ISSN 0021–0382

F—520

IONOSPHERIC DATA IN JAPAN

FOR APRIL 1992

VOL. 44 NO. 4

CONTENTS

COMMUNICATIONS RESEARCH LABORATORY
MINISTRY OF POSTS AND TELECOMMUNICATIONS
TOKYO, JAPAN

INTRODUCTION

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

Station	Geographic		Geomagnetic		Technical Method
	Latitude	Longitude	Latitude	Longitude	
Wakkanai	45°23.5'N	141°41.2'E	35.3°N	206.5°	Vertical Sounding (I)
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 FØF2 AT WAKKANAI

APR. 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	73	70	70	72	66	62	89	112	104	119	121	120	123	123	127	128	117	122	119	111	96	87	83	71
2	74	74	77	66	72	72	59	79	76	89	89	106	116	117	117	114	108	99	104	98	88	85	83	73
3	72	72	72	70	57	66	83	91	95	119	109	116	115	119	117	100	112	107	112	101	89	91	74	90
4	73	73	66	54	69	74	67	76	74	73	62	73	72	74	63	76	73	84	105	84	95	71	74	67
5	64	57	59	54	62	54	91	90	98	98	98	100	101	100	100	97	88	98	110	97	81	85	72	64
6	76	66	72	72	64	61	95	90	100	108	95	100	112	100	98	96	102	101	108	98	90	63	54	67
7	70	63	61	61	59	67	87	95	78	78	80	72	70	73	73	72	79	73	83	77	66	70	67	67
8	75	66	63	62	62	63	74	95	98	95	98	97	98	101	95	97	96	99	92	99	79	65	74	91
9	92	73	62	63	53	66	86	73	76	84	87	94	97	97	104	102	97	89	104	85	84	90	75	90
10	64	70	73	66	67	70	91	91	87	120	104	110	111	111	110	108	104	115	97	91	90	82	85	73
11	74	70	67	72	67	66	100	86	105	102	112	118	107	103	122	125	108	107	114	94	87	94	90	66
12	91	66	68	61	67	73	83	86	109	122	109	117	117	120	111	110	109	100	120	112	93	88	85	74
13	85	67	74	84	67	62	81	100	91	100	98	89	115	101	116	122	106	107	112	125	77	70	72	67
14	68	72	62	70	61	72	84	92	101	113	114	118	118	121	120	117	122	118	98	87	83	92	73	73
15	74	78	68	70	62	63	91	87	89	93	96	98	97	101	119	114	100	108	100	108	77	95	84	71
16	86	65	66	66	63	86	90	74	90	74	98	95	112	100	100	99	94	98	93	90	80	95	74	68
17	76	73	66	70	66	68	70	90	95	92	98	106	100	112	108	98	106	109	100	92	99	77	89	82
18	85	71	72	72	69	82	98	104	101	113	115	112	111	113	118	105	89	124	106	99	93	96	70	73
19	73	67	67	68	77	65	76	72	90	83	72	88	95	98	100	97	104	103	100	96	84	71	73	79
20	92	79	68	66	67	67	110	97	91	109	107	103	119	117	115	104	116	116	103	93	89	79	86	84
21	89	85	73	68	62	60	74	76	116			68	A	79	69	86	93	82	83	85	78	85	76	73
22	84	70	70	66	70	80	93	108	115	96	100	98	100	114	107	117	117	108	98	96	A	90	N	92
23	83	67	71	66	65	61	70	69	64	80	80	83	92	92	90	98	86	91	91	92	94	91	92	86
24	88	86	82	74	72	93	98	90	101	107	115	108	121	121	114	120	134	110	103	98	99	93	96	87
25	90	78	72	68	76	97	125	128	119	122	121	121	124	126	124	126	119	120	98	100	98	96	99	86
26	102	86	84	90	86	77	92	105	90	100	101	113	107	114	114	114	116	118	100	86	96	99	84	86
27	86	93	83	74	67	61	72	98	86	98	98	94	99	122	97	113	102	N	114	109	109	92	91	109
28	91	68	80	74	58	90	64	79	85	114	124	95	111	114	101	87	98	93	125	87				
29																								
30																								
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	28	28	28	28	28	28	28	27	27	28	27	28	28	28	28	27	28	28	26	27	26	27
MED	80	70	70	68	66	67	86	90	93	100	98	100	111	112	109	104	104	107	103	96	89	88	80	73
U Q	88	76	73	72	69	75	92	97	101	113	112	112	116	118	117	115	114	115	111	99	95	93	86	86
L Q	73	67	66	66	62	62	74	79	86	89	95	94	98	100	99	97	95	98	98	88	81	77	73	68

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HOURLY VALUES OF FES AT WAKKANAI

APR. 1992

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	44	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	G	37	27	G	G	28
3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
4	G	G	22	G	G	23	G	G	G	G	G	G	G	G	G	G	G	G	G	24	28	G	G	G
5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	G	G	G
6	G	G	G	G	25	G	G	G	G	G	G	G	G	G	G	G	G	G	32	30	26	G	G	G
7	G	G	26	G	G	G	46	G	G	G	G	G	G	G	G	G	G	G	28	26	G	G	G	G
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	35	32	G	G	G	G
9	G	G	G	G	G	G	G	54	G	G	G	G	G	G	G	G	G	43	37	57	60	60	41	28
10	G	G	G	G	G	G	G	G	G	53	G	G	57	G	G	G	G	34	35	58	42	25	32	28
11	27	G	G	G	G	G	G	G	45	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
12	G	G	G	G	G	G	G	G	G	50	G	G	G	G	G	G	46	44	38	33	32	G	G	G
13	G	G	G	G	G	29	G	123	G	G	G	G	G	G	G	G	G	G	31	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G	G	G	45	G	G	G	G	G	47	38	33	G	G	G	G
15	G	G	G	23	G	G	G	G	G	G	G	G	G	G	G	G	G	42	37	34	28	G	G	G
16	G	G	G	G	G	G	G	G	46	G	G	G	G	G	G	G	47	G	G	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	44	33	G	G	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
19	G	G	G	G	G	G	G	G	G	G	G	G	G	G	45	48	G	60	G	29	G	42	G	G
20	G	57	32	26	G	G	G	G	56	47	56	59	49	G	G	48	61	G	G	28	35	48	G	24
21	G	G	G	G	G	G	G	G	G	G		G	45	59	G	G	G	49	32	28	G	G	G	G
22	G	26	24	G	G	G	G	G	G	G	55	G	G	G	70	82	G	G	33	40	92	58	31	45
23	44	29	29	26	G	34	48	G	G	53	G	G	G	G	G	G	G	G	G	G	44	30	G	G
24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	48	G	36	G	G	G
25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	67	G	41	44	34	G	G	G	G
26	G	G	G	37	G	G	G	47	60	G	G	G	G	G	G	G	G	G	G	30	G	G	G	G
27	G	28	25	G	G	G	G	G	G	G	G	G	G	G	G	G	43	G	G	156	G	G	G	G
28	G	G	G	G	G	G	G	G	G	90	G	G	G	G	G	G	G	47	G	G				
29																								
30																								
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	28	28	28	28	28	28	28	28	27	28	28	28	28	28	28	28	28	28	27	27	27	27
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	41	35	34	33	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT WAKKANAI

APR. 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	16	15	15	15	15	17	26	33	35	38	69	52	40	45	27	38	29	26	18	16	15	17	16	18
2	18	16	15	16	15	17	26	29	33	38	39	40	40	40	36	36	21	17	20	14	17	18	16	17
3	15	16	17	16	17	17	26	33	34	42	40	42	48	41	40	38	32	27	18	16	17	18	16	18
4	16	17	16	16	17	17	17	34	29			54	52	48	40	34	30	26	20	16	17	16	16	16
5	17	16	16	17	16	17	24	33	35	38	42	52	28	46	28	35	22	26	20	17	17	16	16	17
6	18	16	16	16	15	17	23	30	35	27	42	40	40	41	24	24	29	27	15	16	17	22	17	17
7	17	15	18	15	20	18	24	18	20	23	50	50	50	28	28	18	21	27	20	16	20	16	16	17
8	16	16	16	17	17	18	24	18	35	40	28	50	44	47	39	34	21	28	15	16	18	15	17	16
9	16	16	15	16	16	17	26	18	33	24	27	52	51	51	18	34	30	17	16	17	16	16	16	16
10	14	15	17	16	18	17	17	18	34	29	27	40	27	27	44	40	17	17	16	15	16	16	16	17
11	17	17	16	17	17	18	18	20	23	27	32	42	43	44	42	37	32	26	17	20	17	16	15	16
12	17	17	17	16	16	17	26	18	38	26	42	31	49	42	39	36	32	24	16	15	17	17	16	15
13	14	17	16	16	16	15	27	21	29	36	42	31	40	42	39	27	30	18	17	16	16	16	17	16
14	17	15	18	16	17	18	24	32	21	21	40	36	44	26	38	40	22	26	17	16	17	16	17	16
15	17	17	16	16	16	18	27	33	36	35	48	42	53	27	27	36	21	23	16	15	15	17	20	17
16	17	16	17	17	18	20	18	22	32	33	52	46	46	46	39	38	23	18	20	15	17	17	18	17
17	18	17	16	17	15	21	21	22	27	40	43	43	41	48	40	39	34	28	20	17	16	17	17	16
18	17	16	15	16	15	21	17	26	26	29	43	48	43	42	49	24	22	18	23	18	17	17	16	17
19	18	17	16	17	16	21	18	22	38	39	42	43	52	42	36	30	23	18	23	18	17	16	17	18
20	16	16	15	20	15	17	28	22	35	38	39	40	39	48	33	39	24	18	23	17	14	16	17	17
21	18	15	16	15	16	20	28	40					36	35	32	26	33	21	16	14	17	18	16	17
22	17	15	15	16	18	21	29	33	47	42	39	52	54	59	32	27	23	27	18	16	16	14	15	15
23	16	17	17	17	17	18	21	22	26	27	53	43	53	28	52	40	33	27	21	18	17	18	17	15
24	17	16	16	16	16	21	29	35	23	40	45	44	50	42	40	52	39	29	17	18	15	16	17	17
25	17	15	16	17	17	22	28	18	22	48	50	50	42	29	38	34	34	18	18	16	16	16	17	16
26	17	15	17	17	16	21	28	22	33	39	43	39	42	41	39	40	21	27	22	15	16	15	16	15
27	18	17	16	16	17	21	28	32	36	33	42	43	44	40	41	32	35	22	24	18	18	17	18	20
28	18	17	18	17	17	26	32	35	39	45	50	50	54	43	38	52	38	27	34	28				
29																								
30																								
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	28	28	28	28	28	28	27	26	26	27	28	28	28	28	28	28	28	28	27	27	27	27
MED	17	16	16	16	16	18	26	24	33	37	42	43	44	42	38	36	29	26	18	16	17	16	16	17
U 0	17	17	17	17	17	21	28	33	35	40	48	50	50	46	40	39	32	27	20	17	17	17	17	17
L 0	16	15	16	16	16	17	21	20	26	27	39	40	40	37	32	31	22	18	16	15	16	16	16	16

HOURLY VALUES OF FOF2 AT AKITA

APR. 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	78	52	72	64	63	62	80	86	111	121	126	131	133	134	134	125	123	127	121	111	90	64		78
2	73	57	78	66	62	64	77	83	96	106	118	134	135	136	133	125	121	112	111	91	86	86	A	56
3	56	75	73	64	54	61	87	99	102	107	116	121	128	128	121	120	118	113	118	111	87	87	87	78
4	82	73	73	63	67	65	74	70	70	77	79		91	88	84	88	87	87	92	86	75	60	47	57
5	71	56	56	55	52	52	76	86	102	108	104	106	106	112	112	108	104	102	106	89	84	64	68	66
6	62	75	51	72	52	63	80	96	111	117	111	115	111	120	113	107	104	112	110	90	54	56	58	57
7	54	67	54	54	61	57	84	86	97	86	74	A	69	71	76	86	86	87	87	73	58	67	62	60
8	68	65	57	63	63		80	86	88	97	107	111	101	107	108	112	107	107	111	99	84	67	75	74
9	75		64	64	63	55	76	73	88	87	103	105	100	107	109	113	106	108	106	86	80	73	72	70
10	73	A	66	64	57	59	78	101	88	104	108	108	117	111	118	116	111	112	112	99	75	80	74	63
11	57	72	78	70	62	60	86	94	110	108	106	114	120	120	118	121	118	112	111	104	92	86	64	78
12	76	65		67	63	68	86	90	108	116	118	120	122	120	117	112	114	118	109	104	86	79	54	67
13	67	78	66	57	58	70	90	111	111	112	110	106	118	124	129	121	121	120	112	87	82	67	72	68
14	72	72	55	62	53	63	86	97	103	111	116	122	125	127	128	126	121	121	110	100	80	63	67	64
15	50		79	67	63	73	84	99	96	100	104	101	107	120	128	131	111	112	112	96	84	76	79	79
16	78	78	77	67	63	63	86	106	107	110	114	117	123	131	132	126	110	111	102	86	79	79	79	79
17	57	60	73	67	52	62	82	86	100	107	111	115	116	117	127	117	113	110	106	90		83	80	80
18	78	79	75	73	54	78	88	108	111	120	120	114	113	120	123	119	121	110	112	87	87	86	82	81
19	65	75	76	84	78	82	82	88	91	100	103	107	109	118	112	108	113	114	111	90	83	75	71	77
20	52	55	74	66	67	80	102	102		107	115	117	125	126	118	119	120	126	108	88	77	A	57	70
21	86	79	77	54	67	67	54	53	64	56	A	84	90	86	84	92	97	87	91	86	75	74	79	75
22	78	55	72	N	52	78	87	97	107	111	112	111	109	116	118	119	120	113	108	98	85	85	53	90
23	87	72	81	72	74	73	80	78	83		100	N	95	105	110			94		97	84		75	80
24	80		82	58	58		90	103	102	109	104	113	115	118	117	118	N	114	A	A	A	85	85	85
25	84	86	68	68	80	85	110	117	112	118	117	119	121	132	131	131	131	127	108	91	A	90	90	88
26	88	92	87	88	82	85	103	108	112	111	121	115	119	123	124	119	121	120	106	101	87	84	85	77
27	78	84	86	79	71	75	77	86	87	91	101	101	111	120	117	121	118	112	112	103	87	84	84	82
28	80	56	78	74	67		86	87	88	97	105	106	110	112	117	111	106	100	108	100	88	79	86	83
29	84	82	86	73	67	78	88	98	86	84	93	103	111	102	100	102	97	94	90	84	86	82	84	79
30	67	77	74	64	60	62	83	90	100	101	97	102	96	96	108	110	106	101	100	84	86	65	54	80
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	26	29	29	30	27	30	30	29	29	29	27	30	30	30	29	28	30	28	29	27	28	28	30
MED	74	72	74	66	63	65	84	92	100	107	108	113	112	119	118	118	113	112	108	91	84	79	74	78
U Q	80	78	78	72	67	78	87	101	109	111	116	117	121	124	127	121	120	114	111	100	87	84	83	80
L Q	65	60	66	63	57	62	80	86	88	97	103	106	106	107	110	109	106	102	106	86	79	67	63	67

HOURLY VALUES OF FES AT AKITA

APR. 1992

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	G	G	163	60	46	G	52	G	G	28	G	G	G		G
2	G	G	G	G	G	G	33	G	G	G	N	G	G	G	G	50	40	G	G	G	G	30	65	G
3	G	G	25	G	30	G	G	44	41	G	G	G	G	54	G	G	G	G	G	29	25	G	28	G
4	G	G	G	G	G	G	30	G	G	G	45		G	G	G	G	G	37	29	33	29	28	32	24
5	G	G	G	G	G	G	G	39	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
6	G	G	32	G	G	G	G	G	G	G	G	G	59	G	G	G	G	G	31	29	24	G	G	G
7	G	G	G	G	G	G	G	54	41	G	52	51	46	G	G	G	39	34	30	25	G	28	29	28
8	G	G	G	G	26		G	G	G	65	58	58	53	49	45	42	G	46	35	30	25	G	G	G
9	G		G	G	G	G	G	G	G	G	65	65	49	G	G	49	40	34	43	35	40	26	124	91
10	48	49	G	G	G	G	G	G	56	68	61	56	89	84	83	91	68	72	58	40	26	G	30	40
11	G	32	G	25	24	G	34	38	G	58	66	57	54	58	G	G	G	G	56	35	27	27	G	G
12	G	G		G	G	G	G	G	58	68	G	G	G	50	58	G	48	45	54	65	40	26	G	G
13	G	G	G	G	G	G	G	G	G	51	G	G	G	G	G	G	51	50	40	38	G	G	G	G
14	G	G	G	G	G	G	G	G	57	55	53	68	160	66	G	57	G	54	56	44	36	G	G	G
15	G		G	G	G	G	G	40	47	52	53	G	G	49	47	48	G	G	41	40	31	40	G	G
16	G	G	G	G	G	G	G	48	G	G	G	G	46	62	G	G	G	36	44	29	28	25	G	G
17	G	G	G	G	G	G	33	G	41	G	G	G	G	G	G	57	44	44	56	44		44	29	G
18	G	G	G	G	G	G	G	40	44	G	48	G	50	49	48	44	41	G	30	G	G	G	G	G
19	G	G	G	G	G	G	G	38	43	50	G	G	G	G	G	G	G	G	34	27	42	40	40	48
20	G	29	29	30	32	G	G	G		G	45	54	51	G	G	78	G	G	G	28	30	66	32	29
21	26	G	29	31	31	G	37	47	50	54	57	82	75	50	69	70	49	41	40	40	33	30	G	G
22	30	32	27	G	30	G	G	G	G	G	54	G	G	53	53	50	50	39	G	G	G	33	36	103
23	90	58	38	37	34	38	59	45	60		59	55	55	70	51			42		G	58		37	26
24	33		G	G	G		G	G	84	G	48	48	G	G	G	43	G	51	162	161	84	G	G	G
25	G	G	G	G	G	G	37	G	G	51	53	G	G	G	76	50	G	G	93	58	108	41	G	G
26	G	G	G	G	G	G	G	45	47	54	58	G	G	G	G	G	G	G	40	37	G	G	G	G
27	G	G	G	G	24	27	G	G	G	G	54	G	G	G	92	51	65	66	53	G	34	G	G	G
28	G	G	G	G	G		50	44	G	G	G	G	G	G	G	G	G	66	46	40	44	31	G	G
29	G	G	G	G	G	44	36	43	48	58	76	51	G	G	G	G	G	50	48	49	46	86	42	30
30	G	G	G	G	G	G	G	44	55	58	62	G	48	46	G	G	48	58	84	91	83	36	25	G
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	27	29	30	30	27	30	30	29	29	29	29	30	30	30	29	29	30	29	30	29	29	29	30
MED	G	G	G	G	G	G	G	G	41	G	52	G	G	G	G	42	G	36	40	34	29	26	G	G
U Q	G	G	G	G	24	G	33	44	49	54	58	55	53	50	48	50	46	50	55	40	41	34	32	26
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29	25	G	G	G	G

HOURLY VALUES OF FMIN AT AKITA

APR. 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	15	15	15	16	16	20	18	20	22	71	34	28	28	36	21	20	18	20	15	18	17		17
2	16	15	15	16	15	16	18	18	18	23	22		34	42	28	22	21	17	20	17	16	18	17	17
3	18	15	16	15	15	18	24	17	18	21	32	22	44	27	39	22	17	17	18	15	16	18	16	18
4	16	16	15	16	15	18	18	16	21	23	22		28	23	23	20	17	16	18	16	16	16	17	16
5	17	16	16	17	15	16	28	17	17	20	22	23	39	28	21	17	16	16	21	16	17	17	18	16
6	17	16	16	16	16	17	24	16	21	22	23	24	32	21	20	21	17	28	15	16	17	16	17	17
7	20	16	17	17	16	16	18	17	17	20	20	26	20	20	20	17	15	16	18	17	16	16	17	18
8	17	17	18	16	17		24	16	17	20	21	21	28	26	21	18	16	16	16	16	16	17	18	20
9	17		18	17	16	16	22	16	17	20	16	22	26	39	20	20	17	16	16	16	17	17	16	14
10	17	15	16	20	16	17	18	17	18	20	23	23	22	22	23	18	18	16	15	16	15	17	18	18
11	18	17	17	16	17	16	15	17	17	34	23	30	20	24	22	18	17	16	16	16	15	17	18	18
12	18	20		17	15	20	21	17	17	20	21	23	27	23	24	22	17	17	15	16	17	17	17	18
13	17	16	18	16	17	16	18	16	20	21	24	23	23	21	20	18	18	16	16	17	16	18	18	18
14	16	17	15	15	16	17	24	16	17	20	23	22	35	16	21	18	16	16	16	16	17	18	17	17
15	17		16	17	16	17	28	17	17	22	23	23	24	35	24	24	20	17	16	16	17	17	18	16
16	17	17	18	16	18	16	16	18	17	22	22	26	22	24	23	21	16	16	15	16	17	17	18	18
17	17	17	17	16	16	17	16	16	20	21	23	24	26	32	28	23	17	17	16	16		15	17	18
18	18	16	18	18	16	18	16	20	20	22	23	29	27	35	24	23	21	16	17	17	16	17	17	18
19	21	16	18	17	17	18	17	18	18	22	46	46	26	27	22	22	18	17	16	17	16	18	18	17
20	18	15	17	17	16	22	29	18		24	24	27	38	49	22	24	21	17	22	15	16	16	17	16
21	17	17	17	15	15	18	16	20	21	22	38	32	28	28	23	21	16	16	15	16	16	16	18	17
22	17	16	17	18	16	17	18	18	22	22	27	44	26	26	21	23	23	17	23	16	16	16	15	17
23	16	15	18	16	16	15	17	20	21		27	26	28	23	22			16		75	15		16	18
24	17		17	17	17		17	20	20	22	23	26	23	23	24	23	18	16	16	17	16	16	16	17
25	17	17	18	17	16	20	29	17	21	22	24	23	24	27	21	22	16	17	17	15	16	17	20	17
26	16	15	17	17	16	20	16	21	18	23	21	26	46	46	22	22	18	20	16	16	16	17	17	20
27	18	16	18	17	16	21	18	17	21	23	29	35	27	28	21	17	17	17	15	16	16	18	18	17
28	17	17	15	15	15		18	18	20	44	47	38	45	36	24	29	21	18	16	15	16	16	16	18
29	20	20	18	16	16	16	16	18	18	20	22	22	28	23	21	18	20	16	16	17	17	17	17	18
30	23	20	17	16	15	20	16	17	18	22	22	24	23	22	21	21	17	17	16	20	18	17	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	27	29	30	30	27	30	30	29	29	30	28	30	30	30	29	29	30	29	30	29	29	29	30
MED	17	16	17	16	16	17	18	17	18	22	23	25	27	26	22	21	17	16	16	16	16	17	17	17
U Q	18	17	18	17	16	18	24	18	20	22	27	29	32	32	24	22	20	17	18	17	17	17	18	18
L Q	17	15	16	16	15	16	16	17	17	20	22	23	24	23	21	18	16	16	16	16	16	16	17	17

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT KOKUBUNJI

APR. 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	83	80	71	80	64	62	82	97	108	125	136	135	136	139	134	134	129	135	131	114	97	85	77	92
2	77	73	80	74	60	66	81	101	113	126	132	136	133	140	141	137	132	130	123	105	97	86	87	84
3	82	86	84	92	59	60	84	96	105	112	121	131	126	132	128	127	127	122	124	123	100	92	93	86
4	80	73	74	55	67	77	80	78	77	86	102	114	110	113	105	102	104	102	106	93	82	82	73	70
5	82	63	52	50	53	53	76	91	102	111	112	112	117	122	122	123	122	120	121	100	84	77	81	78
6	68	82	71	73	68	73	86	104	111	117	122	117	115	132	124	117	108	121	125	94	72	54	52	62
7	63	68	73	58	46	51	78	97	112	106	103	89	100	101	106	124	111	105	98	80	68	65	71	73
8	68	68	59	61	60	62	81	87	101	105	112	110	110	112	120	130	127	128	122	108	84	76	78	76
9	80	82	72	60	57	57	84	92	104	105	107	118	120	116	123	125	120	125	118	100	87	80	80	80
10	77	77	76	71	63	64	87	105	114	107	115	116	121	126	128	125	117	121	118	104	86	81	84	76
11	77	78	81	72	48	64	85	102	112	111	108	118	126	123	121	126	130	124	123	114	101	83	84	86
12	81	80	78	80	64	67	86	98	114	118	121	124	121	121	120	120	121	128	121	111	86	80	79	86
13	83	78	73	73	62	73	101	117	112	116	113	117	124	134	136	137	137	134	120	99	79	80	82	78
14	74	88	86	74	52	61	86	91	100	111	120	125	125	130	135	132	127	131	121	101	79	76	78	79
15	82	82	82	72	63	68	94	105	101	97	102	107	116	129	135	137	126	126	123	104	88	77	79	80
16	84	80	82	74	74	64	84	108	112	116	112	129	137	141	142	140	131	121	107	87	84	84	78	78
17	83	74	74	68	62	69	90	97	108	111	107	117	125	128	133	135	122	113	107	91	87	93	80	92
18	82	83	77	70	74	78	101	117	112	117	116	120	125	129	134	135	131	122	121	104	87	93	84	91
19	80	71	77	83	90	79	82	91	97	108	111	121	126	125	122	115	120	119	116	98	86	82	81	82
20	80	78	82	67	73	79	100	103	103	112	120	124	A	134	131	130	132	136	124	94	80	87	81	54
21	86	81	67	71	73	66	74	72	68	A	A	107	113	106	98	A	A	107	103	87	80	68	79	77
22	81	78	79	67	68	77	86	100	103	110	113	120	118	122	126	130	127	123	112	101	89	90	91	90
23	87	92	81	80	80	84	88	92	96	104	108	115	111	117	117	113	105	105	105	102	81	81	86	84
24	93	80	91	74	59	73	85	103	107	105	111	118	124	123	121	122	123	120	112	96	91	87	87	87
25	85	90	68	70	73	84	102	114	109	113	115	121	125	138	136	137	138	132	122	101	A	99	100	102
26	102	86	97	92	93	92	98	117	106	117	119	121	125	128	133	132	131	124	113	104	99	89	88	94
27	89	84	84	80	80	87	83	92	98	101	100	112	127	127	126	128	126	128	122	A	90	89	88	93
28	87	77	81	80	72	74	87	90	90	101	101	116	121	121	124	115	112	112	103	101	90	81	88	87
29	81	85	87	74	74	74	86	104	100	98	102	121	130	126	123	123	114	107	97	84	87	84	84	81
30	A	81	81	63	58	64	84	88	98	100	102	111	110	105	111	125	118	111	112	112	92	86	82	80
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	30	30	30	30	30	30	29	29	30	29	30	30	29	29	30	30	29	29	30	30	30
MED	82	80	78	72	64	68	86	98	104	111	112	118	124	126	125	127	126	122	119	101	87	82	82	82
U Q	84	83	82	80	73	77	88	104	112	116	119	121	126	132	134	134	130	128	122	104	90	87	87	87
L Q	78	77	73	67	59	64	82	91	100	104	105	114	115	121	121	122	117	113	107	94	81	80	79	78

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT KOKUBUNJI

APR. 1992

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	43	G	G	G	G	44	G	G	33	G	32	39	28	G	G
2	G	G	G	G	G	G	32	G	43	G	50	G	G	G	G	G	G	G	G	G	G	28	G	28
3	28	G	G	G	G	G	G	G	44	G	G	G	G	G	G	G	G	G	37	G	24	G	23	44
4	G	G	G	G	G	G	G	G	G	G	G	50	G	G	G	44	G	37	34	34	40	38	29	G
5	G	G	G	G	G	G	30	G	44	52	50	G	G	G	G	48	44	38	50	40	24	G	G	G
6	G	G	G	G	G	G	G	G	G	50	G	G	G	G	G	G	G	37	28	25	24	24	G	G
7	G	G	G	24	G	G	G	G	44	49	53	58	74	48	49	G	51	53	47	58	35	33	G	29
8	34	28	24	24	G	G	G	G	47	51	58	52	51	58	60	59	74	49	47	35	29	27	G	28
9	G	28	G	G	G	G	G	36	G	G	51	52	46	54	50	48	48	55	G	G	28	23	G	G
10	58	72	37	30	30	G	G	G	G	44	50	51	50	55	55	98	92	61	50	30	52	28	G	45
11	28	G	G	G	G	G	G	G	44	47	G	G	58	G	G	G	G	40	55	40	49	40	G	G
12	G	G	23	G	G	G	G	42	55	57	58	58	59	66	71	G	62	55	67	58	58	127	29	G
13	G	G	G	G	G	G	G	44	47	50	52	50	G	G	G	G	G	43	52	54	25	G	G	G
14	G	G	G	G	G	G	G	G	44	61	74	54	49	47	67	G	G	42	44	39	36	32	G	G
15	G	G	G	G	G	G	G	42	49	55	54	55	52	48	45	54	66	105	70	58	48	G	G	28
16	G	26	27	G	G	G	G	G	G	G	G	G	G	G	53	G	48	38	27	27	G	G	G	G
17	29	26	G	G	G	G	G	50	G	44	G	G	G	G	G	48	51	52	53	74	58	29	28	27
18	G	G	G	G	G	G	G	40	44	48	50	68	53	58	50	58	50	39	40	50	33	27	G	G
19	G	G	G	G	G	G	G	37	G	G	G	G	G	G	G	58	48	49	G	40	G	G	43	38
20	49	36	31	35	34	G	G	44	G	60	61	56	110	55	54	44	39	G	G	G	28	28	58	51
21	49	56	58	60	54	G	41	51	48	61	108	62	54	74	106	147	176	51	68	58	56	27	24	24
22	34	29	24	G	G	28	55	63	51	G	52	G	48	55	58	54	56	38	G	G	G	G	65	32
23	G	49	46	54	39	34	G	49	55	52	58	52	50	74	57	58	39	G	44	51	126	56	56	39
24	38	G	27	29	36	28	G	50	59	56	G	60	G	56	62	80	86	70	44	46	40	95	G	G
25	G	G	G	G	G	G	G	44	51	51	52	60	54	57	54	62	45	37	37	70	107	40	79	G
26	G	G	G	G	G	G	39	50	60	49	52	G	G	G	G	G	G	48	36	29	40	29	G	G
27	G	24	G	G	G	G	G	43	48	58	60	49	73	47	55	65	48	56	58	110	50	55	40	34
28	G	G	G	G	G	G	G	39	47	48	72	67	93	G	46	G	G	35	G	29	G	27	50	G
29	G	G	G	G	G	29	50	44	49	57	G	G	G	G	G	G	G	43	39	34	43	34	26	37
30	70	26	33	26	23	G	G	G	51	48	G	61	57	49	G	G	G	49	57	41	52	60	55	41
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	G	G	G	G	G	G	G	38	44	49	50	50	48	47	48	44	44	42	42	40	38	28	G	12
U Q	29	26	24	24	G	G	G	44	49	55	58	58	54	55	55	58	51	52	52	54	50	38	40	34
L Q	G	G	G	G	G	G	G	G	G	43	G	G	G	G	G	G	G	37	27	29	24	23	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT KOKUBUNJI

APR. 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	16	15	15	14	15	16	15	17	21	78	34	40	29	23	23	17	16	20	14	15	14	15	15
2	15	14	14	14	14	15	17	16	18	20	41	28	32	43	38	24	17	15	20	15	15	15	15	15
3	15	14	14	15	15	15	17	15	16	22	39	23	40	40	39	35	18	16	15	15	15	16	16	15
4	15	15	15	14	15	16	15	16	17	20	34	32	29	30	30	17	17	14	14	14	15	15	15	15
5	15	14	15	14	15	15	15	15	16	22	32	33	34	36	23	18	20	14	21	15	15	15	15	15
6	15	14	14	14	14	15	17	15	16	23	21	22	29	28	22	21	16	17	14	15	15	15	15	15
7	16	15	15	15	15	15	20	16	17	18	22	22	23	32	23	18	14	14	15	15	15	14	15	14
8	15	14	15	15	15	15	20	16	17	20	27	34	23	32	18	23	16	15	14	14	15	15	15	15
9	15	14	14	15	15	15	17	15	16	20	23	22	32	23	21	18	17	15	18	15	15	16	16	14
10	15	15	14	14	15	14	26	15	16	28	30	33	26	22	22	20	17	15	15	14	14	15	15	15
11	16	14	15	14	15	15	15	15	17	18	20	29	28	30	42	15	15	16	14	14	15	14	17	15
12	15	14	15	15	14	15	15	15	16	17	24	22	24	24	22	20	20	15	14	14	14	15	14	15
13	15	15	15	14	15	15	20	15	17	20	20	35	29	24	20	16	16	14	14	15	14	15	16	16
14	15	14	14	15	14	15	17	16	15	18	22	35	34	33	27	20	17	16	15	14	14	15	15	15
15	15	15	14	14	15	16	15	15	16	20	36	35	23	34	33	22	17	15	15	15	15	15	16	14
16	15	14	15	14	15	16	15	15	17	22	22	30	33	29	26	20	16	14	14	15	15	15	15	15
17	15	15	14	15	14	16	16	15	16	24	29	42	29	43	42	23	17	16	15	15	15	15	15	15
18	15	14	14	15	14	17	16	16	17	27	32	28	32	34	32	21	18	15	15	16	15	15	16	15
19	16	14	15	16	14	17	17	16	17	21	45	33	50	44	23	21	17	16	15	15	15	15	14	15
20	15	14	14	15	14	18	18	16	18	27	26	39	36	41	29	33	18	16	16	15	15	15	15	15
21	15	14	14	14	14	18	16	16	26	30	38	33	35	42	34	17	29	16	17	14	14	14	15	16
22	14	14	15	16	15	16	17	17	21	26	36	43	40	33	32	29	20	17	23	15	15	16	15	14
23	16	15	15	15	14	14	18	17	18	24	30	33	33	24	24	17	17	18	15	16	15	15	15	15
24	15	16	15	14	14	16	33	22	21	27	29	27	33	32	23	21	18	16	16	14	15	15	15	15
25	15	15	15	15	16	18	16	16	21	28	30	35	35	40	39	21	18	15	15	15	15	15	15	15
26	15	14	14	15	15	20	18	18	18	20	32	33	42	48	32	22	16	16	15	15	15	15	16	15
27	15	15	16	15	14	21	28	17	17	23	34	32	33	39	35	34	17	15	14	14	15	15	15	15
28	15	15	15	15	15	26	16	20	22	38	30	32	36	42	33	36	17	16	16	14	15	15	15	15
29	15	15	15	14	14	15	16	16	17	36	39	40	49	40	20	17	16	15	17	14	14	14	16	15
30	15	14	14	14	15	20	16	16	16	24	40	28	30	18	22	18	16	15	15	14	18	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	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	15	14	15	15	15	16	17	16	17	22	30	33	33	33	26	21	17	15	15	15	15	15	15	15
U Q	15	15	15	15	15	17	18	16	18	27	36	35	36	40	33	23	18	16	16	15	15	15	16	15
L Q	15	14	14	14	14	15	16	15	16	20	24	28	29	29	22	18	16	15	14	14	15	15	15	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT YAMAGAWA

APR. 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	108	90	82	80	78	60	66	88	106	120	130	134	142	143	143	147	144	146	146	138	119	106	98	
2	92	90	87	84	62	62	64	88	108	121	130	137	147	154	162	167	160	158	157	156	145	135	141	141
3	141	127	107	101	66		83	104	106	110	125	137	144	145	141	140	138	136	144	146	120	105	102	90
4	88	86		78		86	86	88		C	C	C	C	137	135	128	127	131	131	120	90	C	C	C
5	C	C	A	C	C	C	C	90	102	111	116	118	128	134	136	140	142	C	C	126	108	88		
6	77	86	85				78	96	110	118	112	C	C	C	134	129	135	132	131	111				66
7	71	77	84	62	57	54	64	88	106	118	128	118	126	134	141	156	157	146	138	111	90	87		87
8	84	86	77	72	66	66	82	90		117	116	115	120	135	138	144	156	158	145	134	111	97		
9	88	88	85	82	78	64	66	101	108		104	122	134	129	134	141	145	150	146	136	107	87	98	97
10		87	88	81	74	73	83	104	107	107	112	118	134	141	146	145	143	136	137	138	111	106	108	107
11	102	110	110		66	66		103	107	102	117	126	134	138	133	136	141	140	135	137	110	88		103
12	88		96	86		62	68	97	111	122	114	117	126	127	133	142	144	140	142	138			106	97
13	87	90	86	85	76	64	80	101	88	110	111	130	140	142	143	150	150	148	138	110	110	113	108	120
14		103	128	86		50		86	97	108	111	119	125	137	141	139	145	144	140	118	87	84		106
15	91	97				67	86	105	101	90		115	127	139	145	146	146	171	146	131	110	110		99
16	98	86	85			60	73	102	107	113	111	126	143	150	157	158	154	138	127	120	104	90		108
17	109		86	74	66	64	83	101	102	107	105	118	131	143	146	146	133	122	124	111	103	88	90	87
18	88	96	86		77	72	86	107	111	118	110	118	135	150	149	155	147	144	146	135	108	105	104	108
19	86	89	87	105	85	72	78	84		117	116	128	135	138	133	130	128	129	128	111	95	87	87	87
20		85	87	82	74		83	97	106	107	113	128	138	142	135	134	138	144	137	111	100	85	91	86
21	82	106	86	79	80	66	87		91	98	113	136	138	126	122	123	123	126	123	108	80	80	84	85
22	86	86		68	63	66	82	90		102	112	119	132	132	137	140	138	140	127	111	127	108		104
23	106	108	88	84	82		83	88	102	121	118	123	132	133	134	129	136	136	134	122	90	89		
24	88	102		85	72	N		106	111	104	113	127	128	130	128	135	137	141	128	111	93	89	91	108
25	101	108	83	72		80	86	102	111	108	112	121	130	132	135	142	143	139	132	124	106	108	108	109
26	110	88	110	102	90	87	102	111	114	120	121	120	121	132	140	143	134	122	A	A	105	104	102	106
27	102	87	88	87	86		85	96	90	103	105	123	139	144	141	139	142	136	128	130	118	110		108
28	108	98	104		84	79	83	90	90	90	104	118	130	135	132	132	132	132	132	131	102	88	98	102
29	88	105	104	88	85	72	85	88	104	102	115	123	133	142	137	135	132	122	121	118	108	103	104	90
30	88	99	106			62	79	96	97	103	98	105	114	114	121	129	133	134	135	134	106	97	87	86
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	27	25	22	21	23	26	29	26	28	28	28	28	29	30	30	30	29	28	29	28	27	18	25
MED	88	90	87	83	76	66	83	96	106	109	113	122	132	137	137	140	142	139	135	124	106	97	100	102
U Q	102	103	104	86	83	72	85	102	108	118	116	127	138	142	143	146	145	145	143	135	110	106	106	108
L Q	87	86	85	78	66	62	78	88	101	103	111	118	127	132	134	134	134	132	128	111	97	88	91	87

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT YAMAGAWA

APR. 1992

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	32	G	G	G	
2	G	24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
3	G	G	G	G	24		G	G	G	G	G	G	G	G	G	G	G	G	40	38	28	26	G	28
4	G	28		G		G	24	35		C	C	C	C	G	G	G	G	41	G	38	41	C	C	C
5	C	C	35	C	C	C	C	G	42	50	51	54	G	G	53	52	G	C	C	40	28	G		
6	G	G	G				G	G	G	46	G	C	C	C	52	44	G	G	G	G		G	G	G
7	G	G	G	G	G	G	G	G	G	45	52	54	52	G	56	78	45	66	G	24	34	32		34
8	45	58	26	G	G	G	25	48		G	G	G	G	G	51	G	G	G	G	32	44	48		
9	24	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	43	43	44	48	23	23
10		28	30	29	31	26	G	G	48	56	G	G	G	G	50	54	58	60	65	72	93	83	29	G
11	G	G	G		27	33		35	G	50	57	62	50	G	G	G	G	G	G	50	G	24		G
12	G		25	25		G	G	G	49	51	G	52	57	63	G	44	G	42	47	47			33	77
13	G	G	G	G	G	26	G	39	G	52	51	50	60	G	G	G	51	61	G	G	48	31	G	G
14		G	G	G		G		G	52	57	52	G	G	G	G	G	G	G	36	34	34	69		G
15	G	G	G			G	G	G	44	48		56	54	G	G	76	90	99	96	96	78	G		G
16	G	G	G			G	G	G	45	45	G	G	48	G	G	G	G	G	G	G	G	G		25
17	G		G	G	G	G	29	G	40	48	55	G	49	G	G	56	60	61	58	58	31	G	G	G
18	G	G	G		G	G	G	G	43	G	G	52	47	G	G	56	46	58	G	44	32	33	G	24
19	24	G	G	G	G	G	G	G	G	G	G	55	G	G	G	G	73	62	76	55	54	46	32	31
20	G	G	G	G	G		G	G	G	62	G	60	G	G	G	G	G	53	G	49	69	41	31	25
21	57	26	36	45	G	G	32		G	G	G	49	G	G	G	G	G	G	G	G	G	30	40	68
22	29	G		G	G	24	G	41		55	61	48	59	57	59	54	G	48	53	28	28	G		33
23	G	G	29	26	33		42	50	57	48	69	63	74	G	G	G	G	62	G	82	49	G	G	
24	48	60		43	G	G		56	68	G	G	G	62	63	61	88	80	G	G	G	37	G	94	26
25	30	G	G	G		G	G	39	49	49	G	G	49	G	64	75	G	51	37	42	58	44	38	79
26	72	91	G	G	G	34	G	44	G	58	59	61	G	G	G	G	43	62	150	117	95	82	30	40
27	30	30	24	27	G		28	G	48	49	G	G	56	53	53	G	G	G	G	38	28	G		G
28	G	G	27	G	G	G	G	40	44	63	G	56	85	G	G	G	G	G	38	24	G	G	G	36
29	G	G	G	G	G	G	30	48	68	G	G	G	53	G	G	G	42	G	40	36	G	28	G	G
30	G	G	G			57	44	40	50	56	68	G	G	G	G	56	G	G	64	33	24	26	28	68
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	27	27	23	21	24	26	29	27	28	28	28	28	29	30	30	30	29	29	30	28	28	20	25
MED	G	G	G	G	G	G	G	G	42	48	G	24	48	G	G	G	G	G	G	38	33	26	12	25
U Q	29	26	25	25	G	12	25	40	49	53	52	54	55	G	51	54	45	60	50	49	48	42	31	35
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24	12	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT YAMAGAWA

