F-816

IONOSPHERIC DATA IN JAPAN

FOR DECEMBER 2016

VOL. 68 NO. 12

CONTENTS

≪Real Time Ionograms on the Web ・・・・・・・・・・・・http://wdc.nict.go.jp/index_eng.html≫

NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I) and solar radio emission (S) obtained at the following stations under the National Institute of Information and Communications Technology , Japan.

Stations	Geographic(WGS84)		Geomagnetic (IGRF-10(2005))		Technical Method
	Latitude	Longitude	Latitude	Longitude	
✳Wakkanai/Sarobetsu	45˚10'N	141˚45'E	36.4˚N	208.9˚	Vertical Sounding (I)
Kokubunji	35˚43'N	139˚29'E	26.8˚N	208.2˚	Vertical Sounding (I)
Yamagawa	31˚12'N	130˚37'E	21.7˚N	200.5˚	Vertical Sounding (I)
Okinawa	26˚41'N	128˚09'E	17.0˚N	198.6˚	Vertical Sounding (I)
Hiraiso	36˚22'N	140˚37'E	27.6˚N	209.1˚	Solar Radio Emission (S)

✳We moved the observation facilities at Wakkanai to Sarobetsu on February 2009. The new observatory is located at approximately 26km south from the old observatory. The observation at Sarobetsu commenced on March 6, 2009.

IONOSPHERE

Ionospheric 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 a computer storage medium. 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 by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

Digital ionograms are automatically scaled by the pattern recognition method. The following five characteristics of the ionospheric are listed below. 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 iono-spheric 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*).

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

Blank No digital record because of problems occurring in the auto matic data processing system, but existence of film record.

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Hand-book 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 type ***E)*** layers, respectively
fbEs	Blanketing frequency of the ***Es*** layer, e.g. the lowest ordinary wave frequency visible through ***Es***
fmin	Lowest frequency that shows vertical ionospheric reflections
M(3000)F2 ***M(3000)F1***	Maximum usable frequency factor for a path of 3000 km for transmission by the ***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 by, 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 part *E* layer minimum virtual height.

c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)

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

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

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

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

d A weak diffuse trace at heights below 95 km as-sociated 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.

HOURLY VALUES OF fEs AT Wakkanai

DEC.2016

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz 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	25	G	24	G	G	38	48	26	50	34	34	32	G	24	41	27		60	G	37	G	31
2	G	G	G	G	26	52	65	G	92	33	35	35	112	G	125	G	24	26	G	27	28	G	G	G
3	G	G	G	G	G	G	G	25	48	107	76	51	G	33	G	G	38	G		25	G	G	G	G
4	G	G		G	G	G	G	38	31	36	G	34	50	50	40	23	11	11	32	G	G	G	G	26
5	29	G	G	G	G	G		11	23	39	34	40	G	33	162	49	11		24		G	G	G	G
6	G	G	G	G	106	G	G	21	56	31	34	39	36	36	33	26	24	G	G	G	G	G	G	G
7	G	G	G	11		96	33	G	26	55	34	100	36	33	50	27	G	35	54	32	26	24	25	G
8	G	G	G	G		G	G	26	36	32	46	36	40	130	32	27	25	35	28	G	G	G	G	G
9	G	G	25	G	G	40	56	G	26	46	47	43	34		G	G	44	G	G	G	G	G	G	G
10	G	G	G	G	23	G	26	34	27	G	G	G	52	28	37	31	31	35	35	37	112	45	G	G
11	G	G	G	G	G	G	G	33	35	39	33	G	49	G	92	G	27		G	60	55		26	25
12	G	G	G	G	G	32		39	125	27	51	126	49	G	27	54	48		G	32	70	165	49	140
13	33	25	G	33	37	56	38	39	55	32	G	G	G	G	26	27	107	59	52	47	146	27	26	G
14	G	56	G	G	G	G	134	39	40	G	G	G	39	34	90	63	116	72	26	58	35	G	149	93
15	G	G	G	G	G	27	32	44	39	92	G	G	G	G	G	G	54	34	40	29	28	33	G	G
16	G	G	G	G	G	26	34	31	115	38		G	G	G	G	G	11		32	G	38	28	24	29
17	26	G	26	G	G		G	33	47	45	34	G	G	G	44	38	35		26	32	28	28	G	G
18	G	G	G	G	G	G	G	11	G	G	G	G	G	G	G	G	34	G	35	60	33	40	40	46
19	26	41	G	G	G	G	25	26	46	G	G	G	G	G	G	G	11	G	52	59	46	26	G	25
20		26		G	G	25	G	G	33	G	G	G	G	G	48	G	41	11	G	G	G	41	39	33
21	38	27	G	G	G	G	G	25	48	32	33	G	G	49	G	G	11	G	G	G	G	G	G	G
22	G	G	G	G	G	G	20	124	31	26	G		G	84	110	G	17	G	G	G	G	G	G	25
23	G	32	156	G	G	G	36	G	G	G	29	G	G	G	G	23	11	G	G	G	G	G	28	49
24	G	G	G	G	G	11	G	11	32	27	40	54	49	G	36	G	11	54	46	27	G	32	29	G
25	G	G	24	G	G	G	G	G	G	G	48	40	52	G	G	48	G		70	60	26	G	G	G
26	G	G	G		G		26	G	55	48	47	126	48	G	G	G	11	26	G	G	G	G	G	G
27	G	G	G	G	29	25	G	34	G	69	G	G	G	G	G	78	G	11	25	G	G	46	84	56
28	G	G	26	25	G	G	G	G	42	48	43	G	G	34	27	G	G		133		G	G	G	G
29	G	G	G	G	G	G	G	27	G	60	42	172	35	G	27	24	G				G	59	58	26
30	G	G	G	25	G	G	G	24	22	25	G	G	G	G		G	43		G		G	G	G	G
31	196	G	G	G	G	31	32	G	45	G	52	G	G	G	G	G	11	G	59	33	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	30	31	29	30	29	29	29	31	31	31	30	30	31	30	30	31	31	22	28	27	31	30	31	30
MED	G	G	G	G	G	G	G	25	36	32	34	G	G	G	27	G	24	11	26	27	G	G	G	G
U Q	G	G	G	G	G	26	32	34	48	46	46	40	48	33	44	27	41	35	43	47	33	33	28	29
L Q	G	G	G	G	G	G	G	G	26	G	G	G	G	G	G	G	11	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

DEC. 2016

LAT. 45°10.0'N LON. 141°45.0'E SWEEP 1.0MHz TO 30.0MHz 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	14	15	14	14	14	14	14	14	14	14	14	15	14	15	14	14	14	14		14	15	14	15	14
2	14	14	18	15	14	14	14	15	14	14	14	15	16	26	15	23	14	18	15	14	14	14	14	14
3	14	15	14	14	14	14	14	14	18	14	14	14	14	14	14	23	14	20		15	14	15	15	15
4	14	14		14	14	14	14	14	14	14	18	14	15	15	14	16	15	14	14	15	14	15	15	14
5	14	17	14	14	14	14		15	14	14	15	15	14	14	14	14	15		14		14	14	15	14
6	15	14	14	22	14	14	14	15	14	14	14	15	14	14	14	14	14	15	15	15	14	14	14	14
7	15	14	15	14		15	17	14	14	14	14	14	14	14	14	15	14	14	14	14	15	15	15	14
8	15	18	14	14		14	14	14	14	14	14	14	14	14	14	14	14	15	14	14	14	14	14	14
9	14	14	14	14	15	14	16	15	16	14	14	14	14		15	18	14	14	14	14	14	16	15	14
10	14	15	15	18	14	15	15	14	15	14	14	15	15	18	14	14	14	14	14	14	14	14	14	14
11	14	14	15	15	15	14	14	14	14	14	14	14	14	15	15	18	16		15	14	14		14	15
12	14	14	14	14	14	14		14	14	15	16	21	27	18	14	26	15		18	14	14	14	14	15
13	14	14	14	14	14	14	14	14	14	24	28	30	28	28	20	16	18	14	15	14	15	15	14	14
14	14	14	14	14	15	16	15	14	28	27	27	29	28	27	26	17	14	15	14	17	14	14	14	15
15	15	14	14	14	15	15	15	15	14	26	27	29	20	15	14	20	14	14	15	14	15	14	14	14
16	14	15	14	14	15	15	14	15	14	17		28	28	27	27	20	18		14	15	14	14	14	14
17	14	14	14	15	15		18	14	14	14	14	14	14	14	14	15	14		15	14	14	14	14	14
18	14	15	14	14	14	14	14	14	15	28	28	30	28	28	27	23	14	14	14	14	14	14	15	14
19	14	14	14	14	14	14	14	14	17	27	27	27	29	29	27	20	14	14	14	14	14	14	15	14
20		18		14	15	15	15	14	14	14	14	14	17	15	14	14	14	14	14	14	14	15	14	14
21	14	15	14	14	14	16	14	14	15	14	14	16	18	15	14	20	14	14	14	14	14	15	14	14
22	14	14	14	14	14	15	14	14	14	14	14		15	15	14	14	14	14	15	14	14	14	14	14
23	14	14	14	15	14	14	14	14	14	26	15	27	18	27	15	15	14	14	15	14	14	14	15	14
24	14	15	14	14	15	14	16	14	17	20	18	16	20	27	15	18	15	14	14	14	14	14	14	14
25	14	14	14	16	15	14	15	14	15	15	14	14	15	14	14	27	20		14	14	15	18	14	14
26	14	15	14		14		14	14	17	14	14	16	18	27	27	21	15	16	14	14	14	14	14	14
27	14	14	14	14	14	14	15	14	14	14	14	28	28	27	27	26	15	14	15	14	14	14	14	14
28	14	14	14	14	14	14	14	15	23	27	17	17	18	15	15	20	15		14		14	14	14	14
29	14	14	14	14	14	14	14	15	14	20	17	17	24	27	17	16	18				16	14	14	14
30	14	14	15	14	14	14	18	14	14	15	27	27	28	28		23	15		14		14	14	17	14
31	14	14	14	17	14	15	14	14	23	27	27	33	30	28	27	15	16	15	14	14	15	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	30	31	29	30	29	29	29	31	31	31	30	30	31	30	30	31	31	22	28	27	31	30	31	30
MED	14	14	14	14	14	14	14	14	14	14	14	16	18	16	14	18	14	14	14	14	14	14	14	14
U Q	14	15	14	15	15	15	15	15	16	24	18	27	28	27	20	21	15	15	15	14	14	15	15	14
L Q	14	14	14	14	14	14	14	14	14	14	14	14	14	15	14	15	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

DEC. 2016

LAT. 35°43.0'N LON. 139°29.0'E SWEEP 1.0MHz TO 30.0MHz 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	A	30	31	30	28	34	62	64	56	66	72	64	61	68	52	62	A	A	A	A	A	A	A
2	30	32	30	A	30	26	27	51	81	A	67	62	61	62	64	55	49	A	A	A	36	32	30	A
3	A	34	32	34	32	28	28	52	64	66	77	68	72	67	62	55	48	34	N	30	27	A	A	A
4	30	28	28	30	28	26	27	59	N	64	68	76	64	61	55	56	52	34	32		34	N	30	35
5	31	28	27	26	27	26	26	52	52	60	72	62	63	62	56	55	49	A		27	34	27	N	27
6	30	30	30	30	30	30	26	49	52	59	65	62	67	56	56	58	50	A	36	A	27	A		27
7	28	30	32	37	28		N	54	53	57	81	82	61	56	56	61	54	45	39	27	28	N		A
8	26	28	27	A	30	32		54	41	51	77	80	67	59	62	57	48	34	28	34	27	30	34	38
9	32	32	34	32		N	N	A		61	80	75	109	66	76	76	63	A	31	43	A	A	A	A
10	30	27	28	A	31	32	A	61	58	67	67	84	64	62	73	71	57	42	28	A	37	30	30	32
11	A	28	27	28	27	28	N	51	59	55	72	67	65	65	A	56	A	A	28	A	A	A	32	A
12	A	32	31	32	27	26	27	51	51	51	56	73	71	41	56	N	41	A	30	34	A	31	N	N
13	27	27	A	A	26	26	29	51	55	54	58	69	55	55	54	59	45	A	A	A	36	A	A	27
14	27	27	27	26	27	A	N	44	55	57	57	64		55	58	58	50	38	A	A	A	A		N
15	N	24	27	28	30	28	31	51	54	41	54	54	55	65	59	52	52	28	30	30	34	32	37	42
16	36	38	37	36	30	28	30	47	54	53	42	56	56	51	62	58	44	28	27	34	32	38	N	31
17	32	31	30	30	27		N	41	54	52	54	59	55	53	48	55	42	A	20	28	32	31	27	A
18	27	27	27	26	N		26	41	52	58	63	68	63	60	56	51	54	27	31	38	32	28	A	36
19	28	34	A	27	30	30	32	51	59	56	64	69	64	54	51	54	47	39	89	24	34	N		28
20	A	A	27	A		N	N	46	55	59	54	59	70	55	54	53	56	41	30	34	31	N	N	N
21	26	N	26	N	N	N	N	47	55	58	67	74	71	59	56	59	55	37	27	30	31	N	N	27
22	30		31	30	30	23	27	45	53	51	81	85	77	65	59	69	50	34	34	36	36	32	26	A
23	30	30	30	32	32	26	32	45	53	63	59	78	86	81	66	65	59	36	A	42	32		30	30
24	30	32	30	38	26	30	28	42	47	58	64	72	58	65	62	58	57	42	31	25	42	A	N	28
25	32	32	34	36	42	30	N	42	48	58	56	69	65	74	56	61	59	32	A	28	A	31	A	A
26	34		27	30	30	28	28	47	49	54	66	68	72	61	57	51	48	39	36	28	A	30	32	30
27		27	28	28	30	27	30	45	52	59	62	68	55	64	55	55	43	45	34	36	N	A	A	
28	27			30	30	30		46	56	56	57	65	54	66	56	55	50	23	N	31	30	28		
29	26	30		N	28	N		46	46	56	51	61	56	47	51	52	52	30		N	31	23		28
30	31	30	31	30	27	N	24	43	49	51	62	75	75	61	52	53	47	34	N	26		N		
31		25	27	30	26	N	28	39	45		58	46	53	63	55	58	58	32	28		34	27	A	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	24	25	27	24	27	21	19	30	29	29	31	31	30	31	30	30	30	22	20	21	22	15	10	15
MED	30	30	30	30	30	28	28	47	53	57	64	68	64	61	56	56	50	34	30	30	32	30	30	30
U Q	31	32	31	32	30	30	30	51	55	59	68	75	71	65	62	59	56	39	34	35	34	32	32	35
L Q	27	27	27	28	27	26	27	45	50	53	57	62	56	55	55	54	48	32	28	27	31	28	30	27

HOURLY VALUES OF fEs AT Kokubunji

DEC. 2016

LAT. 35°43.0'N LON. 139°29.0'E SWEEP 1.0MHz TO 30.0MHz 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	41	G	G	G	G	G	G	G	34	G	39	35	50	39	46	28	50	49	59	52	61	49	38
2	24	35	28	24	G	G	G	35	34	116	55	G	33	G	29	25	40	50	27	29	32	22	30	36
3	43	33	28	26	25	G	G	24	62	61	35	33	30	34	28	G	G	23	G	28	G	52	36	29
4	26	G	G	G	23	G	G	24	33	34	46	30	34	30	33	29	26	G	G		26	28	25	26
5	G	G	G	G	G	G	G	28	32	34	34	31	30	31	34	G	29	31		G	G	G	G	G
6	G	G	G	G	G	G	G	24	29	G	G	30	30	30	32	39	47	59	34	24	27	26		24
7	G	G	G	G	G	G	G	27	30	34	35	40	40	34	31	26	G	G	G	G	G	G		28
8	G	G	22	27	G	G		G	29	32	34	37	39	43	36	54	29	G	G	24	27	G	G	25
9	G	G	G	G		G	G	60		41	49	81	62	62	42	30	31	28	G	37	33	47	59	53
10	G	29	G	49	G	24	33	40	29	47	G	39	54	G	28	28	43	27	53	29	29	G	G	G
11	46	26	G	G	G	G	G	G	47	39	35	78	32	29	81	94	70	35	G	51	50	54	34	93
12	56	30	24	34	G	23	G	G	G	42	G	42	52	69	39	55	28	40	G	33	57	G	G	24
13	G	25	30	27	G	26	34	42	34	45	47	29	34	30	33	38	59	93	79	52	29	42	34	G
14	G	G	G	25	G	26	G	26	G	G	G	G	G	G	31	32	37	11	38	42	35	28		G
15	G	G	G	G	G	G	G	21	34	41	N	44	G	G	30	30	29	40	G	G	G	G	G	G
16	G	G	G	G	G	G	G	24	G	28	29	31	G	G	G	25	G	G	G	25	G	26	G	G
17	30	G	G	G	G		G	G	29	37	39	30	35	G	G	37	31	36	26	31	30	31	27	28
18	G	G	24	G	G		G	G	31	35	42	52	34	35	45	37	27	34	36	28	G	93	49	52
19	24	34	37	G	G	G	22	G	G	G	52	G	G	G	N	26	31	G	G	G	G	G		G
20	34	30	G	28		G	G	39	29	35	G	34	36	29	G	28	G	G	G	G	G	G	G	G
21	G	G	G	G	G	G	G	G	29	29	30	34	34	34	G	G	G	11	G	G	G	G	G	G
22	G	G	G	G	G	G	24	25	40	50	34	61	43	31	G	G	47	G	G	G	G	G	G	33
23	G	23	G	G	G	G	23	26	31	34	35	G	34	G	G	G	22	29	30	28	25	G	24	G
24	26	G	G	G	G	G	G	G	31	G	34	34	G	37	48	G	G	27	G	G	G	29	G	G
25	G	G	G	23	24	G	G	G	46	31	G	43	43	43	G	G	G	27	25	G	27	35	69	50
26	24	G	G	32	G	G	28	32	33	G	29	30	G	G	G	G	G	G	G	G	37	27	G	G
27	G	G	G	G	G	G	G	G	26	47	58	50	43	G	G	G	G	G	G	G	G	36	26	
28	G			G	G	G		G	47	34	G	G	G	31	30	G	31	G	G	G	G	G		
29	G	G		G	G	G		G	29	48	36	G	G	29	30	30	42	G		G	G	G		G
30	G	G	G	G	G	G	G	G	24	29	31	G	29	G	G	28	G	G	G	G		G		
31	G	G	G	G	G	G	G	G	41		G	G	G	G	G	G	G	G	G		G	G	30	26
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	29	31	29	29	28	31	30	30	30	31	31	31	30	31	31	31	29	29	30	31	24	28
MED	G	G	G	G	G	G	G	21	30	34	34	33	34	30	30	28	28	23	G	24	13	22	24	24
U Q	24	26	11	25	G	G	G	27	34	42	39	42	39	34	34	37	37	35	28	30	30	35	34	31
L Q	G	G	G	G	G	G	G	G	29	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

DEC. 2016

LAT. 35°43.0'N LON. 139°29.0'E SWEEP 1.0MHz TO 30.0MHz 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	14	13	13	13	13	13	14	18	13	13	13	13	13	13	17	13	13	13	13	13	14	13	13	13
2	14	13	13	14	13	13	14	13	13	13	13	13	13	13	14	14	13	13	14	13	13	13	14	14
3	13	13	13	14	13	14	13	17	13	13	13	13	14	13	13	13	18	13	20	14	14	13	14	14
4	13	15	13	14	13	14	14	17	13	13	13	13	13	13	13	13	13	14	14		13	14	13	14
5	15	13	13	13	13	15	13	13	13	14	14	14	20	13	14	15	13	14		14	13	14	13	13
6	14	13	14	13	14	14	14	14	13	14	17	17	14	13	14	13	14	13	13	17	13	13		13
7	14	13	13	13	14	15	15	13	13	13	14	15	15	13	13	13	13	14	13	13	14	14		13
8	17	14	14	13	14	14		17	13	13	13	13	13	14	14	13	13	14	15	13	14	14	14	13
9	13	13	13	13		14	14	13		13	13	15	13	13	13	15	13	13	17	14	13	13	13	14
10	13	14	14	13	13	13	13	14	13	13	14	13	14	13	18	13	13	14	14	13	13	14	14	14
11	13	14	14	13	14	13	14	15	14	13	13	18	14	17	15	13	13	13	17	13	13	13	14	13
12	13	13	13	14	13	13	14	15	14	18	14	17	18	14	15	13	15	13	14	13	13	14	13	13
13	13	14	13	13	14	14	14	13	13	13	13	15	14	15	25	18	15	13	13	13	13	13	13	13
14	13	13	14	13	13	14	15	14	22	31	33	37	44	43	24	18	13	14	13	13	13	13		17
15	13	14	14	14	14	13	13	14	14	13	17	15	15	20	18	13	15	14	15	18	14	14	14	13
16	14	13	13	13	13	13	13	14	13	17	18	18	21	42	31	17	20	17	18	15	14	14	13	13
17	13	13	14	14	14		13	13	13	13	14	13	14	14	13	13	13	13	13	14	13	14	13	13
18	13	14	13	13	13		13	14	13	14	14	13	14	14	13	13	13	13	13	14	14	14	13	13
19	13	13	13	14	15	14	13	13	14	30	18	39	18	17	13	13	13	15	15	15	14	13		14
20	13	13	14	13		15	15	13	13	13	13	13	17	13	14	14	18	14	20	14	13	14	15	13
21	14	14	13	14	13	13	13	14	13	13	14	14	13	13	13	13	18	13	14	14	13	14	15	14
22	13	15	13	13	13	14	13	15	13	14	13	13	14	13	13	13	20	13	14	13	13	14	13	13
23	15	14	13	13	13	13	15	14	13	13	14	13	15	17	14	13	13	14	14	13	14	23	14	14
24	15	13	15	13	13	15	14	14	14	13	13	13	14	13	13	14	22	13	14	18	14	14	15	14
25	13	13	13	13	13	13	17	15	20	13	14	20	20	15	13	13	13	13	17	13	14	13	13	13
26	13	20	13	13	13	13	13	14	13	14	18	20	18	18	18	24	22	14	20	14	14	14	13	13
27	20	21	17	13	13	15	14	13	14	17	18	17	18	37	14	28	14	13	14	14	20	14	18	
28	13			13	13	13		14	17	18	17	18	20	17	15	14	13	13	13	15	13	13		
29	13	14		13	13	13		13	13	15	15	18	40	18	15	14	14	14		14	14	14		15
30	14	13	14	17	13	14	13	14	15	13	20	18	22	22	36	14	18	15	13	18		14		
31	17	14	13	13	15	13	13	13	22		37	37	38	38	37	29	20	13	13		13	13	13	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	31	30	29	31	29	29	28	31	30	30	31	31	31	31	31	31	31	31	29	29	30	31	24	28
MED	13	13	13	13	13	14	14	14	13	13	14	15	15	14	14	13	13	13	14	14	13	14	13	13
U Q	14	14	14	14	14	14	14	15	14	14	17	18	20	18	18	15	18	14	16	14	14	14	14	14
L Q	13	13	13	13	13	13	13	13	13	13	13	13	14	13	13	13	13	13	13	13	13	13	13	13

HOURLY VALUES OF foF2 AT Yamagawa

DEC.2016

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

HOURLY VALUES OF fEs AT Yamagawa

DEC.2016

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

HOURLY VALUES OF fmin AT Yamagawa

DEC.2016

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

HOURLY VALUES OF foF2 AT Okinawa

DEC.2016

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz 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	B	B	B	B	B	B	B	B	B			B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B		B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	63	58	52	N	34	32	B
6	B		26	B	N		B	38	52	C	74	70	69	81	85	85	81	75	61	47	40	A	A	B
7	31	31	47	B	B	B	B		61	77	82	81	70	86	71	66	75	66	N	48	43	A	B	B
8	29	30	32	B	36	29	B	34	60	74	72	82	75	N	77	63	67	68	54	47	52	31	B	B
9	B	B		32	32	B	B	37	54	57	61	67	72	85	78	87	110	88	51			B	A	A
10	A	A	A	A	28	B	B	47	51	57	74	90	77	69	64	90	110	65	52	A		34	40	N
11	N	B	B	N	A	B	B	48	54	58	65	76	92	92	70	64	57	60	51	53	A		B	A
12	A	A	A	30	A	B	N	32	52	66	64	62	72	80	62	60	44	63	A	A	A	B	B	B
13	30			A	A	A	B	36	52	58	63	58	58	58	62	A	60	54	34	B	30	28	B	B
14	B	B	B		B	B	B	30	56	60	72	61	55	62	68	72	73	85	100	52	51	52	43	
15	B	37	A	37	40	34	B	32	56	56	67	66	68	46	80	88	55	58	52	B		30		B
16	N	B	B	B	C	B	B	30	54	54	54	52		61	68	C	59	48	34	A	A	A	A	B
17	B	B	B	B	C	C	C	28	C	C	63	46	92	59	64	68	C	51	54	A	B	40	C	C
18	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	67	65	57	52	55	41	56	N	29	36	40	B
20	B	B	B	B	B	B	B		52	57	66	64	58	70	67	58	55	51	53	B	52	B	B	B
21	B		B	N	32	30	B	30	52	61	74	82	67	66	71	66	68	54	47	41	B		34	B
22	B	28		B	B	A	B	32	69	49	70	72	74	82	67	82	64	57	46	28	47	B	B	B
23		28	31	30	34		B	41	47	69	67	68	72	76	102	88	76	72	45	42	34	B		B
24	B	B	30		B	N	B	69	59	57	60	56	66	102	80	70	63	50	52	32	B			30
25	B	B	31		N	B		30	47	57	75	81	61	78	81	81	60	55	50	34	B		B	B
26	B	B	B	B	B	B	B	B	63	70	71	88	67	70	67	94	67	67	45		A	B	B	B
27	B	B	B	B	B	B	B	35	54	65	67	58	63	65	79	64	77	66	45	45		B	B	B
28	B		B			B	B	28	62	60	66	97	107	88	73	93	100	67	50		A	37	B	B
29	B	B	B	B	B	30	B	B	48	51	72	62	55	55	64	67	58	57	50	26	B	B	B	B
30	B	B	N	B		B	B	26	52	60	94	86	71	92	123	101	92	81	48	A	A	A	A	B
31	B	B	B	B	B	34	30	30	47	53	48	57	49	70	82	92	72	86	54			47	36	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	3	5	6	4	6	5	1	20	23	22	24	24	24	24	25	23	24	26	24	13	9	10	6	1
MED	30	30	31	31	33	30	30	32	54	58	67	68	68	70	71	72	67	63	51	45	43	35	38	30
U Q	31	34	32	34	36	34	15	37	59	65	73	81	73	83	80	88	76	68	54	50	51	40	40	15
L Q	29	28	30	30	32	29	15	30	52	57	63	59	62	63	65	64	58	54	46	33	32	31	34	15

HOURLY VALUES OF fEs AT Okinawa

DEC.2016

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

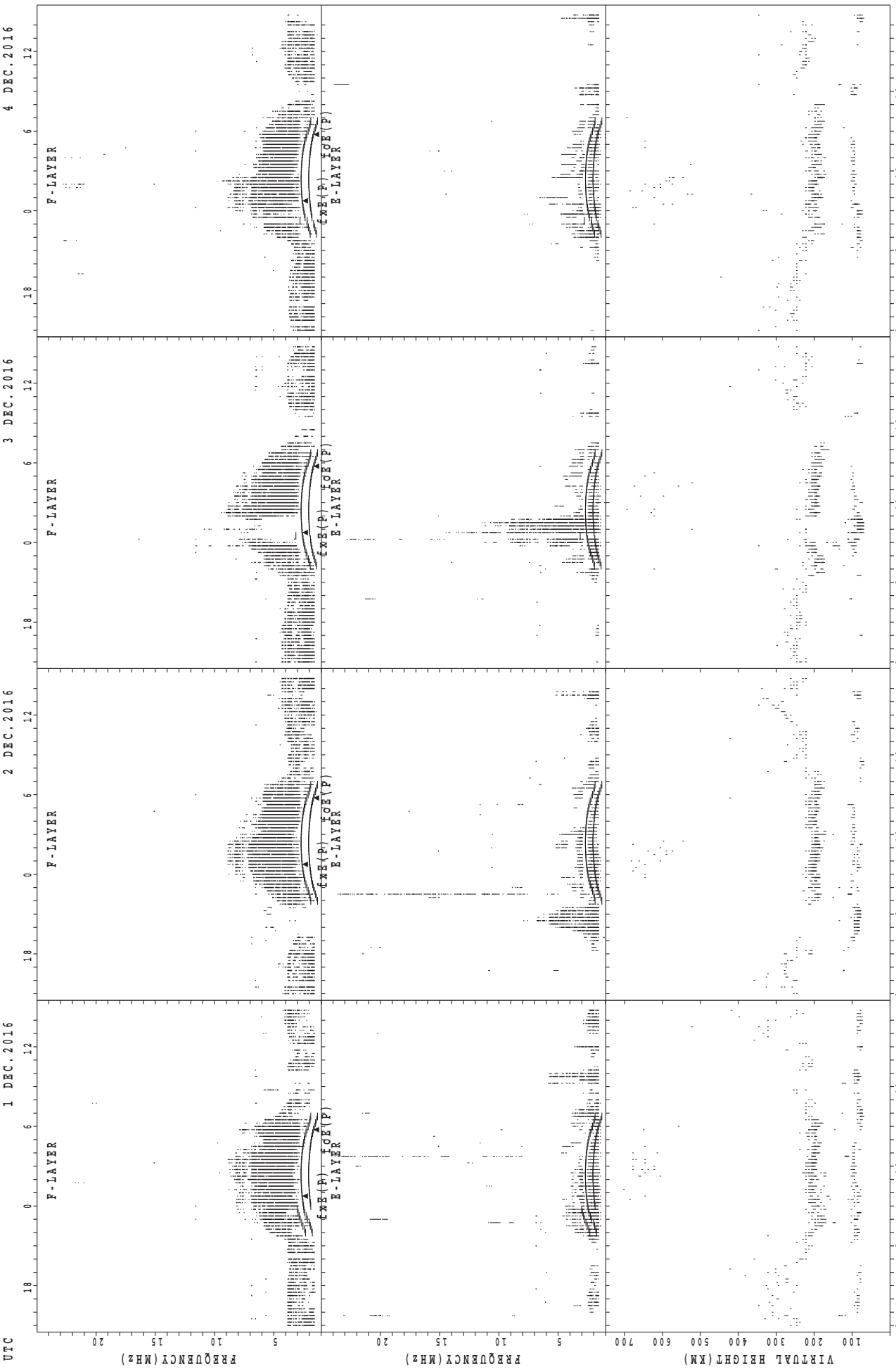
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	B	B	B	G	G	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	46	B	B	B	B	B	B	B	B		B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	G	G	24	G	G	B
6	B	G	G	B	G	G	B	G	30	C	30	42	42	40	48	46	46	41	32	38	36	28	26	B
7	G	G	G	B	B	B	B	G	G	G	34	38	46	52	54	33	55	58	45	G	G	32	B	B
8	G	G	G	B	G	25	B	G	26	31	G	G	46	49	43	40	40	39	36	33	G	G	B	B
9	B	B	G	28	G	B	B	G	26	32	34	35	46	46	45	65	44	40	G	G	G	B	24	54
10	58	28	65	49	G	B	B	G	G	30	G	32	42	44	48	40	46	G	28	30	G	G	G	G
11	G	B	B	G	41	B	B	G	G	31	G	G	46	66	44	39	39	38	32	29	38	G	B	70
12	44	36	26	24	33	B	G	G	29	35	33	49	48	48	58	69	62	58	46	56	27	B	B	B
13	G	G	G	58	53	26	B	G	G	G	G	45	44	46	48	60	48	36	G	B	G	G	B	B
14	B	B	B	G	B	B	B	G	29	32	36	32	38	52	41	51	49	54	60	36	43	G	G	G
15	B	G	27	G	G	G	B	G	30	40	32	36	G	G	G	G	G	G	11	B	G	G	G	B
16	G	B	B	B	C	B	B	G	G	G	G	G	G	44	39	C	34	32	29	44	44	49	47	B
17	B	B	B	B	C	C	C	G	C	C	32	34	G	45	43	41	C	G	33	24	B	25	C	C
18	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	G	32	30	40	36	33	26	24	25	G	32	B
20	B	B	B	B	B	B	B	G	G	36	40	32	G	G	G	G	32	33	27	B	G	B	B	B
21	B	G	B	G	G	G	B	G	29	36	40	46	39	44	35	G	30	G	32	G	B	G	G	B
22	B	G	G	B	B	11	B	G	G	35	G	36	41	32	G	34	G	G	G	G	G	B	B	B
23	G	G	G	G	G	G	B	G	32	31	34	G	56	56	30	39	G	G	G	G	G	B	G	B
24	B	B	G	G	B	G	B	G	G	G	G	44	45	G	50	38	35	G	26	24	B	G	G	G
25	B	B	G	G	G	B	G	G	26	36	40	G	43	43	40	G	41	45	34	G	B	G	B	B
26	B	B	B	B	B	B	B	B	G	36	44	42	G	42	39	50	53	40	G	G	36	B	B	B
27	B	B	B	B	B	B	B	G	G	G	G	G	G	G	G	40	41	46	27	G	G	B	B	B
28	B	G	B	G	G	B	B	G	G	58	35	31	35	42	40	42	G	36	G	G	33	G	B	B
29	B	B	B	B	B	G	B	B	G	33	41	G	G	G	45	G	27	G	G	G	B	B	B	B
30	B	B	G	B	G	B	B	G	G	26	G	G	35	G	G	29	G	28	G	25	37	29	29	B
31	B	B	B	B	B	G	G	G	46	48	G	46	G	37	G	G	G	G	11	G	G	G	G	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	8	11	13	12	13	10	3	22	24	23	25	24	25	25	25	24	24	26	26	23	21	18	13	5
MED	G	G	G	G	G	G	G	G	G	32	32	33	39	43	40	40	38	33	26	G	G	G	G	G
U Q	22	G	13	26	17	11	G	G	29	36	35	42	45	47	46	44	46	40	32	30	36	25	27	62
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	16	15	15	14	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Okinawa

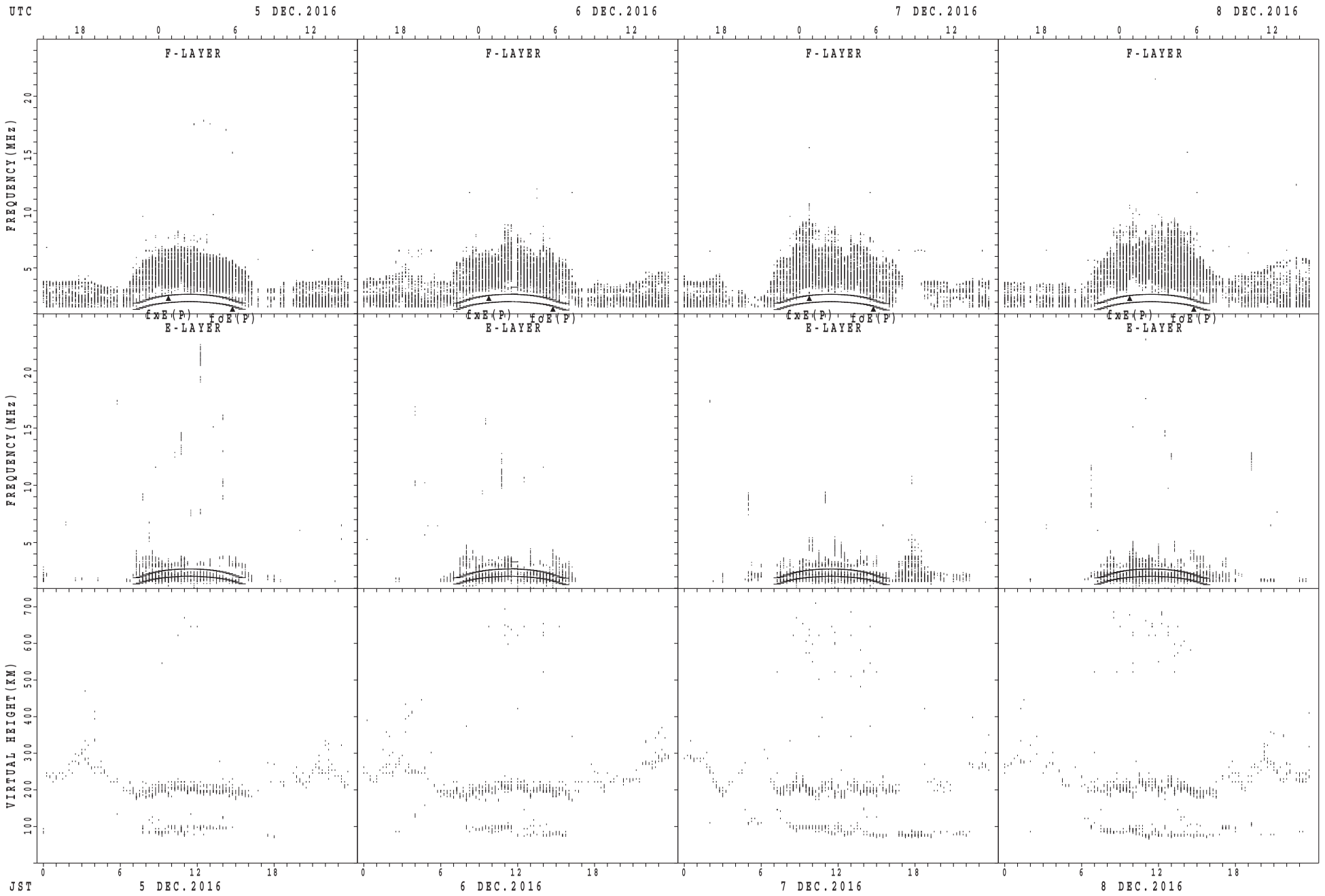
DEC. 2016

LAT. 26°41.0'N LON. 128°09.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

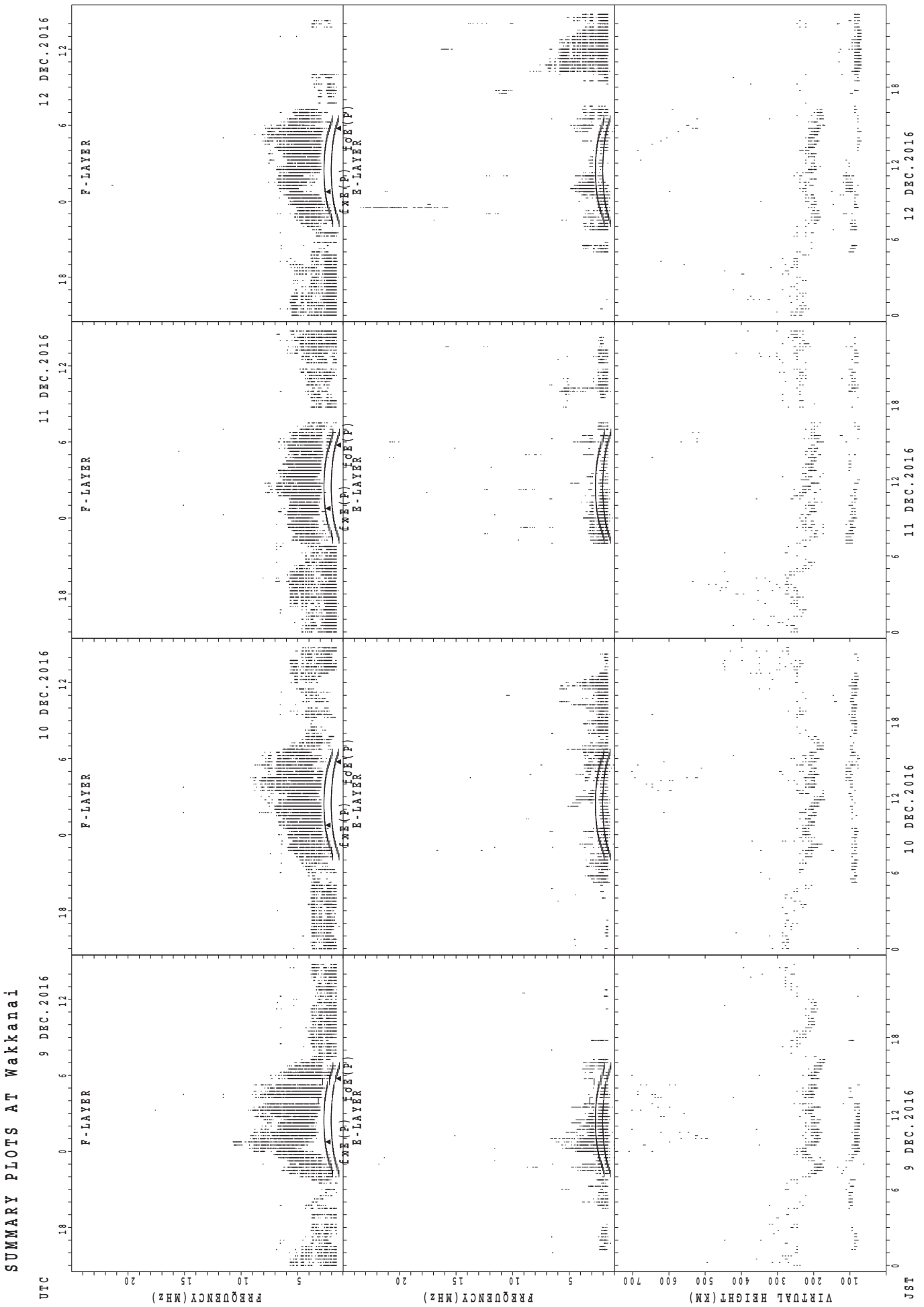
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	B	B	B	162	221	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	B	91	B	B	B	B	B	B	B	B		B	B	B	B	B	B
5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	21	18	17	17	23	18	B
6	B	66	16	B	17	23	B	16	15	C	16	23	22	21	21	17	15	14	16	15	15	14	15	B
7	15	18	17	B	B	B	B	66	14	15	17	22	18	18	35	15	15	15	15	16	17	15	B	B
8	16	16	20	B	18	15	B	18	14	16	18	18	15	21	18	16	15	15	14	16	17	16	B	B
9	B	B	17	15	15	B	B	16	14	15	15	20	18	29	20	21	15	15	23	66	71	B	16	15
10	15	15	15	15	15	B	B	15	16	15	16	18	27	24	18	18	14	22	17	15	15	15	15	16
11	15	B	B	18	14	B	B	15	22	15	16	39	29	18	21	18	17	14	15	15	17	66	B	20
12	15	14	15	15	14	B	15	15	15	15	16	27	21	16	24	20	15	15	15	14	15	B	B	B
13	20	71	71	32	15	16	B	15	17	17	17	32	44	36	21	17	15	14	16	B	15	14	B	B
14	B	B	B	18	B	B	B	16	16	17	21	21	41	29	28	18	16	15	15	15	15	15	18	71
15	B	23	15	17	21	26	B	17	15	16	17	40	18	17	41	17	16	21	16	B	71	15	18	B
16	16	B	B	B	C	B	B	21	23	16	17	35	81	27	26	C	16	15	14	15	15	15	16	B
17	B	B	B	B	C	C	C	15	C	C	17	26	42	32	23	20	C	23	14	15	B	15	C	C
18	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	41	22	20	15	15	15	16	16	15	17	15	B
20	B	B	B	B	B	B	B	66	27	16	18	21	22	40	21	16	15	15	15	B	15	B	B	B
21	B	16	B	15	16	17	B	15	14	15	16	23	21	18	16	16	14	24	15	21	B	18	17	B
22	B	18	16	B	B	17	B	16	29	17	17	20	17	21	17	16	17	22	16	21	27	B	B	B
23	17	16	17	66	15	66	B	16	15	17	16	40	28	22	20	18	15	23	18	22	21	B	26	B
24	B	B	16	15	B	16	B	15	22	34	17	29	30	38	18	16	16	23	16	16	B	18	71	15
25	B	B	15	71	15	B	66	15	26	16	38	18	33	34	24	38	17	16	16	21	B	28	B	B
26	B	B	B	B	B	B	B	B	23	21	24	20	43	23	22	17	16	16	17	36	18	B	B	B
27	B	B	B	B	B	B	B	18	29	32	21	39	46	44	40	18	17	15	16	24	66	B	B	B
28	B	66	B	66	66	B	B	15	26	18	17	21	21	41	15	28	29	21	20	22	15	18	B	B
29	B	B	B	B	B	16	B	B	27	17	36	40	40	42	30	40	18	28	35	16	B	B	B	B
30	B	B	17	B	17	B	B	15	23	17	21	40	42	45	39	38	35	32	18	16	15	15	15	B
31	B	B	B	B	B	15	17	15	20	15	17	33	42	28	35	40	34	23	16	27	66	15	20	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	8	11	13	12	13	10	3	22	24	23	25	24	25	25	25	24	24	26	26	23	21	18	13	5
MED	16	18	16	18	15	16	17	16	21	16	17	24	29	27	21	18	16	16	16	16	17	15	17	16
U Q	16	66	17	49	17	23	66	17	26	17	21	37	42	37	29	20	17	23	17	22	24	18	19	45
L Q	15	16	15	15	15	16	15	15	15	15	16	20	21	21	19	16	15	15	15	15	15	15	15	15


SUMMARY PLOTS AT Wakkanai
UTC
JST
1 DEC.2016
2 DEC.2016
3 DEC.2016
4 DEC.2016
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

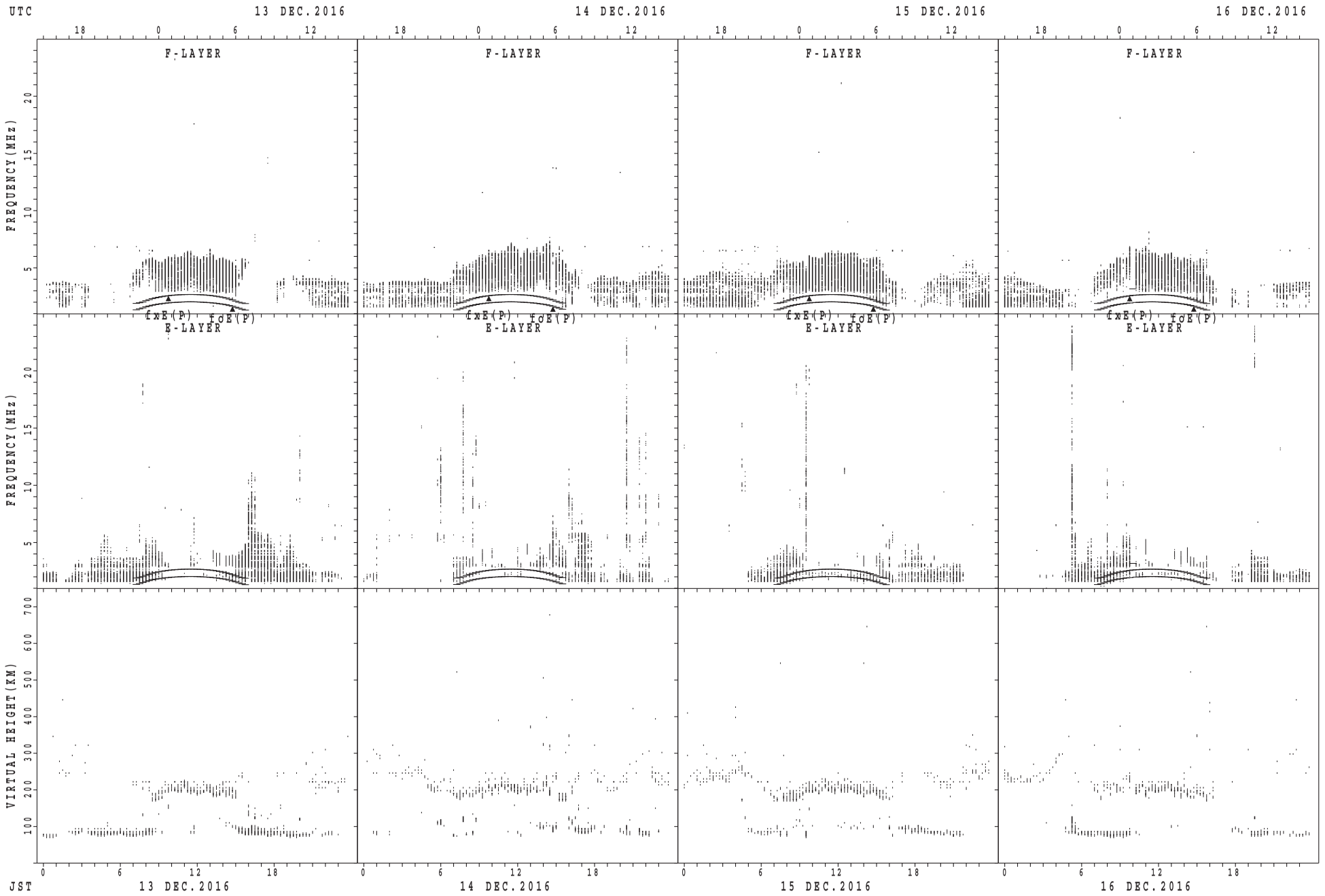
SUMMARY PLOTS AT Wakkanai



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

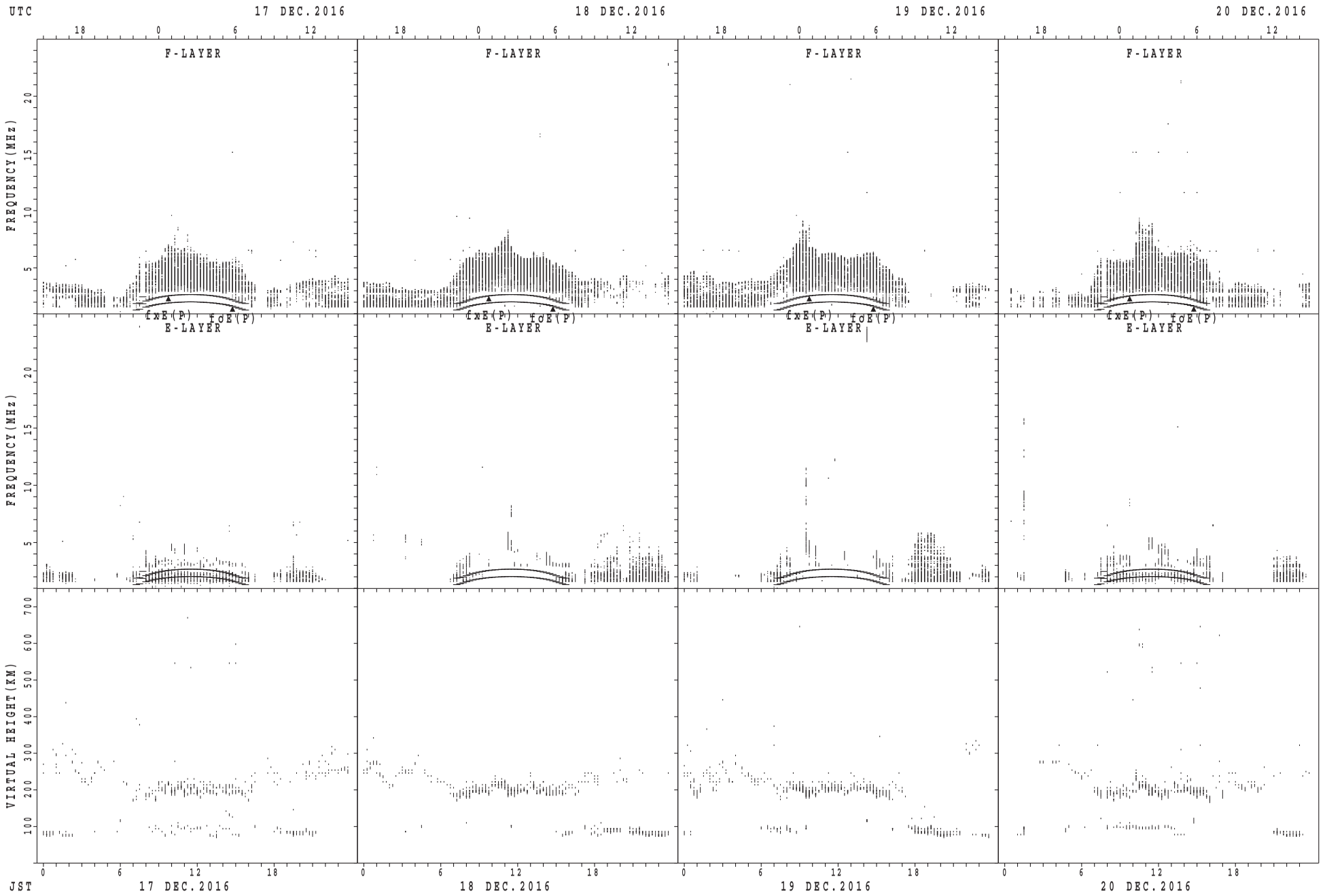

SUMMARY PLOTS AT Wakkanai
UTC
JST
9 DEC.2016
10 DEC.2016
11 DEC.2016
12 DEC.2016
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai

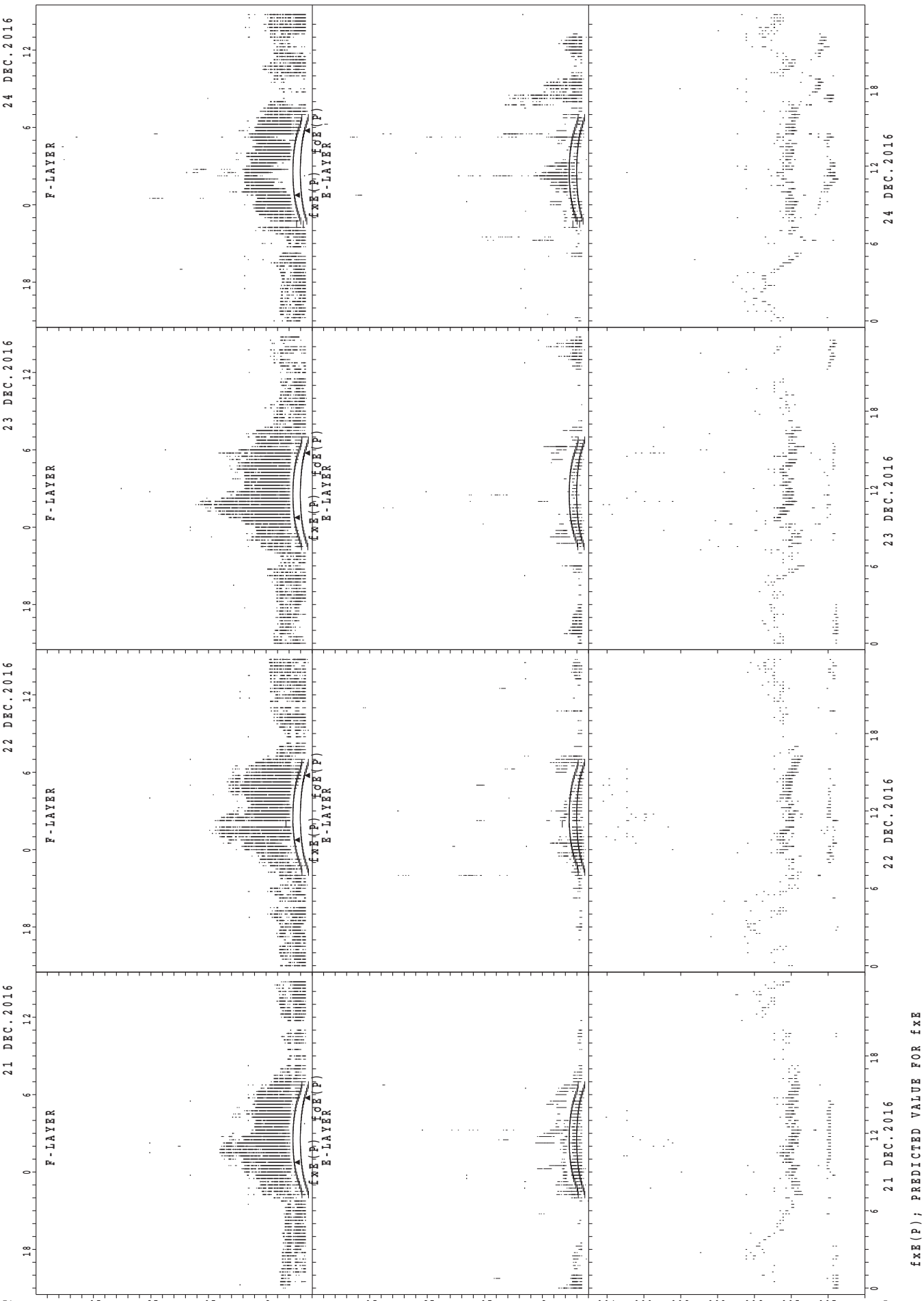


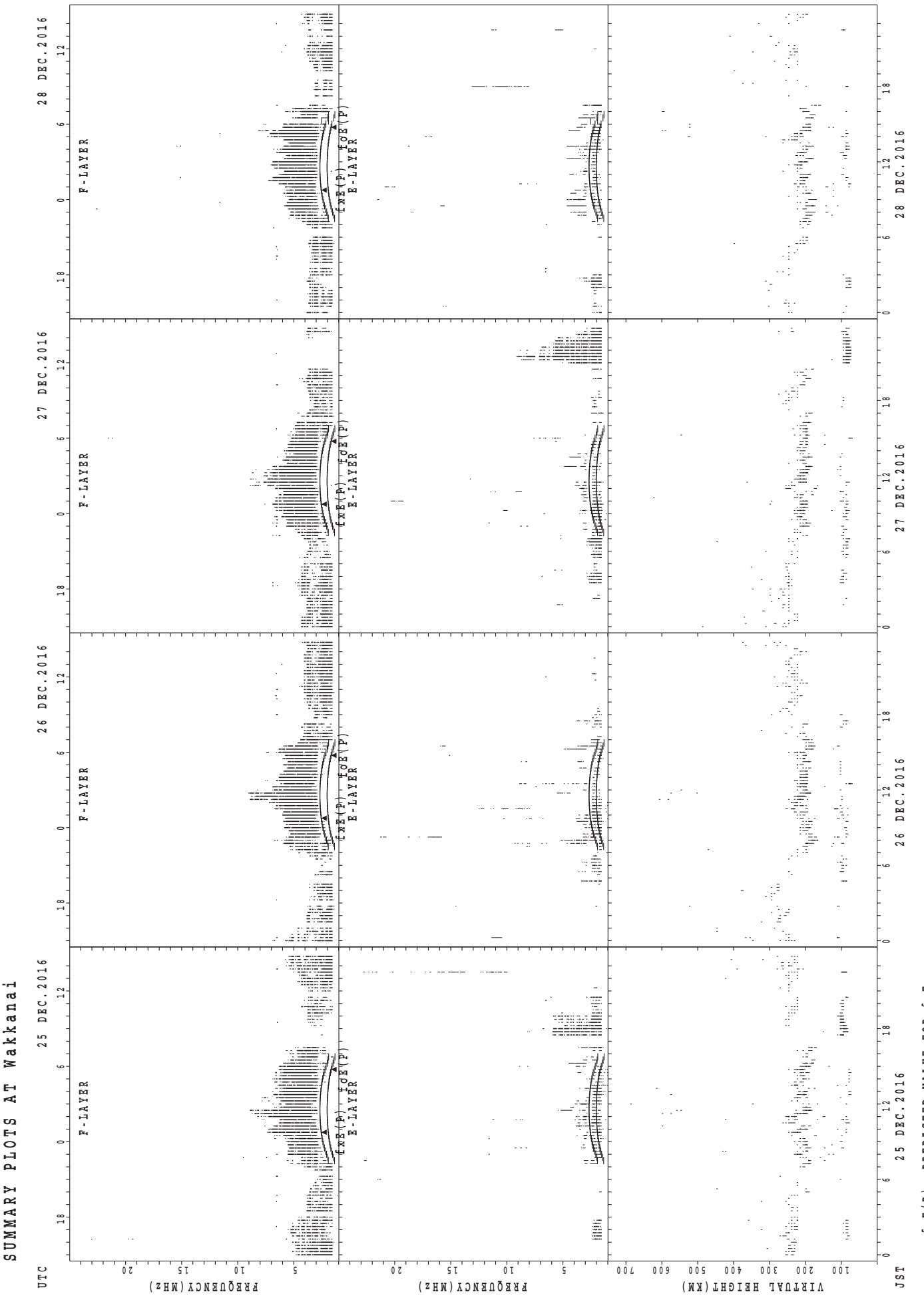
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

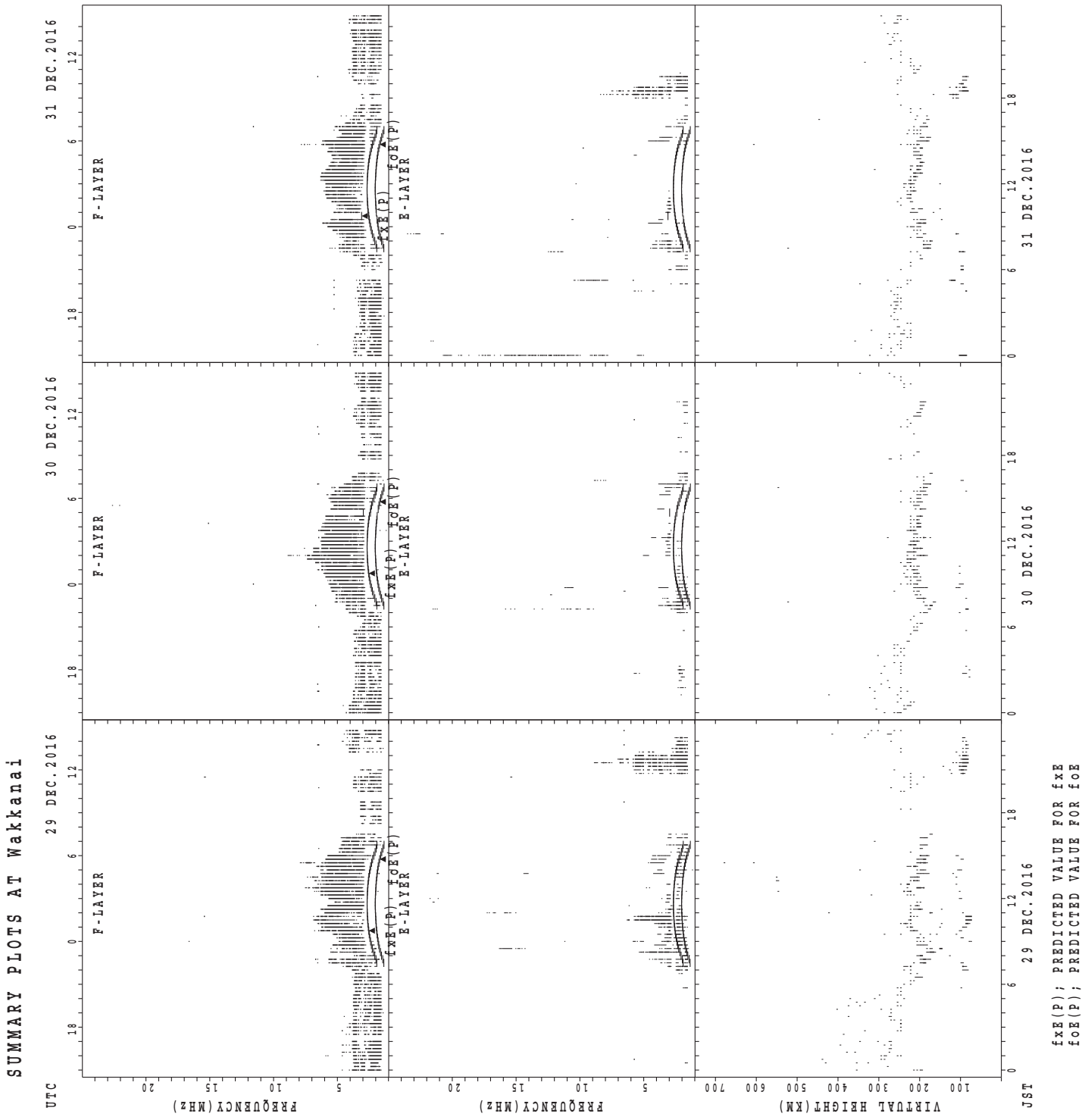
SUMMARY PLOTS AT Wakkanai



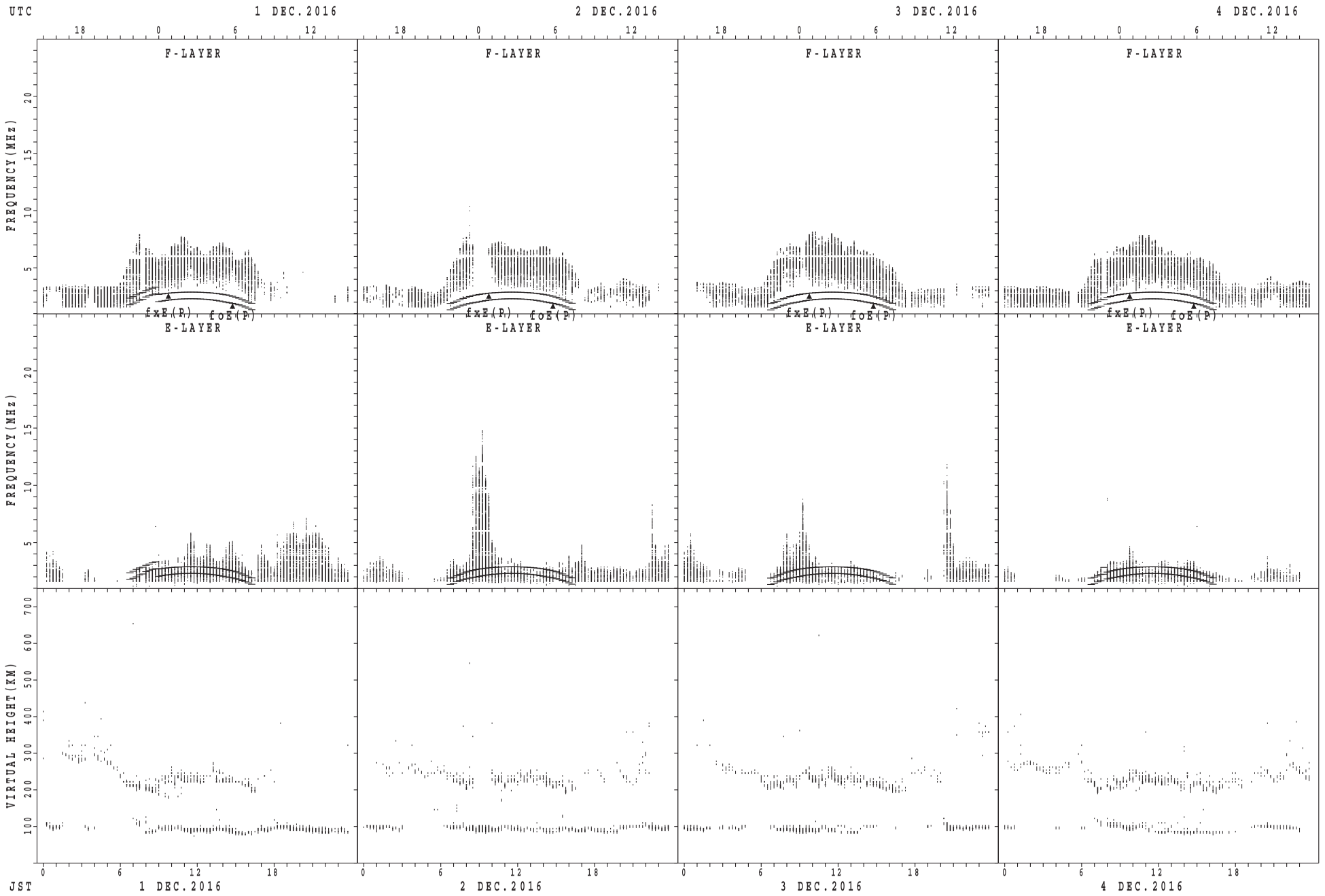
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
21 DEC.2016
22 DEC.2016
23 DEC.2016
24 DEC.2016
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
25 DEC.2016
26 DEC.2016
27 DEC.2016
28 DEC.2016
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

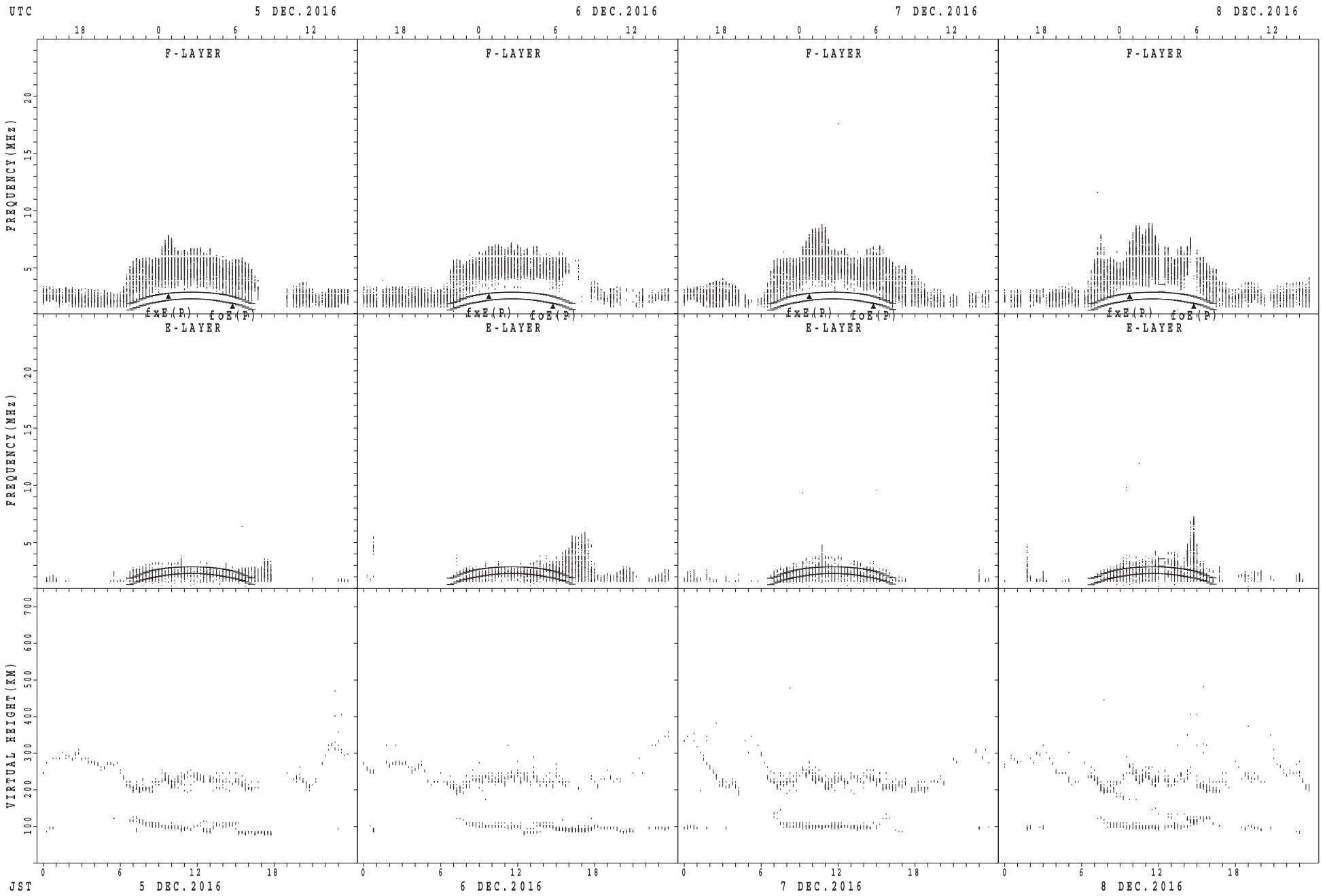

SUMMARY PLOTS AT Wakkanai
UTC
JST
29 DEC.2016
30 DEC.2016
31 DEC.2016
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

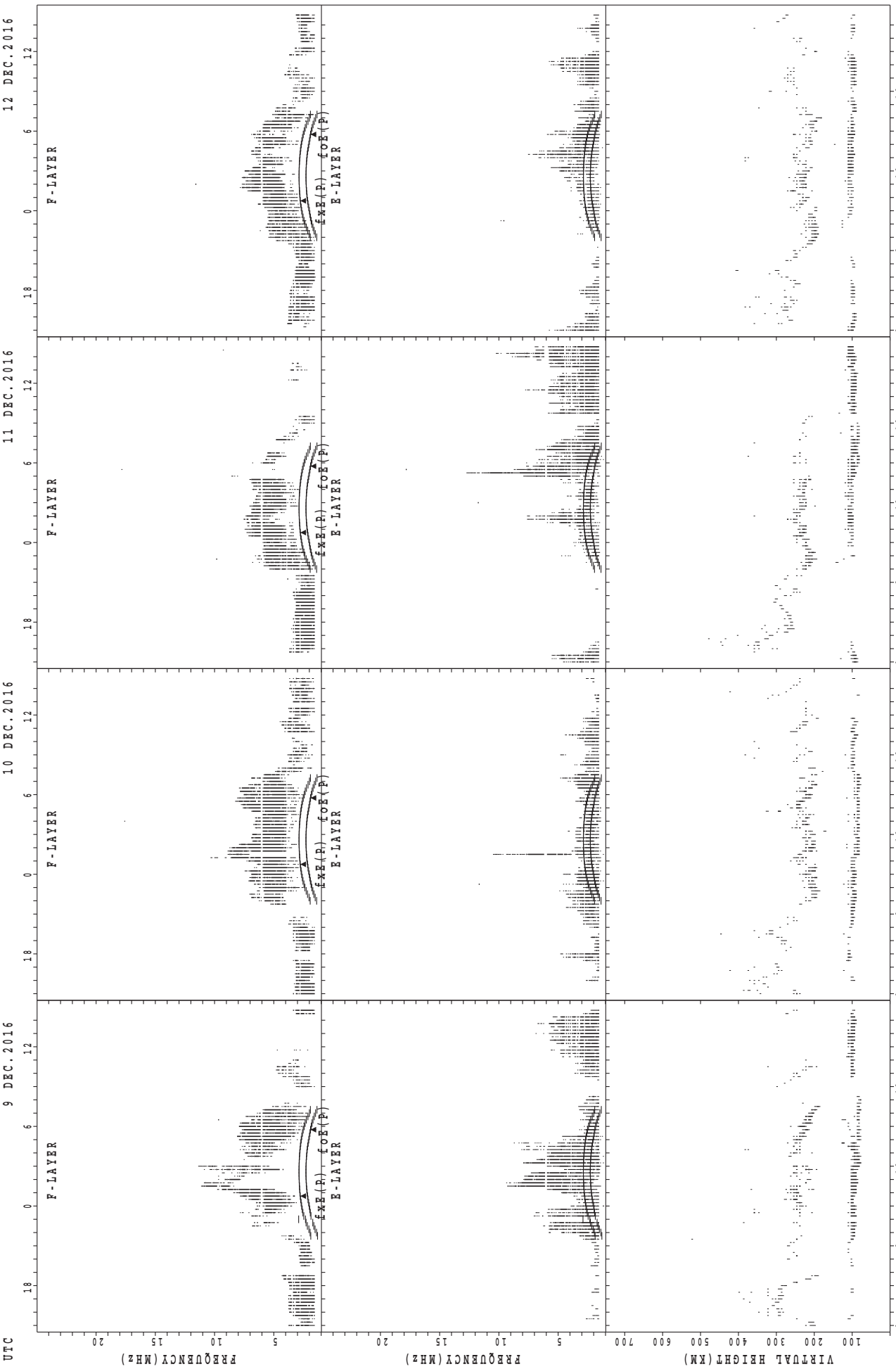


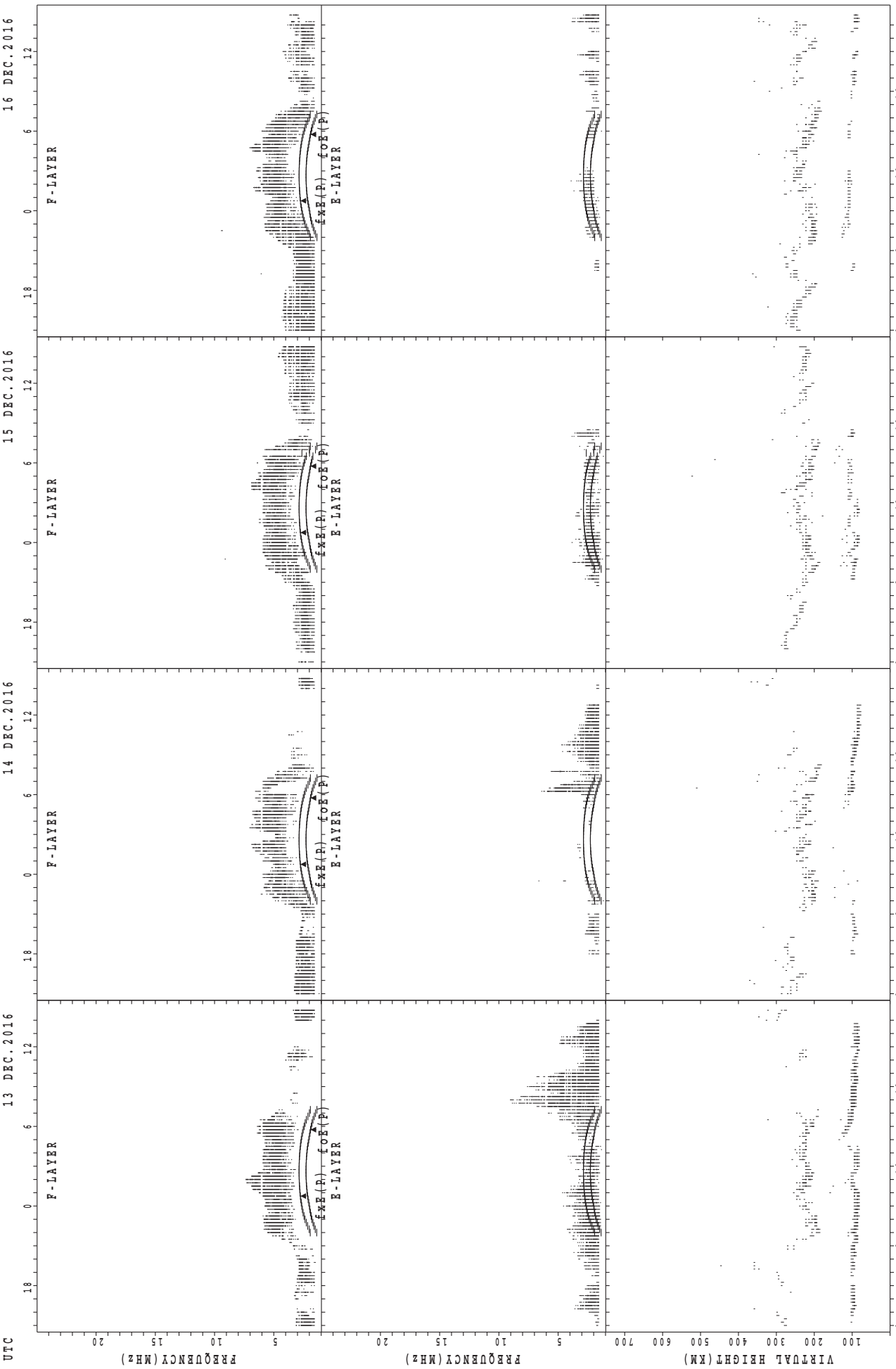
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

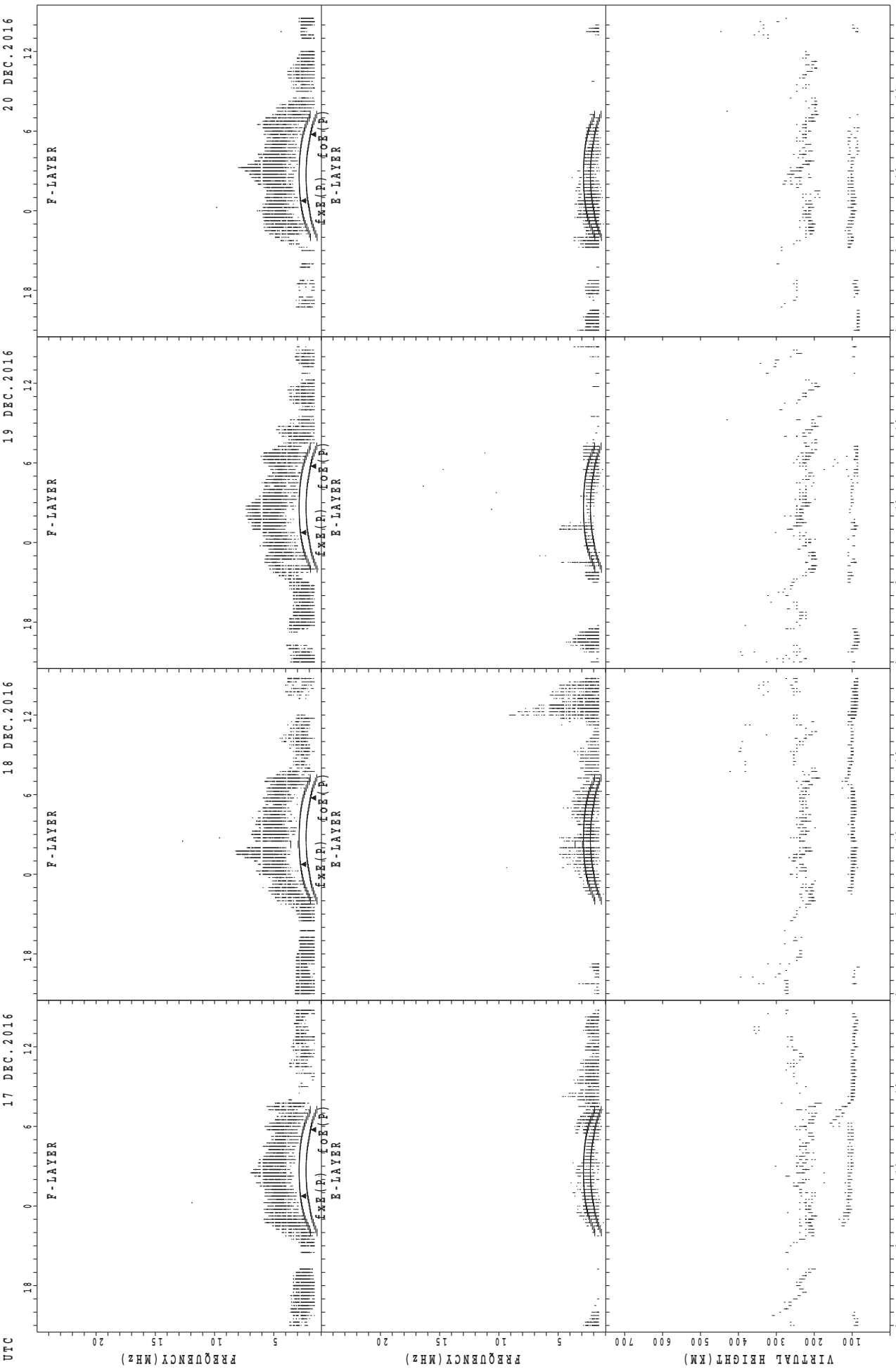
SUMMARY PLOTS AT Kokubunji



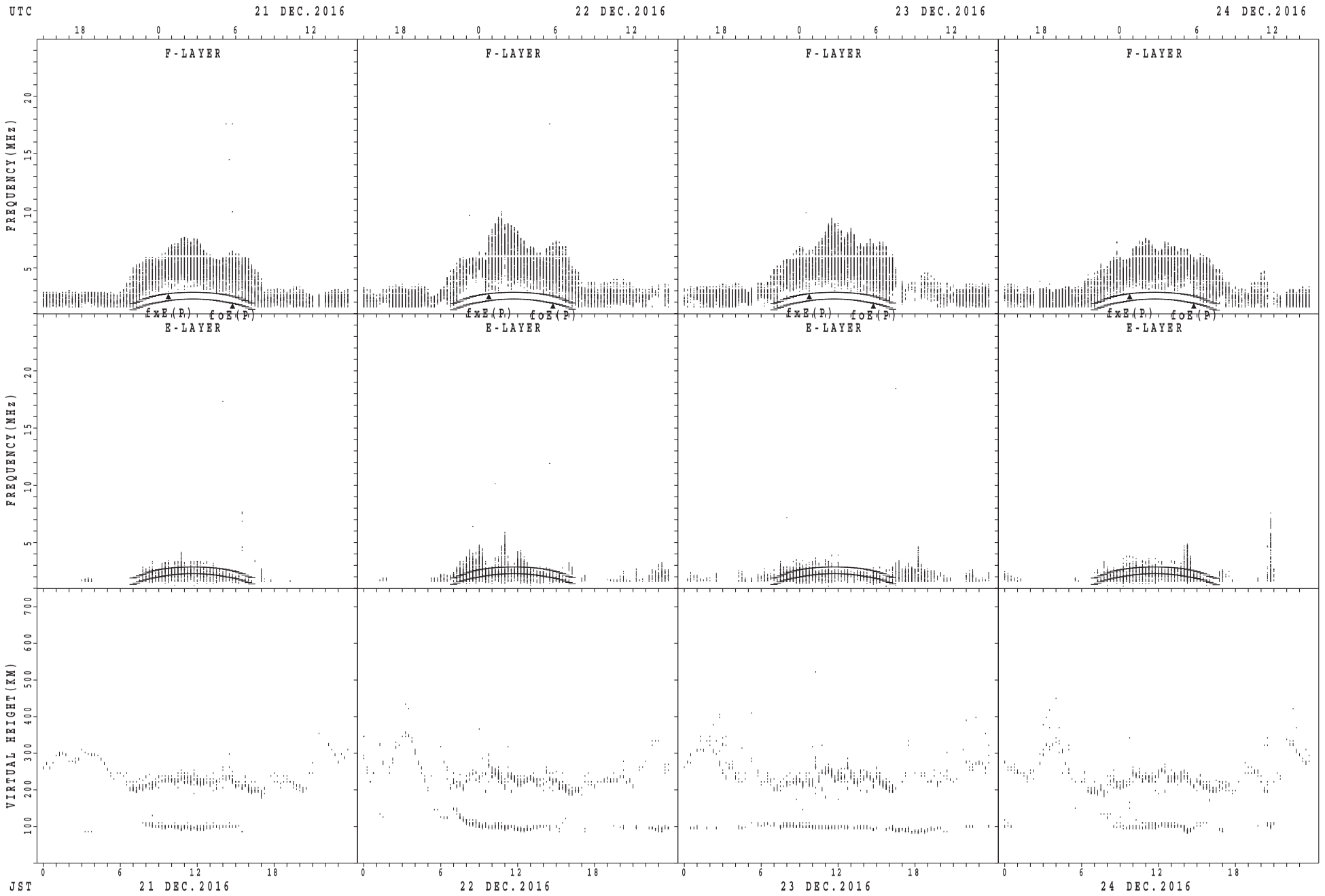
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
UTC
JST
9 DEC.2016
10 DEC.2016
11 DEC.2016
12 DEC.2016
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P), foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
UTC
JST
13 DEC.2016
14 DEC.2016
15 DEC.2016
16 DEC.2016
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P), foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

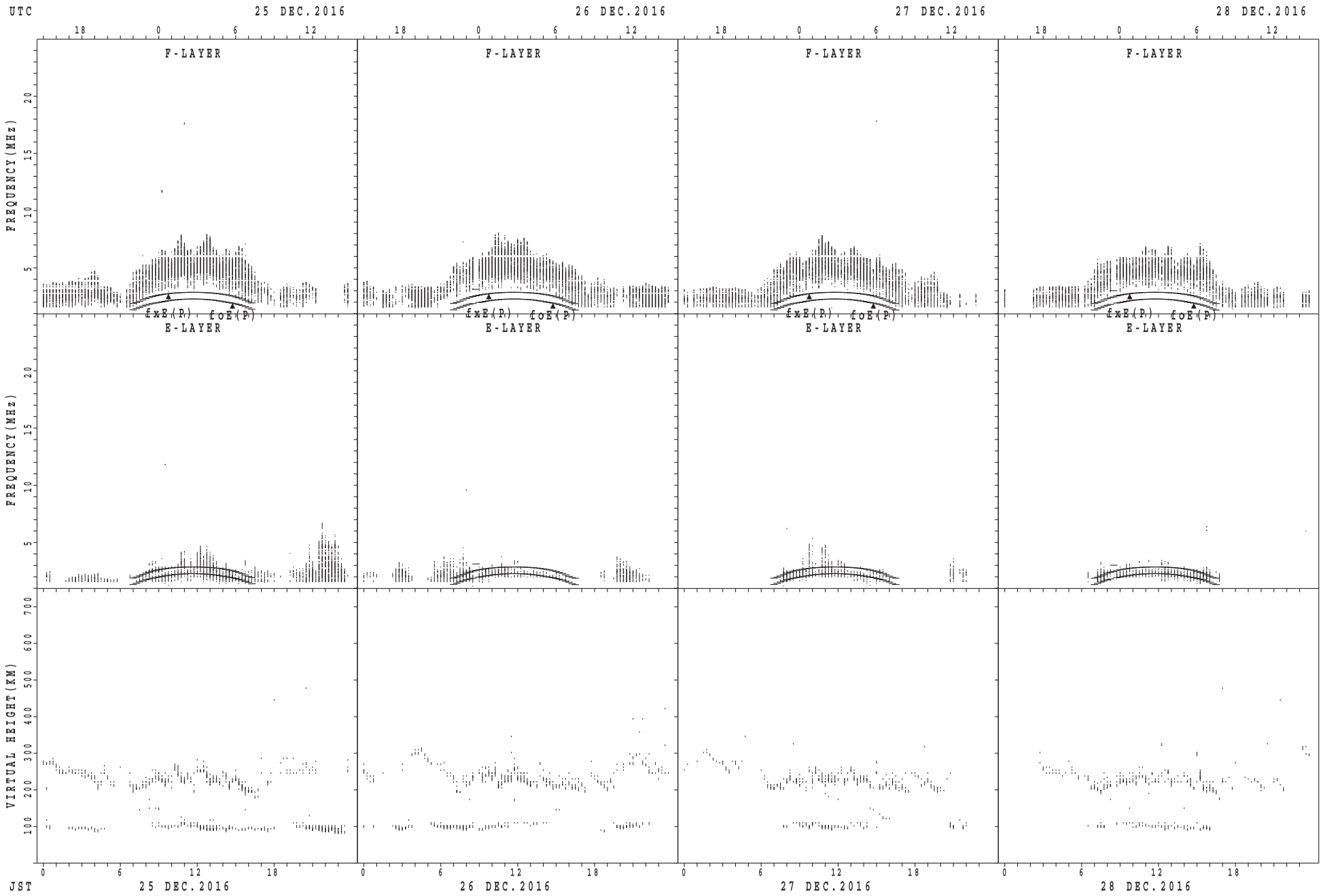

SUMMARY PLOTS AT Kokubunji
UTC
17 DEC.2016
18 DEC.2016
19 DEC.2016
20 DEC.2016
F-LAYER
E-LAYER
fxE(P), foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



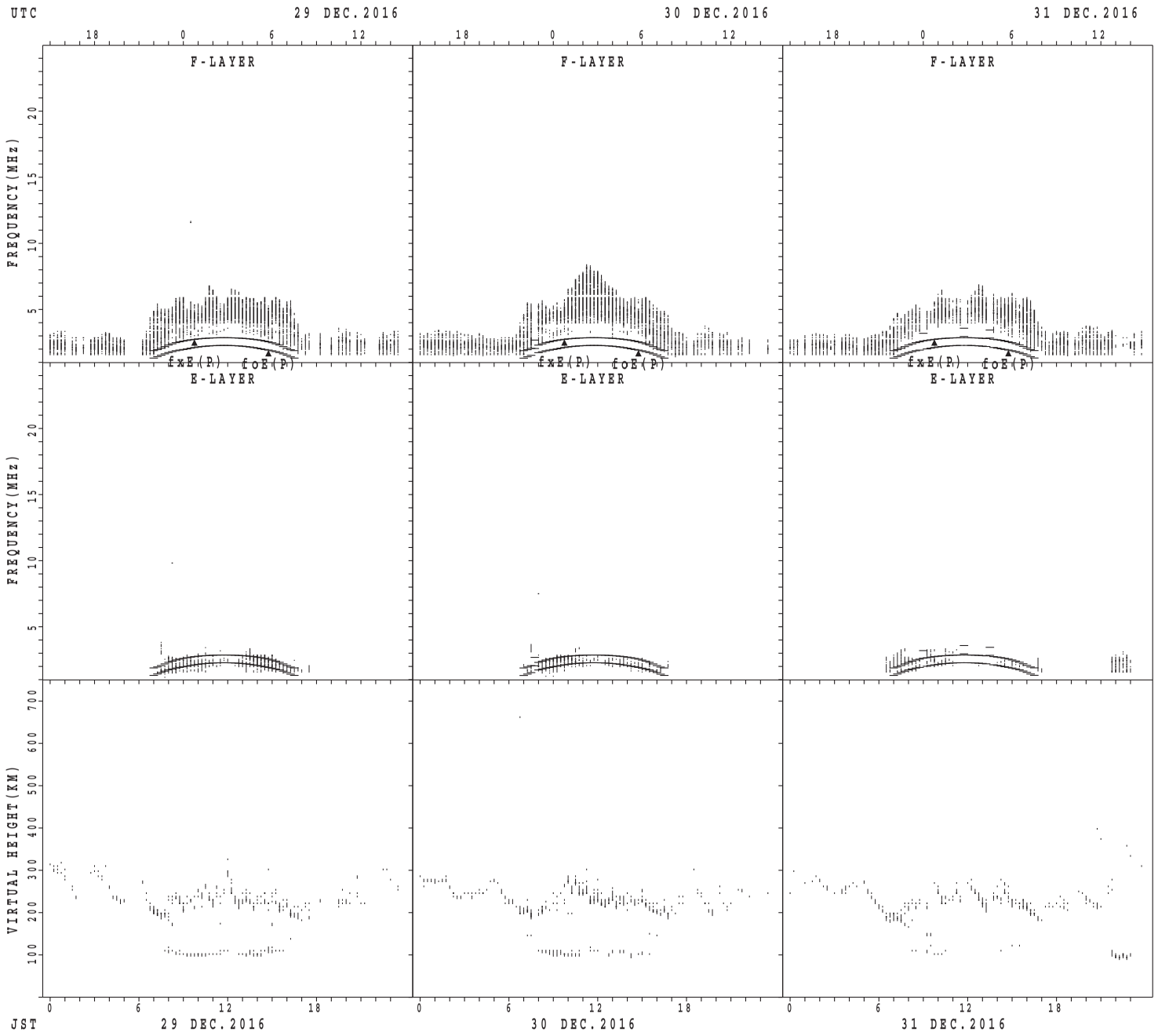
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



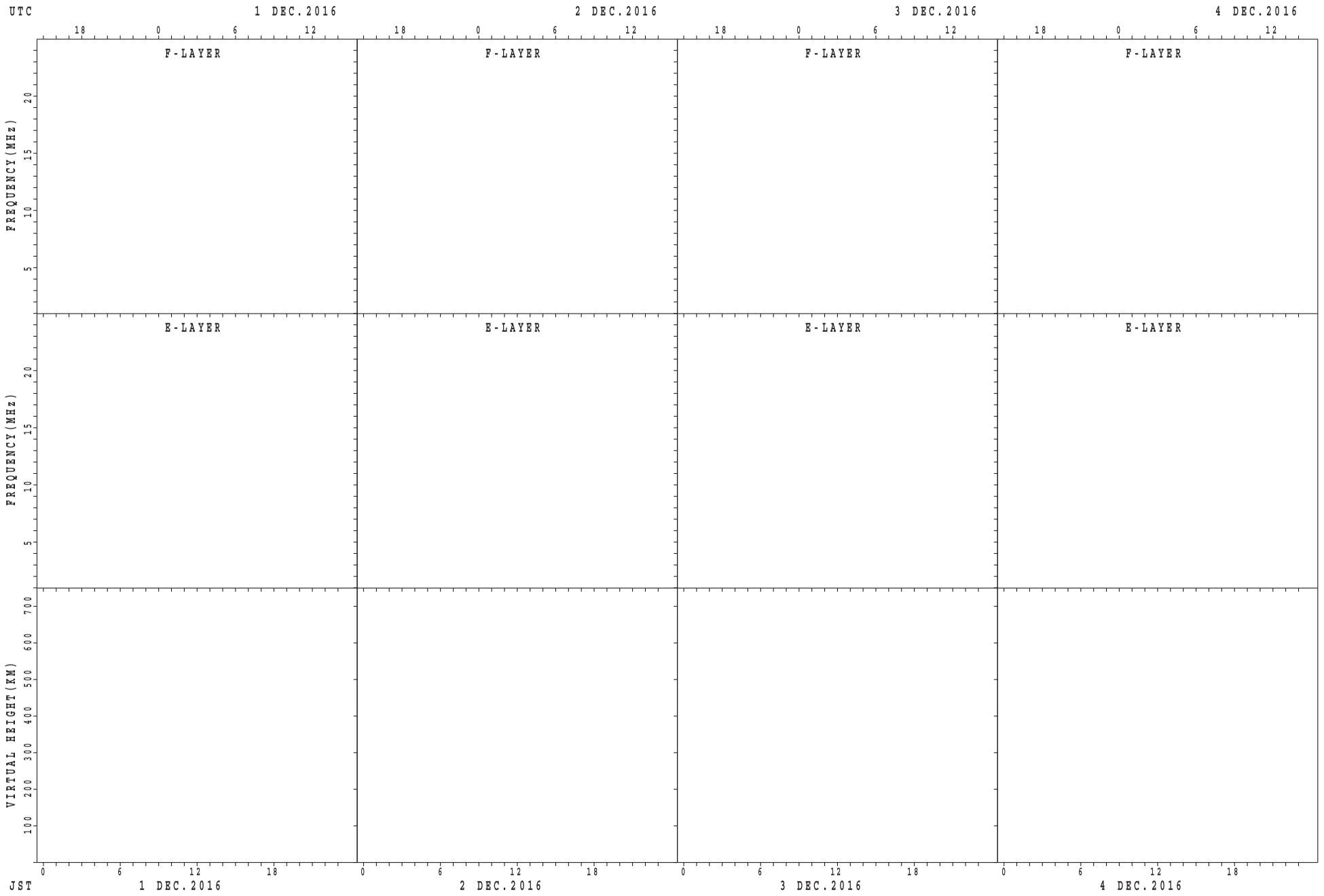
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



