ISSN 0021—0382

F—577

IONOSPHERIC DATA IN JAPAN

FOR JANUARY 1997

VOL. 49 NO. 1

CONTENTS

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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)
Kokubunji	35°42.4′N	139°29.3′E	25.5°N	205.8°	Vertical Sounding (I)
Yamagawa	31°12.1′N	130°37.1′E	20.4°N	198.3°	Vertical Sounding (I)
Okinawa	26°16.9′N	127°48.4′E	15.3°N	196.0°	Vertical Sounding (I)
Hiraiso	36°22.0′N	140°37.5′E	26.3°N	206.8°	Radio Receiving (S,P)
Inubo	35°42.2′N	140°51.5′E	25.6°N	207.0°	Radio Receiving (P)

A. IONOSPHERE

Ionospheic observations are carried out at the above four stations in Japan by means of vertical sounding using ionosondes.The ionosonde produces ionograms,which are recorded digitally on computer storage medium as well as graphically on 35 mm photographic film. The digitally-recorded ionograms are collected from each station by the central computer and reduced to numerical values and Summary Plots by the automatic processing system. The ionograms obtained at Kokubunji are manually scaled as well by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

Digital ionograms are automatically scaled by the pattern recognition method. The following five factors of ionospheric characteristics are published for the present. The reliability of these factors has been ascertained by comparison of the automatically-scaled parameters with the manually-scaled values of large amounts of test ionograms.

The published data consist of tabulations of hourly values of three factors (*foF2, fEs, fmin*) and monthly medians of two factors (*h′Es, h′F*) , daily Summary Plots and monthly medians plot of *foF2.*

a. Characteristics of Ionosphere

foF2	Ordinary wave critical frequency for the *F2* layer
fEs	Highest frequency of the *Es* layer whether it may be ordinary or extraordinary
fmin	Lowest frequency which shows vertical ionospheric reflections
h′Es *h′F*	Minimum virtual height on the ordinary wave for the *Es* and *F* layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

A Impossible measurement because of the presence of a lower thin layer,for example *Es* (for *foF2*).

B Impossible measurement because of absorption in the vicinity of *fmin.*

C Impossible measurement because of any failure in observation.

G Impossible automatic scaling because of too small ionization density of the layer (for *fEs*).

N Impossible automatic scaling because of complex echoes.

Blank No digital record because of trouble in the automatic data processing system, but existence of film record.

c. Definitions of the CNT,MED,UQ and LQ

Median count (CNT) is the number of numerical values from which the median has been computed. In addition to numerical values, the count may include a descriptivel etter G.

Median (MED) is defined as the middle value when the numerical values are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

Upper quartile (UQ) is the median value of the upper half of the values when they are ranked according to magnitude; the *lower quartile* (LQ) is the median value of the lower half.

If CNT is less than 10, there are blank spaces left.

d. Reliability of Automatic Scaling

The results of the comparison between automatically-scaled values and manually-scaled ones showed that hourly values of *foF2* , *fEs* and *fmin* were scaled within a difference of 1 MHz from about 90 , 90 and 99% , respectively of the test ionograms.

e. Summary Plot

Daily Summary Plots which are made from quarter-hourly digital ionograms are published to present general ionosphere conditions. The upper and middle parts of a Summary Plot show the diurnal variation of the frequency range of the echoes reflected from the *F* and *E* regions, respectively. The two solid arcing lines indicate the predicted values of *fxE* and *foE* calculated by the method described in the CCIR report 340. The lower part shows the diurnal variation of the virtual height where the echo traces become horizontal.

A2. Manual Scaling

The published data consist of tabulations of hourly values of the ionospheric characteristics and figures of daily *f*-plot.

All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction (Second Edition) 1972 " and its revision of chapters I-4, published in July 1978.

a. Characteristics of Ionosphere

fxI	Top frequency of spread *F* trace
foF2 *foF1* *foE* *foEs*	Ordinary wave critical frequency for the *F2,F1, E* and *Es* including particle *E* layers, respectively
fbEs	Blanketing frequency of the *Es* layer, e.g. the lowest ordinary wave frequency visible through *Es*
fmin	Lowest frequency which shows vertical ionospheric reflections
M(3000)F2 *M(3000)F1*	Maximum usable frequency factor for a path of 3000 km for transmisson by *F2* and *F1* layers, respectively
h′F2 *h′F* *h′E* *h′Es*	Minimum virtual height on the ordinary wave for the *F2,* whole *F, E* and *Es* layers,respectively
Types of *Es*	See below b.(iii)

b. Symbols

(i) Descriptive Letters

The following 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 normnal *E* trace. (Usually a daytime type.)

q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.

r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.

a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.

s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.

d A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin*.

n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.

k The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

c. Definitions of the CNT, MED, UQ and LQ

Median count (CND) is the number of values from which the median has been computed. In addition to numerical values, the count may include certain descriptive letters.

Median (MED) is the middle value when the numerical values are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

Upper quartile (UQ) is the median value of the upper half of the values when they are ranked according to magnitude; *the lower quartile* (LQ) is the median value of the lower half.

B. SOLAR RADIO EMISSION

Solar radio observations at 200, 500 and 2800 MHz are carried out at Hiraiso. The observation equipment consists of three parabolic antennas, one with 10-meter diameter for 200 MHz measurements, one with 6-meter diameter for 500 MHz measurements and one with 2-meter diameter for 2800 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 are tabulated for 500 MHz measurements. The intensities are expressed by the flux density in 10^{-22} Wm^{-2} Hz^{-1} unit.

The following symbols are used in the tables, when interference or radio bursts prevented measuring the base-level flux densities or determining the variability indices:

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

Daily data within parentheses mean that the observation time does not exceed one third of the period.

B2. Outstanding Occurrences at Hiraiso

The table is a list of outstanding occurrences of solar radio emission bursts observed at 200, 500 and 2800 MHz during a month.

Listed in the table are the date, frequencies, the type of event, the start time and the time of maximum, both in U.T. expressed in hours, minutes and tenths of a minute, the duration in minutes, the peak and mean flux densities in 10^{-22} $Wm^{-2}Hz^{-1}$ unit, and the polarization.

The type of event is expressed by a combination of a numerical code and a letter symbol in accordance with the " Descriptive Text of Solar Geophysical Data, NOAA " as defined by H. Tanaka in the " Instruction Manual for Monthly Report of Solar Radio Emission, WDC-C2 " in January 1975:

SGD Code	Letter Symbol	Morphological Classification
1	S	Simple 1
2	S/F	Simple 1F
3	S	Simple 2
4	S/F	Simple 2F
5	S	Simple
6	S	Minor
7	C	Minor+
8	S	Spike
20	GRF	Simple 3
21	GRF	Simple 3A
22	GRF	Simple 3F
23	GRF	Simple 3AF
24	R	Rise
25	R	Rise A
26	FAL	Fall
27	RF	Rise and Fall
28	PRE	Precursor
29	PBI	Post Burst Increase
30	PBI	Post Burst Increase A
31	ABS	Post Burst Decrease
32	ABS	Absorption
40	F	Fluctuations
41	F	Group of Bursts
42	SER	Series of Bursts
43	NS	Onset of Noise Storm
44	NS	Noise Storm in progress
45	C	Complex
46	C	Complex F
47	GB	Great Burst
48	C	Major
49	GB	Major+

The polarization is expressed by the polarization degree and sense as follows:

R or L	right- or left-handed polarization,
W,M or S	weak,moderate or strong polarization,
0	almost zero or unable to detect polarization due to small increase of flux,
00	polarization degree of less than 1 percent.

One of the following symbols may be attached after numerical values, if necessary.

D	greater than, or later than,
E	less than or earlier than,
U	approximate, or uncertain.

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

The 10.7 cm solar radio flux at Hiraiso is plotted over a one month period. The 10.7 cm flux ($F_{10.7}$) is determined by adjusting the 10.7 cm radio flux measured at Hiraiso to the Pentincton 10.7 cm radio flux. The figure on the right-hand side shows the $F_{10.7}$ index estimated at Hiraiso.

The following symbols are used in the $F_{10.7}$ index:

*	Measurement made not at 3h U.T..
B	Measurement affected by bursts.

C. RADIO PROPAGATION

C1. H.F. Field Strength at Hiraiso

Field strength observation of 15 MHz standard waves transmitted from WWV and WWVH stations which are located respectively at Fort Collins, Colorado and Kauai, Hawaii, is carried out at Hiraiso. In order to avoid interference among the same frequency waves, the upper sideband of WWV or WWVH with the audio tone 600 Hz is picked up by the use of a narrow band-pass filter with 80 Hz bandwidth.Particulars of the transmitters and the receiver are summarized in the following table.

The tabulated *field strength* expressed in dB above one microvolt per meter is the average of quasi-peak values of the incident upper sideband field intensity for 45 seconds after the universal time indicated on the table. Abbreviated symbols are as follows:

CNT	number of observed values,
MED	median,
UD	value of the uppermost decile when they are ranked according to magnitude,
LD	value of the lowest decile when they are ranked according to magnitude,
U	uncertain,
E	less than,
C	innuenced by, or impossible because of, any artificial accident,
S	influenced by, or impossible because of, interferences or atmospherics.

C2. Radio Propagation Quality Figures at Hiraiso

The tabulated six-hourly quality figures are calculated for standard waves WWV transmitted from Fort Collins and WWVH transmitted from Kauai.

Quality figures expressing radio propagation conditions range over five grades as follows:

1	very poor(very disturbed),
2	poor(disturbed),
3	rather poor(unstable),
4	normal,
5	good.

Whole day quality figure ranged in grades of 1o, 1+, 2-, 2o, 2+, 3-, 3o, 3+, 4-, 4o, 4+, 5-, 5o stands for an average of six-hourly quality figures of the two circuits. Abbreviated symbols are as follows:

C	artificial accident,
S	propagational accident,
U	inaccurate.

Characteristics	Transmitter		Receiver
Station Call	WWV	WWVH	
Location	Fort Collins, Colorado	Kauai, Hawaii	Hiraiso, Ibaraki
latitude	40°41´N	22°00´N	36°22´N
longitude	105°02´W	159°46´W	140°38´E
Distance	9150 km	5910 km	--
Carrier Power	10 kW	10 kW	--
Power in each sideband	625 W	625 W	--
Modulation	50 %	50 %	--
Antenna	/2 vertical	/2 vertical	4.5 m vertical rod
Bandwidth	--	--	80 Hz for upper sideband
Calibration	--	--	Every hour

The column of conditions presents a record of the forecast of *radio propagation conditions* which is applicable to forthcoming 12 hours and broadcast six times par hour from JJY (Japan Standard Wave) staion. The conditions are denoted as follows:

N normal,
U unstable,
W disturbed.

Data on *geomagnetic storms* which are often correlated with radio propagation disturbances are tabulated based on reports from observation at Kakioka Magnetic Observatory, Japan Meteorological Agency. *Time* (U.T.) is expressed in hours and minutes (or tenths of an hour) , and *range* in nanotesla. When they are uncertain quantitatively, / 's are used to replace the numerical values. Continuation of a geomagnetic storm is denoted by ---.

C3. Phase Variation in OMEGA Radio Waves at Inubo

The phase values of eight OMEGA radio signals as received at Inubo are depicted for an interval of one month, along with the phase deviation defined as a deviation from a value averaged over the six quietest day within the month. Particulars of the received signals are given in the table below.

In each of the four panels of the figure, the phase (ϕ) is shown in the lower part and the phase deviation ($\Delta\ \phi$) is shown in the upper part. The phase data are sampled every 30 min, so the curves of the phase and phase deviation are composed of 48 data points per day. The phase delay is measured as a positive value.

The polar cap phase anomaly (PCPA) caused by the solar protons are well detected on the Norway signal. The start, end and maximum times of the PCPA are listed in the table next to the figure, where the times are expressed as day / hour & minute in U.T.. The maximum phase deviation in the list is defined as a phase advance (negative values in the figure) in degrees.

C4. Sudden Ionospheric Disturbances

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

The table of short wave fade-out (SWF) is prepared from the record of field intensities measured at Hiraiso.

Drop-out intensities of the 10 MHz, the 20 MHz. and the 25 MHz waves are respectively distinguished by marks ´, ´´, and ´´´ from those of the 15 MHz wave for WWV and WWVH. Values of *start, duration, type,* and *importance* are obtained from data of the circuit whose drop-out intensity in dB is underlined as xx. When these quantities could not be determined accurately, they are accompanied by one of the following symbols.

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

Types of fade-out are as follows:

S sudden drop-out and gradual recovery,
SL slow drop-out taking 5 to 15 minutes and gradual recovery,
G gradual and irregular in both drop-out and recovery.

Importance of fade-out is scaled according to its amplitude into nine ascending grades as 1-, 1, 1+, 2-, 2, 2+, 3-, 3, 3+.

Correspondence of solar optical and X-ray flares, and solar radio burst to SWF is marked by X, being determined with data from interchange messages of IUWDS and observations at Hiraiso.

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

b. Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

Transmitting Stations

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

JAN. 1997

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	A	31	29	35	B			32	31	A	53			55		N	32	24	26	29	B	N	35	35
2		N	26	32	A	34		30	40	56	56	74	80		60	69		35	35	35	35	40		36
3	A	A	29	28	29	32	N		41	48		65	60	57	52	60		B	28	38	35	35	34	
4		29	28	33	31	35	29	35	40	57	55	A	57	59	A	30				35	35		A	25
5	30	A	29	29	28	31	N	35	34	58	57	66		44		46	42	A	N	28		31	A	33
6	30	28			28	28	22		37	49	58	61	52	55	61	51		34	29	28	29	28	A	31
7	37	35	37		34	32	31	35			55	58	54	61			57			A	A	30	28	35
8	30	34	35	25	32	33			57	61	56	56	58	54	57	51	A	A	35	29	35	36	28	35
9	28	34	35	31	31	36			44	52	57	58	66		49	52	40			29	35	29	32	35
10	35	30	35	34	26	37	23	23	45	38	40		55		40			29	A	26	35	35	35	30
11	31	38	29	A	A	28	N	A	55	67	66	73	70	63	60	57		40	A	24	A	A	A	30
12	32	35	32	29	30	29	A	36		56	57	55	57	60	59	60			35	A	A	A	A	N
13	A	A	A	29	31	A	24	A	44		58	55	52	58	58	54	49	B	26	B	A	25	35	A
14	25	25	28	28	28	29	N		69	66	56	58	59	56	56	60	50	35		35	35	28	35	25
15		34	35	32	32	31	26	32		70		57	58	57	56	57			A	35	35	35		38
16	35	34	34	32	30	31			58	60	60	55	56	56	58	58	53	38	A	A	N	N	35	35
17	35	36	35	26	26	32	N	35	47	40	60	61	62	A		56	40	29	31	25	37	35	29	35
18	40	35	36	41	42		36	41	55	54	63	60	59	A	62	56	A	N	28	28	28	26		36
19	35	31	38	34	32	35	35	35	57	58	58	54	57	48	56	59		28	38		59		38	
20	35	32	38	30	30	34	N	30		56	56	A	59	55	57	A	32	36	31	30		32	37	36
21	26	32	37				23		60	57	58	71		52	57	58		38	A	40	32	29	28	34
22	35	31	31		38	38	34	35			62	67	64	A	56	59			35	A	35	40	41	34
23	36	38	37	28	34	28	N	30	47	A	58		63	57	62	A	32	A	A	48		A	30	35
24	35	28	29	28	A	A	A	A	25				56	52	57	57		A	35	A	A	28		29
25	35	35	34	34	35	38	29	31	31			51	51	54	51	55	53	A	N	28	26	N	35	35
26	38	34	35	32	28	35	35	30		58	55	60	50	54	58	60	52		A	38	30	34	28	32
27	28	29	29	36			28	35	57	54	52		N	59	58	62	58		30	57	44			38
28	38	41	35	39		44	35	36	N	50			61	70	68	71	67	A	A	27	40	38	46	43
29	40	38		56		35	29	37	55	58	66	66	68	65	67	58	57		37	49	56	51	48	57
30		51	50		38	35	40	46		57	54	A	50	58	60	51	47	35		37	34	38	38	36
31	36	38	29	26	26	29	N	32	33		61	66	64	A	54	55		A	29	A	A	A	A	29
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	27	28	25	23	25	16	21	23	23	26	22	27	24	26	26	16	12	16	23	20	21	20	27
MED	35	34	34	32	31	33	29	35	45	57	57	60	58	56	58	57	50	35	31	30	35	34	35	35
U Q	36	36	35	34	34	35	35	35	57	58	60	66	63	59	60	60	55	37	35	38	36	37	37	36
L Q	30	31	29	28	28	30	25	30	37	52	55	56	55	54	56	54	40	29	28	28	33	28	29	31

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT WAKKANAI

JAN. 1997

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	28	G	G	G	B	G	G	G		31	30	36	34	40		G		G	G	G	B	G	G	G
2	G	30	G	G		29	G		39	44	32	29	26		24	G	31	G	G	G	G	38	28	34
3	29	28	G	G	G	G	G		29	36		26	26	25	28	G	29	B	G	G	G	G	24	G
4		23	G	27	G	G	G	G		33	33	61	37	31	37	G	G		G	29	25	28	29	30
5	26	28	G	G	G	G	G	G		31	25	28	27	34	30	25	G	26	G	G	G	G	28	G
6	G	G	G	G	G	G	G	G	G		26	31	27	28	26	37	G	G	G	G		G		24
7	G	G	G		G	G	G	G	29	36	36	31	30	28	26	G	G	G		34	33	G	26	G
8	27	G		34	41	G	G	G		39	38	46	34	26	30	24	74		G	37		42		28
9	G	G	G	G	25	G	29	29	29	28	27	31	27	G	28	G	G	G		30	33	30	G	G
10	G	G	G	G	G	G	27	G	G		28	27	27	27	25	23	G	37	29	24	28	25	G	G
11	G	G	G	66		28	29		44	43	48	60		31	37	34	36	42		27	34	34	27	G
12	G	G	29	G	28	27		54		35	60	29	26	29	G		30	G	G	36	47	35		40
13		28	28	G	23	36	29	34	33	28	37	N	29	30	28	23	G	B	G	B	30	G	G	28
14	G	27	29	G	G	G	G	G	25	26	25	26	30	27	G	G	G	27	26	G	G	G	G	G
15	G		G	G	G	G	G	G		29	27	28	27	26	24	G	G	28	28	G	G	G	G	G
16	G	G	G	G	G	G	G	G	23	28	36	28	29	26	30	G	G	G	30		G	G	G	
17	27	G		G	G	G	G	G	35	29	30	28	32	25		G	26	G	G	G	G	G	G	
18	G		G	G	31	G	G	G	G	26	32	32	28	66	70	36	39	G	G	G	G	G	G	G
19	G	G	G	G	27	26	G	G	25	26	31	30	31	29	29	G	G	G	G	G	G	G	G	25
20	G	G	G	G	G	G	G	25	32	32		70	31	65	36		41	G	29	37	34	33	29	G
21	G	26	26	G	G	G		G	29	30	33	35	37	33	32	G	G	G	37	G		29	G	25
22	G	G		G	G	G	G	24	32	38	33	65	38	44	37		27	G	G		G	G	G	G
23	G	G	G	G	24	G	G	G	28	34	31	30	34	28	28	46	27	37	39	39		48	30	24
24		26	G	G	40		34		30	32	31	33	27	30	29	30	33			32	29	G	G	G
25	G	G	G	G	G	G	G	G			31	27	26		26	32	42	50		33	G	G	G	29
26	26	G	G	G	G	G	G	G	28		37	31	27	30	30	24	G	G	26	G			G	G
27	G	G	G	G	G	G	G	G	34	34	30	29	28	31	27	26		41	28	33	30	27		G
28	G	G	G	G	G	G	G	G		30	32	30	30	26	26	24	35	44	31	27	24	26	G	G
29	G	G		G	G	G	G	26	30	29	31	64	28	30	25	G	G	26	G	G	G	G	G	25
30		G	G	G	G	G	G	G		27	25	28	28	27	25	G	G	G	G	G	G	G	G	G
31	G	G	G	G	G	G	G	G	26	24	28	28	28	26	31	26	36	37	G	36	37	32	29	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	27	30	28	30	29	27	22	27	29	30	30	29	29	28	29	26	26	28	25	30	27	29
MED	G	G	G	G	G	G	G	G	29	31	31	30	28	29	28	12	G	G	G	12	G	G	G	G
U Q	G	24	G	G	23	G	G	G	32	35	34	35	31	31	30	26	34	37	28	33	31	30	27	26
L Q	G	G	G	G	G	G	G	G	25	28	28	28	27	26	25	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

JAN. 1997

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

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

HOURLY VALUES OF foF2 AT KOKUBUNJI

JAN. 1997

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	36	N	35	28	N	B	B	36		54	47	A	76	80	66	69			B	A	B	B	89	28
2	38	A	29	N	B	B	A	24	A	A	66	69	74	66	57	57	58			A	34			
3		A	A	N	26	32	N	35		69		57	59	55	66		62		A	35	A	A	A	69
4			A	59		29		48	48	48	50	61	66	60	52	51	A	A			N	35		
5	B	B	59		30			57	60		48	61	67		59	58		A	A	A	26		B	36
6	31	29	30	37	29	B	B	43	47	48	58		67		58	62					N	N	B	38
7	32		B	28	38	B	B	47			48		66	60	59		41	A		A	B	26		A
8	A	A	B		B	B	B	47		68				60	54	59		38		44		59	N	29
9	B	35		32	36	A	A	58	59		55	67		56	48	60		A	A		30	A	59	
10		B	35	38	38	B	B	47	57			58	64	60	50	54	54	42	40	38		36	A	A
11	47		59	N		B	B	57	57		66	70		66		66	51		42	35		36	A	A
12	A	59	49	B	B	A	A	45	58	57	67	67	62	56	60	69	52	42				A	A	A
13	B	36	35	34	36	B		40	46			78				60	48	A		35		35	36	46
14		25	30	32	26	B	29		57			82			59	58	57			32		B	B	26
15	A		34	31	31	N	N	46		68				50	58	57		40	38		37			56
16		59		35	30	34		64		68		86	58	58	48	59	56		A	41	B	B	B	
17		A				A	B	37		60			58	56	59	60	58	A	A	59	59	B	69	
18	49					B	B	44		58	58	62	64	A	48		67		A	59		A	N	B
19	59							56			60		58		42	54	60				40	30		
20	31					B		56		55	53	63	64		50	57	54		A	A	A	A	59	49
21			29	38		20	25						74	60	63	59	66		45		20		35	28
22		32	29					58	51		51	68	68	57	58	60	64		35		35	29		69
23		26			34		69			68	58	66	69	58	58			A		35		69	B	32
24	29	35	36		36		B	35		63	53		56	59	58				A	A		A	59	N
25	49	59		35	31		29	37	60	68	51	60	57	55					A	69	59	A	35	36
26		31	32	35	35	40	35		47		44	82	68		50	47		58	A	B	35	N	69	B
27	24	29	31		B	B	B	47		68	65		88		60	51	57	51	42	46	36		44	
28	A	A	A	35	34	32	N	44	57	61	68	68	60	60	68	68	58	A	A	A	37		A	A
29		35	34	28	B			48	38		69	68		61	60		57	A	40			36	36	41
30	34	35		44		23		48		51	58	67	60	64	56	63				59		44	36	
31		31	A	32	B	B	B	23	A	68		82	74	60	56					A	N		A	59
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	15	16	17	15			27	14	18	21	21	24	22	28	22	18			13	12	11	12	15
MED	35	35	34	35	34			47	57	62	58	67	65	60	58	59	57			41	36	36	52	38
U Q	48	36	35	37	36			56	58	68	65	74	68	60	59	62	60			59	38	44	64	56
L Q	31	29	30	31	30			37	47	55	50	61	59	56	51	57	54			35	32	30	36	29

HOURLY VALUES OF fEs AT KOKUBUNJI

JAN. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	B	B	G	G		40		44	43	47	40	32	G	B	26	B	B	G	G
2	G		G	G	B	B	59	29	55	59	48	35	40	34	38	36	30	G	G	35	30	G	G	G
3	29	30	28	25	G	G	G	G	28	32	30			29	30		26	28	25	G			55	32
4	31			29	G	G	G	G	30	34	44	49	34	36	34	34	48	41	G	G	G	G	G	
5	B	B	G	G	G	G	G	G	29	31	31	32	28	30	28		35	30	32	29	G	G	B	G
6	G	G	G	G	G	B	B	G		30	40	34	34	33	28	30	25	28	G	G	G	G	B	G
7	G	G	B	G	G	B	B	27	33		42	43	41	30	27		27	29	29	27	B	G	26	31
8	29	29	B	G	B	B	B	G		32	34	47	39	37	26	30	G	G	G	G	G	G	G	G
9	B	G	26	25	G	26	57	25	32	G	N	33	29	35	29	29	30	31	30	G	G	26	G	G
10	G	B	G	G	G	B	B	G	29	31	30	40	40	38	G	34	G	28	G	G	G	G	32	33
11	G	25	33	26	G	B	B	G	29	33	43	35		30		29	G	G	G	G	G		60	42
12	40	32	27	B	B	26		G	28	40	37	40	38	32	31	32	G		56	G	33	34	28	25
13	B	G	G	G	G	B	G	28	29	38	48	34		33	43	31	30	34	G	G	G	G	G	G
14	G	G	29	G	G	B	G	G	G	G	31	32	28	28	28	G	G	G	G	28	G	B	B	28
15	28	G	G	G	G	G	G	G	24	25	40	43	45	49	48	25		G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G		35	34	31	31	33	31	37	G		31	G	B	B	B	G
17	30	31		29	28	26	B	G	27	37	47	30	37	38	31	G	34	40	34	G	G	B	G	G
18	G	G	G	G	G	B	B	G		38	32	30	30	47	38	31	G		27	G	G	26	G	B
19	26	G	G	G	G	G	G	G	G	28	34	32	32		29	26	24	G	G	G	G	G	26	G
20	G	G	29	26	G	B	G			37	34	43	42	35		28	29	41	36		34	34	30	30
21	G		G			G	G	G		37	43	41	41	43	30	24	30	G	G	G	G	G	G	G
22	G	G	G	G	G	G	G		32		36	36	35	30	48	27	28	G	G	25	G	G	G	G
23	G	G	24	G	G	G	G	G		30	34	42	41	52	49	38	34	34	G	G		G	B	G
24	G	G			G	27	B	28			34	50	44	34	34	40	31	63	55	57	40	29	G	
25	G	G	G	G	G	G	G	G	G	28	27	29	38	28	41	31	52		49	29	30	30	32	
26	G	G	39	G	G	G	G		34	36	28	46	47	36	43	42	37	G	32	B	G	G	G	B
27	G	G	G	15	B	B	B	G		40	40	40	51	36	34	31	28	G	G	G	G	G	G	G
28	26	32		27	G	G	G	28	30	38	G	48	41	42	34	34	40	76	49	71	27	32		24
29	G	G	G	G	B	G	G	G		G	33	33	31	31	35		30	31	G	G	G	G	G	G
30	G	G	G	G		G	G	G	30	29		33	38	29	29	33	29	G	G	28	G	G	G	G
31		G	26	G	B	B	B	G	40	40	60	40	42	39	34	30	29	37	31	27	G	G		G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	26	25	28	23	18	19	28	21	27	29	29	28	30	29	27	30	27	30	29	26	25	24	26
MED	G	G	G	G	G	G	G	G	29	33	34	36	38	34	34	31	29	28	G	G	G	G	G	G
U Q	26	G	26	20	G	G	G	G	32	38	42	43	41	38	39	34	32	34	32	27	G	26	27	25
L Q	G	G	G	G	G	G	G	G	25	29	31	32	33	30	29	28	24	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

JAN. 1997

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

HOURLY VALUES OF foF2 AT YAMAGAWA

JAN. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	69		38		59		N	49	48	57	66	A	A	86	87		70	50	58		N	43		49
2						31						A	68	66	68	58	57		66		A	69	A	39
3		69	29		31	35	32	49			71	55	56	70	68	61	55	54	A	N	69	59		42
4		A	89	30	31		N	69			60	58	63	71	66	51		54				40	38	
5	N		59	69	32	N	A	34		44		69	68	69	60	51	54	54				A	37	41
6	N	59		N	35	N	B	59	50	49	60	56	63	69	62	66		54		49	49		59	N
7	40		35		44	N	B	29	A	A	58		54	56		A	66	A		A		41	32	
8	A	A	A	B			N	A	A	A	B	A	A	A	A	A	A	A	A	A	A	B	A	59
9	N		A	A	A	B	B	A	A	A	A	A	A	A	A	A	A	B				32	N	
10	B	25		69			A	59		59		60	61		72		A	62		40		23		49
11				69			A	26		A		59	74			61	51	52		A	69			B
12	30	32	A		B	A	A	A	A	B	66				61	60	69			31	A			A
13	22			A	69	A		A		72	59	68		B	82	84	61	52		30				
14	N	30	31		A		N	49		B	58	83	75	66		B	72	54	54	A	34	26		32
15	A		59	31		31		41	48	45			66	68	68	60		A	60	69	32	A	A	59
16		28	32		69		N	38		54	58	67	83		60	66	66	73	60		42	N	41	A
17	A	N	59	59		A	A	59			58	60	66	67		69	66	59		A	30	N	49	59
18	30	23		89				49	54	59	55		78	67	61		83	72	53	31	37		49	
19		30		N		B	69		40	50	59	61	70	58	62	57	66	64		32				32
20		A	41		31		31	69			64	70	72	72	67	58	58	66		A	A	30	B	A
21	A		89	31	34	A	A	26	42	52			61	65	66	80		54	61		31			53
22		B	89		59	A	N	N	40	50		72	85	67	59	58	58	50	54	31			89	
23		49		30		A	39			53		60	72	72	61	66	58					N		N
24	31		59	59			89		42	60	65	56	72	66	69		71		55	A	A	A	A	32
25				59			B	28	60	53				60	68	52	54	72		A	26	34		
26		59	30		31		89		48	54		66					66	69	52		30		A	
27	A		32		B	39	B	30	28		56	84	84	82		57	54	55	54	A	30		A	A
28		A		32		59		69	43		54		80	87	82	66	67		54	A	32		32	A
29	A		59		32			49	52	59	58	66	81	72	67	67		60	65	31				A
30	34	37	30	31		69	69		52	53	53		71	66	68			54	44		32	A	30	A
31	A		59			N	59	31			67	74	82	83		68	50			41	40	49	59	N
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		11	18	13	13			20	14	17	19	19	24	23	22	21	22	21	14	10	15	11	11	12
MED		32	50	59	34			49	48	53	59	66	72	68	67	61	64	54	54	32	32	40	41	46
U Q		59	59	69	59			59	52	59	65	70	79	72	68	66	67	65	60	41	42	49	59	56
L Q		28	32	31	31			30	42	50	58	59	64	66	61	57	55	54	54	31	30	30	32	35

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT YAMAGAWA

JAN. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G		34	30		56	54		32	30	G	G		24	32	28	G
2	47	28	28	25	28	36	G	G		34	31		78		37	39	31	25	24	32		45		
3	G	G	27	25	30	G	23	G			31	30	30	36	57	31	31	35	35	33	27	32	28	31
4	33	91	28	25	31	G	28	G		32	40	37	36	39	44	30	38	48		33	G	22	G	G
5	G	G	G	G	G	G		G	32	28	38	38	38	31			31		37	29	24		G	G
6	G	G	G	G	G	G	B	G	28	30	29	39	33	30	31		30	G	G	G	G	G	G	G
7	G	G	G	G	G	32	B	24		30	G	G	G	G	G	71	72	39	36	32	G	G		G
8		29	26	B	G		G	29		39	B	69	82	79	59	54	51		30	28	24	B	26	G
9	G	30	32	32		B	B	28	33		66	68	61	56	62	59	69	B	36	G	24	G	G	
10	B	G	G		G	G		22	29	31	G	45	52	36	37			31	27	G	G	24	G	24
11		G		G			26		30	33		81	55		G	G	40	38	29	33				B
12		58	33		B	26	26	29		B	33	31		G	32	31	36	G	29	G	31	28	G	24
13	G	G	G		27	26	G		G	32	33	32	37	B	30	30	27		29	G		G	G	
14	G	G	G	G	31	G	G	G		B	55		31			B	27	25	G		G		29	G
15		G		G	G		G	G	28	30	37	G	51		31		G	37	26	26	G			G
16	G	G	G	G	G	G	G	G	G		38	37	31	54		44	30	27	36	26	32	25	26	33
17	30	26	32	27		29	26	G		29	32	37			N	32	33	32	31	26	22	22	G	G
18	G	G	G	G	G	11	G	G	26	31	35	33	38	37	30	29	26	G	11		G	G	G	G
19	G		G	G	G	B	G	G		31	31	38	32	38	47	47		31	48	34	32	27	G	G
20	22		33	30	G	24	24	G	30	29	30	31	30	30	30	30	26	25		38	47	47	B	25
21	31	G	26	G	G	30	22	G	27	34	34	32	37	46	31	28	44	32	38	30	25	33	G	G
22	G	B	28	30		26	G	G	30	30	31	33	36	31	32	30	30		G	G	G	G	G	G
23	G	23	28	30	27	28	27	25	35	45		29	30	31	30	32	32	27			G	G	G	G
24	G	G	G		G	24	G	G	28	29	32	36	32	37		50	51		27	36	30	39		29
25	31	G	G	G	G	G	B	G	28	29	29	29	30	37	31	37		30	28	29	20	G	G	24
26	27	28	29	G	G	G	G	G		28	38	46		30	30		31	28	G	G	25	G	23	G
27			27	G	B	G	B	G	30	38	45	51	49	48	44	36	35	30	29	26	29	G	28	24
28	G	26	30	28	29	G	G	G	28	30	35	45	36	34	31	31	36	33	27	28	28	24		25
29		G	G	25	26	G	G		29	29		37	32	38	30	31	32	27	28	G	22	G	G	
30		G	G	G	26	28	25	G	25	30	33	28	34	32	31	30	31	27	G	G	24	30	26	24
31		30	28	G	30	24	G	G	30		39	39	33	32	36	32	31	26	G	11	G		30	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	27	29	26	25	26	24	28	20	25	27	28	28	25	25	25	28	25	28	27	28	25	24	25
MED	G	G	26	G	G	6	G	G	28	30	33	37	36	36	31	32	31	28	28	26	24	22	G	G
U Q	27	28	28	25	27	26	24	G	30	33	38	42	50	42	40	41	37	32	33	32	27	31	26	24
L Q	G	G	G	G	G	G	G	G	27	29	31	31	31	31	30	30	30	25	6	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT YAMAGAWA

