F-772

IONOSPHERIC DATA IN JAPAN

FOR APRIL 2013

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≪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

APR. 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	53	53	48	34	50	52	62	68	66	67	59	66	69	60	69	88	70	73	65	64	63	60	53	50
2	59	54	34	52	36	58	64	65	N	44	92	45	72	59	70	70	70	70	68	64	62	63	62	53
3	51	34	48	54	54	53	66	66	68	68	68	75	69	N	69	69	70	69	67	66	64	61	58	51
4	52	58	52	57	54	52	64	66	67	69	59	70	69	70	69	70	70	69	66	64	64	54	54	53
5	53	34	35	49	42	53	58	70	67	59	70	68	N	69	68	69	70	70	67	66	67	54	67	34
6	34	40	52	56	53	52	66	65	67	59	59	61	70	58	67	70	70	67	67	64	65	64	64	63
7	52	53	52	52	53	59	67	69	67	68	59	62	71	56	68	67	72	59	66	66	62	64	66	54
8	63	58	62	53	53	60	67	66	68	59	65	59	53	69	58	N	71	67	66	65	64	63	63	53
9	63	53	60	54	57	57	67	67	65	N	69	67		58	62	62		68	67		64	63	54	62
10	63	54	60	60	56	62	74	74	66	69	59	69	61	62	59	69	70	70	67	67	65	63	66	63
11	54	62	66	64	63	63	67	67	69	61	69	70	70	70	69	69	70	69	67	65	66	66	63	62
12	53	59	58	58	52	33	67		70	62	66	71	66	70	69	68	70	69	67	65	55	64	64	63
13	53	49	52	60	57	61	66	70	70	57	69	70	68	N	59	59	70	70	68	66	65	64	62	58
14	63	64	53	60	53	61	66	68	68	91	64	52	48	68	66	69	69	68	61	64	64	63	54	54
15	61	63	60	34	46	52	67	60	66	69	59	69	61	68	69	67	68	67	67	65	64	66	60	52
16		39	42	50	52	61	65	68	69	63	67	70	68	70	67	67	59	69	70	64	60	64	53	A
17	52	53	32	34		54	66	66	66	59	68	70	67	63	69	65	N	70	67	53	63	A	A	64
18	52	65	A	53	51	56	66	70	66	62	59	69	68	69	N	68	68	70	67	65	32	33	A	A
19	38	53	53	53	52	62	66	70	68	69	70	66	67	69	69	59	69	65	65	65	64	63	63	53
20	61	59	53	53	53	61	68	69	67	68	68	59	70	68	71	44	59	64	67	65	64	64	62	A
21	64	62	54	60	56	52	67	66	66	70	69	69	69	69		69	69	68	67	65	64	62	54	53
22	58	53	60	58	50	53	61	68	67	59	69		68	69	59	70	59	70	70	67	63	63	59	53
23	34	N	42	52	53	58	70	70	68	66	70	56	69	69	59	59	N	67	66	65	66	64	52	53
24	37	44	53	53	34	58	62	66	66	67	70	71	69	63	59	59	79	N	64	64	62	64	54	53
25	37	48	34	34	44	52	54	64	64	66	63	69	66	68	70	69	58	66	66	65	63	63	63	62
26	58	53	52	37	52	53	63	67	63	59	62	68	68	68	70	64	59	71	66	63	63	63	63	53
27		54	53	34	36	51	52	A	A	A	63		64	64	69	69	67	67	67	66	67	54	52	34
28	53	34	37	42	44	60	54	63	62	66	64	65	58	58	66	70	74	69	65	64	64	65	64	34
29	64	52	54	53	42	52	54	62	64	61		63	56	66	70	70	70	70	67	66	53	63	62	62
30	65	63	62	62	63	67	67	67	66	70	59	70	69	71	69	70	59		68	65	64	64	64	64
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	29	30	29	30	30	28	28	28	29	28	28	28	28	29	27	28	30	29	30	29	28	27
MED	53	53	53	53	52	56	66	67	67	66	66	68	68	68	69	69	70	69	67	65	64	63	62	53
U Q	62	59	59	58	54	61	67	69	68	68	69	70	69	69	69	70	70	70	67	66	64	64	63	62
L Q	52	48	45	49	45	52	62	66	66	59	59	62	65	62	64	64	67	67	66	64	63	62	54	53