APR. 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	16	15	15	15	15	17	16	21	38	62	44	44	44		38	35	17		15	15	15	15	
2	15	15	15	15	15	15	16	16	16	23	28	38	48	45	40	39			86	15	15		15	15
3	15	15	15	15	15		16	20	17	23	38		43	44	44				15	15	15	15	15	15
4	15	15		15		15	16	15		C	C	C	C	36	44		34	18		15	15	C	C	C
5	C	C	15	C	C	C	C	16	16	21	38	39		45	39	34	24	C	C	15	15	15		
6	15	15	15				17	27	16	21		C	C	C	34	27	24	33						15
7	15	15	15	15	15	15	17	18		20	23	36	38		34	32	22	17		15	15	15		15
8	15	15	15	15	15	15	18	18		20	28	28			41	36			16	15	15	15		
9	15	15	15	15	15	15	17	18	16			38	48	44	44		21		15	15	15	15	15	15
10		16	15	15	15	15	18	15	18	18	40	44	46	47	42	36	22	17	15	15	15	15	15	15
11	15				15	15		15		27	38	36	44	49	43	44		17		15		15		15
12	15		15	15		15	18	15	16	20	24	39	42	42	41	42		17	16	15			15	15
13	16	15	15	15	15	15	20	15	18	21	35	41	37	45	42	39	22	16			15	15	15	15
14		15	15	15		15		17	17	33	36	48	45					18	15	15	15	15		15
15	15	15				15	15	16	18	23		39	40	49	47	39	35	30	16	17	15	16		15
16	15	15	15			15	20	15	17	34	43	43	35	44	39	41	38	17		15	15	15		15
17	15		15	15	15	15	16	15	16	24	34		34	43	47	40	36	17	16	15	15	15	15	15
18	15	16	15		15	15	15	15	18		36	37	49	50		35	29	18		15	15	15		15
19	15	15	15		15	15	22	16		24		43	50	44	47		36	17	16	15	15	15	15	15
20		15	15	15	15		16	18		24	43	40	38	54		52		17		15	15	15	15	15
21	15	15	15	15	16	15	17		21	21	46	38	46	46	45	44	42	24	16	17	15	16	15	15
22	15	15		15	15	15	15	18		38	42	43	44	43	42	38	39	20	16	15	15			15
23	15	15	15	15	15		15	20	20	36	36	42	40		46	40	38	18		15	15	15		
24	15	15		16	15	15		16	23		35		46	44	40	39	35				16	15	15	15
25	15	15	15	16		15	15	18	18	39		45	43		43	38		18	17	15	15	15	15	15
26	15	15		15	15	15	15	16		35	38	36	54		49	40	24	17	15	16		15	15	15
27	15	17	15	15	15		15	30	21	36			43	42	40		35	16		15	15			15
28	16	15	15		15	15	15	18	22	36		40	35		44	44	24	16	14	15		15	15	15
29	15	15		15	15	15	15	16	17	21	39	46	38	42		38	22	16	16	15		15	16	15
30	15	15				15	15	16	18	35	36	40	46	49	50	38	21		16	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	26	26	22	21	21	24	26	29	22	26	22	24	26	22	25	24	22	23	17	27	24	24	17	25
MED	15	15	15	15	15	15	16	16	18	24	37	40	44	44	43	39	32	17	16	15	15	15	15	15
U Q	15	15	15	15	15	15	17	18	20	35	40	43	46	47	45	40	36	18	16	15	15	15	15	15
L Q	15	15	15	15	15	15	15	15	16	21	35	38	38	43	40	37	22	17	15	15	15	15	15	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT OKINAWA

APR. 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		168	111	88	81	54		86	107	119	118	132	146	146	158	161	163	170	171	163	146	146	146	137
2	145	143	127	111	85	54	37	85	104	111	121	132	147	159	190	187	190	187	190	182	146	144	162	161
3	162	158	159	111	64	58	63	88	105	111	120	132	145	147	146	146	150	146	160	158	131	145	147	146
4	144	111	110	87	84	86	85	86	108	123	133	146	157	163	161	165	168	168	169	161	147	122	110	111
5	110	110	87	53	35	55	63	87	108	118	118	123	140	150	160	170	176	172	175	160	136	125	110	110
6	104	105	108	86	80	67	78	96	108	111	112	131	134	N	146	146	146	146	137	131	91	84	73	66
7		86	88	54	37	35		85	104	120	125	116	121	132	146	159	171	177	164	146	111	110	108	110
8	105	88	85	79	66	64	62	85	118	122	111	111	126	145	157	160	188	178	170	146	146	145	111	107
9	110	111	86	72	66	63	54	96	97	95	111	122	132	132	146	146	160	171	162	146	130	112	108	111
10	110	110	110	86	78	74	66	90	110	111	112	125	146	146	160	171	170	160	168	168	144	146	147	176
11		159	146	127	85	86	66	97	102	107	117	130	133	143	146	146	146	146	146	146	136	105	121	111
12	146	144	134	112	87	28																		
13										106	112	129	152	159	163	171	167	175	162	147	146	163	146	161
14	111	127	161	110	59	44	32	80	88	108	105	112	124	142	146	150	156	145	146	130	106	106	107	83
15	110	109	110	86		A	76	90	87	90	94	116	122	146	161	171	171	183	185	150	151	110	123	153
16	108	107	110	106	87	63	63	85	88	105	111	120	146	160	185	185	N	159	161	146	143	129	144	152
17	125	110	110	85	67	63	66	88	88	98	101	118	132	160		154	146	131	131	131	73	87	109	108
18	110	110	146	110	85	86	84	104	110	111	95	117	137	158	166	184	188	171	170	146	146	146	147	141
19	110	100	110	N	108	85	63	78	88	111	111	122	142	145	144	131	144	146	144	105	108	122	108	88
20	109	85	91	86	87	51	62	87	108	111	111	131	125	147	146	145	147	161	160	142	145	109	109	106
21	146	146	130	105	85	66	65	87	88	111	124	136	146	137	137	122	146	146	146	111	87	100	86	86
22	110	111	110	85	85	66	66	86	88	104	109	126	133	144	145	147	146	146	144	131	108	110	130	89
23	132	145	129	86	87	A	79	84	90	122	122	121	146	144	146	148	163	170	162	144	110	79	109	160
24	179	145	162	110	87	86	86	110	110	111	104	131	141	143	144	146	146	146	121	94	107	105	86	101
25	108	109	86	67	72	84	85	98	110	104	110	120	131	134	143	146	146	146	169	146	131	110	104	79
26	110	108	A	108	86	85	85	88	108	111	119	115	125	120	145	146	112	121	122	111	110	76	105	111
27	110	105	110	86	85	67	78	80	87	90	91	118	146	152	146	157	160	146	146	159	146	131	110	109
28	163	160	145	110	100	85	86	86	90	90	107	104	134	136	118	146	146	146	159	A	143	104	104	79
29	143	143	145	N	86	52	66	86	88	90	104	120	109	153	146	146	133	130	146	143	129	110	108	98
30	111	98	128	79	54	35	54	85	87	104	104	94	116	119	124	120	141	145	168	146	108	N	N	83
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	27	28	27	26	28	28	29	29	29	29	28	28	29	28	29	29	28	29	28	28	29
MED	110	110	110	86	85	64	66	86	103	111	111	122	134	146	146	148	153	146	161	146	131	110	110	110
U Q	144	144	139	110	86	85	79	90	108	111	118	131	146	152	160	167	169	171	169	154	146	137	137	143
L Q	110	106	109	85	66	54	63	85	88	104	104	116	125	139	145	146	146	146	146	131	108	105	107	88

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT OKINAWA

APR. 1992

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	33	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	G	G	52	G	G	G	G	40	G	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40	41	34	G	G	G	G
4	G	G	G	G	G	G	G	G	G	45	G	G	52	G	G	G	48	48	51	58	37	G	G	G
5	G	31	27	G	G	G	G	34	41	50	54	52	G	55	57	G	49	53	58	57	38	41	G	G
6	G	G	G	G	G	G	G	G	G	G	52	60	60	61	56	52	47	58	44	36	29	G	G	G
7	G	G	G	26	25	G	G	G	G	G	51	53	55	55	54	60	54	40	36	40	34	24	G	27
8	G	G	24	34	31	24	G	G	43	G	51	55	57	G	G	G	G	G	G	G	26	40	34	G
9	38	32	38	26	37	29	33	33	G	G	50	G	G	G	G	G	G	40	37	34	G	G	G	G
10	G	G	G	G	G	G	34	34	44	58	50	G	G	76	G	51	56	43	50	37	33	58	32	59
11		G	G	G	G	24	28	32	42	47	48	52	G	56	54	G	G	G	44	43	45	59	58	40
12	44	24	25	30	28	26																		
13										65	51	52	55	55	G	G	52	61	72	71	36	40	38	36
14	32	33	36	31	G	G	25	32	46	56	72	64	G	G	G	G	53	61	59	70	51	28	32	39
15	G	G	G	G	G	26	28	G	G	48	52	63	60	G	58	G	G	42	47	31	33	24	41	38
16	28	36	33	30	G	G	G	G	G	G	53	G	G	53	G	G	G	G	37	26	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	54	57		G	57	51	58	92	79	G	G	G
18	25	G	G	G	G	G	G	36	G	G	G	G	56	G	G	G	G	G	G	G	28	G	G	G
19	G	G	G	30	27	33	G	G	G	G	G	G	G	G	G	64	69	91	86	72	40	G	32	38
20	33	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	37	G	G	24	32	34
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	G	G	G	G
22	G	92	38	G	30	27	G	G	61	56	54	G	67	91	64	53	G	G	37	30	G	G	G	39
23	G	G	G	G	G	36	53	45	54	64	50	52	56	59	G	G	G	G	45	45	32	58	G	41
24	37	26	28	G	G	G	G	43	60	54	89	G	G	94	90	86	61	80	47	43	40	G	G	G
25	40	28	G	G	G	G	G	G	44	51	G	G	G	G	65	87	76	98	108	88	68	48	34	27
26	40	58	36	77	32	33	45	55	54	66	60	71	77	100	57	G	G	65	G	G	G	G	G	27
27	G	G	G	G	G	G	G	G	G	G	G	G	58	60	56	56	52	G	G	G	G	33	24	32
28	G	G	G	G	G	G	G	G	44	50	G	53	G	G	G	G	G	49	58	126	G	G	G	31
29	G	G	G	25	27	G	32	44	G	52	G	G	G	G	G	G	G	G	40	56	G	G	28	G
30	G	G	G	G	G	G	G	38	55	80	78	64	56	G	G	G	56	86	86	44	30	25	G	G
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	29	29	29	29	29	27	28	28	29	29	29	29	29	28	29	29	29	29	29	29	29	29	29
MED	G	G	G	G	G	G	G	G	G	45	50	G	G	G	G	G	G	40	44	37	29	G	G	G
U Q	32	27	26	26	26	25	28	34	44	55	52	53	56	58	56	51	53	59	58	57	37	36	32	37
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	13	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT OKINAWA

APR. 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		16	16	17	18	18		28	44	40	62	48	48	46	50	44	27	21	16	17	15	17	15	16
2	17	16	15	15	15	16	15	18	21	39	44	45	48	47	46	43	32	22	16	18	17	16	17	16
3	15	16	15	15	15	15	15	17	17	23	44	46	46	46	48	44	29	21	17	15	16	17	17	16
4	18	16	16	16	17		17	22	29	34	31	49	48	48	45	30	43	29	20	16	17	17	16	18
5	16	16	16	15	18	16	27	16	29	26	40	46	48	43	42	45	36	23	17	17	16	16	18	
6	20	18	16	16	16	16	15	27	33	24	38	36	47	43	33	30	22	22	21	16	15	18	18	17
7	16	17	18	16	17	16	16	27	21	24	42	46	43	44	42	35	30	24	18	16	17	18	17	16
8	16	16	17	15	15	16	16	27	22	28	45	43	45	49	48	46	36	33	27	17	15	16	16	20
9	15	15	16	17	16	16	15	16	18	23	44	46	53	48	46	46	47	35	21	17	16	16		21
10	20	18	17	17	20	16	15	20	18	23	36	48	52	33	49	44	34	21	17	17	16	15	16	15
11		16	17	16	15	16	15	16	20	24	30	37	48	48	44	45	21	23	17	15	17	15	15	15
12	15	15	15	15	15	15																		
13										23	23	33	46	45	45	48	38	23	18	15	16	15	15	16
14	15	16	15	15	16	15	15	16	20	38	39	45	49	52	49	48	40	32	21	18	17	20	22	16
15	18	17	18	17	29	18	18	28	20	28	46	45	45	49	46	46	45	29	20	18	17		17	18
16		18	18	15	18	16	17	30	18	30	32	49	52	42	32	48	46	32	29	21	22	17	18	18
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U Q	19	18	18	18	20	18	21	28	30	43	48	49	52	52	49	48	45	35	22	19	18	19	18	19
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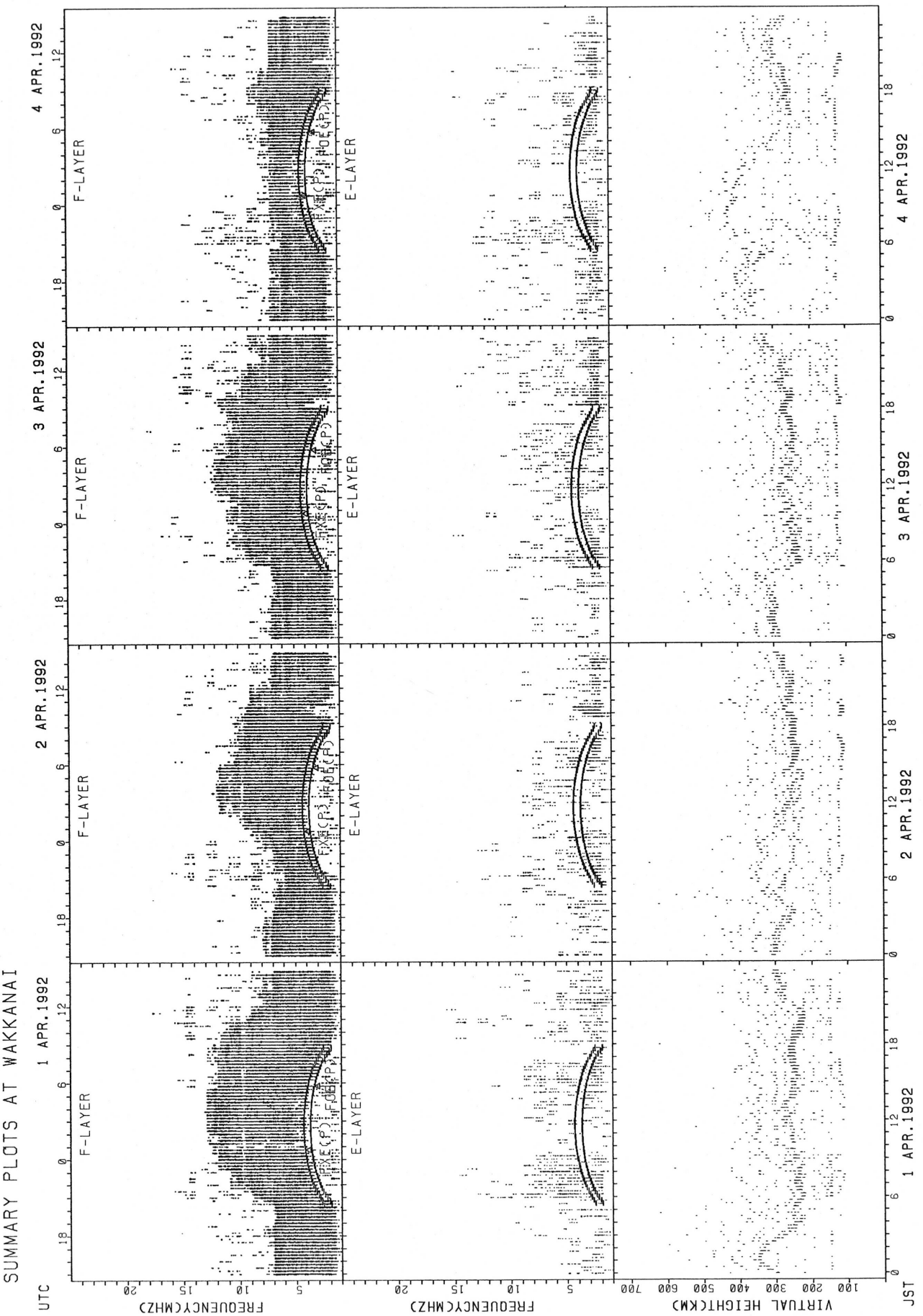
SUMMARY PLOTS AT WAKKANAI
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2 APR.1992
3 APR.1992
4 APR.1992
F-LAYER
E-LAYER
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
UTC
JST
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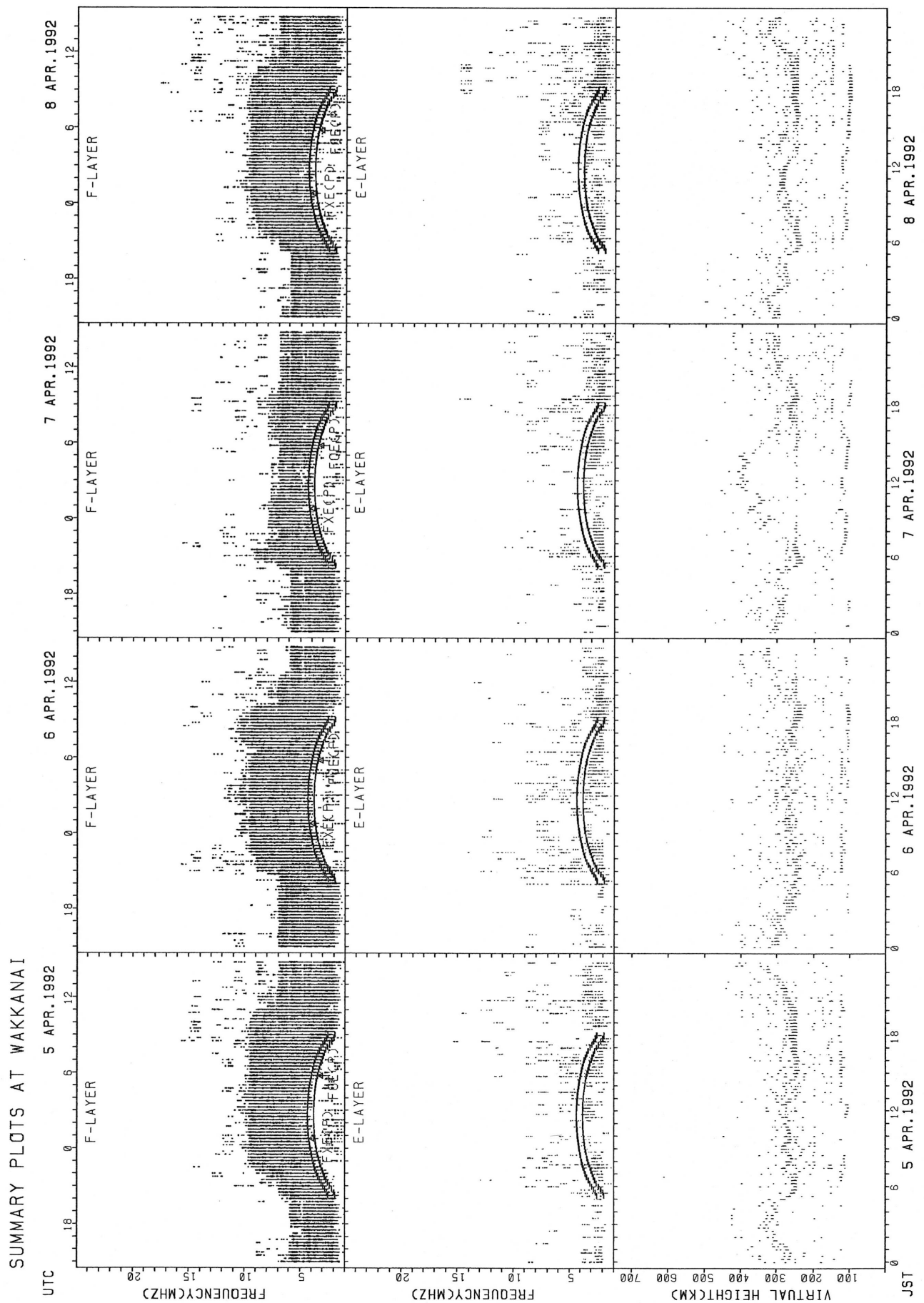
FOE(P); PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT WAKKANAI
UTC
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5 APR.1992
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F-LAYER
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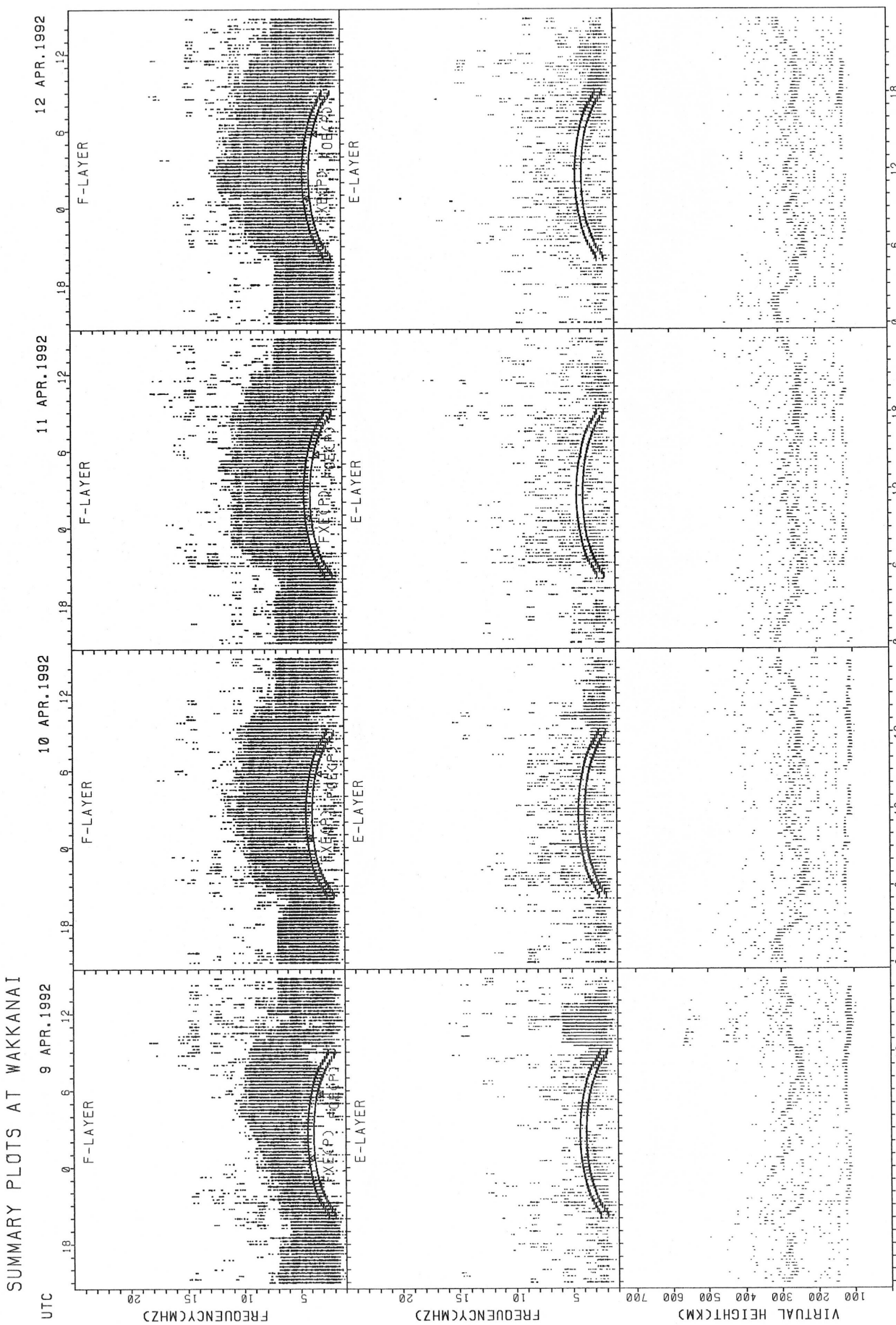
VIRTUAL HEIGHT(KM)
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE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F-LAYER
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VIRTUAL HEIGHT(KM)
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FOE(P); PREDICTED VALUE FOR FOE
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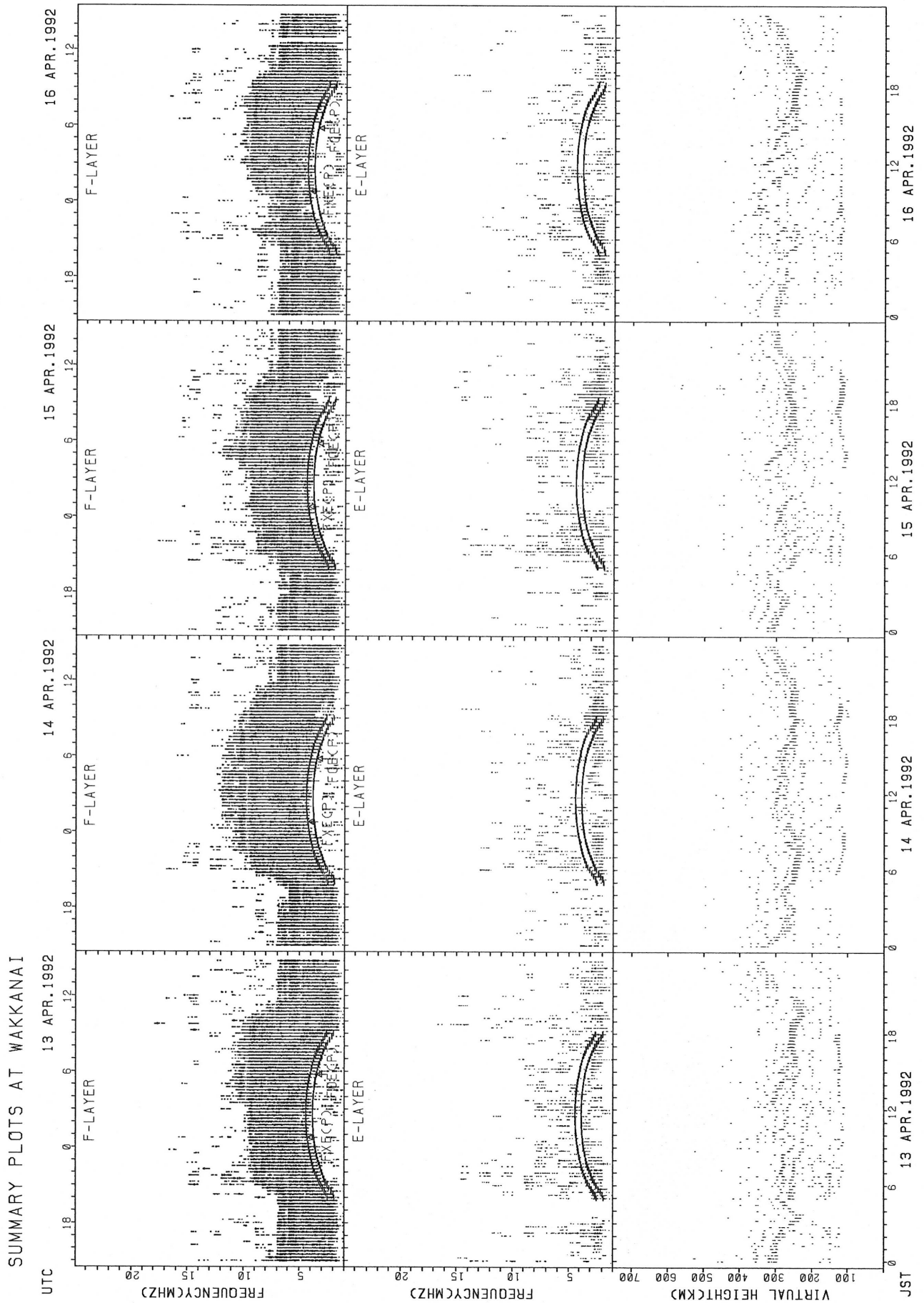
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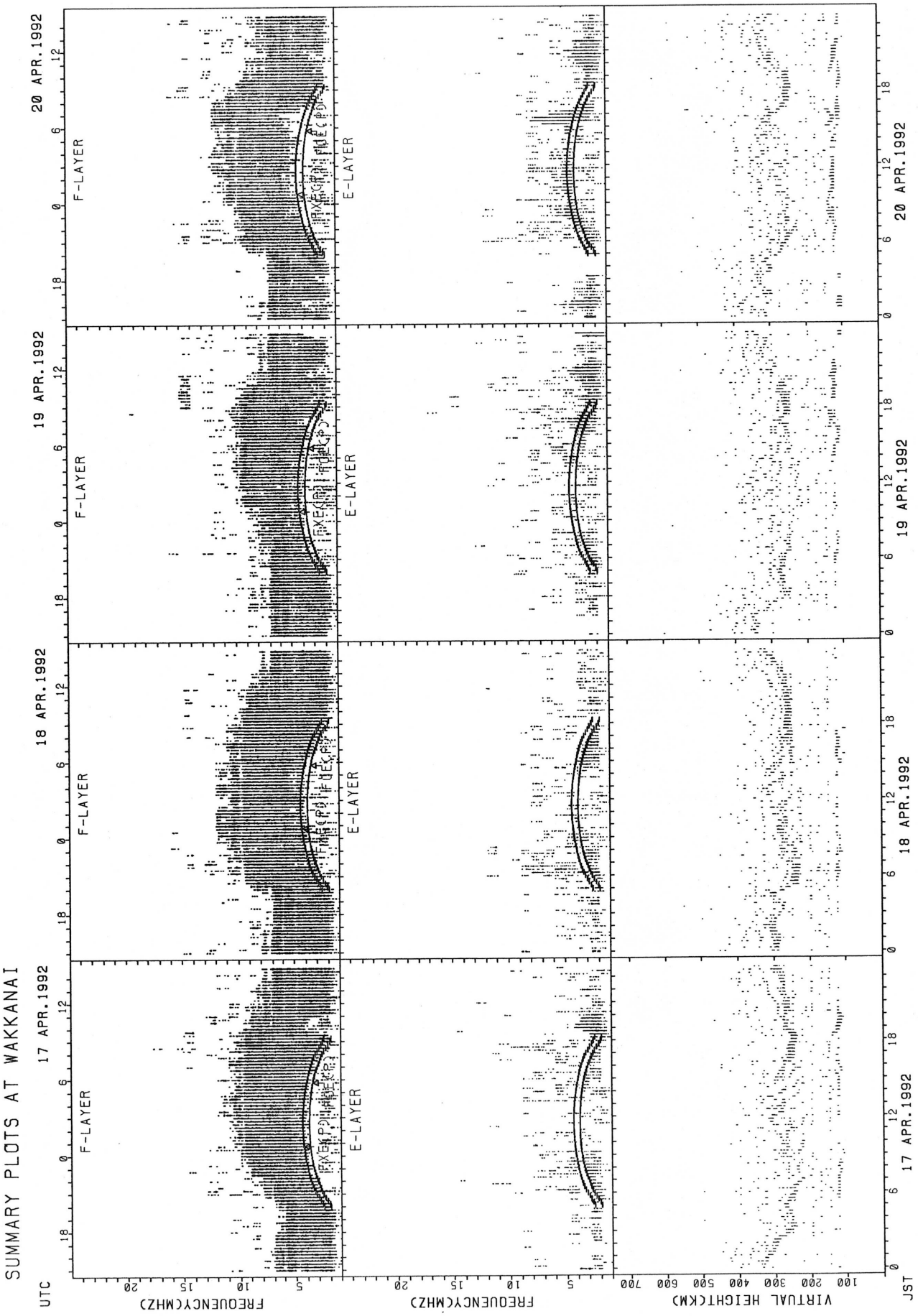
SUMMARY PLOTS AT WAKKANAI
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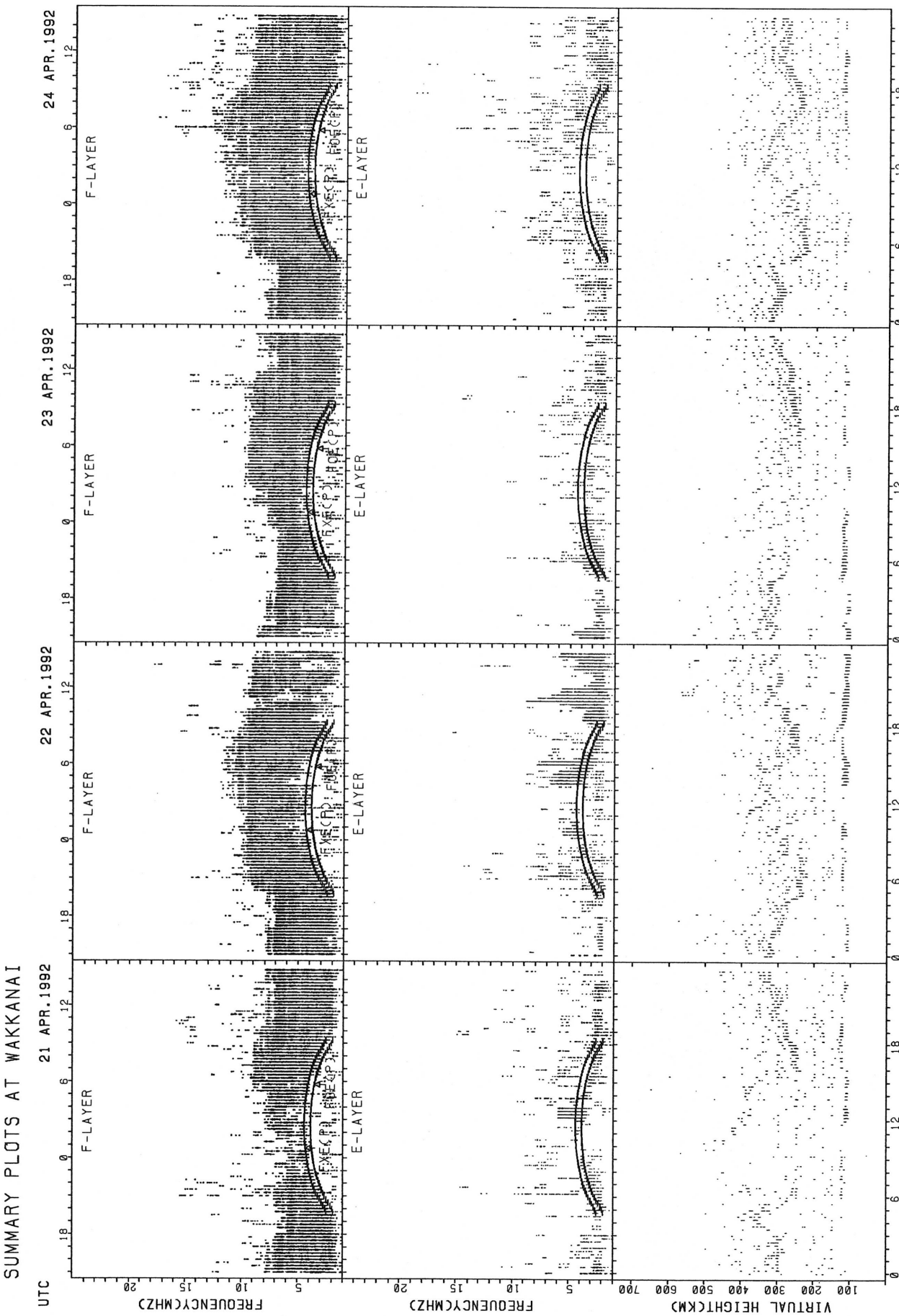
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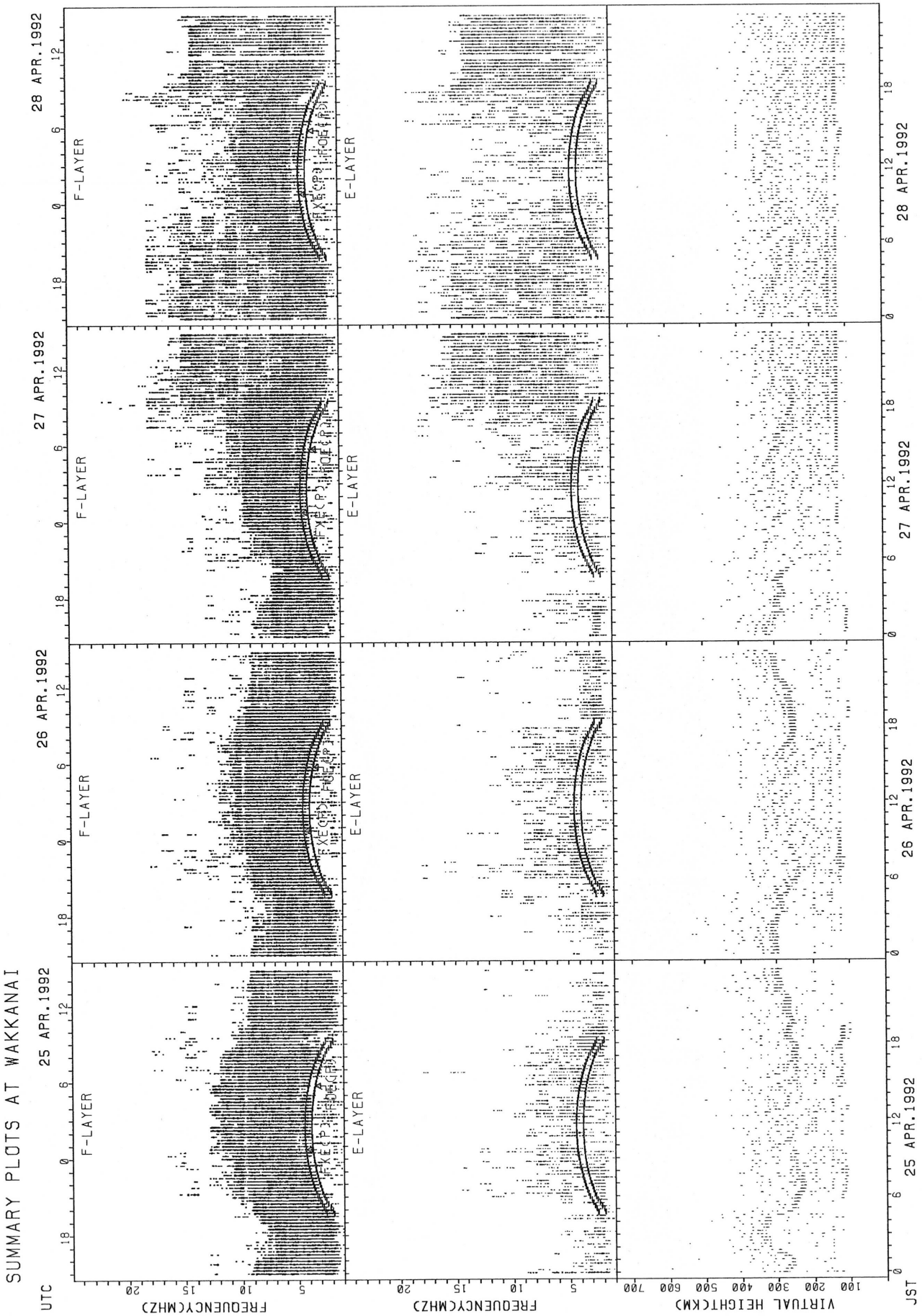
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E-LAYER
FREQUENCY(MHZ)
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FXE(P); PREDICTED VALUE FOR FXE
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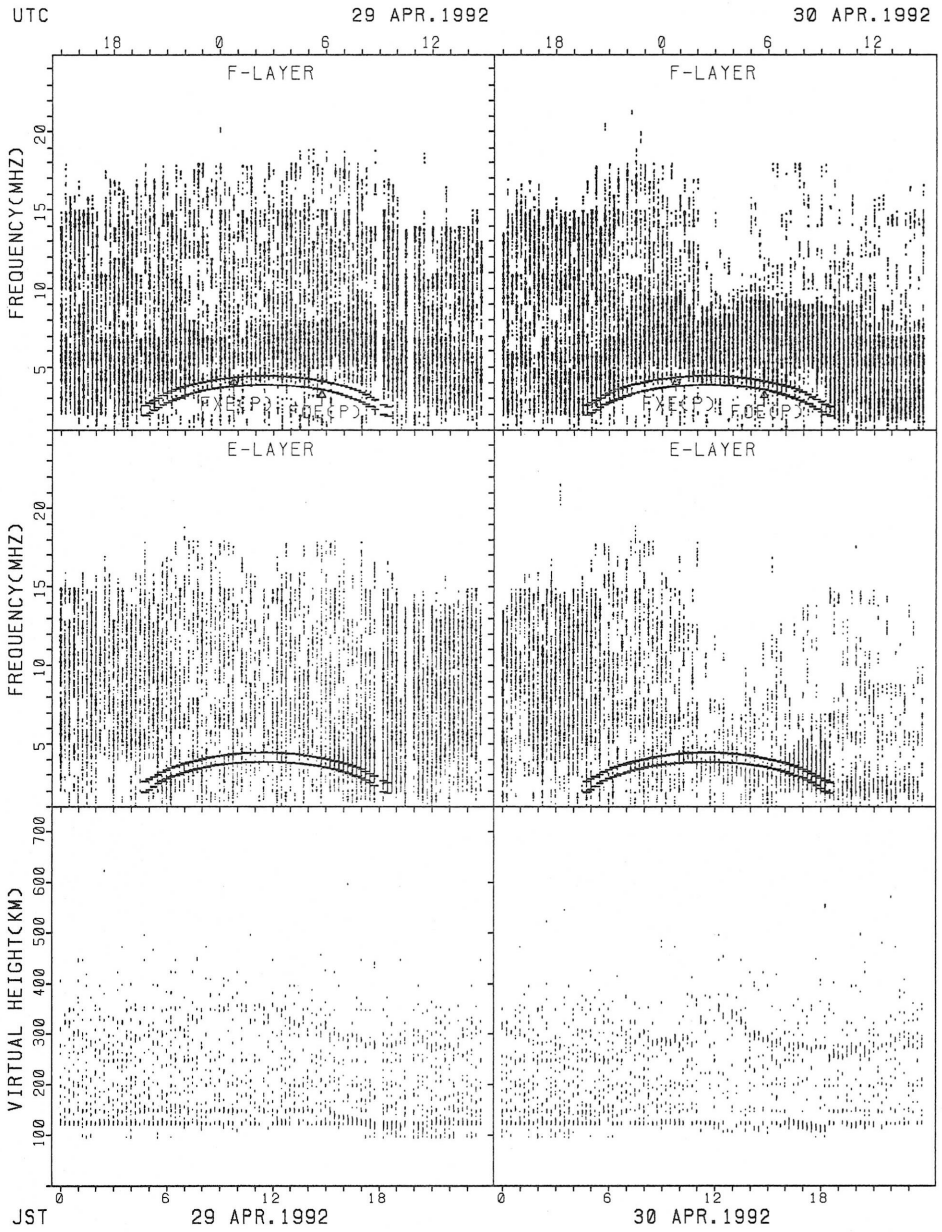
SUMMARY PLOTS AT WAKKANAI