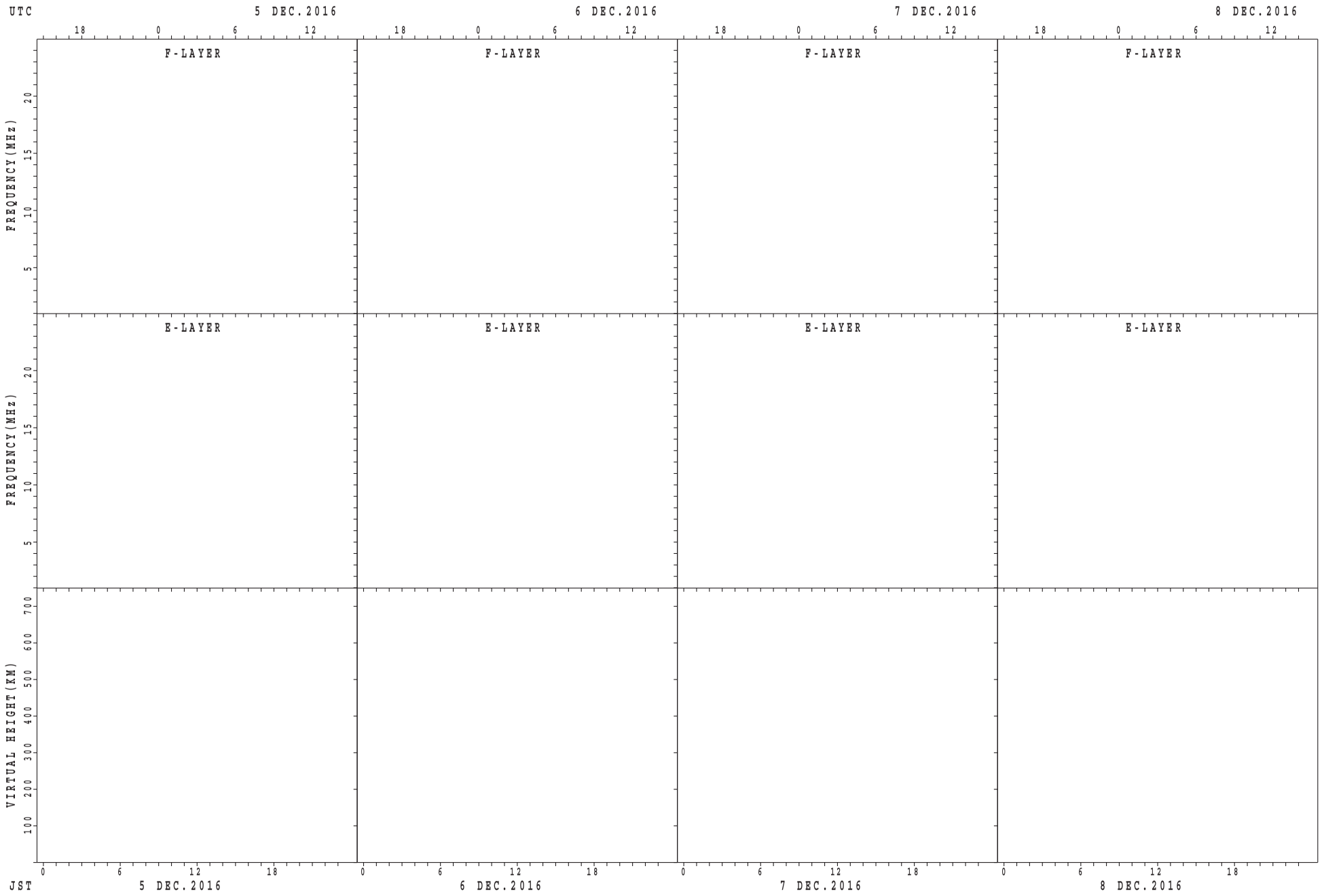
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



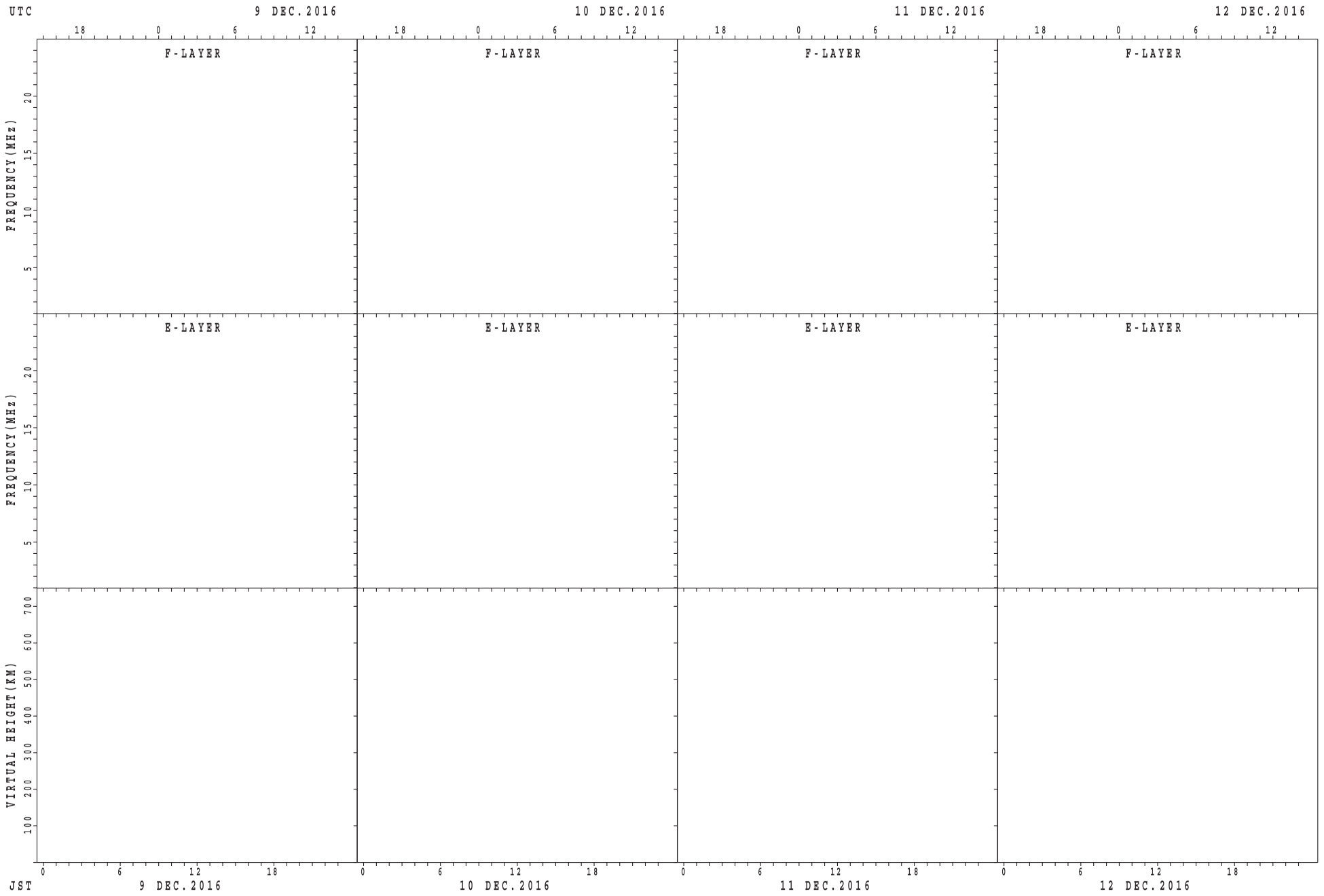
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



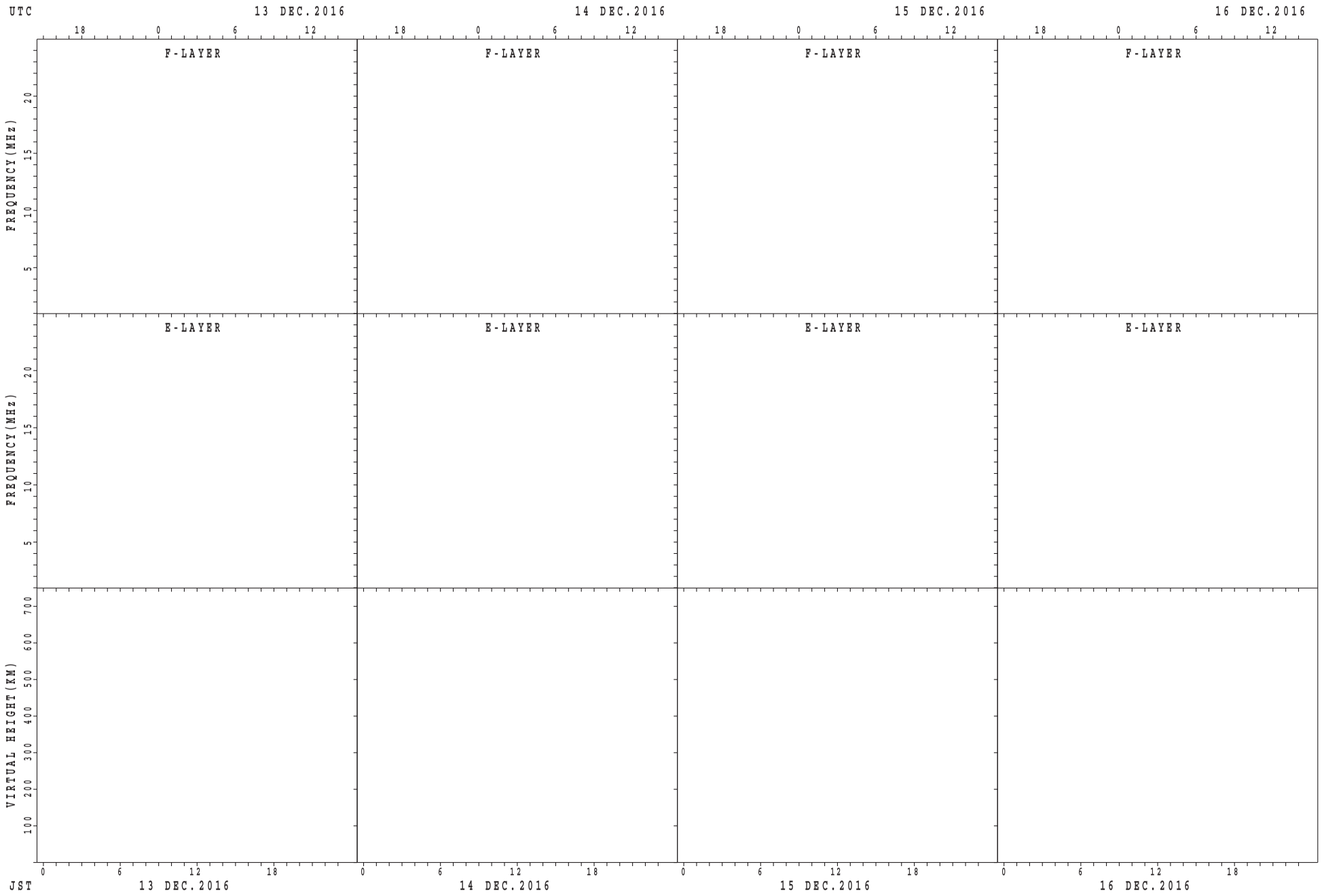
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



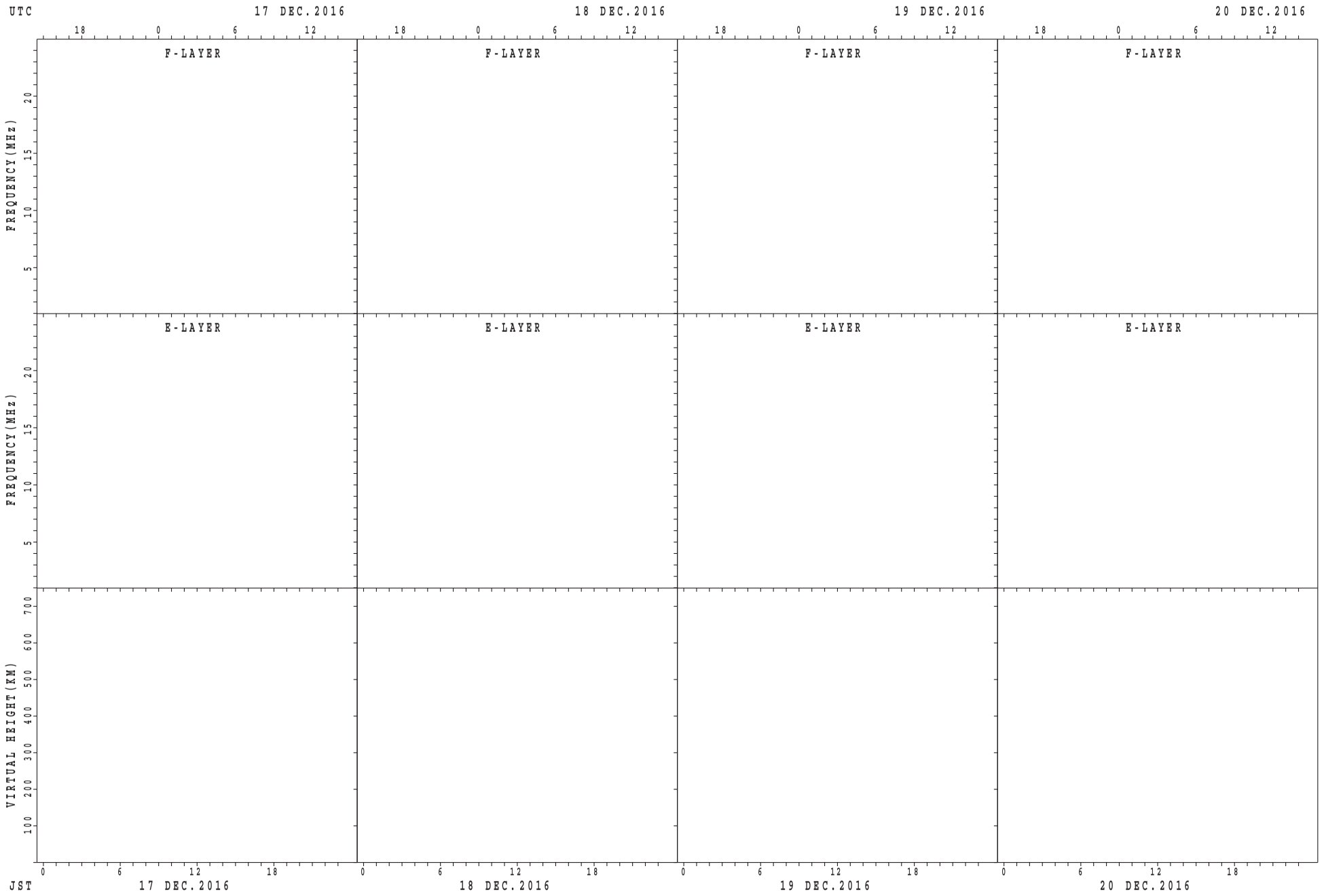
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



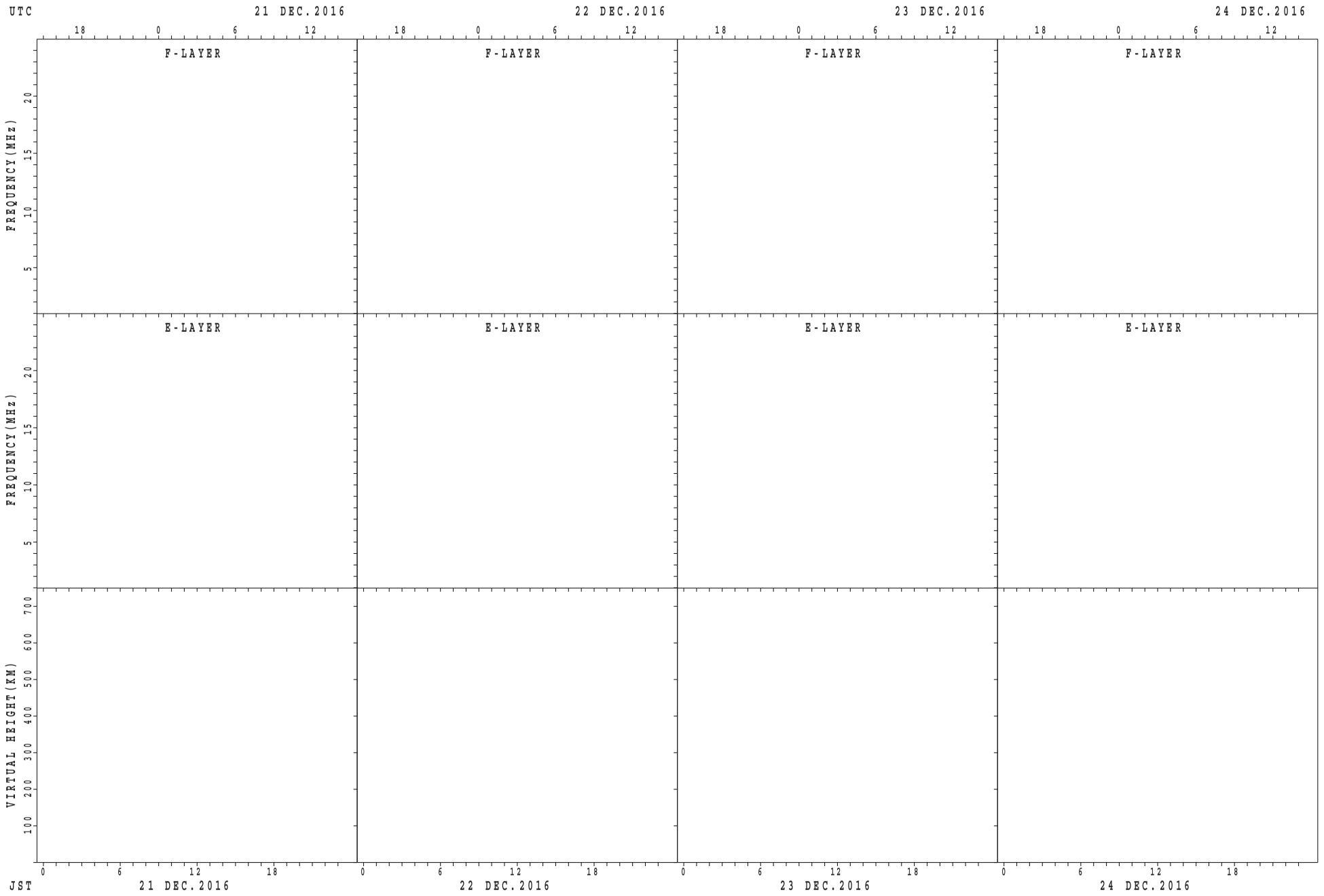
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



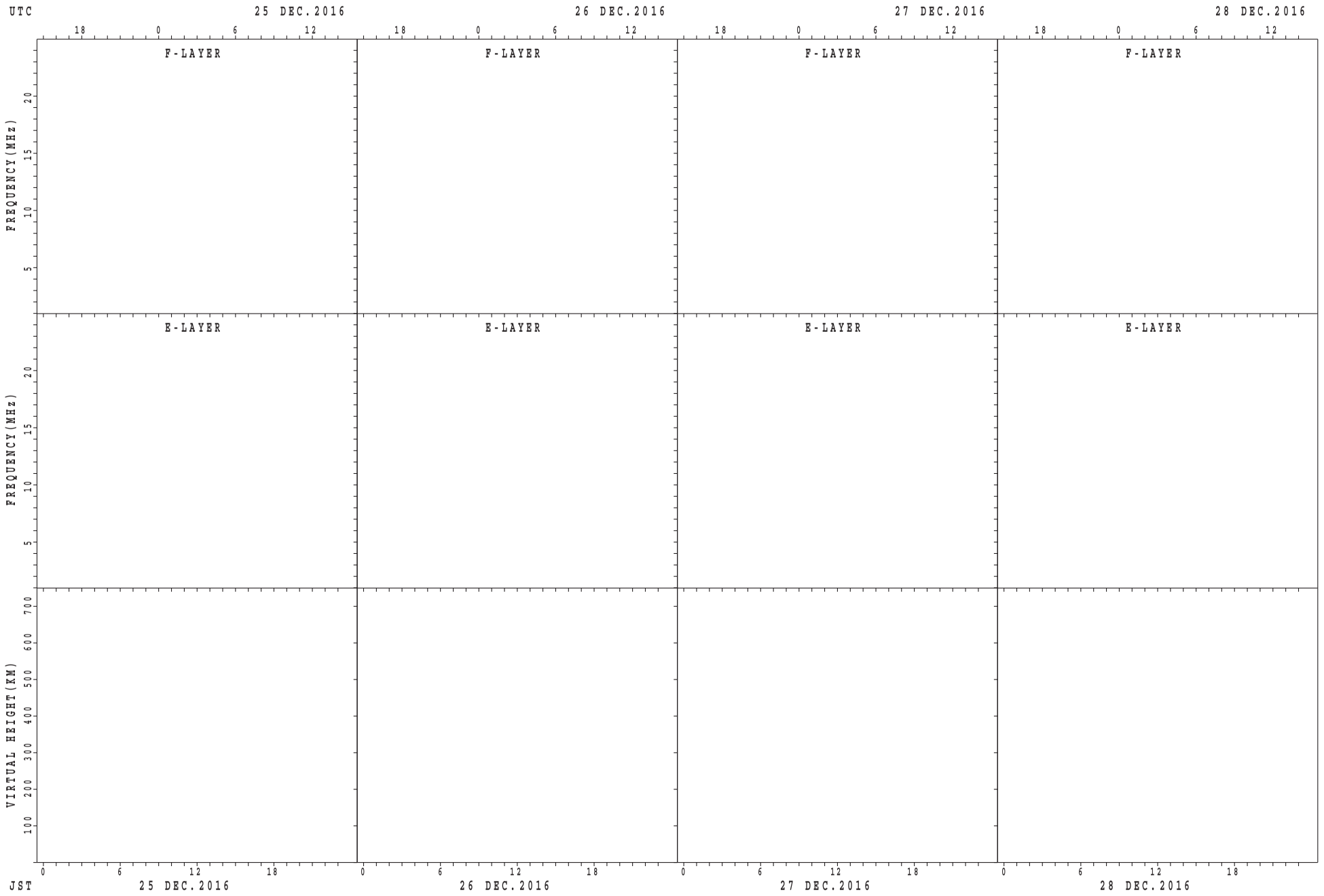
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



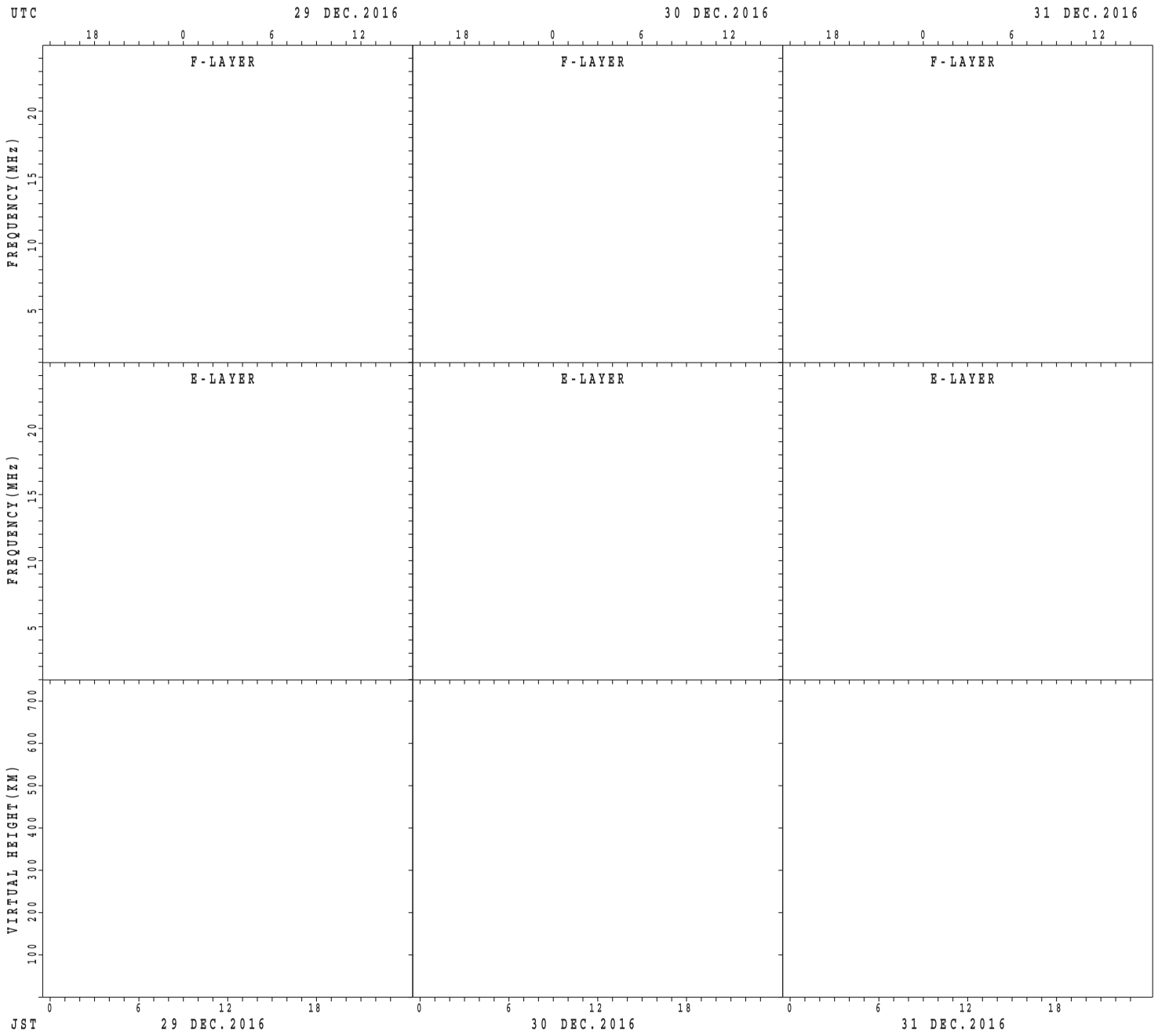
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



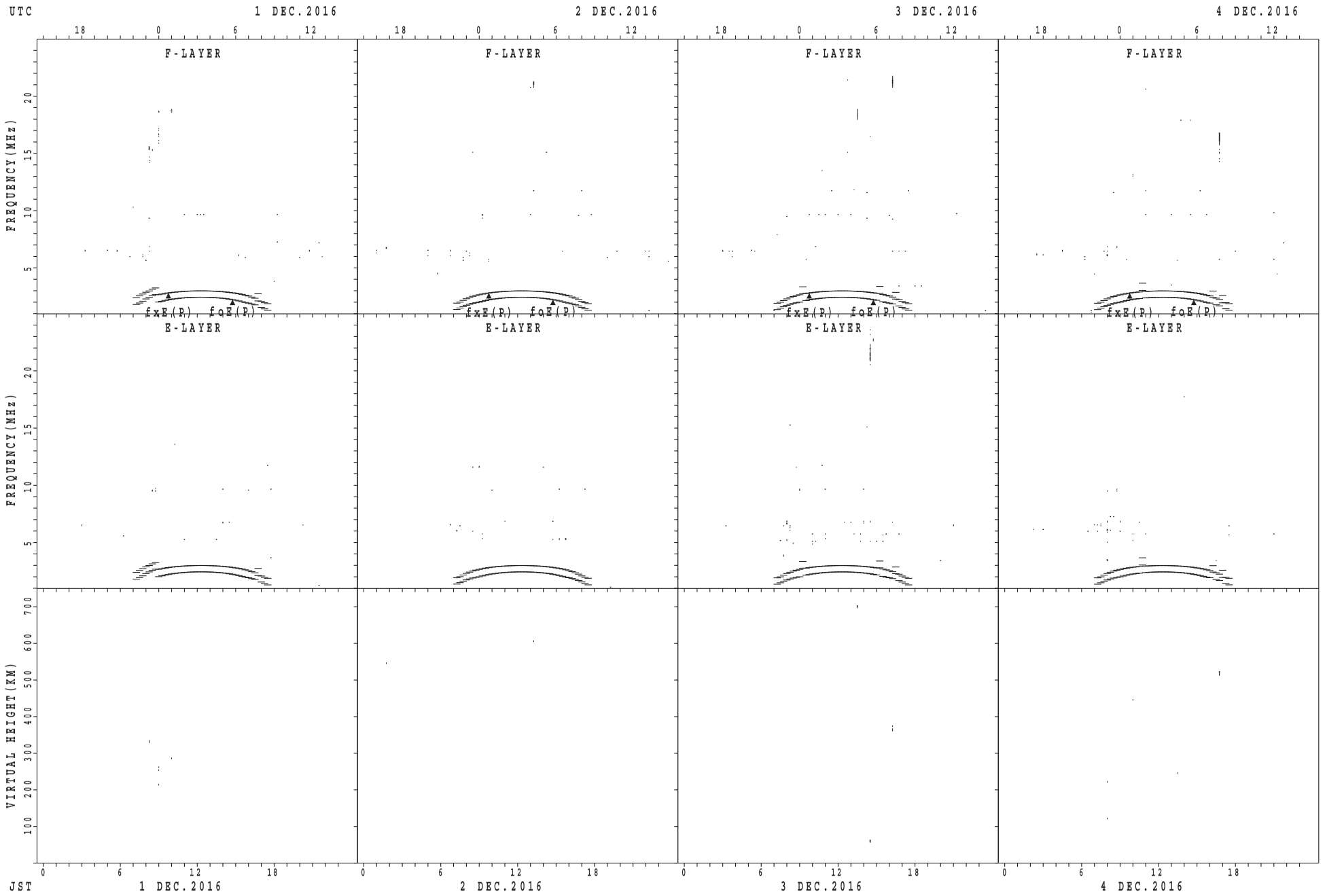
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



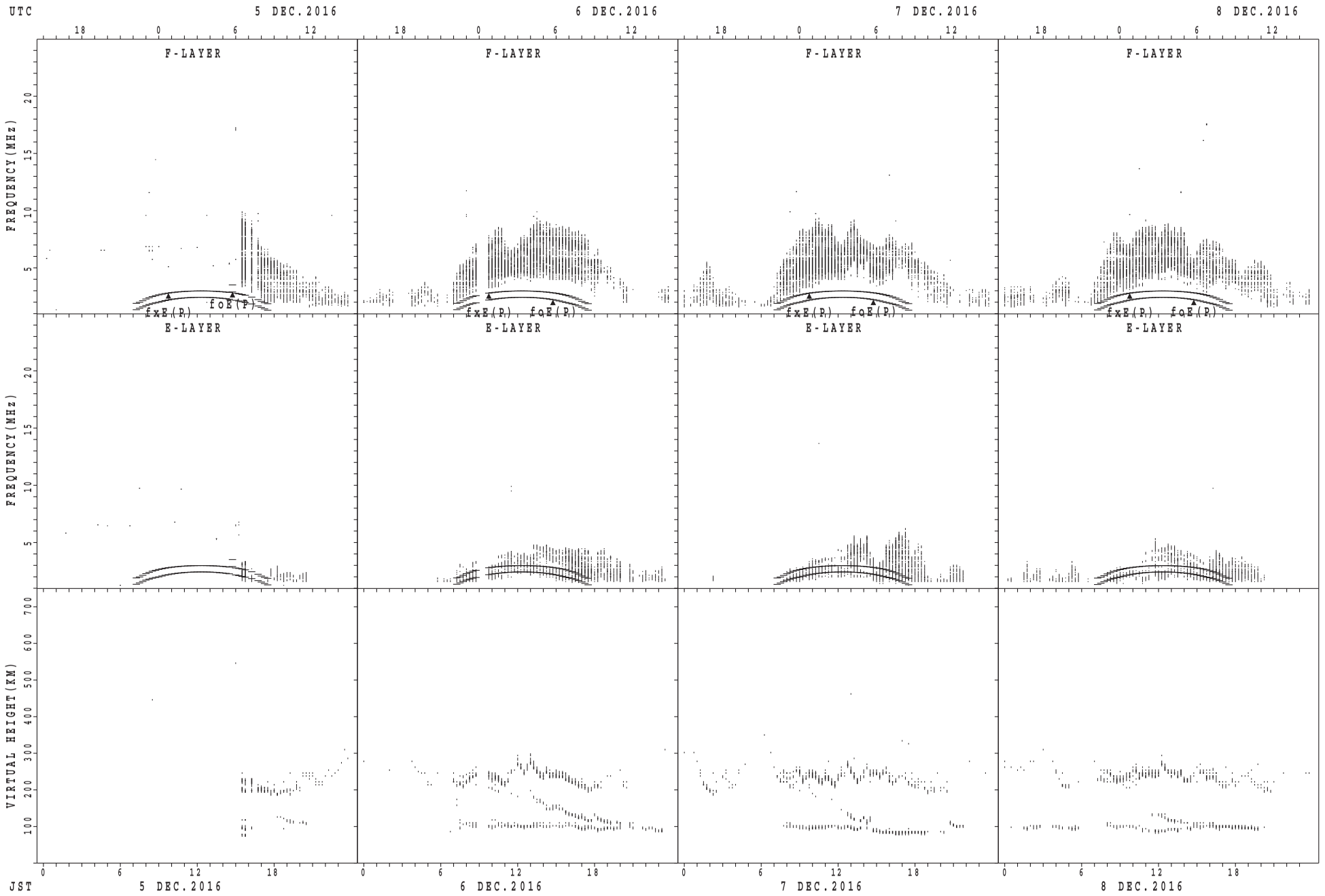
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa

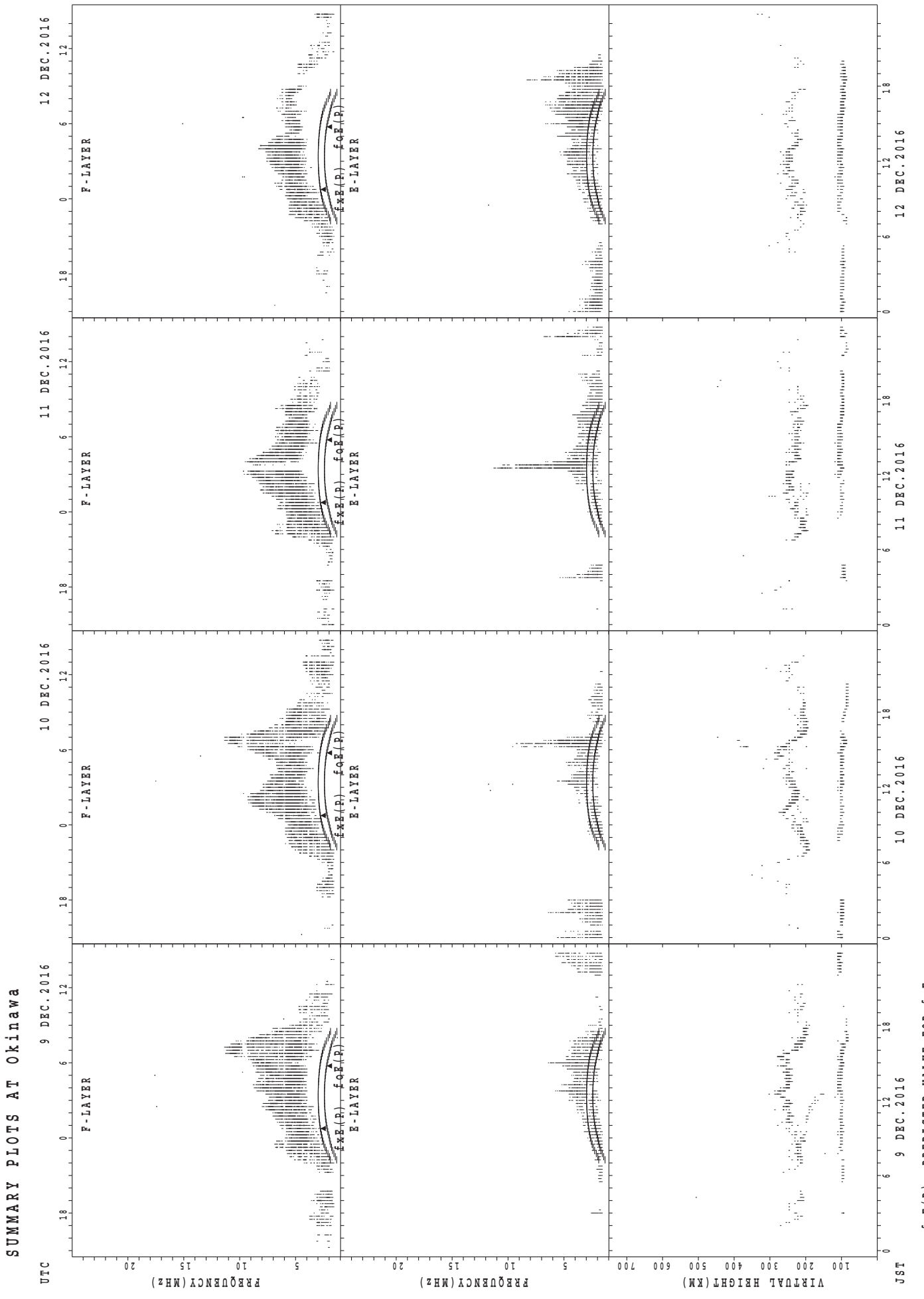


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

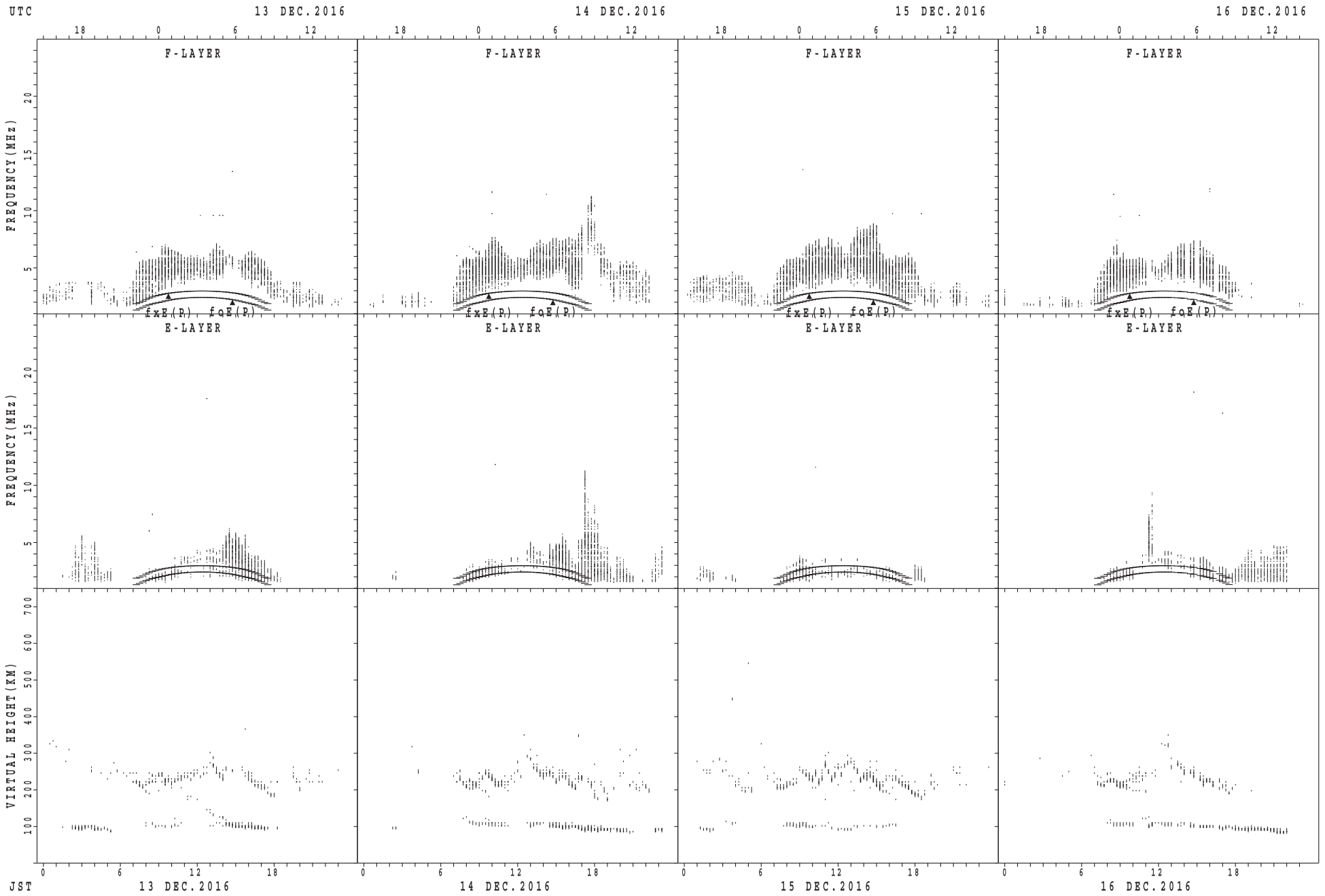
SUMMARY PLOTS AT Okinawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

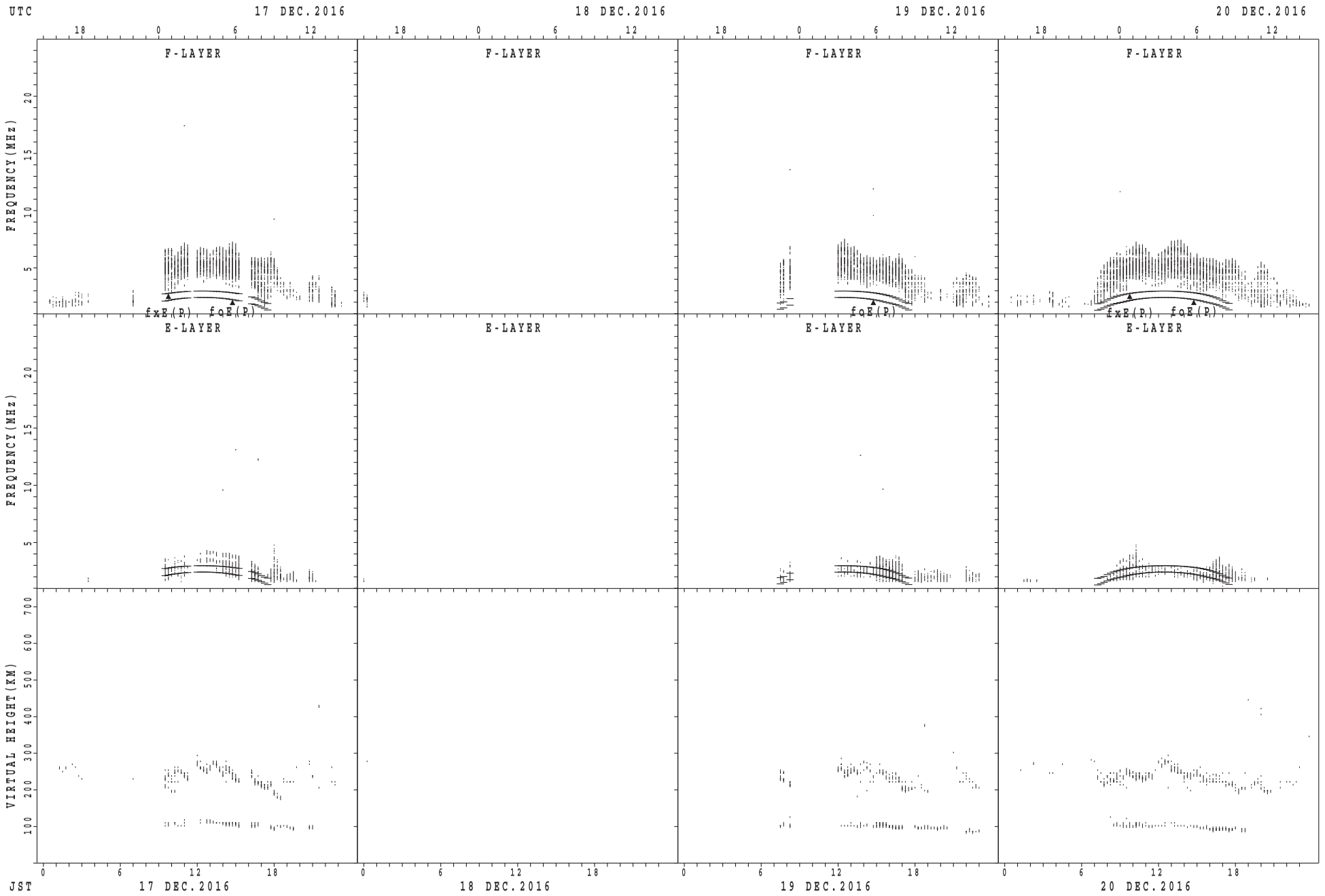

SUMMARY PLOTS AT Okinawa
UTC
JST
9 DEC.2016
10 DEC.2016
11 DEC.2016
12 DEC.2016
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



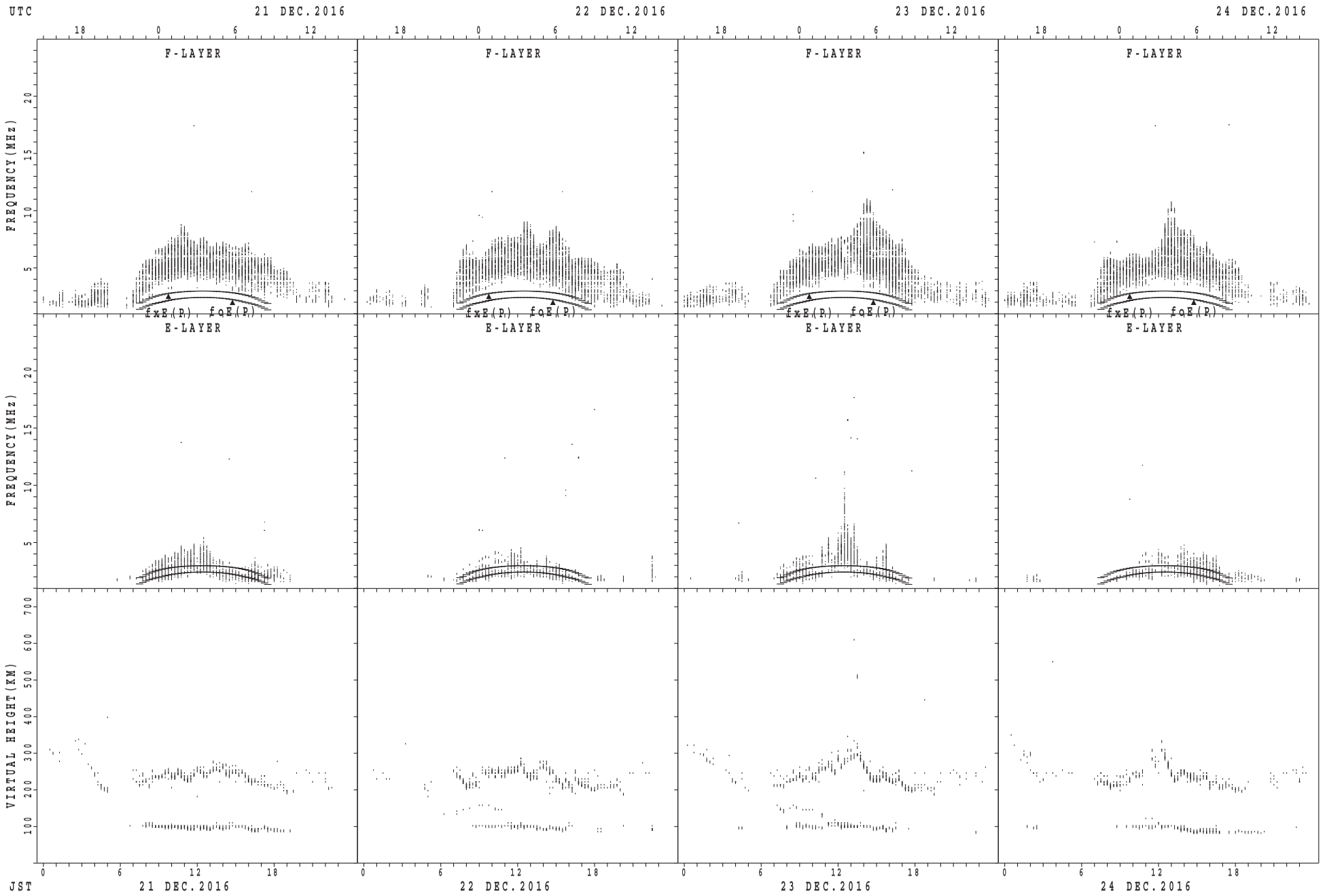
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



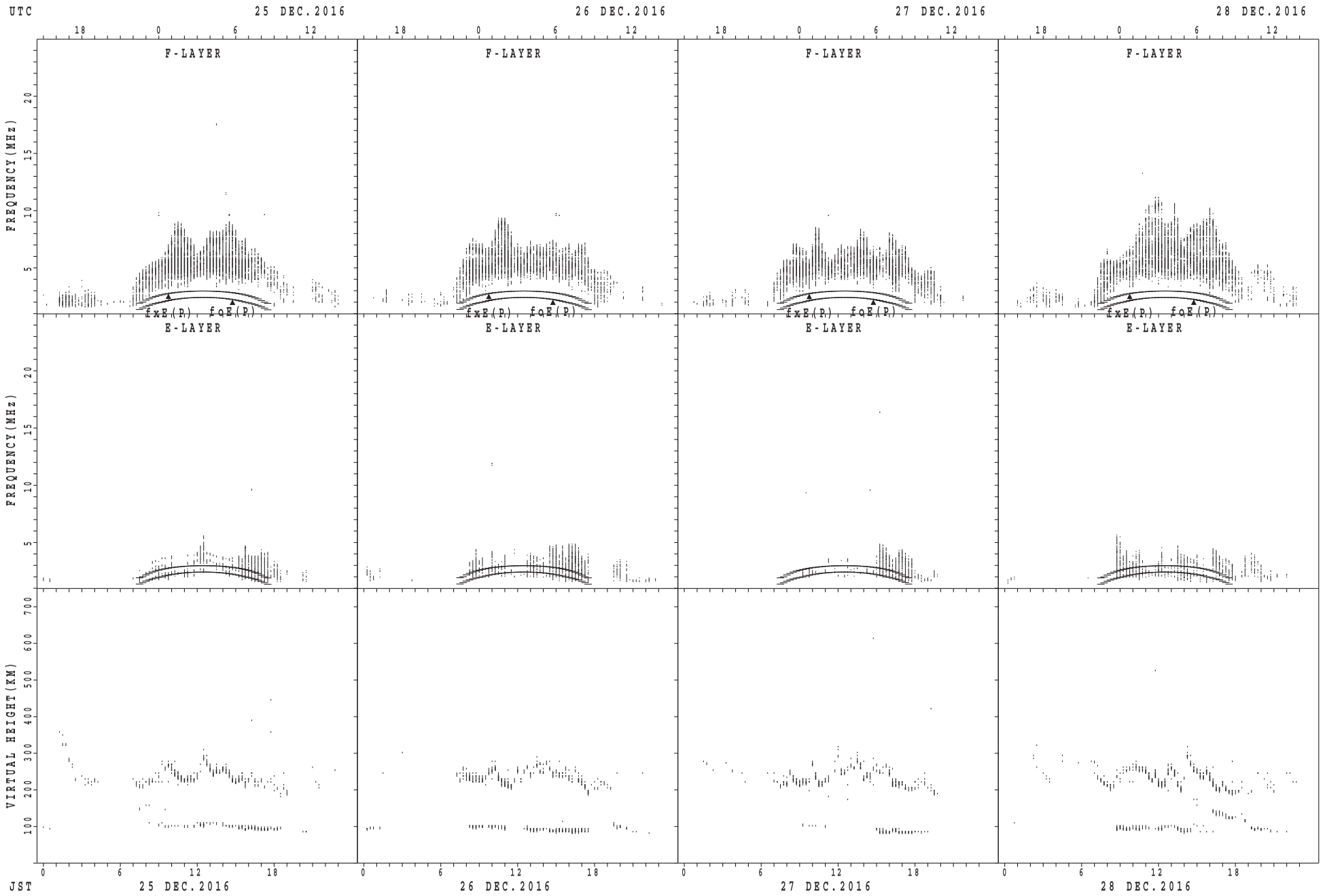
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



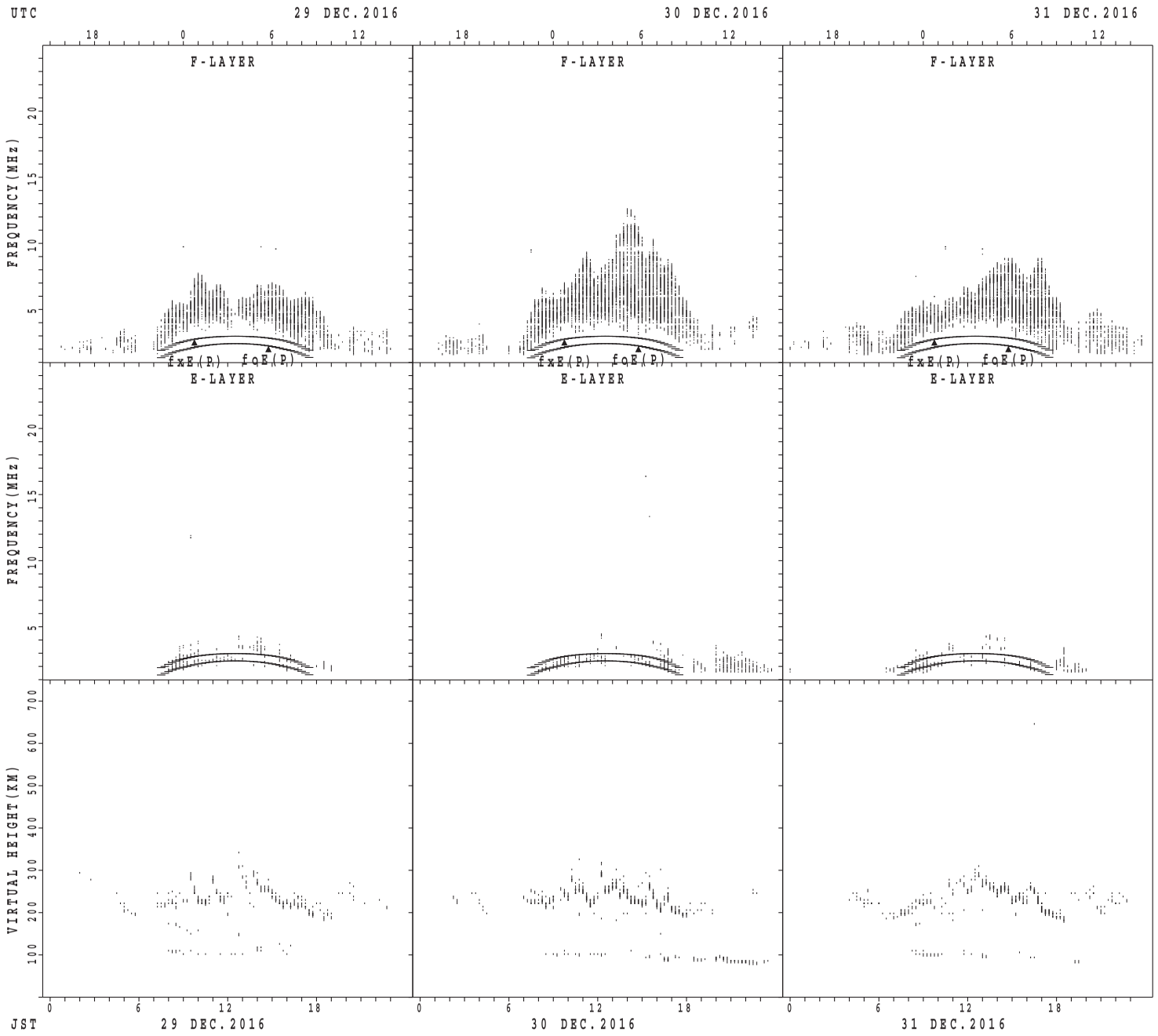
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

MONTHLY MEDIANS OF h'F AND h'Es

DEC.2016 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION Wakkanai LAT. 45°10.0'N LON. 141°45.0'E

	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	9	17	23	18	12	8	3								
MED									218	218	216	218	215	221	217	242								
U Q									109	233	231	232	230	230	230	260								
L Q									109	215	199	206	208	213	215	234								

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	6	6	3	6	10	13	18	26	23	19	14	15	12	15	15	16	10	17	16	13	14	12	13
MED	83	82	85	91	96	96	95	93	110	113	107	102	105	96	115	111	123	95	91	95	89	87	87	89
U Q	89	91	89	91	103	105	114	107	139	143	165	117	177	114	143	141	172	99	99	106	109	99	92	95
L Q	81	81	81	83	85	89	88	83	91	89	95	83	89	94	105	81	83	85	89	88	85	83	82	81

h'F STATION Kokubunji LAT. 35°43.0'N LON. 139°29.0'E

	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	3	8	14	16	9	13	7	7	1							
MED								236	220	233	237	226	230	238	250	236	236							
U Q								238	238	242	250	237	247	242	256	248	118							
L Q								234	206	229	230	215	222	229	246	222	118							

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	7	10	3	4	6	16	25	25	21	23	22	19	18	20	20	16	10	15	15	16	13	15
MED	98	97	97	99	97	101	105	106	109	105	103	101	103	101	102	106	96	96	98	99	97	97	97	97
U Q	105	99	99	101	97	107	111	129	119	131	111	107	107	109	113	130	120	103	103	103	101	104	102	99
L Q	95	91	89	97	91	94	101	100	104	98	96	95	95	95	95	96	89	91	97	95	93	91	95	91

h'F STATION Yamagawa LAT. 31°12.0'N LON. 130°37.0'E

	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																								

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																								
MED																								
U Q																								
L Q																								

MONTHLY MEDIANS OF h'F AND h'Es

DEC.2016 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

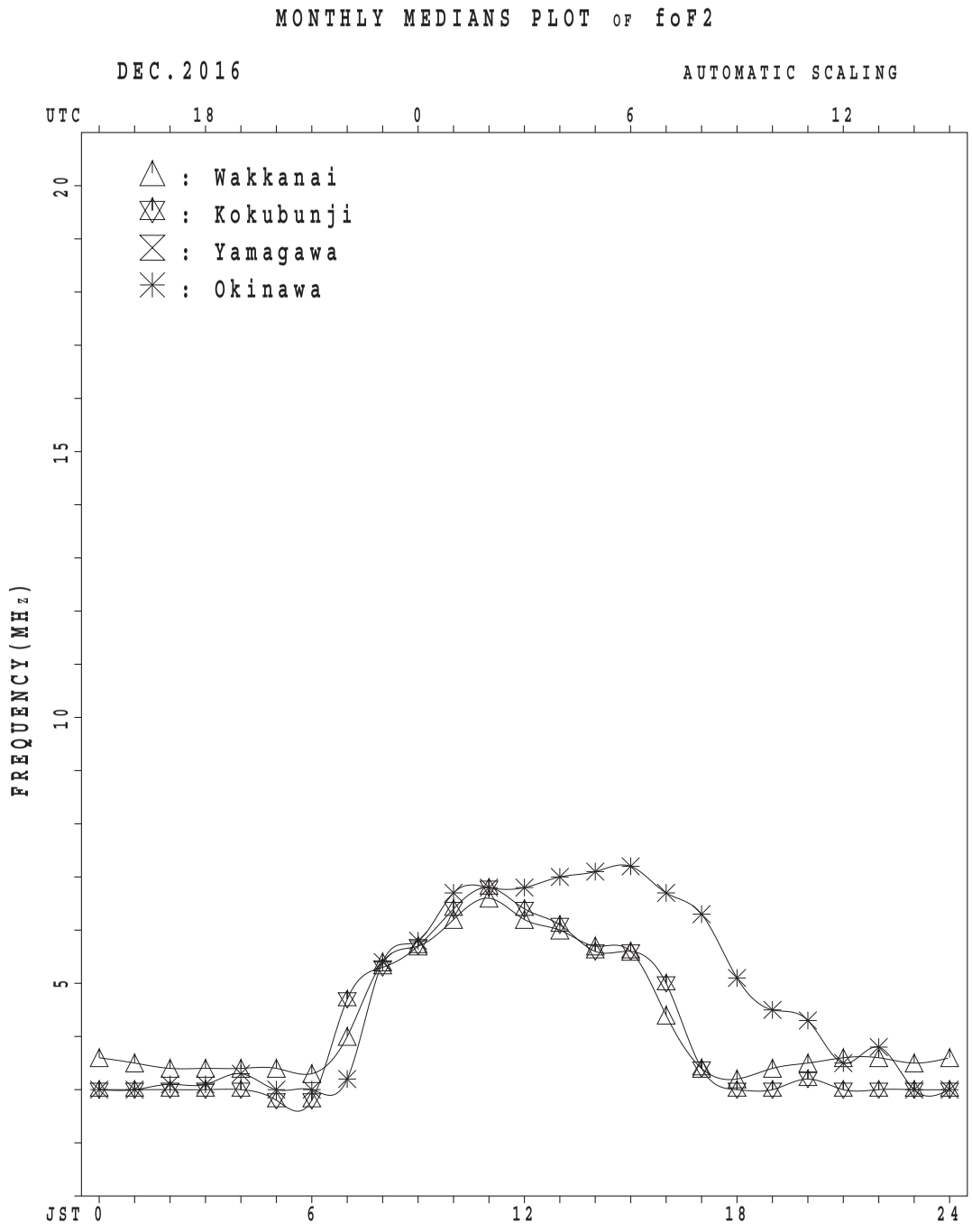
h'F

STATION Okinawa LAT. 26°41.0'N LON. 128°09.0'E

	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									5	9	16					17	17	10	3					
MED									228	244	241					238	232	228	208					
U Q									262	253	251					256	242	232	226					
L Q									214	229	232					222	223	214	192					

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	2	2	3	4	3	2			10	17	14	16	16	19	19	18	18	16	15	11	10	5	5	2
MED	104	102	97	97	95	95			109	105	102	104	109	107	107	103	100	95	95	95	96	97	91	102
U Q	105	103	103	99	95	95			119	159	109	125	150	113	115	105	103	101	99	99	101	102	104	105
L Q	103	101	93	97	95	95			105	103	101	101	105	101	101	97	95	92	93	91	95	91	88	99


MONTHLY MEDIANS PLOT OF foF2
DEC.2016
AUTOMATIC SCALING
UTC
18
0
6
12
: Wakkanai
: Kokubunji
: Yamagawa
: Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Wakkanai

DEC.2016 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 39	X 39	X 39	X 39	X 37	X 38	X 38													X 37		X 33	46	X 41
2	X 45	X 41	48	X 37	X 32	A	A										X 48		X 37	X 37	X 40	X 42	X 42	X 45
3	X 45	X 40	42	X 42	X 41	X 35	X 36												X 31	X 35	X 40	X 43	X 46	X 39
4	X 32	X 37	X 37	X 37	X 38	X 33													X 31	X 36	X 42	X 42	X 41	X 40
5	X 39	X 41	X 40	X 43	X 37	X 34													X 34	X 37	X 37	X 39	X 39	X 43
6	X 39	X 41	X 45	52	X 51	X 34		X 48											X 37	X 36	X 36	X 37	48	48
7	47	X 40	X 42	X 41	X 32	X 29													X 31	X 42	X 42	X 33	X 39	X 42
8	X 40	X 39	X 35	X 38	X 37	X 34													X 44	X 46	X 47	54	56	60
9	X 57	57	X 45	X 37	X 40	X 40													X 41	X 43	X 40	X 34	X 35	X 37
10	X 39	X 38	X 37	X 39	X 39	X 39													X 35	X 43	X 43	57	55	55
11	X 50	X 48	56	58	78	59	48												X 33	X 45	X 44	X 44	56	56
12	56	66	57	X 38	57	X 37													X 35	X 39	A	X 39	X 40	X 37
13	X 36	X 38	X 38	X 36	X 36	X 34													X 39	X 40	X 44	X 41	X 39	X 39
14	X 39	X 37	X 39	X 40	X 38	X 42													X 39	X 43	X 37	X 40	47	52
15	X 41	45	X 51	56	46	X 39													X 31	X 37	X 46	46	58	X 43
16	X 45	X 43	X 38	X 33	X 30	X 31				X 60	X 67	X 69				X 54			X 31	X 30	X 36	X 36	X 37	X 37
17	X 37	X 38	X 34	X 35	X 31	X 26			57										X 34	X 34	X 38	X 40	X 41	X 44
18	X 42	X 36	X 37	X 33	X 31	X 32													X 43	X 39	X 41	X 42	X 41	X 38
19	X 45	X 45	X 43	X 37	X 37	X 37													X 32	X 37	X 39	X 35	X 37	X 34
20	X 33	X 30	X 28			X 30													X 37	X 36	X 37	X 34	X 34	X 36
21		X 38	X 38	X 36	X 36	X 35											X 47		X 31	X 34	X 33	X 37	X 41	X 42
22	X 34	X 40	X 38	X 39	X 51	X 40	X 50												X 34	X 43	X 46	X 46	X 46	X 47
23	X 47	X 44	X 44	X 41	X 43	X 44		X 44											X 45	X 37	X 35	X 37	X 41	X 38
24	X 36	X 41	X 36	X 37	X 42	X 41													X 39	X 45	X 48	X 43	X 48	X 51
25	X 49	X 50	X 51	X 44	X 38	X 37													X 36	X 40	X 42	X 41	X 50	57
26	59	53	50	X 40	X 37	X 32													X 33	X 40	X 42	X 42	X 37	X 39
27	X 45	X 37	X 39	X 46	X 37	X 41	38												X 37	X 39	X 39	X 32	A	X 38
28	X 39	X 33	X 37	X 37	X 37	X 37													X 31	X 29	X 37	47	X 41	46
29	46	46	48	47	47	41	41												X 32	X 31	X 38	X 33	X 36	56
30	X 47	X 39	X 34	X 36	X 37	X 37													X 35	X 31	X 33	X 37	X 32	X 36
31	X 40	X 37	X 33	X 33	X 33	X 33	X 33	X 38											X 32	X 37	X 43	X 39	X 38	X 39
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	30	30	30	7	3	1	1	1	1				1	2		30	31	29	31	30	31
MED	X 42	X 40	X 39	X 38	X 37	X 37	X 38	X 44	57	X 60	X 67	X 69				X 54	X 48		X 34	X 37	X 40	X 40	X 41	X 42
U Q	X 47	45	45	42	42	X 40	48	X 48											X 37	X 42	X 43	43	47	48
L Q	X 39	X 38	X 37	X 37	X 36	X 33	X 36	X 38											X 32	X 36	X 37	X 36	X 38	X 38

DEC.2016 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	32	32	32	32	30	31	31	47	56	60	62	66	66	63	52	60	40	32	26	30	30	26	F 34	34
2	38	34	F 36	30	25	A	A	39	56	62	67	67	59	58	53	50	41	29	30	30	33	35	35	38
3	38	33	F 31	35	34	28	29	47	54	74	78	71	64	66	56	54	41	26	24	28	33	36	39	32
4	25	30	30	30	31	26	26	42	54	58	69	69	58	59	50	54	41	32	24	29	35	35	34	33
5	32	34	33	36	30	27	26	40	52	61	61	62	61	58	54	48	39	25	27	30	30	32	32	36
6	32	34	38	F 38	44	27	34	41	52	57	56	67	60	54	56	48	44	26	30	29	29	30	F 37	F 35
7	F 37	V 33	35	34	25	22	21	39	55	69	67	61	61	54	59	50	50	37	R 24	35	35	26	32	35
8	33	32	28	31	30	27	29	42	58	68	64	66	67	78	64	56	45	34	37	39	40	F 40	F 38	F 51
9	F 43	F 44	38	30	33	33	V 22	40	50	68	72	62	71	71	66	55	42	32	34	36	33	27	28	30
10	32	31	31	32	32	32	36	42	55	55	58	66	53	68	64	64	47	38	28	36	36	F 46	39	F 43
11	43	41	F 34	F 47	F 46	F 46	F 37	40	49	52	52	62	58	52	49	50	42	Z 32	26	38	37	37	F 40	F 46
12	F 46	F 46	F 35	31	31	30	C	36	44	51	59	53	54	60	67	53	50	27	28	32	A	32	33	31
13	29	31	31	29	29	27	24	39	51	51	54	59	54	60	53	46	40	25	32	33	37	34	32	32
14	32	30	32	33	31	35	32	42	46	56	57	60	58	56	63	57	40	R 27	32	36	30	33	F 33	F 34
15	34	F 32	44	F 44	F 35	32	37	43	48	50	54	58	60	59	49	54	35	26	24	30	39	F 34	F 36	36
16	38	36	31	26	23	24	A	37	44	53	60	62	54	58	48	47	39	24	24	23	29	29	30	30
17	30	31	27	28	24	19	19	31	F 45	53	63	62	56	50	51	45	34	24	27	27	31	33	34	37
18	35	29	30	26	24	25	25	36	53	60	58	72	57	55	58	50	41	35	36	32	34	35	34	31
19	38	38	36	30	30	30	31	38	51	71	62	58	55	V 53	59	55	42	35	25	30	32	28	30	26
20	26	23	22	24	24	23	22	36	47	48	55	73	59	58	59	55	41	32	30	29	30	27	27	29
21	31	31	31	29	29	28	28	39	49	62	64	72	59	53	54	52	40	31	24	27	26	30	34	35
22	27	33	31	32	44	33	43	32	44	62	73	74	60	61	67	59	47	33	27	36	39	39	39	40
23	40	37	37	34	36	37	33	37	59	55	78	85	60	63	63	68	52	38	38	30	28	30	34	31
24	29	34	29	30	35	34	24	41	43	56	67	64	60	61	56	54	44	38	32	38	41	36	41	44
25	42	43	44	37	31	30	24	36	50	48	64	68	58	56	59	59	42	32	29	33	35	34	42	F 44
26	F 41	F 38	F 28	33	30	25	20	36	52	53	54	66	J R 60	58	54	60	38	36	26	33	35	35	30	32
27	38	30	32	39	30	34	F 24	33	51	56	59	V 60	65	V 49	50	47	45	32	30	32	32	U R 25	A	31
28	32	26	30	30	30	30	27	34	47	48	53	56	63	57	62	46	41	26	24	22	30	F 34	34	F 38
29	F 30	F 25	F 35	F 34	25	F 25	F 24	32	D C 38	42	53	52	50	57	V 53	52	40	24	25	24	31	26	29	F 33
30	40	32	27	29	30	30	25	33	46	51	58	71	59	58	50	52	39	22	28	24	26	30	25	29
31	33	30	26	26	26	26	26	31	39	53	47	54	55	54	49	55	47	30	25	30	36	32	31	32
	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	30	28	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	30	31
MED	33	32	31	31	30	29	26	39	50	56	60	64	59	58	56	54	41	32	27	30	33	33	34	34
U Q	38	36	35	34	33	32	32	41	54	62	67	69	61	61	62	56	45	34	30	35	36	35	37	F 38
L Q	31	30	30	29	26	26	24	36	46	51	55	60	56	54	51	50	40	26	25	29	30	29	31	31

DEC. 2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC.2016 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	L	L											
2										L	L	380	L	L										
3												L	L	L				L						
4										L	L	L	348	L										
5											204	L	L											
6										L	L	L	L											
7										L	L		L	L										
8											L	L	L	L	L									
9											L	L	L											
10							L		L	L	L	L	L	L		L								
11									L	L	L	L	L	L										
12							C						356	L	L									
13													L											
14											236		L	L	L	L								
15													L	L										
16							A							L			L							
17										L	356	L	L	L										
18											L	L	L	L										
19										L	L	L	L	L										
20												L	L											
21											L	380	L											
22								L			L	L	L		L									
23										L	L	L	L	364				L						
24											L			L		248								
25								L		L	L		L	L	L									
26										L	L	L	L	L										
27										L	L	288		L										
28												L	L	L				L						
29									L			L	L			L		L						
30									L		L	L	L	L		L								
31										L	L		L	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											3	3	2	1		1								
MED											236	380	352	364		248								
U Q											356	380												
L Q											204	288												

DEC.2016 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								A	220	252	284	284	292	268	216	200	A	A	A		204			
2								168	208	240	272	U R 284	272	264	204	180		A						
3								A	224	588	A	264	280	272	244	184	B	B						
4							200	A	200	240	268	288	284	264	244	172	B	B						
5							B	B	240	248	276	292	264	264	236	200	B	B						
6							B		216	248	244	288	276	232	248	176	A	B						
7							A	B	200	240	248	268	268	260	260	216	A	A						
8							B	A	A	236	244	288	264	A	248	184	220	A						
9							B	220	192	A	A	A	A	256	228	196	B	B						
10							A	A	188	220	232	244	244	240	216	236	272	A						
11								216	A	236	240	252	252	256	224	204	A	A						
12							C	A	212	224	244	260	268	248	232	204	204	B						
13							A	232	A	232	B	280	B	B	228	A	328	A						
14							B	A	A	240	248	284	A	312	A	A	A	A						
15							A	A	A	224	280	264	276	256	240	200	A	A						
16							A	A	A				296	256	224		B	A						
17							A	A	192	228	280	R	260	244	232	204	168	B						
18							B	B	204	240	B	B	B	B 292	B	A 208	208	160						
19							A	172	A	240	B	B	B	B 296	B	212	B	196						
20				B	A		B	A	196	240	256	268	284	276	228	208	B	B						
21	A						B	A	180	248	272	284	280	256	224	200		B						
22								216	204	236	260	268	276	240	224	184	160	A						
23							B		192	208	256	288	288	248	232	212	A	B						
24							A	B	180	232	244	352	A	248	236	B	A	A						
25							B	156	244	232	252	260	264	248	232	208	180	B						
26							B	A	180	216	240	244	276	R 248	248	232	B	A						
27								A	196	A	240	260	U R 288	252	228	180	B	A						
28							B	168	220	232	320	R 260	U R 288	156	260	212	204	A						
29							B	A	204	224	248	296	288	280	224	192	B	B						
30							208	196	A	236	248	284	288	B	B	204	B	A						
31									196	240	324	U R 324	B	B	B	216	B	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							2	9	23	28	25	26	24	27	26	27	9	2			1			
MED							204	196	200	236	252	282	276	256	232	204	204	178			204			
U Q								218	216	240	274	288	288	268	244	212	246							
L Q								168	192	230	244	260	266	248	224	184	174							

DEC. 2016 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	25	25	J A 19	24	21	22	J A 31	30	J A 51	J A 46	33	J A 29	J A 45	G 17	25	J A 38	J A 19	J A 31	J A 52	G 20	36	25	30
2	25	E B 15	20	E B 15	J A 20	54	60	23	J A 84	34	28	J A 56	36	G	J A 97	G 21	24	26	20	J A 19	J A 29	23	26	E B 15
3	20	E B 15	25	E B 15	E B 15	20	23	26	G 20	J A 52	J A 87	J A 48	G 19	J A 50	G	21	E B 16	E B 16	E B 16	25	20	20	20	24
4	24	E B 15	E B 15	20	E B 15	20	J A 27	J A 31	J A 40	J A 63	G	G	32	G 24	G	22	E B 16	E B 15	J A 25	E B 15	19	J A 19	22	26
5	29	E B 16	20	25	J A 24	E B 15	E B 15	E B 15	E B 15	J A 33	G	J A 43	33	J A 27	G	G	E B 15	21	21	18	E B 16	E B 15	E B 15	J A 15
6	E B 15	E B 15	E B 15	22	23	E B 15	E B 15	21	28	33	34	47	36	39	J A 45	J A 32	24	E B 15	E B 16	E B 16	E B 16	E B 16	19	E B 16
7	20	E B 15	E B 15	E B 15	E B 15	J A 126	J A 26	E B 16	26	33	G 18	G	G	G 19	G 26	J A 32	J A 17	J A 28	40	J A 27	26	26	26	E B 15
8	22	E B 15	22	17	E B 15	E B 15	E B 15	26	J A 31	J A 27	J A 43	J A 33	J A 33	J A 35	34	J A 27	24	J A 30	J A 21	E B 15	20	19	J A 16	23
9	J A 50	22	27	25	E B 15	J A 33	J A 51	G	J A 19	J A 40	J A 41	J A 41	J A 31	32	G	G	E B 16	E B 15	E B 15	E B 15	E B 15	21	J A 19	22
10	20	22	23	24	23	24	J A 34	J A 29	J A 24	J A 28	G 17	G	G	27	28	J A 33	34	34	J A 32	J A 35	J A 36	J A 48	23	22
11	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	J A 26	J A 28	J A 32	J A 29	G	J A 39	G	J A 89	G	J A 31	J A 25	E B 16	J A 55	30	43	27	25
12	23	23	21	25	E B 15	34	C	J A 39	J A 118	J A 51	J A 43	J A 120	G	G 28	27	J A 26	J A 30	E B 16	19	J A 29	J A 66	J A 79	J A 79	J A 38
13	J A 53	39	J A 24	J A 111	J A 32	J A 51	J A 46	J A 46	J A 47	32	E B 29	32	E B 29	E B 29	26	26	J A 101	J A 52	J A 51	J A 46	33	J A 27	J A 82	J A 51
14	J A 29	J A 61	J A 109	J A 211	J A 51	J A 26	J A 136	J A 49	J A 49	J A 93	G	30	J A 56	34	J A 84	J A 62	J A 26	J A 70	J A 47	J A 76	J A 108	J A 39	J A 154	J A 87
15	21	E B 15	E B 15	E B 15	E B 15	J A 29	J A 31	26	J A 31	26	G 24	32	G	G 22	27	21	J A 53	J A 32	J A 32	34	J A 30	J A 30	26	E B 16
16	E B 16	E B 15	E B 15	25	E B 16	J A 63	J A 31	33	J A 109	J A 52	J A 108	E B 29	32	G	25	20	E B 17	J A 25	J A 30	J A 30	J A 35	J A 27	J A 24	J A 26
17	E B 15	25	26	20	20	E B 15	26	22	J A 25	25	35	G 28	G	J A 52	27	J A 26	J A 19	E B 16	25	J A 32	J A 35	30	J A 17	E B 15
18	E B 15	E B 15	E B 16	E B 15	E B 15	38	E B 16	E B 16	G	G	E B 30	E B 30	E B 30	E B 29	E B 29	G 21	J A 29	J A 16	J A 33	J A 39	J A 31	J A 46	J A 38	J A 40
19	24	24	E B 15	E B 13	24	J A 20	J A 31	26	J A 49	G	E B 29	E B 29	E B 29	E B 30	E B 28	G	E B 16	23	J A 50	J A 54	J A 51	38	25	25
20	23	J A 26	J A 24	E B 16	G	J A 30	E B 16	22	J A 27	31	J A 27	G 24	G	G 24	27	G 20	E B 16	E B 16	E B 16	E B 16	E B 16	J A 41	J A 35	J A 27
21	J A 62	J A 50	24	J A 19	E B 16	23	E B 15	27	29	J A 25	34	J A 47	36	G 24	25	G	E B 16	E B 16	20	J A 17	21	20	E B 15	E B 15
22	E B 15	E B 15	20	J A 22	20	20	20	J A 188	J A 24	J A 27	32	33	G 23	J A 84	G 22	20	J A 21	23	23	21	E B 15	25	20	25
23	25	J A 31	J A 31	24	J A 20	25	E B 15	24	23	26	30	J A 108	G	G 20	G 20	G 20	J A 17	E B 15	E B 15	E B 15	21	21	J A 31	J A 53
24	J A 51	27	E B 15	23	E B 15	E B 12	34	E B 15	24	28	34	J A 51	J A 60	27	J A 47	E B 20	J A 48	35	J A 40	J A 26	26	J A 26	29	E B 15
25	E B 15	26	29	25	J A 133	E B 16	E B 15	E B 15	33	J A 51	G 20	33	G	38	G 21	34	G	E B 16	71	69	J A 31	21	E B 15	E B 15
26	E B 15	E B 16	E B 14	23	E B 16	38	J A 28	J A 76	J A 52	J A 35	J A 33	J A 37	G	G	G	G	E B 15	J A 19	23	23	24	E B 16	E B 16	22
27	21	E B 16	28	20	30	26	J A 29	J A 29	J A 98	36	G	G	G	G	27	J A 71	E B 16	21	25	E B 15	E B 15	B J 47	A J 85	A J 68
28	26	25	26	J A 31	E B 15	E B 15	18	24	G	25	G 25	G	J A 57	J A 34	G 23	G	J A 26	22	132	E B 16	J A 25	24	E B 16	E B 15
29	23	21	E B 16	E B 16	E B 11	E B 15	J A 23	J A 19	G	J A 82	J A 85	J A 49	J A 31	33	27	G 23	E B 16	E B 16	21	E B 15	E B 16	B J 52	A J 63	A J 24
30	24	25	25	J A 26	E B 16	26	J A 30	25	22	26	G	G	34	E B 29	E B 31	J A 24	E B 16	25	E B 16	24	24	24	E B 16	E B 16
31	J A 254	J A 34	E B 16	E B 16	E B 15	31	J A 29	23	G	G	G	G	E B 30	E B 29	E B 29	G	E B 16	E B 16	B J 53	A J 27	E B 15	E B 16	E B 16	E B 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	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	23	22	21	20	E B 16	24	26	26	J A 28	A J 32	29	32	30	E G 29	E G 27	G	17	21	25	25	24	26	24	23
U Q	J A 26	J A 26	25	25	23	33	J A 31	J A 31	A J 47	A J 51	A J 35	A J 47	34	J A 34	J A 29	J A 26	J A 29	A J 26	A J 40	A J 35	A J 31	A J 39	A J 31	A J 27
L Q	E B 15	E B 15	E B 15	E B 16	E B 15	E B 16	E B 16	E B 21	G 22	26	G	G	G	G 27	G 26	21	E B 16	E B 16	E B 19	E B 16	E B 16	20	E B 16	E B 15

DEC. 2016 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 15	E B 15	E B 15	E B 15	15	E B 15	28	G 21	30	30	30	G 26	G 26	G 17	21	26	E B 15	15	E B 15	E B 15	18	E B 15	18
2	15	E B 15	E B 15	E B 15	E B 15	A A 54	A A 60	G 16	23	G 24	G 27	29	29	G	26	G 19	E B 15	15	E B 15	E B 15	15	E B 15	E B 15	E B 15
3	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	23	G 17	G 30	38	28	G 17	29	G	20	E B 16	E B 16	E B 16	E B 15	E B 16	E B 15	E B 15	E B 15
4	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	15	22	G 22	G	G	30	G 22	G	21	E B 16	E B 15	17	E B 15	E B 15	E B 15	E B 15	E B 15
5	E B 15	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G 24	G	30	28	G 26	G	G	E B 15	E B 15	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15
6	E B 15	E B 15	E B 15	16	E B 16	E B 15	E B 15	E B 15	G 21	G 23	28	G 28	G 28	28	27	20	E B 15	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
7	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	18	E B 16	22	28	G 17	G	G	G 18	G 24	G 21	16	16	16	16	20	15	E B 15	E B 15
8	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	28	25	29	G 28	28	28	26	23	G 18	16	15	E B 15	E B 15	15	E B 15	E B 15
9	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 18	36	28	28	28	29	G	G	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
10	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	22	G 19	G 22	G 16	G	G	27	28	29	G 21	23	16	16	16	20	16	E B 16
11	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	22	21	G 23	G 24	G	26	G	28	G	18	E B 16	E B 16	19	E B 16	16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 15	16	C	21	22	28	40	38	G	G 24	25	24	G 20	E B 16	16	E B 16	A A 66	28	21	16
13	E B 16	E B 16	E B 16	E B 16	20	15	E B 15	21	29	29	E B 29	30	E B 29	E B 29	24	23	G 32	18	20	E B 16	19	16	E B 15	E B 15
14	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	27	29	G	29	30	32	37	28	21	21	E B 16	17	E B 16	E B 16	18	E B
15	E B 16	E B 15	E B 15	E B 15	E B 15	E B 16	15	E B 15	29	23	G 23	30	G	G 20	25	G 19	E B 16	E B 16	E B 16	16	E B 16	E B 15	E B 15	E B 16
16	E B 16	E B 15	E B 15	E B 15	E B 16	E B 15	A A 31	24	22	27	30	E B 29	G 29	G	G 22	17	E B 17	E B 16	E B 17	E B 16	E B 16	E B 16	E B 16	E B 15
17	E B 15	E B 15	E B 15	E B 15	16	E B 15	E B 16	E B 15	21	24	G 28	G 18	G	28	24	21	G 16	E B 16	E B 15	E B 15	E B 15	16	E B 15	E B 15
18	E B 15	E B 15	E B 16	E B 15	E B 15	E B 15	E B 16	E B 16	G	G	E B 30	E B 30	E B 30	E B 29	E B 29	G 19	E B 15	G 14	16	17	16	16	16	20
19	E B 15	E B 15	E B 15	E B 13	E B 15	E B 15	E B 15	G 15	27	G	E B 29	E B 29	E B 29	E B 30	E B 28	G	E B 16	G 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
20	E B 16	E B 16	E B 15	E B 16	G	E B 15	E B 16	E B 15	G 20	26	G 23	G 22	G	G 24	24	G 18	E B 16	E B 16	E B 16	E B 16	E B 16	16	16	E B 15
21	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	E B 15	19	19	G 24	G 25	G 28	29	G 23	23	G	E B 16	E B 16	E B 15	E B 15	E B 15	E B 16	E B 15	E B 15
22	E B 15	E B 15	E B 15	16	16	E B 16	E B 16	G 17	G 20	G 22	G 23	28	G 22	26	G 20	G 17	G 15	E B 15	16	E B 15	E B 15	E B 15	E B 15	E B 15
23	E B 15	18	E B 16	16	E B 15	E B 15	E B 15	E B 15	G 18	23	29	29	G	G 18	G 20	G 20	15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	16
24	E B 15	E B 15	E B 15	E B 15	E B 15	E B 12	E B 16	E B 15	23	26	29	G 35	35	25	25	E B 20	16	29	20	E B 15	E B 15	21	E B 15	E B 15
25	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	E B 15	26	29	G 19	31	G	26	G 19	21	G	E B 16	20	16	20	E B 16	E B 15	E B 15
26	E B 15	E B 16	E B 14	E B 15	E B 16	E B 16	E B 16	15	G 17	22	27	28	G	G	G	G	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
27	E B 15	E B 16	E B 16	E B 16	16	16	E B 16	16	G 19	23	G	G	G	G	24	28	E B 16	16	16	E B 15	E B 15	25	A A 85	21
28	E B 16	E B 15	17	E B 15	E B 15	E B 15	15	E B 16	G	24	G 23	G	G 29	28	G 23	G	G 17	15	E B 15	E B 16	E B 15	E B 15	E B 16	E B 15
29	E B 16	E B 16	E B 16	E B 16	E B 11	E B 15	E B 15	17	G	29	32	30	G 29	30	26	G 22	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16
30	E B 15	E B 15	E B 15	E B 15	E B 16	16	E B 16	G 15	20	24	G	G	31	E B 29	E B 31	22	E B 16	14	E B 16	E B 16	E B 15	E B 15	E B 16	E B 16
31	E B 16	E B 16	E B 16	E B 16	E B 15	16	16	E B 15	G	G	G	G	E B 30	E B 29	E B 29	G	E B 16	E B 16	16	E B 15	E B 15	E B 16	E B 16	E B 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	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30
MED	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	16	G	25	G	30	G	E G 26	E G 24	G 22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15
U Q	E B 16	E B 16	E B 16	E B 16	16	16	16	19	23	29	29	G	29	29	27	G	G 18	16	16	16	16	16	16	16
L Q	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G 19	G 23	G 24	G 28	28	G 25	G 24	G 20	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15

DEC. 2016 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC.2016 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

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

DEC.2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	293	302	299	299	303	347	347	382	379	384	364	383	360	385	361	363	369	350	338	341	372	349	F 266	308
2	301	316	F 300	353	340	A	A	380	381	386	367	379	378	369	376	376	361	304	353	345	320	298	298	273
3	313	329	F 290	318	323	332	363	335	356	369	360	376	372	376	392	381	355	354	327	338	310	309	291	332
4	309	300	334	310	302	311	372	359	402	360	403	372	357	357	377	389	348	406	305	324	345	339	355	333
5	315	320	323	293	267	336	347	364	376	372	373	366	373	341	392	368	363	319	349	358	341	321	301	311
6	303	333	295	F 303	289	327	376	378	400	380	359	352	383	390	372	389	380	351	314	351	329	333	F 293	F 307
7	F 270	V 308	319	357	282	318	320	390	377	369	380	371	359	349	388	382	364	388	R 256	342	342	292	305	281
8	300	277	313	312	325	359	359	354	379	389	353	368	366	374	357	356	386	354	328	308	304	F 290	F 336	F 295
9	F 282	F 280	267	319	312	362	V 298	349	388	345	395	371	326	371	365	377	389	292	346	354	362	324	319	309
10	281	293	308	304	296	335	321	332	380	368	353	379	377	379	334	356	377	319	332	339	325	F 318	F 312	F 292
11	295	263	F 278	F 284	F 280	F 289	F 289	326	367	348	356	362	338	366	382	389	379	Z 385	361	337	332	332	F 303	F 274
12	F 302	F 290	F 285	318	312	324	C	355	398	370	375	353	373	341	365	384	381	300	323	325	A	434	365	353
13	298	312	312	324	312	257	338	361	410	389	367	379	390	385	376	396	358	351	316	362	302	339	350	351
14	323	305	312	305	325	347	343	353	388	365	377	363	376	314	383	348	322	R 266	306	355	393	309	F 309	F 302
15	332	F 319	292	F 312	F 301	324	337	397	395	372	386	363	355	365	378	380	361	377	310	344	358	F 342	F 327	314
16	295	312	332	342	315	300	A	383	376	378	386	396	377	373	364	370	356	353	353	323	343	327	309	332
17	312	291	309	348	307	332	340	406	F 245	359	376	358	398	387	357	363	360	345	348	348	299	330	319	294
18	305	299	336	317	312	320	345	364	377	372	363	371	379	342	373	357	346	317	353	372	333	325	337	315
19	294	355	330	301	290	343	330	342	379	368	384	373	384	V 348	345	367	385	365	312	341	372	351	254	289
20	314	302	325	314	314	320	337	373	399	388	318	375	371	333	374	385	391	351	363	356	341	293	307	332
21	315	315	292	301	301	333	366	375	384	337	365	381	382	370	360	377	333	348	326	365	350	294	316	285
22	341	321	342	281	281	290	347	356	359	346	345	362	359	352	365	368	394	374	307	326	360	305	309	301
23	336	322	317	305	326	329	395	349	385	356	363	357	345	355	390	365	326	348	333	357	310	248	286	346
24	346	301	285	285	314	356	304	362	353	386	378	332	388	381	349	372	376	368	296	330	372	321	295	287
25	318	309	316	313	327	388	352	374	382	360	391	363	302	377	342	370	376	314	324	333	359	314	312	F 307
26	F 303	F 261	F 390	261	271	328	320	354	396	371	355	359	R	374	376	351	380	361	320	320	306	294	297	333
27	274	348	301	299	322	334	F 346	341	372	363	383	V 324	366	V 370	375	370	356	365	338	344	349	U R 294	A	333
28	333	332	304	305	307	320	387	357	404	401	336	372	369	329	351	376	359	345	368	303	294	F 310	249	F 289
29	F 345	F 286	F 292	F 307	309	F 309	F 363	370	C	390	357	356	342	362	V 328	400	323	317	352	345	372	294	344	F 289
30	299	274	309	302	322	318	359	390	393	361	357	368	372	370	375	349	394	389	362	329	339	380	303	348
31	272	308	320	315	302	307	348	370	413	369	385	352	367	367	382	394	367	328	349	323	354	313	321	298
	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	30	28	31	30	31	31	31	30	31	31	31	31	31	31	31	30	31	30	31
MED	303	308	309	307	309	328	346	362	382	369	367	368	372	369	373	372	364	351	332	341	342	318	309	307
U Q	318	320	323	318	322	336	361	378	396	384	383	375	378	376	378	384	380	365	352	354	359	333	321	332
L Q	295	291	292	301	296	318	334	353	376	360	357	358	359	349	357	363	356	319	314	326	320	294	297	289

DEC. 2016 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC.2016 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	L	L											
2										L	L	419	L	L										
3												L	L	L				L						
4										L	L	L	426	L										
5											655	L	L											
6										L	L	L	L											
7										L	L		L	L										
8											L	L	L	L	L									
9											L	L	L											
10							L		L	L	L	L	L	L		L								
11									L	L	L	L	L	L										
12							C						402	L	L									
13													L											
14											605		L	L	L	L								
15													L	L										
16							A							L			L							
17										L	415	L	L	L										
18											L	L	L	L										
19										L	L	L	L	L										
20												L	L											
21											L	390	L											
22								L			L	L	L		L									
23										L	L	L	L	391				L						
24											L			L		406								
25								L		L	L		L	L	L									
26										L	L	L	L	L										
27										L	L	540		L										
28												L	L	L				L						
29									L			L	L			L		L						
30									L		L	L	L	L		L								
31										L	L		L	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											3	3	2	1		1								
MED											605	419	414	391		406								
U Q											655	540												
L Q											415	390												

DEC.2016 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC.2016 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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									208		224	226	230											
2										230	218	212	212	224										
3												224	218	216				268						
4										228	206	224	224	230										
5											224	224	224											
6										224	234	228	224											
7										224	208		226	242										
8											208	220	208	240	240									
9											210	220	226											
10							270		204	222	222	222	196	214		260								
11									214	236	226	240	240	224										
12							C						224	236	218									
13													218											
14											218		206	304	228	254								
15													240	228										
16							A							220			270							
17										230	208	208	208	220										
18											234	228	216	244										
19										224	214	224	208	226										
20												226	210											
21											232	232	208											
22								216			268	220	220		222									
23										224	238	220	232	236				258						
24											232			232		222								
25								238		228	220		350	220	238									
26										222	236	246	226	216										
27										232	218	258		222										
28												214	214	228			222							
29									212			242	226			208	256							
30									208		236	210	224	224		234								
31										218	226		238	222	216									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	2	5	13	23	22	28	22	6	5	3	2						
MED							270	227	208	224	224	224	224	225	225	234	256	263						
U Q									213	230	234	228	226	236	238	257	270							
L Q									206	223	214	220	211	220	218	215	222							