HOURLY VALUES OF fEs AT Wakkanai

APR. 2013

LAT. 45°10.0′N LON. 141°45.0′E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	32	38	38	34	38	32	52	34	G	G	G	G	32	G	G
2	G	G	G	G	G	34	G	34	35	32	39	33	36	35	34	29	34	G	30	27	G	G	G	G
3	G	G	G	G	G	G	23	34	30	34	43	34	34	34	32	30	34	29	26	32	G	29	G	26
4	G	27	22	G	G	G	29	33	30	36	35	34	35	42	33	31	28	34	G	G	28	G	G	G
5	G	G	G	G	G	G	24	G	G	31	32	36	36	33	32	30	29	24	27	24	G	G	G	G
6	G	G	G	G	G	G	45	32	29	34	36	33	33	34	35	32	28	24	G	G	G	G	G	G
7	G	G	G	G	G	G	32	35	34	35	37	38	36	35	32	31	34	24	G	G	G	G	G	G
8	G	G	G	G	G	G	G	34	34	39	32	32	36	35	G	32	28	26	G	G	G	G	G	G
9	G	G	G	G	G	G	26	33	29	G	36	34		37	34	35		G	G		G	G	G	G
10	G	G	G	G	G	G	G	33	31	35	G	G	G	G	37	33	29	25	G	G	24	G	G	G
11	G	G	G	G	G	G	29	34	30	33	36	33	36	39	33	39	32	24	G	G	G	G	G	G
12	G	G	G	G	G	G	G		31	33	36	36	36	35	34	32	28	24	G	G	G	G	G	G
13	G	G	G	G	G	G	48	29	33	34	36	38	34	34	34	29	G	G	G	G	G	G	G	G
14	G	G	G	G	G	G	28	33	32	34	35	40	36	36	34	32	34	26	G	G	G	G	G	G
15	G	G	G	G	G	G	35	33	35	34	38	39	36	34	34	38	30	42	36	28	25	G	G	G
16		26	24	G	G	G	G	28	36	G	39	40	50	57	49	39	44	39	32	40	50	56	44	33
17	G	33	G	28		G	24	36	32	39	52	39	39	58	31	49	29	40	34	36	34	70	59	49
18	24	38	40	38	28	28	27	44	49	49	40	44	58	56	38	64	33	40	30	40	38	40	57	46
19	25	G	G	G	G	G	31	28	37	39	41	40	36	40	36	31	28	G	G	G	40	G	G	G
20	G	G	G	G	G	G	34	32	35	40	42	40	33	38	56	38	38	24	G	32	G	28	26	40
21	34	G	G	G	G	G	26	29	30	38	G	39	36	34		31	29	G	G	33	44	33	G	G
22	G	23	23	G	G	G	G	31	G	32	39		38	38	37	34	41	34	23	34	28	G	G	G
23	G	G	G	G	G	28	28	33	36	32	34	36	35	35	34	34	28	25	G	G	G	G	G	G
24	G	G	G	G	G	G	37	34	32	38	36	38	40	35	34	34	33	32	G	G	G	G	G	G
25	G	G	G	G	G	G	32	38	32	48	33	33	39	35	36	32	30	32	27	G	G	G	G	G
26	24	G	G	G	G	G	G	35	33	37	44	62	38	36	36	32	57	32	24	G	G	33	G	G
27		G	G	G	G	G	50	60	61	60	53		G	35	34	34	28	39	38	32	26	G	G	G
28	G	G	G	G	G	G	25	G	32	33	G	35	34	G	G	33	29	30	G	G	G	G	G	G
29	G	G	G	G	G	G	27	35	30	33	G	33	34	G	G	34	30	30	G	37	26	39	G	G
30	G	G	G	G	G	24	30	31	40	51	40	40	G	36	38	32	38		25	33	26	26	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	30	30	29	30	30	29	30	30	30	28	29	30	29	30	29	29	30	29	30	30	30	30
MED	G	G	G	G	G	G	27	33	32	34	36	37	36	35	34	32	30	26	G	G	G	G	G	G
U Q	G	G	G	G	G	G	32	34	35	39	40	39	37	38	36	35	34	33	27	32	26	29	G	G
L Q	G	G	G	G	G	G	G	30	30	33	34	33	34	34	32	31	28	24	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

