F-780

IONOSPHERIC DATA IN JAPAN

FOR DECEMBER 2013

VOL. 65 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 foF2 AT Wakkanai

DEC. 2013

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	34	32	34	37	37	34	28	49	66	80	69	87	69	67	69	81	64	40	48	34	34	32	34	34
2	36	34	40	34	34	44	34	62	68	72	86	100	N	72	67	65	64	36	34	32	30	28	31	32
3	32	34	34	34	34	32	32	58	67	67	70	92	89	70	64	74	62	35	28	30		28	32	32
4	32	35	34	32	32	26	32	63	88	59	96	85	91	76	72	69	N	42	32	31	32		32	A
5		32	34	30	32	34	32	32	N	86	89	N	91	87	82	87	65	50	42	34	34	34	29	38
6	37	32	34	31	34	34	37	60	67	59		94	70	70	70	69	64	47	34	35	37	35	34	42
7	34	32	46	47	46	48	46	52	67	67	86	83	74	89	86	67	67	58	48	34	42	29	40	34
8	35	34	32	38	43	37		52	88	67	87		80	79	90	91	67	61	44	48	43	44	42	50
9	32	32	36	32	N	44	31	61	66	67	65	90	62	86	84	69	64	52	32	34	29	32	34	30
10	29	32	38	34	34	40	38	65	85	88	132	89	103	68	68	64	65	49	31	32	36	31	32	32
11	34	37	36	32	31	38	34	58	62	59	86	97	64		69	68	61	49	44	38	34	31	34	32
12	34	31	34	32	31	37	34	53	67	87	87	90	87	88	81	70	66	54	34	29	31	30	37	37
13	34	32	37	34	37	31	34	52	72	94	70	71	69	91	70	70	66	57	32	37	28	34	32	34
14	34	34	35	31	37	31	34	53		68	71	80	70	87	71	71	65	66	34	34	A	34	A	32
15	36	32	32	32	37	40	30	52	73	81	91	89	90	90	92	70	67	A	A	34	A	A	A	A
16	34	34	34	37	36	36	34	58	66	87	107	101	97	67	71	71	62	29	32	34	35	32	32	34
17	37	34	34	34	34	38	32	58	61	82		68	95	86	78	70		34	31	32	A	A	A	A
18	A	29	34	34	31	A	32	49	74	73	86	94	68	60	60	71	62	52	A	34		30	34	34
19	41	38	38	36	A	40	34	52	67	N	N	90	91	N	79	71	70	54	A	A	34	31	A	A
20	A	A	A	43	45	48	32	52	82	68	87	89	59	96	86	70	66	A	34	34	34	A	34	32
21	37	34	42	43	37	42	34	N	65	61	91	96	92	77	88	66	64	58	34	27	32	32	A	34
22	32	42	34	42	43	32	34	37	65	65	87	71	69	70	84	72	65	20	34	A	A	A	27	28
23	29	32	34	32	34	34	34	47	66	67	65	90	86	70	70	70	56	38	34	32	30	A	A	34
24	34	34	34	32	34	32	32	50	63	67	86	91	68	83	67	71	58	51	30	32	32			30
25				32	34	36	34	N	65	65	65	59	68		65	59	61	48	A	32	31		32	32
26	34	33	34	34	34	34	38	45	64	89	91	69	59	74	86	68	58	29	A	A	A	A	A	30
27	34	31	37	37	34	34	30	44	67	58	70	59	66	70	81	66	65	32	37	26	30	A		A
28	A	32		32	34	32	32	32	60	66	59	89	99	67	83	N	65	51	34	A	A	A	31	32
29	32	32	34	34	34	34	29	32	62	68	59	76	59	69	69	68	58	57	34		N			30
30	A	A	32	32	34	30	32	47	62	55	65	72	70	70	64	69	64	42	34				28	
31					31	32	29	44	67	67	91	72	67	59	71	64	62	32	28	31	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	27	27	30	29	30	30	29	29	30	28	29	30	28	31	30	29	29	26	25	20	17	20	24
MED	34	32	34	34	34	34	33	52	67	67	86	89	70	73	71	70	64	49	34	34	33	32	32	32
U Q	35	34	37	37	37	40	34	58	70	81	90	91	91	86	84	71	65	54	34	34	34	34	34	34
L Q	32	32	34	32	34	32	32	46	64	65	69	72	68	69	69	68	62	35	32	31	30	30	31	32

HOURLY VALUES OF fEs AT Wakkanai

DEC. 2013

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	G	G	G	G	G	28	32	46	28	30	32	28	25	25	G	33	G	33	28	G	26	24
2	G	G	G	G	G	G	G	25	G	26	28	29	29	49	N	26	G	G	G	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	27	N	34	28	27	29	24	G	G	G	G		G	G	G
4	G	G	G	G	G	G	G	28	24	27	30	30	30	28	27	29	G	G	G	G	28	G	24	32
5	G	G	G	G	G	G	G	G	24	27	52	30	30	29	26	G	11	G	G	G	G	G	G	G
6	G	G	G	G	G	G	G	G	25	28		33	32	30	28	25	G	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	48	26	28	32	31	29	30	27	28	G	G	G	G	32	32	G
8	G	G	G	G	G	G		G	22	28	30		68	30	27	33	G	G	G	G	33	G	G	G
9	24	G	G	G	G	G	G	G	26	37	30	30	30	29	34	32	G	G	G	G	G	G	27	26
10	G	G	G	G	G	G	G	G	27	29	35	29	35	31	33	24	G	G	G	G	G	G	G	G
11	G	G	24	G	G	G	G	33	22	34	39	31	28		35	39	G	G	G	G	G	G	G	G
12	G	G	G	G	G	G	G	29	23	35	34	32	31	29	36	34	G	36	28	28	G	G	G	G
13	G	G	G	G	G	G	G	G	30	35	31	36	31	30	39	38	23	33	28	39	G	28	G	G
14	G	G	G	G	G	G	G	28	G	48	31	34	31	36	36	36	38	G	G	G	28	24	34	G
15	G	G	G	G	G	G	G	39	34	27	35	36	56	37	30	43	30	70	39	32	38	40	40	45
16	33	27	G	G	G	G	G	28	48	28	38	71	39	38	33	38	59	46	32	33	G	G	G	G
17	G	G	24	28	24	G	25	27	32	26		50	34	34	36	38		40	33	G	34	36	68	33
18	29	G	24	G	26	50	G	38	27	31	34	48	48	38	60	44	35	61	55	G		G	G	G
19	G	G	G	G	36	33	24	33	24	27	29	40	30	34	42	27	G	26	69	34	G	30	58	50
20	39	49	49	25	27	32	G	G	49	26	39	36	37	28	46	37	41	36	37	28	G	35	28	26
21	G	G	G	G	G	G	G	G	48	26	N	34	38	42	48	40	23	G	G	28	G	G	35	34
22	G	26	34	G	G	G	G	G	50	25	50	N	34	30	33	28	40	27	36	34	34	27	G	G
23	G	G	G	G	G	G	G	G	23	28	29	31	39	31	27	24	11	G	G	G	G	32	31	G
24	26	28	G	G	G	G	G	G	48	36	36	30	30	28	31	25	20	G	G	G	G			G
25				G	G	32	G	11	G	32	28	27	34		28	25	G	G	40	G	G		G	G
26	G	G	G	G	G	32	G	26	32	31	33	39	35	32	32	35	37	27	40	57	39	33	49	33
27	G	G	G	G	G	G	G	G	48	26	28	35	28	28	29	G	G	G	28	G	G	28		33
28	26	G		G	G	G	G	G	23	31	60	N	30	29	35	39	38	40	G	51	33	33	G	G
29	G	G	G	G	G	G	G	G	25	26	32	32	30	30	28	23	32	28	G		G			G
30	33	28	G	G	G	G	G	G	24	26	28	52	36	32	28	G	11	G	G				G	
31					G	G	G	G	48	31	34	34	30	28	30	24	G	34	G	G	26		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	29	29	28	30	31	31	30	31	31	31	27	28	31	29	30	31	30	31	31	29	28	26	28	30
MED	G	G	G	G	G	G	G	G	26	28	32	34	31	30	32	28	11	G	G	G	G	G	G	G
U Q	12	G	G	G	G	G	G	28	48	32	36	36	36	34	36	38	32	34	33	32	28	32	31	26
L Q	G	G	G	G	G	G	G	G	23	26	29	30	30	28	28	24	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

DEC. 2013

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	15	14	15	15	14	15	15	16	14	14	15	15	15	15	14	14	17	15	15	14	14	15	14	15
2	15	16	15	15	15	14	15	17	15	14	16	17	16	14	15	18	15	14	15	16	15	15	16	15
3	15	14	14	14	17	14	14	15	15	14	16	33	16	17	14	15	15	17	14	14		14	15	15
4	15	15	14	14	15	15	15	14	14	15	21	20	20	15	16	14	14	15	14	15	14	23	14	15
5	15	15	14	15	14	14	15	17	14	15	14	14	15	18	16	23	15	14	14	15	15	14	15	15
6	15	15	14	15	14	15	15	15	15	15		17	22	21	17	18	16	14	15	14	14	14	16	14
7	14	18	14	14	15	14	15	16	14	15	16	18	21	21	17	17	14	15	15	15	14	14	15	17
8	15	17	17	15	15	15		18	15	15	18		17	18	15	14	15	17	14	16	14	15	14	14
9	15	16	14	15	14	14	14	17	14	14	14	15	15	15	14	16	16	15	14	14	15	14	14	14
10	15	15	14	14	14	14	15	16	14	14	15	14	15	16	14	14	15	14	14	17	14	14	14	14
11	14	15	14	14	14	14	14	16	14	14	15	17	15		14	14	16	14	14	14	15	16	14	15
12	15	17	14	14	15	15	15	14	14	14	15	15	15	15	15	14	15	14	14	14	15	18	14	15
13	15	14	14	16	15	18	14	16	14	14	14	14	16	15	14	15	15	14	15	14	20	15	15	15
14	15	15	15	15	15	14	15	18	55	18	15	15	15	14	14	15	14	15	15	15	15	15	14	15
15	15	15	15	15	14	14	15	17	15	15	16	15	17	18	16	17	14	14	14	15	14	14	14	14
16	14	14	16	15	14	15	14	14	14	18	15	16	16	15	15	14	14	14	14	14	14	15	17	15
17	16	15	15	15	15	18	15	17	14	14		14	18	16	16	14		14	14	14	14	14	14	14
18	15	15	14	15	16	14	14	14	14	15	16	18	21	18	16	15	14	14	14	14		15	14	14
19	15	14	15	15	14	15	15	15	14	14	15	14	14	17	17	21	16	15	14	14	14	14	14	14
20	14	14	14	14	14	14	15	16	15	14	14	15	15	15	15	15	15	14	14	14	14	14	15	14
21	14	14	15	15	15	14	14	15	16	14	15	17	20	15	15	14	15	16	15	14	15	14	14	14
22	20	14	14	14	14	14	14	14	15	14	14	17	16	18	14	14	14	14	14	14	14	17	14	14
23	14	15	15	15	14	15	14	15	14	14	15	17	17	17	15	14	16	14	17	14	20	14	14	14
24	14	15	16	14	24	14	15	16	18	15	15	14	15	16	15	16	18	15	15	15	15			16
25				15	15	14	14	14	22	15	16	21	21		18	15	16	15	15	16	15		18	15
26	14	14	15	15	15	14	14	15	14	15	15	16	17	18	17	14	14	14	14	14	14	14	14	14
27	15	15	15	14	15	14	15	14	14	14	18	21	21	21	27	22	17	18	14	21	14	16		14
28	15	15		14	17	14	15	14	15	20	20	20	20	20	17	17	14	14	15	14	14	14	14	15
29	14	14	14	15	15	14	17	15	16	16	15	20	20	21	16	18	14	15	16		18			17
30	14	14	14	14	15	14	15	15	15	15	15	18	18	20	18	15	15	14	15				21	
31					17	14	15	14	18	15	18	20	20	20	17	15	18	15	15	15	14		18	18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	28	30	31	31	30	31	31	31	29	30	31	29	31	31	30	31	31	29	28	26	28	30
MED	15	15	14	15	15	14	15	15	14	15	15	17	17	17	15	15	15	14	14	14	14	14	14	15
U Q	15	15	15	15	15	15	15	16	15	15	16	18	20	19	17	17	16	15	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	14	15	15	15	15	14	14	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

DEC. 2013

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		A	A	26		N	N	60	60	86	105	101	84	74	86	74	74	53		36	32		27	N
2	N	N			24		32	67	84	92	87	77	88	82	76	77	73	66	28	N	34			
3	N	N	N	N	N	A	N	75	86	89	83	81	91	83	84	77	67	A						N
4					28		36	77	104	104	112	105	103	96	86	81	67	44	A	N	N	N		N
5					N		35	63	83	85	85	90	100	92	88	90	81		45	44	27		32	N
6				N			N	65	88	86	83	83	97	101	82	80	68	53		N			N	A
7		27		N			32	63	80	82	78	81	101	84	88	91	81	66	53	34	39			
8	N		34	N			28	63	78	90	90	98	93	96	98	96	90	74	41			44		N
9		31		N		28	N	74	90	88	86	102	88	111	92	81	76	63	53		43	N		
10			34		N	N	38	72	100	98	104	108	90	107	87	85	81	53	44	N	38		43	44
11						32		76	98	92	94	87	94	97	92	77	78	69	58	44	36	27		
12	34	N		28		N		64	90	96	86	89	87	86	94	88	83	53	47		N	N	N	28
13	26	N		31			41	70	88	89	90	97	88	84	91	90	76	53	54	52				
14		58					34	66	77	101	74	90	88	90	91	93	83	58	47	44	46	N		39
15				N	34			67	85	92	104	86	125	96	76	86	76	53	51				28	N
16			A	39			N	67	93	104	103	107	112	88	88	86	86	A		34	39	27		
17								65	82	100	90	101	94	80	88	81	73	53			A	N		N
18		A		A			27	64	85	87	82	102	96	102	85	82	78	A	A		A			
19		N					A	52	81	88	80	88	90	104	87	92	83	88	52	30				A
20	N	A						70	78	101	90	87	95	101	90	86	80	64	45					
21				N	N		N	53	85	88	90	96	100	96	88	86	71	71	51			N		
22		N	A			28		61	80	86	96	97	88	96	91	96	80	74	42	N				
23								53	67	72	80	86	87	82	95	73	85	63		N				
24					48		34	54	78	77	76	87	86	97	87	83	84	53	47					
25	N		N	N	N		N	59	81	81	81	81	70	82	103	74	97	62	A	A		N		37
26		24	N		N	N	N	58	79	80	82	108	103	91	77	81	81	A	N			N	N	
27	28	A	N				N	63	83	82	77	81	98	96	90	73	77	53	38		N			
28				N	N	N		52	78	84	84	97	87	107	86	91	74	54	47			N		
29		A	27		N		N	52	65	71	90	82	68	81	76	73	76							
30					N			52	71	80	90	87	96	96	91	102	74	54				N		
31					N			52	66	80	90	94	98	83	81	76	66		36					
	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	4	3	4	4	3	10	31	31	31	31	31	31	31	31	31	31	24	19	8	9	3	4	4
MED	28	29	34	30	31	28	34	63	82	88	87	90	93	96	88	83	78	56	47	40	38	27	30	38
U Q	34	44	34	35	41	32	36	67	88	92	90	101	98	97	91	90	83	66	52	44	41	44	37	41
L Q	26	25	27	27	26	28	32	54	78	82	82	86	88	83	85	77	74	53	42	34	33	27	27	32

HOURLY VALUES OF fEs AT Kokubunji

DEC. 2013

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		27	27	G	G	G	G	G	26	30	G	G	G	G	30	26	47	27		G	G		G	G
2	G	G			G	G	G	G	28	G	G	G	G	G	G	G	G	G	G	G	G			
3	G	G	G	G	G	23	G	G	G	28	G	G	G	G	30	G	25	27						G
4	G				G		G	G	G	G	G	G	G	G	G	31	43	24	33	G	G	G		G
5					G		G	G	G	G	G	G	G	G	G	29	24		G	G	G		G	G
6				G			G	G	25	G	G	G	G	G	29	37	G	G	G	G			G	30
7	G	G		G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			
8	G		G	G	G		G	26	27	27	G	G	G	G	G	26	G	G	G			G	G	G
9		G		G		G	G	G	26	29	G	G	G	29	G	G	G	26	G		G	G		
10			G		G	G	G	G	25	28	29	G	30	33	G	G	G	G	G	G	G		G	G
11						G	G	22	24	29	G	G	G	G	G	27	G	G	G	G	G	G		
12	G	G		G		G	G	G	25	G	G	G	G	G	G	25	G	G	G		G	G	G	G
13	G	G		G		G	G	G	G	G	G	G	G	48	G	29	25	26	G	26				
14		G					G	G	24	G	G	G	50	G	28	G	G	G	G	G	G	G		G
15	G			27	G			23	26	G	G	51	G	G	G	32	G	G	G	G			G	G
16			33	29			G	G	27	G	G	G	49	G	50	51	27	46	G	G	G	G		
17								G	G	27	G	G	G	G	G	96	33	G			26	G		G
18		26		29			G	G	G	G	G	53	G	60	54	48	26	51	47		26			
19		G					29	G	G	G	29	G	G	G	G	26	G	G	G	G			G	33
20	G	28	G					29	60	59	G	G	G	G	G	28	G	G	G					
21		G	G	G	G		G	G	G	G	G	G	G	G	G	G	26	G	G	G		G		
22		G	33			G		G	25	29	G	G	G	G	G	G	28	G	G	G				
23							G	G	25	G	G	G	G	G	G	G	G	G		G				
24					G		G	G	G	27	G	70	G	G	G	G	30	G	G	G				
25	G		G	G	G		G	G	G	G	G	G	G	G	29	G	G	G	28	28	G	G	G	G
26		G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	26	G			G	G	
27	G	31	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G		G			
28				G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
29		27	G		G		G	G	G	G	G	G	G	G	G	G	G		G			G		
30					G			G	G	G	G	G	G	G	G	G	G	11				G		
31					G			G	30	G	G	G	G	G	G	G	G	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	11	16	12	14	17	11	24	31	31	31	31	31	31	31	31	31	31	29	26	20	16	14	10	13
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	26	14	G	G	G	G	G	26	27	G	G	G	G	G	29	26	25	G	G	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

DEC. 2013

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		15	15	17	14	17	15	38	17	22	40	40	37	39	14	13	30	15		17	14		18	22
2	18	18			13	21	13	34	14	17	39	42	40	40	34	39	38	14	14	21	18			
3	15	17	20	14	15	17	18	21	38	39	40	40	39	44	18	42	17	15						18
4	14				14		17	21	36	38	43	45	40	43	40	18	14	14	15	17	17	18		18
5					17		17	23	14	20	44	40	40	40	40	22	14		18	18	14		18	21
6				20			18	25	35	42	39	44	40	42	40	24	42	20	18	18			15	14
7	20	17		17			14	35	35	36	40	40	42	40	37	40	21	21	14	22	21			
8	20		15	20	20		18	14	18	14	40	40	39	39	42	15	24	41	14			14	14	18
9		18		21		14	20	21	13	17	21	22	43	18	15	42	39	14	17		17	20		
10			14		14	14	15	35	15	18	23	40	17	14	38	33	29	20	17	18	14		17	14
11						21	15	14	37	37	40	40	39	39	37	18	30	14	18	18	17	24		
12	20	14		18		20	15	33	39	38	37	42	40	39	40	39	24	20	15		18	21	15	15
13	17	17		14		20	15	42	37	39	42	43	42	40	37	18	15	13	18	13				
14		17					14	39	40	40	40	43	39	40	21	33	34	14	17	20	14	20		20
15	21			15	15			14	33	38	40	34	44	35	39	23	31	15	15	20			15	15
16			21	13			20	22	20	39	44	40	38	42	37	36	20	18	15	14	18	20		
17								34	39	17	39	46	43	42	21	21	17	13			21	14		20
18		18		15			20	22	18	38	40	38	40	40	37	36	15	22	18		17			
19		17					15	20	35	39	40	42	43	43	42	20	39	22	14	17			21	14
20	15	13	20					14	18	21	43	40	39	40	42	22	39	14	15					
21		18	18	14	21		17	40	37	42	40	43	46	39	40	39	20	14	17	17		14		
22		17	14			14		21	15	21	39	42	40	43	40	40	18	40	15	17				
23							18	37	39	43	40	43	42	43	43	43	39	42		15				
24					14		21	44	38	20	40	34	43	43	43	40	21	22	40	21				
25	20		20	18	14		21	22	38	37	42	43	42	18	42	40	29	20	17	18	14	17	22	14
26		14	14		20	14	18	18	37	21	40	43	42	42	18	42	39	17	21			20	20	
27	14	14	18		20		22	20	34	39	39	40	43	40	43	37	42	22	17		14			
28				18	14	15		39	39	39	22	40	43	42	40	40	36	39	20	22	18	22		
29		14	15		15		20	18	38	39	42	44	40	49	38	40	39		21			18		
30					17			43	38	40	43	44	42	52	39	40	34	18				17		
31					14			20	18	38	44	44	44	42	42	40	39	20	14	21				
	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	16	12	14	17	11	24	31	31	31	31	31	31	31	31	31	31	29	26	20	16	14	10	13
MED	18	17	16	17	15	17	18	22	35	38	40	42	40	40	39	37	30	18	17	18	17	19	18	18
U Q	20	17	20	18	18	20	20	37	38	39	42	43	43	43	42	40	39	22	18	20	18	20	20	20
L Q	15	14	14	14	14	14	15	20	18	21	39	40	39	39	37	22	20	14	15	17	14	17	15	14

HOURLY VALUES OF foF2 AT Yamagawa

DEC. 2013

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	34	34	N	28	34	A	N	53	70	88	90	91	73	81	86	90	86	72	54	53	52	55	34	26
2	29	B		30	59	30	N	47	81	86	101	88	68	90	92	85	82	75	50	53	43	42	32	B
3	28	32	34	34	69	32	B	44	84	79	89	76	92	90	95	88	86	69	54	67	54	34	28	
4	40	32	32	34	40	31	28	43	88	82	101	88	97	93	80	94	84	73	54	54	54	38	34	32
5	B	28	28		34	N	28	52	77	90	85	87	90	97	92	93	101	76	55	73	54	44	B	B
6		B	32	B	34	B	89	52	77	86	86	87	88	90	N	91	84	76	54	52	44	38		34
7		B		29	29			46	81	80	87	85	90	91	90	96	N	78	52	39	52	52	42	B
8	29	B	34	28	34	B	29	50	78	77	94	98	96	94	86	89	88	77	77	52	74	54	47	A
9	B	29	31		26	25		53	86	88	88	88	87	90	96	81	88	80	67	73	66	52	40	B
10	N	30	28	29	29	26	B	53	96	90	92	84	97	94	90	90	87	85	59	43	52	47	44	42
11		34	A	A	A	B	B	51	89	77	92	96	93	87	92	88	96	80	N	54	53	49	42	28
12	34	34	36	B	B		28	52	86	82	86	83	86	87	86	88	90	80	69	55	52	52		34
13	36	59	B		29	B	B	44	84	91	69	68	92	87	87	92	86	72	A	53	A	52	A	A
14	A	B	34	34		29	N	44	76	78	97	96	80	N	96	88	90	84	55	77	67	53		42
15	34	B	28	34	34	B		48	N	83	88	78	69	79	90	87	86	74	74	44	43		47	28
16	A	A		B	29	B		45	78	97	79	N	86	69	68	N	79	84	53		53	54	52	
17	32	34	34	34	28	29	29		84	92	89	92	69	79	80	64	86	77	43	54	39	52	59	N
18	B	B	N	N	B	N	B	33	80	86	59	85	86	96	94	87	79	76	53	34	44	42	29	N
19	B	B	32		B	B	59	36	78	86	88	86	93	96	88	90	86	78	81	54	44	52	48	B
20	B	B	B	N		N	30	43	79	79	64	84	77	A	82	69	90	80	58	A		37	34	B
21	B		29	B	B	28	B	36	77	81	87	80	77	65	84	N	80	75	75			52	B	B
22		B	B		B	29	B	42	74	69	69	86	86	87	86	88	91	89	51	37	34	A	34	B
23		B		B		B	28	34	74	80	77	78	91	78	94	88	78	79	58	49	44	B	43	
24	B	N		32	28	29	29	24	76	78	82	80	84	79	78	84	98	86	46	59	54		N	34
25	28	B	B		29	29	B	40	74	82	84	87	81	60	95	81	88	86	60	42	41	53	44	36
26		29	28	B	28	34	34	47	86	90	86	80	79	99	86	76	87	74	51	34	42	43	40	
27	32	N	N	28	B	B		42	79	82	95	92	97	88	78	107	81	88	53	58	B	28	N	B
28	B	B	B	29	37	34	B	32	N	76	87	92	92	92	69	116	94	72	59	45	52	52	B	B
29	B		B	B	40	B	B	34	79	77	80	79	83	90	78	78	86	77	53	48	42		N	B
30		26	B	B	B	B	B	29	57	93	80	84	92	69	69	114	79	74	53		34	47	34	B
31	B	B	B	B	59	B	B	30	59	76	82	87	89	69	84	81	81	72	48	46	44	50	28	29
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	12	14	13	20	13	11	30	29	31	31	30	31	29	30	29	30	31	29	27	27	26	21	11
MED	32	32	32	30	34	29	29	44	79	82	87	86	87	88	86	88	86	77	54	53	52	51	40	34
U Q	34	34	34	34	38	31	34	50	84	88	90	88	92	92	92	91	90	80	59	55	54	52	45	36
L Q	29	29	28	28	29	28	28	36	76	78	80	80	80	79	80	82	82	74	52	44	43	42	34	28

HOURLY VALUES OF fEs AT Yamagawa

DEC. 2013

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	G	G	G	G	G	24	G	G	33	35	35	48	35	32	35	29	40	52	44	28	G	G	G	G
2	G	B	G	G	G	G	G	G	G	34	36	G	G	G	G	N	25	G	G	G	G	G	G	B
3	G	G	G	G	G	G	B	G	24	30	33	31	47	40	39	36	39	G	G	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G	G	G	G	34	33	G	32	34	G	G	G	G	G	G	G
5	B	G	G	G	G	G	G	G	30	39	32	35	34	35	34	33	32	31	26	26	G	G	B	B
6	G	B	G	B	G	B	G	G	G	28	G	G	G	36	50	61	51	G	G	G	G	G	G	G
7	G	B	G	G	G	G	G	26	53	32	29	G	34	34	35	44	34	G	G	G	G	G	G	B
8	G	B	G	G	G	B	G	G	26	32	G	34	48	G	37	35	G	G	36	26	G	G	32	25
9	B	G	G	G	G	G	G	G	26	38	46	36	40	32	37	33	24	G	G	G	G	G	G	B
10	G	G	G	G	G	G	B	G	24	G	31	G	G	G	34	38	28	G	G	G	G	G	G	G
11	G	G	34	26	34	B	B	G	25	33	37	37	40	46	38	34	34	G	G	G	G	G	G	G
12	G	G	G	B	B	G	G	G	25	28	G	G	48	40	43	32	33	23	G	G	G	G	G	G
13	G	G	B	G	G	B	B	G	24	G	G	G	59	61	49	43	40	25	33	33	36	G	26	33
14	33	B	G	G	G	G	G	G	G	34	39	35	65	60	66	46	G	G	G	G	G	G	G	G
15	G	B	G	G	G	B	G	G	N	32	G	G	53	71	56	40	40	G	G	G	G	G	G	G
16	24	26	G	B	G	B	G	G	G	28	G	G	G	G	37	35	25	G	11	G	G	G	G	G
17	G	G	G	G	G	G	G	G	26	29	G	G	G	G	32	30	28	G	26	G	G	G	G	G
18	B	B	G	G	B	G	B	G	25	35	50	52	64	49	66	30	G	G	G	G	G	G	G	G
19	B	B	G	G	B	B	G	G	G	30	G	G	34	G	G	31	G	28	G	11	G	G	G	B
20	B	B	B	G	G	G	G	G	G	G	G	G	G	34	G	45	G	G	G	29	G	G	G	B
21	B	G	G	B	B	G	B	G	G	G	32	G	G	G	G	G	26	G	24	G	G	G	B	B
22	G	B	B	G	B	G	B	G	G	32	34	G	50	48	G	28	34	32	20	G	G	32	G	B
23	G	B	G	B	G	B	G	G	G	27	G	G	36	50	34	28	25	G	G	G	G	B	G	G
24	B	G	G	G	G	G	G	G	G	30	G	G	36	36	G	48	61	49	34	G	G	G	G	G
25	G	B	B	G	G	G	B	G	48	27	31	32	33	G	49	35	26	G	11	G	G	G	G	G
26	G	G	G	B	G	G	G	G	G	26	G	G	42	34	39	G	27	G	G	G	G	G	G	G
27	G	G	G	G	B	B	G	G	G	28	29	33	35	G	31	39	43	G	34	11	B	G	G	B
28	B	B	B	G	G	27	B	G	G	26	35	G	G	G	G	G	G	G	G	G	G	G	B	B
29	B	G	B	B	G	B	B	G	25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	B
30	G	G	B	B	B	B	B	G	G	G	G	G	G	37	G	G	G	39	36	G	G	G	G	B
31	B	B	B	B	G	B	B	G	24	36	34	G	G	G	G	32	25	G	G	G	G	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	21	17	23	22	24	19	19	31	30	31	31	31	31	31	31	30	31	31	31	31	30	30	28	19
MED	G	G	G	G	G	G	G	G	12	29	29	G	34	34	34	33	27	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	25	33	34	33	47	40	39	39	34	23	26	G	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	26	G	G	G	G	G	29	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Yamagawa

DEC. 2013

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	18	17	66	18	16	66	18	20	15	18	27	27	28	41	20	16	15	14	15	15	17	20	15	18
2	18	B	18	15	15	15	15	18	15	17	18	20	21	38	15	33	17	22	15	17	15	20	17	B
3	20	66	17	17	17	17	B	18	17	18	18	21	20	20	18	15	15	23	18	16	27	21	20	17
4	21	15	16	17	15	18	17	16	27	15	36	36	27	27	39	17	15	21	16	15	15	15	15	18
5	B	17	18	66	18	16	15	17	16	17	17	23	39	26	22	16	16	15	17	15	15	16	B	B
6	16	B	15	B	17	B	18	21	26	17	36	42	36	22	20	18	18	21	16	15	16	17	20	18
7	66	B	66	20	15	66	66	18	15	17	16	41	38	26	23	20	17	21	17	16	15	16	17	B
8	22	B	18	17	20	B	17	17	14	16	18	20	28	27	20	17	27	21	15	15	16	17	15	17
9	B	18	18	20	15	15	20	18	14	17	18	22	22	20	17	18	32	20	15	17	50	17	15	B
10	16	16	17	17	18	16	B	17	27	14	21	36	52	42	39	22	17	23	15	15	16	15	15	15
11	24	20	15	15	16	B	B	17	15	17	24	30	27	26	22	32	18	21	16	17	21	20	17	20
12	20	66	17	B	B	66	20	18	27	18	40	42	34	42	21	20	14	27	18	15	15	17	18	16
13	20	18	B	66	18	B	B	17	27	34	20	38	29	34	24	18	20	16	16	15	15	26	18	17
14	14	B	20	17	66	20	18	18	28	26	26	27	29	30	27	21	16	21	18	15	17	16	18	16
15	18	B	21	17	17	B	66	18	16	21	39	39	33	35	28	22	20	24	18	17	22	71	15	21
16	16	18	66	B	21	B	66	18	26	33	20	40	58	39	23	21	18	22	16	24	17	16	18	66
17	17	18	21	17	18	21	18	18	27	18	37	45	39	39	22	18	18	23	17	21	15	17	20	16
18	B	B	21	22	B	18	B	18	16	29	20	34	23	27	26	34	28	23	18	17	16	18	18	20
19	B	B	18	66	B	B	20	18	27	20	40	20	41	38	38	17	18	20	20	16	20	17	20	B
20	B	B	B	20	20	18	18	17	27	38	35	38	46	21	18	29	28	24	23	17	23	20	17	B
21	B	66	18	B	B	21	B	18	27	33	40	45	49	39	50	34	18	30	17	91	66	26	B	B
22	66	B	B	66	B	17	B	17	28	18	21	35	27	27	35	36	27	18	18	18	16	18	16	B
23	66	B	21	B	66	B	17	15	27	33	35	42	43	29	26	33	28	27	17	16	27	B	20	71
24	B	20	66	23	18	15	20	17	27	20	35	40	44	29	37	20	18	17	17	34	20	66	17	66
25	17	B	B	66	18	18	B	18	21	18	22	22	21	47	28	18	18	20	16	17	22	18	30	16
26	66	20	17	B	21	17	17	18	27	20	34	51	35	22	28	37	18	21	15	18	15	16	17	66
27	18	20	18	21	B	B	66	16	24	20	21	42	26	38	21	18	16	24	18	16	B	20	17	B
28	B	B	B	18	18	17	B	17	27	32	38	51	42	50	42	44	29	24	16	20	20	20	B	B
29	B	66	B	B	18	B	B	27	26	34	36	38	44	42	52	37	28	28	20	17	17	81	71	B
30	66	20	B	B	B	B	B	17	49	35	38	55	44	28	54	39	30	17	18	71	17	16	18	B
31	B	B	B	B	20	B	B	17	26	17	20	39	43	49	38	21	18	23	18	20	18	15	16	18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	17	23	22	24	19	19	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	28	19
MED	20	20	18	19	18	18	18	18	26	18	26	38	35	30	26	21	18	21	17	17	17	18	17	18
U Q	45	43	21	23	20	21	20	18	27	32	36	42	43	39	38	33	27	24	18	18	21	20	19	21
L Q	17	17	17	17	16	16	17	17	16	17	20	27	27	26	21	18	17	20	16	15	15	16	16	16

HOURLY VALUES OF foF2 AT Okinawa

DEC. 2013

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	52	87	83	107	120	87	93	102	104	108	87	52	59	82	59	46	B
2	B	39	43	B	B	29	B	B	80	91	107	98	88	116	105	102	102	97	64	58	67	58	51	30
3			B		48	B	B	52	86	114	119	104	74	110	110	118	118	92	72	72	86	63		B
4	53		B	40		39	B	B	90	123	132	120	132	132	121	110	92	88	81	71	63	54		
5	B	B	B	B		B	B	53	86	93	88	107	104	114	120	112	110	108	88	74	87	67	67	B
6	B	B		34		B	B	50	83	114	108	101	112	118	118	114	107	88	87	76	82	72		52
7	46	B	52		50	B	B	50	73	92	93	90	92	90	103	111	94	107	80	73	84	66	54	B
8	B	B	B	52	52		B	52	87	94	88	104	110	118	109	131	133	90	82		79	88	52	B
9	B	B	B	B	B	40	B	52	88	117	121	106	107	108	131	128	127	114	89	59	99	87	54	B
10	B	B		47		B	B	52	87	105	120	101	98	117	119	93	113	107	89	49	59	78	72	63
11	B			B	A	B	B		89	105	110	108	91	112	116	119	120	89	108	49	79	82	86	49
12	B	B			B	B	B	50	88	110	108	101	86	90	107	124	120	109	108	54	79	82	53	52
13	40			B	B	B	B	39	88	113	120	113	105	103	93	110	110	103	82	76	83	77	71	52
14	B			B		34	49	53	87	108	114	116	108	108	108	129	109	N	89	97	54	53	58	55
15		62	67	53	25	B	B	47	107	126	134	110	101	126	114	90	108	102	80	75	62		81	60
16	B		48	47	B	B	B	53	93	107	115	129	92	N	128	130	129	108	N	87			86	52
17	52	53		52	29	34	B		88	118	108	122	122	122	106	120	132	107	87	68		84	52	53
18	B	B	B	B	B	B	B	50	81	99	107	99	120	108	130	N	122	108	88	74	53		B	
19	B	B	B			B		52	85	105	123	118	112	110	110	88	130	120	89	108	76	79	82	80
20		B	N	B			B	58	87	108	108	107	108	121	129	91	118	108	N	83	46	72	59	53
21	B		B	B		B		41	82	109	115	99	90	107	116	99	104	114	86	74	B	80		67
22		B	B	B	B	B	B	B	78	94	108	101	92	112	122	93	131	107	83			54	72	
23	B	B	B	B	B	B	B	45	67	88	102	84	96	107	106	122	118	118	107	55	52	86	N	B
24	B	B	B	B	34	B	B	B	67	94	98	79	87	110	109	108	130	109	89	89	86		B	56
25	B	B	B	B	34		B		78	100	95	98	86	105	128	108	106	107	N	101			N	
26		B	B	B	B			62	89	112	102	120	107	120	128	108	108	94	86	62	54	67		B
27		B	B	32	B	B	B	34	73	93	122	116	105	129	128	109	134	128	79	81	80	81	62	
28			B			B	B	A	62	88	100	114	106	106	109	N	N	130	96	72	73			
29	B		B	B	N	B	B	36	81	85	88	98	87	106	108	105	88	114	83	72	69	59	59	B
30	B		B	30	38		B	B	81	84	114	105	112	148	99	130	131	110	83	76	73		N	B
31	B	B	B		B	B	B	B	74	85	110	111	101	112	118	100	87	84	71	49		64		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	4	3	4	9	8	5	1	21	31	31	31	31	31	30	31	29	30	30	28	29	25	24	19	14
MED	49	53	50	47	36	34	49	52	86	105	108	106	101	111	114	110	116	107	86	73	76	72	59	53
U Q	52	62	59	52	49	39	24	52	88	112	119	116	108	118	122	121	129	110	89	78	82	81	72	60
L Q	43	39	45	33	31	31	24	46	78	92	102	99	90	107	107	101	107	94	80	59	60	61	53	52

HOURLY VALUES OF fEs AT Okinawa

DEC. 2013

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	G	G	B	B	G	B	B	G	G	32	G	G	G	G	G	G	41	G	G	24	G	G	G	B
2	B	G	G	B	B	G	B	B	G	G	G	43	G	G	G	G	38	28	27	G	G	G	G	G
3	G	G	B	G	G	B	B	G	G	G	30	G	G	G	G	G	68	39	G	G	G	G	G	B
4	G	G	B	G	G	G	B	B	G	G	G	G	G	G	G	G	35	G	G	G	G	G	G	G
5	B	B	B	B	G	B	B	G	G	G	G	G	G	G	G	G	36	G	21	G	G	G	G	B
6	B	B	G	G	G	B	B	G	G	28	G	G	G	G	G	G	39	26	G	G	G	G	G	G
7	G	B	G	G	G	B	B	G	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G	B
8	B	B	B	G	G	G	B	G	G	28	G	G	G	G	55	34	49	23	G	G	G	G	G	B
9	B	B	B	B	B	G	B	G	G	G	46	45	G	47	G	G	39	G	G	G	G	G	G	B
10	B	B	G	G	G	B	B	G	N	G	G	G	G	G	G	G	36	36	G	G	G	G	G	G
11	B	G	G	B	29	B	B	G	26	28	G	50	52	G	46	G	26	G	G	G	G	G	G	G
12	B	B	G	G	B	B	B	G	G	30	G	G	G	65	51	34	G	35	G	G	G	G	G	G
13	G	G	G	B	B	B	B	G	G	28	G	G	G	51	49	48	40	35	G	27	G	G	G	G
14	B	G	G	B	G	G	G	G	27	30	G	G	64	50	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	G	B	B	G	G	G	G	G	G	G	76	46	54	G	G	G	27	G	G	G
16	B	G	G	G	B	B	B	G	G	G	G	G	52	52	G	G	G	G	41	32	G	G	G	G
17	G	G	G	G	G	G	B	G	G	31	G	G	G	G	G	G	G	G	G	11	G	G	G	G
18	B	B	B	B	B	B	B	G	G	G	29	G	G	51	86	51	56	43	28	G	G	G	B	G
19	B	B	B	G	G	B	G	G	G	G	G	G	51	G	G	G	42	30	G	G	G	G	G	G
20	G	B	G	B	G	G	B	G	G	G	G	G	G	G	G	G	48	G	25	G	24	G	G	G
21	B	G	B	B	G	B	G	G	G	G	G	G	G	G	G	40	39	40	28	G	B	G	G	G
22	G	B	B	B	B	B	B	B	G	28	G	G	G	G	G	G	48	45	G	G	G	G	G	G
23	B	B	B	B	B	B	B	G	G	G	G	G	G	G	58	42	G	G	27	G	G	G	G	B
24	B	B	B	B	G	B	B	B	G	35	G	G	49	52	49	51	G	35	G	G	G	G	B	G
25	B	B	B	B	G	G	B	G	G	G	G	G	41	50	47	G	G	G	G	G	G	G	G	G
26	G	B	B	B	B	G	G	G	G	G	G	G	G	G	30	G	G	G	G	G	G	G	G	B
27	G	B	B	G	B	B	B	G	G	G	G	G	G	G	G	31	67	50	38	38	G	27	G	G
28	G	G	B	G	G	B	B	29	G	G	G	G	G	G	35	G	G	G	48	G	G	G	G	G
29	B	G	B	B	G	B	B	G	G	G	G	53	54	G	49	42	G	G	33	G	26	29	G	B
30	B	G	B	G	G	G	B	B	G	G	G	G	G	G	G	G	G	G	24	G	G	G	G	B
31	B	B	B	G	B	B	B	B	G	G	G	G	G	G	G	G	G	27	G	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	12	14	12	15	20	10	4	25	30	31	31	31	31	31	31	31	31	31	31	31	30	31	29	20
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	28	G	G	G	47	49	34	42	35	27	G	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

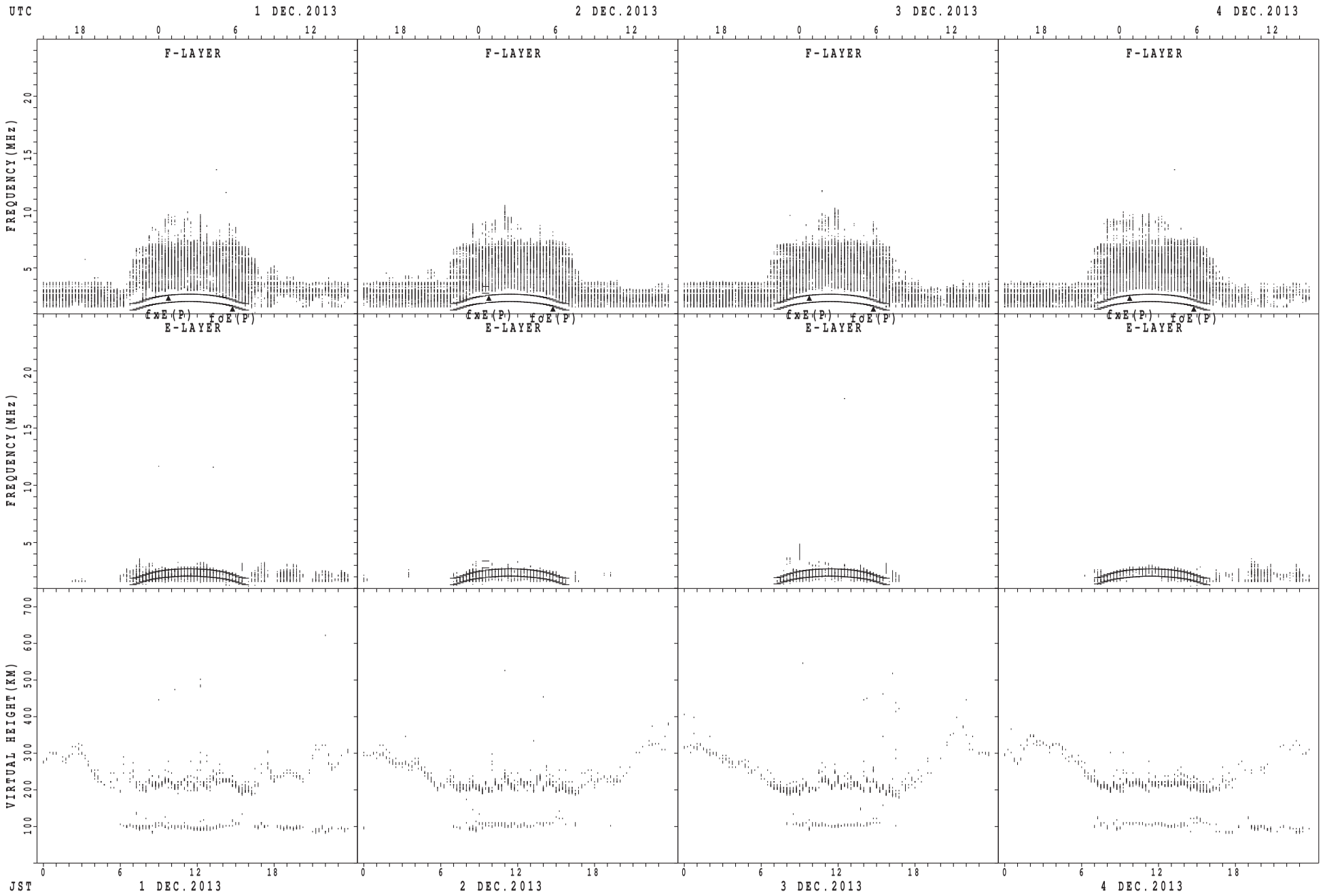
HOURLY VALUES OF fmin AT Okinawa

DEC. 2013

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

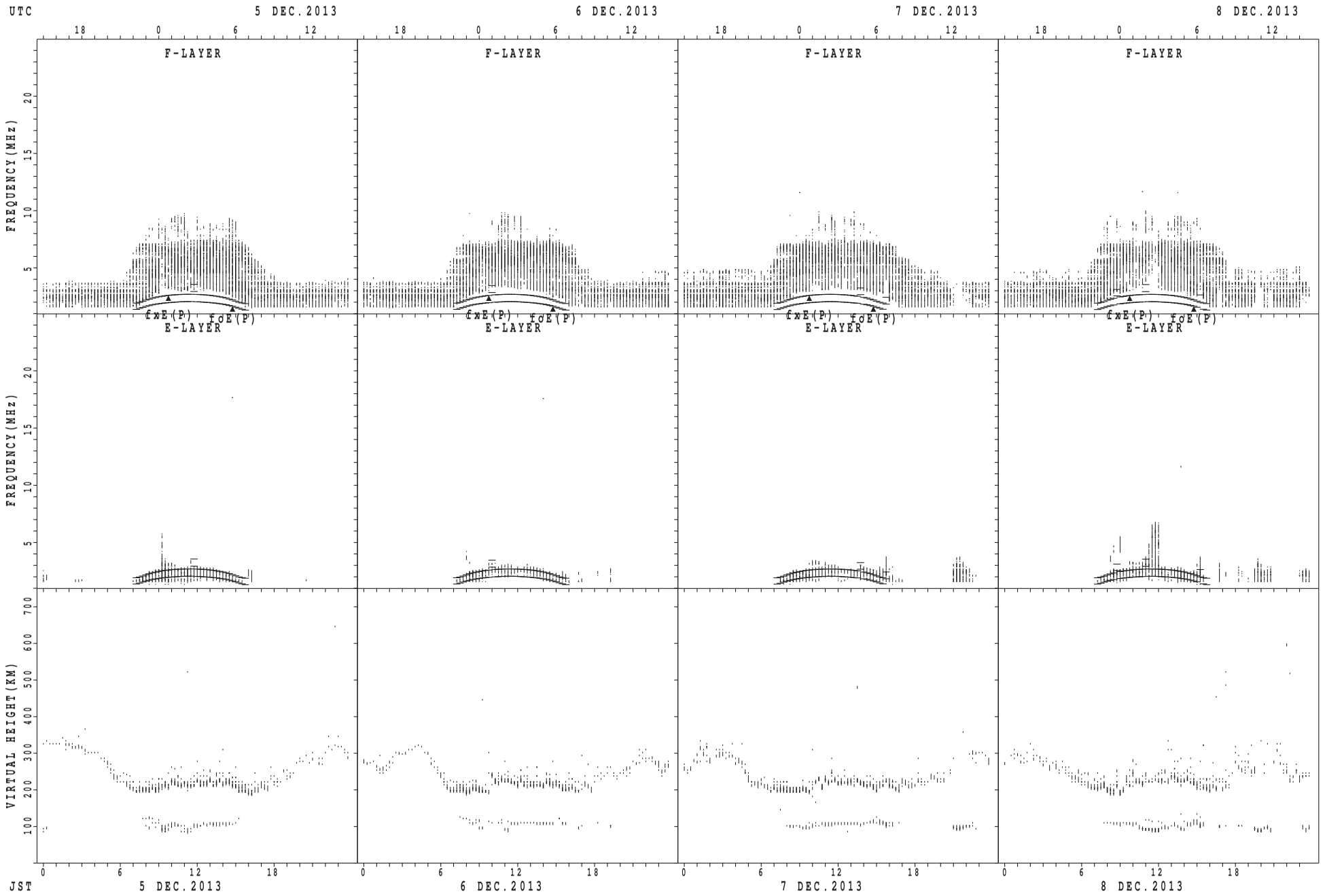
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	66	B	B	17	B	B	17	32	21	38	42	66	53	43	39	26	29	15	15	17	45	18	B
2	B	21	20	B	B	16	B	B	38	36	46	23	45	39	39	38	20	18	17	20	42	20	20	18
3	66	22	B	17	36	B	B	20	28	40	22	45	42	40	40	39	17	17	28	21	29	43	21	B
4	18	66	B	17	66	21	B	B	27	41	39	42	52	46	43	43	39	38	21	22	20	16	42	81
5	B	B	B	B	66	B	B	43	28	39	39	45	47	50	38	40	18	18	17	16	21	39	42	B
6	B	B	66	17	66	B	B	20	27	21	42	43	46	44	40	40	20	38	20	18	21	39	21	17
7	22	B	24	20	40	B	B	21	29	18	40	42	52	43	40	39	20	36	27	22	17	41	18	B
8	B	B	B	44	22	23	B	20	27	20	43	40	50	44	39	41	20	16	18	66	40	45	21	B
9	B	B	B	B	B	20	B	24	29	38	35	46	45	28	49	44	15	40	18	43	49	45	39	B
10	B	B	21	29	20	B	B	21	28	38	18	40	46	52	39	42	17	18	24	41	40	40	42	40
11	B	91	66	B	15	B	B	44	29	20	43	41	39	44	42	41	39	28	23	43	18	42	44	21
12	B	B	66	71	B	B	B	40	27	20	42	42	49	40	34	27	33	22	41	43	21	23	41	20
13	20	21	71	B	B	B	B	21	28	20	43	42	42	40	39	32	20	17	22	18	21	21	23	42
14	B	66	71	B	71	21	17	20	29	38	42	46	40	43	43	40	43	28	24	32	16	27	30	22
15	21	50	18	22	18	B	B	41	40	39	43	43	53	42	40	29	21	38	40	18	16	66	29	32
16	B	71	17	20	B	B	B	18	29	42	43	42	39	40	40	42	42	42	17	16	81	50	21	15
17	21	21	66	20	18	20	B	21	29	23	40	46	47	53	52	40	38	37	20	20	20	32	27	42
18	B	B	B	B	B	B	B	20	28	39	42	45	39	39	34	28	21	20	40	41	43	81	B	71
19	B	B	B	66	81	B	66	21	35	39	42	44	39	64	42	42	17	16	28	42	51	40	30	45
20	81	B	18	B	71	66	B	18	28	39	44	43	53	50	59	43	29	29	16	20	16	52	42	42
21	B	66	B	B	30	B	66	20	29	39	42	43	48	58	42	21	18	17	18	64	B	62	43	21
22	66	B	B	B	B	B	B	B	40	20	43	44	53	44	44	40	30	26	21	45	71	30	52	71
23	B	B	B	B	B	B	B	20	33	40	42	46	44	46	29	26	38	36	20	21	16	40	41	B
24	B	B	B	B	20	B	B	B	23	21	42	43	42	38	44	23	40	35	40	45	32	71	B	44
25	B	B	B	B	20	66	B	20	30	38	40	49	28	48	41	43	35	38	42	20	111	71	22	91
26	66	B	B	B	B	66	66	28	27	39	42	45	48	48	23	42	30	24	30	42	18	45	66	B
27	66	B	B	16	B	B	B	20	39	42	40	43	50	54	44	23	29	17	15	20	21	42	40	81
28	71	66	B	66	44	B	B	16	28	38	40	44	46	43	26	44	39	39	22	21	22	34	71	66
29	B	66	B	B	21	B	B	20	30	39	40	39	40	62	22	22	41	39	44	39	28	16	62	B
30	B	21	B	21	26	66	B	B	39	34	42	49	50	45	43	43	40	28	17	33	52	45	42	B
31	B	B	B	66	B	B	B	B	39	41	42	45	46	43	43	43	39	17	39	42	47	24	43	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	14	12	15	20	10	4	25	31	31	31	31	31	31	31	31	31	31	31	31	30	31	29	20
MED	44	66	45	21	28	22	66	20	29	38	42	43	46	44	40	40	29	28	22	22	22	41	40	42
U Q	66	66	66	66	66	66	66	22	33	39	43	45	50	50	43	42	39	38	30	42	43	45	42	68
L Q	20	21	19	17	20	20	41	20	28	21	40	42	42	40	39	29	20	18	18	20	18	30	21	21

SUMMARY PLOTS AT Wakkanai



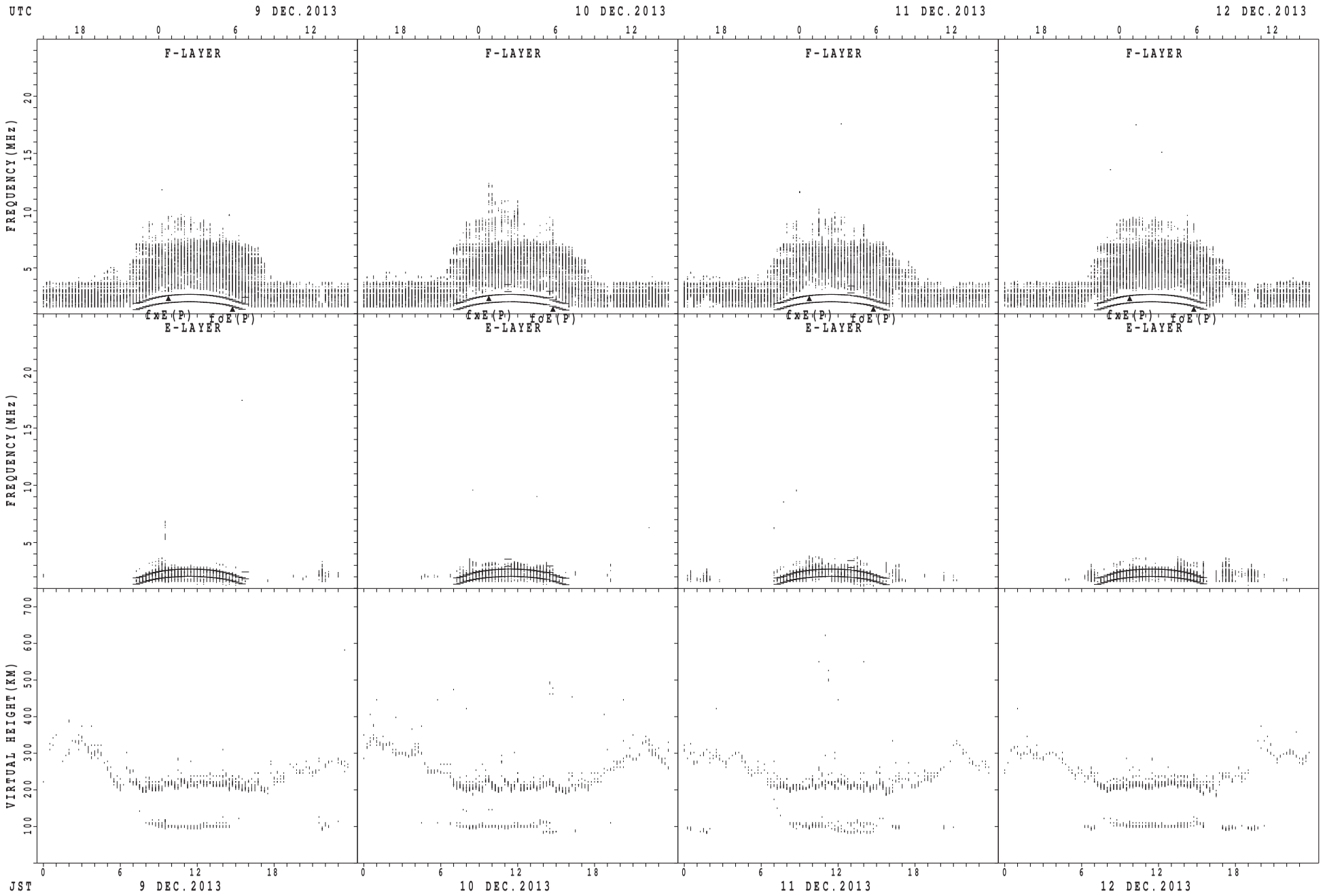
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



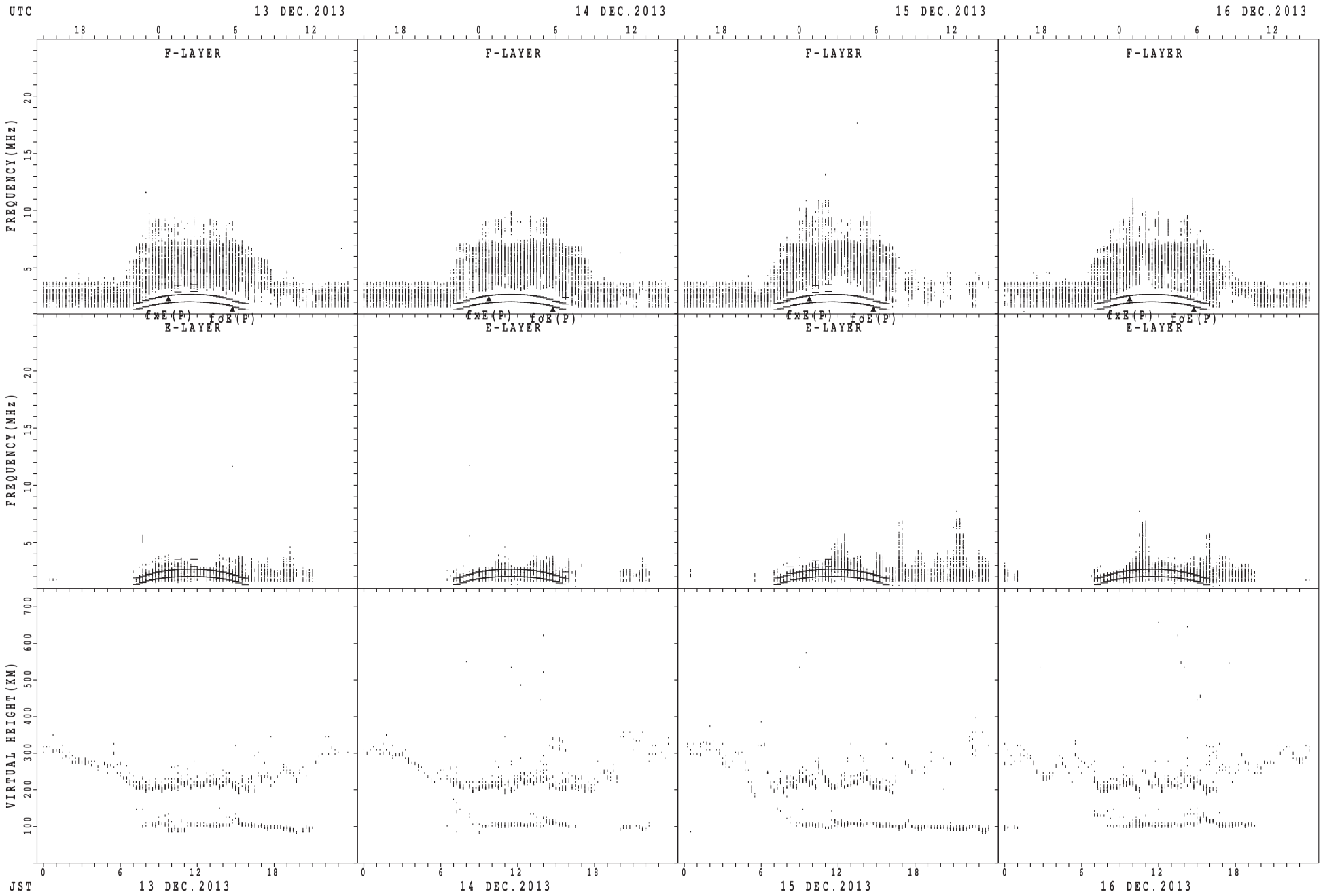
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



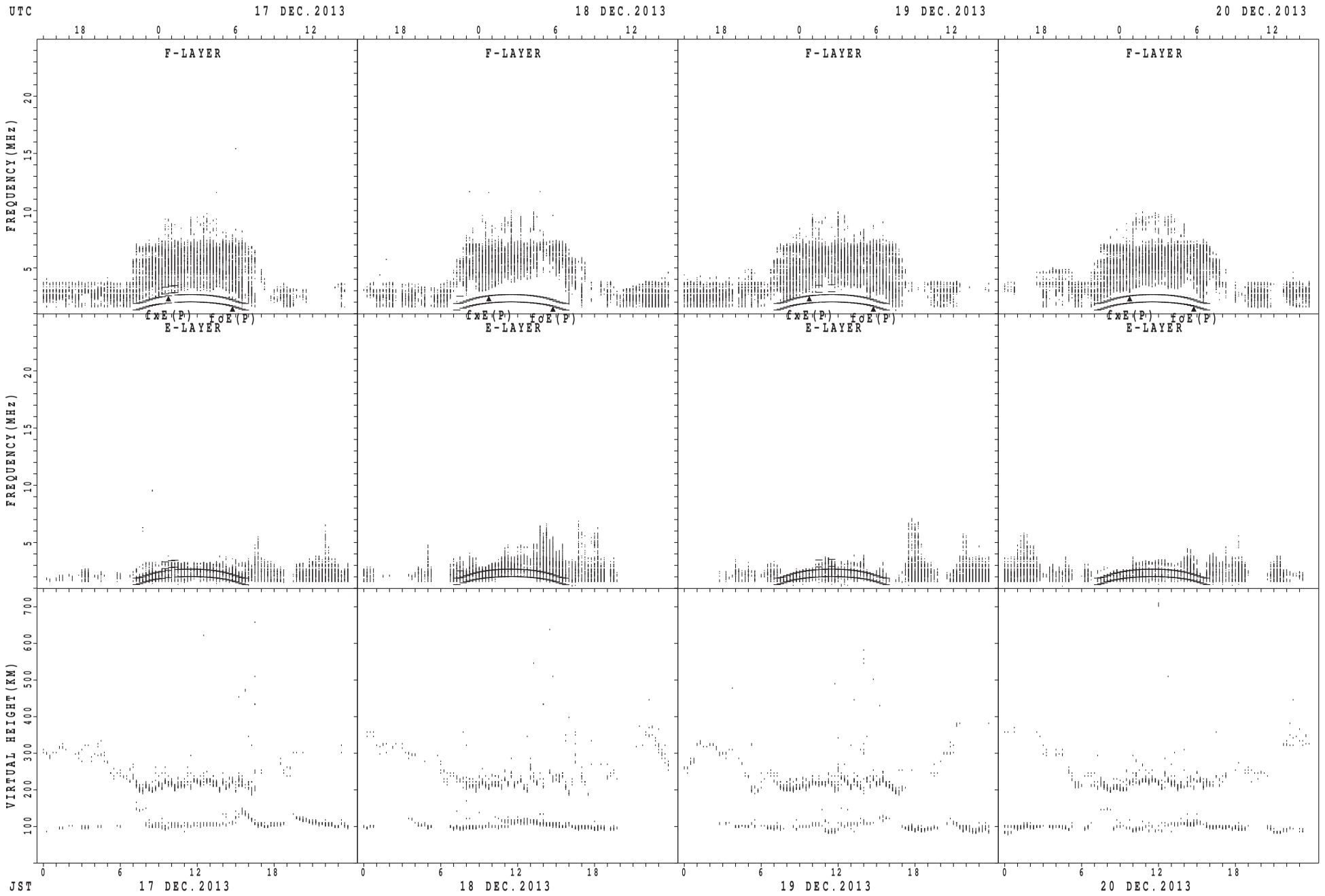
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai

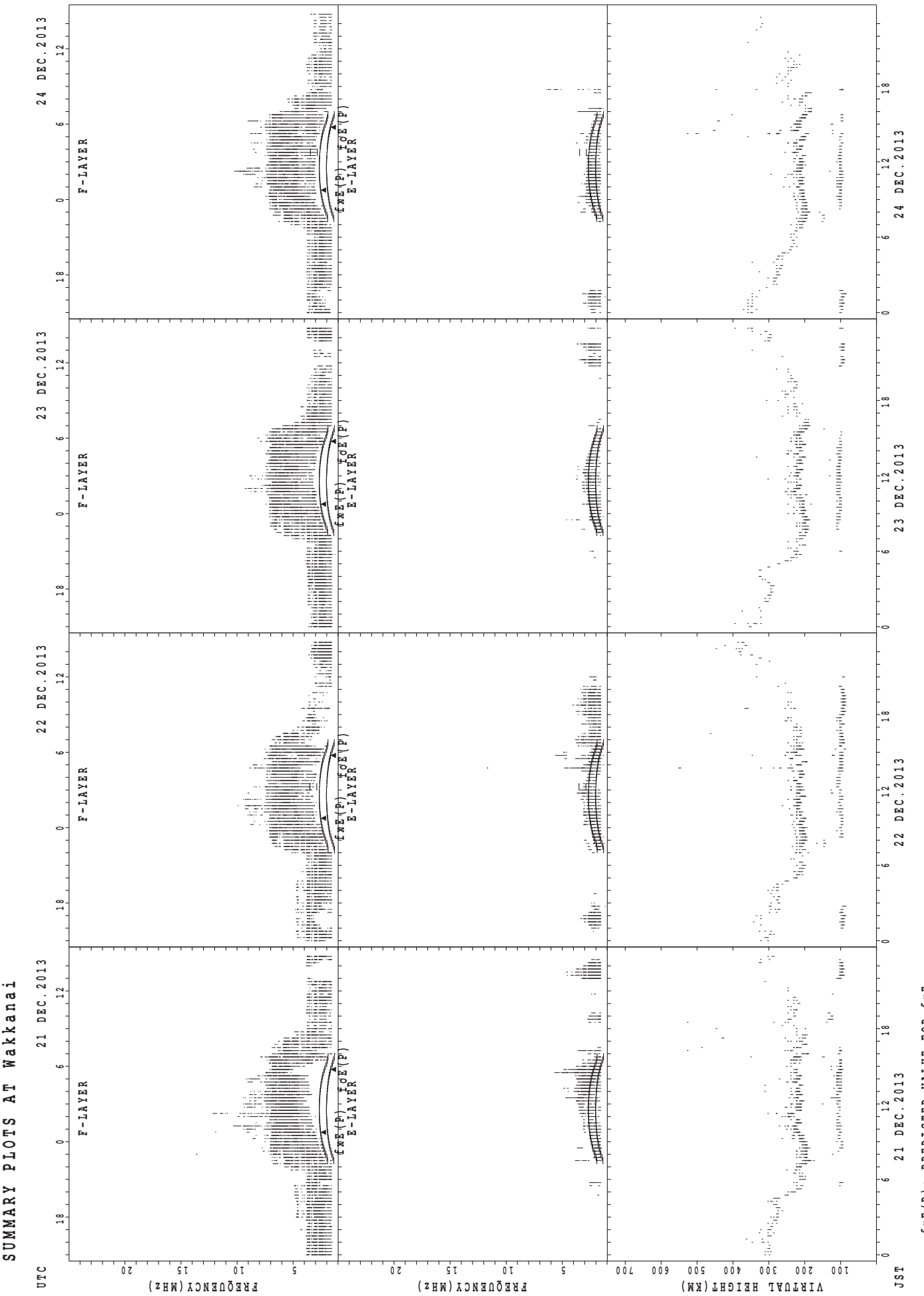


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

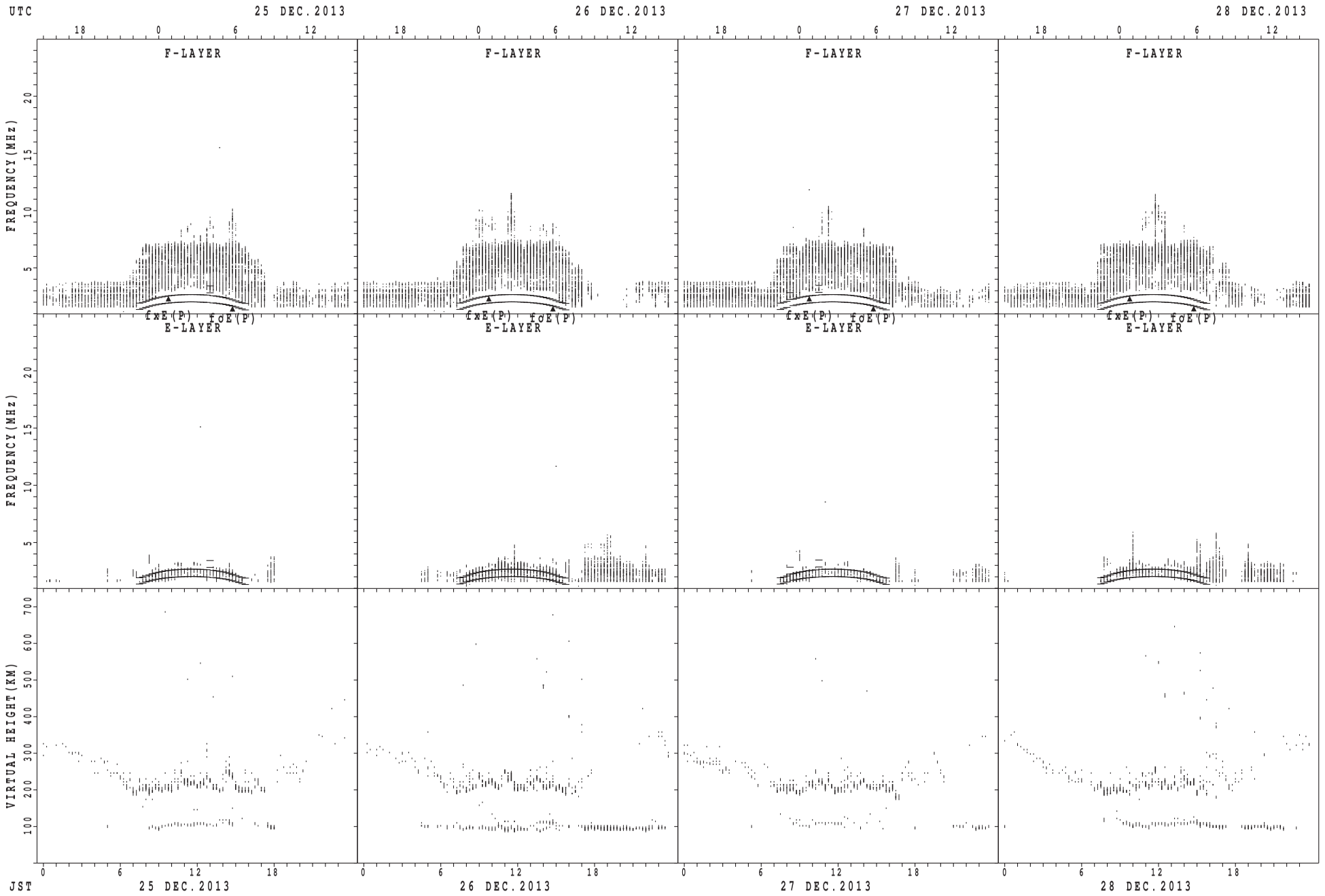
SUMMARY PLOTS AT Wakkanai



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

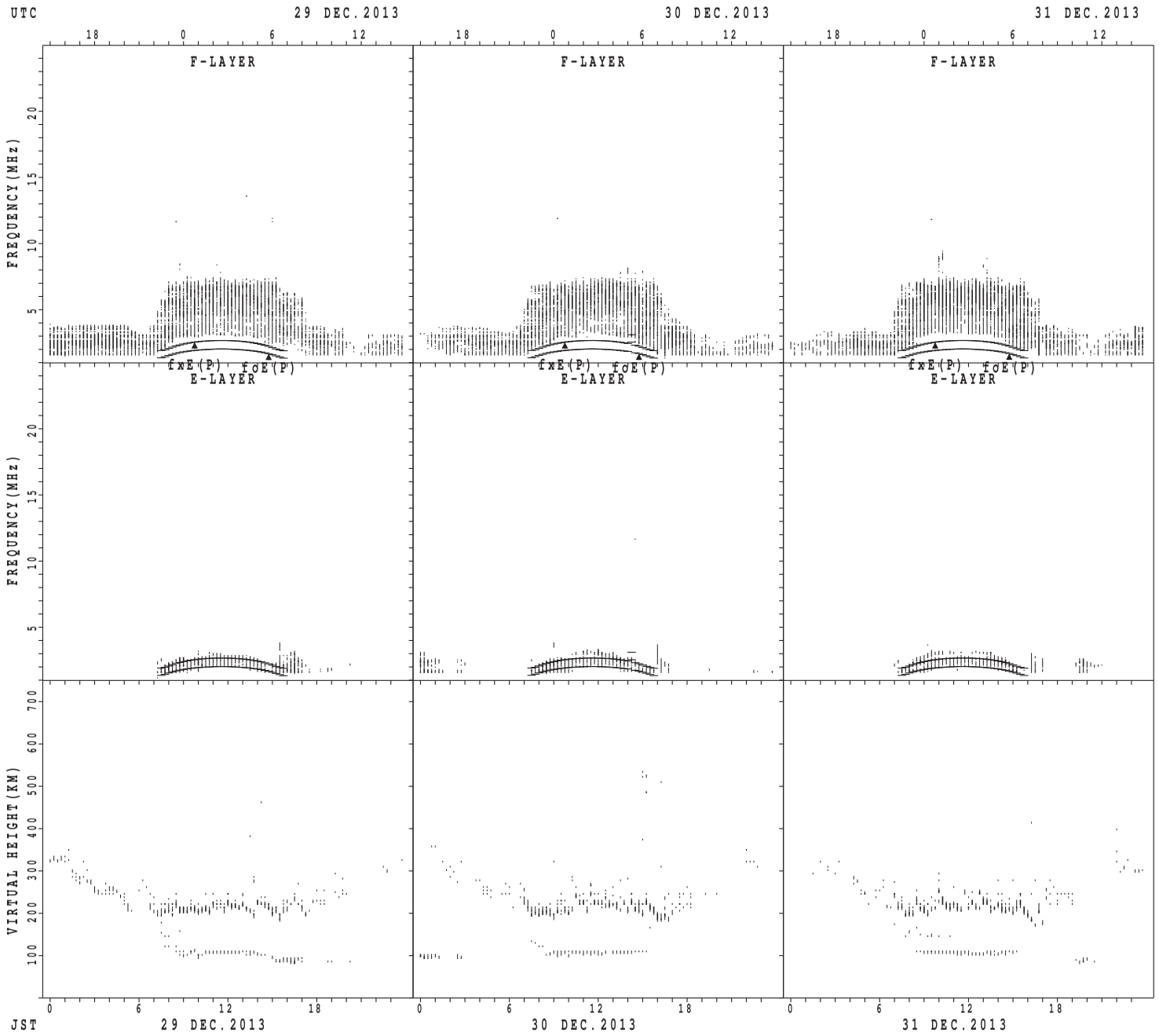

SUMMARY PLOTS AT Wakkanai
UTC
JST
21 DEC.2013
22 DEC.2013
23 DEC.2013
24 DEC.2013
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



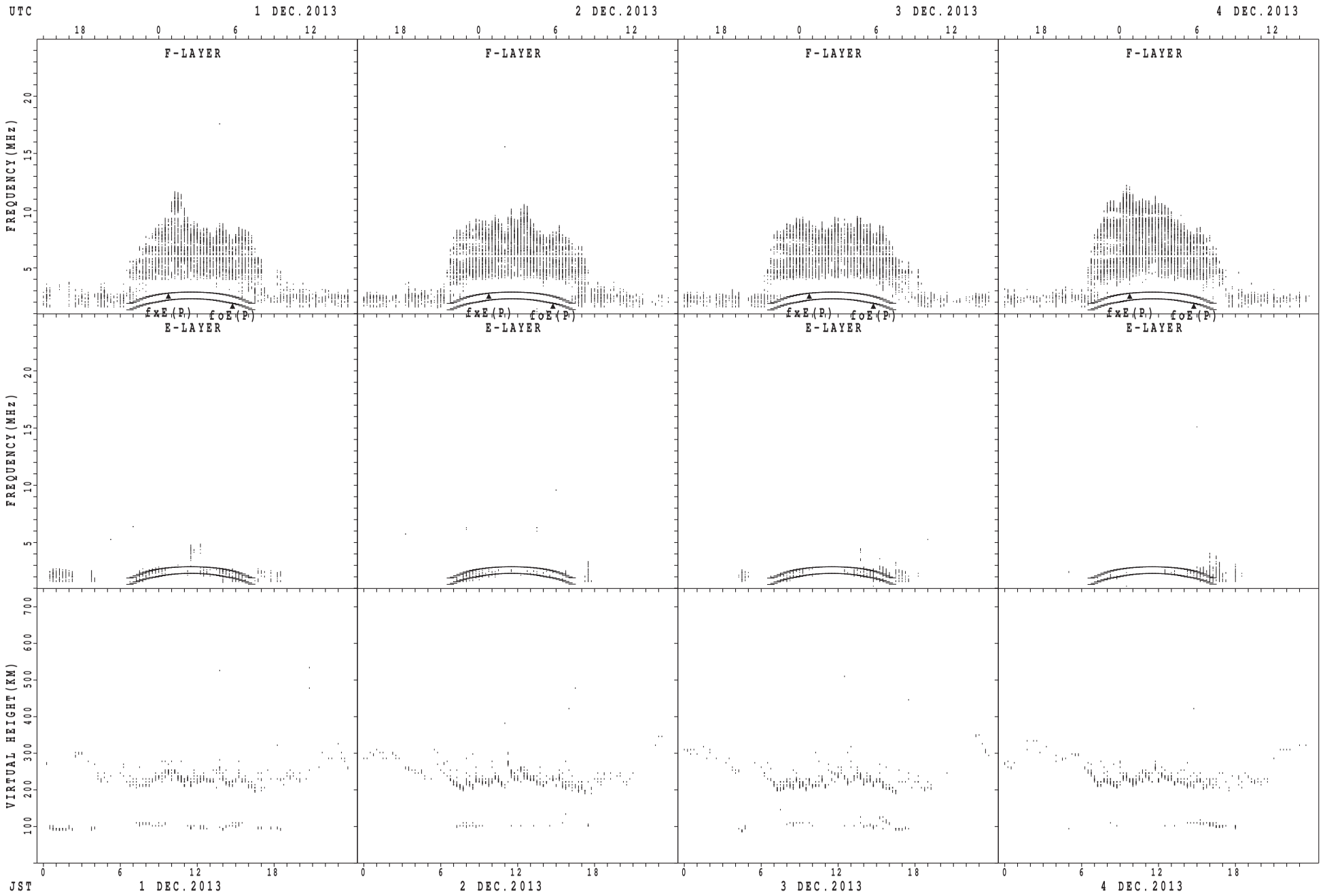
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



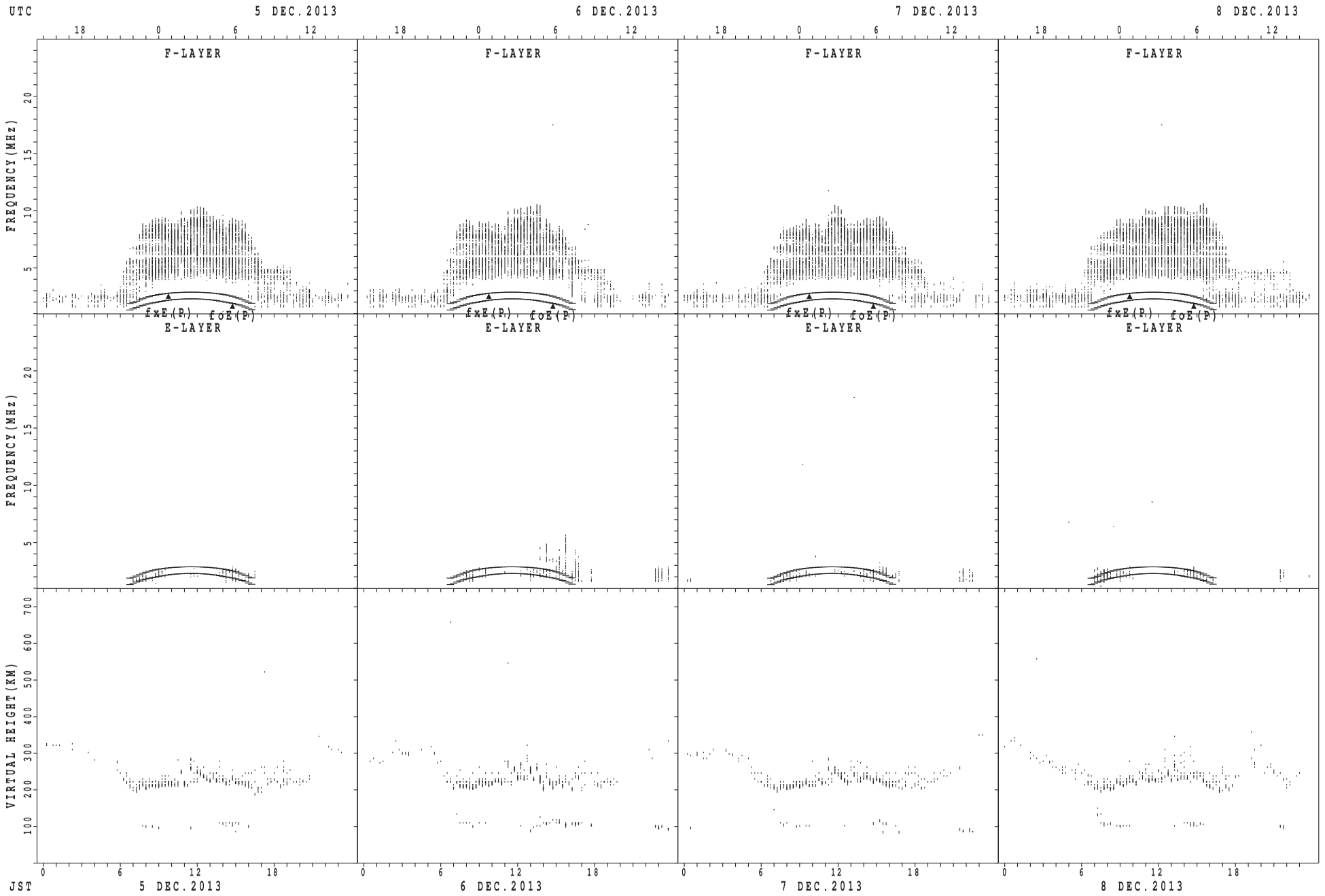
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



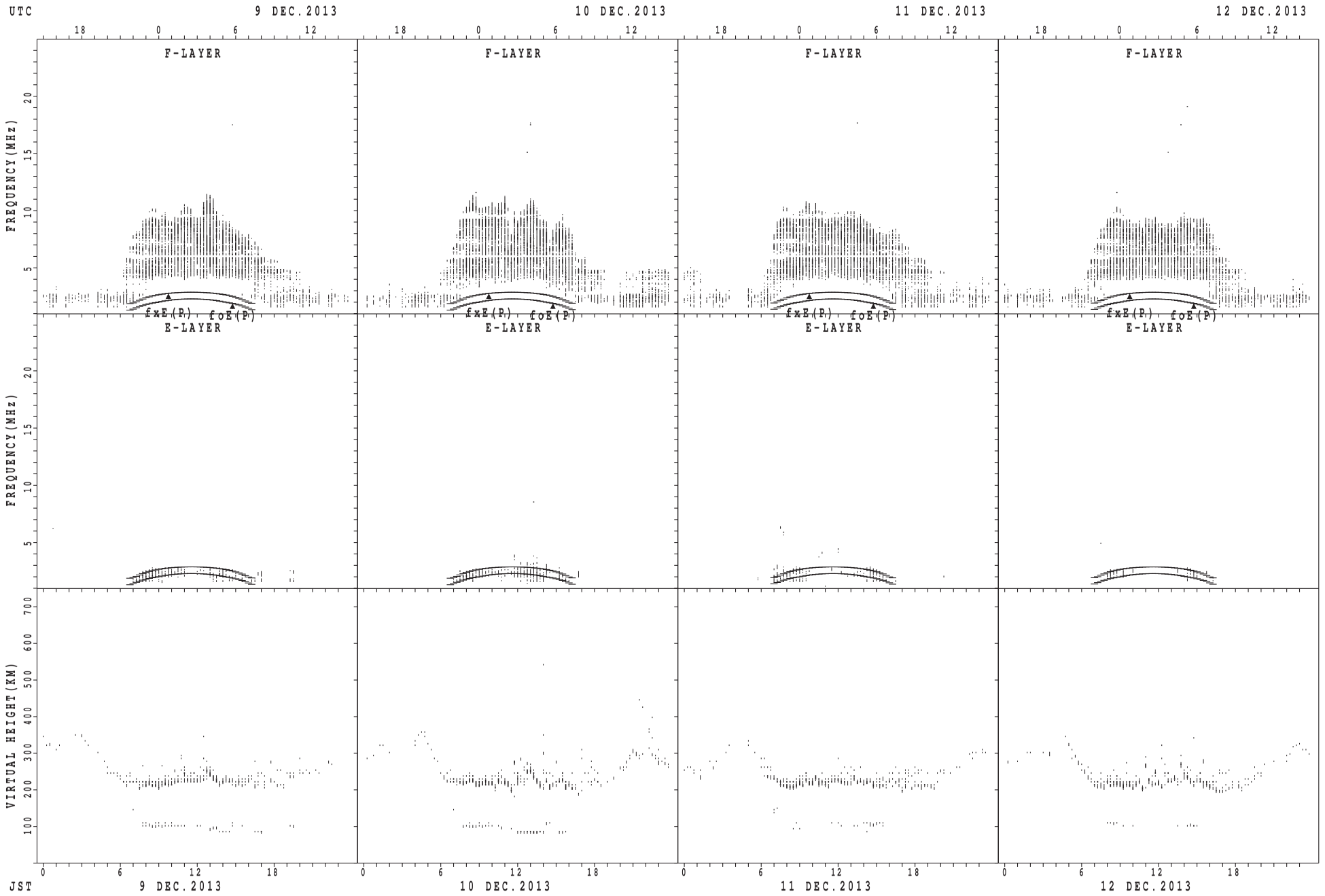
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



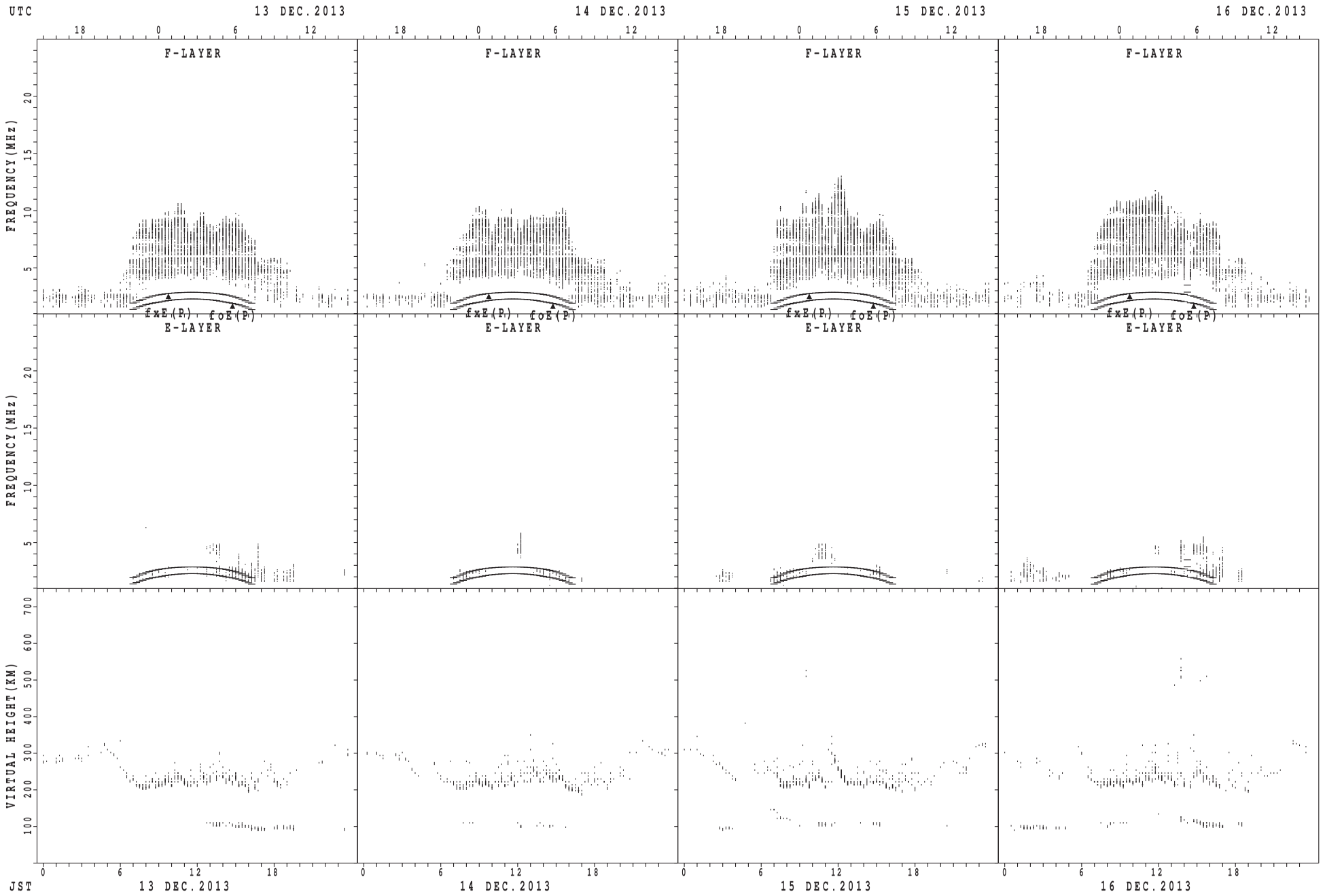
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



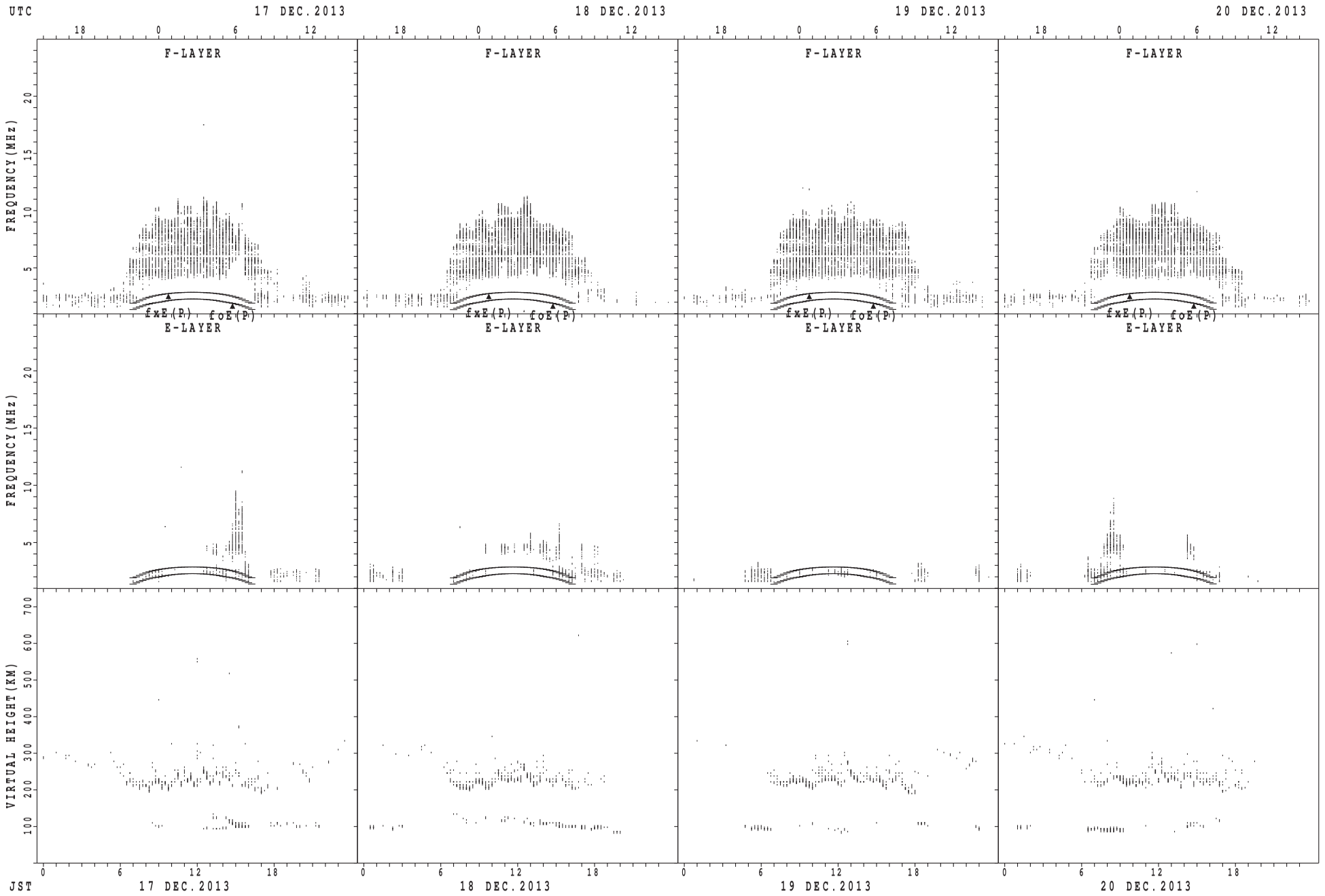
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



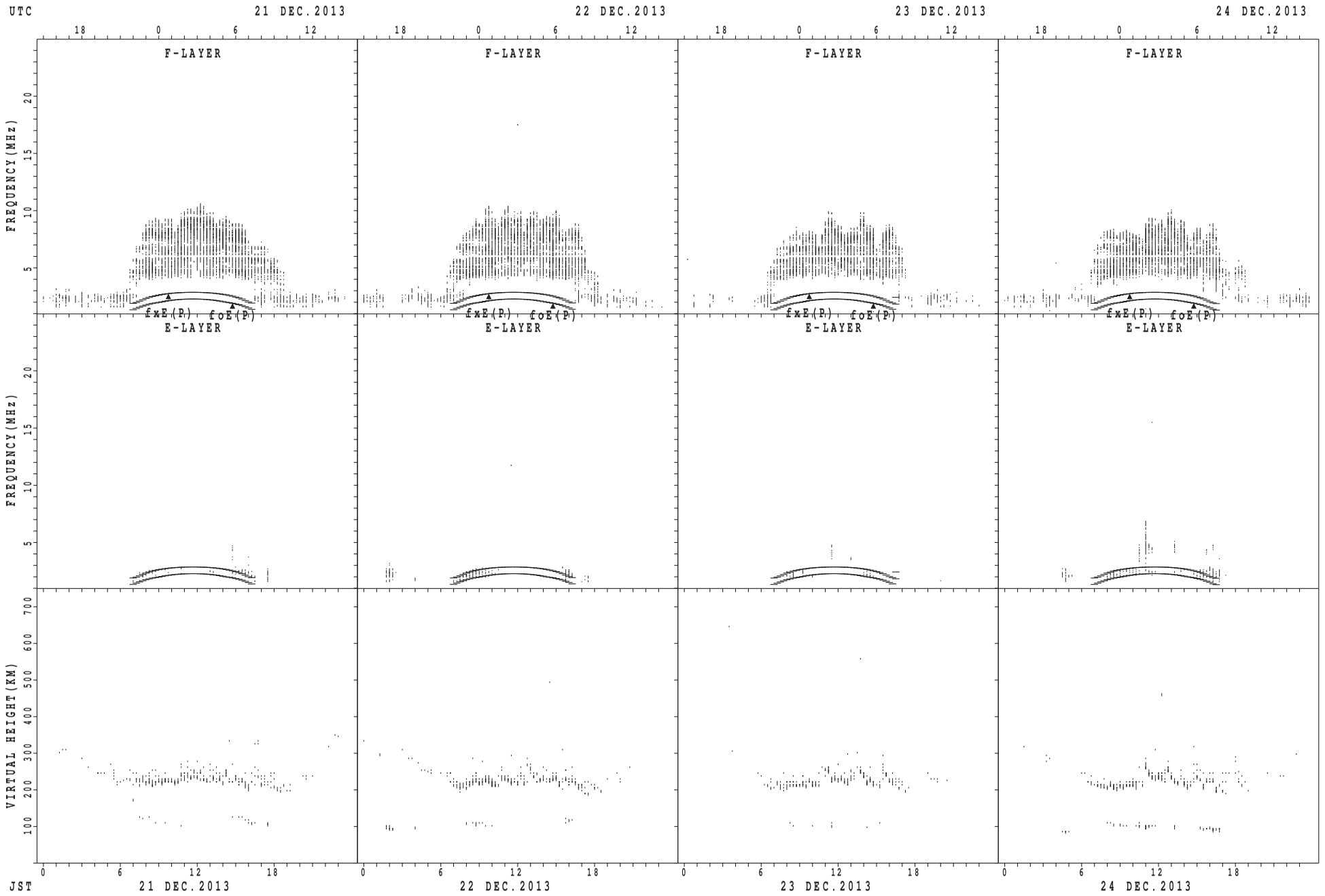
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



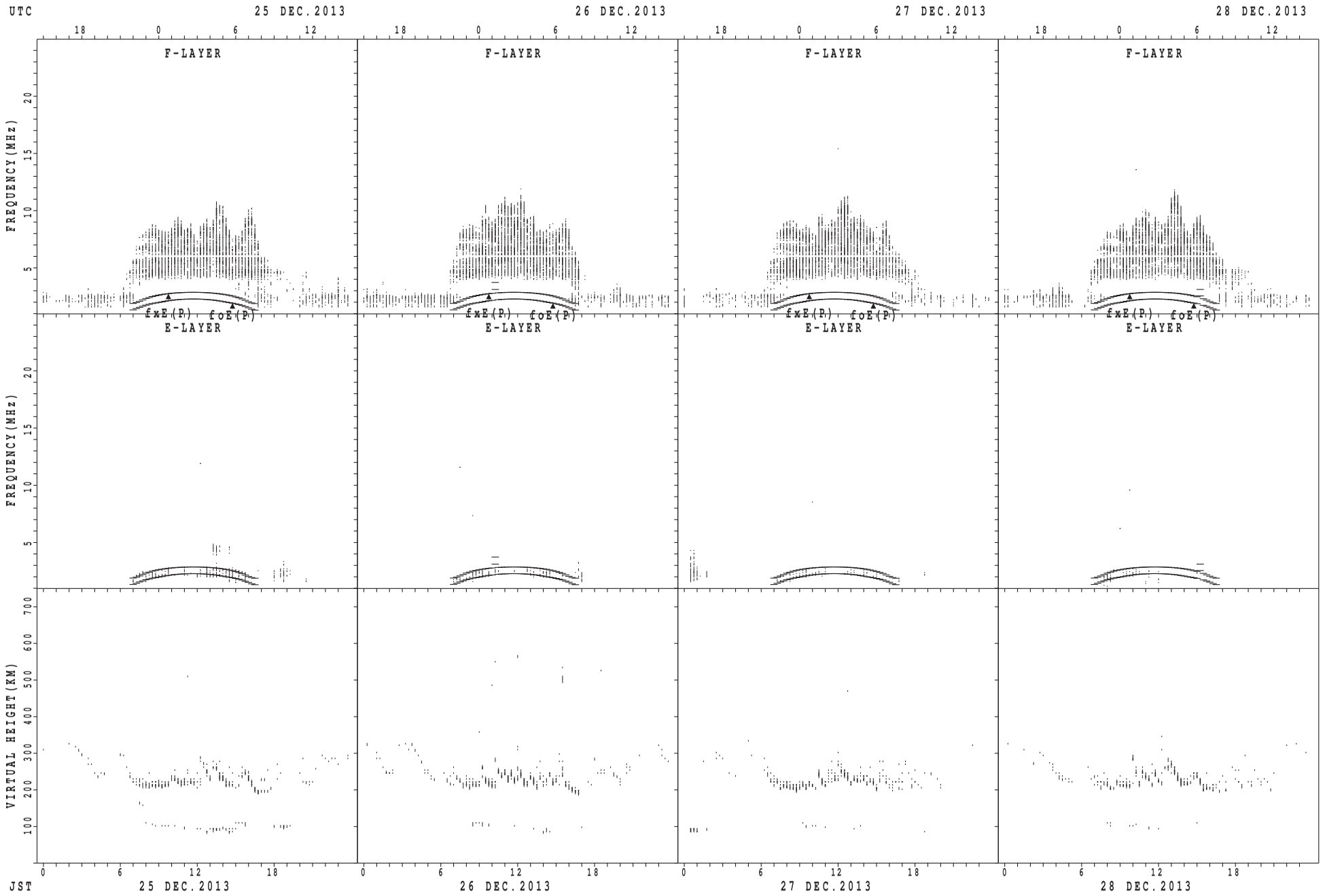
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



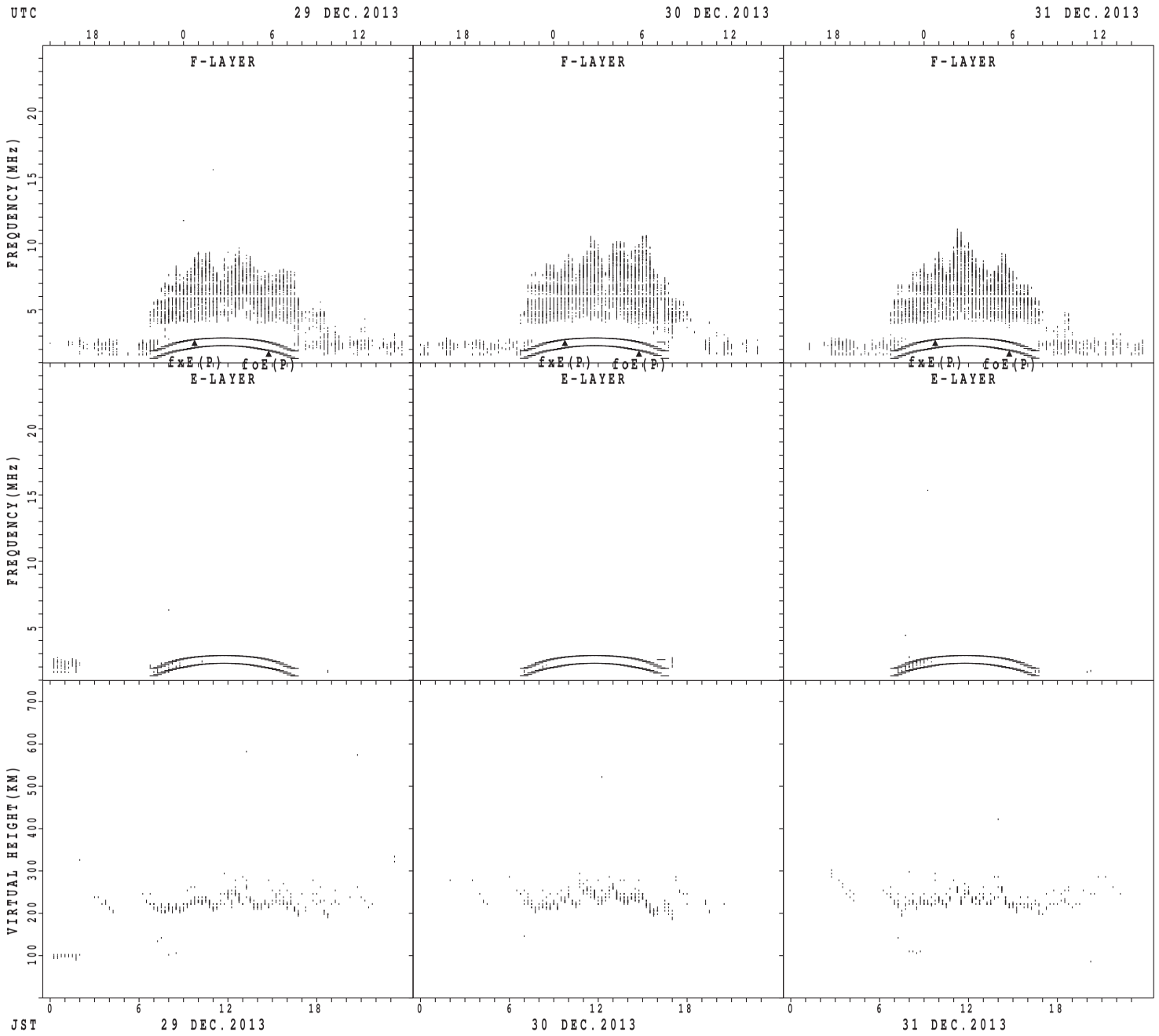
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