DEC.2016 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	Q 230	270	270	256	266	240	220	210	178	216	192	192	196	216	220	220	224	200	222	222	222	210	Q 294	246
2	252	Q 252	Q 276	210	212	A	A	216	216	198	198	182	182	196	214	216	196	214	234	240	226	Q 276	Q 284	Q 248
3	246	246	270	250	238	250	222	222	202	222	216	186	196	210	200	210	182	212	E B 230	228	256	Q 240	Q 224	224
4	234	234	232	Q 258	222	236	238	220	198	188	188	200	164	180	214	214	204	198	252	246	230	230	202	222
5	262	232	232	Q 262	254	240	216	206	200	204	178	206	194	216	212	186	202	204	228	208	230	224	Q 236	244
6	240	220	Q 252	262	Q 246	224	196	196	190	178	198	198	178	204	216	204	198	204	216	204	218	226	Q 272	Q 272
7	292	284	260	200	206	232	A 270	218	218	202	196	230	180	188	216	200	228	226	A	214	208	A 230	244	Q 254
8	256	264	272	244	244	216	242	220	218	218	192	208	192	220	208	208	202	228	208	212	250	260	Q 236	Q 222
9	258	Q 248	288	250	262	214	236	236	202	232	200	194	176	232	206	220	192	244	238	216	200	200	266	266
10	Q 266	266	276	276	278	222	238	220	194	192	196	204	174	204	228	198	198	228	218	200	208	198	252	Q 252
11	Q 252	264	228	248	Q 268	Q 216	Q 234	232	194	194	190	194	188	188	204	194	204	194	194	216	216	224	244	Q 234
12	Q 244	Q 228	234	246	246	212	C	204	204	220	232	242	176	186	202	198	198	216	238	238	A	176	216	216
13	268	240	240	240	264	220	220	198	194	194	198	226	190	214	218	200	200	200	264	208	232	232	228	196
14	234	234	246	246	268	220	210	210	190	222	186	234	194	206	196	196	188	A	226	208	200	228	248	230
15	230	230	240	224	252	230	200	196	192	192	216	228	188	202	202	204	202	194	E A 258	242	222	222	Q 194	Q 224
16	240	240	224	242	258	244	A	202	196	204	214	192	222	200	214	216	190	224	196	254	240	242	Q 268	252
17	230	246	246	224	228	E B 244	242	188	354	202	194	194	194	188	220	214	196	252	236	222	228	222	242	Q 242
18	250	Q 244	212	232	254	238	224	202	202	204	200	200	200	190	218	212	220	244	234	214	234	204	196	A
19	Q 218	Q 180	Q 216	248	240	238	236	206	196	202	190	190	196	186	230	198	198	216	248	242	206	208	274	256
20	210	254	242	244	262	244	214	222	198	198	218	194	194	256	214	196	184	208	220	232	208	214	236	244
21	254	254	254	282	246	238	218	218	198	218	202	186	188	208	208	208	202	216	208	216	216	282	246	Q 278
22	194	222	260	306	Q 238	270	206	190	222	260	192	192	182	226	208	208	198	200	232	232	220	250	236	248
23	240	240	242	254	262	248	200	220	216	206	214	202	202	194	208	206	212	224	200	212	228	282	260	230
24	230	270	280	262	230	192	228	214	214	214	200	226	214	200	240	192	206	218	258	246	224	226	268	Q 244
25	256	252	238	238	238	198	212	212	226	204	212	246	202	202	200	204	210	270	246	208	212	252	218	230
26	Q 230	Q 268	242	274	E B 264	230	250	218	180	180	180	210	186	180	218	218	206	224	232	238	Q 236	Q 218	218	218
27	260	208	232	250	238	Q 232	198	202	218	200	186	176	228	186	222	218	234	194	248	228	206	A	A	248
28	240	224	286	268	230	214	198	206	192	192	216	176	200	194	234	206	192	224	202	E B 246	Q 228	Q 224	Q 264	Q 230
29	Q 206	Q 246	Q 268	Q 228	Q 260	220	214	208	190	198	236	194	186	248	208	202	202	268	228	212	220	256	234	Q 258
30	252	236	258	Q 244	Q 238	206	202	202	188	226	196	192	186	198	224	200	190	202	226	212	226	202	238	E B 212
31	Q 264	Q 246	234	246	232	232	220	202	182	182	186	232	206	194	192	196	196	226	222	222	200	222	248	248
	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	30	28	31	31	31	31	31	31	31	31	31	31	30	30	31	30	30	30	30
MED	244	246	246	248	246	230	220	210	198	202	198	198	192	200	214	204	200	216	228	219	222	225	243	244
U Q	256	254	270	262	262	240	236	220	216	218	214	226	200	214	220	214	206	226	238	238	230	242	Q 264	Q 252
L Q	230	232	234	240	238	216	208	202	192	194	190	192	182	188	206	198	196	202	218	212	208	214	228	224

DEC. 2016 h'F (KM)

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 45°10.0'N LON. 141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								A	102	102	110	106	112	112	106	108	A	A	A		90			
2								98	120	112	110	100	106	106	98	126		A						
3								A	126	108	A	108	96	114	114	108	B	B						
4							94	A	94	108	108	108	108	110	116	106	B	B						
5							B	B	98	104	108	108	96	104	106	120	B	B						
6							B		102	114	114	114	104	102	102	102	A	B						
7							A	B	118	118	114	108	108	102	104	124	A	A						
8							B	A	A	118	114	106	106	A	106	106	98	A						
9							B	110	110	A	A	A	A	94	94	98	B	B						
10							A	A	116	106	106	110	110	110	110	94	104	A						
11								128	128	126	116	112	112	100	100	132	A	A						
12							C	A	120	120	108	122	110	102	102	102	102	B						
13							A	102	A	102	B	108	B	B	116	A	116	A						
14							B	A	A	104	112	112	A	112	A	A	A	A						
15							A	A	A	120	116	116	116	116	116	122	A	A						
16							A	A	A				112	112	92		B	A						
17							A	A	108	112	112	94	100	100	108	122	132	B						
18							B	B	116	124	B	B	B	B	B	A	118	106						
19							A	110	A	114	B	B	B	B	B	128	B	92						
20				B	A		B	A	116	122	122	114	114	114	102	132	B	B						
21	A						B	A	106	116	116	116	116	116	116	116		B						
22								140	118	118	112	112	118	110	118	118	114	A						
23							B		114	114	114	114	106	106	106	116	A	B						
24							A	B	110	110	110	110	A	110	110	B	A	A						
25							B	B	142	122	114	106	108	108	96	96	148	B						
26							B	A	128	104	112	94	100	110	110		B	A						
27								A	104	A	96	102	112	92	110	82	B	A						
28							B	108	142	108	102	106	112	A	116	116	116	A						
29							B	A	116	100	108	112	116	120	110	110	B	B						
30							96	104	104	114	114	108	114	B	B	114	B	A						
31									110	118	E 166	B E 144	B	B	B	122	B	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							2	8	25	28	25	27	24	24	26	25	9	2			1			
MED							95	109	116	114	112	108	110	110	107	116	116	99			90			
U Q								119	120	118	114	114	113	112	114	122	125							
L Q								103	105	107	108	106	106	102	102	104	103							

DEC. 2016 h'E (KM)

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	94	94	94	94	94	92	98	96	96	96	162	112	102	90	90	90	90	102	102	86	88	88	86
2	98	B	94	B	104	102	102	104	136	132	116	90	98	G	98	126	84	84	84	102	102	102	102	B
3	86	B	86	B	B	102	102	102	102	110	88	106	84	102	G	126	B	B	B	104	104	104	84	96
4	86	B	B	104	B	96	104	94	86	132	G	G	156	102	G	144	B	B	108	B	84	96	96	96
5	96	B	88	88	88	B	B	B	B	96	G	96	100	100	G	G	B	86	82	82	B	B	B	86
6	B	B	B	94	94	B	B	126	104	110	110	140	112	112	92	92	92	B	B	B	B	B	92	B
7	112	B	B	B	B	114	114	B	114	114	100	G	G	94	146	84	84	90	90	90	100	96	86	B
8	96	B	96	96	B	B	B	110	100	104	104	96	88	88	88	120	82	110	98	B	92	92	96	96
9	96	96	90	96	B	104	108	G	104	98	96	96	90	124	G	G	B	B	B	B	B	100	94	98
10	88	88	88	88	100	102	104	96	100	94	94	G	G	122	104	108	108	100	100	100	100	100	Q 100	96
11	B	B	B	B	B	B	B	114	114	102	102	G	88	G	94	G	88	88	B	102	102	98	98	98
12	98	82	82	88	B	104	C	104	116	92	110	116	G	110	138	84	92	B	B 154	92	92	92	92	92
13	92	84	98	104	98	104	94	90	98	126	B	130	B	B	112	108	146	104	104	98	88	88	90	86
14	86	88	88	126	86	94	118	84	84	96	G	124	90	108	108	108	104	104	118	108	108	92	92	92
15	92	B	B	B	B	100	100	100	88	122	102	130	G	106	142	128	104	104	104	104	96	88	96	B
16	B	B	B	118	B	100	100	90	90	90	98	B	118	G	118	118	B	102	102	102	102	92	92	92
17	B	100	92	92	90	B	102	98	98	150	148	82	G	88	152	90	118	B	96	96	96	94	94	B
18	B	B	B	B	B	104	B	B	G	G	B	B	B	B	B	92	92	94	96	98	98	98	98	94
19	94	90	B	B	104	94	100	112	108	G	B	B	B	B	B	G	B	108	104	104	100	100	88	88
20	88	88	88	B	G	112	B	100	102	122	110		G	102	154	114	B	B	B	B	B	94	94	94
21	92	92	92	88	B	88	B	108	128	98	120	104	124	108	168	G	B	B	92	92	86	86	B	B
22	B	B	154	84	84	110	96	130	104	102	114	114	108	92	132	106	106	88	88	88	B	104	90	96
23	90	90	90	90	90	96	B	104	132	148	132	100	G	96	96	96	96	B	B	B	108	108	100	100
24	100	100	B	90	B	B	114	B	140	122	114	90	102	132	112	B	106	106	134	100	100	130	124	B
25	B	94	94	94	94	B	B	B	154	130	92	122	G	88	88	88	G	B	112	114	108	108	B	B
26	B	B	B	110	B	112	100	106	106	98	98	90	G	G	G	G	B	100	104	100	122	B	B	90
27	100	B	100	92	96	94	104	94	110	98	G	G	G	G	166	80	B	114	100	B	B	100	100	98
28	98	98	88	96	B	B	82	102	G	138	86	G	96	96	96	G	96	96	88	B	98	98	B	B
29	86	86	B	B	B	B	104	94	G	84	98	104	104	174	104	110	B	B	130	B	B	98	98	98
30	98	100	100	94	B	94	86	94	94	166	G	G	166	B	B	114	B	92	B	92	106	98	B	B
31	98	88	B	B	B	104	104	104	G	G	G	G	B	B	B	G	B	B	108	102	B	B	B	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	22	17	19	21	13	22	21	25	26	28	22	19	17	21	22	22	17	19	24	22	23	27	24	20
MED	95	90	92	94	94	102	102	102	104	107	102	104	102	102	110	108	96	100	102	100	100	98	94	95
U Q	98	97	96	100	99	104	104	107	114	128	114	124	115	111	142	118	106	104	108	102	104	100	98	97
L Q	88	88	88	89	89	94	98	94	98	97	96	96	90	95	96	90	89	90	94	92	92	92	91	91

DEC. 2016 h'Es (KM)

IONOSPHERIC DATA STATION Wakkanai

DEC. 2016 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	F2	F1	F1	F1	LL11	L3	C2	LC11	LC11	C1	L1	L1	L1	L1	L3	L1	L2	FQ21	F1	F4	F1	F3
2	F1		F1		F1	F8	F8	C1	C1	C1	C1	LC11	L1		C1	C1	L1	L2	F1	F1	F2	F1	F1	
3	F1		F1			F1	F1	L3	L1	LL11	LQ41	C1	LC11	LC11		C1				C1	L1	L1	F1	F1
4	F1			F1		F1	C1	L4	LC12	CL12			C1	C1		C1			FF21		F1	F1	F1	F2
5	F2		F1	F2	F1					L2		L1	CL11	CL11				L1	F2	F1				F1
6				F1	F1			F1	C2	C2	C2	C1	C1	C1	LC12	LC11	L1						F1	
7	F1					F1	L1		C2	LC22	LC22			LC11	HL11	LC11	L1	L4	FF41	F3	F2	F1	F1	
8	F1		F1	F1				L1	L4	LC12	C2	CL12	LC11	L2	CL11	CL11	LL31	L1	F1		F2	FF21	FF11	F1
9	F1	F1	F2	FQ11		F2	F1		C1	C4	L3	L3	L2	C1								F1	F1	FF11
10	F1	F1	FF11	F1	F1	F1	L2	L3	L1	C2	L1			C1	C1	CL22	CL21	C3	C3	L4	LL21	LQ21	LQ11	LQ11
11								C4	C1	L2	C1		C1		C1		L1	L1		FF32	F2	F3	FF11	FF11
12	F1	F1	F1	F1		F4		L3	C1	LC11	C2	C1		C1	L1	LC11	C1		F1	F3	F4	FF31	F2	FF11
13	F3	F1	F2	FF21	F3	F4	LL21	LC21	L4	CL11		C2			C1	C2	CL23	LL21	FQ21	FQ31	FF21	FF21	F2	F1
14	F1	F1	F1	F1	F1	F1	L1	L1	L1	LC11		C1	L1	C1	L1	L1	LL31	LQ31	F1	F1	F1	F2	F2	F1
15	F2					F2	L1	L1	L2	C1	L1	C2		L1	C1	C1	LL11	L2	F2	F2	F1	F3	F1	
16				F1		F2	L4	L3	L2	L1	L1		C1		C1	L1		L1	F1	F2	F3	F2	F2	F2
17		FF11	F2	F1	F1		FF21	F1	LC11	C1	HL11	LC11		LC11	C1	LC11	L1		F2	F2	F2	F3	F1	
18						F1										L1	L1	LC11	L3	F2	F2	F2	F3	F2
19	F2	F1			FF11	F1	L1	CL11	L1									L1	FFQ21	FFQ21	FFQ21	FFQ11	FQ11	F2
20	F1	F1	F1			F1		L1	L1	CL11	CL11	CL11		L1	H1	L1						F2	F3	F2
21	F2	F2	FF11	F1		FF11		L3	C2	LC11	C1	LC11	C1	L1	H1				F1	F1	F1	F1		
22			F1	F2	F2	F2	L1	L1	LC11	LC11	C1	C1	LC11	LC11	CL11	CL11	LC11	L1	F1	F1		F1	F1	F1
23	F1	FQ21	FQ21	FQ11	FF11	F1		F1	CL11	CL11	C1	C1		LC11	LC11	LC11	L1				F1	F1	F3	F2
24	FF11	F1		F1			LL11		C1	C1	C1	C2	L1	C1	C1		L1	L3	F2	FF21	FF11	F3	FF21	
25		FF11	FQ11	FQ11	F1				C1	C1	L1	C1		L1	L1	L1			FQ31	FQ21	FQ31	F1		
26				FF11		F1	LL11	L1	L1	LC11	LC11	LC11						L1	FQ11	FF11	F1			F1
27	F1		F1	F1	F3	F2	L1	L2	C1	L1					C1	C1		L1	F1			F2	FQ31	FQ21
28	F1	F1	F3	FQ11			L1	LC11		C1	LC11		LC11	L1	L1		L1	L1	F1		F1	F1		
29	F1	F1					L1	L1		LC11	LC11	CL11	LC11	C1	C1	L1			F1			FF21	FQ21	FQ11
30	F1	FF11	F1	FQ11		F1	L1	C1	L1	HL11			H1			L1		L1		F1	F1	F1		
31	F1	F1				F2	F3	F1											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																								

DEC. 2016 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 33	X 35	40	X 36	X 36	X 35	X 37											X 43	X 40	X 38	A	A	X 32	X 34
2	X 35	X 37	X 36	X 34	X 35	X 32	X 31	X 57										A	X 36	X 35	X 42	X 38	X 36	X 38
3	X 38	X 38	X 38	X 39	X 37	X 35	X 37											X 40	X 32	X 35	X 35	X 35	44	40
4	X 35	X 34	X 33	X 35	X 33	X 31	X 33											X 40	X 40	X 35	X 39	X 43	X 36	X 40
5	X 36	X 34	X 34	X 34	X 34	X 32	X 32											X 40	X 32	X 35	X 39	X 34	X 31	34
6	X 34	X 35	X 34	X 35	X 36	X 34	X 33											A	X 42	X 34	X 36	X 34	X 32	X 34
7	X 35	X 36	X 38	X 40	X 34	X 25	X 26											X 52	X 46	X 33	X 34	X 29	X 29	X 34
8	X 34	X 35	X 35	X 35	X 36	X 38	X 30											X 42	X 35	X 40	X 34	X 36	X 39	X 43
9	X 39	43	48	46	X 36	X 30	X 29	X 51										X 37	X 39	X 48	X 36	A	A	A
10	X 34	34	X 34	X 40	X 36	X 38	X 36											X 49	X 42	X 36	X 42	X 38	X 34	45
11	X 36	39	38	36	X 33	X 34	X 32											X 44	X 34	X 31	A	X 42	X 38	A
12	X 40	X 40	47	X 37	X 33	X 32	X 34	X 56										X 45	X 36	X 40	X 42	X 37	X 29	X 31
13	X 32	X 33	X 33	X 32	X 32	X 31	X 36											X 46		X 35	X 42	X 34	X 34	X 32
14	X 33	X 33	X 31	X 32	X 32	X 29	X 27											X 42	X 40	X 37	X 42	X 34	X 29	X 31
15	X 33	X 34	X 35	X 36	X 37	X 34	X 39											X 35	X 35	X 36	X 39	X 42	X 42	X 47
16	X 42	48	48	46	X 34	X 34	X 36											X 36	X 32	X 39	X 40	X 44	X 38	X 40
17	X 39	X 37	X 37	X 34	X 35	X 28	X 28											X 40	X 33	X 36	X 39	X 36	X 34	X 34
18	X 32	X 32	X 32	X 32	X 29	X 28	X 29											X 40	X 38	X 45	X 38	X 35	X 38	X 41
19	42	43	X 38	X 38	X 34	X 35	X 39											X 47	X 46	X 31	X 40	X 30	X 30	X 35
20	X 34	X 33	X 35	X 32	X 29	X 28	X 27											X 47	X 37	X 39	X 37	X 28	X 28	X 28
21	X 30	X 29	X 31	X 30	X 30	X 30	X 30	X 52										X 42	X 35	X 36	X 35	X 28	X 30	X 33
22	X 35	X 30	X 36	42	X 36	X 33	X 32											X 42	X 42	X 41	X 41	X 39	X 37	X 38
23	X 36	X 36	X 36	X 37	43	X 31	X 38											X 42	X 41	X 48	X 40	X 37	45	46
24	X 37	X 37	X 35	40	36	X 35	X 32											X 48	X 36	X 37	X 47	X 34	X 32	X 35
25	X 36	X 40	X 40	X 40	X 48	X 36	X 29											X 40	X 32	X 38	X 37	X 36	A	X 35
26	X 41	X 33	X 33	X 36	45	X 33	X 36											X 46	X 42	X 39	X 33	X 35	41	X 35
27	X 34	X 33	X 34	X 34	X 35	X 32	X 37											X 52	X 40	X 44	X 39	X 28	X 28	X 32
28	X 33	X 35	X 33	X 36	X 36	X 34	X 35											X 43	X 33	X 38	X 36	X 36	X 28	X 29
29	X 32	X 33	X 31	X 31	X 34	X 30	X 28											X 36	X 33	X 33	X 38	X 36	X 32	X 35
30	X 38	X 37	X 37	X 35	X 33	X 31	X 32											X 42	X 33	X 38	X 34	X 32	X 31	X 30
31	X 31	X 34	X 35	X 35	X 34	X 32	X 34											X 42	X 36	X 34	X 41	X 36	X 34	X 33
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	4										29	30	31	29	29	29	29
MED	X 35	X 35	X 35	X 36	X 35	X 32	X 32	X 54										X 42	X 36	X 37	X 39	X 36	X 34	X 35
U Q	X 38	37	38	39	X 36	X 34	X 36	X 56										X 46	X 40	X 39	X 41	X 38	X 38	X 40
L Q	X 33	X 33	X 33	X 34	X 33	X 30	X 29	X 52										X 40	X 33	X 35	X 36	X 34	X 30	X 32

DEC. 2016 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	27	29	F	30	30	29	31	61	64	58	67	73	64	60	68	52	60	37	34	31	A	A	26	28
2	29	31	30	28	29	26	25	51	72	A	68	68	60	61	64	54	50	A	30	29	36	32	30	32
3	32	32	32	33	31	29	31	52	64	64	76	69	73	67	62	54	48	34	26	29	29	29	F	F
4	28	28	27	28	27	24	27	58	58	62	68	72	64	62	56	54	53	34	34	29	33	36	30	34
5	30	28	28	28	27	26	26	53	58	60	72	62	64	61	54	54	50	34	26	29	33	28	25	F
6	28	29	28	29	30	28	27	54	52	60	65	64	65	54	57	59	51	A	36	28	30	28	26	28
7	29	30	32	34	28	19	20	52	58	56	80	81	60	55	55	62	55	46	40	27	28	23	23	28
8	28	29	29	29	30	32	24	55	54	51	78	80	67	58	61	61	50	36	29	34	28	30	33	37
9	33	F	F	F	30	24	23	45	69	60	81	91	A	69	76	75	63	31	33	42	30	A	A	A
10	28	F	28	34	30	32	30	62	59	68	69	84	64	63	73	72	58	43	36	30	36	32	28	F
11	30	F	F	F	27	27	26	51	59	57	71	69	63	64	A	58	A	38	28	25	A	36	32	A
12	34	34	F	31	27	26	27	50	50	51	55	70	70	62	60	59	45	39	30	34	36	31	23	25
13	26	27	27	26	26	25	30	50	55	53	58	70	54	56	54	59	46	40	A	29	36	28	28	26
14	27	27	25	26	26	23	21	45	53	57	57	64	54	63	57	60	54	36	34	31	35	28	23	25
15	27	27	29	30	31	28	33	49	54	56	53	54	55	64	58	47	53	29	29	30	33	35	36	40
16	36	F	F	F	28	28	30	45	52	52	48	56	61	48	60	56	45	30	26	33	34	38	32	34
17	33	31	31	28	29	22	22	40	54	52	53	57	62	53	48	54	40	34	27	30	33	30	28	28
18	26	26	26	26	23	22	23	42	51	59	63	68	64	60	56	52	54	34	32	38	32	29	32	35
19	F	F	32	32	28	29	32	50	53	56	64	68	64	55	50	54	47	41	40	25	33	24	24	28
20	28	27	29	26	22	22	21	45	53	58	51	56	70	55	54	54	52	41	31	33	31	22	22	22
21	24	23	25	24	24	24	24	45	57	58	66	72	71	59	54	59	54	36	29	30	29	22	24	27
22	29	24	30	F	30	27	26	45	56	60	80	84	77	64	59	69	56	36	36	35	35	33	31	32
23	30	30	30	31	F	25	32	43	52	64	V 62	78	83	81	66	64	58	36	35	42	34	31	F	F
24	31	31	29	F	F	29	26	41	47	57	63	72	61	62	62	58	54	42	30	31	41	28	26	29
25	30	33	34	34	41	30	23	42	48	58	56	68	65	73	57	61	49	36	26	32	30	30	A	29
26	35	26	27	30	F	27	30	46	51	54	65	67	71	61	59	52	50	40	36	33	27	29	F	29
27	28	27	28	28	29	26	30	45	54	57	60	68	55	64	56	57	44	46	34	38	33	22	22	26
28	27	29	27	30	30	28	29	47	51	57	57	64	55	64	58	56	52	37	27	32	30	30	21	23
29	26	27	25	25	28	24	22	46	46	55	50	60	60	52	50	50	54	30	27	26	32	30	26	29
30	32	31	31	29	27	25	26	40	49	51	61	72	75	62	53	56	48	36	26	32	28	26	25	24
31	25	28	29	29	28	26	27	40	45	47	57	52	55	64	54	58	53	36	30	27	35	29	28	27
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	26	26	26	28	31	31	31	31	30	31	31	30	31	30	31	30	29	30	31	29	29	26	25
MED	28	28	29	29	28	26	26	46	54	57	63	68	64	62	57	57	52	36	30	31	33	29	26	28
U Q	31	31	30	31	30	28	30	52	58	60	69	72	70	64	61	60	54	40	34	33	35	32	30	32
L Q	27	27	27	28	27	24	23	45	51	54	57	64	60	56	54	54	48	34	27	29	30	28	24	26

DEC. 2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC.2016 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	L	L		A									
2										A	L		L	L	L									
3												L	L	L	L									
4											L	L	L	L	U L 480	L								
5										L		L	L											
6										L	L	L	L		A									
7									L	L	L		A	L	L									
8											U L 408	A												
9											A		A	A	A									
10											L	L	L		L									
11											A	L	L	L	A	A	A							
12											L		A	A	L									
13										U L 348		L	L	A	A				A					
14									U L 256	A	L		U L 472	L	A									
15											L	L	L	L		L								
16												L	L	L										
17											L	A	A	L										
18										L	L	L	L	L										
19											A	L	L	L	L									
20											L		U L 412	L										
21										L	L	L	L	L										
22											L		U L 400	L										
23											L	372	U L 404	U L 376	L	L								
24										L	U L 388	L	L	L	L	L								
25													L	A	L	L								
26										L	L	U L 384	U L 404		U L 356									
27									L		L	U L 392	396	U L 400	L	U L 300								
28									L	L	L	L	L	A		U L 412								
29									L	L	L	L	U L 432		A	U L 400								
30										L	U L 412	U L 420	U L 408	L										
31											A		U L 416	A	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	1	3	4	9	2	2	3								
MED									U L 256	U L 348	U L 408	U L 388	U L 408	U L 388	U L 418	U L 400								
U Q											U L 412	U L 406	U L 424			U L 412								
L Q											U L 388	378	U L 402			U L 300								

DEC.2016 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								R	U R 244	U R 284	R	A	R	A	A	A	B							
2									A	A	A	R	U R 304	R	R	A	A							
3								A	A	A	A	A	U R 308	R	R	R	B							
4								B	U R 248	U R 288	A	U R 312	U R 340	R	A	U R 244	B							
5								B	A	U R 280	R	R	R	R 296	R	R	B							
6								B	U R 236	U R 284	R	R	R	A	A	A	A							
7								B	U R 236	A	A	A	A	R	U A 248	224	B							
8								B	U R 228	R	R	328	A	U A 276	A	A	B							
9									A	A	A	A	A	A	A	228	B							
10								B	U R 224	A	R	A	R	R	256	U A 228	A							
11								B	R	268	A	A	A	R	A	A	A							
12									R	U R 264	A	A	A	A	A	A	B							
13								B	A	A	U R 284	U R 300	R	A	U A 264	A	A		A					
14								B	U R 224	A	R	R	R	R	A	A	B							
15								B	R	U R 280	R	R	R	U A 296	A	R	176							
16								B	R	R	A	A	R	R	R	A	U R 180							
17								B	U R 240	A	A	A	A	A	U R 272	236	U A 176							
18								B	R	A	A	A	U R 316	R	A	A	B							
19								B	U R 236	U R 272	A	R	U R 296	R	U R 260	236	B							
20								B	U R 228	U R 268	U R 292	312	U R 308	R	R	A	B							
21									228	R	R	R	U R 316	R	U R 264	R	168							
22								B	A	A	R	A	A	R	U R 260	R	172							
23								B	220	252	A	R	U R 292	R	U R 276	A	U R 188							
24								B	A	A	296	A	A	R	A	U R 240	B							
25								B	208	236	276	A	A	A	A	R	B							
26								B	A	R	R	A	R	R	U R 280	U A 216	B							
27								B	208	R	R	A	R	R	R	A	A							
28								B	R	R	R	R	R	A	U A 264	A	B							
29								B	U R 224	U R 268	R	A	R	A	A	A	B							
30								B	A	A	R	R	R	R	R	240	B							
31								B	192	264	A	R	R	A	R	A	U R 180							
	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	13	4	4	8	3	10	9	7							
MED									U R 228	U R 268	288	312	U R 308	U A 296	U R 264	236	U 176							
U Q									U R 236	U R 282	294	320	U R 316	U A 296	U R 272	U R 240	U R 180							
L Q									222	264	280	306	U R 300	U A 276	U 260	226	172							

DEC. 2016 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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 40	22	20	22	E B 15	19	G	J G 24	G 22	G 25	J A 38	J G 29	J A 46	J A 36	J A 43	J A 24	J A 44	J A 56	J A 61	J A 55	J A 65	J A 48	J A 32
2	J A 23	J A 44	J A 22	J A 22	E B 15	E B 15	20	J A 32	J A 31	J A 116	J A 47	G	G 27	G 23	J G 23	30	J A 36	J A 44	J A 22	J A 27	J A 26	J A 20	J A 32	J A 40
3	J A 44	J A 30	J A 23	J A 22	J A 22	J A 22	E B 15	J A 74	J A 62	J A 59	37	G	G	J A 32	G	G	E B 17	22	E B 14	J A 27	E B 14	J A 52	J A 33	J A 25
4	J A 23	E B 16	E B 15	E B 15	22	20	20	19	G	G	J A 44	G	G 27	G	J A 30	G	J A 21	22	J A 23	20	J A 22	J A 30	J A 22	J A 21
5	21	21	20	E B 14	E B 14	20	20	J A 24	J A 28	G 26	G 26	G 25	G	35	G	G	J A 25	J A 26	J A 27	E B 15	E B 15	20	21	21
6	19	E B 15	E B 15	E B 15	E B 15	J A 22	E B 15	E B 16	G	G	G	G	G	37	35	J A 35	J A 42	J A 55	J A 54	J A 19	J A 21	J A 20	20	J A 22
7	22	21	20	E B 15	18	18	19	21	G	34	31	37	J A 39	G 27	G 22	27	20	21	E B 15	21	E B 15	E B 14	E B 14	J A 23
8	20	E B 15	J A 26	J A 22	21	20	E B 15	E B 15	G	G	G	36	38	37	34	J A 50	22	J A 22	J A 17	J A 22	J A 24	21	E B 15	J A 20
9	E B 16	19	E B 15	E B 16	19	20	J A 20	J A 42	J A 52	J A 41	J A 44	J A 76	J A 57	J A 57	J A 38	26	J A 28	J A 23	E B 16	J A 33	J A 34	J A 48	J A 73	J A 60
10	E B 15	J A 25	19	J A 44	20	J A 22	J A 28	J A 38	G	J A 42	G 23	J A 35	G 23	G 20	30	26	J A 42	J A 22	J A 59	J A 32	J A 28	20	20	E B 15
11	J A 43	J A 24	E B 14	E B 14	18	E B 15	E B 14	E B 16	G	34	36	J A 74	J A 34	G	J A 76	J A 66	J A 66	J A 40	J A 20	J A 57	J A 52	J A 57	J A 46	J A 90
12	J A 57	J A 28	J A 21	J A 29	20	22	20	20	G	G	34	37	J A 47	J A 66	J A 46	J A 51	J A 24	J A 46	20	J A 46	J A 67	22	20	J A 22
13	20	J A 23	J A 34	J A 23	20	J A 31	J A 48	J A 36	J A 31	J A 42	36	G	J G 28	35	35	J A 37	J A 55	J A 101	J A 80	J A 57	J A 28	J A 42	J A 32	21
14	J A 20	20	20	J A 21	J A 22	J A 24	J A 22	J A 25	G	35	G	G	G	G	33	33	J A 36	J A 47	J A 38	J A 46	J A 56	J A 29	J A 27	J A 24
15	22	E B 15	E B 14	E B 15	E B 15	E B 15	22	22	G	J A 37	G	G	G 24	34	34	G	22	J A 42	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15
16	E B 15	E B 15	E B 16	E B 15	E B 15	21	E B 14	18	G	G	33	36	G	G	G	30	G	E B 15	20	J A 22	E B 14	E B 24	J A 21	J A 27
17	J A 26	21	18	E B 15	19	20	E B 15	E B 15	G	31	34	36	35	34	G	29	25	J A 33	J A 22	J A 31	J A 28	J A 28	J A 25	J A 24
18	21	21	J A 22	E B 14	E B 14	E B 15	E B 14	E B 14	G 22	J A 34	J A 38	J A 46	G 28	G 28	J A 42	J A 32	21	J A 30	J A 32	J A 23	20	J A 92	J A 60	J A 57
19	J A 18	J A 36	J A 37	20	E B 14	17	22	E B 15	G	G	J A 49	G	G 27	G	G 22	28	J A 27	E B 15	E B 15	E B 15	E B 14	E B 15	19	J A 23
20	J A 34	J A 31	J A 19	J A 24	J A 21	E B 16	E B 14	E B 36	G	G	G	34	G	G	G 23	27	21	E B 15	E B 15	E B 14	E B 15	E B 16	E B 15	E B 19
21	E B 16	E B 14	E B 14	21	19	E B 14	E B 14	E B 15	25	G	G	G 28	G 28	G 23	G	G	20	E B 15	18	19	20	E B 15	E B 15	E B 14
22	E B 15	19	18	E B 14	E B 15	E B 15	23	J A 19	J A 35	J A 46	G	J A 57	J A 40	G	G	G	21	J A 19	18	19	J A 18	E B 15	18	J A 30
23	E B 15	J A 18	20	E B 16	J A 20	E B 16	J A 23	J A 22	26	31	J A 32	G	G	G	G	26	J A 24	J A 26	J A 36	J A 24	J A 21	21	J A 19	19
24	J A 23	J A 20	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	24	28	35	J A 34	36	G	J A 45	G	E B 16	J A 24	E B 16	E B 14	E B 14	E B 50	E B 15	E B 16
25	E B 15	E B 14	22	J A 20	J A 20	20	18	E B 15	G	30	32	J A 40	J A 38	J A 40	33	G	19	J A 23	J A 22	E B 15	J A 30	J A 32	J A 69	J A 48
26	J A 24	J A 19	E B 14	J A 28	J A 22	19	J A 27	J A 45	J A 31	J G 24	G 28	35	G	36	G	26	E B 17	E B 14	E B 14	E B 15	J A 38	J A 24	J A 21	23
27	E B 16	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	28	G	J A 56	J A 47	G	G	G	26	22	E B 15	E B 15	E B 15	E B 14	E B 35	J A 25	E B 15
28	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 16	J A 26	G	G	G	G	G	36	32	28	J A 30	E B 15	E B 15	E B 15	E B 15	E B 15	E B 13	E B 15
29	E B 14	E B 16	E B 14	E B 14	E B 15	20	20	E B 15	G	G	G	33	G	35	33	29	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	E B 16	E B 15
30	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	18	E B 16	27	29	G	G	G	G	G	30	19	E B 14	E B 14	E B 14	E B 14	E B 19	E B 16	J A 23
31	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	24	34	35	34	G	39	G	30	21	E B 15	E B 15	J A 20	E B 16	20	J A 34	J A 27
	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	20	19	18	E B 15	18	18	19	19	G	29	32	34	G	G	30	28	22	J A 22	18	J A 20	J A 20	J A 21	J A 21	J A 23
U Q	J A 23	J A 24	J A 22	J A 22	J A 20	J A 20	J A 22	J A 26	J A 28	J A 35	J A 36	J A 37	J A 35	36	J A 35	J A 32	J A 28	J A 40	J A 27	J A 31	J A 28	J A 35	J A 32	J A 27
L Q	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G	G	G	G 28	G	G	G	20	E B 15	E B 15	E B 15	E B 14	E B 16	E B 16	E B 19

DEC. 2016 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	G	G 19	G 18	G 19	32	G 24	36	30	28	19	25	18	20	A A 55	A A 65	16	18
2	E B 15	20	E B 15	E B 15	E B 15	E B 15	E B 15	23	24	A A 116	35	G	G 20	G 20	G 20	27	30	A A 44	18	18	E B 16	E B 16	E B 15	18
3	18	16	E B 14	16	16	E B 15	E B 15	18	24	36	32	G	G	22	G	G	E B 17	E B 15	E B 14	18	E B 14	20	19	E B 15
4	E B 15	E B 16	E B 15	E B 15	E B 16	E B 15	E B 15	18	G	G	30	G	G 24	G	28	G	18	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
5	E B 16	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	19	23	G 25	G 24	G 23	G	31	G	G	20	19	19	E B 15	E B 15	E B 15	E B 15	E B 15
6	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G	G	G	G	G	33	33	30	36	A A 55	19	E B 15	15	18	E B 15	E B 16
7	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	E B 15	18	G	32	30	34	31	G 26	G 21	25	18	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	16
8	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G	G	34	36	35	31	38	19	E B 14	E B 15	E B 15	17	E B 16	E B 15	E B 15
9	E B 16	E B 14	E B 15	E B 16	E B 14	16	E B 15	38	33	33	34	68	A A 57	48	30	25	20	18	E B 16	25	19	A A 48	A A 73	A A 60
10	E B 15	E B 15	E B 15	27	E B 15	E B 14	19	35	G	27	G 21	31	G 20	G 18	27	25	26	E B 16	E B 15	17	E B 15	E B 15	E B 14	E B 15
11	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15	E B 14	E B 16	G	32	32	32	29	G	A A 76	43	A A 66	19	E B 14	E B 14	A A 52	29	E B 16	A A 90
12	28	18	E B 14	20	E B 16	16	E B 15	E B 15	G	G	30	33	39	42	29	20	17	28	E B 15	E B 14	E B 15	E B 15	E B 15	E B 16
13	E B 14	E B 15	17	16	E B 15	E B 15	E B 16	15	21	31	34	G	G 23	35	32	29	32	29	A A 80	21	E B 15	E B 16	21	E B 15
14	E B 15	E B 15	E B 14	E B 15	E B 14	E B 14	E B 15	18	G	28	G	G	G	G	30	31	30	E B 15	17	15	18	19	17	E B 15
15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	E B 14	E B 16	G	G 20	G	G	G 18	32	31	G	22	19	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15
16	E B 15	E B 15	E B 16	E B 15	E B 15	E B 15	E B 14	17	G	G	31	32	G	G	G	25	G	E B 15	15	E B 15	E B 14	E B 15	E B 15	E B 15
17	18	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	28	31	34	33	32	G	28	22	18	14	E B 15	16	E B 15	E B 15	E B 15
18	E B 15	E B 16	E B 15	E B 14	E B 14	E B 15	E B 14	E B 14	G 19	21	30	32	G 22	G 23	34	23	19	19	E B 15	18	E B 15	18	19	E B 15
19	E B 15	E B 15	22	E B 15	E B 14	E B 15	E B 16	E B 15	G	G	37	G	G 26	G	G 18	25	19	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14
20	E B 14	19	E B 16	E B 15	E B 14	E B 16	E B 14	E B 15	G	G	G	34	G	G	G 21	G 25	19	E B 15	E B 15	E B 14	E B 15	E B 16	E B 15	E B 14
21	E B 16	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	E B 15	24	G	G	G 25	G 26	G 21	G	G	18	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14
22	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	18	30	38	G	35	32	G	G	G	19	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15
23	E B 15	E B 15	E B 15	E B 16	E B 15	E B 16	E B 14	18	24	30	31	G	G	G	G	24	G 17	19	21	E B 15	E B 15	E B 15	E B 15	E B 15
24	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	22	26	32	30	31	G	28	G	E B 16	E B 16	E B 16	E B 14	E B 14	E B 15	E B 15	E B 16
25	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15	G	30	31	36	31	36	29	G	18	18	E B 15	E B 15	E B 15	E B A 69	A E 15	E B 15
26	E B 15	E B 14	E B 14	E B 15	E B 15	E B 15	E B 16	17	28	G 20	G 25	32	G	31	G	25	E B 17	E B 14	E B 14	E B 15	19	E B 15	E B 15	16
27	E B 16	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	G 21	G	24	30	G	G	G	25	21	E B 15	E B 15	E B 15	E B 14	16	E B 15	E B 15
28	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 16	E B 15	G	G	G	G	G	31	30	24	19	E B 15	E B 15	E B 15	E B 15	E B 15	E B 13	E B 15
29	E B 14	E B 16	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15	G	G	G	30	G	32	31	26	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	E B 16	E B 15
30	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	22	26	G	G	G	G	G	27	18	E B 14	E B 14	E B 14	E B 14	E B 15	E B 16	E B 14
31	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	23	32	33	32	G	36	G	26	19	E B 15	E B 15	E B 15	E B 16	E B 15	18	E B 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G	G	30	30	G	G	27	25	19	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
U Q	E B 15	15	E B 15	15	E B 15	E B 15	E B 15	18	23	31	32	33	31	33	30	27	22	19	16	15	16	16	16	16
L Q	E B 15	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	E B 15	G	G	G	G	G 26	G	G	G	18	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15

DEC. 2016 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

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

DEC. 2016 fmin (0.1MHz)

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	314	295	F	305	290	302	341	372	380	393	360	369	366	328	372	368	385	375	363	363	A	A	304	274
2	317	330	333	322	321	322	338	361	390	A	374	382	352	357	370	368	375	A	317	313	340	343	344	309
3	304	305	303	322	338	345	352	358	360	356	367	356	364	338	354	374	375	361	329	327	359	296	F	F
4	309	325	301	332	348	332	331	385	382	390	372	369	376	365	334	352	359	360	350	337	335	364	329	318
5	318	314	309	308	317	306	337	383	389	369	369	365	363	390	360	368	368	359	346	321	345	350	291	F
6	312	319	322	324	326	365	328	391	381	373	365	384	361	365	358	351	383	A	386	334	360	341	336	291
7	284	304	298	371	394	321	330	374	380	345	358	398	374	358	358	359	356	353	365	356	350	338	302	302
8	327	317	306	299	337	347	317	366	390	349	348	358	367	360	358	357	369	347	317	348	349	301	323	335
9	376	F	F	F	363	337	336	348	373	345	347	384	A	368	349	369	386	367	289	350	386	A	A	A
10	344	F	312	306	312	309	314	371	384	370	348	395	389	348	346	361	368	381	359	297	333	365	344	F
11	297	F	F	F	303	321	315	337	387	356	358	370	377	372	A	357	A	372	359	345	A	331	308	A
12	311	300	F	317	298	298	345	393	388	372	384	367	393	366	369	399	379	357	323	314	355	365	341	280
13	304	298	325	320	307	302	356	398	394	371	357	377	380	351	345	387	385	373	A	333	353	382	328	304
14	304	331	302	315	304	329	347	376	357	388	372	361	311	343	382	377	399	386	349	329	357	380	291	308
15	312	309	311	331	347	313	346	383	374	386	359	348	341	360	350	368	382	334	355	318	325	349	346	338
16	309	F	F	F	307	293	319	368	385	388	388	347	363	341	369	388	353	359	300	345	331	353	325	362
17	313	301	316	326	357	307	338	365	400	383	378	367	331	389	368	377	372	378	357	322	331	320	295	313
18	319	299	305	332	343	323	368	379	375	355	346	373	387	395	373	364	366	355	327	349	334	318	302	334
19	F	F	322	320	321	316	321	395	378	391	352	375	388	378	371	352	373	346	351	328	349	387	309	353
20	303	316	317	337	347	304	332	384	385	392	377	369	360	342	376	367	370	378	332	354	369	373	289	316
21	337	315	316	315	317	341	351	394	368	367	384	379	387	386	353	373	385	391	370	365	390	312	299	334
22	307	291	355	F	286	374	304	364	369	377	360	372	360	365	352	364	383	366	336	344	316	359	302	308
23	312	304	284	314	F	312	361	391	380	374	V 339	336	358	363	355	355	381	351	319	350	339	341	F	F
24	314	325	325	F	F	331	372	389	373	389	359	352	362	350	366	376	379	356	357	307	361	338	289	298
25	322	315	322	336	366	324	348	378	388	376	331	372	328	384	362	362	400	313	339	314	324	351	A	312
26	332	336	296	337	F	306	322	369	373	360	352	356	364	378	355	353	343	359	342	382	368	299	F	301
27	301	318	303	318	308	315	327	340	371	375	366	381	367	342	377	355	350	372	332	345	365	334	292	323
28	320	320	308	323	325	322	347	364	393	378	371	389	376	372	361	318	376	340	331	346	376	355	320	295
29	304	329	317	296	310	340	325	384	382	402	371	369	328	375	369	356	359	341	308	310	347	371	298	317
30	301	301	320	325	340	317	362	395	363	361	356	347	370	370	375	363	369	341	357	352	290	363	335	321
31	310	311	311	325	317	321	365	392	389	397	364	371	339	380	369	377	384	343	344	326	343	340	332	308
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	26	26	26	28	31	31	31	31	30	31	31	30	31	30	31	30	29	30	31	29	29	26	25
MED	312	314	312	322	321	321	338	378	381	374	360	369	364	365	362	364	375	359	343	337	349	349	308	312
U Q	319	320	322	331	345	332	351	391	388	388	372	379	376	378	370	374	383	372	357	350	360	364	332	328
L Q	304	301	303	315	308	307	325	365	373	361	352	358	358	350	354	356	368	346	327	321	334	332	298	302

DEC. 2016 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC.2016 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	L	L		A									
2										A	L		L	L	L									
3												L	L	L	L									
4											L	L	L	L	U L 390	L								
5										L		L	L											
6										L	L	L	L		A									
7									L	L	L		A	L	L									
8											U L 379	A												
9											A		A	A	A									
10											L	L	L		L									
11											A	L	L	L	A	A	A							
12											L		A	A	L									
13										U L 444		L	L	A	A				A					
14									U L 441	A	L		U L 385	L	A									
15											L	L	L	L		L								
16												L	L	L										
17											L	A	A	L										
18										L	L	L	L	L										
19											A	L	L	L	L									
20											L		U L 386	L										
21										L	L	L	L	L										
22											L		U L 401	L										
23											L	456	U L 393	U L 382	L									
24										L	U L 413	L	L	L	L	L								
25													L	A	L	L								
26										L	L	U L 445	U L 409		U L 398									
27									L		L	U L 420	430	U L 386	L	U L 420								
28									L	L	L	L	L	A		U L 359								
29									L	L	L	L	U L 379		A	U L 347								
30										L	U L 398	U L 379	U L 388	L										
31											A		U L 382	A	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	1	3	4	9	2	2	3								
MED									U L 441	U L 444	U L 398	U L 432	U L 388	U L 384	U L 394	U L 359								
U Q											U L 413	450	U L 405			U L 420								
L Q											U L 379	U L 400	U L 384			U L 347								

DEC.2016 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC.2016 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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										224	248	230	230		234									
2										A	240		246	252	242									
3												232	238	246	250									
4											238	234	232	248	312	246								
5										234		236	244											
6										234	244	232	246		230									
7									228	252	238		232	244	234									
8											258	240												
9											252		A	238	244									
10											258	216	202		260									
11											238	230	226	244	A	E A 234	A							
12											230		226	230	240									
13										228		230	236	232	226				A					
14									214	212	238		360	258	226									
15											244	242	248	254		232								
16												258	256	286										
17											236	232	236	232										
18										262	252	220	240	242										
19											260	244	234	234	238									
20											234		246	256										
21										248	242	226	222	230										
22											244		226	236										
23											238	256	230	242	248	238								
24										220	246	244	246	258	252	238								
25													258	228	252	242								
26										254	242	232	240		236									
27									232		242	220	230	252	244	256								
28									224	230	236	236	236	232		296								
29									238	222	256	224	282		228	258								
30										242	274	256	234	238										
31											250		278	224	242									
	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									5	13	26	22	29	24	19	9								
MED									228	234	243	232	236	242	242	242								
U Q									235	250	252	242	246	252	250	257								
L Q									219	223	238	230	230	232	234	236								

DEC.2016 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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 274	E B 300	E B 274	E B 272	E B 286	E B 270	E B 236	210	204	190	186	192	190	226	A	212	216	212	218	216	A	A	E A 270	E A 358
2	E B 282	E A 262	E B 242	E B 234	E B 248	E B 232	226	218	208	A	192	208	184	206	206	214	202	A	E A 242	228	E B 234	208	228	E A 310
3	E A 276	E A 276	E B 278	E A 262	E A 244	226	222	214	210	222	226	190	206	198	202	212	204	196	232	E A 246	210	E A 304	E A 324	E B 292
4	E B 276	E B 248	E B 258	E B 248	E B 240	E B 250	E B 250	218	212	206	194	188	192	198	202	H 188	210	200	212	212	E B 234	216	228	E B 250
5	228	E B 258	E B 272	E B 284	E B 268	E B 250	E B 240	204	200	188	214	196	192	220	206	198	206	206	E A 238	E B 238	222	200	E B 264	E B 300
6	E B 266	E B 248	E B 256	E B 254	E B 246	220	228	210	H 182	200	210	198	202	212	A	224	208	A	206	212	222	E A 240	218	E B 298
7	E B 316	E B 284	E B 258	208	206	210	E B 284	220	190	202	196	206	A	194	H 174	214	206	210	202	190	204	E B 244	E B 300	E A 296
8	E B 260	E B 264	E B 278	E B 282	E B 244	218	214	226	198	186	212	A	226	216	226	220	204	198	E B 238	216	218	E B 280	E B 228	E B 232
9	198	E B 272	E B 280	E B 276	192	E B 242	E B 238	E A 276	218	222	A	208	A	A	A	230	206	206	E B 274	234	210	A	A	A
10	E B 236	E B 318	E B 282	E B 328	E A 266	E B 264	E A 248	210	192	212	200	196	172	204	212	210	196	202	214	E A 286	E B 232	198	210	E B 248
11	E B 242	E B 290	E B 308	E B 252	E B 260	E B 258	E B 248	224	H 186	218	A	196	186	208	A	A	A	206	214	212	A	E A 284	E B 244	A
12	E A 304	E A 258	E B 246	E B 264	E A 258	E B 276	220	194	200	196	190	224	A	A	192	198	184	212	E B 266	E B 238	216	198	222	E B 306
13	E B 264	E B 272	E A 276	E A 282	E B 280	E B 282	230	196	198	180	230	204	184	A	A	208	204	218	A	E A 270	208	198	E A 290	E B 272
14	E B 238	230	E B 248	E B 242	E B 258	E B 264	E B 254	206	172	A	H 172	232	200	204	A	206	202	194	E A 242	220	226	206	E A 328	E B 250
15	E B 268	E B 258	E B 264	E B 240	E B 230	E B 250	212	204	208	218	180	182	182	208	212	H 178	200	222	224	E B 238	216	204	226	E B 218
16	228	E B 248	224	208	E B 236	E B 252	E B 232	206	202	198	198	200	204	198	222	210	200	190	E A 270	228	E B 240	208	198	222
17	E A 242	E B 258	E B 238	222	206	E B 266	E B 246	202	206	208	192	A	A	196	204	218	202	214	204	E B 248	228	E B 240	E B 270	E B 264
18	E B 264	E B 264	E B 260	E B 224	E B 238	E B 248	E B 222	206	H 186	196	184	200	194	202	220	210	218	200	222	222	204	222	E A 284	212
19	230	226	E A 276	E B 232	230	E B 248	E B 244	204	204	214	A	198	188	192	182	230	200	218	192	E B 240	214	194	E B 266	E B 254
20	E B 276	E A 282	E B 256	E B 236	E B 248	E B 274	E B 268	210	208	216	186	226	190	208	210	216	208	200	220	214	200	210	E B 294	E B 302
21	E B 256	E B 270	E B 272	E B 292	E B 280	E B 246	222	196	214	198	208	198	188	198	208	216	202	186	210	212	202	E B 224	E B 288	E B 264
22	E B 274	E B 236	234	E B 320	E B 296	198	E B 266	220	220	218	192	206	190	196	204	H 194	196	196	214	214	214	208	E B 242	E B 272
23	E B 244	E B 276	E B 290	232	E B 234	E B 242	206	204	214	224	204	182	182	202	200	192	204	216	E A 244	216	208	210	E B 256	E B 260
24	E B 260	E B 236	E B 230	E B 290	E B 320	228	204	196	H 180	186	188	190	194	192	198	192	202	192	E B 196	E B 230	212	206	E B 260	E B 278
25	E B 258	E B 254	E B 250	230	216	E B 232	228	198	206	226	208	224	208	A	206	190	200	E A 238	202	E B 242	210	226	A	E B 260
26	E B 244	210	E B 262	E B 242	E B 282	E B 274	E A 242	216	208	196	198	184	182	214	190	198	218	214	228	202	220	E B 244	E B 252	230
27	E B 236	E B 250	E B 274	E B 260	E B 256	E B 256	E B 244	210	H 168	216	196	188	182	182	208	184	206	204	230	212	200	E A 278	228	E B 248
28	E B 258	E B 256	E B 252	E B 254	E B 240	E B 248	220	208	178	172	186	194	194	A	224	206	206	228	228	E B 220	206	216	E B 254	E B 308
29	E B 290	E B 278	E B 238	E B 274	E B 258	222	E B 260	206	182	180	178	186	192	224	A	182	214	180	E B 244	E B 238	220	204	E B 296	E B 270
30	E B 250	E B 260	E B 252	E B 230	E B 230	E B 258	218	206	198	190	198	184	200	200	200	226	210	192	200	224	204	206	224	E B 240
31	226	E B 248	E B 258	E B 250	E B 246	E B 256	214	192	H 176	216	A	222	194	A	208	216	216	190	E B 212	212	226	212	E A 246	E B 294
	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	29	27	29	27	25	24	30	30	29	30	31	29	29	29	29
MED	E B 258	E B 258	E B 258	E B 252	E B 246	E B 250	E 232	206	200	202	196	198	192	202	206	210	204	203	213	217	212	207	E 254	E B 264
U Q	E B 274	E B 276	E B 276	E B 276	E B 266	E B 264	E B 248	216	208	217	208	207	200	210	211	216	208	214	E 238	E B 238	224	E 240	E 286	E B 297
L Q	238	E B 248	E B 248	232	234	232	220	204	H 186	190	186	189	184	197	200	194	202	195	210	212	207	205	228	E B 248

DEC. 2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC.2016 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								124	110	114	114	A	112	A	A	A	B							
2									A	A	A	116	114	114	110	A	A							
3								A	A	A	A	112	112	110	112	112	B							
4								B	116	116	A	112	112	114	A	114	B							
5								B	A	116	114	114	116	110	110	112	B							
6								B	114	114	114	116	110	110	114	A	A							
7								B	114	112	A	A	A	116	120	118	B							
8								B	118	114	110	110	116	112	120	120	B							
9									A	A	A	A	A	A	A	116	B							
10								B	120	A	114	A	114	110	112	116	A							
11								B	120	106	110	A	A	112	A	A	A							
12									118	118	114	112	A	A	A	A	B							
13								B	A	A	112	116	112	A	114	A	A		A					
14								B	118	124	118	124	118	120	116	112	B							
15								B	118	120	114	114	110	112	110	114	114							
16								B	118	118	114	118	120	120	124	A	122							
17								B	114	112	114	112	114	112	112	112	112							
18								B	120	A	A	A	116	120	A	A	B							
19								B	120	122	A	118	120	116	116	110	B							
20								B	124	108	108	118	116	110	110	110	B							
21									114	116	116	118	116	114	114	114	114							
22								B	118	A	114	A	A	110	110	110	110							
23								B	120	126	110	112	112	112	112	112	112							
24								B	112	112	112	112	110	116	A	116	B							
25								B	114	110	110	114	A	A	116	114	B							
26								B	A	114	116	A	116	120	114	114	B							
27								B	124	120	120	A	110	110	110	114	114							
28								B	114	114	114	114	114	112	116	114	B							
29								B	112	112	112	112	112	114	114	114	B							
30								B	118	118	118	118	116	116	116	114	B							
31								B	114	114	114	122	122	122	122	122	120							
	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	25	24	24	22	25	26	24	23	8							
MED								124	118	114	114	114	114	113	114	114	114							
U Q									120	118	114	118	116	116	116	116	117							
L Q									114	112	112	112	112	110	111	112	112							

DEC.2016 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC.2016 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	100	102	106	108	100	B	98	G	90	96	100	96	96	96	102	90	88	94	94	104	100	92	92	92
2	94	102	102	96	B	B	114	104	100	98	98	G	94	94	94	94	98	96	94	94	96	98	106	106
3	100	98	94	96	98	104	B	98	98	98	92	G	G	92	G	G	B	100	B	108	B	102	102	100
4	100	B	B	B	100	100	98	146	G	G	102	G	92	G	90	G	90	90	90	92	102	102	100	94
5	94	98	98	B	B	100	106	116	106	102	98	96	G	132	G	G	86	84	86	B	B	90	110	100
6	98	B	B	B	B	96	B	B	G	G	G	G	G	118	118	98	96	96	96	102	96	94	94	98
7	96	102	102	B	106	106	98	128	G	116	104	104	104	104	104	148	126	96	B	96	B	B	B	96
8	104	B	102	98	104	104	B	B	G	G	G	152	128	120	132	120	118	108	108	100	100	100	B	88
9	B	110	B	B	106	110	118	102	106	102	100	102	98	94	92	226	88	90	B	104	104	104	104	104
10	B	104	128	112	116	114	104	102	G	100	102	94	94	90	136	114	88	106	106	106	98	98	98	B
11	94	104	B	B	104	B	B	B	G	154	112	104	108	G	102	100	98	90	92	100	100	100	100	100
12	106	98	100	100	104	102	102	100	G	G	116	116	106	104	106	104	100	100	100	100	98	104	104	102
13	102	102	102	102	108	102	100	98	98	96	160	G	92	90	136	108	104	102	102	96	96	94	94	94
14	98	88	86	100	100	96	102	96	G	116	G	G	G	G	116	110	104	106	98	96	86	92	92	94
15	94	B	B	B	B	B	106	102	G	94	G	G	96	158	126	G	134	106	B	B	B	B	B	B
16	B	B	B	B	B	96	B	120	G	G	118	118	G	G	G	104	G	B	108	102	B	96	98	108
17	98	94	94	B	94	94	B	B	G	116	120	118	116	120	G	142	124	106	106	102	102	102	96	96
18	102	100	98	B	B	B	B	B	104	102	100	98	100	104	100	104	118	114	106	104	102	102	100	96
19	98	96	98	102	B	118	110	B	G	G	94	G	106	G	94	152	90	B	B	B	B	B	100	92
20	92	90	94	90	94	B	B	104	G	G	G	150	G	G	94	120	106	B	B	B	B	B	B	102
21	B	B	B	98	94	B	B	B	164	G	G	100	94	100	G	G	146	B	100	96	94	B	B	B
22	B	138	140	B	B	B	134	142	120	104	G	104	96	G	G	G	158	100	96	104	104	B	104	92
23	B	100	100	B	104	B	110	104	164	146	114	G	G	G	G	126	96	96	96	90	94	94	102	104
24	104	106	B	B	B	B	B	B	126	136	142	120	116	G	104	G	B	100	B	B	B	110	B	B
25	B	B	102	98	98	94	96	B	G	142	130	114	110	102	136	G	126	94	94	B	110	104	100	96
26	110	102	B	102	128	112	112	104	104	98	102	106	G	116	G	138	B	B	B	B	104	104	108	116
27	B	B	B	B	B	B	B	B	158	G	108	104	G	G	G	130	116	B	B	B	B	106	106	B
28	B	B	B	B	B	B	B	120	G	G	G	G	G	132	150	116	100	B	B	B	B	B	B	B
29	B	B	B	B	B	98	98	B	G	G	G	124	G	124	122	116	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	98	B	112	112	G	G	G	G	G	160	152	B	B	B	B	96	B	92
31	B	B	B	B	B	B	B	B	138	158	150	154	G	120	G	122	152	B	B	98	B	98	102	100
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	19	17	13	17	17	18	17	15	20	21	20	18	20	20	23	26	21	18	20	18	23	22	24
MED	98	102	100	100	104	102	103	104	106	103	104	105	99	104	105	116	104	100	97	100	100	100	100	97
U Q	102	104	102	102	106	108	110	120	138	126	119	119	108	120	129	138	126	106	106	104	102	104	104	102
L Q	94	98	96	97	98	96	98	101	100	98	100	101	94	95	97	104	96	94	94	96	96	94	98	94

IONOSPHERIC DATA STATION Kokubunji

DEC. 2016 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	F2	F1	F1	F2		F1		L2	L2	L2	L2	L2	L2	L2	L2	L2	F4	F3	F3	F6	F4	F4	F3
2	F2	F2	F2	F3			F1	L4	L2	L3	L3		L2	L2	L2	L2	L3	F3	F3	F3	F2	F1	F1	F2
3	F2	F2	F2	F2	F3	F2		L2	L2	L3	L2			L2				F1		F3		F4	F4	F3
4	F2				F2	F2	F2	H2			L2		L2		L3		L2	F2	F2	F1	F2	F2	F2	F2
5	F2	F2	F2			F1	F1	C5	L2	L2	L2	L2		CL12			L3	F3	F2			F2	F1	F2
6	F1					F1								CL11	CL21	L3	L4	F5	F2	F2	F3	F3	F1	F3
7	F4	F2	F3		F1	F1	F1	C3		C2	L2	L2	L2	L2	L2	HL12	C2	F1		F1				F3
8	F2		F3	F2	F1	F2						H1	CL22	C2	CL22	C3	C2	F2	F1	F3	F3	F2		F3
9		F1			F3	F1	F2	L5	L4	L3	L2	L3	L3	L3	L3	CL12	L2	F3		F4	F4	F7	F4	F5
10		F2	F2	F7	F2	F3	F4	L3		L2	L2	L3	L2	L2	HL12	CL12	L3	F2	F2	F4	F3	F1	F2	
11	F4	F2			F1					H2	C2	L2	L2		L3	L3	L3	F2	F2	F3	F3	F5	F2	F4
12	F6	F4	F2	F5	F1	F2	F1	F1			C2	C1	L2	L3	L2	L3	L2	F4	F1	F2	F2	F1	F1	F2
13	F3	F2	F5	F4	F2	F2	F4	L2	L3	L2	HL12		L2	L2	HL12	L2	L3	F3	F3	F3	F2	F4	F3	F2
14	F1	F1	F1	F2	F1	F2	F1	L1		C2					C2	C1	L2	F2	F2	F3	F3	F3	F2	F2
15	F1						F1	L1		L2			L2	H1	C1		H2	F3						
16						F2		C2			C2	C2				L2			F2	F2		F3	F2	F2
17	F2	F1	F1		F1	F1				C2	C1	C1	C1	C1		H2	C2	F5	F4	F3	F2	F4	F2	F5
18	F1	F1	F2						L2	L2	L2	L2	L2	L2	L2	L3	C3	F4	F5	F2	F1	F4	F4	F2
19	F2	F2	F2	F1		F1	F2				L2		L2		L2	HL12	L2						F2	F2
20	F3	F3	F1	F2	F2			L2				H1			L2	CL21	L1							F1
21				F1	F2				H2			L2	L2	L2			H1		F2	F2	F1			
22		F1	F1				F2	H2	C3	L3		L2	L2				H1	F1	F1	F1	F1		F1	F2
23		F1	F2		F1		F2	L2	HL12	HL22	CL12					CL12	L2	F3	F4	F2	F3	F1	F2	F2
24	F1	F1							C2	C1	H2	C1	C1		L1			F3				F2		
25			F2	F2	F4	F3	F1			H2	H1	C2	L2	L3	CL11		CL11	F3	F3		F1	F6	F4	F2
26	F2	F1		F3	F1	F1	F2	L3	L2	L1	L1	L1		C1		H1					F5	F2	F1	F1
27									HL22		L2	L2				C2	C3					F2	F1	
28								C2						CL12	HL11	CL12	L2							
29						F1	F1					C1		C1	C1	C1								
30							F1		C2	C1						H1	H1					F1		F1
31									H1	H1	H1	H1		C1		C1	H1			F1		F1	F2	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																								

DEC. 2016 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

DEC.2016 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

DEC.2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								C	C	C	C	C	C	C	C	C	C	C	C					
2								C	C	C	C	C	C	C	C	C	C	C	C					
3								C	C	C	C	C	C	C	C	C	C	C	C					
4								C	C	C	C	C	C	C	C	C	C	C	C					
5								C	C	C	C	C	C	C	C	C	C	C	C					
6								C	C	C	C	C	C	C	C	C	C	C	C					
7								C	C	C	C	C	C	C	C	C	C	C	C					
8								C	C	C	C	C	C	C	C	C	C	C	C					
9								C	C	C	C	C	C	C	C	C	C	C	C					
10								C	C	C	C	C	C	C	C	C	C	C	C					
11								C	C	C	C	C	C	C	C	C	C	C	C					
12								C	C	C	C	C	C	C	C	C	C	C	C					
13								C	C	C	C	C	C	C	C	C	C	C	C					
14								C	C	C	C	C	C	C	C	C	C	C	C					
15								C	C	C	C	C	C	C	C	C	C	C	C					
16								C	C	C	C	C	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C	C					
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	C	C	C	C	C	C	C					
20								C	C	C	C	C	C	C	C	C	C	C	C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	C	C	C	C	C	C	C					
23								C	C	C	C	C	C	C	C	C	C	C	C					
24								C	C	C	C	C	C	C	C	C	C	C	C					
25								C	C	C	C	C	C	C	C	C	C	C	C					
26								C	C	C	C	C	C	C	C	C	C	C	C					
27								C	C	C	C	C	C	C	C	C	C	C	C					
28								C	C	C	C	C	C	C	C	C	C	C	C					
29								C	C	C	C	C	C	C	C	C	C	C	C					
30								C	C	C	C	C	C	C	C	C	C	C	C					
31								C	C	C	C	C	C	C	C	C	C	C	C					
	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																								

DEC.2016 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								C	C	C	C	C	C	C	C	C	C	C	C					
2								C	C	C	C	C	C	C	C	C	C	C	C					
3								C	C	C	C	C	C	C	C	C	C	C	C					
4								C	C	C	C	C	C	C	C	C	C	C	C					
5								C	C	C	C	C	C	C	C	C	C	C	C					
6								C	C	C	C	C	C	C	C	C	C	C	C					
7								C	C	C	C	C	C	C	C	C	C	C	C					
8								C	C	C	C	C	C	C	C	C	C	C	C					
9								C	C	C	C	C	C	C	C	C	C	C	C					
10								C	C	C	C	C	C	C	C	C	C	C	C					
11								C	C	C	C	C	C	C	C	C	C	C	C					
12								C	C	C	C	C	C	C	C	C	C	C	C					
13								C	C	C	C	C	C	C	C	C	C	C	C					
14								C	C	C	C	C	C	C	C	C	C	C	C					
15								C	C	C	C	C	C	C	C	C	C	C	C					
16								C	C	C	C	C	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C	C					
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	C	C	C	C	C	C	C					
20								C	C	C	C	C	C	C	C	C	C	C	C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	C	C	C	C	C	C	C					
23								C	C	C	C	C	C	C	C	C	C	C	C					
24								C	C	C	C	C	C	C	C	C	C	C	C					
25								C	C	C	C	C	C	C	C	C	C	C	C					
26								C	C	C	C	C	C	C	C	C	C	C	C					
27								C	C	C	C	C	C	C	C	C	C	C	C					
28								C	C	C	C	C	C	C	C	C	C	C	C					
29								C	C	C	C	C	C	C	C	C	C	C	C					
30								C	C	C	C	C	C	C	C	C	C	C	C					
31								C	C	C	C	C	C	C	C	C	C	C	C					
	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																								

DEC.2016 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

DEC.2016 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

DEC.2016 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

DEC.2016 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

DEC.2016 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								C	C	C	C	C	C	C	C	C	C	C	C					
2								C	C	C	C	C	C	C	C	C	C	C	C					
3								C	C	C	C	C	C	C	C	C	C	C	C					
4								C	C	C	C	C	C	C	C	C	C	C	C					
5								C	C	C	C	C	C	C	C	C	C	C	C					
6								C	C	C	C	C	C	C	C	C	C	C	C					
7								C	C	C	C	C	C	C	C	C	C	C	C					
8								C	C	C	C	C	C	C	C	C	C	C	C					
9								C	C	C	C	C	C	C	C	C	C	C	C					
10								C	C	C	C	C	C	C	C	C	C	C	C					
11								C	C	C	C	C	C	C	C	C	C	C	C					
12								C	C	C	C	C	C	C	C	C	C	C	C					
13								C	C	C	C	C	C	C	C	C	C	C	C					
14								C	C	C	C	C	C	C	C	C	C	C	C					
15								C	C	C	C	C	C	C	C	C	C	C	C					
16								C	C	C	C	C	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C	C					
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	C	C	C	C	C	C	C					
20								C	C	C	C	C	C	C	C	C	C	C	C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	C	C	C	C	C	C	C					
23								C	C	C	C	C	C	C	C	C	C	C	C					
24								C	C	C	C	C	C	C	C	C	C	C	C					
25								C	C	C	C	C	C	C	C	C	C	C	C					
26								C	C	C	C	C	C	C	C	C	C	C	C					
27								C	C	C	C	C	C	C	C	C	C	C	C					
28								C	C	C	C	C	C	C	C	C	C	C	C					
29								C	C	C	C	C	C	C	C	C	C	C	C					
30								C	C	C	C	C	C	C	C	C	C	C	C					
31								C	C	C	C	C	C	C	C	C	C	C	C					
	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																								

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								C	C	C	C	C	C	C	C	C	C	C	C					
2								C	C	C	C	C	C	C	C	C	C	C	C					
3								C	C	C	C	C	C	C	C	C	C	C	C					
4								C	C	C	C	C	C	C	C	C	C	C	C					
5								C	C	C	C	C	C	C	C	C	C	C	C					
6								C	C	C	C	C	C	C	C	C	C	C	C					
7								C	C	C	C	C	C	C	C	C	C	C	C					
8								C	C	C	C	C	C	C	C	C	C	C	C					
9								C	C	C	C	C	C	C	C	C	C	C	C					
10								C	C	C	C	C	C	C	C	C	C	C	C					
11								C	C	C	C	C	C	C	C	C	C	C	C					
12								C	C	C	C	C	C	C	C	C	C	C	C					
13								C	C	C	C	C	C	C	C	C	C	C	C					
14								C	C	C	C	C	C	C	C	C	C	C	C					
15								C	C	C	C	C	C	C	C	C	C	C	C					
16								C	C	C	C	C	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C	C					
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	C	C	C	C	C	C	C					
20								C	C	C	C	C	C	C	C	C	C	C	C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	C	C	C	C	C	C	C					
23								C	C	C	C	C	C	C	C	C	C	C	C					
24								C	C	C	C	C	C	C	C	C	C	C	C					
25								C	C	C	C	C	C	C	C	C	C	C	C					
26								C	C	C	C	C	C	C	C	C	C	C	C					
27								C	C	C	C	C	C	C	C	C	C	C	C					
28								C	C	C	C	C	C	C	C	C	C	C	C					
29								C	C	C	C	C	C	C	C	C	C	C	C					
30								C	C	C	C	C	C	C	C	C	C	C	C					
31								C	C	C	C	C	C	C	C	C	C	C	C					
	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																								

DEC.2016 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

DEC.2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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								C	C	C	C	C	C	C	C	C	C	C	C					
2								C	C	C	C	C	C	C	C	C	C	C	C					
3								C	C	C	C	C	C	C	C	C	C	C	C					
4								C	C	C	C	C	C	C	C	C	C	C	C					
5								C	C	C	C	C	C	C	C	C	C	C	C					
6								C	C	C	C	C	C	C	C	C	C	C	C					
7								C	C	C	C	C	C	C	C	C	C	C	C					
8								C	C	C	C	C	C	C	C	C	C	C	C					
9								C	C	C	C	C	C	C	C	C	C	C	C					
10								C	C	C	C	C	C	C	C	C	C	C	C					
11								C	C	C	C	C	C	C	C	C	C	C	C					
12								C	C	C	C	C	C	C	C	C	C	C	C					
13								C	C	C	C	C	C	C	C	C	C	C	C					
14								C	C	C	C	C	C	C	C	C	C	C	C					
15								C	C	C	C	C	C	C	C	C	C	C	C					
16								C	C	C	C	C	C	C	C	C	C	C	C					
17								C	C	C	C	C	C	C	C	C	C	C	C					
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	C	C	C	C	C	C	C					
20								C	C	C	C	C	C	C	C	C	C	C	C					
21								C	C	C	C	C	C	C	C	C	C	C	C					
22								C	C	C	C	C	C	C	C	C	C	C	C					
23								C	C	C	C	C	C	C	C	C	C	C	C					
24								C	C	C	C	C	C	C	C	C	C	C	C					
25								C	C	C	C	C	C	C	C	C	C	C	C					
26								C	C	C	C	C	C	C	C	C	C	C	C					
27								C	C	C	C	C	C	C	C	C	C	C	C					
28								C	C	C	C	C	C	C	C	C	C	C	C					
29								C	C	C	C	C	C	C	C	C	C	C	C					
30								C	C	C	C	C	C	C	C	C	C	C	C					
31								C	C	C	C	C	C	C	C	C	C	C	C					
	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																								

DEC.2016 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	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																								

DEC.2016 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2016 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

DEC.2016 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC.2016 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			X 58	X 48	X 45	X 39	X 32
6	X 32	X 34	X 35	X 33	X 35	X 39	X 28			C										X 54	X 45	X 36	X 34	X 36
7	X 37	X 41	X 53	X 34	X 29	X 24	X 24													X 54	X 48	X 36	X 34	X 36
8	X 37	X 39	X 36	X 36	X 42	X 43	X 28													X 53	X 59	X 37	X 42	X 36
9	X 36	X 34	X 37	X 38	X 38	X 24	X 30													X 50	X 46	X 37	X 26	A
10	X 30	X 29	A	X 32	X 34	35	33													X 48	X 40	X 40	46	X 34
11	36	X 34	X 35	X 34	A	31	30													X 54	A	X 40	X 45	X 36
12	33	X 32	X 36	X 35	X 38	X 29	X 32													X 53	X 45	X 38	X 33	X 33
13	X 34	X 40	X 39	X 39	X 39	X 38	X 33													X 34	X 41	X 33	X 26	X 27
14	X 28	X 30	X 30	X 30	X 31	X 27	X 24													X 67	X 57	X 58	X 50	A
15	43	46	X 44	X 43	X 46	X 39	X 30													X 38	X 36	X 35	X 32	O X 29
16	X 33	X 27	X 28	X 30	C	X 28	X 24									C				A	X 35	A	O X 32	X 28
17	X 28	X 30	X 30	X 32	C	C	C		C	C							C			X 43	X 37	X 45	C	C
18	39	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C								X 35	37	47	52	X 36
20	X 30	X 31	X 30	X 32	X 29	X 28	X 25													X 42	X 57	X 43	X 34	X 28
21	X 28	X 32	X 33	38	41	40	X 26													X 50	X 38	X 39	X 40	X 28
22	X 31	X 36	X 32	X 31	X 30	X 34	X 23													X 50	X 51	X 32	36	29
23	X 30	X 34	39	X 37	X 39	X 32	X 24													X 45	X 42	X 40	X 40	X 40
24	X 32	X 34	42	X 33	X 35	X 31	X 27													X 38	X 38	X 41	X 34	X 38
25	X 29	X 32	38	X 37	X 33	X 25	X 26													X 40	O X 35	X 44	X 37	X 33
26	X 34	X 36	X 32	X 32	X 32	X 31	X 31													X 54	X 38	X 34	X 32	X 29
27	X 30	X 30	X 33	X 32	X 34	X 30	X 29													X 52	X 36	X 35	X 34	X 30
28	X 30	X 32	38	X 37	X 34	X 28	X 26													X 36	X 54	X 44	X 35	X 29
29	X 28	X 28	X 30	X 31	X 34	X 39	X 28													X 38	X 37	X 38	X 36	X 30
30	X 29	X 31	X 36	X 32	X 35	X 25	X 26													X 42	X 33	X 42	X 40	X 45
31	X 35	X 36	X 37	X 36	X 39	X 40	X 38													X 40	X 48	X 52	X 42	X 39
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	24	23	24	21	23	23													25	25	25	25	23
MED	X 32	X 33	X 36	X 34	X 35	X 31	X 28													X 48	X 41	X 40	X 36	X 33
U Q	X 36	X 36	38	X 37	X 39	X 39	X 30													X 54	X 48	X 44	X 41	X 36
L Q	X 30	X 30	X 32	X 32	X 32	X 28	X 25													X 39	X 37	X 36	X 34	X 29

DEC.2016 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2016 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	66	58	52	42	J R 39	33	26
6	26	28	29	27	29	33	22	36	54	C	73	69	68	80	84	84	82	75	60	48	39	30	28	30
7	31	35	47	28	23	18	18	32	60	78	82	80	70	86	71	65	74	68	62	48	42	30	28	30
8	31	33	30	30	36	37	22	33	63	72	71	81	74	81	76	63	67	64	52	47	53	31	36	30
9	30	28	31	32	32	18	24	40	59	58	60	68	71	84	77	86	110	91	56	44	40	31	20	A
10	24	23	A	26	28	F 24	F 24	46	56	54	74	90	77	68	66	90	113	66	54	42	34	34	F 40	28
11	F 26	28	29	28	A	F	F	47	62	57	63	76	92	93	69	61	58	59	51	48	A	34	39	30
12	26	26	30	29	32	23	26	30	51	54	63	63	73	78	63	59	64	62	46	47	J R 39	32	27	27
13	28	34	33	33	33	32	27	36	52	58	61	58	57	59	61	54	60	53	35	28	35	27	20	21
14	22	24	24	24	25	21	18	31	59	58	72	60	55	63	68	72	72	84	103	61	52	52	44	A
15	F 36	F 38	38	37	40	33	24	34	53	56	66	66	66	R 69	81	83	54	58	51	32	30	29	26	23
16	27	22	23	24	C	22	18	30	53	58	53	51	46	60	67	C	59	48	35	A	29	A	26	22
17	22	24	24	26	C	C	C	28	C	C	62	68	62	60	64	66	C	57	58	37	31	39	C	C
18	F 28	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	68	65	56	54	54	56	42	29	F 28	F	F 42	30
20	24	25	24	26	23	22	19	30	52	60	65	63	59	70	68	58	54	51	53	R 36	51	37	28	22
21	22	26	27	F 30	F 32	33	20	31	54	63	73	82	68	65	71	66	68	56	48	44	32	R 33	34	22
22	25	30	26	25	24	28	18	30	R 67	55	71	72	74	84	69	82	64	58	52	44	45	26	28	22
23	24	28	31	31	33	26	18	31	49	62	66	69	73	76	102	90	77	70	46	39	36	34	34	34
24	26	28	F 33	27	R 29	26	21	31	59	52	58	56	65	104	79	69	62	50	52	32	32	35	28	32
25	23	J R 26	F 31	31	27	20	20	31	48	55	75	80	60	79	82	79	60	55	48	34	29	38	31	27
26	28	30	26	26	26	25	25	31	63	70	70	94	67	69	66	67	67	68	46	48	32	28	26	23
27	24	24	27	26	28	24	23	34	54	66	68	60	64	65	79	63	77	66	46	46	30	29	28	24
28	24	26	28	31	28	22	20	29	62	58	69	98	108	R 91	72	88	98	68	50	R 30	48	38	29	23
29	22	22	24	25	28	33	22	27	48	51	74	63	54	56	64	66	54	57	48	32	31	32	30	24
30	23	25	30	26	29	19	20	29	57	60	J R 64	86	70	95	123	100	94	82	53	36	27	36	34	39
31	29	30	31	30	33	34	32	31	46	52	50	56	64	69	82	88	71	86	58	34	42	46	36	33
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	24	23	24	21	22	22	24	23	22	24	24	25	25	25	24	24	26	26	25	25	24	25	23
MED	26	27	29	28	29	24	22	31	54	58	67	68	68	70	71	68	67	63	52	42	35	34	29	27
U Q	28	30	31	30	32	33	24	34	60	62	72	80	73	84	80	85	77	68	56	48	42	38	35	30
L Q	24	24	26	26	26	22	19	30	52	55	62	62	61	65	66	63	60	56	46	33	30	30	28	23

DEC. 2016 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2016 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5								C	C	C	C	C	C	C	C	C	C							
6									260	C	L	440	L 456	L 452	A	A	A	A						
7									L	U L 396	L	L	L	A	L	U L 388	A	A						
8									L	L	L	U L 432	L	L	L 420	L		A						
9												U L 428	A	U L 440	L	A		A						
10									L	L	U L 464	L	L	L	L	L								
11										L	L	L	L	L 428	L	L	A							
12									U L 252	L 312	L	U L 436	L	L 432	A	A	A							
13									L	U L 364	L 408	U L 420	L 424	L	A	A	L							
14									L	L	L 416	420	U L 428	A	416	A								
15										L	L	U L 436	U L 448	L 456	L 420	U L 400	L							
16											L	L 420		388	U L 412	C	L							
17									C	C	412	424	436	L 424	L 416	L 400	C							
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	432	L 424	L	U L 364	L							
20										L	412	416	U L 424	432	L 420	U L 404	L							
21										L	L 424	L 436	U L 424	U L 432	L 428	L								
22											L	L 432	L 436	L 420	U L 424	L 388	L	216						
23											L 400	L	U L 444	L	424	400	L							
24										L 340	L		U L 444	U L 440	L 428	L 388								
25										L	L	L 428	U L 428	L 444	L 420	L	L							
26									L	U L 380	L 440	L 424	U L 416	L	L	A								
27										L	U L 424	L	L	U L 424	L	L	L 356							
28									L	L	L	424		U L 436	U L 444	L 396	L							
29									256			U L 424	436	416	L 436	Y 400	L	236						
30										L	L	L 428	432	444	436	L 392	A							
31									252	L	L	L 408	L 432	428	L	L 400	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									4	5	9	18	16	18	14	12	1	2						
MED									254	U L 364	L 416	L 426	L 432	L 432	L 422	L 398	L 356	226						
U Q									258	U L 388	U L 432	U L 432	U L 440	L 440	L 428	L 400								
L Q									252	L 326	L 410	L 420	U L 426	L 424	L 420	L 388								

DEC. 2016 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2016 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5								C	C	C	C	C	C	C	C	C	C	B	B					
6								A	204	C	U A 284	A	A	A	312	288	244	A	A					
7								B	204	260	284	A	R 344	A	296	A	A	A	A					
8								B	196	252	276	284	R 324	316	U A 300	U A 264	A	A	A					
9								B	216	252	276	U R 320	A	U A 312	A	A	A	A	A					
10								B	212	244	288	280	A	A	A	292	248	180	A					
11								B	192	248	268	288	U A 300	A	A	A	A	A	A					
12								B	A	U A 256	284	U A 288	U A 300	A	A	U A 288	A	A	A					
13								B	192	248	288	300	300	332	308	A	A	A	B					
14								B	216	268	300	308	304	U A 312	304	288	A	A	A					
15								B	A	A	A	312	324	304	U R 328	280	236	B	B					
16								B	204	276	300	U A 316	A	A	A	C	A	A	A					
17								B	C	C	U A 284	A	R 308	312	304	284	C	196	A					
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	304	312	296	A	A	A	A					
20								B	208	236	276	A	A	308	304	284	A	A	A					
21								B	A	A	A	A	312	A	A	272	256	A	A					
22								B	196	252	284	A	A	A	308	288	244	184	B					
23								B	A	A	272	312	A	A	A	A	248	172	B					
24								B	188	244	284	304	A	328	A	A	256	A	A					
25								B	196	252	284	300	316	B	U A 288	A	A	A	A					
26								B	B	A	A	A	288	A	A	A	A	A	A					
27								B	B	A	A	292	U R 292	U R 320	R 316	A	A	A	A					
28								B	212	268	288	308	312	304	A	R 276	260	A	196					
29								B	204	256	284	308	300	332	A	A	228	192	B					
30								B	188	260	288	300	A	320	304	292	280	A	A					
31								B	188	240	288	300	316	A	R	292	252	B	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									17	17	20	17	16	13	13	13	11	5	1					
MED									204	252	284	300	306	312	304	288	248	184	196					
U Q									210	260	288	310	316	324	310	290	256	194						
L Q									192	246	280	290	300	310	298	278	244	176						

DEC. 2016 foE (0.01MHz)

IONOSPHERIC DATA STATION Okinawa

DEC. 2016 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	22	17	J A 20	J A 18	E B 13	E B 13	E B 13
6	E B 13	E B 13	J A 16	E B 13	J A 15	20	J A 17	17	22	C	32	36	J A 36	42	41	39	40	J A 39	J A 28	J A 32	J A 31	J A 21	J A 22	J A 22
7	J A 15	E B 14	E B 13	E B 13	18	E B 14	E B 14	18	24	G 21	G 26	33	38	46	J A 50	32	J A 51	J A 55	J A 39	J A 21	J A 21	J A 26	J A 17	19
8	18	17	J A 24	J A 18	J A 27	J A 24	J A 54	18	24	G	36	36	39	43	37	33	J A 36	J A 36	J A 31	J A 32	J A 24	E B 13	17	E B 13
9	E B 13	E B 13	E B 13	J A 24	E B 13	20	20	J A 15	J A 20	G	G	39	40	J A 42	J A 41	J A 60	J A 42	J A 37	J A 24	J A 20	J A 16	18	J A 19	J A 53
10	J A 61	J A 31	J A 66	J A 49	18	E B 13	E B 13	E B 14	24	28	G	33	35	J A 41	J A 45	J A 35	J A 46	G	J A 21	J A 25	J A 18	E B 13	E B 13	E B 13
11	J A 20	19	E B 13	J A 19	J A 37	E B 13	E B 13	E B 14	22	G	G	33	38	J A 74	J A 42	J A 34	J A 34	J A 33	J A 27	J A 24	J A 34	20	J A 26	J A 81
12	J A 43	J A 36	J A 22	J A 21	J A 32	J A 20	18	J A 17	22	28	33	J A 43	J A 45	J A 46	J A 52	J A 63	J A 59	J A 52	J A 44	J A 62	J A 27	16	J A 17	18
13	E B 13	E B 13	J A 29	J A 56	J A 51	J A 23	E B 13	E B 14	G 18	26	33	32	38	39	42	J A 54	J A 46	J A 30	J A 20	E B 13	E B 13	J A 16	19	E B 14
14	E B 14	J A 15	J A 15	20	18	E B 14	18	E B 14	23	G	G	G	34	J A 46	34	J A 42	J A 44	J A 49	J A 63	J A 32	J A 46	J A 21	20	J A 40
15	J A 16	J A 23	J A 23	J A 16	19	J A 25	E B 13	J A 14	25	J A 36	34	G	G 26	G 28	G 29	G	G	20	E B 14	E B 14	E B 14	E B 14	E B 13	J A 17
16	E B 13	E B 14	E B 14	E B 13	C	E B 13	E B 14	E B 14	23	G	G	35	38	36	32	C	27	J A 25	J A 24	J A 41	J A 41	J A 45	J A 44	J A 16
17	18	E B 13	E B 13	E B 13	C	C	C	E B 14	C	C	31	34	37	38	36	34	C	G	J A 28	J A 20	19	J A 25	C	C
18	J A 21	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	35	J A 32	J A 27	J A 22	J A 22	J A 24	18	J A 33	J A 27
20	E B 14	E B 14	18	18	E B 14	E B 14	E B 14	E B 14	22	30	33	34	34	G	G	G	J A 26	J A 30	J A 25	22	E B 13	E B 13	18	E B 13
21	E B 13	18	E B 13	E B 13	E B 13	E B 13	E B 14	E B 14	23	J A 30	32	J A 40	J A 35	J A 40	J A 34	G	28	J A 25	J A 28	J A 22	J A 17	E B 14	E B 13	E B 14
22	E B 14	20	18	E B 14	E B 14	E B 13	21	J A 16	26	31	34	37	J A 37	J A 33	G 28	J A 32	G	G 18	J A 17	J A 16	21	E B 13	E B 13	J A 16
23	19	18	E B 13	E B 13	J A 21	E B 13	19	J A 14	J A 28	31	33	35	J A 57	J A 52	31	J A 33	J A 29	J A 19	E B 14	E B 15	E B 14	E B 13	E B 13	20
24	19	19	20	E B 13	J A 17	18	E B 14	E B 14	22	G	31	36	J A 40	G	J A 52	J A 34	J A 31	25	J A 22	J A 21	J A 21	18	E B 14	J A 20
25	21	E B 13	E B 13	18	E B 14	20	E B 14	J A 15	26	30	34	33	37	37	33	31	J A 42	J A 39	J A 31	J A 24	J A 27	22	E B 14	E B 14
26	J A 21	J A 28	E B 14	E B 14	J A 15	18	E B 14	E B 14	21	J A 30	J A 39	J A 41	33	J A 42	40	J A 46	J A 52	J A 43	J A 20	J A 17	J A 35	20	21	18
27	E B 14	E B 14	E B 14	E B 14	E B 18	E B 14	E B 14	E B 14	23	27	32	34	G 24	G	35	J A 36	J A 36	J A 45	J A 26	J A 17	J A 20	22	18	J A 25
28	J A 35	J A 19	18	E B 15	E B 14	E B 14	J A 15	E B 14	G	J A 50	J A 38	J A 29	36	G	J A 36	G 23	29	31	G	J A 34	J A 29	J A 20	J A 18	E B 14
29	E B 14	E B 14	E B 14	E B 16	E B 14	E B 14	E B 14	E B 14	21	32	34	36	G	37	J A 41	32	29	22	E B 14	18	E B 14	E B 14	E B 14	E B 14
30	E B 20	J A 62	E B 14	20	E B 14	E B 14	E B 14	E B 14	G	G	32	G	36	G	G	G	34	28	J A 21	J A 21	J A 37	J A 30	J A 31	J A 25
31	J A 18	19	19	E B 14	E B 14	E B 14	E B 14	G	G	G	33	G	G	36	36	33	G 24	26	J A 15	J A 16	J A 18	J A 18	J A 21	E B 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	25	24	24	24	22	23	23	24	23	22	24	24	25	25	25	24	24	26	26	26	26	26	25	25
MED	17	18	14	E B 16	16	E B 14	E B 14	E B 14	22	28	32	34	36	38	36	34	J A 34	J A 29	J A 23	J A 21	J A 21	18	18	17
U Q	J A 20	J A 20	J A 20	J A 20	J A 19	J A 20	18	J A 15	24	30	34	36	38	J A 42	J A 42	J A 38	J A 43	J A 39	J A 28	J A 25	J A 29	J A 21	J A 21	J A 24
L Q	E B 14	E B 14	E B 13	E B 13	E B 14	E B 13	E B 14	E B 14	G 21	G	G	G 32	G 34	G	G 32	G 32	28	22	17	J A 17	E B 17	E B 14	E B 14	E B 14

DEC. 2016 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC.2016 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	21	16	18	14	E B 13	E B 13	E B 13
6	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 14	22	C	31	34	34	41	41	38	39	33	24	30	27	19	18	20
7	E B 13	E B 14	E B 13	E B 13	E B 13	E B 14	E B 14	E B 14	24	G 19	G 23	33	38	44	42	29	39	46	34	18	16	18	E B 13	E B 13
8	E B 13	E B 13	E B 13	E B 14	E B 14	E B 13	E B 13	E B 14	24	G	35	36	38	41	35	31	28	24	24	18	19	E B 13	E B 13	E B 13
9	E B 13	E B 13	E B 13	E B 13	E B 13	E B 14	E B 13	E B 14	G 19	G	G	39	40	37	32	45	28	30	19	E B 13	E B 13	E B 16	17	A A 53
10	17	E B 13	A A 66	E B 13	E B 13	E B 13	E B 13	E B 14	22	27	G	32	34	34	34	G 23	G 18	G	19	24	15	E B 13	E B 13	E B 13
11	E B 13	E B 13	E B 13	E B 13	A A 37	E B 13	E B 13	E B 14	21	G	G	33	38	36	34	31	29	28	21	22	A A 34	E B 13	25	19
12	18	17	15	E B 13	16	E B 14	E B 14	E B 14	21	27	32	34	38	36	43	45	40	42	33	24	21	E B 13	E B 13	E B 13
13	E B 13	E B 13	E B 13	20	24	16	E B 13	E B 14	G 17	26	33	32	37	39	40	50	30	27	E B 14	E B 13	E B 13	E B 13	E B 13	E B 14
14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	23	G	G	G	33	44	34	39	31	36	35	20	18	20	16	A A 40
15	E B 14	17	18	16	E B 13	E B 13	E B 13	E B 14	25	28	31	G	G 24	G 22	G 26	G	G	20	E B 14	E B 14	E B 14	E B 14	E B 13	17
16	E B 13	E B 14	E B 14	E B 13	C	E B 13	E B 14	E B 14	23	G	G	34	36	35	32	C	27	24	20	A A 41	22	A A 45	20	E B 14
17	E B 13	E B 13	E B 13	E B 13	C	C	C	E B 14	C	C	30	33	36	38	35	33	C	G	23	E B 13	E B 13	E B 13	C	C
18	E B 13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	31	25	24	19	18	19	E B 13	15	19
20	E B 14	E B 14	E B 13	E B 13	E B 14	E B 14	E B 14	E B 14	22	28	33	34	34	G	G	G	26	21	19	19	E B 13	E B 13	E B 13	E B 13
21	E B 13	E B 14	E B 13	E B 13	E B 13	E B 13	E B 14	E B 14	22	28	32	38	G 26	35	32	G	27	20	15	18	17	E B 14	E B 13	E B 14
22	E B 14	16	E B 14	E B 14	E B 14	E B 13	E B 14	E B 14	25	30	33	36	34	33	G 22	G 19	G	G 14	E B 14	E B 13	E B 13	E B 13	E B 13	E B 14
23	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 14	E B 14	24	30	32	34	38	45	30	32	G 19	G 16	E B 14	E B 15	E B 14	E B 13	E B 13	E B 14
24	E B 13	16	E B 13	E B 13	E B 13	E B 13	E B 14	E B 14	22	G	30	35	36	G	32	30	G 19	22	18	18	17	E B 14	E B 14	E B 13
25	16	E B 13	E B 13	E B 14	E B 14	E B 14	E B 14	E B 14	25	30	33	33	36	36	32	30	26	38	24	E B 14	18	E B 18	E B 14	E B 14
26	17	17	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	20	28	34	38	33	38	38	39	30	26	16	E B 14	17	17	E B 14	18
27	E B 14	E B 14	E B 14	E B 14	E B 18	E B 14	E B 14	E B 14	22	27	32	34	G 22	G	35	31	30	36	18	E B 14	E B 13	18	17	15
28	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14	G	G 24	G 24	G 22	36	G	34	G 20	28	30	G	E B 14	25	17	15	E B 14
29	E B 14	E B 14	E B 14	E B 16	E B 14	E B 14	E B 14	E B 14	G 11	32	34	36	G	36	34	U Y 32	29	22	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14
30	E B 20	E B 18	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14	G	G	32	G	34	G	G	G	34	26	18	17	16	21	20	20
31	E B 14	17	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	32	G	G	35	36	32	G 20	24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 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	25	24	24	24	22	23	23	24	23	22	24	24	25	25	25	24	24	26	26	26	26	26	25	25
MED	E B 14	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14	22	26	32	34	34	36	34	31	28	24	18	18	16	E B 14	E B 14	E B 14
U Q	14	16	E B 14	E B 14	14	E B 14	E B 14	E B 14	24	28	33	36	38	38	36	36	30	30	23	19	19	18	16	18
L Q	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 14	G	G	G	G 32	G	G	G 31	G	G	G 21	G	E B 14	E B 14	E B 13	E B 13	E B 13

DEC.2016 fbEs (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

DEC.2016 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	17	14	14	13	13	13	13
6	13	13	13	13	13	13	13	14	14	C	16	20	21	21	17	16	16	14	13	13	13	13	13	13
7	13	14	13	13	13	14	14	14	14	15	16	18	19	16	18	14	15	15	14	13	13	13	13	13
8	13	13	13	14	14	13	13	14	14	14	14	16	16	15	18	17	15	14	14	13	13	13	13	13
9	13	13	13	13	13	14	13	14	14	15	15	18	17	19	20	18	14	14	13	13	13	16	14	13
10	14	13	13	13	13	13	13	14	14	15	17	18	20	23	19	19	14	14	14	13	13	13	13	13
11	13	13	13	13	13	13	13	14	14	14	16	20	17	16	16	16	16	14	13	13	13	13	13	13
12	13	13	13	13	13	14	14	14	14	16	14	16	19	16	17	16	14	14	14	13	13	13	13	13
13	13	13	13	13	13	13	13	14	14	16	15	25	19	19	18	17	16	15	14	13	13	13	13	14
14	14	14	14	14	14	14	14	14	15	16	17	20	24	26	25	20	15	14	14	13	13	13	13	13
15	14	14	14	14	13	13	13	14	15	14	18	18	18	16	18	17	13	17	14	14	14	14	13	15
16	13	14	14	13	C	13	14	14	14	16	18	22	29	21	20	C	17	14	14	13	13	13	13	14
17	13	13	13	13	C	C	C	14	C	C	14	18	26	24	19	19	C	14	14	13	13	13	C	C
18	13	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	16	20	15	15	14	14	14	13	13	13	13	13
20	14	14	13	13	14	14	14	14	15	16	18	19	21	18	16	16	14	14	14	13	13	13	13	13
21	13	14	13	13	13	13	14	14	14	15	16	22	17	18	14	15	14	14	14	14	14	14	13	14
22	14	13	14	14	14	13	14	14	14	15	16	19	17	17	16	15	14	14	14	13	13	13	13	14
23	13	13	13	13	13	13	14	14	14	18	18	20	21	19	18	16	14	15	14	15	14	13	13	14
24	13	14	13	13	13	13	14	14	14	18	17	18	21	19	15	14	14	14	14	14	14	14	14	13
25	14	13	13	14	14	14	14	14	14	16	18	18	20	32	20	17	17	14	14	14	14	18	14	14
26	14	14	14	14	14	14	14	14	19	18	19	19	19	19	16	16	16	15	15	14	14	14	14	14
27	14	14	14	14	18	14	14	14	20	22	21	20	20	18	18	16	16	14	14	14	13	14	15	14
28	14	14	14	15	14	14	14	14	15	18	18	17	18	15	14	15	16	14	14	14	14	14	14	14
29	14	14	14	16	14	14	14	14	14	16	17	18	21	23	27	17	16	16	14	15	14	14	14	14
30	20	18	14	13	14	14	14	14	14	16	16	20	20	19	19	18	19	15	14	14	14	14	14	14
31	14	14	14	14	14	14	14	14	14	14	17	21	20	24	19	19	16	19	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	25	24	24	24	22	23	23	24	23	22	24	24	25	25	25	24	24	26	26	26	26	26	25	25
MED	13	14	13	13	14	14	14	14	14	16	17	19	20	19	18	16	15	14	14	13	13	13	13	14
U Q	14	14	14	14	14	14	14	14	15	16	18	20	21	22	19	18	16	15	14	14	14	14	14	14
L Q	13	13	13	13	13	13	13	14	14	15	16	18	18	16	16	16	14	14	14	13	13	13	13	13