APR. 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	16	15	15	15	15	21	14	14	17	18	16	20	20	20	16	16	14	17	14	14	15	14	14
2	15	15	18	15	14	14	23	14	16	18	20	18	17	21	17	16	14	15	14	15	15	15	15	14
3	16	15	14	15	15	15	15	15	17	17	26	20	21	23	20	15	14	14	16	14	14	15	15	14
4	14	17	14	15	15	14	14	14	15	16	24	42	18	18	16	17	14	14	17	14	14	15	15	15
5	15	15	15	14	15	15	15	14	14	15	27	22	23	18	17	15	15	14	14	15	15	15	15	17
6	18	14	15	15	15	15	24	14	14	15	15	15	17	21	17	17	15	14	18	15	15	15	15	15
7	15	15	15	14	14	16	14	14	16	18	22	27	21	22	17	15	15	14	20	15	14	15	15	15
8	15	15	15	15	15	16	14	14	14	16	20	20	24	22	20	14	14	14	17	14	15	15	15	15
9	15	15	15	15	15	16	14	14	15	18	16	47		18	15	17		16	21		14	15	15	15
10	15	16	15	26	14	30	14	16	20	52	47	54	52	54	20	21	15	15	18	15	15	15	15	15
11	15	15	14	14	15	15	14	14	15	21	27	22	20	23	18	16	14	14	18	16	15	14	15	15
12	15	15	15	15	14	15	15		16	16	28	23	23	17	21	20	17	14	20	15	15	15	15	14
13	15	15	15	16	15	17	18	14	14	18	27	26	27	20	15	15	14	14	14	15	15	15	15	15
14	15	15	15	15	15	17	14	15	15	22	18	21	26	18	18	14	15	15	18	14	15	15	15	15
15	15	15	15	15	18	18	14	14	14	15	18	18	24	20	18	16	14	14	15	14	15	15	14	15
16		15	15	14	15	17	14	14	14	17	20	24	27	21	17	17	15	14	14	15	14	14	14	14
17	15	14	16	15		20	14	14	16	16	22	20	20	18	22	15	15	14	14	14	14	14	14	14
18	15	15	14	15	14	14	15	15	17	15	44	21	20	18	21	18	16	15	14	14	14	14	14	14
19	15	16	14	15	15	18	14	15	15	20	21	20	20	18	18	15	14	14	18	14	15	14	15	15
20	15	15	15	15	14	18	14	15	15	16	20	28	20	32	22	21	16	15	18	15	15	14	15	14
21	14	14	15	15	14	18	17	14	17	15	44	32	27	24		14	15	14	15	14	14	15	14	15
22	15	15	14	15	14	18	14	14	18	18	17		23	21	20	16	14	14	15	14	14	15	14	15
23	14	14	14	15	14	16	14	15	17	18	18	29	22	20	21	15	14	14	15	15	15	15	15	15
24	15	14	15	14	15	21	14	14	14	22	21	20	18	20	21	15	14	14	20	15	14	17	15	15
25	15	15	15	15	15	20	15	14	17	18	20	22	27	20	17	18	14	14	15	16	14	15	15	15
26	15	15	15	15	15	18	18	15	16	17	18	21	20	20	18	17	15	14	27	14	15	14	14	15
27		15	14	15	14	20	15	14	18	17	21		52	27	21	15	14	15	14	15	15	17	15	15
28	18	15	15	14	14	21	14	15	15	20	53	22	52	54	20	16	14	14	14	14	15	14	15	15
29	15	17	14	16	15	20	18	15	21	18	21	52	53	54	52	22	15	18	15	14	15	15	15	15
30	15	14	15	14	15	22	17	15	20	23	21	23	53	30	26	22	16		14	14	15	14	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	30	30	29	30	30	29	30	30	30	28	29	30	29	30	29	29	30	29	30	30	30	30
MED	15	15	15	15	15	17	14	14	16	18	21	22	23	20	20	16	15	14	16	14	15	15	15	15
U Q	15	15	15	15	15	20	17	15	17	18	27	27	27	23	21	17	15	15	18	15	15	15	15	15
L Q	15	15	14	15	14	15	14	14	14	16	18	20	20	18	17	15	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

APR. 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	52		46	51	44	43	63	78	85	84	90	105	116	108	102	108	105	102	90	75	55	54	A	53
2	52	44	52	53	48	49	64	78	87	98	100	111	108	100	101	95	92	94	90	85	66	54	54	52
3	52	52	52	52	45	46	66	76	84	91	104	107	110	112	106	104	105	97	88	82	66	A	51	52
4	52		53	52	44	52	76	82	90	92	90	91	102	101	97	91	97	102	104	102	71	54	54	54
5	62		58	53	45	51	62	78	82	87	91	110	111	106	104	98	101	100	101	100	81	66	54	67
6	67	52	54	58	52	54	73	85	98	111	104	105	102	101	102	102	97	94	85	88	88	77	74	64
7	67	54	65	61	51	51	72	86	90	88	94	100	108	104	105	107	104	104	107	87	73	55	54	67
8	52	52	66	66	52	52	76	88	87	85	101	110	110	102	108	105	104	105	102	85	78	71	64	54
9	66	54	53	63	58	59	78	89	102	102	106	108	108	105	111	116	118	111	106	87	A	55	54	54
10	52	63	54	53	52	54	64	76	84	96	106	111	108	110	105	104	102	102	103	88	83	76	74	76
11	73	72	64	66	62	63	85	85	91	101	105	103	105	110	106	110	111	108	110	105	89	71	64	54
12	67	64	53	52	53	52	81	85	96	98	100	98	106	112	110	104	97	90	97	90	80	76	77	74
13	64	54	52	53	55	59	81	84	90	100	112	112	113	104	108	108	101	91	97	89	78	67	54	67
14	67	67	54	58	53	53	72	82	91	101	105	102	100	108	101	102	104	102	104	105	71	55	54	55
15	67	64	52	44	46	47	67	102	107	106	108	111	104	92	87	91	93	96	98	87	55	54	53	54
16	52	52	58	54	46	51	71	112	95	87	84	84	93	102	103	110	115	117	111	96	74	54	51	47
17	58	53	53	54	47	45	77	87	85	77	80	88	94	105	105	104	102	95	A	86	80	54	54	64
18	58		63	54	54	54	73	78	86	87	86	96	104	98	101	98	97	94	98	N	86	72	54	63
19	52	54	54	52	52	54	80	84	88	80	91	108	110	100	97	102	104	92	84	81	76	67	66	67
20	52	64	64	52	49	51	76	85	88	82	81	85	98	101	95	96	96	90	82	77	73	55	54	53
21	63	54	65	53	46	48	69	79	81	85	81	90	100	92	90	96	102	93	90	89	76	54	54	54
22	57	53	A	57	42	46	69	80	77	84	87	82	95	94	102	111	116	115	102	90	72	66	54	64
23		58	58	58	A	53	81	73	74	77	86	88	96	97	101	101	101	89	90	91	86	55	54	54
24	52	52	58	53	52	58	73	77	85	86	81	82	91	105	115	116	113	101	82	74	55	66	74	76
25	73	55	52	54	64	63	64	78	76	82	77	85	102	90	88	90	96	93	88	81	74	67	54	53
26	63	54	67	58	52	54	69	84	94	88	86	87	92	105	96	101	104	105	104	86	70	72	65	54
27	54	67	52	52	53	54	64	66	72	73	73	77	96	98	88	96	94	93	88	85	73	65	64	62
28	67	54	58	51	52	53	66	76	76	80	81	80	88	94	104	107	101	93	90	81	81	71	73	64
29	67	67	66	55	58	54	62	59	73	76	82	86	88	92	104	100	90	87	90	88	83	80	78	75
30	78	74	71	53	62	72	78	81	82	81	83	94	104	A	111	112	114	114	107	88	86	77		77
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	26	29	30	29	30	30	30	30	30	30	30	30	29	30	30	30	30	29	29	29	29	28	30
MED	62	54	54	53	52	53	72	82	86	87	90	97	103	102	102	103	102	96	97	87	76	66	54	58
U Q	67	64	64	58	53	54	77	85	91	98	104	108	108	105	106	108	105	104	104	90	82	71	65	67
L Q	52	53	52	52	46	51	66	78	82	82	82	86	96	97	97	98	97	93	89	83	71	54	54	54