JAN. 1997

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

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

HOURLY VALUES OF foF2 AT OKINAWA

JAN. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	36	A	59	56						35		82			105		92		70	A	A	A	A	89
2	B	B	B	B	N	B	B	89		51		54	A	60	83	84			A	A	35	B	A	A
3	A	A	38		B	B	B	59	49	48		65		65		70		52	42	49	B	B	49	B
4	B	B	B	B	59	B	B	N	48			57	48		83	59	50	58	48	48	A	A	B	B
5	B		49	B	69	B	B		36		60	64	60		91	76	76	71	64	A			31	
6			59		47	B			A	44		84		73	83	66	70				46	B	49	
7	B	B	B	B	28		B	89	42		55	62		60		88	78	71	A	A	50	A	A	74
8	B	69	N	B	B	B	B		42	55		80	62	92	69	59	56	56	64	A		B	B	B
9	B	B	29	34		B	B	B	A	66			64	68		87		76	59	A	58		59	49
10	B	32	34	37	N	N	B		47	58	68	66	83	124	126	93	91	83	59		47			89
11			46	56			49		42	59	63	72	A	76	A	82	A	59	60		46	A	49	
12	A	B	B	A	A	B	B		49		66	68		67	81				57	A				
13	A	B	56		A	B	B	89		54	56	68	82	94	122		96	80		A	56		B	35
14	B		N	58		B	B		50	53	68	83	81	91	118	114	112	81	A	A	46	46		B
15	B	B		A		B	B		45	37		61	83	83		60	81		A	A			56	B
16	B		B	56		B	B		51		60	58		100			121	112	84	A	56	56	A	69
17	59	38	37	38	N	B	B	30	59								86	71	51	A			59	
18	N	B	29		35	B	B	89			C	91	92	114	C	91	95			A	56			B
19	49				35		B		43		51	58	67	66	62	73	69	83	73	A	47	38		B
20	B	49	N	26	35	B	N		58	60	58	67		88	72	58	57	63	73	A	B	B	B	39
21		B	25		36	B	B	B	40		88	91	87	91	90	86	86		68	A	40	44		A
22	B	29				A	A		50	69	68	81	91	85		84		54	64		B	B	B	N
23		59	28			A	A		49	54			78	90	89	84	76	71		A	A	69	B	B
24	B	B	N	49	35		B		48	58	62	80	67		90	83	93	89	A	A	A	A	A	A
25	A	58	49	59	32	28	B		45		73	68	71	91	91	76	70	81	62	A	59			B
26	B	B	B	A	59	59	B	B	49		58	63			105	88	92	83	89	A		59	B	
27	B		B		B	B	B		53	58		72	94	80	72		71	66	73	A	A	35	B	A
28	B	B	N	B	32		B	69		68	57		95	104	107		90	87	94	A	37	35	A	32
29	56	36	46	39		B		59		49	58	60	68	83	84	71	69	79	70		B	B	B	49
30	B	A	B	59	A	A	B	B	A	70	66	60		83	93	104		71			A		38	B
31	B		69	B	B	B	B	B	43		71	83	95	100			97	83	75	A	40	46	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			15	12	12				22	19	19	27	19	25	21	23	24	24	21		15			
MED			46	52	35				48	55	62	68	81	85	90	83	84	74	64		47			
U Q			56	57	53				50	60	68	81	91	93	105	88	92	83	73		56			
L Q			29	37	33				43	49	58	61	67	70	82	70	70	64	59		40			

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HOURLY VALUES OF fEs AT OKINAWA

JAN. 1997

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G		G	G	G	G	G	G	G	40	37	42		60		34	34	39	26	28		45		G
2	B	B	B	B	G	B	B	G		36	39	44	60	41	41	73	69		49	39	G	B	42	58
3		42	26	G	B	B	B	37	29	35	34	36	40		34	34	33	37	G	G	B	B	G	B
4	B	B	B	B	G	B	B	G		35	38	45	41	48		40	62	60	48	25	29	26	B	B
5	B	G	G	B	G	B	B	G		31	37	39	38	38	37	40	47	44	34	33	G	G	G	G
6	G	G	G	G	G	B	G	G		33	33	36	40	41	37	37	35	G	G	G	G	B	G	G
7	B	B	B	B	G	G	B	G	31		39	39				69	43	28		27	G			G
8	B	G	G	B	B	B	B	G	G	29	34	36	42	64	62		44	52		38	G	B	B	B
9	B	B	G	G	11	B	B	B	30	29	37	38	47	37	37	41	30	40			33	G	G	G
10	B	G	G	G	G	G	B	G		32	34	44	47	61	83	72	32	37	44	39	G		G	G
11	G	G		33			G	G		32		73	87		95		98	71	39	42	38	49	G	G
12		B	B		38	B	B	G		29	33	52	39	39	37				38	78				
13	28	B	G	G	26	B	B	28		36	41	58	39	39	39	38	36	36	37	40	G	G	B	G
14	B	G	G	G	G	B	B	G	G	32	40	45		58	41	37	66	37			33	28	G	B
15	B	B	G	27	G	B	B	G		36	38	59	42	40		80	68	78	69	48	G	G	G	B
16	B	G	B	G	G	B	B	G	G	30	33	26		28	32	35	35	29	27	40	33	40	46	G
17	G	G	G	G	G	B	B	G	30	36						34	40		40	33	G	G	G	G
18	G	B	G	G	G	B	B	G		25	34	34	39	35	37	C	36	31	30		33	31	27	G	B
19	G	G	G	G	G	G	B	G		26	32	34	36		39	43	48	50	37	G	43	G	G	G	B
20	B	G	G	G	30	B	G	G	G	27		35	34	35	35	35		34	G	36	B	B	B	G
21		B	G	G	26	B	B	B	26	33	36	36		42	38	29	46		50	40	G	G	G	24
22	B	G	G	G	25	28	27	G		29	26	34	44	48	44	42	39	38	24	32	B	B	B	G
23	G	G	G	G	G	25	24	G	30	30	34	35	36	37	37	38	32	48	55		26	G	B	B
24	B	B	G	G		G	B	G	G	30		37	47	53	64	50	54	30			34	68		33
25	38	G	G	G	G	G	B		25	29	28	34	44	50	37			47	45	48	G	G	G	B
26	B	B	B	26	G	G	B	B	35	27	26		40	48	35	36	42	38	45		G	29	B	G
27	B	G	B	G	B	B	B	G	32	40	46	47	57	51	47	43	42			36	28	25	B	25
28	B	B	G	B	G	G	B			42	38	70	63	41	44	40	40	37	28	32	24	G	40	G
29	G	G	G	G	G	B	G		31	30	38	40	47	60	41	40	33	37	44	44	B	B	B	G
30	B	32	B	G		29	B	B	23	31	34	36	44	51	37	38	34	36	G	38	28	23	G	B
31	B	G	G	B	B	B	B	B	28		50	44	45	40	51	40	35		50		27	36	40	40
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	18	22	23	24	11		23	20	29	27	29	24	27	25	27	28	25	24	25	25	21	18	20
MED	G	G	G	G	G	G		G	26	32	36	39	43	41	39	40	40	37	38	38	G	23	G	G
U Q	G	G	G	G	6	25		G	30	35	38	45	47	51	45	43	48	45	46	41	30	32	G	12
L Q	G	G	G	G	G	G		G	G	29	34	36	39	39	37	36	34	35	25	32	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT OKINAWA

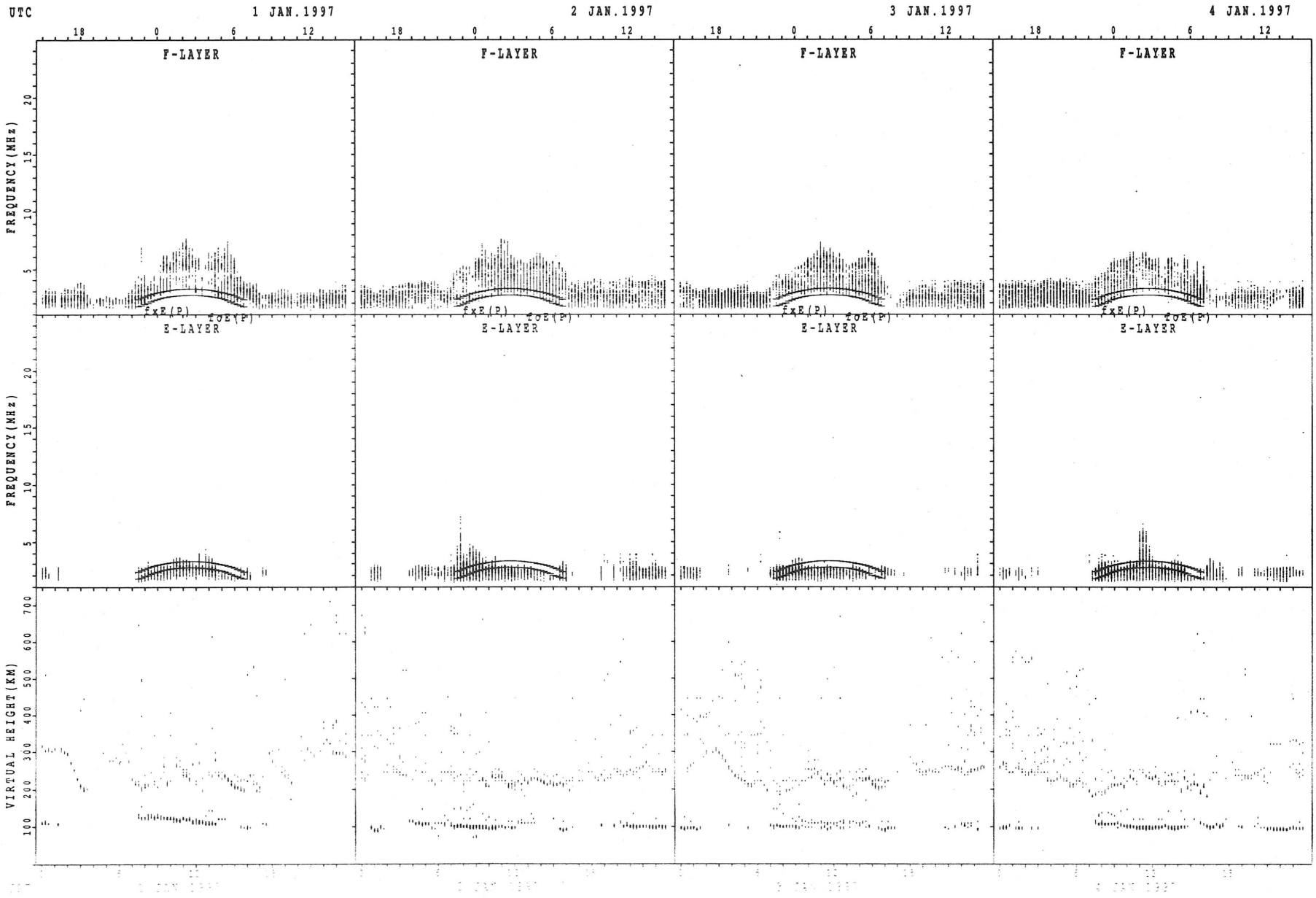
JAN. 1997

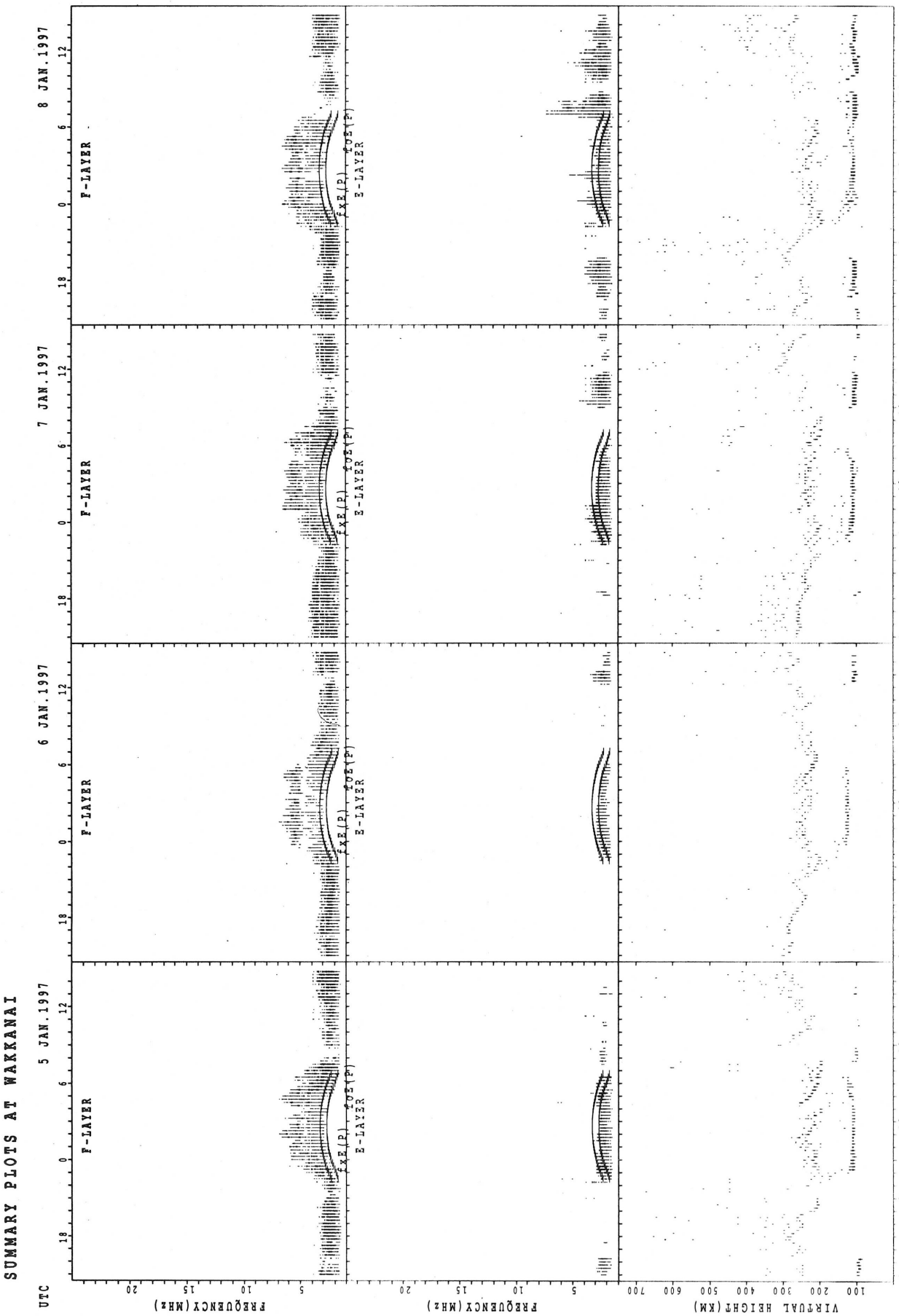
LAT. 26.3N LON. 127.8E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

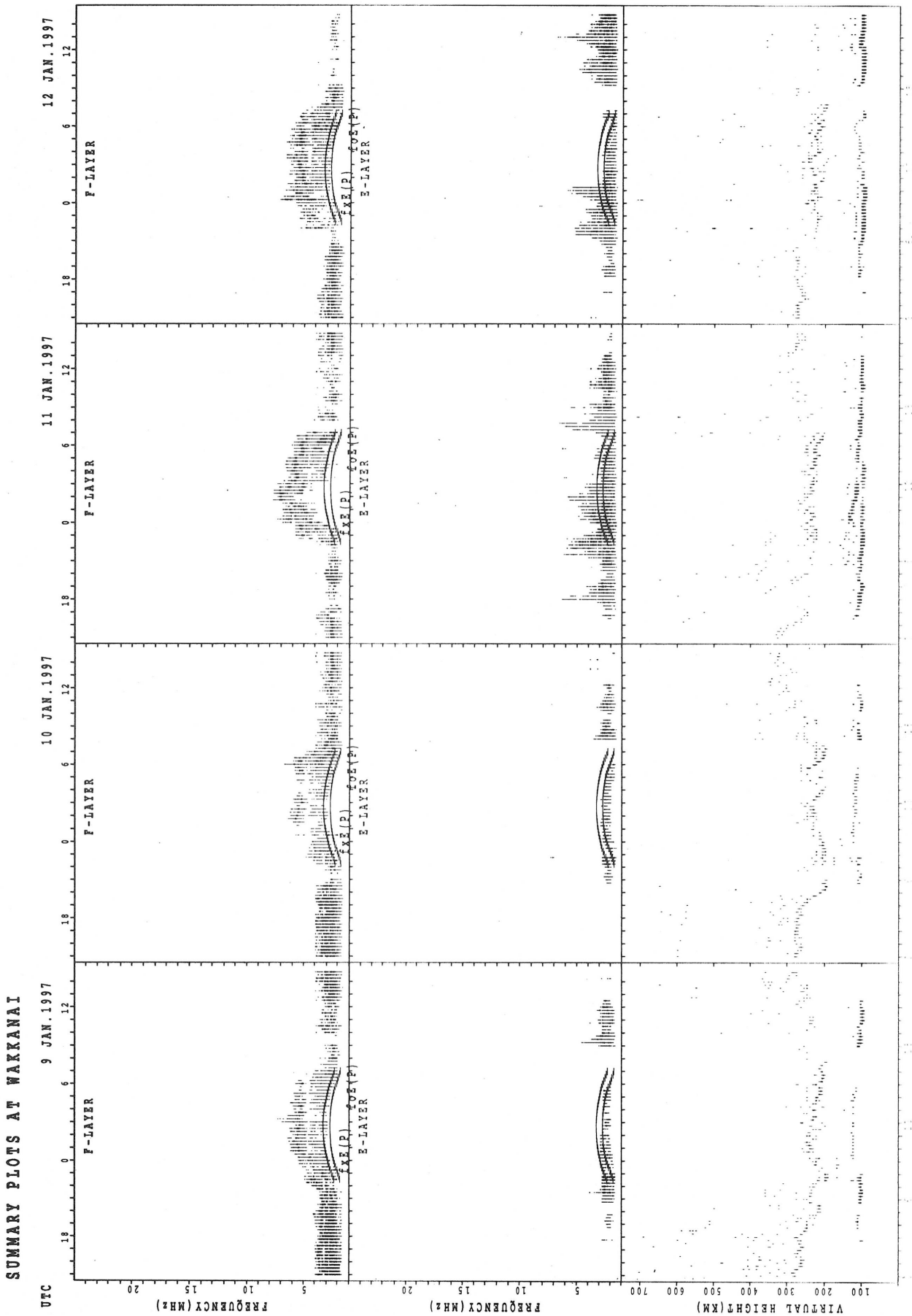
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	17	15	18	14	15		26	23	15	14	15	15	15	15	15	17	15	14	15	15	14	14	15	16
2	B	B	B	B	15	B	B	18	14	14	15	15	15	15	15	15	14	15	14	14	16	B	15	14
3	15	14	14	16	B	B	B	14	14	14	15	14	15	16	16	14	14	14	15	15	B	B	17	B
4	B	B	B	B	15	B	B		16	14	15	15	15	17	15	15	14	14	14	14	15	15	B	B
5	B	16	14	B	15	B	B	17	14	14	15	15	15	18	16	14	14	14	15	14	18	22	15	15
6			15	15	15	B	24	15	15	14	16	15	16	16	17	18	15		15	15	15	B	14	
7	B	B	B	B	16	20	B	17	16		16	15	14	15	16	15	14	14	14	14	15	15	15	16
8	B	15	16	B	B	B	B	15	21	14	14	15	16	15	15	14	15	15	14	15		B	B	B
9	B	B	15	14	15	B	B	B	15	15		21	17		42	14	18	14	14	14	15	15	14	14
10	B	16	15	17	15	15	B		14	14	15	16	17	18	17	16	14	14	14	14	16	15	16	
11	20	17	14	14			14	15	18	15	15	15	17	16	15	15	15	14	14	14	16	16	23	15
12	15	B	B	15	14	B	B	16	21	14	15	15	14	16	15				15	14				
13	15	B	16	16	15	B	B	16	17	15	15	18	16	16	17	16	14	14	14	14	15	15	B	15
14	B		14	16	17	B	B	18	16	14	14	15	15	17	17	17	16	15	14	14	15	15		B
15	B	B	14	18		B	B	15	14	14	15	15	15	16	16	15	14	14	14	14	16	16	16	B
16	B		B	16	15	B	B	15	22	14	14	15	15	16	16	15	15	14	14	15	15	14	15	18
17	15	15	18	15	17	B	B	14	14	14						17	14	14	14	15		26	15	
18	18	B	16	17	15	B	B	14	16	15	15	15	15	16	16	15	16	14		15	14	14	15	B
19	15	15	15	14	14	15	B	16	14	15	15	16	17	16	16	15	15	14	14	14	14	15	16	B
20	B	15	15	15	15	B	16	18	20	14	14	15	15	16	17	15	15	14	15	14	B	B	B	14
21	14	B	15	15	14	B	B	B	14	14	14	15	15	15	15	14	14	14	14	14	14	16	15	14
22	B	14	15	16	15	14	15	14	15	14	14	16	16	17	17	15	15	14	16	14	B	B	B	16
23	15	16	15	15	15	15	16	17	15	14	14	17	16	16	15	15	14	14	14	15	14	15	B	B
24	B	B	15	15	14	15	B	18	21	14	15	15	16	15	16	15	15	14	15	15	14	15	14	14
25	15	14	16	15	14	15	B		16	14	14	16		16	16	15	14	14	14	14	16	15	15	B
26	B	B	B	17	16	17	B	B	21	14	15	16	17	20	17	16	14	14	15	15	16	15	B	
27	B		B	18	B	B	B	18	15	14	14	15	16	16	17	15	14	14	14	14	14	15	B	15
28	B	B	16	B	15	15	B	14		14	15	15	17	18	16	18	15	14	14	15	15	15	15	16
29	17	15	14	22	15	B		14	16	14	15	16	15	16	17	15	14	14	14	14	B	B	B	20
30	B	15	B	16	16	14	B	B	23	14	14	15	17	17	21	16	15	14	17	15	15	16	18	B
31	B	20	16	B	B	B	B	B	15		14	15	17	16		22	15	14	14	15	15	14	15	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	15	23	24	25	10		23	30	29	29	30	29	29	29	30	30	29	30	31	24	23	20	16
MED	15	15	15	16	15	15		16	16	14	15	15	16	16	16	15	14	14	14	14	15	15	15	15
U Q	17	16	16	16	15	15		18	18	14	15	16	17	17	17	16	15	14	15	15	16	16	16	16
L Q	15	15	14	15	15	15		14	14	14	14	15	15	16	15	15	14	14	14	14	14	15	15	14

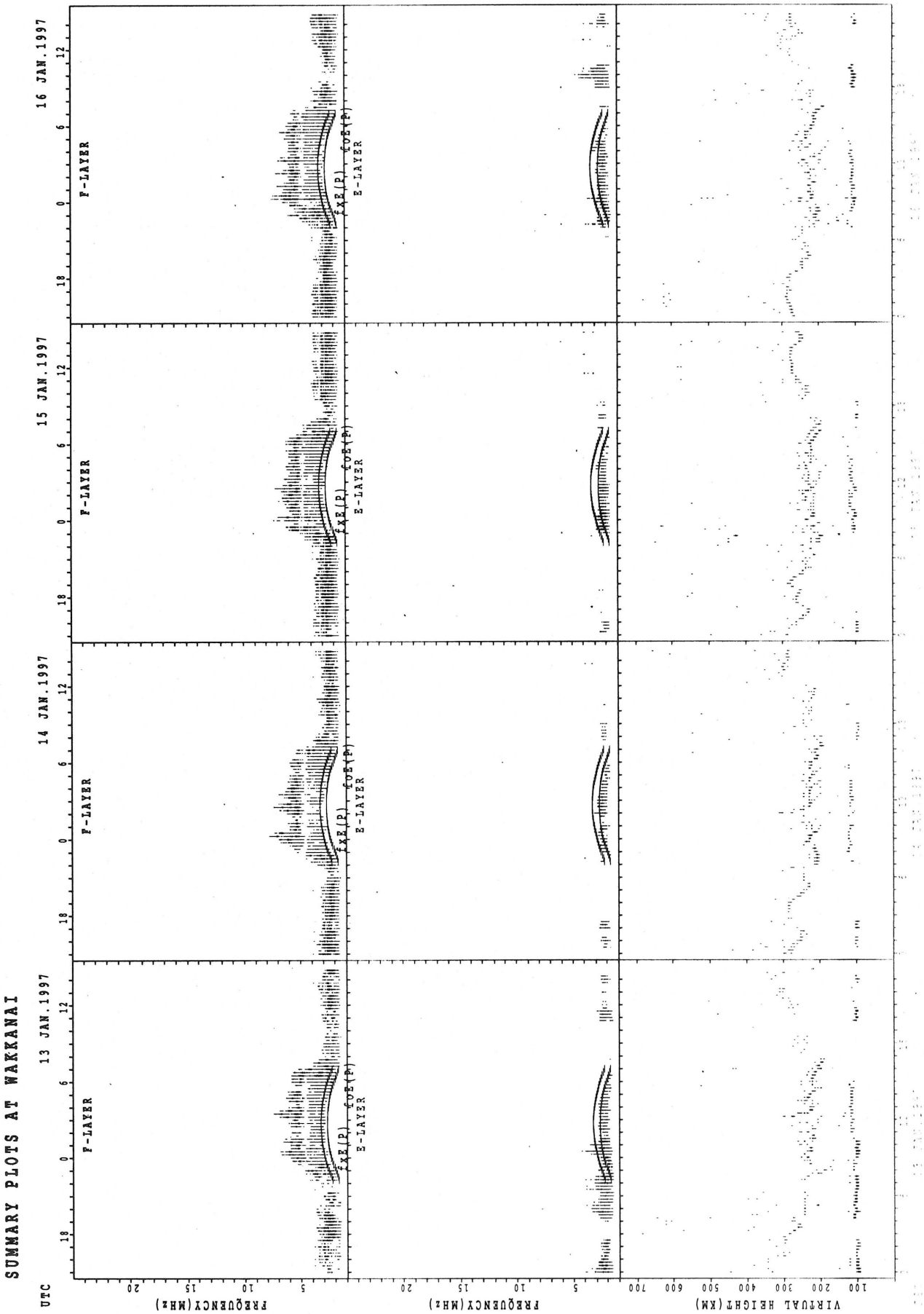
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

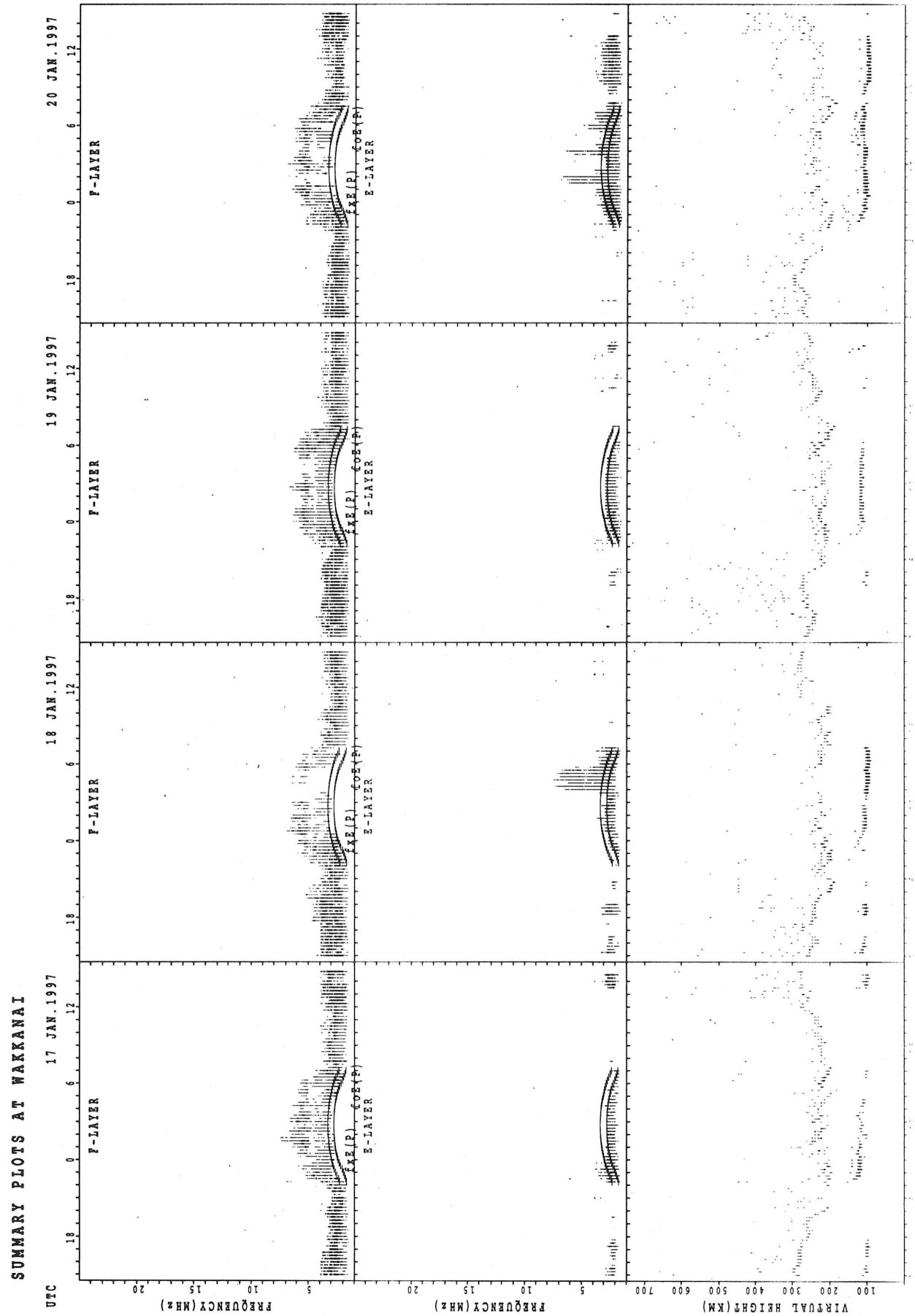
SUMMARY PLOTS AT WAKKANAI

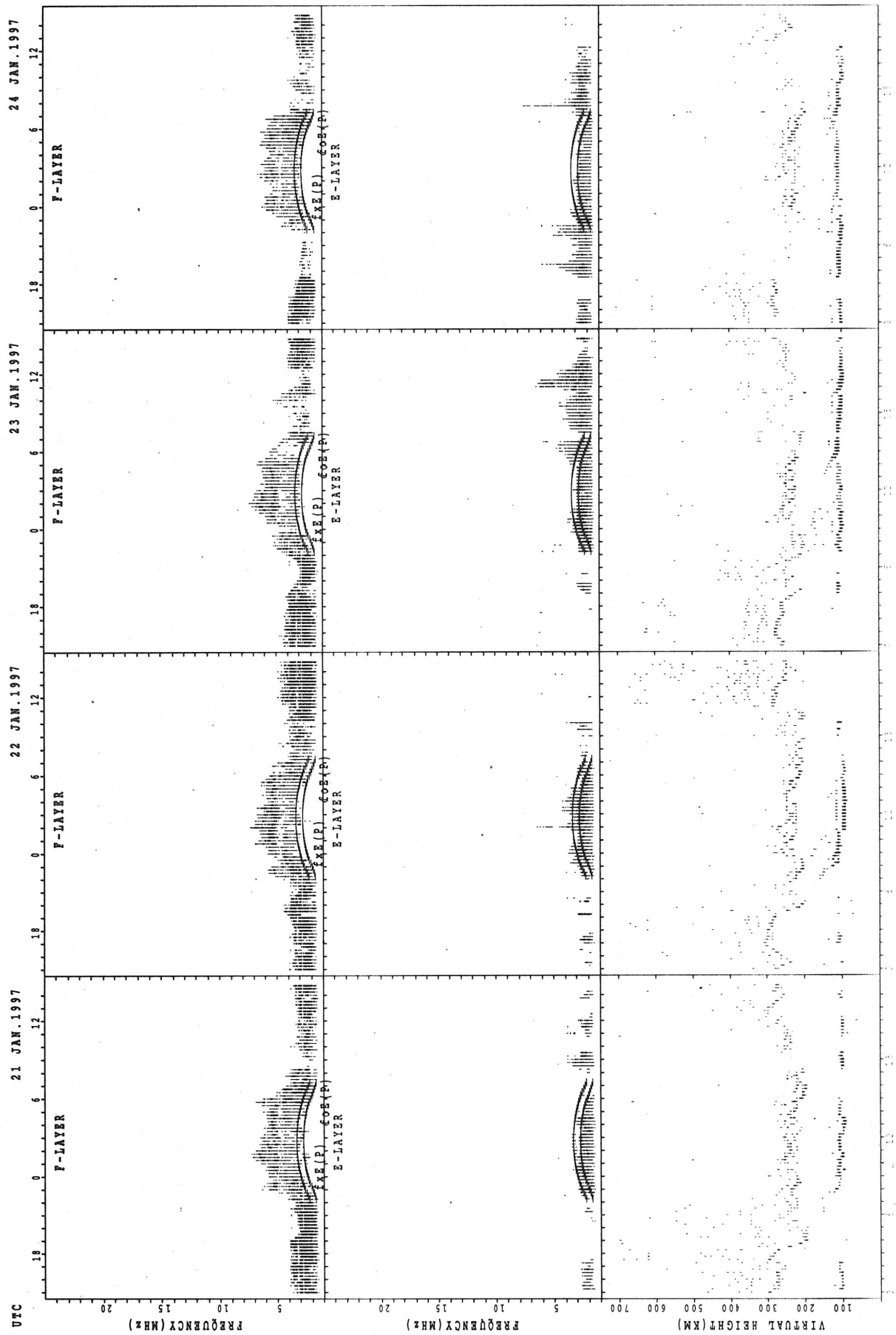



SUMMARY PLOTS AT WAKKANAI
UTC
5 JAN.1997
6 JAN.1997
7 JAN.1997
8 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)

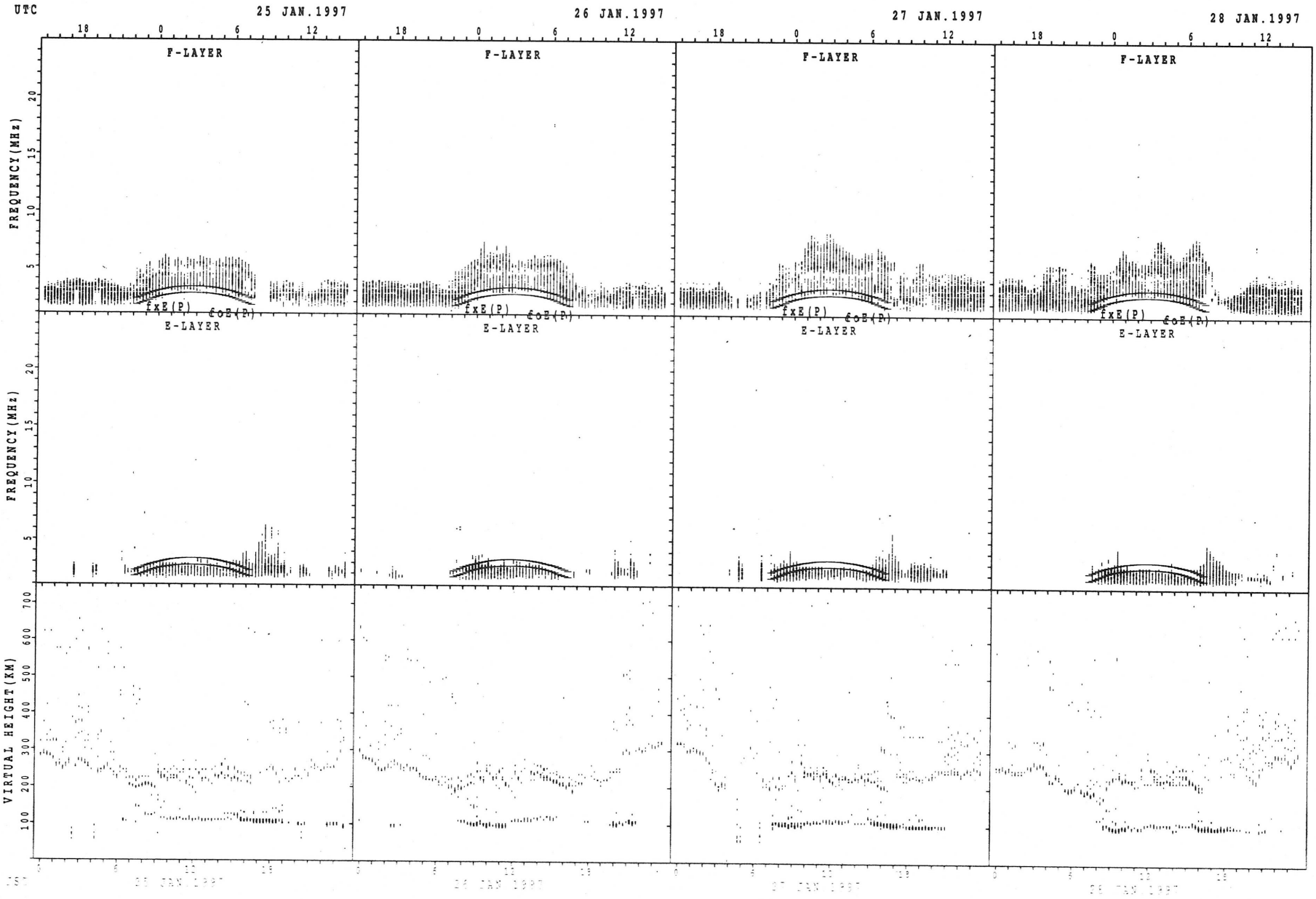

SUMMARY PLOTS AT WAKKANAI
UTC
9 JAN.1997
10 JAN.1997
11 JAN.1997
12 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