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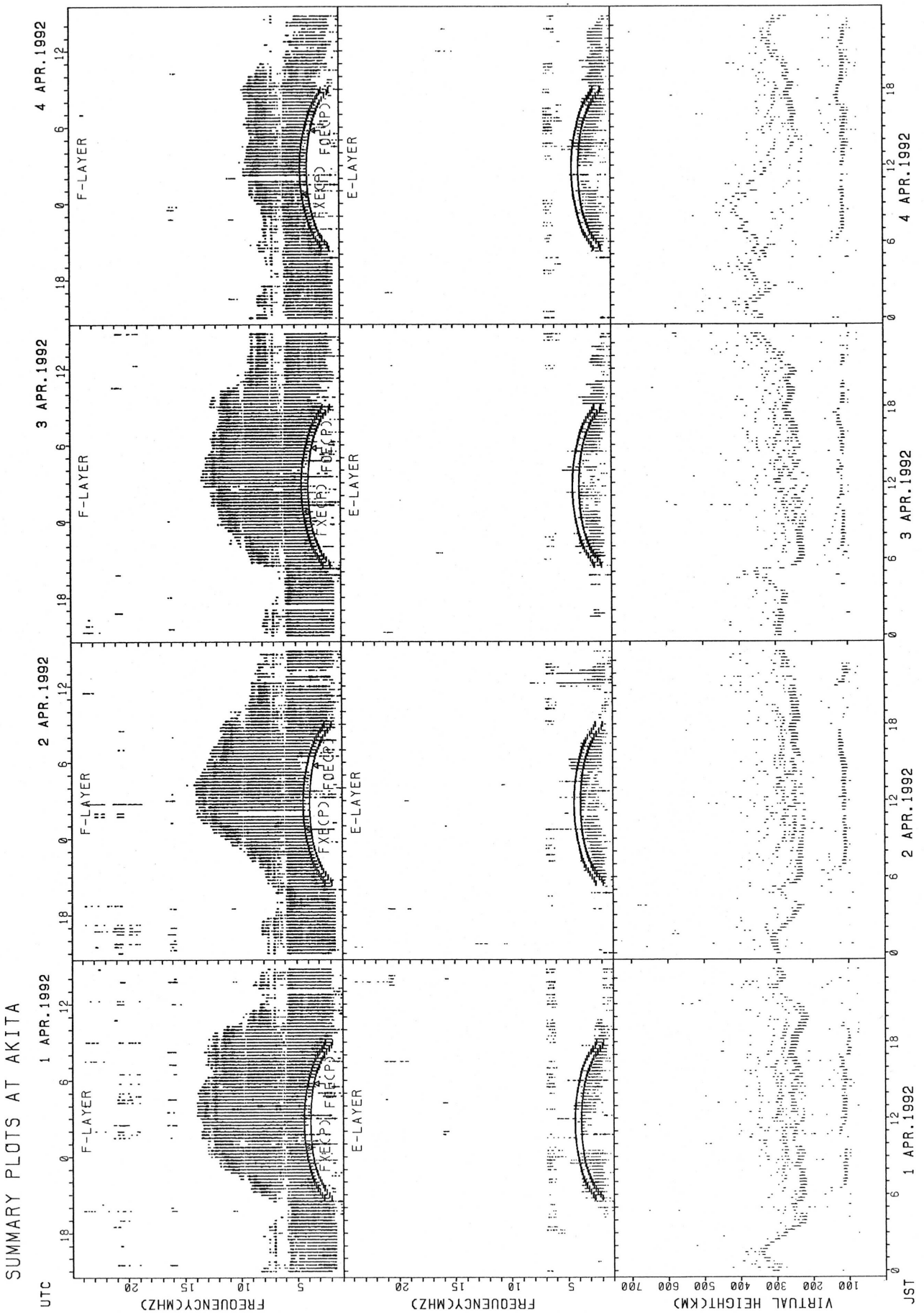
SUMMARY PLOTS AT AKITA
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JST
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4 APR.1992
F-LAYER
E-LAYER
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FOE(P)
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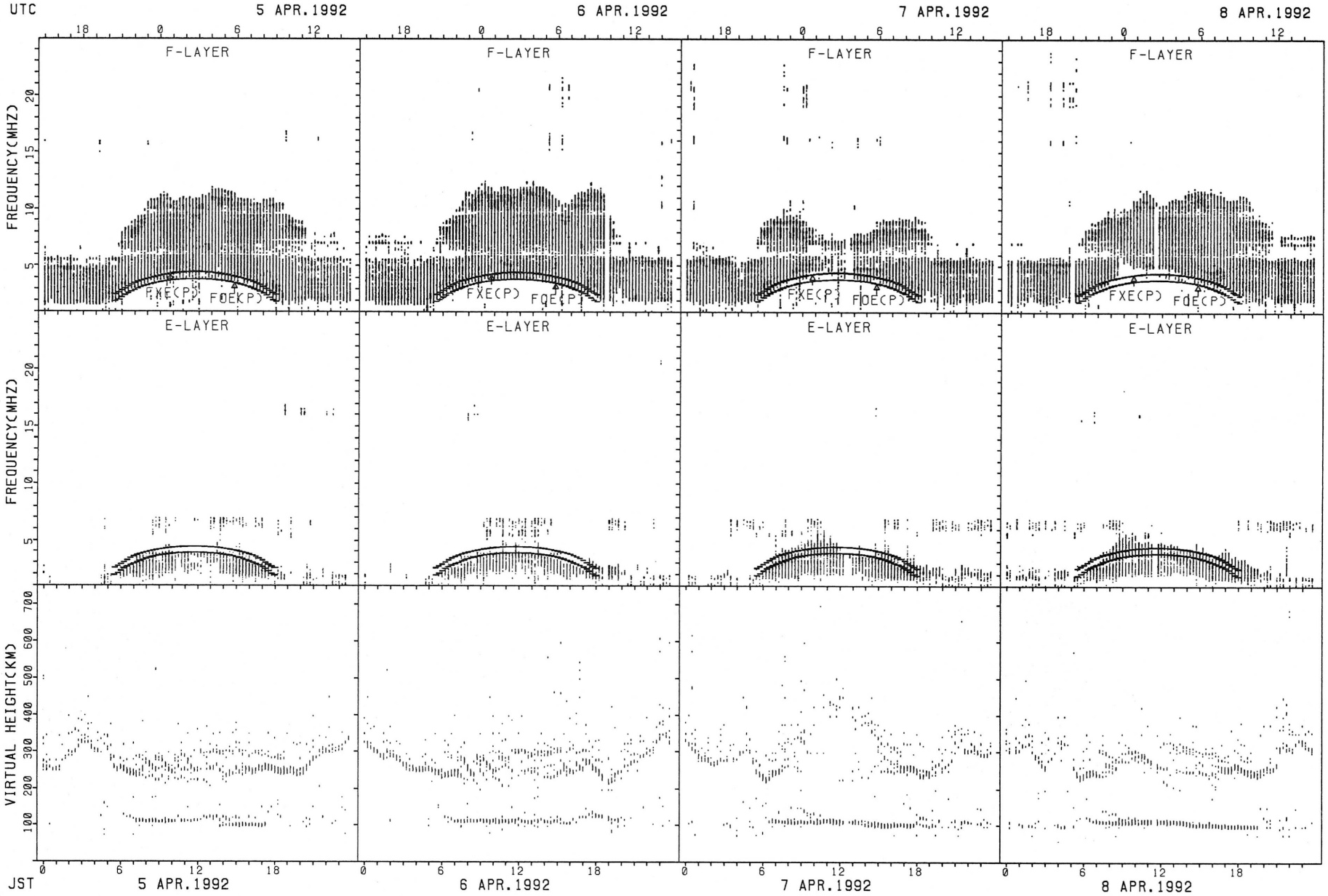
SUMMARY PLOTS AT AKITA



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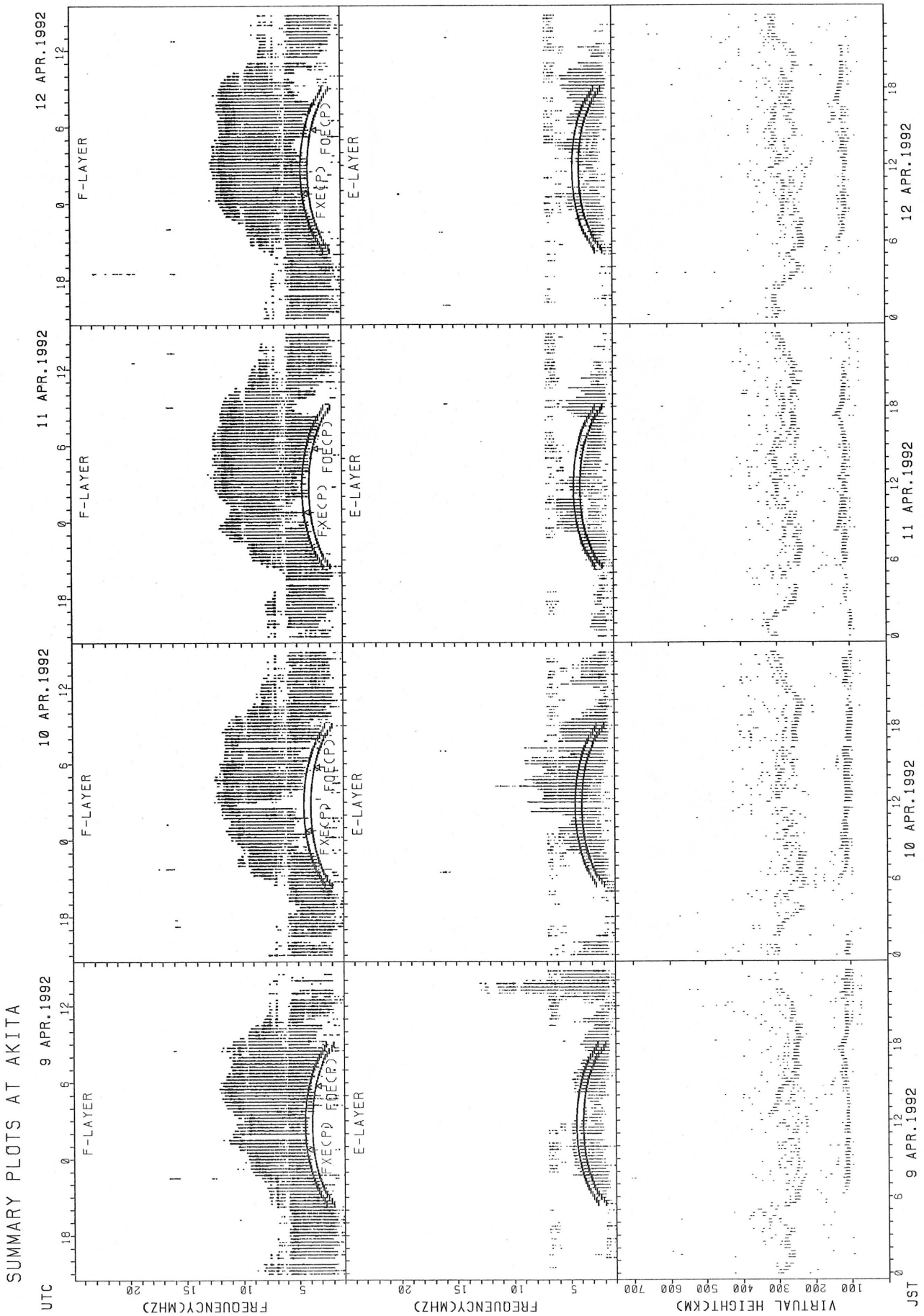
SUMMARY PLOTS AT AKITA
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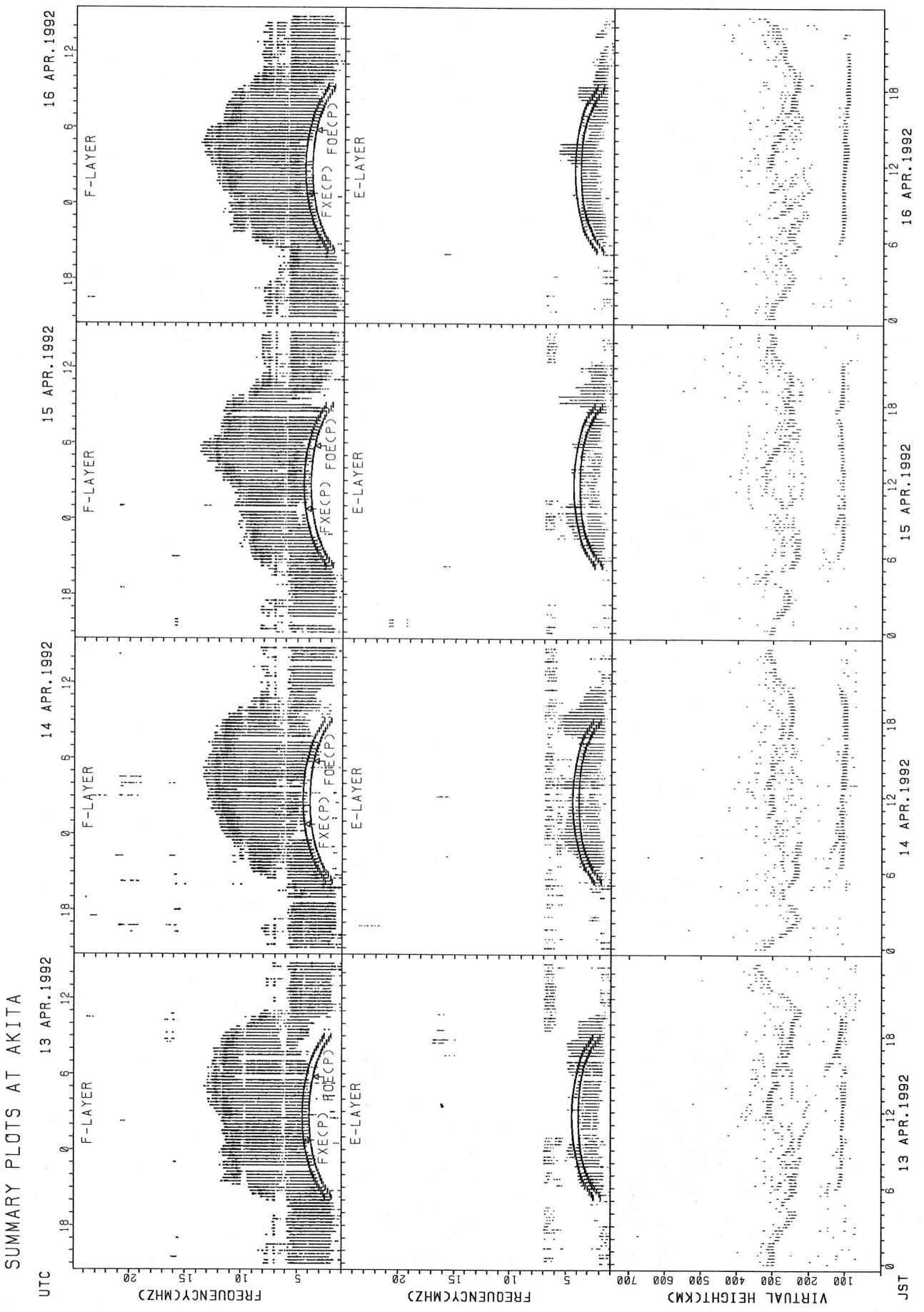
SUMMARY PLOTS AT AKITA
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E-LAYER
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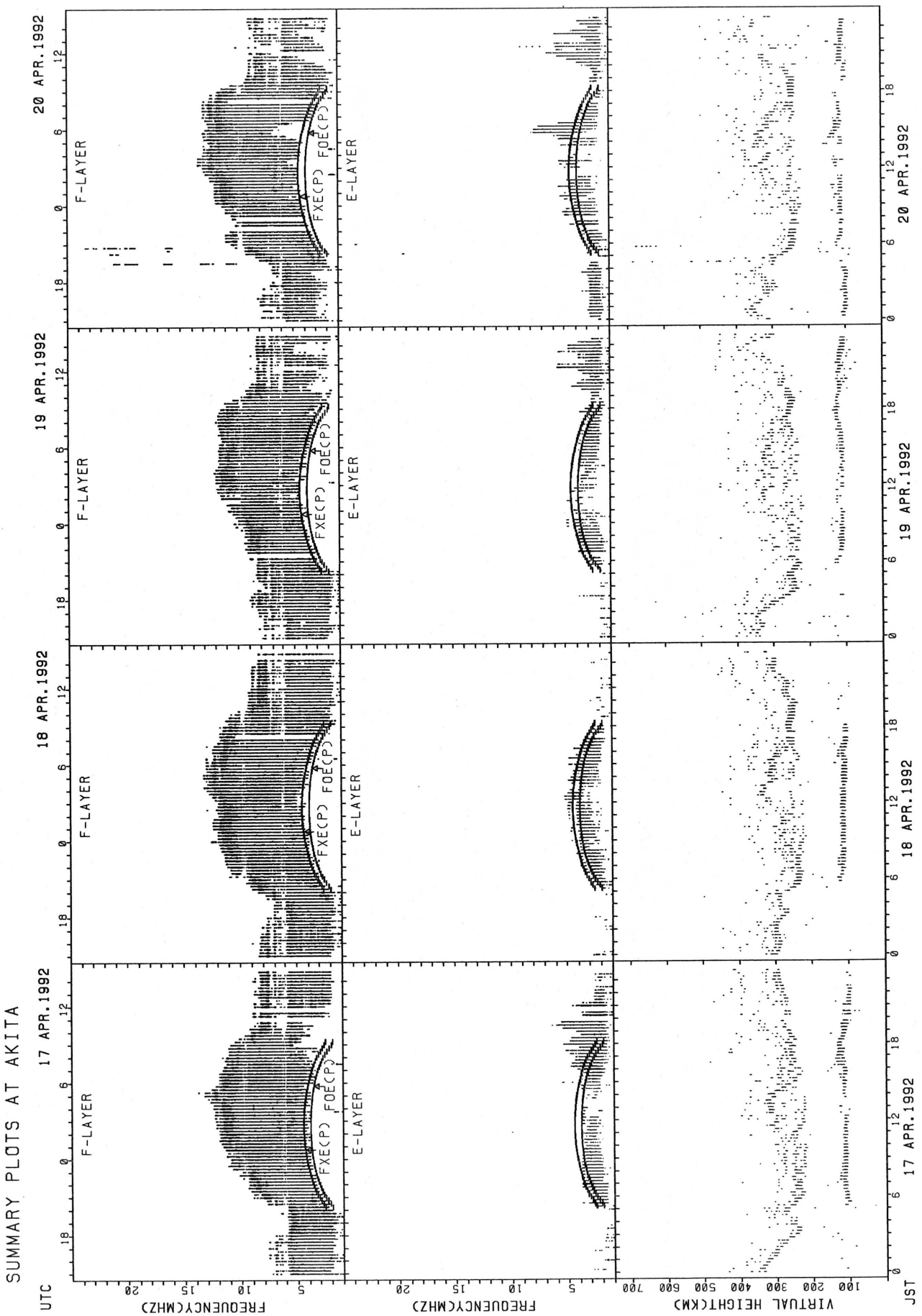
SUMMARY PLOTS AT AKITA
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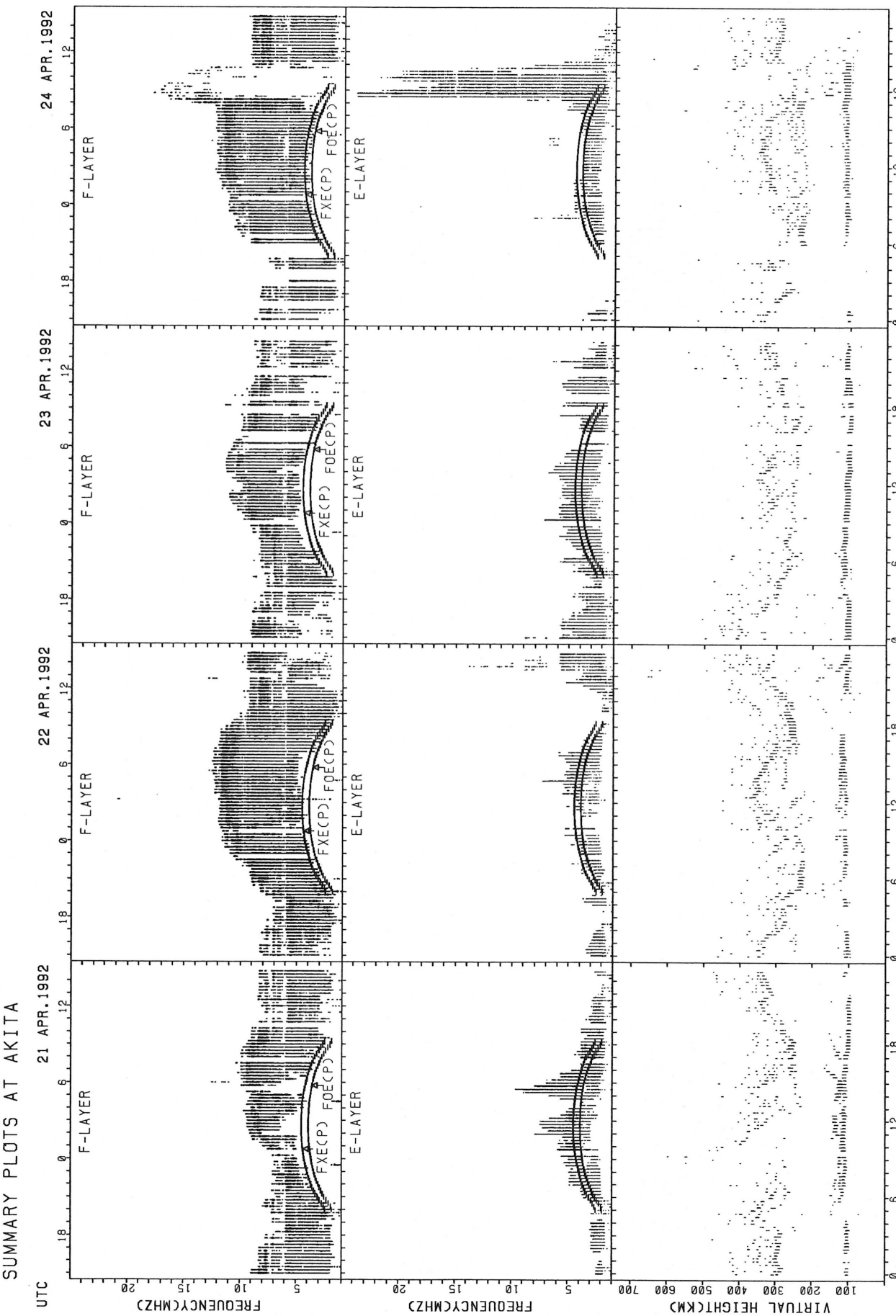
SUMMARY PLOTS AT AKITA
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FOE(P)
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VIRTUAL HEIGHT(KM)
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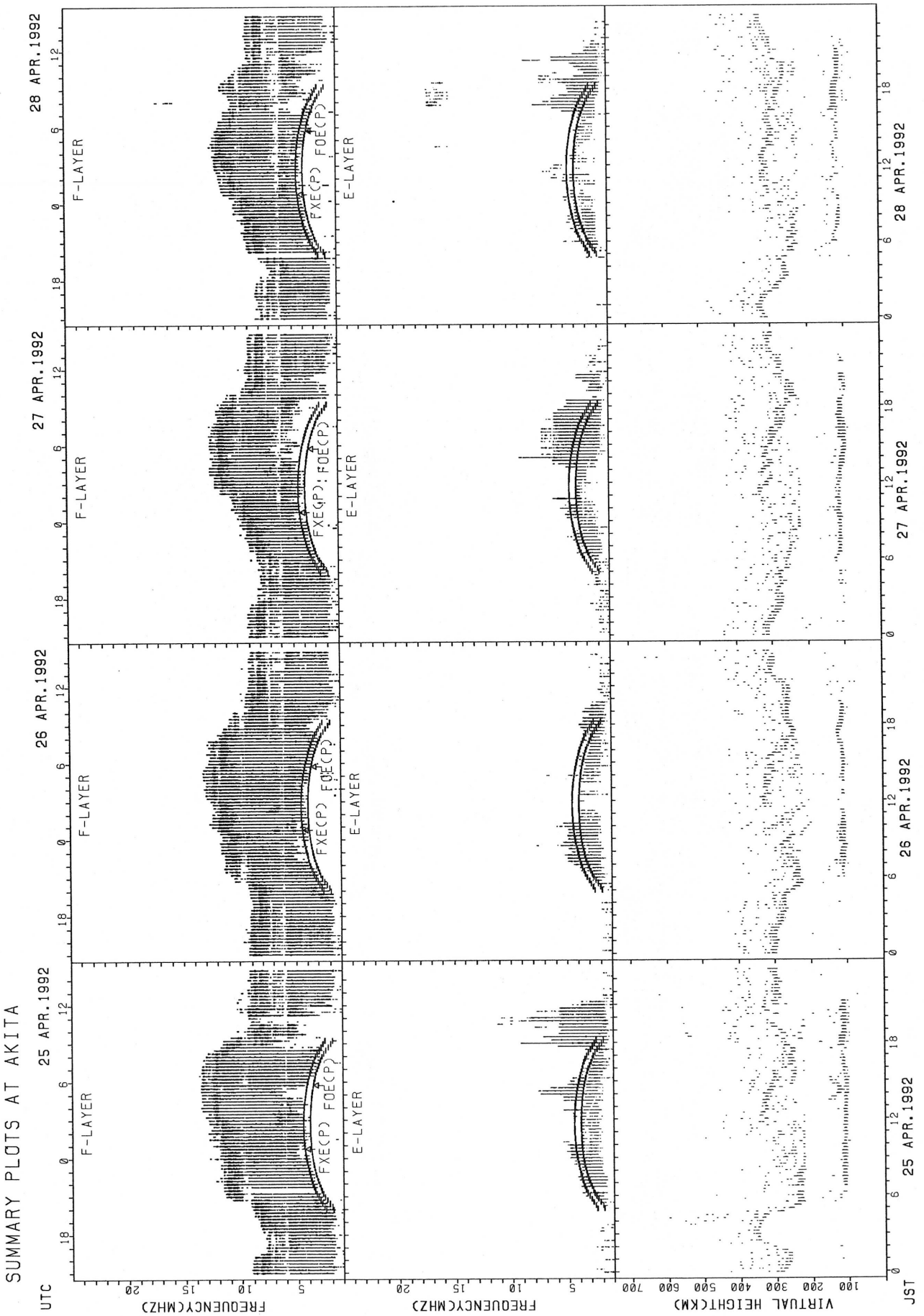
SUMMARY PLOTS AT AKITA
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F-LAYER
E-LAYER
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FREQUENCY(MHZ)
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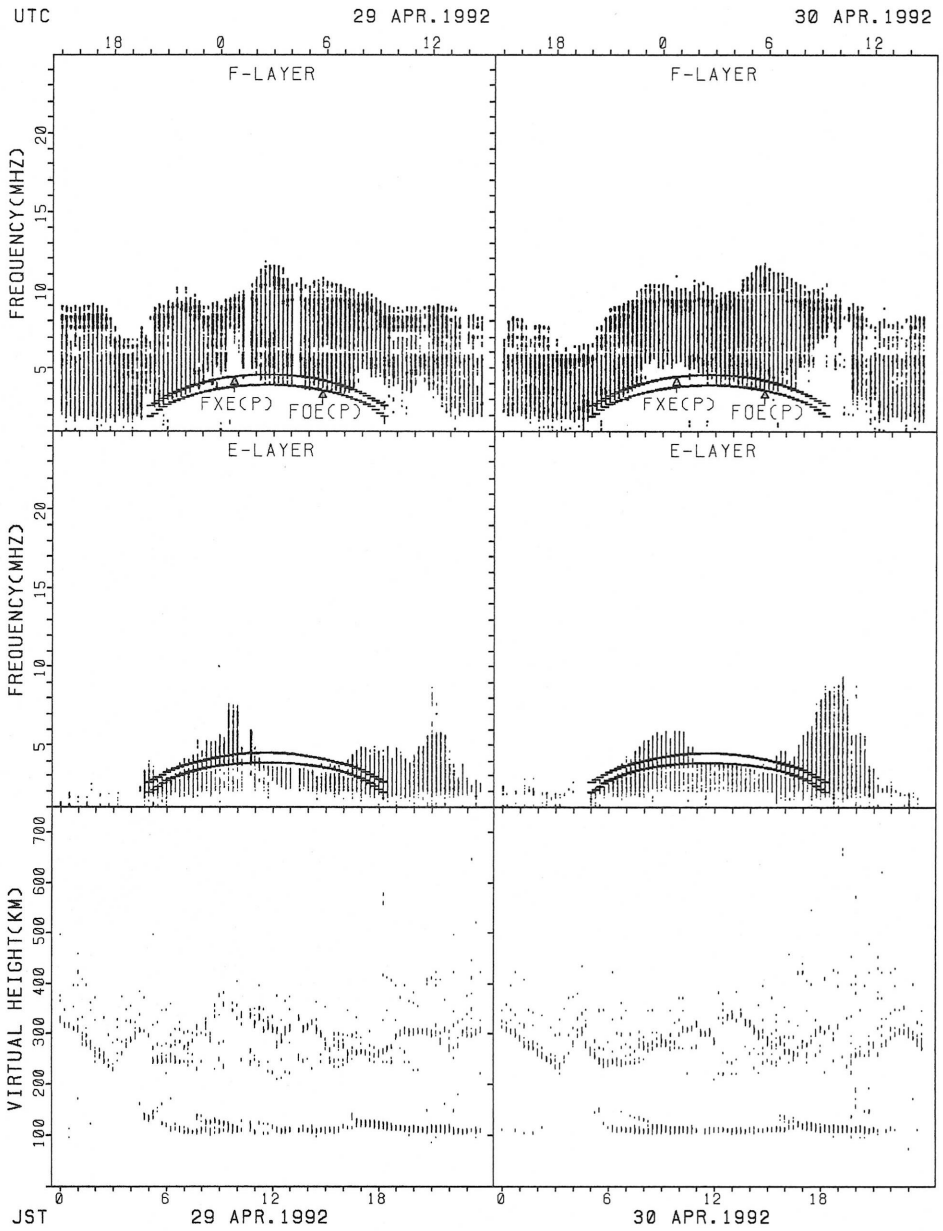
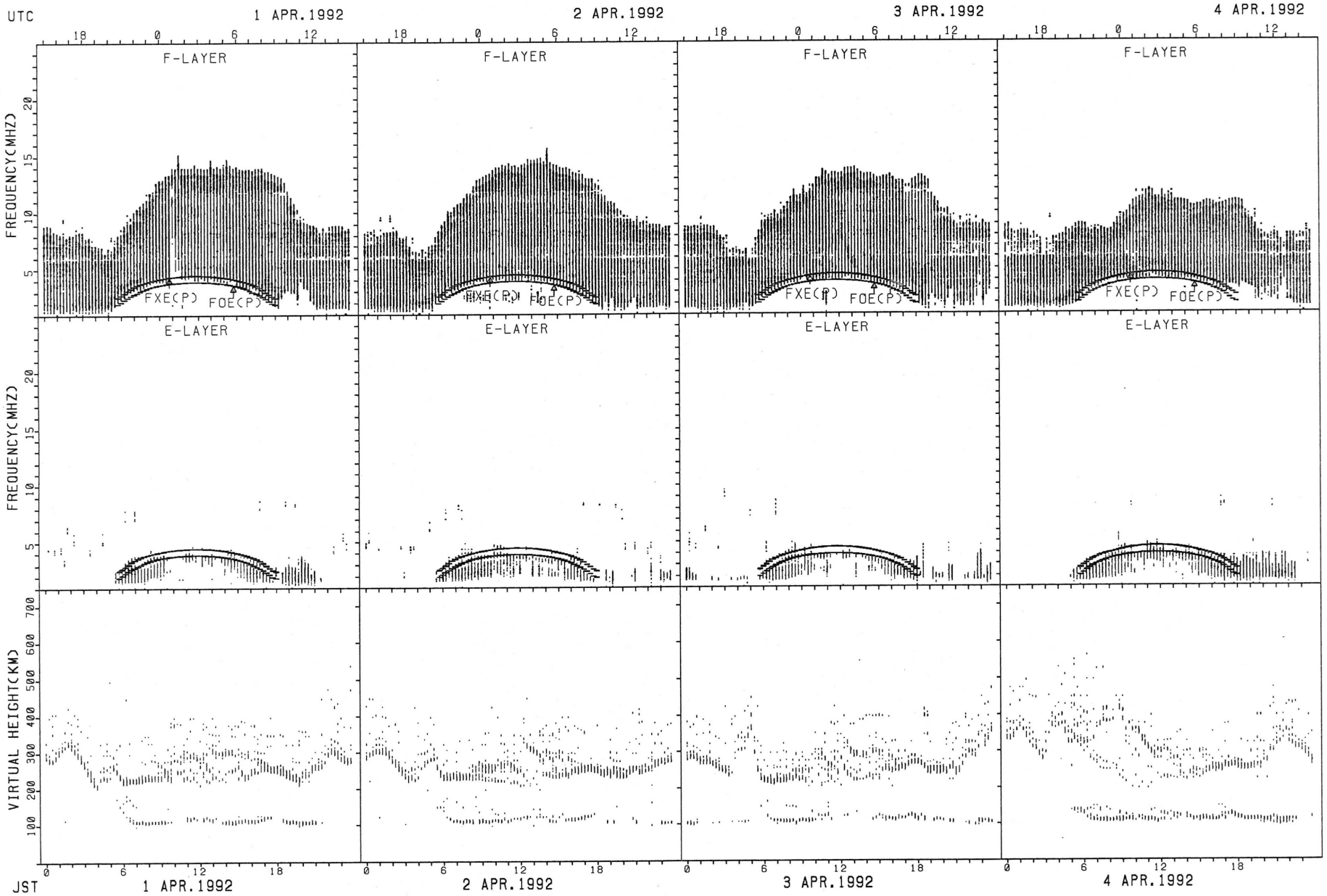
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT AKITA