HOURLY VALUES OF fEs AT Kokubunji

APR. 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	43	47	G	G	28	26	G	G	37	G	28	G
2	36	G	G	G	G	G	G	26	29	G	G	G	G	59	60	53	53	35	27	G	G	44	29	26
3	G	24	G	G	29	G	25	G	46	G	G	G	G	G	50	G	G	30	31	29	31	29	G	G
4	G		G	G	G	G	G	26	G	G	G	G	G	G	G	G	29	G	G	G	G	G	33	G
5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40	G	G	34	G	34	G	G	G	G
6	G	G	G	G	G	G	G	28	32	G	G	48	G	G	G	G	29	32	48	59	G	G	G	G
7	G	G	G	G	G	G	G	26	31	G	G	G	G	G	G	G	29	29	28	G	29	G	G	G
8	G	G	G	G	G	G	G	27	29	G	G	G	G	G	52	52	51	29	34	33	G	G	38	26
9	28	G	G	G	G	G	G	29	30	G	G	G	G	49	G	G	G	24	G	G	70	G	G	G
10	G	G	G	G	G	G	47	G	G	G	G	G	G	G	G	G	G	26	G	G	G	G	G	G
11	G	G	G	G	G	G	G	29	G	G	G	G	G	56	71	45	51	28	38	24	34	39	39	G
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	G	G	G	G	G	G	G
13	G	G	G	G	G	G	27	29	31	G	G	G	G	G	G	37	28	30	34	G	G	G	G	G
14	G	G	G	G	G	G	26	26	45	G	G	G	47	G	G	G	31	G	G	G	G	G	G	G
15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	51	G	27	28	G	G
16	G	G	G	G	G	32	G	G	29	52	G	G	G	G	G	G	43	38	33	34	27	24	34	G
17	G	G	G	27	G	G	27	33	G	50	50	G	G	G	G	58	59	60	95	34	23	G	28	49
18	G		48	34	G	G	39	49	G	G	50	67	55	58	52	64	95	79	40	61	60	44	G	G
19	G	26	G	G	G	G	G	27	45	G	G	G	G	G	G	53	34	128	G	G	G	G	28	33
20	G	G	G	28	35	26	G	G	G	G	G	G	G	G	G	G	G	28	28	25	26	23	G	G
21	G	G	G	G	G	G	G	27	G	G	50	G	G	G	G	G	G	G	G	G	G	G	35	34
22	28	G	45	G	23	G	26	G	G	G	G	G	G	G	G	G	33	32	G	G	30	30	29	24
23		G	G	26	31	G	27	G	31	G	G	G	G	G	40	G	G	26	23	G	G	G	G	G
24	G	G	G	G	G	G	24	27	G	G	G	G	G	G	G	48	G	43	45	29	28	G	G	G
25	G	G	G	G	G	G	G	G	G	49	58	G	G	60	G	G	G	G	27	G	G	G	G	G
26	G	G	G	G	G	G	G	G	31	50	57	G	G	G	43	55	48	41	30	G	G	G	36	30
27	46	G	G	G	G	G	29	G	49	56	59	59	53	G	G	G	G	27	28	47	51	60	45	G
28	27	24	G	G	G	G	30	45	G	51	46	44	G	59	G	45	54	29	37	29	31	24	G	G
29	G	G	G	G	G	G	G	G	G	G	45	G	G	G	G	G	29	26	G	G	39	39	G	27
30	G	G	G	G	G	G	G	G	46	53	64	G	49	114	71	110	51	27	28	G	G	26		46
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30
MED	G	G	G	G	G	G	G	14	G	G	G	G	G	G	G	G	29	28	28	G	12	G	G	G
U Q	G	G	G	G	G	G	26	27	31	G	46	G	G	47	40	48	48	34	34	29	31	28	31	26
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	26	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