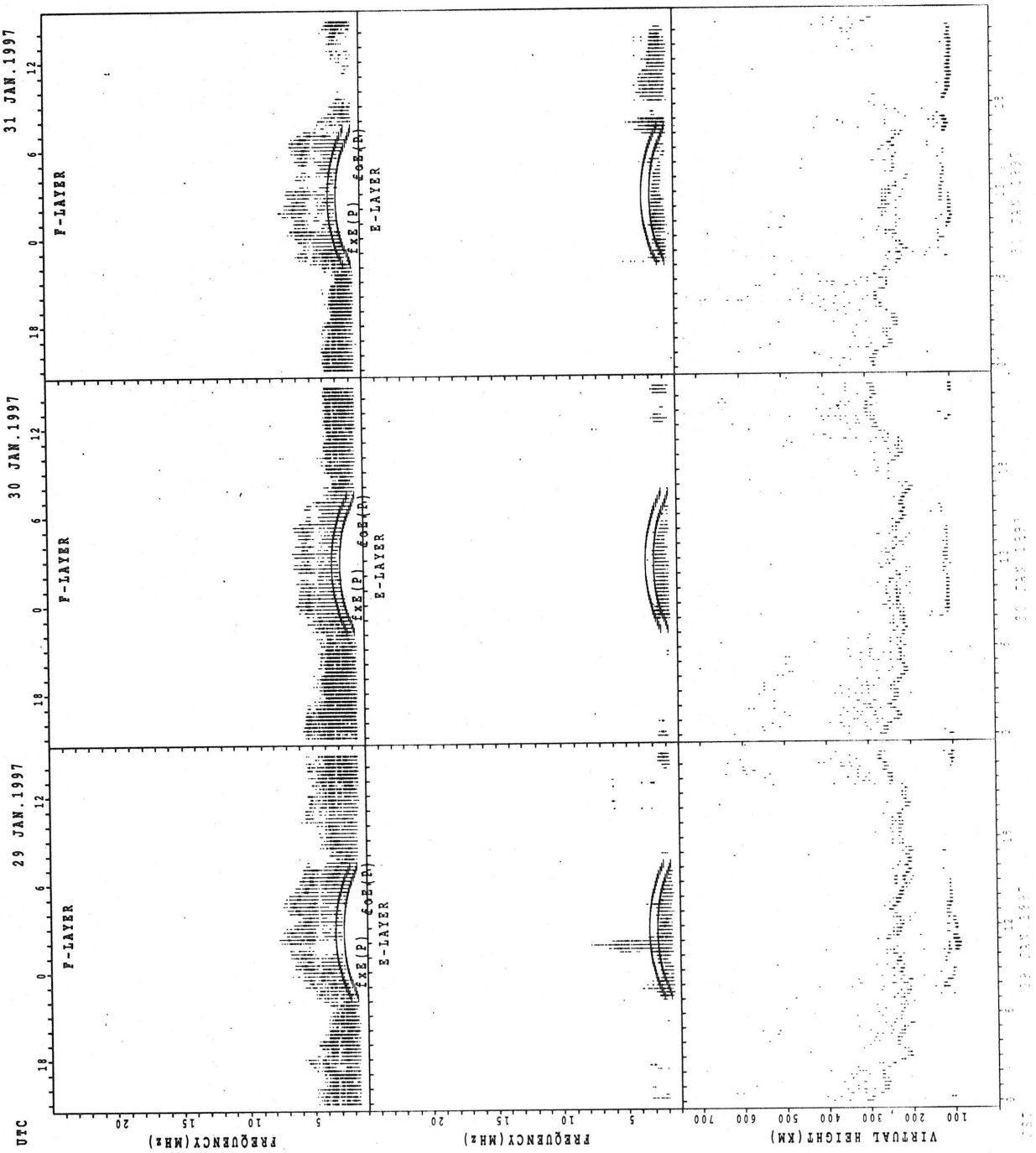

SUMMARY PLOTS AT WAKKANAI
UTC
13 JAN.1997
14 JAN.1997
15 JAN.1997
16 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)


SUMMARY PLOTS AT WAKKANAI
UTC
17 JAN.1997
18 JAN.1997
19 JAN.1997
20 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

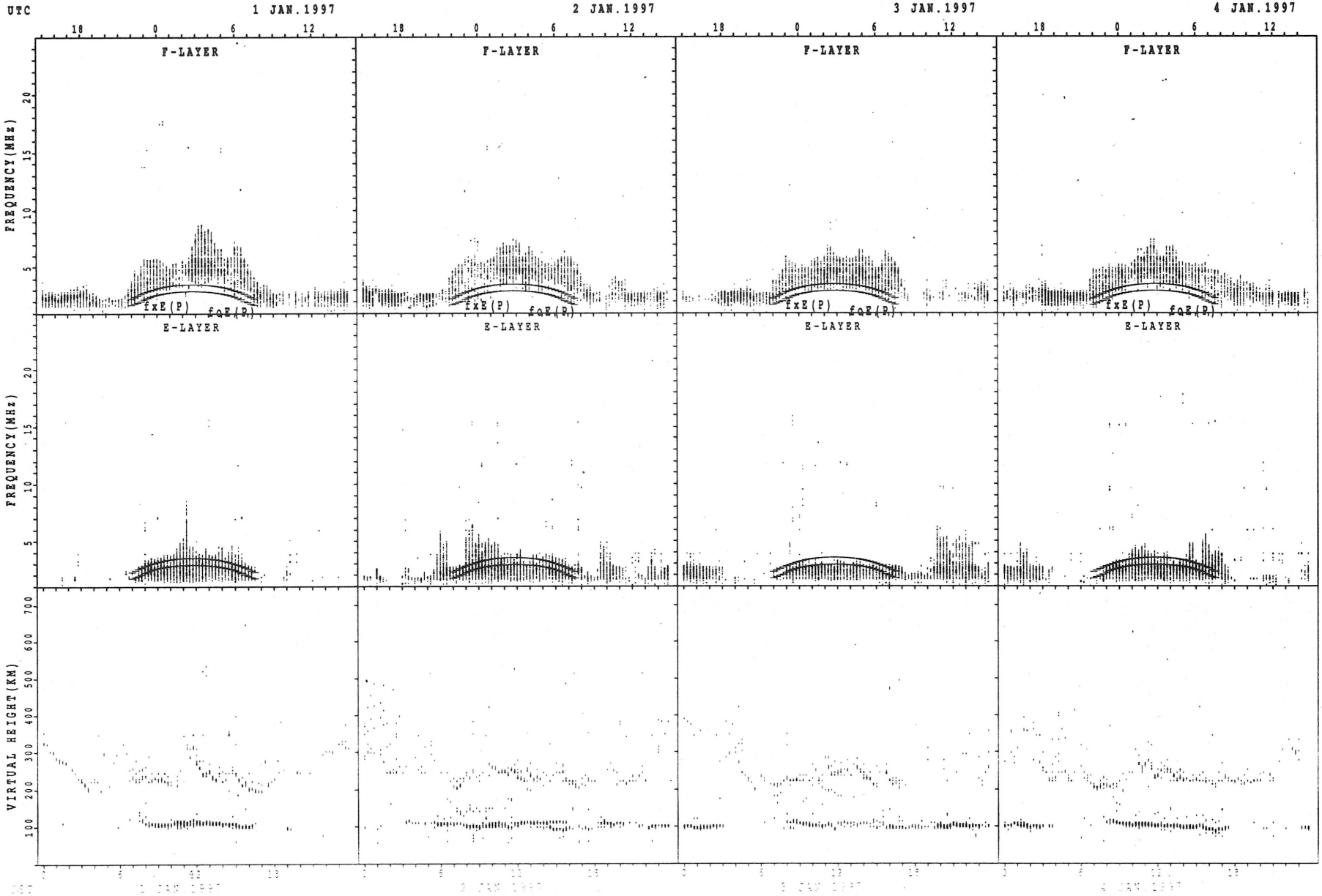

SUMMARY PLOTS AT WAKKANAI
UTC
21 JAN.1997
22 JAN.1997
23 JAN.1997
24 JAN.1997
F-LAYER
E-LAYER
fxE(P)
fOB(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

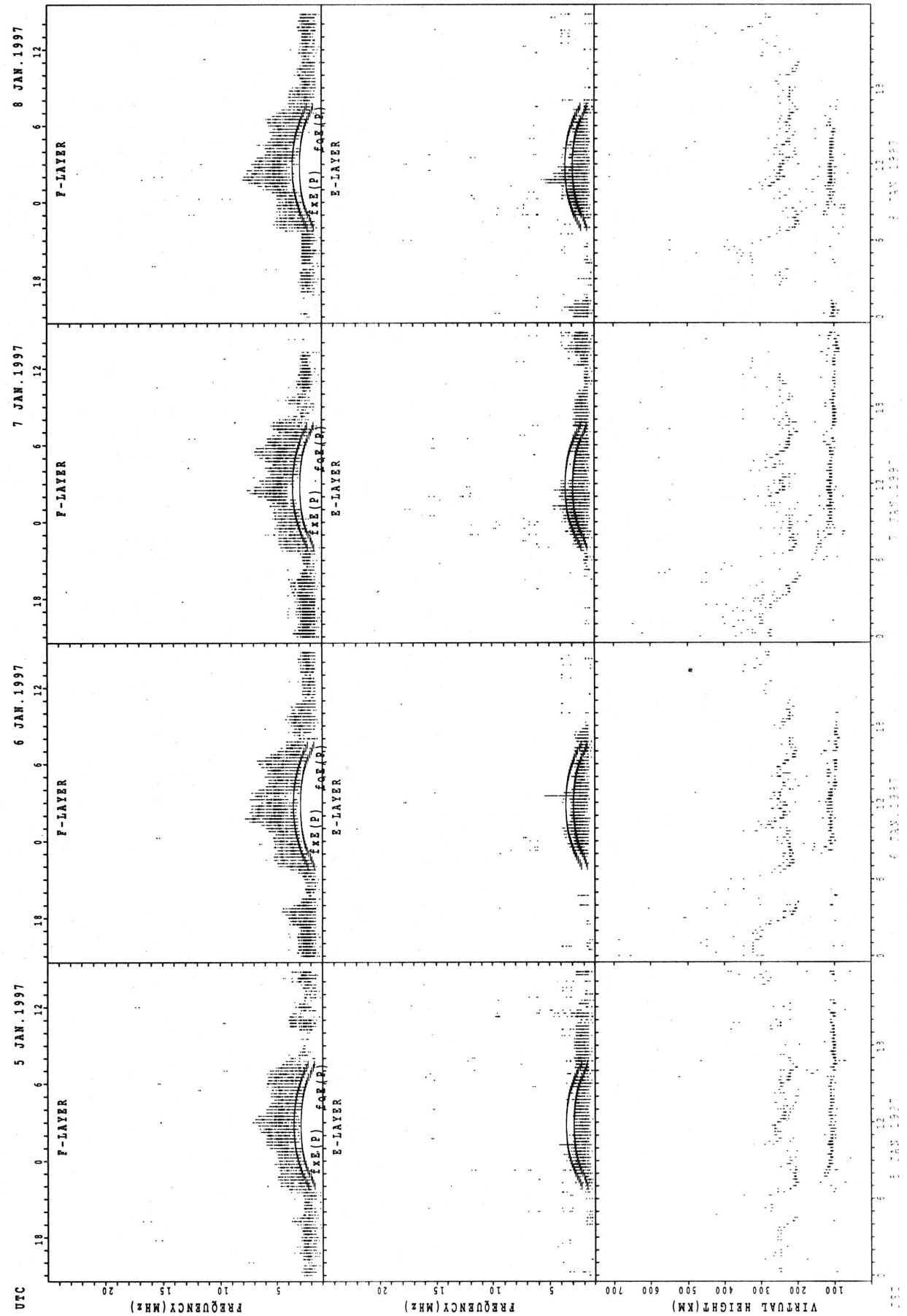
SUMMARY PLOTS AT WAKKANAI



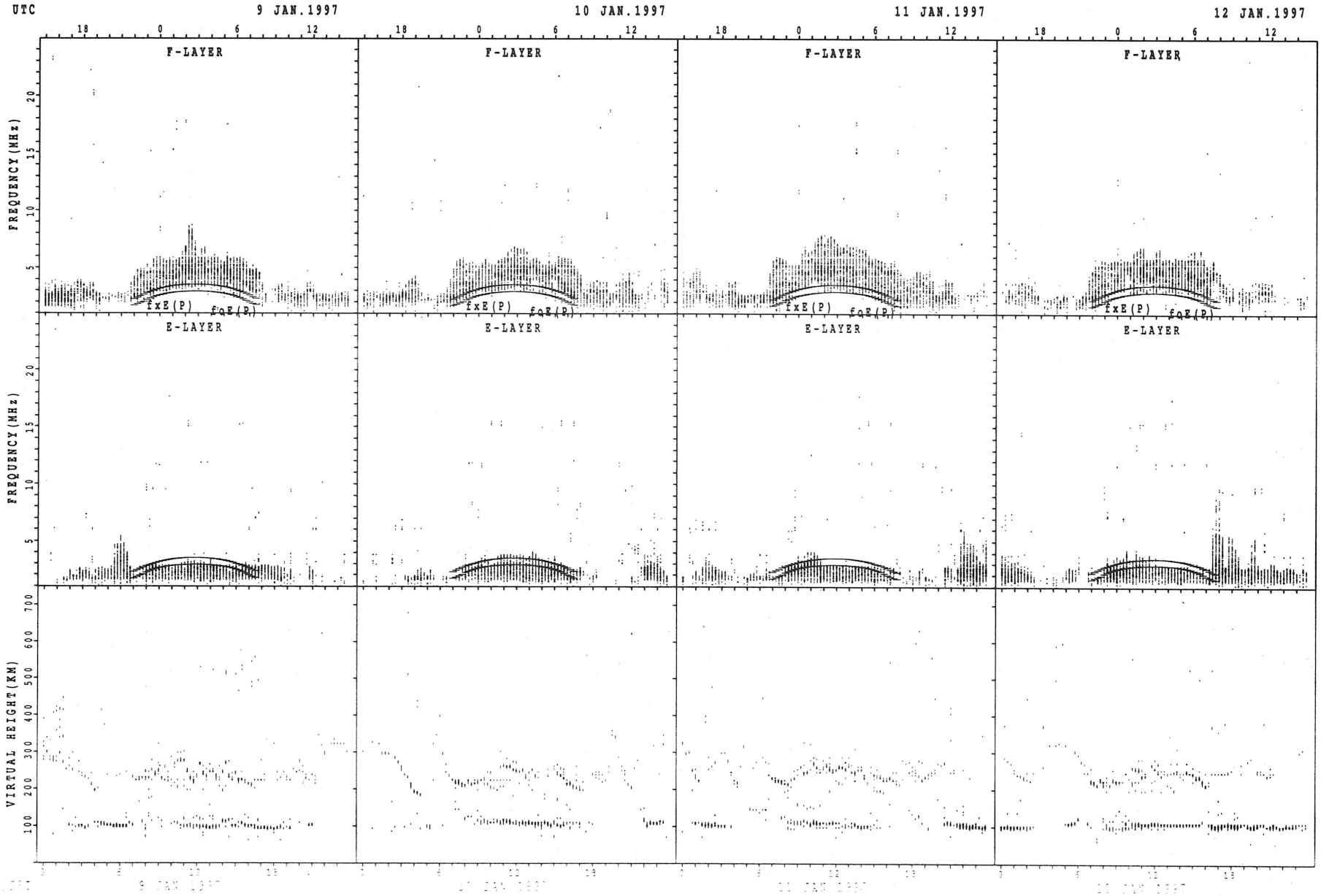

SUMMARY PLOTS AT WAKKANAI
29 JAN.1997
30 JAN.1997
31 JAN.1997
UTC
F-LAYER
E-LAYER
fxE(P)
fo2(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

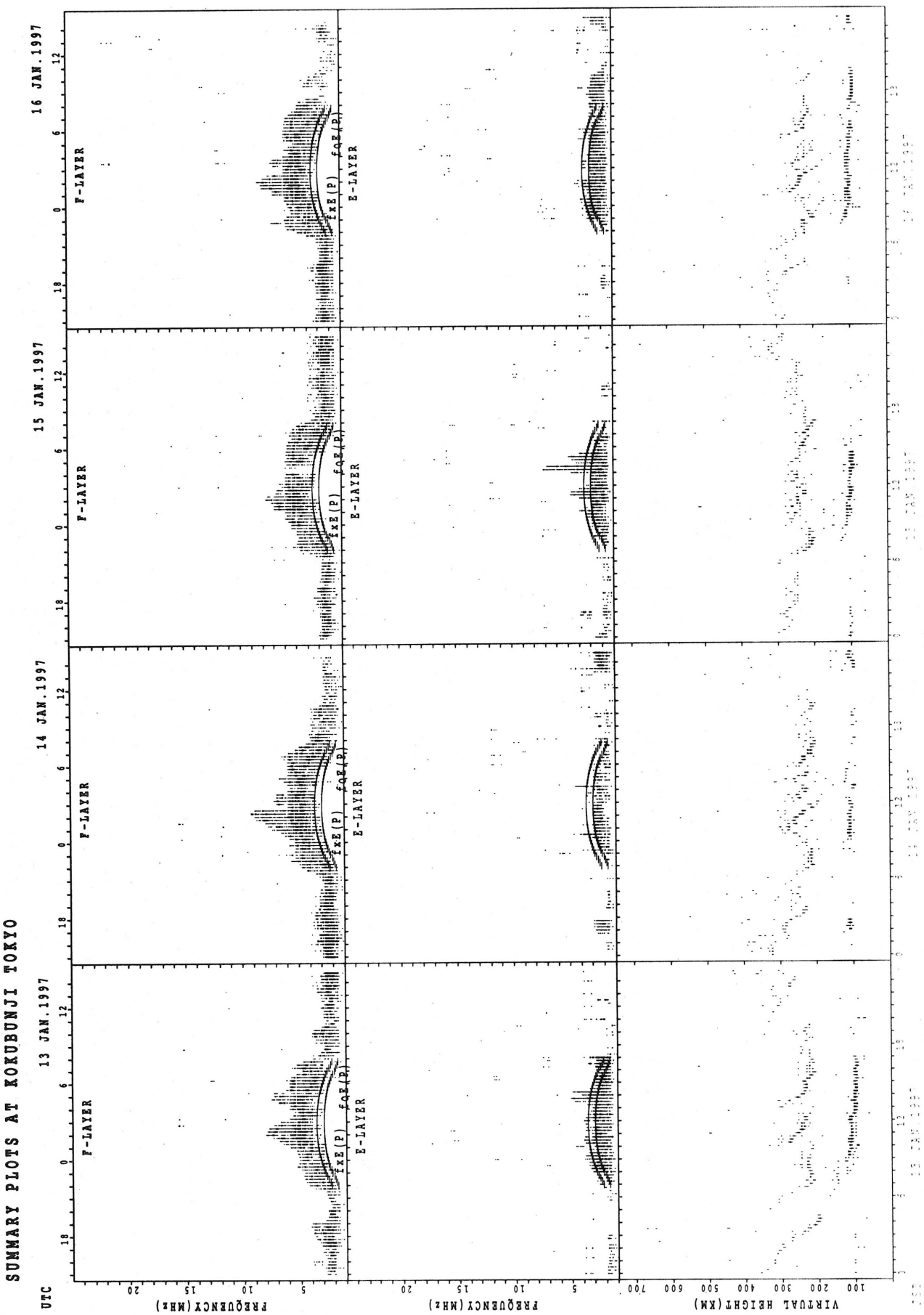
SUMMARY PLOTS AT KOKUBUNJI TOKYO



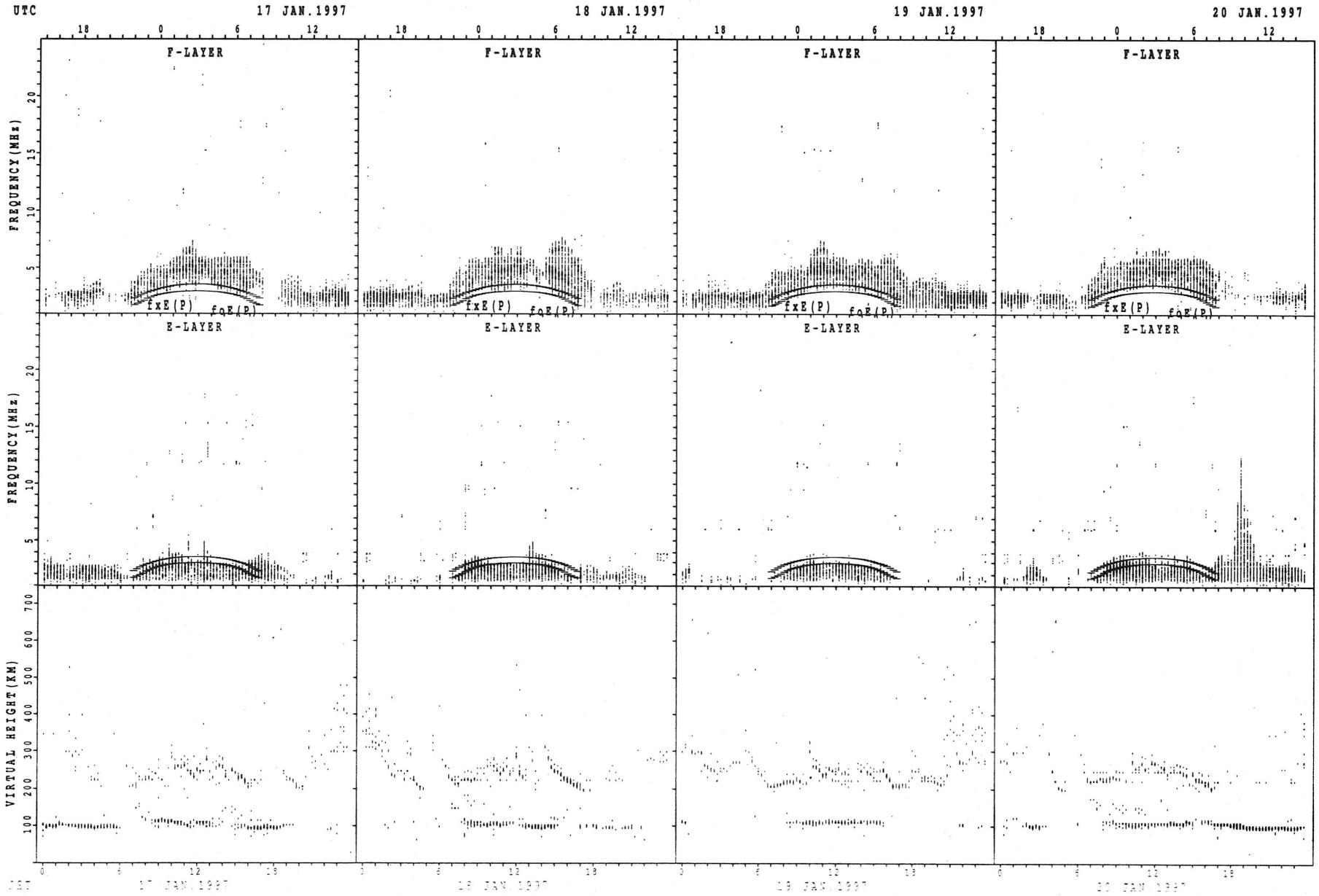

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
5 JAN.1997
6 JAN.1997
7 JAN.1997
8 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

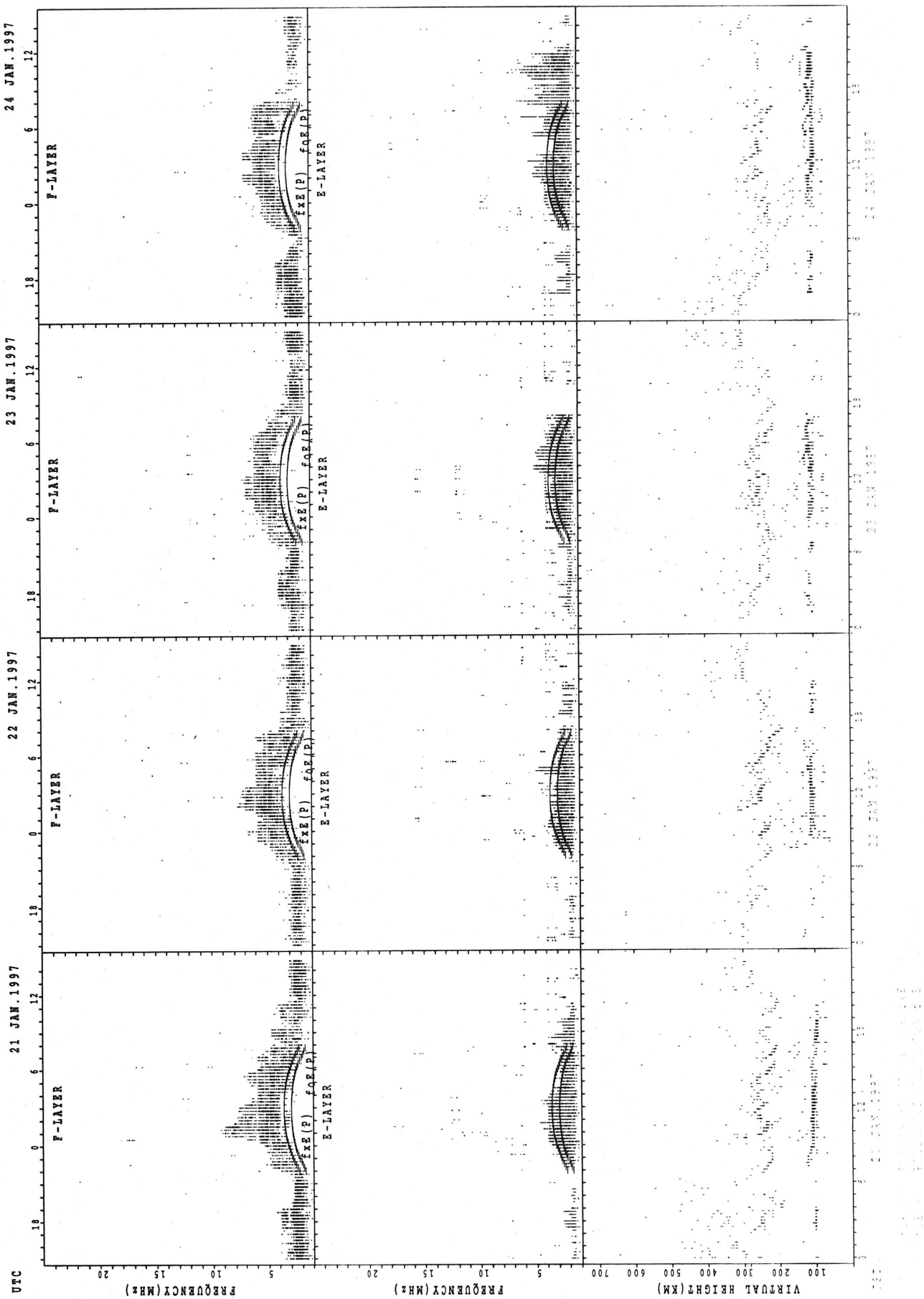
SUMMARY PLOTS AT KOKUBUNJI TOKYO

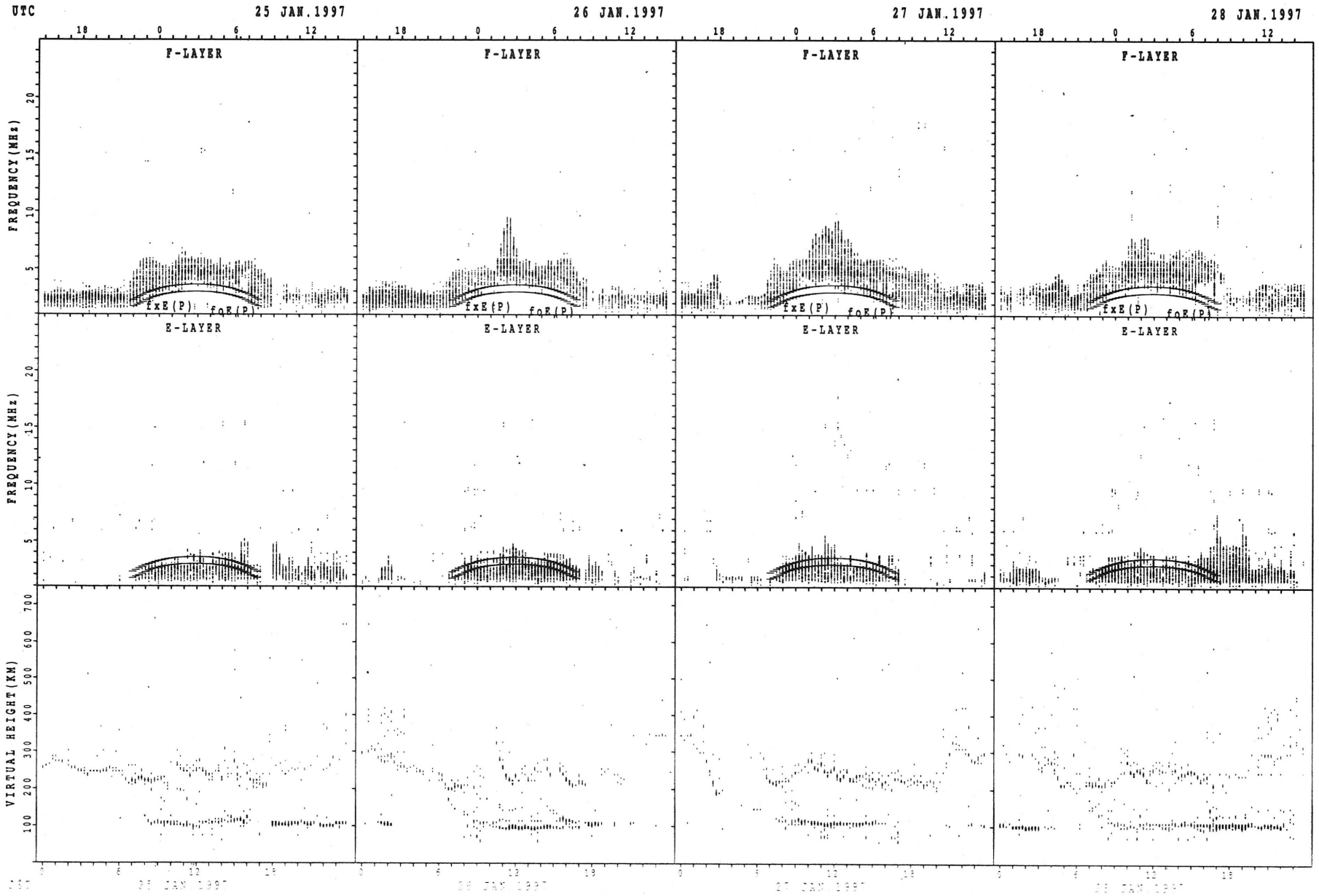


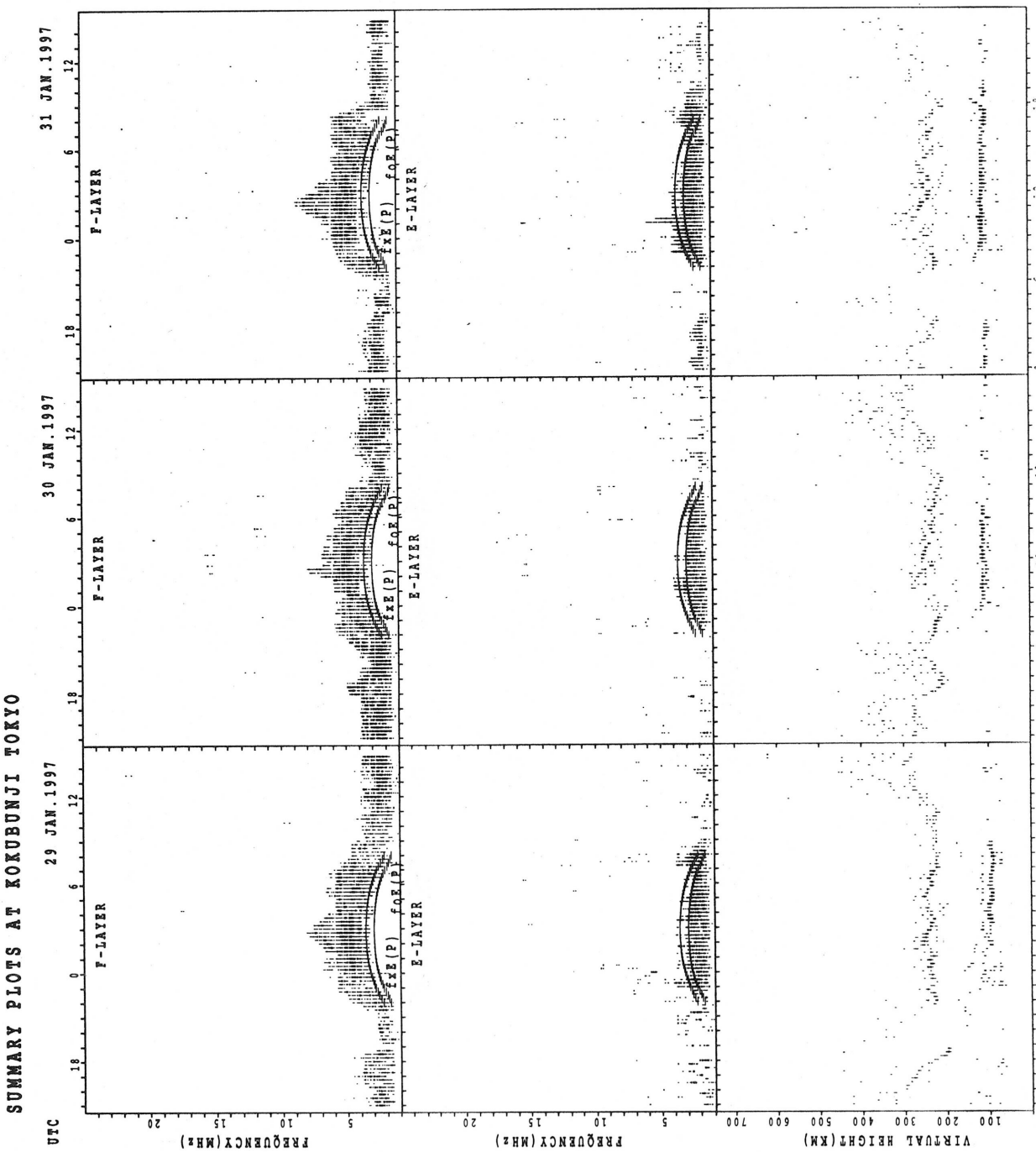

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
13 JAN.1997
14 JAN.1997
15 JAN.1997
16 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foF(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