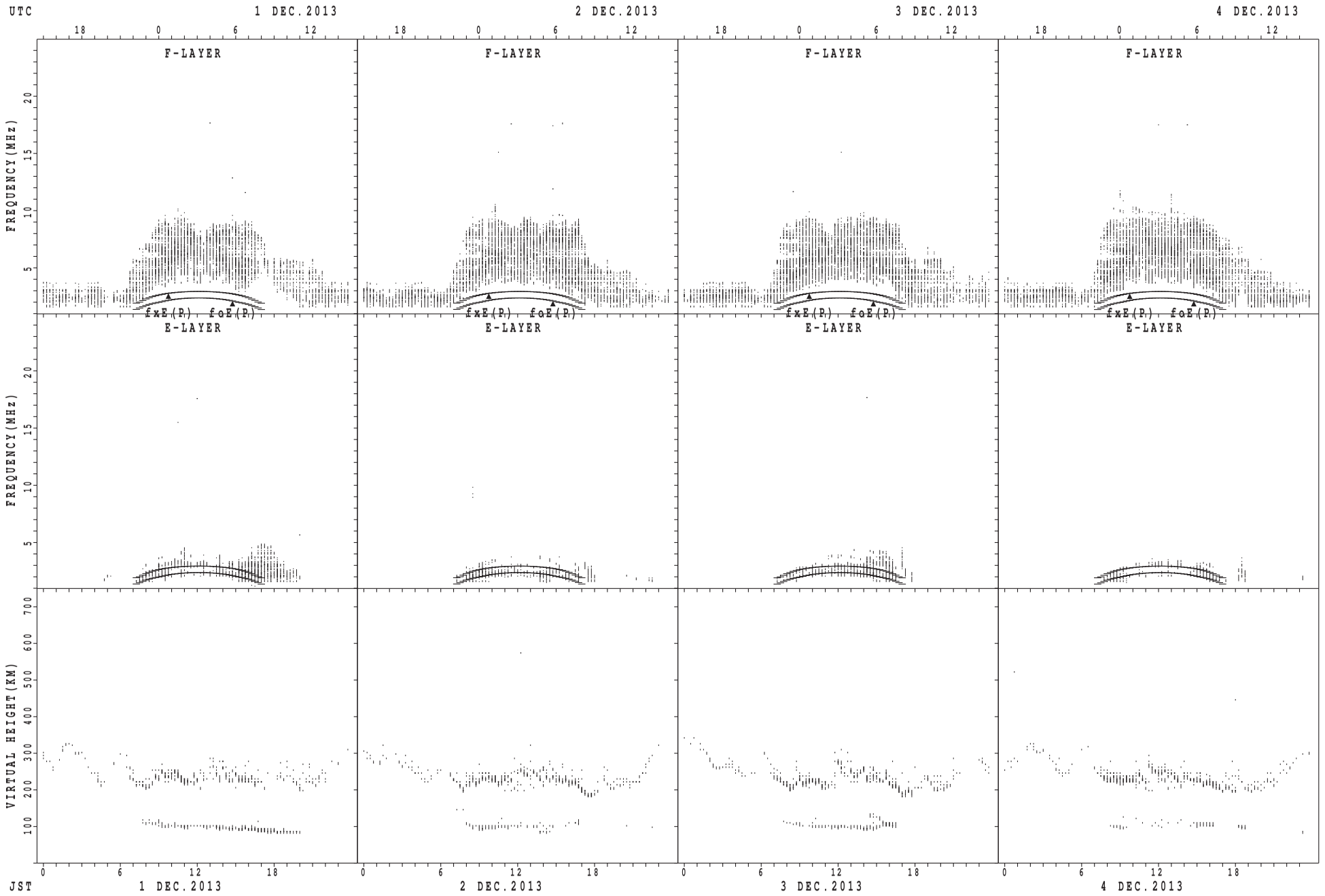
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



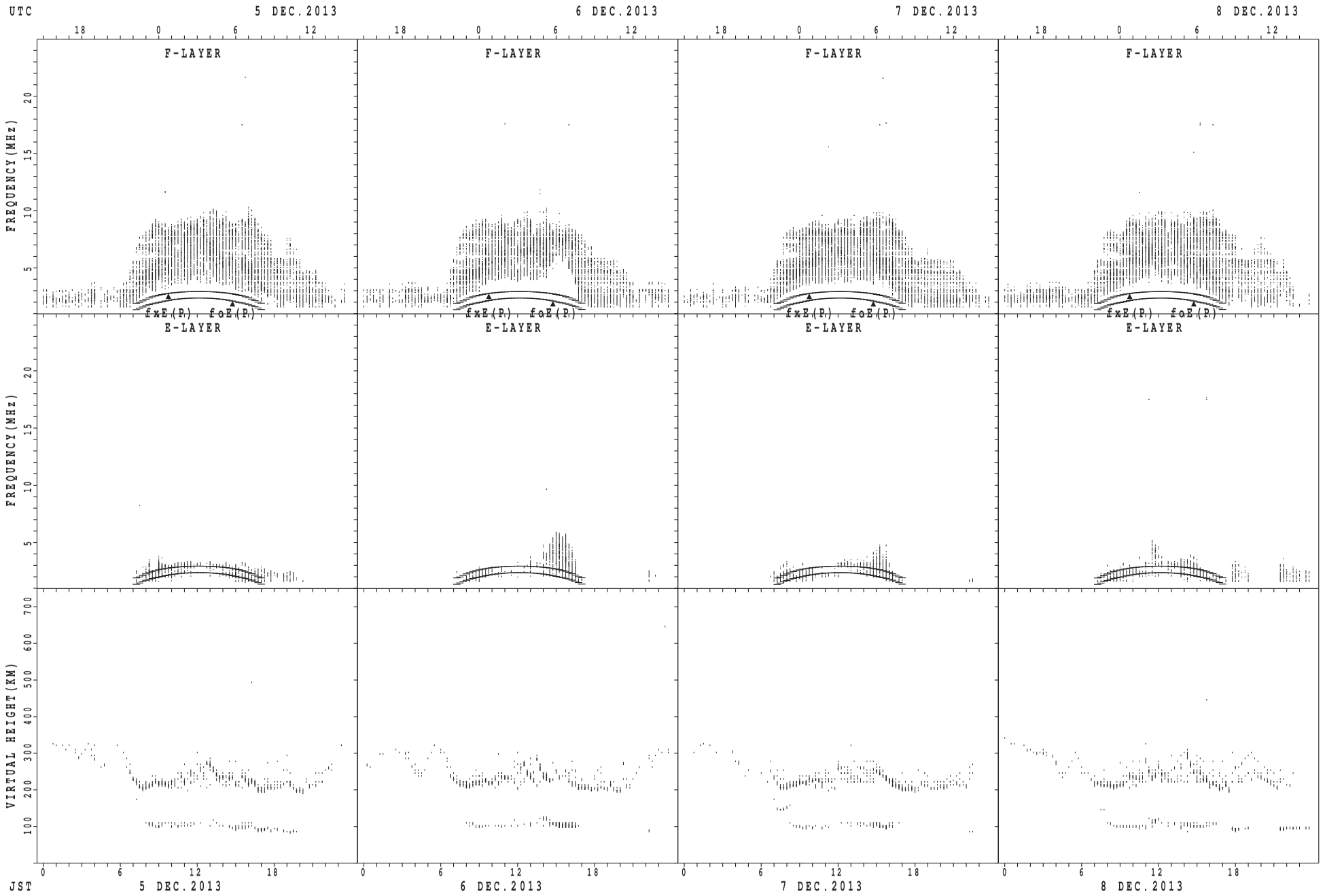
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



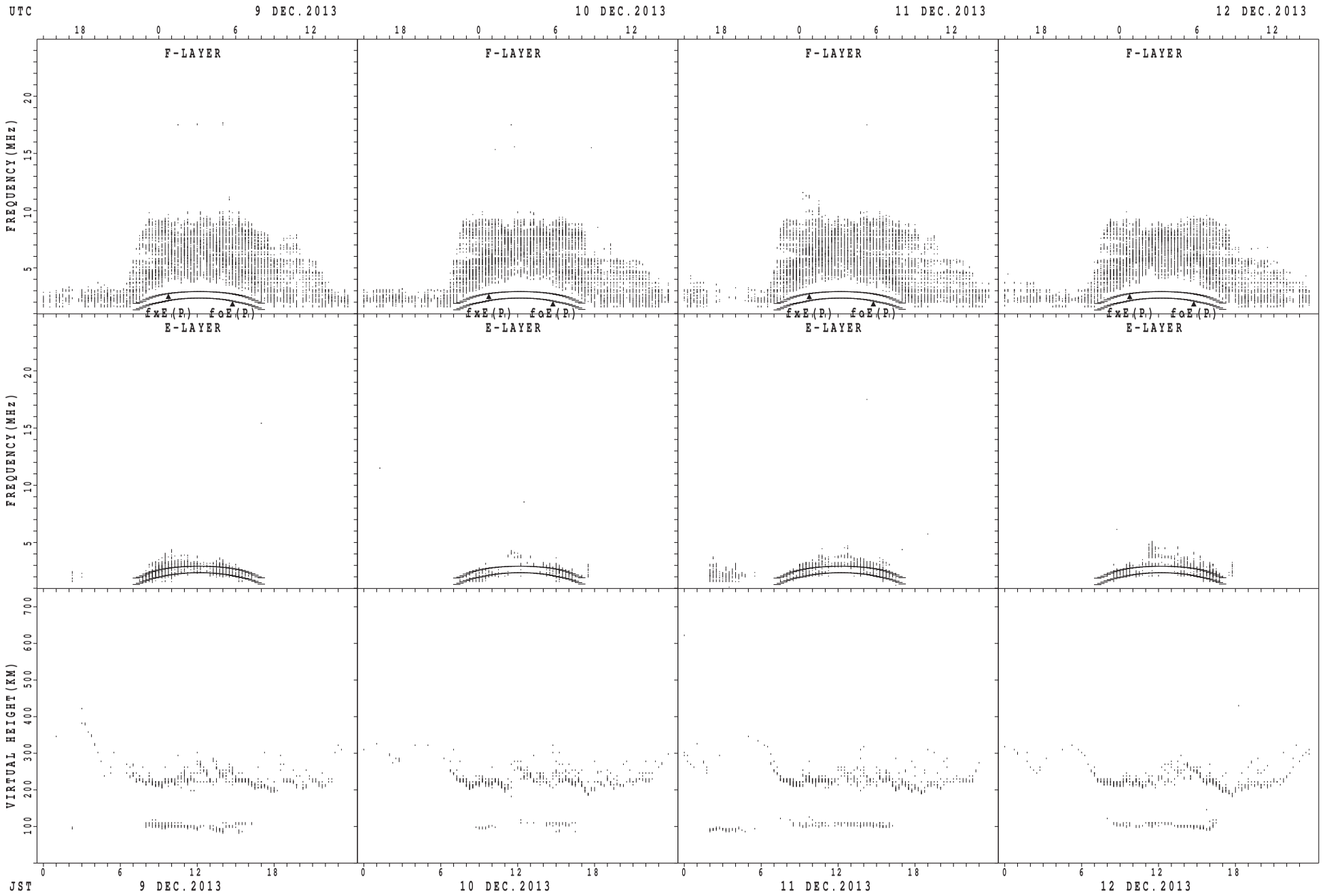
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



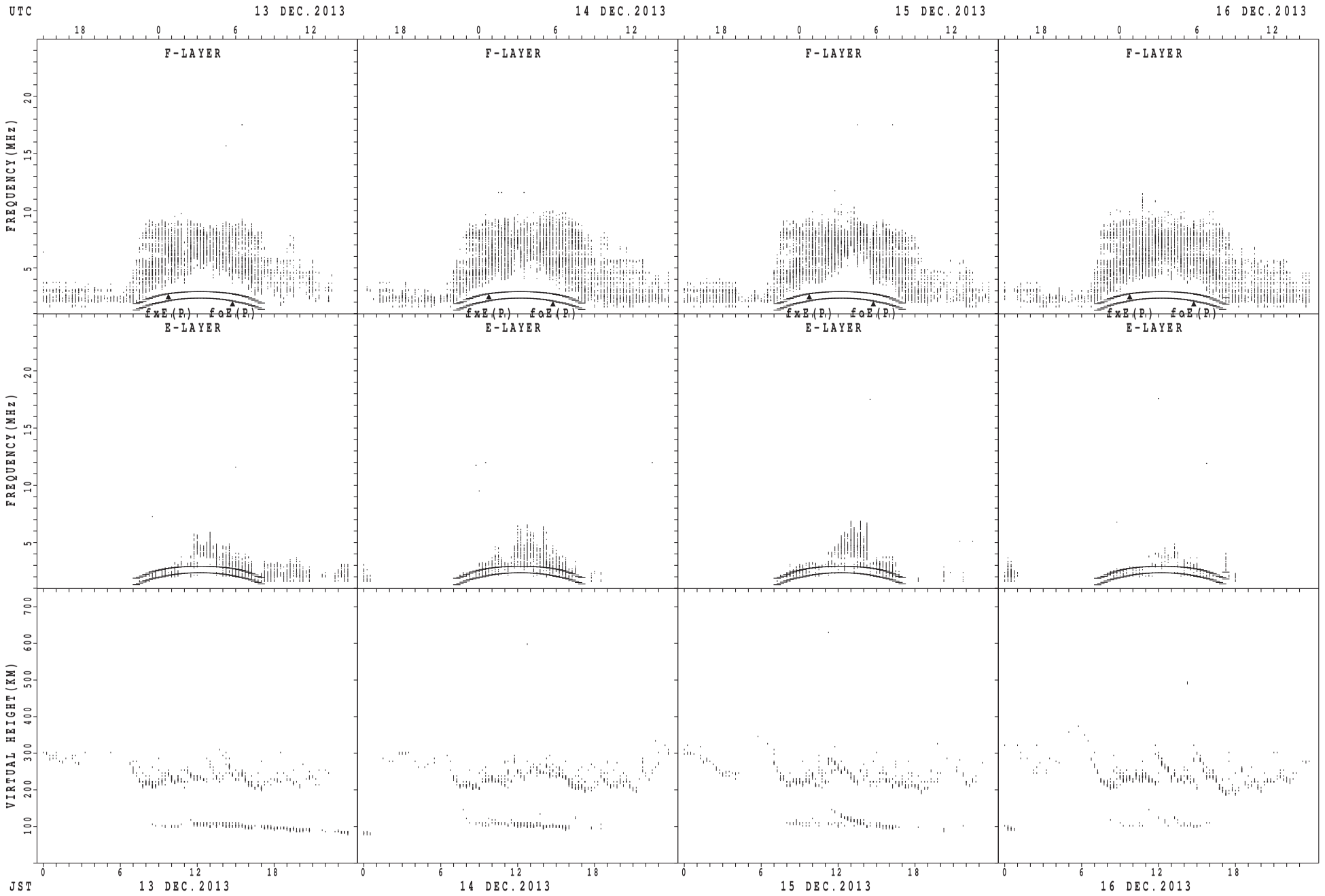
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



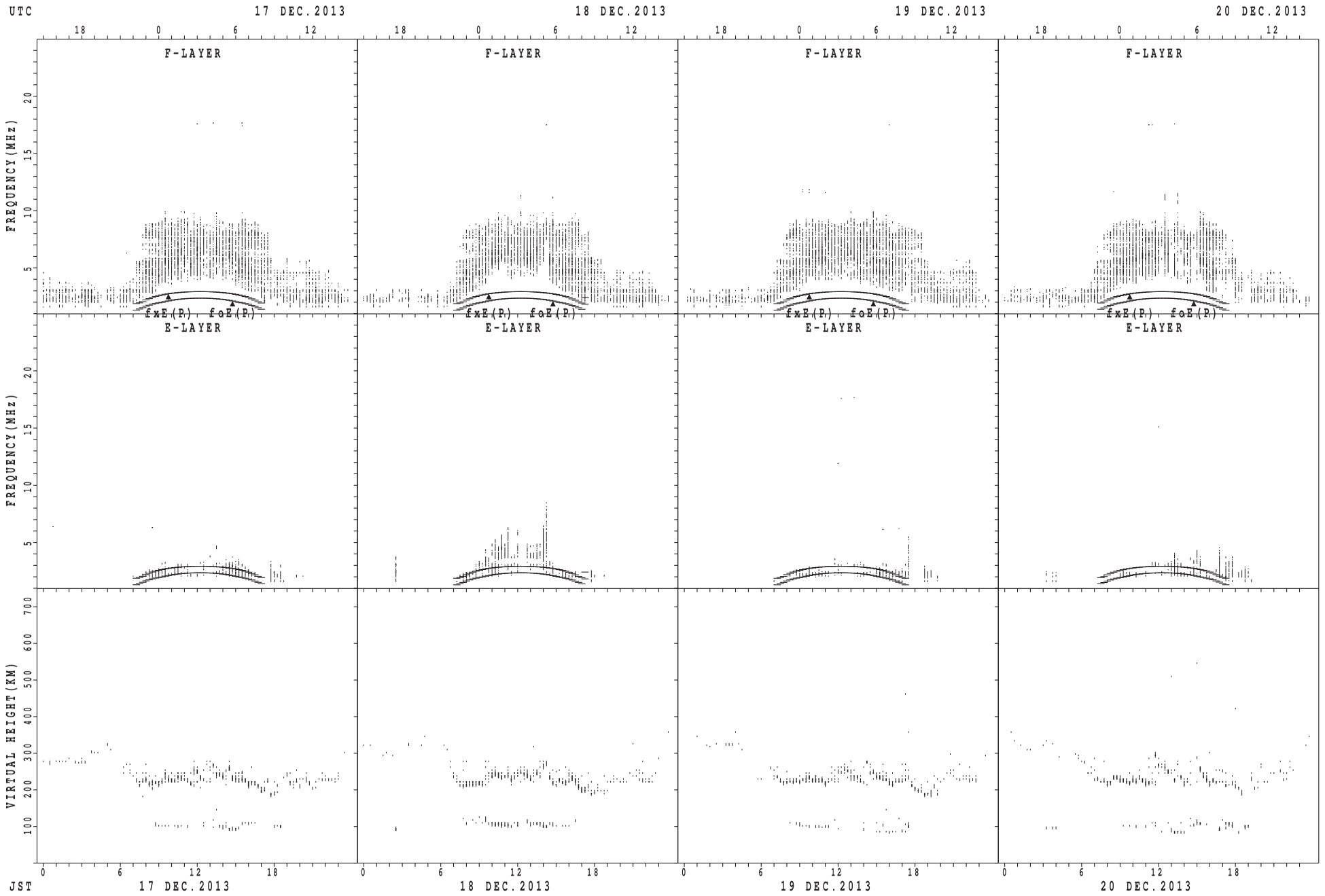
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



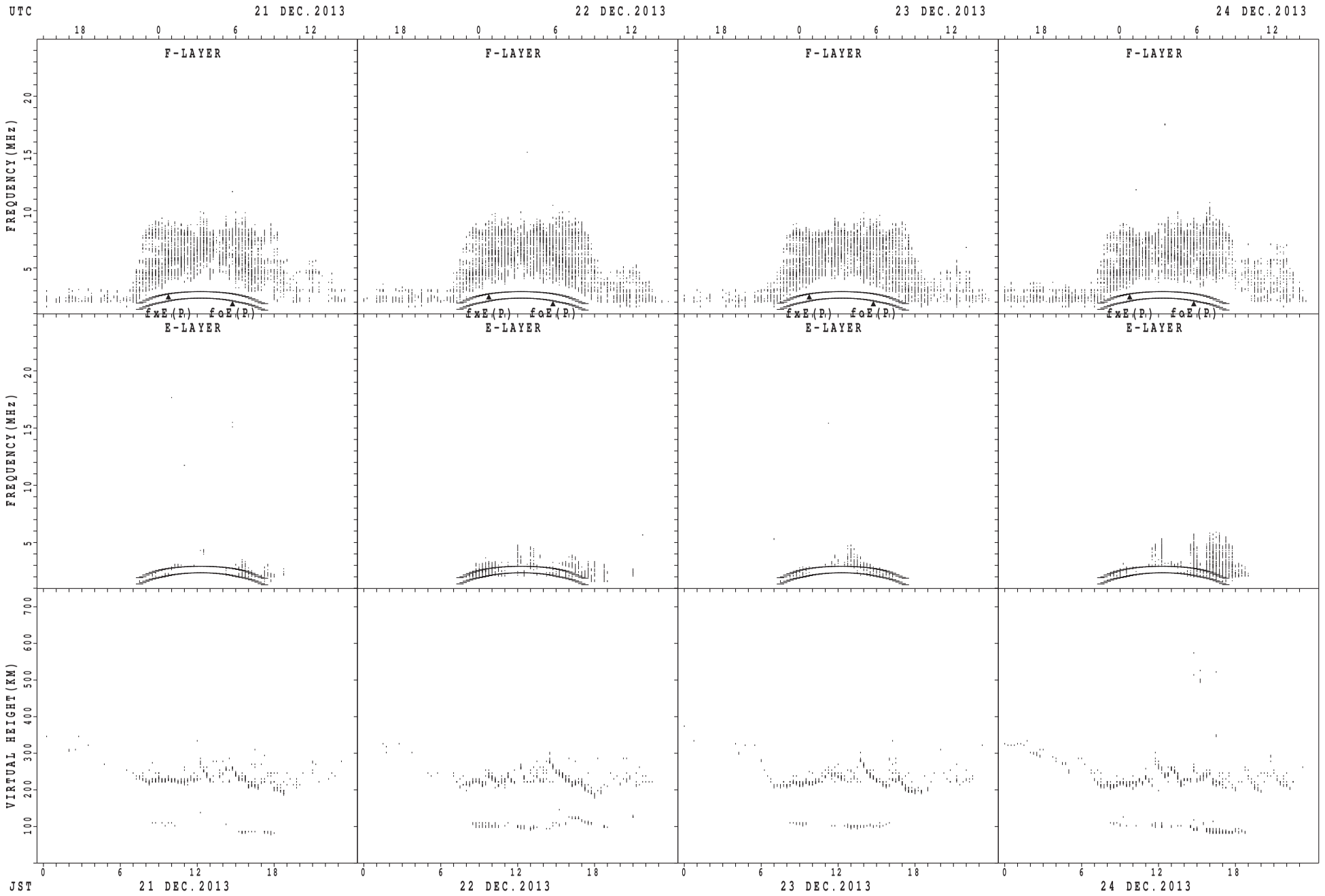
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



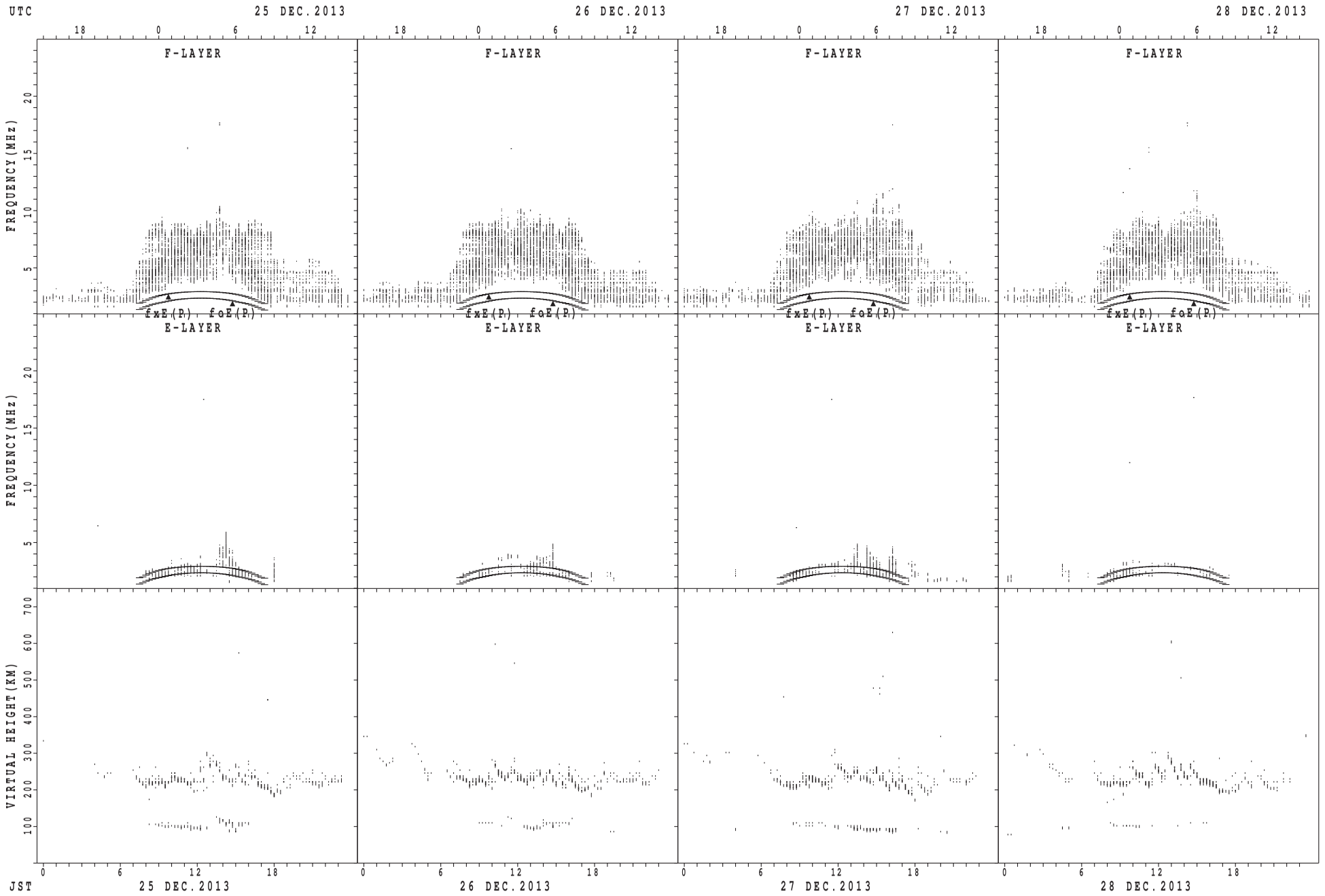
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



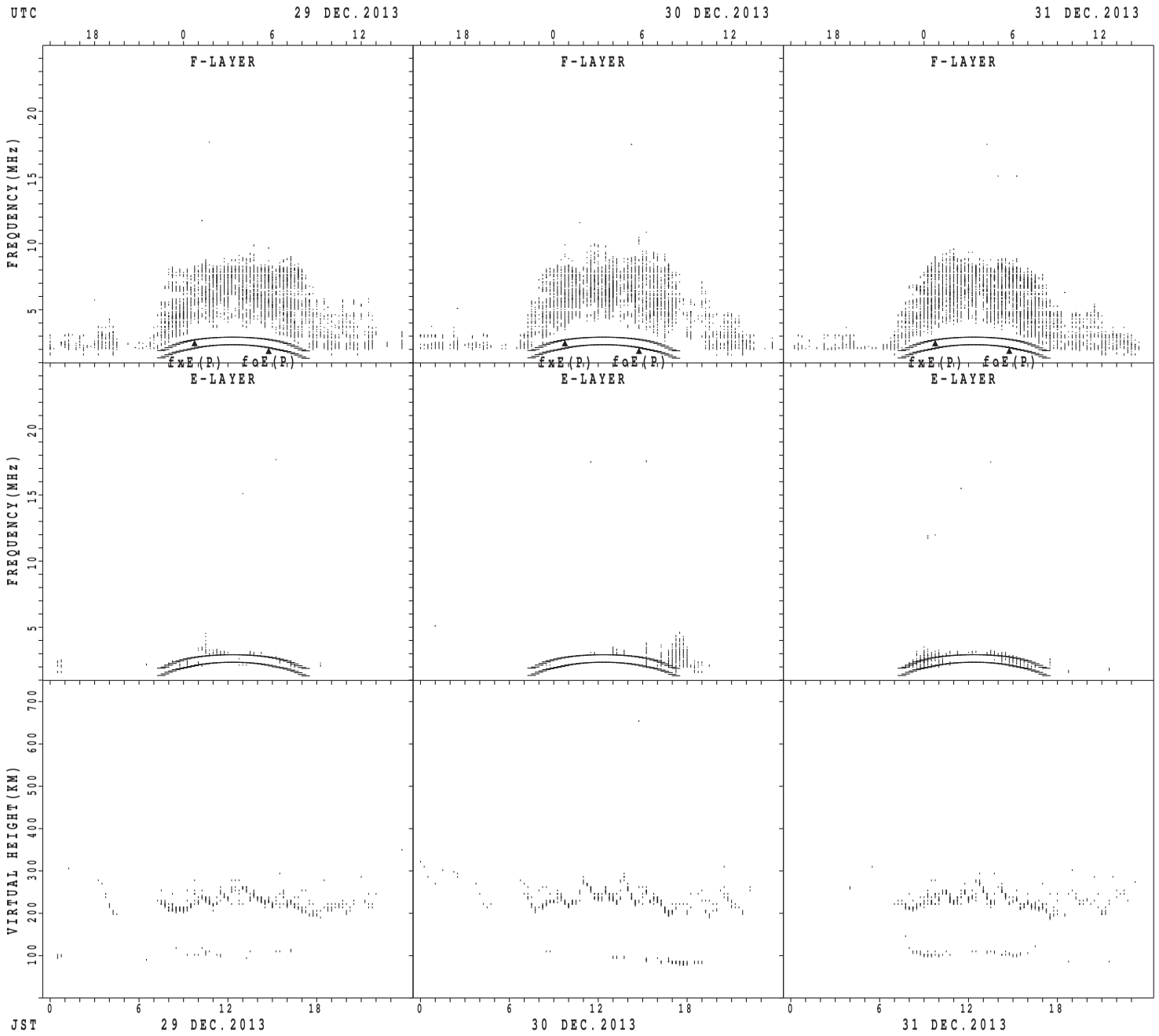
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



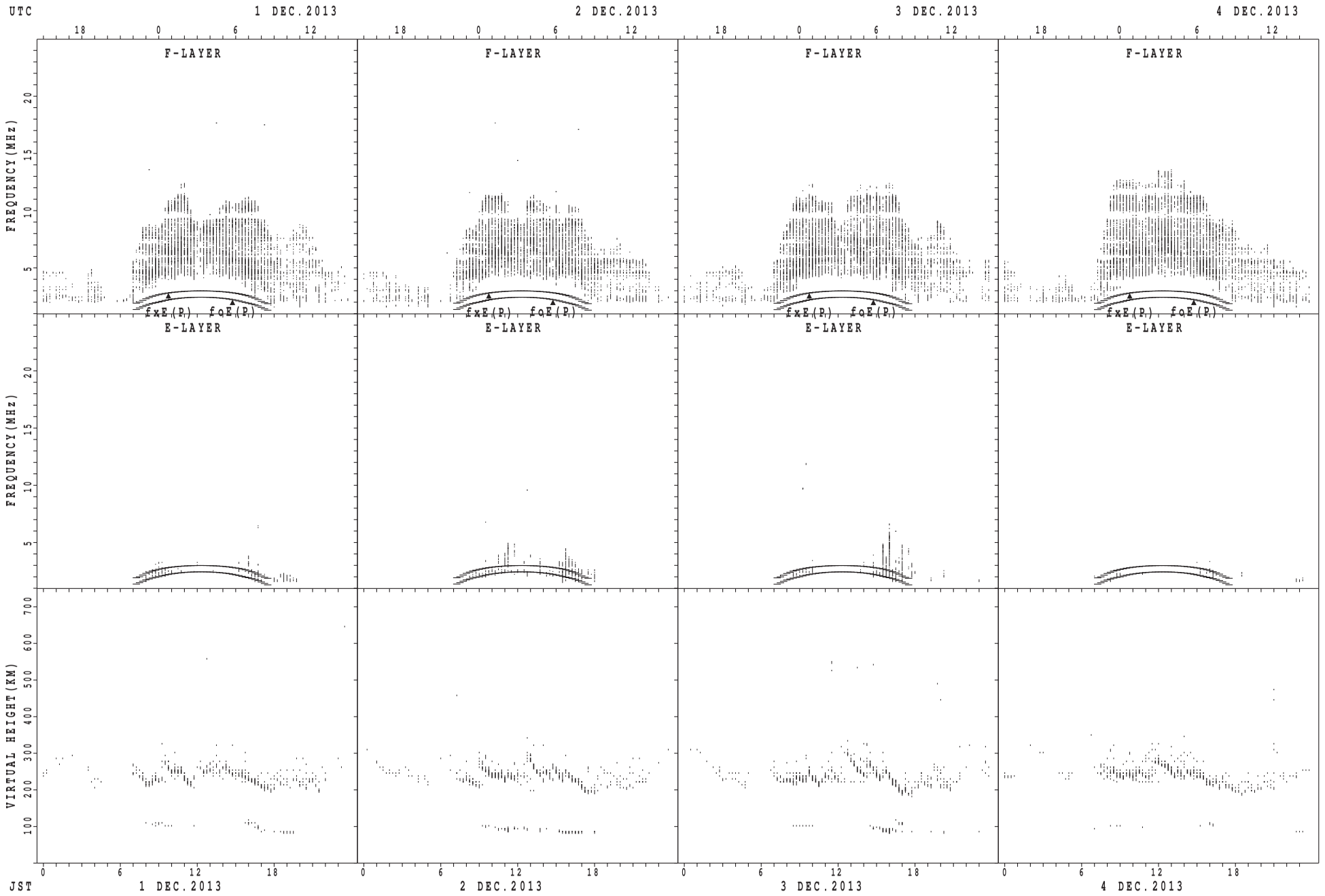
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



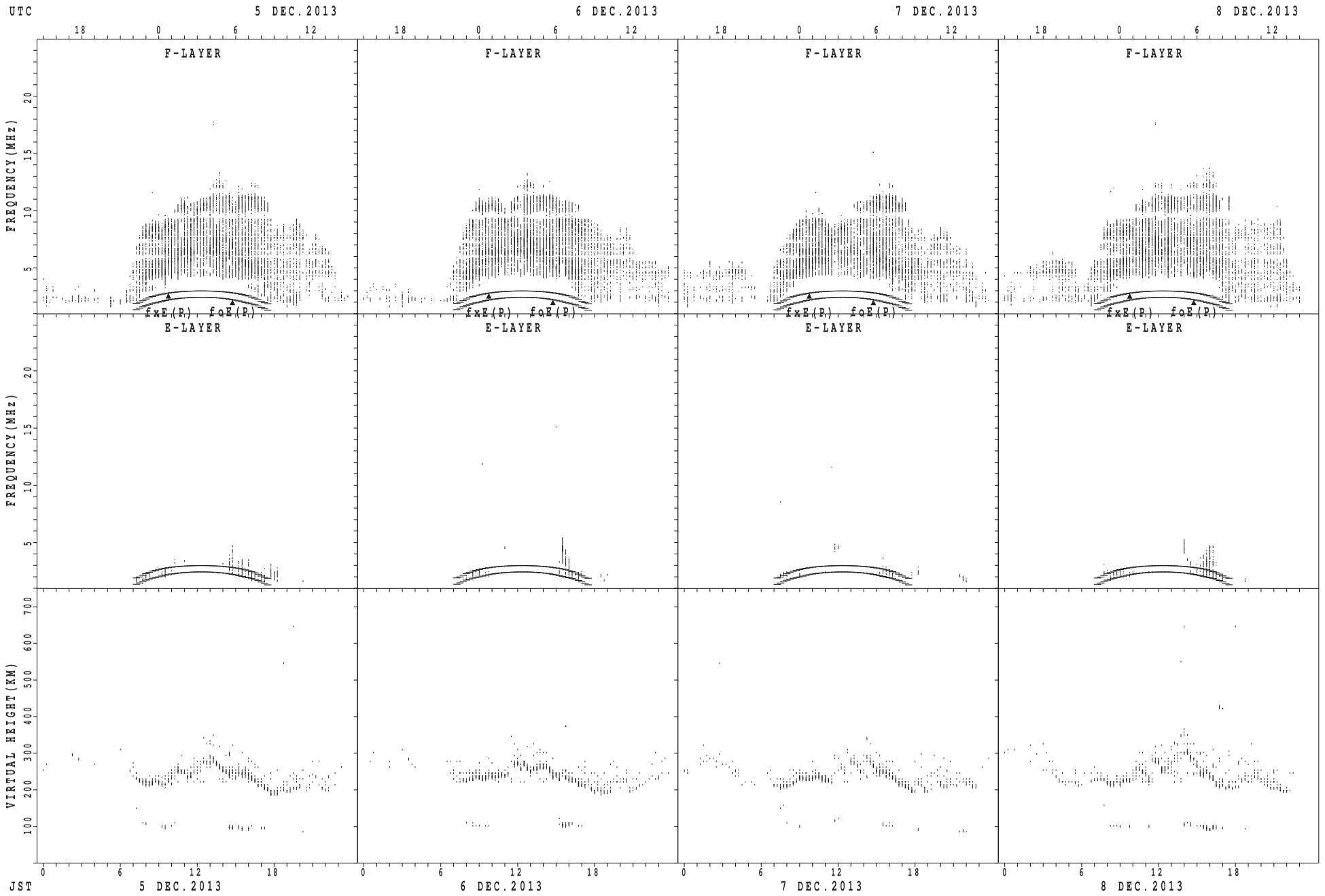
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



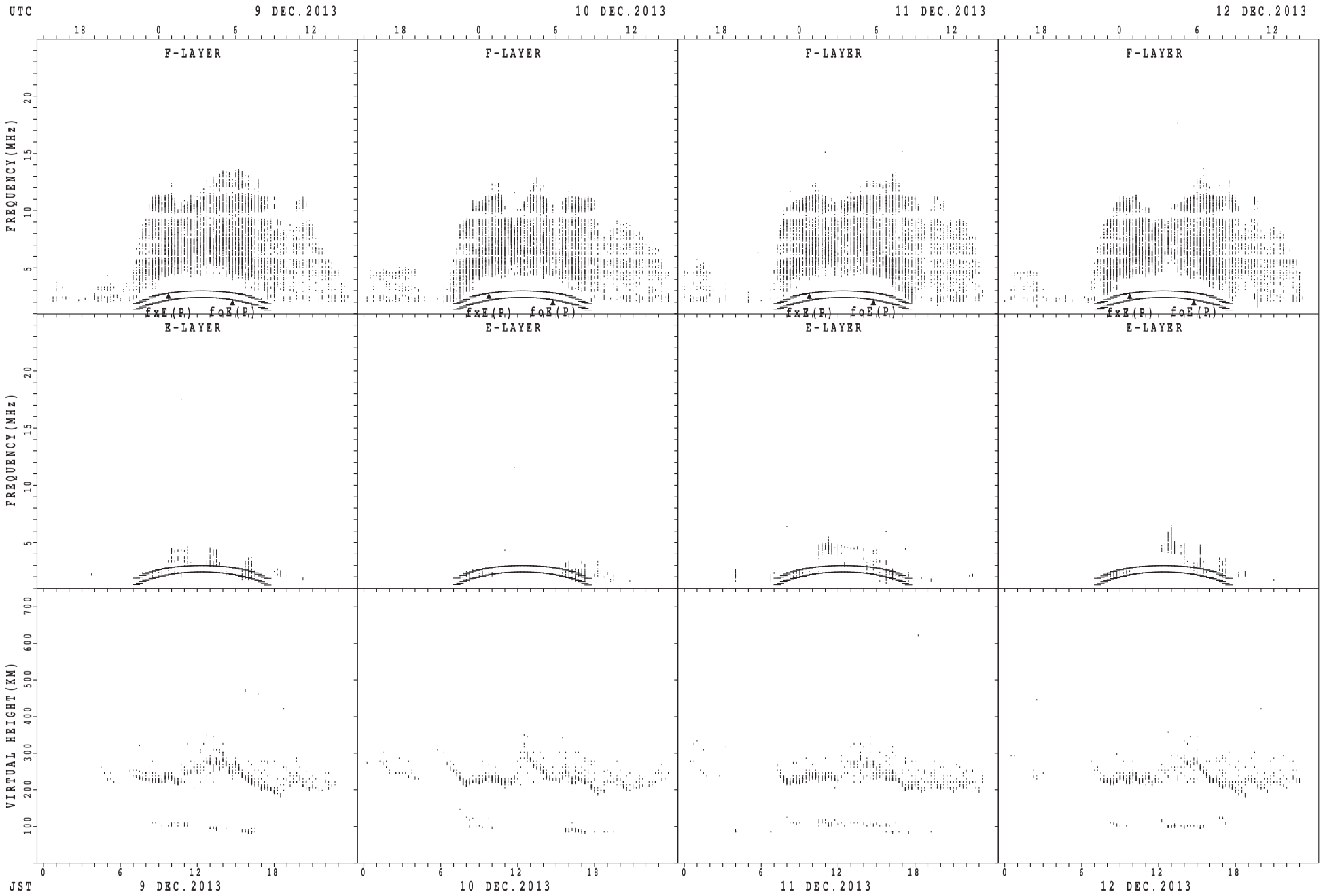
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



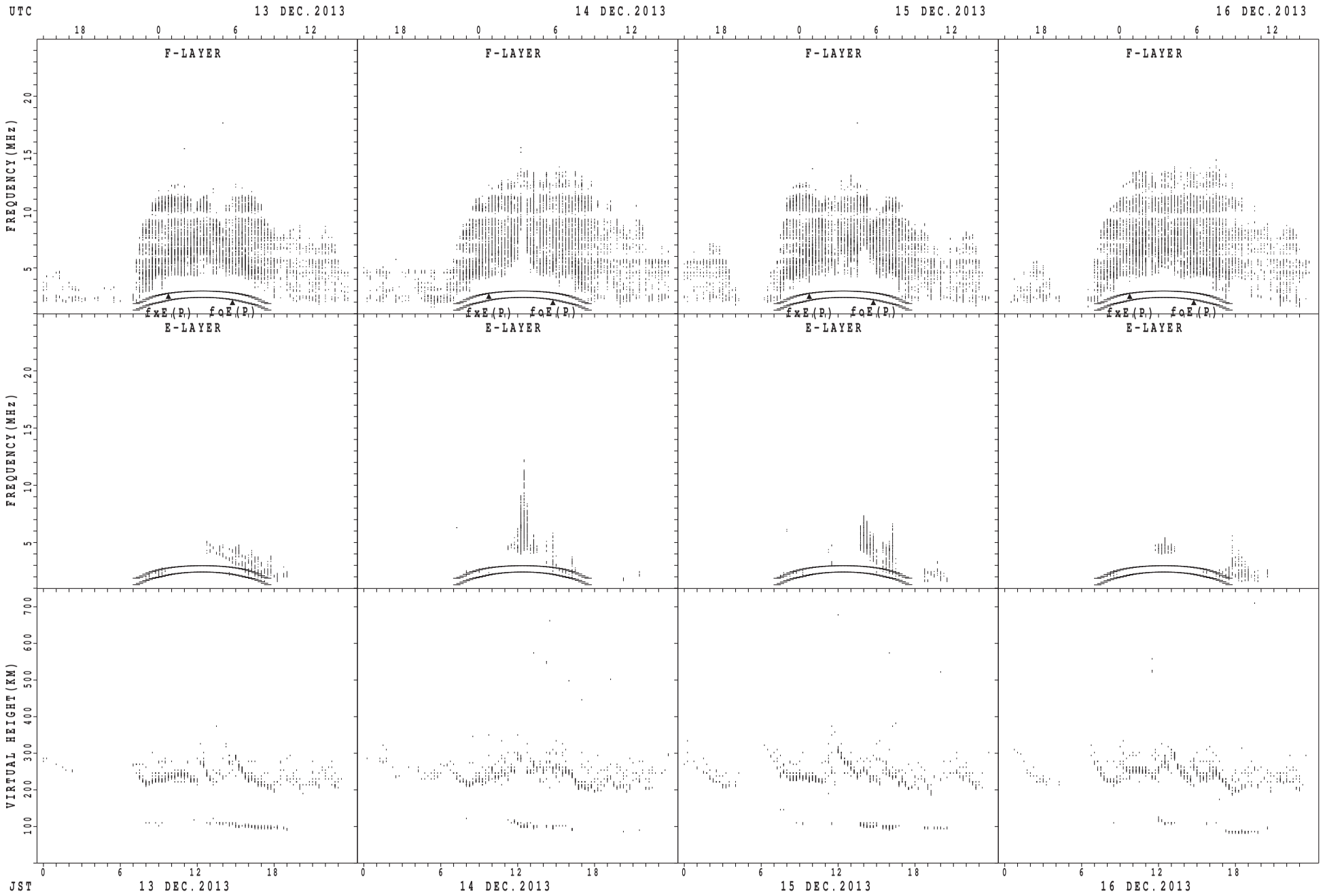
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



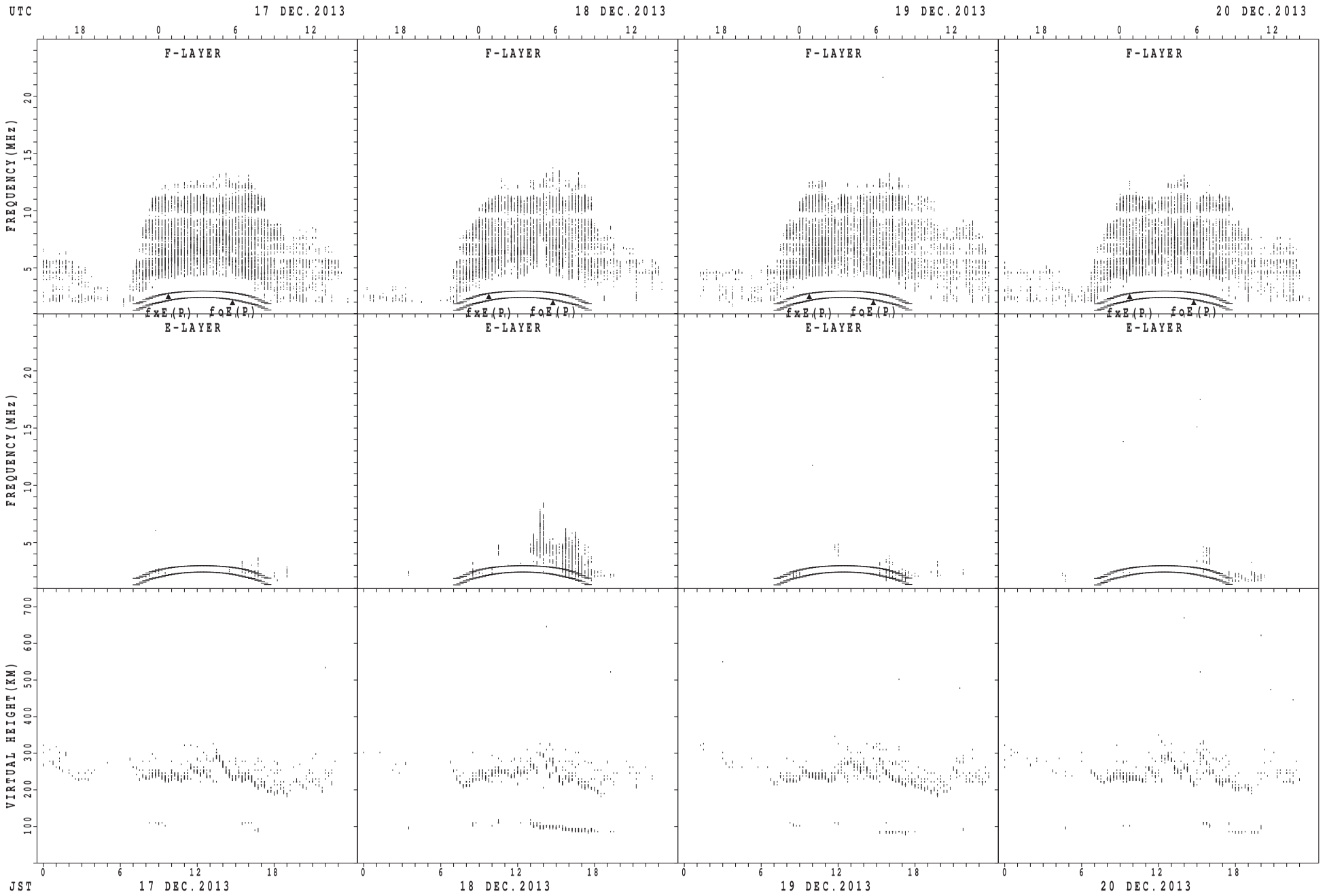
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



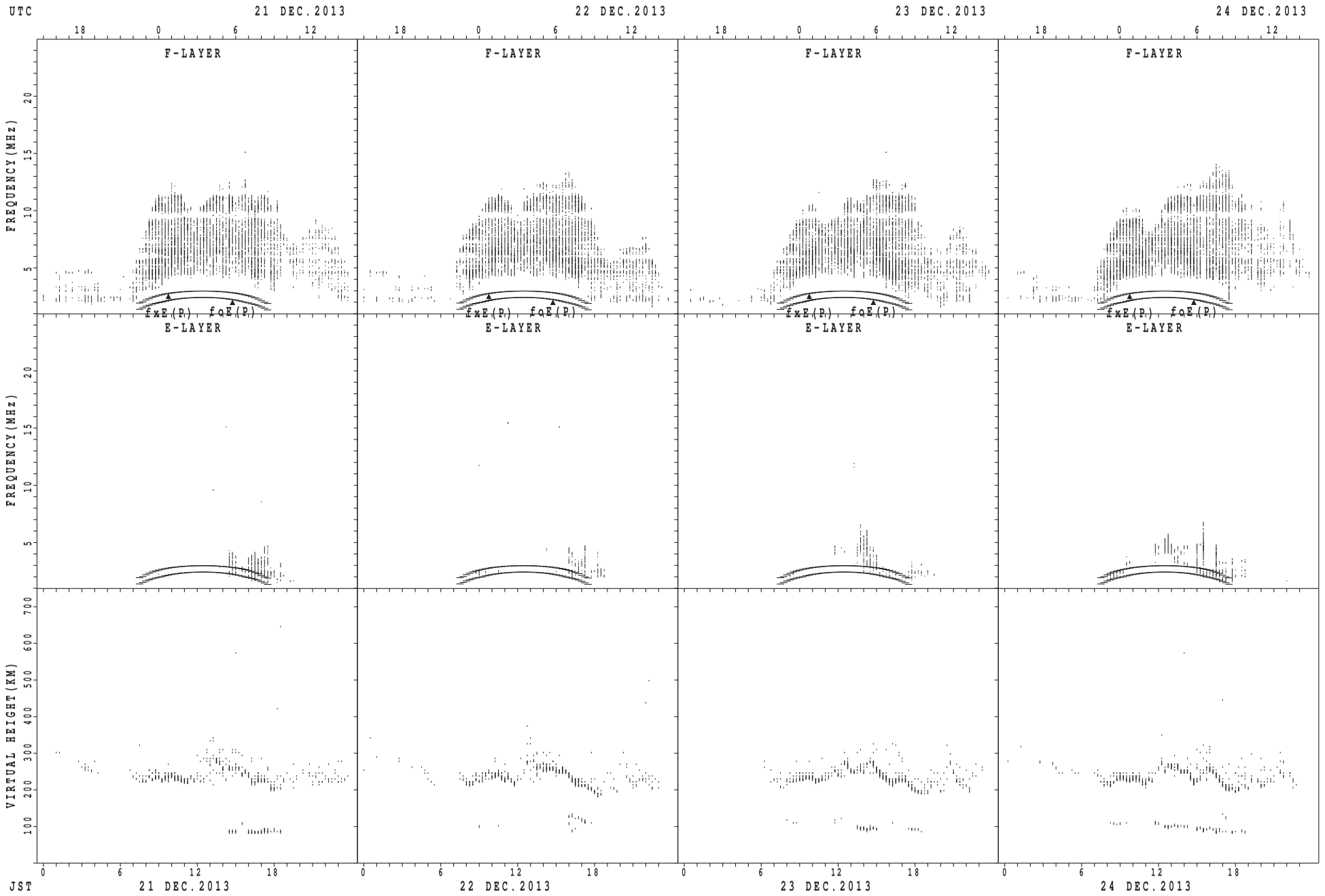
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



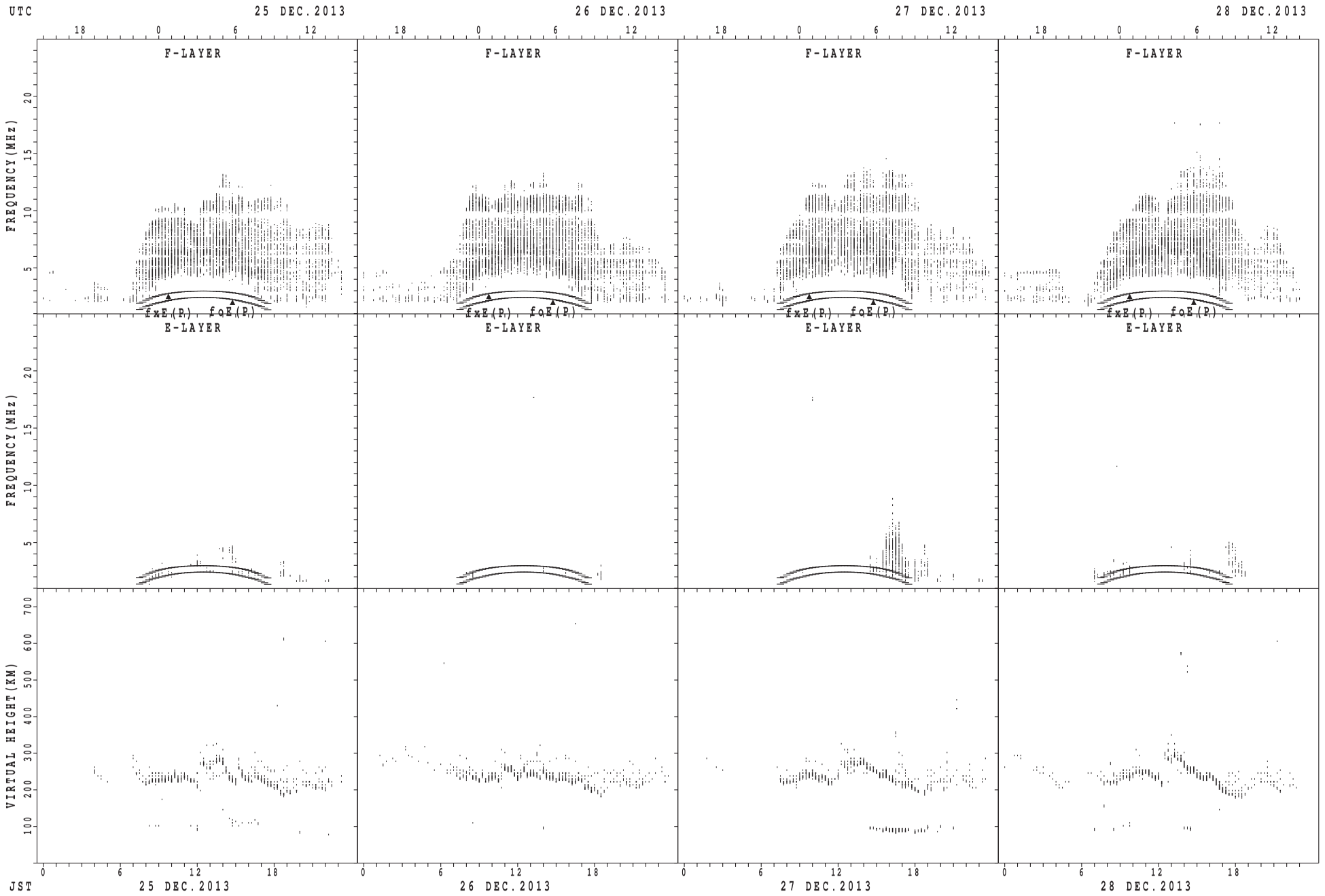
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



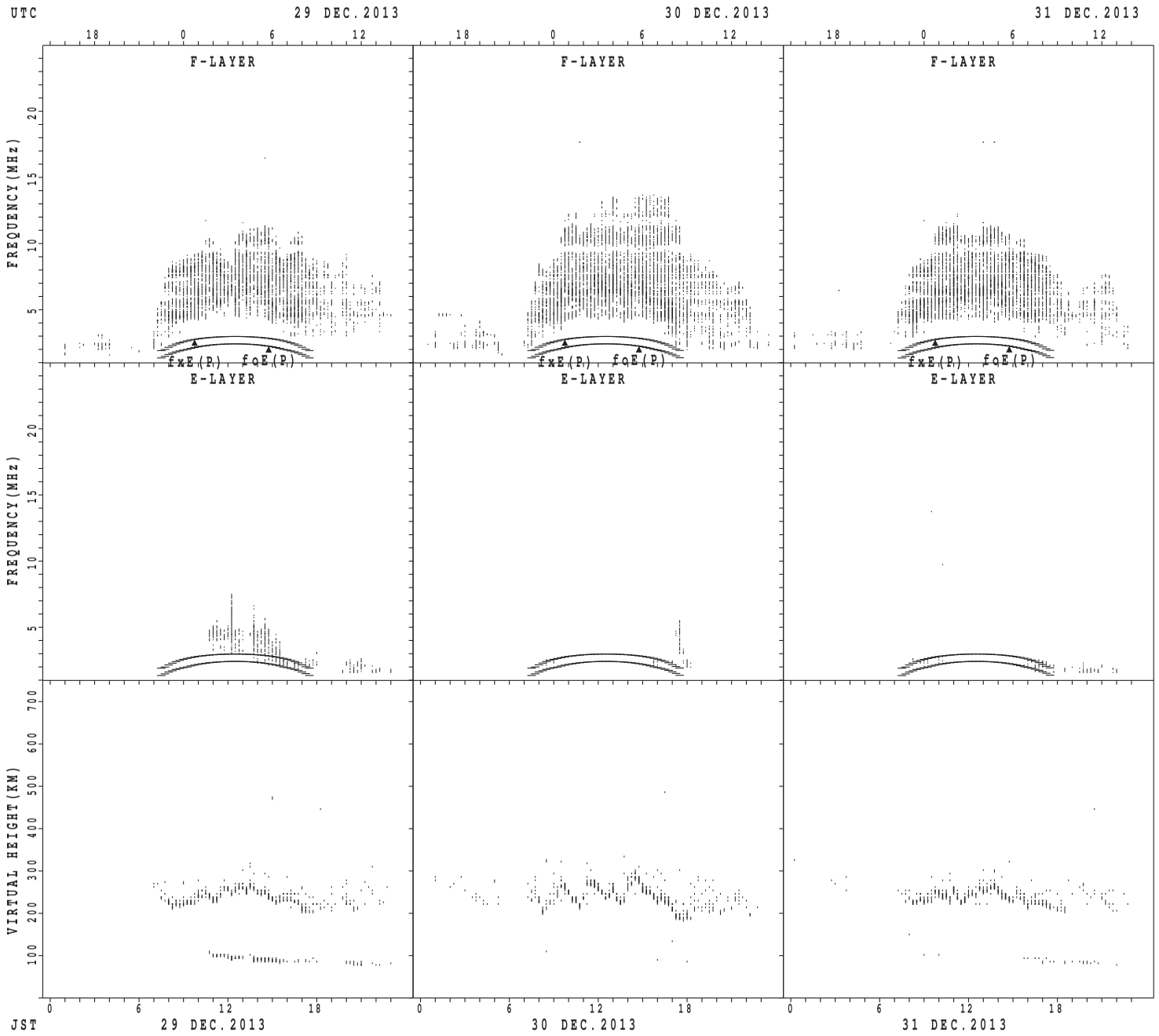
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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.2013 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	28	30	28	30	31	29	30	27	12	2						
MED								270	214	214	222	225	224	226	230	224	242	249						
U Q								135	224	222	232	238	230	237	238	238	254	252						
L Q								135	211	206	215	220	218	222	224	214	232	246						

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	7	5	4	2	4	5	2	12	27	31	27	27	31	29	30	27	13	14	12	11	10	12	12	10
MED	101	97	96	103	105	103	104	105	131	113	113	111	113	111	113	115	103	104	98	99	96	97	97	97
U Q	103	100	102	105	110	104	105	155	155	125	125	125	113	119	119	125	107	105	100	107	103	102	105	101
L Q	95	96	91	101	104	98	103	100	119	107	105	107	105	107	107	109	101	99	96	95	95	95	94	95

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								7	29	31	31	23	17	31	31	29	29	6						
MED								240	222	224	222	238	238	240	238	240	232	238						
U Q								246	231	230	230	254	251	252	246	253	239	256						
L Q								224	214	218	214	220	230	230	230	232	222	230						

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		5	3	3		1	1	4	14	10	2	3	3	4	7	14	11	8	3	2	2			2
MED		101	99	97		97	101	144	113	105	108	107	105	103	107	109	107	98	101	101	97			98
U Q		101	99	103		48	50	145	121	107	111	119	129	111	113	113	115	105	105	103	105			99
L Q		93	97	95		48	50	119	111	103	105	99	89	91	97	105	103	95	99	99	89			97

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									21	29	31	17			31	31	31	25	8	3	3			
MED									234	226	230	226			248	248	230	230	241	260	250			
U Q									242	237	238	236			262	254	240	245	261	262	270			
L Q									224	222	222	218			236	236	222	220	228	256	240			

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	1	1	1	1	2		1	15	23	16	10	20	19	20	25	23	8	10	5	1	1	2	2
MED	96	101	91	97	91	100		163	131	107	107	105	108	105	105	105	107	92	94	95	89	129	93	95
U Q	107	50	45	48	45	103		81	155	113	112	107	111	111	109	109	113	111	105	99	44	64	97	99
L Q	85	50	45	48	45	97		81	113	105	103	103	102	99	99	102	99	89	89	88	44	64	89	91

MONTHLY MEDIANS OF h′F AND h′Es

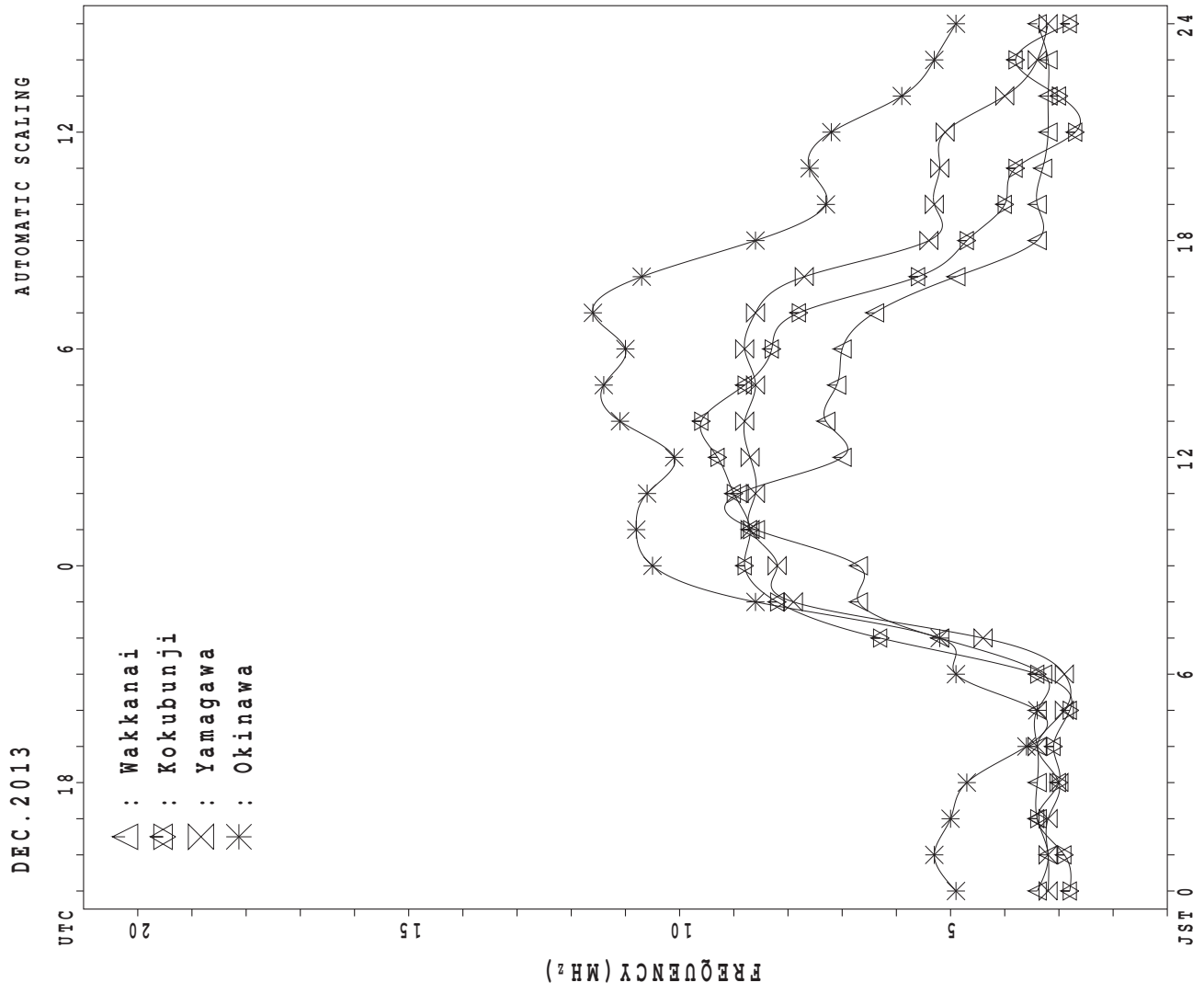
DEC.2013 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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									28	31	31					31	31	31	27	12	15	10	10	2
MED									238	236	238					246	236	222	224	245	248	247	261	271
U Q									248	244	242					254	240	232	238	263	256	256	266	284
L Q									231	230	232					240	230	214	214	224	232	236	246	258

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					1			1	2	10	3	4	7	7	12	10	19	14	11	4	3	2		
MED					91			93	147	107	107	106	111	113	104	98	95	94	91	92	97	90		
U Q					45			46	163	109	109	112	115	113	109	105	107	107	95	98	97	97		
L Q					45			46	131	105	105	99	99	103	97	95	89	89	89	87	87	83		


MONTHLY MEDIANS PLOT OF foF2
DEC.2013
AUTOMATIC SCALING
: Wakkanai
: Kokubunji
: Yamagawa
: Okinawa
FREQUENCY (MHz)
UTC
JST
0
6
12
18
24
5
10
15
20

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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 43	X 42	X 42	X 43	X 44	X 41	X 34											X 49	X 54	X 48	X 44	X 41	X 46	X 45
2	X 43	X 46	X 47	X 47	X 47	X 49	X 43											X 45	X 43	X 41	X 36	X 34	X 37	X 38
3	X 39	X 39	X 41	X 41	X 40	X 39	X 39											X 53	X 41	X 35	X 35	X 37	X 39	X 40
4	X 40	X 41	41	X 41	X 41	X 39	X 41											X 49	X 38	X 37	X 38	X 37	X 39	X 39
5	X 39	X 39	X 42	X 42	X 41	X 41	X 41											X 55	X 47	X 41	X 39	X 42	X 42	X 43
6	X 45	X 46	X 41	X 41	X 41	X 41	X 45											X 55	X 44	X 44	X 43	X 45	X 48	X 53
7	X 52	X 50	X 51	X 51	X 51	X 54	X 51											X 64	X 55	X 48	X 47	X 40	X 46	X 45
8	X 47	X 48	X 50	X 51	X 50	X 50												X 68	X 51	X 54	X 49	X 50	X 55	X 55
9	X 39	X 42	X 43	X 44	X 45	X 50	X 46											X 67	X 47	X 40	X 43	X 43	X 42	X 44
10	X 43	X 45	X 47	X 47	X 47	X 45	X 44										X 73	X 63	X 49	X 43	X 42	X 42	X 44	X 45
11	X 44	X 45	X 45	X 45	X 43	X 44	X 44											X 55	X 54	X 45	X 39	X 38	X 41	X 41
12	X 40	X 41	X 42	X 43	X 43	X 44	X 42											X 59	X 41	X 35	X 37	X 41	X 43	X 45
13	X 42	X 47	X 47	X 46	X 46	X 45	X 47											X 63	X 46	X 48	X 40	X 40	X 38	X 41
14	X 42	X 42	X 44	X 44	X 46	X 45	X 41											X 75	X 44	X 46	X 38	X 41	X 45	X 44
15	X 46	X 44	X 45	X 46	X 44	X 44	X 36									X 92		X 51	X 51	X 49	X 43	X 46	X 46	X 47
16	X 47	X 46	X 49	X 50	X 44	X 43	X 41											X 57	X 48	X 45	X 41	X 40	X 40	X 41
17	X 42	X 42	X 43	X 43	X 43	X 45	X 39											X 54	X 37	X 39	X 36	X 36	X 36	X 38
18	X 39	X 39	X 39	X 39	X 39	A	X 40										X 69	X 65	X 45	X 41	X 31	X 36	X 41	47
19	X 46	X 43	X 45	X 46	X 46	X 54	X 42												X 42	X 39	X 42	44	O X 41	X 43
20	X 45	X 43	A	X 49	X 51	X 52	X 45											X 54	X 41	X 43	X 43	X 41	47	X 45
21	X 45	X 45	X 46	X 47	X 47	X 53	X 49											X 66	X 49	X 47	X 45	X 39	X 39	X 45
22	X 46	X 49	X 48	X 49	X 48	X 51	X 42											X 54	X 47	X 40	X 32	X 32	X 36	X 37
23	X 37	X 37	X 39	X 38	X 38	X 41	X 40											X 45	X 42	X 43	X 37	X 35	X 36	X 39
24	X 40	X 41	X 41	X 41	X 40	X 41	X 37											X 57	X 38	X 40	X 39	X 30	X 35	X 36
25	X 38	X 39	X 40	X 39	X 42	X 42	X 42											X 58	X 40	X 38	X 38	X 35	X 38	X 39
26	X 40	X 40	X 40	X 39	X 42	X 40	X 45											X 53	O X 41	A	X 37	X 37	O X 41	X 43
27	X 43	X 45	X 45	X 44	X 42	X 42	X 35											X 47	X 46	X 32	X 35	X 33	X 34	X 35
28	X 37	X 39	X 40	X 41	X 39	X 40	X 38												X 39	O X 39	X 31	X 31	X 36	X 42
29	X 37	X 39	X 39	X 41	X 40	X 42	X 33											X 66	X 40	X 34	X 38	X 32	X 36	X 35
30	X 36	X 38	X 39	X 39	X 39	X 37	X 39											X 48	X 42	X 32	X 30	X 26	X 32	X 36
31	X 36	X 39	X 38	X 38	X 39	X 38	X 35										X 68	X 53	X 43	X 37	X 35	X 33	X 37	X 38
	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	30	31	31	30	30									1	3	29	31	30	31	31	31	31
MED	X 42	X 42	X 42	X 43	X 43	X 44	X 41									X 92	X 69	X 55	X 44	X 41	X 38	X 38	X 40	X 42
U Q	X 45	X 45	X 46	X 47	X 46	X 49	X 44										X 73	X 64	X 48	X 45	X 43	X 41	X 44	X 45
L Q	X 39	X 39	X 40	X 41	X 40	X 41	X 39										X 68	X 52	X 41	X 38	X 36	X 34	X 36	X 38

DEC. 2013 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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	36	35	35	36	37	34	28	55	69	76	R 102	89	J R 83	R 76	77	81	65	42	47	41	37	34	39	38
2	36	39	40	40	40	42	36	63	76	J R 83	V 82	102	89	74	76	72	66	38	36	34	29	28	30	32
3	32	32	34	34	33	32	32	61	75	70	76	U R 104	R 99	U Y 81	Z 72	R 84	65	46	34	28	28	30	32	33
4	33	34	F 32	34	34	32	34	63	R 90	92	103	92	92	84	84	75	58	42	31	30	31	30	32	32
5	32	32	35	35	34	34	34	58	79	U R 88	R 98	92	92	86	R 88	86	68	49	40	34	32	35	35	36
6	38	39	34	34	34	33	39	57	74	U R 75	95	99	80	80	76	R 83	70	49	37	32	36	38	39	46
7	45	44	44	44	45	46	43	57	74	73	U R 83	90	U R 83	J R 88	U R 87	V 75	75	58	47	41	40	33	39	38
8	40	41	42	44	43	43	40	58	R 88	U R 81	93	101	R 79	98	91	92	75	60	44	48	42	43	48	48
9	32	36	36	37	38	43	39	59	72	75	U R 92	98	94	86	86	80	65	61	41	33	36	36	35	37
10	36	38	40	40	40	38	38	64	J R 89	89	121	R 104	104	U R 77	J R 85	76	66	56	42	36	35	35	37	38
11	38	38	38	38	36	38	36	55	86	U R 84	U R 94	R 97	J R 92	81	R 89	72	63	48	46	38	31	31	34	34
12	33	34	35	35	36	37	34	54	77	87	92	J R 90	85	J R 85	81	J R 82	65	52	34	28	30	34	36	38
13	35	40	40	38	38	37	40	59	77	92	U R 86	J R 88	U R 89	91	79	79	66	56	38	41	33	31	32	34
14	35	35	37	37	40	38	34	51	S 70	78	J R 86	J R 89	95	97	J R 94	R 77	71	66	39	39	31	33	39	37
15	39	36	38	39	37	38	29	56	75	J R 95	J R 105	J R 130	92	91	98	J R 85	73	U A 43	R 43	42	36	39	39	41
16	40	40	42	41	37	36	34	59	75	R 90	105	R 100	U R 100	76	R 89	R 82	64	50	41	38	34	33	33	34
17	35	35	36	36	36	38	32	59	U R 76	R 82	U R 86	R 87	95	R 88	80	76	R 70	47	30	31	29	29	29	31
18	32	32	32	32	32	A	33	45	74	R 74	92	93	J R 88	R 87	79	76	62	58	38	34	24	29	34	36
19	39	37	39	39	39	46	35	52	76	80	98	92	96	U R 79	80	82	85	55	34	32	34	F 36	34	36
20	F 38	36	A	42	44	45	38	50	79	76	86	R 94	U R 100	J R 95	88	77	75	48	36	36	36	35	37	38
21	38	38	39	40	41	46	42	58	71	J R 71	94	J R 112	96	86	87	72	66	V 58	42	40	38	32	32	38
22	39	Z 42	41	43	41	44	34	46	74	75	86	J R 94	J R 86	J R 85	J R 85	R 80	69	46	38	33	24	V 26	30	30
23	30	30	32	31	31	34	33	46	70	72	70	90	J R 86	76	75	76	54	39	34	36	28	29	29	31
24	33	34	35	35	33	34	30	49	61	74	84	91	73	J R 82	H 72	J R 84	58	50	30	33	32	24	28	28
25	31	32	33	33	36	35	36	46	71	70	70	J R 84	77	94	H 72	J R 92	59	51	33	31	31	28	32	32
26	33	33	33	33	35	33	38	44	69	R 96	92	U R 100	J R 81	85	J R 87	76	60	46	34	A	30	31	34	36
27	36	38	37	37	35	35	28	45	66	61	J R 80	Y	73	76	87	69	68	40	39	25	28	25	28	28
28	30	32	33	34	32	33	31	42	65	72	U R 79	J R 91	J R 96	75	J R 83	J R 81	68	50	32	32	24	25	29	35
29	30	32	32	35	33	35	26	39	69	J R 80	74	R 83	U Y 78	73	U R 76	74	58	60	35	27	30	25	29	29
30	29	31	33	32	32	30	32	49	70	59	66	R 78	77	75	R 79	69	65	41	32	25	23	18	26	29
31	29	31	31	30	31	31	27	46	67	73	R 93	J R 84	77	92	76	64	61	46	36	30	27	26	30	30
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	30	31	31	30	31	31	31	31	31	30	31	31	31	31	31	31	31	30	31	31	31	31
MED	35	35	36	36	36	36	34	55	74	76	92	R 92	89	85	83	77	66	49	37	34	31	31	33	35
U Q	38	38	39	40	40	42	38	59	77	87	95	R 100	95	88	R 87	R 82	70	56	41	38	36	35	37	38
L Q	32	32	33	34	33	34	32	46	70	73	82	R 89	80	76	76	75	62	46	34	31	28	28	30	31

DEC. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC.2013 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											
2									256		L	L	L		296									
3											320	L	L	L	L									
4										L	L	L	L											
5									L	U L 340	L	L	U L 372											
6											L													
7										U L 348	L													
8										316	L			L										
9																								
10												L	L											
11													L	L	L									
12																								
13									252			L												
14															L									
15										L														
16												L		L										
17														L										
18														L										
19									248	296			L		H 680									
20																								
21									248	L 304		L												
22									252															
23									240			L				260								
24									256			L	L	324										
25									228		U L 336	L		U L 440										
26											L	L	L	L										
27										308			L	L										
28													L		L									
29													L											
30											336	348			L									
31									252		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									9	6	3	1	1	2	2	1								
MED									252	312	336	348	U L 372	382	488	260								
U Q									254	U L 340	U L 336													
L Q									244	304	320													

DEC.2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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								188	220	260	296	304	308	288	260	200	176							
2								164	224	268	288	296	292	284	260	204	B							
3								B	224	268	284	308	304	288	256	220	B							
4								A	236	284	316	312	300	288	264	220	A							
5								176	212	272	288	296	304	304	268	220	B							
6								168	200	280	300	324	300	312	280	212	B							
7								180	208	272	292	308	316	296	256	208	A							
8							B	U R 168	224	260	308	A	312	296	272	A	B							
9								B	216	A	292	312	320	304	272	196	B							
10								B	212	272	292	304	324	300	256	216								
11								176	212	276	R 304	328	316	300	268	240	A							
12								A	228	272	300	312	304	312	272	A	168							
13								B	208	276	296	312	308	292	252	208	A							
14								184	S	276	292	304	312	300	272	A	A							
15								180	224	268	292	292	300	288	264		A							
16								A	244	256	300	U A 296	316	296	272	228	A							
17								184	260	264	300	300	300	312	276	240	A							
18								A	244	256	288	312	316	308	U A 280	A								
19								A	208	256	296	304	316	284	272	200	A	B						
20								164	184	268	308	312	304	272	260	200	A							
21								164	184	256	296	304	304	304	268	A	A							
22								168	192	248	296	300	312	A	280	232	A							
23								B	208	260	288	300	A	A	A	212	B							
24								B	200	A 236	284	292	296	292	248	A	184							
25								B	192	264	292	300	304	288	U A 248	212	B							
26								A	A	236	288	A 292	U R 296	280	240	A	A							
27								B	H 228	236	276	292	288	280	260	216	172							
28								B	208	260	A	300	300	292	268	U A 204	A	A						
29								J R 156	200	272	284	300	300	300	276	212	A							
30								B	228	264	280	292	308	292	260	216	164							
31								R 156	192	244	292	300	304	296	252	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								15	29	30	30	30	30	29	30	23	5							
MED								168	212	264	292	302	304	296	266	212	172							
U Q								180	226	272	300	312	312	302	272	220	180							
L Q								164	200	256	288	296	300	288	256	204	166							

DEC. 2013 foE (0.01MHz)

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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 13	E B 13	18	22	E B 13	20	J A 16	22	25	28	G	32	32	31	27	22	G	J A 26	20	J A 27	J A 23	J A 18	25	J A 17
2	J A 19	18	E B 11	E B 11	E B 13	E B 13	E B 13	17	24	G 20	32	32	32	31	27	27	J A 20	J A 17	J A 16	J A 16	E B 12	J A 14	E B 12	E B 12
3	E B 14	E B 15	E B 14	E B 14	J A 12	J A 15	E B 15	J A 15	G 20	G	30	34	33	29	29	23	J A 23	E B 11	E B 14	J A 21	E B 14	E B 14	E B 14	E B 14
4	E B 12	E B 12	11	13	E B 12	12	13	19	G 23	G 22	G	G 26	G	G	G	25	J A 22	J A 15	19	J A 25	J A 22	J A 22	J A 18	J A 27
5	J A 20	E B 15	18	18	E B 15	E B 15	J A 18	G	24	30	32	31	G	32	29	G	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
6	E B 12	E B 11	E B 11	E B 11	E B 12	E B 11	E B 11	G	24	G 20	34	G 30	G	G	G	23	17	J A 20	26	J A 19	E B 14	E B 14	E B 14	E B 14
7	E B 14	E B 12	E B 11	E B 14	21	E B 14	E B 14	G	24	G	34	33	G 22	31	30	24	21	21	E B 13	E B 13	E B 13	J A 45	J A 25	J A 17
8	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	34	39	J A 62	34	G 22	24	E B 14	J A 23	E B 13	J A 17	J A 28	J A 17	E B 12	J A 19
9	J A 18	21	J A 17	E B 14	E B 14	E B 14	E B 14	J A 15	25	J A 30	32	G 28	G	G	G	24	E B 12	E B 12	E B 12	J A 11	J A 15	E B 14	J A 25	J A 16
10	18	E B 14	E B 14	E B 14	E B 14	J A 15	E B 14	E B 16	26	31	34	33	33	G 27	30	22	E B 11	J A 19	J A 18	J A 18	E B 12	E B 11	J A 19	E B 11
11	E B 14	18	J A 17	23	E B 14	E B 14	E B 14	G	24	29	32	G 27	G 27	G 21	28	G 19	18	J A 17	E B 13	E B 14	J A 16	23	J A 15	E B 14
12	E B 14	E B 14	E B 14	E B 14	E B 13	22	E B 12	J A 22	G	30	G 30	G	32	G	30	26	G	J A 29	J A 18	J A 23	J A 17	J A 17	J A 17	16
13	E B 11	J A 22	25	E B 13	E B 13	E B 13	E B 13	J A 21	26	34	33	34	33	30	32	32	24	J A 22	J A 21	J A 33	J A 17	E B 16	E B 13	E B 14
14	E B 14	J A 17	J A 17	20	E B 15	E B 14	E B 14	G	E S 29	30	31	34	33	33	35	J A 28	J A 30	E B 13	E B 13	E B 13	J A 30	J A 16	J A 29	J A 16
15	J A 18	E B 15	E B 15	J A 15	E B 12	E B 12	J A 10	G	24	30	32	36	J A 47	36	31	J A 36	J A 25	J A 72	J A 31	J A 27	J A 28	J A 41	J A 35	J A 37
16	J A 29	J A 17	18	18	E B 12	E B 12	J A 17	22	G 18	28	35	J A 63	35	34	33	31	J A 51	J A 56	J A 51	J A 26	E B 14	E B 15	E B 14	J A 32
17	19	J A 16	22	J A 19	J A 17	J A 15	J A 17	23	G 23	30	33	32	32	32	33	32	J A 28	J A 34	J A 28	J A 18	J A 27	J A 26	J A 61	J A 29
18	J A 26	J A 17	J A 18	J A 16	J A 17	J A 43	E B 16	J A 31	J A 25	30	32	42	40	38	J A 56	J A 37	J A 31	J A 96	J A 55	J A 19	E B 18	E B 16	E B 16	E B 16
19	E B 13	E B 15	17	E B 15	J A 29	J A 27	22	J A 27	21	29	32	40	34	34	36	26	20	J A 18	J A 63	J A 26	21	J A 24	J A 58	J A 53
20	J A 33	J A 50	J A 42	24	J A 17	J A 25	J A 16	J A 15	24	G	33	36	36	34	36	28	J A 34	J A 28	J A 45	J A 24	E B 14	B J 31	J A 20	J A 22
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	J A 19	22	G 20	33	33	37	39	39	J A 32	30	E B 12	E B 12	B J 23	A E 12	B E 12	B J 24	A J 27
22	J A 15	27	J A 25	J A 20	J A 15	J A 24	E B 15	G	23	28	32	32	33	31	31	32	J A 51	J A 22	J A 28	J A 31	J A 31	J A 27	E B 11	E B 11
23	E B 11	E B 11	E B 11	E B 11	E B 11	E B 12	J A 21	E B 12	22	G 22	31	32	32	31	25	25	E B 15	E B 15	E B 15	E B 15	J A 12	J A 27	J A 23	J A 16
24	J A 20	J A 21	J A 17	E B 15	J A 18	E B 14	E B 14	E B 14	G 17	30	31	31	G	30	30	23	19	E B 12	E B 12	E B 12	E B 12	E B 13	E B 13	E B 14
25	E B 14	J A 19	E B 14	E B 14	E B 15	J A 27	J A 19	E B 15	22	28	30	32	32	32	28	24	E B 17	E B 17	J A 40	E B 16	J A 18	J A 20	J A 20	E B 12
26	E B 12	E B 12	E B 12	E B 13	E B 13	J A 29	J A 18	J A 18	25	30	32	38	32	30	30	J A 27	J A 31	J A 46	J A 47	J A 52	J A 31	J A 27	J A 46	J A 26
27	E B 15	E B 13	E B 12	E B 12	E B 12	E B 13	J A 19	E B 15	G 19	G	G	33	33	32	30	G 18	G	J A 20	J A 25	E B 10	E B 11	B J 21	A J 21	A J 24
28	J A 23	E B 14	J A 19	E B 14	E B 14	E B 14	E B 14	E B 14	G 18	29	J A 52	32	G 20	31	35	J A 31	38	J A 34	E B 15	J A 44	J A 25	J A 27	J A 21	J A 18
29	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	25	29	G 28	32	G	G	G	24	J A 26	J A 25	24	J A 21	J A 24	J A 25	A E 25	B J 14
30	J A 25	J A 20	E B 16	J A 20	E B 16	E B 16	E B 16	E B 15	G 19	G	E B 15	32	34	33	29	G	G	E B 13	E B 13	E B 15	J A 22	24	E B 15	19
31	18	22	E B 14	E B 14	E B 14	E B 16	E B 16	G	20	30	33	33	31	32	30	G	E B 15	E B 15	B J 20	A J 15	A J 23	A J 58	A E 12	B J 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	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 14	E B 14	E B 14	E B 15	G	E G 23	29	32	32	32	31	30	25	20	J A 20	19	J A 19	J A 17	J A 20	J A 19	J A 16
U Q	J A 19	J A 19	18	18	J A 15	J A 20	J A 17	J A 19	25	30	33	34	34	33	33	31	J A 30	J A 28	J A 28	J A 26	J A 24	J A 27	J A 25	J A 24
L Q	E B 14	E B 14	E B 14	E B 14	E B 13	E B 13	E B 14	G	G 21	G	G 30	G 32	G	G 29	G 27	G 23	G	E B 15	E B 13	E B 15	E B 14	E B 15	E B 14	E B 14

DEC. 2013 foEs (0.1MHz)

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IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	G 13	24	27	G	32	31	31	27	20	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
2	E B 11	E B 11	E B 11	E B 11	E B 13	E B 13	E B 13	G 13	23	G 17	30	31	31	31	26	24	E B 14	E B 14	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12
3	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14	E B 15	E B 14	G 14	G	30	32	32	29	29	G 22	E B 14	E B 11	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
4	E B 12	E B 12	E B 11	E B 13	E B 12	E B 12	E B 13	16	G 16	G 18	G	G 18	G	G	G	G 22	18	E B 13	E B 13	E B 14	E B 14	E B 14	E B 14	16
5	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	22	28	32	31	G	G 30	27	G	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
6	E B 12	E B 11	E B 11	E B 11	E B 12	E B 11	E B 11		20	G 20	32	G 24	G	G	G	23	17	17	E B 13	E B 14	E B 14	E B 14	E B 14	E B 14
7	E B 14	E B 12	E B 11	E B 14	E B 14	E B 14	E B 14	G	22	G	32	32	G 20	G 29	28	21	14	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 15
8	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	33	32	G 22	33	G 19	22	E B 14	16	E B 13	16	17	E B 12	E B 12	E B 12
9	E B 12	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 11	24	24	G 29	G 24	G	G	G	24	E B 12	E B 12	E B 12	E B 14	E B 14	E B 14	E B 14	E B 14
10	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 16	24	G 27	33	31	G 31	G 20	G 26	G 19	E B 11	E B 14	E B 11	E B 11	E B 12	E B 11	E B 11	E B 11
11	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	23	G 26	G 26	G 24	G 20	G 19	G 26	G 18	15	E B 13	E B 13	E B 14	E B 14	E B 14	E B 14	E B 14
12	E B 14	E B 14	E B 14	E B 14	E B 13	E B 12	E B 12	14	G	29	G 22	G	G 30	G	30	22	G	16	E B 12	E B 12	E B 13	E B 11	E B 11	E B 11
13	E B 11	E B 11	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	22	29	G 29	G 29	G 31	30	30	27	19	18	17	17	17	E B 16	E B 13	E B 14
14	E B 14	E B 14	E B 16	E B 15	E B 15	E B 14	E B 14	G	E S 29	G 27	G 27	G 28	G 30	32	32	24	19	E B 13	E B 13	E B 13	E B 13	E B 12	E B 12	E B 12
15	E B 14	E B 15	E B 15	E B 16	E B 12	E B 12	E B 12	G	24	G 25	32	32	35	35	28	26	21	22	20	E B 10	E B 10	E B 15	13	16
16	E B 15	E B 15	E B 15	E B 12	E B 12	E B 12	E B 12	18	G 18	G 26	G 28	34	34	32	32	24	18	18	18	E B 14	E B 14	E B 14	E B 14	E B 14
17	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G 11	30	31	31	30	G 30	30	29	19	19	18	E B 14	18	19	19	E B 14
18	E B 14	E B 14	E B 16	E B 16	E B 16	A A 43	E B 16	18	G 18	28	29	34	36	36	40	33	18	17	E B 14	E B 14	E B 16	E B 16	E B 16	E B 16
19	E B 13	E B 15	E B 15	E B 15	16	16	E B 15	15	21	26	G 28	38	34	32	32	26	14	14	24	18	E B 12	E B 12	25	25
20	23	23	A A 42	E B 14	E B 14	E B 14	E B 14	G	22	G	G 30	G 30	33	32	32	27	27	16	15	E B 14	E B 14	E B 14	E B 15	E B 16
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	19	G 18	G 29	G 30	33	33	32	30	18	E B 12	E B 12	17	E B 12	E B 12	17	17
22	E B 12	E B 12	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 17	27	G 29	G 29	G 29	28	G 24	G 20	20	17	16	16	E B 11	E B 11	E B 11	E B 11
23	E B 11	E B 11	E B 11	E B 11	E B 11	E B 12	E B 12	E B 12	G 20	G 20	G 29	G 30	27	27	25	22	E B 15	E B 15	E B 15	E B 15	E B 13	18	17	E B 12
24	E B 15	E B 15	E B 15	E B 15	18	E B 14	E B 14	E B 14	G 17	27	G 28	G 28	G	G 29	27	20	G 15	E B 12	E B 12	E B 12	E B 12	E B 13	E B 13	E B 14
25	E B 14	15	E B 14	E B 14	E B 15	E B 15	E B 16	E B 15	G 17	28	30	32	32	29	26	24	E B 17	E B 17	E B 19	E B 16	E B 12	E B 12	E B 12	E B 12
26	E B 12	E B 12	E B 12	E B 13	E B 13	E B 12	E B 11	17	20	27	G 28	G 29	G 29	29	29	26	18	E B 12	27	A A 52	20	20	26	E B 11
27	E B 15	E B 13	E B 12	E B 12	E B 12	E B 13	E B 14	E B 15	G 16	G	G	31	31	G 28	28	G 17	G	17	E B 10	E B 10	E B 11	E B 12	16	16
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 14	G 26	30	G 30	G 20	30	30	25	24	20	E B 15	23	E B 16	14	E B 15	E B 15
29	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	22	G 26	G 24	G 28	G	G	G	22	21	E B 13	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
30	E B 15	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	G 10	G	E B 15	30	G 30	30	28	G	G	E B 13	E B 13	E B 15	E B 15	E B 15	E B 15	E B 15
31	E B 16	E B 16	E B 14	E B 14	E B 14	E B 16	E B 16	G	G 18	27	32	32	G 30	30	28	G	E B 15	E B 15	E B 16	E B 12	E B 12	E B 12	E B 12	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G 30	30	G	G	28	22	E G 15	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
U Q	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	15	22	27	31	32	32	32	30	26	19	17	16	16	15	E B 15	15	16
L Q	E B 12	E B 12	E B 13	E B 13	E B 13	E B 13	E B 13	G	G 17	G 26	G 28	G 29	G 30	G 29	G	G 22	E B 14	E B 13	E B 13	E B 13	E B 12	E B 12	E B 12	E B 12

DEC. 2013 fbEs (0.1MHz)

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DEC. 2013 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	13	13	13	13	13	13	13	14	14	14	14	14	14	16	15	15	13	15	15	15	15	15	15	15
2	11	11	11	11	13	13	13	13	13	13	13	12	12	13	13	13	14	14	12	12	12	12	12	12
3	14	15	14	14	14	15	15	14	14	14	13	13	13	14	14	14	14	11	14	14	14	14	14	14
4	12	12	11	13	12	12	13	12	12	12	16	16	16	16	16	16	16	13	13	14	14	14	14	14
5	14	15	15	15	15	15	15	15	12	12	12	12	12	14	17	16	14	14	14	14	15	15	15	15
6	12	11	11	11	12	11	11	11	11	11	16	15	15	16	16	15	15	13	13	14	14	14	14	14
7	14	12	11	14	14	14	14	14	14	14	14	16	15	15	17	14	13	13	13	13	13	13	13	15
8	15	15	14	14	14	14	14	14	14	14	14	16	16	15	15	15	14	12	13	12	12	12	12	12
9	12	14	14	14	14	14	14	15	13	12	14	13	14	14	12	13	12	12	12	14	14	14	14	14
10	14	14	14	14	14	14	14	16	15	15	13	14	14	12	13	12	11	14	11	11	12	11	11	11
11	14	14	14	14	14	14	14	12	11	13	12	16	13	13	13	12	13	13	13	14	14	14	14	14
12	14	14	14	14	13	12	12	12	12	12	11	11	11	11	12	13	13	13	12	12	13	11	11	11
13	11	11	13	13	13	13	13	13	11	11	14	14	14	13	12	12	13	13	13	13	16	16	13	14
14	14	14	16	15	15	14	14	14	ES 29	16	16	15	15	15	17	14	13	13	13	13	13	12	12	12
15	14	15	15	16	12	12	12	12	12	12	12	15	14	15	16	13	11	11	10	10	10	15	12	16
16	15	15	15	12	12	12	12	12	12	14	13	12	14	14	16	13	12	12	12	14	14	14	14	14
17	14	14	14	14	14	14	14	14	14	15	15	16	16	16	16	16	14	14	14	14	14	14	14	14
18	14	14	16	16	16	16	16	16	9	12	13	13	13	13	13	14	13	14	14	14	16	16	16	16
19	13	15	15	15	15	15	15	13	12	11	13	15	11	11	14	14	12	12	12	12	12	12	12	11
20	11	14	14	14	14	14	14	15	12	15	15	16	16	15	15	16	15	14	14	14	14	14	15	16
21	14	14	14	14	14	14	14	14	14	14	14	16	15	15	15	15	15	12	12	12	12	12	12	12
22	12	12	15	15	15	15	15	14	14	14	14	14	14	14	15	15	14	10	11	11	11	11	11	11
23	11	11	11	11	11	12	12	12	9	10	9	11	15	15	15	15	15	15	15	15	13	12	12	12
24	15	15	15	15	14	14	14	14	14	14	10	9	8	8	8	12	12	12	12	12	12	13	13	14
25	14	14	14	14	15	15	16	15	15	15	15	18	18	18	18	16	17	17	17	16	12	12	12	12
26	12	12	12	13	13	12	11	11	11	11	11	11	12	12	12	12	12	12	12	11	11	11	11	11
27	15	13	12	12	12	13	14	15	15	15	15	18	14	15	15	9	9	10	10	10	11	12	12	12
28	14	14	14	14	14	14	14	14	14	14	14	14	14	13	13	11	15	15	15	16	16	12	15	15
29	15	15	15	15	15	15	15	15	15	14	15	18	16	15	14	12	13	13	14	14	14	14	14	14
30	15	17	16	16	16	16	16	15	15	15	15	15	16	18	16	6	13	13	13	15	15	15	15	15
31	16	16	14	14	14	16	16	11	14	16	15	18	18	18	16	14	15	15	16	12	12	12	12	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	14	14	14	14	14	14	14	14	14	14	14	15	14	15	15	14	13	13	13	14	13	13	13	14
U Q	14	15	15	15	15	15	15	15	14	15	15	16	16	15	16	15	15	14	14	14	14	14	14	15
L Q	12	12	13	13	13	13	13	12	12	12	13	13	13	13	13	12	12	12	12	12	12	12	12	12

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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	296	298	298	301	321	320	359	353	330	335	R 367	340	R	R 367	356	346	336	306	350	326	331	300	287	294
2	300	296	300	298	301	330	358	352	349	R	V 318	361	340	351	370	378	346	313	341	348	349	312	290	271
3	290	290	281	300	316	324	337	357	375	380	354	U R 340	R 370	U Y 364	Z 338	R 382	367	332	364	337	300	287	262	281
4	301	300	F 288	282	278	292	312	334	R 370	362	355	354	354	331	346	371	343	345	336	336	324	304	289	293
5	285	278	283	286	290	313	320	360	367	U R 366	R 348	363	344	342	R 337	351	340	341	369	342	309	284	284	279
6	294	305	294	295	295	307	316	337	375	U R 392	340	345	360	352	352	R 354	329	327	319	357	314	308	314	267
7	271	279	288	286	281	329	344	357	376	371	U R 327	336	U R 393	R	U R 350	V 328	342	337	329	345	346	307	270	306
8	291	300	295	289	292	309	334	359	R 380	U R 387	348	337	R 347	311	321	338	323	331	305	282	298	286	307	327
9	317	309	288	285	303	298	356	339	352	355	U R 360	358	353	335	329	340	338	352	325	302	311	319	304	299
10	310	270	270	273	273	303	309	334	R	376	370	R 370	359	U R 361	J R 351	358	327	338	337	325	309	310	287	276
11	311	308	305	300	300	289	308	336	357	U R 380	U R 375	R 351	R	345	R 316	337	331	311	341	332	306	290	296	296
12	304	268	266	281	279	285	335	352	379	355	363	R	358	R	348	R	345	367	307	349	303	292	283	286
13	297	259	295	311	311	307	311	340	377	376	U R 352	R	U R 352	334	346	357	341	353	327	336	354	331	292	275
14	272	292	285	285	307	321	301	331	S 387	351	R	R	332	357	R	R 362	320	344	323	323	280	282	296	297
15	282	305	286	282	294	323	290	361	341	R	R	R	319	318	337	R	336	R	R 346	330	330	303	291	295
16	283	283	298	337	295	305	296	327	362	R 346	R 365	R 341	U R 376	367	R 378	R 355	349	312	347	342	324	276	281	295
17	289	293	288	285	292	291	347	336	U R 366	R 364	U R 386	R 317	323	R 378	337	320	R 323	352	333	326	323	305	305	287
18	279	279	285	285	285	A	322	351	360	R 362	330	350	R	R 342	373	340	351	363	327	344	330	284	241	291
19	318	285	273	273	281	342	344	361	371	389	342	324	330	U R 382	226	334	345	366	343	326	290	F 274	283	319
20	F 302	279	A	289	273	310	368	337	367	386	347	R 358	U R 377	R	324	347	354	324	310	327	308	295	277	275
21	281	281	289	302	299	327	336	361	363	R	345	R	362	334	350	329	360	V 355	342	344	355	297	301	286
22	300	Z 289	295	281	292	340	374	333	377	374	340	R	R	R	R	R 353	330	384	379	369	339	V 279	280	281
23	281	281	281	289	289	303	311	325	361	367	375	356	R	369	350	345	368	326	313	345	350	294	290	284
24	272	262	271	304	319	323	355	345	361	367	372	343	379	R	H 328	R	378	355	315	289	327	349	290	309
25	293	278	276	294	292	307	324	373	375	381	379	R	369	370	H 302	R	365	360	342	342	347	290	270	270
26	265	279	275	279	299	321	332	348	370	R 357	368	U R 345	R	361	R	364	364	361	329	A	336	307	A	266
27	286	310	306	303	305	306	306	337	370	402	R	Y	369	356	348	327	327	364	347	313	336	324	287	287
28	290	276	291	296	323	328	352	350	378	368	U R 380	R	R	360	R	R	331	332	335	335	347	261	297	280
29	307	285	293	314	330	329	354	367	358	R	384	R 356	U Y 380	363	U R 387	372	341	338	325	292	351	300	296	297
30	285	264	287	290	290	310	344	328	358	370	338	R 363	357	360	R 337	354	374	370	383	336	325	336	273	246
31	313	294	293	305	290	321	333	335	372	374	R 346		340	360	349	346	351	348	346	344	304	277	291	322
	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	30	31	31	30	31	31	30	27	28	21	24	26	27	26	31	30	31	30	31	31	30	31
MED	291	285	288	289	294	312	334	345	368	370	354	350	358	358	346	349	342	344	336	336	325	297	290	287
U Q	302	298	295	301	305	324	352	357	375	380	371	358	U R 370	364	351	358	354	360	346	344	346	308	296	297
L Q	282	278	281	285	289	305	311	335	360	362	344	340	342	342	329	338	331	331	325	326	308	284	281	276

DEC. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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											
2									446		L	L	L		421									
3											454	L	L	L	L									
4										L	L	L	L											
5									L	U L 418	L	L	U L 380											
6											L													
7										U L 400	L													
8										419	L			L										
9																								
10												L	L											
11													L	L	L									
12																								
13									471			L												
14															L									
15										L														
16												L		L										
17														L										
18														L										
19									438	456			L		H 294									
20																								
21									435	L 421		L												
22									462															
23									449			L				422								
24									488			L	L	427										
25									477		U L 423	L		U L 333										
26											L	L	L	L										
27										438			L	L										
28													L		L									
29													L											
30											403	428			L									
31									448		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									9	6	3	1	1	2	2	1								
MED									449	420	423	428	U L 380	380	358	422								
U Q									474	438	454													
L Q									442	U L 418	403													

DEC. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC.2013 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											230	230	230											
2									214		274	246	246		214									
3											214	240	234	234	256									
4										220	220	220	220											
5									214	214	222	222	222											
6											254													
7										200	210													
8										194	246			250										
9																								
10											216	226	226											
11													234	216	296									
12																								
13									206			206												
14															262									
15										260														
16												258		240										
17														240										
18														250										
19									214	214			236		560									
20																								
21									208	208		232												
22									214															
23									214			212				212								
24									210			240	234	226										
25									224		212	212		220										
26											220	244	214	218										
27										192			192	222										
28													232		232									
29													232											
30											220	220			220									
31									204		238													
	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	8	13	14	13	10	7	1								
MED									214	211	220	228	232	230	256	212								
U Q									214	217	242	240	234	240	296									
L Q									208	197	215	220	221	220	220									

DEC.2013 h'F2 (KM)