IONOSPHERIC DATA STATION Okinawa

DEC.2016 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	365	372	336	335	J R 340	331	326
6	330	325	334	307	327	385	400	351	359	C	368	376	339	326	341	352	359	353	350	356	348	328	317	300
7	313	324	392	331	353	326	306	339	370	360	358	373	344	364	353	352	373	360	378	372	351	350	303	321
8	315	321	329	303	346	375	359	332	348	376	329	354	351	343	382	335	353	375	352	334	364	346	328	308
9	333	319	323	363	390	397	324	356	361	380	344	326	345	356	344	334	366	365	329	340	363	351	323	A
10	312	346	A	309	332	F 264	F 309	394	395	381	347	364	371	368	306	325	380	371	349	392	355	327	F 337	319
11	F 293	311	354	329	A	F	F	367	400	392	359	350	355	370	376	377	383	369	370	363	A	312	365	342
12	320	300	327	329	365	334	335	387	399	363	373	354	369	378	394	355	362	379	371	357	J R 362	327	326	323
13	310	312	311	332	309	364	331	349	374	366	371	377	368	330	381	374	374	383	364	350	380	363	391	347
14	333	326	308	308	327	349	321	344	384	366	384	396	364	341	365	378	371	353	399	392	300	352	387	A
15	F 296	F 316	326	334	361	345	311	359	376	354	374	343	348	R 341	353	397	349	355	393	339	340	332	398	324
16	383	304	308	346	C	334	292	335	375	406	386	382	392	352	365	C	379	380	384	A	328	A	358	370
17	328	332	332	364	C	C	C	353	C	C	381	376	347	345	366	377	C	380	400	360	334	336	C	C
18	F 313	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	342	349	353	337	371	394	372	392	F 284	F	F 352	407
20	307	334	316	341	353	320	302	334	363	365	373	376	334	358	374	356	361	358	386	R 397	365	345	366	326
21	292	312	313	F 306	F 334	391	347	337	372	362	372	378	337	355	348	363	375	351	385	403	317	R 364	354	297
22	302	364	363	294	303	404	274	338	R 399	350	364	352	349	378	331	369	376	373	367	368	374	318	325	319
23	324	294	312	328	370	407	283	371	361	377	379	348	332	313	339	352	356	375	352	375	333	321	349	359
24	264	309	F 325	348	R 361	344	342	346	373	385	366	339	303	370	354	361	389	346	377	370	312	358	344	359
25	325	J R 306	F 311	372	368	324	342	341	350	351	355	383	367	350	347	361	366	372	377	408	342	324	333	355
26	293	333	328	326	321	305	329	329	363	371	345	383	365	348	345	332	371	376	342	396	372	336	375	337
27	303	296	336	319	335	355	340	358	380	382	350	381	333	326	380	336	369	384	351	361	319	315	368	291
28	292	311	318	351	342	337	323	337	373	361	337	355	393	R 311	296	340	377	366	362	402	368	382	339	384
29	329	320	313	328	342	379	427	339	348	364	386	338	385	345	354	374	378	364	369	366	320	331	332	421
30	307	304	326	363	359	366	317	346	380	377	J R 352	363	325	331	358	359	380	368	370	340	404	319	353	381
31	307	314	332	336	347	363	362	364	389	389	369	372	371	346	344	352	332	368	349	330	321	346	361	320
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	24	23	24	21	22	22	24	23	22	24	24	25	25	25	24	24	26	26	25	25	24	25	23
MED	312	315	326	330	346	352	326	346	373	368	367	368	349	348	353	356	371	368	370	366	342	336	349	326
U Q	326	326	332	347	361	379	342	358	384	381	374	378	368	361	370	372	378	376	378	392	364	350	366	359
L Q	299	308	313	314	330	334	309	338	361	362	351	351	338	336	344	338	362	360	352	345	320	326	330	319

DEC.2016 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2016 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5								C	C	C	C	C	C	C	C	C	C							
6									462	C	L	403	L 373	L 358	A	A	A	A						
7									L	U L 368	L	L	L	A	L	U L 398	A	A						
8									L	L	L	U L 380	L	L	L 382	L		A						
9												U L 392	A	U L 360	L	A		A						
10									L	L	U L 386	L	L	L	L	L								
11										L	L	L	L	L 390	L	L	A							
12									U L 423	L 452	L	U L 383	L	L 378	A	A	A							
13									L	U L 387	L 413	U L 414	L 403	L	A	A	L							
14									L	L	L 385	L 405	U L 424	A	388	A								
15										L	L	U L 385	U L 390	L 375	L 394	U L 383	L							
16											L	L 406		453	U L 375	C	L							
17									C	C	403	392	382	L 384	L 383	L 389	C							
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	399	L 395	L	U L 409	L							
20										L	381	396	U L 395	388	L 385	U L 386	L							
21										L	L 377	L 384	U L 419	U L 392	L 374	L								
22											L	L 386	L 379	L 378	U L 394	L 385	L	455						
23											L 380	L	U L 381	L	371	390	L							
24										L 407	L		U L 390	U L 361	L 381	L 411								
25										L	L	L 386	U L 406	L 365	L 383	L	L							
26									L	U L 398	L 377	L 383	U L 427	L	L	A								
27										L	U L 388	L	L	U L 408	L	L	L 382							
28									L	L	L	391		U L 391	U L 415	L 431	L							
29									455			U L 392	413	406	L 381	Y	L	445						
30										L	L	L 377	418	378	367	L 399	A							
31									455	L	L	L 435	L 384	419	L	L 388	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									4	5	9	18	16	18	14	11	1	2						
MED									455	U L 398	L 385	L 392	L 397	L 386	L 382	L 390	L 382	450						
U Q									458	L 430	L 396	L 403	U L 416	395	L 388	L 409								
L Q									439	U L 378	L 378	L 384	L 383	L 375	375	U L 386								

DEC. 2016 M(3000)F1 (0.01)

IONOSPHERIC DATA STATION Okinawa

DEC.2016 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5								C	C	C	C	C	C	C	C	C	C							
6									220	C	232	218	272	276	236	238	230	212						
7									240	248	242	234	232	252	242	246	230	232						
8									242	232	254	238	244	244	224	L 252		218						
9												246	246	256	246	254		208						
10									212	220	264	228	228	252	252	260								
11										226	252	238	244	236	222	222	214							
12									206	216	238	260	244	240	220	258	242							
13									220	244	222	240	244	280	232	260	232							
14									214	248	232	220	252	284	234	224								
15										258	228	270	264	278	238	216	242							
16											234	240		264	246	C	226							
17									C	C	224	238	274	260	244	230	C							
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	258	252	256	236	228							
20										246	242	230	284	256	236	248	244							
21										240	236	232	256	246	264	248								
22											250	242	258	236	264	228	216	216						
23											236	258	290	294	270	230	228							
24										214	246		278	244	250	234								
25										244	262	226	240	258	258	226	226							
26									246	228	256	216	252	242	250	240								
27										214	272	226	294	270	234	274	248							
28									220	220	264	250		262	240	252	234							
29									226			278	238	282	268	242	226	218						
30										232	232	252	238	262	246	224	222							
31									202	220	264	244	244	266	244	228	228							
	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	17	22	23	23	25	25	24	17	6						
MED									220	232	242	238	252	258	244	239	228	217						
U Q									240	245	256	250	272	273	254	252	238	218						
L Q									212	220	232	228	244	245	235	228	226	212						

DEC.2016 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC.2016 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	202	196	196	192	222	214	232
6	262	248	240	282	252	200	190	220	168	C	206	202	264	264	A	A	A	A	210	224	A 234	E A 238	A 266	E A 308
7	280	262	198	224	204	268	B	244	220	202	240	H 188	228	A	A	188	A	A	206	194	194	A 218	282	252
8	252	244	254	290	242	200	208	240	222	218	226	216	238	A	224	214	236	A	202	232	204	210	222	256
9	234	258	258	218	206	B	272	214	220	212	224	230	A	256	228	A	230	A	194	216	198	218	A 304	A
10	A 258	238	A	272	242	Q 332	262	196	192	204	H 202	194	206	208	200	218	220	202	202	196	210	224	216	224
11	Q 274	236	224	244	A	Q 316	Q 288	224	210	H 202	210	198	244	202	212	208	A	222	202	210	A	258	A 234	E A 250
12	A 284	304	254	266	208	234	244	194	190	178	H 196	218	A	220	A	A	A	A 214	204	214	210	210	230	270
13	286	266	236	A 284	E A 308	212	238	216	198	192	202	H 182	212	238	A	A	222	208	184	200	202	212	218	238
14	264	266	280	272	252	250	B	236	210	200	188	192	178	A	218	A	220	224	188	180	220	220	210	A
15	268	256	240	238	202	198	270	222	218	208	208	176	202	188	210	190	192	216	188	208	208	250	204	276
16	212	E B 304	288	264	C	248	B	228	222	212	202	194	186	170	202	C	202	210	202	A	E A 270	A	A 230	224
17	248	258	256	226	C	C	C	224	C	C	198	196	198	228	220	220	C	216	190	202	238	226	C	C
18	Q 266	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	190	188	206	206	216	206	200	186	E A 324	Q 268	226	206
20	266	248	262	250	234	274	324	236	220	216	210	204	200	186	206	196	H 194	224	206	198	204	194	210	232
21	314	282	270	Q 294	Q 232	200	248	226	216	196	206	228	184	182	198	198	228	214	194	190	204	208	212	314
22	302	224	228	312	306	178	468	250	212	206	240	206	206	206	196	208	206	176	204	204	190	228	Q 234	246
23	248	300	Q 256	244	208	184	418	212	220	240	230	238	218	A	190	212	226	220	198	194	212	230	210	214
24	A 322	300	Q 246	222	222	230	224	230	222	192	204	206	224	H 186	224	204	208	210	200	218	262	204	228	214
25	252	304	Q 276	220	226	230	242	228	220	216	244	220	208	214	192	190	216	216	210	186	212	258	208	226
26	296	250	244	266	266	286	260	244	230	204	216	A	184	A 228	244	A	234	218	204	200	200	A 246	212	A 276
27	270	282	242	274	240	212	246	220	218	210	180	200	186	H 190	234	206	A 222	216	202	194	190	A 270	232	276
28	314	290	264	232	234	228	264	240	214	196	178	H 180	218	178	190	164	226	218	190	176	218	196	222	198
29	258	282	280	278	246	202	182	232	172	230	228	216	192	210	200	Y	214	194	188	188	230	222	216	188
30	E B 346	E B 304	258	210	216	222	280	232	222	212	212	196	190	186	196	212	A	210	194	190	190	E A 270	E A 230	210
31	280	284	248	252	228	218	214	188	178	H 176	200	H 180	H 186	184	234	216	204	208	192	210	238	198	216	228
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	24	23	24	21	22	20	24	23	22	24	23	23	21	21	17	19	22	26	25	25	25	25	23
MED	267	263	254	258	233	225	254	227	218	205	207	200	202	202	206	206	220	214	200	198	207	221	220	230
U Q	291	295	264	276	249	250	276	236	220	212	225	216	218	224	224	213	226	218	204	210	232	248	A 231	270
L Q	255	249	240	229	212	200	231	218	198	196	201	H 192	186	186	197	193	206	208	192	190	199	210	212	214

DEC.2016 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC.2016 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5								C	C	C	C	C	C	C	C	C	C	B	B					
6								A	108	C	108	A	A	A	110	110	110	A	A					
7								B	108	108	108	A	108	A	110	A	A	A	A					
8								B	108	108	108	110	106	116	112	110	A	A	A					
9								B	E A 154	110	108	108	A	114	A	A	A	A	A					
10								B	114	108	108	108	A	A	A	116	114	114	A					
11								B	118	110	108	108	108	A	A	A	A	A	A					
12								B	A	108	108	110	110	A	A	108	A	A	A					
13								B	118	110	110	110	110	112	112	A	A	A	B					
14								B	116	114	110	110	112	112	112	110	A	A	A					
15								B	A	A	A	110	110	110	114	110	110	B	B					
16								B	116	110	110	110	A	A	A	C	A	A	A					
17								B	C	C	110	A	114	114	112	112	C	112	A					
18								C	C	C	C	C	C	C	C	C	C	C	C					
19								C	C	C	C	C	110	110	110	A	A	A	A					
20								B	116	112	110	A	A	110	110	110	A	A	A					
21								B	A	A	A	A	112	A	A	110	112	A	A					
22								B	112	110	110	A	A	A	110	114	110	130	B					
23								B	A	A	110	112	A	A	A	A	112	110	B					
24								B	118	112	108	108	A	108	A	A	110	A	A					
25								B	122	110	110	110	110	B	110	A	A	A	A					
26								B	B	A	A	A	108	A	A	A	A	A	A					
27								B	B	A	A	108	110	108	110	A	A	A	A					
28								B	116	118	110	110	110	110	A	110	110	A	126					
29								B	128	112	110	110	110	110	A	A	110	116	B					
30								B	112	112	110	110	A	110	110	110	112	A	A					
31								B	114	112	112	110	110	A	A	114	114	B	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									17	17	20	17	16	13	13	13	11	5	1					
MED									116	110	110	110	110	110	110	110	110	114	126					
U Q									118	112	110	110	110	113	112	113	112	123						
L Q									112	109	108	108	109	110	110	110	110	111						

DEC.2016 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2016 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 26°41.0'N LON. 128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	180	138	120	120	B	B	B
6	B	B	92	B	94	94	96	176	110	C	114	108	108	184	156	152	136	128	100	118	118	110	98	96
7	118	B	B	B	118	B	B	106	164	100	98	102	158	128	124	96	94	92	92	90	90	108	108	108
8	106	102	106	110	102	98	98	102	172	G	192	150	132	120	116	110	110	108	106	102	102	B	94	B
9	B	B	B	100	B	102	102	100	104	G	G	190	168	114	112	104	104	92	92	102	98	94	114	110
10	110	106	106	106	106	B	B	B	110	110	G	110	106	104	104	104	102	G	96	92	90	B	B	B
11	114	98	B	98	98	B	B	B	150	G	G	118	110	112	114	110	108	102	102	102	102	106	92	102
12	104	102	102	102	100	98	98	96	112	114	110	108	110	110	106	106	106	104	100	100	98	98	98	98
13	B	B	100	102	100	96	B	B	106	136	128	118	170	138	126	110	110	102	102	B	B	90	90	B
14	B	98	98	94	106	B	96	B	120	G	G	G	116	110	110	108	108	100	100	96	94	90	90	96
15	100	100	96	122	116	136	B	114	142	110	108	G	100	98	104	G	G	152	B	B	B	B	B	92
16	B	B	B	B	C	B	B	B	146	G	G	116	112	112	110	C	108	100	100	100	100	96	94	94
17	94	B	B	B	C	C	C	B	C	C	116	114	114	114	112	110	C	G	102	104	104	104	C	C
18	94	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	112	108	104	104	102	102	102	96	94
20	B	B	96	96	B	B	B	B	172	116	114	110	108	G	G	G	100	100	100	98	B	B	94	B
21	B	130	B	B	B	B	B	B	110	106	106	102	104	102	102	G	174	98	96	94	94	B	B	B
22	B	122	118	B	B	B	144	136	152	166	176	130	108	104	100	100	G	98	98	94	110	B	B	102
23	138	140	B	B	104	B	170	154	102	152	140	126	114	104	104	102	100	102	B	B	B	B	B	94
24	94	128	132	B	110	102	B	B	156	G	166	124	114	G	102	96	96	96	94	92	90	96	B	100
25	102	B	B	126	B	100	B	150	158	152	134	134	114	110	108	104	104	98	98	102	98	94	B	B
26	98	98	B	B	98	98	B	B	108	104	104	102	110	98	98	98	96	96	96	96	106	92	86	86
27	B	B	B	B	B	B	B	B	166	168	142	104	98	G	160	100	96	92	92	94	94	88	86	112
28	116	110	90	B	B	B	106	B	G	104	102	102	176	G	94	94	184	138	G	102	98	98	94	B
29	B	B	B	B	B	B	B	B	114	166	154	156	G	140	116	160	122	168	B	92	B	B	B	B
30	B	96	B	102	B	B	B	B	G	G	184	G	108	G	G	G	156	150	98	94	94	94	90	90
31	90	90	90	B	B	B	B	G	G	G	166	G	G	102	168	138	96	142	98	92	96	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	14	14	12	11	12	9	8	9	20	14	19	20	22	19	22	20	22	24	22	23	21	17	16	15
MED	103	102	99	102	103	98	100	114	131	115	128	115	111	110	110	105	107	102	99	98	98	96	94	96
U Q	114	122	106	110	108	102	125	152	157	152	166	128	116	120	116	110	110	133	102	102	103	105	98	102
L Q	94	98	94	98	99	97	97	101	110	106	108	106	108	104	104	100	100	98	96	94	94	93	90	94

IONOSPHERIC DATA STATION Okinawa

DEC.2016 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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																								
2																								
3																								
4																								
5																		H 1	HL 11	FF 11	FF 11			
6			F 1		F 1	F 1	F 1	HL 11	C 1		C 1	C 1	C 1	HL 11	HC 11	H 1	H 1	CL 32	LCH 22	FF 42	FF 33	FF 11	FQ 21	F 4
7	F 1				F 1			L 1	H 1	L 1	L 1	L 1	H 1	CL 11	CL 11	L 1	L 3	L 7	L 5	F 3	F 2	F 1	F 1	F 1
8	F 1	F 1	FQ 11	FQ 11	F 2	F 3	F 1	L 1	H 1		H 1	HL 11	HL 11	CL 11	CL 11	CL 11	C 2	C 2	C 3	F 4	F 2		F 1	
9				F 3		F 1	F 2	L 1	L 1			H 1	HCL 11	CH 11	C 1	L 3	L 2	L 2	L 2	F 1	F 1	F 1	F 1	F 4
10	F 3	FF 21	FQ 61	F 3	F 1				C 1	C 1		C 1	C 1	L 1	L 1	L 2	L 2		L 3	F 3	F 3			
11	F 1	F 1		F 2	FQ 41				H 1			C 1	C 1	CQ 11	CQ 11	CQ 11	C 1	L 2	L 4	F 5	F 2	F 1	F 2	FF 31
12	FQ 31	FQ 31	FQ 21	FQ 21	FQ 21	F 2	F 1	L 1	C 1	C 1	C 1	CL 11	C 1	C 1	C 4	C 3	C 4	L 6	L 5	FQ 31	FQ 31	F 1	F 1	F 1
13			F 1	F 4	F 3	F 3			L 1	H 1	C 1	C 1	H 1	H 1	C 1	C 3	C 2	L 2	L 1			F 1	F 1	
14		F 1	F 1	F 1	F 1		F 1		C 1				C 1	C 1	C 1	CQ 21	C 2	L 3	LQ 31	F 3	F 3	FF 21	F 1	F 1
15	F 1	F 1	F 3	F 1	F 1	F 1		C 1	HC 11	C 2	C 1		L 1	L 1	L 1			H 1						F 1
16									H 1			C 1	C 1	C 1	C 1		C 1	L 2	L 2	F 4	F 6	F 5	F 3	F 1
17	F 1										C 1	C 1	C 1	C 1	C 1	C 1			L 3	F 1	F 1	F 2		
18	F 1																							
19																C 1	C 1	L 2	L 2	F 2	F 4	F 1	FQ 31	F 2
20			F 1	F 1					H 1	C 1	C 1	C 1	C 1				L 2	L 2	L 3	F 5			F 1	
21		F 1							C 2	C 1	C 1	L 1	L 1	L 1	L 1		HL 11	L 1	L 1	F 1	F 1			
22		F 1	F 1				F 1	H 1	H 1	H 1	H 1	H 1	C 1	L 1	L 1	L 1		L 1	L 1	F 1	F 1			F 1
23	F 1	F 1			F 1		F 1	H 1	LH 21	HC 11	H 1	C 1	C 2	L 3	L 1	L 2	L 1	LH 11						F 1
24	FF 11	F 1	F 1		F 1	F 1			H 1		H 1	C 1	C 1		L 1	L 2	L 1	L 1	L 2	F 2	F 2	F 1		F 1
25	F 1			F 1		F 1		H 1	H 1	H 1	H 1	H 1	C 1	C 1	C 1	L 1	L 3	L 3	L 4	F 1	L 2	F 1		
26	F 2	F 2			F 2	F 1			C 1	L 1	L 1	L 1	C 1	L 2	L 1	L 2	L 2	L 2	LQ 11	FQ 11	F 1	F 1	F 1	F 1
27									H 1	HC 11	HC 11	L 1	L 1		HL 11	LH 11	L 2	L 3	L 3	F 1	F 1	F 1	F 1	F 1
28	F 1	F 1	F 1				F 1			L 1	L 1	L 1	HL 11		L 1	L 1	HL 11	HL 11		F 1	L 3	F 1	F 2	
29									C 1	H 1	H 1	HL 11		H 1	C 1	HC 11	C 1	H 1		F 1				
30		F 1		F 1							H 1		C 1				H 1	HL 11	L 3	L 3	F 3	FQ 21	FQ 31	FQ 21
31	F 1	F 1	F 1								H 1			L 1	HL 11	HL 11	L 1	H 1	L 1	F 2	FQ 21	F 1	F 1	
	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																								

DEC.2016 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, 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

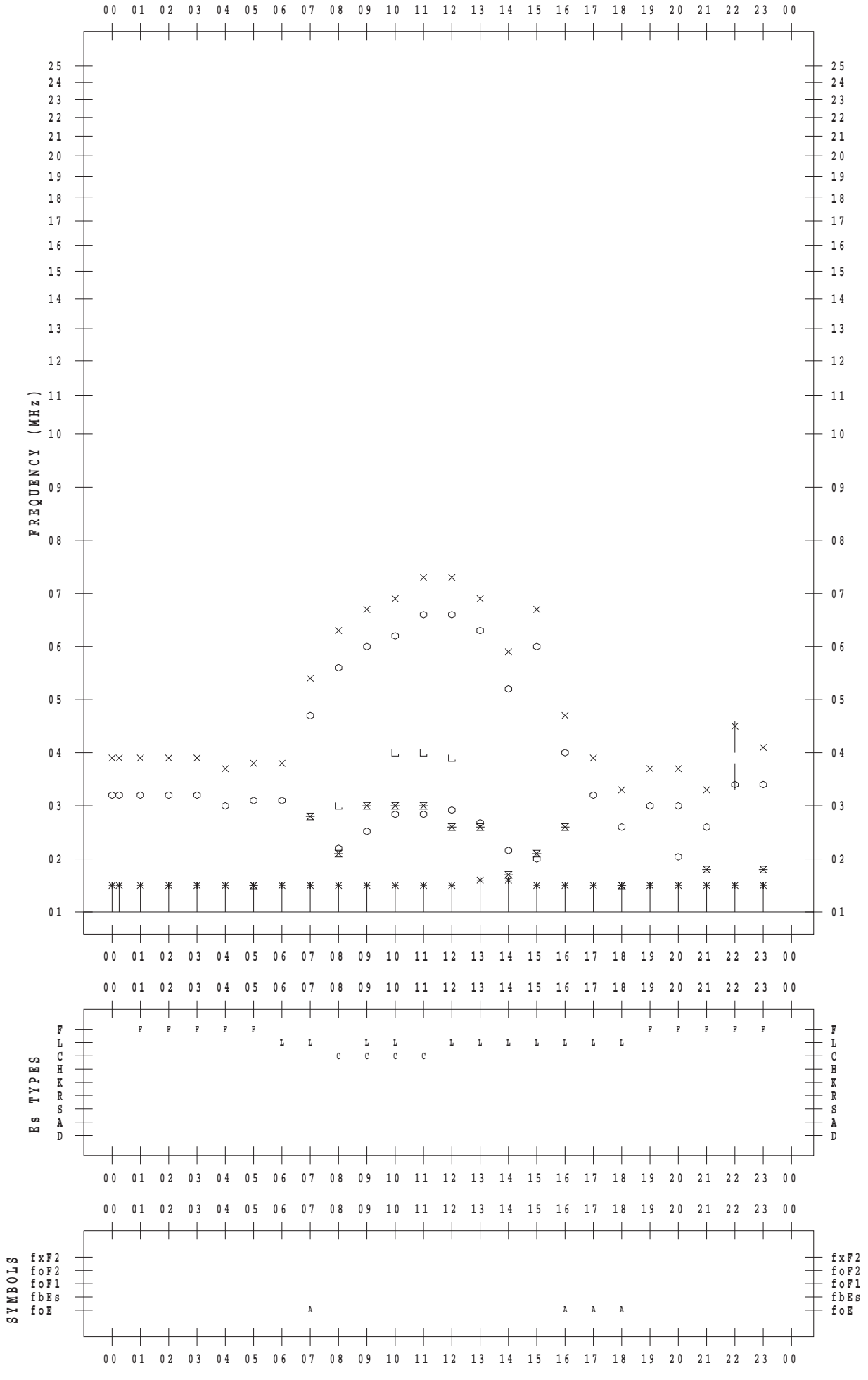
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 1

135 °E MEAN TIME



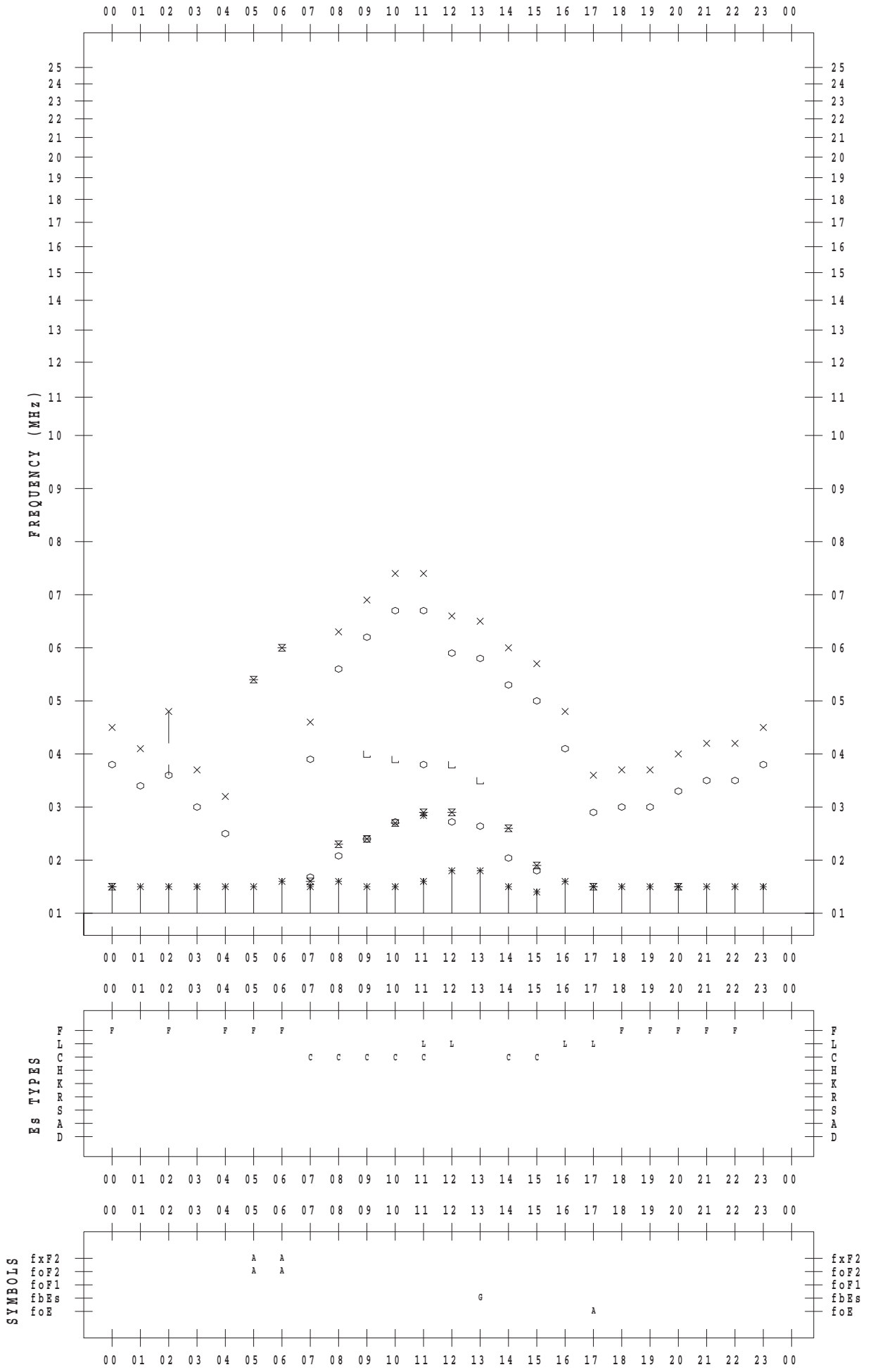
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 2

135 °E MEAN TIME



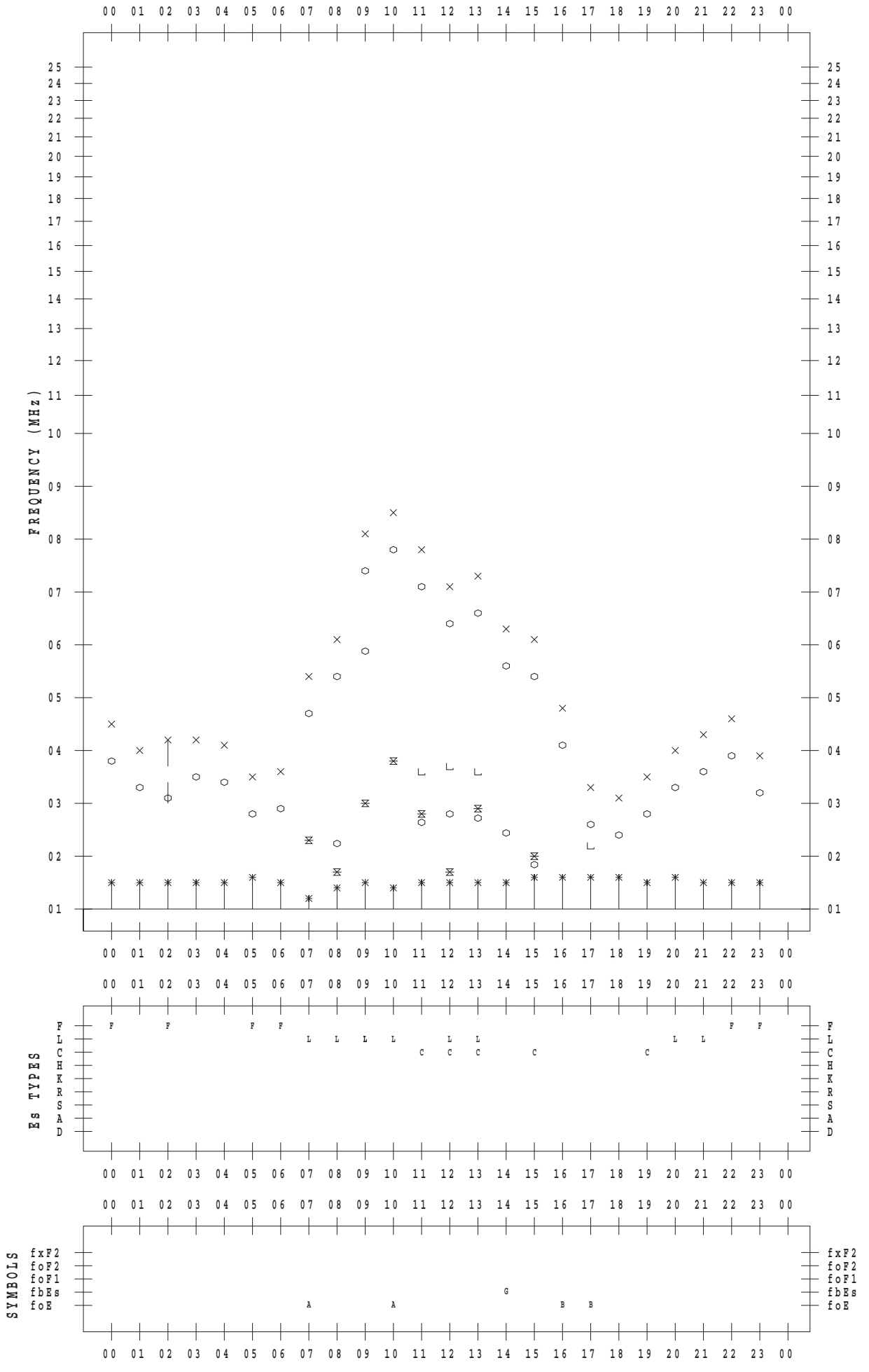
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 3

135 °E MEAN TIME



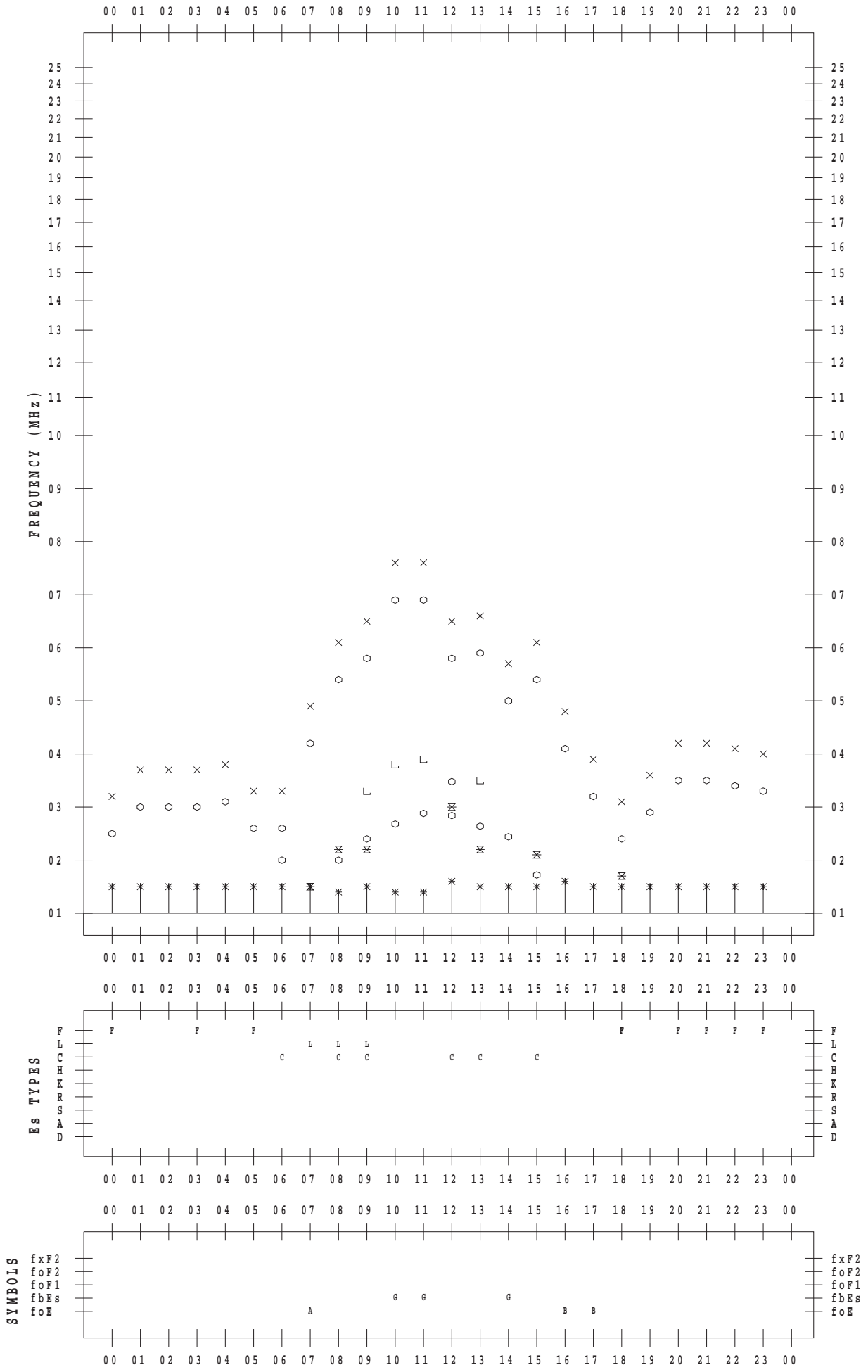
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 4

135 °E MEAN TIME



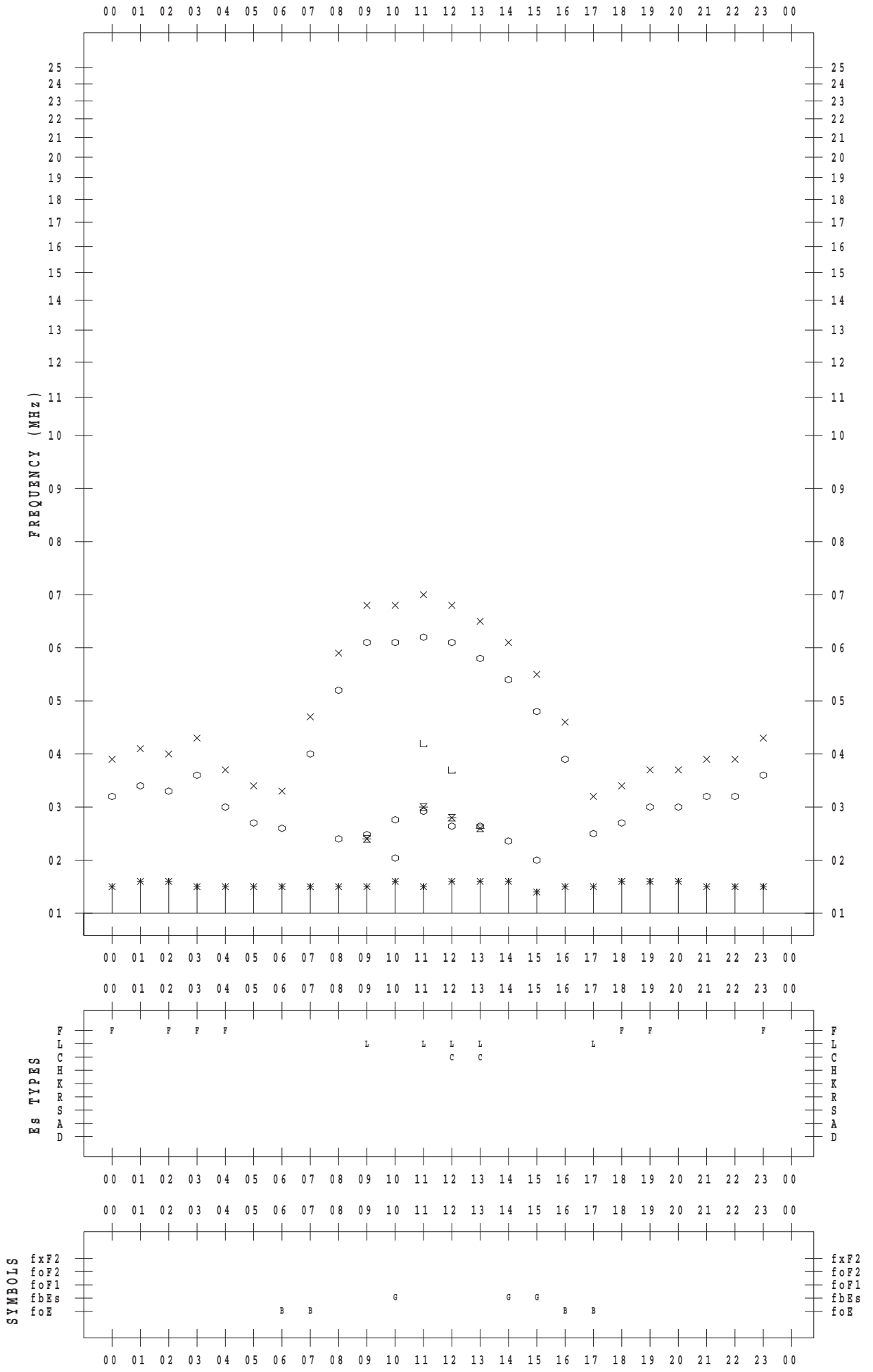
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 5

135 °E MEAN TIME



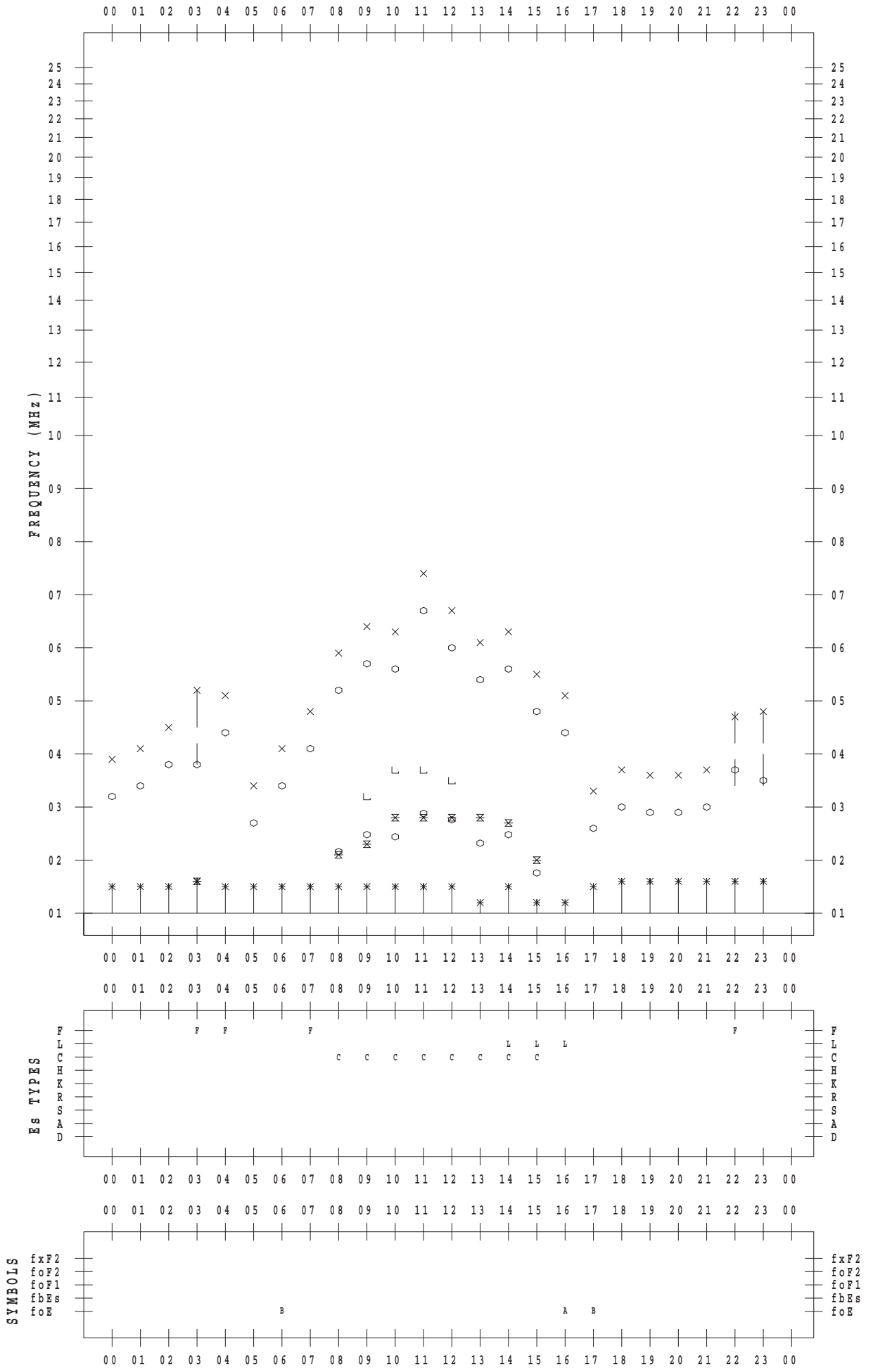
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 6

135 °E MEAN TIME



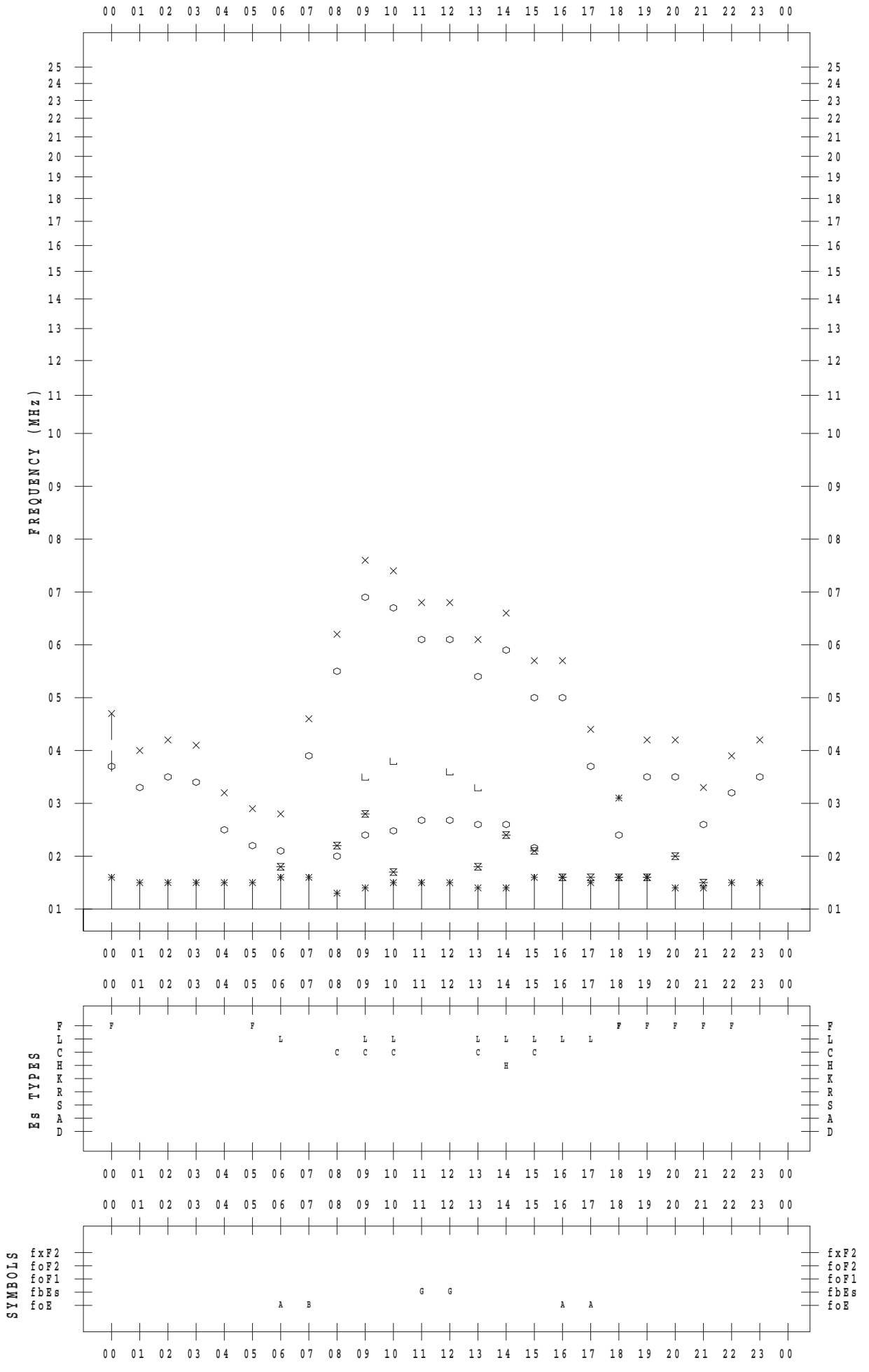
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 7

135 °E MEAN TIME



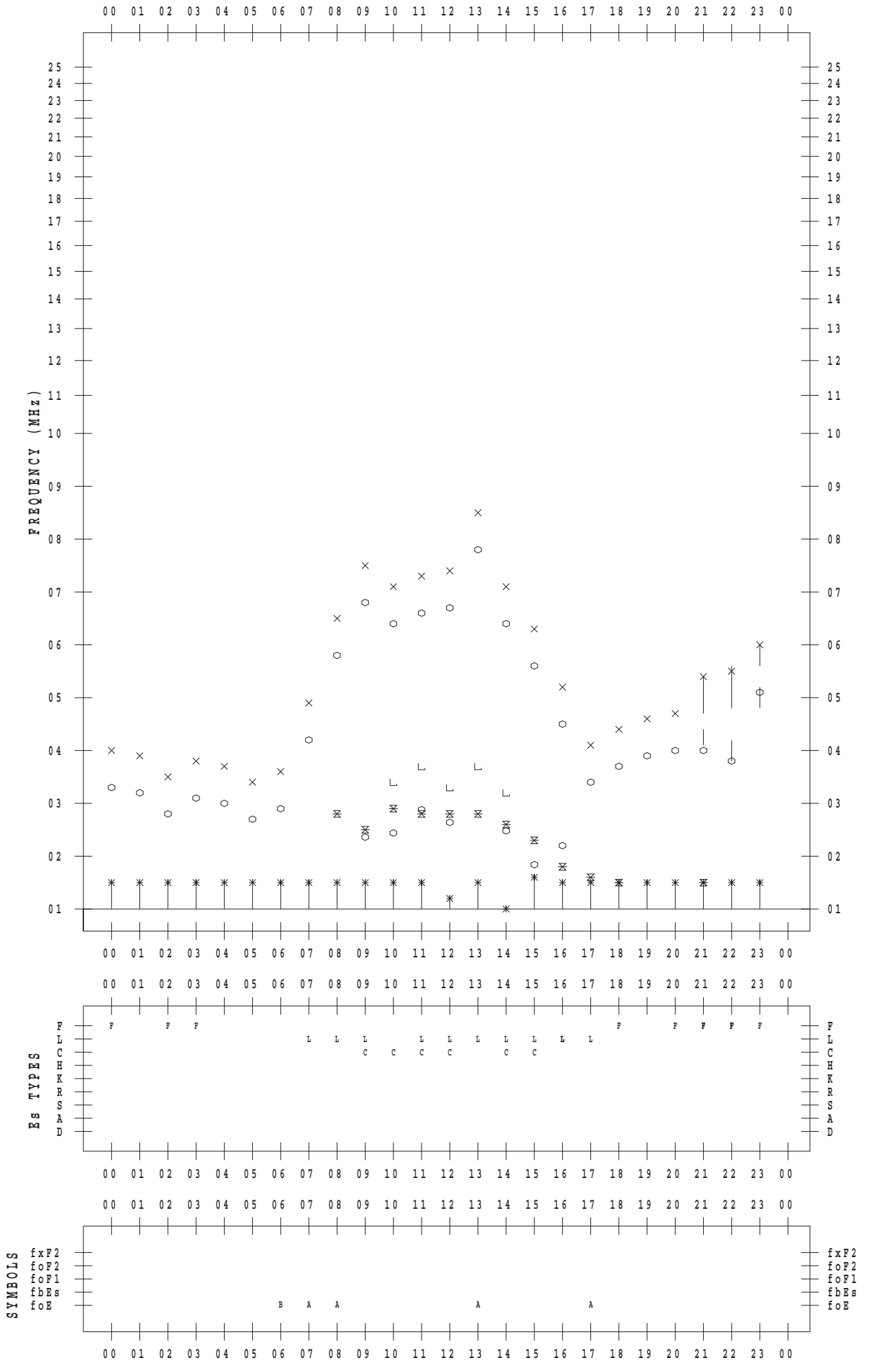
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 8

135 °E MEAN TIME



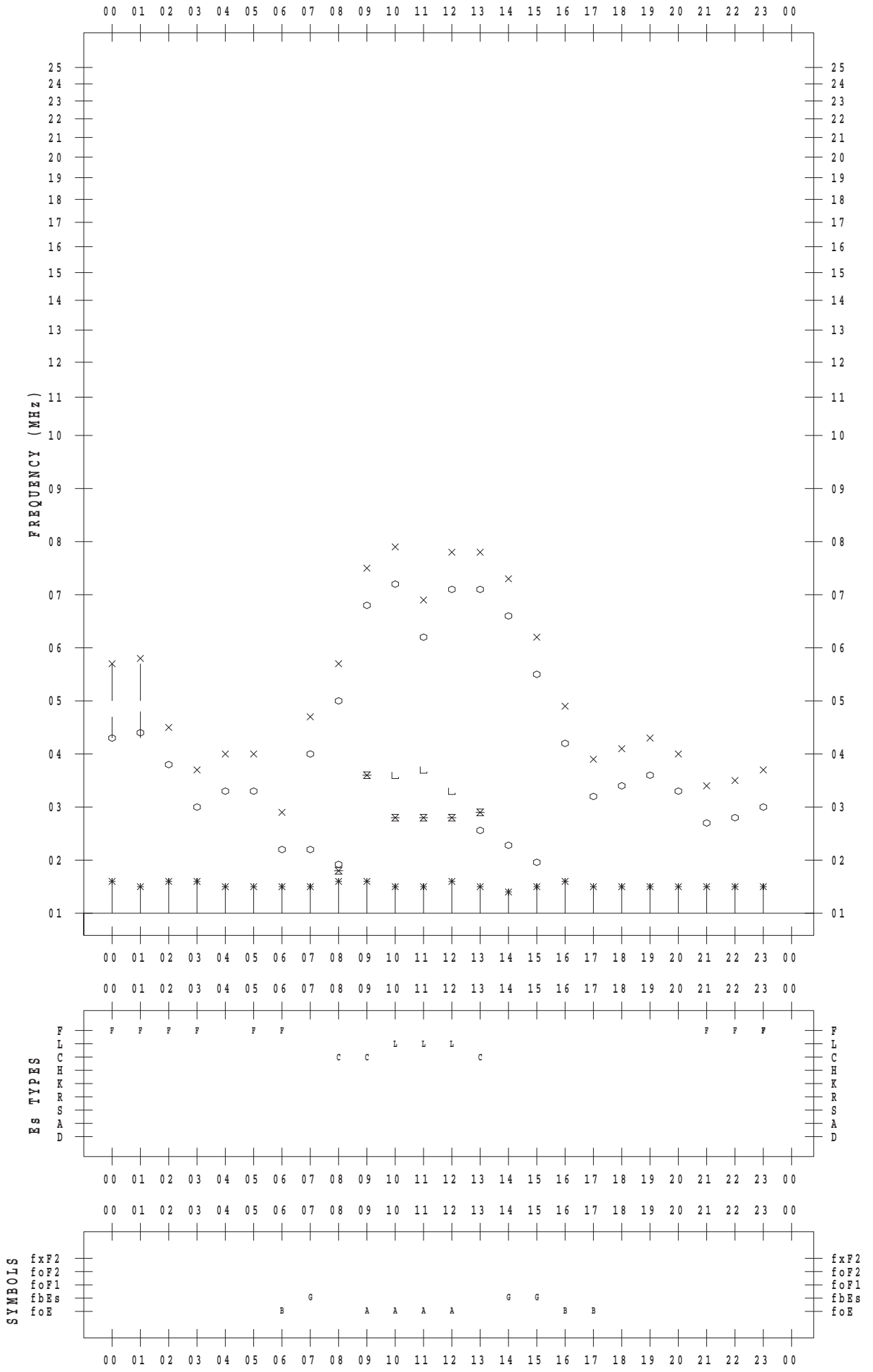
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/ 9

135 °E MEAN TIME



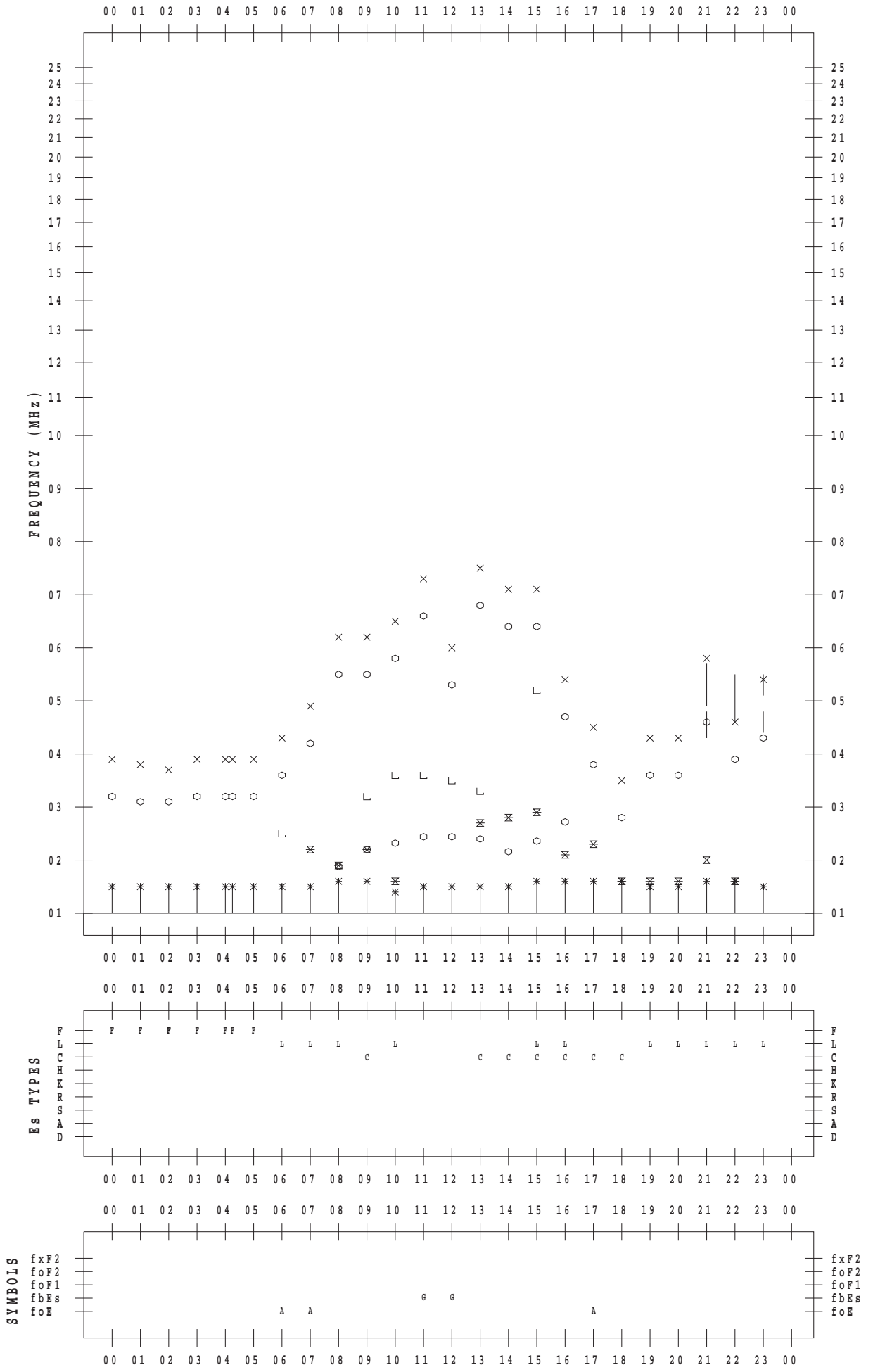
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/10

135 °E MEAN TIME



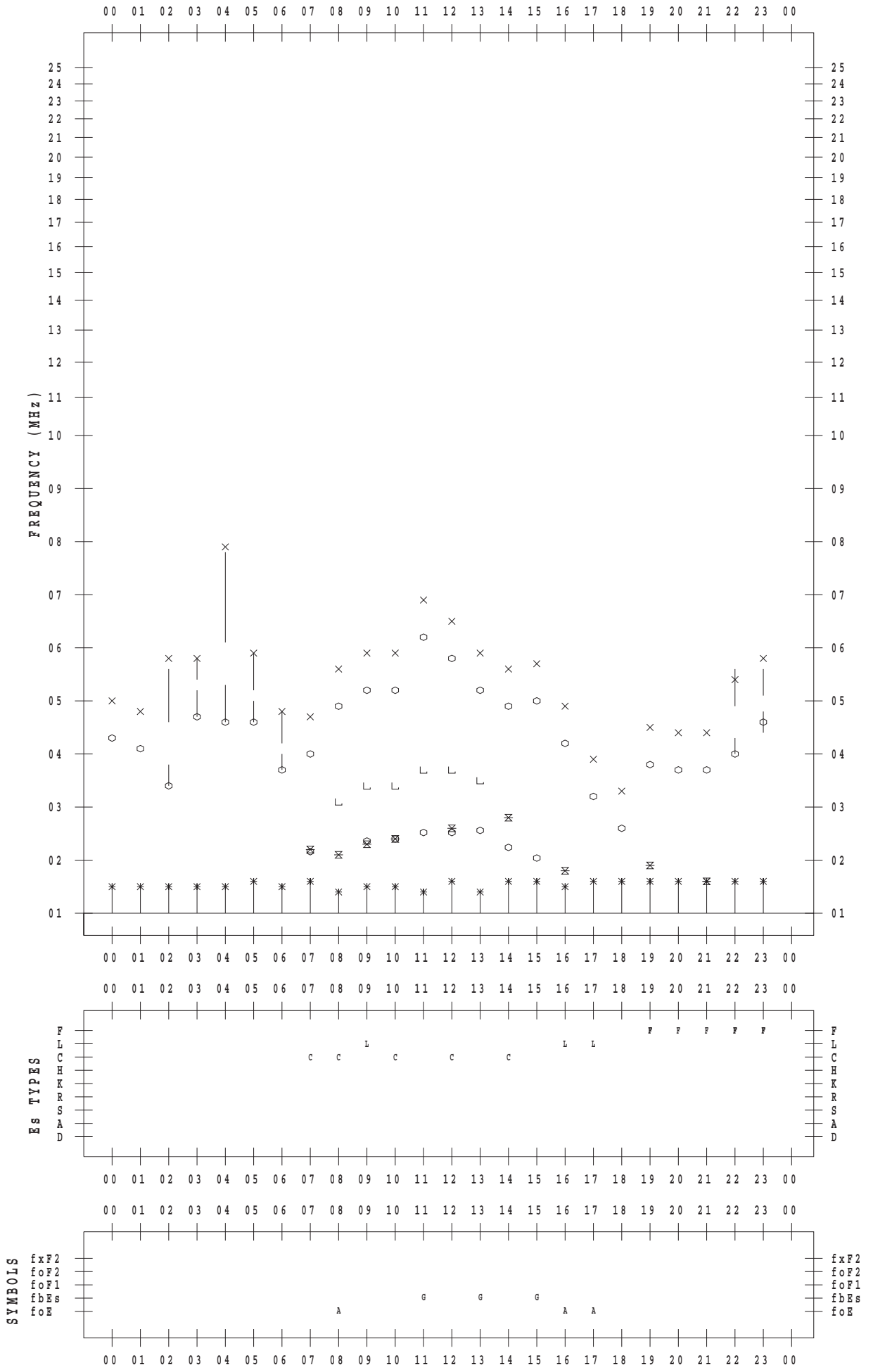
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/11

135 °E MEAN TIME



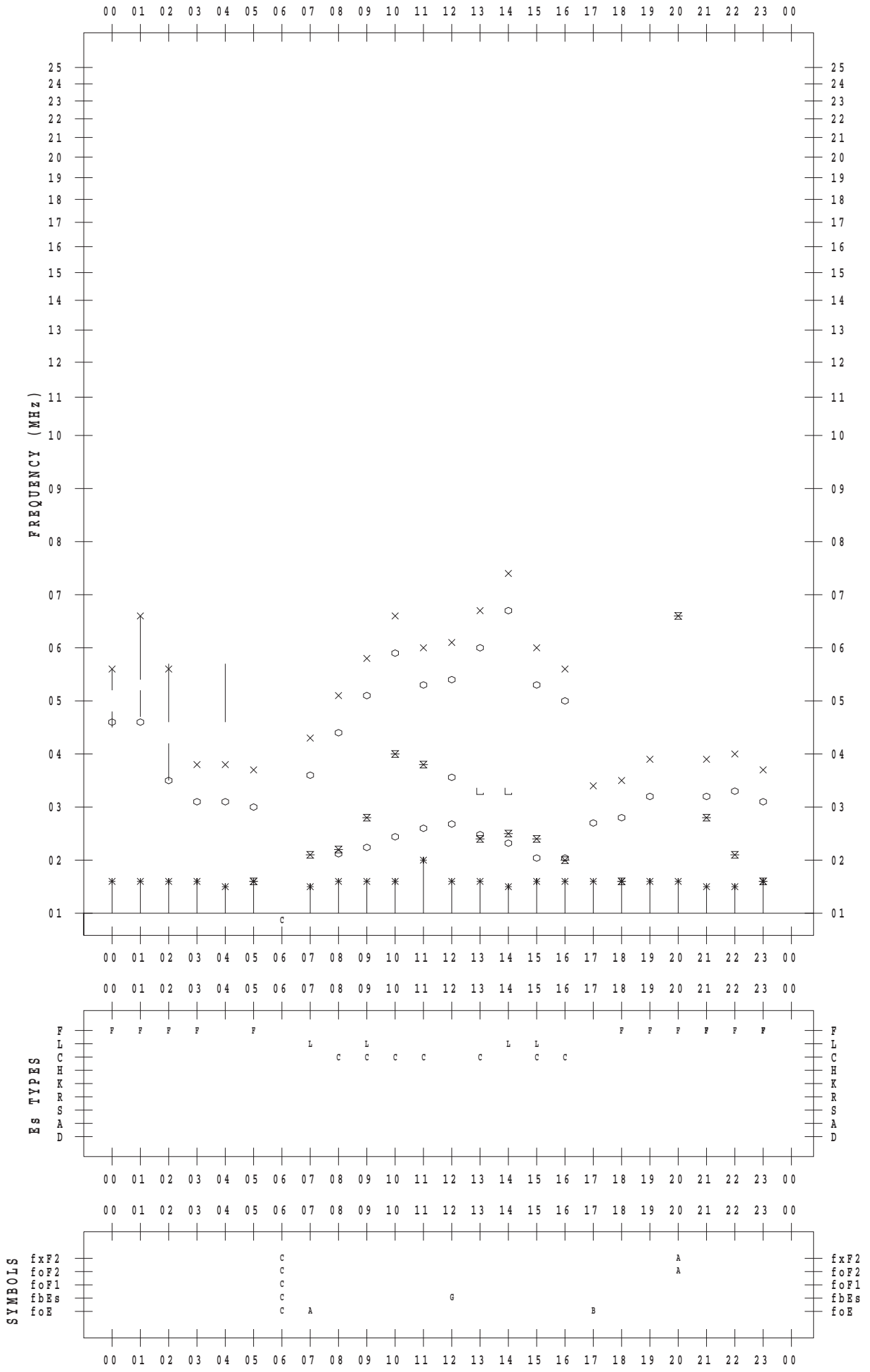
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/12

135 °E MEAN TIME



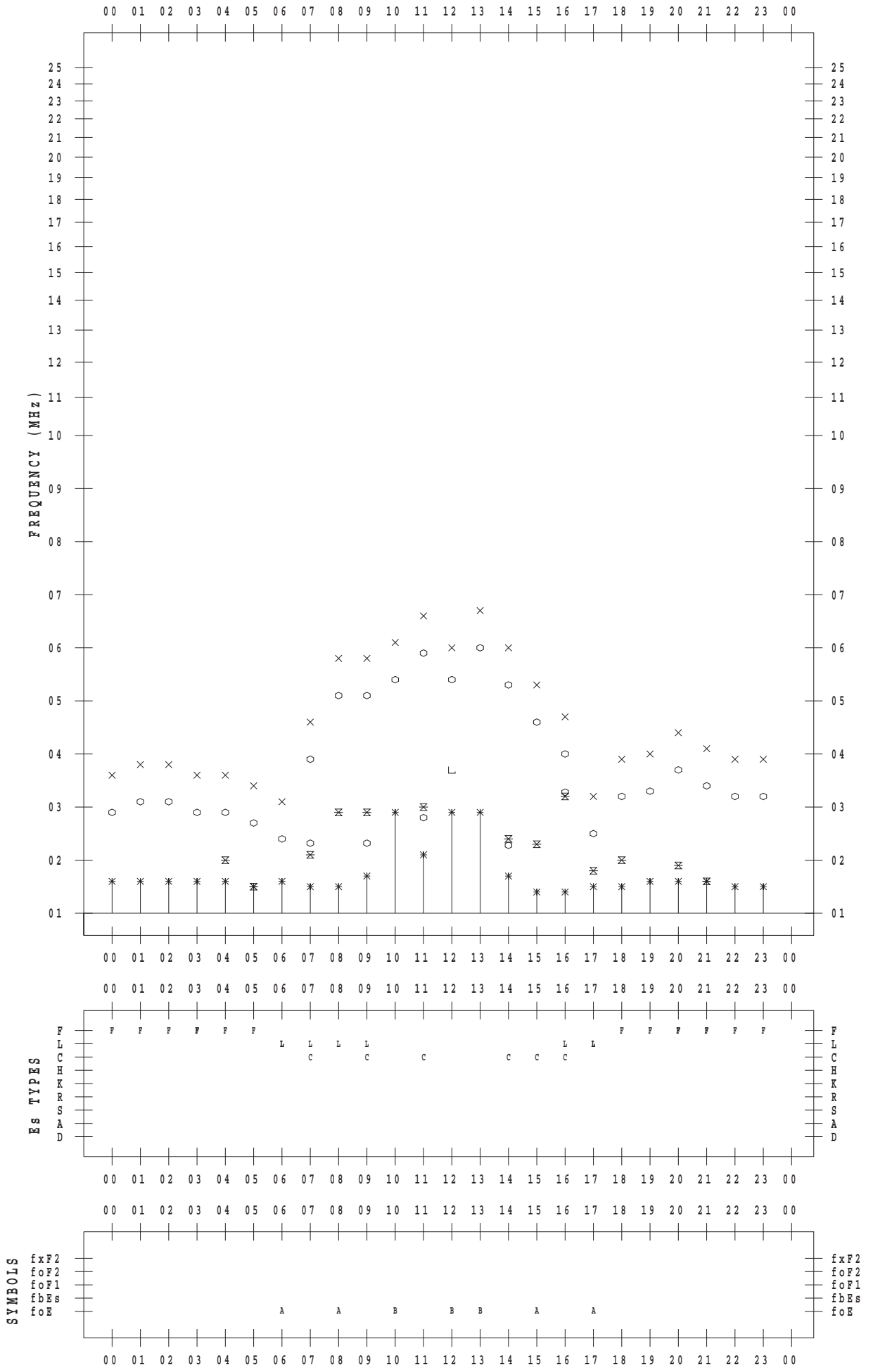
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/13

135 °E MEAN TIME



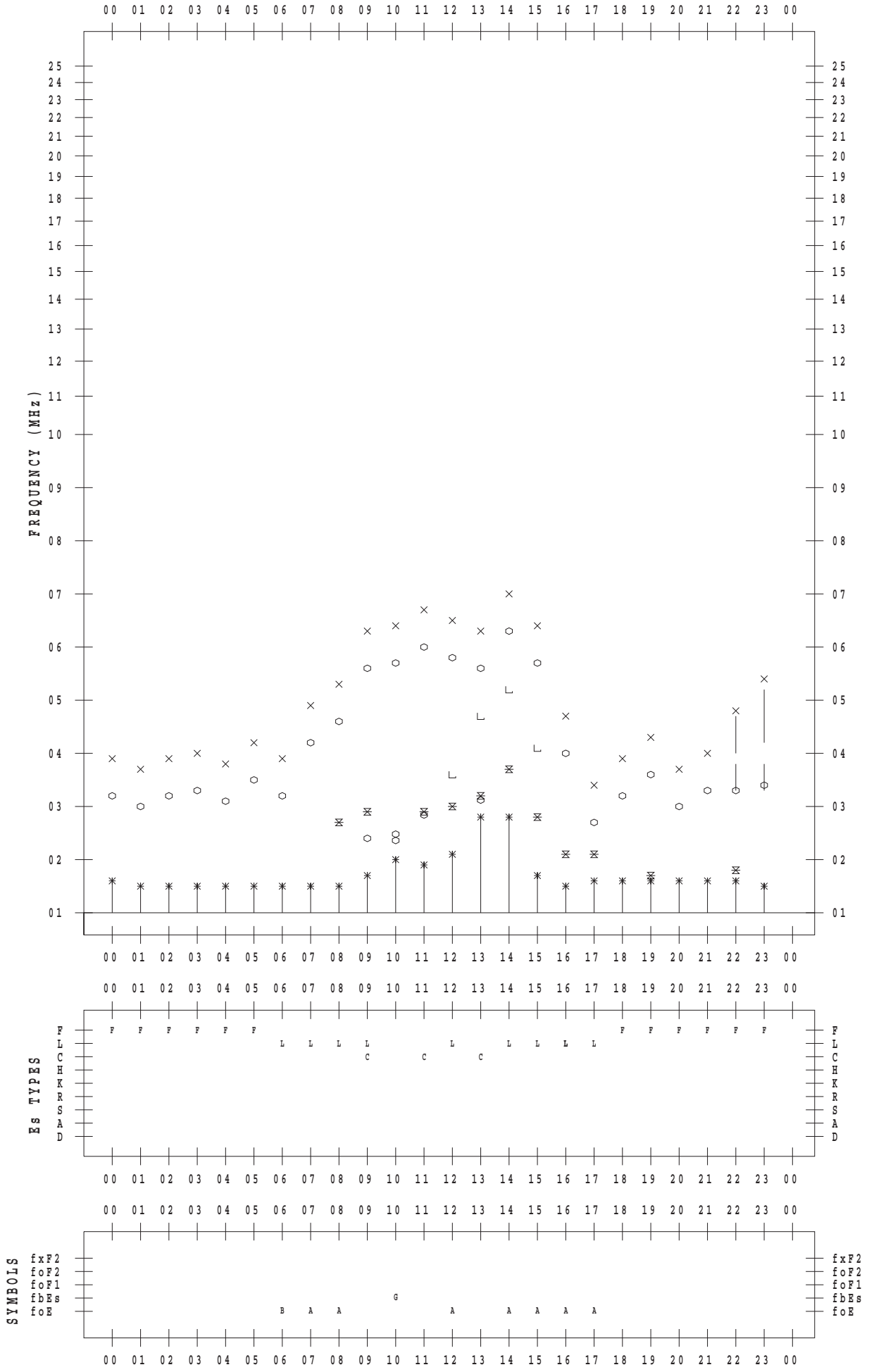
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/14

135 °E MEAN TIME



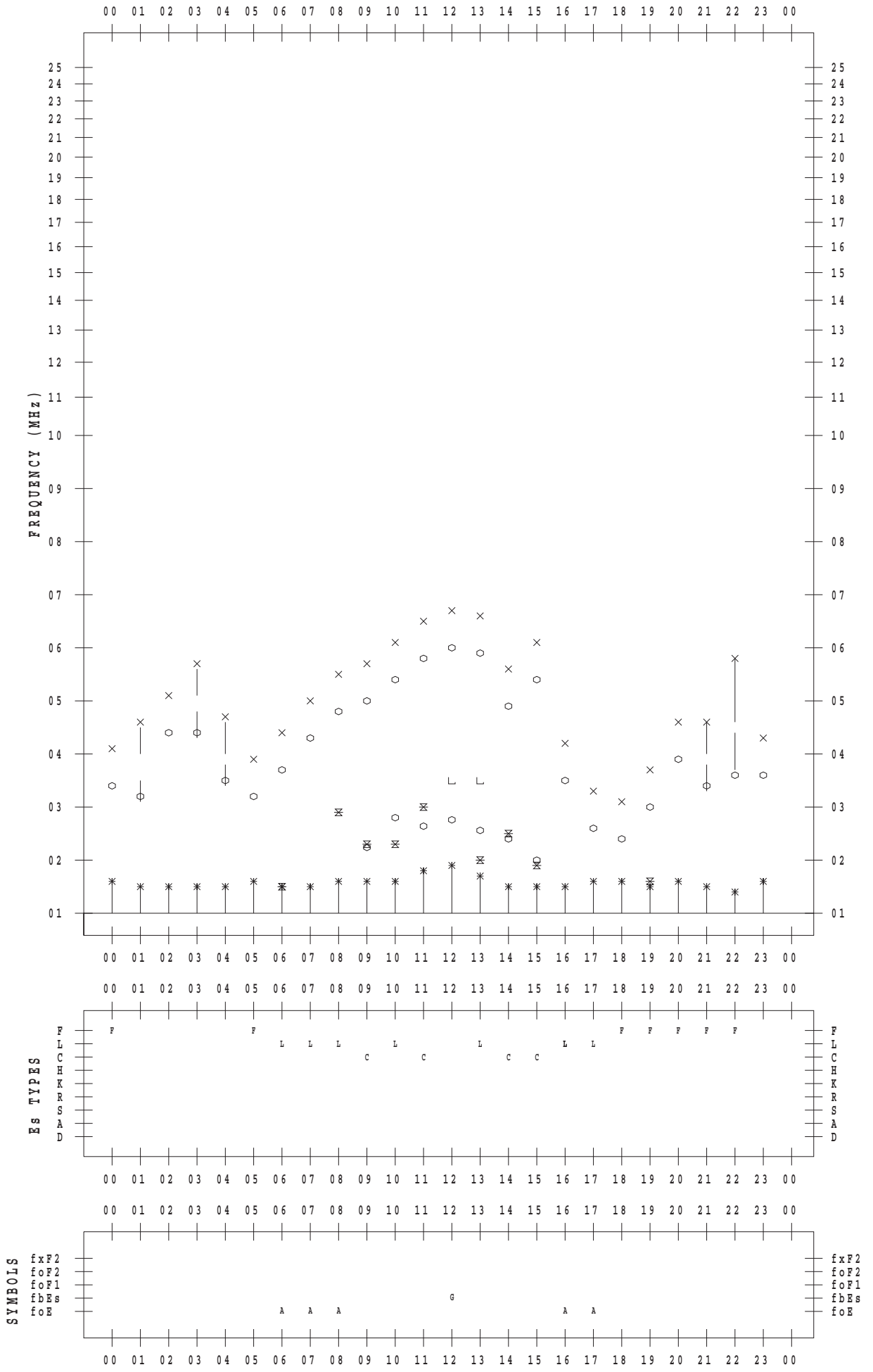
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/15

135 °E MEAN TIME



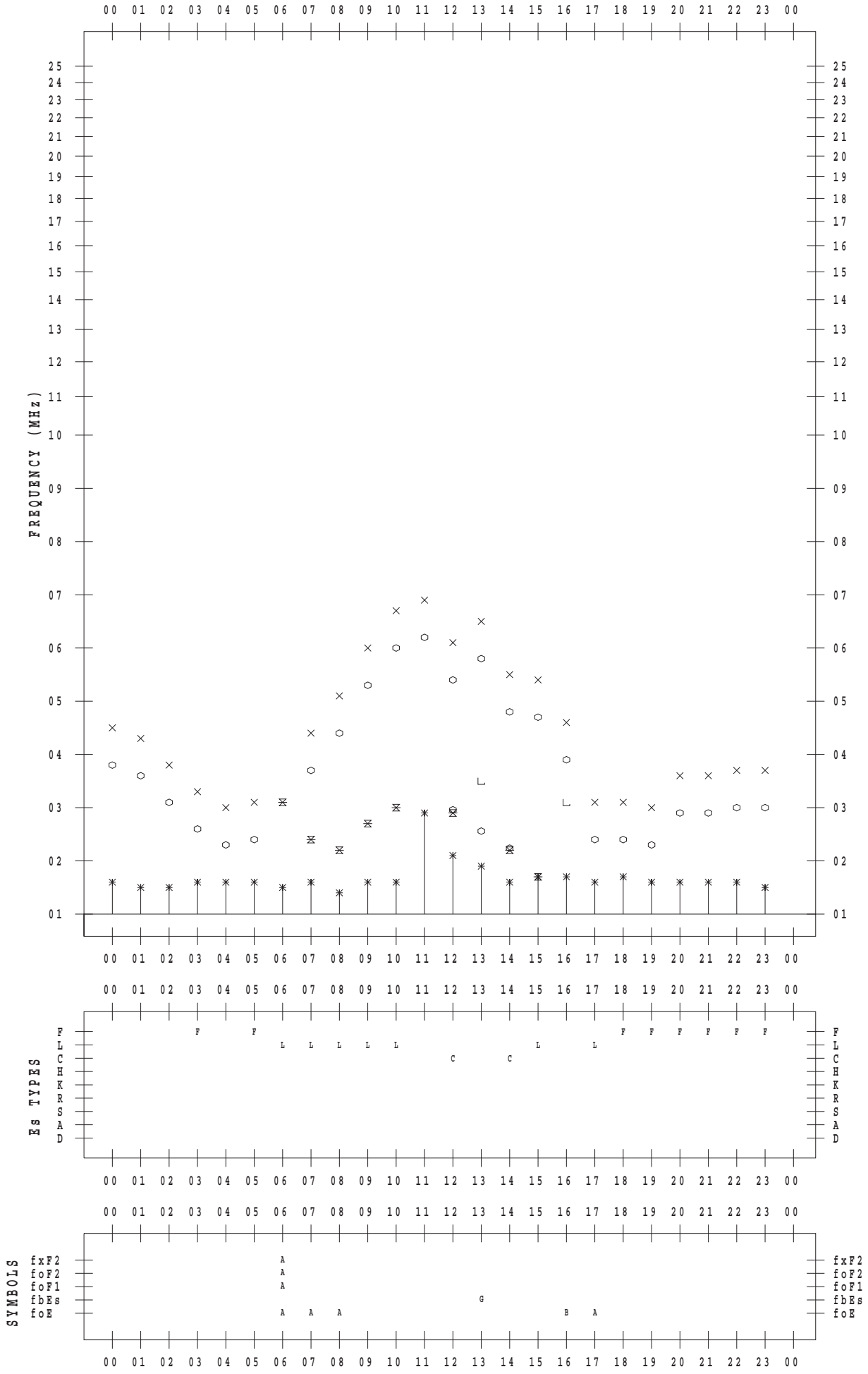
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/16

135 °E MEAN TIME



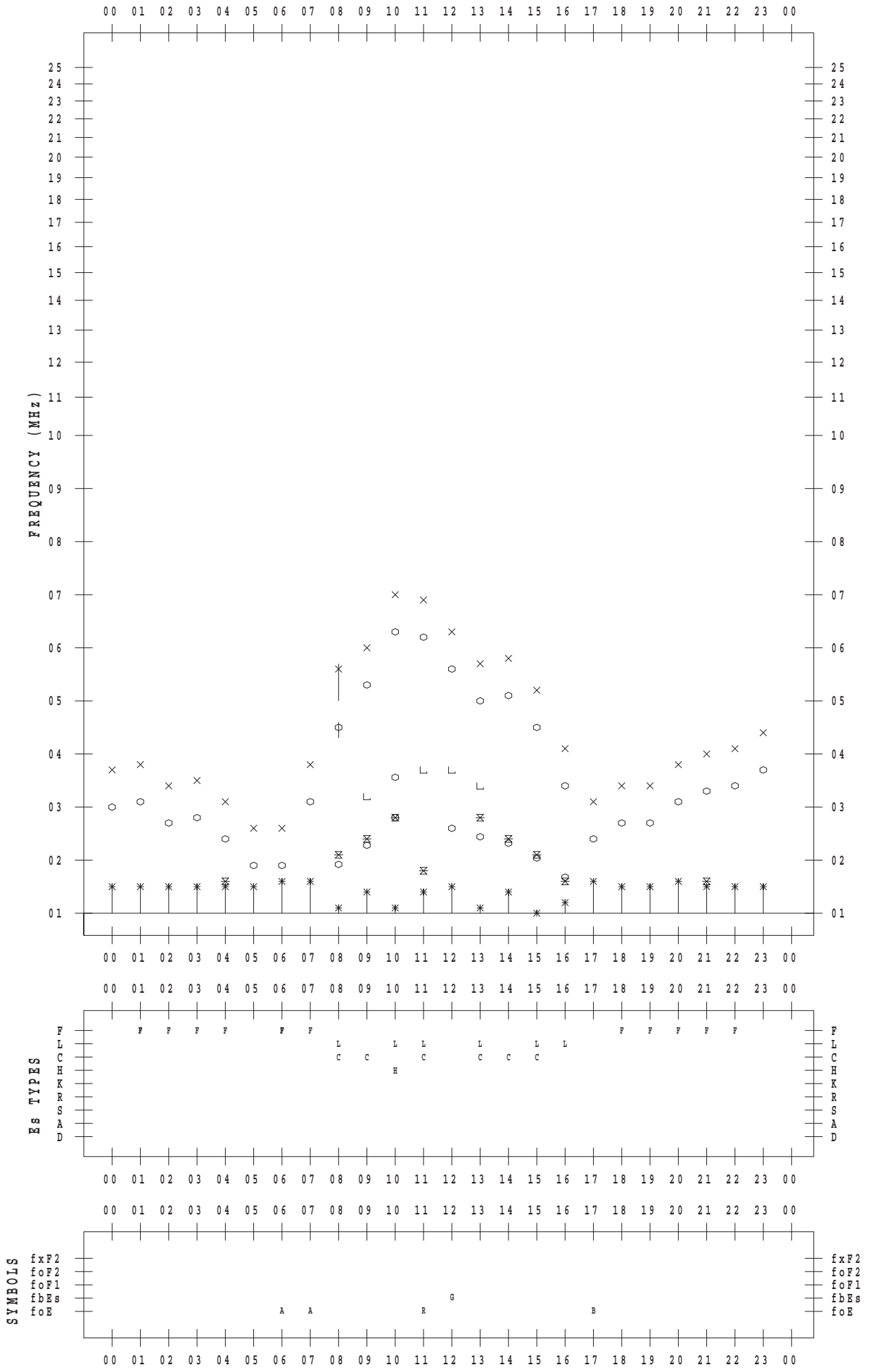
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/17

135 °E MEAN TIME



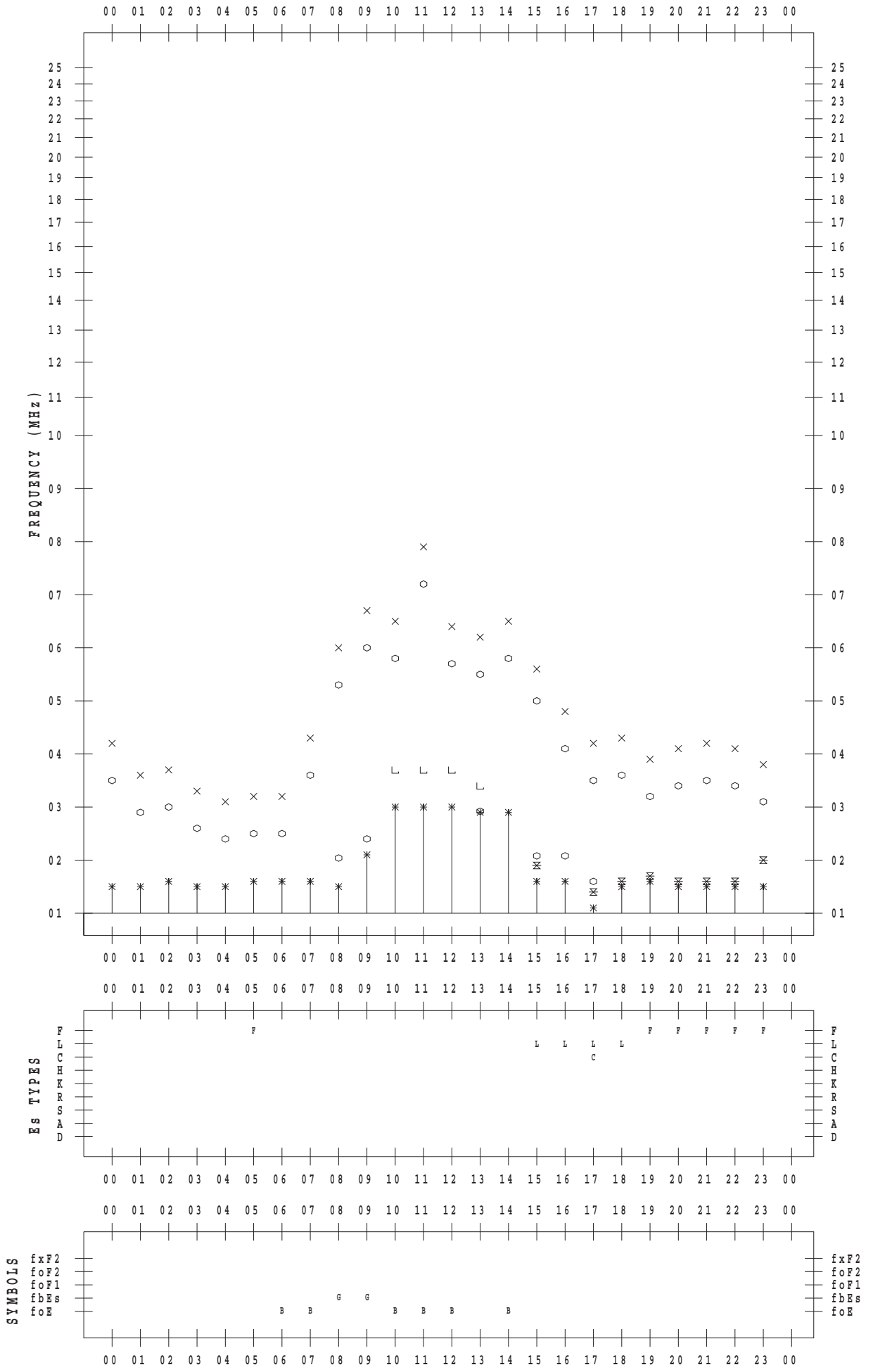
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/18

135 °E MEAN TIME



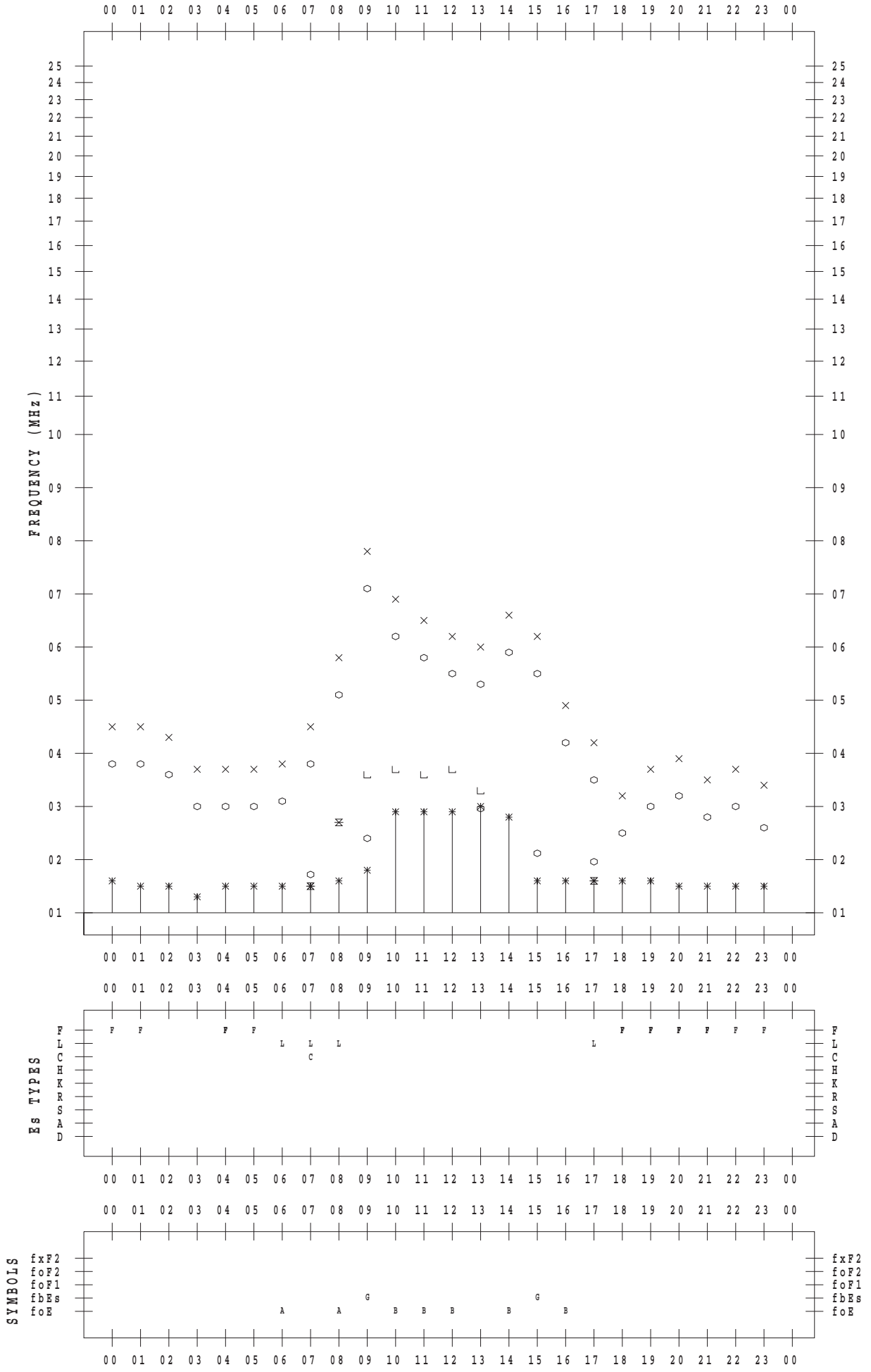
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/19

135 °E MEAN TIME



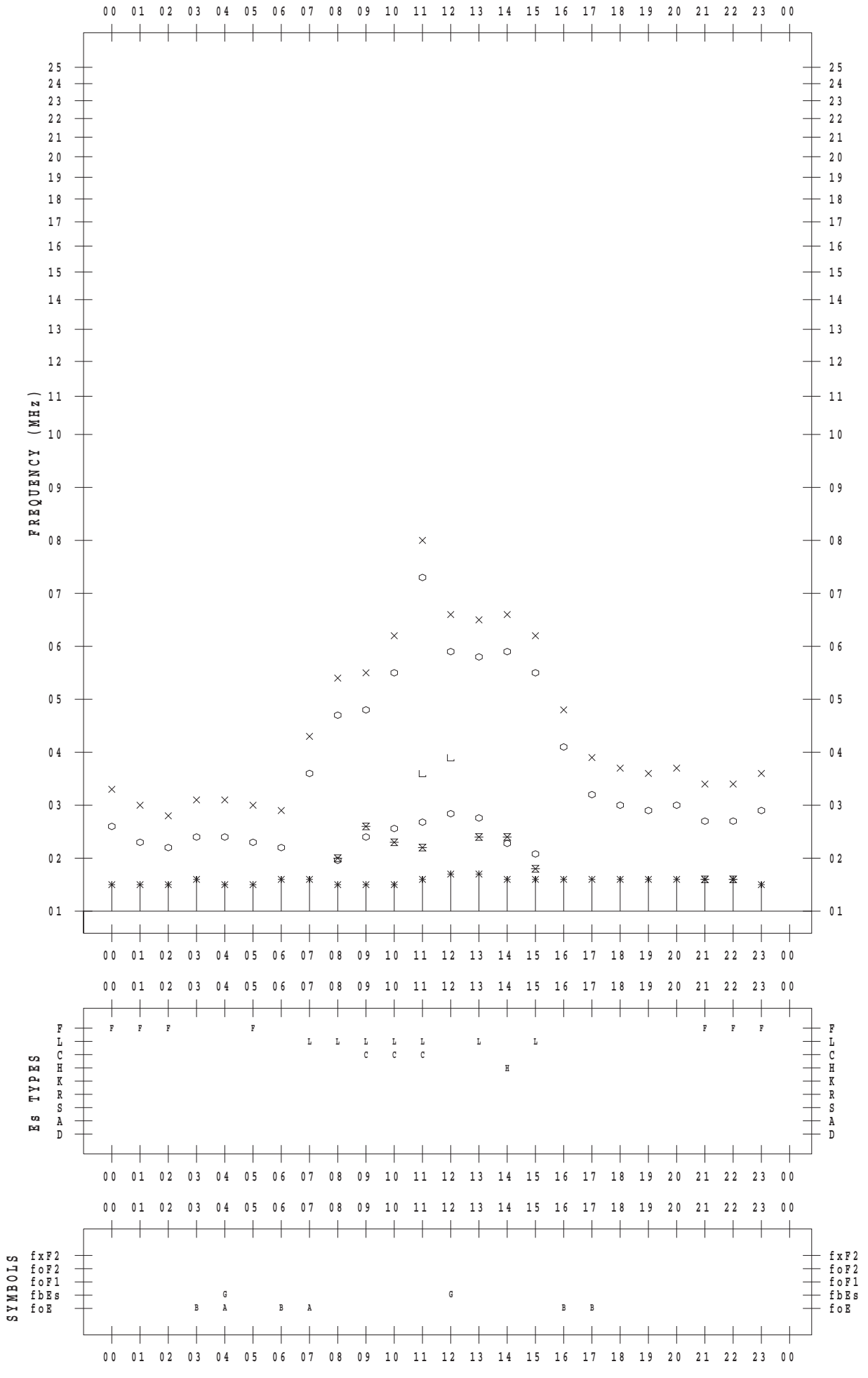
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/20

