F-771

IONOSPHERIC DATA IN JAPAN

FOR MARCH 2013

VOL. 65 NO. 3

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

MAR. 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	34	34	36	34	42	48	63	71	67	59	88	85	69	79	59	68	64	54	34	54	54	52	54
2	32		29	A	A	28	38	68	67	74	69	60	66	84	68	66	70	67	58	49	34	32	34	A
3	A	34	32	34	34	37	37	51	65	66	59	71	59	57	74	66	67	66	54	50	34	37	34	32
4	34	44		39	39	34	47	60	66	65	69	67	74	75	71	65	71	66	58	37	34	32	34	32
5	34	34	37	34	37	34	47	58	66	64	68	68	69	59	68	70	70	67	58	54	53	43	43	34
6	47	34	47	32	28	48	53	61		64	70	69	70	69	69	59	70	70	58	43	52	34	43	34
7	42	37	50	32	46	32	52	66	67	67	N	70	67	64	70	67	70	65	64	54	50	32	42	37
8	52	52	53	N	37	37	53	64	68	68	N	70	59	69	69	68	68	65	63	54	53	53	52	53
9	53	51	62	54	63	59	65	64	68	68	59	70	59	65	68	71	71	65	64	53	50	54	52	40
10		32	52	51	34	34	53	66	59	60	N	69	N	N	74	67	66	67	63	62	53	34	36	34
11	52	49	48	43	34	52	59	66	68	70	69	69	50	59	69	68	68	65	62	58	52	53	53	
12	42	53	53	37	53	52	58	64	70		69	59	59	70	68	70	68	67	63	54	43	54	53	53
13		52	42	50	37	53	63	65	66	N	70	69	69	68	70	70	70	66	62	53	52	60	54	52
14	52	44	52	33	53	54	63	66	68	77	67	59	N	70	71	66	70	70	62		60	62	63	63
15	62	56	57	54	52	54	64	67	67		70	69	N	63	70	68	70	70	65	65	64	53	53	52
16	52	52	43	53	49	53	63	67	68	66	54	69	69	70	70	60	52	67	66	54	52	54	52	60
17	42	52	53	34	53	52	66	67	70	59	68	69	59	N	71	70	70	66	62	43	54	53		37
18	34	54	31				40	50	53	61	61	61	70	57	69	N	68	64	64	63	60	46	52	34
19	32	34	32	32	34	30	34	57	65	64		54	69	69	73	68	68	67	61	54	53	53	49	42
20	34	28	37	32	31	34	51	67	66	69	66	46	69	67	70	67	70		64	58	54	50	42	32
21	32	32	34	34	33	34	53	62	65	70	89	59	N	68	59	70	59	67	66	57	53	58	38	34
22	26	48	42	34	37	37	53	64	68	66	79	69	65	69	59	68	75	64	63	54	53	53	59	42
23	52	34	50	50	44	37	60	66	68	62	68	70	66	59	70	67	66	67	66	57	53	53	47	34
24	34	32	34	34	34	34	N	52	66	69	69	69	69	59	69	67	70	66	66	64	62	53	53	53
25	53	49	42	43	34	44	54	59	62	66	67	59	59	69	71	70	70	67	62	54	34	53	34	37
26	53	42	47	N	47	34	60	64	64	67	70	80	67	69	70	66	64	67	66	58	59	58	54	53
27	53	42	37	53	52	52	62	60	64	49	67	67	69	70	68	70	70	66	67	64	54	53	58	53
28	53	52	53	34	34	47	48	63	67	62	60	68	59	74	59	68	68	62	66	63	60	51	53	43
29	43	42	37	43	34	48	50	67	66	68	68	59	59	70	70	69	71	68	67		52	53	60	53
30	43	50	35	42	42	54	61	66	67	59	46	67	70	74	70	68		70	66	64	52	63	52	53
31	34	54	53	33	48	47	64	64	67	59	59	74	71	65	79	70	67	68	65	66	54	62	53	53
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	30	27	29	30	30	31	30	28	27	31	27	29	31	30	30	30	31	29	31	31	30	29
MED	42	44	42	36	37	43	53	64	67	66	68	69	67	69	70	68	70	67	63	54	53	53	52	42
U Q	52	52	52	50	48	52	62	66	68	68	69	70	69	70	71	70	70	67	66	62	54	54	53	53
L Q	34	34	35	34	34	34	48	60	65	62	60	60	59	63	68	66	68	65	62	53	52	46	42	34

HOURLY VALUES OF fEs AT Wakkanai

MAR. 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	26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	31	G	G	G	G	G	G
2	24		G	28	28	28	G	G	35	40	G	G	G	G	G	G	G	G	G	G	G	G	G	26
3	28	G	G	G	G	24	G	G	G	G	G	G	G	54	G	G	G	33	G	G	G	G	G	G
4	G	G		G	G	G	G	G	G	38	41	G	G	G	50	G	G	G	11	G	G	G	G	G
5	G	G	26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
6	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	48	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
8	G	G	G	G	G	G	G	48	G	G	G	G	G	G	G	37	G	G	G	G	G	G	G	G
9	G	G	G	G	G	G	G	44	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
10		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
11	G	G	25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
12	G	G	G	G	G	G	G	N	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G
13		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	G	G	33	G	G	G	28	36	G	G	G	G	G	G	G	G	G	32	G		G	G	G	G
15	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	26	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	G	G	26	26	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	G	G	G	G		G
18	G	G	32				G	34	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
19	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24
20	G	G	G	G	G	G	G	34	G	G	G	G	G	G	G	G	G		25	G	G	G	G	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	29	29	G	G	G
22	G	24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
23	G	G	G	G	G	G	G	G	G	G	G	G	54	G	G	G	G	G	G	G	G	G	G	G
24	G	24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	27	G	G	G	G	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
27	G	G	G	G	G	G	G	35	G	N	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	G	G	G	G	G	G
29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30		G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40		G	G	35	33	28	24	G
31	G	G	G	G	24	G	G	G	G	G	G	G	G	G	G	G	40	32	G	G	33	30	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	30	30	30	30	30	31	30	30	28	31	31	31	31	31	31	30	30	31	29	31	31	30	30
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	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	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 Wakkanai

MAR. 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	15	15	15	15	14	15	15	18	15	15	16	21	15	14	14	14	14	17	14	14	14	14	15
2	14		15	14	15	15	14	15	14	15	17	20	17	17	17	15	14	20	15	14	15	15	15	17
3	15	15	15	14	15	15	16	14	14	16	16	20	15	14	14	14	14	14	15	14	15	15	15	14
4	15	15		14	15	15	15	15	14	16	17	17	20	16	14	15	15	21	14	16	15	15	16	20
5	14	15	15	15	14	15	16	14	15	20	20	20	18	15	21	16	16	21	15	15	15	14	15	16
6	15	15	14	17	22	15	16	14		16	18	21	21	21	20	20	15	18	14	15	15	15	15	15
7	15	15	15	14	16	14	15	14	14	15	18	17	15	20	18	16	15	20	15	15	15	15	14	14
8	15	15	14	15	15	15	17	26	14	14	16	20	20	18	14	15	14	20	15	16	18	15	15	14
9	15	14	15	17	15	14	17	14	14	16	17	17	18	21	18	18	14	20	14	15	15	15	15	15
10		15	14	15	15	15	17	14	33	17	20	18	18	21	15	14	14	22	15	15	16	15	14	15
11	15	16	15	14	15	14	17	14	14	16	17	15	18	16	14	15	15	21	15	15	15	14	15	
12	15	15	15	15	15	15	17	15	15		22	20	20	17	18	20	14	22	16	15	15	15	15	15
13		15	15	15	14	14	18	15	16	20	20	45	21	20	20	17	15	22	14	14	15	15	14	15
14	15	15	15	15	15	14	14	14	14	17	20	20	26	18	17	17	18	14	18		15	15	15	16
15	17	15	14	14	14	14	20	14	14		18	18	15	17	15	14	17	14	15	15	15	15	15	15
16	14	16	17	17	18	14	15	15	14	15	20	17	18	27	22	17	14	14	15	14	14	14	15	15
17	15	15	14	15	14	15	20	14	14	14	17	20	18	18	21	18	14	14	15	18	15	15		15
18	15	14	15				18	14	14	15	21	18	21	17	16	16	14	21	15	15	14	15	14	15
19	14	14	14	14	15	18	20	14	14	16	15	21	22	20	18	17	15	15	15	15	15	15	15	15
20	15	16	15	16	15	15	14	14	14	14	48	46	21	16	15	15	14		15	15	15	15	15	17
21	15	18	15	15	14	16	15	14	14	14	17	18	21	21	15	14	14	14	14	14	14	17	15	15
22	15	14	14	15	14	14	20	14	15	15	16	20	26	21	18	15	14	14	14	15	15	15	15	14
23	18	21	17	15	17	14	20	14	15	15	20	20	20	17	14	14	14	22	17	14	15	15	15	15
24	14	15	15	14	14	14	23	14	14	15	18	18	15	18	21	15	14	21	14	17	15	14	15	15
25	15	15	15	14	14	15	21	14	15	15	15	16	21	20	21	16	14	14	15	14	15	15	15	15
26	15	15	14	15	14	14	21	14	15	14	17	17	17	17	15	15	15	14	16	16	15	15	15	15
27	15	15	15	14	15	15	21	14	15	17	15	18	17	16	15	21	14	14	15	15	15	15	15	15
28	15	15	15	15	15	14	15	14	14	16	17	18	17	20	17	14	15	14	15	14	15	15	14	15
29	15	15	15	15	14	14	22	14	14	17	15	18	21	18	14	15	14	14	15		15	14	17	14
30	15	14	16	22	15	15	24	14	14	15	47	18	21	44	14	14		14	18	15	14	14	15	16
31	14	14	14	16	16	18	16	14	14	14	18	18	21	21	14	17	14	14	16	14	14	15	16	17
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	31	31	30	29	31	31	31	31	31	31	30	30	31	29	31	31	30	30
MED	15	15	15	15	15	15	17	14	14	15	17	18	20	18	16	15	14	14	15	15	15	15	15	15
U Q	15	15	15	15	15	15	20	14	15	16	20	20	21	21	18	17	15	21	15	15	15	15	15	15
L Q	15	15	14	14	14	14	15	14	14	15	16	17	17	17	14	14	14	14	15	14	15	15	15	15

HOURLY VALUES OF foF2 AT Kokubunji

MAR. 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	44	39	39	42	43	38	44	64	77	71	85	88	100	104	81	87	80	77	65	54	64	66	44	39
2		27	28	28	31	30	42	67	88	90	80	101	110	103	78	87	86	77	66	51	44	45	42	43
3	43	43	38	43	39	37	45	63	74	76	84	91	106	107	86	91	82	77	62	49	39	42	43	43
4	42	42	43	42	41	38	49	72	80	85	81	87	101	101	90	86	81	76	57	47	44	43	N	42
5	43	44	42	43	37	39	46	61	72	81	84	92	76	96	86	80	78	75	64	53	53	A	51	51
6	51	48	89	43	43	43	49	67	82	85	84	84	102	94	90	86	87	93	84	40	44	43		46
7	51	51	44	45	43	36	44	66	78	87	82	95	96	85	81	86	84	84	73	47	44	46	45	42
8	47	44	36	44	32	42	42	68	76	76	82	92	101	102	98	87	77	80	67	58	A	51	53	53
9	53	53	53	53	42	38	48	65	81	92	86	97	112	106	98	92	101	88	76	54	51	51	44	49
10	51	51	49	45	38	34	46	78	85	86	97	106	114	97	93	92	81	78	80	53	51	44	47	47
11	48	43	46	44	43	44	54	80	86	84	86	101	112	108	98	96	91	82	75	52	53	44	44	48
12	48	53	46	47	49	39	52	75	82	81	86	101	98	105	98	87	82	85	72	52	44	43	49	51
13	52	44	54	46	43	42	54	65	82	82	78	96	94	101	92	88	81	82	75	52	50	53	53	53
14	53	52	52	49	44	43	54	67	77	84	90	96	96	102	91	76	75	86	84	52	50	53	53	53
15	52	52	53	52	44	47	52	76	90	90	101	97	92	96	91	88	87	95	81	78	76	53	53	53
16	52	52	52	52	44	42	53	77	90	87	90	97	100	105	94	87	82	87	80	54	54	53	52	52
17	48	43	44		44	45	53	81	88	87	100	97	110	95	102	88	85	85	62	54	54	78	64	53
18	46	52	47	42	49	42	53	82	75	69	77	101	106	105	101	97	N	90	77	67	67	54	54	51
19	54	53	51	52	43	44	54	66	82	84	104	113	98	104	88	90	91	87	71	54	53	53	43	52
20	51	48	47	48	44	45	54	77	87	85	88	96	94	109	103	85	81	86	86	54	44	44	26	47
21	44	42	44	46	39	43	58	64	73	81	104	104	108	105	98	90	94	90	80	54	54	49	43	43
22	46	47	44	46	38	36	54	64	81	82	98	96	105	111	106	100	86	86	77	54	44	51	51	51
23	44	44	47	48	44	43	55	86	76	72	72	91	110	112	93	82	75	85	86	73	43	49	46	44
24	44	43	44	47	38	26	55	66	70	87	91	100	108	106	95	92	76	77	78	67	53	52	51	52
25	52	51	44	44	43	39	58	72	71	75	80	84	93	96	102	90	75	78	80	67	41	46	42	47
26	43	44	48	47	41	41	58	67	75	72	81	97	105	96	94	81	71	72	76	52	53	49	47	45
27	44	47	47	47	43	38	52	70	74	69	77	90	96	85	80	81	78	82	82	83	47	44	45	54
28	54	52	53	45	39	37	54	78	78	88	90	108	112	102	101	84	77	76	81	76	50	53	52	53
29	53	51	51	51	47	47	54	72	73	82	84	88	96	98	96	92	86	88	85	76	67	54	52	52
30	52	48	41	44	44	51	65	87	87	85	84	115	104	96	91	94	98	101	96	71	53	A	52	54
31	52	45	51	49	45	43	66	74	80	90	95	100	100	97	94	96	95	91	90	83	73	54	54	53
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	30	29	29	31
MED	50	47	47	46	43	42	53	70	80	84	85	97	101	102	94	88	82	85	77	54	51	51	49	51
U Q	52	52	51	48	44	43	54	77	85	87	91	101	108	105	98	92	87	88	82	67	54	53	52	53
L Q	44	43	44	44	39	38	48	66	75	76	81	91	96	96	90	86	78	77	71	52	44	44	44	45

HOURLY VALUES OF fEs AT Kokubunji

MAR. 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	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
2		G	G	G	G	G	G	G	G	G	G	G	G	G	49	G	G	31	24	G	G	G	G	34
3	28	22	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G	G	G	G	G	50	53	G	G	G	26	G	G	G	G	G
5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	50	G	G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	43	G	34	40	G	G	G		G
7	G	G	G	G	G	G	G	G	G	G	G	49	G	G	G	G	G	G	G	G	G	23	G	23
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	33	26	54	G	G	G
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G
10	G	G	G	G	G	G	24	G	G	G	G	G	G	G	G	G	G	G	G	29	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	G	55	G	G	G	G	G	36	G	G	25	G	25
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	G	G	G	G	G	G	26	47	G	G	G	G	G	G	G	G	G	G	G	G	G	23	23	G
15	G	G	G	G	G	G	25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29	G	G	G	G	G
17	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	39	G	G	G	G	G	G	G	G	G	G	40	25	G	G	G	G	G
19	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
20	G	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
22	G	G	G	G	G	G	G	G	G	G	G	G	G	G	67	44	51	35	28	G	G	31	33	G
23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	33	G	G	G	G	G	G
24	G	G	G	G	G	G	G	G	G	G	G	G	95	G	G	G	G	31	24	57	G	G	G	G
25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	27	G	33	G	G	G
26	G	G	G	G	G	G	29	G	G	G	G	G	G	G	G	G	G	34	27	24	G	G	G	G
27	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	29	G	G	G	G	G	G	G	G	G	G	G	25	G	G	22	G	G
29	G	G	G	G	G	G	48	G	G	G	G	G	G	G	G	G	G	G	G	58	G	G	G	G
30	G	G	G	G	24	G	G	G	G	45	G	G	G	G	G	G	G	G	32	41	30	29	39	23
31	28	33	23	50	24	G	29	G	G	G	G	G	G	G	G	G	G	46	31	29	29	31	24	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31
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	G	G	G	G	G	25	G	G	G	G	G	G	G	G	G	G	31	27	G	G	22	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

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

HOURLY VALUES OF foF2 AT Yamagawa

MAR. 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	41	34	37	40	43	32	30	53	67	72	70	76	59	69	76	73	69	77	74	43	45	59	43	59
2	B		B	B	37	B	N	52	71	72	76	59	A	72	71		59	77	47	52	49	43	48	34
3	34	A	A	A	38	36	34	53	49	69	64	72		69	69	76	79	77	74	52	36	42	43	B
4	34	49	50	50	34	B	34	53	71	73	73	76	75	72	69	N	N	39	69	54	44	42	A	34
5	43	37	37	28	34	34	69	53	74	74	72	69	71		60	77	78	78	66	54	52	53	28	42
6	37	42	34	N	38	29	32	53	75	76	60	70	60		69	70	77	N	49	52	50	A	37	N
7	52	45	49	37	34	30	28	52	73	59	N	72	74	74	74	79	N	77	75	67	45	50	42	54
8	51	44	42	37	37	36	34	52	69	68	71	73	61	69	69	69	80	61	73	55	52	54	53	B
9		53	52	44	51	32	34	54	73	76	69	N			89	63	N	N	59	52	53	52	49	53
10	37	52	43	47	47	29	B	54	74	72	69	78	69	62	69	59	79	76	69	54	54	53	A	32
11	42	42	43	44	46	37	34	54	74	74	69	N	69	72	69	N	79	72	73	51	54	52	52	47
12	48	46	43	46	46	49	32	52	50	75	73	63	72	59	59	70	77	81	72	67	53	52	52	44
13	43	47	43	44	37	38	43	63	74	77	69	72	73	74		69	81	81	74	54	54	52	51	53
14	52	44	52	48	47	37	40	64	72	69	69	70	73	69	69	73	74	74	72	53	52		43	53
15	53	42	59	47	37	42	34	52	74	68	72	69	74	77	58	69	74	78	39	49	52	55	53	43
16	52	53	43	34	40	37	42	N	73	76	74	71	69	69	63	70	75	N	71	77	53	42	53	54
17	53	47	42	43	43	44	46	52	72	70	76	69	69	70		59	74	76	65	60	49	53	53	48
18	42	53	47	44	43	44	47	67	70	A	A	69	76	73	71	75	69	70	N	59	52	43	42	53
19	52		46	53	45	34	42	51	73	74	69		69	69	67	59	86	88	77	N	52	47	43	49
20	47	48	44	36		B	34	54	65	59	N	81		N	69	64	69	95	N	65	47	43		43
21	42		43	B	40	37	61	58	68	72	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	96	111	C	97	99	90	85	77	51	45	50	52
23	48	42	43	43	38	38	40	78	76	72	75	96	114	117	113	108	115	95	89	92	54	46	47	47
24	43	44	43	47	34	25	34	45	78	77	71	91	96	111	100	96	90	82	82	77	52	51	44	43
25	44	52	54	52	47	40	40	66	67	78	81	84	96	111	114	104	90	88	88	81	53	43	42	50
26	44	50	43	43	38	36	42	81	72	74	78	91	96	101	96	102	86	75	77	84	72	53	42	53
27	53	52	52	52	37	29	34	58	68	78	84	90	91	96	96	94	93	90	87	87	87	53	44	44
28	50	52	53	45	32	59	40	52	80	95	85	90	111	97	96	87	96	86	84	81	66	54	54	46
29	53	52	48	51	45	43	51	66	80	81	76	92	90	109	111	99	96	96	110	88	A	A	53	52
30	53	53	46	50	46	49	66	65	76	90	85	96	97	97	88	95	95	110	81	87	67	52	53	54
31	52	53	A	52	46	40	47	66	88	87	85	92	106	108	96	98	96	114	107	89	85	72	52	43
	00	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	26	27	26	29	27	28	29	30	29	26	26	26	26	27	27	27	27	28	29	29	27	27	27
MED	48	48	43	44	40	37	40	54	73	74	72	74	74	74	71	75	79	78	74	60	52	52	48	48
U Q	52	52	50	50	46	42	44	64	74	77	76	90	96	101	96	96	93	90	83	81	54	53	53	53
L Q	42	44	43	43	37	32	34	52	69	71	69	70	69	69	69	69	74	76	69	52	49	43	43	43

HOURLY VALUES OF fEs AT Yamagawa

MAR. 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	G	G	G	G	G	46	51	48	G	G	G	G	G	G	G	G	G	G	G
2	B	G	B	B	G	B	G	G	G	G	G	G	53	G	G	G	G	35	G	G	G	G	G	G
3	G	30	37	34	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	B
4	G	G	G	G	26	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24	23
5	G	G	G	G	G	G	G	G	G	G	G	49	G	G	G	G	G	G	G	45	G	G	G	G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	32	G	29	G	G
7	G	G	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	45	G	G	25	35	27	32
8	27	27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	62	37	30	26	32	27	B
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	35	G	G	G	G	G	G
10	G	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	31	G
11	24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	46	40	G	G	G	G	G	G	G
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	30	G	G	48	51	G	G	G	G	G	51	31	27	26	G	G	G
15	G	G	G	G	G	G	G	30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	45	51	81	50	G	G	53	G	45	40	39	36	41	28	G	G	G
19	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	30	G	G	G	G	G
20	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	G	30	G	G	G	G	G
21	G	G	G	B	G	G	G	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	G	G	C	G	G	42	33	G	G	G	G	G
23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	32	20	G	28	G
24	G	G	25	G	11	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	G	G
25	G	G	G	G	G	G	G	G	G	G	G	G	62	50	47	47	42	G	33	25	G	G	G	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	47	45	70	48	46	33	32	G	G	G
27	G	G	G	G	11	G	G	G	G	G	G	G	G	G	G	48	45	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	33	G	G	G	G	G	G	G	G	G	G	G	G	G	23	G	G
29	G	G	G	G	G	G	G	46	G	G	G	G	50	52	57	48	G	40	43	36	60	46	27	26
30	G	G	G	G	G	G	G	48	40	G	G	G	G	G	G	49	47	39	35	G	G	G	G	G
31	34	43	44	54	41	26	34	32	37	43	G	55	51	G	50	52	49	48	40	34	28	26	23	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	29	30	29	28	30	27	29	30	30	30	29	29	30	30	29	30	30	30	30	30	30	30	30	28
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	G	G	G	G	G	G	28	G	G	G	G	G	G	G	45	39	39	33	32	20	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 Yamagawa

MAR. 2013

LAT. 31°12.0′N LON. 130°37.0′E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

HD \ 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	20	15	16	16	15	16	18	15	15	16	34	34	53	29	20	20	16	21	15	26	15	16	18
2	B	71	B	B	15	B	66	22	17	17	24	22	20	22	51	66	18	15	18	15	18	15	15	15
3	17	15	16	16	21	18	15	21	14	15	44	46	35	52	46	27	20	15	20	15	18	15	17	B
4	21	18	18	15	15	B	18	20	15	17	20	17	24	47	20	17	14	18	20	16	16	16	17	15
5	17	16	16	21	16	16	16	21	17	17	18	18	21	59	48	44	34	27	21	20	17	15	18	17
6	20	15	15	16	16	16	15	22	15	15	36	20	53	81	45	24	18	16	20	14	15	16	16	16
7	20	16	15	15	16	15	17	14	15	18	18	45	53	49	26	24	27	17	18	16	15	15	15	15
8	17	15	16	16	17	15	16	15	14	16	23	50	32	46	28	24	20	15	14	15	20	17	17	B
9	66	17	16	23	15	18	17	17	16	20	20	18	101	55	24	26	40	15	18	15	21	16	17	16
10	18	16	17	16	16	16	B	22	14	21	44	47	50	56	53	26	17	17	22	15	16	15	15	16
11	15	18	16	16	15	15	15	14	15	17	22	21	51	56	46	18	14	18	18	15	16	16	16	16
12	15	15	15	15	16	16	15	22	17	17	21	46	59	50	44	44	22	15	21	15	15	15	17	16
13	17	15	17	15	16	16	16	23	15	34	23	50	49	53	57	45	22	18	21	18	15	16	16	18
14	18	16	17	17	16	15	16	16	15	18	20	35	36	53	48	44	30	17	16	17	15	71	16	15
15	17	15	17	17	16	20	16	26	15	17	21	53	53	58	45	44	53	33	23	16	17	15	15	16
16	15	16	15	15	15	18	16	16	15	16	21	48	55	49	46	46	22	16	17	15	18	30	16	15
17	15	15	17	15	17	16	15	23	15	18	21	24	50	55	53	44	21	14	23	16	17	16	16	18
18	22	18	16	18	16	16	17	16	26	18	34	35	49	36	40	23	18	15	15	15	15	20	21	28
19	23	18	17	16	16	16	16	23	17	34	45	45	59	52	45	45	18	15	14	15	18	16	17	18
20	16	17	16	16	71	B	16	17	17	48	54	54	91	52	52	24	21	16	24	16	16	15	17	15
21	17	22	14	B	15	16	15	18	16	20	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	44	46	C	22	17	14	15	17	15	22	15	15
23	14	16	16	15	15	15	14	14	15	16	20	18	20	51	18	21	16	14	15	14	14	18	15	16
24	15	15	15	17	15	17	20	14	16	17	17	18	17	45	20	18	16	14	18	15	15	14	15	17
25	15	15	15	16	14	15	14	14	14	17	18	20	22	24	18	18	16	14	14	15	18	15	14	15
26	16	14	15	15	16	15	15	14	14	16	17	18	20	18	23	17	17	14	14	14	14	15	16	16
27	15	14	14	14	15	15	14	22	14	18	18	20	24	28	26	20	18	14	21	15	15	15	15	15
28	15	15	14	14	16	15	15	17	14	16	17	17	17	18	22	16	14	14	15	14	15	15	16	15
29	14	15	15	16	14	17	14	18	16	17	20	22	21	27	22	20	16	14	14	14	16	15	14	15
30	15	15	15	15	15	15	15	14	14	17	24	21	27	24	21	18	17	15	14	15	14	15	14	15
31	14	14	14	14	15	14	14	14	14	14	20	20	22	22	21	21	17	14	15	14	15	15	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	29	28	30	27	29	30	30	30	29	29	30	30	29	30	30	30	30	30	30	30	30	28
MED	16	16	16	16	16	16	16	18	15	17	21	22	36	50	40	24	18	15	18	15	16	15	16	16
U Q	18	17	16	16	16	16	16	22	16	18	24	46	53	53	47	44	22	17	21	16	18	16	17	16
L Q	15	15	15	15	15	15	15	14	14	16	18	19	22	28	22	20	17	14	15	15	15	15	15	15

HOURLY VALUES OF foF2 AT Okinawa

MAR. 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	36	B	32	43	47	N	N	47	75	81	82	92	96	107	118	93	119	131	130	120	87	87	73	31
2	28		B	32	47	A	B	53	82	90	97	118	105	110	117	133	143	135	119	88	78	67	A	B
3			38	A	38	37	B	51	78	85	95	101	116	125	137	137	138	148	141	109	106	62	54	48
4	B		34	42	34	36	B	52	85	85	87	88	101	110	134	134	132	116	107	106	82	53	60	
5	52	52	52	48	43	43	B	64	84	82	81	86	94	105	110	117	104	101	104	88	88	74	78	53
6	49	52	48	38	40	36	34	40	77	82	86	90	102	116	107	102	107	115	110	104	86	86	68	76
7	72	73	52	42	31	B	B	54	78	91	115	96	97	121	134	146	142	142	131	128	110	107	A	87
8	78	88	47	32	37	38	31	49	63	74	85	105	108	100	105	111	107	100	88	88	80	53	64	54
9	52	66	53	47	44	B	30	54	77	88	104	108	122	132	136	147	143	133	132	119	117	106	81	74
10	52	67	53	52	43	31	30	54	78	104	114	105	120	134	131	147	143	135	131	121	110	77	53	
11	47	48	47	47	51	40	29	54	82	87	110	114	128	143	132	147	142	142	132	125	108	88	B	84
12	76	67	67	66	51	29	31	52	73	86	104	113	127	132	134	140	142	132	130	128	120	107	88	87
13	84	78	58	52	46	40	35	66	78	86	86	100	110	121	120	128	131	120	108	104	87	79	73	54
14	66	67	58	54	50		38	64	80	114	97	95	101	121	136	129	141	131	120	89	107	104	88	107
15	87	86	82	74	52	52	43	66	87	90	93	88	102	108	118	123	120	121	118	108	88	87	87	77
16	74	67	73	67	64	44	50	73	82	88	96	97	110	127	130	122	120	125	114	107	87	53	81	78
17	67	52	52	48	44	47	42	54	81	88	100	110	114	126	117	121	128	122	120	110	73	81	54	53
18	42	53	54	32	42	48	34	62	101	77	83	A	107	118	108	123	122	117	120	108	82	79	73	66
19	43	74	66	67	63	30	26	63	77	92	90	97	110	122	127	120	93	116	108	104	72	53	B	51
20	52	51	53	52	38	B	31	59	76	101	108	110	106	121	131	131	126	120	120	104	76	51		54
21	52	48	43	46		38	34	60	67	88	108	101	101	120	123	121	122	120	107	87	88	67		43
22	49	51	54	51	B		34	70	77	88	97	109	110	129	130	131	128	130	119	107	87	53	45	54
23	52	48			40	34	N	72	78	76	83	111	134	130	142	137	142	143	130	128	104	67	67	64
24	60	53	64	78	49	B	28	59	83	88	72	88	128	122	124	120	118	117	88	82	54	66	74	80
25	76	83	80	74	52	44	30	54	76	88	85	88	110	127	110	126	126	120	89	88	73		51	42
26	53	49	53	43	B		36	58	74	78	87	88	110	122	117	119	107	104	87	87	87	76	67	67
27	67	70	77	67	B	B	B	51	64	87	98	104	110	120	131	N	120	118	119	119	87	88		80
28	74	74	67	51		28	40	63	80	106	98	94	110	110	107	107	110	111	102	87	78	54	60	A
29	58	53	58	68	52	42	52	74	76	88	82	97	107	121	129	131	119	120	125	118	80	80	53	54
30	52	52	50	47	49	44	62	72	74	101	101	96	108	125	128	120	131	131	118	109	81	60	B	66
31	53	61	52	54	37	A	30	71	87	93	88	100	108	110	120	127	118	117	120	110	87	86	64	53
	00	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	27	29	29	26	20	23	31	31	31	31	30	31	31	31	30	31	31	31	31	31	30	23	27
MED	53	61	53	51	45	39	34	59	78	88	95	98	110	121	127	126	126	120	119	107	87	76	67	64
U Q	73	73	65	66	51	44	40	66	82	91	101	108	114	127	132	134	141	132	130	119	104	87	78	78
L Q	50	52	49	43	40	35	30	53	76	85	85	92	102	110	117	120	118	117	107	88	80	60	54	53

HOURLY VALUES OF fEs AT Okinawa

MAR. 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	B	G	G	G	G	G	G	G	G	47	52	57	52	52	G	G	G	G	34	G	G	G	G
2	G	G	B	G	G	25	B	G	G	G	G	51	G	G	48	G	G	48	58	30	27	G	27	B
3	G	G	G	57	G	G	B	G	G	G	G	G	G	G	G	G	G	G	G	29	30	G	G	G
4	B	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	29	26	G	G	G	G
5	G	G	G	G	G	G	B	G	48	G	G	47	52	G	47	G	G	G	G	G	G	G	G	G
6	G	G	G	G	G	G	G	G	G	G	G	48	G	G	G	G	G	38	G	G	G	G	G	G
7	G	G	G	G	G	B	B	G	G	G	G	G	G	G	G	50	43	38	30	G	G	G	31	G
8	G	G	G	G	G	G	G	G	G	G	46	48	48	G	52	58	83	47	34	G	G	G	G	G
9	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	26	G	G
10	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	45	G	G	G	G	G	B	G
12	40	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G	G	48	53	54	53	G	G	G	36	G	G	G	G	35	G
15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	G	55	73	95	51	G	G	60	46	44	33	G	G	G	G	G
19	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	B	G
20	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	30	27	28	G	G
22	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	G	37	G	G	G	G	G	G
23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	42	50	G	G	G	G
24	G	G	G	G	G	B	G	G	G	43	G	G	G	G	G	G	G	G	G	G	G	G	35	G
25	G	G	G	G	G	G	G	G	38	G	G	56	58	47	G	49	52	G	G	G	G	G	G	G
26	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	47	46	G	G	28	G	G	G	G
27	G	G	G	G	B	B	B	G	G	G	G	G	G	G	G	G	G	G	G	G	38	G	G	40
28	40	26	G	G	G	G	G	32	G	G	G	G	G	G	49	G	G	42	35	G	G	G	G	32
29	33	40	G	24	34	G	G	G	G	G	G	G	G	G	G	G	G	40	36	G	25	G	G	G
30	26	26	G	G	G	G	G	G	G	G	48	50	49	G	G	G	57	92	72	45	G	G	B	24
31	29	26	G	G	33	39	26	30	39	41	44	46	G	G	54	G	47	53	44	34	31	G	G	24
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	31	28	26	25	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	30
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	G	G	G	G	G	G	G	G	G	G	48	G	G	G	G	43	38	34	28	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

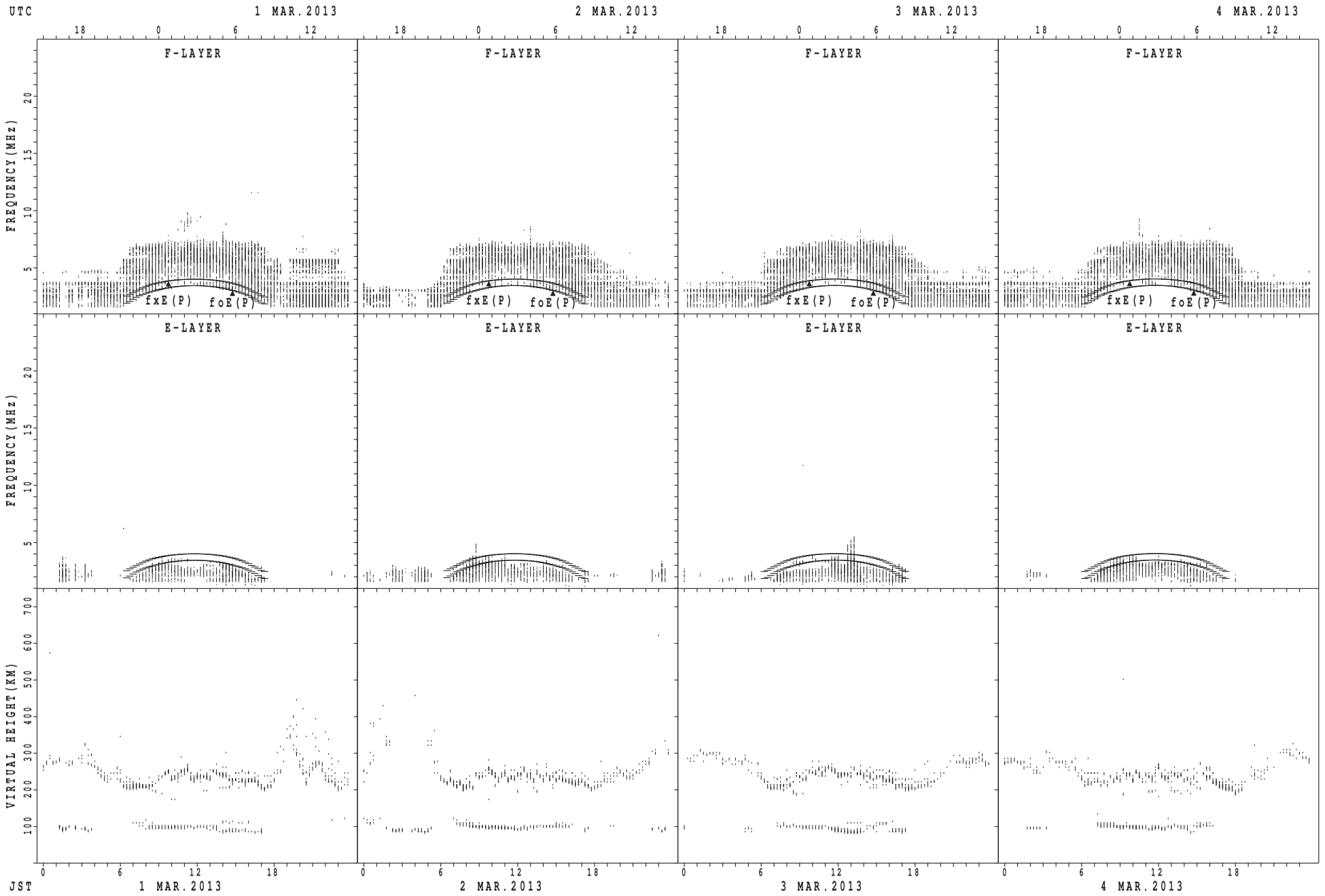
HOURLY VALUES OF fmin AT Okinawa

MAR. 2013

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

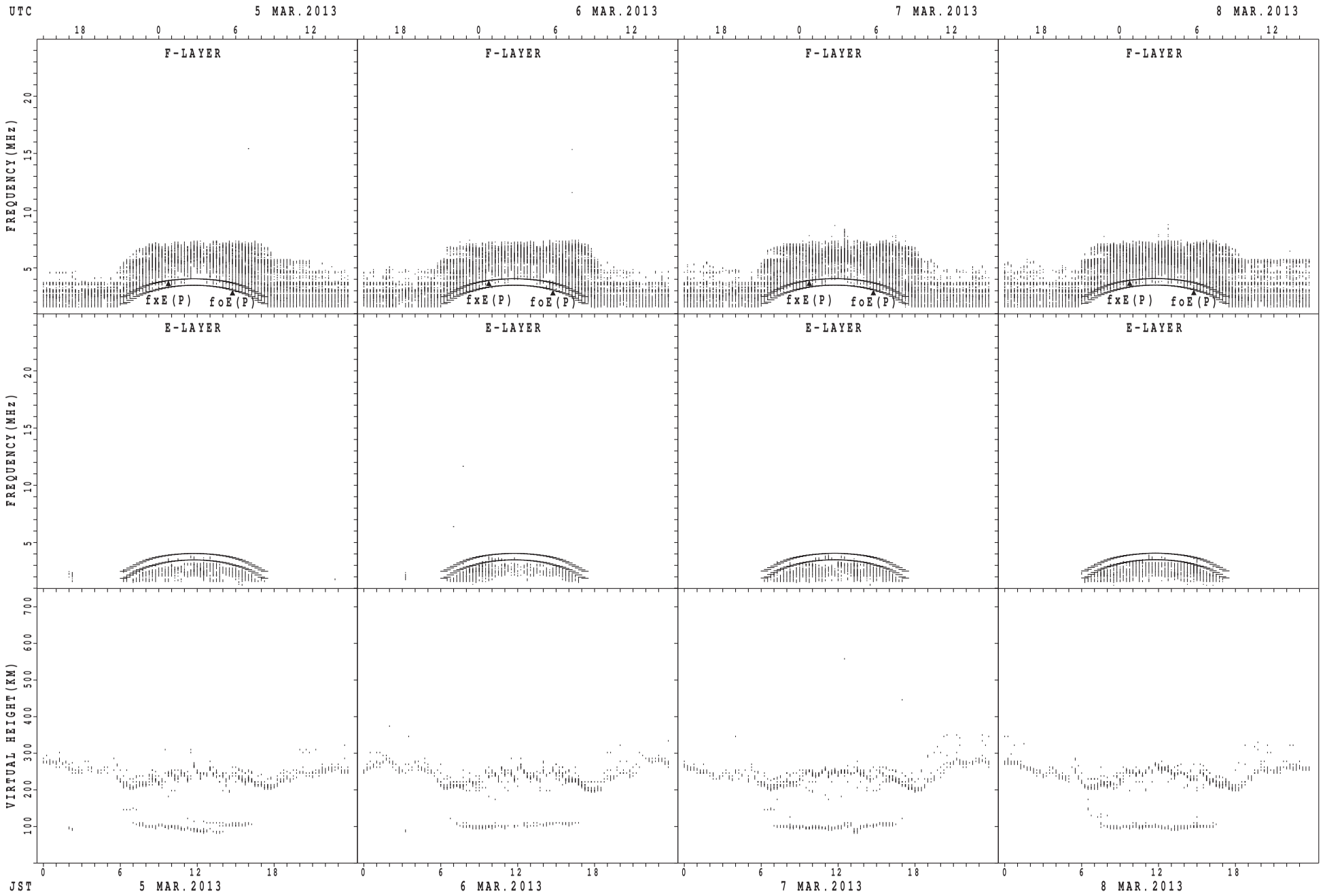
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	B	16	18	17	15	17	21	27	16	38	39	39	39	36	40	32	18	15	14	20	21	18	15
2	18	66	B	18	16	15	B	18	16	20	18	39	45	47	43	43	22	17	14	16	17	16	15	B
3	66	24	16	14	14	17	B	22	28	17	39	46	47	48	47	42	39	16	23	15	17	17	18	15
4	B	20	15	17	20	18	B	20	16	17	20	44	47	39	46	43	22	14	15	15	15	17	22	71
5	15	15	15	20	17	16	B	22	17	17	21	40	39	46	42	43	23	23	14	24	17	15	15	15
6	21	17	18	16	15	17	20	21	15	18	21	22	49	48	45	40	26	20	15	15	20	16	17	17
7	18	15	15	15	15	B	B	20	15	21	40	45	52	52	50	42	20	18	15	18	16	17	15	15
8	15	15	15	15	16	16	16	21	17	20	27	52	46	52	38	30	32	17	16	15	15	38	66	16
9	20	17	15	16	15	B	17	21	15	21	24	49	49	47	48	44	42	18	26	14	17	15	15	16
10	17	15	15	15	16	20	66	21	15	18	43	45	52	49	49	44	40	17	23	16	18	15	17	17
11	16	17	17	17	16	15	18	22	15	21	24	47	50	59	50	52	15	15	23	15	20	15	B	17
12	14	15	16	15	16	17	16	21	16	20	42	47	49	49	52	44	21	20	23	15	17	15	16	17
13	20	17	15	15	16	16	18	23	18	39	42	46	49	50	53	44	39	21	23	16	17	18	15	16
14	38	17	16	17	16	21	66	23	16	20	38	38	42	39	50	50	40	21	15	17	15	15	14	16
15	15	15	17	15	15	22	21	23	15	21	42	47	50	50	52	52	44	32	22	16	20	16	17	16
16	18	17	15	15	16	16	16	22	16	40	42	49	53	49	50	42	40	18	23	16	17	15	16	16
17	15	18	18	16	17	16	20	23	17	20	46	48	50	51	53	44	44	29	22	16	16	17	16	16
18	18	18	17	20	20	29	20	22	18	21	36	43	43	54	53	32	24	16	20	14	17	16	20	21
19	17	16	17	16	14	15	18	27	34	38	44	52	48	49	54	43	39	18	22	29	17	15	B	20
20	15	21	18	20	15	B	22	16	16	21	44	48	54	53	49	45	40	15	24	21	16	16	21	17
21	15	16	17	17	21	18	15	23	17	20	40	47	52	49	47	43	40	20	16	15	18	16	42	21
22	22	16	17	15	B	66	16	30	18	18	44	45	49	53	48	42	42	18	24	18	24	17	17	20
23	18	38	18	22	18	15	18	21	17	20	45	45	49	52	46	44	40	18	14	16	17	20	27	20
24	18	81	22	23	18	B	20	39	17	40	20	46	62	63	54	52	21	18	14	16	21	20	15	45
25	16	21	21	16	14	15	16	21	20	26	40	35	39	33	46	33	28	18	15	16	23	66	15	17
26	18	15	16	18	B	18	17	22	16	20	40	50	47	49	49	33	28	18	21	14	17	17	20	18
27	30	17	21	17	B	B	B	22	17	22	42	47	49	52	55	44	40	20	28	20	14	16	66	14
28	15	15	17	15	66	20	17	18	32	21	44	48	61	50	42	48	40	14	15	24	20	24	17	16
29	15	17	18	16	14	20	20	26	20	23	42	52	53	52	46	43	42	18	16	21	18	17	40	16
30	14	14	17	17	66	18	17	23	16	18	43	46	49	55	47	44	17	14	15	15	15	41	B	17
31	20	23	27	20	15	15	16	15	18	22	29	51	52	49	38	46	32	18	17	14	15	17	17	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	30	30	30	31	28	26	25	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	28	30
MED	18	17	17	16	16	17	18	22	17	20	40	46	49	49	48	43	39	18	17	16	17	17	17	16
U Q	20	20	18	18	17	20	20	23	18	22	43	48	52	52	52	44	40	20	23	18	20	18	20	18
L Q	15	15	15	15	15	15	16	21	16	18	27	44	47	48	46	42	23	17	15	15	16	15	15	16

SUMMARY PLOTS AT Wakkanai



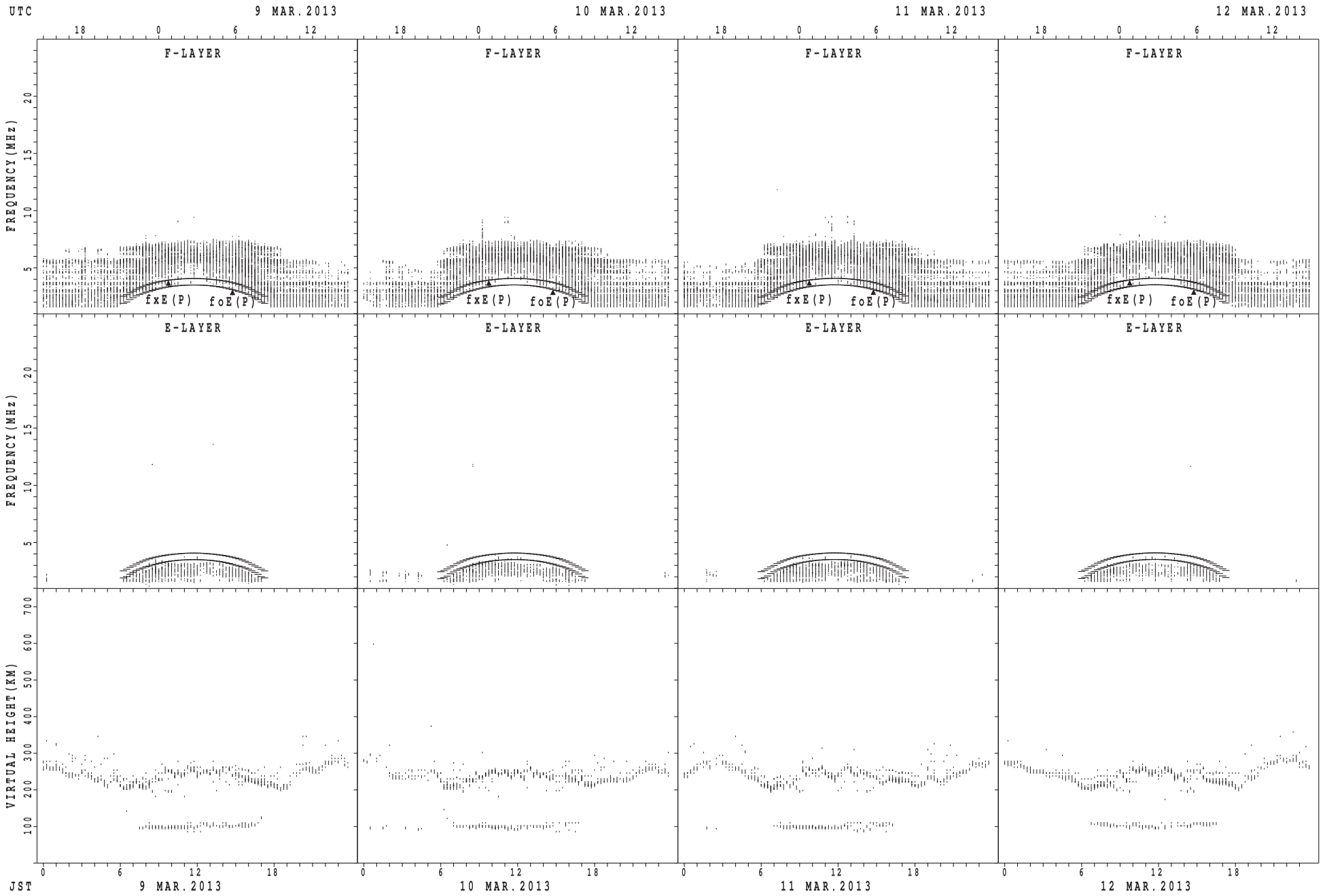
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



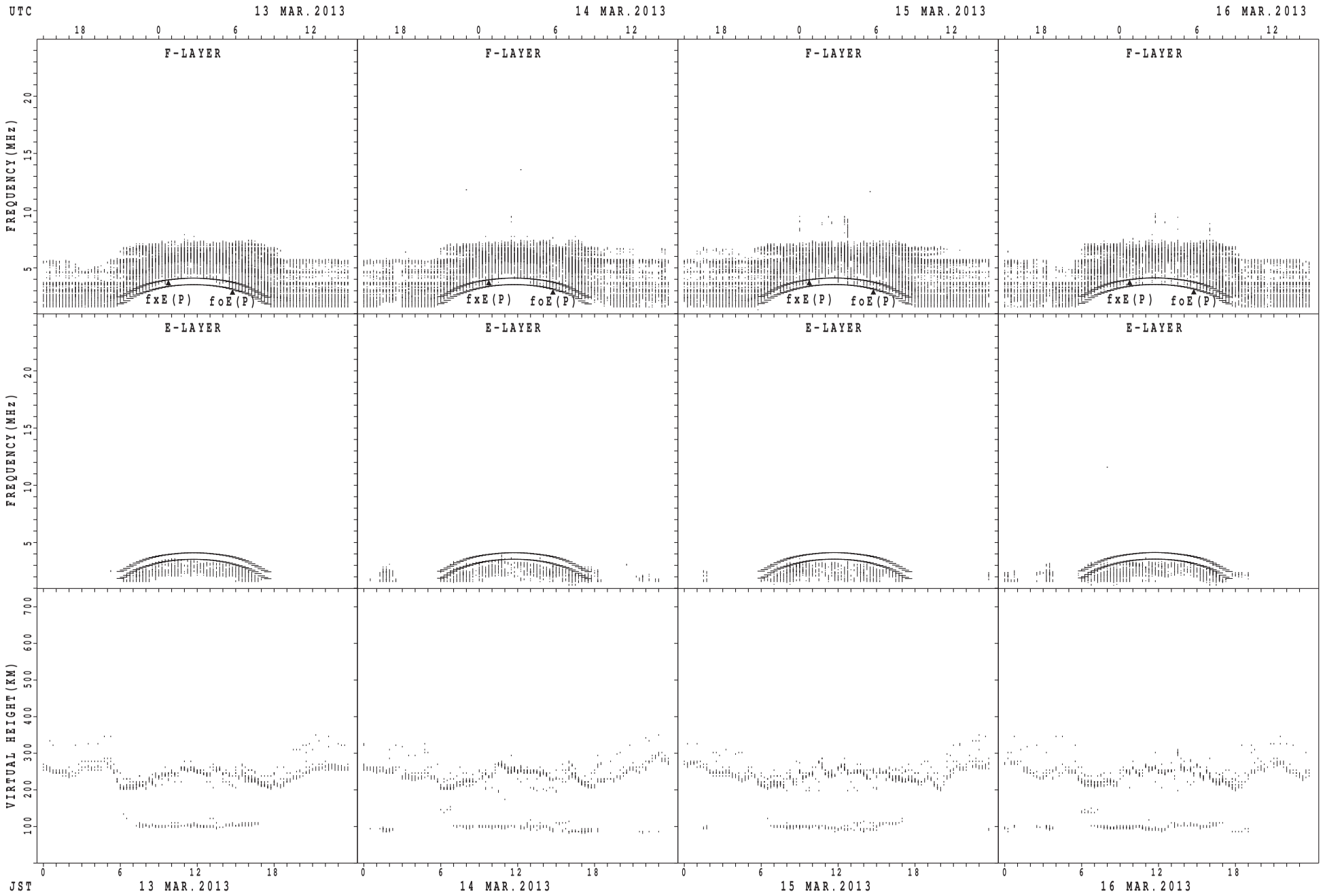
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



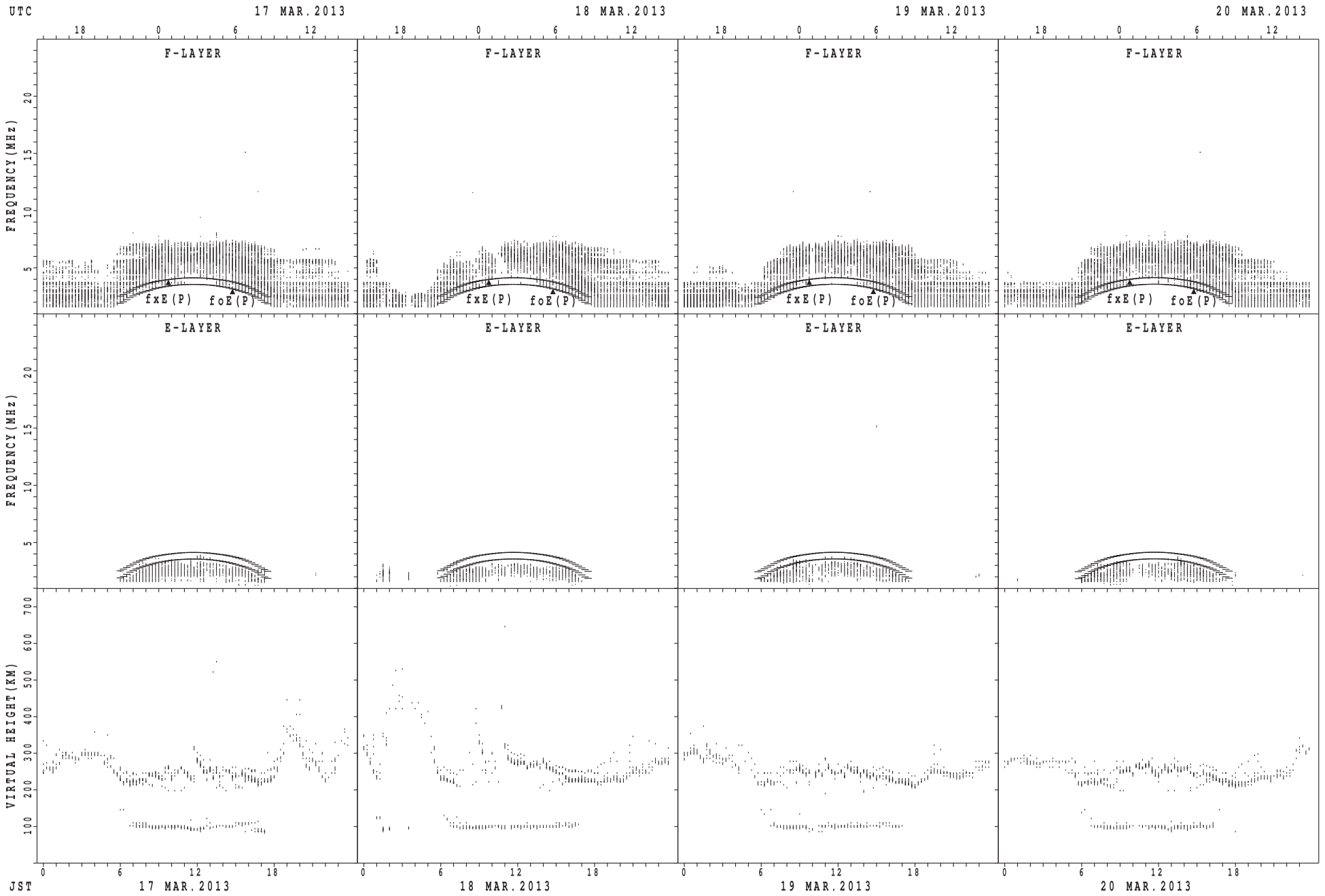
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



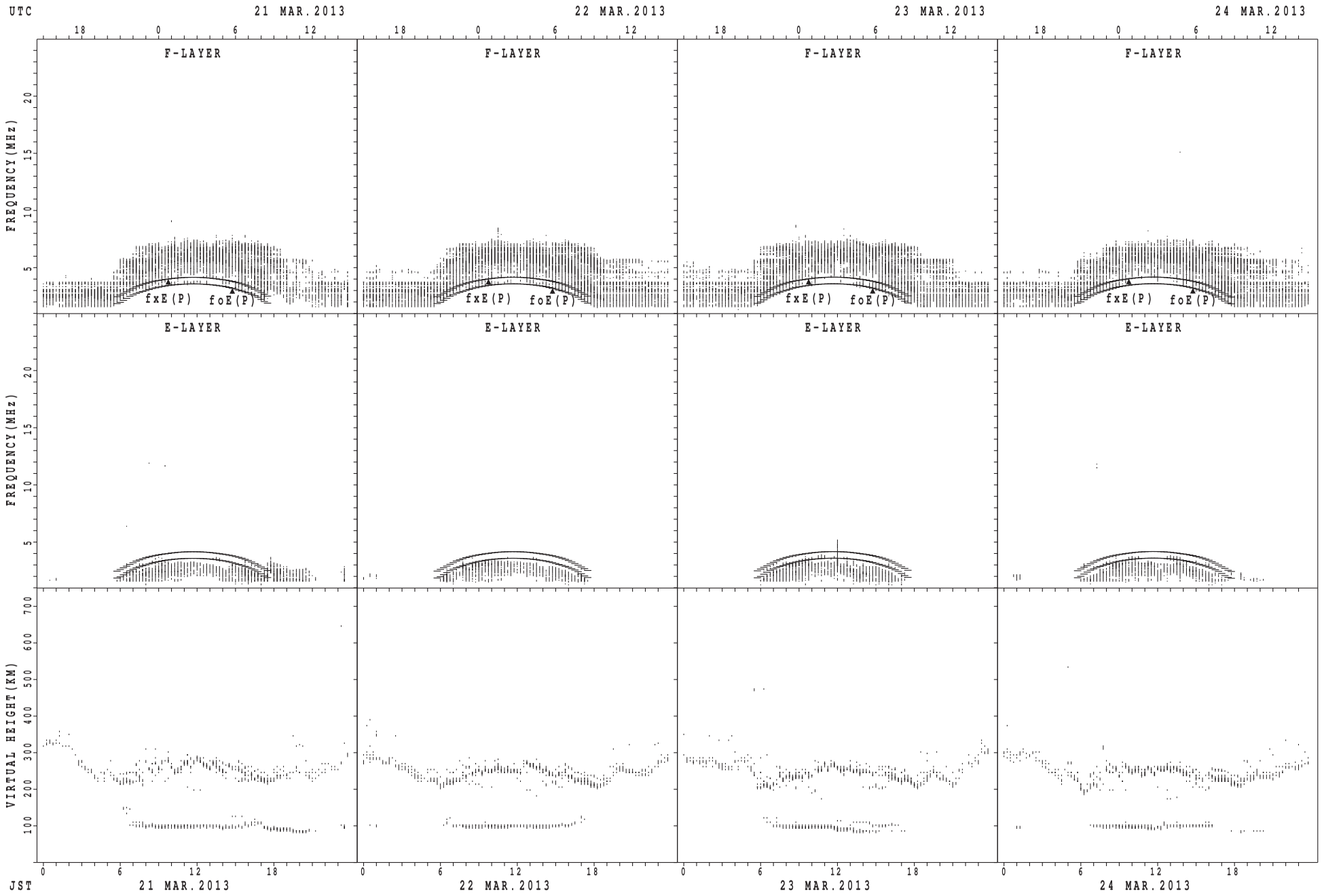
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



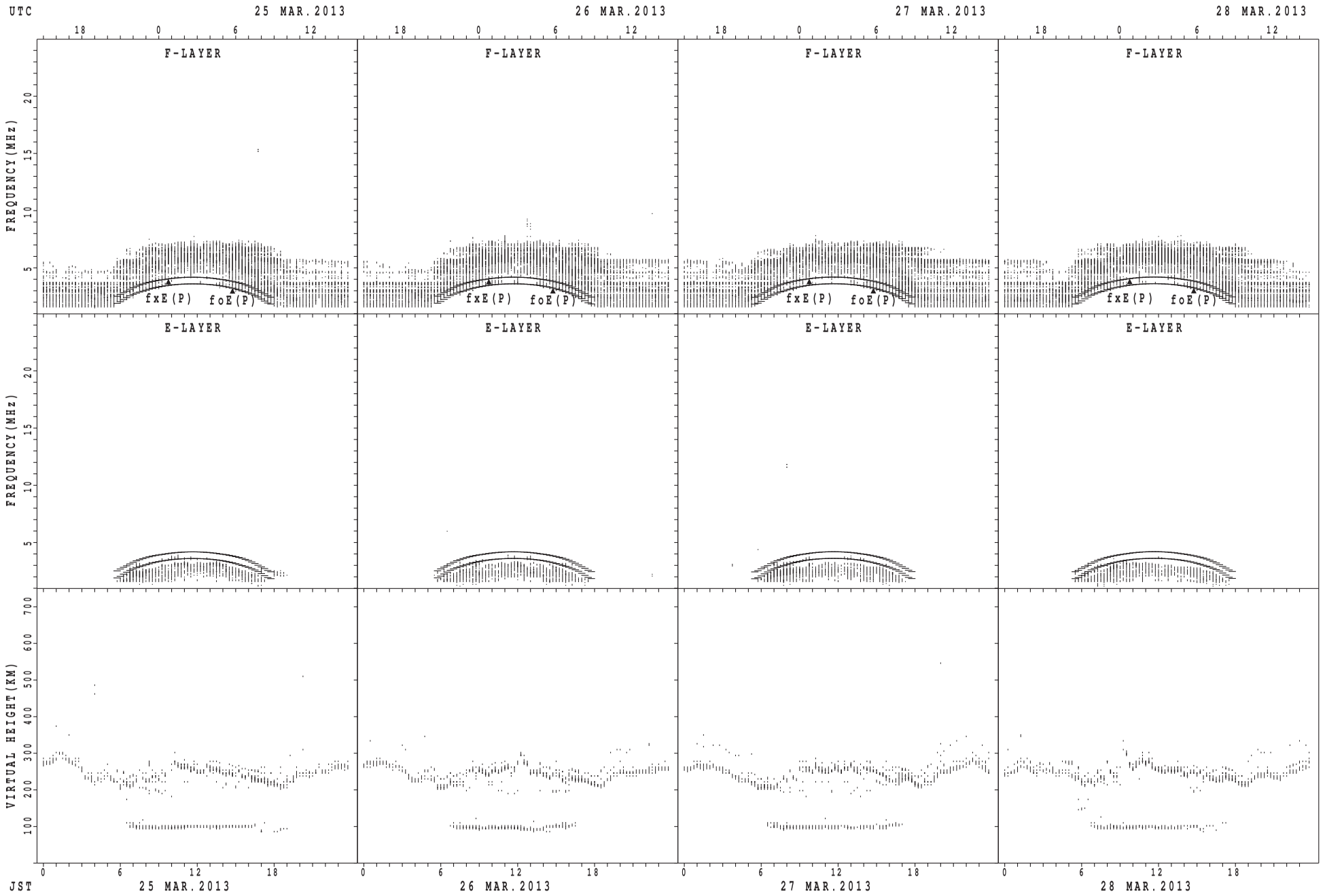
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



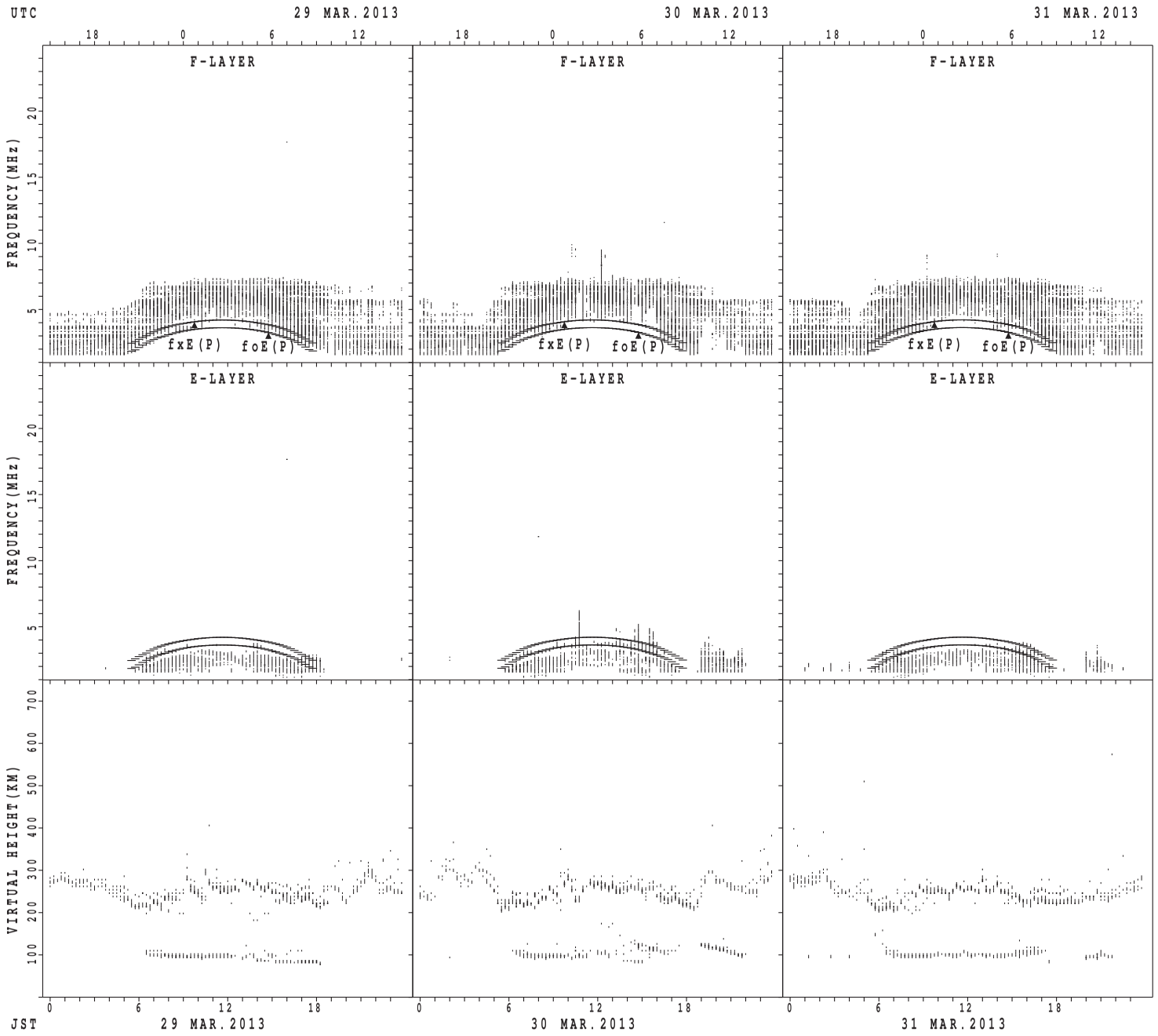
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



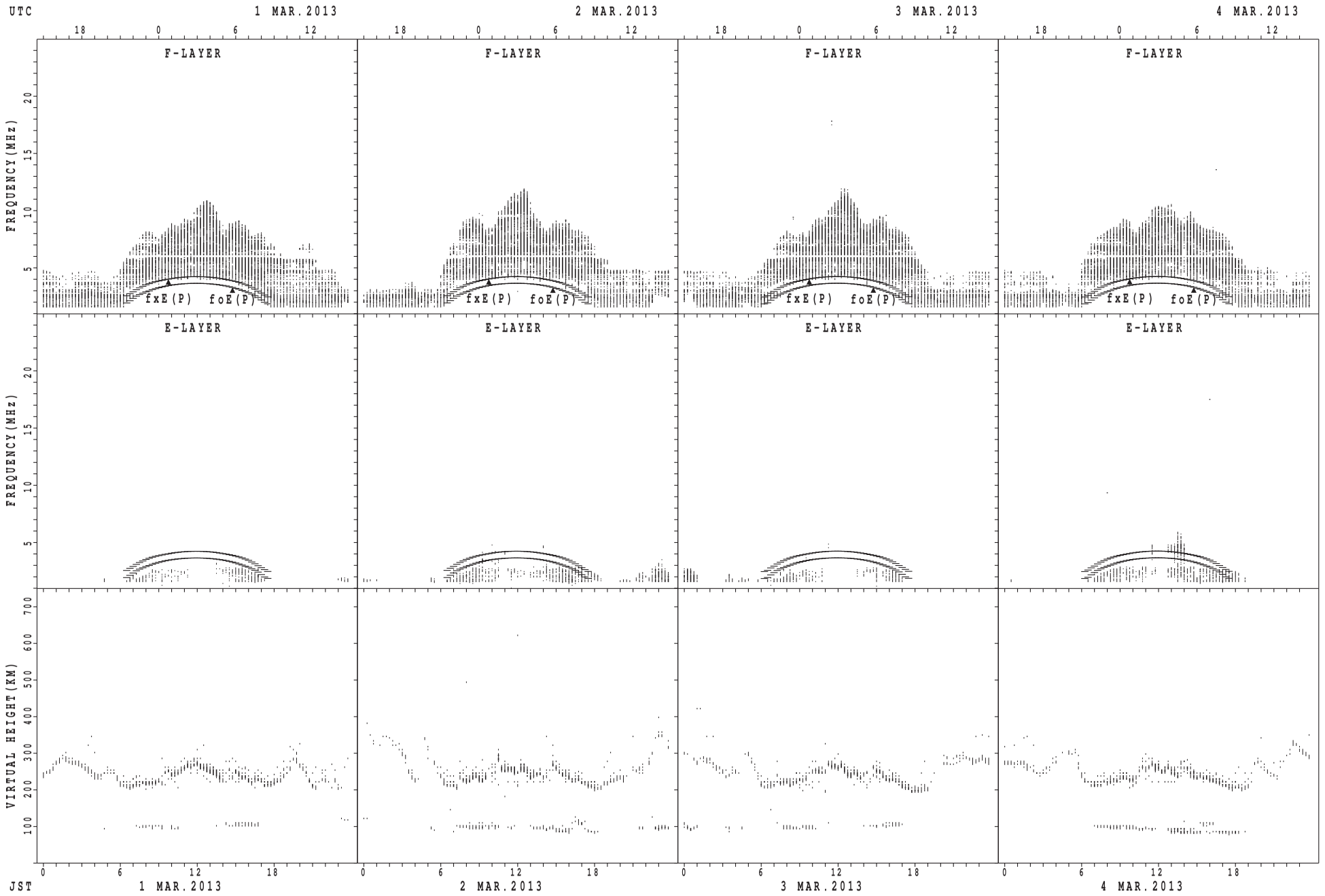
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



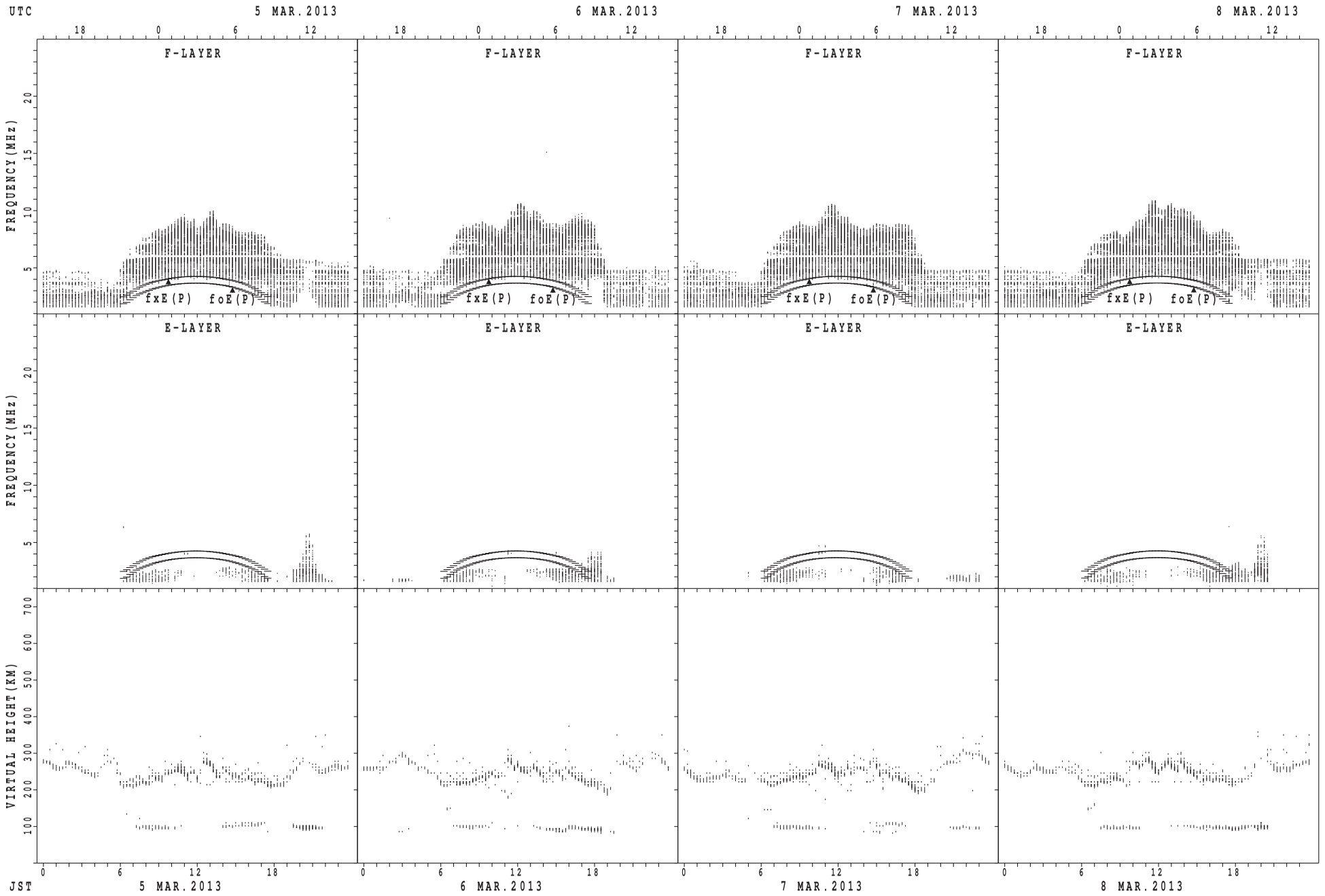
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



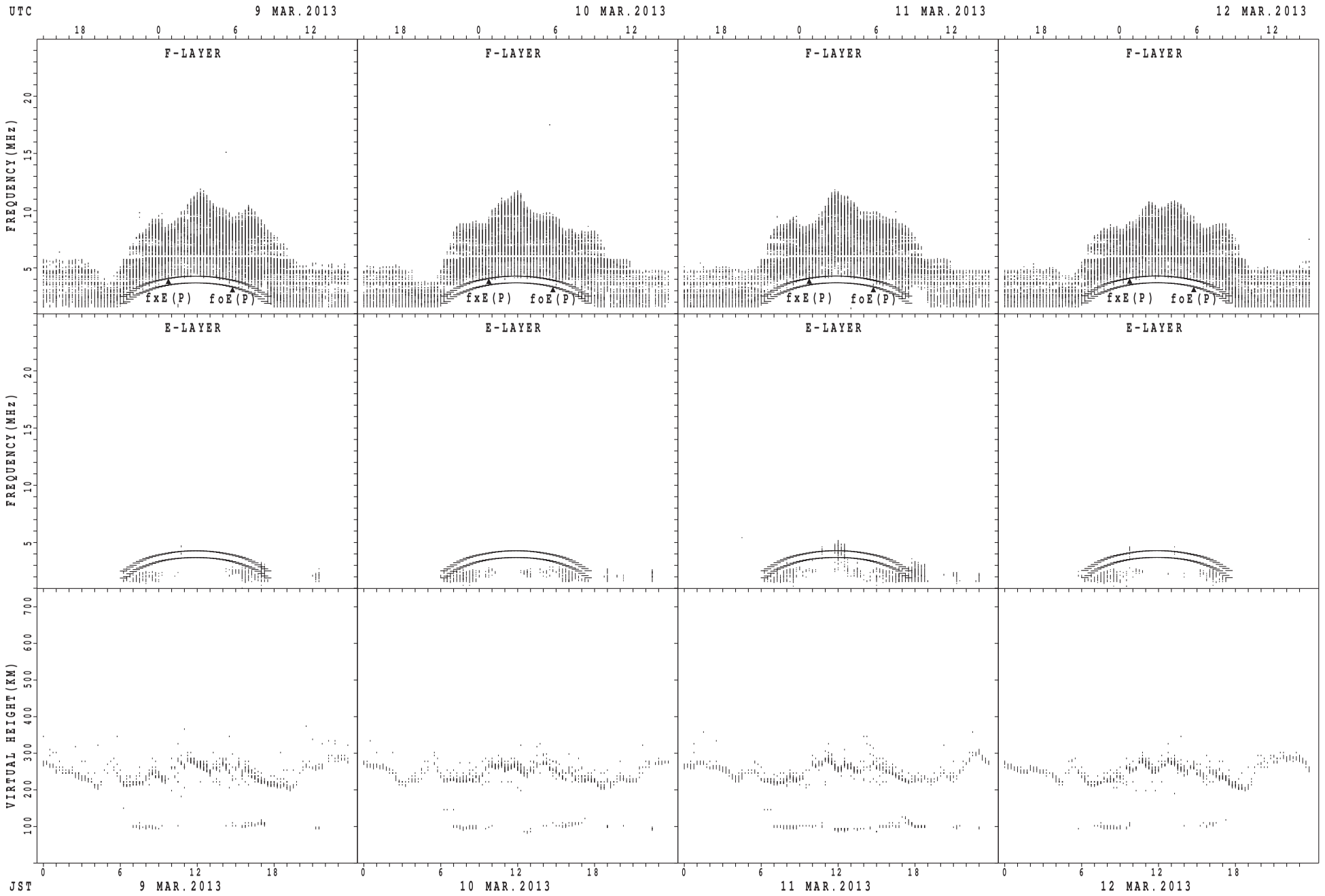
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



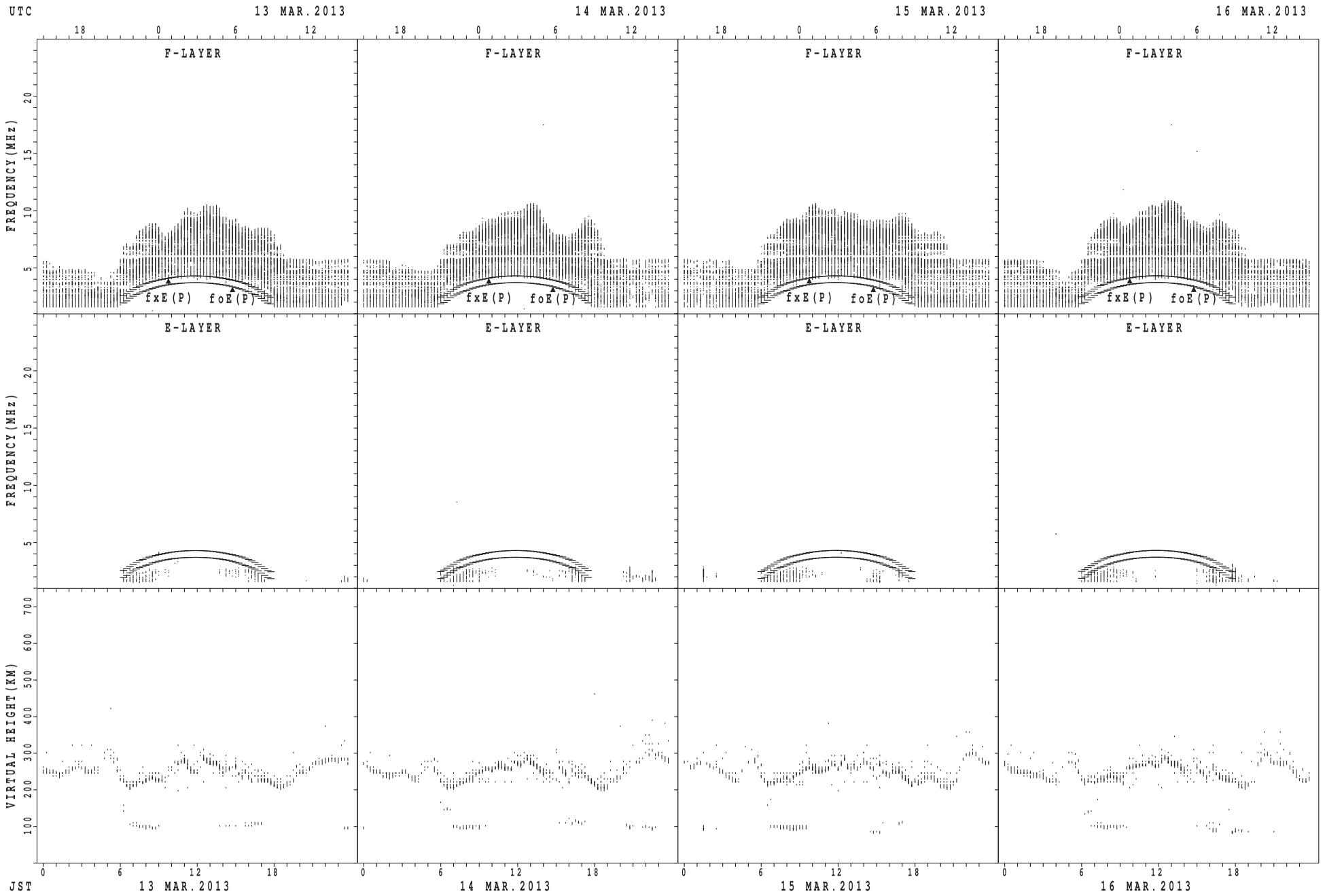
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



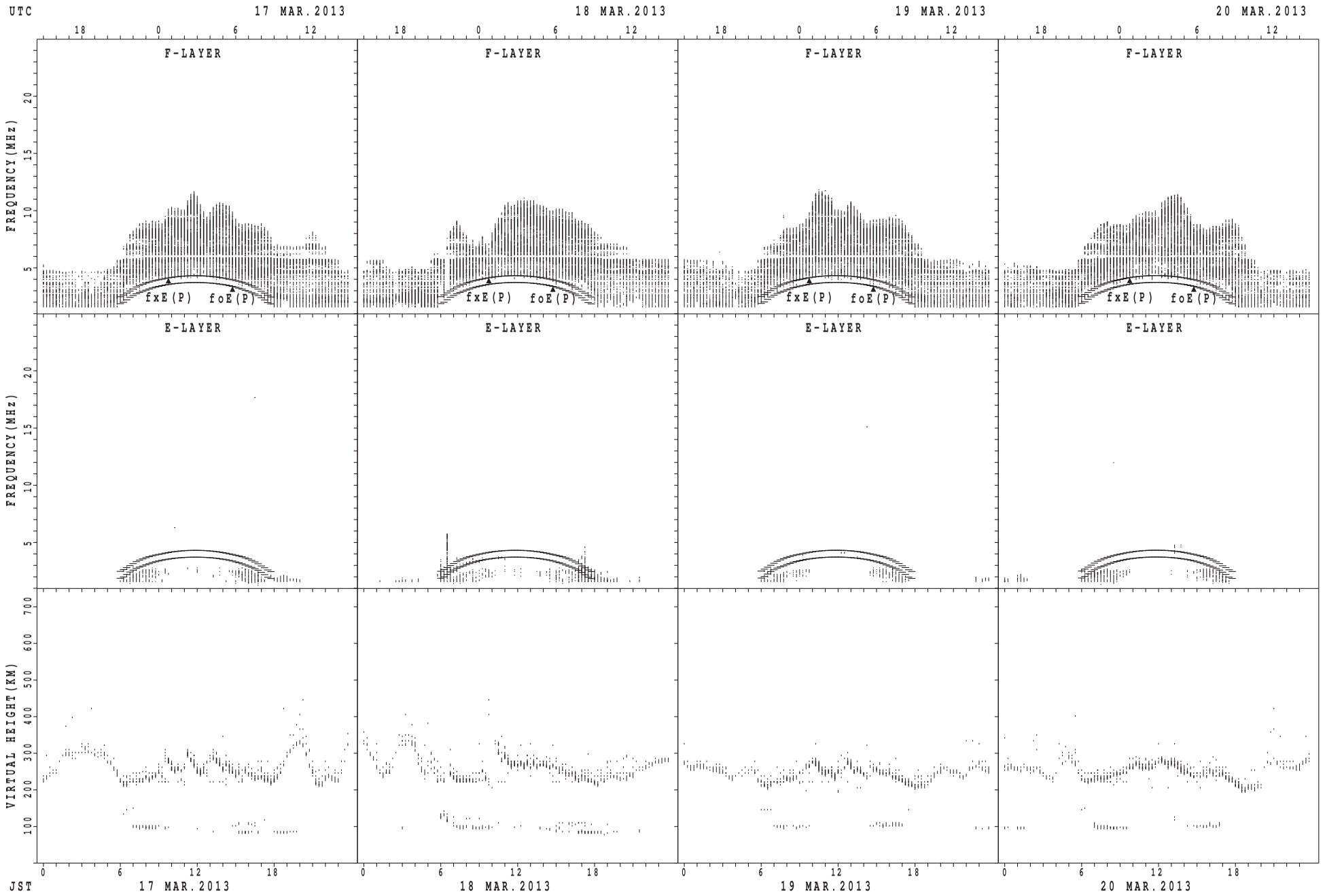
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



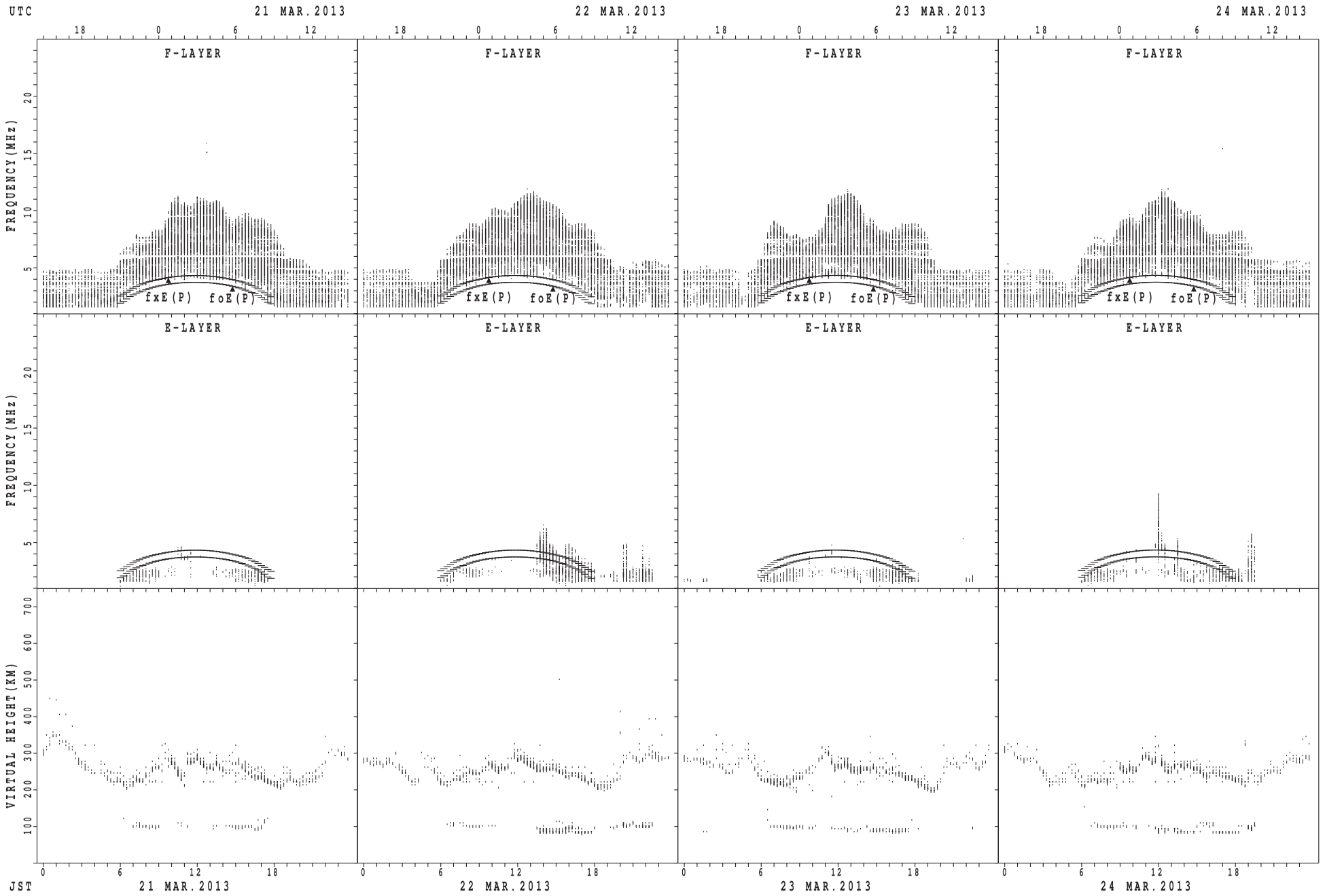
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



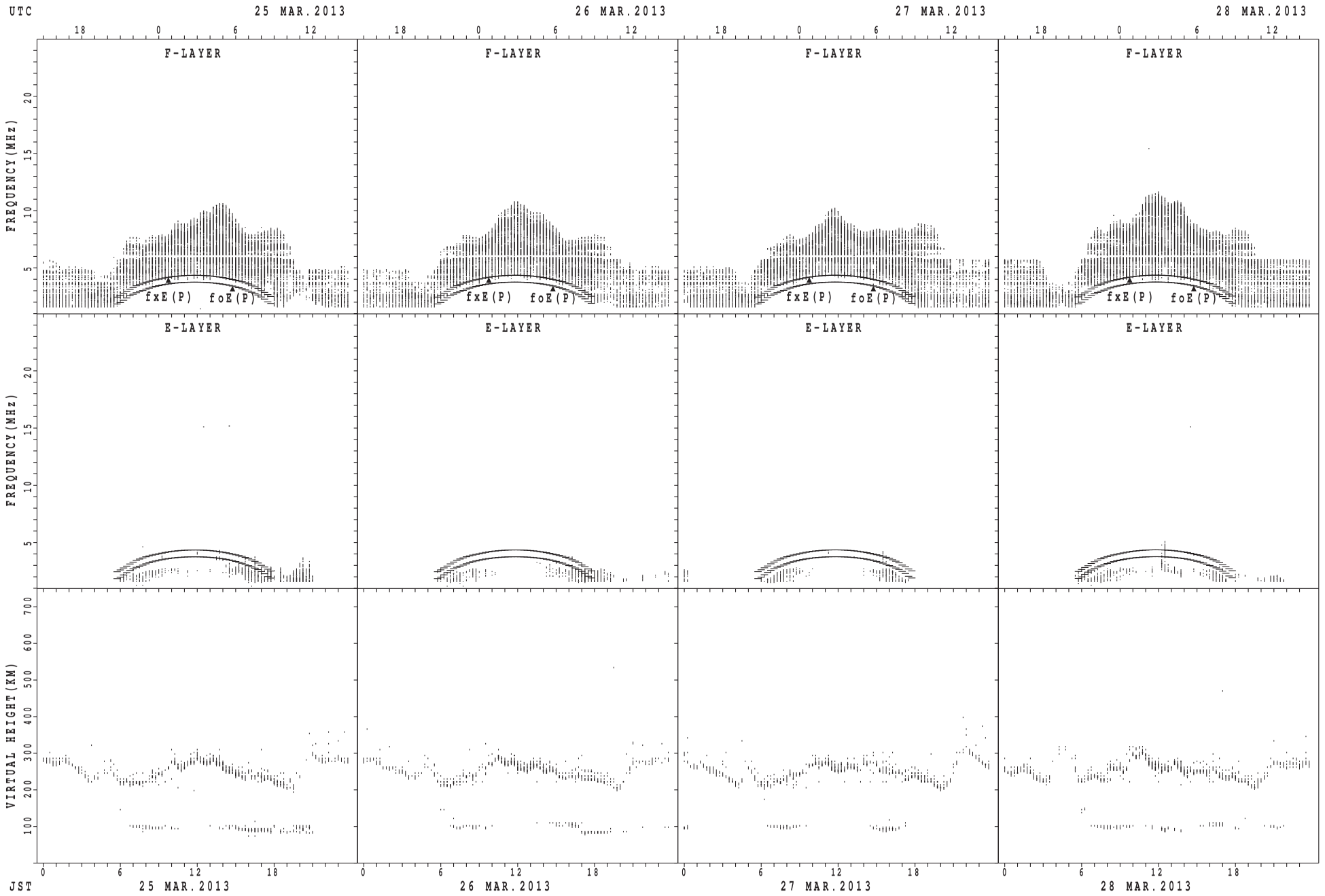
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



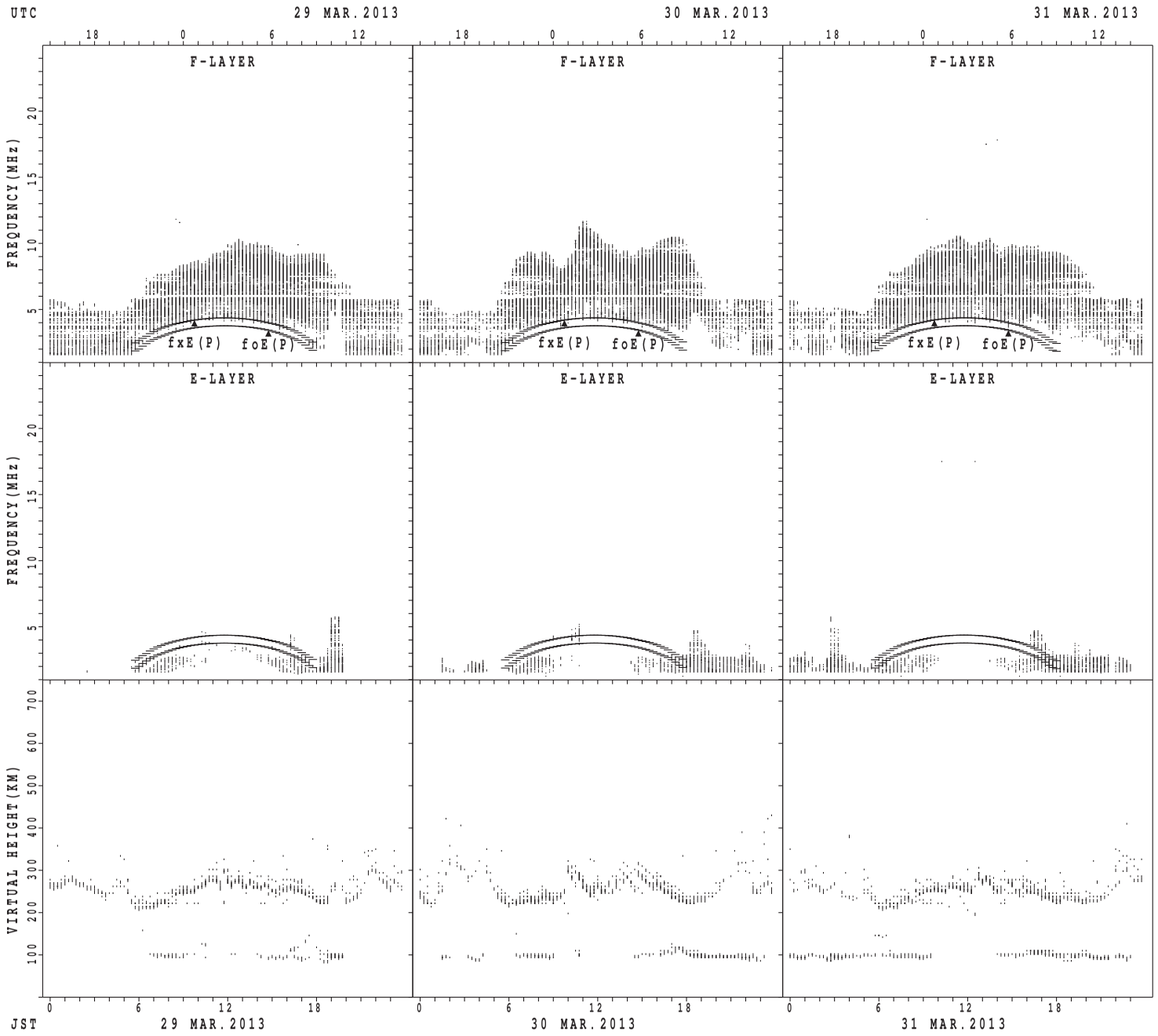
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



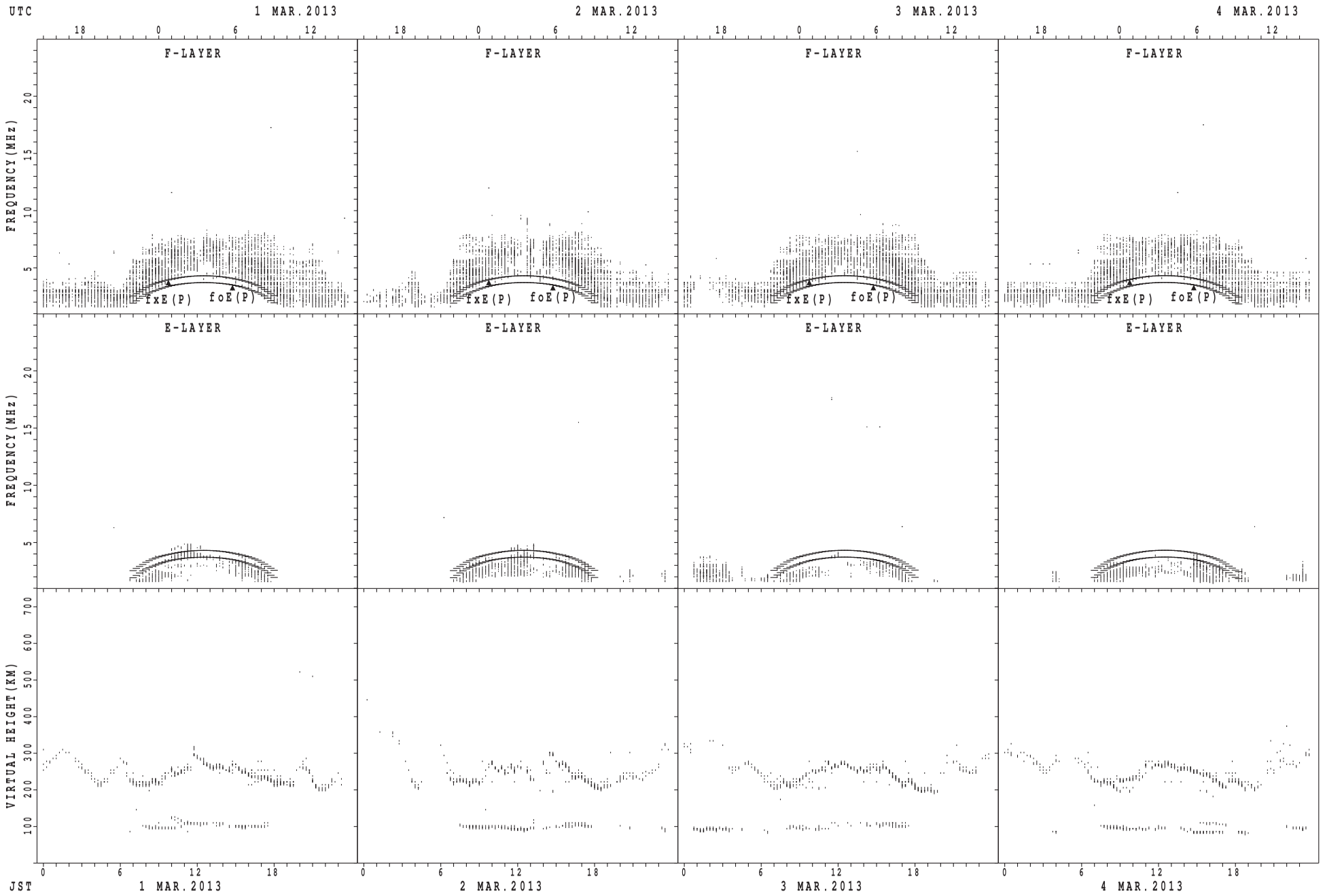
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



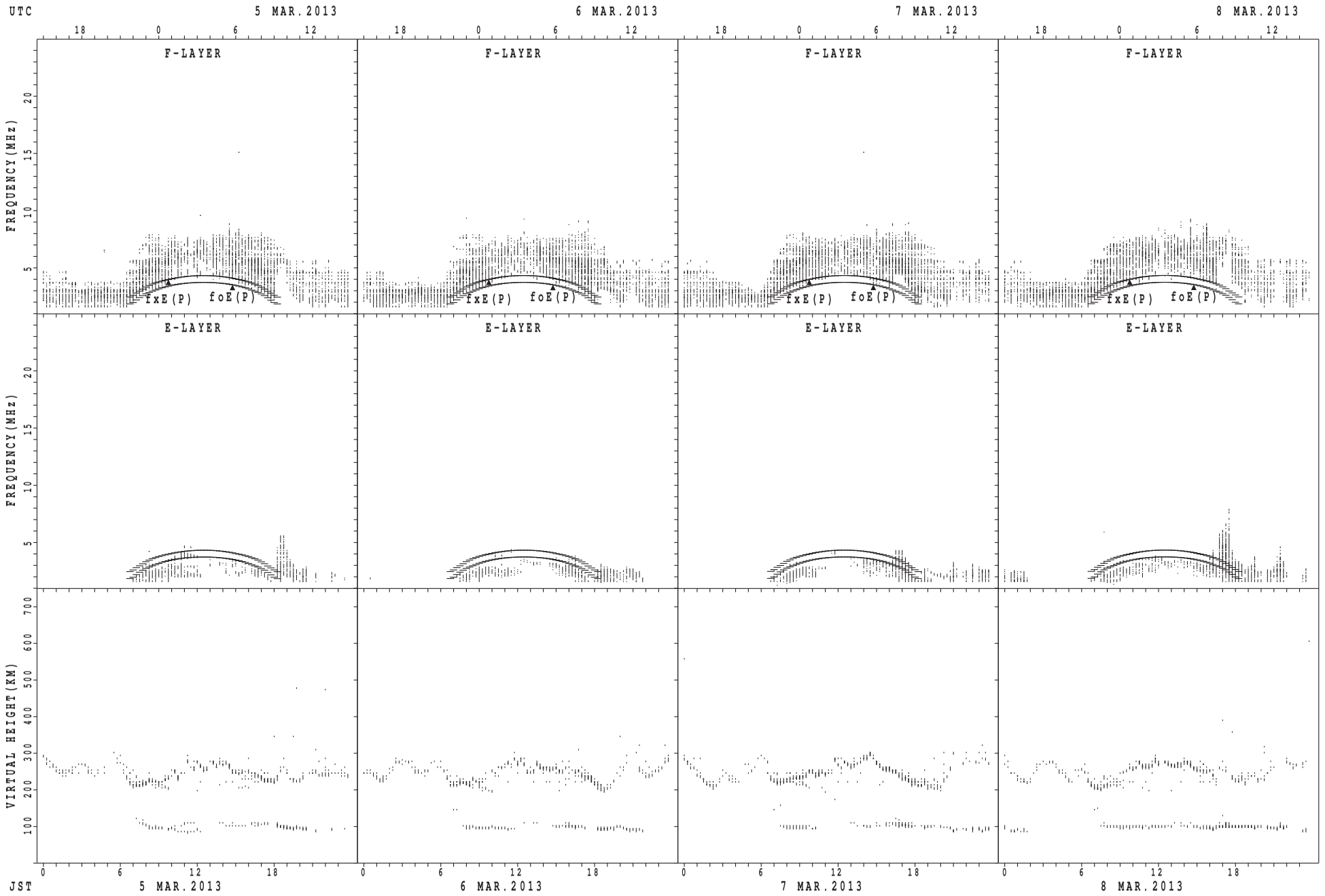
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



