ISSN 0021–0382

F—501

IONOSPHERIC DATA IN JAPAN

FOR SEPTEMBER 1990

VOL. 42 NO. 9

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 flare, solar radio burst, and geomagnetic crochet to SWF is marked by X, being determined with data from interchange messages of IUWDS and observations at Hiraiso.

In table (a) SWF, *date* indicates the day to which the *start-time* of the event belongs.

b. Sudden Phase Anomaly (SPA) at Inubo

Data of sudden phase anomaly (SPA) are prepared from the records of phase measurement of VLF radio waves received at Inubo. The transmitting stations are listed in the following table.

Phase advance is shown in unit of degree at its maximum stage. No transmission or no reception during the period is indicated by —, an indistinguishable record is spaced out, and a multi-peak event is marked by *. The most remarkable or distinct phase advance is underlined and listed in the column of *Time*.

In table (b) SPA, *date* indicates the day to which the *start-time* of the event belongs.

The following letters may be attached to the value, if necessary.

D	greater than,
E	less than,
U	uncertain or doubtful.

Transmitting Stations

Name	Location (Geographic Coordinates)		Call Sign	Frequency (kHz)	Radiation Power (kW)	Arc Distance from Inubo (km)
Norway	66°25'N	013°08'E	Ω/N	13.6	10	7820
Liberia	06°18'N	010°40'W	Ω/L	13.6	10	14480
Hawaii	21°24'N	157°50'W	Ω/H	13.6	10	6100
North Dakota	46°22'N	098°20'W	Ω/ND	13.6	10	9140
La Reunion	20°58'S	055°17'E	Ω/LR	13.6	10	10970
Argentina	43°03'S	065°11'W	Ω/AR	13.6	10	17640
Australia	38°29'S	146°56'E	Ω/AU	13.6	10	8270
Japan	34°37'N	129°27'E	Ω/J	13.6	10	1040
North West Cape	21°49'S	114°10'E	NWC	22.3	1000	6990

HOURLY VALUES OF FOF2 AT WAKKANAI

SEP. 1990

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	54	59	57	53	54	63	86	91	102	92	103	105	96	102	91	98	93	97	101	90	81	67	59	60
2	60	63	57	53	51	48	61	83	87	72	67	74	77	80	85	80	80	79	74	77	81	71	64	39
3	57	60	56	60	60	60	76	89	90	90	84	83	89	86	80	80	90	82	85	85	86	66	58	60
4	53	61	64	62	60	64	81	90	91	91	96	88	91	89	87	86	87	92	100	88	88	72	66	66
5	66	68	66	65	58	57	76	87	90	84	84	92	93	102	90	92	97	102	87	89	78	70	68	68
6	62	64	60	61	64	73	83	87	96	89	88	96	97	97	94	93	89	100	98	89	86	83	73	66
7	60	59	64	65	58	62	66	79	78	87	70	91	89	89	87	90	87	85	79	86	86	68	72	67
8	63	57	56	58	58	49	67	71	85	81	66	65	82	91	90	89	87	88	A	112	80	53	72	66
9	57	52	53	51	55	56	73	91	100	106	94	89	88	96	96	91	88	90	92	87	88	74	64	65
10	63	62	62	58	57	64	88	90	104	102	101	104	95	104	104	95	93	99	99	92	91	81	64	62
11	A	63	67	66	60	67	84	106	122	116	100	104	111	110	102	103	102	100	98	90	90	81	66	63
12	62	64	59	44	38	37	A	60	61	57	54	66	64	65	80	72	71	83	80	61	63	58	53	53
13	52	41	51	51	45	52	66	66	77	61	C	C	88	85	C	C	C	C	67	68	65	68	50	A
14	45	52	62	54	54	51	64	86	101	98	C	C	100	100	C	C	C	C	C	79	68	64	54	54
15	A	52	38	26	20	54	78	101	98	107	92	98	101	94	94	103	100	97	96	86	84	73	64	64
16	67	64	64	58	53	58	85	89	90	88	C	C	101	107	C	C	C	91	88	87	84	71	64	63
17	58	52	50	62	52	65	77	100	109	102	C	C	110	102	94	98	101	97	90	85	73	62	57	60
18	46	44	51	51	48	53	80	89	98	101	105	100	102	99	C	88	93	95	96	86	68	62	60	56
19	58	54	54	45	56	63	66	83	77	78	76	73	80	83	78	73	78	81	86	65	66	63	58	55
20	54	51	53	48	44	47	82	88	91	100	100	99	100	104	93	90	89	86	90	88	82	74	66	63
21	64	68	57	54	54	66	85	110	98	108	85	105	100	101	100	92	100	99	91	80	79	70	69	68
22	64	66	60	66	57	60	70	86	110	122	117	110	118	107	101	98	102	94	83	66	69	64	58	63
23	54	53	54	54	54	67	66	64	72	83	85	92	88	94	86	87	91	90	79	68	65	54	66	57
24	58	58	52	53	56	65	78	96	112	123	108	116	114	119	108	101	104	104	89	86	66	72	71	63
25	62	63	63	54	55	59	80	79	91	90	99	103	102	95	98	95	97	91	87	86	66	67	66	68
26	66	66	57	53	54	53	66	88	91	103	113	98	110	116	110	115	105	97	86	67	72	64	65	66
27	62	58	50	52	57	57	64	78	96	N	110	108	116	101	111	112	110	103	90	84	64	67	62	60
28	62	65	59	59	60	63	80	87	88	94	90	112	108	114	105	108	100	103	94	88	69	62	63	62
29	66	63	61	58	57	61	84	86	96	104	109	99	95	105	100	100	96	91	88	75	70	66	65	64
30	62	64	64	62	62	64	85	86	101	103	107	106	102	90	95	96	95	98	84	82	65	64	66	57
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	30	30	30	30	30	29	30	30	29	26	26	30	30	26	27	27	28	28	30	30	30	30	29
MED	61	60	57	54	56	60	78	87	94	94	95	98	98	100	94	93	93	94	88	86	76	67	64	63
U Q	63	64	62	61	58	64	83	90	101	103	105	105	102	104	101	100	100	99	95	88	84	72	66	66
L Q	55	53	53	52	53	53	66	83	88	85	84	89	89	90	87	88	88	89	84	77	66	64	59	58

HOURLY VALUES OF FES AT WAKKANAI

SEP. 1990

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	37	40	G	G	G	G	G	G	G	G	41	38	G	G	39	28	39	40
2	32	25	25	29	26	G	46	46	52	G	G	G	G	53	G	G	G	40	38	50	58	38	48	60
3	58	36	34	34	34	G	G	44	G	97	115	G	G	G	G	G	G	G	33	29	59	51	33	44
4	36	36	35	36	28	33	G	G	G	G	G	G	G	G	G	G	G	32	G	G	G	38	27	36
5	G	G	G	G	27	G	G	39	70	54	G	G	G	G	G	G	G	G	30	G	35	G	G	G
6	G	G	G	25	28	G	38	G	G	G	G	G	G	G	G	G	G	44	36	G	G	G	G	28
7	32	34	24	30	25	29	34	G	G	G	G	G	G	G	G	G	43	80	44	G	G	G	G	G
8	G	G	26	G	27	G	G	G	52	50	62	G	66	G	56	59	60	57	148	126	95	59	64	44
9	28	28	35	29	G	G	G	41	57	G	G	G	G	G	G	G	G	G	G	27	28	28	G	G
10	G	G	G	G	G	27	G	G	G	58	G	G	G	G	G	G	38	40	G	G	G	36	G	24
11	28	G	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	G	27	G	26	28	23
12	G	G	G	26	27	33	39	52	G	G	G	G	G	G	G	G	38	54	34	58	32	31	28	28
13	G	36	58	60	30	29	37	G	45	54	C	C	81	68	C	C	C	C	42	70	70	40	40	69
14	66	68	40	G	G	G	37	58	55	54	C	C	69	74	C	C	C	C	C	59	58	40	35	58
15	69	58	32	29	32	35	40	38	51	50	G	54	56	56	G	64	70	55	39	36	44	G	33	28
16	43	50	58	30	28	29	36	44	43	G	C	C	G	G	C	C	C	36	G	60	58	37	47	37
17	29	G	28	28	28	29	G	G	G	G	C	C	G	G	G	53	61	39	40	34	54	34	31	G
18	49	11	G	G	G	G	G	G	G	G	G	G	G	G	C	G	35	36	33	62	40	36	31	G
19	26	G	G	31	G	28	G	43	46	G	G	G	G	55	G	G	42	34	29	26	G	29	28	G
20	G	G	G	G	G	G	36	50	54	G	G	G	G	G	G	G	G	35	G	G	G	G	G	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	G	33	G	G	G	G
22	G	G	G	G	33	G	G	G	G	G	G	G	G	G	G	G	G	34	27	G	G	G	G	G
23	G	G	G	G	G	G	G	G	G	G	G	G	G	57	G	40	52	46	28	G	G	G	36	G
24	G	G	G	G	G	28	G	43	46	G	G	G	60	63	G	71	54	58	40	59	58	31	37	39
25	34	30	43	G	G	G	47	59	50	54	57	50	G	G	G	43	52	46	34	54	32	33	29	31
26	28	28	G	G	G	G	G	G	71	78	59	55	57	60	46	G	50	34	G	32	55	44	41	44
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	41	G	G	G	G	G	G	33	62
28	33	36	28	G	27	37	35	40	G	G	58	G	G	G	G	G	34	G	40	28	31	G	28	28
29	27	27	27	28	G	40	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
30	G	G	G	G	33	G	34	G	G	50	G	G	G	G	G	42	46	G	28	27	35	G	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	30	30	30	30	30	30	30	30	30	30	26	26	30	30	26	27	27	28	29	30	30	30	30	30
MED	26	G	12	G	13	G	G	G	G	G	G	G	G	G	G	G	35	36	29	28	32	28	28	28
U Q	33	34	32	29	28	29	37	43	51	50	G	G	G	53	G	41	50	45	38	54	55	37	36	40
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	15	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT WAKKANAI

SEP. 1990

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	15	15	15	17	22	18	23	38	46	42	49	50	27	22	23	18	16	15	16	16	15	15
2	16	16	15	16	16	22	18	23	23	27	45	44	41	33	29	23	21	17	18	17	16	15	17	17
3	16	18	16	16	16	17	20	23	28	27	45	43	40	42	38	27	23	20	20	17	18	18	16	16
4	17	16	15	16	15	16	27	30	34	28	40	44	40	42	39	24	20	17	20	16	16	16	15	17
5	15	15	15	15	15	17	22	22	24	52	48	42	40	40	48	39	23	23	16	15	15	16	15	15
6	15	17	15	16	17	17	17	20	26	35	43	46	42	41	38	36	20	17	17	16	16	16	16	17
7	15	15	15	15	14	16	17	37	26	28	27	41	49	40	36	39	23	17	17	16	18	16	15	16
8	18	15	15	16	16	16	20	28	23	26	29	30	35	30	23	23	29	20	20	18	16	15	16	16
9	17	17	16	18	15	17	18	21	26	28	32	41	45	45	28	33	22	23	22	16	17	17	17	16
10	16	15	18	15	15	18	22	21	23	26	29	40	43	42	28	22	18	21	16	17	16	17	16	16
11	22	21	15	15	16	16	26	32	18	38	40	40	41	48	27	26	20	21	18	15	16	16	16	15
12	16	15	15	16	15	15	18	16	23	38	42	47	40	28	42	24	18	20	16	17	15	16	17	16
13	16	16	16	15	15	15	20	24	28	24	C	C	29	27	C	C	C	C	16	17	16	15	15	17
14	17	16	15	15	15	17	20	21	23	26	C	C	36	30	C	C	C	C	C	16	17	16	15	16
15	15	15	17	15	21	16	17	22	27	30	40	34	35	33	30	26	21	22	17	16	20	18	18	15
16	18	17	16	16	17	16	20	21	24	38	C	C	32	40	C	C	C	17	18	17	18	18	18	17
17	16	16	14	17	14	15	24	30	24	28	C	C	47	31	27	28	20	17	14	16	16	18	16	16
18	16	17	16	15	15	16	23	35	26	22	29	41	45	34	C	24	20	18	16	17	17	16	18	15
19	18	16	17	18	15	18	23	21	24	26	39	40	43	27	27	22	20	20	17	15	16	18	17	16
20	16	18	15	15	15	16	20	20	22	24	43	40	40	39	38	22	21	18	15	17	15	18	16	16
21	16	15	17	15	15	16	23	30	26	32	39	43	42	38	37	20	17	17	21	15	20	17	17	17
22	16	16	16	15	16	17	23	28	23	36	28	38	39	40	36	33	18	20	16	16	16	17	16	17
23	16	17	16	15	17	16	18	18	33	24	39	44	39	28	24	22	17	18	17	18	18	15	20	16
24	15	15	16	15	18	18	23	21	28	36	42	42	33	29	35	21	22	18	21	17	18	17	17	17
25	18	20	17	18	15	16	20	27	24	35	27	34	39	40	24	24	18	18	16	17	17	17	18	20
26	18	17	16	17	16	18	22	27	26	29	30	34	33	28	26	24	21	21	18	16	18	18	15	18
27	18	15	17	15	15	15	22	28	23	24	29	38	30	26	36	23	17	21	18	16	16	15	17	18
28	18	17	16	16	15	14	17	20	22	24	32	33	28	22	22	21	20	21	17	17	16	15	15	17
29	16	15	20	18	15	18	21	21	23	38	24	38	38	39	24	30	26	21	15	20	17	18	17	18
30	18	18	15	15	17	17	20	21	22	23	41	37	36	38	35	23	20	24	18	17	17	18	17	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	26	26	30	30	26	27	27	28	29	30	30	30	30	30
MED	16	16	16	15	15	16	20	22	24	28	39	40	40	38	30	24	20	20	17	16	16	16	16	16
U Q	18	17	16	16	16	17	23	28	26	36	42	43	42	40	37	28	22	21	18	17	18	18	17	17
L Q	16	15	15	15	15	16	18	21	23	26	29	38	35	29	27	22	18	17	16	16	16	16	15	16

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT AKITA

SEP. 1990

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	54	51	60	47	42	37	88	104	97	94	95	114	118	113	99	109	109	107	111	89	70	67	53	54
2	51	52	67	A	A	A	70	90	A	80	A	85	91	A	94	93	83	A	82	80	A	A	A	38
3	A	34	54	53	48	60	77	88	92	92	81	87	88	87	96	87	90	92	92	90	84	74	52	64
4	A	A	54	63	51	59	81	86	94	91	93	86	90	88	94	93	91	94	90	91	84	56	63	67
5	52	67	67	53	59	54	85	97	91	84	89	96	96	104	88	90	101	110	110	90	78	N	51	75
6	66	66	62	69	53	74	84	90	101	104	94	94	99	108	102	100	96	103	105	87	85	81	65	60
7	74	54	52	53	37	63	86	98	91	95	95	91	101	94	98	94	88	89	99	85	82	79	73	73
8	66	67	63	66	58	53	62	78	88	88	92	100	99	100	112	103	94	93	89	90	83	33	A	73
9	50	54	54	52	51	66	77	104	107	107	93	100	106	98	107	96	92	96	100	90	88	79	64	70
10	68	67	64	53	A	66	85	100	103	105	118	109	94	106	114	106	100	100	111	90	84	66	69	73
11	67	52	67	67	52	60	85	107	121	104	100	110	111	112	110	110	113	110	109	92	86	86	67	68
12	67	72	67	45	45	46	41	73	70	70	73	83	86	76	84	82	85	119	90	53	A	A	A	A
13	A	53	50	50	50	52	68	79	84	91	88	94	94	90	102	94	84	89	80	74	A	A	A	74
14		46	50	52	52	49	81	100	115	117	95	106	114	112	104	92	91	94	96	A	67	51	30	62
15	51	53	53	44	A	A	84	100	107	110	110	108	115	111	107	107	112	A	106	86	86	73	71	67
16	70	74	64	52	62	62	86	100	112	109	112	114	117	117	114	107	103	100	93	90	87	65	A	62
17	65	A	60	53	60	54	88	105	110	115	116	112	116	116	110	105	102	104	101	52	80	67	A	62
18	52	54	53	52	53	60	88	117	112	109	112	113	110	112	106	101	100	100	108	88	A	52	N	A
19	62	54	51	47	53	66	74	81	96	94	94	89	93	93	92	88	86	86	87	80	54	63	52	N
20	59	52	53	48	47	46	75	105	107	110	107	110	112	113	107	95	95	100	87	82	82	71	76	68
21	73	54	58	55	54	54	86	107	117	110	113	101	102	107	108	107	97	103	87	80	81	76	74	79
22	69	66	54	67	53	68	84	108	122	116	120	124	117	112	96	101	93	101	85	65	80	54	73	67
23	64	54	61	62	60	65	90	90	90	108	125	122	117	108	104	100	93	94	90	39	54	69	53	52
24	53	64	52	53	59	64	86	90	110	120	115	122	127	123	120	110	104	114	100	84	84	62	75	73
25	74	54	67	49	63	63	86	111	111	120	118	134	122	112	106	103	112	104	89	83	A	72	68	74
26	67	67	57	63	53	53	79	88	110	111	116	114	115	116	122	126	116	104	90	76	79	64	69	67
27	54	53	A	A	53	66	72	90	100	112	116	116	116	116	118	120	116	113	90	84	80	67	66	66
28	67	68	68	52	54	53	77	98	94	98	108	109	118	116	122	112	112	103	97	83	67	63	64	50
29	54	64	59	50	52	53	85	90	103	100	106	107	103	101	103	109	97	88	91	82	78	76	64	66
30	62	54	54	52	51	57	82	90	107	108	102	112	112	106	96	102	101	107	89	82	75	64	64	54
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	28	29	28	27	28	30	30	29	30	29	30	30	29	30	30	30	28	30	29	25	26	23	27
MED	64	54	58	52	53	60	84	98	103	106	106	108	110	108	105	102	97	100	92	84	81	67	65	67
U Q	67	66	64	58	58	64	86	104	110	110	115	114	116	113	110	107	104	105	101	90	84	74	71	73
L Q	54	53	53	50	51	53	77	90	93	94	93	94	96	99	96	94	91	94	89	80	76	63	53	62

HOURLY VALUES OF FES AT AKITA

SEP. 1990

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	32	40	36	31	43	49	39	46	54	G	G	G	G	G	62	G	44	42	56	82	G	G	G	29
2	43	50	50	53	60	41	38	54	64	92	51	51	66	103	83	44	56	96	73	48	115	129	177	128
3	119	46	41	33	37	G	G	40	51	51	G	47	G	G	G	G	G	G	32	30	30	32	24	28
4	49	51	29	28	32	32	44	G	G	G	G	G	G	G	G	G	45	36	32	G	G	G	28	40
5	36	27	28	G	G	32	G	39	G	G	G	G	46	46	G	G	46	46	32	30	G	29	30	31
6	G	G	G	G	G	27	34	G	G	G	G	G	G	G	44	G	58	56	52	36	26	G	30	30
7	26	G	G	25	31	29	36	G	G	60	91	G	58	50	54	50	91	93	91	41	55	G	28	G
8	G	G	G	G	25	G	G	G	G	51	G	G	G	50	52	G	60	54	56	51	59	50	57	33
9	35	34	32	30	31	32	G	G	45	58	74	69	70	55	51	54	51	51	40	37	32	51	51	35
10	29	28	29	26	28	G	36	G	G	G	G	G	G	G	G	G	G	34	31	34	G	G	26	24
11	G	27	G	G	G	G	G	G	G	G	G	G	G	45	50	43	46	40	34	29	28	G	G	G
12	G	24	G	G	24	28	35	44	G	G	G	G	61	48	G	60	50	73	48	91	54	58	57	50
13	49	49	31	28	29	30	39	125	116	56	54	56	G	G	46	G	G	56	68	54	54	72	58	34
14	30	40	26	G	G	G	G	58	55	57	63	46	48	50	44	G	50	60	71	93	40	40	36	G
15	G	23	G	30	72	49	G	55	61	52	51	57	78	G	56	77	83	122	55	37	30	38	32	28
16	29	28	30	G	G	G	32	39	40	G	G	G	G	45	G	47	49	69	30	54	41	47	59	49
17	32	36	32	35	36	26	G	49	G	G	G	G	G	G	G	G	43	61	57	88	84	47	58	32
18	32	30	G	G	24	29	G	G	G	G	G	G	G	G	G	G	G	40	38	38	49	58	38	41
19	38	34	36	37	31	26	34	44	54	59	67	72	50	G	G	G	37	43	34	48	33	28	26	29
20	G	G	G	G	G	G	G	37	40	44	G	G	G	G	G	G	G	36	27	G	G	G	G	G
21	G	28	26	30	G	G	G	39	G	G	G	G	G	G	G	G	48	30	31	29	G	32	30	27
22	G	G	G	G	G	G	31	35	G	G	G	G	G	G	G	G	45	39	28	29	G	G	37	G
23	24	G	G	G	G	G	G	36	G	G	54	G	G	G	G	54	53	40	45	54	31	29	G	G
24	G	G	G	G	G	G	G	42	52	59	49	51	50	44	50	49	G	47	40	44	G	24	26	30
25	26	G	G	G	G	G	G	G	51	68	91	91	93	61	53	43	44	50	47	60	58	55	G	31
26	G	G	G	G	G	G	G	37	55	G	G	53	51	44	47	G	38	29	G	G	G	G	G	G
27	G	G	37	44	24	G	G	G	G	G	G	G	G	50	G	43	G	G	35	33	G	G	G	G
28	G	29	G	33	G	G	G	G	G	G	52	54	G	G	G	39	G	G	26	34	G	32	32	30
29	28	28	G	G	G	G	G	G	50	G	G	G	G	G	G	G	35	G	31	29	32	27	28	G
30	G	G	G	G	G	G	30	G	G	G	G	45	G	G	G	50	49	40	49	38	38	33	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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	26	28	G	G	12	G	G	36	G	G	G	G	G	G	G	G	45	42	39	38	30	30	29	29
U Q	32	34	31	30	31	29	34	44	52	56	52	51	50	48	50	47	50	56	55	54	49	47	38	33
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	31	30	G	G	24	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT AKITA

SEP. 1990

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	15	17	18	15	20	22	29	28	55	51	23	21	36	15	15	15	15	16	16	15
2	15	15	15	15	15	16	17	18	20	27	33	27	28	27	24	21	18	16	18	16	15	15	15	15
3	16	15	15	15	16	17	17	21	22	20	23	21	21	22	20	20	18	17	16	16	15	16	16	17
4	17	15	15	15	15	15	16	17	20	20		49	52	26	42	21	16	17	16	16	16	16	17	16
5	16	15	16	15	15	16	17	16	17	18	49	27	23	20		47	20	21	15	17	16	17	17	16
6	18	16	16	15	15	16	16	17	17	20	22	26	22	24	22	18	16	16	16	16	17	16	16	16
7	16	15	16	15	15	15	18	26	23	24	35	32	38	28	23	24	17	17	16	15	16	16	16	15
8	15	15	16	16	15	18	18	16	20	23	26	24	24		26	21	17	16	16	16	17	16	16	15
9	15	15	15	16	16	15	16	17	17	22	23	33	28	24	22	18	17	16	16	17	15	17	16	16
10	15	15	15	15	17	17	15	16	18	24	28	48	26	23	24	21	16	17	16	16	16	18	17	16
11	16	15	16	15	15	16	21	16	21	22	44	21	24	26	24	20	15	15	15	15	16	16	16	15
12	15	15	15	15	15	15	15	16	18	22	32	36	24	23	22	18	16	16	15	15	15	15	15	15
13	15	15	15	15	15	15	16	17	20	21	23	24	26	23	21	22	18	16	15	16	15	16	16	16
14	16	15	16	17	20	16	20	21	18	20	35	26	27	34	34	17	18	17	15	15	15	17	15	16
15	18	16	16	16	15	15	16	18	20	22	21	24	24	45	21	21	17	17	15	15	15	15	16	16
16	15	15	16	15	16	16	16	16	18	23	23	23	18	18	24	20	17	16	15	16	16	16	16	15
17	16	15	15	15	15	16	23	17	18	20	22	24	34	30	24	23	17	17	15	15	15	15	15	15
18	15	16	15	15	16	15	24	36	16	20	21	21	21	26	23	20	21	18	16	15	16	15	15	15
19	15	15	15	16	16	16	16	17	21	22	34	32	29	26	24	20	18	18	15	15	15	16	16	16
20	15	15	16	16	16	16	16	17	24	24	24	43	45	23	40	36	18	18	16	16	15	15	16	16
21	16	15	15	15	15	16	24	18	18	23	24	34	70	46	18	20	17	16	15	16	16	16	17	16
22	16	16	16	17	16	16	16	16	18	23	44	23	64	40	23	18	16	16	16	15	16	16	16	16
23	16	16	15	16	16	16	23	17	20	21	35	27	42		22	18	18	18	15	15	15	17	18	16
24	16	15	15	15	16	15	20	20	21	23	35	44	48	27	22	20	20	16	16	15	17	15	18	17
25	15	16	16	15	16	15	22	18	22	22	26	24	33	33	26	23	18	16	15	15	16	16	15	15
26	15	15	15	15	15	15	24	18	21	23	23	22	46	24	22	23	18	20	16	18	15	15	15	15
27	15	15	15	14	15	15	22	17	20	22	28	27	33	24	21	20	17	22	16	15	15	15	15	15
28	16	15	16	15	16	16	22	17	18	21	21	24	27	24	24	20	20	21	16	15	16	15	15	16
29	15	15	15	15	15	16	21	18	21	36	23	22	24	22	20	21	15	18	15	21	16	17	16	16
30	15	15	15	16	15	16	16	15	20	21	18	36	36	45	22	18	15	15	16	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	29	30	30	28	29	30	30	30	30	30	30	30	30	30
MED	16	15	15	15	15	16	18	17	20	22	26	26	28	26	23	20	17	17	16	16	16	16	16	16
U Q	16	15	16	16	16	16	22	18	21	23	34	33	42	31	24	21	18	18	16	16	16	16	16	16
L Q	15	15	15	15	15	15	16	16	18	21	23	24	24	23	22	20	16	16	15	15	15	15	15	15

HOURLY VALUES OF FOF2 AT KOKUBUNJI

SEP. 1990

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	A																			A				
		64	65	61	56	61	83	106	100	100	107	118	125	124	122	122	125	123	118		86	75	68	66
2												A												
	65	72	78	43	41	44	72	83	82	98	104		97	97	99	94	90	91	96	91	78	70	58	66
3		A	A	A																				
	64				50	60	86	94	104	88	86	92	95	104	101	97	100	94	99	96	83	72	69	65
4	64	72	67	64	61	63	80	80	96	90	94	90	94	95	97	102	111	105	108	96	79	65	66	68
5	62	63	68	59	56	63	98	101	90	90	93	105	115	109	107	104	111	116	114	86	74	70	74	74
6			N																					
	70	74		68	65	74	101	99	96	100	105	95	105	115	113	104	102	108	112	93	80	79	71	67
7	67	62	63	63	51	62	98	102	91	106	104	98	100		106	100	101	103	110	100	82	77	72	78
8	68	65	65	68	53	52	66	78	88	104	108	116	120	119	122	116	104	104	111	105	84	75	78	78
9	83	72	68	64	57	60	84	105	118	105	98	109	112	114	118	111	101	101	108	103	88	78	80	72
10	70	74	67	62	62	66	94	104	103	110	113	112	106	111	117	123	108	112	122	101	77	71	71	73
11	69	68	67	65	52	60	93	112	108	99	107	112	116	117	120	118	116	118	113	100	86	85	77	77
12																A							A	A
	68	74	65	62	48	46	64	75	76	78	85	94	93	88	96		93	101	100	76	66	64		
13																				A				
	54	56	54	54	49	50	72	95	101	101	98	102	104	113	111	100	94	95	88		73	71	75	71
14																								
15	66	58	60	57	55	57	87	107	110	109	118	120	128	128	121	120	122	119	114	91	84	81	86	77
16																						N		
	76	80	70	67	62	62	87	105	118	119	117	130	132	127	120	110	114	111	103	100	87		77	77
17	73	64	62	72	68	68	86	103	116			122	130	123	119	117	109	111	106	89	82	78	75	72
18	68	69	67	60	56	59	105	116	112	105	111	118	118	121	113	109	112	115	117	84	65	61	67	68
19	67	60	55	54	61	69	89	94	110	112	113	N	114	121	109	100	89	90	98	65	68	73	66	58
20	59	58	62	54	46	51	80	112	114	110	112	122	120	122	113	106	101	107	97	82	79	76	79	75
21	75	74	60	54	53	57	90	108	111	114	111	109	112	114	116	115	109	104	90	76	73	75	64	76
22	69	67	65	63	65	66	89	131	125	120	120	134	130	119	106	105	104	106	95	81	79	78	78	71
23	72	63	70	64	62	67	88	112	112	120	133	142	124	118	115	111	105	100	93	76	74	76	76	71
24	71	67	54	58	60	60	91	99	107	117	121	132	130	128	117	110	108	112	105	90	88	87	84	78
25	78	73	61	64	61	62	85	118	126	130	128	140	134	120	112	110	117	110	97	86	80	78	82	74
26	71	68	69	61	58	54	77	104	117	109	118	120	127	121	125	131	127	113	91	80	79	80	75	
27							78	97	105	116	118	127	122	122	122	126	124	115	108	91	83	76	71	71
28	68	72	67	63	62	57	82	92	96	97	117	114	116	128	130	121	120	115	103	87	72	65	65	64
29	67	67	58	50	52	52	84	97	105	102	104	106	106	102	106	115	112	102	96	85	80	77	67	64
30	60	58	52	50	52	54	74	104	111	100	112	116	112	110	101	100	110	108	104	87	82	71	69	64
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	26	27	28	28	29	29	29	28	28	27	29	28	29	28	29	29	29	27	29	28	28	27
MED	68	67	65	62	56	60	86	103	107	105	111	116	116	118	113	110	109	108	104	89	80	76	73	71
U Q	71	72	67	64	61	63	90	107	113	113	117	122	126	122	120	117	115	114	111	96	83	78	77	76
L Q	65	63	60	54	52	54	79	94	96	99	104	105	105	110	106	103	101	101	96	82	74	71	67	66

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT KOKUBUNJI

SEP. 1990

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	92	58	104	54	27	50	40	55	49	58	47	G	G	63	G	G	44	44	109	123	94	G	G	G
2	43	36	30	32	26	G	G	48	100	64	115	179	92	79	122	114	74	58	58	52	57	33	29	29
3	91	108	93	102	59	44	38	48	48	102	61	46	48	53	G	G	49	35	37	31	30	29	G	23
4	27	33	G	G	G	27	34	44	G	G	G	G	G	78	G	G	43	37	G	27	26	G	G	G
5	G	G	G	G	G	G	G	39	44	G	G	G	61	56	60	54	G	50	34	31	52	G	G	G
6	G	G	24	G	G	G	33	37	46	49	55	55	52	47	G	49	55	49	51	58	49	59	25	25
7	41	27	G	G	30	25	40	45	66	64	69	G	58	89	60	73	111	142	134	73	92	27	G	28
8	G	G	G	G	G	28	33	43	G	48	58	54	50	103	51	48	54	57	45	65	55	33	56	57
9	45	50	49	40	37	32	G	40	52	57	63	64	60	G	G	G	47	38	G	29	41	26	62	45
10	27	25	G	24	25	24	G	53	47	44	G	G	51	G	G	G	42	38	31	30	31	24	G	G
11	G	G	G	G	G	G	36	G	54	G	G	G	G	47	46	G	58	50	28	26	32	32	G	G
12	G	G	28	G	23	23	32	44	G	44	58	54	57	58	50	86	53	46	34	G	33	26	58	94
13	48	30	G	G	G	26	47	58	80	58	47	G	58	50	77	52	54	64	84	92	48	59	59	50
14																								
15	26	G	23	G	G	G	34	58	71	50	50	G	G	G	51	50	54	50	94	86	50	60	27	G
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	52	49	58	37	46	32	31	58	30
17	41	32	29	G	G	G	G	G	G			G	G	G	G	G	50	53	58	44	41	34	40	31
18	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	49	51	55	34	58	41	37	32
19	31	27	G	G	G	28	32	48	50	48	48	G	48	49	G	G	G	48	34	49	57	30	29	25
20	G	G	G	G	G	G	G	G	G	45	54	50	58	G	G	G	G	G	G	G	24	G	40	G
21	G	G	23	28	27	28	G	36	41	G	G	G	G	G	G	G	G	34	25	G	G	G	34	25
22	G	G	G	G	G	G	G	54	48	G	G	G	G	G	G	46	42	37	25	G	G	24	G	G
23	G	G	G	G	G	G	G	G	58	G	G	59	G	G	G	49	G	51	49	24	27	40	40	32
24	29	G	G	G	G	G	G	50	49	G	G	55	59	50	51	51	47	34	31	30	79	37	G	G
25	G	G	G	G	G	G	G	G	44	50	59	60	54	53	52	50	52	34	52	50	51	61	45	29
26	23	G	G	G	G	G	G	G	G	G	48	G	G	G	G	43	40	G	G	28	G	G	G	
27							32	G	G	G	49	48	G	48	48	43	37	G	G	32	37	40	G	G
28	G	G	G	G	G	24	G	G	42	G	54	58	50	G	43	G	41	G	32	23	48	34	24	25
29	27	26	27	25	G	G	G	40	56	49	48	G	64	46	G	49	40	50	58	52	30	26	G	G
30	G	G	G	G	G	G	29	G	G	G	45	78	52	G	G	G	44	40	36	34	30	G	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	28	28	28	28	28	28	29	29	29	28	28	29	29	29	29	29	29	29	29	29	29	29	29	28
MED	24	G	G	G	G	G	G	40	46	44	48	G	50	47	G	43	47	46	36	32	41	30	25	25
U Q	36	28	25	12	24	26	33	48	53	50	56	55	58	54	51	50	53	51	56	52	53	38	40	30
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40	34	26	26	30	12	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT KOKUBUNJI

SEP. 1990

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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT YAMAGAWA

SEP. 1990

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	78	72	76	67	57	64	70	98	96	91	104	114	126	136	140	145	147	142	131	134	110	107	113	87
2	86			59	48	36	58	79	75	86	104	108	115	112	114	110	113	118	117	A	C	78	C	C
3	C	C	C	C	55	50	74	105	101	85	87	98	108	121	117	112	105	108	110		74	70		
4			65		102	77	80	90	107	100	93	92	102	98	108	120	125	119	108					
5					67	66	80	88	90	91	88	102	116	124	114	122	134	128	108	A	84	81	77	77
6	82	79	68	71	71	67	82	93	90	99	101	107	110	119	124	124	126	130	128	107	85	80	77	71
7	72	81	71	67	68	64	82	90	101	108	99	111	109	119	121	113	113	122	123	110	90	75	84	84
8	75	73	76	76	59	52	58	86	88	100	106	130	136	145	152	147	140	143	145	144	124	118	109	107
9	86	86	80	64	56	58	76	98	121	96	94	112	121	130	135	127	123	144	127	121	102	90	87	88
10	87	110	109	84	81	67	84	94	108	112	112	109	112	122	125	131	130	136	128	114	86	85	83	84
11	78	74	74	69	72	54	74	94	97	102	110	115	116	119	124	127	125	128	130	111	88	99	87	82
12	86	85	78	78	64	54	62	84	85	86	97	93	100	101	102	104	102	111	108	85	82	76	84	76
13	59	59	53	50	54	48	61	95	111	100	102	104	122	127	116	117	110	108	98	86	78	74	76	86
14	71	66	74	64	59	57	62	93	108	114	113	122	131	126	124	122	121	126	121	101	88	84	83	73
15	73	74	64	65	66	59	73	102	106	116	114	130	138	141	140	130	141	145	134	110	99	94	108	103
16	88	88	83	71	66	63	79	94	109	112	113	135	145	141	135	131	132	131	109	108	114	89	88	93
17	84	77	74	76	76	53	64	96	113	120	122	126	134	141	133	129	132	131	118	115	103	90	90	82
18	74	73	70	62	58	60	82	108	110	100	112	119	133	133	132	131	137	135	126	110	86	83	85	84
19	84	77	74							127			144	144	135	128	117	117	125	114	86	86	86	84
20	86	82	82	81	51	51	72	111	127	112	112	N	141	140	144	135	131	122	120	108	106	140	143	136
21	127	120	85	74	69	66	78	104	115	118	107	114	120	124	126	128	123	120	110	102	84	74	76	72
22	83	72	66	62	59	51	64	108	123	114	122	140	138	132	120	118	116	114	110	108	114		84	84
23	86	68	67	70	68	57	80	106	108	109	125	137	135	132	130	126	122	113	108	101	87	90	86	84
24	79	70	62	54	61	62	67	94	104	104	118	135	136	137	129	126	125	124	132	130	113	110	88	86
25	83	71	63	59	62	64	74	106	128	127	130	136	140	134	134	130	130	141	128	110	108	112	107	84
26	81	75	68	67	58	48	51	96	110	101	116	127	131	131	129	135	136	131	118	104	104	108	106	86
27	85	76	66	62	68	52	60	85	107	114	109	123	134	137	136	139	135	135	129	135	110	107	99	104
28	85	106	88	84	68	59	60	81	91	102	101	110	120	132	135	138	137	140	123	89	89	86	84	82
29	83	86	73	54	50	53	59	87	104	102	107	116	115	117	118									
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	26	25	26	25	28	28	28	28	28	29	28	27	29	29	29	28	28	28	28	24	26	26	25	25
MED	83	76	74	67	63	58	72	94	107	102	108	115	126	131	129	128	126	128	122	110	90	88	86	84
U Q	86	85	78	75	68	64	79	103	110	114	113	130	136	137	135	131	134	135	128	114	108	107	102	87
L Q	78	72	66	62	57	52	61	89	96	99	101	108	115	120	119	121	119	118	110	103	86	80	83	82

HOURLY VALUES OF FES AT YAMAGAWA

SEP. 1990

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	30	25	30	72	45	65	62	80	83	88	77	66	53	77	42	40	94	144	30	29
2	G	28	30	11	G	G	G	36	48	48	58	69	57	G	G	G	G	70	75	75	C	30	C	C
3	G	C	C	C	26	39	32	42	40	G	45	G	G	G	G	G	58	44	100	G	G	G		
4		G	G		24	24	32	G	45	45	G	G	G	G	G	G	45	41	39					
5					G	G	G	G	G	49	G	G	G	G	G	58	56	65	85	93	65	58	46	28
6	24	26	G	G	G	G	G	G	43	48	50	52	G	G	G	50	56	38	51	96	42	40	41	29
7	23	G	G	G	G	G	G	G	43	48	G	G	G	G	G	G	64	47	58	57	65	81	31	29
8	G	G	G	G	G	G	G	39	43	G	G	G	77	83	69	54	48	46	72	93	95	72	56	39
9	G	69	35	25	G	G	G	35	47	42	G	G	G	48	G	74	81	63	60	84	59	28	33	69
10	40	G	G	G	G	G	G	G	38	48	54	53	G	G	46	G	46	46	43	41	58	39	31	27
11	G	G	G	G	G	G	G	G	39	48	G	G	G	64	G	60	51	62	78	49	24	55	41	28
12	G	G	G	G	G	G	G	34	44	G	64	G	56	G	G	48	59	69	56	70	54	32	40	58
13	32	26	G	G	G	G	G	40	43	45	G	51	52	G	G	68	71	72	54	42	36	49	81	40
14	44	G	G	G	G	G	G	G	46	50	52	G	G	61	G	G	G	51	34	G	G	G	30	38
15	31	24	G	G	28	30	27	37	52	77	58	G	55	57	46	G	49	54	84	93	82	92	38	31
16	27	G	G	G	G	G	G	33	39	44	G	G	G	G	G	G	42	42	32	25	G	G	G	G
17	G	43	35	32	30	26	27	40	40	42	G	G	G	G	G	G	G	39	41	24	G	34	41	38
18	26	G	G	G	G	G	G	G	44	46	G	G	G	G	G	G	52	55	32	40	41	36	35	40
19	31	32	37							66			56	G	G	G	41	G	47	92	66	45	40	31
20	29	34	34	26	31	28	G	G	G	G	G	59	48	57	G	G	42	40	37	26	24	G	G	36
21	32	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40	31	29	41	G	G	G
22	G	G	G	G	G	G	G	32	G	G	G	G	G	46	G	51	53	53	42	30	26	G	25	G
23	G	G	G	G	G	G	G	34	45	G	44	50	G	G	G	G	48	43	29	30	32	31	36	30
24	G	G	G	G	G	G	G	38	44	53	45	G	G	G	64	76	88	146	89	66	48	G	34	25
25	G	G	G	G	G	G	G	G	41	45	49	G	56	82	56	58	52	61	59	93	36	49	32	36
26	38	G	G	G	G	G	G	G	G	G	53	G	G	G	50	47	44	39	38	72	71	36	32	G
27	G	G	G	G	G	G	G	G	G	G	G	G	G	46	G	51	45	35	42	71	G	24	G	29
28	27	32	30	G	G	G	G	G	G	G	49	52	G	46	48	43	39	G	G	G	33	31	G	G
29	G	29	24	G	G	G	G	33	44	47	47	G	G	G	G									
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	27	27	27	25	28	28	28	28	28	29	28	28	29	29	29	28	28	28	28	27	26	27	25	25
MED	G	G	G	G	G	G	G	16	43	45	22	G	G	G	G	22	48	46	45	49	41	34	33	29
U Q	31	28	24	G	G	G	G	36	44	48	51	50	53	52	46	56	56	62	66	84	65	49	40	38
L Q	G	G	G	G	G	G	G	G	19	G	G	G	G	G	G	G	42	40	37	29	24	G	27	26

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FMIN AT YAMAGAWA

SEP. 1990

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FOF2 AT OKINAWA

SEP. 1990

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	91	90	90	84	66	64	66	90	95	A	A	124	140	146	159	168	174	170	171	164	144	180	168	146
2	140	140	131	87	69	62	66	88	88	88	114	121	132	132	128	129	140	146	141	111	124	144	166	142
3	140	110	140	82	86	82	77	103	84	82	94	119	139	145	140	134	126	134	145	122	139	166	171	162
4	170	168	192	138	88	80	79	104	108	94	90	102	116	112	112	128	144	141	110	104	88	84	100	83
5	86	85	88	87	71	69	75	90	88	92	97	117	98	121	145	156	157	140	121	86	109	85	102	87
6	101	67	80	72	78	66	67	85	102	96	95	104	122	129	138	146	160	164	147	139	104	88	86	96
7	86	88	93	109	87	80	83	106	101	105	108	116	120	130	133	141	141	147	138	82	A	90	87	87
8	85	85	77	73	53	52	A	82	105	70		122	155	166	170	181	195	197	187	176				
9		162	128	111																				
10											110	116	128	138	143	147	161	153	146	143	144	130	128	144
11	119	109	123	86	71	64	54	84	102	92	116	117	128	131	137	137	146	146	143	136	120	146	146	142
12	131	75	87	83	78	52	64	88	104	109	113	108	116	122	115	130	130	123	139	121	160	142	109	103
13	86	76	62	54	50	49	62	96	88	105	112	126	N	139	128	137	139	120	103	111	108	90	86	89
14	86	77	70	68	53	51	53	90	108	107	122	132	137	138	142	146	146	141	134	142	142	138	108	86
15	86	87	86	84	68	62	66	96	102	110	117	141	145	N	162	164	162	163	151	144	N	165	172	146
16	121	141	144	85	76	66	78	94	110	107	104	146	166	164	N	155	161	147	146	138	171	144	145	
17	108	88	88	84	76	42	58	86	88	122	126	129	142	150	152	144	146	144	139	140	145	146	130	108
18	85	85	85	77	66	60	72	102	108	104	105	129	141	146	157	163	166	165	146	159	159	158	143	145
19	146	140	88	85	84	87	85	106	125	111	114	146	162	165	155	164	163	160	165	164	162	160	161	166
20	164	164	145	127	63	66	76	108	107	108	110	119	162	164	171	169	168	164	160	154	129	167	170	171
21	164	164	142	131	86	75	80	102	120	126	97	112	110	145	142	142	144	143	136	136	111	90	85	88
22	87	90	80	68	53	52	56	99	119	107	129	144	148	143	144	124	123	125	116	128	142	90	108	88
23	86	84	76	72	74	59	64	96	105	107	124	130	142	147	144	142	136	124	122	120	145	118	111	139
24	110	87	70	64	72	80	60	87	102	104	116	136	147	137	146	146	158	146	162	182	169	165	164	146
25	127	110	89	76	73	68	71	107	108	128	133	119	136	144	N	162	166	164	168	171	197	198	194	145
26	104	70	85	66	60	47	52	96	105	104	108	137	144	145	142	151	156	157	146	163	170	166	184	160
27	162	147	82	87	88	56	52	81	107	107	118	128	154	160	163	164	161	164	177	202	188	158	169	164
28	158	171	149	140	90													172	163	145	162	163	151	169
29	137	122	89	70	68	54	54	88	105	104	111	121	135	145	146	158	145	142	146	146	144	162	174	166
30	162	150	136	110	82	64	63	90	105	126	120	122	138	151	N	168	180	196	202	184	168	162	160	147
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	29	29	29	28	27	26	27	27	26	26	28	27	27	25	28	28	29	29	29	26	28	28	27
MED	114	90	88	84	72	64	66	94	105	106	112	122	139	145	144	146	156	147	146	142	144	146	146	144
U Q	143	144	133	98	83	69	76	102	108	109	118	131	147	150	156	163	162	164	162	163	162	164	168	160
L Q	86	85	81	72	66	52	58	88	101	96	105	117	128	132	137	139	142	141	137	121	124	104	108	89