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

SUMMARY PLOTS AT KOKUBUNJI TOKYO



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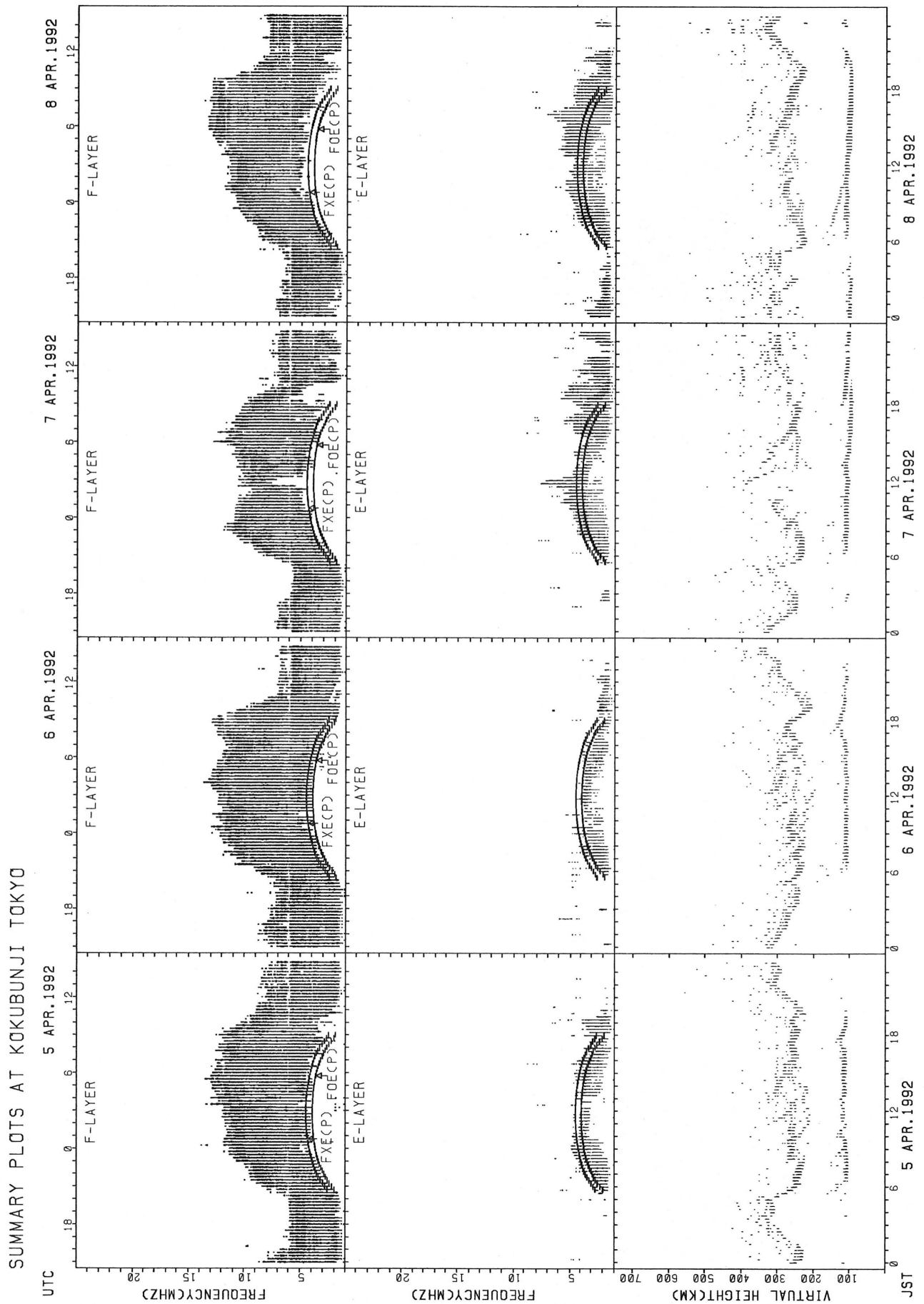
SUMMARY PLOTS AT KOKUBUNJI TOKYO
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7 APR.1992
8 APR.1992
F-LAYER
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FXE(P) FOE(P)
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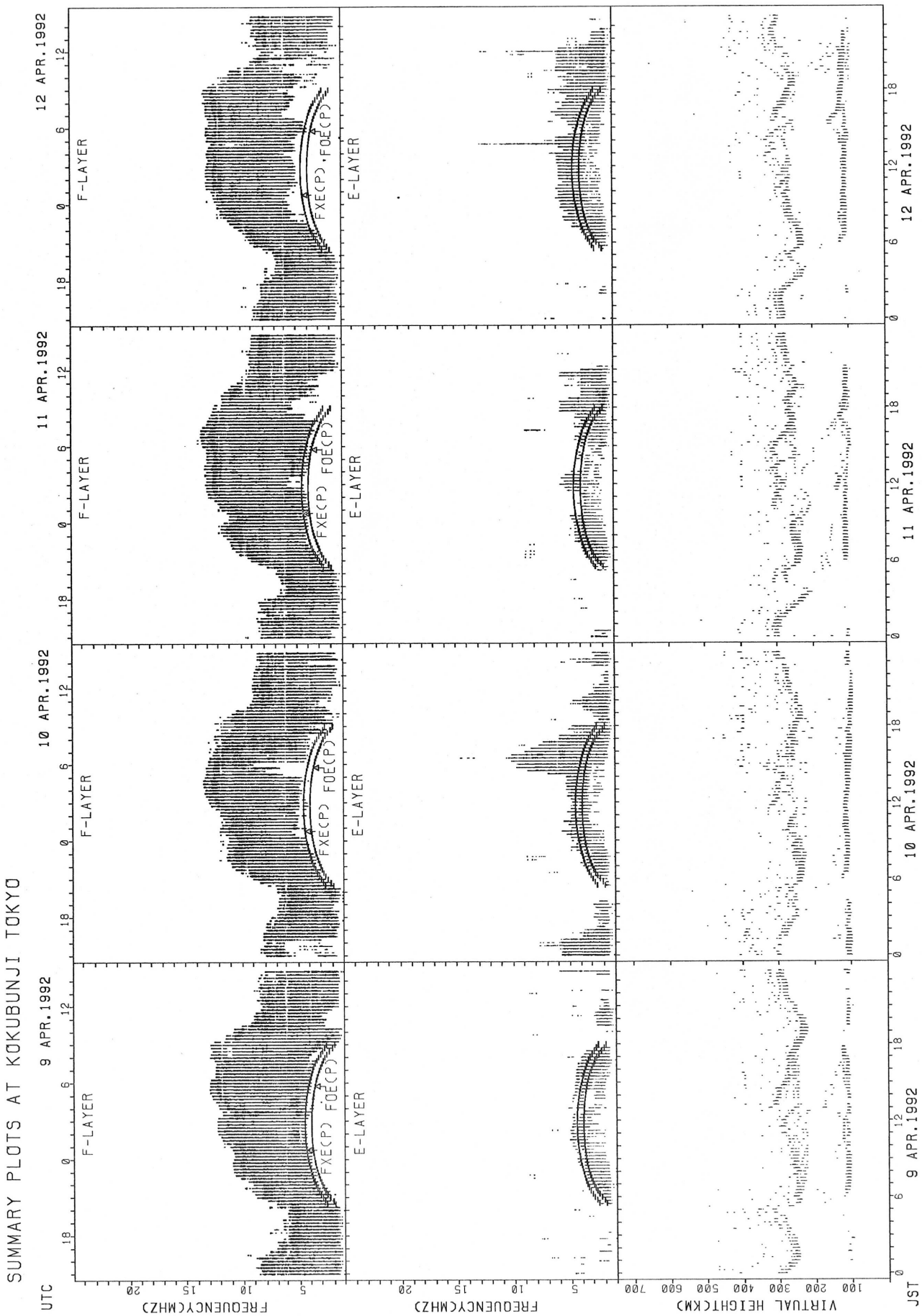
SUMMARY PLOTS AT KOKUBUNJI TOKYO
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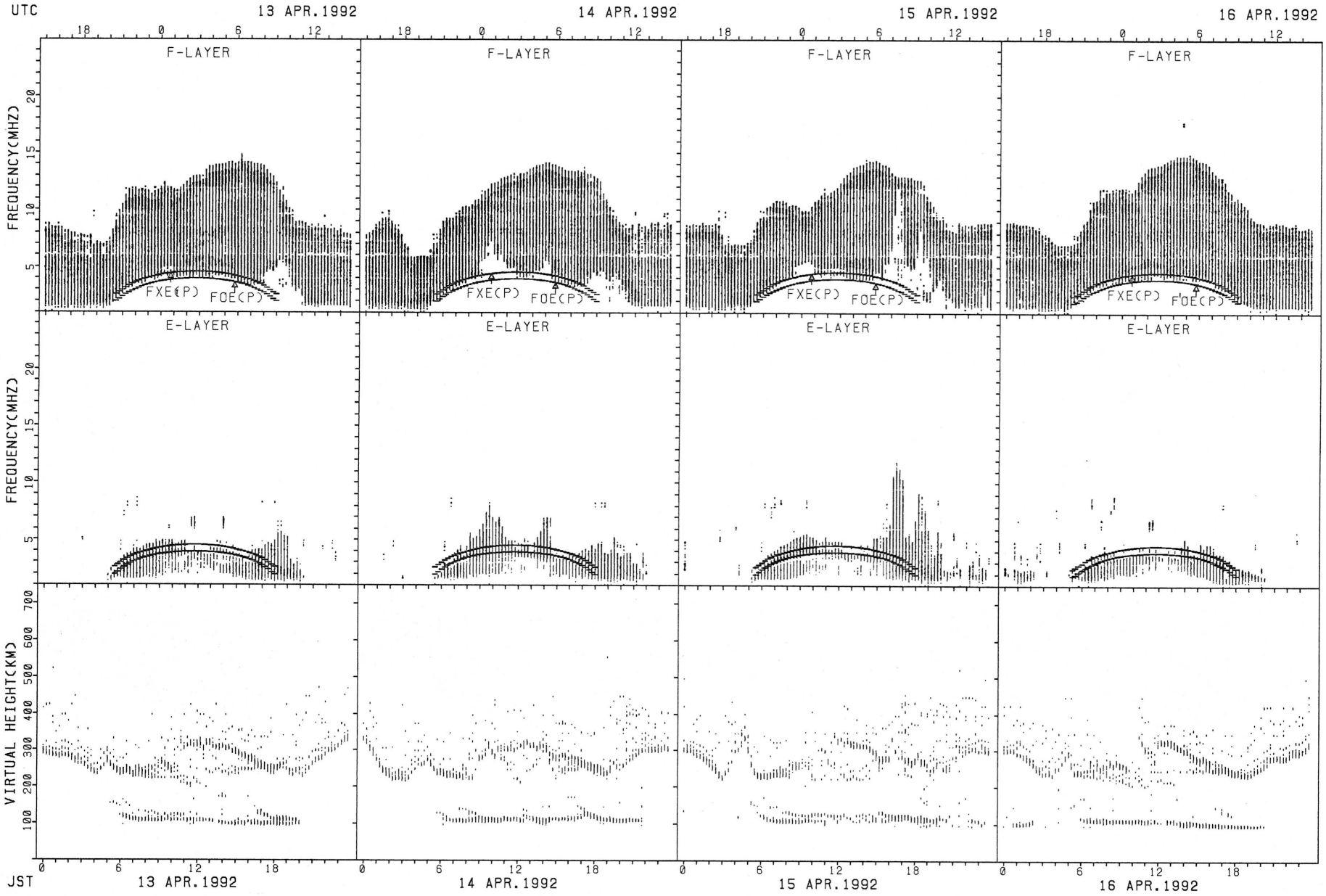
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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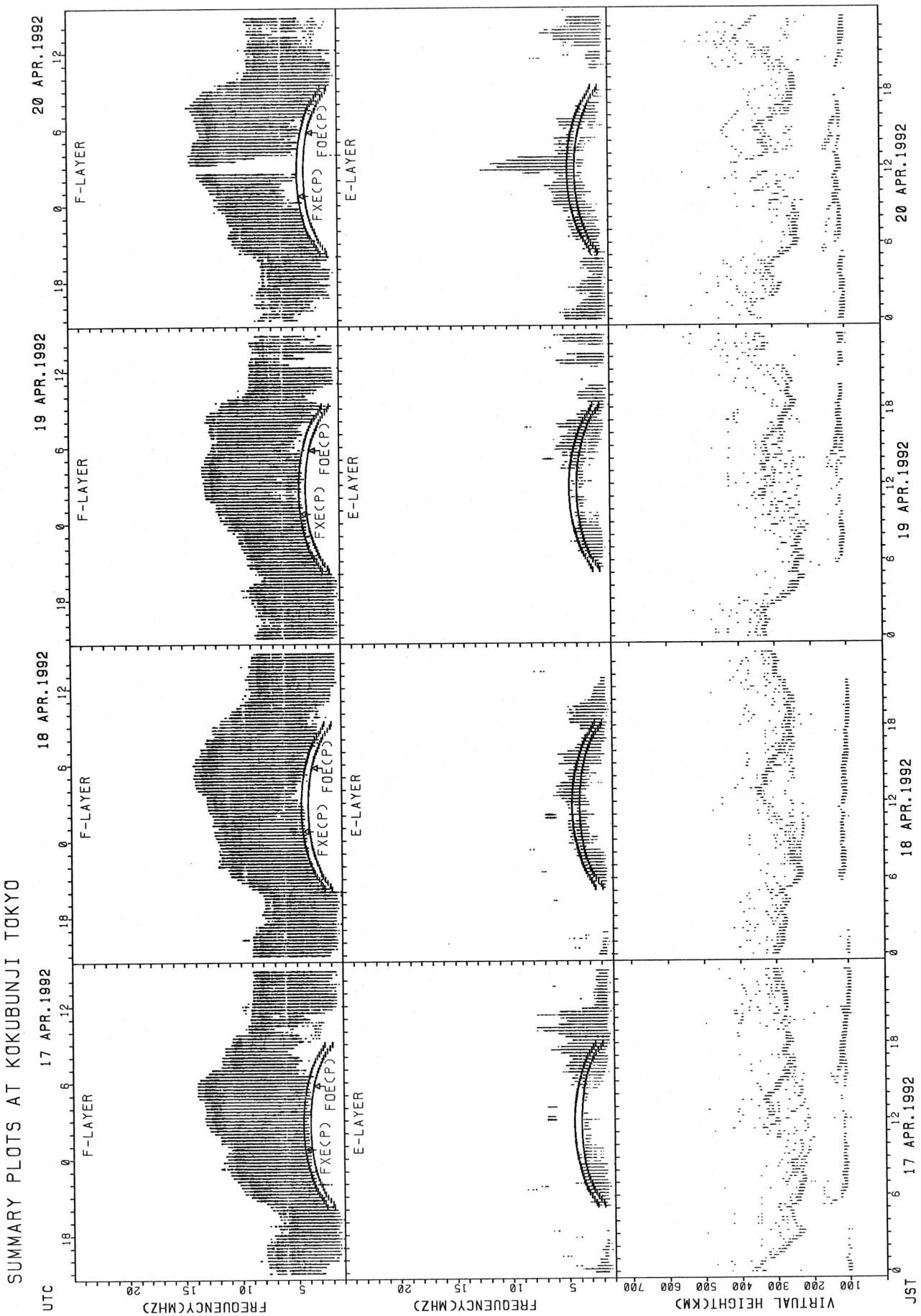
SUMMARY PLOTS AT KOKUBUNJI TOKYO
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F-LAYER
E-LAYER
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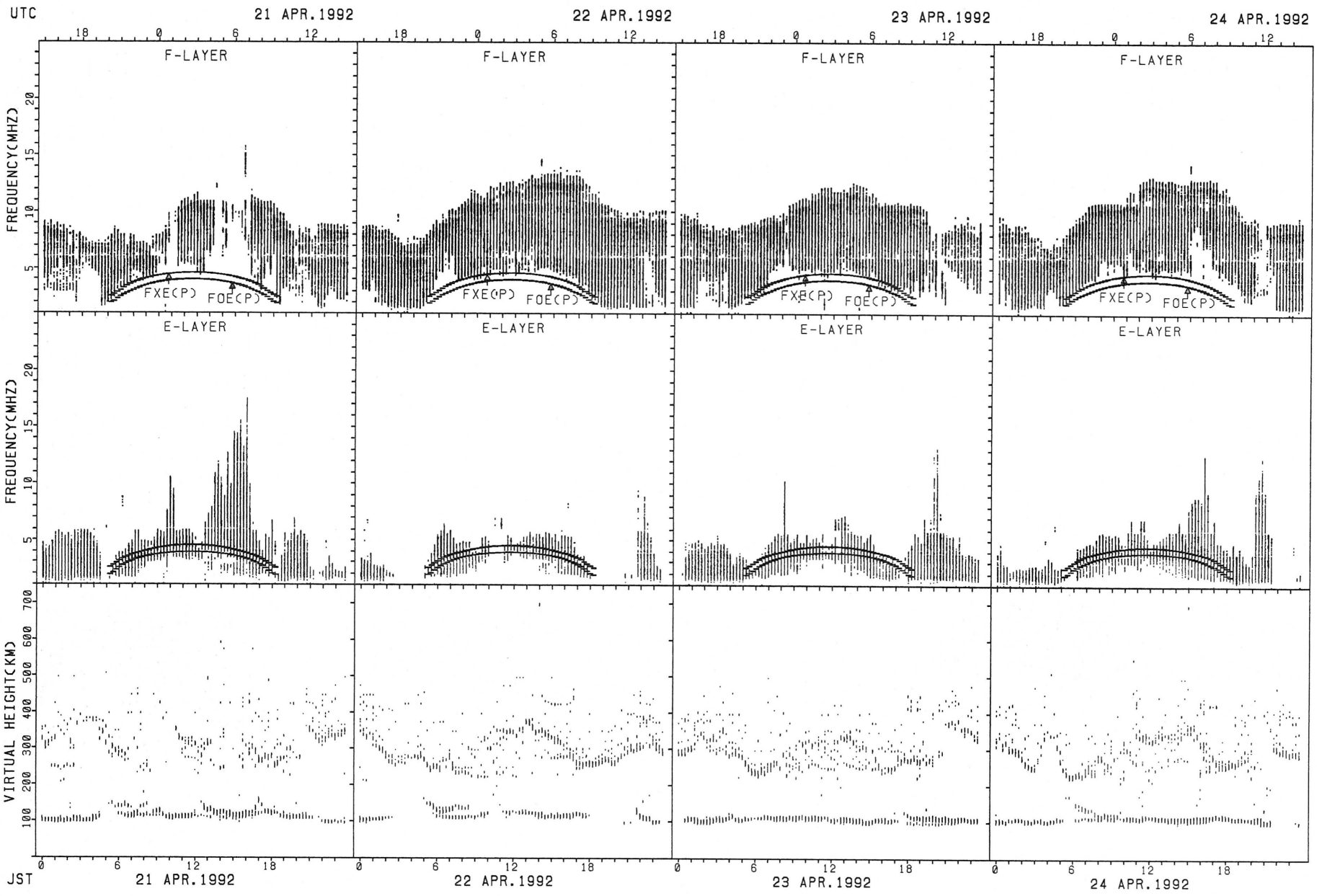

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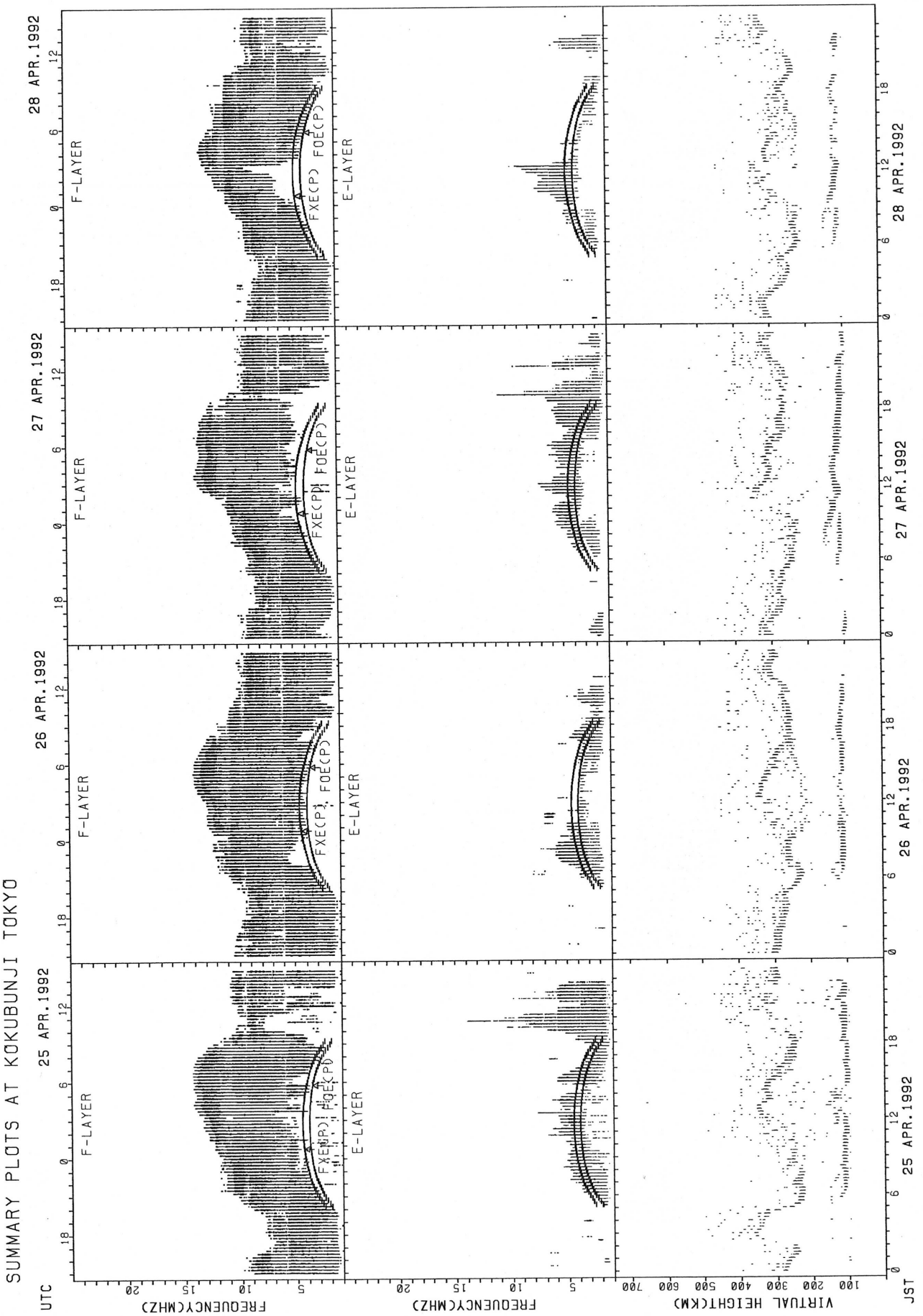
SUMMARY PLOTS AT KOKUBUNJI TOKYO
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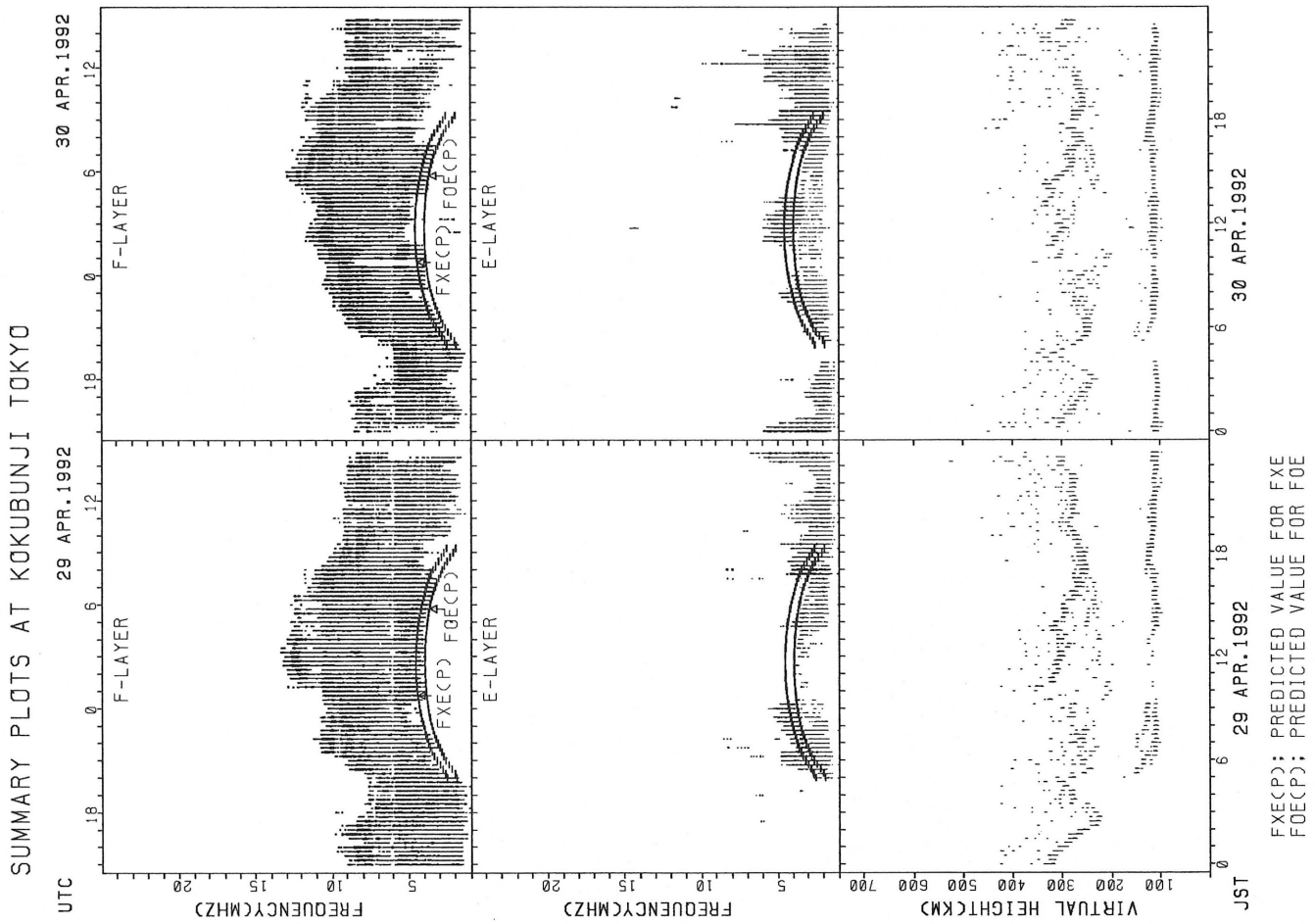
SUMMARY PLOTS AT KOKUBUNJI TOKYO
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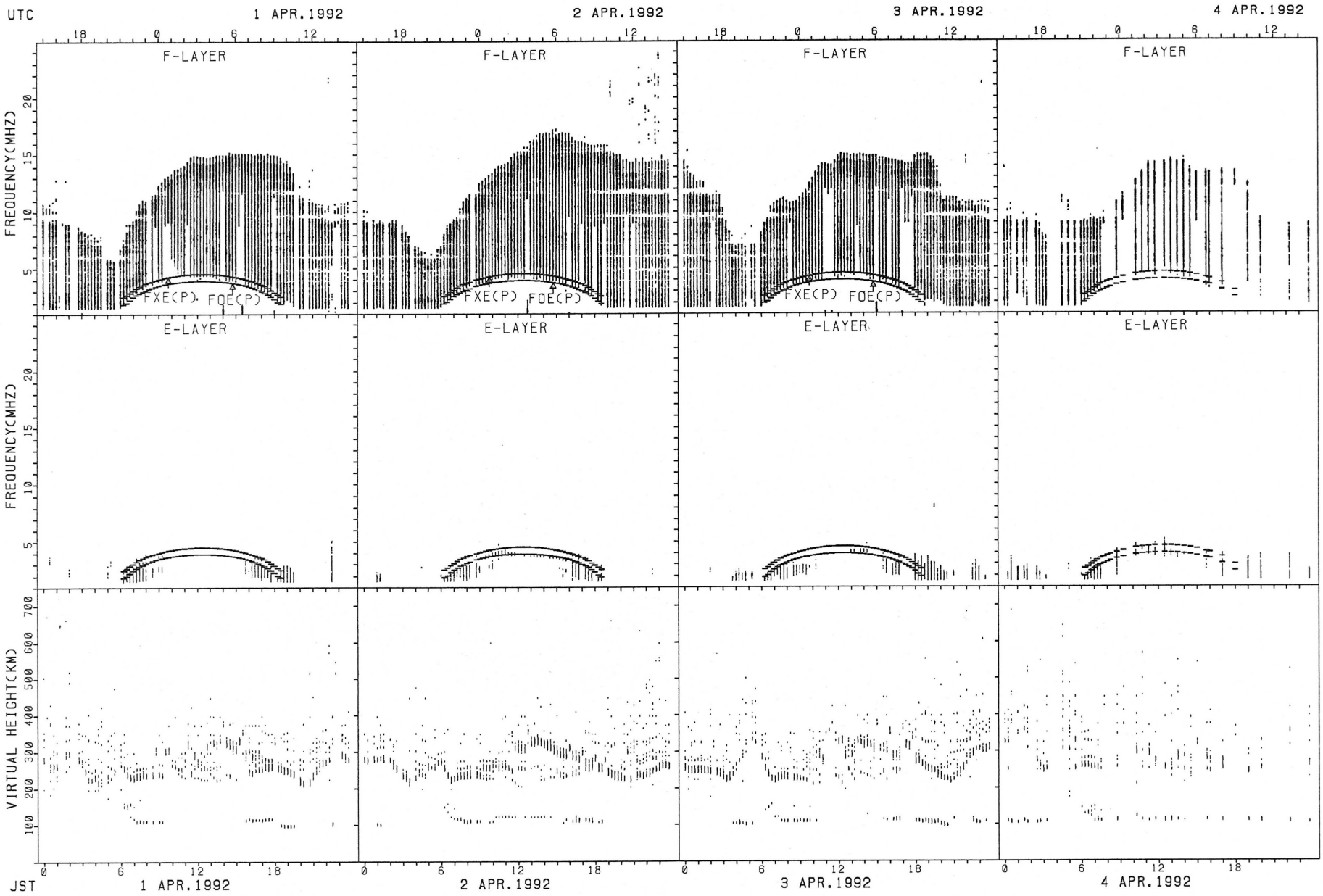
SUMMARY PLOTS AT YAMAGAWA



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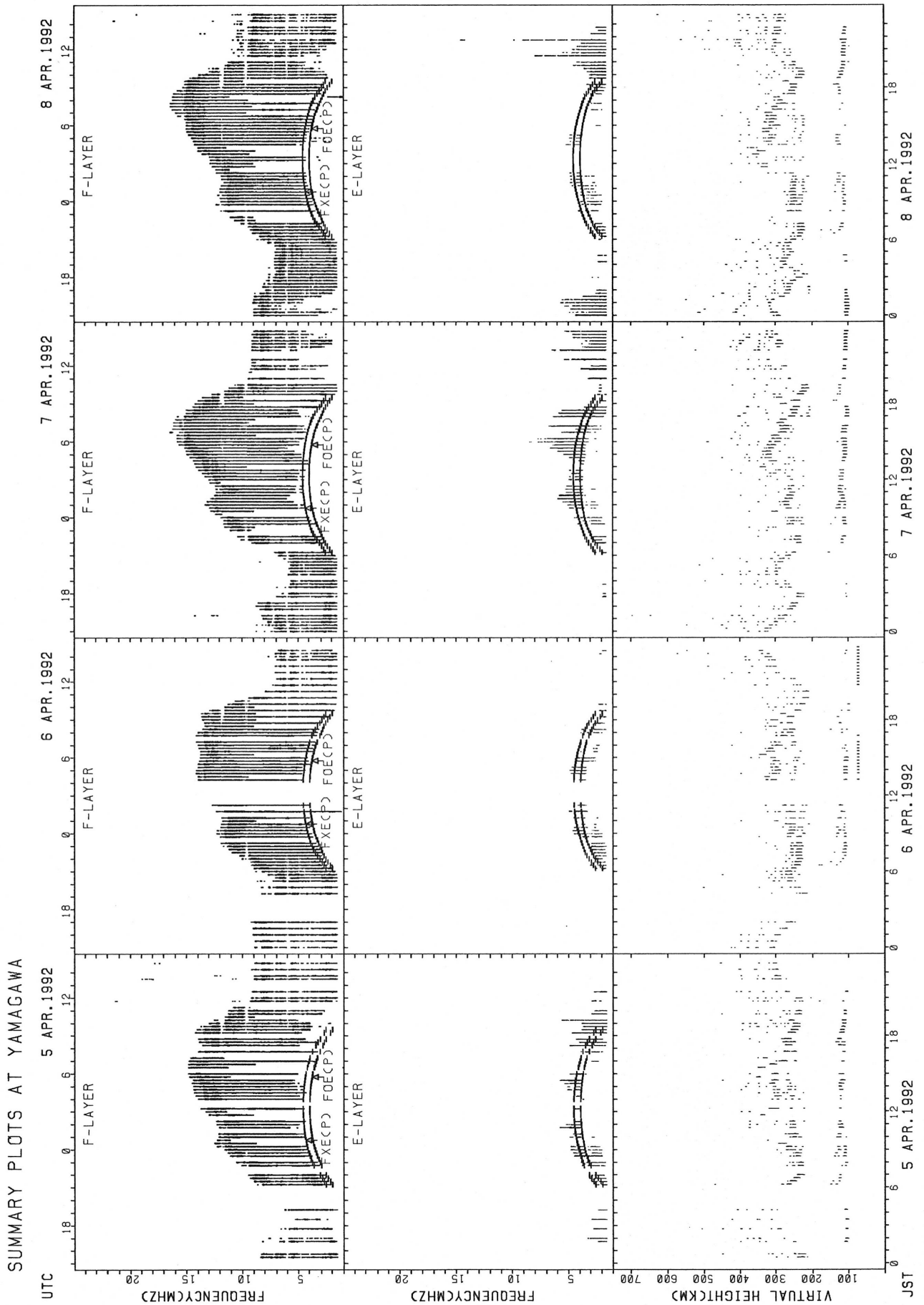
SUMMARY PLOTS AT YAMAGAWA
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E-LAYER
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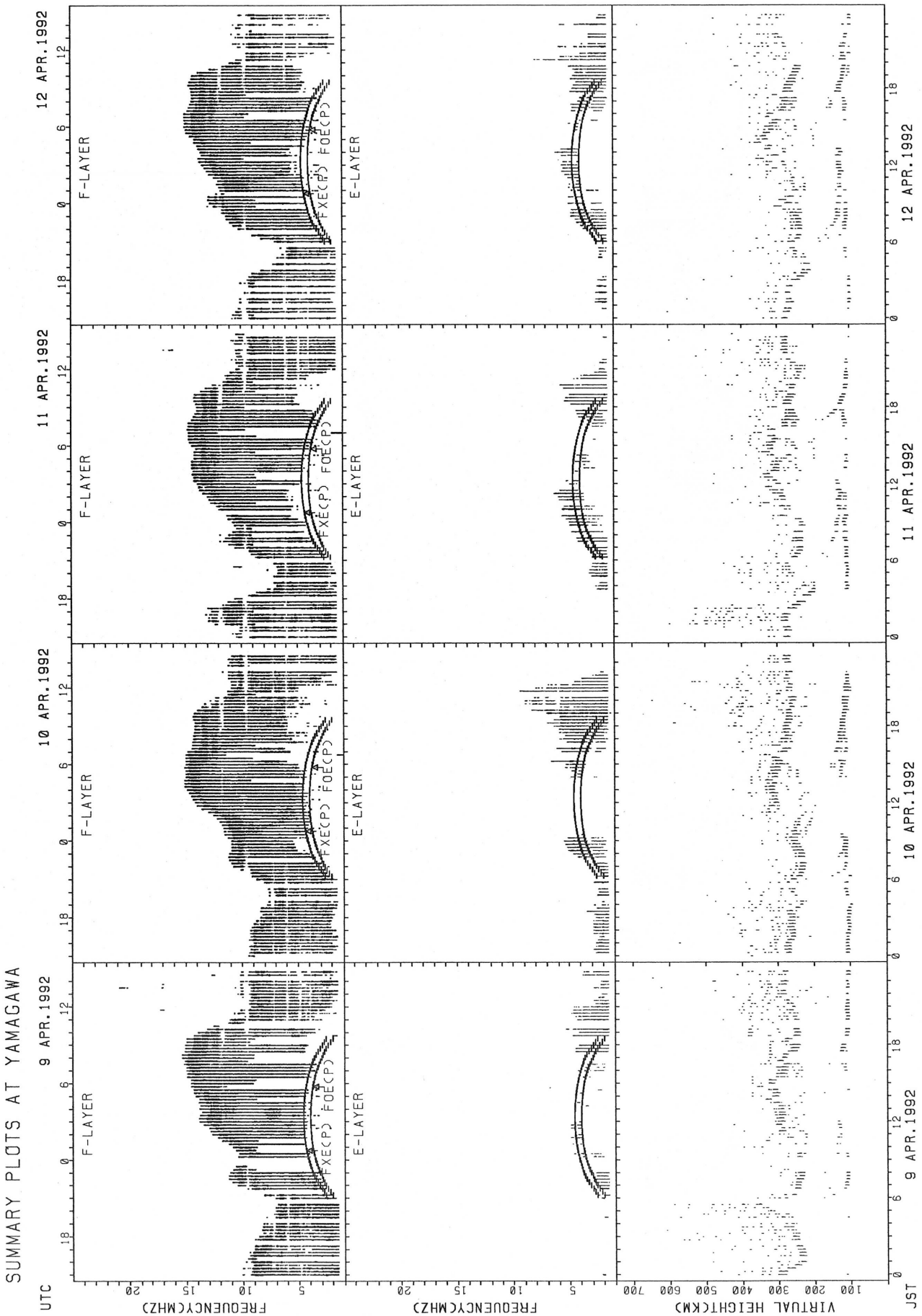
SUMMARY PLOTS AT YAMAGAWA
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E-LAYER
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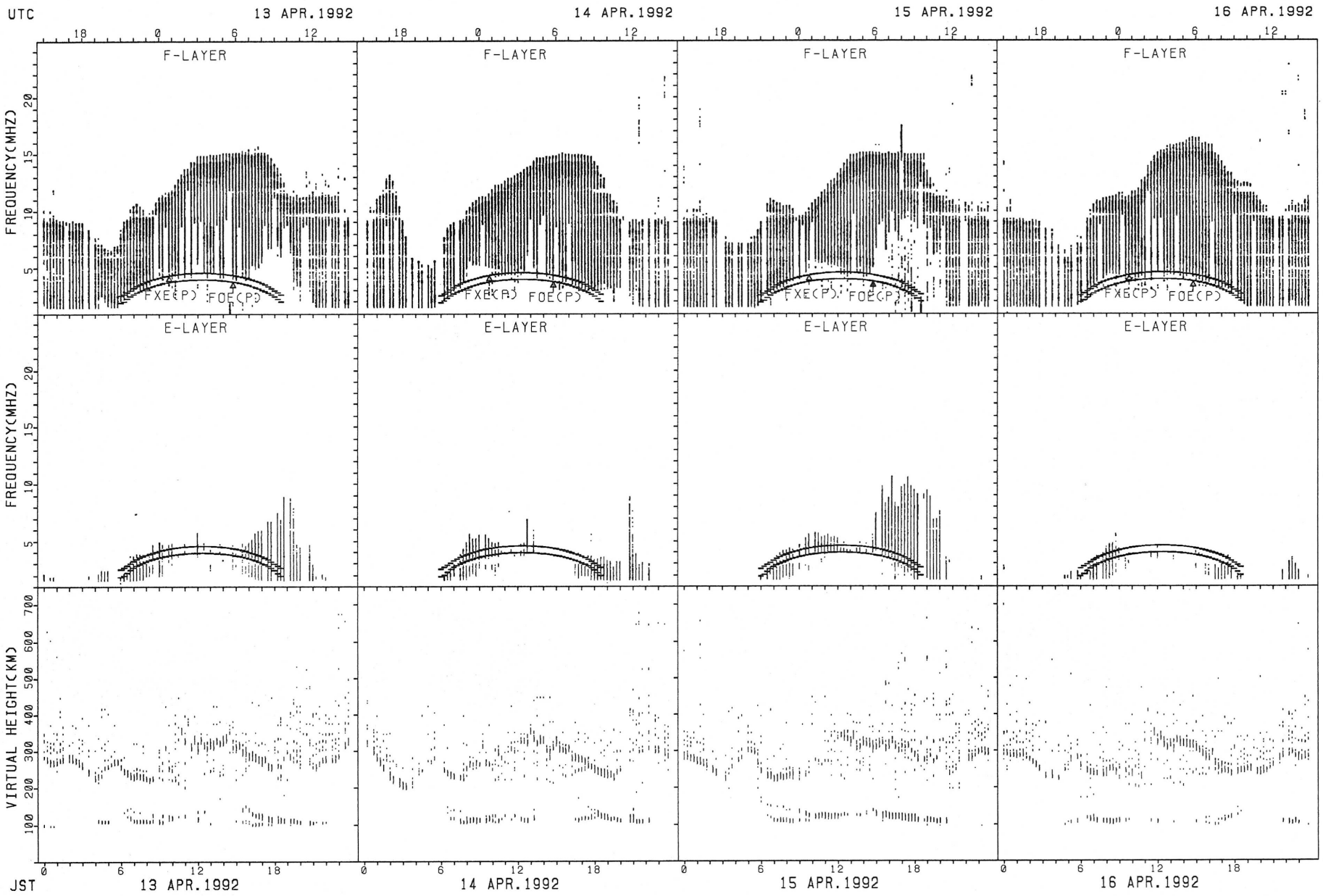
SUMMARY PLOTS AT YAMAGAWA