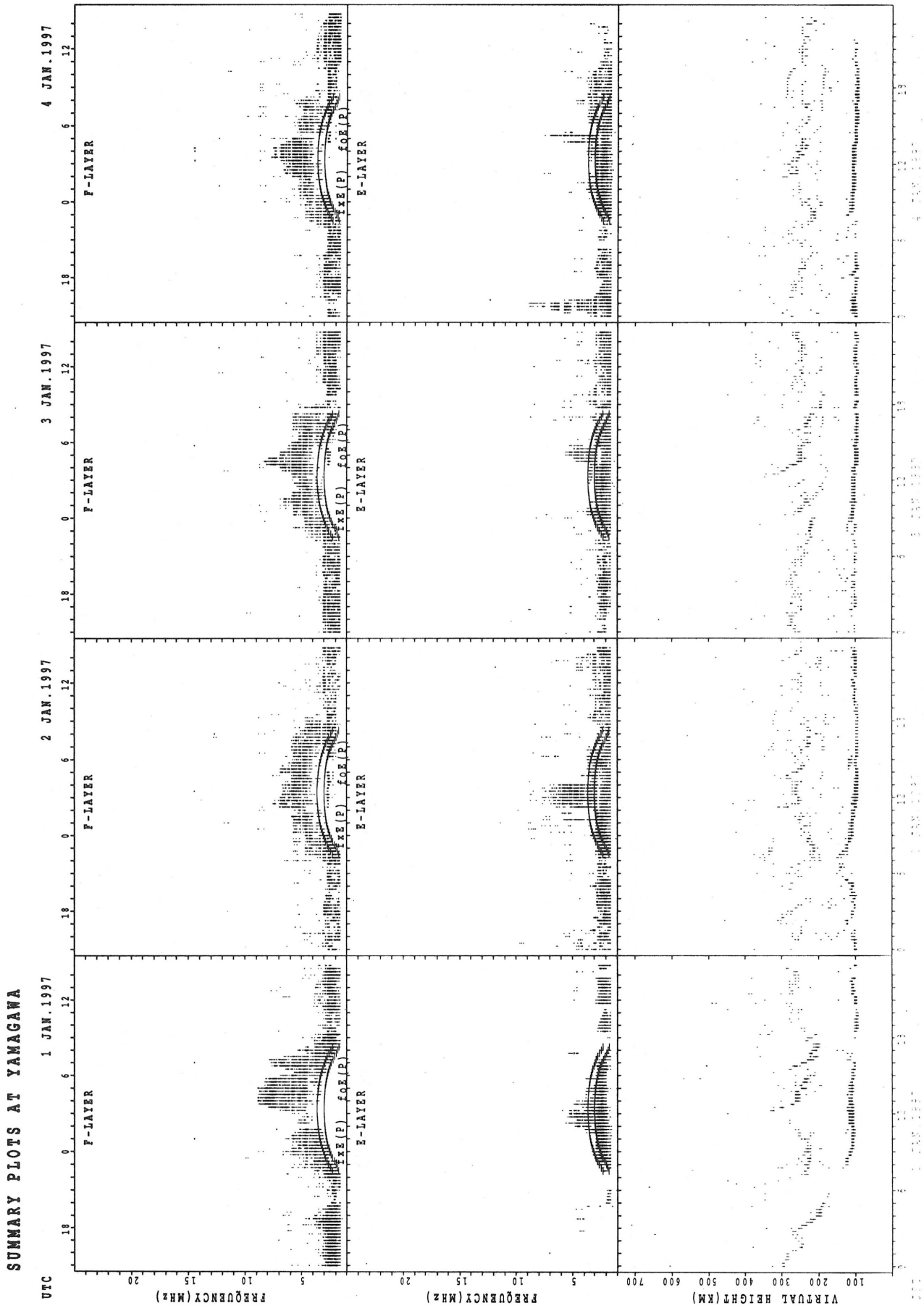
SUMMARY PLOTS AT KOKUBUNJI TOKYO

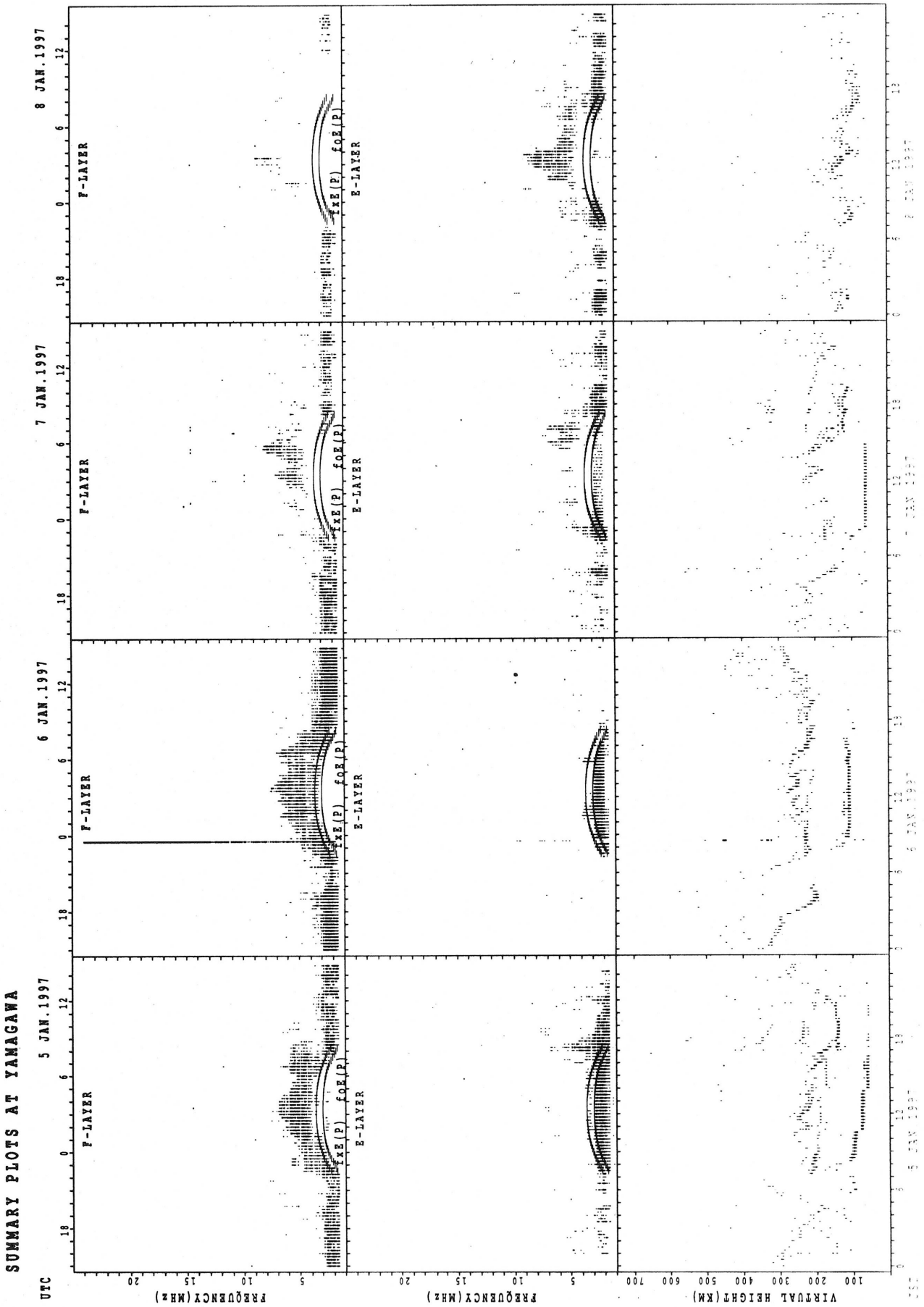


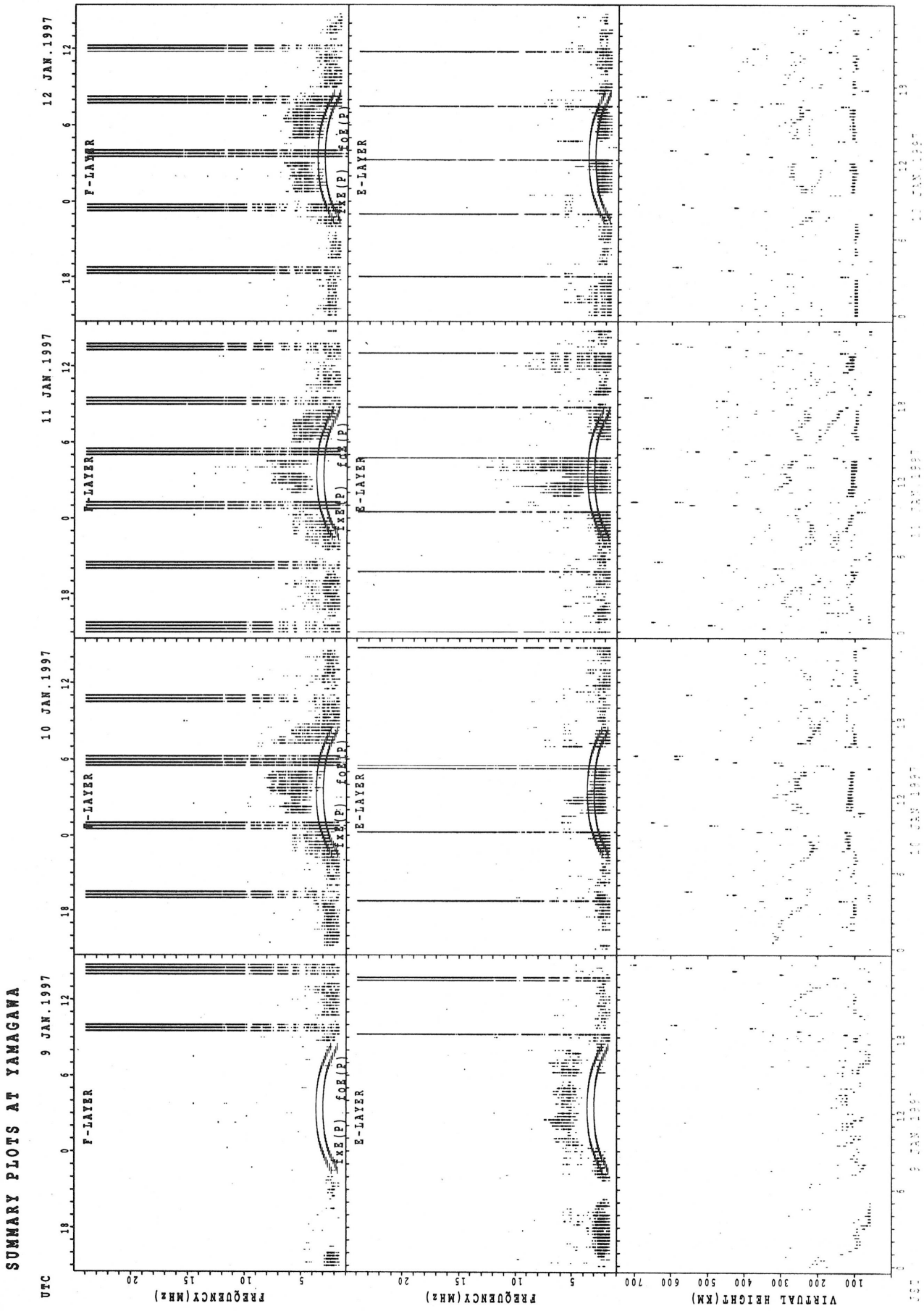

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
21 JAN.1997
22 JAN.1997
23 JAN.1997
24 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

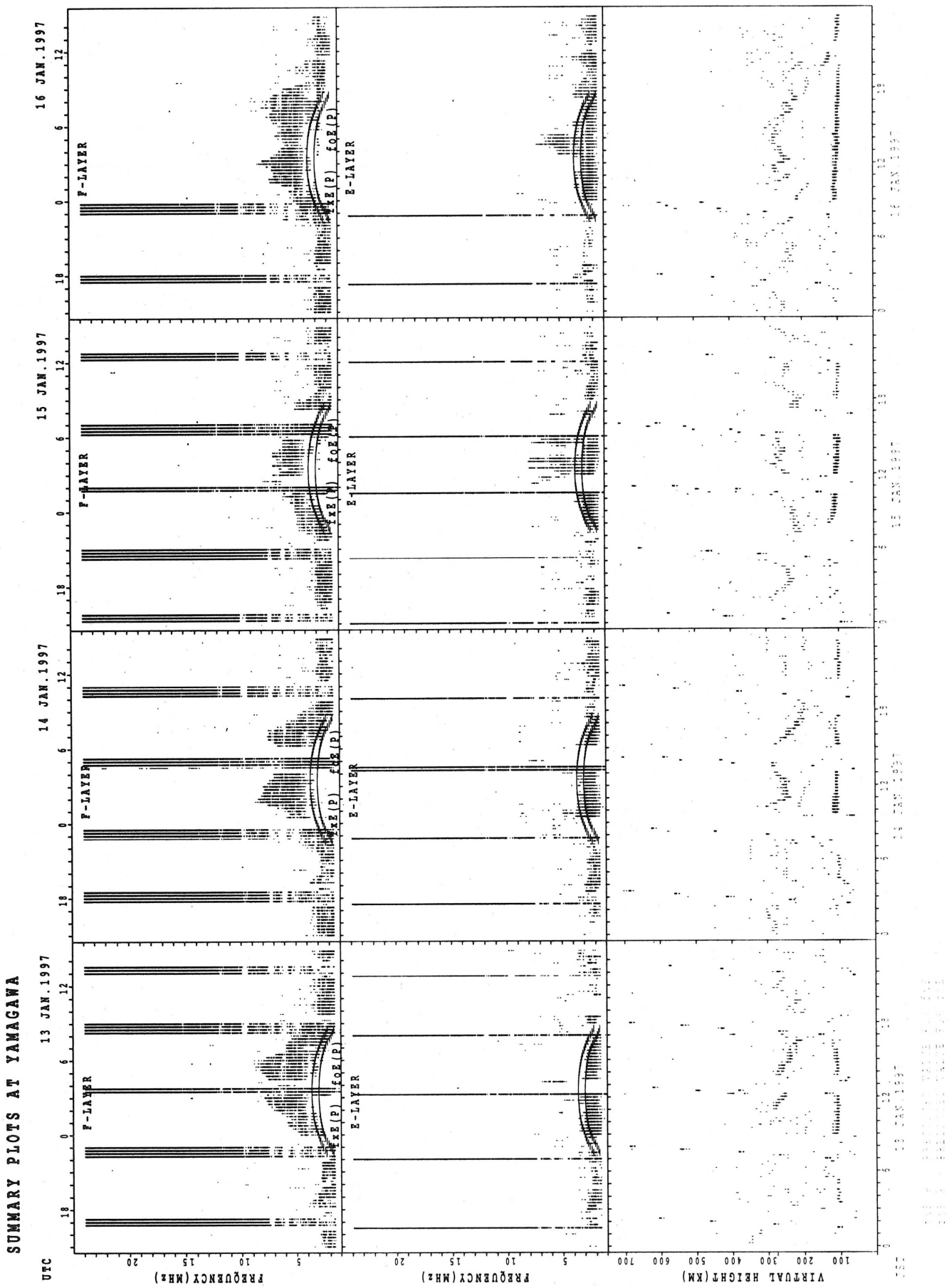

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
25 JAN.1997
26 JAN.1997
27 JAN.1997
28 JAN.1997
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)


SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
29 JAN.1997
30 JAN.1997
31 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

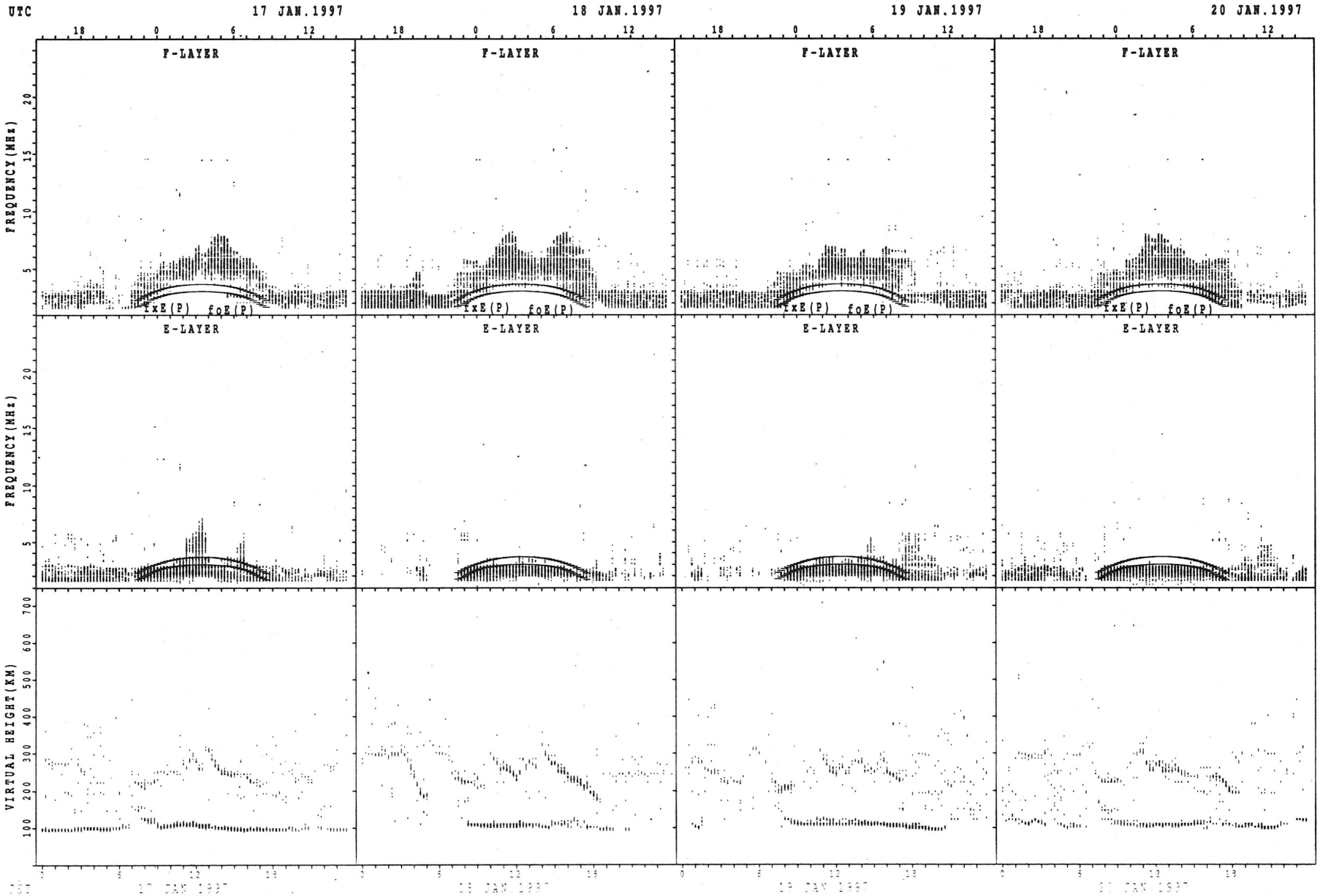

SUMMARY PLOTS AT YAMAGAWA
UTC
1 JAN.1997
2 JAN.1997
3 JAN.1997
4 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

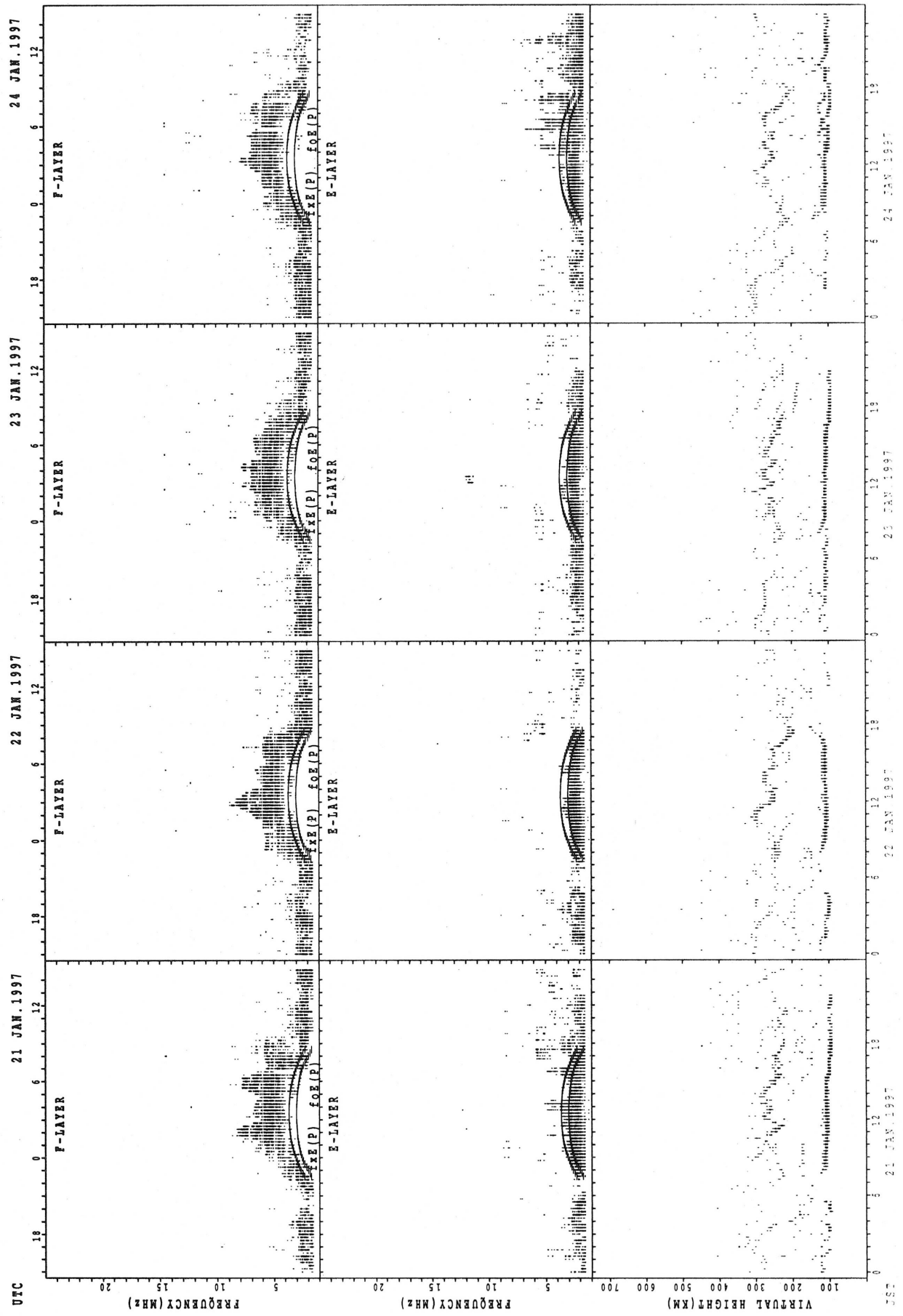

SUMMARY PLOTS AT YAMAGAWA
UTC
5 JAN.1997
6 JAN.1997
7 JAN.1997
8 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)


SUMMARY PLOTS AT YAMAGAWA
UTC
9 JAN.1997
10 JAN.1997
11 JAN.1997
12 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

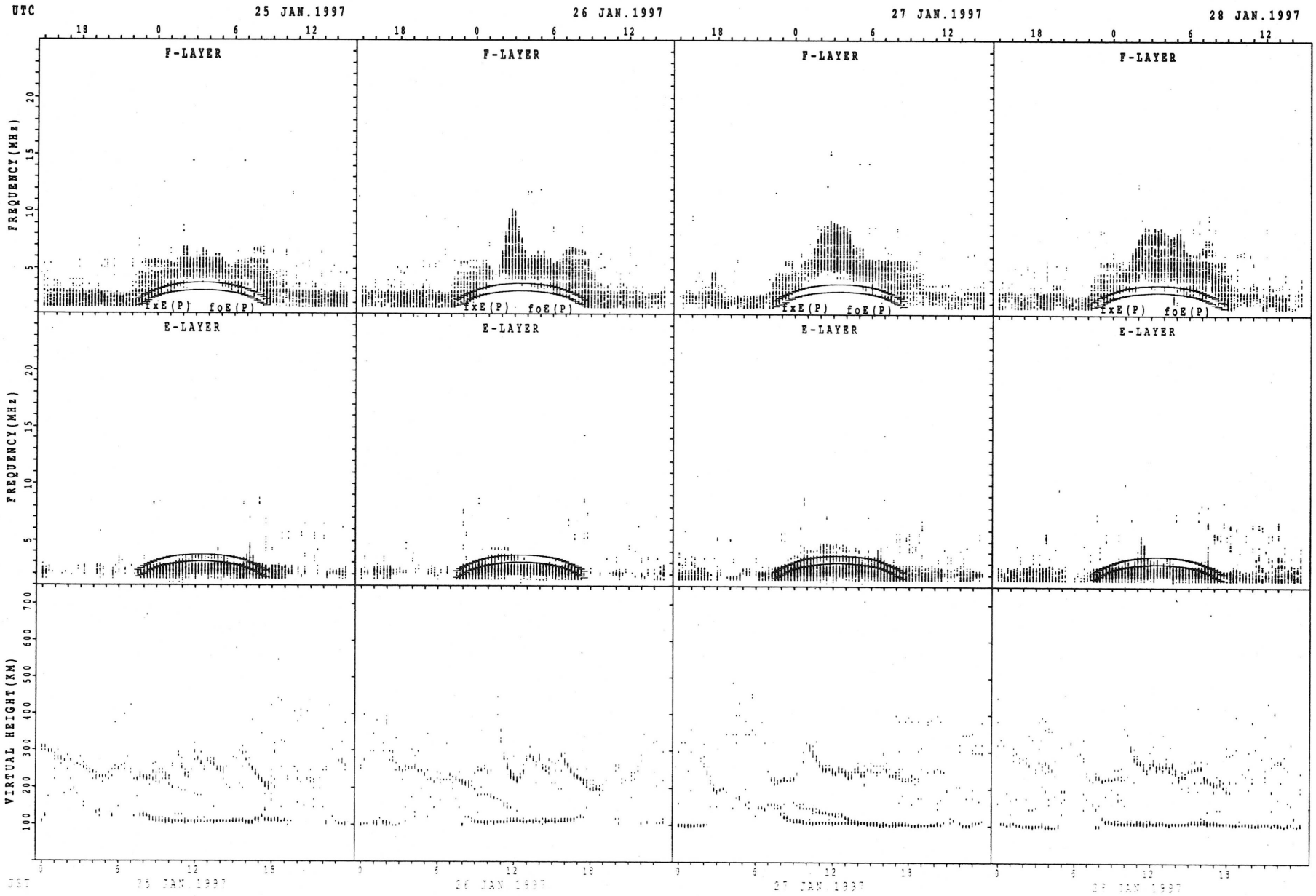

SUMMARY PLOTS AT YAMAGAWA
13 JAN.1997
14 JAN.1997
15 JAN.1997
16 JAN.1997
UTC
F-LAYER
E-LAYER
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
foE(P)
fxE(P)

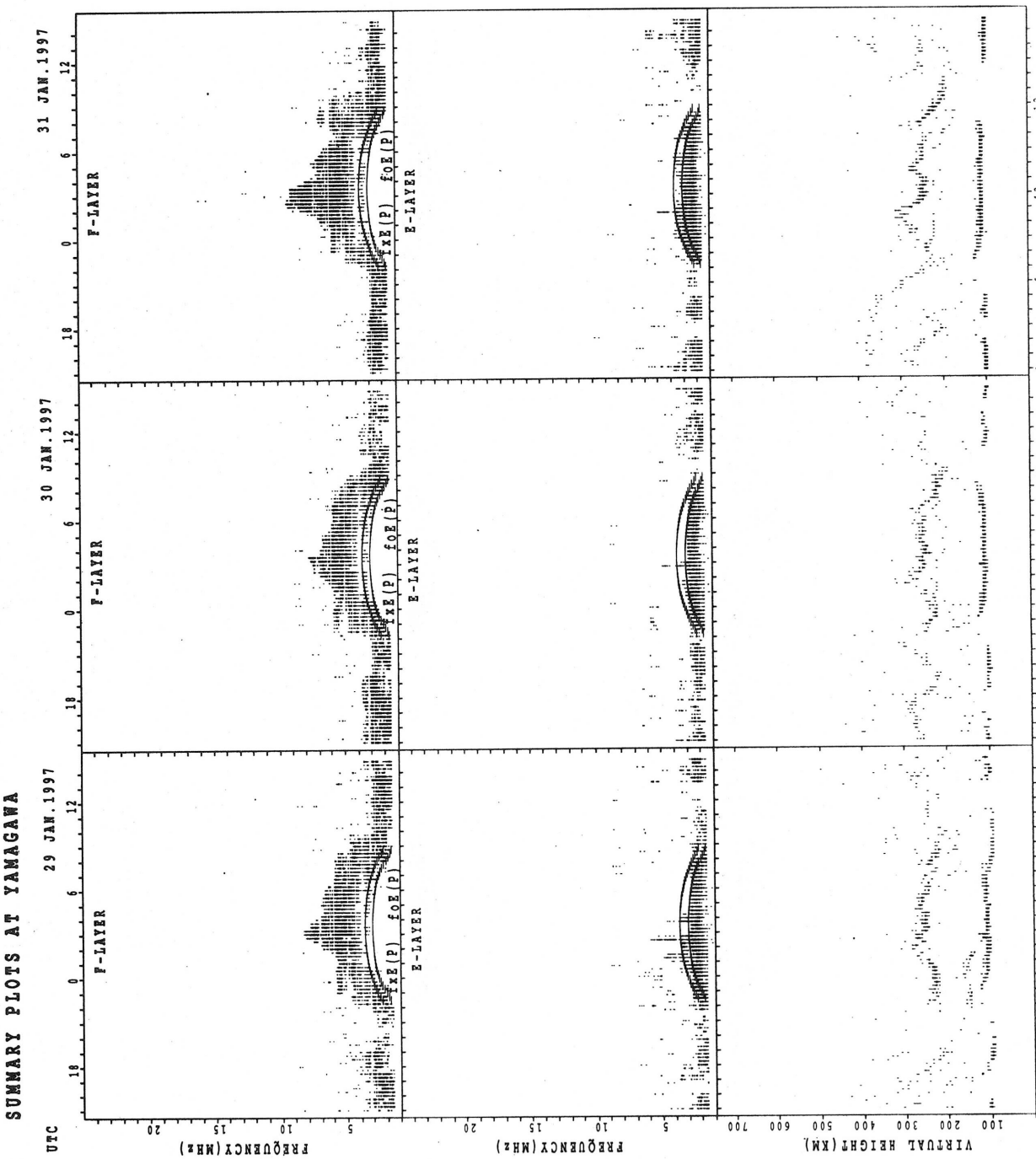
SUMMARY PLOTS AT YAMAGAWA



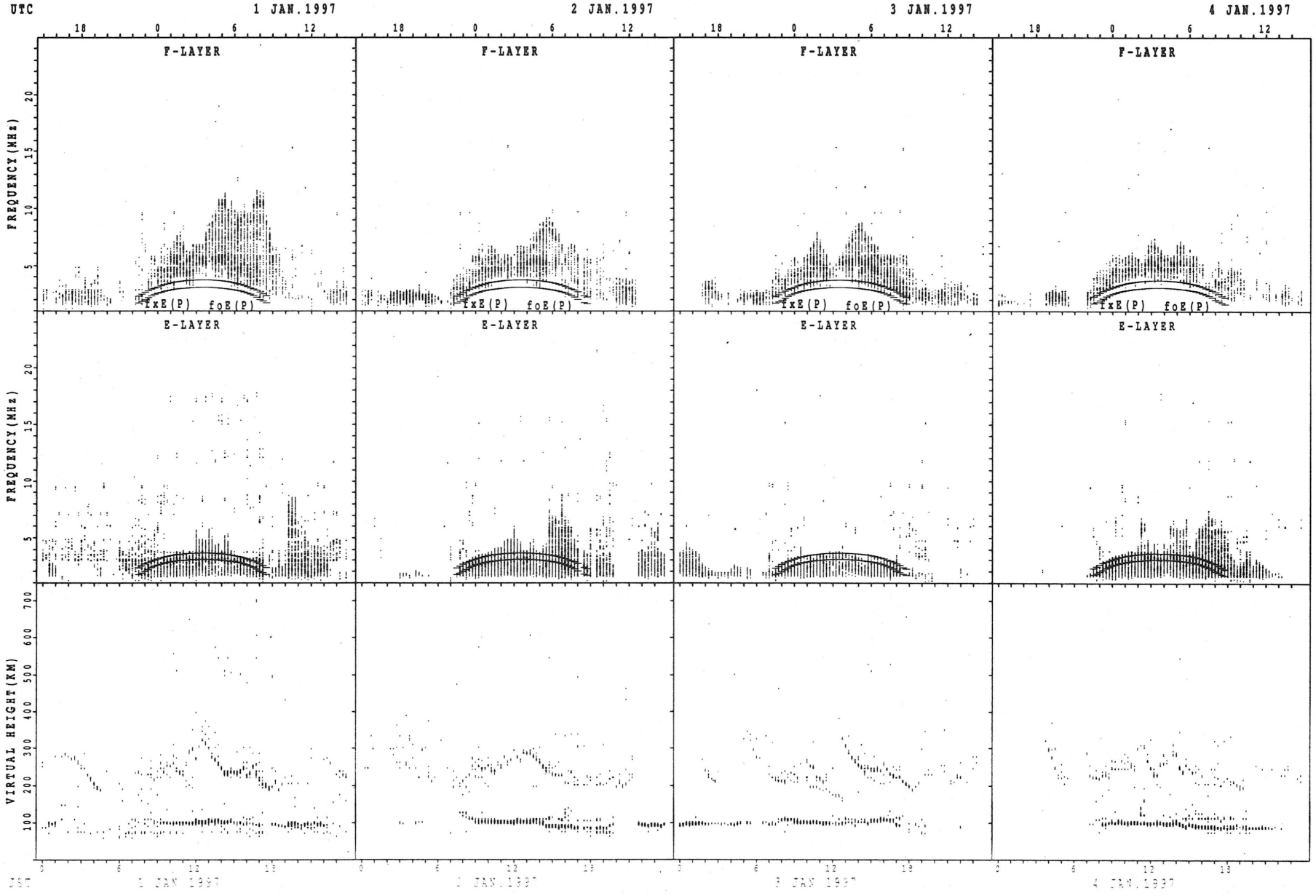

SUMMARY PLOTS AT YAMAGAWA
UTC
21 JAN.1997
22 JAN.1997
23 JAN.1997
24 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST

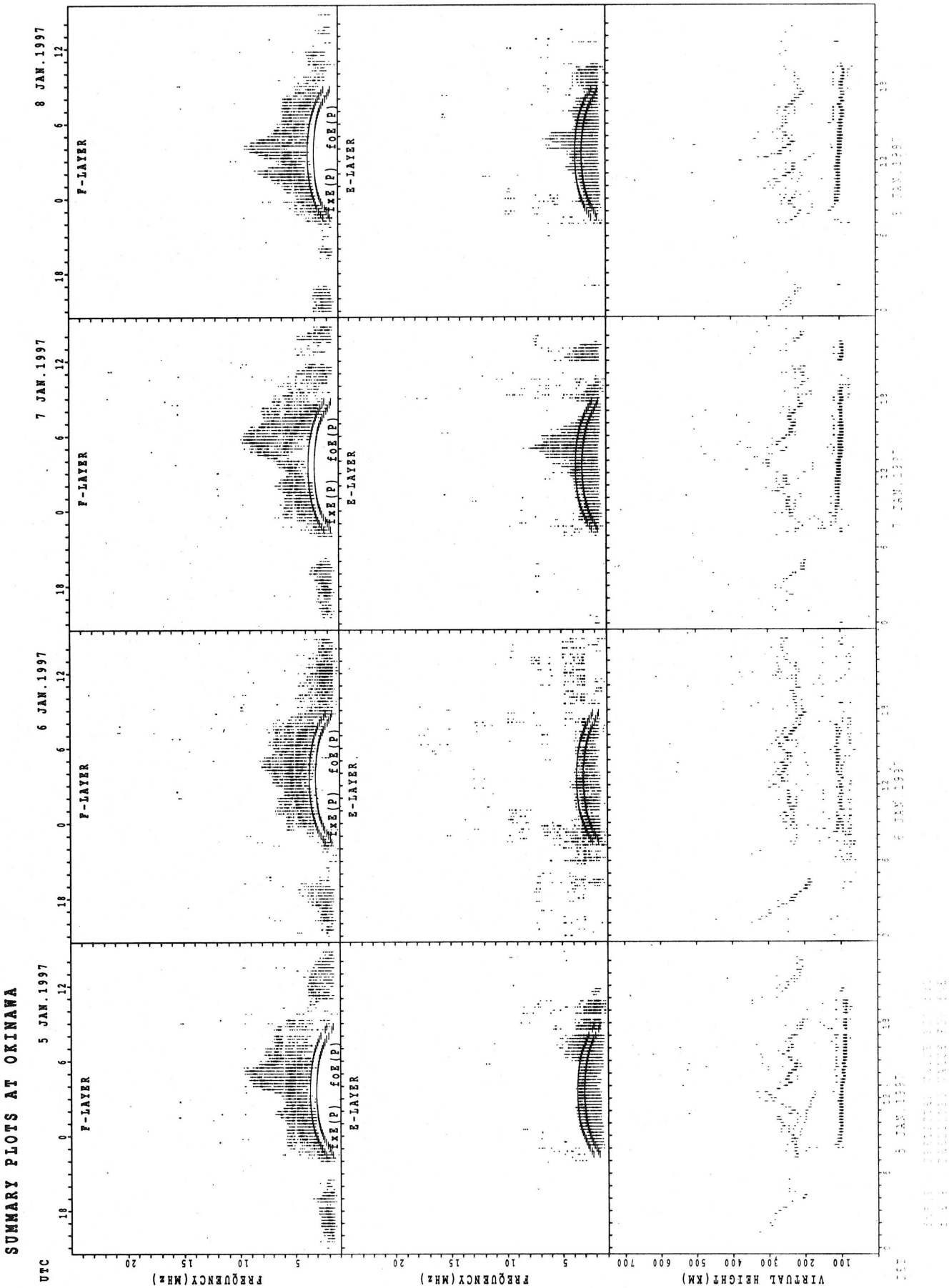
SUMMARY PLOTS AT YAMAGAWA



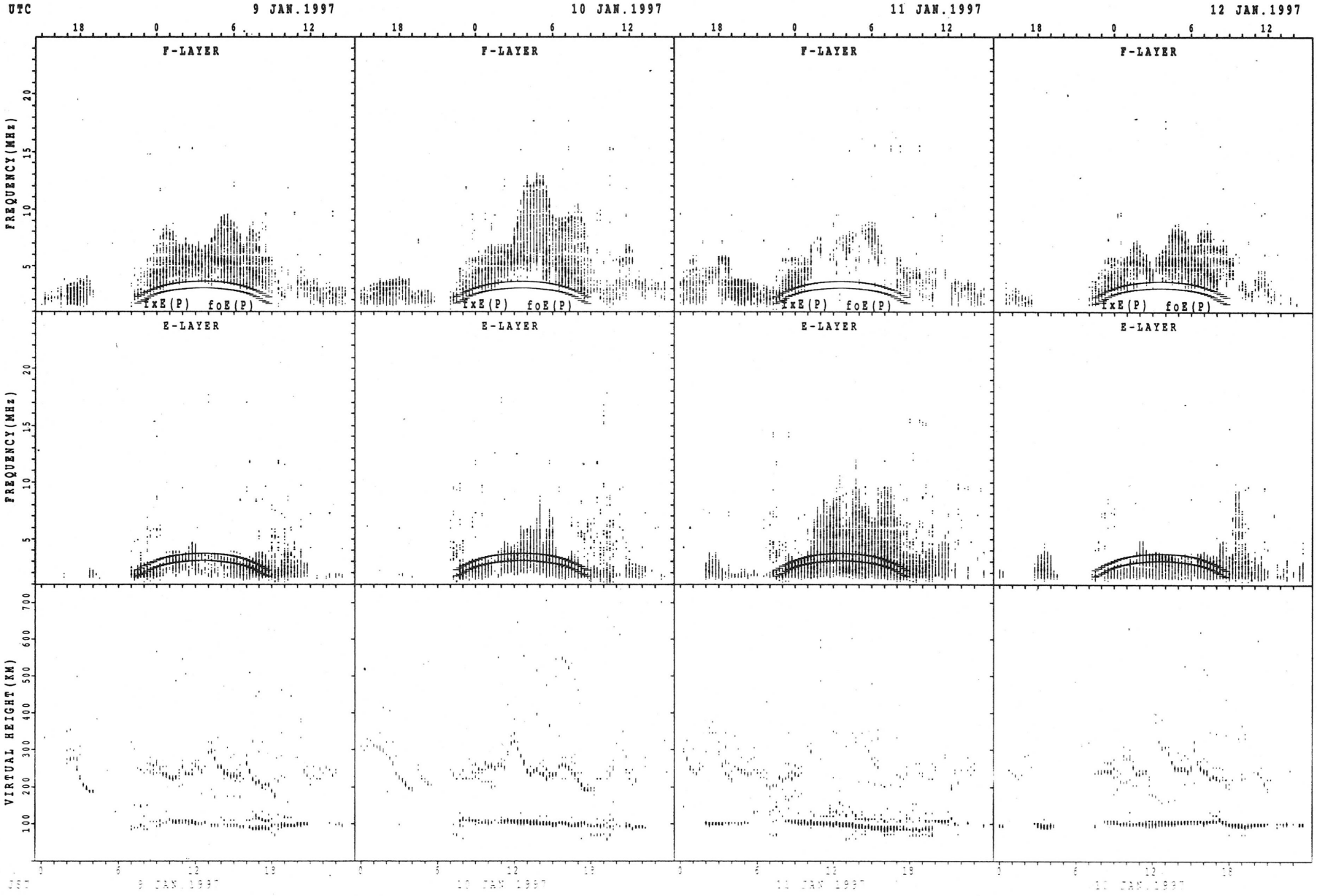

SUMMARY PLOTS AT YAMAGAWA
UTC
29 JAN.1997
30 JAN.1997
31 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

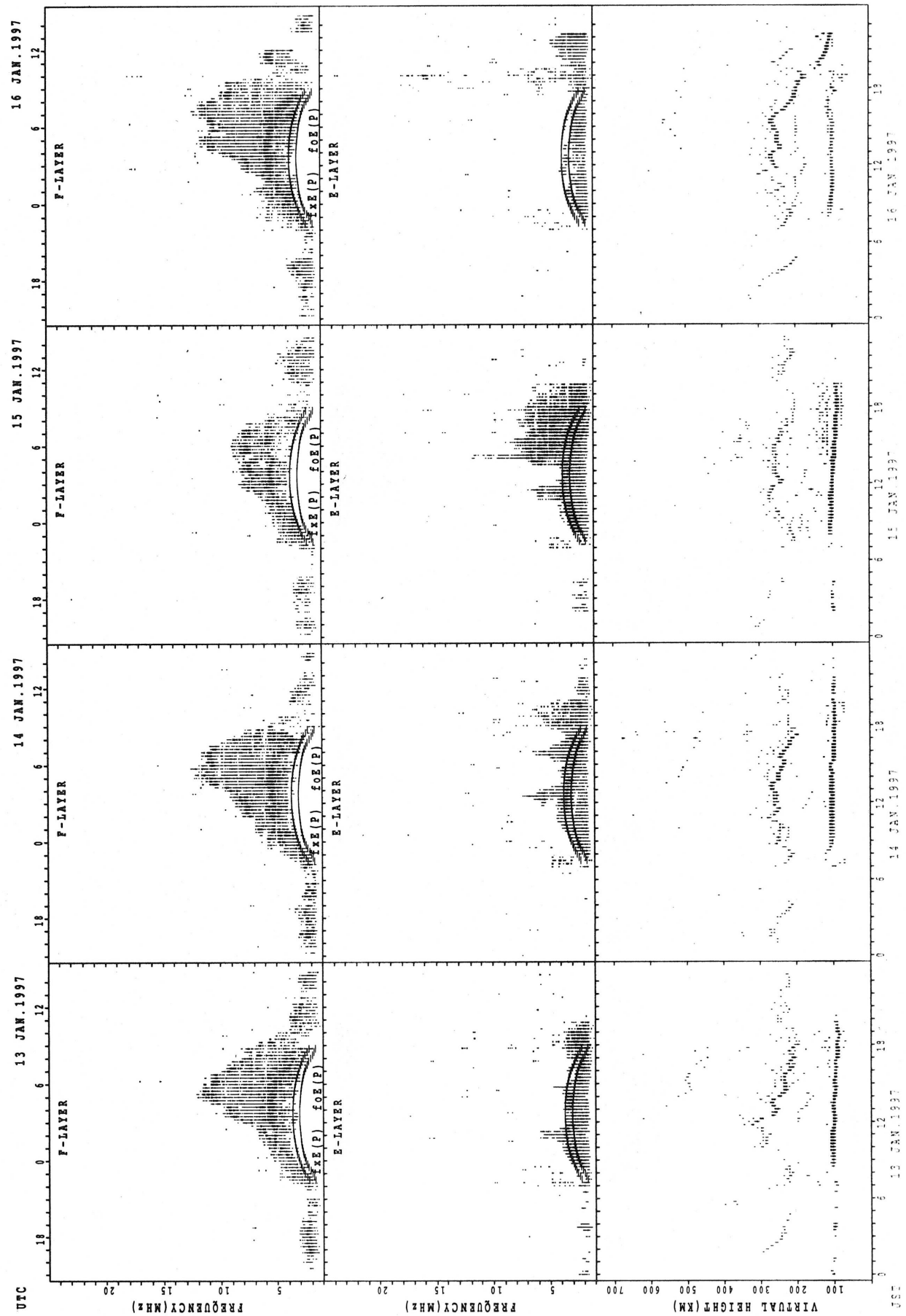
SUMMARY PLOTS AT OKINAWA



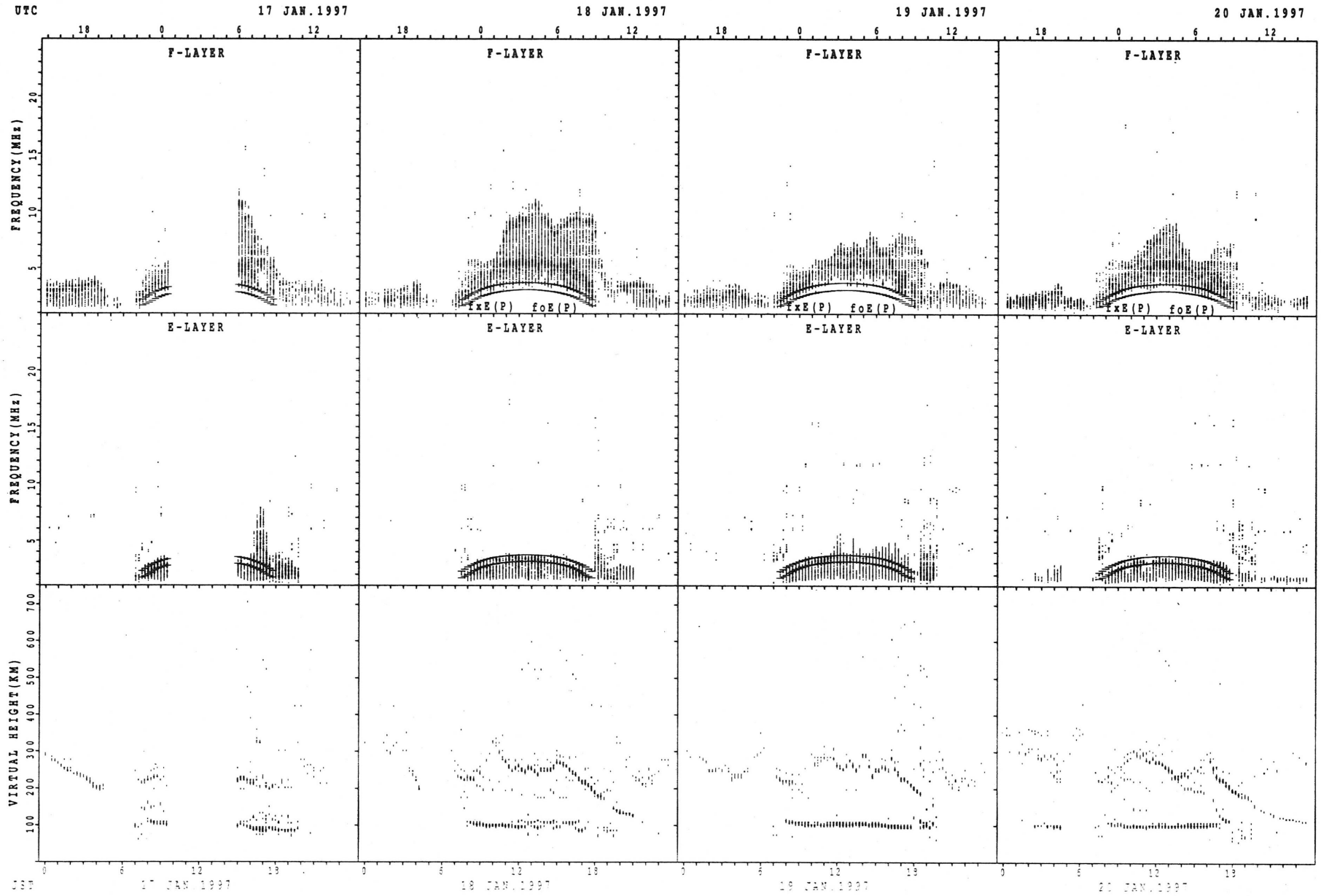

SUMMARY PLOTS AT OKINAWA
UTC
5 JAN.1997
6 JAN.1997
7 JAN.1997
8 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

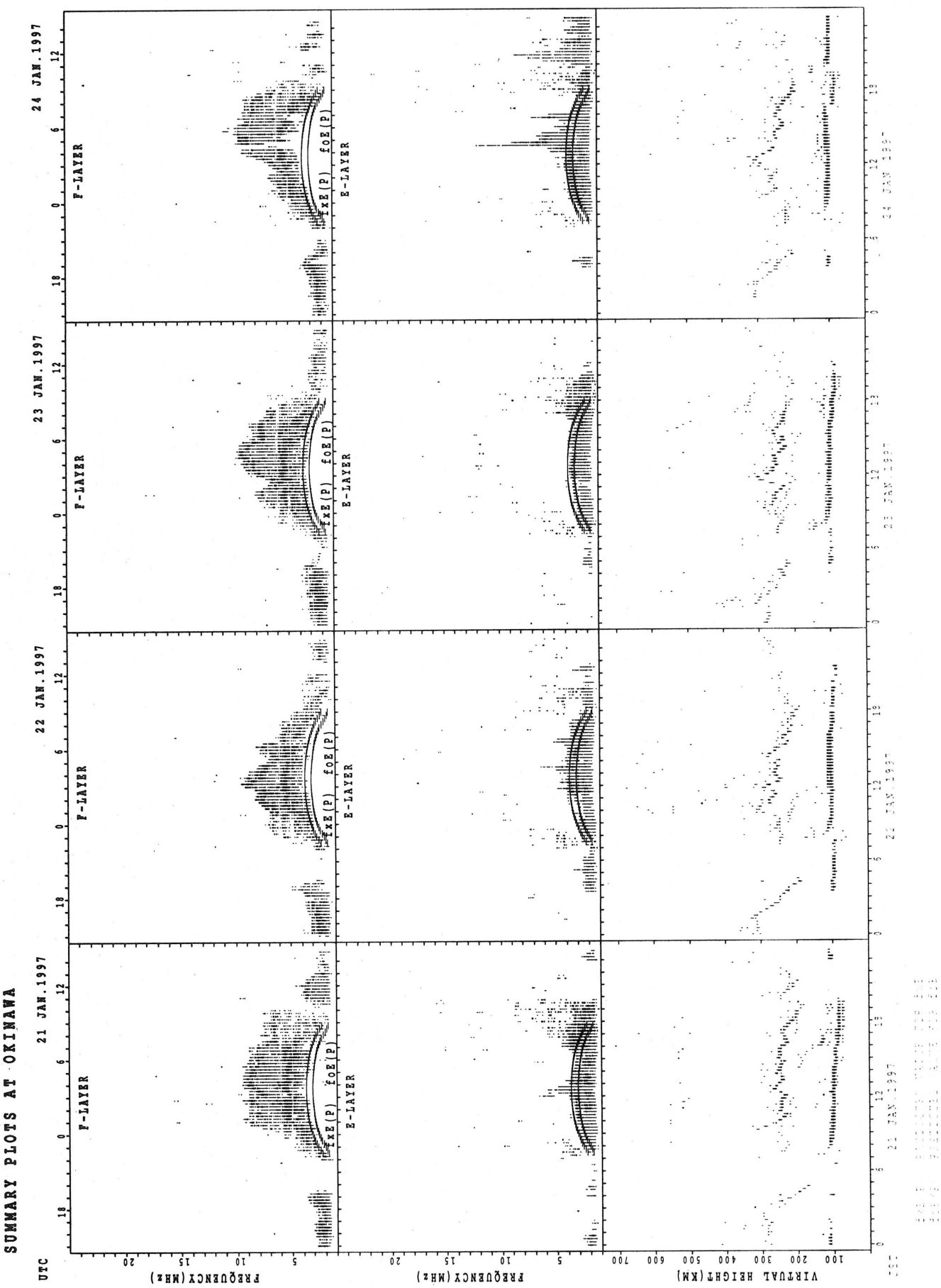
SUMMARY PLOTS AT OKINAWA



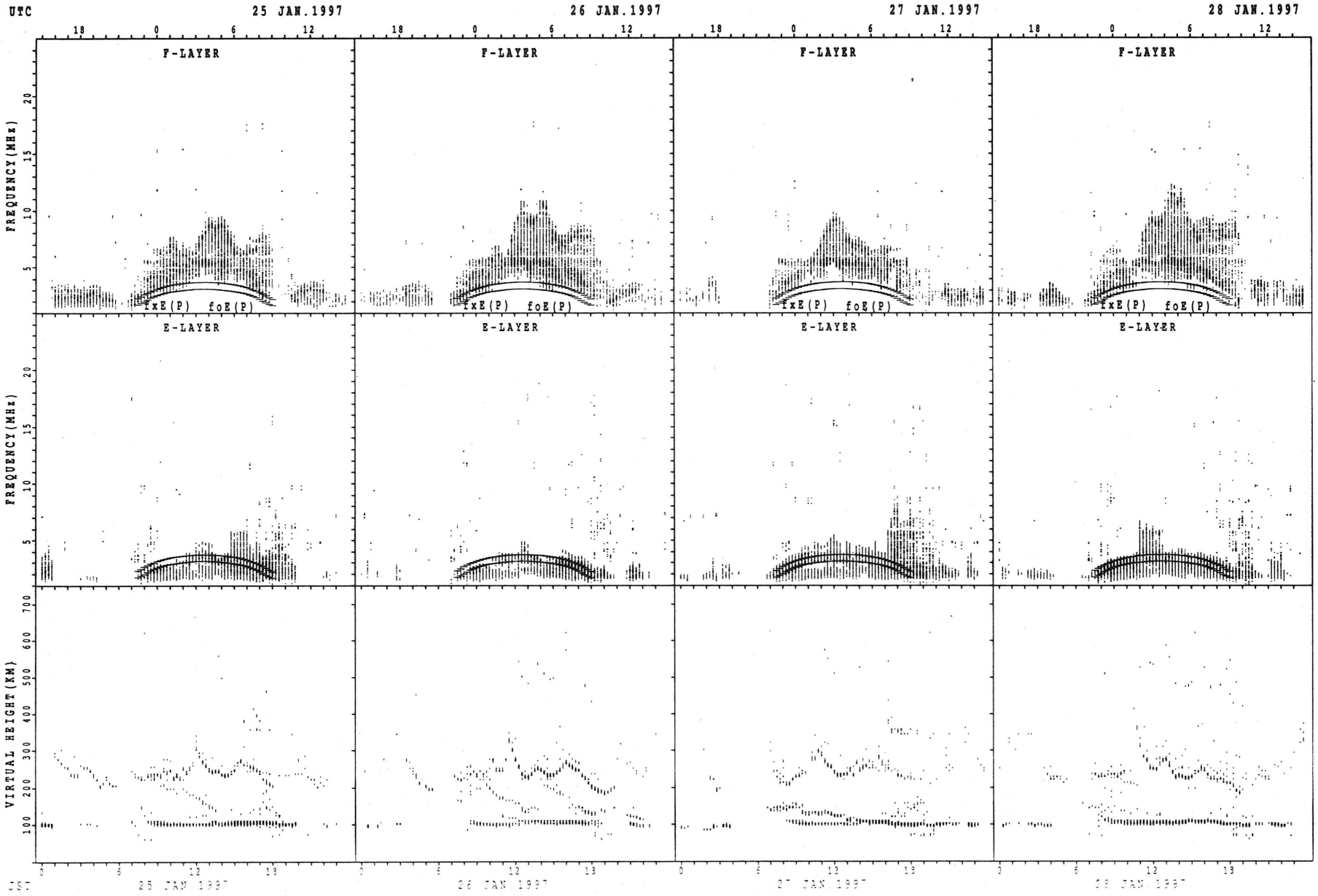

SUMMARY PLOTS AT OKINAWA
UTC
13 JAN.1997
14 JAN.1997
15 JAN.1997
16 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST

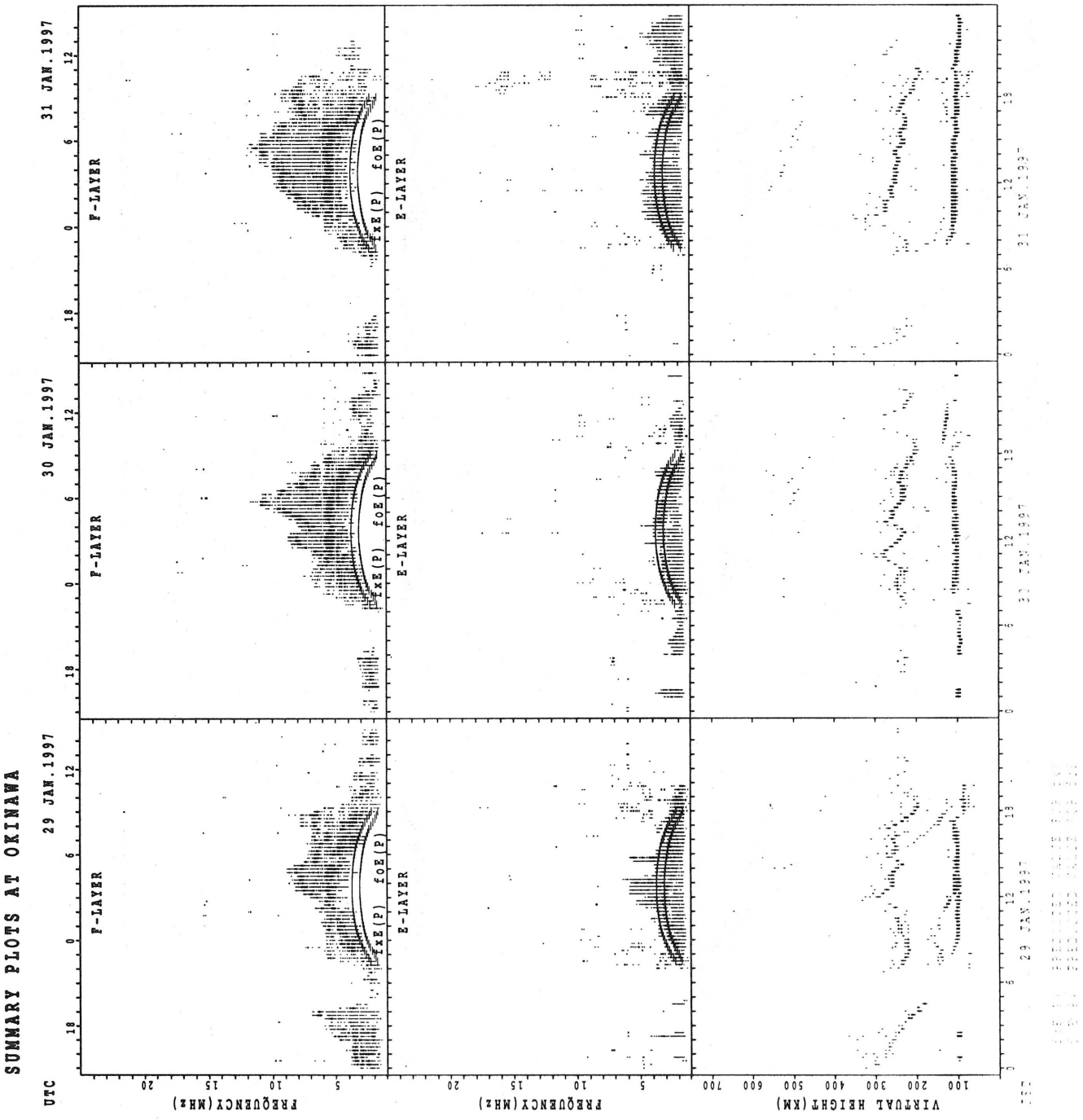
SUMMARY PLOTS AT OKINAWA




SUMMARY PLOTS AT OKINAWA
UTC
21 JAN.1997
22 JAN.1997
23 JAN.1997
24 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

SUMMARY PLOTS AT OKINAWA




SUMMARY PLOTS AT OKINAWA
UTC
29 JAN.1997
30 JAN.1997
31 JAN.1997
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)

MONTHLY MEDIANS OF h'F AND h'Es

JAN. 1997 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												18	13											
MED												256	246											
U Q												262	261											
L Q												242	236											

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		10			10				26	31	30	30	29	30	28	17	16	14	15	16	17	14	12	14
MED		101			107				122	119	113	113	113	118	118	115	105	108	109	105	103	103	106	103
U Q		105			113				137	153	139	123	119	137	128	127	111	111	113	107	106	103	107	105
L Q		97			105				111	107	105	109	111	111	114	111	97	103	103	103	98	99	101	99

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												24	18	15										
MED												260	254	256										
U Q												272	256	274										
L Q												244	242	248										

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			13						21	26	29	31	30	30	29	27	23	17	14	12			10	
MED			105						121	113	113	113	113	107	107	107	105	99	106	105			104	
U Q			107						131	131	125	127	115	111	119	113	121	107	109	107			105	
L Q			94						113	109	107	107	107	103	102	101	97	93	99	101			103	

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												18	22	19	15	10								
MED												278	252	256	254	256								
U Q												304	264	276	264	272								
L Q												254	246	248	248	242								

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	14	13	16	14	12	14	11		28	28	27	28	30	27	27	27	30	26	22	21	19	19	15	13
MED	104	109	105	105	106	106	105		131	113	113	113	113	113	111	111	108	113	104	101	107	105	109	109
U Q	113	120	119	113	108	123	107		158	116	155	128	119	125	119	137	113	121	113	109	109	127	113	116
L Q	103	106	103	103	100	105	105		120	112	109	107	111	111	109	109	103	99	97	97	99	103	105	103

MONTHLY MEDIANS OF h'F AND h'Es

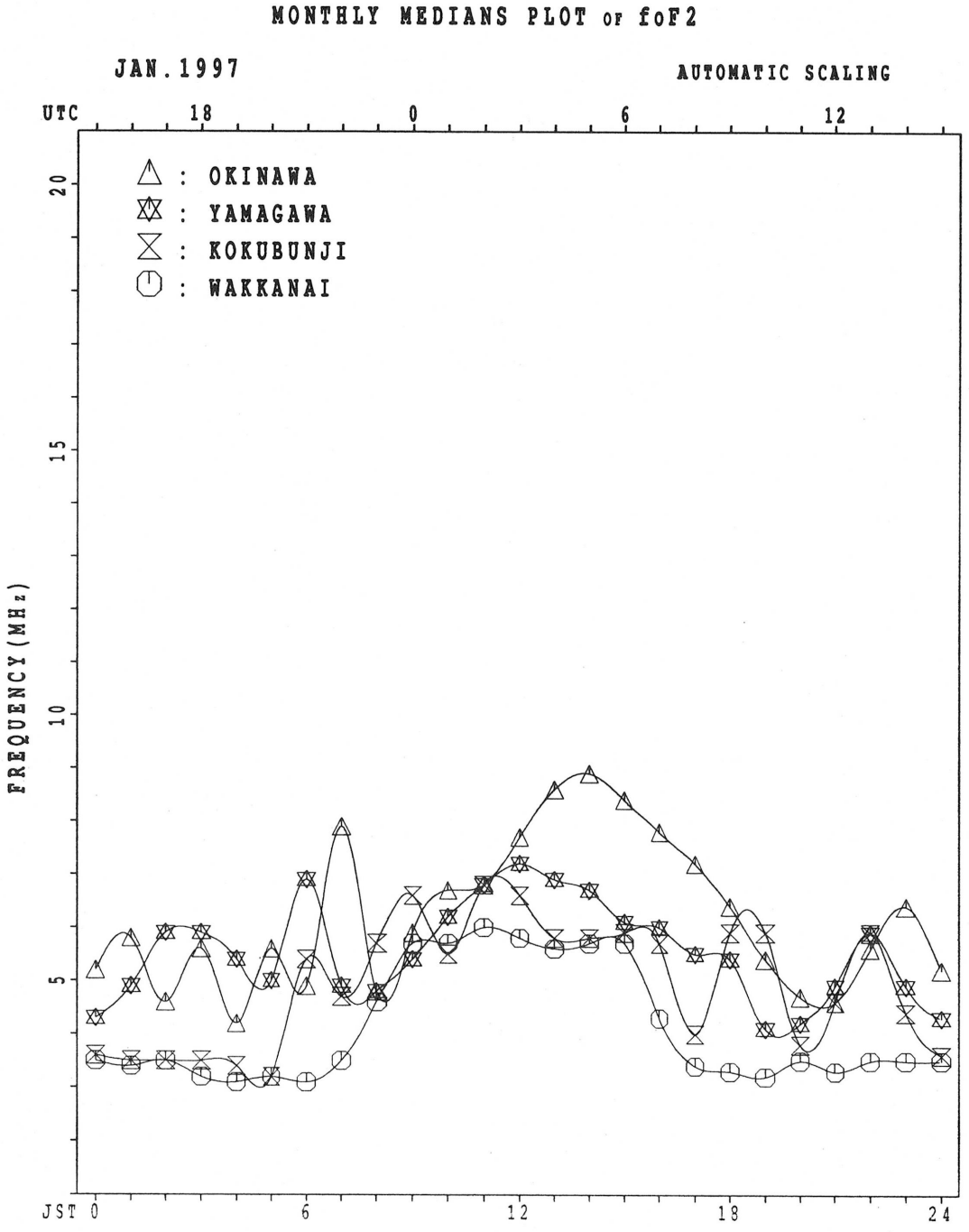
JAN. 1997 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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											14	21	23	25	29	27	23	21	11					
MED											259	258	270	256	248	240	248	234	228					
U Q											266	274	294	265	252	256	256	245	246					
L Q											246	242	248	250	245	232	232	220	216					

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									24	29	28	30	30	30	29	30	30	29	25	29	13	13		
MED									139	107	104	107	111	105	105	105	107	99	95	91	103	103		
U Q									153	128	113	119	125	113	111	111	113	107	104	105	112	119		
L Q									115	105	103	103	103	103	102	101	99	94	89	89	98	95		


MONTHLY MEDIANS PLOT OF foF2
JAN. 1997
AUTOMATIC SCALING
UTC
18
0
6
12
△ : OKINAWA
⛛ : YAMAGAWA
⧖ : KOKUBUNJI
⏀ : WAKKANAI
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JAN. 1997 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JAN. 1997 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L 308	L 416	L 420	420	L 408	U L 396	U L 356								
2											A	L	L 420	L 400	L									
3											L	L 452	L 404	L 404	L 392	L								
4									252	L	U L 404	L 420	408	408	L	U L 340								
5									256	308	L	404	420	412	U L 376	L								
6										L		L 412	L 420	U L 408	L 392	U L 356								
7										L		L 416	L 412	U L 436	L 412	U L 348	224							
8								L		L	404	L 416	L 408	L 416	L	U L 300	248							
9									276	L	424	416	L 416	L 420	L 380	L 352	L							
10											L	L 416	L 420	L 408	L	U L 324								
11											U L 440	416	L 416	U L 448	L 432	344								
12									L 264	L	L	L 412	L 420	L 416	L	U L 372	U L 260							
13											404	404	L 424	L 412	L 392	L 348	L 264							
14										L	L 428	420	L 420	L 420	U L 404	L 372								
15									280		L	416	U L 428	L 424	L 404	U L 356	U L 252							
16									U L 308	L 348	396	L 416	L 408	U L 416		U L 352								
17									L	L	404	412	L 412	U L 416	L 408	U L 376	U L 280							
18											404	L 416	L 444	420	L 432	L 380	U L 308							
19									268	L	L 420	L 416	L 416	U L 408	L 408	L	L							
20											L	L 412	L 416	L 416	L 352	L 360	U L 292							
21										L	408	416	420	412	L 404	U L 348								
22										U L 388	U L 404	384	420	L 408	396	360								
23										L	L 408	408	412	L 408	A	L								
24											U L 412	L 416	420	L 416	U L 400	U L 376	L	A						
25								U L 216	L	L 360	U L 420	412	420	L 400	L 372	L 380	L							
26									L 316	U L 368	U L 392	388	L 416	U L 412	L									
27									L	L	S 400	L 416	432	L 416	U L 408	U L 368	L 280							
28											L 440	L 420	416	L 416	384	U L 384								
29											L 404	L 416	420	L 432	L 408	L	L							
30									L	L	L 432	412	420	L 420	L 400	L	U L 284							
31									L	L	L 440	420	420	L 420	L 412	L	L							
	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	8	5	22	30	31	31	23	22	10							
MED								U L 216	272	L 360	L 408	L 416	L 420	L 416	L 400	U L 356	U L 272							
U Q									L 294	U L 378	L 424	L 416	L 420	L 420	L 408	U L 372	U L 284							
L Q									260	328	404	412	L 416	L 408	L 392	U L 348	252							

JAN. 1997 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B	H 228	260	292	292	300	288	268	A 232	A							
2								B	A	A	A	308	312	A	A	A	A							
3								160	224	A	288	304	304	288	272	232	180							
4								B	208	268	A	A	304	300	272	240	A							
5								A	A 216	268	288	304	308	300	280	228	172							
6								B	208	252	288	300	A	300	276	240	A							
7								A	224	280	304	304	A	300	272	244	188							
8								B	200	260	300	A	A	A	276	248	188							
9								A	212	268	292	300	308	292	280	A	B							
10								148	224	272	288	A	A	A	A	252	H 188							
11								156	240	276	296	308	R 308	300	280	240	176							
12								B	196	256	276	A	A	288	A 272	A	204							
13								156	220	A	A	308	A	A	A	244	A							
14								B	216	A	292	A	312	304	284	248	180							
15								B	212	268	A	A	308	296	A	244	A							
16								B	224	A	284	304	308	A	280	244	212	B						
17								160	232	A	A	R	A	A	A	252	A	B						
18								152	248	276	296	308	308	300	A	A	200	B						
19								B	232	272	A	304	A	A	A	A	204	B						
20								U S 164	H 240	268	296	308	308	300	280	A	A	B						
21								B	220	284	304	A	A	304	260	240	176	B						
22								176	A	A	A	A	308	R	276	244	196	B						
23								B	U S 216	252	288	308	308	300	276	244	U A 204	B						
24								A	224	280	300	A 308	A	300	280	256	A	B						
25								152	224	268	292	308	R 320	304	272	268	A	B						
26								176	228	264	296	312	316	304	284	268	208	B						
27								152	208	256	A	A	A	296	272	260	216	B						
28								160	228	280	300	312	308	300	276	A	A	B						
29								156	S 220	264	284	300	308	300	288	248	224	B						
30								156	224	256	U A 284	A	A	304	276	A	224	B						
31								B	A	A	A	A	A	A	276	260	A	B						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								14	28	23	22	19	18	22	24	23	18							
MED								156	224	268	292	308	308	300	276	244	198							
U Q								160	228	276	296	308	308	300	280	252	208							
L Q								152	214	260	288	304	308	296	272	240	180							