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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	270	274	274	278	242	230	200	236	214	214	214	214	214	214	220	218	206	206	210	212	212	260	268	268
2	288	286	286	278	276	250	224	222	212	212	212	H 208	208	H 206	196	196	196	196	198	210	210	252	294	308
3	308	308	302	286	272	264	246	212	202	202	192	220	222	222	212	212	202	202	202	250	260	338	334	304
4	280	276	342	334	328	296	272	246	220	210	210	210	210	210	222	222	218	224	224	224	248	260	282	282
5	302	312	312	312	294	266	248	212	204	196	H 192	214	206	226	224	224	210	212	212	230	248	262	262	298
6	262	260	260	270	290	290	240	204	204	204	204	218	218	218	218	218	218	218	218	226	236	240	262	262
7	262	262	262	282	282	228	228	220	220	214	200	218	218	218	218	218	218	218	218	218	218	254	280	280
8	272	274	274	274	274	250	218	218	204	204	216	218	218	H 218	220	220	220	220	262	262	262	262	262	252
9	252	280	280	304	304	266	218	230	212	212	212	214	214	214	214	214	212	212	218	226	230	230	246	266
10	266	304	310	310	310	274	264	226	212	212	212	218	224	222	222	208	208	208	212	230	254	256	290	290
11	250	248	264	264	278	262	258	220	220	220	220	220	220	220	220	218	216	216	216	230	236	272	272	272
12	266	270	290	290	290	282	236	224	204	204	204	204	204	224	224	220	210	210	230	226	266	266	280	280
13	292	290	290	290	272	272	250	236	200	206	206	206	206	216	216	216	216	216	216	216	236	258	278	288
14	288	288	288	288	278	236	236	230	220	212	212	212	212	214	214	214	214	214	214	230	240	284	288	286
15	306	306	310	286	286	242	314	208	208	214	214	232	232	232	220	218	196	A 184	220	236	260	274	300	300
16	288	288	288	244	248	248	248	238	212	210	216	220	220	220	220	220	210	218	218	230	242	246	282	282
17	282	282	280	280	280	280	254	242	220	220	220	220	218	218	218	218	214	222	230	230	E A 310	E A 326	326	326
18	308	308	308	308	304	A	270	242	220	220	220	226	226	226	220	220	214	226	236	236	236	270	334	330
19	252	316	316	306	306	242	234	234	204	204	218	218	218	218	216	216	216	216	A 268	248	248	264	E A 354	A 332
20	332	330	A	316	316	264	228	222	216	210	210	218	218	218	218	218	218	218	222	222	224	244	284	296
21	296	296	296	294	294	242	222	222	188	192	214	220	220	220	220	220	218	218	218	218	218	226	292	292
22	292	292	292	292	292	246	218	218	186	202	202	202	202	204	204	218	218	218	218	218	218	312	312	356
23	356	316	316	308	308	278	244	234	234	214	214	212	212	212	212	212	212	214	230	230	230	A 306	306	306
24	316	316	316	272	272	244	236	222	184	204	218	218	218	202	202	220	190	212	222	222	222	228	262	282
25	282	302	302	302	252	252	246	196	196	196	196	212	212	212	212	212	212	212	236	236	236	270	290	300
26	300	302	302	290	284	254	238	228	214	240	238	230	226	226	226	220	214	214	E A 342	A	E A 312	312	A	312
27	284	284	284	256	256	256	256	232	214	212	212	212	212	212	222	222	216	218	218	228	228	254	312	312
28	298	306	306	276	276	228	228	216	206	206	206	206	206	206	206	204	204	210	210	E A 304	250	310	310	298
29	298	298	282	272	272	238	238	222	222	218	218	218	218	218	218	218	218	218	218	218	218	288	288	278
30	314	314	298	298	268	254	254	244	214	208	202	190	212	214	214	214	206	206	212	252	252	286	312	306
31	306	306	298	298	288	246	246	246	190	196	202	218	218	220	220	220	202	192	214	214	248	270	270	270
	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	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	30	31
MED	288	296	294	290	282	253	240	224	212	210	212	218	218	218	218	218	214	214	218	228	236	263	287	292
U Q	306	308	308	304	294	266	254	236	220	214	216	220	220	220	220	220	218	218	230	236	252	286	310	306
L Q	270	280	282	276	272	242	228	218	204	204	204	212	212	212	214	214	206	210	214	218	224	254	272	280

DEC. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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 152	128	124	108	112	112	112	112	112	E B 166							
2								124	124	122	118	116	116	114	114	114	B							
3								B	A 140	108	108	108	108	108	118	118	B							
4									120	120	120	120	120	118	118	118	A							
5								E B 168	114	114	114	114	114	114	114	114	B							
6								122	122	122	122	122	122	122	122	122	B							
7								E B 218	104	102	102	102	102	102	102	122	A							
8							B	E B 194	126	124	124	A	126	110	118	A	B							
9								B	118	A	118	118	118	118	114	114	B							
10								B	114	114	114	114	124	124	124	124								
11								150	146	118	122	122	122	122	122	136								
12								A	136	126	126	120	122	122	122	A	E B 176							
13								B	134	134	134	110	110	110	118	118	A							
14								138	S	138	116	116	116	116	116	A	A							
15								140	140	136	136	112	112	112	118		A							
16								A	A 140	142	114	114	120	122	124	124	A							
17								130	132	132	130	118	118	118	118	118								
18								A	118	118	118	118	118	118	118	A								
19									118	118	118	118	118	118	118	118	A	B						
20								B	118	118	118	118	118	118	118	118	A							
21								E B 224	134	114	114	114	114	114	114									
22								E B 164	132	122	122	122	122		122	122								
23								B	122	122	122	122		A	A	122	B							
24								B	A 128	A	128	132	126	126	126	A	126							
25								B	126	126	124	124	124	124	124	124	B							
26								A	A	124	E A 130	A	130	130	130		A							
27								B	138	128	126	126	124	124	124	124	154							
28								B	124	124		124	116	116	116	116	A	A						
29								B	124	124	122	122	122	124	124	124								
30								B	124	124	124	120	120	120	120	120	134							
31								184	114	114	114	114	114	114	114	114								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								13	29	29	30	29	30	29	30	23	5							
MED								U 138	124	122	120	118	118	118	118	118	U 140							
U Q								E B 189	134	126	124	122	122	122	122	124	E B 171							
L Q								134	118	118	114	114	114	114	116	116	130							

DEC. 2013 h′E (KM)

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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	B	96	96	B	96	112	108	170	170	G	170	180	188	188	118	G	118	108	108	108	108	106	106
2	104	104	B	B	B	B	B	106	182	104	186	186	152	168	168	148	110	110	110	110	B	110	B	B
3	B	B	B	B	112	112	B	112	112	G	180	176	176	138	138	134	118	B	B	98	B	B	B	B
4	B	B	B	B	B	B	B	104	104	104	G	104	G	G	G	124	114	90	90	130	112	110	106	96
5	96	B	96	96	B	B	96	G	124	196	174	182	G	182	158	G	B	B	B	B	B	B	B	B
6	B	B	B	B	B	B	B	G	126	98	166	96	G	G	G	120	96	110	100	126	B	B	B	B
7	B	B	B	B	106	B	B	G	146	G	180	180	94	158	158	132	114	114	B	B	B	134	108	102
8	B	B	B	B	B	B	B	G	G	G	160	98	98	206	98	108	B	108	B	108	104	104	B	104
9	104	104	168	B	B	B	B	122	144	116	172	100	G	G	G	136	B	B	B	136	136	B	116	116
10	106	B	B	B	B	106	B	B	144	190	156	156	146	114	112	108	B	104	110	110	B	B	110	B
11	B	106	106	106	B	B	B	G	144	160	110	110	110	96	154	112	112	84	B	B	104	104	104	B
12	B	B	B	B	B	104	B	104	G	196	110	G	188	G	148	122	G	110	110	110	110	134	110	110
13	B	100	100	B	B	B	B	86	164	152	146	124	182	182	134	130	124	108	108	108	108	B	B	B
14	B	108	106	102	B	B	B	G	S	158	144	126	178	144	130	120	112	B	B	B	104	104	104	144
15	100	B	B	100	B	B	100	G	152	152	152	138	118	118	114	114	114	114	114	114	114	112	112	112
16	112	110	110	110	B	B	130	134	116	142	132	114	150	162	152	146	120	114	128	128	B	124	B	114
17	106	106	104	104	104	116	114	170	110	180	166	166	166	156	148	148	146	116	116	144	138	132	128	126
18	122	122	118	122	122	118	B	112	108	142	142	126	126	126	126	122	122	122	104	116	108	B	B	B
19	B	B	112	B	112	112	112	112	180	180	180	126	184	160	136	136	134	112	106	106	106	106	104	112
20	112	112	112	112	112	112	112	112	158	G	158	148	142	140	124	124	124	116	116	116	B	108	108	108
21	B	B	B	B	B	B	B	108	160	104	178	172	144	138	136	114	114	B	B	128	B	B	124	116
22	116	110	106	106	106	104	B	G	152	198	176	176	142	126	126	126	114	114	114	114	114	112	B	B
23	B	B	B	B	B	B	110	B	144	128	176	176	108	108	108	148	B	B	B	B	148	110	108	108
24	96	96	96	B	120	B	B	B	118	154	154	156	G	182	156	132	114	B	B	B	B	B	B	B
25	B	110	B	B	B	110	110	B	178	178	204	158	156	156	124	136	B	B	102	B	102	102	102	B
26	B	B	B	B	B	102	102	102	100	152	150	142	142	142	142	124	112	112	110	110	108	108	108	108
27	B	B	B	B	B	B	96	B	116	G	G	122	136	136	136	106	G	106	106	B	B	106	106	106
28	100	B	104	B	B	B	B	B	104	124	110	158	108	128	128	128	114	108	B	108	108	108	108	108
29	B	B	B	B	B	B	B	G	168	168	112	122	G	G	G	184	90	90	90	90	90	90	90	B
30	94	94	B	94	B	B	B	B	108	G	B	156	118	118	130	G	G	B	B	B	96	88	B	88
31	122	92	B	B	B	B	B	G	166	164	156	156	156	138	132	G	B	B	96	96	96	96	B	116
	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	14	11	8	11	11	14	28	25	27	30	25	26	27	28	20	21	19	22	20	22	19	19
MED	105	106	106	104	112	110	110	110	144	154	158	152	144	141	136	125	114	110	108	110	108	108	108	108
U Q	112	110	112	110	116	112	112	112	162	179	176	170	171	162	152	136	121	114	114	126	113	112	110	116
L Q	100	100	100	96	106	104	100	104	114	126	144	122	118	126	126	119	112	107	102	108	104	104	104	106

DEC. 2013 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

DEC. 2013 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			F 1	F 1		F 1	FF 11	LC 11	HL 11	HL 11		HL 11	HL 11	HL 11	HL 11	C 1		F 1	F 1	F 2	F 2	FF 11	FF 21	FQ 11
2	F 1	F 1						L 1	H 1	L 1	H 1	H 1	H 1	H 1	H 1	H 1	C 1	F 1	F 1	F 1		F 1		
3					F 1	FF 11		L 1	L 1		H 1	H 1	H 1	H 1	HL 11	H 1	C 1			F 1				
4								L 1	L 1	L 1		L 1				CL 22	L 1	F 1	F 1	F 1	F 1	F 1	F 1	F 3
5	F 1		F 1	F 1			F 1		HL 11	HL 11	HL 11	HL 11		HL 11	H 1									
6									C 1	L 1	HL 11	L 1				C 1	F 1	F 3	FF 11	FF 11				
7					F 1				H 1		H 1	H 1	L 1	H 1	H 1	CL 11	C 2	C 2				FF 12	F 1	F 1
8											H 1	L 1	LH 11	HL 11	L 2	L 2		F 1		F 2	F 3	F 1		FF 11
9	F 1	F 1	F 1					L 1	CL 11	C 1	HL 11	L 1				H 1				F 1	F 1		F 1	F 2
10	F 1					F 1			HL 12	HL 12	HL 21	HL 11	HL 11	L 1	CL 12	L 2		F 1	F 1	F 1			F 1	
11		F 1	F 1	F 1					H 1	HL 12	L 2	L 2	L 1	L 2	HL 11	L 2	CL 11	F 1			F 2	F 1	F 1	
12						F 1		L 1		HL 11	L 1		H 1		H 1	C 2		F 2	F 1	F 1	F 1	FF 11	F 1	F 1
13		F 1	F 1					L 1	HL 11	CL 11	CL 11	CL 11	HL 11	H 1	HL 11	C 4	C 2	F 3	F 2	F 2	F 2			
14		FF 11	FF 11	F 1						HL 11	H 1	CL 11	HL 11	H 2	C 2	C 2	L 3				F 2	FF 11	F 1	F 1
15	F 1			FF 11			F 1		H 1	H 1	HL 11	HL 21	C 3	C 1	C 4	C 4	C 4	F 3	F 3	F 3	F 3	F 3	F 3	F 5
16	F 1	F 2	F 1	F 1			F 1	C 3	L 1	HL 11	CL 11	CL 21	CL 11	HL 11	CL 11	CL 21	CL 21	F 2	FF 11	F 1		F 1		F 1
17	F 1	F 1	F 1	F 2	F 1	F 1	F 2	H 1	L 2	H 1	HL 12	HL 12	HL 12	HL 12	CL 21	CL 21	C 4	F 3	F 2	F 1	F 3	F 5	F 3	F 1
18	F 1	F 1	F 1	F 1	F 2	F 4		L 3	L 2	HL 11	HL 11	CL 21	C 1	C 1	C 3	C 4	C 4	F 2	FQ 21	L 1	L 1			
19			F 2		F 2	F 3	F 1	L 3	HL 11	HL 11	H 1	H 1	HL 11	HL 11	C 1	H 1	C 1	C 1	FQ 31	F 3	F 2	F 1	FQ 31	FFQ 22
20	FF 22	F 3	F 3	F 2	F 3	F 3	F 1	L 1	H 1		HL 12	HL 11	C 2	HL 11	C 2	C 2	L 3	F 3	F 2	F 1		F 2	F 2	F 1
21								L 1	H 1	L 1	H 1	H 1	C 2	CL 21	C 4	L 2	L 2			L 2			F 3	FQ 21
22	F 1	F 1	FQ 21	F 2	F 1	F 1			H 1	HL 11	HL 11	HL 11	HL 11	C 1	L 1	L 1	L 3	F 1	F 2	F 2	F 1	F 1		
23							F 1		R 1	L 1	H 1	H 1	L 1	L 1	L 1	HL 11					F 1	F 4	F 2	F 1
24	F 1	F 2	FQ 11		F 1				L 1	HL 11	HL 11	HL 11		HL 11	HL 11	C 1	L 1							
25		F 1				F 1	F 1		H 1	HL 11	HL 11	HL 11	H 1	HL 11	C 1	H 1			F 2		F 1	F 1	F 1	
26						F 2	F 1	L 1	L 2	HL 11	HL 11	CL 11	CL 11	CL 11	CL 11	CL 21	C 2	F 1	F 4	F 3	F 3	F 3	F 4	F 2
27							F 1		L 1			C 1	H 1	HL 11	HL 11	L 1		F 1	F 1			F 1	F 1	F 2
28	F 1		F 1						L 1	H 1	C 1	HL 11	L 1	CL 11	F 2	C 2	L 3	L 3		F 3	F 2	F 2	F 1	F 1
29									HL 11	HL 11	L 1	H 1				HL 11	L 3	FQ 11	F 1	F 1	F 1	F 1	F 1	
30	F 1	F 1		F 1					L 1			H 1	H 1	HL 11	HL 11						F 1	F 1		F 1
31	FF 11	F 1							H 1	H 1	H 1	H 1	H 1	H 1	H 1				F 1	F 1	F 1	FF 11		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																								

IONOSPHERIC DATA STATION Kokubunji

DEC.2013 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 42	X 41	X 43	X 42	X 42	X 38	X 35											X 61	X 50	X 47	X 46	X 37	X 37	X 38
2	X 41	X 40	X 40	X 42	X 43	X 41	X 41											X 74	X 43	X 40	X 42	X 33	X 34	X 35
3	X 37	X 40	X 40	X 40	X 41	X 39	X 38											X 58	X 47	X 41	X 37	X 34	X 37	X 38
4	X 42	X 39	X 39	X 38	X 42	X 44	X 44											X 56	X 48	X 44	X 42	X 35	X 36	X 36
5	X 38	X 38	X 41	X 41	X 40	X 43	X 43											X 62	X 57	X 56	X 46	X 35	X 38	X 41
6	X 43	X 42	X 42	X 40	X 42	X 40	X 44											X 60	X 56	X 48	X 39	X 36	X 39	X 40
7	X 42	X 41	X 42	X 42	X 43	X 42	X 47											X 72	X 64	X 50	X 46	X 45	X 39	X 41
8	X 39	X 44	X 46	X 45	X 46	X 41	X 48											X 82	X 53	X 53	X 56	X 56	X 57	X 41
9	X 41	X 44	X 42	X 42	X 45	X 46	X 50											X 68	X 62	X 54	X 48	X 44	X 40	X 41
10	X 42	X 42	X 43	X 44	X 41	X 42	X 47											X 63	X 57	X 47	X 45	X 47	X 49	X 51
11	X 53	X 51	X 46	X 42	X 39	X 40	X 44											X 77	X 64	X 60	X 50	X 50	X 40	X 46
12	X 45	X 42	X 41	X 41	X 40	X 40	X 42											X 66	X 57	X 47	X 46	X 41	X 42	X 43
13	X 44	X 43	X 44	X 44	X 44	X 42	X 43											X 65	X 71	X 59	X 45	X 43	X 43	X 44
14	X 43	X 44	X 42	X 43	X 43	X 39	X 41											X 65	X 62	X 54	X 54	X 44	X 45	X 47
15	X 45	X 45	X 46	X 47	X 42	X 39	X 40											X 65	X 59	X 48	X 42	X 44	X 44	X 44
16	X 46	X 50	X 46	X 46	X 45	X 40	X 43											X 70	X 62	X 54	X 47	X 49	X 42	X 44
17	X 48	X 46	X 43	X 48	X 40	X 39	X 40											X 68	X 50	X 42	X 48	X 42	X 40	X 38
18	X 43	X 40	X 40	X 38	X 38	X 40	X 40											X 67	A	X 43	X 36	X 36	X 36	X 40
19	X 40	X 42	X 41	X 42	X 41	X 42	X 38											X 96	X 60	X 42	X 40	X 46	X 50	X 42
20	X 41	X 42	X 41	X 41	X 40	X 41	X 44											X 70	X 59	X 43	X 39	X 36	X 35	X 40
21	X 41	X 42	X 41	X 42	X 44	X 42	X 37											X 78	X 64	X 50	X 42	X 42	X 36	X 37
22	X 38	X 41	X 41	X 41	X 41	X 40	X 37											X 80	X 50	X 35	X 37	X 35	X 32	X 34
23	X 40	X 37	X 38	X 40	X 40	X 41	X 42											X 72	X 37	X 43	X 41	X 35	X 34	X 35
24	X 36	X 37	X 39	X 40	X 39	X 38	X 40											X 62	X 56	X 48	X 44	X 50	X 38	X 40
25	X 39	X 38	X 38	X 40	X 42	X 36	X 37											X 72	X 57	X 52	X 55	X 37	X 41	X 43
26	X 41	X 44	X 46	X 40	X 40	X 41	X 36											X 50	X 44	X 46	X 43	X 39	X 39	X 40
27	X 42	X 42	X 41	X 41	X 41	X 36	X 40											X 67	X 54	X 45	X 40	X 46	X 32	X 34
28	X 36	X 40	X 40	X 38	X 44	X 39	X 32											X 61	X 54	X 51	X 45	X 33	X 32	X 38
29	X 38	X 35	X 39	X 44	X 44	X 30	X 34											X 59	X 57	X 47	X 44	X 47	X 31	X 37
30	X 37	X 37	X 38	X 38	X 39	X 35	X 33											X 63	X 59	X 50	X 39	X 36	X 32	X 34
31	X 38	X 38	X 37	X 39	X 39	X 35	X 35											X 53	X 45	X 48	X 41	X 37	X 40	X 36
	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	30	31	31	31	31	31
MED	X 41	X 42	X 41	X 41	X 41	X 40	X 40											X 66	X 57	X 48	X 44	X 41	X 39	X 40
U Q	X 43	X 44	X 43	X 43	X 43	X 42	X 44											X 72	X 60	X 52	X 46	X 46	X 42	X 43
L Q	X 38	X 39	X 40	X 40	X 40	X 39	X 37											X 61	X 50	X 43	X 40	X 36	X 35	X 37

IONOSPHERIC DATA STATION Kokubunji

DEC. 2013 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	36	35	37	36	36	32	29	54	74	85	105	98	86	80	85	80V	80	55	44	41	39	31	30	32
2	35	32	34	36	37	35	35	74	84	89	88	86	90	92	79	76	73	68	36	34	36	27	28	29
3	31	34	34	34	35	32	34	76	87	91	84	82	91	88	84	78	69	52	41	35	30	27	31	32
4	36	33	33	32	36	38	38	76	103	103	113	105	102	96	86	81	74	50	41	38	36	29	30	30
5	32	32	35	35	34	36	37	69	82	91	88	93	97	90	88	90	82	56	51	50	40	29	33	35
6	37	36	36	34	36	34	38	65	88	87	85	86	97	101	89	82	70	54	50	42	33	30	33	35
7	36	35	36	36	37	36	41	69	82	83	80	81	101	91	90	90	82	66	58	44	40	39	33	35
8	38	38	40	38	40	35	42	70	79	90	90	98	94	96	98	96	92	76	47	47	50	50	50	35
9	35	38	36	36	39	40	44	75	92	90	89	102	92	109	88	82	76	62	56	48	41	38	34	35
10	36	36	37	38	35	36	41	72	100	98	104	110	96	106	89	85	82	57	51	41	39	41	43	45
11	47	45	40	36	33	34	38	76	99	96	95	94	94	96	89	78	79	71	58	54	44	44	34	40
12	39	36	35	35	33	34	36	66	92	98	86	90	86	85	96	89	85	60	51	41	40	35	36	37
13	38	37	38	38	38	36	37	73	89	91	92	98	89	84	90	94	76	59	65	53	39	37	36	38
14	37	38	36	37	37	33	35	65	77	99	81	90	89	94	92	95	83	59	55	48	48	38	39	41
15	39	38	40	41	36	33	34	70	90	91	105	90	126	96	83	87	76	59	53	42	36	38	38	38
16	40	44	40	40	39	34	36	67	93	103	101	108	114	101	89	86	87	64	56	48	41	43	36	38
17	41	40	37	42	34	33	34	66	85	100	94	102	94	90	90	80	74	62	44	36	42	36	34	32
18	37	34	34	32	32	34	34	70	84	94	84	100	95	103	86	83	80	61	A	36	30	30	29	34
19	33	37	35	36	34	35	32	61	80	94	80	96	90	100	89	93	82	89	53	35	34	40	43	36
20	35	36	34	35	34	35	38	67	79	99	92	86	100	102	91	87	78	64	53	37	33	30	29	34
21	35	36	35	36	38	36	31	55	84	90	90	96	98	96	89	86	72	72	58	43	36	36	30	31
22	32	35	35	35	35	34	31	60	78	92	96	98	94	95	92	96	82	74	44	29	31	29	26	28
23	34	31	32	34	34	35	36	56	66	74	80	87	87	80	96	72	86	66	30	37	35	29	28	28
24	31	30	32	34	33	32	34	62	79	78	75	87	90	95	88	84	85	56	50	42	38	44	32	33
25	33	32	32	34	36	30	31	58	78	80	82	80	72	84	100	75	96	66	51	46	49	31	35	37
26	35	38	40	33	34	35	30	58	82	78	90	107	107	93	80	80	82	44	38	40	36	32	32	34
27	36	36	35	35	35	30	34	65	88	83	78	89	100	97	90	72	77	61	47	39	34	40	26	28
28	30	34	34	32	38	33	26	56	78	85	82	97	88	107	86	92	74	55	48	45	39	27	26	32
29	32	29	33	38	38	24	28	58	72	70	90	84	95	86	76	73	77	52	51	41	37	40	25	30
30	31	31	32	32	33	29	27	56	71	81	89	87	98	95	92	101	75	56	53	44	33	30	26	28
31	32	32	31	33	33	29	29	61	64	81	92	96	98	84	82	77	65	47	38	42	35	31	34	30
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31
MED	35	36	35	35	35	34	34	66	82	90	89	94	94	95	89	84	79	60	51	42	37	35	33	34
U Q	37	38	37	37	37	35	38	70	89	96	94	98	98	100	91	90	82	66	53	46	40	40	36	37
L Q	32	32	34	34	34	32	31	58	78	83	82	87	90	88	86	78	74	55	44	37	34	30	29	30

DEC. 2013 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

DEC.2013 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												A	A	L	A									
2																								
3													A											
4												L												
5												A	L	A	L									
6														A										
7																								
8												L	L											
9																								
10														L										
11																								
12												L												
13																								
14													L		L									
15													A											
16												L	L			A								
17													L	A	A	A								
18															L									
19														L										
20												L												
21																								
22														L										
23												L			A									
24												L	A											
25															A									
26												L												
27																								
28											L		A	L		A								
29													L	L										
30												L		L										
31											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																								
MED																								
U Q																								
L Q																								

DEC.2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC.2013 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								U R 192	A	A	A	A	A	R	R	A	200							
2								184	R	R	R	R	R	R	A	R	A							
3								B	A	R	A	A	A	A	A	A	B							
4								B	U R 272	R	A	A	A	A	A	A	A							
5								B	R	R	R	A	A	A	R	A	A							
6								176	A	A	R	R	A	A	A	A	A							
7								B	R	R	R	R	A	A	R	A	R							
8								B	A	A	A	A	A	R	A	R	R							
9								U R 192	R	R	A	A	A	A	R	R	R							
10								B	R	R	R	A	A	A	R	R	U R 216							
11								B	256	R	A	A	A	A	R	A	R							
12								B	R	R	A	R	A	A	A	R	A							
13								B	252	R	A	A	A	A	A	A	A							
14								B	R	A	R	A	A	A	A	A	A							
15								B	R	R	A	A	A	R	R	A	R							
16								B	A	A	A	A	A	A	A	A	A							
17								B	R	R	R	R	R	336	A	A	A							
18								B	260	A	A	A	A	A	A	A	A							
19								B	A	A	R	R	A	A	R	R	R							
20								B	A	A	A	A	R	A	A	A	216							
21								B	272	R	R	A	R	R	A	A	A							
22								B	R	A	R	A	A	A	A	A	A							
23								B	R	A	A	A	A	A	A	R	R							
24								B	R	A	A	A	A	A	A	R	A							
25								B	232	A	R	R	A	A	A	A	A							
26								B	R	R	R	R	R	R	R	A	U R 212							
27								B	R	R	A	A	A	A	R	A	A							
28								B	U R 268	A	A	A	A	R	A	A	R							
29								B	256	A	A	A	R	R	A	A	R							
30								B	232	A	A	A	A	R	R	A	A							
31								B	244	A	R	R	R	R	R	A	R							
	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	10					1			4							
MED								188	256					336			214							
U Q								U R 192	U R 268								216							
L Q								180	244								206							

DEC.2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2013 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 19	J A 27	J A 28	E B 15	J A 20	21	E B 14	G	31	38	42	42	44	G	J A 37	38	24	J A 22	E B 15	21	E B 15	E B 15	E B 15	E B 16
2	E B 15	E B 15	E B 15	E B 16	E B 14	E B 15	E B 15	G	G	G	G	G	G	G	37	G	26	E B 14	J A 21	J A 19	E B 15	E B 14	E B 14	E B 14
3	E B 15	E B 15	E B 16	E B 16	E B 15	J A 22	20	24	35	G	42	42	41	43	44	J A 40	25	J A 24	23	E B 15	E B 15	E B 14	E B 14	E B 15
4	E B 14	E B 16	E B 15	E B 14	E B 16	J A 21	E B 16	22	G	G	41	41	43	42	41	34	J A 40	33	J A 30	E B 16	22	E B 15	E B 14	E B 16
5	E B 14	E B 16	E B 15	E B 15	E B 15	E B 14	E B 13	E B 15	G	J A 34	G	40	38	40	G	32	J A 26	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
6	E B 13	E B 14	E B 14	E B 13	E B 14	E B 14	E B 15	21	35	42	G	G	41	43	38	42	33	J A 26	J A 30	E B 14	E B 14	E B 14	E B 15	J A 39
7	J A 24	E B 15	E B 14	E B 14	E B 15	E B 13	E B 14	24	G	G	G	G	38	39	G	J A 37	G	J A 24	E B 21	E B 15	E B 14	22	J A 23	E B 14
8	E B 15	E B 14	E B 15	E B 14	E B 15	E B 14	E B 15	23	32	40	42	41	41	G	J A 42	G	G	E B 14	E B 14	E B 14	E B 15	E B 15	E B 24	J A 21
9	J A 22	20	20	E B 14	E B 14	E B 14	E B 14	G	G	G	42	41	42	43	G	G	G	J A 24	E B 14	J A 25	E B 16	E B 16	E B 14	E B 14
10	E B 13	E B 14	E B 15	E B 15	E B 16	E B 14	E B 14	20	G	G	G	39	40	41	G 28	G	G	E B 14	E B 14	E B 16	E B 15	E B 15	E B 16	E B 16
11	E B 15	E B 15	E B 13	E B 14	E B 15	E B 14	20	24	32	G	40	40	J A 41	42	J A 40	36	G	19	E B 16	E B 14	E B 15	E B 15	E B 13	E B 14
12	E B 15	E B 16	E B 15	E B 15	E B 14	E B 15	E B 15	E B 16	G	G	41	G	40	41	39	G	24	E B 14	E B 15	E B 15	E B 15	E B 14	E B 15	E B 14
13	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 16	21	29	G	43	44	42	J A 46	37	35	J A 28	J A 28	J A 33	J A 32	E B 15	E B 16	E B 16	E B 14
14	E B 14	E B 14	E B 16	E B 14	E B 13	E B 16	E B 15	23	G	38	G	43	J A 49	42	J A 39	33	24	E B 16	E B 16	E B 23	J A 14	E B 15	E B 16	E B 14
15	E B 14	J A 17	J A 17	J A 24	20	E B 15	E B 16	23	G	G	42	J A 46	41	G	G	32	G	E B 14	E B 15	E B 15	E B 14	20	E B 14	J A 21
16	J A 21	J A 21	J A 31	J A 29	J A 20	21	20	E B 18	34	39	42	42	44	41	J A 45	J A 47	J A 38	J A 42	E B 15	J A 17	J A 16	E B 15	E B 14	E B 15
17	E B 16	E B 14	E B 15	E B 15	E B 14	E B 15	20	E B 16	G	G	G	G	G	42	44	J A 92	J A 39	E B 14	J A 23	J A 24	J A 23	E B 14	E B 14	E B 15
18	E B 16	J A 23	J A 19	J A 34	E B 16	E B 16	E B 15	22	31	42	41	54	J A 45	J A 59	J A 53	J A 42	J A 32	J A 50	J A 52	26	J A 23	E B 15	E B 15	E B 16
19	E B 14	E B 16	E B 15	J A 19	E B 13	J A 26	J A 29	J A 24	32	38	G	G	43	42	G	40	G	E B 15	E B 16	J A 28	E B 14	E B 13	E B 14	J A 30
20	J A 27	J A 31	J A 27	E B 15	E B 14	21	E B 14	J A 29	J A 57	J A 54	42	43	G	42	J A 41	41	27	E B 15	E B 15	E B 19	J A 21	E B 14	E B 16	E B 15
21	22	E B 15	22	E B 15	E B 15	E B 15	E B 15	22	35	G	G	J A 38	G	G	41	J A 39	J A 36	E B 15	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14
22	E B 15	E B 15	J A 37	E B 14	J A 26	J A 19	E B 15	E B 16	G	43	G	42	39	43	43	40	34	J A 19	J A 20	E B 15	E B 15	E B 15	E B 16	E B 14
23	E B 14	E B 15	E B 15	22	E B 15	E B 14	E B 15	E B 16	G	42	41	J A 44	42	41	39	G	G	E B 14	E B 14	E B 15	22	E B 16	E B 15	E B 14
24	E B 15	E B 14	E B 14	E B 14	E B 15	J A 22	21	E B 17	G	41	J A 40	J A 72	44	45	41	G	J A 45	J A 26	20	E B 14	E B 15	E B 14	E B 14	E B 14
25	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	30	J A 38	G	G	39	40	J A 44	36	24	E B 14	E B 31	J A 48	E B 15	E B 15	E B 14	23
26	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14	E B 15	22	G	G	G	G	G	G	G 26	40	G	20	E B 14	J A 19	E B 15	E B 15	E B 14	E B 14
27	E B 15	J A 36	J A 21	E B 16	E B 15	E B 14	E B 16	E B 14	G	G	42	42	42	41	G	41	34	J A 26	J A 21	J A 24	E B 16	E B 13	E B 14	E B 15
28	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	G	42	44	41	40	G	42	43	G	E B 16	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14
29	J A 32	J A 28	J A 20	E B 15	22	22	E B 15	21	G	J A 38	41	40	G	G	J A 37	41	G	E B 16	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
30	E B 15	E B 14	E B 14	E B 15	E B 14	E B 14	E B 16	20	29	40	41	42	G	G	G	41	27	E B 14	E B 32	J A 14	E B 15	E B 15	E B 15	E B 15
31	E B 16	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14	32	40	G	G	G	G	G	42	G	E B 16	E B 15	E B 15	20	E B 15	E B 15	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	20	G	38	41	41	41	41	39	38	24	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15
U Q	J A 16	J A 17	J A 20	16	16	21	16	23	32	40	42	42	42	42	42	41	J A 33	J A 24	J A 23	J A 23	J A 16	E B 15	E B 15	16
L Q	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	E B 15	E B 16	G	G	G	G	G	G	G	G 32	G	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14

DEC. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2013 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	18	16	E B 15	E B 14	E B 15	E B 14	G	27	30	35	36	37	G	26	38	22	17	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16
2	E B 15	E B 15	E B 15	E B 16	E B 14	E B 15	E B 15	G	G	G	G	G	G	G	33	G	23	E B 14	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14
3	E B 15	E B 15	E B 16	E B 16	E B 15	E B 15	E B 15	22	30	G	37	37	39	39	37	30	23	18	18	E B 15	E B 15	E B 14	E B 14	E B 15
4	E B 14	E B 16	E B 15	E B 14	E B 16	17	E B 16	20	G	G	41	37	40	38	37	32	34	22	25	E B 16	16	E B 15	E B 14	E B 16
5	E B 14	E B 16	E B 15	E B 15	E B 15	E B 14	E B 13	E B 15	G	25	G	37	36	35	G	30	21	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
6	E B 13	E B 14	E B 14	E B 13	E B 14	E B 14	E B 15	20	30	35	G	G	37	41	37	37	29	21	E B 16	E B 14	E B 14	E B 14	E B 15	17
7	16	E B 15	E B 14	E B 14	E B 15	E B 13	E B 14	21	G	G	G	G	37	38	G	35	G	21	E B 15	E B 15	E B 14	E B 15	20	E B 14
8	E B 15	E B 14	E B 15	E B 14	E B 15	E B 14	E B 15	20	28	33	39	39	37	G	39	G	G	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
9	16	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14	G	G	G	38	37	40	39	G	G	G	19	E B 14	18	E B 16	E B 16	E B 14	E B 14
10	E B 13	E B 14	E B 15	E B 15	E B 16	E B 14	E B 14	19	G	G	G	36	37	37	G 23	G	G	E B 14	E B 14	E B 16	E B 15	E B 15	E B 16	E B 16
11	E B 15	E B 15	E B 13	E B 14	E B 15	E B 14	E B 15	21	32	G	37	39	38	38	35	34	G	E B 15	E B 16	E B 14	E B 15	E B 15	E B 13	E B 14
12	E B 15	E B 16	E B 15	E B 15	E B 14	E B 15	E B 15	E B 16	G	G	36	G	38	38	35	G	22	E B 14	E B 15	E B 15	E B 15	E B 14	E B 15	E B 14
13	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 16	20	26	G	38	40	38	37	36	30	22	23	18	18	E B 15	E B 16	E B 16	E B 14
14	E B 14	E B 14	E B 16	E B 14	E B 13	E B 16	E B 15	20	G	35	G	40	42	40	35	32	21	E B 16	E B 16	E B 15	E B 14	E B 15	E B 16	E B 14
15	E B 14	E B 15	E B 14	18	E B 15	E B 15	E B 16	20	G	G	38	42	39	G	G	30	G	E B 14	E B 15	E B 15	E B 14	E B 15	E B 14	E B 15
16	E B 15	E B 16	23	19	18	16	E B 15	E B 18	34	35	39	37	40	40	36	42	37	36	E B 15	14	E B 15	E B 15	E B 14	E B 15
17	E B 16	E B 14	E B 15	E B 15	E B 14	E B 15	E B 15	E B 16	G	G	G	G	G	40	40	53	35	E B 14	18	16	E B 15	E B 14	E B 14	E B 15
18	E B 16	E B 15	E B 16	E B 15	E B 16	E B 16	E B 15	20	29	39	41	48	42	52	46	36	22	40	A A 52	16	20	E B 15	E B 15	E B 16
19	E B 14	E B 16	E B 15	E B 15	E B 13	19	17	18	31	34	G	G	40	38	G	37	G	E B 15	E B 16	16	E B 14	E B 13	E B 14	25
20	E B 16	20	E B 15	E B 15	E B 14	E B 15	E B 14	24	43	37	37	39	G	40	37	36	24	E B 15	E B 15	E B 16	E B 17	E B 14	E B 16	E B 15
21	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	20	32	G	G	37	G	G	35	37	32	E B 15	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14
22	E B 15	E B 15	27	E B 14	19	E B 15	E B 15	E B 16	G	38	G	38	37	40	38	39	29	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 14
23	E B 14	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 16	G	40	35	38	39	38	36	G	G	E B 14	E B 14	E B 15	E B 15	E B 15	E B 16	E B 14
24	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 17	G	36	35	40	40	39	36	G	34	20	18	E B 14	E B 15	E B 14	E B 14	E B 14
25	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	26	33	G	G	36	34	33	36	22	E B 14	20	20	E B 15	E B 15	E B 14	E B 14
26	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14	E B 15	19	G	G	G	G	G	G	G 22	39	G	18	E B 14	E B 15	E B 15	E B 15	E B 14	E B 14
27	E B 15	18	17	E B 16	E B 15	E B 14	E B 16	E B 14	G	G	35	35	37	36	G	36	25	19	18	20	E B 16	E B 13	E B 14	E B 15
28	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	G	40	38	37	37	G	37	40	G	E B 16	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14
29	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	E B 19	G	34	35	35	G	G	30	32	G	E B 16	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
30	E B 15	E B 14	E B 14	E B 15	E B 14	E B 14	E B 16	E B 19	29	37	37	38	G	G	G	35	24	E B 14	19	E B 14	E B 15	E B 15	E B 15	E B 15
31	E B 16	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14	31	34	G	G	G	G	G	34	G	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	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	19	G	30	35	37	37	38	35	34	22	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
U Q	E B 15	E B 16	15	E B 15	E B 15	15	E B 15	20	30	35	38	39	39	39	37	37	25	19	18	16	E B 15	E B 15	E B 15	E B 15
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	E B 16	G	G	G	G	G	G	G	G 30	G	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14

DEC. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC.2013 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	14	14	15	14	15	14	15	12	13	17	16	14	15	13	13	14	14	15	15	15	15	15	16
2	15	15	15	16	14	15	15	14	14	14	14	16	18	16	15	16	14	14	15	15	15	14	14	14
3	15	15	16	16	15	15	15	15	13	20	19	20	18	15	17	14	14	14	15	15	15	14	14	15
4	14	16	15	14	16	16	16	15	14	16	15	14	19	19	16	17	14	14	15	16	15	15	14	16
5	14	16	15	15	15	14	13	15	15	17	18	17	16	14	14	14	15	14	14	14	15	15	15	15
6	13	14	14	13	14	14	15	14	15	17	18	18	17	14	15	17	14	13	16	14	14	14	15	15
7	15	15	14	14	15	13	14	16	15	16	18	16	16	16	15	15	14	14	15	15	14	15	14	14
8	15	14	15	14	15	14	15	15	14	13	15	17	16	17	16	14	15	14	14	14	15	15	15	15
9	14	15	15	14	14	14	14	16	16	14	16	18	14	18	14	15	13	14	14	16	16	16	14	14
10	13	14	15	15	16	14	14	16	16	14	14	13	13	13	14	14	14	14	14	16	15	15	16	16
11	15	15	13	14	15	14	14	15	15	16	16	16	19	16	14	14	15	15	16	14	15	15	13	14
12	15	16	15	15	14	15	15	16	12	16	15	22	17	17	16	14	15	14	15	15	15	14	15	14
13	15	15	15	15	14	15	16	15	15	19	18	22	17	22	15	13	15	15	14	16	15	16	16	14
14	14	14	16	14	13	16	15	15	15	20	19	19	19	22	17	14	14	16	16	15	14	15	16	14
15	14	15	14	16	15	15	16	14	14	15	20	22	18	17	18	15	13	14	15	15	14	15	14	15
16	16	16	14	14	14	16	15	18	12	16	14	16	21	19	19	19	14	16	15	14	15	15	14	15
17	16	14	15	15	14	15	15	16	14	11	17	16	20	18	16	16	14	14	14	15	15	14	14	15
18	16	15	16	15	16	16	15	14	16	18	17	18	20	24	22	16	13	15	15	14	14	15	15	16
19	14	16	15	15	13	15	14	14	12	12	14	13	14	16	22	18	14	15	16	15	14	13	14	14
20	16	14	15	15	14	15	14	14	13	14	16	21	17	16	17	17	15	15	15	16	15	14	16	15
21	14	15	15	15	15	15	15	16	15	18	17	18	21	18	18	17	13	15	14	14	15	15	15	14
22	15	15	14	14	14	15	15	16	14	16	17	16	17	17	19	16	14	15	15	15	15	15	16	14
23	14	15	15	15	15	14	15	16	18	17	19	16	19	18	17	17	14	14	14	15	15	16	15	14
24	15	14	14	14	15	15	15	17	14	16	16	20	15	15	16	16	14	13	13	14	15	14	14	14
25	15	15	15	15	15	15	15	15	12	12	14	18	14	17	16	12	12	14	14	14	15	15	14	14
26	15	15	14	15	15	14	15	16	14	14	17	19	20	18	14	12	14	14	14	15	15	15	14	14
27	15	14	14	16	15	14	16	14	14	14	17	18	18	19	15	18	16	15	15	15	16	13	14	15
28	15	15	15	15	15	14	14	15	13	14	14	14	16	16	15	17	17	16	15	15	14	14	14	14
29	15	15	15	15	15	15	15	15	14	15	13	16	16	16	16	15	15	16	14	14	15	15	15	15
30	15	14	14	15	14	14	16	14	14	16	17	16	16	16	14	15	12	14	14	14	15	15	15	15
31	16	14	14	14	15	15	15	14	14	16	15	17	18	16	19	15	15	16	15	15	15	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	16	17	17	17	17	16	15	14	14	15	15	15	15	15	15
U Q	15	15	15	15	15	15	15	16	15	17	18	19	19	18	17	17	15	15	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	13	14	15	16	16	16	15	14	14	14	14	14	15	14	14	14

DEC.2013 fmin (0.1MHz)

IONOSPHERIC DATA STATION Kokubunji

DEC. 2013 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	295	298	290	296	337	347	325	355	349	357	334	361	348	340	349	309V	352	365	305	316	343	305	312	299
2	291	309	303	320	330	331	305	372	351	360	340	292	313	350	339	333	364	371	341	348	348	334	298	289
3	302	275	294	309	326	320	303	365	359	360	361	362	345	330	338	345	371	332	331	349	313	311	290	283
4	317	292	292	335	304	281	315	348	354	330	346	334	334	348	349	340	359	340	334	350	359	306	305	305
5	291	299	288	294	317	289	332	364	372	368	350	358	337	333	352	340	357	328	336	341	338	316	307	293
6	312	314	286	304	310	289	309	344	375	355	338	299	332	346	344	340	333	344	339	346	333	315	314	295
7	301	311	316	290	292	300	341	366	375	359	344	325	344	332	331	338	353	328	339	349	317	323	308	281
8	288	273	295	299	326	335	327	375	364	367	358	339	323	312	316	305	335	333	317	295	303	300	344	306
9	280	280	290	288	279	305	331	352	358	354	347	338	322	343	329	332	333	338	330	322	317	316	332	306
10	284	287	290	285	287	276	319	355	355	368	351	352	340	341	329	332	339	312	333	336	311	286	290	287
11	317	322	317	291	301	290	311	342	362	363	351	348	338	335	337	342	342	327	326	343	310	300	308	296
12	296	299	303	313	278	286	316	341	365	381	357	344	353	336	340	349	357	329	330	337	309	310	298	284
13	313	303	308	295	298	297	310	349	355	347	356	356	319	332	333	351	347	326	342	333	322	348	308	289
14	300	295	296	300	335	290	319	360	348	368	361	341	340	321	326	330	361	310	342	341	316	284	274	292
15	279	281	298	325	350	289	304	331	361	336	328	315	331	335	326	331	340	303	352	328	308	315	309	290
16	294	294	304	318	335	289	296	344	346	341	337	341	329	353	360	320	337	325	313	311	315	309	289	275
17	290	297	313	309	318	278	338	345	364	357	302	333	327	343	339	337	344	368	355	306	306	327	318	295
18	265	303	297	321	286	292	295	362	372	355	326	340	332	353	337	352	342	327	A	321	290	292	296	264
19	279	268	285	278	289	315	319	347	359	363	365	336	331	346	323	347	328	354	338	339	292	293	303	295
20	271	288	293	284	293	289	319	359	351	358	347	341	317	337	336	337	348	350	342	345	303	324	316	269
21	279	296	298	323	342	309	346	338	356	363	351	328	330	331	329	342	366	342	343	328	318	327	278	276
22	292	296	340	317	324	327	321	358	365	362	361	340	340	329	329	352	343	370	361	353	349	314	310	296
23	262	290	289	282	284	283	335	363	374	365	376	329	348	342	359	351	344	367	311	319	324	311	297	290
24	288	292	292	307	311	305	333	351	369	361	372	339	358	358	362	341	340	362	330	344	307	319	293	292
25	288	278	290	299	335	320	301	361	364	371	344	359	326	334	353	330	351	328	307	331	316	354	306	310
26	283	298	299	283	294	325	313	331	364	329	354	360	320	353	344	347	363	325	324	294	349	301	313	298
27	318	307	303	317	335	306	304	354	374	329	362	337	331	351	368	372	351	341	359	327	337	331	298	287
28	295	262	295	302	328	341	335	344	366	353	341	357	355	323	354	356	365	344	341	335	345	322	290	273
29	314	291	292	311	352	287	321	373	381	358	362	355	360	324	368	332	349	335	318	307	317	346	275	278
30	295	297	307	300	332	298	320	339	353	361	349	331	316	338	327	355	345	357	351	321	325	358	283	274
31	284	288	315	309	333	306	309	356	341	371	362	312	345	347	320	363	359	330	335	349	327	325	304	299
	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	30	31	31	31	31	31
MED	291	295	296	302	318	298	319	354	362	360	351	340	332	338	338	340	348	335	336	335	317	315	304	290
U Q	301	299	304	317	335	320	331	362	369	365	361	355	345	347	352	351	359	354	342	345	337	327	310	296
L Q	283	287	290	291	293	289	309	344	354	354	341	331	326	332	329	332	340	327	326	321	309	305	290	281

IONOSPHERIC DATA STATION Kokubunji

DEC.2013 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												A	A	L	A									
2																								
3													A											
4												L												
5												A	L	A	L									
6														A										
7																								
8												L	L											
9																								
10														L										
11																								
12												L												
13																								
14													L		L									
15													A											
16												L	L			A								
17													L	A	A	A								
18															L									
19														L										
20												L												
21																								
22														L										
23												L			A									
24												L	A											
25															A									
26												L												
27																								
28											L		A	L		A								
29													L	L										
30												L		L										
31											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																								
MED																								
U Q																								
L Q																								

DEC.2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC.2013 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												230	240	246	242									
2																								
3													248											
4												242												
5												224	252	230	242									
6														252										
7																								
8												266	262											
9																								
10														262										
11																								
12												266												
13																								
14													272		264									
15													260											
16												252	254			238								
17													284	220	244	240								
18															286									
19														246										
20												250												
21																								
22														266										
23												266			246									
24												272	238											
25															234									
26												258												
27																								
28											282		230	272		246								
29													246	236										
30												264		268										
31											244	282		246										
	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	12	11	11	7	3								
MED											263	261	252	246	244	240								
U Q												266	262	266	264	246								
L Q												246	240	236	242	238								

DEC.2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2013 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 266	E A 296	E A 306	E B 292	E B 250	208	212	210	210	226	220	A	A	206	A	218	212	196	220	214	216	228	E B 264	E B 278
2	E B 262	E B 276	E B 282	E B 278	E B 240	228	E B 254	218	206	224	216	212	226	222	212	210	208	200	210	214	216	214	E B 280	E B 304
3	E B 304	E B 286	E B 288	E B 274	242	E B 260	E B 248	212	216	214	212	212	A	216	222	220	202	202	212	206	E B 256	E B 232	E B 296	E B 310
4	E B 270	E B 272	E B 294	E B 298	E B 278	E A 276	E B 266	226	214	210	220	202	226	232	222	220	208	212	E A 244	226	212	E B 256	E B 270	E B 290
5	E B 304	E B 298	E B 300	E B 296	E B 268	E B 290	E B 242	202	206	212	216	A	216	A	210	222	214	190	222	212	E B 212	E B 218	E B 288	E B 274
6	E B 266	E B 260	E B 274	E B 282	E B 268	E B 294	E B 254	208	212	212	214	218	226	A	204	218	202	198	214	214	212	E B 250	E B 268	E A 316
7	E A 290	E B 278	E B 278	E B 296	E B 280	E B 266	216	202	206	212	210	216	E A 240	224	226	226	212	204	210	E B 204	214	E B 228	E A 268	E B 322
8	E B 306	E B 302	E B 274	E B 262	E B 250	E B 236	228	210	212	216	228	220	214	222	228	228	206	198	226	E B 256	E B 244	E B	212	E B 234
9	E A 308	E B 296	E B 294	E B 326	E B 302	E B 242	222	216	214	210	218	220	220	E A 236	220	212	210	210	216	226	E B 240	E B 234	E B 242	E B 258
10	E B 272	E B 278	E B 280	E B 272	E B 304	E B 306	E B 242	222	220	214	216	216	212	218	210	212	208	200	212	E B 208	E B 242	E B 282	E B 288	E B 272
11	E B 248	232	E B 244	E B 264	E B 268	E B 286	E B 248	226	210	216	218	214	220	218	218	212	226	198	E B 204	218	226	E B 234	E B 250	E B 270
12	E B 264	E B 278	E B 278	E B 276	E B 274	E B 302	E B 248	208	218	218	208	202	212	222	226	216	210	196	204	204	216	E B 236	E B 268	E B 290
13	E B 268	E B 264	E B 266	E B 270	E B 272	E B 280	E B 252	218	208	210	216	220	210	224	230	230	202	210	224	210	E B 232	E B 240	E B 248	E B 288
14	E B 290	E B 268	E B 272	E B 272	E B 236	E B 264	232	210	202	216	208	216	212	220	216	220	206	194	220	204	230	E B 246	E B 298	E B 288
15	E B 288	E B 292	E B 278	E B E A 256	210	E B 312	E B 228	238	210	220	222	214	A	218	212	220	212	198	206	208	228	E B 256	E B 240	E B 298
16	E B 286	E B 268	E B 288	E A 270	E A 230	E A 266	E B 276	222	216	218	222	222	228	228	216	A	220	206	204	200	E B 244	222	E B 274	E B 300
17	E B 272	E B 266	E B 262	E B 254	E B 248	E B 292	E B 244	212	214	226	206	220	212	A	A	A	202	198	202	232	E B 254	228	E B 248	E B 280
18	E B 298	E B 296	E B 274	E B 272	E B 274	E B 274	E B 270	214	210	224	222	232	228	222	222	220	212	E A 240	A	210	E A 318	E B 244	E B 268	E B 346
19	E B 318	E B 308	E B 306	E B 308	E B 278	E A 246	E A 240	222	216	224	204	220	220	212	218	222	208	216	182	228	E B 264	E B 262	E B 238	E A 280
20	E B 300	E A 312	E B 294	E B 284	E B 272	E B 288	222	220	218	232	218	206	224	222	226	226	214	196	214	200	E A 256	E B 232	E B 246	E B 316
21	E B 318	E B 294	E B 292	E B 278	E B 246	E B 236	206	210	222	220	224	226	230	222	218	222	210	216	202	200	224	226	E B 242	E B 308
22	E B 302	E B 288	E B 298	E A 270	E A 270	E B 238	E B 246	214	208	216	220	226	222	208	226	228	218	198	198	204	218	E B 256	E B 258	E B 302
23	E B 332	E B 304	E B 304	E B 296	E B 286	E B 278	230	206	204	212	218	208	222	224	A	210	218	200	E B 200	E B 240	214	E B 238	E B 264	E B 300
24	E B 300	E B 302	E B 284	E B 274	E B 264	E B 270	E B 234	212	208	208	212	206	A	232	220	220	220	198	E A 238	200	E B 244	E B 232	214	E B 276
25	E B 286	E B 308	E B 306	E B 288	E B 246	E B 228	E B 252	218	212	212	220	214	214	216	A	204	232	198	224	220	E B 238	208	E B 264	E B 264
26	E B 274	E B 292	E B 240	E B 298	E B 290	E B 236	E B 252	216	212	212	212	216	232	226	214	218	204	178	E B 252	E B 232	214	E B 238	E B 262	E B 288
27	E B 258	E A 280	E A 276	E B 260	E B 230	E B 278	E B 264	216	210	204	216	216	232	214	228	206	210	206	224	E A 232	208	218	E B 278	E B 308
28	E B 308	E B 294	E B 276	E B 264	E B 238	218	E B 230	216	216	214	210	234	A	218	216	A	204	198	E B 216	212	206	E B 232	E B 298	E B 296
29	E B 264	E B 294	E B 296	E B 226	214	E A 338	E B 258	214	210	210	228	214	210	206	210	212	216	188	214	200	216	E B 230	E B 256	E B 316
30	E B 296	E B 290	E B 276	E B 288	224	E B 262	E B 262	226	208	220	222	216	214	212	226	234	200	188	212	220	E B 246	216	E B 340	E B 314
31	E B 298	E B 278	E B 278	E B 276	E B 238	E B 250	E B 250	222	214	224	204	214	226	204	212	216	210	192	216	212	E B 230	E B 248	E B 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	31	31	29	26	28	27	28	31	31	30	31	31	31	31	31
MED	E B 290	E B 290	E B 280	E B 276	E B 264	E B 266	E B 246	216	212	216	216	216	220	220	218	220	210	198	212	210	218	E B 234	E B 264	E B 294
U Q	E B 304	E B 296	E B 294	E B 292	E B 274	E B 288	E B 254	222	216	220	220	220	226	224	226	222	214	206	222	226	E B 244	E B 246	E B 278	E B 308
L Q	E B 268	E B 276	E B 274	E B 270	E B 238	E B 238	230	210	208	212	212	213	214	215	212	212	206	196	204	204	214	228	E B 246	E B 278

DEC. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2013 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								120	A	A	A	A	A	122	116	A	120							
2								112	116	114	112	114	116	116	A	118	124							
3								B	114	114	A	A	A	A	120	118	B							
4								B	116	114	120	116	116	118	116	118	A							
5								B	114	114	116	118	116	116	116	116	A							
6								112	122	116	120	120	A	120	120	A	A							
7								B	116	110	124	124	A	124	118	120	116							
8								B	120	114	A	A	A	118	118	118	120							
9								124	120	114	A	A	A	A	114	118	120							
10								B	120	114	114	A	A	A	110	120	116							
11								B	118	110	114	118	A	A	116	A	122							
12								B	114	118	A	118	A	118	A	118	118							
13								B	122	124	A	A	A	A	A	A	A							
14								B	122	120	120	A	A	A	A	124	A							
15								B	116	116	114	A	A	112	114	A	120							
16								B	A	A	A	A	122	A	122	116	A							
17								B	116	112	112	112	128	116	A	A	A							
18								B	118	122	114	114	120	A		A	A							
19								B	116	120	120	118	A	A	120	120	124							
20								B	A	A	A	120	124	A	A	A	114							
21								B	114	118	116	A	120	112	A	120	A							
22								B	118	116	116	A	A	A	A	A	118							
23								B	116	A	A	A	A	A	A	118	120							
24								B	122	A	A	A	A	A	A	116	A							
25								B	118	118	118	116	A	A	A	114	A							
26								B	118	116	116	116	116	112	114	112	124							
27								B	124	116	118	A	A	A	110	116	A							
28								B	120	A	A	A	A	120	A	A	124							
29								B	124	120	A	A	122	124	A	A	122							
30								B	112	120	124	124	124	122	122	124	128							
31								B	120	116	116	122	122	116	120	122	118							
	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	28	25	19	15	12	16	17	20	18							
MED								116	118	116	116	118	121	118	116	118	120							
U Q								122	120	119	120	120	123	121	120	120	124							
L Q								112	116	114	114	116	116	116	114	116	118							

DEC. 2013 h′E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2013 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	102	100	100	B	96	100	B	G	108	108	108	100	100	G	94	104	160	100	B	96	B	B	B	B
2	B	B	B	B	B	B	B	G	G	G	G	G	G	G	104	G	128	B	114	112	B	B	B	B
3	B	B	B	B	B	98	96	134	130	G	108	104	106	104	122	114	112	94	94	B	B	B	B	B
4	B	B	B	B	B	96	B	140	G	G	122	112	116	120	124	120	106	104	104	B	106	B	B	B
5	B	B	B	B	B	B	B	B	G	98	G	112	114	116	G	114	102	B	B	B	B	B	B	B
6	B	B	B	B	B	B	B	140	128	124	G	G	102	126	122	110	106	112	110	B	B	B	B	102
7	94	B	B	B	B	B	B	142	G	G	G	G	106	126	G	118	G	90	90	B	B	92	92	B
8	B	B	B	B	B	B	B	142	136	126	106	106	108	G	120	G	G	B	B	B	B	B	100	98
9	98	98	98	B	B	B	B	G	G	G	106	106	106	104	G	G	G	90	B	108	B	B	B	B
10	B	B	B	B	B	B	B	138	G	G	G	108	96	90	88	G	G	B	B	B	B	B	B	B
11	B	B	B	B	B	B	98	136	154	G	122	120	108	108	124	106	G	90	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	G	G	104	G	106	122	106	G	128	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	146	158	G	106	110	108	108	108	106	102	102	102	102	B	B	B	B
14	B	B	B	B	B	B	B	156	G	134	G	110	110	104	110	130	100	B	B	96	B	B	B	B
15	B	110	98	96	94	B	B	138	G	G	118	110	106	G	G	110	G	B	B	B	B	100	B	98
16	114	98	98	98	98	96	98	B	108	110	108	108	126	106	122	118	104	102	B	104	128	B	B	B
17	B	B	B	B	B	B	100	B	G	G	G	G	G	138	118	106	104	B	100	102	104	B	B	B
18	B	104	100	100	B	B	B	140	150	118	124	120	122	106	106	106	106	100	98	104	86	B	B	B
19	B	B	B	106	B	104	102	98	120	118	G	G	96	104	G	122	G	B	B	106	B	B	B	98
20	102	104	102	B	B	102	B	96	94	94	108	120	G	106	110	106	144	B	B	104	100	B	B	B
21	124	B	98	B	B	B	B	160	168	G	G	108	G	G	108	128	110	B	B	B	B	B	B	B
22	B	B	102	B	96	96	B	B	G	124	G	106	108	106	106	108	122	112	112	B	B	B	B	B
23	B	B	B	94	B	B	B	B	G	104	110	106	106	106	102	G	G	B	B	B	90	B	B	B
24	B	B	B	B	B	92	96	B	G	102	108	100	106	106	102	G	100	98	98	B	B	B	B	B
25	B	B	B	B	B	B	B	B	156	114	G	G	102	98	100	112	110	B	106	106	B	B	B	106
26	B	B	B	B	B	B	B	148	G	G	G	G	G	G	92	114	G	104	B	92	B	B	B	B
27	B	90	94	B	B	B	B	B	G	G	122	104	98	104	G	122	102	92	94	92	B	B	B	B
28	B	B	B	B	B	B	B	B	G	102	106	108	96	G	106	106	G	B	B	B	B	B	B	B
29	118	100	100	B	100	100	B	130	G	118	106	110	G	G	104	100	G	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	136	158	132	126	110	G	G	G	124	120	B	88	B	B	B	B	B
31	B	B	B	B	B	B	B	B	148	126	G	G	G	G	G	122	G	B	B	B	98	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	7	8	10	5	5	9	6	17	14	17	18	22	23	21	23	24	19	14	13	13	7	2	2	5
MED	102	100	99	98	96	98	98	140	142	118	108	108	106	106	106	113	106	100	100	104	100	96	96	98
U Q	118	104	100	103	99	101	100	144	156	125	122	110	108	118	120	121	122	104	108	106	106			104
L Q	98	98	98	95	95	96	96	135	120	103	106	106	102	104	102	106	102	92	94	96	90			98

DEC. 2013 h'Es (KM)

IONOSPHERIC DATA STATION Kokubunji

DEC. 2013 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	F2	F2	F2		F2	F1			L2	L2	L2	L2	L2		L2	L2	H2	F2		F1				
2															L2		C2		F1	F2				
3						F2	F2	C L 1 2	C1		L2	L1	L1	L1	C2	C2	C2	F2	F2					
4						F1		H2			C1	C2	C1	C1	C2	C2	L2	F2	F2		F2			
5										L2		C1	C1	C1		C2	L2							
6								H1	C1	C2			L1	C2	C2	L2	L2	F2	F2					F2
7	F2							H2					L1	C1		C1		F2	F1			F2	F3	
8								H2	C2	C2	L1	L1	L1		C1								F3	F1
9	F2	F1	F1								L1	L2	L1	L1				F2		F2				
10								H1				L2	L2	L2	L2									
11							F2	H2	H2		C2	C2	L1	L1	C1	L2		F1						
12											L2		L2	C2	L2		C1							
13								H2	H1		L2	L2	L2	L2	L2	L2	L1	F2	F2	F3				
14								H1		C1		L1	L1	L2	L2	C L 1 1	L1			F2				
15		F1	F2	F2	F1			H2			C2	L2	L2			L1						F2		F2
16	F2	F1	F3	F2	F2	F2	F1		L2	L2	L2	L2	C2	L2	C2	C2	L2	F3		F1	F1			
17							F1							H L 1 1	C L 2 2	L2	L2		F2	F1	F1			
18		F2	F2	F2				H1	H1	C1	C2	C2	C2	L3	L2	L2	L3	F4	F3	F2	F2			
19				F1		F3	F2	L2	C2	C2			L1	L1		C1				F2				F4
20	F2	F3	F3			F2		L2	L3	L3	L2	C1		L2	L2	L2	H1			F1	F2			
21	F2		F1					H2	H1			L1			L2	C1	L2							
22			F3		F2	F1				C1		L2	L2	L2	L2	L2	C2	C2	F2					
23				F1						L1	L2	L2	L2	L2	L2						F1			
24						F2	F1			L2	L1	L2	L2	L2	L2		L2	F1	F2					
25									H1	C2			L2	L1	L2	C L 1 1	L2		F2	F2				F2
26								H2							L1	C1		F2		F2				
27		F3	F2								C2	L2	L2	L2		C1	L2	F2	F2	F2				
28										L1	L1	L1	L1		L2	L2								
29	F2	F2	F2		F1	F2		C L 1 1		C1	L2	L2			L2	L2								
30								H1	H1	C1	C1	C1				C1	C1		F2					
31									H1	C1						C1					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. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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	X 43	X 40	X 40	X 41	X 44	X 34	X 34												X 65	X 66	X 63	X 60	X 44	X 39
2	X 41	X 40	X 39	X 38	X 40	X 37	X 32												X 56	X 62	X 54	X 49	X 40	X 38
3	X 39	X 40	X 42	X 41	X 41	X 39	X 34												X 60	X 72	X 72	X 55	X 48	X 49
4	X 47	X 40	X 41	X 41	X 46	X 41	X 38												X 66	X 62	X 54	X 46	X 42	X 40
5	X 37	X 38	X 37	X 38	X 40	X 37	X 38												X 71	X 79	X 66	X 54	X 42	X 37
6	X 42	X 38	X 39	X 40	X 43	X 38	X 38												X 72	X 66	X 55	X 46	X 42	X 40
7	X 39	X 38	X 38	X 38	X 40	X 35	X 36												X 68	X 72	X 68	X 59	X 47	X 36
8	X 39	X 40	X 40	X 40	X 42	X 36	X 38												X 85	X 71	X 81	X 72	X 55	X 30
9	X 34	X 38	X 38	X 38	X 40	X 37	X 38												X 77	X 82	X 78	X 60	X 45	X 35
10	X 35	X 36	X 38	X 36	X 36	X 36	X 36												X 74	X 78	X 73	X 62	X 56	X 48
11	X 46	X 43	X 41	X 36	X 37	X 37	X 36												X 96	X 86	X 72	X 69	X 62	X 43
12	X 42	X 41	X 43	X 38	X 38	X 38	X 38												X 73	X 76	X 73	X 64	X 54	X 49
13	X 46	X 48	X 43	X 40	X 41	X 41	X 41												X 73	X 78	X 66	X 66	X 55	X 45
14	X 46	X 39	X 41	X 40	X 41	X 37	X 38												X 78	X 84	X 76	X 71	X 64	X 54
15	X 52	X 48	X 48	X 46	X 41	X 34	X 37												X 82	X 57	X 52	X 56	X 64	X 44
16	X 41	X 44	X 45	X 40	X 39	X 34	X 34												X 70	X 68	X 70	X 70	X 64	X 51
17	X 53	X 48	X 44	X 42	X 39	X 38	X 40												X 61	X 68	X 61	X 60	X 56	X 42
18	X 38	X 38	X 38	X 38	X 37	X 37	X 36												X 72	X 55	X 55	X 53	X 54	X 33
19	X 36	X 38	X 38	X 36	X 38	X 40	X 36												X 99	X 65	X 58	X 70	X 67	X 49
20	X 39	X 39	X 38	X 37	X 37	X 36	X 38												X 77	X 61	X 59	X 57	X 51	X 37
21	X 37	X 38	X 39	X 39	X 38	X 36	X 36												X 94	X 61	X 58	X 66	X 59	X 45
22	X 38	X 40	X 40	X 39	X 40	X 42	X 34												X 62	X 49	X 53	X 59	X 50	X 30
23	X 33	X 35	X 34	X 35	X 36	X 34	X 38												X 68	X 49	X 57	X 60	X 52	X 45
24	X 42	X 40	X 42	X 40	X 39	X 38	X 37												X 68	X 79	X 65	X 81	X 76	X 47
25	X 39	X 38	X 37	X 38	X 42	X 38	X 32												X 78	X 64	X 64	X 72	X 64	X 45
26	X 39	X 40	X 40	X 39	X 40	X 42	X 44												X 58	X 51	X 58	X 58	X 54	X 40
27	X 38	X 38	X 38	X 38	X 40	X 38	X 38												X 80	X 68	X 54	X 58	X 52	X 38
28	X 36	X 38	X 37	X 38	X 42	X 37	X 29												X 66	X 62	X 66	X 60	X 41	X 32
29	X 34	X 37	X 37	X 38	X 46	O X 29	X 30												X 73	X 70	X 64	X 62	X 50	O X 38
30	X 39	X 40	X 39	X 38	X 40	X 29	X 30	X 45											X 70	X 79	X 54	X 55	X 39	X 33
31	X 34	X 37	X 37	X 36	X 39	X 33	X 32												X 57	X 55	X 57	X 58	X 42	X 34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	1											31	31	31	31	31	31
MED	X 39	X 39	X 39	X 38	X 40	X 37	X 36	X 45											X 72	X 68	X 63	X 60	X 52	X 40
U Q	X 42	X 40	X 41	X 40	X 41	X 38	X 38												X 78	X 78	X 70	X 66	X 59	X 45
L Q	X 37	X 38	X 38	X 38	X 38	X 35	X 34												X 66	X 61	X 55	X 56	X 44	X 36

DEC. 2013 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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	37	34	34	35	38	28	28	56	70	90	96	R 101	80	83	88	89	86	83	59	60	57	54	38	33
2	35	34	33	32	34	31	26	48	80	93	R 102	95	87	94	90	88	82	78	50	56	48	43	34	32
3	33	34	36	35	35	33	28	50	86	99	96	Z 86	92	100	101	91	90	R 72	54	66	66	49	42	43
4	41	34	35	35	40	35	32	48	93	U R 121	J R 113	U R 108	R 114	R 118	98	95	88	73	60	56	48	40	36	34
5	31	32	31	32	34	31	32	58	77	92	84	92	96	U R 110	R 102	93	101	84	65	73	60	48	36	31
6	36	32	33	34	37	32	32	57	82	91	88	88	96	R 88	J R 113	92	84	76	66	60	49	40	36	34
7	33	32	32	32	34	29	30	48	77	80	86	84	94	92	92	103	101	79	62	66	62	53	41	30
8	33	34	34	34	36	30	32	50	79	76	94	100	102	101	R 101	U R 108	R 108	90	79	65	75	66	49	24
9	28	32	32	32	34	31	32	56	89	96	92	R 96	96	103	110	105	91	83	R 71	76	72	54	39	29
10	29	30	32	30	30	30	30	53	R 99	101	95	90	104	96	90	91	91	89	68	72	67	56	50	42
11	40	37	35	30	31	31	30	52	102	95	U R 110	102	96	102	102	R 104	104	92	90	80	66	63	R 56	37
12	36	35	37	32	32	32	32	51	90	92	100	86	87	88	96	U R 108	108	92	79	70	67	58	48	43
13	40	42	37	34	35	35	35	51	86	R 92	J R 110	U R 87	92	93	92	U R 90	92	80	67	72	60	60	49	39
14	40	U R 29	35	34	35	31	32	52	82	88	102	96	R	J R 107	J R 110	U R 105	U R 99	87	72	78	70	65	58	48
15	46	42	42	40	35	28	31	52	91	92	101	100	U R 118	U R 116	90	90	87	82	76	51	46	50	58	38
16	35	38	39	34	33	28	28	53	94	U R 110	J R 104	J R 112	J R 118	R	J R 114	U R 92	116	94	64	R 62	64	64	58	R 45
17	47	42	38	36	33	32	34	49	86	95	J R 109	U R 108	J R 112	J R 112	R	R	87	79	R 55	62	55	54	50	36
18	32	32	32	32	31	31	30	48	80	87	98	J R 102	U R 104	R 104	110	102	102	86	66	49	49	47	48	27
19	30	32	32	30	32	34	30	45	80	92	104	92	101	109	R 101	U R 98	88	U R 92	93	59	52	64	61	43
20	33	33	32	31	31	30	32	48	78	R 94	U R 102	86	R	R	88	94	92	90	R 71	55	53	51	45	31
21	31	32	33	33	32	30	30	41	83	R 98	95	R 90	88	R 90	96	R 106	90	83	88	55	50	60	53	39
22	32	34	34	33	34	36	28	43	74	90	U R 98	R 94	R	90	88	100	98	95	56	43	47	53	44	24
23	27	29	28	29	30	28	32	42	74	86	80	84	92	82	R 96	94	84	R 99	62	43	51	54	46	39
24	36	34	36	34	33	32	31	43	76	86	81	80	91	96	84	90	108	99	62	73	59	75	70	40
25	33	32	31	32	36	32	26	39	74	89	85	88	83	93	U R 104	82	90	94	72	58	58	66	58	39
26	33	34	34	33	34	36	38	49	88	86	R 93	U R 99	R	R 98	U R 90	80	93	74	52	45	52	52	48	34
27	32	32	32	32	34	32	32	43	78	83	101	89	102	J R 110	R	R 118	U R 110	U R 110	R 74	60	48	R 52	46	32
28	30	32	31	32	36	31	23	36	68	82	92	R 95	94	R 116	R	R	U R 108	74	60	56	60	54	35	26
29	28	31	31	32	40	23	24	39	77	76	82	85	84	92	92	79	88	84	67	64	58	56	44	32
30	33	34	33	32	34	23	24	39	65	81	92	R 95	R	J R 104	R	U R 102	R	84	64	73	48	49	33	27
31	28	31	31	30	33	27	26	38	67	75	87	95	92	U R 93	87	86	78	73	51	49	51	52	36	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	26	29	27	29	30	31	31	31	31	31	31	31
MED	33	33	33	32	34	31	30	48	80	91	96	94	95	98	96	94	92	84	66	60	57	54	46	34
U Q	36	34	35	34	35	32	32	52	88	95	R 102	R 100	R 102	R 108	R 102	R 104	102	92	72	72	64	60	53	39
L Q	31	32	32	32	32	29	28	43	76	86	88	87	91	92	90	90	88	79	60	55	49	50	38	30

DEC. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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									L 264		L	L	L	L	U L 468	L	L							
2									L	U L 376	L	L	L	L	L	L								
3									260	L	L	L	U L 532	L	L	L		R 188						
4									L	L	L	L	L	L	L	A								
5									264	L	L	L	L	L	L	L	L							
6								168	256		L	L	L	L	L	A	A	204						
7									284	328	L	L	L	L	L	L								
8									260		L	L	L	L	L	L								
9									256		L	L	L	L	L	L								
10										L	L	L	L	L	L	L								
11											L	L	L	L	L	L	284							
12											L	L	L	L	L	L	L							
13									264	L	L	L	A	L	L	L	L							
14									256	L	L	L	L	L	L	L								
15								176		L	L	L	L	A	A	L								
16									256	L	L	L	U L 588	L	L	L								
17									268	344	L	L	L	L	L	L								
18									252	L	L	A	L	L	A	L	L	200						
19										324	L	L	L	L	L	L								
20											L	L	L	L	L	L								
21									260	L	L	L		L	L	L								
22									268		L	L	L	L	L	L	A							
23									260			L	L	L	L	L	L							
24									U L 280	L	L	U L 420	L	L	L	A								
25									268	L	L	L	L	U L 500	L	U L 368	L							
26									252	L	L	L	L	L	L	L	L	200						
27									U L 284	U L 336	L	L	L	L	L	L								
28									U L 272	L	L	L	U L 496	L 496	L	L	L	224						
29									244	L	L	L	L	U L 508	L	L								
30									244	312	L	L	L	L	U L 480	L	L							
31									240	L	L	L	L	L	L	L	L	220						
	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	23	6		1	3	3	2	1	1	6						
MED								172	260	332		U L 420	U L 532	U L 500	U L 474	U L 368	284	202						
U Q									268	344			U L 588	U L 508				220						
L Q									256	324			U L 496	L 496				200						

DEC. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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								172	A 228	R 300	316	A	A	A	320	296	A	A						
2								B	236	280	R 320	332	336	U R 344	U R 340	288	252	180						
3								172	236	300	332	332	360	352	332	300	A 236	B						
4								B	232	296	332	340	360	R 356	340	320	U A 240	B						
5								184	232	U A 288	328	A 320	R 352	R 360	348	316	252	A						
6								B	224	292	320	328	U A 328	360	336	316	A 256	B						
7								188	U A 232	280	304	332	360	364	348	U A 324	264	A 176						
8								B	220	296	332	U A 332	360	360	U A 332	A	256	B						
9								B	236	U A 292	U A 316	U A 336	364	364	340	312	248	B						
10								B	240	300	332	332	368	364	344	320	272	216						
11								B	244	308	A 336	U A 352	360	356	A 336	U A 304	272	200						
12								B	244	296	R 324	356	356	356	U A 332	308	U A 276	U A 180						
13								B	224	300	336	U R 360	U A 360	A 360	U A 348	U A 292	A	B						
14								B	236	U A 308	U A 336	364	U A 360	U A 356	U A 316	U A 304	256	B						
15								180	A 236	R 320	R 348	U R 368	A 360	356	U A 344	U A 316	A	U A 240						
16								B	224	292	336	R 340	360	364	U A 328	A	260	B						
17								B	224	296	328	R 368	364	364	332	316	U A 248	U R 188						
18								B	A 232	312	336	R 344	U R 348	352	A 332	A 296	256	U A 180						
19								A	244	R 304	R 316	R 320	U R 352	R 360	R 344	312	R 268	A						
20								B	228	276	328	352	360	A	R 340	308	U R 264	A						
21								164	220	312	U A 308	336	U R 380	U R 336	R 328	U A 308	R 268	A						
22								B	220	304	332	R 336	A	U R 352	356	U R 324	284	R 196						
23								B	236	300	324	352	U A 324	A	328	312	264	180						
24								B	220	A 304	R 316	332	336	U A 312	324	316	A	A						
25								B	208	292	312	R 336	R 340	R 340	328	A 288	256	B						
26								B	R 200	292	R 320	R 356	R 356	U R 356	U A 328	U R 300	R 272	B						
27								B	204	U A 256	316	A	U R 376	U R 360	A	300	A	B						
28								B	204	R 292	320	U R 332	R 368	360	336	300	260	B						
29								B	216	R 268	U A 312	U A 320	R 348	R 348	R 344	R 324	U R 300	A						
30									224	280	R 308	R	R	A	336	308	A	A						
31								B	212	U A 296	U A 324	328	R 336	R 348	336	312	256	A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	31	31	31	28	28	27	30	29	25	10						
MED								176	228	296	324	336	360	356	336	308	260	184						
U Q								184	236	304	332	352	360	360	344	316	270	200						
L Q								172	220	292	316	332	348	R 352	328	300	254	180						

DEC. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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	E B 16	E B 16	E B 16	E B 16	E B 16	J A 24	E B 16	G	26	33	34	J A 41	35	31	33	32	J A 34	J A 51	J A 38	J A 30	J A 20	E B 16	E B 16	E B 16
2	E B 16	21	E B 16	E B 16	E B 16	E B 16	18	J A 21	26	30	36	G 28	G 28	38	37	33	26	21	E B 16	J A 17	E B 16	J A 16	18	J A 19
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	G 28	G	G 29	40	40	38	35	J A 34	E B 16	E B 16	21	E B 16	E B 16	18	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	G	G	G 22	G 23	40	G 23	G	34	27	E B 19	E B 16	J A 22	E B 16	E B 16	E B 16	22
5	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 21	J A 34	G 23	34	G 33	G 29	G	G 26	G 19	J A 26	J A 22	J A 20	20	18	17	E B 16
6	E B 16	E B 16	J A 19	E B 16	E B 16	E B 16	E B 16	22	23	31	G	34	34	39	43	J A 55	J A 44	E B 16	E B 19	16	E B 16	E B 16	22	22
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	31	32	G	38	G	36	J A 38	G	19	J A 18	E B 16	E B 16	E B 16	18	19
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	32	36	35	42	G	36	33	G	18	J A 34	J A 26	21	J A 19	J A 29	J A 22
9	E B 16	E B 16	J A 19	J A 19	E B 16	E B 16	E B 16	22	J A 25	35	39	J A 36	G 34	38	38	G 25	26	E B 20	E B 16	E B 16	E B 16	E B 16	17	E B 16
10	E B 16	E B 16	18	E B 16	E B 16	E B 16	E B 16	E B 16	26	G 20	G	G	40	40	G 18	34	G 18	26	J A 16	E B 16	E B 16	E B 16	E B 16	E B 16
11	E B 16	E B 16	J A 33	J A 22	J A 29	J A 18	18	E B 16	G	34	37	38	40	39	37	34	G 24	G	E B 16	E B 16	22	E B 16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	38	41	39	38	33	J A 32	J A 26	21	E B 16	18	E B 16	E B 16	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	G	G	38	J A 52	60	J A 43	J A 40	J A 33	J A 25	J A 29	J A 27	J A 31	26	J A 24	J A 34
14	J A 27	26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	35	38	41	J A 60	J A 59	J A 60	J A 41	28	17	J A 25	18	18	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	G	G	40	J A 48	J A 64	J A 64	J A 42	J A 33	26	E B 16	E B 16	24	22	20	20
16	J A 29	J A 22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	31	36	G	44	39	36	38	G	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 16	21	E B 16	E B 16	E B 16	E B 16	J A 21	25	32	34	39	39	39	G 31	36	28	G	J A 20	25	J A 18	E B 16	18	17
18	18	E B 16	E B 16	22	E B 16	E B 16	E B 16	18	25	35	45	52	J A 60	42	J A 60	31	G	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 20	G	G 21	G 24	G	G 28	G 23	G 28	G 25	31	J A 30	18	E B 16	E B 16	E B 16	E B 16	E B 20
20	18	E B 16	E B 16	E B 16	J A 19	E B 16	E B 16	E B 16	G	29	36	38	38	33	G 25	40	30	26	24	32	E B 22	E B 16	E B 16	E B 16
21	E B 16	E B 16	E B 16	E B 16	17	18	E B 16	G	24	33	32	G 41		G	G	32	30	J A 28	J A 23	E B 16	E B 16	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	32	35	G	J A 44	J A 42	G	34	33	28	19	19	E B 16	36	E B 16	E B 16
23	E B 16	E B 20	E B 16	E B 16	E B 16	E B 16	J A 16	E B 16	26	G	G	38	36	J A 43	34	G 26	G	22	E B 16	J A 22	J A 19	E B 20	E B 16	J A 20
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	G	G	G	38	35	G	J A 42	J A 57	J A 52	J A 40	30	18	E B 16	E B 16	E B 20
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	31	36	G 32	G 29	G 36	43	31	G	19	E B 16	E B 16	E B 16	E B 16	21	E B 16
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	31	34	38	41	38	38	33	G	E B 17	J A 17	J A 20	18	E B 16	E B 16	E B 16
27	19	E B 16	E B 16	E B 16	J A 24	E B 16	E B 16	E B 16	G	29	G	28	41	G 33	32	J A 37	J A 38	18	E B 16	J A 16	22	21	20	E B 16
28	J A 18	19	E B 16	E B 16	E B 16	J A 24	21	E B 16	24	31	36	G	39	38	G	31	30	E B 20	E B 16	E B 16	E B 16	E B 16	E B 16	J A 20
29	E B 16	J A 19	E B 16	E B 16	E B 16	E B 17	E B 16	J A 19	23	29	35	36	G 33	G 26	G	G 21	G 18	22	E B 16	E B 16	E B 16	E B 19	18	E B 17
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 22	31	G	G	G	36	G 24	G	27	J A 35	J A 33	26	J A 18	18	E B 16	E B 16
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	J A 35	38	G	G	G	G	G	28	20	J A 20	22	22	18	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	31	34	34	39	38	34	33	28	20	18	17	E B 18	E B 16	E B 16	E B 16
U Q	16	16	16	E B 16	16	16	E B 16	18	25	33	36	38	J A 41	40	38	J A 38	J A 33	J A 26	J A 23	22	20	18	18	20
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	G	G	G	G	G 31	G	18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

DEC. 2013 foEs (0.1MHz)

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DEC. 2013 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	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	24	32	32	39	U Y 35	U Y 31	U Y 33	30	28	38	35	19	E B 16	E B 16	E B 16	E B 16
2	E B 16	17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	30	36	G 28	G 28	38	37	33	26	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	G 28	G	G 29	40	39	36	34	32	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G 22	G 23	40	G 23	G	U Y 34	27	E B 19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 21	30	G 23	U Y 34	G 33	G 29	G	G 26	G 19	20	18	E B 16	E B 16	E B 16	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	31	G	U Y 34	U Y 34	38	42	54	39	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	31	U Y 32	G	38	G	35	36	G	18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	32	36	U Y 35	42	G	36	31	G	U Y 18	30	23	E B 16	E B 16	19	16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 23	31	35	36	G 34	38	36	G 25	U Y 26	E B 20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
10	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	G 20	G	G	39	40	G 18	33	G 18	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
11	E B 16	E B 16	23	18	23	E B 16	E B 16	E B 16	G	G 31	36	37	39	39	36	32	G 24	G	E B 16	E B 16	20	E B 16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G	U Y 38	40	38	38	32	30	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	G	G	37	52	56	39	36	29	20	25	22	28	20	20	29
14	24	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 24	32	36	38	39	46	46	33	28	U Y 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	G	G	40	44	63	47	35	32	G 22	E B 16	E B 16	19	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	30	36	G	42	U Y 39	U Y 36	35	G	U Y 19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	32	34	U Y 39	39	39	G 31	35	U Y 28	G	18	20	E B 16	E B 16	E B 16	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	G 30	45	47	43	42	56	U Y 31	G	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 21	G 24	G	G 28	G 23	G 28	G 25	30	26	U Y 18	E B 16	E B 16	E B 16	E B 16	E B 20
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	U Y 29	36	U Y 38	U Y 38	U Y 33	G 25	40	29	21	24	29	E B 22	E B 16	E B 16	E B 16
21	E B 16	E B 16	E B 16	E B 16	16	E B 16	E B 16	G	24	33	U Y 32	G	U Y 41	G	G	32	28	22	22	E B 16	E B 16	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	32	35	G	42	38	G	34	33	27	18	19	E B 16	31	E B 16	E B 16
23	E B 16	E B 20	E B 16	E B 16	E B 16	16	E B 16	E B 16	24	G	G	U Y 38	U Y 36	40	U Y 34	G 26	G	20	E B 16	E B 16	16	E B 20	E B 16	20
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	G	G	G	37	U Y 35	G	37	44	37	23	28	U Y 18	E B 16	E B 16	E B 20
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	31	36	U Y 32	G 29	U Y 36	37	31	G	U Y 19	E B 16	E B 16	E B 16	E B 16	E B 21	E B 16
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	30	U Y 34	38	U Y 41	38	36	32	G	E B 17	E B 16	19	E B 16	E B 16	E B 16	E B 16
27	E B 16	E B 16	E B 16	E B 16	21	E B 16	E B 16	E B 16	G	29	G	U Y 28	41	G 33	U Y 32	35	30	U Y 18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
28	16	E B 16	E B 16	E B 16	E B 16	16	E B 16	E B 16	24	31	36	G	39	38	G	31	30	E B 20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 17	E B 16	E B 16	E B 16	23	U Y 29	35	36	G 33	G 26	G	G 21	G 18	22	E B 16	E B 16	E B 16	E B 19	17	E B 17
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 22	30	G	G	G	U Y 36	G 24	G	U Y 27	30	28	20	E B 16	E B 16	E B 16	E B 16
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	31	34	G	G	G	G	G	28	20	19	17	18	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	G	32	34	39	38	34	32	28	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 16	24	31	36	38	41	39	37	35	30	22	19	19	16	E B 16	E B 16	E B 16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	30	G	G	G	G	G	G 30	G	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

DEC. 2013 fbEs (0.1MHz)

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DEC. 2013 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	16	16	16	16	16	16	16	16	16	16	16	20	23	19	19	16	16	16	16	16	16	16	16	16
2	16	16	16	16	16	16	16	16	16	16	16	17	16	16	16	16	16	16	16	16	16	16	16	16
3	16	16	16	16	16	16	16	16	16	16	17	20	20	18	19	16	16	16	16	16	16	16	16	16
4	16	16	16	16	16	16	16	16	16	16	18	18	20	18	29	16	16	19	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	16	16	16	16	17	17	19	16	16	16	16	16	16	16	16	16
6	16	16	16	16	16	16	16	16	16	16	16	19	18	16	16	16	18	16	16	16	16	16	16	16
7	16	16	16	16	16	16	16	16	16	16	16	16	16	23	20	16	16	16	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	16	16	16	17	21	16	16	16	16	16	16	16	16	16	16	16
9	16	16	16	16	16	16	16	16	16	16	16	16	20	19	16	16	16	20	16	16	16	16	16	16
10	16	16	16	16	16	16	16	16	16	16	16	16	25	17	16	16	16	16	16	16	16	16	16	16
11	16	16	16	16	16	16	16	16	16	16	21	20	24	16	20	19	17	16	16	16	18	16	16	16
12	16	16	16	16	16	16	16	16	16	16	20	20	18	26	21	16	16	16	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	16	16	20	20	21	29	17	20	16	16	16	16	16	16	16	16
14	16	16	16	16	16	16	16	16	16	19	20	20	22	21	22	20	16	16	16	16	16	16	16	16
15	16	16	16	16	16	16	16	16	16	18	21	19	21	21	20	21	20	16	16	16	16	16	16	16
16	16	16	16	16	16	16	16	16	18	17	20	20	20	20	21	16	16	16	16	16	16	16	16	16
17	16	16	16	16	16	16	16	16	16	16	16	17	20	20	19	18	18	16	15	16	16	16	16	16
18	16	16	16	16	16	16	16	16	16	18	20	29	20	24	21	20	20	16	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	22	20	21	20	20	20	19	17	16	16	16	16	16	16	16	20
20	16	16	16	16	16	16	16	16	16	20	17	20	20	19	17	21	20	16	16	16	22	16	16	16
21	16	16	16	16	16	16	16	16	16	17	20	21	19	20	21	22	16	16	16	16	16	16	16	16
22	16	16	16	16	16	16	16	16	16	16	18	20	18	17	22	21	20	16	15	16	16	16	16	16
23	16	20	16	16	16	16	16	16	16	20	20	21	26	24	20	18	18	16	16	16	16	20	16	16
24	16	16	16	16	16	16	16	16	16	20	21	20	21	28	21	20	20	16	16	16	16	16	16	20
25	16	16	16	16	16	16	16	16	16	17	18	20	20	24	19	16	16	16	16	16	16	16	21	16
26	16	16	16	16	16	16	16	16	20	16	17	20	24	21	20	20	16	17	16	16	16	16	16	16
27	16	16	16	16	16	16	16	16	16	16	20	19	19	20	22	17	16	16	16	16	16	16	16	16
28	16	16	16	16	16	16	16	16	16	20	19	21	21	22	21	20	20	20	16	16	16	16	16	16
29	16	16	16	16	17	16	16	16	16	21	22	23	22	20	24	17	16	16	16	16	16	19	17	17
30	16	16	16	16	16	16	16	16	17	18	20	26	22	24	21	22	17	16	16	16	16	16	16	16
31	16	16	16	16	16	16	16	16	16	16	17	21	24	21	21	20	16	18	16	16	16	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	16	16	16	16	16	16	16	16	16	16	18	20	20	20	20	17	16	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	18	20	20	22	23	21	20	18	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	16	16	16	18	19	18	19	16	16	16	16	16	16	16	16	16

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DEC. 2013 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	310	308	287	296	334	301	303	357	354	341	341	R 379	360	333	340	350	349	369	324	335	350	338	328	303
2	297	308	305	328	335	346	337	340	344	347	R 375	348	357	329	340	339	352	379	326	341	328	333	317	284
3	284	287	310	328	336	343	306	334	380	368	378	Z 340	332	337	347	347	359	R 356	333	334	361	324	292	305
4	317	305	288	300	320	324	301	304	348	U R 364	J R	U R 312	R 330	R 351	342	346	356	337	358	368	317	341	324	300
5	290	289	289	310	306	312	298	340	366	377	350	351	327	U R 323	R 333	335	340	345	331	335	353	332	324	292
6	314	308	299	301	334	297	296	345	374	360	355	356	321	R 362	J R	351	355	343	340	346	356	306	310	292
7	290	284	293	294	315	332	337	341	363	370	363	351	341	333	325	332	354	355	345	331	337	349	319	310
8	284	292	298	300	327	325	323	342	363	354	350	316	336	310	R 312	U R 315	R 323	328	319	313	318	338	367	324
9	286	278	288	262	283	323	306	335	350	389	367	R 365	335	313	322	350	344	333	R 333	329	351	339	359	294
10	294	289	305	301	292	279	310	336	R 381	365	353	346	323	354	334	328	347	360	319	333	331	332	327	295
11	301	300	326	303	298	285	289	329	364	362	U R 360	353	332	330	343	R 335	347	341	339	320	340	312	R 316	291
12	290	302	320	300	294	294	296	338	362	369	374	362	344	337	323	U R 334	338	345	296	316	342	319	321	284
13	297	296	300	305	305	298	296	317	358	R 348	J R	U R 346	346	323	315	U R 352	359	345	330	332	362	332	319	295
14	278	U R 302	314	305	326	312	299	340	357	341	351	337	R	R	J R	U R 331	U R 358	337	318	328	328	344	309	288
15	292	296	306	340	348	265	291	307	367	375	351	308	R	U R 358	344	320	342	344	341	334	308	321	347	328
16	293	300	322	320	319	280	277	314	361	U R 339	R	R	R	R	R	U R 322	323	365	344	R 352	315	308	326	R 292
17	298	308	306	305	293	293	315	331	358	355	R	U R 342	R	R	R	R	346	347	R 359	326	333	341	342	319
18	285	303	304	303	286	277	287	339	364	356	362	R	U R 332	R 345	323	324	353	358	328	324	334	313	344	308
19	278	284	302	286	291	324	324	322	352	351	367	356	340	337	R 308	U R 347	360	U R 346	384	378	312	300	335	330
20	277	292	293	287	302	302	305	336	356	R 381	U R 359	375	R	R	374	328	332	346	R 344	327	314	315	320	302
21	277	290	293	296	307	297	309	317	362	R 365	R 360	R 339	330	R 365	325	R 338	364	333	367	348	334	321	343	304
22	307	295	296	297	300	336	336	330	358	375	U R 378	R 351	R	344	332	350	361	366	369	341	321	343	354	334
23	280	296	291	282	296	296	315	331	359	382	367	354	356	335	R 347	356	329	R 374	367	316	311	328	342	309
24	285	288	297	307	315	331	324	343	374	361	375	362	336	351	354	347	338	355	371	334	328	325	350	309
25	296	289	276	295	335	340	290	329	354	369	352	368	321	333	U R 360	328	325	361	347	342	319	325	334	331
26	278	300	317	283	298	335	300	328	370	365	R 322	U R 372	R	R 352	U R 352	360	346	331	338	332	333	322	360	333
27	286	305	323	295	317	296	319	332	371	348	363	362	337	J R	R	R 342	U R 327	U R 344	R 333	371	301	R 347	343	297
28	278	293	304	305	343	382	379	322	365	363	346	R 381	348	R 330	R	R	U R 346	354	343	335	333	360	342	284
29	286	296	298	320	372	322	300	334	373	380	366	369	351	352	363	356	340	363	347	330	352	331	344	296
30	303	328	304	312	339	377	304	314	341	333	366	R 327	R	J R	R	U R 333	R 356	337	342	319	351	316	280
31	291	304	298	306	339	306	311	341	374	340	355	365	363	U R 358	330	336	346	365	332	315	325	353	348	339
	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	27	29	23	25	24	29	30	31	31	31	31	31	31	31
MED	290	296	300	301	315	312	305	334	362	363	360	353	336	337	337	338	346	347	339	334	331	332	334	302
U Q	297	304	306	307	335	332	319	340	370	370	367	365	348	R 352	347	350	355	361	347	342	342	341	344	319
L Q	284	289	293	295	298	296	296	322	356	348	351	341	330	330	324	330	338	343	330	327	318	321	319	292

DEC. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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									L 426		L	L	L	L	U L 388	L	L							
2									L	U L 412	L	L	L	L	L	L								
3									461	L	L	L	U L 378	L	L	L		R 405						
4									L	L	L	L	L	L	L	A								
5									460	L	L	L	L	L	L	L	L							
6								A	459		L	L	L	L	L	A	A	457						
7									486	466	L	L	L	L	L	L								
8									508		L	L	L	L	L	L								
9									459		L	L	L	L	L	L								
10										L	L	L	L	L	L	L								
11											L	L	L	L	L	L	430							
12											L	L	L	L	L	L	L							
13									413	L	L	L	A	L	L	L								
14									462	L	L	L	L	L	L	L								
15								363		L	L	L	L	A	A	L								
16									446	L	L	L	U L 364	L	L	L								
17									470	433	L	L	L	L	L	L								
18									490	L	L	A	L	L	A	L	L	479						
19										417	L	L	L	L	L	L								
20											L	L	L	L	L	L								
21									419	L	L	L		L	L	L								
22									428		L	L	L	L	L	L	A							
23									408			L	L	L	L	L	L							
24									U L 402	L	L	U L 427	L	L	L	A								
25									463	L	L	L	L	U L 372	L	U L 435	L							
26									494	L	L	L	L	L	L	L	L	444						
27									U L 419	U L 438	L	L	L	L	L	L								
28									U L 442	L	L	L	U L 373	L 360	L	L	L	422						
29									503	L	L	L	L	U L 369	L	L								
30									A	465	L	L	L	L	U L 366	L	L							
31									509	L	L	L	L	L	L	L	L	493						
	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	22	6		1	3	3	2	1	1	6						
MED								363	460	436		U L 427	U L 373	U L 369	U L 377	U L 435	430	450						
U Q									486	465			U L 378	U L 372				479						
L Q									426	417			U L 364	L 360				422						

DEC. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC.2013 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									206		246	218	228	248	260	246	220							
2									248	220	228	230	244	248	258	238								
3									212	230	222	218	272	256	254	240		182						
4									236	234	226	222	246	246	242	222								
5									206	216	226	226	252	266	236	218	216							
6								228	208		220	232	244	234	236	248	222	204						
7									204	218	226	234	258	236	250	254								
8									212		238	282	260	254	290	240								
9									214		218	244	240	232	240	232								
10										222	220	206	260	238	234	240								
11											222	226	226	236	248	252	226							
12											216	218	230	250	278	250	228							
13									216	220	230	222	230	282	290	228	218							
14									212	226	232	224	250	250	274	246								
15								270		222	238	226	262	234	228	264								
16									212	240	226	238	294	232	224	294								
17									226	216	228	234	248	270	238									
18									212	218	238	236	242	228	258	218	240	196						
19										222	226	216	250	240	244	234								
20											230	218	268	256	218	274								
21									224	234	224	218		228	242	242								
22									216		232	226	296	256	256	248	222							
23									210			236	236	238	266	226	228							
24									214	220	222	234	264	260	230	226								
25									210	222	226	222	H 226	266	230	222	264							
26									222	228	224	228	232	234	224	214	240	198						
27									212	214	226	218	260	236	232	248								
28									214	216	262	218	250	276	238	236	216	194						
29									208	208	232	218	236	260	234	220								
30									210	228	218	276	238	234	258	260	230							
31									212	228	234	224	232	254	268	240	226	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								2	25	22	30	31	30	31	31	30	14	6						
MED								249	212	222	226	226	247	248	242	240	226	197						
U Q									216	228	232	234	260	256	258	248	230	204						
L Q									210	218	222	218	236	234	234	226	220	194						

DEC.2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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	272	254	300	284	226	248	266	224	200	228	H 222	216	204	202	202	204	A	216	252	224	198	214	218	250
2	288	272	260	254	240	218	232	226	H 192	H 184	224	198	H 198	214	210	216	214	194	180	214	206	206	242	292
3	316	306	274	248	242	226	270	232	186	216	210	202	200	222	202	220	218	E B 190	192	224	200	218	266	272
4	242	254	304	284	250	234	286	256	218	216	214	204	218	206	202	A	216	196	194	198	196	210	244	270
5	284	300	298	270	274	254	270	226	170	H 200	202	196	208	206	212	212	214	196	194	216	194	208	210	286
6	262	264	282	288	244	264	282	B	166	218	212	224	202	224	236	A	A 180	198	200	194	204	262	278
7	282	300	308	292	270	232	226	230	154	188	218	204	210	222	218	228	222	198	198	206	204	210	196	244
8	314	294	284	284	258	242	238	212	148	210	214	204	230	H 202	216	222	208	202	242	242	232	212	202	248
9	322	322	304	358	310	228	260	238	180	212	206	194	194	222	216	220	220	208	198	214	206	218	208	286
10	290	306	276	268	294	316	264	242	214	210	208	194	176	220	222	214	224	210	192	228	210	214	222	252
11	280	250	262	266	326	320	300	252	220	214	220	206	196	206	208	212	198	218	200	208	200	212	218	244
12	290	280	252	262	280	292	282	240	218	214	A 218	A 210	198	H 188	H 210	A 210	222	194	186	202	206	218	224	268
13	290	270	270	250	266	292	288	250	198	212	224	208	A	E A 254	214	220	222	200	224	226	206	234	234	334
14	334	296	264	276	262	246	268	230	180	204	216	214	244	236	234	230	216	206	200	214	214	198	232	262
15	280	274	262	232	222	316	298	E B 282	212	222	216	212	248	A	A	206	222	218	206	204	238	258	214	234
16	302	300	248	248	258	304	334	264	196	210	220	228	204	222	222	202	234	198	186	200	188	218	222	246
17	260	266	266	264	284	296	256	236	172	194	214	230	220	216	224	226	210	194	186	236	208	196	220	226
18	292	286	278	270	282	322	304	234	168	218	234	A	224	A 220	A	214	218	174	184	186	216	226	216	258
19	334	318	296	316	312	258	206	228	218	A 220	214	212	198	226	218	228	216	220	200	184	202	228	224	224
20	312	306	290	302	276	274	256	228	214	228	220	212	H 208	242	218	H 218	216	218	206	250	258	236	222	256
21	324	306	286	290	288	252	240	244	222	226	226	204	228	226	216	238	208	212	200	182	210	230	236	240
22	278	296	286	284	278	234	228	236	186	220	228	208	212	H 202	220	218	A	214	182	200	210	242	214	234
23	332	318	312	324	298	300	262	208	E A 228	212	216	232	214	204	206	220	206	216	190	198	246	218	224	260
24	286	304	286	274	266	242	260	226	212	216	202	190	194	226	210	A	244	208	192	230	194	240	208	244
25	288	306	322	304	248	232	322	252	176	216	220	210	196	186	226	184	212	208	H 184	198	222	214	220	220
26	326	288	254	300	296	224	254	218	166	224	204	226	A	212	194	210	226	172	210	214	218	222	210	234
27	296	278	260	286	272	276	260	228	H 198	H 196	208	204	228	208	204	202	202	222	168	188	214	214	212	244
28	326	298	278	278	244	216	214	244	H 176	214	216	214	200	204	214	204	214	E A	196	212	226	202	226	318
29	318	298	292	256	212	298	310	248	160	A	214	204	210	206	230	208	218	204	198	206	200	232	216	322
30	306	248	276	278	234	212	288	238	A	188	222	210	222	230	206	206	228	194	198	218	202	214	248	352
31	322	290	290	298	248	272	280	222	150	216	220	222	216	204	200	212	222	154	198	248	228	196	234	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	31	31	31	31	31	31	31	30	30	30	31	30	29	30	29	28	28	30	31	31	31	31	31	31
MED	292	296	282	278	266	254	266	234	188	214	216	209	208	214	214	214	217	203	198	212	206	214	222	252
U Q	322	306	296	292	284	296	288	244	214	218	220	214	221	224	221	220	222	214	200	224	218	228	234	278
L Q	282	272	264	264	244	232	254	226	170	210	212	204	198	204	206	207	213	194	186	200	200	210	214	240

DEC. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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								E B 160	106	100	100	A	A	A	110	114	A	A						
2								B	106	106	110	110	110	102	102	100	110	110						
3								E B 182	114	114	98	108	112	108	108	108	102	B						
4								B	102	98	102	106	106	106	114	100	104	B						
5								E B 152	112	112	112	108	114	112	102	106	104	A						
6								B	108	102	102	100	100	104	104	104	108	B						
7								154	130	98	96	96	102	106	104	104	104	E B 122						
8								B	104	100	100	100	100	100	100	100	104	B						
9								B	110	100	98	98	110	108	106	104	104	B						
10								B	108	102	100	98	104	96	102	106	108	146						
11								B	110	100	102	102	104	102	102	102	106	142						
12								B	110	102	104	100	100	104	100	110	110	128						
13								B	124	102	100	100	102	A 106	104	102	A	B						
14								B	114	110	106	110	104	106	104	102	A	B						
15								140	110	110	108	104	102	102	104	102	A	102						
16								B	118	106	100	100	102	102	102	A	108	B						
17								B	110	104	96	100	104	102	112	112	A	138						
18								B	112	110	104	108	102	104	104	104	102	E B 154						
19								A	168	104	108	98	106	106	106	108	108	A						
20								B	110	104	100	106	108	A	104	106	104	A						
21								E B	110	104	104	102	102	102	106	106	104	A						
22								B	110	118	116	98	A	108	106	108	110	E B 122						
23								B	110	106	102	104	104	A	114	112	110	E B 142						
24								B	110	106	104	104	104	A 106	104	A	A	A						
25								B	110	104	110	108	110	102	106	108	108	B						
26								B	B 102	104	114	112	112	108	108	108	B							
27								B	122	116	102	A	A	114	A	110	A	B						
28								B	110	106	98	100	100	104	104	102	108	B						
29								B	132	104	102	102	114	110	110	110	114	A						
30									A 140	106	104	106	108	A	116	108	A	A						
31								B	124	102	102	102	106	104	104	104	106	A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								5	30	31	31	29	28	27	30	29	23	10						
MED								E B 154	110	104	102	102	104	104	104	106	108	128						
U Q								E B 171	118	106	104	107	109	108	108	108	108	142						
L Q								146	110	102	100	100	102	102	104	102	104	122						