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF FES AT OKINAWA

SEP. 1990

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	40	36	36	40	30	29	37	38	79	106	126	85	81	G	57	60	65	86	70	38	25	34	G	58
2	G	G	G	G	G	33	32	35	47	86	54	G	66	G	82	G	G	44	70	42	33	32	28	25
3	34	34	33	28	G	24	24	33	G	73	G	49	54	56	64	70	64	56	50	57	54	30	G	G
4	G	G	G	G	G	G	33	43	43	46	G	G	G	54	53	53	58	58	35	G	G	28	28	G
5	G	G	G	G	G	G	32	G	G	G	G	G	G	73	56	65	64	79	50	58	54	59	72	66
6	29	G	G	G	G	G	G	32	44	54	63	60	64	71	G	G	46	70	61	61	33	G	33	G
7	23	G	G	G	G	G	24	36	44	78	85	70	62	52	G	G	61	74	69	84	115	113	81	33
8	36	26	29	27	G	25	48	43	45	46		G	59	G	G	G	G	40	39	30				
9		39	30	26																				
10											62	67	G	G	G	65	59	85	73	66	49	65	39	29
11	26	G	G	G	G	G	G	34	42	79	54	58	61	47	56	48	66	84	116	63	58	39	32	40
12	36	G	G	G	G	G	29	34	44	55	58	80	76	77	G	51	68	51	34	72	24	G	G	G
13	G	G	G	G	G	G	G	32	39	44	49	50	54	50	G	49	66	50	39	86	40	38	22	59
14	88	150	G	G	G	G	25	36	44	48	G	63	56	G	G	G	49	104	91	45	28	37	30	G
15	G	26	32	G	G	30	G	33	42	46	52	48	52	G	G	G	46	46	39	39	32	24	58	47
16	32	31	G	G	G	G	G	G	G	G	48	G	G	G	G	G	66	47	39	32	G	24	G	G
17	24	G	G	G	G	G	G	G	60	56	N	65	G	G	68	G	64	56	40	33	38	G	G	G
18	27	G	29	30	G	G	G	36	44	68	60	G	51	G	G	G	42	64	69	58	28	G	G	28
19	46	40	30	30	25	G	28	43	44	52	82	81	85	78	G	G	42	G	29	G	G	G	G	G
20	G	31	27	26	G	G	G	G	G	G	G	G	G	G	G	52	42	42	34	46	42	40	26	G
21	G	G	G	G	G	G	G	G	42	G	G	G	G	G	G	G	G	49	51	34	G	31	29	G
22	G	G	G	G	G	G	G	G	42	45	G	G	G	G	G	G	G	45	50	G	31	G	28	G
23	G	G	G	G	G	G	G	35	42	49	G	G	G	G	G	G	G	67	56	39	G	G	G	G
24	33	24	G	G	G	G	G	36	40	47	44	G	88	62	52	48	55	48	40	61	34	G	G	32
25	25	G	G	G	G	G	G	33	43	48	47	57	G	57	62	51	66	42	47	39	30	G	G	G
26	36	25	G	G	28	G	G	41	38	42	50	G	G	56	50	62	57	61	29	G	G	G	G	G
27	G	G	G	G	G	G	G	34	G	G	G	G	59	93	56	107	111	88	91	34	G	G	24	G
28	G	G	G	G	24													36	36	36	32	58	45	38
29	33	G	G	G	G	G	G	33	44	56	86	54	50	50	78	56	56	57	40	92	90	38	39	23
30	G	G	G	G	G	G	G	32	42	42	G	G	G	66	G	G	G	44	G	30	G	G	39	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	28	29	29	29	28	27	27	27	27	27	26	28	28	28	28	28	28	29	29	29	28	28	28	28
MED	24	G	G	G	G	G	G	34	42	48	48	24	52	48	G	24	56	56	47	39	32	26	27	G
U Q	33	28	28	13	G	G	28	36	44	56	60	61	61	59	56	54	64	72	69	61	41	38	36	32
L Q	G	G	G	G	G	G	G	32	39	42	G	G	G	G	G	G	42	44	37	32	G	G	G	G

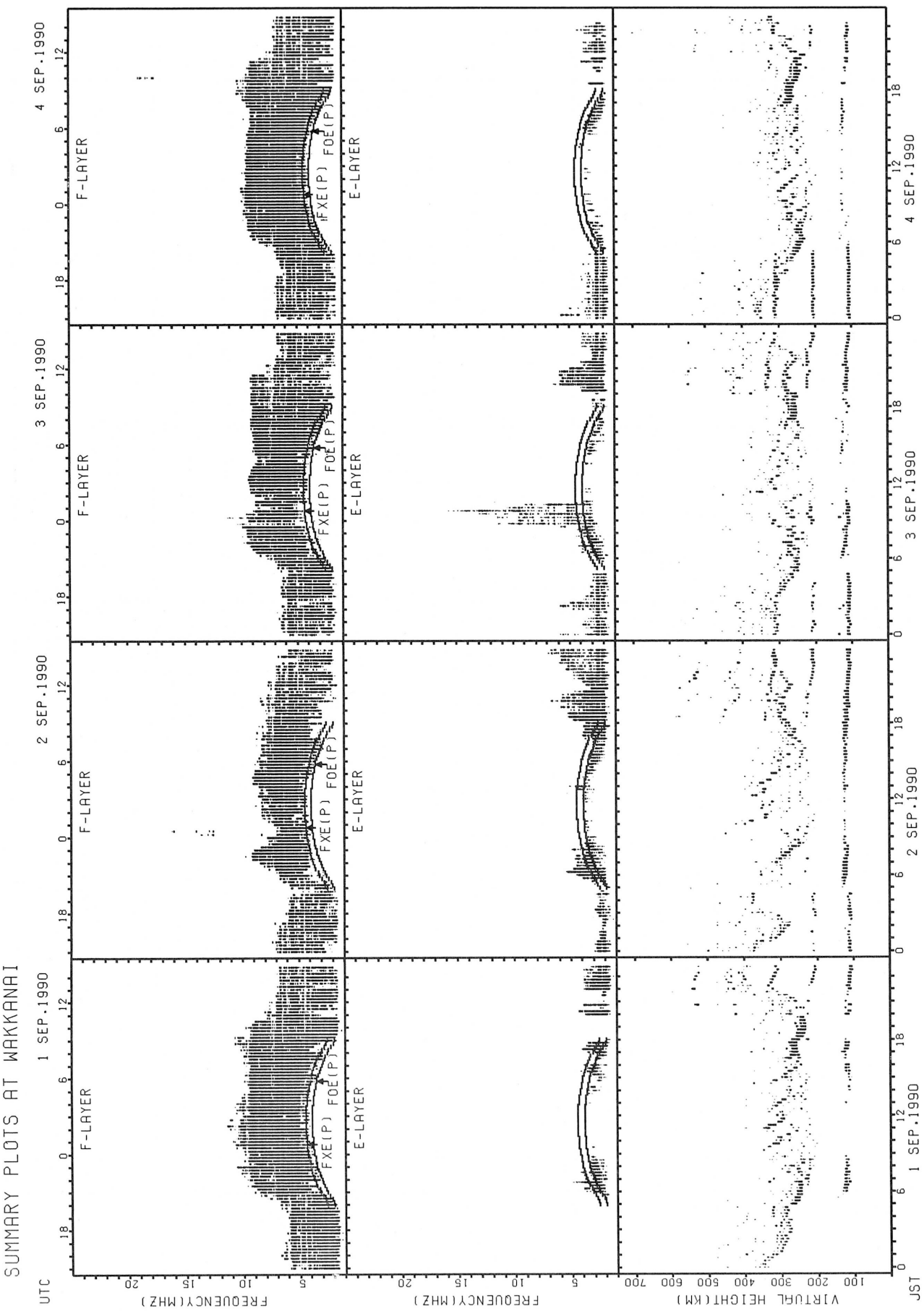
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

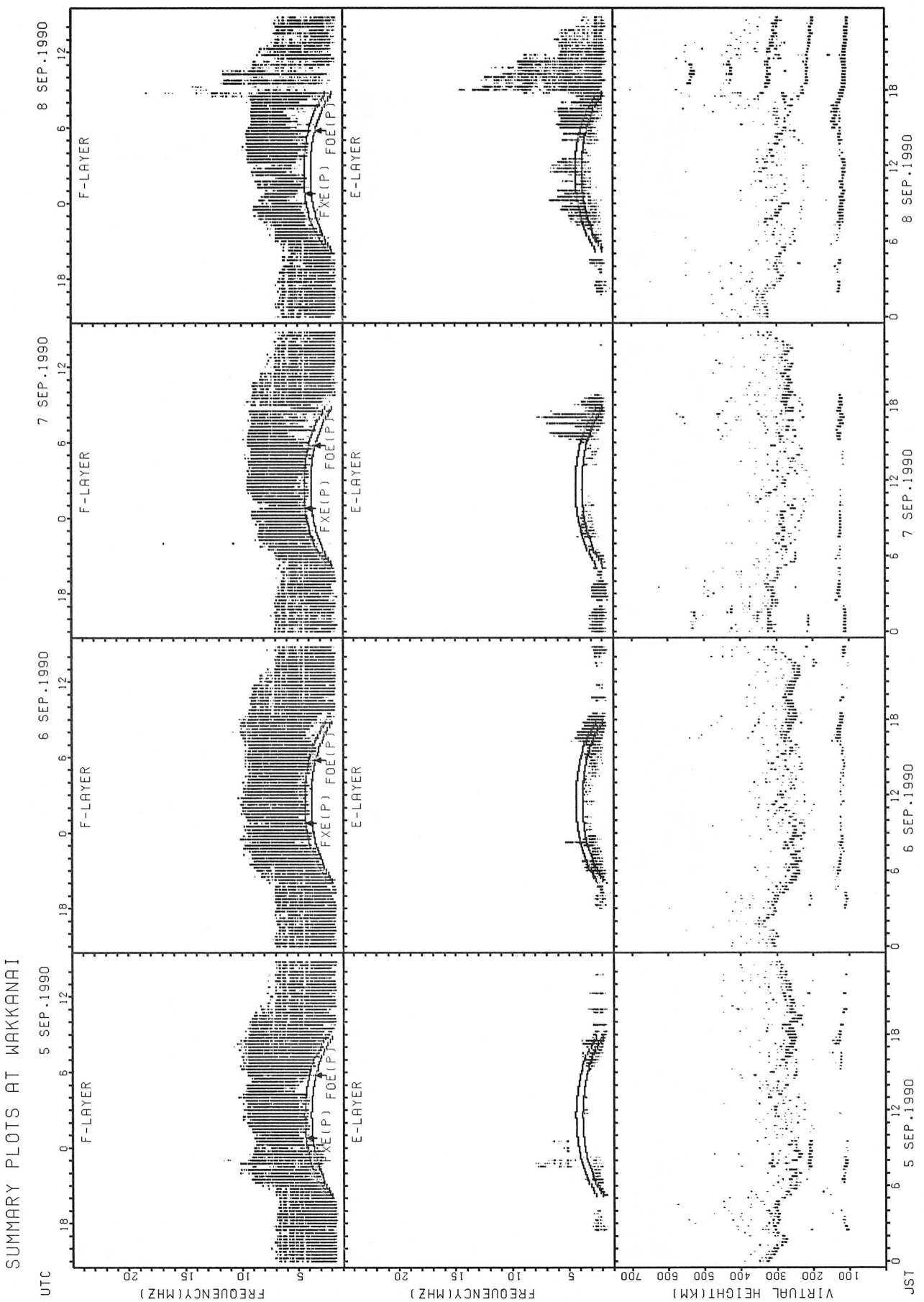
HOURLY VALUES OF FMIN AT OKINAWA

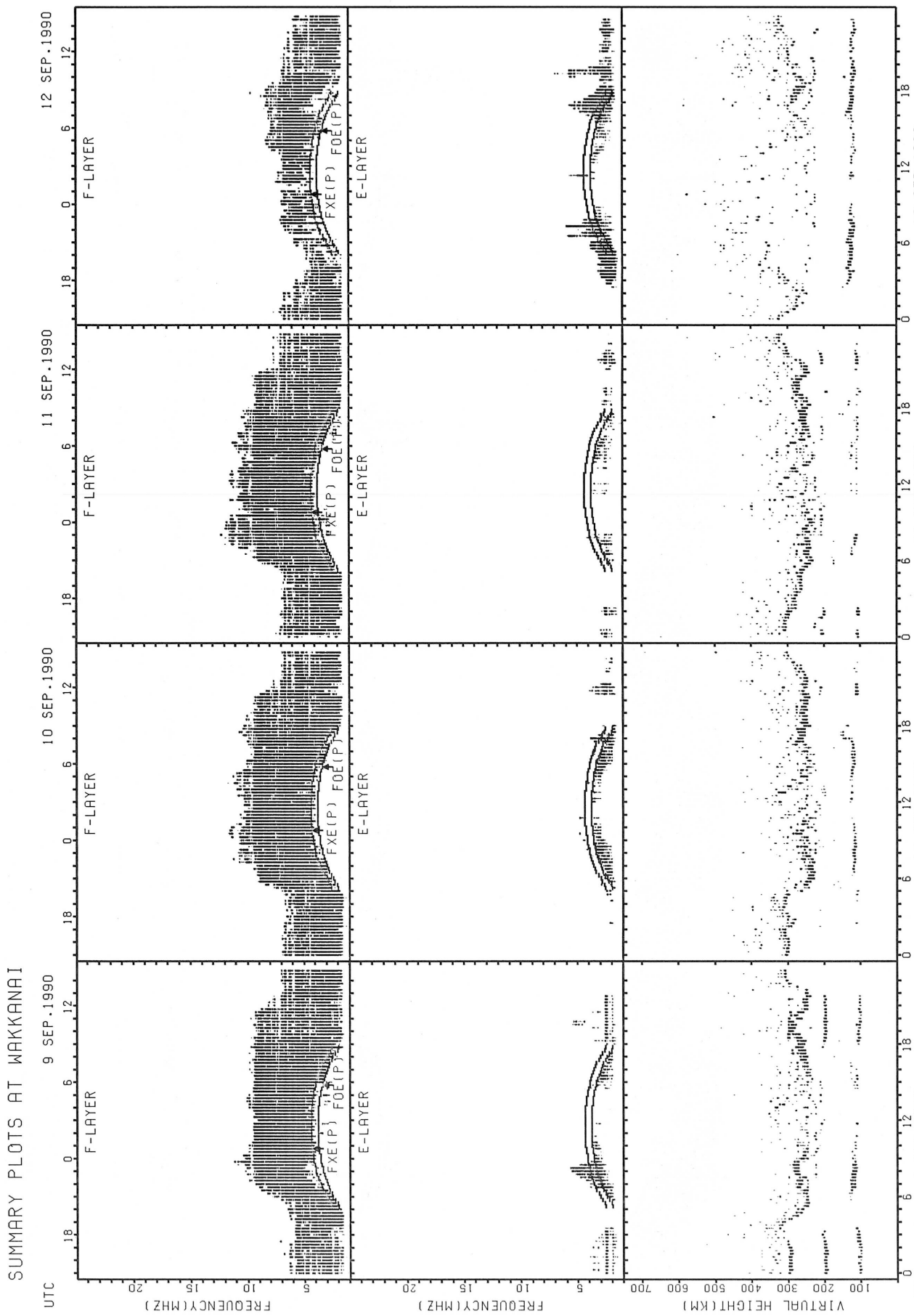
SEP.1990

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

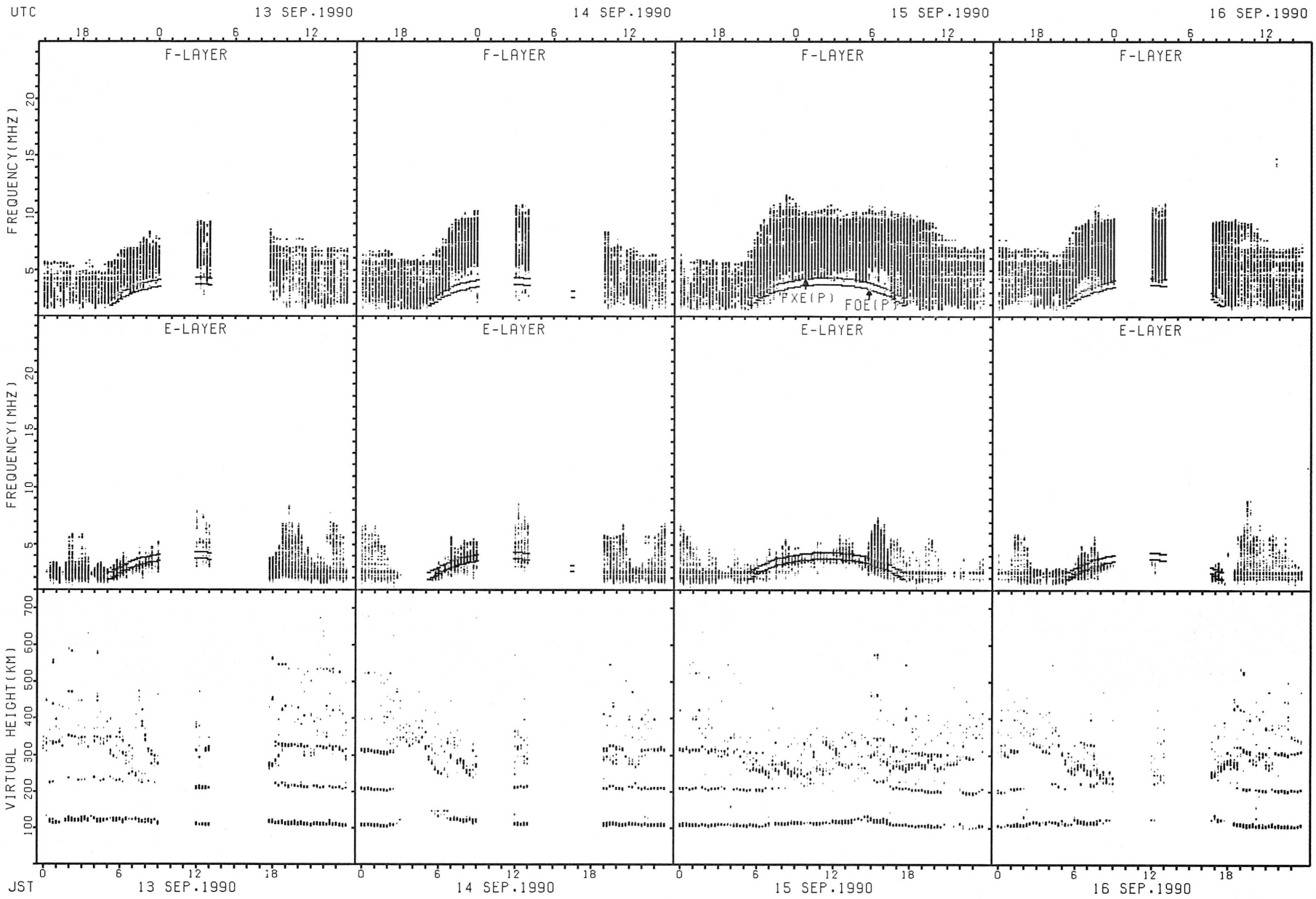
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	15	16	15	15	15	15	17	21	26	33	29	34	53	24	24	22	22	14	15	15	15	17	15
2	15	15	15	15	15	15	15	16	16	24	27	30	35	32	28	26	23	16	16	14	15	15	15	15
3	15	15	15	15	14	15	15	16	18	23	27	24	30	29	28	26	21	17	16	15	15	15	18	15
4	16	15	15	15	15	15	14	16	15	21	33	28	23	22	29	26	23	24	16	16	15	15	15	15
5	15	15	15	15	15	15	16	16	17	22	28	28	51	50	50	40	29	15	15	15	15	15	15	15
6	15	15	15	15	15	15	15	15	18	22	27	27	29	30	27	26	23	16	15	15	15	15	15	16
7	16	16	15	15	15	15	15	16	20	24	27	28	40	30	27	29	23	18	14	14	15	15	15	15
8	15	15	15	20	15	15	14	15	18	26		28	27	27	24	24	26	17	16	14				
9		15	15	14																				
10											26	27	28	29	29	26	22	16	15	15	15	15	15	15
11	15	14	15	15	15	15	15	15	18	20	24	27	32	38	32	27	23	23	15	14	15	15	15	15
12	15	15	15	15	15	15	15	14	16	23	29	30	34	30	32	26	24	22	14	15	15	15	15	15
13	15	15	15	15	15	15	15	15	16	23	27	29	27	27	28	28	22	18	15	15	15	15	15	15
14	15	15	15	15	15	15	16	15	16	21	26	24	41	28	45	21	16	15	14	14	15	15	16	15
15	15	16	15	15	15	14	15	15	17	26	24	30	29	33	29	27	24	22	14	14	15	15	15	15
16	15	15	14	15	14	15	15	15	23	26	26	29	26	26	24	22	18	16	14	15	15	15	15	15
17	15	15	15	15	15	15	15	15	16	24	24	26	27	32	23	26	16	15	14	15	15	15	15	15
18	15	16	15	15	15	15	15	22	18	24	27	33	33	50	62	42	23	20	16	15	15	16	15	15
19	15	15	15	15	15	15	15	15	16	22	27	34	29	26	22	26	23	16	15	15	15	15	15	15
20	15	15	15	15	15	15	15	15	24	29	49	59	29	60	58	29	26	21	15	15	15	15	16	15
21	15	15	15	15	15	15	14	17	17	24	26	27	28	59	60	28	27	21	17	15	15	15	14	15
22	15	15	15	15	15	15	15	16	17	26	22	29	44	50	58	27	26	22	16	15	14	15	15	15
23	15	15	15	15	15	15	15	18	17	24	28	50	52	58	55	28	24	17	14	14	15	15	15	15
24	15	15	15	15	15	15	15	15	15	20	28	29	32	44	41	27	26	21	14	15	15	15	15	15
25	15	15	15	15	15	15	15	15	15	21	26	45	62	54	38	27	26	21	15	15	15	15	15	15
26	15	15	15	15	15	15	15	15	18	26	28	29	29	33	30	29	26	17	15	15	15	15	15	16
27	15	15	15	15	15	14	15	21	22	23	27	40	30	41	28	26	24	23	15	14	15	15	15	15
28	15	15	14	15	15													16	15	14	15	15	14	15
29	15	15	14	14	15	15	15	15	15	21	28	29	28	29	28	23	18	15	14	14	15	15	15	15
30	15	15	15	14	14	15	15	15	15	26	24	27	26	29	26	23	20	16	14	15	15	15	14	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	29	29	28	27	27	27	27	27	27	28	28	28	28	28	28	29	29	29	28	28	28	28
MED	15	15	15	15	15	15	15	15	17	24	27	29	30	32	29	26	23	17	15	15	15	15	15	15
U Q	15	15	15	15	15	15	15	16	18	26	28	30	34	50	43	28	26	21	15	15	15	15	15	15
L Q	15	15	15	15	15	15	15	15	16	22	26	27	28	29	27	26	22	16	14	14	15	15	15	15


SUMMARY PLOTS AT WAKKANAI
UTC
1 SEP.1990
2 SEP.1990
3 SEP.1990
4 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

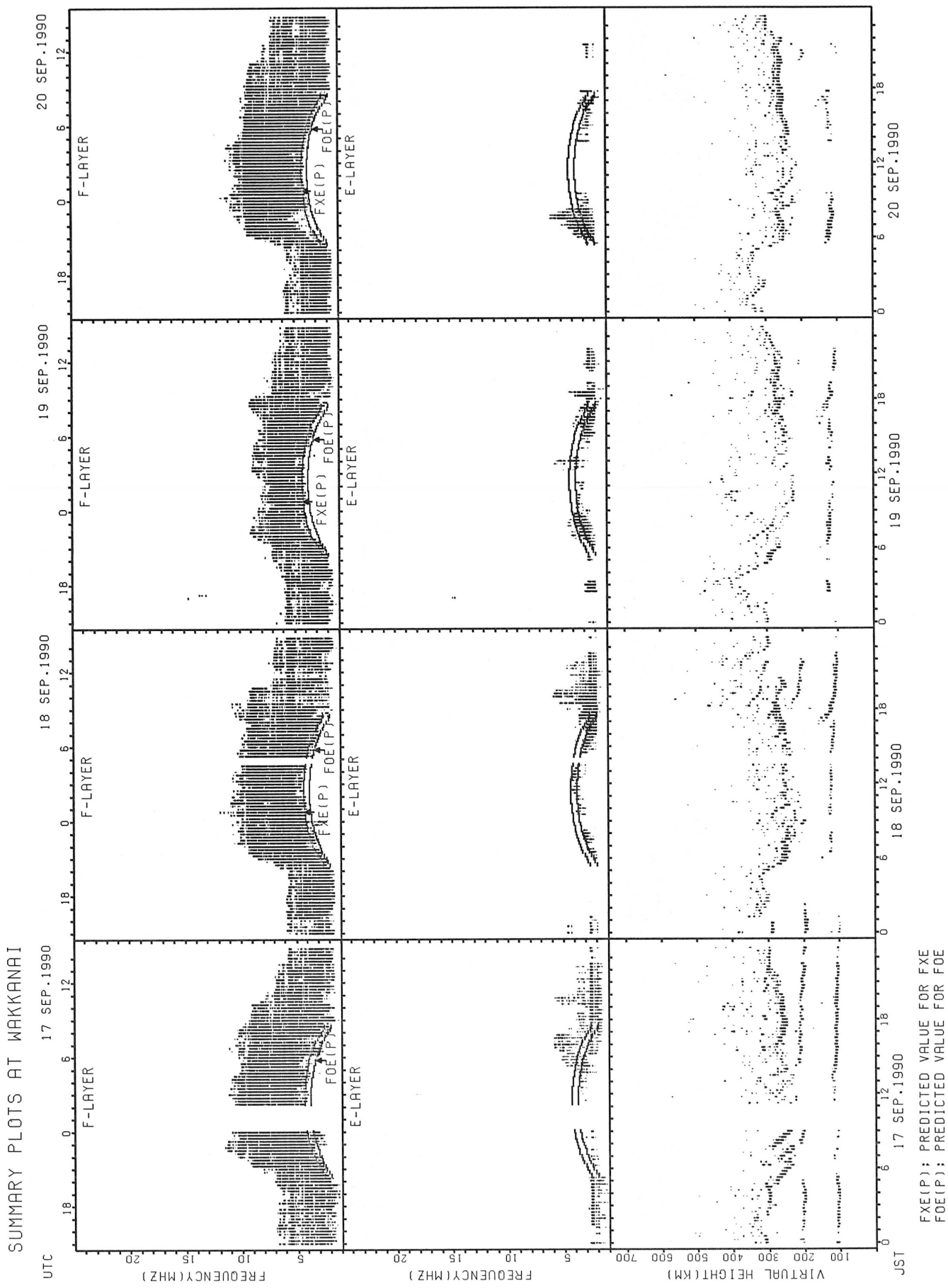

SUMMARY PLOTS AT WAKKANAI
UTC
JST
5 SEP.1990
6 SEP.1990
7 SEP.1990
8 SEP.1990
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT WAKKANAI
UTC
9 SEP.1990
10 SEP.1990
11 SEP.1990
12 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

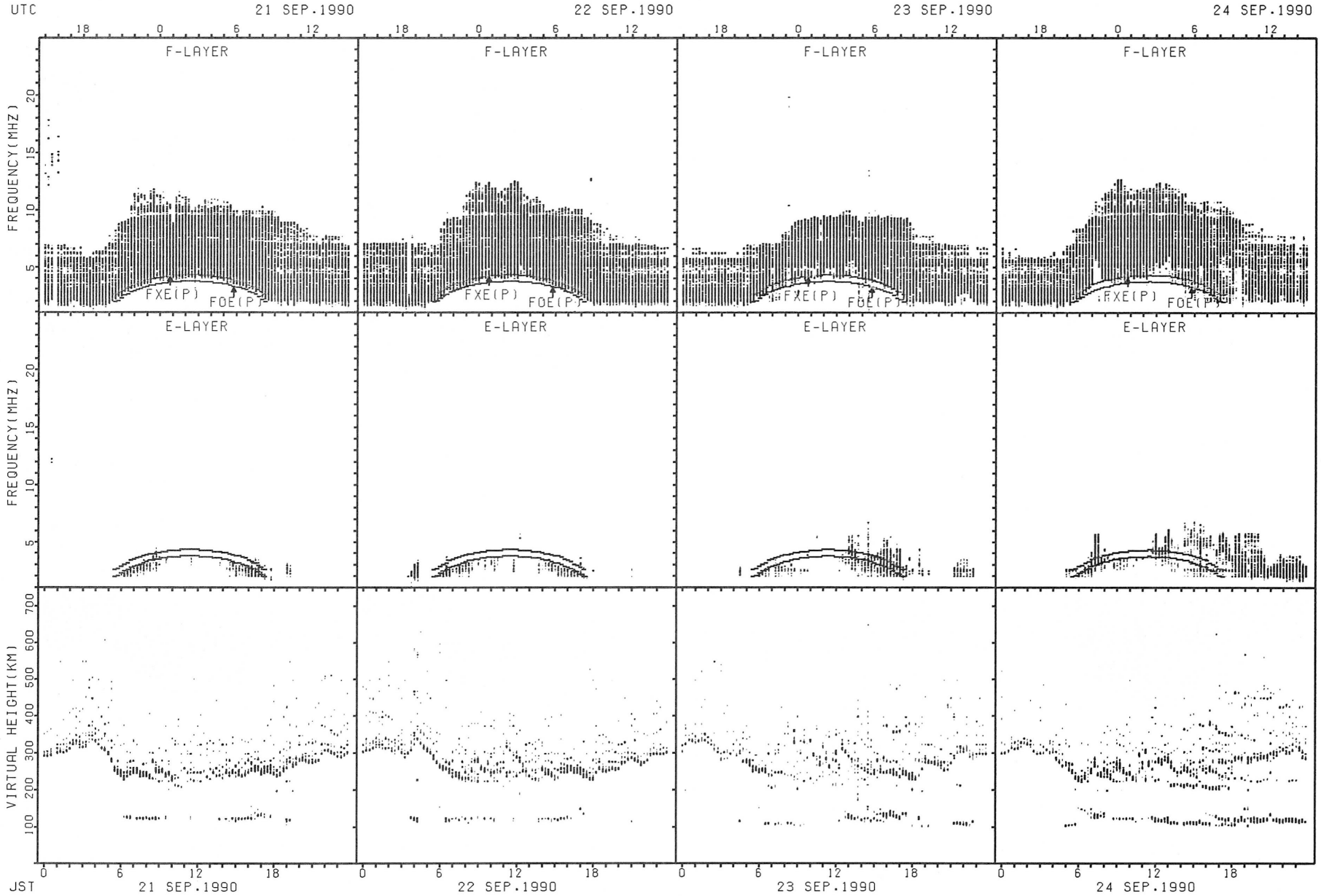
SUMMARY PLOTS AT WAKKANAI



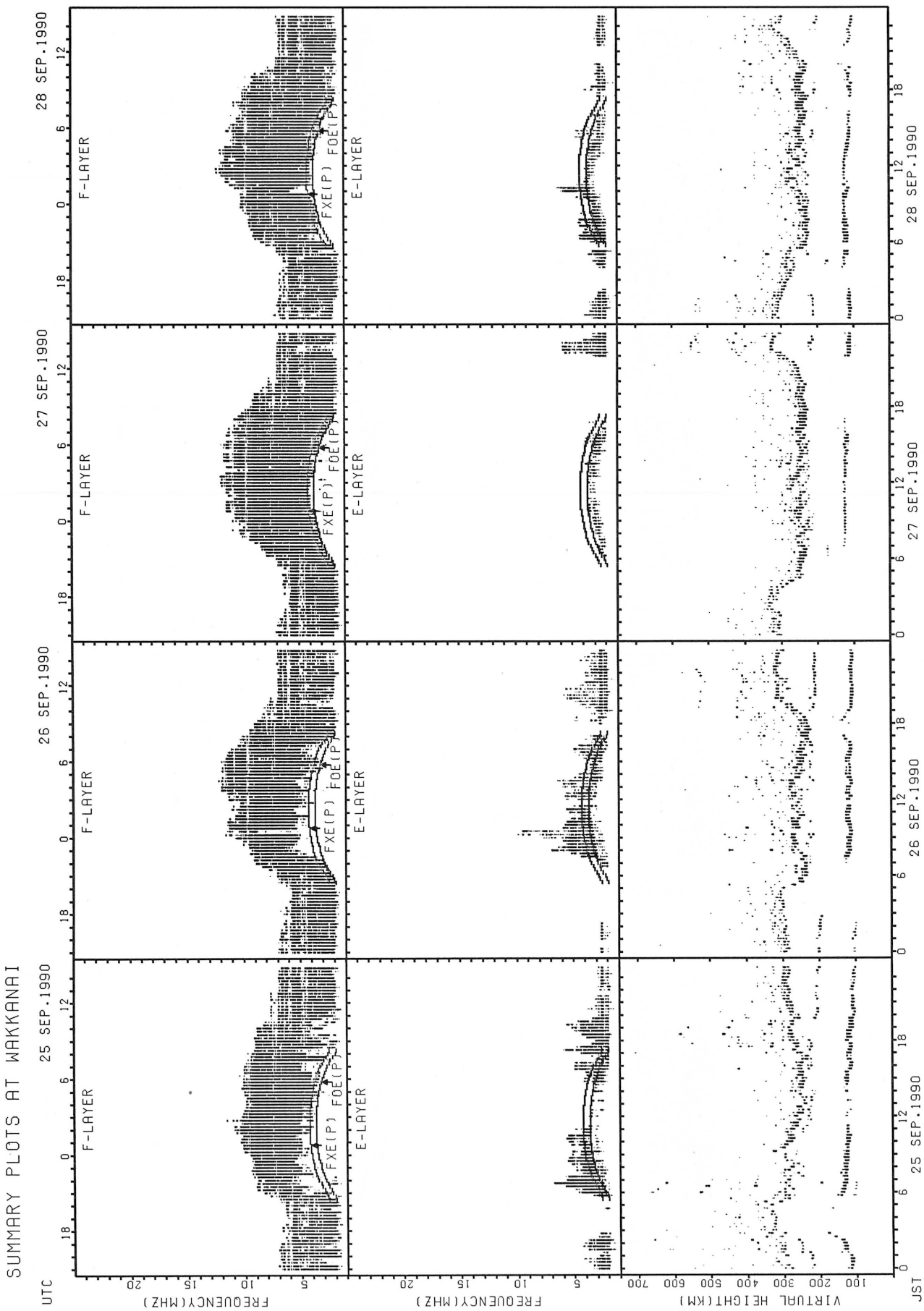
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
17 SEP.1990
18 SEP.1990
19 SEP.1990
20 SEP.1990
F-LAYER
E-LAYER
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P)
FOE(P)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

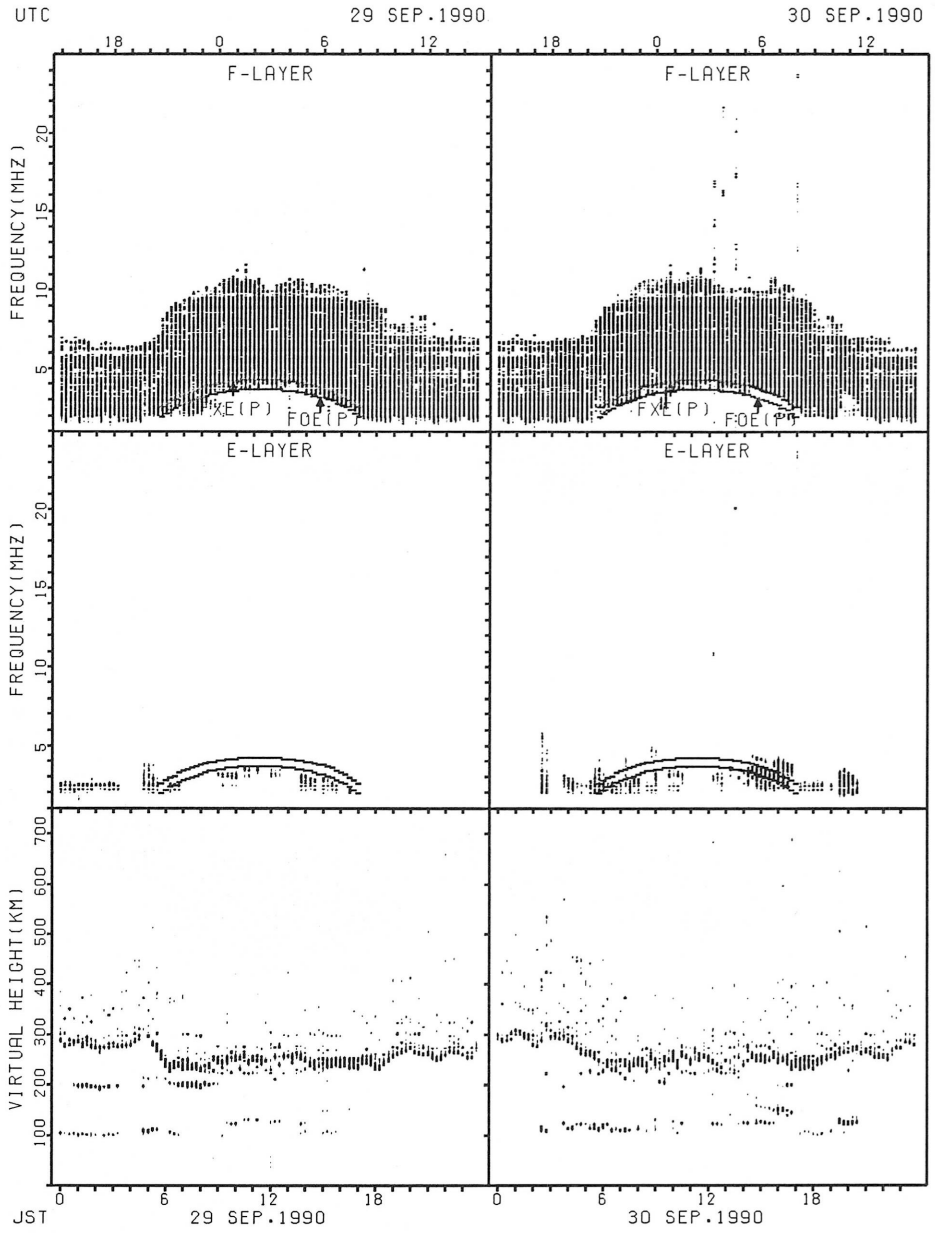
SUMMARY PLOTS AT WAKKANAI



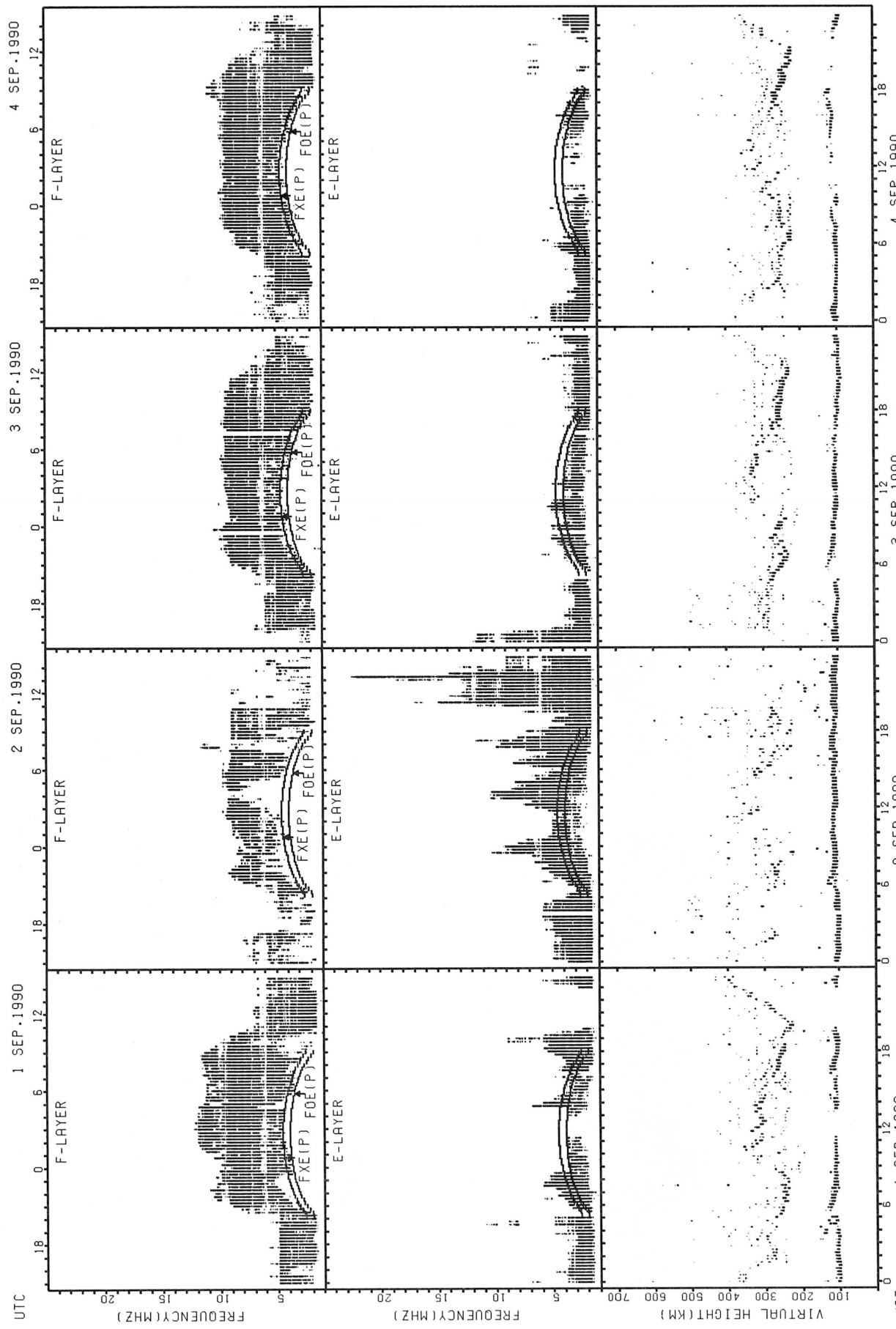
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
25 SEP.1990
26 SEP.1990
27 SEP.1990
28 SEP.1990
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