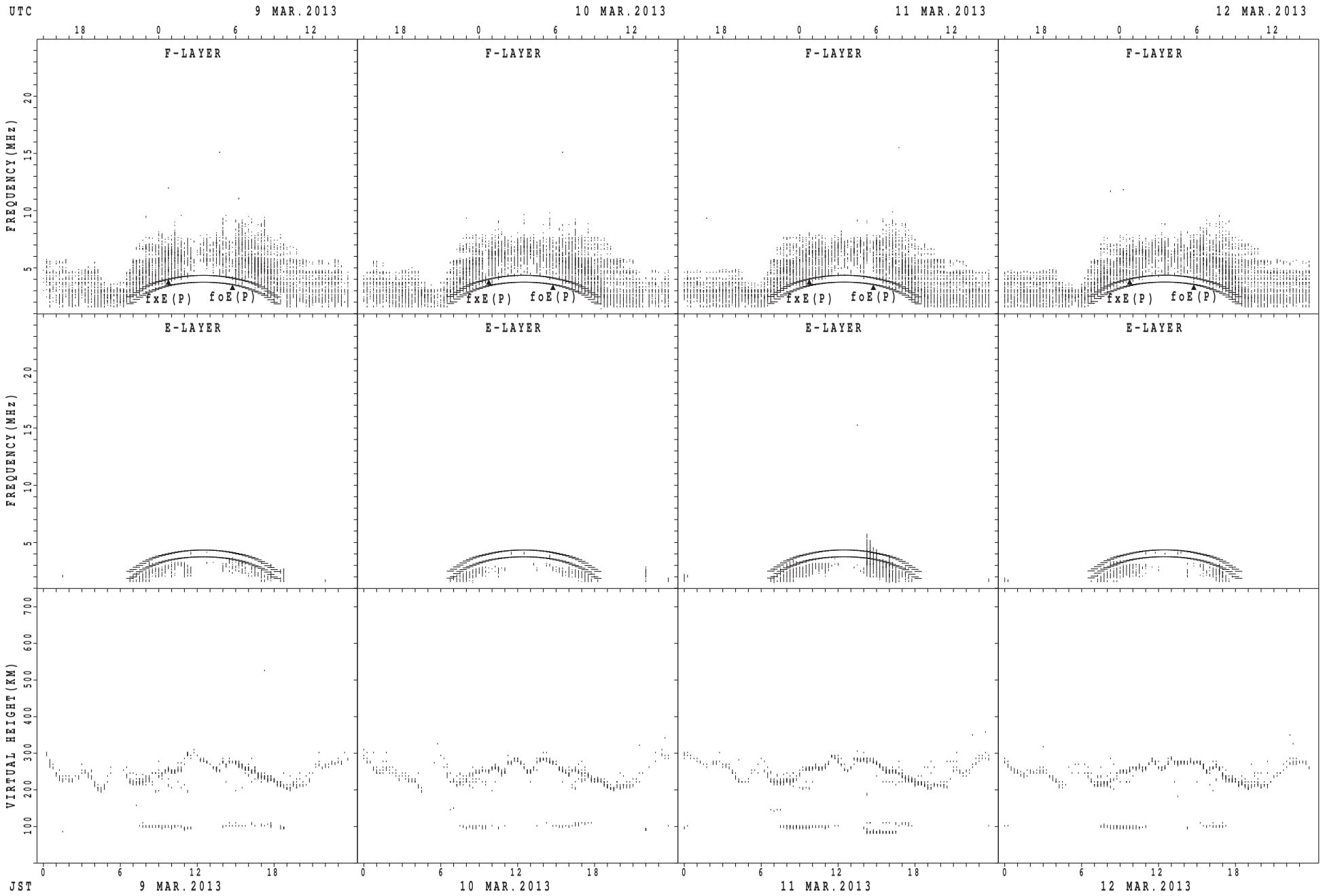
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



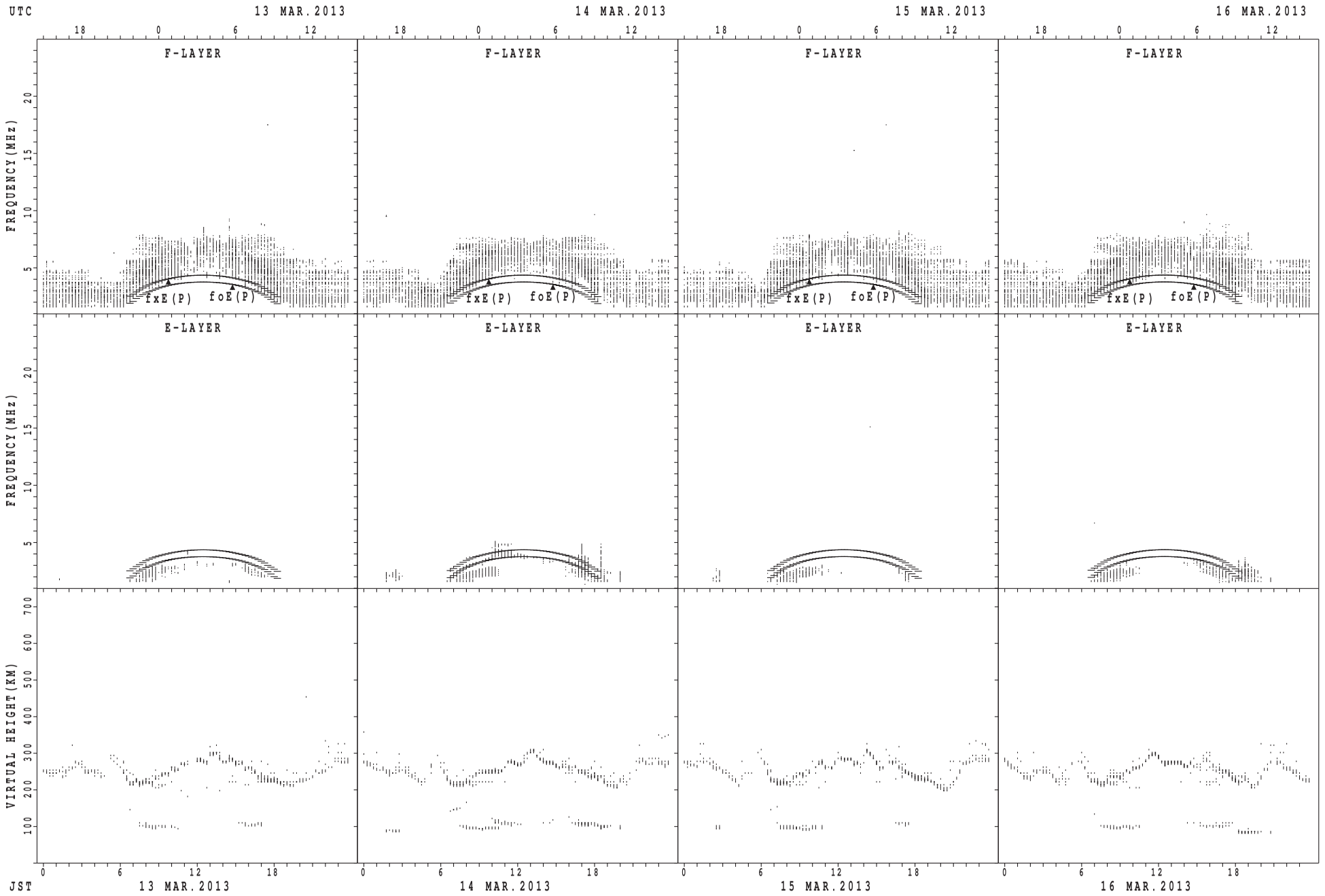
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



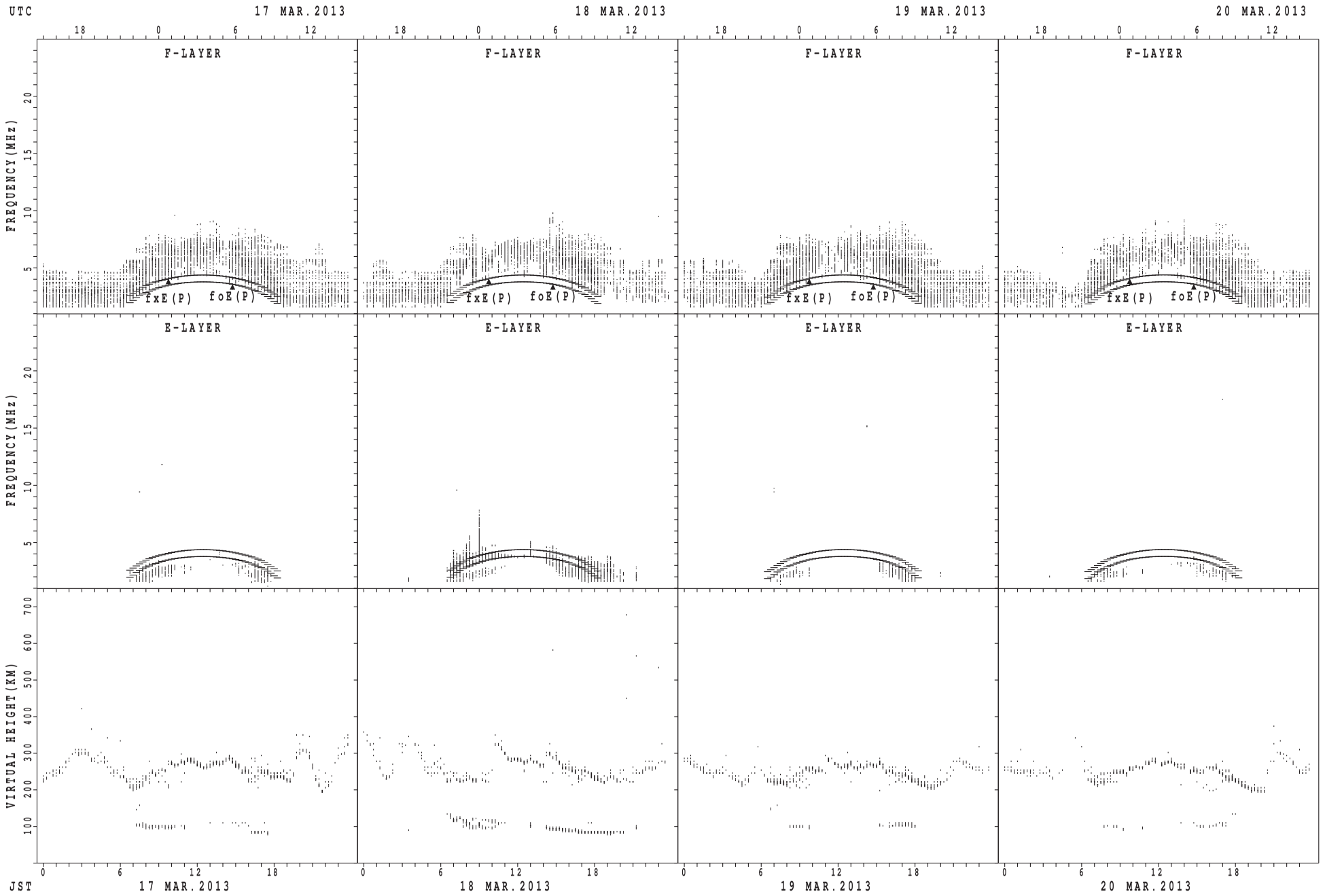
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



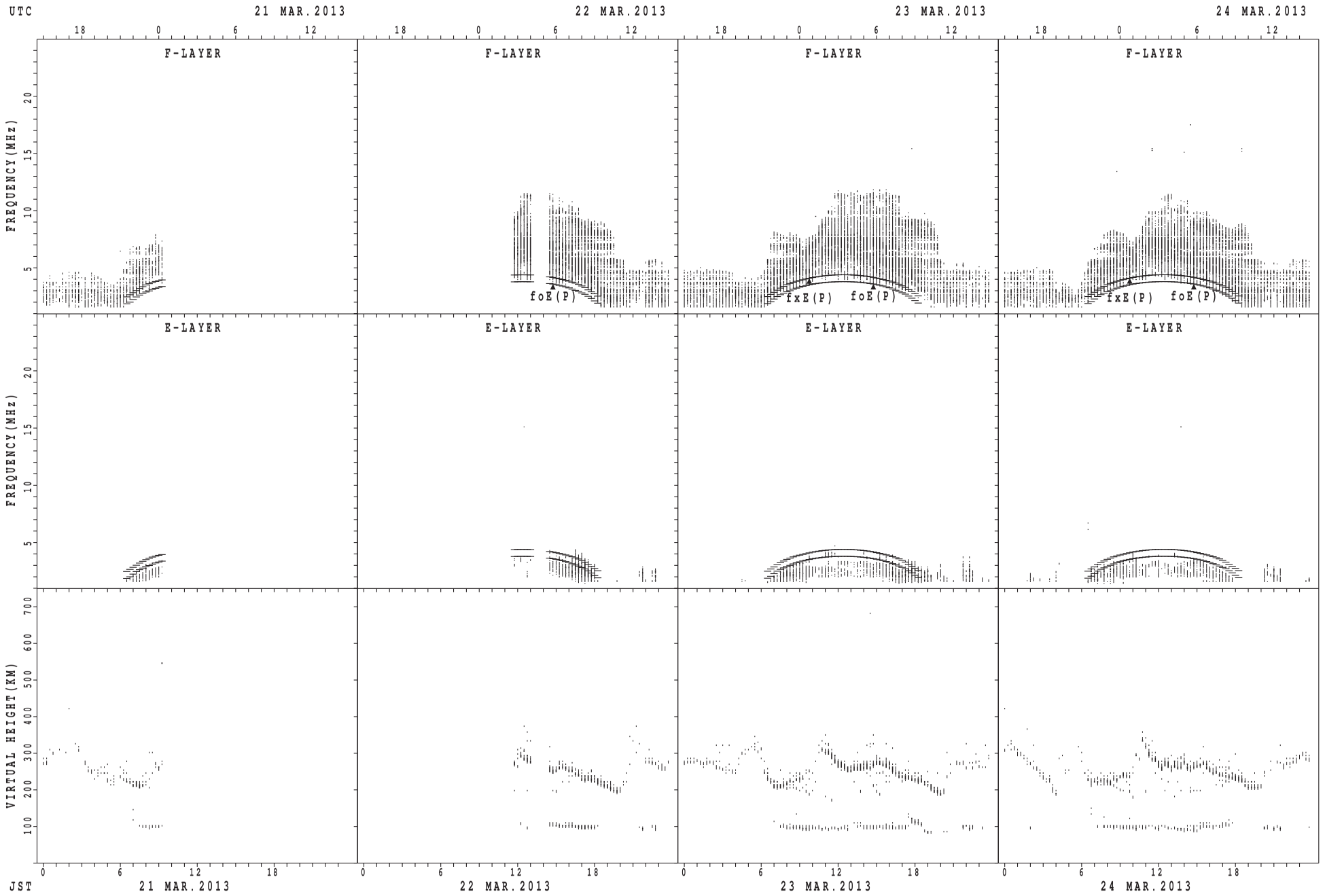
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



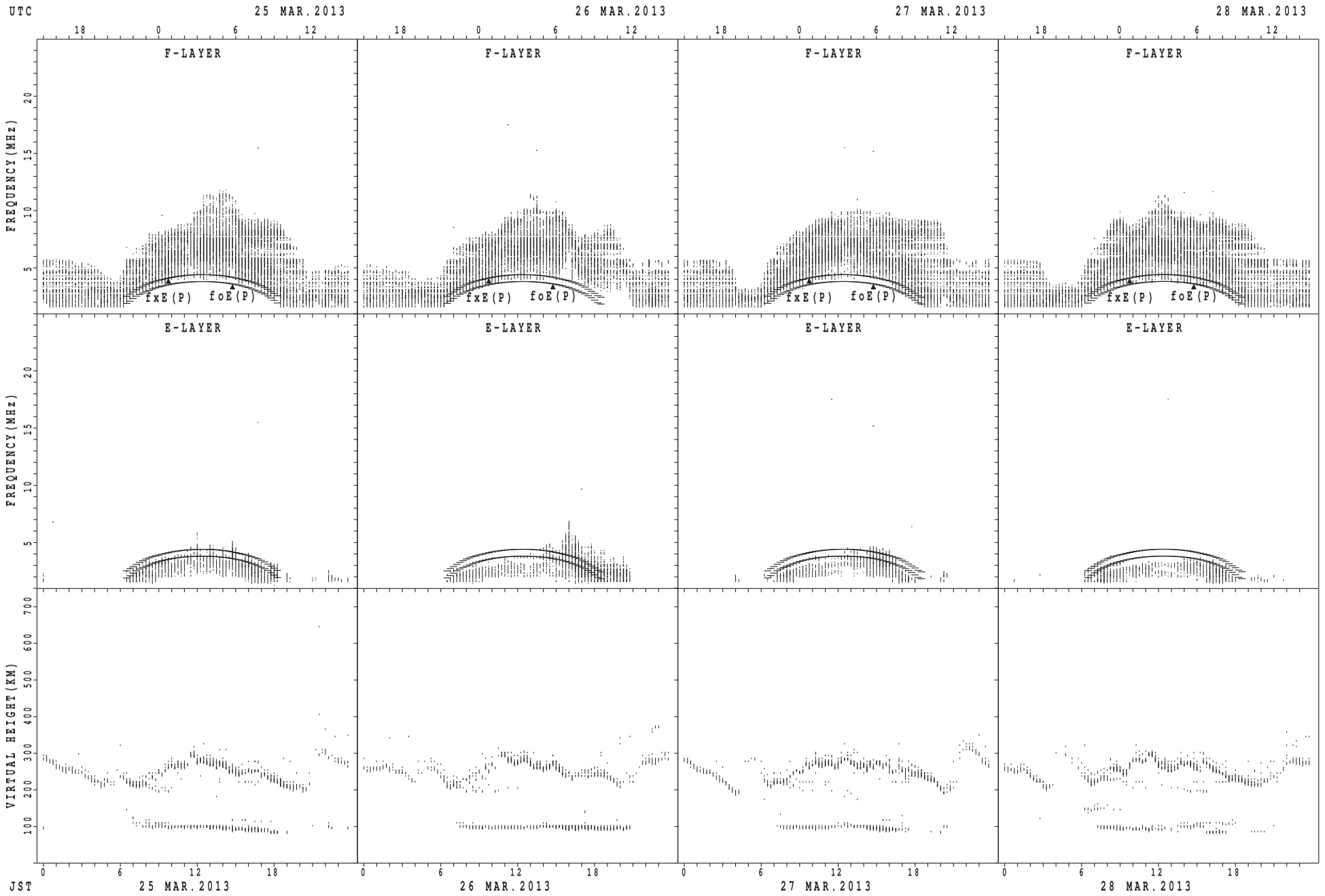
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

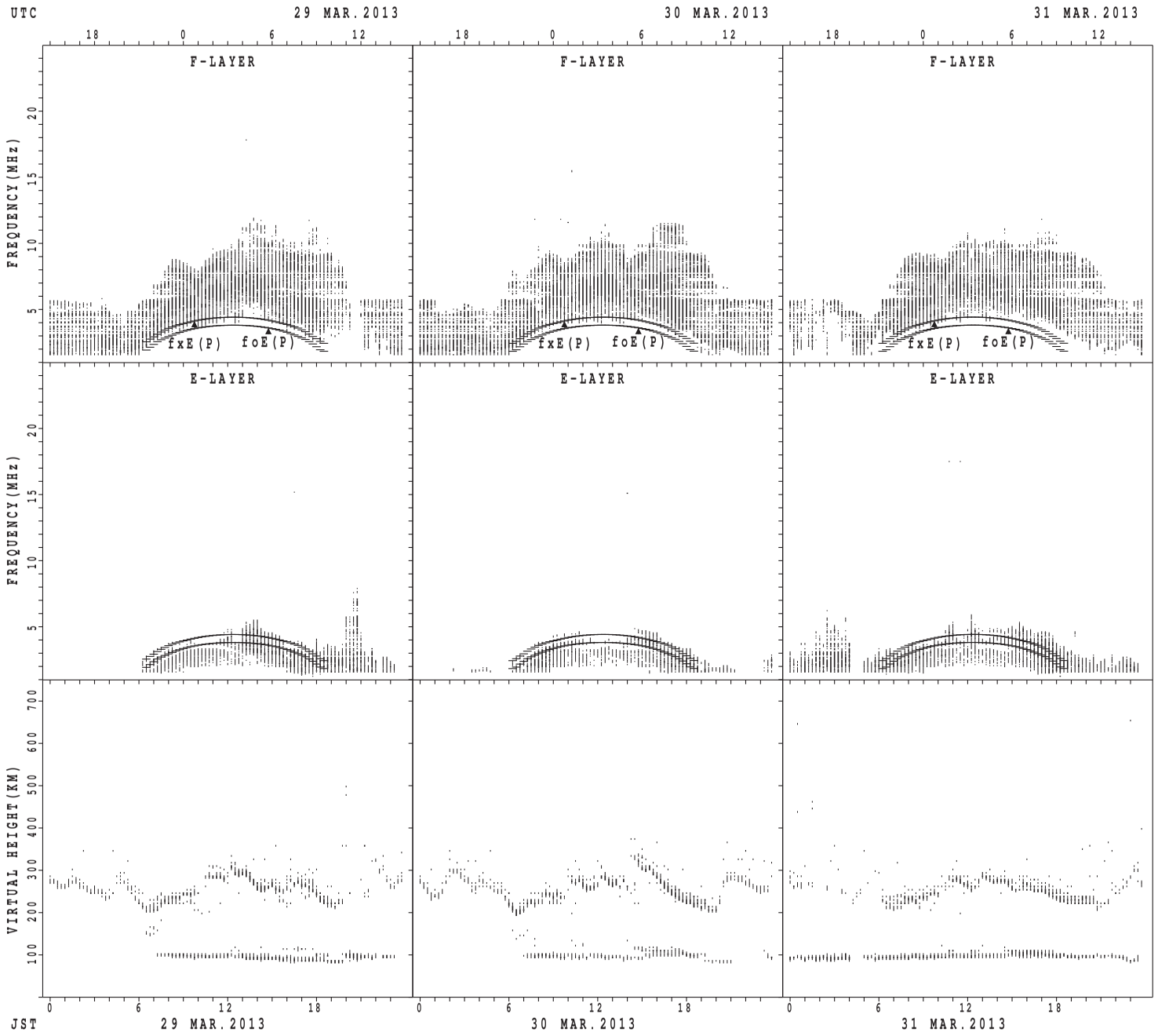


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

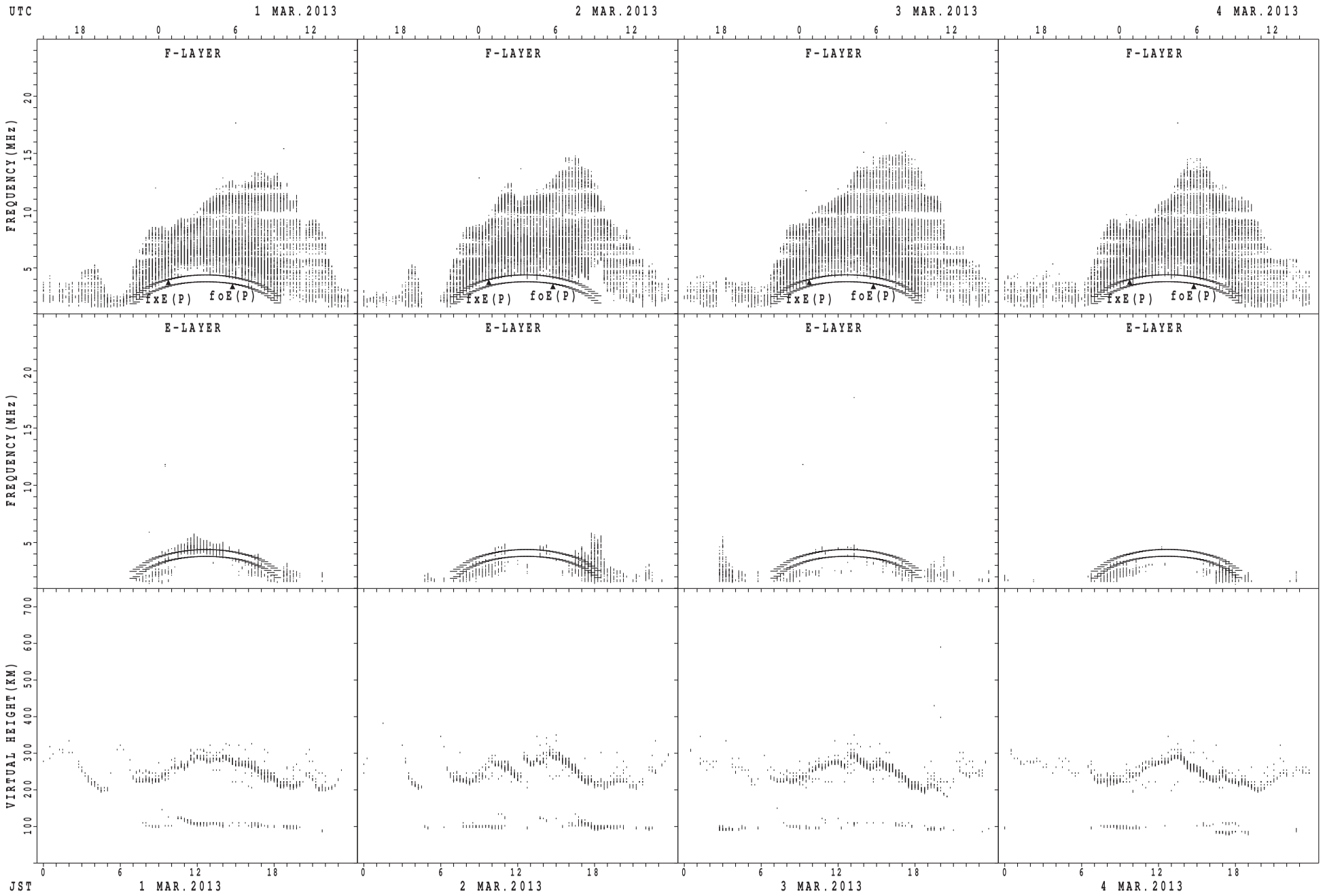
SUMMARY PLOTS AT Yamagawa



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

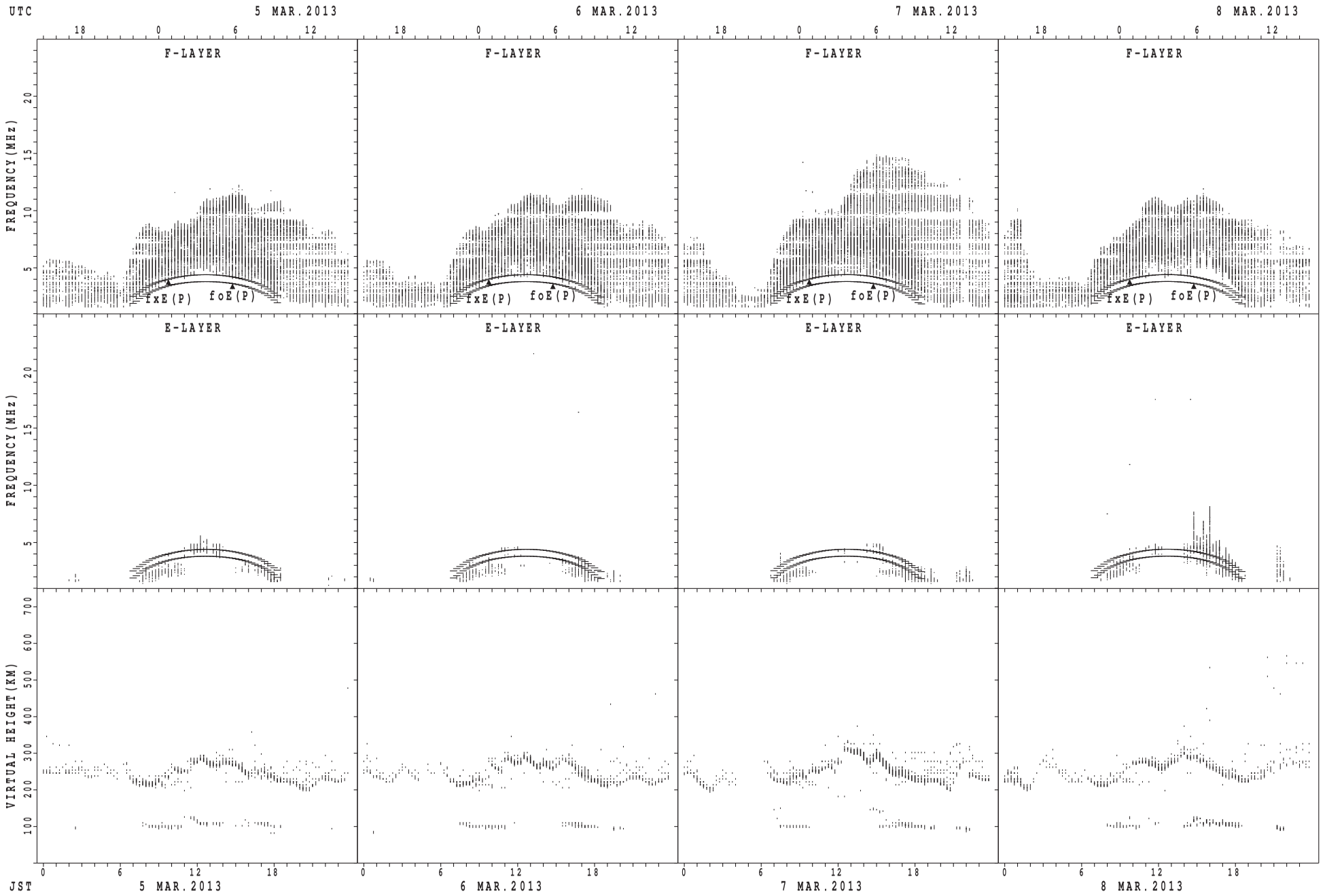

SUMMARY PLOTS AT Yamagawa
UTC
29 MAR.2013
30 MAR.2013
31 MAR.2013
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
JST
29 MAR.2013
30 MAR.2013
31 MAR.2013
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



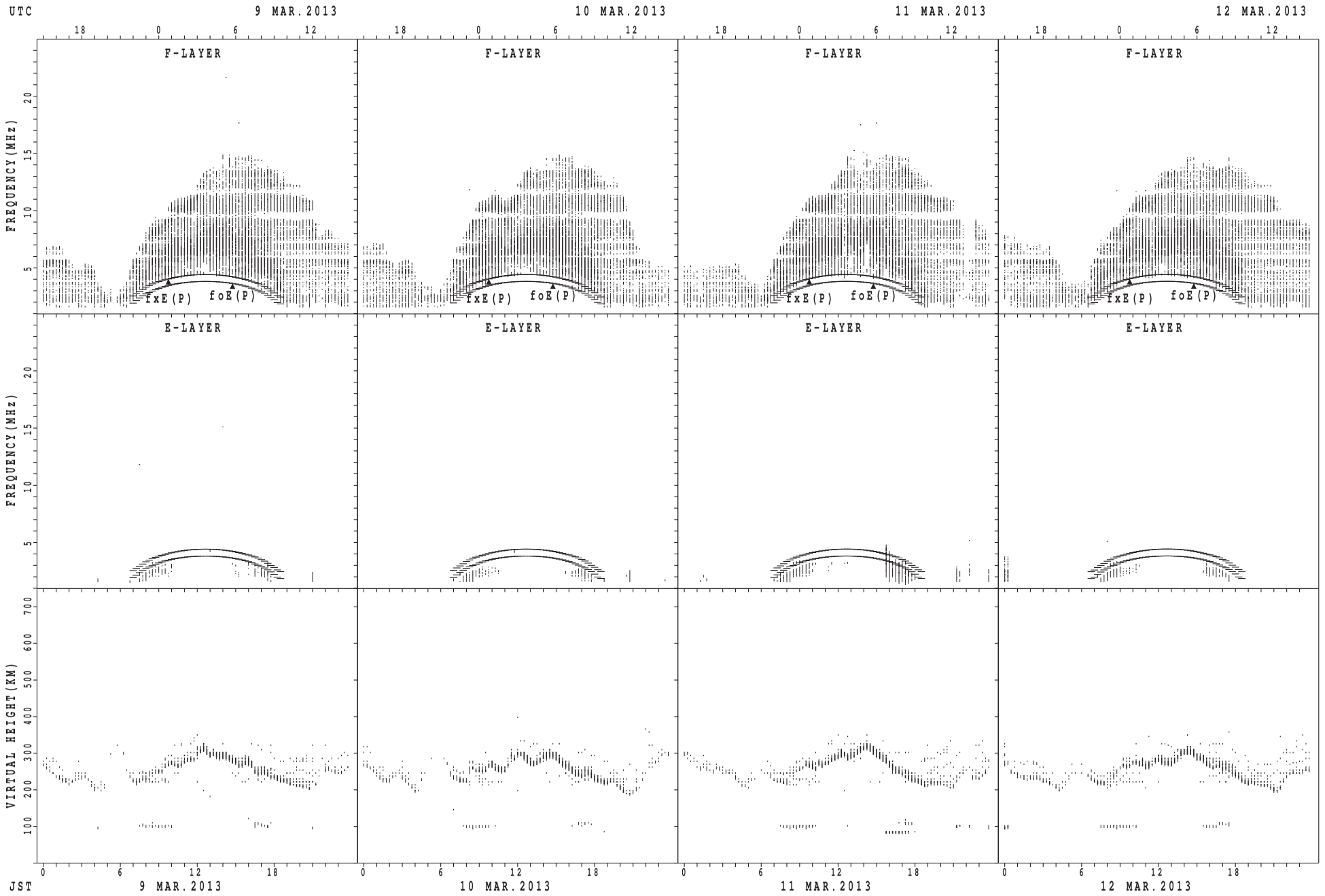
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



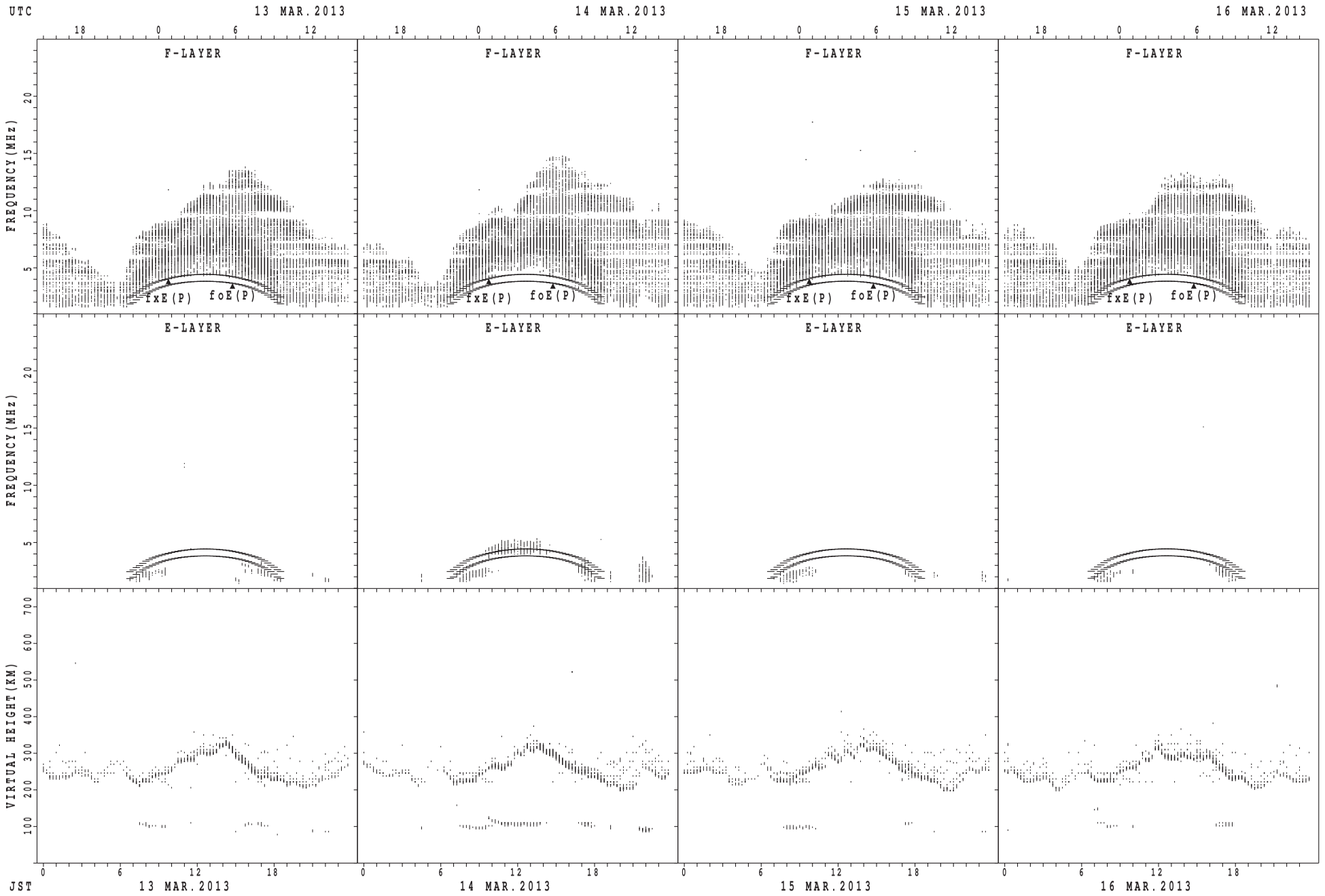
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



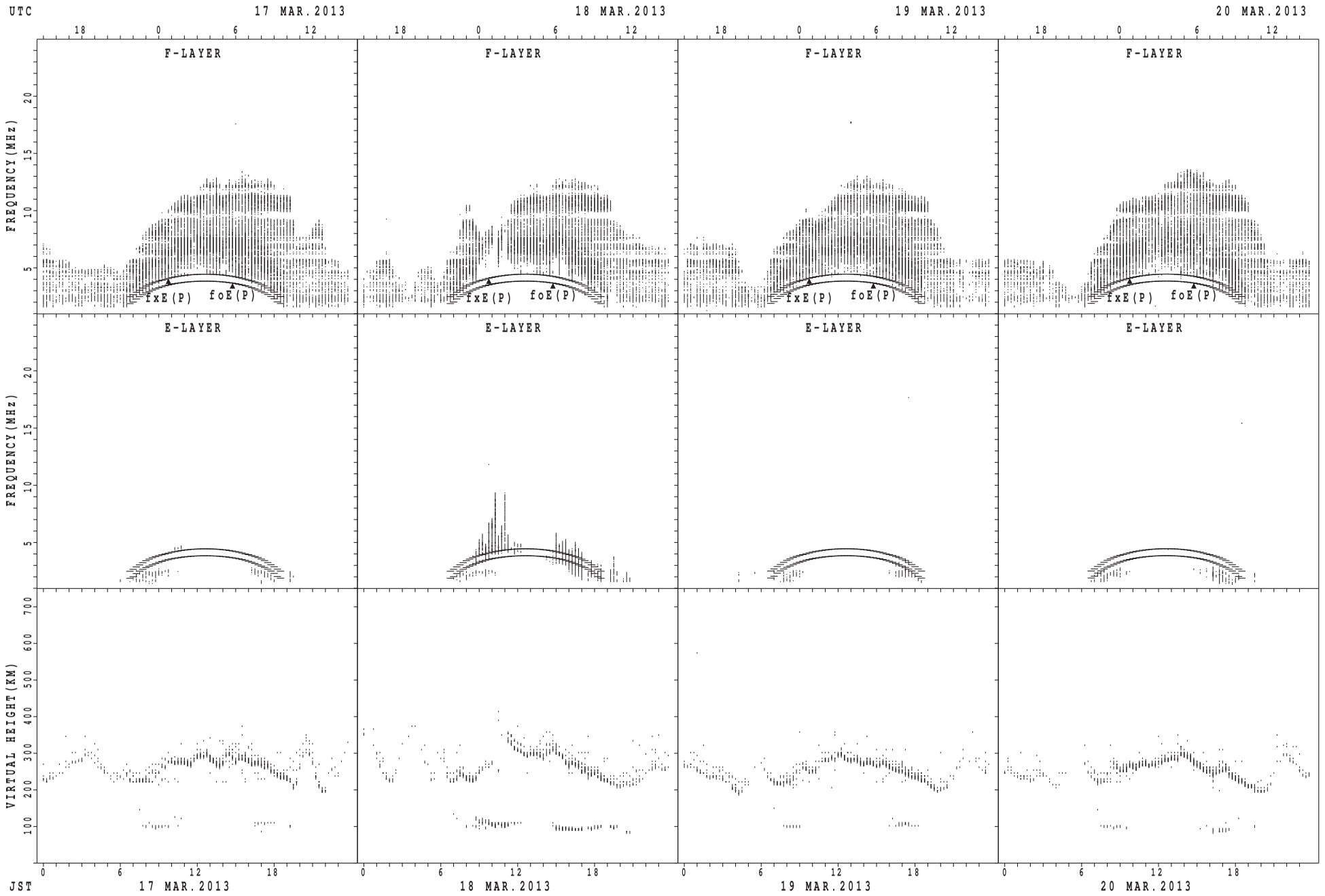
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



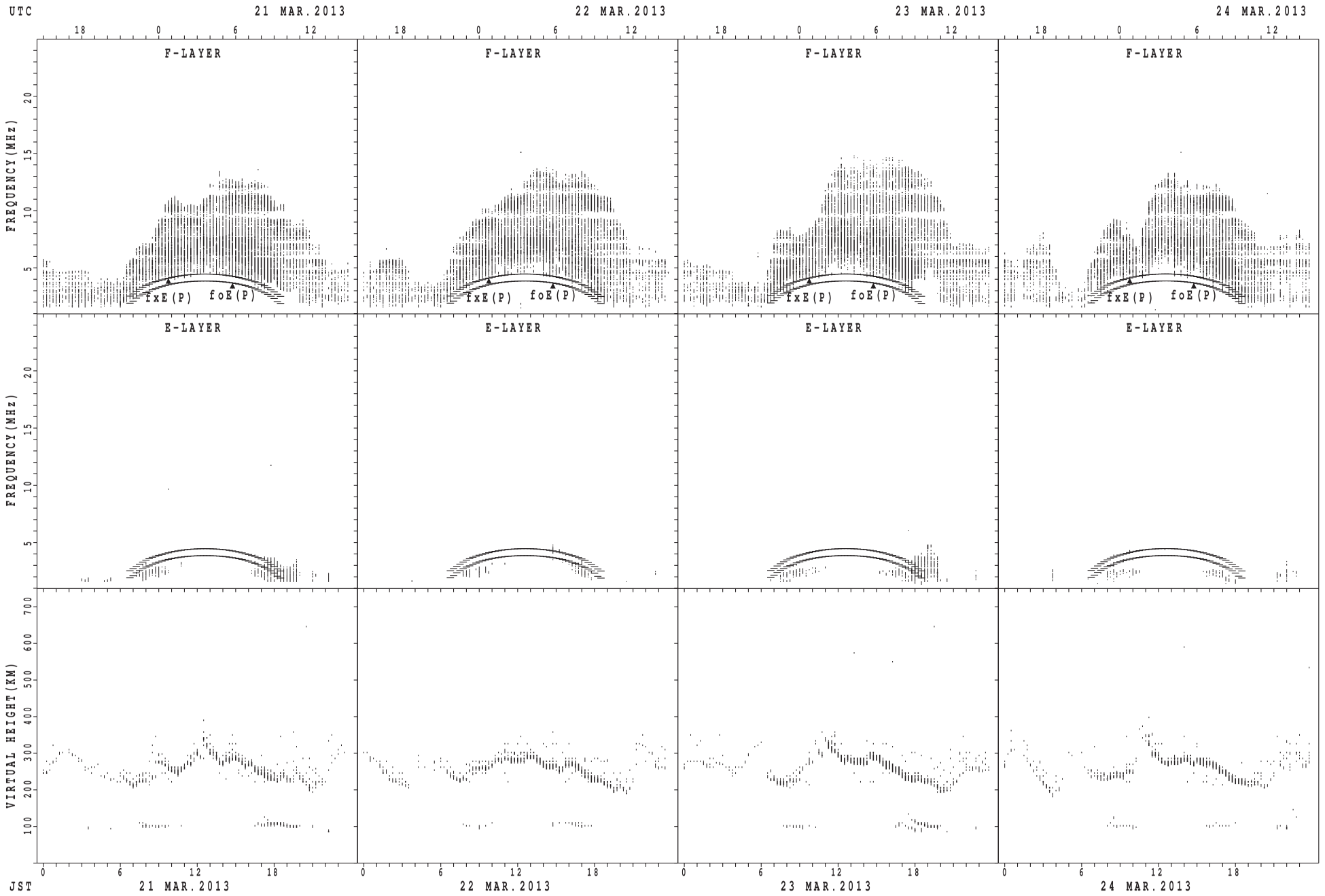
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



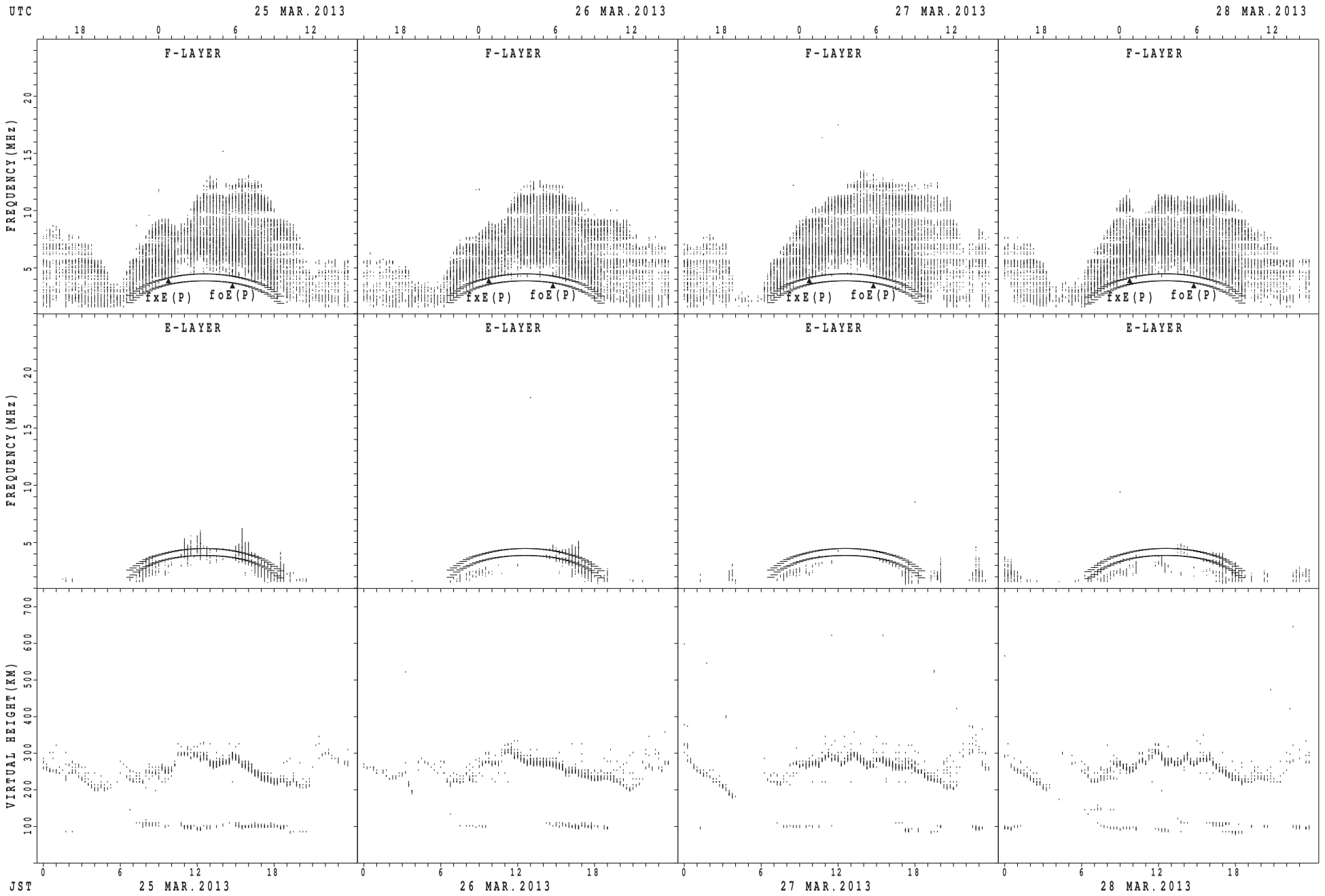
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



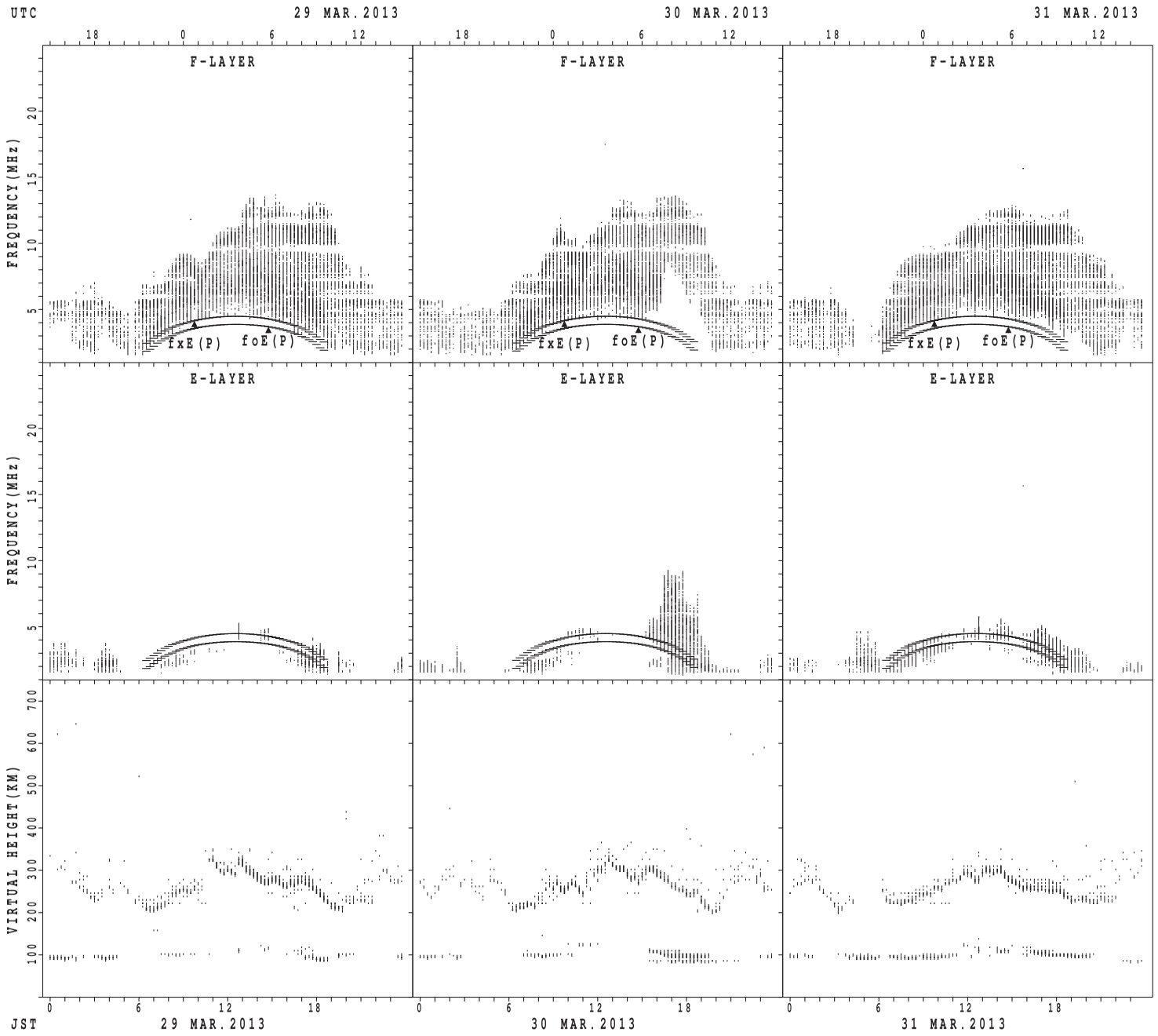
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

MAR. 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							2	18	27	23	8			1	18	30	30	27	10	2				1
MED							256	232	248	244	245			232	246	254	248	246	252	281				282
U Q							256	236	256	254	246			116	254	260	258	254	262	290				141
L Q							256	230	236	238	235			116	244	246	240	238	246	272				141

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	3	2	5	1	2	2	2	7	1	2	1		1	1	1	2	1	6	5	3	3	2	1	2
MED	99	99	97	93	96	93	145	155	105	102	99		91	87	187	106	113	89	91	93	95	106	105	101
U Q	121	103	101	46	99	95	145	157	52	103	49		45	43	93	109	56	91	93	127	119	109	52	105
L Q	95	95	94	46	93	91	145	113	52	101	49		45	43	93	103	56	89	89	91	87	103	52	97

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	25	31	29	3				9	30	29	31	22	7	3	1		
MED							241	238	234	240	254				264	255	254	246	241	248	256	280		
U Q							244	248	240	250	266				272	264	264	254	246	252	256	140		
L Q							238	230	230	231	242				256	252	249	238	232	240	246	140		

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	3	2	1	1	2		9	1		1		1	2	1	3	2	1	9	14	7	5	8	4	4
MED	97	100	99	103	94		151	161		131		171	92	93	95	90	99	95	94	99	99	101	100	95
U Q	107	105	49	51	97		165	80		65		85	93	46	103	91	49	108	99	103	104	104	102	96
L Q	97	95	49	51	91		144	80		65		85	91	46	89	89	49	88	89	89	90	100	98	93

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							1	6	25	28	17					23	30	30	27	18	3			
MED							252	239	240	246	260					266	257	246	238	243	256			
U Q							126	248	252	252	262					272	264	256	246	252	264			
L Q							126	232	230	234	250					256	254	238	234	232	222			

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	3	3	3	2	2	1	1	8	3	2	3	4	5	3	4	8	8	12	12	11	8	7	7	4
MED	99	93	95	96	91	97	95	150	111	123	119	111	103	99	101	95	95	105	101	95	99	97	99	97
U Q	99	95	97	97	93	48	47	159	131	139	125	112	109	103	106	106	103	107	105	99	102	99	101	98
L Q	95	93	93	95	89	48	47	132	95	107	113	110	97	97	96	95	91	100	95	87	96	93	95	92

MONTHLY MEDIANS OF h'F AND h'Es

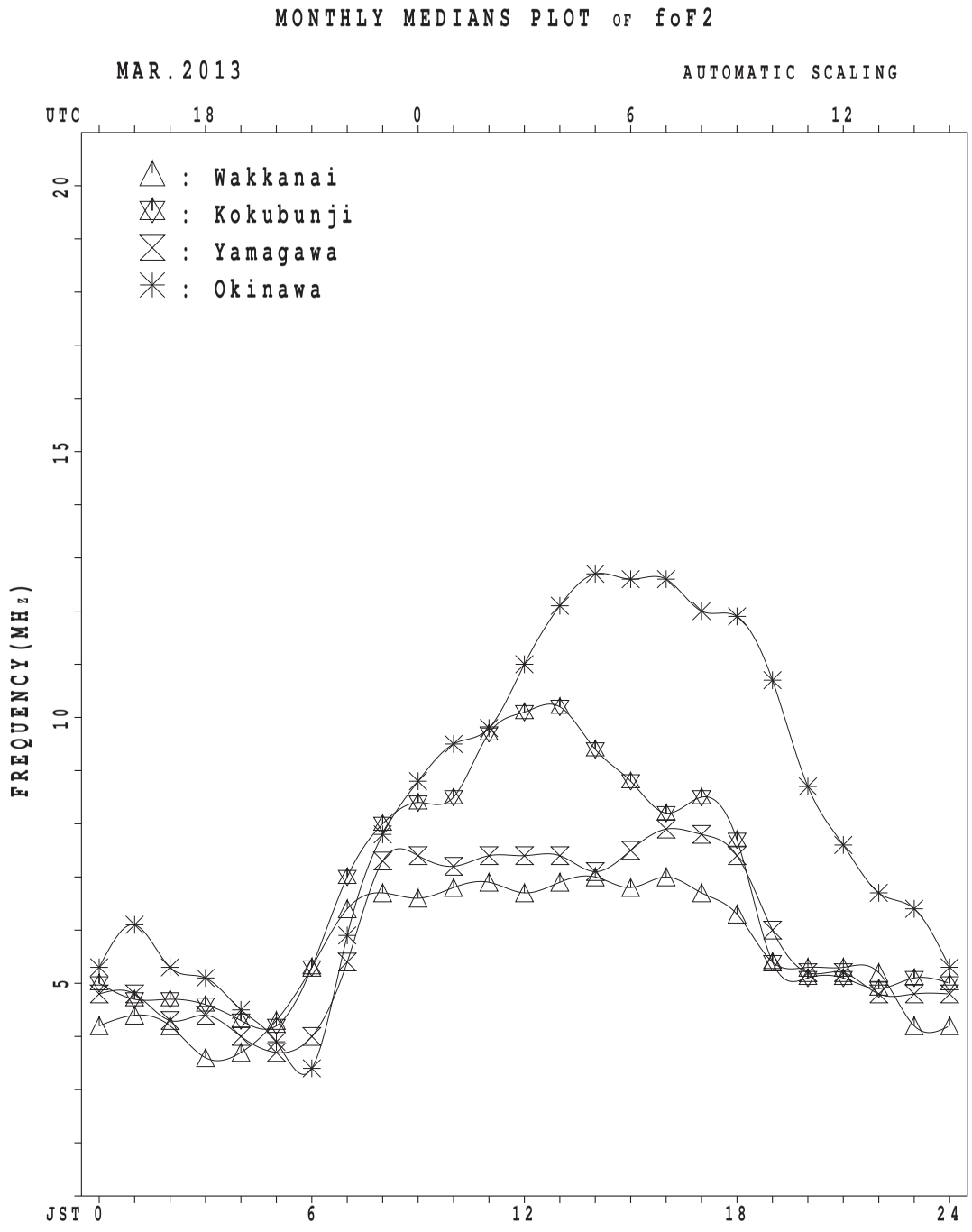
MAR.2013 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	7	9	3	3				7	25	31	26					16	31	31	31	31	23	15	10	9
MED	292	280	290	262				248	240	252	262					286	264	246	238	238	240	256	290	278
U Q	298	297	298	292				252	259	262	272					290	270	254	246	240	256	270	298	296
L Q	276	261	262	230				238	230	242	254					271	258	242	230	230	232	240	272	267

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	4		2	2	2	1	2	3	3	6	10	7	3	6	5	8	11	11	9	6	2	4	4
MED	99	99		97	96	95	97	123	109	107	110	117	115	105	114	107	105	105	101	99	103	101	95	97
U Q	100	103		97	97	95	48	151	179	113	121	129	115	111	117	134	109	109	103	102	105	105	97	100
L Q	96	95		97	95	95	48	95	95	97	105	103	107	101	105	102	99	103	91	96	99	97	92	91


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

IONOSPHERIC DATA STATION Wakkanai

MAR. 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 50	X 49	X 49	X 49	X 49	X 48													X 63	X 57	80	70	70	70
2	X 37	34	35	34	34	34	48												X 65	X 58	X 56	X 50	X 49	X 48
3	X 45	X 47	X 47	X 48	X 47	X 47													X 63	X 55	X 51	X 50	57	X 54
4	X 52	X 51	X 53	X 53	X 50	X 48													X 65	X 53	X 51	X 49	X 49	X 49
5	X 52	X 52	X 52	X 51	X 49	X 47													X 65	X 61	X 58	X 58	X 56	X 55
6	X 54	X 53	X 53	X 51	X 52	X 52													X 65	X 59	X 57	X 55	X 53	X 54
7	X 57	X 56	X 56	X 53	X 51	X 48													X 73	X 58	X 57	X 56	X 56	X 56
8	X 57	X 58	X 58	X 57	X 57	X 49													X 69	X 66	X 66	X 66	X 66	X 67
9	X 68	X 67	X 69	X 68	X 68	X 65													X 79	X 63	X 59	X 59	X 57	X 57
10	X 58	X 57	X 58	X 57	X 53	X 49													X 74	X 70	X 67	X 61	X 61	X 61
11	X 58	X 57	X 57	X 57	X 56	X 57													X 76	X 67	X 62	X 61	X 59	X 59
12	X 59	X 58	X 59	X 59	X 59	X 59													X 69	X 61	X 59	X 59	X 59	X 61
13	X 61	X 61	X 60	X 57	X 57	X 57													X 75	X 66	X 66	X 64	X 64	X 66
14	X 67	X 67	X 66	X 64	X 62	X 61														X 70	X 69	X 70	X 70	X 70
15	X 68	X 67	X 69	X 70	X 69	X 67													X 81	X 82	X 74	X 69	X 66	X 67
16	X 67	X 66	X 65	X 62	X 56	X 55													X 74	X 64	X 65	X 64	X 64	X 64
17	X 59	X 56	X 56	56	X 56	X 57													X 68	X 66	X 69	X 69	X 63	X 56
18	60	62	41	33	X 30	X 32														X 70	X 67	X 61	X 57	59
19	59	60	60	60	X 40	X 36													X 69	X 63	X 63	X 61	X 57	X 53
20	X 51	X 49	X 47	X 46	X 43	X 43														X 67	X 65	X 59	X 55	X 49
21	X 47	X 47	X 47	X 47	X 47	X 41													X 74	X 66	X 64	X 58	X 54	X 53
22	X 53	X 54	X 52	X 51	X 51	X 47														X 61	X 61	X 61	X 59	X 57
23	X 57	X 58	X 57	X 56	X 53	X 53														X 67	X 67	X 61	X 53	X 53
24	X 53	X 52	X 52	X 51	X 51	X 47														X 71	X 69	X 63	X 62	X 60
25	X 57	X 56	X 55	X 57	X 52	X 51														X 63	X 61	X 61	X 60	X 60
26	X 58	X 57	X 56	X 56	X 55	X 52														X 66	X 66	X 65	X 62	X 60
27	X 61	X 60	X 58	X 58	X 57	X 58														X 75	X 69	X 67	X 63	X 68
28	X 67	X 62	X 61	X 58	X 54	X 53														X 69	X 67	X 65	X 58	X 57
29	X 57	X 55	X 55	X 54	X 54															X 72	X 69	X 69	X 69	X 67
30	X 67	X 56	X 56	X 56	X 56															X 74	X 72	X 70	X 65	X 60
31	X 60	X 60	X 58	X 59	X 54															X 77	X 75	X 68	X 64	X 61
	00	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	28	1												18	31	31	31	31	31
MED	X 58	X 57	X 56	X 56	X 53	X 50	48												X 69	X 66	X 66	X 61	X 59	X 59
U Q	X 61	X 60	X 59	X 58	X 56	X 57													X 74	X 70	X 69	X 67	X 64	X 64
L Q	X 53	X 52	X 52	X 51	X 49	X 47													X 65	X 61	X 59	X 59	X 56	X 54

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	43	42	42	42	42	41	45	69	76	75	J R 85	R 94	J R 93	76	R 85	R 78	74	69	56	R 50	F 60	F 55	F 55	F 51
2	30	24	Z 26	Z 26	F 24	F 24	F 38	73	71	J R 78	U R 101	U R 90	U R 78	U R 83	75	71	72	71	59	52	49	44	42	41
3	38	40	40	41	40	40	42	57	66	73	R 78	U R 79	R 100	77	79	73	73	70	56	49	45	43	R 46	47
4	46	45	47	46	44	42	46	59	67	70	R 73	U R 78	Y	U R 75	76	72	R 82	76	58	47	45	42	42	42
5	45	45	45	44	42	40	48	58	65	70	U Y 77	76	Y	Y	75	76	74	68	57	55	52	51	49	48
6	47	46	46	44	45	45	54	65	71	72	76	J R 85	R 77	78	R 78	79	79	77	58	52	51	48	46	48
7	50	50	49	46	44	41	50	65	73	72	Y	Y 90	U R 80	78	78	72	77	76	66	52	50	49	49	49
8	50	51	51	50	50	42	53	64	73	R 74	U R 88	U R 80	U R 91	J Y 92	Y	76	R 77	74	62	59	59	59	59	60
9	62	61	62	61	61	58	65	71	R 74	76	R 92	Y	Y	U Y 78	U Y 82	87	82	74	72	56	53	52	50	50
10	51	50	51	50	46	42	55	69	U R 69	U Y 78	U Y 82	U R 98	Y	Y	J R 77	73	73	72	67	63	60	54	54	54
11	51	50	50	50	49	50	59	72	75	U Y 77	J R 93	U Y 100	U Y 79	J R 93	U R 79	77	75	72	69	60	57	55	53	52
12	52	51	52	52	52	52	60	70	R 76	J Y 85	J Y 87	J Y 89	Y	U Y 98	77	R 78	75	72	62	54	53	52	52	54
13	54	55	53	50	50	50	60	70	R 74	U Y 79	U Y 80	U R 92	Y	U Y 81	U Y 83	79	80	72	68	59	58	57	57	59
14	60	60	59	57	55	54	61	65	R 75	82	78	U Y 95	Y	U Y 82	U R 80	72	R 78	80	68	62	63	63	63	63
15	61	60	62	63	62	60	69	72	U Y 76	100	U R 88	U R 100	U Y 92	Y	U R 78	80	82	78	75	75	67	63	60	60
16	60	59	58	55	49	48	62	75	R 76	82	J Y 86	J Y 92	J Y 91	R 80	U Y 80	J R 91	R 89	76	67	58	58	57	57	57
17	52	49	49	48	49	50	66	R 76	R 77	86	Y	Y	Y	U R 94	R 82	R 80	79	71	61	59	63	62	56	49
18	F 48	F 49	Z 34	22	23	25	49	56	52	60	58	R 74	77	U R 75	J R 73	U Y 78	74	71	70	63	60	54	50	50
19	F 50	F 50	F 46	F 45	33	29	46	54	64	R 75	R 73	U Y 77	R 81	J R 88	R 85	76	76	70	62	56	56	54	50	46
20	44	42	40	39	36	36	R 54	64	67	76	U R 75	U Y 77	77	J Y 81	U Y 77	74	77	74	65	60	58	52	48	42
21	40	40	40	40	40	35	52	59	72	R 72	J R 93	U Y 77	U Y 85	J R 91	J R 87	R 79	77	76	67	59	57	51	47	46
22	46	47	45	44	44	40	52	64	72	R 84	U R 82	Y	U Y 78	U Y 82	J R 87	77	78	74	64	54	54	54	52	50
23	50	51	50	49	46	46	V 62	68	74	U Y 79	78	U Y 83	Y	U Y 84	76	70	72	69	68	60	60	54	46	46
24	46	45	45	44	44	40	R 54	56	68	U R 75	Y	J R 90	J R 92	Y	U Y 78	74	73	70	70	64	62	56	55	53
25	50	49	48	50	45	44	54	58	68	70	70	U R 81	J Y 81	U Y 80	78	74	72	71	66	56	55	55	52	53
26	51	50	49	49	48	45	55	62	70	U Y 79	78	R 78	75	R 97	76	75	72	70	66	59	59	58	55	52
27	54	53	51	51	50	51	61	60	65	64	73	76	75	76	75	76	71	74	78	68	62	60	56	61
28	61	55	54	51	47	46	61	H 63	74	67	U Y 78	U R 88	U Y 103	J R 91	Y	72	70	69	R 73	62	60	58	52	50
29	50	47	48	47	47	47	58	68	66	70	77	U Y 78	R 77	U R 78	U Y 81	U R 78	74	74	76	65	62	62	62	60
30	60	49	49	49	49	54	64	73	76	J R 81	J R 93	Y	J Y 91	R 94	U Y 80	R 77	78	R 77	75	67	65	63	58	53
31	53	53	51	52	47	44	61	62	72	U Y 77	Y	84	U Y 84	U Y 85	R 89	R 79	74	75	74	70	68	61	57	54
	00	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	27	22	27	29	31	31	31	31	31	31	31	31	31
MED	50	50	49	49	46	44	55	65	72	76	78	U R 84	81	82	78	76	75	72	67	59	58	55	52	51
U Q	54	53	51	51	49	50	61	70	75	79	R 88	U R 92	91	R 91	R 82	79	78	76	70	63	62	59	57	54
L Q	46	45	45	44	42	40	50	59	67	72	76	78	77	78	76	73	73	70	62	54	53	52	49	48

MAR. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	U L 436	L	U L 480	L	L	L								
2									L	L	L	U L 444	L	U L 448	L	L	260							
3									L	U L 404	428	L	U L 456	L	L	L								
4										L	L	L	L 468	L	L	L	L							
5								252		L	L	U L 468	L 464	L	L	L	L							
6									L	L	L	U R 440	L	L	L	L	L							
7								256		L	L 468	U L 464	L	L	U L 476	L	L							
8											U L 488	L	L 488	L	L	L	L							
9								L 284	L	L	L	U L 456	U L 468	U L 464	L	L								
10								L		L	L	U L 500	U L 492	U L 492	L	L								
11									L	L	U L 456	L 476	L	L 476	L	L								
12										L	U L 496	L 492	L	U L 504	L	L								
13									L	L	L	L	L	L	L	L								
14									L	L	L	U L 500	L	L	L	L	L							
15									L	L	L	U L 476	L	L	U L 476	L	L							
16									L	L	L	U L 496	L	U L 484	U L 460	L	L							
17								304		L	L	U L 484	U L 496	U L 496	L	L								
18									L	L 452	L	484	484	L U L 484	L	L	L							
19									L	L		L	L	U L 436	L	L	L							
20								288		L 432	U R 440	L	L	L	L	L	L							
21									L	U L 456	L 476	L 476	L 476	U L 464	L	L								
22										L	U L 464	U L 476	U L 476	L 476	L	L	L							
23								L	L	L	L	L 496	A	L 480	L	L	L							
24								L	U L 416	U L 412	U L 456	U L 464	U L 472	L 468	U L 464	L	L							
25							216		L	U L 436	U L 472	A 468	L 464	L 460	U L 456	L	L							
26							224		L	L 444	L	L	L	R 476	L	L	U L 344							
27									L	U L 480	L 472	U L 476	L 476	U L 476	U L 476	L	L							
28									L	L	U L 452	U L 468	L 476	U L 476	U L 476	L	L							
29							232		L	L	U L 492	L 492	L 492	U A 492	L 484	L								
30									L	U L 452	U L 496	U L 496	U L 504	U L 496	L	L	L							
31							232	284		L	U L 492	L	L	U R 492	U L 492	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							4	6	1	9	16	22	17	20	9		2							
MED							228	284	U L 416	U L 444	U L 470	U L 476	L 476	U L 476	U L 476		302							
U Q							232	288		U L 454	U L 490	U L 492	U L 490	U L 492	U L 480									
L Q							220	256		U L 422	U L 454	U L 468	L 468	U L 466	U L 462									

MAR. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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							B	208	284	U A 288	312	328	336	324	304	284	240	A						
2							J R 168	216	260	A	A 304	312	332	328	312	296	208	172						
3							B	220	256	296	312	328	A	A	316	300	252	A						
4							B	228	260	A	A	R 352	356	344	316	284	244	188						
5							172	204	H 284	R	324	360	356	344	324	304	244	U R 172						
6							B	232	280	316	R 324	340	352	340	332	312	264	184						
7							152	204	276	304	328	340	332	336	316	300	252	196						
8							172	248	300	312	328	U A 328	352	356	328	296	248	180						
9							U R 172	216	272	308	336	R 348	352	344	332	300	256	200						
10							J R 172	228	R 284	A	A	336	344	344	332	308	272	188						
11							J R 188	240	296	316	344	356	352	352	336	308	260	196						
12							176	236	276	308	348	356	364	352	340	316	264	208						
13							176	224	292	316	340	R 352	A	348	324	296	268	196						
14							200	224	276	300	336	R 332	356	352	340	328	276	A	A					
15							196	228	292	332	348	352	R 368	356	344	308	284	228						
16							208	236	292	312	340	356	360	356	344	316	264	200						
17							184	228	292	332	A	340	360	352	332	312	268	208						
18							A	228	284	320	A 328	R 344	356	R 344	324	300	268	204	B					
19							196	236	280	308	R 356	356	R 360	344	328	308	260	208						
20							200	240	284	316	R 336	U R 344	340	352	344	320	268	220	B					
21							208	268	296	316	340	U R 344	R 348	344	316	304	252	208						
22							196	252	300	320	332	348	356	344	324	304	264	216	U R 228					
23							188	248	296	U A 312	A	340	A	332	320	300	256	200	B					
24							188	236	296	332	A	R 344	352	348	332	300	252	208	B					
25							176	244	292	U R 300	R 332	348	352	348	332	300	252	A	B					
26							164	240	284	296	312	R	348	348	328	300	260	204	B					
27							200	256	292	316	324	348	348	344	328	292	276	212	B					
28							220	240	276	308	U A 316	U A 320	R 348	R 348	336	292	252	224	B					
29						J R 136	196	252	292	R 328	U A 328	A	R	316	336	304	272	224	A					
30						B	196	252	296	320	R 324	U A 332	U R 332	336	336	308	276	224	B					
31						B	200	240	296	328	344	R 360	360	A	336	308	U A 276	A 208	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						1	26	31	31	27	26	29	27	29	31	31	31	27	1					
MED						J R 136	188	236	284	316	330	344	352	344	332	304	260	204	U R 228					
U Q							200	244	296	320	340	352	356	352	336	308	268	212						
L Q							172	224	276	308	324	334	348	342	324	300	252	196						

MAR. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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 15	E B 15	J A 28	J A 19	J A 18	E B 15	J A 15	G	G 18	33	36	35	39	36	34	32	26	J A 25	J A 16	E B 16	E B 13	E B 13	E B 15	J A 15
2	J A 16	J A 14	J A 25	27	J A 21	J A 20	G	G 20	26	35	35	37	G 27	36	34	31	26	19	J A 19	J A 16	E B 16	J A 16	E B 15	24
3	J A 22	J A 15	J A 13	20	20	22	E B 15	G	28	32	34	36	J A 34	J A 45	G 22	G 20	G 20	J A 27	E B 15	E B 12	E B 12	E B 12	E B 12	E B 14
4	E B 14	E B 14	J A 19	J A 16	J A 16	E B 14	E B 14	G	G 26	J A 31	J A 31	39	38	G	34	G	G	21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
5	E B 13	E B 12	J A 17	E B 12	E B 12	E B 12	G	26	G	G	G 31	G 28	G 32	38	G 18	G 17	G	21	E B 12	E B 12	E B 14	E B 14	E B 14	E B 14
6	E B 15	E B 15	E B 15	J A 15	E B 15	E B 15	E B 15	G	33	G	38	37	G	G	G	35	G	G	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14
7	E B 14	E B 14	E B 14	E B 14	19	E B 14	G	24	G	32	G 32	G 29	38	G 22	G	G	G	G 18	E B 11	22	J A 20	E B 11	E B 11	E B 11
8	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	33	36	36	40	G 24	G 24	G 29	G	20	E B 12	J A 13	E B 12	E B 12	E B 12	E B 12
9	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	24	G	33	38	39	38	G	36	32	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
10	J A 20	E B 15	J A 16	J A 16	J A 17	J A 13	G	G	G	35	35	34	G 26	G 28	G 23	32	G 19	21	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14
11	E B 13	E B 14	J A 19	J A 19	E B 14	E B 14	G	G	G	G	G 30	G 31	38	38	G 23	G 19	G	G	J A 16	E B 17	E B 12	20	18	E B 10
12	E B 12	E B 13	E B 12	E B 12	E B 12	E B 12	G	G	30	34	38	G	40	37	G	G	27	G	E B 15	J A 16	E B 15	E B 15	18	18
13	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15	G	26	G	35	38	38	37	G 29	G 23	G	G	G	E B 14	J A 18	E B 13	E B 13	E B 16	E B 16
14	20	20	J A 29	E B 15	E B 15	E B 15	G	28	30	34	36	38	G	G 28	G	34	G 23	25	J A 30	J A 20	E B 13	21	21	J A 17
15	19	E B 12	J A 14	E B 12	E B 13	E B 12	G	27	G	G 31	G	G 31	G	G	G 28	G 22	G	G	E B 16	E B 16	E B 14	E B 14	E B 14	E B 14
16	J A 17	22	20	J A 18	J A 18	E B 15	G	27	G 24	34	G 28	G 30	G 27	G	G	G	29	G	J A 19	J A 19	J A 15	E B 14	E B 14	E B 14
17	E B 15	E B 15	E B 15	E B 15	E B 13	E B 13	G	26	G	G	37	G	41	38	G	G	G 18	J A 19	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16
18	E B 16	J A 19	J A 24	E B 12	J A 12	E B 14	19	26	G	35	35	G 30	40	G 26	G 25	G 24	29	G	E B 12	E B 12	E B 14	E B 14	E B 14	E B 14
19	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	G	28	32	36	38	40	40	38	38	G	G	G 20	E B 16	E B 15	E B 13	J A 19	E B 13	J A 18
20	E B 13	J A 19	E B 13	E B 13	E B 13	E B 13	G	26	32	34	37	G	G 33	G 26	G 26	G	G	G	J A 19	E B 14	E B 14	E B 14	E B 14	E B 14
21	E B 14	21	E B 14	E B 14	E B 14	E B 14	G	G	G	33	G	G	G	G	35	32	G	21	J A 31	J A 26	J A 26	J A 21	E B 12	J A 26
22	J A 17	J A 17	E B 12	E B 13	E B 12	E B 12	G 18	G	G	G 31	G	38	G	G	G 27	G	G	22	G	E B 14	E B 14	E B 14	E B 14	E B 14
23	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G	28	G	36	36	G 34	53	36	37	G 20	G	24	E B 14	18	E B 17	E B 16	E B 16	E B 16
24	E B 16	J A 17	E B 15	E B 15	E B 15	E B 15	G	27	33	G	39	39	37	38	36	G	G	G	J A 15	J A 15	J A 15	E B 15	E B 15	E B 15
25	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	20	26	G 22	G 26	G 26	G 32	37	G	37	G	28	J A 22	J A 21	J A 24	E B 19	E B 14	E B 15	E B 15
26	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	20	26	G	34	34	G 31	G 32	38	36	34	28	23	J A 16	E B 14	J A 13	E B 14	E B 14	J A 13
27	E B 15	19	18	E B 15	E B 15	E B 14	G	28	31	35	39	G 30	39	38	38	33	G	G 20	E B 11	J A 17	19	E B 13	E B 15	E B 15
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 20	27	31	32	35	35	39	40	37	G 26	G	G	E B 14	J A 19	E B 14	E B 14	E B 14	E B 14
29	E B 13	E B 13	E B 13	18	20	G	22	28	30	37	35	35	G 32	G 26	G 24	34	G 22	J A 23	J A 24	25	E B 16	E B 12	E B 12	E B 12
30	E B 14	E B 14	J A 24	E C 23	E B 14	E B 14	G	G	32	38	36	37	38	38	38	39	32	G 21	E B 13	J A 29	J A 27	J A 20	J A 18	E B 15
31	E B 13	J A 15	E B 12	18	J A 19	E B 12	22	28	32	35	40	G 31	G	36	36	35	35	24	J A 16	17	J A 25	J A 25	17	J A 12
	00	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 15	E B 15	E B 15	E B 15	E B 14	G	26	G	33	35	34	37	G	G	G	G	G	E B 15	16	E B 14	E B 14	E B 14	E B 14
U Q	J A 16	17	J A 19	18	J A 17	E B 15	G	27	31	35	38	37	39	38	36	32	26	22	J A 16	J A 19	16	J A 16	16	16
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	G 31	G	G 29	G 25	G 29	G	G	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14

MAR. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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 15	E B 15	E B 16	E B 15	E B 15	E B 15	E B 14	G	G 15	30	32	33	37	34	34	32	26	E B 17	E B 16	E B 16	E B 13	E B 13	E B 15	E B 15
2	E B 14	E B 12	E B 12	E B 12	E B 13	E B 14	G	G 13	G 13	33	34	33	G 22	35	32	31	22	G 17	E B 11	E B 16	E B 16	E B 15	E B 15	17
3	16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	27	G 30	33	34	33	34	G 20	G 19	G 18	18	E B 15	E B 12	E B 12	E B 12	E B 12	E B 14
4	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G 12	29	29	37	37	G	34	G	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
5	E B 13	E B 12	E B 12	E B 12	E B 12	E B 12	G	G 20	G	G	G 24	G 23	G 23	35	G 18	G 16	G	19	E B 12	E B 12	E B 14	E B 14	E B 14	E B 14
6	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	30	G	34	34	G	G	G	32	G	G	E B 15	E B 14	E B 14	E B 14	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	G	21	G	32	G 29	G 24	35	G 21	G	G	G	G 17	E B 11	E B 12	E B 12	E B 11	E B 11	E B 11
8	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G 28	33	G 33	37	G 23	G 20	G 20	G	G 18	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12
9	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	22	G	33	36	36	38	G	35	30	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
10	E B 14	E B 15	E B 13	E B 13	E B 13	E B 13	G	G	G	34	33	G 27	G 24	G 24	G 21	32	G 18	20	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14
11	E B 13	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G 17	G 20	36	36	G 20	G 17	G	G	E B 12	E B 12	E B 12	E B 10	E B 10	E B 10
12	E B 12	E B 13	E B 12	E B 12	E B 12	E B 12	G	G	28	31	37	G	38	37	G	G	27	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
13	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15	G	24	G	32	36	36	35	G 25	G 23	G	G	G	E B 14	E B 12	E B 13	E B 13	E B 16	E B 16
14	E B 15	E B 15	E B 20	E B 15	E B 15	E B 15	G	26	29	34	G 33	36	G	G 28	G	G 31	G 23	22	18	E B 13	E B 13	E B 13	E B 13	E B 13
15	E B 12	E B 12	E B 12	E B 12	E B 13	E B 12	G	24	G	G 24	G	G 24	G	G	G 21	G 17	G	G	E B 16	E B 16	E B 14	E B 14	E B 14	E B 14
16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	25	G 22	34	G 27	G 27	G 25	G	G	G	27	G	E B 12	E B 11	E B 11	E B 14	E B 14	E B 14
17	E B 15	E B 15	E B 15	E B 15	E B 13	E B 13	G	G 21	G	G	32	G	36	36	G	G	G 16	G 15	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16
18	E B 16	E B 13	E B 12	E B 12	E B 13	E B 14	17	G 22	G	G 32	G 32	G 28	38	G 22	G 21	G 20	G 26	G	E B 12	E B 12	E B 14	E B 14	E B 14	E B 14
19	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	G	26	30	36	U Y 38	37	39	38	37	G	G	G 18	E B 16	E B 15	E B 13	E B 13	E B 13	E B 13
20	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	G	G 24	G 28	33	35	G	G 31	G 23	G 22	G	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	32	G	G	G	G	34	32	G	G 18	18	18	21	E B 12	E B 12	E B 12
22	E B 12	E B 12	E B 12	E B 13	E B 12	E B 12	G 16	G	G	G 18	G	35	G	G	G 24	G	G	G 17	G	E B 14	E B 14	E B 14	E B 14	E B 14
23	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G	26	G	G 30	32	G 29	53	35	35	G 19	G	22	E B 14	15	E B 17	E B 16	E B 16	E B 16
24	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 23	30	G	34	36	36	35	34	G	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
25	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 18	G 24	G 18	G 18	G 22	G 22	36	G	G 36	G	27	20	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15
26	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	18	25	G	32	32	U G 31	G 29	G 35	35	33	28	22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
27	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14	G	27	30	33	37	G 27	37	37	34	32	G	G 18	E B 11	E B 14	E B 14	E B 13	E B 15	E B 15
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 19	24	30	G 31	33	32	36	38	35	G 20	G	G	E B 14	E B 16	E B 14	E B 14	E B 14	E B 14
29	E B 13	E B 13	E B 13	E B 13	E B 13	G	G 19	26	30	35	35	34	U G 31	G 23	G 21	31	G 18	G 18	21	19	E B 16	E B 12	E B 12	E B 12
30	E B 14	E B 14	E B 14	E C 23	E B 14	E B 14	G	G	31	34	34	36	37	37	38	37	31	G E 19	B 13	27	22	19	E B 15	E B 15
31	E B 13	E B 12	E B 12	E B 12	E B 12	E B 12	20	G 24	G 29	G 32	38	G 28	G	33	35	35	31	23	E B 17	E B 11	19	17	E B 11	E B 11
	00	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	G	G	G	G	33	G	35	G	G	G	G	G	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	G	24	29	33	35	35	37	35	35	32	G	G	16	E B 16	E B 15	E B 14	E B 15	E B 15
L Q	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	18	G 24	G 28	G 30	G 32	G 27	G	G 28	G 21	G 20	G	G 18	E B 12	E B 12	E B 13	E B 13	E B 13	E B 13

MAR. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	15	15	16	15	15	15	14	14	14	13	13	13	14	14	15	15	16	17	16	16	13	13	15	15
2	14	12	12	12	13	14	14	10	10	10	12	8	8	7	10	11	11	11	11	16	16	15	15	15
3	15	15	15	15	15	15	15	15	15	17	16	16	16	16	15	15	15	15	15	12	12	12	12	14
4	14	14	14	14	14	14	14	14	14	14	14	14	15	15	15	15	15	15	14	14	14	14	14	14
5	13	12	12	12	12	12	12	12	14	14	14	16	15	15	13	13	13	12	12	12	14	14	14	14
6	15	15	15	15	15	15	15	15	16	16	16	17	16	16	15	15	15	15	15	14	14	14	14	14
7	14	14	14	14	14	14	10	9	9	12	13	12	12	12	14	14	14	11	11	12	12	11	11	11
8	14	14	14	14	14	14	13	13	13	13	14	14	14	14	14	14	14	14	12	12	12	12	12	12
9	14	14	14	14	14	14	14	14	14	14	13	13	12	12	12	14	14	14	14	14	14	14	14	14
10	14	15	13	13	13	13	16	14	14	14	14	14	14	19	15	14	14	14	14	15	14	14	14	14
11	13	14	14	14	14	14	16	14	14	14	14	14	14	14	15	14	13	12	12	12	12	10	10	10
12	12	13	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
13	14	14	14	14	15	15	15	15	15	21	20	22	22	21	14	14	14	14	14	12	13	13	16	16
14	15	15	15	15	15	15	15	15	14	16	16	16	12	11	12	12	11	11	11	13	13	13	13	13
15	12	12	12	12	13	12	12	12	12	15	15	17	16	16	16	16	16	16	16	16	14	14	14	14
16	15	15	15	15	15	15	15	15	15	12	12	12	17	16	16	16	14	14	12	11	11	14	14	14
17	15	15	15	15	13	13	13	13	17	14	14	14	14	16	15	15	15	15	15	16	16	16	16	16
18	16	13	12	12	13	14	14	14	14	14	18	17	18	17	16	16	18	12	12	12	14	14	14	14
19	14	14	15	14	14	14	14	13	13	12	13	12	12	13	16	16	16	16	16	15	13	13	13	13
20	13	13	13	13	13	13	13	13	13	13	20	20	20	20	17	16	13	12	14	14	14	14	14	14
21	14	14	14	14	14	14	14	12	12	12	10	12	15	16	13	12	12	14	14	13	12	12	12	12
22	12	12	12	13	12	12	16	12	12	13	12	12	15	13	17	15	15	15	15	14	14	14	14	14
23	15	15	15	15	15	16	14	14	14	12	12	12	13	12	14	14	14	15	14	15	17	16	16	16
24	16	15	15	15	15	15	15	14	13	13	15	15	15	15	15	15	15	15	15	15	15	15	15	15
25	14	14	14	14	14	14	14	14	13	13	14	14	13	12	14	14	14	14	14	14	14	14	15	15
26	16	15	15	15	15	15	14	16	14	14	14	14	14	14	14	13	12	13	14	14	14	14	14	14
27	15	15	15	15	15	14	14	14	12	12	12	14	14	12	11	20	11	11	11	14	14	13	15	15
28	14	14	14	14	14	14	15	15	15	14	16	11	11	11	11	10	14	14	14	16	14	14	14	14
29	13	13	13	13	13	13	13	13	12	11	16	16	16	15	15	15	14	16	16	16	16	12	12	12
30	14	14	14	EC 23	14	14	14	11	11	11	12	11	11	11	11	11	12	13	13	15	15	15	15	15
31	13	12	12	12	12	12	13	12	12	12	16	15	15	15	15	14	14	14	17	11	11	11	11	11
	00	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	13	14	14	14	15	15	14	14	14	14	14	14	14	14	14
U Q	15	15	15	15	15	15	15	14	14	14	16	16	16	16	15	15	15	15	15	15	14	14	15	15
L Q	13	13	13	13	13	13	13	12	12	12	13	12	13	12	13	14	13	12	12	12	13	13	13	13

MAR. 2013 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	303	301	301	301	301	314	338	357	347	349	R	R 328	J R 328	355	R 344	R 351	349	374	308	R 254	F 309	F 305	F 305	F 340
2	333	253	Z 285	Z 285	F 302	F 297	F 330	371	361	J R 381	U R 338	U R 358	U R 354	U R 358	341	358	357	345	321	321	304	303	303	300
3	297	288	295	293	296	298	344	362	364	347	R 357	U R 351	R 352	350	341	345	350	342	333	314	297	284	R 296	286
4	300	306	300	287	291	300	330	351	343	357	R 370	U R 352	Y	U R 355	343	335	R 345	350	348	311	312	312	299	300
5	300	299	301	300	309	304	332	360	349	363	U Y 372	357	Y	Y	361	358	355	343	328	312	298	302	299	304
6	297	297	298	308	306	305	343	365	361	358	344	R	R 344	360	R 346	349	350	359	342	302	296	300	301	288
7	309	307	310	327	305	331	334	355	361	346	Y	Y 337	U R 350	342	342	325	349	353	348	307	287	290	297	292
8	289	289	303	308	306	318	331	362	357	R 370	U R 346	U R 337	U R 342	Y	Y 328	R 346	333	340	303	304	296	297	297	
9	296	300	316	306	325	310	335	351	R 361	352	R 352	Y	Y	U Y 356	U Y 338	341	341	329	324	320	295	300	293	291
10	292	287	320	316	325	305	342	348	U R 348	U Y 378	U Y 365	U R 348	Y	Y	R 328	336	340	324	312	310	306	304	305	
11	312	301	298	289	288	325	334	363	372	U Y 342	R	U Y 348	U Y 361	R	U R 361	343	337	341	316	322	315	310	309	297
12	301	301	309	311	312	320	344	359	R 368	V	Y	Y	Y	U Y 349	336	R 342	343	338	346	307	287	292	291	293
13	305	309	306	292	297	303	343	358	R 362	U Y 362	U Y 357	U R 336	Y	U Y 344	U Y 344	335	347	337	331	315	304	291	295	301
14	302	303	305	314	311	305	348	364	R 366	336	331	U Y 359	Y	U Y 344	U R 340	336	R 338	352	325	321	309	305	299	285
15	305	308	314	306	312	305	325	361	U Y 352	343	U R 330	U R 356	U Y 334	Y	U R 361	322	342	337	332	316	311	280	284	286
16	288	292	298	311	293	293	337	358	R 354	340	Y	Y	Y	R 345	U Y 355	R	R 336	338	331	290	290	287	291	313
17	304	298	296	279	288	288	331	R 354	R 360	355	Y	Y	Y	U Y 348	R 331	R 339	343	335	312	251	258	276	290	276
18	F 270	F 314	Z 263	263	255	251	353	343	315	309	335	R 325	339	U R 348	R	U Y 349	344	332	338	325	321	313	305	290
19	F 263	F 263	F 287	F 280	320	284	356	342	333	R 355	R 366	U Y 348	343	R	R 339	336	355	331	326	300	305	316	317	312
20	291	291	303	305	302	307	R 344	348	352	335	U R 360	U Y 356	355	Y	U Y 356	331	346	344	324	330	309	301	294	288
21	290	281	281	318	321	299	352	328	322	R 345	R	U Y 348	U Y 332	R	R	R 319	330	335	334	303	315	337	313	299
22	299	289	297	302	313	315	346	350	344	R 332	U R 339	Y	U Y 364	U Y 347	R	336	353	334	339	314	302	310	308	293
23	296	290	295	298	299	297	V 348	353	351	U Y 381	325	U Y 341	Y	U Y 353	340	332	343	337	339	308	315	336	297	298
24	298	300	295	303	314	320	R 379	355	346	U R 361	Y	R	R	Y	U Y 369	357	331	322	321	313	319	297	292	299
25	289	287	289	309	337	314	346	347	352	346	345	U R 342	Y	U Y 348	333	327	335	339	346	325	323	305	309	302
26	307	299	302	300	309	315	356	346	344	U Y 357	340	R 338	310	R 340	356	337	329	340	348	312	312	306	291	301
27	298	298	308	316	315	319	360	367	341	345	350	355	358	351	337	333	320	322	337	326	315	302	295	292
28	303	303	308	302	296	302	369	H 312	332	311	U Y 367	U R 322	U Y 338	R	Y	334	339	325	R 345	328	312	306	301	298
29	300	306	294	297	294	318	324	350	360	330	344	U Y 366	R 362	U R 332	U Y 342	U R 357	341	343	331	298	317	297	297	303
30	305	296	287	297	268	315	349	371	359	R	R	Y	Y	R 334	U Y 329	R 346	342	R 333	339	307	303	303	294	297
31	290	291	288	309	309	313	360	356	334	U Y 368	Y	324	U Y 340	U Y 340	R 327	R 349	333	330	338	327	328	325	298	300
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	29	21	23	18	21	25	30	31	31	31	31	31	31	31	31
MED	299	298	298	302	306	305	344	355	352	349	346	U R 348	344	U 348	342	336	343	338	333	312	309	303	297	298
U Q	304	303	306	309	313	315	352	362	361	U 362	U 362	U 356	355	U 354	U 356	349	349	343	340	321	315	310	304	301
L Q	291	289	294	293	296	299	334	348	344	341	338	R 337	U Y 338	343	338	332	336	333	324	303	298	296	294	291

MAR. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	U L 405	L	U L 368	L	L	L								
2									L	L	L	U L 412	L	U L 386	L	L	431							
3									L	U L 399	409	L	U L 385	L	L	L								
4										L	L	L	L 384	L	L	L	L							
5								523		L	L	U L 390	L 393	L	L	L	L							
6									L	L	L	U R 409	L	L	L	L	L							
7								479		L	L 380	U L 390	L	L	U L 354	L	L							
8											U L 373	L	L 376	L	L	L	L							
9								L 443	L	L	L	U L 408	U L 398	U L 401	L	L								
10								L		L	L	U L 371	U L 378	U L 378	L	L								
11									L	L	U L 366	L 377	L	L 377	L	L								
12										L	U L 361	L 364	L	U L 372	L	L								
13									L	L	L	L	L	L	L	L								
14									L	L	L	U L 367	L	L	L	L	L							
15									L	L	L	U L 390	L	L	U L 344	L	L							
16									L	L	L	U L 353	L	U L 362	U L 382	L	L							
17								388			L	U L 380	U L 371	U L 364	L	L								
18									L	L 338	L	359	359	U L 359	L	L	L							
19									L	L		L	L	U L 420	L	L	L							
20								464		L 407	U R 399	L	L	L	L	L	L							
21									L	U L 360	L 361	L 361	L 361	U L 371	L	L								
22										L	U L 374	U L 370	U L 371	L 371	L	L	L							
23								L	L	L	L	L 360	A	L 371	L	L	L							
24								L	U L 398	U L 402	U L 363	U L 388	U L 382	L 386	U L 379	L	L							
25							464		L	U L 397	U L 368	A 375	L 379	L 382	U L 385	L	L							
26							451		L	L 383	L	L	L	R 384	L	L	U L 414							
27									L	U L 374	L 382	U L 378	L 378	U L 378	U L 372	L	L							
28									L	L	U L 393	U L 380	L 372	U L 372	U L 360	L	L							
29							439		L	L	U L 335	L 353	L 353	U A 397	L 378	L								
30									L	U L 406	U L 369	U L 385	U L 380	U L 385	L	L	L							
31							495	445		L	U L 357	L	L	U R 355	U L 355	L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							4	6	1	9	16	22	17	20	9		2							
MED							458	454	U L 398	U L 397	U L 371	U L 378	L 378	U L 378	U L 372		422							
U Q							480	479		U L 404	U L 388	U L 390	U L 383	U L 386	U L 380									
L Q							445	443		U L 367	U L 362	L 364	L 370	U L 371	U L 354									

MAR. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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										238	238	254	252	242	242	242								
2									222	234	250	246	246	246	246	236	232							
3									232	232	232	254	250	252	252	244								
4										246	232	244	250	252	250	246	246							
5								218		222	230	240	240	256	248	248	246							
6									238	228	240	244	244	244	252	252	244							
7								218		228	230	248	248	248	248	248	248							
8											248	248	254	254	254	246	232							
9								220	228	228	244	244	246	246	256	256								
10								228		238	240	242	258	258	258	244								
11									226	226	234	240	240	254	254	246								
12										246	250	250	250	262	242	242 L								
13									236	236	242	250	250	250	250	250								
14									232	242	250	266	258	258	258	244	256							
15									256	256	256	252	252	252	252	252	250							
16									226	234	246	264	248	250	254	256	242							
17								226		234	234	234	262	262	262	252								
18									294	332	280	312	276	276	278	252	234							
19									258	258		278	262	262	262	242	236							
20								226		250	250	264	244	244	252	252	252							
21									268	268	268	268	290	266	258	258								
22										258	258	254	254	254	254	254	254							
23								240	240	240	240	258	258	258	258	258	258							
24								236	250	248	248	248	256	256	256	238	238							
25							212		216	222	264	264	254	254	254	254	254							
26							222		242	246	252	260	264	264	254	254	250							
27									242	260	260	260	260	264	264	264	252							
28									274	246	248	270	262	262	250	250	250							
29							228		234	280	256	256	256	270	270	268								
30									236	244	286	258	264	264	264	264	258							
31							220	220		236	248	258	258	266	266	244								
	00	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	9	20	30	30	31	31	31	31	31	20							
MED							221	226	237	241	248	254	254	256	254	250	249							
U Q							225	232	253	250	256	264	260	262	258	254	253							
L Q							216	219	230	234	240	246	248	250	250	244	240							

MAR. 2013 h'F2 (KM)

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	252	266	266	266	266	224	224	218	218	200	196	196	198	198	214	216	216	216	216	350	Q 276	276	Q 236	224
2	234	324	318	Q 322	322	316	248	224	224	224	198	198	198	198	198	204	206	228	222	222	246	246	266	286
3	286	286	286	282	282	268	234	222	222	204	198	198	196	206	H 184	210	230	230	216	216	230	264	264	280
4	262	262	262	262	264	264	234	H 204	214	214	214	214	206	206	H 204	204	220	220	198	226	236	252	288	288
5	274	274	274	252	254	254	240	174	214	214	202	202	198	186	204	204	212	212	212	224	242	246	246	246
6	246	264	264	262	262	260	226	216	200	200	192	H 192	200	224	210	210	214	214	206	222	236	238	272	274
7	274	266	252	246	246	238	230	162	214	214	212	190	H 178	206	206	206	218	218	218	222	228	272	272	272
8	272	272	264	246	246	242	232	216	216	216	H 198	198	210	222	222	200	220	220	214	230	250	250	262	262
9	258	258	256	256	236	224	224	180	H 192	200	206	204	204	204	204	H 204	224	224	224	222	248	248	262	272
10	272	276	246	244	244	244	232	208	226	226	198	198	196	196	204	204	224	230	222	222	222	234	248	248
11	248	248	258	264	264	242	220	218	204	204	204	208	208	208	208	208	222	222	220	224	224	242	242	254
12	260	262	262	254	250	246	214	212	212	212	204	192	H 194	184	194	194	218	220	220	230	246	266	268	268
13	264	258	258	258	258	260	216	214	212	212	212	212	214	214	214	214	222	222	222	222	230	242	252	252
14	250	252	252	240	240	240	220	220	H 160	198	H 198	212	H 190	202	202	202	230	228	222	222	228	256	256	282
15	262	262	258	258	254	248	232	228	H 206	206	206	206	206	206	206	206	222	222	222	228	218	246	252	262
16	264	264	258	248	248	254	230	224	224	224	224	180	212	212	204	210	H 212	218	214	224	244	262	262	254
17	262	262	280	284	284	274	244	202	216	216	216	216	182	182	196	210	222	222	230	334	324	282	238	254
18	Q 312	Q 236	350	396	386	364	234	234	220	220	220	214	214	214	214	214	222	230	230	230	230	238	238	Q 272
19	Q 262	Q 292	292	290	250	266	222	222	222	226	248	206	206	202	210	208	218	218	218	218	238	238	238	250
20	254	264	264	264	264	264	228	168	214	212	212	198	216	216	204	204	220	220	220	220	226	226	226	284
21	304	304	304	272	232	232	232	232	226	226	214	210	210	210	226	226	226	226	226	226	226	226	236	238
22	274	274	274	270	240	228	218	220	220	220	220	216	202	202	210	214	224	224	216	216	246	246	246	256
23	270	270	270	270	270	270	206	206	206	206	206	188	A	H 186	206	206	216	216	216	226	228	228	252	266
24	286	286	286	284	250	248	206	214	192	A 192	202	202	202	194	194	210	210	220	220	230	230	230	252	254
25	278	278	278	272	224	230	196	204	204	204	198	198	198	198	198	198	198	222	222	222	222	230	242	260
26	260	262	262	262	240	240	180	214	214	200	200	200	200	198	198	198	198	220	220	226	234	238	240	244
27	264	264	264	264	244	242	214	214	204	204	204	204	204	204	204	H 202	208	226	226	226	242	250	256	262
28	252	252	252	252	252	252	226	226	H 202	202	202	204	204	222	210	210	212	222	222	222	232	232	238	254
29	282	282	272	272	268	248	188	234	214	H 198	198	198	198	198	198	H 196	220	230	228	232	232	256	264	264
30	244	242	302	278	292	258	212	214	214	214	H 184	198	H 198	196	A 224	A 244	A 240	240	236	236	256	256	256	256
31	272	272	272	272	260	260	176	190	210	210	242	216	H 188	188	188	218	218	220	220	220	234	234	234	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	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31
MED	264	264	264	264	254	248	224	214	214	212	204	202	201	202	204	206	220	222	220	224	234	246	252	260
U Q	274	276	280	272	266	264	232	222	220	216	214	210	206	210	210	210	222	226	222	230	246	256	262	272
L Q	254	262	258	254	244	240	214	204	204	202	198	198	198	196	198	204	212	220	216	222	228	234	238	252

MAR. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

MAR. 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							B 122	108	108	108	110	110	110	110	110	110	110	A						
2							B 134	132		A	118	118	116	116	116	116	116	120						
3							B 120	120	118	114	114	A	A	102	108	108	108	A						
4							B 140	136	A	A	120	120	116	116	116	116	116	136						
5							172	130	120	120	120	116	116	116	108	108	108	122						
6							B 122	122	106	110	110	110	110	110	110	110	110	110						
7							166	112	112	110	110	110	110	110	110	110	110	140						
8							164	108	108	108	108	108	108	108	108	110	110	120						
9							E B 190	96	96	108	112	112	112	112	112	112	112	112						
10							B 112	112	A	A	112	106	112	112	112	112	112	112						
11							B 118	118	110	116	116	114	114	114	118	114	114							
12							172	114	114	114	112	112	114	110	110	110	110	110						
13							128	112	118	118	118	118	112	112	112	112	112	112						
14							134	112	112	112	112	112	114	114	114	114	114	A	A					
15							152	122	118	118	118	118	102	102	102	110	110	110						
16							130	120	116	112	112	112	112	112	112	112	112	112						
17							134	114	114	114	112	112	112	104	104	104	104	126						
18								122	106	106	A	110	110	110	110	114	114	114	B					
19							142	126	126	122	108	108	108	108	108	108	108	144						
20							144	114	114	114	112	112	112	112	112	112	112	126	B					
21							136	124	112	112	112	112	112	112	114	112	112	130						
22							A 168	112	112	120	108	108	108	108	108	108	108	144	B					
23							120	120	112	112	A	112	A	112	114	116	116	116	B					
24							132	102	102	102		110	110	110	112	112	112	112	B					
25							118	118	118	112	112	112	112	112	112	112	112	A	B					
26							128	120	112	112	112	A	112	112	112	112	112	112	B					
27							118	118	118	118	118	118	120	112	112	112	112	134	B					
28							E A 158	110	110	110	110	110	114	112	112	112	112	112	B					
29						B	114	114	114	110	110	A	A	110	110	110	110	E A 122						
30						B	122	116	114	112	112	106	108	118	118	114	114	126	B					
31						B	114	120	120	114	114	114	108	108	A	108	108	108	A	B					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	23	31	31	28	25	29	28	29	31	31	31	26						
MED						B 114	133	118	114	112	112	112	112	112	112	112	112	116						
U Q							164	122	118	116	114	115	114	112	112	112	112	126						
L Q							122	112	112	110	110	110	109	110	108	110	110	112						