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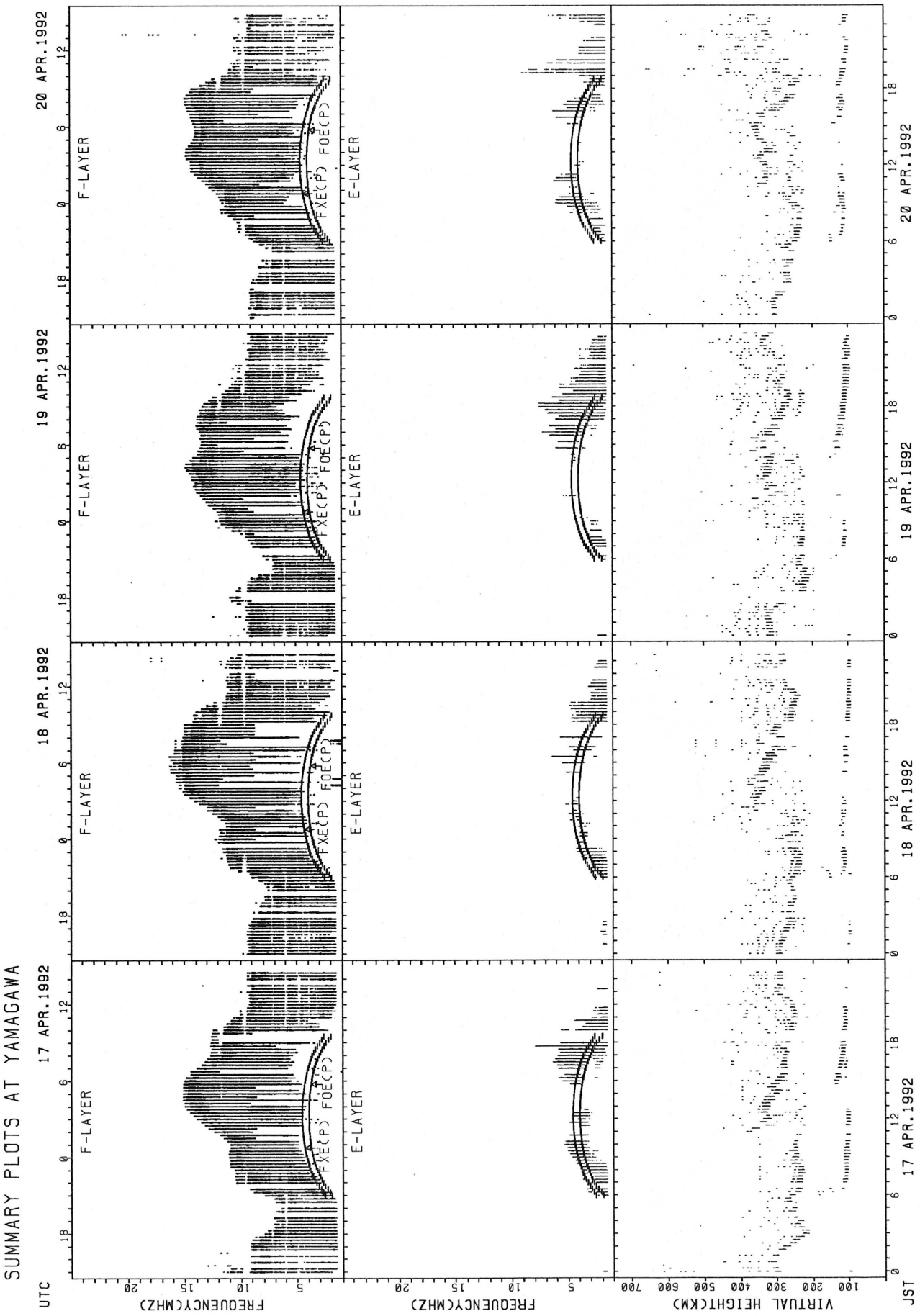
SUMMARY PLOTS AT YAMAGAWA
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FOE(P)
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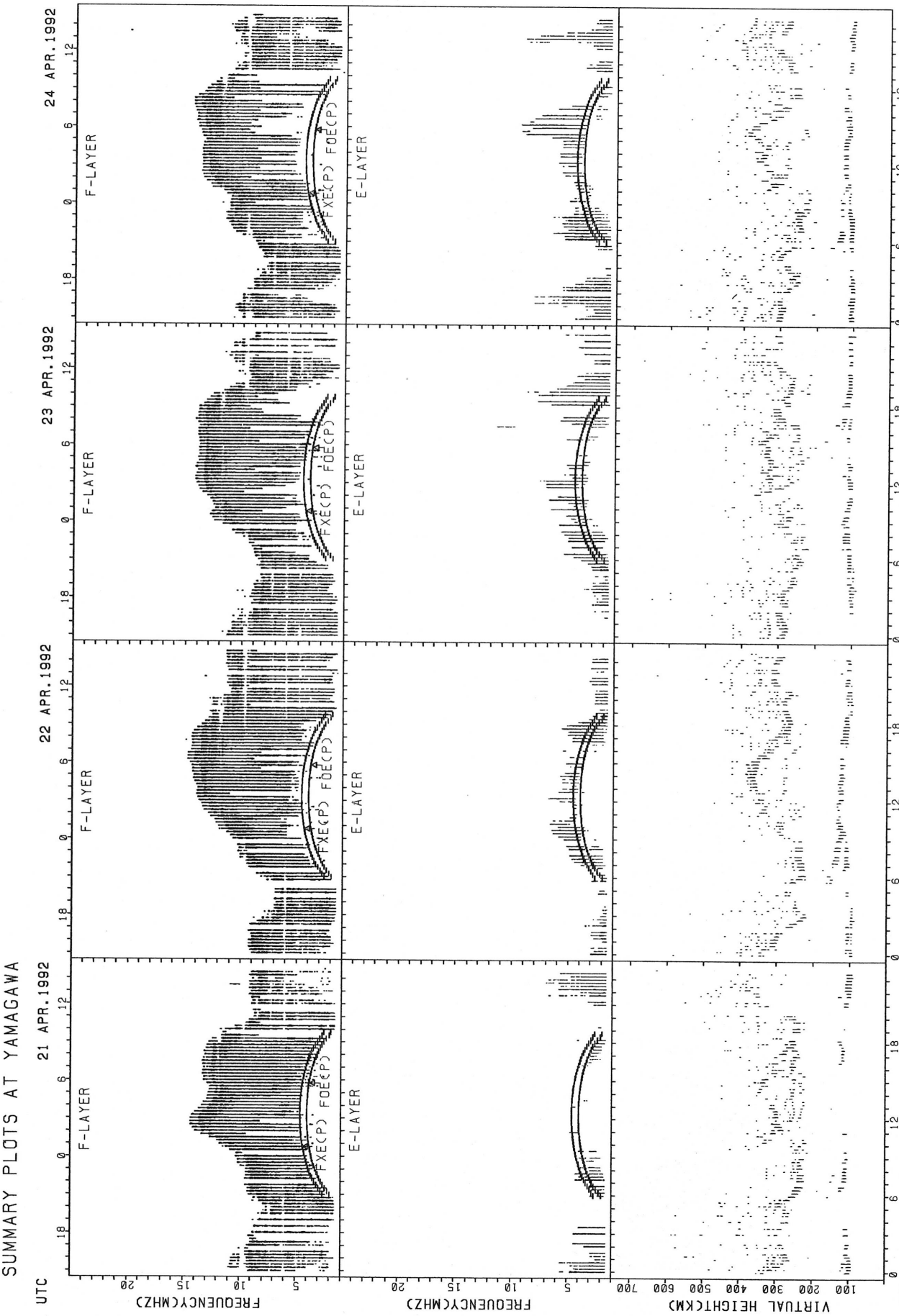
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E-LAYER
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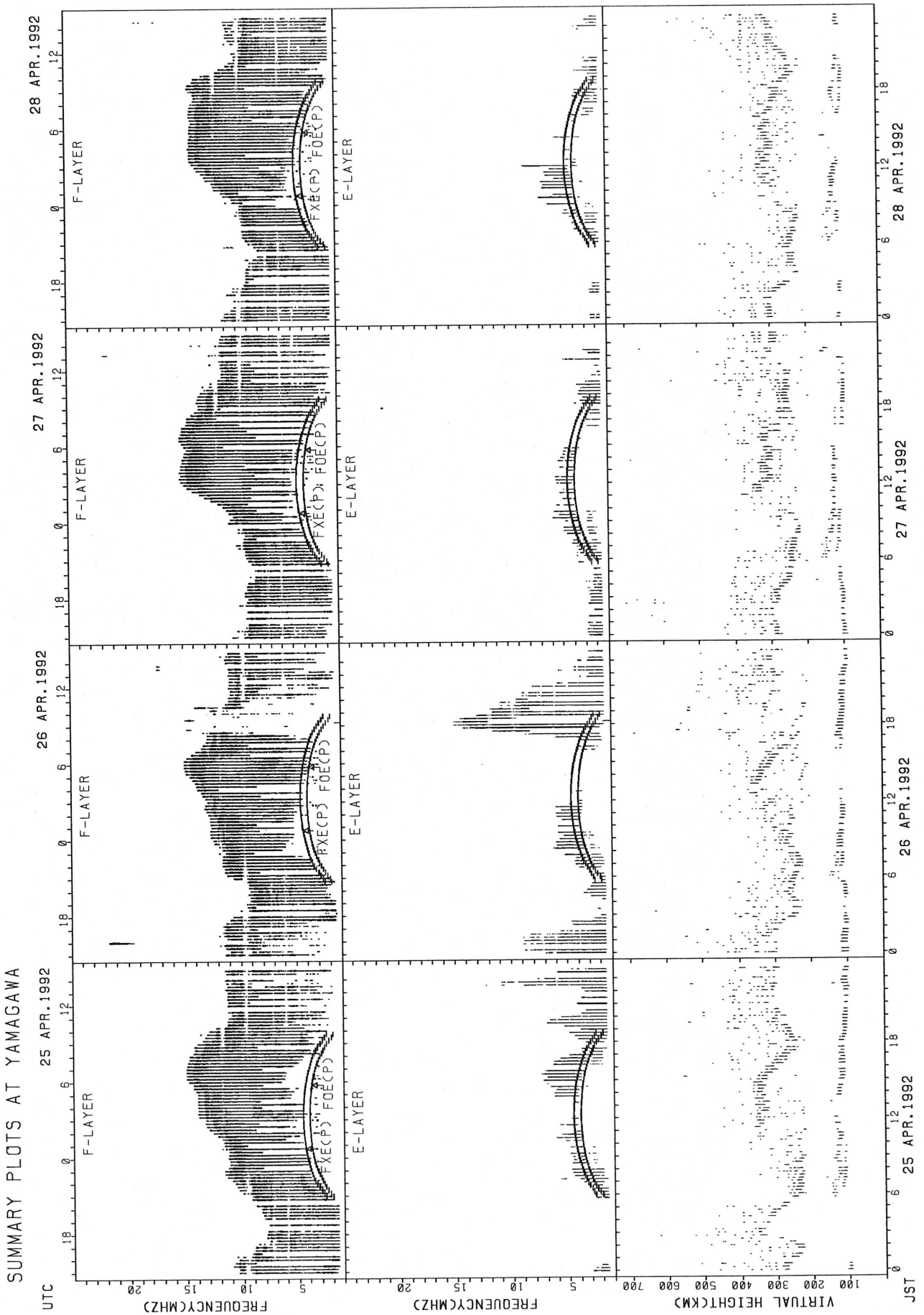
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E-LAYER
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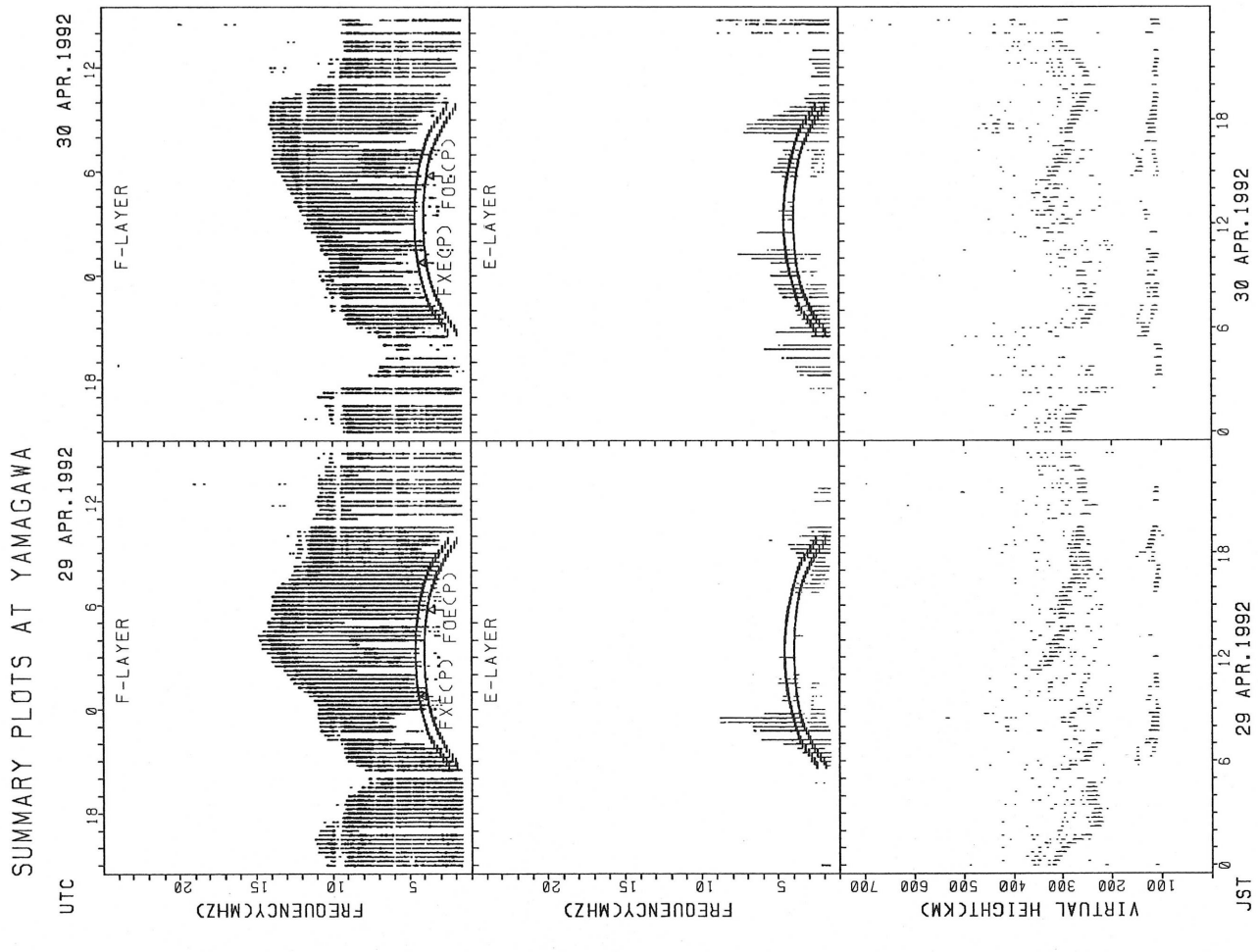
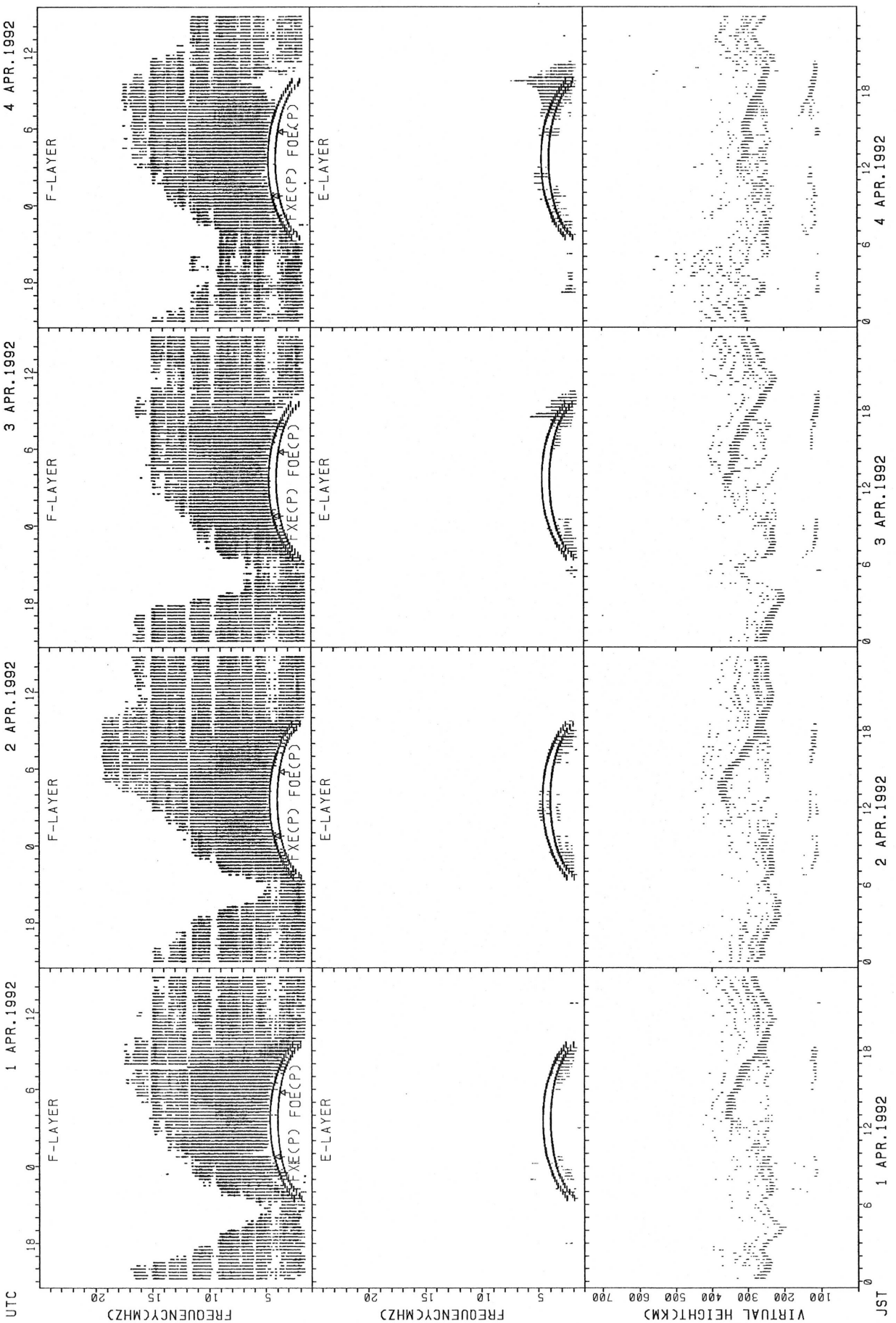
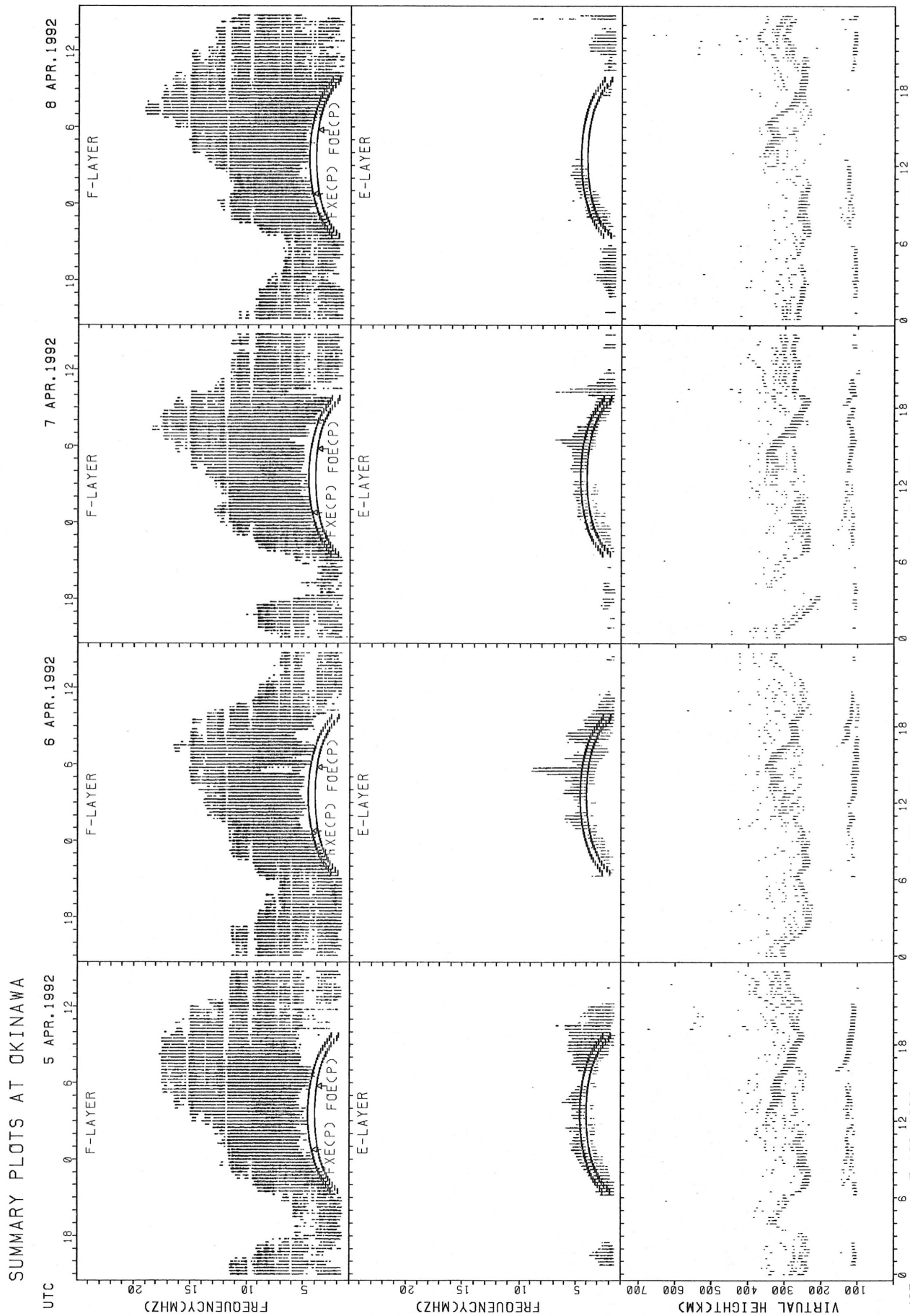
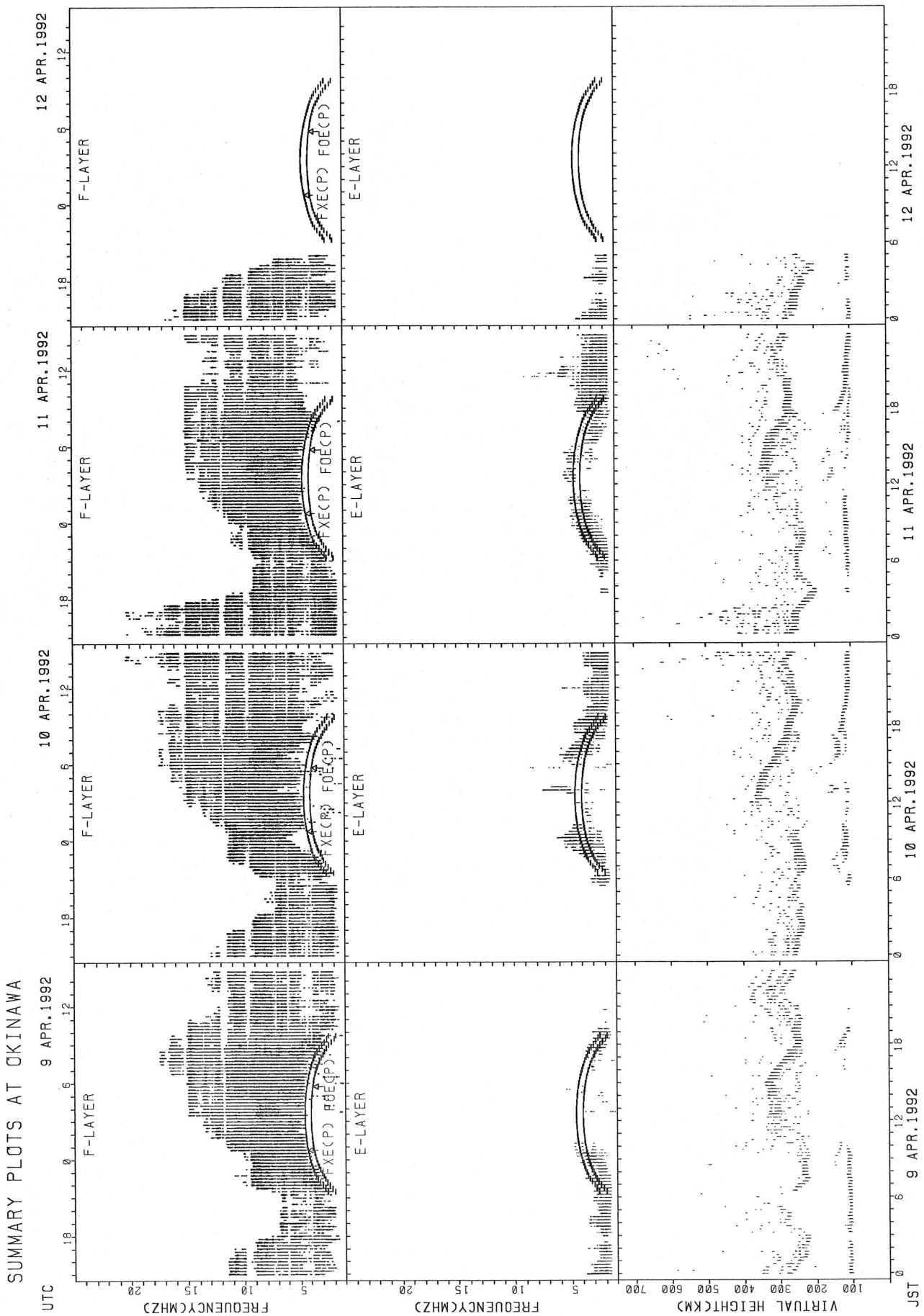
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

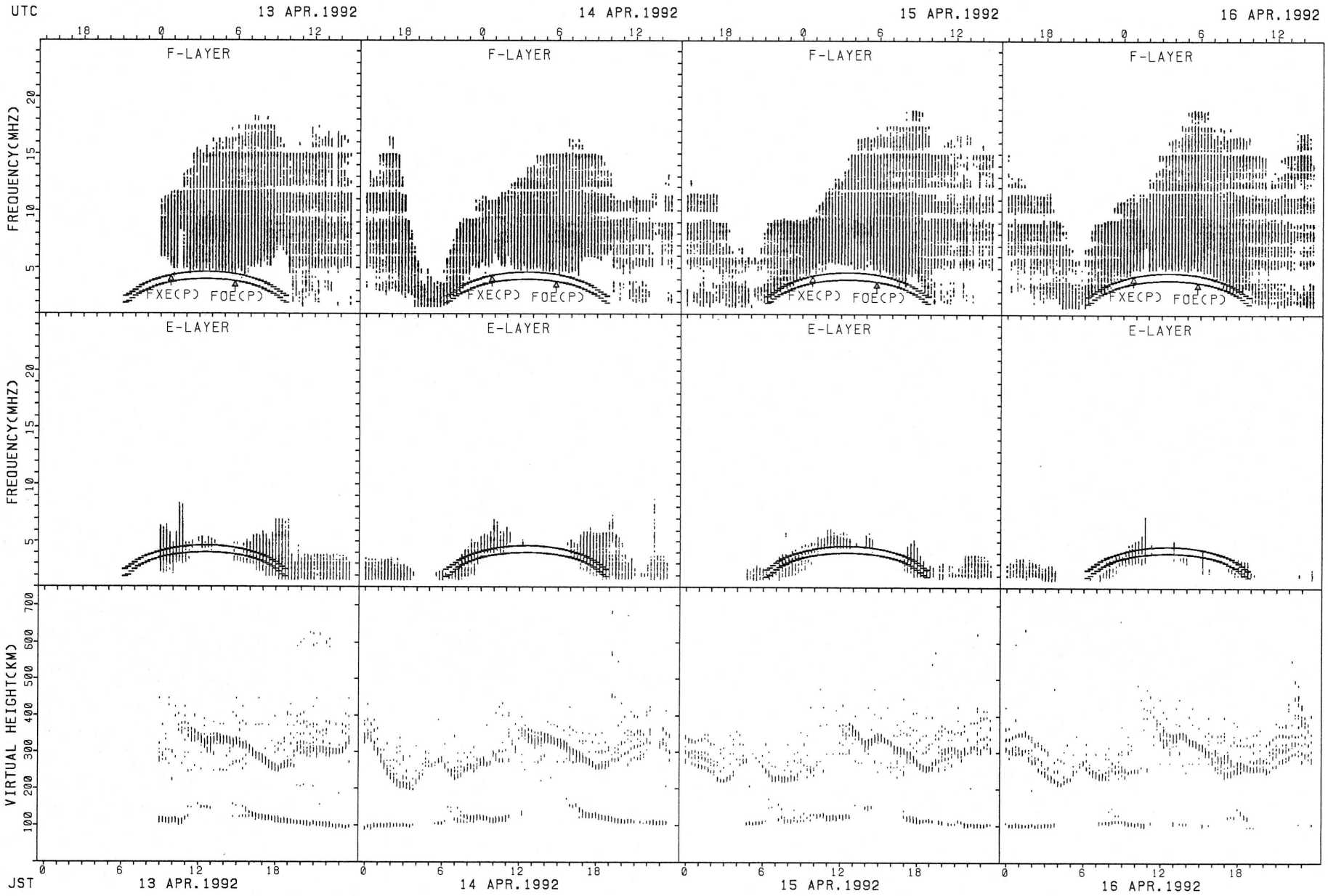

SUMMARY PLOTS AT YAMAGAWA
UTC
29 APR.1992
30 APR.1992
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT OKINAWA
UTC
1 APR.1992
2 APR.1992
3 APR.1992
4 APR.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

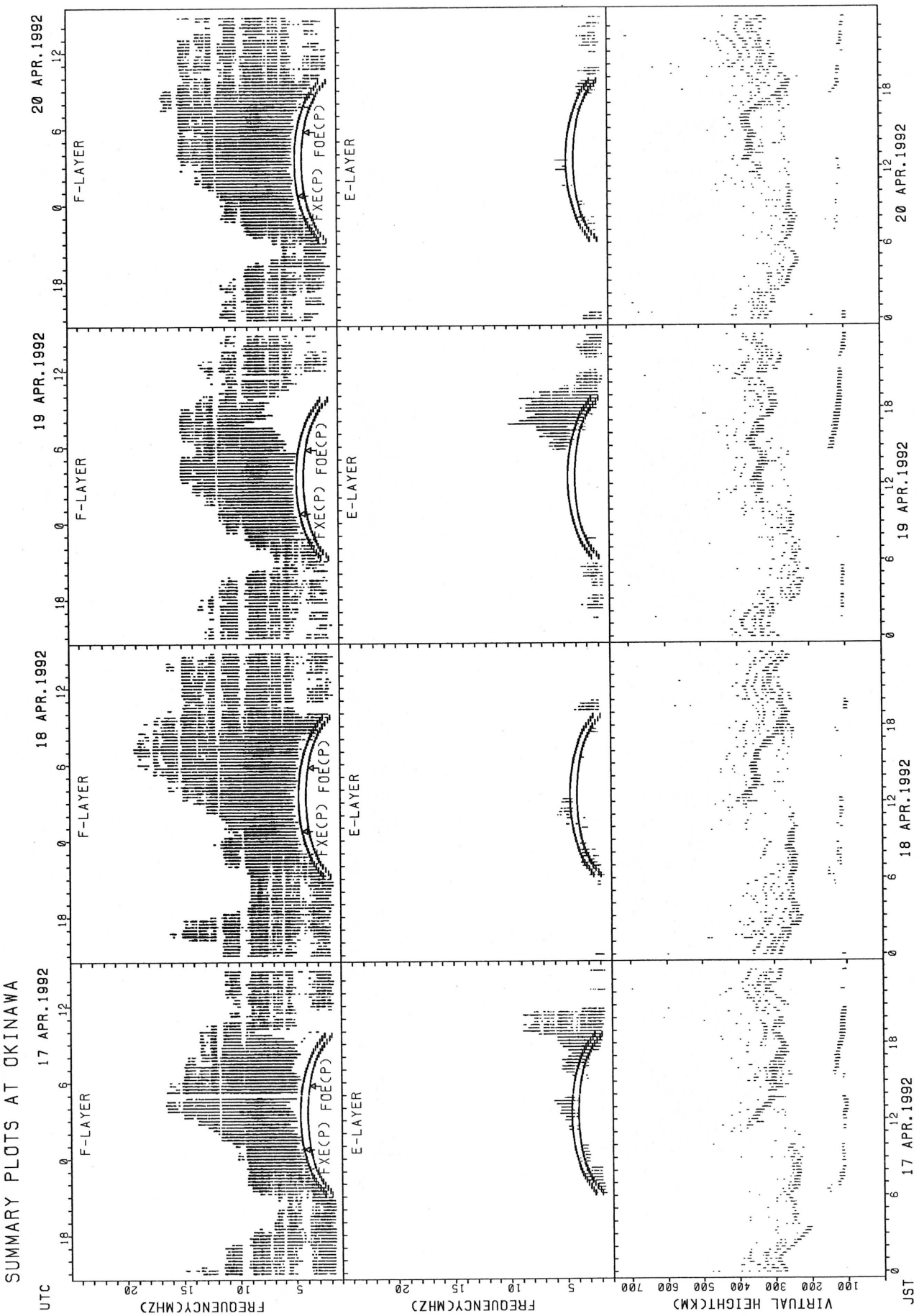

SUMMARY PLOTS AT OKINAWA
UTC
5 APR.1992
6 APR.1992
7 APR.1992
8 APR.1992
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT OKINAWA
UTC
9 APR.1992
10 APR.1992
11 APR.1992
12 APR.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

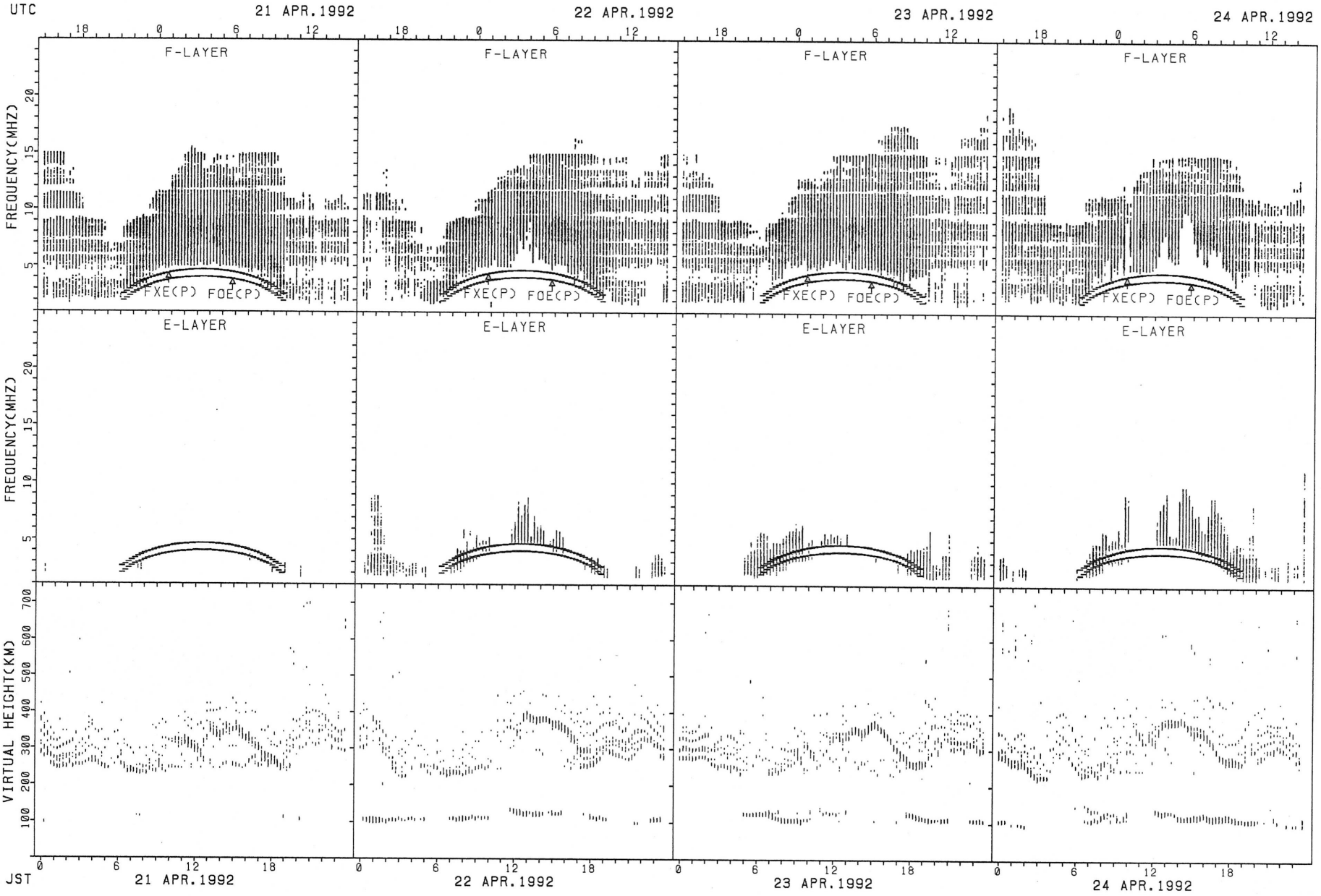
SUMMARY PLOTS AT OKINAWA



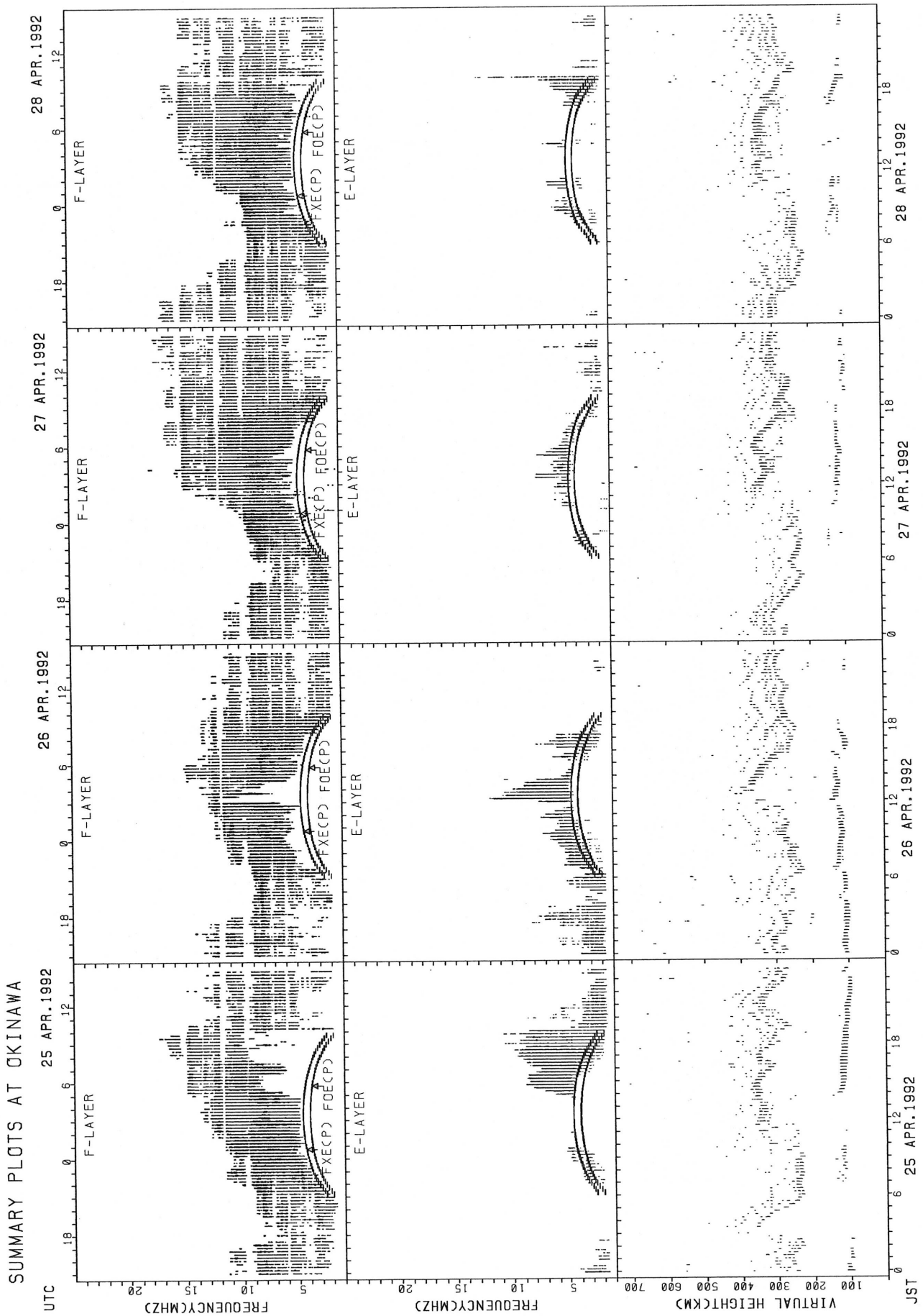
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


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

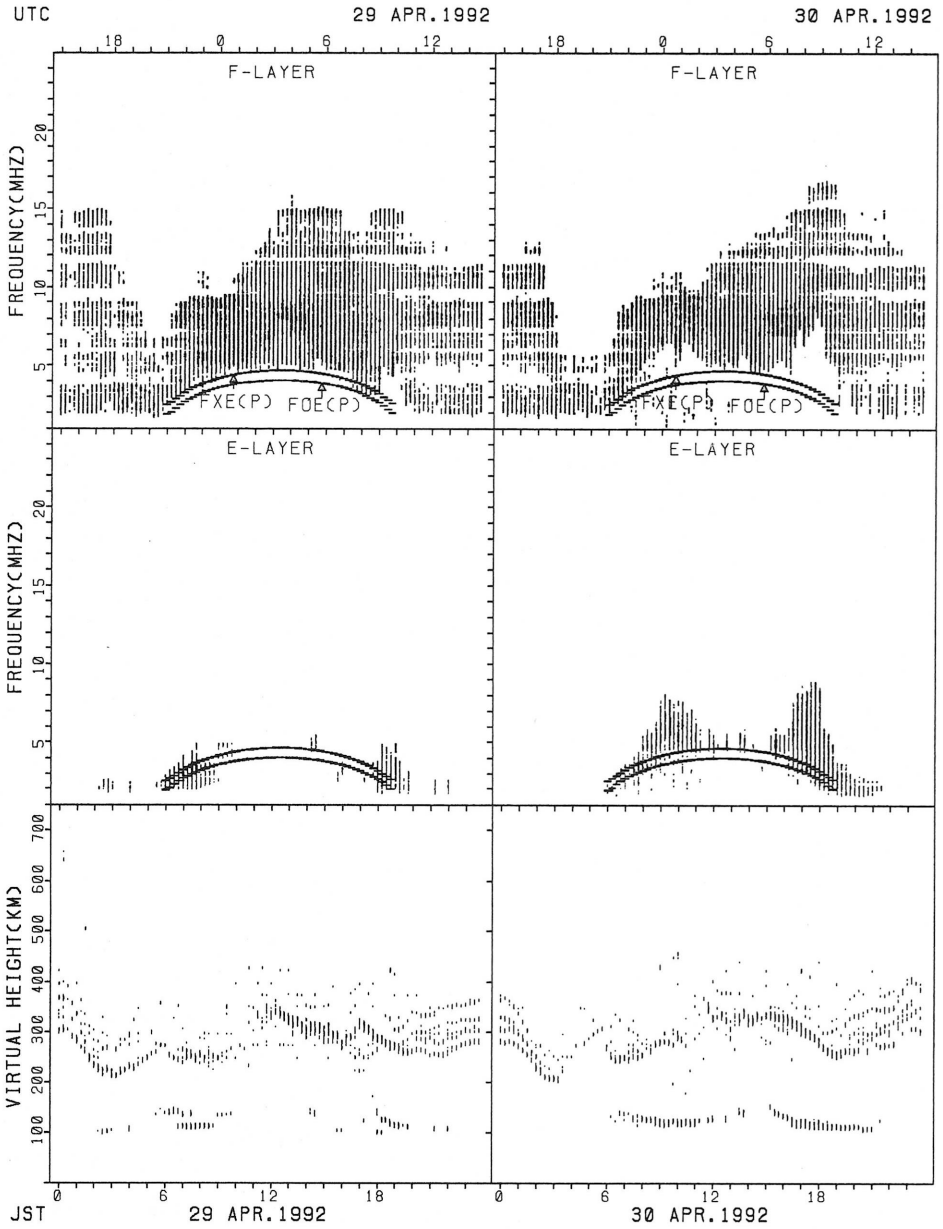
SUMMARY PLOTS AT OKINAWA



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


SUMMARY PLOTS AT OKINAWA
UTC
25 APR.1992
26 APR.1992
27 APR.1992
28 APR.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



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

MONTHLY MEDIANS OF H'F AND H'ES

APR. 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	12	11	10	11			26	26	19							19	30	30	30	29	25	22	14	13
MED	360	348	353	336			288	275	268							274	273	268	264	276	306	324	341	352
U Q	388	382	396	380			308	292	280							288	290	278	270	288	327	354	358	371
L Q	143	21	26	27			260	250	252							256	268	262	260	260	278	294	24	23

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																		13	16	21	17	10		
MED																		131	124	117	119	121		
U Q																		227	131	126	229	364		
L Q																		127	115	108	116	117		

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							16	25	26							20	30	30	28	25	10			
MED							270	270	278							287	287	277	272	286	310			
U Q							295	282	296							305	308	286	284	311	338			
L Q							259	263	262							276	278	268	266	274	292			

H'ES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							10	15	16	14	20	13	15	15	11	16	13	19	25	24	22	18	14	10
MED							144	125	116	122	115	117	115	113	117	119	131	117	115	113	113	113	111	109
U Q							159	155	127	125	119	123	123	117	123	123	138	127	121	115	117	117	113	127
L Q							113	115	113	117	113	113	109	107	107	114	114	101	106	103	105	109	109	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	19	22	16	11			30	29	30							21	30	31	31	30	22	16	17	18
MED	356	368	334	340			268	258	259							292	283	268	266	274	308	359	364	358
U Q	368	382	359	382			278	273	278							310	296	280	270	296	334	373	377	378
L Q	348	350	315	326			256	243	252							286	270	260	258	258	282	341	341	344

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	11	12	11					18	22	24	20	19	18	17	19	17	19	27	24	26	26	24	15	16
MED	105	107	105					131	127	121	118	113	115	115	115	115	117	121	115	113	110	111	109	107
U Q	109	112	113					145	139	129	119	117	119	130	125	127	125	131	119	115	115	115	113	109
L Q	105	105	105					113	119	116	113	109	111	108	107	106	105	113	113	111	109	108	103	105

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

MONTHLY MEDIANS OF H'F AND H'ES

APR.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	23	25	24	17	11		19	30	25	27							31	29	27	30	26	24	16	21
MED	334	328	327	308	328		294	248	250	256							302	274	278	265	289	327	337	340
U Q	346	349	349	347	342		316	254	275	276							312	288	306	276	322	348	357	350
L Q	310	308	307	284	306		270	238	240	252							280	265	268	252	274	318	323	328

H'ES

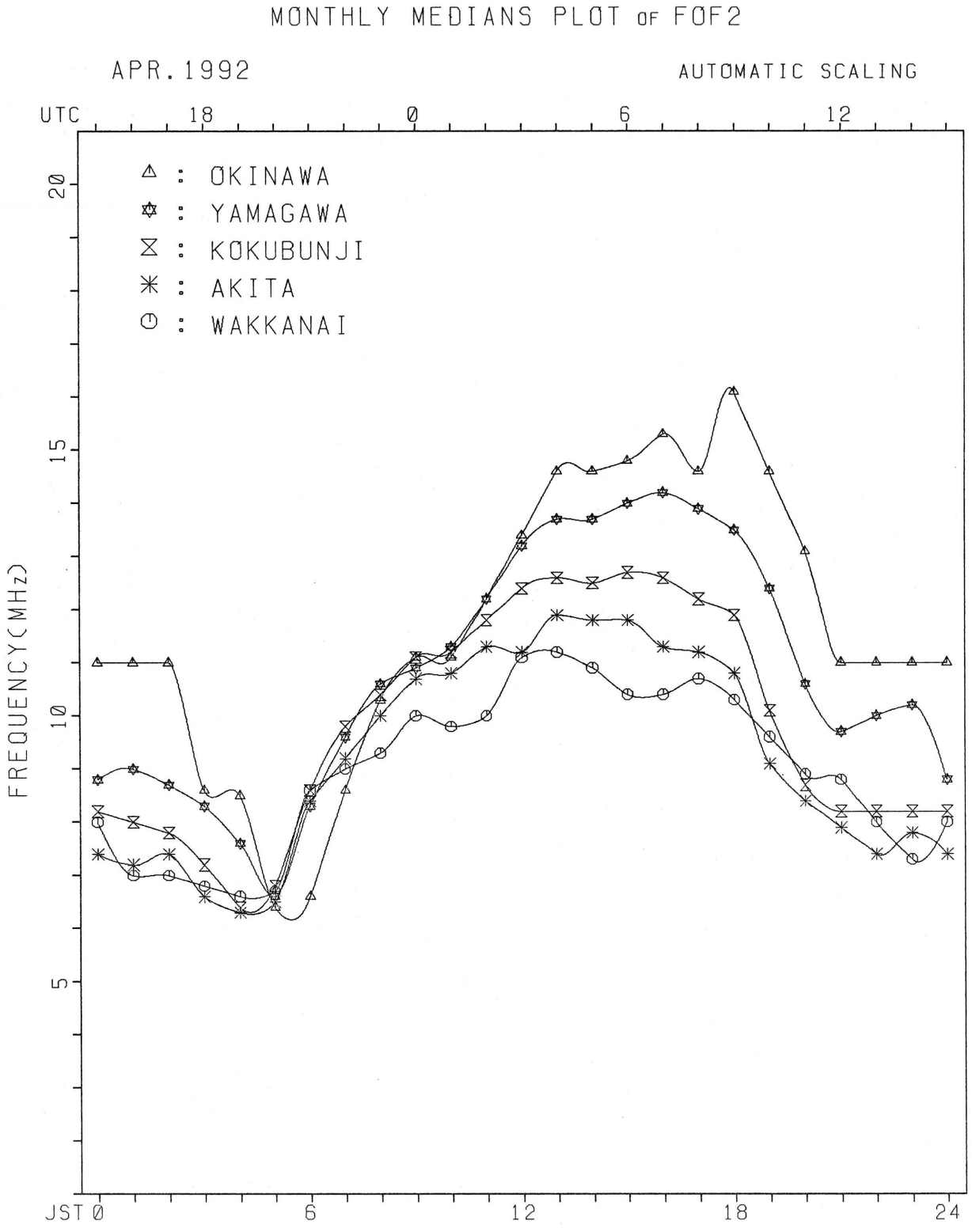
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10							13	16	20	11	15	16		10	13	11	16	16	25	22	17	11	16
MED	107							127	122	119	119	121	120		122	125	121	119	119	113	111	111	109	109
U Q	113							146	131	130	127	125	129		125	144	125	138	127	117	113	115	111	114
L Q	99							119	117	117	115	113	113		115	116	111	117	113	106	109	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	27	29	29	25	15			28	29	28							30	30	30	29	30	28	29	29
MED	308	298	278	266	284			255	254	274							312	291	269	262	295	314	320	322
U Q	330	333	318	303	342			270	269	285							328	302	286	283	320	329	345	331
L Q	292	269	260	251	254			249	243	259							302	276	260	256	276	293	306	306

