
9	3+	2 2 4 4	3 4 4 4	N N N N			
10	3o	4 2 2 2	4 4 4 2	N N N N			
11	3o	3 2 3 3	3 4 3 4	U U U U			
12	3+	3 4 2 2	4 4 3 4	U U U U			
13	3+	2 3 3 4	4 4 4 3	U U U U			
14	4o	4 4 5 4	3 4 4 4	U U U U			
15	4+	4 5 5 5	3 4 4 4	N N N N			
16	4o	4 3 4 4	4 4 4 4	N N N N			
17	4+	4 5 5 4	4 4 4 4	N N N N			
18	4o	4 4 4 4	4 4 4 4	N N N N			
19	3+	3 4 2 3	4 4 4 4	N N N N			
20	4+	4 4 4 5	4 4 4 5	N N N N			
21	4o	4 4 4 4	4 4 3 4	N N N N			
22	4+	5 4 5 5	4 4 4 4	N N N N			
23	4o	5 3 4 4	4 4 3 4	N N N N			
24	3o	3 4 2 3	4 4 2 3	N N N N			
25	3o	3 2 3 3	3 4 3 2	N N N N			
26	C	3 2 C C	3 C C C	N N N N			
27	4o	C C 4 4	C C 3 4	N N N N			
28	4-	3 2 4 4	4 4 4 4	N N N N			
29	3-	3 2 2 2	4 4 3 2	U U U U			
30	2+	2 2 2 2	3 2 2 4	U U U U			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo



Inubo June 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.)
Jun.24/2130	Jul.02/1046	Jun.24/2240	176

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso — Time in U.T.

June 1992	S W F								Correspondence	
	Drop-out Intensities(dB)					Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS	BBC						
4			11			0405	23	2	1-	x	x
7		>40	26	x		0139	8	2	2	x	x
7		x	30	x		0147	31	2	2+	x	x
8					8	0840	19	2	1-	x	x
9			12			0229	14	1	1	x	x
23			12			0232	28	2	1	x	x
25					5	1400	25	2	1-	x	-
25	>35	>48			x	1952	288	2	3+	x	x
26	>34	>34	15	x		0406	26	2	3+	x	-
28		x	12			0311	17	2	1	x	x
28			20			0328	xx	2	2-	x	-
28		>48	28			0442	106	2	3+	x	x
29			13			0010	12	2	1		-

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

Jun. 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
4	40	44	78	50	25	34	0408	0514	0418
6				24	17	18	0200	0252	0210
7	86	93	86	144	109	100	0140	0320	0150
7			12	10			0526	0556	0534
8			8	9	11		0256	0322	0300
8			9	9	9		0400	0434	0408
8	48	103	133				0836	1000	0850
9	17	29	44	43	30	28	0228	0314	0236
9	18	29	46	22	11		0624	0718	0632
18					35		2025	2130	2034
19				14	12	16	2336	0010	2344
20			17	9			0432	0502	0444
22			11	7			0554	0620	0600
22					7		2108	2138	2114
22				6	6		2306	2332	2310
23	9		25	22	16	23	0233	0304	0240
23	16		36	27	16	29	0311	0350	0322
23		24	26				0727	0757	0736
23		59	33				1058	1144	1108
23					11		2037	2100	2046
23				22	25	13	2120	2210D	2130
23				30*	37*	24*	2210E	2308	2218
23				18	19		2320	2338D	2326
23				12	13		2338E	0012	2344
24				12	7		0026	0048	0038
24				12	8		0050	0108	0056
24				9	9		0112	0138	0116
24				14	9		0230	0306	0234
24			12	12	16		0432	0512	0438
24			9				0536	0604	0542
24		28	11	10			0706	0742	0712
24		27	22				0938	0958	0950
24			7				1036	1048	1040
24	13			17	30	29	2130	2210	2138
24	36		19	32	27	17	2354	0016	0000
25				7	6		0131	0204	0136
25			9	7	4		0332	0402	0338
25		34	54*	41*	19	22	0434	0552	0454
25		122	86	45		37	0622	0924	0654
25		66					1408	1452	1424

Inubo

Jun. 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
25		32					1750	1830	1800
25					9		1834	1912	1854
25	65			73	195	233	1952	0114	2014
26		59	103	66	42	42	0406	0450	0417
26			28	22	43		0657	0728	0704
27				8	8		0006	0036	0012
27			12	17	11		0140	0200D	0150
27				25	15		0200E	0228D	0210
27			17	20	9		0228E	0254D	0238
27	18		45	45	23		0254E	0344	0306
27					5		2120	2138	2124
28				6	4		0016	0048	0025
28	52*	118*	128*	94*	59*	71*	0224	0440D	0338
28	144	———	280	238	140	132	0440E	1000	0506
28		98					1354	1508	1422
28	18		23	50	42	31	2332	0100	2340
29				9	7		0226	0256	0232
29			13				0836	0904	0840
30					12		2104	2132	2112

IONOSPHERIC DATA IN JAPAN FOR JUNE 1992
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