DEC. 2013 h′E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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	B	B	B	B	B	94	B	G	110	118	104	98	98	98	156	98	94	90	90	86	86	B	B	B
2	B	92	B	B	B	B	106	100	184	172	174	98	98	178	188	168	172	132	B	142	B	102	102	104
3	B	B	B	B	B	B	B	G	180	102	G	100	166	146	142	128	104	B	B	88	B	B	86	B
4	B	B	B	B	B	B	B	100	G	G	96	96	190	96	G	192	108	B	B	102	B	B	B	86
5	84	B	B	B	B	B	B	G	104	112	96	114	106	100	G	94	94	90	90	88	88	88	88	B
6	B	B	98	B	B	B	B	86	156	208	G	114	112	128	116	106	104	B	84	B	B	B	92	92
7	B	B	B	B	B	B	B	G	152	166	148	G	182	G	128	106	G	134	96	B	B	B	90	84
8	B	B	B	B	B	B	B	B	140	202	186	110	116	G	110	102	G	140	90	90	92	102	94	94
9	B	B	110	96	B	B	B	94	100	106	104	104	94	178	88	94	140	B	B	B	B	B	98	B
10	B	B	94	B	B	B	B	B	178	96	G	G	126	152	92	118	92	92	88	B	B	B	B	B
11	B	B	90	92	90	90	96	B	G	114	114	120	112	108	106	106	98	G	B	B	86	B	B	B
12	B	B	B	B	B	B	B	B	G	G	G	122	106	108	102	176	114	92	98	B	88	B	B	B
13	B	B	B	B	B	B	B	B	134	G	G	122	108	104	106	104	96	98	96	94	90	94	84	86
14	82	86	B	B	B	B	B	B	148	116	112	138	104	104	100	102	150	100	94	94	88	B	B	B
15	B	B	B	B	B	B	B	G	156	G	G	184	104	116	110	106	98	106	B	B	96	96	98	94
16	102	96	B	B	B	B	B	B	180	188	158	G	122	142	110	100	G	136	B	B	B	B	B	B
17	B	B	96	B	B	B	B	94	158	186	204	162	162	162	96	136	108	G	102	102	102	B	92	94
18	80	B	B	96	B	B	B	114	140	132	110	106	108	110	102	108	G	162	B	B	B	B	B	B
19	B	B	B	B	B	B	B	90	G	96	96	G	96	96	92	90	138	86	98	B	B	B	B	B
20	96	B	B	B	94	B	B	B	G	178	146	132	164	90	86	112	146	114	104	100	B	B	B	B
21	B	B	B	B	92	92	B	G	174	166	118	G	168	G	G	124	134	88	84	B	B	B	B	B
22	B	B	B	B	B	B	B	B	G	196	154	G	100	96	G	146	128	114	106	96	B	126	B	B
23	B	B	B	B	B	88	B	B	198	G	G	144	104	98	100	100	G	98	B	88	88	B	B	90
24	B	B	B	B	B	B	B	B	158	G	G	G	110	102	G	94	88	88	88	88	88	B	B	B
25	B	B	B	B	B	B	B	B	186	204	172	98	98	144	116	110	G	110	B	B	B	B	B	B
26	B	B	B	B	B	B	B	B	154	178	178	144	130	132	114	112	G	B	92	88	90	B	B	B
27	96	B	B	B	92	B	B	B	G	110	G	100	172	98	94	92	92	90	B	90	84	84	80	B
28	80	82	B	B	B	92	96	B	164	204	174	G	170	156	G	168	126	B	B	B	B	B	B	98
29	B	98	B	B	B	B	B	92	146	134	110	108	100	94	G	92	90	90	B	B	B	B	86	B
30	B	B	B	B	B	B	B	B	116	178	G	G	G	98	98	G	92	86	80	82	88	84	B	B
31	B	B	B	B	B	B	B	B	114	108	108	G	G	G	G	G	190	146	88	94	92	90	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	7	5	5	3	4	5	3	8	24	25	21	21	29	27	23	29	24	23	18	17	15	9	12	10
MED	84	92	96	96	92	92	96	94	155	166	118	114	110	108	106	106	106	98	91	90	88	94	91	93
U Q	96	97	104	96	93	93	106	100	176	187	173	135	163	144	116	126	136	132	98	98	92	102	96	94
L Q	80	84	92	92	91	89	96	91	137	111	106	100	102	98	96	99	94	90	88	88	88	86	86	86

DEC. 2013 h'Es (KM)

IONOSPHERIC DATA STATION Yamagawa

DEC. 2013 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						F1			C2	CH11	CH11	L2	L2	L1	HL11	LL11	LQ21	L3	F6	F2	F2			
2		F1					F1	LH11	H1	HL11	HL11	L1	L1	HL11	HL11	H1	HL11	H1		F1		F1	F1	F1
3									HC11	L1		L1	HL11	HL11	HL11	CL11	C2			F1			F1	
4								L1			L1	L1	HL11	L1		H1	C2			F1				F1
5	F1								L1	CL11	L1	L1	L1	L1		L1	L1	L2	F3	F2	F1	F1	F1	
6			F1					L1	H1	HC11		C1	C1	CL11	C1	C2	C4		F1				F1	F1
7									HL11	H1	H1		HL11		C1	C2		H1	F1				F1	F1
8									H1	H1	HL11	C1	C1		CL11	C1		H1	F3	F1	F1	F1	F3	F2
9			F1	F1				L1	L1	C1	C1	C1	L1	HL11	L2	L1	HL11						F1	
10			F1						H1	L1			C1	H1	L1	CL11	L1	L1	F1					
11			F3	F3	F4	F1	F1			C1	C1	C1	C1	CL11	C1	C1	L1				F1			
12												C1	C1	C1	C1	HL11	CL12	LH11	F1		F1			
13									HL11			C1	C1	C1	C1	C2	L2	L2	F2	F3	F4	F1	F2	F2
14	F2	F1							H1	C1	C1	H1	C1	C2	C2	C2	HL11	L1	F1	F1	F1			
15									H1			H1	C1	C2	C2	C1	L2	C1			F1	F1	F1	F1
16	FQ11	FQ11							H1	H1	H1		C1	H1	C1	L1		H1						
17			F1					L1	HL11	H1	H1	H1	HL11	H1	L1	HL11	C1		F1	F1	F1		F1	F1
18	F1			F1				C1	H1	H1	C1	C1	C1	C1	C2	C1		HC11						
19								L2		L1	L1		L1	L1	L1	L1	HL11	LL11	F2					
20	F1				F1					H1	H1	HL11	HL11	L1	L1	CL11	H1	CL11	FF31	FF21				
21					F1	F1			H1	H1	C1		H1			C1	HL11	L1	F2					
22										HL11	HL11		L1	L1		H1	C1	C2	F2	F1		F3		
23						F1			H1			H1	C1	L1	L1	L1		L1		F1	F1			F1
24									H1				C1	C1		LH21	L2	L3	F1	F1	F1			
25									H1	H1	HL11	L1	L1	H1	CL11	CL11		C1						
26									H1	H1	H1	HL11	HL11	HL11	CL11	C1			F1	F1	F1			
27	F1				F2					C1		L1	HL11	L1	L1	LH21	L2	L2		F1	F2	F1	F2	
28	F2	F1				F2	F1		H1	H1	H1		H1	H1		H1	C1							F1
29		F1						L1	H1	H1	C1	C1	L1	L1		L1	L1	L1					F1	
30									L1	H1				L1	L1		L1	L2	F4	F1	F1	F1		
31									CH11	C1	C1						HL11	H1	F1	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. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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	X 57	X 52	X 47	X 48	X 47	X 33	X 32													X 95	X 97	X 92	X 61	X 54
2	X 52	X 52	X 49	X 47	X 42	X 36	X 31													X 76	X 76	X 65	X 59	X 48
3	X 47	X 49	X 53	X 55	X 55	X 38	X 35													X 91	X 102	X 73	X 64	X 64
4	X 62	X 50	X 47	X 46	X 50	X 46	X 36													X 79	X 76	X 65	X 59	X 56
5	X 45	X 44	X 39	X 38	X 40	X 34	X 34													X 98	X 105	X 90	X 80	X 59
6	X 51	X 52	X 43	X 40	X 43	X 34	X 34													X 88	X 97	X 84	X 72	X 64
7	X 58	X 59	X 60	X 58	X 64	X 51	X 38													X 87	X 97	X 82	X 75	X 51
8	X 49	X 53	X 64	X 72	X 73	X 62	X 42													X 116	X 122	X 122	X 72	X 40
9	X 38	X 42	X 39	X 38	X 43	X 47	X 35													X 116	X 136	X 104	X 74	X 58
10	X 54	X 59	X 62	X 60	X 56	X 41	X 42													X 107	X 124	X 108	X 91	X 73
11	X 58	X 60	X 53	X 41	X 39	X 37	X 37													X 133	X 136	X 118	X 108	X 67
12	X 51	X 52	X 54	X 42	X 36	X 35	X 34												X 123	X 114	X 118	X 101	X 79	X 62
13	X 56	X 56	X 50	X 43	X 40	X 40	X 38													X 91	X 100	X 103	X 94	X 79
14	X 60	X 58	X 56	X 50	X 53	57	56													X 123	X 125	X 115	X 96	X 80
15	X 76	X 73	X 82	X 70	X 40	X 33	X 34													X 93	X 71	X 82	X 89	X 68
16	X 45	X 46	X 57	X 55	X 36	X 30	X 33													X 118	X 120	X 103	X 103	X 83
17	X 70	X 68	X 67	X 59	X 44	X 44	X 36													X 84	X 92	X 92	X 76	X 60
18	X 48	X 46	X 44	X 38	X 34	X 34	X 35													X 92	X 76	X 79	X 70	X 55
19	X 48	X 52	X 55	X 56	X 55	X 50	X 54													X 138	X 121	X 109	X 111	X 94
20	X 67	X 58	X 56	X 56	X 50	X 45	X 47													X 94	X 78	X 89	X 82	X 64
21	X 50	X 52	X 53	X 51	X 48	X 39	X 40	X 54												X 92	X 96	X 116	X 115	X 82
22	X 59	X 56	X 52	X 48	X 43	X 46	X 32													X 71	X 70	X 80	X 80	X 49
23	X 40	X 38	X 37	X 37	X 40	X 40	X 41													X 81	X 72	X 98	X 92	X 71
24	X 58	X 52	X 51	X 44	X 46	X 40	X 34													X 118	X 118	X 114	X 118	X 72
25	X 57	X 52	X 44	X 42	X 46	X 36	X 34													X 126	X 112	X 120	X 102	X 64
26	X 53	X 55	X 50	X 45	X 45	X 48	X 53	X 68												X 76	X 79	X 85	X 76	X 61
27	X 41	X 44	X 45	X 43	X 37	X 36	X 37													X 108	X 96	X 91	X 81	X 65
28	X 57	X 56	X 58	X 56	X 55	X 32	X 29													X 90	X 93	X 100	X 62	X 38
29	X 37	X 38	X 38	X 36	X 36	X 30	X 31													X 90	X 109	X 94	X 84	X 58
30	X 50	X 51	X 49	X 52	X 47	X 38	X 30													X 99	X 92	X 79	X 72	X 36
31	X 42	X 42	X 44	X 44	X 40	X 39	X 42													X 67	X 77	X 81	X 62	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	31	31	31	31	31	31	31	2											1	31	31	31	31	31
MED	X 52	X 52	X 51	X 47	X 44	X 39	X 35	X 61											X 123	X 93	X 97	X 92	X 80	X 62
U Q	X 58	X 56	X 56	X 56	X 50	X 46	X 41													X 116	X 118	X 108	X 94	X 71
L Q	X 47	X 46	X 44	X 42	X 40	X 34	X 34													X 87	X 78	X 82	X 72	X 54

DEC. 2013 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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	51	46	41	42	41	27	26	52	86	82	108	120	J R 86	90	J R 102	104	108	95	82	89	91	R 86	55	48
2	46	46	43	41	36	30	25	49	80	96	R 120	108	98	112	104	102	102	96	70	70	70	59	53	42
3	41	43	47	49	49	32	29	53	86	109	122	105	R 96	R 120	116	123	124	95	74	85	96	67	58	58
4	56	44	41	40	44	40	30	46	95	130	128	127	141	137	123	117	96	97	88	73	70	59	53	50
5	39	38	33	32	34	28	28	53	86	87	96	111	106	119	128	R 118	125	120	100	92	99	R 84	74	H 53
6	45	46	37	34	R 37	28	28	50	84	109	110	R 101	120	R 127	125	116	108	100	96	82	91	78	66	58
7	52	53	R 54	52	58	45	32	50	74	93	93	90	88	R 101	108	119	122	111	87	81	90	76	69	45
8	43	47	58	R 66	67	56	36	55	87	91	94	105	128	124	124	131	137	122	115	J R 110	116	116	66	34
9	32	36	33	32	R 37	41	29	52	96	118	121	106	116	132	U R 142	U R 147	U R 139	U R 130	R 116	J R 110	130	R 98	68	52
10	48	53	56	54	50	35	36	58	93	104	121	R 101	R 99	124	120	R 103	116	115	114	101	118	102	85	67
11	52	54	47	35	33	31	31	56	100	105	120	112	101	114	124	R 130	132	R 130	127	127	R 130	J R 112	102	61
12	45	46	48	36	30	29	28	52	91	111	117	100	92	102	109	127	122	123	117	108	R 112	95	73	56
13	50	50	44	37	34	34	32	49	91	112	121	120	104	104	94	123	114	105	86	85	94	J R 97	88	73
14	54	52	R 50	44	47	F 50	F 50	58	88	109	128	126	U R 136	J R 134	U R 138	140	R 136	137	R 120	117	119	109	90	74
15	70	67	76	64	34	27	30	54	108	128	R 124	115	R 127	R 140	J R 124	100	108	106	87	87	65	76	83	62
16	39	40	51	49	30	24	27	54	93	R 114	R 142	143	J R 140	D Y 145	R 155	U R 146	R 152	D Y 144	U R 124	112	114	97	97	77
17	64	62	61	53	38	38	30	48	91	122	123	124	129	J R 126	U R 140	135	133	118	98	78	86	86	70	54
18	R 42	40	38	32	28	28	29	51	80	99	112	R 131	J R 122	125	U R 145	U R 152	R 136	R 130	J R 106	86	70	73	64	49
19	42	46	49	50	49	44	48	55	85	104	126	124	111	128	130	J R 128	R 136	R 129	132	R 132	115	103	J R 105	88
20	61	52	50	50	44	39	41	58	89	114	126	110	115	135	136	R 106	120	114	102	88	72	83	78	58
21	44	46	47	45	42	33	34	48	82	115	124	106	96	112	122	R 124	124	120	114	86	90	110	109	76
22	53	50	46	42	37	40	26	J R 43	80	93	111	113	91	115	126	125	135	114	88	65	64	74	74	43
23	34	32	31	31	34	34	35	50	72	95	102	86	98	111	110	130	122	123	114	75	66	92	86	65
24	52	46	45	38	40	34	28	40	73	95	98	80	90	114	J R 121	R 121	R 134	U R 144	R 130	112	112	R 108	112	66
25	51	46	38	36	40	30	28	42	79	100	96	99	92	112	136	118	107	R 124	R 134	120	J R 106	114	96	58
26	47	49	44	39	39	42	47	62	99	114	105	120	R 120	124	R 129	R 120	116	123	96	70	73	79	70	55
27	35	R 38	39	37	31	30	31	R 42	77	96	R 122	124	107	136	U R 148	Y	R 153	U R 140	U R 140	102	90	85	75	59
28	51	50	52	50	49	26	23	37	68	90	100	R 117	105	113	U R 140	U R 159	U R 155	J R 148	R 108	84	87	94	56	32
29	31	32	32	30	30	24	25	38	82	86	94	98	R 98	110	114	109	98	R 104	92	84	103	R 88	78	52
30	44	45	43	46	41	H 32	24	38	81	85	127	106	140	R 144	130	U R 141	U R 142	134	R 102	93	86	73	J R 66	30
31	36	36	38	R 38	34	33	36	38	74	84	111	117	R 102	110	119	101	95	90	79	61	71	R 75	56	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	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31
MED	46	46	45	41	38	33	30	50	86	104	120	111	105	120	124	123	124	120	102	87	91	86	74	56
U Q	52	50	50	50	44	40	35	54	91	114	124	120	122	132	U R 136	U R 131	R 136	R 130	R 117	110	112	102	88	65
L Q	41	40	38	36	34	28	28	43	80	93	102	101	96	112	116	116	108	105	88	81	72	76	66	48

DEC. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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											L	L	L	L	L	L	L							
2									L	L		L	L	L 524	L	L								
3										L	L	L	L	L	L	L	A							
4										L	L	L	L	U L 500	L	L								
5											L	L	L	L	L	L	L							
6											L	L	L	L	L	L								
7											L	L	L	L	L	L	L							
8											L	L	U L 532	L 456	L	L	A							
9										L	L	L	L 480	L	L	L								
10											L	L	L	L	L		L							
11										L	L	L	L	L	L	L								
12										L	L	L		L	L	U L 500								
13											L	L	L	L		L 516								
14											L	L	L	L	L									
15											L	L	L	L	A									
16											L	L	L	L		L	L							
17										L	L	L 484	L	L	L	L	L							
18											L	L	L	U L 512	L	L	L							
19										L	L	L	U L 516	L	L		L							
20									248	L	L	L	L	L	L		L							
21											L	L		L	L	L								
22									284	328		L	L	L	L	L	L							
23											L	L	L	L	L	L	L							
24										L	L	L 468	L	L	L	A	L							
25									L		L	L	L	L	U L 516	L								
26											L	U L 488	L	L	L	L								
27										L	L	L		L	L	L								
28										L	L	L	L 500	L	U L 500	L	L							
29										L	L	L	L 500	L	L	L	L							
30										L	L	L	U L 496	U L 504	L	L								
31											L	L 500	L	U L 484	U L 496	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									2	1		4	6	6	3	2								
MED									266	328		L 486	L 500	U L 502	U L 500	L 508								
U Q												L 494	U L 516	L 512	U L 516									
L Q												L 476	L 496	L 484	U L 496									

DEC. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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								176	236	312	U R 336	U A 328	U R 360	U R 328	B	R 292	272	A	B					
2								B	240	288	R	A	R	R 336	R	R 304	A	A	B					
3								B	256	R 320	336	364	R	U R 352	R 348	A	A	A	A					
4								A	240	U R 280	B	R 356	R 384	R 360	B	324	292	220	B					
5								B	236	U R 292	R 328	B	B	U R 360	356	336	A	A	B					
6								B	248	U R 316	U R 360	B	R	B	R 352	R 324	A	A	A					
7								180	236	304	R	R	B	U R 372	U R 368	U R 356	A	R 200	A					
8								172	236	R 284	R 356	B	B	B	U R 368	R 340	A	A	B					
9								B	240	304	U A 320	U R 300	U R 376	U A 384	368	U R 348	A	R 204	B					
10								B	244	R	A	B	B	B	B	U R 292	A	A	A					
11								A	252	R 300	U R 292	360	U A 376	A	U A 344	U A 328	R 288	196	B					
12								B	240	308	R 332	U R 356	U R 384	A	A	R	304	A						
13								B	248	U R 288	U R 344	356	R 352	B	U A 340	A	A	A	A					
14								B	240	320	R 352	B	U A 380	U A 372	U R 348	A	276	A	B					
15								B	236	300	356	A	B	B	U R 344	A	A	192	B					
16								B	248	R 284	R	R	A 376	U R 356	R 356	A	U R 288	232	A					
17								B	244	308	R 344	U R 324	U R 284	U R 352	R 340	332	288	A	B					
18								B	244	A	340	R 376	U R 352	U A 368	A	A	A	A	A					
19								B	A	U R 288	336	340	A	B	U R 336	320	A	A	A					
20								B	A	U R 284	B	B	B	B	R 352	336	A	A	A					
21									248	300	B	R	B	B	R	A	A	A	A					
22								B	228	A 268	R	U R 308	B	B	B	U R 344	292	A	A					
23								B	248	B	B	B	U R 364	U R 352	A	A	A	A 232	A					
24								B	228	296	U A 320	B	R 352	A	A	A	276	U A 208	A					
25								B	216	260	R 308	R 332	A	U R 392	356	U A 320	U A 272	B	B					
26									216	296	U R 272	B	U R 420	R	A	U R 308	A	212	B					
27								B	B	R 292	B	B	R	R	R	R	A	A	A					
28								A	216	288	336	R	U R 308	U R 396	R	B	R 288	A	B					
29								B	236	B	U R 348	A	A	A	A	A	A	A	A					
30								B	B	R 280	B	B	B	B	B	B	R	B	A					
31								B	B	A	U R 328	A	U R 356	U R 364	B	R 320	U R 284	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	26	26	20	12	15	15	15	17	12	9						
MED								176	240	294	R 336	R 348	U R 364	U R 360	R 352	R 324	288	208						
U Q								180	248	304	R 346	358	U R 380	U R 372	R 356	U R 338	290	226						
L Q								172	236	R 284	U R 324	U R 326	R 352	U R 352	U 344	R 314	276	198						

DEC. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	35	G	35	G	G 25	E B 38	G	34	25	J A 16	J A 19	18	18	E B 14	E B 14
2	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 20	G	G	G 29	42	G 34	G 25	G 27	G 25	J A 42	J A 23	J A 21	E B 18	E B 14	E B 14	E B 14	E B 14
3	E B 14	E B 14	E B 17	E B 14	E B 14	E B 14	E B 14	E B 16	G	J A 44	37	G	G 27	G	36	J A 33	J A 66	J A 32	22	22	J A 23	J A 18	E B 14	26
4	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	J A 20	G	G	E B 38	40	G	43	E B 42	36	32	G	E B 14	E B 19	E B 14	18	J A 18	J A 17
5	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 17	26	G	36	36	E B 43	G	G	G 28	36	J A 24	J A 15	18	18	J A 20	E B 14	E B 14
6	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 17	G	G	G	42	G 27	E B 43	G	35	J A 33	28	J A 21	19	18	E B 16	E B 14	E B 14
7	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	34	25	G 26	44	G 26	G	G	31	G	J A 32	E B 14	E B 14	22	20	18
8	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	28	G	G E 32	B 41	E B 43	E B 41	54	J A 34	J A 45	24	J A 20	21	E B 14	E B 14	E B 14	E B 14
9	E B 14	E B 14	E B 14	19	J A 19	19	J A E 16	B 18	26	G	40	44	G	J A 40	30	G	J A 34	J A 19	J A 20	J A 20	22	E B 18	E B 17	E B 14
10	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	27	25	40	45	E B 42	E B 44	E B 40	G	35	J A 31	J A 19	J A 24	19	E B 14	J A 18	E B 14
11	E B 14	E B 14	E B 14	E B 14	J A 28	J A 17	J A 17	J A 25	G	G	G	J A 45	J A 46	J A 43	J A 40	J A 40	G 26	23	J A 19	J A 18	E B 14	E B 14	J A 17	19
12	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	44	J A 60	J A 45	G 33	34	30	J A 19	23	18	19	E B 14	E B 14
13	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 21	G	G	G	G	J A 44	46	42	J A 41	J A 34	J A 30	J A 24	J A 37	E B 14	E B 14	18	E B 14
14	E B 14	J A 18	E B 17	E B 14	E B 14	E B 14	E B 14	E B 14	27	G	G	45	J A 60	J A 52	G	42	G 26	24	J A 28	E B 14	J A 19	J A 29	J A 18	20
15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	27	G	G	J A 40	E B 44	E B 42	J A 69	J A 42	J A 54	22	E B 16	J A 23	J A 29	J A 16	E B 14	E B 14
16	E B 14	E B 14	E B 14	J A E 19	B 14	E B 14	E B 14	E B 14	26	G 23	26	28	47	J A 46	G	30	G	26	J A 45	J A 30	J A 20	19	E B 16	E B 14
17	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	48	G 32	G 27	J A 29	E B 16	E B 14	E B 17	J A 24	23	E B 14
18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	34	G	G	G	45	J A 87	J A 45	J A 61	J A 46	J A 32	22	J A 25	22	E B 20	J A 22
19	E B 17	E B 17	E B 14	E B 14	J A 22	E B 14	E B 14	E B 14	24	G	G	G	J A 45	E B 44	G 25	G 25	J A 40	29	27	22	E B 14	E B 14	25	E B 14
20	E B 14	E B 14	E B 14	E B 14	19	J A 19	E B 18	B 14	23	G	E B 44	E B 43	E B 45	E B 45	G	37	J A 42	26	J A 20	J A 20	J A 25	J A 18	E B 14	E B 16
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 16	E B 14	G	G	E B 40	26	E B 44	E B 43	G 34	39	38	J A 42	J A 28	26	18	18	E B 14	E B 14
22	J A 16	E B 16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 18	G	33	G 26	34	E B 42	E B 45	E B 44	G 23	41	J A 39	20	E B 14	17	E B 14	18	E B 14
23	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 16	G	E B 36	E B 42	E B 45	41	G	J A 54	J A 36	35	27	J A 25	J A 22	E B 14	E B 14	E B 14	E B 17
24	E B 17	E B 16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	35	E B 40	44	45	J A 49	J A 45	G 26	34	J A 26	J A E 30	B 21	22	27	22
25	E B 21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	42	42	40	J A 41	32	E B 23	J A E 14	B J A 14	16	18	20	18
26	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	26	G	G E 40	B 42	46	G 33	36	G	25	24	J A 14	19	18	E B 14	J A 19	E B 14
27	E B 14	E B 16	E B 14	E B 14	E B 14	J A 20	E B 18	E B 14	E B 26	G	E B 41	E B 43	G 32	G 28	G 31	G 31	J A 65	J A 53	J 38	A 32	J A 21	J A 22	A E 14	B 21
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	J A 28	26	32	38	G 27	35	42	G E 35	B 39	G	25	E B 16	E B 14	E B 15	E B 14	E B 14	E B 14
29	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	26	E B 32	G	J A 46	J A 59	J A 51	J A 44	J A 39	34	34	J A 31	J A 21	27	30	26	J A 20
30	20	18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 25	G	E B 43	E B 44	E B 42	E B 44	E B 43	E B 43	G 26	26	J A 18	19	E B 14	E B 14	E B 14	E B 14
31	E B 14	E B 15	E B 20	E B 14	E B 14	E B 17	E B 14	E B 14	25	34	G	34	G	G	E B 42	G	G 26	33	26	26	J A 20	A 18	J A 16	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E G 24	G	G E 40	B G	U 38	42	E G 40	E G 34	34	26	J A 20	20	18	18	E B 16	E B 14
U Q	E B 14	E B 14	E B 14	E B 14	14	14	E B 14	20	26	32	E B 38	43	J A 44	45	J A 44	J A 40	J A 41	J A 32	J A 27	J A 23	J A 21	20	19	18
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	G	G 33	G	24	E 16	B 18	E B 14	E B 14	E B 14	E B 14

DEC. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	26	33	G	U Y 35	G	G 24	E B 38	G	33	22	E B 14	17	E B 14	E B 14	E B 14	E B 14
2	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 20	G	G	U G 29	41	U G 34	G 25	U G 27	G 21	41	22	E B 14	E B 18	E B 14	E B 14	E B 14	E B 14
3	E B 14	E B 14	E B 17	E B 14	E B 14	E B 14	E B 14	E B 16	G	34	U Y 37	G	U G 27	G	G 31	33	43	30	20	18	20	16	E B 14	23
4	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	19	G	G	E B 38	39	G	42	E B 42	34	32	G	E B 14	E B 19	E B 14	E B 14	E B 14	E B 14
5	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 17	26	G	36	U Y 36	E B 43	G	G	G 27	32	22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
6	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 17	G	G	G	42	U G 27	E B 43	G	U Y 35	31	25	18	17	E B 14	E B 16	E B 14	E B 14
7	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	33	U G 25	U G 26	42	G 25	G	G	31	G	17	E B 14	E B 14	19	E B 14	E B 14
8	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	G	G 27	E B 41	E B 43	E B 41	53	G 25	42	23	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
9	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 18	26	G	38	43	G	G 35	G 28	G	32	G 18	E B 14	17	18	E B 18	E B 17	E B 14
10	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	27	U G 25	39	E B 40	E B 42	E B 44	E B 40		32	27	17	20	18	E B 14	E B 14	E B 14
11	E B 14	E B 14	E B 14	E B 14	20	E B 14	E B 14	23	G	G	G	42	44	42	40	38	G 25	23	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
12	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	44	54	45	U G 33	33	28	17	18	E B 14	E B 14	E B 14	E B 14
13	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 21	G	G	G	G	43	44	40	39	32	27	22	28	E B 14	E B 14	E B 14	E B 14
14	E B 14	E B 14	E B 17	E B 14	E B 14	E B 14	E B 14	E B 14	27	G	G	43	56	42	G	39	G 22	24	E B 14	E B 14	E B 14	22	E B 14	E B 14
15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	27	G	G	39	E B 44	E B 42	68	38	39	22	E B 16	E B 14	21	E B 14	E B 14	E B 14
16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 23	G 22	U G 26	U G 28	44	44	G	U Y 30	G	U Y 26	32	18	16	18	E B 16	E B 14
17	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	43	G 30	G 24	22	E B 16	E B 14	E B 17	16	18	E B 14
18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	32	G	G	G	43	43	43	33	33	20	20	23	21	E B 20	20
19	E B 17	E B 17	E B 14	E B 14	20	E B 14	E B 14	E B 14	U Y 24	G	G	G	43	E B 44	G 25	G 23	33	28	24	19	E B 14	E B 14	23	E B 14
20	E B 14	E B 14	E B 14	E B 14	16	E B 14	E B 14	E B 14	23	G	E B 44	E B 43	E B 45	E B 45	G	36	37	26	18	18	22	18	E B 14	E B 16
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 16	E B 14	G	G	E B 40	U G 26	E B 44	E B 43	U G 34	U G 39	U Y 38	32	23	22	18	E B 14	E B 14	E B 14
22	E B 14	E B 16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 18	G	30	U G 26	U Y 34	E B 42	E B 45	E B 44	G 20	40	38	20	E B 14	E B 14	E B 14	E B 14	E B 14
23	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 16	G	E B 36	E B 42	E B 45	40	G	40	36	32	26	21	18	E B 14	E B 14	E B 14	E B 17
24	E B 17	E B 16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	34	E B 40	42	45	41	41	G 22	34	22	24	E B 21	21	27	20
25	E B 21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	41	41	39	38	32	E B 23	E B 14	E B 14	16	16	E B 14	E B 14
26	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	26	G	G	E B 42	44	U G 33	U Y 36	G	U Y 25	24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
27	E B 14	E B 16	E B 14	E B 14	E B 14	E 16	B E 18	B E 14	B 26	G	E B 41	E B 43	U G 32	U G 28	U G 31	U G 31	44	36	32	28	18	21	E B 14	17
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	21	26	32	38	U G 27	U Y 35	41	U G 35	E B 39	G	25	E B 16	E B 14	E B 15	E B 14	E B 14	E B 14
29	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	26	E B 32	G	43	43	43	41	36	33	28	27	20	23	24	22	19
30	20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 25	G	E B 43	E B 44	E B 42	E B 44	E B 43	E B 43	U G 26	26	17	17	E B 14	E B 14	E B 14	E B 14
31	E B 14	E B 15	E B 20	E B 14	E B 14	E B 17	E B 14	E B 14	25	32	G	U Y 34	G	G	E B 42	G	G 22	30	22	24	18	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E G 23	G	G E 39	G	U 38	E G 42	E G 39	E G 33	32	26	17	18	E B 14	E B 14	E B 14	E B 14
U Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	26	32	E B 38	42	44	44	42	38	37	28	22	20	18	18	14	14
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	G	G 31	G	22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14

DEC. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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	14	14	14	14	14	14	14	14	14	21	22	21	27	22	38	21	20	14	14	14	14	14	14	14
2	14	14	14	14	14	14	14	20	16	16	20	24	22	21	21	16	15	15	14	18	14	14	14	14
3	14	14	17	14	14	14	14	16	17	21	22	21	23	24	27	20	15	14	14	14	14	14	14	14
4	14	14	14	14	14	14	14	14	14	15	38	21	32	24	42	22	22	14	14	19	14	14	14	14
5	14	14	14	14	14	14	14	17	14	20	23	34	43	27	25	24	18	14	14	14	14	14	14	14
6	14	14	14	14	14	14	14	17	16	17	21	38	26	43	24	24	20	14	14	14	14	16	14	14
7	14	14	14	14	14	14	14	14	14	16	22	21	39	22	25	23	21	16	14	14	14	14	14	14
8	14	14	14	14	14	14	14	14	14	15	17	41	43	41	24	22	20	16	14	14	14	14	14	14
9	14	14	14	14	14	14	14	18	16	18	20	21	23	25	24	16	15	14	14	14	14	18	17	14
10	14	14	14	14	14	14	14	14	14	20	20	40	42	44	40	25	16	14	14	14	14	14	14	14
11	14	14	14	14	14	14	14	14	16	20	24	21	21	33	24	24	18	14	14	14	14	14	14	14
12	14	14	14	14	14	14	14	14	18	18	25	27	32	31	24	24	21	18	14	14	14	14	14	14
13	14	14	14	14	14	14	14	21	16	17	21	24	24	39	22	21	19	14	14	14	14	14	14	14
14	14	14	17	14	14	14	14	14	18	22	22	42	31	27	28	22	18	19	14	14	14	14	14	14
15	14	14	14	14	14	14	14	14	18	22	23	26	44	42	22	24	20	16	16	14	14	14	14	14
16	14	14	14	14	14	14	14	14	17	21	24	22	23	27	26	24	21	15	14	14	14	14	16	14
17	14	14	14	14	14	14	14	14	14	20	30	24	22	26	23	21	15	14	16	14	17	14	14	14
18	14	14	14	14	14	14	14	14	17	22	21	23	24	25	23	24	18	20	14	14	14	14	20	14
19	17	17	14	14	14	14	14	14	21	22	22	24	25	44	21	15	15	14	14	14	14	14	14	14
20	14	14	14	14	14	14	14	14	21	21	44	43	45	45	29	29	22	24	14	14	14	14	14	16
21	14	14	14	14	14	14	16	14	18	22	40	24	44	43	21	22	20	14	14	14	14	14	14	14
22	14	16	14	14	14	14	14	18	21	21	21	23	42	45	44	19	18	22	14	14	14	14	14	14
23	14	14	14	14	14	14	14	16	20	36	42	45	22	31	22	20	17	16	14	14	14	14	14	17
24	17	16	14	14	14	14	14	14	15	20	22	40	32	24	22	23	20	16	14	14	21	16	14	14
25	21	14	14	14	14	14	14	14	14	16	20	22	30	22	21	22	22	23	14	14	14	14	14	14
26	14	14	14	14	14	14	14	14	18	22	22	42	33	24	24	21	21	15	14	14	14	14	14	14
27	14	16	14	14	14	14	18	14	26	22	41	43	24	26	24	22	20	14	14	14	14	14	14	14
28	14	14	14	14	14	14	14	14	14	15	23	24	22	24	25	39	22	21	16	14	15	14	14	14
29	14	14	14	14	14	14	14	14	21	32	24	24	24	24	20	22	19	18	14	14	14	14	14	14
30	14	14	14	14	14	14	14	14	25	21	43	44	42	44	43	43	20	22	14	14	14	14	14	14
31	14	15	20	14	14	17	14	14	21	21	23	24	26	31	42	25	16	14	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	14	14	14	14	14	14	14	14	17	21	22	24	27	27	24	22	20	15	14	14	14	14	14	14
U Q	14	14	14	14	14	14	14	16	20	22	25	40	42	42	28	24	21	18	14	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	14	17	21	22	23	24	22	21	17	14	14	14	14	14	14	14

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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	302	311	296	291	342	328	308	345	350	339	336	363	R	333	J R 317	322	333	343	321	327	328	R 326	310	297
2	293	300	335	292	338	363	325	332	353	328	R 341	355	321	322	332	337	347	371	347	310	341	326	330	297
3	287	287	310	339	349	367	314	328	350	355	349	339	R 303	R 318	312	336	338	348	308	328	343	320	282	297
4	330	283	284	285	305	339	295	296	316	343	329	319	314	331	319	331	335	337	347	335	322	309	325	315
5	317	284	301	316	330	256	292	332	367	366	334	340	317	309	326	R 316	326	342	339	326	343	R 320	343	H 307
6	263	308	305	303	R 321	297	292	342	332	352	351	R 334	321	R 322	313	335	327	329	337	319	313	333	307	314
7	291	280	R 302	296	336	330	321	354	358	352	357	365	317	R 314	305	314	332	344	319	317	317	327	332	300
8	278	288	269	R 286	319	307	343	323	359	361	328	323	321	297	289	311	326	322	307	J R 302	313	321	337	295
9	291	279	292	270	R 294	347	344	347	349	354	362	319	309	305	U R 315	U R 319	U R 336	U R 322	R 347	J R 310	342	R 356	330	306
10	284	281	314	310	311	294	282	323	368	355	356	R 358	R 301	310	337	R 310	333	328	339	321	334	319	314	313
11	285	300	329	295	308	273	293	317	362	348	349	343	316	313	309	R 316	322	R 333	323	328	R 336	J R 323	336	340
12	281	304	330	342	307	305	288	321	355	353	351	348	323	314	305	315	325	322	339	334	R 337	328	320	304
13	294	299	310	308	312	290	288	314	345	344	334	334	311	328	305	311	325	348	318	309	333	J R 288	320	325
14	289	289	R 323	332	327	F 320	F 299	314	356	334	334	324	R	R	U R 316	304	R 332	324	R 332	320	322	307	316	285
15	288	300	331	346	354	263	297	293	333	347	R 347	309	R 316	R 329	J R 321	298	320	333	316	335	322	302	335	339
16	286	297	330	349	365	277	274	304	343	R 319	R 328	338	R	Y	R 328	U R 333	R 318	Y	U R 354	313	314	322	320	322
17	291	306	324	334	328	307	337	317	331	343	340	335	328	R	U R 348	319	331	331	320	342	324	326	324	338
18	R 287	302	316	326	298	289	277	317	354	334	333	R 336	J R 328	309	U R 313	U R 338	R 320	R 320	J R 322	323	299	322	330	326
19	261	271	306	307	290	277	298	328	345	335	341	346	309	311	311	J R 299	R 318	R 322	341	R 344	312	305	J R 307	329
20	264	280	303	290	314	327	288	332	343	336	346	315	299	313	312	R 301	321	331	345	342	316	299	322	325
21	278	276	303	316	315	302	296	320	326	350	354	349	310	309	315	R 313	332	327	340	335	295	317	319	318
22	301	287	300	323	312	352	326	J R 312	361	340	345	352	312	302	319	327	343	343	370	305	300	324	335	370
23	256	278	285	297	293	290	312	332	343	354	358	347	333	328	309	334	332	328	356	330	315	325	327	320
24	276	276	292	316	332	330	355	314	362	358	356	365	320	328	J R 330	R 316	R 336	U R 361	R 345	322	326	R 301	347	328
25	292	286	279	286	330	362	299	317	345	357	351	347	303	307	328	307	320	R 331	R 351	331	J R 311	331	338	328
26	260	274	316	292	290	310	306	314	331	366	339	331	R 345	330	R 322	R 322	332	339	352	317	308	325	320	331
27	325	R 314	323	315	306	316	314	R 314	356	344	R 350	356	312	318	U R 334	Y	R 345	U R 336	U R 365	333	329	339	345	331
28	309	287	310	310	360	367	303	316	343	343	332	R 342	355	305	U R 343	U R 348	U R 353	J R 362	R 329	322	308	354	343	317
29	282	308	341	319	341	327	303	317	359	353	354	359	R 341	332	336	344	317	R 339	318	327	330	R 306	327	298
30	290	312	319	311	349	H 326	310	318	376	328	349	316	337	R 336	306	U R 344	U R 334	360	R 333	330	329	338	J R 364	312
31	288	307	310	R 324	328	306	348	327	354	353	349	342	R 325	321	331	312	322	339	353	318	329	R 343	355	345
	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	28	28	31	30	31	30	31	31	31	31	31	31
MED	288	288	310	310	321	310	303	318	350	348	347	342	317	316	317	318	332	334	339	326	322	323	327	318
U Q	293	304	323	324	338	330	321	332	359	354	351	352	326	328	330	334	335	343	347	333	333	328	337	329
L Q	278	280	300	292	307	290	292	314	343	339	334	331	310	309	311	311	322	328	321	317	313	309	320	304

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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											L	L	L	L	L	L	L							
2									L	L		L	L	L 381	L	L								
3										L	L	L	L	L	L	L	A							
4										L	L	L	L	U L 372	L	L								
5											L	L	L	L	L	L	L							
6											L	L	L	L	L	L								
7											L	L	L	L	L	L	L							
8											L	L	U L 366	L 416	L	L	A							
9										L	L	L	L 408	L	L	L								
10											L	L	L	L	L		L							
11										L	L	L	L	L	L	L								
12										L	L	L		L	L	U L 374								
13											L	L	L	L		L 367								
14											L	L	L	L	L									
15											L	L	L	L	A									
16											L	L	L	L		L	L							
17										L	L	L 403	L	L	L	L	L							
18											L	L	L	U L 382	L	L	L							
19										L	L	L	U L 386	L	L		L							
20									438	L	L	L	L	L	L		L							
21											L	L		L	L	L								
22									415	445		L	L	L	L	L	L							
23											L	L	L	L	L	L	L							
24										L	L	L 409	L	L	L	A	L							
25									L		L	L	L	L	U L 353	L								
26											L	U L 392	L	L	L	L								
27										L	L	L		L	L	L								
28										L	L	L	L 392	L	U L 354	L	L							
29										L	L	L	L 392	L	L	L	L							
30										L	L	L	U L 370	U L 367	L	L								
31											L	L 373	L	U L 390	U L 381	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									2	1		4	6	6	3	2								
MED									426	445		L 398	L 389	U L 382	U L 354	L 370								
U Q												L 406	L 392	L 390	U L 381									
L Q												L 382	U L 370	U L 372	U L 353									

DEC. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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											252	232	262	258	268	250	232							
2									232	280		230	246	284	252	254								
3										238	234	244	236	286	248	246	238							
4										244	242	244	284	250	240	246								
5											244	252	266	286	260	256	242							
6											244	244	276	260	268	248								
7											240	228	258	288	260 L	260	246							
8											250	254	282	252 L	308	270	242							
9										226	236	258	256	284	292	280								
10											236	224	230 L	288	254		244							
11										228	244	236	232	272	278	258								
12										238	246	240		284	290	278								
13											242	242	234	234		292								
14											260	248	290	252	254									
15											236	230	310	266	254									
16											260	254	260	300		254	260							
17										246	244	238	254	242	270	236	244							
18											250	250	256	278	298	260	230							
19										240	244	238	254	282	274		242							
20									234	248	236	240 L	256	288	268		258							
21											244	224		278	264	268								
22									220	228		232	232	274	258	256	242							
23											240	244	246	254	254	262	222							
24										238	238	220	260	266	252	226	260							
25									220		228	242	222	268	276	224								
26											236	262	236	242	252	226								
27										238	248	234		280	278	252								
28										232	250	254	238	282	270	246	244							
29										226	246	234	262	264	250	234	236							
30										260	252	238	262	258	276	258								
31											248	256	246	258	258	234								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									4	15	29	31	28	31	29	26	16							
MED									226	238	244	240	256	272	264	254	242							
U Q									233	246	249	250	262	284	276	260	245							
L Q									220	228	237	232	237	258	254	246	237							

DEC. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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	228	256	274	258	198	222	288	244	218	226	H 202	E Y 232	210	Y 224	214	216	234	212	204	214	214	210	222	256
2	266	262	232	240	224	208	256	236	204	208	242	A 226	222	186	226	212	242	214	180	206	202	200	218	256
3	280	288	256	222	224	206	272	240	228	224	Y 232	202	Y 216	216	212	204	A	194	184	214	208	196	240	A 264
4	230	236	278	284	250	218	292	260	240	222	226	212	206	228	B 228	222	220	222	200	204	198	206	220	236
5	242	272	288	260	256	262	288	240	220	220	204	Y 222	B 222	224	216	210	A 220	214	190	196	208	204	200	210
6	290	258	252	286	246	240	288	230	226	236	232	212	Y 238	E B 234	218	Y 224	224	216	196	192	204	190	218	228
7	240	250	266	254	234	200	244	212	214	230	E Y 224	E Y 218	A 208	222	224	234	232	218	196	194	214	198	214	206
8	280	288	262	244	230	212	200	226	222	222	218	B 214	226	210	E A 272	222	A	212	208	216	222	206	190	258
9	286	296	280	344	296	218	240	238	232	218	224	214	196	206	234	242	228	206	198	200	224	200	202	210
10	258	272	240	238	228	270	270	254	218	224	216	204	194	B 224	226	232	224	228	198	208	214	200	212	214
11	252	254	236	250	E A 286	308	298	270	224	224	232	214	208	216	216	220	226	218	214	204	208	196	208	194
12	288	268	234	226	270	276	302	256	226	218	212	214	216	244	232	224	226	212	198	208	204	214	198	216
13	268	256	242	258	272	286	308	268	218	228	Y 224	218	212	E A 230	214	226	230	218	196	224	206	212	224	200
14	264	272	258	218	234	Q 222	Q 236	246	220	222	224	224	E A 264	220	206	238	248	214	198	218	210	222	202	206
15	262	250	230	206	204	354	310	282	240	236	222	210	224	238	A	224	242	222	200	204	226	242	234	204
16	284	290	234	214	208	322	346	276	226	202	Y 226	220	A 222	218	234	E Y 236	228	224	194	196	188	208	220	204
17	266	258	240	224	240	254	236	262	234	236	216	206	Y 232	Y 230	Y 252	224	218	216	188	184	216	216	218	214
18	264	272	254	232	276	304	324	254	216	228	218	228	216	A 216	236	A	A	212	190	208	228	218	234	224
19	304	316	266	260	278	240	238	218	226	212	228	224	198	E B 238	222	220	236	218	212	198	180	212	220	216
20	248	284	258	270	240	232	246	242	202	222	E B 232	B 222	B 228	E B 254	220	214	E A 238	216	204	202	230	230	216	226
21	288	284	262	244	244	236	272	236	226	236	232	Y 216	222	B 226	E Y 242	Y 242	242	228	202	188	194	208	216	218
22	242	282	262	254	248	216	220	254	198	186	238	Y	B 218	B 232	B	Y 236	A	220	198	182	196	204	214	200
23	322	320	304	288	286	288	252	232	218	232	E B 238	228	214	E Y 232	220	224	228	232	198	192	196	236	204	226
24	246	300	288	256	250	252	220	234	220	220	222	208	224	E A 262	230	A	220	214	196	196	206	212	220	204
25	E B 274	292	302	302	242	208	268	260	206	226	E Y 226	Y 216	A 204	230	238	A 214	230	228	204	194	194	202	200	200
26	292	280	254	294	270	254	258	236	234	224	Y 218	B 210	E A 232	Y 218	E Y 240	212	218	226	194	194	206	214	218	214
27	228	292	262	246	258	264	272	242	220	214	B 228	B 220	236	Y 226	E Y 238	E Y 250	232	214	200	200	218	230	214	214
28	234	282	256	238	216	204	298	E A 252	222	214	234	E Y 240	E Y 232	222	Y 232	236	Y 238	202	182	204	216	212	188	212
29	320	280	234	260	226	240	264	260	230	216	198	E A 228	202	E A 250	A 230	230	226	212	204	200	218	212	228	224
30	A 296	260	248	248	222	198	314	246	232	226	B 244	B 224	B 224	E B 240	B 224	B	230	214	194	202	212	206	210	232
31	324	292	B 286	250	238	262	224	222	236	228	230	Y 222	226	194	E B 228	210	218	220	202	210	226	232	198	214
	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	30	31	31	29	28	27	31	31	31	31	31	31	31
MED	266	280	258	250	241	240	270	243	222	224	225	216	219	222	226	224	228	216	198	202	208	210	216	214
U Q	288	290	274	260	270	270	298	260	230	228	232	224	226	E 234	235	235	236	222	202	208	218	216	220	226
L Q	246	258	240	238	226	216	240	236	218	218	218	212	208	218	219	215	224	212	194	194	202	202	202	206

DEC. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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								164	112	112	110	108	108	108	B	108	116	A	B					
2								B	110	108	110	A	A	112	A	110	A	A	B					
3								B	110	112	108	108	A	108	118	A	A	A	A					
4								A	114	108	B	108	116	110	B	110	110	116	B					
5								B	112	110	108	B	B	112	110	114	A	A	B					
6								B	112	110	108	B	A	B	110	110	A	A	A					
7								152	130	108	A	A	B	114	116	116	A	108	A					
8								170	114	108	108	B	B	B	112	122	A	A	B					
9								B	118	108	108	108	108	134	114	110	A	118	B					
10								B	120	A	A	B	B	B	B	110	A	A	A					
11								A	114	114	110	110	110	A	110	110	114	114	B					
12								B	116	110	110	110	110	A	A	A	110	A						
13								B	110	110	110	110	110	B	110	A	A	A	A					
14								B	118	112	110	B	112	110	110	A	110	A	B					
15								B	112	112	112	A	B	B	106	A	A	112	B					
16								B	E A 168	116	A	A	110	110	110	A	112	154	A					
17								B	114	110	114	106	106	106	106	112	118	A	B					
18								B	112	A	110	114	110	110	A	A	A	A	A					
19								B	A	110	108	110	A	B	A	114	A	A	A					
20								B	A	108	B	B	B	B	114	114	A	A	A					
21									116	110	B	A	B	B	A	A	A	A	A					
22								B	126	108	A	A	B	B	B	112	112	A	A					
23								B	120	B	B	B	108	106	A	A	A	A	A					
24								B	114	114	112	B	116	A	A	A	114	A	A					
25								B	110	108	108	108	A	A	108	108	116	B	B					
26									118	120	112	B	124	A	A	106	A	100	B					
27								B	B	108	B	B	A	A	A	A	A	A	A					
28								A	112	106	110	A	106	110	A	B	112	A	B					
29								B	158	B	110	A	A	A	A	A	A	A	A					
30								B	B	110	B	B	B	B	B	B	A	B	A					
31								B	B	A	110	A	110	114	B	110	110	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	26	26	21	11	15	14	14	17	12	7						
MED								164	114	110	110	108	110	110	110	110	112	114						
U Q								170	118	112	110	110	112	112	114	114	115	118						
L Q								152	112	108	108	108	108	108	110	110	110	108						

DEC. 2013 h′E (KM)

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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	B	B	B	B	B	B	B	G	158	152	G	112	G	104	B	G	110	92	92	88	88	88	B	B
2	B	B	B	B	B	B	B	B	G	G	102	96	100	96	100	98	92	90	90	B	B	B	B	B
3	B	B	B	B	B	B	B	B	G	108	158	G	104	G	100	100	94	112	94	90	92	92	B	92
4	B	B	B	B	B	B	B	96	G	G	B	120	G	118	B	114	188	G	B	B	B	106	96	92
5	B	B	B	B	B	B	B	B	190	G	118	112	B	G	G	104	100	98	98	94	94	96	B	B
6	B	B	B	B	B	B	B	B	G	G	G	128	104	B	G	130	108	108	104	90	86	B	B	B
7	B	B	B	B	B	B	B	G	166	172	104	102	118	106	G	G	108	G	98	B	B	98	94	92
8	B	B	B	B	B	B	B	G	154	G	104	B	B	B	110	104	102	102	102	100	B	B	B	B
9	B	B	B	98	98	98	98	B	158	G	108	108	G	102	102	G	92	94	94	92	90	B	B	B
10	B	B	B	B	B	B	B	B	174	104	122	112	B	B	B	G	96	94	94	92	88	B	98	B
11	B	B	B	B	94	94	94	94	G	G	G	116	112	112	108	108	106	156	96	88	B	B	96	88
12	B	B	B	B	B	B	B	B	G	G	G	G	124	108	104	104	140	120	98	94	94	88	B	B
13	B	B	B	B	B	B	B	B	G	G	G	G	118	110	108	106	104	102	102	98	B	B	90	B
14	B	94	B	B	B	B	B	B	156	G	G	122	114	112	G	106	100	140	96	B	94	100	94	94
15	B	B	B	B	B	B	B	B	144	G	G	118	B	B	110	110	102	136	B	102	100	98	B	B
16	B	B	B	98	B	B	B	B	114	106	106	106	118	114	G	110	G	156	90	92	94	94	B	B
17	B	B	B	B	B	B	B	B	G	G	G	G	G	G	170	100	110	94	B	B	B	98	92	B
18	B	B	B	B	B	B	B	B	G	110	G	G	G	110	104	104	100	96	94	94	90	88	B	92
19	B	B	B	B	92	B	B	B	116	G	G	G	112	B	96	94	90	90	90	106	B	B	96	B
20	B	B	B	B	100	96	100	B	134	G	B	B	B	B	G	122	108	128	90	90	102	96	B	B
21	B	B	B	B	B	B	B	B	G	G	B	106	B	B	96	94	94	94	94	88	88	86	B	B
22	94	B	B	B	B	B	B	B	G	112	106	118	B	B	B	96	128	118	108	B	90	B	90	B
23	B	B	B	B	B	B	B	B	G	B	B	B	124	G	100	96	116	150	96	92	B	B	B	B
24	B	B	B	B	B	B	B	B	G	G	118	B	112	102	106	100	98	130	94	96	B	102	88	92
25	B	B	B	B	B	B	B	B	G	G	G	G	102	160	140	116	118	B	96	B	90	90	86	84
26	B	B	B	B	B	B	B	B	162	G	G	B	146	104	100	G	108	174	94	94	92	B	98	B
27	B	B	B	B	B	96	B	B	B	G	B	B	102	102	102	100	98	100	94	100	100	98	B	90
28	B	B	B	B	B	B	B	98	164	170	178	104	112	170	100	B	G	134	B	B	B	B	B	B
29	B	B	B	B	B	B	B	B	220	B	G	106	100	100	100	96	96	96	92	96	88	88	86	88
30	86	86	B	B	B	B	B	B	B	G	B	B	B	B	B	B	94	134	88	90	B	B	B	B
31	B	B	B	B	B	B	B	B	152	108	G	110	G	G	B	G	96	96	94	90	88	88	88	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	2		2	4	4	3	3	15	9	11	17	17	17	19	23	29	28	27	23	19	18	14	10
MED	90	90		98	96	96	98	96	158	110	108	112	112	108	102	104	102	105	94	92	90	95	93	92
U Q					99	97	100	98	166	161	122	118	118	113	108	110	109	134	98	96	94	98	96	92
L Q					93	95	94	94	144	107	104	106	103	102	100	98	96	95	92	90	88	88	88	88

IONOSPHERIC DATA STATION Okinawa

DEC. 2013 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									H 1	H 1		C 1		L 1			C 1	L 1	L 1	F 3	F 1	F 1		
2											L 1	L 1	L 1	L 1	L 1	L 1	L 2	L 1	L 1					
3										L H 1 1	H L 1 1		L 1		L 1	L 1	L 3	C L 2 1	L 1	F 1	F 1	F 1		F 1
4								L 1				C 1		C 1		C 1	H 1					F 1	F 1	F 2
5									H 1		C 1	C 1				L 1	L 2	L 1	L 1	F 1	F 1	F 1		
6												C 1	L 1			C 1	C 1	C 1	L 1	F 2	F 1			
7									H L 1 1	H 1	L 1	L 1	C 1	L 1			L 1		L 3			F 1	F 1	F 1
8									H C 1 1		L 1				C 1	L 1	L 3	L 1	L 1	F 1				
9				F 1	F 1	F 1	F 1		H 1		C 1	C 1		L 1	L 1		L 2	L 1	L 1	F 2	F 1			
10									H L 1 1	L 1	C L 1 1	C 1					L 1	L 2	L 1	F 3	F 1		F 1	
11					F 2	F 2	F 1	L 3				C 1	C 1	C 1	C 1	C 1	L 1	H L 1 1	L 1	F 1			F 1	F 1
12													C 1	C 2	C 1	L 1	H L 1 1	C 1	C L 1 3	F 1	F 1	F 1		
13													C L 1 1	C 1	C 1	C 1	C 1	L 2	L 2	F 2			F 1	
14		F 1							H 1			C 1	C 1	C 1		L 1	L 1	H 1	L 1		F 2	F 1	F 1	F 1
15									H 1			C 1			C 3	C 1	L 2	H 1		F 1	F 2	F 1		
16				F 1					C 1	L 1	L 1	L 1	C L 1 1	C 1		C 1		H 1	L 3	F 3	F 1	F 1		
17															H 1	L 1	L 1	L C 1 1				F 1	F 1	
18										C 1				C 1	L 2	L 2	L 2	L 2	L 1	F 1	F 1	F 1		F 1
19					F 1				C 1				C 1		C 1	L 1	L 1	L 1	L 1	F F 1 1			F 1	
20					F 1	F 1	F 1		H 1							C 1	C 1	C 1	L 3	F 2	F F 2 1	F 1		
21												L 1			L 1	L 1	L 1	L 2	L 1	F 1	F 1	F 1		
22	F 1									C 1	L 1	C 1				L 1	C L 1 1	C 1	C L 1 1		F 1		F 1	
23													C 1		L 1	L 1	C 1	C L 1 1	L Q 1 1	F 1				
24											C 1		C 1	L 1	L 1	L 1	L 1	H L 1 1	L 1	F 1		F 1	F 1	F 1
25													L 1	H L 1 1	H 1	C 1	C 1		L 1		F 3	F F 1 1	F 1	F 1
26									H 1				H 1	L 1	L 1		L 1	H 1	L 1	F 1	F 1		F 1	
27						F 1							L 1	L 1	L 1	L 1	L 2	L 3	L 2	F 2	F 2	F 1		F 1
28								L 3	H 1	H 1	H 1	L 1	C 1	H 1	L 1			H 1						
29									H 1			C 1	L 1	L 1	L 1	L 1	L 1	L 1	L 2	F 1	F 2	F 3	F 2	F 1
30	F 1	F 1															L 1	H 1	L 1	F 1				
31									H 1	L 1		C 1					L 1	L 1	L 1	F 2	F 1	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. 2013 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

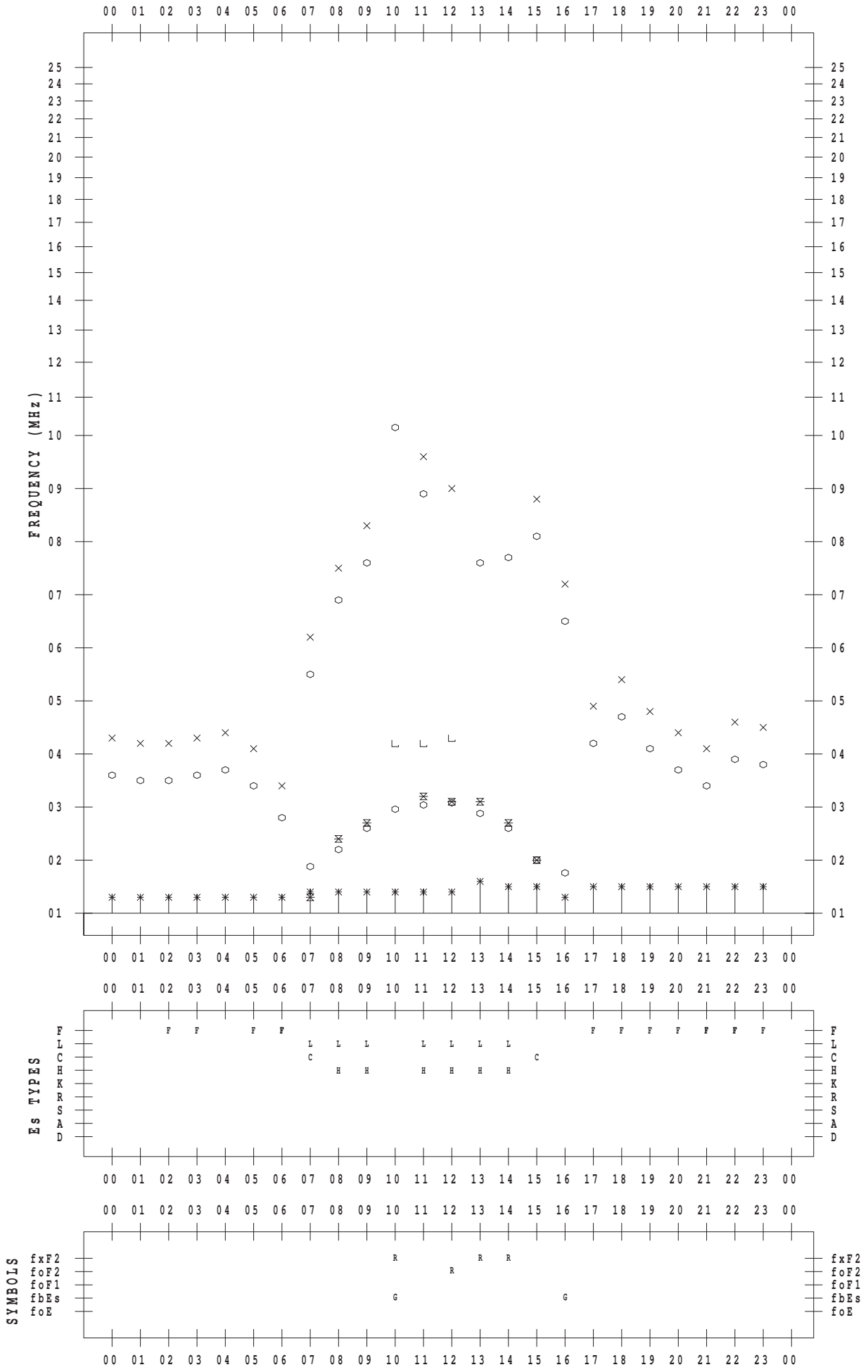
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 1

135 °E MEAN TIME



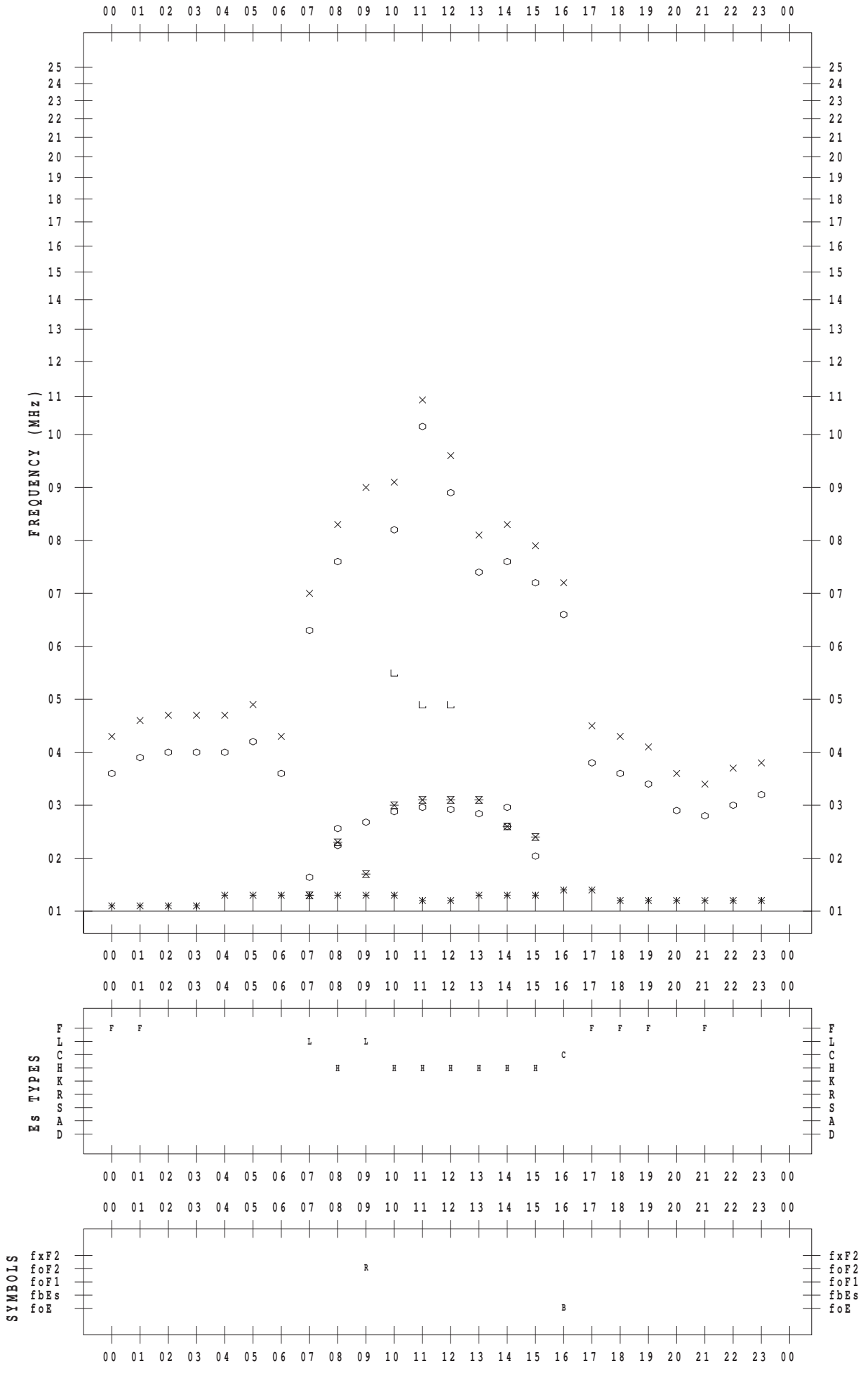
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 2

135 °E MEAN TIME



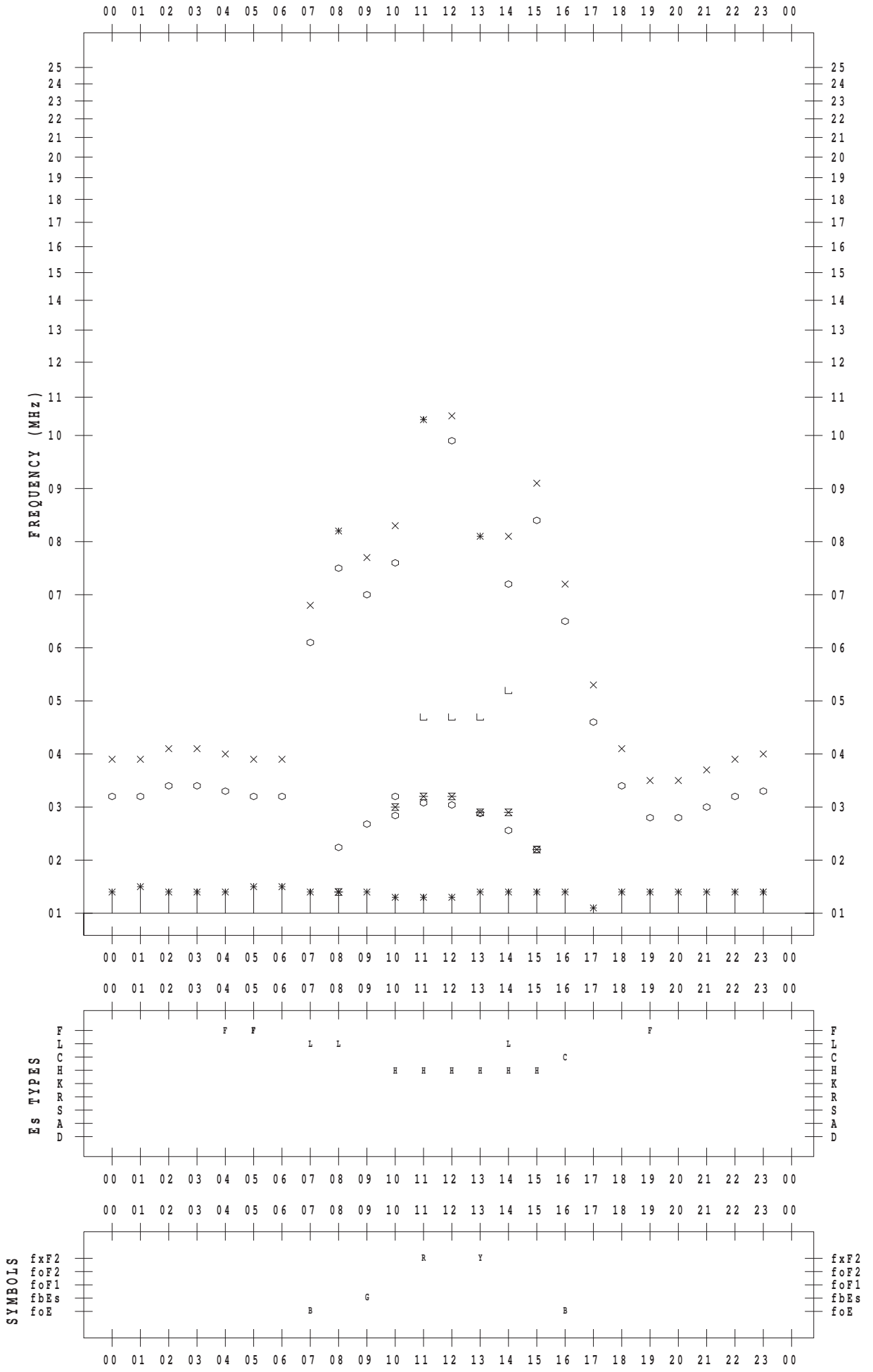
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 3

135 °E MEAN TIME



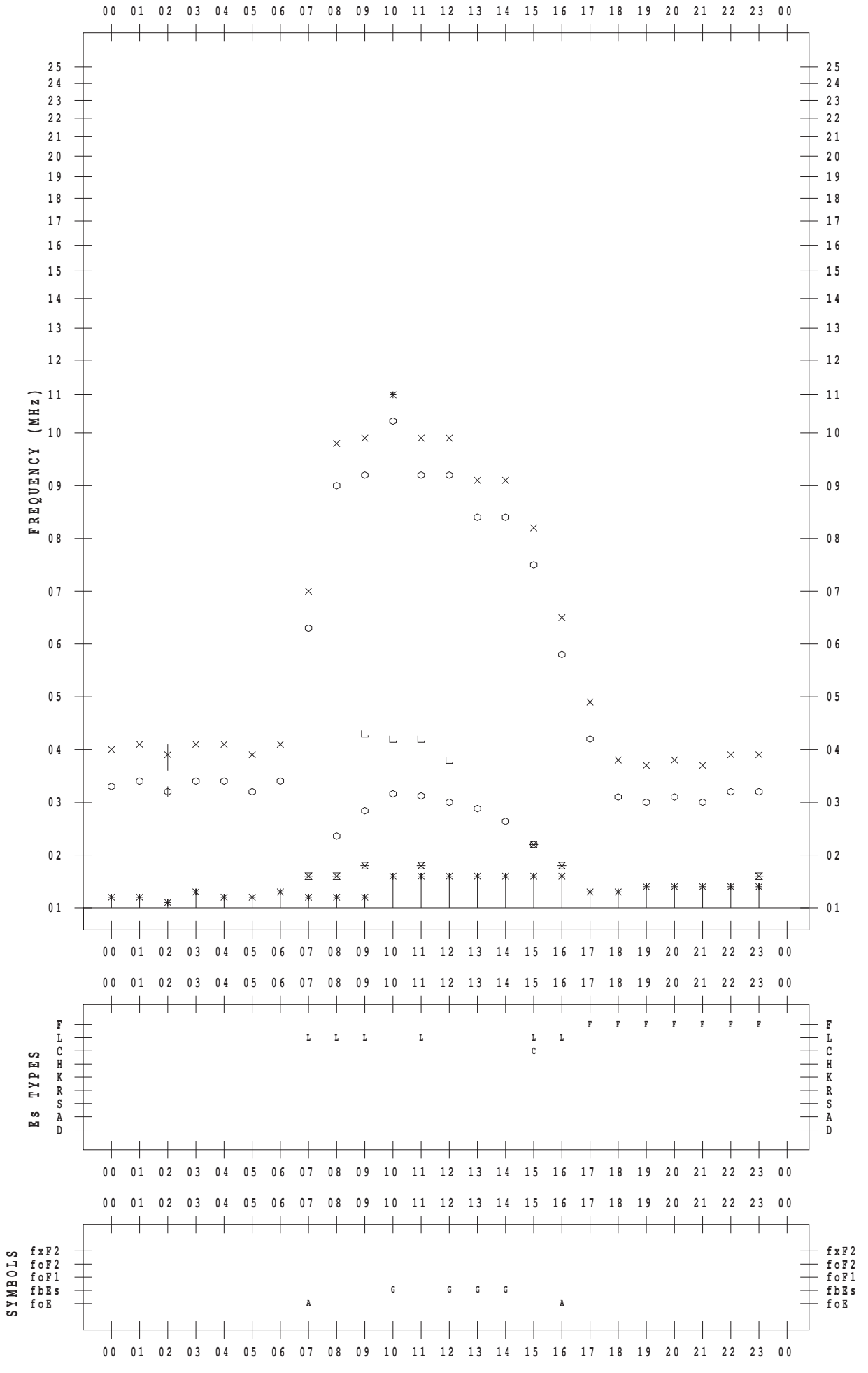
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 4

135 °E MEAN TIME



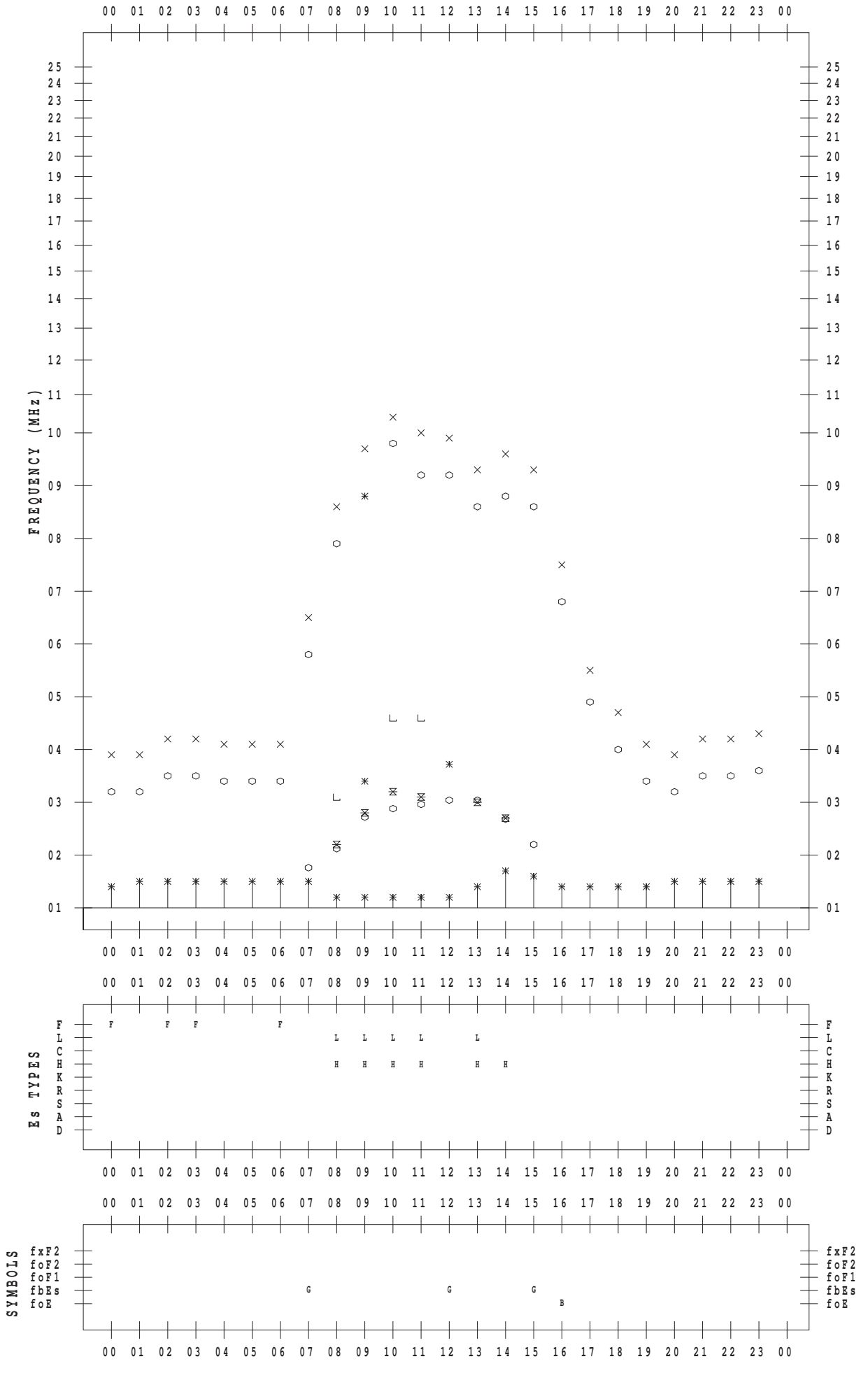
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 5

135 °E MEAN TIME



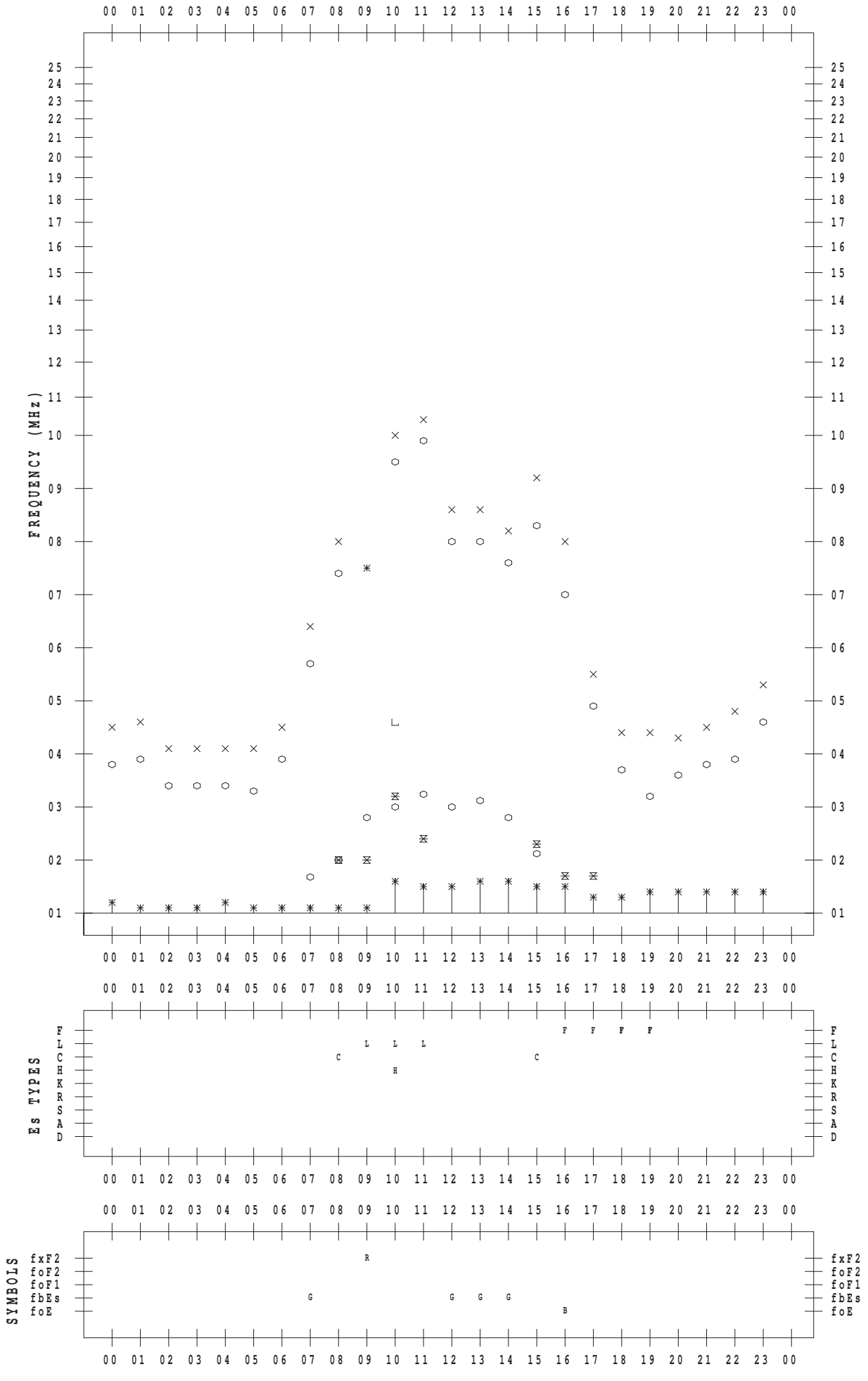
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 6

135 °E MEAN TIME



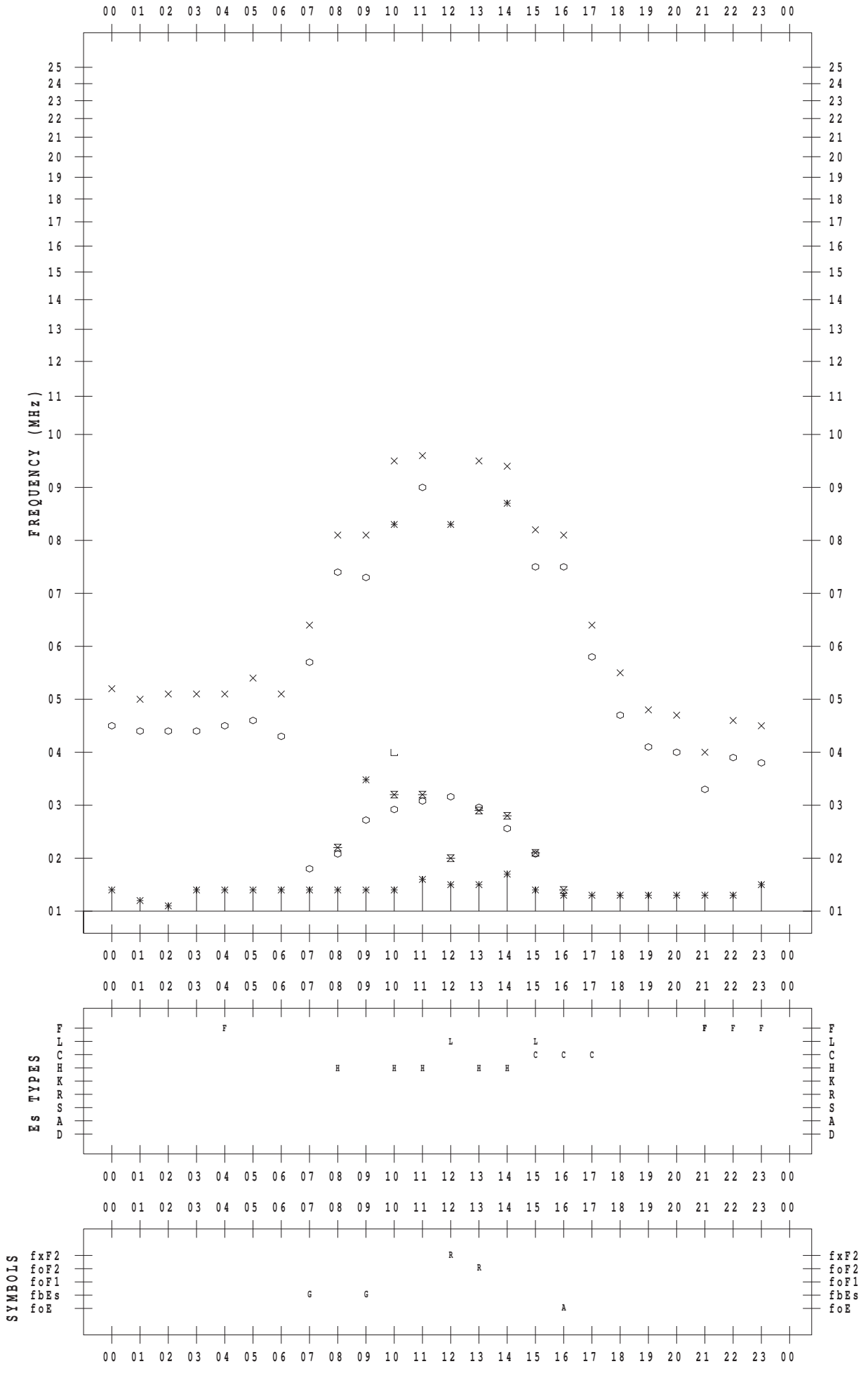
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 7

135 °E MEAN TIME



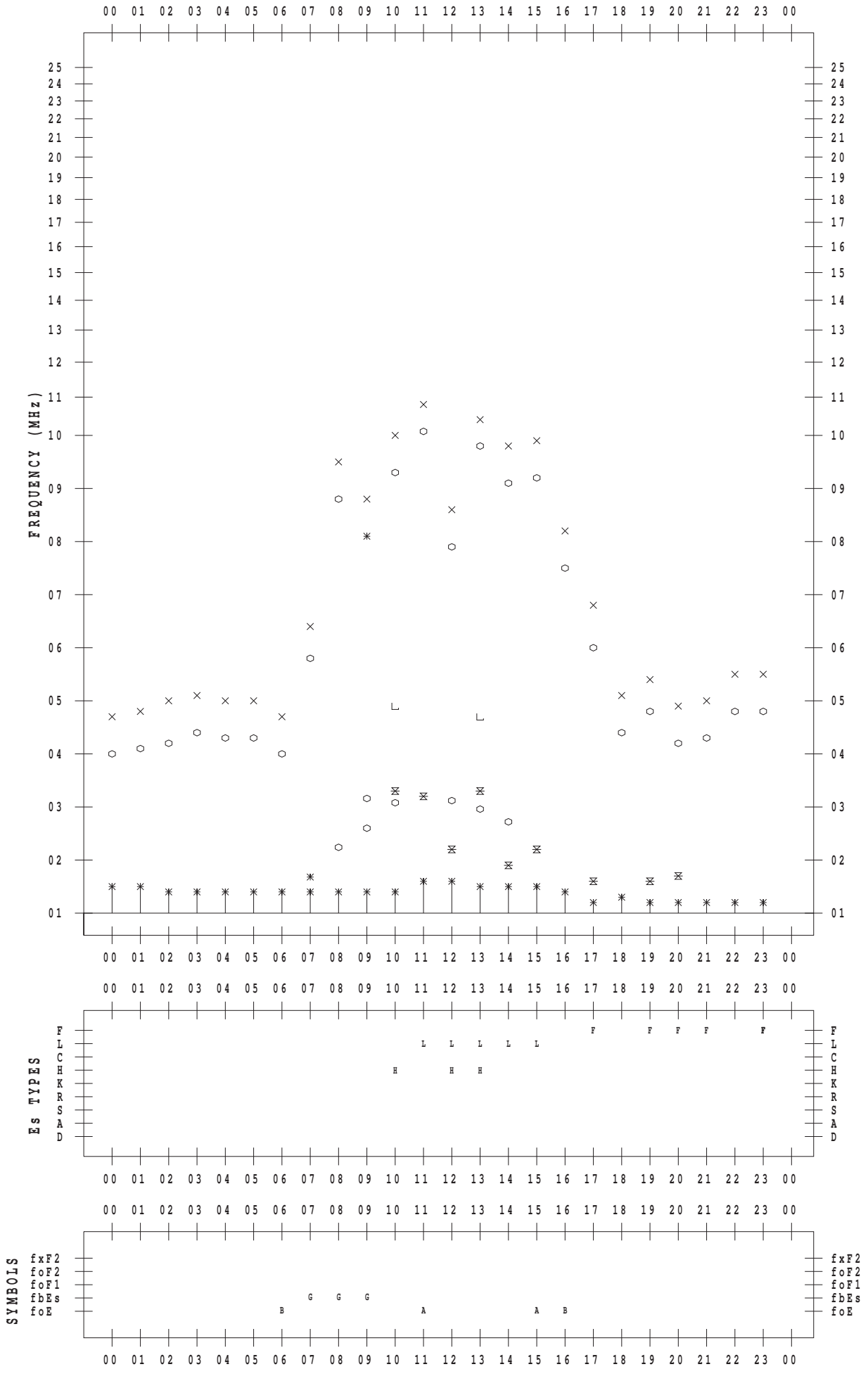
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 8

135 °E MEAN TIME



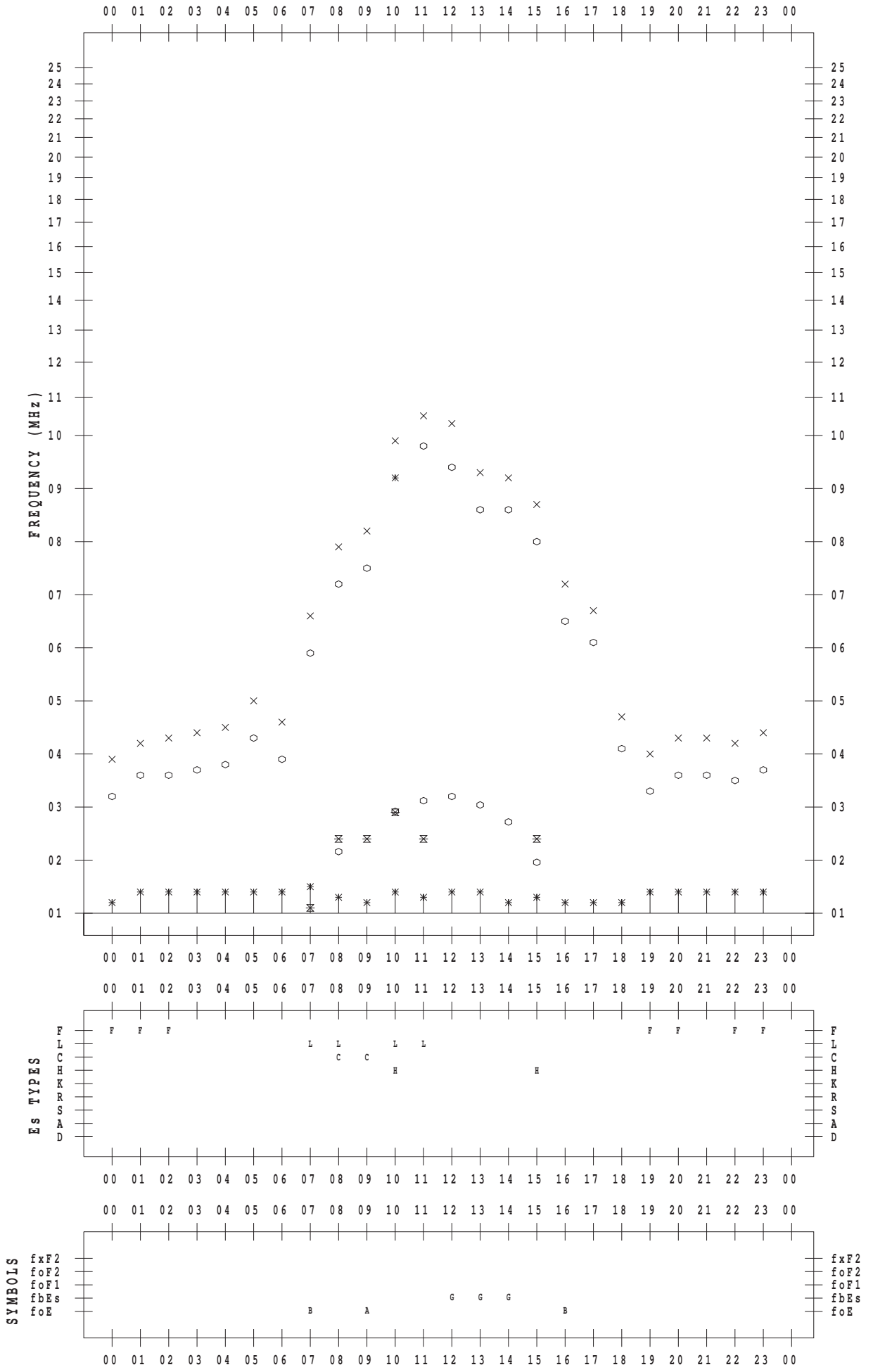
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/ 9

135 °E MEAN TIME



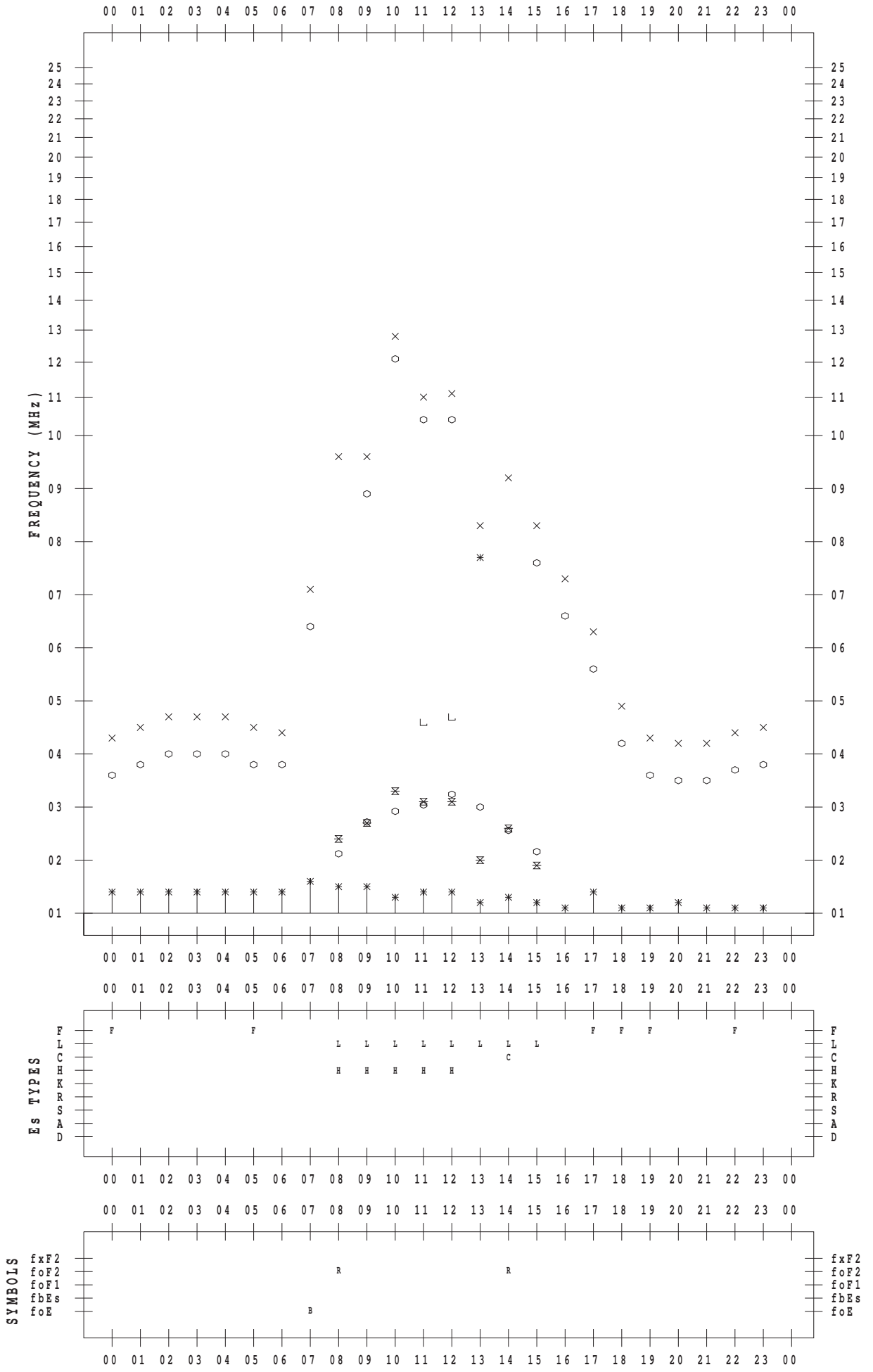
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/10

135 °E MEAN TIME



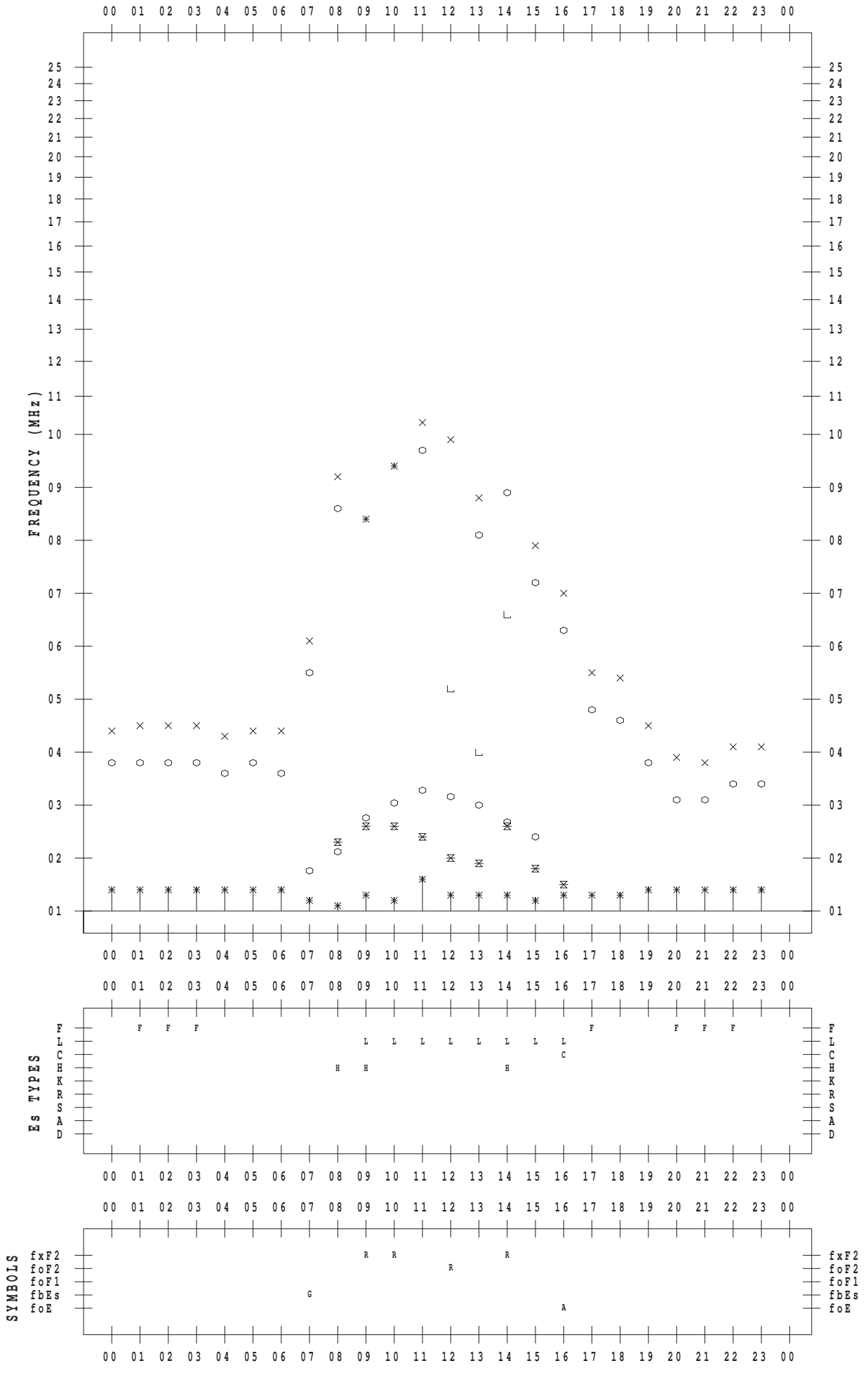
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/11

135 °E MEAN TIME



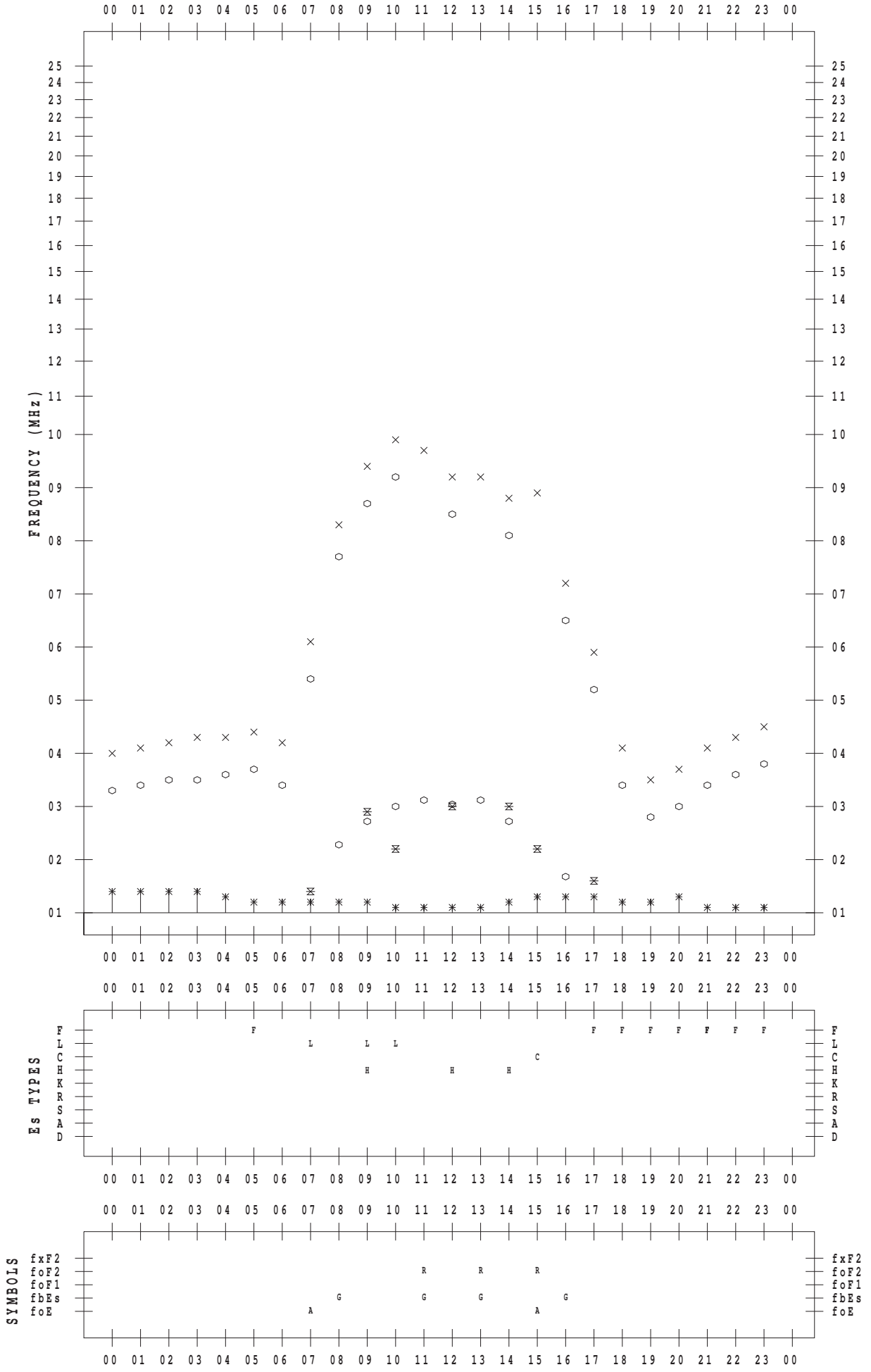
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/12

135 °E MEAN TIME



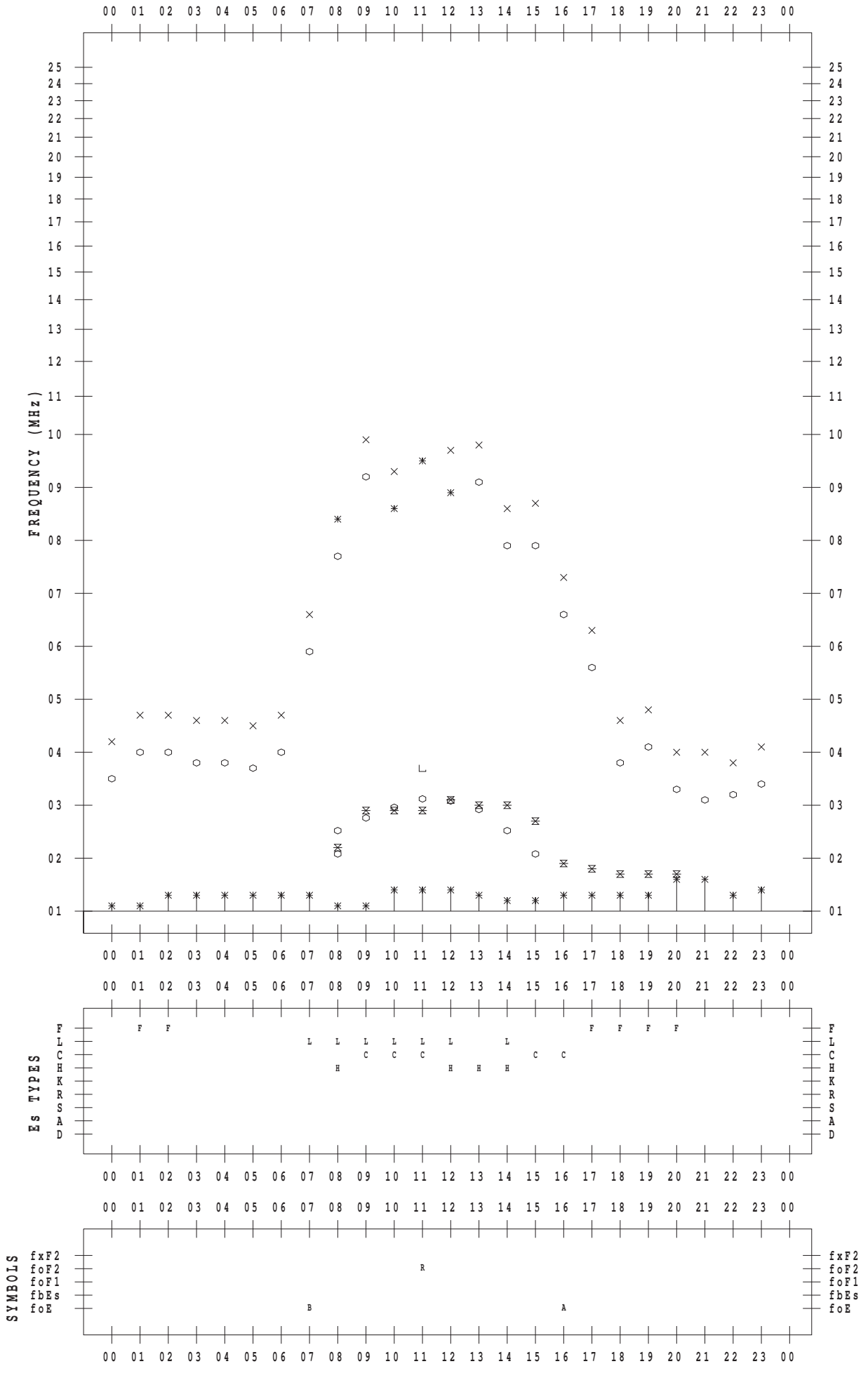
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/13