135 °E MEAN TIME



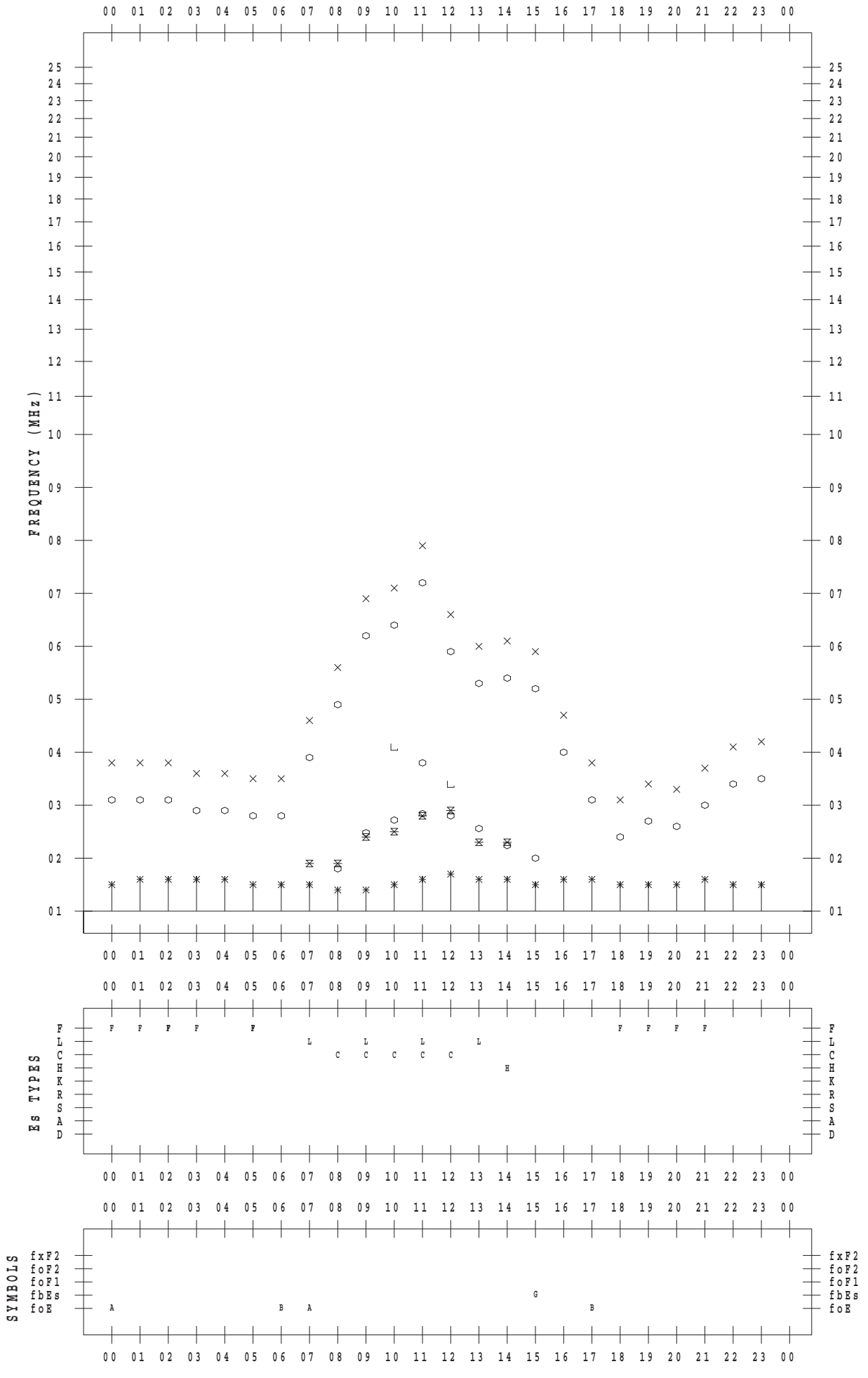
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/21

135 °E MEAN TIME



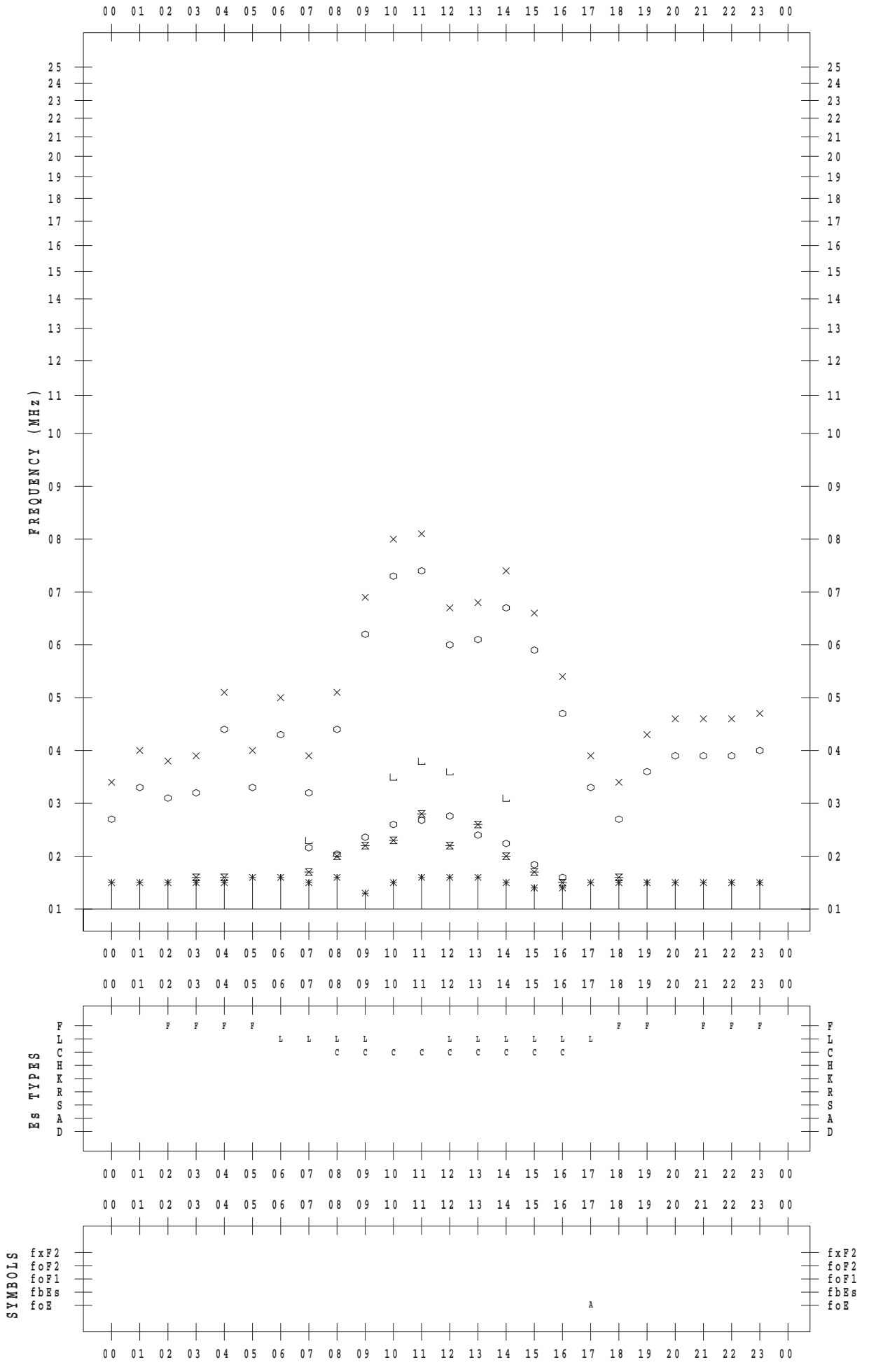
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/22

135 °E MEAN TIME



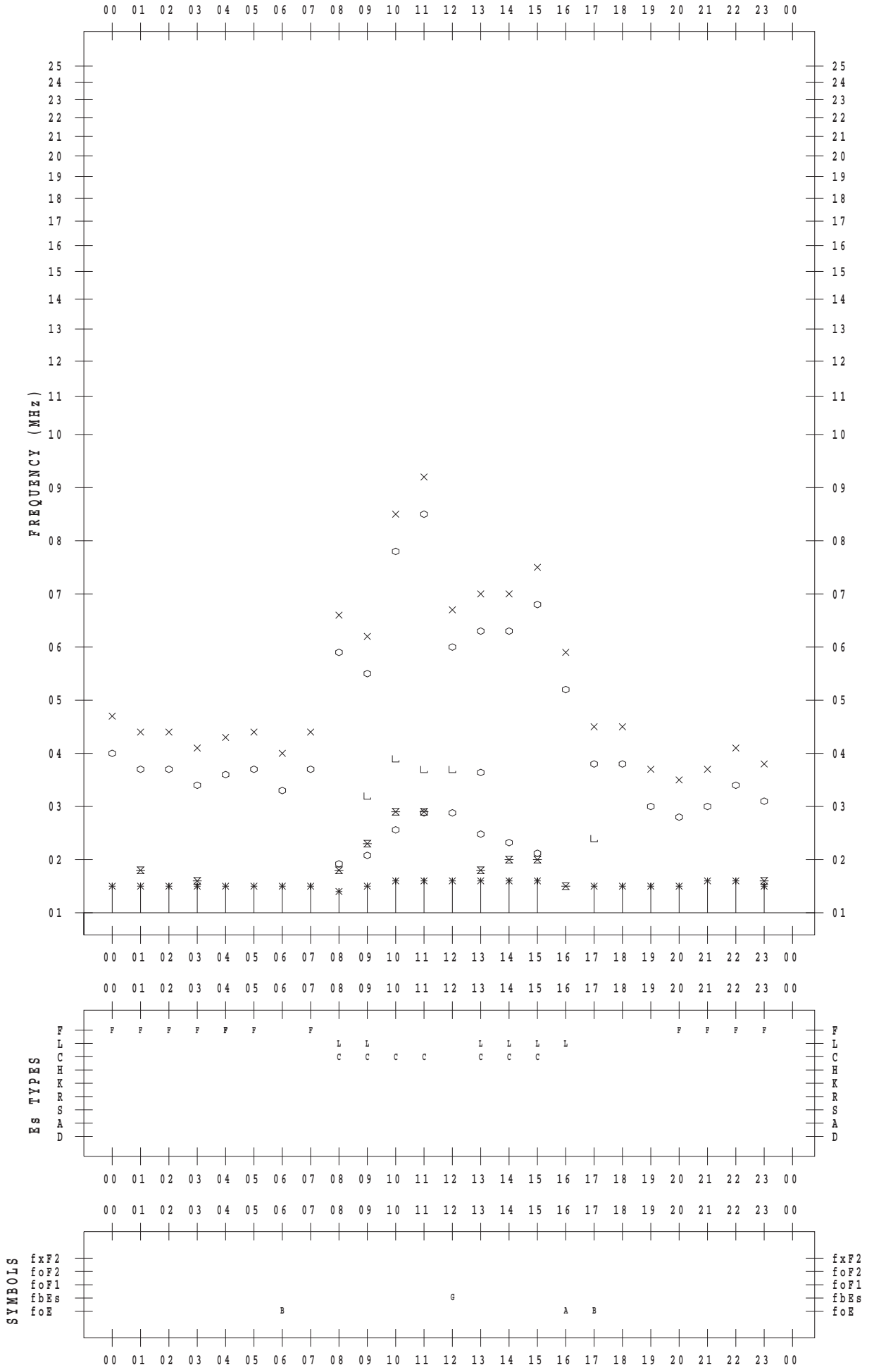
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/23

135 °E MEAN TIME



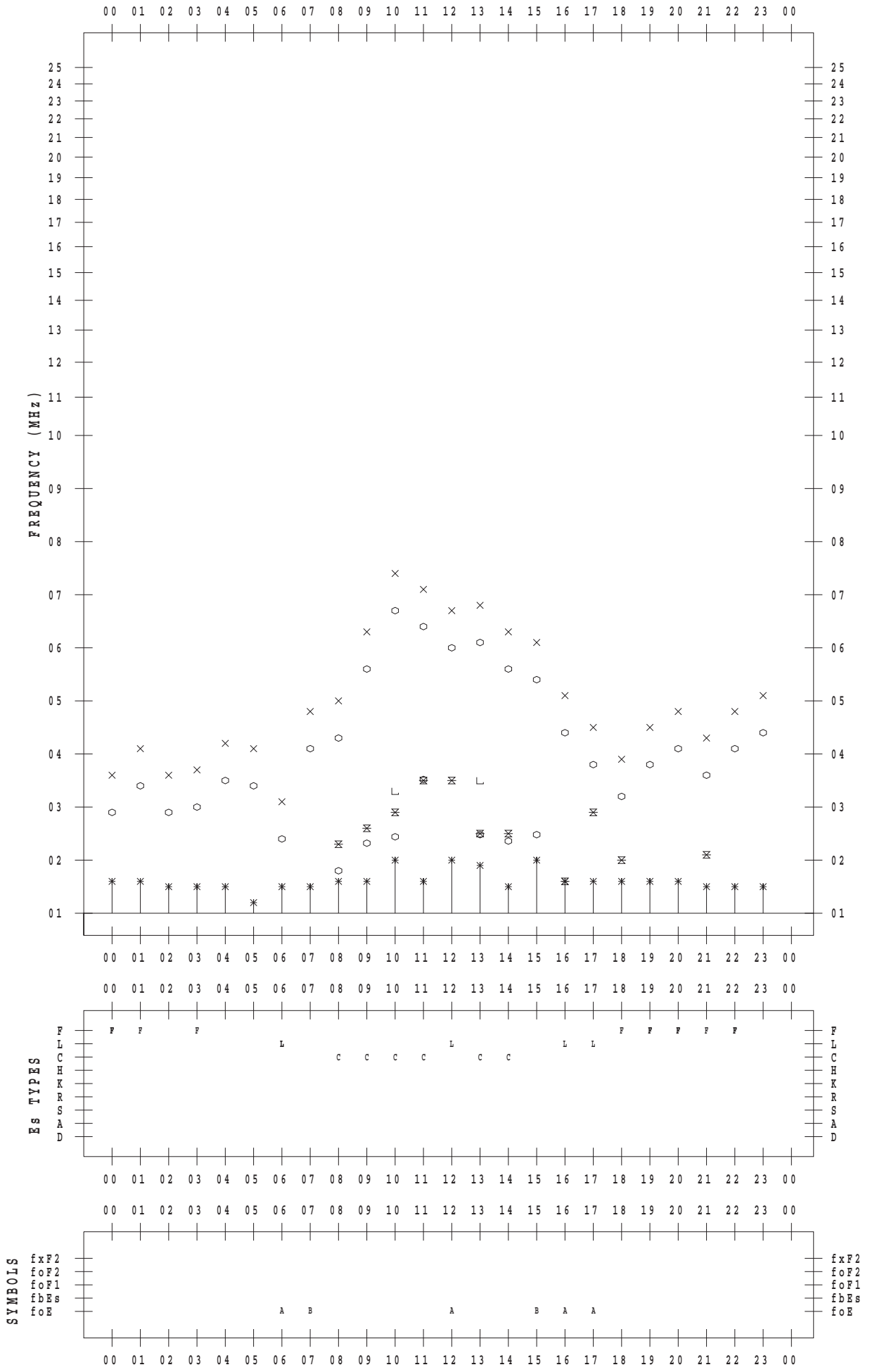
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/24

135 °E MEAN TIME



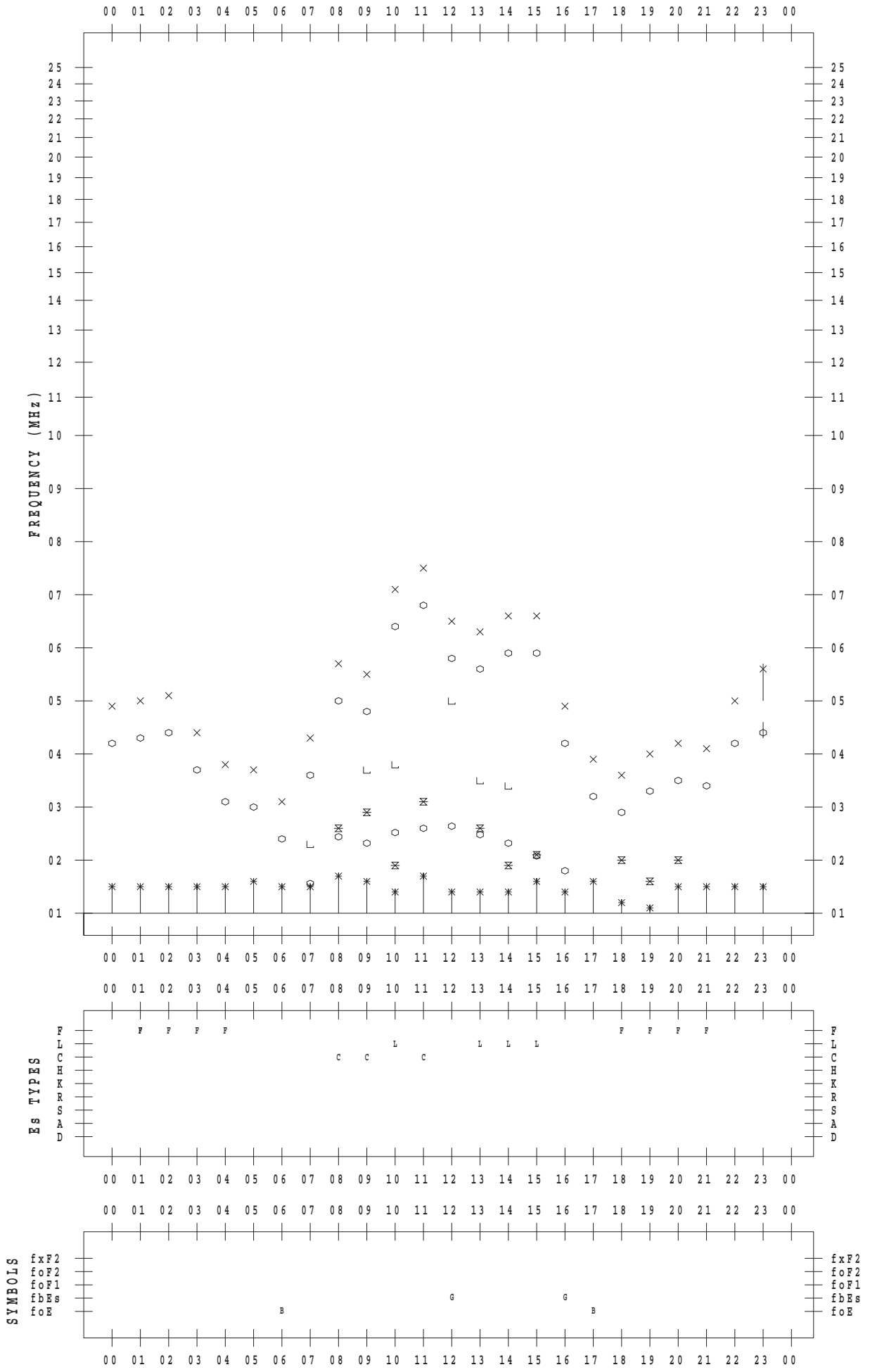
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/25

135 °E MEAN TIME



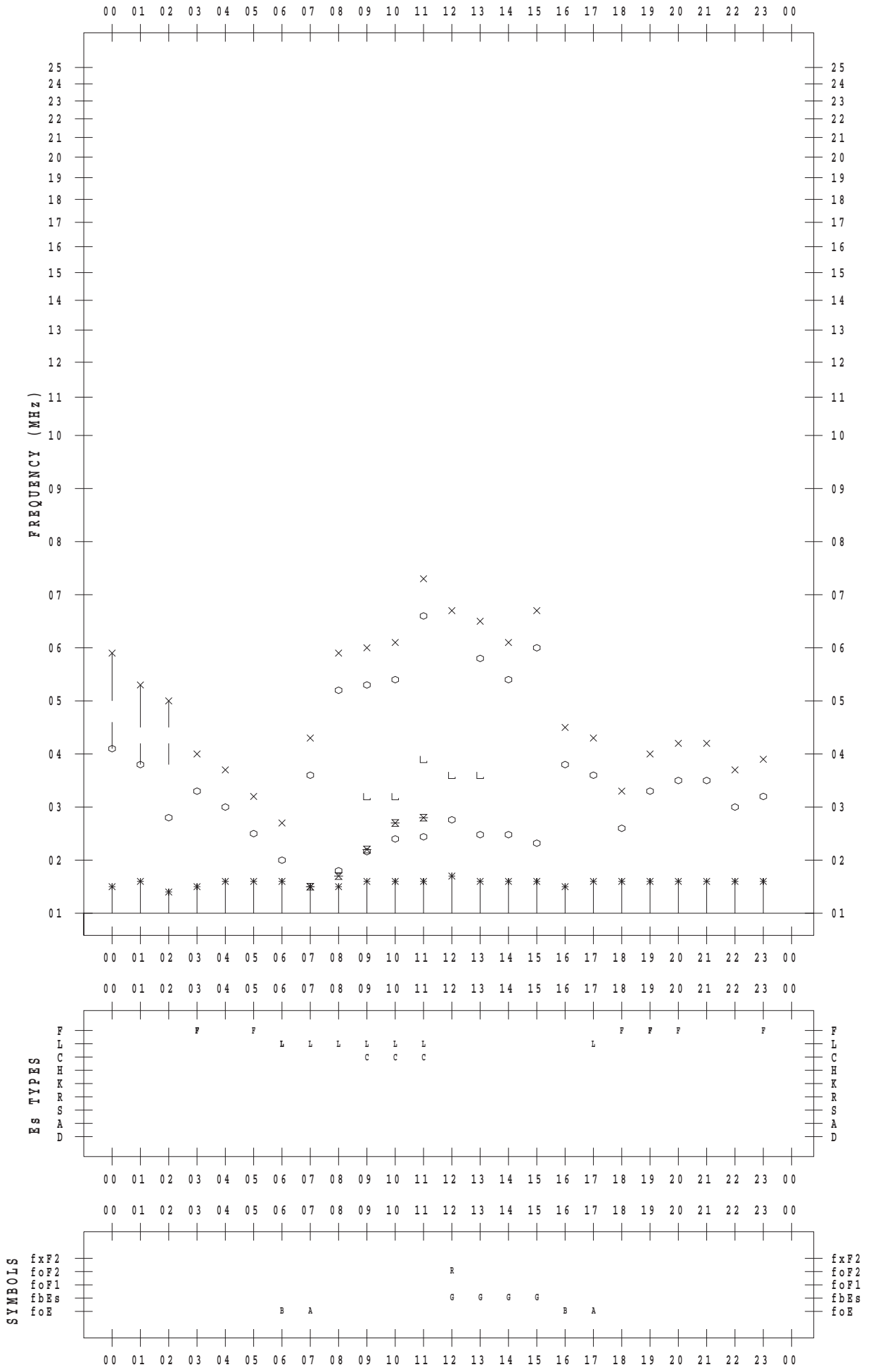
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/26

135 °E MEAN TIME



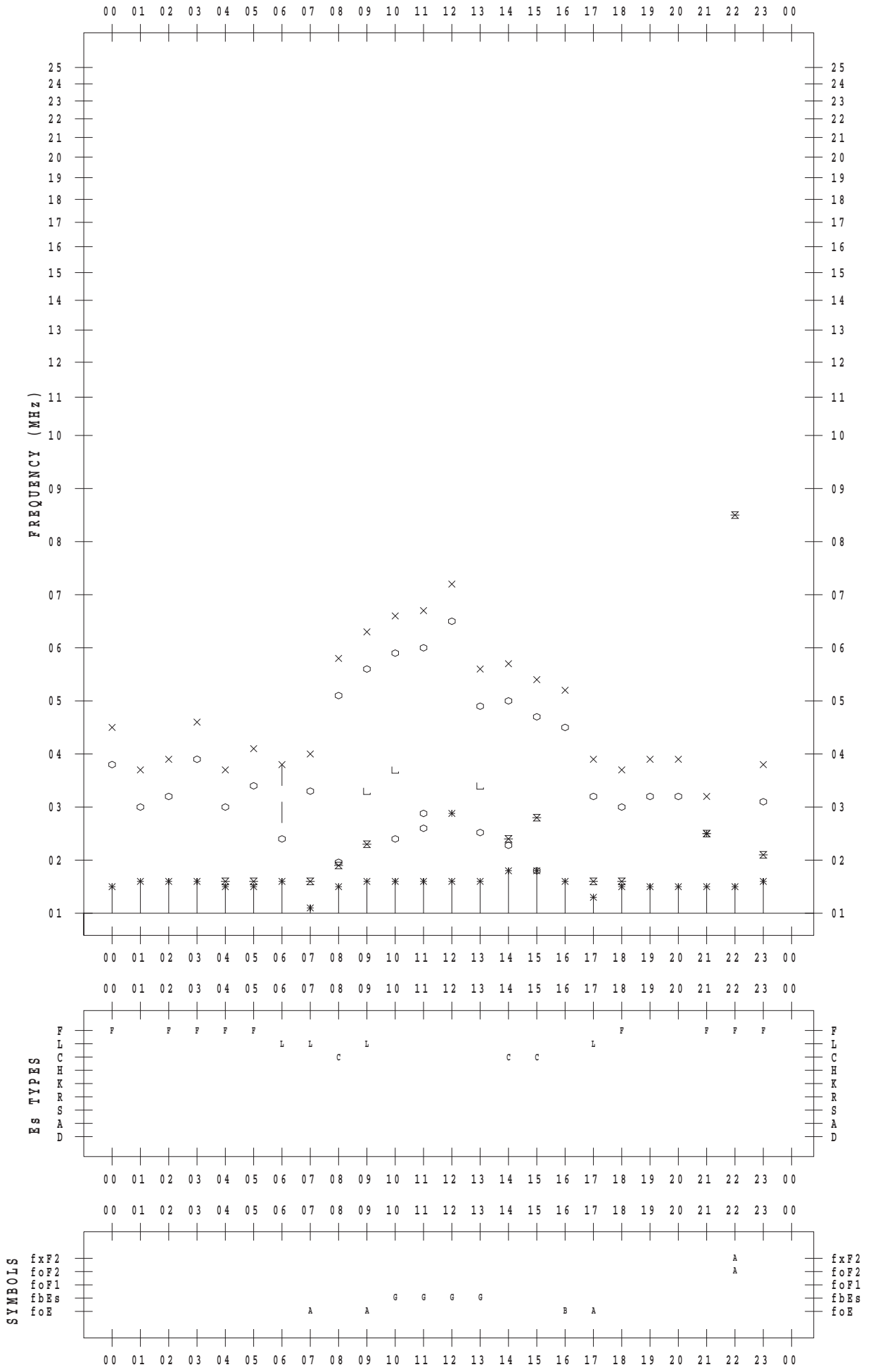
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/27

135 °E MEAN TIME



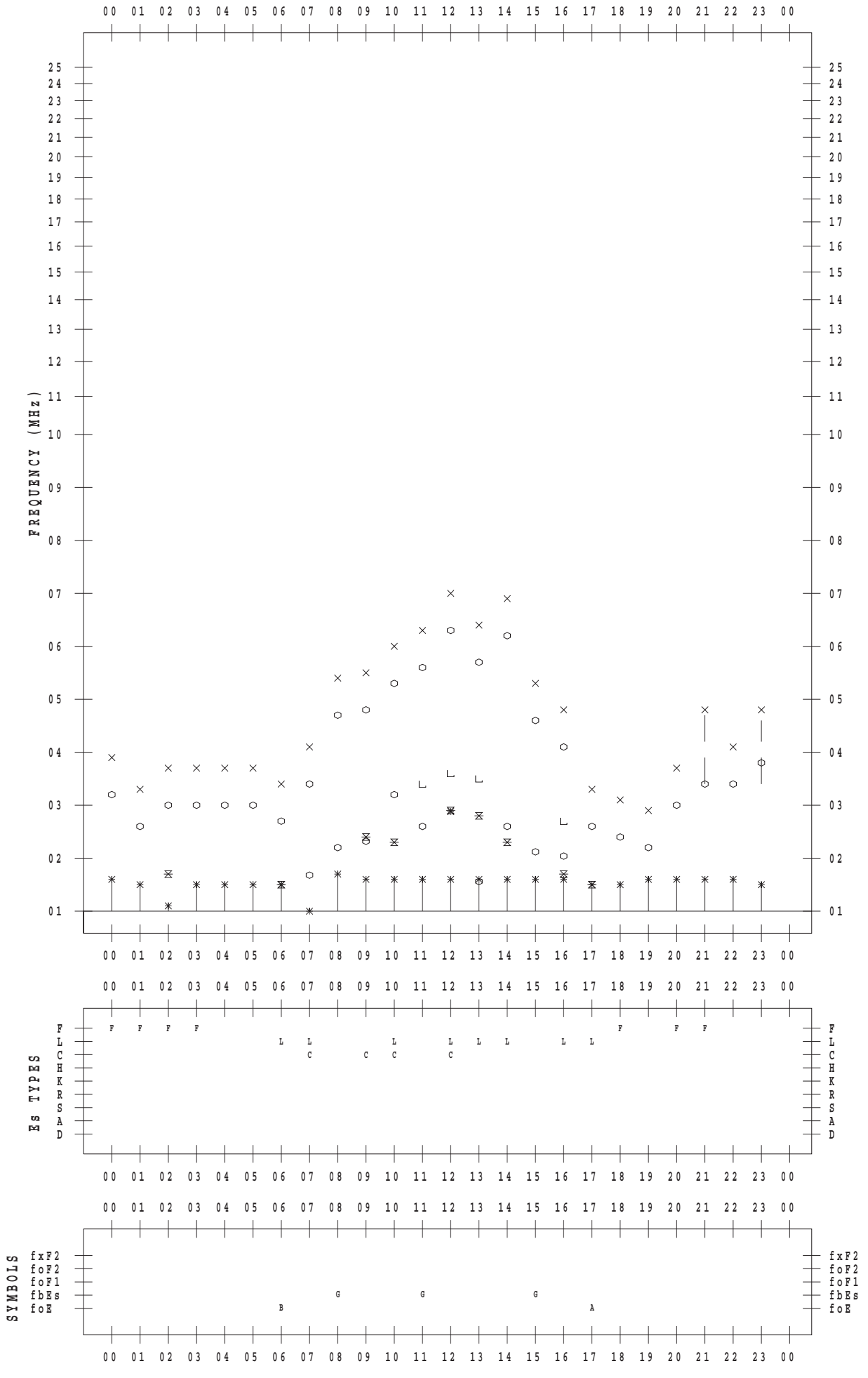
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/28

135 °E MEAN TIME



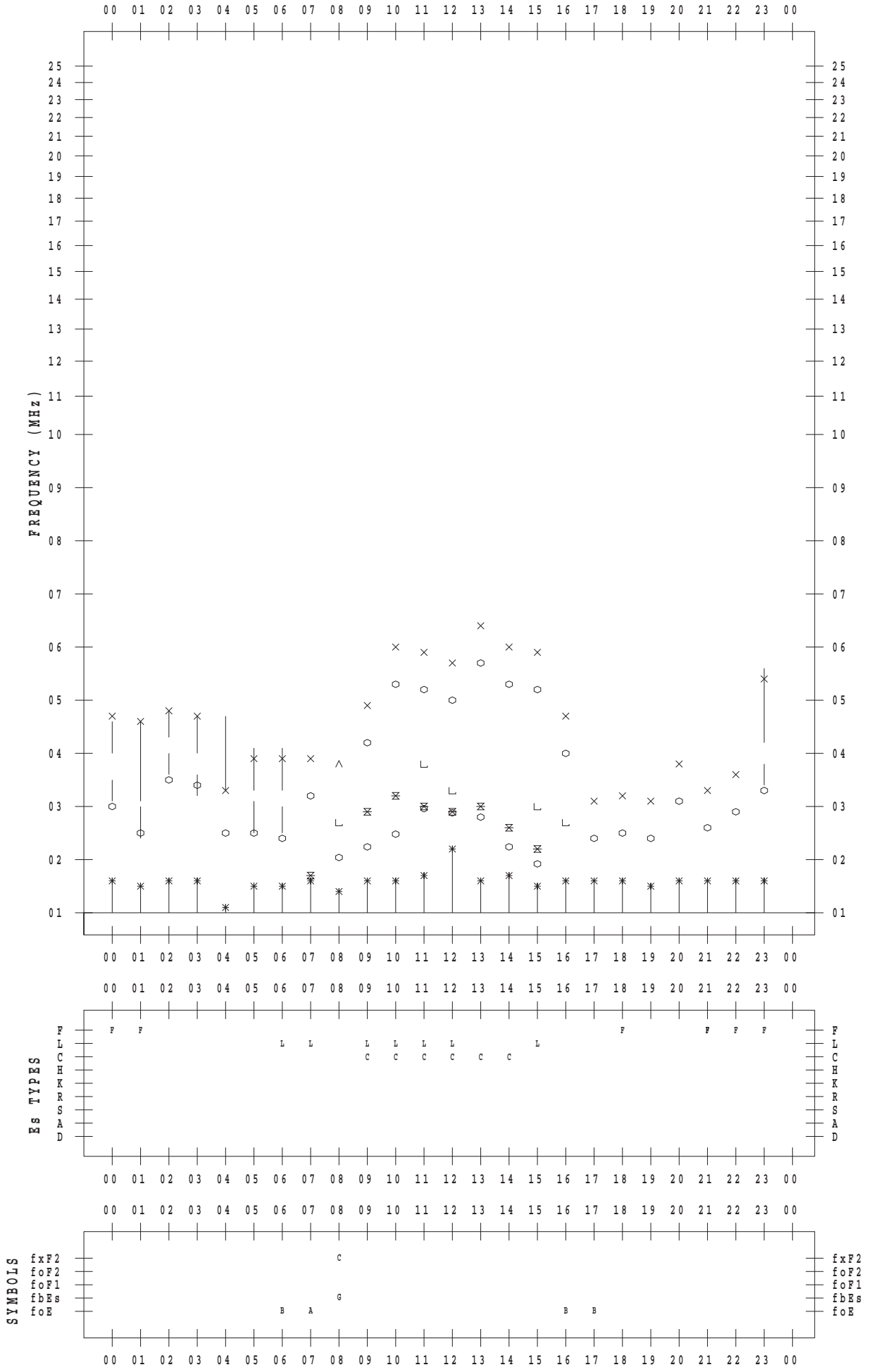
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/29

135 °E MEAN TIME



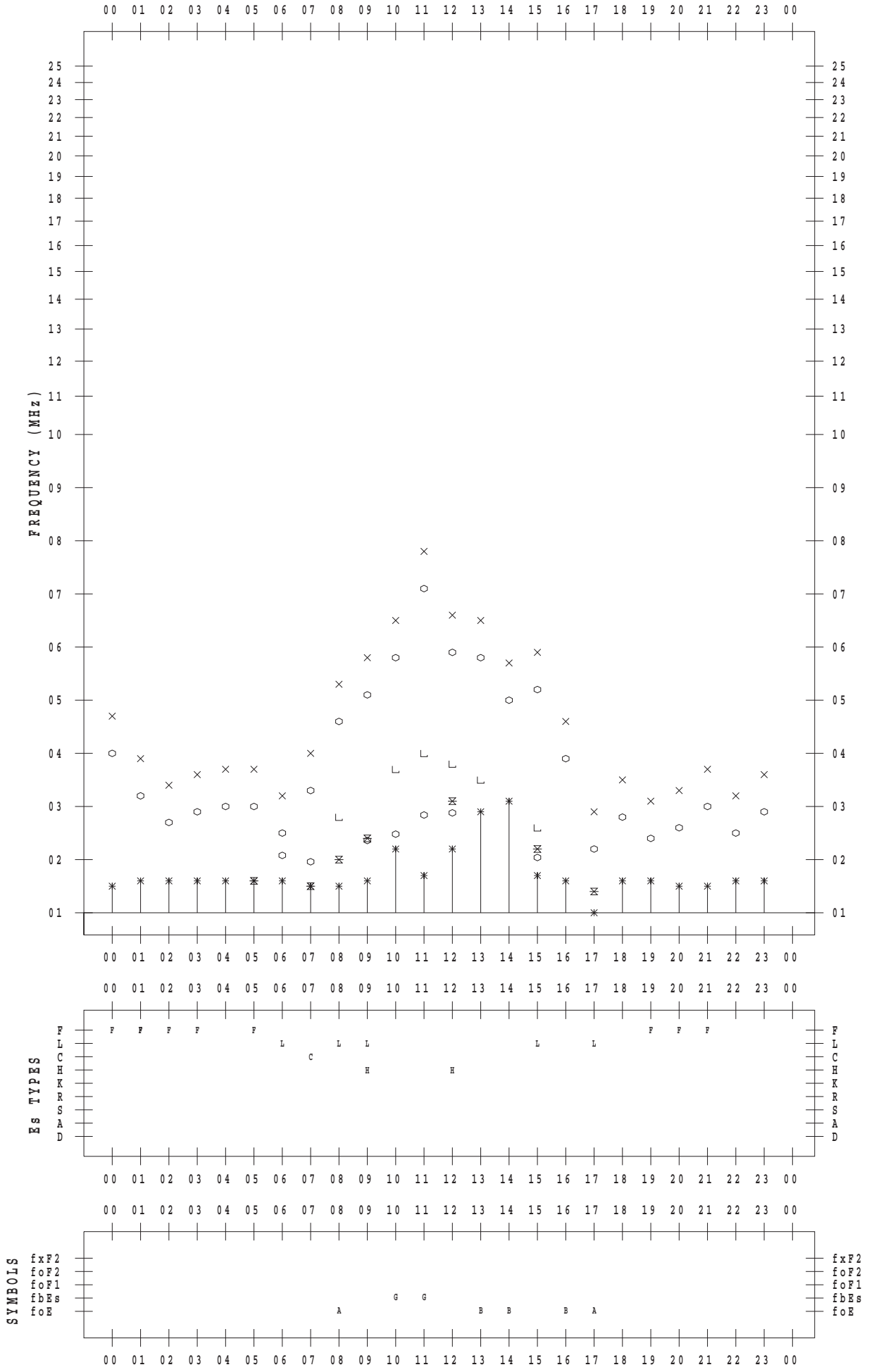
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/30

135 °E MEAN TIME



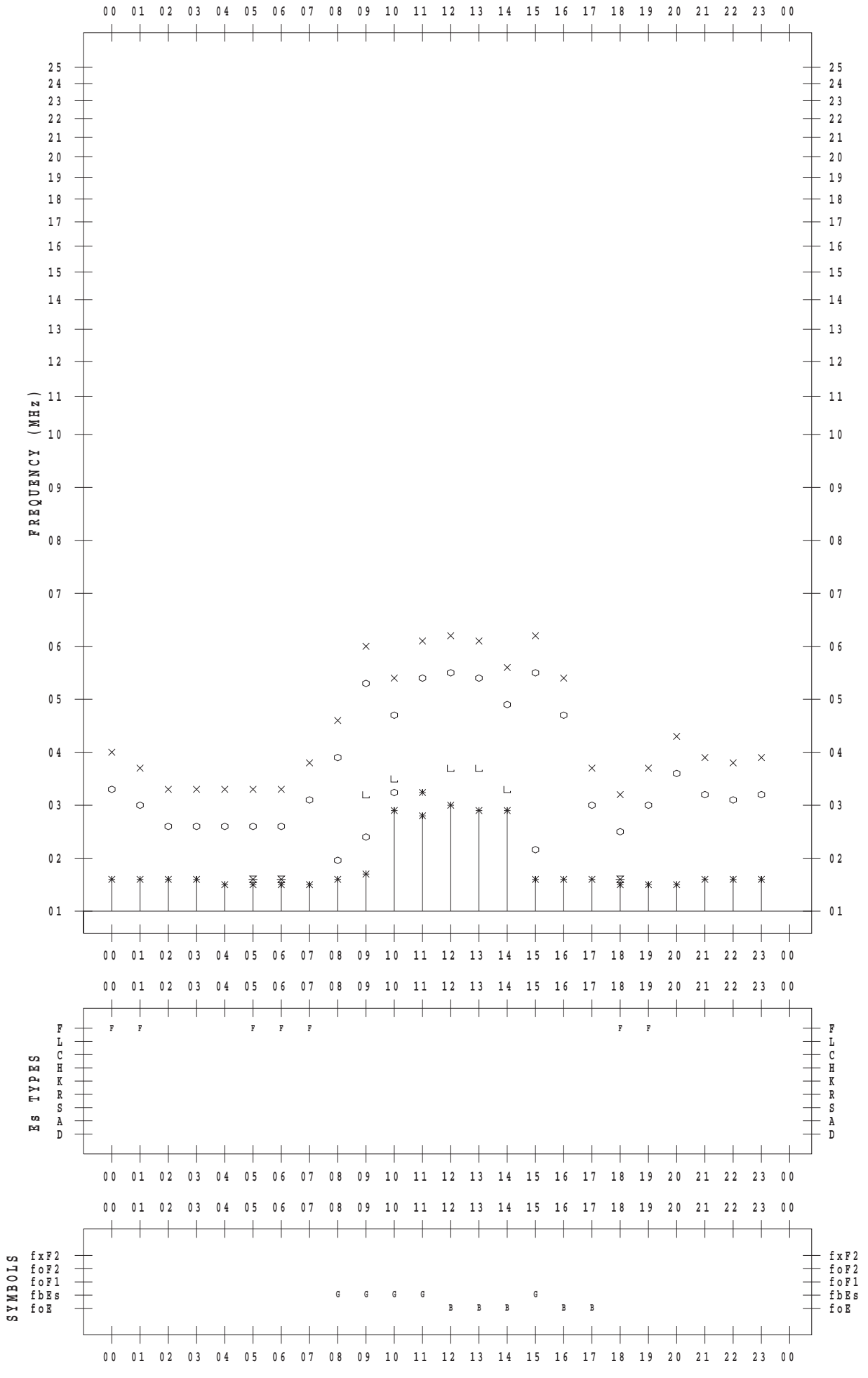
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2016/12/31

135 °E MEAN TIME



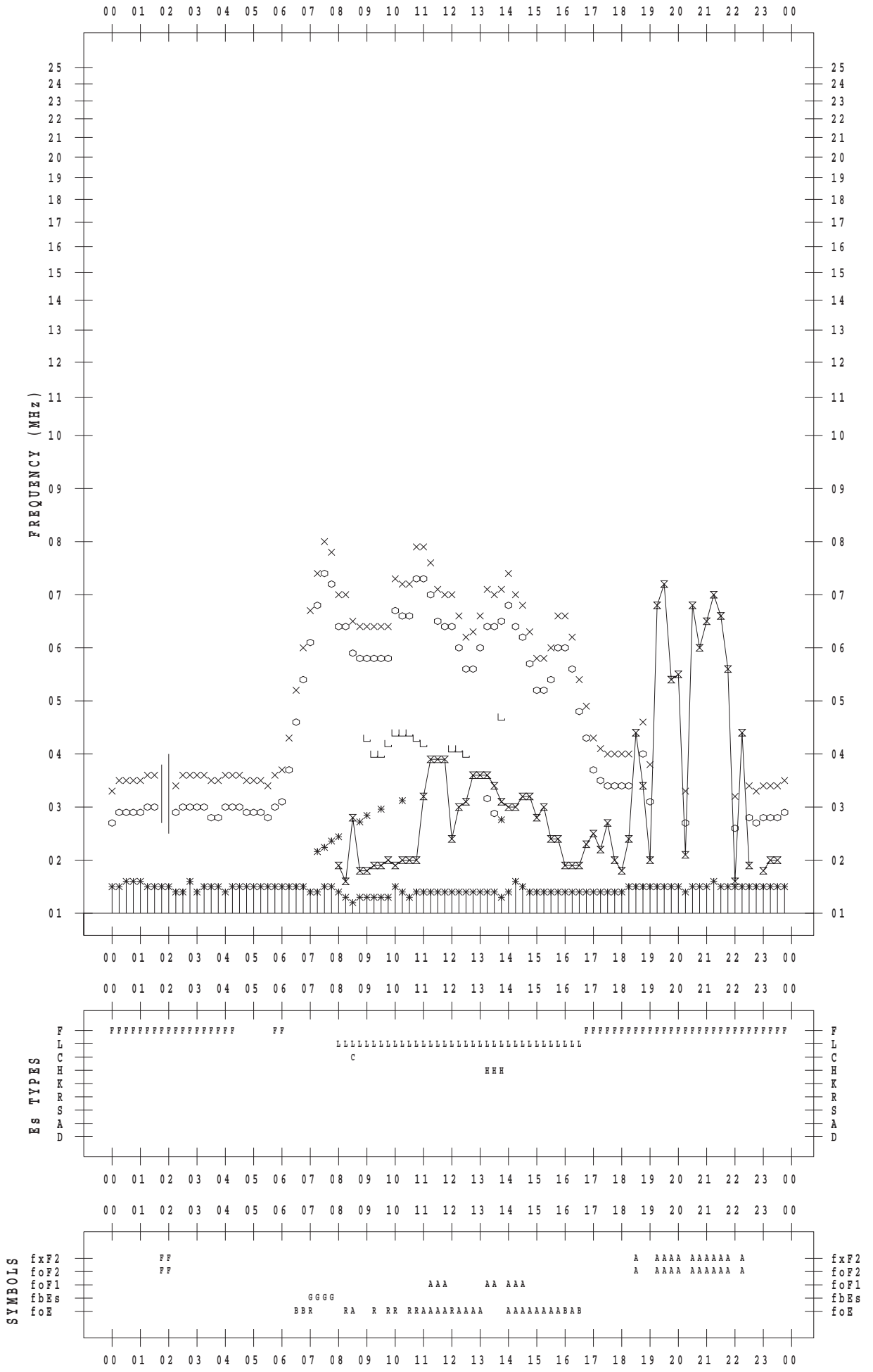
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 1

135 °E MEAN TIME



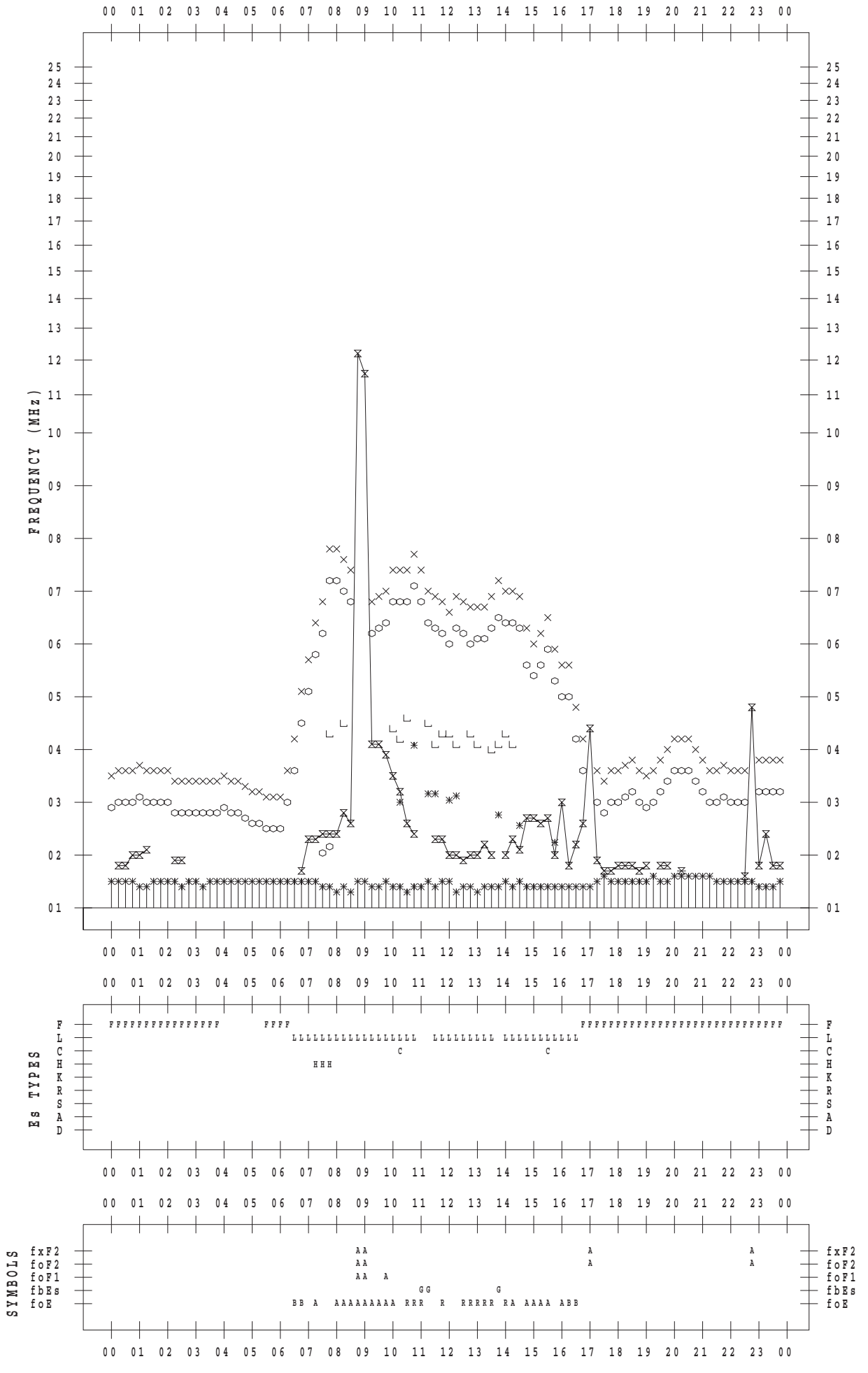
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 2

135 °E MEAN TIME



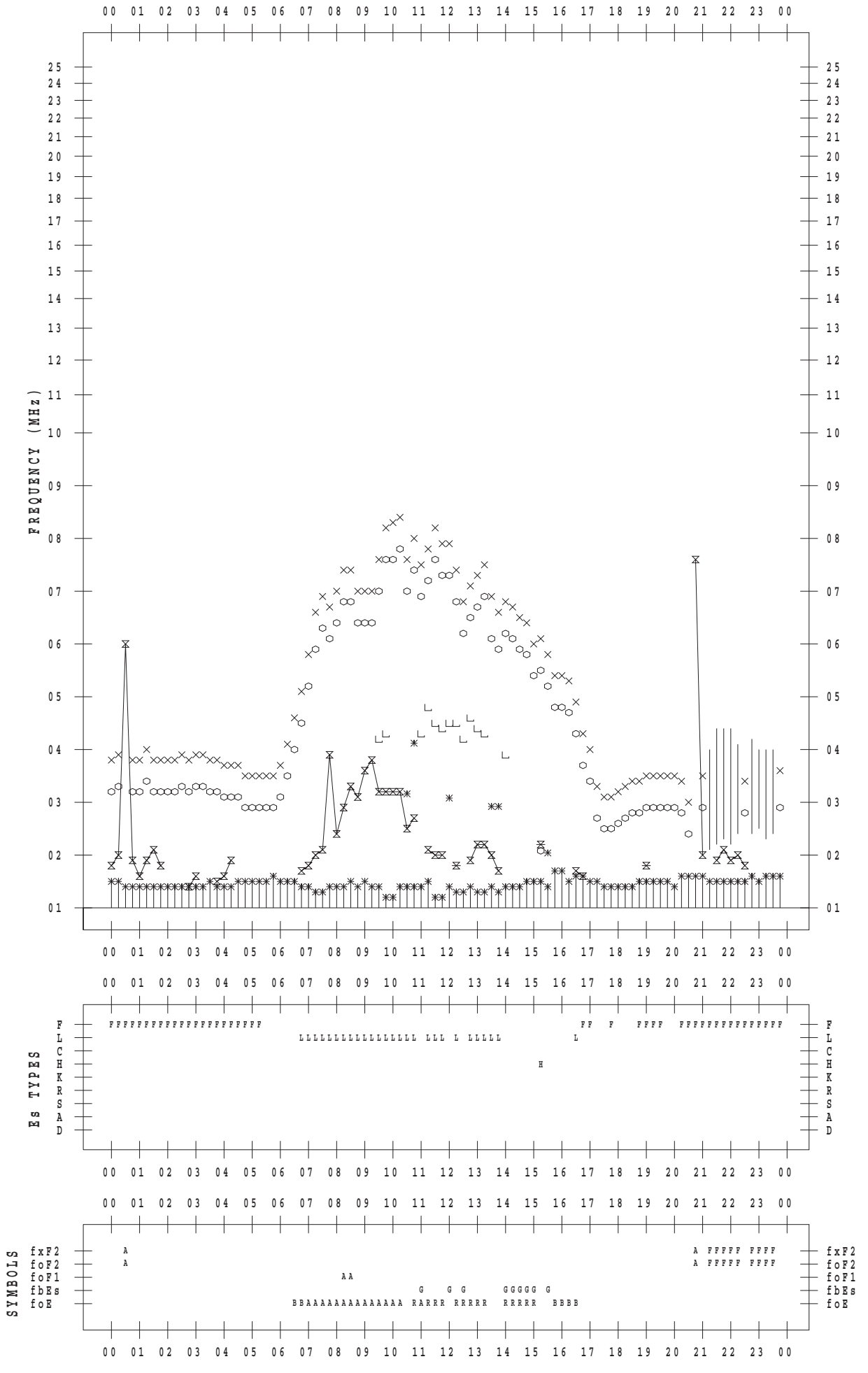
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 3

135 °E MEAN TIME



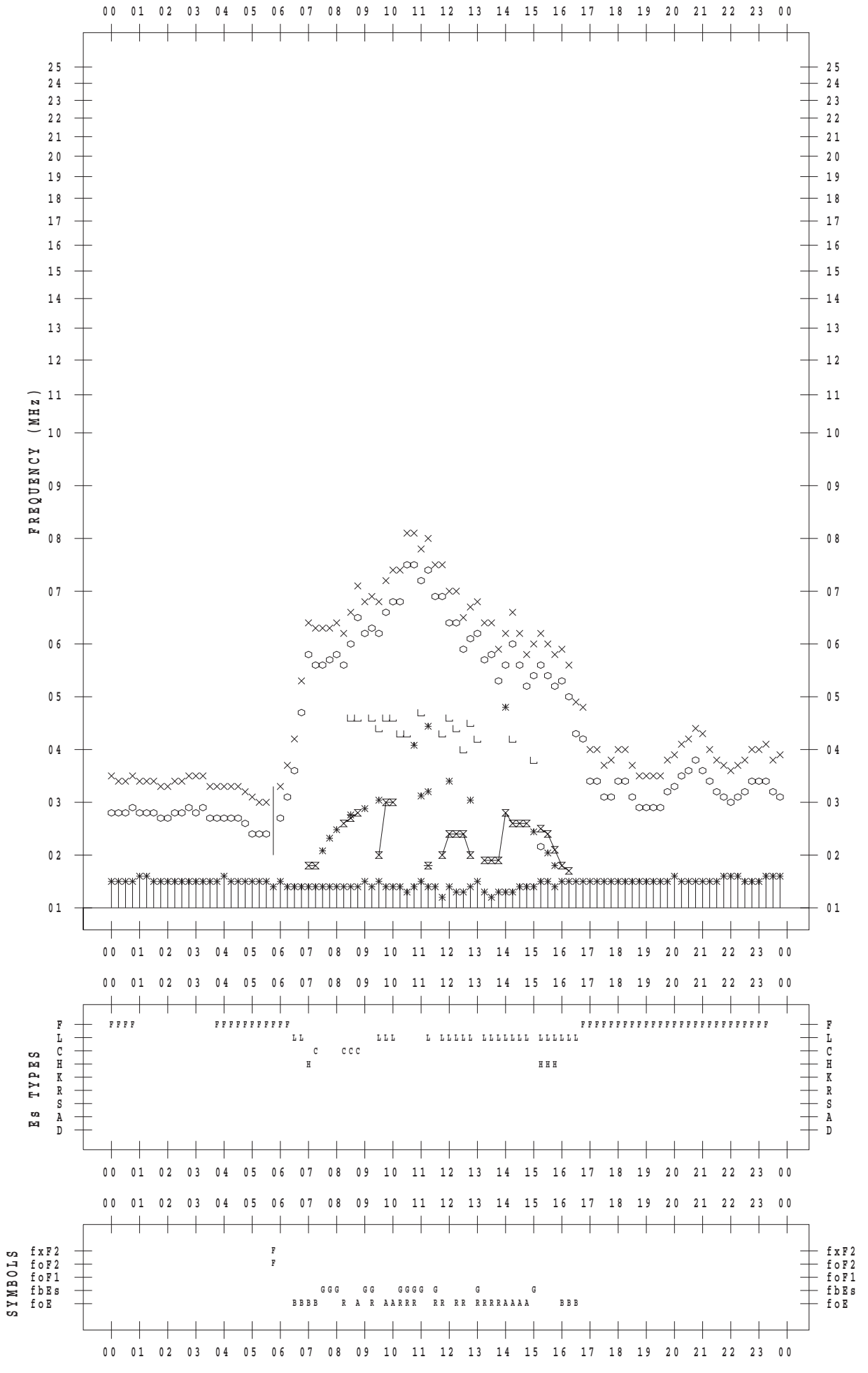
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 4

135 °E MEAN TIME



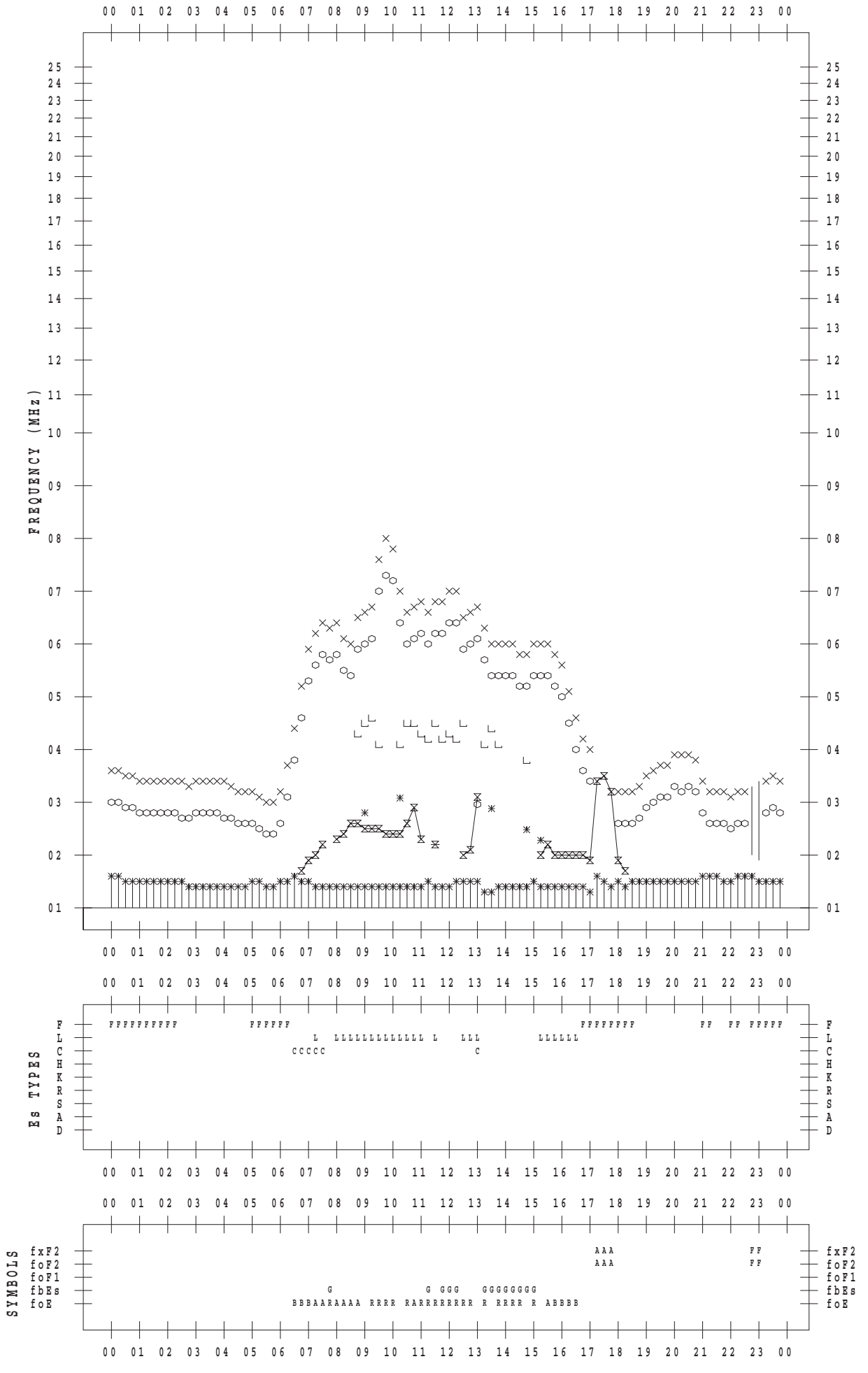
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 5

135 °E MEAN TIME



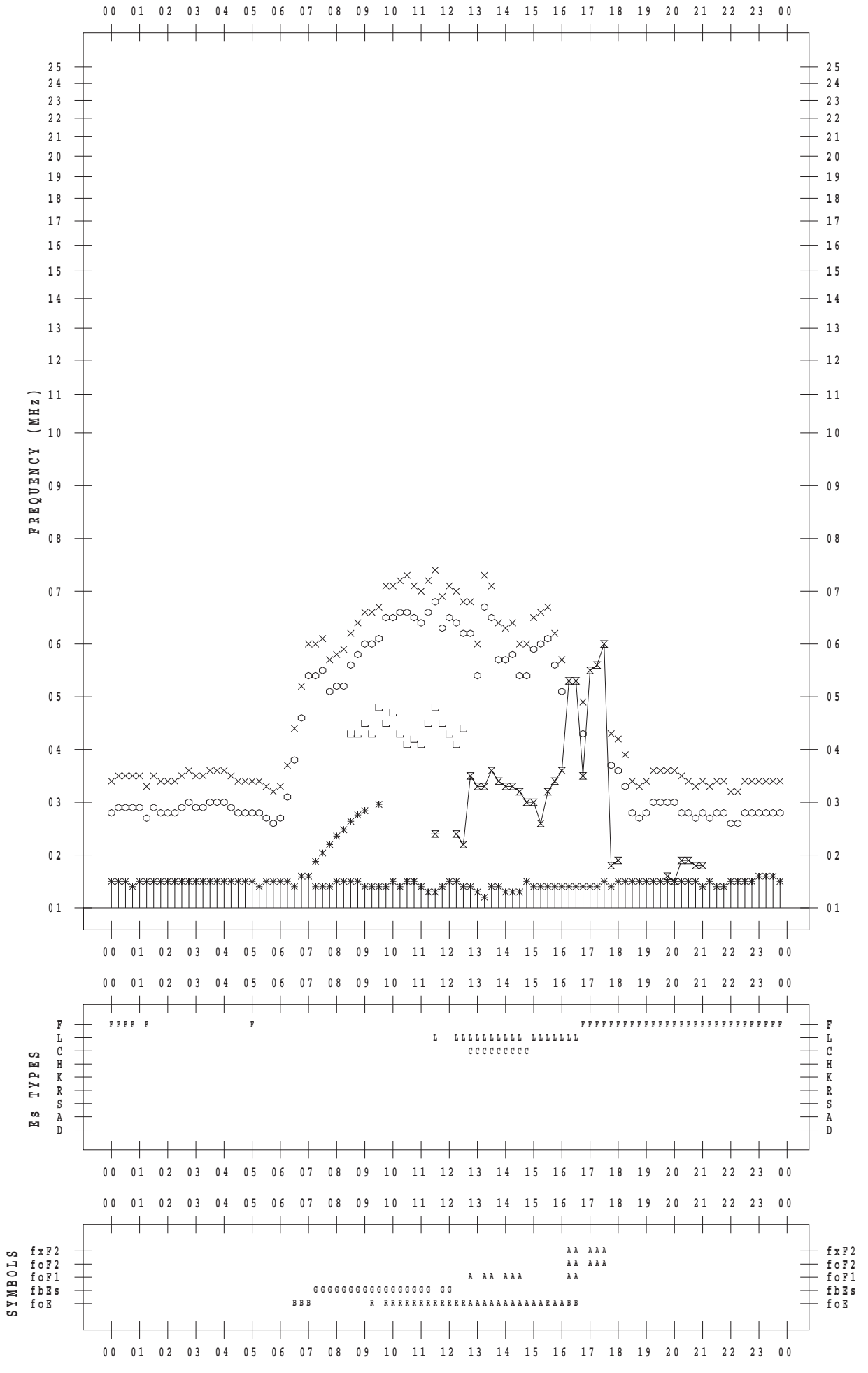
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 6

135 °E MEAN TIME



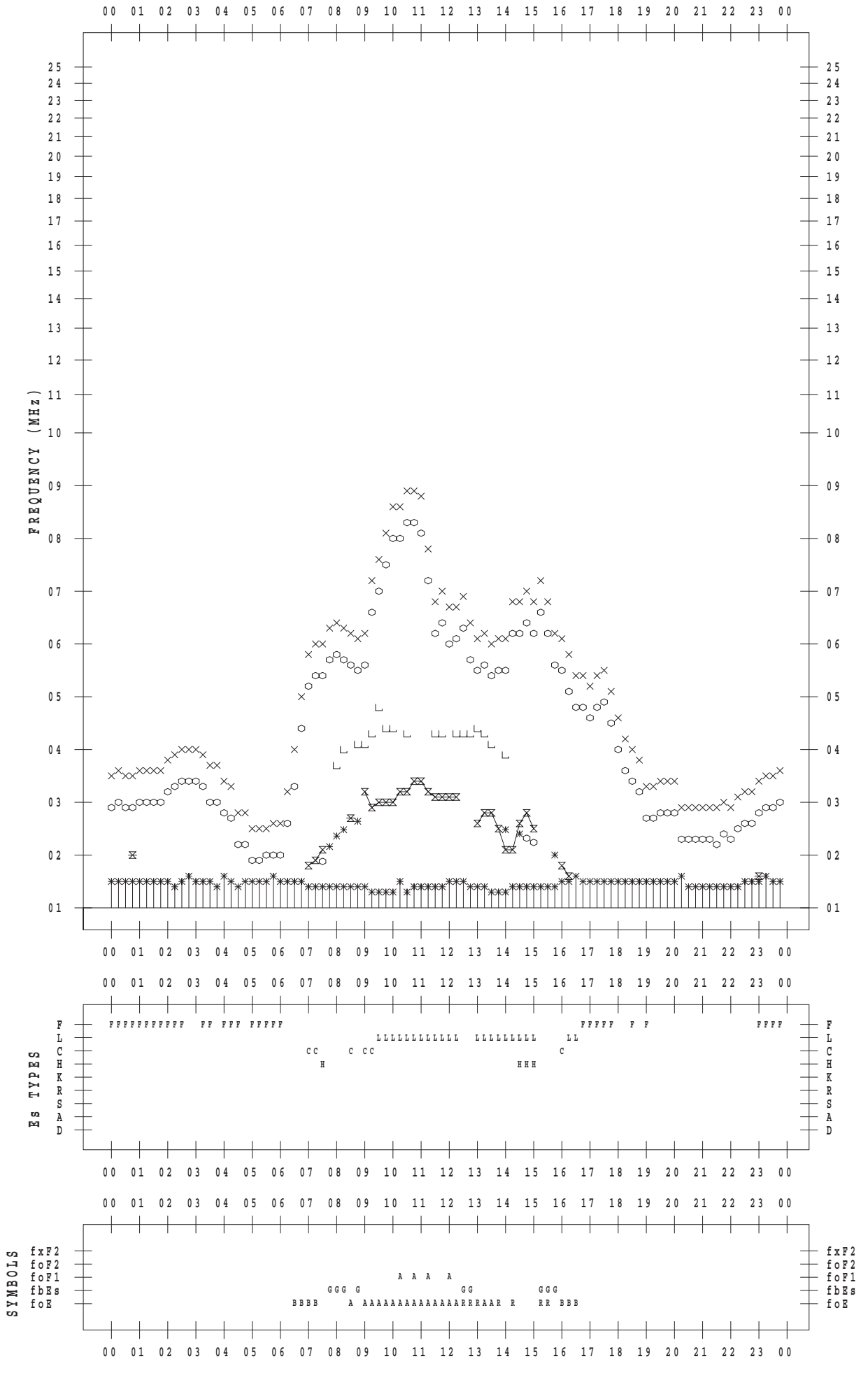
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 7

135 °E MEAN TIME



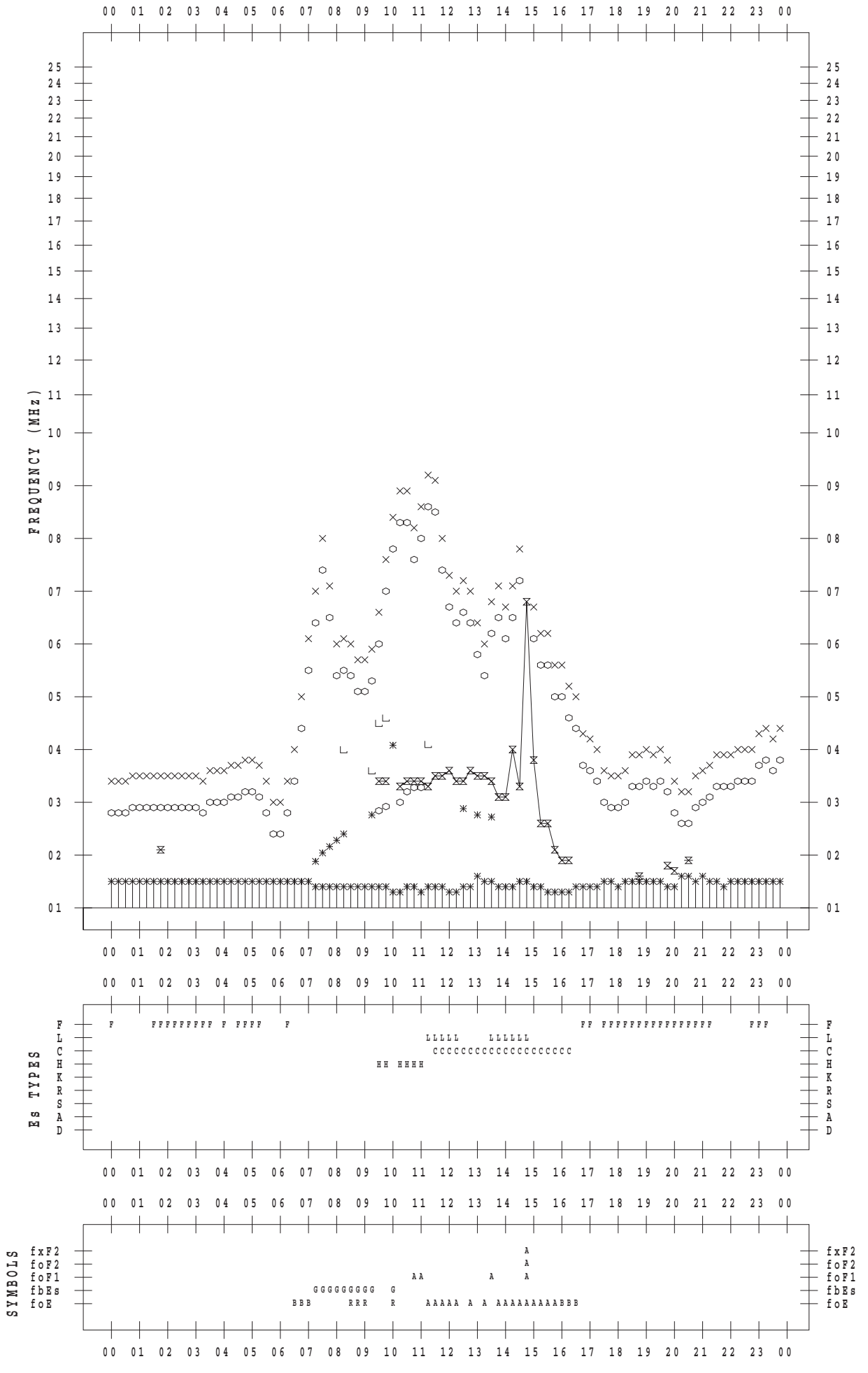
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 8

135 °E MEAN TIME



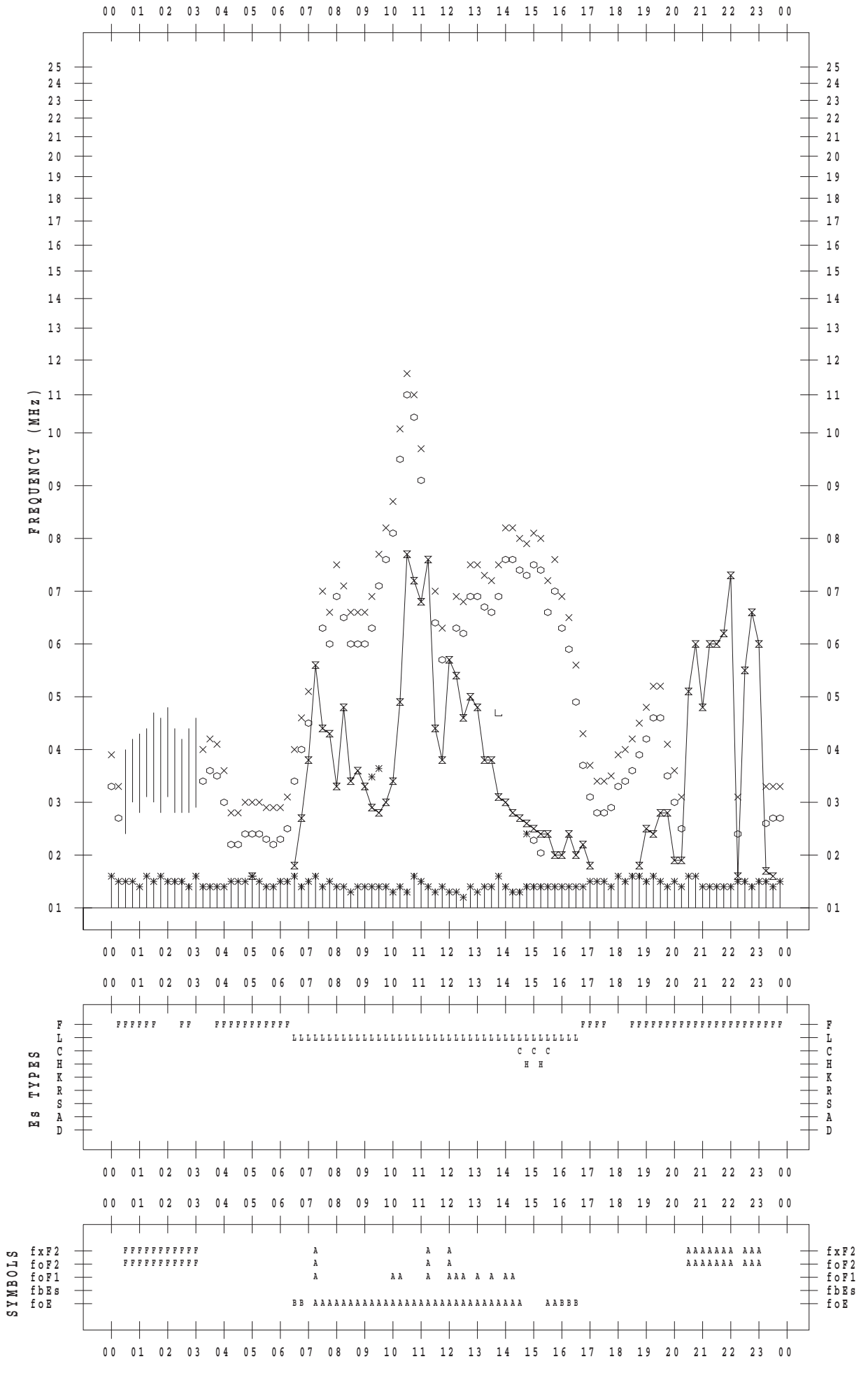
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/ 9

135 °E MEAN TIME



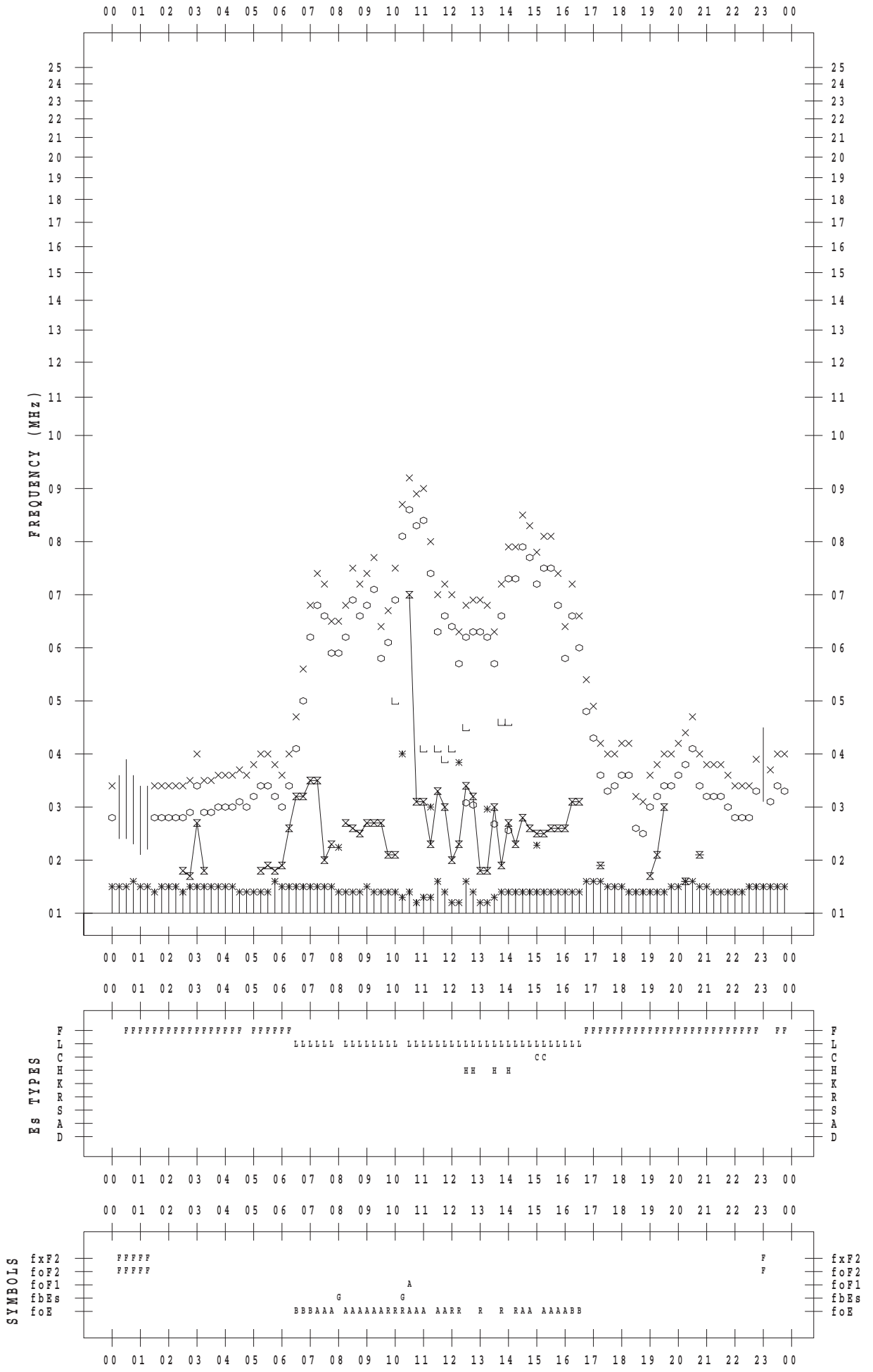
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/10

135 °E MEAN TIME



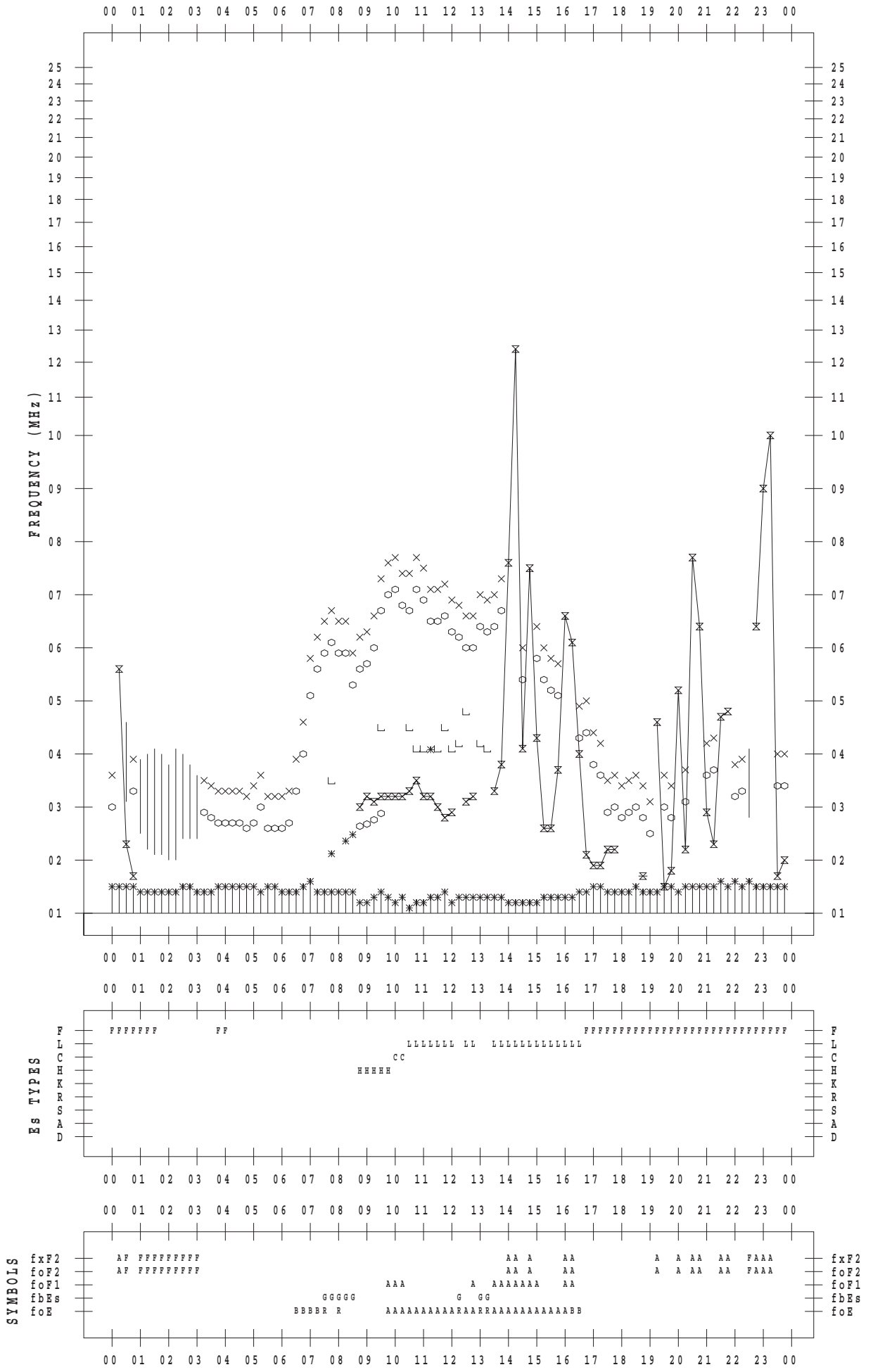
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/11

135 °E MEAN TIME



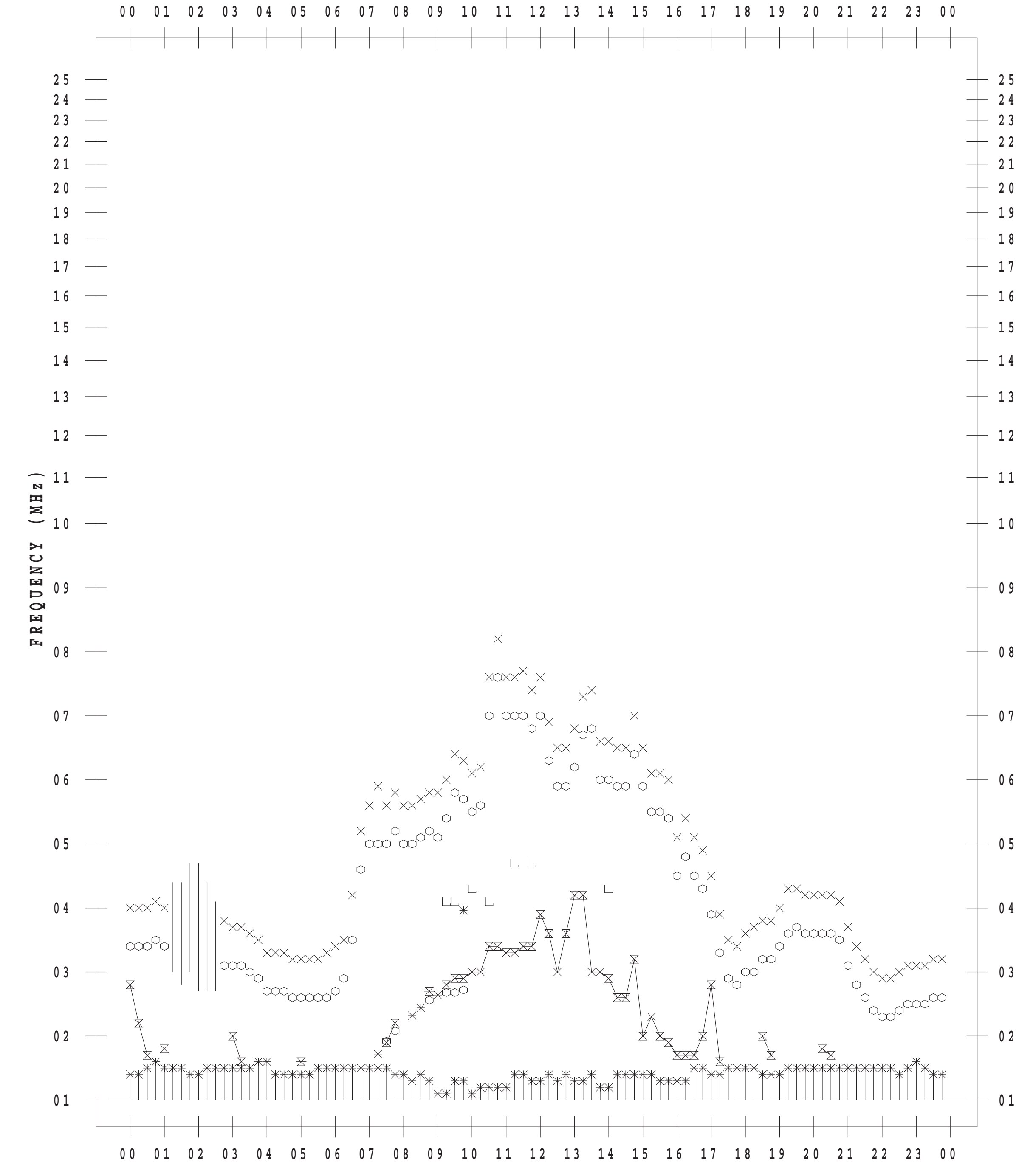
f-PLOT DATA

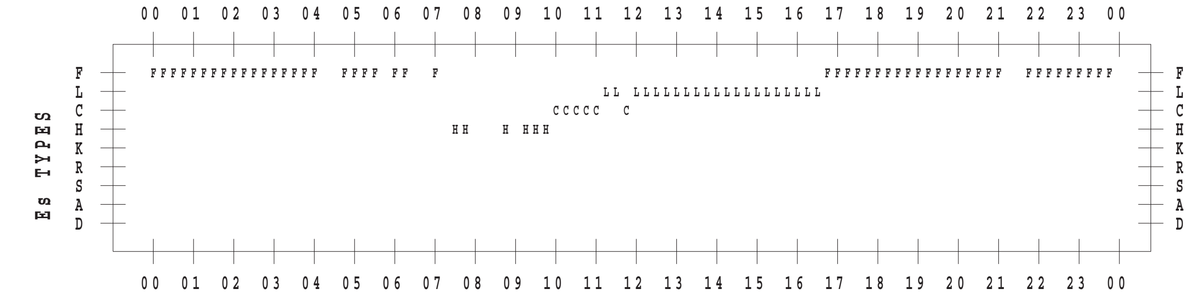
SCALER : I.NISHIMUTA

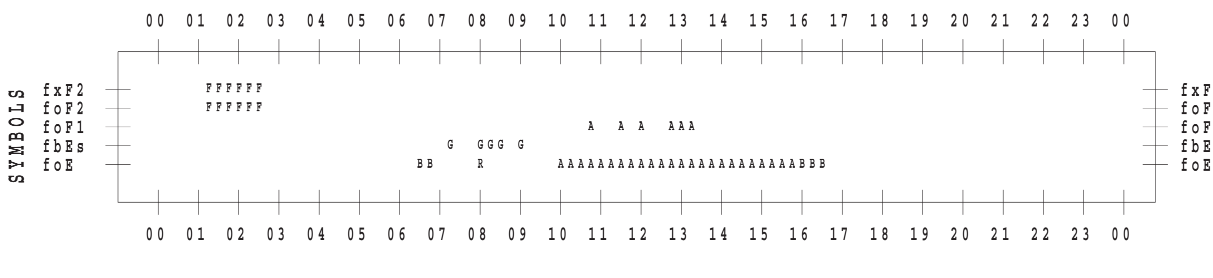
STATION : Kokubunji

DATE : 2016/12/12

135 °E MEAN TIME







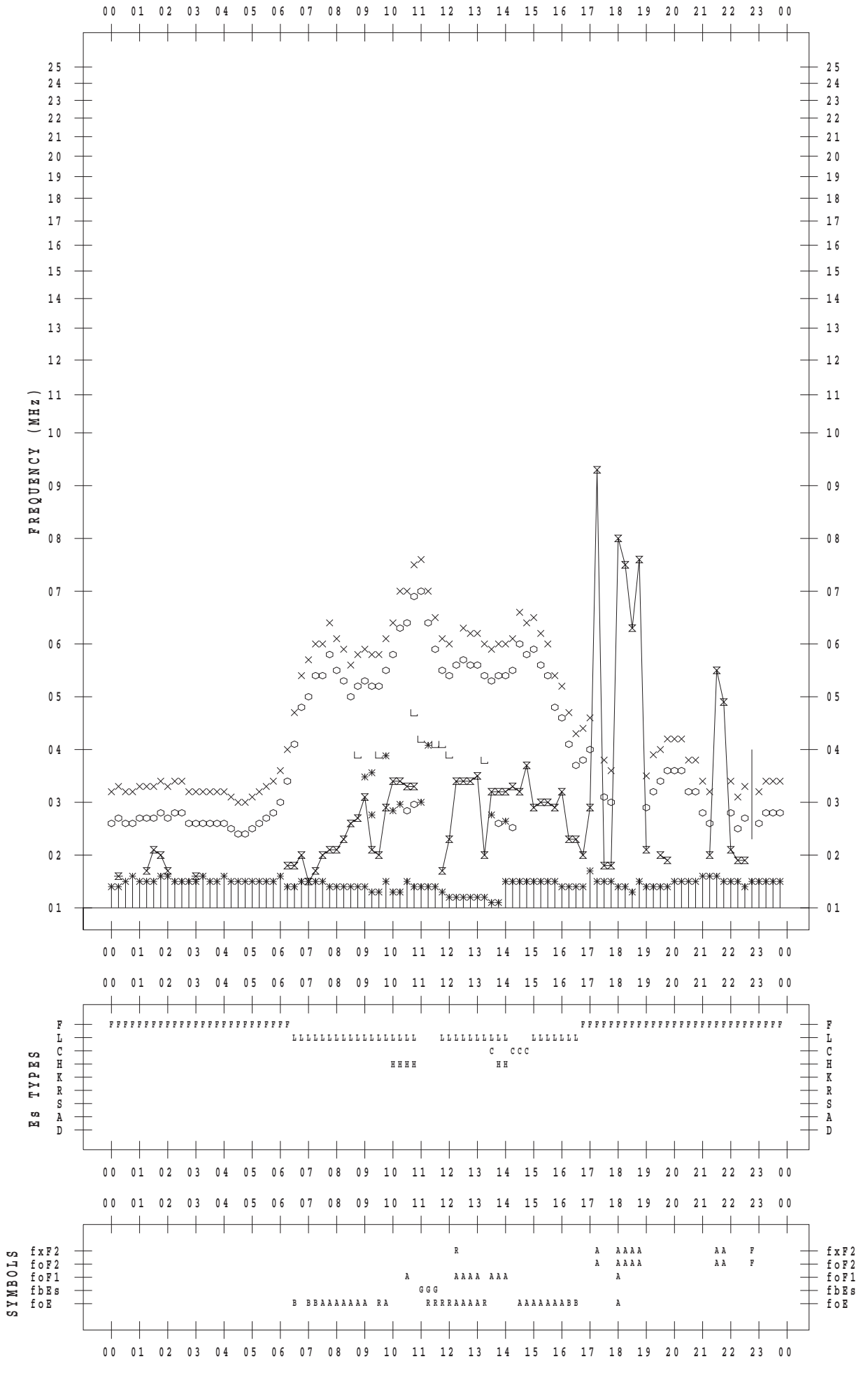
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/13

135 °E MEAN TIME



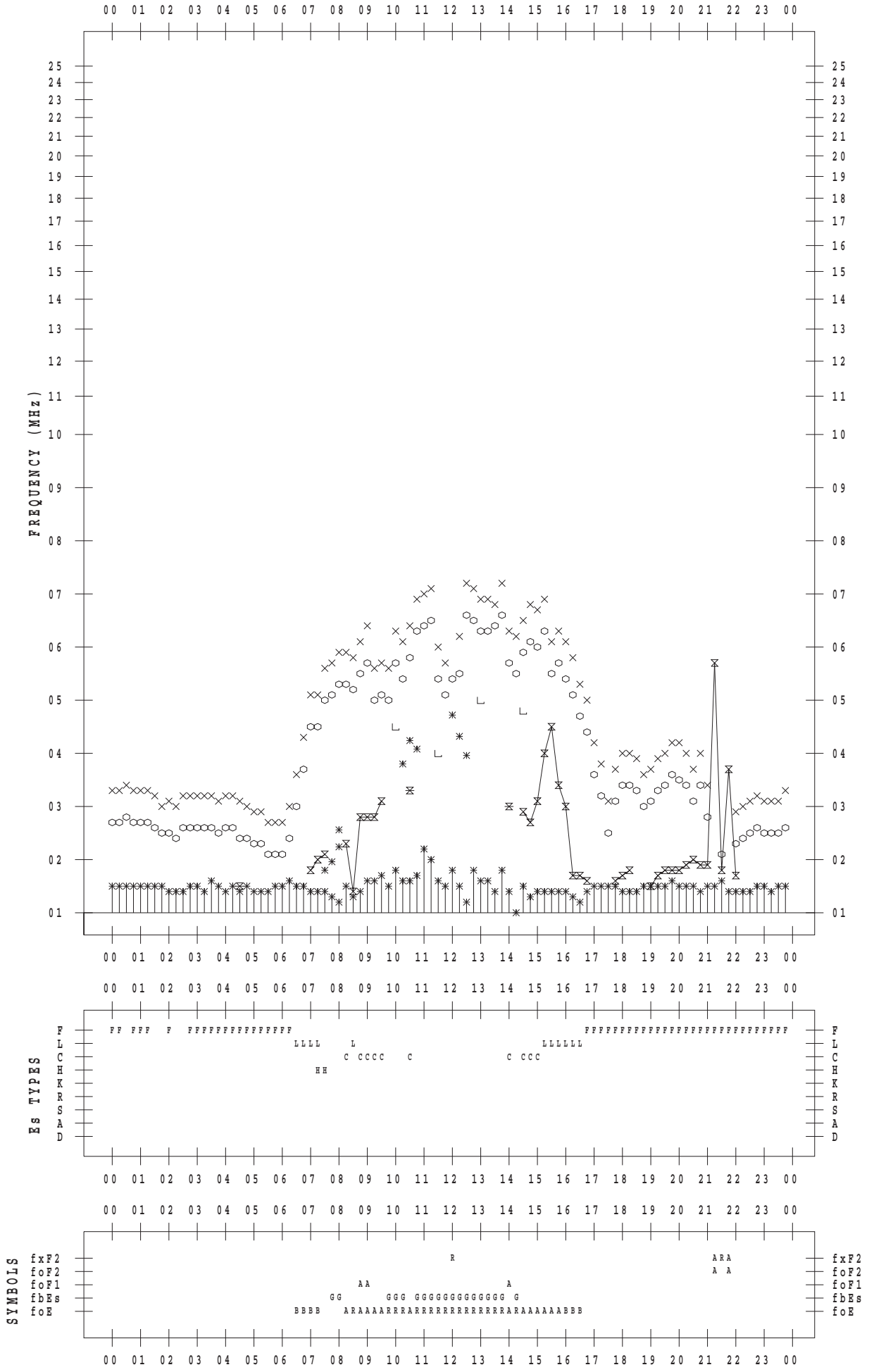
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/14