MAR. 2013 h′E (KM)

IONOSPHERIC DATA STATION Wakkanai

MAR. 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	112	102	102	B	102	G	102	106	182	182	198	154	206	212	156	98	98	B	B	B	B	144
2	124	124	106	96	96	92	G	112	112	112	174	190	104	194	194	200	130	94	94	94	B	94	B	96
3	96	96	96	96	96	94	B	G	184	178	164	130	88	88	88	88	88	88	B	B	B	B	B	B
4	B	B	98	98	118	B	B	G	118	112	112	210	180	G	180	G	G	84	B	B	B	B	B	B
5	B	B	100	B	B	B	G	154	G	G	102	98	96	180	88	92	G	150	B	B	B	B	B	B
6	B	B	B	100	B	B	B	G	200	G	178	178	G	G	G	182	G	G	B	B	B	B	B	B
7	B	B	B	B	96	B	G	150	G	130	94	94	162	92	G	G	G	116	B	100	100	B	B	B
8	B	B	B	B	B	B	G	G	G	124	122	120	202	98	98	98	G	142	B	92	B	B	B	B
9	B	B	B	B	B	B	G	150	G	166	194	194	194	G	194	194	G	G	B	B	B	B	B	B
10	100	B	100	100	104	104	G	G	G	104	104	104	104	104	104	160	94	152	B	B	B	B	B	B
11	B	B	92	92	B	B	G	G	G	G	96	96	204	198	96	96	G	G	96	96	B	94	94	B
12	B	B	B	B	B	B	G	G	168	164	184	G	196	176	G	G	180	G	B	90	B	B	92	92
13	B	B	B	B	B	B	G	130	G	136	118	118	118	112	100	G	G	G	B	94	B	B	B	B
14	110	94	94	B	B	B	G	146	138	138	126	172	G	106	G	196	88	88	100	100	B	100	100	110
15	102	B	102	B	B	B	G	164	G	108	G	108	G	G	102	102	G	G	B	B	B	B	B	B
16	102	100	100	100	100	B	G	134	102	134	100	100	100	G	G	G	122	G	100	100	100	B	B	B
17	B	B	B	B	B	B	G	158	G	G	112	G	172	172	G	G	100	100	B	B	B	B	B	B
18	B	120	110	B	110	B	126	124	G	218	192	100	204	98	98	98	116	G	B	B	B	B	B	B
19	B	B	B	B	B	B	G	194	144	144	198	194	194	194	194	G	G	114	B	B	B	114	B	112
20	B	100	B	B	B	B	G	158	136	128	198	G	106	106	106	G	G	G	96	B	B	B	B	B
21	B	100	B	B	B	B	G	G	G	134	G	G	G	G	170	134	G	124	90	90	90	90	B	108
22	108	108	B	B	B	B	152	G	G	104	G	196	G	G	112	G	G	112	G	B	B	B	B	B
23	B	B	B	B	B	B	G	200	G	118	108	108	100	168	192	94	G	160	B	92	B	B	B	B
24	B	92	B	B	B	B	G	160	168	G	98	168	168	172	182	G	G	G	94	94	94	B	B	B
25	B	B	B	B	B	B	186	170	104	104	104	104	174	G	198	G	174	88	88	88	98	B	B	B
26	B	B	B	B	B	B	162	162	G	176	120	100	100	180	190	192	192	198	92	B	92	B	B	94
27	B	98	98	B	B	B	G	164	188	188	208	106	182	182	182	182	G	116	B	106	98	B	B	B
28	B	B	B	B	B	B	142	148	148	132	122	122	184	210	202	106	G	G	B	108	B	B	B	B
29	B	B	B	110	106	G	150	150	162	198	116	116	98	98	98	176	94	94	94	94	B	B	B	B
30	B	B	94	C	B	B	G	G	146	144	144	118	180	174	150	136	132	122	B	122	122	122	108	B
31	B	102	B	102	102	B	152	172	172	140	210	106	G	106	126	126	126	214	88	88	88	104	104	104
	00	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	11	13	10	10	3	8	20	17	26	28	27	25	23	25	20	14	20	12	17	9	7	5	8
MED	102	100	100	100	102	94	151	156	146	134	122	118	172	168	150	135	124	115	94	94	98	100	100	106
U Q	110	108	104	102	106	104	157	164	170	164	183	178	194	180	193	187	156	146	97	100	100	114	106	111
L Q	100	96	95	96	96	92	134	147	115	112	106	104	102	104	99	98	94	94	91	91	91	94	93	95

MAR. 2013 h'Es (KM)

IONOSPHERIC DATA STATION Wakkanai

MAR. 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			F1	F1	F1		L1		L1	C2	HL11	HL11	HL11	HL11	HL11	HL12	HL12	L2	F1					F1
2	F1	F1	F2	F2	F2	F2		L1	L1	L2	HL11	HL11	L1	HL11	HL11	HL11	HL11	LL11	F1	F1		F1		F3
3	F2	F1	F1	F2	F2	F2			HL11	H1	H1	C1	L2	L2	L1	L1	L2	L2						
4			F2	F1	F1				L1	C2	C1	HL11	HL12		HL12			L1						
5			F1					H1			L1	L1	L1	HL11	L1	L1		H1						
6				F1					H1		HL11	HL11				H1								
7					F1			H1		H1	L1	L1	H1	L1				L1		F1	F1			
8										C1	C1	C1	HL11	L1	L1	L1		H1		F1				
9								H1		H1	HL11	HL11	HL11		HL11	HL11								
10	F1		F1	F1	FF11	F1				C2	C2	L1	L1	L1	L1	HL11	L1	H1						
11			F1	F1							L1	L2	HL11	HL11	L1	L1			F1	F1		F1	F1	
12									H1	H1	H1		HL11	HL11			H1			F1			F1	F1
13								H1		H1	C1	C1	C1	L1	L1					F1				
14	F1	F2	F3					H1	H1	H1	H1	HC11		L2		HL11	L2	L2	L2	F1		F1	F1	FF11
15	F1		F1					H1		L1		L1			L1	L1								
16	F2	F2	F1	F1	F1			H1	L1	HL11	L1	L1	L1				CL11		F1	F1	F1			
17								H1			C1		HL11	HL11			L1	L2						
18		F1	F3		F1		C2	C1		H1	HL11	L1	HL11	L1	L1	L1	C1							
19								HL11	HL11	H2	HL11	HL11	H1	H1	H1			L1				F1		F1
20		F2						H1	C2	C1	H1		L1	L1	L1				L1					
21		F1								H1					HL11	HL11		L1	F2	F2	F2	F3		F2
22	F1	F1					L1			L1		HL11			L1			L1						
23								H1		C2	C1	L2	L2	HL11	HL11	L2		HL11		F1				
24		F2						H1	H1		L2	HL11	HL11	HL11	HL11				L1	F1	F1			
25							H1	H1	L1	L1	L1	L1	HL11		HL11		H1	L2	L1	F1	F1			
26							H1	H1		H1	C1	L1	L2	HL11	HL11	HL11	HL11		L1		F1			F1
27		F1	F1					HL11	HL11	HL11	HC11	L1	HL11	HL11	H1	H1		L2		F1	F1			
28							L1	H1	HC11	HC11	C1	C1	H1	HL11	HL11	L1				F1				
29				F1	F1		H1	H1	H1	HL11	C1	C1	L1	L1	L1	HL11	L2	L3	L3	F1				
30			F1						H1	H1	H1	CL11	HL11	HL11	HL11	HL11	CL21	L1		F2	F4	F2	F1	
31		F1		F1	F1		H1	HL11	HL11	HL11	HL11	L1		C1	HL11	CL11	CL21	HL11	L1	F1	F3	F3	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																								

MAR. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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 51	X 47	X 47	X 48	X 49	X 46	X 51												X 73	X 67	X 71	X 70	X 52	X 44
2	X 32	X 36	X 38	X 40	X 38	X 37	X 48								X 87				X 72	X 59	X 55	X 51	X 49	X 49
3	X 49	X 48	X 49	X 49	X 44	X 43	X 52												X 68	X 48	X 46	X 48	X 48	X 49
4	X 49	X 47	X 49	X 48	X 46	X 44	X 54												X 66	X 52	X 53	X 52	X 47	X 47
5	X 50	X 50	X 47	X 49	X 46	X 45	X 52												X 70	X 61	X 61	X 59	X 58	X 57
6	X 58	X 54	X 52	X 50	X 50	X 49	X 56												X 89	X 51	X 52	X 54	X 53	X 54
7	X 57	X 58	X 52	X 51	X 50	X 42	X 49												X 80	X 55	X 51	X 52	X 54	X 52
8	X 54	X 56	X 50	X 50	X 48	X 48	X 54												X 74	X 64	X 62	X 63	X 64	X 60
9	X 60	X 61	X 60	X 61	X 53	X 45	X 56												X 82	X 69	X 57	X 58	X 57	X 56
10	X 58	X 57	X 56	X 52	X 46	X 43	X 52												X 85	X 68	X 63	X 57	X 52	X 53
11	X 54	X 54	X 55	X 56	X 54	X 51	X 61												X 81	X 65	X 61	X 56	X 52	X 55
12	X 56	X 55	X 55	X 54	X 53	X 48	X 58												X 79	X 57	X 56	X 56	X 57	X 57
13	X 59	X 56	X 52	X 52	X 49	X 48	X 62												X 81	X 65	X 62	X 60	X 60	X 61
14	X 62	X 60	X 60	X 56	X 52	X 49													X 92	X 66	X 62	X 61	X 64	X 64
15	X 63	X 60	X 61	X 61	X 56	X 54													X 88	X 84	X 83	X 65	X 63	X 64
16	X 65	X 66	X 62	X 60	X 51	X 47													X 86	X 65	X 61	X 64	X 64	X 67
17	X 56	X 52	X 51	X 50	X 51	X 52													X 75	X 73	X 72	X 85	X 72	X 60
18	X 57	X 65	X 53	X 50	57	X 51													X 84	X 75	X 73	X 68	X 66	X 64
19	X 62	X 61	X 60	X 58	X 54	X 49													X 76	X 62	X 60	X 61	X 57	X 57
20	X 56	X 55	X 54	X 52	X 48	X 48	66												X 93	X 67	X 53	X 55	X 54	X 55
21	X 51	X 48	X 51	X 52	X 51	X 49													X 86	X 68	X 62	X 56	X 50	X 51
22	X 53	X 53	X 52	X 52	X 45	X 44													X 83	X 65	X 54	X 56	X 57	X 58
23	X 56	X 56	X 55	X 54	X 50	X 48													X 93	X 80	X 54	X 55	X 55	X 54
24	X 51	X 52	X 53	X 53	X 46	X 40													X 85	X 72	X 62	X 61	X 59	X 59
25	X 58	X 58	X 56	X 56	X 50	X 47													X 87	X 76	X 52	X 53	X 52	X 54
26	X 54	X 54	X 53	X 51	X 47	X 47													X 82	X 79	X 60	X 57	X 56	X 55
27	X 56	X 55	X 54	X 54	X 49	X 45													X 89	X 91	X 77	X 60	X 61	X 60
28	X 64	X 62	X 60	X 54	X 46	X 45													X 86	X 82	X 63	X 62	X 62	X 61
29	X 61	X 59	X 57	X 58	X 53	X 52													X 97	X 83	X 74	X 65	X 66	X 66
30	X 68	X 56	X 50	X 51	X 51	X 56													X 102	X 76	X 61	X 62	X 64	X 63
31	X 64	X 60	X 59	X 57	X 52	X 48													X 98	X 90	X 80	X 68	X 62	X 64
	00	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	14								1				31	31	31	31	31	31
MED	X 56	X 56	X 53	X 52	X 50	X 48	X 54								X 87				X 84	X 67	X 61	X 59	X 57	X 57
U Q	X 61	X 60	X 57	X 56	X 52	X 49	X 58												X 89	X 76	X 63	X 63	X 63	X 61
L Q	X 53	X 52	X 51	X 50	X 46	X 45	X 52												X 76	X 62	X 54	X 55	X 52	X 54

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	45	41	41	42	43	40	45	63	77	72	85	90	99	103	82	86	78	78	67	61	65	64	46	38
2	26	30	32	34	32	31	42	69	87	88	80	99	111	99	81	88	87	78	66	53	49	45	43	43
3	43	42	43	42	38	37	46	61	78	76	84	92	106	106	86	89	81	78	62	42	40	42	42	43
4	43	41	43	42	40	38	47	71	79	85	81	87	100	99	90	86	80	76	60	46	47	46	41	41
5	44	44	41	43	40	39	46	61	72	80	84	92	82	96	85	80	78	76	64	55	55	53	52	51
6	52	48	46	44	44	43	50	71	82	84	84	84	102	94	89	84	87	93	83	46	46	48	47	48
7	51	52	46	45	44	36	43	65	78	86	83	95	94	86	81	86	83	84	74	49	45	46	47	46
8	48	50	44	44	42	42	48	67	75	76	84	92	100	102	98	88	78	79	68	58	56	57	55	54
9	54	55	54	55	48	39	50	70	80	91	86	98	112	105	98	91	100	88	76	63	51	52	51	50
10	52	51	50	46	40	37	46	78	85	86	96	106	113	97	93	92	80	78	79	62	57	51	46	47
11	48	48	49	50	48	45	55	79	86	84	86	99	113	107	96	95	90	84	75	59	55	50	46	49
12	50	49	49	48	47	42	52	74	82	80	87	100	98	104	98	87	82	84	73	51	50	50	50	51
13	53	50	46	46	43	41	56	70	81	82	80	96	92	100	92	88	81	81	75	59	56	54	54	55
14	56	54	54	50	46	43	56	68	76	84	89	95	96	102	90	76	74	85	86	60	56	55	58	58
15	57	54	55	55	50	48	59	76	91	90	102	97	93	96	90	89	88	94	82	78	77	59	57	58
16	59	59	56	54	45	41	53	76	89	86	89	96	100	106	94	87	82	88	80	59	55	57	58	60
17	50	46	45	44	44	46	61	79	88	88	100	99	109	96	102	88	84	85	69	66	66	78	66	54
18	51	59	47	44	F	45	59	82	74	72	78	102	105	105	100	97	94	87	78	69	67	62	60	58
19	56	55	54	52	48	43	60	68	81	84	104	108	97	104	88	89	90	87	70	56	53	55	51	51
20	50	49	48	46	42	42	F	74	86	83	87	96	98	107	102	85	82	87	87	61	47	49	48	49
21	45	42	45	46	45	43	57	69	73	80	102	103	108	103	100	90	94	90	80	62	56	50	44	45
22	47	47	46	46	39	38	54	70	80	84	97	96	104	111	105	99	84	85	77	59	48	50	51	51
23	50	50	49	47	43	42	61	84	75	73	74	92	110	112	94	82	78	84	86	74	48	49	48	48
24	45	46	46	47	40	34	57	72	71	87	90	98	108	104	94	92	76	77	79	66	56	55	53	53
25	52	52	50	50	44	40	57	73	72	74	80	84	92	96	102	88	75	78	81	70	46	47	46	48
26	48	48	46	45	41	41	58	66	74	73	80	97	104	96	93	81	70	73	76	73	54	51	50	49
27	50	49	48	48	43	39	56	66	74	72	78	88	96	86	79	80	78	80	82	85	71	54	55	54
28	58	56	54	48	40	39	56	78	78	88	91	109	112	103	99	84	77	75	80	75	56	56	55	55
29	55	53	51	51	46	46	60	71	73	81	83	88	95	97	94	93	86	88	91	77	68	59	60	60
30	62	50	44	45	45	50	71	86	87	84	86	114	104	96	90	92	97	101	96	70	55	56	58	56
31	58	54	53	50	46	42	64	74	79	89	94	99	99	97	93	94	94	92	92	84	74	62	56	58
	00	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	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	50	50	47	46	44	41	56	71	79	84	86	96	100	102	93	88	82	84	78	61	55	53	51	51
U Q	55	54	51	50	46	43	59	76	85	86	91	99	108	105	98	92	88	88	82	70	57	57	56	55
L Q	47	46	45	44	40	39	48	68	74	76	81	92	96	96	89	85	78	78	70	56	48	49	46	48

IONOSPHERIC DATA STATION Kokubunji

MAR. 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										L	L	L	L	L	L	L								
2											L	U L 472	L	L		L								
3										L	L	L	U L 512	L	L	L								
4										L	L	L	L	L	A	L	L							
5										L	L	U L 464		L	L	L								
6										L	L	L	U L 516	L	L	L	L							
7										L	L	A	L	L	L	U L 480								
8										L	L	L	L	L	U L 492	L	L							
9										L	L	L	U L 488	U L 476	L	L	L							
10										L	L	U L 520	L	L	L	L	L							
11										L	L	L	460	U L 504	A	L	L							
12										L	L	U L 512	L	U L 516	L	L	L							
13										L	L	U L 520	L	U L 504	L	L								
14										L	L	L	L	U L 512	L	L	L							
15										L	L	L	L	L	U L 500	L								
16										L	L	L	L	L	L	L								
17									L	L	L	L	U L 488	L	L	L	A							
18								A			L	508	L		L	L	L							
19										L	L	L	L	U L 500		U L 472	L							
20									L	L	L	U L 504	L	U L 528	L	L	L							
21									L	L	472		U L 532	L	L	L	L							
22										L	U L 504	U L 484	L	U L 492	A	L	A							
23										L	L	U L 532	L	U L 500	L	L	A							
24									L	U L 476	A	U L 504	A	A	L	A								
25								A		L	L	U L 480	U L 520	U L 476	U L 476	L	L							
26									L	L	U L 500	U L 500	U L 504	L	U L 452	L	L							
27										L	U L 476	U L 524	U L 492	L	L	U L 456	A							
28									L	L	U L 500	U L 508	L	L	L	L								
29										L	L	L	476	U L 496	L	L	L							
30										L	516	U L 496	L	L	L	L	L	A						
31									L	L	L	L	L	U L 520	A	L	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										1	6	15	10	12	4	3								
MED										U L 476	U L 500	U L 504	U L 498	U L 502	U L 484	U L 472								
U Q											504	U L 520	U L 516	U L 514	U L 496	U L 480								
L Q											476	U L 484	488	U L 494	U L 464	U L 456								

MAR. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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								R	R	R	R	R	R	R	R	R	R	B						
2								188	A	A	A	R	R	R		A	A	B						
3								212	R	R	R	A	R	R	R	R	R	U R 204						
4								U R 216	R	R	A	R	R	A	A	R	A	A						
5								U R 232	R	R	R	R	R	R	R	R	R	A						
6								220	R	R	A	A	A	A	R	A	R	B						
7								212	A	A	A	368	R	R	R	A	R	A						
8								216	R	R	R	R	R	R	R	R	R	A						
9								216	R	R	R	R	R	R	A	R	R	A						
10								228	R	R	R	R	R	R	R	A	R	U R 212						
11								224	A	A	A	A	A	A	A	R	R	U R 216						
12								224	R	R	A	R	R	R	R	R	R	R						
13								236	A	A	A	R	A	R	R	R	R	R						
14							B	224	R	A	A	A	R	A	A	R	R	U R 228						
15							B	A	A	A	A	A	R	R	R	R	R	R						
16							B	232	A	R	A	R	R	R	R	R	A	216						
17							B	232	R	A	A	R	R	R	R	A	A	U R 212						
18							B	A	A	A	A	A	R	R	R	R	R	A						
19							B	252	R	A	A	R	A	R	R	A	A	U R 224						
20							B	252	R	R	R	R	U R 348	A	A	A	A	U R 216						
21							B	248	R	R	R	A	R	A	R	A	R	U A 216						
22							B	R	R	A	A	A	R	A	A	A	A	A						
23							B	U R 260	A	R	A	R	R	A	A	A	A	A						
24							B	276	R	A	A	R	A	A	A	A	A	A						
25							B	256	R	R	R	R	R	R	A	A	A	A						
26							B	256	R	A	A	A	R	R	R	A	A	A						
27							160	R	R	A	A	R	R	R	A	A	A	U R 220						
28							B	236	R	A	A	R	R	A	R	A	R	R						
29							B	248	A	A	A	A	A	A	R	A	R	U A 236						
30							B	R	A	A	A	A	R	R	R	R	R	A						
31							B	A	A	A	A	R	R	A	A	A	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							1	24				1	1					11						
MED							160	232				368	U R 348					U R 216						
U Q								250										U R 224						
L Q								218										U R 212						

MAR. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	19	G	G 24	G 28	G 28	G 27	G	G	G	G 29	G 25	21	E B 14	E B 15	E B 15	E B 14	E B 14	E B 15
2	18	19	E B 15	E B 15	E B 15	E B 15	E B 15	27	38	40	40	G	G	G 27	J A 42	37	38	J A 34	J A 20	20	20	E B 15	22	J A 30
3	J A 28	J A 19	E B 15	E B 14	E B 15	20	20	24	G	G 24	G 28	40	G	G	G	G 29	G	G	E B 14	E B 15	E B 16	19	E B 15	E B 15
4	E B 16	E B 15	E B 14	19	E B 15	E B 14	E B 15	G	G 24	G 28	36	G 30	G	J A 44	J A 48	G 23	35	J A 24	J A 21	20	E B 15	E B 16	E B 14	E B 15
5	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	G	G 24	G 27	G 29	G	G	G	G 31	G 30	G 24	26	E B 15	21	J A 31	J A 52	19	E B 14
6	E B 15	E B 15	18	J A 20	J A 21	E B 16	E B 15	26	G 26	G 27	37	38	42	39	G 28	J A 39	G 26	J A 32	J A 40	20	20	E B 14	E B 15	E B 16
7	E B 16	E B 15	E B 16	E B 15	E B 14	E B 14	E B 14	27	37	37	40	43	G	G	G	36	G	22	J A 19	E B 14	20	22	22	J A 20
8	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	26	G 23	G 25	G 28	G 35	G 33	G	G	G	G	24	J A 28	J A 22	J A 55	E B 15	E B 15	E B 15
9	E B 15	E B 14	E B 15	E B 14	E B 14	E B 15	E B 16	26	G 25	G 26	G	G	G	G	40	G 28	G 26	J A 30	E B 14	E B 14	E B 14	24	25	20
10	E B 15	E B 14	E B 15	E B 15	E B 15	E B 14	E B 15	28	G 25	G 28	G 28	G 29	G	G 29	G 30	36	G	G	E B 15	J A 25	22	E B 15	E B 14	E B 15
11	E B 14	E B 15	E B 15	E B 15	E B 16	E B 15	E B 16	28	33	37	40	42	J A 52	40	38	G 24	G 23	G	36	J A 25	20	J A 20	19	J A 19
12	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 16	G	G 25	G 23	J A 39	G	G	G	G 29	G	G	G	E B 13	E B 14	E B 14	E B 14	E B 15	E B 15
13	E B 14	E B 16	E B 14	E B 15	E B 15	E B 15	E B 15	28	36	36	42	G	41	G	G	G 29	G	G	E B 14	E B 14	18	18	E B 15	18
14	21	18	E B 15	E B 15	E B 15	E B 15	20	28	G 25	39	41	40	G	42	41	G	G	G	E B 15	19	J A 20	J A 19	22	20
15	E B 14	20	20	E B 14	E B 15	E B 15	20	26	37	36	38	38	G	G	G	G 24	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
16	E B 15	E B 13	E B 14	E B 15	E B 15	E B 16	19	28	36	G	41	G	G	G	G	G 31	34	26	J A 30	20	20	19	E B 14	20
17	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	19	30	G 26	40	42	G	G 32	G	G	J A 36	35	G	22	22	20	E B 15	E B 15	E B 15
18	E B 15	E B 16	18	20	20	E B 14	J A 36	31	35	38	40	40	G	G	G	G 22	G 20	J A 35	J A 24	J A 22	20	J A 20	E B 15	E B 14
19	E B 14	E B 15	E B 15	E B 15	E B 16	E B 15	21	31	G 24	38	40	G	40	G	G	36	31	G 21	E B 15	E B 14	E B 15	E B 15	E B 15	19
20	20	22	E B 14	E B 15	E B 14	E B 14	22	G	G 28	G 30	G	G	44	42	J A 40	38	30	G	E B 14	E B 15	E B 15	E B 14	E B 15	E B 15
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	19	29	G 28	G 30	G 30	41	G	38	36	39	G 26	27	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15
22	E B 14	E B 15	E B 15	E B 16	E B 14	E B 15	20	G	35	37	41	43	G	J A 46	J A 69	J A 39	J A 47	36	J A 22	22	J A 22	J A 33	J A 39	E B 15
23	21	20	20	E B 15	E B 15	E B 14	20	G 21	36	G 30	G 33	G	G 32	40	40	38	36	J A 30	21	E B 13	E B 14	E B 15	22	E B 15
24	E B 15	E B 15	E B 15	E B 14	E B 16	E B 14	20	35	G 28	38	43	G 27	J A 106	43	40	37	31	J A 29	J A 24	J A 54	J A 28	E B 14	E B 15	E B 15
25	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15	21	31	G 24	G 27	G 31	G	G	G	40	35	J A 32	J A 25	J A 29	J A 17	J A 31	22	E B 15	E B 15
26	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15	24	32	G 26	38	42	41	G	G	G	36	J A 34	27	J A 24	J A 20	20	E B 16	J A 22	20
27	J A 26	E B 15	E B 16	E B 15	E B 15	E B 14	20	G 23	G 27	37	40	G	G	G	39	35	34	G	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14
28	E B 16	E B 14	E B 15	E B 15	E B 15	E B 15	24	31	G	38	40	G	G	42	G	39	G	G	J A 23	21	20	22	E B 15	E B 15
29	E B 14	E B 15	E B 14	19	E B 14	E B 14	23	30	34	38	41	44	43	40	G	38	G	37	22	J A 53	E B 15	E B 16	E B 15	E B 15
30	E B 15	E B 15	20	20	23	E B 15	21	G 23	36	39	41	42	G	G	G 30	G 28	G	33	J A 30	J A 38	J A 27	J A 24	J A 36	J A 21
31	J A 24	J A 29	24	J A 46	J A 18	20	23	34	38	37	40	G	G	40	40	40	J A 38	J A 40	J A 28	J A 26	J A 29	J A 28	J A 20	22
	00	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	20	27	G 28	36	40	G	G	G	G	35	G	24	21	20	20	E B 16	E B 15	E B 15
U Q	16	16	16	15	15	E B 15	21	30	36	38	41	40	G	40	40	38	34	J A 30	J A 24	J A 22	J A 22	22	22	20
L Q	E B 14	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	G	G 25	G 28	G 33	G	G	G	G	G 29	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15

MAR. 2013 foEs (0.1MHz)

IONOSPHERIC DATA STATION Kokubunji

MAR. 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 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 23	G 24	G 26	G 25	G	G	G	G 29	G 25	20	E B 14	E B 15	E B 15	E B 14	E B 14	E B 15
2	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	24	34	37	38	G	G	G 24	37	34	33	21	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
3	E B 16	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	22	G	G 22	G 26	37	G	G	G	G 26	G	G	E B 14	E B 15	E B 16	E B 15	E B 15	E B 15
4	E B 16	E B 15	E 14	E B 15	E B 15	E B 14	E B 15	G	G 24	G 26	35	G 30	G	37	42	G 21	29	21	18	E B 16	E B 15	E B 16	E B 14	E B 15
5	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	G	G 22	G 26	G 28	G	G	G	G 28	G 29	G 24	24	E B 15	E B 15	24	21	E B 15	E B 14
6	E B 15	E B 15	E 14	E B 15	E B 15	E B 16	E B 15	25	G 25	G 26	36	38	39	37	G 27	35	G 24	29	31	E B 14	E B 16	E B 14	E B 15	E B 16
7	E B 16	E B 15	E B 16	E B 15	E B 14	E B 14	E B 14	25	33	35	36	42	G	G	G	34	G	22	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15
8	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	25	G 22	G 24	G 25	G 34	G 32	G	G	G	G	22	23	17	24	E B 15	E B 15	E B 15
9	E B 15	E B 14	E B 15	E B 14	E B 14	E B 15	E B 16	25	G 24	G 25	G	G	G	G	G 38	G 27	G 25	23	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15
10	E B 15	E B 14	E B 15	E B 15	E B 15	E B 14	E B 15	26	G 24	G 26	G 27	G 26	G	G 27	G 27	34	G	G	E B 15	20	E B 15	E B 15	E B 14	E B 15
11	E B 14	E B 15	E B 15	E B 15	E B 16	E B 15	E B 16	25	31	36	39	40	38	37	36	G 22	G 22	G	28	18	E B 15	16	E B 15	E B 15
12	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 16	G	G 25	G 22	36	G	G	G	G 26	G	G	G	E B 13	E B 14	E B 14	E B 14	E B 15	E B 15
13	E B 14	E B 16	E B 14	E B 15	E B 15	E B 15	E B 15	26	33	36	39	G	40	G	G	G 28	G	G	E B 14	E B 14	16	E B 15	E B 15	E B 15
14	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	18	27	G 24	38	39	39	G	39	37	G	G	G	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15
15	E B 14	E B 15	E B 15	E B 14	E B 15	E B 15	18	22	34	35	37	37	G	G	G	G 22	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
16	E B 15	E B 13	E B 14	E B 15	E B 15	E B 16	18	27	34	G	38	G	G	G	G	G 29	32	24	20	E B 14	E B 15	E B 15	E B 14	E B 16
17	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	18	28	G 25	37	39	G	G 30	G	G	36	32	G	E B 15	E B 15	E B 16	E B 15	E B 15	E B 15
18	E B 15	E B 16	E B 15	E B 16	E B 15	E B 14	32	29	32	36	38	38	G	G	G	G 21	G 19	29	18	E B 16	E B 15	18	E B 15	E B 14
19	E B 14	E B 15	E B 15	E B 15	E B 16	E B 15	19	28	G 22	34	37	G	39	G	G	32	30	G 20	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15
20	E B 15	E B 15	E B 14	E B 15	E B 14	E B 14	19	G	G 26	G 26	G	G	42	41	38	36	29	G	E B 14	E B 15	E B 15	E B 14	E B 15	E B 15
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	18	26	G 26	G 28	G 28	39	G	35	35	35	G 26	25	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15
22	E B 14	E B 15	E B 15	E B 16	E B 14	E B 15	19	G	34	34	38	38	G	39	43	35	36	33	E B 15	E B 15	E B 15	E B 16	18	E B 15
23	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14	18	G 20	30	G 28	G 29	G	G 29	36	36	31	32	25	18	E B 13	E B 14	E B 15	E B 15	E B 15
24	E B 15	E B 15	E B 15	E B 14	E B 16	E B 14	20	32	G 27	36	40	G 25	73	40	34	35	28	22	E B 15	29	14	E B 14	E B 15	E B 15
25	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15	20	30	G 22	G 26	G 28	G	G	G	36	34	31	22	16	E B 14	26	E B 15	E B 15	E B 15
26	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15	22	28	G 23	34	38	38	G	G	G	34	29	25	18	19	E B 16	E B 16	E B 15	E B 15
27	19	E B 15	E B 16	E B 15	E B 15	E B 14	20	G 21	G 26	33	38	G	G	G	35	32	31	G	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14
28	E B 16	E B 14	E B 15	E B 15	E B 15	E B 15	22	28	G	34	39	G	G	37	G	33	G	G	E B 15	E B 15	E B 15	16	E B 15	E B 15
29	E B 14	E B 15	E B 14	E B 15	E B 14	E B 14	22	29	33	34	39	41	38	40	G	37	G	32	19	45	E B 15	E B 16	E B 15	E B 15
30	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	19	G 22	32	37	38	39	G	G	G 28	G 27	G	32	21	33	20	19	20	E B 14
31	20	24	E B 15	20	E B 15	E B 15	22	28	34	35	40	G	G	40	37	34	30	36	23	20	E B 16	20	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	18	25	G 26	34	37	G	G	G	G	32	G	22	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 15	E B 15	E B 15	E B 15	E B 15	20	28	33	36	39	38	G	37	36	34	30	25	18	17	16	16	E B 15	E B 15
L Q	E B 14	E B 15	E 15	E B 15	E B 14	E B 14	E B 15	G	G 24	G 26	G 29	G	G	G	G	G 28	G	G	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15

MAR. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	318	300	301	308	329	311	339	370	370	344	346	326	323	334	319	336	356	347	330	304	289	346	310	348
2	281	300	289	295	346	303	332	377	362	372	325	331	321	346	322	333	346	346	343	317	326	307	302	278
3	291	295	301	318	305	293	357	364	366	356	333	316	316	336	331	338	349	357	363	317	296	300	296	289
4	306	296	300	311	296	293	329	370	351	348	350	329	328	335	331	349	346	350	342	315	295	319	289	291
5	299	301	308	319	319	294	337	369	361	359	343	360	336	329	329	339	339	348	328	306	304	305	302	307
6	306	303	300	293	299	310	333	356	363	348	352	312	326	316	326	340	323	345	353	357	292	297	293	290
7	315	329	330	313	322	310	335	353	360	358	331	330	338	332	323	333	337	341	351	305	293	290	284	301
8	307	311	307	312	304	316	340	355	363	354	324	312	321	325	327	333	335	338	336	309	297	301	302	295
9	301	306	303	324	354	302	335	366	342	348	331	308	317	312	313	309	326	345	333	336	296	298	295	294
10	296	301	300	327	329	305	339	358	347	332	327	329	330	320	315	328	329	336	340	327	319	318	306	303
11	300	293	296	314	319	305	332	357	349	349	327	311	324	322	302	308	322	334	339	316	300	313	297	287
12	300	306	300	310	323	299	328	360	357	350	324	323	316	318	321	322	326	341	343	317	289	288	289	291
13	309	319	309	311	307	296	335	364	367	365	312	318	308	316	316	328	338	337	333	314	302	293	291	289
14	303	309	315	307	318	303	343	366	355	340	337	328	317	322	336	313	319	323	343	316	297	287	281	278
15	290	294	297	310	309	281	326	352	344	334	324	319	313	300	308	305	311	332	317	306	318	304	278	288
16	295	310	310	308	313	295	332	349	344	351	327	314	301	309	326	323	308	327	333	325	282	292	294	326
17	314	291	286	284	283	288	344	352	347	336	335	295	336	298	318	321	331	333	317	276	259	310	301	293
18	265	309	294	274	F	280	343	354	366	330	300	315	314	314	319	321	318	336	334	309	309	304	289	289
19	297	300	294	308	295	300	336	356	349	332	312	325	325	331	330	331	334	347	344	320	299	305	300	311
20	303	304	306	317	291	292	F	344	344	337	333	322	304	316	333	326	327	325	341	350	279	285	302	297
21	278	267	273	297	292	315	367	347	345	327	324	306	309	305	318	311	326	340	344	323	313	312	292	296
22	300	310	292	324	317	302	347	343	335	330	331	317	306	319	322	327	331	341	355	338	301	286	282	291
23	291	298	292	315	303	299	353	370	360	357	321	296	316	328	322	329	322	336	347	367	289	301	291	302
24	285	304	302	323	340	313	354	344	371	336	337	300	311	316	321	333	340	340	341	342	307	301	287	288
25	293	294	300	311	303	310	358	362	340	349	319	321	316	308	333	346	328	338	338	352	313	283	302	295
26	297	297	307	319	301	298	359	365	353	333	316	317	335	323	336	346	340	338	342	329	334	289	298	299
27	298	302	314	321	343	316	366	355	351	344	325	327	341	330	327	326	321	336	323	323	337	295	279	293
28	318	308	320	346	284	283	343	347	328	337	305	310	322	311	342	328	333	335	335	344	313	288	298	299
29	305	291	306	310	300	304	357	357	347	352	340	325	321	324	317	323	319	327	330	311	310	285	276	296
30	312	318	278	294	282	313	353	357	340	371	315	330	324	312	312	307	313	325	343	334	294	279	295	288
31	294	293	305	303	310	302	357	360	343	335	331	323	325	313	317	323	325	328	329	332	325	309	295	292
	00	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	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	300	301	301	311	308	302	342	357	351	348	327	319	321	319	322	328	328	338	340	320	300	300	295	293
U Q	306	309	307	319	322	310	354	365	362	354	335	327	326	329	330	333	338	345	343	336	313	307	301	299
L Q	293	295	294	307	299	294	335	352	344	335	321	312	314	312	317	321	322	333	333	311	293	288	289	289

IONOSPHERIC DATA STATION Kokubunji

MAR. 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										L	L	L	L	L	L	L								
2											L	U L 419	L	L		L								
3										L	L	L	U L 367	L	L	L								
4										L	L	L	L	L	A	L	L							
5										L	L	U L 413		L	L	L								
6										L	L	L	U L 371	L	L	L	L							
7										L	L	A	L	L	L	U L 358								
8										L	L	L	L	L	U L 373	L	L							
9										L	L	L	U L 401	U L 391	L	L	L							
10										L	L	U L 365	L	L	L	L	L							
11										L	L	L	418	U L 380	A	L	L							
12										L	L	U L 388	L	U L 375	L	L	L							
13										L	L	U L 376	L	U L 379	L	L								
14										L	L	L	L	U L 374	L	L	L							
15										L	L	L	L	L	U L 382	L								
16										L	L	L	L	L	L	L								
17									L	L	L	L	U L 400	L	L	L	A							
18								A			L	371	L		L	L	L							
19										L	L	L	L	U L 377		U L 350	L							
20									L	L	L	U L 380	L	U L 364	L	L	L							
21									L	L	408		U L 365	L	L	L	L							
22										L	U L 367	U L 404	L	U L 380	A	L	A							
23										L	L	U L 361	L	U L 371	L	L	A							
24									L	U L 382	A	U L 395	A	A	L	A								
25								A		L	L	U L 393	U L 376	U L 393	U L 360	L	L							
26									L	L	U L 384	U L 386	U L 362	L	U L 397	L	L							
27										L	U L 395	U L 356	U L 381	L	L	U L 371	A							
28									L	L	U L 369	U L 358	L	L	L	L								
29										L	L	L	405	U L 377	L	L	L							
30										L	392	U L 373	L	L	L	L	L	A						
31									L	L	L	L	L	U L 385	A	L	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										1	6	15	10	12	4	3								
MED										U L 382	U L 388	U L 380	U L 378	U L 378	U L 378	U L 358								
U Q											395	U L 395	401	U L 382	U L 390	U L 371								
L Q											U L 369	U L 365	U L 367	U L 374	U L 366	U L 350								

MAR. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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										236	250	264	272	252	254	262								
2											264	256	258	244		272								
3										238	258	260	268	244	254	260								
4										240	244	266	266	252	264	248	248							
5										238	256	246		272	264	254								
6										236	246	278	264	258	246	260	262							
7										248	248	268	246	246	268	266								
8										244	276	282	252	266	268	250	254							
9										240	264	270	268	250	278	272	254							
10										240	268	252	260	258	276	266	264							
11										240	270	284	262	262	262	274	256							
12										244	264	268	256	280	266	256	266							
13										238	262	284	254	278	264	272								
14										260	262	260	272	276	246	258	284							
15										250	264	254	266	266	278	276								
16										244	268	268	270	276	256	272								
17									246	256	268	268	254	294	268	258	258							
18								238			324	288	276		280	276	260							
19										252	276	252	256	264		266	254							
20									248	248	264	262	290	270	252	256	258							
21									248	268	276		286	268	268	282	254							
22										250	274	266	280	278	254	258	240							
23										236	274	304	264	260	262	262	252							
24									236	264	248	296	E 284	A 250	266	260								
25								220		244	276	258	286	276	270	250	262							
26									244	262	274	276	264	264	254	254	256							
27										250	276	270	252	264	276	270	254							
28									260	258	290	290	268	258	252	256								
29										246	264	280	276	266	270	262	272							
30										230	300	264	264	268	284	290	280	242						
31									252	254	264	264	258	272	258	268	256							
	00	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	7	29	31	30	30	30	29	31	21	1						
MED								229	248	244	264	268	264	265	264	262	256	242						
U Q									252	253	276	280	272	272	270	272	263							
L Q									244	239	262	260	258	258	254	256	254							

MAR. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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 232	E B 256	E B 274	E B 258	E B 228	E B 246	212	210	218	196	202	200	220	204	208	196	230	222	216	E B 240	E B 264	212	218	198
2	E B 252	E B 300	E B 334	E B 294	214	E B 280	E B 234	216	220	230	208	184	208	204	214	208	230	224	200	212	228	E B 242	E B 250	E B 308
3	E B 288	E B 272	E B 274	E B 242	E B 240	E B 274	214	210	216	198	192	194	186	196	208	204	224	214	202	198	E B 246	E B 258	E B 276	E B 270
4	E B 266	E B 258	E B 256	E B 236	E B 266	E B 282	238	216	216	198	190	188	218	196	A	208	212	216	202	200	E B 260	E B 236	E B 268	E B 296
5	E B 274	E B 256	E B 260	E B 254	E B 236	E B 266	218	208	216	186	194	188	216	210	204	200	216	222	210	218	E A 266	E A 260	E A 246	E B 254
6	E B 252	E B 252	E B 256	E B 278	E B 262	E B 250	216	220	216	208	196	194	198	186	202	212	210	228	208	196	E B 262	E B 258	E B 262	E B 282
7	E B 250	226	E B 218	E B 224	E B 226	E B 228	226	214	220	206	196	A	204	194	198	196	234	224	202	196	E B 256	E B 264	E B 290	E B 284
8	E B 260	E B 238	E B 242	E B 250	E B 238	E B 250	220	210	218	204	192	196	200	194	202	202	202	228	206	210	E A 268	E B 256	E B 254	E B 266
9	E B 266	E B 248	E B 242	224	210	E B 238	224	214	214	192	188	200	194	182	202	212	202	220	E B 210	206	228	E B 256	E B 256	E B 280
10	E B 266	E B 258	E B 248	212	216	E B 246	E B 234	228	216	202	190	196	204	190	194	218	214	230	222	208	222	216	E B 248	E B 266
11	E B 260	E B 260	E B 256	E B 256	224	E B 244	232	218	212	196	194	210	186	186	A	210	208	232	218	214	228	220	E B 260	E B 286
12	E B 260	E B 250	E B 250	E B 246	E B 226	E B 246	E B 236	212	216	208	196	202	194	184	232	208	210	232	210	198	E B 256	E B 270	E B 276	E B 276
13	E B 246	E B 242	E B 246	E B 252	E B 244	E B 282	226	210	218	202	194	188	196	190	208	220	222	226	210	208	E A 240	E B 258	E B 268	E B 274
14	E B 264	E B 246	E B 236	E B 236	E B 226	E B 250	216	206	216	220	206	198	222	212	218	204	220	234	214	206	226	E B 260	E B 284	E B 288
15	E B 268	E B 262	E B 266	E B 240	218	E B 266	238	222	216	200	200	198	192	198	196	212	218	238	224	224	208	E B 210	E B 286	E B 282
16	E B 262	E B 248	E B 240	E B 236	214	E B 264	230	220	220	206	200	204	208	198	202	204	212	230	220	208	E B 266	E B 270	E B 266	232
17	218	240	E B 290	E B 296	E B 296	E B 274	222	220	212	210	208	214	194	200	208	208	A	228	220	E B 282	E B 318	E B 240	228	220
18	E B 320	E B 264	E B 236	E B 306	E B 306	E B 240	222	A	222	222	208	212	200	226	220	216	220	226	222	E B 224	224	E A 234	E B 256	E B 270
19	E B 262	E B 262	E B 254	E B 246	228	E B 238	218	218	214	198	200	194	196	192	222	192	210	226	208	208	E B 242	E B 240	E B 232	E B 258
20	E B 250	E B 254	E B 244	E B 236	226	E B 270	232	222	210	212	206	206	208	196	212	208	196	238	214	202	200	E B 262	E B 256	E B 252
21	E B 280	E B 332	E B 304	E B 264	E B 234	226	220	212	210	202	196	216	184	194	210	214	220	238	214	218	208	E B 216	E B 240	E B 286
22	E B 270	E B 266	E B 266	E B 244	210	E B 252	216	224	222	198	198	184	202	208	A	202	A	232	212	202	220	E B 280	E A 288	E B 288
23	E B 274	E B 272	E B 262	E B 254	E B 244	E B 280	228	222	206	194	184	206	206	200	194	212	A	236	218	206	204	E B 258	E B 270	E B 250
24	E B 294	E B 288	E B 276	E B 236	214	220	216	220	200	198	A	206	A	A	192	A	210	228	222	216	228	E B 248	E B 264	E B 270
25	E B 276	E B 268	E B 272	E B 240	222	E B 242	218	A	214	196	204	200	186	188	204	208	204	220	216	202	224	E B 286	E B 274	E B 276
26	E B 270	E B 272	E B 250	E B 250	E B 230	E B 252	216	218	200	198	204	192	200	204	190	202	202	226	226	218	202	E B 262	E B 266	E B 270
27	E A 276	E B 260	E B 252	E B 240	208	E B 244	216	214	216	202	194	220	218	198	194	196	A	222	232	220	198	E B 232	E B 296	E B 278
28	E B 254	E B 244	E B 246	E B 220	E B 270	E B 286	216	228	214	208	212	208	216	202	208	200	220	228	232	216	206	E A 262	E B 260	E B 262
29	E B 262	E B 264	E B 268	E B 248	E B 234	E B 254	208	210	218	208	208	212	190	208	196	214	216	E A 246	224	E A 236	E B 224	E B 244	E B 292	E B 248
30	E B 234	214	E B 292	E B 288	E B 298	E B 254	218	224	228	198	204	192	218	200	214	220	232	A	224	218	E A 238	E A 284	E A 296	E B 246
31	E A 250	E A 268	E B 254	E A 260	224	E B 238	216	218	208	206	206	204	198	190	A	218	A	232	228	220	212	220	E B 244	E B 282
	00	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	29	31	31	30	30	30	30	27	30	26	30	31	31	31	31	31	31
MED	E B 262	E B 258	E B 256	E B 246	E B 228	E B 250	219	218	216	202	199	200	200	197	204	208	215	228	216	209	U 215	E B 256	E B 264	E B 270
U Q	E B 274	E B 268	E B 272	E B 258	E B 244	E B 270	230	221	218	208	206	206	208	204	212	212	220	232	222	218	E B 256	E B 262	E B 276	E B 282
L Q	E B 252	E B 248	E B 246	E B 236	218	E B 242	216	211	212	198	194	194	194	190	196	202	210	224	210	202	212	234	E B 250	E B 254

MAR. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	118	118	114	114	114	114	116	122	122	B						
2								118	114	A	A	114	114	114		A	114	B						
3								120	112	116	118	114	114	114	114	118	116	116						
4								112	114	118	A	114	114	A	A	114	A	A						
5								116	118	116	116	114	114	116	118	118	122	118						
6								114	120	116	A	A	A	A	114	A	116	B						
7								112	A	A	A	114	118	118	118	A	114	A						
8								112	116	122	116	118	118	112	112	116	116	A						
9								114	114	114	120	120	122	118	A	118	118	A						
10								116	114	114	116	114	114	116	114	A	120	118						
11								112	114	A	A	A	A	A	A	114	116	114						
12								112	112	114	A	114	116	114	114	112	116	116						
13								112	116	A	128	122	126	124	122	122	114	114						
14							B	106	120	122	122	124	122	A	A	116	116	120						
15							B	A	A	A	A	A	120	120	118	116	126	116						
16							B	114	108	116	A	116	116	116	120	120	A	114						
17							B	112	118	A	A	118	120	116	118	114	116	110						
18							B	122	116	116	120	A	122	124	124	114	114	114						
19							B	116	116	110	112	122	A	126	122	A	A	122						
20							B	118	116	116	118	120	120	A	124	A	A	112						
21							B	114	116	116	116	A	114	114	114	122	124	118						
22							B	110	114	A	A	A	114	A	A	A	A	A						
23							B	118	116	116	116	116	114	A	A	A	A	A						
24							B	116	126	A	A	116	A	A	A	A	A	A						
25							B	116	116	116	112	112	126	128	A	A	A	A						
26							B	116	116	A	116	A	120	120	118	A	A	A						
27							128	118	118	A	A	114	118	124	A	A	A	120						
28							B	114	114	A	A	110	110	A	118	A	118	118						
29							B	110	A	A	118	116	A	A	118	114	114	114						
30							B	116	A	118	118	A	120	124	118	118	118	118						
31							B	A	A	A	116	122	126	A	A	A	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							1	29	26	18	18	23	26	20	20	17	20	18						
MED							128	114	116	116	116	116	118	117	118	116	116	116						
U Q								117	118	118	118	120	120	124	119	119	119	118						
L Q								112	114	116	116	114	114	114	114	114	115	114						

MAR. 2013 h'E (KM)

IONOSPHERIC DATA STATION Kokubunji

MAR. 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	B	B	B	B	B	B	94	G	102	102	100	100	G	G	G	108	106	106	B	B	B	B	B	B
2	120	114	B	B	B	B	B	148	126	108	106	G	G	98	98	100	122	104	88	88	92	B	96	100
3	106	102	B	B	B	94	98	162	G	104	96	120	G	G	G	104	G	G	B	B	B	102	B	B
4	B	B	B	94	B	B	B	G	104	100	104	102	G	94	96	92	104	92	88	88	B	B	B	B
5	B	B	B	B	B	B	B	G	100	102	102	G	G	G	102	104	108	122	B	106	102	100	100	B
6	B	B	92	92	92	B	B	154	102	100	102	102	104	96	98	98	102	102	98	92	92	B	B	B
7	B	B	B	B	B	B	B	148	108	104	104	154	G	G	G	104	G	106	96	B	104	98	96	102
8	B	B	B	B	B	B	B	158	100	100	102	102	104	G	G	G	G	104	98	100	100	B	B	B
9	B	B	B	B	B	B	B	162	104	100	G	G	G	G	106	106	104	108	B	B	B	100	100	104
10	B	B	B	B	B	B	B	150	98	100	100	100	G	94	100	106	G	G	B	112	100	B	B	B
11	B	B	B	B	B	B	B	144	132	102	104	104	98	96	94	90	104	G	110	106	100	102	104	104
12	B	B	B	B	B	B	B	G	122	100	104	G	G	G	104	G	G	G	B	B	B	B	B	B
13	B	B	B	B	B	B	B	150	124	102	118	G	120	G	G	106	G	G	B	B	108	108	B	106
14	94	96	B	B	B	B	144	154	106	126	116	116	G	96	98	G	G	G	B	94	104	108	106	100
15	B	98	102	B	B	B	148	104	106	102	106	100	G	G	G	94	G	G	B	B	B	B	B	B
16	B	B	B	B	B	B	148	144	118	G	102	G	G	G	G	102	104	154	92	88	88	86	B	84
17	B	B	B	B	B	B	148	150	98	100	104	G	104	G	G	112	108	G	94	90	88	B	B	B
18	B	B	98	98	96	B	126	124	122	116	116	104	G	G	G	94	94	114	92	92	94	94	B	B
19	B	B	B	B	B	B	138	154	102	118	118	G	104	G	G	106	108	108	B	B	B	B	B	102
20	102	102	B	B	B	B	138	G	100	100	G	G	128	102	114	102	104	G	B	B	B	B	B	B
21	B	B	B	B	B	B	122	156	104	102	102	102	G	112	104	120	100	118	B	B	B	B	B	B
22	B	B	B	B	B	B	136	G	106	104	104	104	G	106	96	90	96	88	96	98	106	110	104	B
23	108	96	96	B	B	B	128	102	120	100	100	G	100	94	102	92	94	92	92	B	B	B	100	B
24	B	B	B	B	B	B	140	142	104	104	108	104	90	98	96	98	106	88	90	108	134	B	B	B
25	B	B	B	B	B	B	144	144	106	98	100	G	G	G	102	100	98	98	98	92	96	96	B	B
26	B	B	B	B	B	B	148	156	100	104	118	104	G	G	G	104	106	104	86	86	90	B	102	106
27	96	B	B	B	B	B	166	104	104	104	100	G	G	G	98	96	94	G	B	B	B	B	B	B
28	B	B	B	B	B	B	142	140	G	104	104	G	G	100	G	106	G	G	96	108	108	104	B	B
29	B	B	B	100	B	B	158	156	100	100	120	120	102	102	G	120	G	130	122	104	B	B	B	B
30	B	B	96	94	90	B	158	104	100	124	124	106	G	G	104	102	G	124	112	106	102	102	102	96
31	100	100	100	96	98	98	146	102	106	104	130	G	G	104	104	106	106	106	106	104	102	102	96	94
	00	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	7	6	6	4	2	20	25	29	30	29	17	10	14	18	28	20	20	18	19	19	14	11	11
MED	102	100	97	95	94	96	143	148	104	102	104	104	104	98	101	103	104	106	96	98	100	102	100	102
U Q	108	102	100	98	97		148	155	113	104	116	111	104	102	104	106	106	116	98	106	104	104	104	104
L Q	96	96	96	94	91		132	132	100	100	102	102	100	96	98	97	99	100	92	90	92	98	96	96

MAR. 2013 h'Es (KM)

IONOSPHERIC DATA STATION Kokubunji

MAR. 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							F1		L2	L2	L2	L2				L2	L2	L2						
2	F2	F2						H2	C2	L2	L2			L2	L2	L2	CL22	L2	F2	F1	F1		F3	F2
3	F1	F1				F2	F2	H2		L2	L2	CL22				L2						F2		
4				F2					L2	L2	L1	L2		L2	L2	L2	L2	L2	F2	F1				
5									L2	L2	L2				L2	L2	L2	C1		F1	F4	F3	F1	
6			F1	F2	F1			H1	L2	L1	L2	L2	L2	L2	L2	L2	L2	L3	F3	F1	F1			
7								H2	L2	L2	L2	HL11				L2		L2	F1		F1	F2	F2	F2
8								H2	L2	L2	L2	L2	L2					L2	F4	F3	F3			
9								H2	L2	L2					L2	L2	L1	L2				F2	F1	F2
10								H2	L2	L2	L2	L2		L2	L2	L2				F3	F1			
11								H2	C2	L2	L2	L2	L2	L2	L2	L2	L2		F3	F2	F1	F2	F2	F2
12									L1	L2	L2				L2									
13								H2	C2	L2	C2		C2			L2					F1	F1		F1
14	F2	F1					H2	H2	L2	CL22	C2	C2		L2	L1					F2	F1	F2	F2	F1
15		F1	F1				H1	L2	L2	L2	L2	L2				L2								
16							H2	H2	C2		L1					L1	L1	H1	F3	F1	F1	F1		F1
17							H1	H2	L2	L2	L2		L1			C2	CL11		F1	F2	F1			
18			F1	F2	F1		C3	C2	CL21	CL11	CL11	L2				L1	L1	CL22	F2	F2	F3	F2		
19							H2	H2	L2	C2	C2		L2			L1	L2	L1						F2
20	F2	F2					H2		L2	L2			C1	L2	C2	L2	L2							
21							C2	H2	L1	L2	L2	L2		C1	L2	CL22	L1	CL22						
22							H2		L1	L2	L2	L2		L2	L2	L3	L2	L3	F2	F2	F2	F2	F3	
23	F1	F1	F1				C2	L2	CL21	L1	L2		L1	L2	L2	L2	L2	L2	F1				F1	
24							H2	H2	L2	L2	L2	L2	L2	L2	L2	L2	L1	L3	F2	F3	F1			
25							H2	HL22	L2	L1	L2				L2	L2	L2	L2	F2	F3	F3	F3		
26							H2	H2	L1	L2	C1	L2				L2	L1	L2	F2	F3	F1		F2	F1
27	F4						H2	L2	L2	L2	L2				L2	L2	L2							
28							H1	H1		L1	L1			L2		L1			F1	F1	F1	F3		
29				F1			H2	H1	L2	L1	C2	C1	L2	L2		CL12		CL11	F2	F4				
30			F2	F2	F2		H1	L2	L2	CL11	CL11	L2			L1	L2		C1	F3	F3	F4	F5	F3	F2
31	F2	F4	F2	F3	F3	F2	H2	L2	L2	L1	CL11			L1	L2	L2	L2	L2	F3	F3	F2	F3	F2	F2
	00	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																								

MAR. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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 48	X 46	X 46	X 46	X 48	X 40														X 87	X 67	X 79	X 51	X 42
2	X 29	X 35	X 36	X 40	X 51	X 30	X 32													X 67	X 58	X 56	X 52	X 46
3	X 46	X 46	X 45	X 46	X 45	X 45	X 45													X 63	X 49	X 50	X 52	X 48
4	X 48	X 46	X 46	X 46	X 44	X 43	X 43													X 74	X 53	X 53	X 52	X 51
5	X 52	X 54	X 50	X 46	X 45	X 42	X 42													X 77	X 66	X 66	X 65	X 60
6	X 55	X 55	X 46	X 44	X 46	X 42	X 43													X 74	X 58	X 61	X 64	X 58
7	X 58	X 61	X 57	X 48	X 43	X 37	X 35													X 85	X 70	X 64	X 59	X 59
8	X 59	X 59	X 49	X 47	X 47	X 46	X 40													X 76	X 69	X 66	X 67	O X 63
9	X 65	X 67	X 59	X 56	X 59	X 41	X 41													X 95	O X 80	X 64	X 63	X 62
10	X 60	X 62	X 55	X 54	X 54	X 41														X 93	X 75	X 60	X 52	X 52
11	X 53	X 52	X 52	X 52	X 54	X 46														X 85	X 72	X 64	X 60	X 56
12	X 58	X 57	X 53	X 52	X 52	X 42														X 92	X 80	X 68	X 64	X 63
13	X 62	X 59	X 52	X 52	X 52	X 47														X 81	X 70	X 65	X 60	X 60
14	X 62	X 62	X 60	X 56	X 55	X 46														X 88	X 70	X 60	X 62	X 65
15	X 64	X 63	X 62	X 60	X 54	X 50														O X 94	X 84	X 70	X 66	X 65
16	X 65	X 68	X 59	X 58	X 56	X 46														X 88	X 67	X 65	X 68	X 69
17	X 60	X 54	X 50	X 50	X 50	X 51														X 86	X 73	X 80	X 62	X 58
18	X 56	X 60	X 56	X 50	X 53	X 52														X 93	X 81	X 67	X 70	X 70
19	X 67	X 67	X 65	X 61	X 59	X 48														X 81	X 63	X 56	X 57	X 56
20	X 56	X 55	X 51	X 48	X 45	X 38														X 84	X 58	X 51	X 55	X 56
21	X 52	X 48	X 48	X 48	X 48	X 48					C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C			C					X 90	X 63	X 55	X 57	X 58
23	X 54	X 54	X 52	X 50	X 47	X 46														X 105	X 65	X 54	X 55	X 55
24	X 48	X 49	X 51	X 53	X 42	X 36														X 84	X 60	X 59	X 60	X 60
25	X 60	X 60	X 59	X 59	X 54	X 46														X 82	X 68	X 48	X 52	X 54
26	X 57	X 55	X 52	X 51	X 45	X 43														X 92	X 78	X 58	X 58	X 59
27	X 57	X 58	X 59	X 58	X 45	X 35														X 106	X 98	X 59	X 57	X 58
28	X 60	X 60	X 59	X 54	X 39	X 40														X 89	X 71	X 65	X 64	X 61
29	X 62	X 60	X 60	X 57	51															X 106	X 79	X 71	X 62	X 64
30	X 64	X 62	X 55	X 55	X 54	X 54														X 101	X 72	X 68	X 69	X 68
31	X 65	X 62	X 59	X 59	X 50	X 47														X 106	X 92	X 80	X 67	X 58
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	8													30	30	30	30	30
MED	X 58	X 58	X 52	X 52	X 50	X 45	X 42													X 88	X 70	X 64	X 60	X 58
U Q	X 62	X 62	X 59	X 56	X 54	X 47	X 43													X 93	X 78	X 67	X 64	X 63
L Q	X 53	X 54	X 50	X 48	X 45	X 40	X 38													X 81	X 63	X 56	X 55	X 56

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	42	40	40	40	42	34	32	54	70	74	U R 87	82	R 84	U R 98	U Y 93	U Y 94	94	90	88	80	60	U R 73	45	36
2	23	29	30	34	45	24	26	60	R 81	76	U Y 92	Y	U R 104	U Y 99	U R 81	U R 86	R 98	R 92	79	61	52	50	46	40
3	40	40	39	40	39	39	39	54	U R 72	75	U R 83	U R 84	U Y 88	D R 101	J R 97	U Y 102	D R 107	89	87	57	42	45	46	42
4	42	41	41	40	38	37	38	61	R 79	80	R 80	85	Y	R 102	J R 98	U R 100	J R 91	65	75	68	47	47	46	45
5	46	48	44	40	39	36	36	58	R 75	81	84	79	U R 94	R 86	J R 91	92	85	82	80	71	60	60	59	54
6	49	49	40	38	40	36	37	61	82	82	U R 80	U R 84	U Y 88	U R 94	U R 92	J R 85	87	95	96	67	52	55	58	53
7	52	R 55	51	42	37	31	29	58	U R 78	90	Y	83	U R 86	92	R 94	U Y 104	R 99	98	92	79	64	58	53	53
8	53	53	43	41	41	40	34	58	70	74	U R 77	U R 85	R	U Y 96	U R 90	R 96	89	84	81	70	64	60	61	R 57
9	59	61	53	R 50	53	35	35	59	72	R 82	U R 90	R 88	Y	U Y 121	U R 118	J Y 108	U Y 105	J R 110	R 102	89	74	58	56	56
10	54	56	49	48	48	35	36	61	80	U R 95	R 97	R 90	Y	U R 100	U Y 102	U R 113	U R 98	95	94	87	69	54	46	46
11	47	46	46	46	48	40	38	62	82	85	R 90	R 91	Y	Y	Y	U Y 108	U Y 115	U R 103	U R 85	79	65	58	53	50
12	52	51	47	46	46	36	36	60	75	U R 82	U R 86	R 90	R 98	U Y 102	U Y 102	Y	U R 99	R 100	R 98	86	74	62	58	57
13	56	53	46	46	46	41	42	68	81	82	Y	R 82	U Y 90	101	U Y 99	U Y 99	R 96	95	88	75	64	59	54	54
14	56	56	54	50	49	40	41	64	74	R 88	88	84	88	U R 88	U Y 99	R 95	89	86	90	82	64	54	56	59
15	58	57	56	54	48	44	42	68	R 81	U R 86	85	R 89	U Y 90	U R 94	Y	R 92	R 89	94	93	R 88	78	64	60	59
16	59	62	53	52	50	40	42	68	R 80	88	R 84	R 82	R 103	U R 103	J Y 108	U R 92	J R 91	98	95	R 82	61	59	63	63
17	54	48	44	44	44	45	47	62	74	R 79	U R 86	U R 94	U Y 101	U R 99	J R 86	U Y 105	96	R 89	86	81	67	74	56	52
18	49	54	50	44	47	46	49	R 75	79	A	68	U Y 100	U Y 96	Y	U Y 89	J R 95	U R 99	R 95	R 98	87	75	61	64	64
19	61	R 61	59	55	53	42	42	66	R 77	U R 82	90	Y	U R 96	U Y 104	U Y 99	U Y 99	R 99	96	88	75	57	50	51	50
20	50	49	45	42	39	33	33	63	R 76	U R 89	U R 85	92	Y	Y	Y	Y	U R 92	U Y 98	J Y 86	79	52	45	49	50
21	46	42	42	42	42	42	40	68	67	U Y 79	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	R 104	118	C	109	107	97	90	84	57	49	51	52
23	48	48	46	44	41	40	40	78	75	73	74	R 96	U Y 120	J R 128	R 119	115	116	105	99	99	59	48	49	49
24	42	43	45	46	36	30	36	63	77	78	71	95	U R 113	112	109	98	95	83	82	78	54	53	54	54
25	54	54	53	53	48	40	40	65	71	78	83	84	U Y 102	114	118	104	91	90	89	76	62	42	46	48
26	51	49	46	45	39	37	42	64	72	74	78	92	100	112	104	104	89	73	76	86	72	52	52	52
27	51	52	53	52	39	29	36	61	70	78	83	92	94	104	105	99	96	91	90	100	92	53	51	52
28	54	54	53	48	33	34	40	63	79	98	84	93	R 110	104	99	92	96	92	86	83	65	59	58	56
29	56	54	54	51	F 42	44	49	64	80	82	78	90	95	U R 109	118	R 108	99	99	113	100	73	65	56	58
30	58	56	49	49	48	48	66	69	82	92	85	102	102	R 108	90	96	114	116	109	95	66	62	63	62
31	60	56	53	53	44	41	45	66	88	88	86	96	R 109	109	107	105	104	106	106	100	86	74	61	52
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	29	27	27	24	27	26	28	30	30	30	30	30	30	30	30
MED	52	52	46	46	43	40	40	63	77	82	84	90	U 97	102	99	99	96	95	90	82	64	58	54	52
U Q	56	56	53	50	48	41	42	66	80	88	R 87	93	R 104	109	107	105	99	98	96	87	72	61	58	57
L Q	47	48	44	42	39	35	36	60	72	78	80	84	U Y 90	U R 98	U R 92	R 94	91	89	86	75	57	50	49	50

MAR. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	L	U L 492	L	U L 504	L	L	L						
2											U L 504	L	L	U L 520	L	U L 452	L	L						
3										L	L	L	L	L	L	L	L	L						
4										U L 396	U L 468	U L 488	U L 512	U L 508	L	L	L							
5									U L 308	L	L		L	L	U L 512	L	L							
6									L	L	L	L	U L 512	U L 512	L	L	L	L						
7										L	U L 492	U L 492	U L 500	U L 500	U L 520	U L 516	L							
8										L	L	U L 496	L 496	L 496	L	L	L							
9									L	L	L	L	L 524	L	U L 532	L 524	L	L						
10									L	L	L	U L 504	L 516	U L 512	U L 528	U L 520	L	L						
11									L	L	L	L 504	L 516	U L 504	U L 548	L 524	L	L						
12										L	L	U L 504	L 512	L 520	U L 536	U L 524	L	L						
13								224	L	L	L	L 500	L	U L 520	U L 516	U L 512	L							
14										L	L	U L 496	L 496	U L 580	L 532	U L 520	488	L						
15										L	L	L 492	L	L 528	L	U L 524	L	L						
16										L	L	L 504	L 504	L 520	L	L	L	L						
17									U L 392	L	U L 500	L 504	L 508	L 508	U L 504	U L 500	L	L						
18										A		L 508	L	L	L	L	L	L						
19										L	L	L	U L 548	U L 548	U L 516	U L 484	L	L						
20									L	L	L	U L 496	U L 508	L 524	U L 520	L	U L 496	L						
21										L	C	C	C	C	C	C	C	C	C					
22							C	C	C	C	C	C	U L 500	L 504	C	U L 496	L							
23									L	U L 440	L	L 500	L 500	U L 500	L 500	U L 500	L 480	L						
24									L	L	U L 464	L 516	L 512	L 508	U L 516	U L 492	L	L	U L 264					
25										U L 476	L 476	L 484	L 492	L 500	L 500	L 500	U L 460	L						
26									L	L	U L 480	L 496	L 496	L 496	L 496	U L 496	A							
27								L 284	L	L	U L 488	488	U L 496	L 496	L 488	U L 488	L	U L 432						
28										L	L 492	U L 492	L 496	L 496	L 496	U L 496	U L 496	L	L					
29									L	L	L	U L 496	L	L 520	U L 516	U L 512	L	L						
30										L	L	L 500	U L 500	L	L	L 500	L	L						
31									L	L	L	L	L	U L 536	U L 536	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								2	2	3	9	21	22	24	20	20	5	1	1					
MED								254	U L 350	U L 440	U L 488	L 496	L 502	L 510	U L 516	U L 500	U L 488	U L 432	U L 264					
U Q										U L 476	U L 496	L 504	L 512	U L 520	U L 530	U L 520	U L 496							
L Q										U L 396	U L 472	L 492	L 496	L 500	L 502	U L 496	L 470							

MAR. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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							B	188	252	304	340	356	UA 356	A	A	A	304	A	176					
2								196	244	308	324	R 344	A	R 344	332	R 332	304	276	R 168					
3								208	256	R 296	UR 324	R	UR 332	UR 376	356	A	A	260	UR 176					
4								188	R 256	R 308	R 324	R 340	344	UR 368	360	A	A	A	A					
5								H 188	252	316	344	UR 352	UR 356	UR 348	R	348	328	268	A					
6								212	252	324	UR 344	R	A	UR 364	R	348	B 316	260	A					
7								200	260	300	328	R 332	R 348	A	A	336	A	A	A					
8								208	264	308	R 352	A	A	R	R	348	A	A	A					
9								232	R 272	R 312	R 348	372	UR 364	UA 368	A	A	UR 324	A	184					
10							B	212	264	312	328	R 340	UR 352	R 352	R 348	344	316	272	A					
11							B	220	R 264	308	336	UR 344	UR 364	UR 372	372	A	328	280	UR 168					
12							B	216	R 268	R 316	UR 352	R 360	UR 364	R 372	364	R 364	312	268	208					
13							B	184	284	R 324	344	UR 352	R	R	R	344	324	280	B					
14							B	248	280	316	352	R 352	UR 348	A	UA 344	340	336	UA 288	A					
15							B	232	268	R 312	344	R 352	B	B	R 360	R 344	B	304	204					
16							B	220	272	320	336	R 348	B	UR 356	R 356	A	320	272	200					
17							B	212	272	316	R 352	UR 356	UR 352	A	R 364	356	332	268	204					
18							B	UA 220	268	R 324	R 348	UR 360	A	A	A	A	A	A	A					
19							B	H 232	276	UR 304	R	B	B	B	360	344	320	A	A					
20							B	232	280	B	B	UR 372	R	R 372	364	UA 352	324	272	A					
21							B	200	260	R 316	C	C	C	C	C	C	C	C	C					
22							C	C	C	C	C	C	R 380	R	C	A	304	A	A					
23							B	220	280	308	340	R 360	360	372	364	348	324	256	A					
24							B	216	280	312	340	356	A	R 344	332	A	300	256	188					
25							B	220	288	UA 320	340	A	A	A	A	A	A	A	A					
26							B	224	284	312	340	A	UR 348	UA 352	UA 344	A	A	A	A					
27							B	200	288	R 320	364	R 364	A	A	A	A	A	268	184					
28							JR 136	196	264	308	R 324	R	352	344	344	340	320	272	A					
29							BJR 144	208	A 272	320	352	A 356	A	A	A	A	332	UA 300	A					
30							B	244	R 268	332	356	372	R	A 372	352	336	324	UA 280	A					
31							A	236	A 276	332	348	360	UA 364	368	368	364	316	UA 280	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							2	30	30	29	27	22	16	17	18	17	21	20	11					
MED							JR 140	214	268	312	344	R 356	UR 354	R 368	358	344	320	272	184					
U Q								224	280	320	352	R 360	UR 364	R 372	364	350	326	UA 280	204					
L Q								200	260	308	336	R 348	UR 348	R 350	344	340	314	268	R 176					

MAR. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	21	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	G	28	34	40	43	43	42	41	37	G 30	J A 26	G 17	J A 17	J A 16	E B 16	E B 15	E B 15
2	E B 14	E B 14	E B 14	E B 15	E B 14	E B 15	E B 15	G	29	36	38	38	J A 48	41	40	40	33	G 26	18	J A 16	24	J A 16	E B 15	J A 16
3	E B 12	J A 26	J A 37	46	22	20	20	G	29	33	G	40	42	43	G	35	33	G	G	E B 13	J A 14	E B 13	20	E B 13
4	E B 11	E B 11	E B 11	20	J A 19	E B 12	E B 12	G	G	37	G	40	36	G 34	G 28	39	32	28	J A 22	J A 18	E B 12	E B 12	J A 18	J A 17
5	21	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14	G	G	G 22	37	44	42	41	G	G	G	G	39	J A 40	J A 20	E B 13	E B 12	22
6	E B 14	E B 14	E B 14	E B 16	E B 16	E B 16	E B 16	G	28	G	G	G 28	38	G 36	G 34	G 32	32	27	J A 21	J A 24	J A 20	J A 21	J A 18	E B 15
7	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	29	33	G	G 30	G	44	42	37	36	J A 38	22	J A 22	J A 18	34	27	J A 25
8	J A 22	J A 23	19	E B 12	E B 12	E B 12	E B 12	G	31	35	G	38	40	G 34	G 34	G 34	33	J A 58	J A 31	J A 22	J A 20	J A 27	J A 24	J A 20
9	J A 20	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	30	34	G	40	G	40	40	38	35	28	19	J A 16	E B 14	E B 14	19	E B 14
10	J A 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G 28	36	39	G	G	G	G 31	G	G	23	J A 14	E B 15	E B 15	J A 25	E B 15
11	24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	35	36	38	G	G	G 29	J A 41	40	G	G	E B 12	E B 13	E B 13	E B 13	E B 13
12	19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	38	38	40	G	42	G 29	G	34	30	G	E B 12	E B 14	E B 14	E B 14	17
13	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	22	30	G	G 30	G	G 36	G 32	G	G 32	G 30	G 26	E B 18	E B 14	E B 14	E B 14	E B 14	E B 14
14	E B 13	E B 13	J A 18	J A 18	19	E B 15	E B 15	G	32	36	40	44	42	39	39	39	37	J A 43	J A 26	J A 19	J A 19	J A 14	E B 14	E B 14
15	E B 12	E B 14	J A 16	22	E B 14	E B 14	E B 14	G	G	G	G	G	E B 41	E B 38	G	G	E B 34	G	G	E B 12	19	E B 12	E B 12	E B 12
16	E B 14	18	E B 14	E B 14	E B 14	E B 14	E B 13	G	G	G	G	39	E B 42	G	G	38	G	G	G	J A 30	J A 18	19	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	30	34	38	38	G	38	G	G	G	J A 21	G	E B 15	E B 15	E B 15	E B 15	E B 15
18	E B 14	E B 14	E B 14	E B 14	J A 12	E B 14	E B 14	J A 39	49	J A 76	43	43	39	45	37	J A 42	34	J A 34	J A 29	J A 34	J A 22	23	E B 14	E B 14
19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	34	G	E B 37	E B 41	E B 40	G	G	34	31	24	E B 13	J A 18	E B 13	E B 14	E B 14
20	E B 13	E B 13	E B 13	E B 13	E B 13	E B 16	E B 16	G	31	E B 32	E B 40	G	G	G	G	38	G	G	24	E B 12	E B 12	E B 12	E B 12	E B 12
21	E B 15	E B 15	E B 15	E B 15	E B 15	E B 13	E B 12	24	33	36	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	G 28	G 35	C	36	32	J A 35	J A 27	E B 13	E B 13	E B 13	J A 21	J A 25
23	E B 13	E B 13	E B 13	E B 13	20	J A 14	J A 14	G	G 24	34	G	42	G 30	G 26	42	39	35	27	J A 31	J A 29	19	20	J A 27	18
24	18	E B 15	J A 18	20	E B 15	17	E B 15	27	G 26	34	36	39	J A 37	38	G 28	36	G 24	G 24	19	19	18	J A 23	E B 15	E B 15
25	J A 20	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	24	G 24	35	G	35	J A 55	J A 44	J A 41	J A 41	J A 35	27	J A 27	J A 19	18	18	E B 14	19
26	20	E B 14	E B 14	20	E B 14	E B 13	E B 13	G 19	G	G	37	39	39	39	J A 42	J A 40	J A 64	J A 43	J A 39	J A 25	J A 29	J A 17	E B 14	E B 14
27	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	22	31	34	G	38	38	38	39	J A 41	J A 38	G 22	G 18	20	20	19	E B 15	E B 15
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	18	25	31	34	G 28	G 31	40	G	37	G 22	G 26	G 24	22	E B 11	J A 15	J A 16	E B 12	E B 12
29	E B 15	E B 15	E B 15	E B 15	E B 14	E B 13	G	28	32	34	38	40	44	J A 46	J A 50	J A 43	35	35	J A 36	J A 32	J A 56	45	J A 20	25
30	E B 12	E B 15	E B 15	E B 15	J A 16	J A 16	E B 15	G 21	32	37	40	42	G 34	41	42	42	J A 41	33	J A 29	J A 18	22	21	19	J A 18
31	J A 28	J A 38	J A 38	J A 48	J A 39	J A 20	34	27	31	36	40	J A 47	46	41	44	J A 45	48	J A 42	J A 36	J A 26	J A 23	J A 20	21	J A 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	30	30	30	30	30	30	30	30	30	30	29	29	30	30	29	30	30	30	30	30	30	30	30	30
MED	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	G	29	34	E G 36	39	37	38	G	38	34	27	22	J A 18	18	16	E B 15	E B 15
U Q	20	15	J A 15	16	15	15	E B 15	22	31	36	38	41	42	41	41	J A 40	35	J A 34	J A 29	J A 24	J A 20	20	J A 20	J A 18
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G 32	G	G 36	G	G	G	G	G	G	G	E B 13	E B 14	E B 13	E B 14	E B 14

MAR. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	G	26	G 29	35	40	40	40	38	34	G 27	22	G	E B 15	E B 12	E B 16	E B 15	E B 15
2	E B 14	E B 14	E B 14	E B 15	E B 14	E B 15	E B 15	G	27	32	35	35	29	39	38	35	31	G 20	18	E B 15	19	E B 15	E B 15	E B 15
3	E B 12	18	18	E B 12	17	E B 12	E B 12	G	G 24	32	G	39	42	43	G	32	32	G	G	E B 13	E B 13	E B 13	E B 13	E B 13
4	E B 11	E B 11	E B 11	E B 11	16	E B 12	E B 12	G	G	33	G	37	U Y 36	G 31	G 26	37	30	26	19	E B 13	E B 12	E B 12	E B 12	E B 12
5	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14	G	G	G 14	36	40	40	39	G	G	G	G	19	27	15	E B 13	E B 12	E B 12
6	E B 14	E B 14	E B 14	E B 16	E B 16	E B 16	E B 16	G	27	G	G	U G 26	38	G 34	U G 34	G 31	G 26	G 24	19	18	E B 15	E B 15	E B 15	E B 15
7	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G 26	G 30	G	G 27	G	40	39	36	34	34	19	17	E B 14	26	18	18
8	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	G	28	33	G	37	39	U G 34	U G 34	G 28	30	45	27	21	18	22	18	16
9	16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	28	33	G	40	G	38	38	37	34	26	G 15	E B 16	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	G	G	G 24	35	38	G	G	G	G 28	G	G	21	E B 14	E B 15	E B 15	22	E B 15
11	E B 12	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	35	35	36	G	G	G 28	35	G 27	G	G	E B 12	E B 13	E B 13	E B 13	E B 13
12	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	33	37	40	G	40	G 27	G	32	28	G	E B 12	E B 14	E B 14	E B 14	E B 14
13	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	19	G 28	G	G 28	G	U G 35	U G 32	G	G 32	G 27	G 24	E B 18	E B 14	E B 14	E B 14	E B 14	E B 14
14	E B 13	E B 13	E B 15	E B 15	E B 15	E B 15	E B 15	G	29	33	G 35	40	40	U Y 39	39	38	37	32	20	18	17	E B 14	E B 14	E B 14
15	E B 12	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	E B 41	E B 38	G	G	E B 34	G	G	E B 12	E B 12	E B 12	E B 12	E B 12
16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 13	G	G	G	G	38	E B 42	G	G	36	G	G	G 17	21	18	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 27	G 32	G 34	G 35	G	35	G	G	G	G 19	G	E B 15	E B 15	E B 15	E B 15	E B 15
18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	34	40	A A 76	38	40	38	42	34	36	34	30	27	31	19	18	E B 14	E B 14
19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	32	G	E B 37	E B 41	E B 40	G	G	34	30	22	E B 13	18	E B 13	E B 14	E B 14
20	E B 13	E B 13	E B 13	E B 13	E B 13	E B 16	E B 16	G	G 26	E B 32	E B 40	G	G	G	G	G 32	G	G	24	E B 12	E B 12	E B 12	E B 12	E B 12
21	E B 15	E B 15	E B 15	E B 15	E B 15	E B 13	E B 12	22	32	G 32	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	G 23	U G 35	C	34	G 25	28	24	E B 13	E B 13	E B 13	E B 13	E B 13
23	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	G	G 14	32	G	40	G 28	G 25	40	38	34	27	20	18	E B 15	E B 15	E B 15	E B 15
24	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	23	G 23	G 30	G 34	38	36	38	G 26	32	G 24	G 22	G 18	15	E B 16	19	E B 15	E B 15
25	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G 22	G 18	34	G	33	33	39	37	35	31	26	22	18	E B 14	E B 14	E B 14	E B 14
26	E B 14	E B 14	E B 14	E B 14	E B 14	E B 13	E B 13	G 15	G	G	37	37	37	37	37	37	61	26	24	19	19	E B 12	E B 14	E B 14
27	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	21	30	32	G	G 36	36	36	35	35	34	G 19	G 17	E B 17	E B 14	E B 14	E B 15	E B 15
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	24	29	34	G U 26	G 31	38	G	G 36	G 20	G 20	G 17	20	E B 11	E B 11	E B 11	E B 12	E B 12
29	E B 15	E B 15	E B 15	E B 15	E B 14	E B 13	G	25	30	33	G 35	37	38	38	41	37	35	30	30	28	52	35	19	16
30	E B 12	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G 14	29	G 32	G 36	39	U G 33	38	38	38	38	28	23	18	E B 14	E B 14	E B 14	E B 14
31	22	29	26	38	27	E B 12	23	25	29	G 32	35	38	38	38	37	37	37	33	27	22	18	17	17	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	30	30	30	30	30	30	30	30	30	30	29	29	30	30	29	30	30	30	30	30	30	30	30	30
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	37	E G 36	38	G	34	30	G	19	E B 16	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	G	29	33	G	40	39	39	38	37	34	28	23	18	18	15	15	15
L Q	E B 13	E B 14	E B 14	E B 14	E B 14	E B 13	E B 14	G	G 27	G 32	G 35	G	G	G	G	G	G	G 24	G	E B 13	E B 13	E B 13	E B 13	E B 13

MAR. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	15	15	15	15	15	16	16	14	15	15	16	14	19	23	23	17	16	16	16	15	12	16	15	15
2	14	14	14	15	14	15	15	14	16	13	16	17	16	18	16	20	18	12	12	15	15	15	15	15
3	12	12	12	12	12	12	12	12	12	12	17	16	16	18	18	17	16	18	13	13	13	13	13	13
4	11	11	11	11	11	12	12	12	11	11	16	13	13	13	14	10	7	7	11	13	12	12	12	12
5	15	15	15	15	14	14	14	14	13	13	14	16	16	16	16	16	17	17	14	13	13	13	12	12
6	14	14	14	16	16	16	16	15	15	17	17	17	20	19	25	18	17	15	15	16	15	15	15	15
7	14	14	14	14	14	14	14	14	12	14	14	16	16	18	18	18	18	18	13	14	14	14	14	14
8	12	12	12	12	12	12	12	12	12	14	14	24	20	20	20	20	20	16	15	15	15	16	15	15
9	11	15	15	15	15	15	15	15	15	17	18	18	20	20	20	20	20	15	15	16	14	14	14	14
10	14	14	14	14	14	14	14	14	14	14	17	17	20	20	20	19	18	16	16	14	15	15	15	15
11	12	14	14	14	14	14	14	14	16	15	16	16	16	26	20	17	14	14	13	12	13	13	13	13
12	15	14	14	14	14	14	14	15	11	14	14	17	17	28	22	22	18	16	12	12	14	14	14	14
13	15	15	15	15	15	15	15	15	15	17	19	18	29	28	21	24	14	19	18	14	14	14	14	14
14	13	13	15	15	15	15	15	15	15	15	15	15	17	36	27	27	20	18	18	14	14	14	14	14
15	12	14	14	14	14	14	14	14	14	14	18	19	41	38	21	21	34	24	16	12	12	12	12	12
16	14	14	14	14	14	14	13	13	13	14	14	14	42	23	22	18	17	17	15	14	14	14	14	14
17	14	14	14	14	14	14	14	14	14	14	14	16	22	24	24	24	20	15	15	15	15	15	15	15
18	14	14	14	14	14	14	14	14	9	10	17	22	19	32	31	23	19	14	15	14	14	14	14	14
19	14	14	14	14	14	14	14	13	13	13	26	37	41	40	22	22	19	16	16	13	13	13	14	14
20	13	13	13	13	13	16	16	16	16	32	40	27	21	24	24	20	19	14	14	12	12	12	12	12
21	15	15	15	15	15	13	12	12	12	15	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	24	26	C	18	17	17	14	13	13	13	13	13
23	13	13	13	13	13	13	13	14	14	13	15	15	16	16	16	16	16	16	12	15	15	15	15	15
24	15	15	15	15	15	15	15	14	14	14	14	14	15	15	15	15	15	15	16	12	16	15	15	15
25	15	15	15	15	15	15	15	15	15	15	15	18	17	16	17	16	16	16	14	14	14	14	14	14
26	14	14	14	14	14	13	13	13	13	13	13	14	14	17	17	17	16	16	13	12	13	12	14	14
27	15	15	15	15	15	15	15	15	15	15	14	14	18	22	16	16	16	16	15	17	14	14	15	15
28	14	14	14	14	14	14	14	13	13	12	12	12	12	13	13	12	12	12	12	11	11	11	12	12
29	15	15	15	15	14	13	13	13	14	14	14	14	15	16	18	18	16	13	12	13	13	13	13	13
30	12	15	15	15	15	15	15	15	14	14	14	16	17	17	17	14	14	14	14	14	14	14	14	14
31	14	14	14	12	12	12	12	12	12	12	14	14	14	14	14	14	14	14	14	14	14	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	30	30	30	30	30	30	30	30	30	30	29	29	30	30	29	30	30	30	30	30	30	30	30	30
MED	14	14	14	14	14	14	14	14	14	14	15	16	17	20	20	18	17	16	14	14	14	14	14	14
U Q	15	15	15	15	15	15	15	15	15	15	17	18	20	26	22	20	19	17	15	15	14	15	15	15
L Q	13	14	14	14	14	13	13	13	12	13	14	14	16	16	16	16	16	14	13	13	13	13	13	13

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	313	294	285	314	358	339	308	350	360	368	U R 351	331	R 336	U R 350	U Y 354	U Y 340	342	332	333	353	312	U R 329	354	336
2	277	275	268	303	369	298	298	340	R 377	346	U Y 332	Y	U R 341	U Y 365	U R 332	U R 346	R 358	R 355	348	335	332	320	309	306
3	299	299	284	309	313	300	308	347	U R 379	366	U R 360	U R 349	U Y 351	R	R	U Y 329	R	361	360	355	321	301	326	311
4	276	292	294	321	311	295	289	345	R 386	363	R 363	333	Y	R 328	R	U R 353	R	378	338	331	310	311	311	295
5	305	303	313	306	315	299	302	367	R 366	369	348	321	U R 336	R 330	R	340	330	343	325	333	320	317	314	320
6	316	329	312	292	320	322	311	350	375	366	U R 351	U R 343	U Y 338	U R 367	U R 345	R	306	333	360	322	306	295	322	301
7	290	R 328	357	311	345	342	311	340	U R 365	358	Y	356	U R 344	342	R 313	U Y 337	R 351	341	329	336	324	283	301	297
8	306	346	326	291	309	340	331	367	343	343	U R 363	U R 346	R	U Y 352	U R 335	R 335	321	330	330	330	317	306	303	R 304
9	311	327	323	R 325	355	303	304	348	354	R 357	U R 349	R 306	Y	U Y 339	U R 321	Y	U Y 364	R	R 348	329	335	291	301	298
10	288	310	307	307	331	301	298	341	336	U R 331	R 334	R 334	Y	U R 348	U Y 332	U R 342	U R 333	325	335	351	329	334	297	295
11	289	304	295	313	321	305	308	350	359	344	R 344	R 341	Y	Y	Y	U Y 352	U Y 347	U R 343	U R 369	337	330	280	303	290
12	300	308	302	310	340	313	317	362	358	U R 370	U R 359	R 338	R 350	U Y 336	U Y 337	Y	U R 327	R 343	R 347	325	338	309	286	291
13	308	324	308	309	309	298	314	340	364	351	Y	R 342	U Y 337	299	U Y 353	U Y 330	R 328	329	329	337	308	307	313	305
14	303	306	316	304	323	307	311	368	353	R 354	350	333	337	U R 323	U Y 343	R 339	313	323	335	346	327	305	298	296
15	299	304	297	308	342	315	300	353	R 358	U R 366	335	R 349	U Y 333	U R 332	Y	R 330	R 315	328	336	R 341	342	297	288	285
16	301	311	313	308	317	309	305	346	R 366	352	R 337	R 330	R 330	U R 338	Y	U R 326	J R 320	321	332	R 323	295	298	290	327
17	308	308	298	287	288	299	318	337	349	R 347	U R 351	U R 341	U Y 346	U R 337	R	U Y 331	312	R 323	328	317	282	310	344	290
18	266	299	324	279	268	284	308	R 348	359	A	306	U Y 318	U Y 331	Y	U Y 318	R	U R 345	R 339	R 347	331	348	313	300	298
19	299	R 301	311	306	323	327	312	351	R 363	U R 350	342	Y	U R 356	U Y 345	U Y 348	U Y 329	R 331	337	342	355	327	295	305	310
20	319	319	329	325	320	311	307	362	R 352	U R 346	U R 367	337	Y	Y	Y	Y	U R 337	U Y 344	Y	337	341	288	293	326
21	308	291	291	297	316	319	338	365	344	U Y 349	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	R 303	320	C	319	321	332	340	345	320	274	298	301
23	298	296	307	310	314	288	303	377	360	361	318	R 302	U Y 335	R	R 325	312	318	328	340	350	359	287	307	305
24	296	288	293	338	343	334	296	339	358	342	317	296	U R 329	331	314	308	323	336	342	350	305	291	287	286
25	299	299	293	301	328	342	329	355	333	351	330	324	U Y 335	320	322	336	320	323	335	343	344	292	277	294
26	306	316	318	312	303	307	316	370	350	340	324	310	314	324	339	336	346	335	322	333	347	304	293	293
27	292	308	321	327	385	327	306	350	343	340	317	330	321	326	332	306	316	322	310	331	362	305	282	293
28	311	311	323	361	282	293	323	348	331	347	320	295	R 324	327	313	330	316	330	332	335	322	304	286	294
29	287	291	294	308	F 310	296	321	361	347	351	312	307	295	U R 309	323	R 320	302	302	326	356	336	290	274	295
30	306	315	290	287	290	301	364	347	341	348	320	319	317	R 317	309	297	309	335	329	331	310	282	292	296
31	303	305	320	316	321	310	318	351	343	345	335	314	R 318	308	310	317	313	324	326	329	326	319	305	298
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	29	27	27	24	25	21	25	28	29	29	30	30	30	30	30
MED	300	306	308	308	320	307	310	350	358	351	337	331	U 335	U 331	U 332	330	322	332	335	336	326	302	300	298
U Q	308	315	320	314	340	322	318	362	R 364	362	U R 351	U R 341	U R 340	U 344	U Y 341	U R 340	340	342	344	346	338	310	309	305
L Q	292	299	294	303	310	299	304	346	344	346	320	314	322	322	316	320	316	324	329	331	312	291	290	294

MAR. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	L	U L 376	L	U L 368	L	L	L						
2											U L 363	L	L	U L 353	L	U L 406	L	L						
3										L	L	L	L	L	L	L	L	L						
4										U L 453	U L 407	U L 390	U L 373	U L 376	L	L	L							
5									U L 413	L	L		L	L	U L 370	L	L							
6									L	L	L	L	U L 390	U L 391	L	L	L	L						
7										L	U L 366	U L 398	U L 402	U L 386	U L 373	U L 358	L						
8										L	L	U L 381	L 397	L 397	L	L	L							
9									L	L	L	L	L 376	L	U L 370	L 361	L	L						
10									L	L	L	U L 383	L 374	U L 377	U L 365	U L 357	L	L						
11									L	L	L	L 374	L 380	U L 387	U L 356	L 355	L	L						
12										L	L	U L 376	L 386	L 380	U L 368	U L 359	L	L						
13								490	L	L	L	L 390	L	U L 376	U L 379	U L 359	L							
14										L	L	U L 402	L 402	U L 344	L 344	U L 354	367	L						
15										L	L	L 398	L	L 371	L	U L 355	L	L						
16										L	L	L 376	L 391	L 379	L	L	L	L						
17									U L 414	L	U L 370	L 368	L 365	L 389	U L 392	U L 377	L	L						
18										A		L 363	L	L	L	L	L	L						
19										L	L	L	U L 356	U L 356	U L 379	U L 377	L	L						
20									L	L	L	U L 397	U L 389	L 377	U L 375	L	U L 355	L						
21										L	C	C	C	C	C	C	C	C	C					
22							C	C	C	C	C	C	U L 370	L 371	C	U L 377	L							
23									L	U L 395	L	L 384	L 384	U L 384	L 384	U L 379	L 346	L						
24									L	L	U L 406	L 366	L 369	L 372	U L 367	U L 377	L	L	U L 368					
25										U L 371	L 371	L 379	L 389	L 374	L 360	L 361	U L 354	L						
26									L	L	U L 374	L 367	L 374	382	L 379	U L 362	A							
27								L 378	L	L	U L 402	400	U L 394	L 394	L 387	U L 387	L	U L 351						
28										L	L 355	U L 369	L 367	L 367	L 372	U L 364	U L 349	L	L					
29									L	L	L	U L 381	L	L 364	A 367	U L 353	L	L						
30										L	L	L 382	U L 382	L	L	L 380	L	L						
31									L	L	L	L	L	U L 370	U L 368	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								2	2	3	9	21	22	24	20	20	5	1	1					
MED								434	U L 414	U L 395	U L 371	L 381	L 381	L 376	U L 370	U L 362	U L 354	U L 351	U L 368					
U Q										U L 453	U L 404	U L 394	L 390	U L 385	L 379	U L 377	361							
L Q										U L 371	U L 364	L 372	L 373	U L 370	L 367	U L 358	L 348							

MAR. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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											250	260	284	280	276	276	262	256						
2											278	238	266	240	268	278	272	256						
3										244	244	260	260	260	260	260	256	226						
4										244	244	258	262	264	264	258	254							
5									220	220	234		268	268	274	270	270							
6									218	218	242	260	270	258	258	258	258	258						
7										248	248	248	270	270	282	282	258							
8										244	244	258	276	276	276	268	268							
9									254	254	254	278	294	268	274	274	270	254						
10									244	246	252	252	280	256	278	278	262	256						
11									236	242	254	262	272	252	280	272	266	240						
12										244	258	266	266	282	282	282	274	256						
13								230	230	236	244	266	280	296	286	280	270							
14										256	256	264	268	290	284	274	274	260						
15										254	258	262	284	286	294	282	294L	276						
16										242	256	274	286	284	282	282	286	272						
17									248	248	264	272	272	272	272	272	264	264						
18										A		294	294	294	278	280	280	262						
19										250	258	278	274	274	268	270	262	258						
20									256	256	256	268	268	274	266	262	262	260						
21										258	C	C	C	C	C	C	C	C	C					
22							C	C	C	C	C	C	276	276	C	266	266							
23									226	226	276	302	262	264	264	266	266	246						
24									238	240	250	328	268	268	274	274	268	264	244					
25										246	256	262	270	270	270	262	262	262						
26									246	250	276	288	288	284	270	270	A252							
27								236	236	248	262	272	272	278	278	278	278	272						
28										250	270	288	282	262	270	270	270	260	236					
29									250	250	250	280	284	286	272	272	272	272						
30										250	280	278	278	278	274	300	300	254						
31									246	246	246	276	276	282	282	282	282							
	00	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	14	27	28	28	30	30	29	30	30	22	2					
MED								233	241	246	255	267	273	274	274	273	268	259	240					
U Q									248	250	260	278	282	282	281	280	274	264						
L Q									230	242	247	260	268	264	269	268	262	256						

MAR. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	246	272	282	266	220	220	268	222	222	220	220A	232A	214	252EA	198	200	220	220	220	220	248	236	218	224
2	278	314	336	310	208	328	298	218	220	220	220	200	212	222EA	222	194	222	224	212	212	226	232	234	246
3	296	296	296	290	268	268	252	220	220	220	218	218	238	236	224	224	224	224	216	214	214	272	268	268
4	274	288	288	274	274	274	274	232	234	202	202	202	202	204	204	208	208	208	228	228	228	236	242	254
5	284	268	246	246	244	258	258	226	200	210	210	238	198	200	200	200	204	230	228	242	234	234	234	234
6	250	250	250	260	260	234	252	216	180H	202	202	200	186H	186	188	190	202	212	212	212	216	260	258	258
7	282	246	210	230	230	234	254	240	240	230	224	200	170H	198	198	198	222	234	234	222	212	284	284	284
8	266	226	226	260	260	226	226	212	212	214	214	200	200	200	200	200	204	244A	228	228	228	256	270	270
9	258	242	238	238	226	226	252	232	224	224	216	198H	196	174H	186	194	218	218	218	218	218	238	248	258
10	288	248	248	248	236	244	268	226	226	226	210	198	198	198	198	198	212	220	220	220	218	218	268	276
11	270	270	270	270	220	220	248	222	222	216	214	208	208	196	196	226	226	226	226	224	222	242	242	268
12	268	258	258	258	222	240	244	218	218	218	210	200	198	198	198	198	204	226	226	216	216	234	258	258
13	242	242	242	254	250	258	258	178	220	220	214	202	190H	190	190	210	210	218	228	228	228	230	244	264
14	280	264	256	256	246	246	260	226	226	226	236	222A	210	210	210	210	210	230EA	232	226	226	232	262	262
15	258	258	264	258	224	236	278	228	228	228	204	204	204	204	204	204	222EB	228	230	230	226	228	250	260
16	282	272	228	234	234	230	266	236	236	222	220	218	218	214	214	214	214	230	228	228	228	264	264	248
17	220	236	256	284	282	282	248	210	210	210	210	208	208	208	208	206	226	226	232	232	294	274	202	268
18	342	280	250	286	304	248	262	242	234	A	232AE	232EA	232	254EA	226	226A	226A	226A	226	226	226	226	246	250
19	272	272	248	248	228	228	252	228	226	218	216	196H	196	202	202	194	204	224	224	224	224	242	260	260
20	250	250	250	250	250	264	272	222	222	222	236EB	222	216B	200	200	200	200	208	212	212	212	276	276	266
21	268	286	286	286	256	236	236	222	220	220A	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	192	192	C	192	220	224	224	224	212	282	282	280
23	258	264	264	264	256	294	294	216	212	212	198	198	188	188	188	198	216	228	228	228	200	270	270	270
24	294	294	292	248	186	220	252	238	238	214	200	200	200	200	200	200	200	210	222	222	222	268	268	272
25	278	278	272	262	236	230	230	230	230	208	194	186	186	186	186	186	188	204	228	224	222	236	298	296
26	246	252	254	254	232	256	250	230	218	218	218	218	218	202	202	202	A	220	230	230	222	222	262	270
27	298	264	254	228	200	260	252	202	192	200	200	198H	198	196	196	198	210	216	244	244	218	218	306	304
28	268	254	254	216	274	274	256	230	230	230	230	222	216	214	214	212	210	218	226	226	226	226	256	268
29	272	272	272	266	250	262	244	222	222	222	220	220	220	220	EA250	234	226	230	236	226	A256	A270	A294	282
30	262	244	280	280	280	272	226	226	226	226	218H	212	206	206	238	238	A260	260	242	230	220	262	262	262
31	282	A282	278	EA310	A250	250	A272	218	218	218	216	A228	A228	228	228	228	A230	A246	246	246	240	224	240	272
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	29	29	29	30	30	29	30	29	30	30	30	30	30	30	30
MED	271	264	256	258	245	247	253	224	222	220	215	203	203	200	200	200	213	224	228	226	223	237	261	267
U Q	282	278	278	274	260	264	268	230	228	223	220	221	216	214	214	212	223	230	230	228	228	268	270	272
L Q	258	250	248	248	226	230	248	218	218	213	207	200	196	196	197	198	204	218	222	220	218	230	244	258

MAR. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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							B	146	114	104	104	104	104	A	A		116	A	176					
2								142	114	110	112	A	A	116	116	116	116	116	166					
3								148	118	108	108	110	110	108	108		A	108	148					
4								152	120	104	104	104	104	104	104	A	104	A	A					
5								122	114	114	108	102	102	102	106	106	106	106	A					
6								130	120	112	110	A	110	110	A	110	110	110						
7								144	92	92	92	110	108	A	A	108	A	A	A					
8								138	100	100	100	100	A	A	A	116								
9								142	110	110	108	108	108	108	108	108	108		E A 166					
10							B	130	104	114	112	114	114	112	112	112	116	116						
11							B	130	104	104	104	104	104	108	108	A	A 108	108	118					
12							B	144	114	114	108	108	108	108	108	108	114	114	140					
13							B	112	112	112	112	108	A	108	108	114	120	120	B					
14							B	138	102	E A 126	A 126	106	106	A	106	106	106	106	A					
15							B	148	106	106	106	106	B	B	106	106	B	106	106					
16							B	112	112	112	106	106	B	106	106	A	106	106	134					
17							B	110	110	110	110	110	110		110	110	110	110	116					
18							B	114	114	108	108	108	A	A		A		A	A					
19							B	114	114	114	108	B	B	B	108	108	108	A	A					
20							B	118	118	B	B	118	112	112	112	112	112	112	A					
21							B	108	108	108	C	C	C	C	C	C	C	C	C					
22							C	C	C	C	C	C	114	114	C	A	114							
23							B	120	120	114	112	108	108	108	108	108	108	108	A					
24							B	112	124	112	112	112	A	112	112	A	112	116	146					
25							B	114	114	114	114		A		A	A	A							
26							B	132	120	114	114	A	114	112	112	112	A	A	A					
27							B	118	118	118	110	110	A		A		A	110	118					
28							B	112	112	110	110	A	110	110	110	112	112	112	A					
29						B	B	114	A	114	114	A	A	A	A	A	114	114	A					
30							B	126	126	116	116	110	A	A	110	110	110	110	A					
31							A	114	114	114	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								30	29	29	28	22	18	18	21	19	22	20	11					
MED								124	114	112	110	108	109	109	108	110	111	110	137					
U Q								142	118	114	112	110	112	112	112	112	114	114	166					
L Q								114	109	108	107	106	106	108	107	108	108	108	118					

MAR. 2013 h′E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	94	B	B	B	B	B	B	G	204	148	126	124	124	114	114	114	114	114	114	114	100	B	B	B
2	B	B	B	B	B	B	B	G	198	174	150	158	94	118	124	124	124	116	192	104	104	104	B	104
3	B	88	88	88	88	88	88	G	164	172	G	118	118	204	G	110	110	G	G	B	104	B	104	B
4	B	B	B	94	94	B	B	G	G	192	G	192	118	108	108	100	114	114	88	88	B	B	100	100
5	102	B	B	B	B	B	B	G	G	102	118	114	114	114	G	G	G	G	114	110	100	B	B	100
6	B	B	B	B	B	B	B	G	170	G	G	102	102	102	102	102	102	102	122	90	104	104	100	B
7	B	B	B	B	B	B	B	G	164	164	G	100	G	100	100	118	118	118	106	106	106	94	94	94
8	92	92	92	B	B	B	B	G	156	150	G	104	104	104	104	104	104	104	104	104	104	102	102	102
9	98	B	B	B	B	B	B	G	196	190	G	190	G	120	120	120	120	120	120	102	B	B	96	B
10	94	B	B	B	B	B	B	G	G	104	114	178	G	G	G	100	G	G	142	90	B	B	90	B
11	96	B	B	B	B	B	B	G	G	122	116	116	G	G	106	98	92	G	G	B	B	B	B	B
12	104	B	B	B	B	B	B	G	G	192	192	190	G	178	102	G	194	194	G	B	B	B	B	92
13	B	B	B	B	B	B	B	138	170	G	108	G	108	108	G	108	108	108	B	B	B	B	B	B
14	B	B	94	94	94	B	B	G	152	148	130	118	118	116	116	116	122	122	106	106	106	B	B	B
15	B	B	112	102	B	B	B	G	G	G	G	G	B	B	G	G	B	G	G	B	102	B	B	B
16	B	98	B	B	B	B	B	G	G	G	G	118	B	G	G	114	G	G	90	90	90	90	B	B
17	B	B	B	B	B	B	B	G	154	154	146	140	G	116	G	G	G	90	G	B	B	B	B	B
18	B	B	B	B	100	B	B	120	120	116	116	116	116	108	108	100	100	100	100	94	90	90	B	B
19	B	B	B	B	B	B	B	G	G	192	G	B	B	B	G	G	118	118	114	B	106	B	B	B
20	B	B	B	B	B	B	B	G	154	B	B	G	G	G	G	118	G	G	122	B	B	B	B	B
21	B	B	B	B	B	B	B	150	146	146	C	C	C	C	C	C	C	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	98	112	C	112	112	112	108	B	B	B	108	108
23	B	B	B	B	104	128	108	G	106	124	G	186	96	96	182	182	182	158	116	96	96	96	96	96
24	98	B	98	98	B	98	B	134	114	114	114	154	100	148	98	108	108	108	112	112	96	96	B	B
25	100	B	B	B	B	B	B	162	104	110	G	110	110	110	110	94	94	108	104	98	98	104	B	104
26	102	B	B	102	B	B	B	102	G	G	192	112	112	112	112	112	108	108	108	108	108	104	B	B
27	B	B	B	B	B	B	B	138	174	174	G	122	122	114	112	110	106	106	96	96	96	114	B	B
28	B	B	B	B	B	B	108	150	150	150	106	106	124	G	124	100	94	94	110	B	100	100	B	B
29	B	B	B	B	B	B	G	162	162	158	144	134	114	112	94	94	124	124	114	114	114	112	110	110
30	B	B	B	B	108	108	B	108	134	134	134	134	102	162	130	130	120	120	106	106	102	100	100	100
31	98	98	98	98	98	98	98	166	166	146	132	120	120	120	120	120	120	120	120	122	112	112	104	102
	00	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	4	6	7	7	5	4	11	21	24	16	25	20	23	20	25	24	23	24	20	21	15	12	12
MED	98	95	96	98	98	98	103	138	156	149	128	120	113	114	111	110	113	114	111	104	102	102	100	101
U Q	102	98	98	102	104	118	108	162	170	173	145	156	118	120	120	118	120	120	118	109	106	104	104	104
L Q	94	90	92	94	94	93	93	120	140	123	115	113	102	108	103	100	105	106	105	95	97	96	96	98