135 °E MEAN TIME



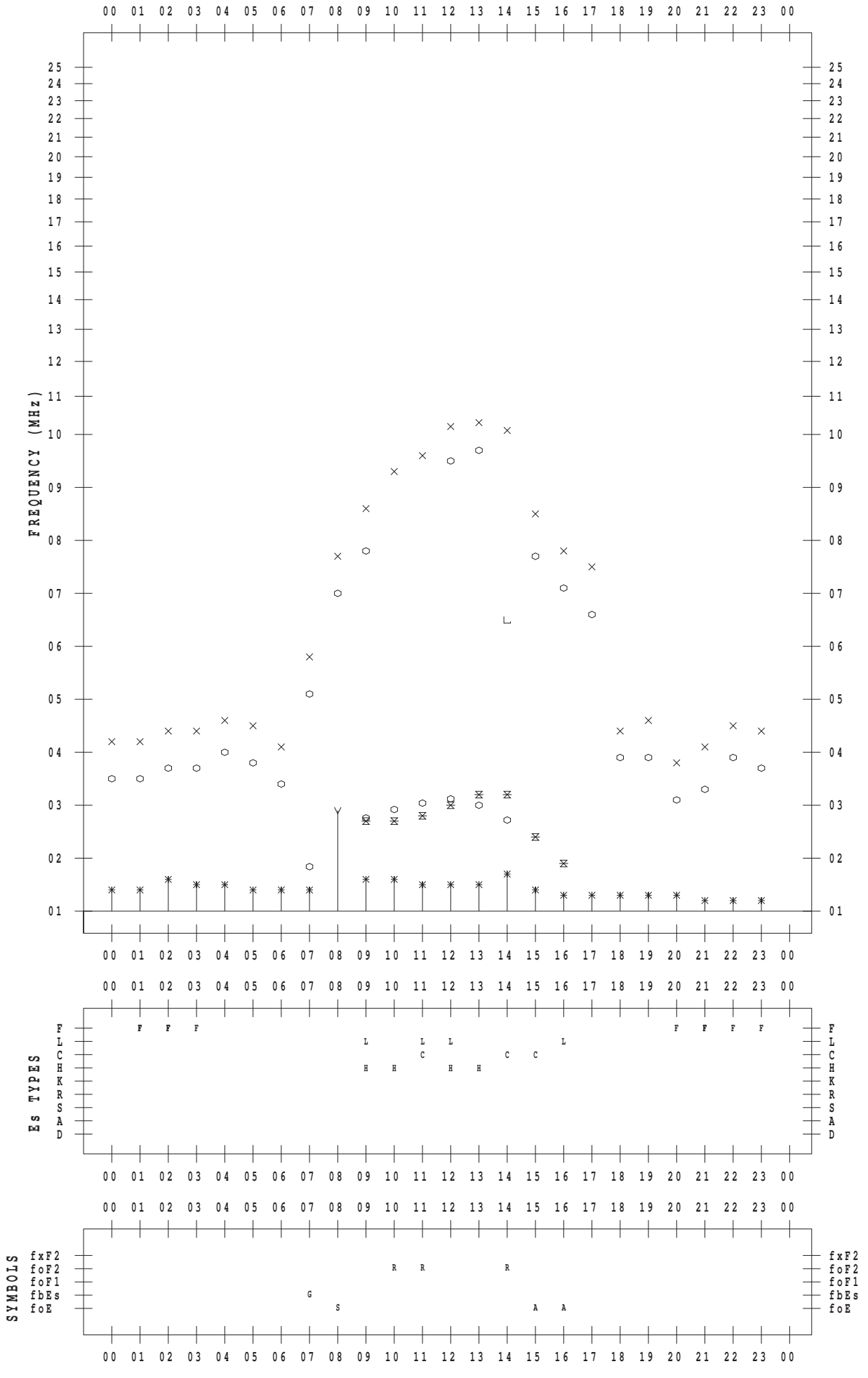
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/14

135 °E MEAN TIME



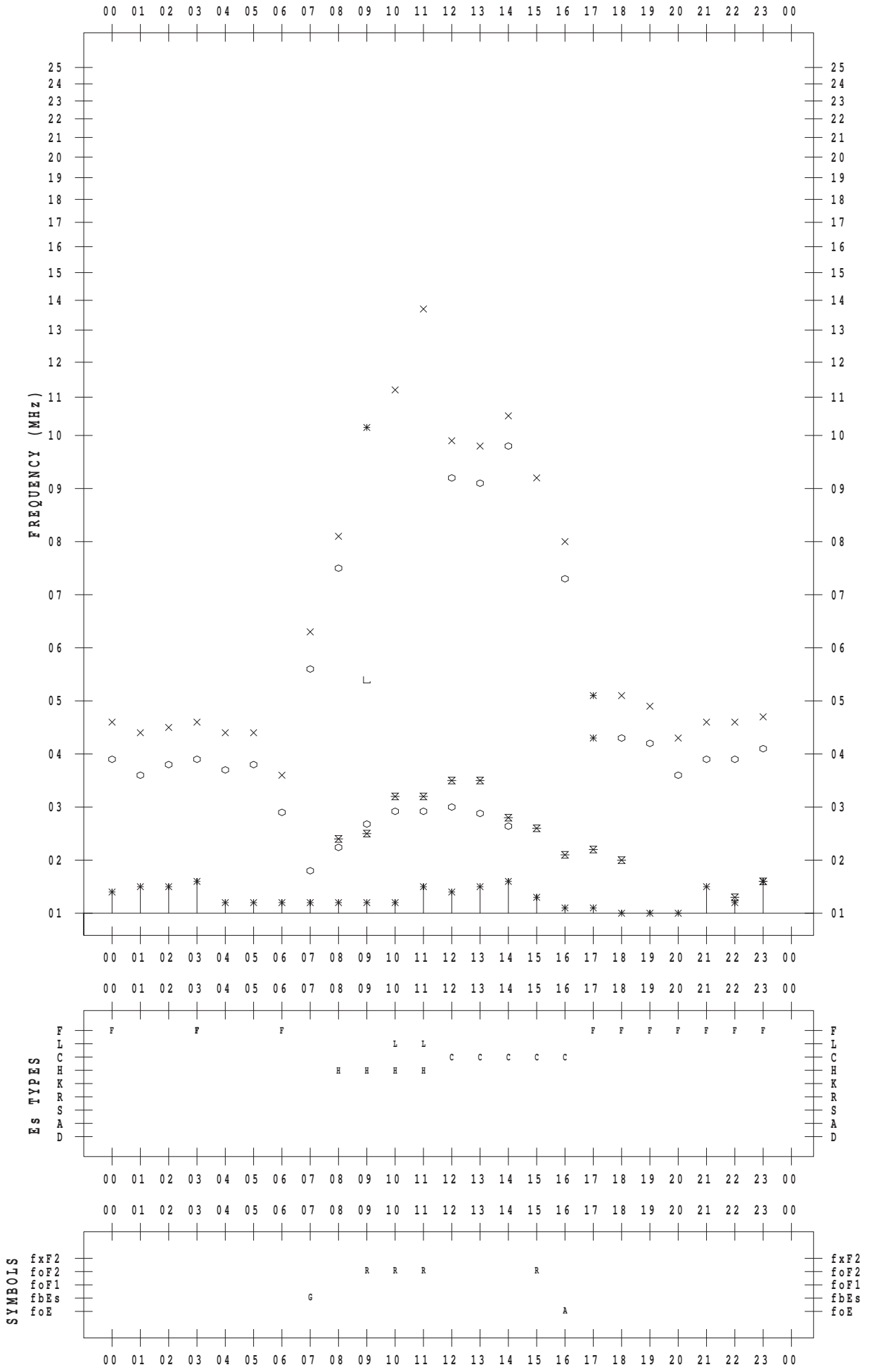
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/15

135 °E MEAN TIME



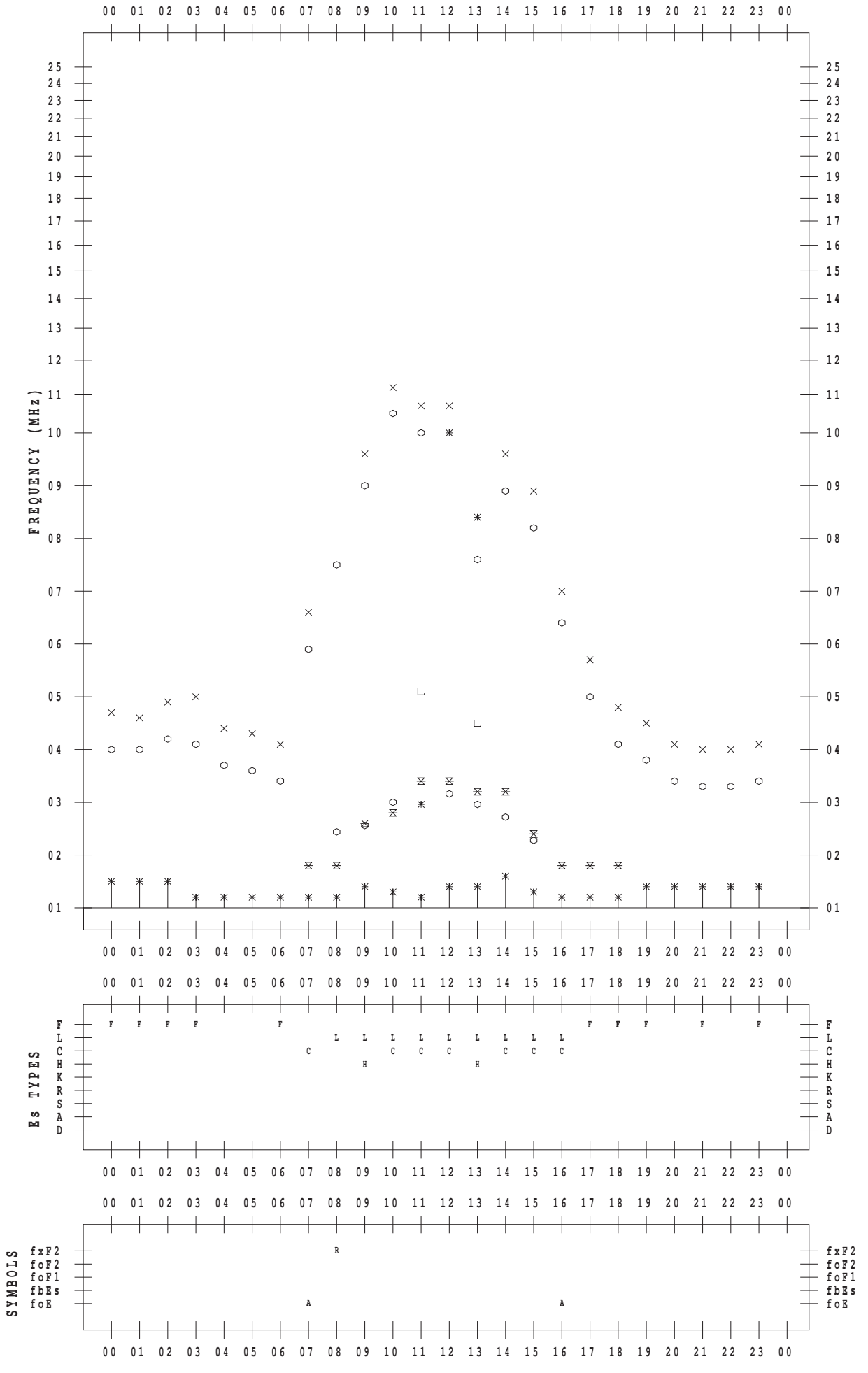
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/16

135 °E MEAN TIME



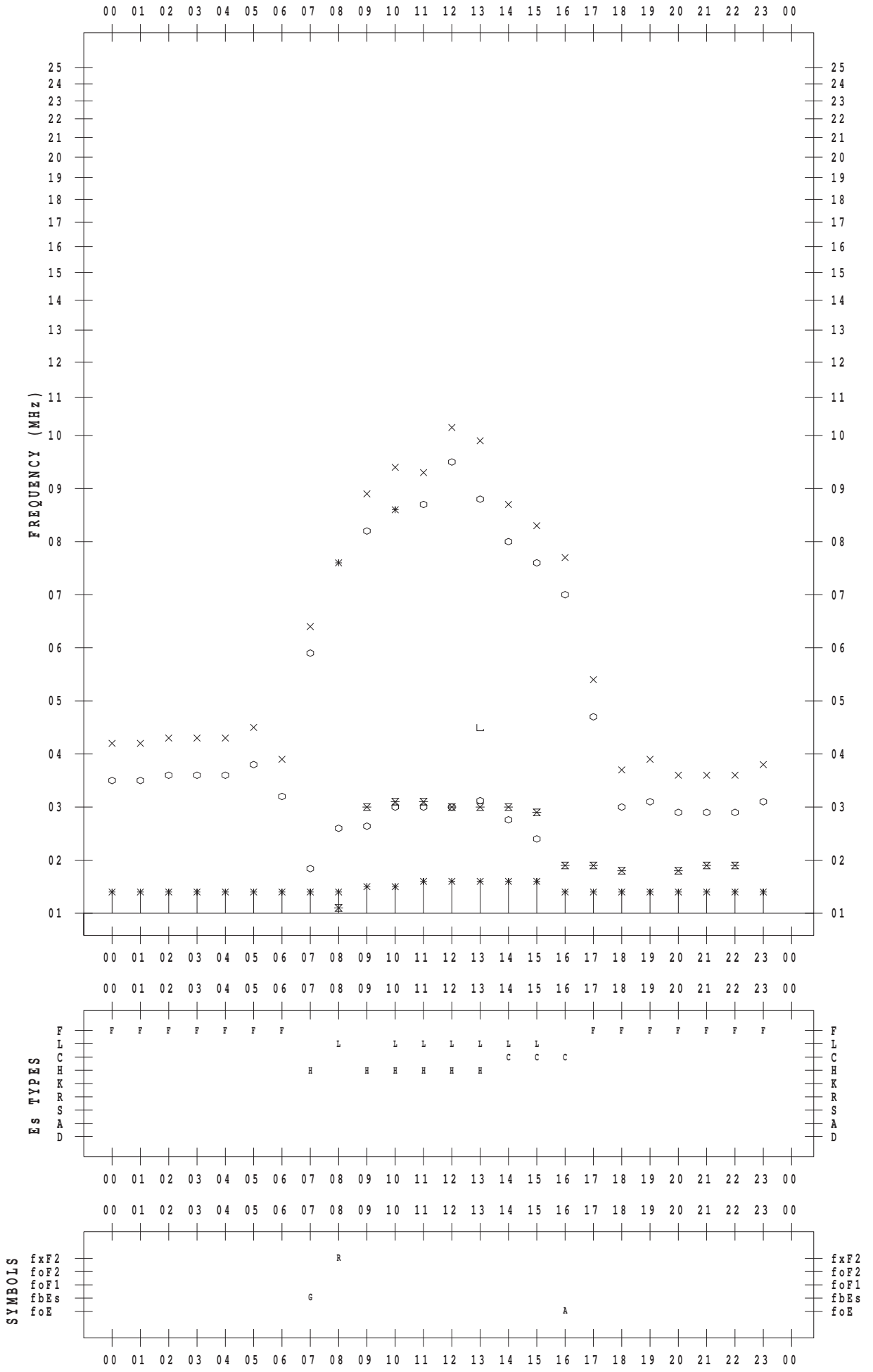
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/17

135 °E MEAN TIME



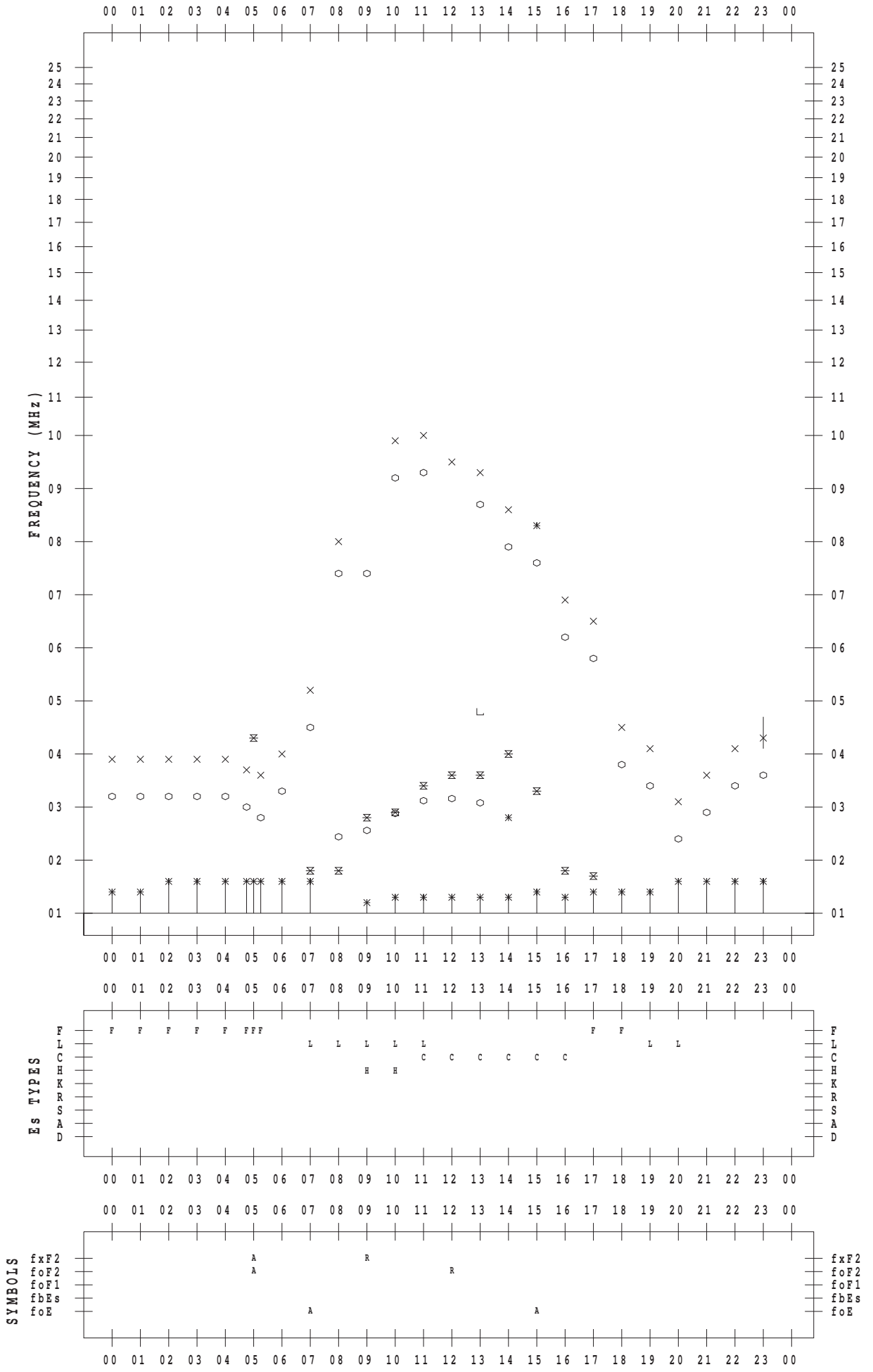
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/18

135 °E MEAN TIME



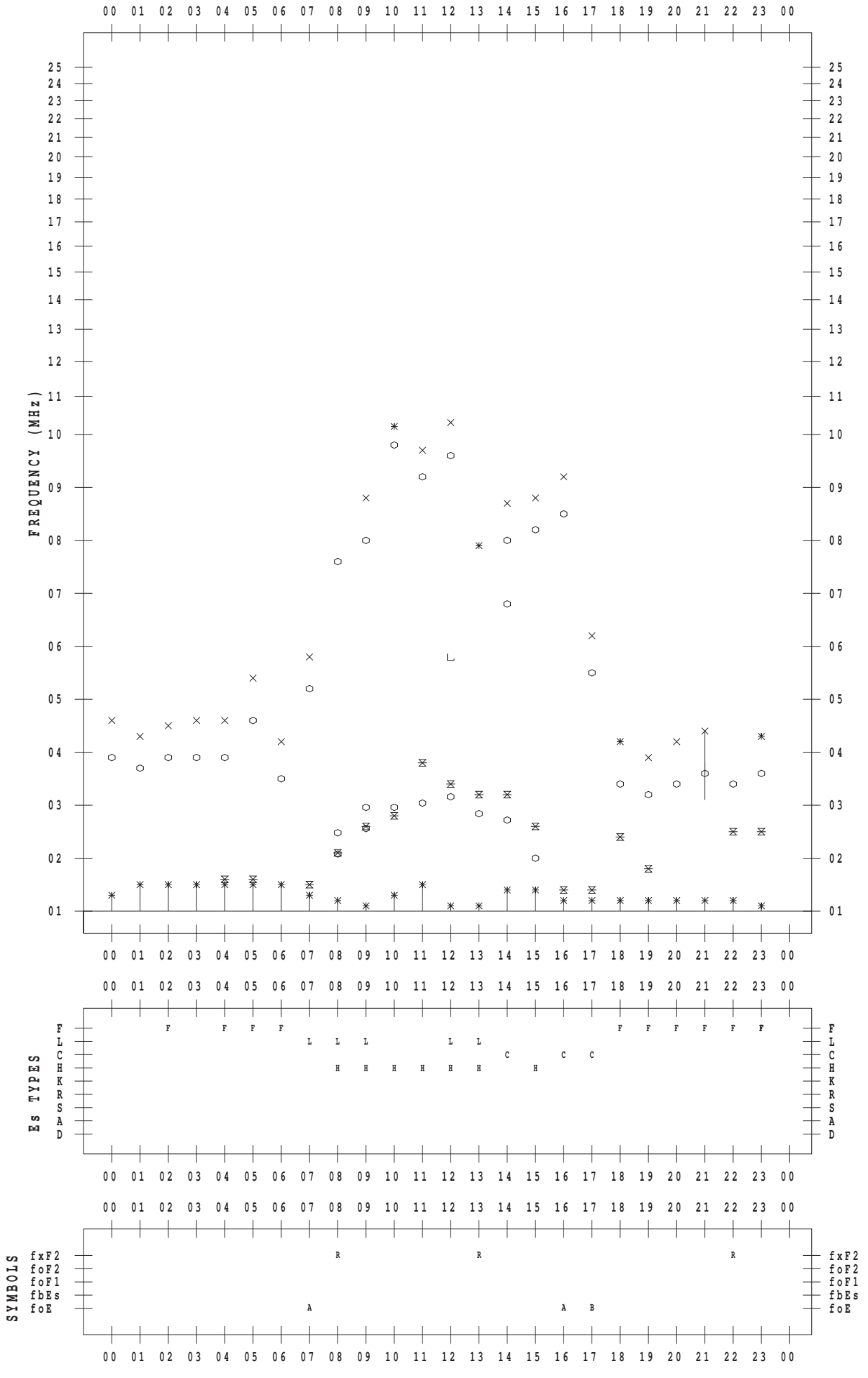
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/19

135 °E MEAN TIME



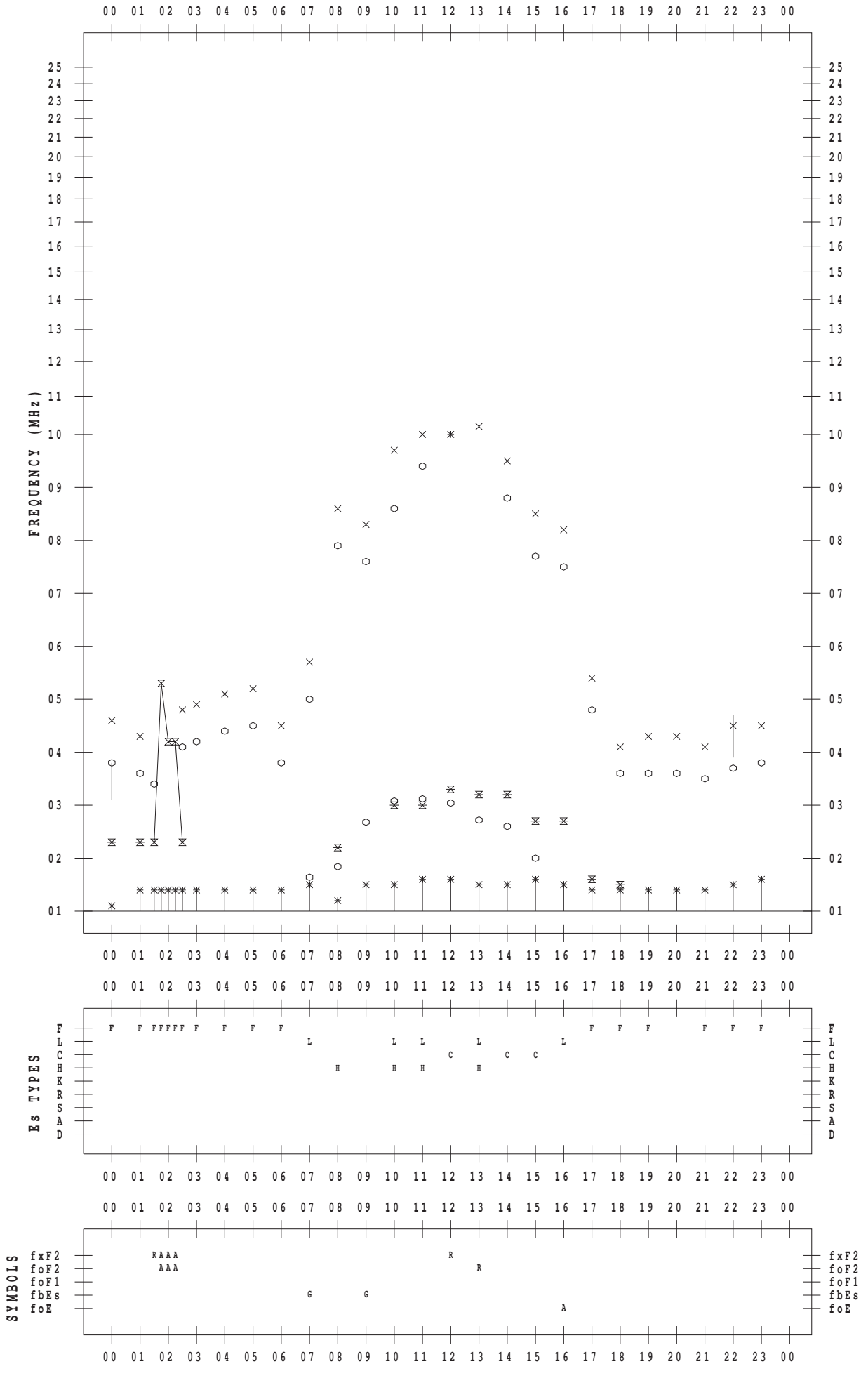
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/20

135 °E MEAN TIME



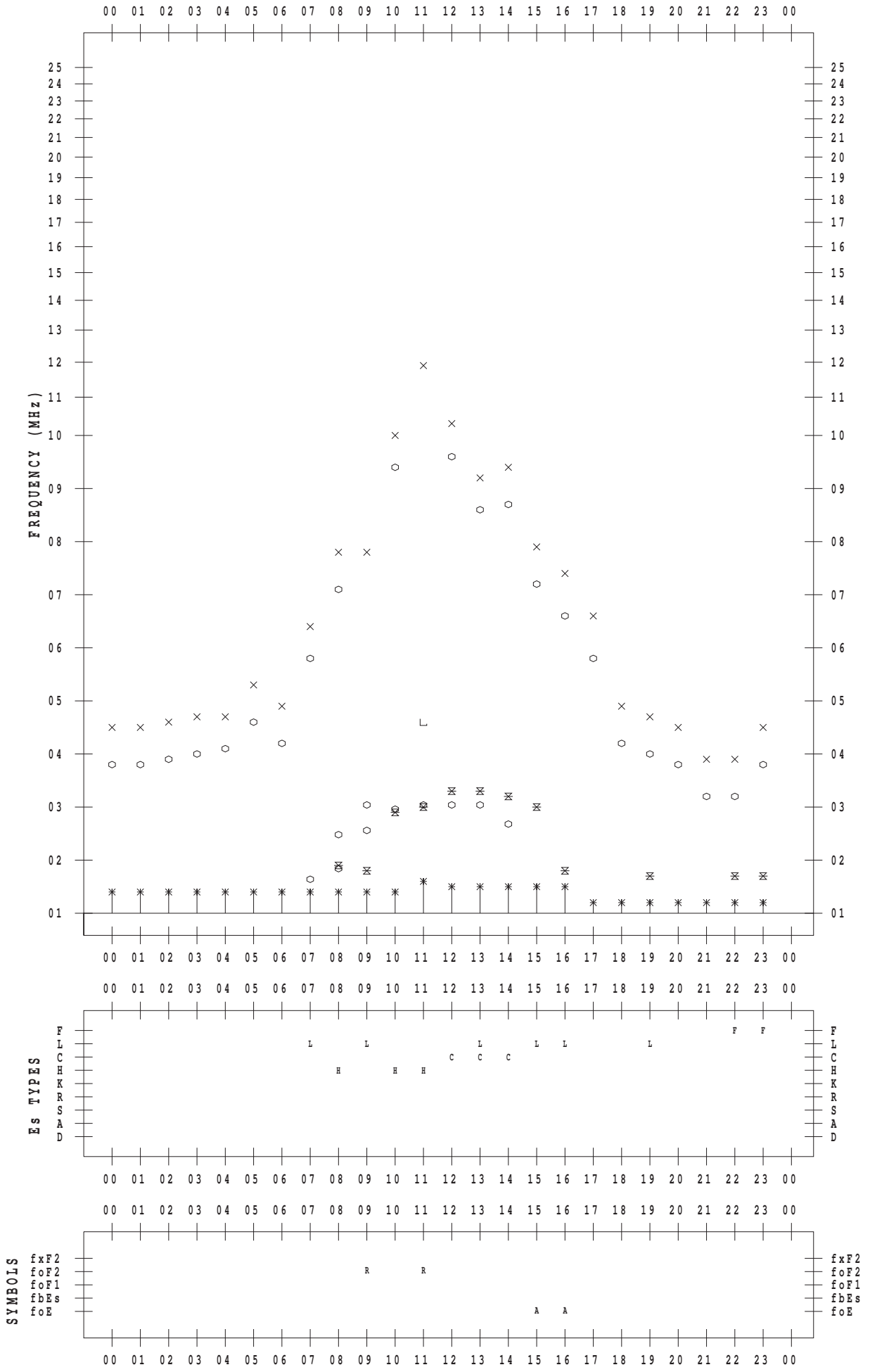
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/21

135 °E MEAN TIME



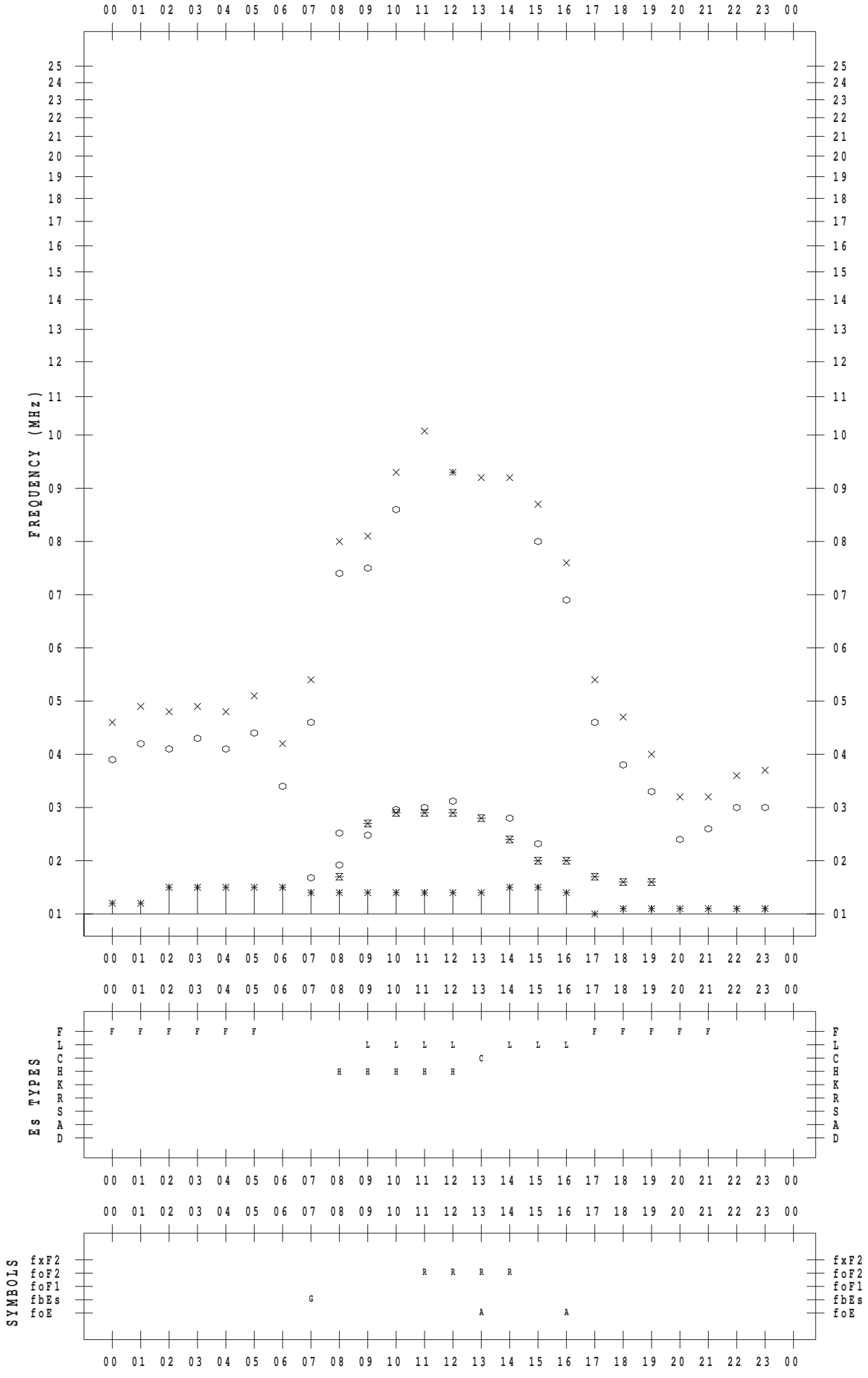
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/22

135 °E MEAN TIME



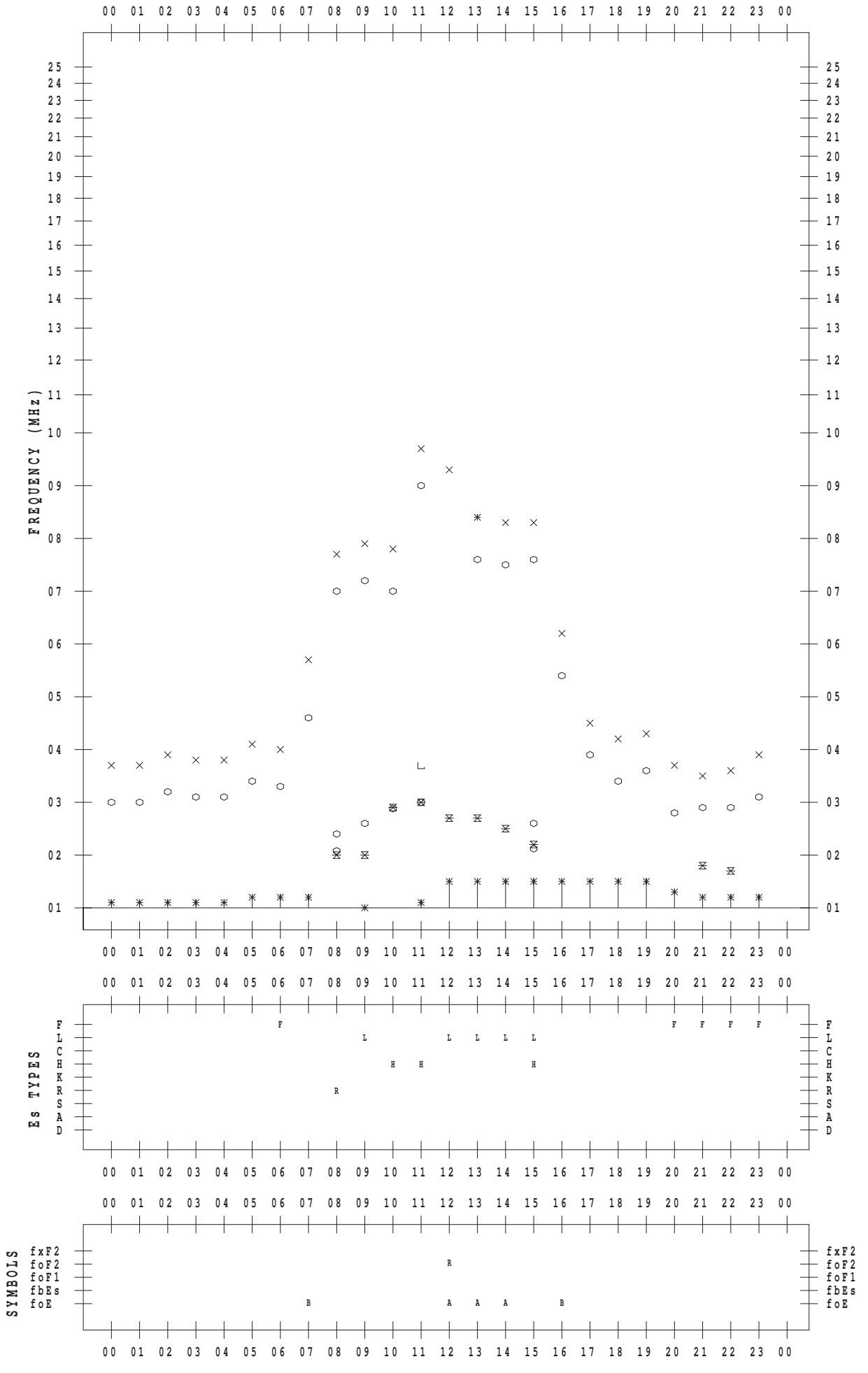
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/23

135 °E MEAN TIME



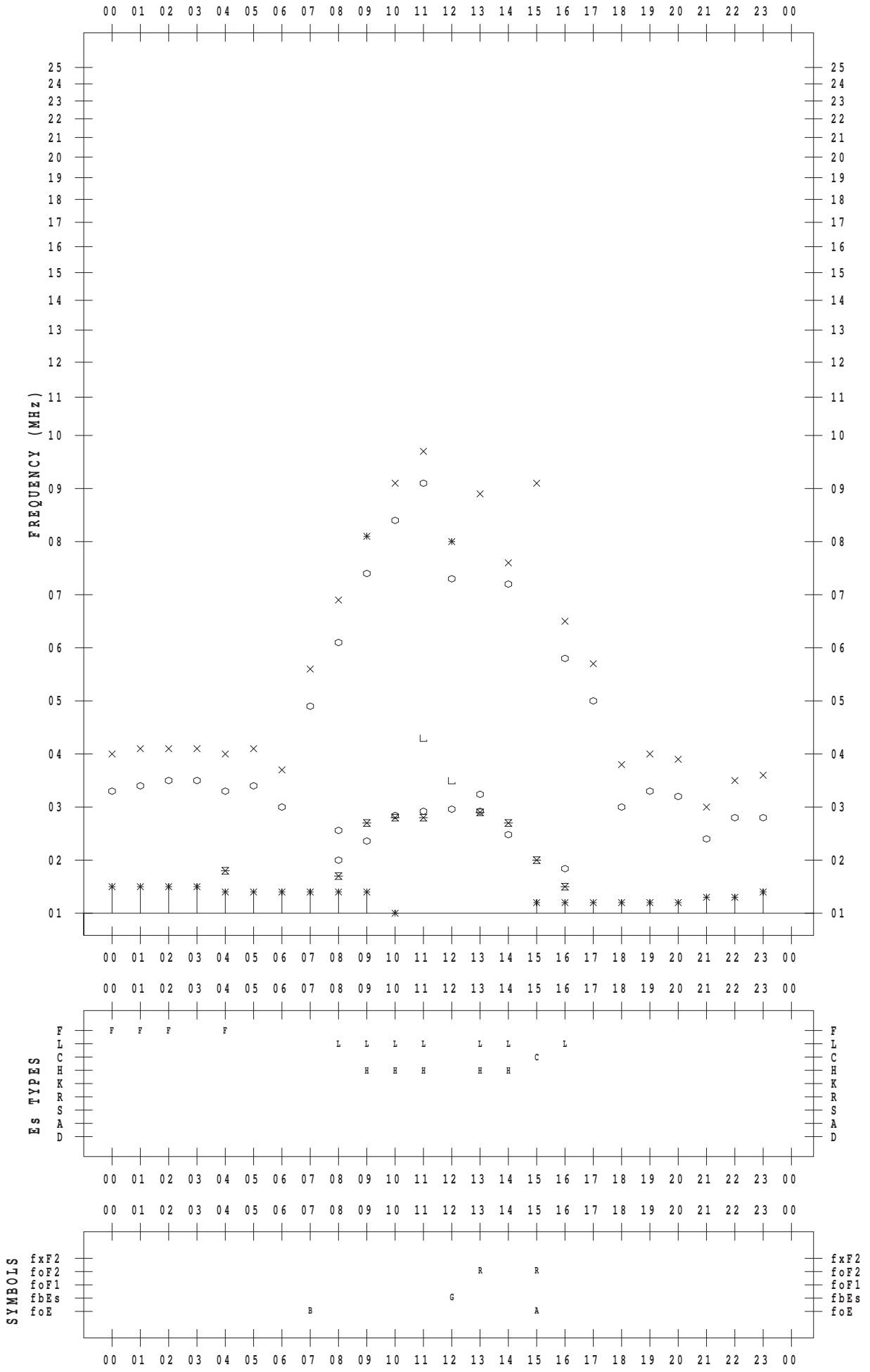
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/24

135 °E MEAN TIME



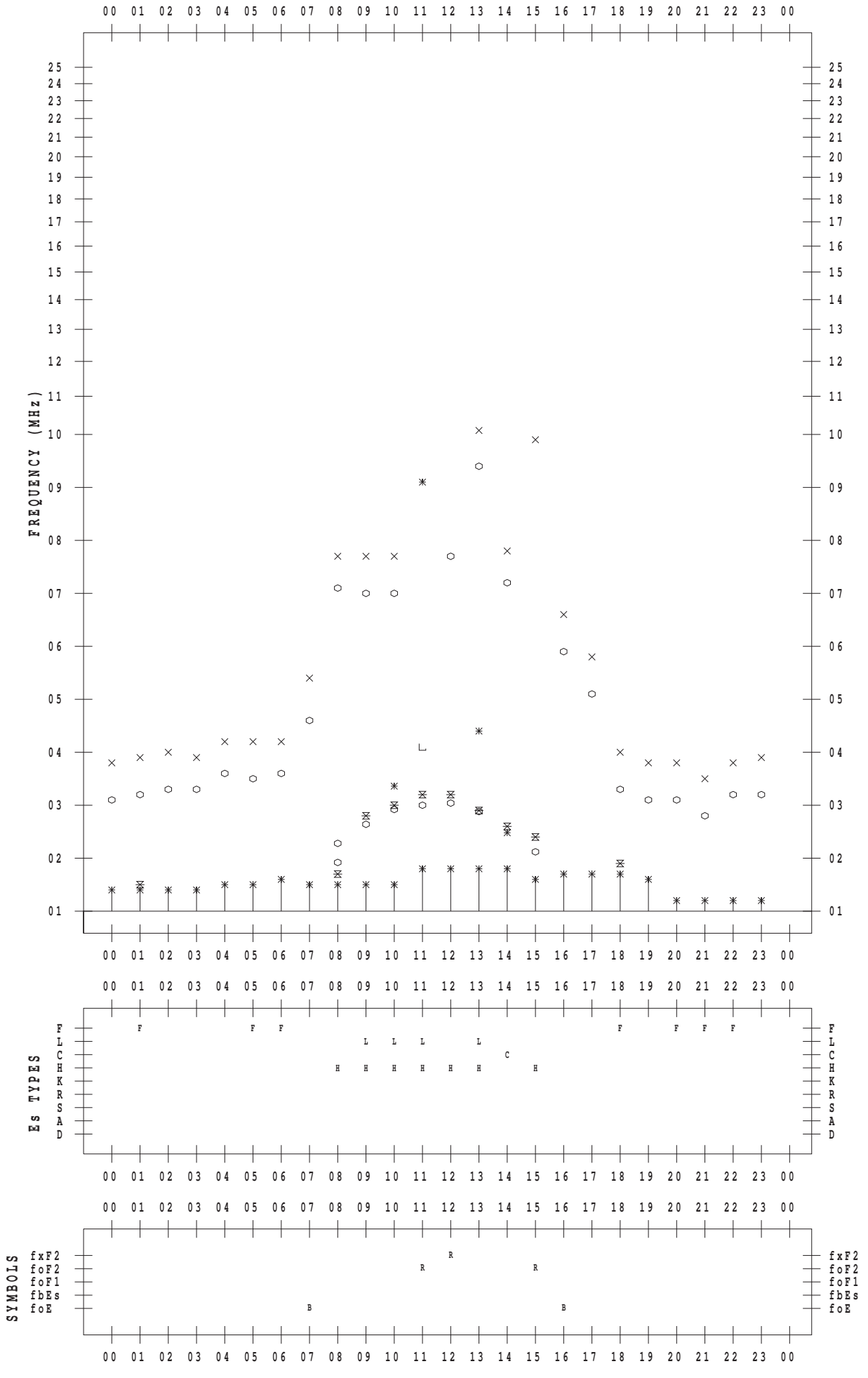
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/25

135 °E MEAN TIME



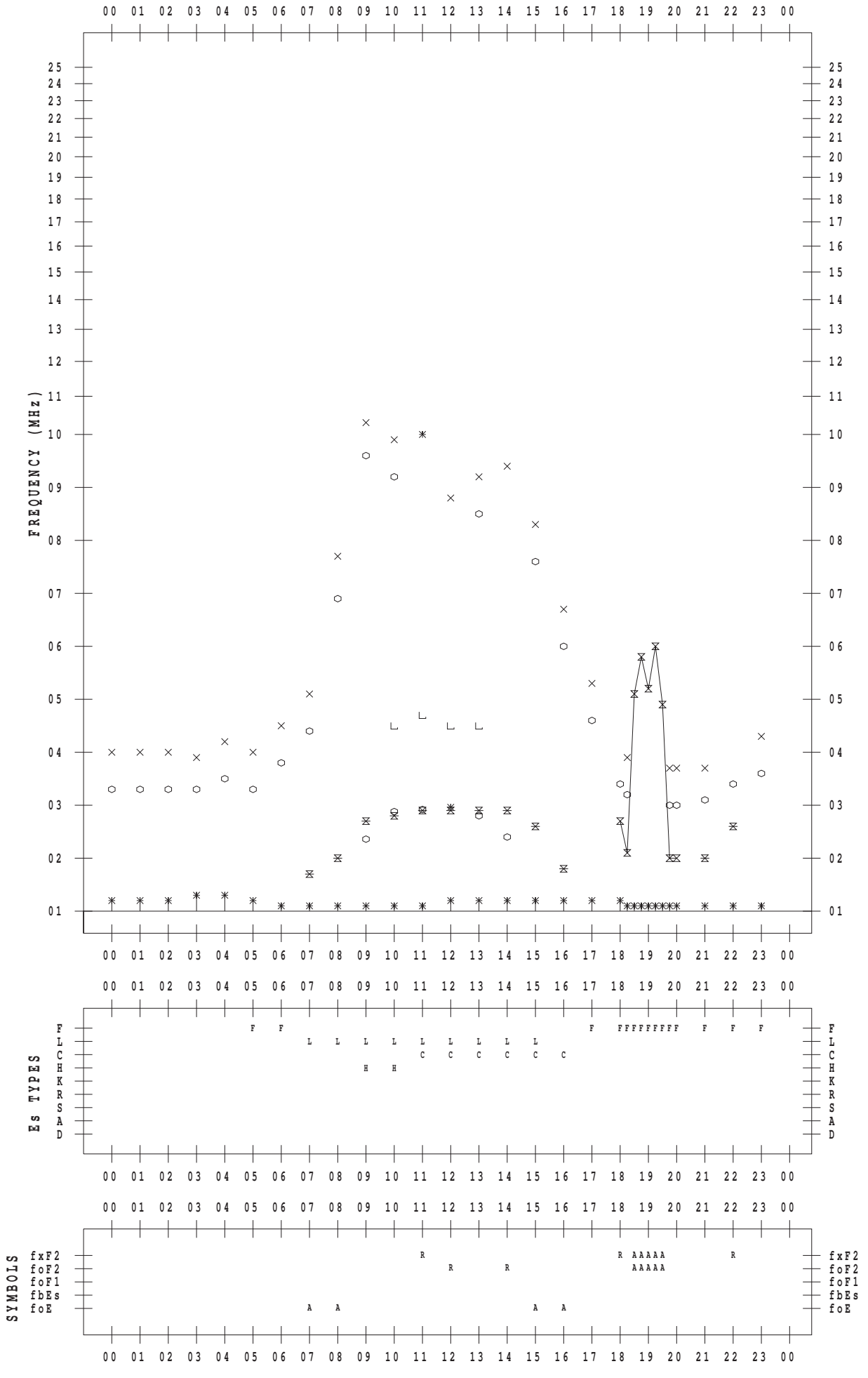
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/26

135 °E MEAN TIME



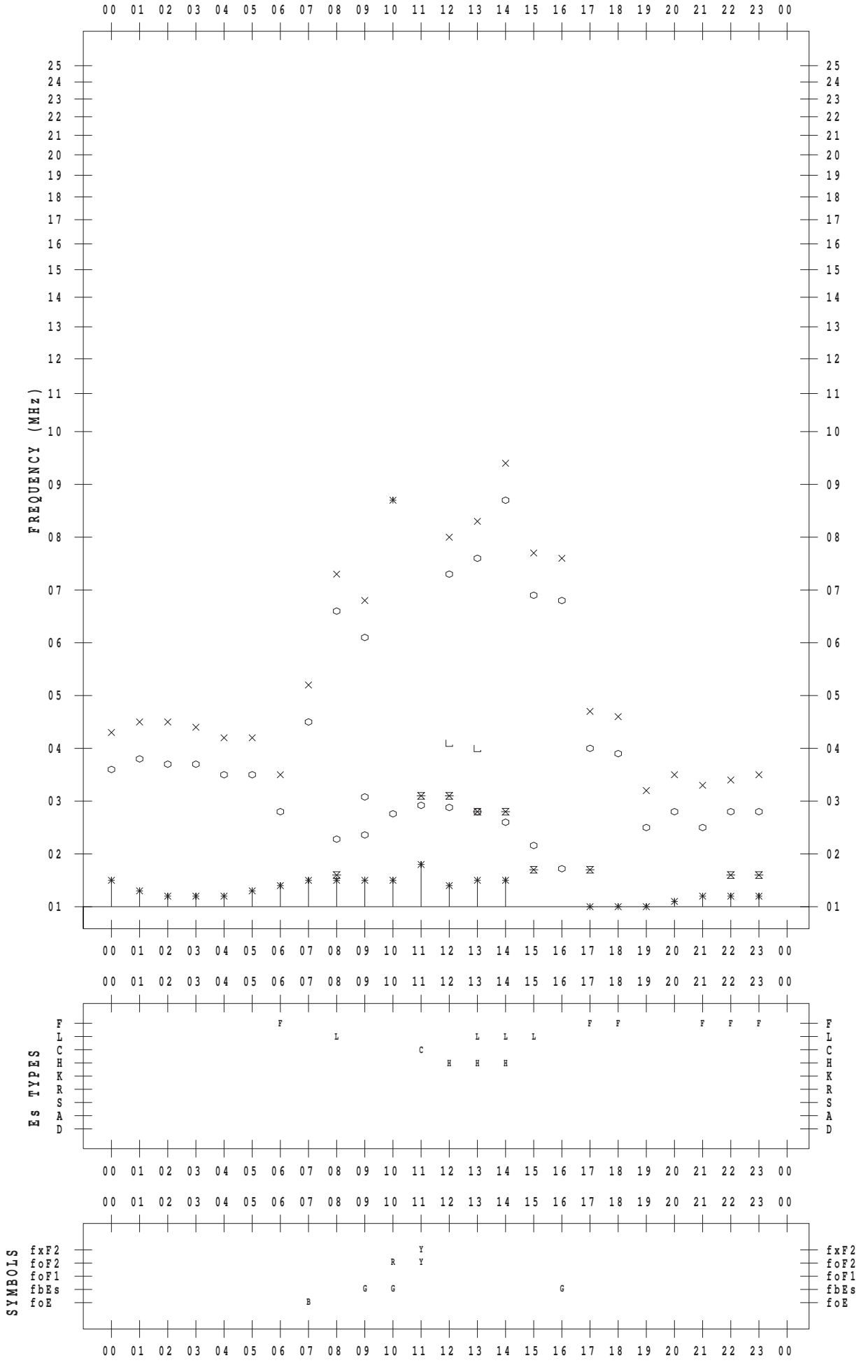
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/27

135 °E MEAN TIME



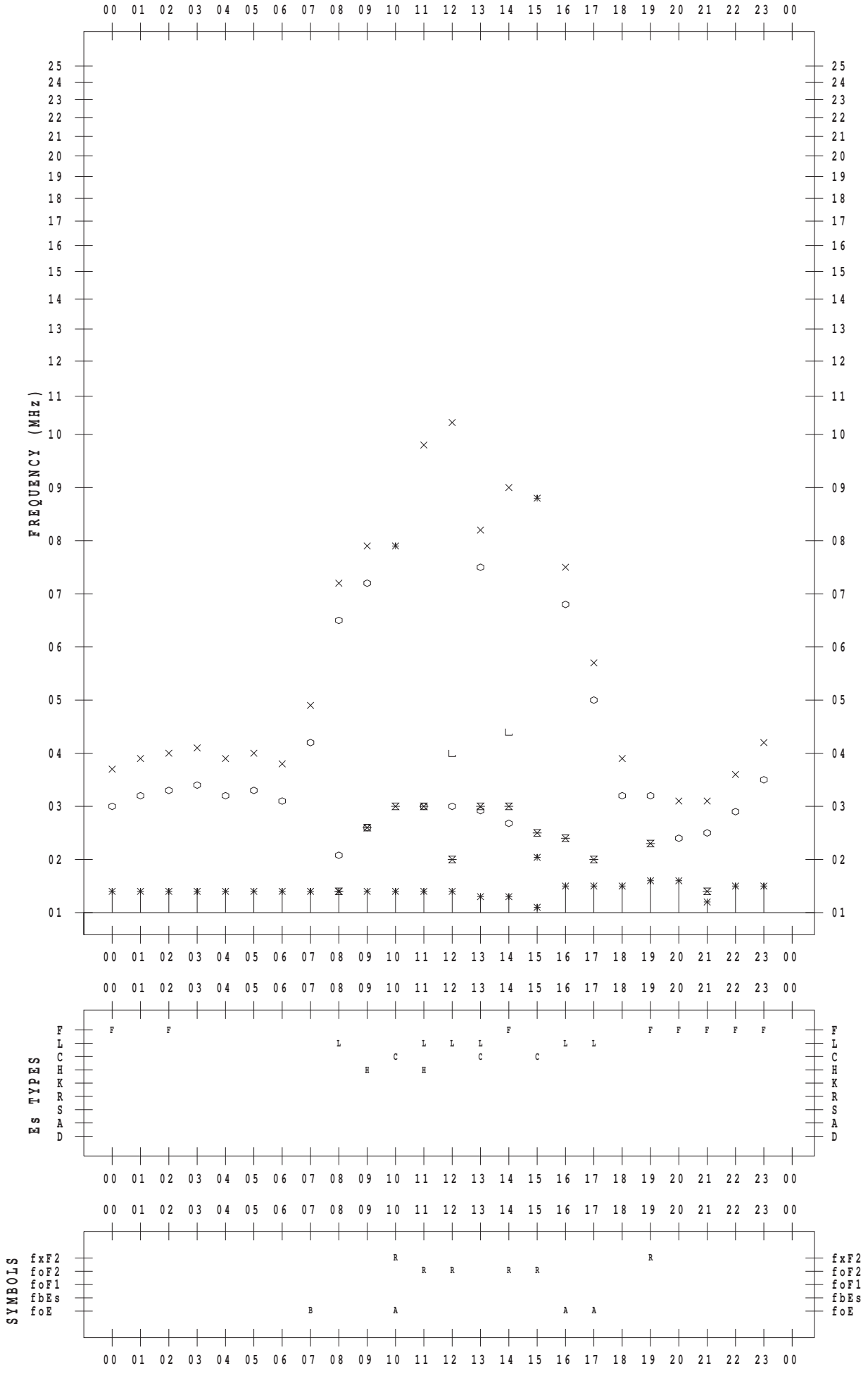
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/28

135 °E MEAN TIME



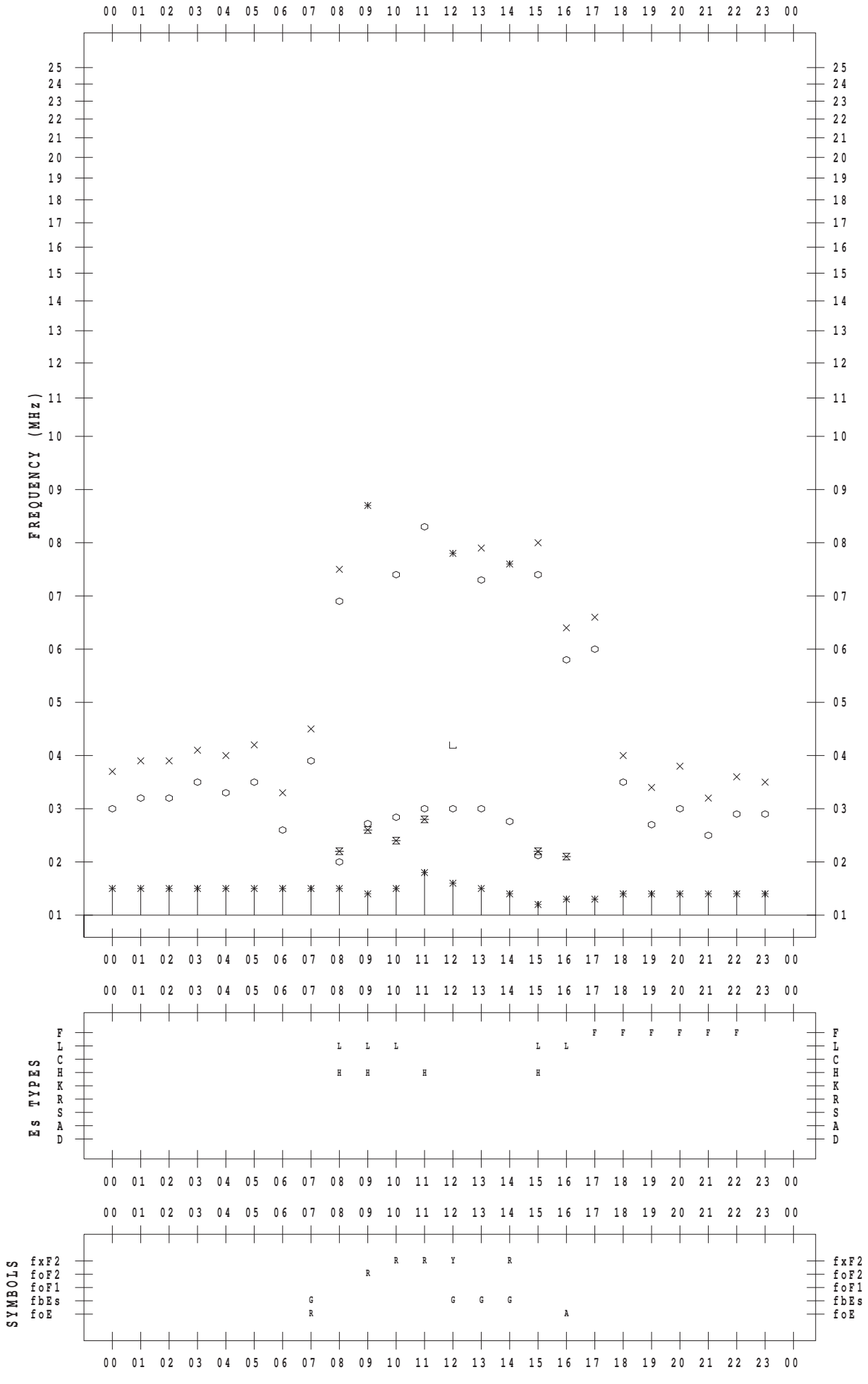
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/29

135 °E MEAN TIME



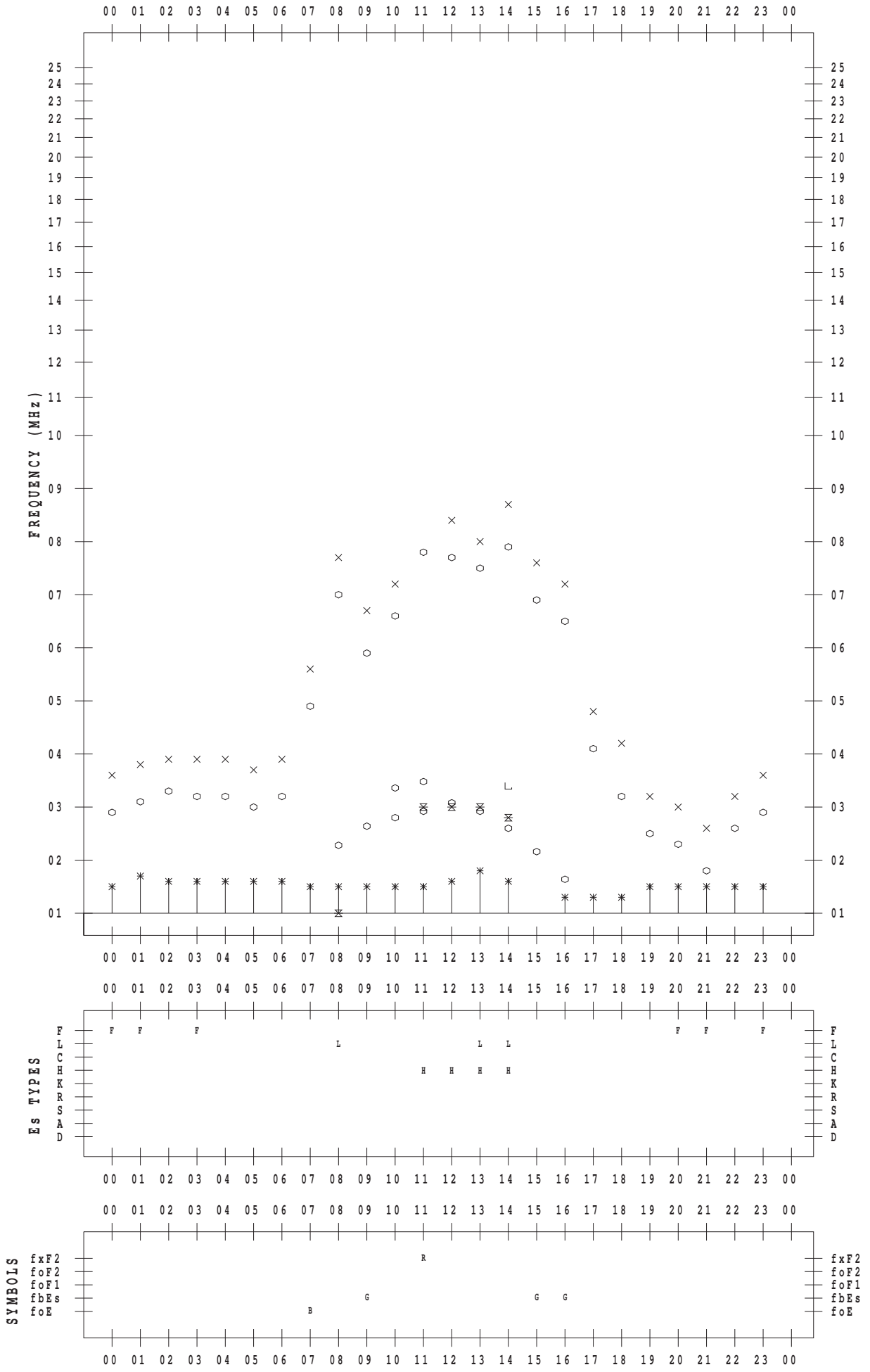
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/30

135 °E MEAN TIME



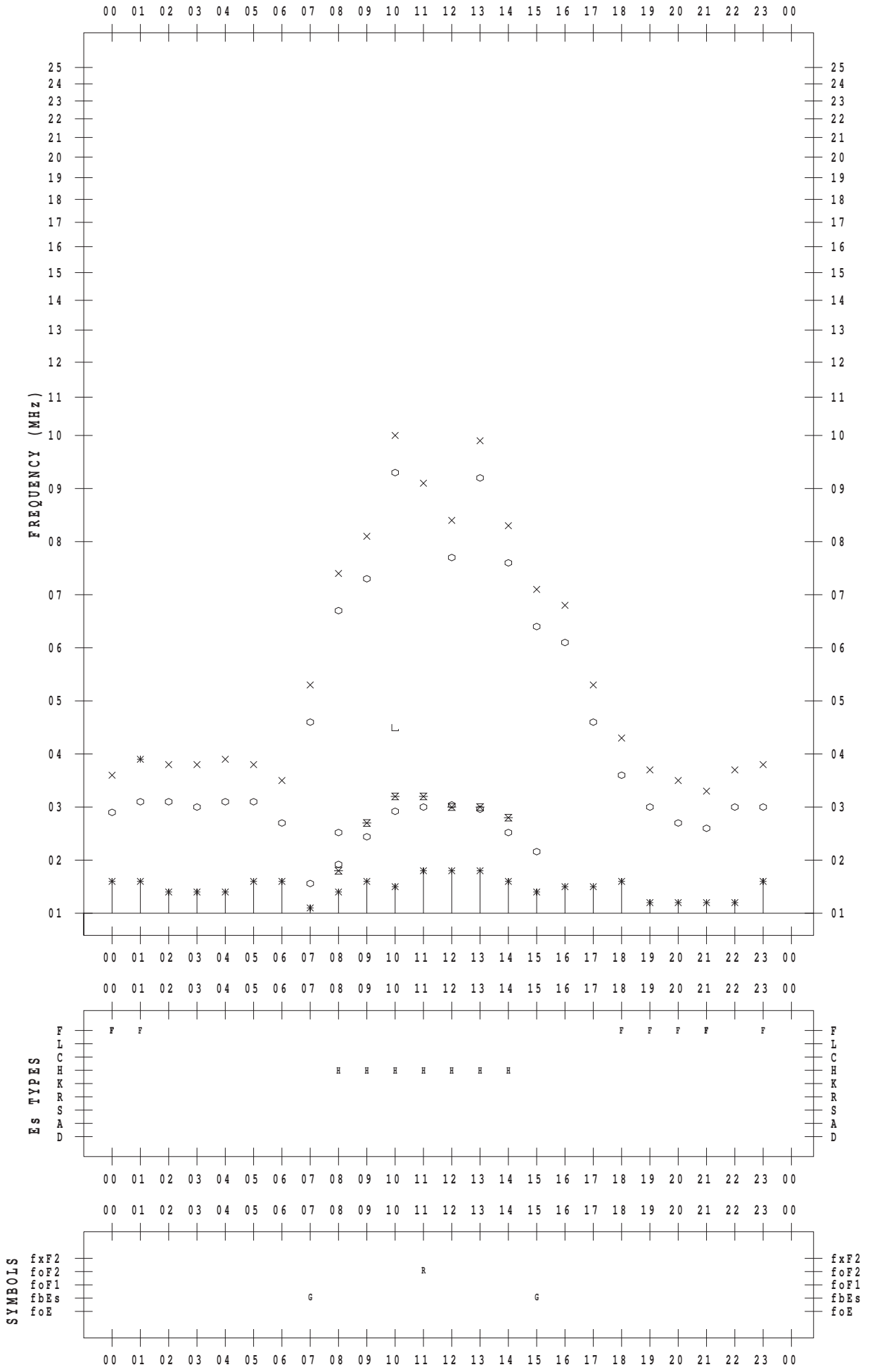
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/12/31

135 °E MEAN TIME



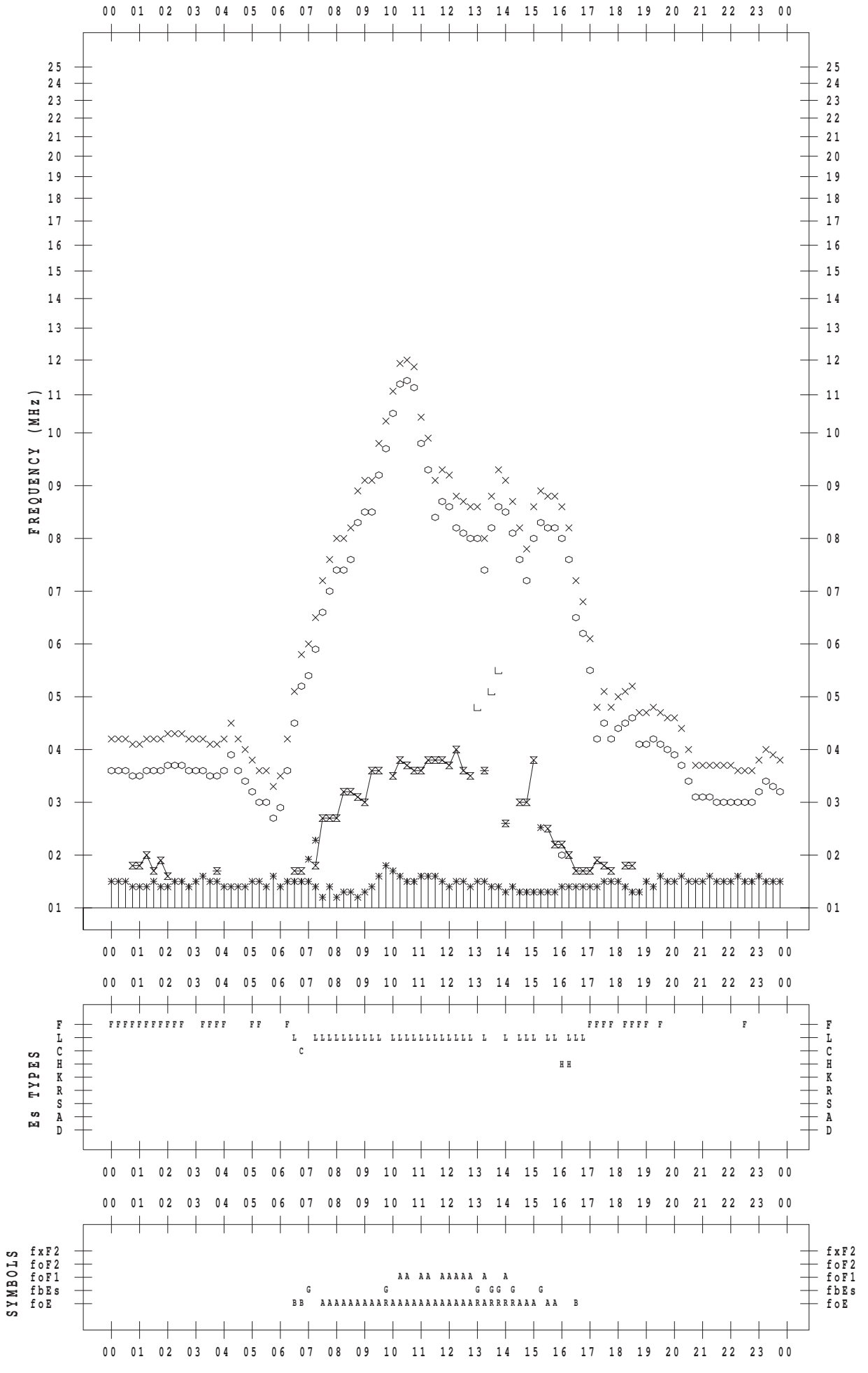
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 1

135 °E MEAN TIME



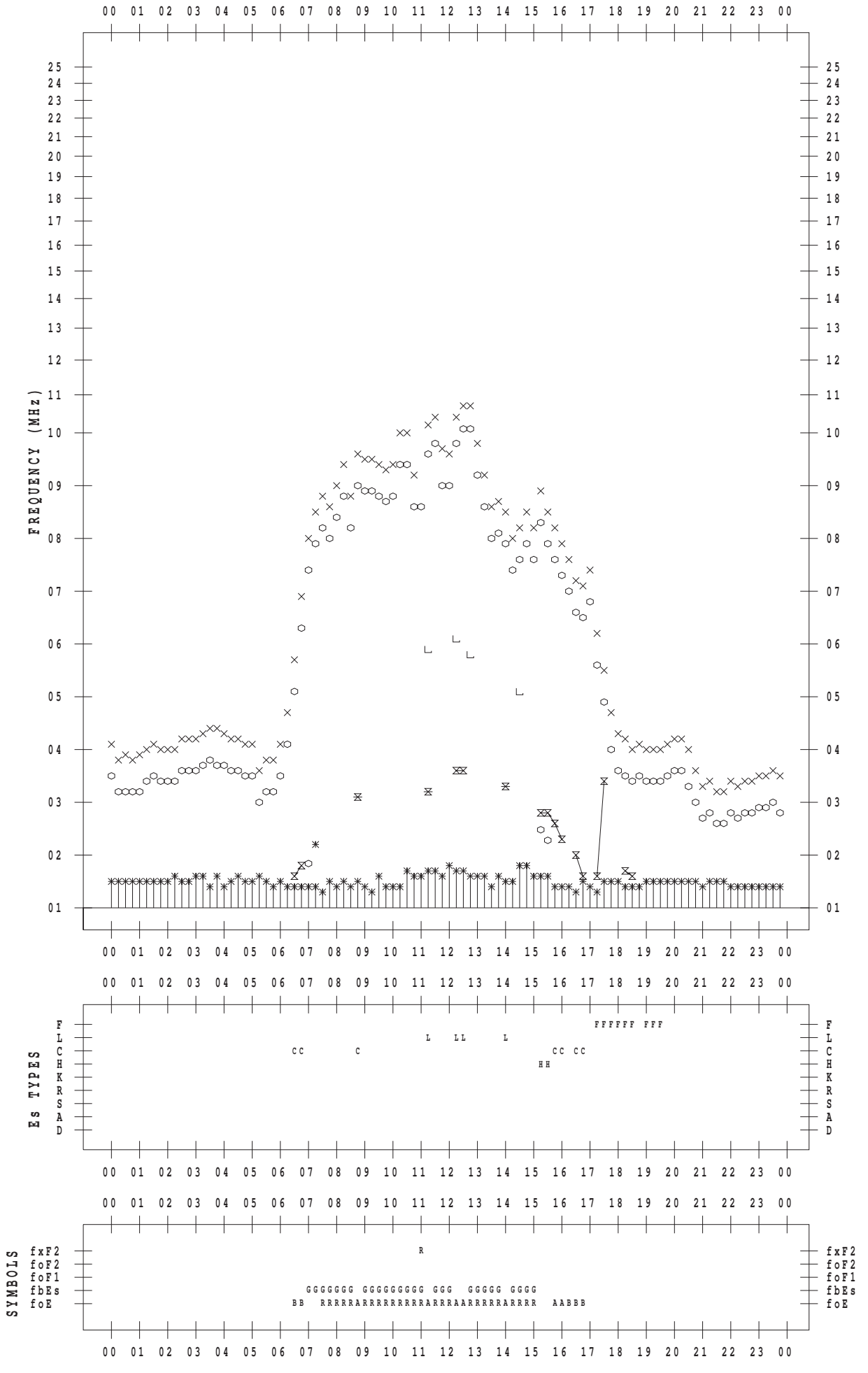
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 2

135 °E MEAN TIME



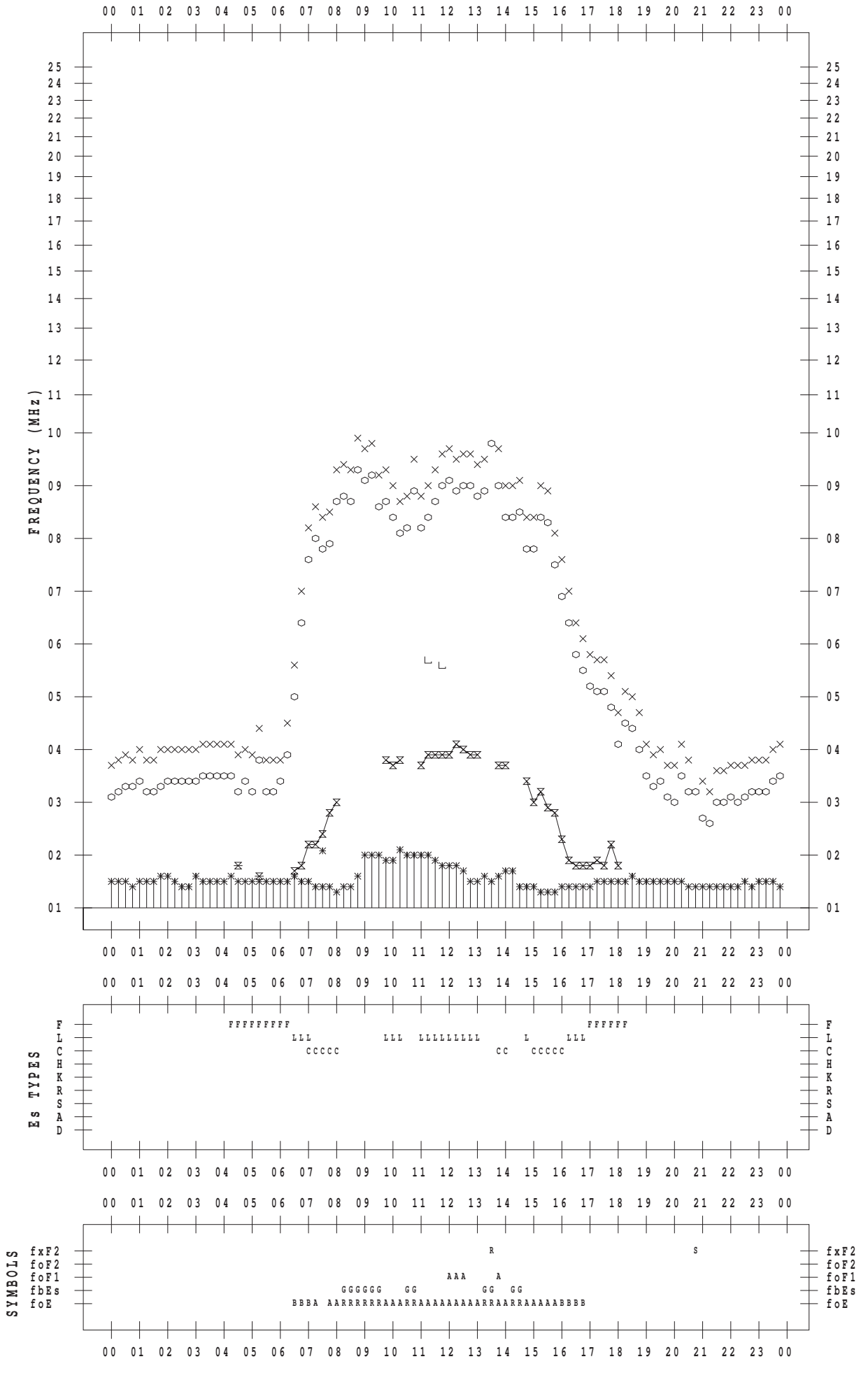
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 3

135 °E MEAN TIME



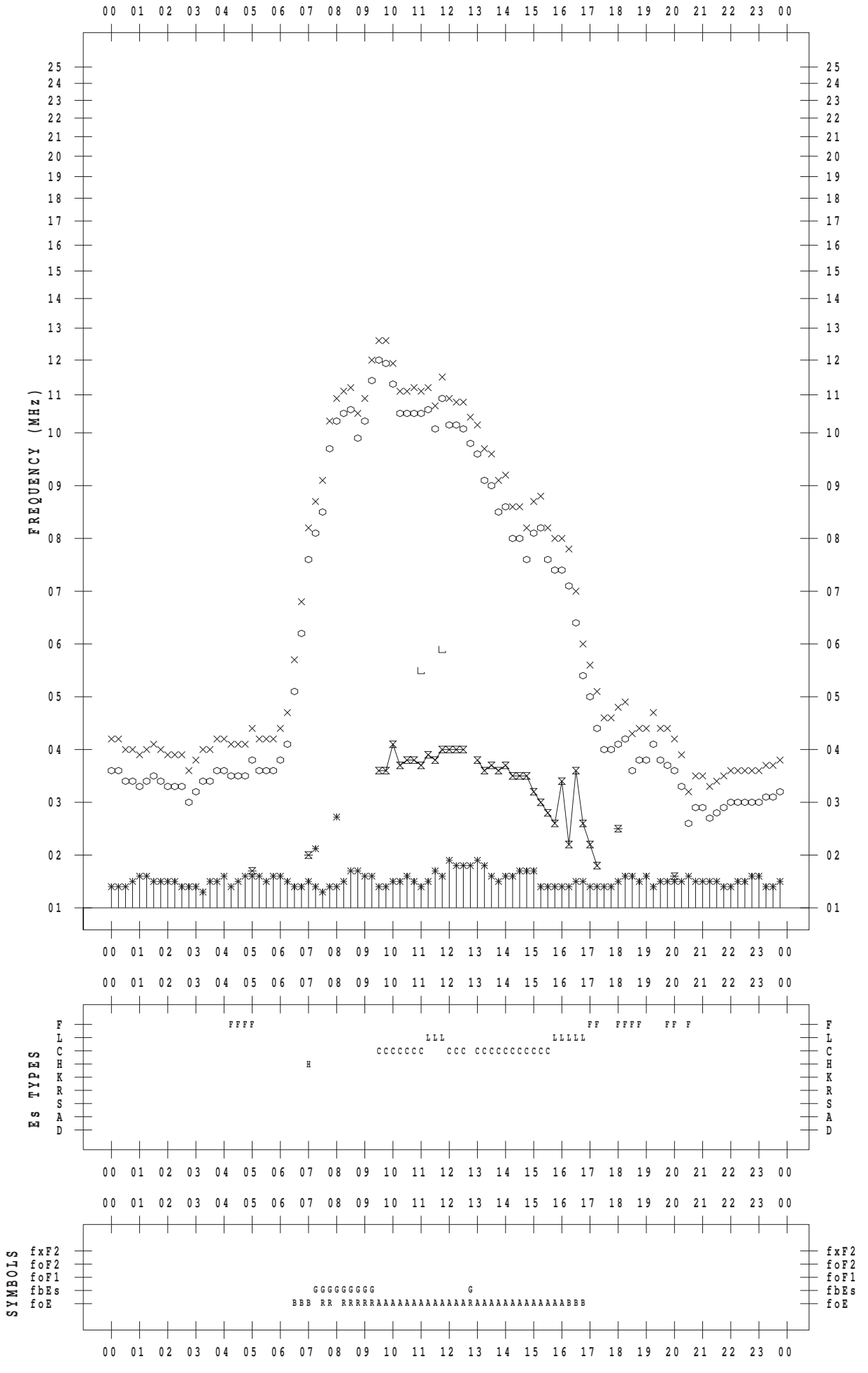
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 4

135 °E MEAN TIME



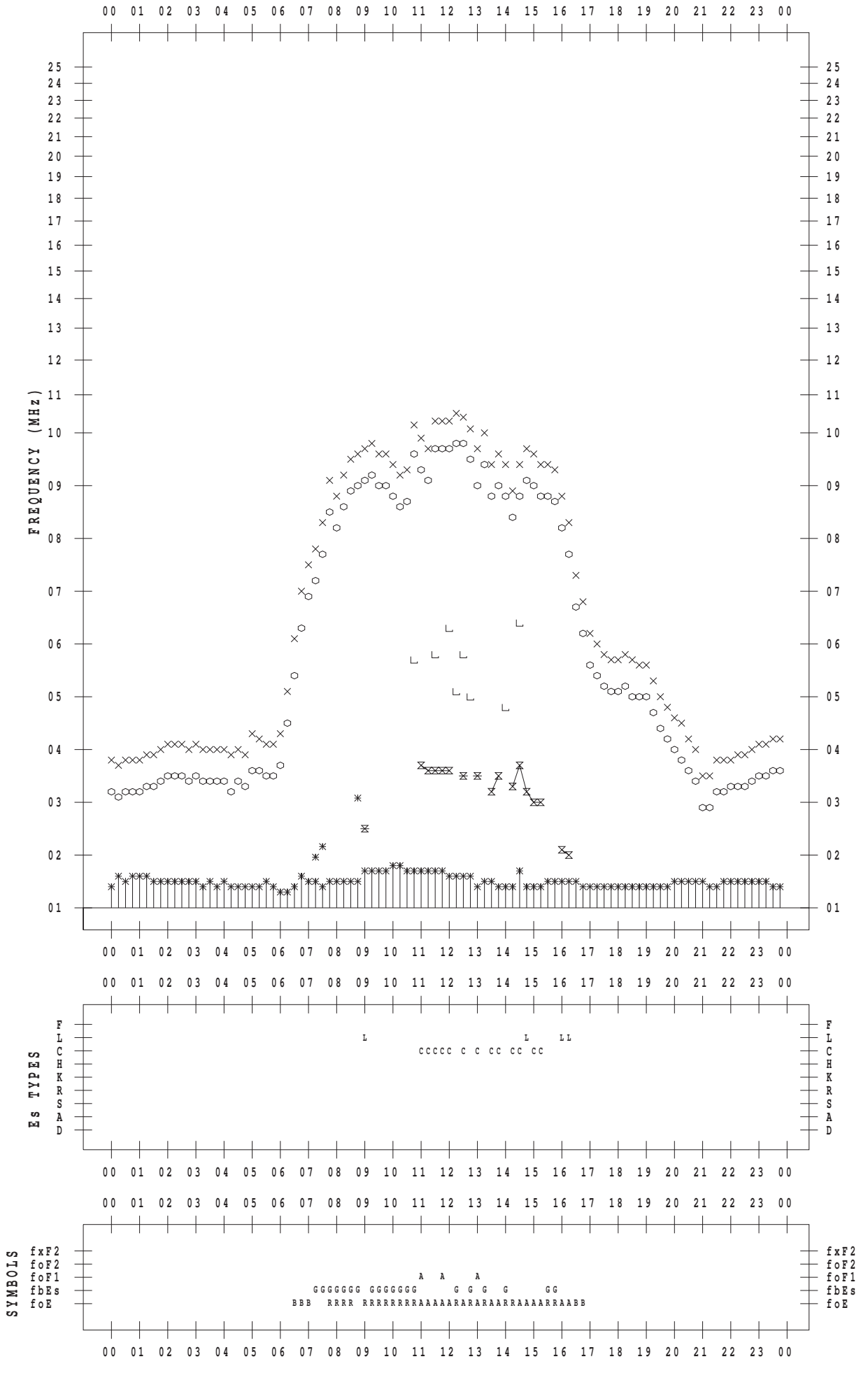
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 5

135 °E MEAN TIME



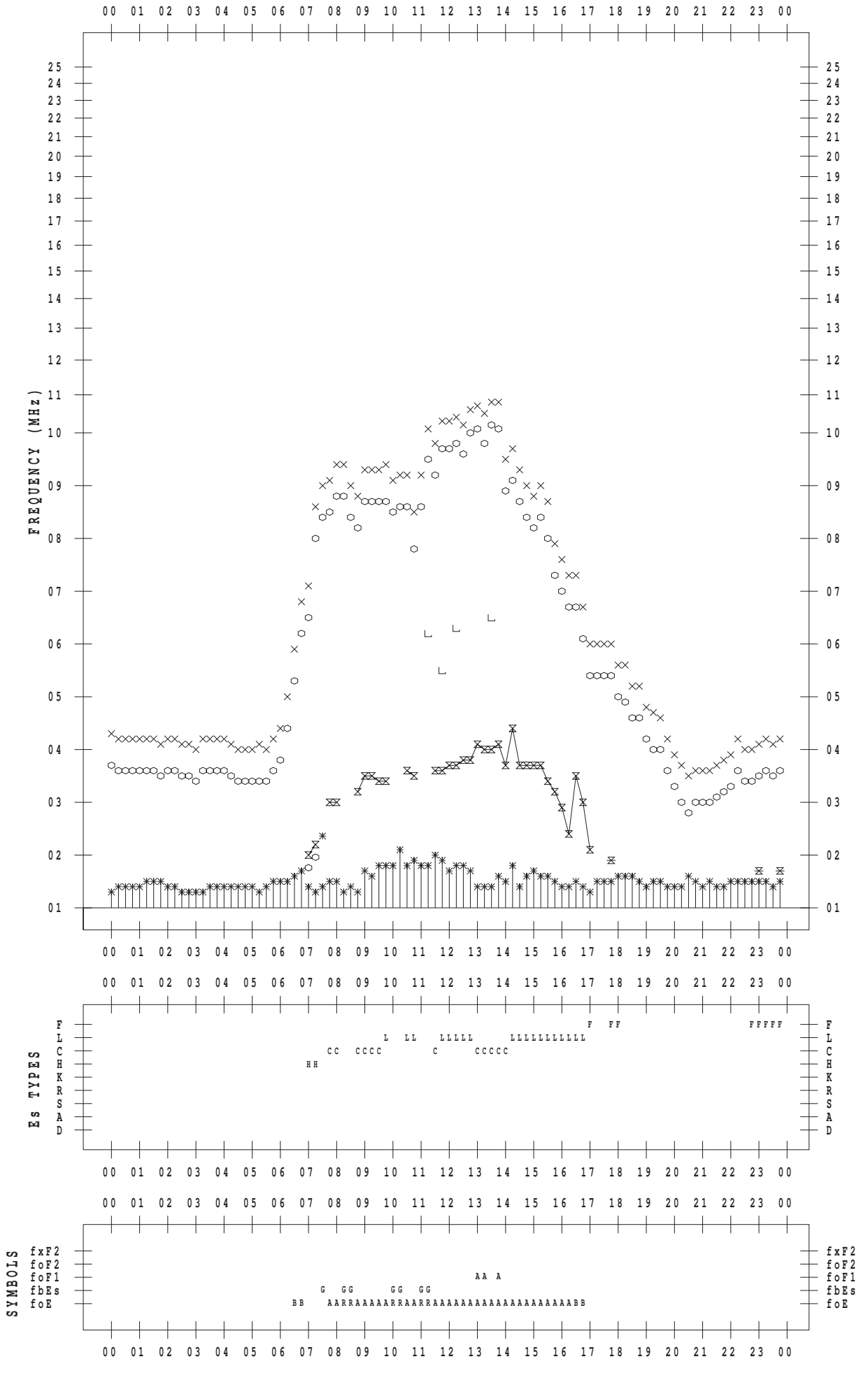
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 6

135 °E MEAN TIME



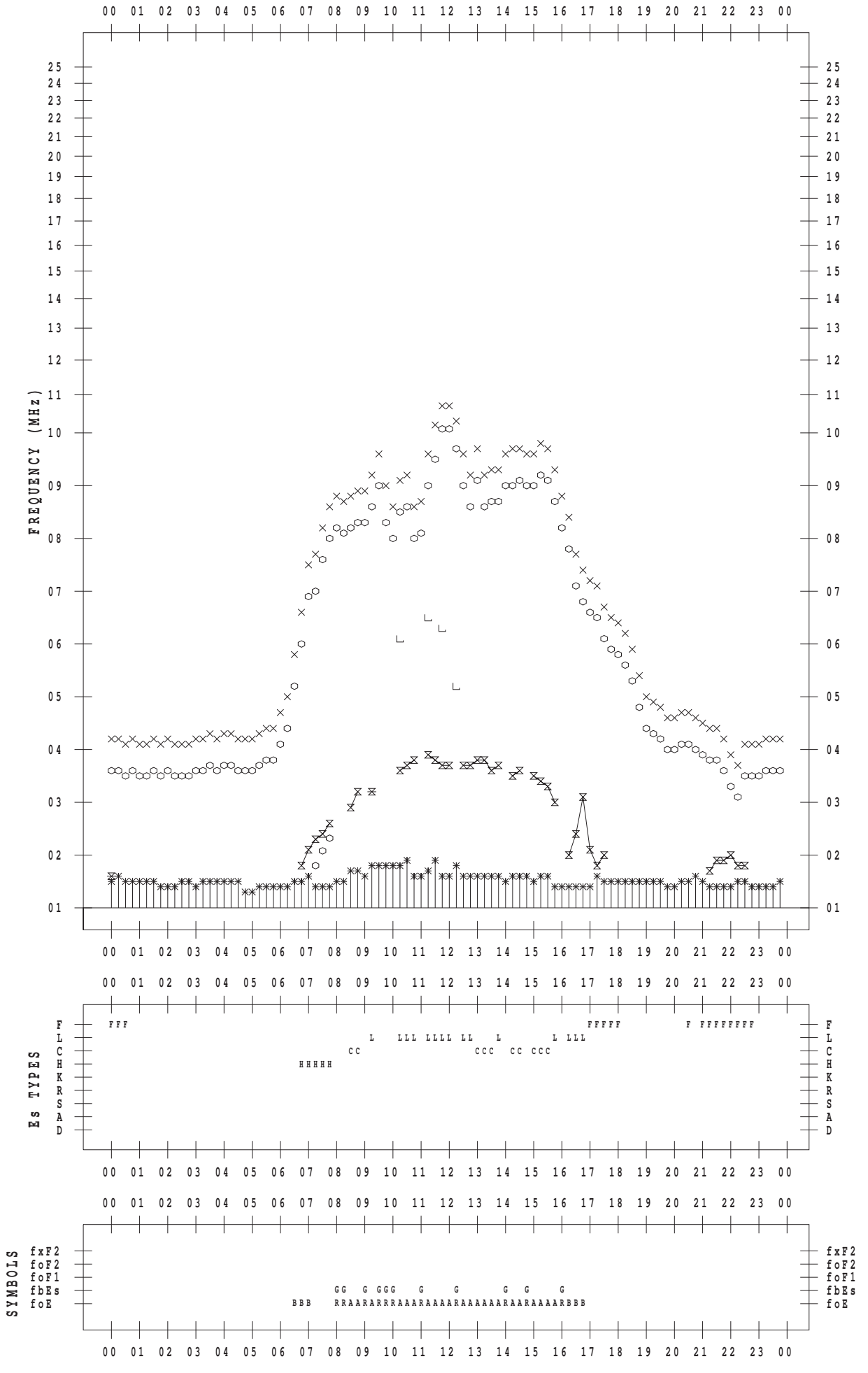
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 7

135 °E MEAN TIME



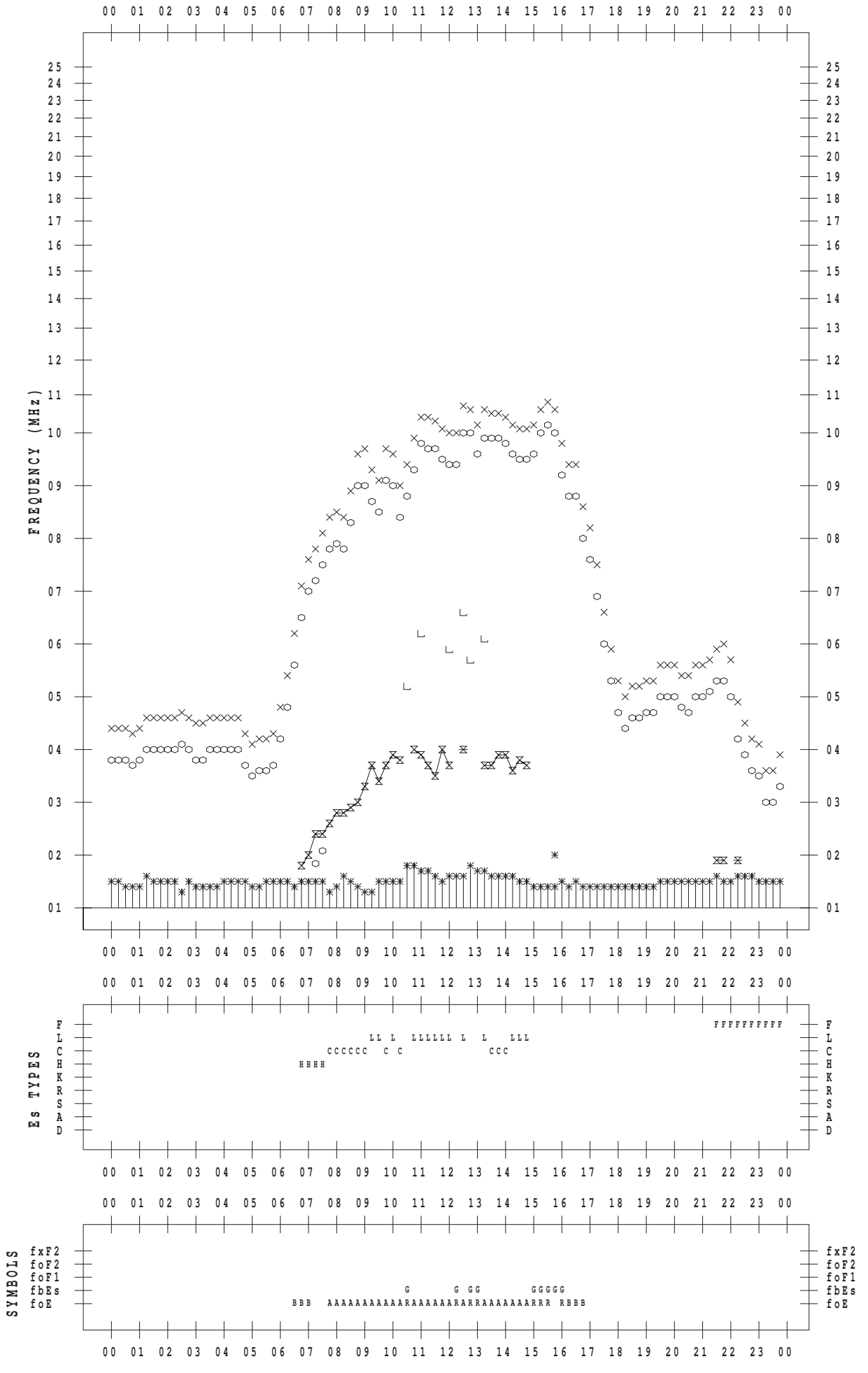
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 8

135 °E MEAN TIME



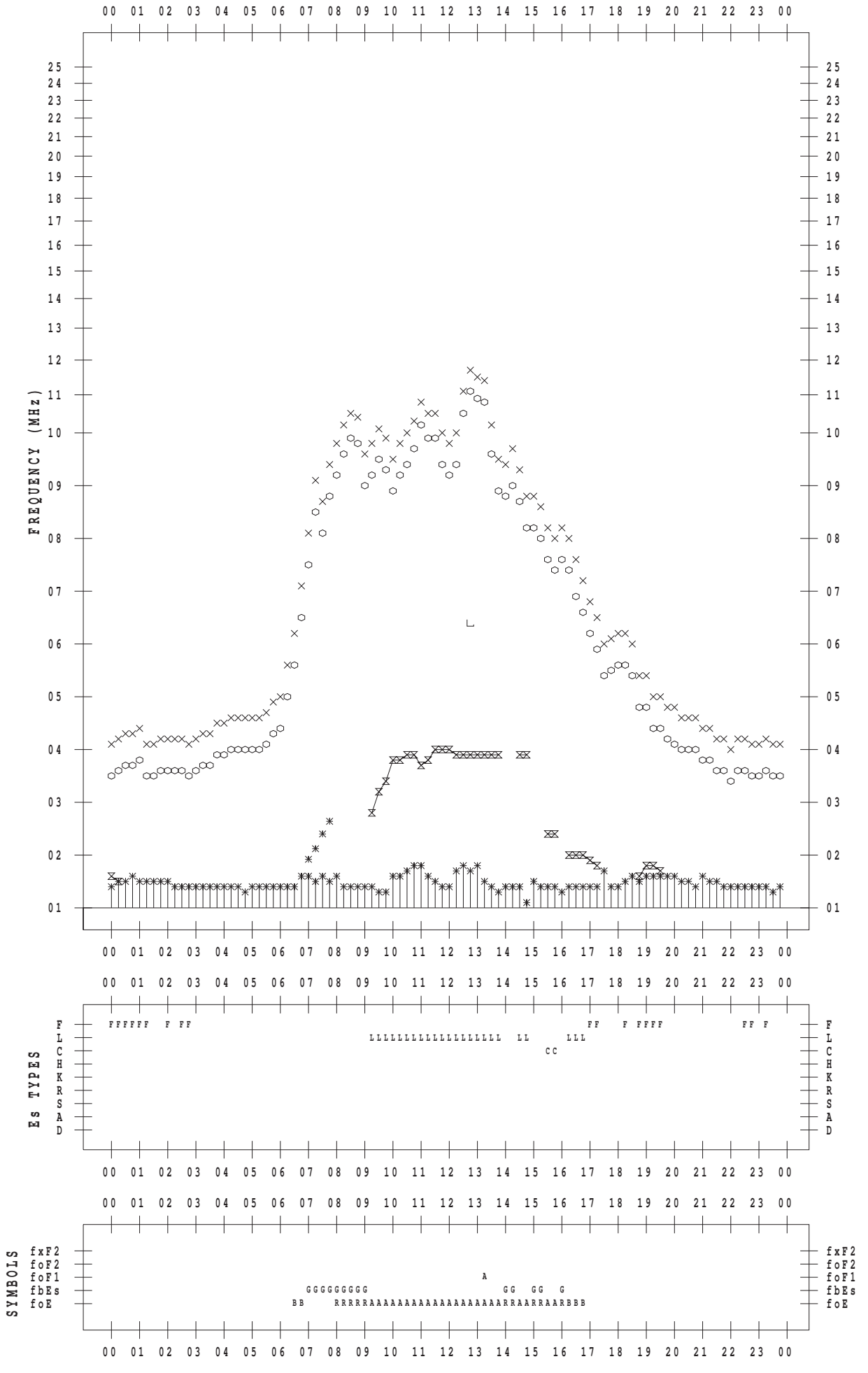
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/ 9