135 °E MEAN TIME



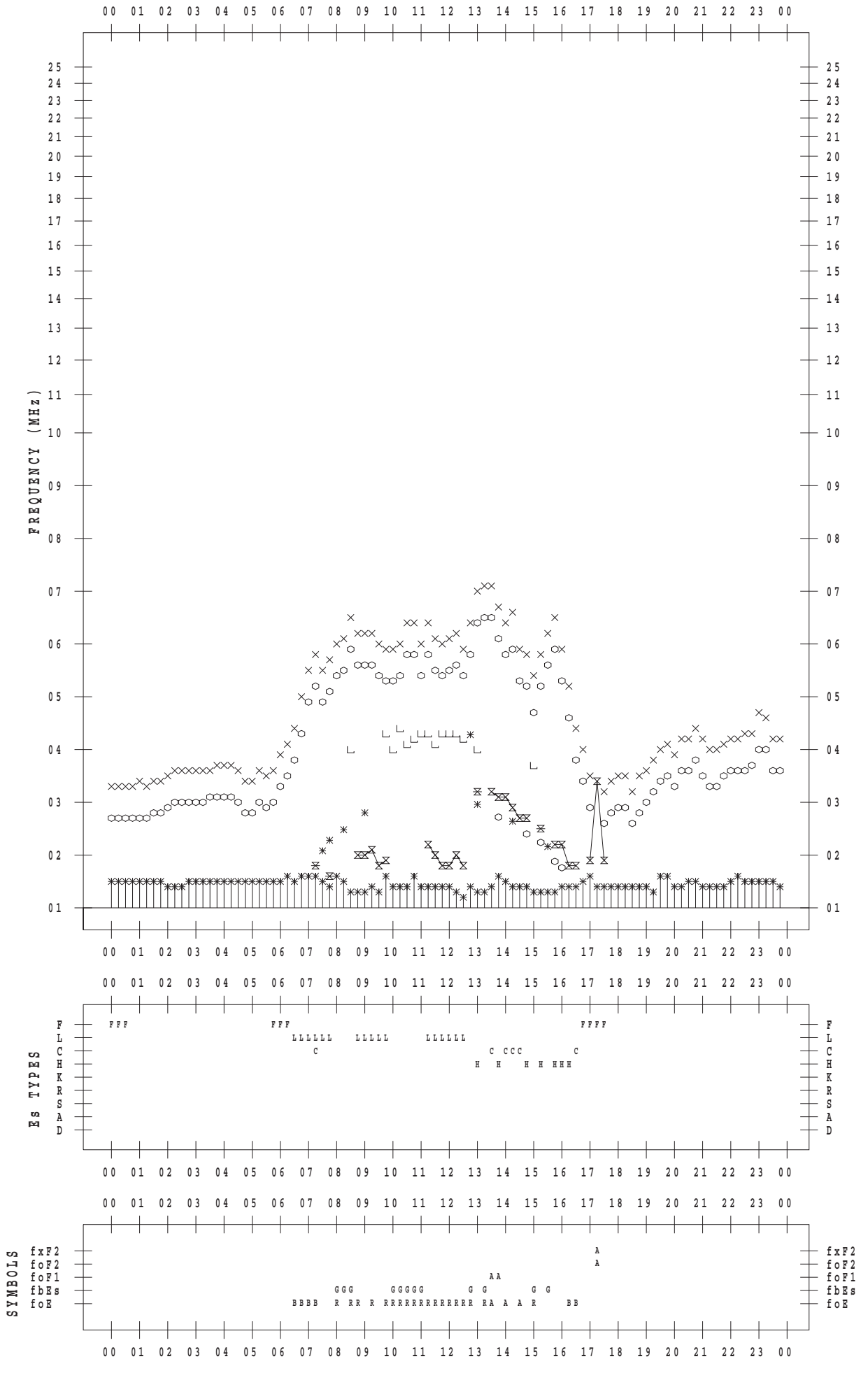
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/15

135 °E MEAN TIME



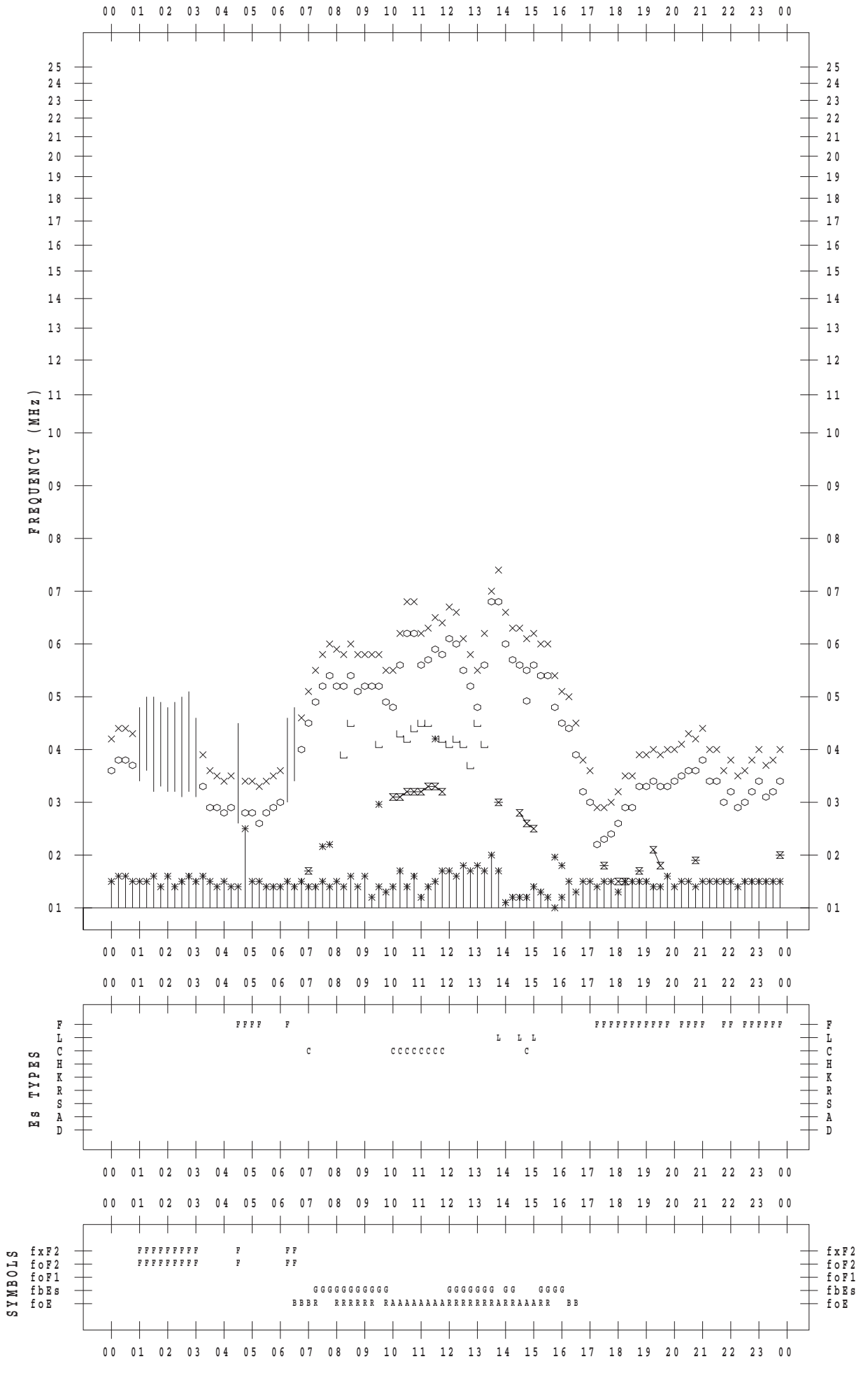
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/16

135 °E MEAN TIME



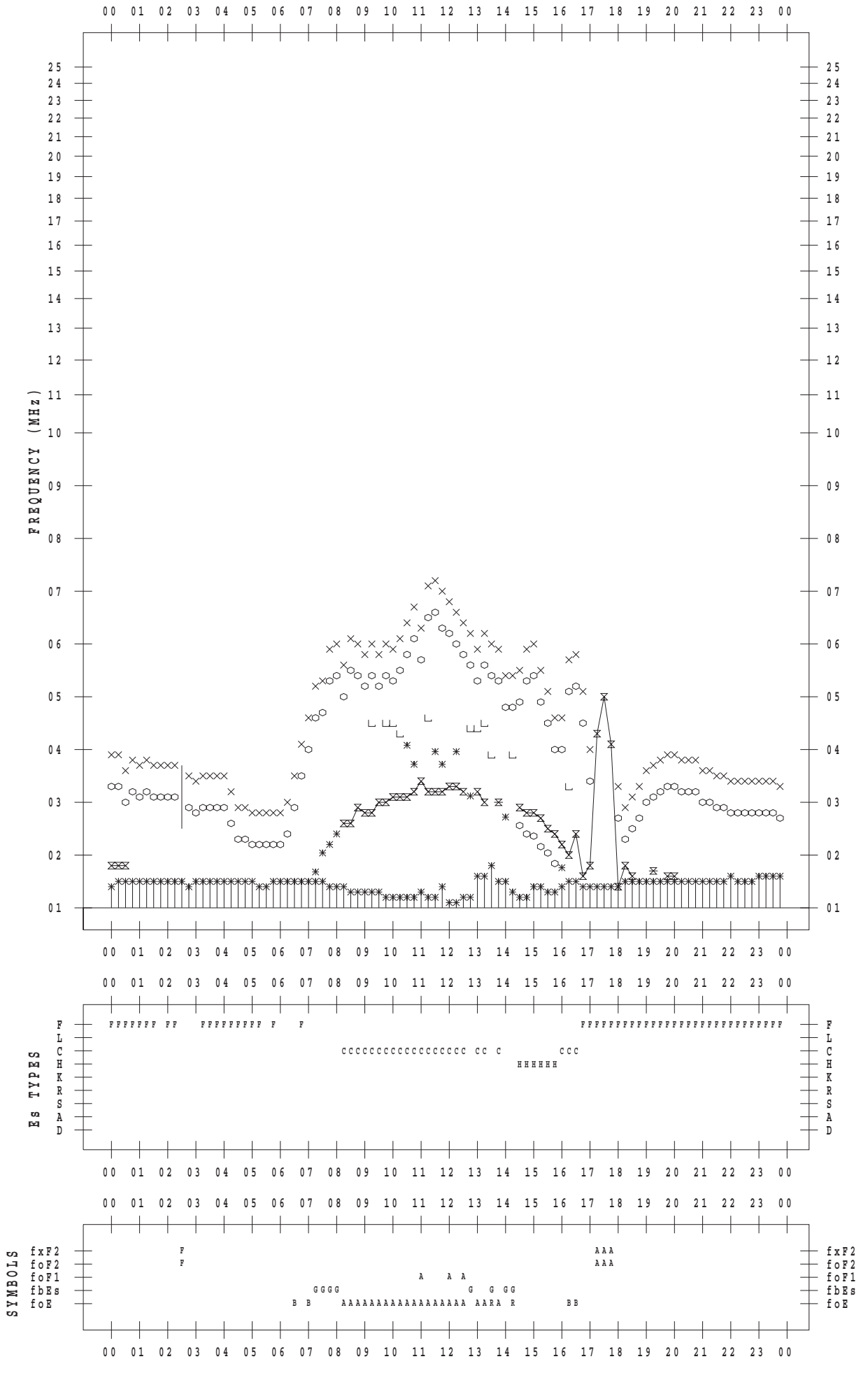
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/17

135 °E MEAN TIME



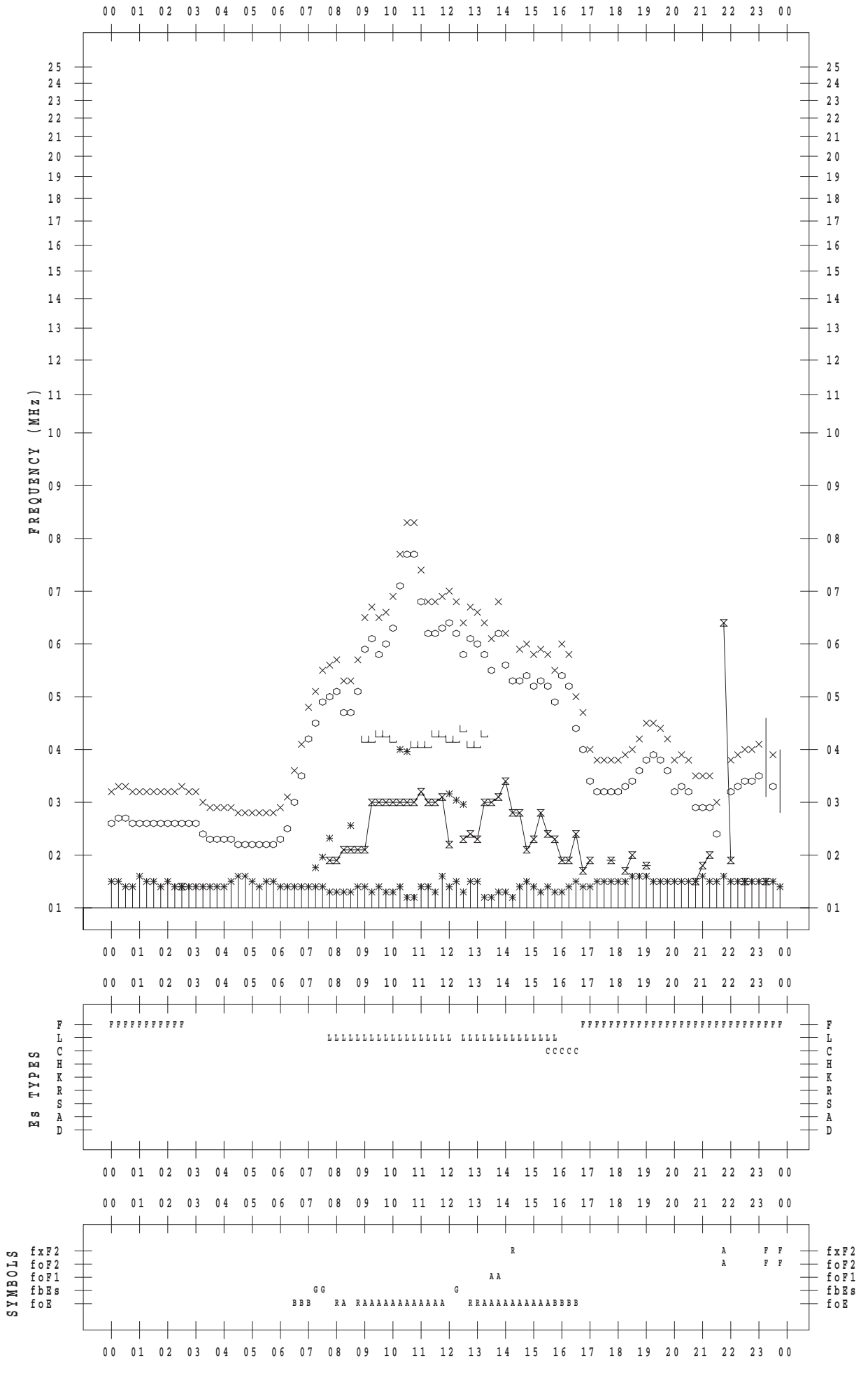
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/18

135 °E MEAN TIME



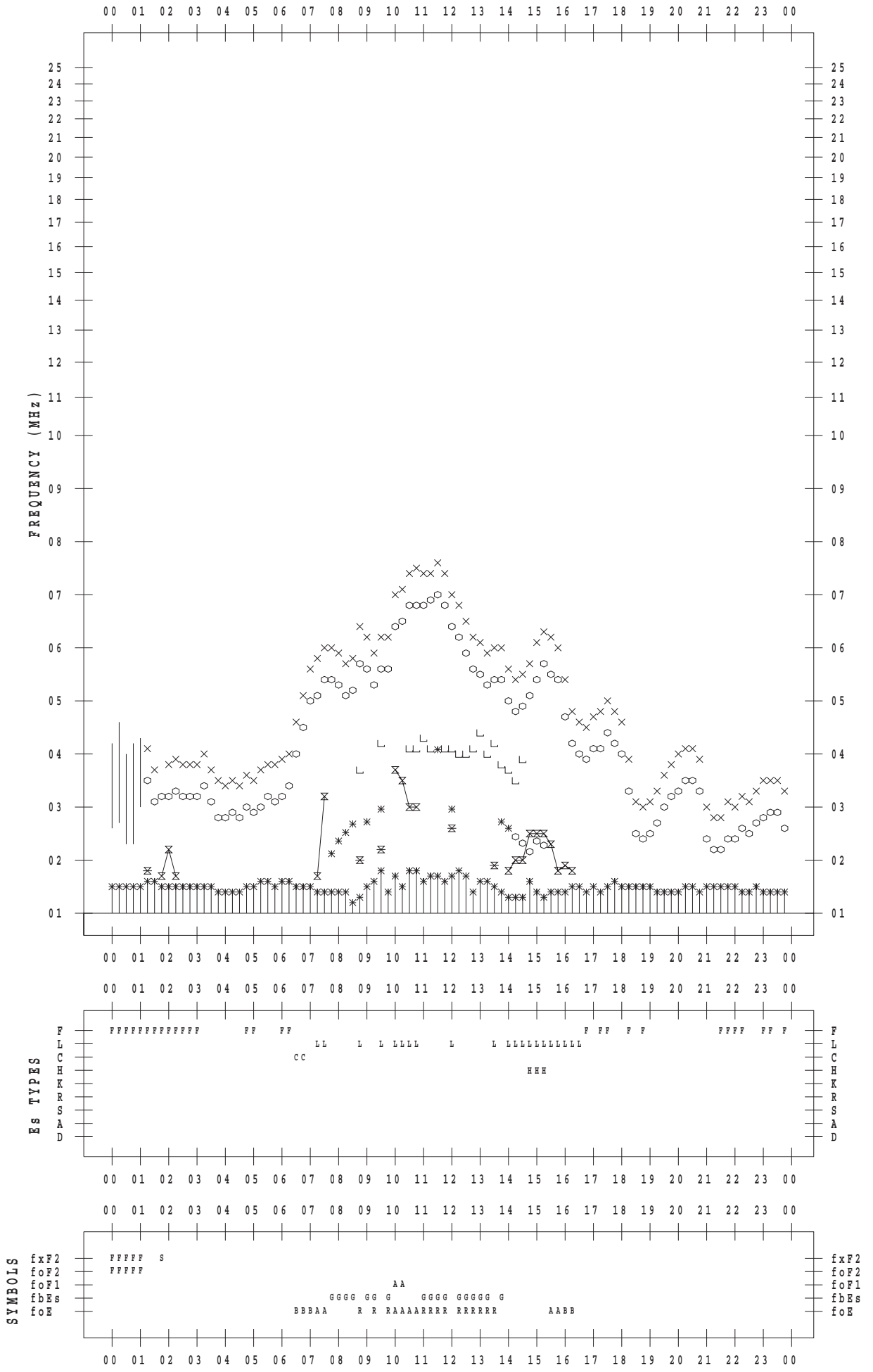
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/19

135 °E MEAN TIME



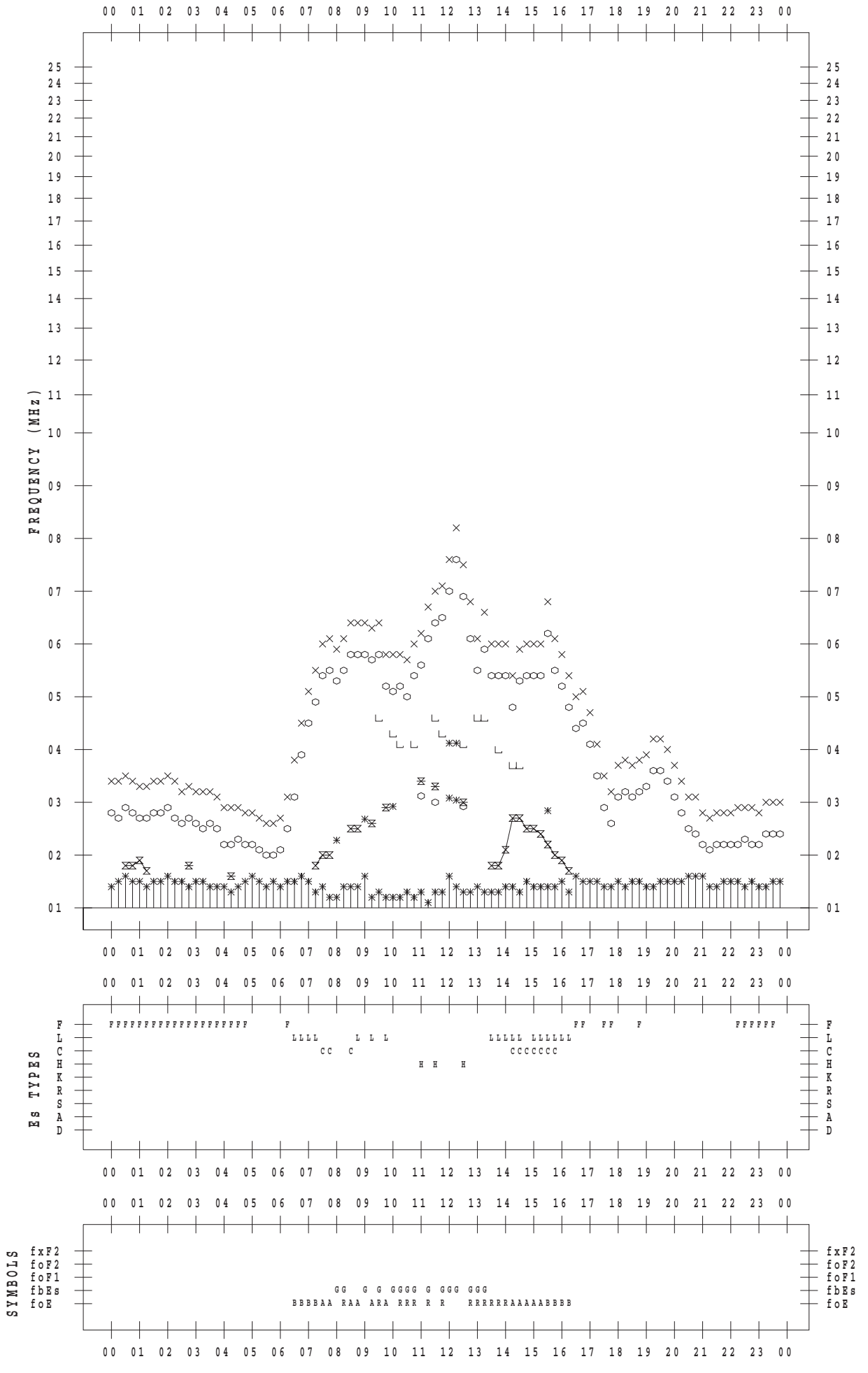
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/20

135 °E MEAN TIME



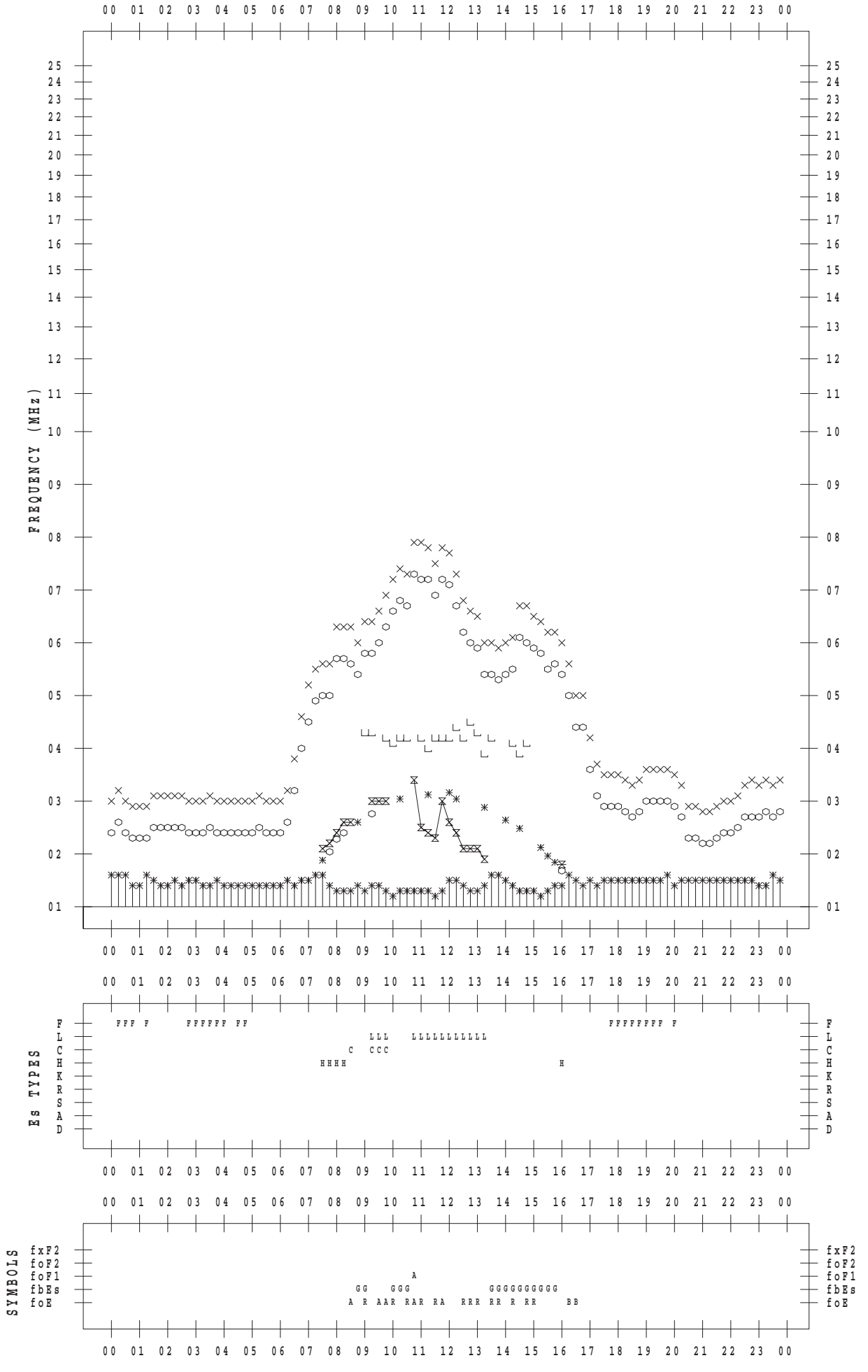
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/21

135 °E MEAN TIME



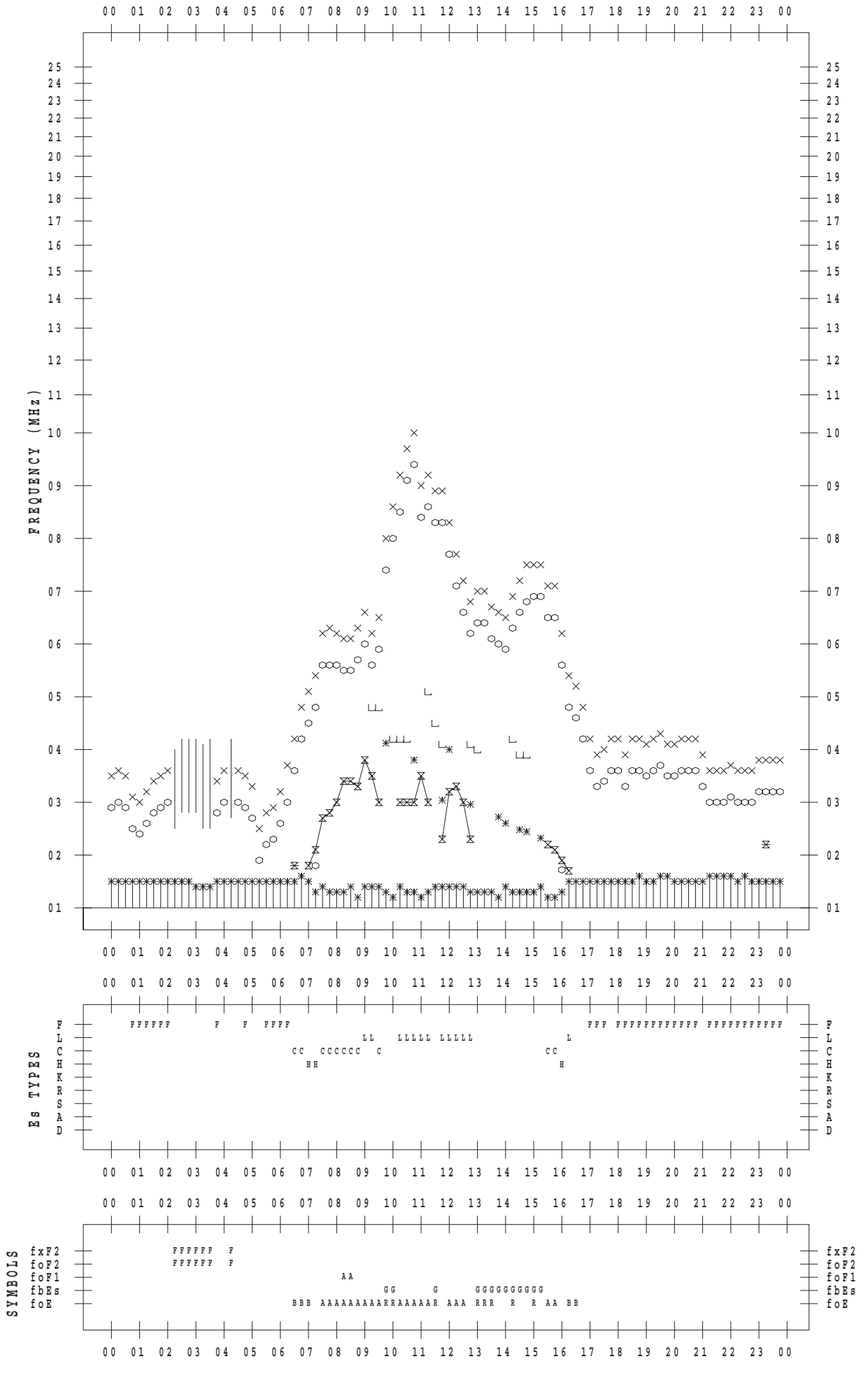
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/22

135 °E MEAN TIME



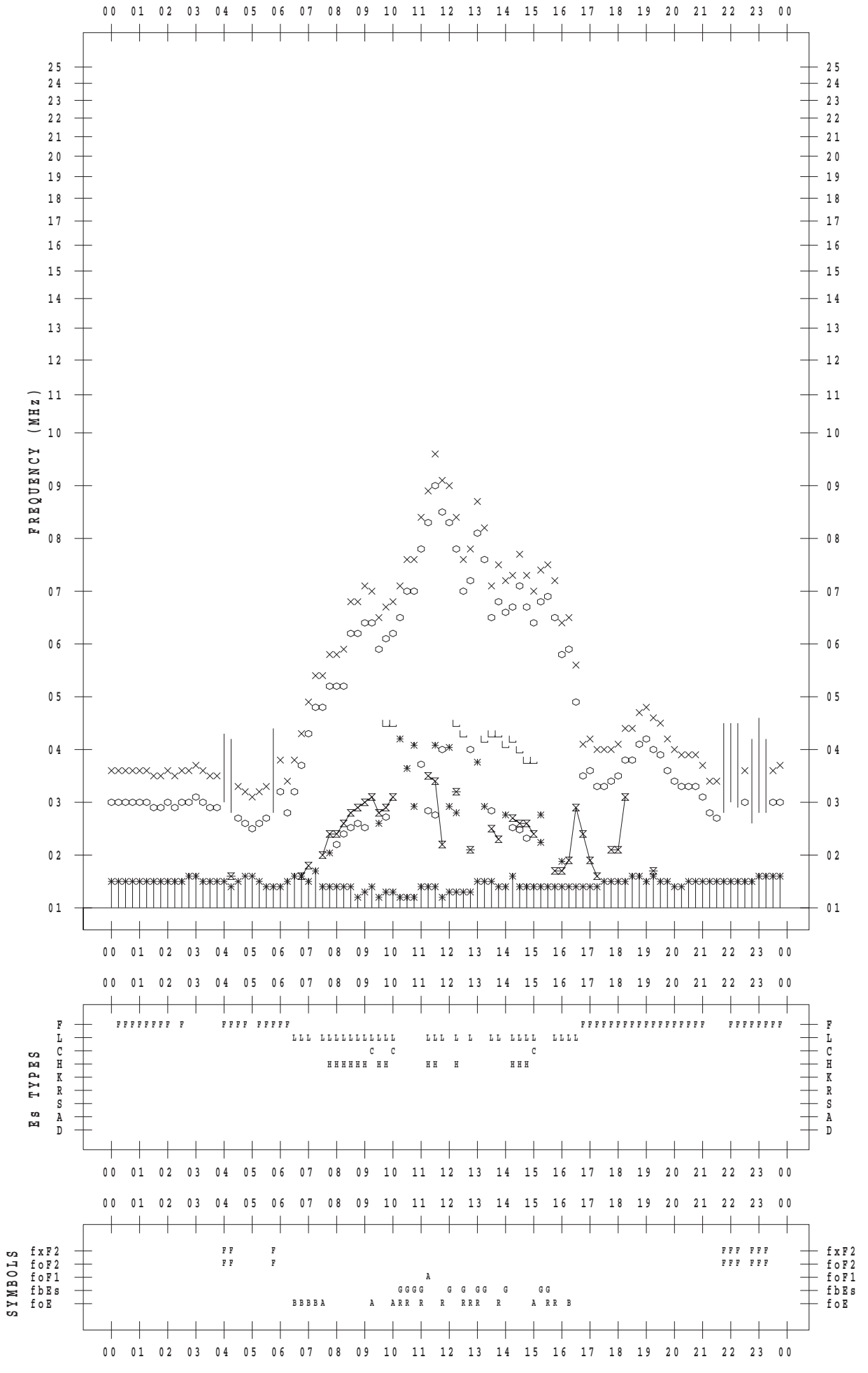
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/23

135 °E MEAN TIME



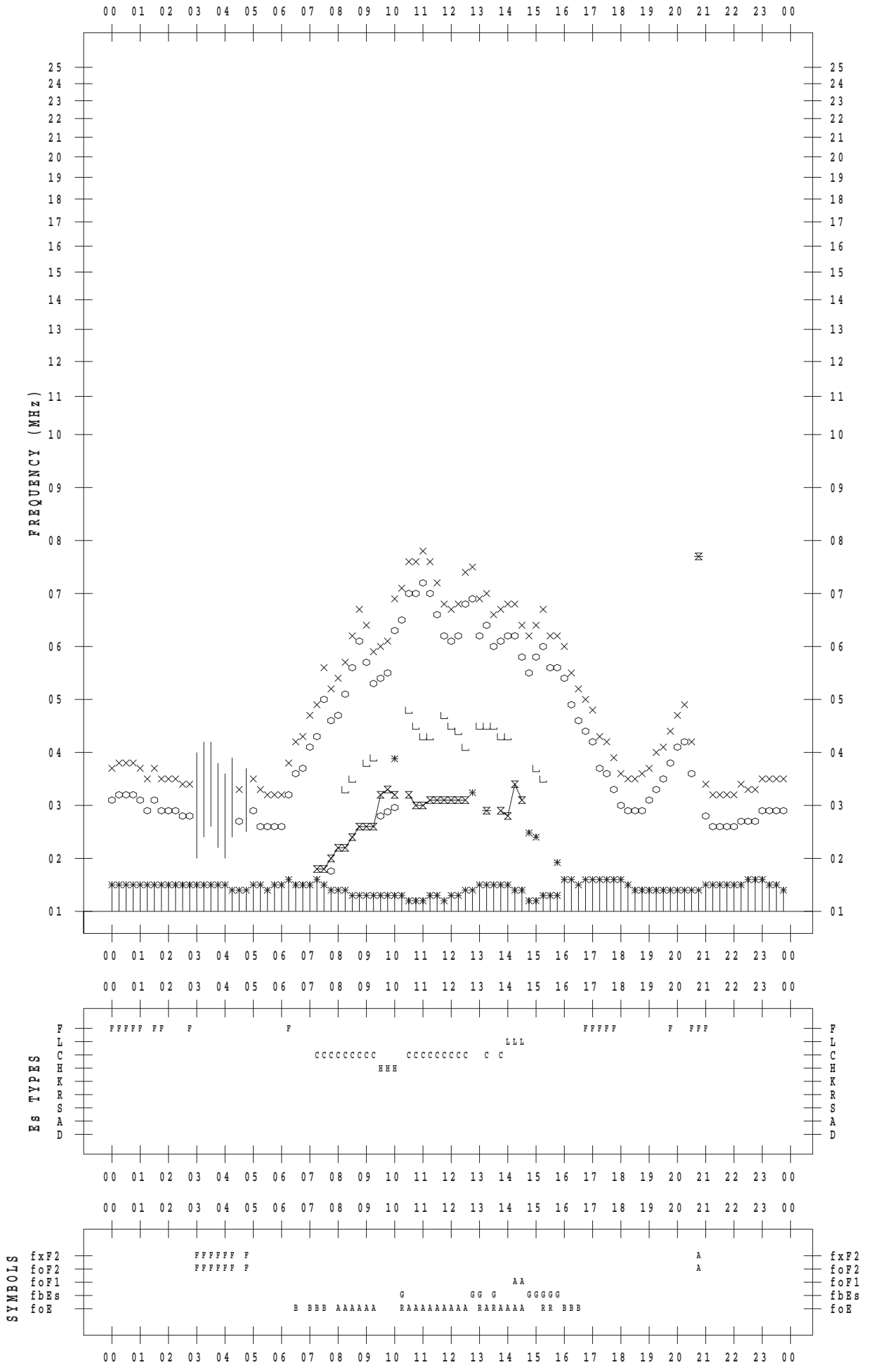
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/24

135 °E MEAN TIME



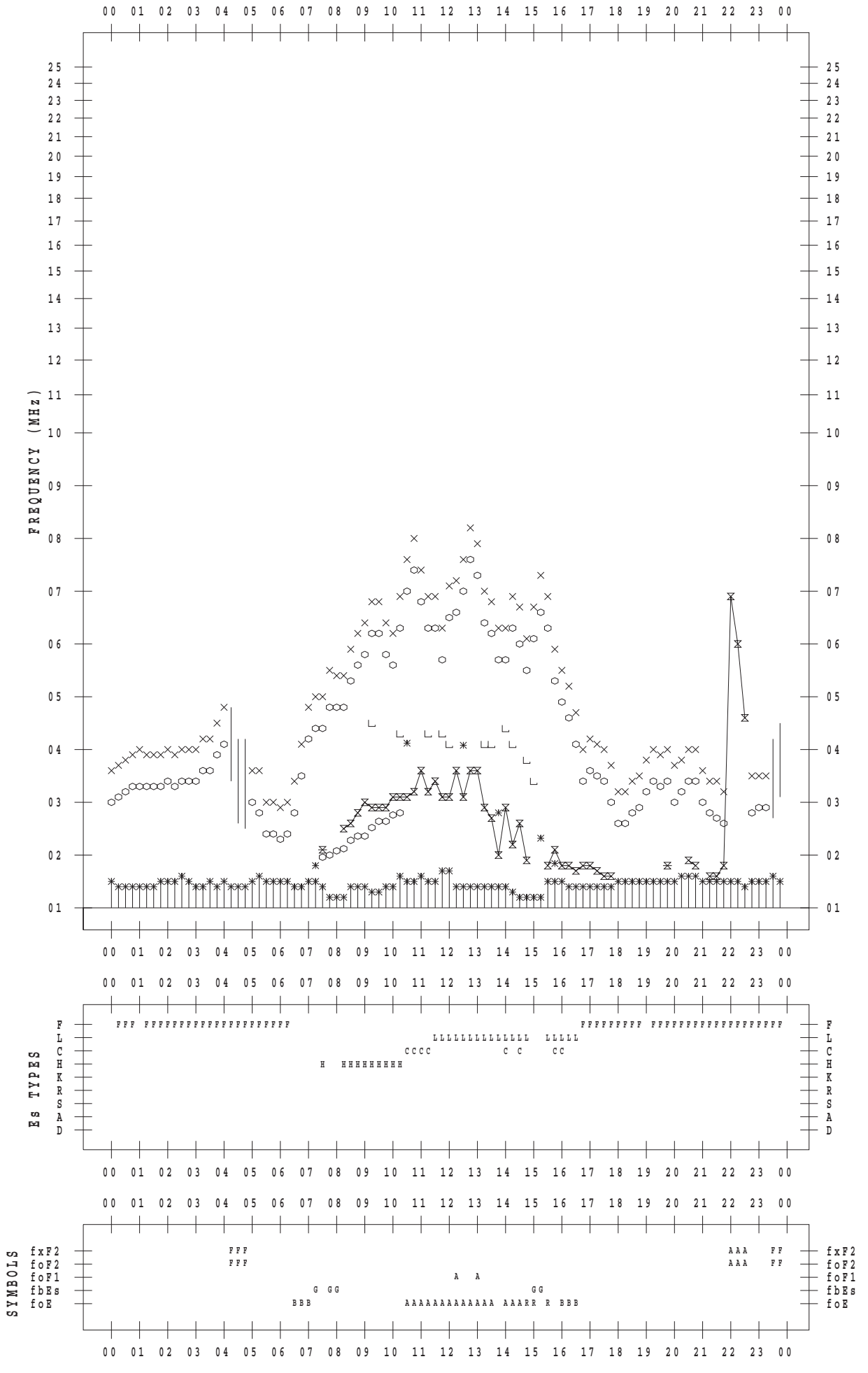
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/25

135 °E MEAN TIME



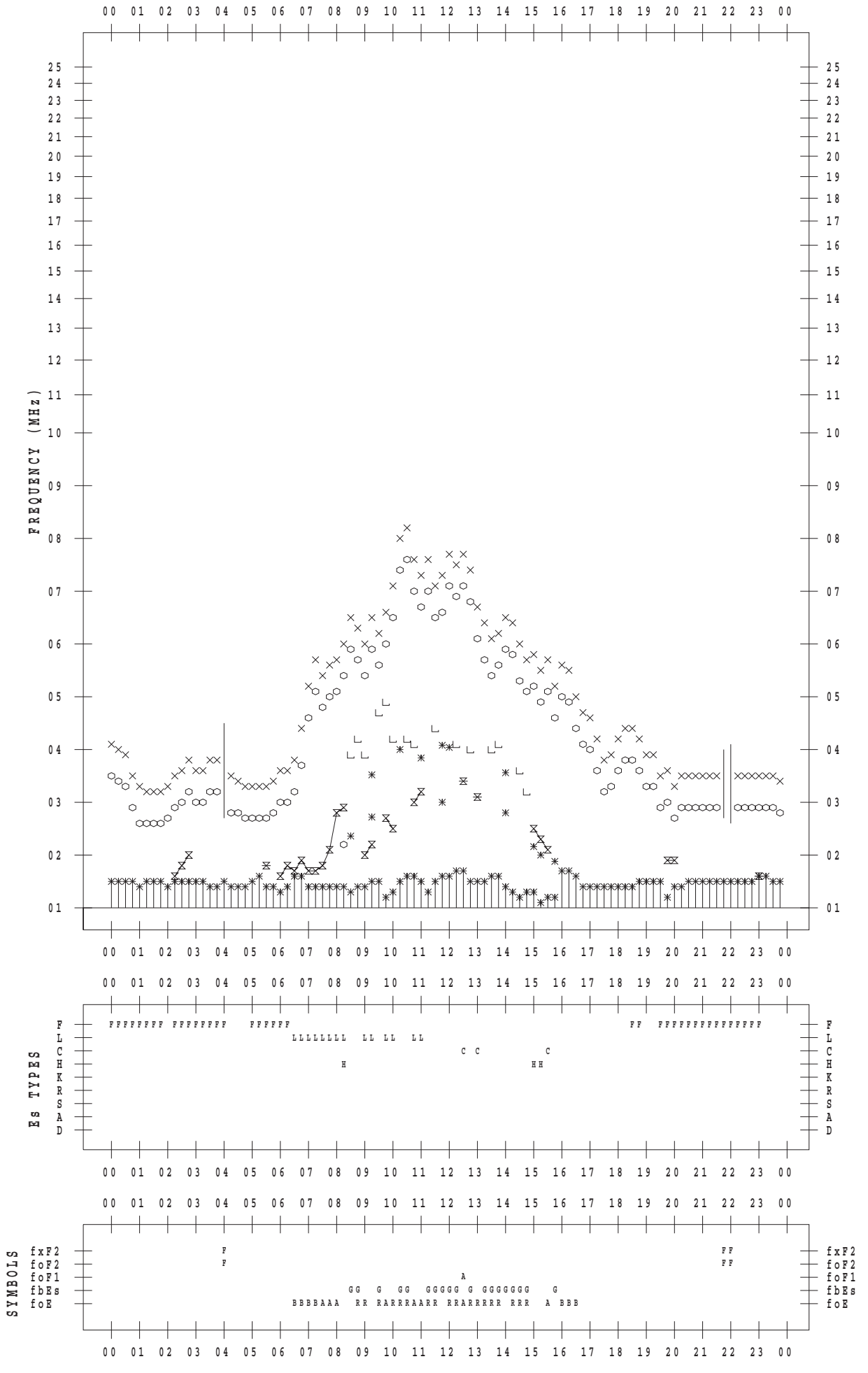
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/26

135 °E MEAN TIME



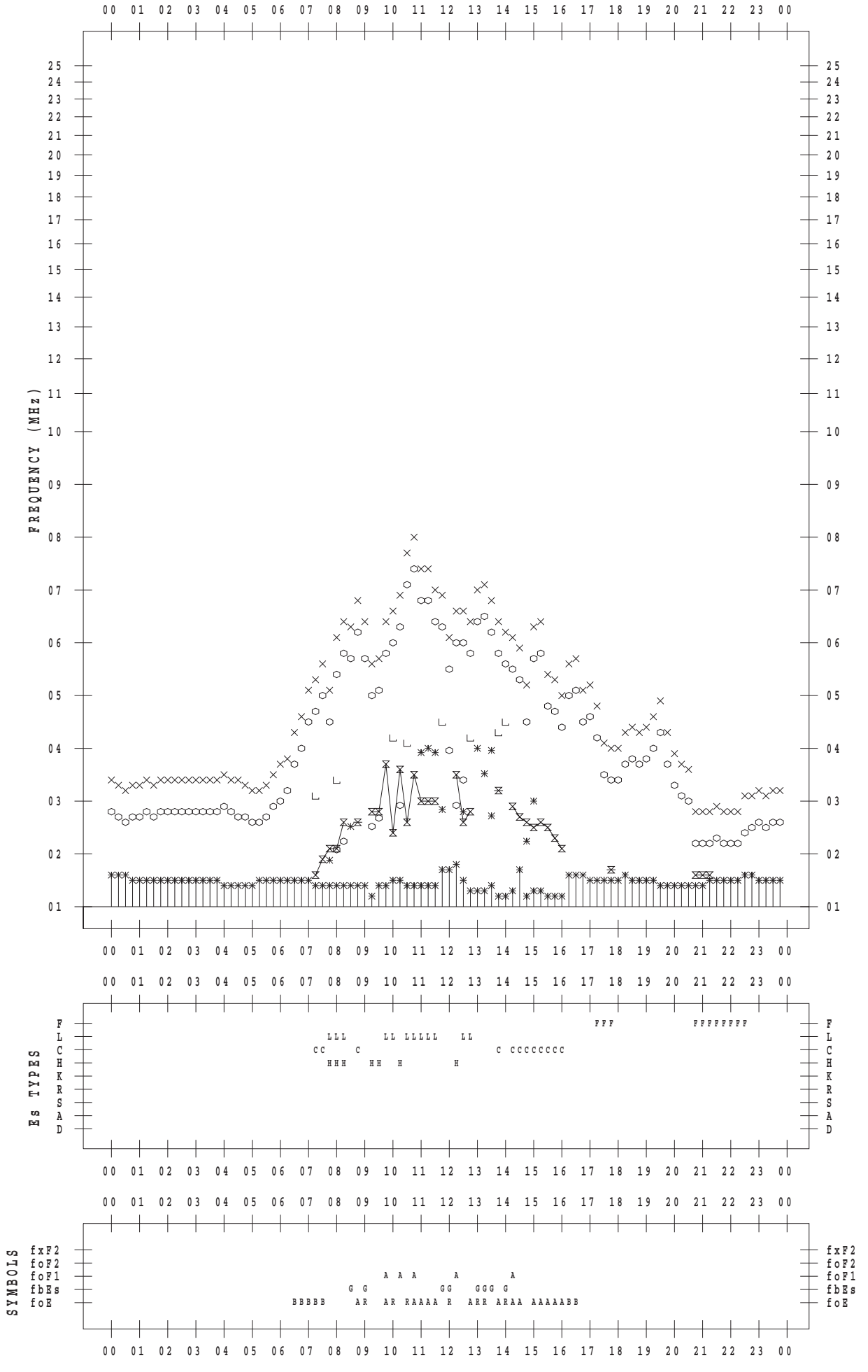
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/27

135 °E MEAN TIME



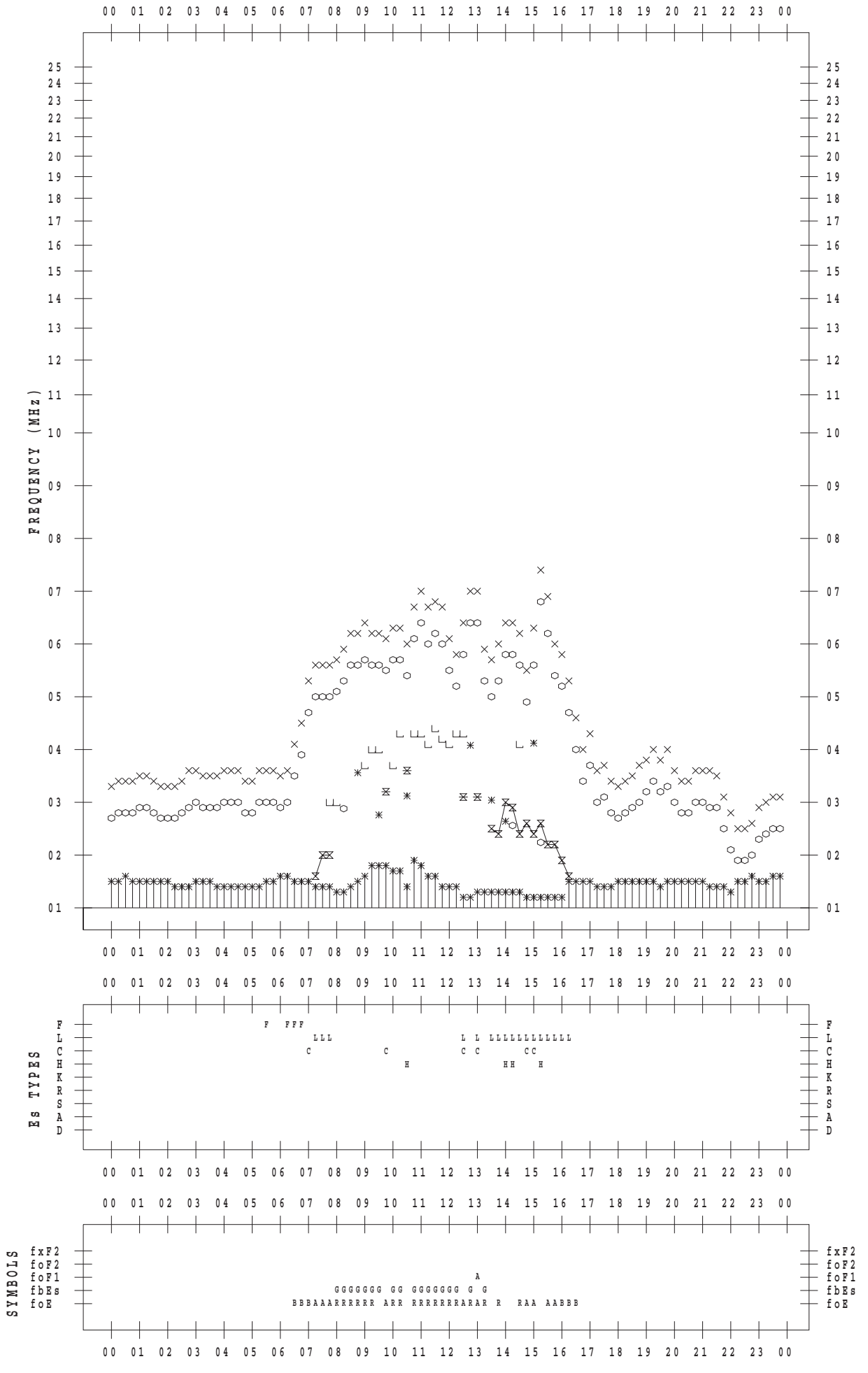
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/28

135 °E MEAN TIME



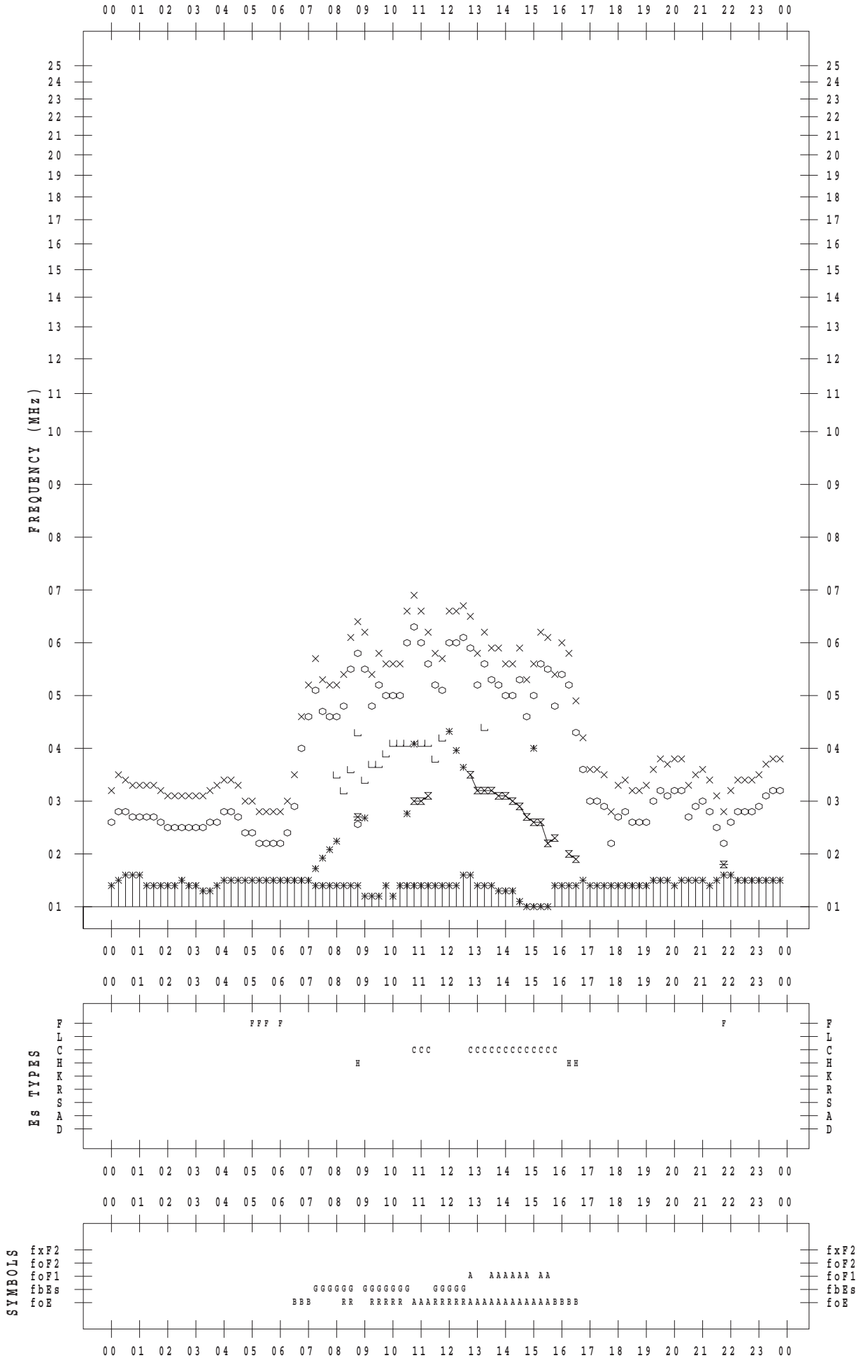
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/29

135 °E MEAN TIME



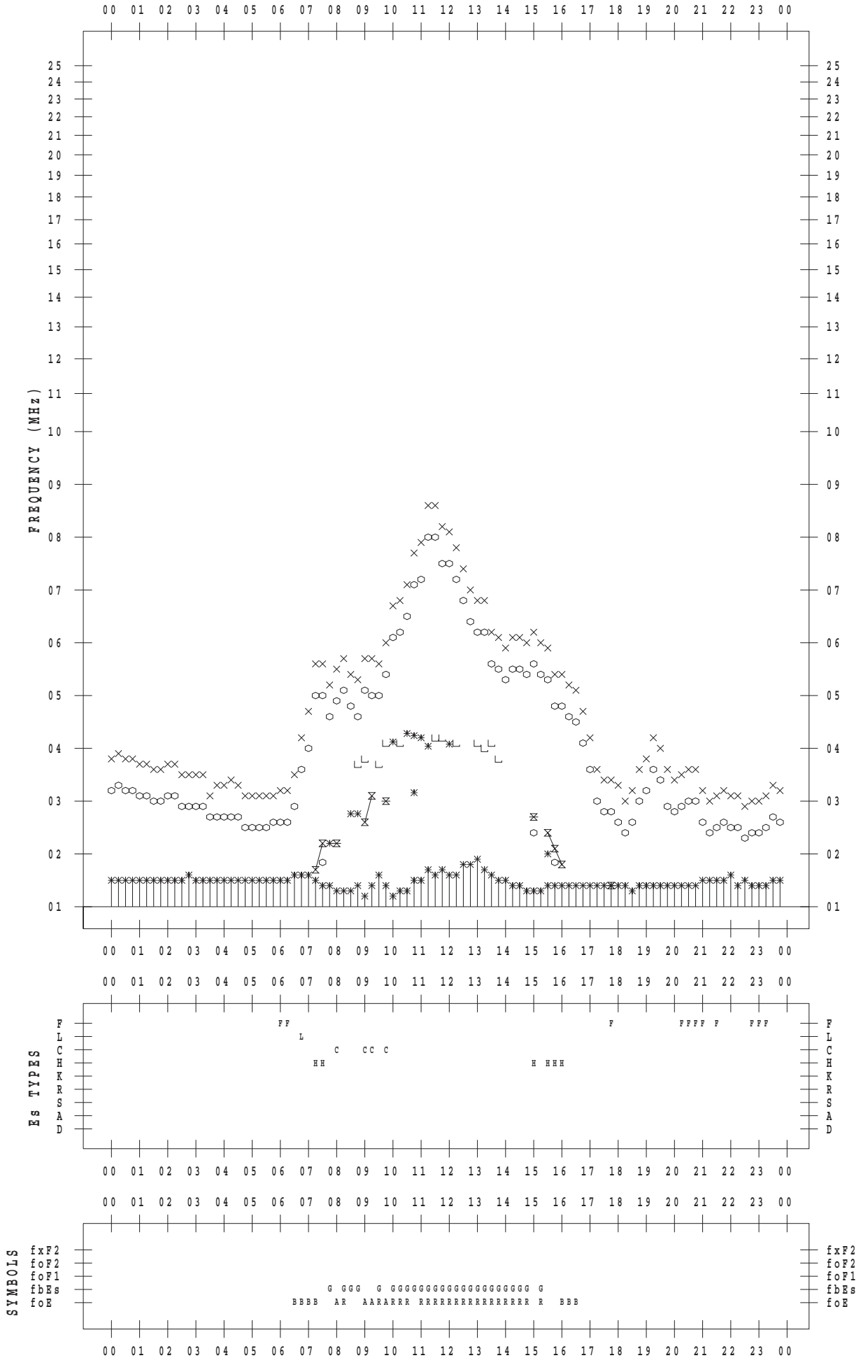
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/30

135 °E MEAN TIME



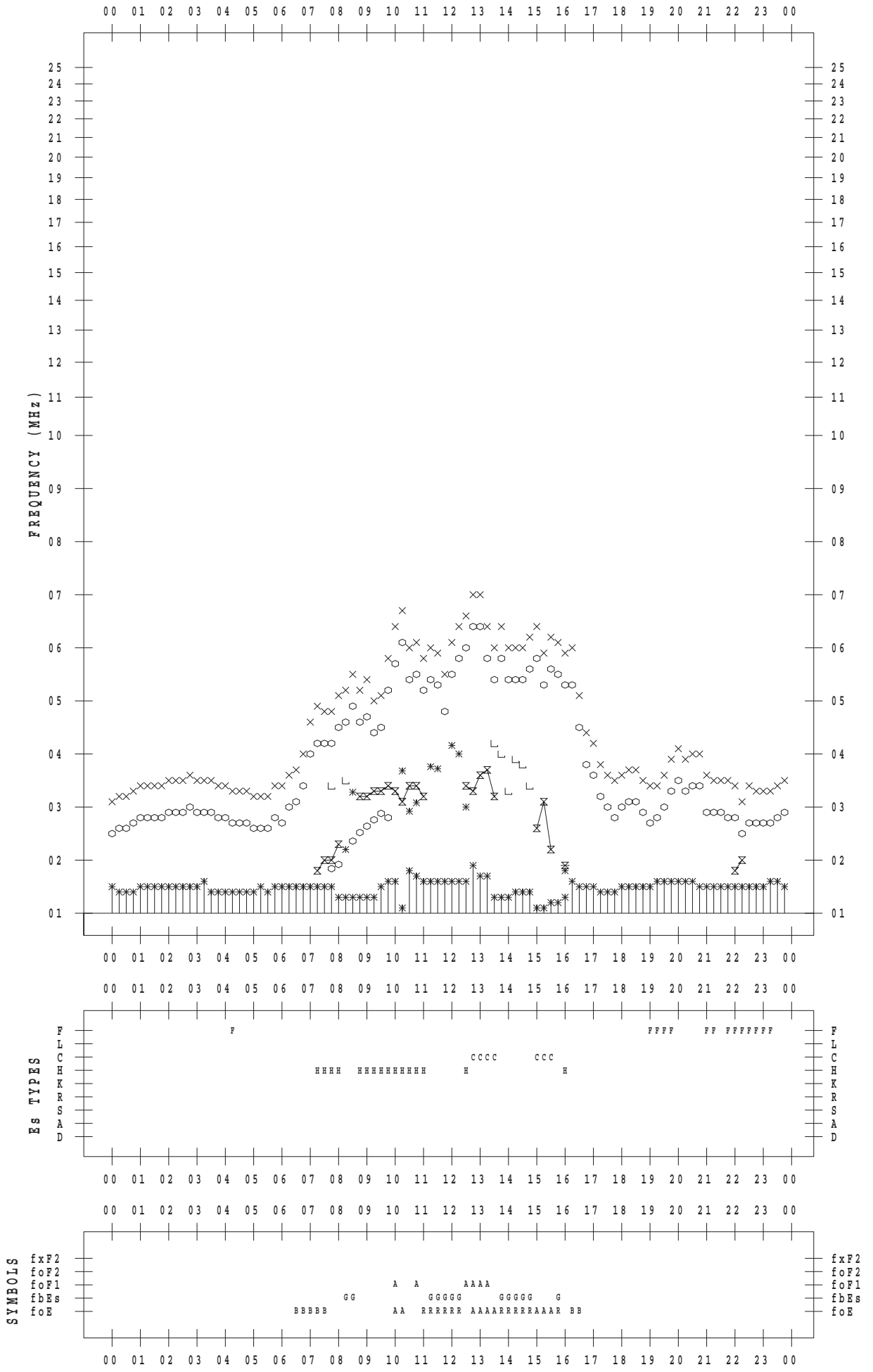
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2016/12/31

135 °E MEAN TIME



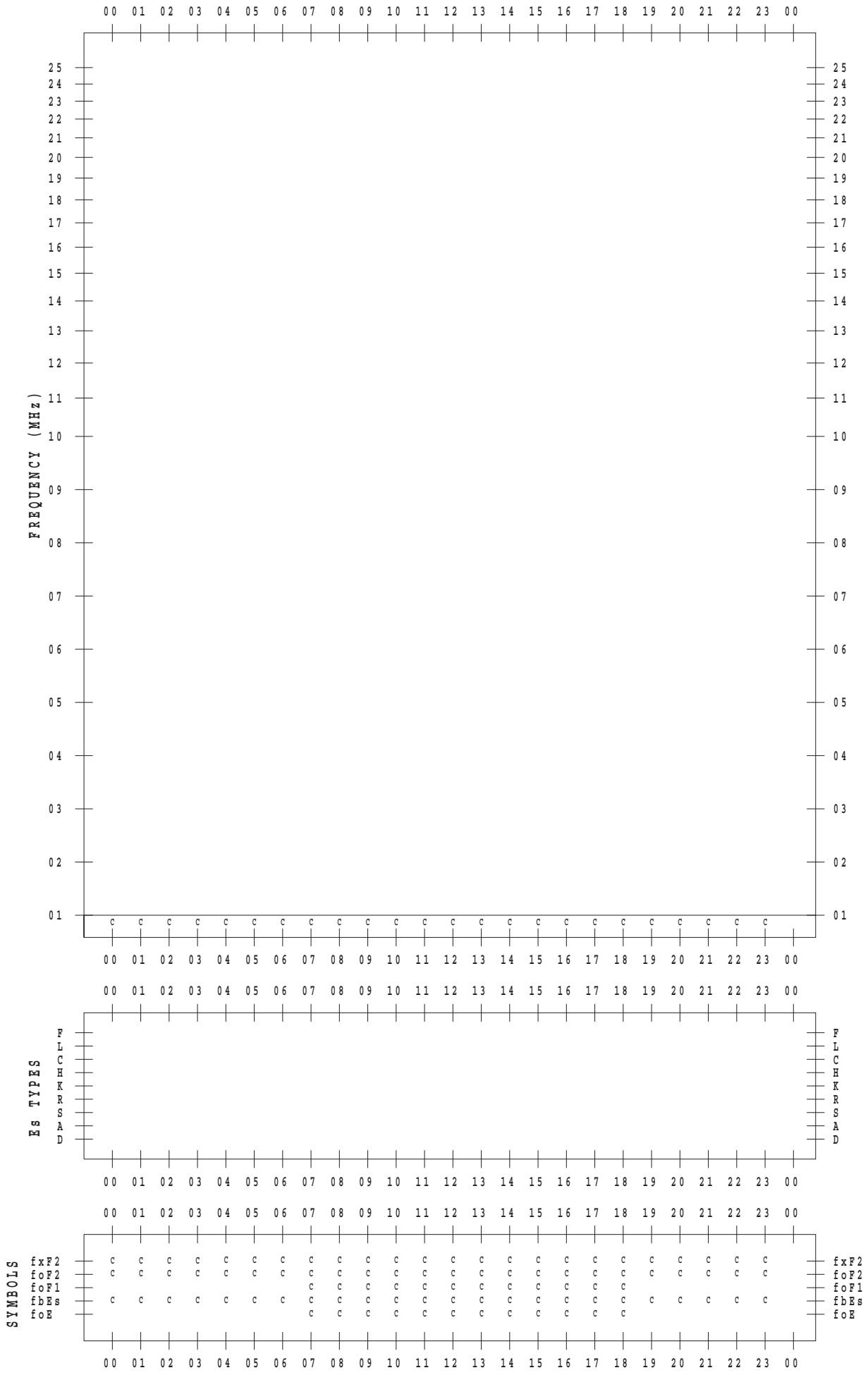
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 1

135 °E MEAN TIME



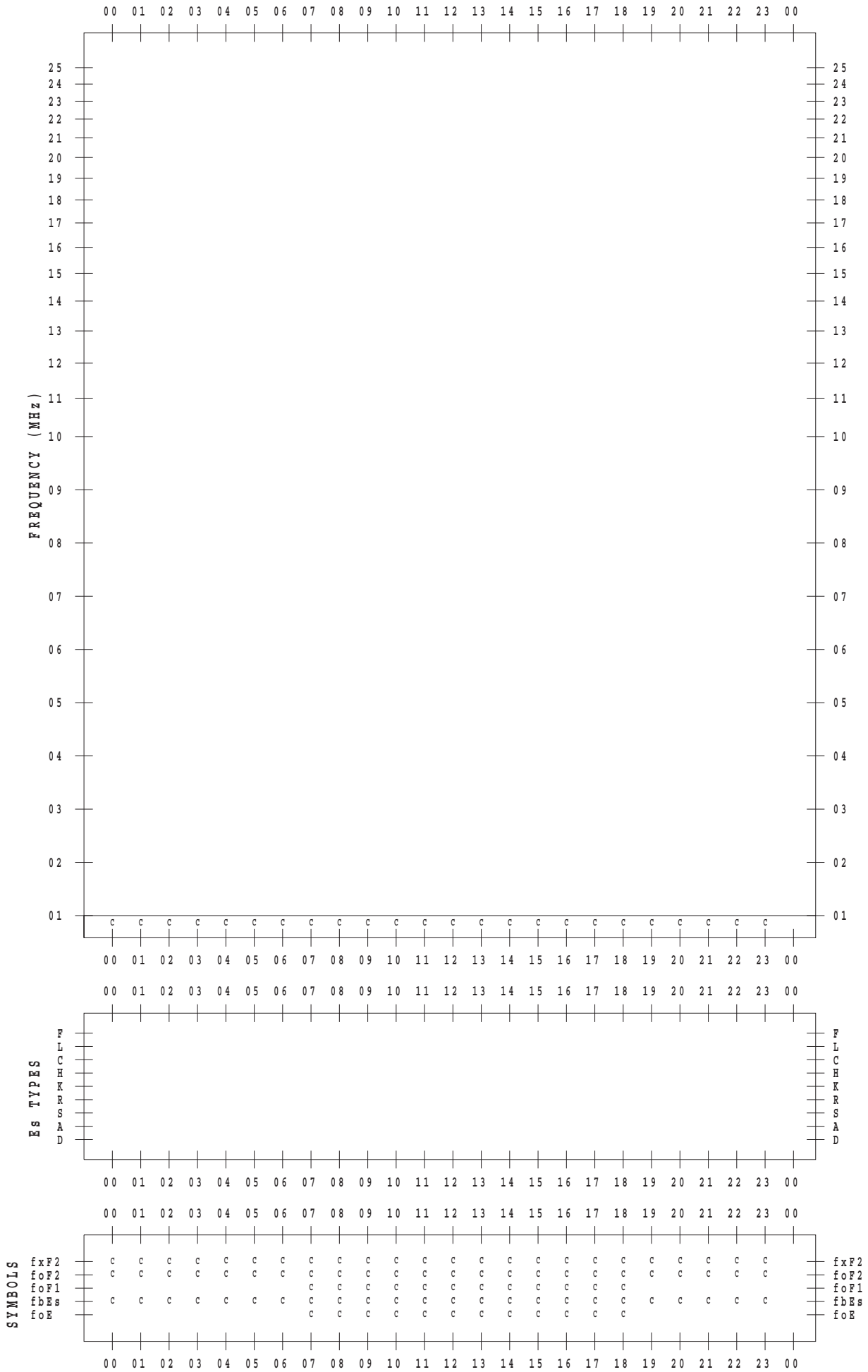
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 2

135 °E MEAN TIME



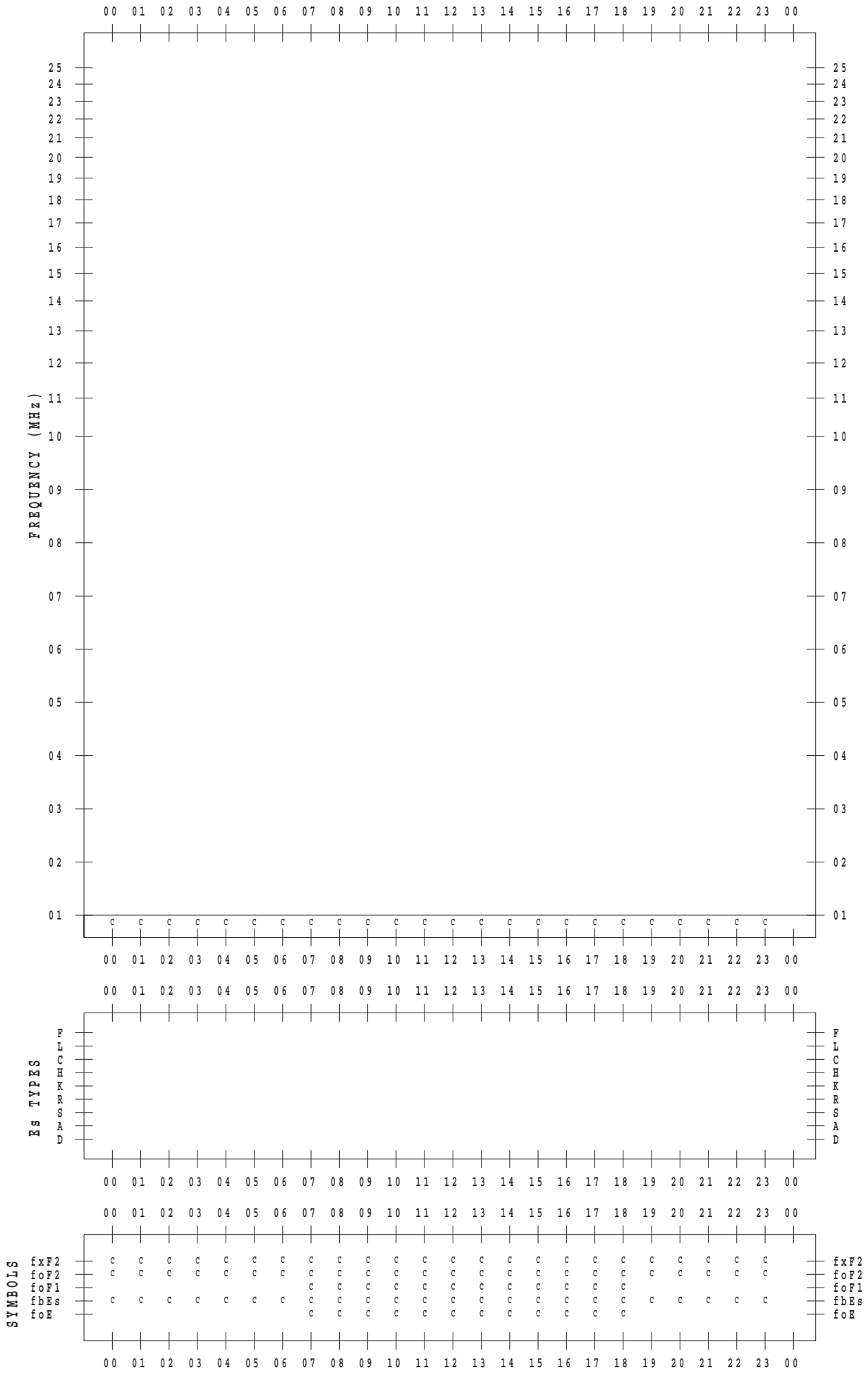
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 3

135 °E MEAN TIME



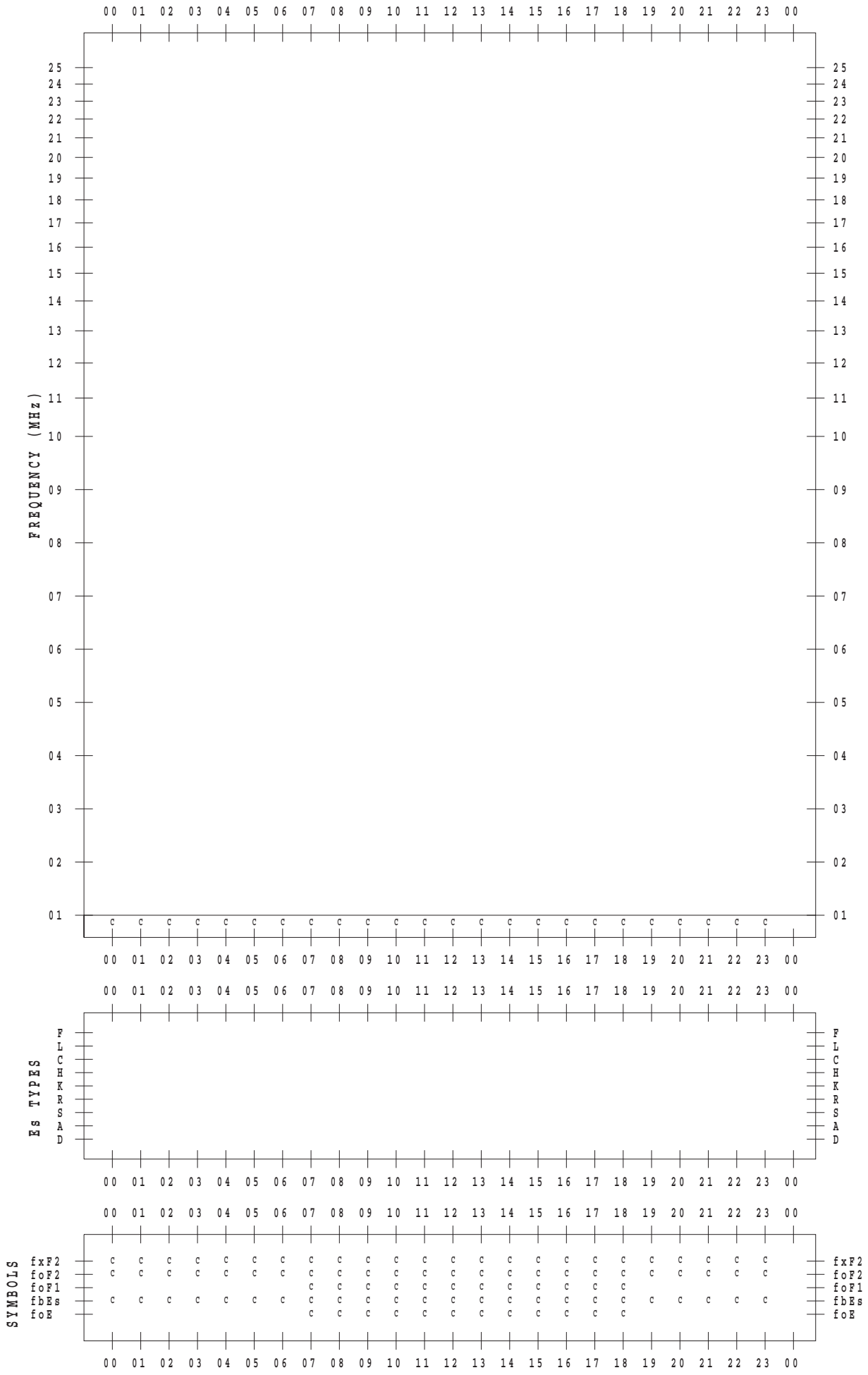
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 4

135 °E MEAN TIME



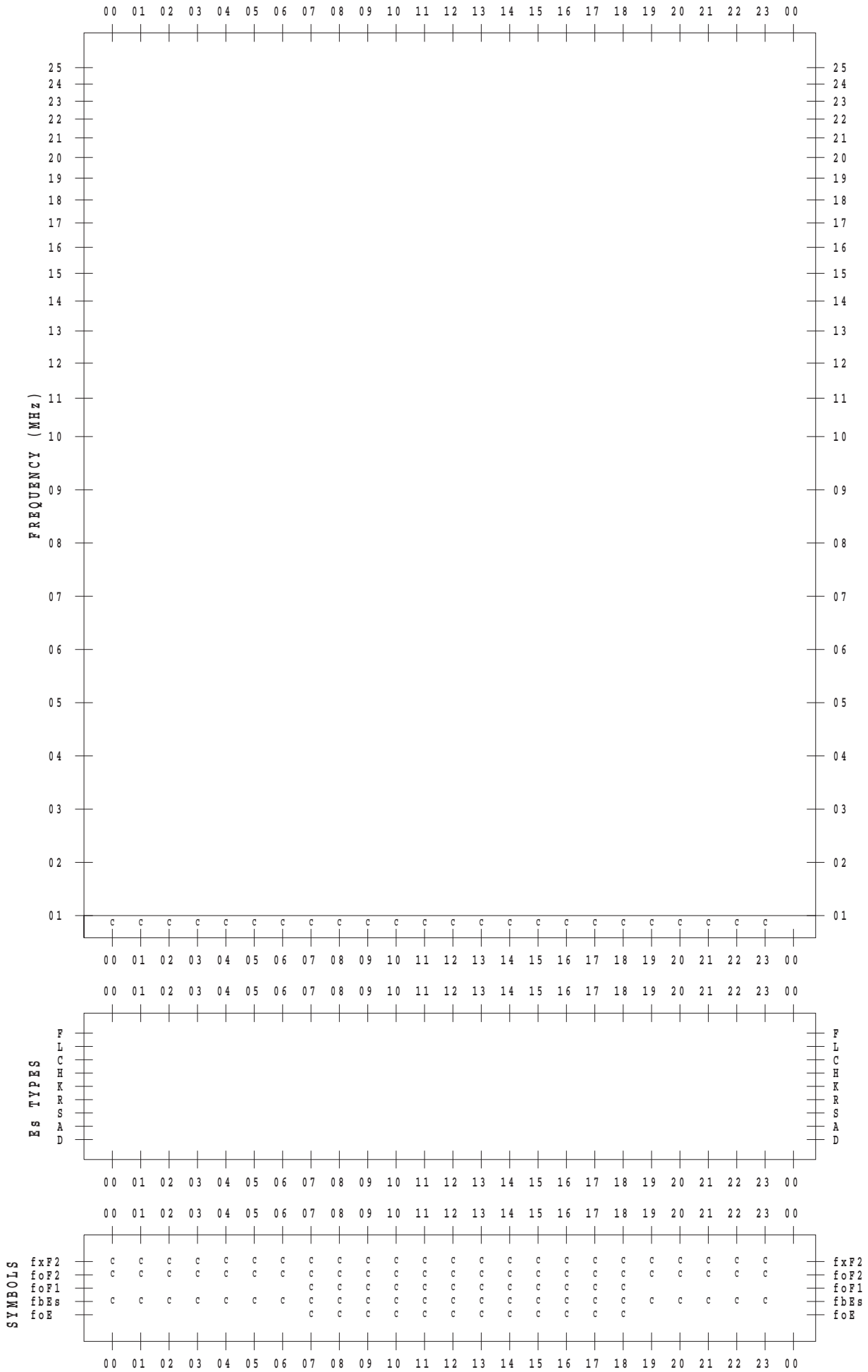
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 5

135 °E MEAN TIME



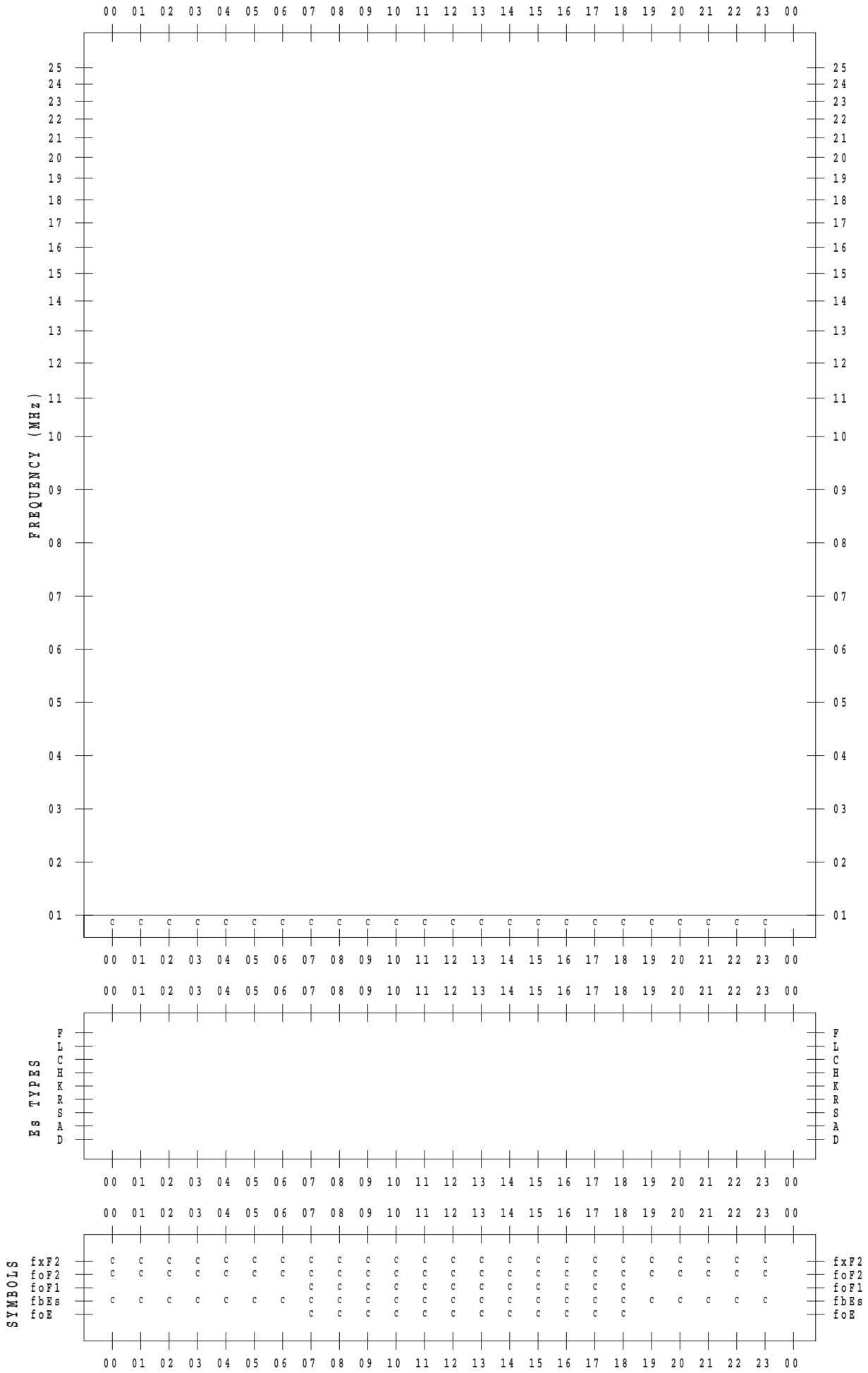
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 6

135 °E MEAN TIME



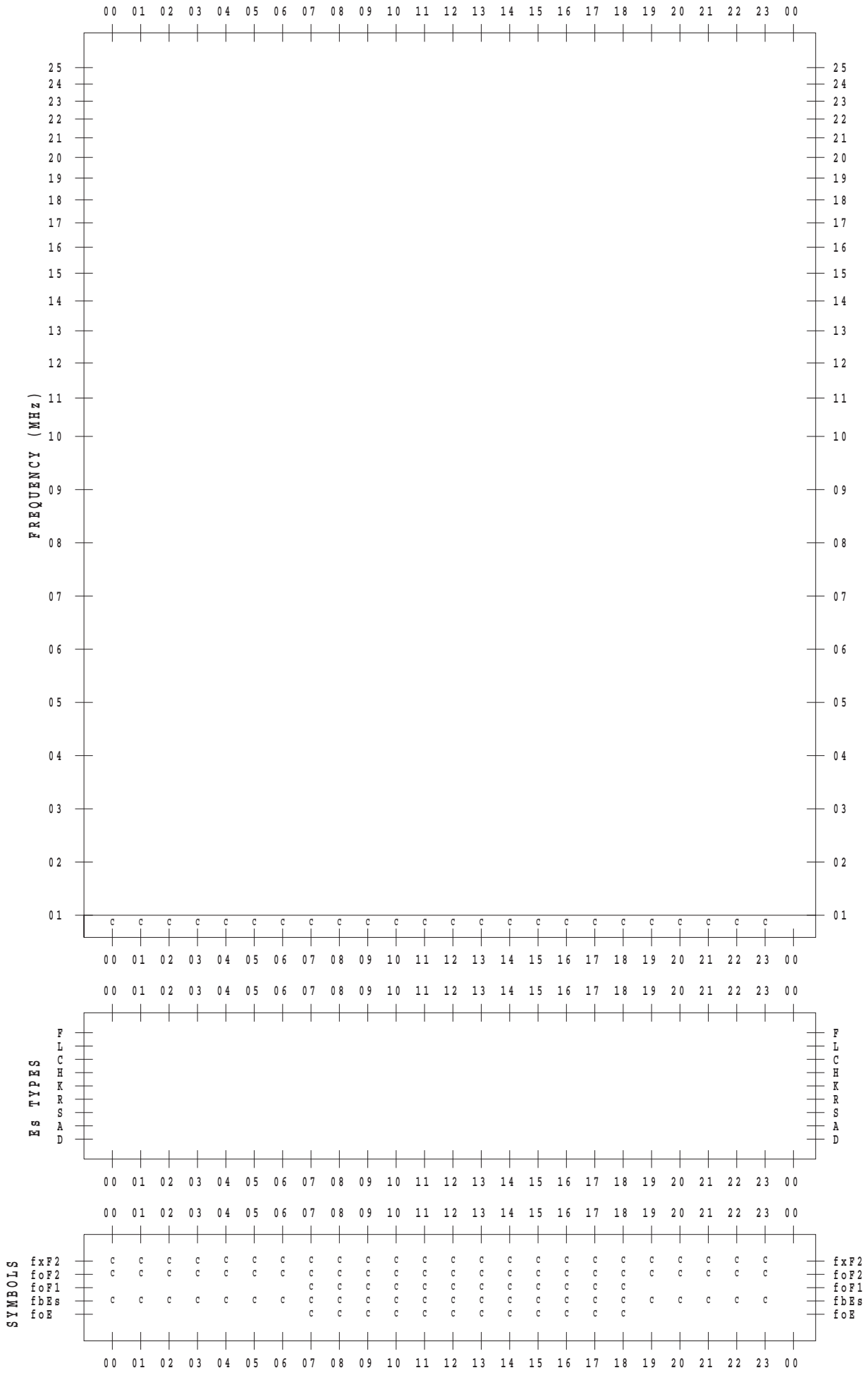
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 7

135 °E MEAN TIME



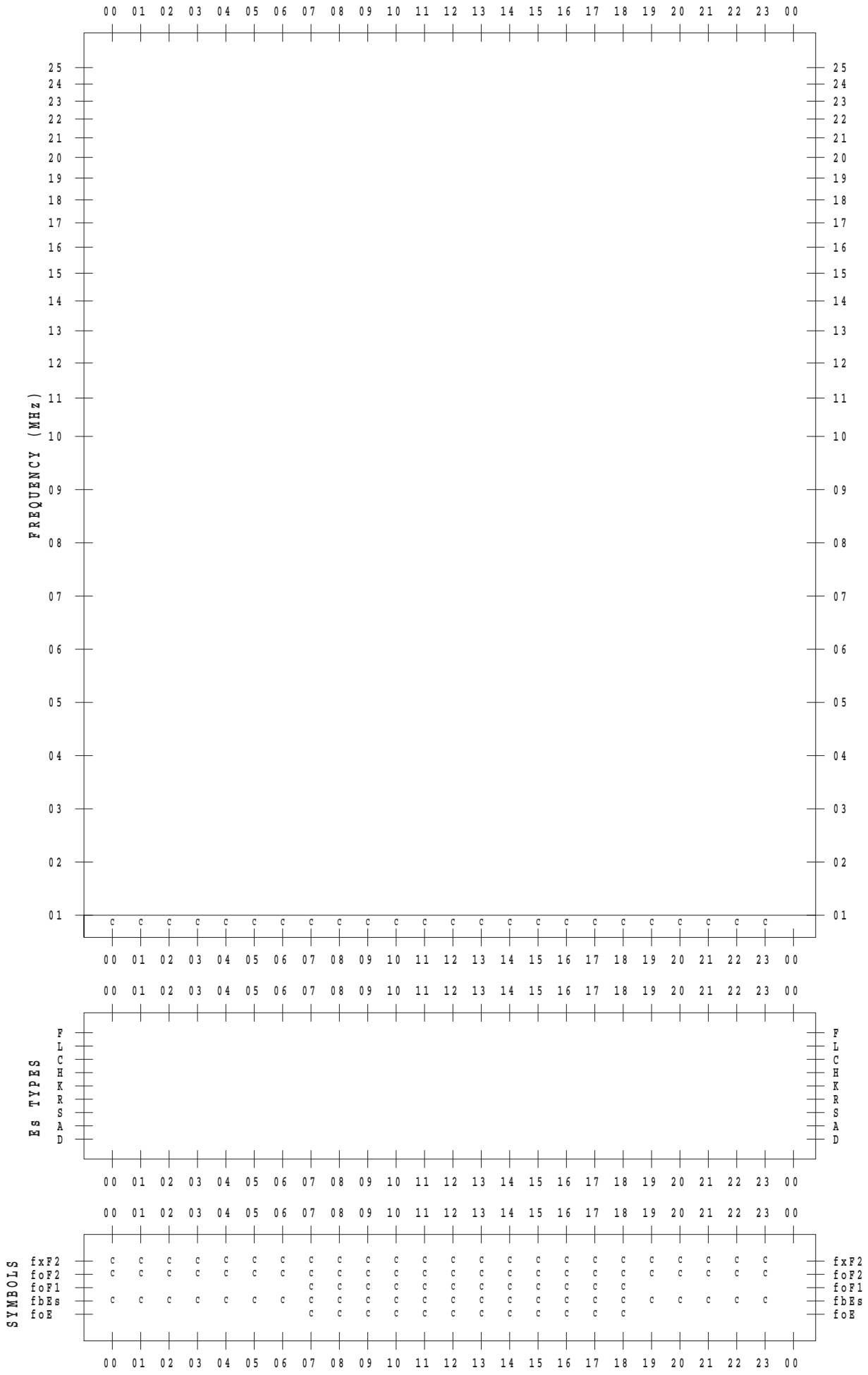
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 8

135 °E MEAN TIME



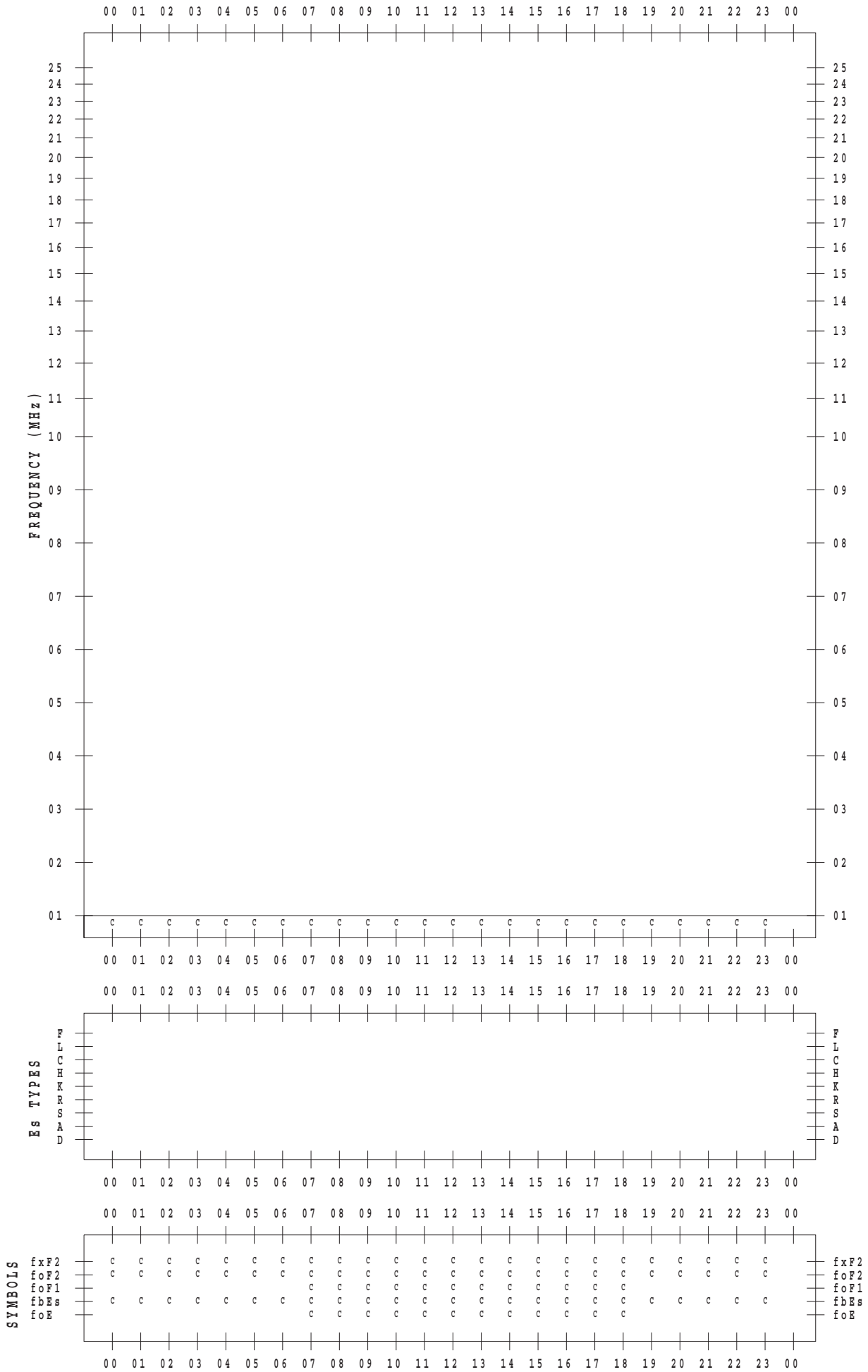
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/ 9