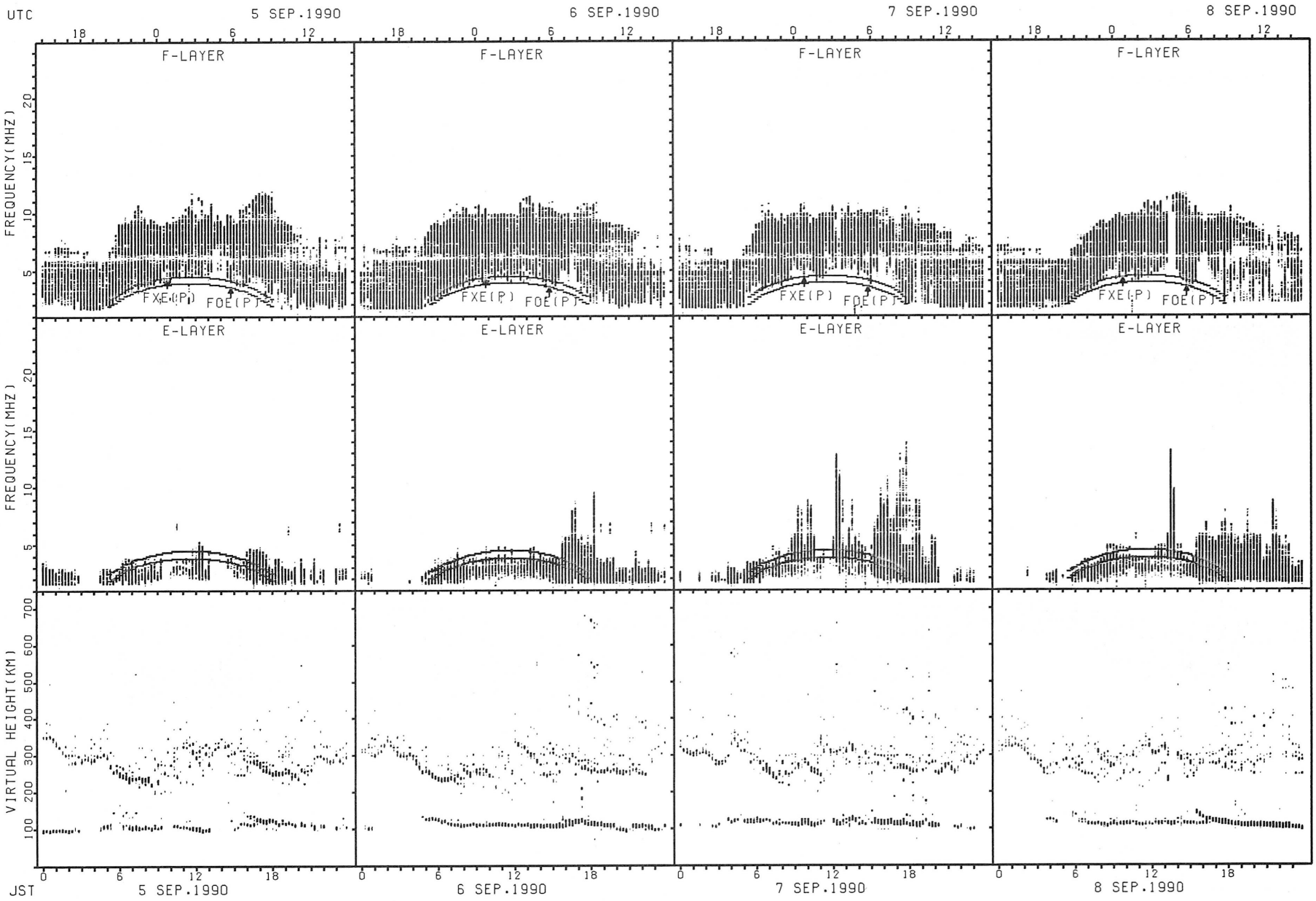
SUMMARY PLOTS AT WAKKANAI



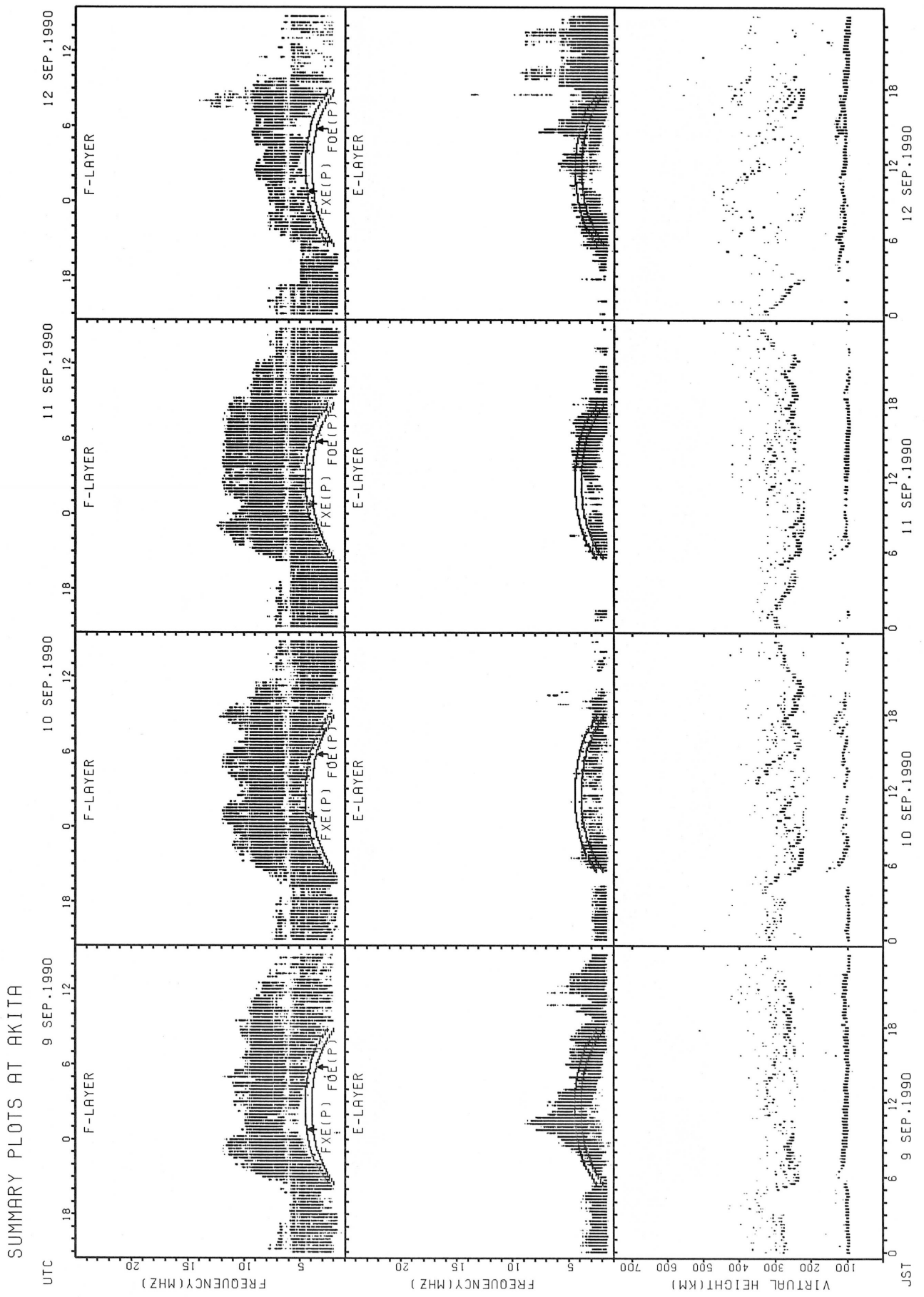
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT AKITA
UTC
1 SEP.1990
2 SEP.1990
3 SEP.1990
4 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

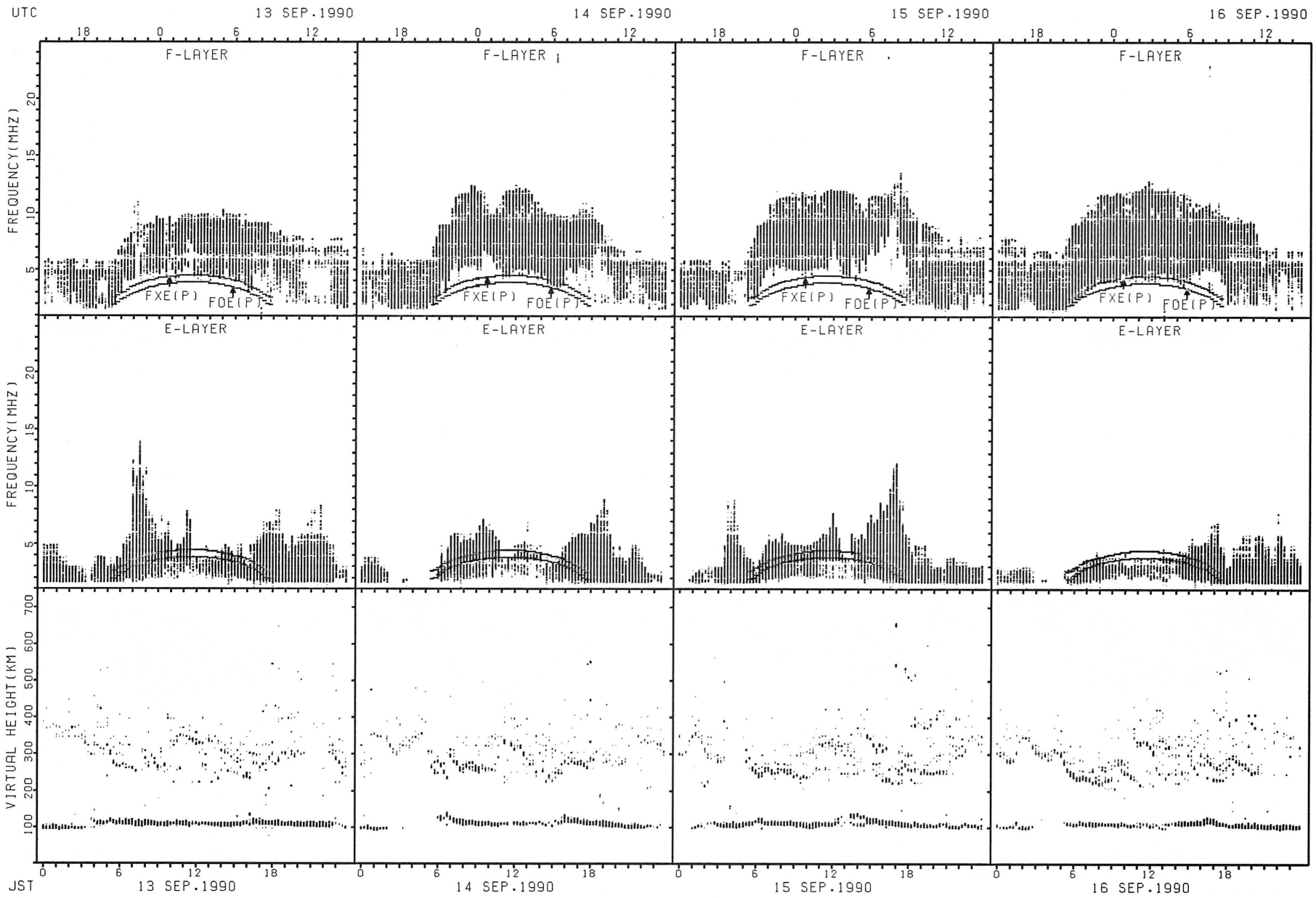
SUMMARY PLOTS AT AKITA



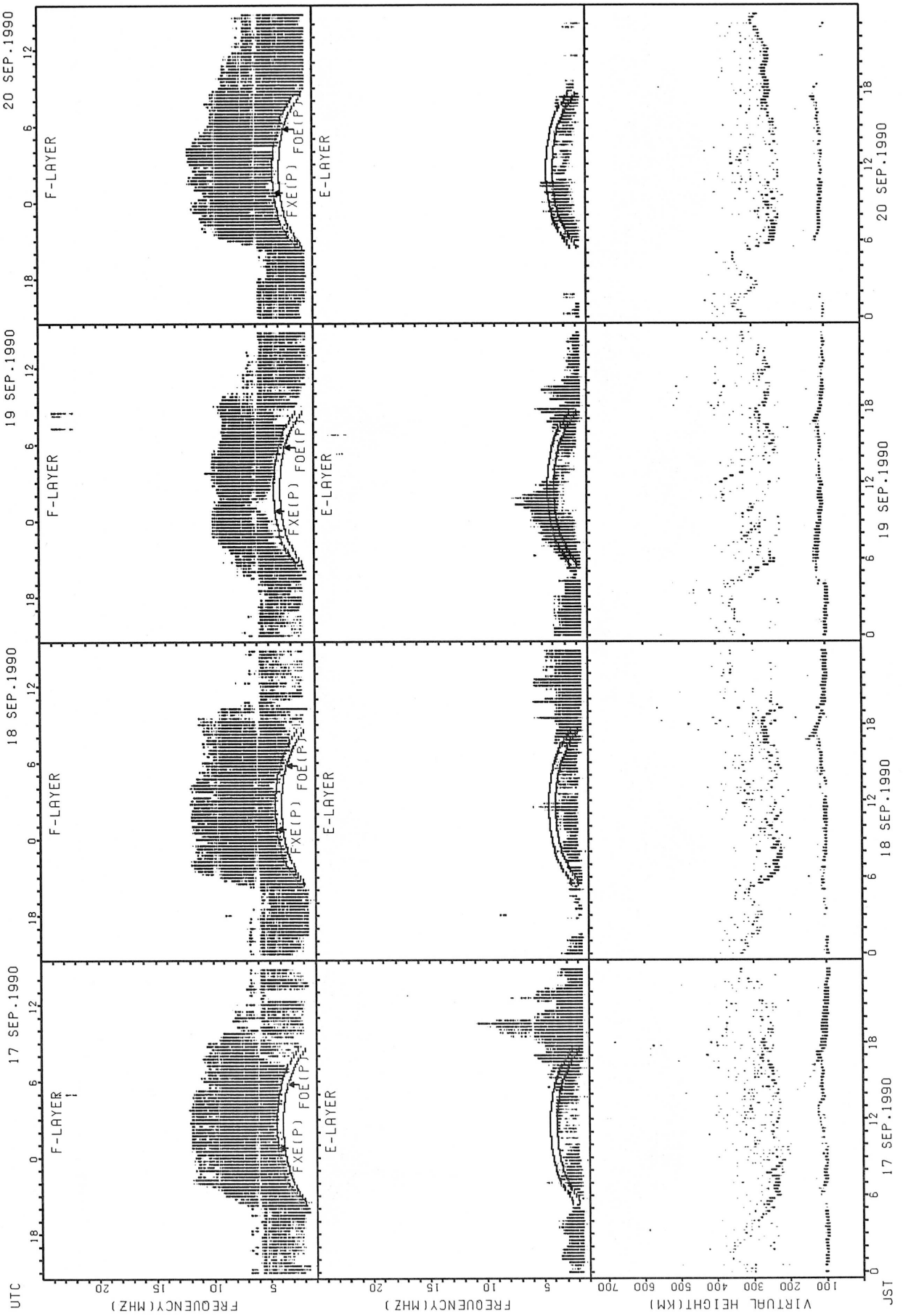
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT AKITA
UTC
9 SEP.1990
10 SEP.1990
11 SEP.1990
12 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

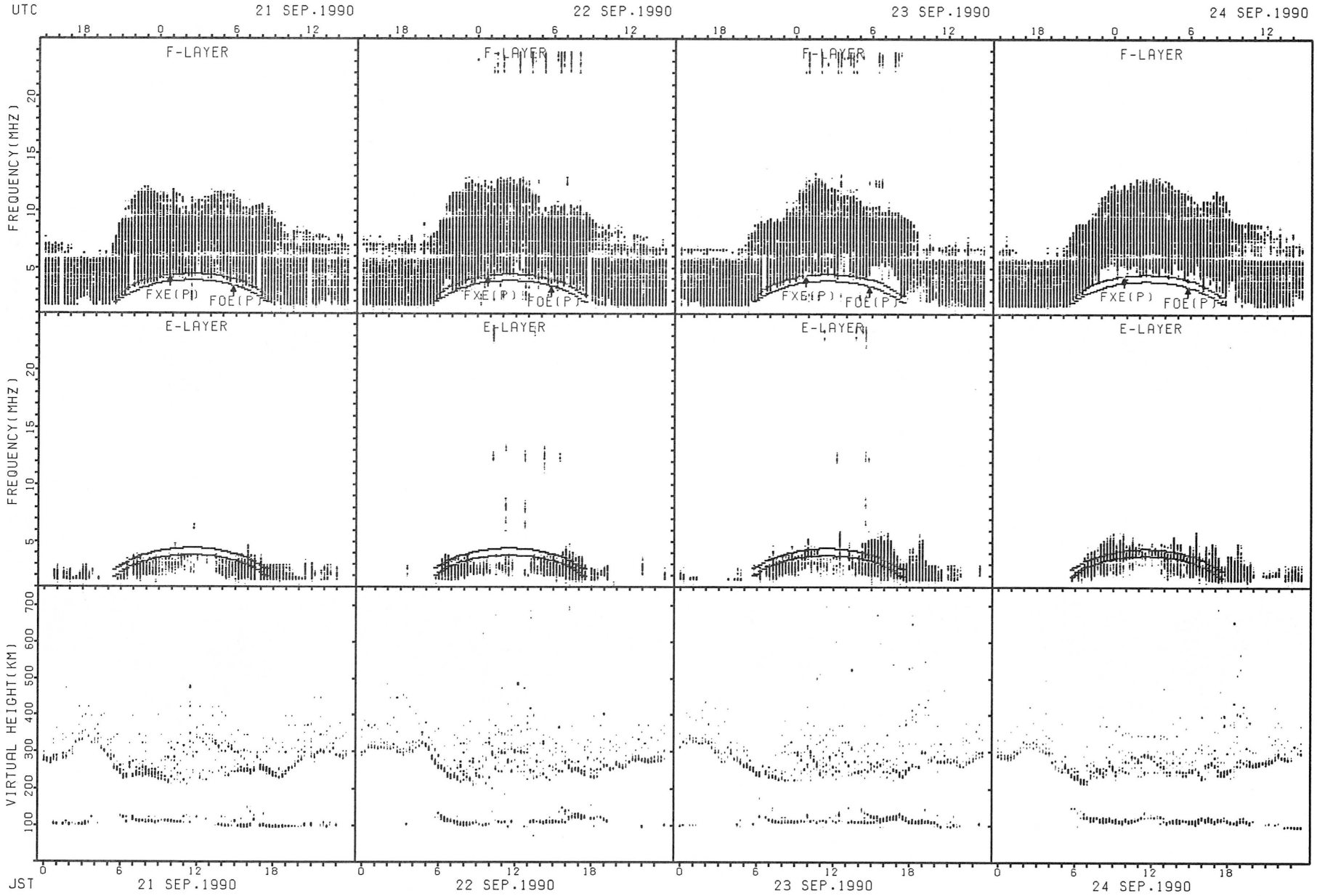
SUMMARY PLOTS AT AKITA



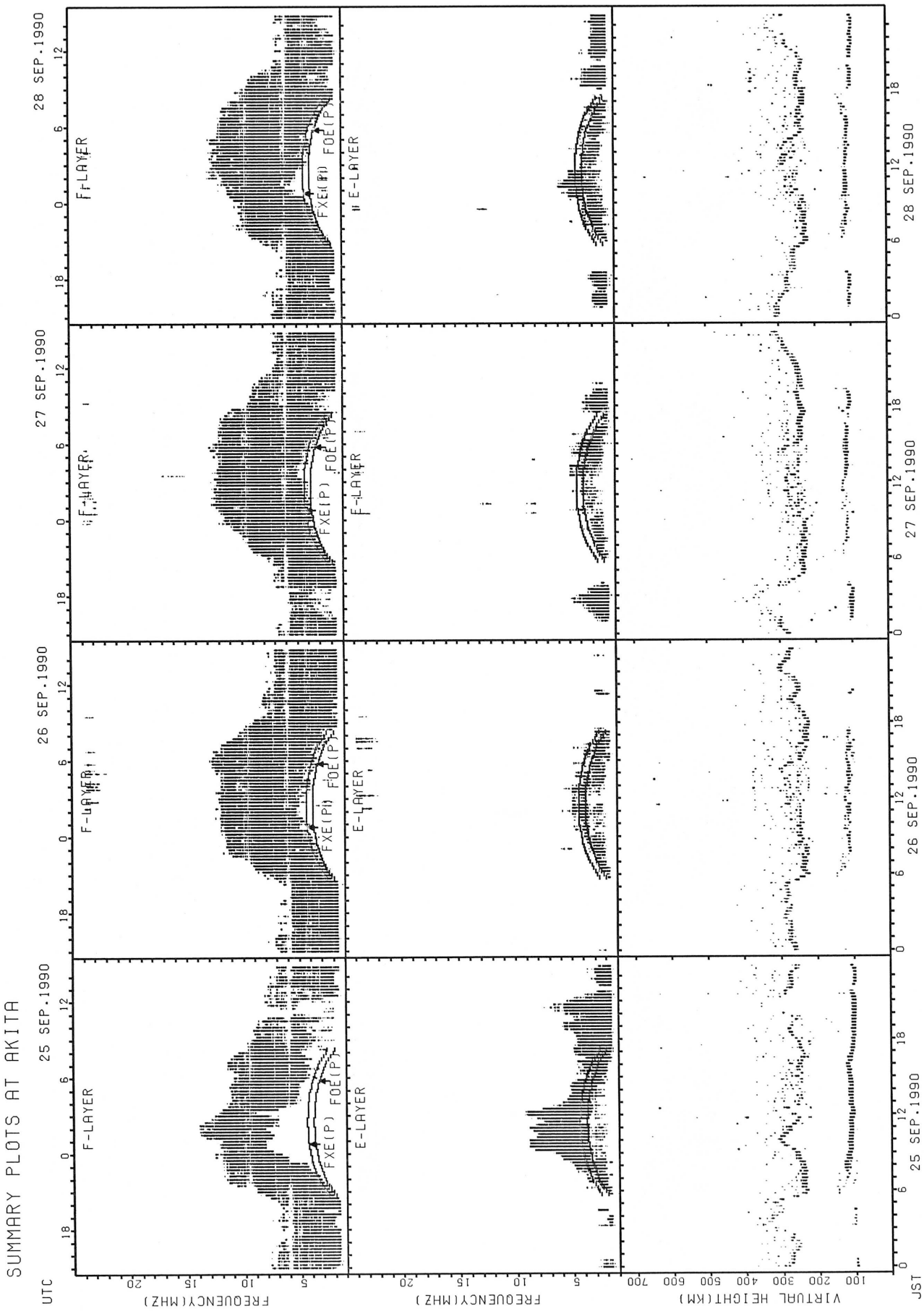
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

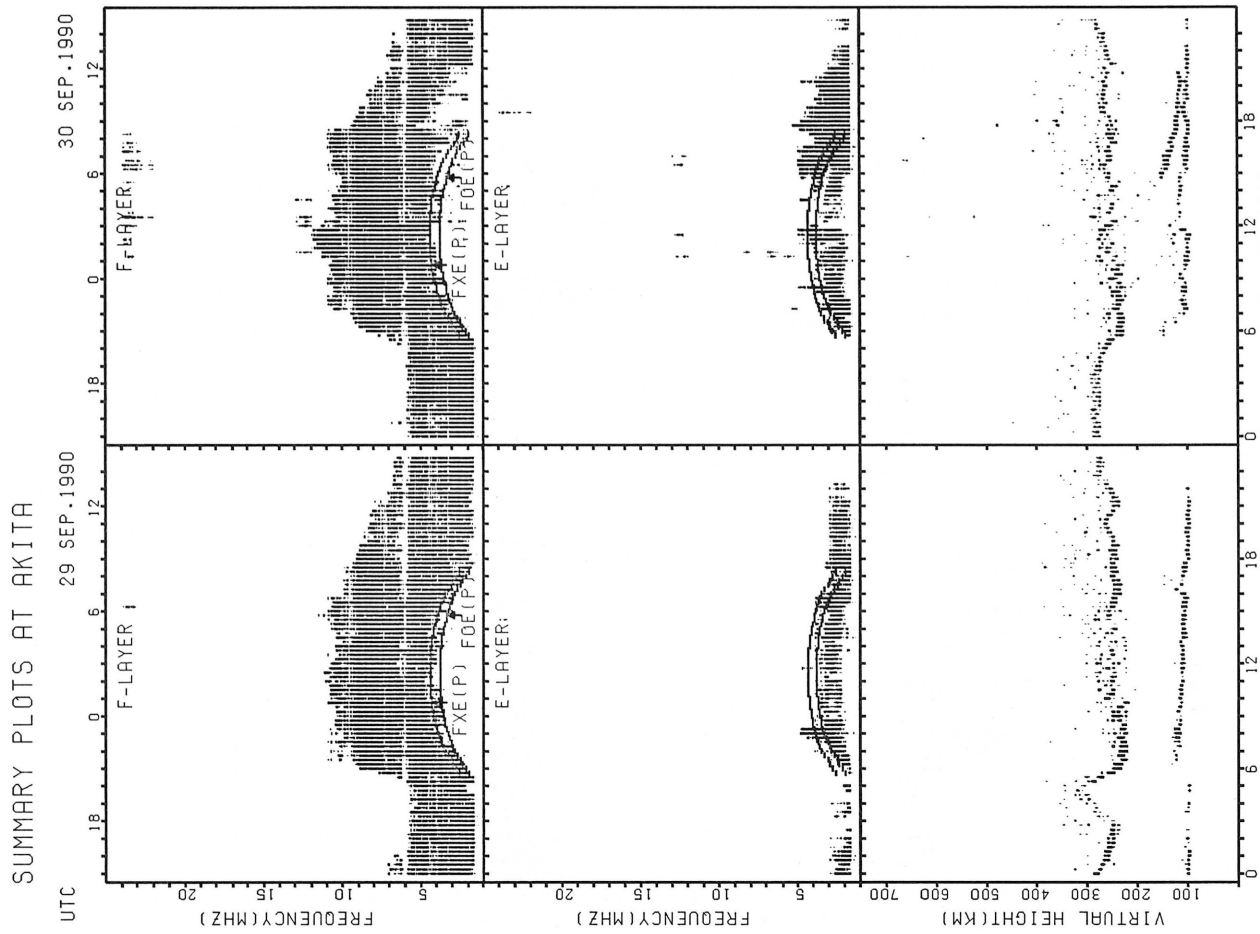

SUMMARY PLOTS AT AKITA
17 SEP.1990
18 SEP.1990
19 SEP.1990
20 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
UTC
JST
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE

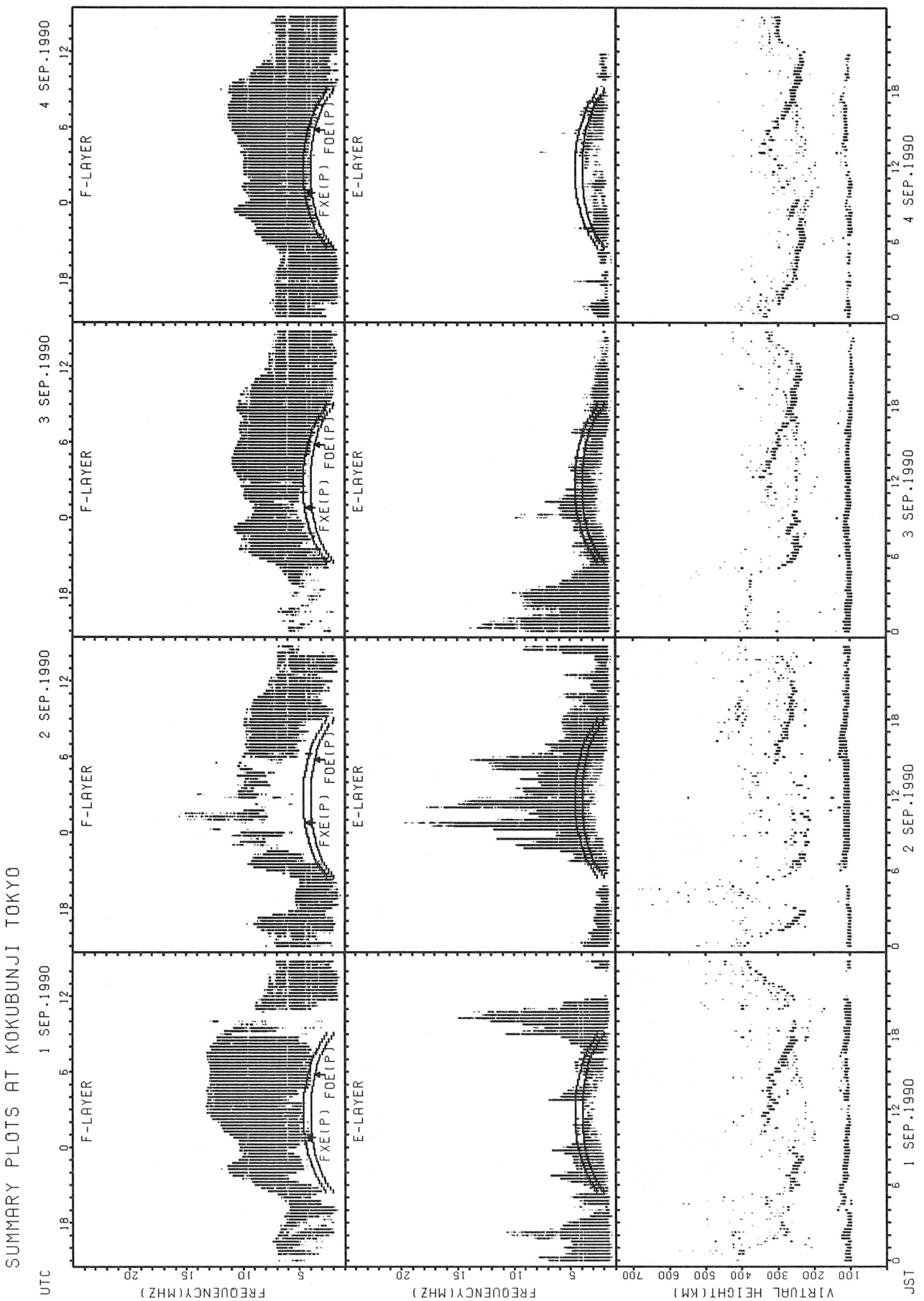
SUMMARY PLOTS AT AKITA

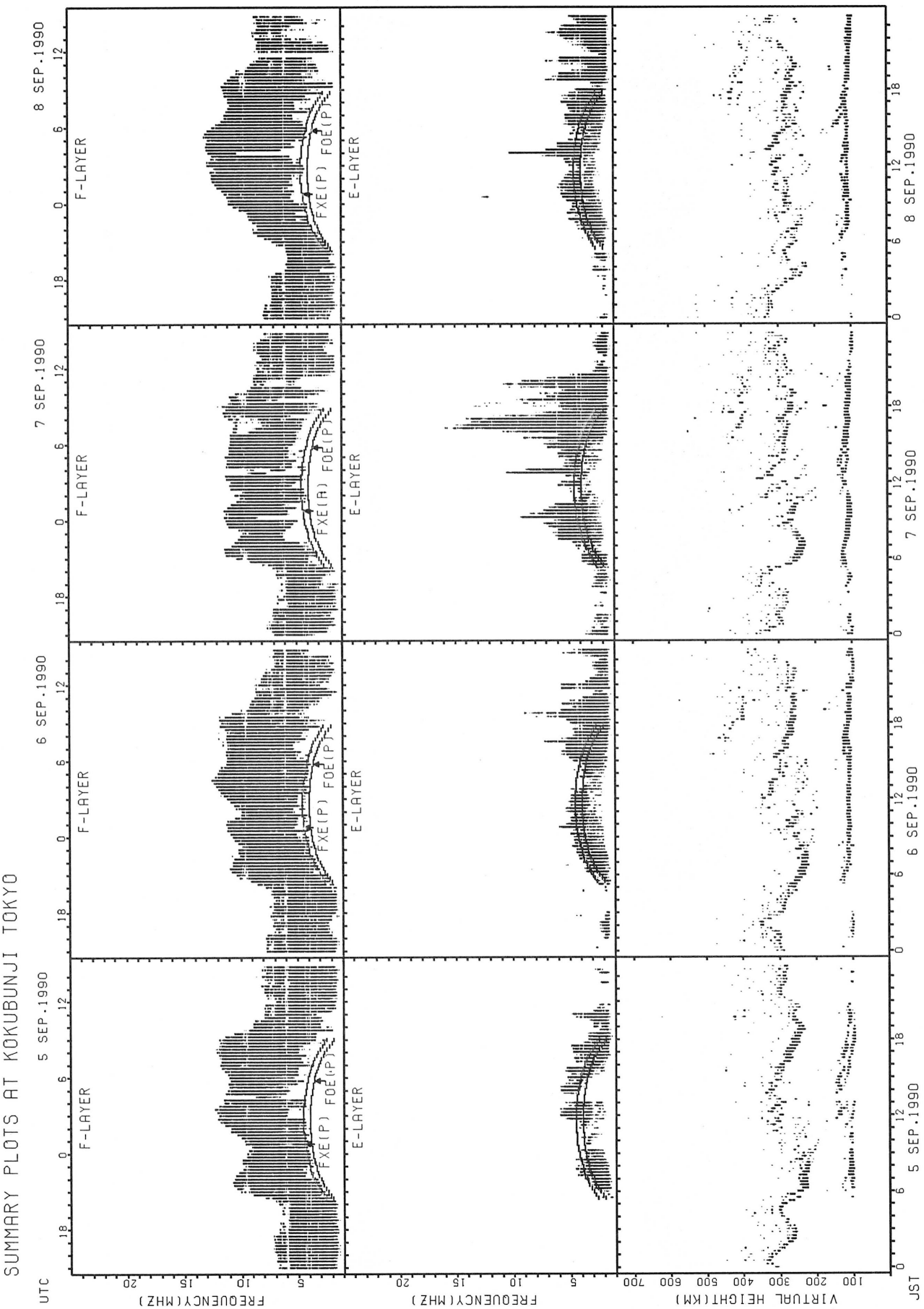


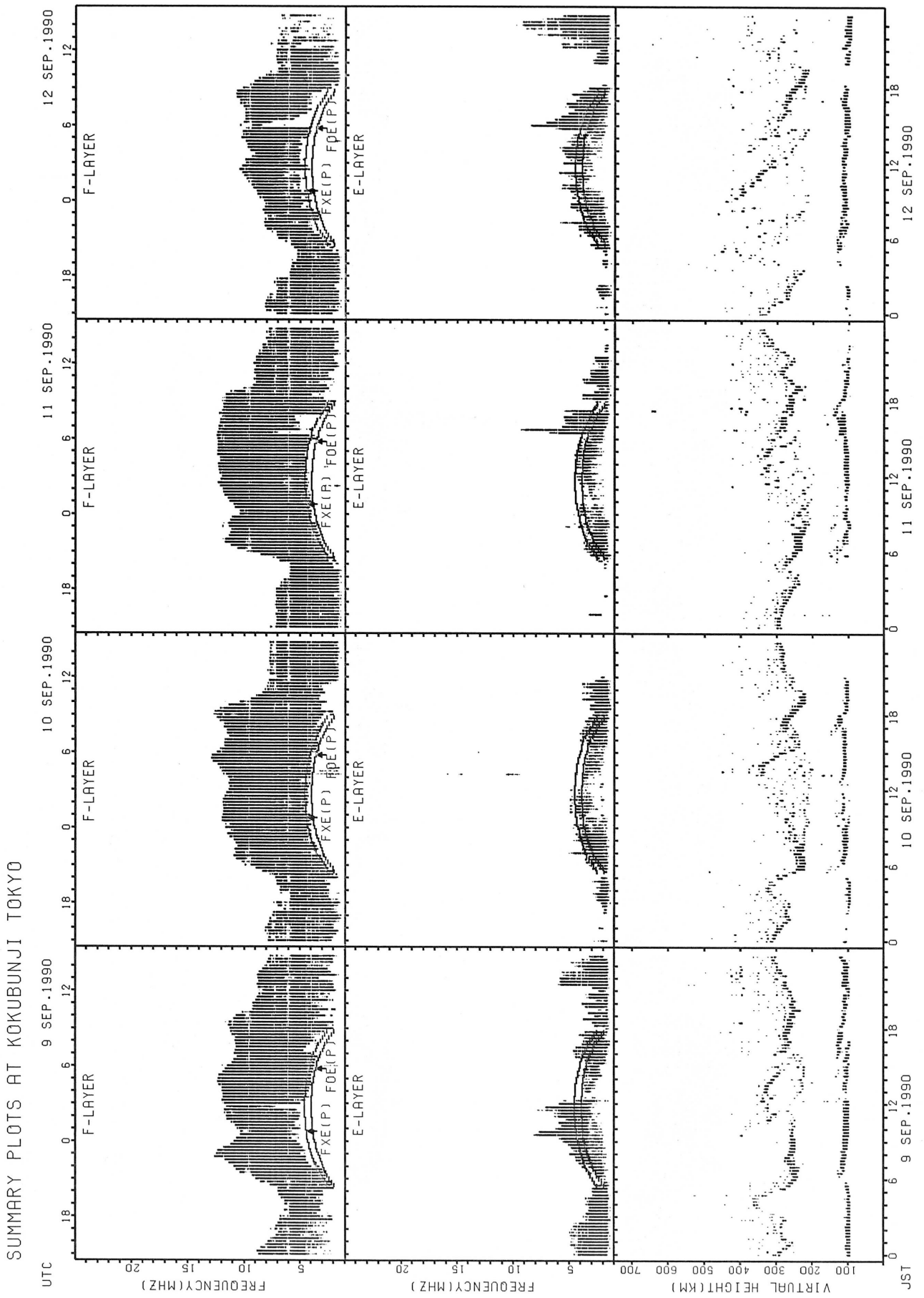
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT AKITA
UTC
25 SEP.1990
26 SEP.1990
27 SEP.1990
28 SEP.1990
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

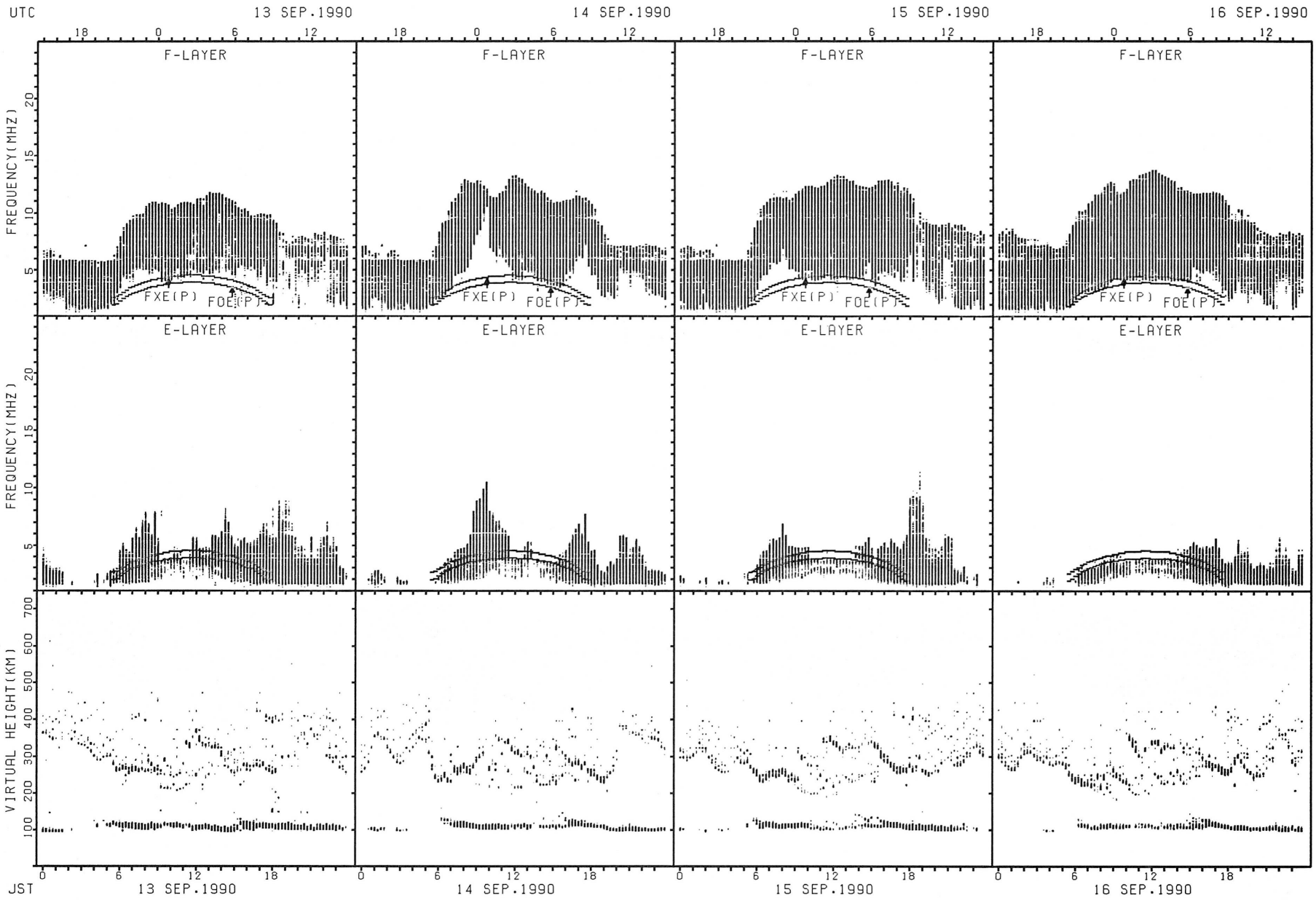

SUMMARY PLOTS AT AKITA
UTC
29 SEP.1990
30 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
1 SEP.1990
2 SEP.1990
3 SEP.1990
4 SEP.1990
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

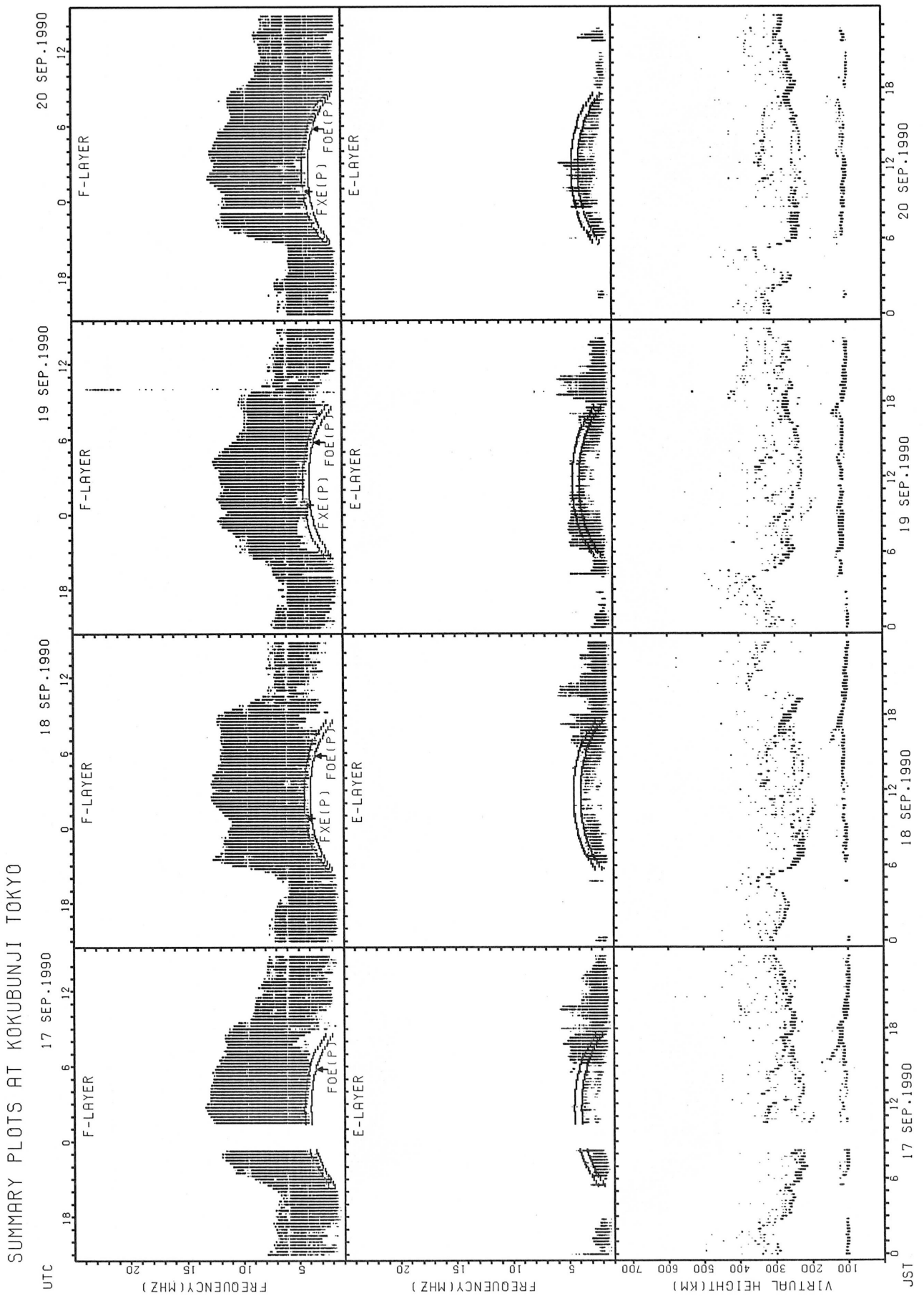

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
5 SEP.1990
6 SEP.1990
7 SEP.1990
8 SEP.1990
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
9 SEP.1990
10 SEP.1990
11 SEP.1990
12 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