135 °E MEAN TIME



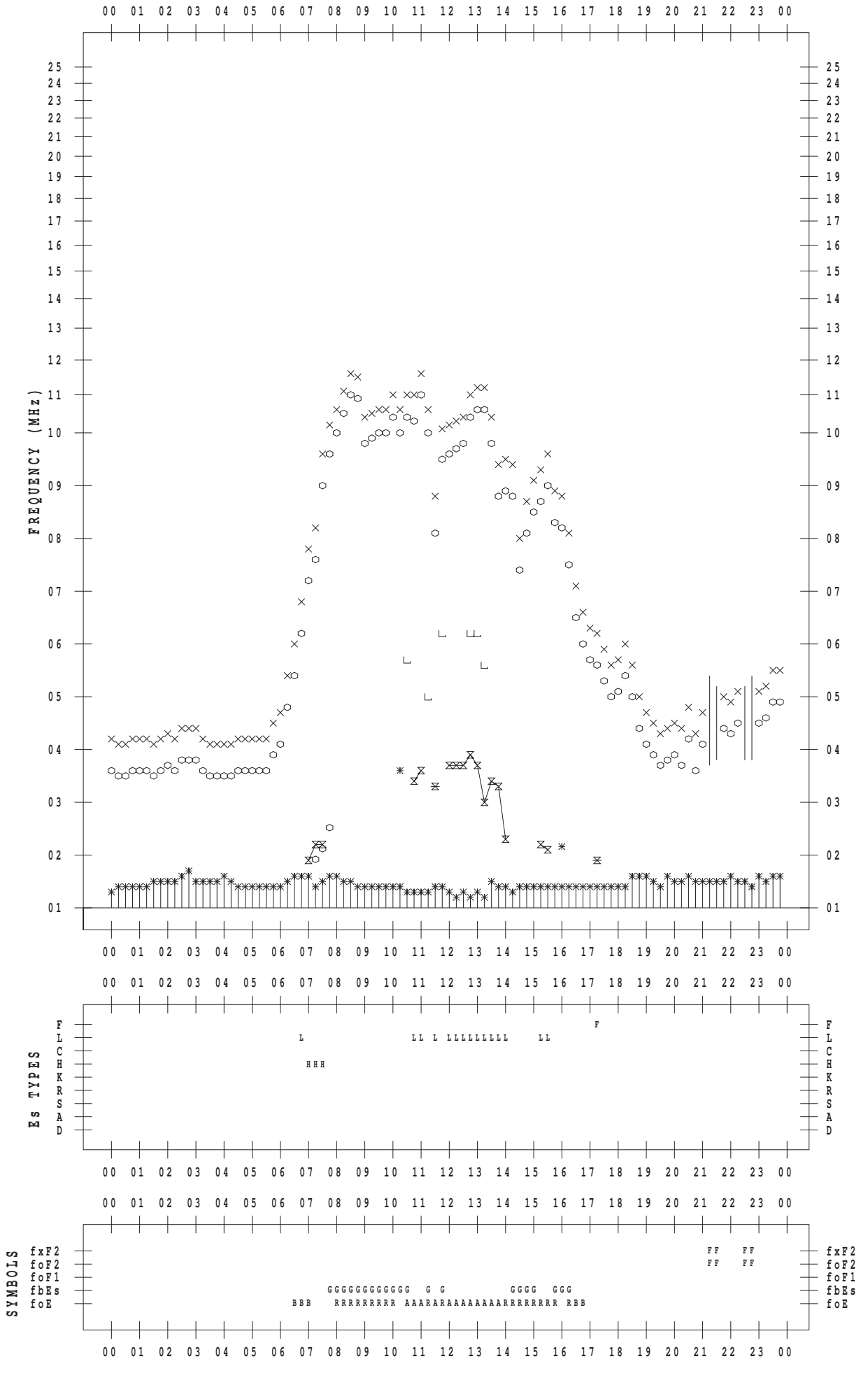
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/10

135 °E MEAN TIME



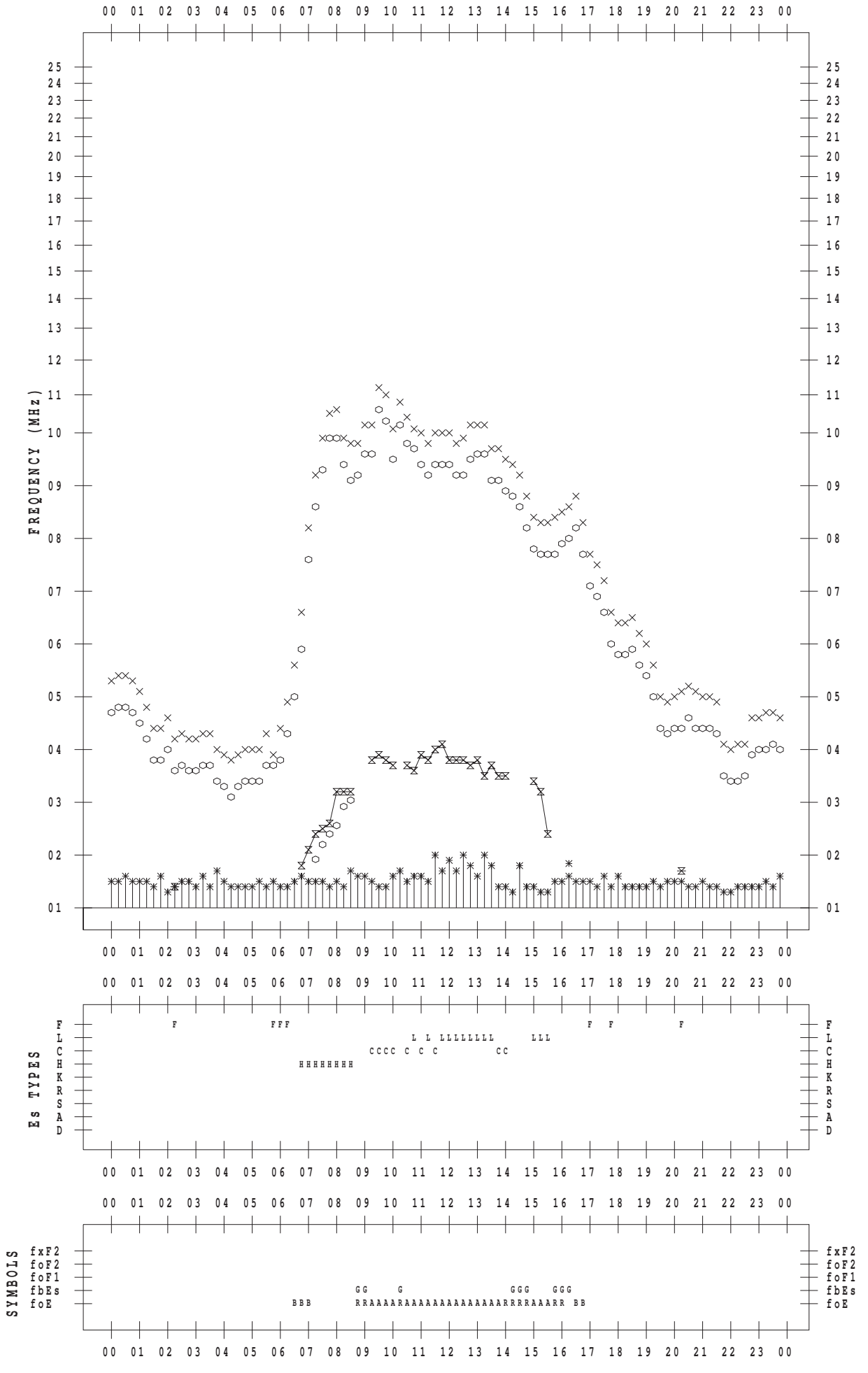
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/11

135 °E MEAN TIME



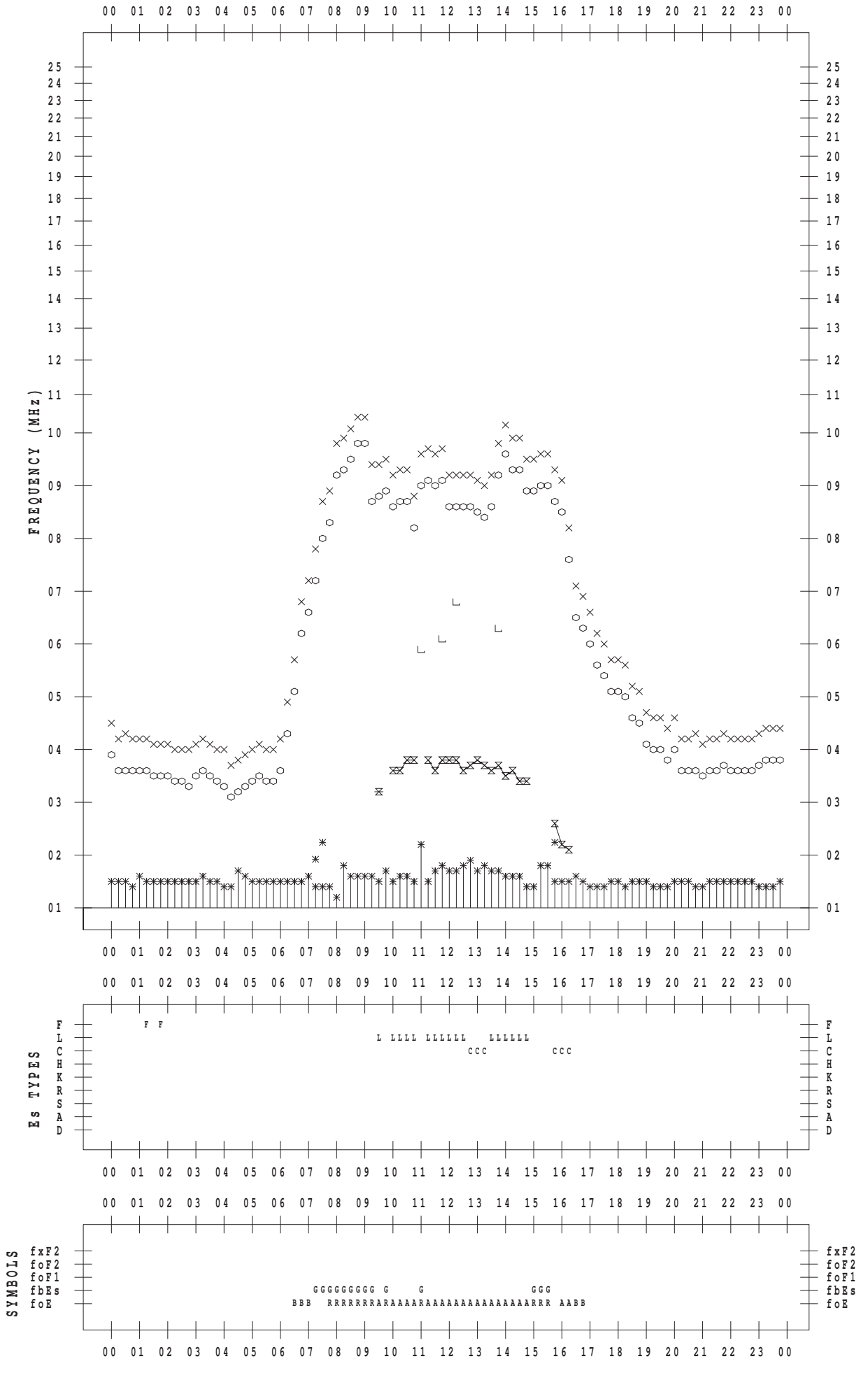
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/12

135 °E MEAN TIME



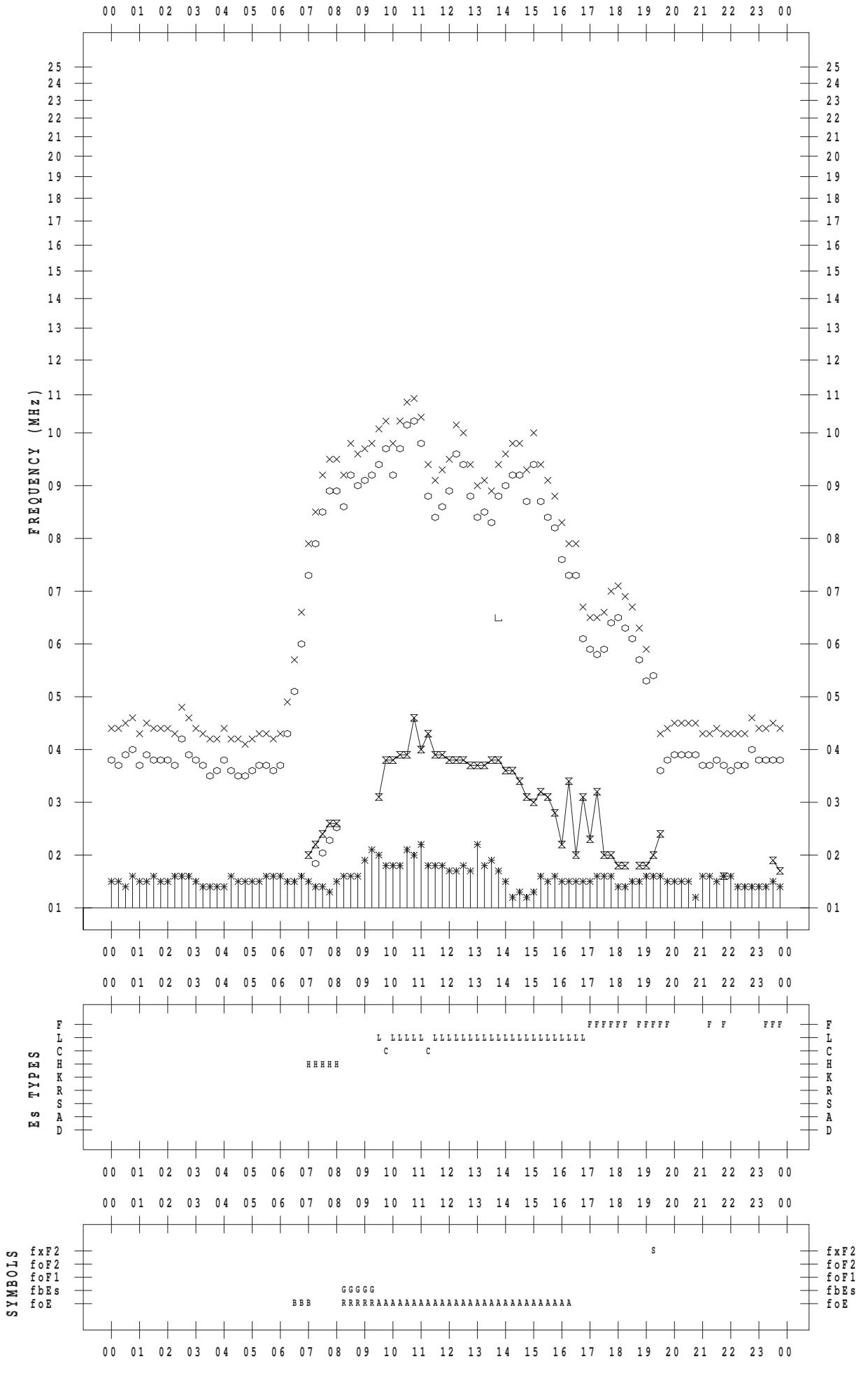
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/13

135 °E MEAN TIME



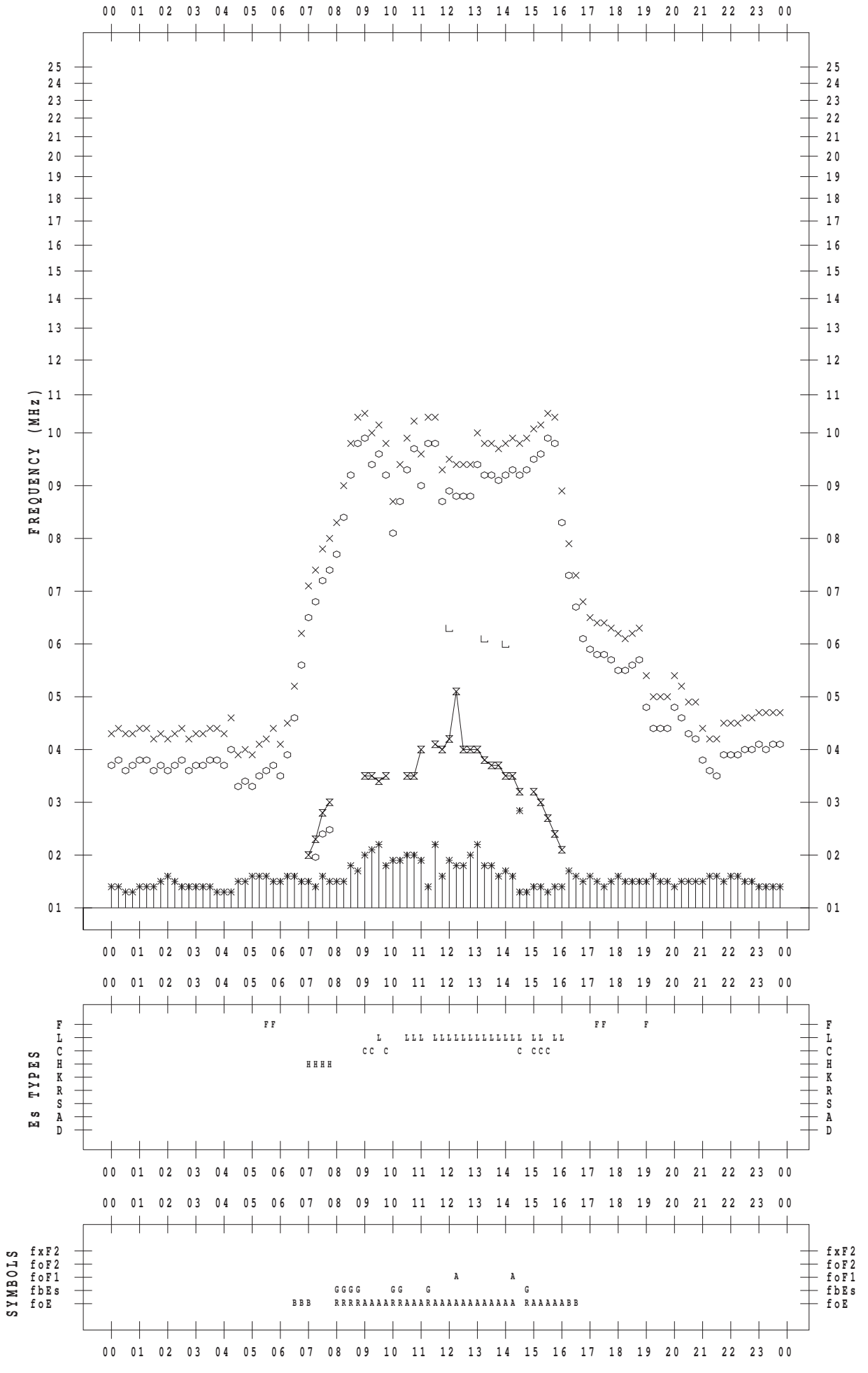
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/14

135 °E MEAN TIME



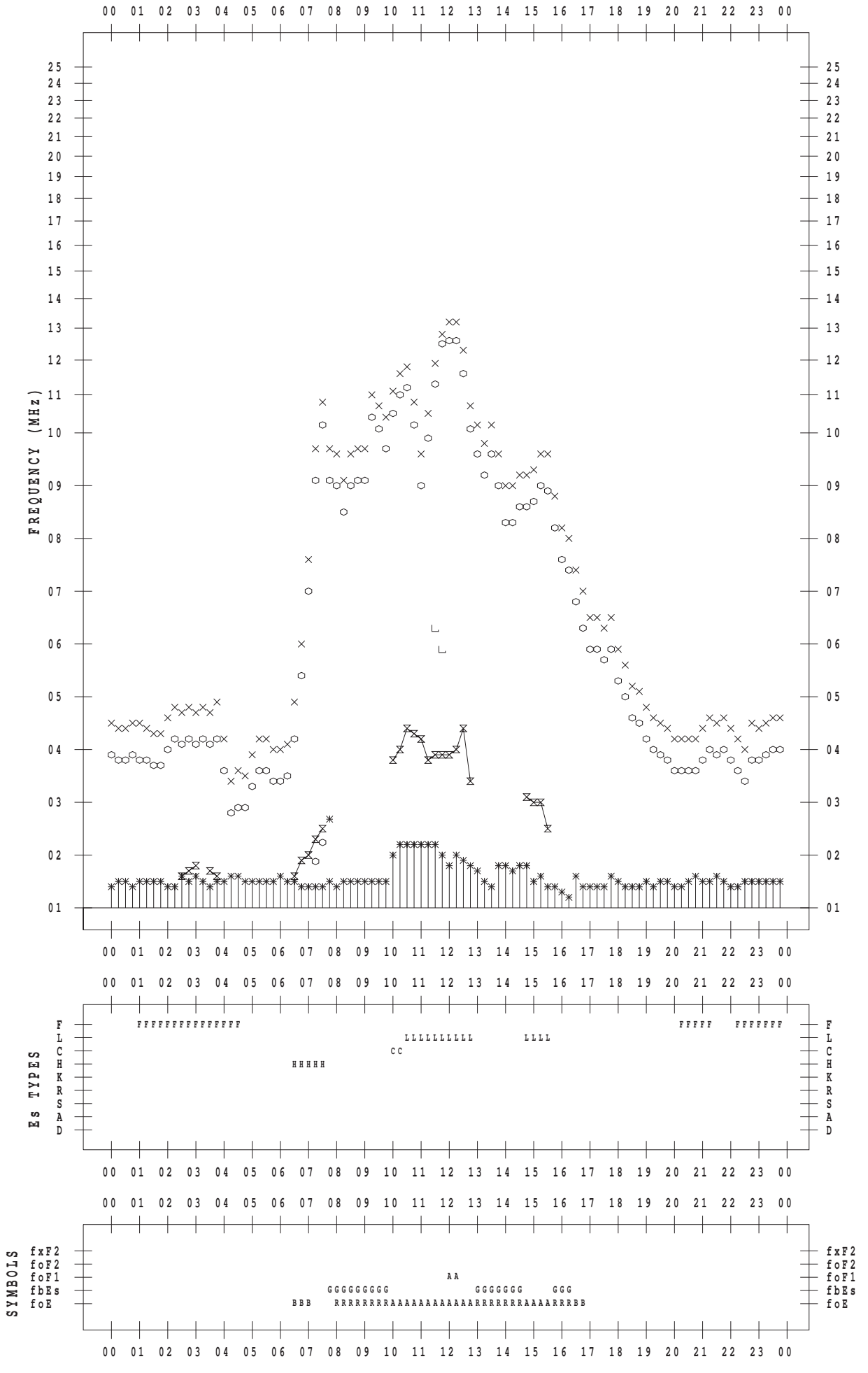
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/15

135 °E MEAN TIME



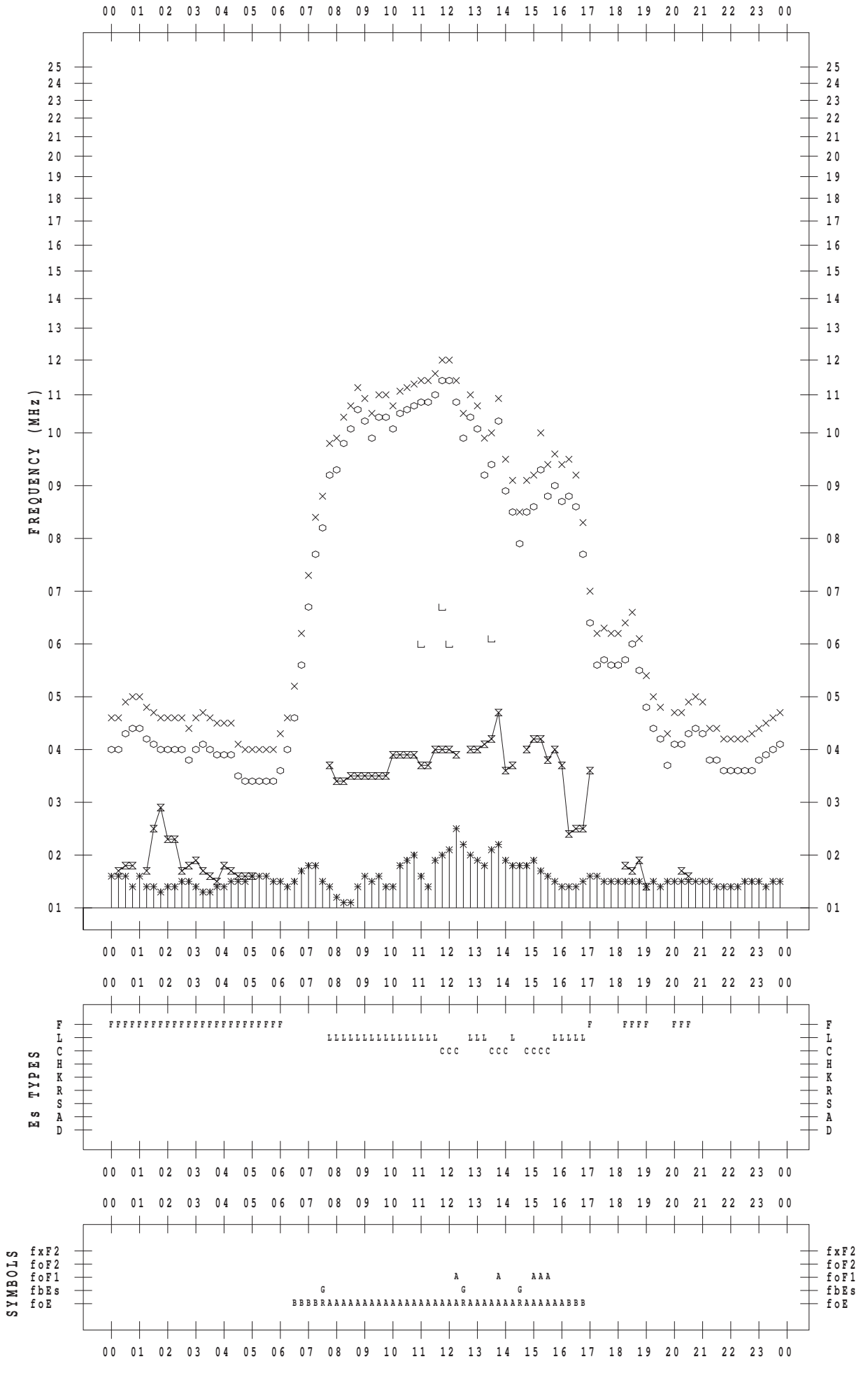
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/16

135 °E MEAN TIME



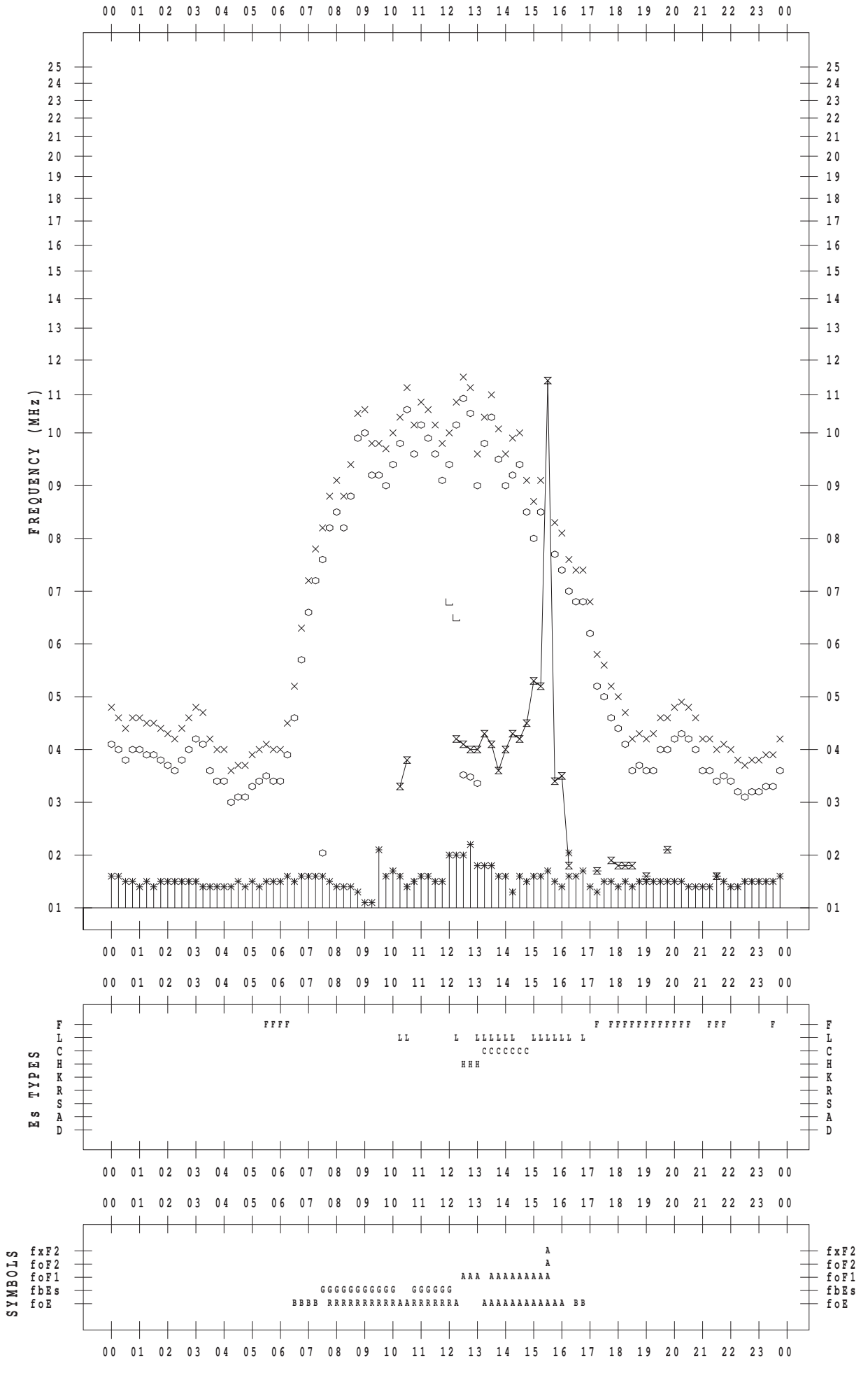
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/17

135 °E MEAN TIME



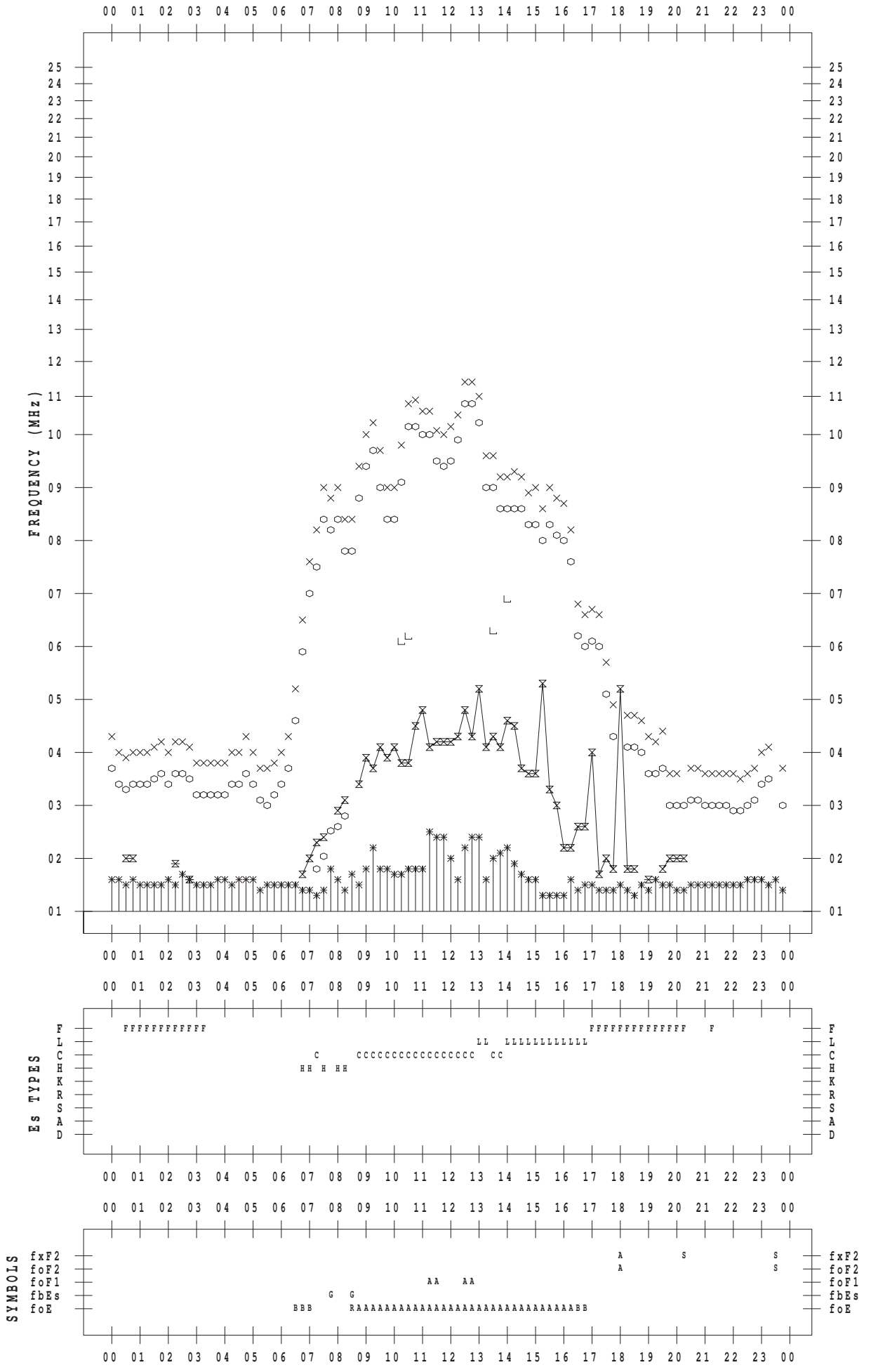
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/18

135 °E MEAN TIME



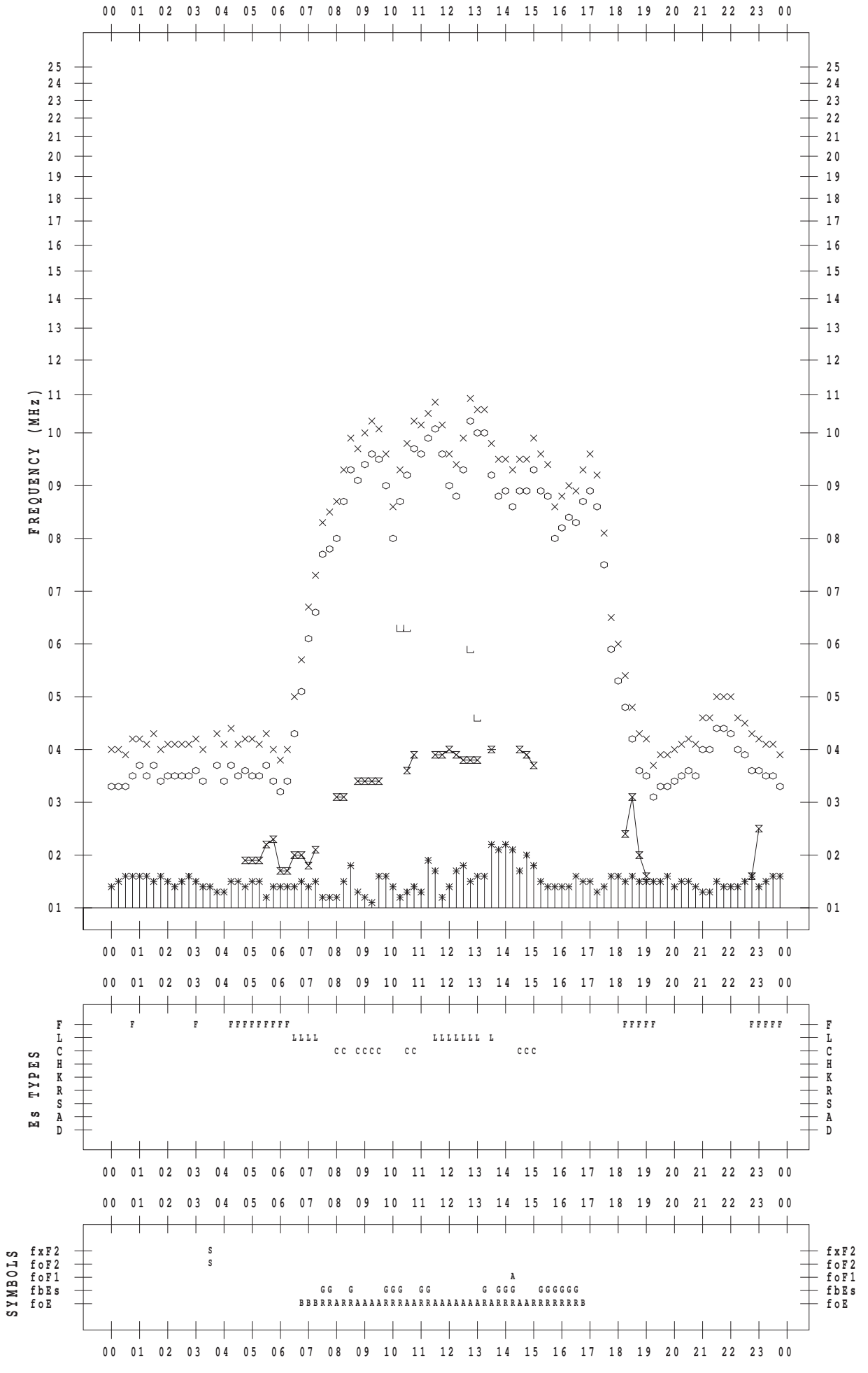
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/19

135 °E MEAN TIME



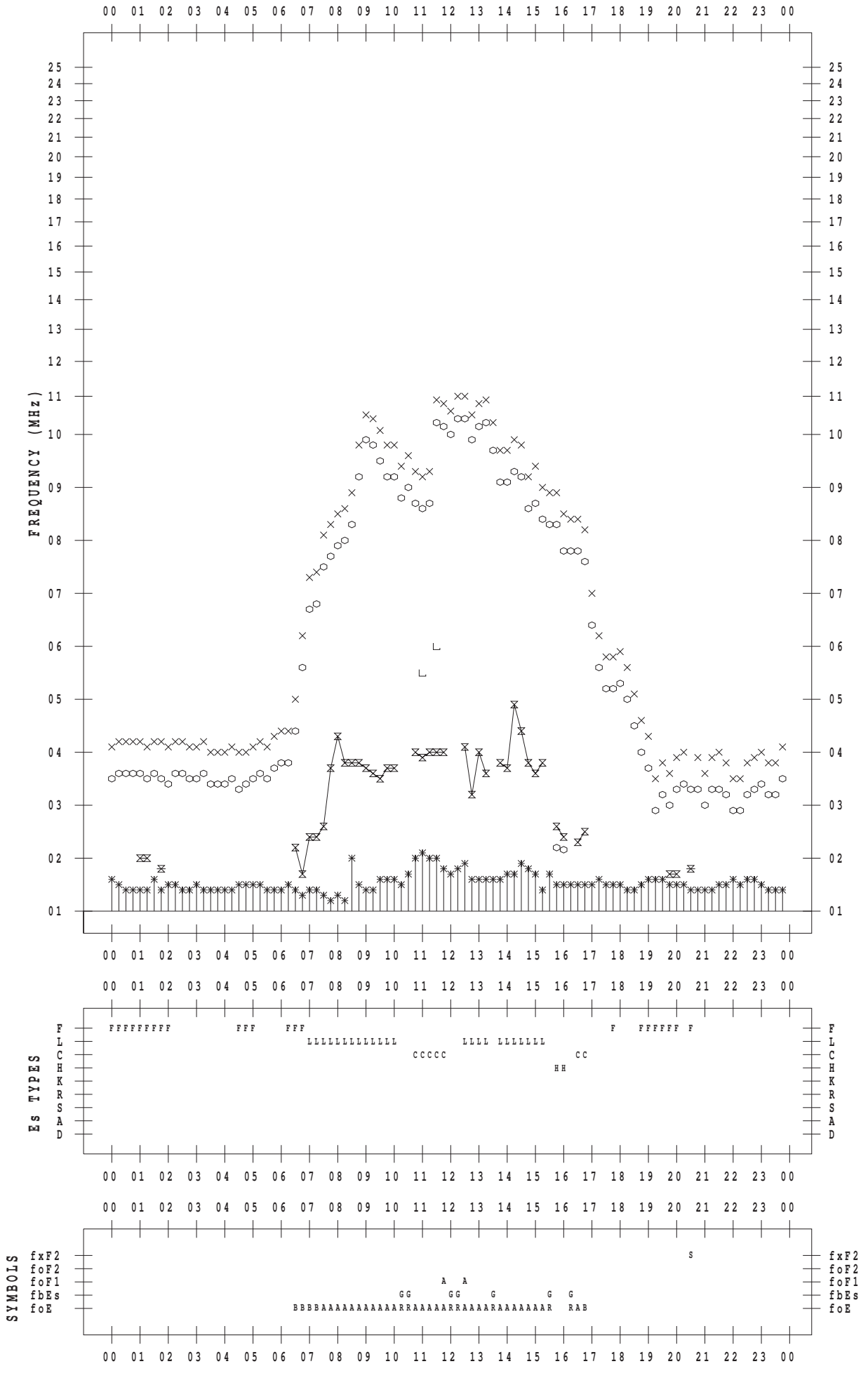
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/20

135 °E MEAN TIME



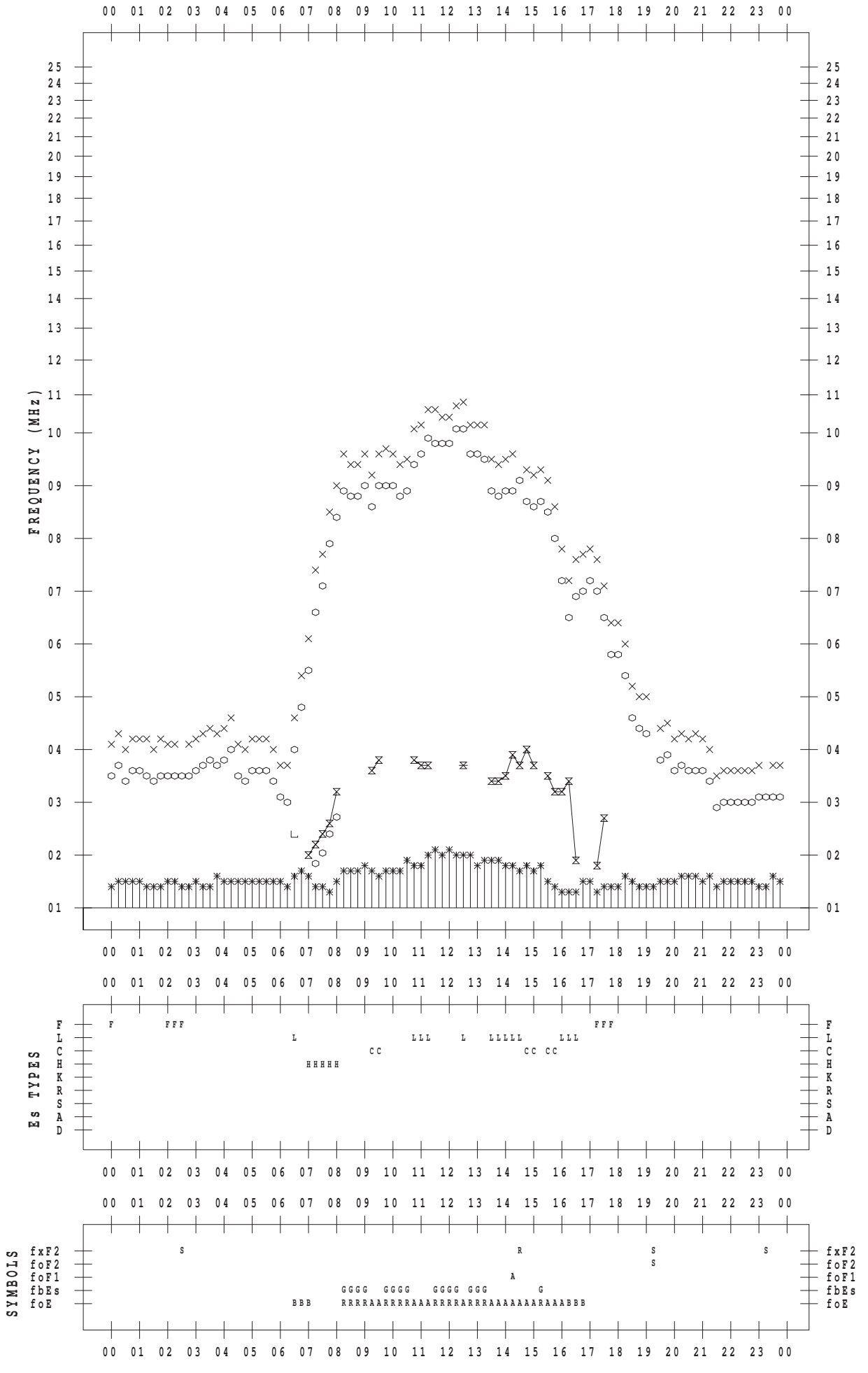
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/21

135 °E MEAN TIME



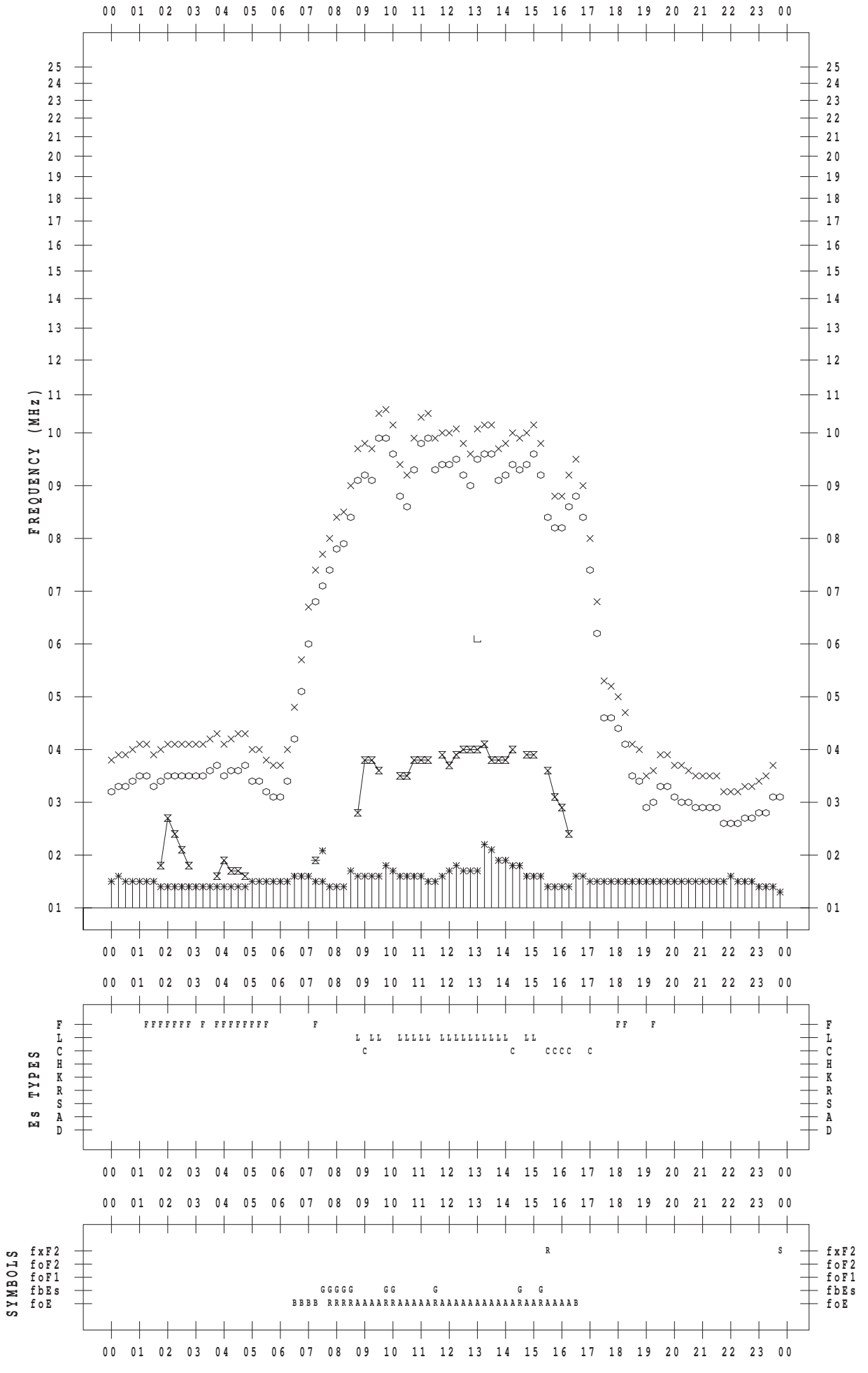
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/22

135 °E MEAN TIME



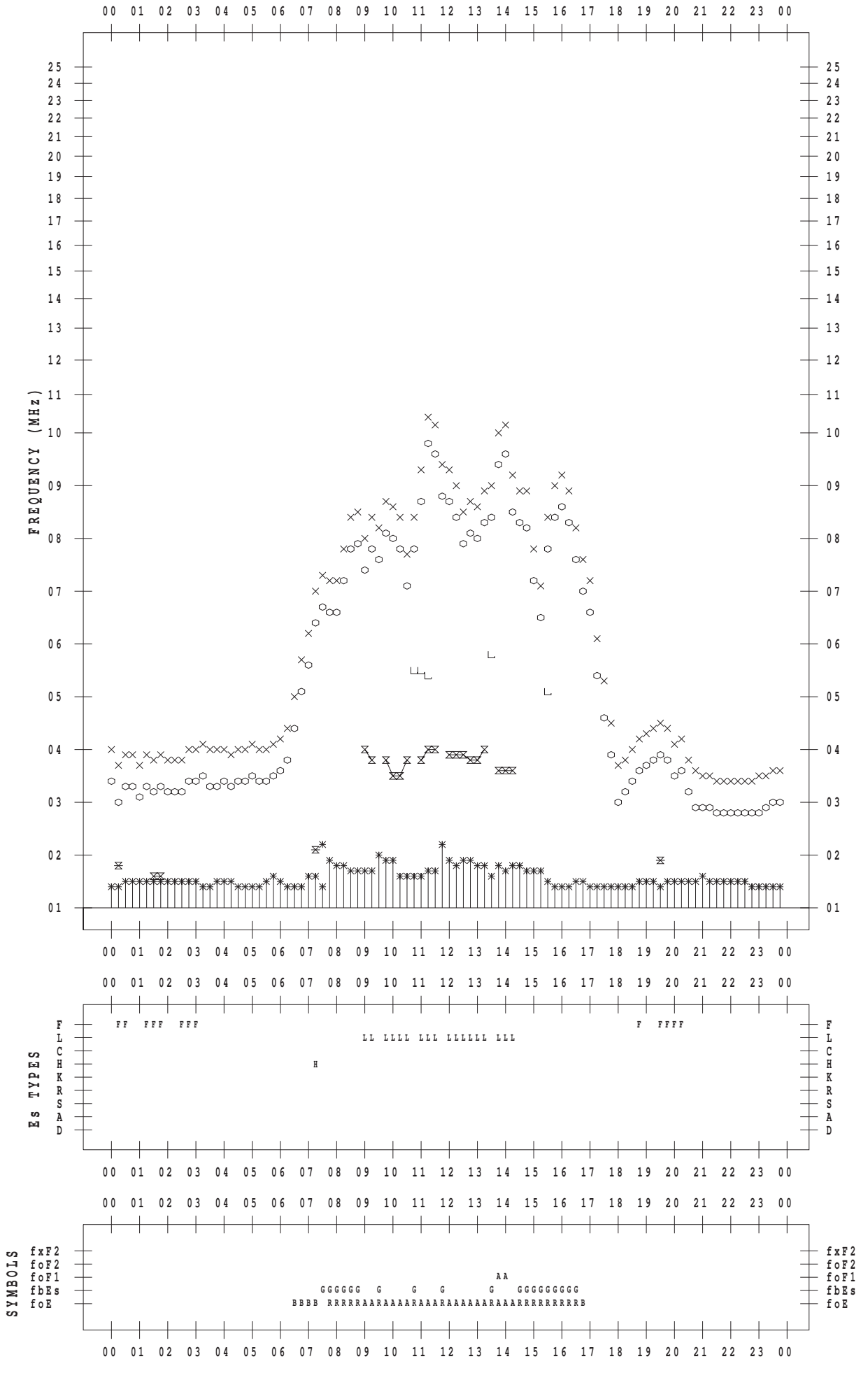
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/23

135 °E MEAN TIME

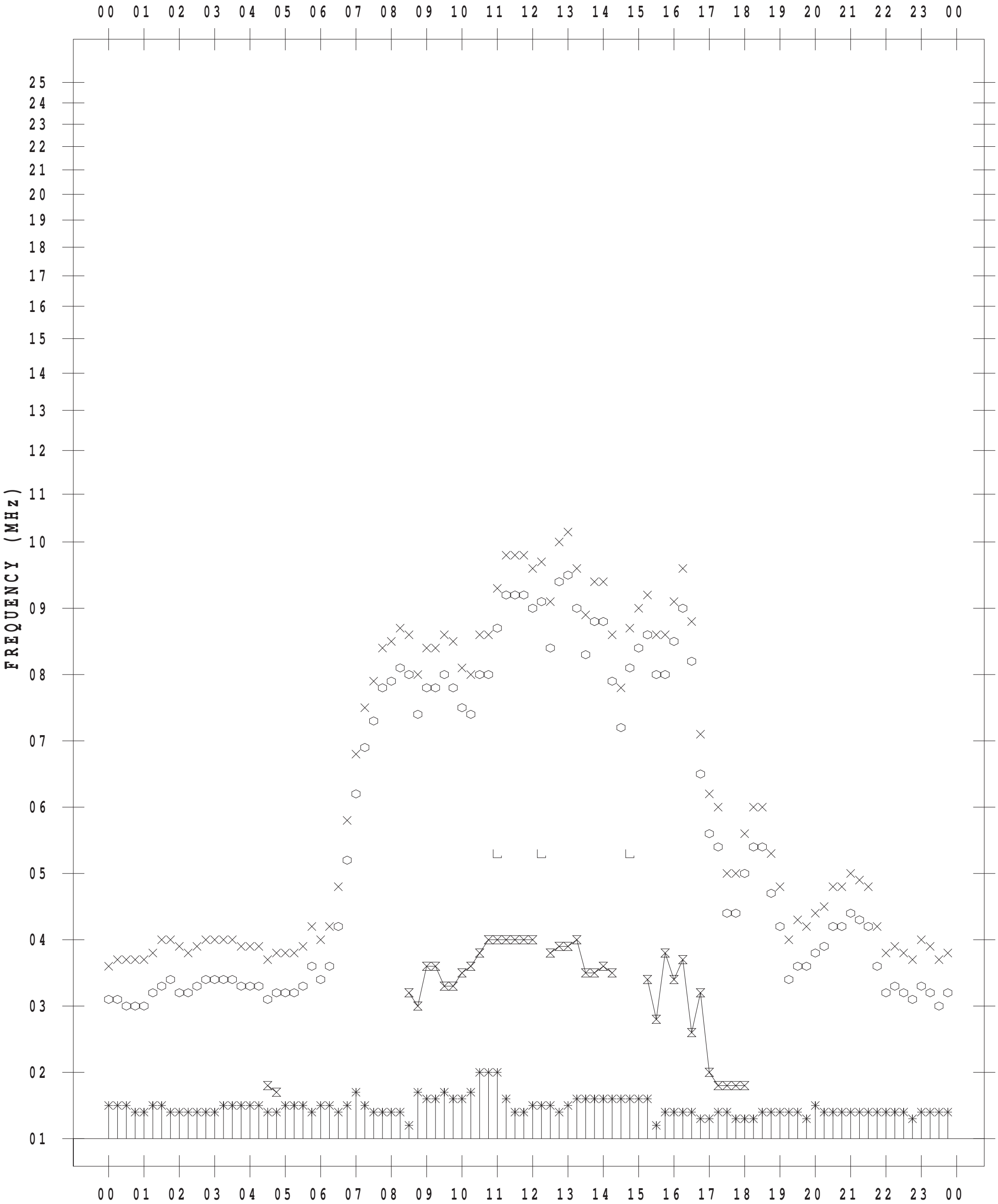


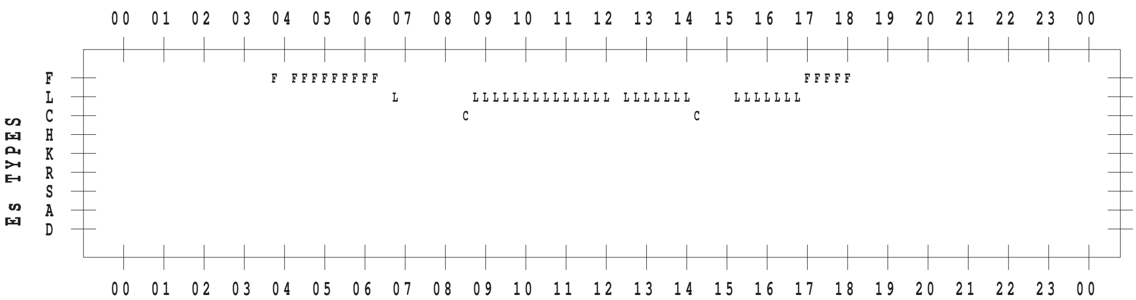
f-PLOT DATA

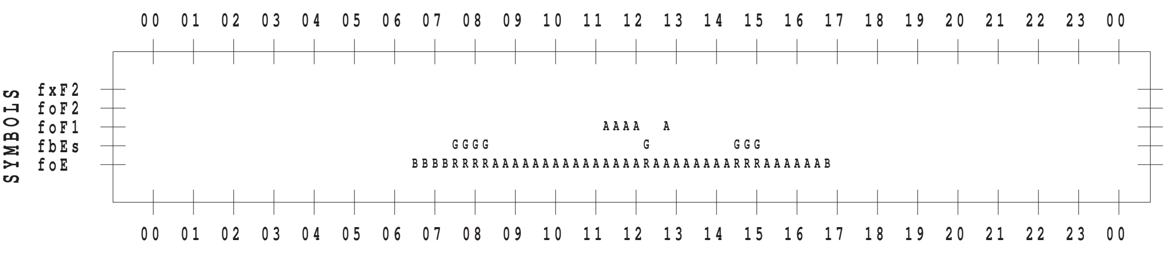
SCALER : I.NISHIMUTA

STATION : Kokubunji DATE : 2013/12/24

135 °E MEAN TIME







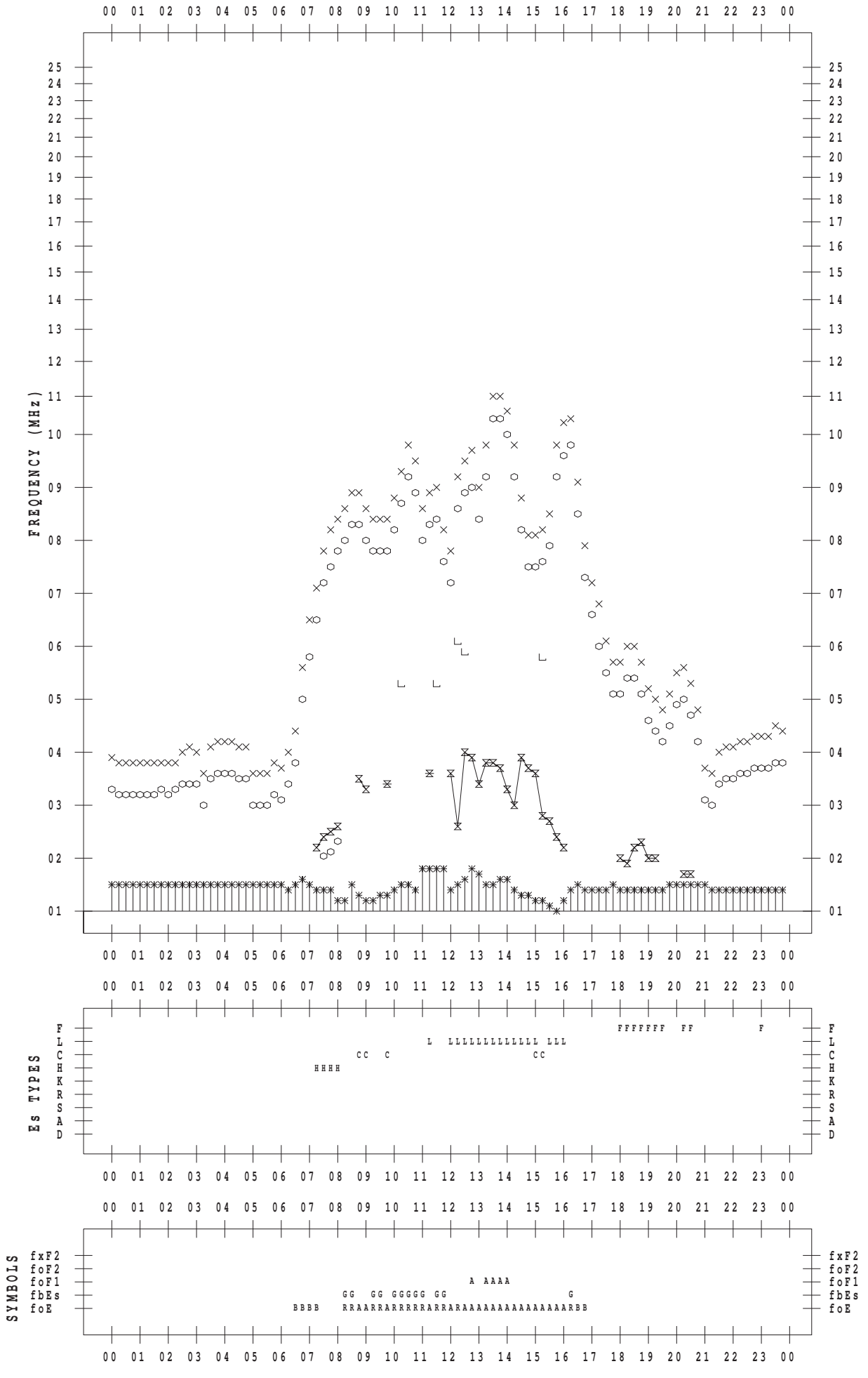
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/25

135 °E MEAN TIME



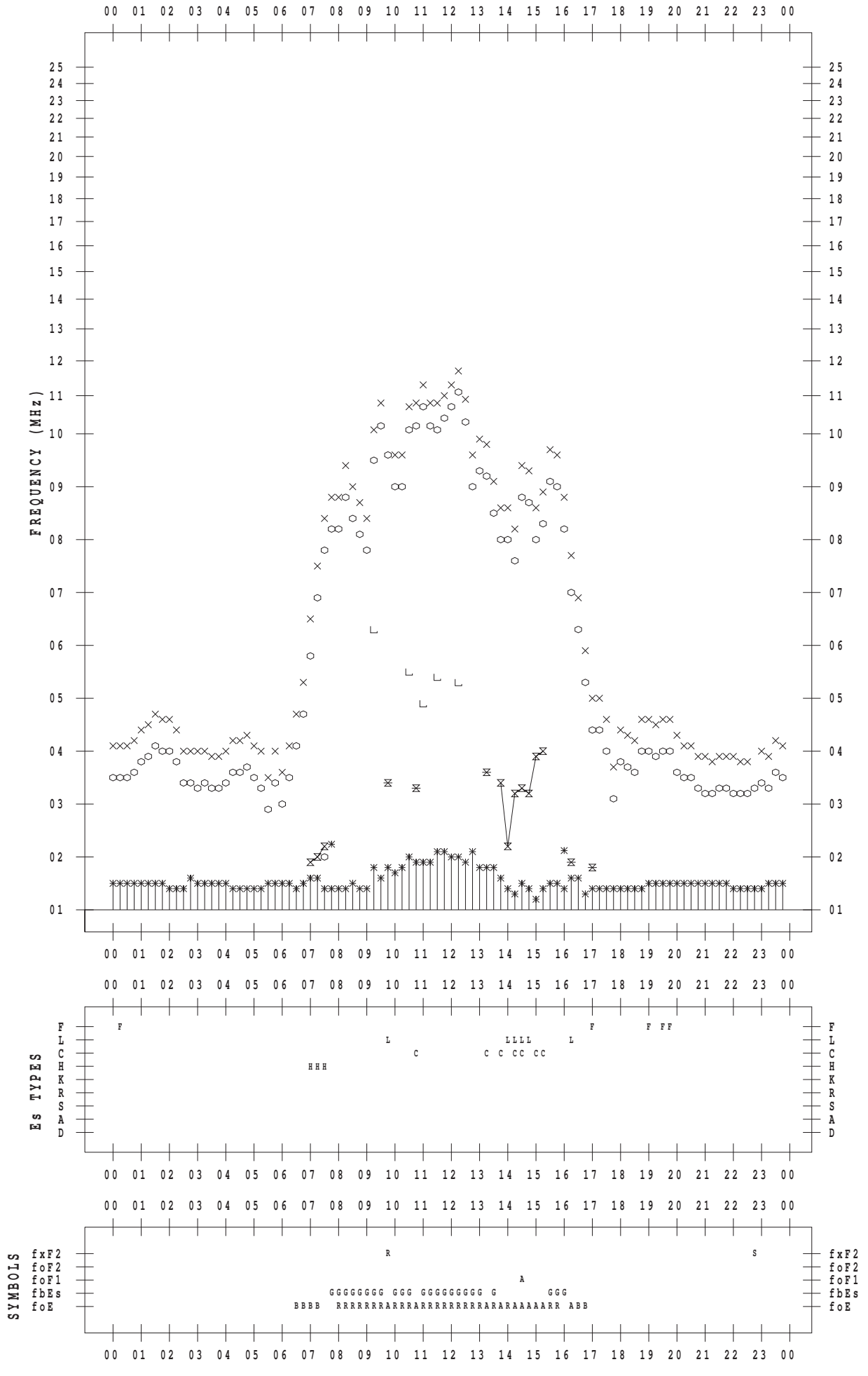
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/26

135 °E MEAN TIME



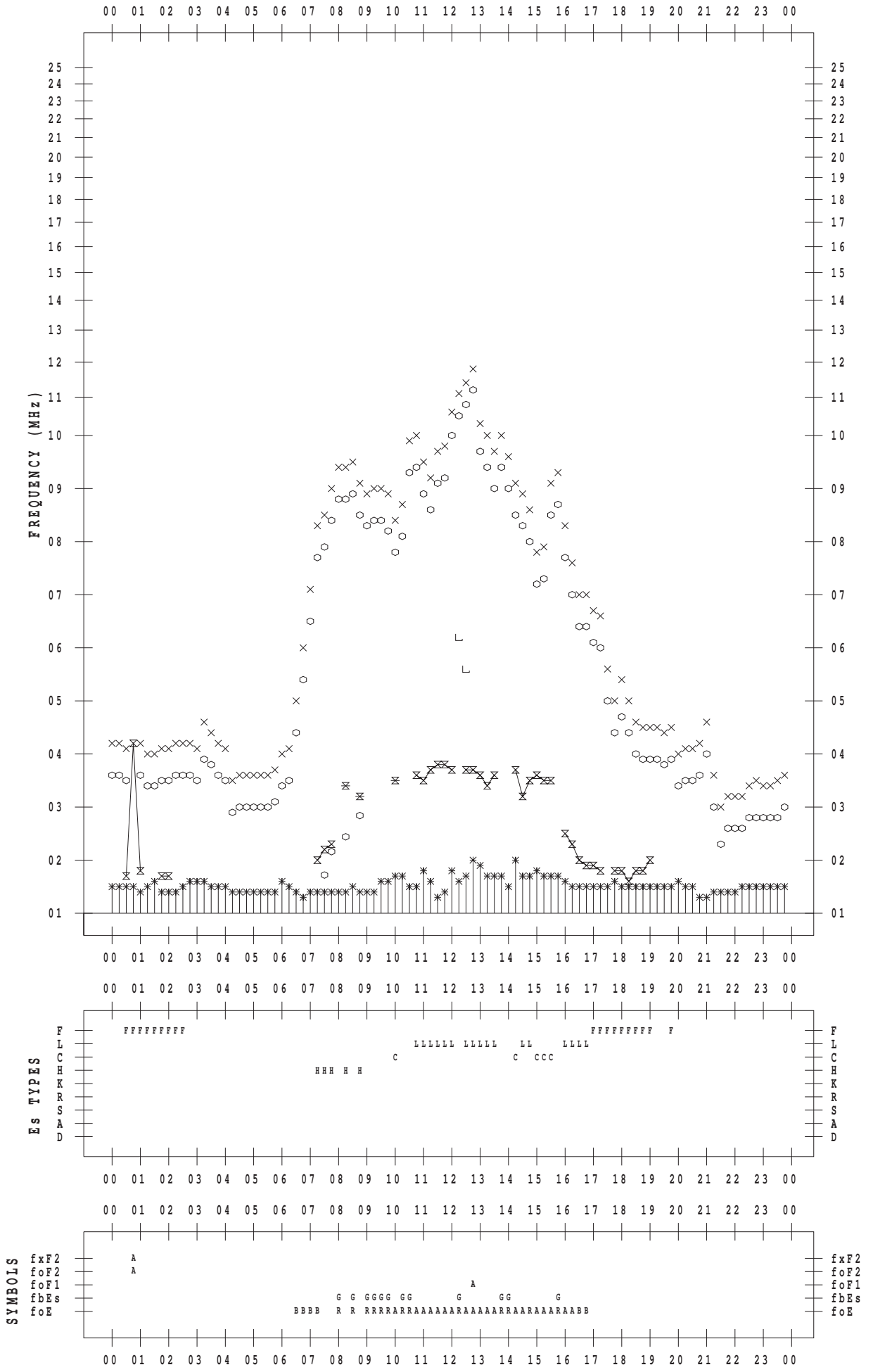
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/27

135 °E MEAN TIME



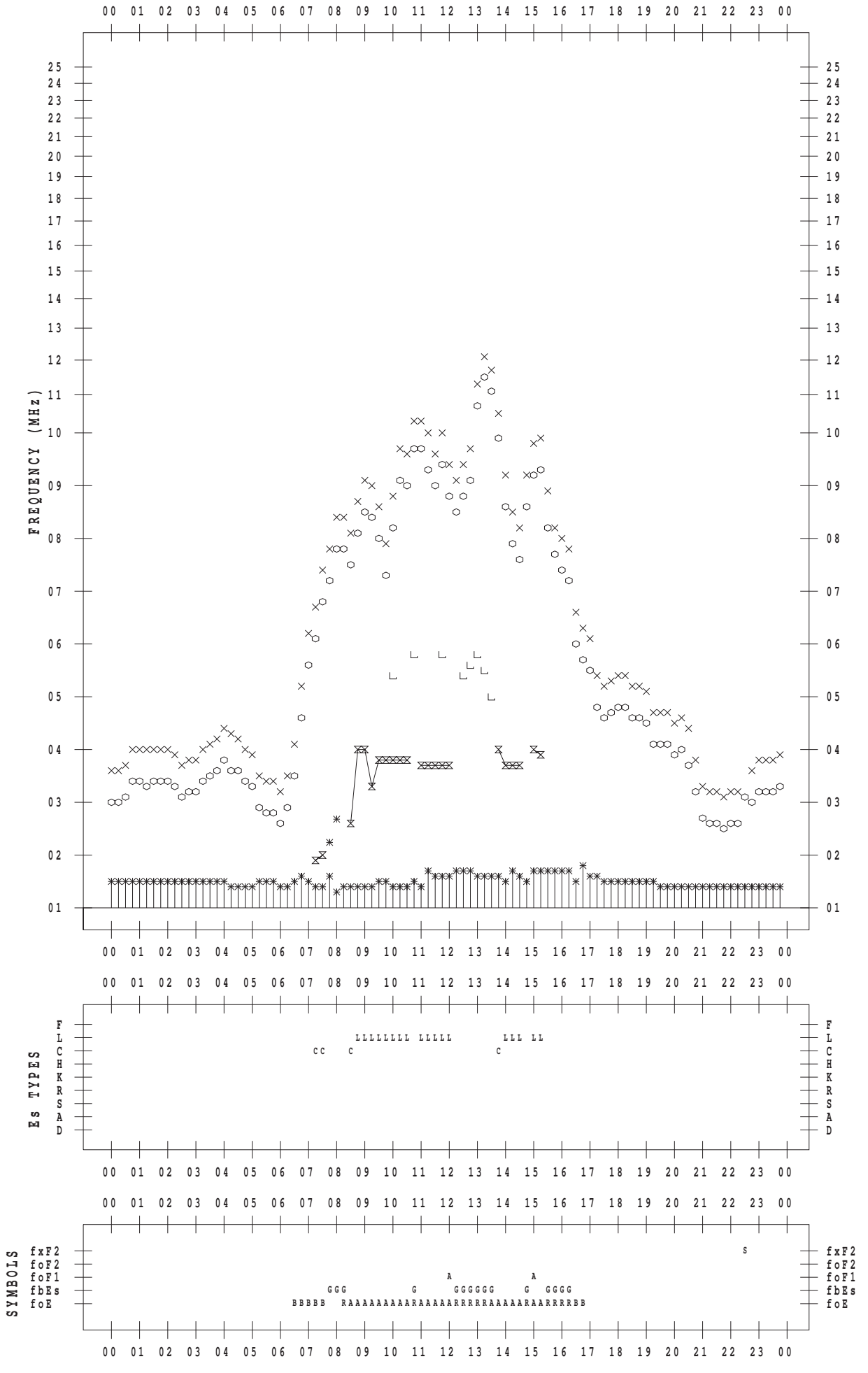
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/28

135 °E MEAN TIME



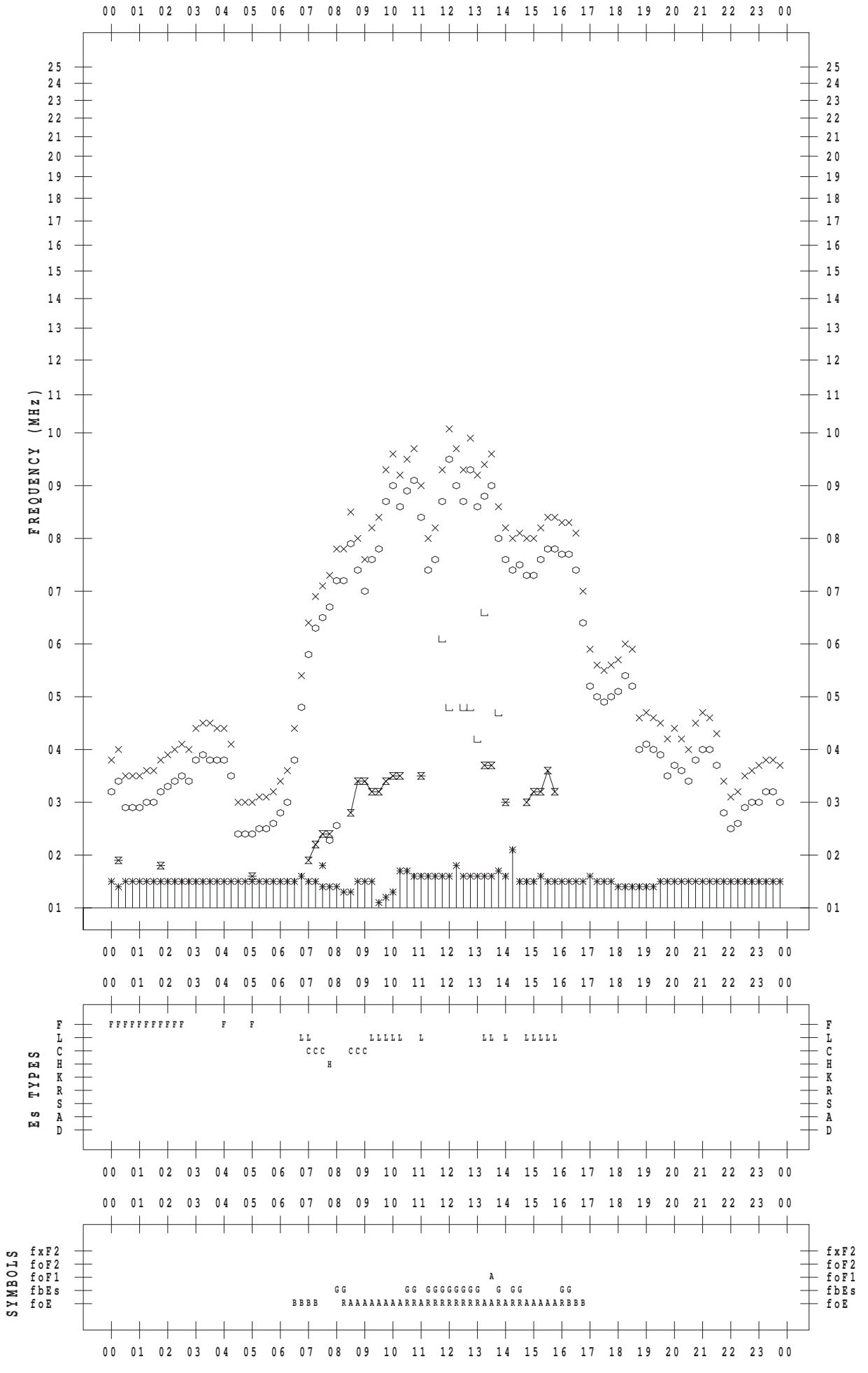
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/29

135 °E MEAN TIME



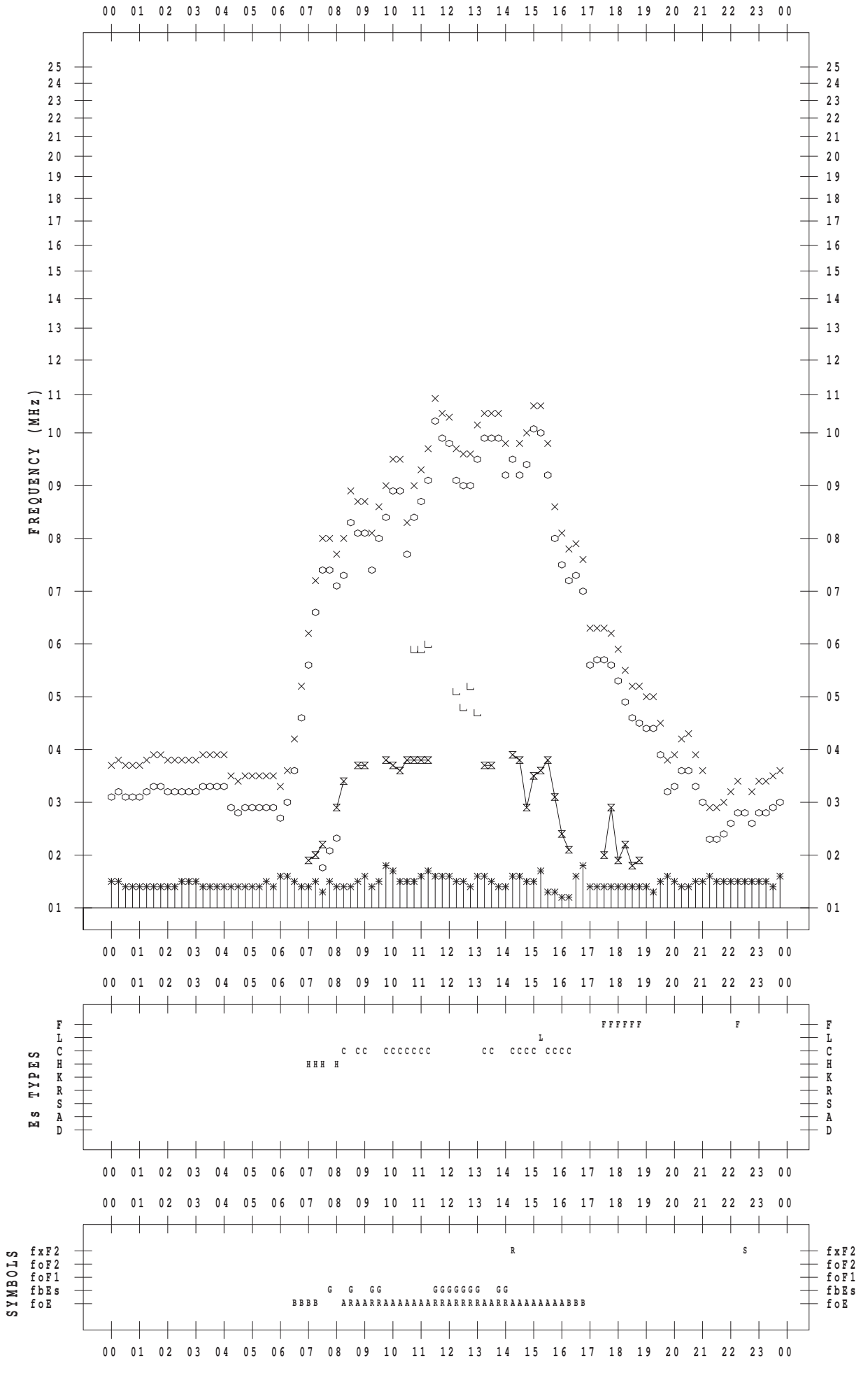
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/30

135 °E MEAN TIME



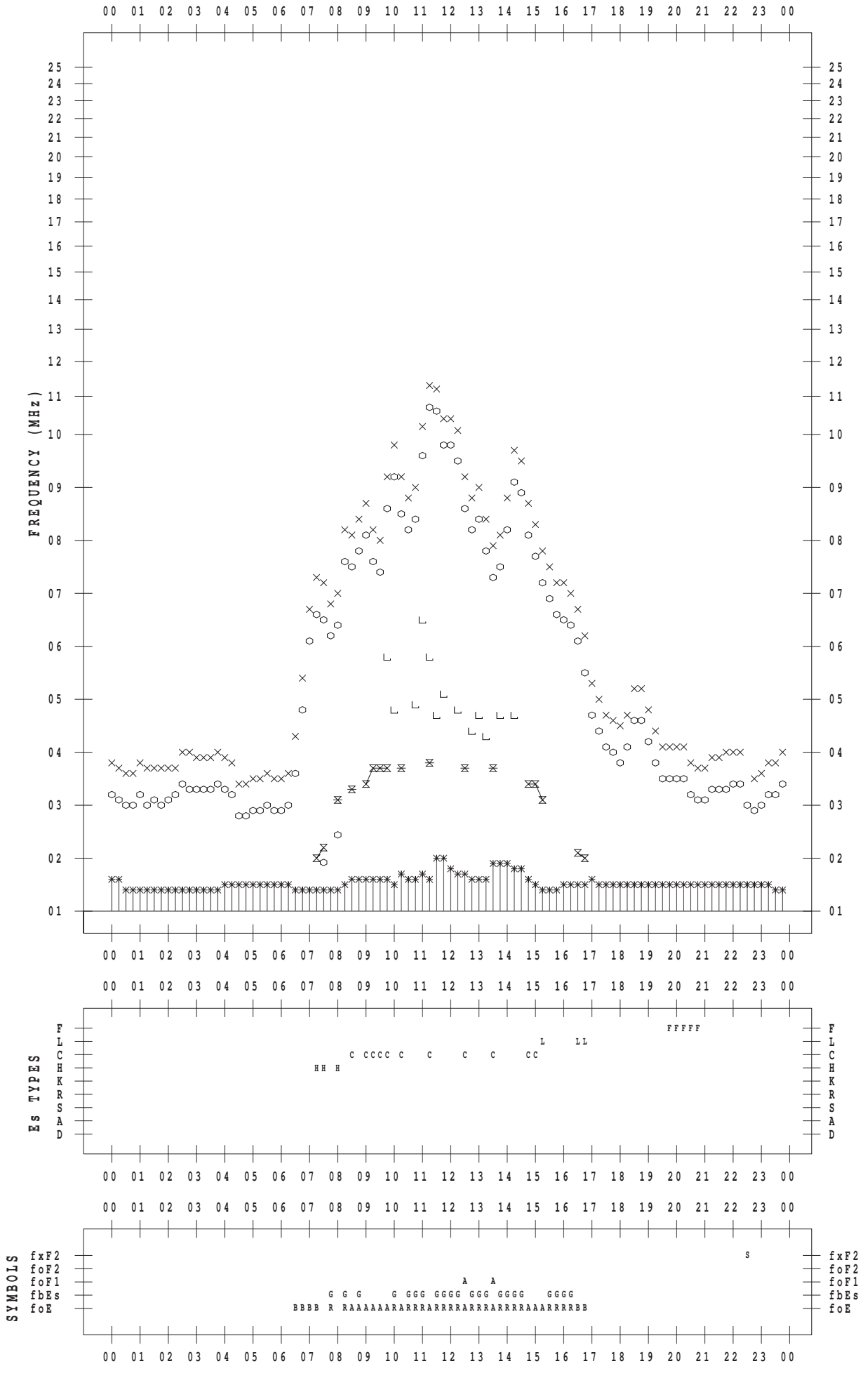
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/12/31

135 °E MEAN TIME



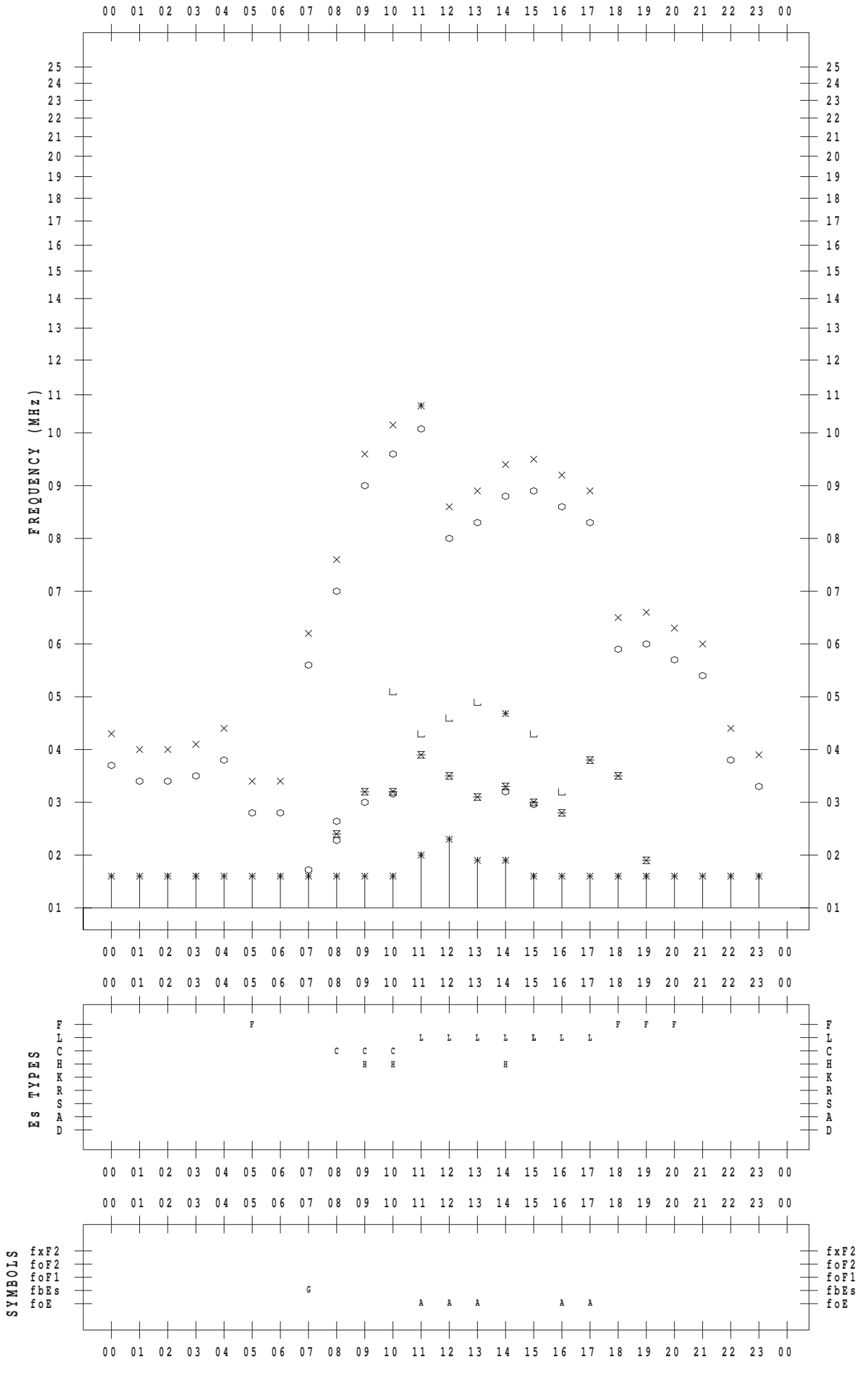
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 1

135 °E MEAN TIME



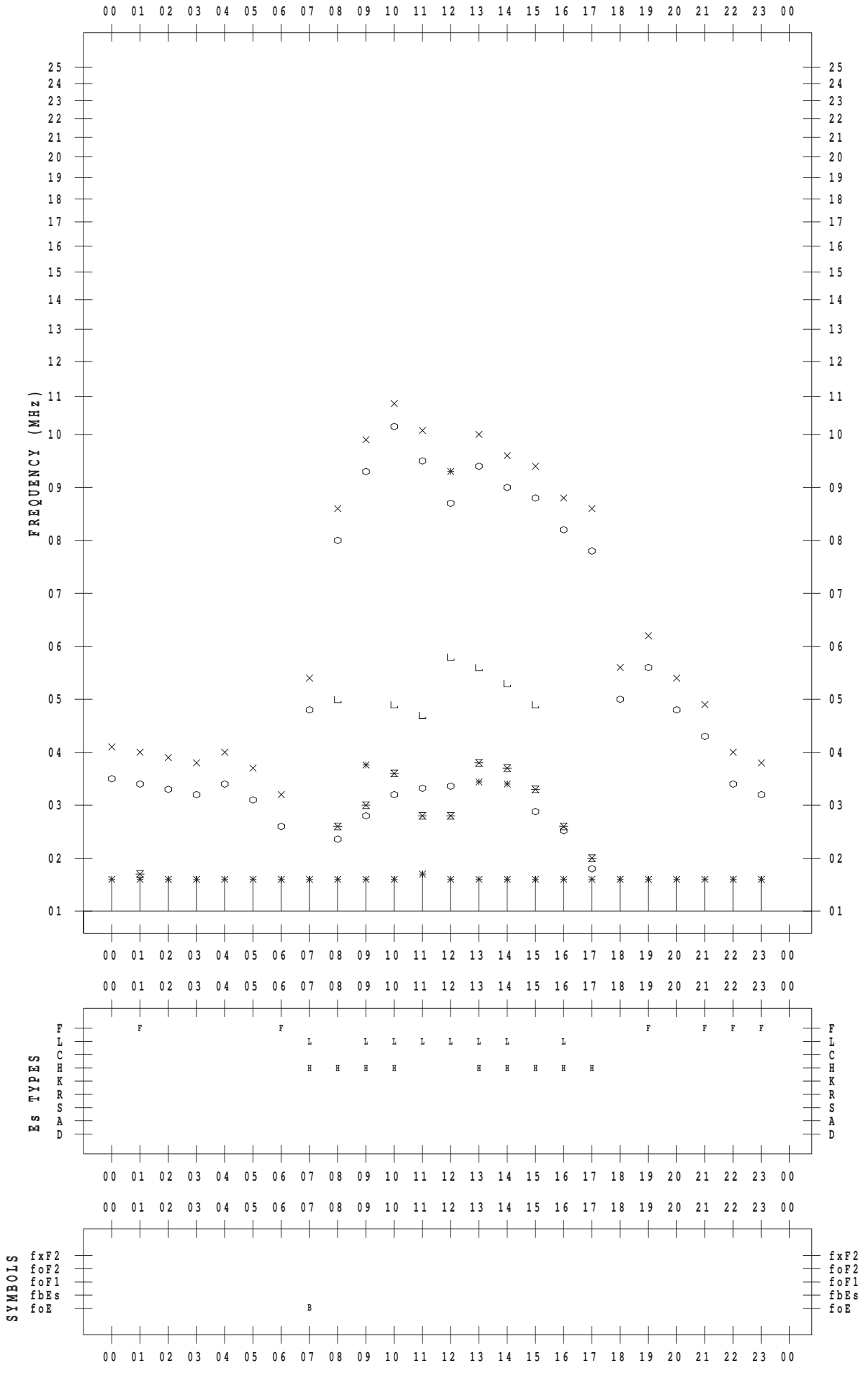
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 2

135 °E MEAN TIME



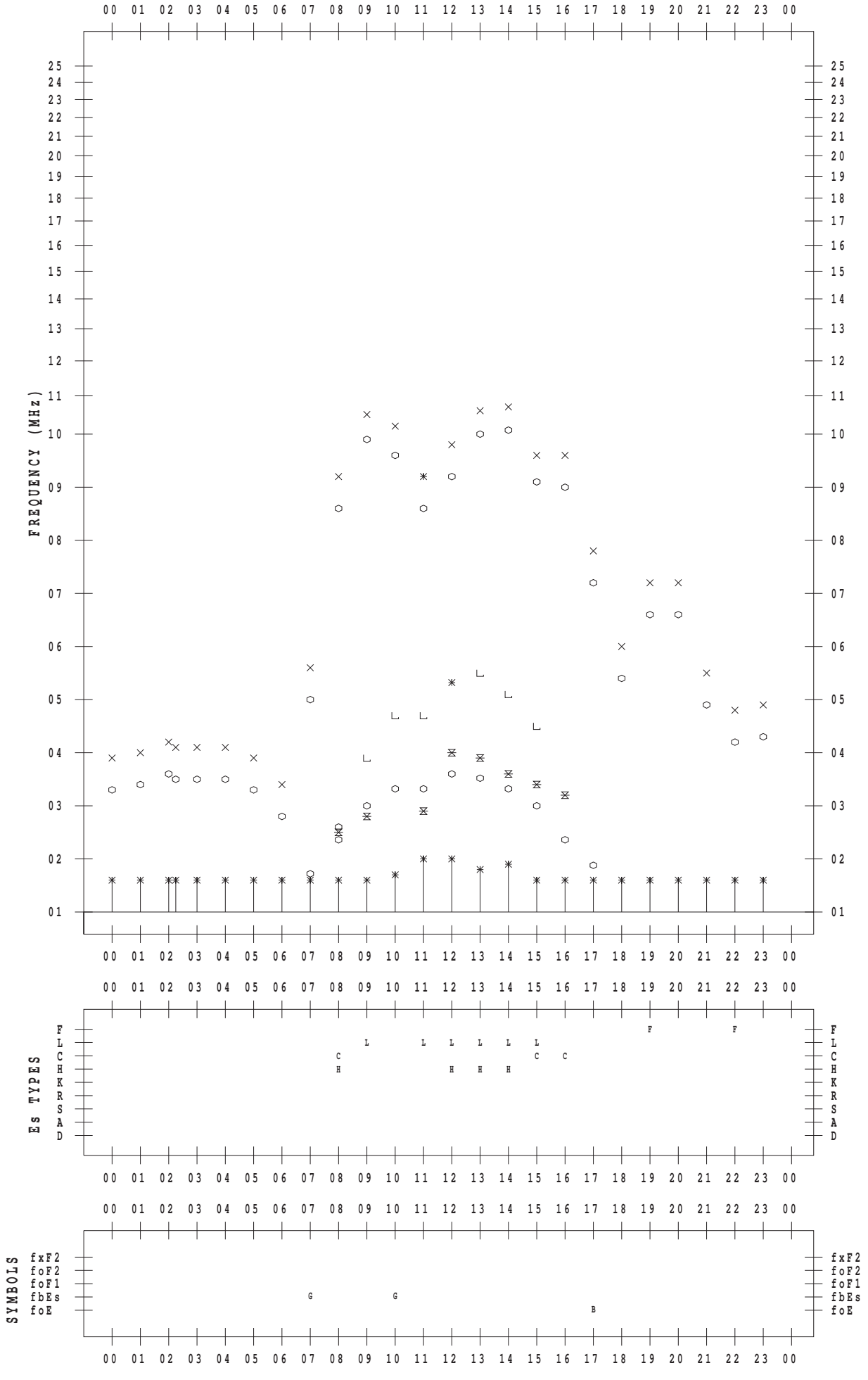
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 3

135 °E MEAN TIME



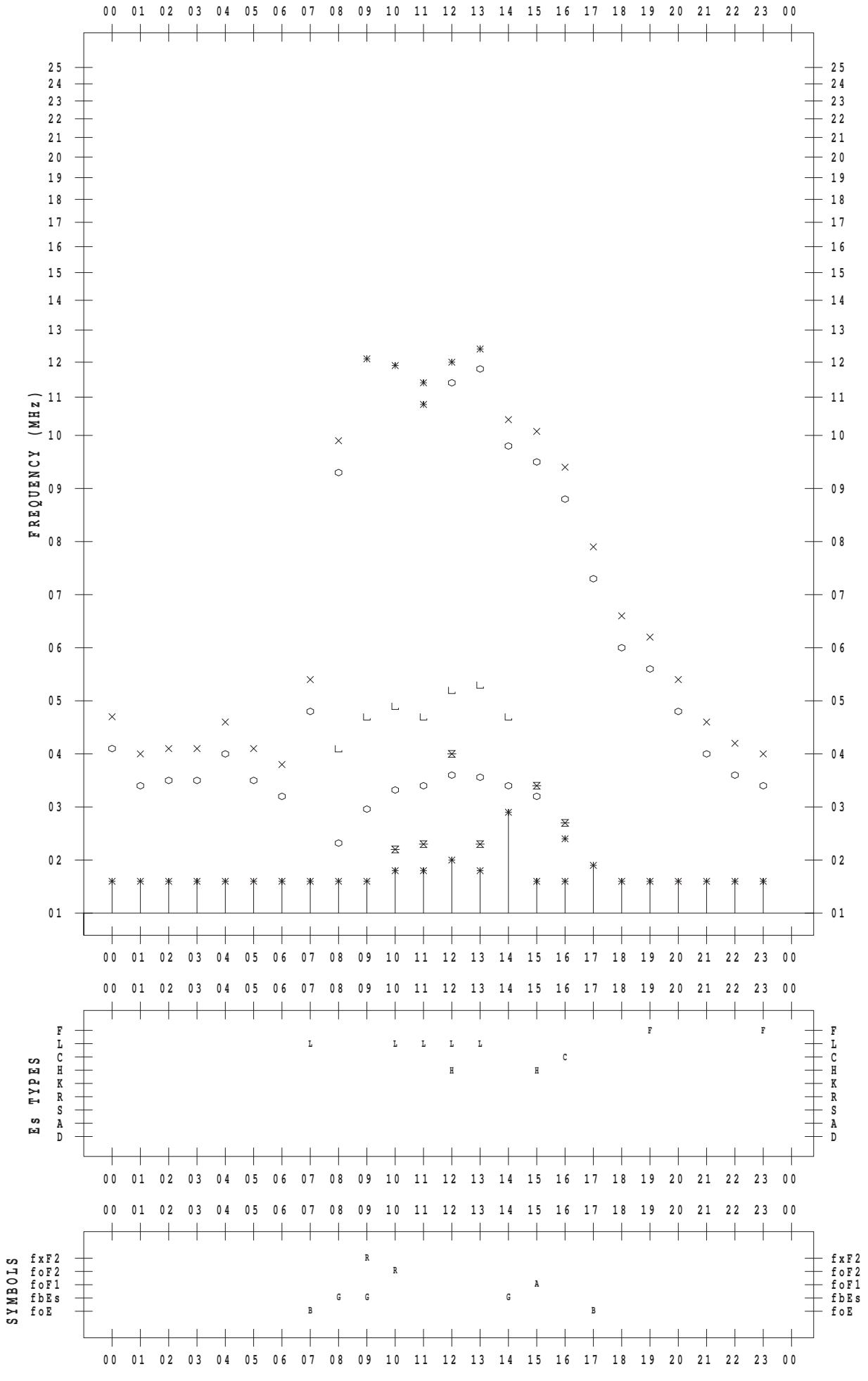
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 4

135 °E MEAN TIME



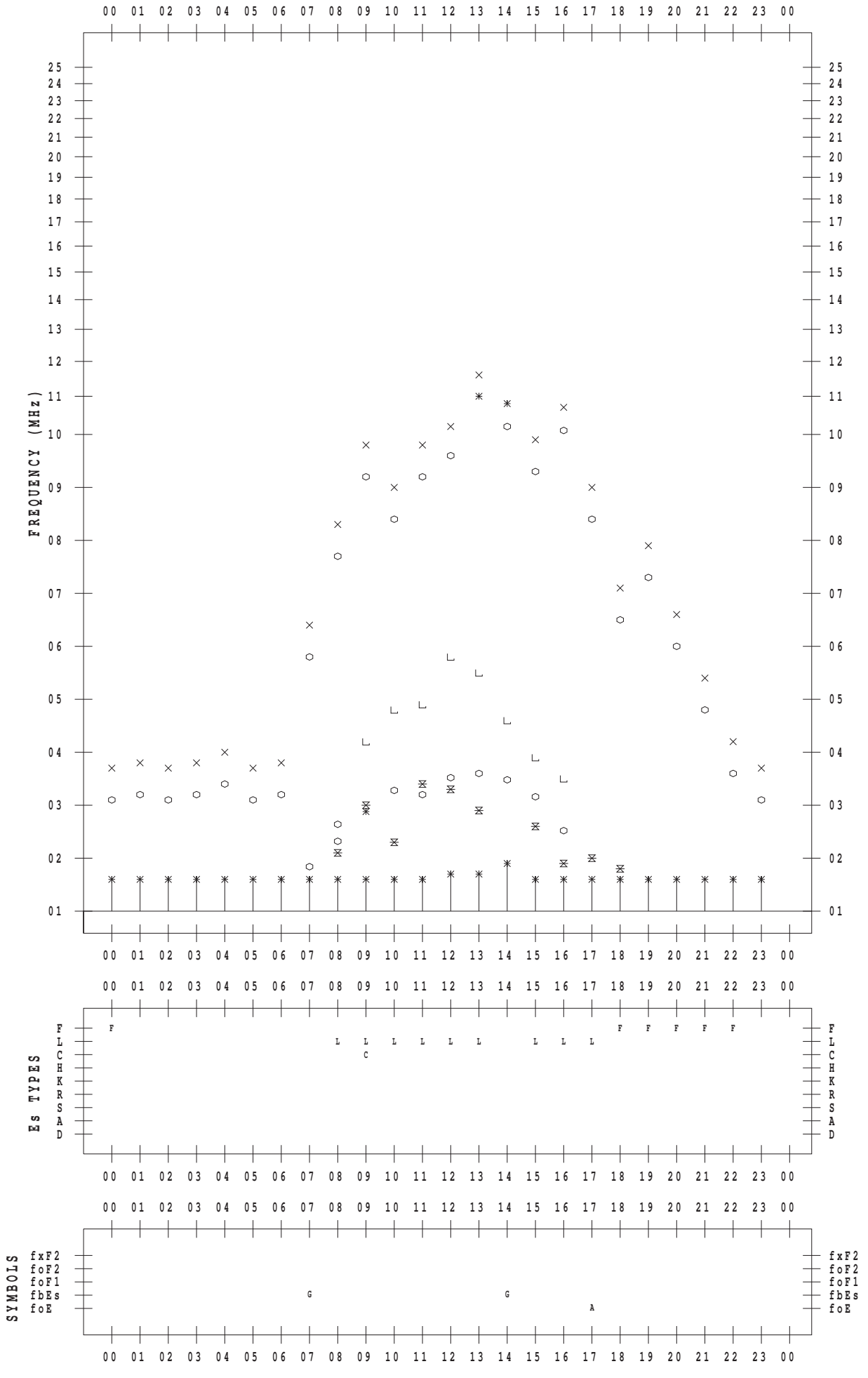
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 5