135 °E MEAN TIME



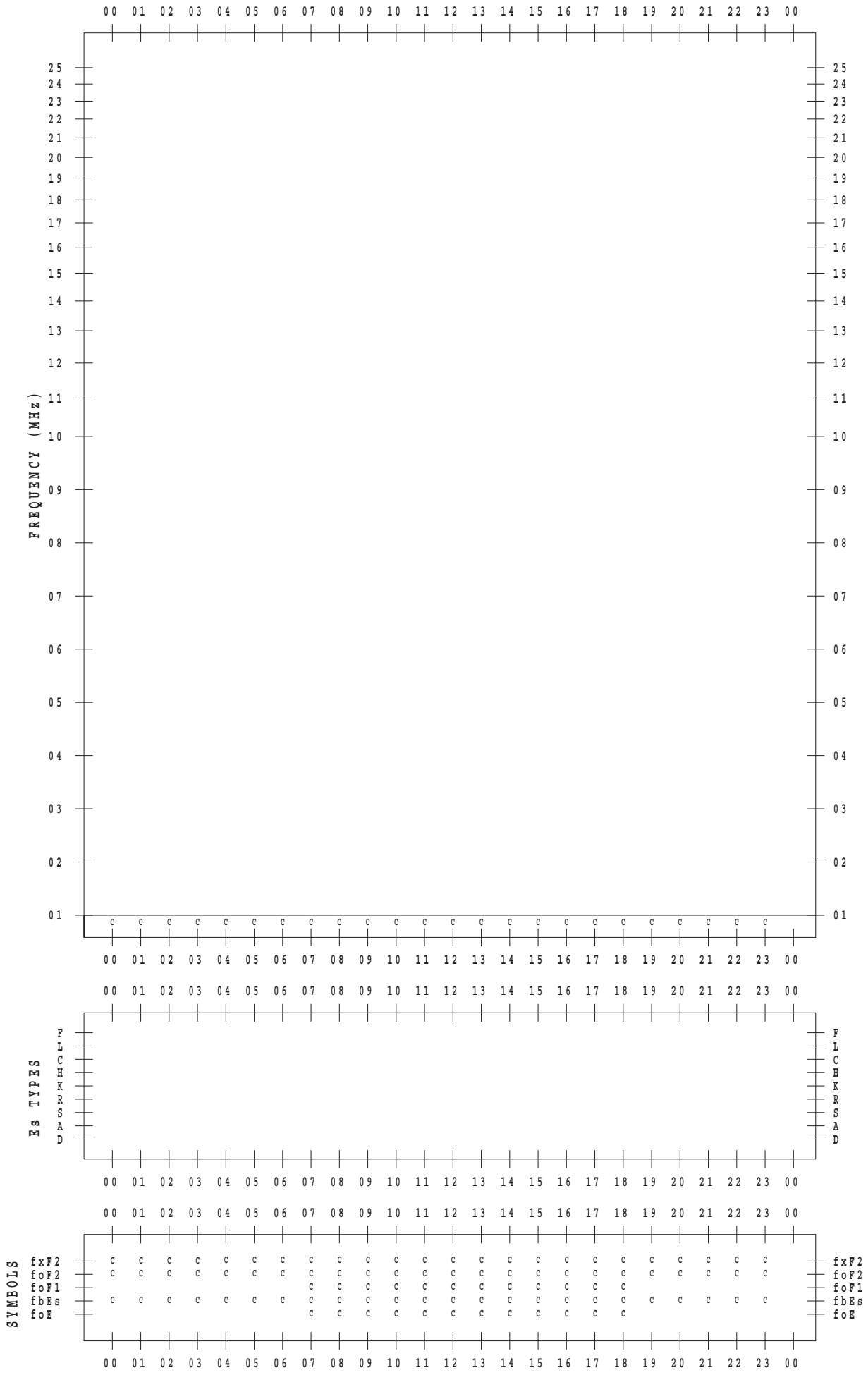
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/10

135 °E MEAN TIME



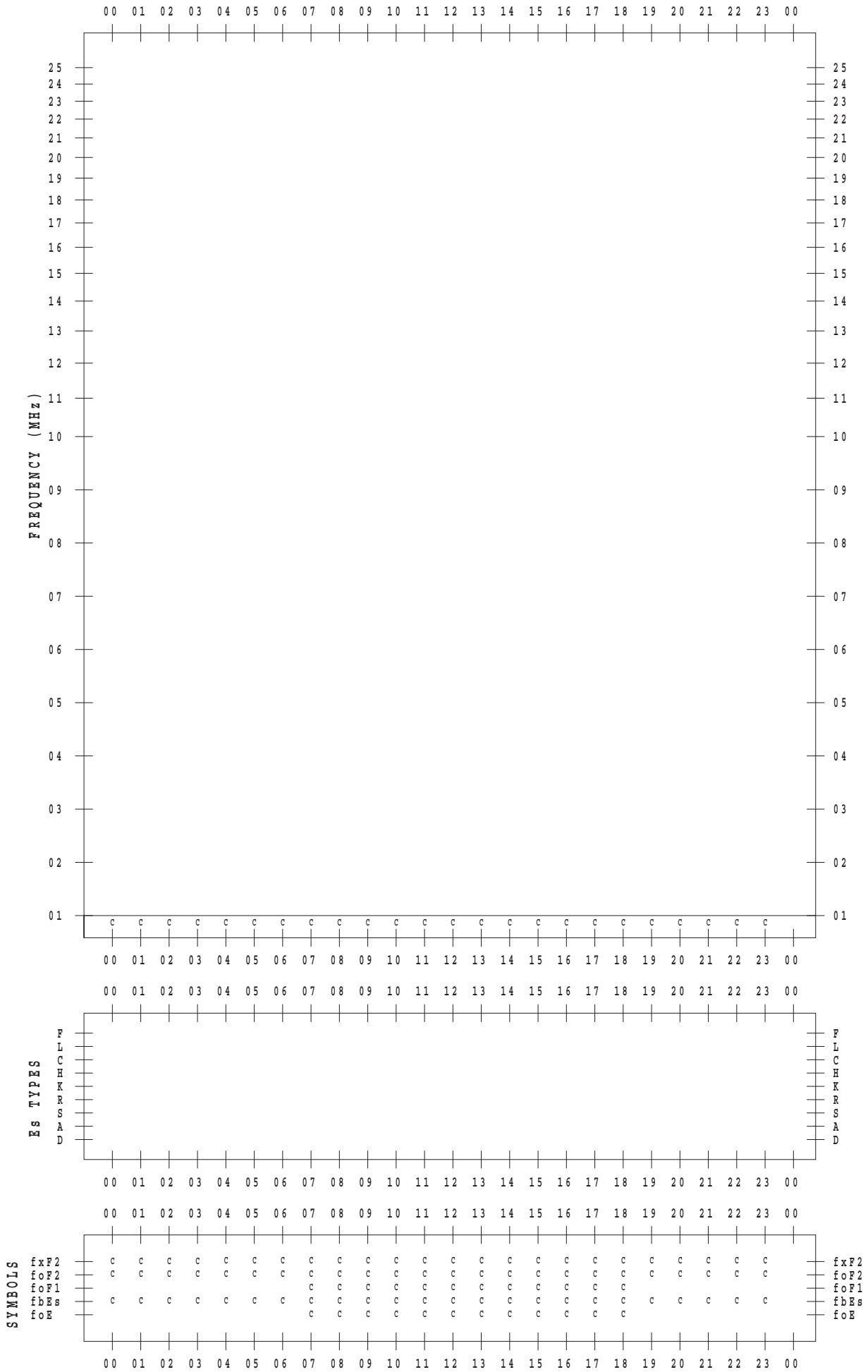
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/11

135 °E MEAN TIME



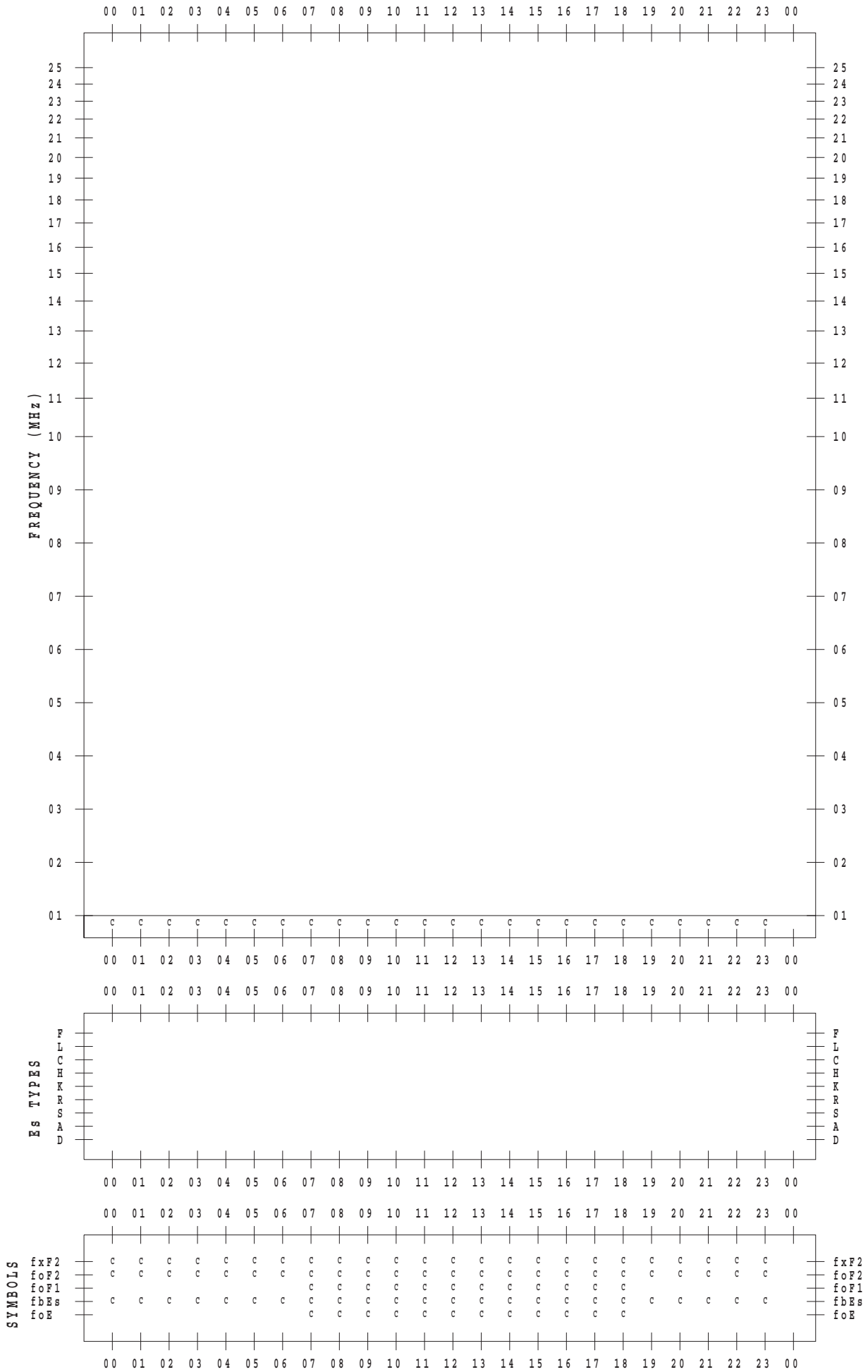
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/12

135 °E MEAN TIME



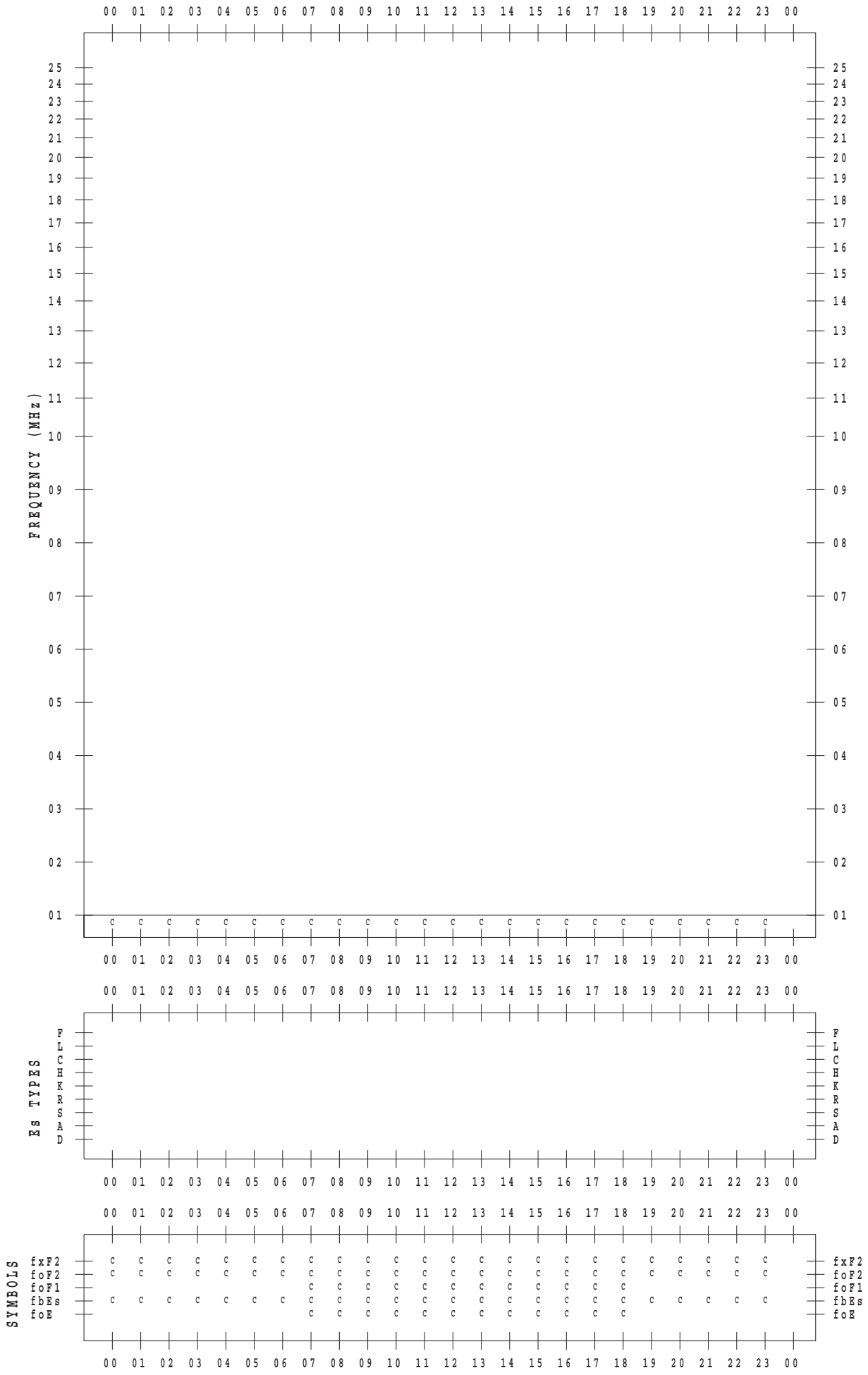
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/13

135 °E MEAN TIME



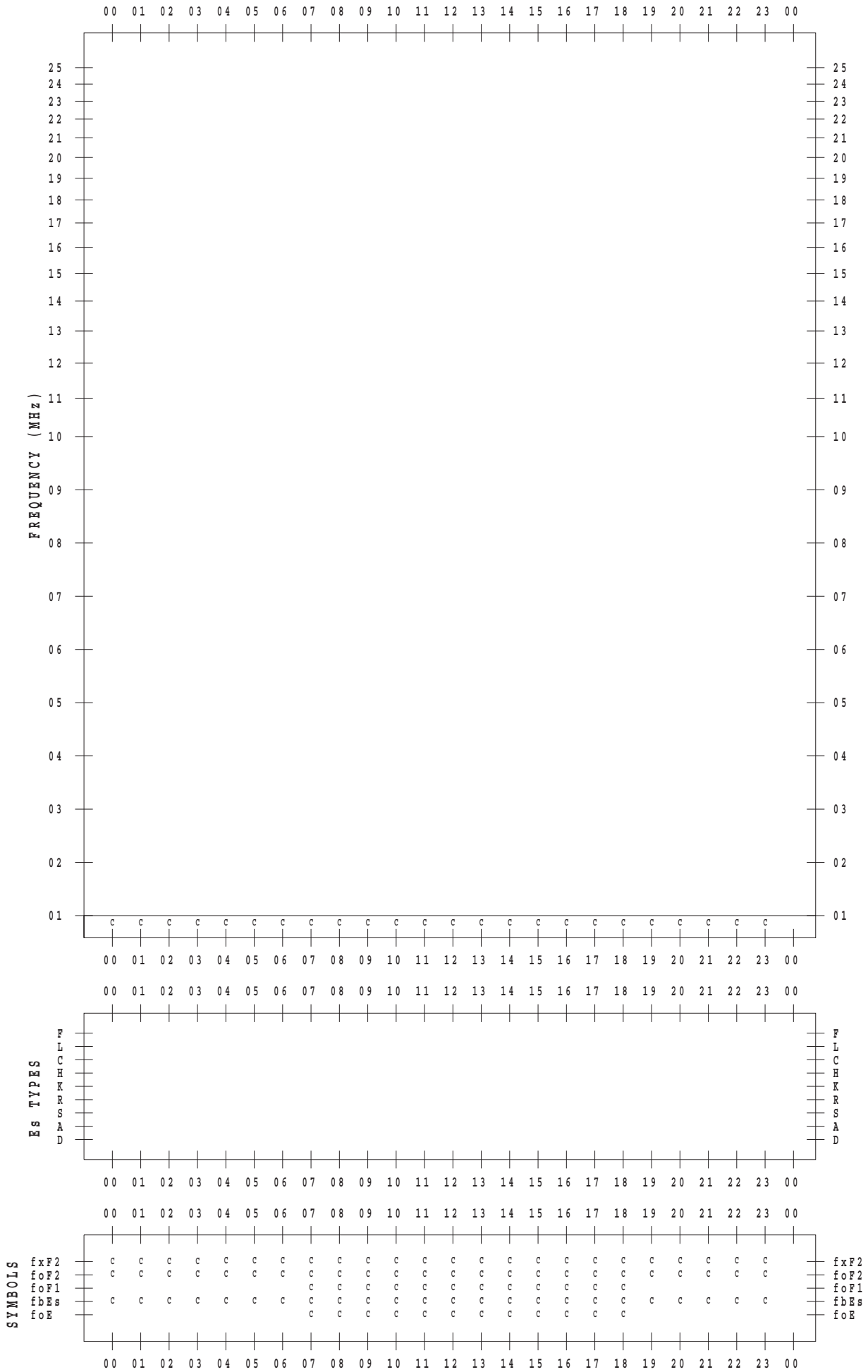
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/14

135 °E MEAN TIME



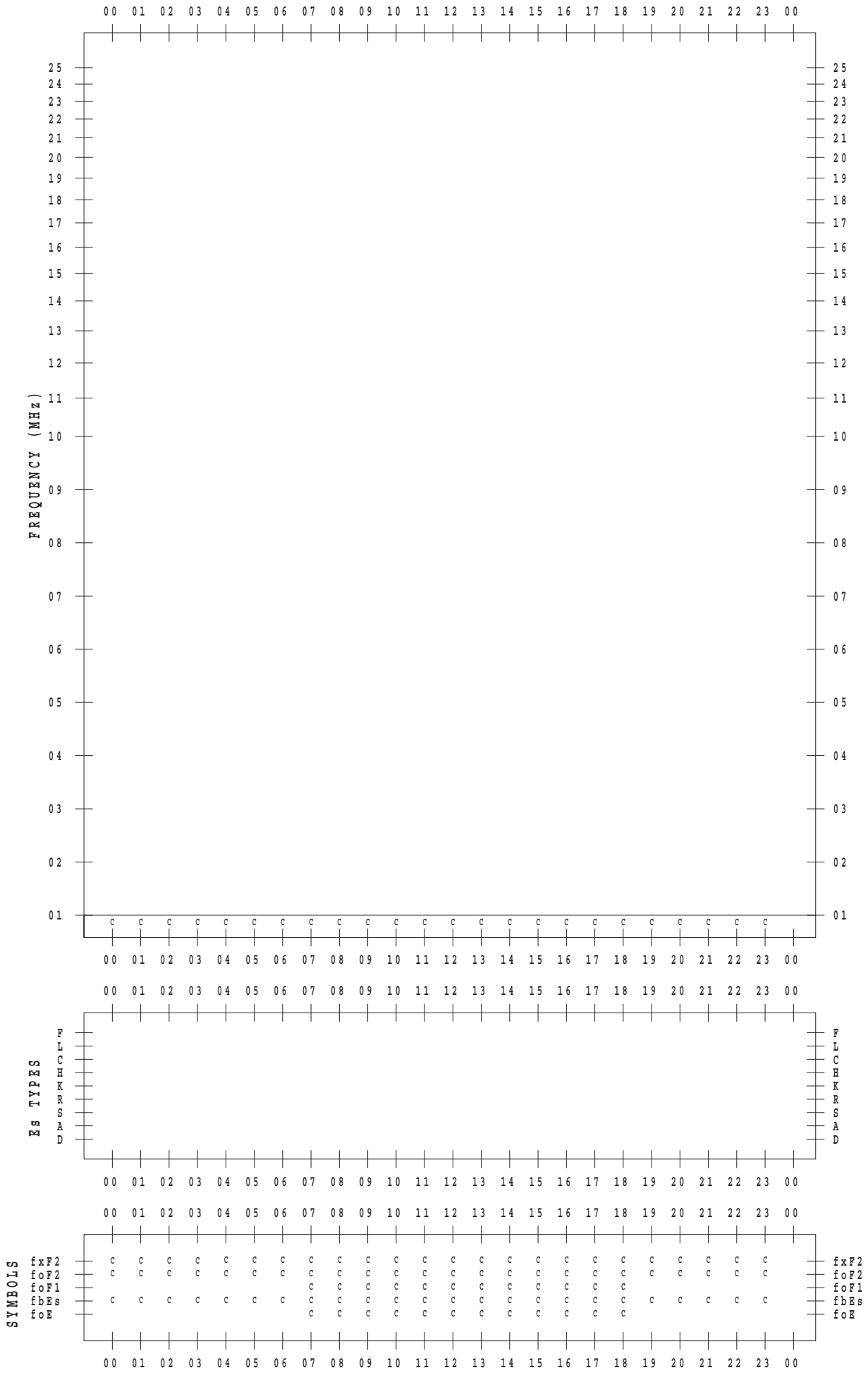
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/15

135 °E MEAN TIME



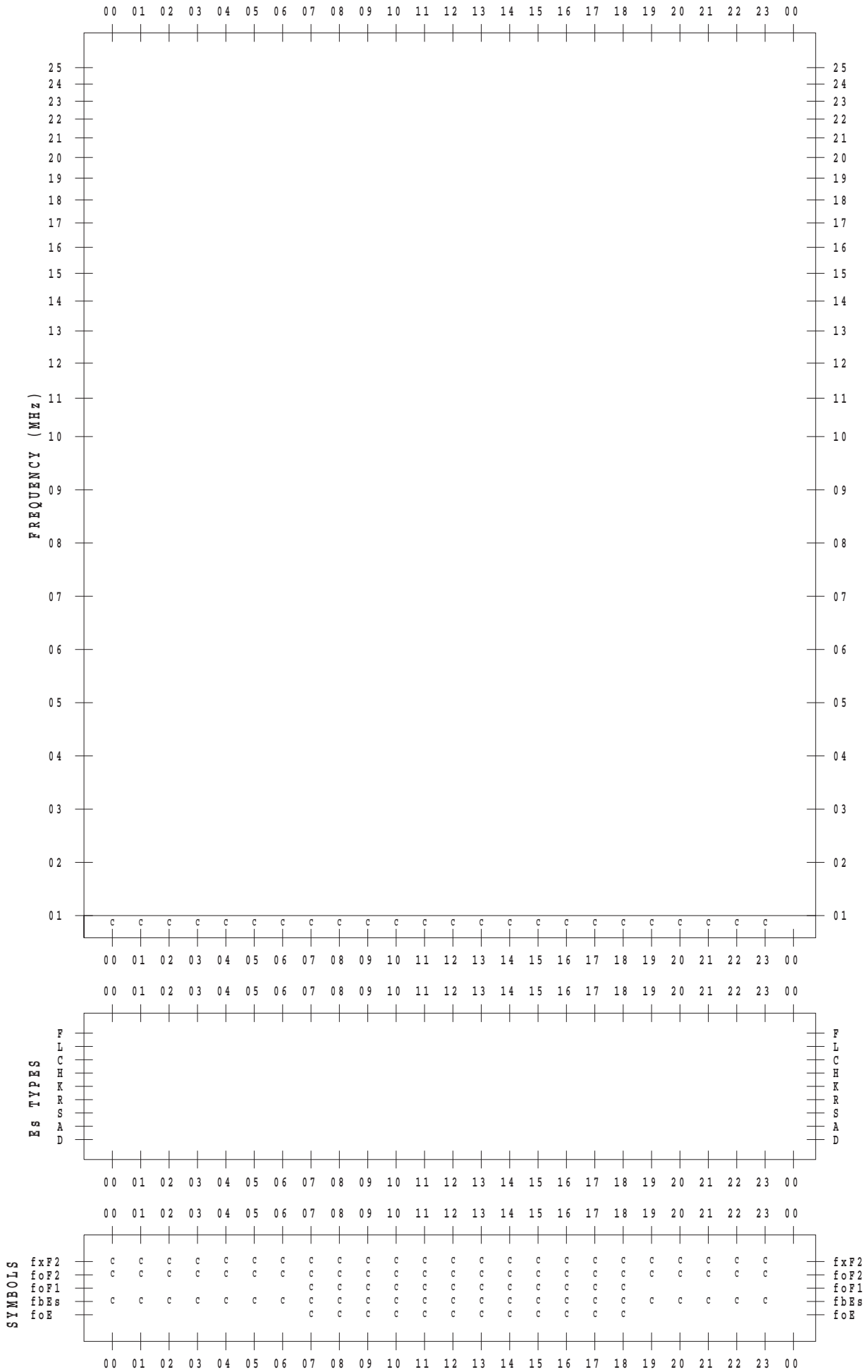
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/16

135 °E MEAN TIME



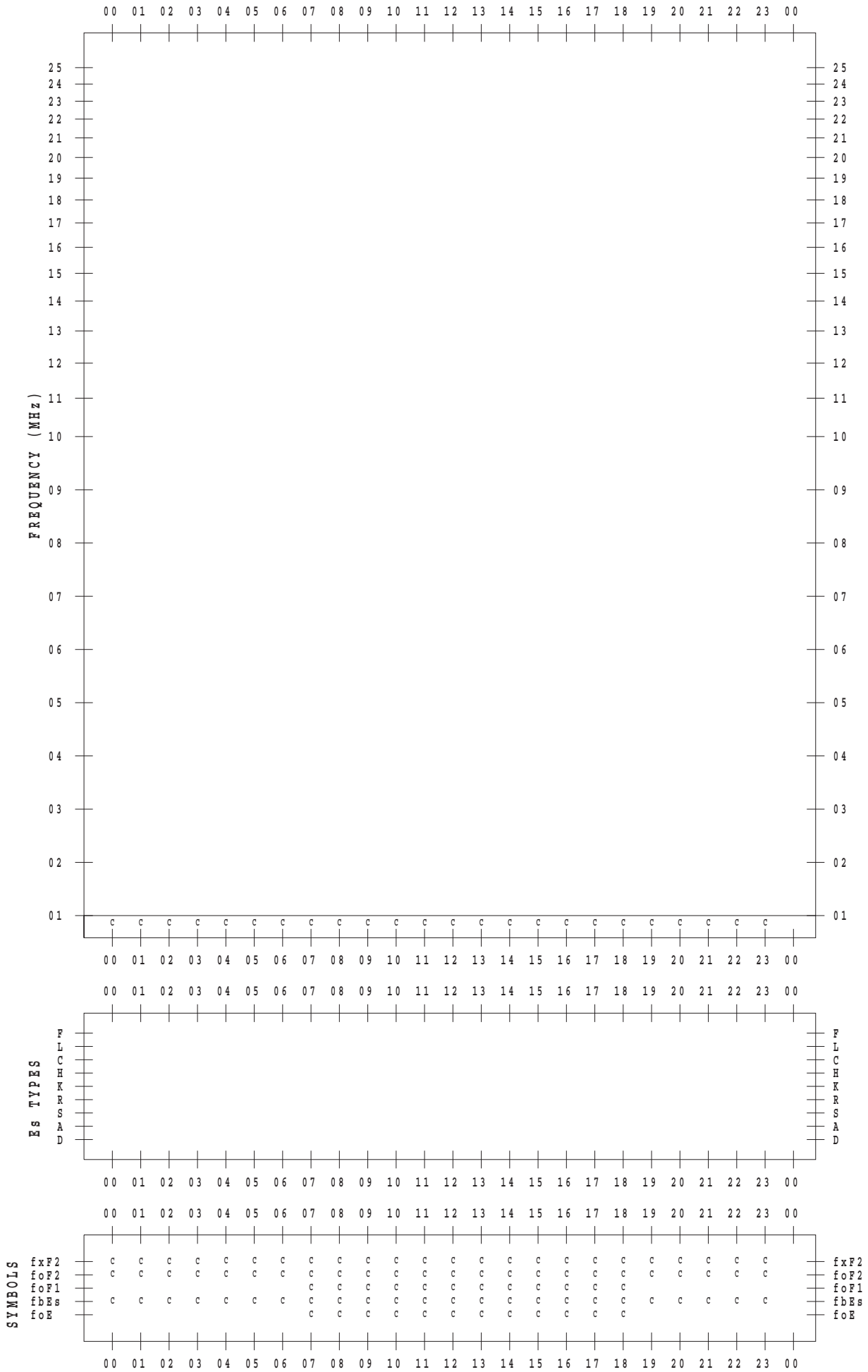
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/17

135 °E MEAN TIME



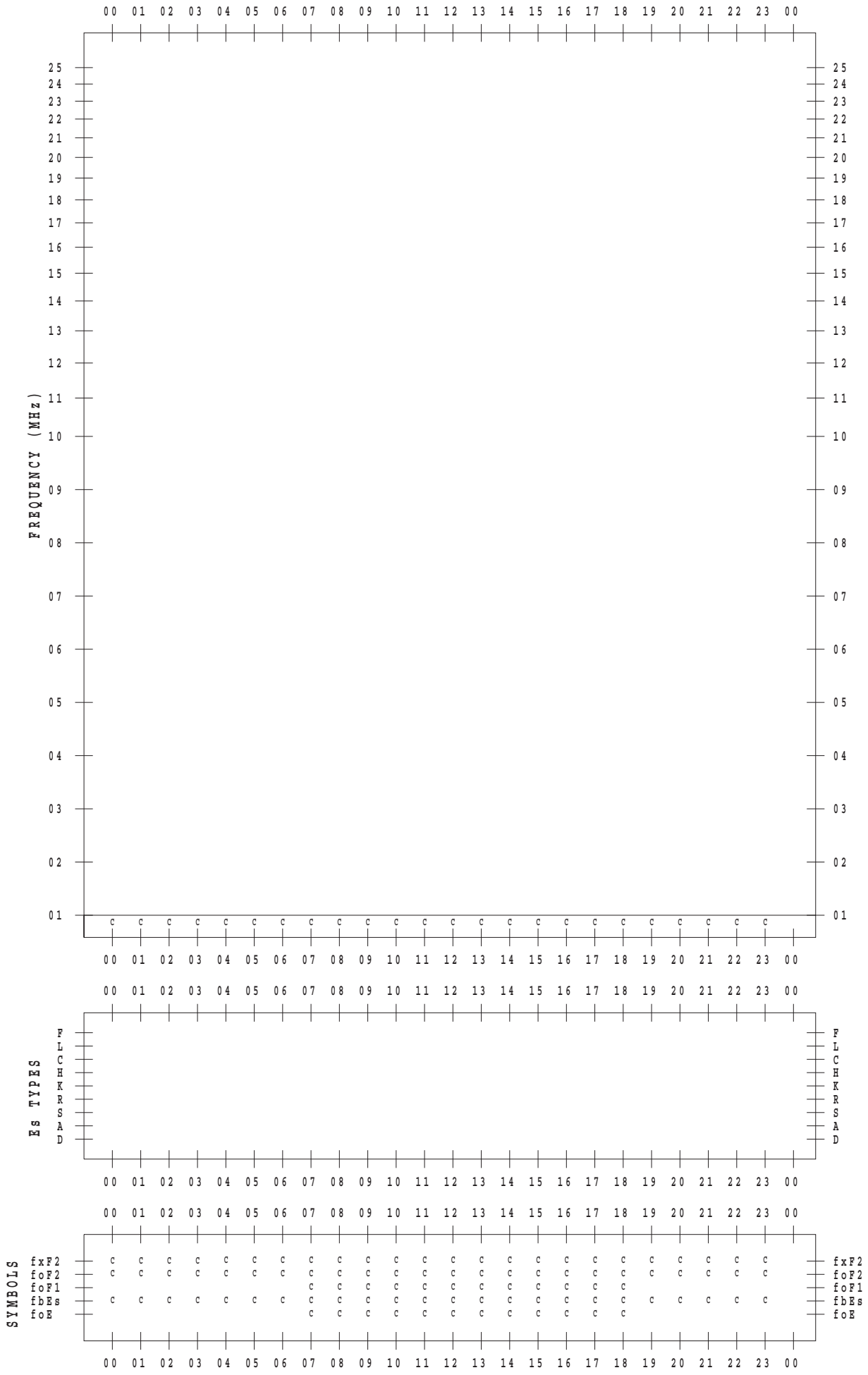
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/18

135 °E MEAN TIME



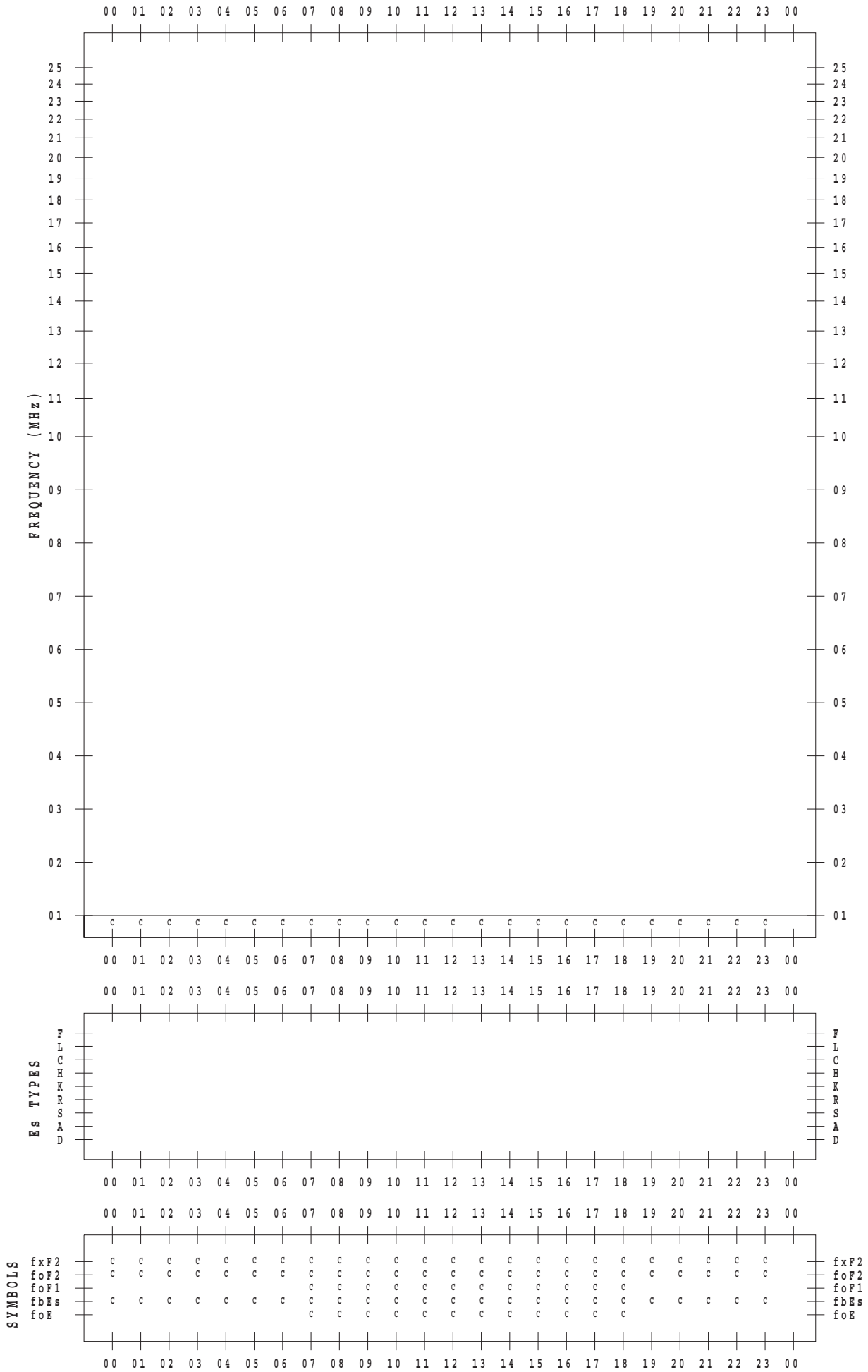
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/19

135 °E MEAN TIME



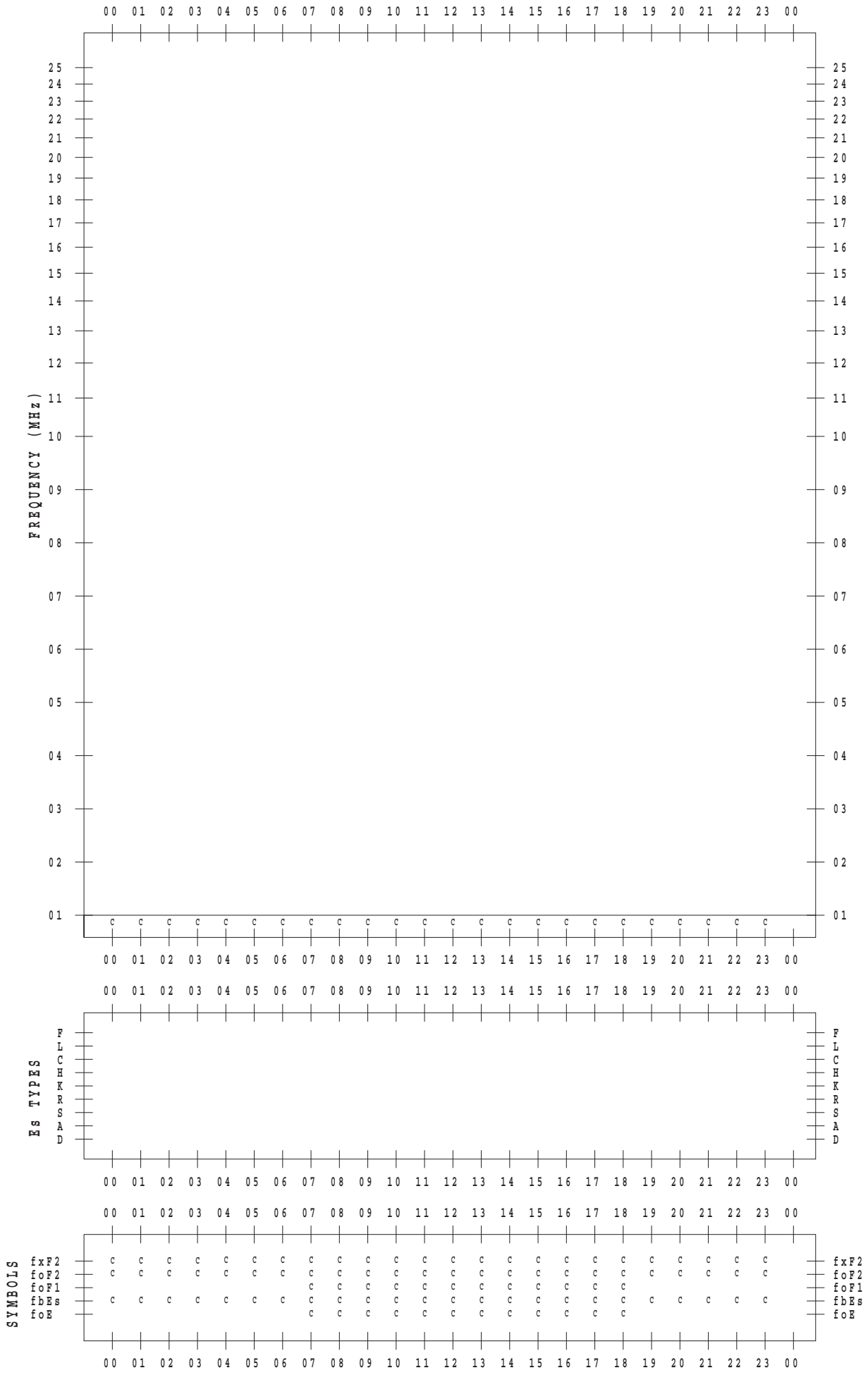
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/20

135 °E MEAN TIME



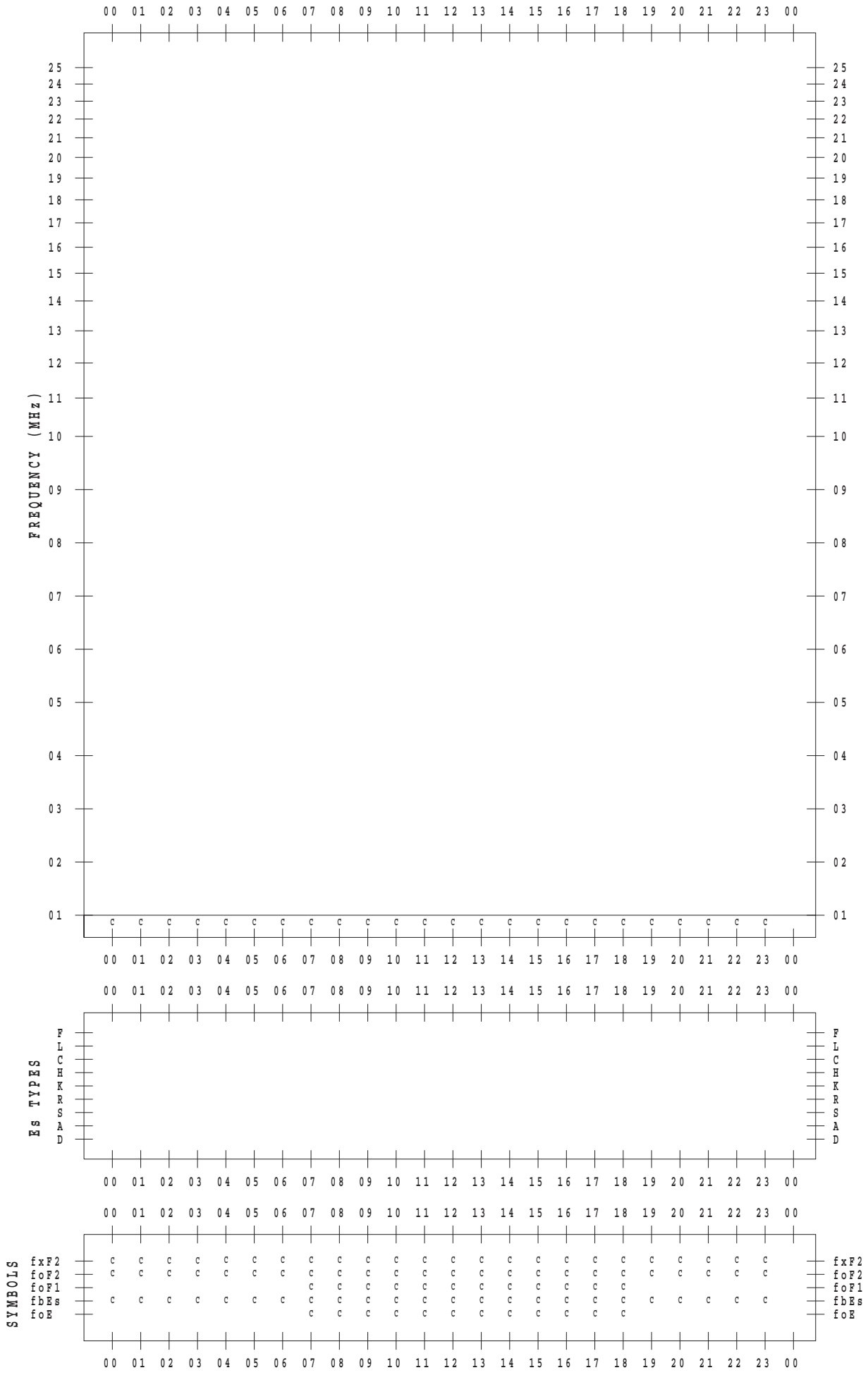
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/21

135 °E MEAN TIME



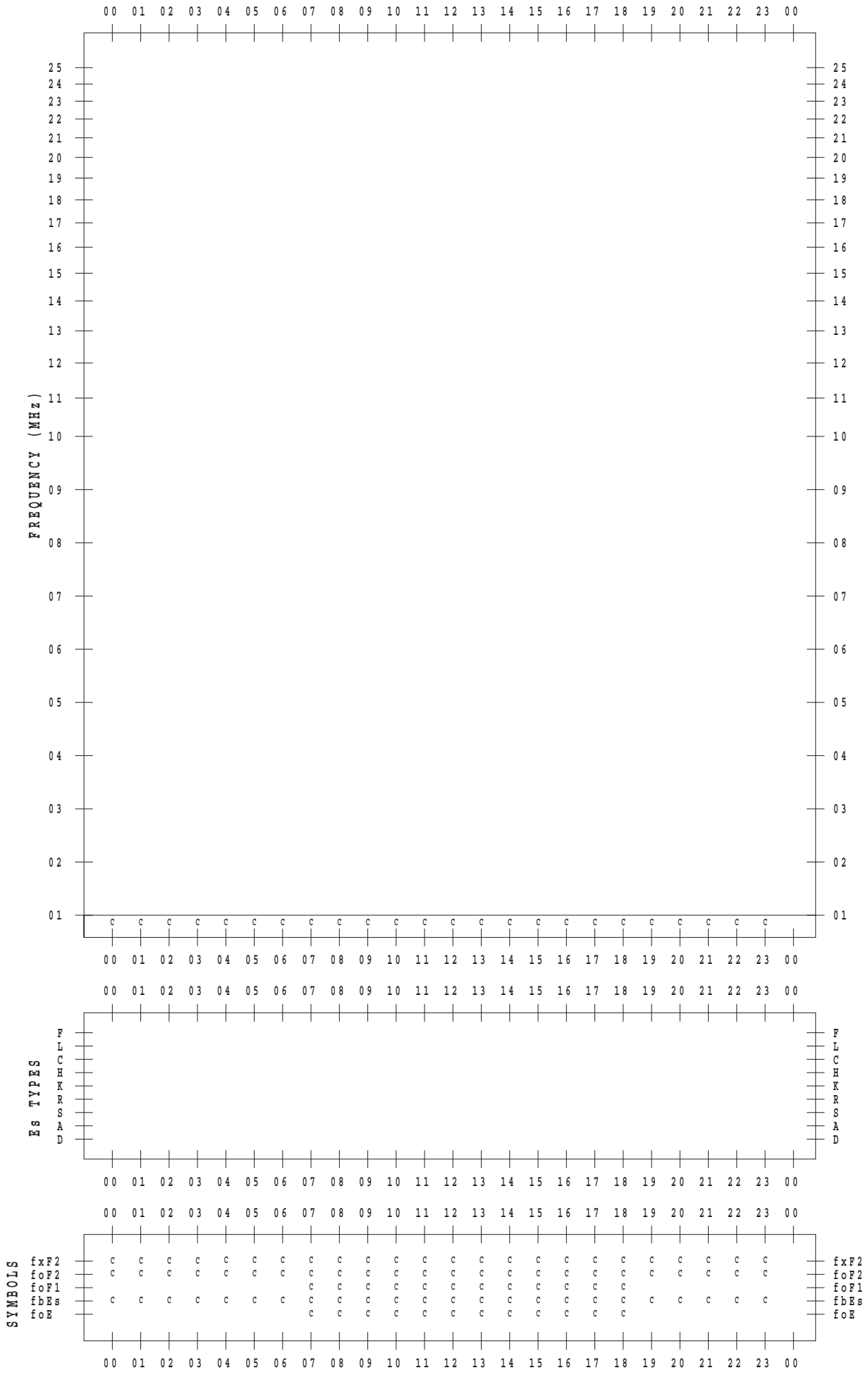
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/22

135 °E MEAN TIME



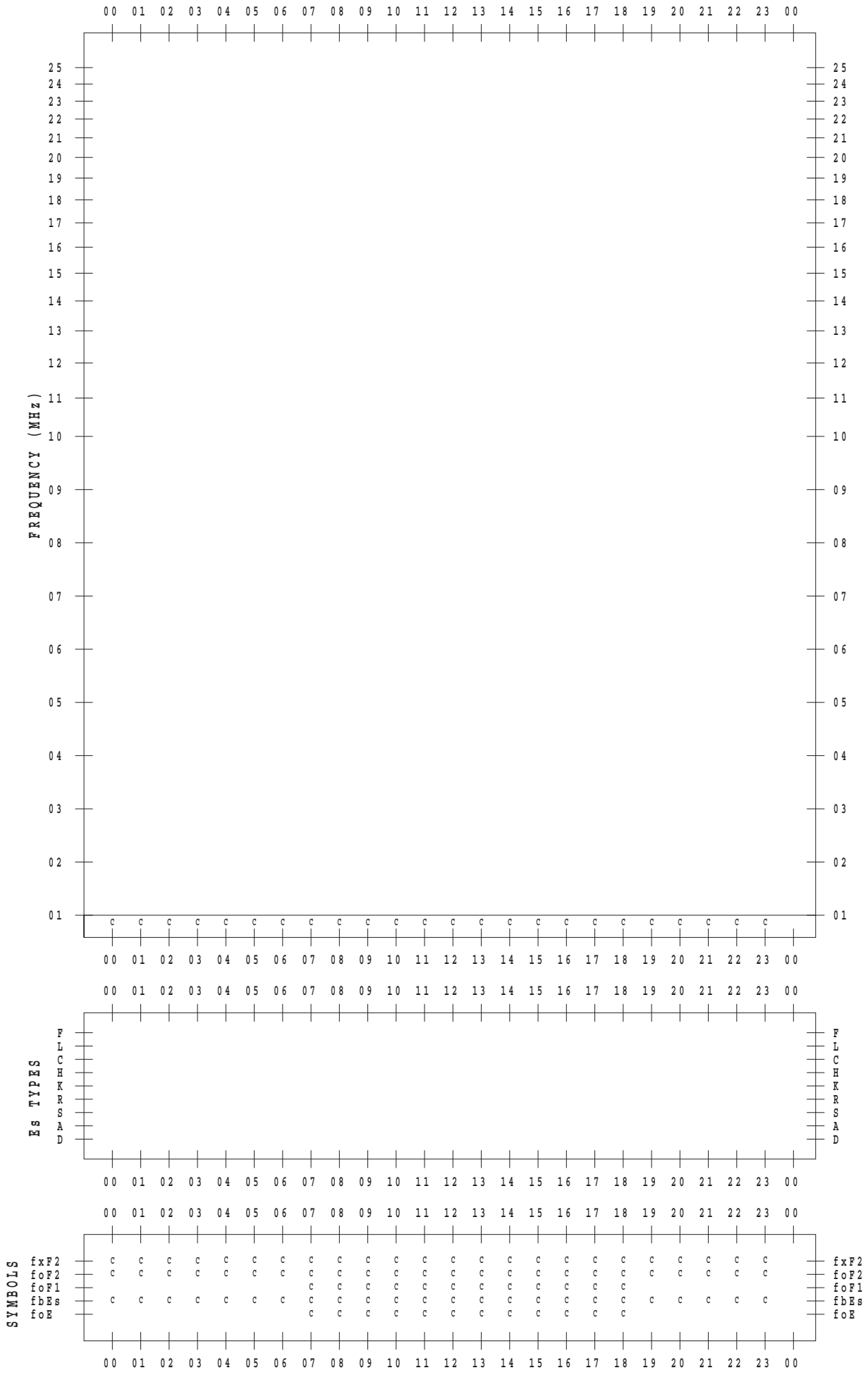
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/23

135 °E MEAN TIME



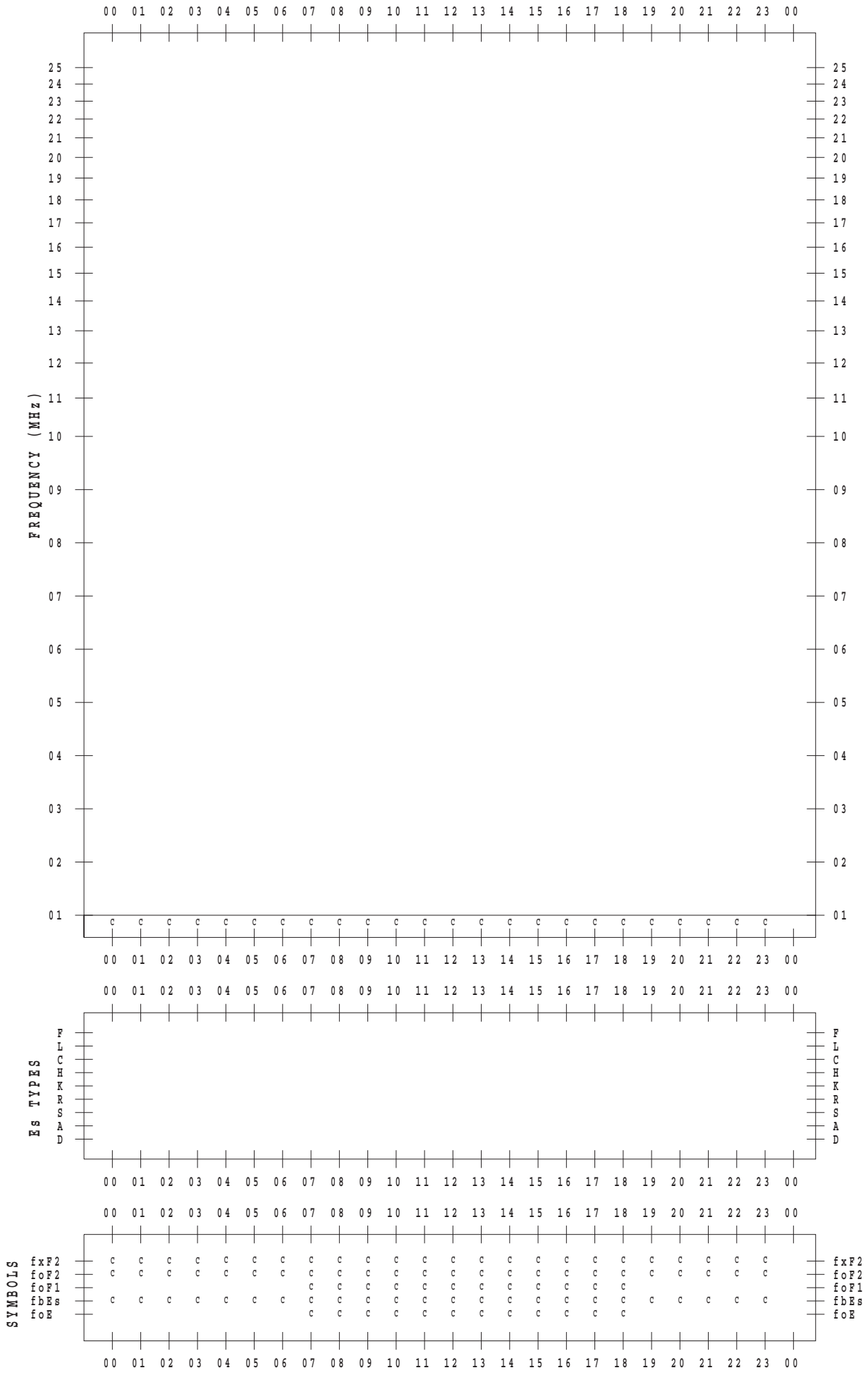
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/24

135 °E MEAN TIME



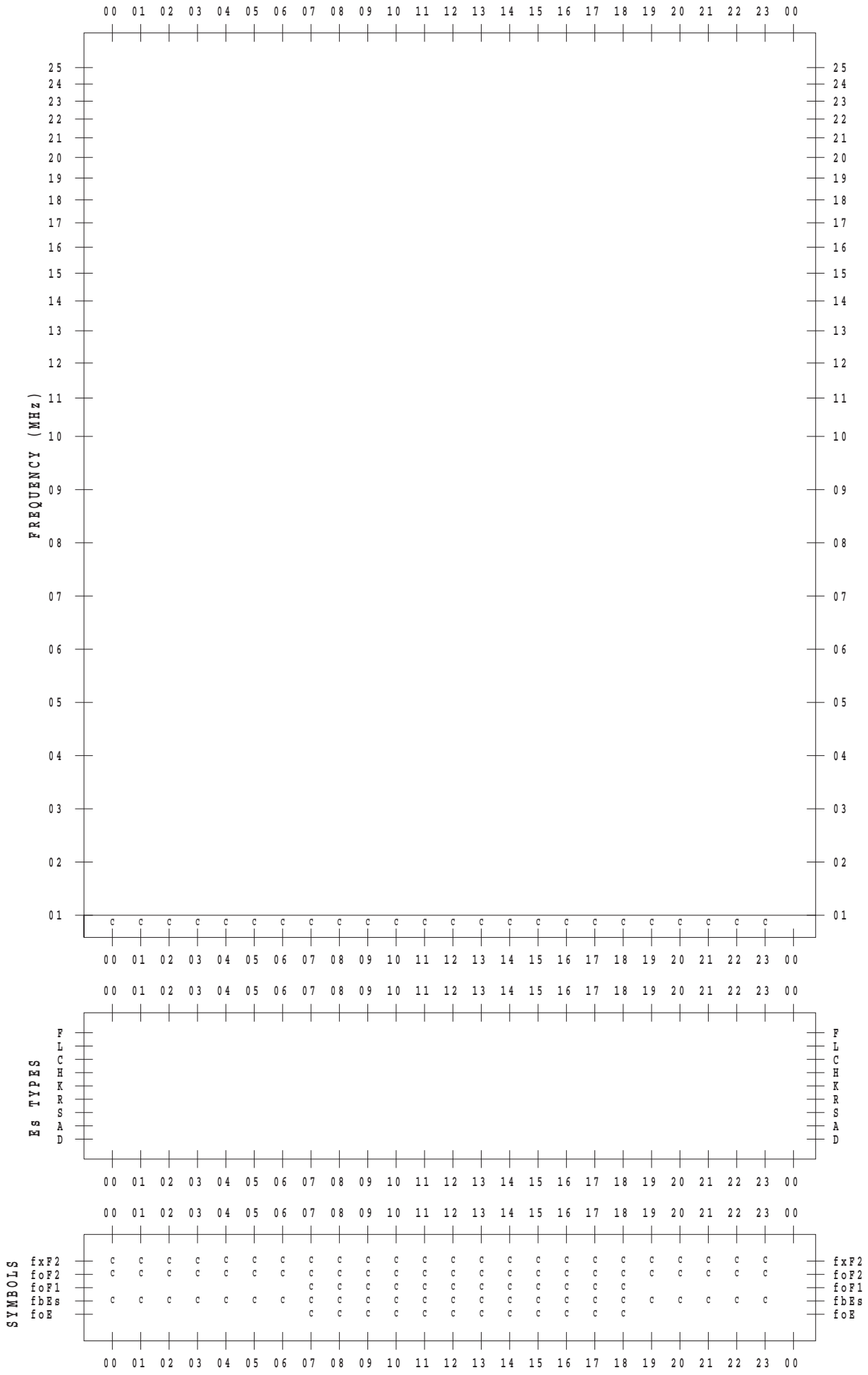
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/25

135 °E MEAN TIME



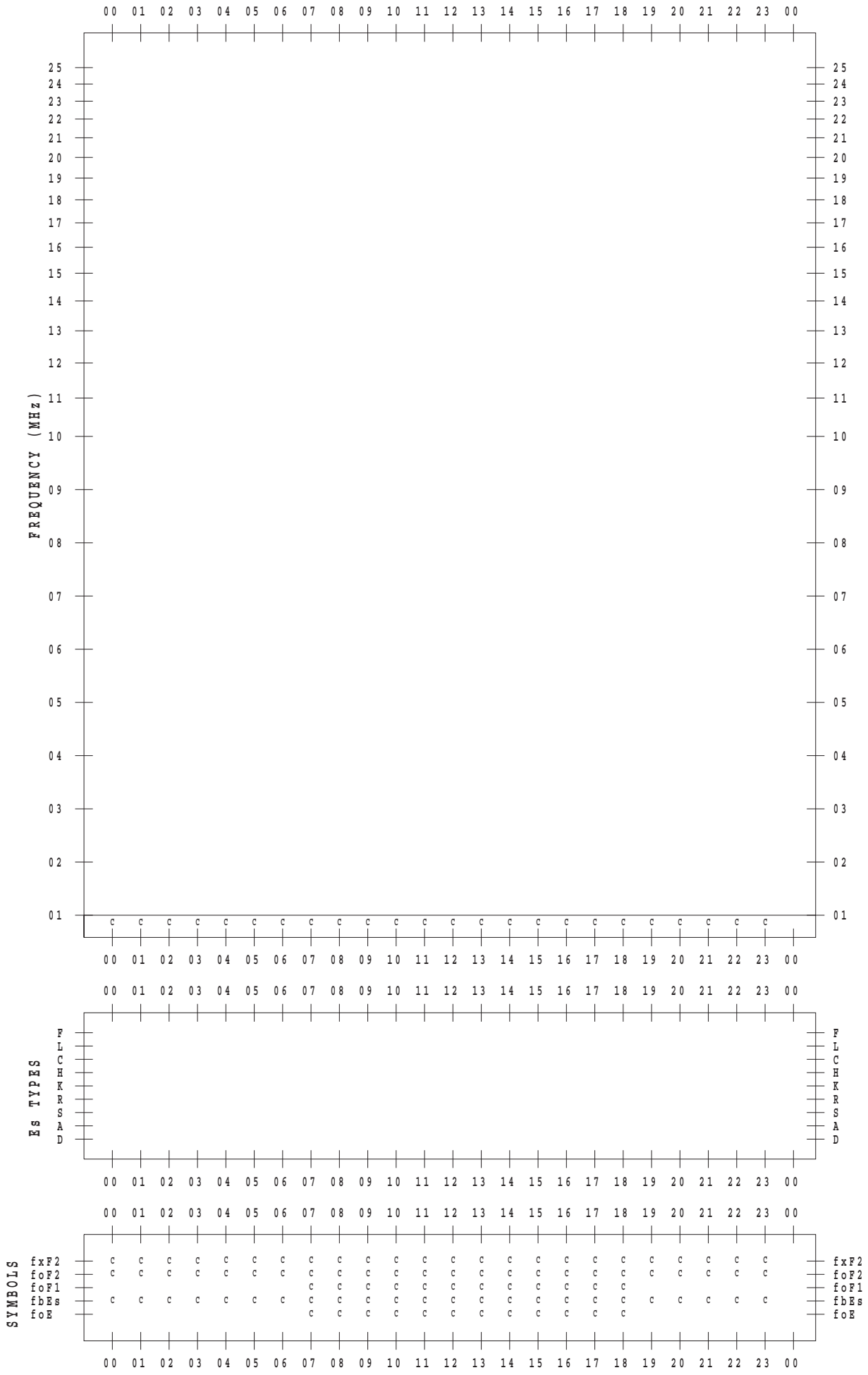
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/26

135 °E MEAN TIME



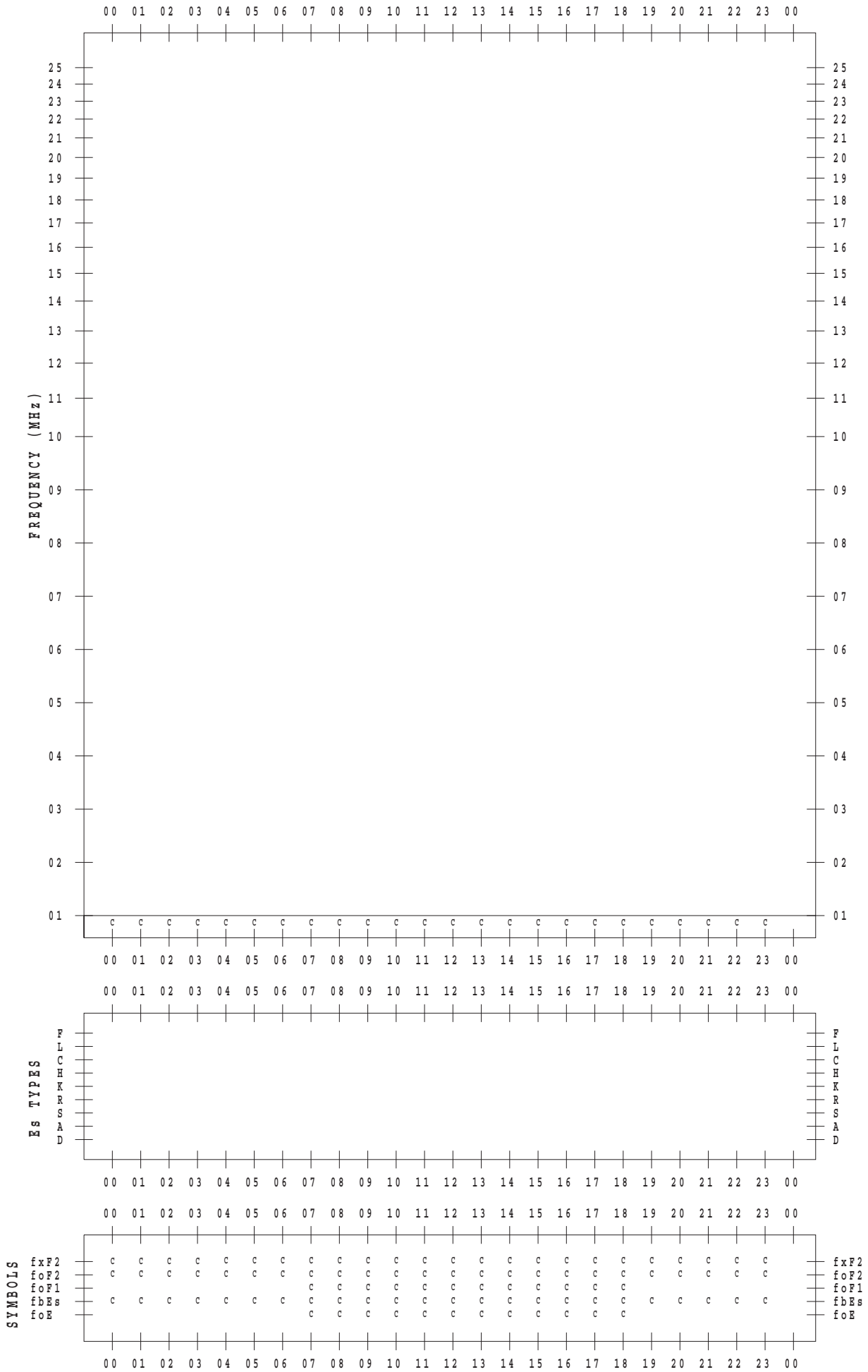
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/27

135 °E MEAN TIME



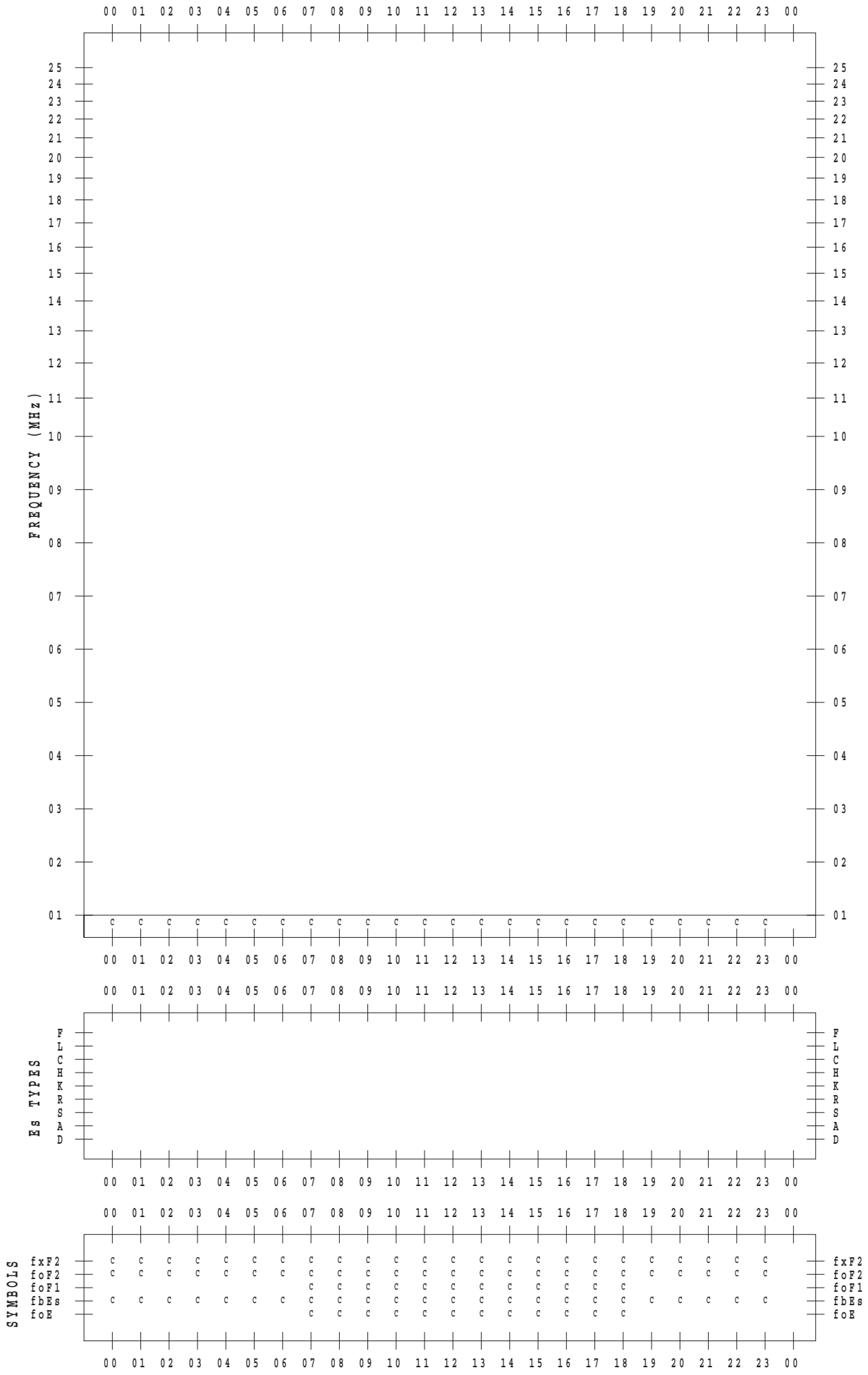
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/28

135 °E MEAN TIME



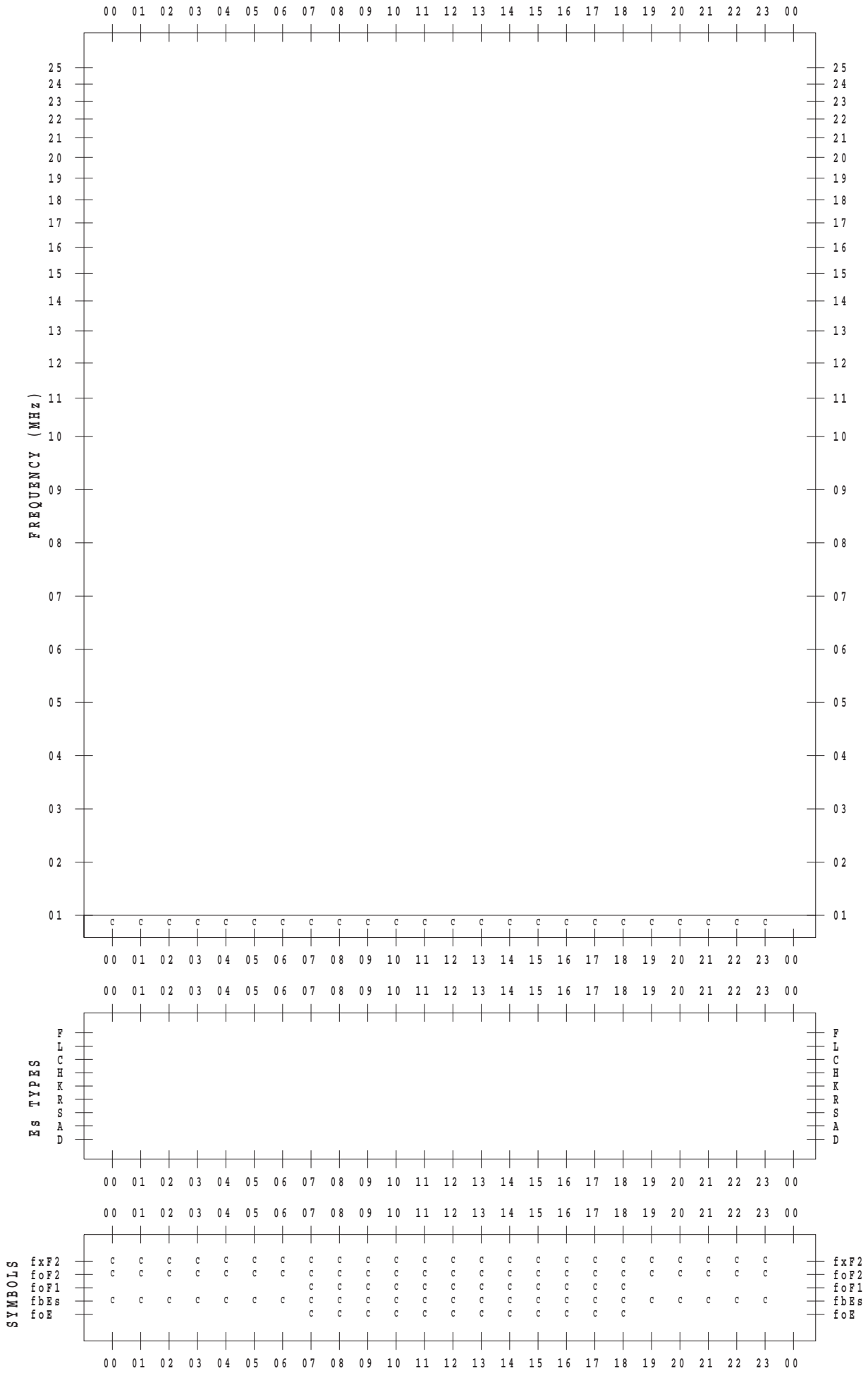
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/29

135 °E MEAN TIME



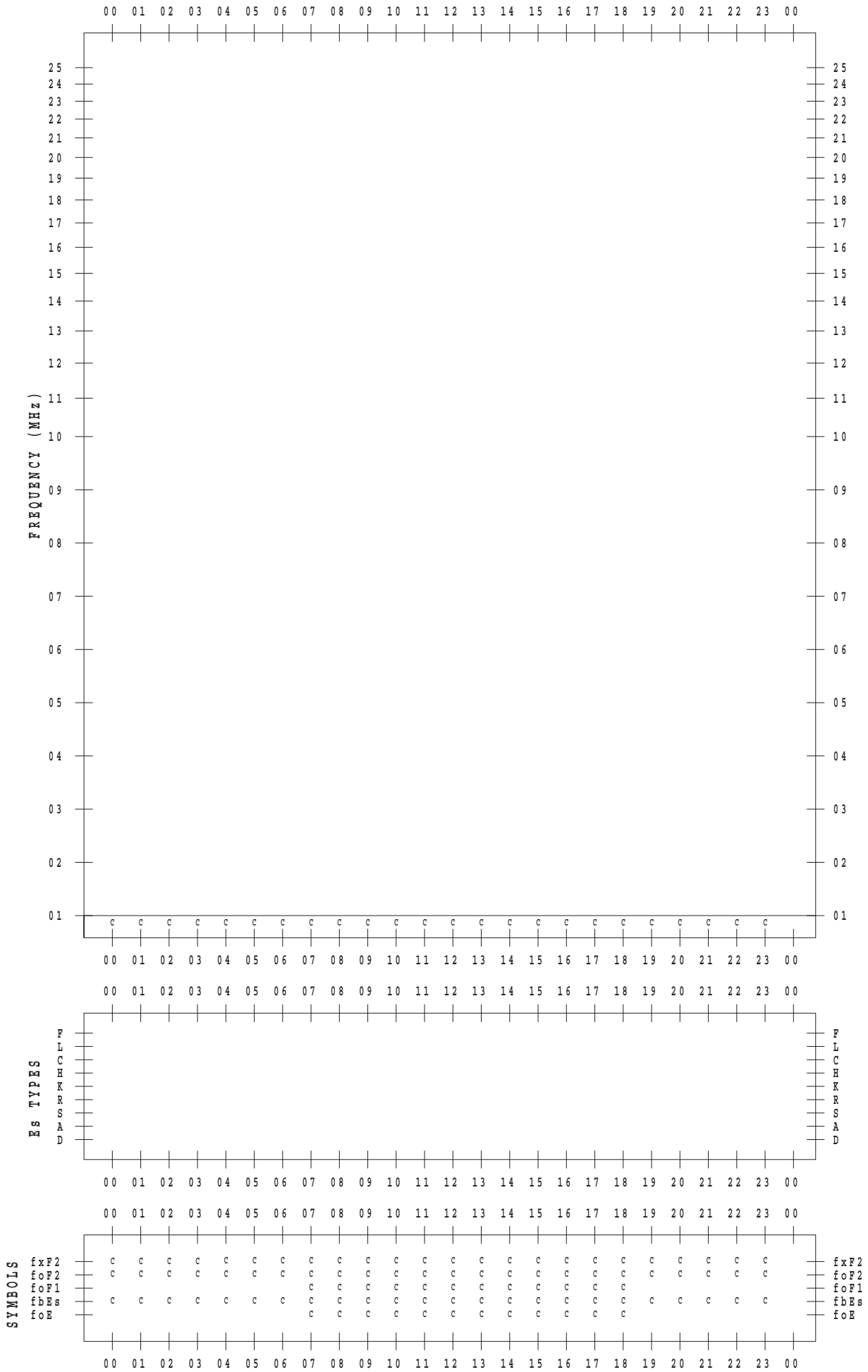
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/30

135 °E MEAN TIME



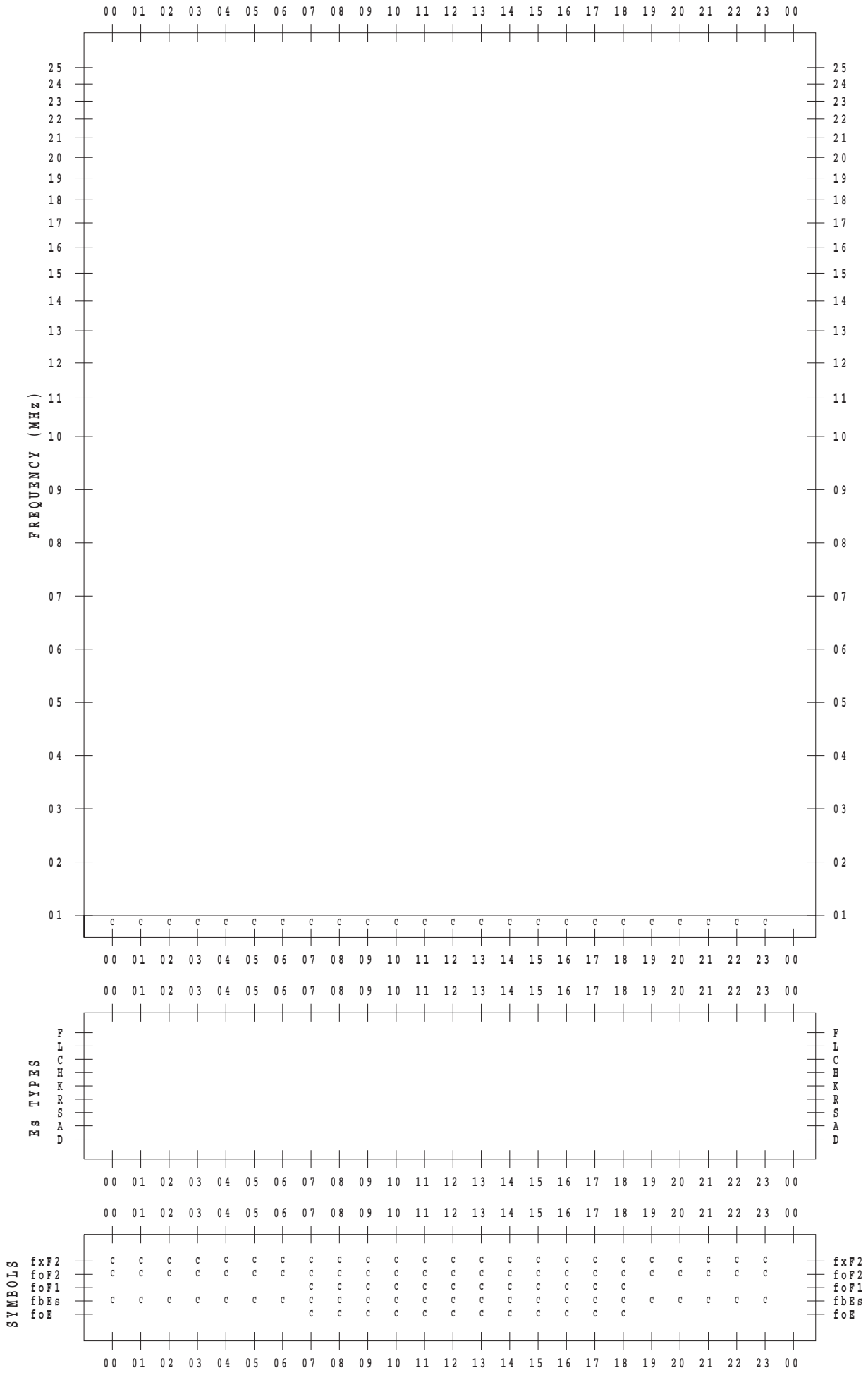
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2016/12/31

135 °E MEAN TIME



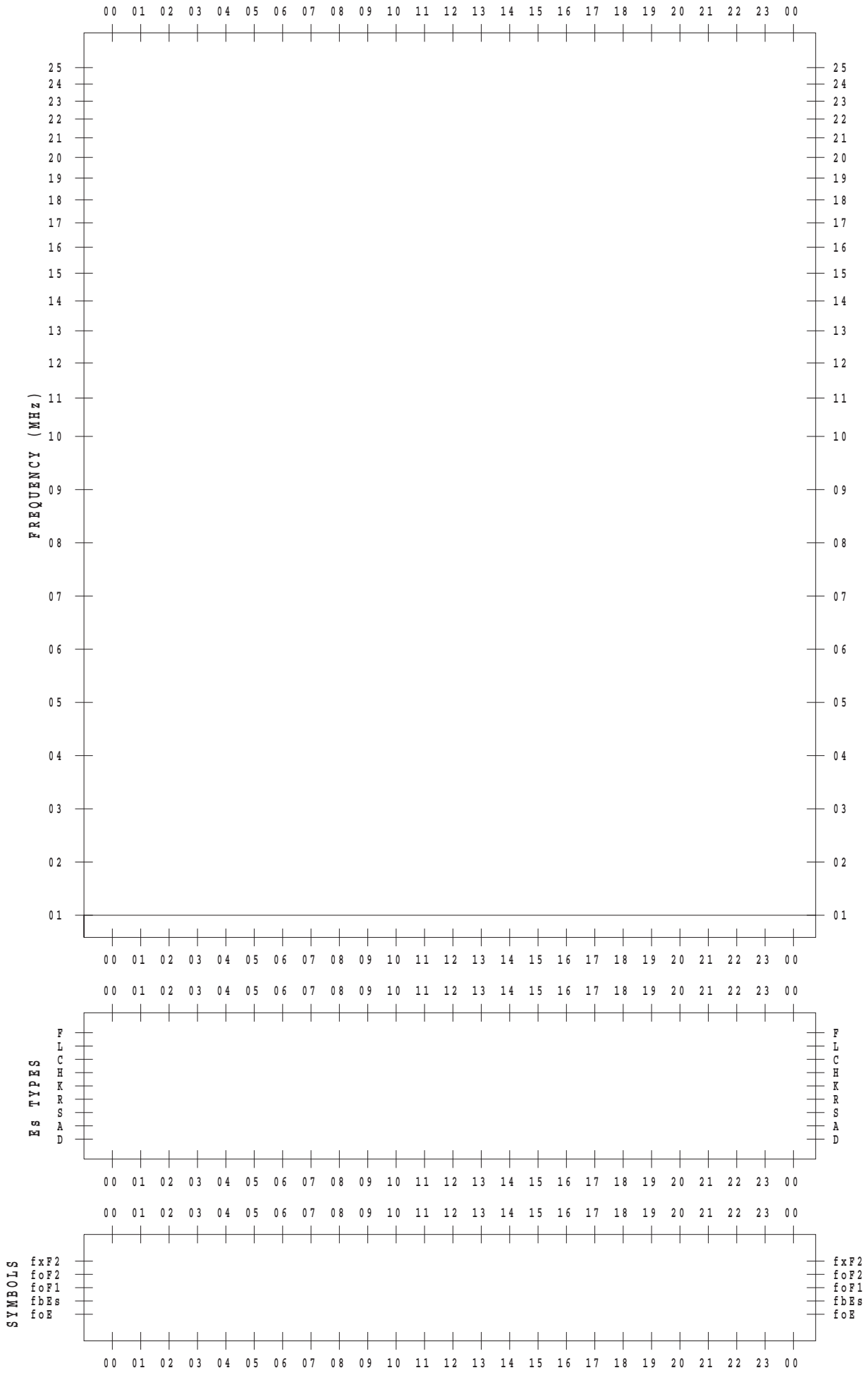
f-PLOT DATA

SCALER :

STATION : Okinawa

DATE : 2016/12/ 1

135 °E MEAN TIME



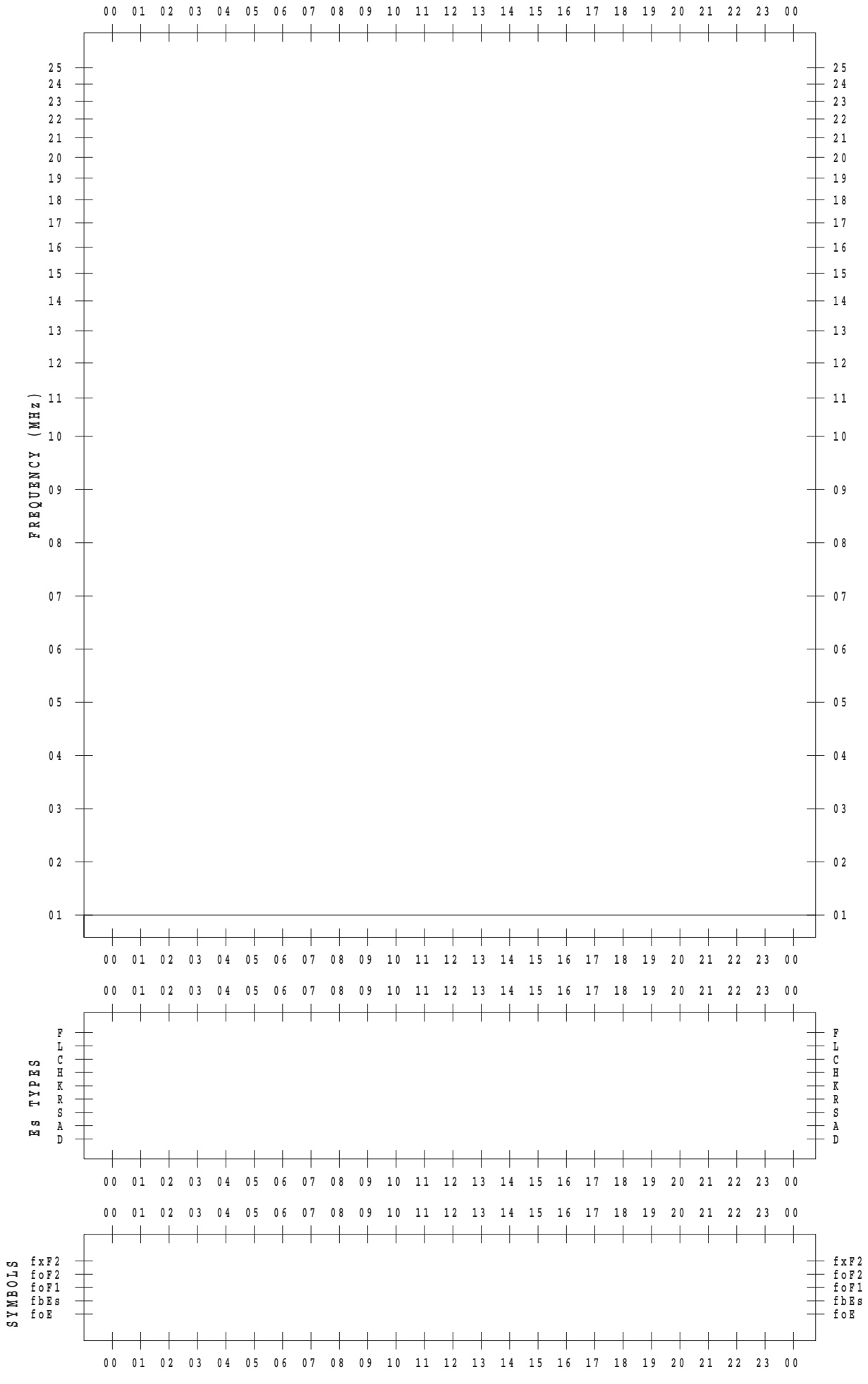
f-PLOT DATA

SCALER :

STATION : Okinawa

DATE : 2016/12/ 2

135 °E MEAN TIME



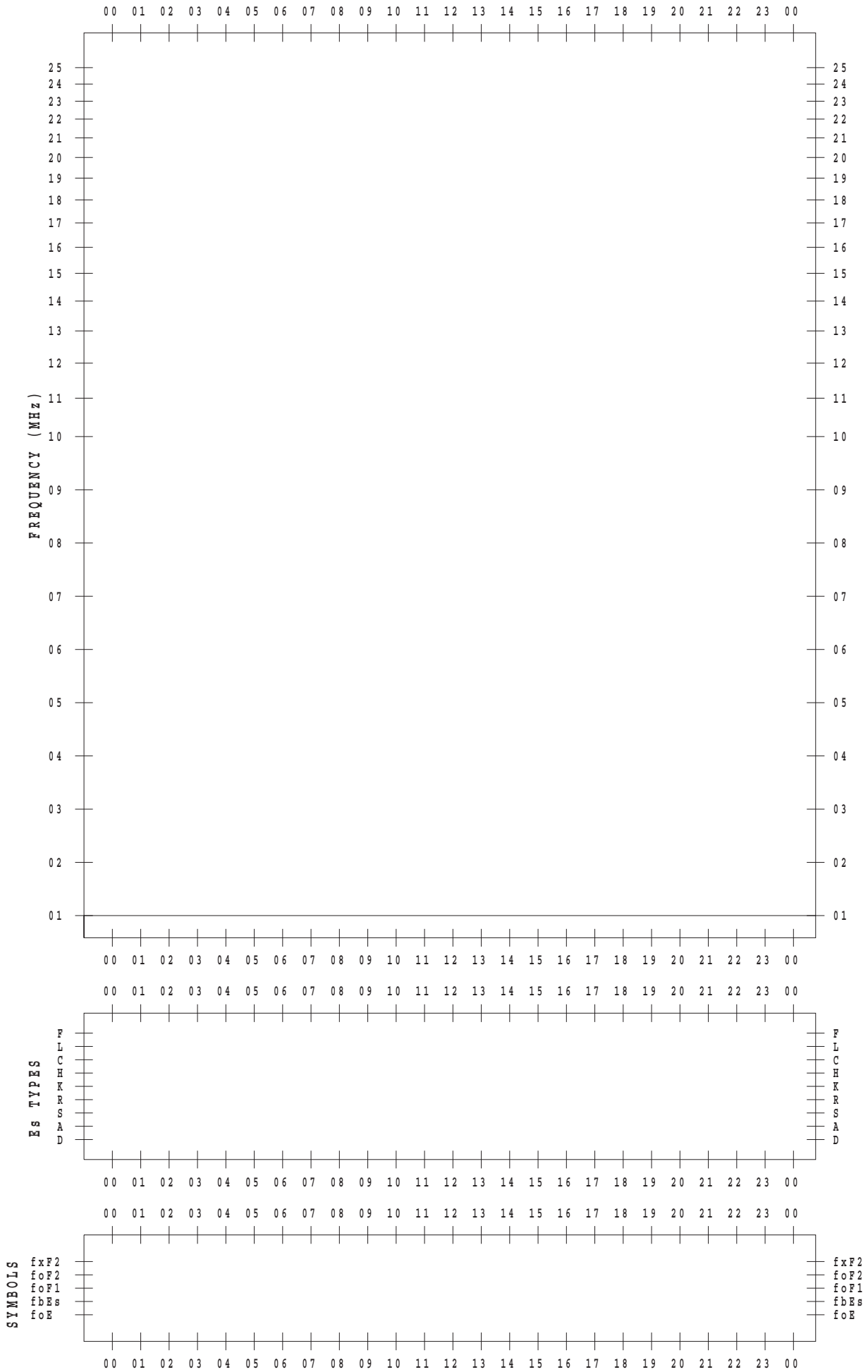
f-PLOT DATA

SCALER :

STATION : Okinawa

DATE : 2016/12/ 3

135 °E MEAN TIME



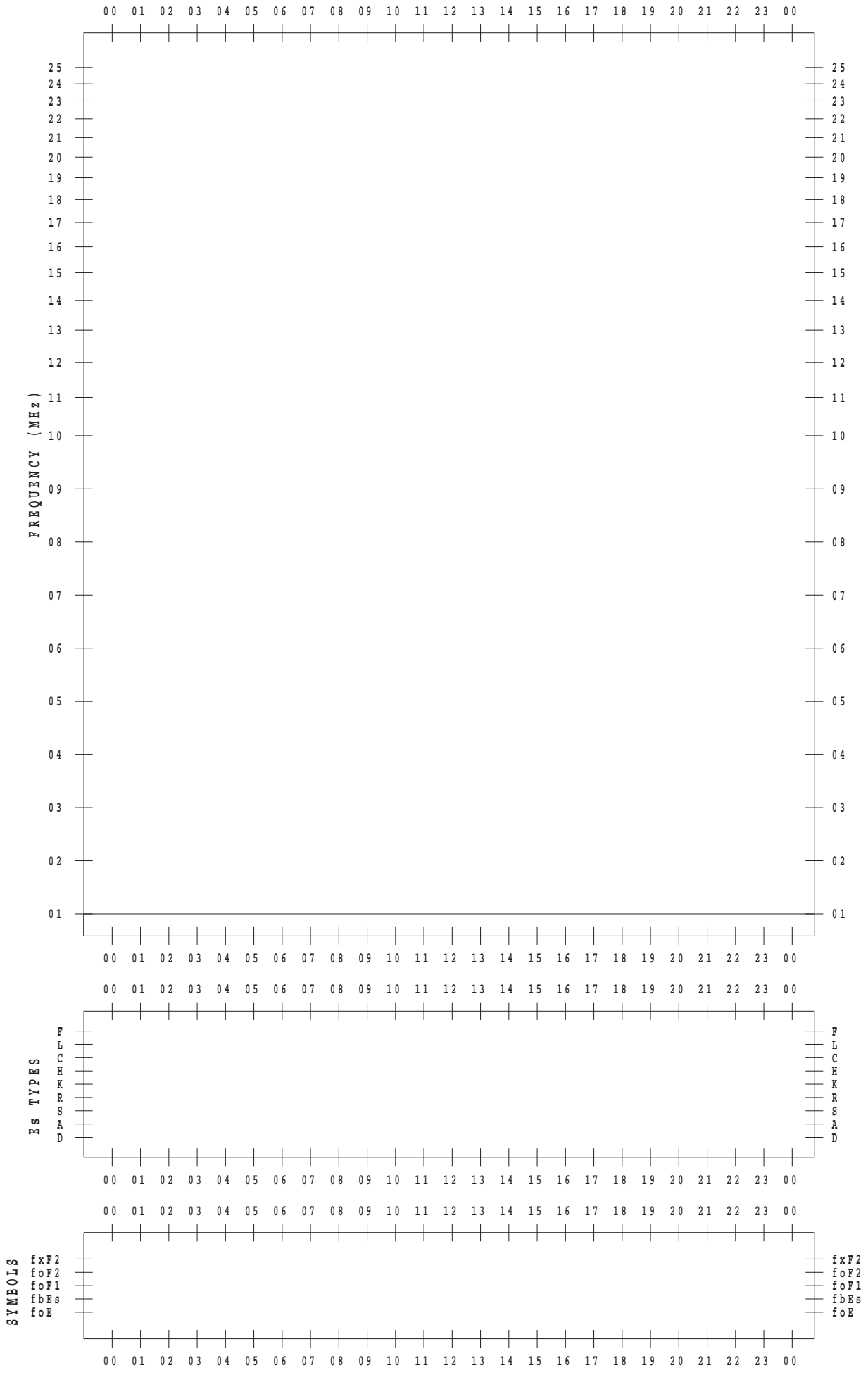
f-PLOT DATA

SCALER :