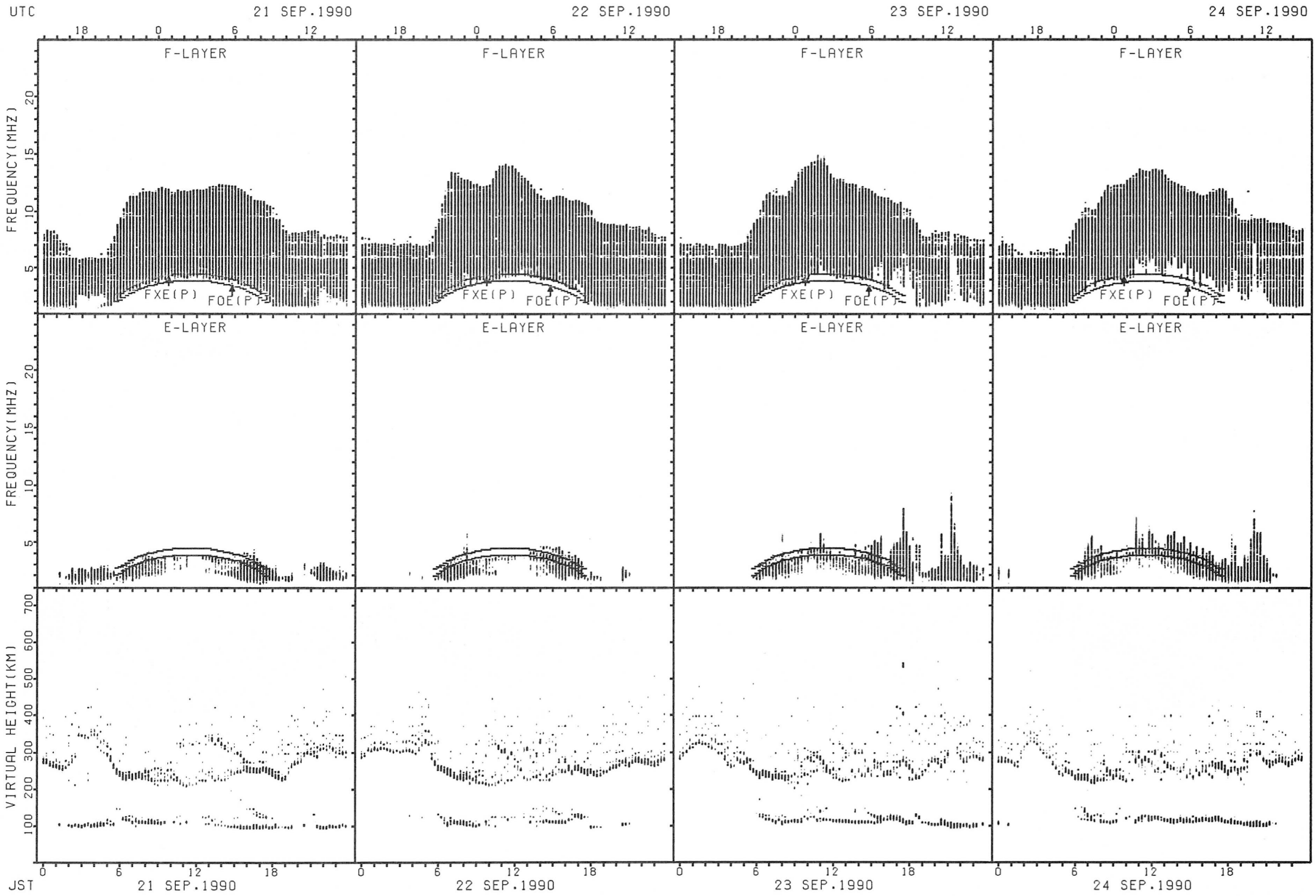
SUMMARY PLOTS AT KOKUBUNJI TOKYO



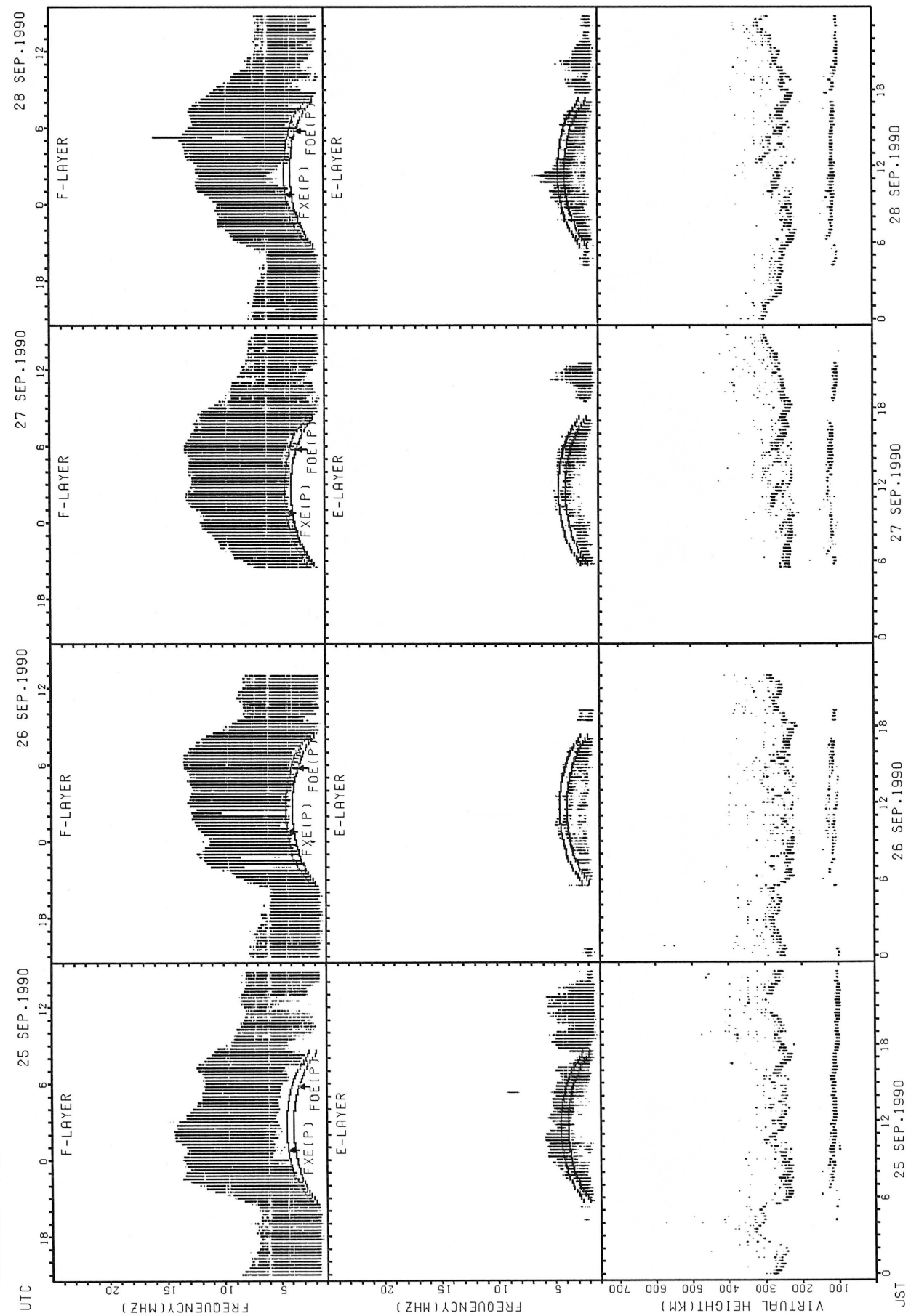
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
17 SEP.1990
18 SEP.1990
19 SEP.1990
20 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
UTC
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

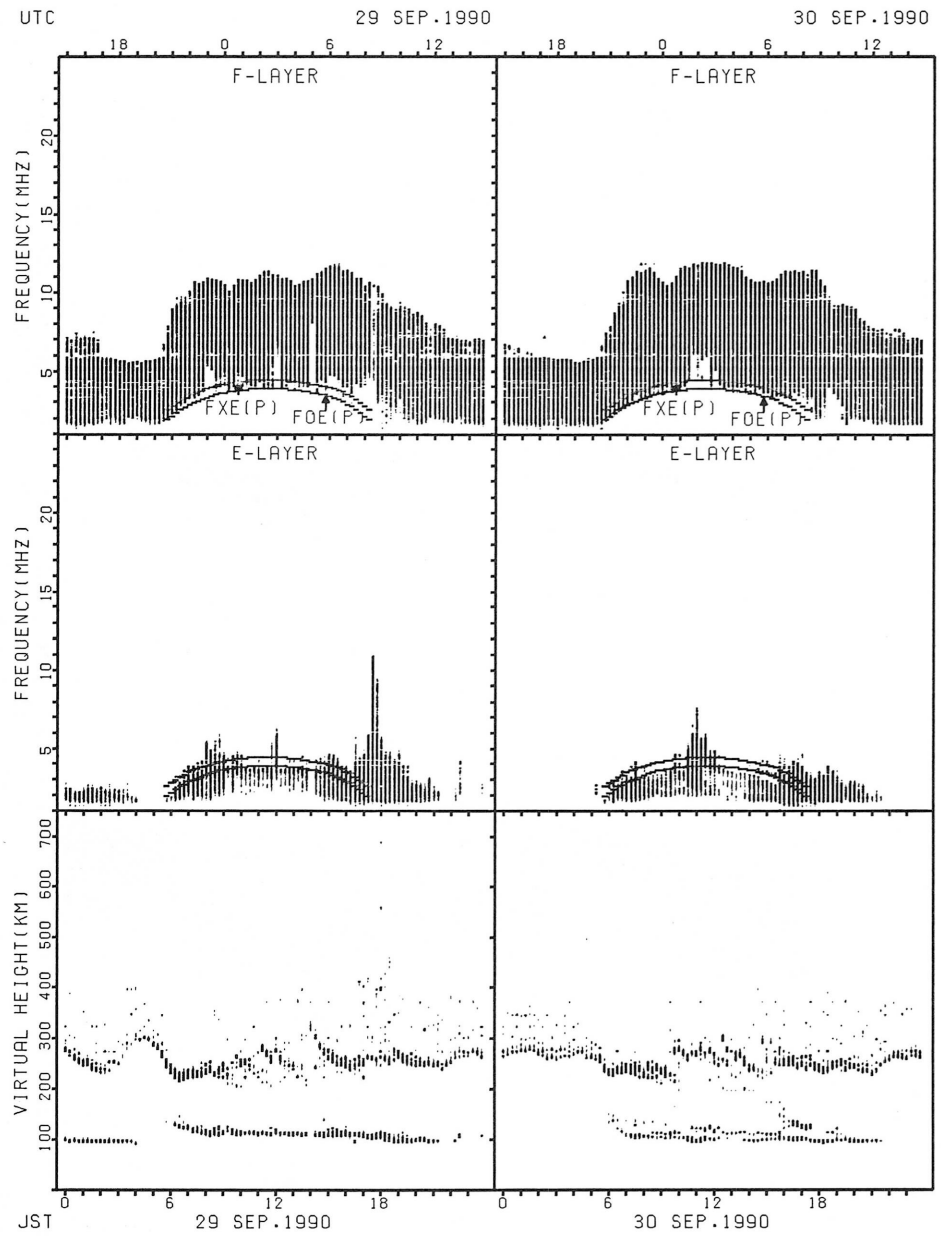
SUMMARY PLOTS AT KOKUBUNJI TOKYO



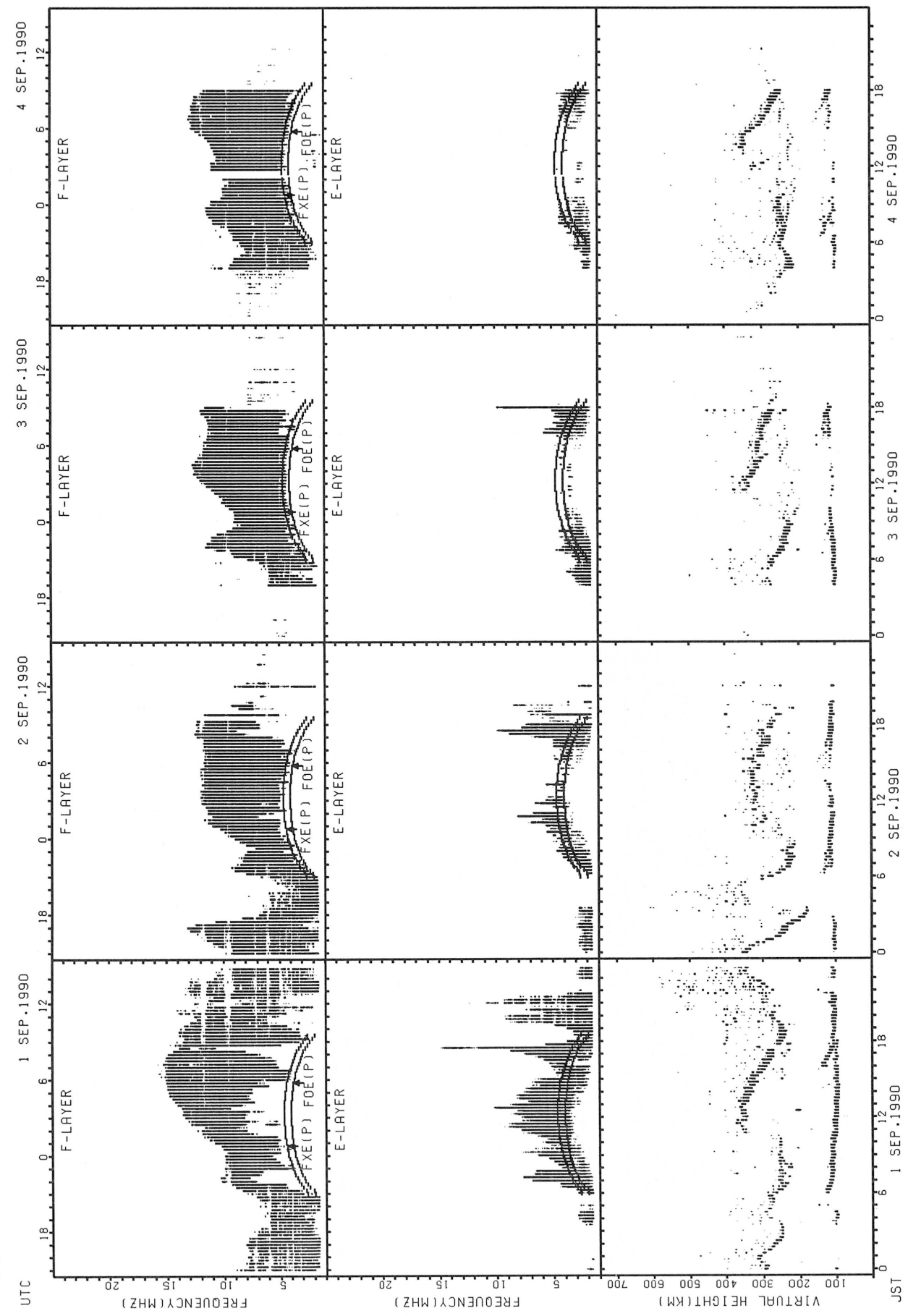
FXE(P); PREDICTED VALUE FOR FXE
FOE(P); PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
25 SEP.1990
26 SEP.1990
27 SEP.1990
28 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

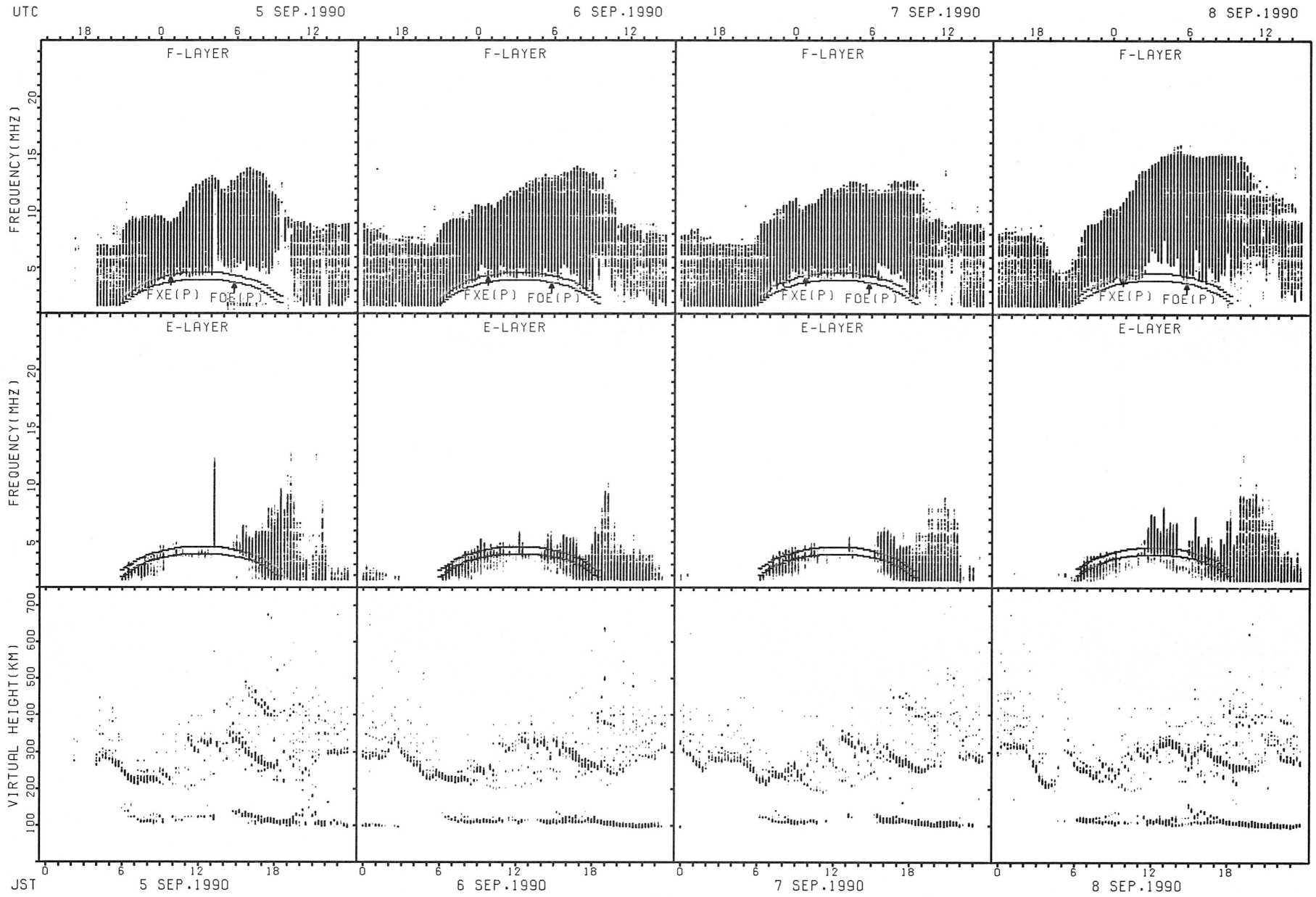
SUMMARY PLOTS AT KOKUBUNJI TOKYO



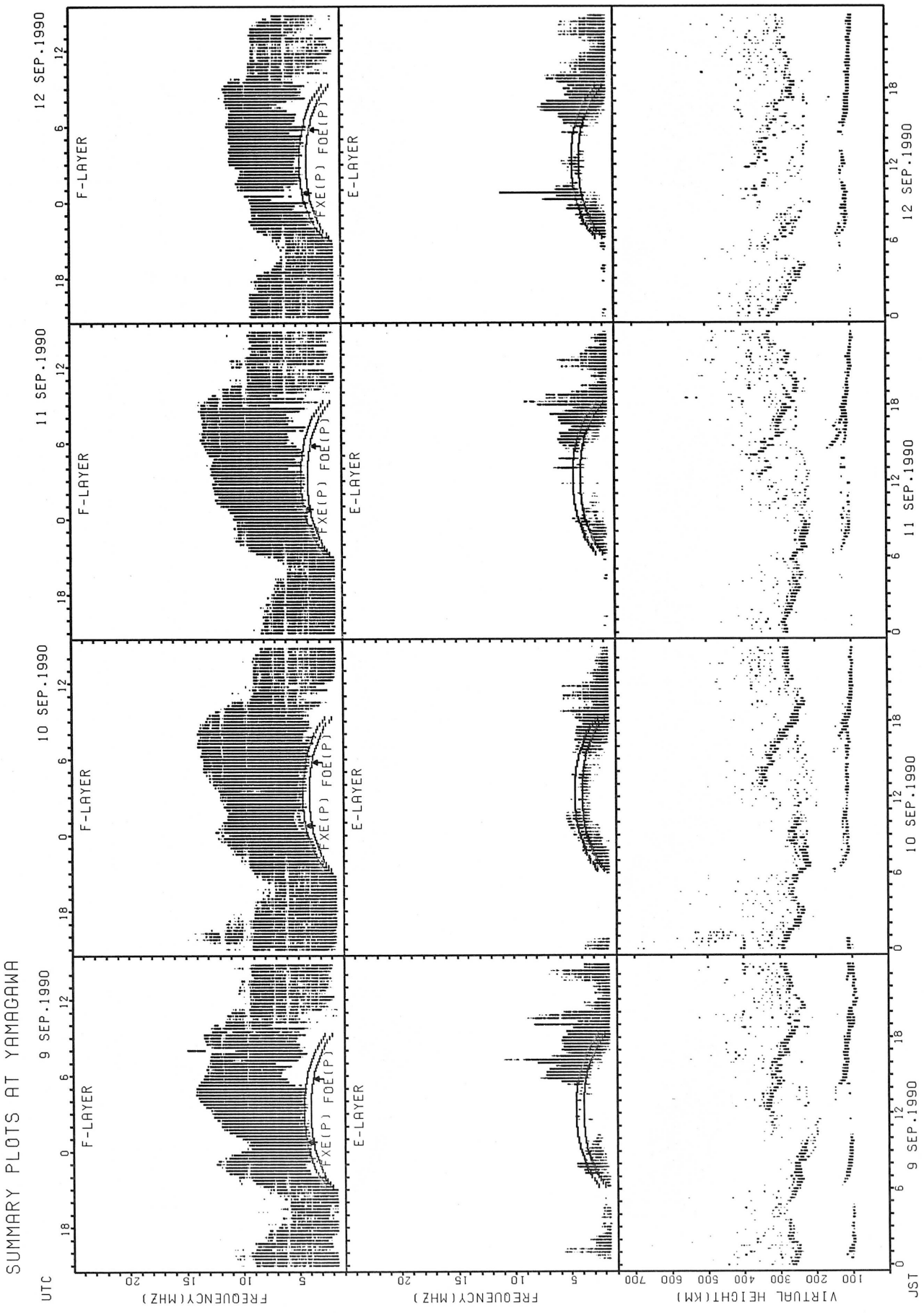
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT YAMAGAWA
UTC
1 SEP.1990
2 SEP.1990
3 SEP.1990
4 SEP.1990
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

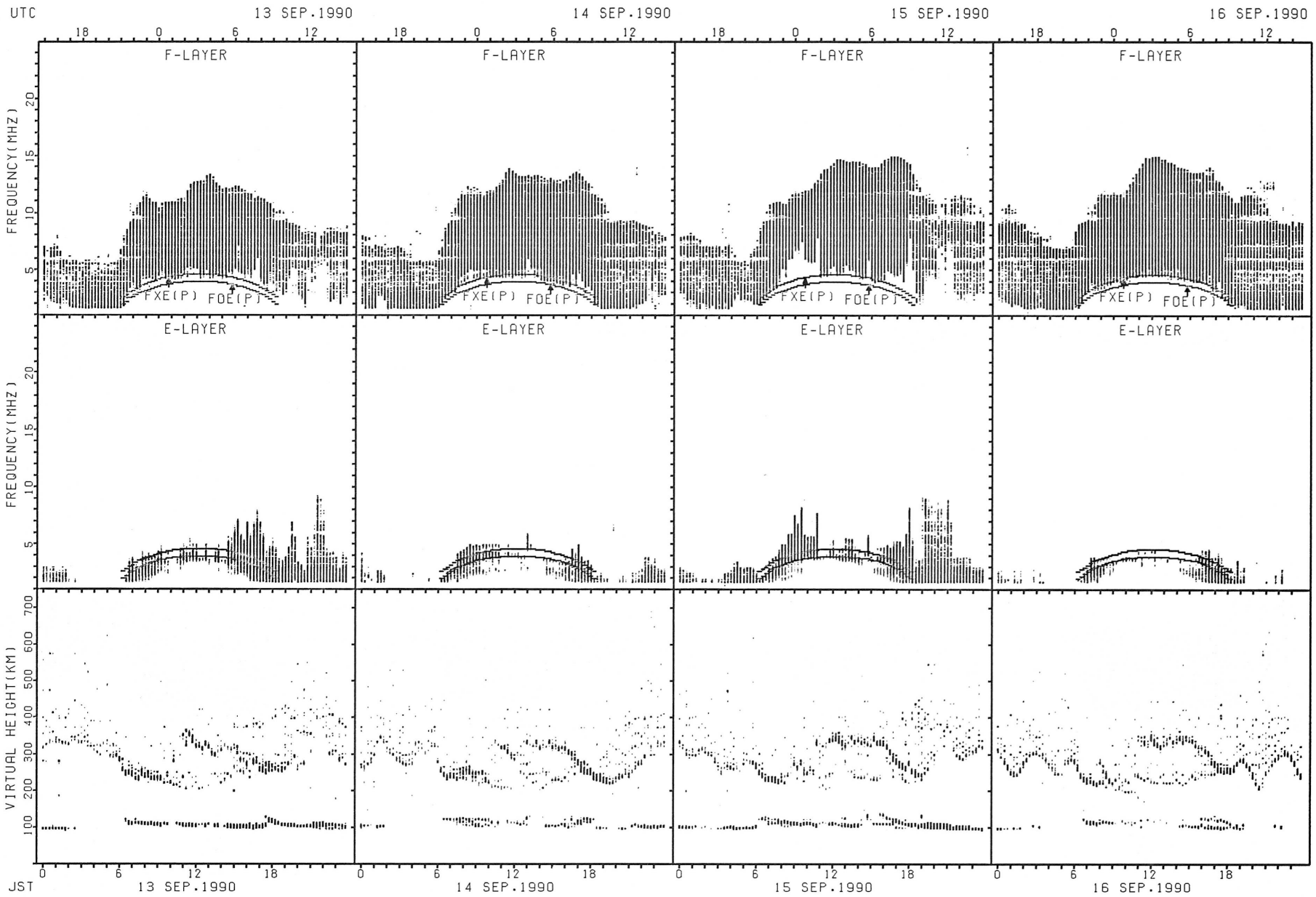
SUMMARY PLOTS AT YAMAGAWA



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

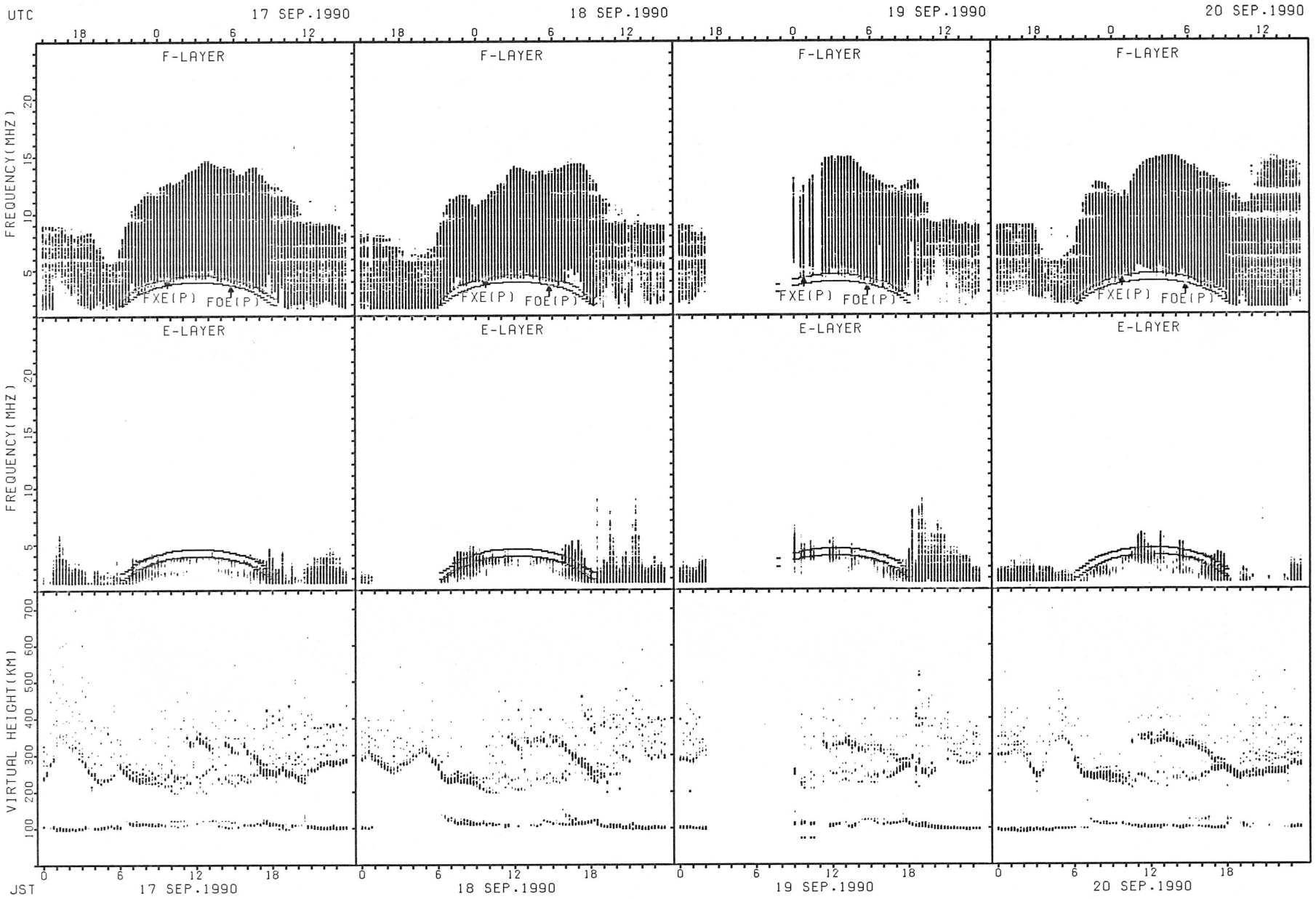

SUMMARY PLOTS AT YAMAGAWA
UTC
9 SEP.1990
10 SEP.1990
11 SEP.1990
12 SEP.1990
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT YAMAGAWA

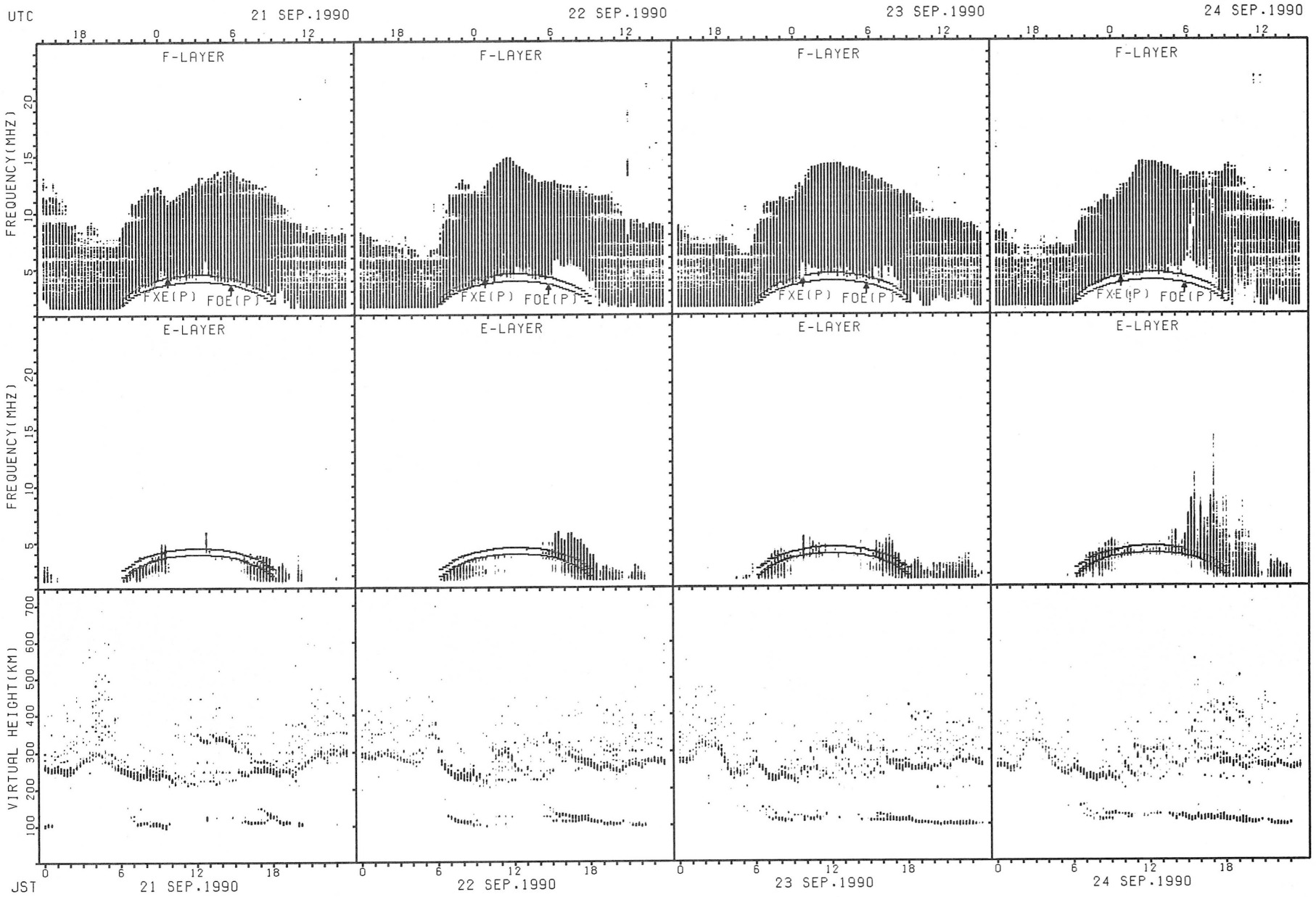


FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

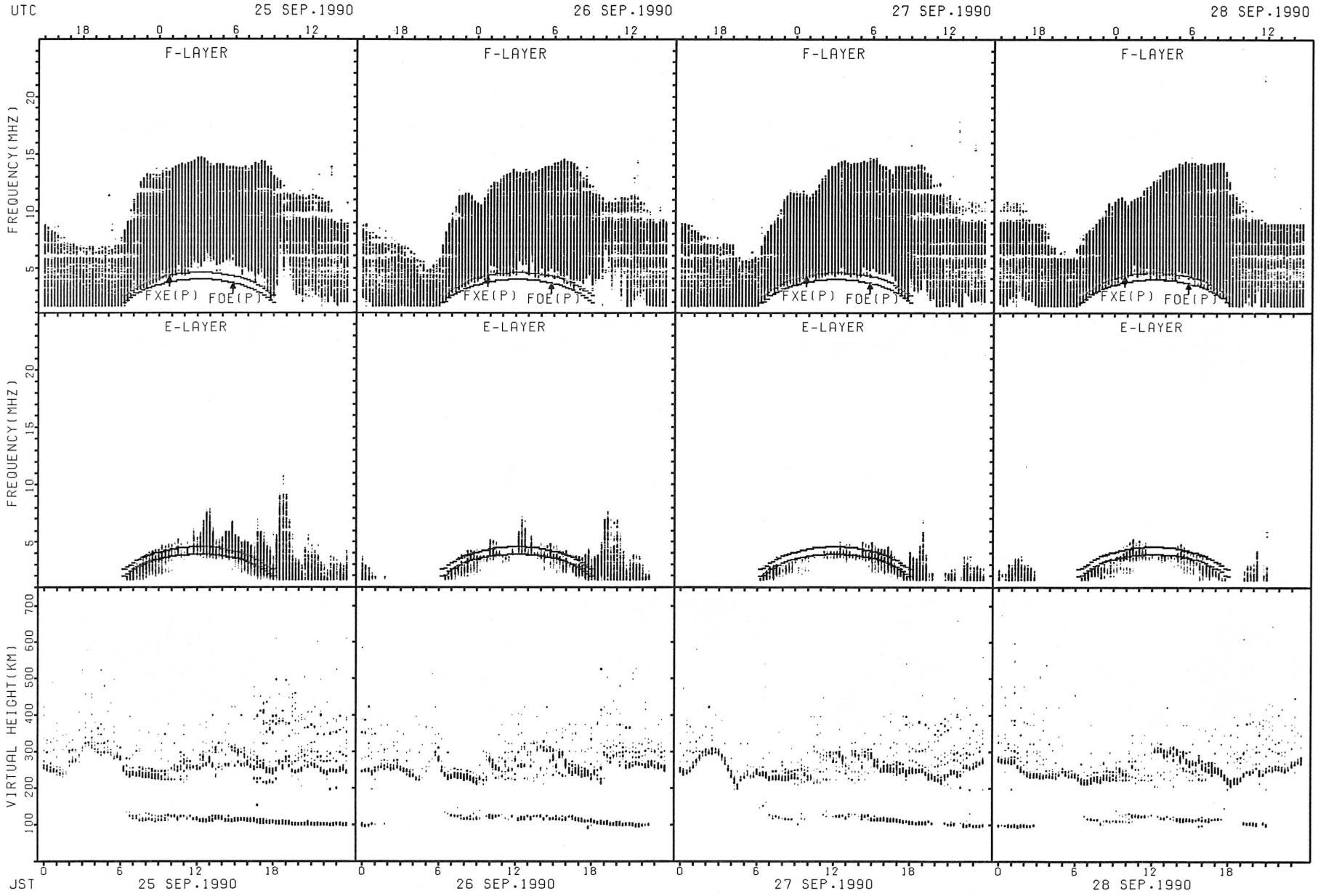
SUMMARY PLOTS AT YAMAGAWA



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

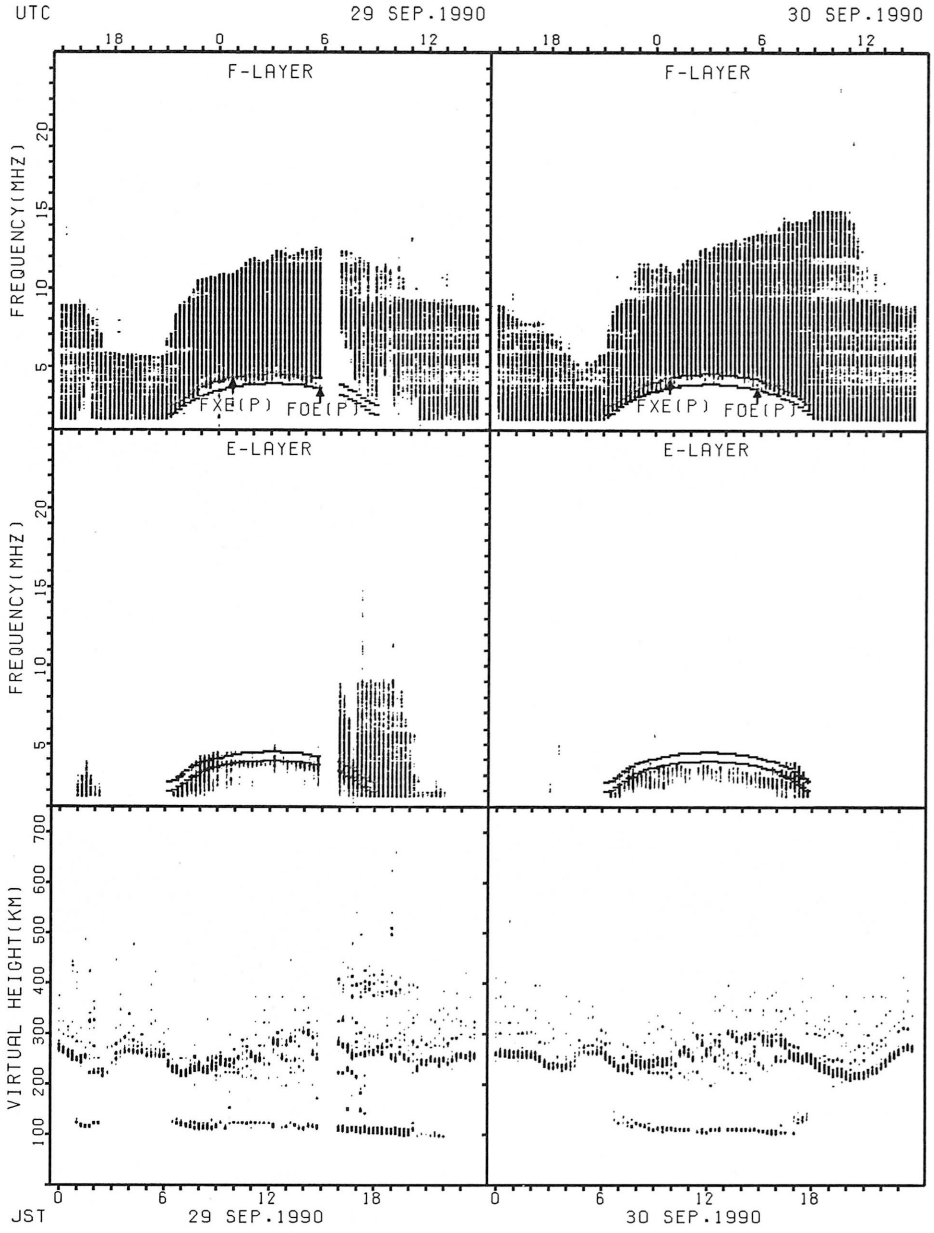

SUMMARY PLOTS AT YAMAGAWA
UTC
21 SEP.1990
22 SEP.1990
23 SEP.1990
24 SEP.1990
F-LAYER
E-LAYER
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P)
FOE(P)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT YAMAGAWA