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	11	10	10	10		10		12	13	16	17	13	15	14	11		14	19	24	23	18	14	12	15
MED	107	107	107	108		111		133	125	121	121	119	127	128	121		131	127	121	113	113	110	109	109
U Q	111	111	111	111		113		144	137	135	127	129	131	141	147		143	133	125	117	117	115	113	111
L Q	103	103	105	107		109		125	121	114	114	115	119	121	121		123	119	115	111	113	105	104	103


MONTHLY MEDIANS PLOT OF FOF2
APR. 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

APR. 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 90	X 84	X 83	X 84	X 74	X 67														X 119	X 101	X 90	X 87	X 90
2	X 84	X 84	X 85	X 80	X 68	X 71														X 115	X 102	X 99	X 94	X 91
3	X 88	X 88	X 88	X 75	X 68	X 67														X 129	X 105	X 99	X 96	X 93
4	X 92	X 85	X 86	X 68	X 80	X 86														X 97	X 84	X 83	X 81	X 80
5	X 84	X 68	X 63	X 60	X 62	X 63														X 105	X 90	X 83	X 83	X 84
6	X 78	X 83	X 80	X 78	X 75	X 73														X 98	X 75	X 71	X 72	X 69
7	X 69	X 74	X 73	X 61	X 57	X 60														X 84	X 75	X 75	X 79	X 78
8	X 73	X 75	X 69	X 66	X 65	X 68														X 114	X 89	X 84	X 84	X 80
9	84	X 86	X 76	X 68	X 67	X 66														X 113	X 93	X 87	X 87	X 83
10	X 82	X 82	X 81	X 76	X 69															X 111	X 92	X 90	X 90	X 86
11	X 85	X 83	X 85	X 78	X 66															X 122	X 105	X 93	X 93	X 91
12	X 89	X 87	X 83	X 82	X 70															X 117	X 97	X 86	X 89	X 90
13	X 89	X 86	X 82	X 79	X 75															X 103	X 90	X 87	X 85	X 86
14	X 80	X 90	X 91	X 73	X 60															X 105	X 89	X 87	X 89	X 89
15	X 88	X 88	X 89	X 74	X 72															X 111	X 95	X 86	X 89	X 90
16	X 90	X 89	X 87	X 80	X 71															X 98	X 90	X 90	X 88	X 88
17	X 82	X 80	X 82	X 74	X 69															X 102	X 95	X 93	X 90	X 91
18	X 90	X 90	X 88	X 80	X 80															X 112	X 99	X 95	X 95	X 92
19	X 87	X 86	X 85	X 91	X 90															X 104	X 93	X 91	X 89	X 90
20	X 88	X 84	X 86	X 78	X 79															X 100	X 91	X 93	X 88	X 92
21	X 95	X 91	X 87	X 81	X 76															X 94	X 84	X 86	X 91	X 90
22	X 89	X 88	X 85	X 77	X 74															X 109	X 104	X 104	X 102	X 104
23	X 103	X 97	X 91	X 86	X 87															X 107	X 87	X 90	X 93	X 93
24	X 93	X 91	X 90	X 75	X 74															X 103	X 93	X 95	X 98	X 96
25	X 95	X 97	X 75	X 79	X 80															X 108	X 104	X 108	X 112	X 112
26	X 108	X 105	X 101	X 98	X 95															X 112	X 105	X 103	X 99	X 102
27	X 98	X 95	X 93	X 86	X 86															X 111	X 101	X 99	X 100	X 99
28	X 96	X 89	X 89	X 85	X 77															X 116	X 95	X 89	X 95	X 95
29	X 94	X 95	X 95	X 82	X 79															X 95	X 95	X 93	X 94	X 90
30	X 87	X 87	X 87	X 68	X 65															X 113	X 100	X 93	X 92	X 90
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	9														30	30	30	30	30
MED	X 88	X 87	X 86	X 78	X 74	X 67														X 108	X 94	X 90	X 90	X 90
U Q	X 93	X 90	X 89	X 82	X 79	X 72														X 113	X 101	X 95	X 95	X 93
L Q	X 84	X 84	X 82	X 74	X 68	X 64														X 102	X 90	X 86	X 87	X 86

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	84	78	77	78	68	61	78	95	108	124	129	135	137	136	137	136	133	134	130	R 113	95	84	81	84
2	78	77	79	74	62	65	85	99	113	126	130	141	137	145	145	138	133	128	122	109	96	93	88	85
3	82	82	82	69	62	61	88	94	103	111	120	131	129	134	129	127	127	121	125	123	99	93	90	87
4	86	79	80	62	74	80	85	80	80	90	104	R 114	110	110	103	100	103	101	105	91	78	77	75	74
5	78	62	57	54	56	57	80	91	101	110	112	110	115	119	121	123	117	114	112	99	84	77	77	77
6	72	77	74	72	69	67	84	102	110	117	116	117	118	127	123	117	111	120	124	92	69	65	66	S 63
7	63	68	67	55	51	54	77	97	112	108	R 108	99	103	103	106	110	110	105	98	78	69	69	73	72
8	67	69	63	60	59	F 60	76	86	99	102	109	111	111	114	123	129	127	127	126	108	83	78	78	74
9	F 76	80	70	62	61	60	82	86	104	104	108	118	119	117	123	124	119	123	124	107	87	81	81	77
10	76	76	75	70	63	65	85	104	109	106	113	112	125	129	128	126	121	120	118	105	86	84	84	80
11	79	77	79	72	60	63	86	101	110	109	111	121	127	126	125	128	130	124	120	116	99	87	87	85
12	83	81	77	76	64	68	85	96	109	118	121	124	124	124	123	123	123	127	126	111	91	80	83	84
13	83	80	77	73	69	71	100	112	112	117	113	120	127	134	137	137	137	133	121	97	84	81	79	80
14	74	84	85	67	54	59	85	91	98	111	120	125	128	133	137	133	130	129	123	99	83	81	83	83
15	82	82	83	68	65	69	93	103	99	95	104	111	121	132	138	138	128	127	124	105	89	80	83	84
16	84	83	81	74	65	66	84	108	113	116	118	133	137	145	147	141	131	121	107	92	84	84	82	82
17	76	74	76	68	63	67	89	96	108	110	110	121	128	128	135	134	121	113	R 110	96	89	87	84	85
18	84	84	82	74	74	80	100	111	112	117	119	120	125	133	137	137	132	125	R 121	106	93	89	89	86
19	81	80	79	85	84	77	85	93	97	109	115	124	125	128	125	119	119	121	119	98	87	85	83	84
20	82	78	80	72	73	80	98	102	102	113	120	129	132	138	132	130	133	135	123	94	85	87	82	86
21	89	85	81	75	70	72	79	74	71	76	88	108	R 113	107	100	I A 104	106	107	102	88	79	80	86	84
22	83	82	79	71	68	76	89	99	105	112	118	121	122	124	127	130	128	127	116	103	98	98	96	98
23	97	91	85	80	81	84	88	89	95	105	110	118	117	118	119	114	107	105	107	101	81	84	87	87
24	87	85	84	69	68	72	90	103	106	106	R 113	122	127	124	123	124	127	124	J R 116	97	V 87	89	92	90
25	89	91	69	73	74	84	100	108	112	114	118	126	131	138	138	141	141	134	122	102	98	J R 102	106	106
26	102	98	95	92	89	93	104	115	118	116	122	125	126	132	137	135	131	124	R 113	106	99	97	93	96
27	92	89	87	80	80	87	84	92	97	100	104	115	129	130	129	129	129	127	121	105	95	93	94	93
28	90	83	83	79	71	79	85	88	89	101	107	116	122	124	124	118	112	111	R 113	R 110	89	83	89	89
29	88	89	89	76	73	74	91	105	100	99	R 111	125	129	126	123	121	112	107	97	89	89	87	88	84
30	81	81	81	62	59	63	84	93	98	100	102	111	109	106	115	124	118	110	115	108	94	87	86	84
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	82	81	80	72	68	68	85	96	104	110	113	120	125	128	126	128	127	124	120	102	88	84	84	84
U Q	87	84	83	76	73	79	90	103	110	116	119	125	129	133	137	135	131	127	123	108	95	89	89	87
L Q	78	77	76	68	62	63	84	91	98	102	108	114	118	119	123	121	117	113	112	96	84	80	81	80

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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

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		L	L	L	L	L	L	L						
2										L	L	L	L	L	L	L	L							
3										L	L	L	L	L	L	L	L							
4								L U L 500	U L 500	520	L 580	L 580	U L 640	L	L	L								
5										L	L	L	L	L	L	L								
6									L	L	L	L	L	L	L	L								
7										L	L	L		L	L	L	L							
8									L	L	L	L	U L 600	L	L	L								
9								L	L	L	L	L	L	L	L	L	L							
10									L	L	L	L	U L 670	L	L									
11									L	L	L	U L 600	L	L	L	L	L							
12									L	L			L	L	L	L								
13									L	L	L	L	U L 630	U L 620	U L 630	L	L							
14									L	L		L	L	L	L	L	L							
15										L	L	U L 600	U L 630	L 600	L	L								
16									L	L	L	L 630	L	L 620	L	L	L							
17								L	L	L	L	L	L	L	L 580	L								
18									L	L	L	L	L	U L 650	L 610	L	L							
19								L	L		L	L 660	U L 530	L	L		L							
20									L	L	U L 760	U L 760		L	L	U L 700	L	L						
21								L	L	L	L	L	L											
22									L	L	L	L	U L 670	L 700	L	L	L							
23									U L 700	L	U L 560	L	L	L	L	L	L							
24								L	L	L	L	L	L	U L 640	L	U L 710								
25									L	L	L	L	L	L	L	L	L	L						
26										L	L	L	L	L 650	U L 600	L	L							
27						L		L		L		U L 600		L	U L 620	L								
28								L		U L 600				L	L	L	L	L						
29								L	L	L	U L 680	L 610	L	570	U L 600	L	L							
30									L	U L 515	L 570	L	U L 590	L	U L 590	L	L							
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								1	2	3	5	8	9	8	7	2								
MED								U L 500	U L 600	U L 520	U L 580	L 605	U L 630	L 630	U L 600	U L 705								
U Q										U L 600	U L 720	L 645	U L 655	L 650	U L 620									
L Q										U L 515	L 565	U L 600	U L 570	L 610	L 590									

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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							205	275	325	365	B	A	A	395	375	350	310	255	B					
2							200	265	330	350	365	A	U A 370	R 385	365	340	305	255	B					
3							195	280	320	350	A 365	U S 385	390	385	370	345	320	260	A					
4							215	275	320	350	A	A	A	385	370	A	305	255	A					
5						J K 140	220	300	330	355	375	380	A 375	A 365	360	A	A	255	B					
6							195	280	325	350	R 375	375	A	380	365	340	305	265	A					
7							200	280	345	370	380	A	A	A	A	340	A	A	A					
8							200	280	345	365	370	375	A 360	A	A	A	A	A	B					
9							H 225	280	330	355	375	380	370	370	360	345	320	260	145					
10						B	215	280	325	A 365	A	A	A	A	A	A	A	A	A					
11						B	200	A 285	340	360	370	380	385	370	365	345	310	250	A					
12						B	210	280	335	355	375	A 380	A 370	A	A	340	320	250	A					
13						B	235	290	340	360	A 380	U A 370	A	380	365	340	315	260	A					
14						B	220	285	335	365	380	370	A	A	A	340	320	255	B					
15						B	205	285	335	350	365	375	385	A	A	A	315	U A 270	A					
16						B	220	280	A	360	A	A	R	380	A	350	A	265	A					
17						B	230	300	340	375	R 390	390	390	380	370	360	325	270	A					
18						B	240	315	360	395	A	A	U A 400	A	A	A	A	A 280	A					
19						B	235	315	345	375	400	410	410	405	385	365	335	U A 270	A					
20						B	240	310	360	395	400	405	400	405	390	375	340	275	A					
21						B	250	325	365	395	A 395	395	A 400	410	390	365	330	280	185					
22						145	255	315	345	380	395	U R 410	405	400	385	355	320	A	B					
23						A	245	295	A 335	A	A	A	A	A	A	A	325	270	A					
24						B	R 260	A 310	355	385	385	U A 390	A	A	A	A	A	275	A					
25						160	250	310	350	A	A	A	A	B	380	A	A	A	A					
26						B	245	300	U A 340	A	A	A	R 390	R	A	350	315	A 270	A					
27						145	R	310	340	370	400	A	400	390	380	355	320	A 260	A					
28						165	245	310	340	365	390	400	385	U B 390	A	340	310	270	A					
29						170	H 260	305	340	360	U R 375	390	385	380	365	345	315	270	A					
30						165	H 250	305	335	350	370	380	A	A	370	340	310	270	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	29	30	29	27	22	19	18	18	18	21	22	25	2					
MED						160	225	292	340	365	378	380	388	385	370	345	318	265	165					
U Q						165	245	310	345	375	390	395	400	395	380	355	320	A 270						
L Q						145	205	280	330	355	370	375	A 375	380	365	340	310	255						

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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	E B 15	E B 16	E B 14	E B 13	E B 14	E B 14	G	33	36	41	E B 70	42	40	G	G 37	G 31	G	27	E B 17	J A 24	J A 34	J A 21	E B 15	E B 14
2	E B 14	E B 13	E B 13	21	E B 13	E B 13	G	31	35	39	41	41	40	G	G 36	G	G	G	E B 18	E B 14	E B 14	J A 22	E B 15	J A 21
3	J A 21	E B 13	19	E B 14	18	E B 14	G	G	37	40	39	G	G	G	G	G	G	G	J A 31	21	22	20	22	J A 36
4	20	E B 14	E B 15	E B 13	E B 14	J A 14	24	G 27	35	40	41	42	43	41	40	43	33	29	J A 28	J A 27	J A 34	J A 30	J A 22	E B 15
5	20	E B 13	E B 14	E B 14	19	K 14	G	G 24	37	45	43	41	40	40	37	J A 42	36	G	24	J A 35	22	E B 13	E B 15	E B 15
6	E B 15	E B 13	E B 14	E B 13	E B 13	E B 14	G	G	G	J A 42	G	G 36	40	G 35	40	G	G	29	20	J A 18	23	22	19	17
7	17	E B 13	E B 13	J A 16	E B 13	E B 14	G	31	39	42	47	J A 51	70	42	38	G 29	J A 47	J A 50	J A 40	J A 51	J A 29	J A 27	20	28
8	J A 28	J A 21	22	22	J A 19	E B 14	G	32	42	42	46	45	45	J A 51	J A 54	J A 53	J A 68	J A 42	J A 41	J A 29	J A 22	J A 21	E B 15	J A 22
9	18	J A 20	17	E B 15	E B 14	E B 14	G	G	35	40	43	45	45	47	43	42	40	36	G	20	J A 22	21	21	E B 14
10	J A 52	J A 71	J A 29	J A 24	J A 24	E B 13	25	35	36	43	43	43	43	J A 49	J A 49	96	J A 85	60	48	J A 24	J A 47	J A 21	20	J A 38
11	J A 19	E B 13	E B 13	E B 14	E B 13	E B 14	G 20	33	39	40	38	40	J A 52	42	43	41	34	32	53	J A 34	J A 36	J A 33	E B 16	E B 15
12	19	E B 13	21	E B 13	E B 13	E B 13	G	34	J A 49	J A 50	51	J A 51	J A 52	J A 60	J A 64	40	J A 54	J A 48	J A 61	44	J A 52	J A 121	J A 22	21
13	E B 15	E B 13	E B 13	E B 13	E B 13	E B 15	26	36	39	42	J A 45	43	40	43	42	37	34	36	J A 45	J A 47	J A 19	E B 15	E B 15	E B 15
14	E B 14	E B 13	E B 14	E B 13	E B 13	E B 14	G	33	39	J A 55	J A 67	47	42	41	J A 60	G	G	35	J A 37	39	36	J A 26	E B 13	E B 14
15	E B 14	E B 13	E B 14	E B 14	E B 13	E B 14	G	34	42	48	46	J A 48	44	40	38	J A 47	J A 59	J A 100	69	J A 51	J A 35	21	E B 14	J A 18
16	E B 13	J A 19	J A 20	E B 13	E B 14	E B 14	G	29	34	G	38	39	G 38	G 36	J A 47	38	47	31	J A 20	J A 19	20	E B 15	E B 15	E B 15
17	J A 21	J A 20	20	18	E B 13	E B 14	26	33	G	G	G	G	G	G	G	40	45	J A 44	51	J A 67	52	J A 22	J A 22	J A 22
18	J A 20	20	E B 13	E B 14	E B 13	E B 15	G	34	J A 37	G	44	J A 43	46	J A 52	43	J A 52	J A 44	J A 32	39	J A 42	32	J A 20	E B 14	E B 13
19	E B 14	E B 13	17	18	E B 13	E B 16	G	34	36	G 37	G	44	43	44	43	J A 52	E B 17	48	23	J A 33	E B 13	E B 14	40	J A 32
20	J A 42	J A 32	J A 31	J A 27	J A 29	20	29	36	40	J A 54	J A 54	50	109	J A 49	47	43	40	G	23	E B 12	J A 21	J A 23	J A 53	J A 47
21	J A 42	J A 50	J A 51	J A 55	J A 47	E B 17	33	J A 45	42	J A 55	107	J A 55	47	J A 68	J A 100	J A 140	J A 170	J A 45	J A 62	J A 51	J A 50	26	21	23
22	J A 27	J A 22	23	E B 14	E B 14	20	54	J A 55	43	41	47	G	48	47	51	48	J A 49	32	20	E B 14	E B 14	19	J A 52	J A 26
23	20	J A 42	J A 37	J A 44	J A 32	J A 28	G 21	J A 42	J A 49	J A 45	J A 51	45	43	J A 67	J A 51	57	G 24	G 25	J A 37	51	J A 120	J A 51	J A 49	J A 33
24	J A 36	J A 17	J A 20	J A 22	J A 29	J A 21	30	42	J A 53	49	44	J A 54	44	J A 49	J A 56	J A 73	84	69	J A 36	45	39	J A 80	E B 15	E B 13
25	E B 13	19	E B 14	E B 15	E B 15	G	27	36	J A 44	43	J A 45	59	52	49	47	60	44	J A 30	29	J A 63	J A 102	J A 36	J A 72	E B 13
26	E B 14	E B 13	20	E B 14	E B 13	E B 17	31	J A 42	J A 55	J A 43	43	41	G	G	39	G 34	G 29	J A 42	J A 29	J A 22	J A 34	J A 22	21	E B 14
27	21	23	E B 15	E B 14	E B 13	15	G	36	41	J A 52	54	49	J A 66	46	48	64	40	J A 49	58	J A 102	42	21	J A 24	J A 28
28	22	E B 13	E B 14	E B 14	E B 13	G	G	38	40	43	J A 64	J A 61	92	G	40	G	G 27	30	23	J A 21	E B 13	J A 21	J A 42	E B 13
29	E B 14	E B 14	E B 13	E B 14	E B 13	21	J A 44	36	42	J A 50	G	G	G	G	42	G	G	J A 33	J A 33	J A 27	J A 37	J A 28	J A 19	J A 30
30	61	24	J A 27	25	22	G	28	32	J A 45	41	39	J A 54	J A 51	J A 42	G	G	33	J A 42	55	40	J A 45	J A 53	J A 48	J A 36
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	20	E B 15	16	E B 14	E B 14	E B 14	G	34	39	42	44	44	44	42	43	42	38	34	34	J A 34	J A 34	J A 22	20	20
U Q	J A 22	J A 21	J A 21	J A 21	J A 19	16	27	36	J A 42	J A 48	51	J A 50	51	J A 49	J A 49	52	J A 47	J A 45	48	J A 47	J A 42	28	24	28
L Q	E B 14	E B 13	E B 14	E B 14	E B 13	E B 14	G	G 31	36	40	39	G 41	G 40	G	G 38	G	G	G 29	23	21	22	21	E B 15	E B 14

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 16	E B 14	E B 13	E B 14	E B 14	G	32	35	39	E B 70	41	40	G	G 36	G 30	G	27	E B 17	22	30	19	E B 15	E B 14
2	E B 14	E B 13	E B 13	E B 13	E B 13	E B 13	G	31	34	38	40	40	40	G	G 35	G	G	G	E B 18	E B 14	E B 14	17	E B 15	17
3	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14	G	G	36	37	38	G	G	G	G	G	G	G	25	E B 13	E B 13	E B 14	E B 14	33
4	E B 14	E B 14	E B 15	E B 13	E B 14	E B 13	23	G 25	34	38	40	40	40	40	G	35	32	G	25	23	29	21	17	E B 15
5	E B 13	E B 13	E B 14	E B 14	E B 13	K 14	G	G 23	36	43	41	40	40	40	G 35	36	33	G	22	31	E B 14	E B 13	E B 15	E B 15
6	E B 15	E B 13	E B 14	E B 13	E B 13	E B 14	G	G	G	G	G	G 35	39	G 35	40	G	G	28	20	15	E B 13	E B 14	E B 13	E B 14
7	E B 15	E B 13	E B 13	E B 13	E B 13	E B 14	G	31	37	39	45	48	62	40	37	G 28	35	36	36	37	16	20	E B 14	21
8	20	20	E B 14	E B 14	E B 14	E B 14	G	31	36	41	44	43	43	48	45	48	47	39	38	26	21	17	E B 15	E B 15
9	E B 14	E B 13	E B 14	E B 15	E B 14	E B 14	G	G	34	40	43	44	44	46	42	40	38	34	G	E B 14	15	E B 14	E B 14	E B 14
10	16	32	17	E B 14	17	E B 13	25	34	35	40	43	43	42	47	47	89	41	37	38	18	22	19	17	31
11	18	E B 13	E B 13	E B 14	E B 13	E B 14	G 18	32	37	39	U Y 38	U Y 40	44	41	42	40	34	31	45	30	28	17	E B 16	E B 15
12	E B 14	E B 13	E B 13	E B 13	E B 13	E B 13	G	32	42	47	49	50	48	58	42	39	49	46	61	41	29	30	19	E B 14
13	E B 15	E B 13	E B 13	E B 13	E B 13	E B 15	26	34	38	41	41	41	40	43	41	36	33	34	39	34	17	E B 15	E B 15	E B 15
14	E B 14	E B 13	E B 14	E B 13	E B 13	E B 14	G	32	38	47	61	41	41	40	50	G	G	34	34	36	30	16	E B 13	E B 14
15	E B 14	E B 13	E B 14	E B 14	E B 13	E B 14	G	34	39	43	44	G	43	40	37	45	58	65	62	18	20	E B 15	E B 14	E B 14
16	E B 13	14	E B 14	E B 13	E B 14	E B 14	G	29	34	G	U Y 38	U Y 39	U G 38	G 35	44	38	38	30	20	17	E B 13	E B 15	E B 15	E B 15
17	18	E B 13	E B 13	E B 15	E B 13	E B 14	26	31	G	G	G	G	G	G	G	40	44	42	44	63	39	18	E B 13	E B 14
18	16	E B 13	E B 13	E B 14	E B 13	E B 15	G	34	G 32	G	43	42	43	50	43	39	39	30	32	40	20	18	E B 14	E B 13
19	E B 14	E B 13	E B 13	E B 14	E B 13	E B 16	G	34	36	G 35	G	43	43	42	42	47	E B 17	40	20	30	E B 13	E B 14	28	E B 14
20	33	18	17	19	17	E B 16	28	34	39	50	51	49	U Y 109	47	45	42	38	G	21	E B 12	15	E B 13	36	28
21	30	39	34	34	27	E B 17	30	40	40	54	86	54	45	62	89	A A 140	65	39	33	27	40	16	E B 13	E B 15
22	20	19	15	E B 14	E B 14	20	48	50	42	41	42	G	44	47	49	45	40	31	20	E B 14	E B 14	E B 14	E B 14	19
23	E B 15	15	21	16	E B 14	23	G 21	40	43	43	48	44	42	52	40	48	G 23	G 23	30	31	27	30	22	23
24	18	E B 14	E B 14	17	26	19	30	41	49	48	43	46	43	43	50	46	68	61	32	29	33	50	E B 15	E B 13
25	E B 13	E B 13	E B 14	E B 15	E B 15	G	27	35	42	42	42	56	49	48	46	54	35	28	28	60	34	17	50	E B 13
26	E B 14	E B 13	E B 13	E B 14	E B 13	E B 17	30	35	49	41	42	41	G	G	38	G 34	G 29	40	25	E B 13	22	17	E B 13	E B 14
27	E B 13	16	E B 15	E B 14	E B 13	G	G	35	37	43	52	42	64	44	44	56	40	46	51	71	32	E B 13	17	27
28	E B 14	E B 13	E B 14	E B 14	E B 13	G	G	34	39	41	62	61	84	G	40	G	G 26	30	22	19	E B 13	19	22	E B 13
29	E B 14	E B 14	E B 13	E B 14	E B 13	G	40	34	40	43	G	G	G	G	41	G	G	31	29	24	20	17	16	27
30	41	16	21	23	E B 14	G	27	32	40	39	39	52	43	40	G	G	32	37	44	31	41	28	23	26
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	E B 14	E B 13	E B 14	E B 14	E B 13	E B 14	G	33	37	41	42	42	43	40	42	39	34	32	30	26	20	17	E B 15	E B 15
U Q	18	16	15	15	14	E B 15	27	34	40	43	48	46	44	47	45	46	40	39	38	34	30	19	17	21
L Q	E B 14	E B 13	E B 13	E B 13	E B 13	E B 14	G	G 31	35	G 38	39	G 40	G 40	G	G 37	G	G	G 28	21	E B 17	E B 14	E B 14	E B 14	E B 14

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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	15	16	14	13	14	14	13	14	17	20	70	34	34	30	23	20	16	15	17	14	13	13	15	14
2	14	13	13	13	13	13	16	16	19	18	26	30	29	E S 34	31	18	18	15	18	14	14	13	15	16
3	14	13	14	14	14	14	14	14	16	20	23	E S 30	34	33	32	25	18	16	13	13	13	14	14	15
4	14	14	15	13	14	13	14	16	17	18	21	32	29	24	24	17	17	13	13	13	14	14	15	15
5	13	13	14	14	13	14	15	13	16	21	32	32	30	30	22	17	16	13	14	13	14	13	15	15
6	15	13	14	13	13	14	15	15	17	22	18	21	26	27	21	21	16	16	13	13	13	14	13	14
7	15	13	13	13	13	14	16	15	18	18	18	21	23	32	23	18	15	13	15	14	14	13	14	13
8	15	13	14	14	14	14	16	16	17	18	22	22	22	28	19	24	16	13	15	13	14	15	15	15
9	14	13	14	15	14	14	15	16	16	20	20	22	32	20	20	19	17	15	13	14	14	14	14	14
10	13	15	13	14	14	13	16	15	16	19	30	27	25	21	20	20	17	14	13	14	13	15	14	14
11	14	13	13	14	13	14	14	13	17	18	20	22	22	23	18	16	16	16	14	13	16	13	16	15
12	14	13	13	13	13	13	14	15	16	18	21	21	23	22	22	20	19	13	13	13	14	14	14	14
13	15	13	13	13	13	15	15	14	17	20	18	24	27	25	18	17	13	13	13	13	13	15	15	15
14	14	13	14	13	13	14	15	16	15	20	21	21	25	33	24	17	18	15	14	13	13	13	13	14
15	14	13	14	14	13	14	13	14	16	19	21	25	20	31	31	18	17	15	14	14	14	15	14	14
16	13	13	14	13	14	14	15	13	17	21	22	31	32	25	25	20	17	13	13	13	13	15	15	15
17	13	13	13	15	13	14	16	15	16	21	26	30	28	36	31	21	18	16	15	14	14	14	13	14
18	13	13	13	14	13	15	16	16	18	23	31	26	31	33	28	18	18	14	13	16	14	13	14	13
19	14	13	13	14	13	16	16	16	16	18	22	33	34	34	22	21	17	16	13	13	13	14	14	14
20	13	13	13	14	13	16	17	16	18	24	25	34	33	27	25	22	20	17	16	12	13	13	15	15
21	14	13	13	13	13	17	15	15	23	30	35	34	31	27	23	17	17	16	15	13	14	13	13	15
22	13	13	13	14	14	14	17	17	20	23	27	37	32	34	23	23	20	17	15	14	14	14	14	14
23	15	14	14	15	14	13	18	18	19	24	26	31	33	23	21	18	18	16	15	18	15	16	15	15
24	14	14	14	13	14	13	17	18	22	25	25	25	31	27	20	18	17	16	16	13	13	14	15	13
25	13	13	14	15	15	13	16	16	20	E S 30	30	36	35	40	31	23	18	15	13	13	13	13	14	13
26	14	13	13	14	13	17	17	18	18	20	20	29	32	33	33	18	17	16	14	13	13	14	13	14
27	13	14	15	14	13	13	17	16	18	20	35	31	32	35	34	21	16	16	13	14	13	13	13	14
28	14	13	14	14	13	13	16	17	18	27	30	31	35	39	31	30	18	14	15	13	13	14	15	13
29	14	14	13	14	13	13	14	16	17	25	31	26	28	31	18	18	16	13	14	14	13	13	13	14
30	15	13	14	13	14	14	17	16	16	22	23	31	23	17	20	18	16	16	15	13	18	13	14	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	14	13	14	14	13	14	16	16	17	20	24	30	30	30	23	18	17	15	14	13	14	14	14	14
U Q	14	13	14	14	14	14	16	16	18	23	30	32	32	33	31	21	18	16	15	14	14	14	15	15
L Q	13	13	13	13	13	13	15	15	16	19	21	24	25	25	20	18	16	13	13	13	13	13	14	14

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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	275	260	255	290	280	280	320	320	300	300	290	290	285	280	275	280	280	300	300	R 310	290	275	260	280
2	265	260	280	290	265	275	310	310	305	300	295	290	280	280	285	285	290	295	300	300	295	285	285	285
3	280	290	295	295	260	245	320	335	305	305	285	295	285	285	280	280	290	285	290	310	295	280	270	250
4	255	235	255	255	230	245	260	250	250	250	255	R 285	285	290	295	295	300	300	310	305	285	255	250	260
5	290	290	260	255	265	260	320	325	305	305	300	290	295	285	285	290	295	295	310	300	280	270	260	275
6	255	270	275	280	285	285	315	305	300	300	295	280	280	290	290	285	275	290	310	305	290	265	275	S 255
7	255	275	285	280	260	260	310	300	300	280	R 265	250	240	260	265	285	300	310	315	295	265	265	270	280
8	270	270	265	265	265	F 270	315	310	310	300	300	285	285	275	275	285	290	295	305	315	290	265	265	260
9	F 275	295	295	265	270	260	305	310	305	310	290	290	290	280	280	290	295	300	310	315	300	270	280	270
10	270	285	280	285	280	270	310	315	320	300	300	285	280	285	285	290	290	300	300	305	280	280	285	270
11	275	270	295	320	270	280	310	315	305	310	280	280	285	280	275	280	295	295	300	305	305	275	280	275
12	280	280	280	295	285	285	320	315	300	300	290	285	285	280	275	275	285	295	315	310	310	265	265	275
13	275	275	275	280	290	280	315	310	310	290	280	275	280	285	285	290	295	305	310	305	270	265	260	255
14	250	290	315	315	275	290	315	320	300	285	285	280	275	280	285	285	285	300	310	305	265	260	265	270
15	270	275	290	280	260	260	315	320	320	305	275	275	265	275	280	290	290	290	300	295	285	255	260	265
16	265	275	285	285	290	270	290	300	295	290	265	280	270	285	280	290	290	300	300	295	275	270	270	270
17	255	260	280	280	270	280	320	305	305	295	275	270	275	275	285	290	295	285	R 300	290	275	275	270	270
18	275	275	275	270	275	270	305	310	305	290	280	270	265	270	280	280	280	285	R 290	285	280	255	265	265
19	255	260	250	280	310	310	320	295	285	280	275	275	270	275	275	270	280	285	290	285	260	250	250	260
20	265	255	275	250	265	280	320	305	305	280	270	270	A 265	275	265	265	275	285	295	280	255	255	245	255
21	270	270	255	270	255	260	285	275	280	255	A	285	R 295	285	A 280	I A 285	290	285	290	285	245	250	255	255
22	255	265	270	265	260	275	310	305	280	280	270	265	265	255	260	265	265	280	285	265	260	260	260	265
23	270	270	260	255	255	285	315	305	290	285	275	275	275	270	280	280	280	275	295	300	270	250	250	265
24	265	270	290	265	250	265	310	295	300	285	R 270	270	275	265	260	260	270	280	J R 295	280	V 265	250	260	265
25	270	295	260	245	250	275	315	315	300	285	280	270	270	270	265	275	280	285	290	275	260	J R 260	265	270
26	265	270	275	270	265	285	295	300	295	295	280	275	265	270	275	280	285	285	R 295	280	275	260	265	270
27	265	270	275	270	270	290	300	295	290	290	270	265	280	280	280	280	280	295	300	295	270	260	265	265
28	270	255	270	280	275	295	310	300	290	285	265	275	275	280	285	280	285	280	R 300	R 310	285	260	265	255
29	255	265	300	275	280	265	300	300	285	280	R 265	280	285	290	280	290	300	305	295	290	275	270	280	275
30	270	280	300	295	270	280	305	300	295	290	285	285	290	275	275	290	290	295	300	300	285	260	265	265
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	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	270	270	275	280	270	275	310	305	300	290	280	280	280	280	280	285	290	295	300	300	278	262	265	265
U Q	275	280	290	285	280	285	315	315	305	300	290	285	285	285	285	290	295	300	310	305	290	270	270	270
L Q	255	265	265	265	260	265	305	300	290	285	270	270	270	275	275	280	280	285	295	285	265	255	260	260

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

IONOSPHERIC DATA STATION KOKUBUNJI

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	B	L	L	L	L	L	L	L						
2										L	L	L	L	L	L	L	L							
3										L	L	L	L	L	L	L	L							
4								L U L 300	U L 320	360	L 330	L 330	U L 330	L	L	L								
5										L	L	L	L	L	L	L								
6									L	L	L	L	L	L	L	L								
7										L	L	L	A	L	L	L	L							
8									L	L	L	L	U L 345	L	L	L								
9								L	L	L	L	L	L	L	L	L	L							
10									L	L	L	L	U L 320	L	L	A								
11									L	L	L	U L 345	L	L	L	L	L							
12									L	L			L	L	L	L								
13									L	L	L	L	U L 340	U L 330	U L 340	L	L							
14									L	L	A	L	L	L	L	L	L							
15										L	L	U L 345	U L 330	L 335	L	L	A	A						
16									L	L	L	L 330	L	L 335	L	L	L							
17								L	L	L	L	L	L	L	L 345	L								
18									L	L	L	L	L	U L 325	L 330	L	L							
19								L	L		L	L 335	U L 365	L	L		L							
20									L	L	U L 315	U L 310	A	L	L	U L 285	L	L						
21								L	L	L	A	L	L	A	A	A	A							
22									L	L	L	L	U L 320	L 315	L	L	L							
23									U L 315	L	U L 360	L	L	L	L	L	L							
24								L	L	L	L	L	L	U L 330	L	U L 325	A							
25									L	L	L	L	L	L	L	L	L	L						
26										L	L	L	L	L 325	U L 320	L	L							
27						L		L		L		U L 340	A	L	U L 335	L								
28								L		U L 340	A	A	A	L	L	L	L	L						
29								L	L	L	U L 310	L 330	L 360	350	U L 345	L	L							
30									L U L 375		L 355	L	U L 335	L	U L 335	L	L							
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								1	2	3	5	8	9	8	7	2								
MED								U L 300	U L 318	U L 360	U L 330	L 332	U L 335	L 330	U L 335	U L 305								
U Q										U L 375	L 358	U L 342	U L 352	L 335	L 345									
L Q										U L 340	U L 312	L 330	U L 325	L 325	L 330									

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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										265	B 275	300	270	310	305	300	300	265						
2										260	260	270	L 300	310	305	300	280							
3										255	L 275	270	285	300	300	300	300							
4							325	385	385	390	360	310	300	300	300	300								
5										255	250	260	275	320	300	285								
6									245	260	265	L 320	280	305	285	300								
7										280	320	315	365	305	315	295	265							
8									270	280	280	270	285	L 350	320	305								
9								255	255	260	270	290	290	325	305	290	280							
10									255	250	275	320	315	300	295	A 310								
11									260	255	L 320	300	295	300	320	305	280							
12									270	270			285	320	320	L 300								
13									250	270	U L 340	310	315	320	310	295	275							
14									240	L 280	295	300	310	315	315	285	275							
15										265	L 260	300	330	315	315	290	275	A 275						
16									255	265	L	305	325	320	300	280	270							
17							255		255	265	260	L 350	H 285	305	315	290								
18									260	260	270	L 280	345	345	330	310	290							
19								240	315		L 325	330	305	330	310		305							
20									255	305	335	350	A	325	335	340	305	265						
21							290	365	325	420	A	325	315	310	A	A	315							
22									L 310	280	330	350	345	380	345	335	320							
23									345	275	300	315	285	330	300	L 305	L 305							
24								L 285	290	325	L 320	350	325	340	340	350	A 315							
25									280	270	275	310	330	350	330	320	295	260						
26										255	310	315	350	335	320	300	290							
27						300		265		310		325	320	305	320	305								
28								230		300	295	310	A 330	315	300	300	300	295						
29								280	285	300	360	310	305	300	315	300	265							
30									300	260	310	310	300	330	320	290	290							
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						1	3	8	21	29	26	29	29	30	29	28	22	5						
MED						300	290	272	270	270	295	310	305	318	315	300	290	265						
U Q							325	325	305	290	320	322	328	330	320	305	305	285						
L Q							255	248	255	260	270	300	285	305	300	292	275	262						

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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	285	295	315	260	205	235	220	225	230	230	B	235	210	230	225	230	250	255	250	225	230	255	290	285
2	285	300	275	235	235	280	230	230	230	230	225	210	H 210	200	240	235	245	250	250	235	235	250	250	270
3	280	270	265	250	310	H 365	225	225	225	225	210	225	210	220	230	230	250	255	270	245	245	240	295	A 340
4	340	370	310	300	370	325	295	270	240	230	215	H 200	225	230	220	210	245	255	255	250	270	320	325	305
5	250	230	280	315	315	320	250	240	230	240	240	220	220	H 225	220	240	245	250	245	250	230	265	305	300
6	315	300	275	260	245	250	240	245	230	230	225	H 220	210	210	245	240	245	255	255	210	225	270	300	315
7	330	285	250	250	280	315	235	230	240	235	E A 255	A	A	215	230	H 225	A 250	250	245	A 250	260	300	290	300
8	300	305	300	255	305	300	230	235	240	235	235	225	230	A 255	255	A	A 265	265	A 250	235	A 240	270	300	325
9	290	255	250	265	290	315	255	240	235	230	225	220	230	250	250	250	250	260	245	230	220	255	280	290
10	300	305	280	245	250	265	240	235	230	240	230	230	220	A 250	A 260	A	A 255	A 260	A 255	235	235	270	275	A 310
11	300	300	265	230	H 240	280	240	235	235	230	H 215	215	230	230	250	255	250	255	A 260	250	240	250	275	280
12	280	285	285	245	220	265	230	230	245	A 250	E A 260	E A 260	A 250	A	240	245	A 285	270	E A 260	240	A 240	E A 290	305	300
13	295	290	285	265	240	270	240	230	225	225	H 220	210	210	240	240	240	250	255	245	250	240	265	290	310
14	330	275	235	225	250	275	240	230	230	A 255	A	230	220	235	A	225	250	A 260	245	240	250	280	295	300
15	305	285	260	225	295	300	230	235	235	240	220	215	225	220	H 225	A 280	A	A	A	230	245	255	295	305
16	300	290	270	235	250	290	240	235	230	220	205	205	220	220	A	250	A 245	245	240	235	255	280	275	295
17	325	315	275	235	255	270	235	225	235	225	205	225	220	235	235	235	255	A 260	A 255	A	A 275	275	280	295
18	295	285	280	280	270	285	235	240	235	230	220	225	225	A 260	A 240	A 245	A 245	255	265	260	255	275	300	295
19	325	325	325	270	235	235	225	240	H 225	H 215	H 205	215	230	H 230	215	290	A 255	A 270	250	250	250	265	330	315
20	A 330	335	290	295	300	270	235	235	225	A 245	240	240	A	260	A 255	240	255	250	240	240	270	310	E A 390	A 350
21	A 310	315	A 310	A 315	A 325	315	280	265	240	A	A	A	A 240	A	A	A	A	265	255	A 260	A 340	335	310	320
22	335	315	275	260	275	270	240	A 265	235	225	215	235	230	230	A 255	A 260	A 255	250	255	265	260	290	305	305
23	290	295	310	295	280	280	235	245	235	230	A 255	A 225	245	A 265	205	A 265	235	245	265	265	260	A 325	340	335
24	310	300	275	245	A 325	265	225	235	A 245	240	210	A 250	220	225	E A 265	A 265	A	E A 270	250	265	A 305	E A 375	305	290
25	280	260	255	365	340	260	230	240	230	230	220	A	A 255	A 260	250	A	A 240	250	245	A	A 315	310	A	300
26	300	290	280	275	265	260	225	235	A 255	235	220	230	215	220	215	240	245	A 250	260	255	275	270	310	300
27	305	300	280	275	275	270	245	240	230	230	A 265	215	A	A 250	250	A	255	E A 270	A 265	E A 280	270	270	300	A 325
28	300	315	295	260	250	250	220	230	225	210	A	A	A	H 190	235	220	240	245	270	245	240	300	330	320
29	320	295	250	230	280	280	A 255	235	240	A 255	H 210	210	215	225	250	230	235	245	250	270	285	270	270	300
30	A 340	280	260	235	290	270	245	240	240	225	210	A	230	H 215	H 205	225	230	A 250	A 260	245	A 265	A 285	310	A 320
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	26	25	26	28	27	25	27	29	29	28	30	30	29	30
MED	300	295	278	260	275	272	235	235	235	230	220	222	222	230	240	240	250	255	252	246	252	271	300	302
U Q	325	305	290	275	300	300	240	240	240	240	A 235	230	230	A 250	A 250	A 252	A 255	A 260	260	258	270	300	310	320
L Q	290	285	265	235	250	265	230	230	230	225	210	215	215	220	225	230	245	250	245	235	240	265	285	295