JAN. 1997 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 20	J A 18	20	E B 13	18	E B 14	19	18	G	29	32	J A 42	34	34	31	30	28	J A 22	20	J A 53	J A 45	31	28	J A 29
2	20	E S 17	E B 15	J A 20	19	E S 17	J A 53	J A 22	J A 48	J A 55	J A 43	36	G 31	31	30	J A 30	J A 26	21	18	J A 35	J A 23	E B 13	19	22
3	J A 22	J A 22	28	J A 22	18	E B 15	E B 12	20	24	31	G 28	G 26	G	G	30	J A 79	22	28	22	J A 20	J A 51	J A 46	J A 51	J A 27
4	J A 23	J A 29	J A 27	J A 23	E B 14	E B 14	E B 14	19	J A 24	28	J A 37	J A 42	J G 30	G 29	33	29	J A 42	J A 36	E B 14	E B 18	18	18	E B 14	E B 16
5	E B 12	E B 14	E B 13	E B 14	19	E B 14	E B 14	20	28	J A 28	G	G 27	G	G	G	25	25	J A 22	30	28	J A E B 21	13	J A E B 20	13
6	J A 24	J A 48	J A 44	J A 31	28	J A 21	20	E B 16	J A 26	29	34	34	J A 34	34	33	28	44	39	J A E B 20	13	E B 13	E B 14	J A E B 22	14
7	E B 15	E B 13	E B 14	17	E B 14	E B 14	20	J A 22	25	J G 27	J A 36	37	J A 36	G	G 23	G	G	J A 23	28	J A 21	21	21	25	29
8	J A 24	30	E B 15	21	E B 13	E B 13	18	18	G	G	32	J A 40	31	32	G 22	G	G	E B 14	E B 13	E B 14	E B 13	E B 13	E B 13	E B
9	E B 12	E B 14	E B J A 19	24	25	25	J A 52	26	J A 24	G 22	31	32	G 26	34	G J A	27	28	J A 24	J A J A 23	18	22	24	E B 15	16
10	E B 14	E B 14	E B 14	E B 15	18	20	E B 14	G	J A 24	G	G	33	33	J A 32	34	G	J A 21	J A 22	21	E B 14	E B 12	E B 14	J A 26	J A 28
11	E B 14	23	J A 29	24	E B 12	E B 14	20	21	G	32	37	G 30	G 27	G 20	28	G	G	E B 14	E B 13	E B 14	E B 13	E B J A 23	J A 54	J A 36
12	J A 33	J A 26	J A 20	19	E B 14	J A 26	J A 27	J A 18	G	33	31	J A 34	32	31	G 27	26	22	J A 98	J A 50	J A 22	J A 31	J A 27	J A 22	J A 19
13	22	20	19	19	E B 14	E B 13	E B 13	21	29	J A 34	J A 44	J A 32	J A 42	34	J A 39	J A 26	28	J A 22	E B 16	E B 14	E B 15	E B 13	E B 13	E B 13
14	E B 14	E B 14	28	E B 13	18	18	E B 14	E B 15	G	28	30	32	G 28	34	32	G	G	E B 15	E B 13	J A 22	E B 14	E B 14	E B J A 14	21
15	J A 22	20	20	E B 14	E B 12	E B 13	E B 14	E B 17	G	G J 25	J A 35	J A 36	34	J A 42	J A 43	G	20	E B 14	E B 14	18	E B 15	E B 14	E B 13	E B 15
16	E B 15	E B 14	E B 16	21	18	E B 14	E B 14	17	30	J A 30	G 27	36	G 30	32	30	J A 30	G J 20	A 24	32	J A 23	19	E B 15	E B 15	J A 20
17	J A 24	J A 25	24	J A 23	J A 22	J A 20	21	G	28	J A 32	J A 44	G 28	J A 38	32	31	G 21	J A 26	J A 31	J A 28	J A 20	16	E B 15	E B 16	E B 14
18	E B 15	E B 13	E B 13	17	E B 14	E B 14	20	G	J A 28	J A 33	G 29	28	G	J A 40	33	30	G J	A 20	27	23	E B 13	J A 22	E B 15	14
19	J A 20	E B 13	E B 15	E B 14	E B 13	E B 15	E B 14	E B 15	G	G J	A 35	33	32	32	30	26	G 20	E B 14	E B 14	E B 15	E B 14	E B 14	23	E B 14
20	E B 16	18	J A 23	26	E B 14	E B 13	E B J A 21	G	J G 20	32	34	37	36	35	31	30	23	37	35	J A 79	34	28	30	28
21	20	E B 12	E B 14	27	22	E B 13	E B 13	E B 16	26	J G 28	J A 38	J A 37	J A 36	J A 37	28	G	24	J A 22	26	23	20	E B 15	E B 15	E B 14
22	J A 19	19	E B 14	18	E B 14	E B 14	E B 14	G	27	32	33	34	G 31	G J 29	A 42	G	24	E B 16	E B 12	B J A 19	J A 21	18	E B 14	E B 14
23	18	E B 15	22	22	20	19	21	19	26	30	33	34	34	J A 46	J A 43	32	J A 30	J A 28	E B 14	E B 15	E B 14	18	E B 13	E B 13
24	E B 12	E B 14	28	27	21	J A E B 22	12	22	28	33	35	J A 46	J A 38	J A 32	33	33	J A 33	J A 58	J A 48	J A 52	J A 34	J A 22	E B 14	20
25	E B 13	E B 14	E B 14	E B 14	E B 15	E B 16	E B 15	G	G	G 20	G	G 23	G	32	33	J A 30	J A 50	E B 14	50	28	J A 22	J A 23	J A 28	J A 36
26	E B 13	E B 12	E B J A 33	19	E B 14	E B 14	E B 14	23	G	28	35	40	J A 41	J A 32	36	34	31	25	J A E B 26	E B 14	14	B J A 19	J A 20	E B 14
27	E B 14	E B 13	E B 13	E B 14	E B 14	18	19	G	28	34	36	33	J A 46	J A 33	33	G 24	G	E B 16	E B 14	E B 14	E B 13	E B 14	E B 14	18
28	25	J A 28	J A 29	26	20	E B 13	E B 14	G	G 23	33	34	J A 42	34	34	33	J A 28	J A 33	J A 70	J A 46	J A 68	J A 22	34	J A 33	24
29	E B 14	E B 15	E B 16	E B 13	E B 13	E B 14	E B 14	G	J A 29	30	32	33	34	G J 28	A 33	28	30	J A 25	E B 14	E B 12	E B 14	E B 13	18	E B 15
30	E B 13	E B 15	E B 12	E B 15	E B 14	E B 14	E B 14	G	G	J A 27	37	34	J A 33	G	29	26	G	E B 15	22	J A 22	E B 13	E B 14	E B 13	E B 13
31	24	20	J A 20	21	E B 14	E B 12	E B 14	E B 17	J A 26	J A 34	J A 54	33	J A 36	35	J A 28	27	28	J A 32	J A 24	J A 23	A E B 13	20	J A E B 22	13
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	18	E B 15	19	19	E B 14	E B 14	E B 14	G	24	30	34	34	33	32	31	27	24	J A 22	22	20	16	18	18	E B 16
U Q	J A 22	J A 22	J A 27	23	19	18	20	20	28	33	J A 37	J A 37	J A 36	34	J A 33	30	J A 30	J A 31	28	J A 23	J A 22	23	J A 25	J A 24
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G 31	G 32	G	G	G 28	G	G	E B 16	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14

JAN. 1997 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 12	E B 12	E B 14	E B 13	16	E B 14	E B 13	17	G	28	31	38	33	33	29	27	21	17	E B 13	A A 53	18	19	19	21
2	16	E S 17	E B 15	E B 15	E B 14	E B 17	S A 53	19	32	27	37	32	G 28	29	29	26	21	18	16	17	17	E B 13	17	17
3	17	18	18	E B 16	E B 14	E B 15	E B 12	17	23	28	G 22	G 21	G	G	28	26	20	E B 15	18	E B 14	19	23	17	16
4	18	18	17	E B 14	E B 14	E B 14	E B 14	E B 14	G 19	G 21	30	32	G 23	G 24	G 23	G 20	25	19	E B 14	E B 18	E B 13	17	E B 14	E B 16
5	E B 12	E B 14	E B 13	E B 14	16	E B 14	E B 14	16	G 18	G 21	G	G 24	G	G	G	G 21	G 14	18	A A 30	23	16	E B 13	13	E B 13
6	17	A A 48	20	19	16	17	15	E B 16	G 18	28	34	33	33	32	30	27	30	A A 39	18	E B 13	E B E B 13	E B 14	17	E B 14
7	E B 15	E B 13	E B 14	17	E B 14	E B 14	E B 14	17	25	G 22	G 24	34	31	G	G 22	G	G	18	18	18	16	E B 13	16	21
8	19	A A 30	E B 15	E B 13	E B 13	E B 13	E B 12	16	G	G	32	34	30	30	G 22	G	G	E B 14	E B 13	E B 14	E B 13	E B 13	E B 13	E B 13
9	E B 12	E B 14	E B 14	15	E B 13	17	A A 52	18	G 17	G 20	30	31	G 22	G 23	G	24	20	21	20	E B 14	E B E B 12	E B 13	E B 15	16
10	E B 14	E B 14	E B 14	E B 15	E B 14	18	E B 14	G	G 19	G	G	31	30	32	28	G	G 16	E B 15	E B 14	E B 14	E B 12	E B 14	E B 13	21
11	E B 14	E B 13	18	17	E B 12	E B 14	E B 14	18	G	31	34	G 26	G 26	G 19	G 23	G	G	E B 14	E B 13	E B 14	E B 13	17	A A 54	22
12	27	18	E B 14	E B 14	E B 14	16	16	E B 14	G	30	29	32	30	30	G 26	24	22	32	20	E B 14	E B 14	22	16	16
13	17	16	16	18	E B 14	E B 13	E B 13	20	25	28	27	G 25	33	31	30	G 18	21	18	E B 16	E B 14	E B E B 15	E B 13	E B 13	E B 13
14	E B 14	E B 14	16	E B 13	E B 13	E B 13	E B 14	E B 15	G	26	G 23	31	G 24	34	31	G	G	E B 15	E B 13	16	E B 14	E B 14	E B 14	18
15	18	E B 14	17	E B 14	E B 12	E B 13	E B 14	E B 17	G	G 22	32	32	34	G 22	30	G	19	E B 14	E B 14	17	E B 15	E B 14	E B 13	E B 15
16	E B 15	E B 14	E B 16	E B 14	E B 13	E B 14	E B 14	16	G 20	29	G 25	34	G 27	32	G 19	G 19	G	18	22	18	17	E B E B 15	E B 15	E B 14
17	12	17	16	18	18	17	17	G	26	27	29	U G 28	33	32	30	G 19	22	21	23	E B 14	E B E B 13	E B 15	E B 16	E B 14
18	E B 15	E B 13	E B 13	15	E B 14	E B 14	E B 15	G	G 22	G 22	G 22	G 25	G	G 24	31	27	G	E B 16	18	17	E B 13	17	E B 15	E B 14
19	E B 13	E B 13	E B 15	E B 14	E B 13	E B 15	E B 14	E B 15	G	G	32	32	32	31	29	25	G 17	E B 14	E B 14	E B 15	E B E B 14	E B 14	17	E B 14
20	E B 16	E B 14	16	E B 14	E B 14	E B 13	E B 15	G	G 16	30	32	34	34	33	30	27	21	35	26	A A 79	29	18	18	18
21	17	E B 12	E B 14	17	18	E B 13	E B 13	E B 16	24	G 26	32	32	33	G 26	G 22	G	G	E B 17	18	20	17	E B 15	E B 15	E B 14
22	E B 16	17	E B 14	E B 16	E B 14	E B 14	E B 14	G	26	29	30	32	G U 27	G 28	34	G	24	E B 16	E B 12	17	17	E B 12	E B 14	E B 14
23	E B 14	E B 15	E B 15	E B 13	16	E B 13	E B 16	E B 14	24	28	31	34	33	G 26	39	30	26	21	E B 14	E B E B 15	E B 14	16	E B 13	E B 13
24	E B 12	E B 14	18	E B 14	E B 14	16	E B 12	20	26	31	34	G 29	34	G 25	32	30	23	A A 58	18	20	E B E B 14	E B 14	E B 14	E B 14
25	E B 13	E B 14	E B 14	E B 14	E B 15	E B 16	E B 15	G	G	G 17	G	G 22	G	32	32	29	19	E B 14	A A 50	18	18	17	12	18
26	E B 13	E B 12	17	E B 15	E B 14	E B 14	E B 14	G	G	28	34	36	G 23	G 25	34	33	28	E B 14	E B 20	E B 14	E B E B 14	16	E B 13	E B 14
27	E B 14	E B 13	E B 13	E B 14	E B 14	15	17	G	25	31	30	30	34	G 24	G 22	G 21	G	E B 16	E B 14	E B 14	E B E B 13	E B 14	E B 14	E B 14
28	E B 14	23	17	18	E B 13	E B 13	E B 14	G	G	31	33	34	U Y 32	33	30	27	26	33	19	A A E B 68	14	19	16	E B 14
29	E B 14	E B 15	E B 16	E B 13	E B 13	E B 14	E B 14	G	25	U Y 30	31	33	33	G 27	G 22	27	G 19	20	E B 14	E B 12	E B E B 14	E B 13	E B 14	E B 15
30	E B 13	E B 15	E B 12	E B 15	E B 14	E B 14	E B 14	G	G	27	30	31	32	G	G 24	26	G	E B 15	16	17	E B E B 13	E B 14	E B 13	E B 13
31	16	E B 14	E B 13	E B 13	E B 14	E B 12	E B 14	E B 17	22	27	34	32	33	31	G 25	G 22	23	21	E B 16	17	E B 13	17	E B 15	E B 13
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14	G	G	27	30	32	31	G	29	24	20	18	16	16	E B 14	E B 14	E B 15	E B 14
U Q	17	17	17	16	14	16	15	17	25	29	32	34	33	32	30	27	23	21	20	18	17	17	16	17
L Q	E B 13	E B 13	E B 14	E B 14	E B 13	E B 13	E B 14	G	G 22	G 26	G	G 29	G 28	G 25	G 23	G	G	E B 15	E B 14	E B 14	E B E B 13	E B 13	E B 13	E B 14

JAN. 1997 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

JAN. 1997 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F 305	F 328	338	358	F 311	F 331	362	369	R 354	350	325	354	359	372	364	357	386	R 362	347	A	352	333	F 300	F 342
2	F U 302	S 291	F 339	F 375	372	F 332	A	373	360	373	346	360	368	372	378	342	371	365	364	348	366	348	R 352	F 293
3	F 289	332	317	F 317	F 312	355	359	R 371	349	365	368	321	362	360	362	358	365	383	327	303	F 320	305	323	363
4	F 337	F 336	F 322	F 329	F 375	367	F 365	381	377	F 361	331	335	355	345	373	359	385	350	346	350	352	367	301	327
5	353	338	354	360	347	336	336	388	R 381	372	338	335	354	373	352	351	371	388	A	311	F 343	374	307	318
6	F 310	A	F 321	F 329	F 345	F 326	332	373	377	367	326	340	351	381	352	362	363	A	366	306	352	349	U 344	R 288
7	F 307	F 311	F 338	F 336	F 361	369	302	377	R 379	R 376	369	331	362	325	343	361	389	354	335	366	343	F 316	F 294	312
8	315	A	337	333	309	F 303	F 293	395	402	370	330	364	364	362	367	347	369	349	353	341	404	333	319	F 318
9	F 275	F 307	F 331	355	406	309	A	364	364	347	339	330	343	358	327	374	370	360	330	340	328	372	319	307
10	290	307	306	328	388	H 387	317	375	377	383	371	336	350	358	364	335	369	379	340	350	315	362	271	285
11	273	349	308	302	353	308	340	386	392	338	322	326	343	339	R 358	363	350	345	336	341	317	318	A	299
12	321	324	367	328	317	309	343	363	381	383	334	363	353	362	349	352	368	365	332	328	339	350	321	314
13	289	295	306	337	379		338	369	368	353	314	362	R 370	330	355	354	329	342	346	341	322	293	297	329
14	F 273	F 310	F 299	F 329	345	346	357	R 366	366	357	334	366	320	369	R 368	362	382	333	357	346	366	308	296	288
15	305	307	328	337	330	341	325	365	382	348	318	R 355	362	359	358	377	368	379	345	328	322	331	303	300
16	301	297	311	311	F 320	324	330	342	J R 357	343	354	365	326	365	335	362	364	353	327	361	333	342	281	283
17	314	302	297	334	368	289	339	377	354	354	330	339	330	366	R 338	360	384	365	332	333	R 333	322	F 317	F 296
18	F 306	F 315	F 340	337	374	319	328	355	361	363	340	360	336	J R 339	291	354	373	380	367	336	344	322	320	316
19	304	301	321	334	329	307	339	378	379	352	316	376	374	354	364	363	361	366	318	347	363	F 313	F 328	F 313
20	F 314	F 320	330	F 305	F 348	394	315	361	R 354	367	323	340	330	365	365	353	375	A 366	331	A	R	F 325	331	344
21	F 336	320	F 321	F 338	F 344	F 406	F 305	331	350	315	352	347	364	353	338	370	367	332	341	332	J R 344	327	327	F 302
22	315	319	310	317	340	329	334	354	J R 356	363	349	348	360	361	348	361	355	397	357	349	341	318	297	299
23	311	328	317	F 326	357	353	F 367	370	355	335	339	339	358	332	343	347	371	363	380	355	349	344	F 321	F 278
24	F 300	F 305	F 312	F 314	F 330	F 364	343	372	J R 368	358	337	361	333	355	351	349	370	A	384	325	339	365	300	303
25	325	334	330	321	341	337	351	366	J R 376	386	340	365	364	373	374	V 338	356	366	A	346	356	344	313	333
26	326	F 300	F 301	F 305	332	353	360	383	384	362	357	346	372	392	333	334	367	368	346	333	344	326	301	285
27	F 286	F 294	312	F 348	460	322	296	359	R 345	356	324	333	343	363	371	356	371	348	346	365	356	303	304	F 301
28	295	304	F 296	F 321	F 317	F 350	F 339	370	357	367	335	359	359	356	356	343	359	386	361	A	311	F 312	F 315	F 282
29	F 299	296	324	361	396	313	316	358	J R 374	336	375	346	R 353	361	347	359	380	345	335	347	374	322	330	312
30	F 307	F 313	F 304	F 374	F 370	F 329	F 315	374	368	355	336	351	356	367	369	348	369	365	357	313	F 336	F 311	F 305	F 298
31	320	316	351	370	346	310	315	376	359	364	346	338	360	382	344	354	363	354	361	303	316	336	303	311
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	29	31	31	31	30	29	31	31	31	31	31	31	31	31	31	31	29	29	28	30	31	30	31
MED	306	311	321	333	346	332	336	370	368	361	337	347	356	361	355	356	369	365	346	341	343	327	310	303
U Q	315	326	337	348	372	353	347	377	379	367	349	361	362	369	365	362	373	374	359	348	352	348	321	318
L Q	295	302	308	321	330	313	316	363	356	350	326	336	343	354	343	348	363	350	334	328	328	316	300	293

JAN. 1997 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L 365	A	378	L 384	U L 364	U L 377								
2											A	L	L 371	L 370	L									
3											L	L 364	L 391	L 372	L 359	L								
4									459	L	U L 381	L 369	368	374	L	U L 388								
5									441	422	L	379	350	377	U L 400	L								
6										L		L 395	L 375	H 383	L 359	U L 393								
7										L		H 372	L 382	U L 362	L 343	U L 371	412							
8								L		L	A 366	A 368	L 377	L 383	L	U L 420	399							
9									412	L		L 372	383	L 392	L 378	L 388	L 367	L						
10											L	L 373	L 378	L 375	L	U L 401								
11											U L 355	372	L 384	U L 353	L 361	370								
12									L 391	L	L	L 369	L 384	L 380	L	U L 352	U L 420							
13											381	375	L 369	L 374	L 363	L 389	L 408							
14										L	L 361	362	L 398	L 385	U L 371	L 368								
15									456		L	384	U L 387	L 386	L 373	U L 393	U L 401							
16									U L 380	L 420	389	L 374	L 408	U L 401		U L 408								
17									L	L	381	398	H 396	U L 385	L 359	U L 372	L							
18											381	L 382	L 359	392	L 359	L 361	L							
19									435	L	L 354	L 355	L 387	U L 398	L 385	L	L							
20											L	L 381	L 366	L 383	393	L 373	U L 393							
21										L	362	380	365	368	L 368	U L 376								
22										U L 375	U L 387	413	363	L 382	388	399								
23										L	L 364	375	368	L 368	A	L								
24											U L 387	L 375	373	L 364	U L 392	L	L	A						
25								U L 387	L	L 411	U L 383	392	384	L 394	L 408	L 375	L							
26									L 442	U L 377	U L 401	A 376	L 377	U L 387	L									
27									L	L	S 378	L 377	376	L 379	L	U L 386	L 414							
28											L 343	L 356	377	L 399	389	U L 375								
29											L 380	L 365	372	L 383	L 367	L	L							
30									L	L	L 348	381	376	L 367	L 373	L	U L 412							
31									L	L	L 340	358	387	L 379	L 367	L	L							
	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	8	5	22	29	31	31	22	21	8							
MED								U L 387	438	L 411	L 375	375	L 377	L 380	L 370	U L 376	L 410							
U Q									449	421	U L 381	382	L 387	L 385	L 388	U L 393	U L 413							
L Q									L 402	U L 376	L 361	L 368	369	L 372	L 361	L 370	U L 400							

JAN. 1997 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L 292	296	252	240	236	248	246								
2											262	248	238	242	232									
3											244	286	246	246	238	224								
4									212	228	L 296	268	242	254	232	232								
5									214	228	276	266	252	242	250	252								
6										L 256		260	272	248	262	224								
7										228		280	244	302	274	230	210							
8								214		242	304	242	244	248	232	236	220							
9									236	256	288	282	238	248	250	244	218							
10											240	270	254	248	246	248								
11											282	260	256	268	260	240								
12									220	222	234	242	264	250	260	248	220							
13											308	256	240	306	246	240	218							
14										238	280	244	270	232	232	248								
15									218		286	252	238	258	248	238	228							
16									202	234	266	240	258	230		234								
17									230	252	292	268	258	250	262	246	214							
18											274	252	292	314	400	248	224							
19									220	230	308	240	246	248	250	238	240							
20											L 276	270	276	246	254	244	222							
21										310	248	258	254	262	268	232								
22										234	254	268	256	254	272	246								
23										240	268	254	254	284	258	254								
24											272	254	294	244	258	262	230	A						
25								226	224	228	290	256	252	242	230	274	244							
26									218	244	260	260	236	234	272									
27									230	248	280	270	260	250	242	238	228							
28											284	254	256	254	242	256								
29											234	264	242	240	260	242	224							
30									222	234	280	264	256	244	236	246	226							
31									230	244	274	258	238	242	268	234	236							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	13	20	29	31	31	31	30	29	16							
MED								220	220	239	276	258	254	248	250	244	224							
U Q									230	250	289	268	258	254	262	248	229							
L Q									216	229	261	252	242	242	242	235	219							

JAN. 1997 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	282	288	234	240	266	278	246	224	228	220	236	A	214	218	H 210	220	210	220	230	A	236	E A 306	A 336	A 258
2	288	S 348	248	260	286	E S 334	A	212	232	212	A	252	238	204	210	232	222	206	226	260	218	220	228	312
3	A 324	304	A 316	274	296	232	222	216	230	226	H 206	206	188	188	186	208	228	208	304	290	252	E A 370	286	230
4	A 254	294	296	270	236	236	252	214	198	212	222	224	204	H 192	222	200	216	232	218	222	210	230	284	284
5	242	276	242	234	234	274	276	212	200	186	212	212	206	220	200	H 194	224	210	A	E A 318	230	214	282	266
6	334	A	A 332	258	230	244	230	216	222	208	232	220	196	H 180	A 248	210	222	A	232	270	218	234	A 302	E B 328
7	280	296	298	260	228	200	302	220	218	216	216	H 202	214	210	208	H 186	200	210	264	216	230	304	320	E A 370
8	312	A	276	236	B 316	332	324	226	204	H 184	218	E A 254	200	214	214	194	222	222	214	230	200	244	260	298
9	322	278	260	242	202	320	A	238	180	240	216	H 196	216	224	194	200	224	214	282	226	252	216	286	304
10	292	312	298	260	204	186	302	230	216	222	212	210	H 214	218	206	200	220	206	242	224	280	208	316	330
11	318	224	268	288	216	308	256	236	224	238	244	218	H 200	216	212	204	228	220	246	226	250	256	A	350
12	A 332	258	226	302	332	326	300	230	208	230	202	200	H 202	220	H 180	224	218	A 238	A 254	260	250	234	294	302
13	324	318	300	254	210	B 360	272	224	226	234	H 202	H 222	226	H 210	230	198	200	212	238	240	254	290	288	266
14	320	310	286	258	244	266	246	220	220	198	H 206	208	200	234	228	208	220	212	224	226	220	338	296	338
15	304	264	272	250	254	246	274	222	190	222	H 178	210	218	200	210	H 200	216	206	226	252	250	246	282	306
16	286	304	308	292	264	254	270	228	224	180	206	246	188	218	208	224	222	218	288	218	A 316	276	318	316
17	278	306	290	268	226	A 408	284	214	224	H 196	198	206	H 188	210	212	230	212	222	A 276	238	210	272	270	318
18	336	310	266	236	224	288	270	226	228	230	216	210	220	H 200	212	244	234	210	204	232	222	262	272	272
19	300	298	258	248	272	296	250	210	202	206	196	H 214	228	210	214	216	H 202	214	228	228	218	256	270	292
20	282	282	296	290	258	B 228	B 346	228	230	236	232	226	244	232	224	220	214	A	A 266	A	E A	A 306	252	254
21	266	320	292	260	204	B 232	324	248	228	H 192	244	210	232	222	204	H 182	234	216	240	244	216	240	276	284
22	288	292	302	276	248	270	264	240	240	238	210	186	240	226	220	204	226	194	218	232	232	294	302	306
23	292	284	266	258	224	244	226	214	234	222	234	234	222	A 234	A	242	224	218	212	236	222	260	374	B 326
24	326	306	280	264	220	232	234	228	236	234	220	232	210	H 188	220	E A 254	234	A	208	A	242	236	308	298
25	258	280	270	250	250	254	244	214	232	H 196	204	198	198	220	228	210	238	214	A	230	236	240	260	264
26	300	308	286	262	260	238	234	206	198	202	206	E A 256	242	228	232	244	232	218	A 260	224	226	276	320	340
27	344	322	280	192	180	332	306	228	210	244	234	H 200	212	226	226	210	206	232	218	212	208	304	314	284
28	304	E A 336	294	270	276	216	234	224	218	228	A 254	232	220	214	206	220	232	214	220	A	278	306	286	320
29	320	306	278	222	210	344	268	232	240	234	228	214	228	216	204	H 192	234	222	226	238	222	252	276	292
30	278	264	276	232	212	232	260	228	218	192	194	H 186	216	214	208	210	212	216	214	286	234	262	288	306
31	264	268	238	224	B 274	342	E B 344	222	224	246	A 228	216	218	206	192	204	232	226	210	A 282	266	258	296	290
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	29	31	31	31	31	29	31	31	31	30	30	31	31	30	31	31	28	29	27	30	31	30	31
MED	300	297	280	258	236	260	266	224	224	222	216	212	214	216	211	209	222	215	228	232	231	257	287	300
U Q	322	310	296	270	266	326	301	228	230	234	232	226	226	222	222	224	232	221	257	260	250	294	308	320
L Q	280	279	266	240	216	232	245	214	208	198	206	206	200	206	206	200	214	210	218	226	218	236	276	284

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B	128	122	A 130	A 128	124	124	A 132	128	A							
2								B	A	A	A	A 144	E A 168	A	A	A	A							
3								124	A 146	A	A 128	122	120	116	114	114	A 132							
4								B	A	E A 152	A	A	A 132	E A 148	126	A	A							
5								A	A	A 138	122	124	122	120	114	A	A							
6								B	E A 150	A 146	A 150	124	A	A 140	A 132	122	A							
7								A	A 136	A 140	A 138	A 136	A	120	120	124	124							
8								B	126	122	A 140	A	A	A	124	118	138							
9								A	A 144	124	118	120	114	A 126	122	A	B							
10								138	A 146	120	120	A	A	A	A	124	A							
11								E B 178	124	E A 158	A	A 138	126	120	A 130	120	E B 180							
12								B	120	116	116	A	A	120	A	A	A 142							
13								130	132	124	A	A 138	A	A	A	A 128	A							
14								B	126	A	A 138	A	A 136	116	140	126	120							
15								B	126	138	A	A	122	A 124	A	116	A							
16								B	E A 146	A	122	132	A 132	A	124	A 132	128	B						
17								156	124	A	A	A	A	A	A	122	A	B						
18								B	E A 156	A 146	A 140	A 130	120	A 126	A	A	122	B						
19								B	130	126	A	A 120	A	A	A	A	A	B						
20								156	146	128	A 134	A 134	A 134	A	A	116	A	B						
21								B	122	128	118	A	A	A 124	A 140	116	124	B						
22								162	A	A	A	A	E A 144	A	A 126	120	126	B						
23								B	128	E A 144	A 132	122	A 142	E A 140	112	116	120	B						
24								A	126	124	A 134	A	A	A 130	122	118	A	B						
25								114	124	120	118	120	112	116	116	116	A	B						
26								148	124	122	118	120	A 130	A 134	124	126	122	B						
27								174	124	E A 158	A	118	A	A 140	A 140	A 134	118	B						
28								150	128	124	116	116	114	116	116	A	A	B						
29								150	132	118	116	A 122	116	120	A 126	122	A 128	B						
30								B	126	118	118	A	A	120	128	A	126	B						
31								B	A	A	A	A	A	A	A 124	A 118	A	B						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								12	26	24	21	19	18	21	22	22	15							
MED								150	127	124	122	124	124	122	124	121	125							
U Q								159	A 144	E A 142	A 136	A 134	A 134	A 132	A 130	126	132							
L Q								134	124	122	118	120	120	120	120	116	122							

JAN. 1997 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	106	110	106	B	96	B	152	140	G	166	160	118	126	128	124	122	100	96	100	106	106	104	104	106
2	102	S	B	122	118	S	108	108	108	100	106	172	112	114	114	118	112	100	104	118	114	B	110	108
3	104	100	102	108	102	B	B	176	170	114	106	108	G	G	178	96	152	102	104	106	104	108	104	102
4	106	110	102	102	B	B	B	108	116	112	108	108	104	108	102	102	98	96	B	B	104	94	B	B
5	B	B	B	B	108	B	B	112	126	116	G	112	G	G	G	114	106	104	108	108	116	B	116	B
6	106	104	102	102	102	102	106	B	110	160	188	138	110	166	150	166	102	96	102	B	B	B	104	B
7	B	B	B	134	B	B	160	144	148	118	110	142	116	G	112	G	G	102	104	108	110	108	122	98
8	110	106	B	110	B	B	106	110	G	G	180	112	114	114	110	G	G	B	B	B	B	B	B	B
9	B	B	108	108	110	108	104	110	98	110	168	124	104	100	G	114	108	100	96	104	114	112	B	132
10	B	B	B	B	110	104	B	G	122	G	G	114	114	114	110	G	112	112	112	B	B	B	122	114
11	B	114	110	108	B	B	148	182	G	174	152	112	114	110	102	G	G	B	B	B	B	114	108	108
12	104	104	104	108	B	120	126	124	G	142	114	112	112	182	110	110	152	122	112	112	110	110	104	108
13	112	108	112	112	B	B	B	152	140	134	96	110	118	102	104	98	100	104	B	B	B	B	B	B
14	B	B	114	B	106	106	B	B	G	118	112	114	110	182	166	G	G	B	B	104	B	B	B	102
15	110	106	106	B	B	B	B	B	G	116	106	106	180	106	102	G	118	B	B	102	B	B	B	B
16	B	B	B	106	116	B	B	108	116	110	108	174	110	108	108	98	106	96	96	96	100	B	B	102
17	110	104	108	102	102	100	100	G	146	118	116	112	114	118	142	106	100	98	100	104	94	B	B	B
18	B	B	B	108	B	B	116	G	120	110	110	110	G	106	100	108	G	102	104	100	B	102	B	B
19	118	B	B	B	B	B	B	B	G	G	114	130	118	124	118	118	122	B	B	B	B	B	110	B
20	B	126	118	108	B	B	112	G	116	154	142	142	168	150	136	122	118	112	112	102	104	106	106	102
21	106	B	B	108	104	B	B	B	E 202	G 112	128	114	114	110	110	G	106	108	104	100	98	B	B	B
22	138	132	B	112	B	B	B	G	152	114	128	118	110	112	118	G	184	B	B	110	120	118	B	B
23	124	B	118	122	118	116	136	114	172	188	168	146	146	108	120	122	118	118	B	B	B	112	B	B
24	B	B	108	110	114	110	B	176	164	164	160	116	106	102	128	122	116	112	116	112	108	126	B	128
25	B	B	B	B	B	B	B	G	G	114	G	110	G	170	148	128	128	B	112	108	112	110	106	116
26	B	B	110	114	B	B	B	168	G	152	174	146	98	98	176	144	120	100	110	B	B	110	112	B
27	B	B	B	B	B	170	148	G	132	170	118	114	114	116	116	116	G	B	B	B	B	B	B	112
28	110	104	102	104	112	B	B	G	110	176	156	140	156	126	122	114	114	110	110	108	112	106	108	124
29	B	B	B	B	B	B	B	G	162	174	150	134	152	110	98	122	96	96	B	B	B	B	150	B
30	B	B	B	B	B	B	B	G	G	124	114	114	114	G	116	116	G	B	114	112	B	B	B	B
31	108	110	108	106	B	B	B	B	122	110	114	114	112	110	108	106	110	108	124	106	B	108	114	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	14	17	21	14	9	13	15	21	28	28	31	27	27	29	23	24	22	20	20	16	16	16	15
MED	109	107	108	108	109	108	116	124	124	118	117	114	114	112	116	116	112	102	106	106	109	109	109	108
U Q	111	110	111	112	114	118	148	168	157	162	158	138	118	126	132	122	119	110	112	109	113	112	115	116
L Q	106	104	103	106	102	103	106	110	116	113	110	112	110	108	108	106	104	98	103	103	104	106	105	102

JAN. 1997 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JAN. 1997 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

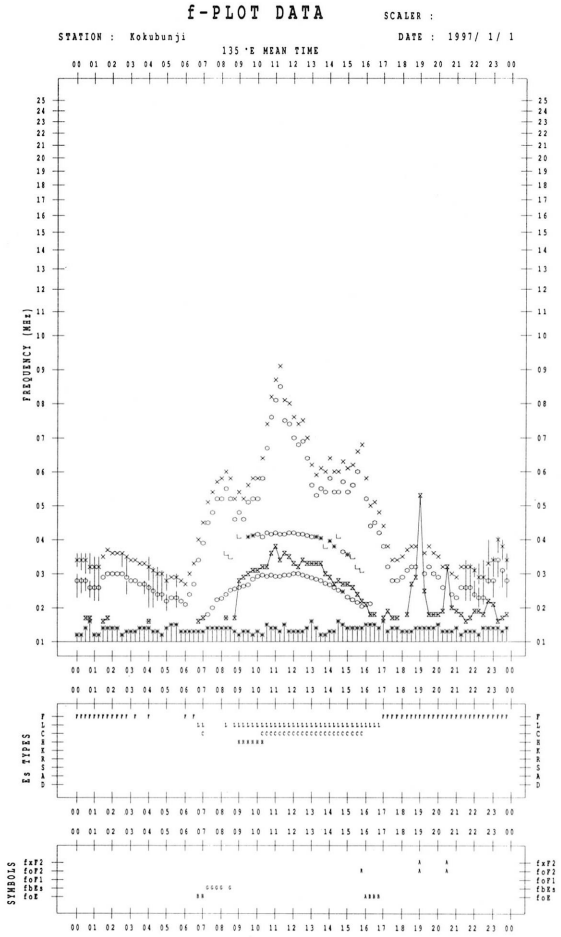
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