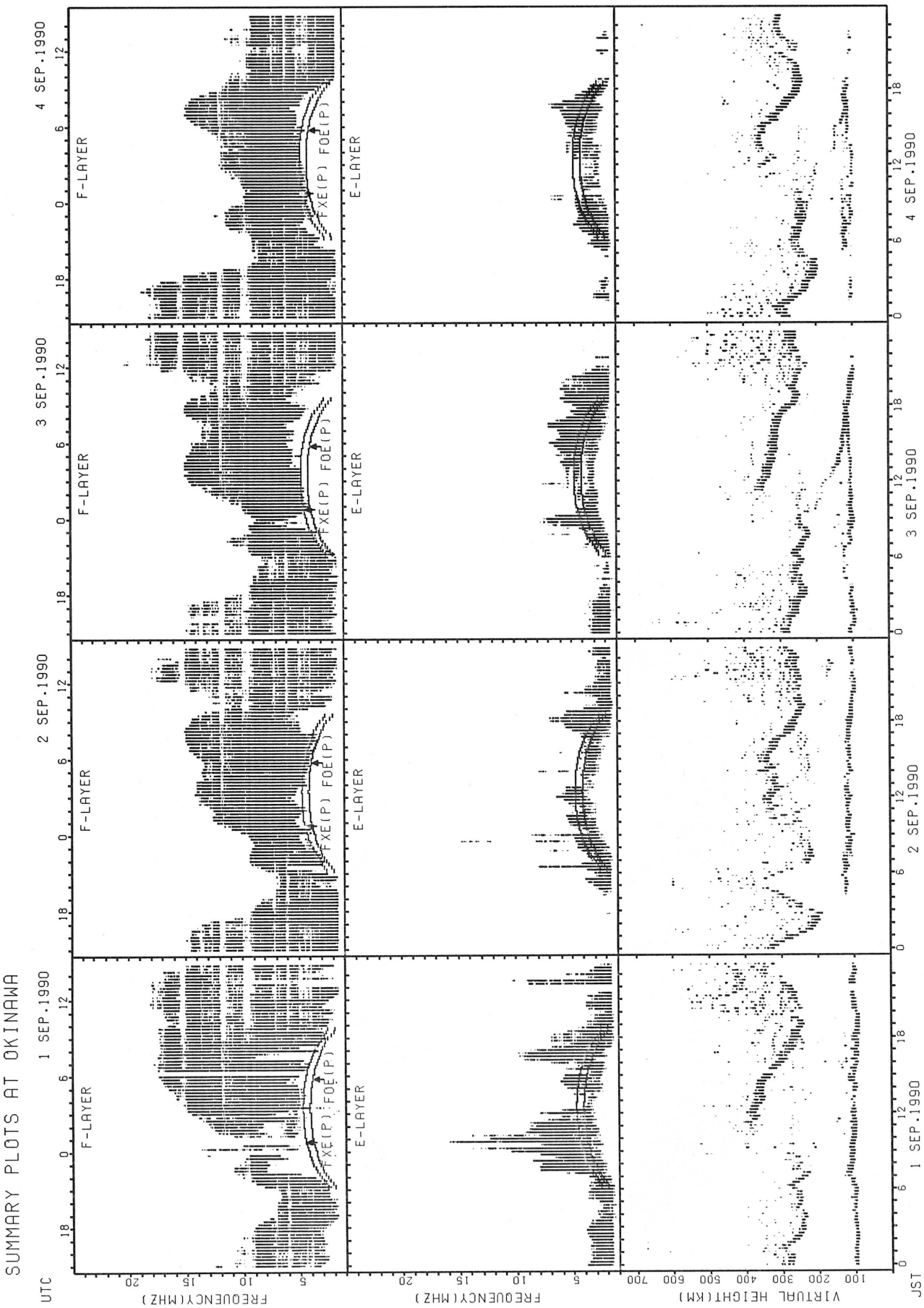


FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

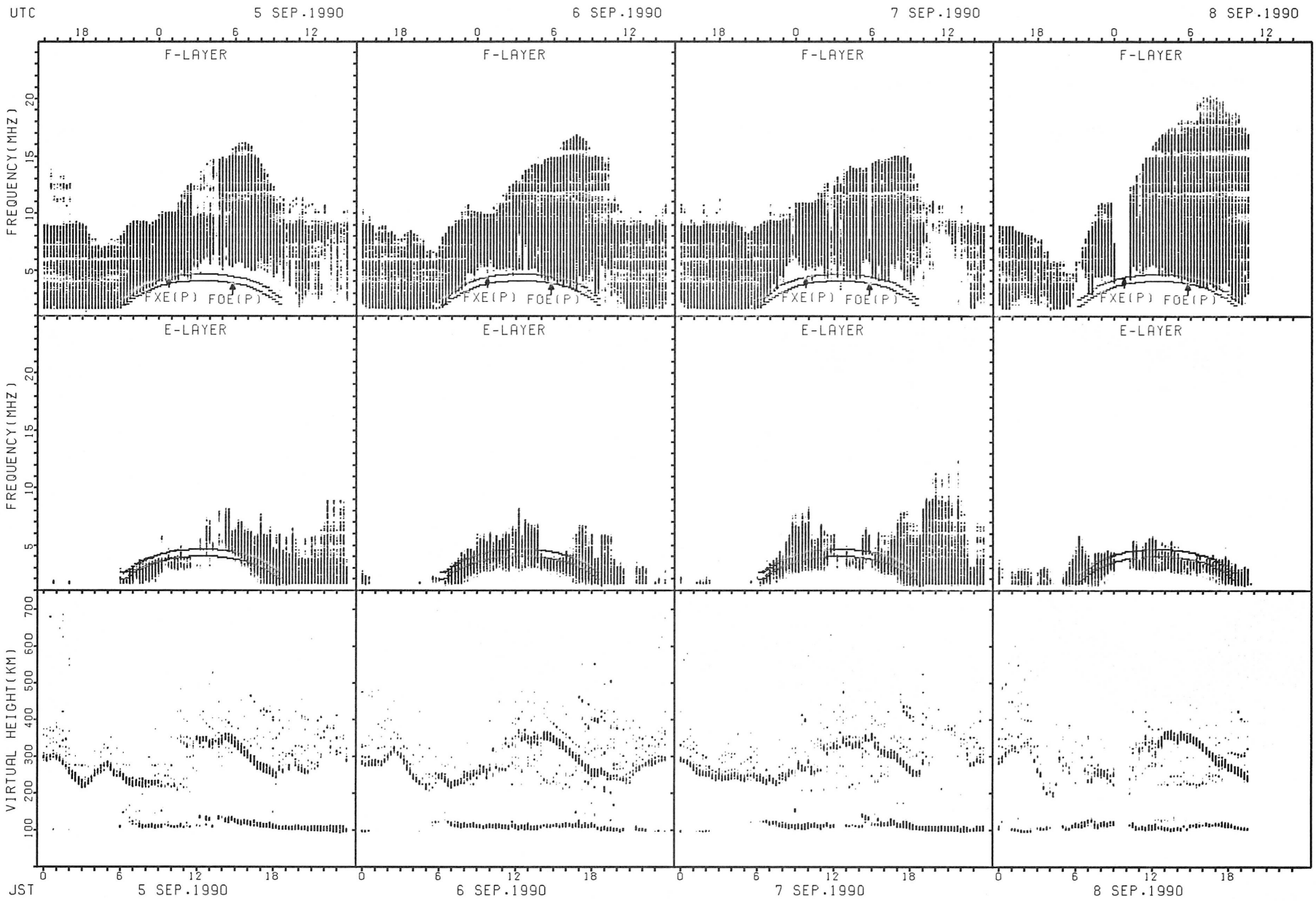
SUMMARY PLOTS AT YAMAGAWA



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

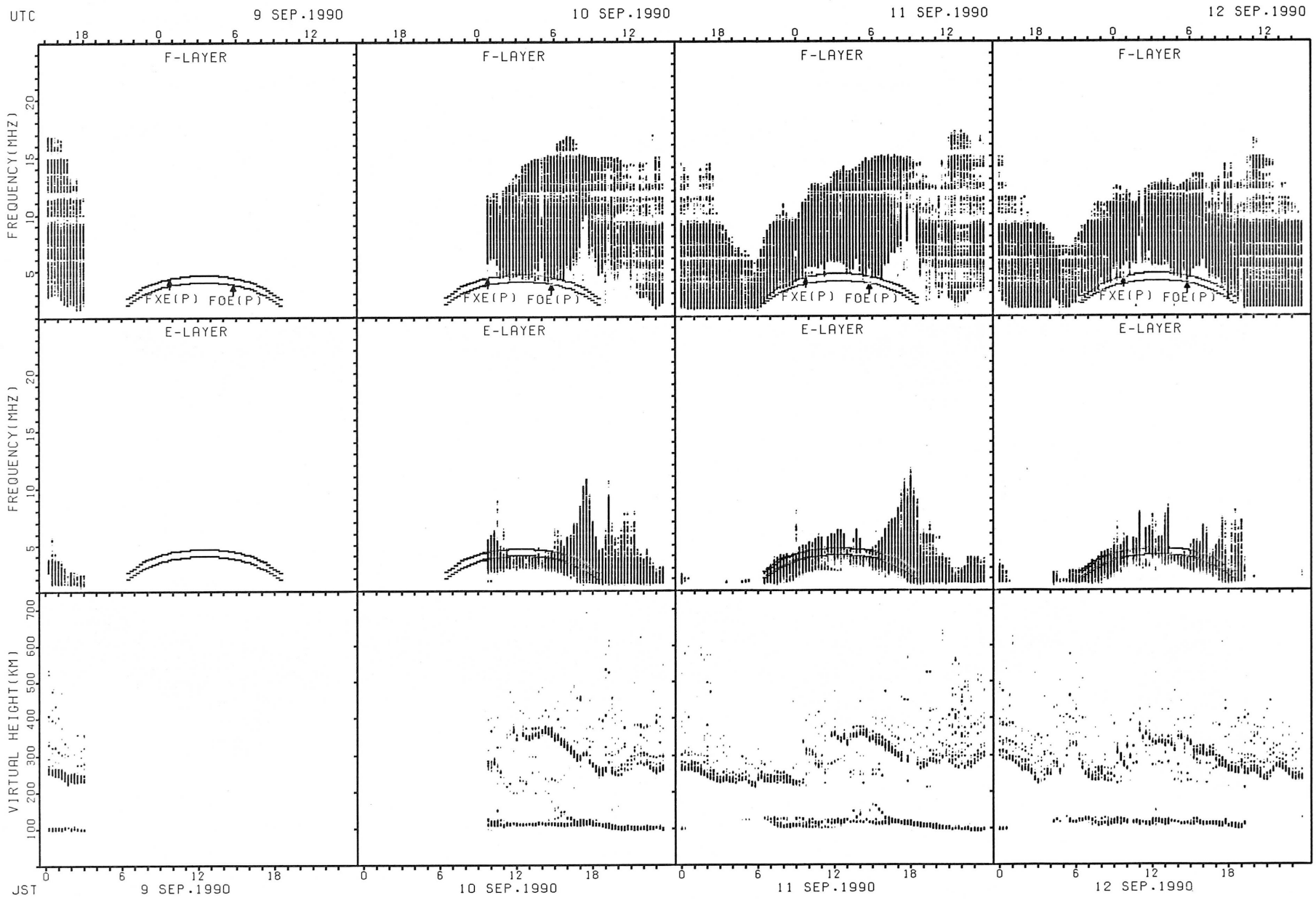

SUMMARY PLOTS AT OKINAWA
UTC
1 SEP.1990
2 SEP.1990
3 SEP.1990
4 SEP.1990
F-LAYER
E-LAYER
FXE(P) FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
JST
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT OKINAWA



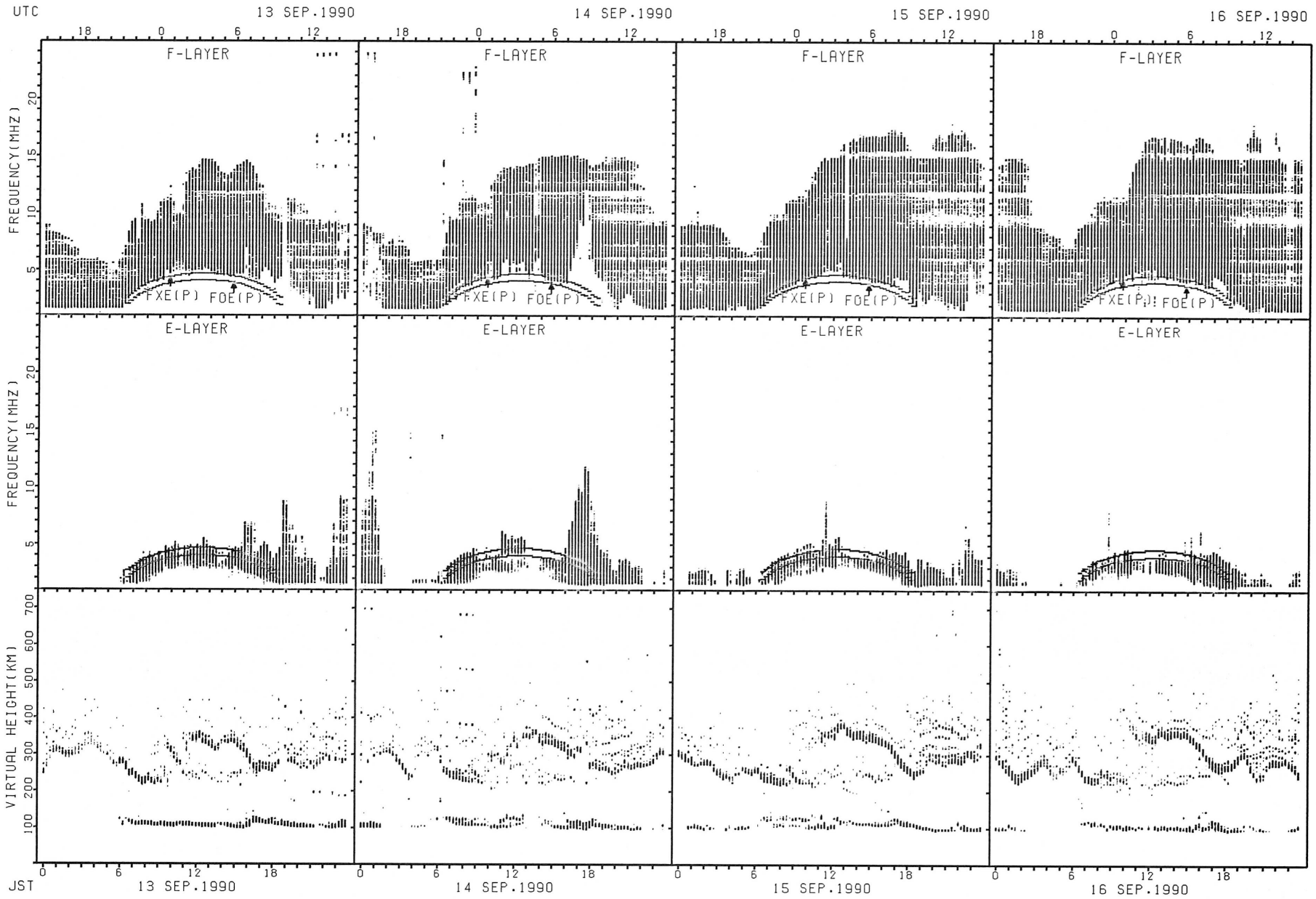
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT OKINAWA

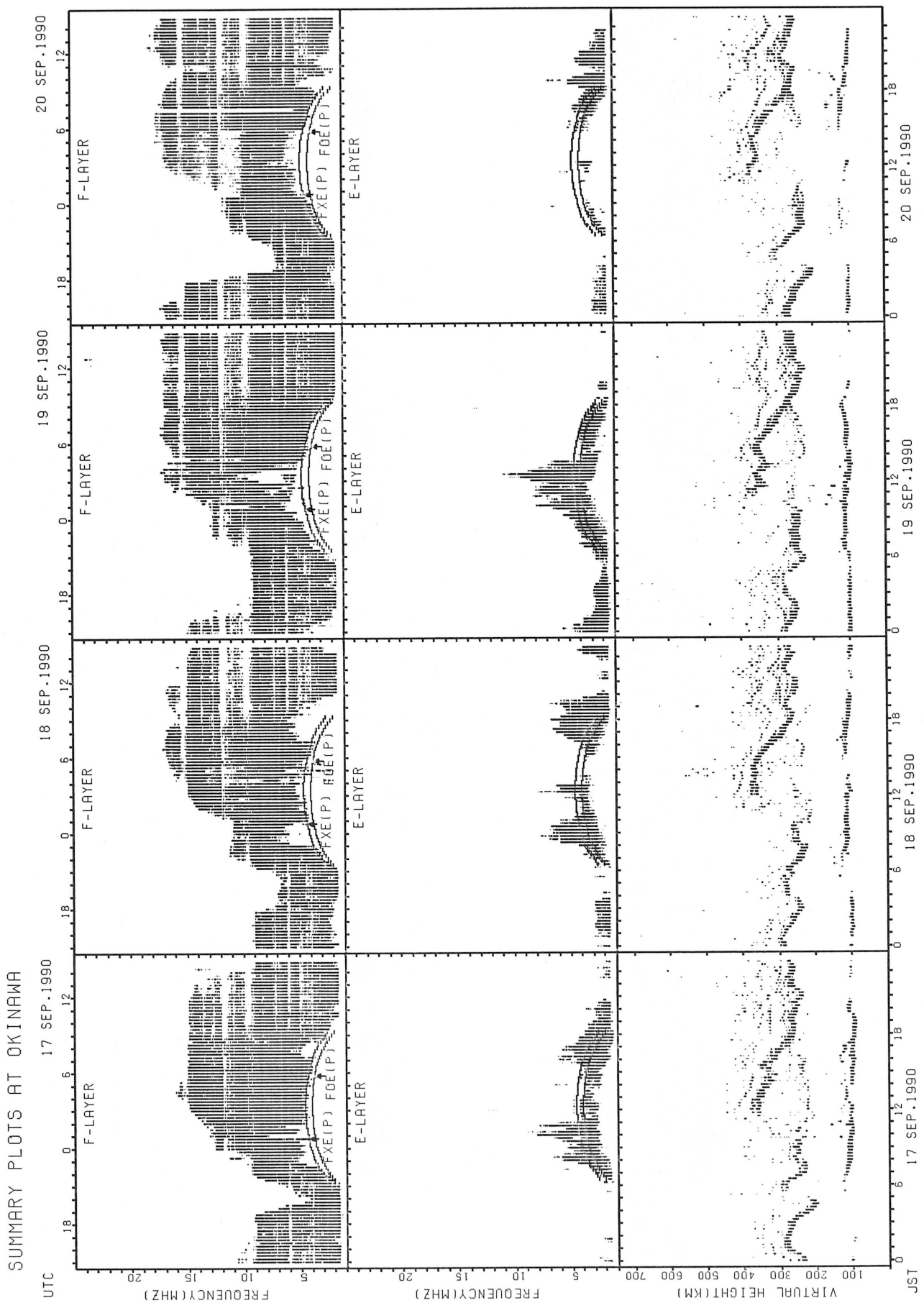


FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

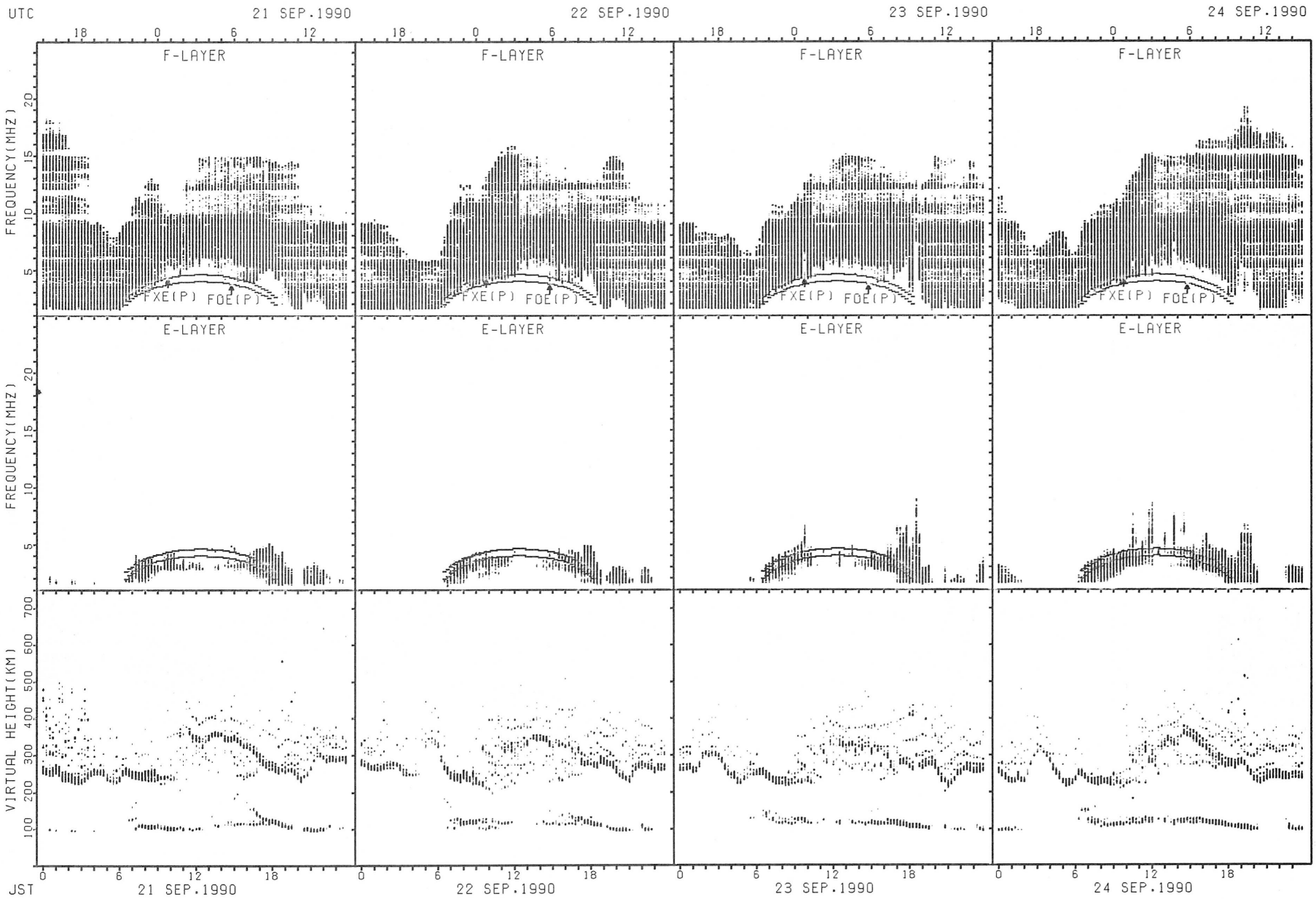
SUMMARY PLOTS AT OKINAWA



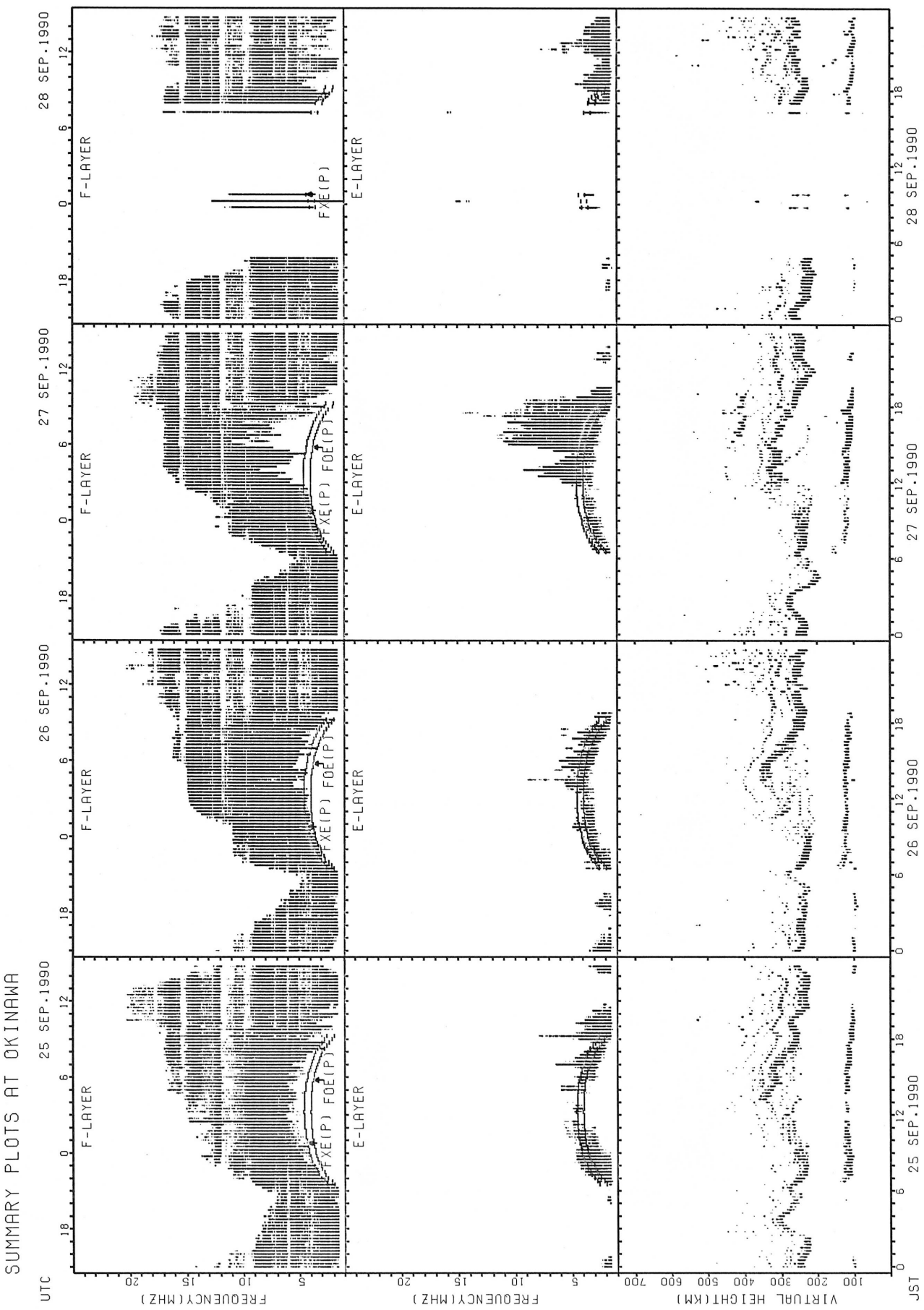
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE


SUMMARY PLOTS AT OKINAWA
17 SEP.1990
18 SEP.1990
19 SEP.1990
20 SEP.1990
UTC
JST
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

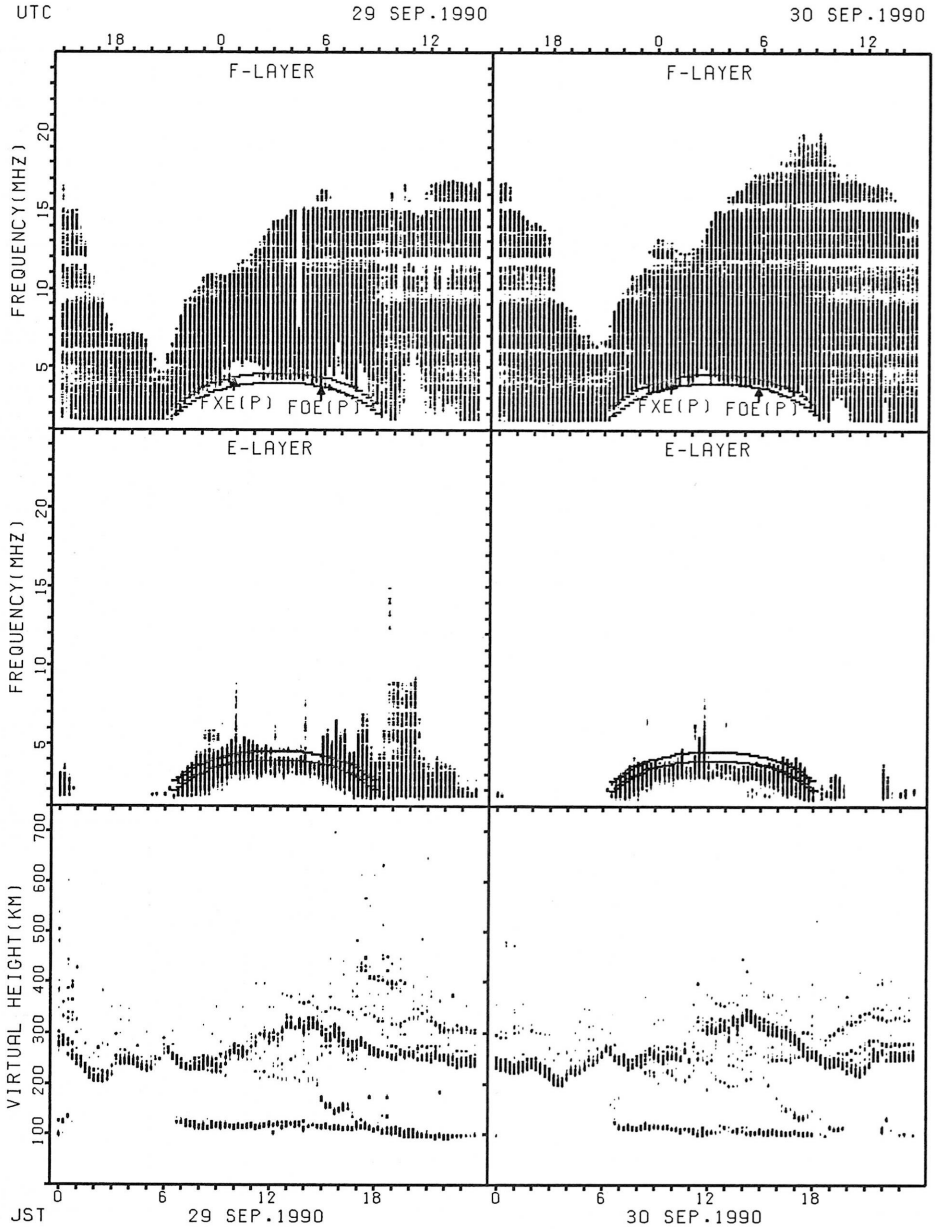
SUMMARY PLOTS AT OKINAWA



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


SUMMARY PLOTS AT OKINAWA
UTC
JST
25 SEP.1990
26 SEP.1990
27 SEP.1990
28 SEP.1990
F-LAYER
E-LAYER
FXE(P)
FOE(P)
FREQUENCY(MHZ)
VIRTUAL HEIGHT(KM)
FXE(P): PREDICTED VALUE FOR FXE
FOE(P): PREDICTED VALUE FOR FOE

SUMMARY PLOTS AT OKINAWA



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

MONTHLY MEDIANS OF H'F AND H'ES

SEP.1990 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							22	27	29	10					16	30	29	31	25	22	16			
MED							275	264	264	257					259	276	278	272	280	303	307			
U Q							294	280	278	270					271	300	293	290	292	314	324			
L Q							262	250	247	246					45	260	248	262	267	272	300			

H'ES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	14	16	14	16	13	14	15	14	11						12	19	24	20	20	19	19	21	19
MED	109	111	114	111	122	117	123	121	119	121						133	131	130	121	115	115	111	113	111
U Q	113	117	129	129	131	126	131	129	123	133						272	145	140	126	123	123	115	116	117
L Q	108	109	107	109	110	109	123	117	115	115						123	117	122	110	112	113	109	111	109

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							21	30	29	12					10	30	29	29	28	18	10			
MED							272	257	254	250					276	296	284	278	276	295	325			
U Q							296	266	270	257					304	308	300	296	288	316	330			
L Q							261	246	242	245					268	276	270	270	268	276	284			

H'ES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	20	15	15	16	14	13	18	15	13	12	13	12	14	14	14	23	27	30	28	20	21	24	21
MED	103	101	101	103	108	113	123	118	117	113	114	113	110	112	114	115	121	119	112	111	105	107	106	103
U Q	107	106	105	107	128	123	133	123	121	115	120	118	120	117	123	125	131	125	115	114	110	111	108	107
L Q	101	99	99	101	103	107	114	113	111	110	111	110	109	107	109	111	111	113	107	107	103	103	103	100

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							28	30	30	14						26	31	31	30	26	20	15	13	
MED							259	241	247	245						297	284	270	268	280	323	352	364	
U Q							266	252	254	260						308	294	280	274	300	347	370	380	
L Q							250	234	236	238						274	268	264	264	268	279	312	332	

H'ES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	13	11			13	15	20	20	16	19	14	18	17	13	18	26	27	26	27	28	23	17	18
MED	103	105	103			113	125	115	115	113	115	115	116	113	119	123	121	119	111	109	107	105	107	103
U Q	109	108	107			117	141	125	125	119	121	121	119	123	137	137	131	125	121	111	109	107	110	105
L Q	101	100	101			105	119	111	109	110	107	109	109	109	114	115	117	113	107	107	105	103	101	101

MONTHLY MEDIANS OF H'F AND H'ES

SEP.1990 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	19	19	12				14	31	31	31						23	31	31	31	27	28	22	24	24
MED	336	352	303				296	242	238	242						310	302	274	264	272	304	325	324	337
U Q	350	376	342				304	252	250	252						326	314	282	272	294	332	342	359	356
L Q	326	306	267				270	230	234	236						286	284	264	250	256	269	300	299	306

H'ES

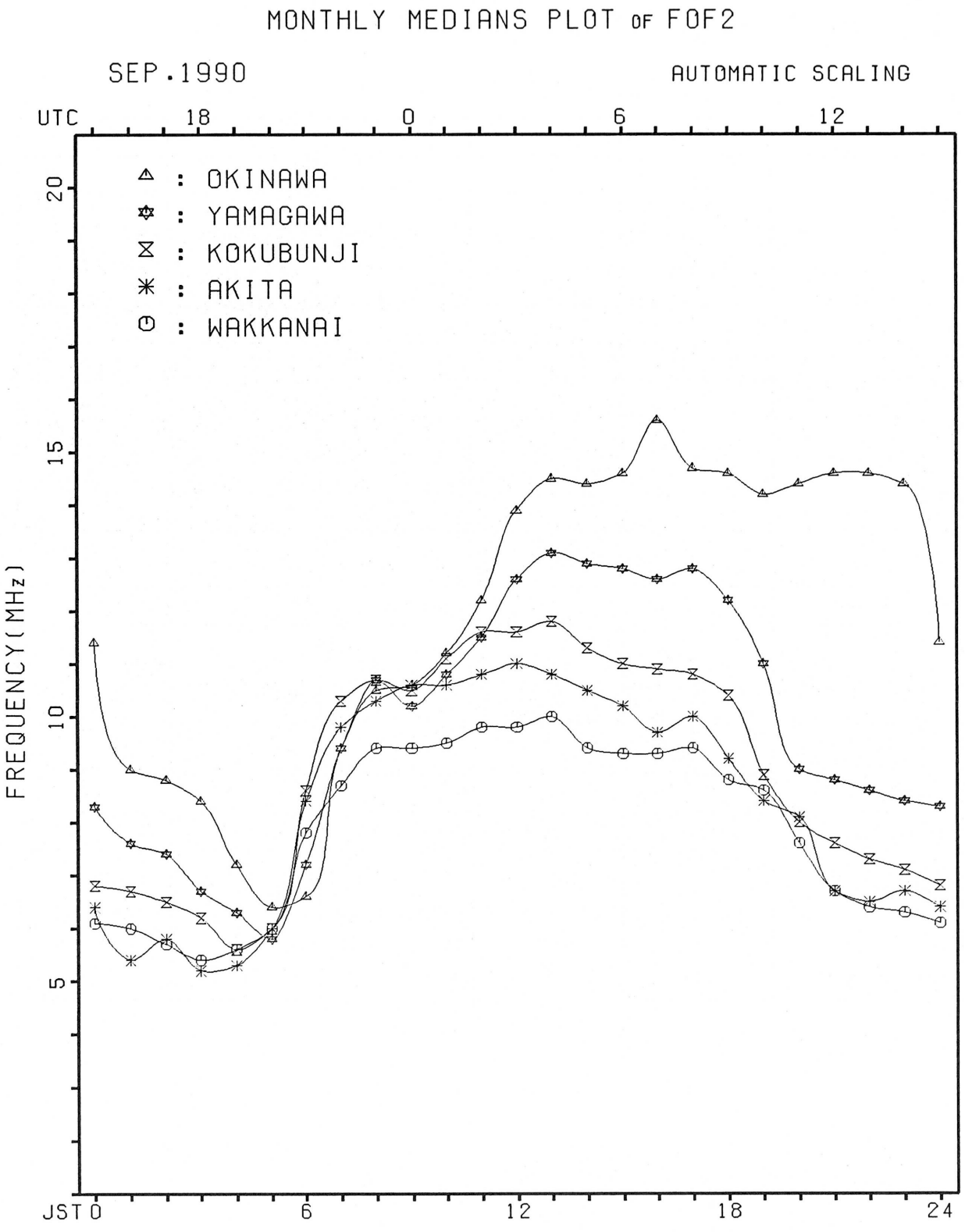
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	12						17	24	21	16	10	11	13	10	17	27	29	30	27	24	23	23	23
MED	103	103						115	118	117	120	116	111	119	117	121	125	119	113	111	106	105	103	105
U Q	105	119						136	121	121	124	125	117	136	123	148	131	125	119	113	112	109	105	107
L Q	99	101						113	115	111	114	107	105	113	113	112	113	115	109	107	105	103	101	99

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	28	28	25	21	15		10	29	29	27						18	30	30	30	30	28	28	29	29
MED	301	295	282	298	300		292	244	242	248						332	313	284	263	268	286	287	308	302
U Q	334	323	315	324	332		338	258	250	254						346	320	294	272	288	293	316	346	354
L Q	268	266	253	258	254		272	236	234	240						310	300	276	256	254	271	271	281	276

H'ES

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	12					12	23	24	24	18	15	17	16	13	16	24	29	29	26	21	17	18	13
MED	103	104					121	123	117	118	117	113	115	120	123	126	125	119	115	107	107	103	106	103
U Q	107	117					134	137	126	125	123	121	126	127	136	160	131	125	119	111	109	112	111	110
L Q	100	99					113	117	113	112	115	109	109	115	113	117	117	115	109	105	102	100	101	100


MONTHLY MEDIANS PLOT OF FOF2
SEP.1990
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

SEP. 1990 | FXI (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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	76	X 73	X 67	X 62															A	X 91	X 85	X 79	X 75
2	75	X 81	X 89	X 54	56	51			A											X 99	X 85	X 80	X 72	X 71
3	71	X 72	X 66	X 62	X 64															X 103	X 91	X 81	X 78	X 74
4	X 75	X 76	X 75	X 72	X 69															X 101	X 88	X 75	X 74	X 74
5	X 70	X 71	X 76	X 69	X 67															X 93	X 83	X 79	X 84	X 83
6	X 79	X 80	X 74	X 75	X 74															X 102	X 89	X 87	X 81	X 75
7	X 76	X 74	X 71	X 69	X 67															X 105	X 94	X 86	X 83	X 85
8	X 78	X 78	X 75	X 75	X 60															X 109	X 93	X 85	X 87	X 86
9	X 89	X 80	X 76	X 69	X 65															X 109	X 96	X 88	X 89	X 82
10	X 80	X 81	X 76	X 72	X 69															X 106	X 85	X 80	X 80	X 79
11	X 77	X 76	X 75	X 74	X 64															X 105	X 96	X 96	X 88	X 84
12	X 82	X 83	X 75	X 68	X 59															X 83	X 72	X 74	X 75	X 70
13	69	X 64	X 63	X 62	X 61															X 80	X 80	X 81	X 83	X 80
14	X 73	X 67	X 68	X 65	X 63															X 83	X 72	X 75	X 74	X 73
15	X 74	X 70	X 68	X 67	X 62															X 99	X 91	X 91	X 91	X 84
16	X 86	X 88	X 79	X 76	X 73	X 74													X 108	X 105	X 95	X 84	X 84	X 87
17	X 82	X 75	X 73	X 75	X 72	X 71				C	C								X 114	X 95	X 90	X 86	X 85	X 81
18	X 77	X 77	X 76	X 70	X 65	X 70													X 124	X 98	X 79	X 77	X 78	X 77
19	X 77	X 71	X 68	X 68	X 71	X 78													X 104	S	X 77	X 78	X 75	X 68
20	X 70	X 67	X 70	X 63	X 59	X 59													X 105	X 89	X 88	X 85	X 88	X 85
21	X 84	X 81	X 70	X 65	X 65	X 68													X 105	X 85	X 84	X 86	X 81	X 81
22	X 79	X 77	X 75	X 74	X 75	X 74													X 105	X 90	X 90	X 88	X 86	X 81
23	X 77	X 74	X 73	X 73	X 70	X 75													X 103	X 83	X 85	X 84	X 81	X 78
24	X 76	X 74	X 66	X 68	X 68	X 69													X 115	X 99	X 97	X 95	X 91	X 86
25	X 87	X 79	X 73	X 71	X 72	X 72													X 104	X 93	X 87	X 86	X 87	X 82
26	X 79	X 75	X 72	X 68	X 66	X 63													X 100	X 85	X 88	X 86	X 84	X 87
27	X 81	X 74	X 71	X 70	X 71	X 69													X 115	X 99	X 93	X 85	X 80	X 80
28	X 78	X 77	X 74	X 70	X 67	X 64													X 109	X 92	X 81	X 73	X 73	X 71
29	X 75	X 75	X 67	X 59	X 57	X 60													X 101	X 97	X 89	X 83	X 75	X 71
30	X 70	X 66	X 63	X 59	X 57	X 59													X 111	X 95	X 91	X 80	X 77	X 75
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	16													15	28	30	30	30	30
MED	X 77	X 76	X 73	X 69	X 66	X 69													X 105	X 98	X 88	X 84	X 81	X 80
UQ	X 80	X 79	X 75	X 72	X 70	X 73													X 112	X 102	X 91	X 86	X 86	X 84
LQ	X 74	X 72	X 68	X 65	X 62	X 62													X 104	X 90	X 84	X 80	X 77	X 74

SEP. 1990 | FXI (0.1 MHZ)

IONOSPHERIC DATA

SEP. 1990 | FOF2 (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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	64	64	67	61	56	60	87	109	100	101	109	119	128	128	126	127	127	126	119	A	85	79	73	70
2	65	75	83	48	F 48	F 42	75	86	A	85	93	U R 99	101	98	102	96	94	93	95	93	79	74	66	V 65
3	F 65	S 66	60	S 56	58	62	88	95	103	91	89	96	98	103	103	100	99	97	100	97	85	75	72	68
4	69	70	69	66	63	64	78	83	99	94	96	93	95	97	100	105	109	108	108	96	82	69	68	68
5	64	65	70	63	61	63	S 99	103	94	92	93	106	116	R 112	110	107	114	118	115	88	77	73	78	78
6	73	74	68	69	68	75	100	102	98	102	108	96	108	118	116	107	107	108	115	96	84	81	75	69
7	70	U S 68	65	63	62	64	U S 100	103	93	108	106	100	104	U R 107	108	103	R 102	107	111	99	88	80	77	80
8	72	72	69	69	55	53	68	80	90	104	112	119	123	123	124	119	108	105	110	103	86	79	81	80
9	83	S 74	70	63	59	V 64	88	105	120	105	102	112	112	117	119	110	104	103	109	103	90	82	83	76
10	74	75	70	66	63	69	97	104	106	112	116	115	109	111	120	121	111	112	124	100	79	74	74	73
11	71	70	69	68	59	60	94	112	109	101	109	115	118	120	121	120	118	118	115	S 99	90	90	82	78
12	76	77	69	S 62	53	50	67	78	78	80	89	H 98	97	91	99	99	97	99	99	77	66	68	69	64
13	F 60	58	57	56	55	55	76	93	101	105	100	105	107	113	112	103	96	94	91	74	74	75	77	74
14	67	61	62	59	57	57	81	106	126	124	111	117	129	120	113	105	106	111	104	77	66	69	68	67
15	68	64	62	61	56	59	94	108	109	112	121	119	128	126	121	119	125	121	115	93	85	85	85	78
16	80	82	73	70	67	68	93	103	116	121	119	129	133	128	120	115	114	114	102	S 99	89	78	78	81
17	76	69	67	69	66	65	87	105	115	C	C	126	129	126	122	119	114	111	108	89	84	80	79	75
18	71	71	70	64	59	64	105	116	113	108	112	121	122	121	117	117	116	118	118	92	73	71	72	71
19	71	65	62	62	65	72	S 100	96	112	112	117	112	115	121	113	99	92	93	98	I S 84	71	72	69	62
20	64	61	64	57	53	53	83	110	114	111	116	126	120	123	117	109	104	107	99	83	82	79	83	79
21	78	75	64	59	59	62	91	107	113	116	113	113	115	118	119	118	111	105	99	79	78	80	75	75
22	73	71	69	68	69	68	91	129	124	120	120	138	133	122	110	108	108	106	99	84	84	82	80	75
23	71	68	67	67	64	69	91	112	110	124	136	147	126	121	118	113	108	102	96	77	79	78	75	72
24	70	68	60	62	62	63	86	S 99	109	118	124	134	133	129	120	112	109	114	109	93	92	89	85	80
25	81	73	67	65	66	66	89	118	129	132	130	142	136	123	116	112	118	113	S 98	87	81	80	81	76
26	73	69	66	62	60	57	79	107	119	110	119	123	127	123	127	131	128	116	94	79	82	80	78	81
27	75	68	65	64	65	63	78	97	104	116	119	127	122	125	124	129	123	118	109	93	87	79	74	74
28	72	71	68	64	61	59	82	94	98	100	116	118	119	128	132	124	123	118	103	86	75	68	67	65
29	69	69	61	53	51	54	85	98	105	101	104	108	108	101	106	114	111	102	95	91	83	77	69	65
30	64	60	57	53	52	53	75	103	110	102	111	115	114	112	105	101	110	109	105	89	85	74	71	69
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	29	29	29	30	30	30	30	30	30	30	30	29	30	30	30	30
MED	71	69	67	63	60	62	88	103	109	108	112	116	118	120	117	112	110	108	104	91	82	78	75	74
UQ	74	73	69	66	64	65	94	108	114	116	119	126	128	123	121	119	116	116	111	96	85	80	80	78
LQ	67	65	62	59	56	57	79	96	100	101	104	106	108	112	110	105	104	103	99	84	78	74	71	68