135 °E MEAN TIME



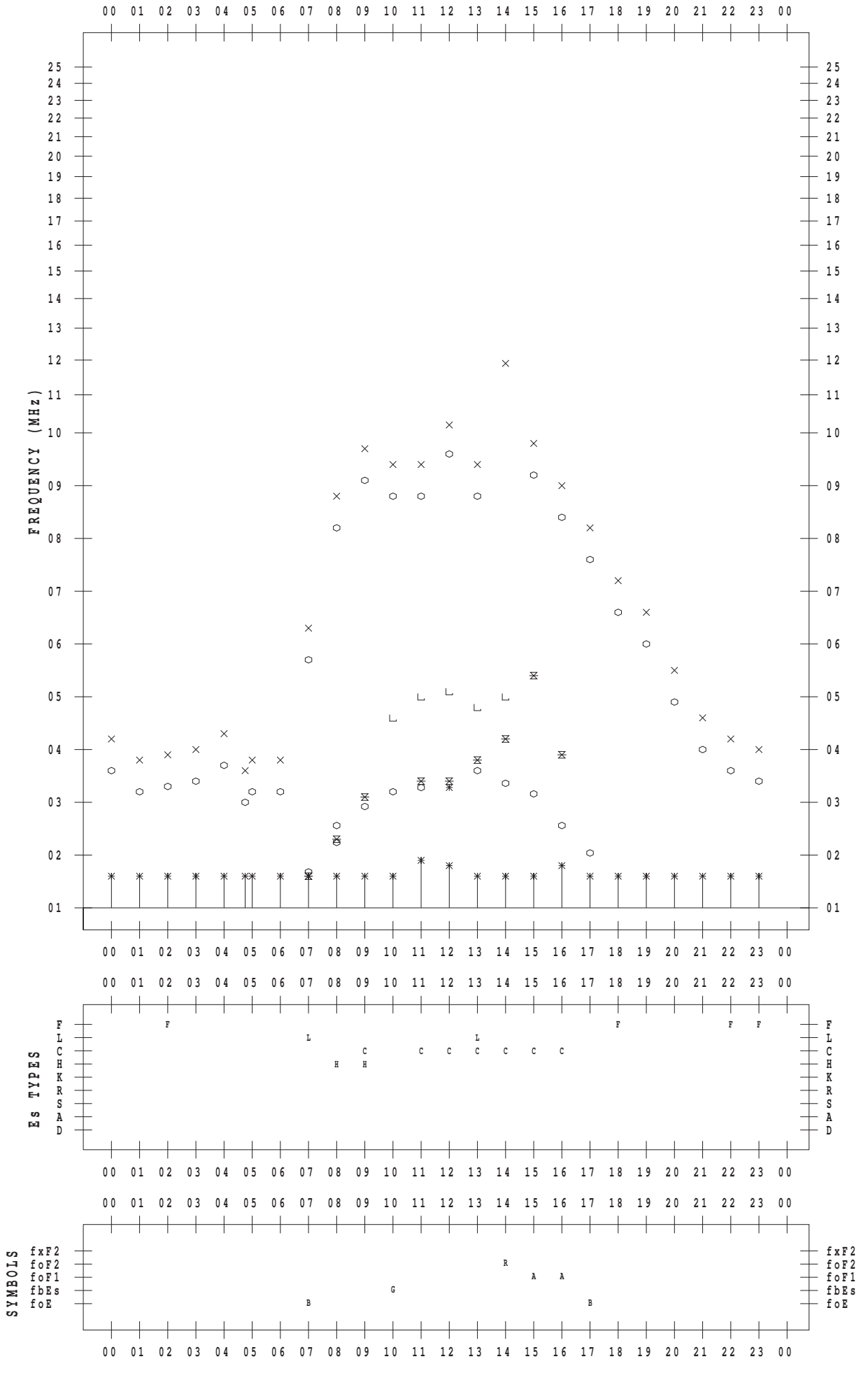
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 6

135 °E MEAN TIME



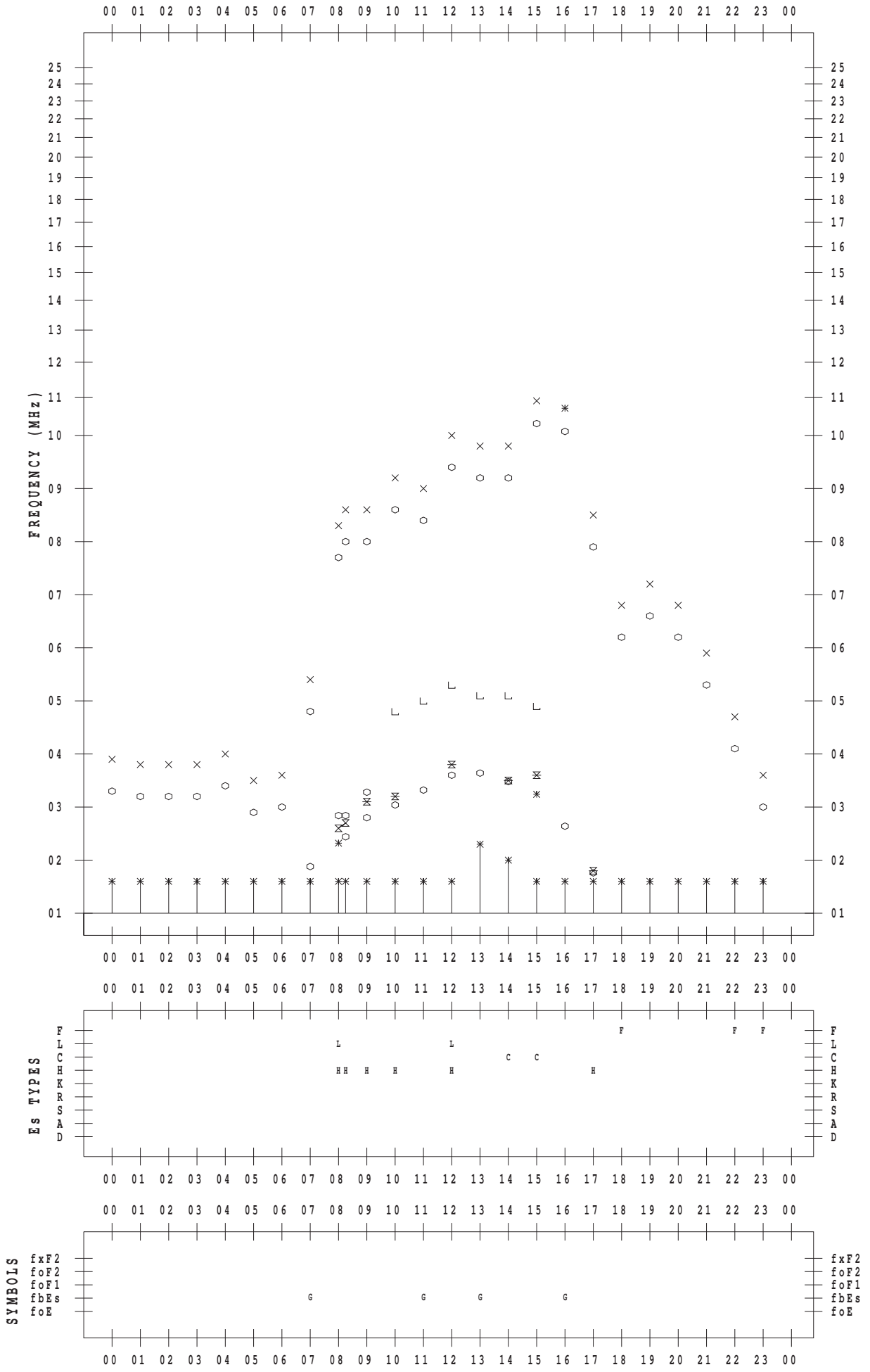
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 7

135 °E MEAN TIME



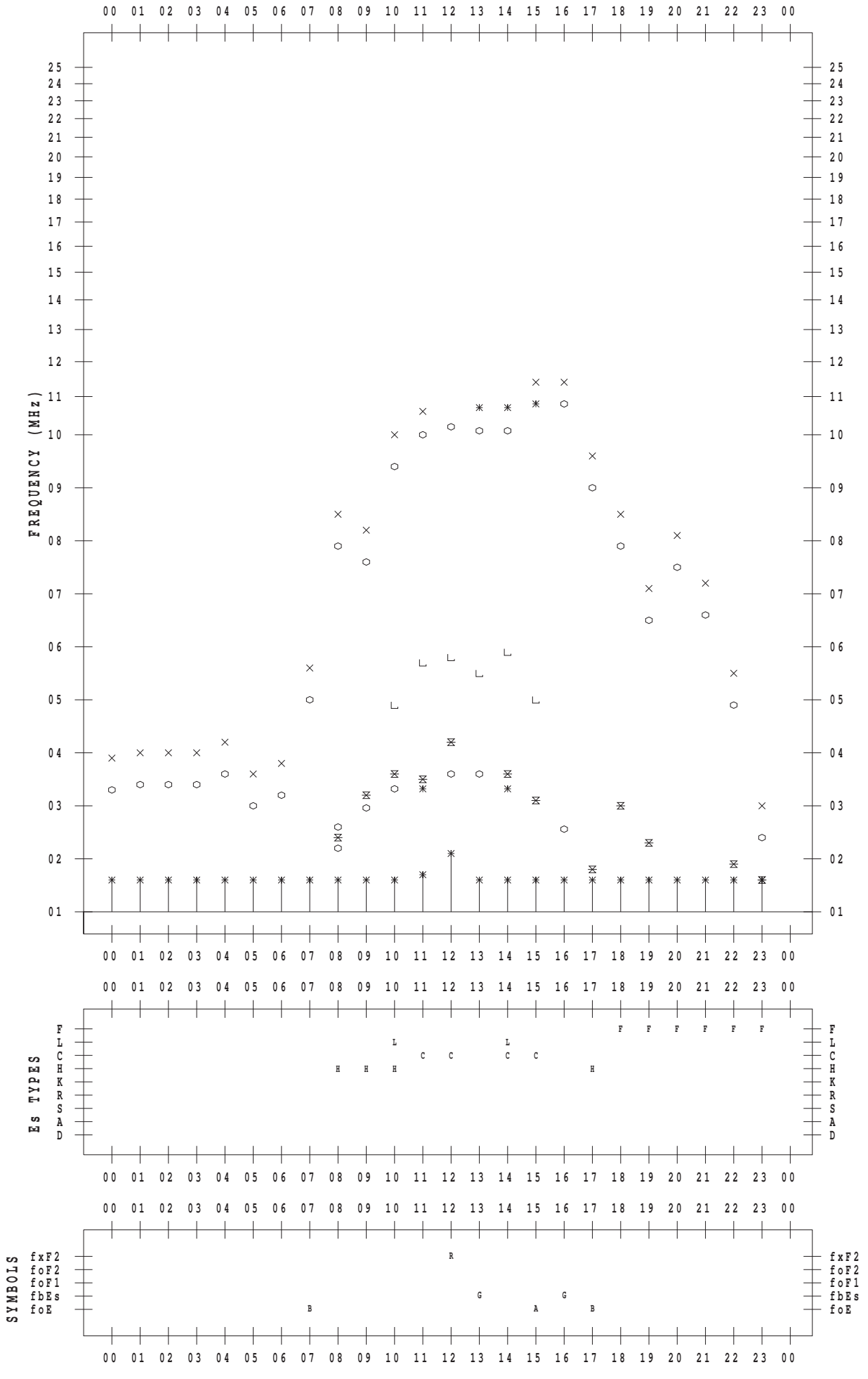
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 8

135 °E MEAN TIME



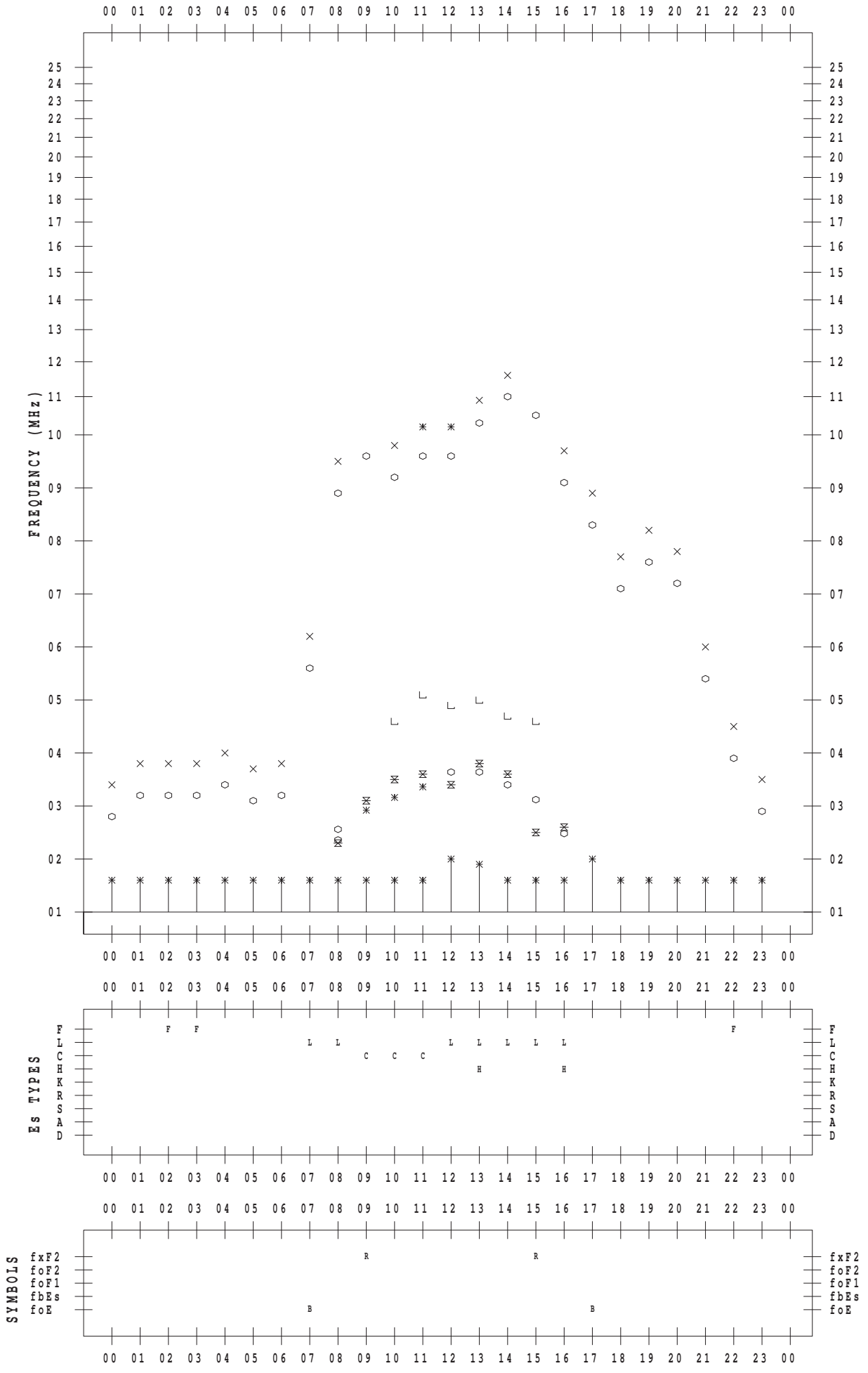
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/ 9

135 °E MEAN TIME



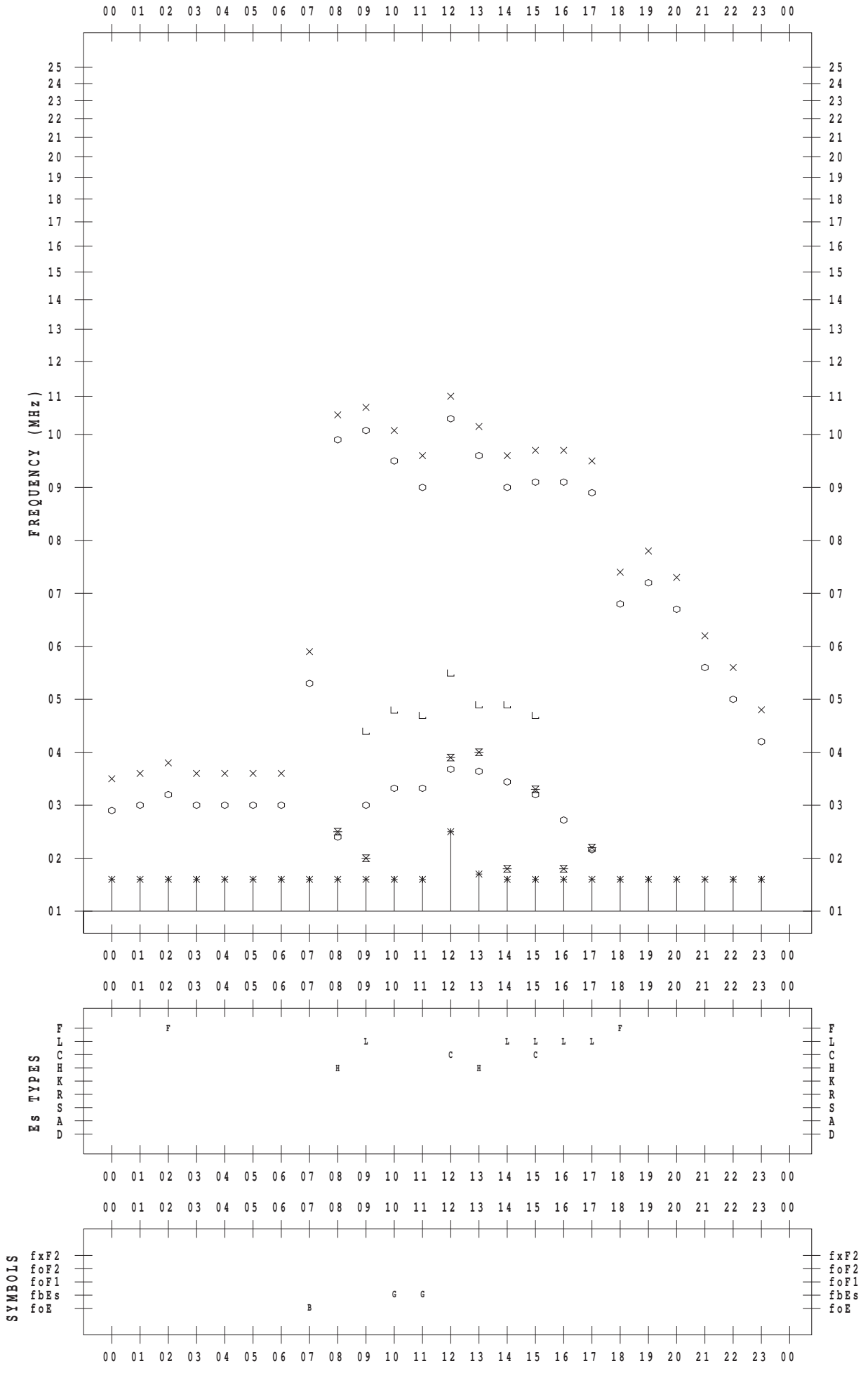
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/10

135 °E MEAN TIME



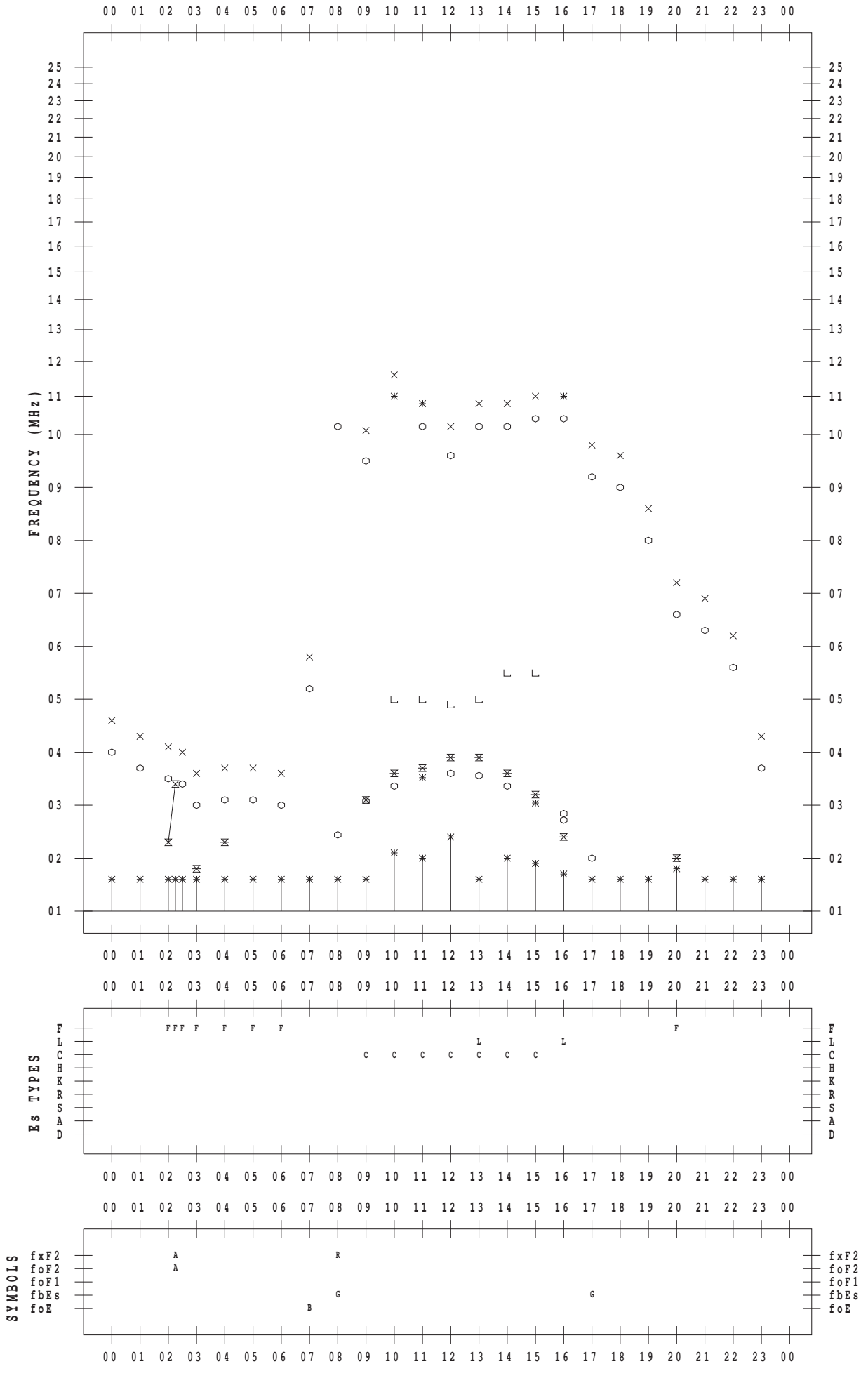
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/11

135 °E MEAN TIME



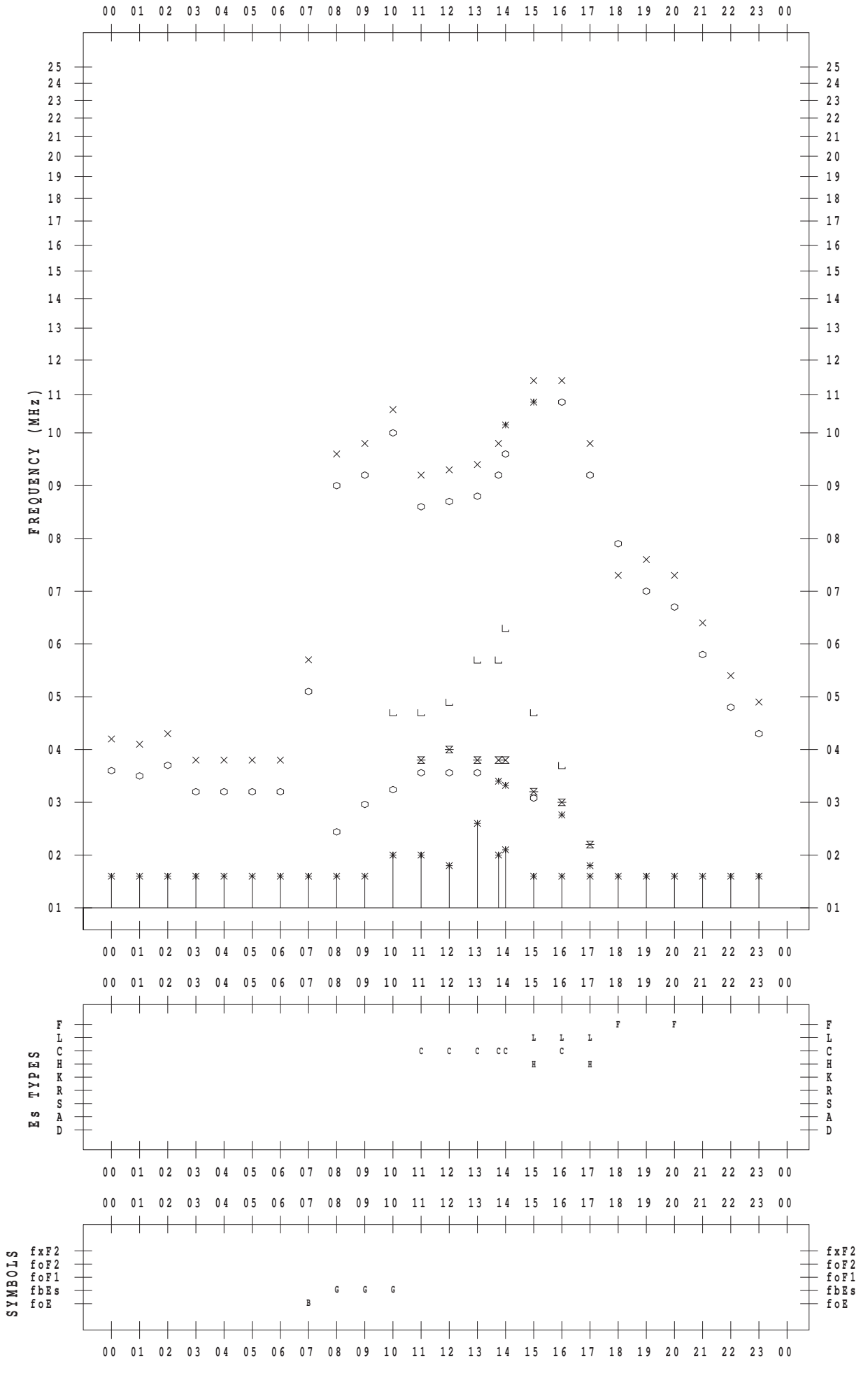
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/12

135 °E MEAN TIME



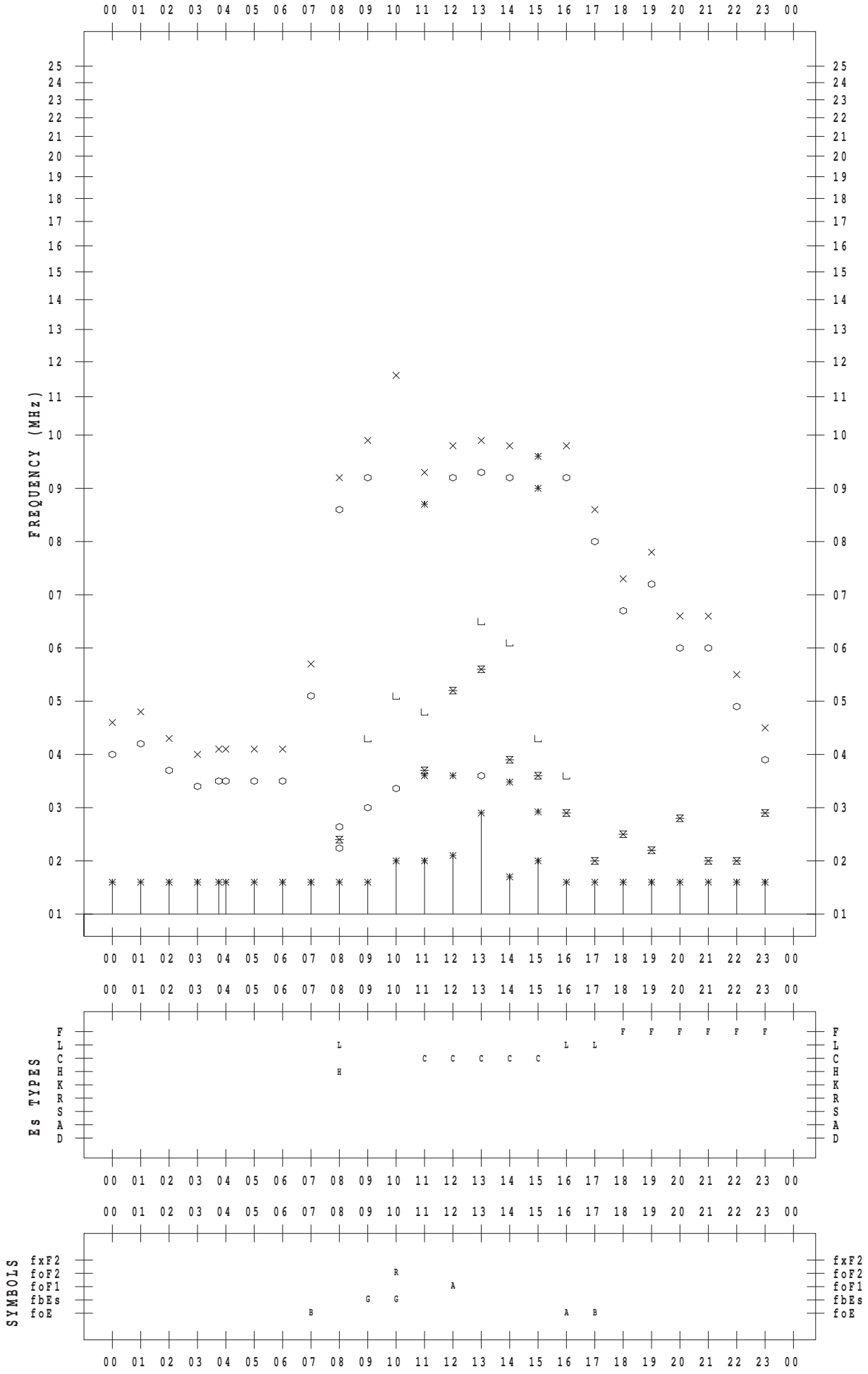
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/13

135 °E MEAN TIME



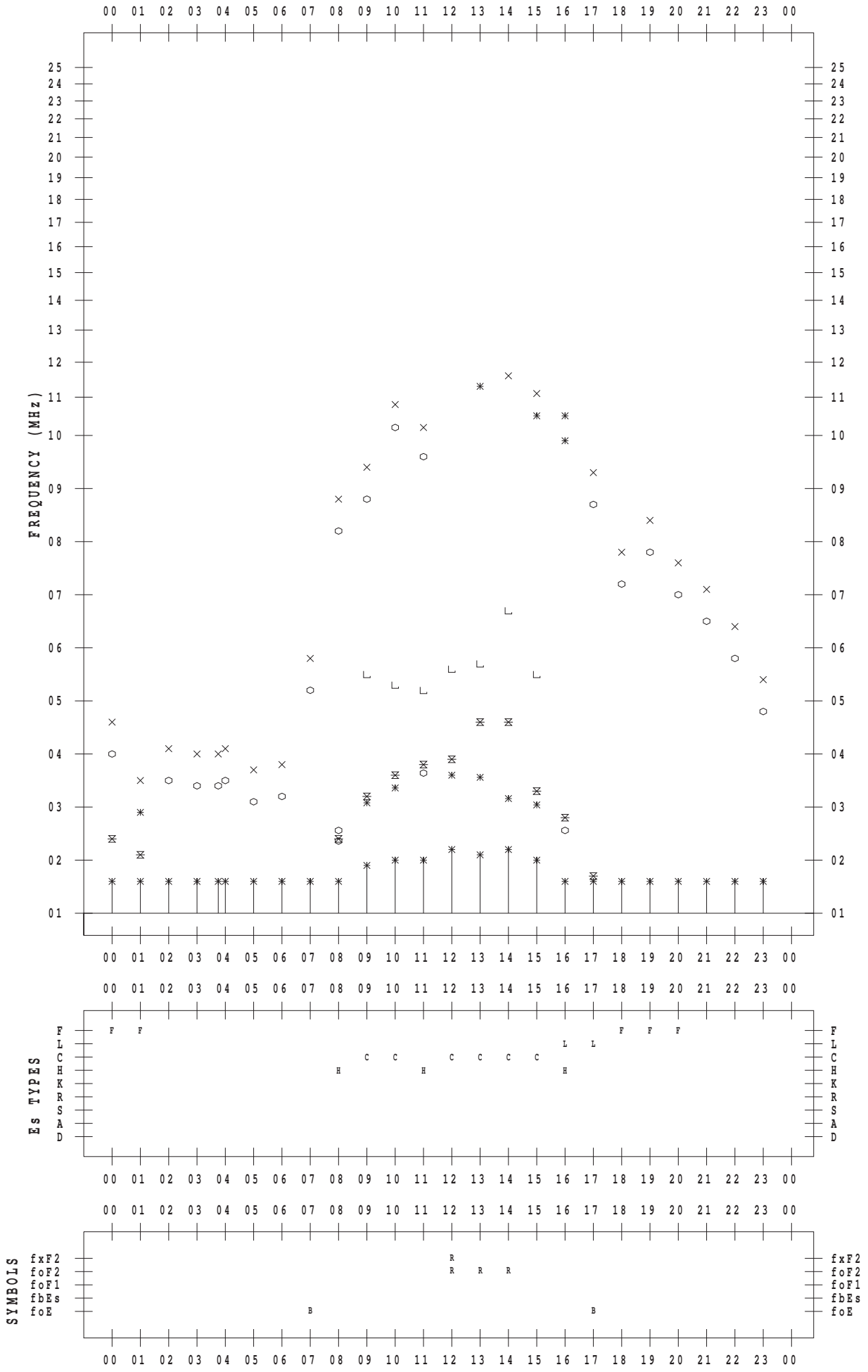
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/14

135 °E MEAN TIME



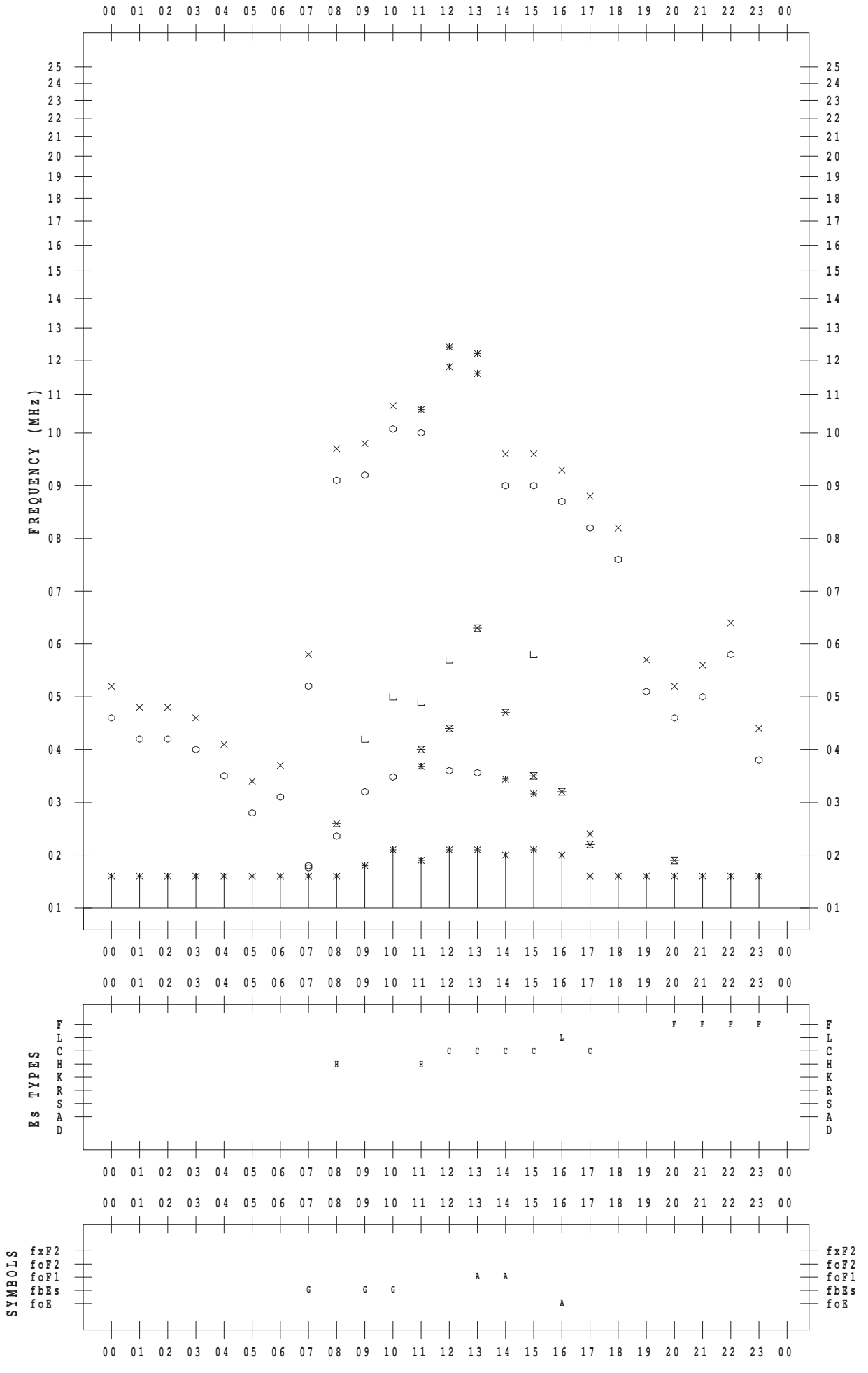
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/15

135 °E MEAN TIME



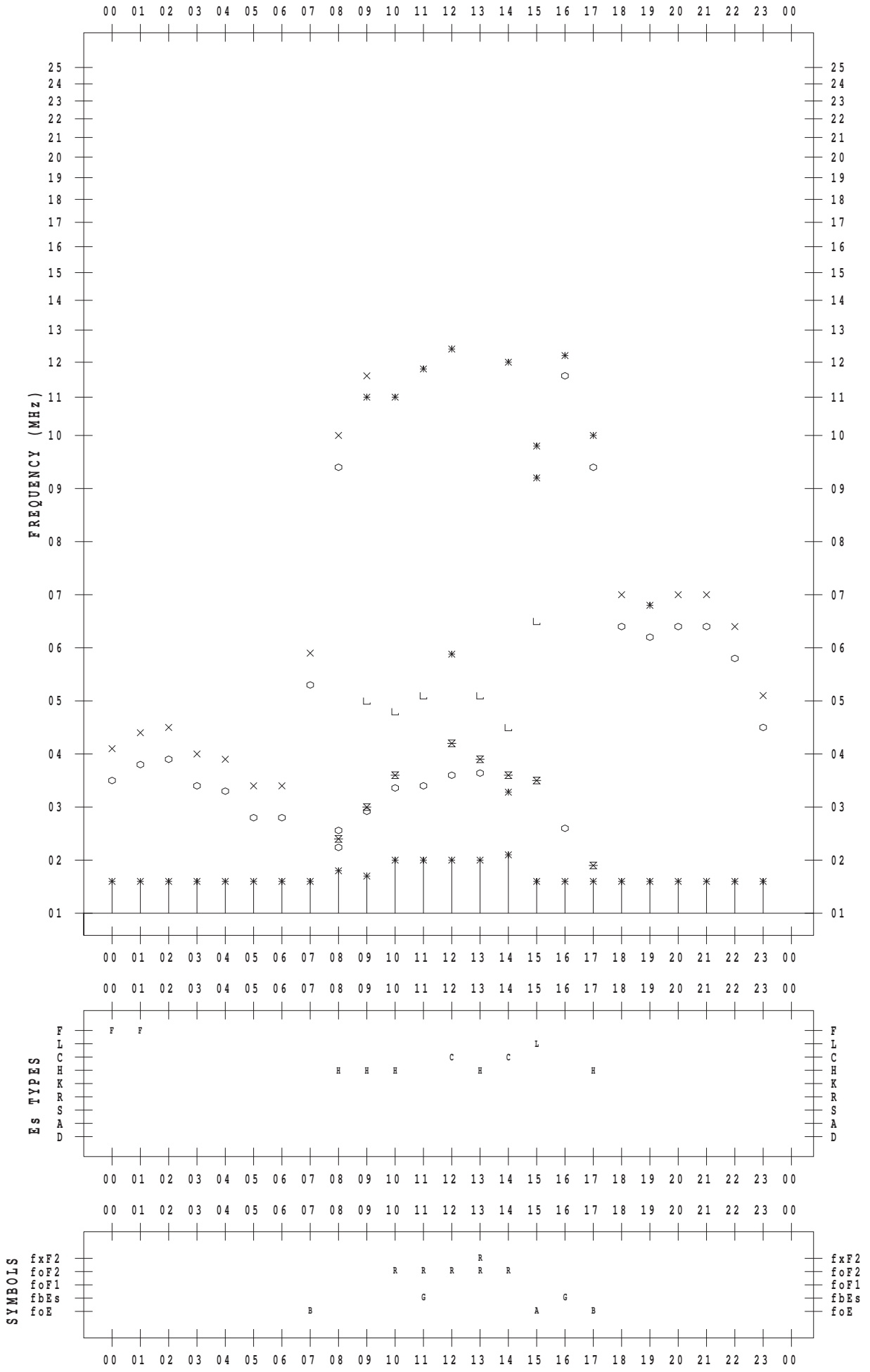
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/16

135 °E MEAN TIME



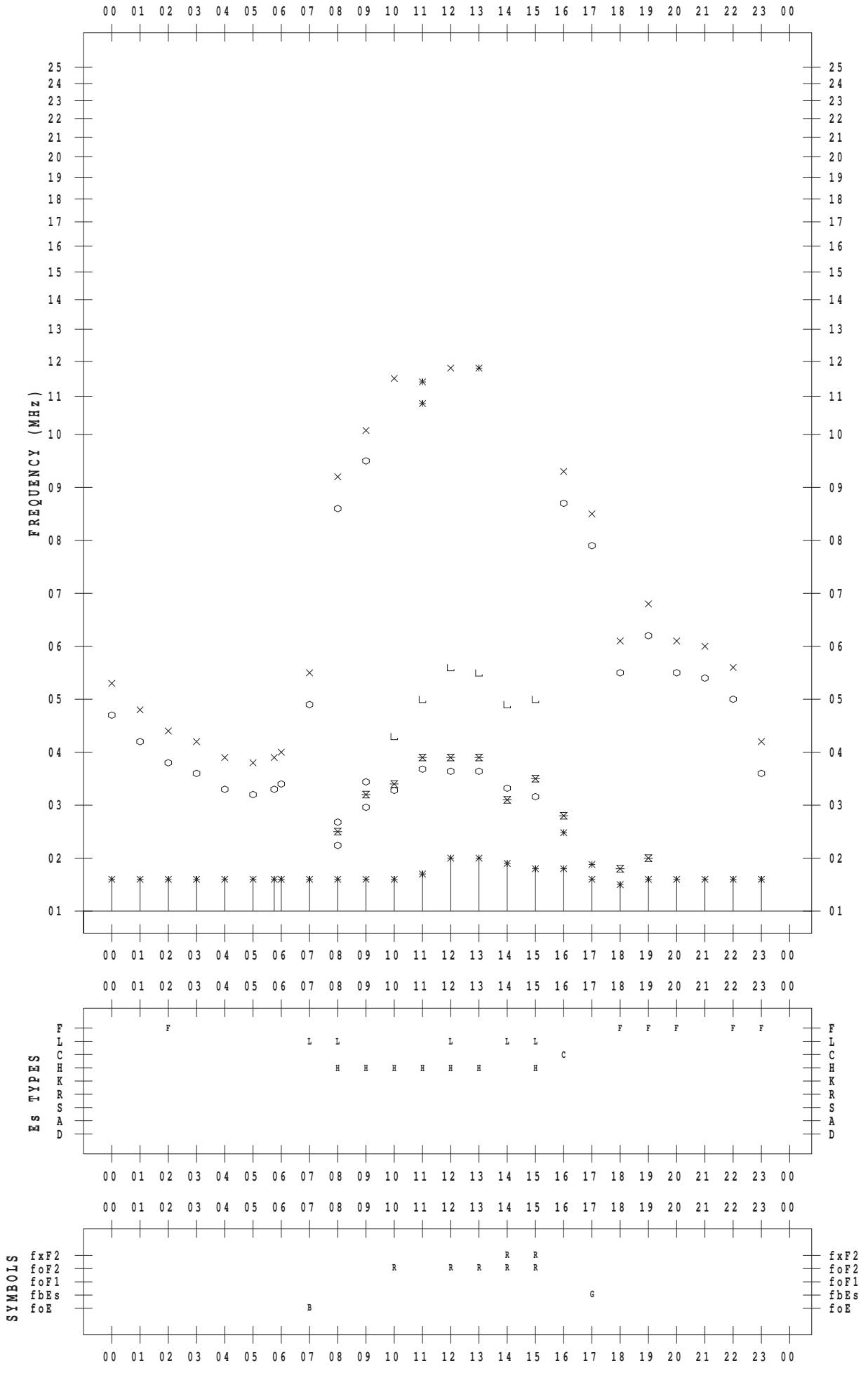
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/17

135 °E MEAN TIME



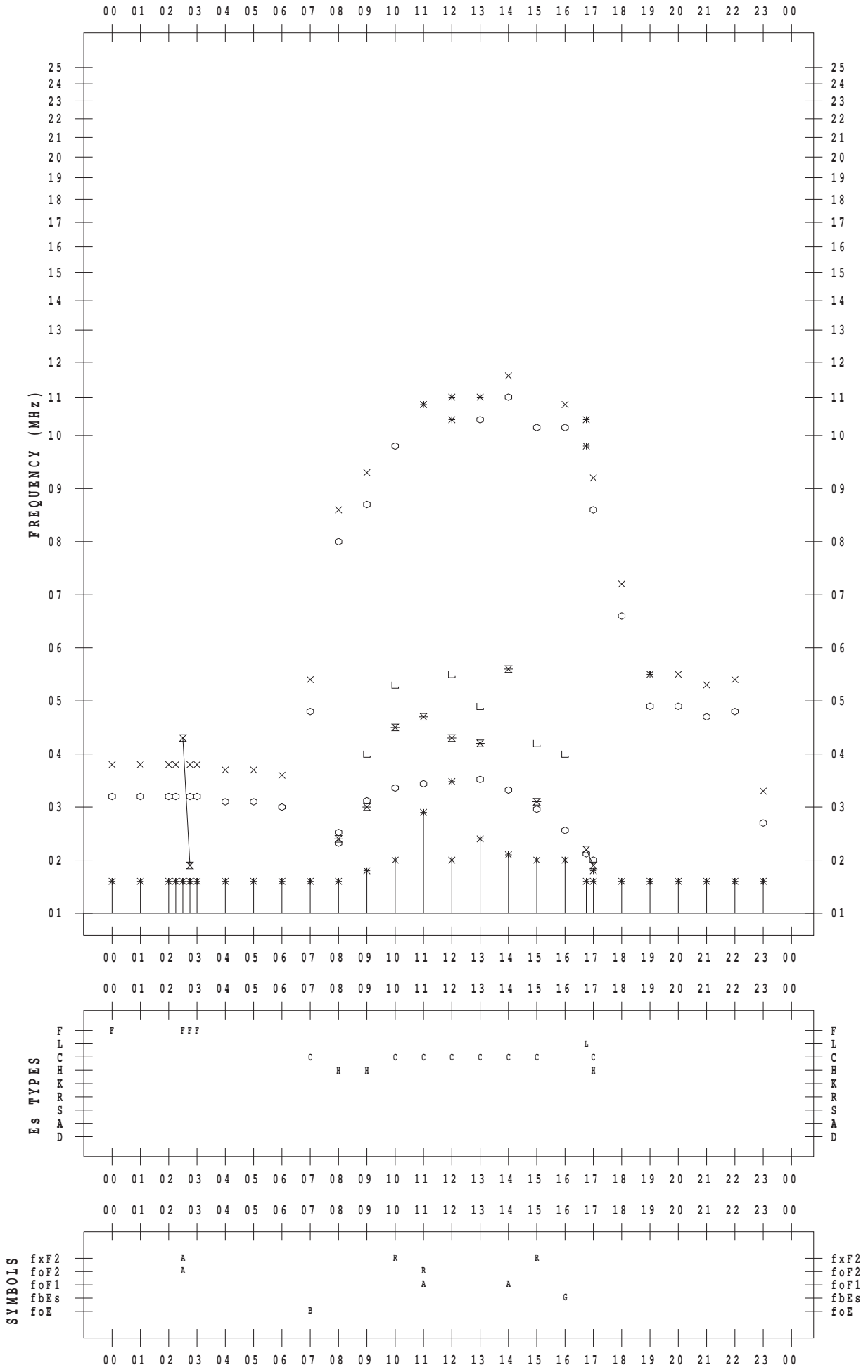
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/18

135 °E MEAN TIME



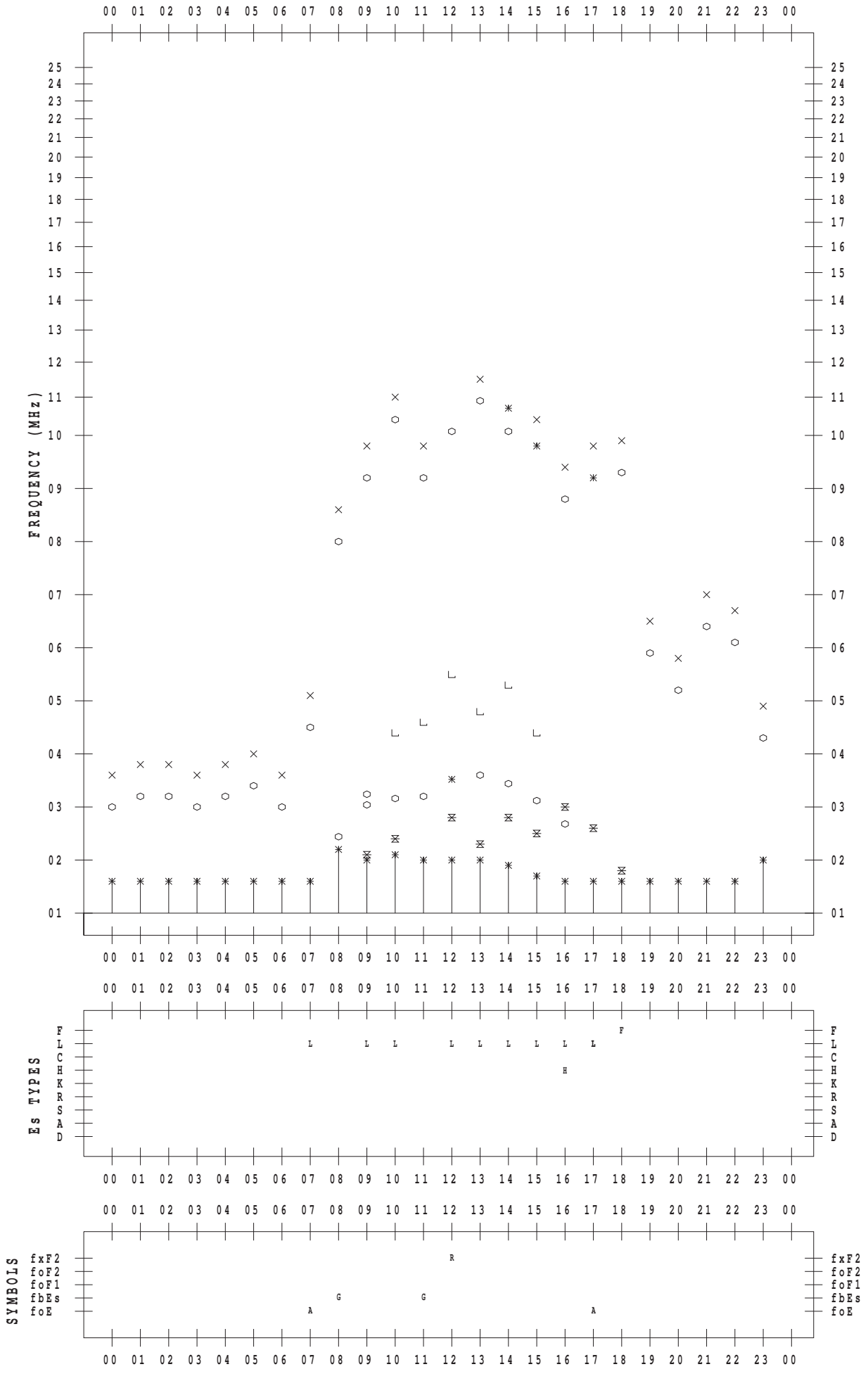
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/19

135 °E MEAN TIME



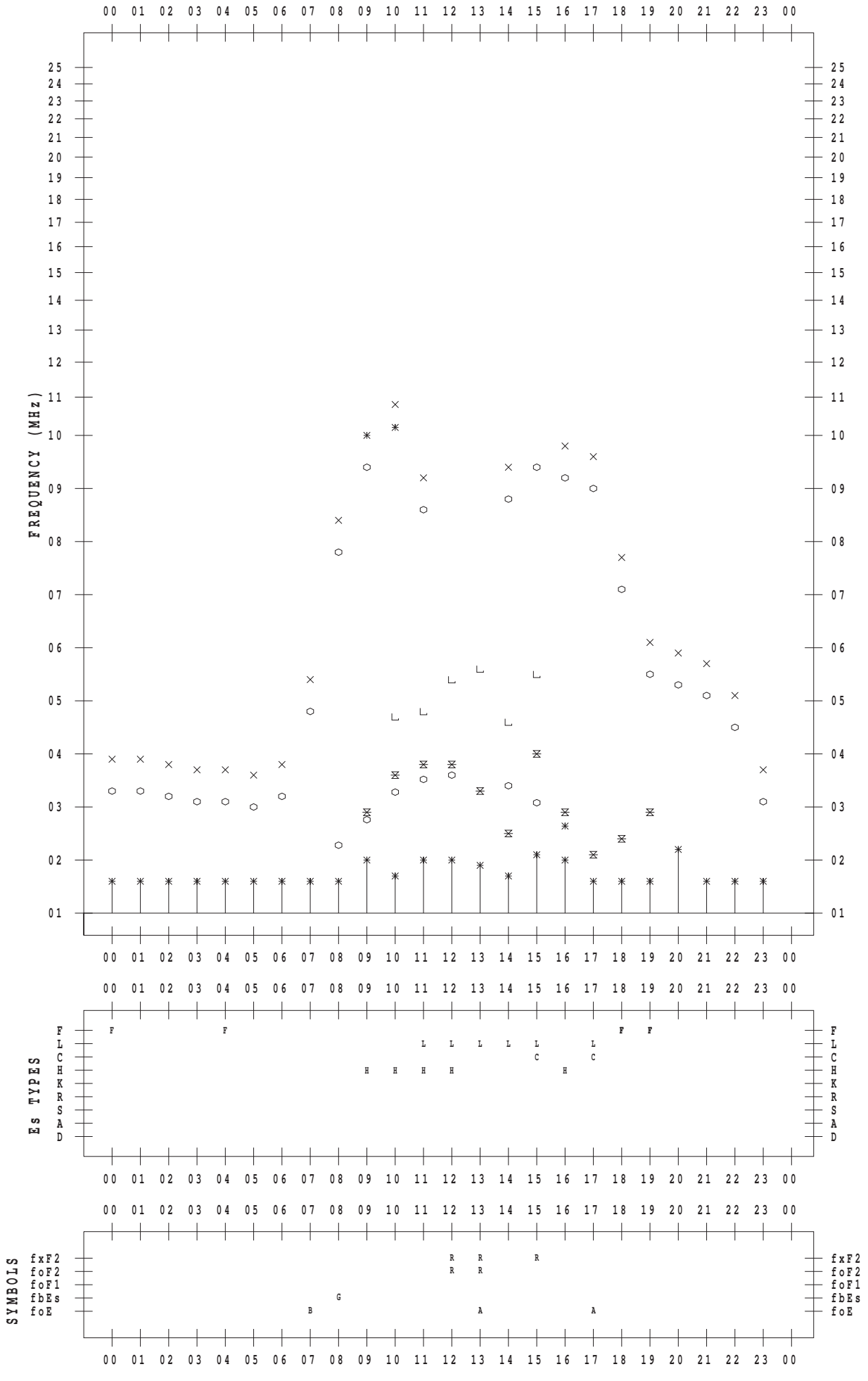
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/20

135 °E MEAN TIME



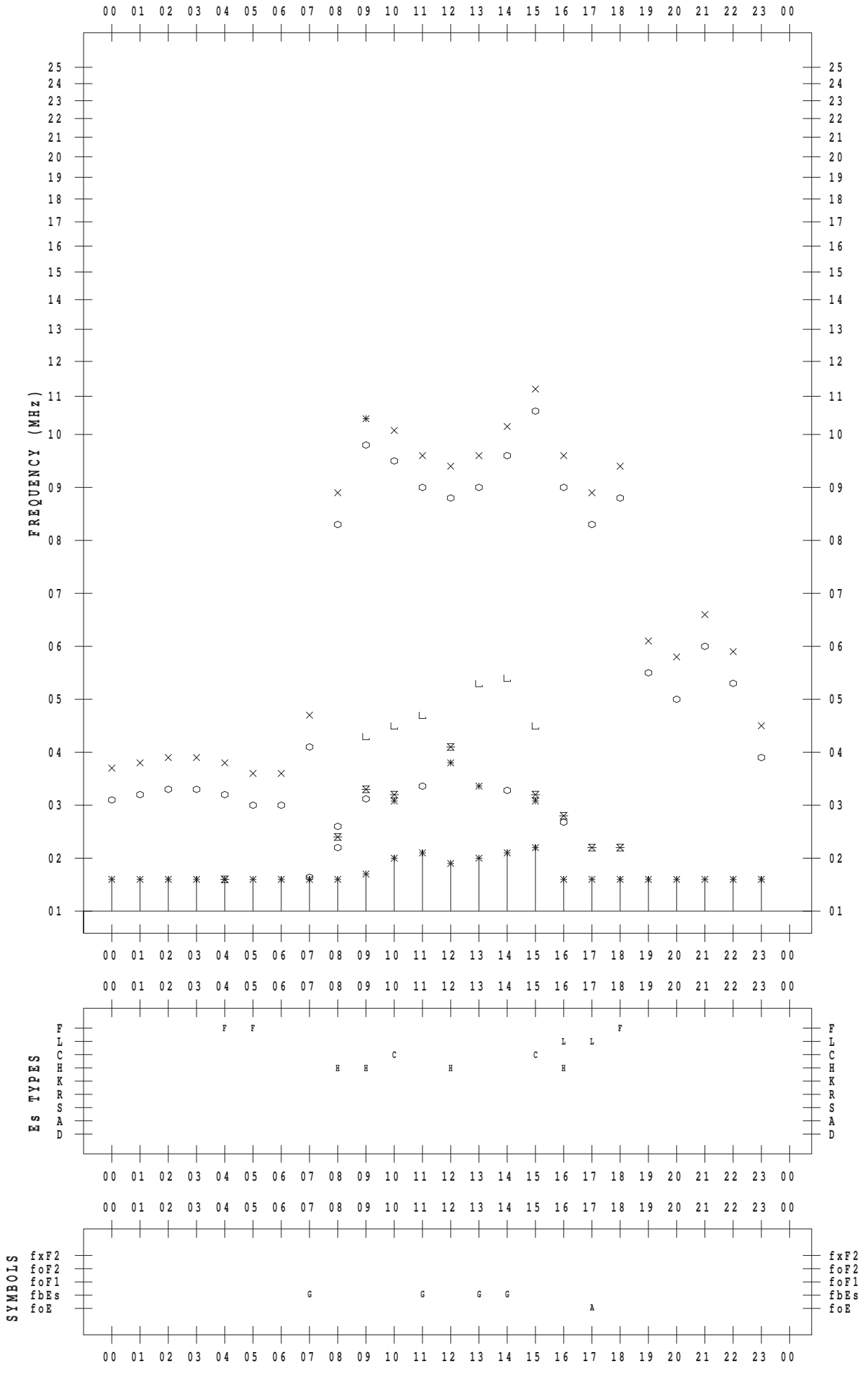
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/21

135 °E MEAN TIME



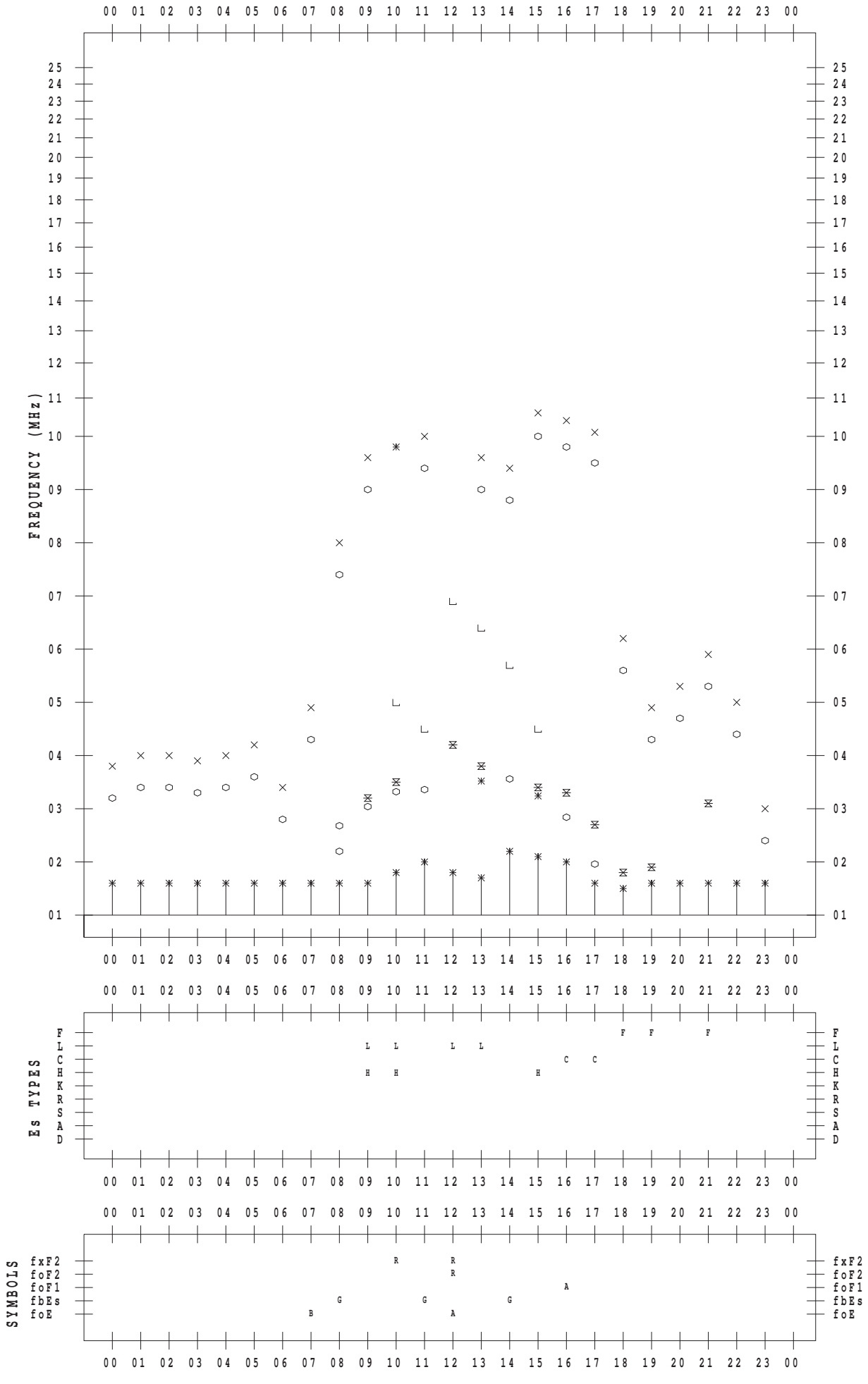
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/22

135 °E MEAN TIME



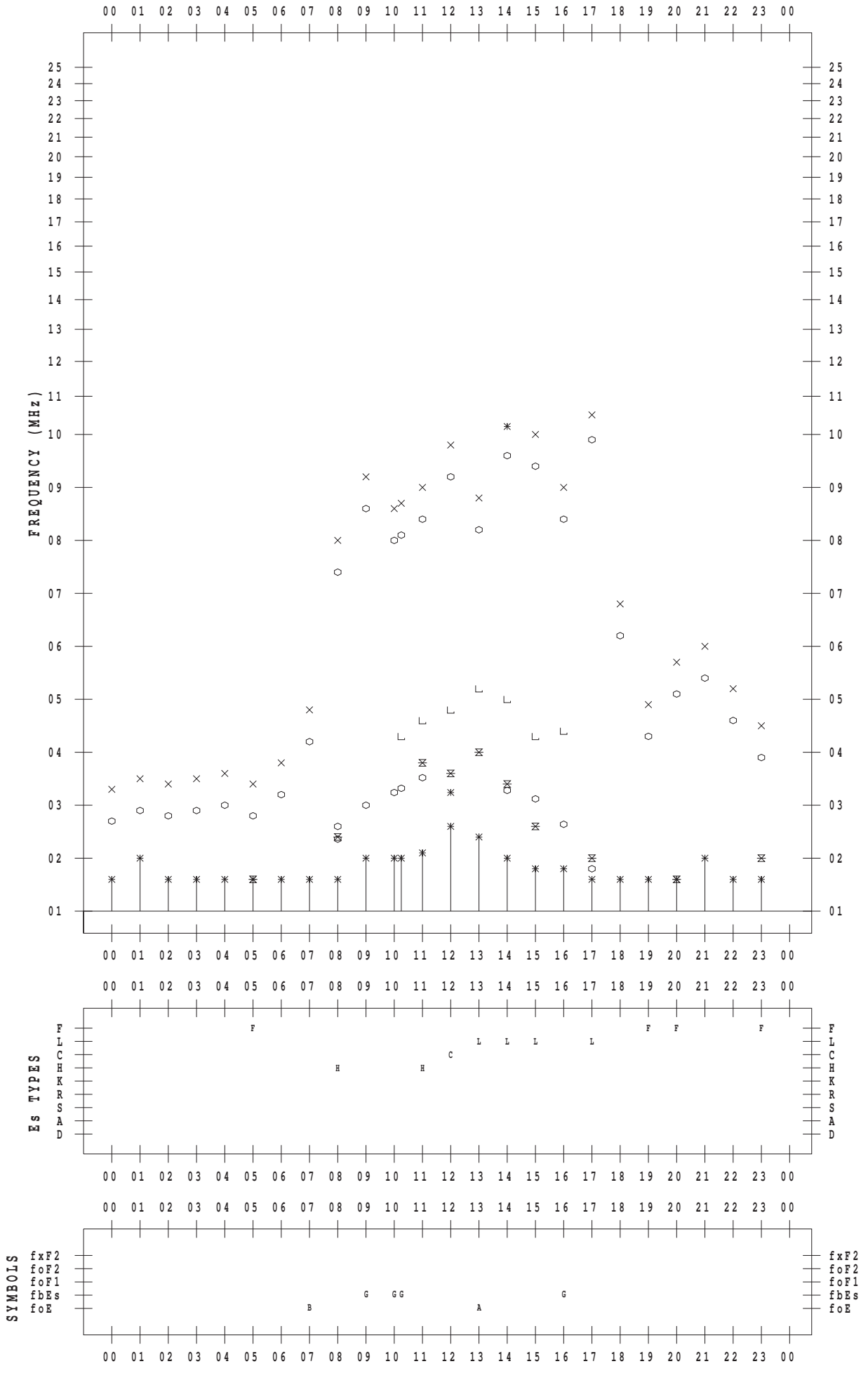
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/23

135 °E MEAN TIME



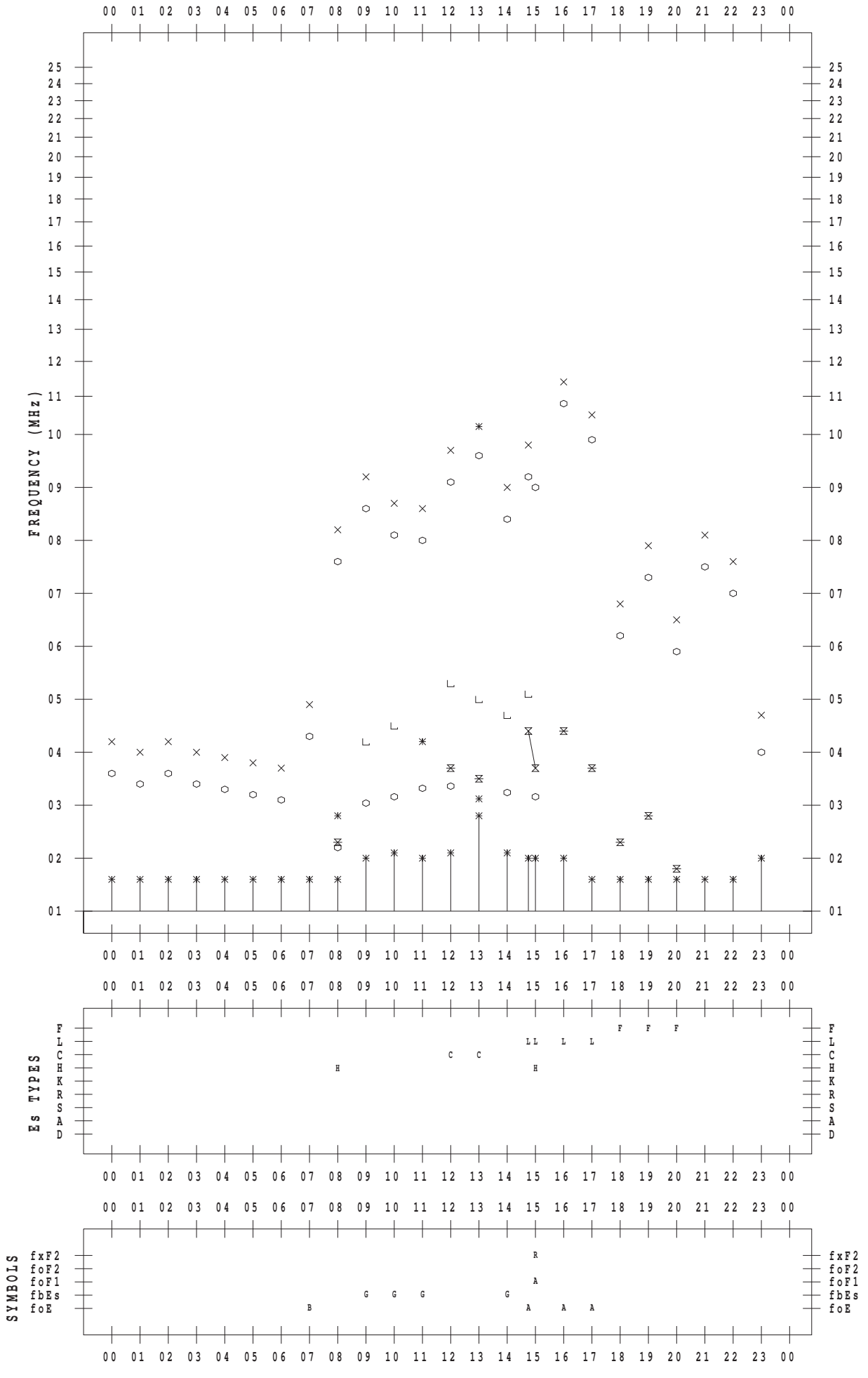
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/24

135 °E MEAN TIME



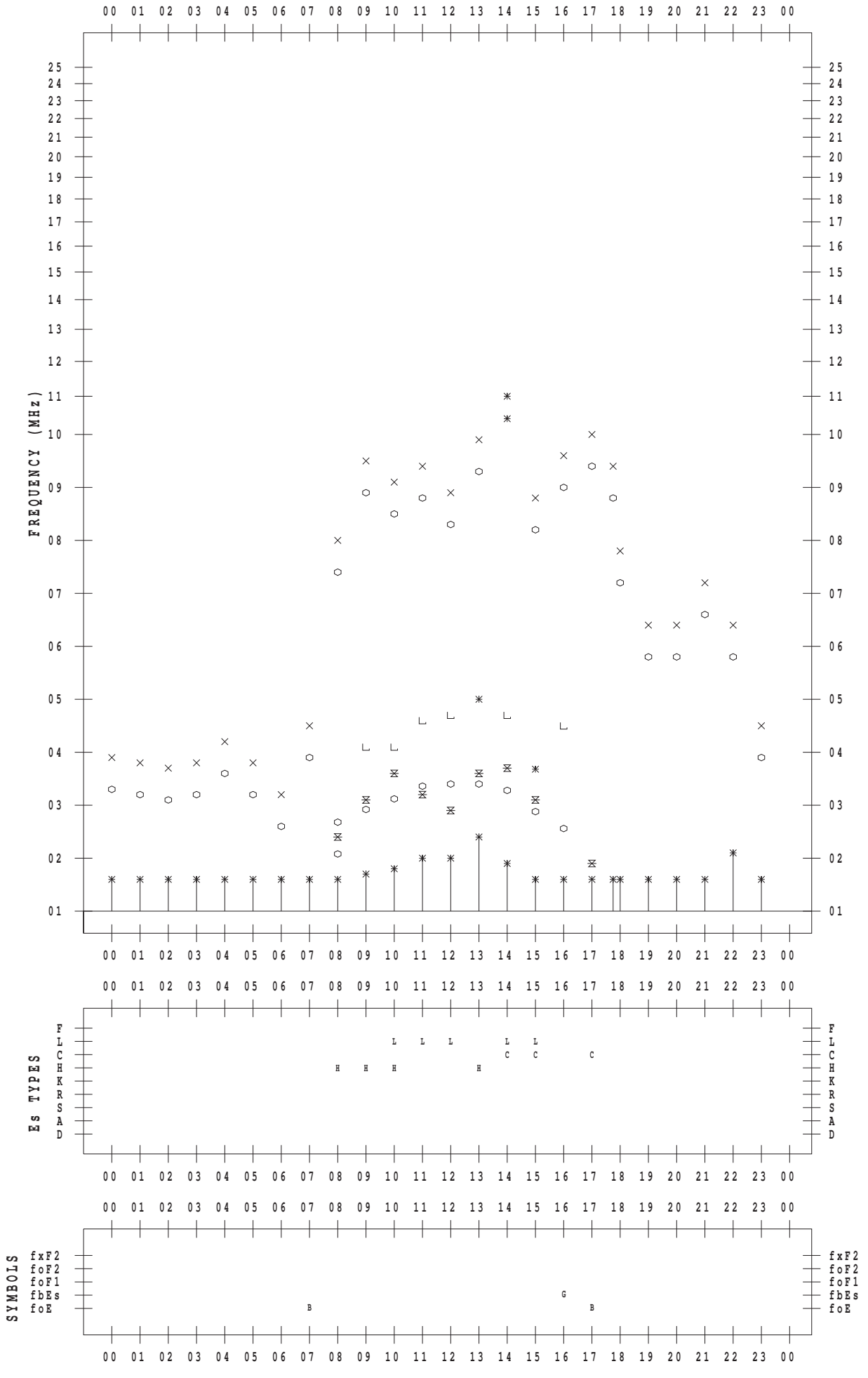
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/25

135 °E MEAN TIME



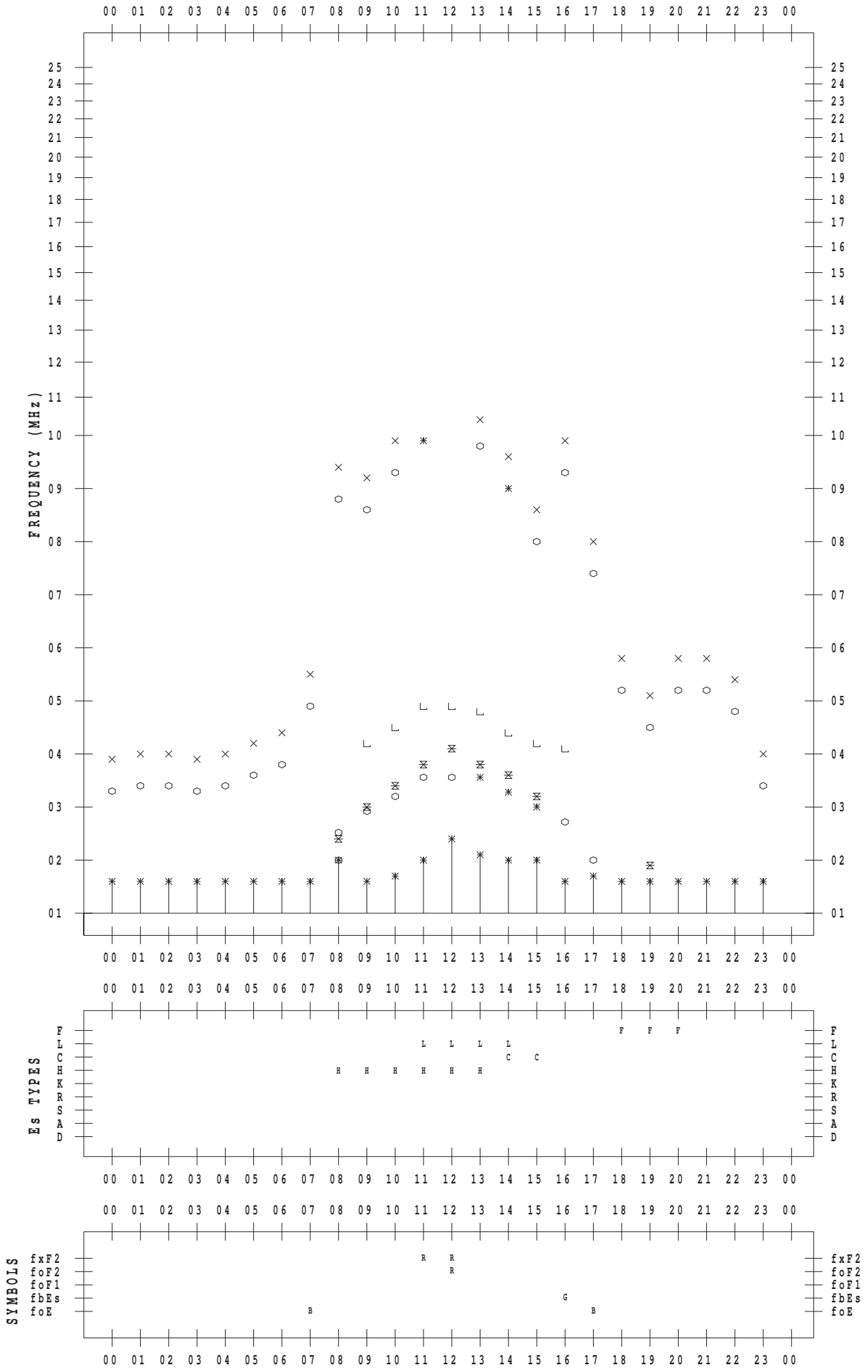
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/26

135 °E MEAN TIME



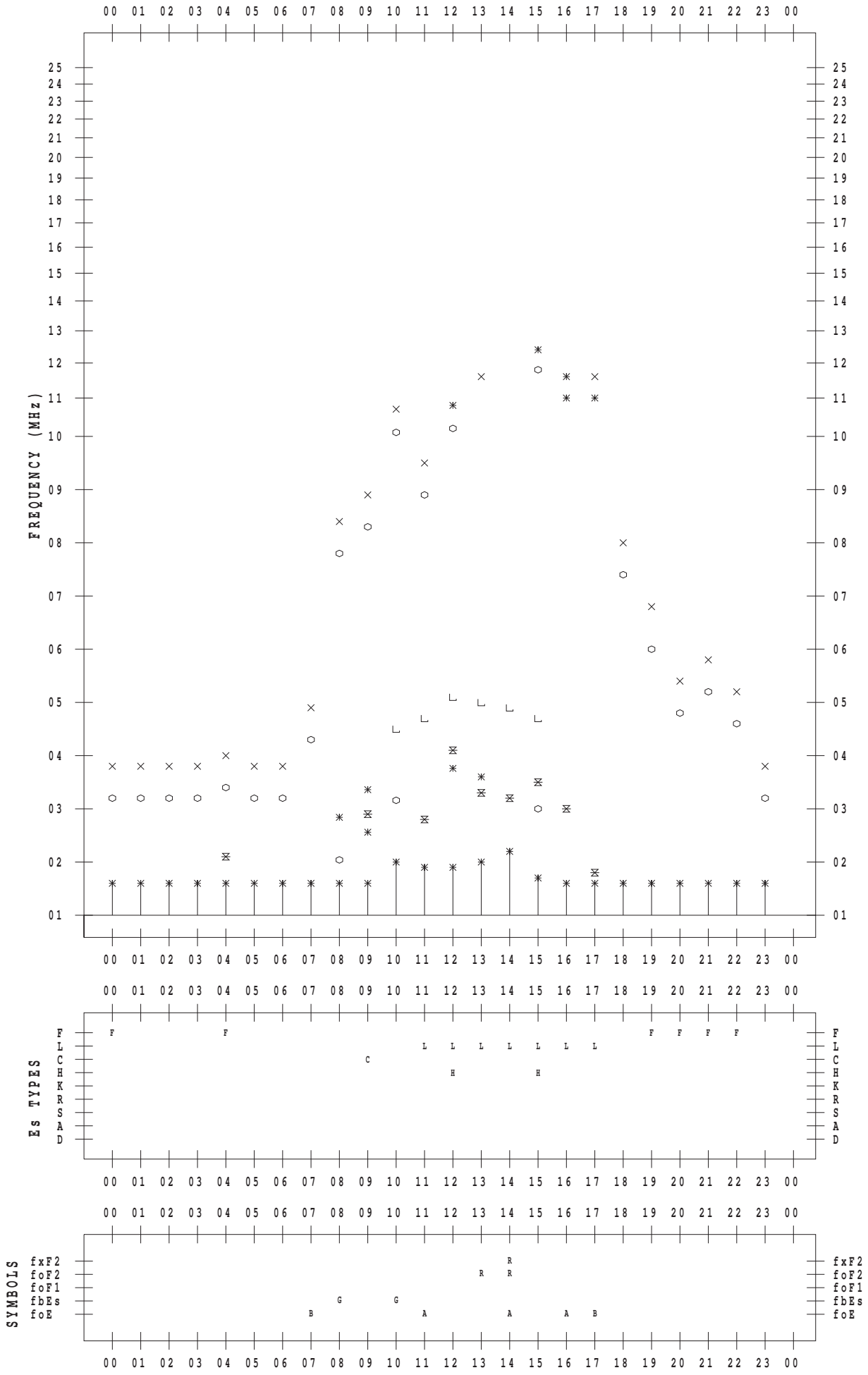
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/27

135 °E MEAN TIME



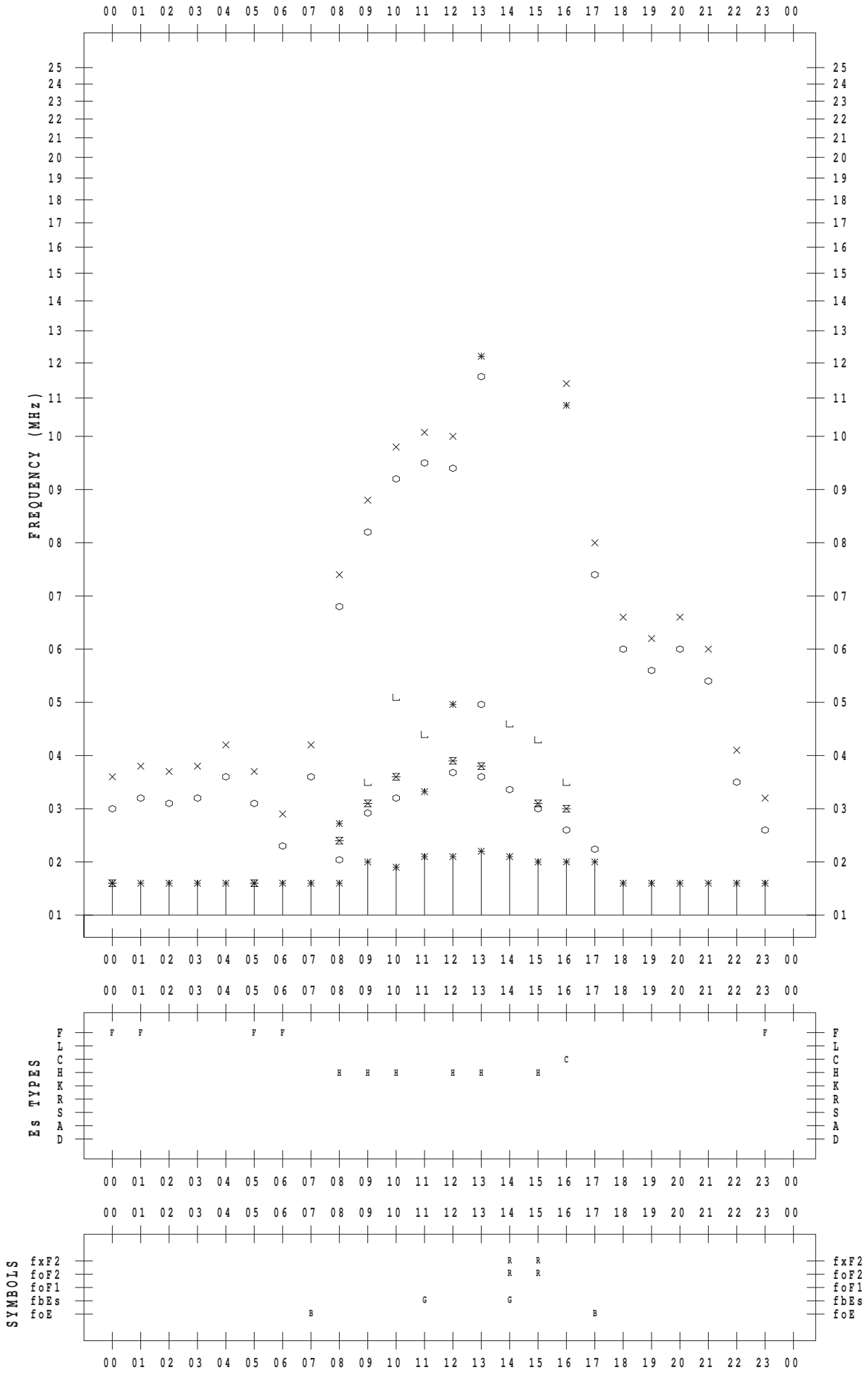
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/28

135 °E MEAN TIME



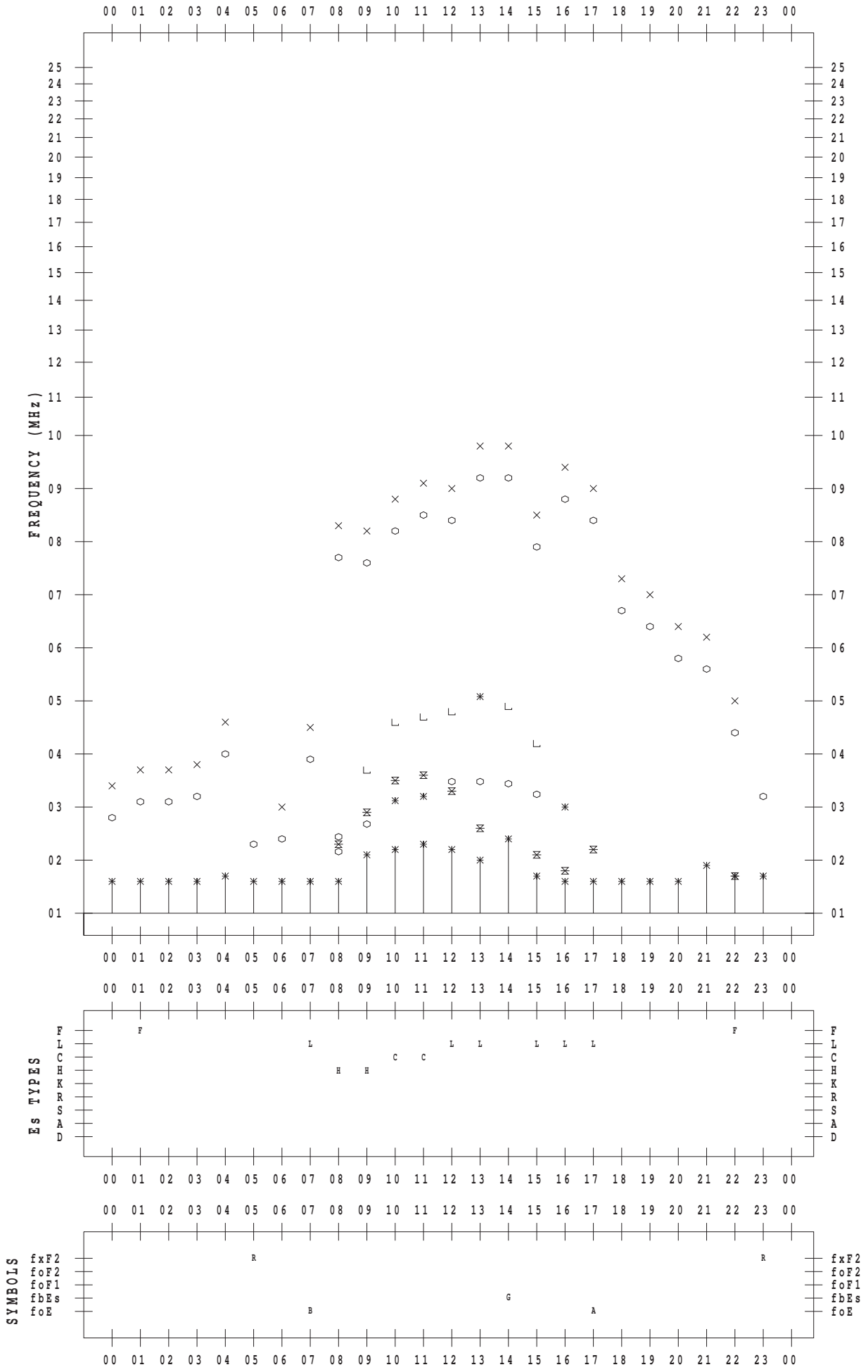
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/29

135 °E MEAN TIME



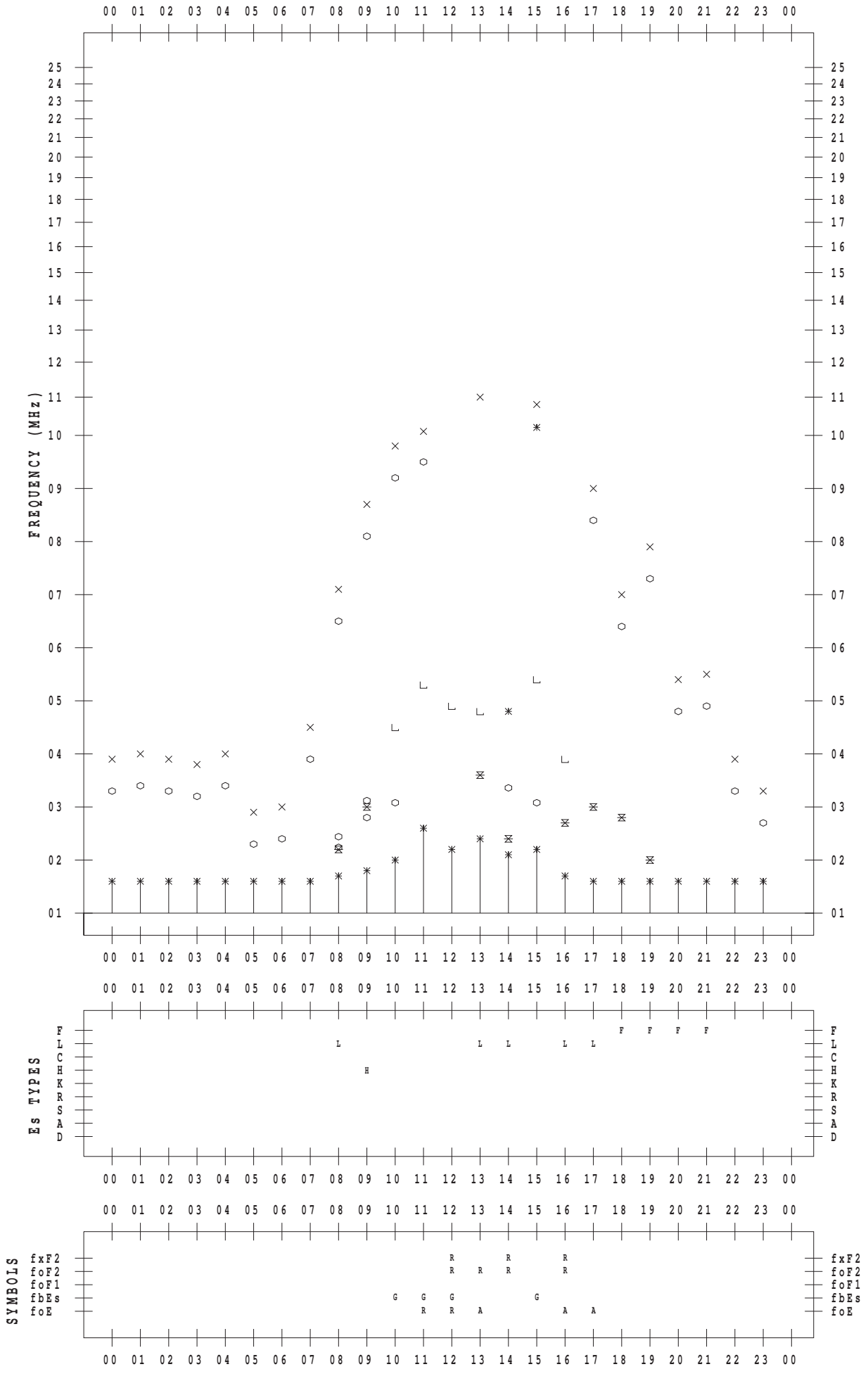
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/30

135 °E MEAN TIME



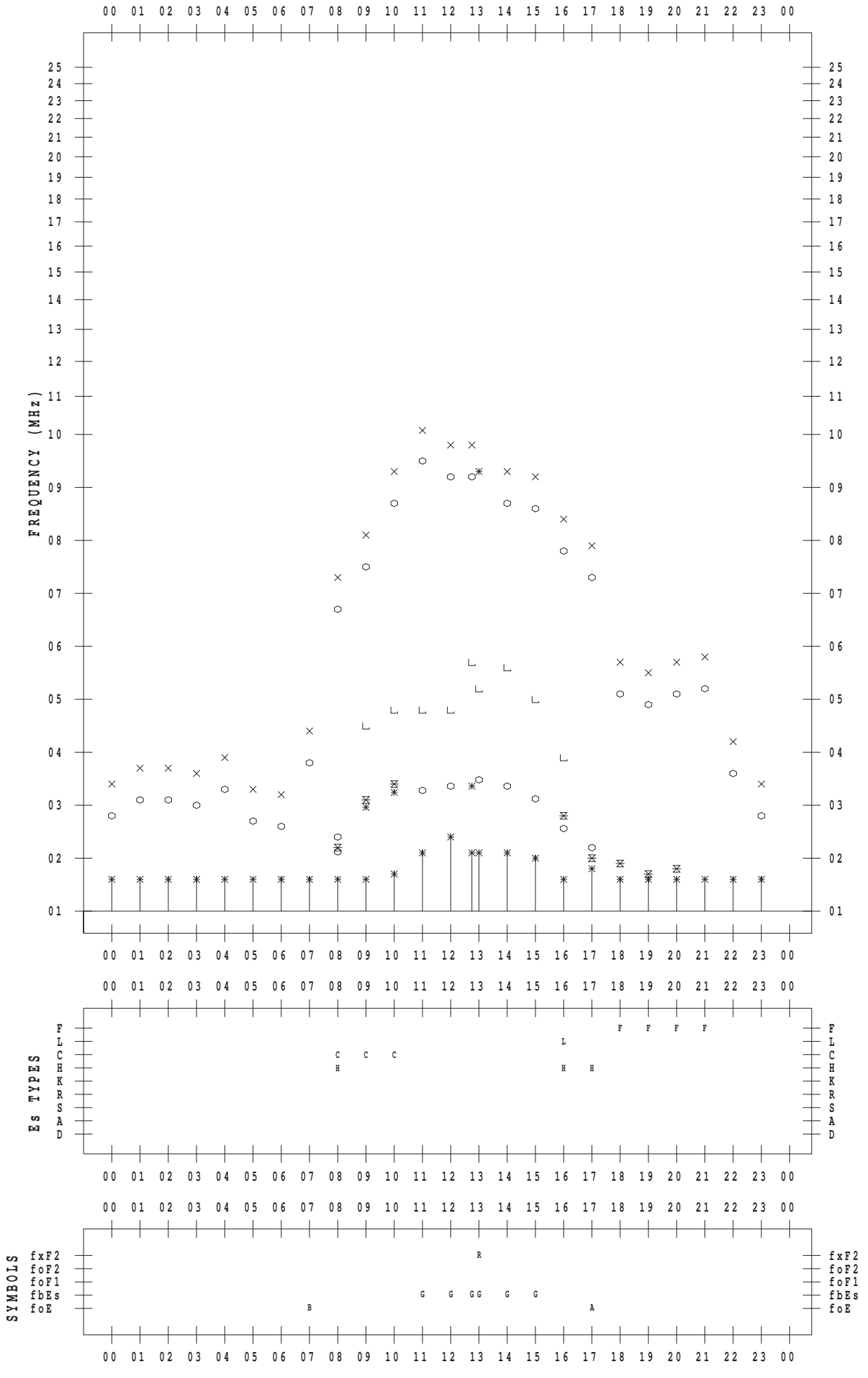
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/12/31

135 °E MEAN TIME



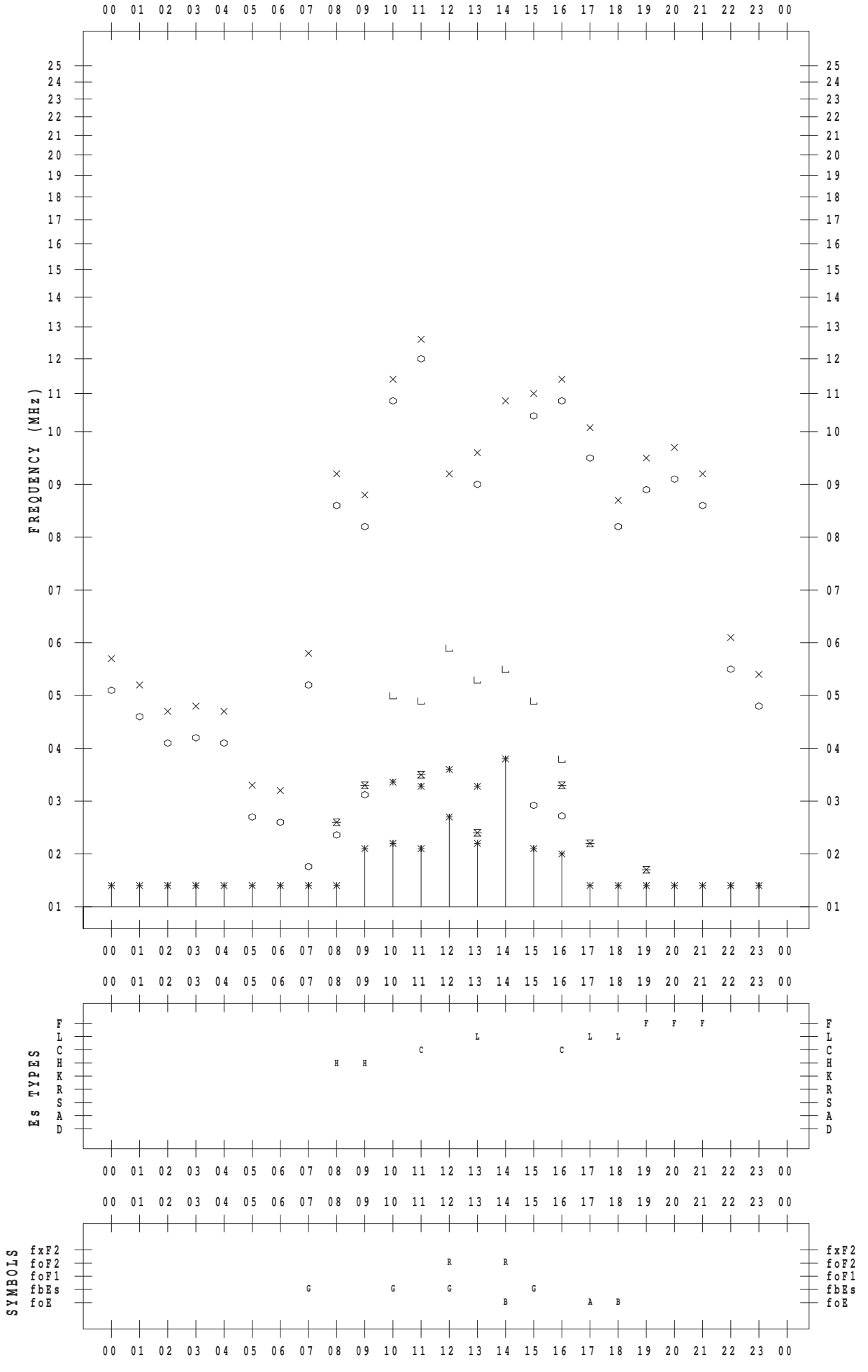
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 1

135 °E MEAN TIME



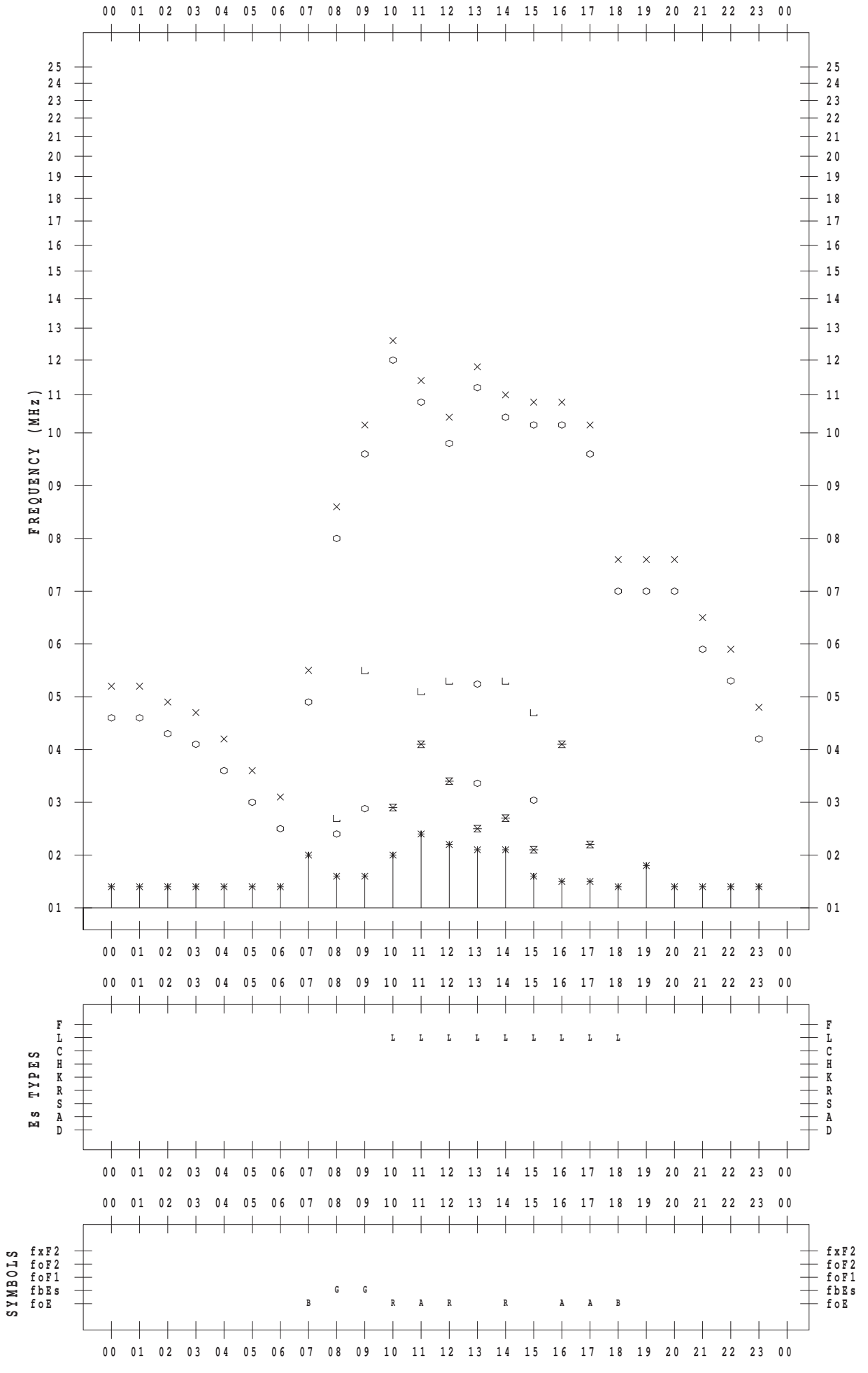
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 2