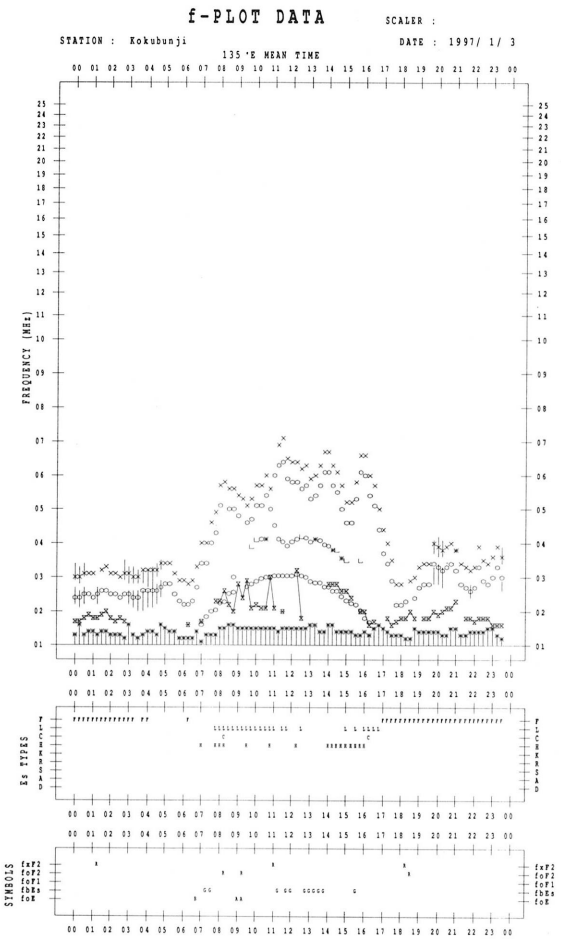
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F1	F1	F1		F1		FF11	CL11		HL11	HL12	CL22	CL12	CL13	CL23	CL23	L2	F2	F1	F3	F3	F3	F2	FF31
2	F2			F1	F1		F3	L1	L4	LC21	L2	HL12	L1	L1	C2	CL11	CL12	F1	F1	F2	F1		F1	F2
3	F2	F2	F1	F1	F1			H1	HL11	L1	L1	L1			H1	LH11	HL11	F1	FF11	F2	F2	F2	F2	F2
4	F2	F2	F2	F1				L1	L2	L2	L2	L2	L1	L1	L2	L1	L3	F2			F1	F1		
5					F1			L1	L1	L1		L1				L2	L1	F2	F4	F3	F1		F1	
6	F3	F3	F4	F2	F2	F2	FF11		L3	HL12	HL11	C1	C1	HL12	CL12	HL11	L3	F5	F2				F1	
7				F1			FF11	C1	CL11	L2	L2	CL11	L1		L1			F1	F2	F1	F1	F1	F1	F2
8	F2	F2		F1			F1	L1			HL11	C2	L2	L2	L2									
9			F1	F1	F1	F2	F3	L2	L1	L1	HL11	CL11	L1	L2		CL11	L2	F2	F2	F1	F1	F2		F1
10					F1	F2			LC11			L1	L1	L2	L2		L1	F1	F1				F1	F3
11		F1	F1	F2			F2	C1		HL11	HL11	L1	L1	L1	L1							F2	F3	F2
12	F3	F3	F1	F1		F1	F1	L1		HL21	CL21	L2	L1	H1	L2	L2	HL12	FF24	F2	F1	F2	F2	F2	F2
13	F1	F1	F1	F1				H1	CH11	C1	LC11	L1	L1	L2	L3	LC21	L2	F1						
14			F2		F1	F1				L1	L1	L1	L1	H1	HL11					F1				F2
15	F1	F1	F1							L1	L1	L1	HL11	L1	L2		L1			F1				
16				F2	F1			L1	L2	L2	L2	HL12	L2	L1	L1	L1	L1	L2	F2	F2	F1			F1
17	F1	F2	F1	F1	F2	F2	F1		C1	C1	L1	L1	L2	CL11	CL11	L1	L2	L2	F2	F1	F1			
18				F1			F1		L1	L1	L2	L2		L3	L2	LC11		L1	F1	F2		F1		
19	F2										C1	C1	L1	L1	C1	L1	L1						F2	
20		F1	FF22	F2			F1		L1	HL11	CL11	CL11	HL11	HL11	CL12	L1	L1	L5	F2	F4	F4	F3	F3	F4
21	F2			F2	F1				H1	L1	CL11	L1	L1	L2	L1		L1	L1	F2	F2	F2			
22	F1	F1		F1					CL11	L1	CL11	L1	L2	L2	LC21		H1			F2	F1	F1		
23	F1		F1	F1	F1	F1	F1	L1	H1	HL12	HL12	HL11	HL11	LH21	CL21	C2	C2	C2				F2		
24			F2	F3	F1	F1		C1	H1	HL12	HL11	LC11	LC11	L1	CL11	CL21	CL11	L4	FF11	F2	F2	F1		F1
25										L1		L1		H1	H1	C1	C2		F2	F2	F2	F1	F2	F2
26			F2	F2				H1		H1	H1	HL11	LH21	LH21	HL11	HL21	C3	L1	F3			F1	F1	
27						F1	F2		C2	HL12	L1	C1	L1	L1	L2	L1								F1
28	F2	F3	F2	F2	F1				L1	H1	H1	C1	H1	C1	C1	L2	CL21	L2	F2	F3	FR11	F2	F2	F1
29									H1	H2	H1	CL11	HL11	L1	L2	CL11	L2	L2					F1	
30										C1	C1	L1	L1		L1	L2			F1	F1				
31	F1	F1	F1	F1					C1	C2	C2	C1	C1	L1	L1	L1	L2	L2	F1	F2		F1	F1	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

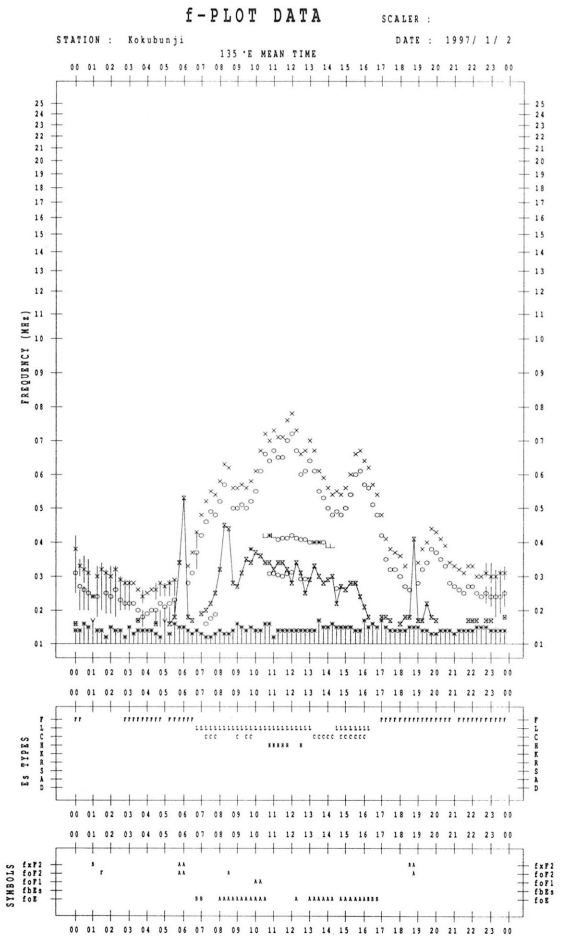
JAN. 1997 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

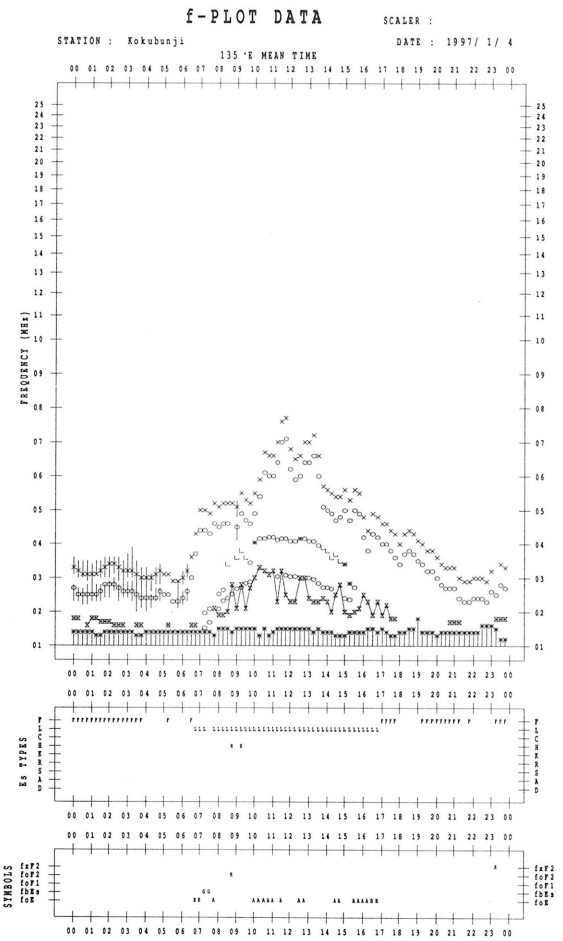
f-PLOTS OF IONOSPHERIC DATA

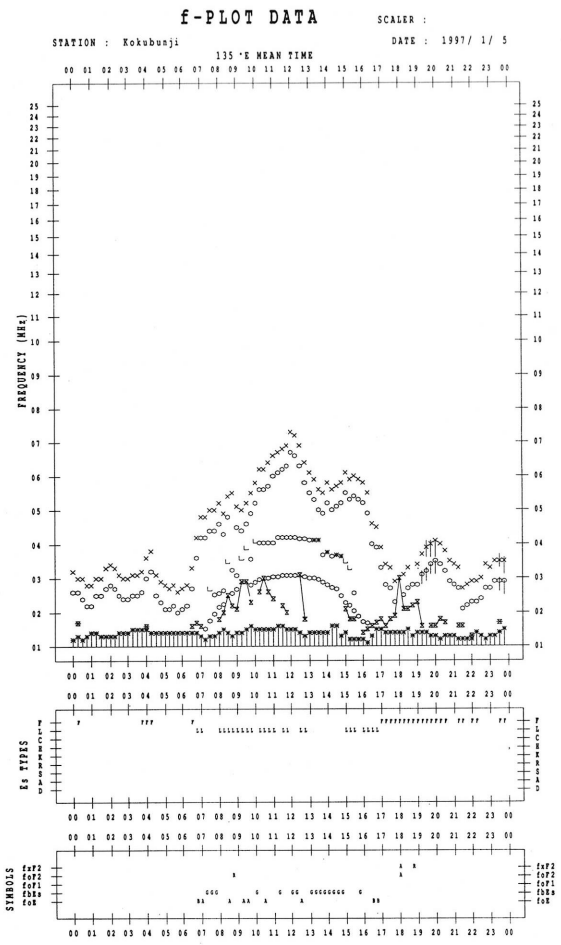
KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