SEP. 1990 | FOF2 (0.1 MHZ)

IONOSPHERIC DATA

SEP. 1990 | FOF1 (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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	U L 690	U L 640	L 590	L	L	L	L	L						
2							L	L	A	A	A	A	L	A	A		A							
3								L	L	L	L	L	L	U L 610	U L 570	L	L	L						
4									L	L	L	L	U L 560	U L 610	U L 570	L 520	L	L						
5								L	L	L	L	L	L	L 530	A	L	L							
6									L	L	L	L	U L 630	L	L	L	L							
7										L 500	L	L 660	L	L	L	L								
8							L	L	L	L	L	L	L	A	L	L		A						
9								L	L	L	L	L	L	U L 620	U L 600	L	L							
10								L	L	L	L	L	L	L	L 620	L	L	L						
11								L	L	L	L	L	L	U L 640	L 610	L	L							
12						L	L	L	U L 620	L 630	580	U L 630	L	L	600	A	L							
13										L	L	L	U L 700	L	L	L	L							
14								L	L	A	A	L	L	L	L	L	L							
15									A	L	L	L	U L 680	L	L	L	L							
16										L	U L 770	L	U L 720	L	L	L	L							
17									L	C	C	L	L	L	L	L								
18										L	L	L	L	L	L	L	L							
19									L	U L 560	L	L	L	L	L									
20									L	L	L	L	U L 700	U L 670	L	L	L							
21									L	L	L	L	L	L	U L 670	L								
22									L	L	L	L	L	L	L	L	L							
23									L	L	L	L	L	L	L									
24									L		L	L	L	L	L									
25											L		L	L	L	L								
26									L	L	L	L	L	L	L									
27										L	L	L	L	L		L								
28								L	L	L	L	L	L	L	L	L								
29										L	L	L	A	L	B									
30								L	L	L	L	L	L	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	3	3	3	7	6	7	1								
MED									U L 620	L 560	U L 690	U L 640	U L 680	U L 615	U L 600	L 520								
UQ										L 595	U L 730	L 650	U L 700	U L 640	L 615									
LQ										L 530	635	U L 635	U L 610	U L 610	U L 585									

SEP. 1990 | FOF1 (0.01 MHZ)

IONOSPHERIC DATA

SEP. 1990 | FOE (0.01 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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	A 225	290	330	A	A	400	405	410	390	365	325	A 245	A					
2						B	225	A 280	A	A	A	A	A	A	A	A	320	A 260	A					
3						B	A	A	A	A	A	A	A	A	380	345	325	255	B					
4						B	220	A 290	330	360	380	U R 385	400	395	370	345	305	260	A					
5						B	215	A 300	345	370	375	390	400	400	405	380	315	255	B					
6						B	205	290	330	A 365	A	A	A	A	385	355	305	250	A					
7						B	210	305	345	A	A	400	390	400	375	360	U A 315	A	B					
8						B	220	290	340	355	A	385	385	380	370	350	315	245	B					
9						B	H 225	U A 235	A	A	A	A	A	380	370	350	320	250	B					
10						B	230	295	340	370	385	390	395	390	370	345	300	240	B					
11						B	225	295	340	370	380	R	I R 390	A	A	350	315	255	B					
12						B	205	285	345	360	A 395	U A 400	A 395	U A 375	370	A	A	U A 235	B					
13						B	A	U A 260	A	A	A	R	A	A	A	A	315	A	B					
14						B	225	295	340	355	370	A	A	A	375	345	305	240	B					
15						B	U A 205	280	A	A	A	R	390	395	380	350	305	U A 215	B					
16							R 205	285	330	355	380	395	395	395	370	360	315	225						
17							205	290	340	C	C	395	400	385	375	365	325	230						
18							205	305	340	365	385	U S 390	R 385	385	385	345	305	230						
19							A	A	A	U A 375	A	405	A	A	380	350	305	220						
20							200	295	R	A	A	A	A	400	375	350	305	225						
21							215	295	340	355	385	395	395	385	375	340	300	215						
22							205	290	330	350	375	390	395	395	370	340	300	220						
23							190	295	330	365	390	395	400	380	375	340	295	205						
24							205	295	335	355	380	390	395	370	350	U A 330	295	A						
25							210	285	335	355	365	375	A	U A 345	A 340	U A 320	A	A						
26							200	B	315	345	365	380	380	375	365	A	A	210						
27							A 180	270	325	350	380	385	390	380	U A 360	A	A	205						
28							185	275	325	355	375	A	A	380	A	310	A	195						
29							200	285	330	A	A	385	385	A	B	305	A	A						
30							165	280	325	340	370	A	365	355	345	320	270	185						
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	23	20	17	19	20	22	25	25	24	25						
MED							205	290	335	355	380	390	395	385	375	345	305	230						
UQ							220	295	340	365	385	395	398	395	380	350	315	250						
LQ							202	285	330	355	375	385	388	380	370	340	302	215						

SEP. 1990 | FOE (0.01 MHZ)

IONOSPHERIC DATA

SEP. 1990 | FOES (0.1 MHZ) | 135° E Mean Time (G.M.T. + ? h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 70	J A 50	J A 99	J A 47	20	J A 45	33	J A 50	43	J A 52	40	G 39	G 34	J A 57	G 31	41	39	J A 38	108	122	53	20	E B 14	20
2	J A 34	35	J A 24	J A 27	J A 21	J A 13	E B 13	J A 41	100	J A 60	113	J A 198	J A 85	78	J A 117	J A 119	J A 68	J A 51	J A 51	J A 42	J A 51	J A 27	J A 22	J A 22
3	J A 85	J A 105	J A 86	J A 97	J A 53	J A 39	J A 32	J A 42	J A 42	J A 53	J A 55	J A 43	J A 42	J A 43	G 34	39	J A 42	J A 29	J A 32	J A 28	J A 23	J A 22	22	21
4	J A 21	J A 26	19	J A 20	E B 13	J A 20	27	J A 37	36	39	G 30	G 29	G	42	40	37	35	31	17	J A 20	J A 18	E B 13	E B 12	E B 14
5	E B 12	E B 13	E B 13	E B 13	J A 16	E B 13	25	34	41	G 35	40	G	J A 55	J A 49	60	48	40	J A 43	J A 29	J A 24	J A 44	J A 20	E B 13	E B 13
6	E B 14	J A 15	J A 18	19	E B 13	E B 14	25	33	40	43	J A 49	J A 49	45	39	41	42	J A 49	J A 42	J A 46	J A 53	J A 34	J A 52	J A 20	J A 19
7	J A 33	J A 22	E B 12	E B 13	J A 23	J A 19	33	39	J A 59	J A 58	J A 63	G 36	51	J A 82	J A 53	J A 66	J A 107	J A 136	J A 53	J A 71	J A 85	J A 20	20	J A 22
8	J A 16	E B 13	17	J A 14	J A 15	J A 21	26	36	39	41	J A 52	48	43	J A 97	45	41	J A 48	J A 50	J A 38	59	J A 51	J A 28	J A 48	J A 51
9	J A 39	J A 37	J A 45	J A 29	J A 29	J A 26	G 19	34	J A 46	J A 51	J A 58	J A 58	J A 54	G 35	G 31	G 30	39	32	19	21	J A 35	J A 19	J A 57	J A 43
10	25	J A 18	E B 13	J A 17	J A 18	J A 19	27	J A 46	J A 42	42	43	44	43	G	G	G	35	30	J A 24	J A 24	J A 25	J A 18	E B 14	E B 14
11	E B 13	E B 13	E B 13	E B 13	E B 13	J A 16	23	G	J A 48	42	41	G 34	G 38	39	38	G 31	J A 51	J A 43	20	J A 18	J A 27	J A 24	20	E B 14
12	J A 16	E B 14	J A 21	E B 13	J A 16	J A 16	25	J A 39	37	39	J A 52	J A 48	51	J A 52	43	J A 79	J A 46	J A 39	J A 28	E B 13	J A 28	25	J A 52	J A 83
13	J A 41	J A 22	J A 14	E B 14	J A 14	J A 20	J A 41	J A 53	J A 75	J A 52	41	G 38	J A 54	J A 43	J A 57	J A 46	J A 46	J A 58	J A 52	J A 85	J A 42	J A 53	J A 52	J A 44
14	E B 14	J A 21	J A 13	20	E B 12	E B 14	G	34	43	J A 85	81	65	39	48	G	G	39	J A 64	J A 39	J A 21	J A 36	J A 44	J A 37	J A 22
15	J A 18	E B 13	J A 16	18	E B 14	J A 18	28	J A 51	J A 64	43	J A 43	G 33	G 28	G 30	45	43	J A 48	J A 43	J A 88	J A 79	J A 44	J A 53	J A 22	21
16	E B 13	E B 13	E B 14	E B 13	J A 17	E B 14	G	G	G	J A 38	G	G	G	G	41	45	41	J A 51	J A 31	J A 37	J A 25	J A 24	J A 52	J A 22
17	J A 35	J A 25	J A 22	J A 15	E B 13	E B 15	G	G 23	G 30	C	C	G	G	G 26	40	45	J A 45	J A 46	J A 51	J A 42	J A 33	J A 27	32	J A 23
18	J A 22	E B 13	E B 13	E B 13	E B 13	E B 13	22	34	G 28	G 31	G	G 36	G 37	G	G	38	42	J A 46	J A 48	J A 29	J A 51	J A 37	J A 30	J A 26
19	J A 24	J A 20	J A 15	J A 15	J A 14	J A 22	26	J A 41	J A 43	43	42	G 40	41	42	G	G	34	29	J A 28	J A 44	J A 51	J A 23	J A 22	J A 19
20	E B 13	E B 13	E B 14	E B 13	E B 13	E B 13	G	G	G 33	39	J A 48	J A 44	J A 52	G	G 30	G 28	G 21	27	J A 16	21	J A 17	E B 15	J A 34	E B 14
21	E B 14	E B 13	21	J A 21	J A 20	J A 23	G	G	G	G	G	G	G	G	G 25	G 24	35	23	J A 21	J A 15	E B 13	E B 13	J A 27	23
22	J A 14	E B 14	E B 13	E B 13	E B 13	E B 13	G	J A 40	J A 43	G 29	G 24	G	G	42	42	39	36	31	J A 18	E B 14	E B 13	J A 17	E B 13	E B 13
23	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	22	G	J A 38	G	45	53	41	G	40	42	32	J A 45	48	23	J A 20	J A 33	J A 33	J A 26
24	J A 22	J A 17	E B 13	E B 13	E B 13	E B 14	26	J A 44	42	39	42	J A 49	J A 53	45	44	J A 45	40	27	J A 26	28	J A 72	J A 31	J A 15	E B 14
25	E B 14	E B 15	E B 13	E B 14	E B 13	E B 14	24	31	38	44	J A 52	J A 54	48	46	45	J A 43	J A 46	J A 28	J A 45	J A 45	J A 43	J A 53	J A 37	J A 22
26	J A 16	E B 13	E B 13	E B 13	E B 13	E B 13	G	E B 35	34	39	42	42	41	G	G 24	35	33	G 19	E B 14	J A 21	E B 13	E B 14	E B 13	E B 14
27	E B 14	E B 13	J A 22	E B 13	E B 13	E B 13	J A 25	G	G	G 21	42	43	41	42	43	J A 38	J A 32	G 20	J A 18	J A 27	J A 32	J A 34	E B 13	E B 13
28	E B 14	E B 13	E B 13	18	J A 18	J A 18	21	G	35	40	48	J A 50	43	G 37	36	G 31	J A 35	G 19	J A 27	22	J A 35	J A 27	J A 18	J A 19
29	J A 22	J A 19	J A 21	J A 18	J A 15	E B 14	G	34	J A 49	J A 42	41	G 37	63	38	E B 80	J A 42	J A 35	J A 43	J A 53	J A 43	J A 23	J A 20	E B 15	E B 14
30	E B 13	E B 14	E B 12	E B 13	E B 13	E B 12	22	G 21	G 26	G	42	J A 72	46	G 23	40	36	34	J A 35	J A 29	J A 32	J A 24	20	E B 14	E B 14
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	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A 16	E B 14	14	14	14	14	24	34	40	41	42	42	42	40	40	40	40	J A 38	J A 30	J A 28	J A 34	J A 24	J A 22	20
UQ	J A 25	J A 22	J A 21	J A 19	J A 18	J A 20	27	J A 41	J A 43	J A 44	J A 52	J A 49	51	48	44	45	J A 46	J A 46	J A 48	J A 44	J A 44	J A 33	J A 34	J A 23
LQ	E B 14	E B 13	E B 13	E B 13	E B 13	E B 13	G	G 21	34	33	41	G 34	G 37	G 23	G 31	G 31	35	29	J A 21	J A 21	J A 23	J A 20	E B 14	E B 14

SEP. 1990 | FOES (0.1 MHZ)

IONOSPHERIC DATA

SEP. 1990 | FBES (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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	44	36	18	21	16	39	31	44	39	43	39	G 37	G 34	54	G 31	38	35	34	102	A A 122	35	E B 12	E B 14	E B 13
2	20	31	18	E B 13	E B 13	E B 13	E B 13	37	A A 100	56	86	71	55	65	72	40	50	39	30	23	27	20	19	18
3	22	48	32	41	26	20	30	32	39	42	49	41	41	41	G 32	37	G 25	G 23	19	18	17	18	E B 13	E B 12
4	17	15	E B 13	E B 13	E B 13	17	27	G 29	35	39	G 27	G 27	G	42	40	37	34	29	16	16	E B 12	E B 13	E B 12	E B 14
5	E B 12	E B 13	E B 13	E B 13	E B 13	E B 13	25	31	37	G 34	39	G	49	42	57	45	39	39	24	21	29	E B 14	E B 13	E B 13
6	E B 14	E B 12	15	E B 12	E B 13	E B 14	24	31	38	40	43	42	42	39	G	40	37	32	33	44	20	26	16	17
7	16	17	E B 12	E B 13	E B 12	E B	31	37	48	45	44	G 35	48	43	43	43	33	42	24	27	50	17	E B 13	16
8	16	E B 13	E B 13	E B 13	E B 13	14	23	33	38	40	43	47	43	90	42	39	40	50	34	33	29	16	21	33
9	34	21	30	20	21	18	G 17	33	41	45	47	47	46	G 34	G 30	G 30	38	29	18	20	24	17	30	20
10	20	18	E B 13	E B 13	17	E B 13	26	G 21	G 25	39	40	41	42	G	G	G	34	27	23	16	19	E B 12	E B 14	E B 14
11	E B 13	E B 13	E B 13	E B 13	E B 13	E B 15	27	G	36	40	40	U G 34	G 38	U Y 39	U Y 38	G 31	37	27	17	16	25	16	E B 14	E B 14
12	E B 14	E B 14	18	E B 13	E B 13	E B 14	23	35	G	38	49	48	49	50	43	61	44	36	22	E B 13	E B 15	E B 14	30	31
13	26	17	E B 14	E B 14	E B 13	E B 14	32	39	46	39	39	U G 38	45	43	51	40	36	44	41	44	18	28	30	27
14	E B 14	17	E B 13	E B 13	E B 12	E B 14	G	33	41	79	70	61	38	47	G	G	38	62	37	16	32	23	30	18
15	15	E B 13	15	E B 13	E B 14	E B 14	26	43	60	40	42	G 32	G 28	G 29	43	41	43	40	51	41	23	32	E B 14	E B 16
16	E B 13	E B 13	E B 14	E B 13	E B 13	E B 14	G	G	G	G 33	G	G	G	G	41	41	38	46	24	32	20	16	20	E B 13
17	22	20	20	E B 13	E B 13	E B 15	G	G 21	G 28	C	C	G	G	G 25	40	38	40	41	18	27	20	20	24	17
18	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	U Y 22	33	G 27	G 30	G	G 34	G 36	G	G	37	35	34	42	18	32	22	17	19
19	18	18	E B 13	E B 13	E B 12	17	25	33	38	40	41	G 37	U Y 41	41	G	G	33	27	27	30	28	19	15	E B 14
20	E B 13	E B 13	E B 14	E B 13	E B 13	E B 13	G	G	G 32	38	41	41	44	G	G 29	G 28	G 20	25	E B 13	E B 13	E B 14	E B 15	23	E B 14
21	E B 14	E B 13	E B 13	17	17	E B 13	G	G	G	G	G	G	G	G	G 24	G 24	35	G 20	E B 13	E B 13	E B 13	E B 13	17	E B 14
22	E B 13	E B 14	E B 13	E B 13	E B 13	E B 13	G	G	G	G 29	U G 23	G	G	41	40	39	35	28	17	E B 14	E B 13	E B 13	E B 13	E B 13
23	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	21	G	G	G	41	49	41	G	40	40	G	33	35	17	17	27	25	21
24	E B 13	E B 13	E B 13	E B 13	E B 13	E B 14	24	38	39	38	41	45	50	41	42	44	38	23	20	20	46	21	E B 15	E B 14
25	E B 14	E B 15	E B 13	E B 14	E B 13	E B 14	22	30	36	42	48	51	45	45	43	40	42	25	43	20	23	29	26	16
26	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	G	E B 35	34	38	42	41	40	G	G 24	35	31	G 18	E B 14	18	E B 13	E B 14	E B 13	E B 14
27	E B 14	E B 13	E B 13	E B 13	E B 13	E B 13	G 18	G	G	G 20	41	42	41	40	38	34	28	G 16	15	15	21	18	E B 13	E B 13
28	E B 14	E B 13	E B 13	E B 13	E B 13	E B 12	20	G	34	38	42	43	41	G 34	35	G 29	33	G 17	16	E B 13	29	17	E B 15	E B 13
29	17	E B 13	17	16	E B 14	E B 14	G	32	46	36	40	G 36	59	37	E B 80	37	28	38	E B 13	22	E B 14	18	E B 15	E B 14
30	E B 13	E B 14	E B 12	E B 13	E B 13	E B 12	20	G 20	G 25	G	40	44	41	G 23	40	35	32	34	27	17	17	E B 13	E B 14	E B 14
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	29	30	30	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 14	E B 14	E B 13	E B 13	E B 13	E B 14	22	32	36	39	41	41	41	40	40	38	35	32	24	19	20	17	15	E B 14
UQ	18	17	15	E B 13	E B 13	E B 14	26	35	39	40	43	45	45	43	42	40	38	39	34	27	29	21	23	18
LQ	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	G	G	G 25	G 34	39	G 34	G 36	G 23	G 29	G 31	33	25	17	16	17	E B 14	E B 14	E B 14

SEP. 1990 | FBES (0.1 MHZ)

IONOSPHERIC DATA

SEP. 1990 | FMIN (0.1 MHZ) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	12	13	14	13	14	17	16	18	21	22	30	28	25	24	20	18	14	14	13	13	12	14	13
2	13	13	13	13	13	13	13	17	18	23	25	26	27	26	21	18	15	16	13	13	15	13	13	13
3	13	14	13	13	13	14	13	16	13	26	25	25	22	22	20	20	15	14	13	14	14	14	13	12
4	13	13	13	13	13	14	13	15	16	18	20	18	22	23	20	18	18	17	13	12	12	13	12	14
5	12	13	13	13	13	13	13	13	16	20	29	23	20	21	37	31	19	13	13	15	14	14	13	13
6	14	12	13	12	13	14	15	16	18	17	20	26	25	21	20	17	16	15	13	14	13	14	14	14
7	14	14	12	13	12	14	16	21	19	21	22	24	30	25	23	22	15	14	13	15	13	13	13	13
8	13	13	13	13	13	13	18	13	19	20	22	27	25	22	20	19	17	14	14	13	15	13	13	13
9	14	14	13	13	14	13	14	17	17	18	21	28	25	30	24	22	16	13	14	14	13	14	14	14
10	13	14	13	13	13	13	15	15	14	16	22	22	22	27	20	19	14	16	14	13	12	12	14	14
11	13	13	13	13	13	15	15	17	14	21	21	24	31	23	22	21	17	14	14	13	14	13	14	14
12	14	14	13	13	13	14	16	13	18	20	27	24	30	20	19	17	17	16	14	13	15	14	15	14
13	13	13	14	14	13	14	16	16	17	19	21	20	22	21	20	E S 20	17	13	14	13	14	14	14	15
14	14	13	13	13	12	14	18	16	18	20	25	34	21	21	20	21	16	15	13	12	14	13	13	13
15	13	13	13	13	14	14	16	16	20	20	23	24	24	22	21	20	18	15	13	13	13	14	14	16
16	13	13	14	13	13	14	17	14	16	21	21	24	24	24	20	20	14	13	12	15	14	13	15	13
17	13	14	13	13	13	15	16	14	18	C	C	34	26	22	21	21	17	14	12	12	13	13	13	13
18	13	13	13	13	13	13	17	20	19	21	29	27	22	22	22	16	17	14	14	13	13	13	14	14
19	14	13	13	13	12	13	15	14	17	13	24	31	27	33	20	19	17	15	13	13	14	13	13	14
20	13	13	14	13	13	13	14	18	18	21	25	23	23	26	22	20	17	15	13	13	14	15	13	14
21	14	13	13	13	13	13	14	13	19	19	26	27	27	23	21	18	14	13	13	13	13	13	14	14
22	13	14	13	13	13	13	13	14	17	20	20	26	33	31	19	21	15	16	13	14	13	13	13	13
23	13	13	13	13	13	13	14	15	17	21	31	24	24	20	20	19	17	15	13	15	13	13	14	12
24	13	13	13	13	13	14	15	17	18	20	28	23	32	27	20	19	17	14	13	12	14	13	15	14
25	14	15	13	14	13	14	17	16	18	26	17	27	35	26	21	20	13	15	18	13	13	14	13	14
26	13	13	13	13	13	13	15	35	20	21	22	21	21	20	18	18	17	14	14	14	13	14	13	14
27	14	13	13	13	13	13	13	17	18	17	26	23	23	27	20	18	17	13	13	13	13	13	13	13
28	14	13	13	13	13	12	13	16	15	20	17	21	18	22	20	18	15	12	12	13	14	13	15	13
29	13	13	13	14	14	14	16	16	16	18	22	25	28	23	30	17	16	13	13	14	14	14	15	14
30	13	14	12	13	13	12	13	15	18	20	21	20	18	20	16	15	14	12	13	13	14	13	14	14
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	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	13	13	13	13	13	14	15	16	18	20	22	24	24	23	20	19	17	14	13	13	14	13	14	14
UQ	14	14	13	13	13	14	16	17	18	21	25	27	28	26	22	20	17	15	14	14	14	14	14	14
LQ	13	13	13	13	13	13	13	14	17	19	21	23	22	21	20	18	15	13	13	13	13	13	13	13

SEP. 1990 | FMIN (0.1 MHZ)

IONOSPHERIC DATA

SEP. 1990 | M(3000)F2 (0.01) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N, Long. 139°29.3'E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	260	260	275	275	280	280	310	315	325	290	260	265	275	275	275	280	290	300	310	A	275	265	255	245
2	235	275	315	285	F 240	F 245	290	340	A	295	A	U R 280	280	280	280	285	295	300	295	305	295	270	270	V 270
3	F 255	S 280	260	S 285	275	285	315	335	325	310	285	285	275	285	290	295	300	300	305	300	300	270	265	260
4	265	275	280	285	290	310	335	335	315	330	295	285	295	280	285	285	295	305	310	300	290	270	265	275
5	265	265	285	285	275	285	S 325	330	320	305	295	275	280	R 285	280	275	290	295	315	295	270	260	260	265
6	265	275	245	275	270	290	330	325	325	305	300	280	275	275	285	280	295	295	310	310	280	275	280	265
7	260	U S 270	270	275	250	270	U S 320	330	315	310	310	285	275	U R 285	295	285	R 290	295	305	305	280	260	260	275
8	260	255	265	300	290	270	295	325	300	295	285	280	280	275	280	295	280	285	295	305	300	260	260	265
9	285	S 295	280	275	260	V 275	310	310	320	310	275	285	275	275	280	290	285	290	300	305	290	265	265	270
10	265	280	280	270	270	270	315	330	300	290	290	285	275	265	275	285	285	285	305	330	275	265	265	270
11	270	270	280	295	285	290	325	340	315	305	280	275	270	275	275	280	285	290	295	S 310	270	270	255	250
12	250	270	270	S 290	255	240	250	270	245	255	265	H 270	285	275	285	290	290	300	320	295	250	260	280	265
13	F 245	260	240	250	260	255	300	305	285	300	285	275	270	275	285	295	305	300	305	270	255	260	270	280
14	270	250	255	260	250	250	280	295	305	290	280	265	275	280	275	275	285	300	310	295	270	255	255	255
15	265	255	265	275	260	275	315	320	315	275	280	265	270	270	265	265	280	285	300	290	255	260	265	250
16	260	280	260	265	265	260	300	300	290	305	260	265	270	265	265	265	280	290	290	S 290	275	255	250	270
17	270	250	250	275	285	290	310	310	305	C	C	275	275	275	275	285	285	290	295	295	275	275	275	265
18	265	265	270	265	260	265	320	330	315	300	280	270	270	265	270	270	275	285	305	305	250	250	255	260
19	265	255	245	245	235	275	S 310	295	280	295	275	260	265	270	280	285	285	290	295	I S 280	265	275	275	260
20	260	255	275	290	245	245	310	310	315	295	270	275	265	265	270	275	275	290	300	270	275	265	265	275
21	280	285	270	250	250	270	320	330	310	300	290	270	270	265	275	280	290	290	295	270	260	265	260	270
22	260	260	255	255	260	250	280	320	305	290	270	280	280	280	275	275	290	290	295	265	270	270	280	270
23	270	250	250	255	265	285	310	330	305	275	285	295	280	280	280	285	290	295	300	275	270	280	275	275
24	280	280	255	255	270	295	325	S 335	305	295	280	285	285	285	280	275	280	285	290	275	275	280	265	270
25	280	270	260	250	255	255	290	300	315	305	290	295	295	285	285	290	295	305	S 300	295	275	270	290	275
26	300	290	280	280	280	275	315	320	330	310	295	290	295	280	285	290	300	315	295	280	275	290	270	285
27	290	275	265	265	290	310	325	325	320	310	295	300	290	285	285	295	300	300	310	290	290	285	285	270
28	270	280	295	285	290	290	325	325	325	310	310	300	280	290	295	295	305	315	305	305	290	285	280	265
29	285	305	310	285	285	285	350	335	335	335	320	305	300	300	290	295	305	305	310	295	290	295	285	275
30	285	285	290	290	290	295	335	335	325	320	310	300	300	295	295	290	300	310	315	300	305	285	285	285
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	29	29	28	30	30	30	30	30	30	30	30	29	30	30	30	30
MED	265	270	270	275	268	275	315	325	315	300	285	280	275	278	280	285	290	295	302	295	275	270	265	270
UQ	280	280	280	285	285	290	325	330	320	310	295	285	285	285	285	290	295	300	310	305	290	275	280	275
LQ	260	260	255	260	255	260	300	310	305	295	278	270	270	275	275	275	285	290	295	280	270	260	260	265

SEP. 1990 | M(3000)F2 (0.01)

IONOSPHERIC DATA

SEP. 1990 | M(3000)F1 (0.31) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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	U L 325	U L 335	L 350	L	L	L	L	L						
2							L	L	A	A	A	A	L	A	A		A							
3								L	L	L	L	L	L	U L 330	U L 330	L	L	L						
4									L	L	L	L	U L 365	U L 345	U L 340	L 345	L	L						
5								L	L	L	L	L	L	L 370	A	L	L							
6									L	L	L	L	U L 330	L	L	L	L							
7										L 400	L	L 350	L	L	L	L								
8							L	L	L	L	L	L	L	A	L	L		A						
9								L	L	L	L	L	L	U L 340	U L 335	L	L							
10								L	L	L	L	L	L	L	L 335	L	L	L						
11								L	L	L	L	L	L	U L 340	L 345	L	L							
12						L	L	L	U L 310	L 320	345	U L 325	L	L	365	A	L							
13										L	L	L	U L 315	L	L	L	L							
14								L	L	A	A	L	L	L	L	L	L							
15									A	L	L	L	U L 310	L	L	L	L							
16										L	U L 335	L	U L 300	L	L	L	L							
17									L	C	C	L	L	L	L	L								
18										L	L	L	L	L	L	L	L							
19									L	U L 365	L	L	L	L	L									
20									L	L	L	L	U L 325	U L 320	L	L	L							
21									L	L	L	L	L	L	U L 315	L								
22									L	L	L	L	L	L	L	L	L							
23									L	L	L	L	L	L	L									
24									L		L	L	L	L	L									
25											L		L	L	L	L								
26									L	L	L	L	L	L	L									
27										L	L	L	L	L		L								
28								L	L	L	L	L	L	L	L	L								
29										L	L	L	A	L	B									
30								L	L	L	L	L	L	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	3	3	3	7	6	7	1								
MED									U L 310	L 365	U L 335	U L 335	U L 325	U L 340	U L 335	L 345								
UQ										L 382	L 340	L 342	U L 340	U L 345	L 342									
LQ										L 342	U L 330	U L 330	U L 312	U L 330	U L 332									

SEP. 1990 | M(3000)F1 (0.31)

IONOSPHERIC DATA

SEP. 1990 | H'F2 (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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									235	270 L	355	335	315	330	315	305	290	270						
2							305 L	230	A	335	A	E A 335	340	340	345 A		305							
3								255	270	255	320 L	310	355	330	315	305	295	270						
4									270	250	320	340	300	345	315	305	285	265						
5								235	230	255	265	310	300	295	320	320	300							
6									255	260	270	355	345	315	300	305	280							
7										265	260	335	290	320 H	310	300 L								
8							310	260	310	270	305	290	320	E A 350	305	280		285 A						
9								260	255	250	260	310	325	330	315	305	310							
10								240	255	260	260	310 L	290	355 L	340	290	300	285						
11								245	255	255	310 L	320 L	285	325	325	310	300							
12						420	U L 360	380	465	445	395	355	310 L	385	335	300	285							
13										270	275	350 L	370	340	305	285	270							
14								300	275	285 A	265 A	355	315	320	350 L	330 L	310							
15									260	240 H	285	350 L	340	330 L	330	355	300							
16										265	365	310	340	330	350 L	325 L	310							
17									250	C	C	335	305	330	330	295								
18										260	305 L	270	275 H	305	340	335	305 L							
19									305	270	320	335 L	325	340	305									
20									250	255	320 L	310	355	330	325 L	310 L	310 L							
21									255	260	260	330	355 L	360	325	310								
22									230	255	325	310	285	315	330	335	290							
23									255	260 L	290	285	265 H	305	305									
24									275		310	300	305	275	305									
25											275		270	300	305	285								
26									245	260	270	255	300	290 L	300									
27										240	295 L	275	260	300		270								
28								235	230	255	280	260	270 L	290	285	260								
29										245	260	285 L	275	260 L	E B 320									
30								240	230	235	280	260	265	270		260								
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	11	22	27	28	29	30	30	28	24	17	5						
MED						420	310 L	245	255	260	288	310	305	325	316	305	300	270						
UQ							335	260	270	268	320	335	340	335	330	315	305	285						
LQ							308	238	245	255	268	290	285	300	305	288	290	270						

SEP. 1990 | H'F2 (KM)

IONOSPHERIC DATA

SEP. 1990 | H'F (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI, TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A 375	280	A 305	270	A	250	250	230	220	205	210	225	A	230	235	240	A 265	A	A	A 285	260	315	355
2	A 390	A 325	250	240	380	H 360	255	A 240	A	A	A	A	A	A	A	A 260	A	A 270	260	260	255	260	270	295
3	305	A	E A 365	A	A 320	300	255	235	230	230	A 255	205	200	H 190	230	220	240	255	255	255	240	240	265	310
4	320	300	290	250	250	245	230	235	230	215	H 210	H 200	205	230	H 215	235	250	255	255	235	235	230	295	305
5	310	315	270	260	295	290	240	230	225	215	195	H 185	A 265	215	A	A 275	A 260	270	255	235	260	270	300	285
6	290	300	335	300	285	260	235	230	225	210	210	H 205	200	230	H 220	225	265	265	260	255	245	270	260	300
7	330	290	290	280	320	325	250	230	240	A 225	240	H 205	A	235	245	255	250	E A 285	260	250	E A 300	275	285	280
8	320	320	310	260	220	280	250	250	240	205	235	A 235	215	A	A 250	240	255	A	265	260	245	265	A 305	E A 320
9	A 290	255	A 300	285	340	300	250	240	A 240	A 235	A 240	A 240	A 240	235	230	230	240	255	265	250	245	260	A 300	300
10	315	290	270	270	310	290	230	230	230	220	215	H 220	210	H 215	235	220	240	260	260	225	225	260	280	285
11	295	290	280	260	250	275	255	240	220	220	H 215	230	230	225	225	H 205	A 245	255	255	230	275	260	280	315
12	325	290	260	245	300	375	280	A 250	235	215	E A 265	E A 265	A	A	235	A	E A 265	A 270	250	225	265	300	E A 305	A 310
13	A 360	315	335	335	305	305	A 255	A 255	A 255	230	215	215	H 230	225	A	235	250	E A 270	A 250	E A 310	300	A 335	A 330	300
14	260	335	325	280	325	340	235	235	240	A	A	A	220	240	H 225	235	255	E A 275	A 255	230	A 295	315	A 335	330
15	305	310	310	270	280	285	255	240	A	230	210	H 215	H 195	240	240	235	A 275	255	E A 270	A 265	260	305	280	320
16	300	270	310	295	280	285	235	230	215	H 185	H 195	195	220	230	H 225	240	260	A 260	255	290	235	265	320	290
17	300	A 320	325	275	260	260	235	220	215	C	C	H 195	230	225	240	260	255	A 250	250	250	255	270	275	290
18	295	290	275	270	295	320	250	230	220	210	200	205	230	215	220	250	255	A 265	A 260	230	A 290	A 335	315	320
19	290	305	305	340	355	285	255	A 250	230	215	H 200	H 195	225	H 230	225	235	240	260	260	A 255	A 280	275	260	275
20	310	315	305	250	335	350	240	235	230	215	220	215	225	225	230	235	245	260	250	250	260	265	295	275
21	275	265	270	325	335	295	240	230	230	215	225	215	220	H 210	225	250	255	250	240	225	275	295	295	295
22	290	310	310	305	305	330	260	240	220	220	210	225	H 215	230	H 220	240	245	255	250	245	260	265	275	265
23	285	315	325	300	265	270	245	235	H 220	205	210	A 255	235	220	235	235	240	A 250	A 255	235	280	290	A 285	290
24	275	270	310	320	285	240	230	230	225	230	225	240	A 255	H 215	240	240	A 250	260	240	250	A 310	275	275	270
25	275	260	245	320	310	315	240	240	230	235	A 230	A 270	230	230	H 230	230	A 260	235	A 250	255	260	310	280	265
26	250	260	265	280	260	275	235	240	225	225	H 220	225	230	H 215	220	240	250	235	215	250	270	260	280	280
27	260	280	290	310	260	235	235	H 235	220	220	H 210	230	235	230	235	235	240	240	230	230	250	260	265	285
28	300	295	255	260	255	250	230	210	220	220	230	A 240	225	215	230	235	245	235	225	230	A 265	260	280	305
29	280	250	240	260	295	290	235	230	235	220	215	220	A	215	B	260	240	A 245	240	265	250	250	255	270
30	265	275	270	260	270	260	230	235	220	215	H 205	A 240	235	H 205	235	230	250	245	240	235	240	230	260	260
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	29	30	29	30	29	30	30	28	27	27	28	26	26	26	29	29	29	29	29	30	30	30	30
MED	295	295	290	280	295	290	240	235	230	220	215	216	225	225	230	235	250	255	255	250	260	265	280	291
UQ	310	315	310	305	320	315	255	240	232	225	226	235	230	230	235	240	255	A 262	260	255	278	290	300	308
LQ	280	275	270	260	265	270	235	230	220	215	210	205	215	215	225	235	240	250	250	230	245	260	275	280

SEP. 1990 | H'F (KM)

IONOSPHERIC DATA

SEP. 1990 | H'E (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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	125	115	110	110	A	E A 135	A 120	115	A 120	115	115	115	A					
2						B	125	115	115	115	115	A	A	115	110	A	115	120	A					
3						B	A	A	A	A	A	A	A	A	E A 130	A 125	A 125	E A 135	B					
4						B	A 130	A	A 115	A 115	A 120	A 120	120	115	115	115	115	115	A					
5						B	A 120	A 115	A 110	A 125	A 125	115	115	115	B 125	125	115	A 120	B					
6						B	125	115	115	110	110	115	A	115	110	110	110	120	A					
7						B	130	120	115	115	A	E A 130	120	120	115	115	115	A	B					
8						B	130	115	E A 130	115	A	A 120	110	110	110	110	115	120	B					
9						B	E A 130	115	110	110	A	A	A	A 120	E A 125	A 125	A 120	125	B					
10						B	130	A 120	A	115	115	115	115	120	110	110	110	120	B					
11						B	135	115	A 115	115	115	A	A	A	A	E A 130	110	115	B					
12						B	130	110	115	110	115	110	115	110	110	A	A	115	B					
13						B	A	115	A	110	A	A	A	A	A		A 120	110	B					
14						B	135	120	115	110	115	A	110	110	115	110	115	120	B					
15						B	125	120	A	A	A	A 120	A 120	A 120	115	115	115	115	B					
16							130	110	110	E A 135	110	115	115	115	110	110	110	120						
17							125	A 120	E A 125	C	C	B 120	115	A 115	115	120	115	120						
18							E A 145	115	E A 120	A 120	115	E A 125	E A 140	115	115	110	115	120						
19							A	110	115	115	115	E A 135	A	A	115	120	115	115						
20							120	110	A	A	A	A	A	115	A 115	A 120	A 120	120						
21							130	110	110	110	120	115	115	110	A 115	A 120	A 120	A						
22							135	120	110	A 115	115	120	120	120	115	115	115	130						
23							130	115	115	115	120	120	115	115	110	115	115	125						
24							B 150	120	120	110	120	120	120	120	115	115	115	A						
25							B 150	120	115	120	115	120	A	120	120	120	A	A						
26							B 145	B	115	115	120	115	A 115	115	120	115	A	E A 135						
27							A	120	115	110	120	A 130	120	120	115	A	A	A 140						
28							E A 145	115	115	110	110	110	110	A 125	A	E A 135	A	E A 135						
29							140	130	120	115	120	E A 140	A 135	A	B	115	A	A						
30							115	A 125	A 125	110	110	A	115	115	115	110	A 115	E A 135						
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	26	21	22	21	25	26	26	24	25						
MED							130	115	115	115	115	118	115	115	115	115	115	120						
UQ							135	120	115	115	120	A 122	120	120	115	120	115	122						
LQ							125	115	115	110	115	115	115	115	110	110	115	115						

SEP. 1990 | H'E (KM)

IONOSPHERIC DATA

SEP. 1990 | H'ES (KM) | 135° E Mean Time (G.M.T. + 9 h)

Station KOKUBUNJI TOKYO Lat. 35°42.4'N, Long. 139°29.3'E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

Hour / Day	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	105	105	120	105	110	115	120	110	115	110	110	110	110	110	110	E G 145	130	115	110	105	105	115	B	115
2	105	105	105	105	110	110	B	116	110	110	110	120	110	110	110	120	120	120	110	110	110	110	110	105
3	110	105	105	100	105	105	110	115	115	110	105	105	110	110	110	E G 150	105	105	105	100	100	100	100	100
4	110	105	110	110	B	105	150	100	E G 160	E G 160	105	105	G	E G 180	E G 165	E G 155	140	130	120	105	110	B	B	B
5	B	B	B	B	105	B	E G 175	115	135	105	130	G	135	140	135	140	140	125	120	115	110	115	B	B
6	B	110	105	105	B	B	125	140	120	120	110	110	115	120	E G 150	135	125	120	110	110	110	110	110	100
7	115	115	B	B	115	120	125	120	110	110	110	110	125	125	130	120	115	110	115	110	110	105	110	100
8	100	B	100	125	125	120	135	140	130	130	120	120	130	115	125	E G 155	130	115	110	110	120	110	115	105
9	100	105	100	100	100	105	110	115	115	110	105	105	105	110	110	105	125	125	130	115	110	105	110	105
10	110	110	B	105	100	110	E G 160	110	110	130	140	135	135	G	G	G	150	130	120	115	110	115	B	B
11	B	B	B	B	B	135	150	G	150	140	140	110	110	105	105	110	120	140	120	110	105	120	105	B
12	105	B	105	B	120	130	135	115	E G 140	125	110	120	115	110	115	105	105	115	110	B	110	105	120	105
13	100	100	110	B	120	115	115	110	105	110	120	115	105	110	100	105	120	110	110	110	110	110	110	105
14	B	105	110	105	B	B	G	125	120	110	110	110	120	110	G	G	125	115	115	110	105	110	105	105
15	110	B	105	110	B	120	120	120	110	120	115	110	105	110	140	130	120	110	110	110	105	105	110	110
16	B	B	B	B	105	B	G	G	G	110	G	G	G	G	E G 155	140	130	115	110	110	105	110	105	105
17	105	105	105	110	B	B	G	105	105	C	C	G	G	110	150	E G 185	145	125	130	110	110	105	100	100
18	100	B	B	B	B	B	E G 160	E G 165	105	110	G	115	115	G	G	E G 180	140	130	120	110	110	105	105	105
19	105	100	105	105	125	120	120	115	120	120	115	115	115	120	G	G	E G 155	130	110	105	100	100	100	105
20	B	B	B	B	B	B	G	G	110	105	105	105	105	G	110	110	105	145	105	105	100	B	105	B
21	B	B	105	105	105	110	G	G	G	G	G	G	G	G	110	105	150	100	120	105	B	B	100	105
22	110	B	B	B	B	B	G	125	115	105	105	G	G	E G 160	150	145	135	130	100	B	B	110	B	B
23	B	B	B	B	B	B	E G 160	G	125	G	145	135	E G 180	G	E G 150	130	E G 150	120	110	115	110	105	105	105
24	110	110	B	B	B	B	E G 160	130	125	145	135	120	120	125	115	115	120	120	110	110	105	105	120	B
25	B	B	B	B	B	B	E G 210	E G 165	135	120	120	115	115	110	115	115	110	115	105	110	105	100	105	110
26	105	B	B	B	B	B	G	B	E G 150	130	130	130	130	G	105	120	120	115	B	115	B	B	B	B
27	B	B	115	B	B	B	105	G	G	100	145	135	145	130	120	120	115	120	115	110	105	105	B	B
28	B	B	B	110	130	105	E G 160	G	E G 155	140	125	115	115	115	115	115	110	110	115	115	100	105	105	100
29	110	100	100	100	100	B	G	130	120	120	120	115	120	115	B	120	115	110	110	100	100	100	B	B
30	B	B	B	B	B	B	140	110	110	G	155	120	120	105	E G 190	E G 160	150	125	100	115	100	100	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	14	16	15	15	15	21	22	27	26	26	25	25	23	25	27	30	30	29	28	27	26	21	19
MED	105	105	105	105	110	115	U 125	115	118	112	118	115	115	110	112	118	122	120	110	110	105	105	105	105
UQ	110	110	110	110	120	120	E G 160	128	126	128	130	120	122	120	U 135	U 132	138	125	120	112	110	110	110	105
LQ	105	105	105	105	105	108	120	110	110	110	110	110	110	110	110	115	115	115	110	108	105	105	105	102