IONOSPHERIC DATA STATION Yamagawa

MAR. 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	F2								H1	H1	H1	C1	C1	L1	L1	C1	L1	L1	L1	F1	F1			
2									HL11	HL11	HL11	HL11	LC11	CL11	HL11	HL11	C1	L1	HL11	F1	F1	F1		F1
3		F3	F2	F2	F1	F1	F1		H1	H1		C1	CL11	HL11		L1	L1				F1		F1	
4				L1	F2					H1		H1	CL11	L1	L1	L2	CL11	CL11	L2	F2			F1	F1
5	F1									L1	C1	C1	C1	C1					CL21	F2	F2			F1
6									H1			L1	CL11	L1	L1	L1	L1	L1	CL11	F3	F1	F3	F1	
7									H1	H1		L1		C1	C1	C1	C1	C2	C1	F1	F1	F4	F2	F2
8	F2	F1	F1						H1	H1		H1	C1	L1	L1	L1	L2	L3	L3	F3	F1	F2	F3	F1
9	F1								H1	H1		H1		C1	C1	C1	C1	C1	L1	F1			F1	
10	F1									L1	C1	H1				L1			C2	F1			F4	
11	F3									H1	C1	C1			L1	L2	L3							
12	F2									H1	H1	H1		H1	L1		H1	HL11						F1
13								H1	H1		L1		L1	L1		L1	L1	L1						
14			F1	F1	F1				H1	HL11	CL11	C1	C1	C1	C1	C1	C1	C2	C1	F1	F2			
15			F1	F1																	F1			
16		F1										C1				C1			L2	F2	F1	F1		
17									H1	H1	H1	H1		C1				L2						
18					F1			C3	C2	C2	C1	C1	C1	C1	C1	L1	L2	L3	L4	F5	F2	F1		
19										H1							C1	C1	C1		F1			
20									H1							C1			C1					
21								H1	H1	H1														
22													L1	L1		L1	L1	L3	L2				F1	F1
23					F1	F1	L1		L1	CL11		HL11	L1	L1	H1	H1	H1	H1	CL11	F2	F1	F1	F2	F1
24	F1		F1	F1		F1		C1	C1	C1	C1	H1	L1	H1	L1	CL11	L1	L1	L1	F1	F1	F2		
25	F1							H1	L1	C1		C1	C1	L2	L1	L2	L2	CL12	L3	F2	F1	F1		F2
26	F1			F1				L1			H1	C1	C1	CL11	CL11	C1	L2	LQ31	LQ31	F3	F3	F1		
27								H1	HL11	HL11		C1	C1	C1	C1	L1	L3	L2	L2	F1	F1	F1		
28							L1	H2	H1	HL11	L1	L1	HL11		H1	L1	L2	L2	CL21		F1	F1		
29								H1	H1	H1	H1	CL11	C1	C1	C1	C1	CL12	CL12	CL42	FF12	FF61	FF41	F3	F3
30					F1	F1		L1	CL11	CL11	CL11	C1	L1	HL11	HL11	CL11	CL21	CL11	C3	FF11	F1	F2	F1	F1
31	F3	F5	F4	F5	F4	F2	L3	HL13	HL12	HL12	CL11	CL11	CL11	CL11	CL11	CL11	CL21	CL31	C3	F3	F3	F1	F2	F4
	00	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																								

MAR. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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 46	X 48	X 44	X 50	X 55	X 33	X 32													X 138	X 121	X 110	X 82	X 40
2	X 36	X 34	X 35	X 39	X 53	X 28	X 30													X 117	X 103	X 81	X 60	X 52
3	X 46	X 46	X 44	X 44	X 44	X 44	X 38													X 134	X 114	X 80	X 70	X 56
4	X 47	X 49	X 45	X 47	X 43	X 44	X 40													X 119	X 100	X 78	X 66	X 59
5	X 60	X 65	X 59	X 56	X 50	X 49	X 45													X 109	X 113	X 102	X 94	X 76
6	X 64	X 62	X 55	X 46	X 46	X 42	X 40													X 114	X 104	X 102	X 100	X 86
7	X 78	X 79	X 60	X 49	X 38	X 36	X 36													X 151	X 150	X 135	94	X 118
8	106	114	X 57	X 46	X 46	X 45	X 38													X 99	X 100	92	X 84	X 74
9	X 70	X 72	X 61	X 53	X 51	X 36	X 36													X 143	X 138	X 119	X 98	X 82
10	X 74	X 77	X 61	X 58	X 50	X 38	X 38													X 142	X 140	X 94	X 63	X 55
11	X 55	X 55	X 54	X 56	X 58	X 46	X 38													X 136	X 128	X 122	112	X 98
12	X 92	X 84	X 73	X 74	X 63	X 42	X 38													X 151	X 146	X 129	X 115	X 106
13	X 98	X 86	X 72	X 60	X 52	X 47	X 46													X 112	X 105	X 98	X 85	X 77
14	X 74	X 76	X 67	X 62	X 55	X 43	X 43													X 136	X 128	X 114	X 112	X 119
15	X 110	X 102	X 96	X 88	X 72	X 57	X 52													X 124	X 119	X 120	X 104	X 102
16	X 96	103	X 84	X 79	X 72	X 62	X 57													X 122	X 106	X 94	X 92	X 86
17	X 78	X 64	X 59	X 54	X 55	X 55	X 48													X 131	X 92	X 92	X 74	X 60
18	X 53	X 59	X 62	X 47	X 48	X 56	X 44													X 124	X 96	X 91	X 81	X 79
19	X 76	X 80	X 78	X 76	X 70	X 42	X 42													X 112	X 86	X 65	X 62	X 64
20	X 64	X 66	X 60	X 58	X 48	X 36	X 38													X 110	X 85	X 66	X 64	X 70
21	X 65	X 55	X 51	X 51	X 49	X 48														X 104	X 98	X 81	X 62	X 57
22	X 56	X 61	X 69	X 60	X 42	X 41														X 125	X 110	X 78	X 69	X 68
23	X 61	X 56	X 55	X 51	X 48	X 44														X 143	X 115	X 84	X 79	X 77
24	X 72	X 64	X 72	X 92	X 54	X 36														X 90	X 80	X 90	X 95	X 92
25	X 98	X 95	X 90	X 84	X 69	X 51														X 96	X 82	X 65	X 60	X 64
26	X 63	X 63	X 58	X 57	X 42	X 43														X 103	X 105	X 98	X 85	X 86
27	X 73	X 77	X 84	X 78	X 34	X 32														X 145	X 143	X 118	X 93	X 95
28	X 84	X 82	X 79	X 57																X 95	X 86	X 78	X 69	X 66
29	X 67	X 66	X 66	X 76	X 59	X 58														X 128	X 90	X 86	X 72	X 70
30	X 67	X 61	X 58	X 56	X 57	X 54														X 126	X 89	X 73	X 72	X 76
31	X 69	X 67	X 68	X 70	X 49	O X 45														X 124	X 108	X 95	X 74	X 67
	00	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	30	30	20													31	31	31	31	31
MED	X 69	X 66	X 61	X 57	X 50	X 44	X 39													X 124	X 105	X 92	X 81	X 76
U Q	X 78	X 80	X 72	X 74	X 57	X 49	X 44													X 136	X 121	X 110	X 94	X 86
L Q	X 60	X 59	X 55	X 50	X 46	X 38	X 38													X 110	X 92	X 80	X 69	X 64

IONOSPHERIC DATA STATION Okinawa

MAR. 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	40	42	38	44	49	27	26	47	74	82	82	90	96	109	119	123	129	136	R 143	R 132	115	R 104	76	34
2	30	28	29	33	47	22	24	56	82	85	96	118	106	110	119	134	R 147	R 146	R 130	R 111	97	75	54	46
3	40	40	38	38	38	38	32	50	80	86	95	101	112	126	146	J R 150	R 157	U R 169	R 152	128	108	74	64	50
4	41	43	39	41	37	38	34	57	84	85	88	89	102	112	140	R 147	136	U R 122	112	113	94	72	60	53
5	54	59	53	50	44	43	39	64	84	83	80	86	94	104	111	118	103	100	104	103	107	96	88	70
6	58	56	49	40	40	36	34	61	78	82	86	93	103	116	110	103	108	113	110	108	98	96	94	80
7	72	73	54	43	32	30	30	56	78	95	95	96	99	121	143	152	158	150	145	145	144	R 129	U F 80	U R 112
8	J F 99	F 107	51	40	40	39	32	56	64	74	86	105	108	101	106	111	108	99	96	93	94	F 86	78	68
9	64	66	55	47	45	30	30	56	78	90	104	110	122	J R 146	J R 152	U R 161	U R 156	R 148	141	137	132	113	92	76
10	68	71	55	52	44	32	32	55	79	104	112	105	122	140	R 146	R 155	R 158	R 147	142	136	134	R 88	57	49
11	49	49	48	50	52	40	32	55	79	94	111	114	132	R 152	R 160	U R 161	R 154	152	140	130	122	116	F	92
12	86	78	67	68	57	36	32	58	73	86	104	114	129	R 142	R 154	R 156	151	147	149	R 145	140	123	109	100
13	92	80	66	54	46	41	40	67	78	86	87	100	112	122	127	140	R 142	126	118	106	99	92	79	71
14	68	70	61	56	49	37	37	64	80	86	96	95	104	126	R 148	U R 152	R 151	R 140	R 134	R 130	122	108	106	113
15	104	96	90	82	66	51	46	64	86	94	92	92	102	113	119	126	125	123	126	118	113	114	98	96
16	90	F 94	78	73	66	R 56	51	73	85	90	95	98	116	130	134	129	128	130	122	116	100	88	86	80
17	72	58	53	48	49	49	42	61	78	88	101	112	116	129	123	R 130	130	129	128	125	86	86	68	54
18	47	53	56	41	42	50	38	63	101	78	83	93	111	120	117	124	124	125	122	118	90	85	75	73
19	R 70	74	72	70	64	36	36	63	77	89	92	98	115	124	128	125	122	117	110	106	80	59	56	58
20	58	60	54	52	42	30	32	60	76	102	108	113	113	125	138	141	131	123	122	104	79	60	58	64
21	59	49	45	45	43	42	35	61	68	89	108	100	102	122	128	128	128	124	107	98	92	75	56	51
22	50	55	63	54	H 36	35	36	65	78	95	99	110	115	130	139	135	130	132	122	119	104	72	63	62
23	55	50	49	45	42	38	36	72	79	76	85	112	R 144	R 158	U R 154	R 155	R 156	150	138	137	109	78	73	71
24	66	58	66	H 82	H 48	30	R 33	60	83	88	72	94	128	133	128	122	119	118	98	84	74	84	89	86
25	R 92	89	84	78	63	45	32	61	74	88	85	92	110	128	120	127	128	120	99	90	76	59	54	58
26	57	57	52	51	H 36	37	37	60	73	78	88	93	114	123	124	120	109	104	96	97	99	92	79	80
27	67	71	78	72	28	26	28	56	69	88	98	104	117	122	137	R 132	132	122	123	139	139	112	J R 87	J R 89
28	78	76	73	51	34	36	40	63	80	105	99	95	113	116	108	108	113	114	102	89	80	72	63	R 60
29	61	60	60	70	53	52	60	65	76	92	83	98	110	124	136	132	126	123	130	122	84	80	66	64
30	61	55	52	50	51	48	62	72	76	100	100	97	109	127	131	127	132	138	130	120	83	67	66	70
31	63	61	62	64	43	39	40	72	86	92	94	99	114	118	125	128	119	118	120	118	102	89	68	61
	00	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	30	31
MED	63	60	55	51	44	38	35	61	78	88	95	98	112	124	128	130	130	125	122	118	99	86	74	70
U Q	72	74	66	68	51	43	40	64	82	94	100	110	116	130	R 143	R 150	R 151	146	138	130	115	104	87	80
L Q	54	53	49	44	40	32	32	56	76	85	86	93	104	116	119	124	122	118	110	104	86	74	63	58

IONOSPHERIC DATA STATION Okinawa

MAR. 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	U L 488	L	L	U L 492	L	L	L	L						
2										L	L	U L 496	U L 484	L 508	U L 512	U L 536	U L 460							
3										L	L	U L 512	U L 520	L	U L 532	L	L	L						
4									L	L	U L 468	U L 492	U L 520	U L 532	U L 536	L	L	L						
5									L	L	L	L 508	L 528	476	L	U L 520	L							
6										L 424	U L 524	U L 528	U L 512	U L 516	U L 516	L	L	L	L					
7									288	L	U L 504	U L 492	U L 548	U L 540	L 520	L 532	L	L						
8										L	U L 516	U L 528	U L 520	U L 524	U L 556	L	A	L						
9										L	U L 504	U L 528	U L 520	U L 528	U L 564	U L 520	U L 500	L						
10									L	L	U L 504	U L 500	L	U L 504	U L 576	U L 528	L	L						
11										L	L	U L 528	U L 560	U L 528	U L 624	L 524	U L 480	L						
12										L	U L 512	L 520	U L 548	U L 536	U L 580	U L 544	L	L						
13										L	U L 488	U L 520	L	U L 568	U L 556	U L 528	L	L						
14										L	L	U L 516	L	U L 548	U L 548	L 540	L	L	220					
15										L	U L 512	U L 504	U L 516	U L 544	U L 560	U L 596	L	L						
16									L	L	L	L 512	U L 536	U L 516	U L 564	L	U L 504	L						
17									L	L	U L 524	U L 516	U L 524	U L 540	U L 528	U L 504	L	L	L					
18										L	A	A	U L 524	L	U L 508	U L 580	L							
19										L	L	U L 532	U L 552	U L 512	U L 528	U L 508	L	L						
20										L	U L 512	U L 508	S	L	U L 548	U L 504	L	L						
21										L	L	L 524	L 556	516	L	L 516	L	L						
22										L	U L 488	U L 508	U L 516	U L 504	U L 524	U L 548	L	L						
23								L	L	L	U L 496	L	524	L 520	U L 508	U L 532	U L 472	L						
24										L	L	L	U L 520	L	L	L	L	L						
25									L		L	L	A	U L 492	U L 492	U L 528	476	412						
26									L	L	U L 500	L 508	492	L 488	L 492	U L 488	L	L						
27										U L 472	U L 484	L 500	L 488	U L 512	500	L	L 488	L						
28									L	L	U L 488	L 492	512	U L 512	U L 524	U L 512	492	L						
29										L	L	L 536	U L 548	504	U L 496	L	L	L						
30										L	L	U L 500	L	U L 548	L	L	A	A						
31									L	L	L	U L 512	U L 544	L	L	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	17	26	24	26	25	20	8	1	1					
MED									288	L 448	U L 504	U L 512	U L 522	U L 516	U L 528	U L 528	U L 484	412	220					
U Q											U L 512	U L 524	U L 546	U L 536	U L 558	U L 538	U L 496							
L Q											U L 488	U L 500	U L 516	U L 504	U L 510	U L 514	U L 474							

MAR. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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								172	240	300	332	U R 360	R 356	B	U A 352	U A 328	A	264	188					
2								192	236	320	348	368	U R 372	R	R 348	336	320	A	A					
3								188	256	308	336	U A 360	U R 372	A	A	A	A	A	204					
4								188	248	300	A	R 364	U R 364	U R 368	U R 376	U A 328	A	A	A					
5								188	256	304	352	364	U A 372	A	A	348	332	A	A					
6								192	R 268	R 316	344	356	R 364	A	R 376	A	A	A	A					
7								200	248	316	356	B	U R 368	R	400	376	U A 336	A	A					
8								200	268	320	340	364	R	U R 388	A	A	A	292	A					
9								212	264	320	U R 348	U R 384	U R 400	B	U R 376	U R 356	U A 324	288	216					
10								200	252	320	U R 344	A 360	U R 384	U R 388	R	U R 368	R	280	204					
11								200	264	316	U R 368	U R 380	U R 388	B	U R 368	R 360	A	A	A					
12								172	260	324	360	U R 376	R	B	U R 364	356	A	R 276	188					
13								192	R 276	312	R	A	A	B	R	U R 360	332	A	U R 200					
14								220	264	324	R 340	A	A	A	A	B	328	A	A					
15								216	252	R 312	U R 332	R 360	B	R 376	380	376	B	296	216					
16								216	268	320	344	R 388	A	B	B	B	332	292	192					
17								212	260	320	R 340	R 376	U R 356	B	B	U R 356	336	280	200					
18								208	260	U A 312	U R 328	U R 384	B	B	A	A	A	A	A					
19								228	256	R 316	B	B	U R 396	B	B	U R 356	R 356	A	A					
20								224	268	316	B	U R 408	S	B	B	360	R	276	196					
21							B	196	268	304	360	R 356	B	B	U R 376	R	320	272	192					
22							B	192	284	312	344	348	B	U R 380	B	A	A	A	216					
23							B	212	268	R 328	348	U R 344	R	R	R	R 360	316	280	A					
24							B	208	272	U A 324	U A 332	U R 400	B	B	B	R 340	312	268	196					
25							B	200	A	A	A	A	A	A	A	U A 324	A	A	A					
26							B	208	272	R 300	U R 328	364	U R 368	U R 376	U A 352	U A 328	A	A	B					
27							B	196	268	316	R	A	B	B	B	U R 320	U A 304	A	188					
28					J K 132	J K 116	B	188	272	R 324	U R 352	U R 364	A	U R 392	U R 368	U R 360	U A 308	U A 260	A					
29							B	R 200	R 296	U R 352	U R 372	R	R	B	A	R 360	332	A	A					
30							B	216	280	332	R 364	U R 364	R 376	R	U R 364	348	324	U A 276	A					
31							B	A	A	A	A	A	A	U R 376	U A 384	A	324	U A 272	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					1	1		30	29	29	24	23	14	8	14	22	17	15	14					
MED					J K 132	J K 116		200	264	316	344	R 364	U R 372	U R 378	U R 372	356	324	276	198					
U Q								212	270	322	R 354	U R 380	U R 384	U R 388	376	R 360	332	288	204					
L Q								192	256	312	U 338	360	R 364	U R 376	U 364	U A 336	318	272	192					

MAR. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	21	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	35	39	46	50	46	46	38	J A 34	28	J A 26	J A 32	J A 20	J A 17	J A 17	E B 14
2	E B 14	E B 14	17	E B 14	E B 14	J A 20	E B 14	G	26	35	39	44	G	G 26	41	40	35	J A 42	J A 54	J A 28	J A 23	J A 16	J A 27	20
3	20	E B 14	E B 14	J A 54	J A 20	J A 20	J A 20	G	29	34	37	42	42	J A 42	39	38	34	29	G	J A 28	J A 26	J A 20	J A 17	J A 18
4	J A 18	E B 14	E B 14	E B 14	E B 14	J A 16	E B 14	J A 19	28	G 27	35	G 32	G	G	G	35	33	28	23	J A 20	J A 18	E B 14	J A 21	J A 18
5	E B 14	E B 14	J A 21	E B 14	E B 14	E B 14	E B 14	G	28	33	38	40	46	46	J A 45	G	36	32	J A 25	E B 14	E B 14	E B 14	J A 14	J A 18
6	E B 14	18	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	41	41	42	G	39	J A 35	J A 32	J A 22	J A 19	J A 20	E B 14	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	G E B 40		41	G 27	45	44	36	31	J A 25	J A 21	J A 16	E B 14	J A 26	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 19	31	33	40	42	42	G	J A 46	J A 52	J A 79	J A 42	J A 28	20	E B 14	J A 40	E B 17	E B 14
9	18	E B 14	E B 14	E B 14	J A 17	18	E B 14	G	G	34	G	G	G	E B 42	G	G	35	31	G 18	18	E B 14	J A 19	E B 14	19
10	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	34	G	42	G	G	G	G	G	G	G	18	E B 14	E B 14	E B 14	E B 14
11	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	34	G	G	G	E B 42	G	G	J A 42	31	22	E B 14	E B 14	E B 14	E B 14	E B 14
12	J A 37	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	20	G	36	39	G	G	E B 42	G	G	36	G	21	E B 14	E B 14	E B 14	E B 14	18
13	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	22	G	G	40	41	40	E B 43	G	G 31	G	29	23	18	J A 16	J A 19	J A 17	E B 14
14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	30	36	42	47	J A 49	J A 47	J A 43	E B 44	G	J A 32	J A 33	J A 19	20	19	J A 30	E B 14
15	E B 14	E B 14	E B 14	E B 14	J A 18	J A 18	E B 14	G	G	G	G	G	E B 43	G	G	G	E B 41	G	G	E B 14	19	E B 14	E B 14	E B 14
16	19	E B 14	E B 14	18	E B 14	E B 14	E B 14	G 17	G	35	G 31	G	43	E B 42	E B 43	E B 41	G	G	G	E B 14	E B 14	E B 14	E B 14	E B 14
17	E B 14	E B 14	19	E B 14	E B 14	E B 14	19	G	G 22	35	40	42	43	E B 44	E B 42	G	G	G 21	24	E B 14	E B 14	E B 14	18	18
18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	30	J A 48	J A 67	J A 91	45	44	40	J A 56	J A 39	J A 40	J A 28	J A 19	E B 14	18	E B 14	E B 14
19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	34	E B 40	E B 42	G	E B 43	E B 43	G	G	32	24	J A 17	E B 14	E B 14	E B 14	E B 14
20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	34	E B 42	G	S	E B 47	E B 42	G	G 26	G 25	24	J A 16	E B 14	E B 14	E B 14	E B 14
21	E B 14	E B 14	E B 14	21	19	18	E B 14	22	30	G	G	40	E B 43	E B 42	G	G	G	31	J A 32	J A 24	J A 21	J A 28	J A 18	E B 14
22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	22	G	G	38	G	E B 45	42	E B 42	J A 42	41	J A 35	25	E B 16	E B 15	E B 14	E B 14	J A 20
23	E B 14	E B 14	E B 14	E B 14	E B 14	19	E B 14	G	G	G	G	40	G	G	G	G	G	33	J A 35	J A 44	J A 20	J A 16	E B 14	J A 20
24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	37	39	44	E B 44	E B 41	E B 46	37	G 27	G	G	E B 14	E B 14	E B 14	J A 31	J A 19
25	E B 14	19	J A 16	E B 14	E B 14	E B 14	E B 14	22	J A 31	J A 36	39	J A 50	J A 56	J A 41	J A 42	J A 43	J A 46	J A 30	J A 24	J A 20	J A 16	18	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	G	G	G	G	G 31	42	G	41	42	J A 40	J A 34	J A 24	J A 24	J A 17	19	E B 14	E B 14
27	J A 19	J A 15	E B 14	E B 14	J A 18	E B 14	E B 14	G	G	36	G 32	40	E B 42	E B 41	E B 46	40	34	28	24	J A 20	J A 34	E B 14	E B 14	J A 37
28	J A 35	J A 24	21	E B 14	J K 13	J K 12	J A 14	24	33	36	38	40	42	G 31	43	43	36	35	J A 29	J A 22	J A 18	E B 14	J A 18	J A 28
29	J A 31	J A 41	J A 22	J A 18	J A 41	E B 14	E B 14	25	32	G	G	G 34	G E 34	B 42	J A 42	G	G	34	J A 35	J A 20	J A 26	E B 14	E B 14	E B 14
30	J A 20	J A 20	J A 16	J A 20	18	E B 14	20	G 20	31	36	J A 42	J A 44	43	45	G 31	39	J A 51	J A 87	J A 73	J A 40	J A 16	19	E B 14	J A 25
31	J A 30	J A 31	J A 19	J A 21	J A 31	J A 43	J A 21	J A 25	J A 33	J A 36	40	41	46	47	48	43	J A 41	J A 46	J A 39	J A 29	J A 26	18	21	J A 22
	00	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	30	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	34	38	40	42	42	40	36	34	31	J A 24	J A 19	J A 16	E B 14	E B 14	E B 14
U Q	J A 19	J A 15	J A 16	14	J A 17	J A 16	14	20	30	36	40	42	44	44	43	42	J A 40	J A 34	J A 29	J A 24	J A 20	J A 19	J A 18	J A 19
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	G	G	G	G	G 28	G E 22	B 16	E B 14	E B 14	E B 14	E B 14

MAR. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	19	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	35	39	44	49	44	43	37	32	G 23	G 15	20	19	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	G	26	34	38	43	G	U G 26	40	40	35	34	30	21	20	E B 14	21	E B 14
3	E B 14	E B 14	E B 14	21	E B 14	E B 14	E B 14	G	28	33	36	42	41	42	39	38	34	28	G	E B 14	24	20	E B 14	E B 14
4	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 14	28	G 21	35	G 30	G	G	G	35	U Y 33	28	23	16	E B 14	E B 14	17	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	G	28	32	38	40	45	44	40	G	35	32	23	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	G	G	G	G	40	40	42	G	38	35	30	21	E B 14	17	E B 14	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	G	E B 40	41	U G 27	45	43	36	30	22	18	E B 14	E B 14	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 14	30	33	40	41	41	G	43	45	62	G 29	26	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	G	G	34	G	G	G	E B 42	G	G	35	30	G 17	E B 14	E B 14	17	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	G	G	33	G	42	G	G	G	G	G	G	G	E B 14	E B 14	E B 14	E B 14	E B 14
11	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	33	G	G	G	E B 42	G	G	38	30	21	E B 14	E B 14	E B 14	E B 14	E B 14
12	22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	20	G	36	39	G	G	E B 42	G	G	33	G	21	E B 14	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	22	G	G	39	41	40	E B 43	G	G 24	G	28	G 14	E B 14	E B 14	E B 14	E B 14	E B 14
14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	30	36	41	46	47	45	43	E B 44	G	31	20	E B 14	E B 14	E B 14	25	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	G	G	G	G	G	E B 43	G	G	G	E B 41	G	G	E B 14	E B 14	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	G 16	G	34	G 29	G	42	E B 42	E B 43	E B 41	G	G	G	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 21	34	40	41	43	E B 44	E B 42	G	G	G 18	23	E B 14	E B 14	E B 14	E B 14	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	G	29	44	65	55	44	44	40	42	39	36	27	E B 14	E B 14	E B 14	E B 14	E B 14
19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	33	E B 40	E B 42	G	E B 43	E B 43	G	G	30	23	E B 14	E B 14	E B 14	E B 14	E B 14
20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	34	E B 42	G	S	E B 47	E B 42	G	U G 26	G 21	22	E B 14	E B 14	E B 14	E B 14	E B 14
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	22	30	G	G	39	E B 43	E B 42	G	G	G	30	31	22	19	16	E B 14	E B 14
22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	22	G	G	38	G	E B 45	42	E B 42	40	41	31	24	E B 16	E B 15	E B 14	E B 14	18
23	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	40	G	G	G	G	G	32	31	E B 14	E B 14	E B 14	E B 14	19
24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	36	38	44	E B 44	E B 41	E B 46	37	G 23	G	G	E B 14	E B 14	E B 14	30	E B 14
25	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	22	30	34	38	47	48	40	41	40	41	29	24	17	E B 14	E B 14	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	G	G	G	G	G 30	42	G	40	42	38	29	20	21	E B 14	E B 14	E B 14	E B 14
27	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	35	U G 32	39	E B 42	E B 41	E B 46	40	34	28	24	18	20	E B 14	E B 14	27
28	32	E B 14	E B 14	E B 14	K 13	K 12	E B 14	24	32	35	38	40	41	G 28	42	41	36	34	26	20	E B 14	E B 14	E B 14	22
29	26	30	E B 14	E B 14	22	E B 14	E B 14	25	32	G	G	U G 34	U G 33	E B 42	41	G	G	32	28	19	21	E B 14	E B 14	E B 14
30	16	19	E B 14	E B 14	E B 14	E B 14	E B 14	G 17	30	35	40	42	42	44	G 28	39	49	81	58	38	E B 14	E B 14	E B 14	20
31	20	16	E B E B 14	14	19	32	17	24	30	35	40	41	44	45	47	43	38	44	34	24	21	E B 14	E B 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	31	31	31	31	31	31	31	31	31	31	31	31	30	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	33	37	40	41	42	E G 40	36	34	30	23	E B 14	E B 14	E B 14	E B 14	E B 14
U Q	14	14	E B 14	E B 14	E B 14	E B 14	E B 14	20	30	35	40	42	44	44	43	41	38	32	26	19	17	E B 14	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	G	G	G	G	G	G	G	G	G	G	29	G	E B 14	E B 14	E B 14	E B 14	E B 14

MAR. 2013 fbEs (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

MAR. 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	14	20	20	24	37	29	23	19	14	14	14	14	14	14	14
2	14	14	14	14	14	14	14	14	14	14	19	20	22	20	21	21	23	16	14	14	14	14	14	14
3	14	14	14	14	14	14	14	14	14	16	21	21	24	23	31	22	22	15	14	14	14	14	14	14
4	14	14	14	14	14	14	14	14	14	16	19	22	25	23	24	22	20	14	14	14	14	14	14	14
5	14	14	14	14	14	14	14	14	14	14	20	17	20	21	17	23	23	21	14	14	14	14	14	14
6	14	14	14	14	14	14	14	14	14	20	20	20	24	22	20	20	17	16	14	14	14	14	14	14
7	14	14	14	14	14	14	14	14	14	20	21	40	24	25	26	21	20	17	14	14	14	14	14	14
8	14	14	14	14	14	14	14	14	14	20	24	23	24	34	23	23	21	17	14	14	14	14	14	14
9	14	14	14	14	14	14	14	14	16	20	21	29	22	42	27	22	21	16	14	14	14	14	14	14
10	14	14	14	14	14	14	14	14	14	16	20	24	27	24	26	24	16	14	16	14	14	14	14	14
11	14	14	14	14	14	14	14	14	14	14	21	22	23	42	23	22	14	14	14	14	14	14	14	14
12	14	14	14	14	14	14	14	14	16	16	21	22	22	42	24	24	20	15	14	14	14	14	14	14
13	14	14	14	14	14	14	14	14	16	20	21	26	23	43	34	14	23	18	14	14	14	14	14	14
14	14	14	14	14	14	14	14	14	14	19	21	24	39	37	33	44	21	19	14	14	14	14	14	14
15	14	14	14	14	14	14	14	15	14	20	21	24	43	31	29	32	41	21	14	14	14	14	14	14
16	14	14	14	14	14	14	14	14	15	18	21	32	39	42	43	41	21	16	14	14	14	14	14	14
17	14	14	14	14	14	14	14	14	13	16	21	21	30	44	42	26	22	13	14	14	14	14	14	14
18	14	14	14	14	14	14	14	14	14	16	22	23	40	39	24	31	24	16	14	14	14	14	14	14
19	14	14	14	14	14	14	14	14	15	19	40	42	27	43	43	24	21	18	14	14	14	14	14	14
20	14	14	14	14	14	14	14	14	16	17	42	24	50	47	42	24	21	14	14	14	14	14	14	14
21	14	14	14	14	14	14	14	14	15	20	24	24	43	42	25	23	24	19	14	14	14	14	14	14
22	14	14	14	14	14	14	14	14	15	18	21	29	45	32	42	27	24	16	14	16	15	14	14	14
23	14	14	14	14	14	14	14	14	14	16	22	24	25	26	24	22	23	14	14	14	14	14	14	14
24	14	14	14	14	14	14	14	14	15	20	19	24	44	41	46	26	19	16	14	14	14	14	14	14
25	14	14	14	14	14	14	14	14	15	20	20	24	22	23	26	21	21	16	14	14	14	14	14	14
26	14	14	14	14	14	14	14	14	15	15	20	20	24	26	32	24	22	16	14	14	14	14	14	14
27	14	14	14	14	14	14	14	14	16	20	20	23	42	41	46	24	20	14	14	14	14	14	14	14
28	14	14	14	14	14	14	14	14	14	18	21	24	24	21	21	19	15	13	14	14	14	14	14	14
29	14	14	14	14	14	14	14	14	18	21	32	26	24	42	29	23	21	17	14	14	14	14	14	14
30	14	14	14	14	14	14	14	14	15	14	21	24	31	31	24	22	17	14	14	14	14	14	14	14
31	14	14	14	14	14	14	14	14	15	20	20	24	32	32	25	24	21	16	16	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	14	18	21	24	25	34	26	23	21	16	14	14	14	14	14	14
U Q	14	14	14	14	14	14	14	14	15	20	21	24	39	42	34	24	23	17	14	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	14	16	20	22	24	24	24	22	20	14	14	14	14	14	14	14

MAR. 2013 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	306	302	295	328	371	372	301	335	354	359	334	332	303	303	305	315	316	325	R 337	R 344	318	R 311	323	319
2	318	271	266	304	386	272	288	347	362	343	319	329	332	311	295	305	R 328	R 345	R 334	R 304	300	320	316	306
3	291	303	311	279	320	333	288	340	346	352	341	326	314	308	322	R 314	R	U R 342	R 343	326	355	305	313	315
4	294	298	298	311	320	314	295	342	359	369	354	333	317	304	326	R 330	323	U R 303	312	316	303	279	296	302
5	303	305	316	305	306	319	307	358	370	372	336	338	316	322	312	317	319	309	327	323	306	292	298	324
6	310	320	326	300	338	327	311	366	356	361	332	312	312	320	314	301	307	317	324	317	304	290	321	313
7	320	342	361	324	344	316	313	348	346	352	336	320	297	299	312	310	334	325	325	317	R 321	R 301	F	U R 303
8	F	F 325	318	296	303	321	351	363	363	341	321	321	333	305	297	306	317	328	321	312	298	F 305	296	294
9	308	329	341	336	373	302	296	352	341	335	320	310	293	J R 302	J R 319	U R 314	U R 315	R 315	317	320	317	304	285	306
10	290	326	325	327	369	316	291	336	327	337	328	315	300	315	R 303	R 315	R 328	R 314	327	322	347	R 302	283	287
11	287	307	310	316	334	340	312	337	332	329	331	315	305	R 310	R 301	U R 311	R 324	312	322	319	312	296	F	305
12	284	291	314	315	349	326	329	353	343	329	318	325	312	R 315	R 304	R 310	306	307	315	R 324	325	323	294	296
13	302	306	330	313	333	314	302	353	363	350	327	302	291	296	287	306	R 314	311	307	315	314	294	304	297
14	302	308	318	306	335	312	313	362	362	346	332	321	291	292	R 302	R	R 325	R 314	R 313	R 336	320	301	295	311
15	296	296	288	304	312	322	292	343	349	345	331	300	299	293	291	292	302	309	315	320	314	300	288	283
16	300	F 322	306	297	327	R 305	300	344	347	340	328	306	293	299	299	296	298	321	313	313	309	281	307	316
17	319	307	293	288	299	312	315	345	338	326	316	318	307	312	296	R 301	305	302	313	319	274	296	318	276
18	265	291	346	278	267	320	287	347	357	350	336	282	288	300	294	297	310	314	320	334	321	289	292	295
19	R 305	305	326	327	365	336	305	359	349	329	332	305	302	310	312	309	321	318	329	341	320	287	290	299
20	300	328	326	325	328	313	293	350	332	337	334	323	313	305	308	317	315	315	336	343	335	264	275	309
21	310	291	285	301	308	320	336	368	346	317	329	320	297	291	306	301	301	326	324	325	326	311	299	283
22	289	305	343	350	H 293	311	309	358	336	333	317	310	309	308	321	317	309	328	327	331	305	270	290	306
23	312	297	316	319	319	297	294	365	356	343	294	289	R 309	R 322	U R 320	R 313	R 318	325	326	342	344	304	295	311
24	280	273	312	H 311	H 373	314	R 301	345	357	356	337	279	316	312	309	305	321	331	356	339	319	274	280	292
25	R 299	312	302	310	317	333	318	346	336	341	332	303	311	326	321	312	324	336	341	338	325	284	288	291
26	317	317	326	330	H 298	306	305	357	356	328	324	298	316	318	319	323	318	316	320	323	324	294	286	297
27	287	311	336	365	353	326	308	355	335	329	320	314	319	308	319	R 303	309	307	315	333	329	301	J R 278	J R 276
28	304	311	331	364	295	298	313	348	336	332	339	293	306	319	301	307	310	330	333	331	318	304	292	R 308
29	304	305	311	322	310	284	324	358	341	342	319	294	300	301	313	309	309	304	322	337	312	293	281	290
30	296	303	297	293	307	306	349	363	339	332	334	302	296	301	309	294	303	323	332	342	315	283	290	300
31	308	304	311	354	348	293	293	352	360	344	329	307	305	298	302	313	309	310	317	332	316	309	288	308
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	29	31
MED	302	305	316	313	327	314	305	352	347	341	331	312	306	308	308	310	315	316	324	325	318	296	292	302
U Q	308	317	326	327	349	326	313	358	357	350	334	321	314	315	319	314	321	326	332	337	325	304	302	309
L Q	291	298	302	301	307	306	294	345	338	332	320	302	297	300	301	303	309	310	315	319	309	287	287	292

MAR. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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	U L 382	L	L	U L 370	L	L	L	L						
2										L	L	U L 379	U L 382	L 378	U L 364	U L 359	U L 366							
3										L	L	U L 377	U L 375	L	U L 355	L	L	L						
4									L	L	U L 394	U L 390	U L 373	U L 371	U L 361	L	L	L						
5									L	L	L	L 396	L 374	415	L	U L 371	L							
6										L 405	U L 383	U L 381	U L 390	U L 385	U L 380	L	L	L	L					
7									461	L	U L 388	U L 392	U L 372	U L 381	L 356	L 345	L	L						
8										L	U L 372	U L 365	U L 372	U L 387	U L 349	L	A	L						
9										L	U L 374	U L 373	U L 390	U L 394	U L 336	U L 362	U L 360	L						
10									L	L	U L 372	U L 386	L	U L 405	U L 354	U L 349	L	L						
11										L	L	U L 370	U L 357	U L 379	U L 319	L 352	U L 359	L						
12										L	U L 377	L 373	U L 360	U L 375	U L 338	U L 342	L	L						
13										L	U L 394	U L 385	L	U L 360	U L 350	U L 345	L	L						
14										L	L	U L 378	L	U L 356	U L 340	L 347	L	L	417					
15										L	U L 382	U L 391	U L 388	U L 361	U L 345	U L 344	L	L						
16									L	L	L	L 378	U L 374	U L 380	U L 355	L	U L 357	L						
17									L	L	U L 366	U L 374	U L 381	U L 357	U L 368	U L 368	L	L	L					
18										L	A	A	A 355	L	U L 376	U L 336	L							
19										L	L	U L 364	U L 364	U L 376	U L 359	U L 370	L	L						
20										L	U L 369	U L 384	S	L	U L 340	U L 370	L	L						
21										L	L	L 374	L 352	370	L	L 361	L	L						
22										L	U L 376	U L 369	B 372	U L 380	U L 362	U L 343	L	L						
23								L	L	L	U L 367	L	376	L 373	U L 367	U L 343	U L 369	L						
24										L	L	L	U L 359	L	L	L	L	L						
25									L		L	L	A	U L 382	U L 386	U L 343	369	391						
26									L	L	U L 370	L 373	396	L 407	L 398	U L 361	L	L						
27										B 366	U L 377	L 384	L 430	H 394	B 347	L	L 361	L						
28									L	L	U L 365	L 379	380	U L 381	U L 360	U L 357	357	L						
29										L	L	L 361	U L 338	B 383	U L 378	L	L	L						
30										L	L	U L 390	L	U L 338	L	L	A	A						
31									L	L	L	U L 387	U L 366	L	L	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	2	17	26	24	26	25	20	8	1	1					
MED									461	386	U L 376	U L 378	U L 374	U L 380	U L 356	U L 350	U L 360	391	417					
U Q											U L 382	U L 386	U L 382	U L 385	U L 368	U L 362	U L 368							
L Q											U L 370	U L 373	U L 362	U L 370	U L 346	U L 344	U L 358							

MAR. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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										234	266	262	290	282	294	270	270	250						
2										244	284	258	232	270	280	290	268							
3										240	260	264	278	294	272	270	258	238						
4									230	226	240	260	276	290	278	256	236	244						
5									218	226	256	254	282	270	280	272	244							
6										230	272	282	276	282	272	274	278	248	228					
7									222	250	254	266	278	306	288	294	254	250						
8										244	276	280	262	276	304	294	266	244						
9										254	276	278	298	296	292	278	278	250						
10									224	260	268	254	306	274	290	290	264	244						
11										262	266	276	294	294	318	298	266	246						
12										270	276	262	282	272	304	290	270	266						
13										246	258	284	300	302	326	294	270	234						
14										246	268	262	308	312	310	292	264	252	242					
15										248	264	270	276	304	322	316	290	258						
16									232	258	266	284	318	290	298	298	294	262						
17									236	256	284	276	292	284	274	282	280	274	250					
18										244	264	326A	312	304	294	306	272							
19										258	256	284	298	284	272	268	268	258						
20										256	264	272	268	288	296	270	252	260						
21										282	256	264	304	304	274	286	274	248						
22										262	270	290	282	292	270	264	268	252						
23								234	226	252	282	332	294	280	278	288	264	240						
24										242	250	354	288	276	286	278	274	250						
25									256		256	300	296	272	276	286	260	234						
26									250	270	272	306	294	278	270	266	250	244						
27										268	274	290	284	290	276	282	272	264						
28									262	272	254	276	304	282	288	276	286	256						
29										260	258	326	302	318	286	280	266	280						
30										264	262	244	306	316	292	294	292	264						
31									234	252	266	284	300	296	304	278	268	266						
	00	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	11	30	31	31	31	31	31	31	31	28	3					
MED								234	232	253	266	276	294	290	288	282	268	250	242					
U Q									250	262	272	290	302	302	298	294	274	261	250					
L Q									224	244	256	262	278	278	276	272	264	244	228					

MAR. 2013 h'F2 (KM)

IONOSPHERIC DATA STATION Okinawa

MAR. 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	266	288	290	242	214	196	286	236	230	224	216	E A 248	A	E A 256	A 220	H 202	210	212	234	218	216	226	200	204
2	240	340	362	306	212	376	314	228	224	220	236	E A 232	208	200	200	224	222	232	212	210	218	204	230	246
3	284	276	252	A 314	240	232	246	230	230	218	206	210	208	206	198	206	204	218	210	204	196	224	238	236
4	294	270	262	248	240	250	234	234	214	200	196	196	210	200	194	212	Y	204	222	214	202	220	238	250
5	246	242	244	244	228	240	244	222	H 178	206	214	198	222	A 218	H 180	214	214	230	234	220	208	216	230	220
6	234	234	222	252	232	246	250	224	218	196	200	200	186	182	220	206	208	218	226	212	212	234	222	216
7	240	226	200	224	208	244	244	228	176	216	206	196	186	178	244	244	228	224	230	224	218	214	Q 248	234
8	Q 224	Q 222	202	260	246	214	216	218	214	202	216	202	194	198	A 216	A 258	A	216	236	226	232	Q 230	256	266
9	264	234	216	230	202	234	282	226	226	208	208	202	216	184	210	220	202	218	240	224	212	216	254	244
10	266	244	224	232	198	240	270	234	H 200	218	204	214	190	192	Y 206	212	E Y 224	212	230	220	206	192	222	270
11	290	266	252	246	228	208	222	230	218	214	210	208	196	192	200	202	E A 228	230	230	216	218	206	Q 246	230
12	268	238	230	224	206	218	238	226	208	214	214	206	208	192	182	208	204	228	244	220	214	200	234	242
13	252	232	238	238	220	238	250	224	222	222	206	198	188	196	204	198	220	218	232	216	214	210	224	238
14	262	250	238	238	218	228	244	220	228	222	224	E A 234	E A 250	A 224	A 218	E B 252	206	214	A 218	218	202	208	262	236
15	248	250	254	246	212	222	248	230	226	218	210	198	200	198	192	194	B 244	230	244	232	206	202	240	248
16	250	Q 238	220	230	204	220	238	228	222	216	212	208	200	200	B 218	B 226	216	226	236	220	206	236	236	220
17	228	232	256	276	268	234	214	220	222	214	218	210	214	B 238	212	200	218	226	242	230	258	270	194	230
18	336	284	226	292	348	244	264	224	234	236	A	A	E A 234	E A 252	212	E A 234	A 232	244	246	226	208	214	236	256
19	264	252	232	222	200	212	246	222	220	204	B 210	B 206	212	222	E B 232	206	244	226	236	216	202	230	266	254
20	242	232	226	238	198	226	280	232	226	222	B 230	S 210	S	E B 260	240	218	210	198	234	210	196	240	282	254
21	242	276	290	264	250	230	214	212	218	214	214	198	B 210	206	Y 226	E Y 234	220	228	228	226	234	200	216	280
22	288	264	230	216	216	242	254	236	230	230	214	198	E B 236	226	B 210	218	248	234	228	214	212	206	276	258
23	254	266	256	254	232	272	300	228	216	E Y 222	192	204	190	198	210	204	212	228	230	220	198	216	242	254
24	262	292	260	214	190	254	284	224	232	210	198	H 230	E B 246	B 236	B	240	H 210	H 208	226	218	210	228	272	266
25	258	250	Q 234	228	198	200	240	226	204	H 204	H 192	A	A	214	202	204	E A 244	206	222	216	206	210	284	272
26	262	240	228	236	192	246	246	224	206	194	Y 216	204	204	196	190	E A 242	A 220	202	H 206	230	216	200	248	256
27	274	252	232	210	182	238	252	H 198	210	220	208	194	178	H 178	B	224	210	220	256	238	214	202	Q 290	290
28	268	250	230	210	280	270	246	222	232	236	A 226	214	200	214	236	208	222	240	236	220	224	216	252	286
29	A 276	A 282	250	232	A 242	256	222	208	218	232	216	202	220	B 208	204	222	212	208	250	216	212	224	230	272
30	264	240	280	256	232	260	220	214	220	224	226	214	194	A 244	236	220	A	A	246	228	202	260	268	272
31	240	272	252	214	216	E A 330	A 278	224	224	218	218	206	A 212	A E 236	E A 260	252	242	A	256	228	230	230	230	274
	00	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	30	29	28	31	29	31	28	29	31	31	31	31	31	31
MED	262	250	238	238	216	238	246	224	220	217	213	204	204	203	210	213	216	220	234	220	212	216	240	254
U Q	268	272	256	254	240	250	270	230	226	222	216	212	215	226	223	234	228	229	242	226	218	230	262	270
L Q	242	238	226	224	202	222	238	222	214	208	206	198	194	196	200	206	210	212	226	216	206	206	230	236

MAR. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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								172	118	110	110	110	110	B	110	110	A	110	116					
2								150	108	108	108	108	108	A	108	108	108	A	A					
3								148	112	108	108	108	108	A	A	A	A	A	120					
4								156	108	108	A	108	108	108	108	108	A	A	A					
5								146	112	112	112	108	108	A	A	108	108	A	A					
6								134	112	110	108	108	108	A	108	A	A	A	A					
7								142	110	108	108	B	108	A	110	110	110	A	A					
8								142	114	110	110	110	108	112	A	A	A	112	A					
9								148	112	108	108	108	108	B	108	108	108	108	136					
10								140	108	108	108	108	108	108	110	110	108	108	114					
11								140	108	108	108	108	108	B	108	108	A	A	A					
12								132	108	108	108	108	108	B	108	108	A	112	112					
13								134	114	108	108	A	A	B	110	110	110	A	110					
14								134	108	108	108	A	A	A	A	B	108	A	A					
15								148	108	108	108	106	B	112	112	118	B	114	114					
16								144	110	108	110	114	A	B	B	B	110	110	110					
17								132	114	108	110	110	110	B	B	110	110	112	112					
18								128	110	108	108	108	B	B	A	A	A	A	A					
19								136	108	108	B	B	108	B	B	108	108	A	A					
20								126	108	108	B	108	S	B	B	108	A	112	118					
21							B	114	110	110	110	108	B	B	108	106	110	110	110					
22							B	110	110	108	108	108	B	110	B	A	A	A	110					
23							B	134	108	108	108	108	108	104	104	108	108	108	A					
24							B	118	108	108	108	112	B	B	B	112	116	110	114					
25							B	118	A	A	A	A	A	A	A	110	A	A	A					
26							B	126	110	110	110	110	110	108	114	108	A	A	B					
27							B	112	108	108	A	A	B	B	B	110	110	A	114					
28					B	B	B	120	110	A	A	110	A	114	110	110	110	110	A					
29							B	114	110	110	110	A	A	B	A	110	110	A	A					
30							B	134	112	110	110	110	110	110	110	110	110	110	A					
31							B	A	A	A	A	A	A	A	110	A	110	110	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								30	29	28	24	23	17	9	17	23	18	15	14					
MED								134	110	108	108	108	108	110	110	110	110	110	114					
U Q								144	112	110	110	110	109	112	110	110	110	112	116					
L Q								126	108	108	108	108	108	108	108	108	108	110	110					

MAR. 2013 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

MAR. 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	90	B	B	B	B	B	G	186	150	132	118	110	108	104	108	112	104	106	104	102	96	96	B
2	B	B	96	B	B	102	B	G	162	170	150	126	G	102	122	116	172	116	102	104	102	102	100	92
3	90	B	B	100	102	100	100	G	178	156	132	112	114	112	116	114	108	120	G	102	102	96	96	94
4	94	B	B	B	B	92	B	102	164	102	102	102	G	G	G	116	108	112	110	88	104	B	102	100
5	B	B	102	B	B	B	B	G	174	162	194	126	114	110	110	G	134	106	104	B	B	B	94	96
6	B	94	B	B	B	B	B	G	G	G	G	114	112	110	G	112	110	106	102	108	100	B	B	B
7	B	B	B	B	B	B	B	G	162	158	G	B	122	102	176	144	146	108	106	104	102	B	98	B
8	B	B	B	B	B	B	B	98	176	156	120	120	110	G	104	124	114	118	106	110	B	112	100	B
9	94	B	B	B	104	104	B	G	G	184	G	G	G	B	G	G	116	158	110	94	B	100	B	94
10	B	B	B	B	B	B	B	G	G	190	G	118	G	G	G	G	G	G	G	92	B	B	B	B
11	B	B	B	B	B	B	B	G	G	148	G	G	G	B	G	G	94	112	112	B	B	B	B	B
12	102	B	B	B	B	B	B	166	G	178	168	G	G	B	G	G	108	G	154	B	B	B	B	96
13	B	B	B	B	B	B	B	166	G	G	114	112	110	B	G	92	G	108	84	84	100	94	92	B
14	B	B	B	B	B	B	B	G	160	134	116	108	108	106	114	B	G	114	110	116	102	106	98	B
15	B	B	B	B	100	100	B	G	G	G	G	G	B	G	G	G	B	G	G	B	90	B	B	B
16	96	B	B	96	B	B	B	120	G	144	104	G	116	B	B	B	G	G	G	B	B	B	B	B
17	B	B	92	B	B	B	98	G	104	140	126	120	112	B	B	G	G	90	168	B	B	B	104	100
18	B	B	B	B	B	B	B	G	136	114	112	108	108	110	116	102	100	100	100	108	B	90	B	B
19	B	B	B	B	B	B	B	G	G	142	B	B	G	B	B	G	G	112	106	106	B	B	B	B
20	B	B	B	B	B	B	B	G	G	144	B	G	S	B	B	G	96	96	138	114	B	B	B	B
21	B	B	B	100	100	98	B	166	148	G	G	126	B	B	G	G	G	132	112	110	106	106	102	B
22	B	B	B	B	B	B	B	146	G	G	132	G	B	114	B	110	114	108	142	B	B	B	B	100
23	B	B	B	B	B	96	B	G	G	G	G	116	G	G	G	G	G	134	120	110	106	106	B	100
24	B	B	B	B	B	B	B	G	G	116	108	116	B	B	B	202	104	G	G	B	B	B	102	102
25	B	94	94	B	B	B	B	160	112	108	108	104	102	102	108	106	104	104	104	104	94	90	B	B
26	B	B	B	B	B	B	B	G	G	G	G	104	118	G	112	106	106	110	108	100	112	90	B	B
27	96	104	B	B	102	B	B	G	G	178	102	122	B	B	B	110	108	104	194	94	106	B	B	100
28	102	106	102	B	B	B	B	146	144	142	136	132	98	96	110	124	112	106	90	108	108	B	106	102
29	100	98	102	100	98	B	B	158	156	G	G	104	104	B	122	G	G	116	110	96	106	B	B	B
30	104	102	102	102	102	B	102	104	156	134	128	124	122	182	98	130	110	108	106	104	90	90	B	102
31	102	102	102	114	100	100	102	102	100	98	98	100	120	118	112	110	114	110	106	106	102	102	94	94
	00	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	8	6	8	8	4	12	16	23	19	22	17	13	14	17	21	26	26	23	18	14	14	14
MED	98	100	102	100	101	100	101	146	158	144	120	116	112	110	112	112	110	109	107	104	102	98	99	100
U Q	102	103	102	102	102	101	102	163	169	162	132	122	117	113	116	124	114	116	112	108	106	106	102	100
L Q	94	94	95	100	100	97	99	103	140	134	108	108	108	102	108	107	105	106	104	96	100	90	96	94

MAR. 2013 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

MAR. 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		F1							HL11	H1	H1	C1	C1	C1	C1	C1	C1	C1	L1	FQ31	F2	F1	F1	
2			F1			F3			H1	H1	H1	C1		L1	C1	C1	H1	CL11	L6	F2	F4	F1	FF41	F1
3	F1			F3	FQ11	F1	F1		H1	H1	H1	C1	C1	C1	C1	C1	C1	C1		F3	F4	F2	F1	F1
4	F1					F1		L1	H1	L1	L1	L1				C1	C1	CL11	CL11	F2	FF11		F1	F1
5			F1						H1	H1	HL11	C1	C1	C1	C1		H1	C1	CL22				F1	F1
6		F1										CL11	C1	C1		C1	C1	C1	C2	F1	F1			
7									H1	H1			C1	L1	H1	H1	HC11	C1	L1	F2	F1		F2	
8								L1	H1	H1	C1	C1	C1		C1	CL11	C3	C1	C1	F1		FF11	F1	
9	F1				F3	F1				H1							C1	HC11	L1	F1		F1		F1
10										H1		C1								F1				
11										H1							L2	CL12	CL11					
12	F3							H1		H1	H1						C1		H1					F1
13								H1			C1	C1	C1			L1		L1	L1	F1	F1	F1	F1	
14									H1	H1	CL11	CL11	C1	C1	C1			C1	C1	F1	F1	F1	F4	
15					F1	F1															F1			
16	F1			F1				L1		H1	L1		C1											
17			F1				F1		L1	H1	CL11	C1	C1					L1	H1				F1	F1
18									HL11	CL11	C2	C2	C1	C1	C1	L1	L1	L2	L2	F1		F1		
19										H1								C1	CL11	FF11				
20										H1							L1	L1	HL11	FF11				
21				F1	F1	F1		H1	H1			C1						H1	C2	F2	F3	F2	F1	
22								H1			H1			C1		C1	C1	LH11	H1					F1
23						F1						C1						H1	CL51	FF51	F3	F1		F1
24										C1	C1	C1				H1	L1						F5	F1
25		F1	F1					H1	C1	C1	C1	L1	L1	L1	L1	C1	C1	C1	C1	FF21	F1	F1		
26												L1	CL11		C1	C1	C1	C1	C1	F2	F1	F1		
27	F2	F1			F1					HL11	L1	CL11				C1	C1	CL11	HCL11	F1	F1			F4
28	F9	FQ11	F2		K1	K1	H1	H1	H1	HL11	HL11	HL11	L1	L1	CL11	C1	C1	CL11	L3	F1	F1		F1	F3
29	F4	F3	F1	F1	FQ21			H1	H1			L1	L1		C1			C1	CL22	F1	F2			
30	F2	F1	F1	F1	F1		L1	L1	HL11	HL11	CL11	CL11	C1	H1	L1	H1	CL21	CL52	CL71	FF61	F2	F2		F2
31	F2	F2	F1	F1	F2	F4	L2	L1	L1	L1	L1	L1	CL11	CL11	C1	C1	C1	C2	C3	F2	F4	F1	F1	F2
	00	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																								

MAR. 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

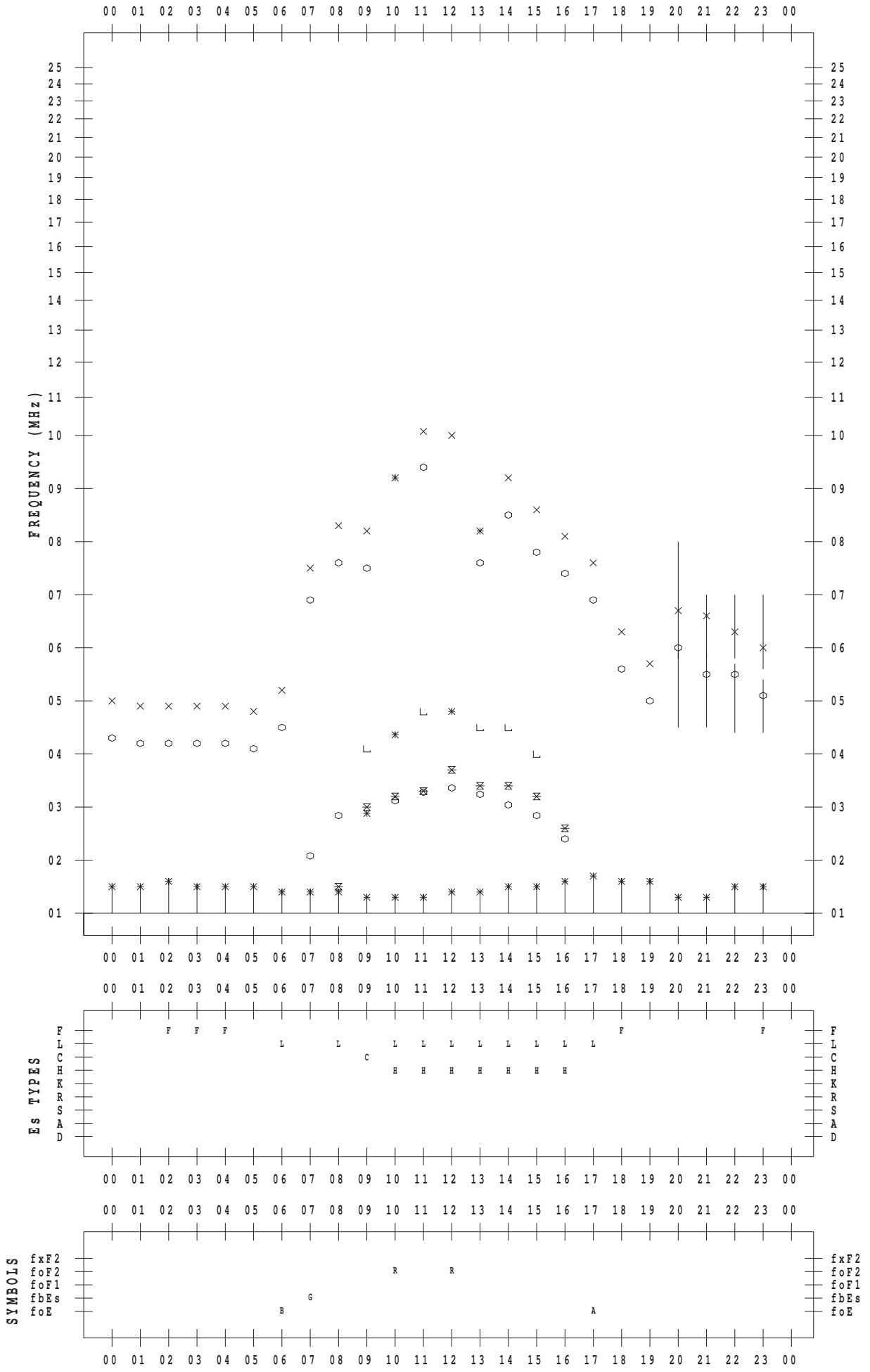
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 1

135 °E MEAN TIME



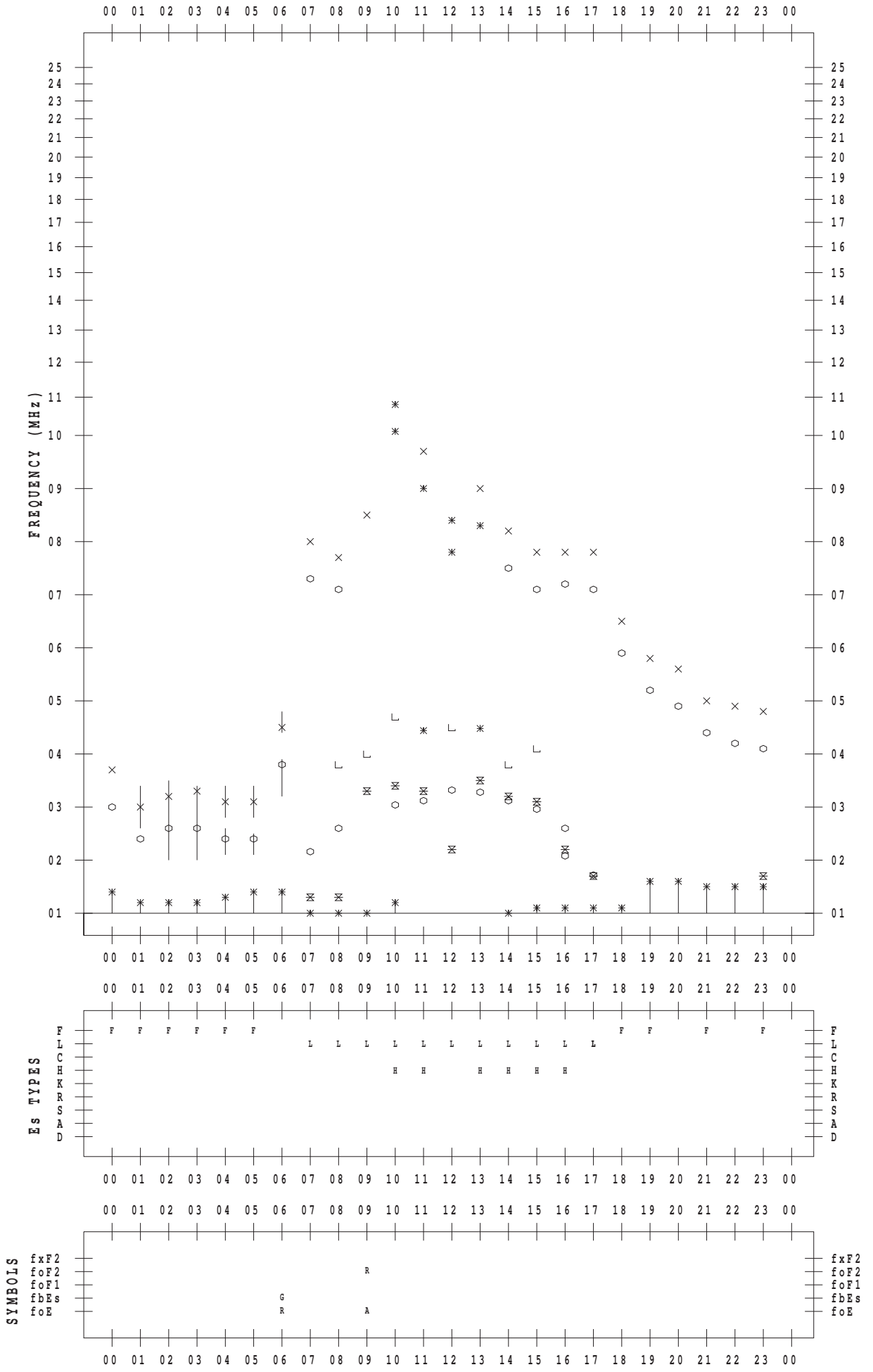
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 2

135 °E MEAN TIME



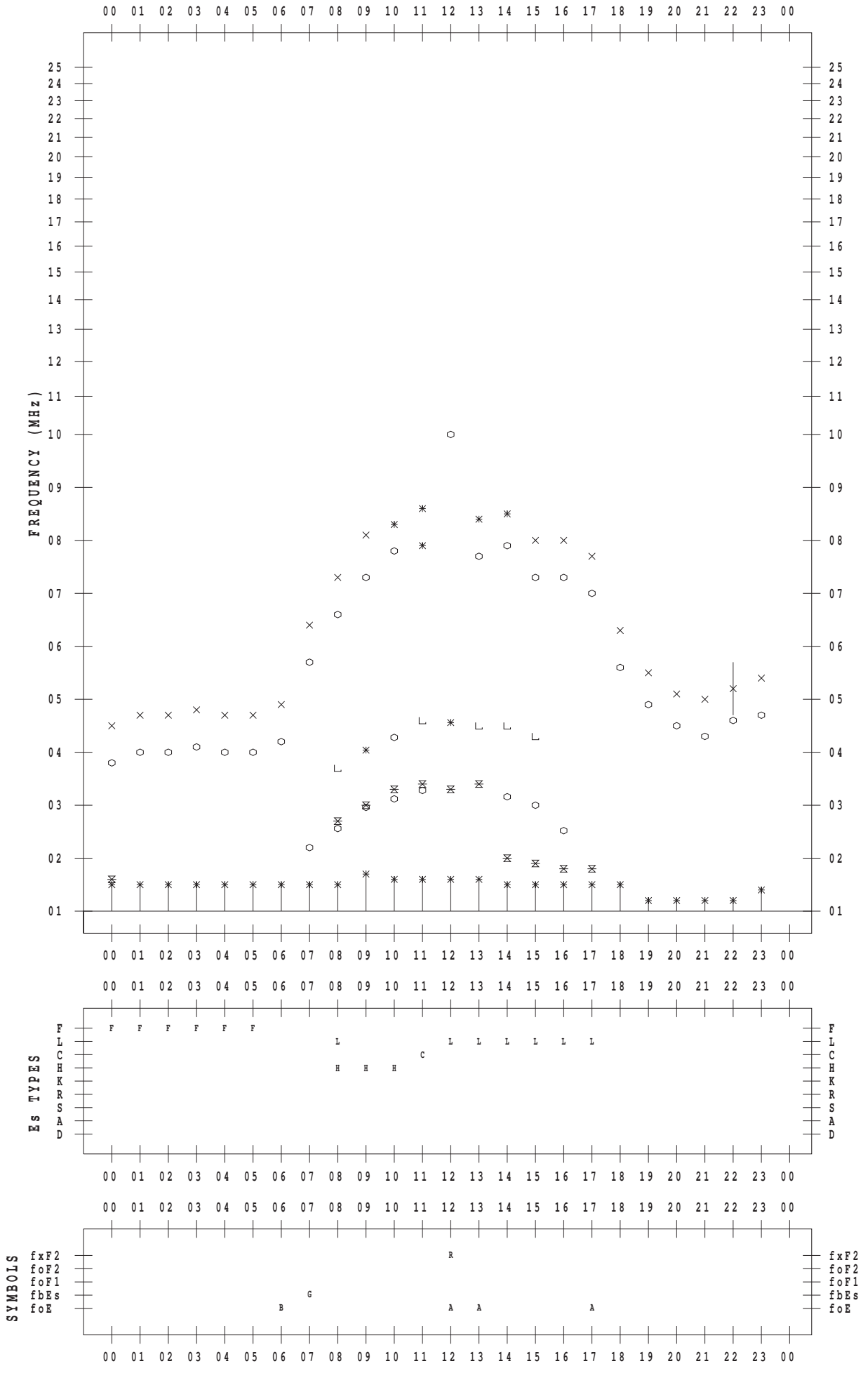
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 3

135 °E MEAN TIME



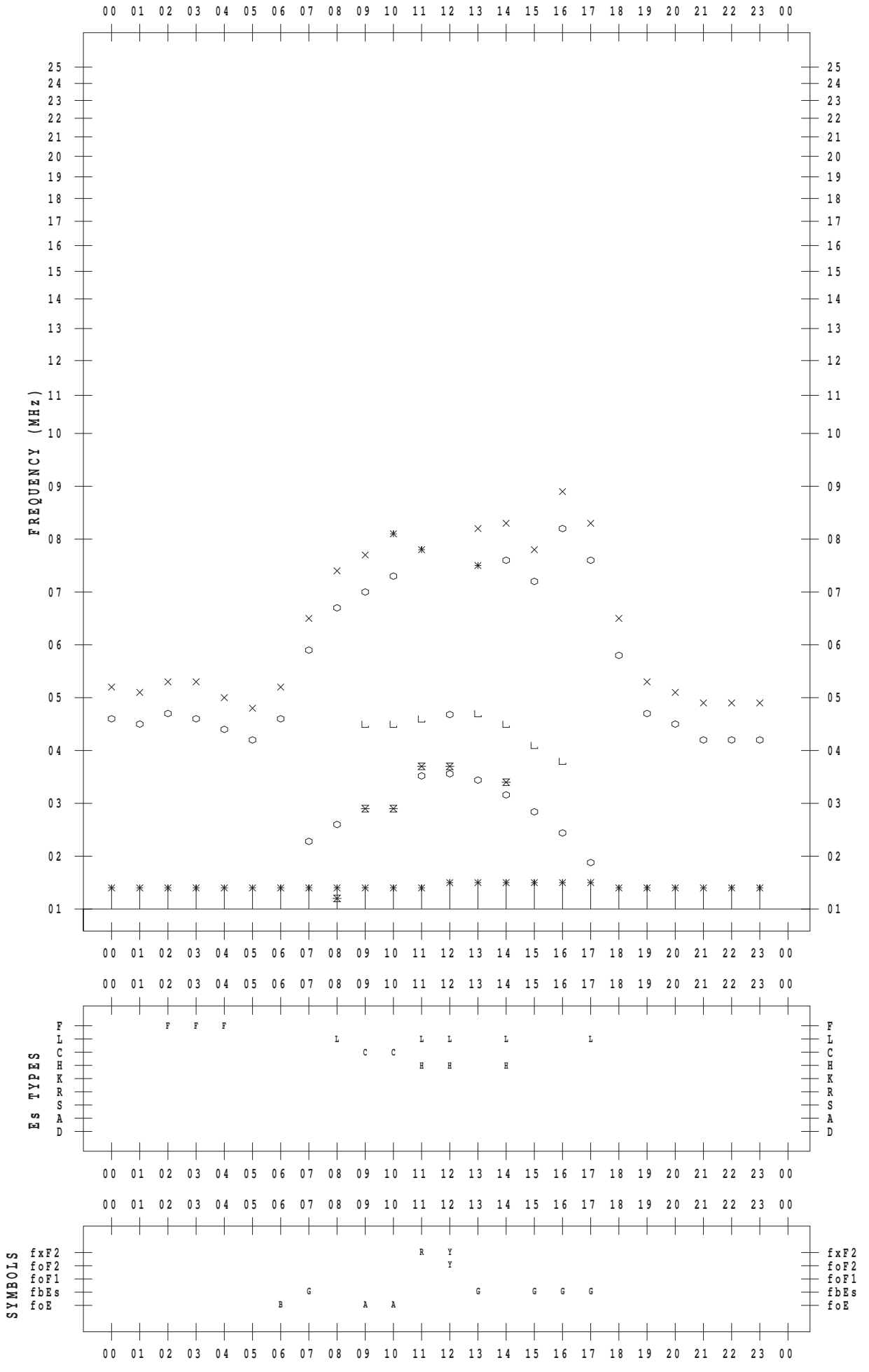
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 4

135 °E MEAN TIME



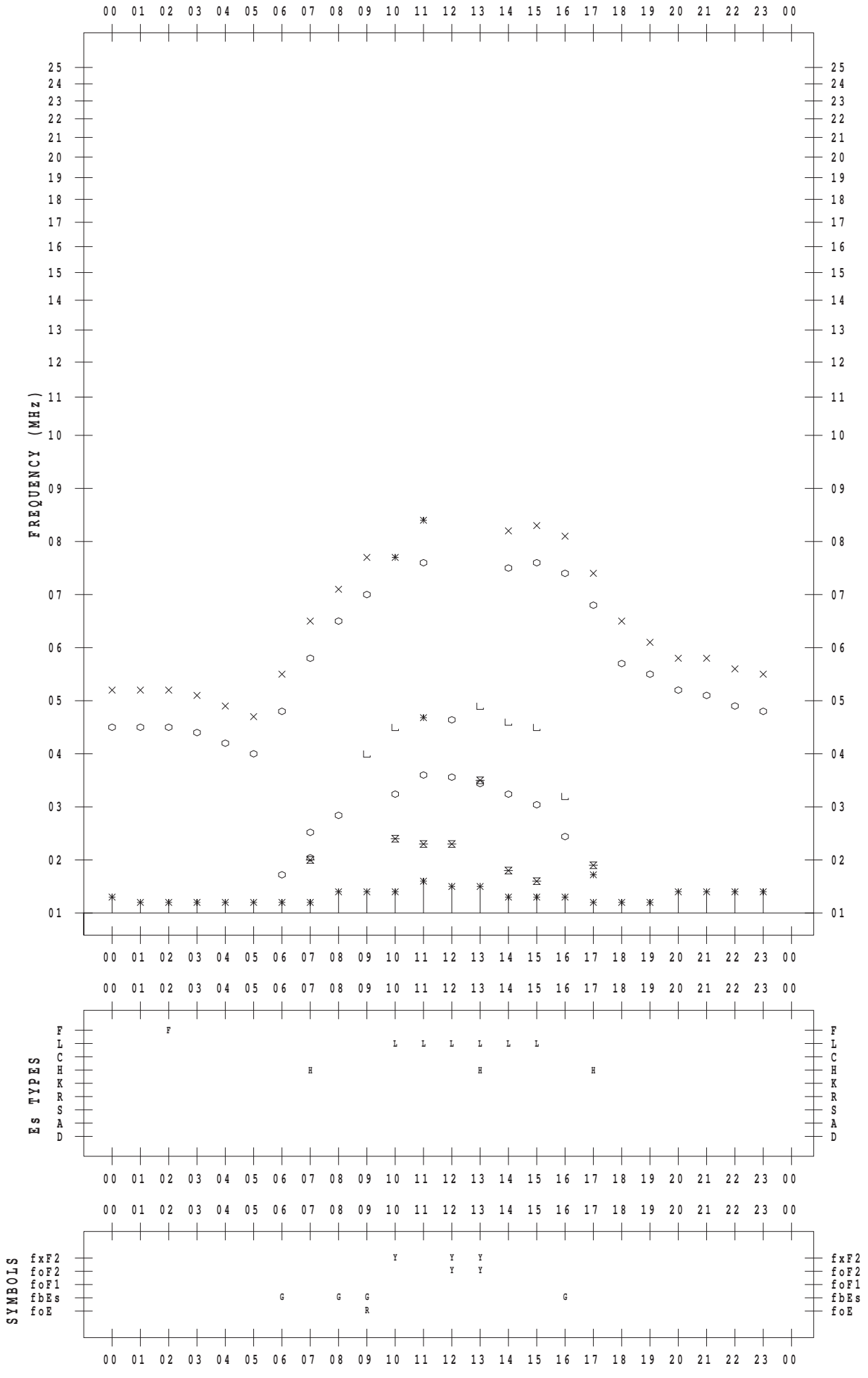
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 5

135 °E MEAN TIME



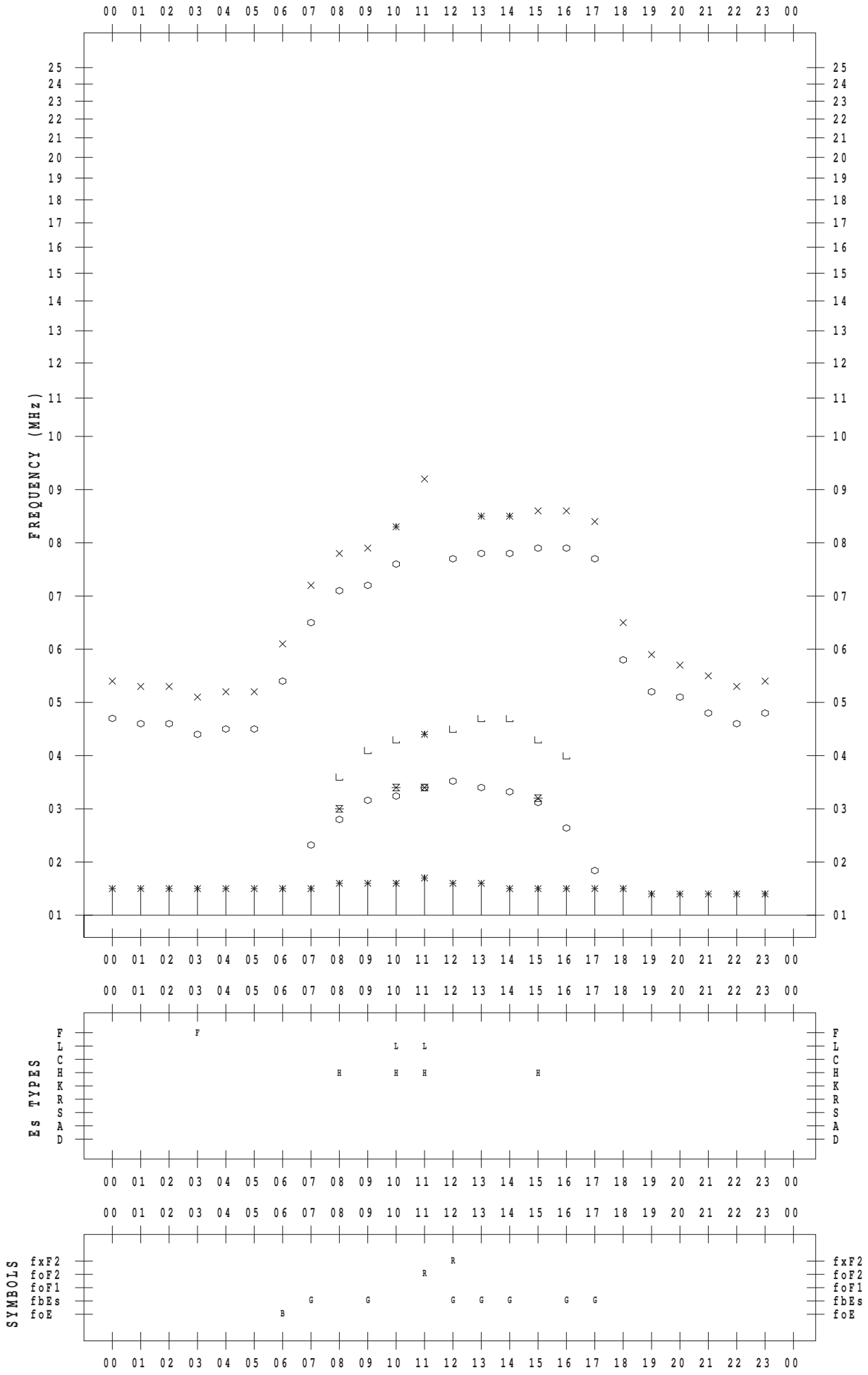
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 6

135 °E MEAN TIME



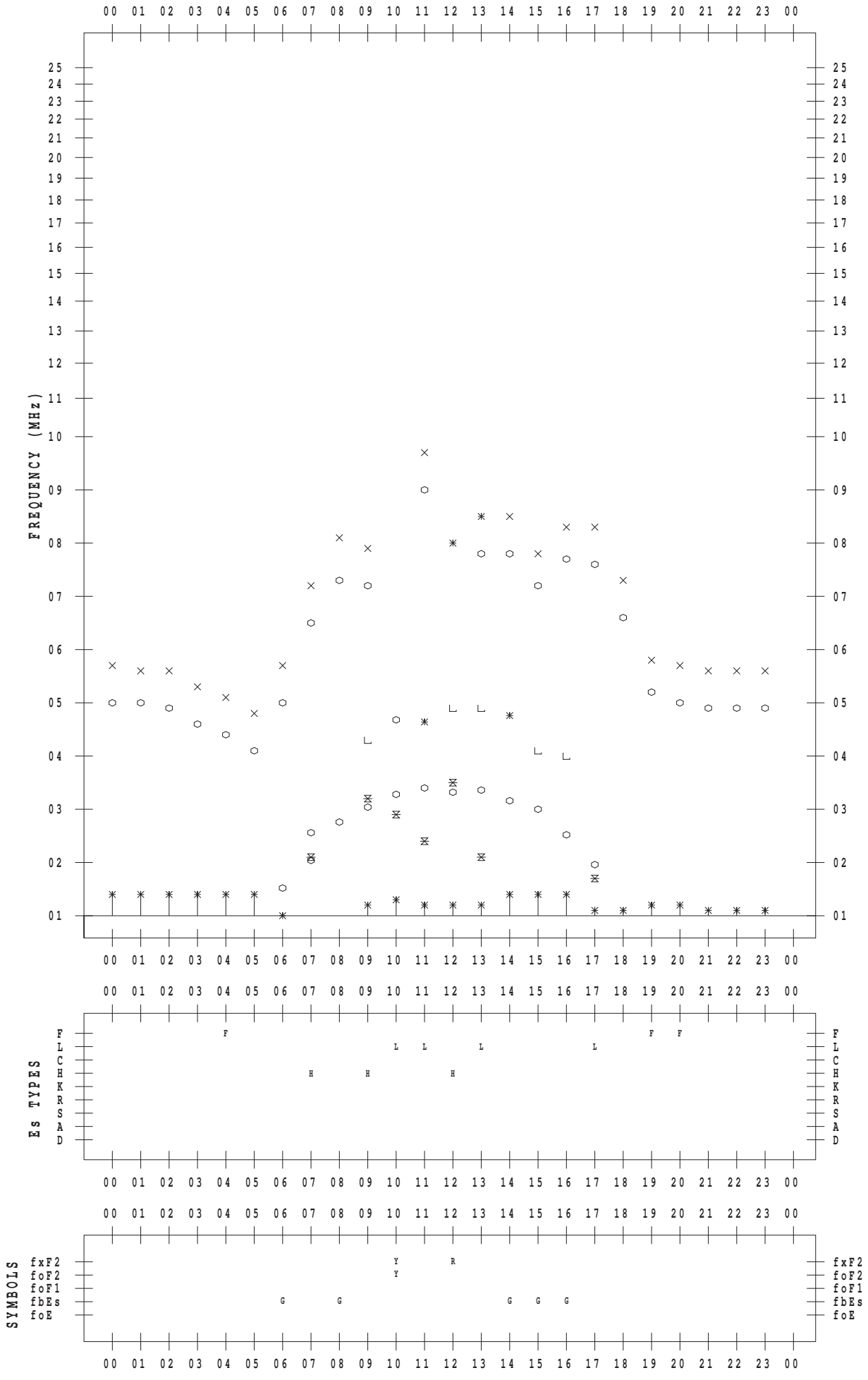
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 7

135 °E MEAN TIME



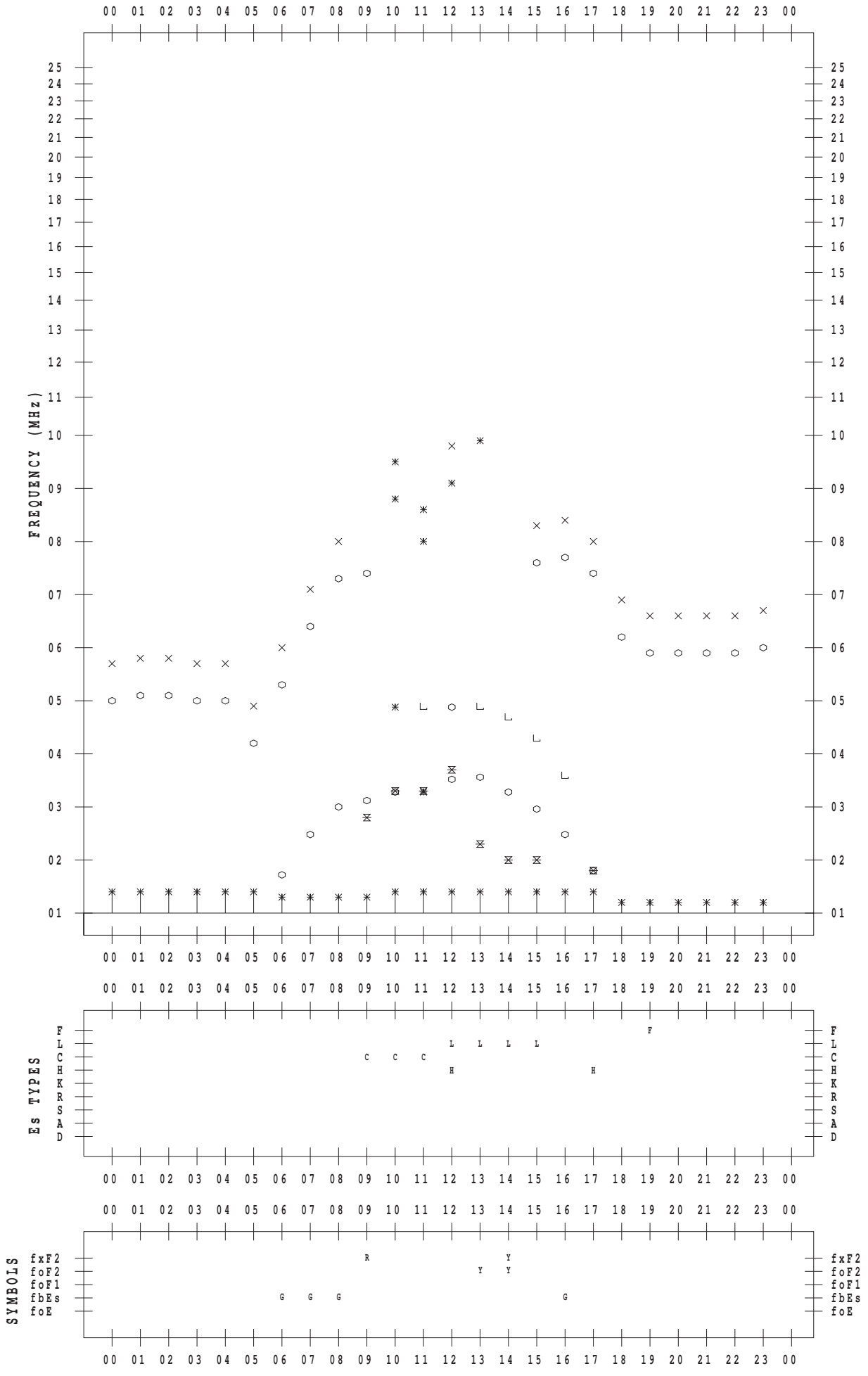
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 8

135 °E MEAN TIME



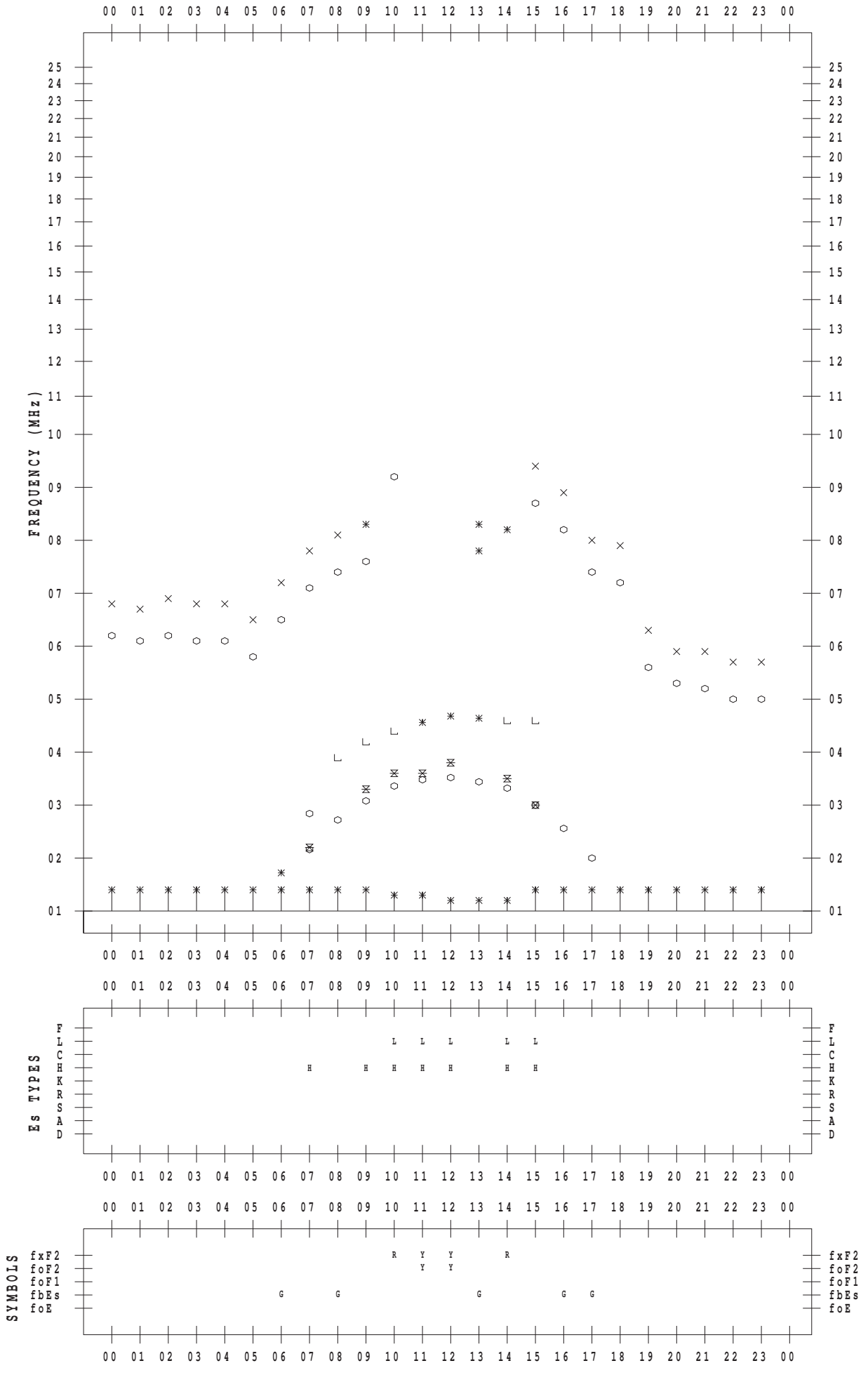
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/ 9

135 °E MEAN TIME



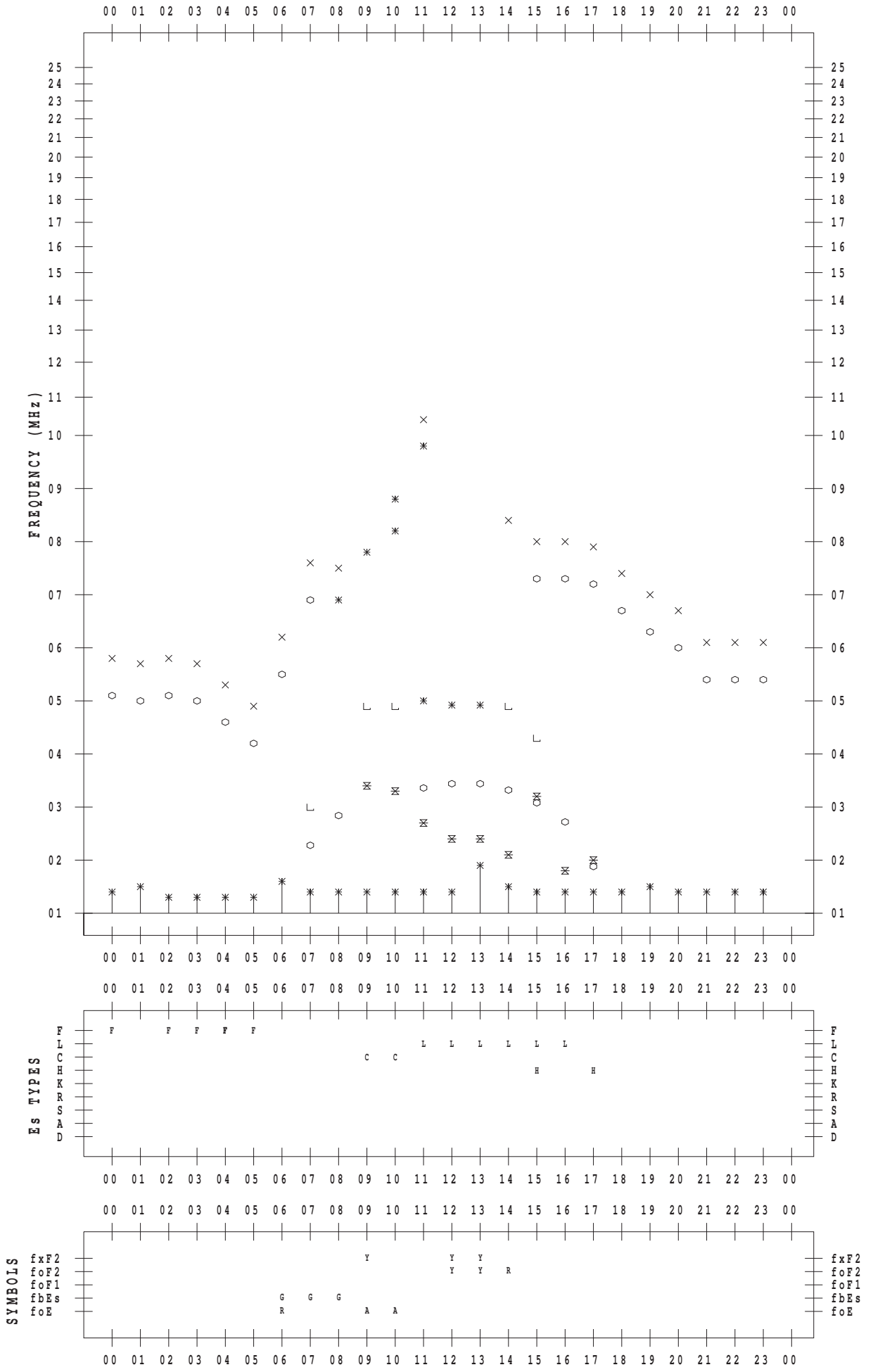
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/10

135 °E MEAN TIME



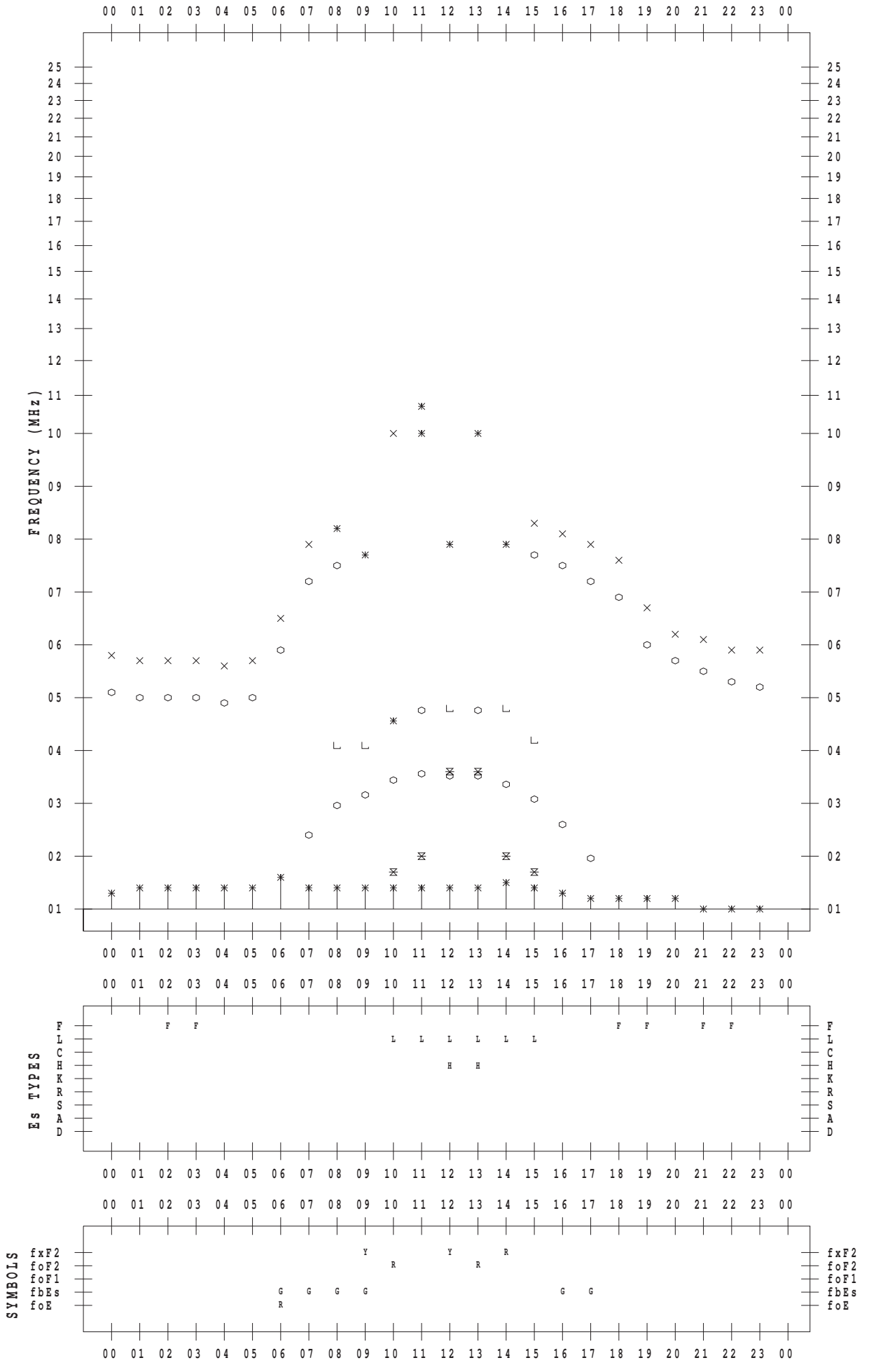
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/11

135 °E MEAN TIME



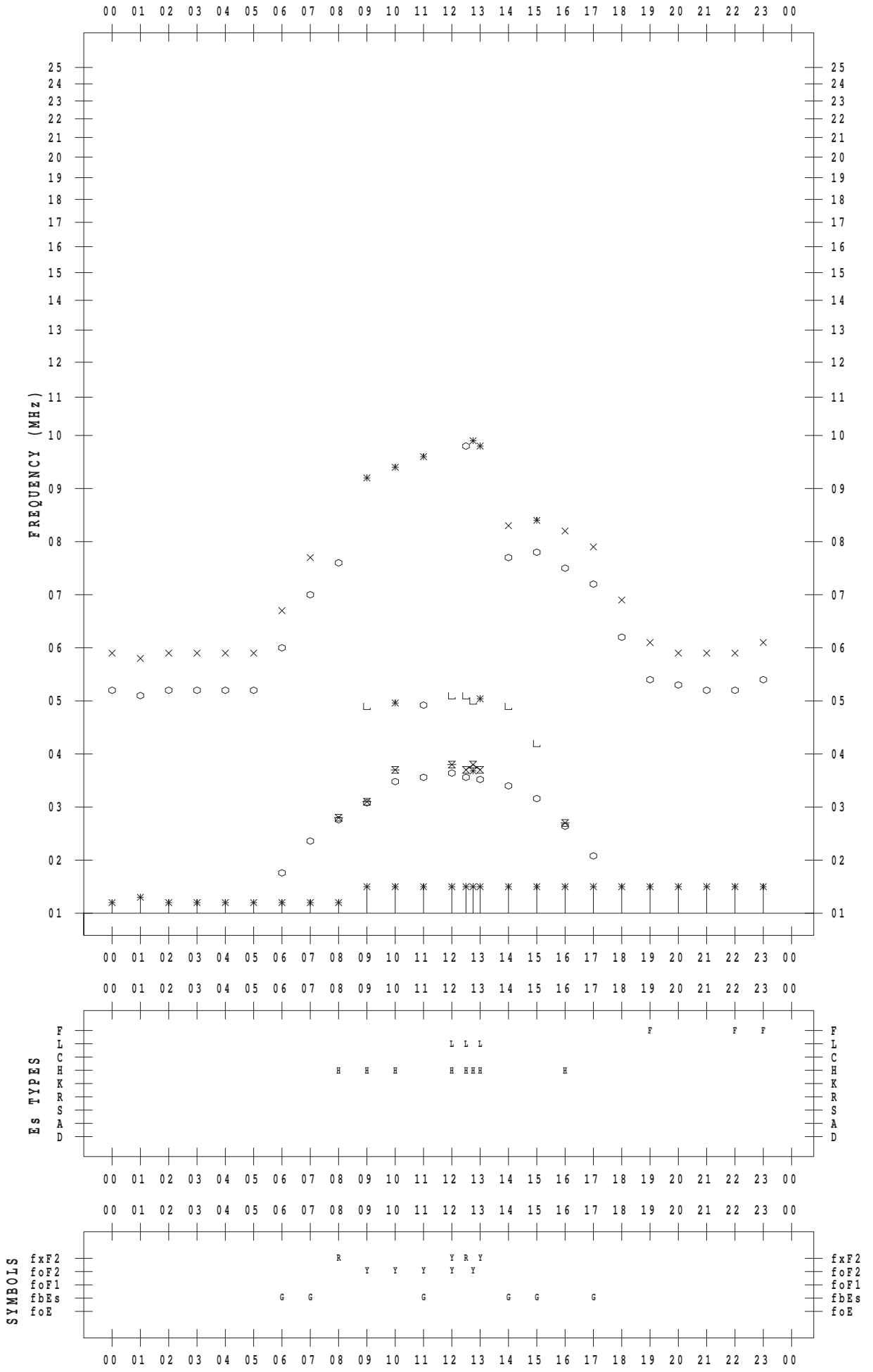
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/12