APR. 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	14	14	17	14	14	13	23	38	21	42	43	40	43	39	39	40	34	14	20	13	13	15	14	14
2	14	13	13	13	15	14	22	15	15	42	42	45	48	40	40	34	31	14	13	14	14	13	13	13
3	13	14	13	14	14	14	23	17	20	44	47	48	47	43	36	40	42	18	13	13	14	14	13	40
4	14		14	14	14	13	22	13	18	40	45	45	50	45	45	40	14	18	17	13	14	14	13	15
5	15	18	14	14	14	13	23	34	37	43	45	48	44	44	44	47	37	13	13	14	13	13	13	14
6	14	17	13	13	14	13	25	13	15	42	43	34	43	43	39	39	21	15	14	15	14	14	14	13
7	14	14	14	13	13	14	23	14	17	37	45	45	52	44	37	39	13	18	13	13	13	14	14	14
8	14	14	13	13	14	13	26	14	21	37	47	45	45	43	33	30	15	14	13	14	13	14	14	14
9	14	13	13	14	14	13	24	17	20	39	44	42	43	31	50	39	18	13	18	13	14	14	14	20
10	14	14	13	14	14	13	29	35	20	38	40	48	52	48	40	37	18	15	18	14	14	13	14	14
11	13	14	14	13	14	14	34	13	21	40	44	52	52	38	39	33	31	20	13	14	14	13	13	18
12	14	13	13	14	14	13	35	15	39	39	45	43	52	47	42	39	22	34	18	14	14	14	13	14
13	14	14	14	14	13	14	34	17	20	42	44	44	48	44	45	41	40	14	17	14	15	14	14	14
14	13	14	14	14	14	14	18	13	21	40	40	52	36	47	45	40	17	13	20	14	15	13	14	14
15	13	14	14	14	14	14	28	18	39	46	44	44	47	47	42	45	18	35	13	14	14	14	14	14
16	14	13	14	13	13	14	13	14	21	37	43	45	40	48	40	40	15	14	13	13	13	13	14	14
17	21	17	14	13	14	13	14	14	37	36	38	47	55	43	44	36	28	13	22	14	13	14	13	13
18	14		13	13	13	14	13	14	40	43	37	39	38	36	38	36	28	13	13	14	13	13	14	14
19	17	13	13	13	14	13	29	33	39	42	44	45	52	43	42	40	14	14	14	14	14	14	13	13
20	14	14	14	13	14	14	13	14	40	43	46	50	48	44	45	42	39	18	13	17	14	14	14	17
21	39	20	14	14	13	15	18	18	39	40	40	45	52	45	43	45	39	29	20	14	14	14	14	14
22	14	14	13	13	18	15	34	14	37	44	45	47	50	48	45	42	22	14	18	13	14	14	13	14
23		14	14	14	14	14	13	38	18	45	44	47	48	52	44	44	39	37	13	17	14	13	14	14
24	14	14	13	13	13	15	18	15	41	44	45	44	56	53	44	18	39	14	13	13	13	14	14	14
25	14	14	14	14	14	15	34	17	39	40	38	55	45	34	44	21	21	13	14	13	14	14	15	13
26	14	17	14	14	13	18	30	37	42	43	40	51	43	52	45	38	21	14	14	13	15	14	14	13
27	13	14	13	15	14	17	22	15	34	36	39	40	40	50	46	43	38	13	13	13	17	13	13	14
28	13	14	13	14	14	17	22	36	37	38	39	45	48	39	47	29	21	14	17	13	14	14	13	14
29	14	13	14	13	14	18	35	15	43	41	38	55	53	52	45	40	22	20	14	14	14	14	14	13
30	14	15	15	13	13	20	29	35	40	37	39	53	43	36	34	30	40	15	13	14	13	15		13
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30
MED	14	14	14	14	14	14	23	15	36	40	44	45	48	44	44	40	22	14	14	14	14	14	14	14
U Q	14	14	14	14	14	15	29	33	39	43	45	48	52	48	45	41	38	18	18	14	14	14	14	14
L Q	14	14	13	13	13	13	18	14	20	38	40	44	43	40	39	36	18	14	13	13	13	13	13	13