STATION : Okinawa

DATE : 2016/12/ 4

135 °E MEAN TIME



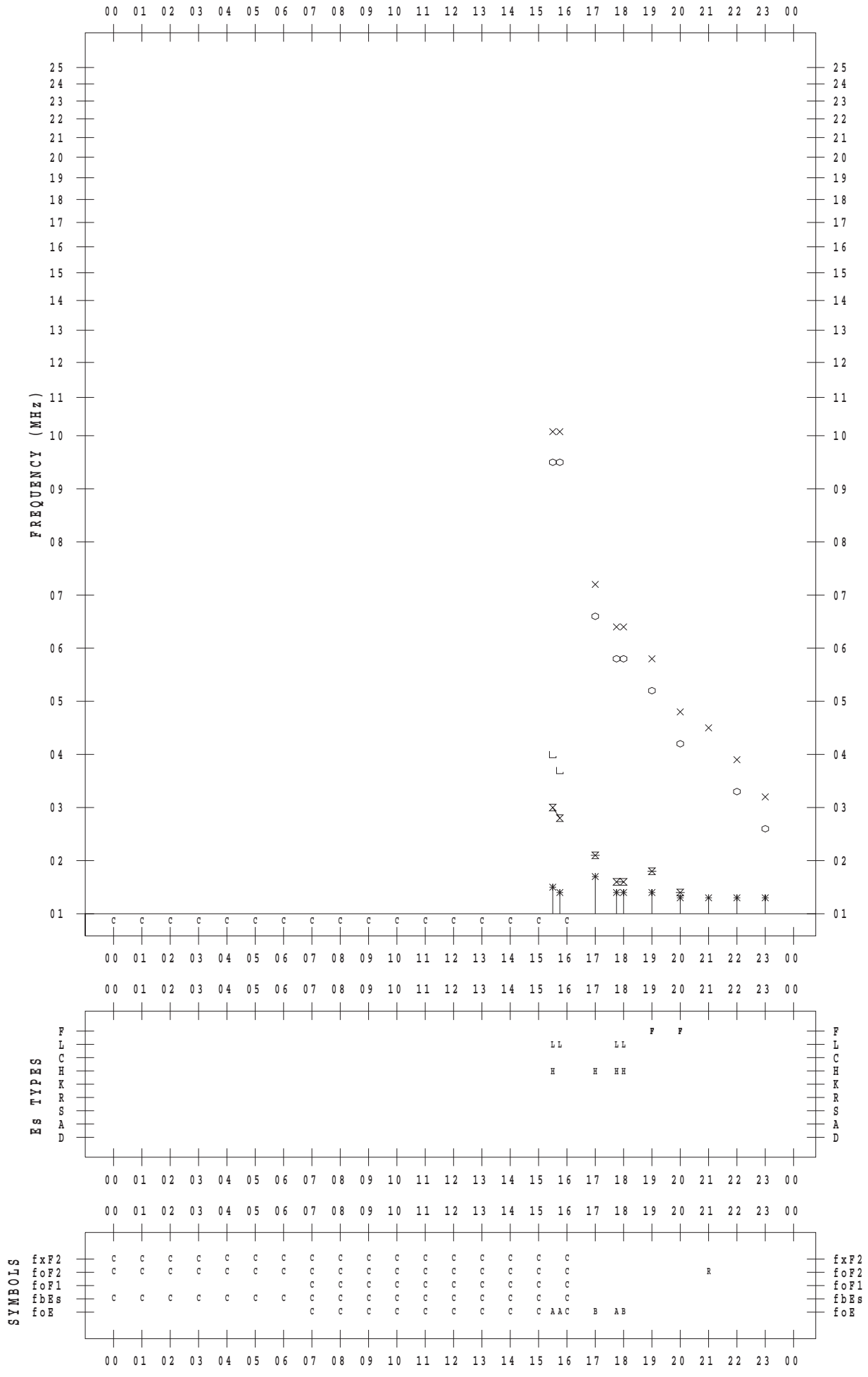
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/ 5

135 °E MEAN TIME



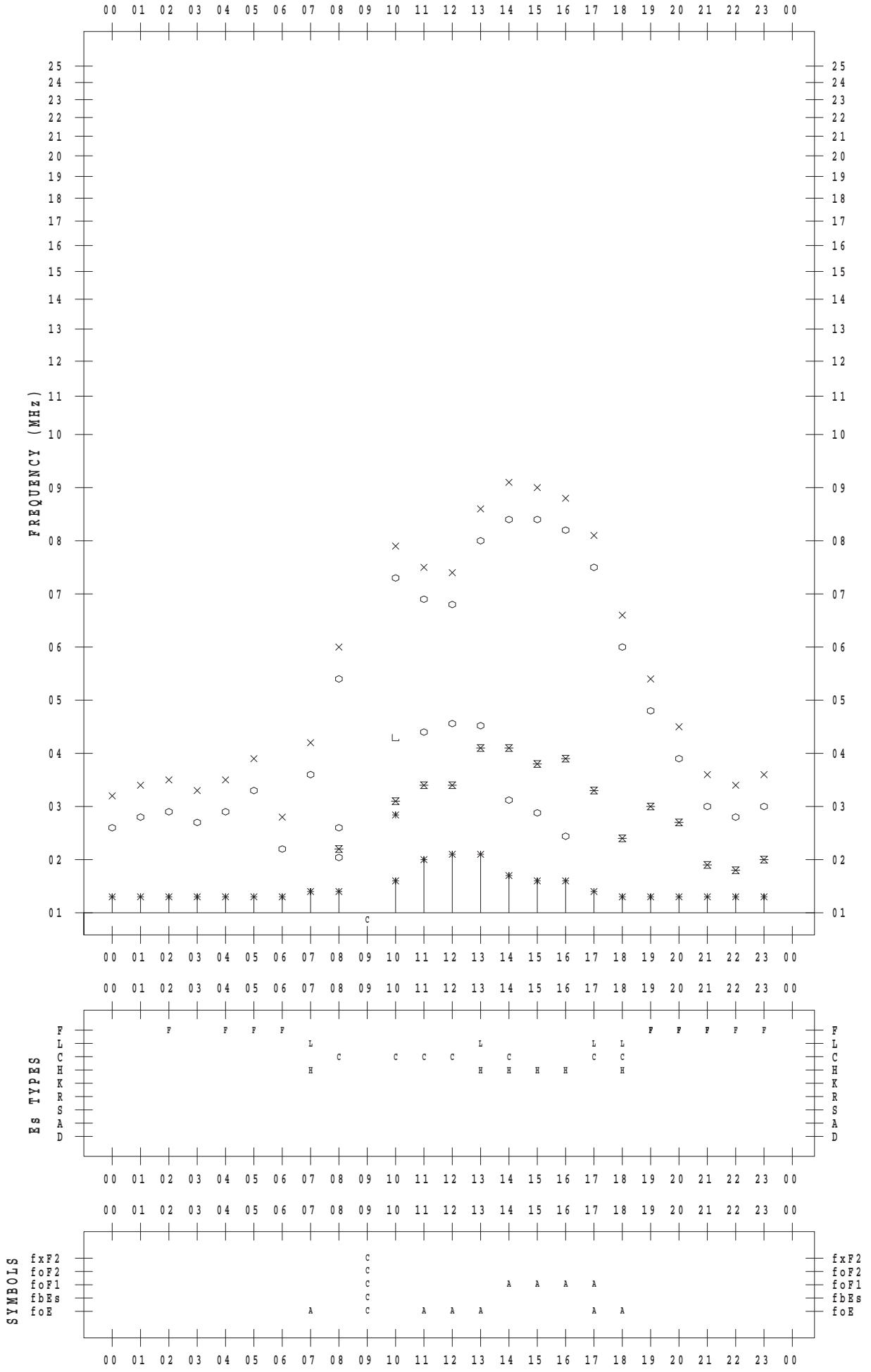
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/ 6

135 °E MEAN TIME



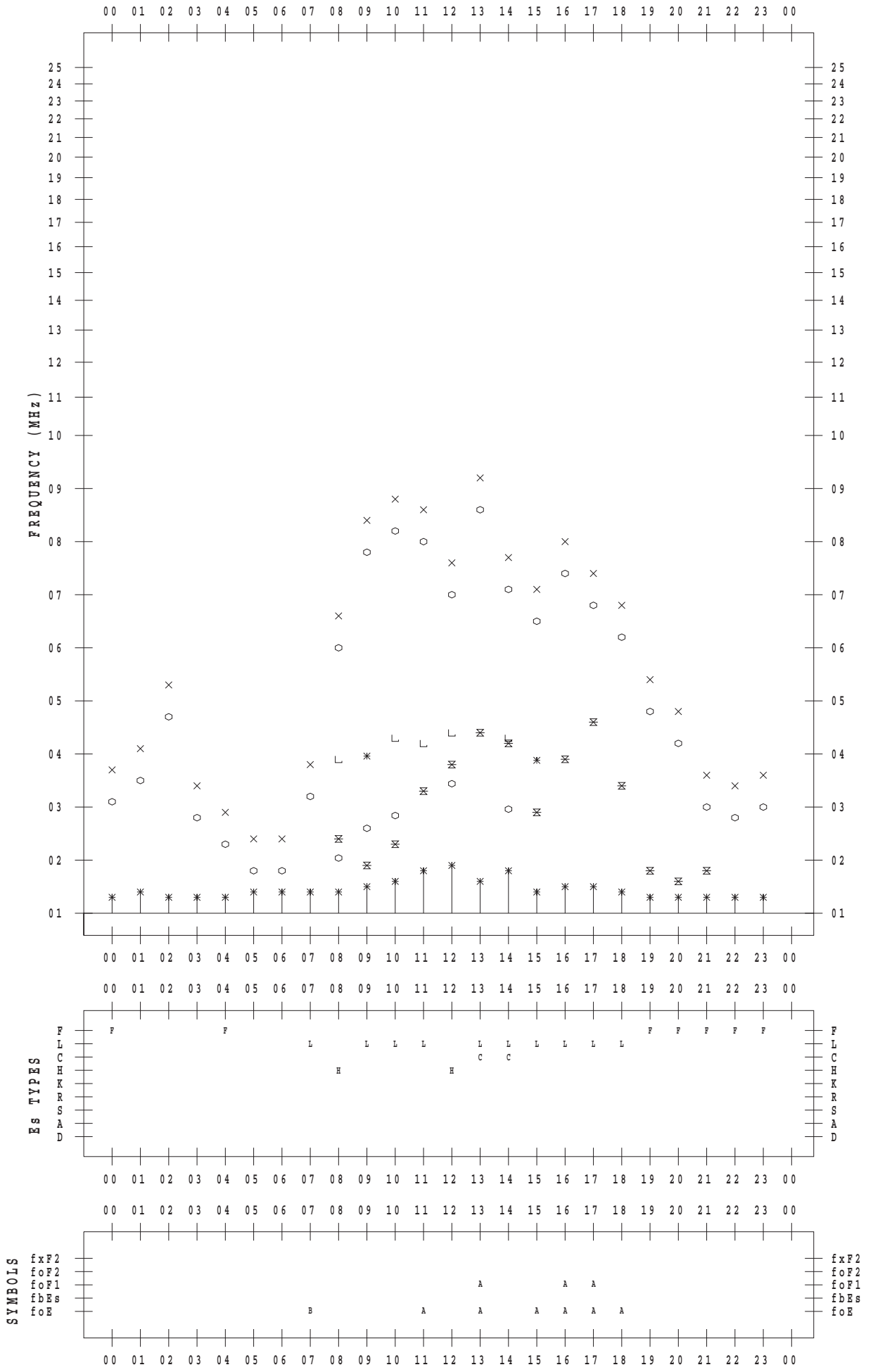
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/ 7

135 °E MEAN TIME



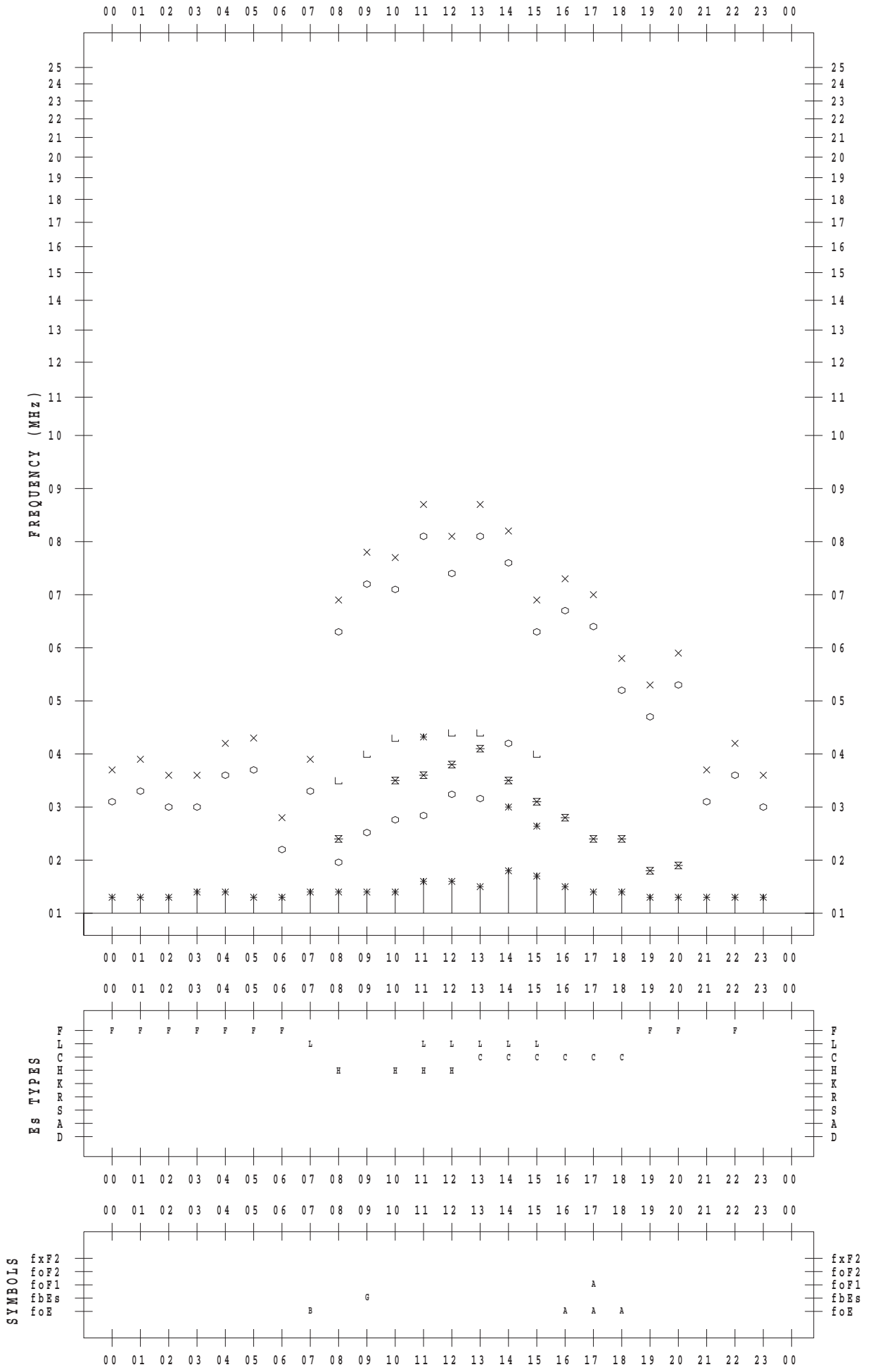
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/ 8

135 °E MEAN TIME



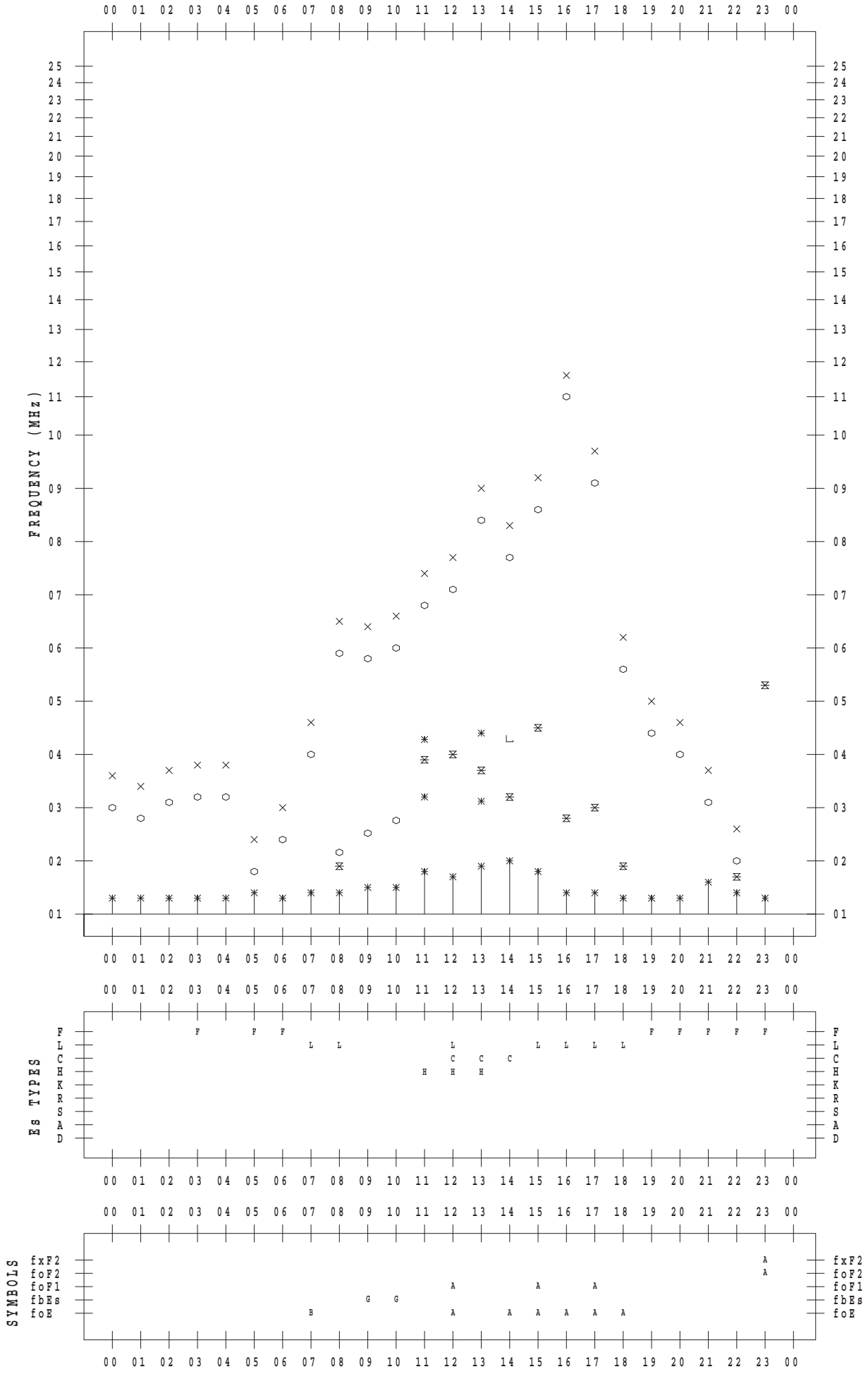
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/ 9

135 °E MEAN TIME



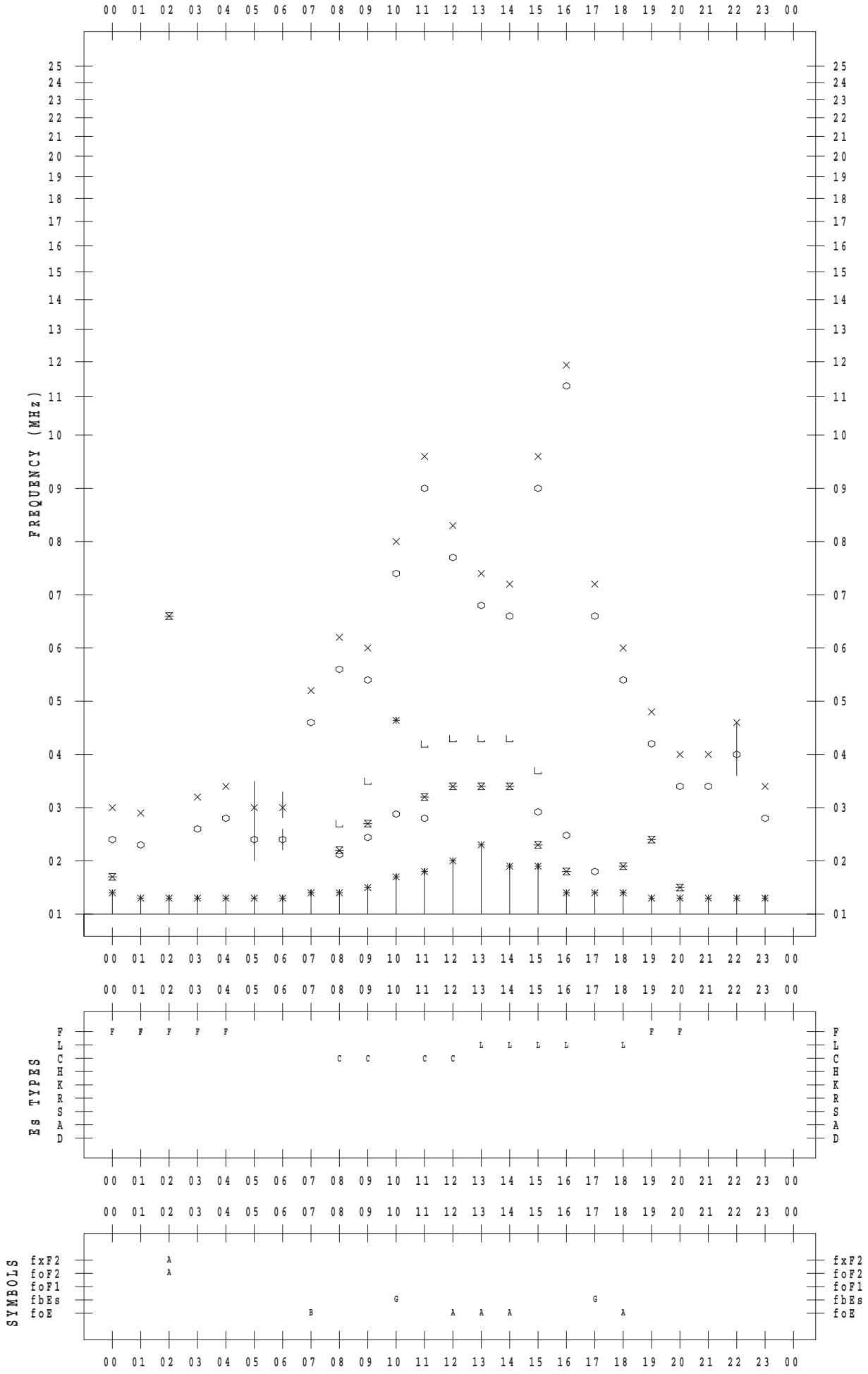
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/10

135 °E MEAN TIME



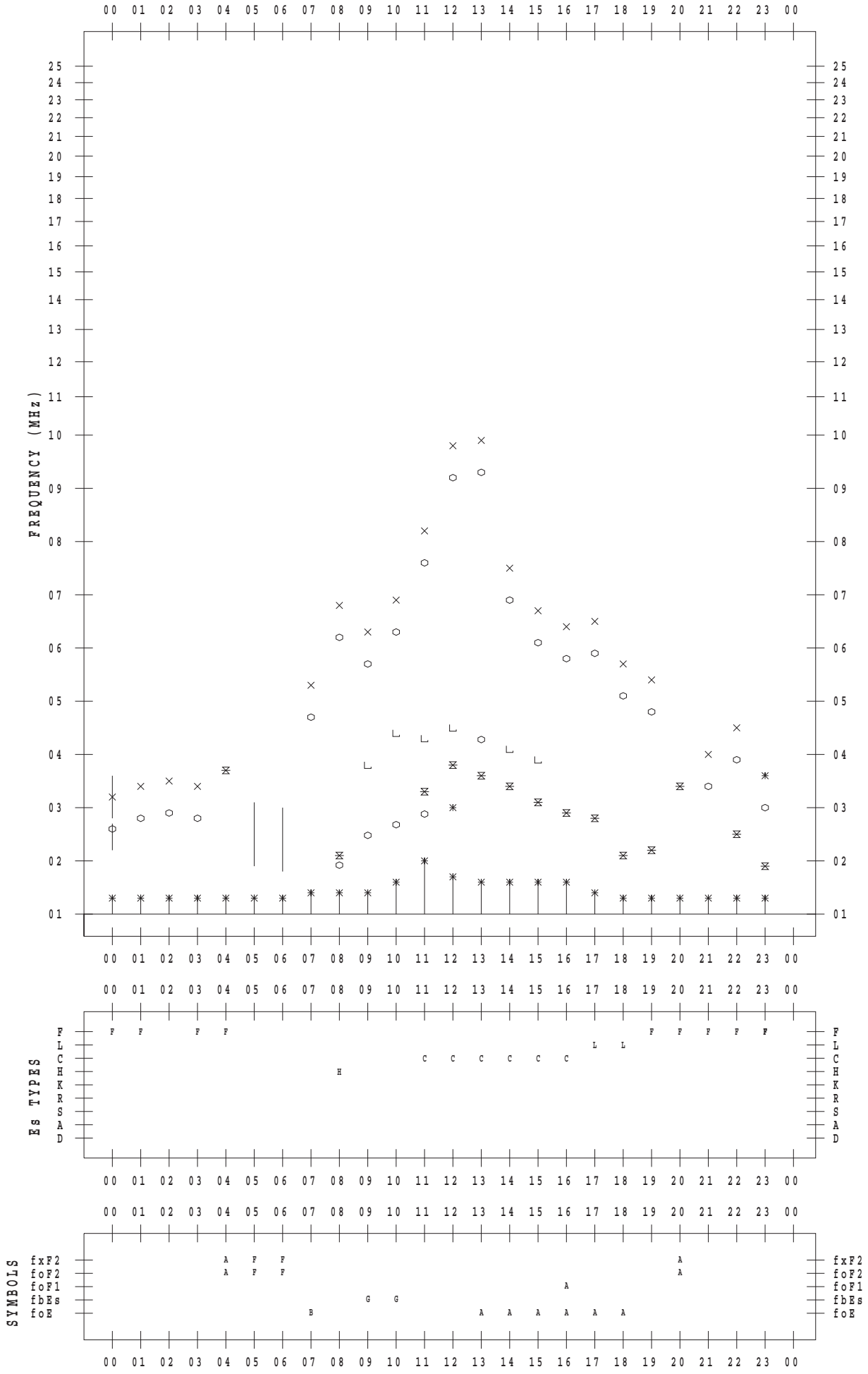
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/11

135 °E MEAN TIME



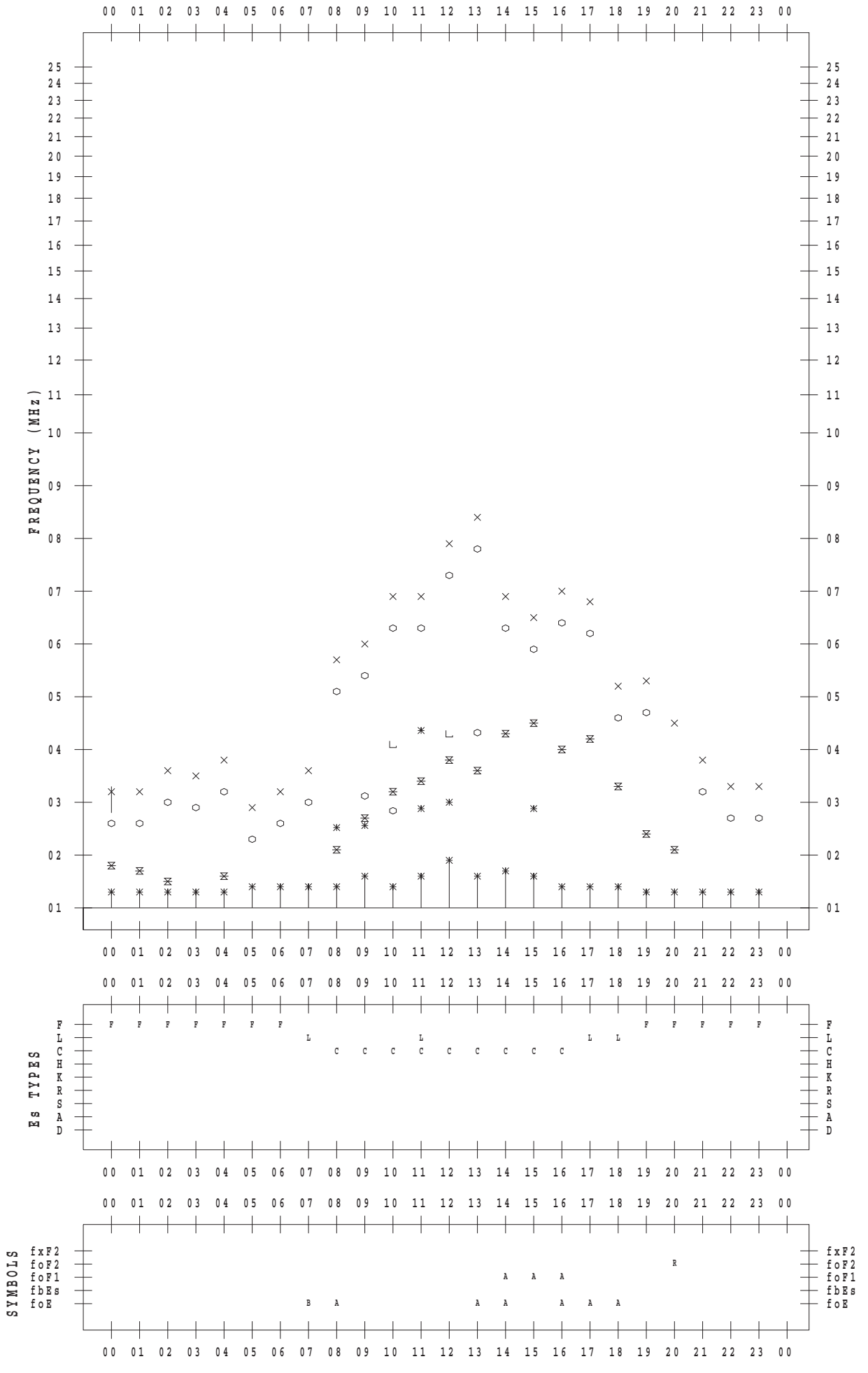
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/12

135 °E MEAN TIME



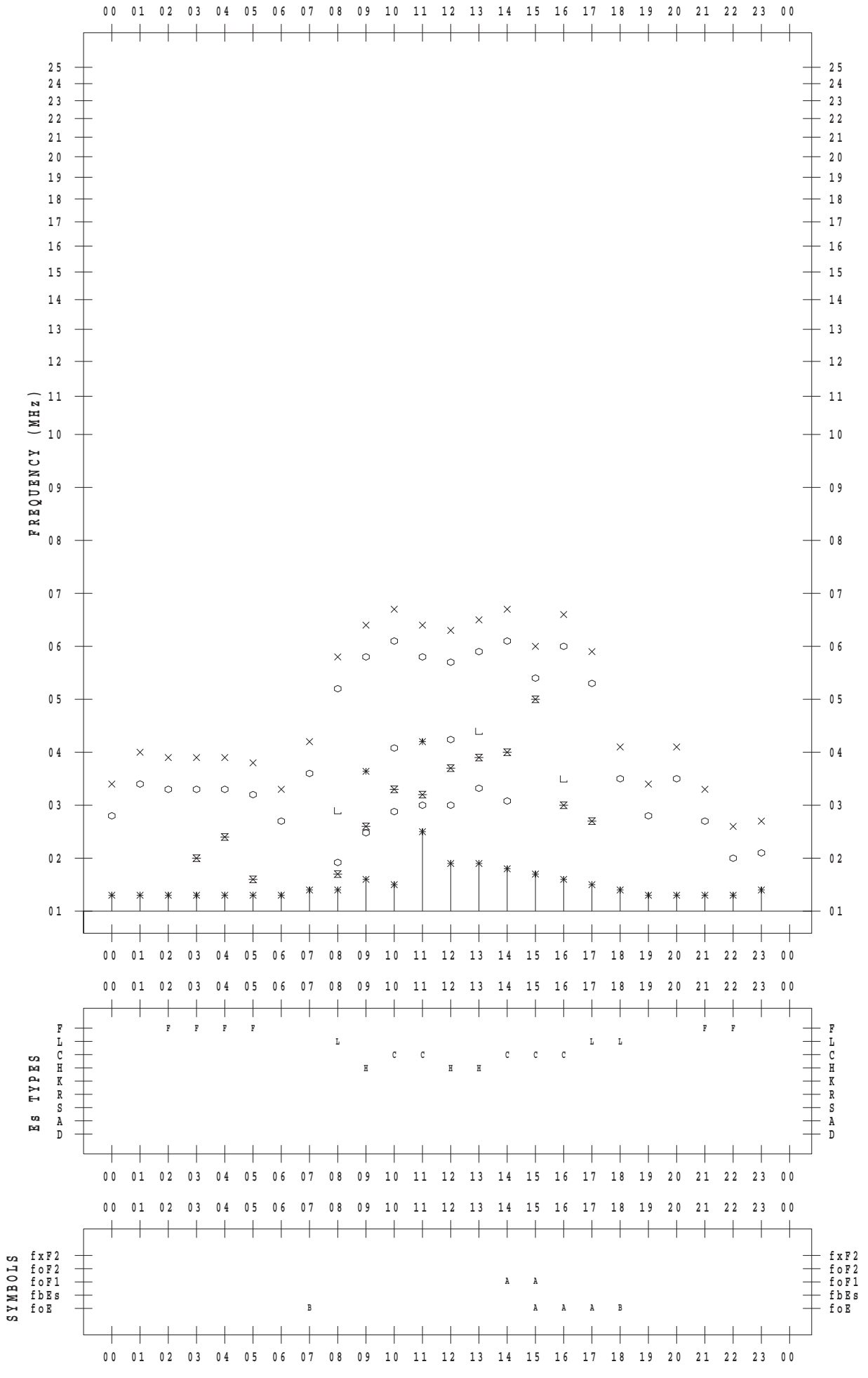
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/13

135 °E MEAN TIME



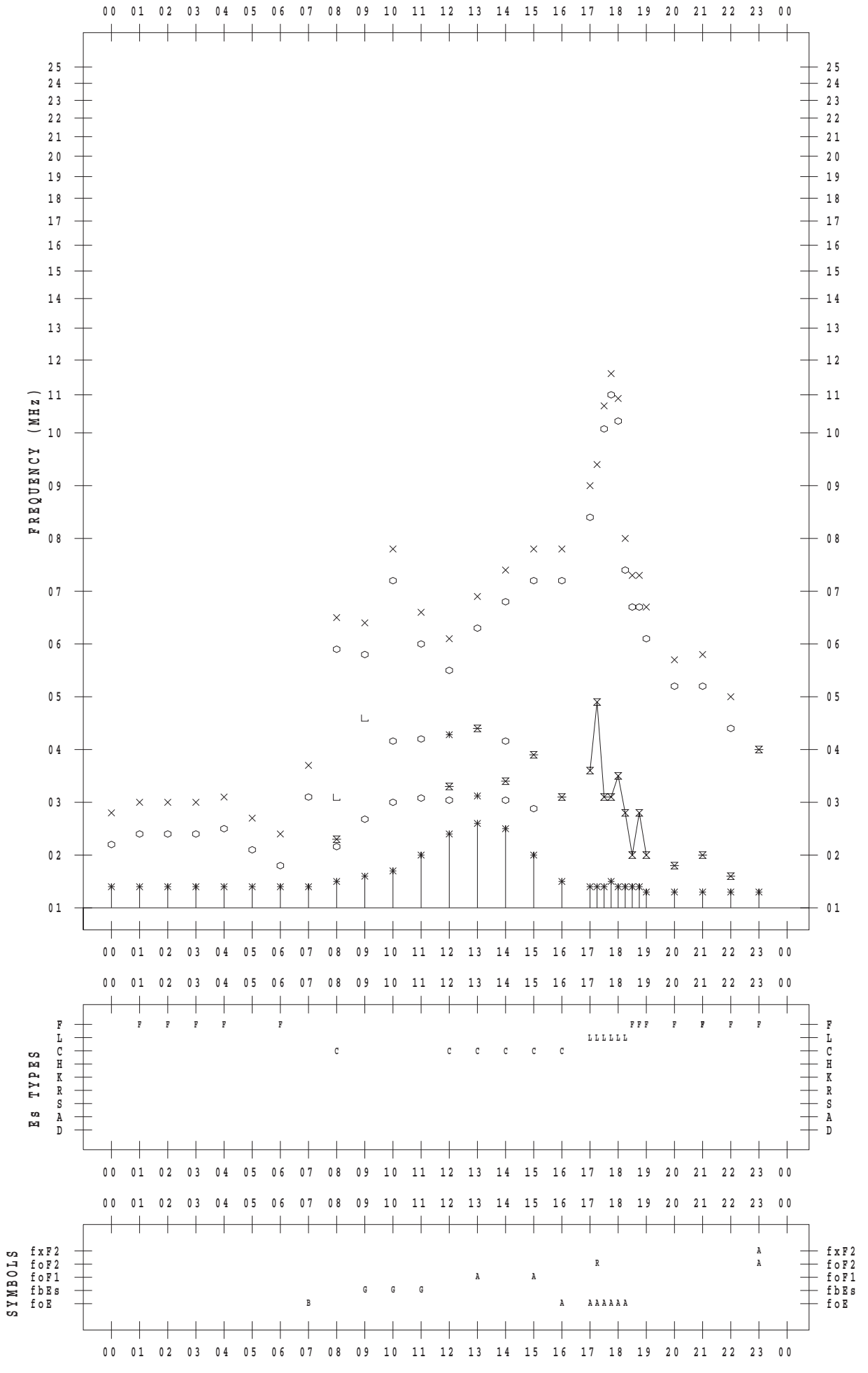
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/14

135 °E MEAN TIME



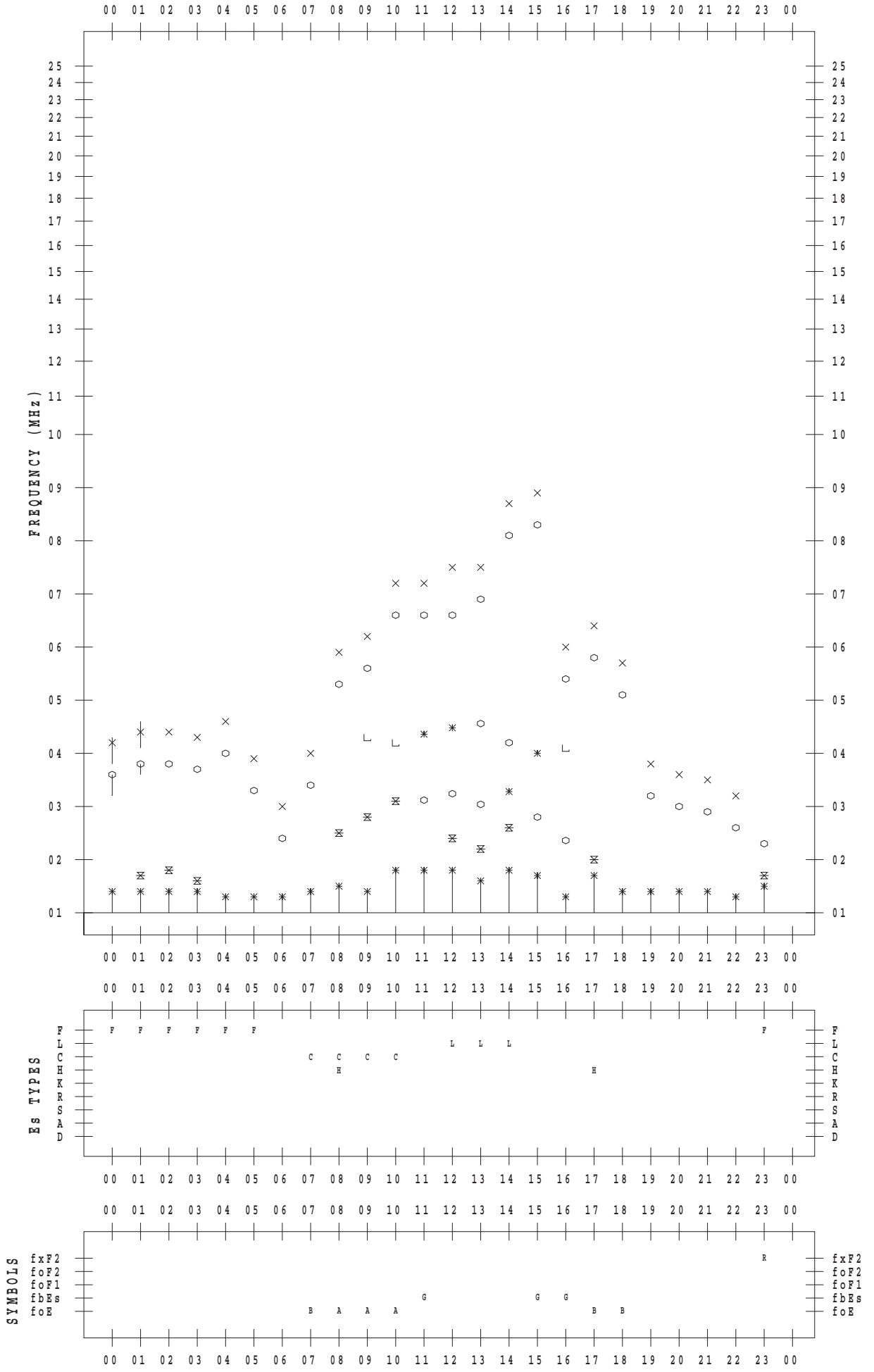
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/15

135 °E MEAN TIME



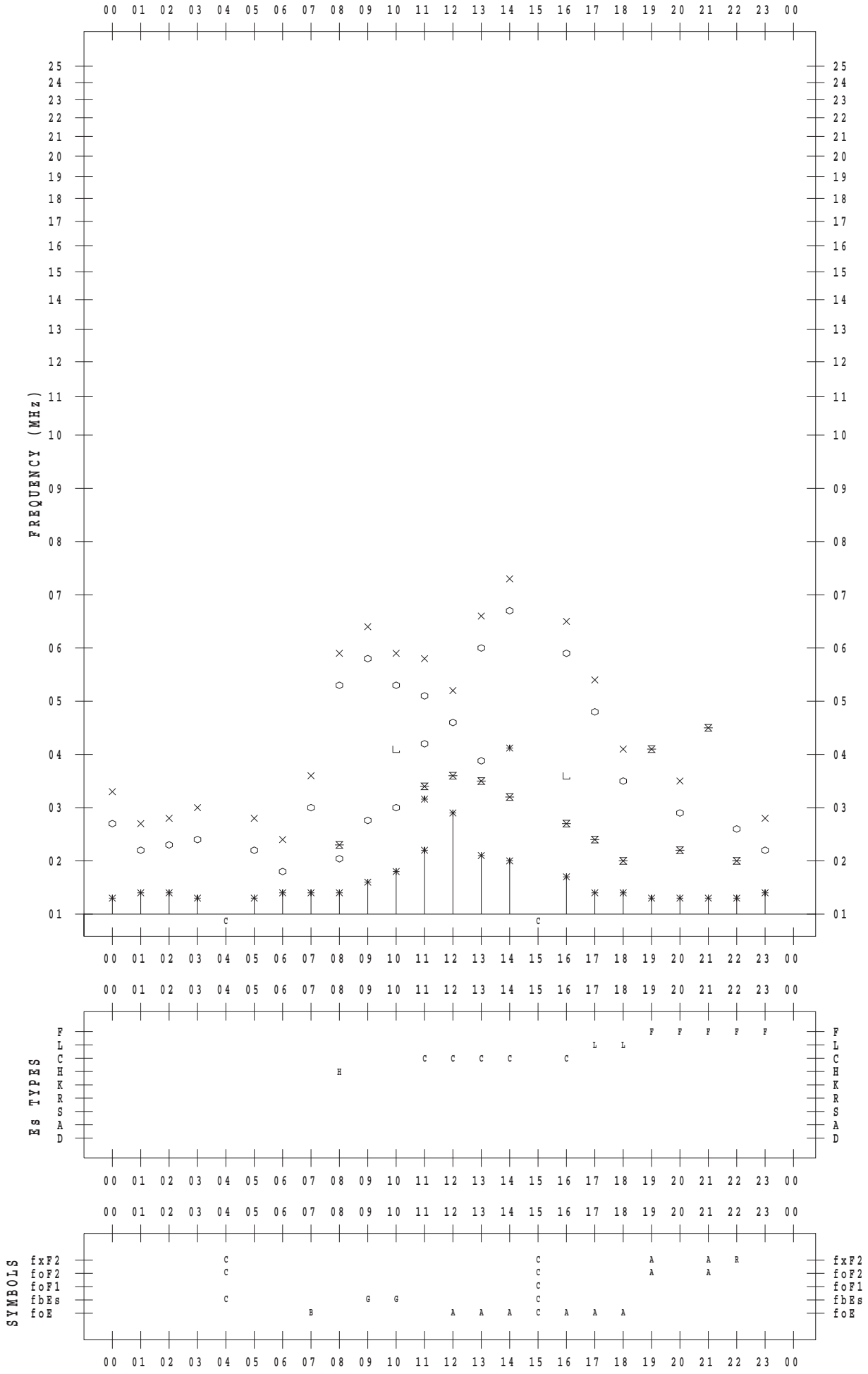
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/16

135 °E MEAN TIME



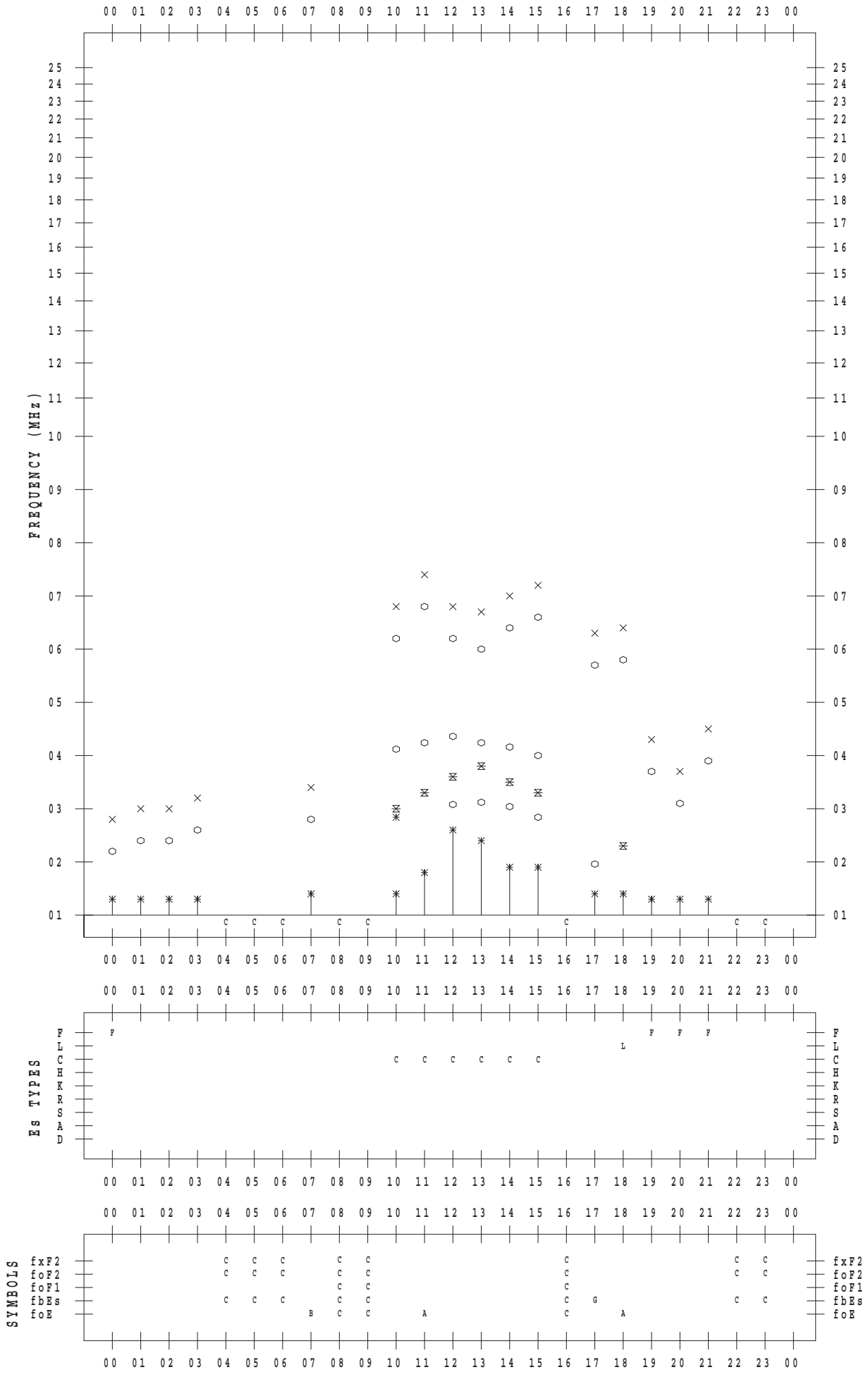
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/17

135 °E MEAN TIME



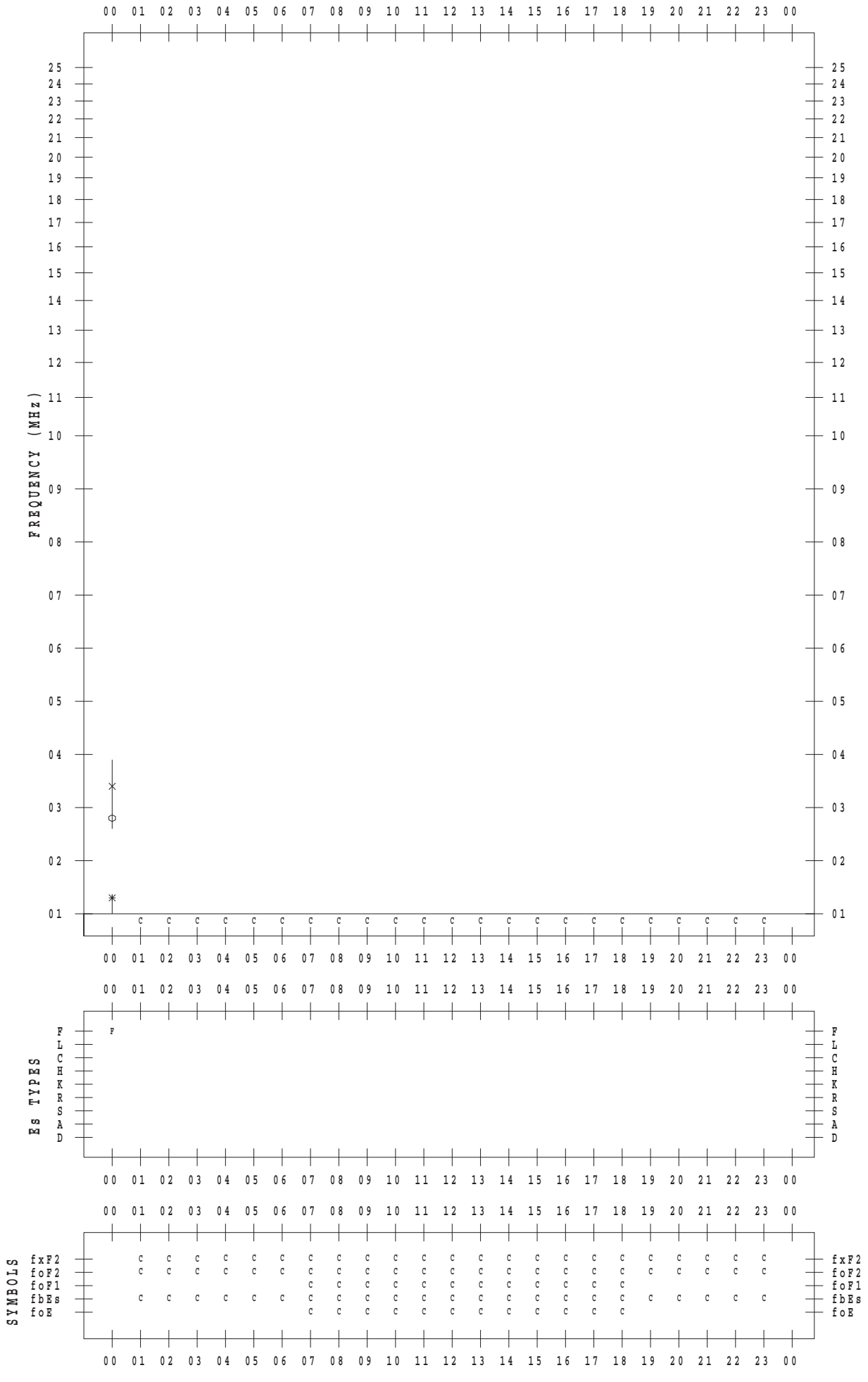
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/18

135 °E MEAN TIME



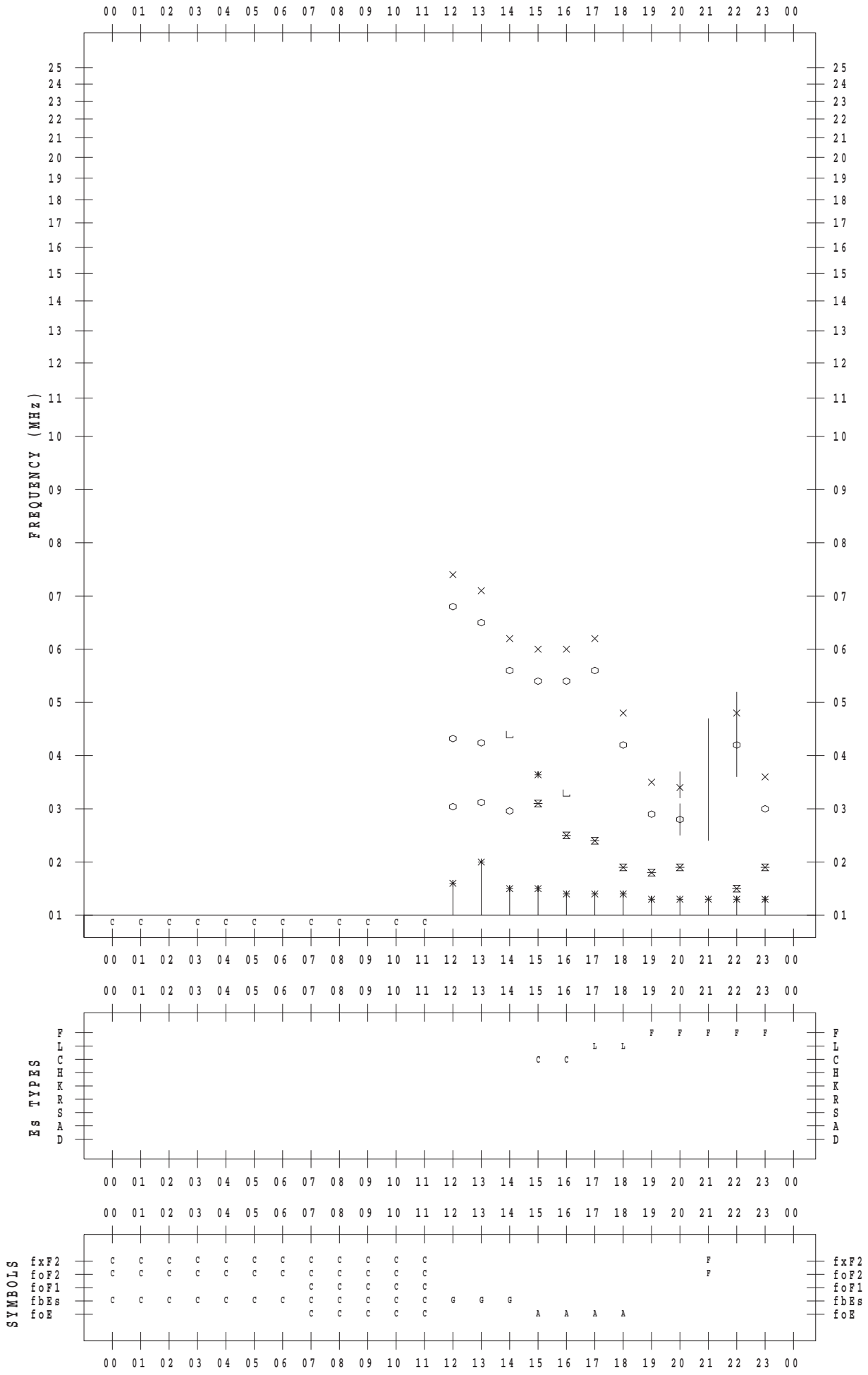
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/19

135 °E MEAN TIME



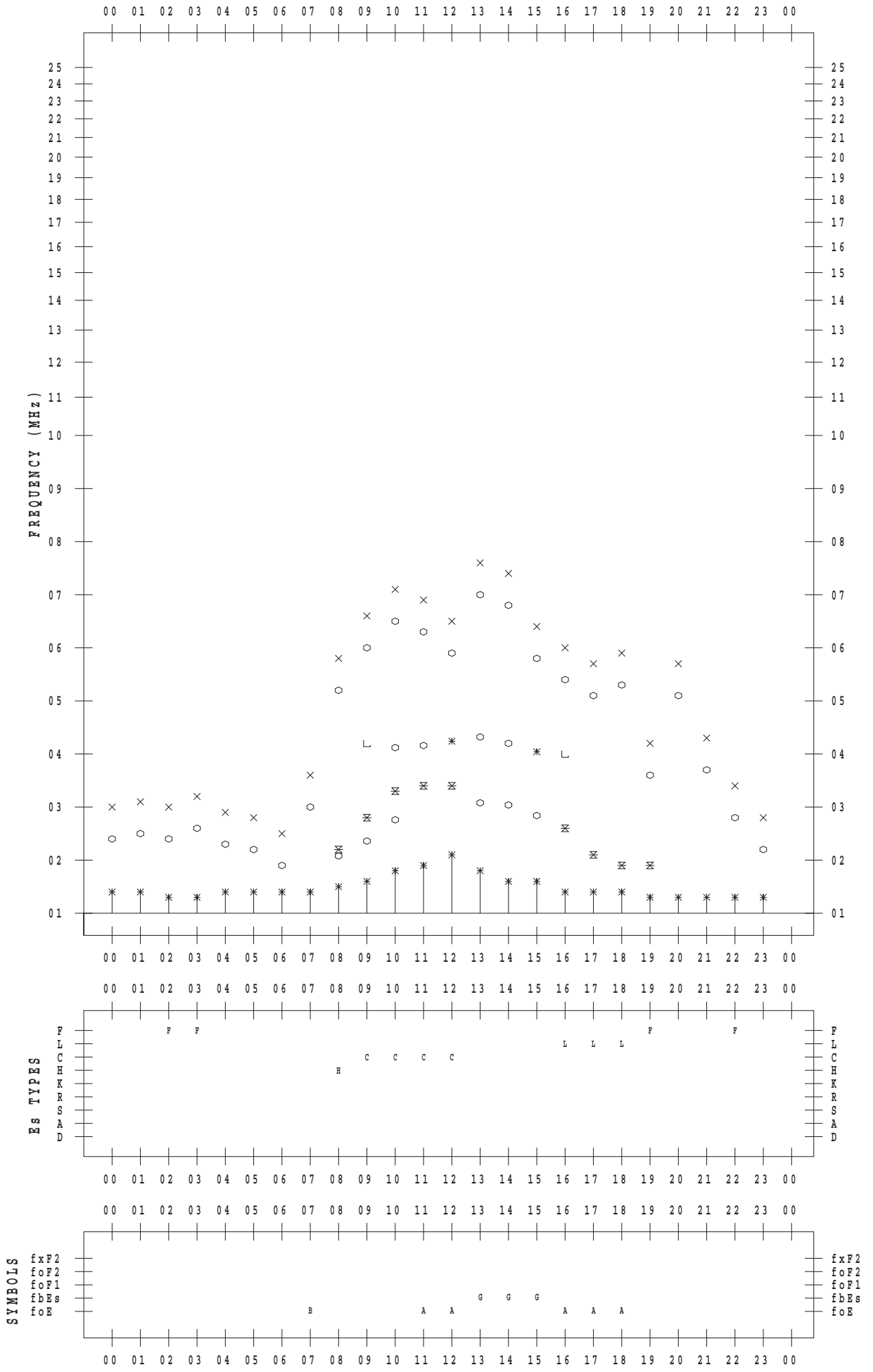
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/20

135 °E MEAN TIME



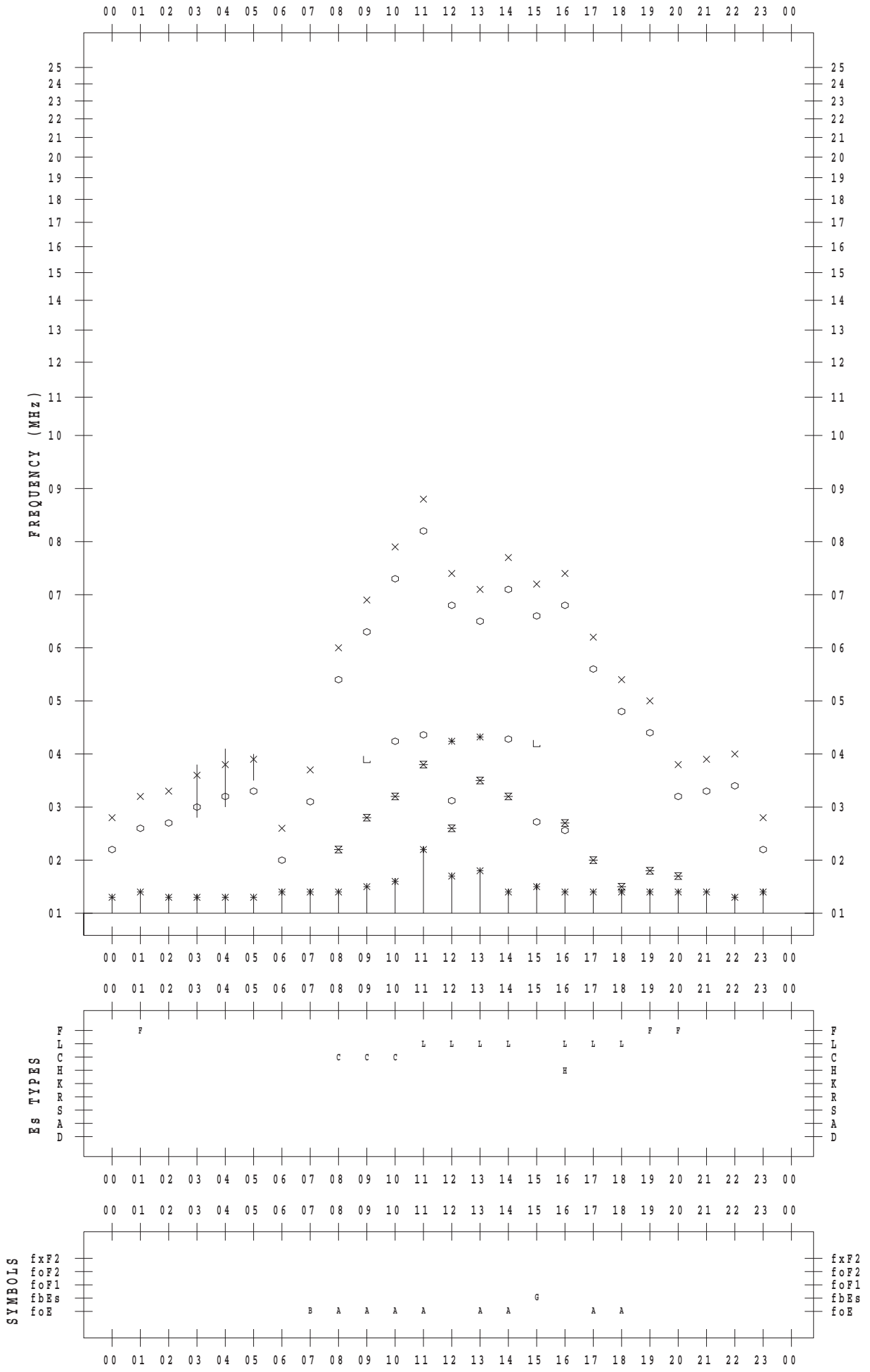
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/21

135 °E MEAN TIME



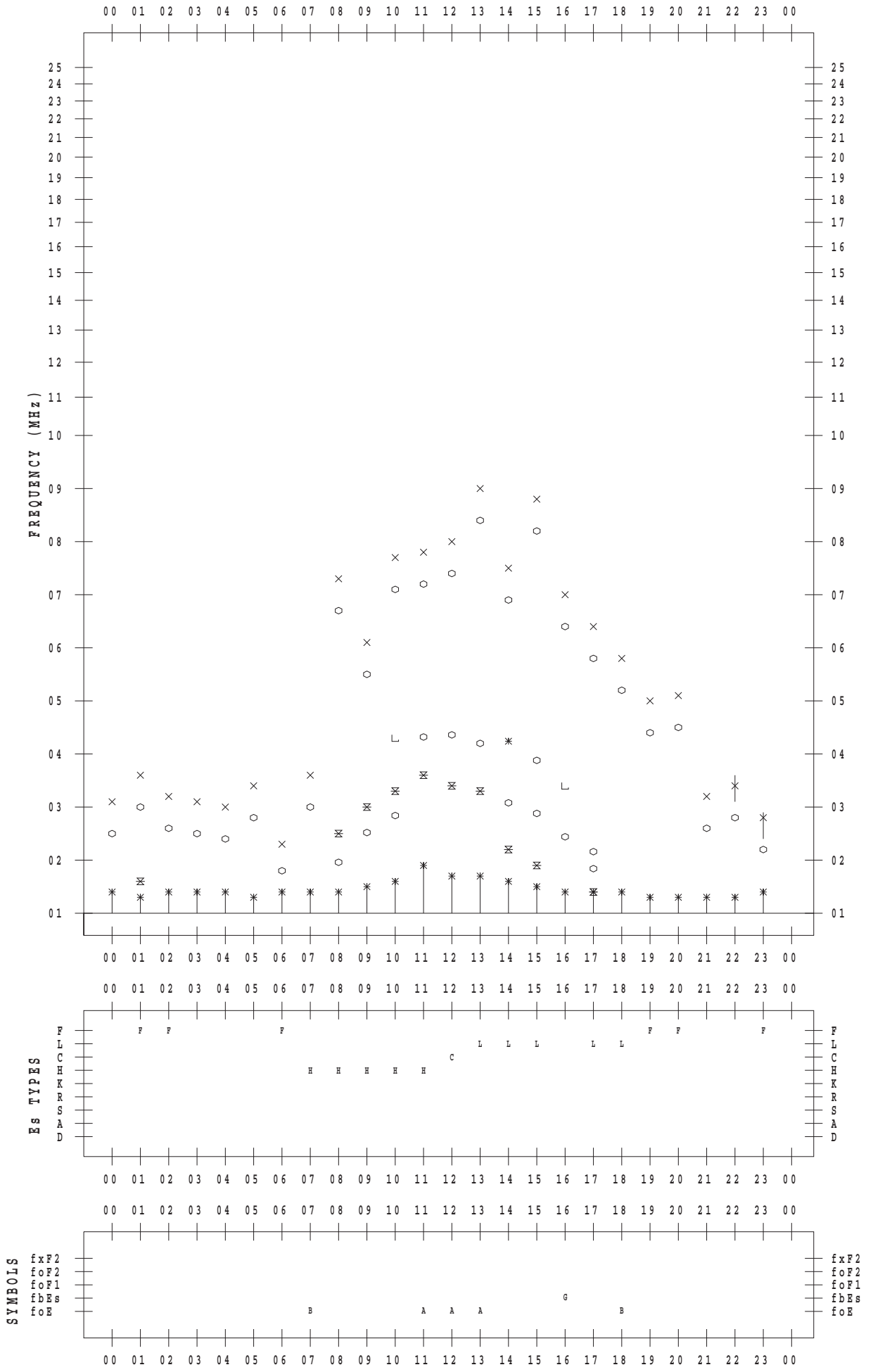
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/22

135 °E MEAN TIME



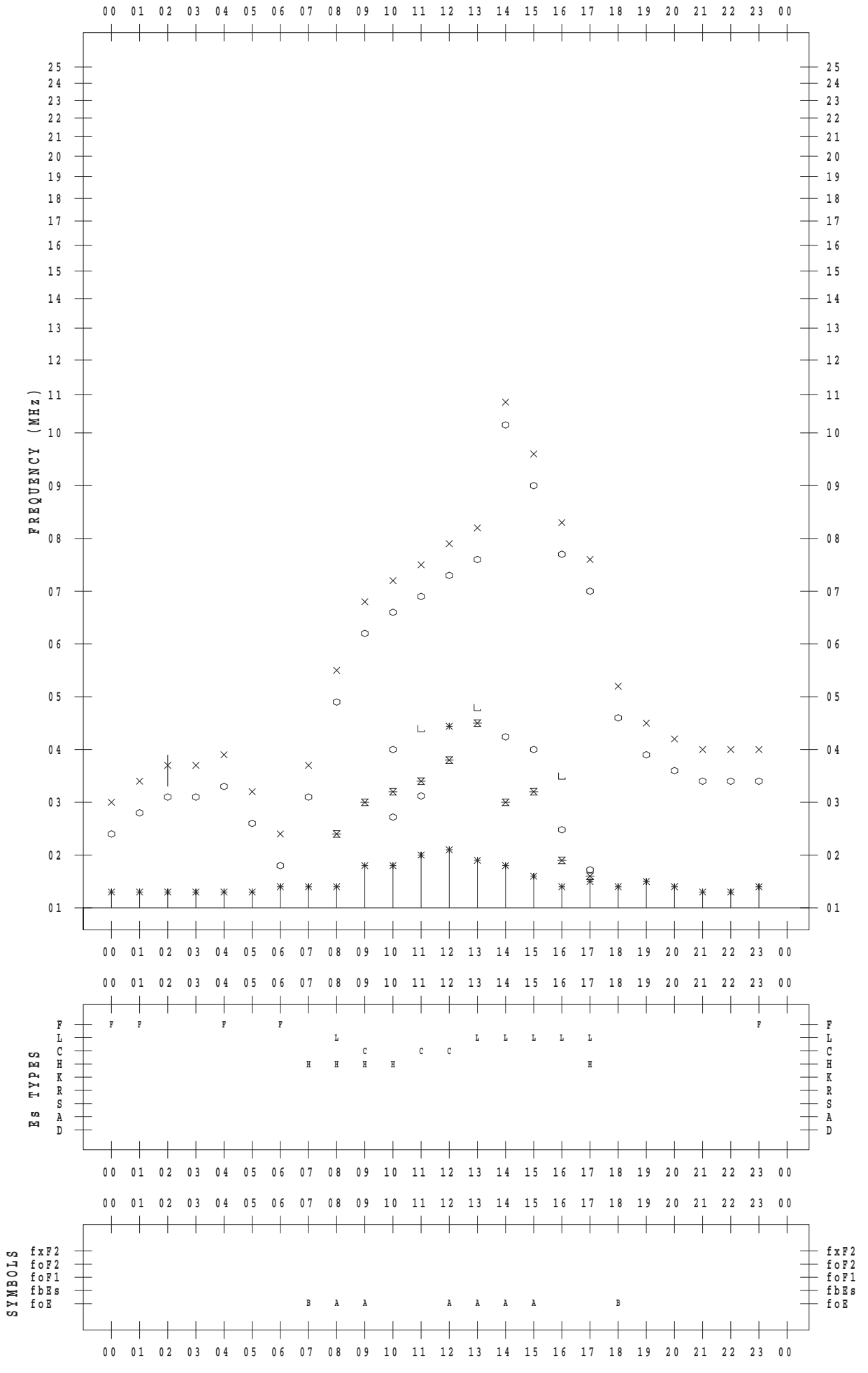
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/23

135 °E MEAN TIME



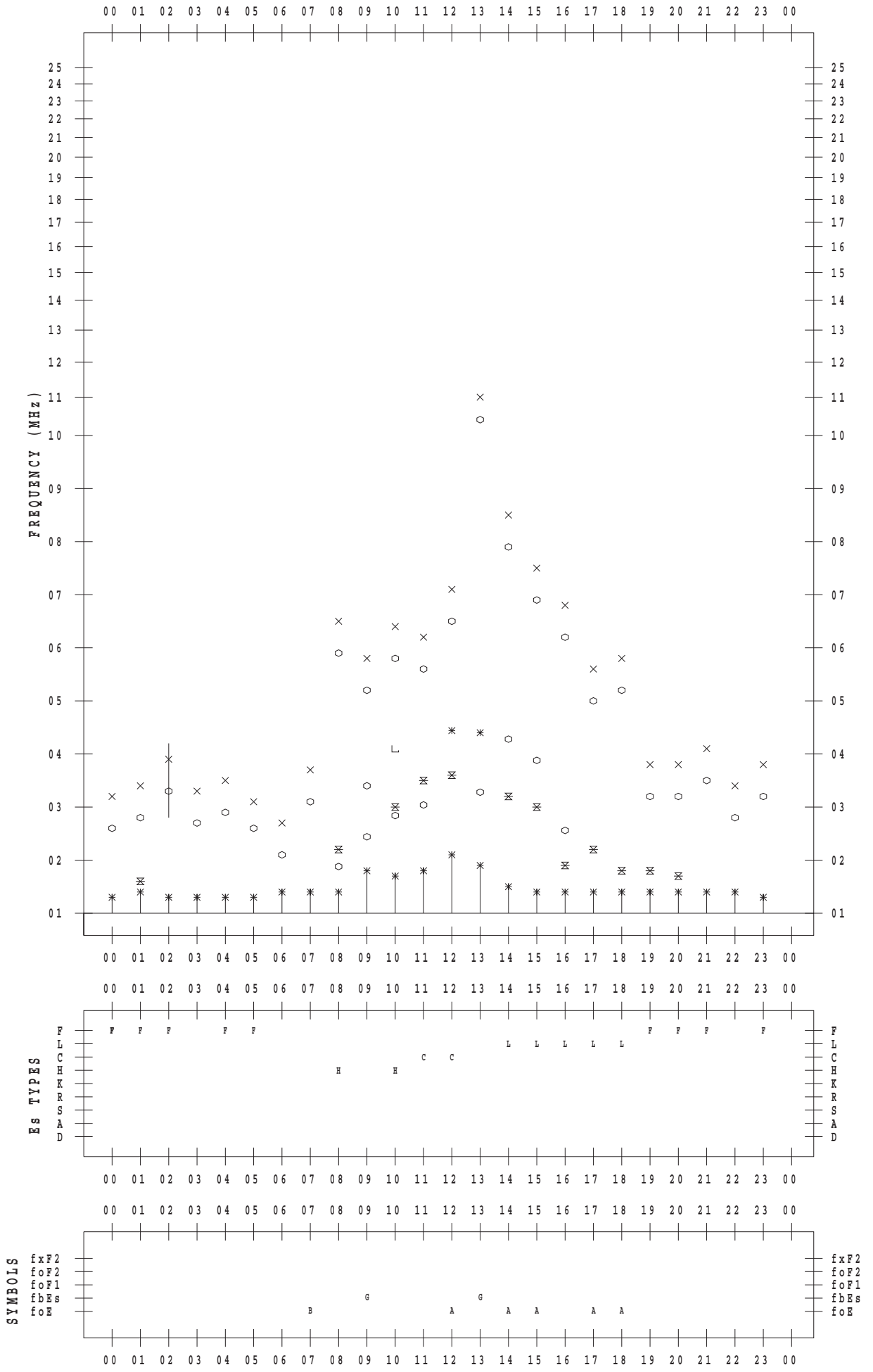
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/24

135 °E MEAN TIME



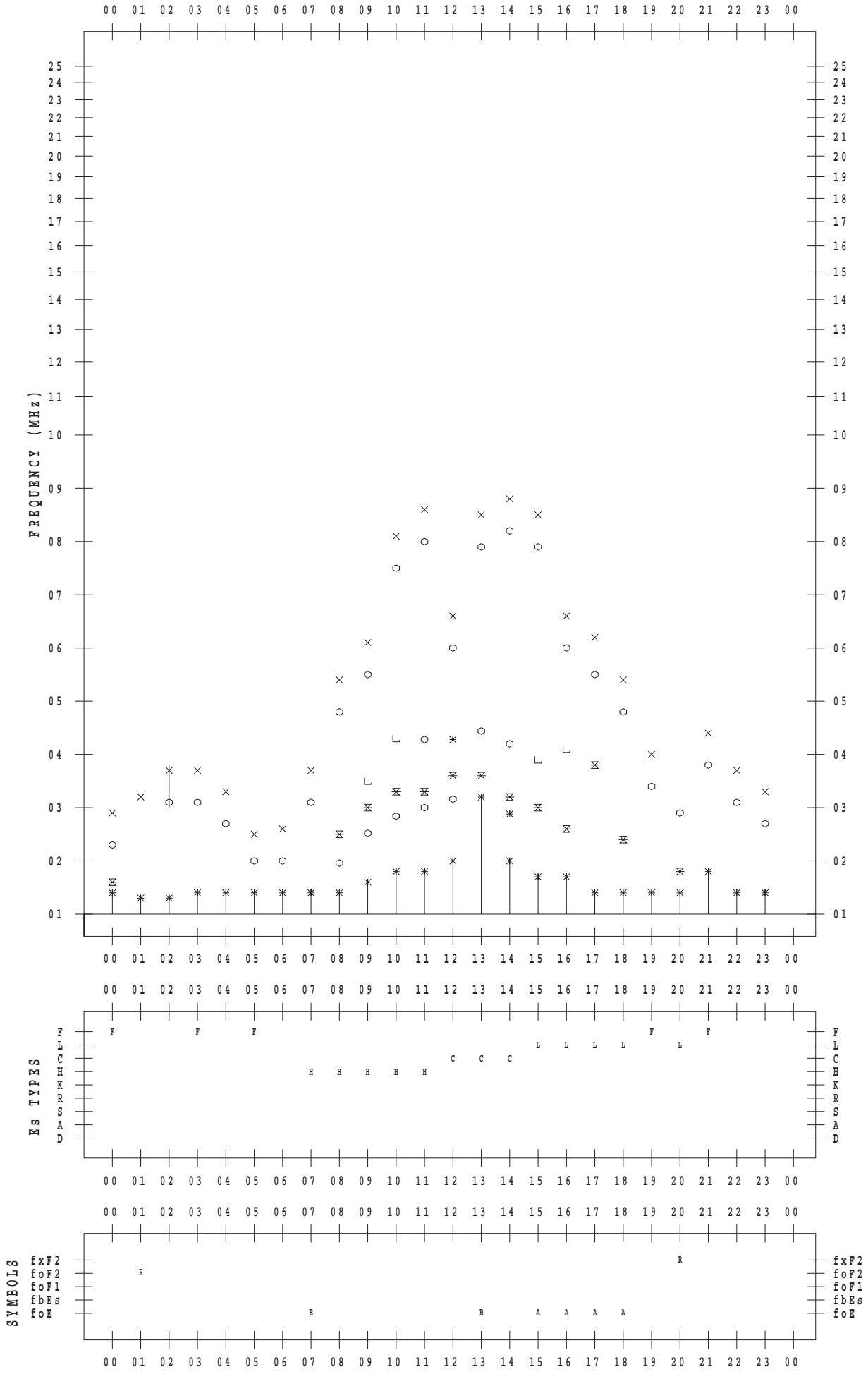
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/25

135 °E MEAN TIME



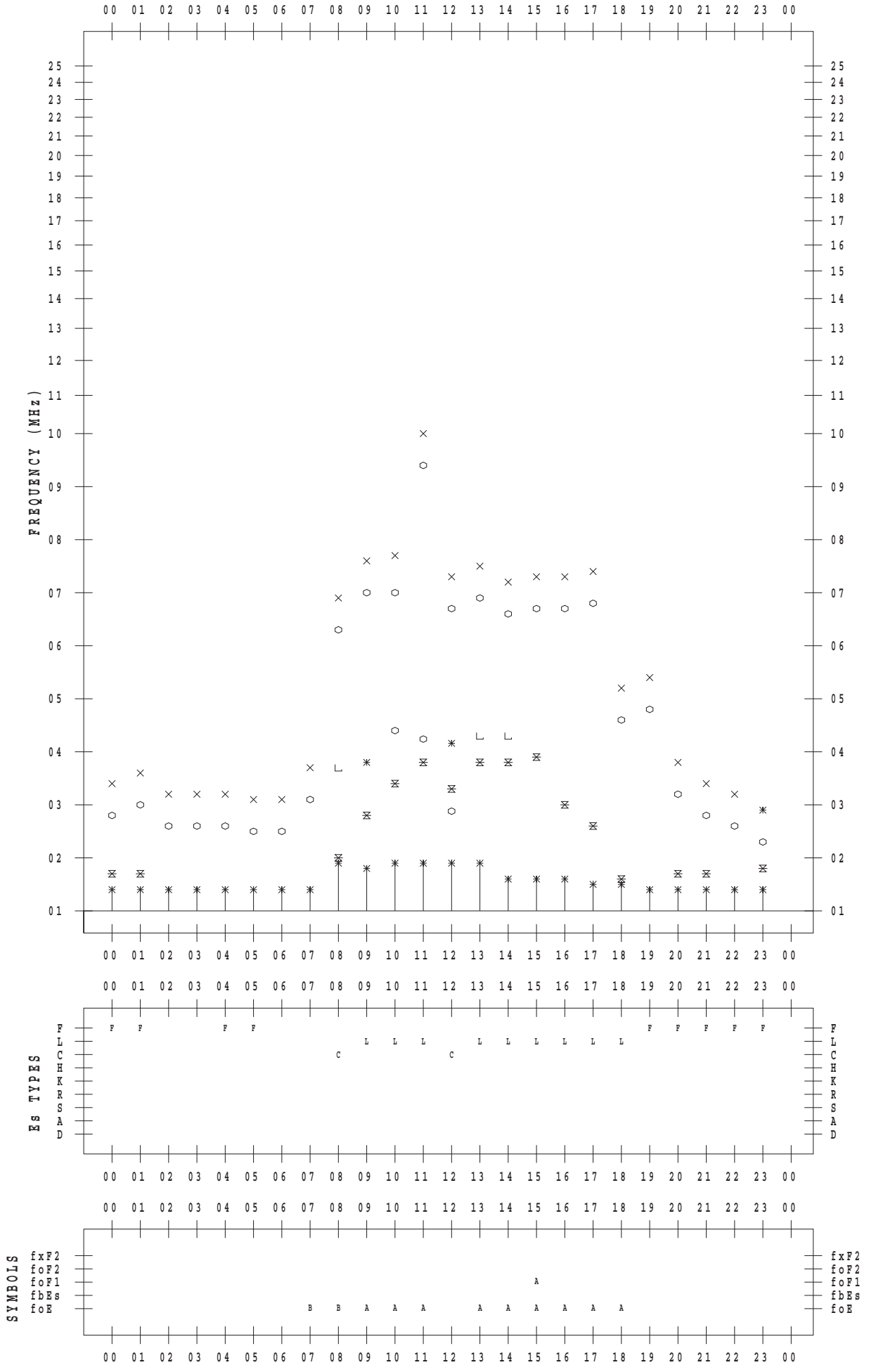
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/26

135 °E MEAN TIME



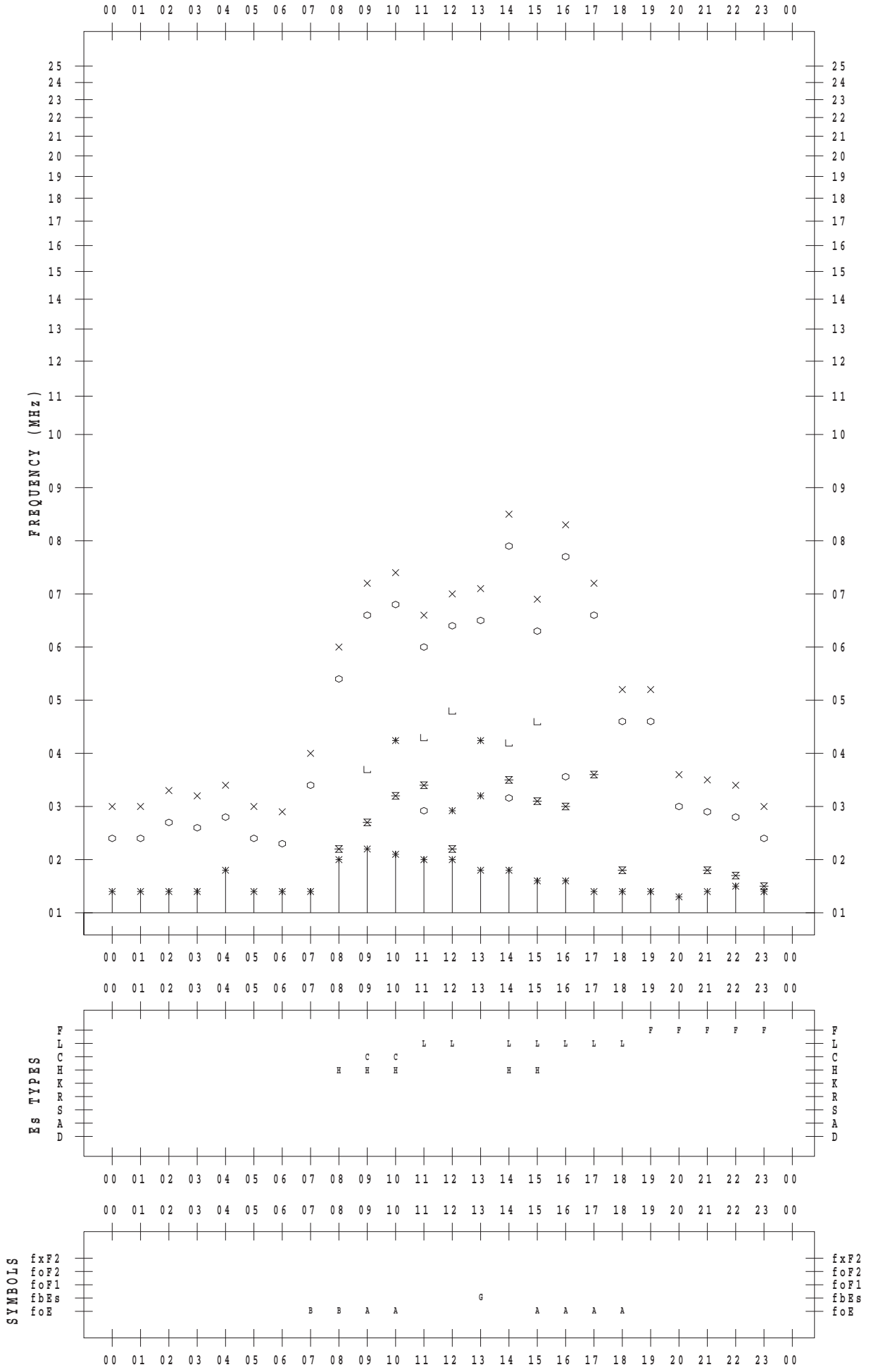
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/27

135 °E MEAN TIME



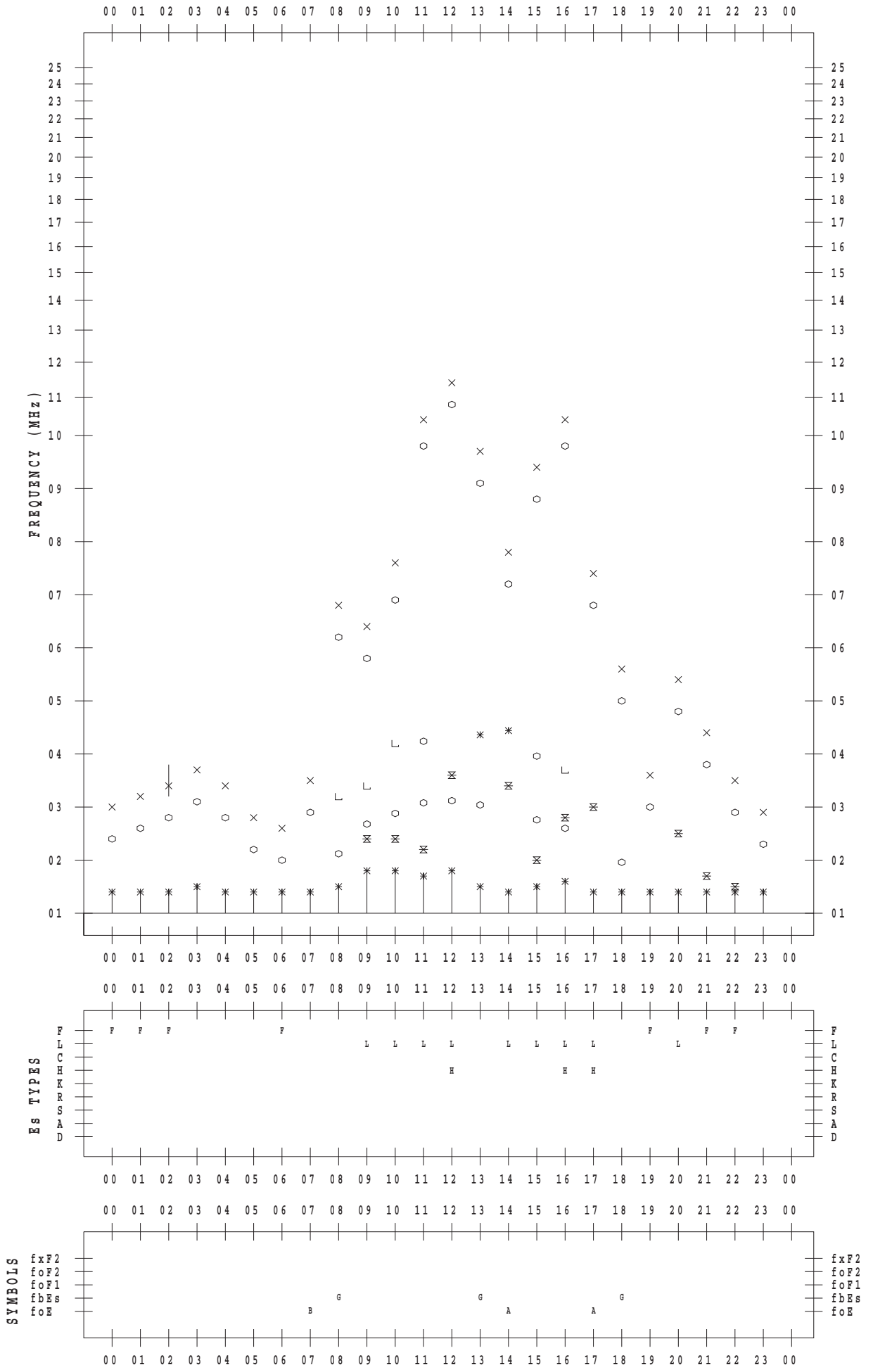
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/28

135 °E MEAN TIME



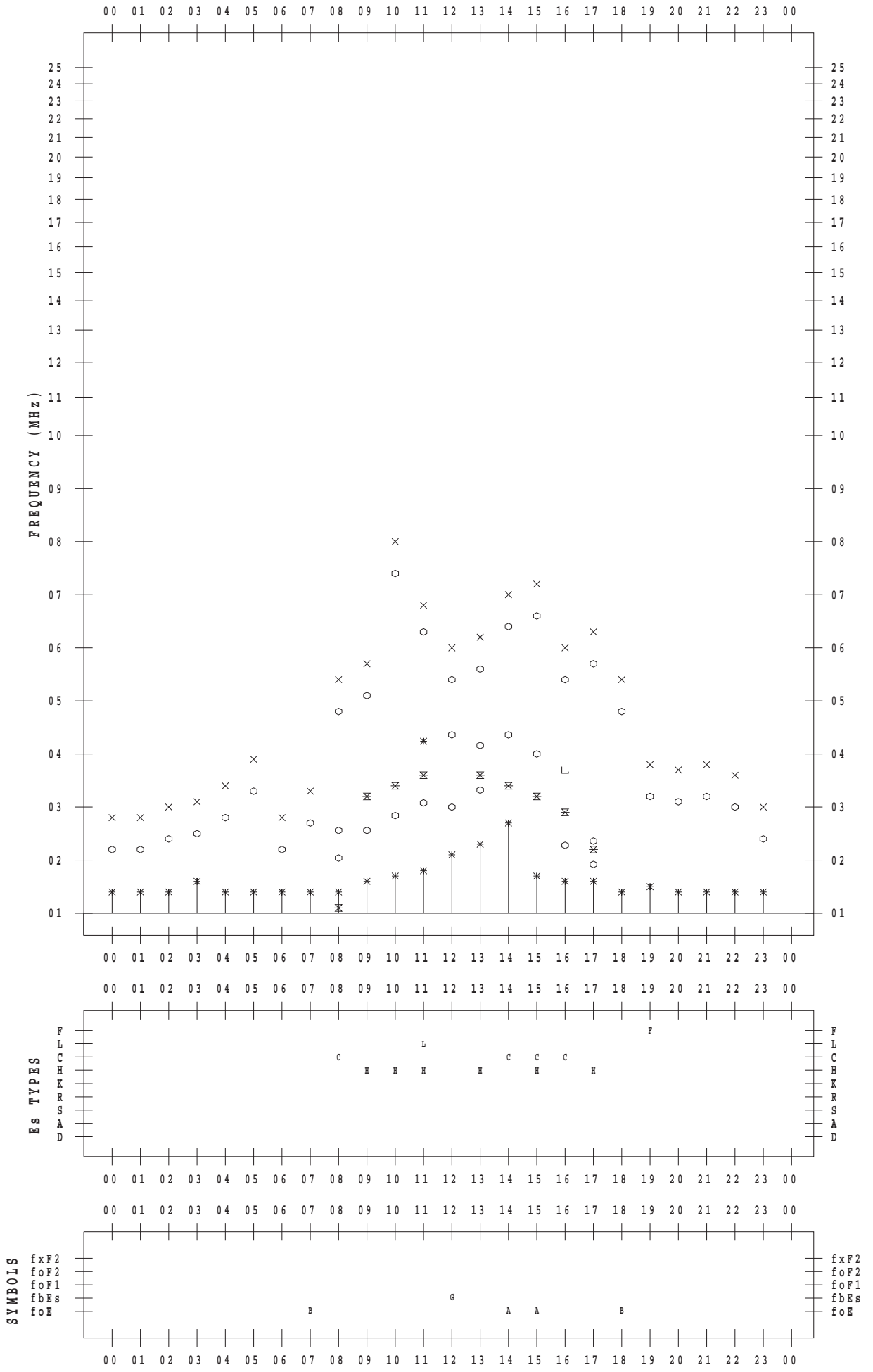
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/29

135 °E MEAN TIME



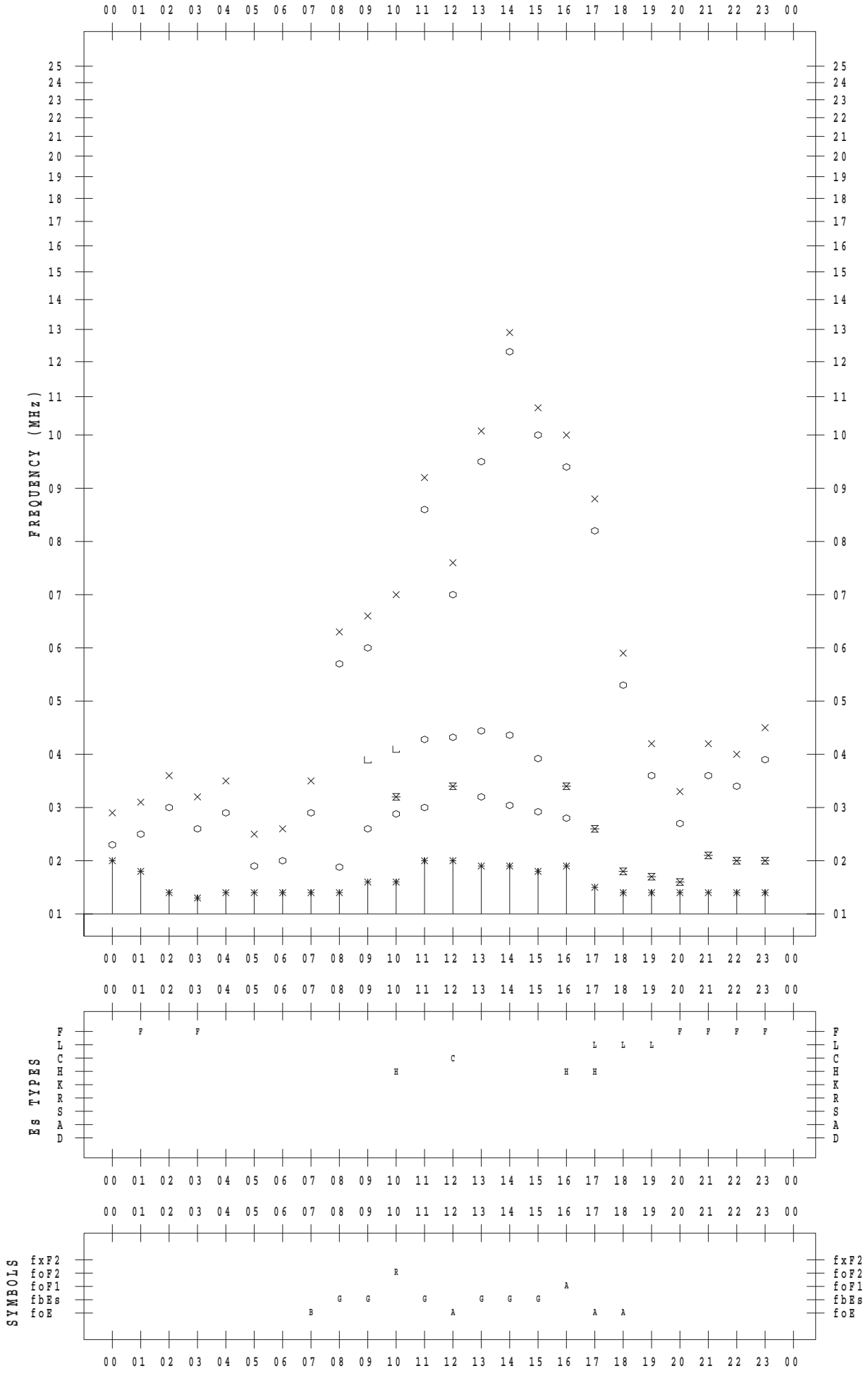
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/30

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2016/12/31

135 °E MEAN TIME