135 °E MEAN TIME



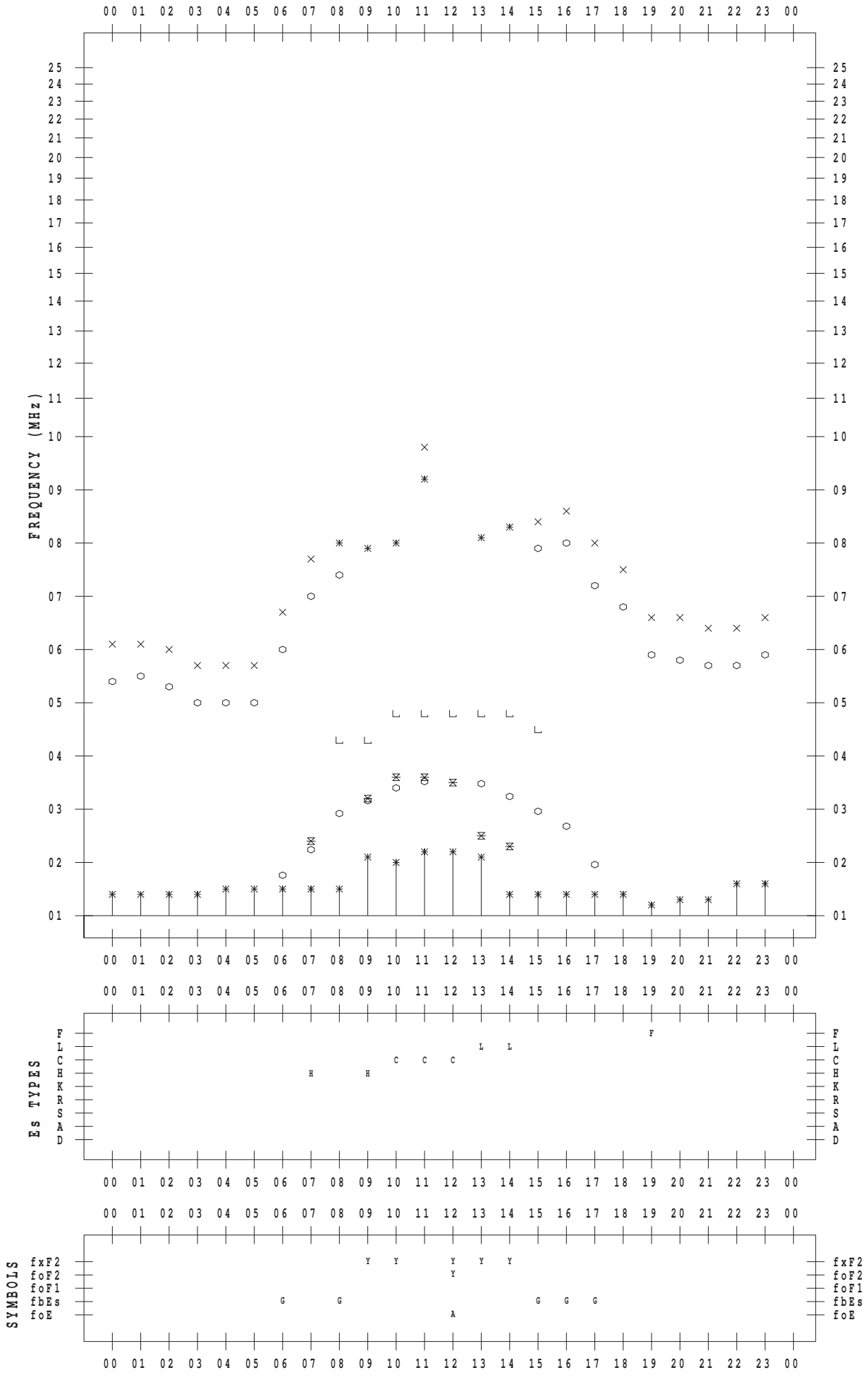
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/13

135 °E MEAN TIME



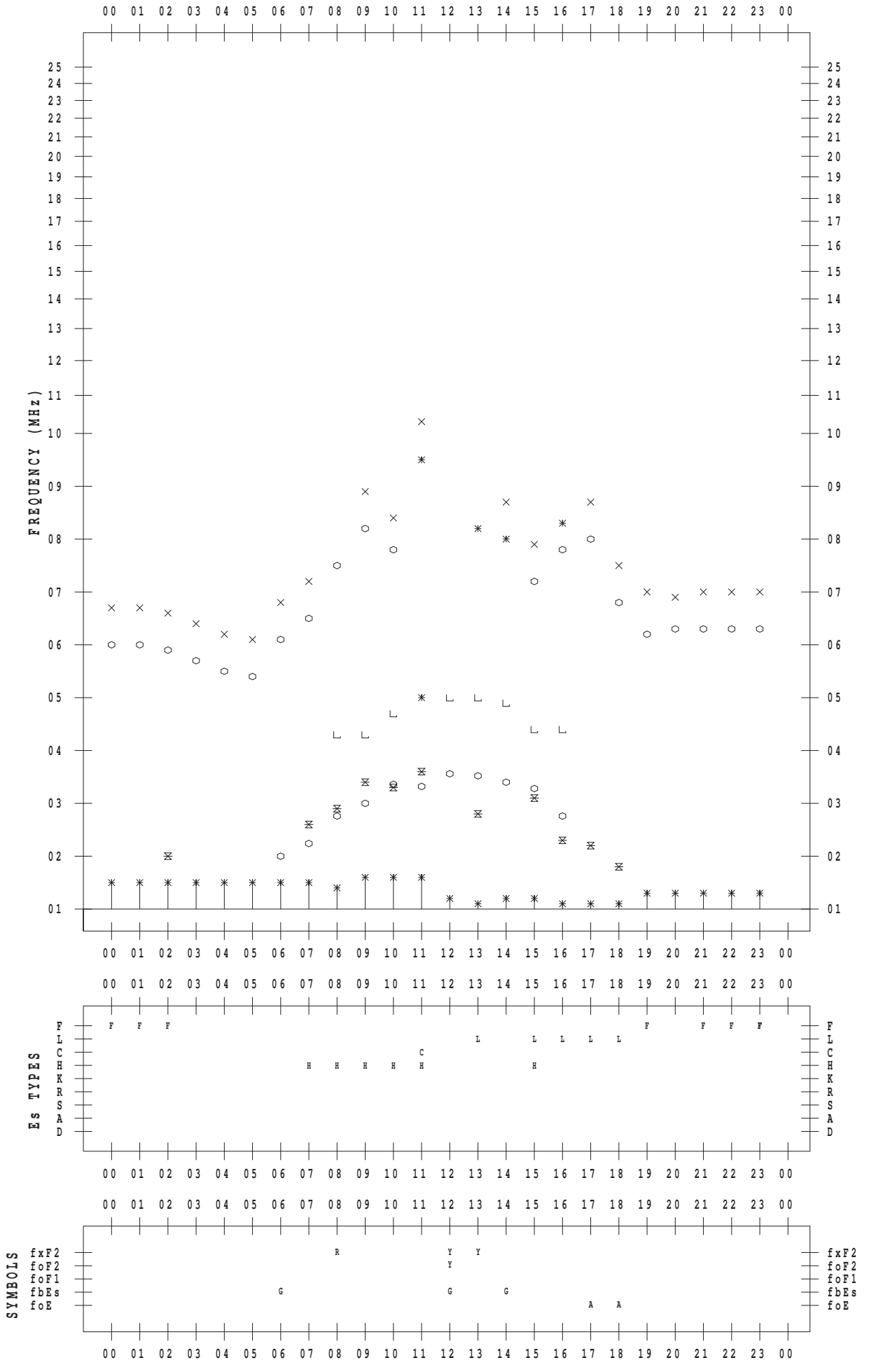
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/14

135 °E MEAN TIME



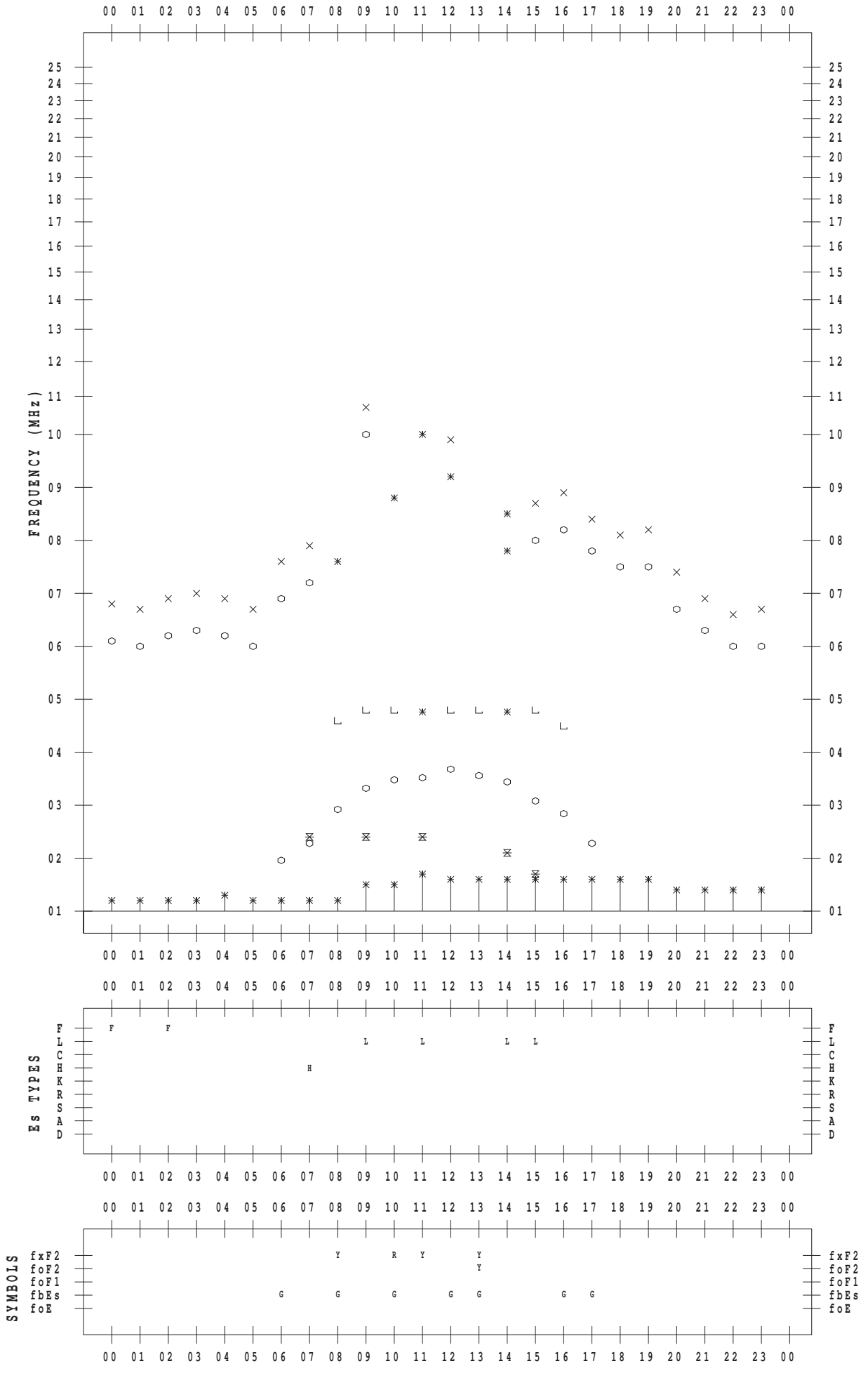
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/15

135 °E MEAN TIME



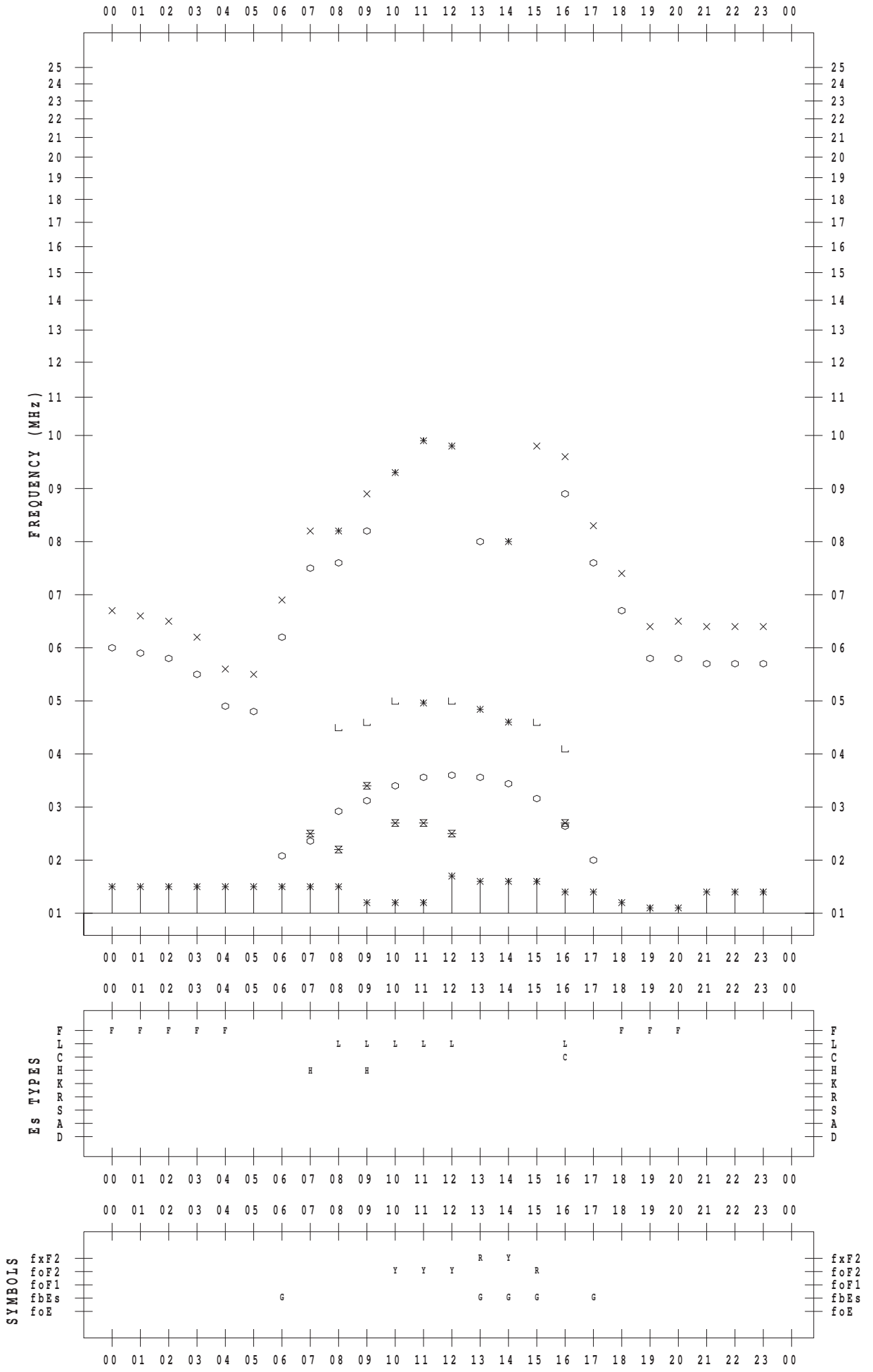
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/16

135 °E MEAN TIME



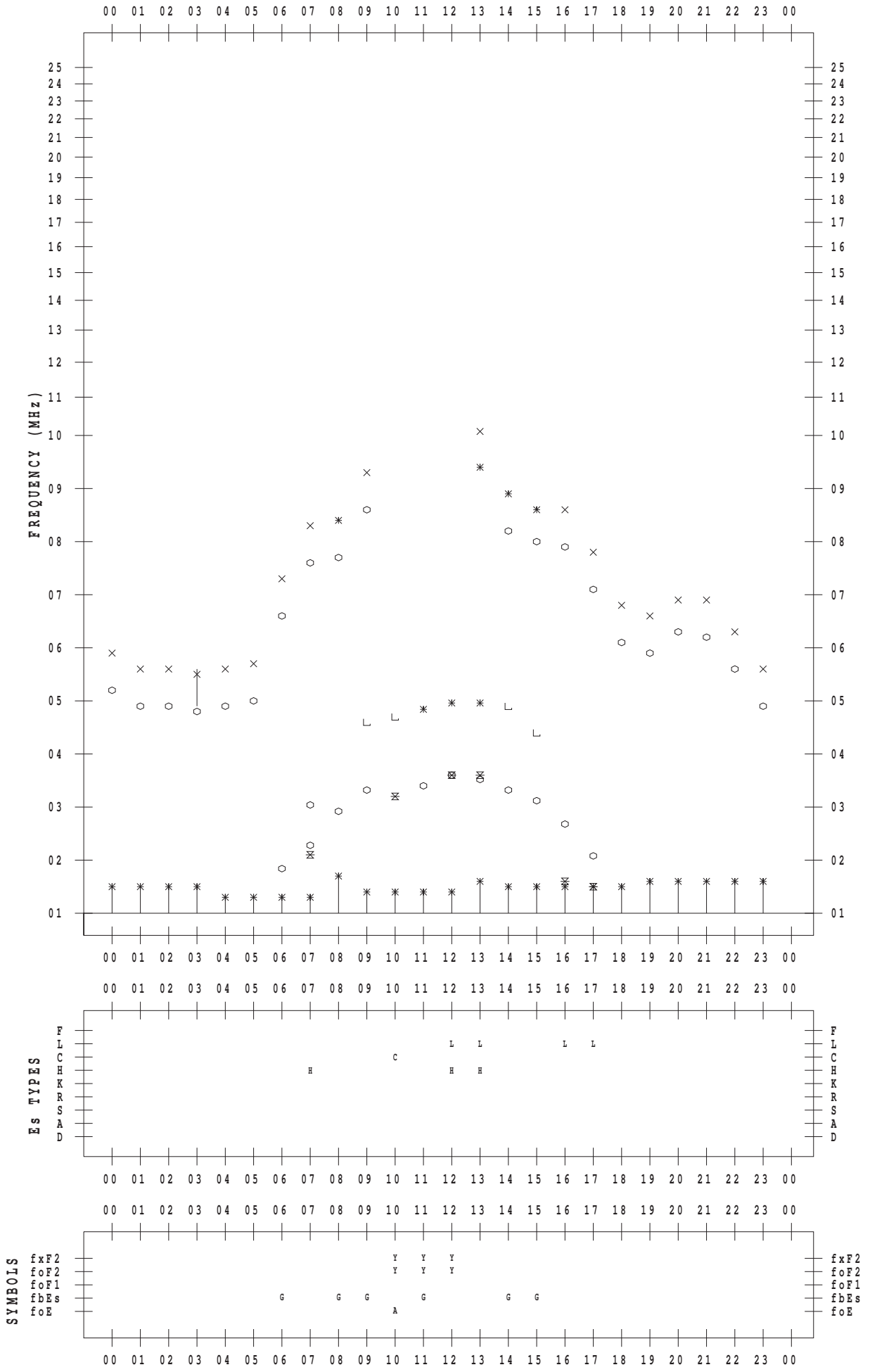
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/17

135 °E MEAN TIME



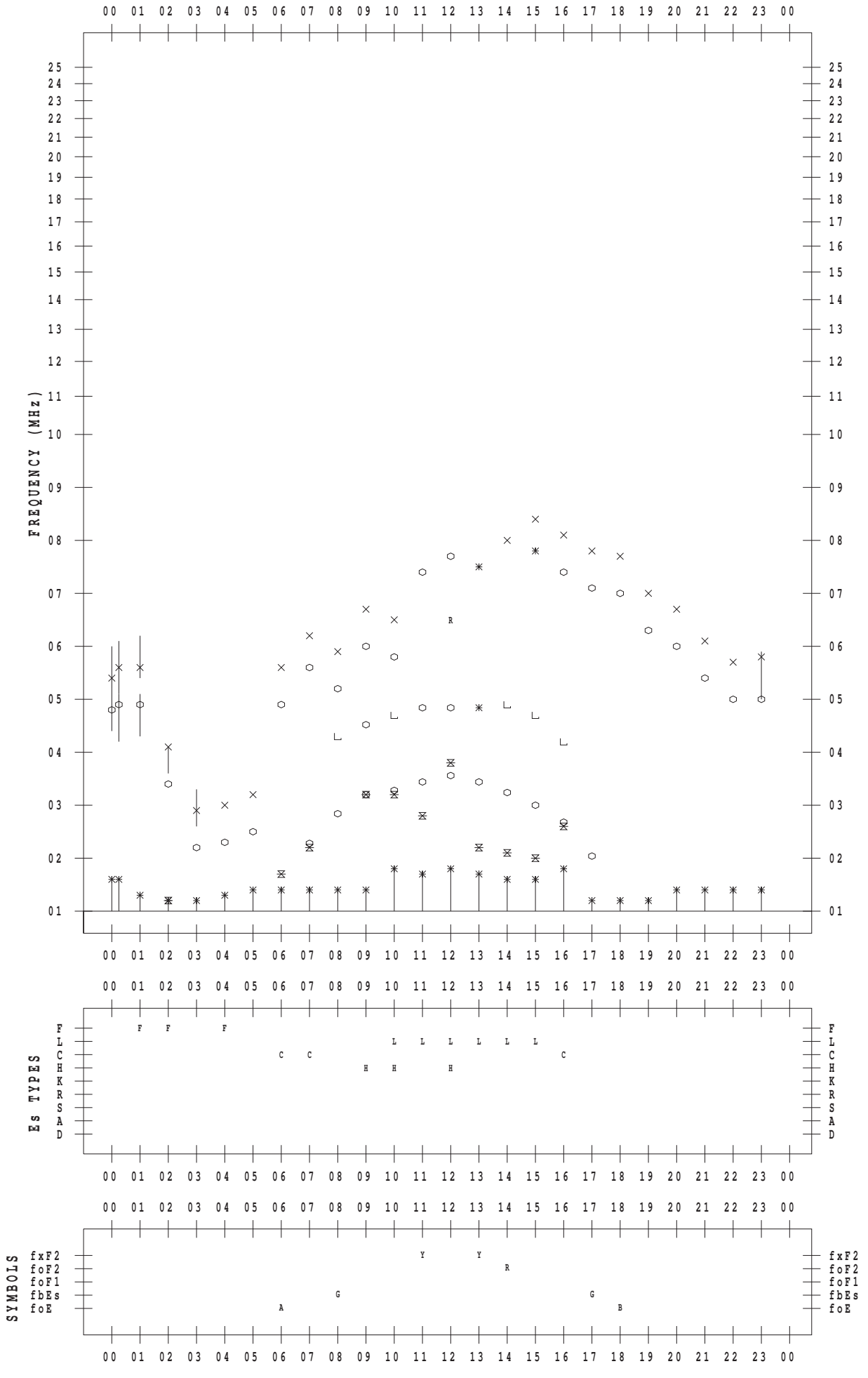
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/18

135 °E MEAN TIME



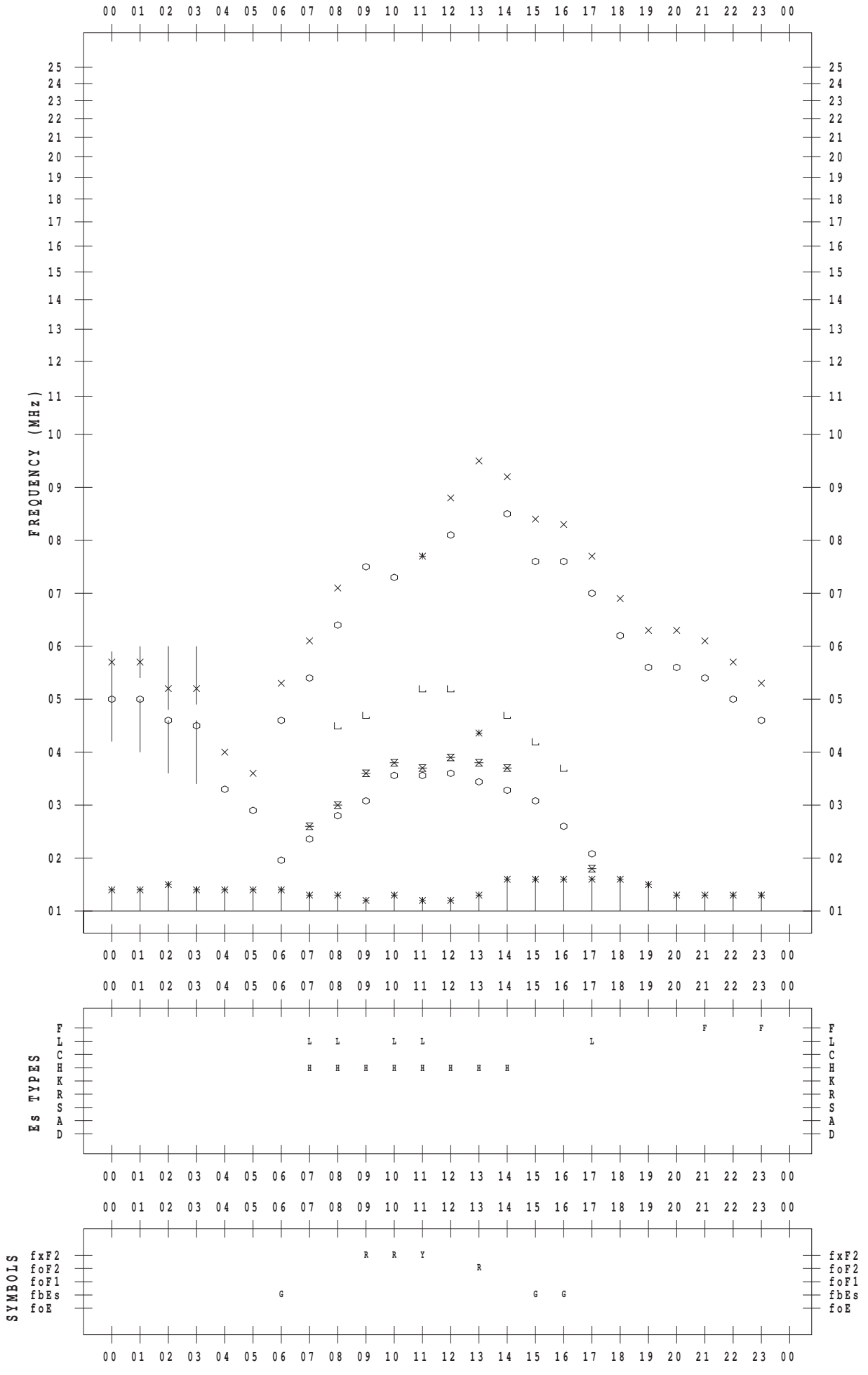
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/19

135 °E MEAN TIME



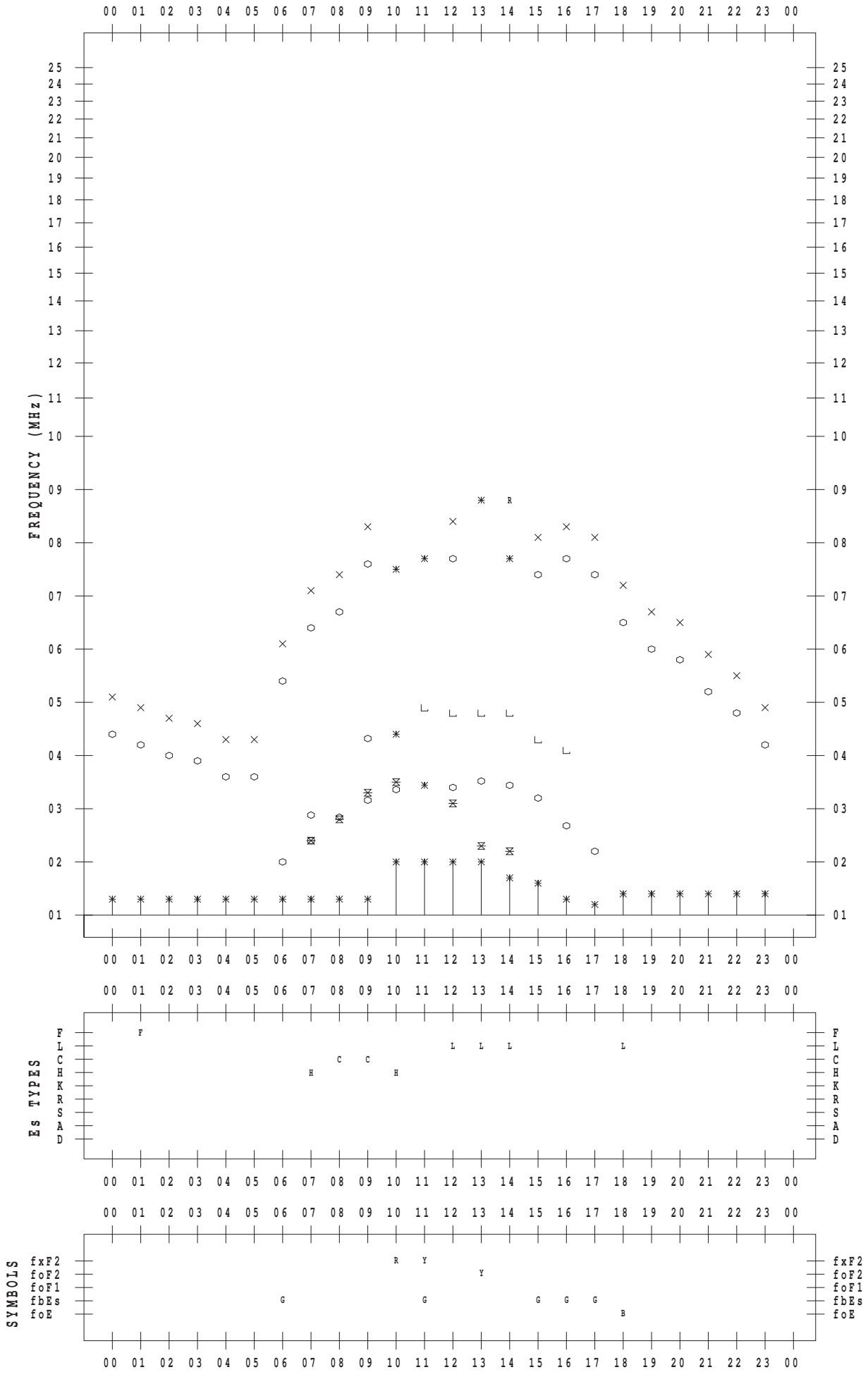
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/20

135 °E MEAN TIME



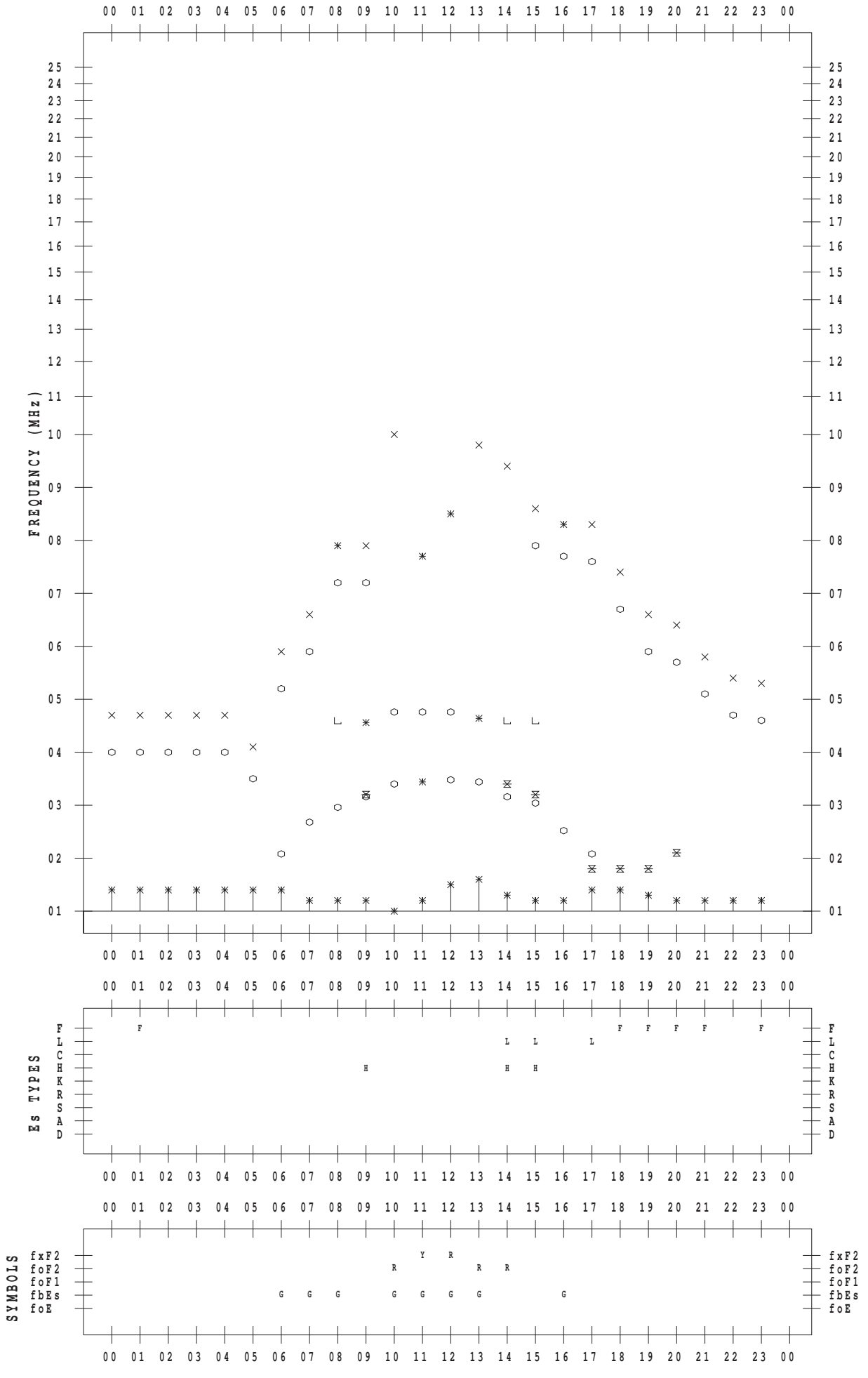
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/21

135 °E MEAN TIME



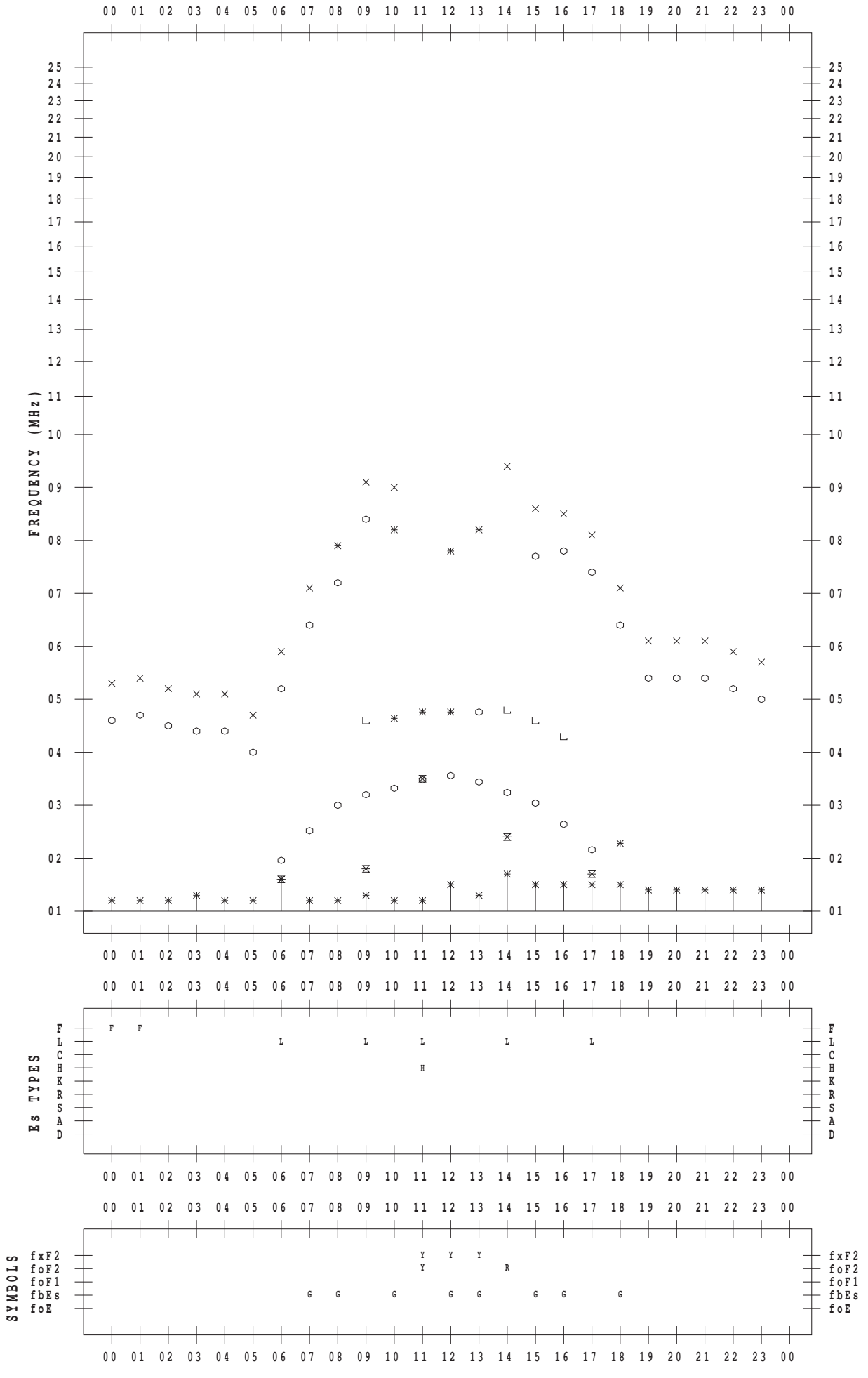
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/22

135 °E MEAN TIME



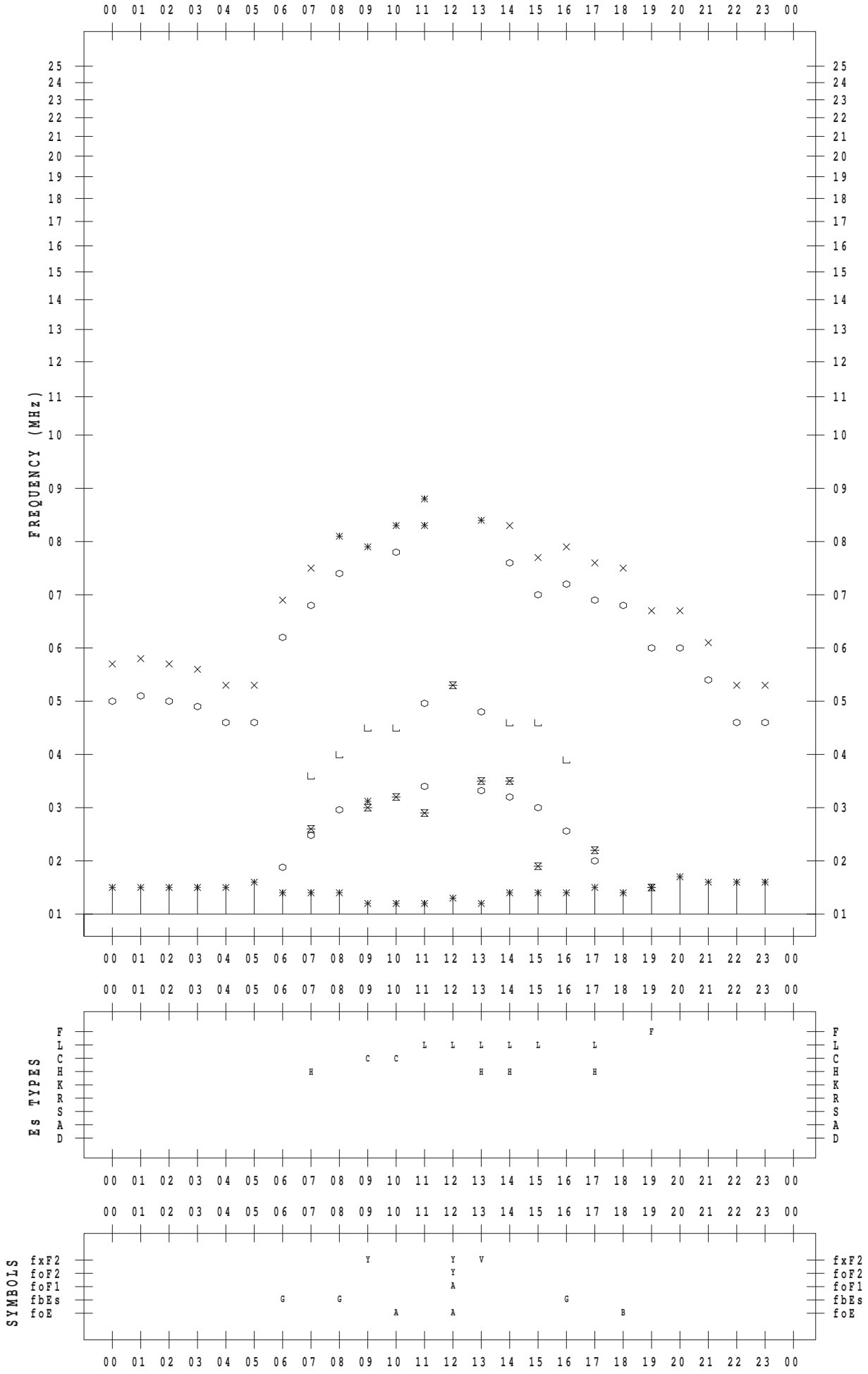
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/23

135 °E MEAN TIME



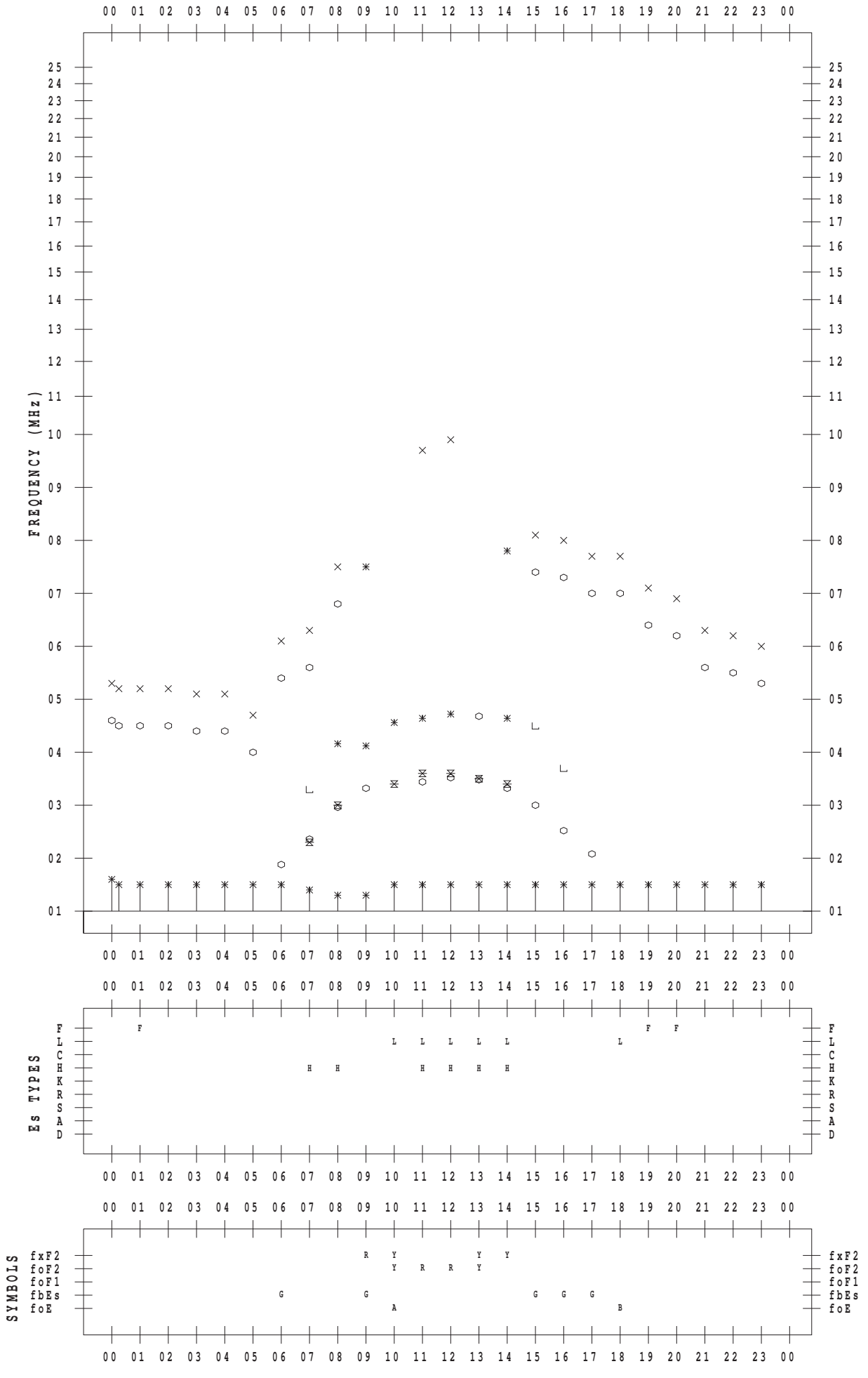
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/24

135 °E MEAN TIME



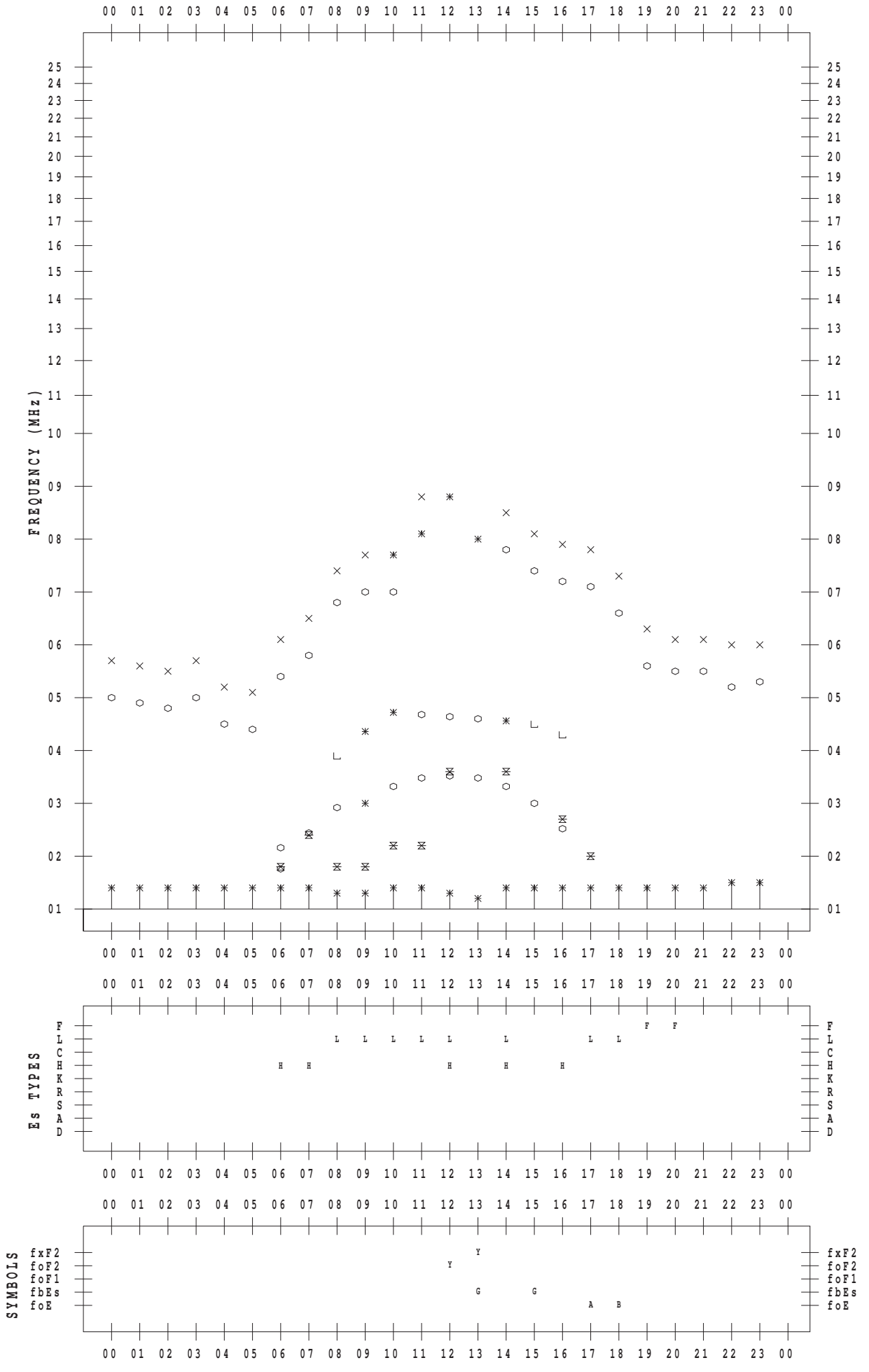
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/25

135 °E MEAN TIME



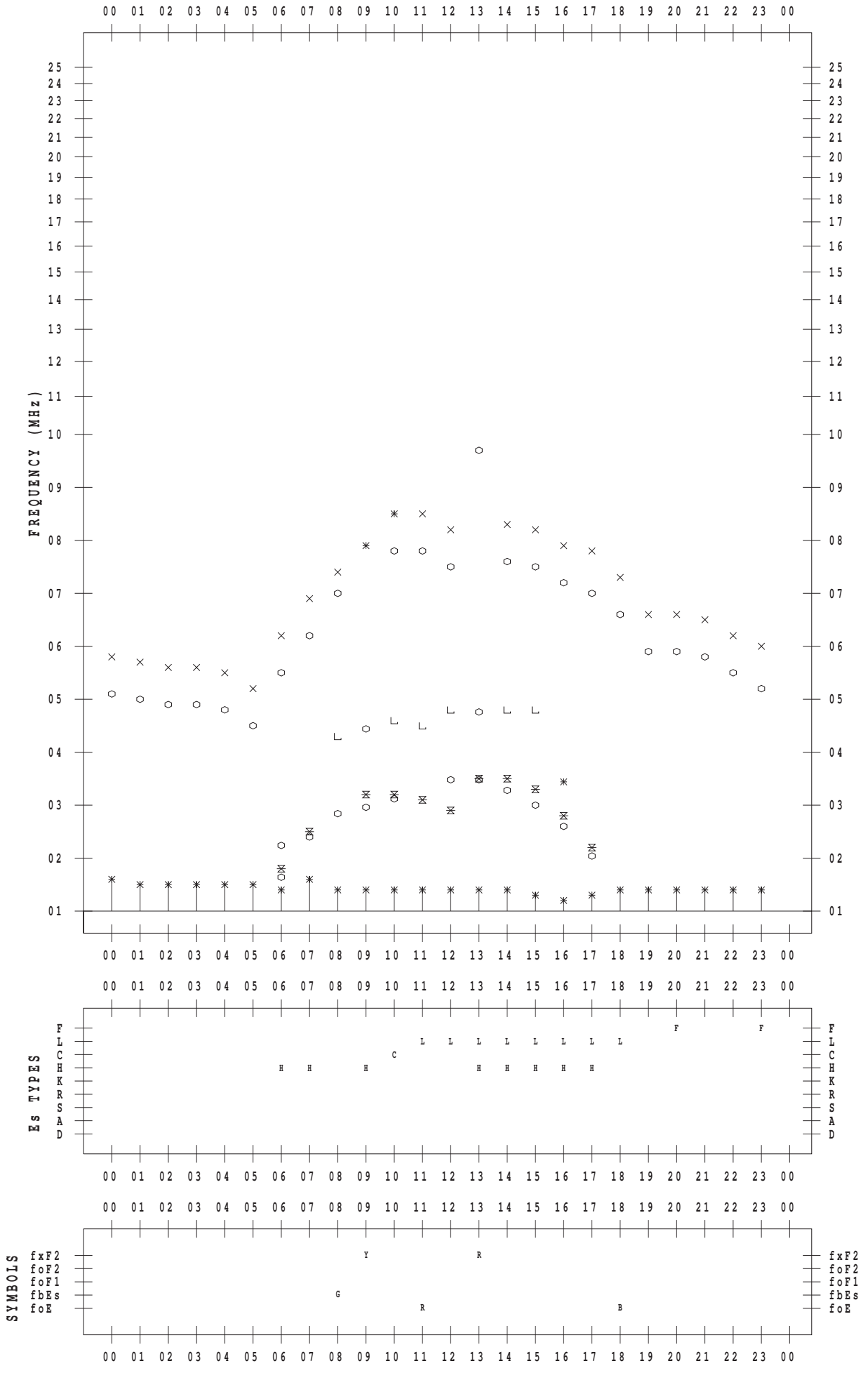
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/26

135 °E MEAN TIME



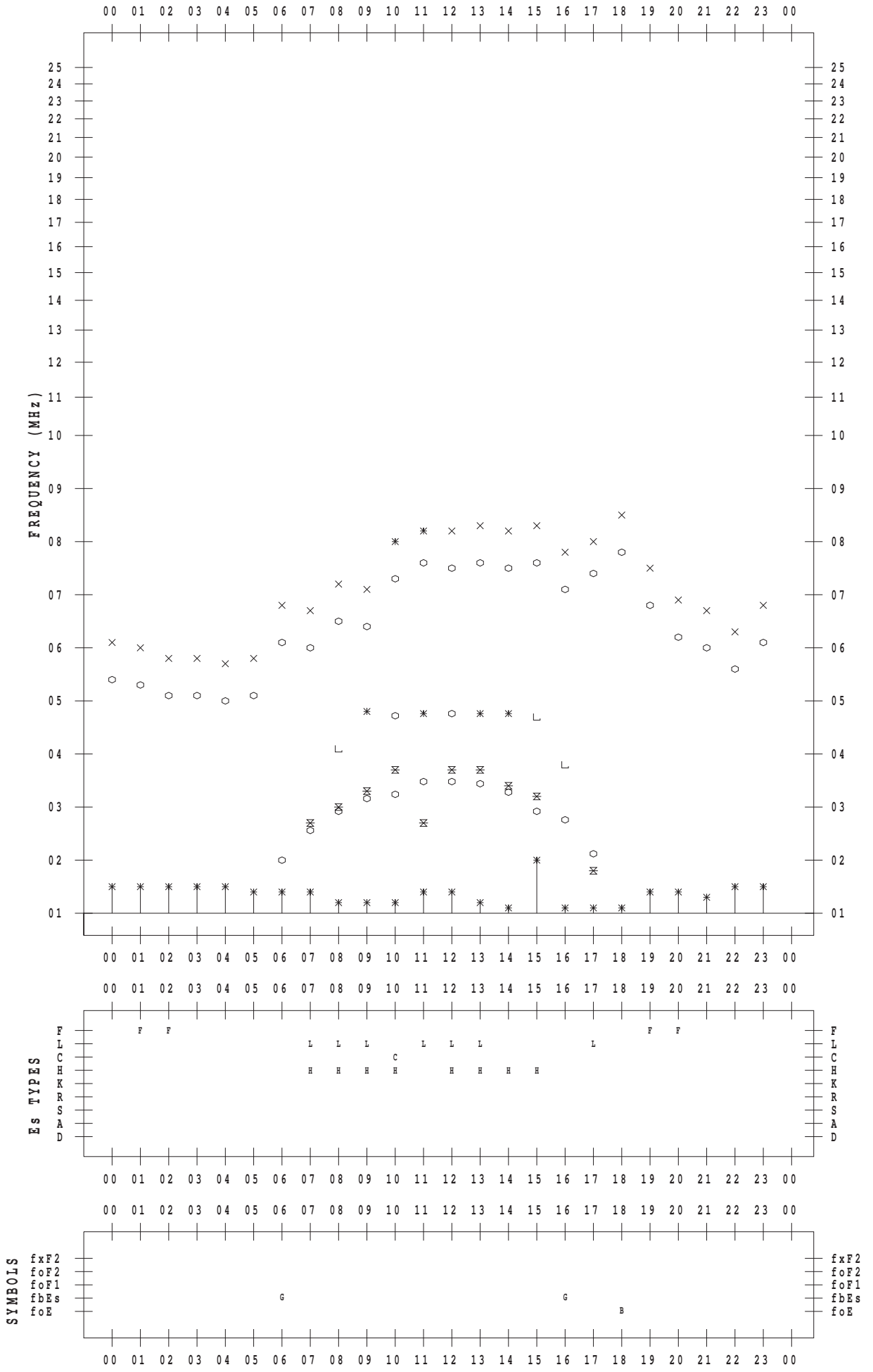
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/27

135 °E MEAN TIME



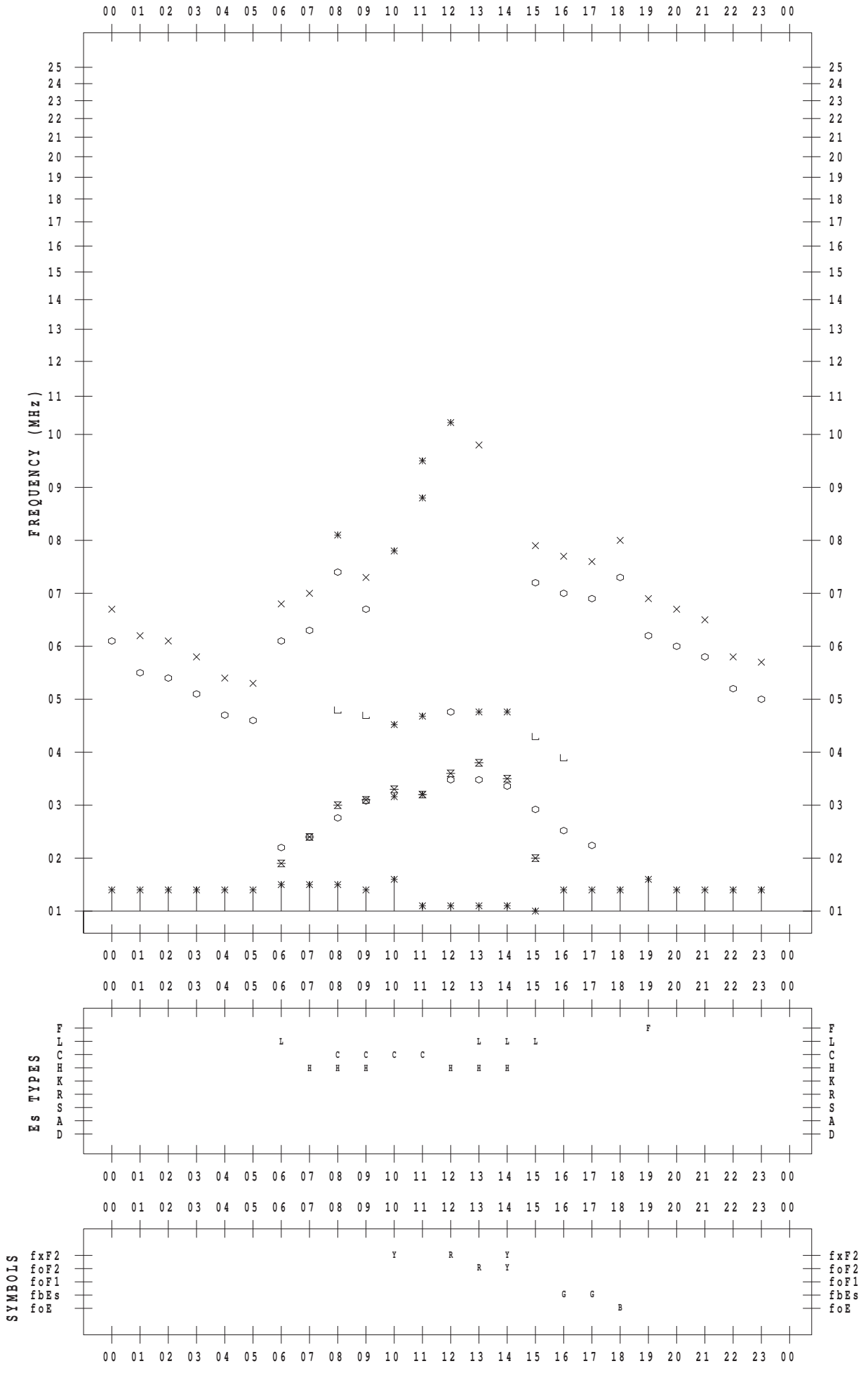
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/28

135 °E MEAN TIME



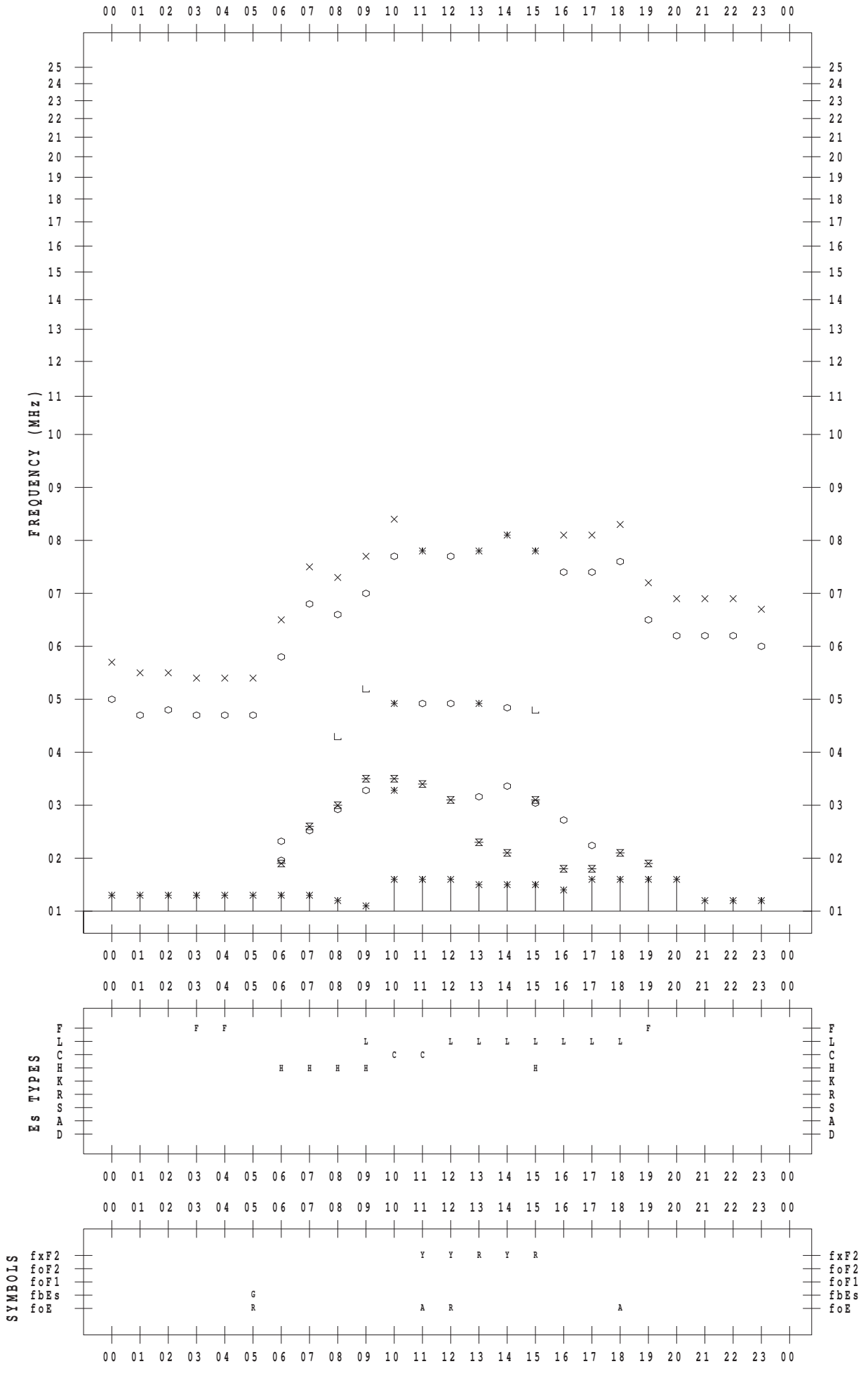
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/29

135 °E MEAN TIME



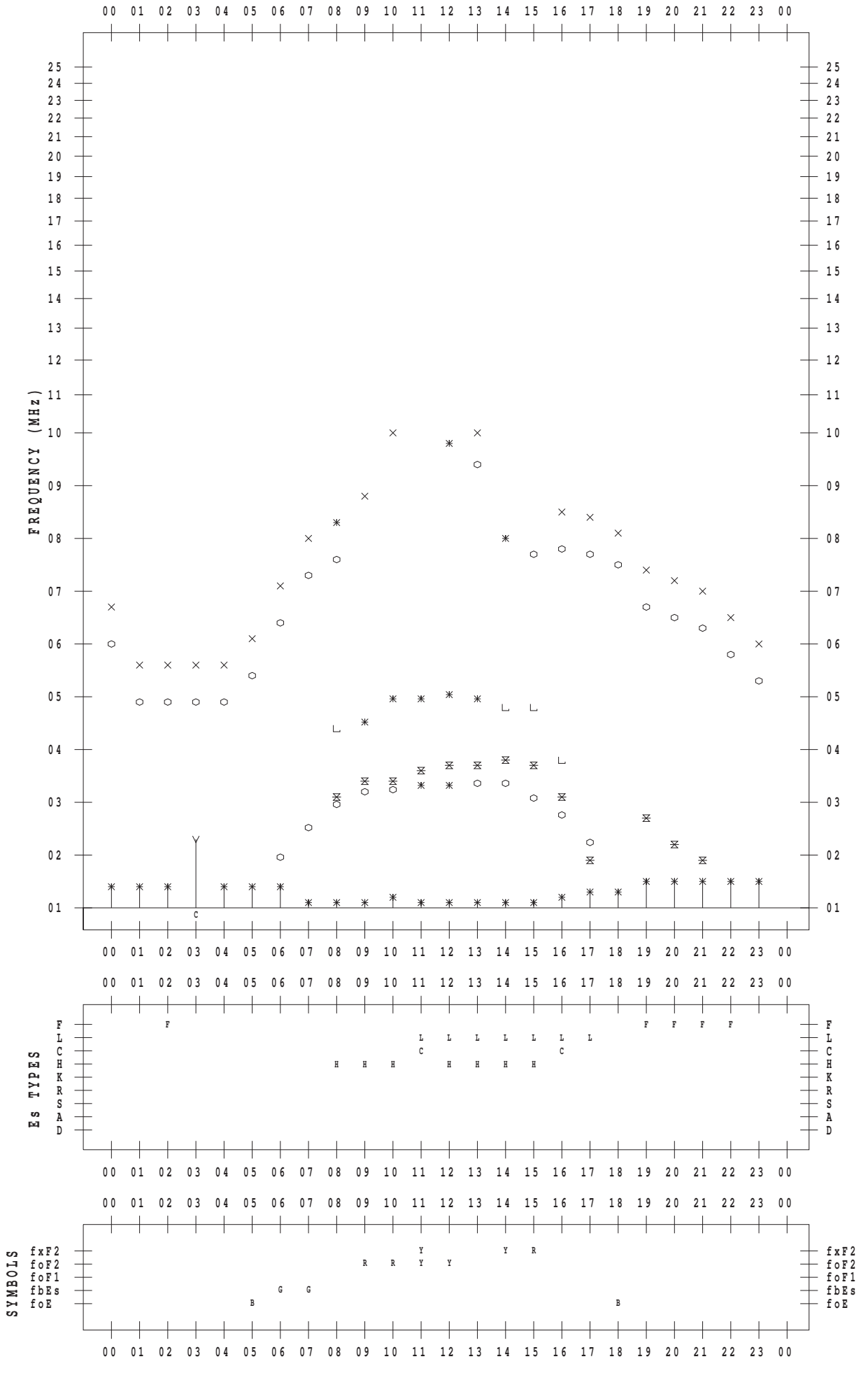
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/30

135 °E MEAN TIME



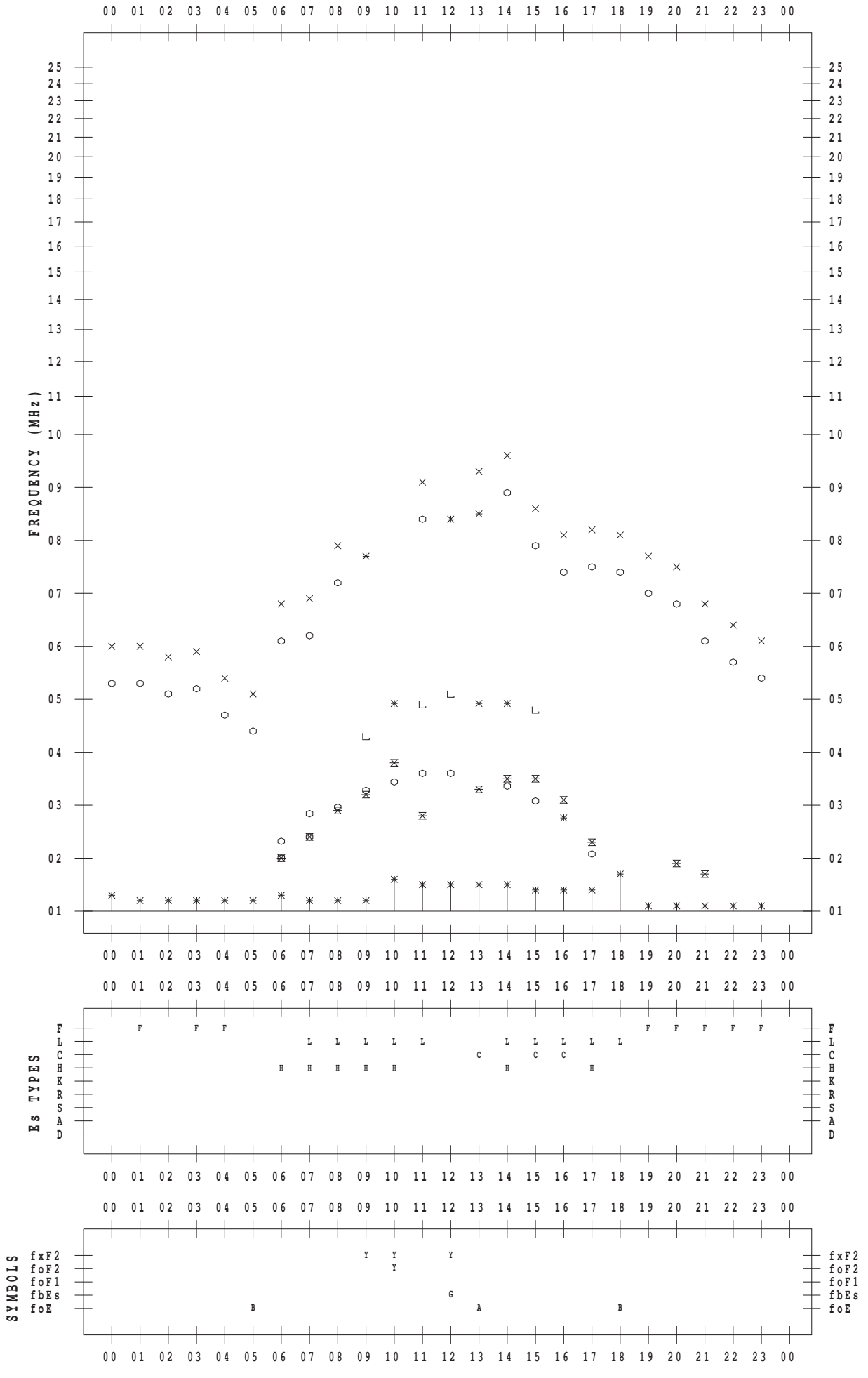
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 3/31

135 °E MEAN TIME

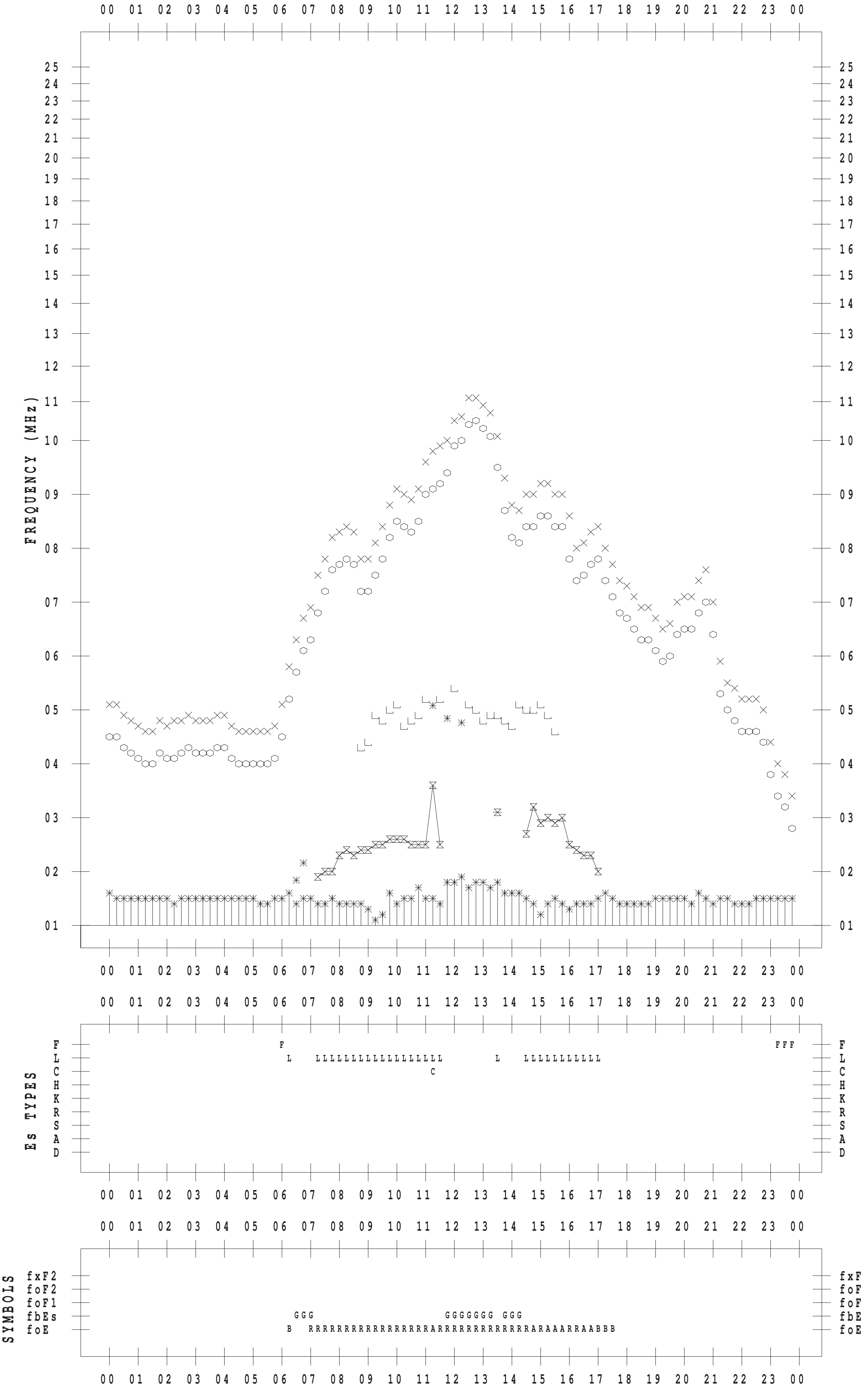


f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji DATE : 2013/ 3/ 1

135 °E MEAN TIME



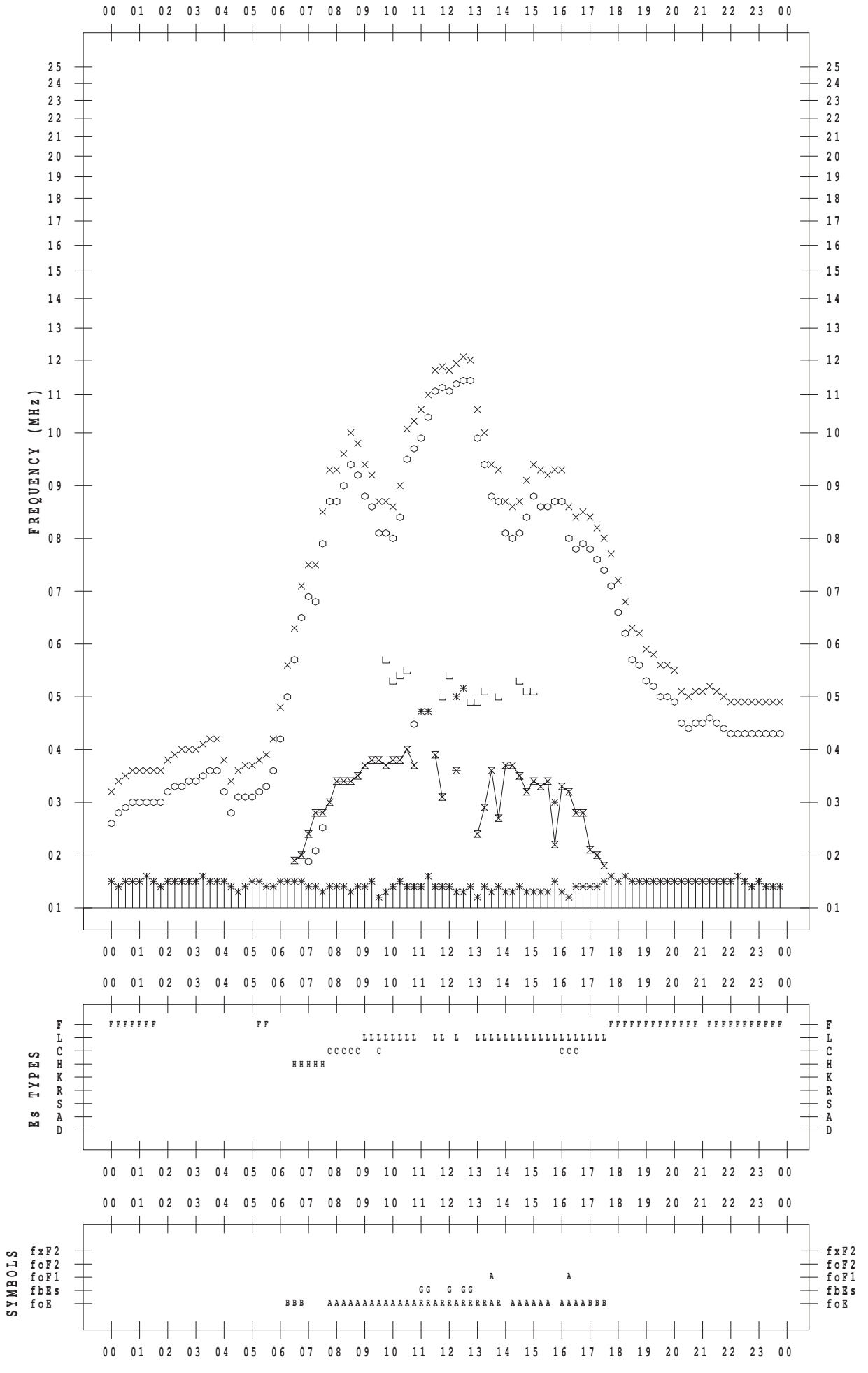
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/ 2

135 °E MEAN TIME



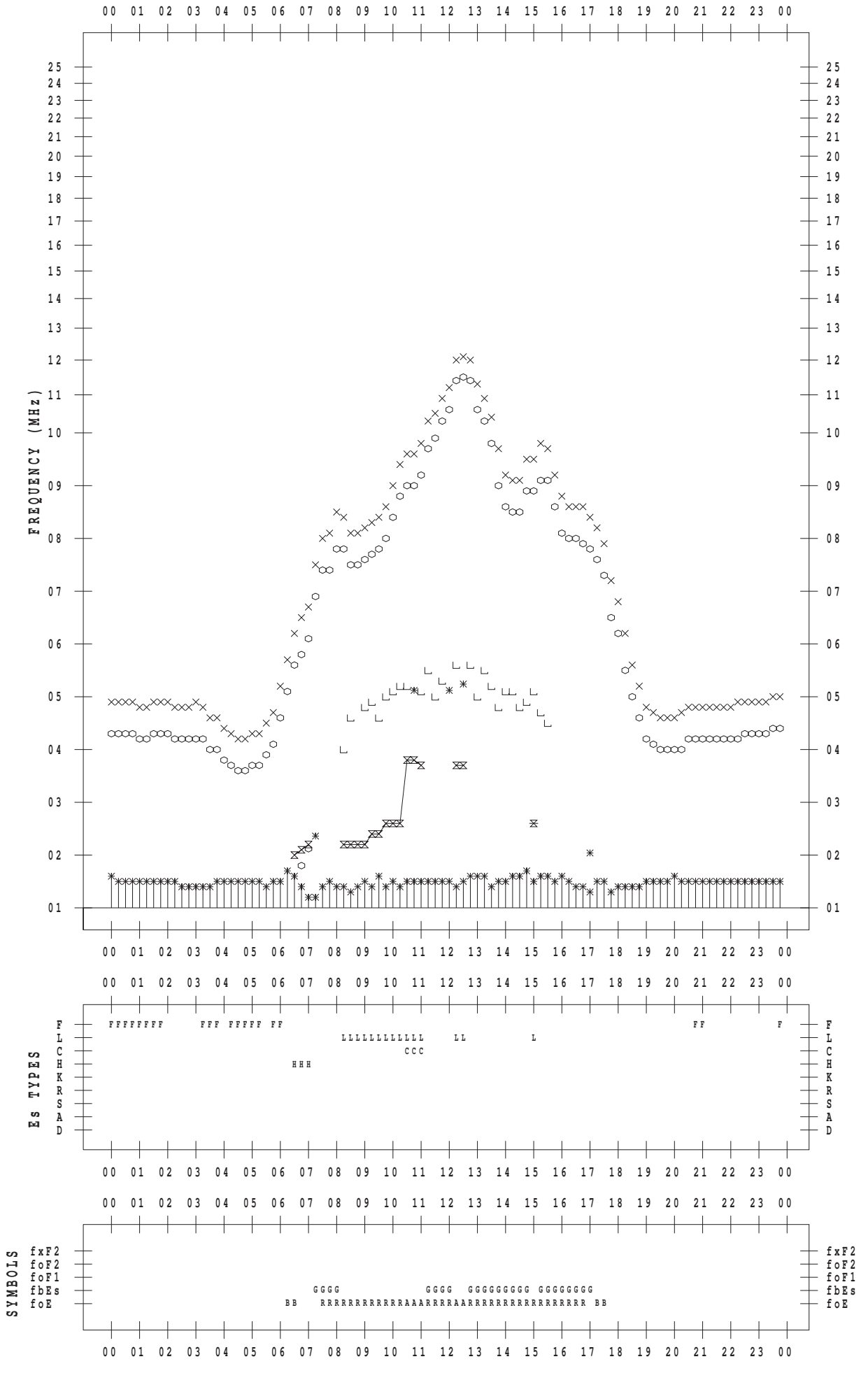
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/ 3

135 °E MEAN TIME



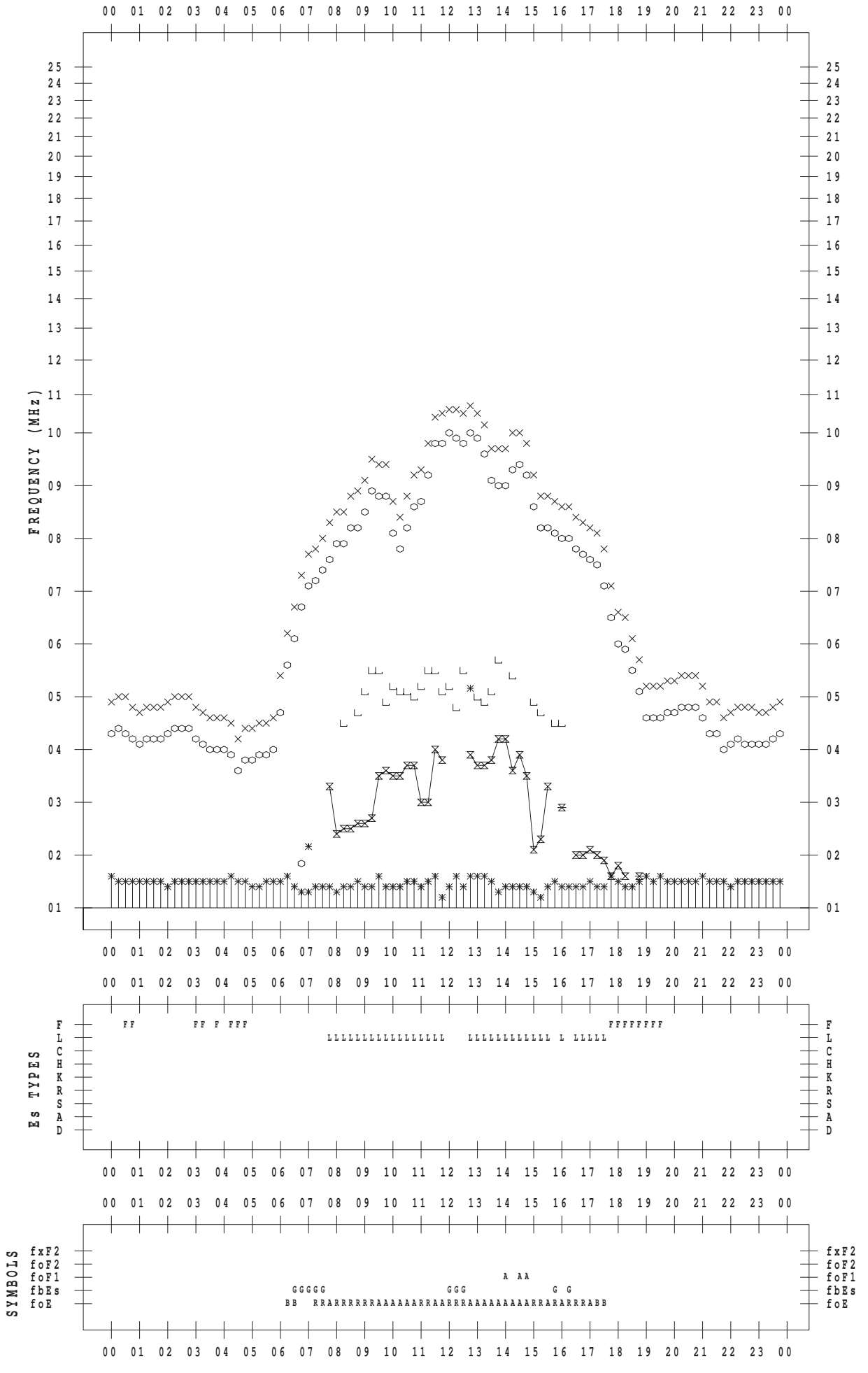
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/ 4

135 °E MEAN TIME



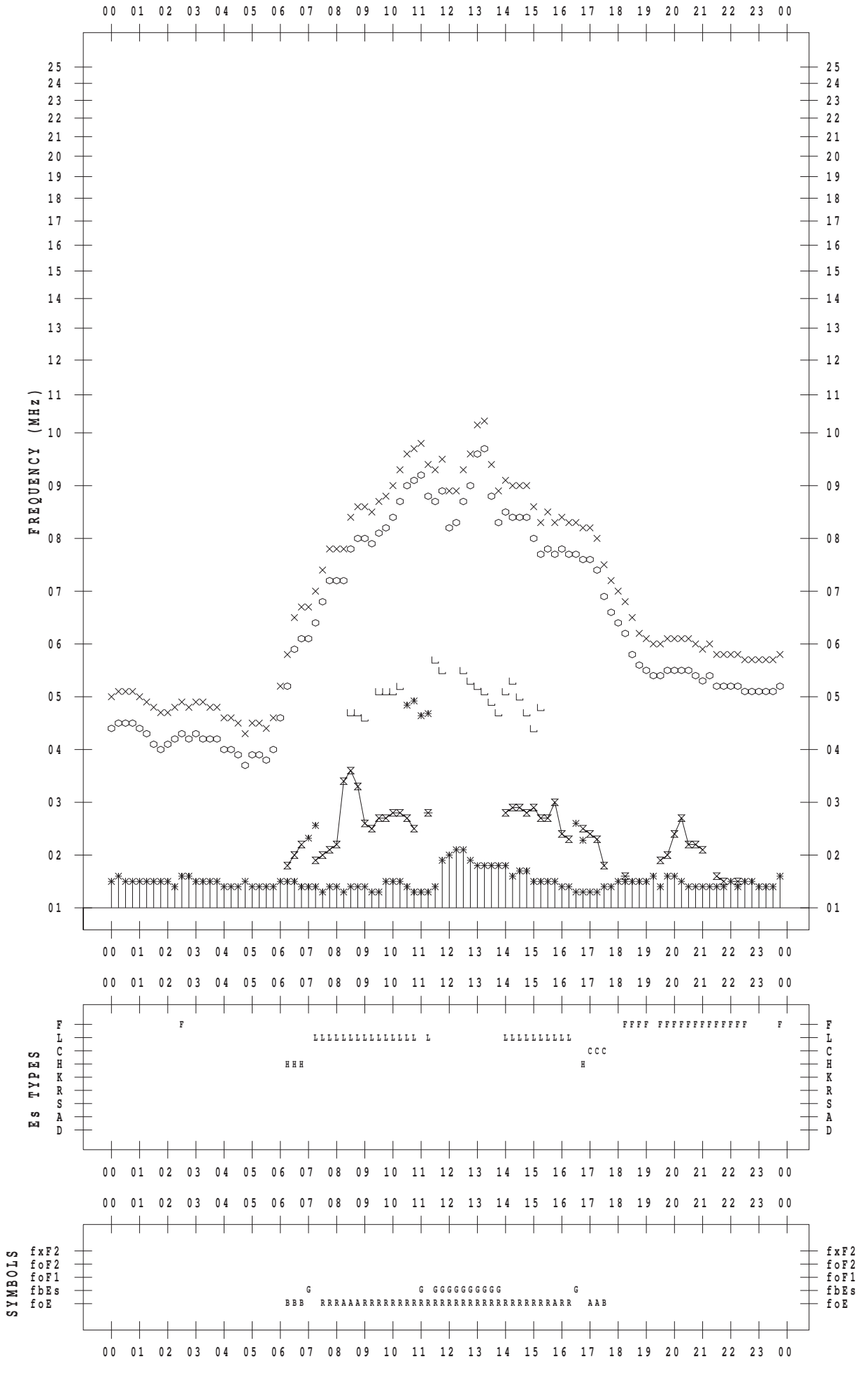
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/ 5

135 °E MEAN TIME



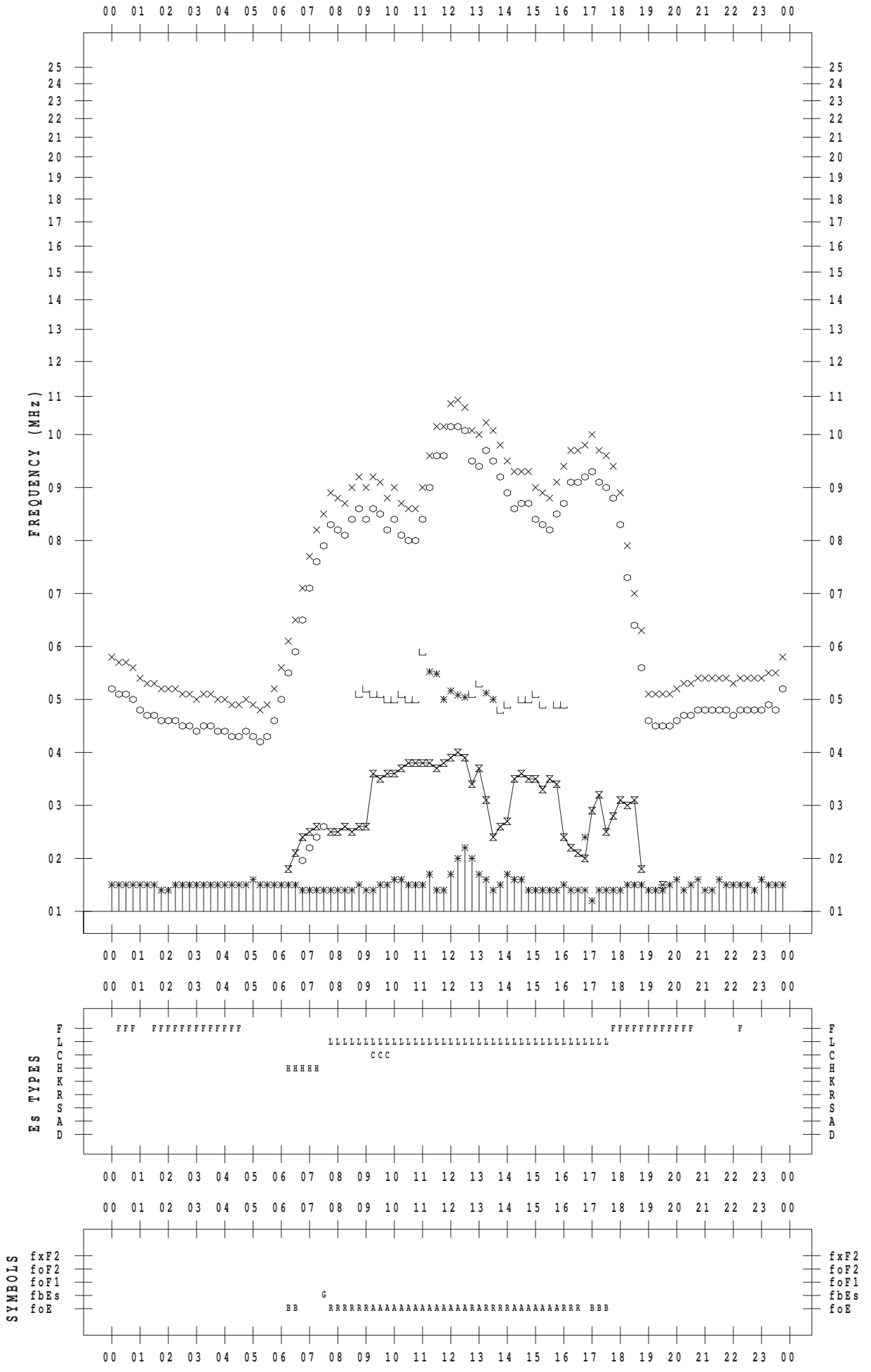
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/ 6

135 °E MEAN TIME



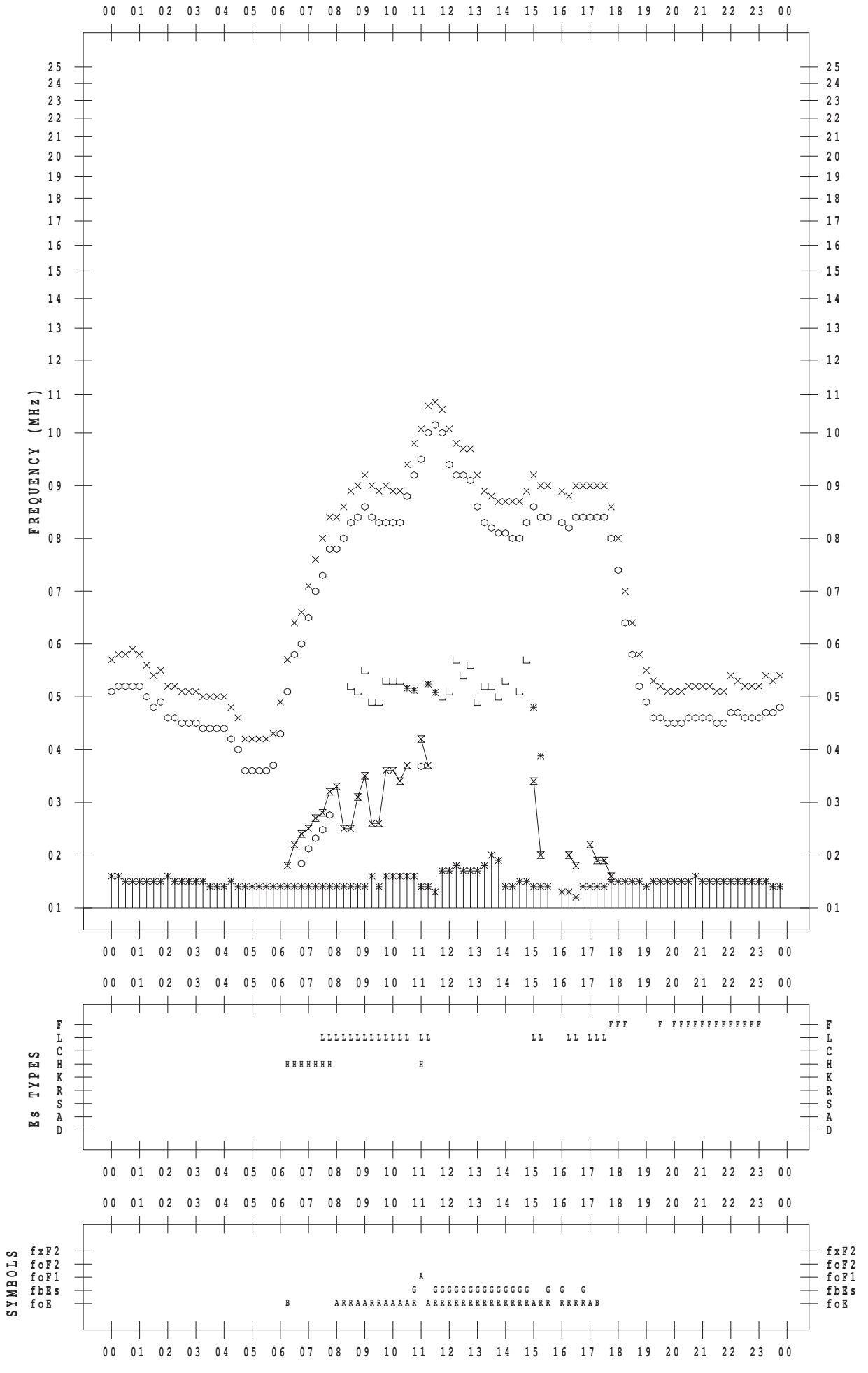
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/ 7

135 °E MEAN TIME



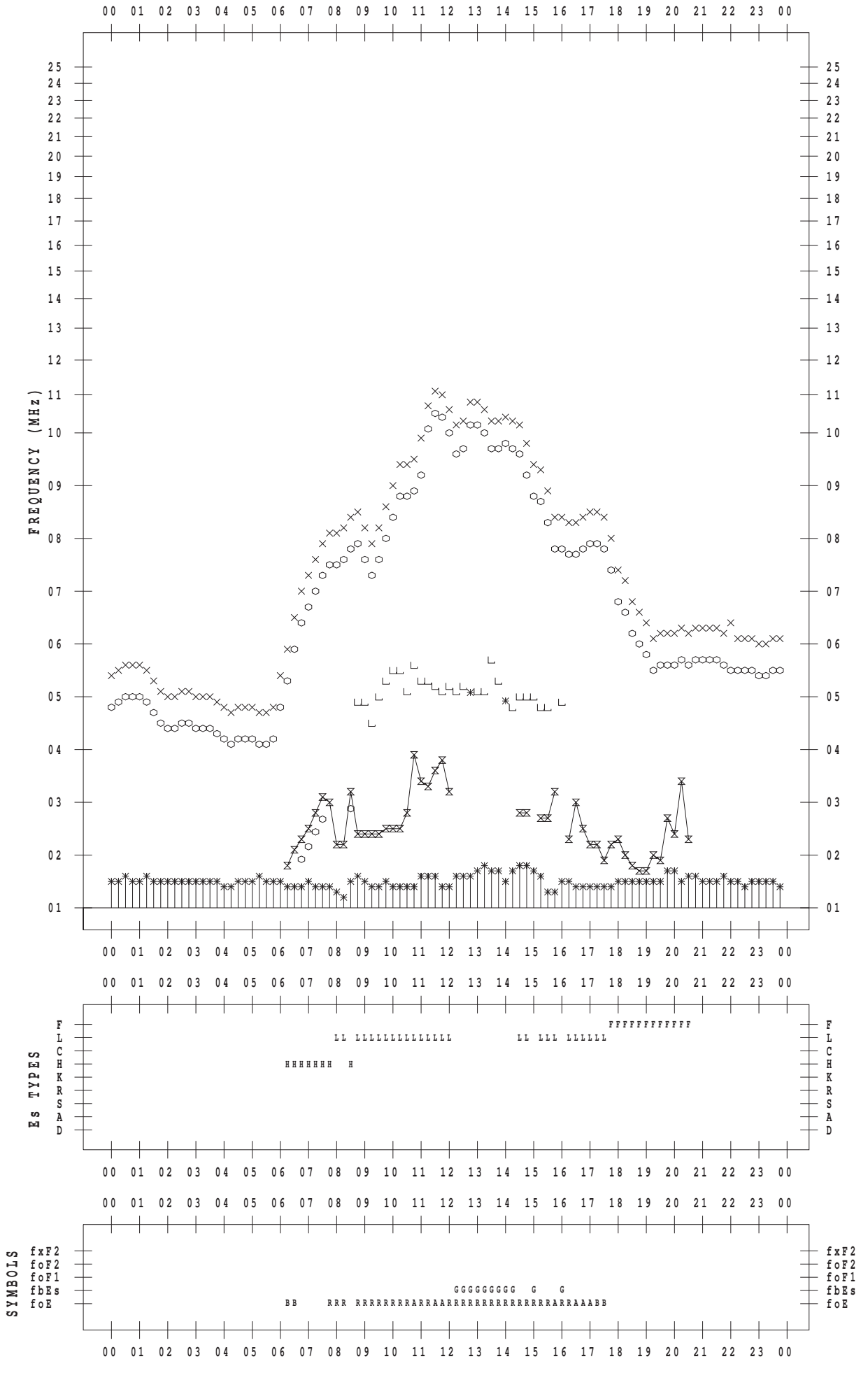
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/ 8

135 °E MEAN TIME



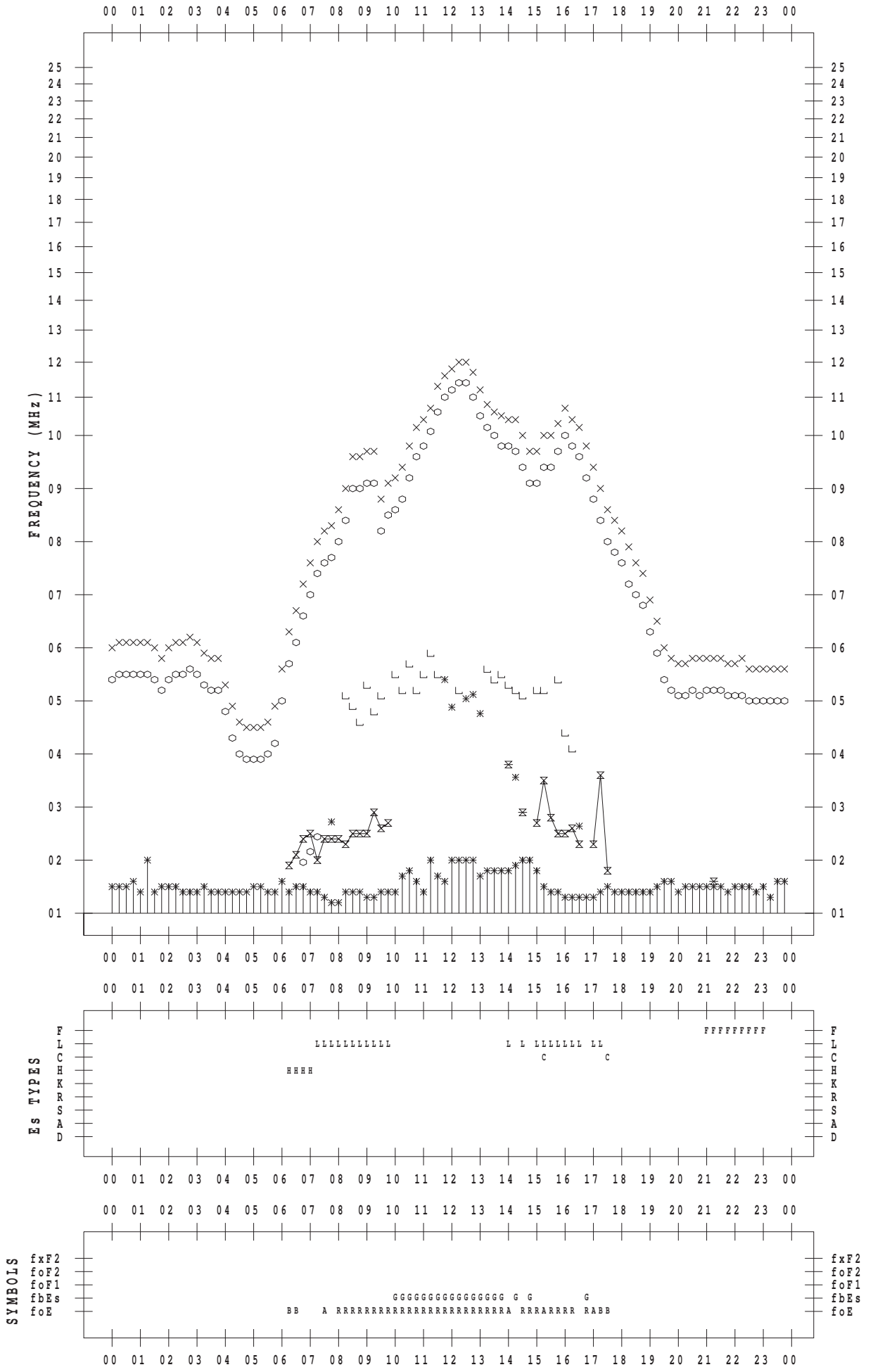
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/ 9