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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							140	110	110	115	B	120	A	115	A	A 120	115	120	B					
2							140	115	110	A 125	115	A 120	115	S 120	A	120	120	120	B					
3							B 145	115	110	115	115	130	B 130	130	130	120	120	120	A					
4							130	A 135	110	110	115	A	A	120	120	A	A 130	115	A					
5						K 120	130	A 125	A 120	110	120	120	120	120	E A 140	A	A	115	B					
6							125	115	110	115	115	A	A	A 125	115	115	115	120	A					
7							B 140	115	110	110	110	110	110	A	A	A 125	A	A	A					
8							140	110	115	115	110	115	110	A	A	A	A	A	B					
9							120	115	115	110	110	115	120	A 115	115	115	115	115	130					
10						B	130	110	A	A	A	A	A	110	110	110	A	A	A					
11						B	A 130	A	E A 145	115	110	A 125	115	120	120	A 120	120	120	A					
12						B	125	110	110	110	110	110	110	115	A	A 125	A 125	A 120	A					
13						B	120	115	110	110	115	110	A	A 120	120	110	A 120	E A 135	A					
14						B	130	110	110	110	110	110	110	A	A	115	115	115	B					
15						B	120	110	110	110	110	110	110	120	A	A 110	115	115	A					
16						B	120	135	110	110	A	A	A	A	A	A 125	A	A	A					
17						B	120	115	110	115	115	115	115	E B 130	120	115	110	115	A					
18						B	120	110	E A 140	115	115	A	115	B 120	B 115	A	A	A	A					
19						B	120	110	A 125	A	110	115	B 120	125	115	110	110	115	A					
20						B	120	110	110	115	115	120	120	120	115	120	110	115	A					
21						B	120	110	115	120	B 120	120	120	115	115	110	110	120	125					
22						B	120	115	110	115	115	B 130	115	B 125	115	115	115	120	B					
23						A	A 125	115	115	110	120	120	A	A	A	A	120	A 130	A					
24						B	A 125	A	115	115	115	115	115	A	115	115	A	120	A					
25						E B 175	120	115	115	115	120	A	A	B	125	A	A	A	A					
26						B	125	115	110	A	110	A	120	120	A	A	A 130	120	A					
27						135	120	115	110	115	B 130	A	125	B 135	B 125	120	115	110	A					
28						B 160	120	120	115	120	120	120	B 130	B	125	120	A 130	120	A					
29						150	120	115	110	115	120	115	120	120	115	110	110	115	A					
30						B 155	120	110	110	115	110	115	A	A	110	110	115	115	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						6	30	28	29	27	27	22	21	21	20	23	22	24	2					
MED						147	122	115	110	115	115	115	115	120	115	115	115	119	128					
U Q						B 160	130	115	115	115	120	120	120	125	122	A 120	A 120	120						
L Q						135	120	110	110	110	110	115	112	118	115	110	115	115						

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

IONOSPHERIC DATA STATION KOKUBUNJI

APR. 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

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	B	B	B	B	B	B	G	150	150	150	B	125	120	G	110	115	G	140	B	110	110	110	B	B
2	B	B	B	110	B	B	G	160	145	140	130	125	120	G	120	G	G	G	B	B	B	110	B	105
3	110	B	110	B	110	B	G	G	140	130	125	G	G	G	G	G	G	G	120	120	115	120	105	110
4	115	B	B	B	B	140	135	115	140	130	120	110	130	130	125	115	170	140	120	115	115	110	110	B
5	115	B	B	B	110	K 115	G	110	135	120	125	125	125	125	120	115	120	G	120	115	115	B	B	B
6	B	B	B	B	B	B	G	G	G	115	G	115	125	110	E G 195	G	G	155	130	120	120	115	115	115
7	110	B	B	110	B	B	G	E G 160	150	140	120	110	105	115	110	110	100	100	125	115	115	110	120	110
8	110	105	105	100	110	B	G	160	140	130	125	120	115	110	105	105	100	100	100	100	120	120	B	120
9	115	110	115	B	B	B	G	G	155	140	125	120	125	170	160	150	130	125	G	120	110	110	115	B
10	105	110	110	110	110	B	E G 175	145	140	125	120	120	120	110	110	110	105	105	105	105	100	100	100	110
11	110	B	B	B	B	B	110	160	145	140	140	150	130	140	185	185	165	135	120	110	110	110	B	B
12	115	B	110	B	B	B	G	150	120	120	115	115	115	110	115	165	135	125	120	120	115	115	110	120
13	B	B	B	B	B	B	160	125	125	125	120	120	125	175	165	E G 175	E G 170	130	115	110	110	B	B	B
14	B	B	B	B	B	B	G	150	140	120	115	115	110	115	105	G	G	140	120	115	110	110	B	B
15	B	B	B	B	B	B	G	145	130	120	120	105	120	120	120	115	125	120	115	110	115	120	B	110
16	B	105	105	B	B	B	G	E G 170	115	G	110	110	110	110	105	E G 170	100	140	100	100	105	B	B	B
17	105	110	105	110	B	B	E G 175	155	G	G	G	G	G	G	G	150	130	120	115	110	110	105	100	100
18	115	105	B	B	B	B	G	150	110	G	115	115	110	110	110	110	100	105	100	100	100	100	B	B
19	B	B	115	115	B	B	G	E G 160	E G 160	110	G	150	150	E G 170	140	125	B	115	120	110	B	B	110	115
20	110	100	125	100	110	110	160	145	140	125	120	120	110	125	140	140	140	G 95	B	115	115	105	105
21	105	100	100	105	110	B	140	135	140	125	110	110	115	130	120	115	130	155	120	125	110	110	100	105
22	110	105	115	B	B	165	135	130	135	140	120	G	130	125	120	115	115	120	120	B	B	105	115	100
23	105	110	105	120	110	105	115	115	110	110	110	110	110	105	105	100	105	105	120	110	110	110	110	110
24	125	110	110	105	105	110	170	135	120	120	130	115	120	115	110	110	115	120	120	115	115	105	B	B
25	B	105	B	B	B	G	170	135	125	115	110	110	130	155	135	100	110	110	120	110	110	115	115	B
26	B	B	110	B	B	B	135	125	110	110	115	120	G	G	120	115	115	120	120	120	110	110	115	B
27	110	100	B	B	B	120	G	150	140	135	125	140	125	130	125	120	120	110	110	105	110	110	105	105
28	105	B	B	B	B	G	G	145	140	140	120	120	110	G	120	G	115	130	130	120	B	120	115	B
29	B	B	B	B	B	165	140	140	130	130	G	G	G	G	E G 180	G	G	130	120	120	125	115	115	110
30	110	110	110	105	110	G	150	E G 170	120	140	135	115	110	115	G	G	E G 180	120	110	110	110	110	105	110
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	19	14	15	11	9	8	14	27	28	27	25	26	26	23	27	23	23	26	27	27	26	26	19	17
MED	110	105	110	110	110	118	142	142	139	125	120	118	120	118	120	115	118	120	120	110	110	110	110	110
U Q	115	110	115	110	110	152	170	E G 160	140	140	125	120	125	130	140	150	135	135	120	120	115	115	115	112
L Q	105	105	105	105	110	110	135	135	122	120	115	110	110	110	110	110	105	110	110	110	110	110	105	105

IONOSPHERIC DATA STATION KOKUBUNJI

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

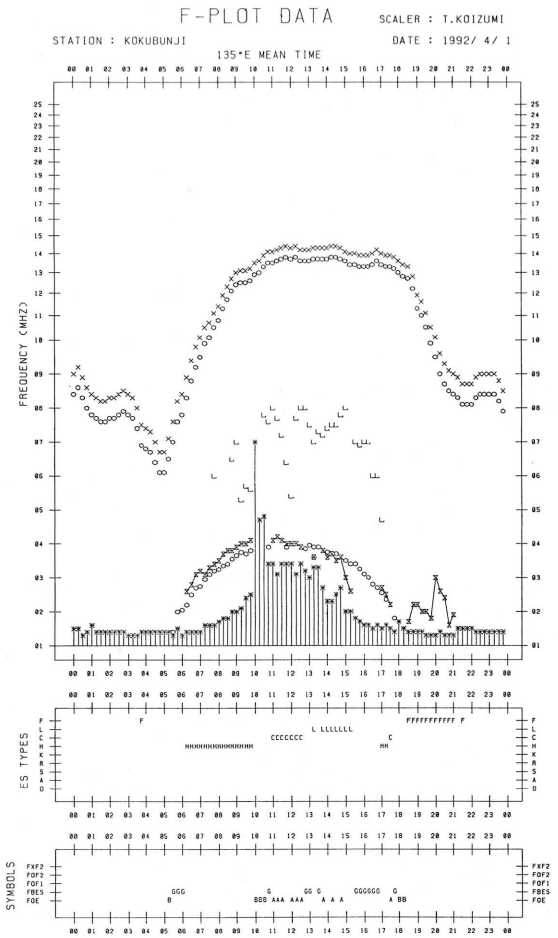
LAT. 35° 42.4'N LON. 139° 29.3'E SWEEP 1.0MHZ TO 25.0MHZ IN 24.0SEC IN MANUAL SCALING

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								H 1	H 1	H 1		C 1	C 1		L 1	L 1		H 1		F 5	F 5	F 3		
2				F 1				H 1	H 1	HL 11	H 1	CL 11	C 1		L 1							F 2		F 2
3	F 2		F 1		F 1				H 1	H 1	C 1								C 2	F 1	F 2	F 1	F 1	F 4
4	F 1					F 1	C 2	L 2	H 1	H 1	C 1	C 1	HL 11	H 1	C 1	L 1	HL 11	H 2	C 5	F 5	F 3	FF 32	F 2	
5	F 1				F 1	K 1		L 2	HL 22	C 2	C 1	C 1	C 1	C 1	L 1	L 2	C 2		C 3	F 6	F 1			
6										C 1		L 1	CL 11	L 1	H 1			H 1	C 2	F 1	F 1	F 2	F 2	F 1
7	F 1			F 1				H 1	H 1	H 2	C 2	C 2	C 4	L 2	L 2	L 2	L 3	C 3	CL 23	FF 52	FF 21	F 4	F 2	F 5
8	F 4	F 3	F 2	F 2	F 1			H 1	H 1	H 2	C 2	C 2	C 2	C 2	L 3	L 4	L 4	L 3	L 4	F 4	FF 31	F 3		F 2
9	F 1	F 1	F 1						H 1	H 1	H 1	C 2	C 1	HL 11	H 1	H 1	H 2	C 3		F 1	F 1	F 1	F 1	
10	F 2	F 3	F 3	F 2	F 2		H 1	H 2	HL 12	CL 12	CL 21	C 1	C 1	C 2	C 3	C 3	L 3	L 3	L 3	F 3	F 3	F 3	F 1	F 4
11	F 1						L 2	HL 13	HL 12	H 2	H 1	HL 11	H 1	HL 11	HL 11	HL 11	HL 21	H 2	C 4	F 5	F 5	F 3		
12	F 1		F 2					H 1	C 3	C 2	C 3	C 2	C 2	C 2	CL 21	HL 11	HL 41	C 4	C 4	F 6	F 3	F 3	F 3	F 1
13							H 1	H 2	H 2	C 2	C 1	C 1	CL 11	HL 11	HL 11	HL 11	HL 11	HL 23	CL 42	FF 52	FF 21			
14								H 1	H 2	C 2	C 2	C 1	C 1	L 1	L 3			H 2	C 3	F 5	F 6	F 3		
15								H 2	H 2	C 2	C 1	LC 11	C 1	C 1	C 1	C 2	C 4	C 4	C 4	F 3	F 2	F 1		F 1
16		F 2	F 2					HL 11	L 1		L 1	L 2	L 1	L 1	L 2	HL 11	L 3	HL 12	L 2	F 2	F 1			
17	F 2	F 1	F 2	F 1			H 1	H 1								H 1	H 2	C 4	C 5	F 7	F 5	F 2	F 2	F 2
18	FF 11	F 1						H 1	L 1		C 2	C 1	C 1	C 2	C 2	L 2	L 3	LH 31	L 3	F 4	F 3	F 2		
19			F 1	F 1				H 1	HL 11	L 1		H 1	H 1	H 1	H 1	H 2		C 3	C 2	F 4			F 5	F 2
20	F 3	F 2	FF 12	F 2	F 2	L 1	H 1	H 2	H 1	H 2	C 2	C 2	C 3	C 2	H 1	H 1	H 2		L 1		F 2	FF 21	F 3	F 4
21	F 3	F 6	F 3	F 3	F 5		H 1	H 2	H 1	H 2	C 2	C 2	C 1	H 2	C 3	C 3	HC 23	H 2	C 3	FF 15	F 3	F 2	F 2	F 2
22	F 3	F 5	F 2			H 1	HL 21	H 3	H 2	H 1	C 2		C 2	C 2	C 2	C 2	C 2	C 2	C 2			F 1	F 2	F 2
23	F 1	F 1	FF 21	FF 21	F 1	L 3	L 1	C 2	C 3	C 2	C 2	C 2	L 2	L 2	L 2	L 2	L 1	L 1	CL 21	F 2	F 3	F 2	F 2	F 2
24	FF 12	F 1	F 1	F 1	F 4	L 2	HL 11	HL 21	C 3	C 2	C 1	C 2	C 1	C 1	C 2	C 2	CL 43	C 4	C 2	F 4	F 4	F 4		
25		F 2					H 1	H 2	C 2	C 2	C 1	L 2	CL 12	H 1	H 1	L 3	L 2	L 2	CL 31	F 5	F 4	F 2	F 4	
26			F 1				H 1	C 1	C 3	C 2	C 2	C 1			L 1	L 1	L 1	C 3	C 3	F 2	F 3	F 2	F 1	
27	F 1	F 2				L 1		H 1	H 1	H 1	C 2	HC 11	CL 21	C 1	C 2	C 3	C 2	C 4	C 6	F 4	F 4	F 2	F 2	F 4
28	F 1							H 1	H 1	H 1	C 2	C 3	C 3		C 1		L 1	H 1	C 1	F 2		F 2	F 2	
29						H 1	H 3	H 1	H 2	H 2					H 1			H 1	C 2	F 3	FF 12	F 2	F 1	F 5
30	F 4	F 3	F 4	F 4	F 1		H 1	H 1	C 2	H 1	H 1	C 2	C 2	CL 11			H 1	C 3	C 3	F 4	F 3	F 4	F 3	F 4
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																								

APR. 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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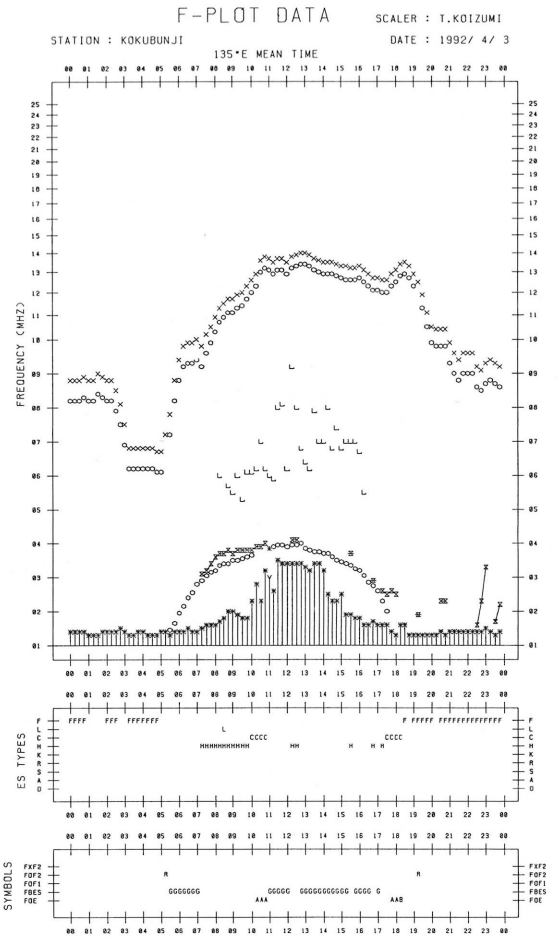
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/ 1
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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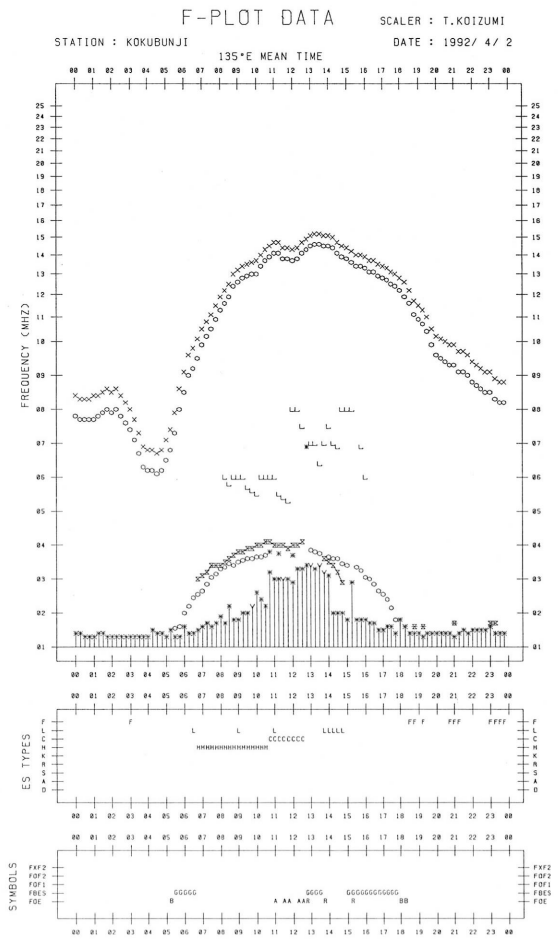
STATION : KOKUBUNJI
DATE : 1992/ 4/ 3
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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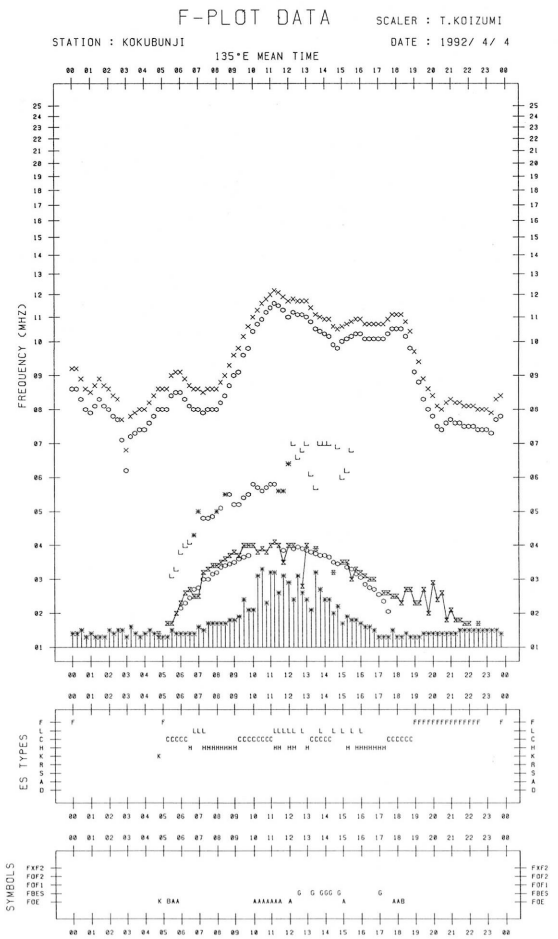
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/ 2
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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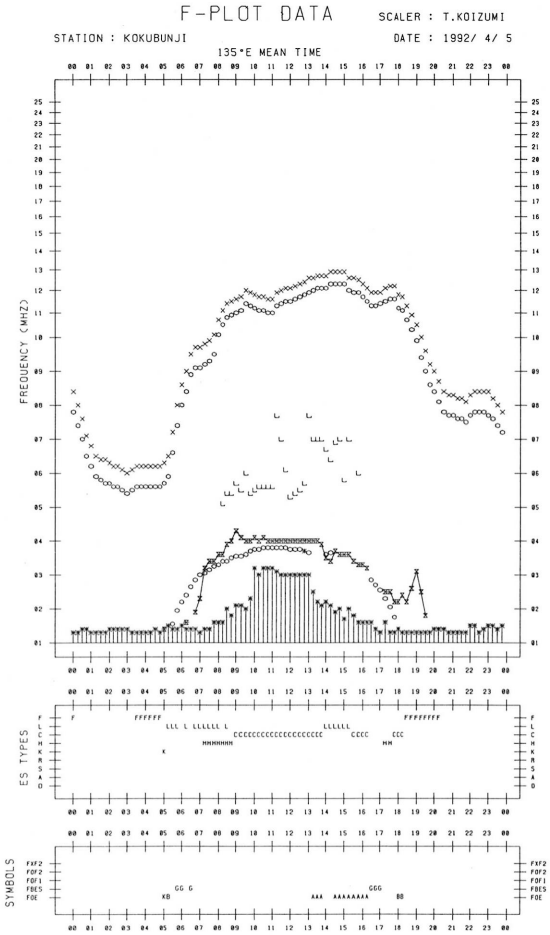
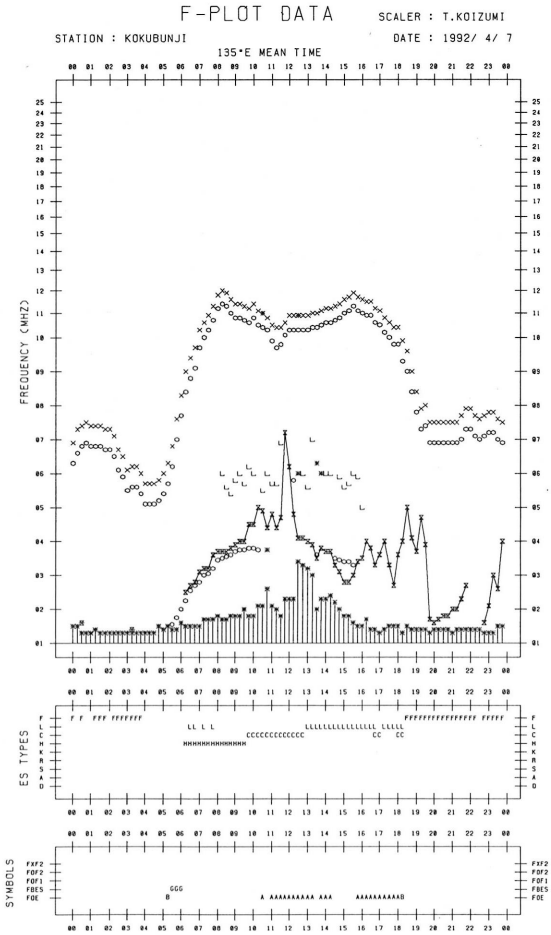
STATION : KOKUBUNJI
DATE : 1992/ 4/ 4
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/ 5
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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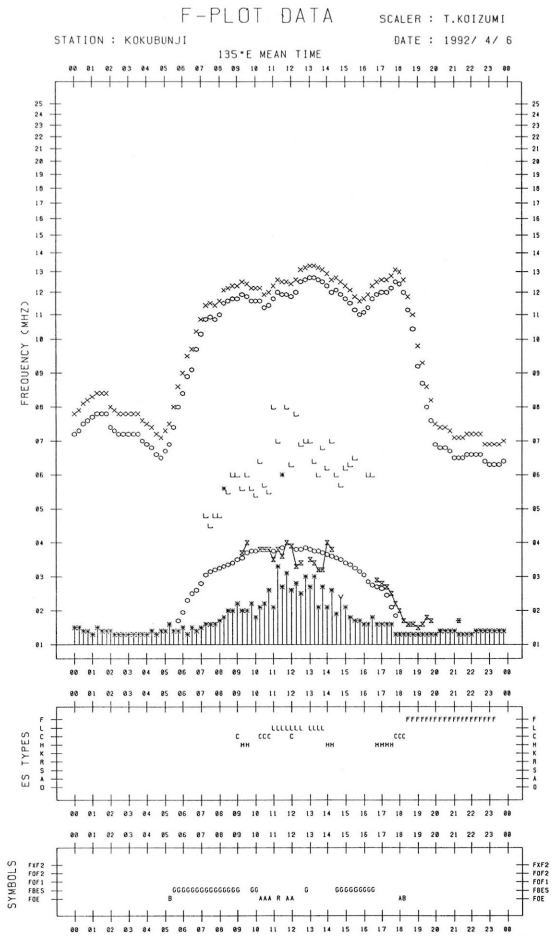
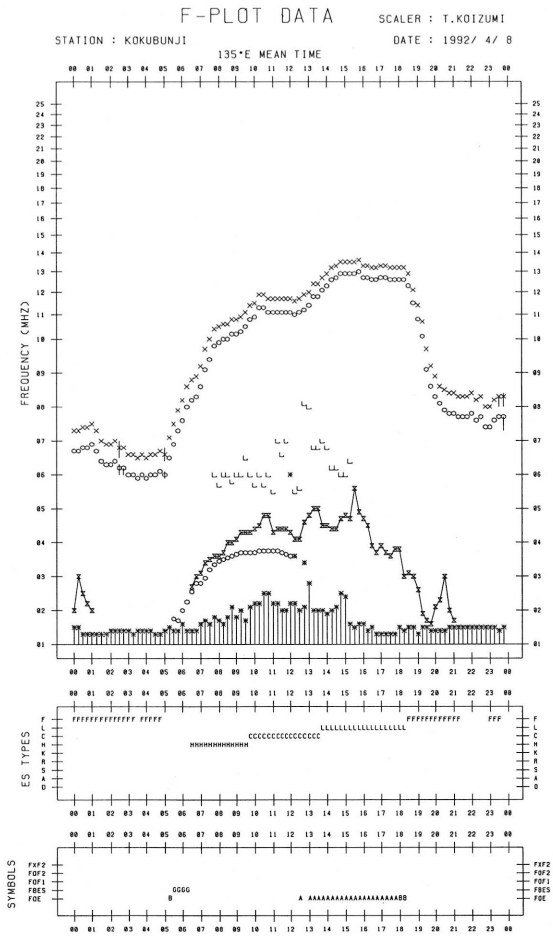
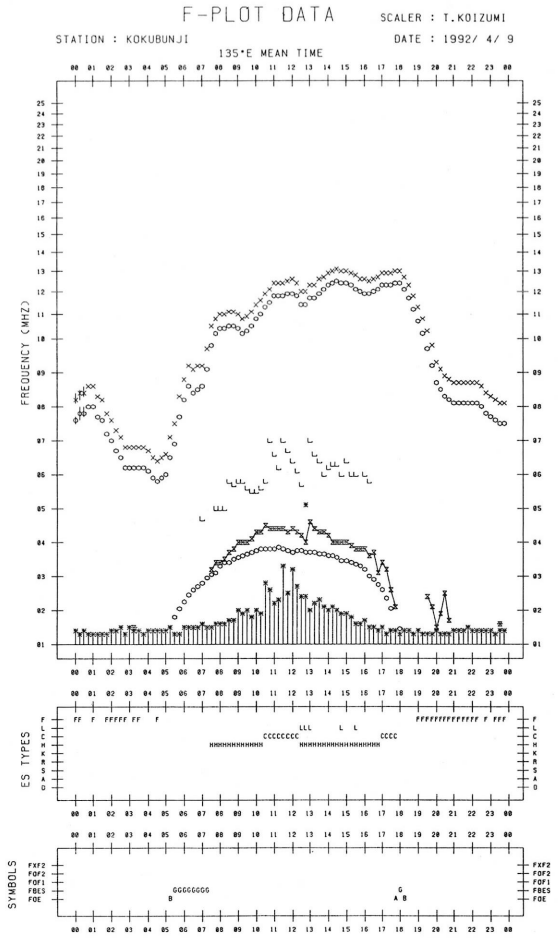
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/ 7
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/ 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/ 4/ 8
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE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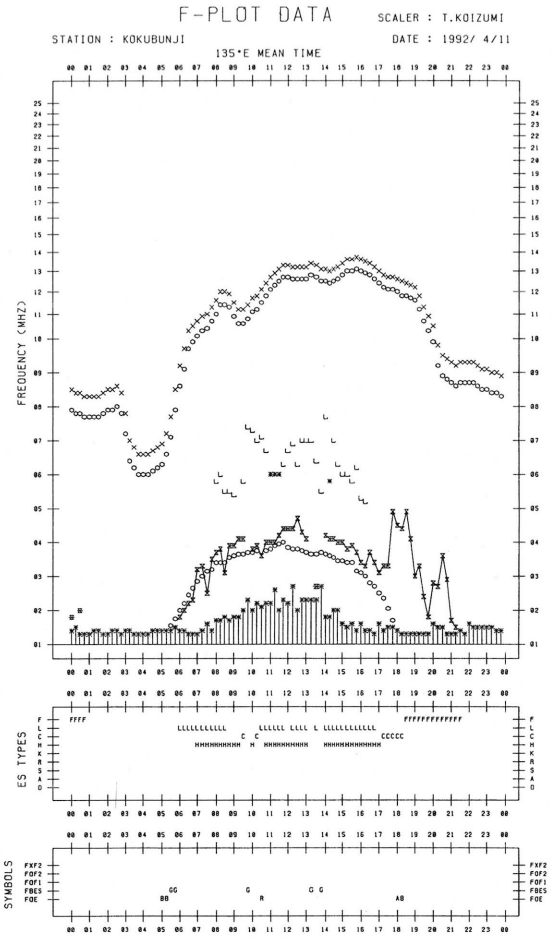
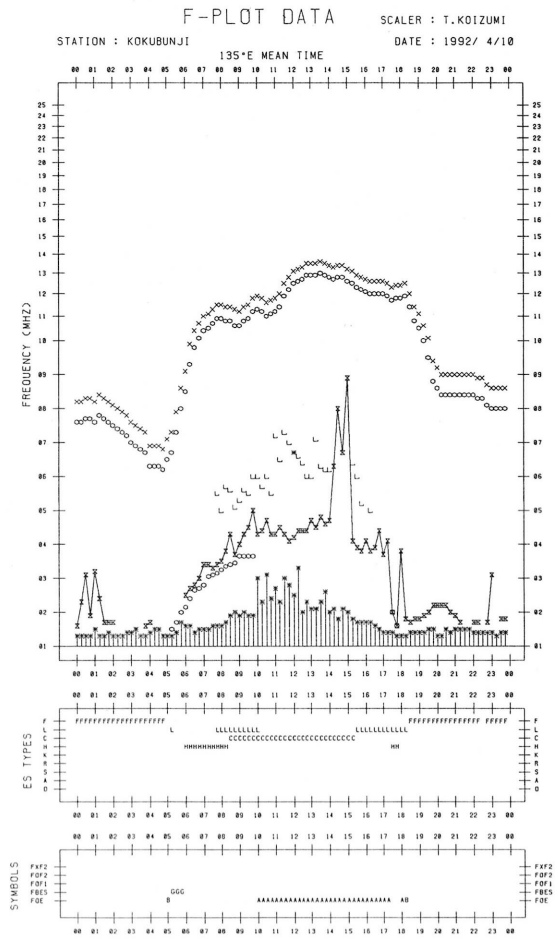
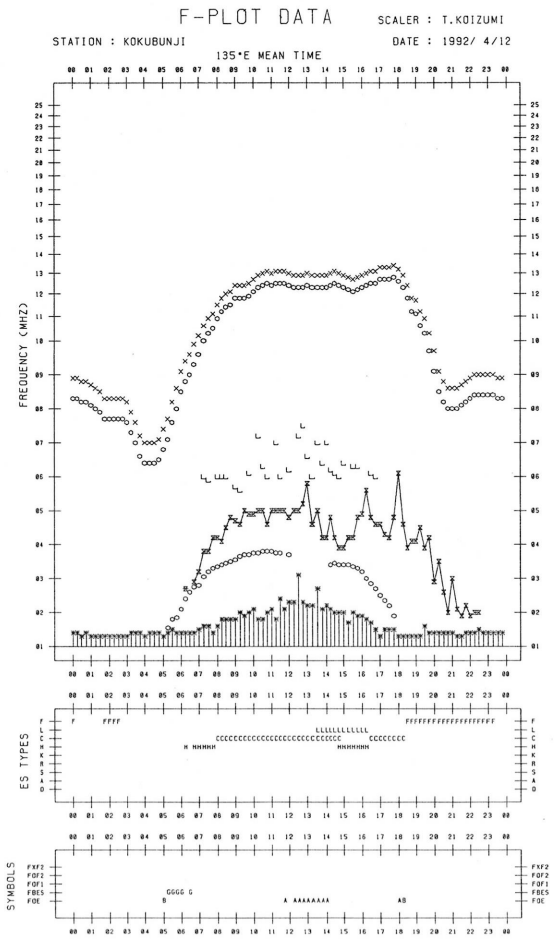
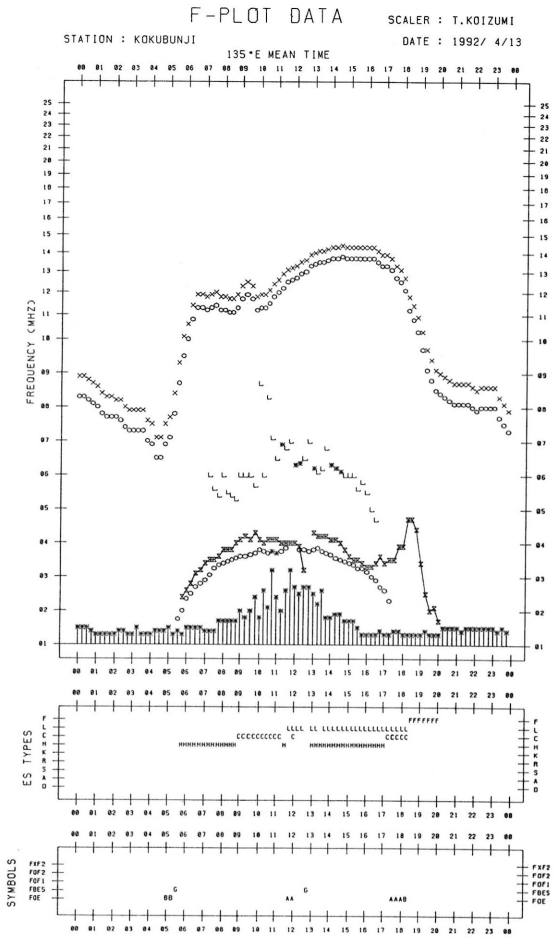
STATION : KOKUBUNJI
DATE : 1992/ 4/ 9
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/11
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/10
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/12
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
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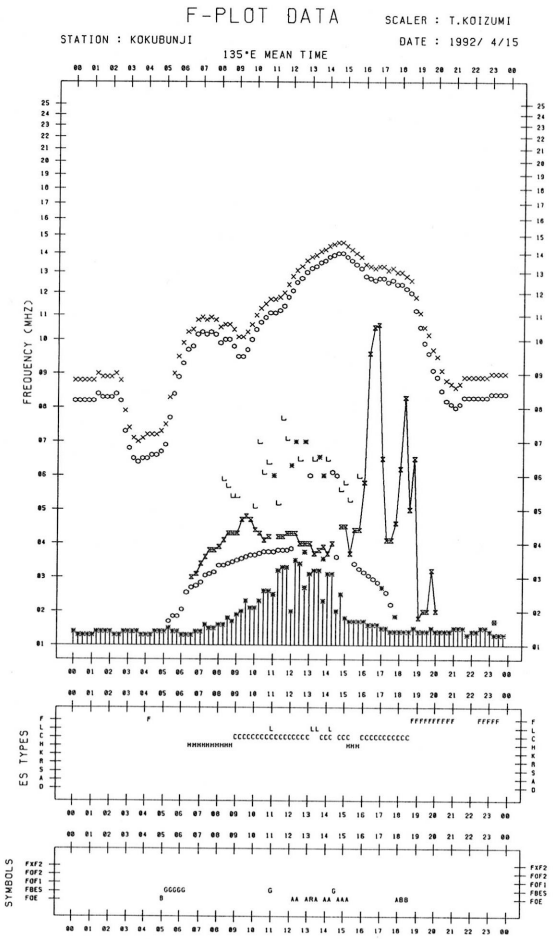
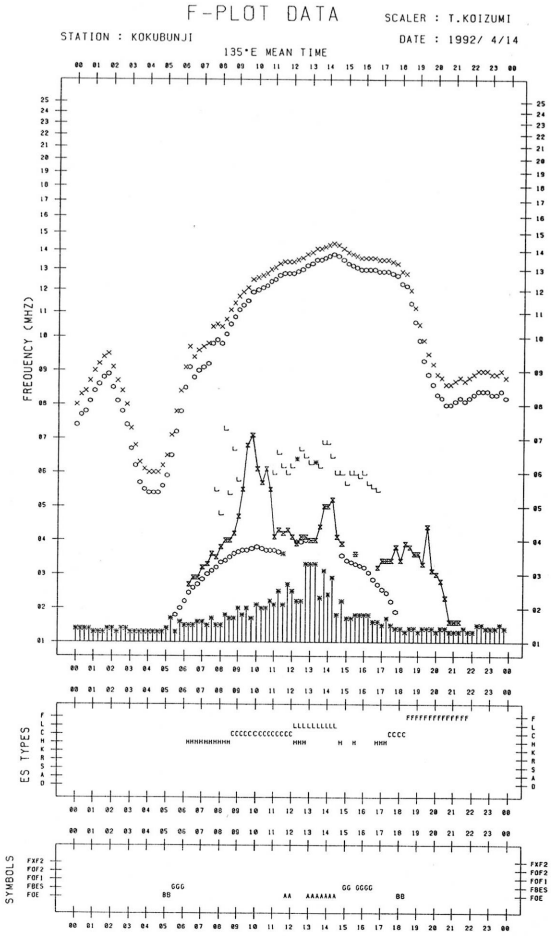
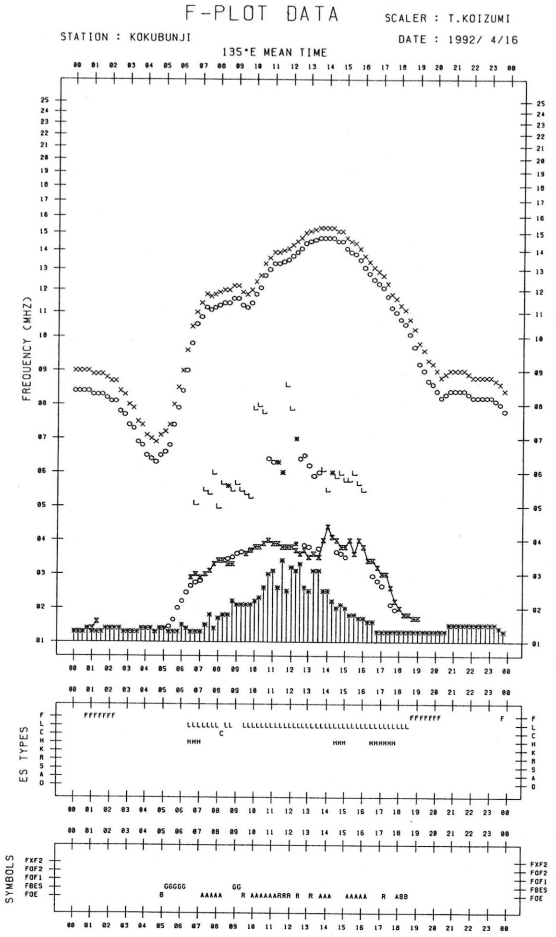
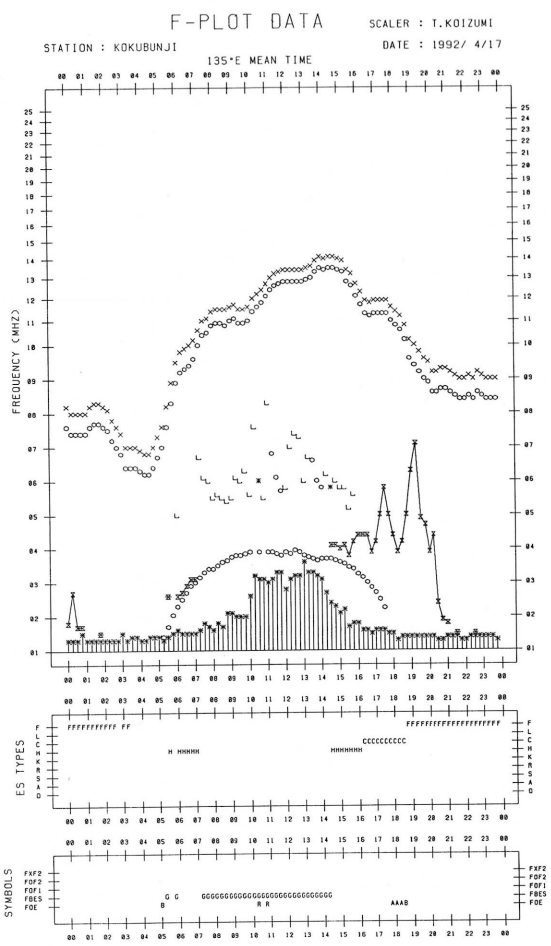
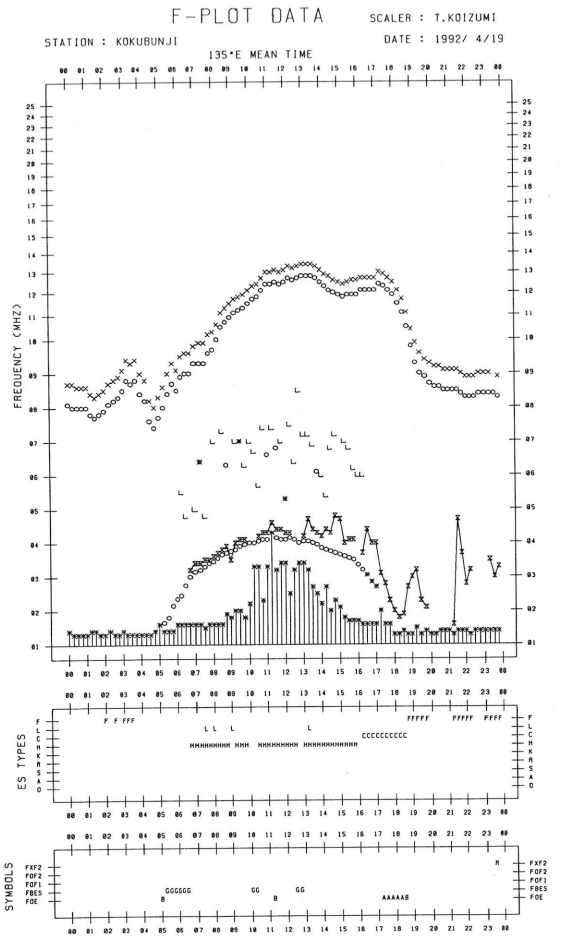
STATION : KOKUBUNJI
DATE : 1992/ 4/13
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