135 °E MEAN TIME



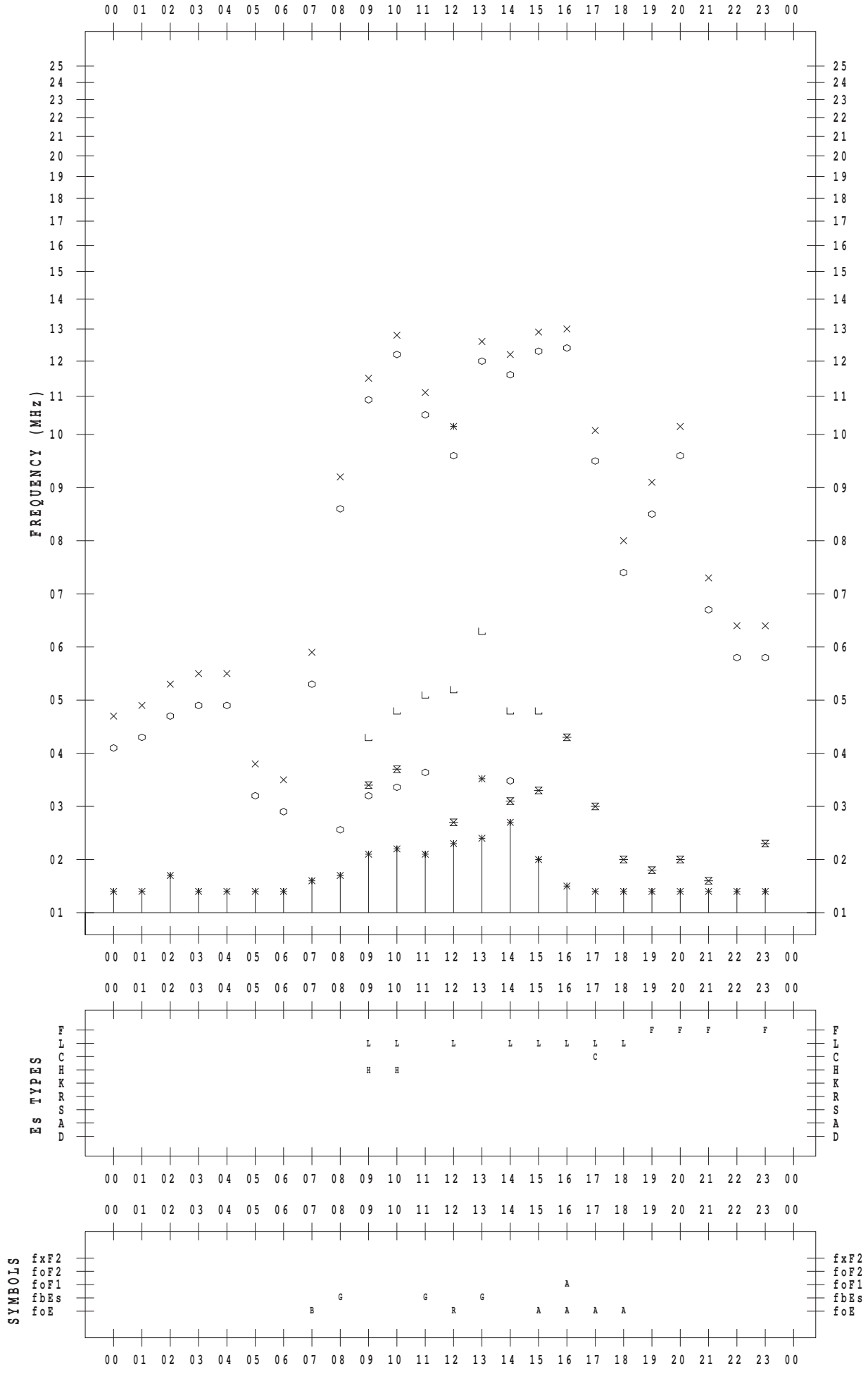
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 3

135 °E MEAN TIME



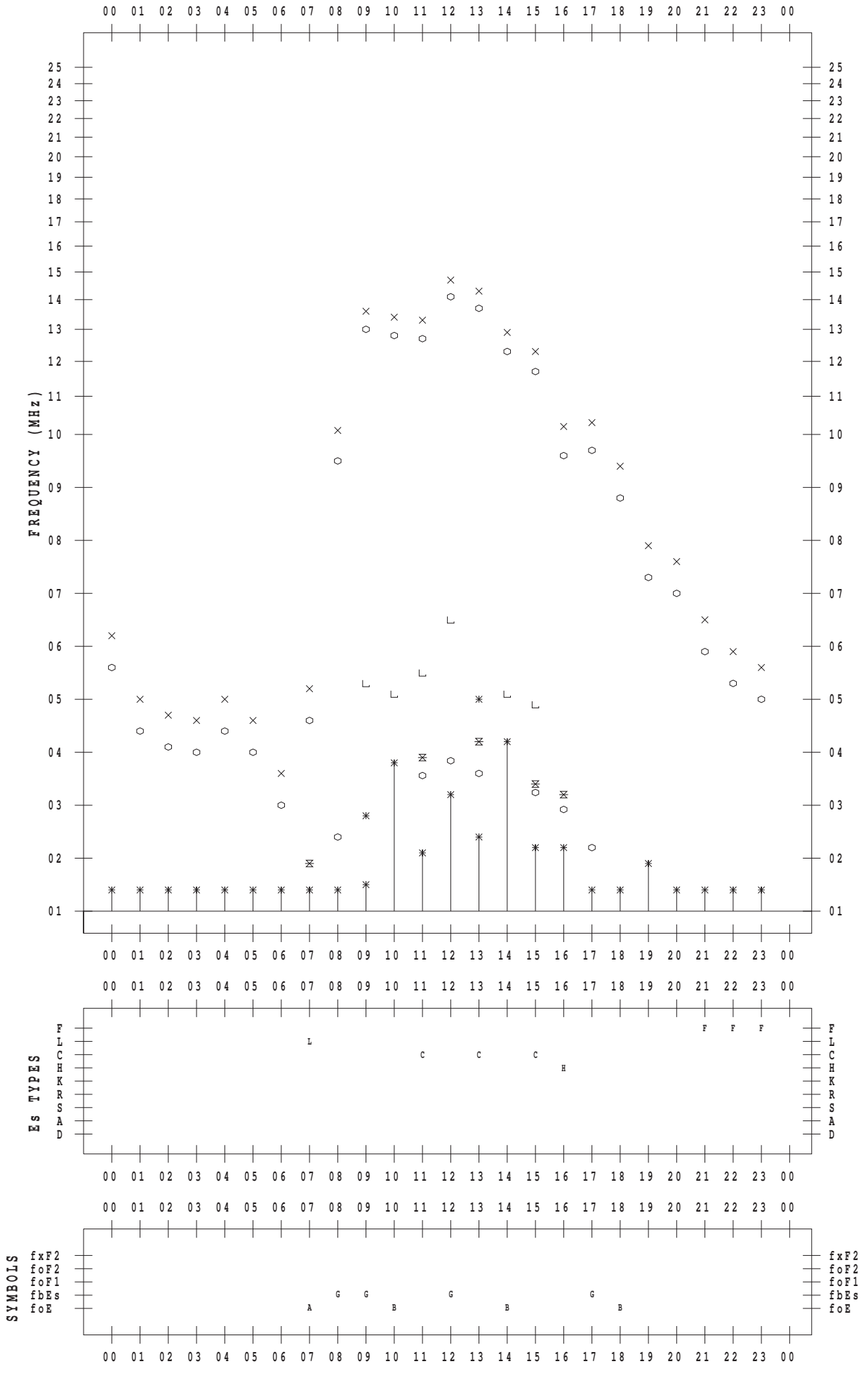
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 4

135 °E MEAN TIME



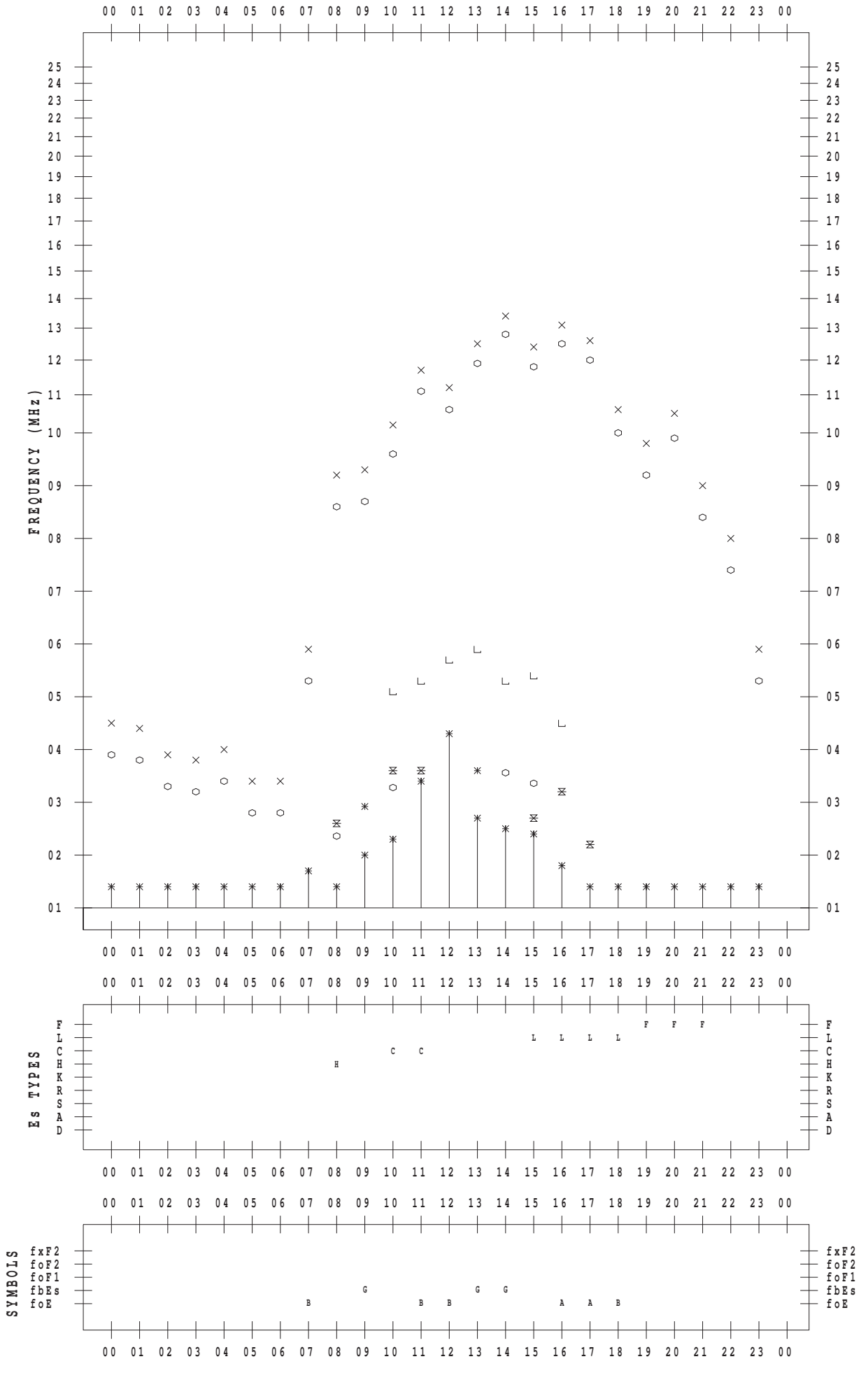
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 5

135 °E MEAN TIME



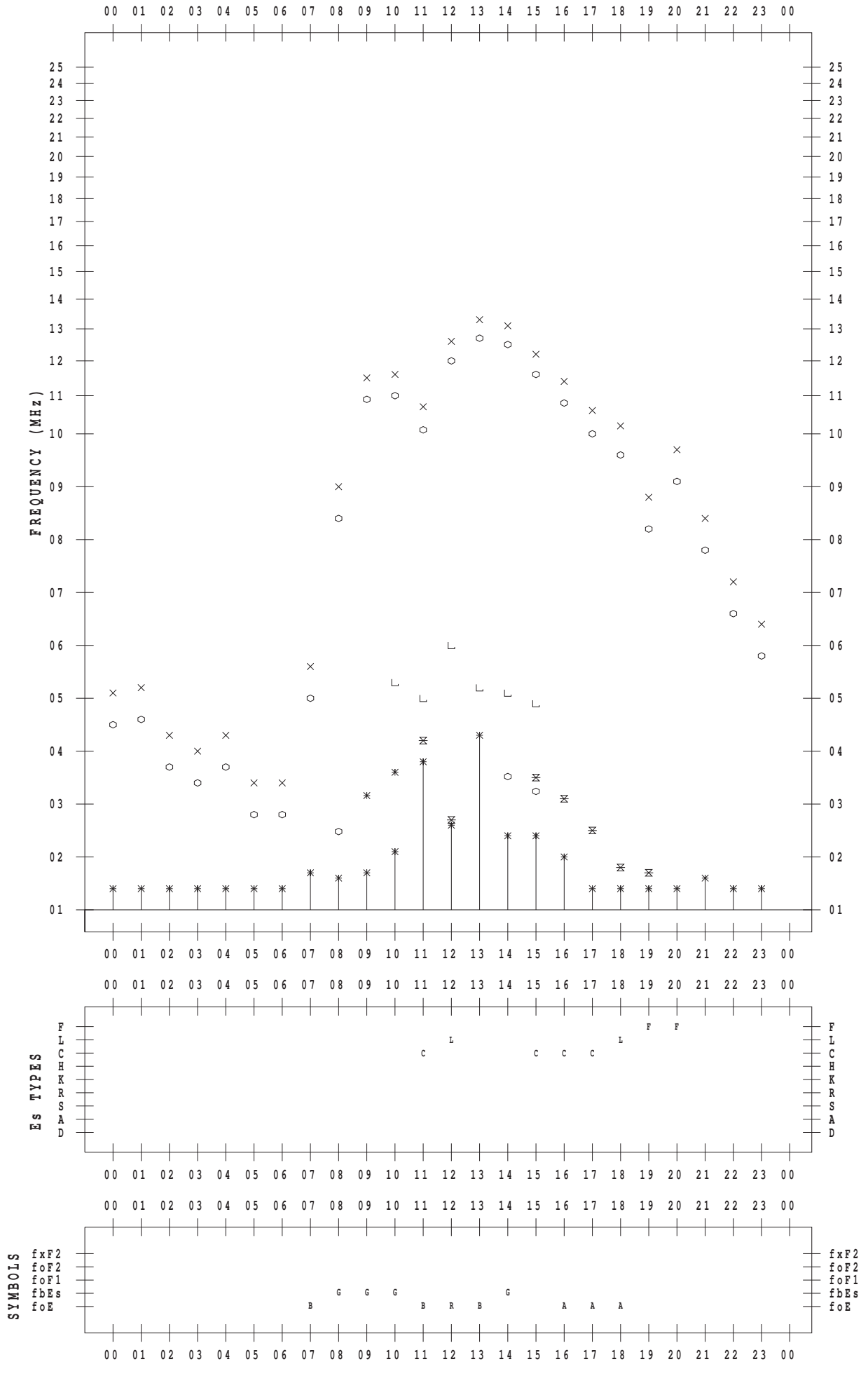
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 6

135 °E MEAN TIME



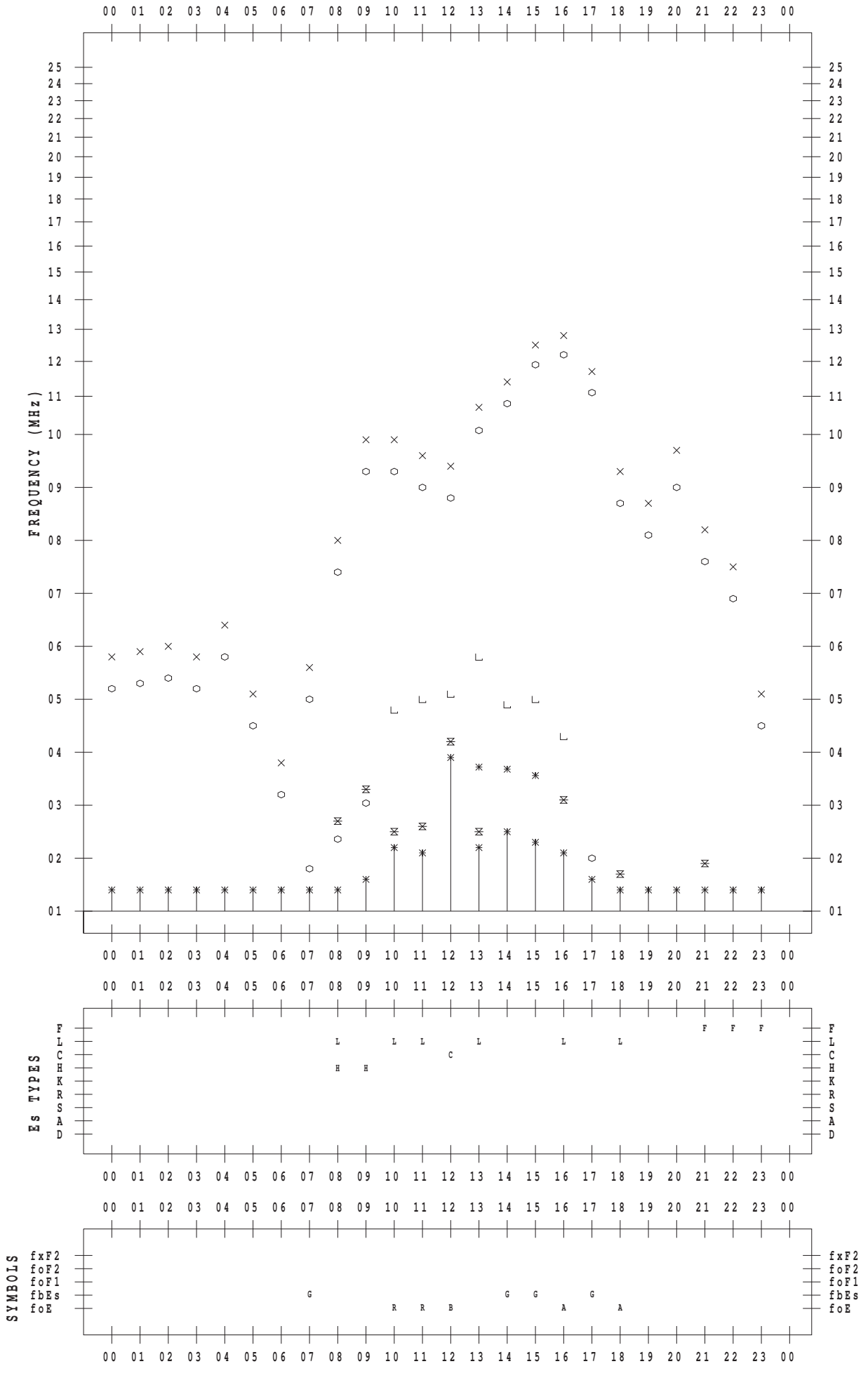
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 7

135 °E MEAN TIME



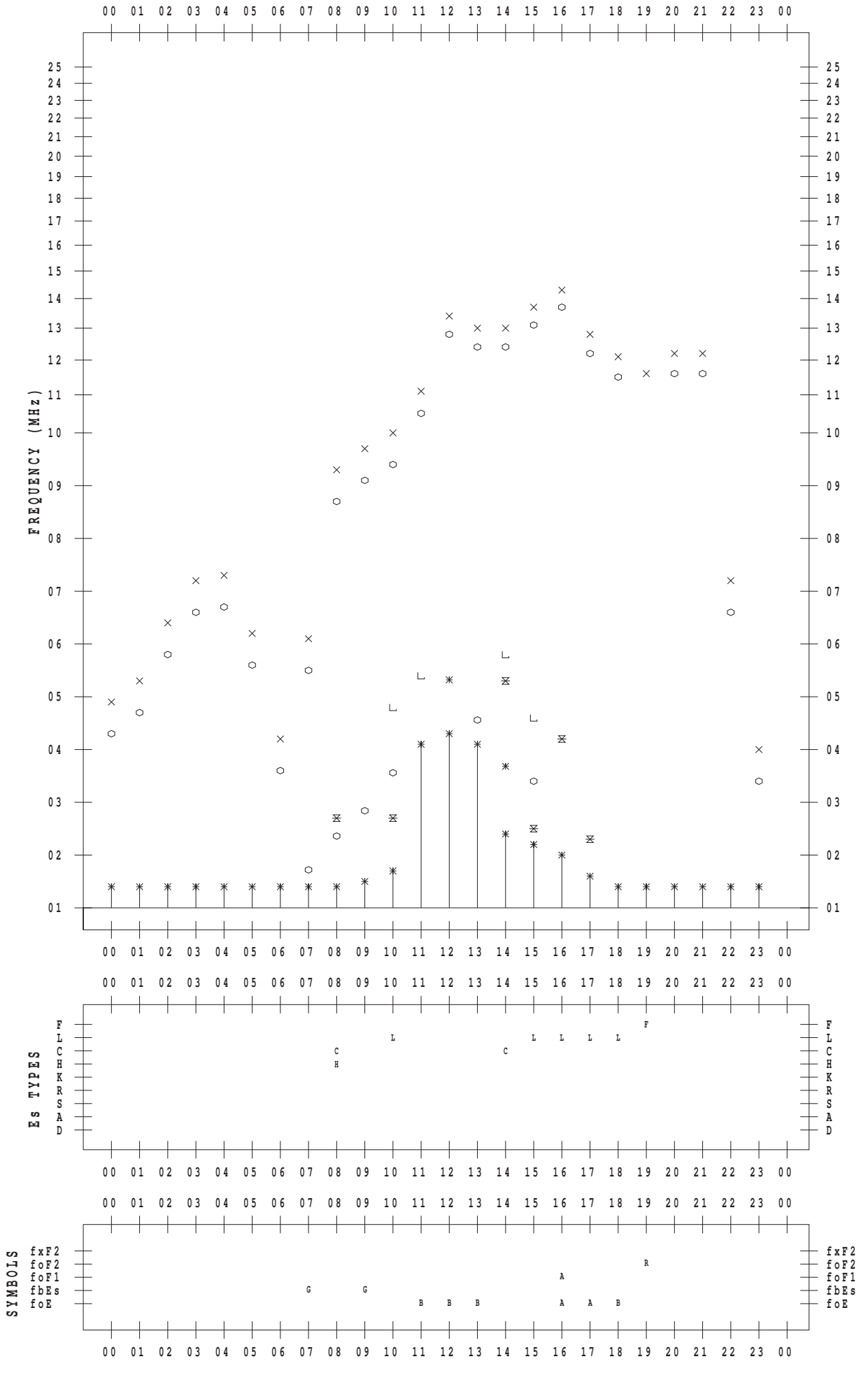
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 8

135 °E MEAN TIME



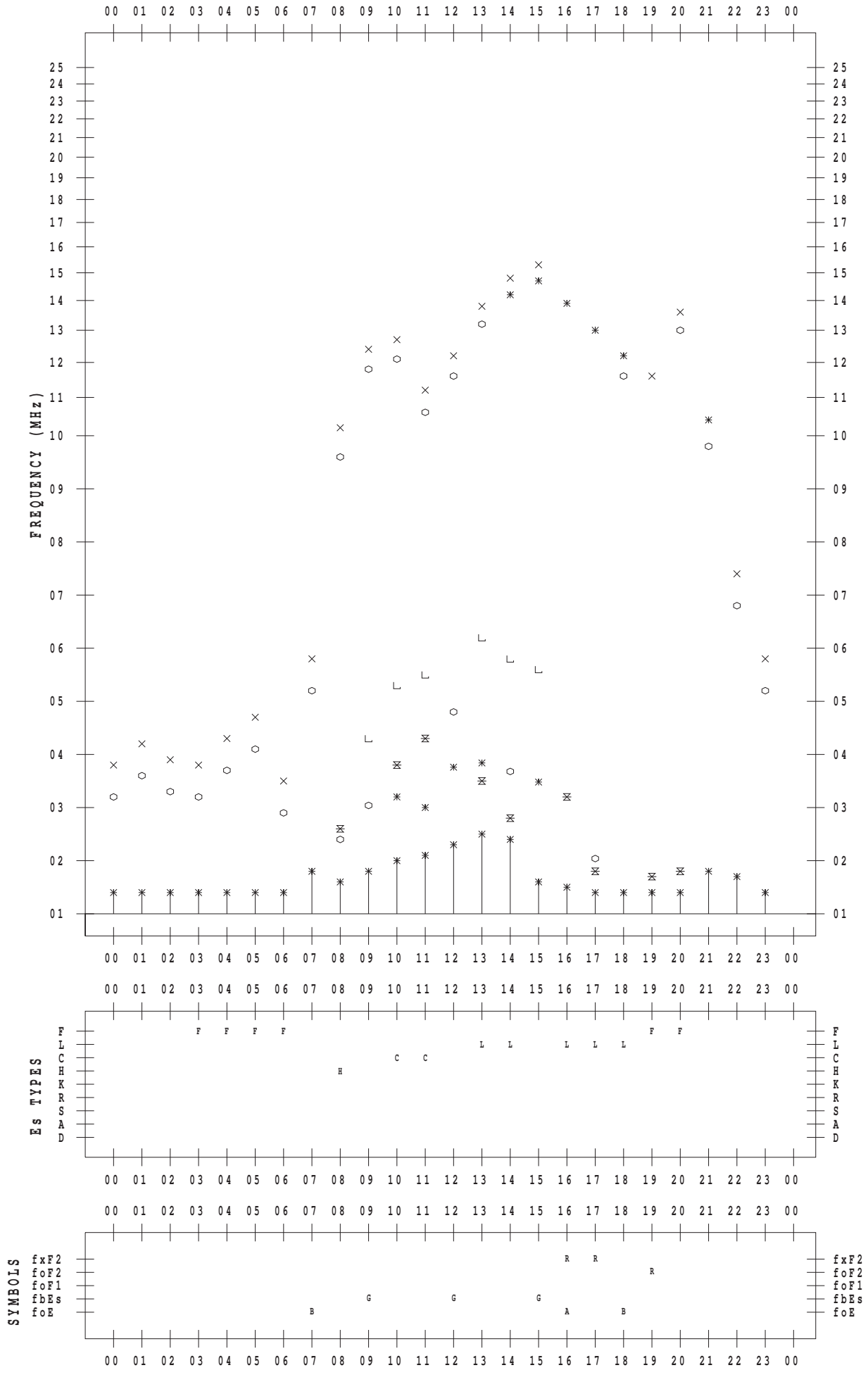
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/ 9

135 °E MEAN TIME



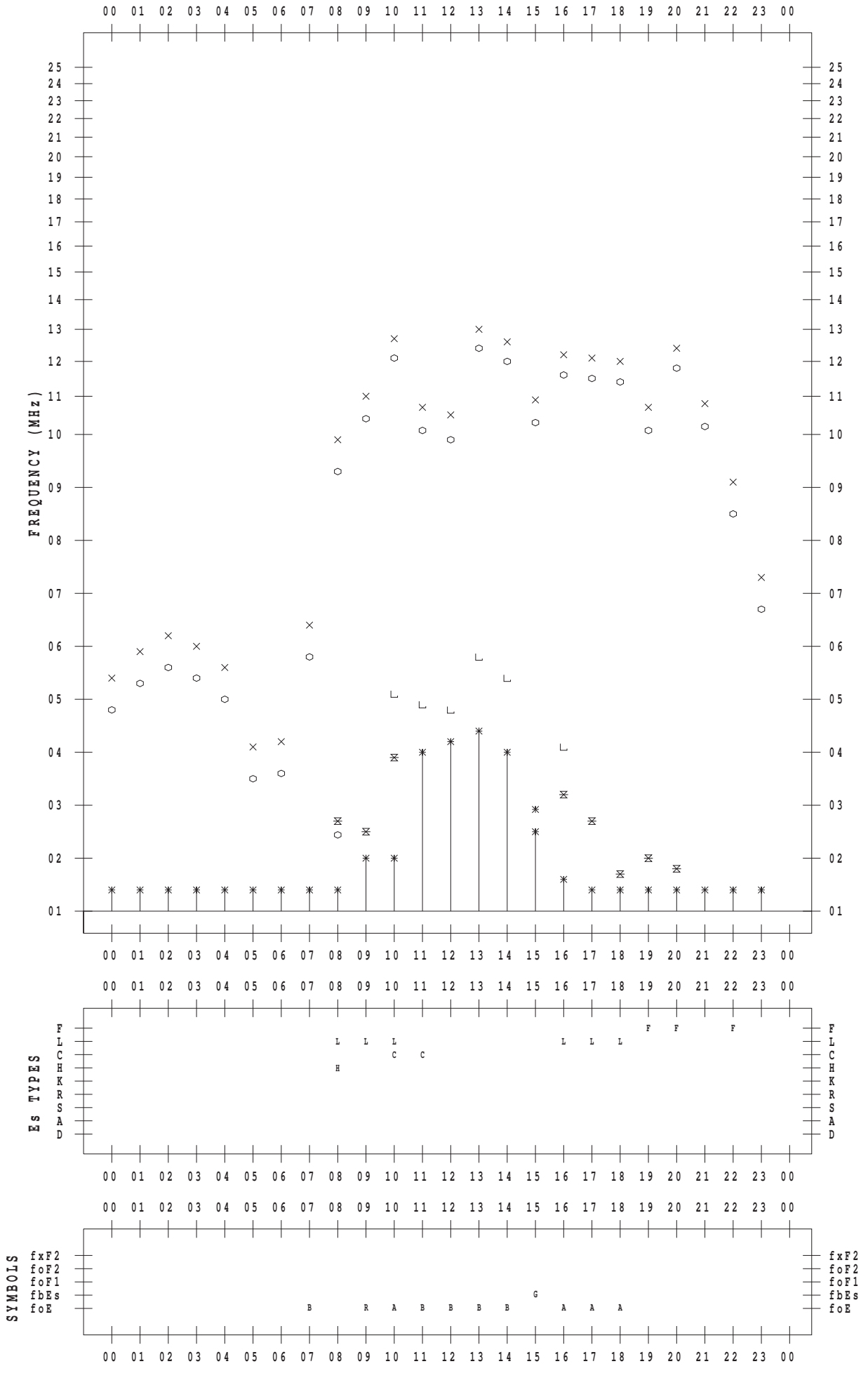
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/10

135 °E MEAN TIME



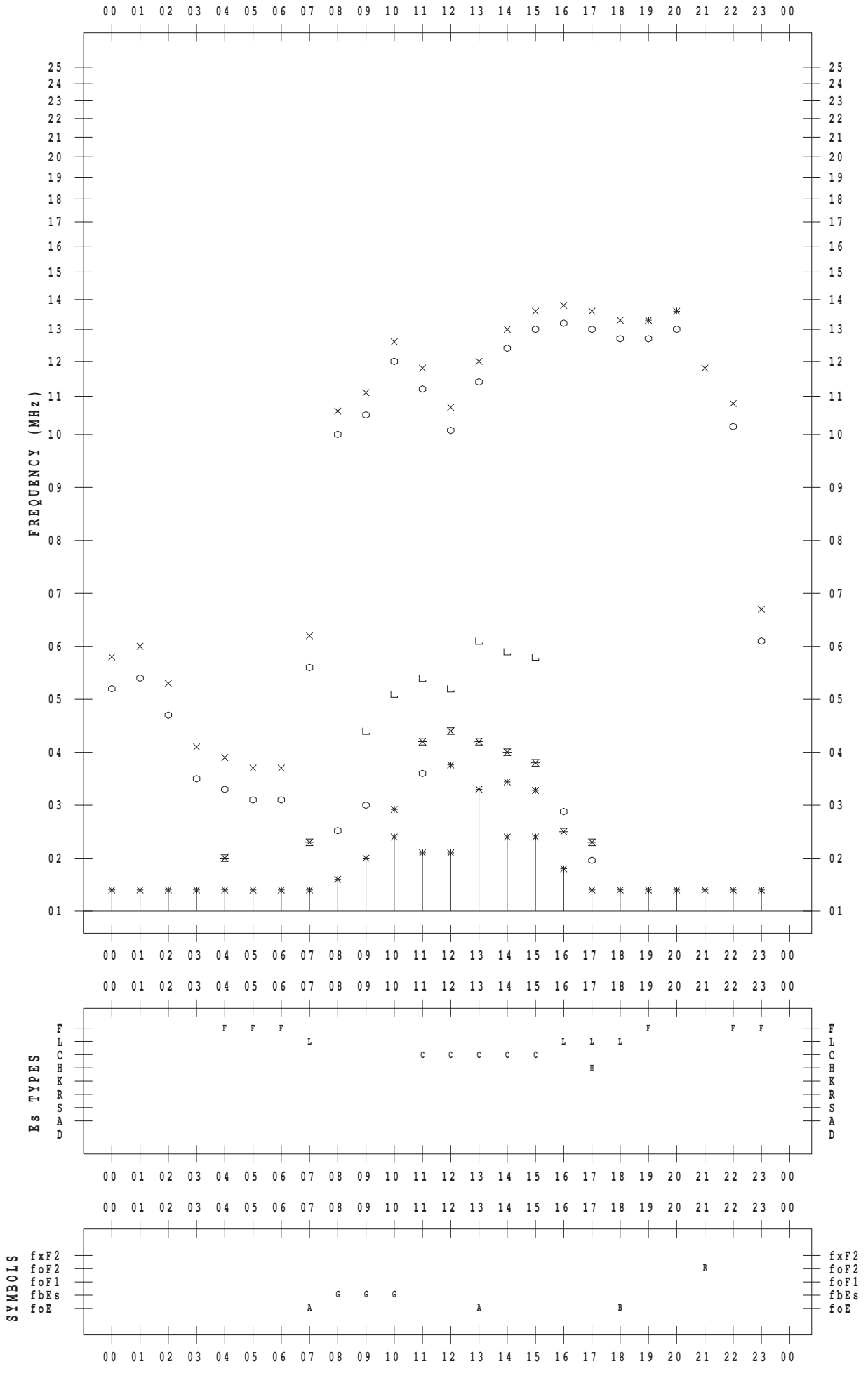
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/11

135 °E MEAN TIME



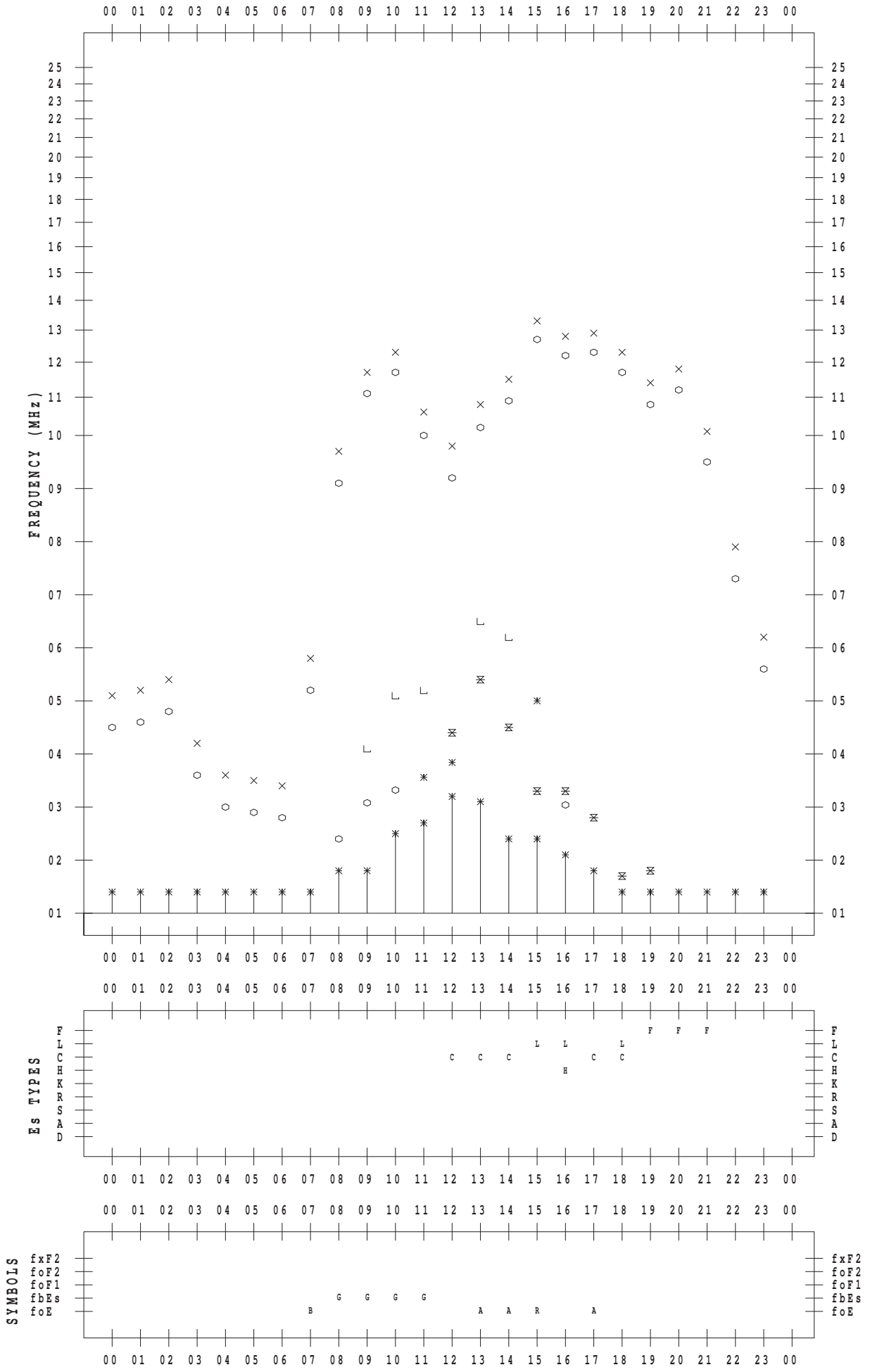
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/12

135 °E MEAN TIME



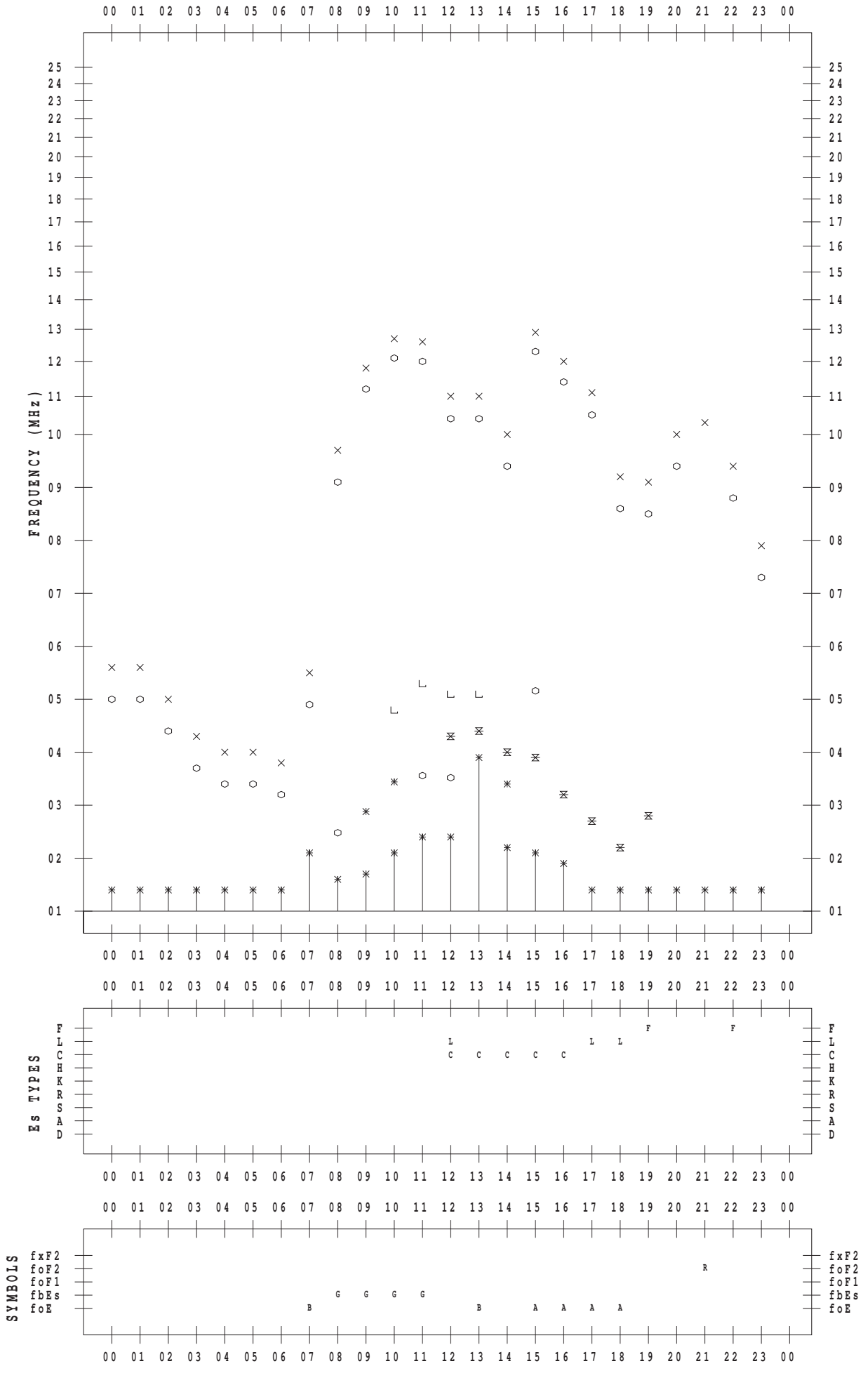
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/13

135 °E MEAN TIME



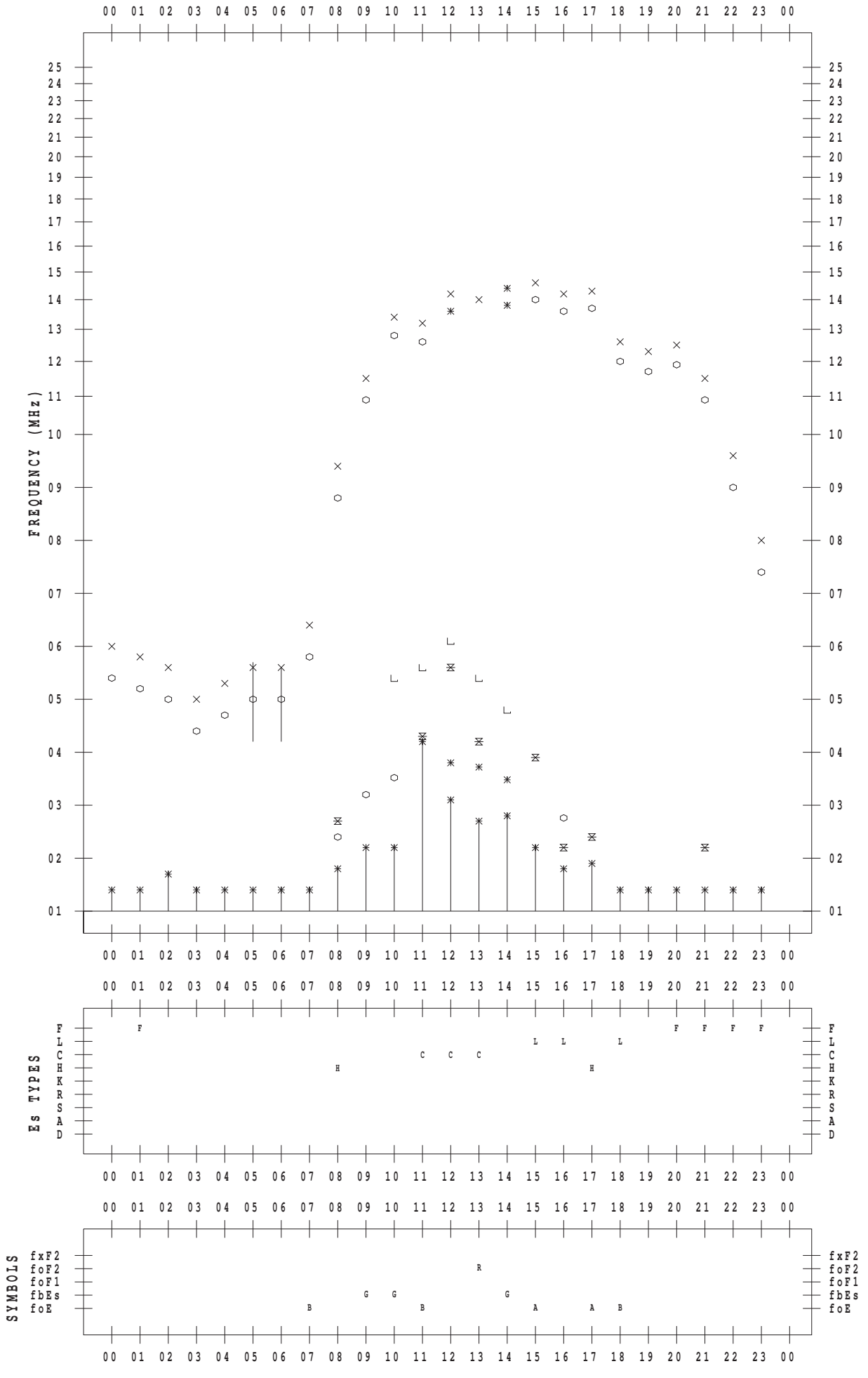
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/14

135 °E MEAN TIME



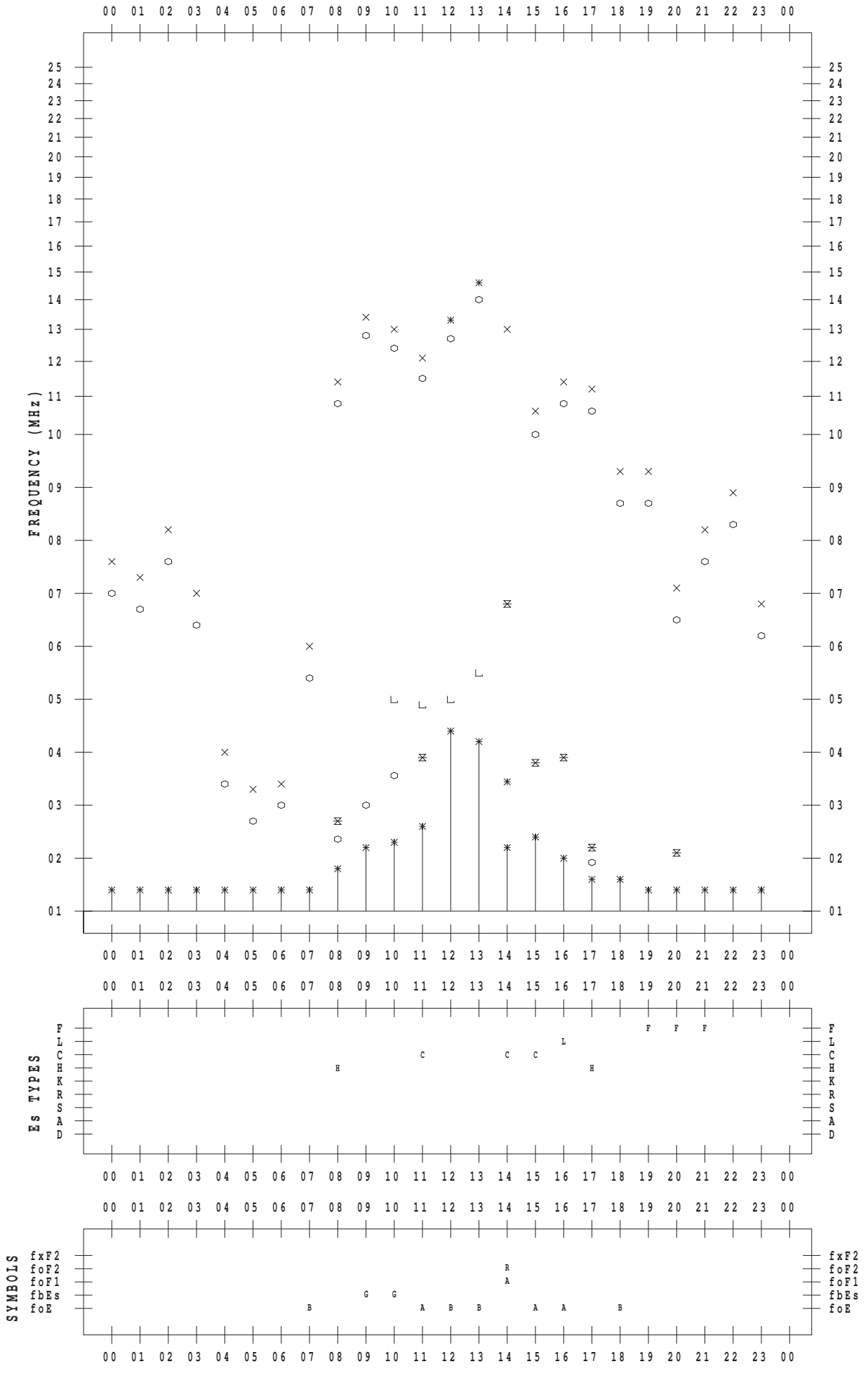
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/15

135 °E MEAN TIME



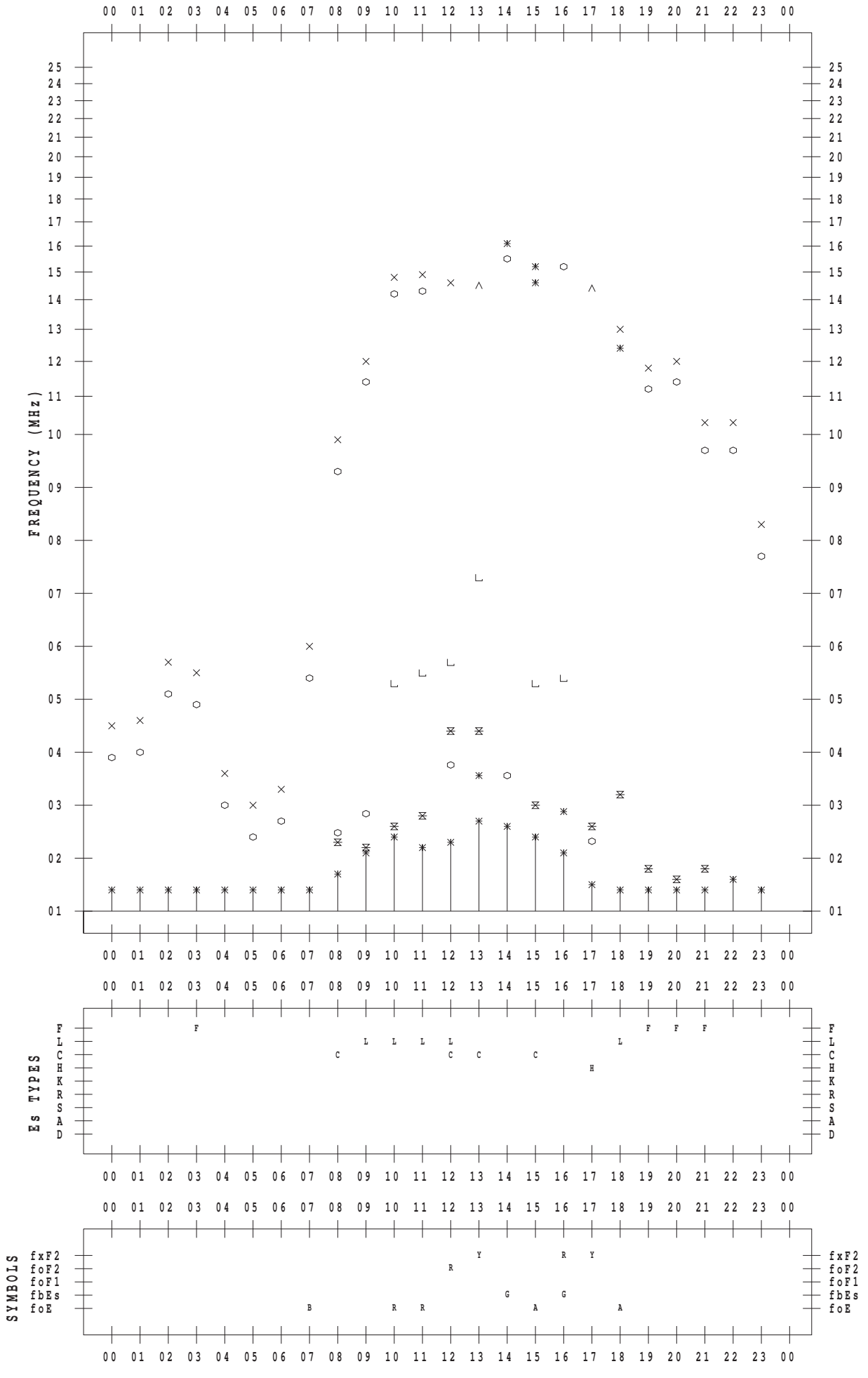
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/16

135 °E MEAN TIME



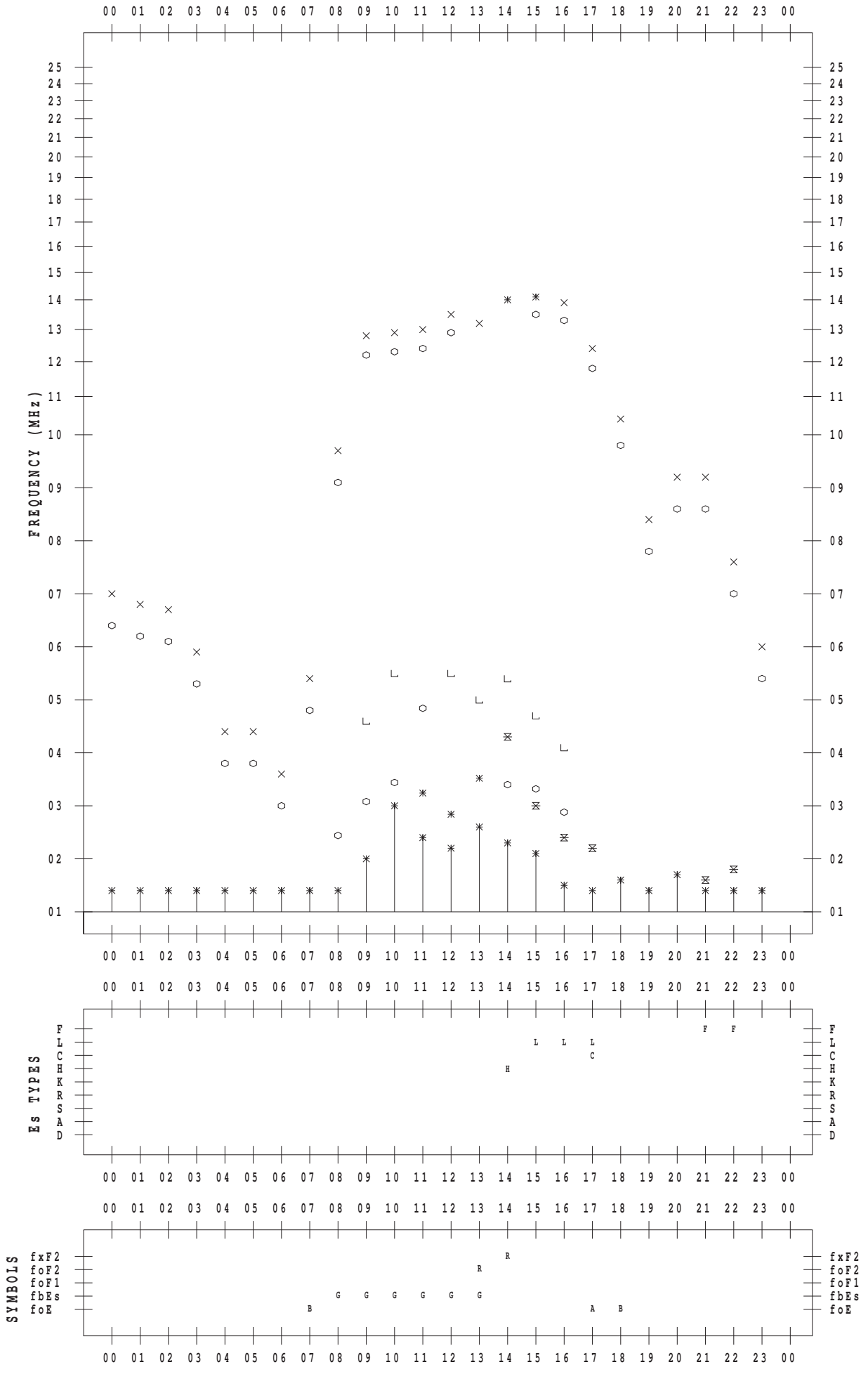
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/17

135 °E MEAN TIME



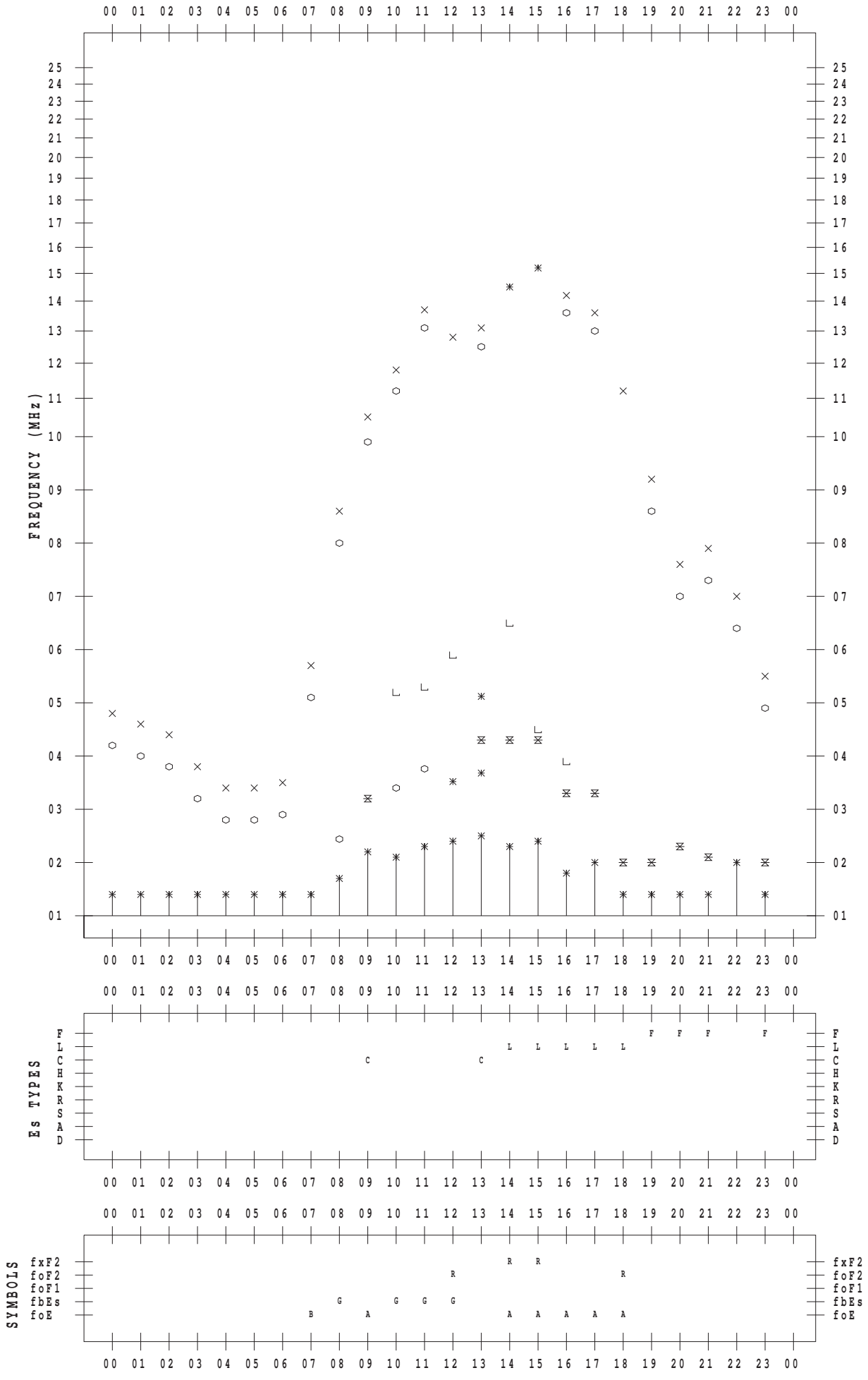
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/18

135 °E MEAN TIME



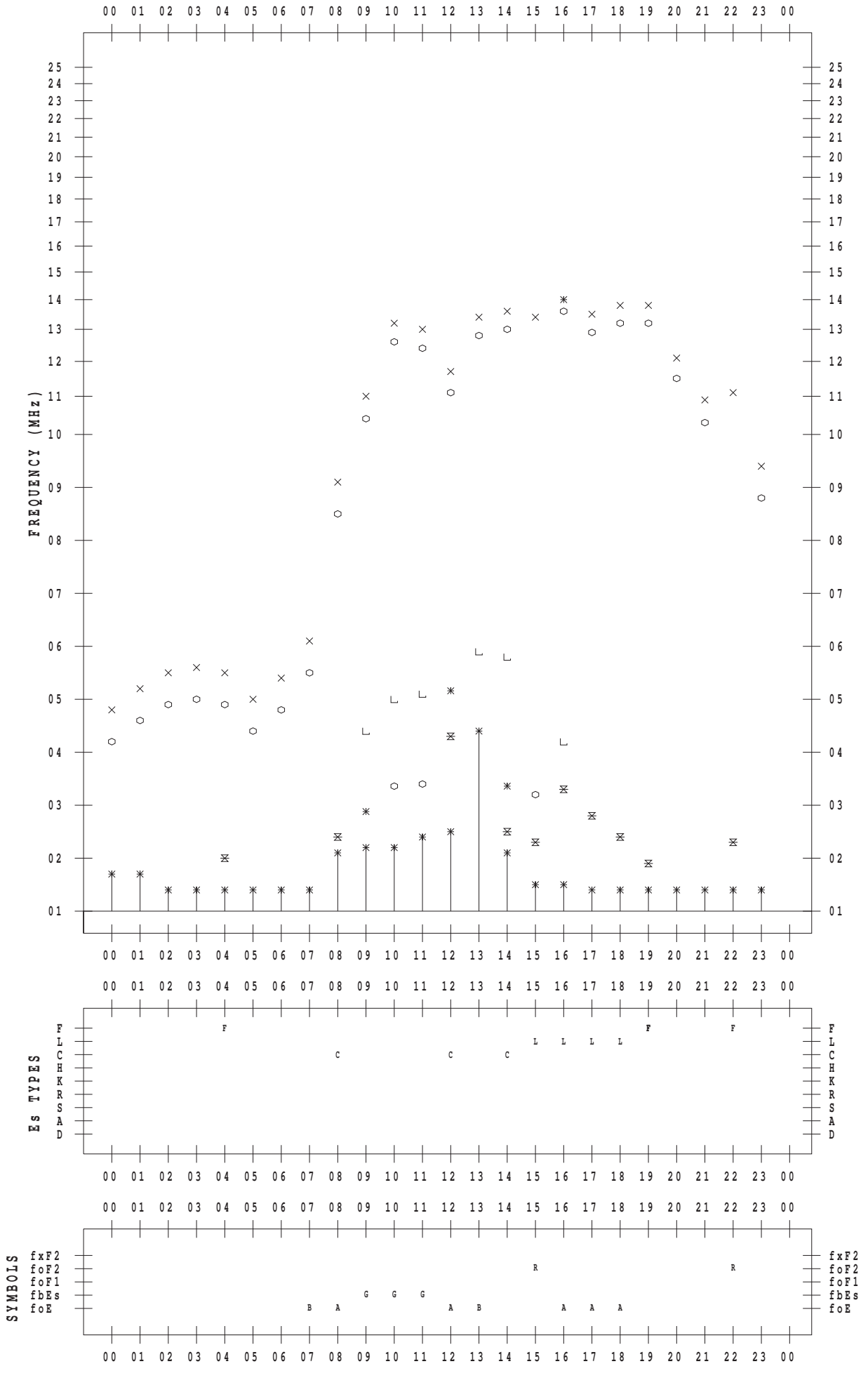
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/19

135 °E MEAN TIME



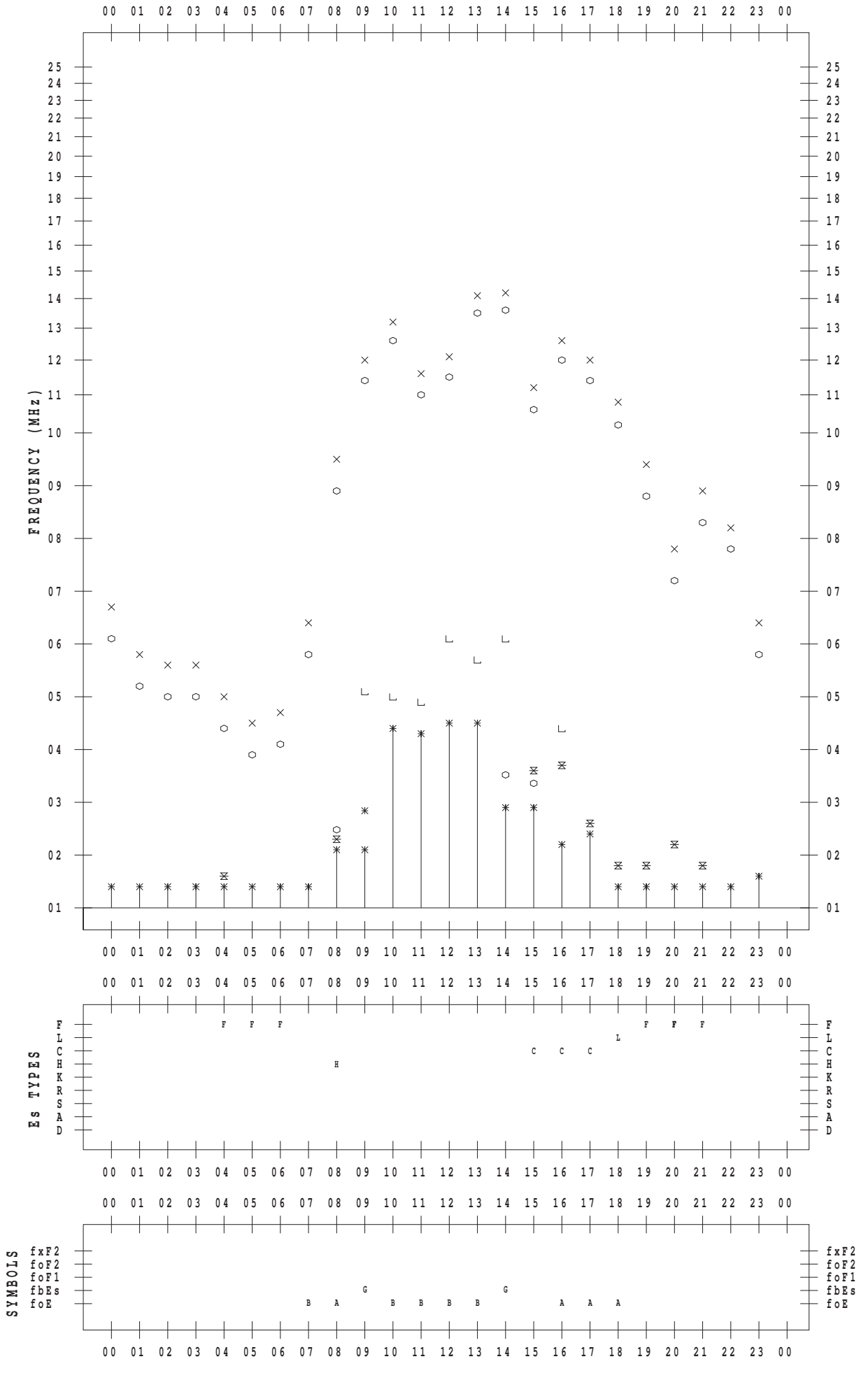
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/20

135 °E MEAN TIME



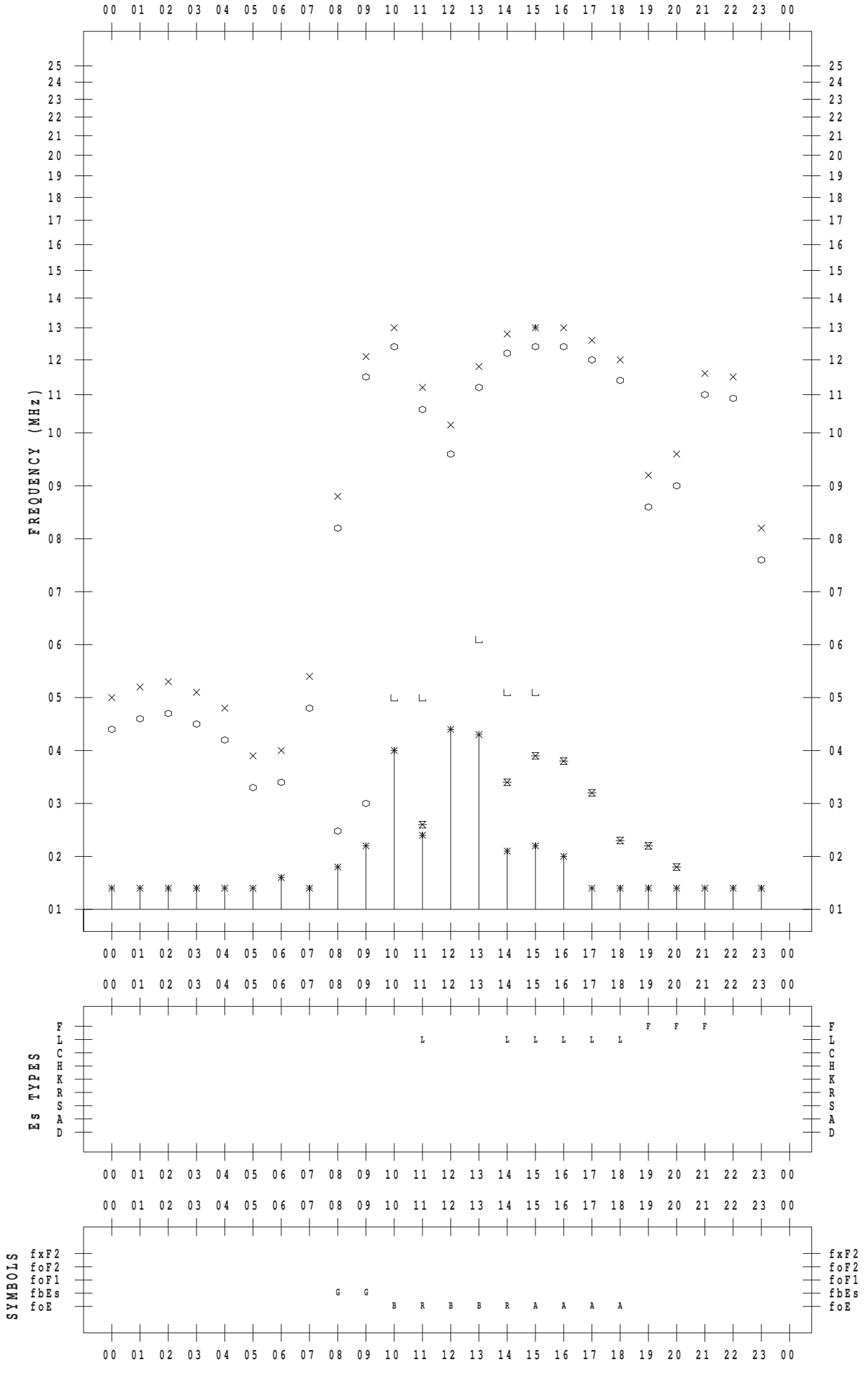
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/21

135 °E MEAN TIME



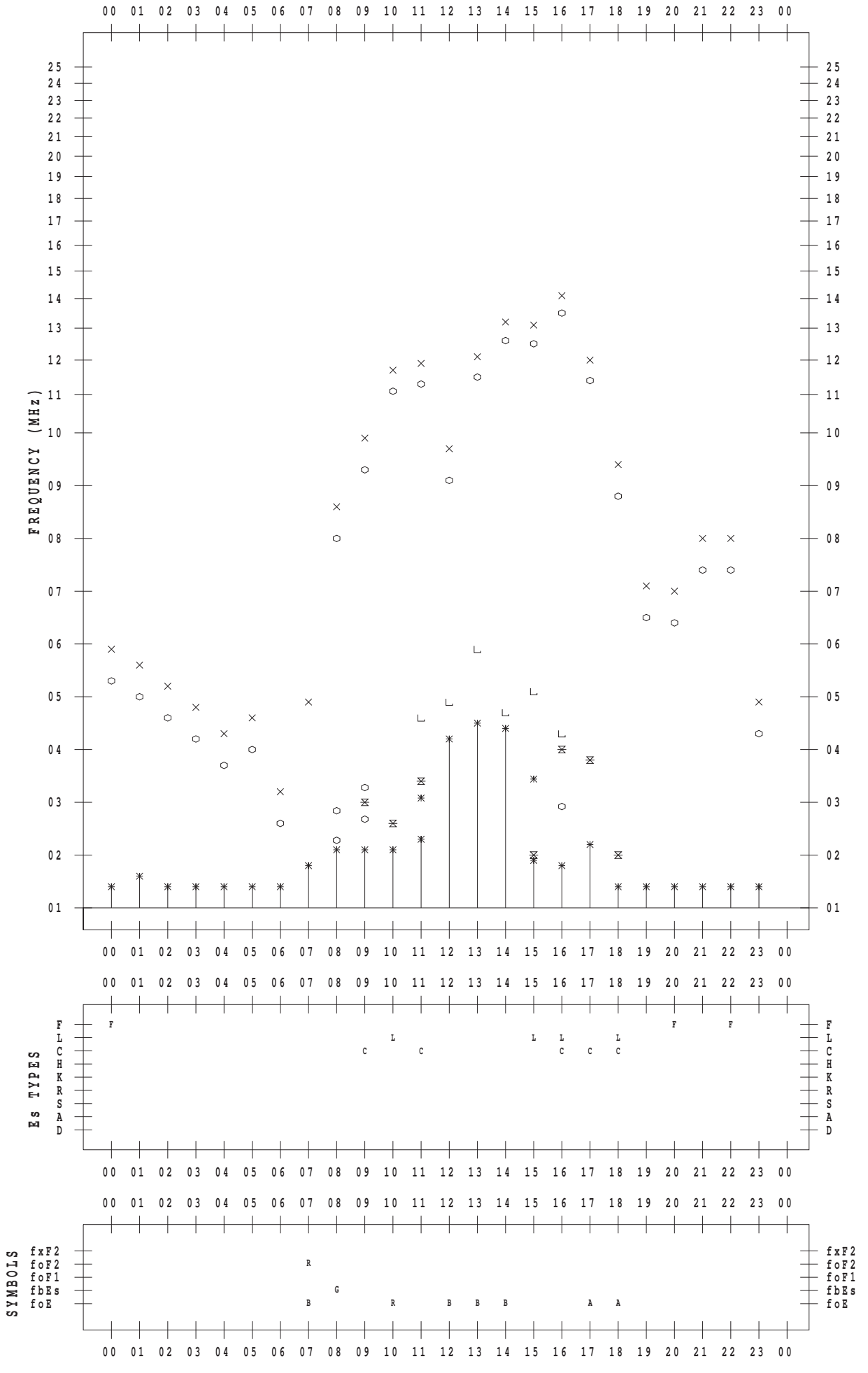
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/22

135 °E MEAN TIME



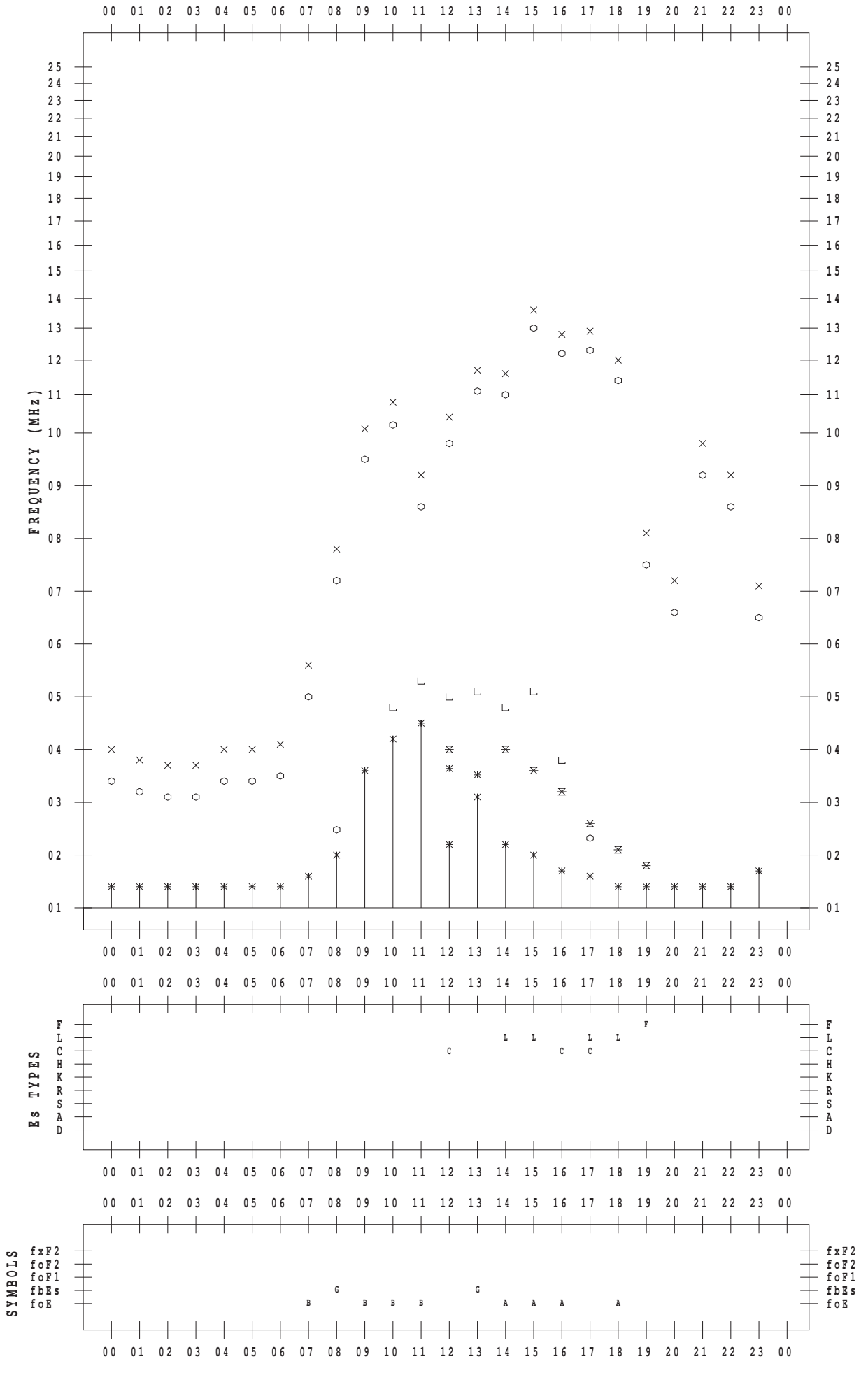
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/23

135 °E MEAN TIME



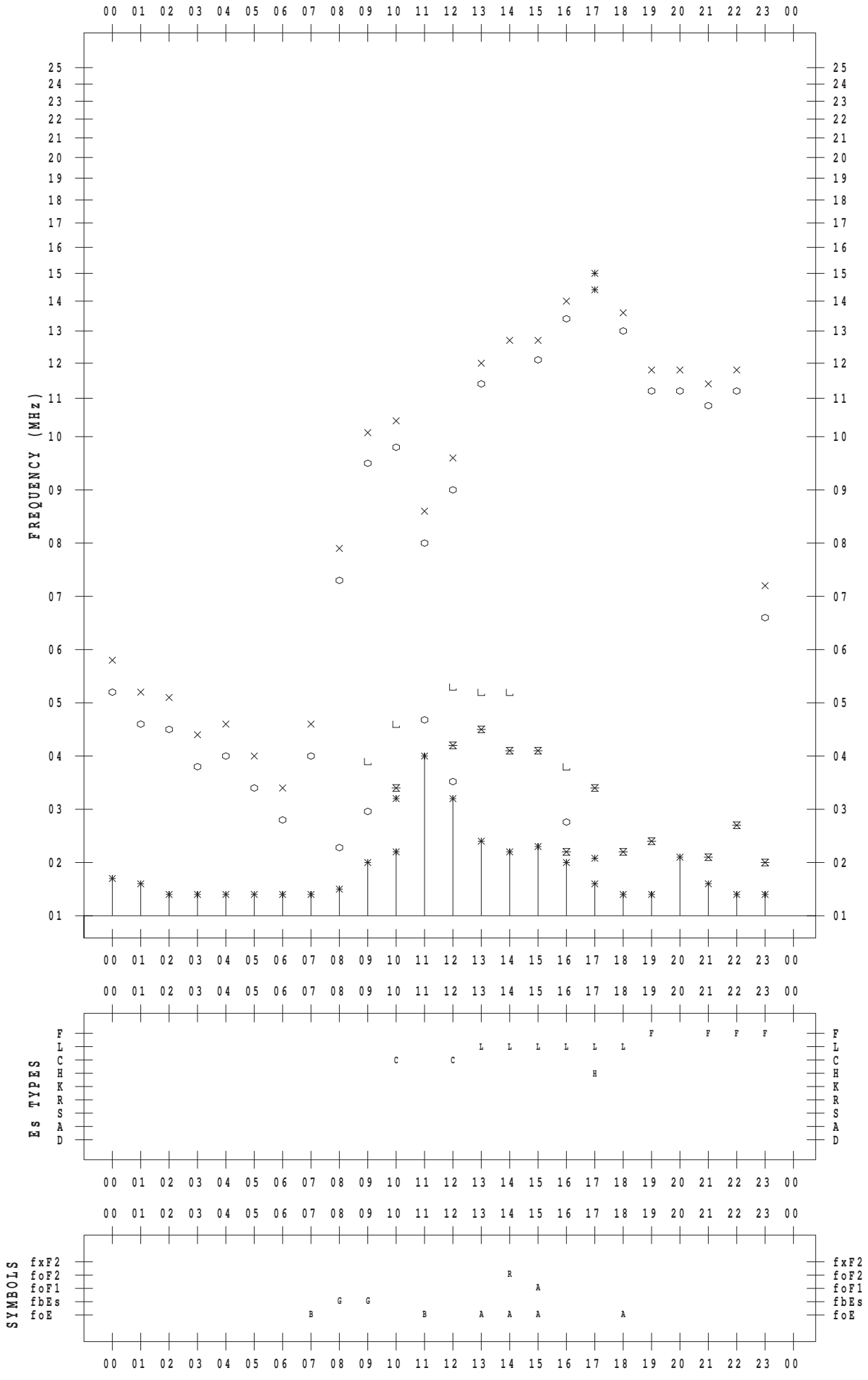
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/24

135 °E MEAN TIME



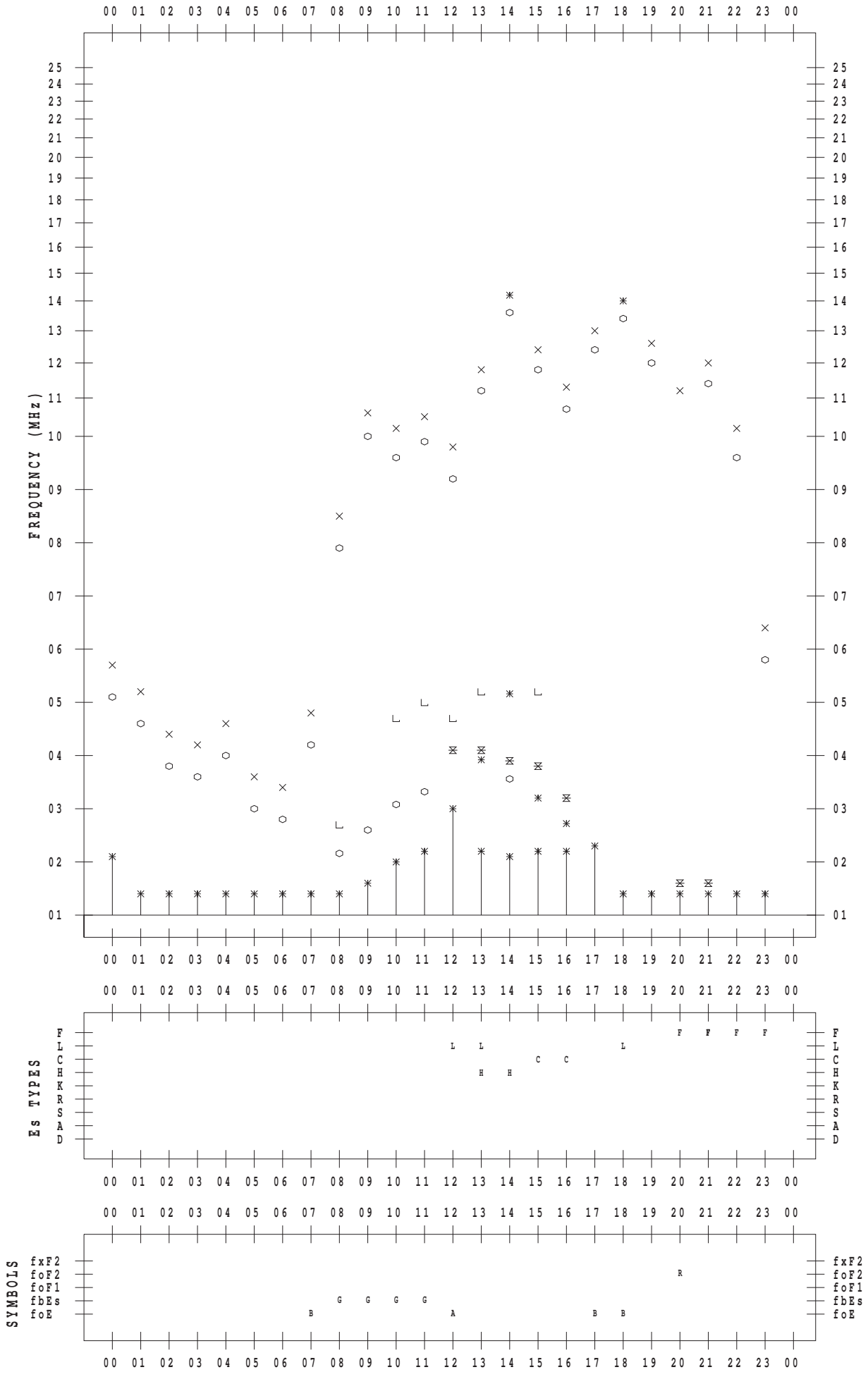
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/25

135 °E MEAN TIME



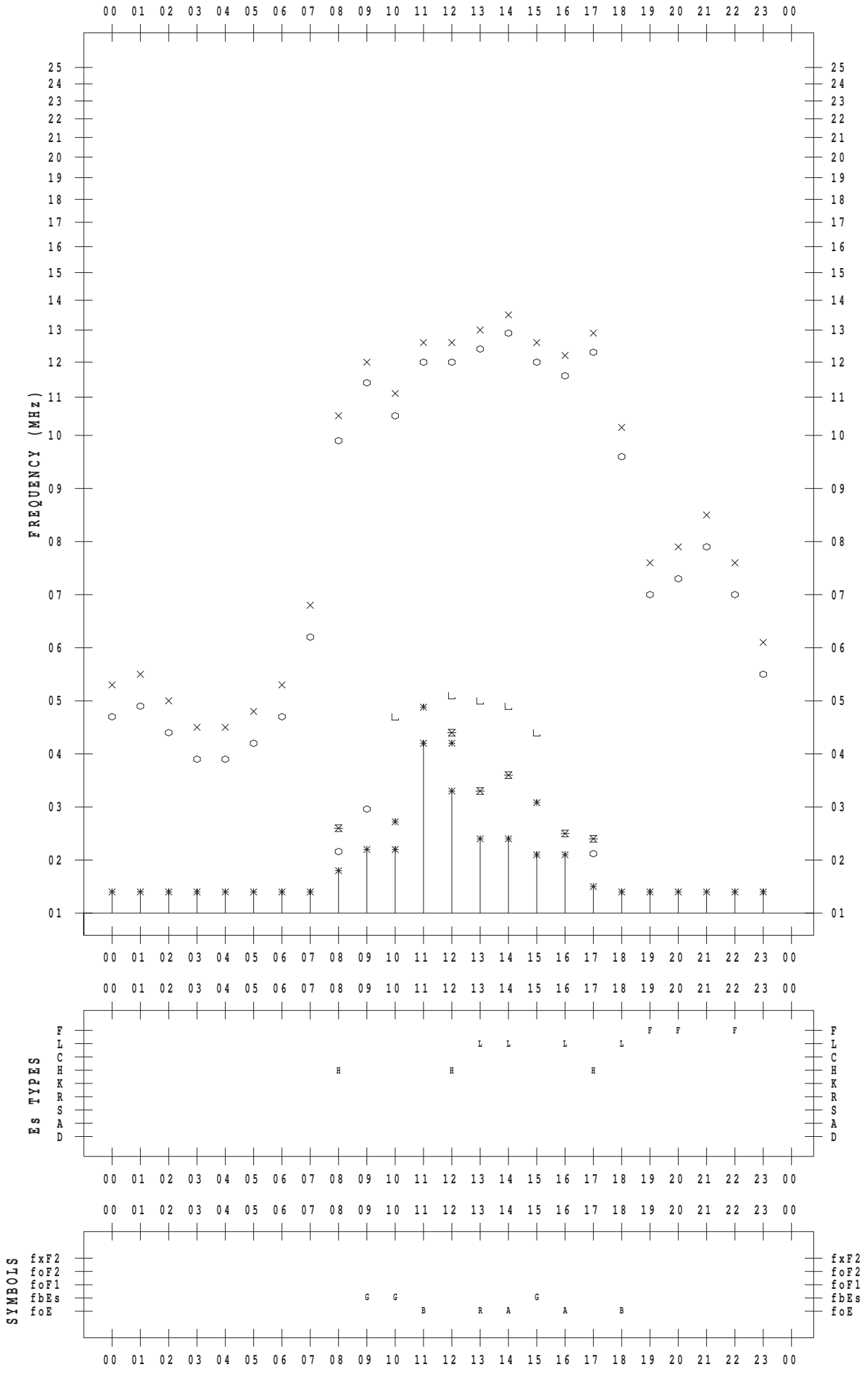
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/26

135 °E MEAN TIME



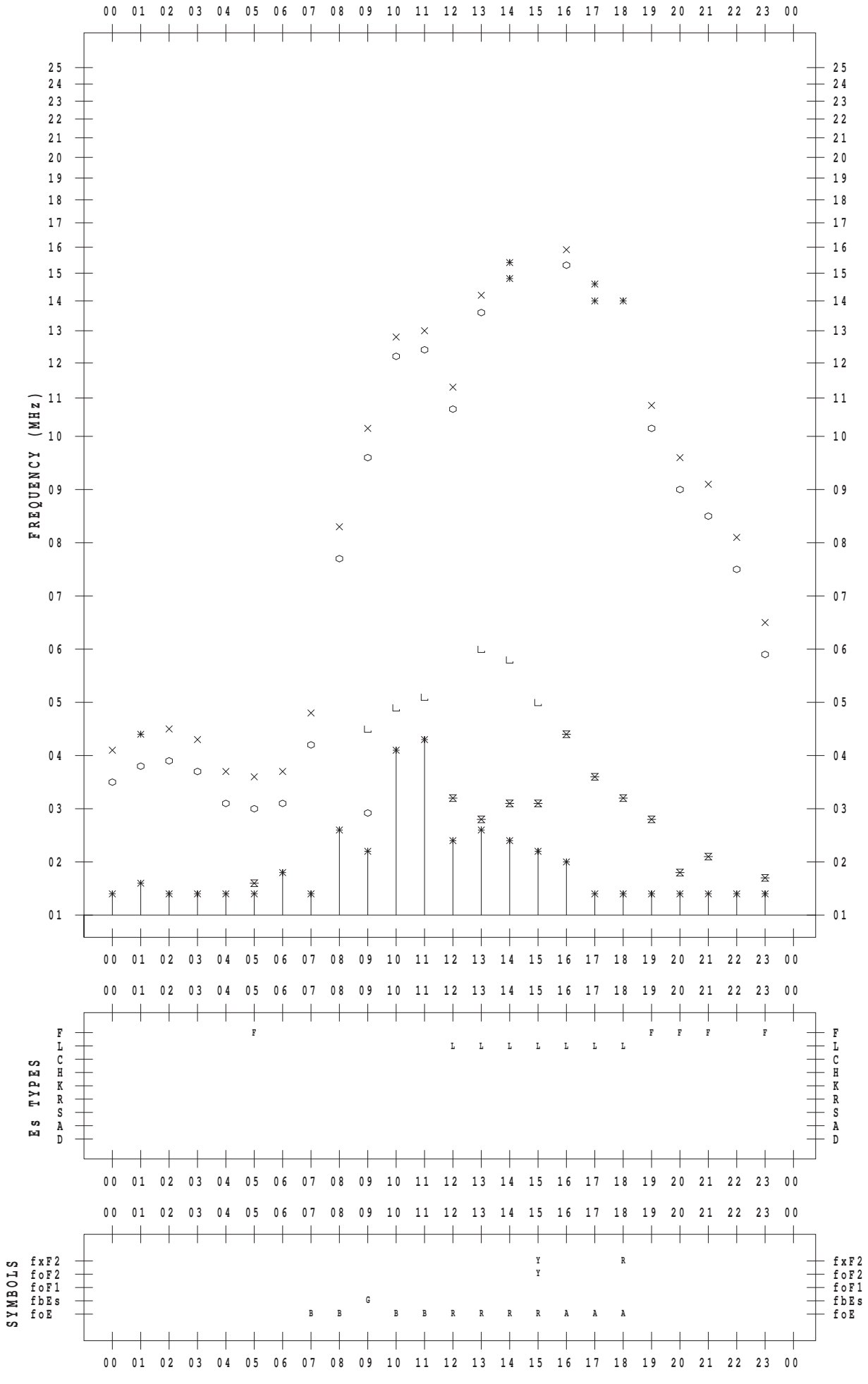
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/27

135 °E MEAN TIME



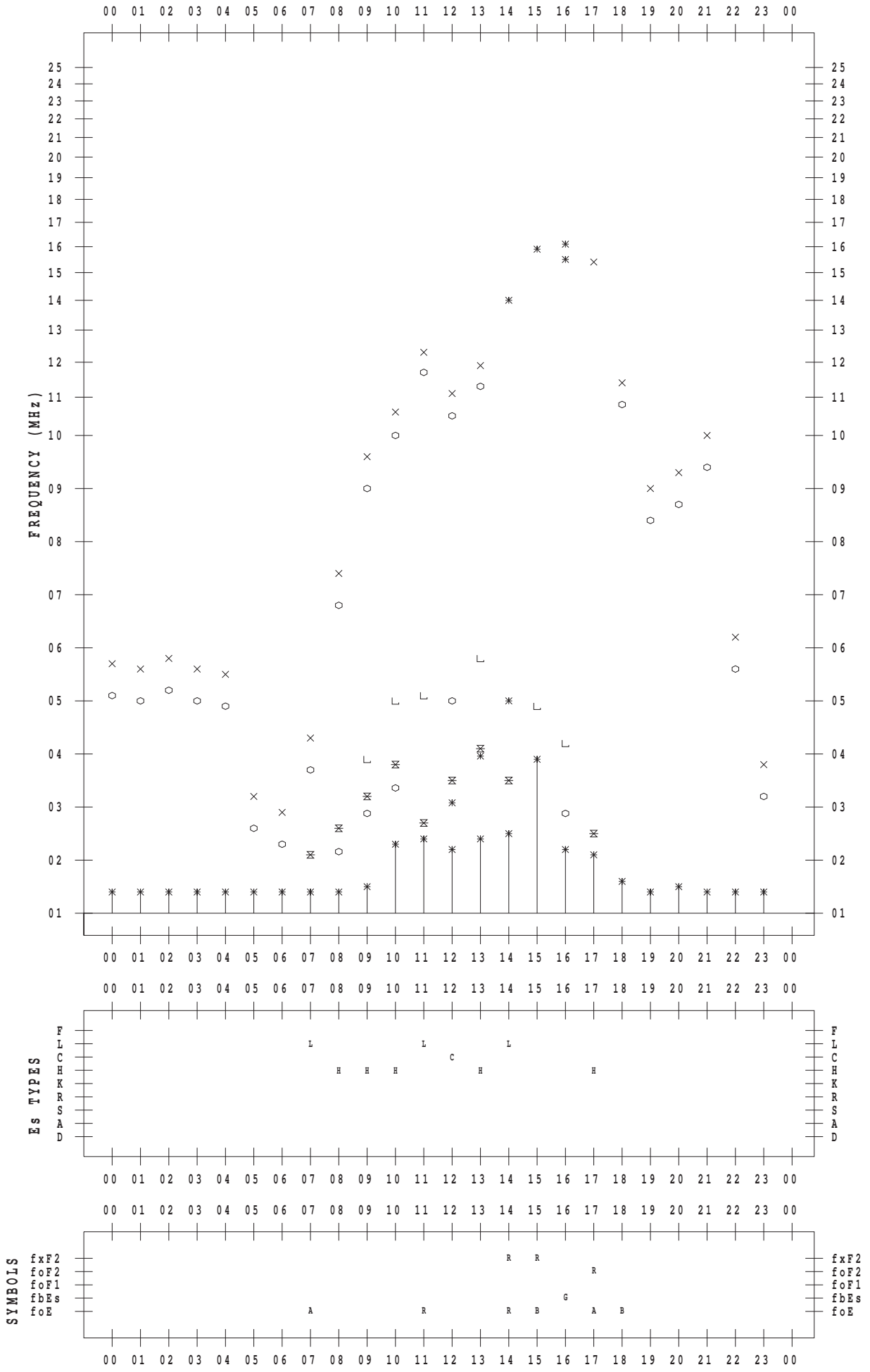
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/28

135 °E MEAN TIME



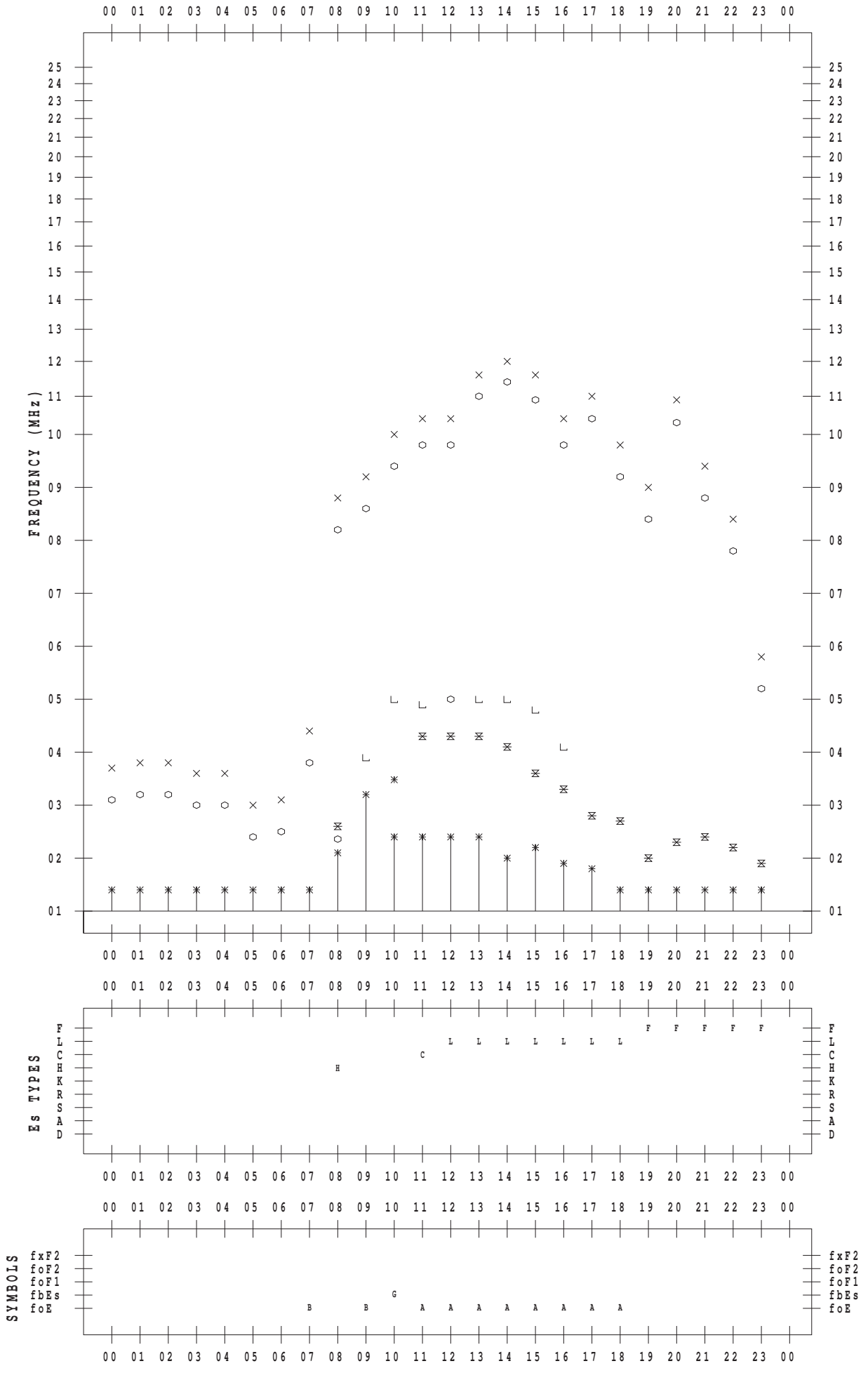
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/29

135 °E MEAN TIME



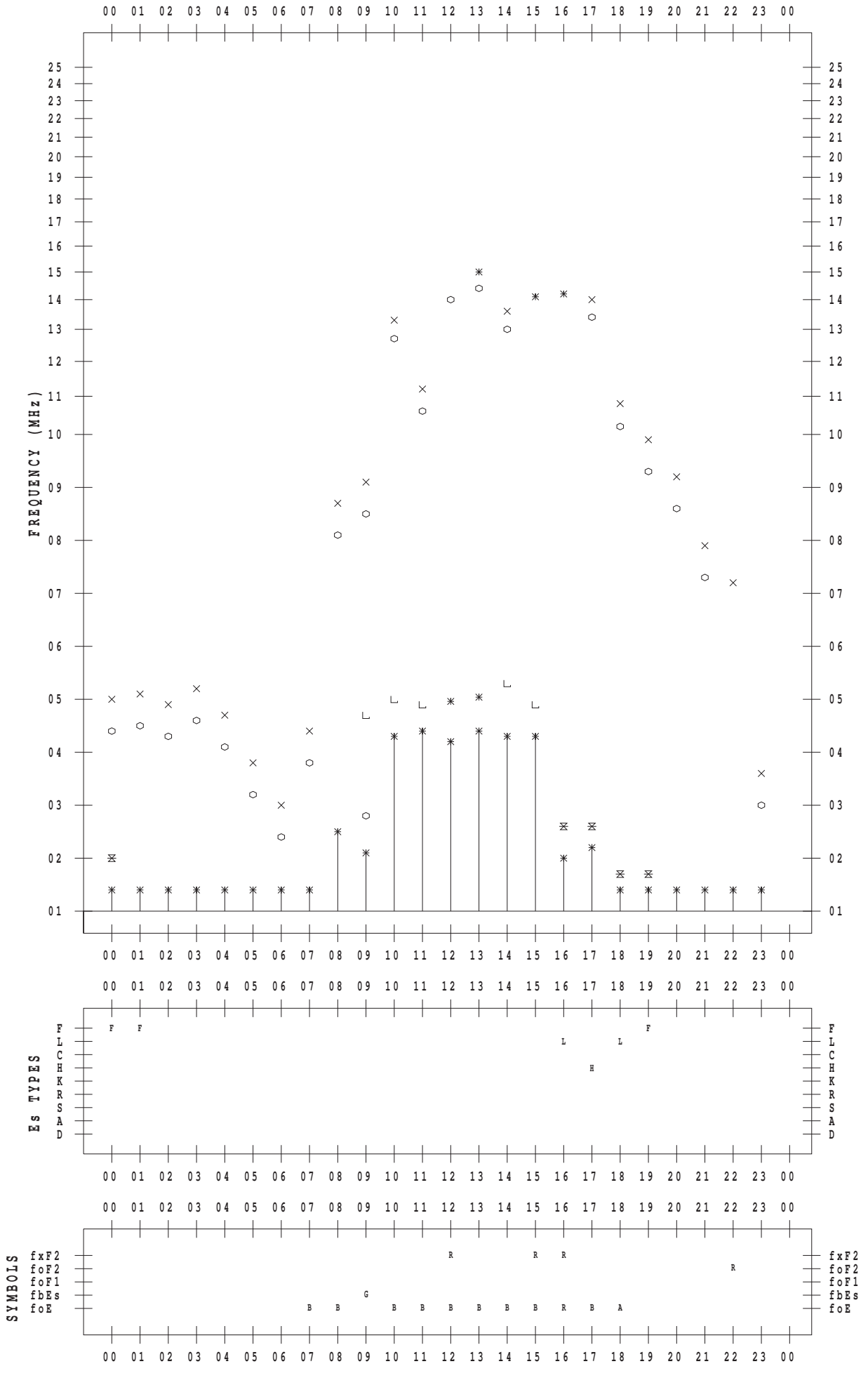
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/30

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/12/31

135 °E MEAN TIME