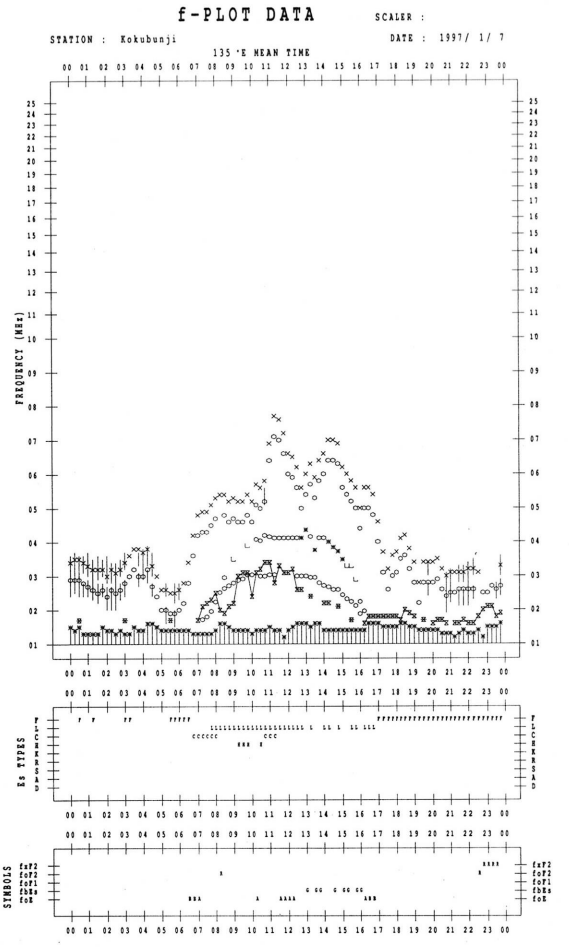

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

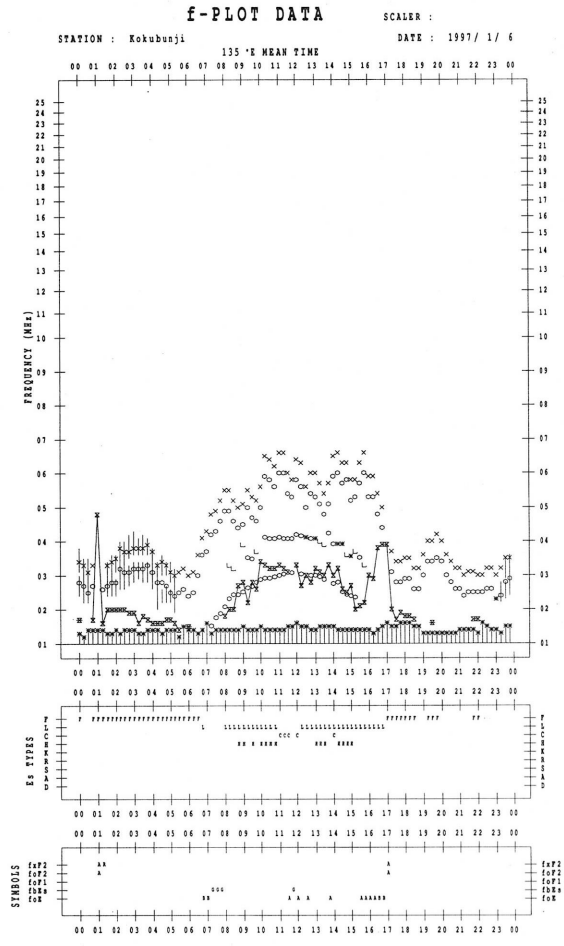

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

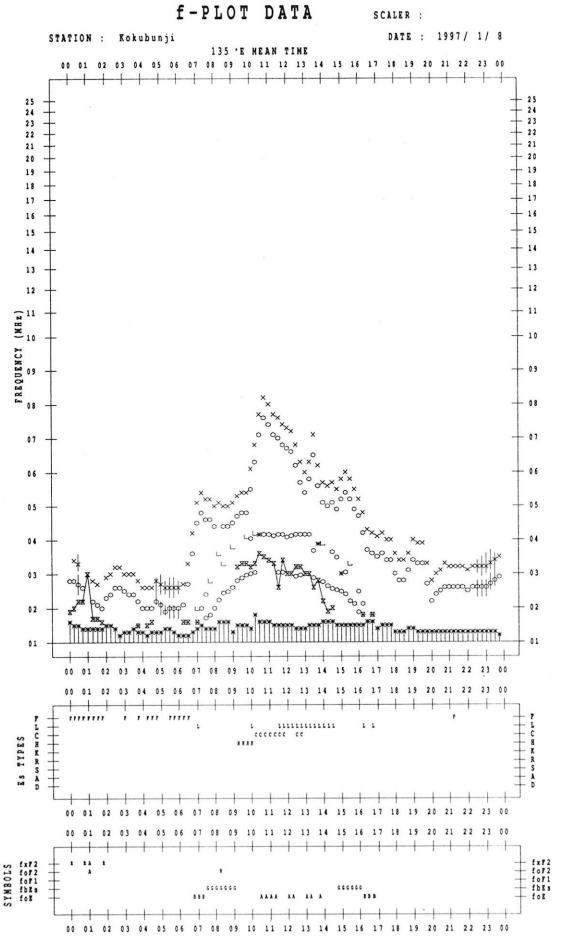

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

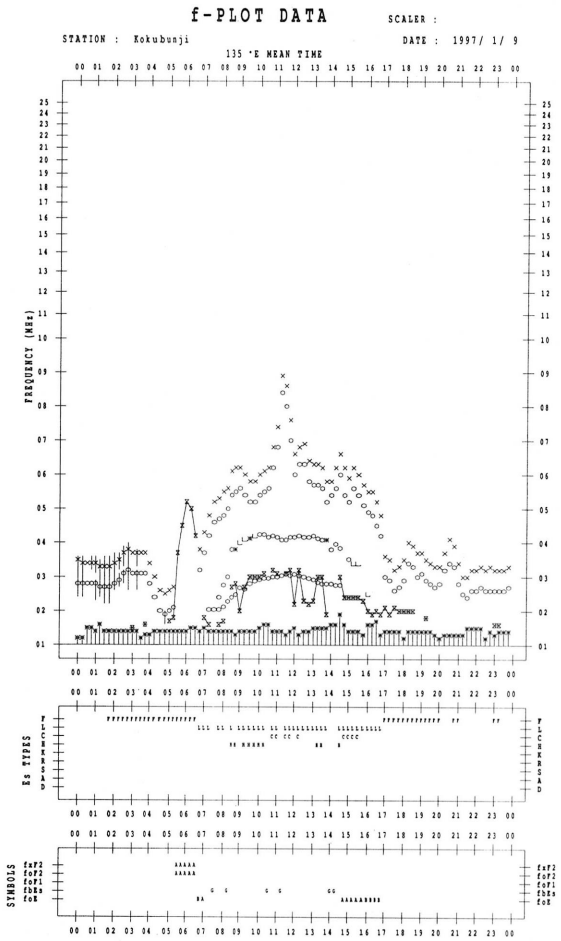

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

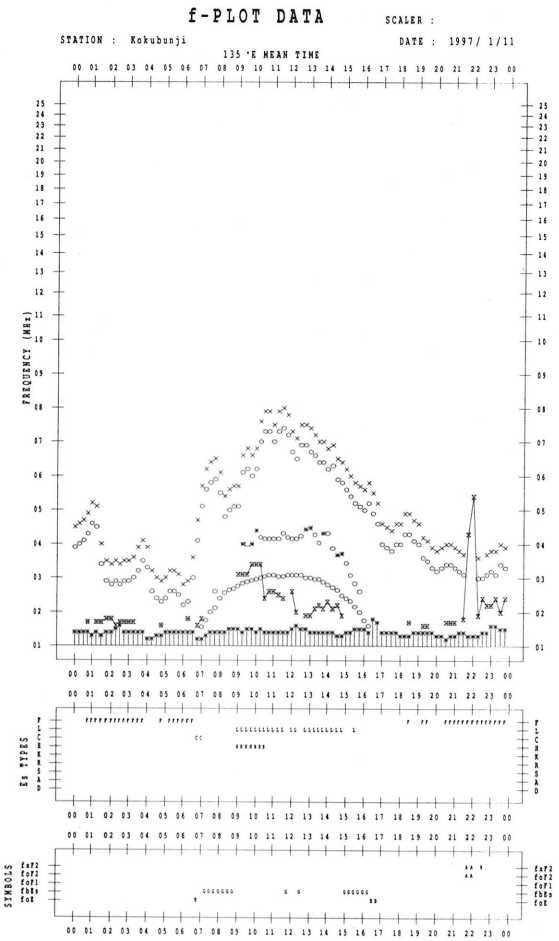

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

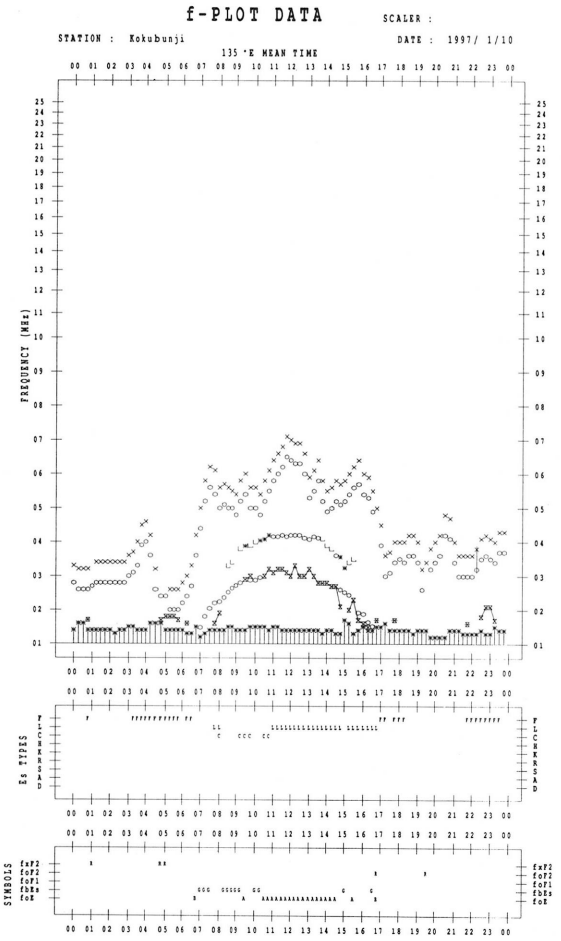

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

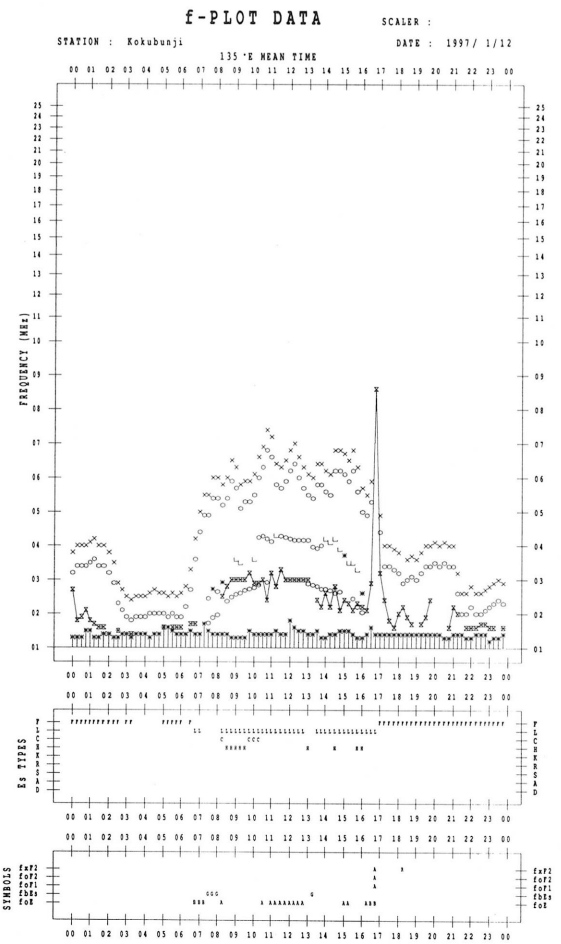

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

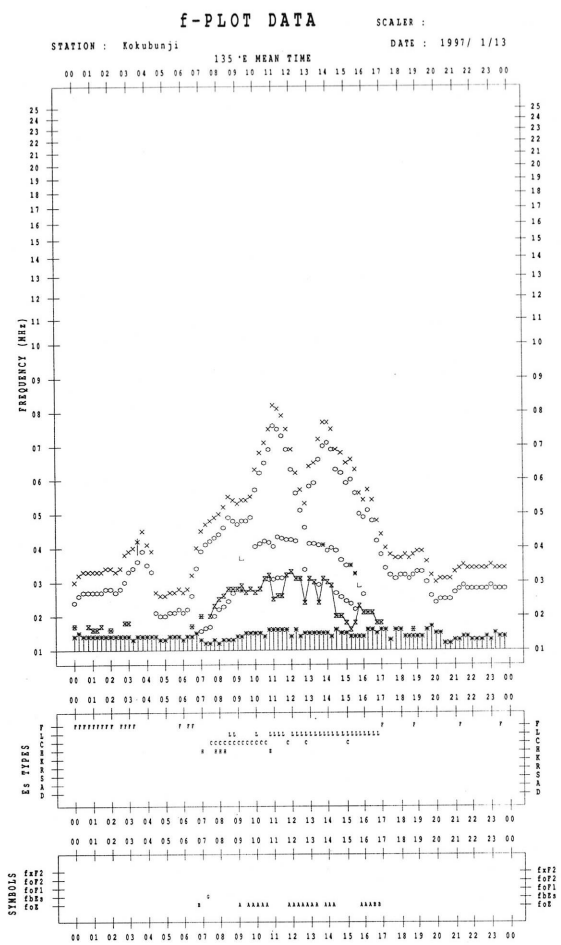

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

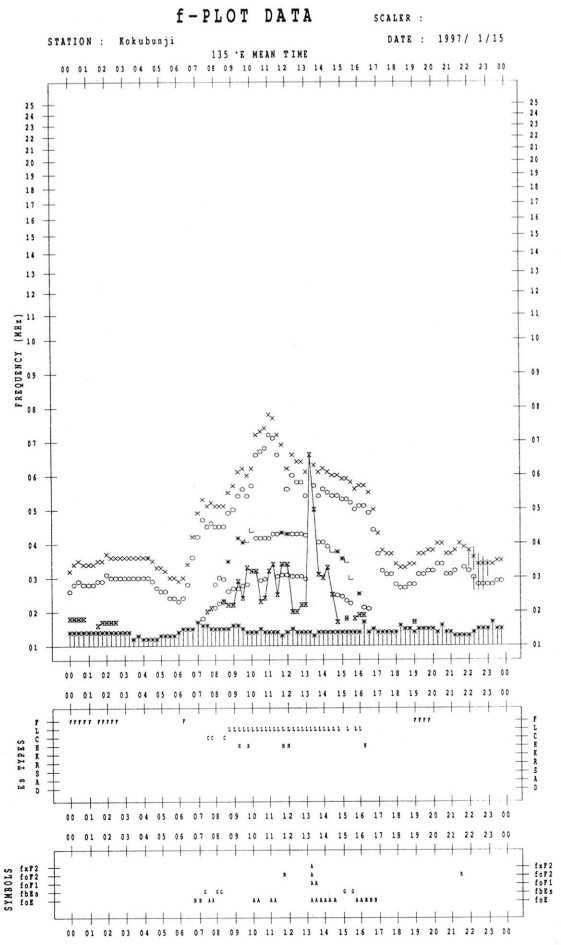

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

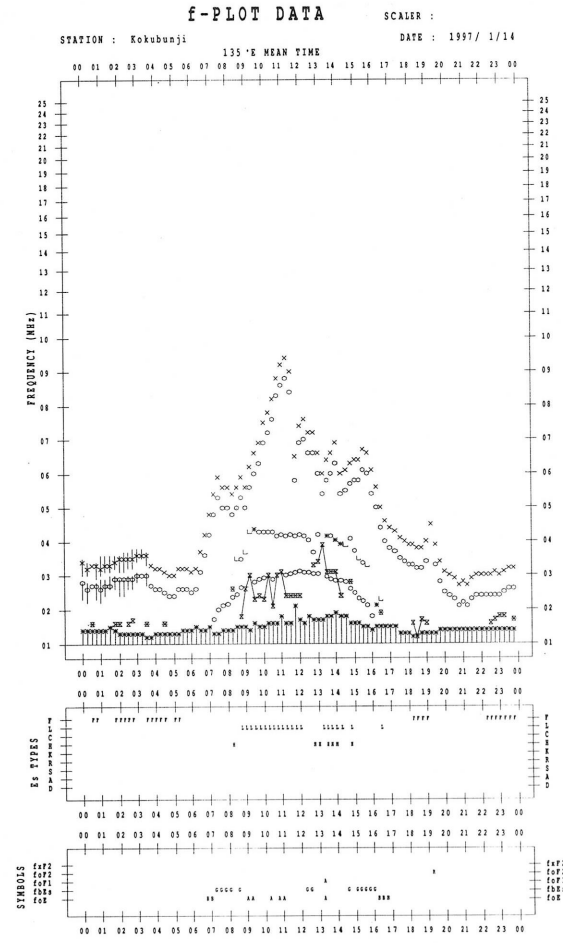

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

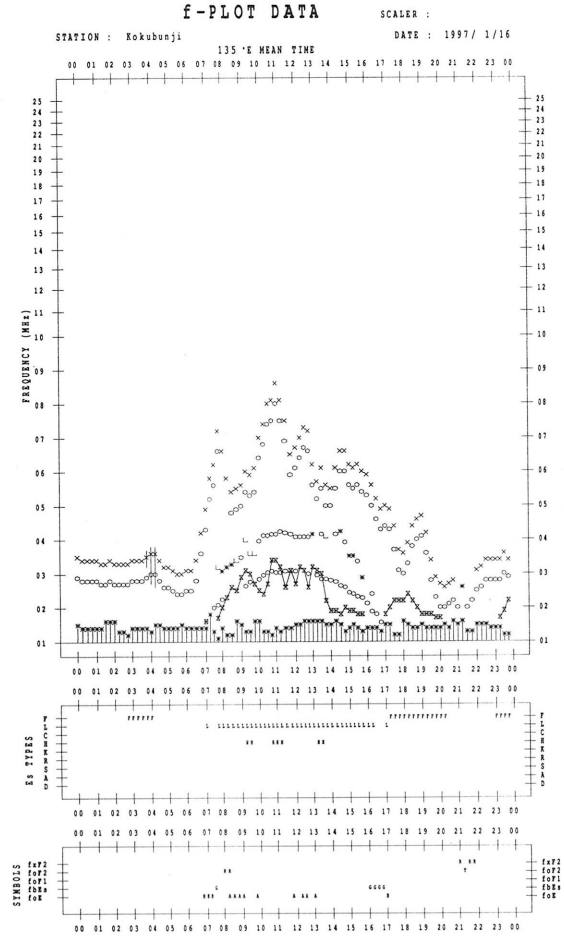

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

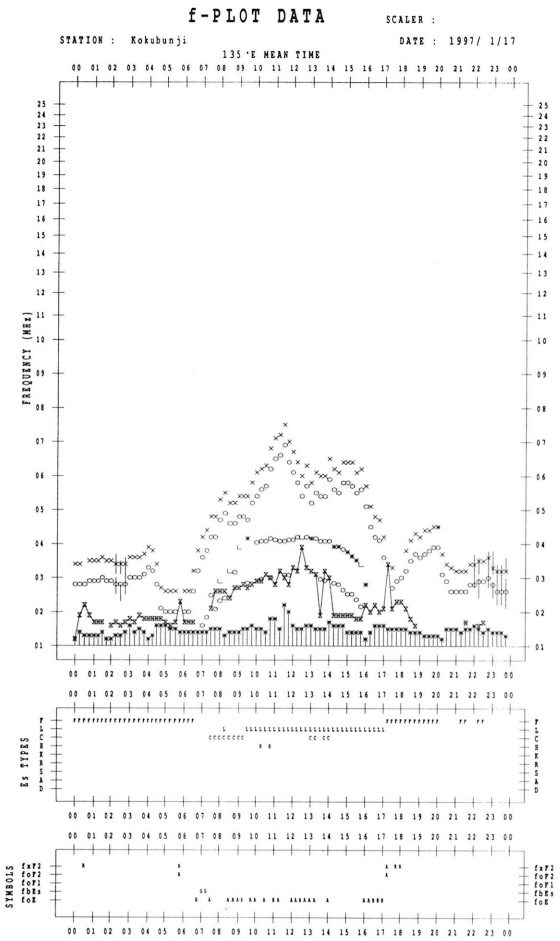

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

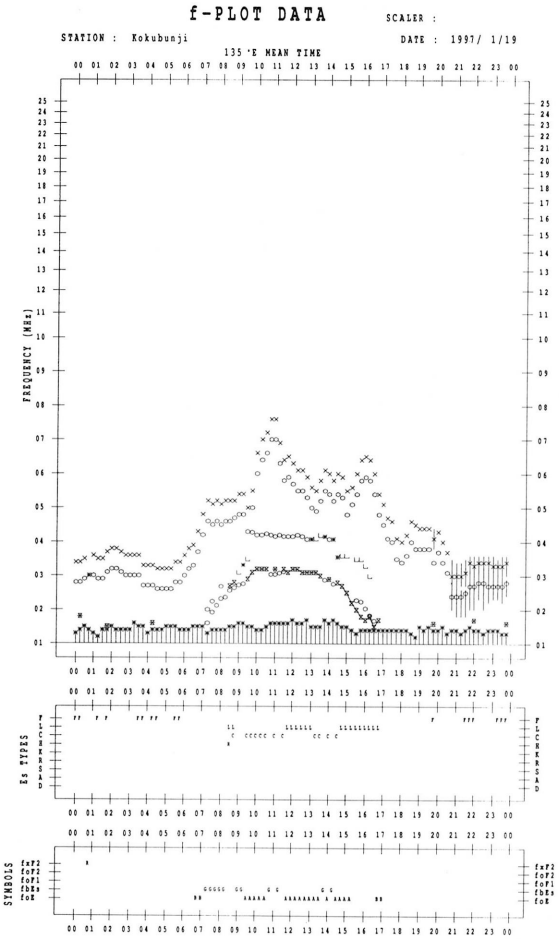

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

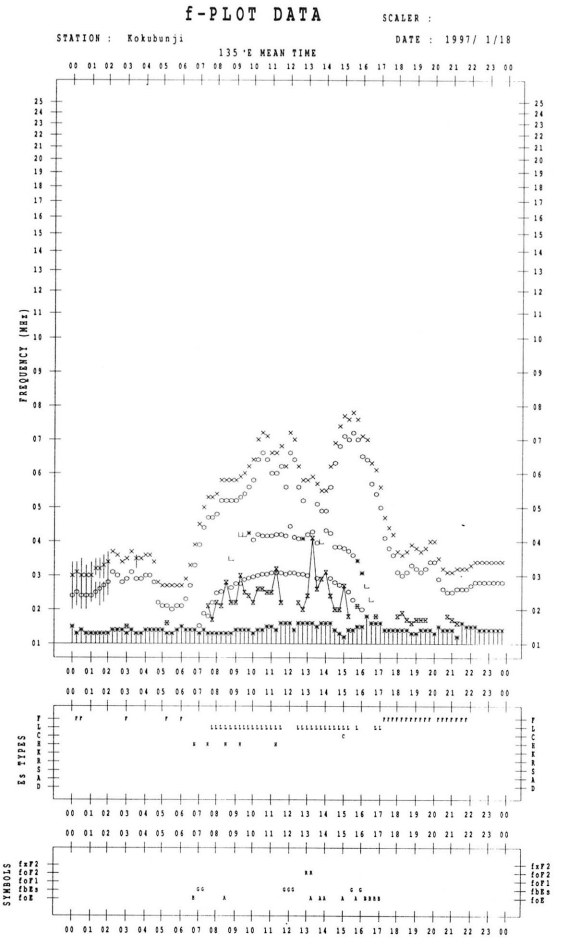

f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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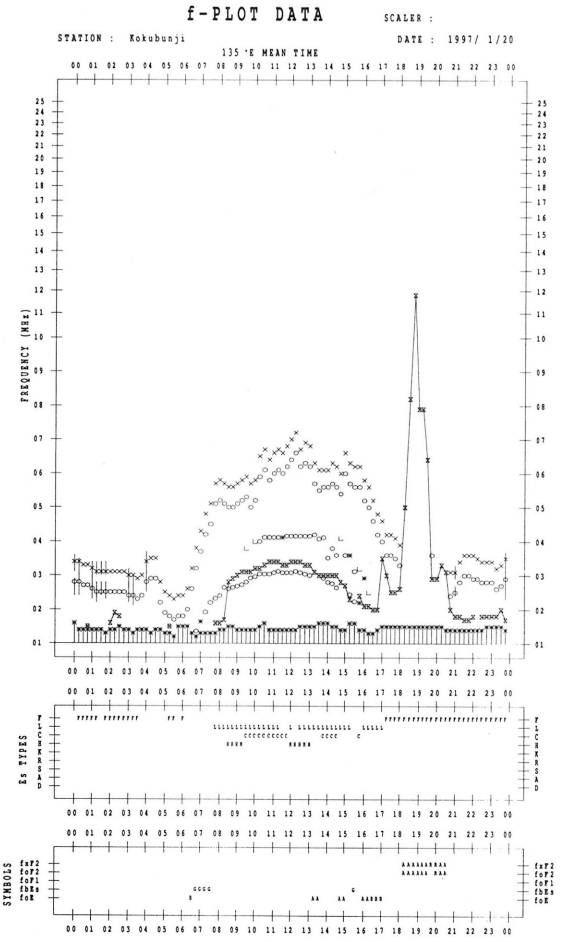
STATION : Kokubunji
DATE : 1997/ 1/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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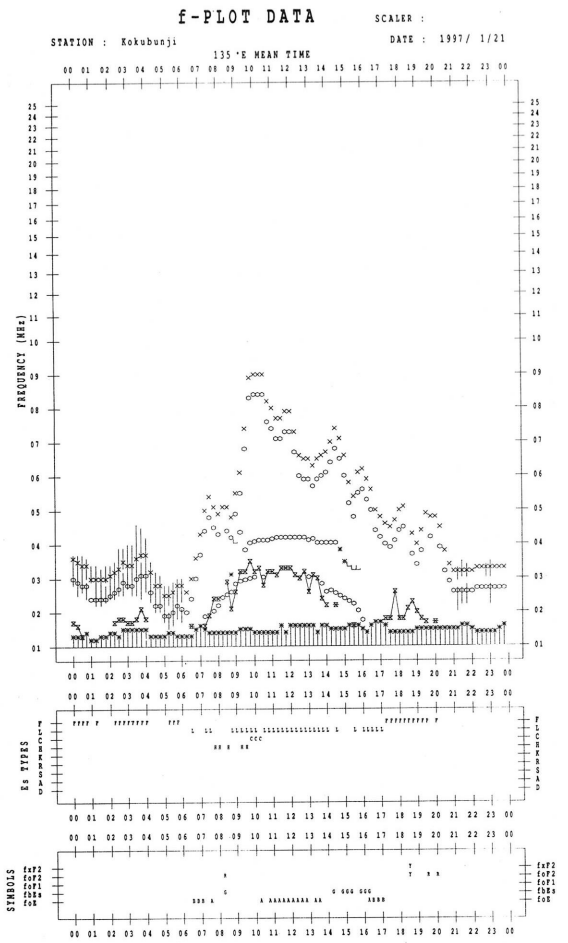
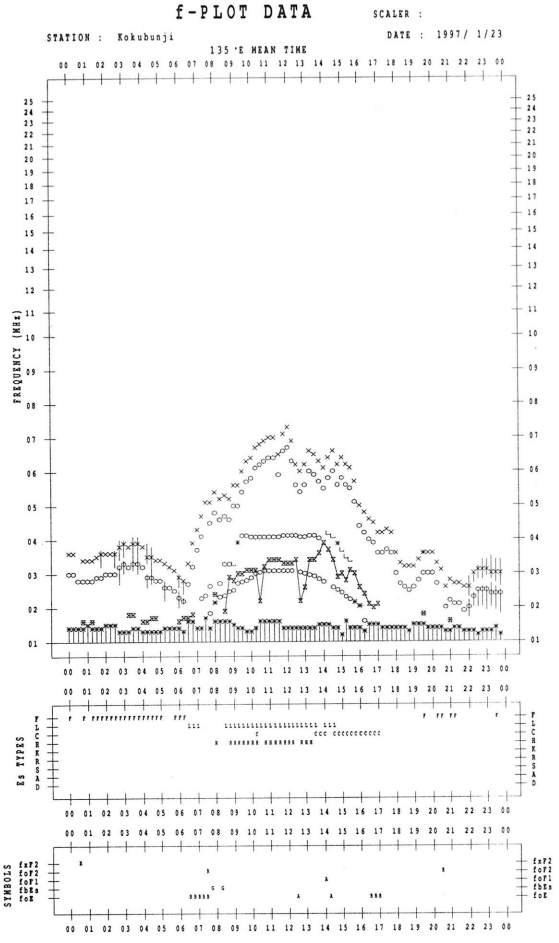
STATION : Kokubunji
DATE : 1997/ 1/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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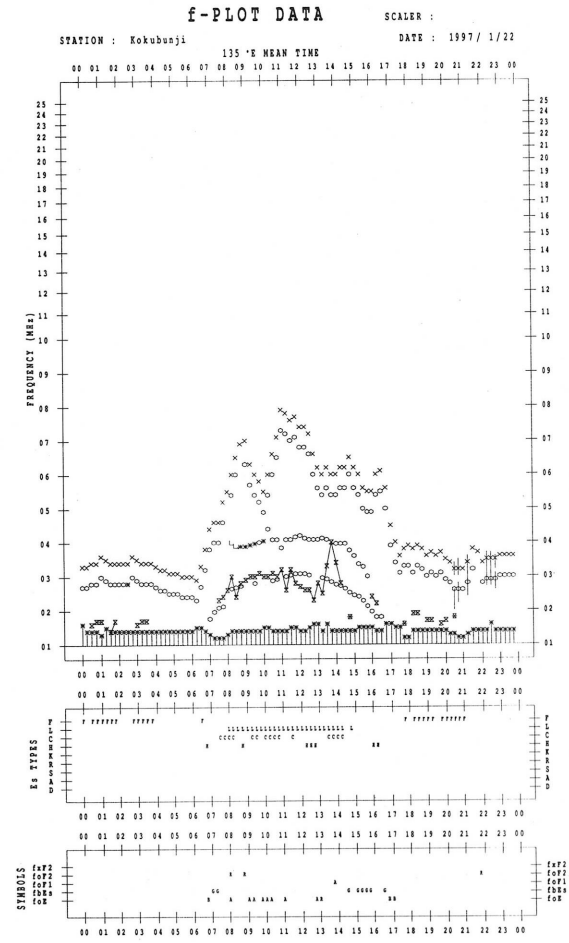
STATION : Kokubunji
DATE : 1997/ 1/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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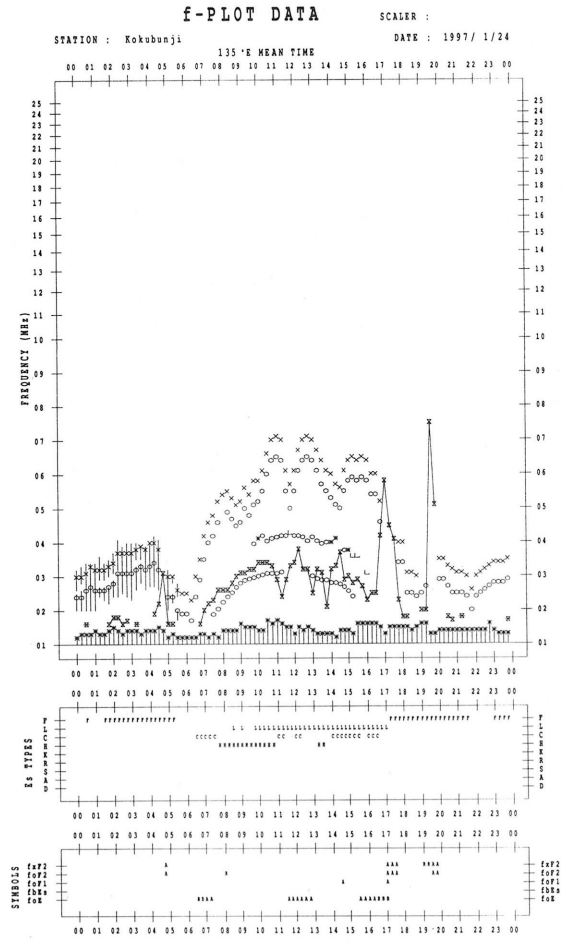
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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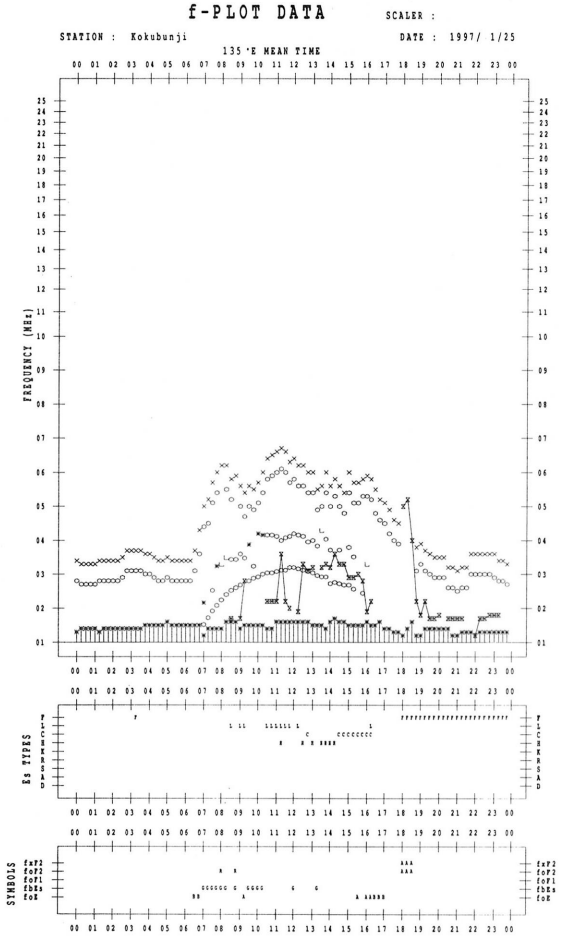
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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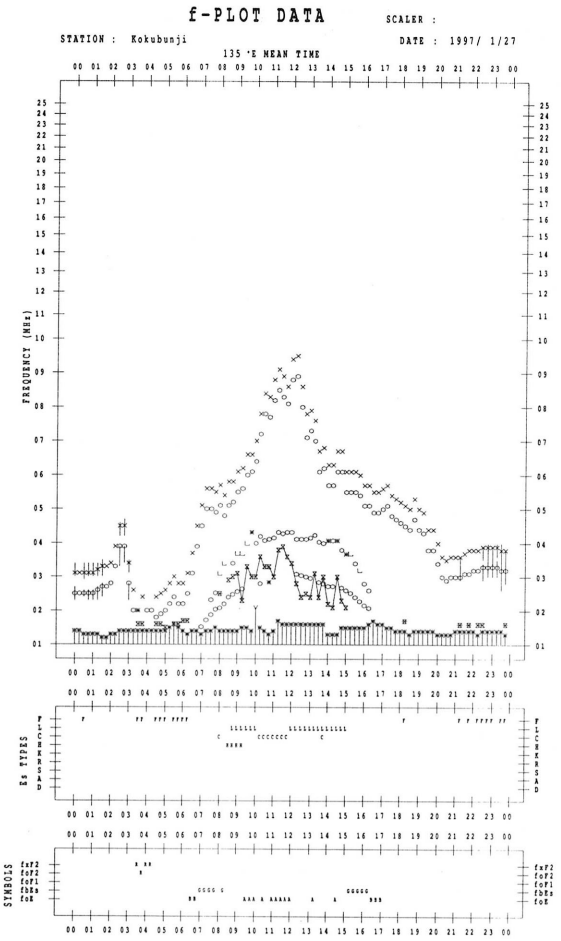
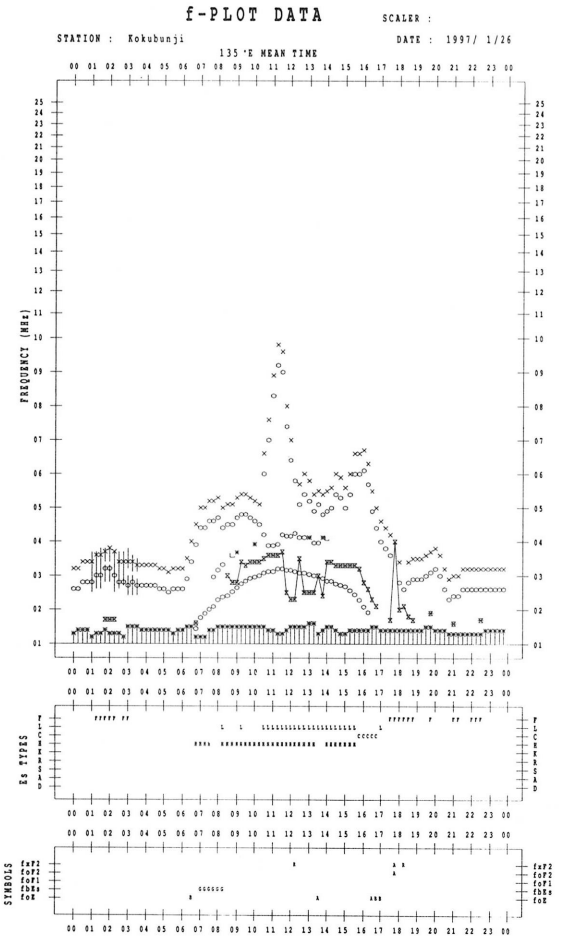
STATION : Kokubunji
DATE : 1997/ 1/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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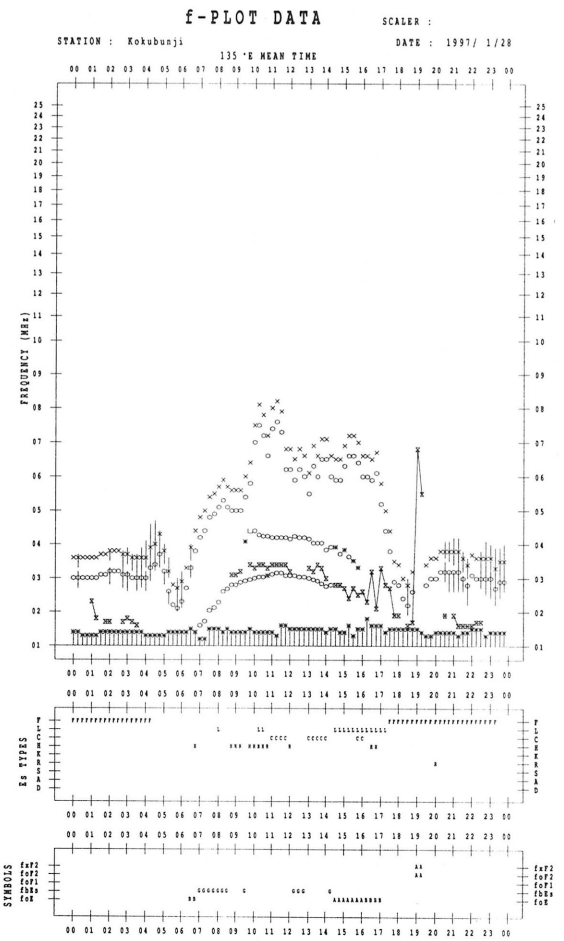
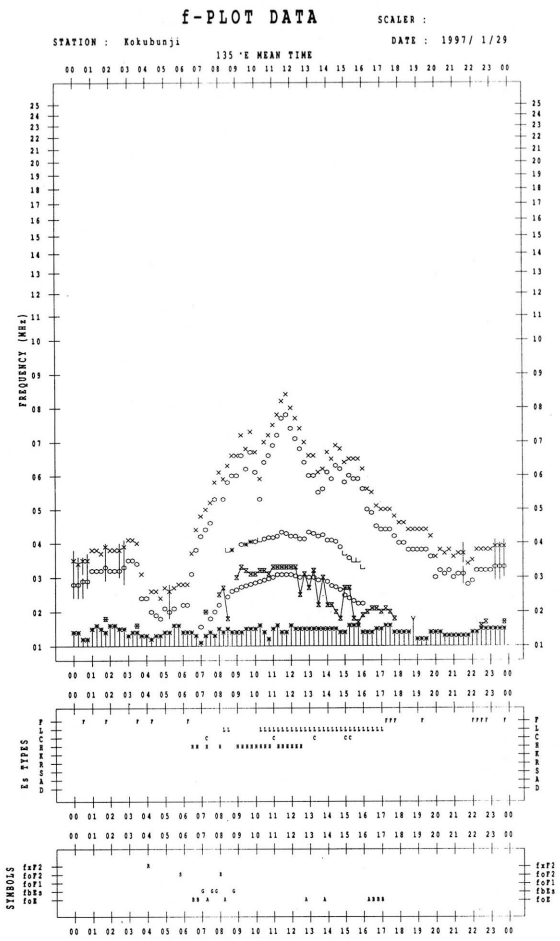
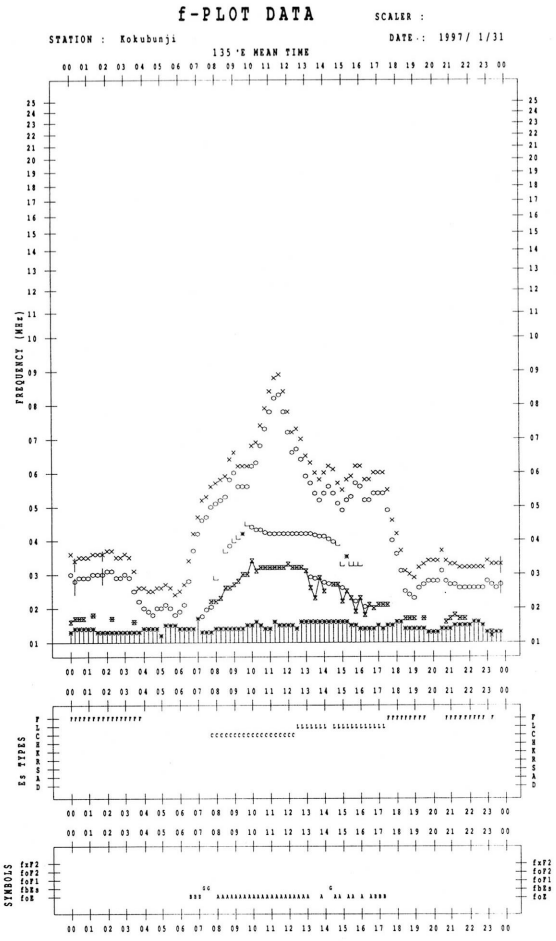
DATE : 1997/ 1/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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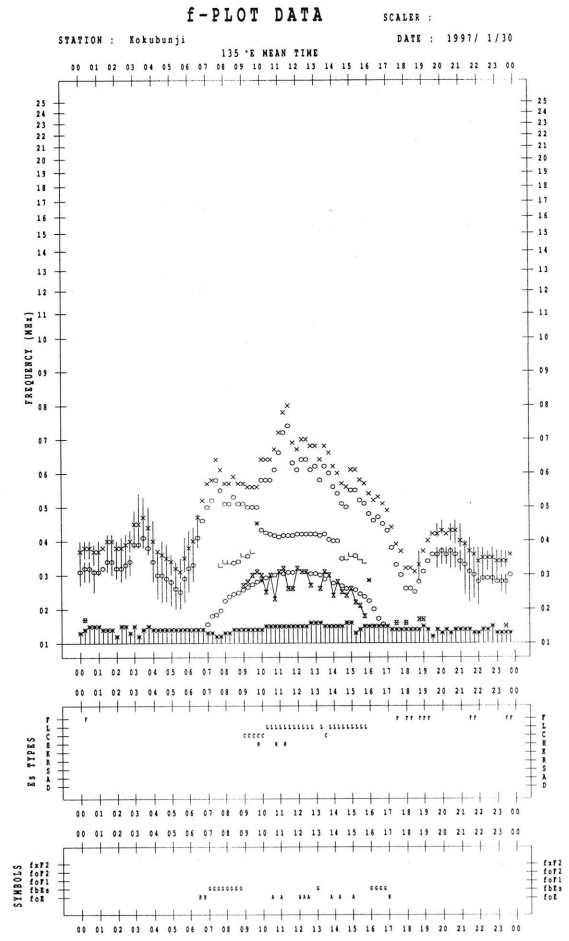
STATION : Kokubunji
DATE : 1997/ 1/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER :
STATION : Kokubunji
DATE : 1997/ 1/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

200 MHz

Hiraiso January 1997

Not available until system improvement is completed.

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso January 1997

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

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso January 1997

Single-frequency observations

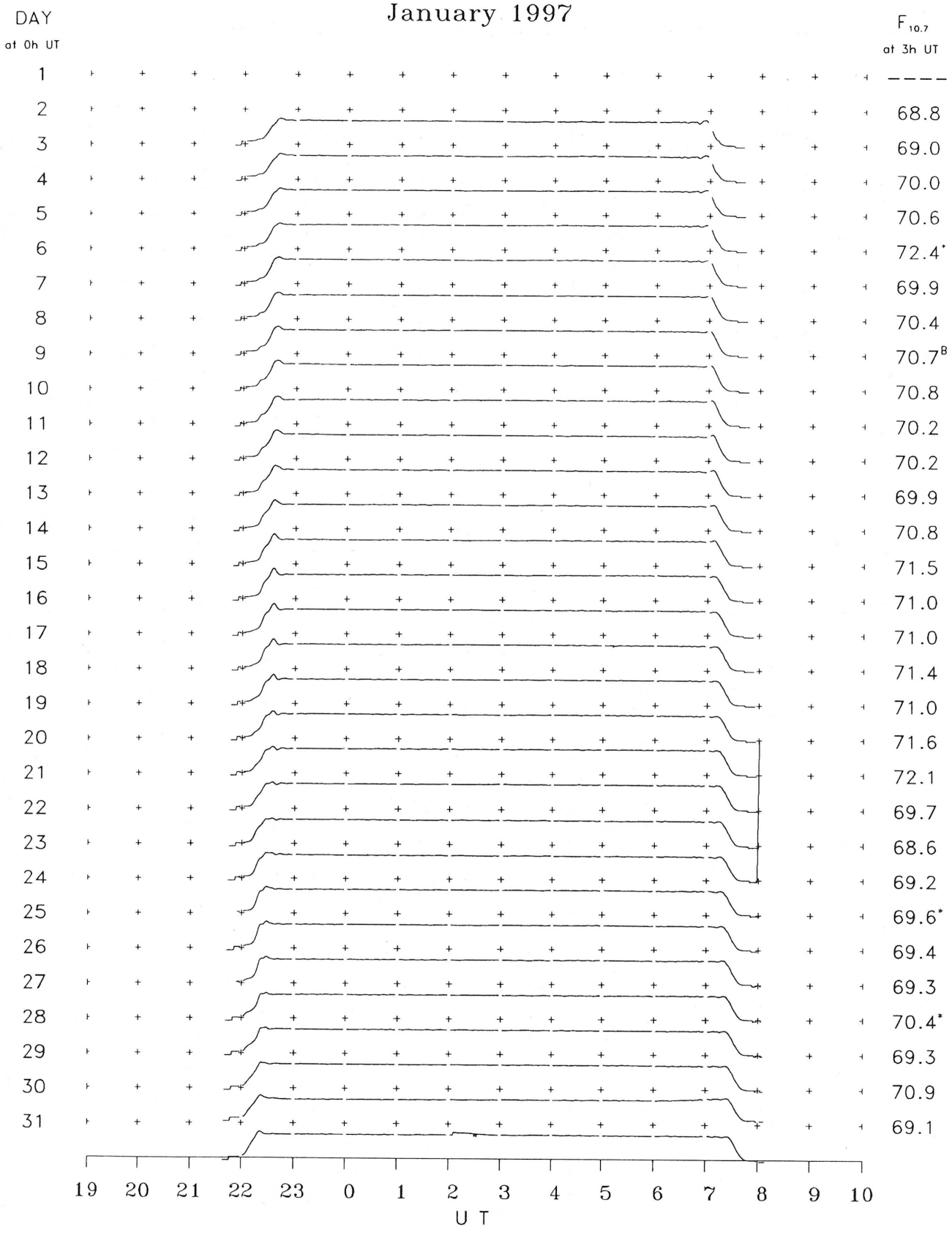
Normal observing period: 2150 - 0750 U.T. (sunrise to sunset)

JAN. 1997	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
	(N o n e)							

B. Solar Radio Emission

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

January 1997



Note: A vertical grid space corresponds to a 100 sfu.
Elevation angle range ≧ 6°.

C. RADIO PROPAGATION

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

JAN 1997 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

C. RADIO PROPAGATION

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

JAN 1997 FREQUENCY 15 MHZ BANDWIDTH 80 HZ RECEIVING ANTENNA ROD 4.5 M

MEASURED AT HIRAISO

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

C. Radio Propagation

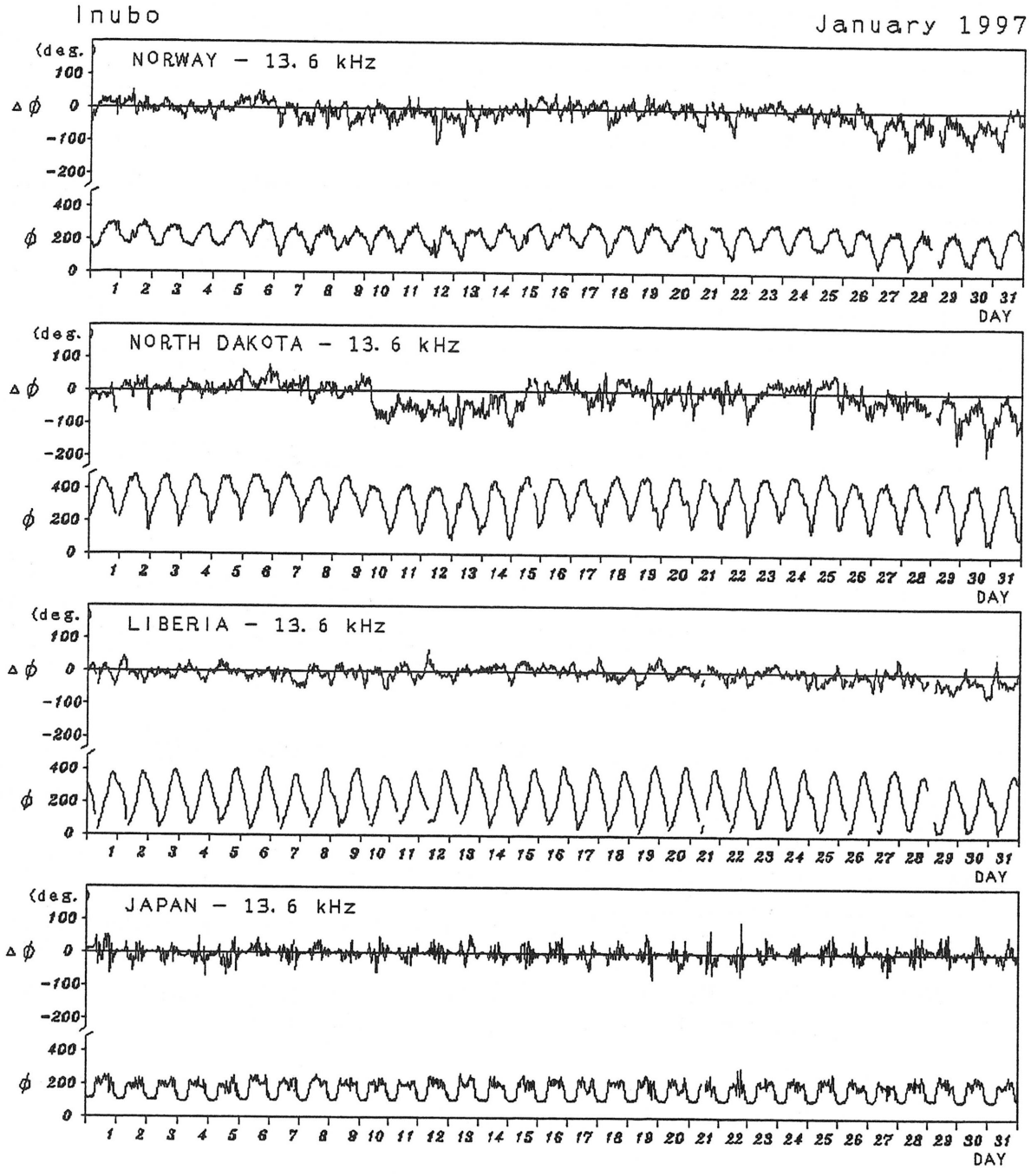
C2. Radio Propagation Quality Figures at Hiraiso

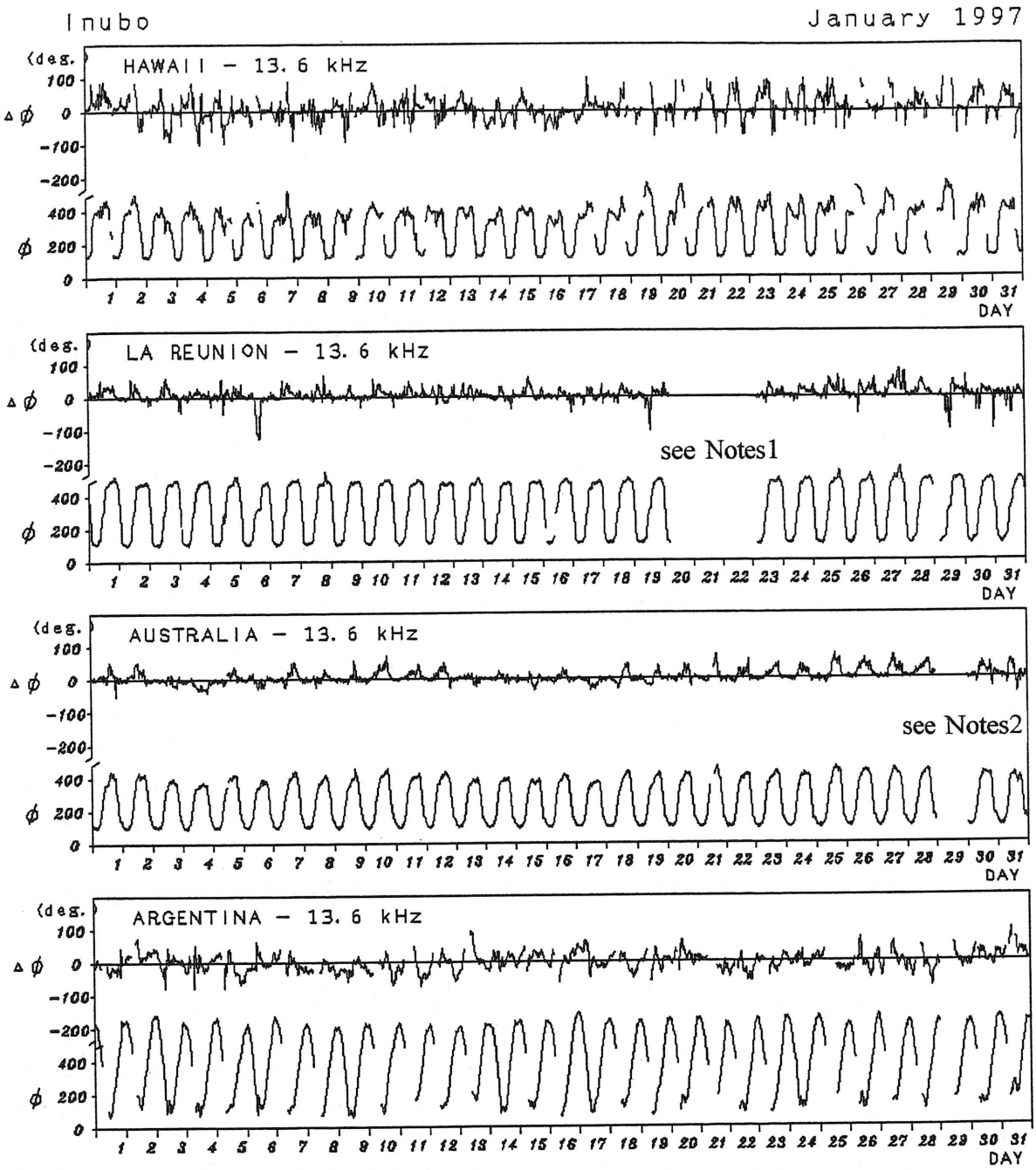
Hiraiso — Time in U.T.

JAN. 1997	Whole Day Figure	W W V 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Condition 00 06 12 18 / 06 12 18 24	Principal Geomagnetic Start h m	Principal Geomagnetic End h	Storms Range nT
1	4o U	- - - -	4 - - 4	N N N N			
2	3+ U	- - - -	4 - - 3U	N N N N			
3	3o U	- - - -	4 - - 2	N N N N			
4	3+ U	- - - -	4 - - 3U	N N N N			
5	4o U	- - - -	4 - - 4	N N N N			
6	4o U	- - - -	4 - - 4	N N N N			
7	4+ U	- - - 5U	4 - - 4	N N N N			
8	4o U	- - - -	4 - - 4	N N N N			
9	4o U	- - - -	4 - - 4	N N N N			
10	4o U	- - - -	3 - - 5	N N N N	01. 1—	C	163...
11	3+ U	- - - -	4 - - 3	N N N N	01.16—	21	145SSC
12	4o U	- - - -	4 - - 4	N N N N			
13	4o U	- - - -	4 - - C	N N N N			
14	4o U	- - - -	4 - - 4	N N N N			
15	4o U	- - - -	4 - - 4	N N N N			
16	4o U	- - - -	4 - - 4	N N N N			
17	3+ U	- - - -	3 - - 4	N N N N			
18	3+ U	- - - -	4 - - 3U	N N N N			
19	4o U	- - - -	4 - - 4	N N N N			
20	3+ U	- - - -	4 - - 3U	N N N N			
21	4o C	- - - -	4U C C C	N N N N			
22	4o U	- - - -	4 - - 4	N N N N			
23	3o U	- - - -	4 - - 2U	N N N N			
24	3+ U	- - - -	3 - - 4	N N N N			
25	2+ U	- - - -	3 - - 2U	N N N N			
26	2+ U	- - - -	2 - - 3	N N N N			
27	4o U	- - - -	4 - - 4	N N N N			
28	3o U	- - - -	4 - - 2U	N N N N			
29	3+ U	- - - -	4 - - 3U	N N N N			
30	4o U	- - - -	4 - - 4	N N N N			
31	3+ U	- - - -	3 - - 4U	N N N N			

C. Radio Propagation

C3. Phase Variation in OMEGA Radio Waves at Inubo





Notes1 : As for LA REUNION-13.6 kHz, no record during 20 January 0400 UT to 23 January 0425 UT, due to transmitter maintenance.

Notes2 : As for AUSTRALIA-13.6 kHz, no record during 29 January 0000 UT to 30 January 0015 UT, due to the receiver trouble.

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

NONE

C. Radio Propagation

C4. Sudden Ionospheric Disturbance

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

Hiraiso

Time in U.T.

JAN. 1997	S W F						Correspondence	
	Drop-out Intensities(dB)				Start	Dur.	Type	Imp.	Solar * Flare	Solar Burst
	CO	HA	AUS	MOS BBC						
None										

NOTE CO:Colorade(WWV) HA:Hawaii(WWVH) AUS:Australia MOS:Moscow BBC:London

* Optical and X-ray Flares

(b) Sudden Phase Anomaly (SPA) at Inubo

Inubo

Jan. 1997	S P A								
	Phase Advance (degrees)						Time (U.T.)		
Date	Ω/N	Ω/L	Ω/LR	Ω/AU	Ω/H	Ω/ND	Start	End	Maximum
			NONE						

IONOSPHERIC DATA IN JAPAN FOR JANUARY 1997
F-577 Vol.49 No.1 (Not for Sale)

電離層月報（1997年１月）
第49巻 第１号（非売品）
1997年７月５日 印刷
1997年７月10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) (27) ７４７８(直通)

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