135 °E MEAN TIME



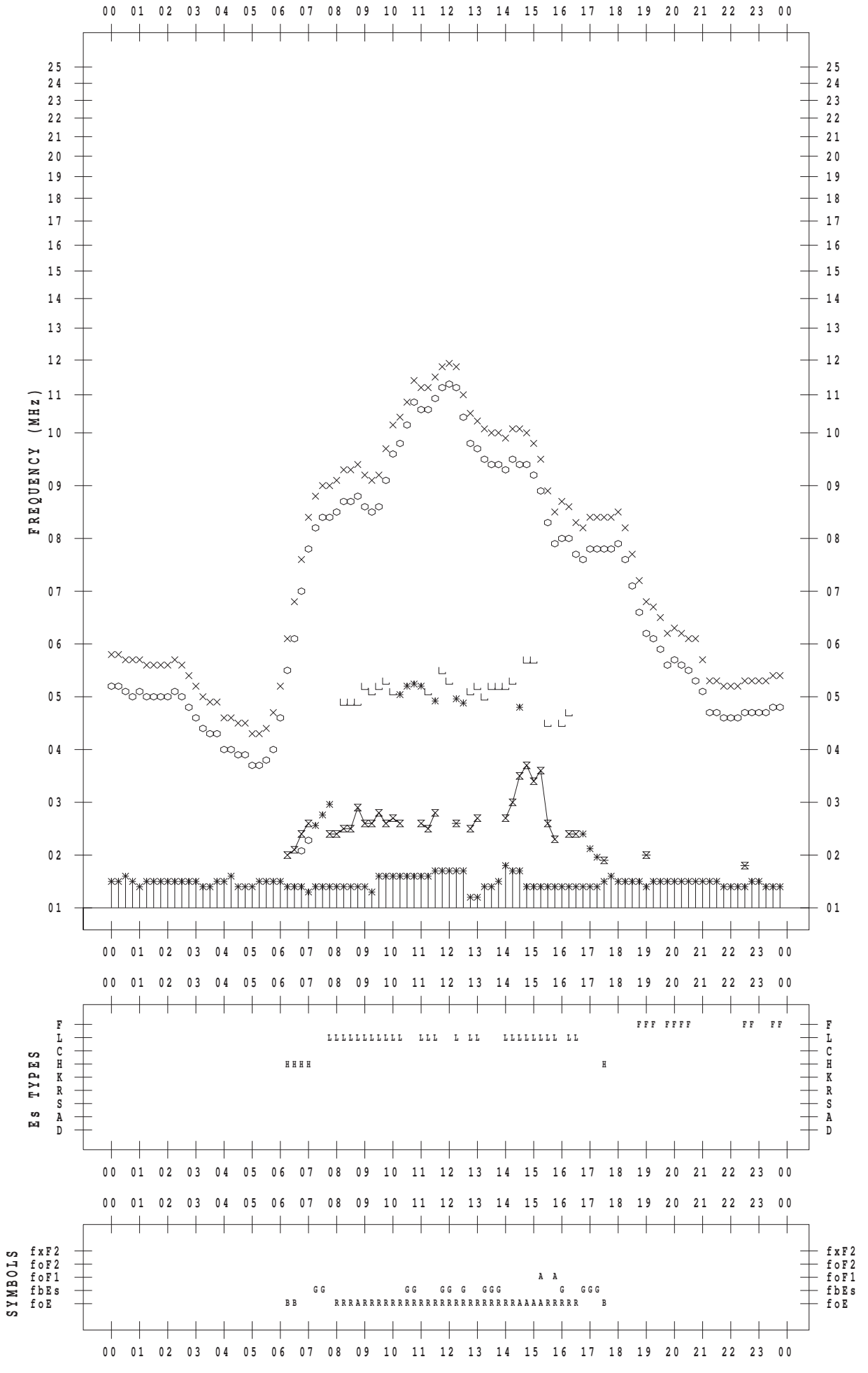
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/10

135 °E MEAN TIME



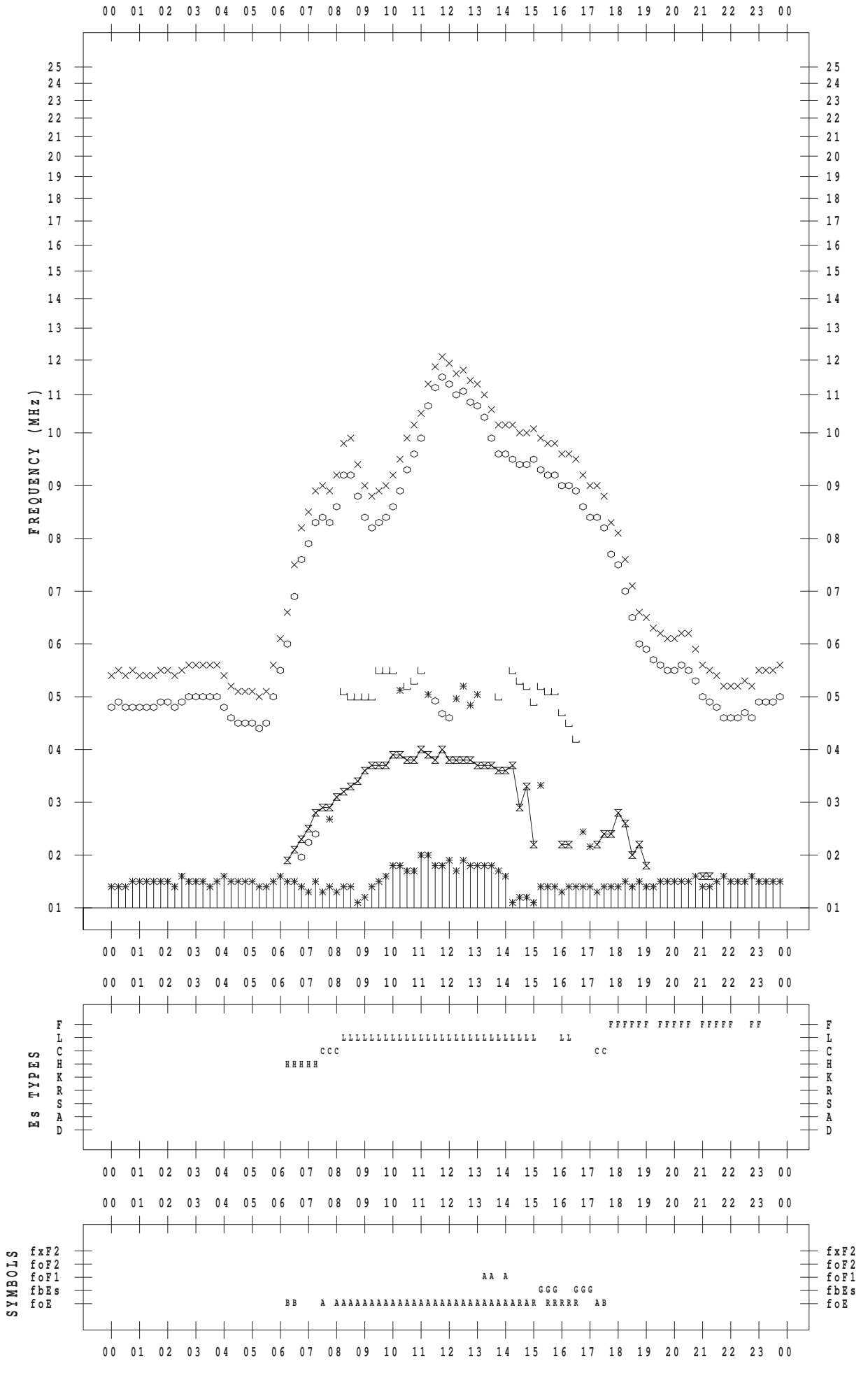
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/11

135 °E MEAN TIME



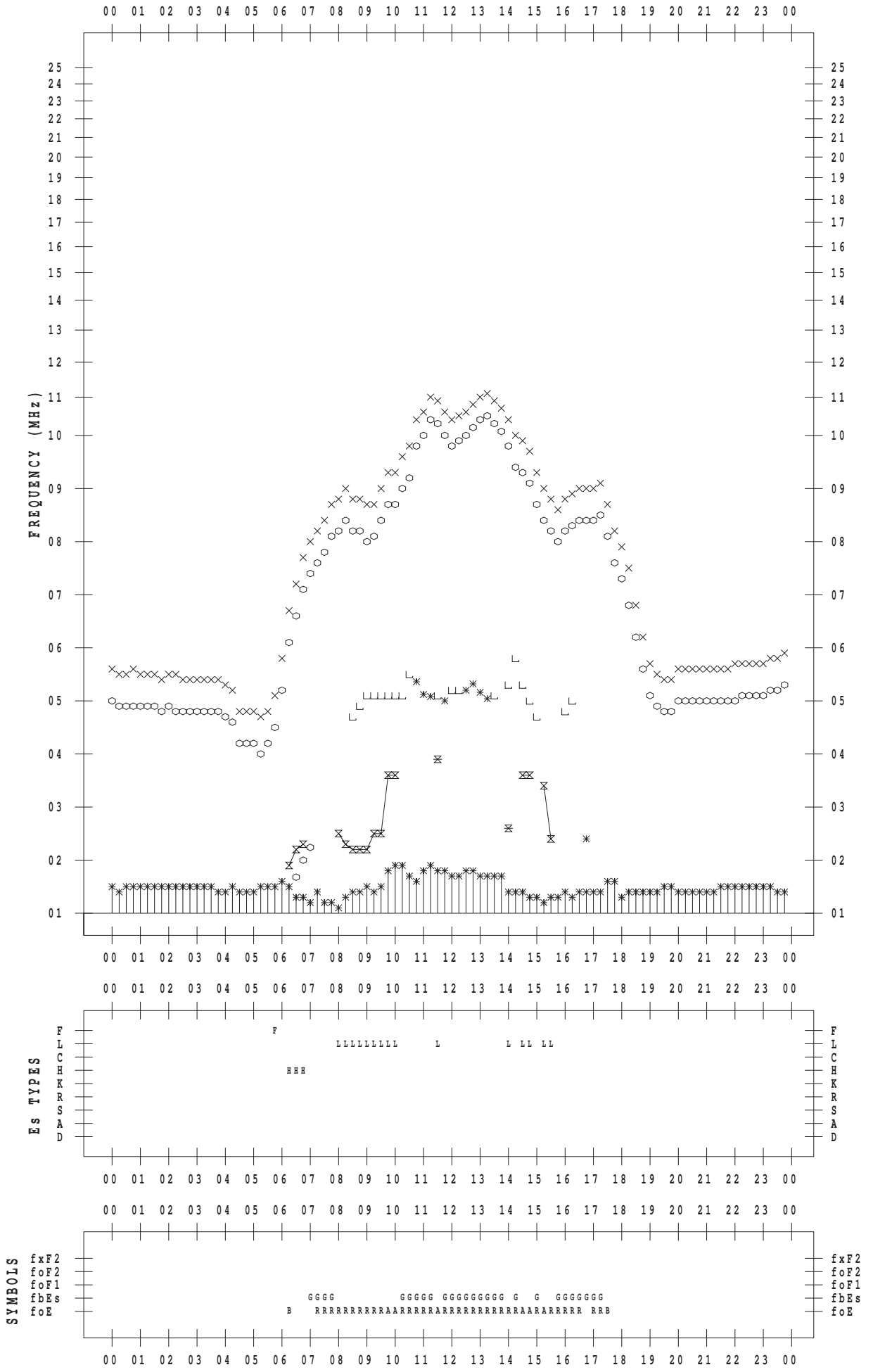
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/12

135 °E MEAN TIME



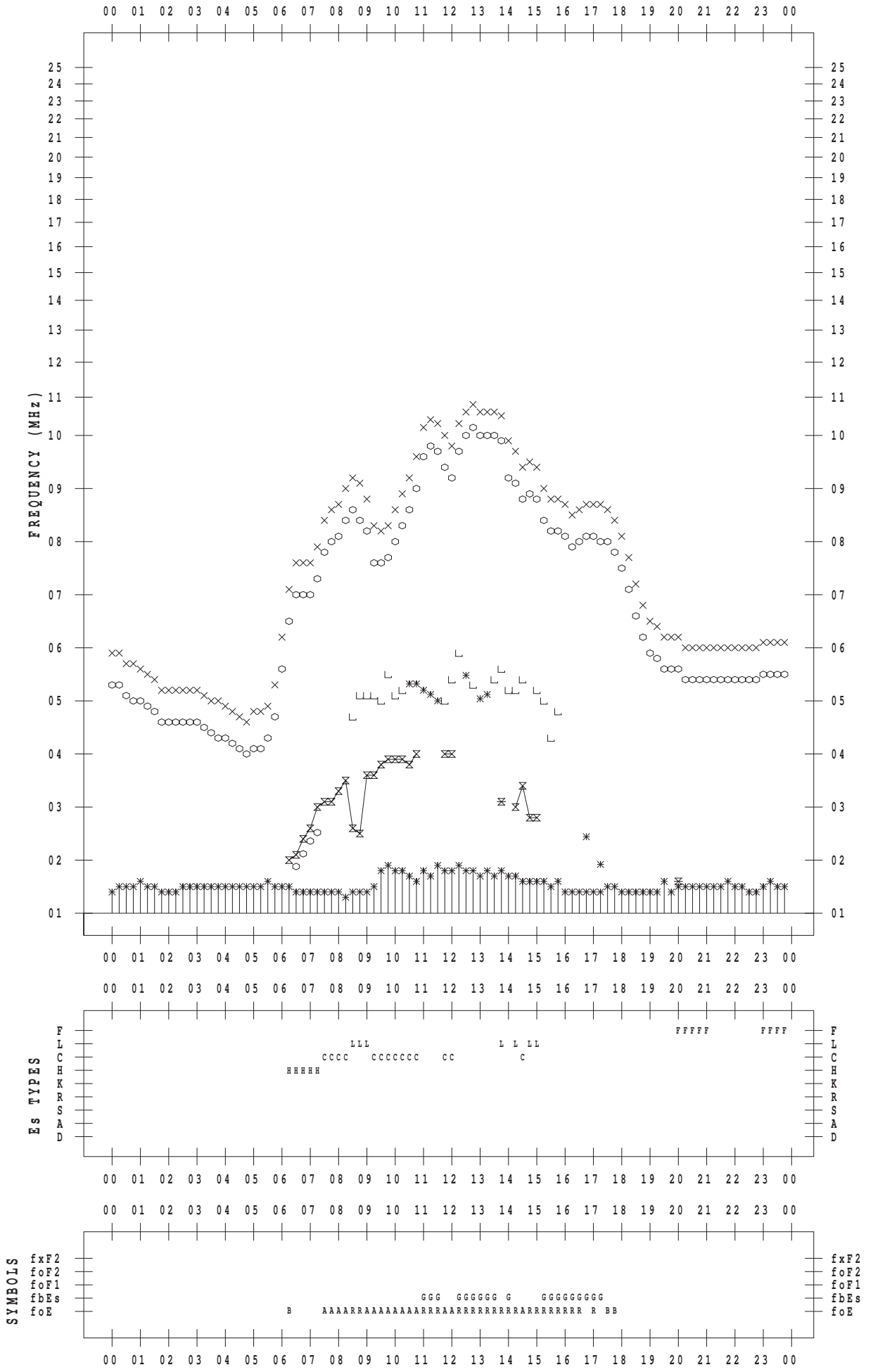
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/13

135 °E MEAN TIME



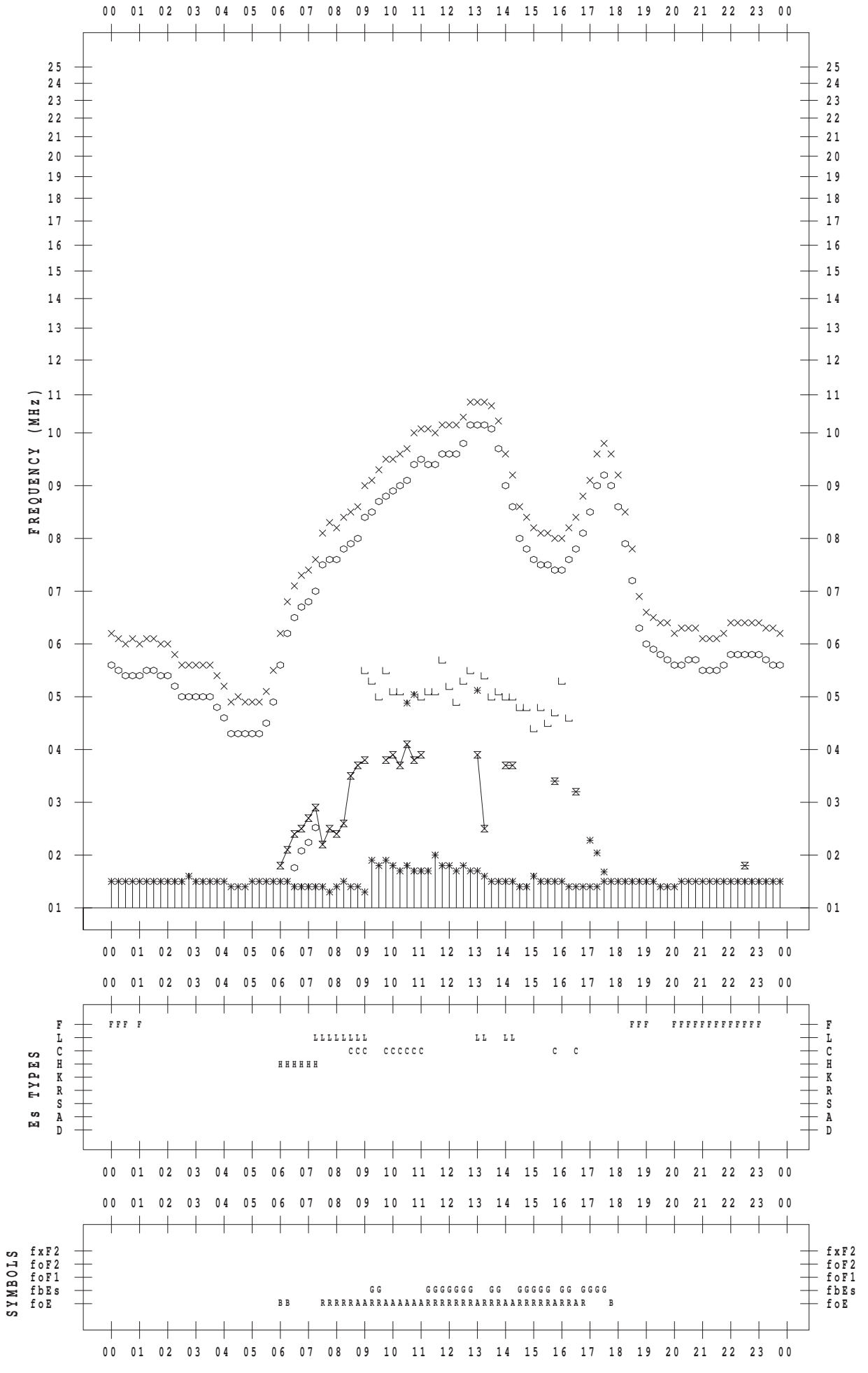
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/14

135 °E MEAN TIME



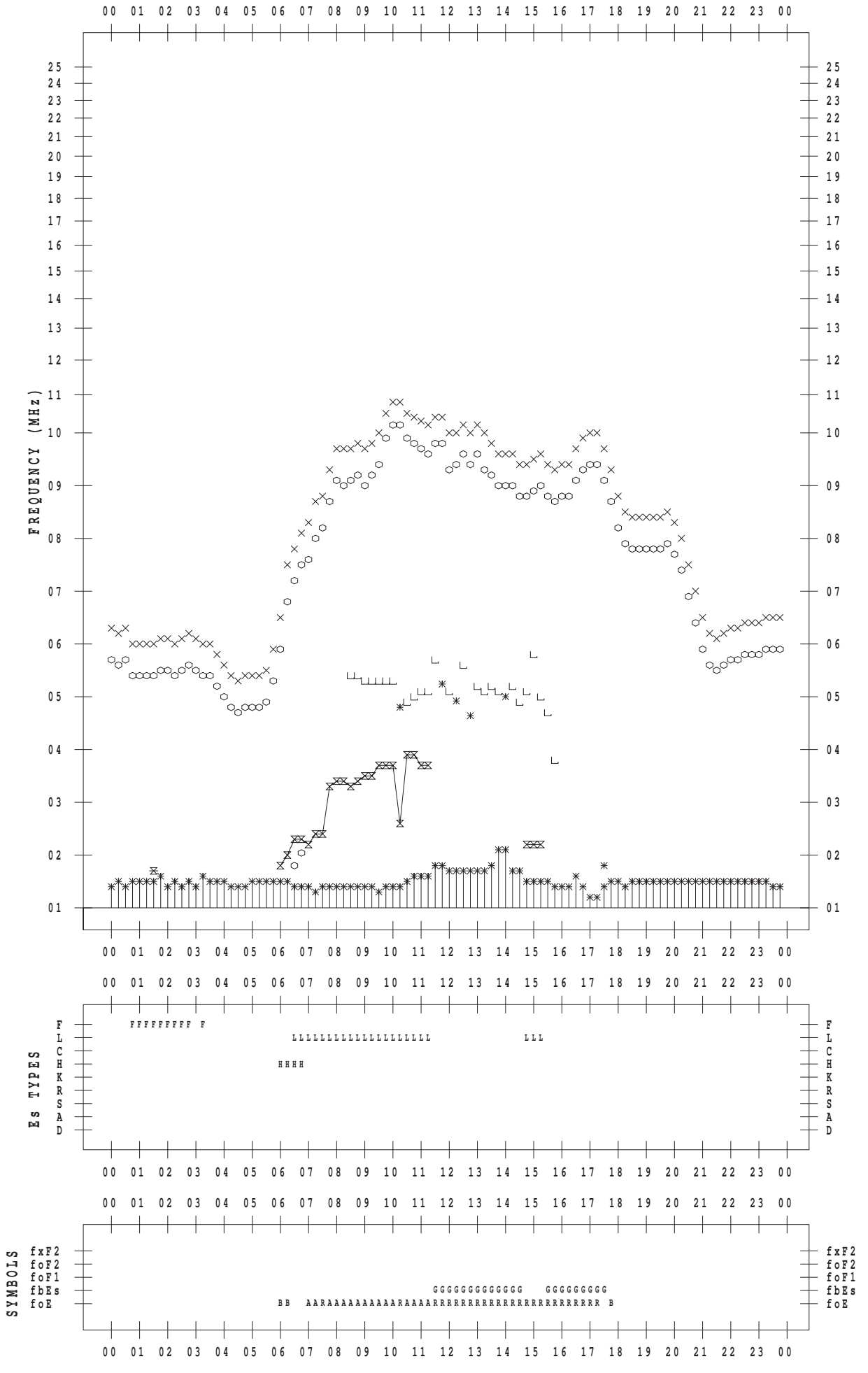
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/15

135 °E MEAN TIME



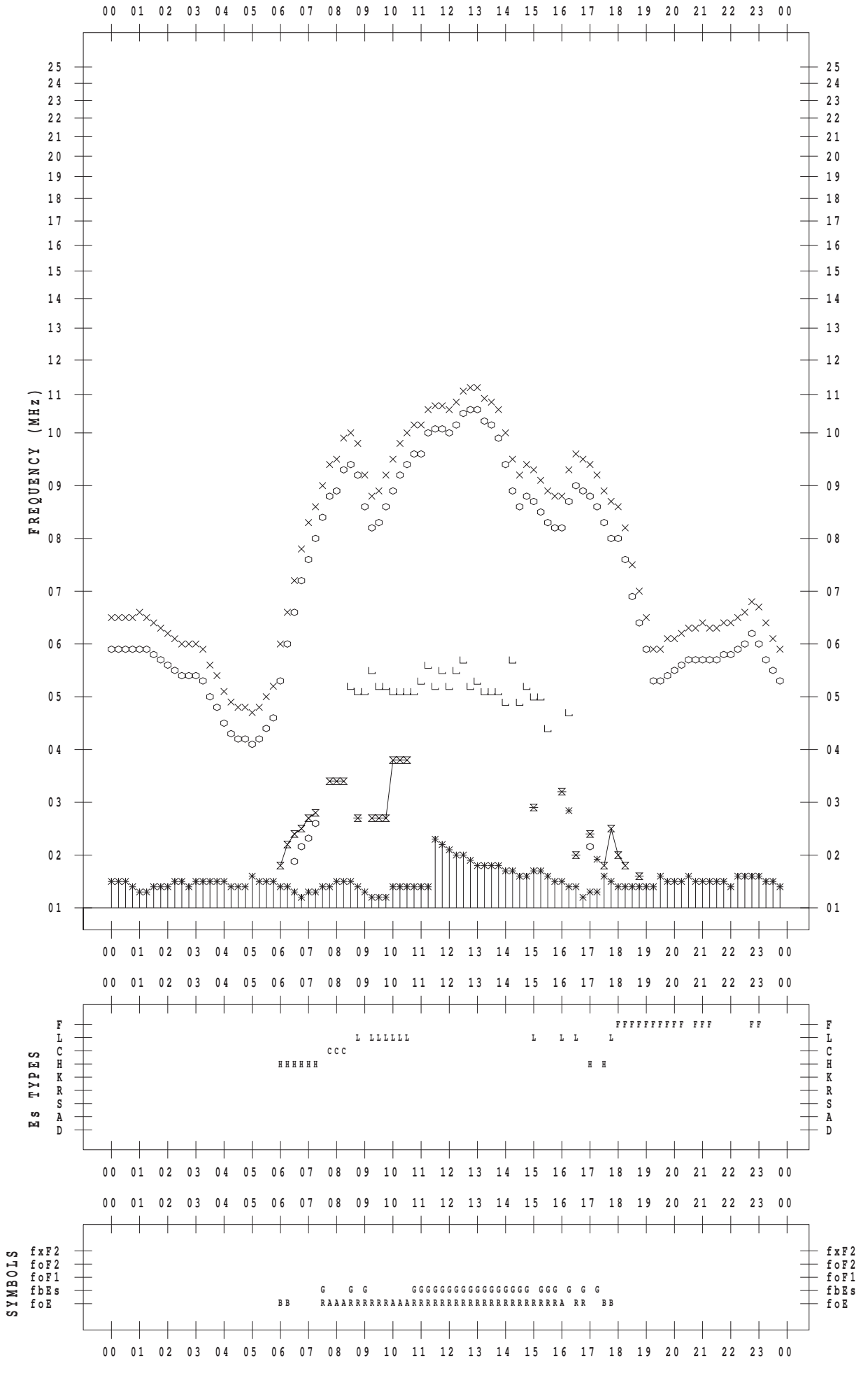
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/16

135 °E MEAN TIME



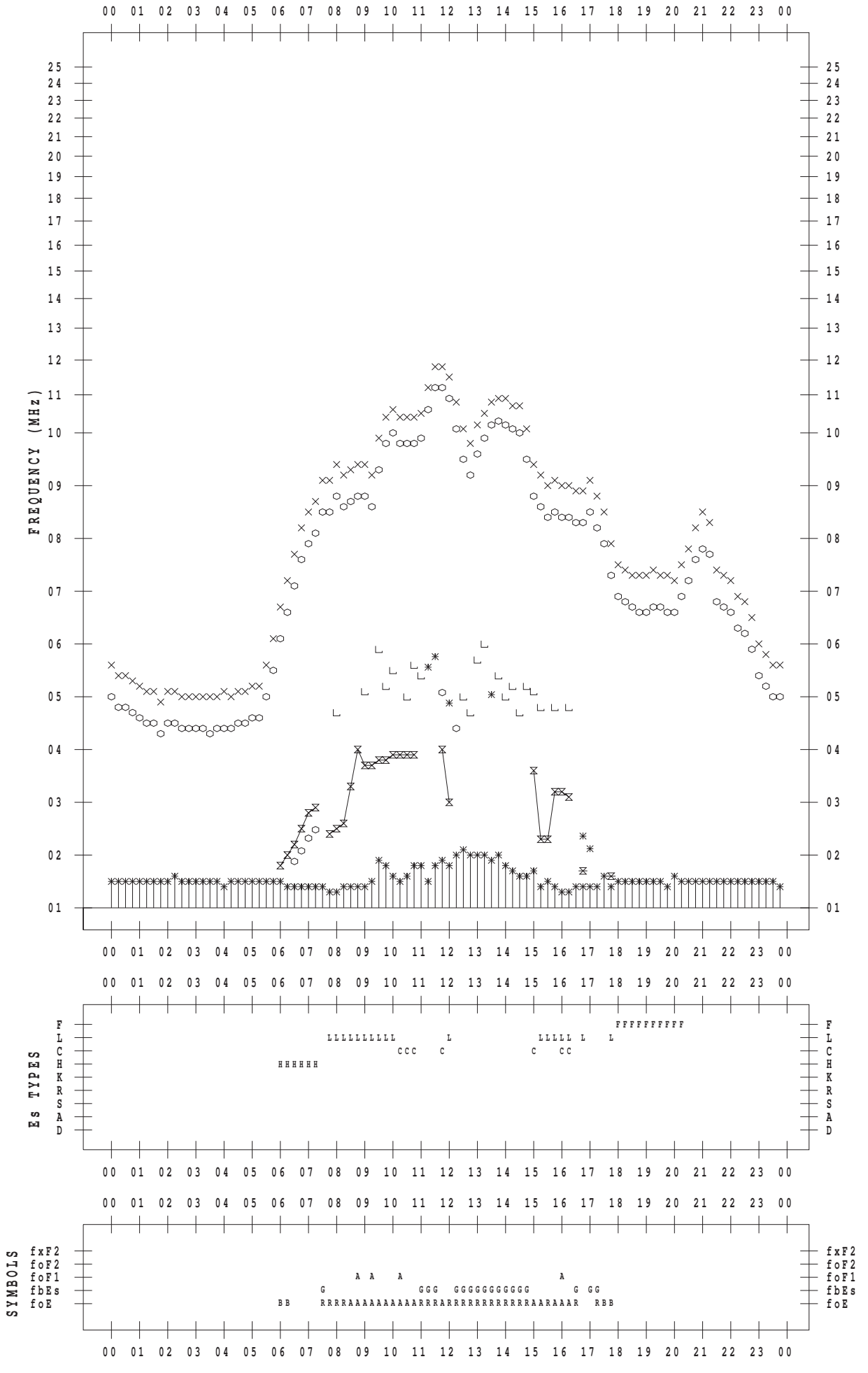
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/17

135 °E MEAN TIME



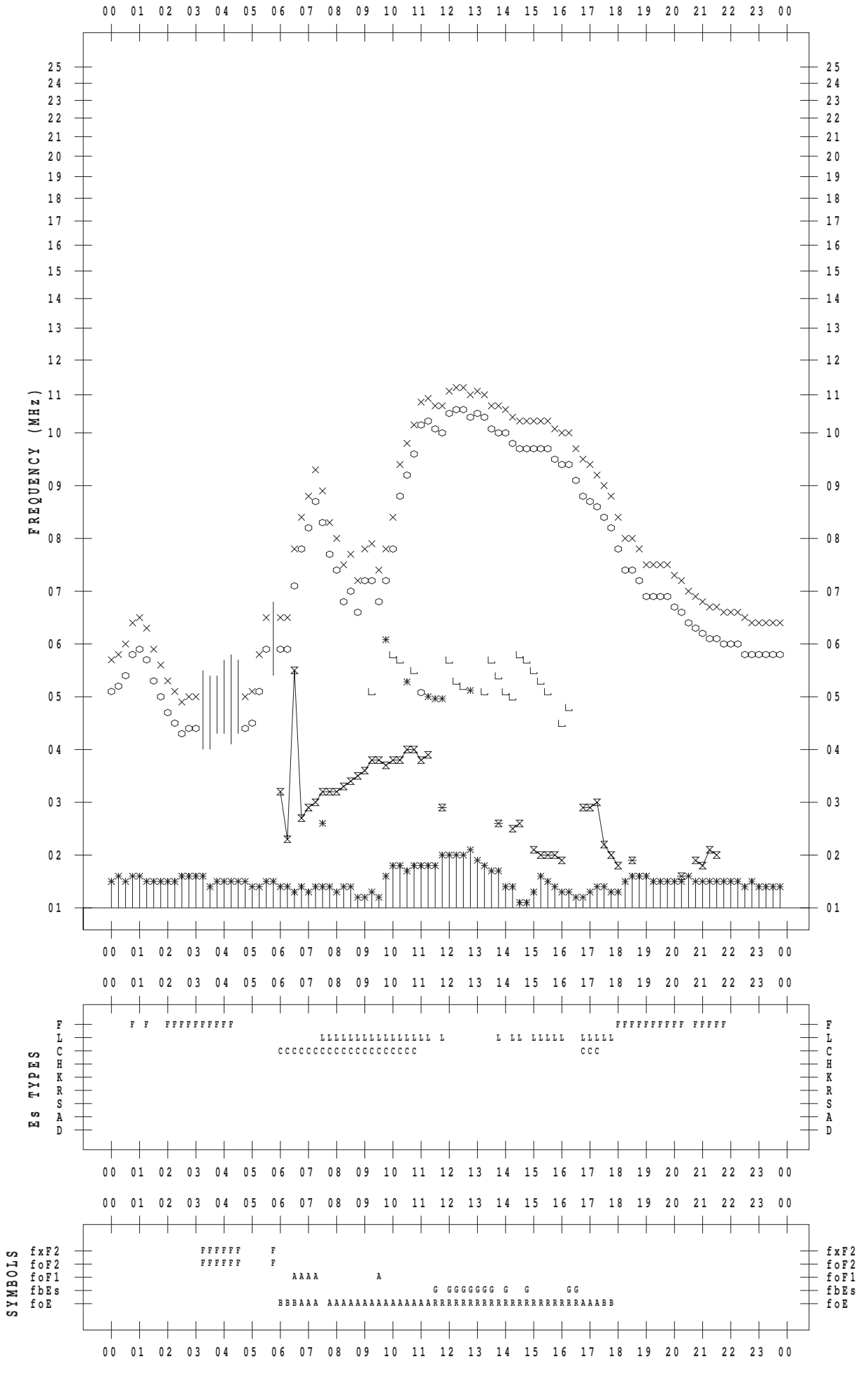
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/18

135 °E MEAN TIME



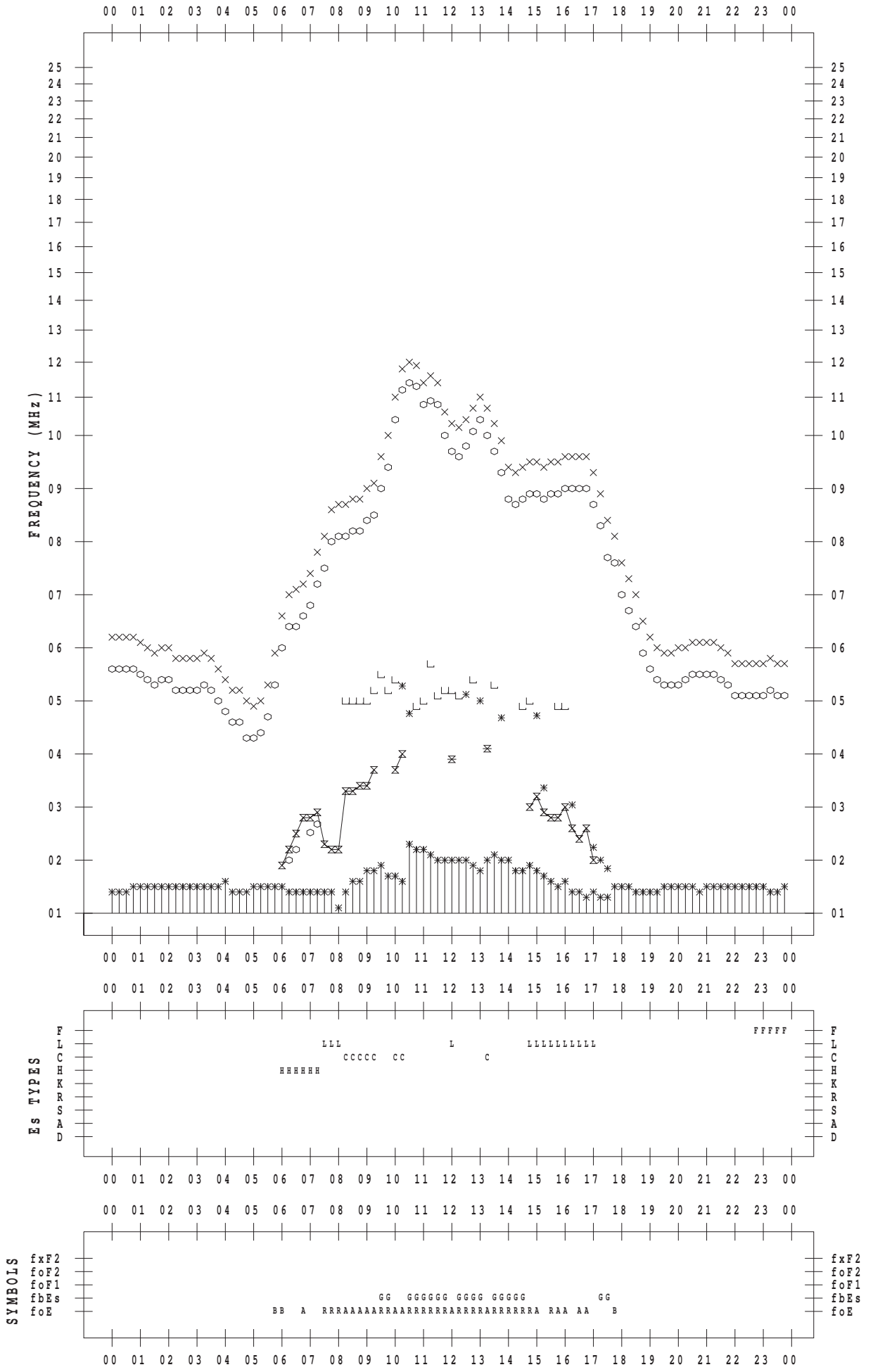
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/19

135 °E MEAN TIME



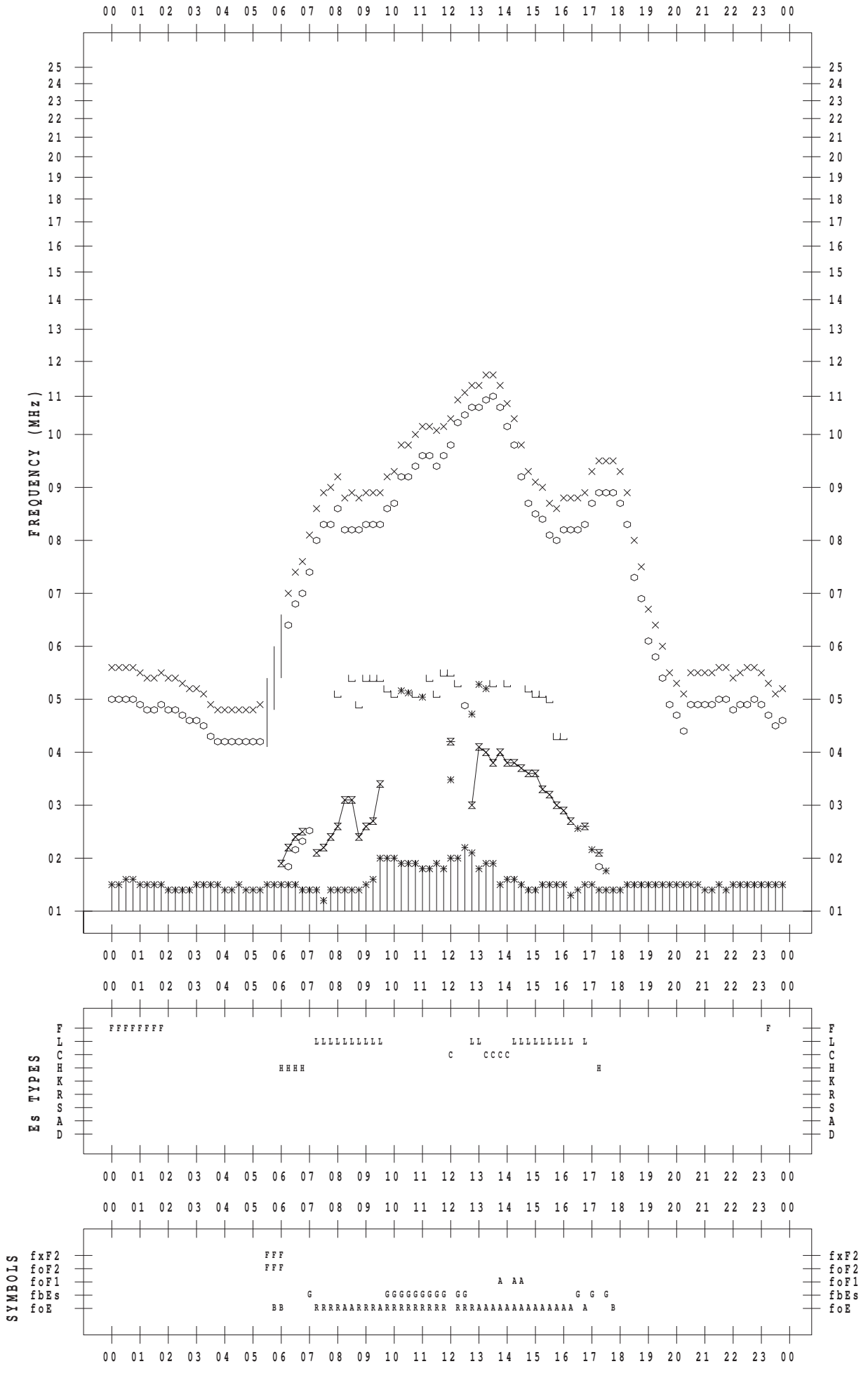
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/20

135 °E MEAN TIME



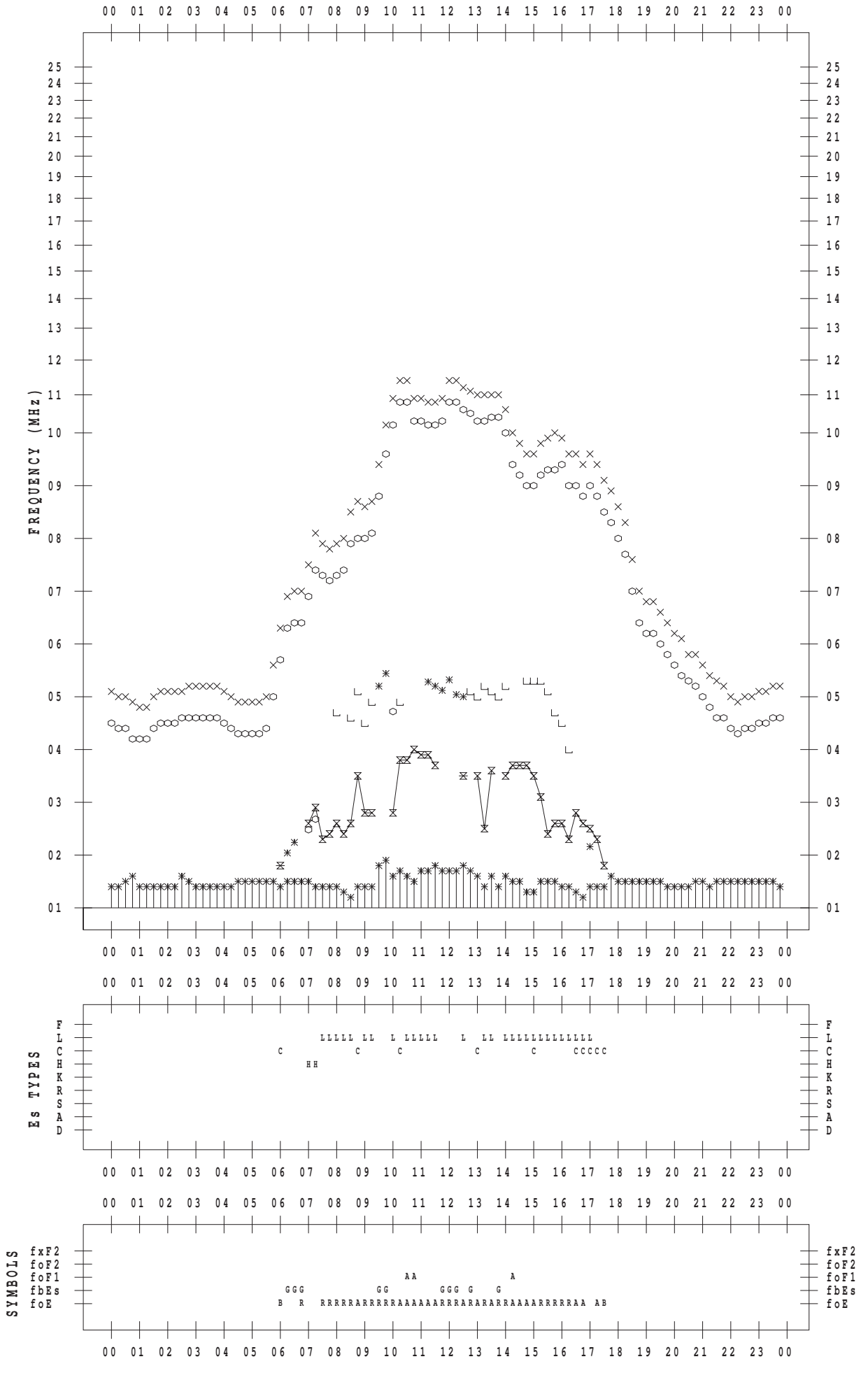
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/21

135 °E MEAN TIME



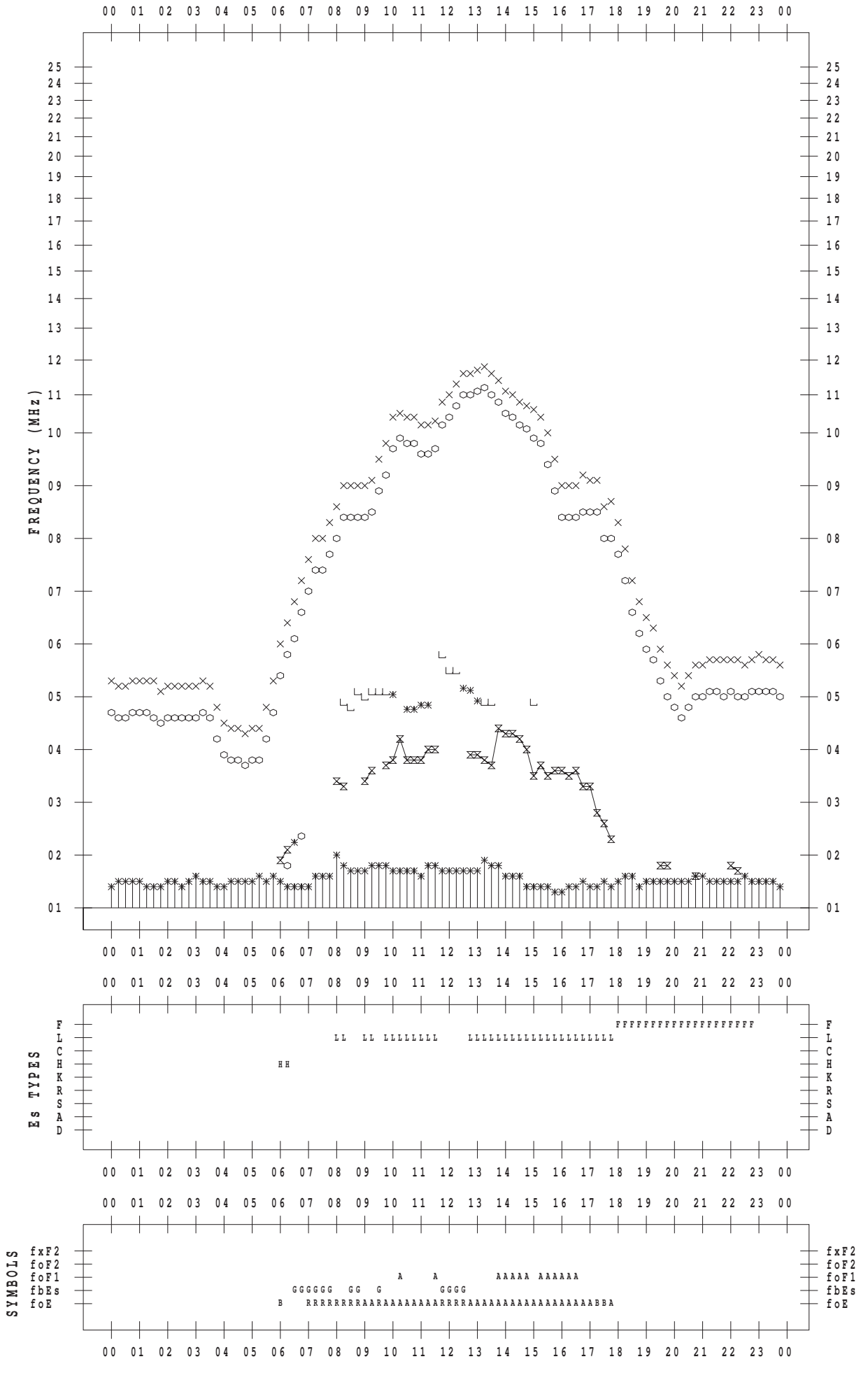
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/22

135 °E MEAN TIME



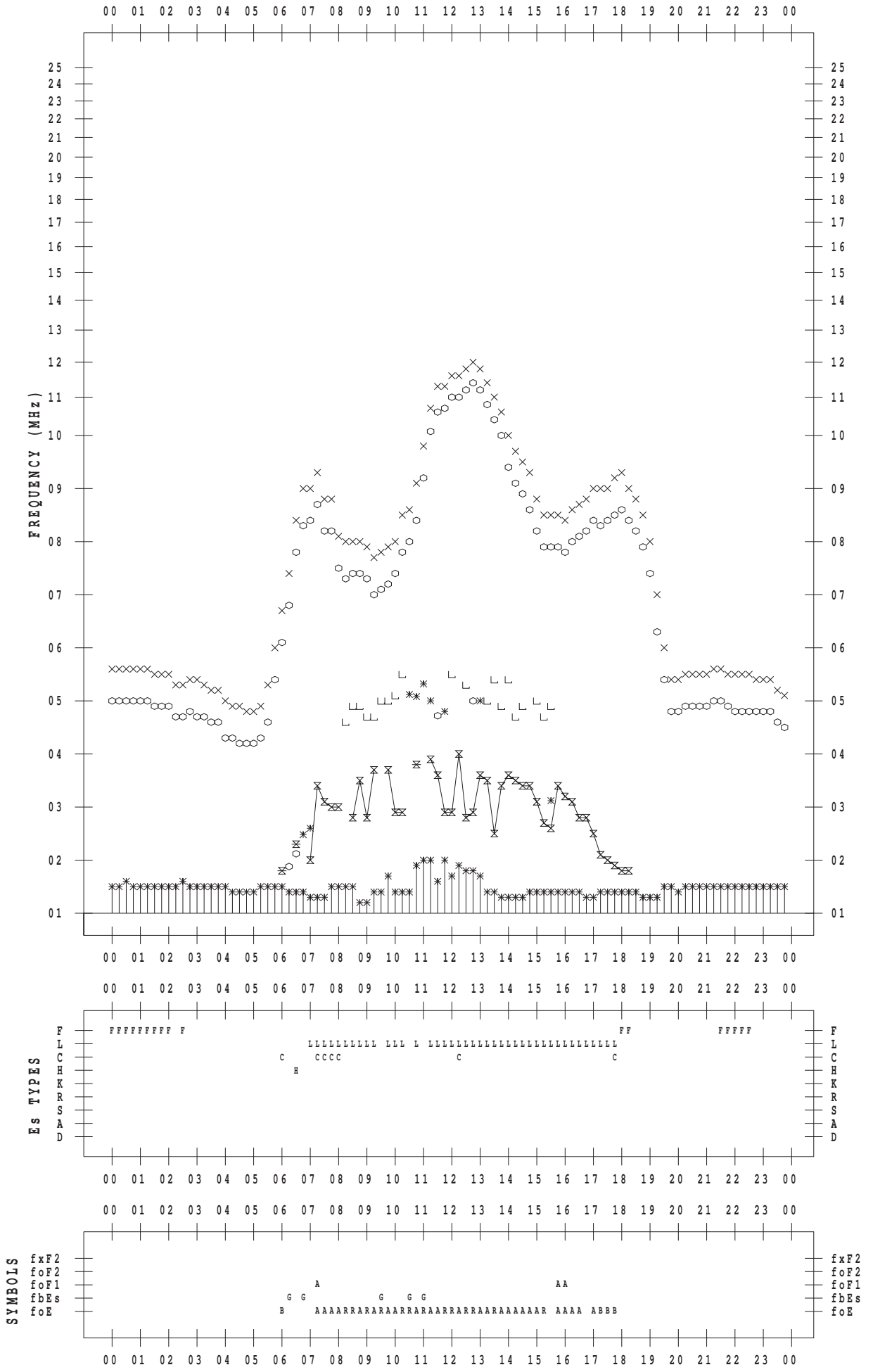
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/23

135 °E MEAN TIME



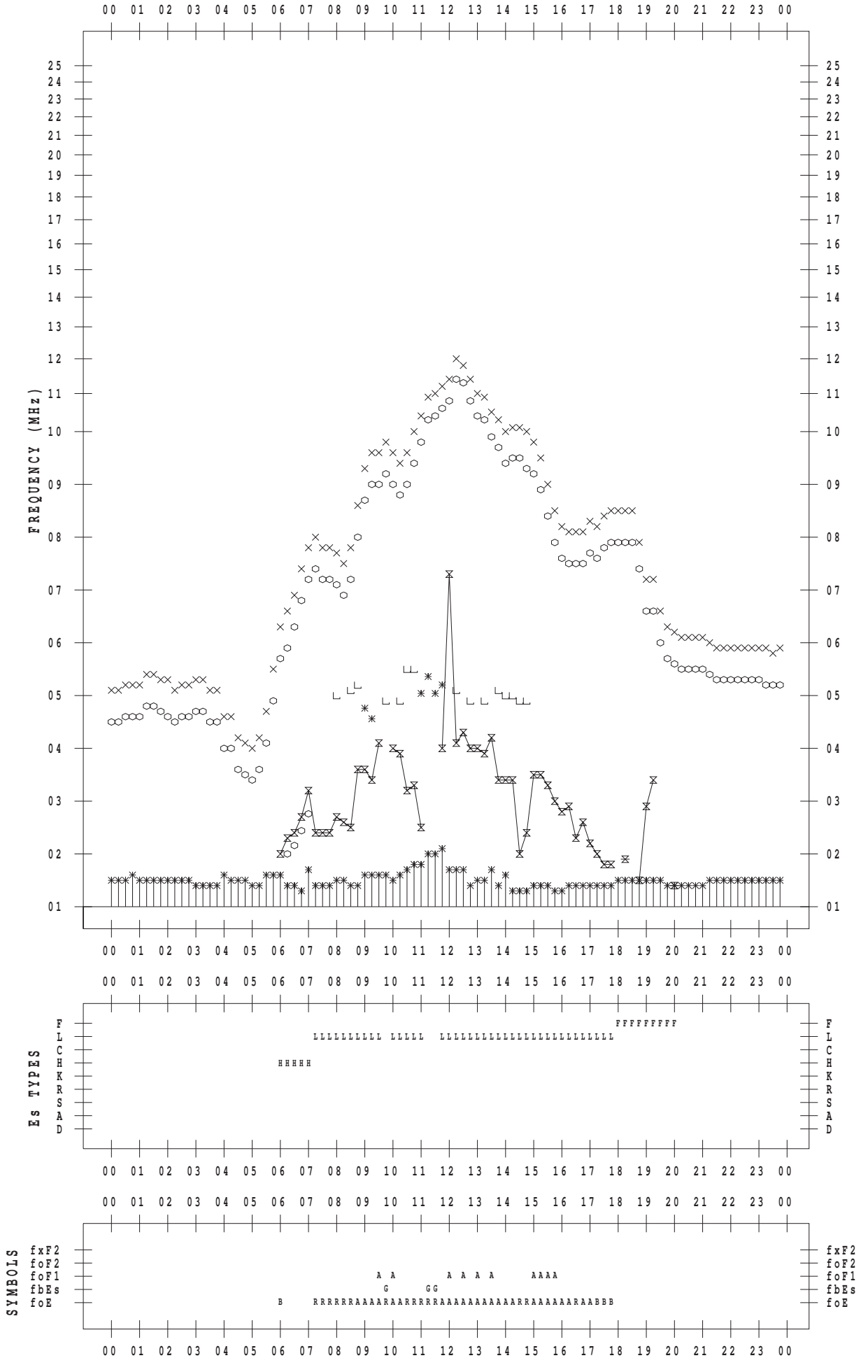
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/24

135 °E MEAN TIME



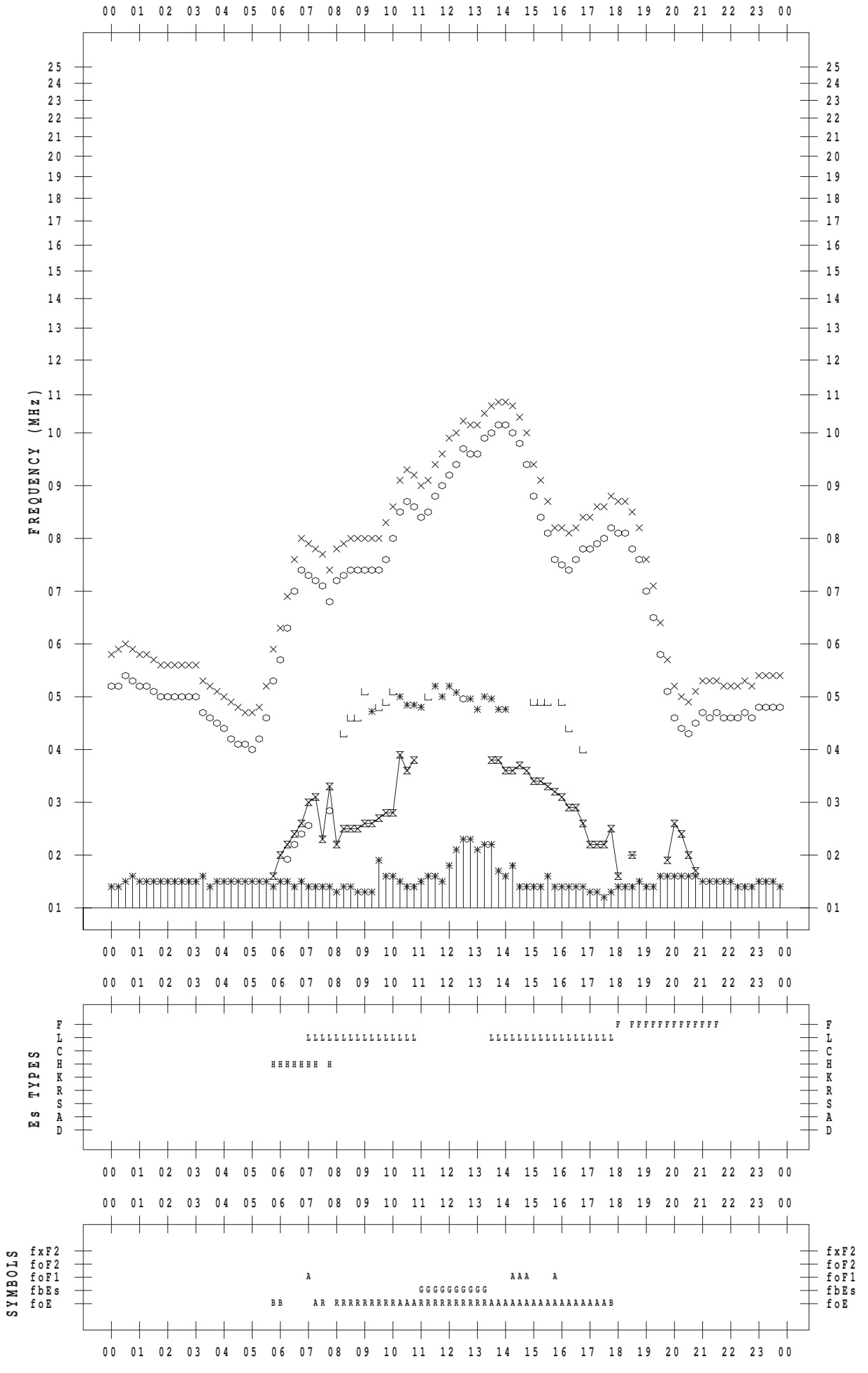
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/25

135 °E MEAN TIME



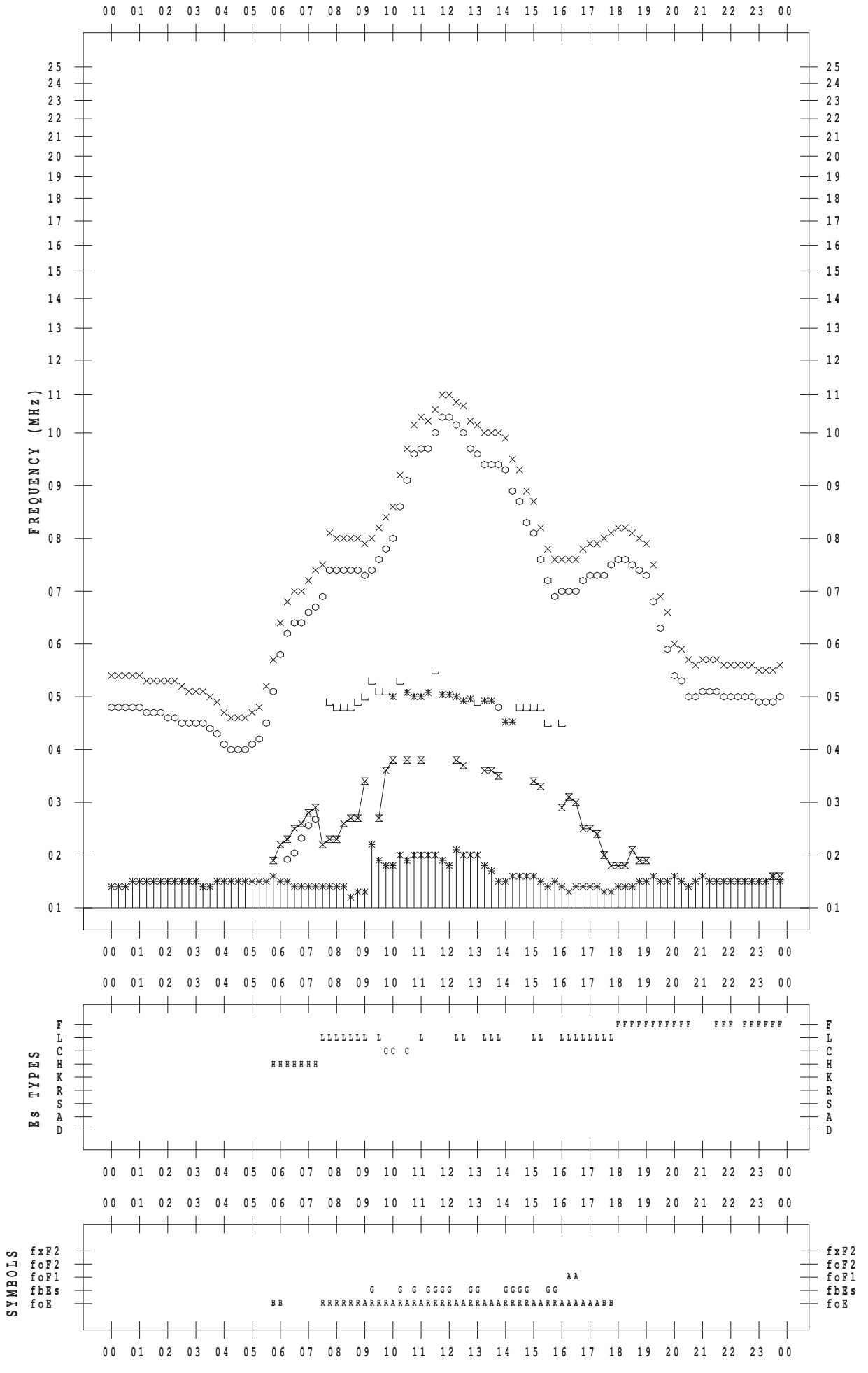
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/26

135 °E MEAN TIME



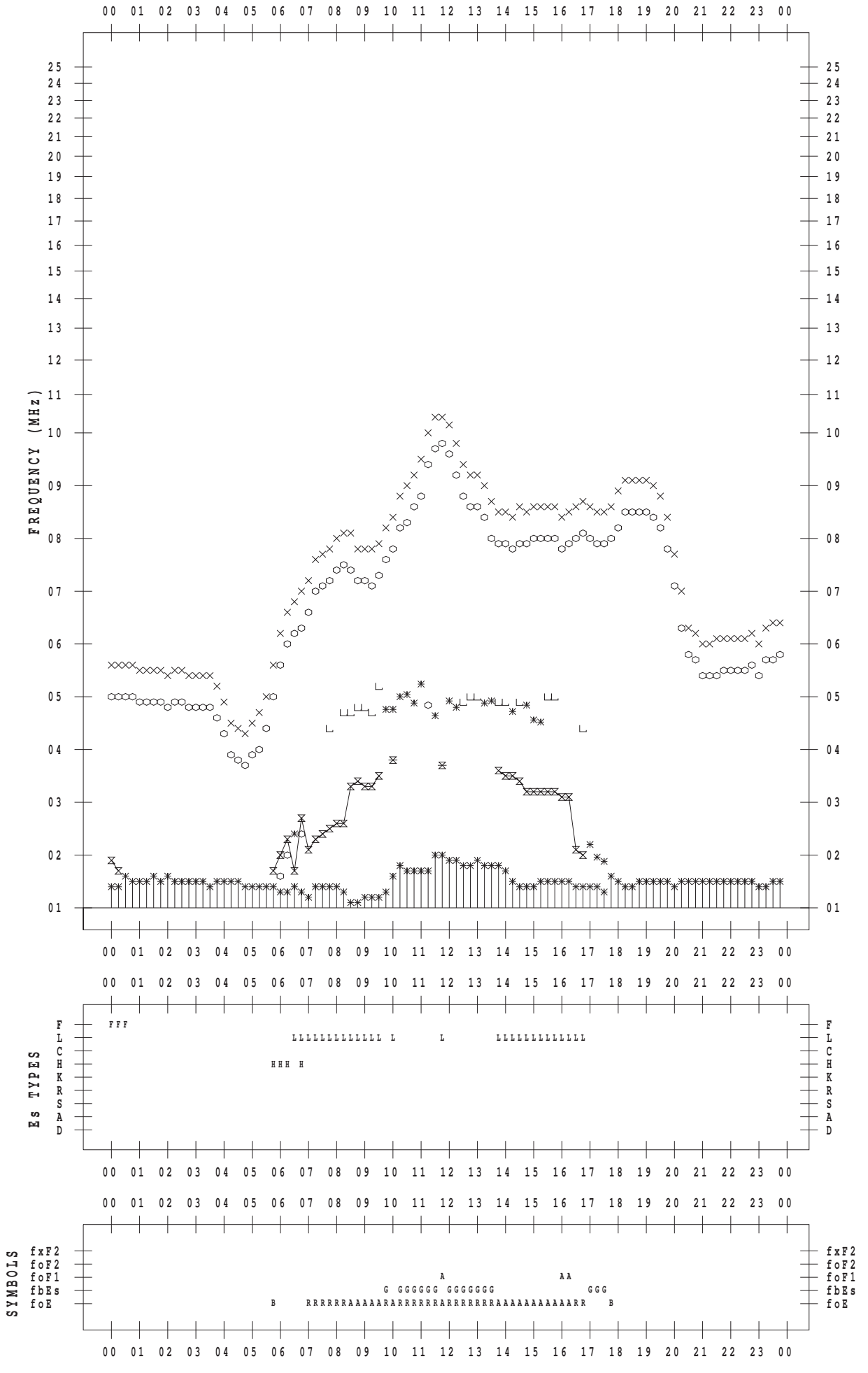
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/27

135 °E MEAN TIME



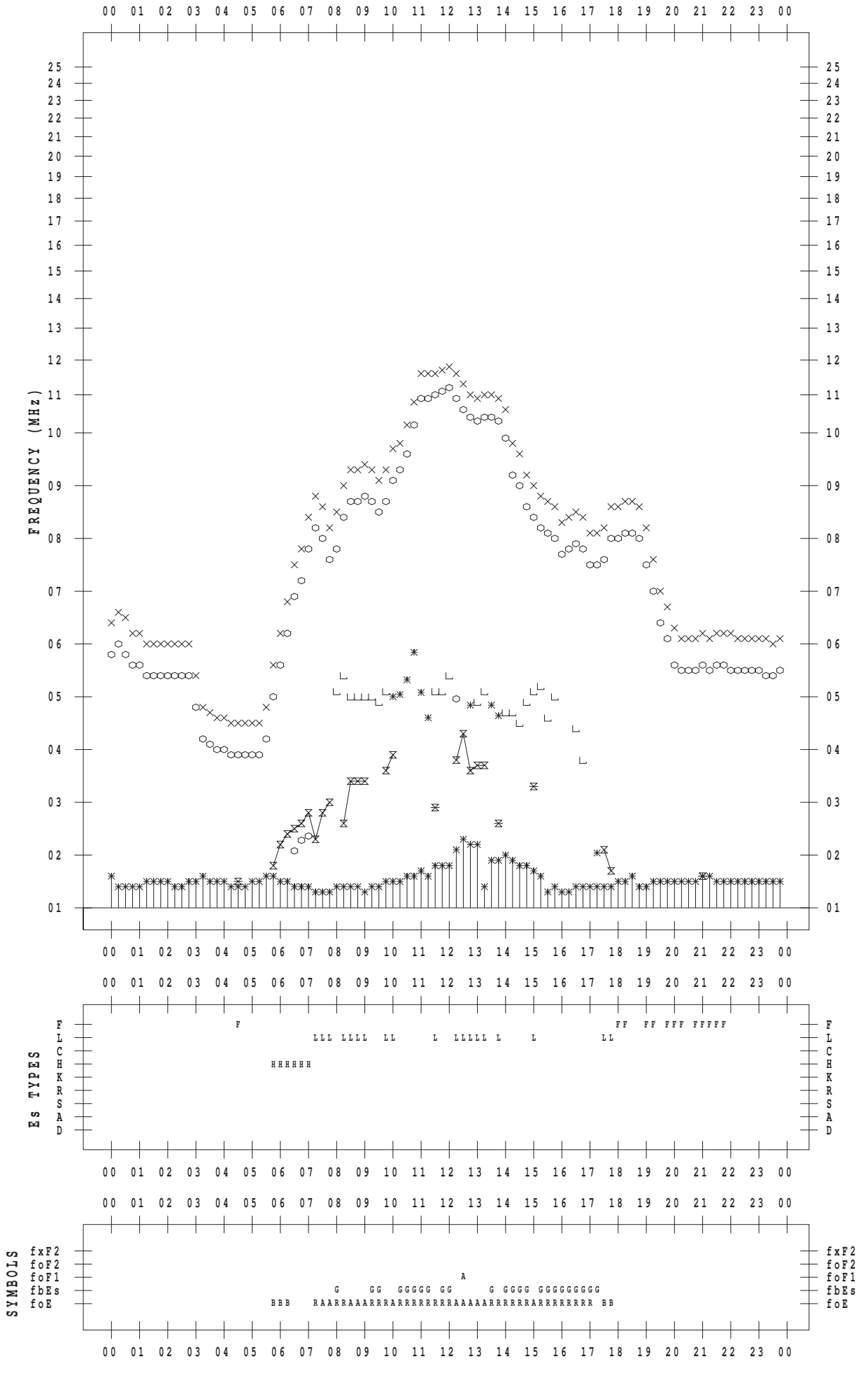
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/28

135 °E MEAN TIME



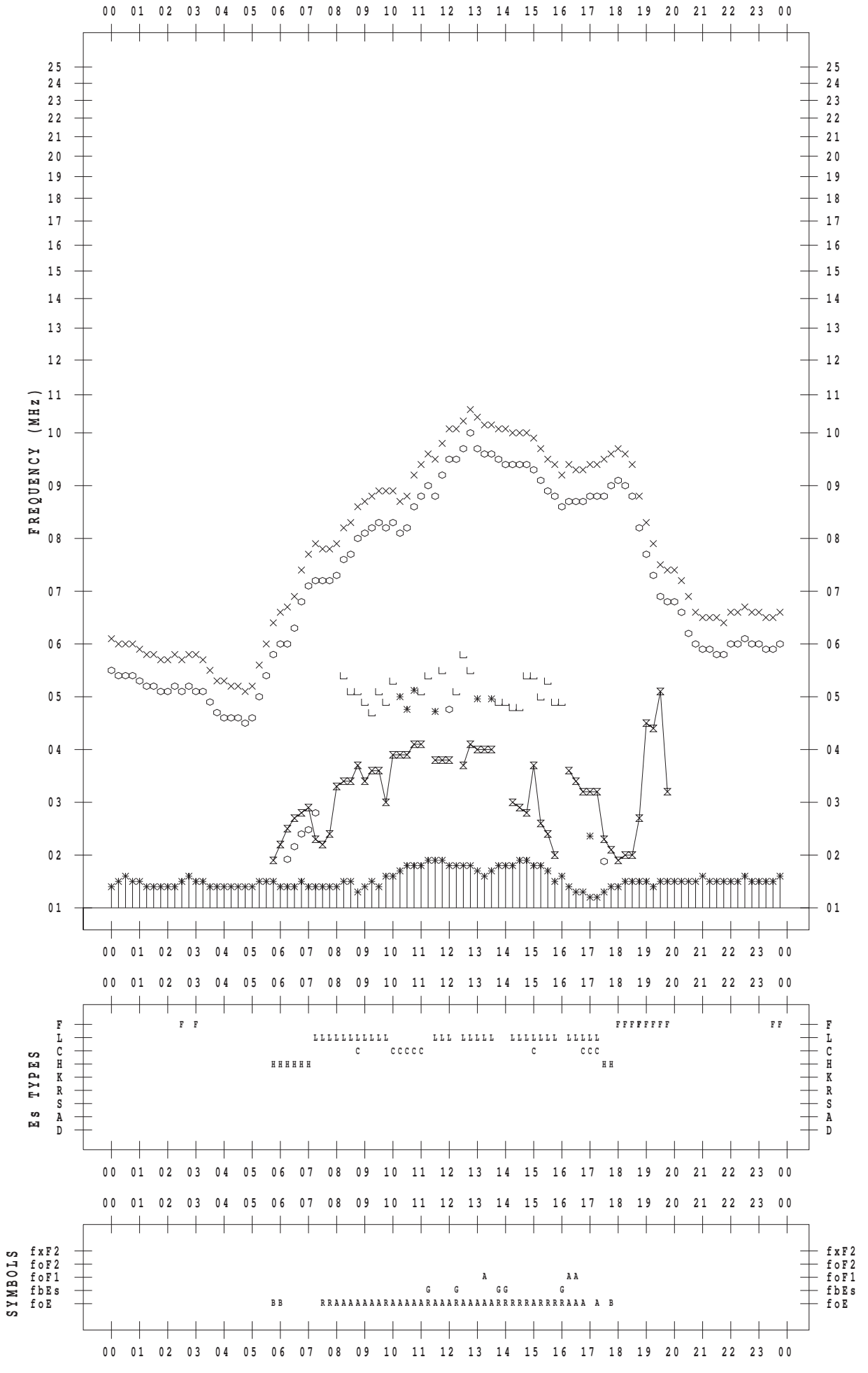
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/29

135 °E MEAN TIME



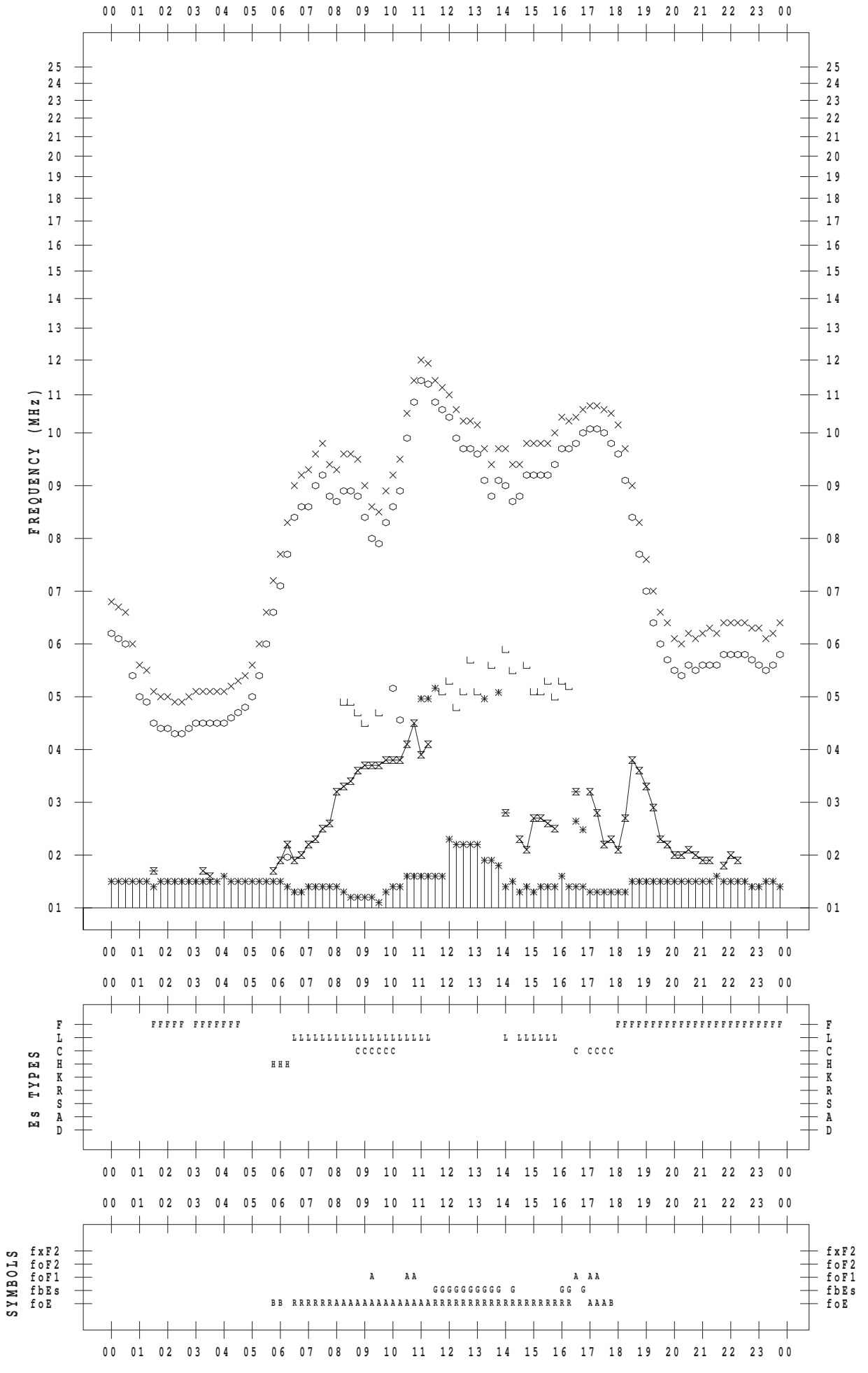
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/30

135 °E MEAN TIME



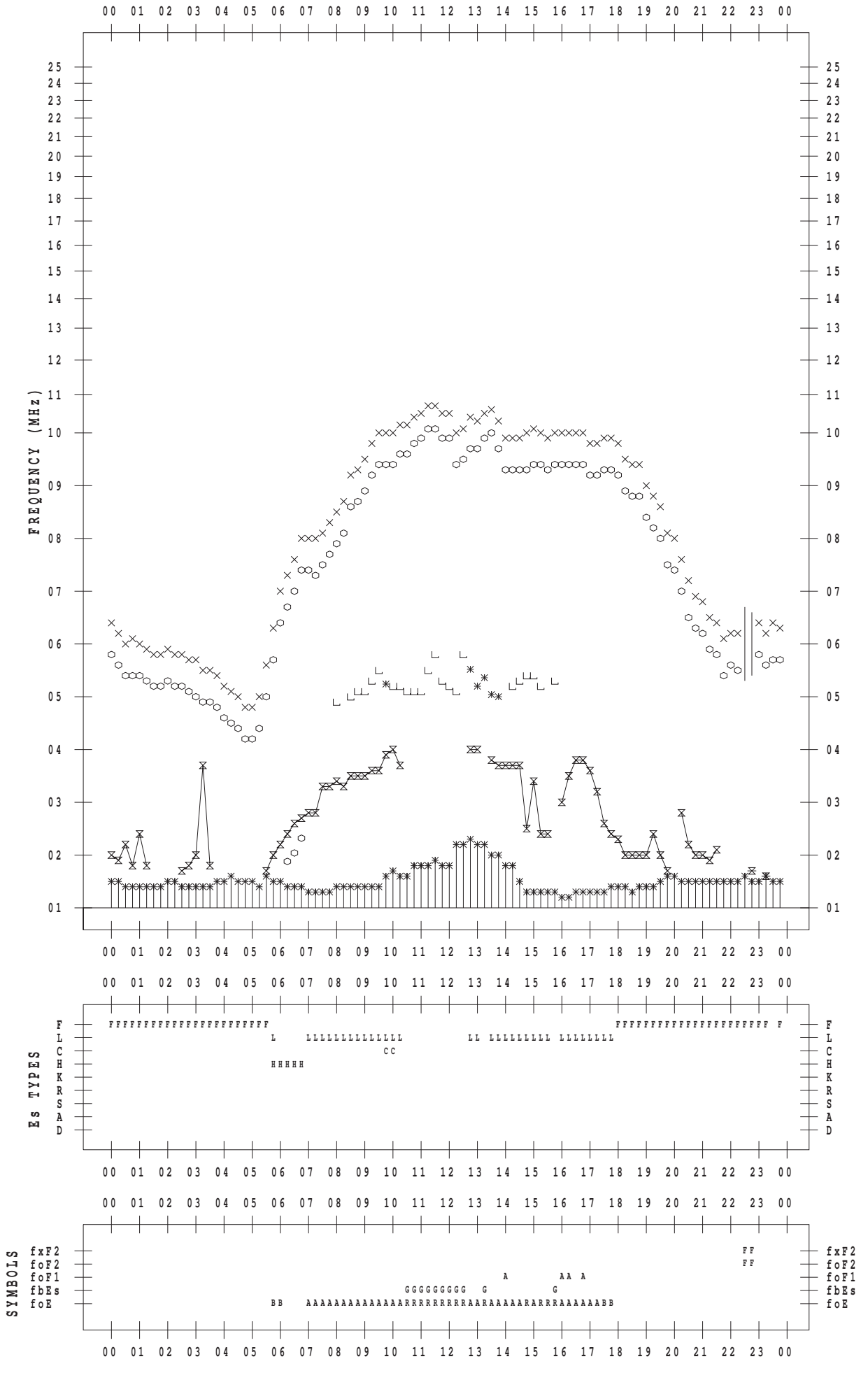
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 3/31

135 °E MEAN TIME



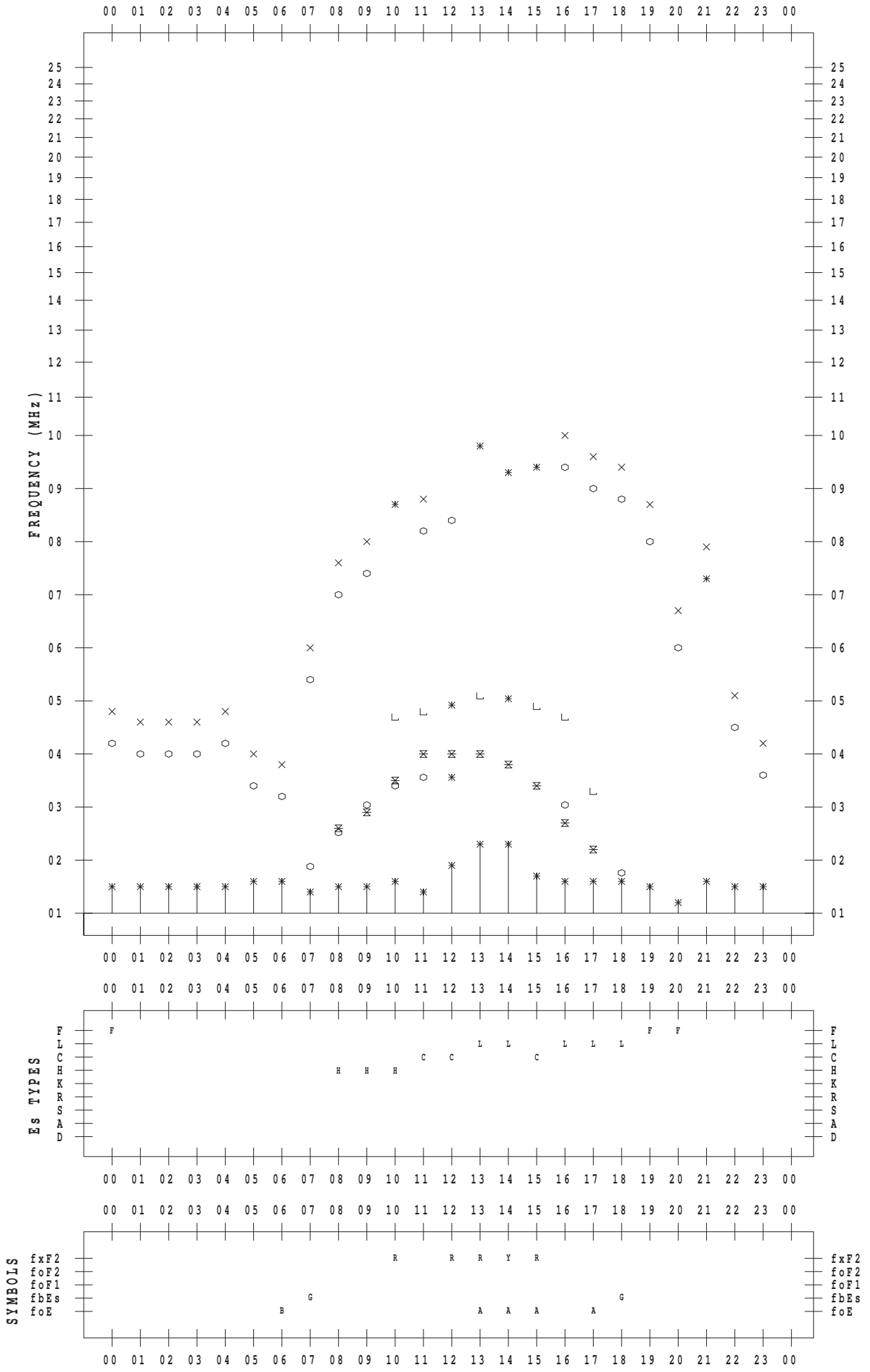
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 1

135 °E MEAN TIME



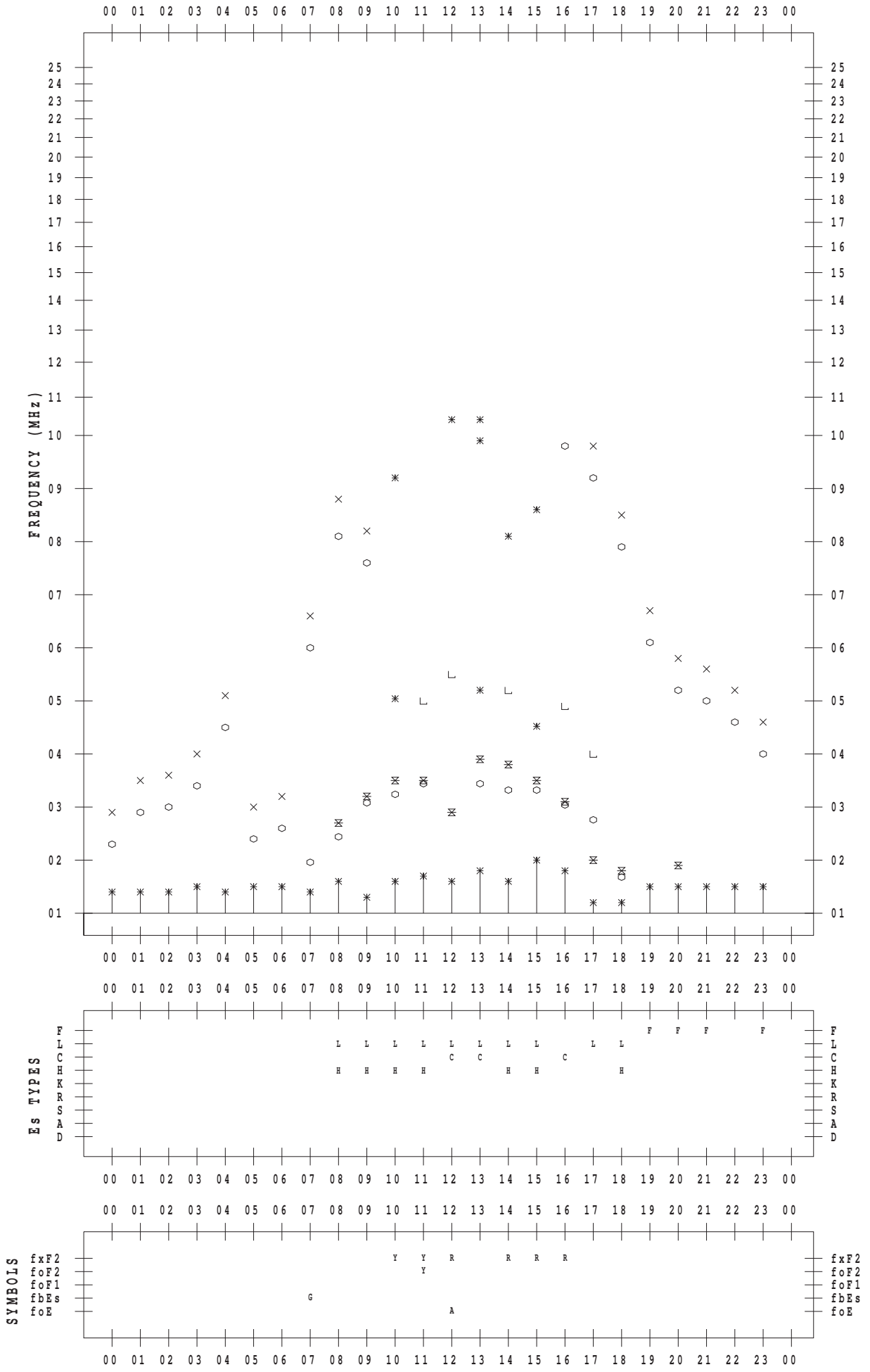
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 2

135 °E MEAN TIME



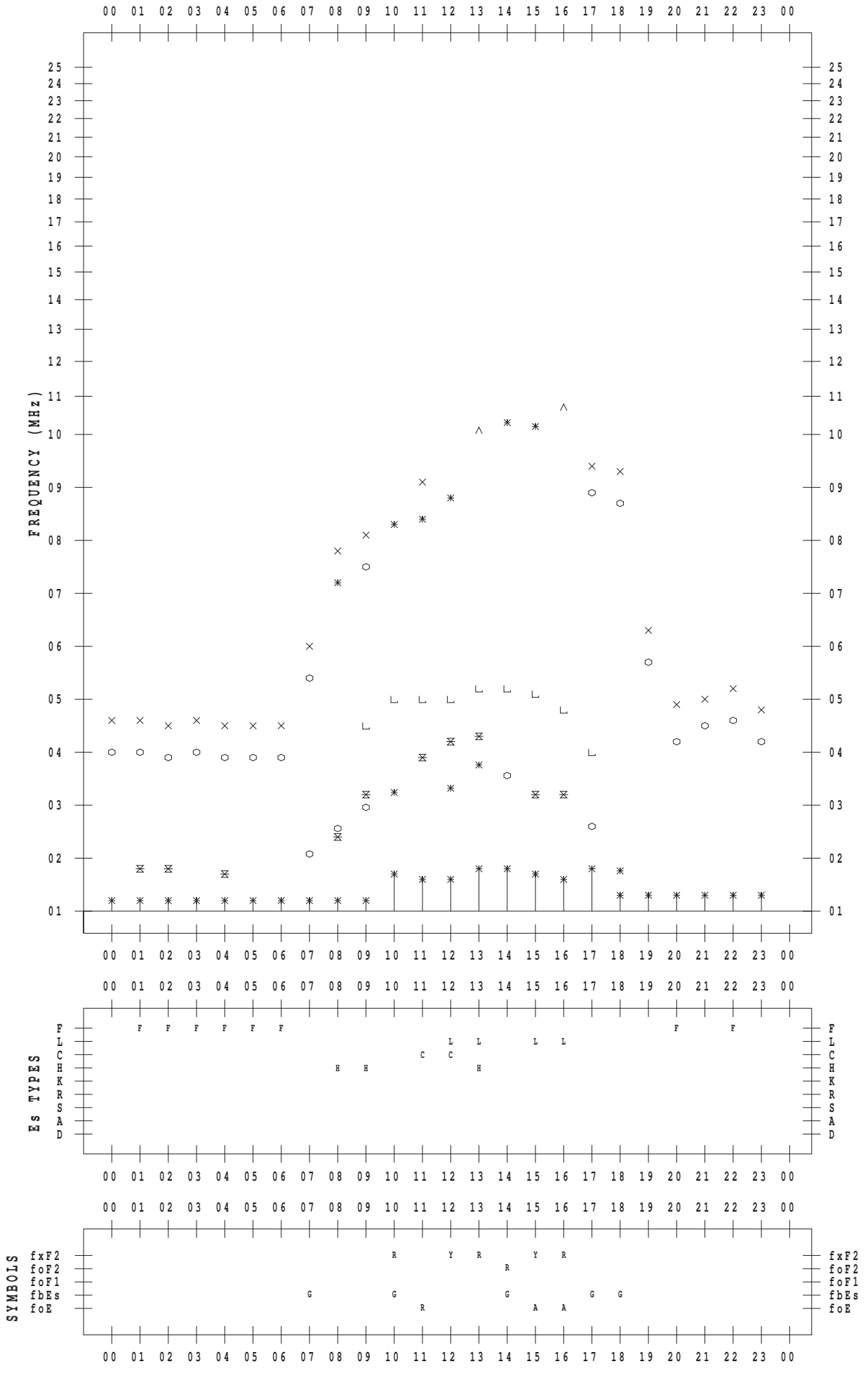
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 3

135 °E MEAN TIME



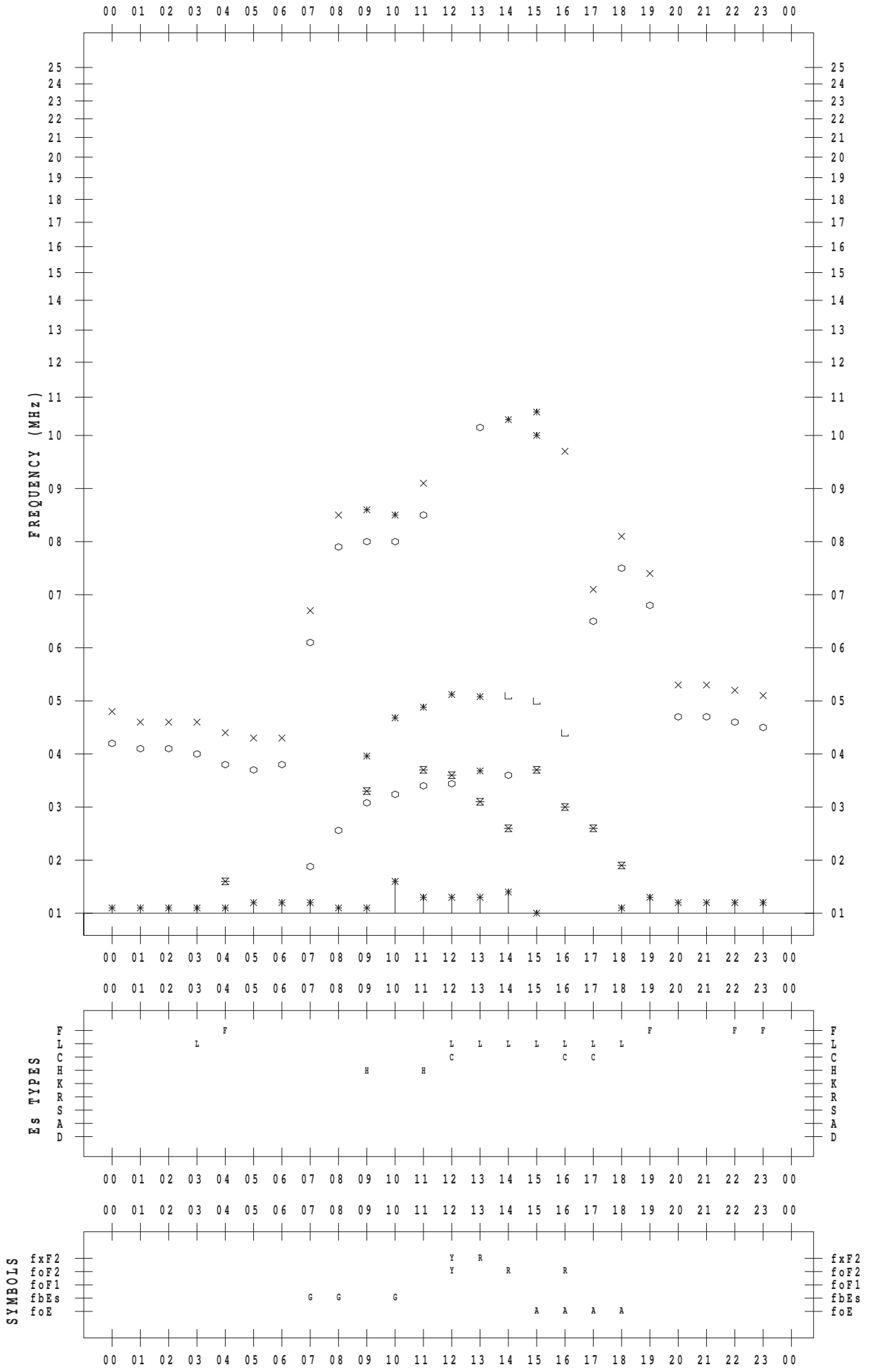
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 4

135 °E MEAN TIME



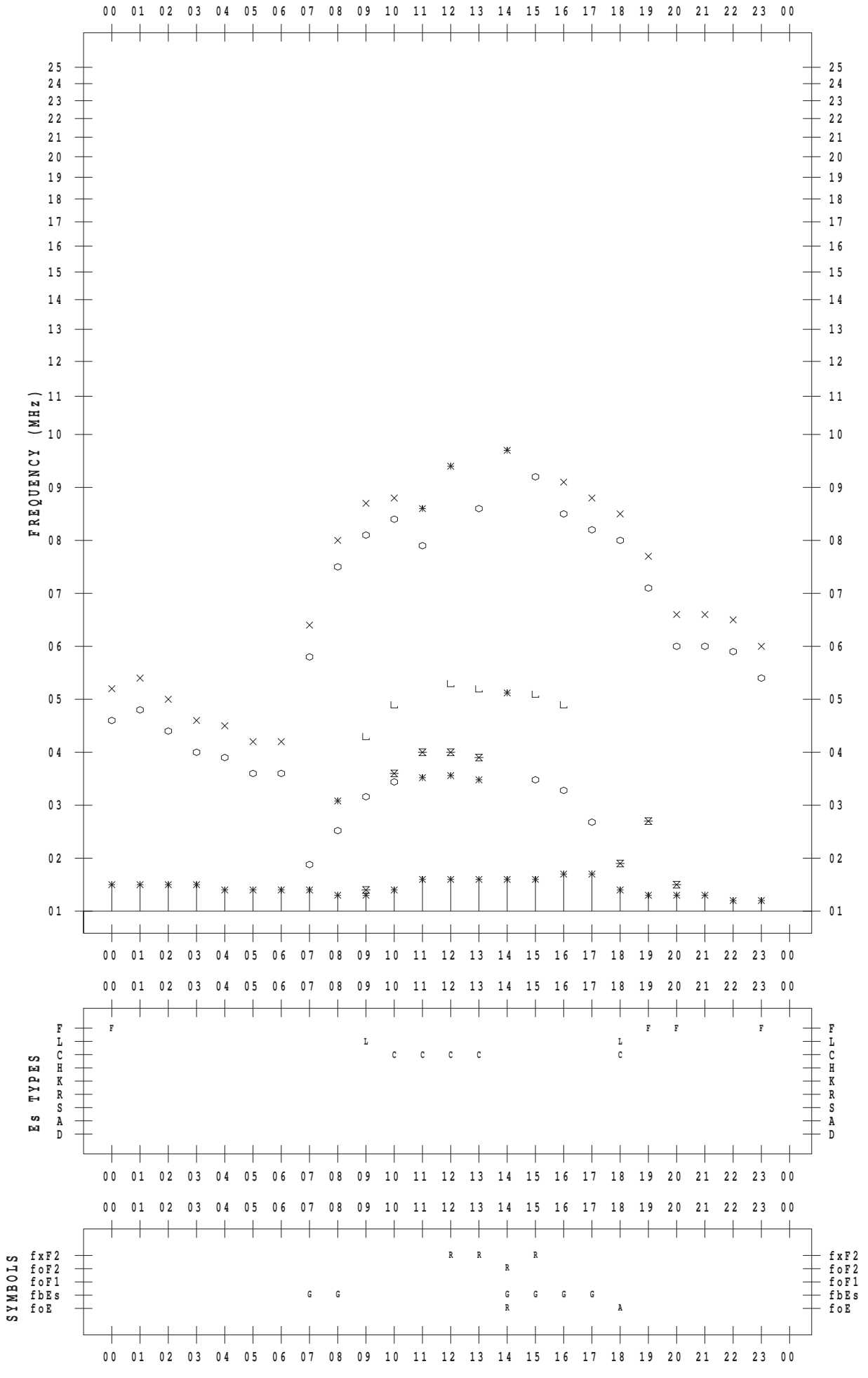
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 5

135 °E MEAN TIME



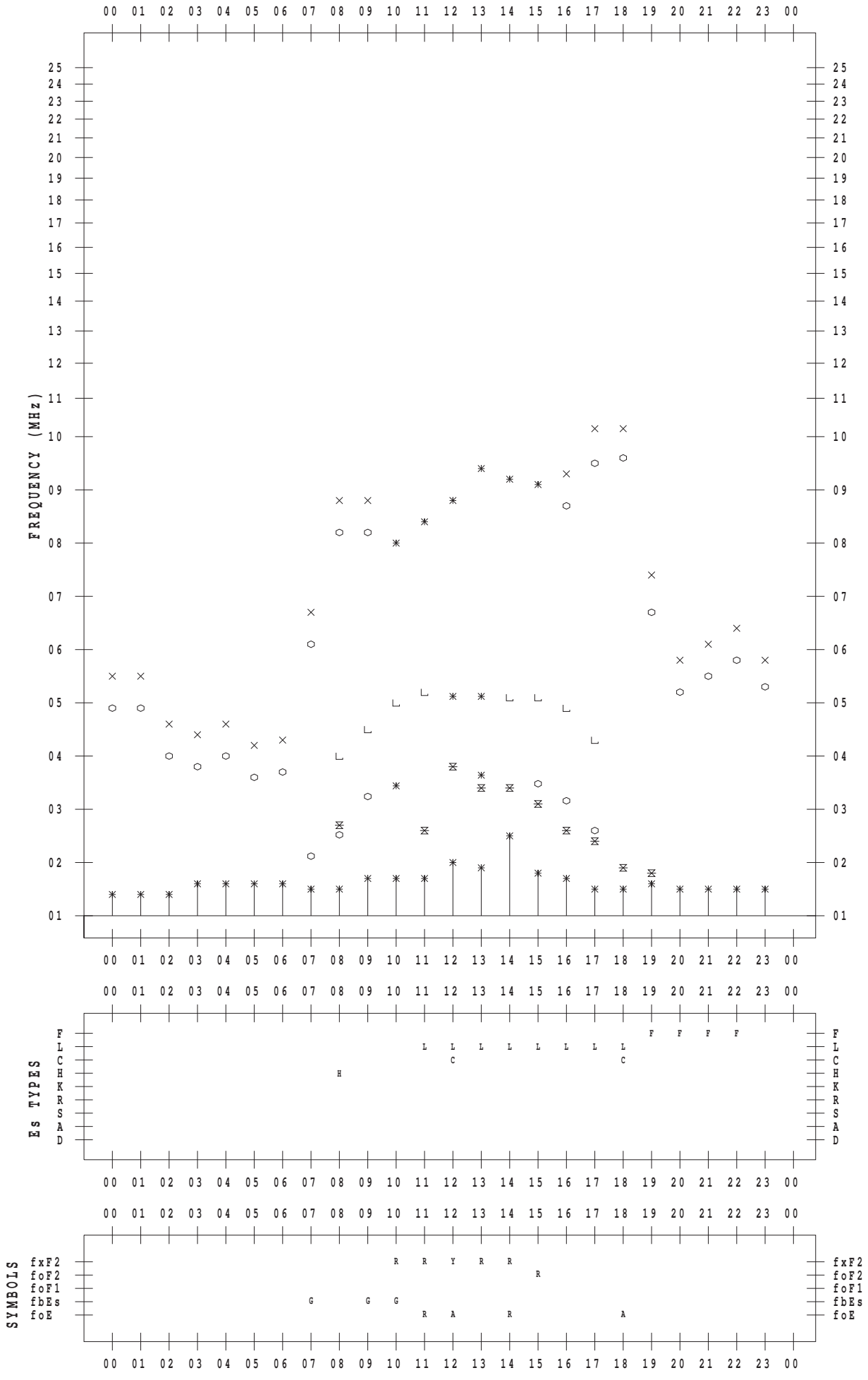
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 6