SEP. 1990 | H'ES (KM)

IONOSPHERIC DATA

SEP. 1990 | TYPES OF ES | 135° E Mean Time (G.M.T. + 9 h)

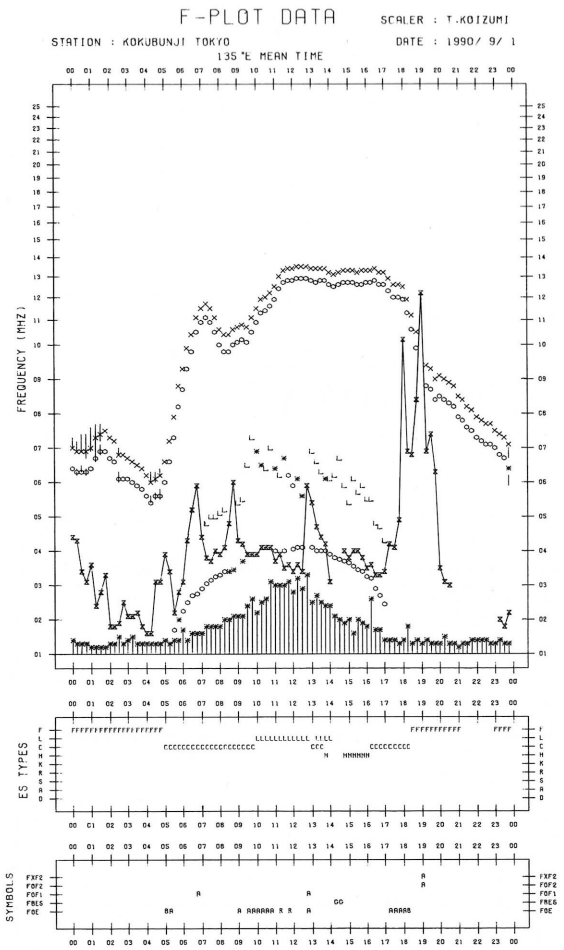
Station KOKUBUNJI TOKYO Lat. 35° 42.4' N, Long. 139° 29.3' E Sweep 1 MHz to 25 MHz in 24 sec in automatic operation

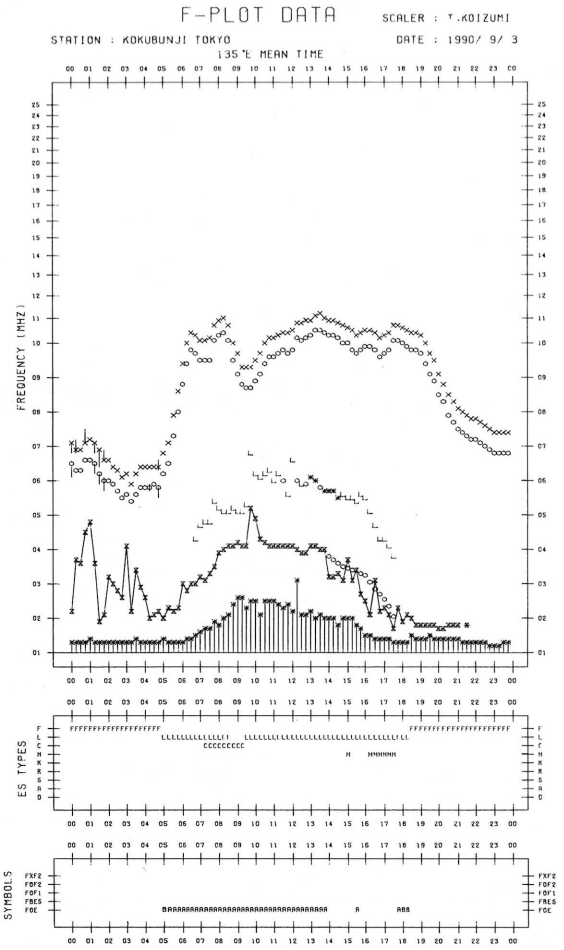
Hour / Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 5	F 6	FF 24	F 5	F 2	C 4	C 2	C 3	C 2	C 2	L 2	L 1	L 1	C 2	L 1	H 1	H 2	C 3	C 5	F 6	F 4	F 1		F 1
2	F 4	F 5	F 4	F 2	F 2	C 1		C 2	C 3	C 2	C 3	CC 22	C 2	C 3	C 3	C 2	C 3	C 3	C 3	F 3	F 4	F 3	F 2	F 3
3	F 3	F 3	F 4	F 4	F 3	L 2	L 2	L 2	CL 22	C 1	L 2	L 1	L 2	L 2	L 1	HL 11	L 2	LH 21	L 1	F 2	F 1	F 2	F 1	F 1
4	F 2	F 2	F 1	F 2		L 2	HL 21	LH 31	HL 12	HL 12	L 1	L 1		H 1	H 1	H 1	H 1	H 2	L 1	F 2	F 1			
5					F 1		HL 11	CL 22	CL 22	L 2	HL 11		HL 21	HL 11	H 1	H 1	H 2	CL 31	CL 22	FF 21	F 3	F 1		
6		F 1	F 2	F 1			C 2	H 1	C 2	C 1	C 1	C 1	L 2	C 1	H 1	H 1	H 2	C 3	C 3	F 5	F 3	F 3	FF 21	F 1
7	FF 21	F 1			F 2	L 1	C 3	C 1	C 2	C 2	C 2	L 1	C 2	C 1	H 1	H 2	C 2	C 3	C 4	F 4	F 4	F 2	F 1	F 2
8	F 1		F 1	F 1	F 1	C 2	H 1	H 2	HL 22	H 1	C 1	CL 21	H 1	C 2	H 1	H 1	H 2	C 3	C 2	F 4	FF 25	F 2	FF 13	F 4
9	F 5	F 2	F 4	F 3	F 3	L 2	L 1	C 2	C 2	C 2	C 3	L 2	L 2	L 1	L 1	L 1	HL 22	CL 32	C 2	F 2	F 3	F 2	F 3	F 2
10	F 1	F 1		F 2	F 3	L 1	H 2	LH 11	LH 21	H 1	HL 11	H 1	H 1				H 1	HL 21	C 2	F 3	F 3	F 1		
11						C 1	H 2		HL 12	H 1	H 1	L 1	L 1	L 1	L 2	L 1	C 2	H 2	C 1	F 3	F 5	F 2	F 1	
12	F 1		F 2		F 2	C 1	C 2	C 2	H 1	H 1	C 2	C 2	C 2	C 2	C 1	L 3	L 3	C 4	C 3		F 2	F 2	FF 14	F 3
13	F 3	F 3	F 1		F 1	C 2	C 3	C 3	C 3	C 2	L 1	L 1	L 2	L 2	L 3	L 2	CL 21	C 4	C 3	F 4	F 2	F 3	F 4	F 4
14		F 2	F 1	F 2				C 2	C 2	C 3	C 3	C 3	C 1	C 2			H 2	C 5	C 4	F 3	F 6	F 3	F 4	F 2
15	F 2		F 1	F 1		C 1	C 3	C 3	C 4	C 1	C 1	L 1	L 1	L 1	H 1	H 1	C 2	C 4	C 4	F 3	F 3	F 3	F 1	F 1
16					F 1					L 1					HH 11	HC 21	H 2	C 4	F 4	F 4	F 3	F 3	F 3	F 2
17	F 3	F 4	F 3	F 2				L 2	L 2					L 1	HL 11	H 1	H 2	C 4	FF 13	F 3	F 3	F 3	F 3	F 2
18	F 1						HL 11	H 1	L 2	L 1		L 1	LL 11			H 1	H 2	H 4	F 4	F 3	F 4	F 3	F 2	F 5
19	F 2	F 4	F 1	F 1	F 1	F 3	C 2	C 3	C 2	C 1	C 1	L 1	L 1	L 1			H 1	H 2	F 3	F 5	F 5	F 4	F 2	F 2
20									L 2	L 2	L 2	L 1	L 2		L 1	L 1	L 1	H 1	F 1	F 2	F 2		F 3	
21			F 2	F 3	F 3	F 1									L 1	L 1	HL 12	LH 31	FF 12	F 1			F 2	F 1
22	F 1							L 1	L 1	L 1	L 1			H 1	HL 11	H 2	H 2	C 3	F 1			F 1		
23							H 1		HHL 11		H 1	H 2	H 1		H 1	H 2	H 1	C 3	F 5	F 2	F 2	F 3	F 4	F 4
24	F 1	F 1					H 1	H 2	C 2	H 1	H 1	C 2	C 2	C 1	C 2	C 2	C 3	C 3	F 3	F 3	F 5	F 5	F 1	
25							H 1	H 1	H 2	C 2	CL 21	C 2	C 2	C 2	C 2	C 2	C 2	C 2	F 5	F 2	F 3	F 4	F 4	F 2
26	F 1								H 1	HL 11	H 1	H 1	HL 11		L 1	C 1	C 2	L 1		F 2				
27			F 1				L 1			L 1	H 1	HL 11	H 1	H 1	C 1	C 1	L 2	L 1	F 1	F 1	F 3	F 2		
28				F 1	F 1	F 2	HL 11		H 1	H 1	H 2	C 2	C 1	L 1	L 2	L 2	L 3	L 2	F 1	F 1	F 4	F 2	F 1	F 2
29	F 1	F 2	F 2	F 2	F 1			H 2	C 3	C 1	C 2	L 1	CL 21	L 2		C 2	C 2	C 4	F 2	F 3	F 1	F 1		
30							H 1	L 1	L 2		HL 11	CL 12	CL 11	L 1	HL 11	HL 11	HL 21	HL 42	F 4	FF 22	F 2	F 1		
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																								
UQ																								
LQ																								

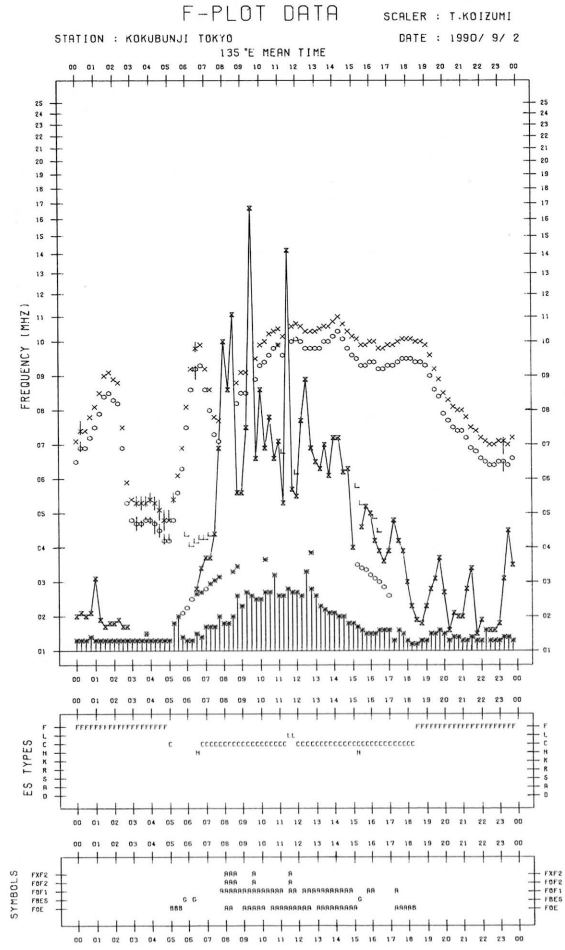
SEP. 1990 | TYPES OF ES

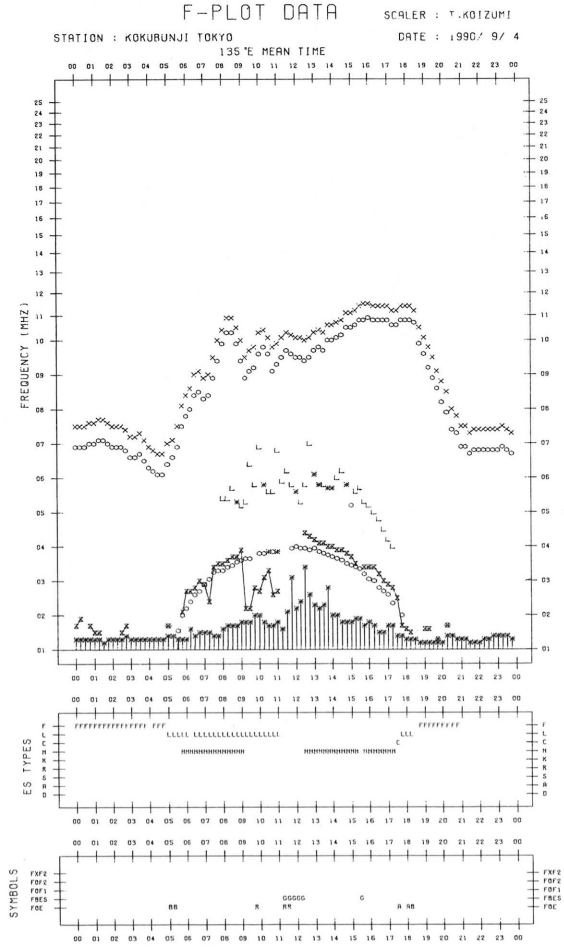
f-PLOTS OF IONOSPHERIC DATA

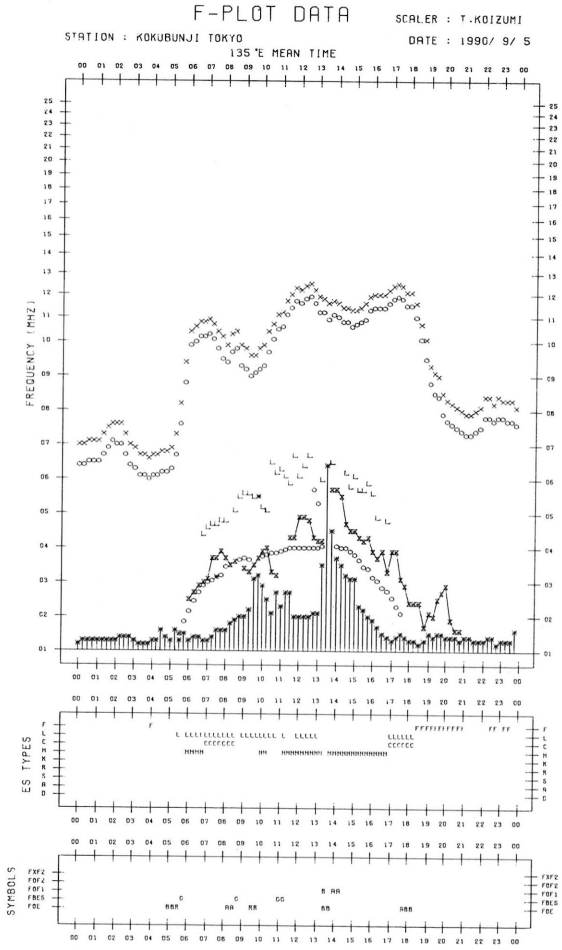
KEY OF F-PLOT	
I	SPREAD
○	FOF2, FOF1, FOE
×	FXF2
✳	DOUBTFUL FOF2, FOF1, FOE
⧖	FBES
⌊	ESTIMATED FOF1
↑, ↓	FMIN
∧	GREATER THAN
∨	LESS THAN

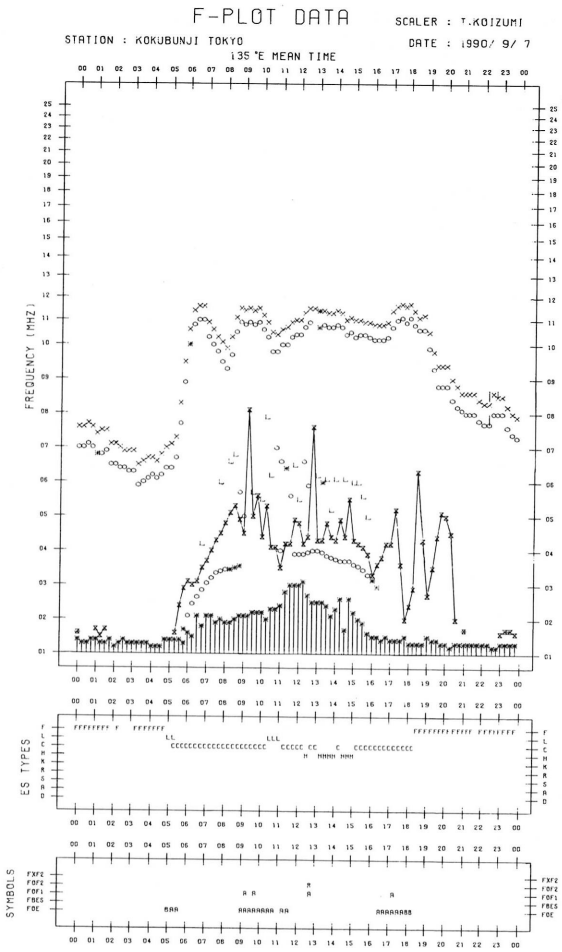

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 1
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

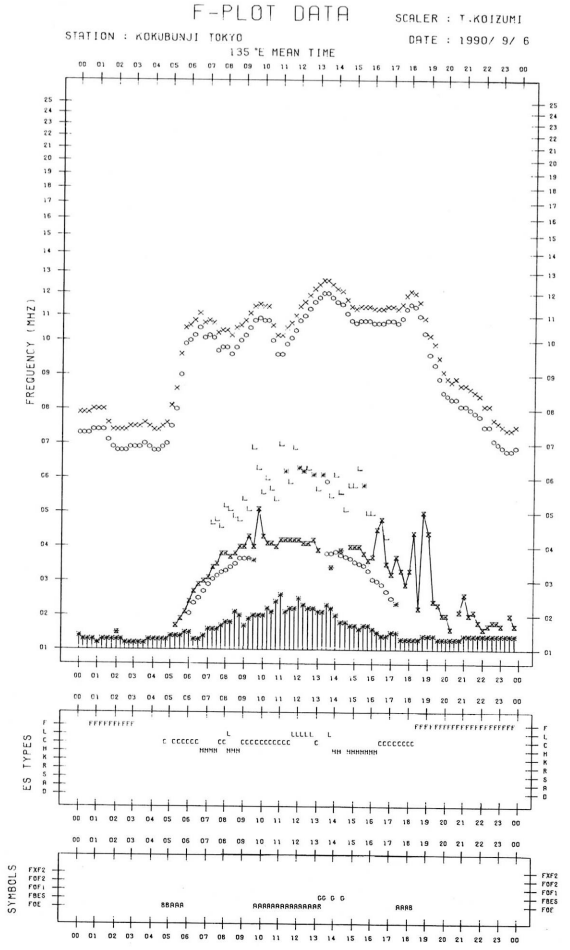

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 3
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

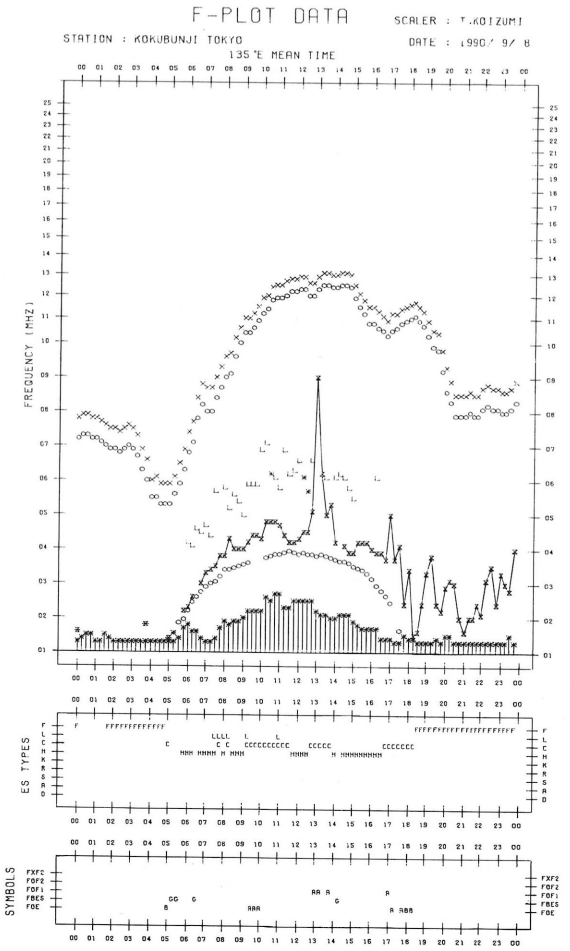

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 2
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

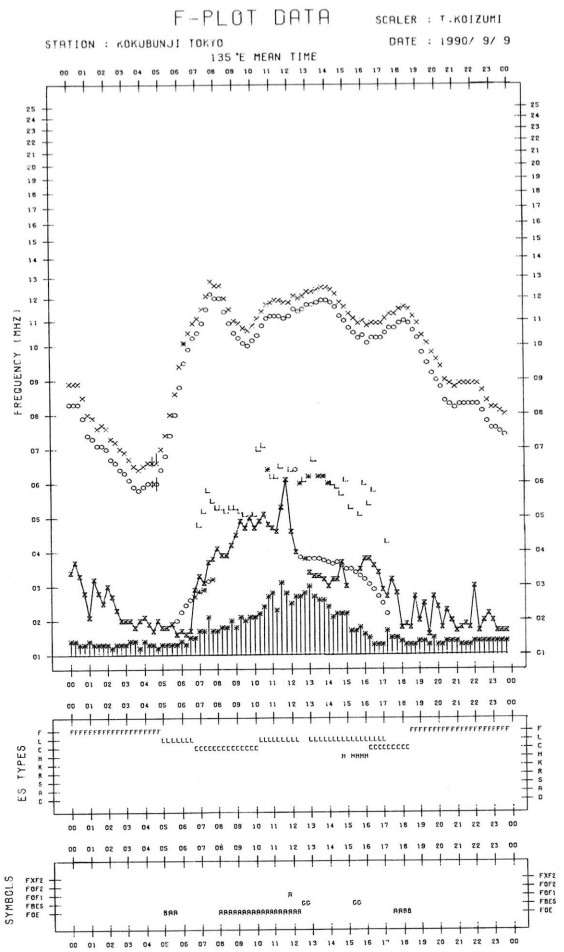

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 4
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

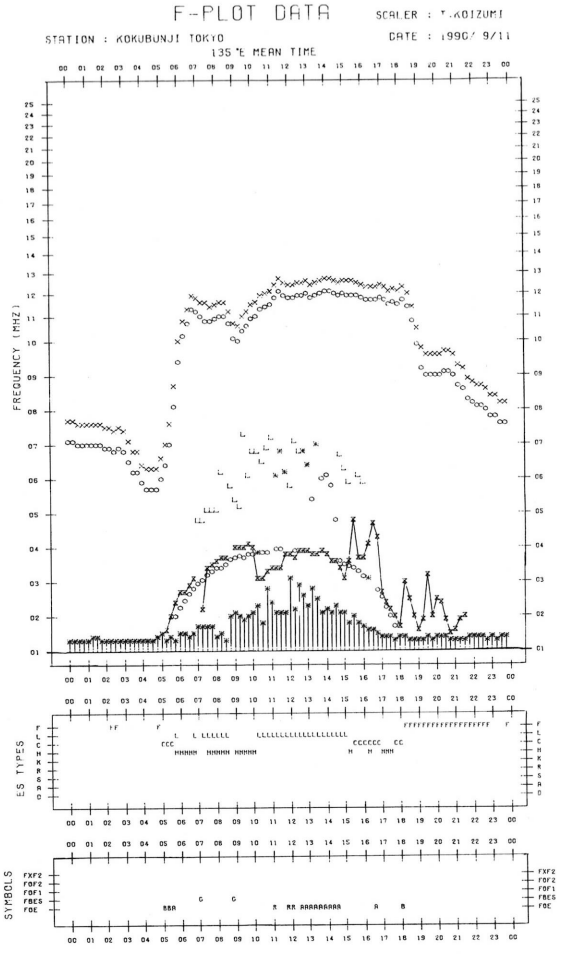

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 5
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

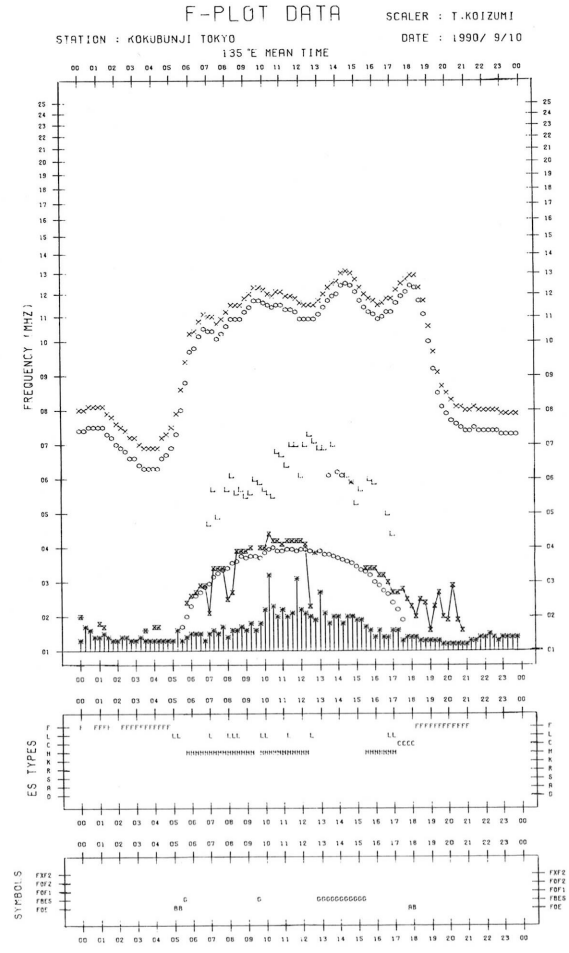

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 7
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

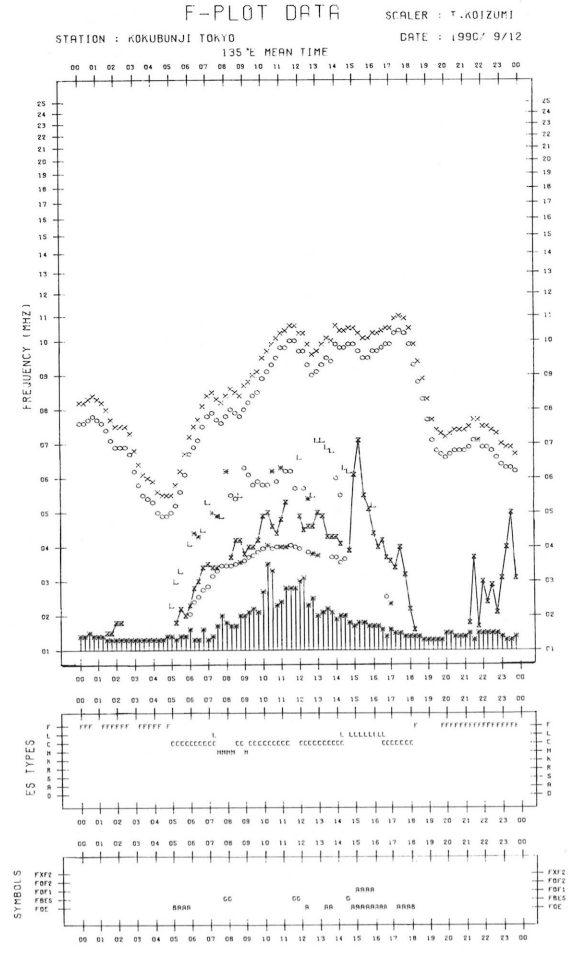

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 6
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

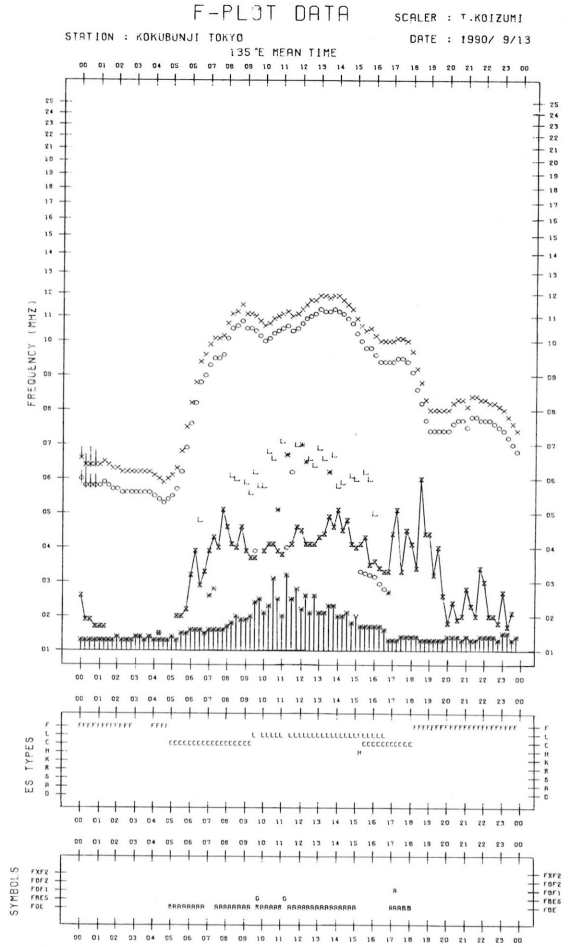

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 8
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

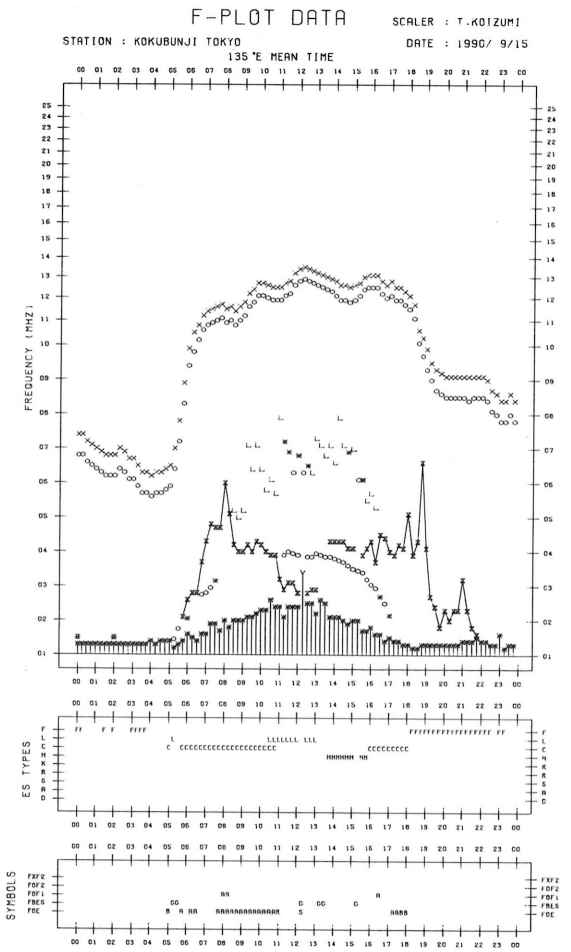

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/ 9
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

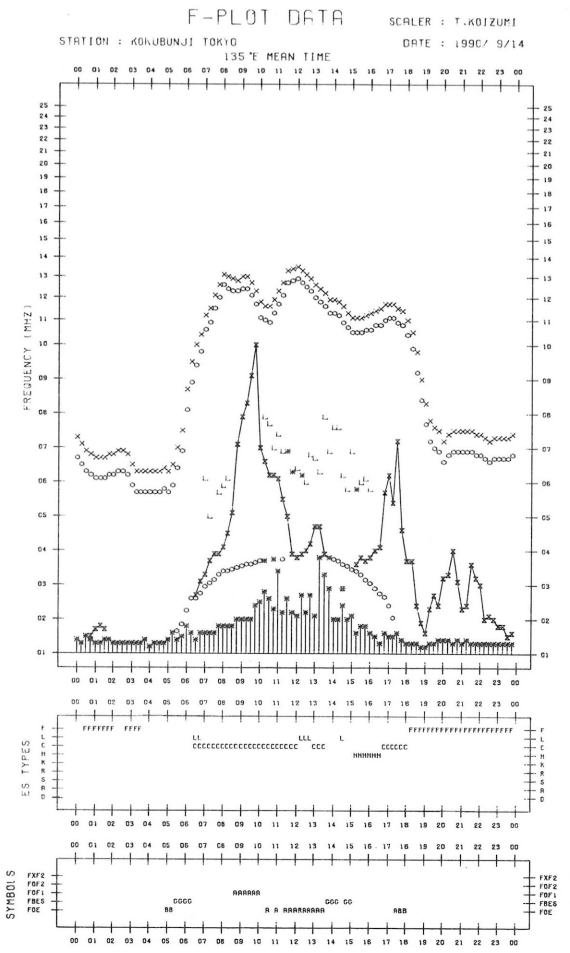

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/11
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

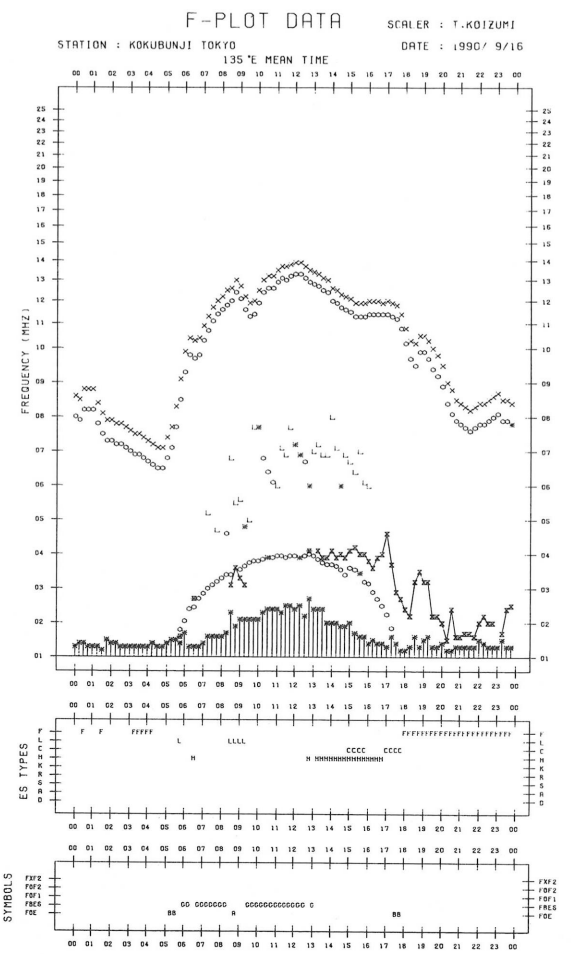

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/10
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

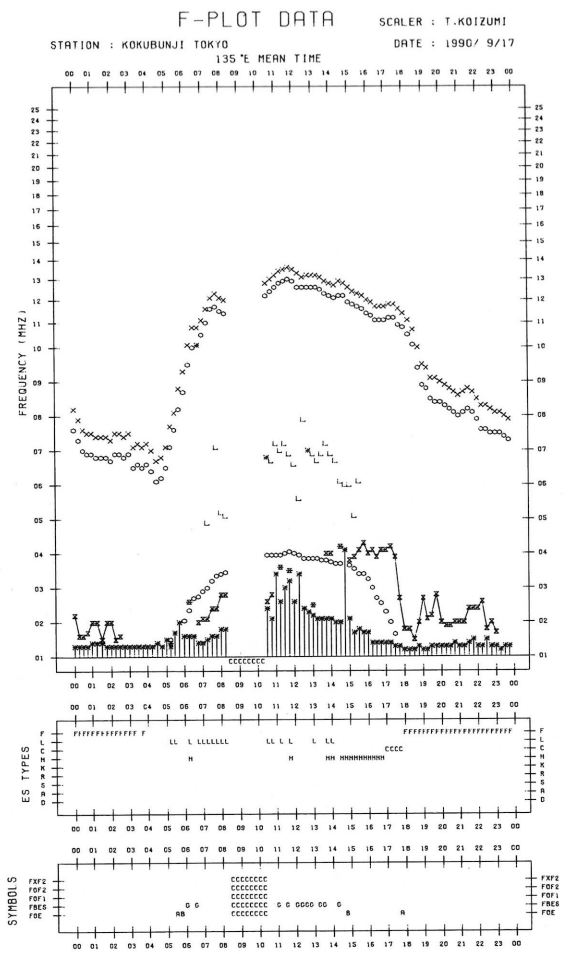

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/12
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE

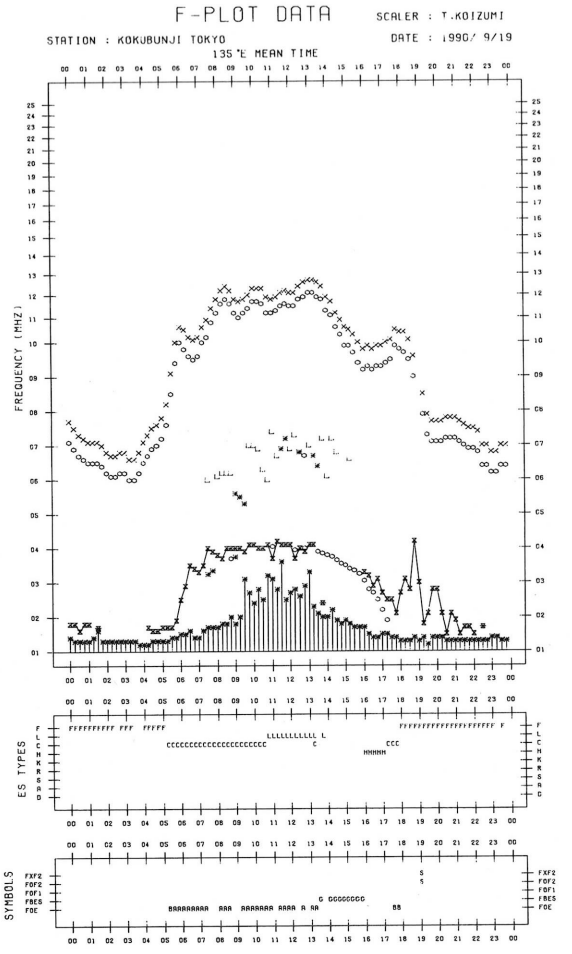

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/13
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

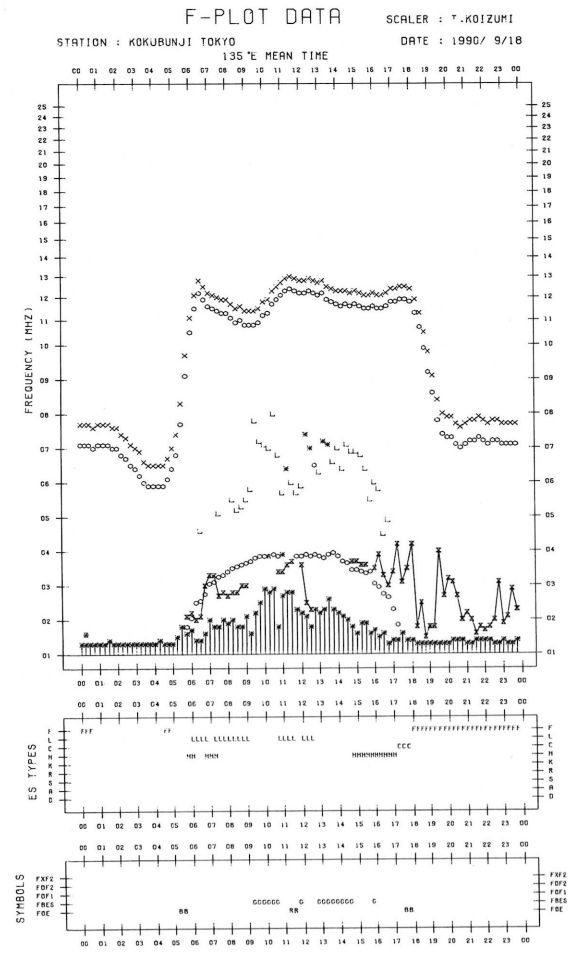

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/15
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

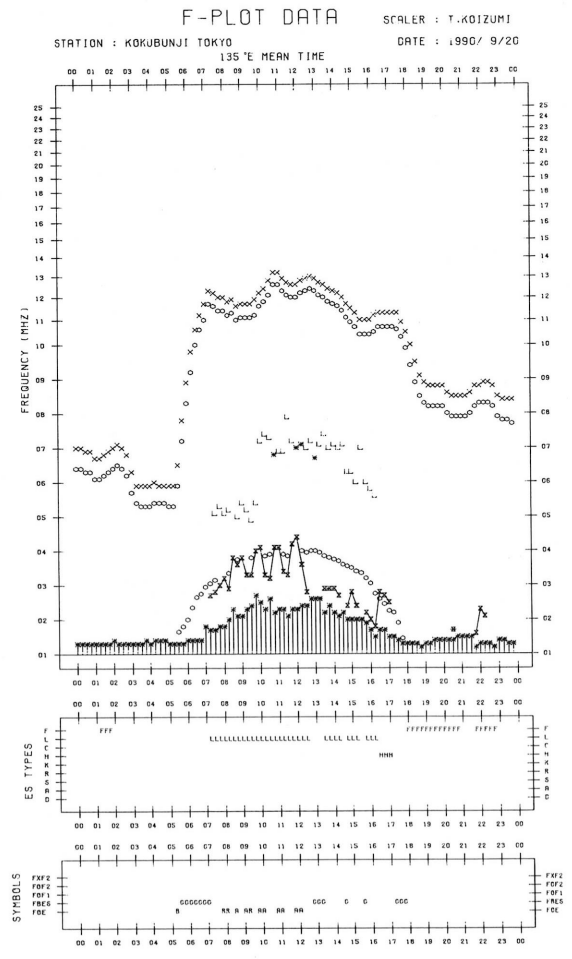

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/14
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

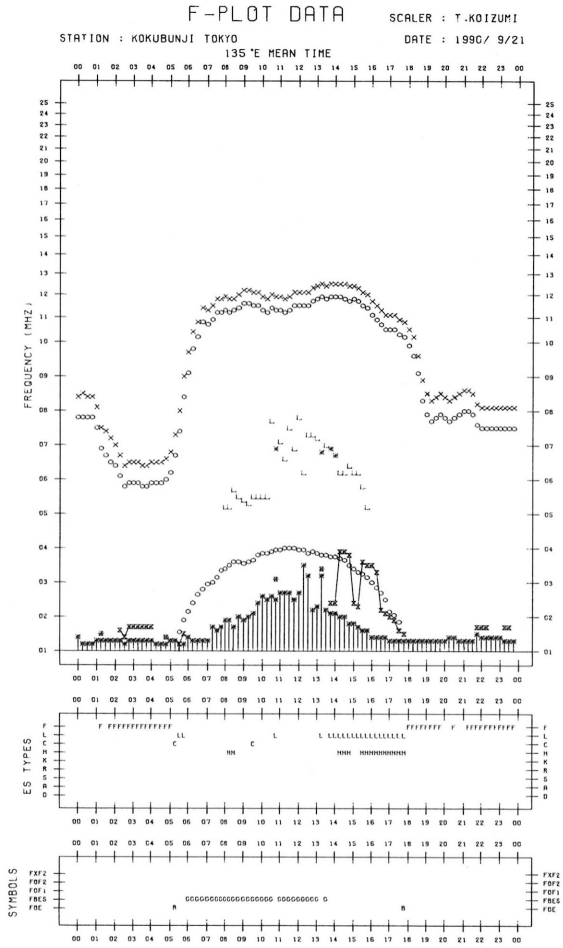

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/16
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