HOURLY VALUES OF foF2 AT Yamagawa

APR. 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	52	54	54	52	53	43	50	64	85	90	90	114	110	114	89	113	114	113	113	95	86	71	67	53
2	48	45	54	51	47	40	52	75	90	94	96	98	96	96	111	95	96	98	90	88	84	71	51	N
3	52	53	52	53	40	40	43	76	90	91	94	96	97	99	98	94	110	110	97	96	86	59	52	52
4	53	51	53	53	50	46	52	90	91	87	78	93	96	112	96	95	107	95	114	89	87	72	54	54
5	54	55	54	62	51	46	53	73	81	87	92	90	104	79	110	111	111	114	110	108	87	78	76	74
6	72	52	64	65	52	53	52	80	111	112	96	96	116	99	115	114	113	97	96	95	81	84	83	78
7	77	76	74	74	67	51	53	78	84	83	90	96	100	110	111	109	111	95	73	N	88	75	74	72
8	72	63	67	74	52	40	53	78	84	86	96	97	96	97	79	100	108	114	110	73	87	77	80	80
9	76	78	67	73	63	48	63	91	97	96	93	98	107	112	96	115	N	110	114	96	86	78	53	A
10	52	66	66	64	53	50	51	72	85	94	95	100	96	96	111	97	110	108	110	79	87	80	78	78
11	N	86	76	64	63	52	67	88	92	94	94	97	97	99	110	110	110	110	116	73	88	85	78	82
12	78	77	67	66	52	57	66	85	89	95	86	90	101	110	110	115	108	96	98	89	87	77	78	83
13	76	72	67	62	52	50	53	86	90	116	96	107	110	110	113	112	108	111	110	N	86	64	76	76
14	72	72	67	62	54	52	59	82	92	87	94	96	116	112	110	109	110	110	105	89	86	74	74	77
15	77	77	77	60	53	52	53	88	104	116	97	96	97	96	88	92	95	116	96	88	77	70	67	65
16	67	52	67	54	52	53	69	94	88	88	78	85	95	97	92	110	117	117	111	79	73	88	86	77
17	74	75	73	67	51	52	69	90	93	76	78	86	95	97	106	110	110	102	96	79	72	85	77	72
18	73	72	73	67	26	43	51	80	82	85	80	90	95	95	96	97	110	A	111	109	79	72	54	A
19	53	54	63	62	47	43	52	90	72	74	90	96	94	96	94	96	109	114	100	88	87	78	54	67
20	54	60	66	68	A	44	54	75	88	85	79	85	97	88	91	96	92	91	89	88	81	74	67	54
21	67	61	72	55	46	43	53	77	74	78	85	88	96	96	96	98	111	115	112	79	84	54	54	54
22	66	44	51	53	A	44	54	67	81	85	77	82	92	94	103	99	111	116	114	88	82	75	73	73
23	A	67	59	53	53	50	67	81	70	80	77	90	94	95	95	98	114	109	90	88	86	73	67	67
24	54	58	58	52	51	46	54	77	N	81	75	80	92	96	97	110	112	115	90	89	77	74	80	78
25	78	67	54	54	67	53	62	72	75	87	80	80	96	94	89	66	96	95	116	87	83	72	77	77
26	64	67	67	51	53	50	63	81	87	92	81	82	94	110	110	101	112	113	111	81	78	77	74	54
27	67	66	67	53	58	57	78	74	82	84	80	84	94	93	95	110	108	113	93	89	80	75	59	77
28	80	77	73	54	61	54	68	77	84	81	75	78	93	96	96	110	114	98	89	90	86	80	78	77
29	77	N	78	76	67	53	62	70	73	73	84	90	97	101	109	111	N	112	92	95	86	78	80	78
30	52	78	77	66	57	61	75	84	83	81	77	92	108	110	109	117	79	146	144	110	87	86	85	52
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	30	30	28	30	30	30	29	30	30	30	30	30	30	30	28	29	30	28	30	30	30	27
MED	67	66	67	62	52	50	54	79	85	87	86	91	96	97	98	109	110	110	108	88	86	75	74	74
U Q	76	75	73	66	57	53	66	86	90	94	94	96	101	110	110	111	111	114	112	95	87	78	78	78
L Q	53	54	58	53	51	44	52	75	81	81	78	85	95	96	95	97	108	98	93	84	81	72	59	54