135 °E MEAN TIME



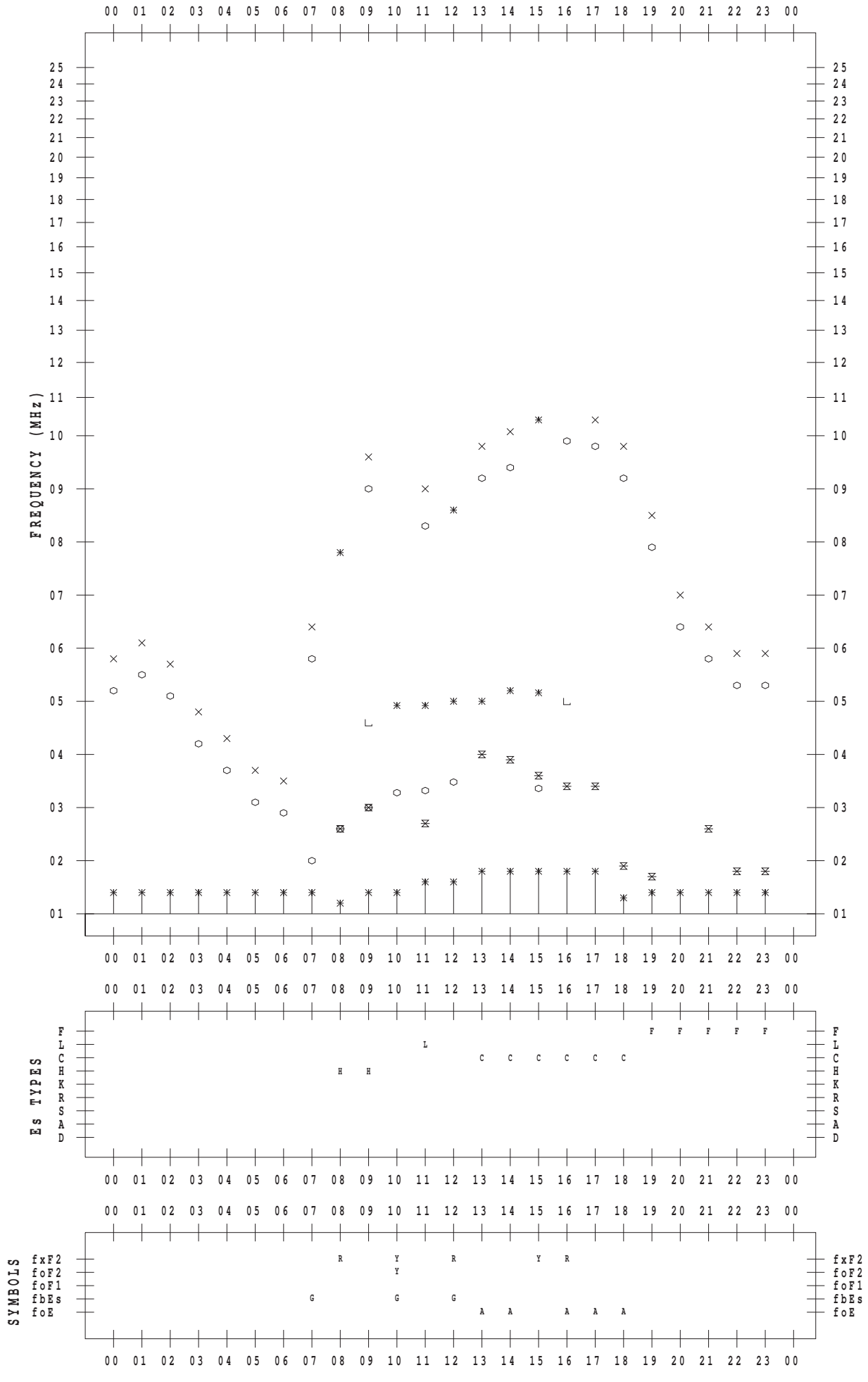
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 7

135 °E MEAN TIME



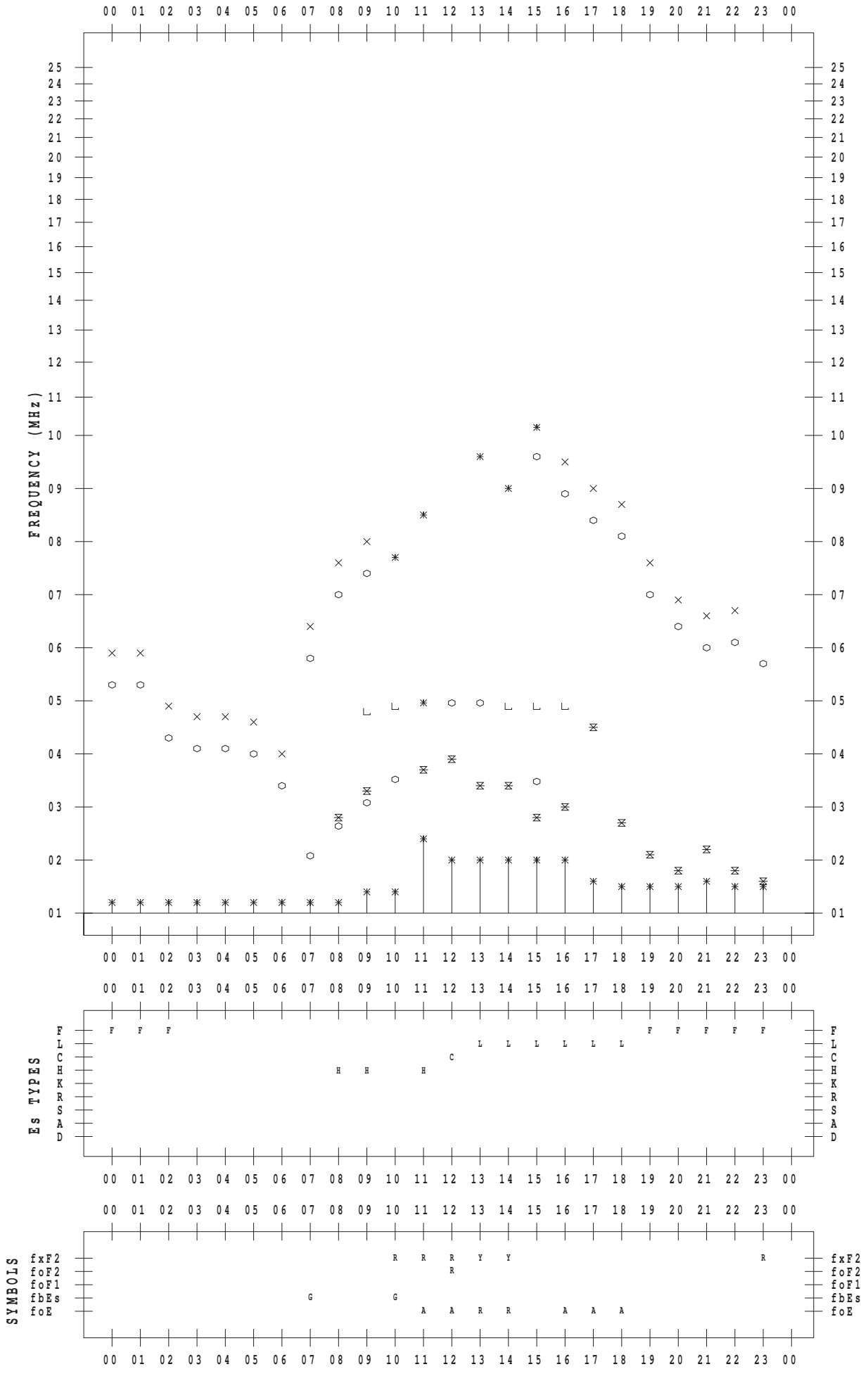
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 8

135 °E MEAN TIME



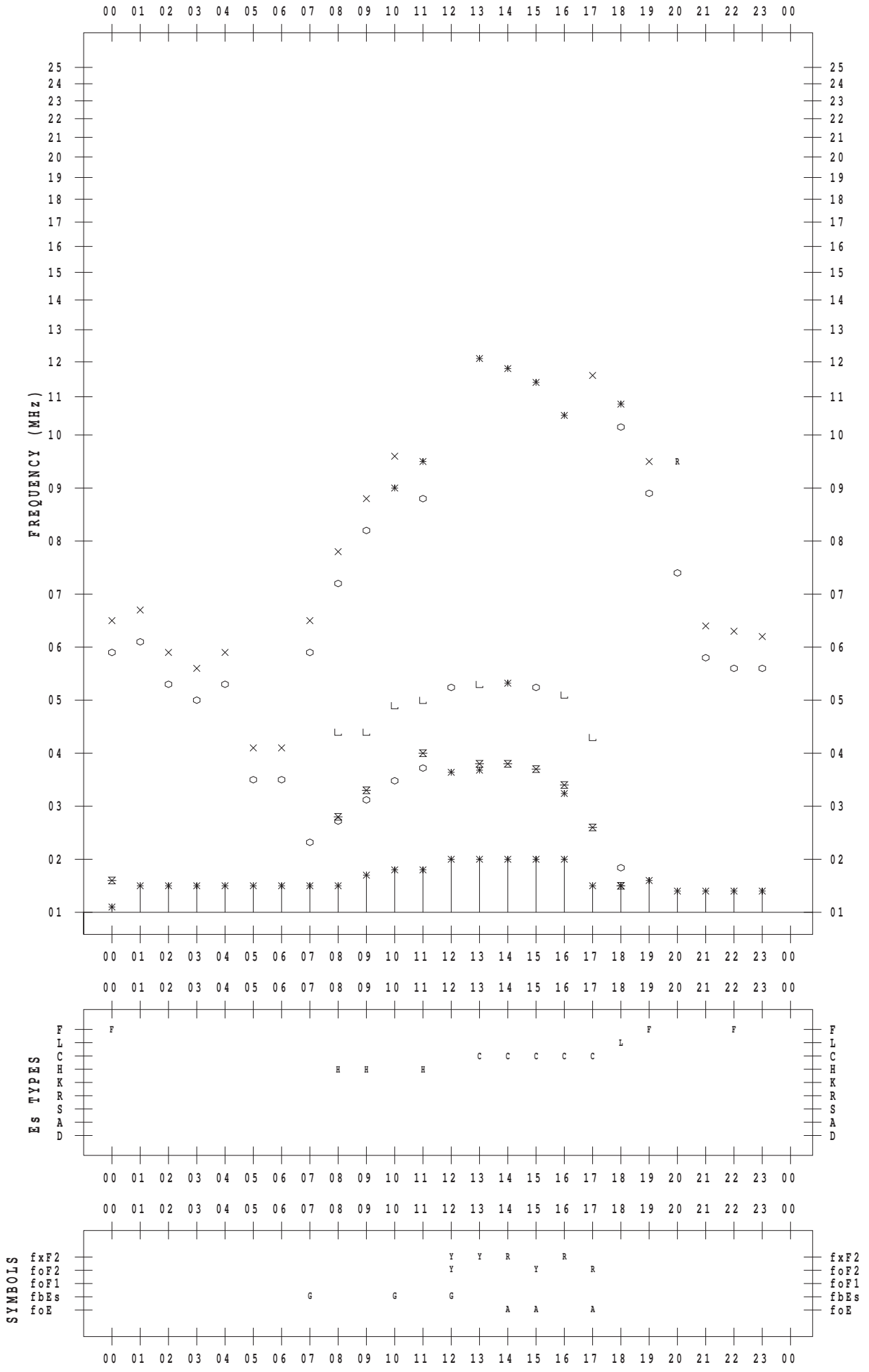
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/ 9

135 °E MEAN TIME



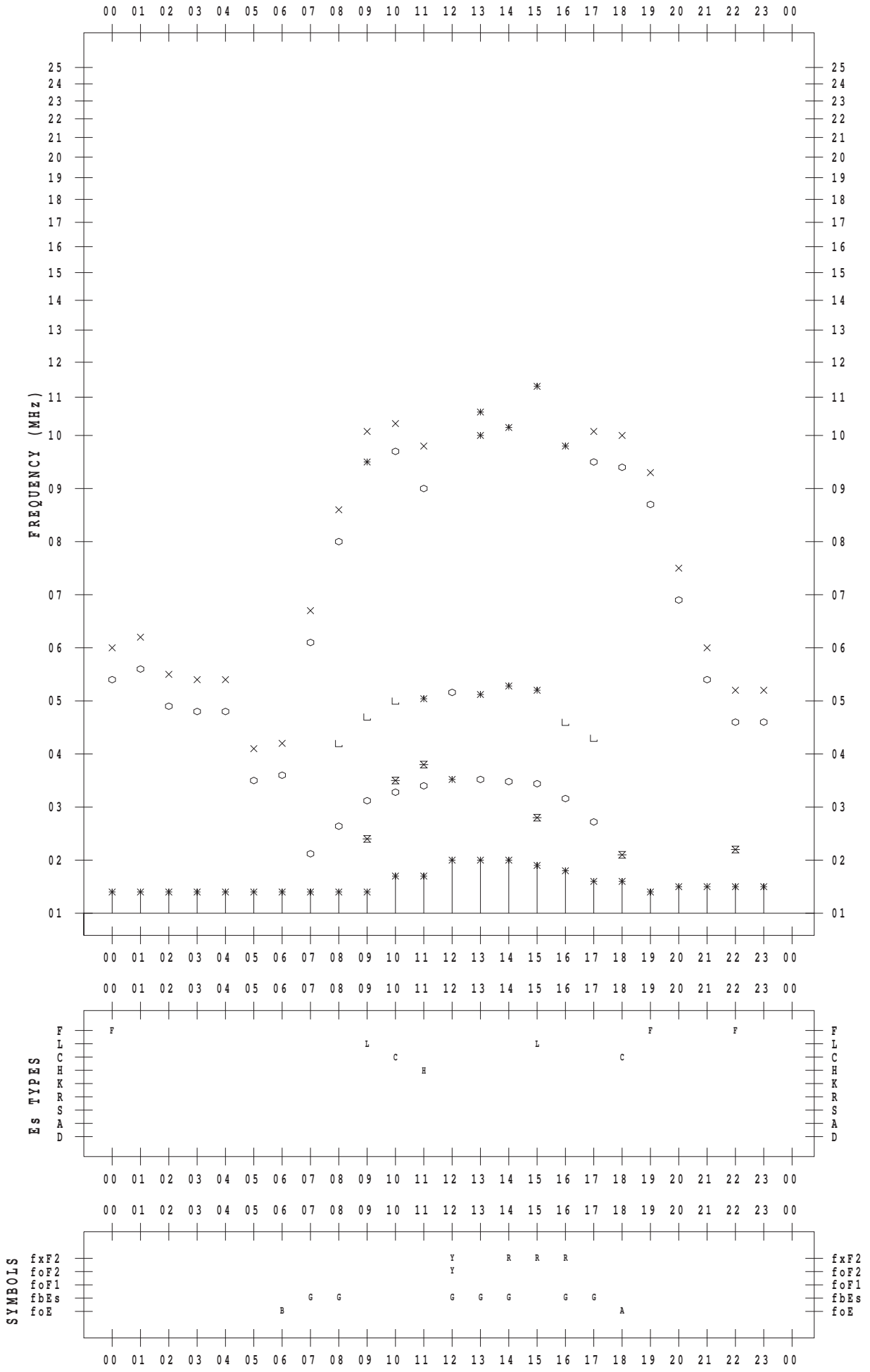
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/10

135 °E MEAN TIME



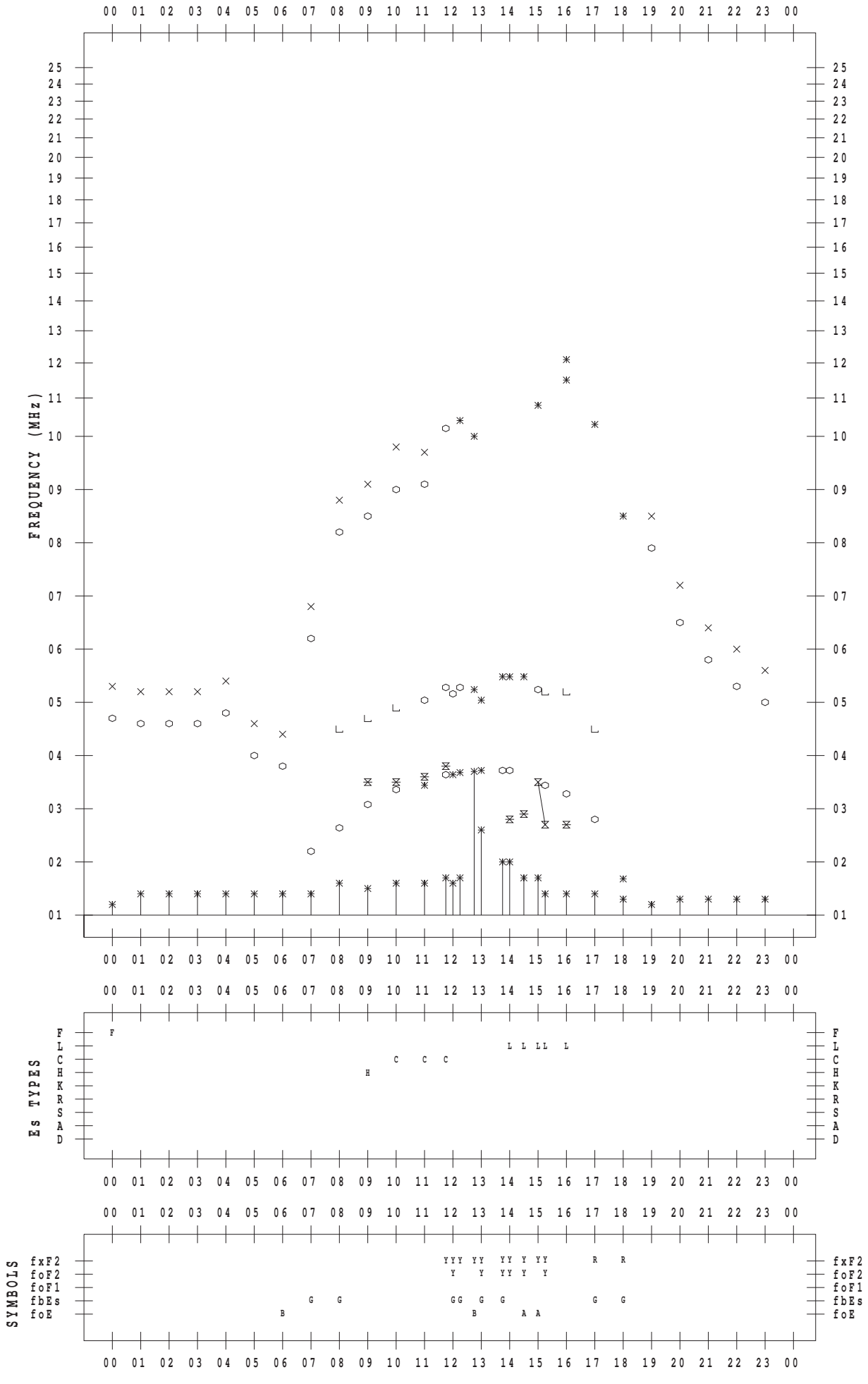
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/11

135 °E MEAN TIME



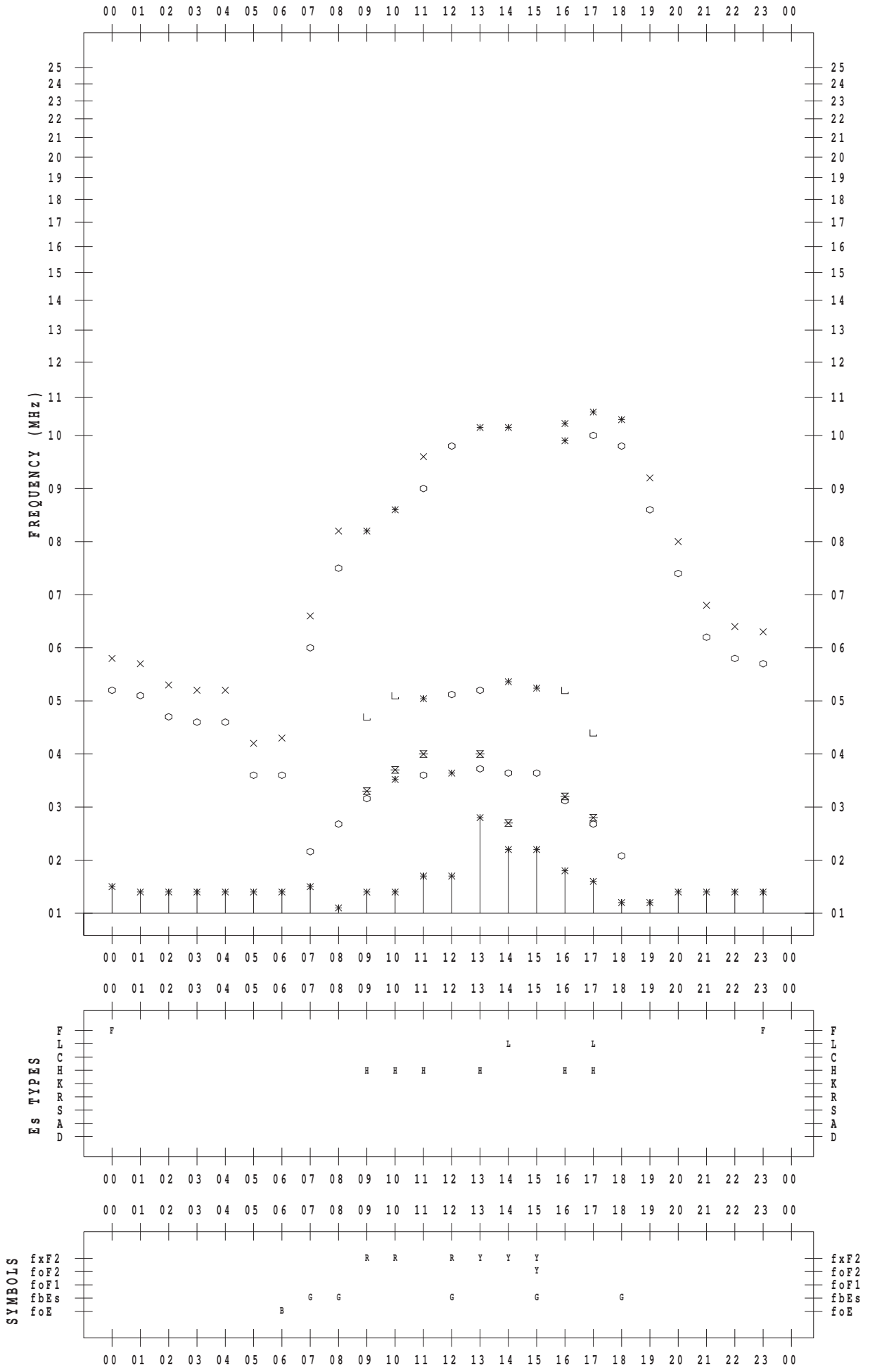
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/12

135 °E MEAN TIME



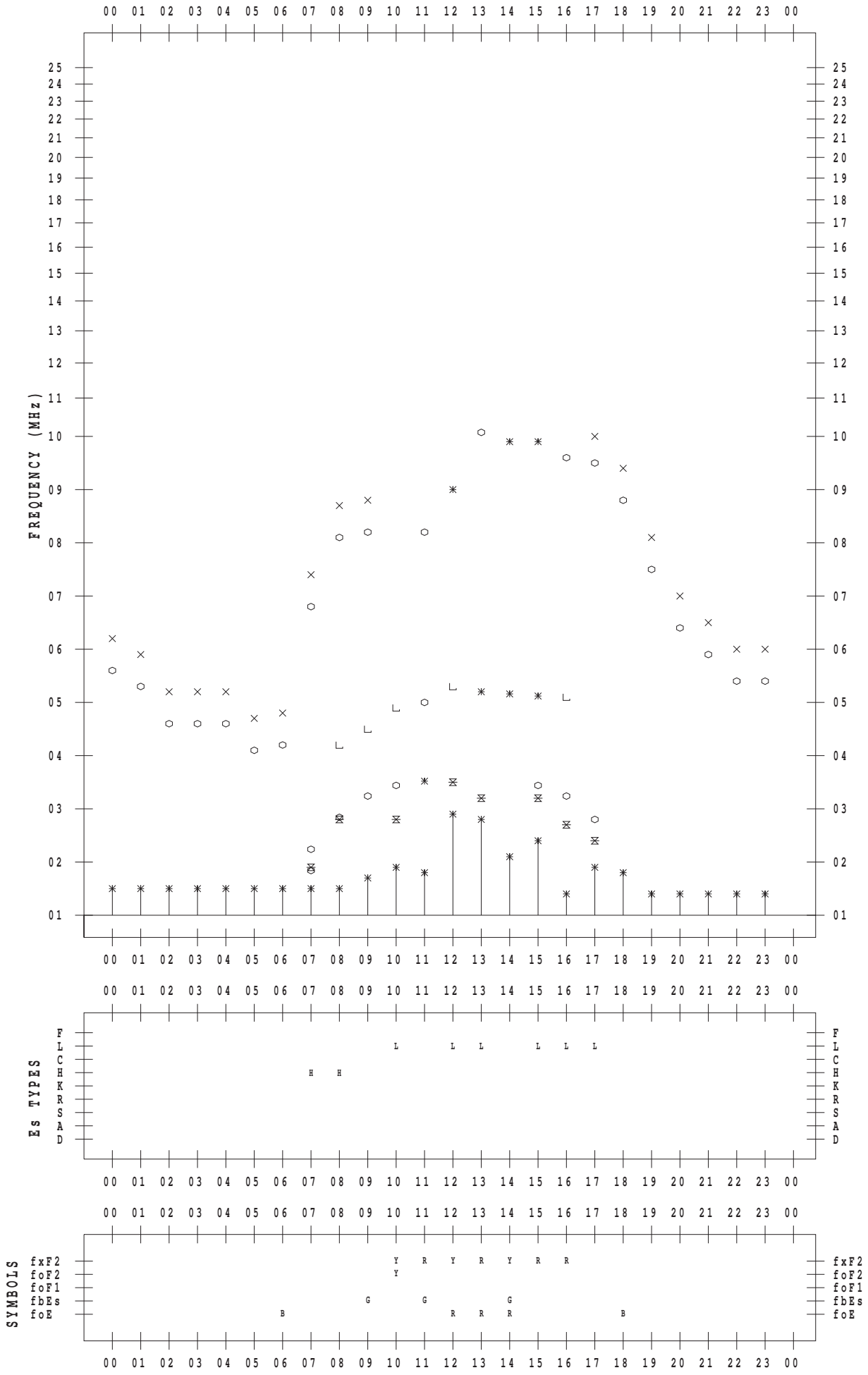
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/13

135 °E MEAN TIME



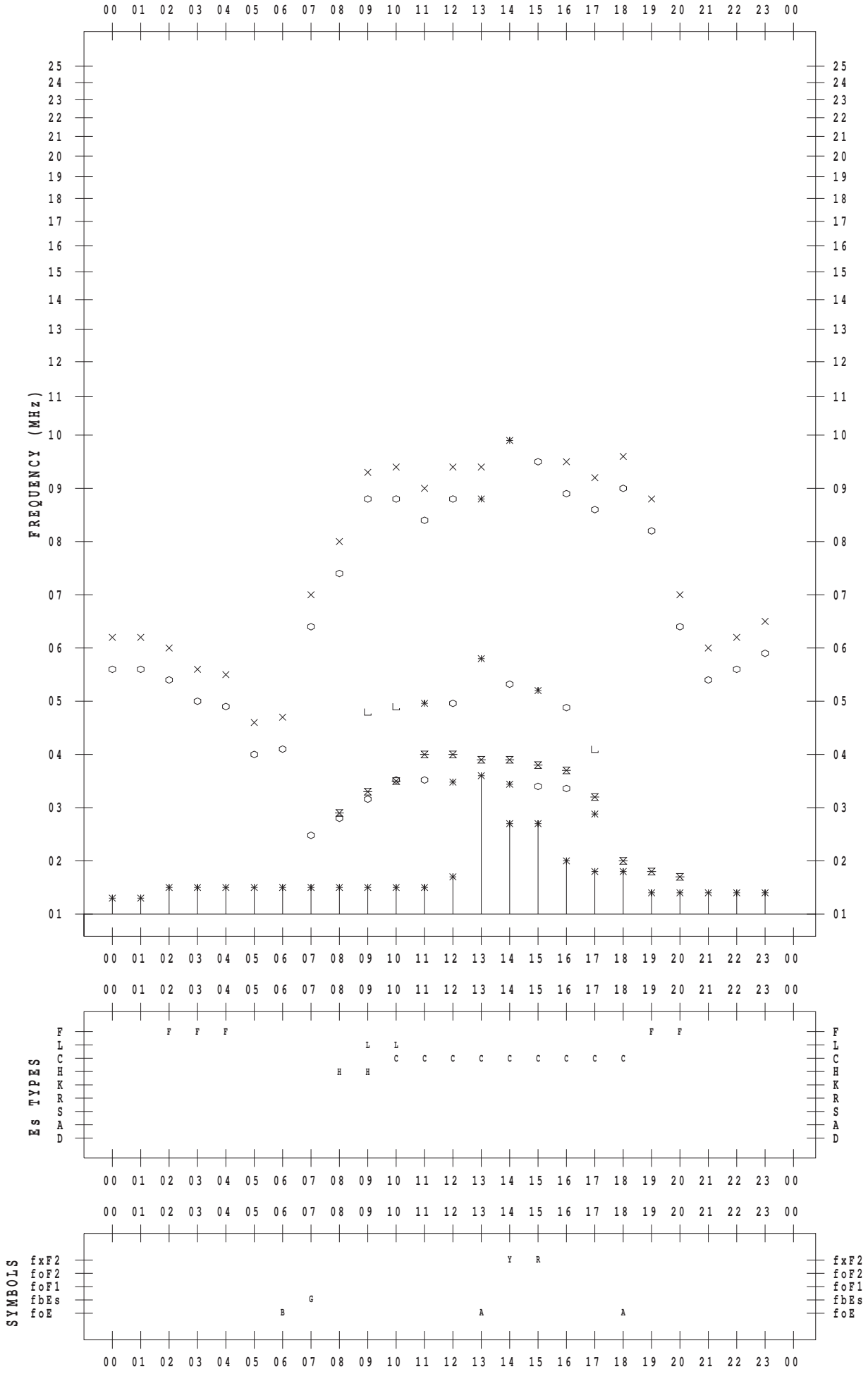
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/14

135 °E MEAN TIME



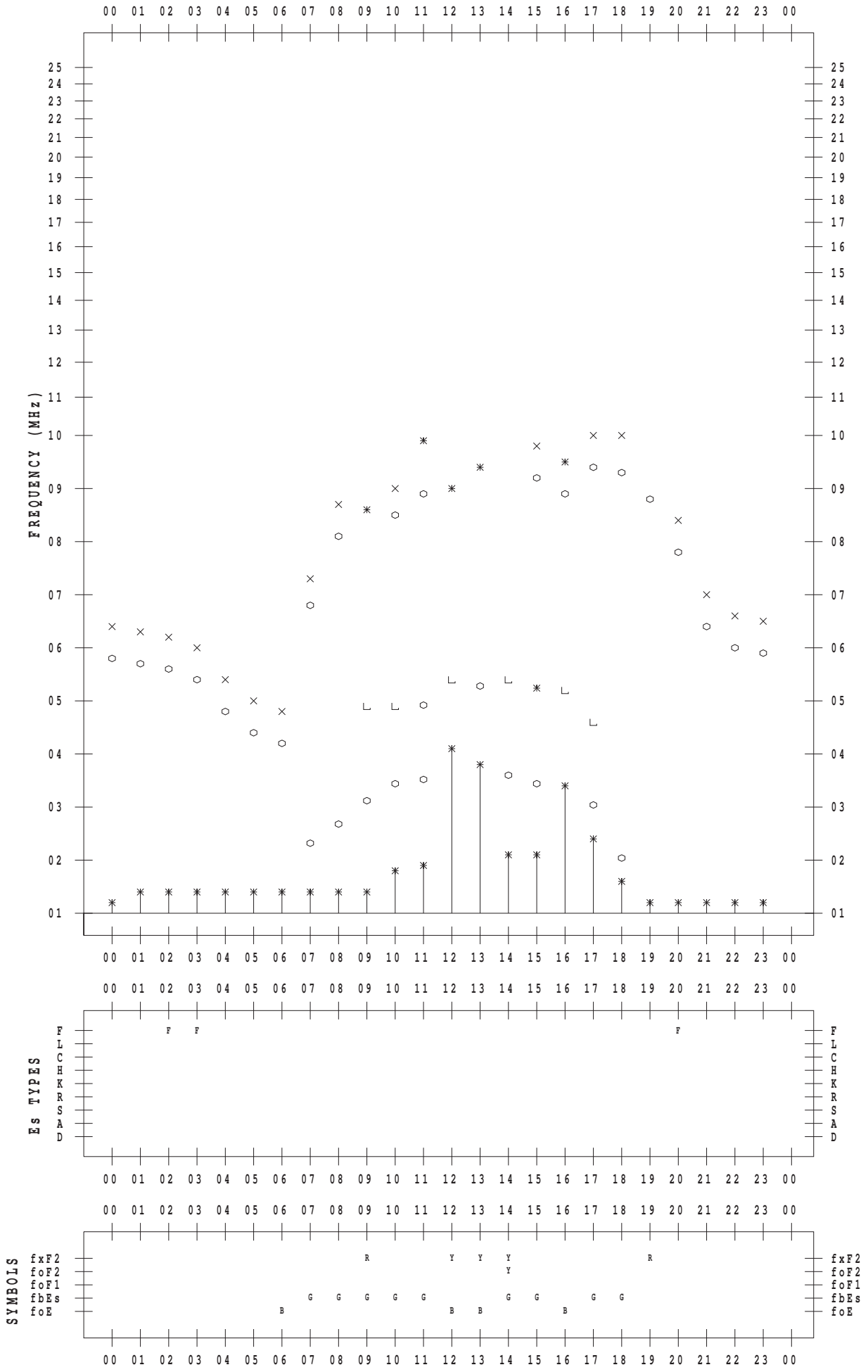
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/15

135 °E MEAN TIME



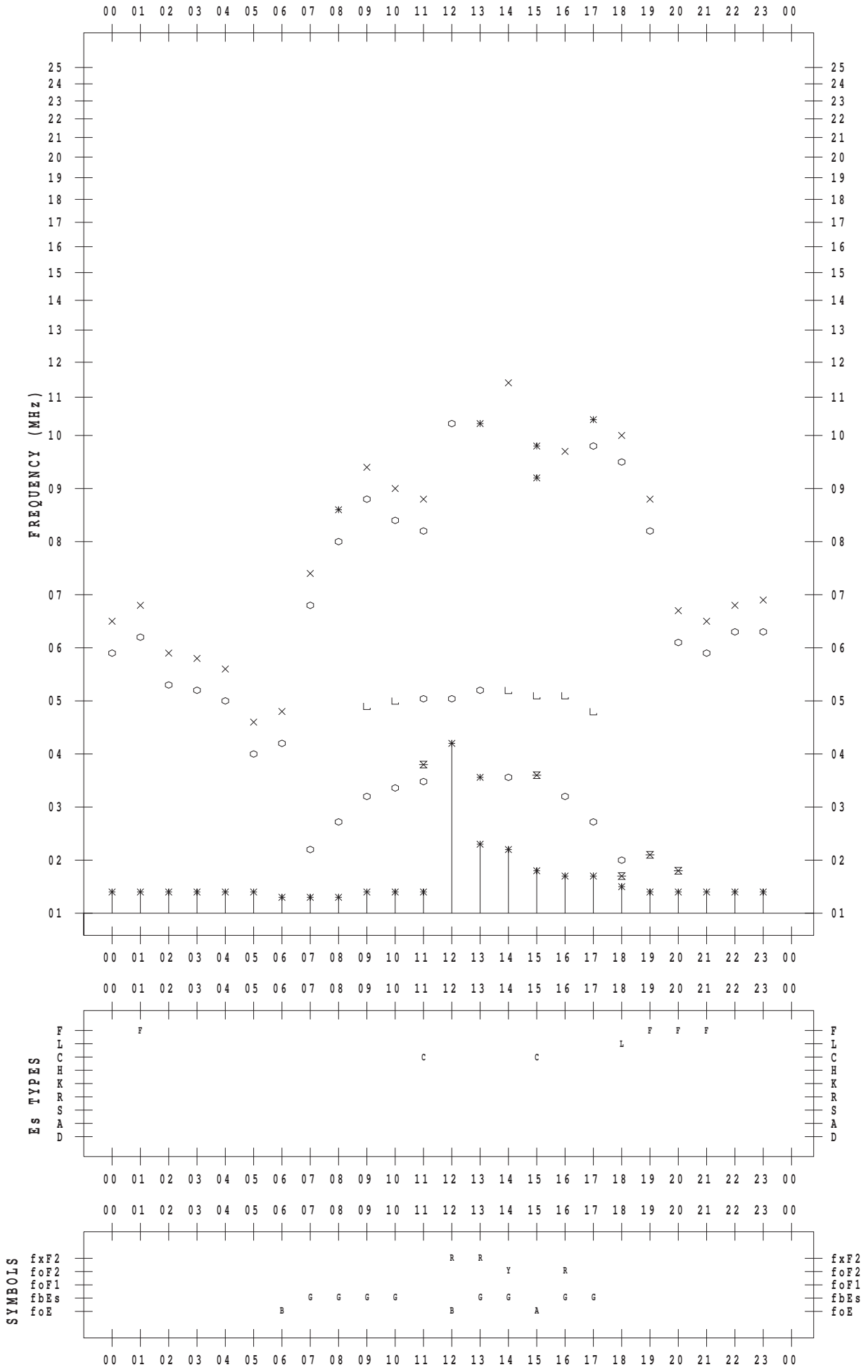
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/16

135 °E MEAN TIME



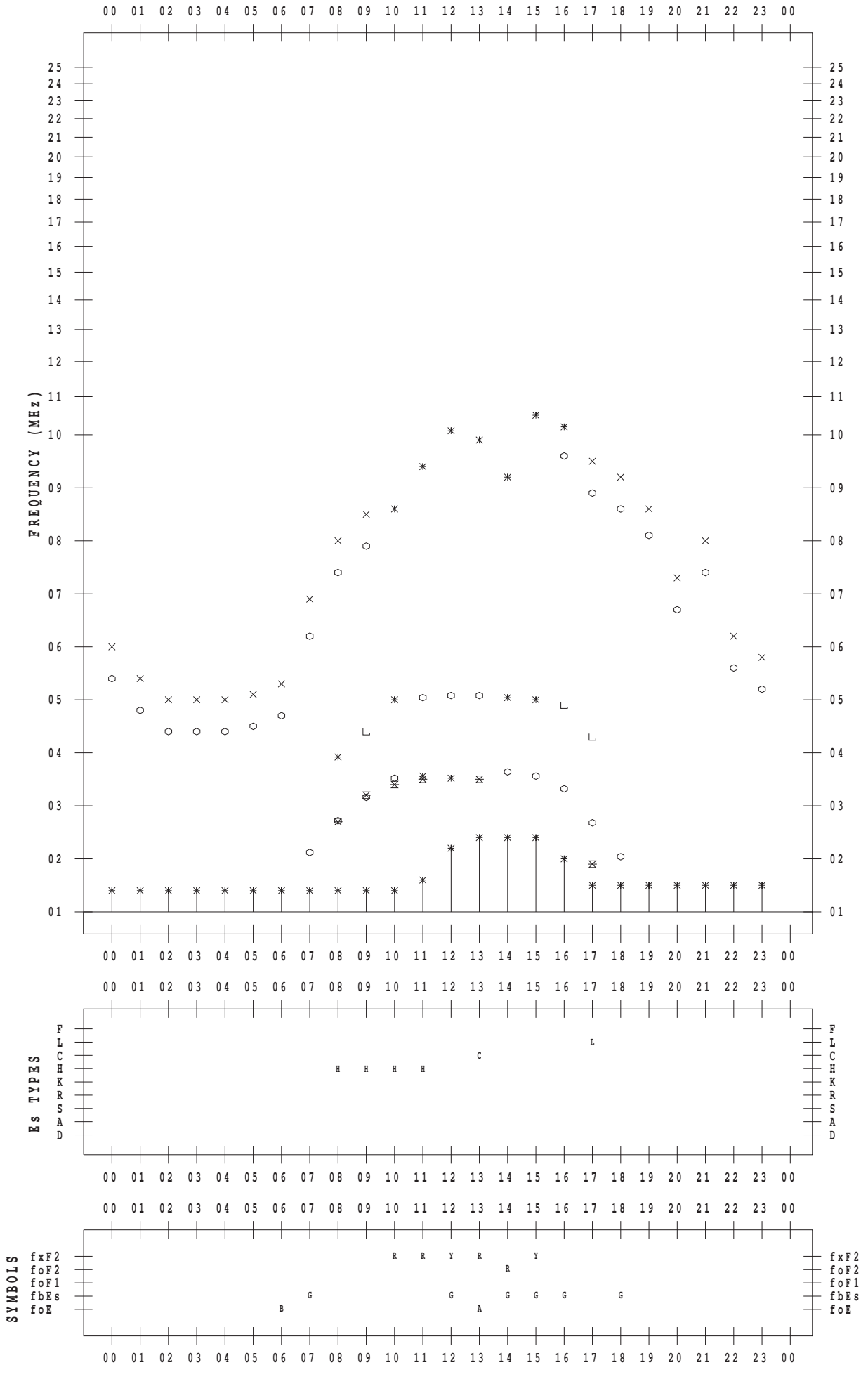
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/17

135 °E MEAN TIME



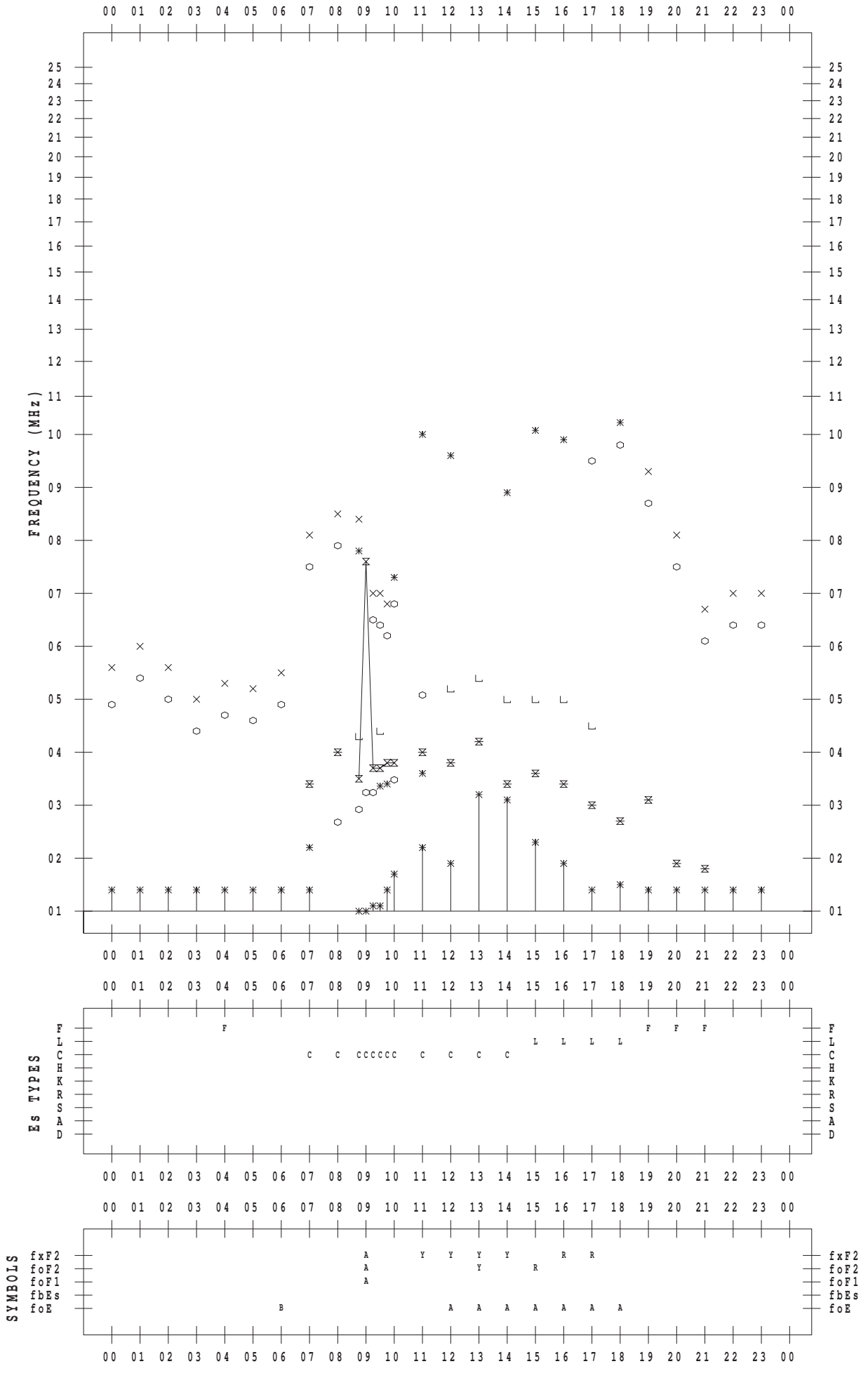
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/18

135 °E MEAN TIME



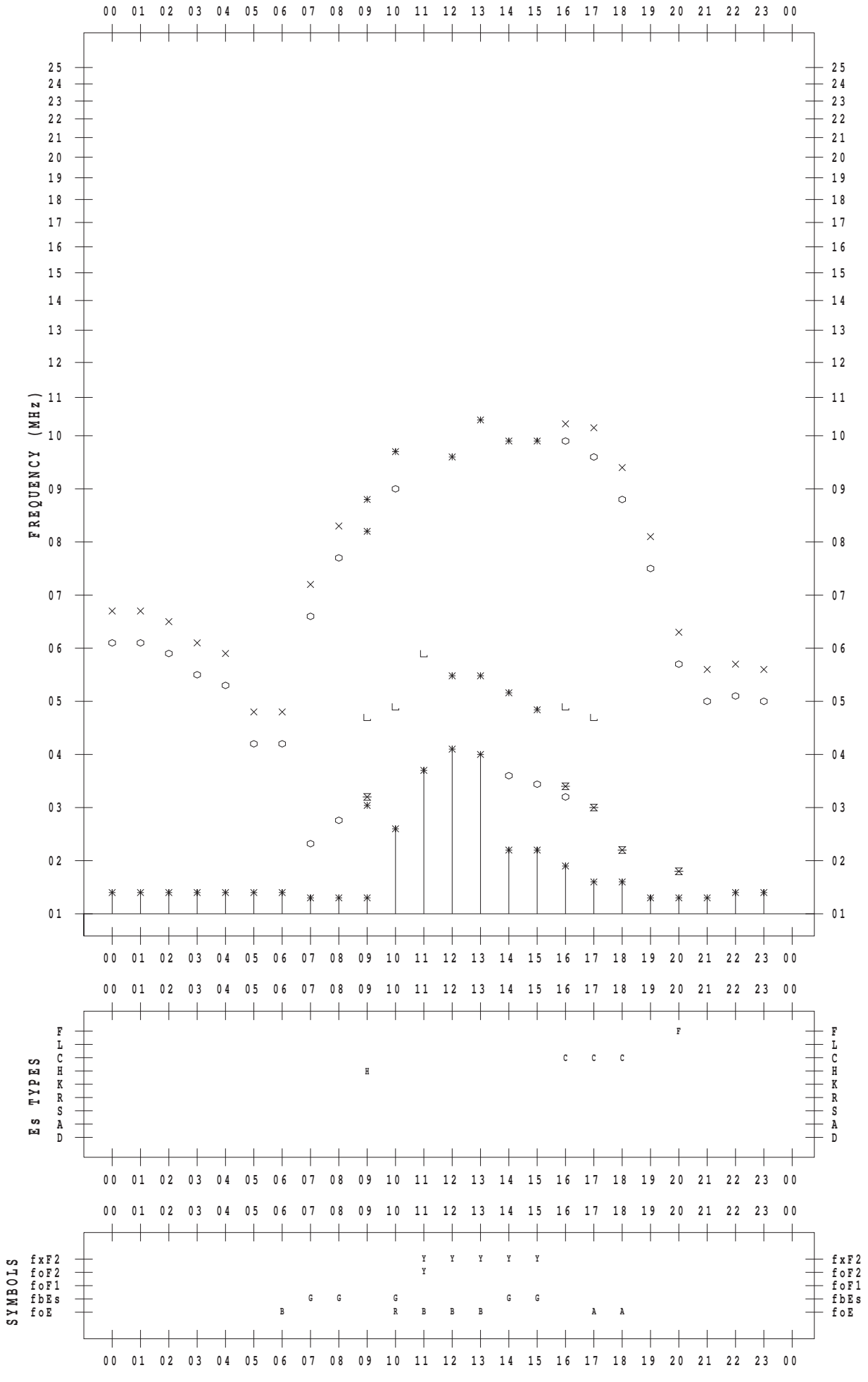
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/19

135 °E MEAN TIME



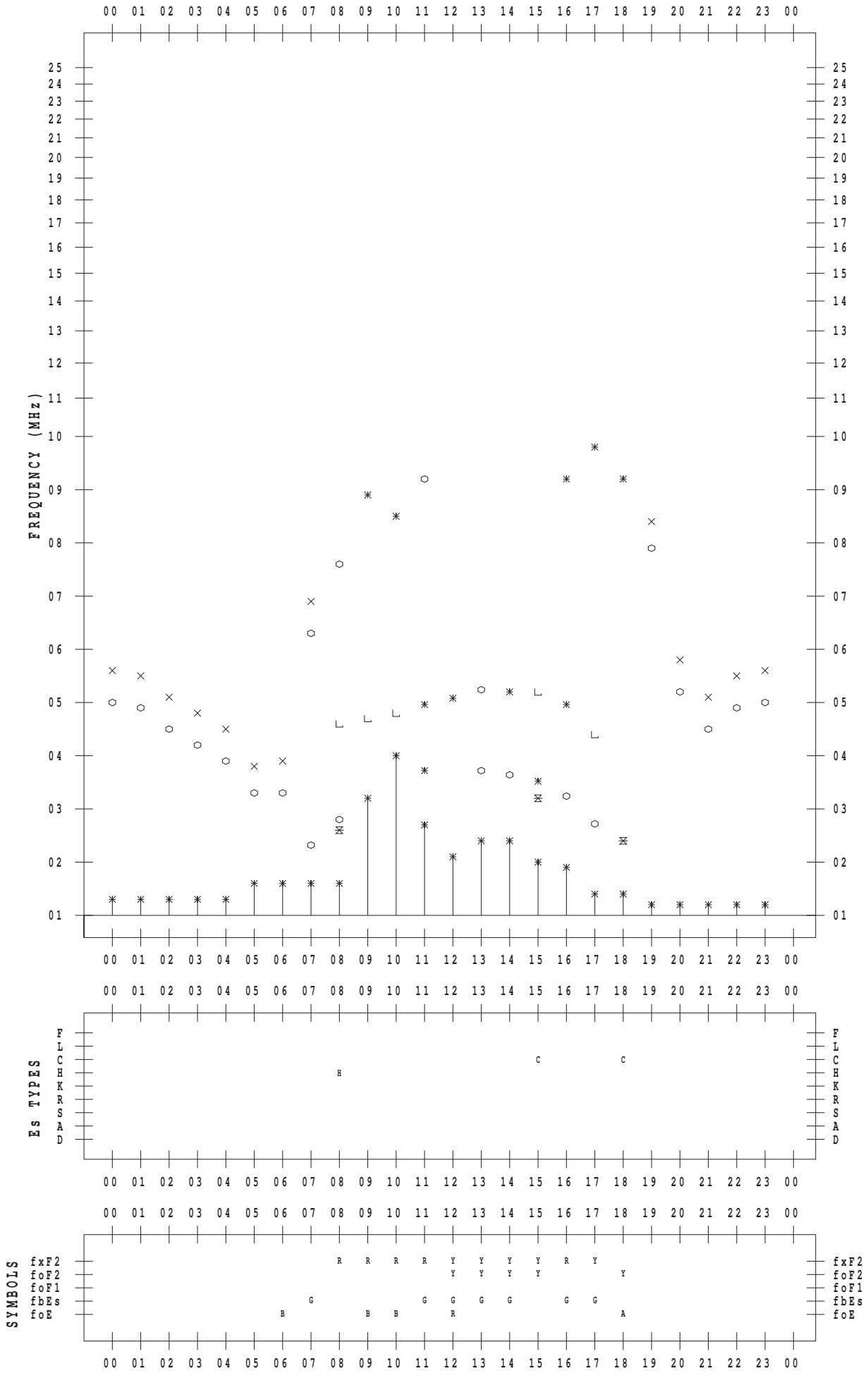
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/20

135 °E MEAN TIME



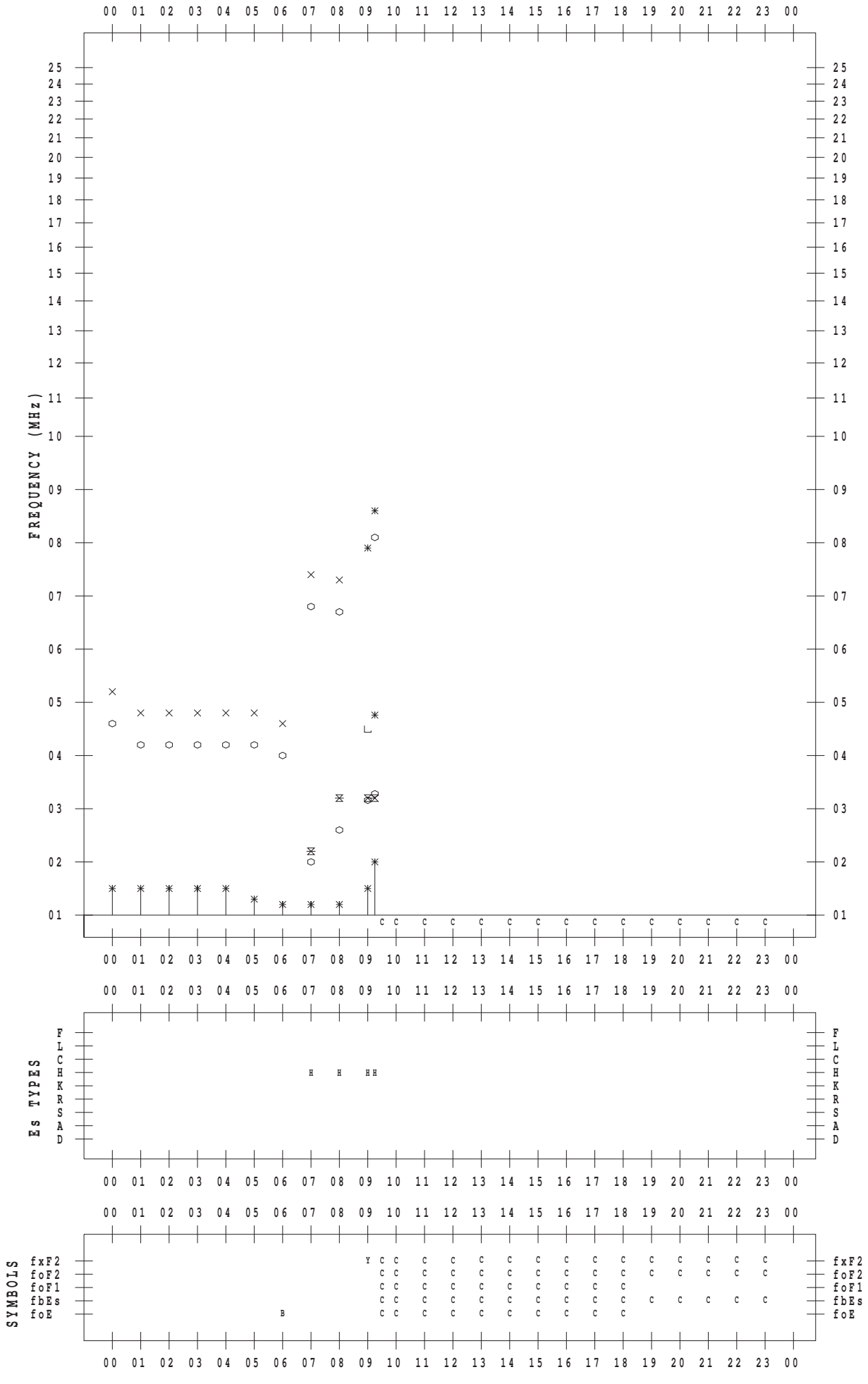
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/21

135 °E MEAN TIME



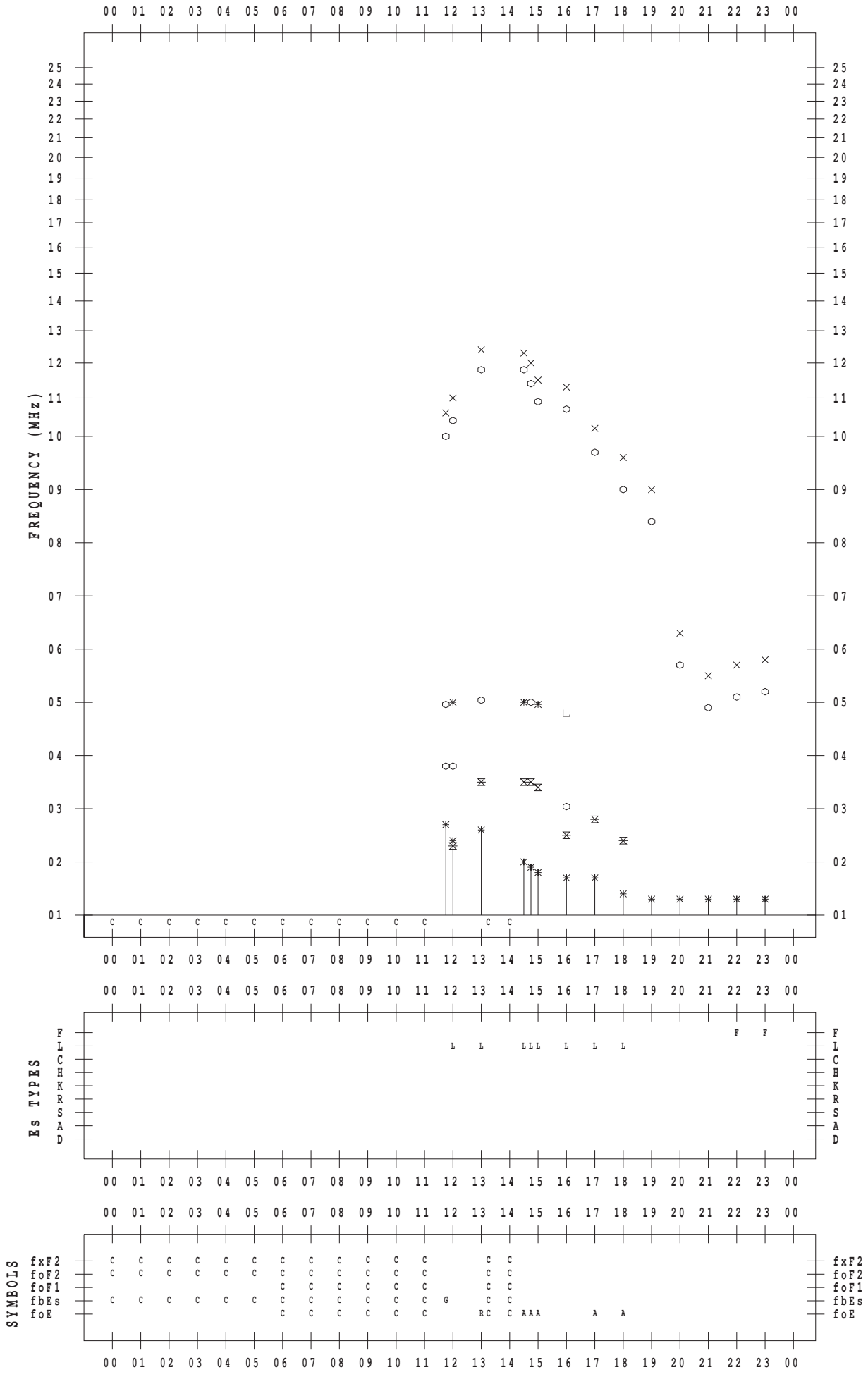
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/22

135 °E MEAN TIME



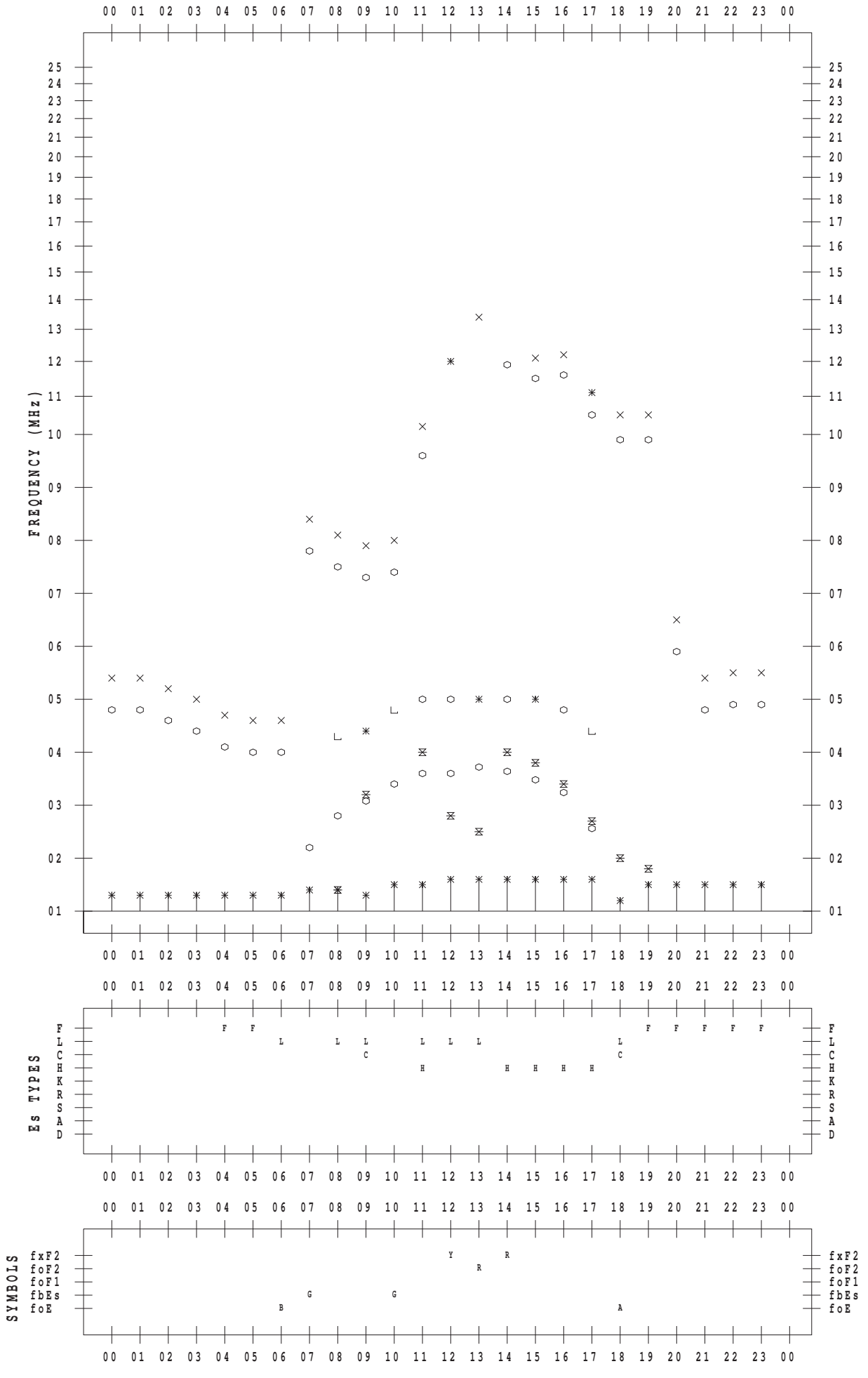
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/23

135 °E MEAN TIME



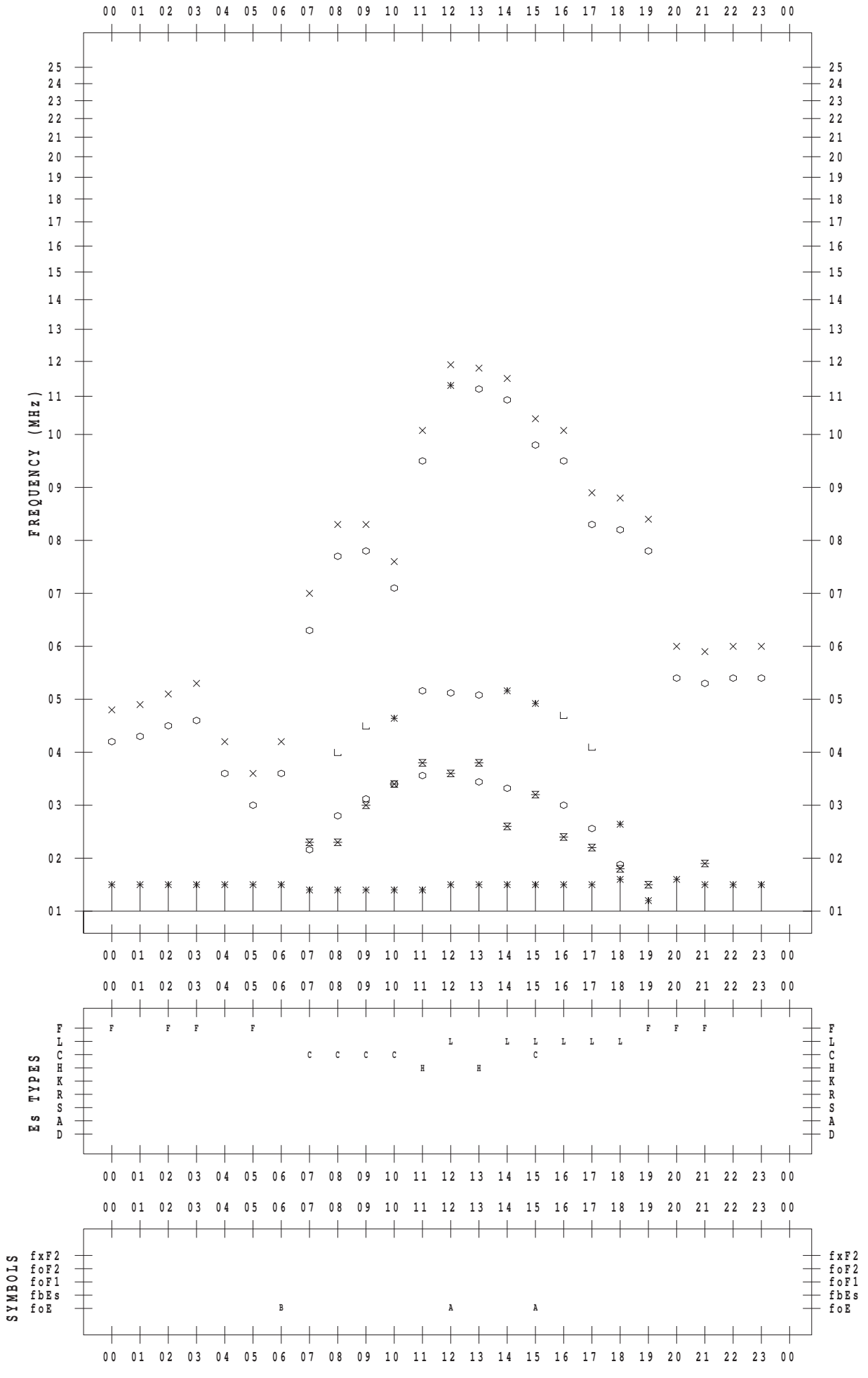
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/24

135 °E MEAN TIME



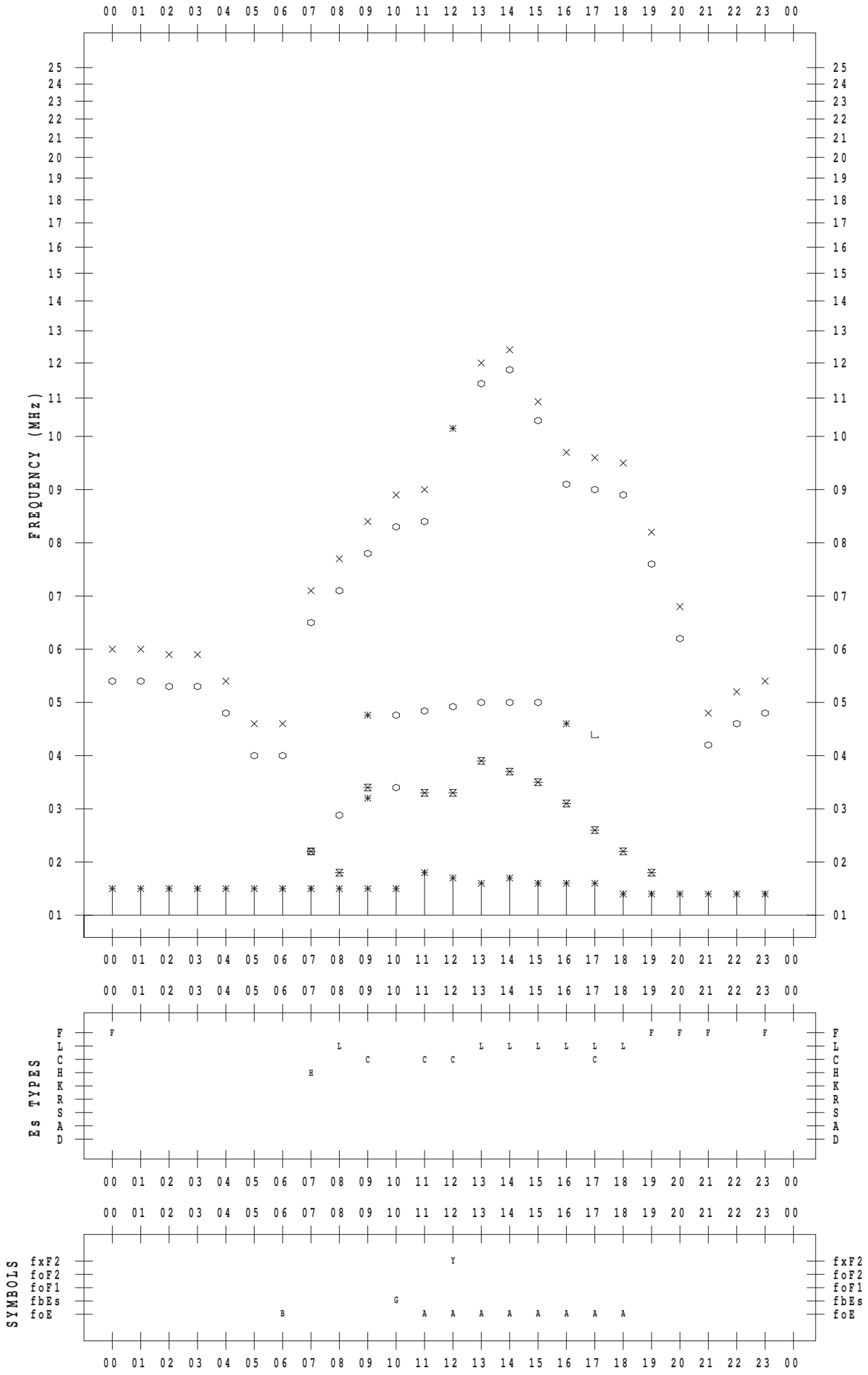
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/25

135 °E MEAN TIME



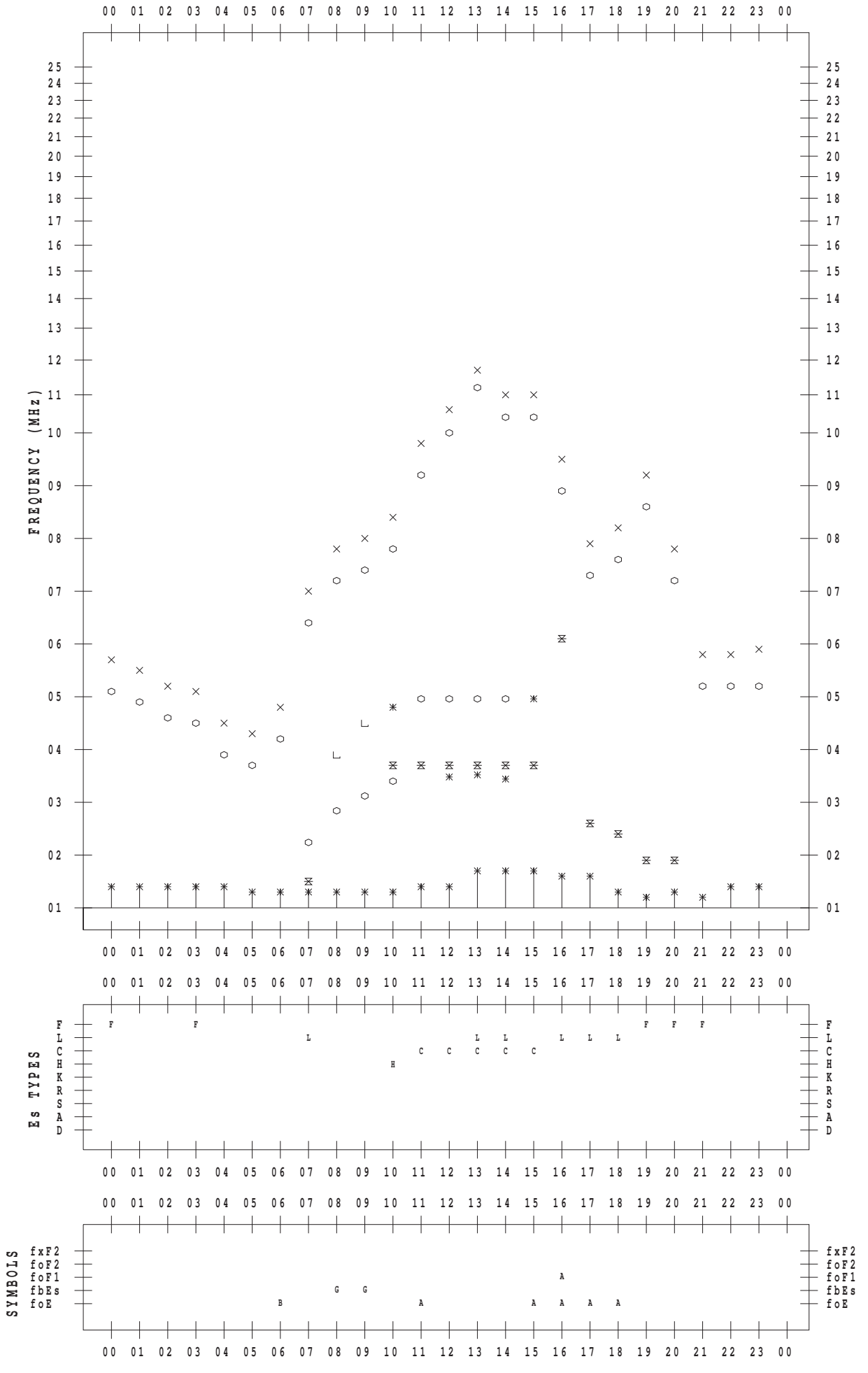
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/26

135 °E MEAN TIME



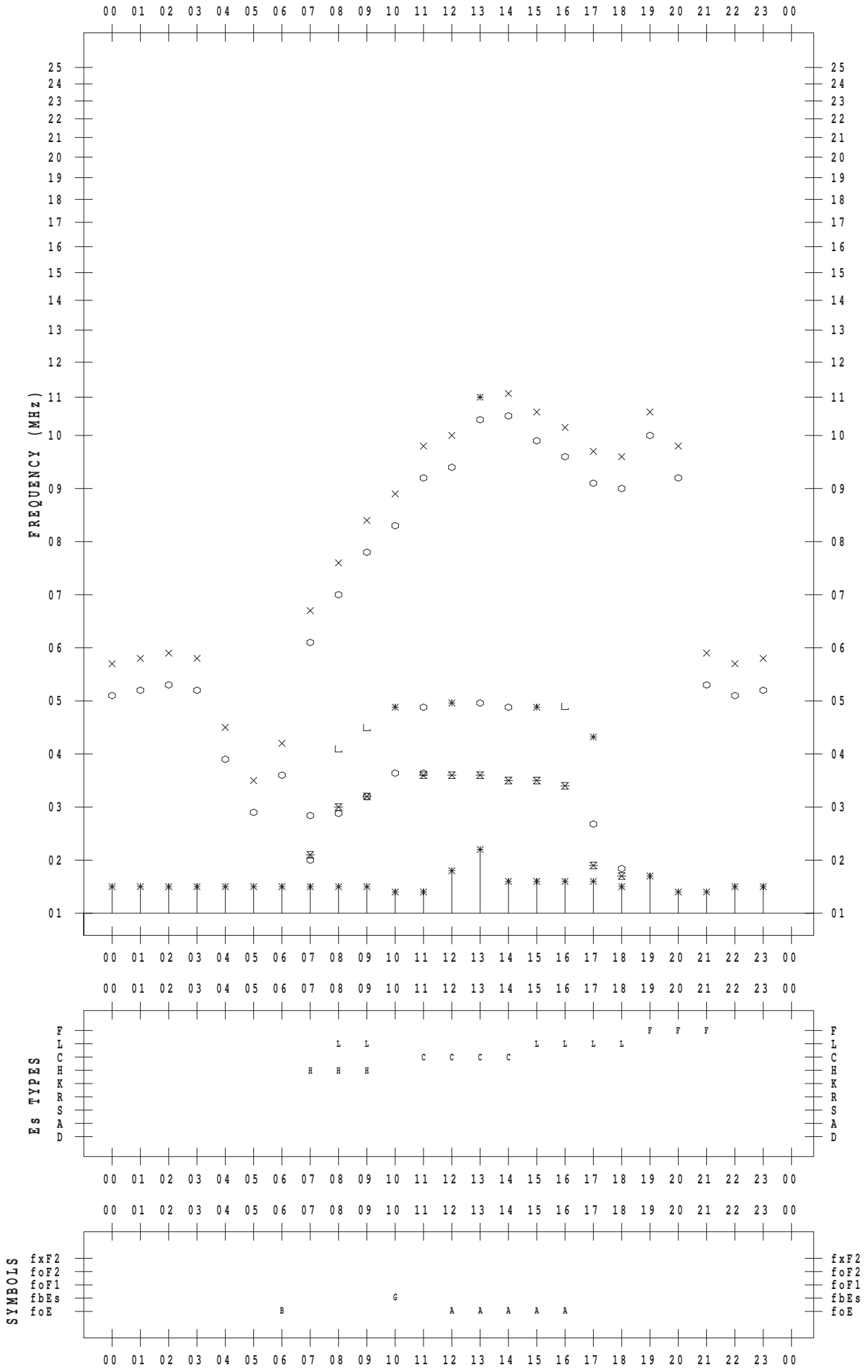
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/27

135 °E MEAN TIME



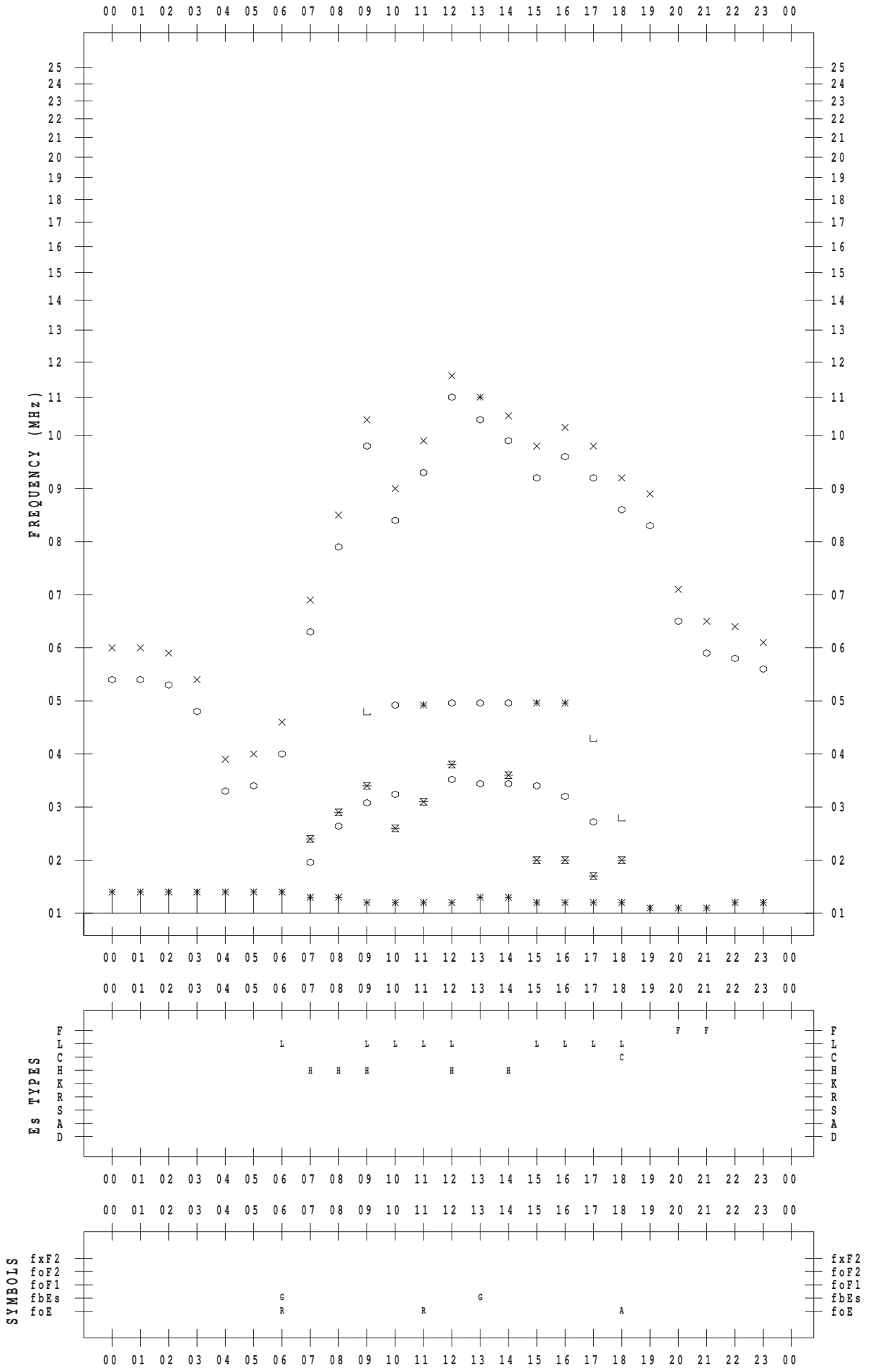
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/28

135 °E MEAN TIME



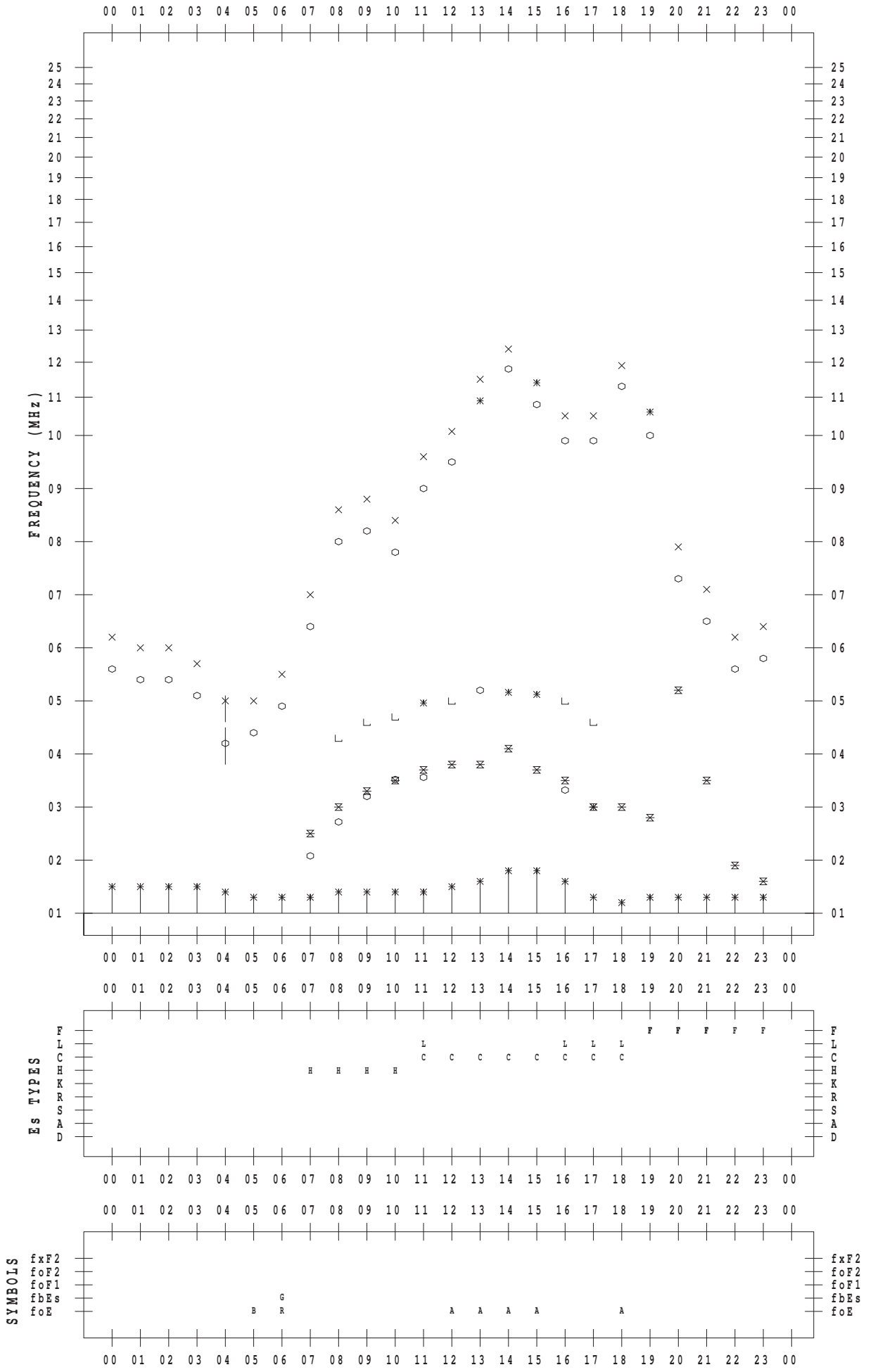
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/29

135 °E MEAN TIME



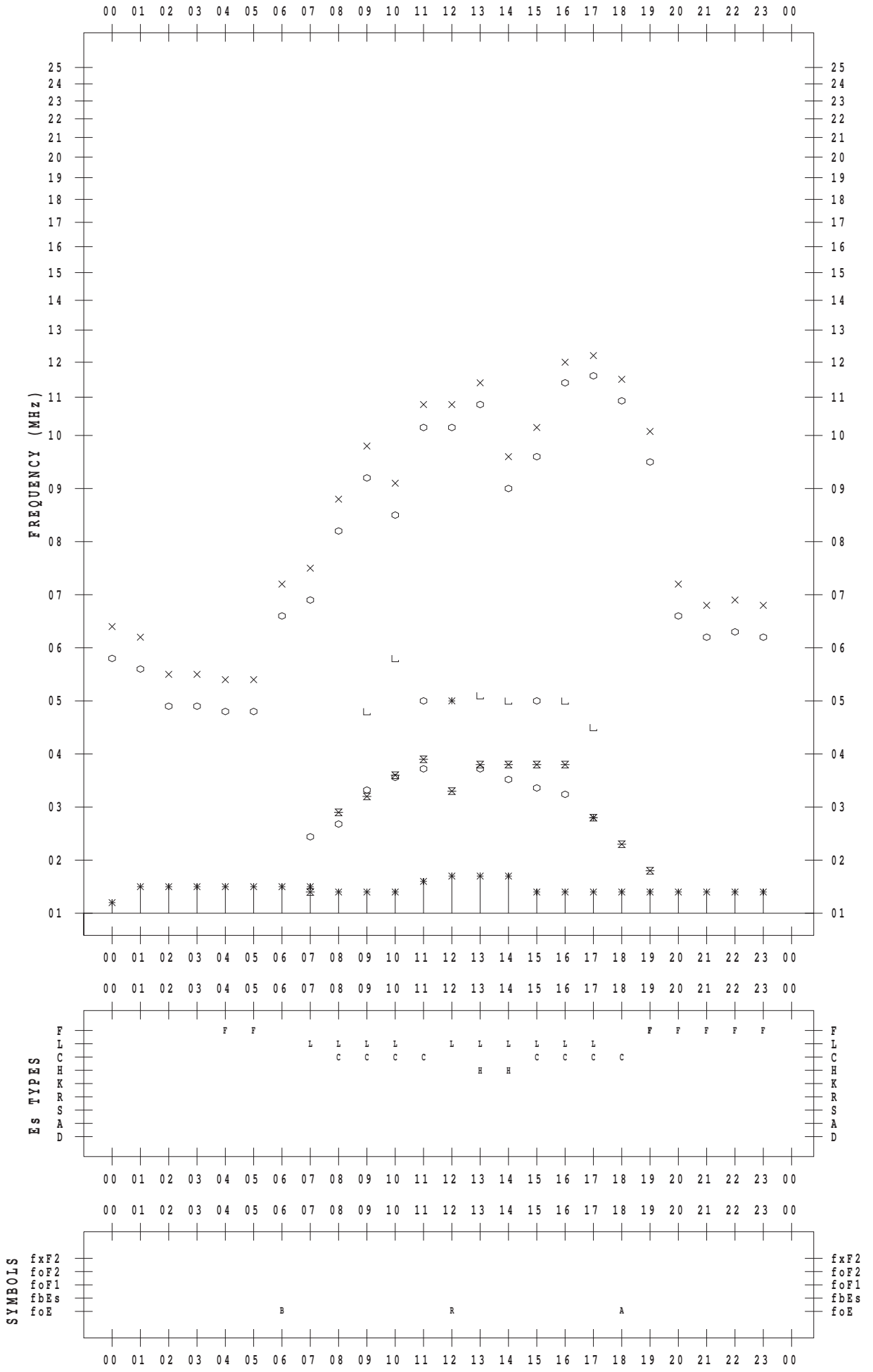
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/30

135 °E MEAN TIME



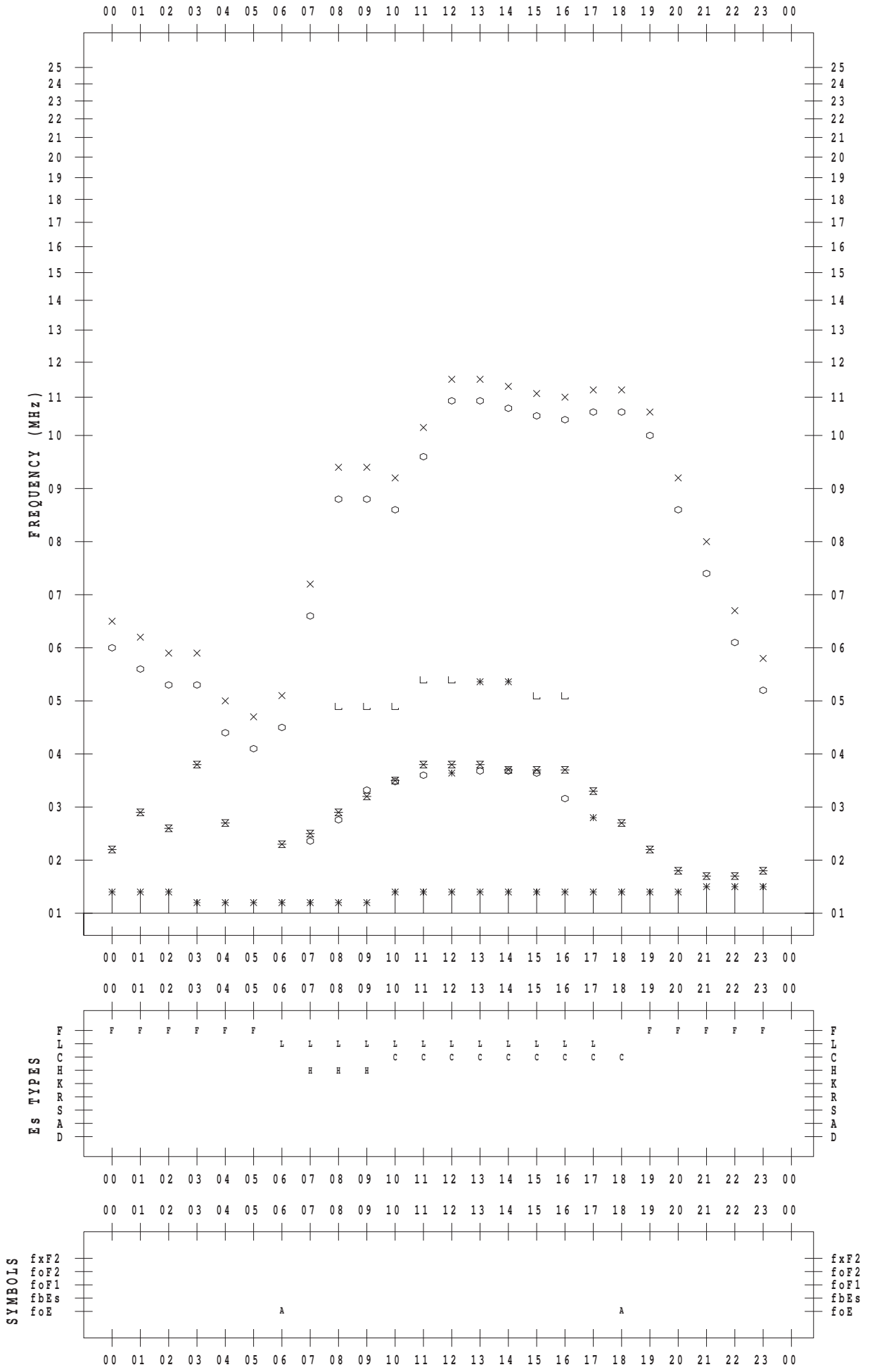
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 3/31

135 °E MEAN TIME



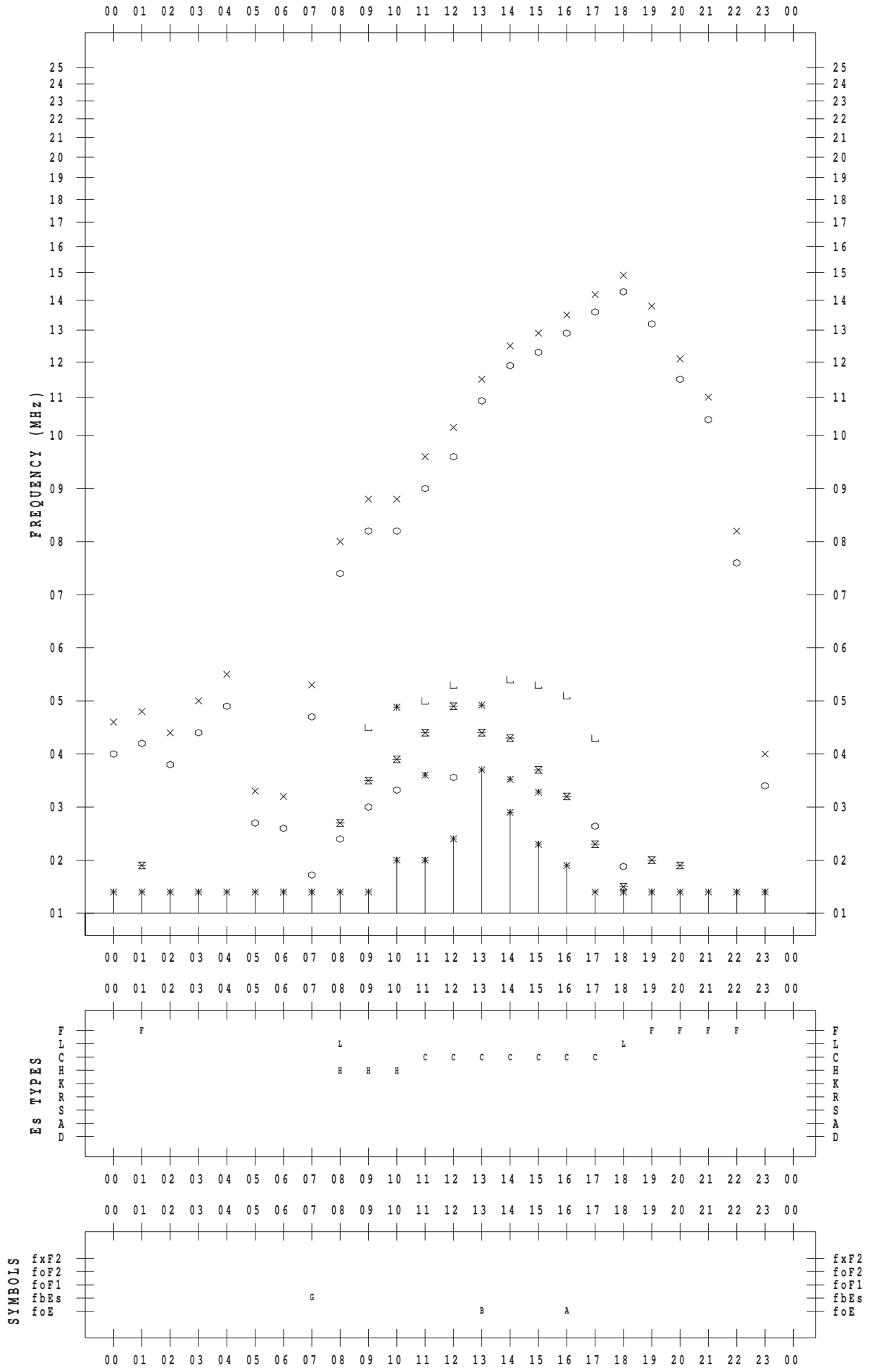
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 1

135 °E MEAN TIME



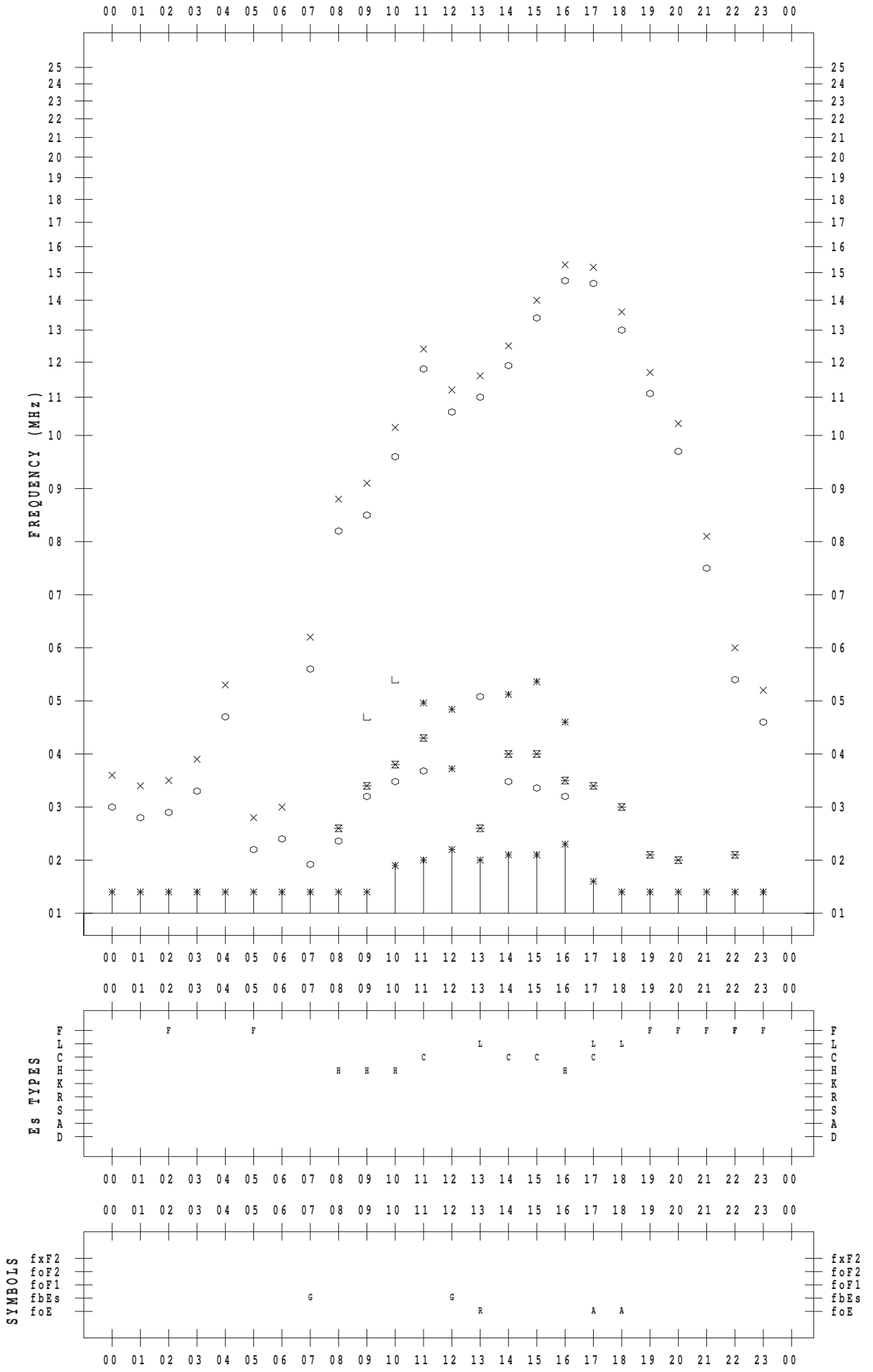
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 2