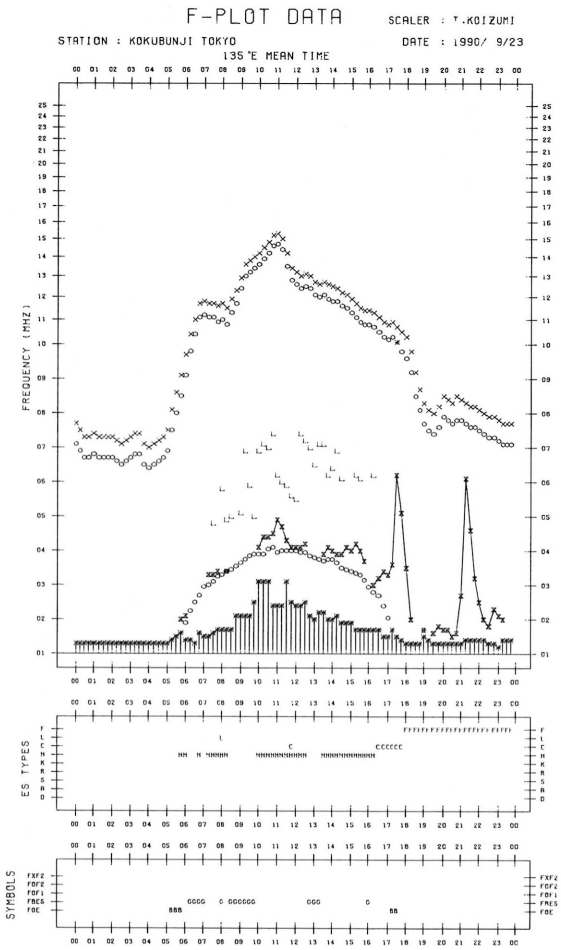

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/17
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

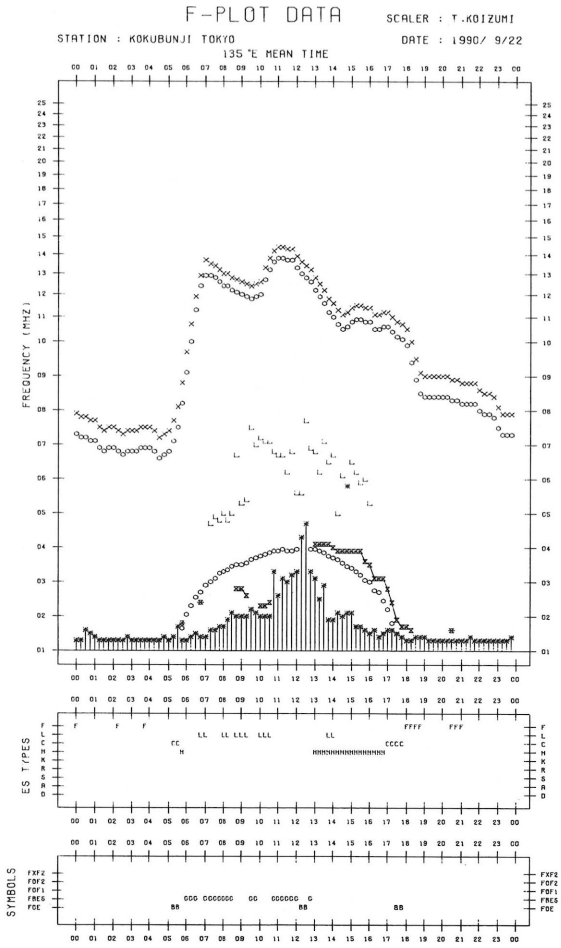

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/19
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

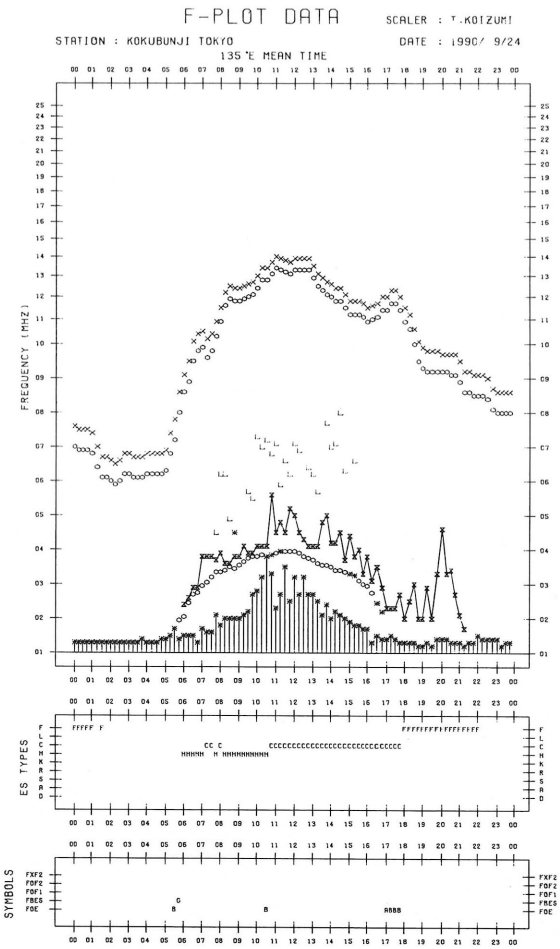

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/18
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

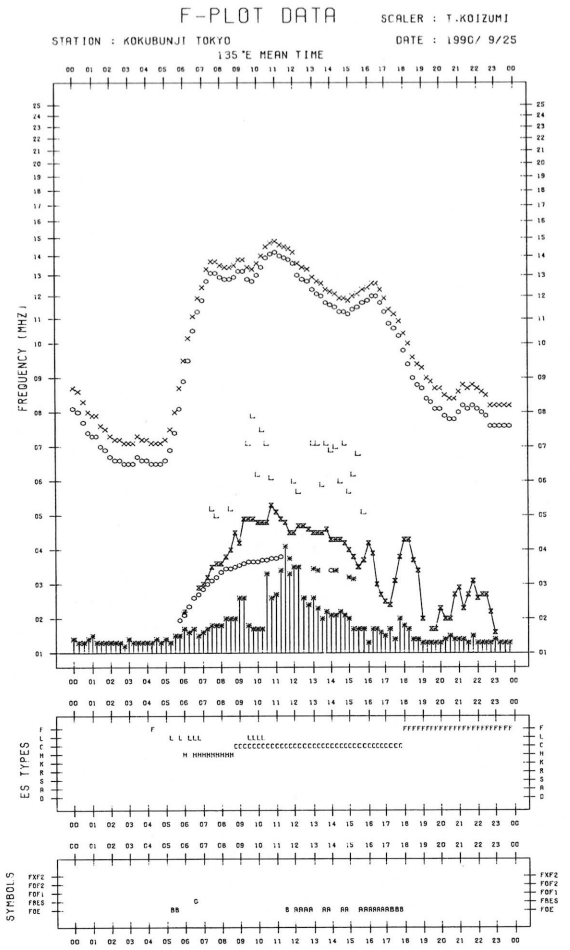

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/20
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

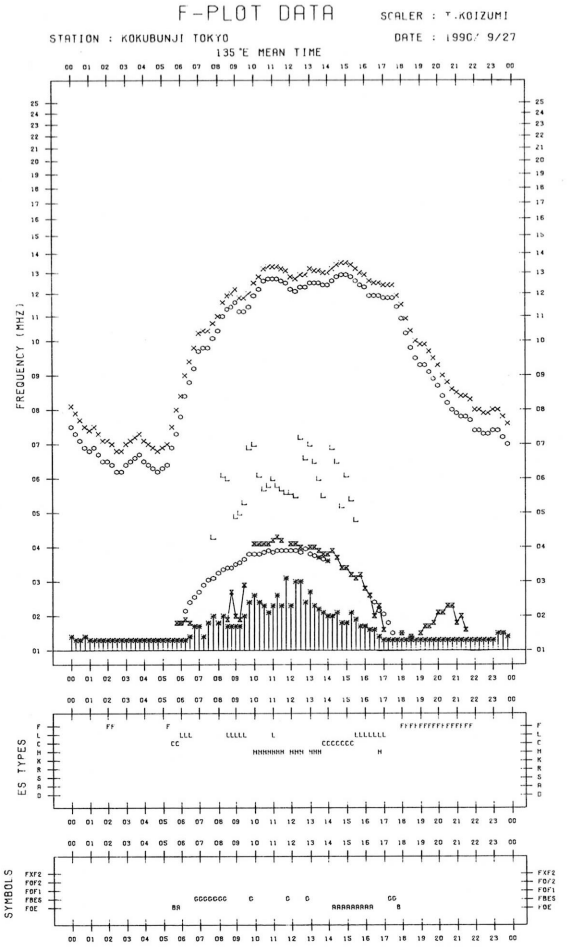

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/21
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

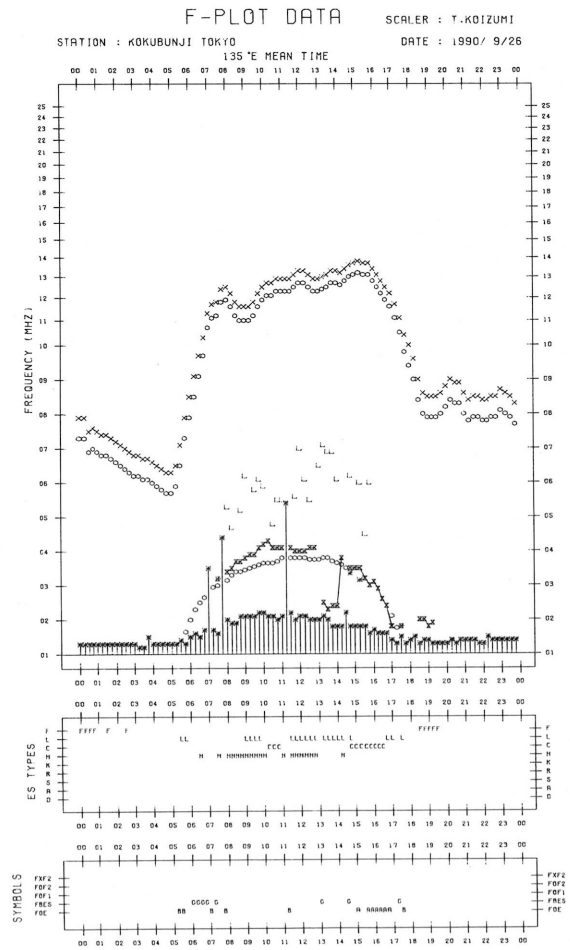

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/23
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

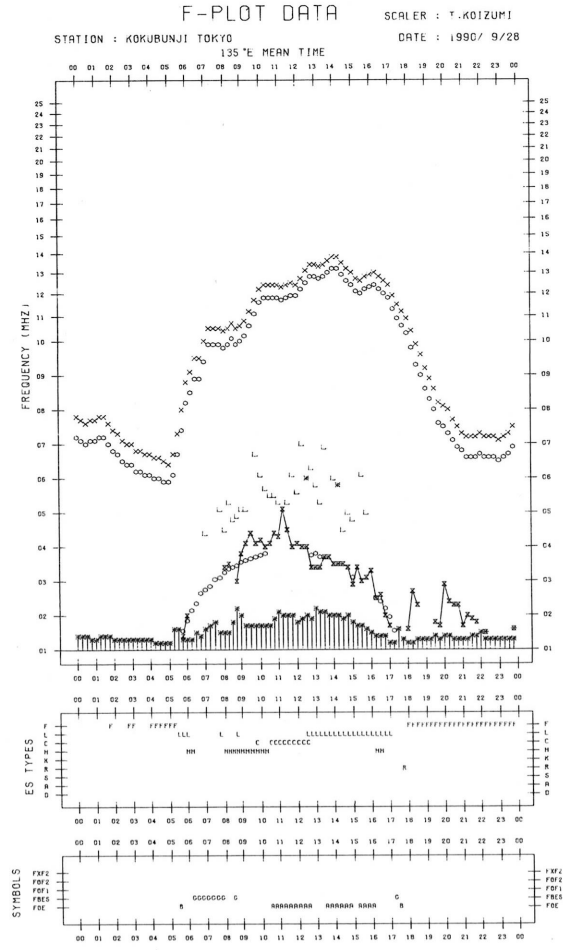

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/22
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

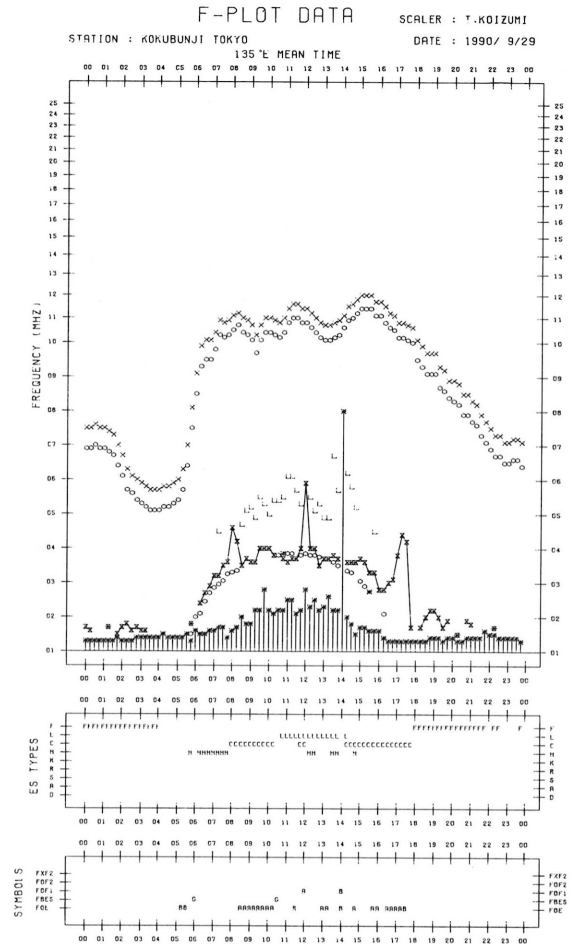

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/24
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS

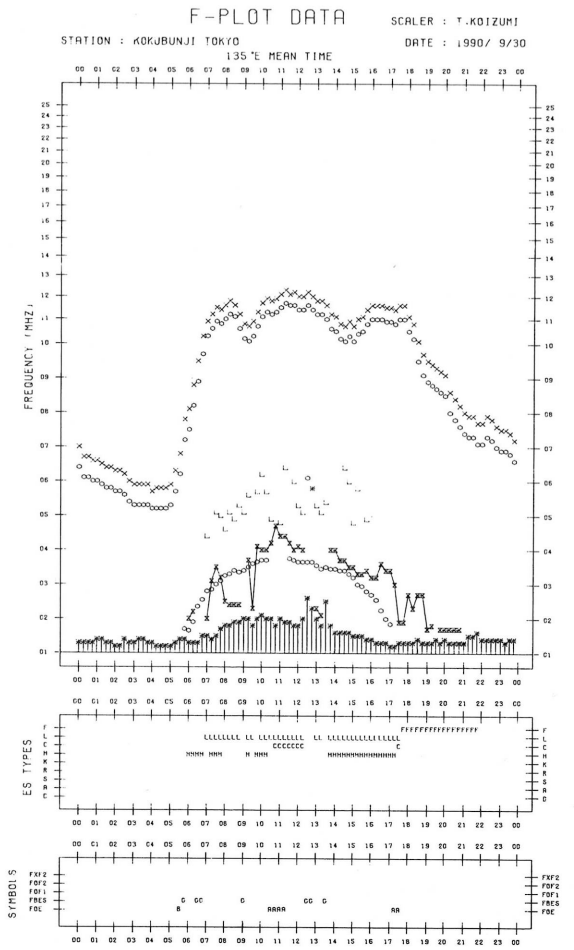

F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/25
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/27
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/26
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/28
135°E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FBES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/29
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FOES
FOE


F-PLOT DATA
SCALER : T.KOIZUMI
STATION : KOKUBUNJI TOKYO
DATE : 1990/ 9/30
135 °E MEAN TIME
FREQUENCY (MHZ)
ES TYPES
SYMBOLS
FXF2
FOF2
FOF1
FOES
FOE

B.Solar Radio Emission

B1.Daily Data at Hiraiso

200 MHz

Hiraiso — September 1990

Single-frequency total flux observations at 200 MHz

	FLUX DENSITY: $10^{-22}Wm^{-2}Hz^{-1}$					VARIABILITY: 0 TO 3				
UT	00-03	03-06	06-09	21-24	DAY	00-03	03-06	06-09	21-24	DAY
DATE										
1	11	10	10	12	11	0	0	0	1	0
2	B	B	B	13	B	2	3	3	3	2
3	12	*	*	10	12	*	*	*	0	*
4	10	10	10	10	10	0	0	0	0	0
5	11	11	11	10	11	1	1	1	1	1
6	10	11	10	10	10	0	1	1	0	1
7	11	10	10	10	12	1	*	1	0	1
8	10	9	9	10	9	*	*	0	0	0
9	9	9	9	9	9	0	*	0	0	0
10	9	9	10	10	9	0	*	0	0	0
11	(9)	9	9	10	9	(0)	0	0	0	0
12	9	10	10	10	10	1	1	0	1	0
13	9	9	9	11	9	0	*	*	0	*
14	10	11	(10)	9	10	1	2	0	1	1
15	10	*	9	9	9	*	*	0	0	*
16	8	9	9	9	9	0	0	0	0	0
17	9	9	9	8	9	0	0	0	0	0
18	8	*	(9)	9	8	0	*	*	0	0
19	8	9	9	-	9	0	0	*	-	0
20	(9)	10	(10)	10	10	*	1	*	*	*
21	9	10	10	10	10	0	1	0	0	0
22	10	10	10	8	10	0	0	0	0	0
23	*	9	9	9	9	*	0	0	0	0
24	9	9	9	9	9	0	0	0	2	0
25	9	8	(8)	8	8	1	0	*	*	1
26	(9)	8	*	*	8	*	*	*	*	*
27	*	*	*	9	*	*	*	*	0	*
28	9	9	9	9	9	0	*	*	0	0
29	8	8	-	-	9	0	0	-	-	0
30	-	-	-	-	-	-	-	-	-	-

Note: No observations during the following periods.

29th 0515 - 30th 2400

B.Solar Radio Emission

B1.Daily Data at Hiraiso

500 MHz

Hiraiso September 1990

Single-frequency total flux observations at 500 MHz					
FLUX DENSITY: $10^{-22}Wm^{-2}Hz^{-1}$					
UT	00-03	03-06	06-09	21-24	DAY
DATE					
1	49	49	48	-	49
2	47	46	44	-	45
3	49	48	48	-	48
4	48	47	47	48	47
5	48	49	48	47	48
6	47	49	49	47	48
7	47	47	48	-	47
8	46	46	45	-	45
9	49	47	48	-	48
10	48	48	48	48	48
11	48	48	48	-	48
12	51	54	53	53	52
13	53	56	54	50	54
14	49	50	(48)	54	49
15	54	53	52	-	53
16	52	51	50	51	51
17	51	51	51	50	51
18	50	50	49	-	50
19	50	49	50	-	50
20	52	-	51	-	51
21	52	52	52	-	52
22	54	53	52	-	53
23	53	52	50	-	51
24	50	51	50	49	50
25	51	49	48	-	49
26	48	47	46	48	47
27	48	47	46	46	47
28	46	46	45	45	46
29	46	46	-	-	46
30	-	-	-	-	-

Note: No observations during the following periods:

1st 2005 - 2nd 0020. 2nd 2005 - 2350. 3rd 2005 - 2345.
7th 2011 - 8th 0006. 8th 2012 - 2357. 9th 2013 - 2345.
11th 2011 - 2352. 15th 2020 - 16th 0030. 18th 2020 - 2345.
19th 2020 - 2400. 20th 2020 - 2345. 21st 2024 - 2400.
22nd 2020 - 23rd 0010. 23rd 2025 - 24th 0015. 25th 2025 - 2345.
29th 0520 - 30th 2400.

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso September 1990

Single-frequency observations

Normal observing period: 2025 - 0845 U.T. (sunrise to sunset)

SEP 1990	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	43 NS	2300	0356	600D	15	5	MR
2	200	46 C	0040.5	0040.9	1.0	84	-	SR
	100	42 SER	0607.9	-	11.9	1000D	-	-
	200	41 F	2046	2122	132	73	-	MR
3	500	41 F	0142.4	0143.4	2.0	24	-	0
	500	4 S/F	0712.5	0712.7	1.2	17	-	WR
4	500	42 SER	0538.3	0540.2	7.5	14	-	0
	200	45 C	0539.3	0539.7	1.1	140	-	0
5	200	8 S	0400.5	0400.7	1.0	62	-	0
	500	27 RF	0420	0450	100	5	3	0
	500	46 C	2300.5	2304.0	5.5	28	-	0
6	500	46 C	2114.9	2140.6	30.5	17	4	0
				2126.3		8		0
	200	46 C	2123.1	2140.3	34	98	11	0
				2124.8		12		0
	100	46 C	2127.0	2135.3	9.2	145	-	-
7	100	48 C	0525.1	-	33.7	1000D	130D	-
	200	46 C	0525.4	0540.9	74.5	160	25	MR
				0554.8		140		MR
	500	46 C	0525.5	0549.8	42.5	102	17	MR
				0526.5		54		WR
	200	46 C	2216.0	2220.6	6.6	37	-	0
	200	27 RF	2226.7	2243.5	41.0	10	-	0
	100	27 RF	2236.0	2256.8	43.0	60	17	-
8	200	42 SER	0300.0	0307.3	9.2	93	-	0
9	500	41 F	0016.5	0018.5	26.5	6	-	0
	500	46 C	0043.5	0059.0	34	52	7	0
	500	4 S/F	0638.2	0639.5	3.0	13	-	0
12	500	4 S/F	0054.5	0100.3	9.0	6	-	0
13	500	27 RF	0226.0	0240.0	47.5	6	2	0
	200	8 S	2200.0	2200.3	0.7	150	-	0
14	500	46 C	0410.0	0413.0	10.3	40	11	0
	200	46 C	0410.4	0414.5	11.9	140	21	WL
	100	48 C	0413.7	0414.9	12.5	3800	790	WL
	100	8 S	2211.9	-	1.0	1000D	-	-
14	200	8 S	2212.1	2212.3	0.7	1600	-	0
15	200	48 C	0427.7	0428.1	2.2	10000	1600	0
	500	46 C	0428.0	0428.6	2.6	24	-	WR
17	100	42 SER	0311.9	-	5.9	1000D	-	-
	500	42 SER	0312.5	0341.5	4.0	158	-	0
	500	41 F	0547.0	0550.0	10.0	430	-	SL
	100	41 F	0550.1	0552.1	5.3	970	-	-
	200	48 C	2152.5	2152.8	1.6	52000	-	WL
	500	46 C	2152.5	2153.5	7.5	2300	145	WL
	100	46 C	2153.0	-	1.5	1000D	-	-
22	500	41 F	0233.4	0238.0	7.0	5	-	0
	500	46 C	0250.0	0306.7	53	37	6	WL
	200	46 C	0302.9	0309.9	20.5	46	-	0
23	200	46 C	2230.4	2230.8	31.7	73	8	0
				2241.3		25		0
	100	42 SER	2230.6	2231.0	22.4	2100	-	0
24	100	42 SER	0430.5	0434.5	5.0	3200	-	0
	200	8 S	0434.3	0434.3	0.8	120	-	0
25	500	42 SER	0222.5	0227.6	26	91	-	0
	200	8 S	0530.4	0530.5	0.9	110	-	0
27	500	41 F	2041.0	2042.0	1.0	154	-	WL
29	500	46 C	0405.7	0406.4	3.8	31	9	0

C. RADIO PROPAGATION

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

SEP 1990 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

C. RADIO PROPAGATION

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

SEP 1990 FREQUENCY 15 MHZ BANDWIDTH 30 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	-14	-1	-4	5	11	15	24	24	32	26	24	24	9	-4	ES -23	11	25	5	ES -23	4	4	4	-11	ES -23
2	ES -23	-11	-11	5	12	18	22	23	25	27	25	25	29	19	9	-8	12	15	5	13	12	0	-11	ES -23
3	ES -23	-11	-3	2	13	14	20	31	30	26	35	20	28	20	15	-8	15	31	24	11	5	0	-11	ES -23
4	ES -23	-5	5	5	13	20	25	29	31	30	26	29	15	19	20	-11	20	20	ES -23	8	10	-5	-3	-11
5	ES -23	-11	0	5	-14	20	22	21	19	24	18	19	25	20	22	15	-11	12	16	12	0	0	-11	-11
6	-11	0	0	10	20	20	25	29	22	22	23	21	22	29	12	-10	7	25	ES -23	8	12	ES -23	ES -23	ES -23
7	ES -23	ES -23	-11	7	13	15	28	23	26	28	26	20	18	25	-11	ES -23	ES -23	15	19	5	8	2	0	ES -23
8	ES -23	-8	-11	5	20	23	25	24	28	25	27	29	25	27	22	5	0	13	ES -23	6	9	2	-5	-4
9	ES -23	-2	-4	3	17	17	25	26	25	27	25	26	26	26	28	16	16	21	14	14	14	1	-10	-10
10	ES -23	-11	5	10	18	23	25	26	27	25	26	21	20	5	-11	ES -23	ES -23	18	18	6	5	-5	-5	ES -23
11	3	-5	-4	0	12	24	28	24	25	27	30	23	14	4	ES -23	ES -23	11	24	ES -23	-4	-8	-5	-11	ES -23
12	ES -23	ES -23	-5	5	15	19	25	25	28	25	27	11	8	8	-10	ES -23	ES -23	ES -23	ES -23	2	2	-3	-4	-11
13	-14	-11	-1	7	14	19	22	26	27	20	18	18	10	18	ES -23	ES -23	ES -23	12	ES -23	-3	-4	-4	-5	ES -23
14	ES -23	-11	4	4	10	20	25	22	29	26	19	-4	-4	6	-11	ES -23	ES -23	7	ES -23	8	1	-11	-11	ES -23
15	ES -23	4	-4	8	14	23	24	26	25	20	22	14	4	ES -23	ES -23	ES -23	ES -23	22	14	7	7	-10	ES -23	ES -23
16	ES -23	-2	0	12	15	24	29	24	27	24	28	27	8	14	-14	ES -23	ES -23	22	13	-2	5	-3	ES -23	ES -23
17	ES -23	1	-4	8	13	20	20	30	24	25	31	24	8	ES -22	ES -22	ES -22	ES -22	23	ES -22	1	2	-1	ES -22	ES -22
18	ES -23	ES -23	3	5	12	22	18	20	25	31	25	ES -23	ES -23	ES -23	-11	ES -23	ES -23	ES -23	ES -23	11	6	0	-11	ES -23
19	ES -23	-2	-4	13	11	19	21	30	15	27	27	15	ES -23	ES -23	ES -23	ES -23	ES -23	12	ES -23	5	3	ES 3	-4	-5
20	ES -23	-5	-1	5	13	16	27	29	28	29	23	ES -23	-5	ES -23	ES -23	ES -23	ES -23	18	ES -23	14	0	0	-8	ES -23
21	ES -22	-4	3	8	20	21	25	26	20	28	12	21	11	-1	ES -23	ES -23	ES -23	19	22	8	5	5	-3	3
22	-10	-10	5	1	16	20	28	31	25	23	21	18	11	17	-5	ES -23	-3	22	ES -23	5	5	-1	-1	ES -23
23	ES -23	ES -23	0	5	13	21	23	20	27	25	21	23	19	21	-10	ES -22	ES -22	ES -22	4	6	6	-2	ES -22	ES -22
24	-8	-10	-11	6	19	19	28	30	25	27	23	25	5	25	26	ES -23	0	17	3	5	3	3	ES -23	ES -23
25	ES -22	-2	-10	6	14	24	21	21	14	21	22	30	10	-2	11	ES -22	ES -22	16	16	9	3	4	-2	-7
26	-10	-3	3	10	14	18	27	26	26	19	2	14	-2	-3	-3	3	8	15	14	12	5	5	2	ES 0
27	ES 1	2	6	12	19	20	28	19	19	22	18	17	2	12	ES -23	5	22	30	22	6	10	8	2	-11
28	-11	2	5	13	25	22	19	21	30	19	14	13	-3	-11	-11	ES -23	ES -23	25	-10	8	13	10	-3	-3
29	5	-3	5	17	23	23	23	17	20	22	21	20	20	ES -23	ES -23	ES -23	ES -23	20	15	5	8	3	-10	-3
30	1	5	6	19	19	24	25	31	31	27	22	25	-4	-11	ES -8	ES -23	ES -23	16	22	11	6	9	5	7
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	ES -23	-5	0	6	14	20	25	26	26	25	23	20	10	7	US -11	ES -23	US -22	18	4	6	5	US 0	-9	ES -22
UD	1	2	5	13	20	24	28	31	31	29	30	29	26	26	22	11	20	25	22	13	12	8	2	ES 0
LD	ES -23	ES -23	-11	2	11	15	20	20	19	20	14	-4	-5	ES -23	ES -23	ES -23	ES -23	ES -22	ES -23	-2	0	ES -10	ES -23	ES -23

C. Radio Propagation

C2. Radio Propagation Quality Figures at Hiraiso

Hiraiso

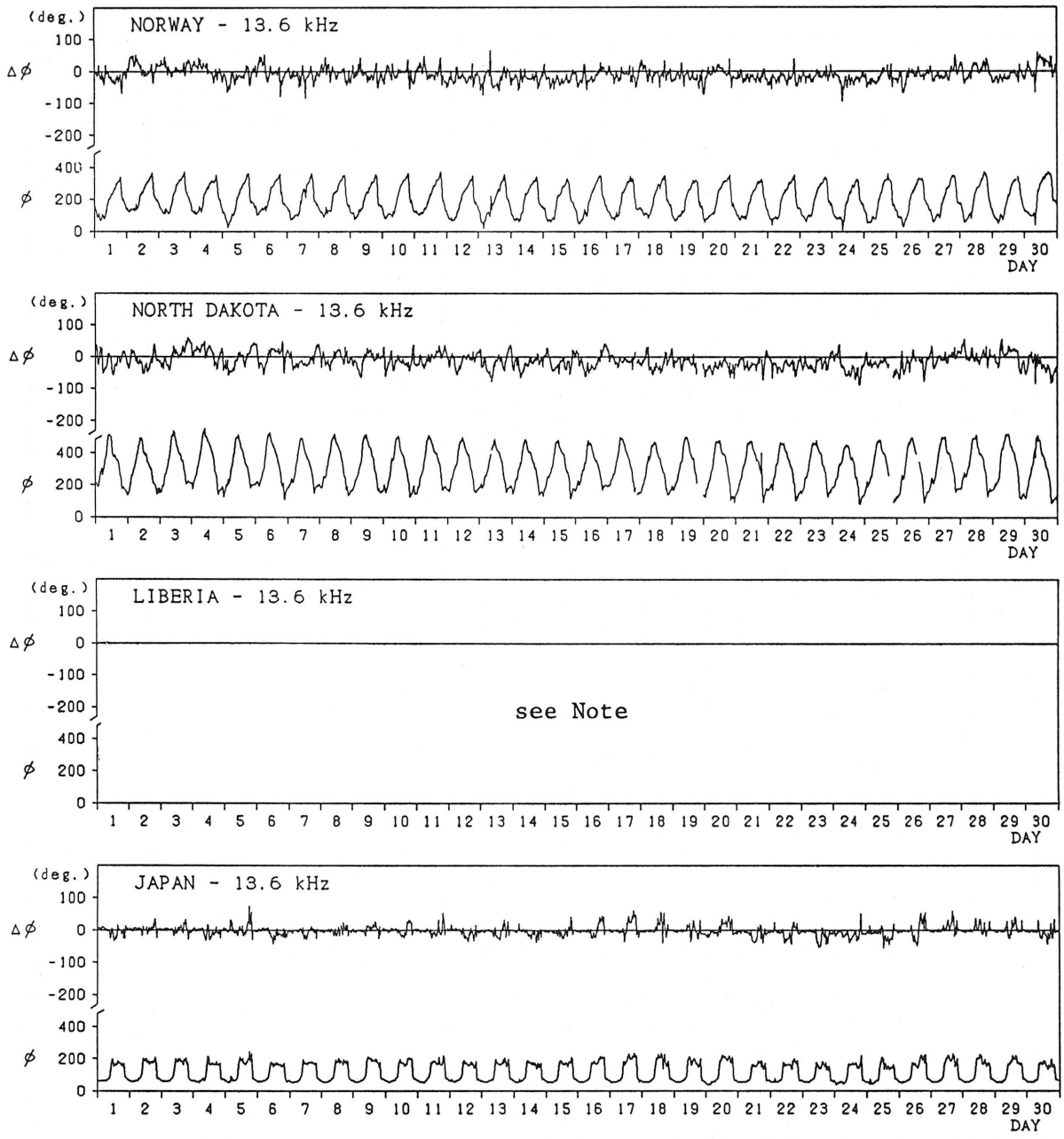
Time in U.T

Sep. 1990	Whole Day Figure	W W V 00|06 06|12 12|18 18|24	W W V H 00|06 06|12 12|18 18|24	Conditions 00|06 06|12 12|18 18|24	Principal Geomagnetic Storms Start h m	End h	Range nT
1	4o	4 5U 4 S	4 4 3 3	N N N N			
2	4o	4 S 4 S	4 4 5 4	N N N N			
3	4o	4 5U 4 4U	3 4 5 4	N N N N			
4	4o	4 5U 4 S	4 4 4 4	N N N N			
5	4o	2U S 4 5U	3 4 5 4	N N N N			
6	4o	4 S 4 5U	4 4 4 3U	N N N N			
7	4+	4 5U 5 5U	3 4 4 4	N N N N			
8	4o	4 S 4 S	4 4 4 4	N N N N			
9	4+	4 S 4 S	4 4 5 5	N N N N			
10	4+	4 5U 4 5U	4 4 4 4	N N N N			
11	4o	4 5U 3U 4U	4 4 4 3	N N N N	NONE		
12	3+	4 S 3U 5U	3 4 3U 4	N N N N			
13	4-	4 S 2U S	4 4 4U 4	N N N N			
14	3+	3 S 2U S	4 4 4 4	N N N N			
15	4-	4 S 3 S	4 4 3U 4	N N N N			
16	4o	5 S 3U 4U	4 4 4 4	N N N N			
17	4-	4 5U 3U 4U	4 4 3U 3U	N N N N			
18	3+	4 3U 4 4U	3 3 2U 3	N N N N			
19	3+	3U S 3U 4U	4 3 2U 4U	N N N N			
20	4-	5 5U 4 S	4 3 2U 3	N N N N			
21	4o	4 5U 3U S	4 4 4 5	N N N N			
22	4-	3U 4U 3U 4U	4 4 4 4	N N N N			
23	4-	3 3U 4 4U	4 4 4 4	N N N N			
24	4o	4 4U 4 4U	4 4 4 4	N N N N			
25	4+	4 4U 5 4U	4 4 4 5	N N N N			
26	4+	4 5U 4 5U	4 3 4 5	N N N N			
27	4+	4 5U 4 5U	4 3 4 5	N N N N			
28	4o	4 S 4 5U	4 3 3 5	N N N N			
29	4o	4 S 4 5U	4 4 4U 4	N N N N			
30	4o	4 3U 3U 5U	5 4 4 4	N N N N			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo

Inubo September 1990



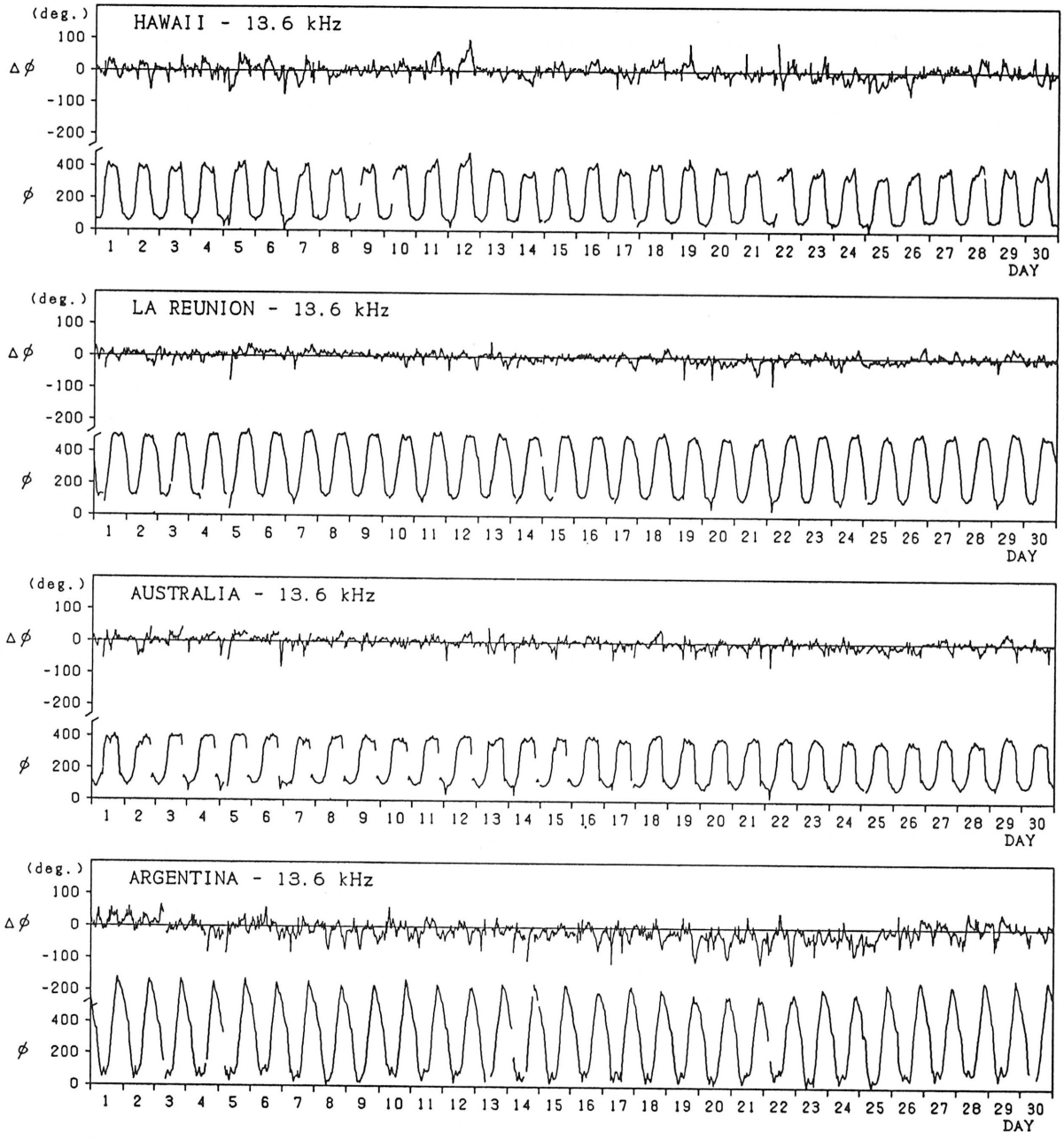
Note: As for LIBERIA - 13.6 kHz, no record during July 09 - September 30, due to the maintenance of transmitter.

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

NONE

Inubo

September 1990



C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso — Time in U.T.

Sep. 1990	S W F								Correspondence	
	Drop-out Intensities (dB)					Start	Duration	Type	Imp.	Solar Flare	Solar Noise
	CO	HA	1)	2)	3)						
1		x	15/10	x	15	0705	25	SL	1	x	x
2					17	0141	21	SL	1-	x	x
3						0943	36	S	1	x	
4			19/19	x	6	0042	17	SL	1+	x	
5				x	x	0023	26	SL	1+		x
5	27	36	33	17		0401	69	G	3-	x	
7			x	10	9	0527	21	SL	1-	x	x
11			7	x	x	0525	21	SL	1-	x	
12		x	20	x	x	0100	25	SL	2-	x	x
14	30	23	25	x	x	0411	31	SL	2	x	x
17			14	x	8	0550	8	SL	1		
17		x	26		7	2153	10	S	2	x	x
19					12	0903	6	SL	1-	x	
20			11			0618	32	SL	1-	x	
22			14	x		0300	45	SL	1	x	x
23					11	1305	16	SL	1-		
25	32	32	29/16	x		0219	22	SL	2+		x
29						0406	24	S	1+	x	x

NOTES CO: Colorado(WWV) HA: Hawaii(WWVH) 1): Australia 2): Moscow 3): London

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Sep. 1990	S P A								
	Phase Advance (degrees)						Time (U.T.)		
Date	Ω/N	Ω/L	Ω/LR	NWC	Ω/H	Ω/ND	Start	End	Maximum
1		—	19	19	5		0310	0329D	0316
1		—	38	31	11		0329E	0415	0341
1	52	—	188	101	13		0700	0908	0713
1		—			12		2221	2313	2234
1	21	—			9	25	2353	0028	0002
2		—			6		0046	0116	0049
2		—		12	10		0142	0203	0147
2		—		10	8		2347	0011	2358
3		—		23	12		0218	0308	0223
3		—	14	5			0715	0734D	0728
3		—	24	8			0734E	0813	0749
3	27	—	116				0938	1144	0949
3		—			4		2351	0021	0003
4	24	—	33	—	47	38	0043	0158	0051
4		—	12	—			0507	0548	0526
4	41	—	110	40			0755	0943	0817
5	30	—	56	79	62	49	0025	0141D	0038
5	13	—	22	22	17		0141E	0221	0145
5	36	—	204	130	72	48	0357	0820	0440
5		—			8		2155	2239	2206
5		—		10	9		2332	0002	2341
6		—		—	5		0006	0042	0016
6		—	12				0646	0737	0659
6		—			90	123	2109	0002	2148
7	24	—		—	13	25	0203	0233	0210
7	18	—	62	47			0527	0716	0539
8		—		13	21	10	2215	2304	2224
10		—	12	—			0542	0620	0550
10		—	13	—			0914	0933	0920
11	13	—		—	5	13	0004	0026	0010

Inubo

Sep. 1990	S			P		A			
	Phase Advance (degrees)						Time (U.T.)		
Date	Ω/N	Ω/L	Ω/LR	NWC	Ω/H	Ω/ND	Start	End	Maximum
11	23	—	58	46	14		0523	0655	0541
11		—	9				1007	1031	1011
12	47	—	67	92	66	56*	0055	0302	0110
13		—		8	8		0028	0052	0034
13		—		14	4		0157	0248	0211
14		—		6	4		0056	0108	0059
14	33	—	111	79	33	21	0409	0623	0423
14		—	12				0956	1018	1000
14		—			33		2004	2124	2015
14		—			7		2236	2300	2240
15		—	12	12			0553	0620	0603
15		—	57	15			0750	0807D	0756
15		—	89	43			0807E	0940	0819
17		—	13	—	6		0312	0333	0318
17	28	—	105	—	26		0550	0711	0557
17		—	21				0728	0922	0747
17		—			20		1845	1916	1855
17	45*	—	17	43	104	107	2153	2336	2200
18		—	7	10	4		0249	0313	0258
18		—	22				0935	1039	0939
18		—			9		2027	2104	2036
18		—			10		2206	2250	2210
18		—		6	6		2327	0008	2335
19		—		11	6		0039	0106	0044
19		—	11	10	7		0236	0257	0240
19		—	130	22			0902	1034	0910
20		—		14	9		0050	0125	0056
20		—	46	27			0621	0716	0628
21		—	6	7			0304	0327	0310
21		—	9	7			0406	0439	0415
21		—	13	12			0528	0636	0558
22	36	—	104	78	37	47	0252	0530	0318
23	18	—		18	13	21	0023	0133	0042
23		—	18	18			0323	0402	0334
23		—	12	8			0601	0633	0610
23		—	24				0708	0808	0725
23	24	—	14	30	49	31	2232	2344	2243
24		—		26	14		0051	0146D	0105
24		—	14	16	14		0146E	0227D	0157
24		—	29	31	22		0227E	0337	0234
24		—	31	20			0517	0612D	0537
24		—	38				0612E	0730	0642
24		—	22				0812	0857	0815
24		—		—	12		2217	2311	2222
25	38	—	117	93	66	46	0222	0354	0230
25		—	16				0902	0922	0910
25		—	15				1035	1107	1040
29	14	—	86	67	23	28	0404	0528	0412
29	26	—		8	9		2255	2344	2312
30		—	10	10		22	0623	0653	0631
30		—	11	9			0646E	0709	0652
30		—	100	29			0738	0908	0752

IONOSPHERIC DATA IN JAPAN FOR SEPTEMBER 1990
F-501 Vol.42 No.9 (Not for Sale)

電離層月報 (1990年9月)
第42巻 第9号 (非売品)
1990年12月20日 印刷
1990年12月25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
☎ (0423) (21) 1211(代)

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