HOURLY VALUES OF fEs AT Yamagawa

APR. 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	29	G	G	G	G	G	G	G	34	48	48	43	42	35	48	44	36	28	38	33	26	G	G
2	33	27	G	26	G	G	23	27	29	34	36	35	45	45	41	32	32	32	24	G	28	31	34	23
3	G	G	G	G	G	G	G	40	35	34	46	49	47	G	44	34	31	G	33	32	G	G	G	G
4	G	G	G	G	G	G	G	32	36	44	40	49	38	45	36	34	32	34	32	26	G	G	G	G
5	G	G	G	G	G	G	G	30	36	47	36	33	G	46	36	36	34	36	29	G	27	G	24	G
6	G	G	G	G	G	G	G	29	35	34	36	36	G	46	46	34	31	40	38	33	26	G	G	G
7	G	G	G	G	G	G	G	G	35	34	G	G	G	53	42	G	G	28	37	28	25	G	G	40
8	23	G	G	G	G	G	G	48	35	35	36	36	35	34	56	50	47	33	G	G	G	G	G	34
9	30	31	G	24	G	G	G	28	36	35	35	34	G	50	49	47	37	33	25	G	26	28	30	27
10	G	G	G	G	G	G	G	46	34	35	35	G	42	G	42	G	36	35	23	28	G	G	G	G
11	G	G	G	G	G	G	G	27	36	38	36	37	38	G	G	32	33	33	31	G	G	26	29	34
12	G	G	G	G	G	G	G	24	30	34	35	34	36	G	34	34	34	34	40	28	G	G	G	G
13	G	G	G	G	G	G	28	29	35	38	41	38	41	39	42	44	50	34	36	32	28	39	34	28
14	28	G	G	G	G	G	G	28	34	34	34	53	49	G	37	34	31	35	39	36	G	G	G	G
15	G	G	G	G	G	G	G	29	36	51	34	36	35	56	35	33	32	62	50	44	27	27	24	40
16	G	G	28	G	G	G	28	29	45	32	56	50	56	52	46	40	44	34	26	32	26	26	G	G
17	G	G	26	44	36	28	28	43	45	50	54	43	51	61	52	40	52	52	50	28	39	34	G	28
18	33	G	G	G	40	26	32	35	42	43	50	49	51	54	66	71	68	92	39	31	48	30	G	60
19	G	44	30	G	G	32	G	44	34	44	36	50	40	40	39	42	37	34	28	46	28	24	28	G
20	G	G	G	33	39	48	46	38	40	40	36	48	42	42	34	39	37	27	33	29	G	G	G	G
21	G	G	G	G	G	G	G	40	29	34	36	G	33	G	34	32	30	28	23	G	G	G	G	G
22	G	G	33	30	36	G	23	36	40	31	50	43	38	48	33	38	35	36	34	24	G	34	33	G
23	50	39	G	G	G	G	28	36	36	42	36	35	35	G	G	33	32	34	36	29	G	G	G	G
24	G	G	G	G	G	G	G	25	35	40	44	G	G	G	36	33	51	39	31	30	24	G	G	G
25	G	G	G	G	G	G	28	30	43	39	44	35	G	58	46	59	37	38	40	G	54	G	G	G
26	G	G	G	G	G	G	28	32	31	40	40	34	G	46	44	47	34	46	44	41	31	G	33	36
27	38	G	G	G	G	G	30	43	45	40	61	G	G	G	G	G	G	35	37	G	32	27	34	59
28	58	59	G	G	G	24	30	40	49	54	42	48	47	44	67	G	35	35	90	50	50	59	59	43
29	G	23	G	G	G	G	G	28	46	55	61	55	47	44	38	G	37	30	35	34	36	26	G	G
30	33	40	26	29	26	28	G	30	43	41	45	46	46	G	61	G	33	38	35	30	36	G	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	G	G	G	G	G	G	G	30	36	38	38	36	38	43	40	34	34	34	34	29	26	G	G	G
U Q	28	23	G	G	G	G	28	40	42	43	46	48	46	48	46	42	37	38	39	33	32	27	29	34
L Q	G	G	G	G	G	G	G	28	34	34	36	34	G	G	35	32	32	33	28	G	G	G	G	G

HOURLY VALUES OF fmin AT Yamagawa

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

HOURLY VALUES OF foF2 AT Okinawa

APR. 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	62	61	52	60	51	46	42	66	80	88	105	95	130	149	139	143	141	150	132	N	109	107	87	88
2	67	59	74	66	59	32	42	76	88	110	108	108	118	131	133	131	128	126	107	108	107	83	64	54
3	52	59	51	47	38	B	38	67	88	101	97	105	108	126	131	132	140	135	139	132	110	88	79	85
4	74	63	67	71	54	52	51	77	84	93	90	100	109	126	126	125	120	120	130	131	107	88	87	76
5	73	73	72	67	61	48	50	66	78	96	97	104	118	131	130	128	130	130	131	122	118	108	87	87
6	86	78	86	87	86	73	71	87	107	133	107	120	130	147	129	133	132	131	129	129	109	108	107	107
7	104	98	87	88	82	51	50	66	87	87	97	108	121	123	124	127	126	130	131	129	108	88	80	A
8	86	87	88	106	66	48	51	76	82	96	101	105	109	121	125	126	128	126	131	126	108	44	B	59
9	84	66	87	76	54	52	58	88	97	97	102	108	121	148	110	135	140	133	133	128	110	107	87	88
10	79	87	87	76	67	53	54	71	92	97	102	108	110	108	123	120	125	123	122	109	87	88	87	B
11	52	88	83	73	N	62	67	114	88	84	98	107	102	103	132	132	131	133	132	130	109	110	108	108
12	105	87	84	74	63	51	64	76	88	89	88	102	121	132	132	134	128	130	127	118	108	107	88	83
13	84	83	83	73	51	50	52	84	93	106	108	108	124	131	129	140	140	135	132	131	108	102	82	87
14	81	79	76	76	58	50	53	76	88	88	100	107	122	130	130	131	131	130	118	114	107	86	N	87
15	84	81	84	52	57	52	52	88	105	113	101	88	108	118	107	101	109	115	108	105	87	64	82	53
16	76	82	79	54	60	52	64	88	108	85	81	86	102	118	120	126	130	134	143	129	130	109	99	B
17		87	88	87	51	A	66	80	84	80	80	97	105	110	119	131	130	N	130	122	79	108	79	88
18	82	80	67	52	51	A	53	77	81	94	81	85	88	108	120	120	122	128	130	131	108	83	83	73
19	78	72	83	84	48	51	53	86	74	82	98	106	114	99	120	118	131	131	125	110	117	88	71	54
20	74	B	66	72	50	B	48	78	71	74	82	86	97	98	106	110	106	108	112	107	87	73	79	
21	76	67	76	64	43	30	48	67	80	94	88	84	106	110	125	124	133	129	137	129	107	88	78	86
22	80	67	67	49	44	43	48	77	88	80	74	78		107	119	128	133	148	130	62	108	88	77	80
23	74	69	52	53	51	53	64	76	82	N	75	86	108	107	112	118	N	125	117	89	87	80	74	49
24	67	66	63	68	47		52	81	84	77	B	77	102	108	109	127	126	126	122	107	76	81	78	84
25	86	69	54	54	58	54	54	74	77	94	82	81	106	116	107	110	120	117	110	102	81	78	55	86
26	78	84	74	62	50	52	58	81	90	83	82	87	118	120	122	120	130	133	134	117	88	84	80	78
27	81	74	59	74	63	60	70	73	88	88	74	91	107	110	127	130	130	130	127	118	87	53	39	88
28	A	88	88	81	64	64	74	87	80	82	79	91	104	118	120	127	131	120	110	116	A	80	87	A
29	A	53	83	86	58	51	72	71	78	77	94	101	107	110	108	132	132	132	130	119	107	87	75	80
30		74	74	53	71	62	72	84	85	81	82	90	118	127	109	129	136	129	134	132	118	N	109	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	29	30	30	29	25	30	30	30	29	29	30	29	30	30	30	29	29	30	29	29	29	28	24
MED	78	74	76	72	57	52	53	77	86	88	94	98	109	118	122	128	130	130	130	119	108	88	81	84
U Q	84	85	84	76	63	53	64	84	88	96	101	107	119	130	129	132	132	133	132	129	109	107	87	87
L Q	74	66	67	54	50	49	50	73	80	82	81	86	105	108	112	120	126	125	122	108	87	80	77	74