135 °E MEAN TIME



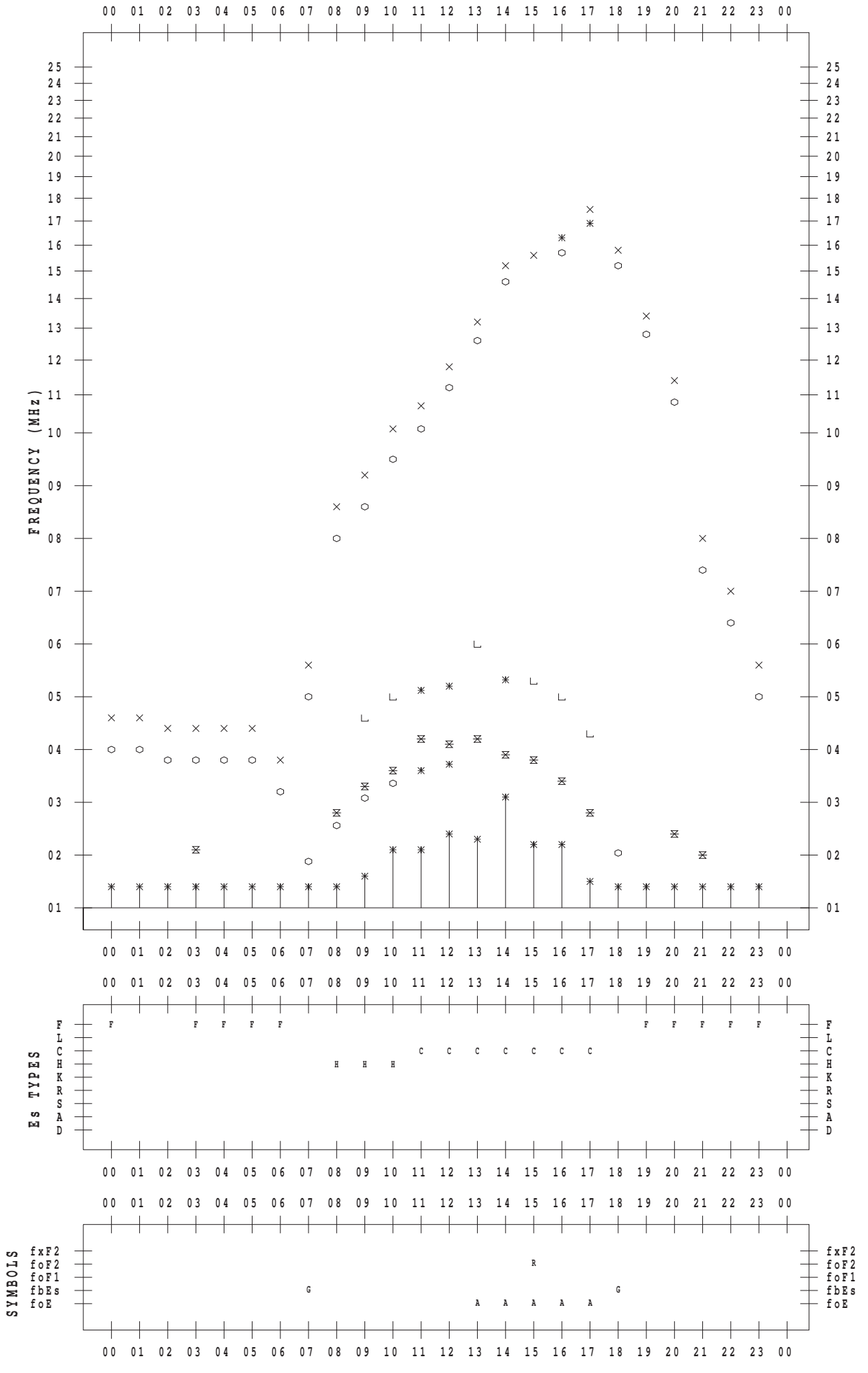
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 3

135 °E MEAN TIME



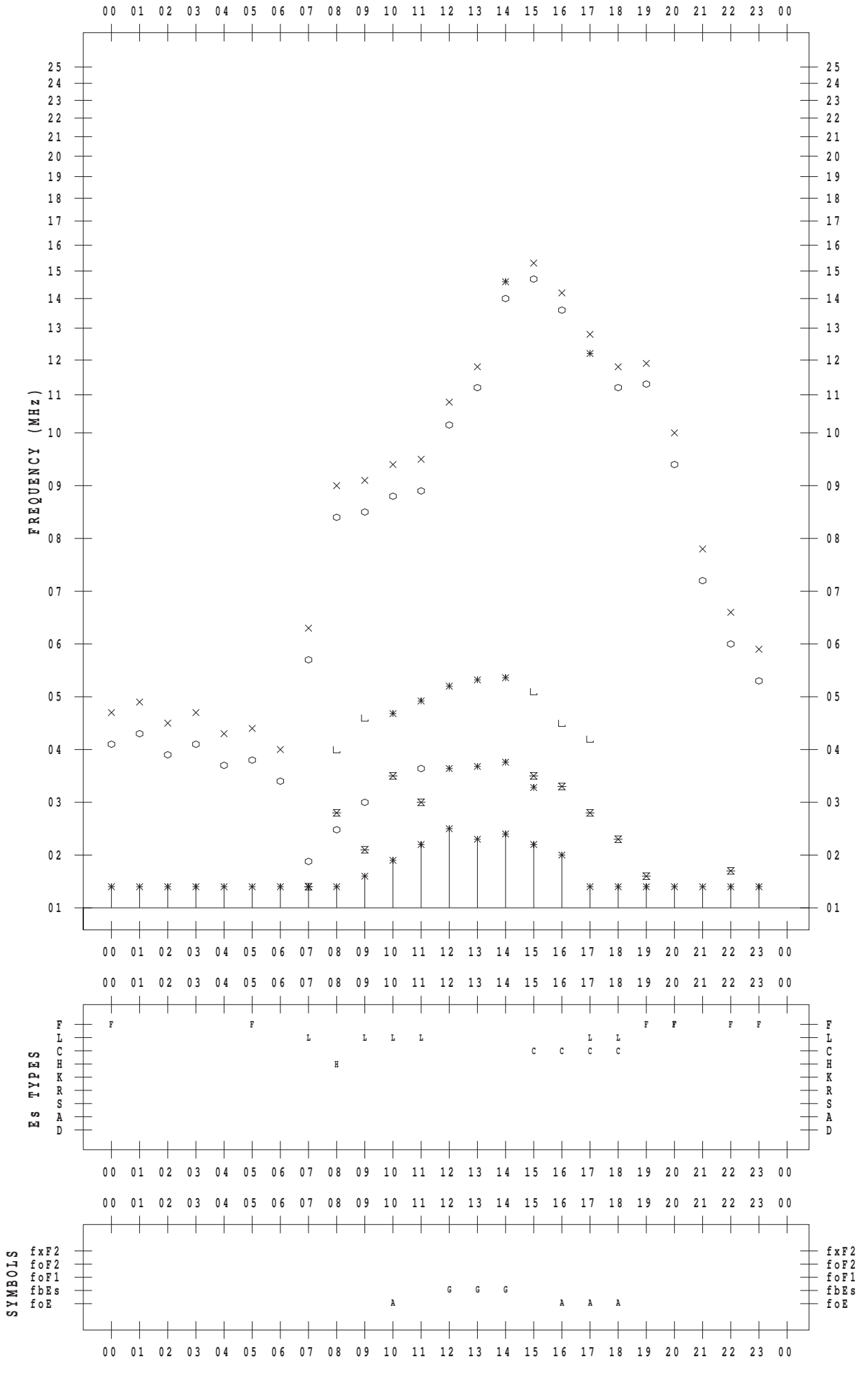
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 4

135 °E MEAN TIME



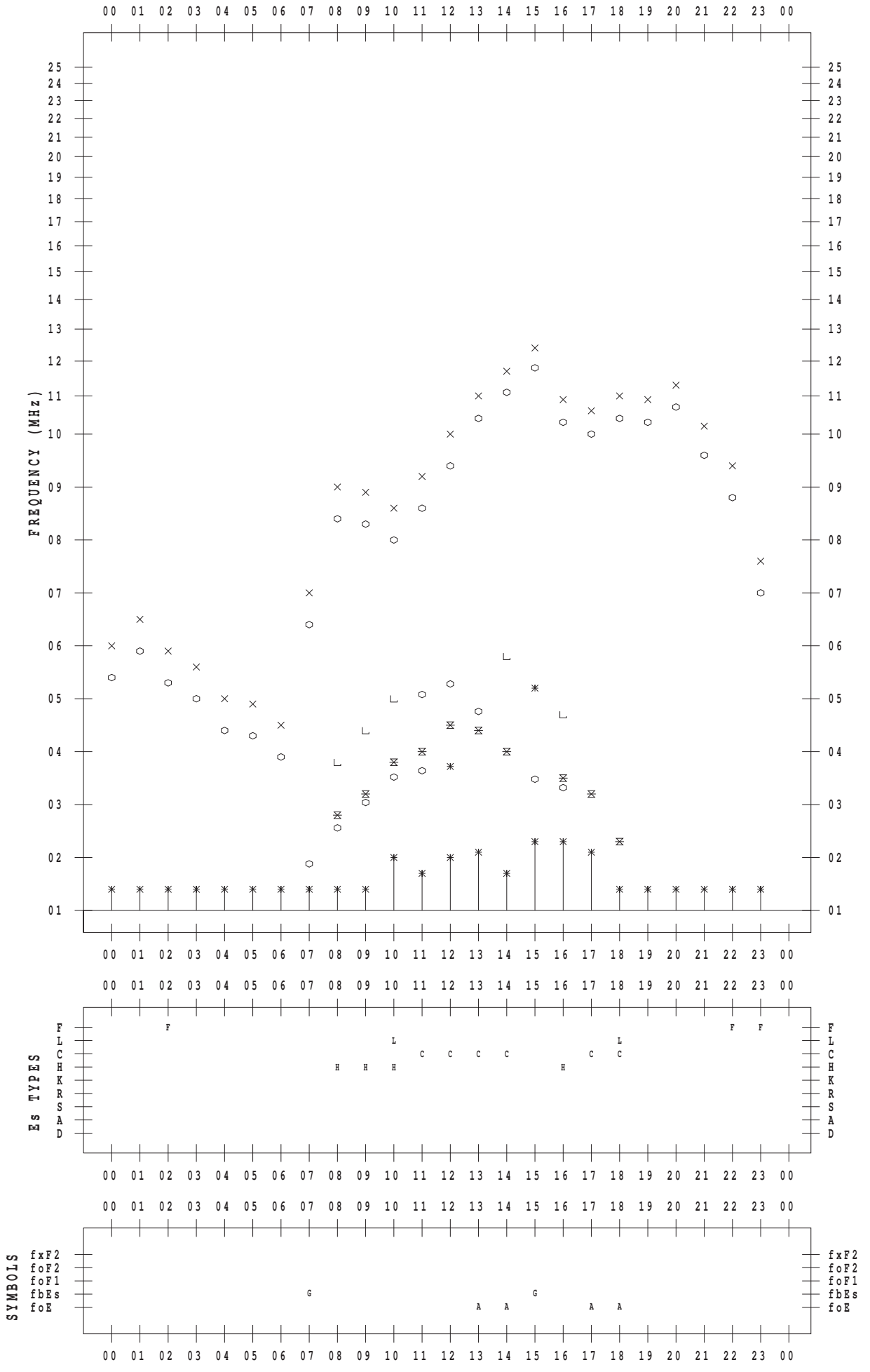
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 5

135 °E MEAN TIME



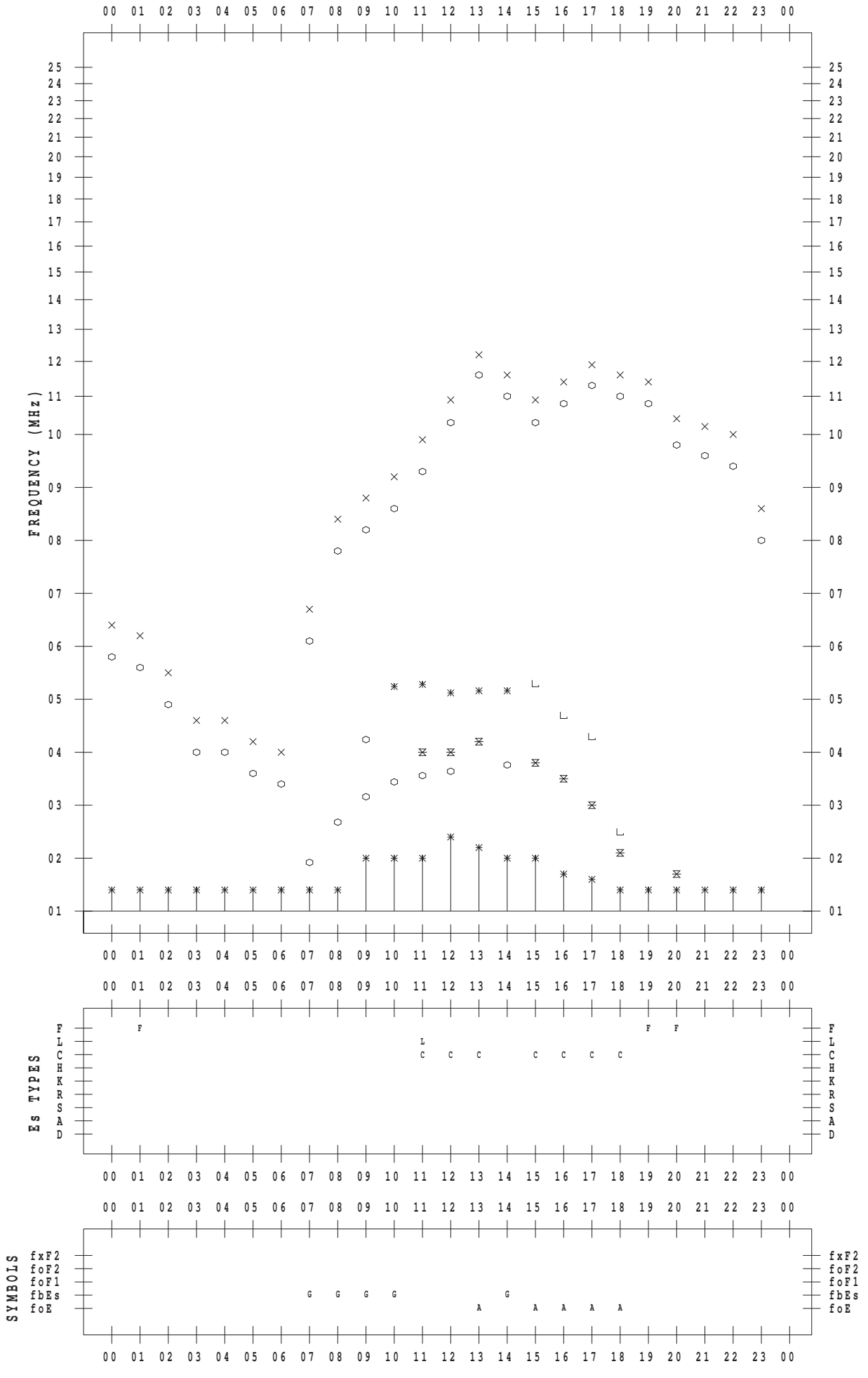
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 6

135 °E MEAN TIME



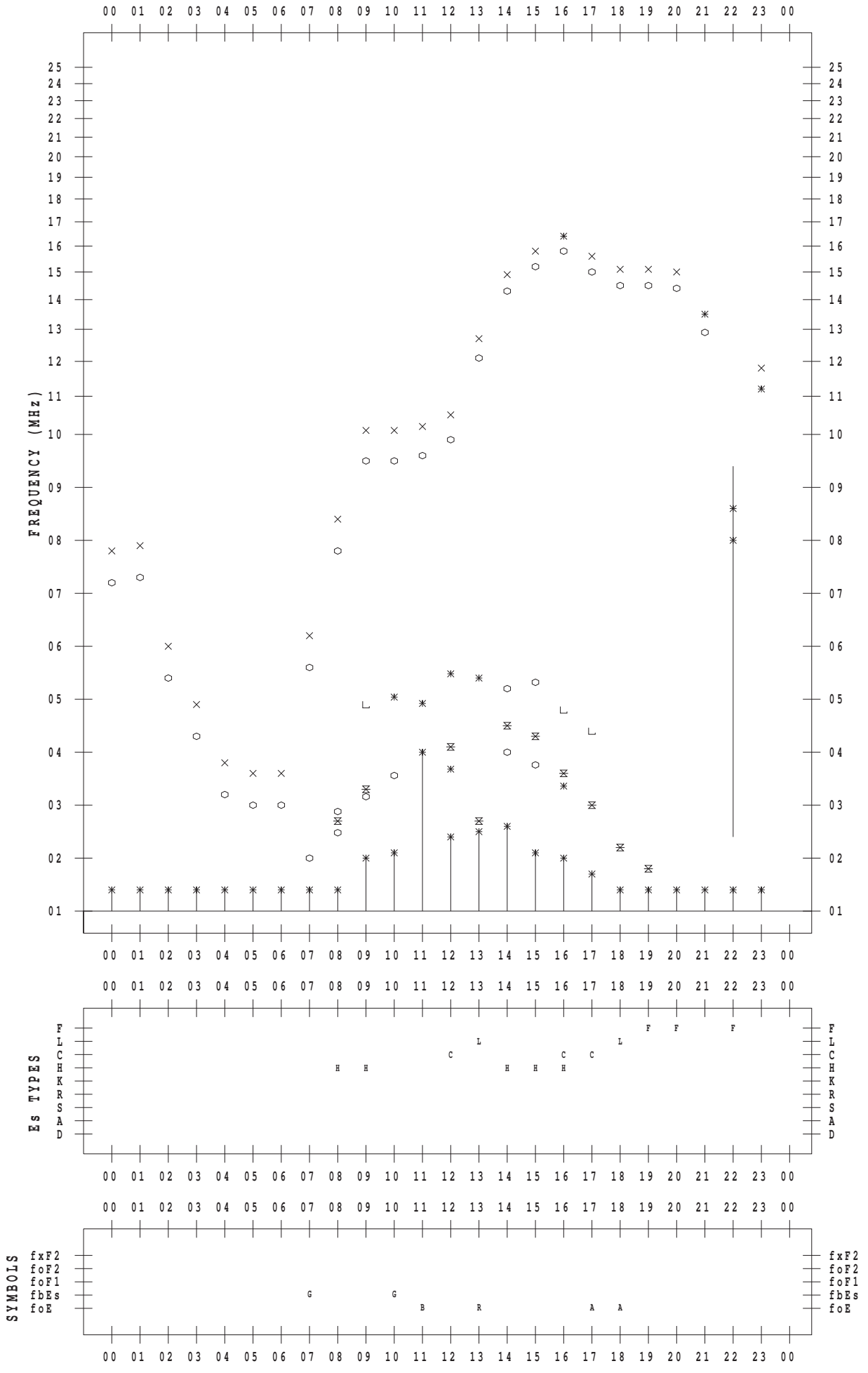
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 7

135 °E MEAN TIME



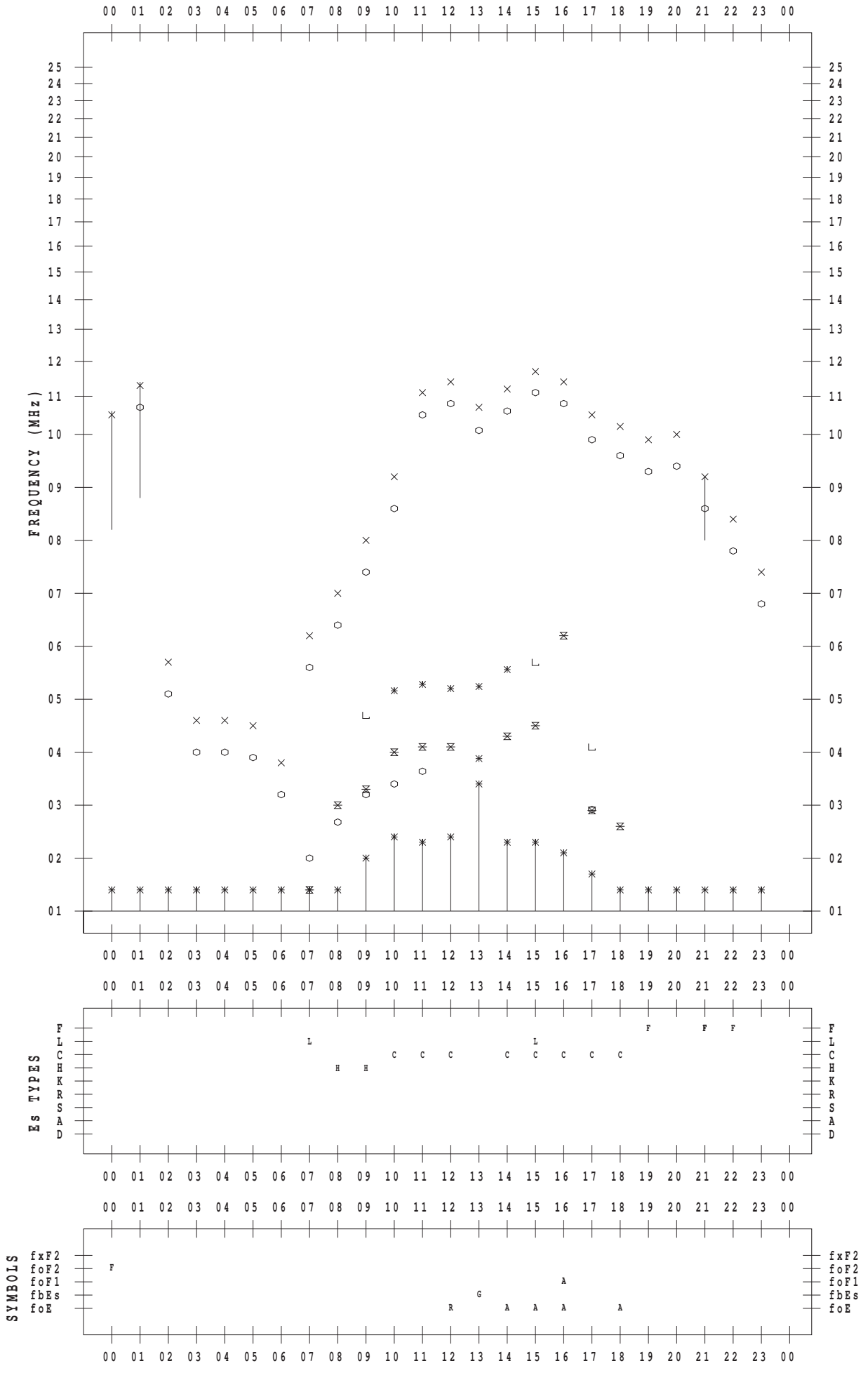
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 8

135 °E MEAN TIME



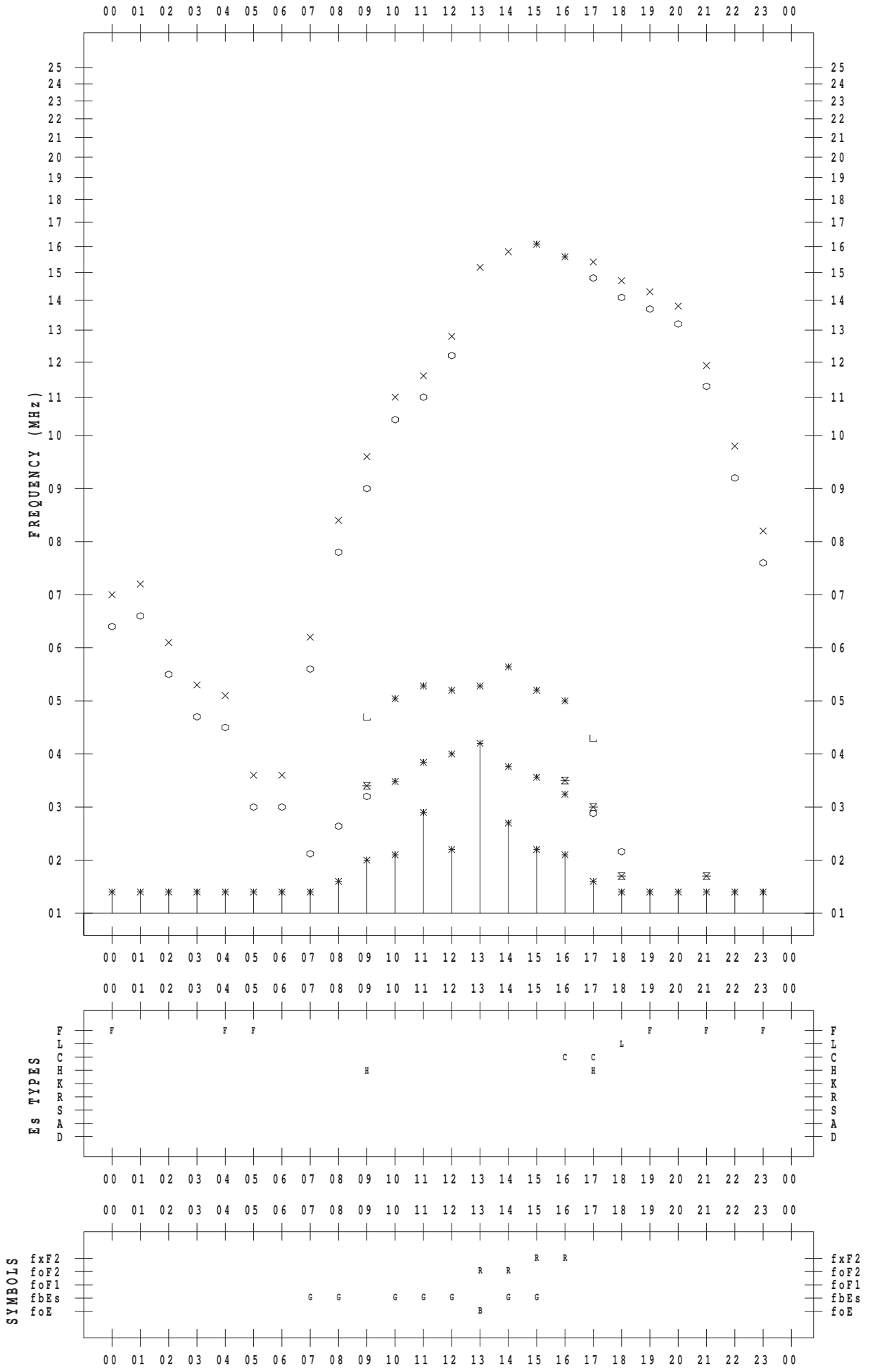
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/ 9

135 °E MEAN TIME



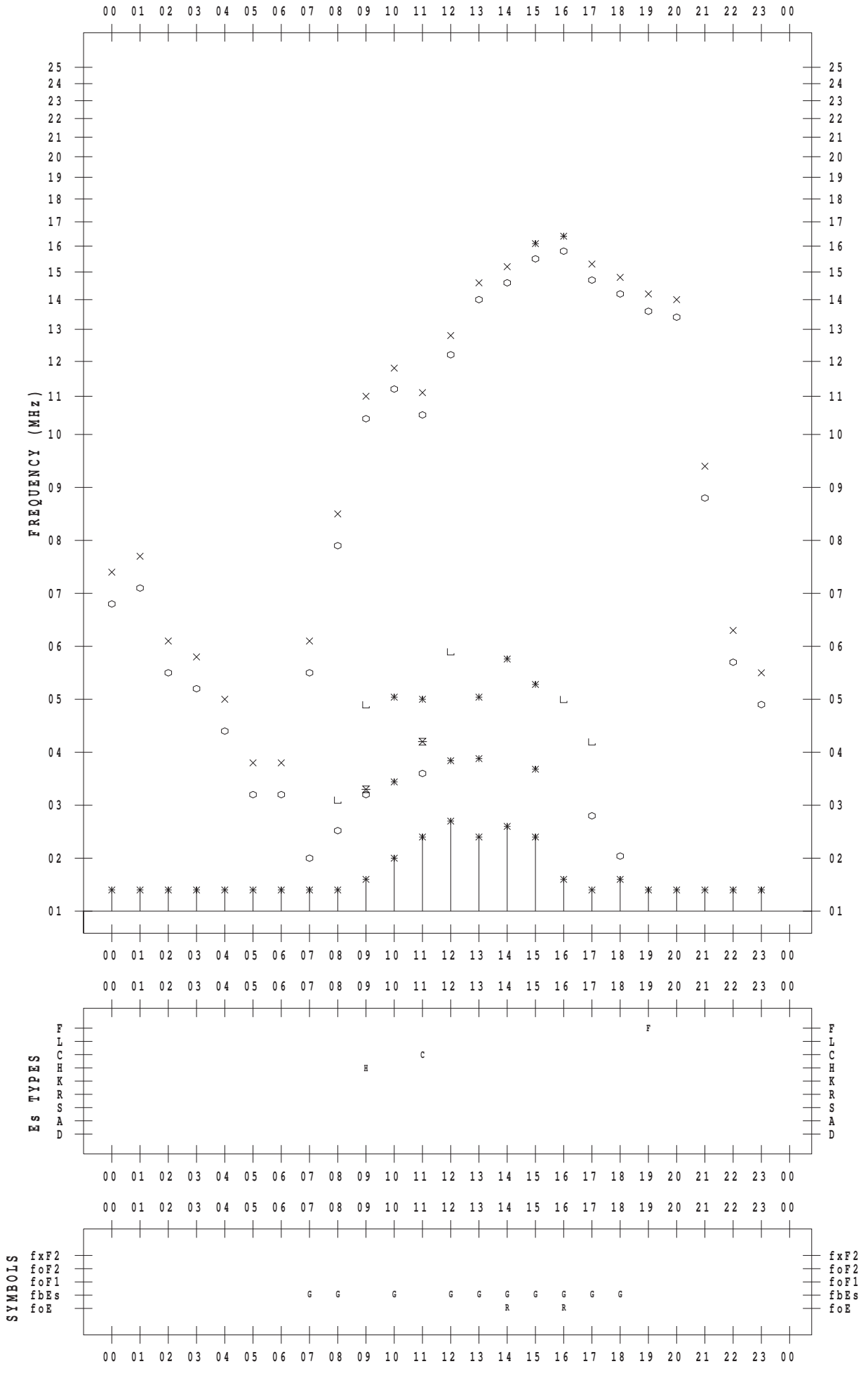
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/10

135 °E MEAN TIME



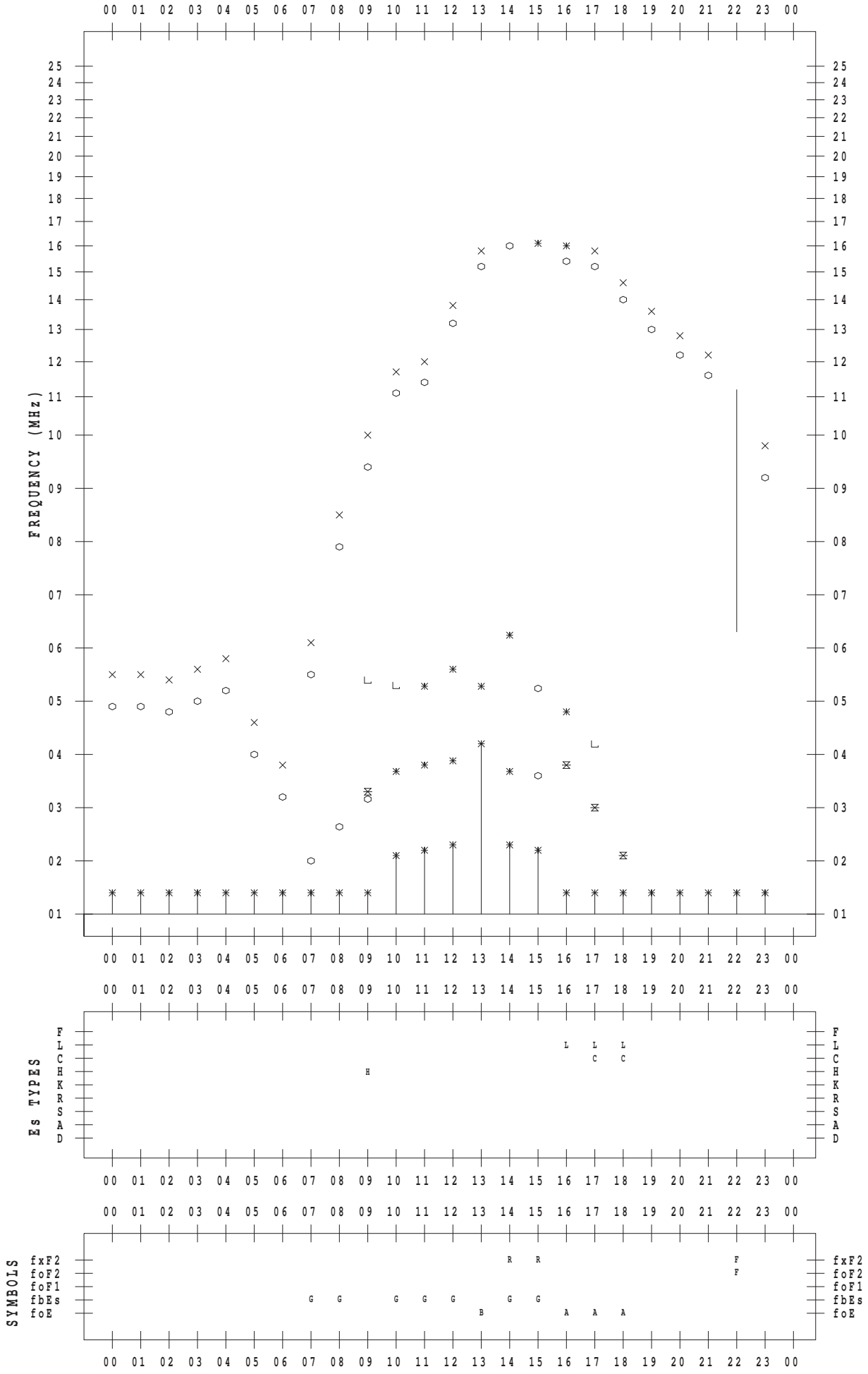
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/11

135 °E MEAN TIME



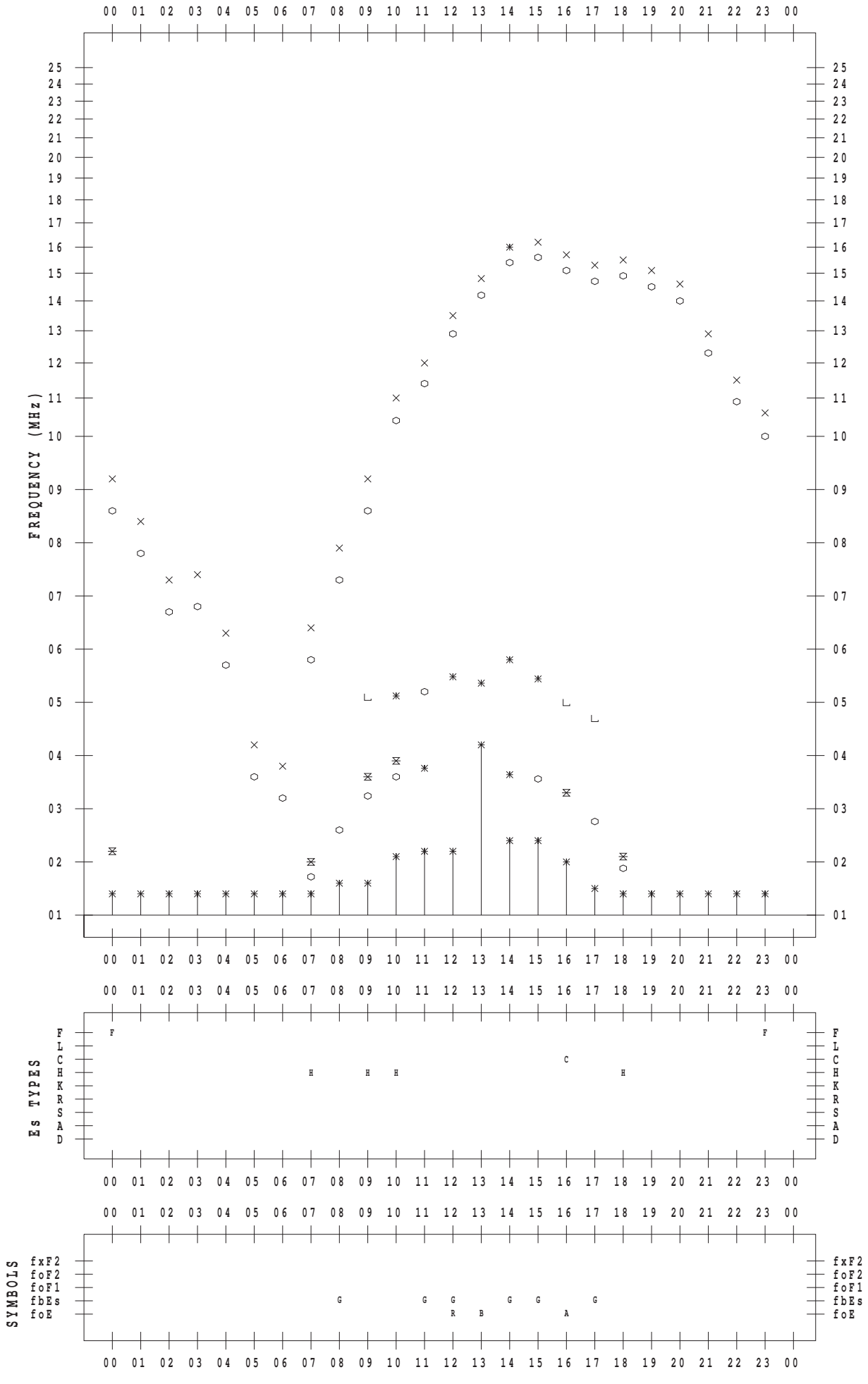
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/12

135 °E MEAN TIME



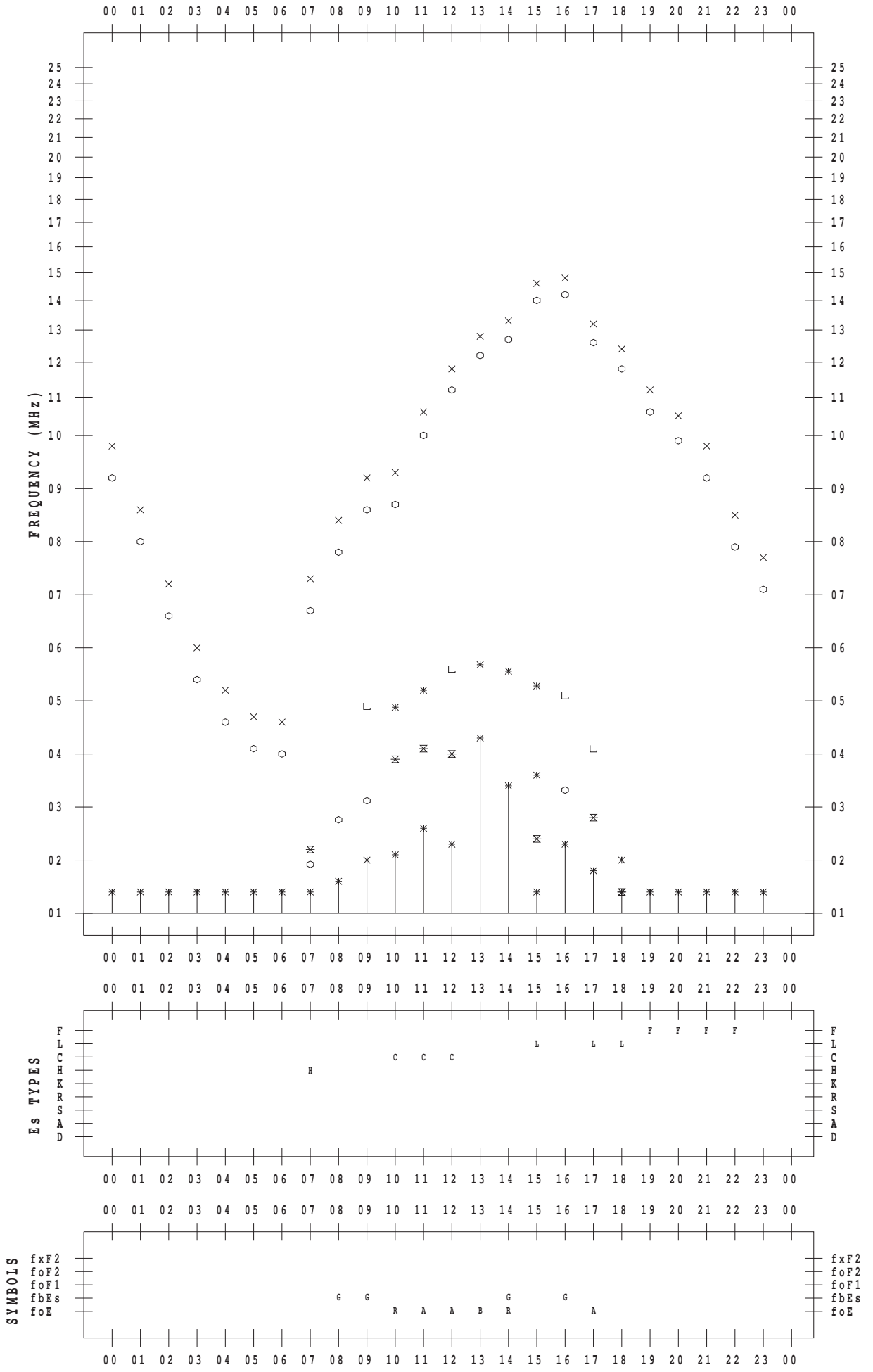
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/13

135 °E MEAN TIME



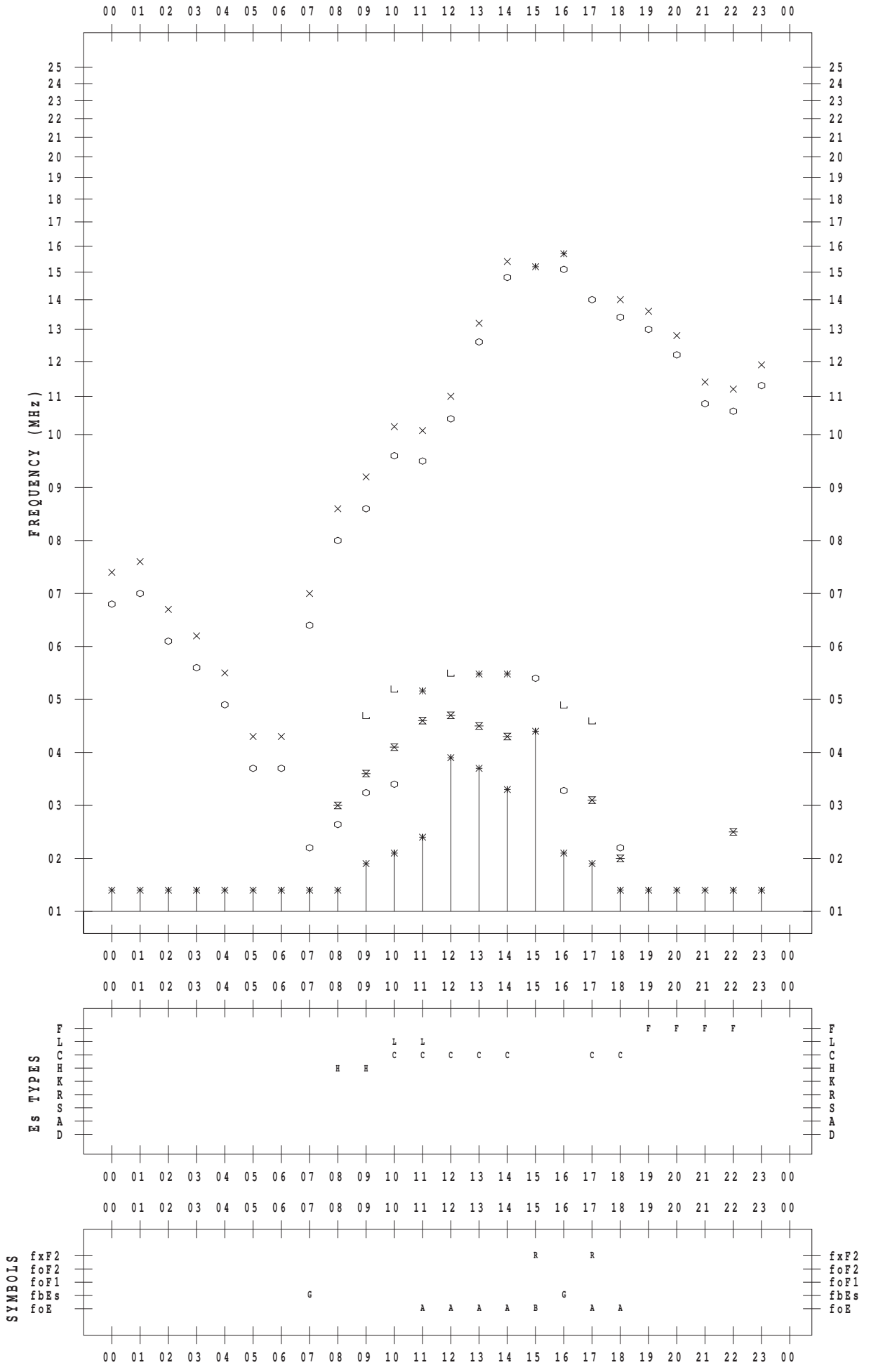
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/14

135 °E MEAN TIME



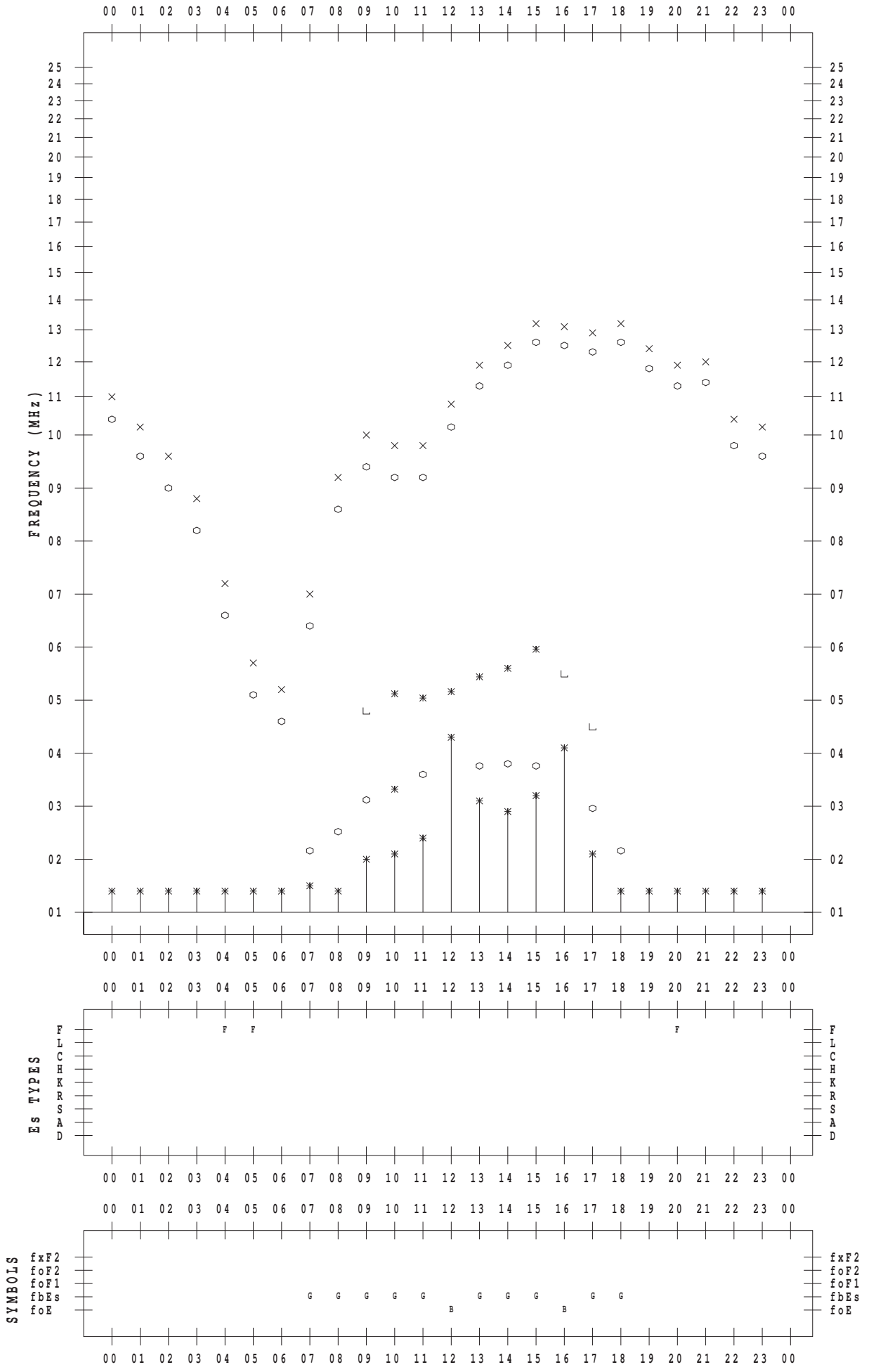
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/15

135 °E MEAN TIME



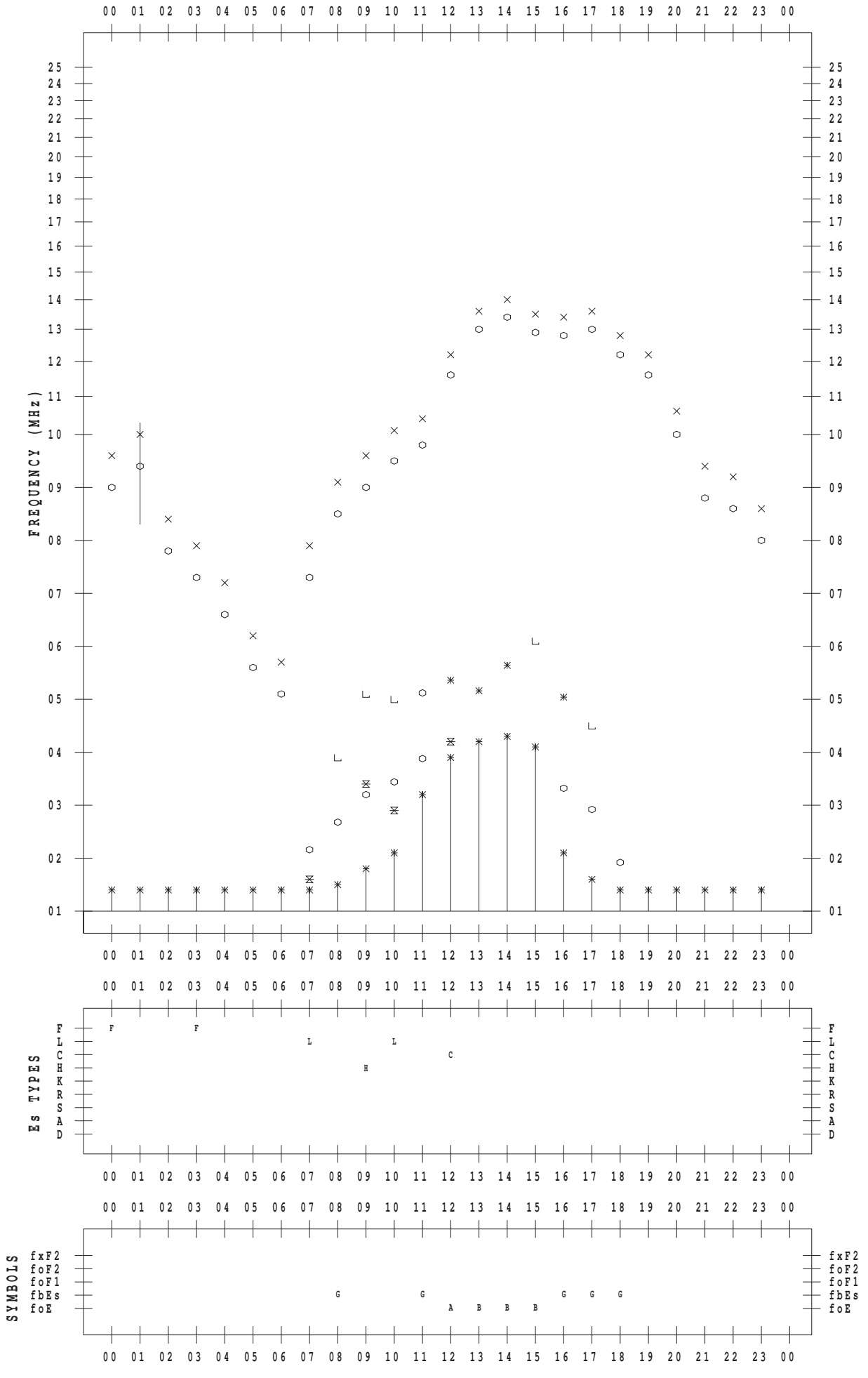
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/16

135 °E MEAN TIME



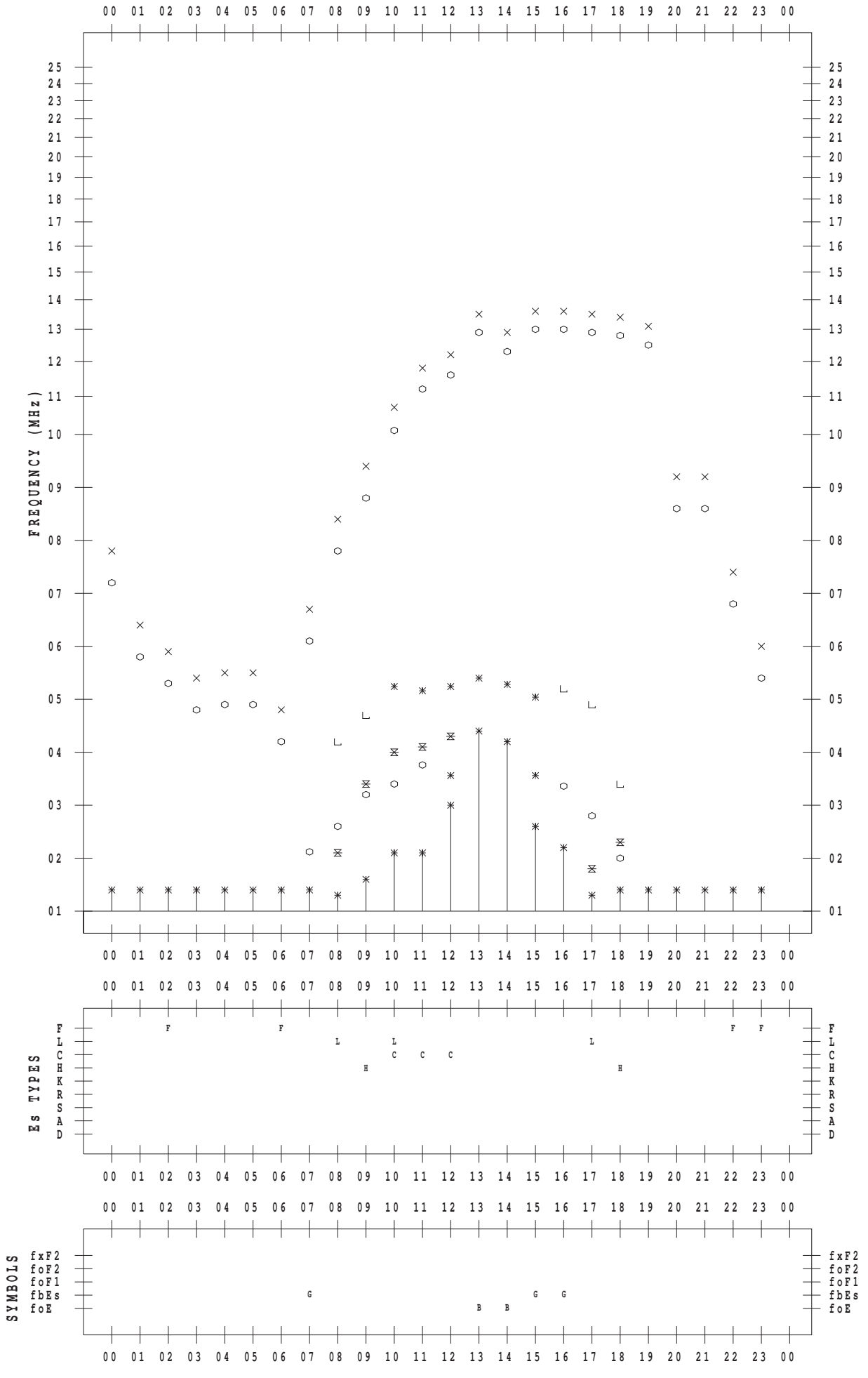
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/17

135 °E MEAN TIME



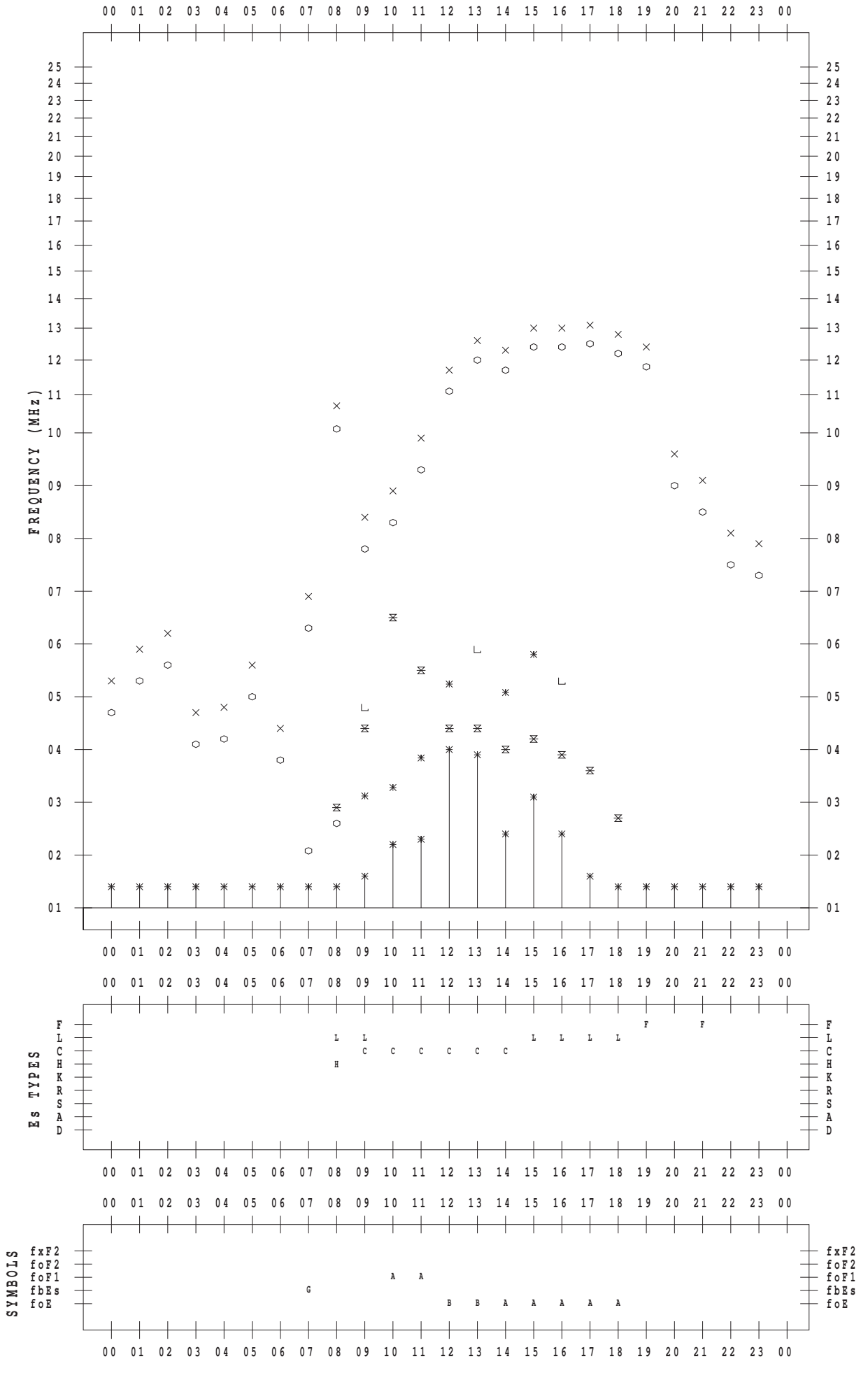
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/18

135 °E MEAN TIME



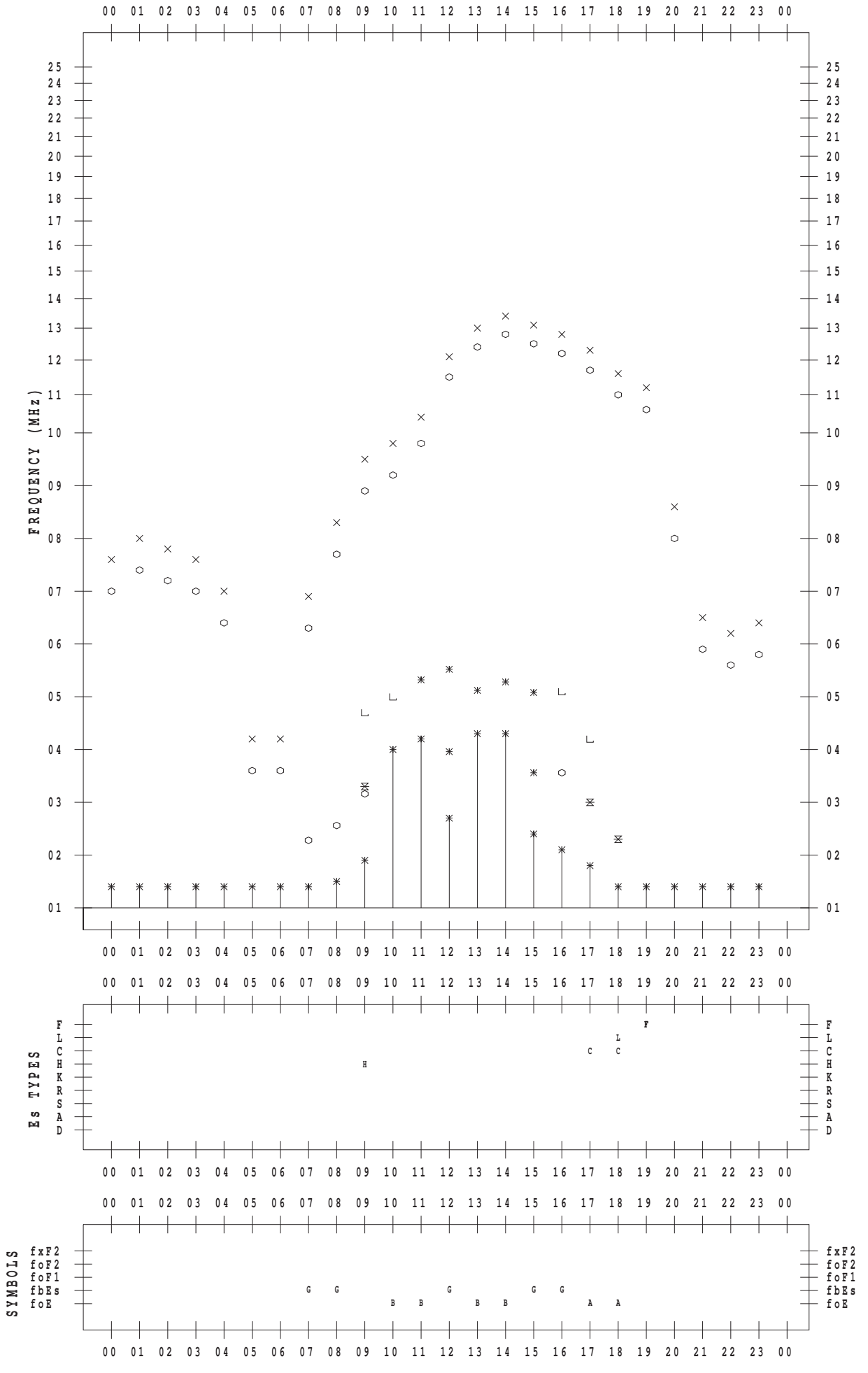
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/19

135 °E MEAN TIME



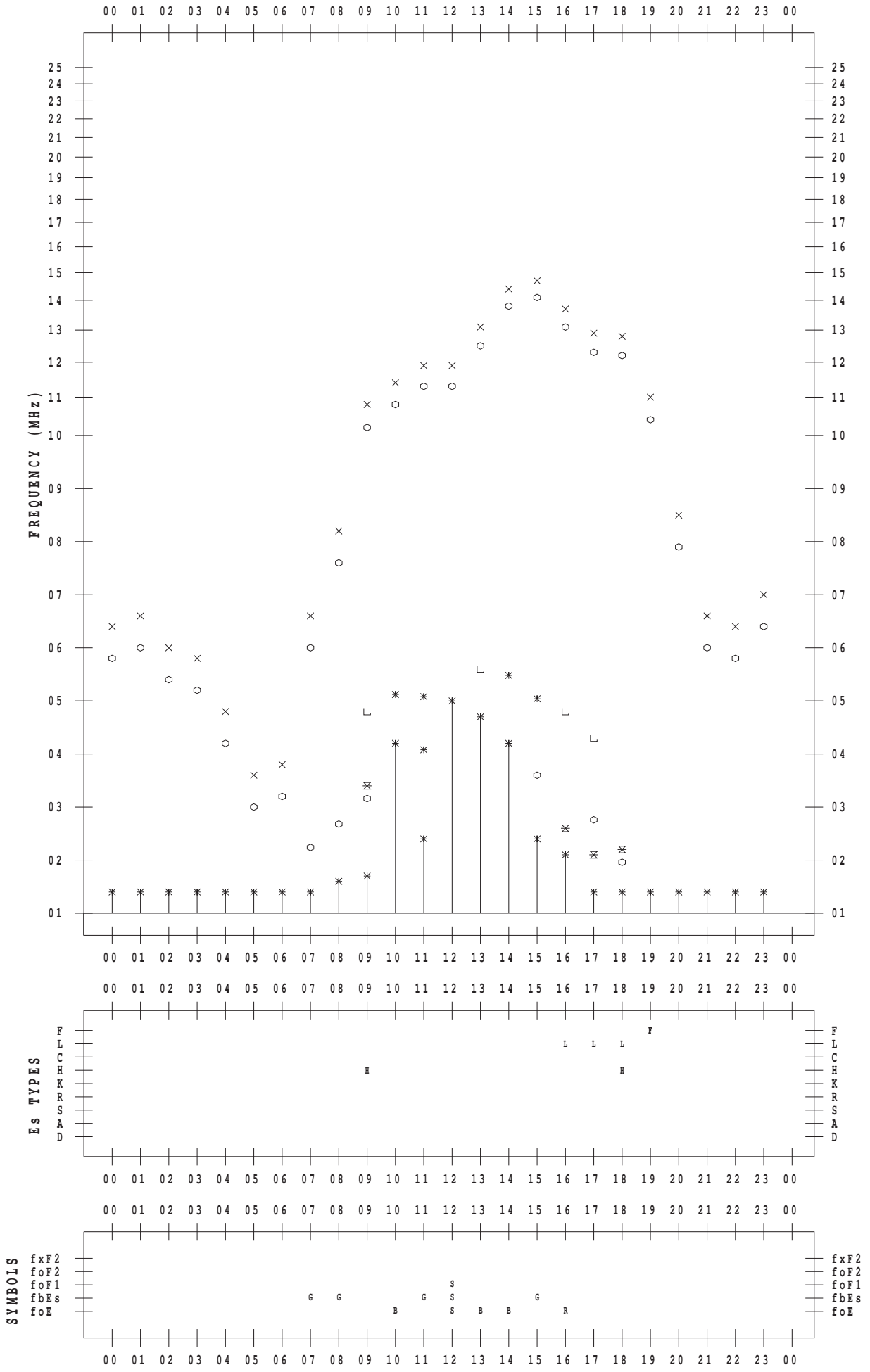
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/20

135 °E MEAN TIME



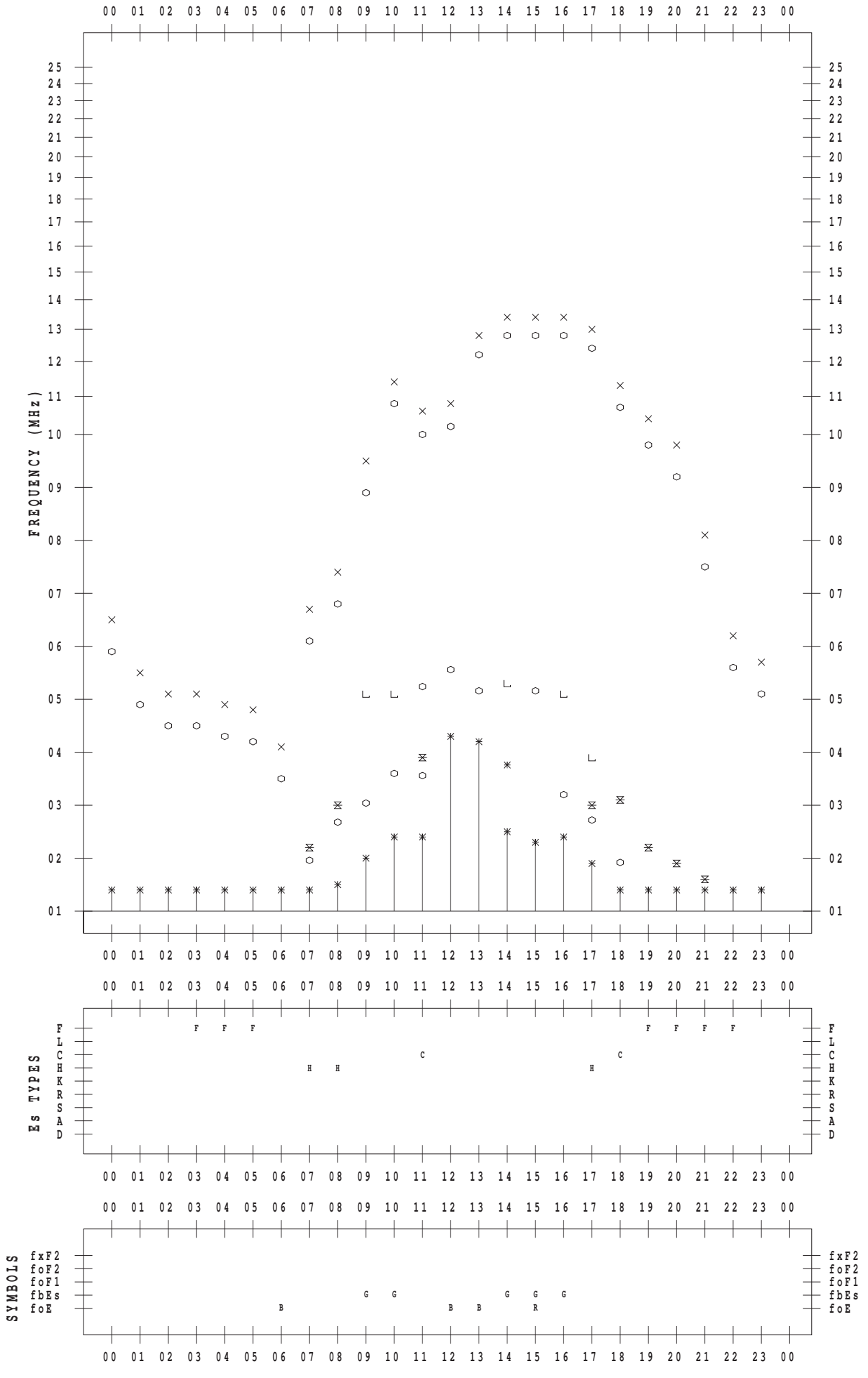
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/21

135 °E MEAN TIME



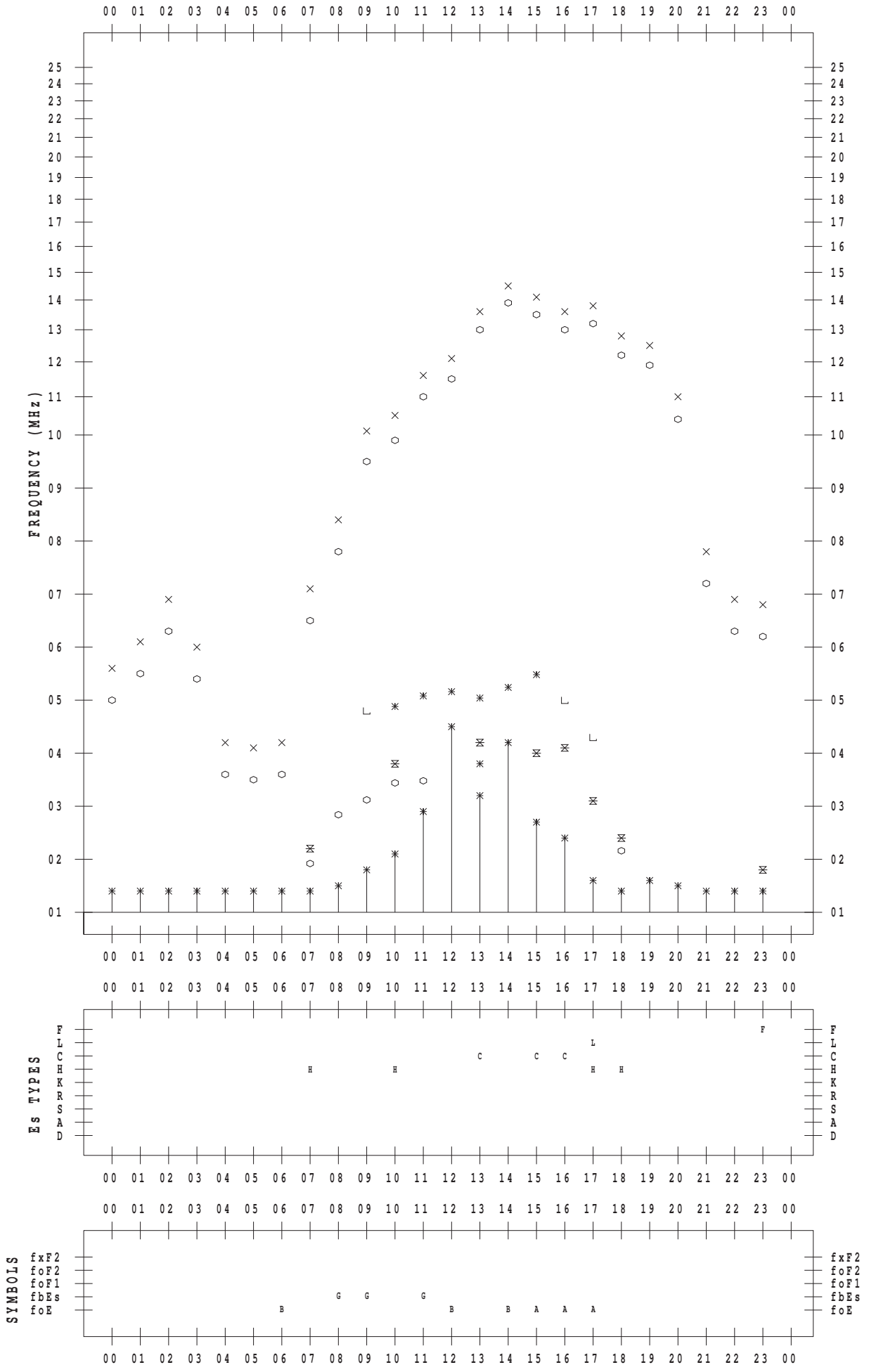
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/22

135 °E MEAN TIME



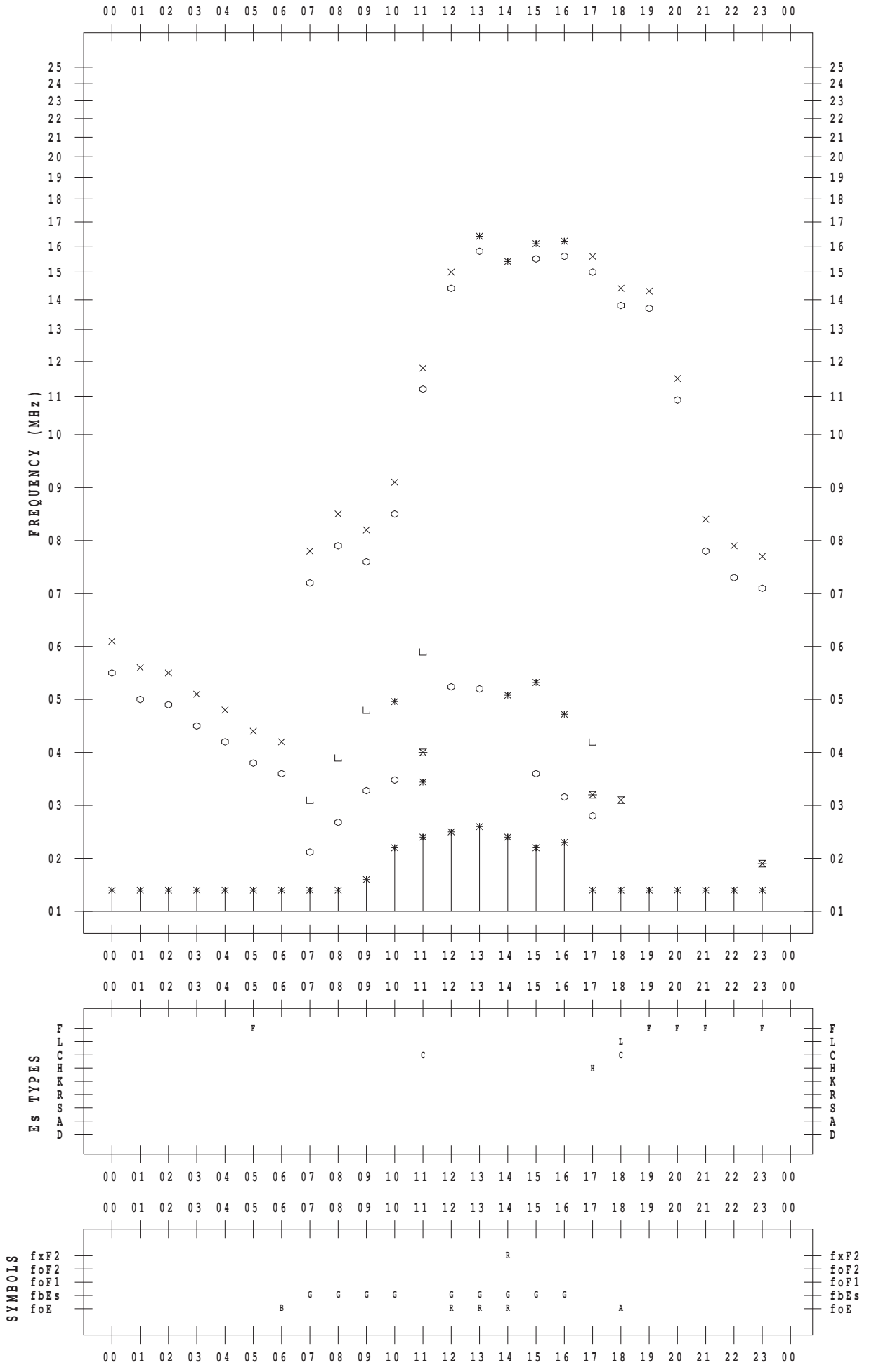
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/23

135 °E MEAN TIME



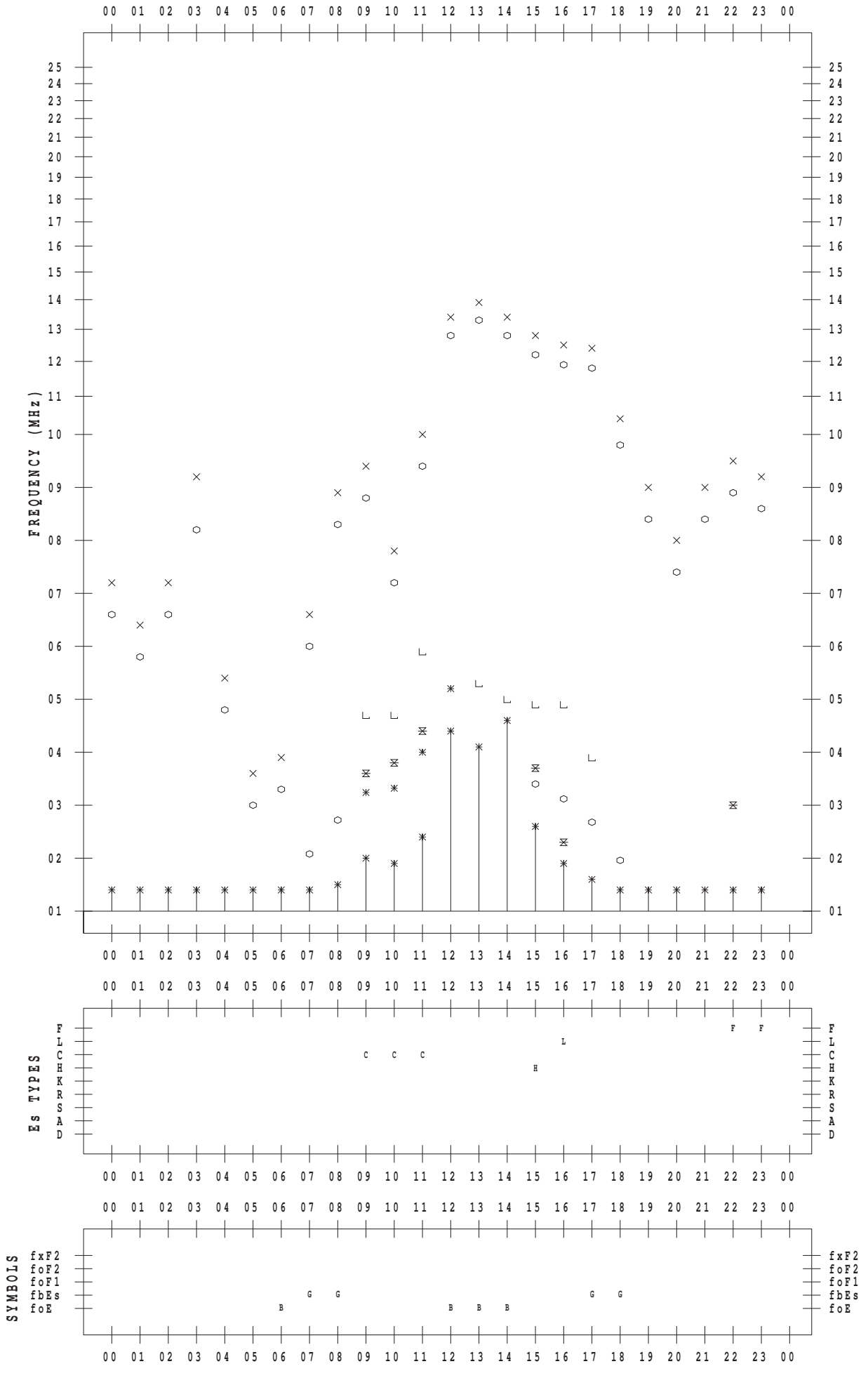
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/24

135 °E MEAN TIME



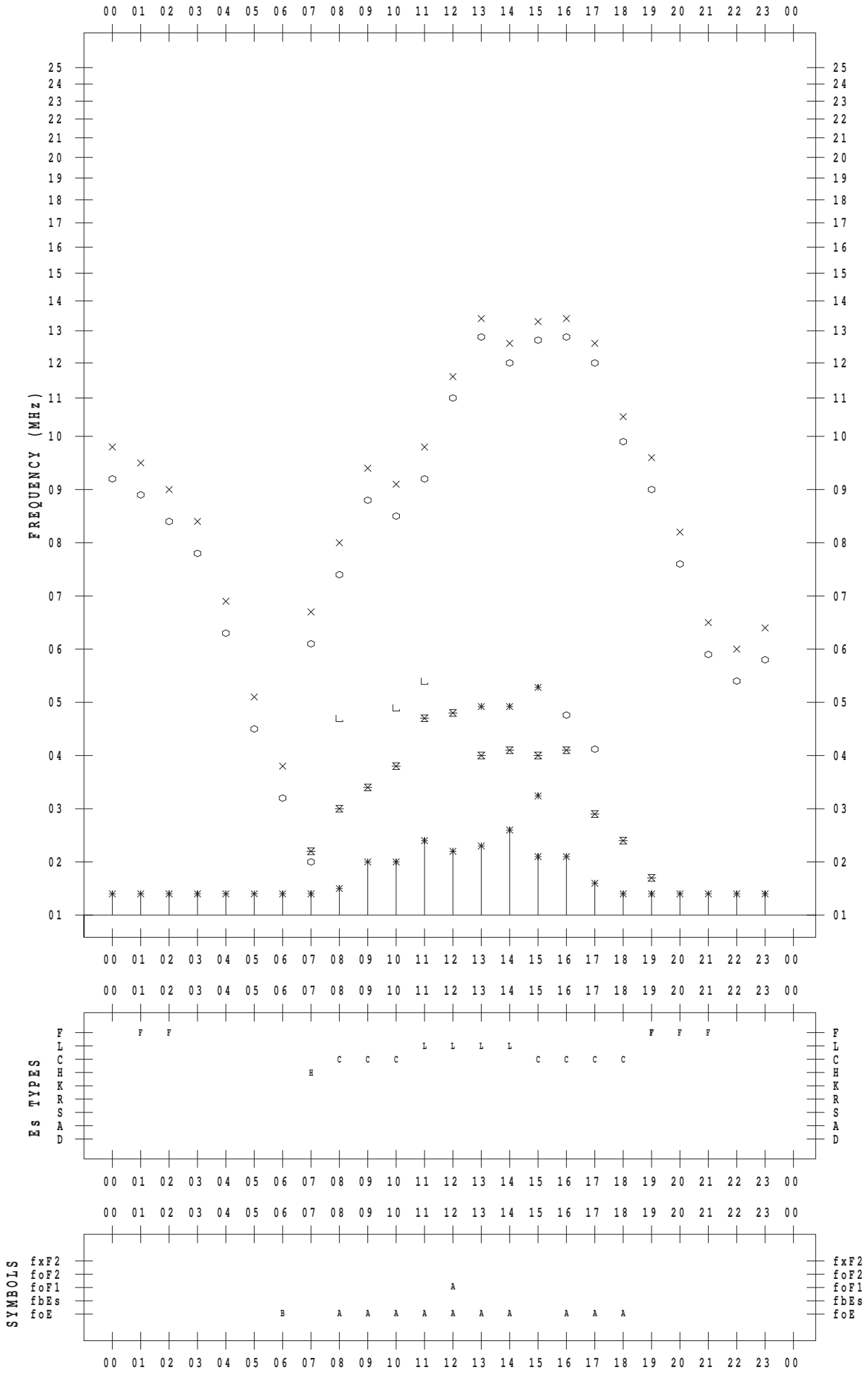
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/25

135 °E MEAN TIME



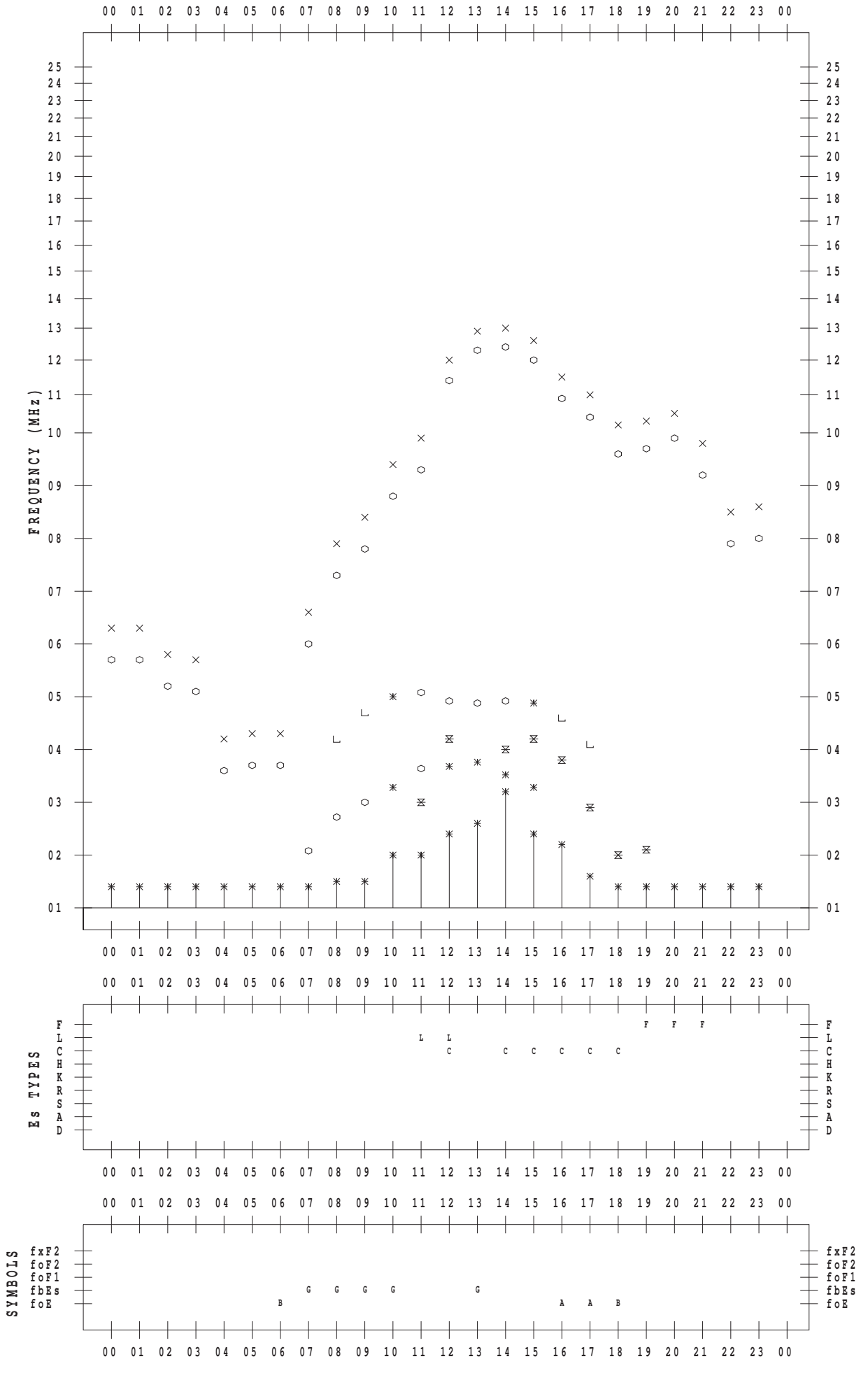
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/26

135 °E MEAN TIME



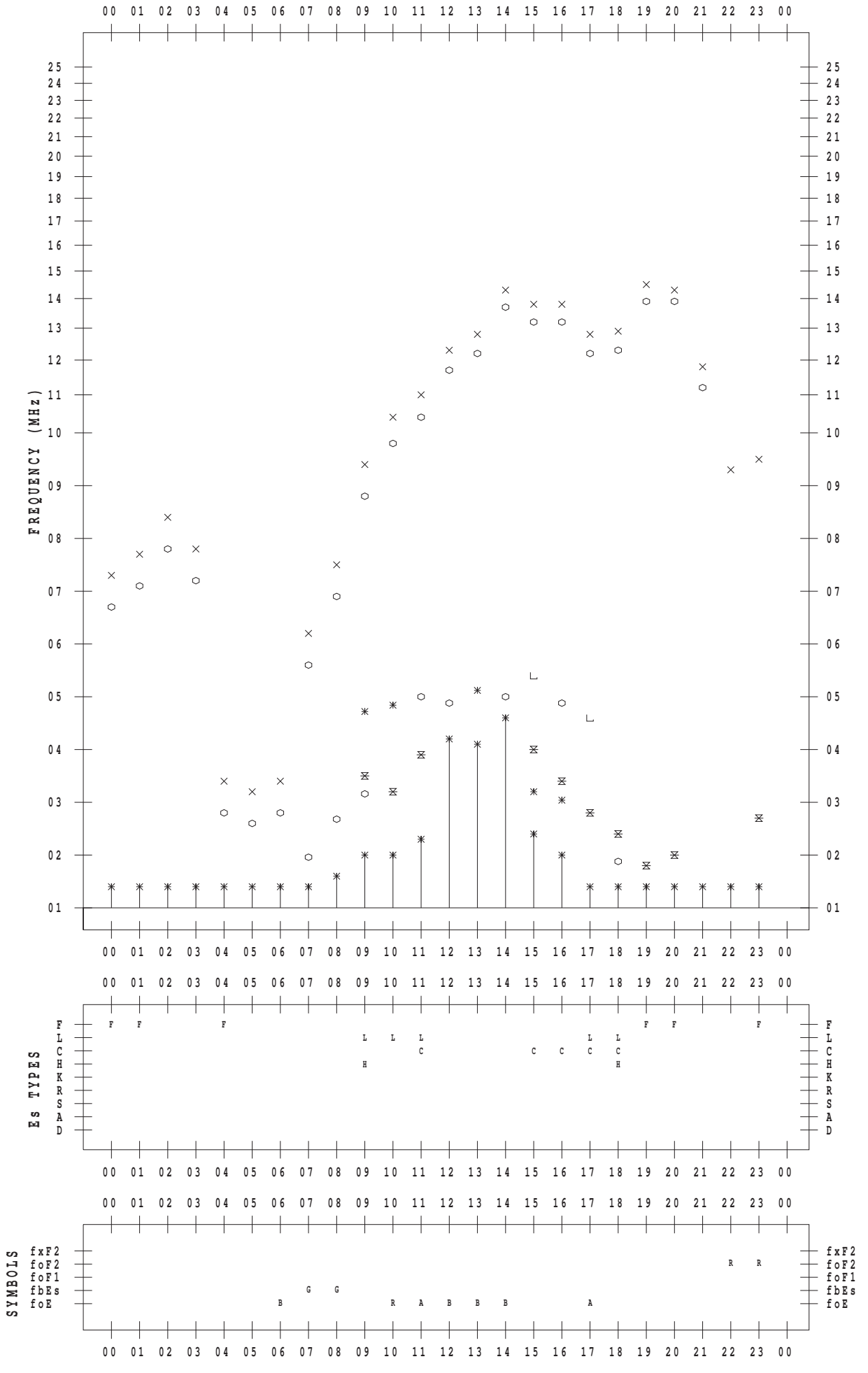
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/27

135 °E MEAN TIME



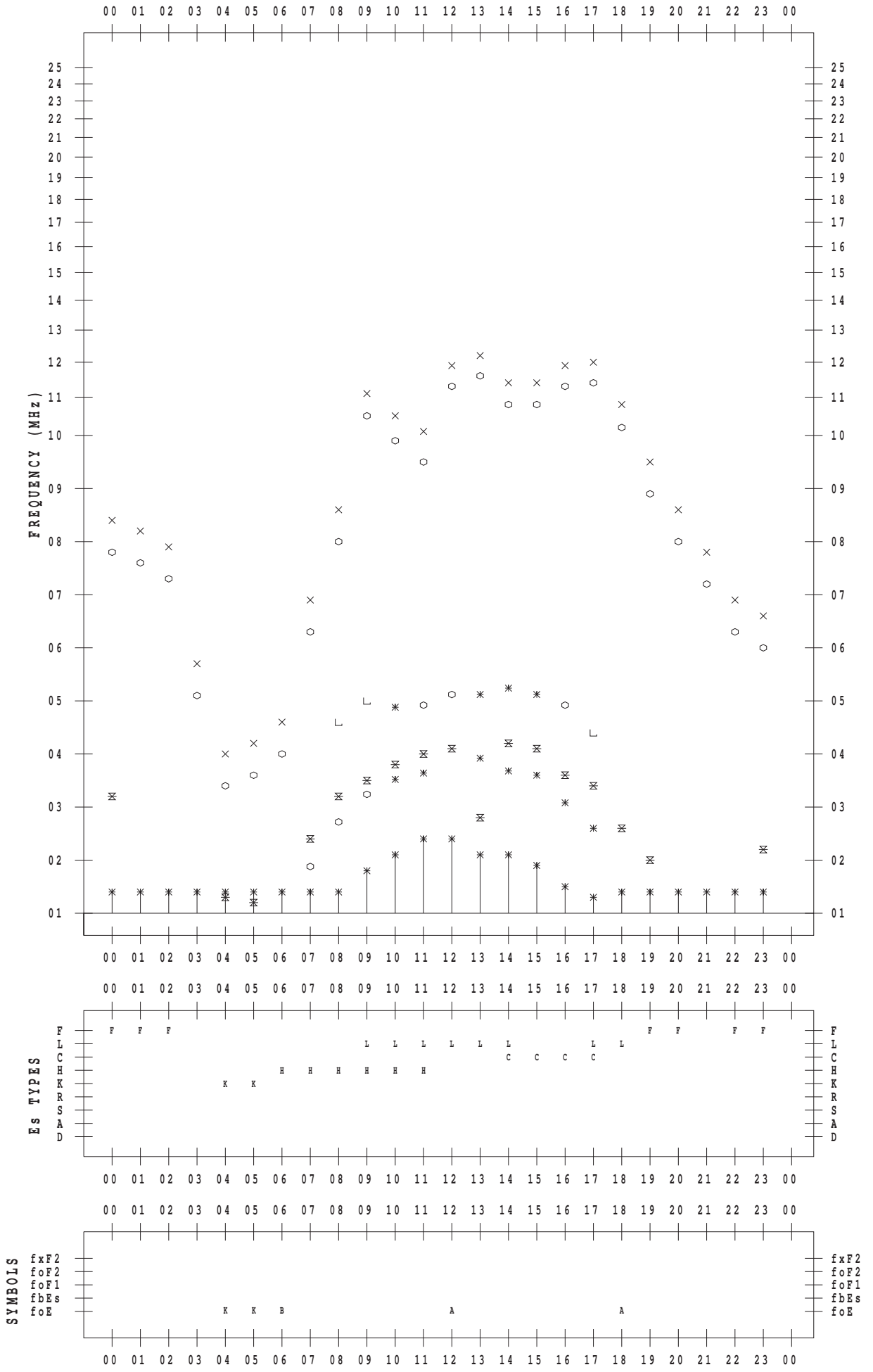
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/28

135 °E MEAN TIME



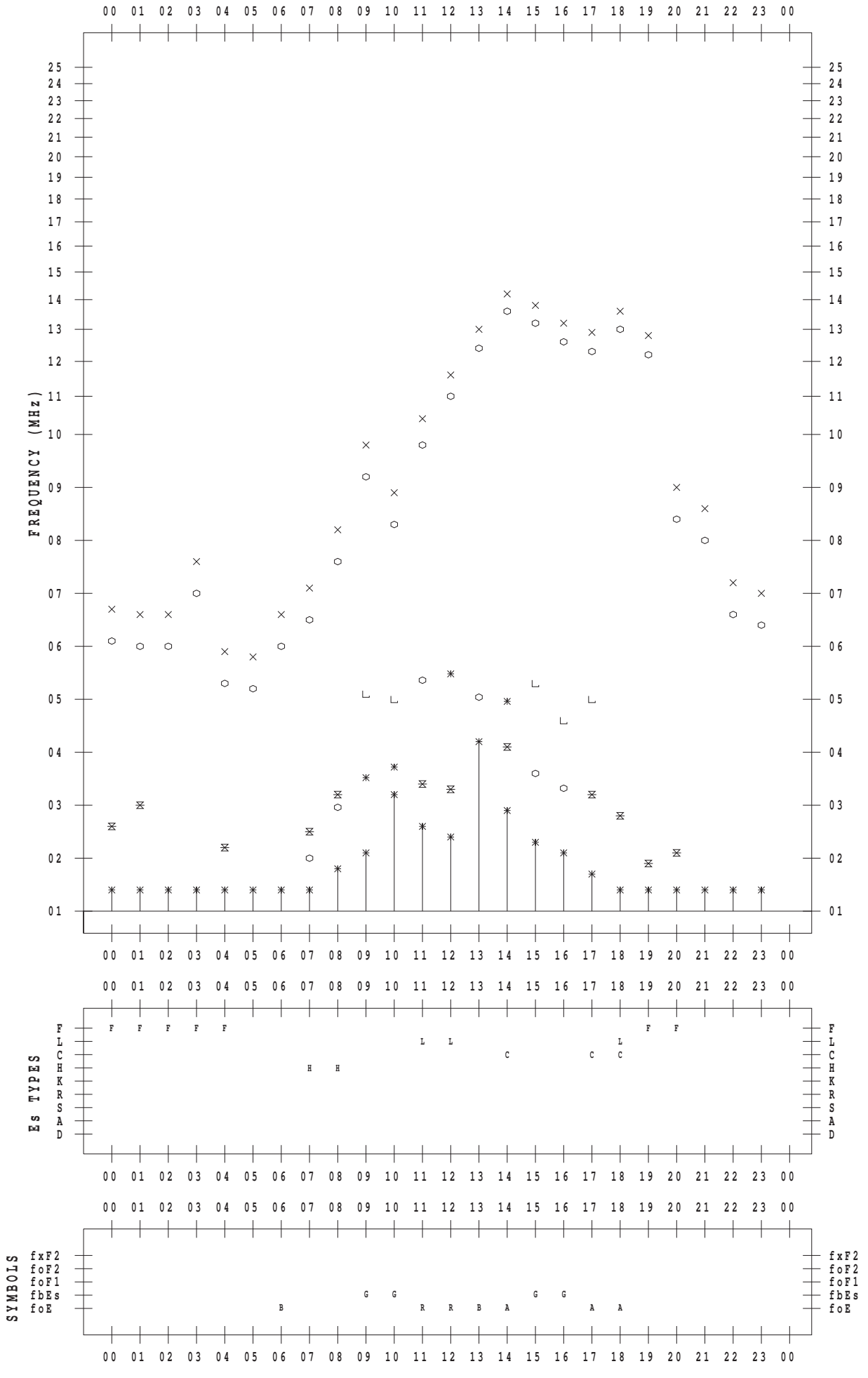
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/29

135 °E MEAN TIME



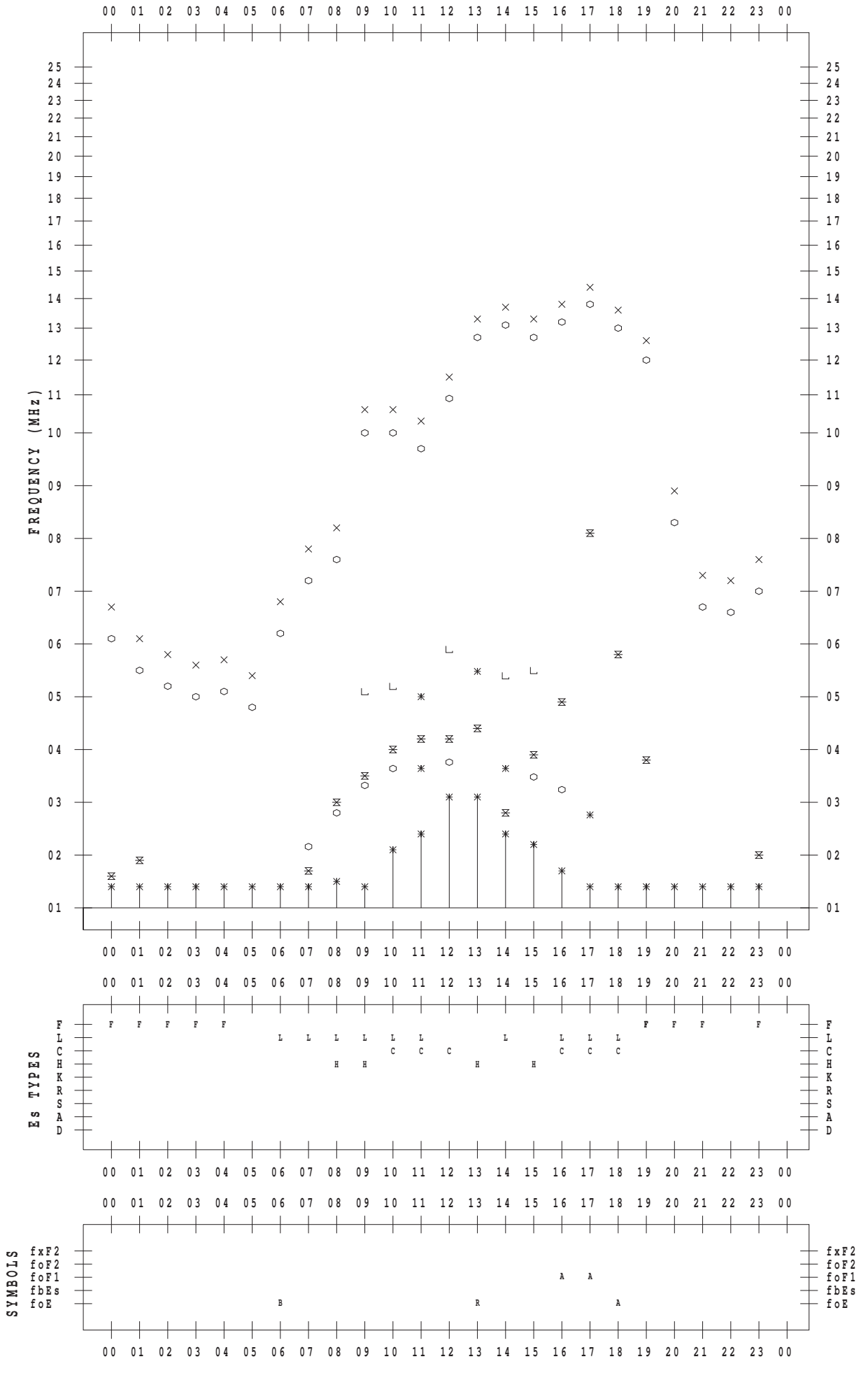
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/30

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 3/31

135 °E MEAN TIME