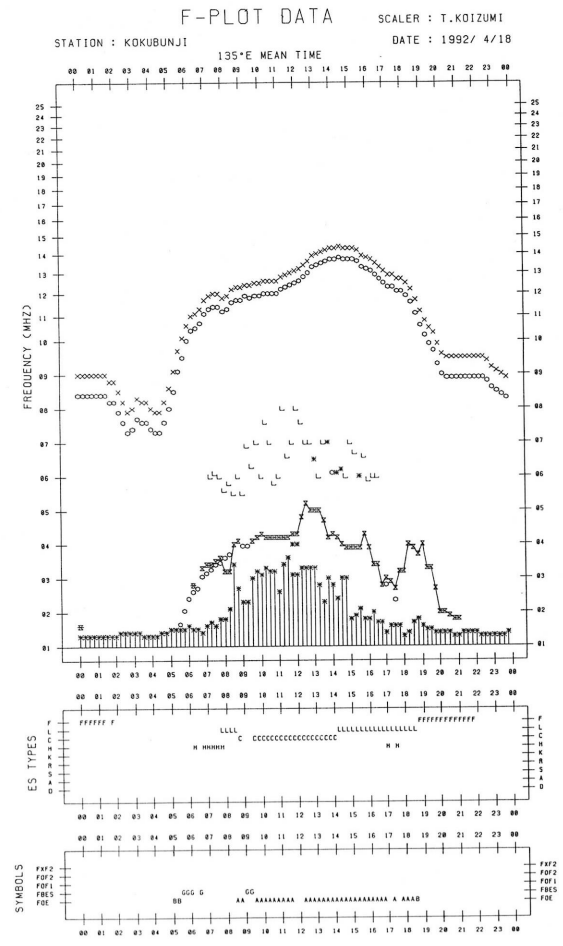

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/15
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

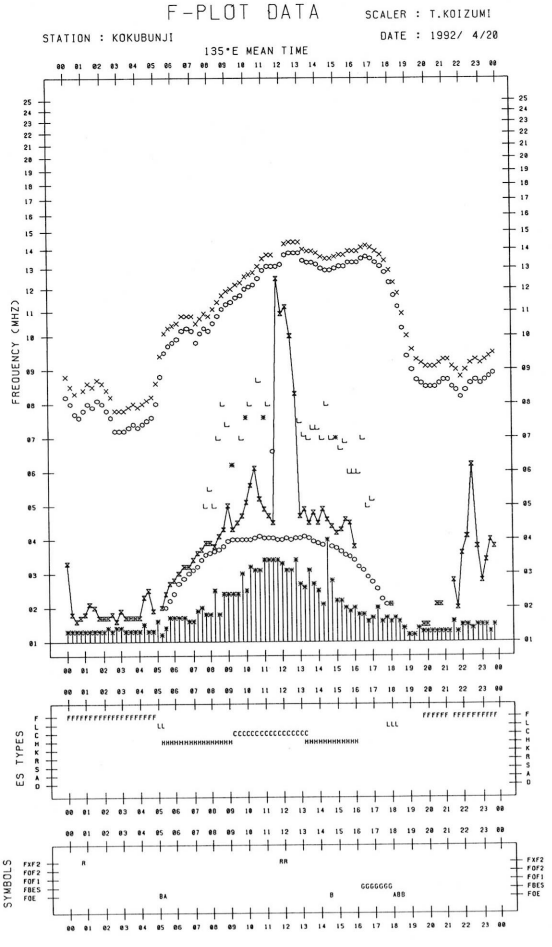

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/14
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

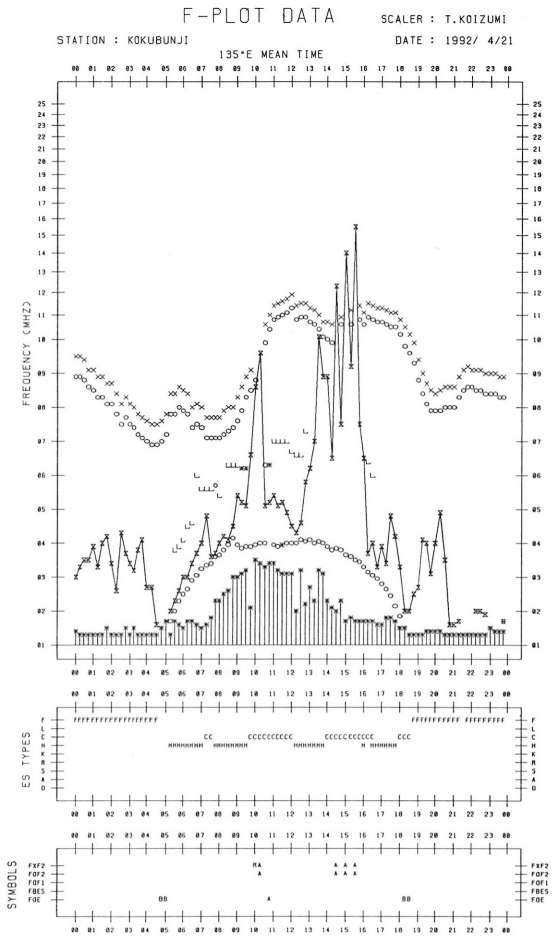

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/16
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

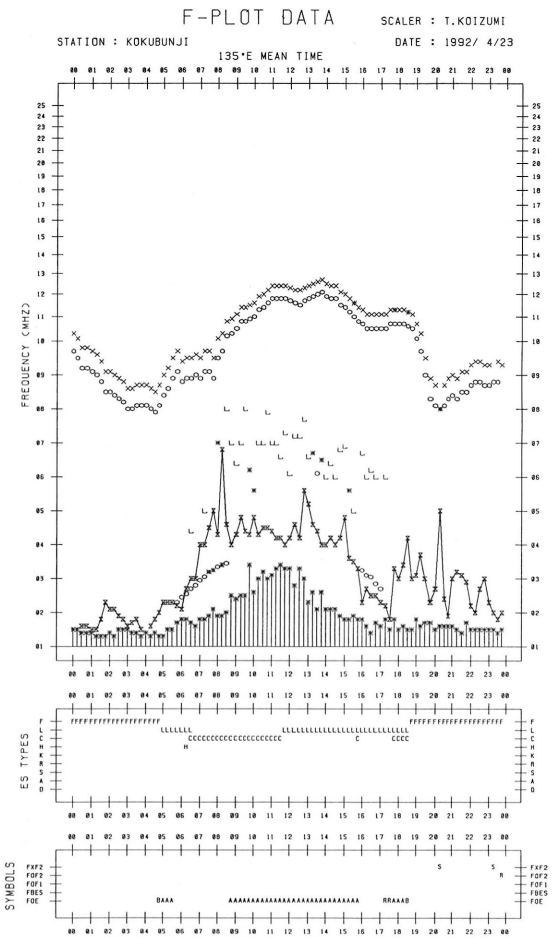

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/17
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

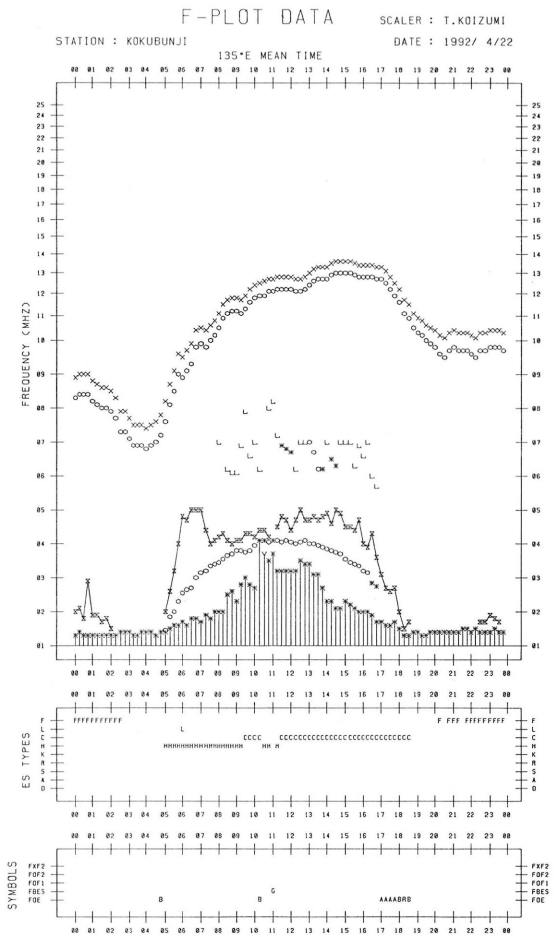

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/19
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

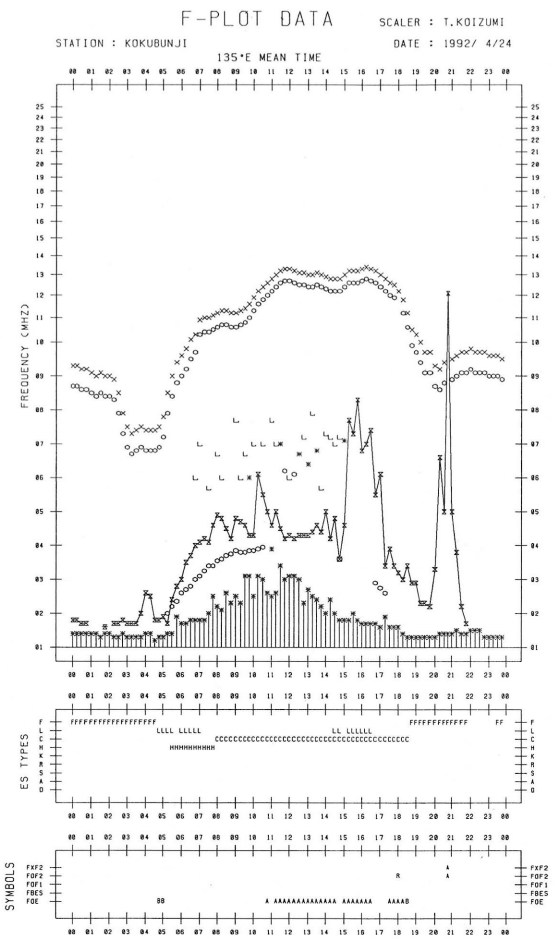

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/18
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

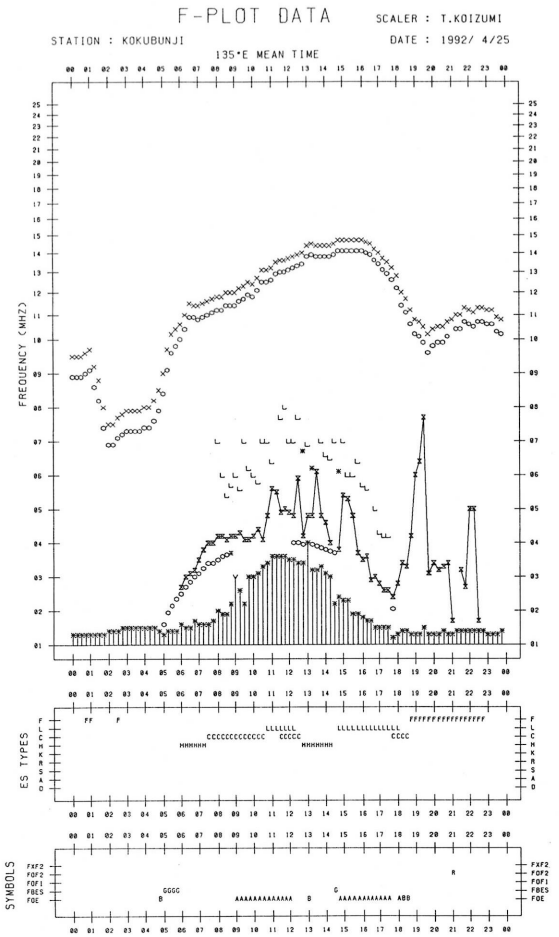

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/20
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

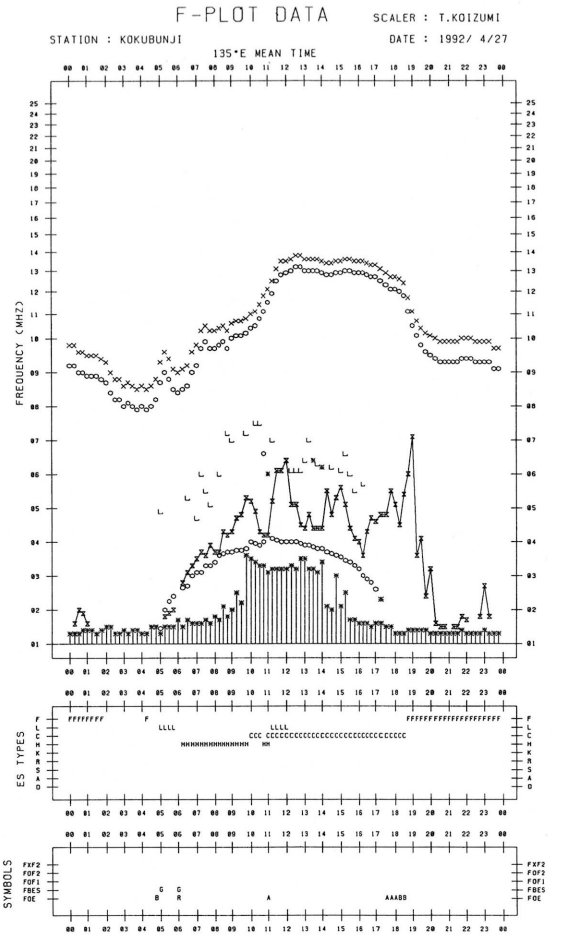

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/21
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

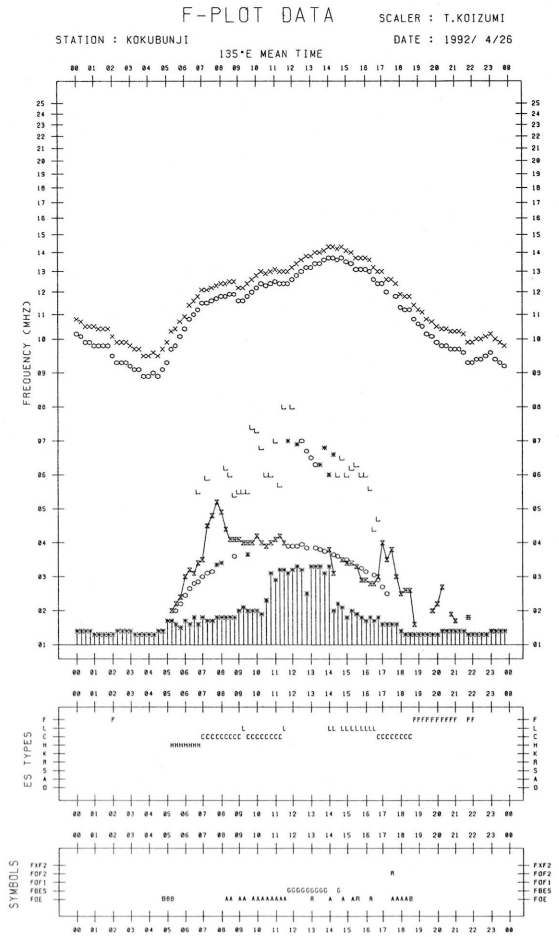

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/23
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

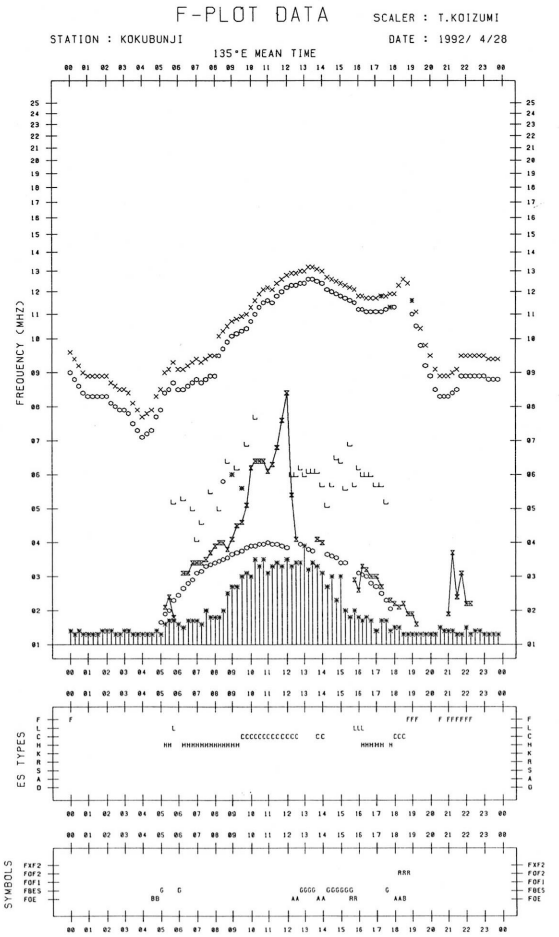

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/22
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

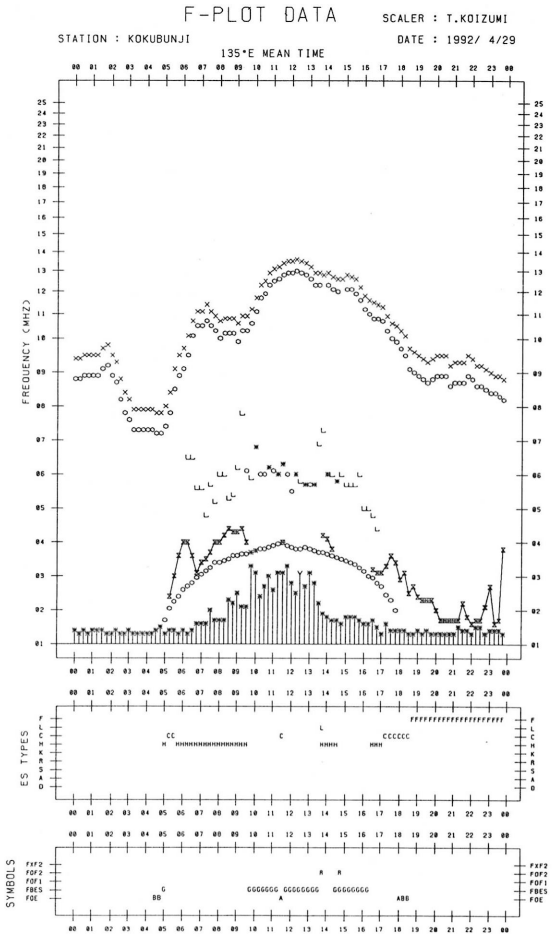

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/24
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

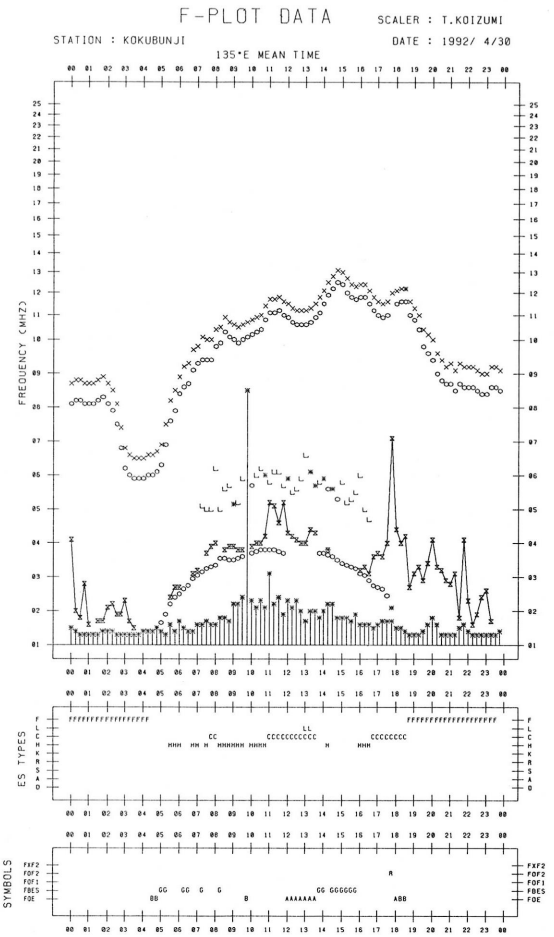

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/25
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/27
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/26
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/28
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/29
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI
DATE : 1992/ 4/30
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 April 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	18	13	15	B	16	0	0	0	2	0
2	B	B	B	*	B	2	2	1	*	2
3	B	B	B	B	B	1	1	1	2	1
4	B	B	B	13	B	1	1	1	0	1
5	11	11	11	*	12	0	0	0	*	0
6	*	*	B	B	*	*	*	2	1	*
7	B	B	B	*	B	1	1	1	*	1
8	*	B	B	-	B	*	1	1	-	1
9	10	10	12	9	11	0	0	0	0	0
10	9	10	12	*	10	0	0	0	*	0
11	*	*	*	-	*	*	*	*	-	*
12	12	11	*	11	12	0	0	*	0	0
13	11	11	*	12	11	0	0	*	0	0
14	10	10	*	14	11	0	0	*	0	0
15	12	11	12	12	12	0	0	0	0	0
16	*	*	*	10	*	*	*	*	0	*
17	11	10	11	10	10	0	0	0	0	0
18	*	10	10	*	10	*	0	0	*	0
19	*	10	11	10	10	*	0	0	0	0
20	10	10	11	13	10	0	0	0	0	0
21	14	13	15	*	14	0	0	0	*	0
22	*	*	15	B	*	*	*	0	2	*
23	B	B	B	B	B	2	2	2	2	2
24	B	B	B	B	B	2	2	2	1	2
25	B	B	B	11	B	1	1	1	0	1
26	12	12	*	11	12	0	0	*	0	0
27	11	10	*	*	11	0	0	*	*	0
28	*	*	*	11	*	*	*	*	0	*
29	12	11	12	*	12	0	0	0	*	0
30	11	10	B	B	21	0	0	0	1	0

Notes: No observations during the following periods.

8th 2030 - 9th 0005 11th 2015 - 12th 0015

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

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso April 1992

Single-frequency observations

Normal observing period: 2010 - 0915 U.T. (sunrise to sunset)

APR. 1992	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22}Wm^{-2}Hz^{-1}) PEAK	FLUX DENSITY (10^{-22}Wm^{-2}Hz^{-1}) MEAN	POLARIZATION REMARKS
1	200	7 C	0054.3	0056.4	42	2500	80	WR
				0104.0		40		WL
	200	44 NS	2030E	0212	750D	200	40	WL
3	200	44 NS	0000E	0616	540D	60	15	ML
	100	44 NS	2000E	2145	780D	400	80	ML
	200	44 NS	2030E	2128	750D	200	30	ML
6	200	43 NS	0500	0803	240D	100	40	ML
	200	44 NS	2030E	2123	750D	100	20	ML
	100	44 NS	2000E	0749	780D	350	70	ML
7	100	44 NS	2000E	2304	780D	150	30	ML
8	200	44 NS	0200E	0228	420D	200	20	SL
9	200	46 C	2042.3	2042.8	1.3	150	70	ML
15	200	46 C	2334.0	2335.2	2.0	1800	300	0
22	200	44 NS	2000E	2026	780D	250	60	SL
	100	44 NS	2000E	0727	780D	200	30	ML
23	100	44 NS	2000E	0228	780D	100	40	ML
	200	44 NS	2000E	0618	780D	100	40	SL
24	200	44 NS	2000E	0254	780D	200	30	SL
	100	44 NS	2000E	0628	780D	600	50	SL
30	100	46 C	0714.3	0715.1	3.3	580	250	WL
	200	46 C	0715.1	0715.8	2.5	200	60	0
	200	27 RF	0752	0903	88D	200	70	SL
	100	27 RF	0800	0855	80D	450	150	SL
	200	44 NS	2000E	0636	780D	100	20	ML

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)

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

C. RADIO PROPAGATION

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

APR 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	ES -22	ES -22	-7	4	25	22	27	29	23	28	29	16	22	18	24	18	24	17	18	14	6	1	-4	-4
2	-7	-1	6	11	16	31	26	23	24	23	24	23	32	27	12	14	29	24	21	13	13	-5	3	-5
3	-13	4	3	7	11	22	18	28	23	31	29	24	29	29	18	-12	-3	29	5	4	7	7	4	-3
4	-1	2	3	6	19	21	23	36	29	23	29	18	19	13	18	-1	-7	-13	-22	13	5	1	0	-11
5	-4	-10	-1	4	13	23	20	27	25	19	23	24	19	16	3	18	23	16	19	10	11	3	4	ES -7
6	0	4	0	5	16	21	20	20	26	29	26	24	11	21	-9	9	4	20	ES -22	5	24	12	3	-1
7	7	6	1	2	11	21	23	25	27	23	7	17	19	2	3	-3	6	5	-13	17	8	-4	-3	-1
8	-10	4	4	7	16	19	26	24	29	29	28	23	20	22	14	11	17	18	-2	17	9	1	-1	-7
9	-5	4	2	7	20	22	24	26	21	31	29	28	19	21	21	19	14	24	14	11	11	8	2	-3
10	-6	-12	4	9	19	24	22	29	34	33	34	26	22	26	26	24	24	17	6	13	19	6	0	0
11	-2	-1	3	13	14	18	27	31	29	29	30	26	31	29	11	16	19	20	15	13	6	9	-3	-1
12	-1	1	5	8	17	21	24	27	29	30	29	34	29	24	18	25	23	21	24	14	7	4	0	0
13	-4	1	4	19	14	24	22	26	26	24	26	26	24	12	4	21	29	24	17	20	12	4	5	-1
14	-1	1	3	8	17	23	22	29	28	30	26	31	20	23	2	-1	23	29	13	13	15	6	4	-1
15	-7	4	5	6	16	23	24	26	26	26	26	23	24	24	18	13	24	29	18	7	17	6	5	-4
16	-1	0	2	11	13	18	25	24	28	30	29	27	24	23	29	25	7	20	23	19	6	6	4	-3
17	-12	-3	1	7	13	20	25	26	21	23	29	23	23	23	24	24	33	25	31	9	9	-1	1	-10
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	21	29	29	28	29	19	19	24	23	18	14	24	14	1	1	2	2	-2	-3
20	-9	-9	-10	2	14	18	12	29	29	26	34	24	29	18	23	24	29	18	6	17	11	-4	-13	-22
21	-13	-13	1	5	12	13	19	23	23	29	24	24	27	17	16	15	20	24	5	14	4	-4	ES -7	-13
22	-13	ES -27	-10	6	14	21	21	28	29	29	29	27	24	28	24	28	26	23	6	13	8	-1	-1	-11
23	-13	-10	-10	6	13	14	23	26	29	28	26	26	31	24	24	33	22	18	13	9	6	1	-10	-13
24	-22	-1	-1	6	15	23	19	28	24	29	29	20	24	20	18	22	23	26	7	13	8	4	5	-5
25	-4	-4	1	6	9	21	23	26	24	26	25	23	25	22	23	23	29	29	24	19	9	-8	-13	-1
26	-8	-4	6	9	13	20	24	26	26	28	24	20	29	23	24	24	27	19	17	17	7	7	0	-13
27	-7	-7	-1	2	9	19	22	25	23	26	29	24	24	22	24	15	29	18	8	12	5	4	1	-4
28	-1	-8	1	3	9	13	23	27	25	26	25	25	20	27	26	20	30	24	17	13	9	7	7	-5
29	-12	-6	0	12	15	18	20	24	24	24	20	29	26	15	6	22	14	27	24	12	4	7	0	-6
30	5	7	8	13	19	26	29	32	34	35	31	29	25	25	23	27	21	34	22	21	22	7	5	10
CNT	28	28	28	28	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
MED	-6	-1	2	6	14	21	23	26	26	28	28	24	24	23	18	19	23	21	14	13	8	4	0	-4
UD	0	4	6	13	19	24	27	31	29	31	31	29	31	28	26	27	29	29	24	19	19	8	5	0
LD	-13	-13	-10	2	9	14	19	23	23	23	20	18	19	13	3	-1	4	14	-13	5	4	-4	ES -10	ES -13

C. Radio Propagation

C2. Radio Propagation Quality Figures at Hiraiso

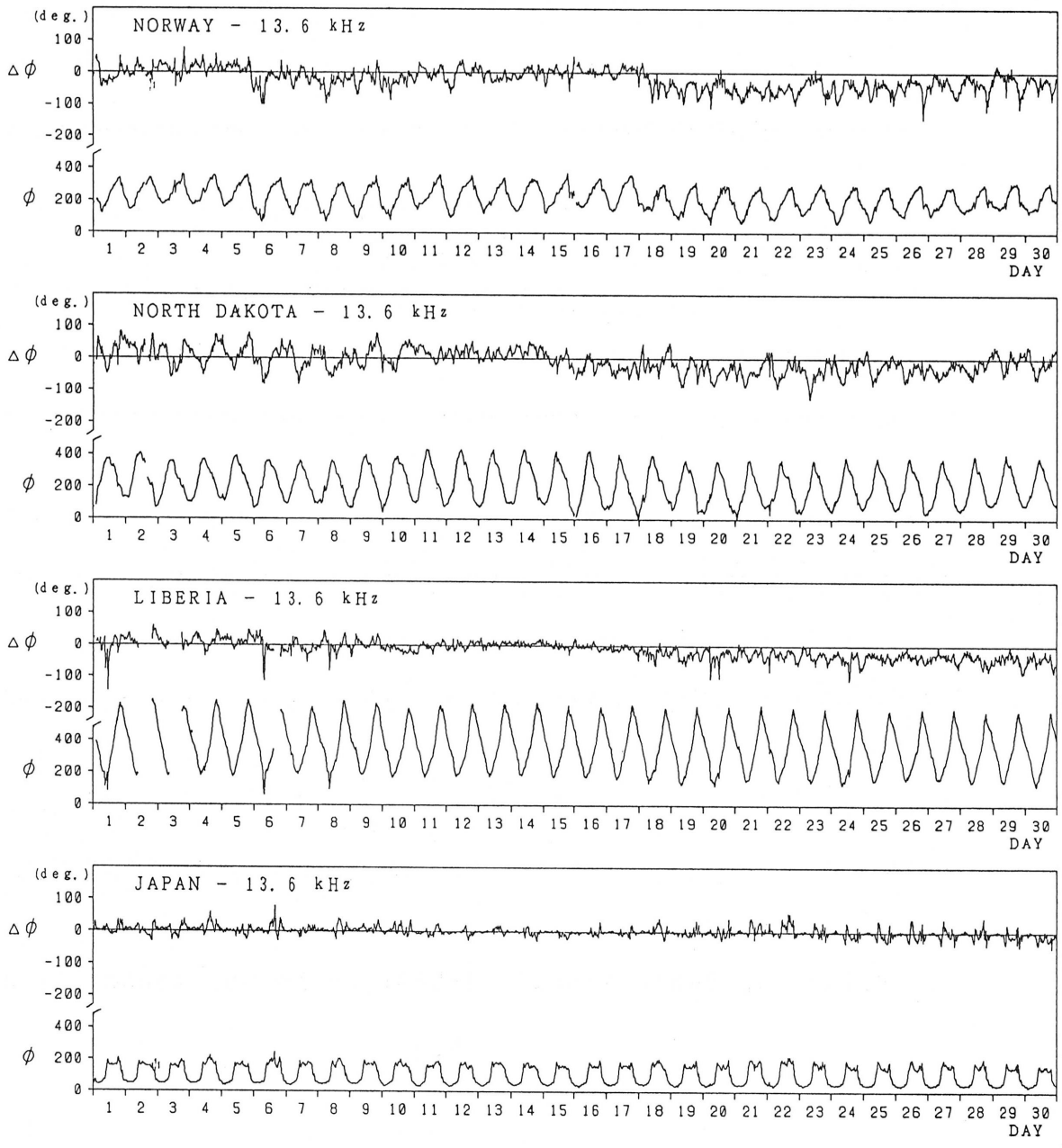
Hiraiso — Time in U.T.

Apr. 1992	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Conditions 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Storms Start h m	End h	Range nT
1	4-	3 4 4 4	3 4 4 4	N N N N			
2	4o	4 4 4 4	4 4 4 4	N N N N			
3	4o	4 5 4 4	4 4 3 4	N N N N	04.4	24	142
4	3o	3 3 3 3	4 4 2 3	N N N N			
5	4-	4 4 3 4	4 4 3 4	N N N N			
6	3+	3 3 3 4	4 4 3 4	N N N N			
7	3+	4 4 4 4	4 3 2 3	N N N N			
8	4-	4 3 4 4	4 4 3 4	N N N N			
9	4-	4 3 4 3	4 4 4 4	N N N N			
10	4o	4 3 4 4	4 4 4 4	N N N N			
11	4o	4 4 4 4	4 4 4 4	N N N N			
12	4o	4 4 3 4	4 4 4 4	N N N N			
13	4o	4 4 4 4	4 4 4 4	N N N N			
14	4o	4 4 4 4	4 4 4 4	N N N N			
15	4o	4 4 3 4	4 4 4 4	N N N N			
16	4o	4 4 4 4	4 4 4 4	N N N N			
17	4o	4 4 4 4	4 4 4 4	N N N N			
18	C	C C C C	C C C C	N N N N			
19	4o	C 4 4 4	(4)C4 4 4	N N N N			
20	4-	3 4 4 3	4 4 4 3	N N N N			
21	3+	3 3 4 3	4 4 4 3	N N N N			
22	4-	3 4 4 4	3 4 4 3	N N N N			
23	3+	3 4 4 3	3 4 4 3	N N N N			
24	4o	3 4 4 4	4 4 4 4	N N N N			
25	4o	4 4 5 4	4 4 4 4	N N N N			
26	4-	3 4 4 3	4 4 4 4	N N N N			
27	4o	4 5 4 4	4 4 4 4	N N N N			
28	4o	4 4 4 4	4 4 4 4	N N N N			
29	4o	4 4 4 4	4 4 4 4	N N N N			
30	4+	4 4 4 4	5 4 4 5	N N N N			

C. Radio Propagation

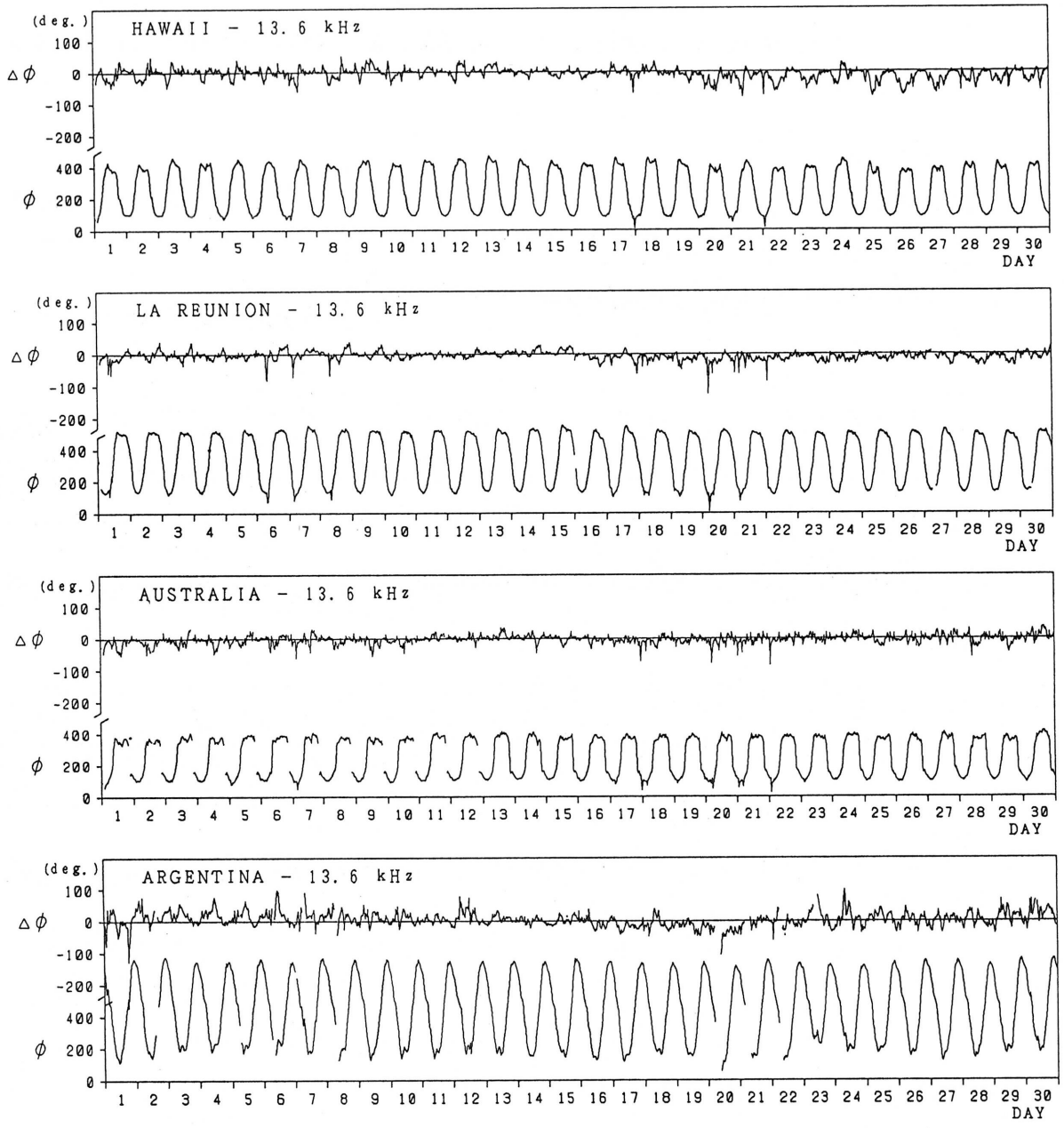
C3. Phase Variation in OMEGA Radio Waves at Inubo

Inubo April 1992



Inubo

April 1992



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

NONE

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso — Time in U.T.

Apr. 1992	S W F								Correspondence	
	Drop-out Intensities (dB)					Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS	BBC						
1			28			0052	31	2	2+	x	
1					13	1013	15	1	1	x	
7	6	11	12	x		0320	31	2	1	x	
15			8			2334	22	1	1-	x	
17		16	10			2320	23	2	1-	x	
20			15	x		0334	9	2	1	x	x
20			11	x		0520	20	2	1-	x	x
20			5	x	x	0824	19	1	1-	x	
20					5	1145	13	1	1-	x	
21			17			0055	23	2	1+	x	
21			7			0417	28	2	1-	x	
22			28	x		0103	32	2	2+	x	
23			11			0205	35	3	1-	x	

NOTE CO:Colorado(WWV) HA:Hawaii(WWVH) Aus:Australia Mos:moscow BBC:London
* Optical and X-ray Flares

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Apr. 1992	S P A								
	Phase Advance (degrees)						Time (U.T.)		
Date	Ω/N	Ω/L	Ω/LR	Ω/AU	Ω/H	Ω/ND	Start	End	Maximum
1	81	108	112	157	124	113	0051	0238	0101
1			5	5		12	0406	0440	0414
1			5				0647	0705	0652
1	32	91	56				0805	1002	0833
1	23	125	90				1013	1143	1030
1		29				44	1730	1850	1746
2			11				0844	0911	0850
3			7	5			0326	0400	0340
3		20	22	7			0442	0545	0503
4				5	7		0013	0039	0021
4				4	4		0258	0312	0300
4			9				0608	0637	0614
4	29	54	14				1050	1146	1102
4	27			13	9		2332	0029	2346
5				25*	18*	29*	0120	0236	0147
5			11	13	7	12	0255	0339D	0306
5				9			0339E	0411	0354
5			7				0741	0809	0745
5				16	14		2302	0012	2328
6			14				0339	0412	0344
6	43*	149*	117*	25*		29*	0712	0917	0752
6					9		2156	2238	2212
7	34	61	85	65	40	29	0320	——	0336
7		56					1530	1625	1544
8				7	4		0123	0151	0128
8		98	85	13			0742	0916	0801
8		24					1310	1404	1318
9				13	7		0054	0130	0101
9			11				0732	0805	0739
10				9	7		0115	0156	0122
11				5	7		0045	0112	0050
14		27	11				0620	0650	0629
15					11		2334	2356	2338
17				5	4		0106	0153	0111
17	27	44	50*	36*	20	24	0352	0459D	0405
17		37	20	11			0450E	0529	0507
17			7				0543	0620	0551
17		29					1315	1357	1325
17	14		11	20	31	27	2151	2259	2159
17	38	34	34	86	72	54	2307	0044	2327
18	23	22	32	27	18		0317	0410	0328
18			7				0633	0650	0639
18	29		36				0709	0830	0731
18		54					1150	1300	1216
18	25			13	13	20	2144	2252	2204

Inubo

Apr. 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
19				7	5		0009	0046	0028
19		29	36	31	23	20	0209	0256	0218
19	31	24	29	23	23	20	0530	0630	0547
19		24	47*	18			0630E	0720D	0652
19		39	54	13			0720E	0835D	0748
19		44	50				0835E	0914	0845
19		32	5				1048	1114	1059
19				7	25		1940	2008	1947
19				7	7		2220	2245	2226
19	36*	20	18	29*	29*	20*	2309	2348	2318
20				5	4		0023	0059	0032
20				13			0149	0236	0158
20			9	7	5		0245	0307D	0254
20			6	5			0307E	0323	0313
20	32	54	83	59	34	42	0333	0418D	0342
20		10	22	13		15	0418E	0510	0425
20	54	115	122	76	40	39	0520	0633D	0530
20	14	56	40	14			0633E	0720	0642
20		54	54				0820	0922	0834
20		27	16				0926	1004	0934
20		56	38				1106	1142D	1124
20		59	5				1142E	1230	1159
20					13	24	2119	2159	2131
20				20	22	24	2214	2239	2223
20				7	7		2315	2358	2334
21	43	27	41	67	45	39	0046	0213	0106
21	20	54	76	45	29	27	0411	0524D	0426
21			38	16			0524E	0629	0541
21		44	40				0921	1018	0940
21		27					1646	1711	1700
22	47	71	63	100	74	77	0103	0244	0123
22			13	11	11		0500	0548	0522
23		24	22	22*	14*	7	0219	0259	0239
23				7	9		2146	2212	2154
24		49	69	25			0656	0818	0710
24			16				0907	0935	0914
24		73	10				1246	1354	1304
24					34	36	1915	1954	1922
26			21	13	6		0356	0451	0406
26		35					1510	1552	1518
27				9			0546	0625	0552
30				9	8		0157	0250	0213
30		30					0802	0853	0816
30		21		13	16		2306	2337	2313

IONOSPHERIC DATA IN JAPAN FOR APRIL 1992
F-520 Vol.44 No.4 (Not for Sale)

電離層月報 (1992年4月)
第44巻 第4号 (非売品)
1992年7月25日 印刷
1992年7月31日 発行
編集兼 郵政省通信総合研究所
発行所 〒184 東京都小金井市貫井北町4丁目2－1
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