HOURLY VALUES OF fEs AT Okinawa

APR. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	N	G	35	G	G	G	G	G	G	G	28	26	G	G	G	G	G
2	G	28	25	G	G	G	G	G	28	G	G	G	G	G	G	G	G	36	36	G	33	G	G	G
3	G	G	G	G	G	B	G	34	40	33	G	G	G	56	62	51	38	27	24	G	G	G	G	G
4	G	G	G	G	G	G	G	G	36	34	53	G	G	G	G	G	31	48	52	37	G	G	G	G
5	G	G	G	G	G	G	G	G	28	G	G	50	G	G	G	G	G	33	30	G	G	G	G	G
6	G	G	G	G	G	G	G	G	41	G	51	G	G	G	G	G	G	44	45	35	G	25	G	G
7	G	G	G	G	G	G	G	G	28	G	G	G	G	G	G	G	G	34	31	32	G	G	G	78
8	G	G	G	G	36	G	G	G	29	G	G	G	G	G	G	G	G	34	24	G	G	G	B	G
9	24	G	G	G	G	G	G	26	G	G	G	G	G	G	G	G	G	28	G	G	G	G	G	G
10	25	G	G	G	G	G	G	G	29	34	G	G	G	G	G	G	G	G	28	G	G	G	G	B
11	G	G	G	G	G	G	G	23	34	G	G	G	G	G	G	G	G	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	23	G	G	G
13	G	G	G	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	37	31	26	G	G	G
14	G	G	G	G	G	G	G	27	34	G	G	G	G	G	G	35	G	G	G	24	33	27	G	G
15	G	G	G	G	G	G	G	G	33	34	50	G	G	G	G	62	48	61	73	50	53	26	27	G
16	24	36	G	24	G	G	G	28	28	50	52	52	G	62	56	74	47	G	41	G	40	26	G	B
17	G	G	G	34	G	26	45	29	43	44	G	48	G	57	54	G	50	61	51	34	32	57	30	G
18	G	G	G	G	G	34	29	36	29	48	G	G	55	53	56	56	60	41	36	28	G	G	G	G
19	G	G	G	29	G	G	35	34	36	36	45	G	50	48	G	G	G	28	G	G	69	G	G	G
20	G	B	G	G	G	B	28	38	39	32	G	48	57	46	G	G	32	G	G	30	31	G	G	G
21	G	G	G	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	39	43	44	G	G	G
22	G	G	G	G	G	25	35	36	48	38	G	49	G	G	G	G	G	33	24	G	G	G	G	G
23	G	G	G	24	28	24	G	G	34	32	G	G	G	70	G	G	G	48	42	40	26	G	G	G
24	G	G	G	G	G	G	G	G	G	47	B	G	G	G	G	G	G	41	49	36	G	G	G	G
25	G	G	G	G	G	G	G	27	G	G	52	G	G	G	G	G	63	45	94	44	60	G	G	G
26	G	G	G	G	G	G	G	G	29	G	G	G	G	G	G	51	53	60	80	46	G	G	G	G
27	56	38	28	34	25	G	G	35	39	56	67	G	G	50	G	G	G	28	25	43	35	36	28	26
28	68	40	44	35	27	G	31	41	54	G	53	G	94	G	51	78	59	G	45	37	94	77	46	58
29	38	G	G	G	G	G	G	29	47	58	56	58	50	G	G	G	G	G	30	24	G	G	G	G
30	G	G	26	30	28	29	G	26	47	61	60	G	G	G	G	G	G	48	48	46	33	34	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	28	30	29	30	30	29	30	30	30	30	30	30	30	30	30	30	30	29	28
MED	G	G	G	G	G	G	G	23	31	32	G	G	G	G	G	G	G	30	34	29	12	G	G	G
U Q	G	G	G	G	G	G	G	31	39	38	51	G	G	46	G	G	38	44	45	37	33	25	G	G
L Q	G	G	G	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	24	G	G	G	G	G

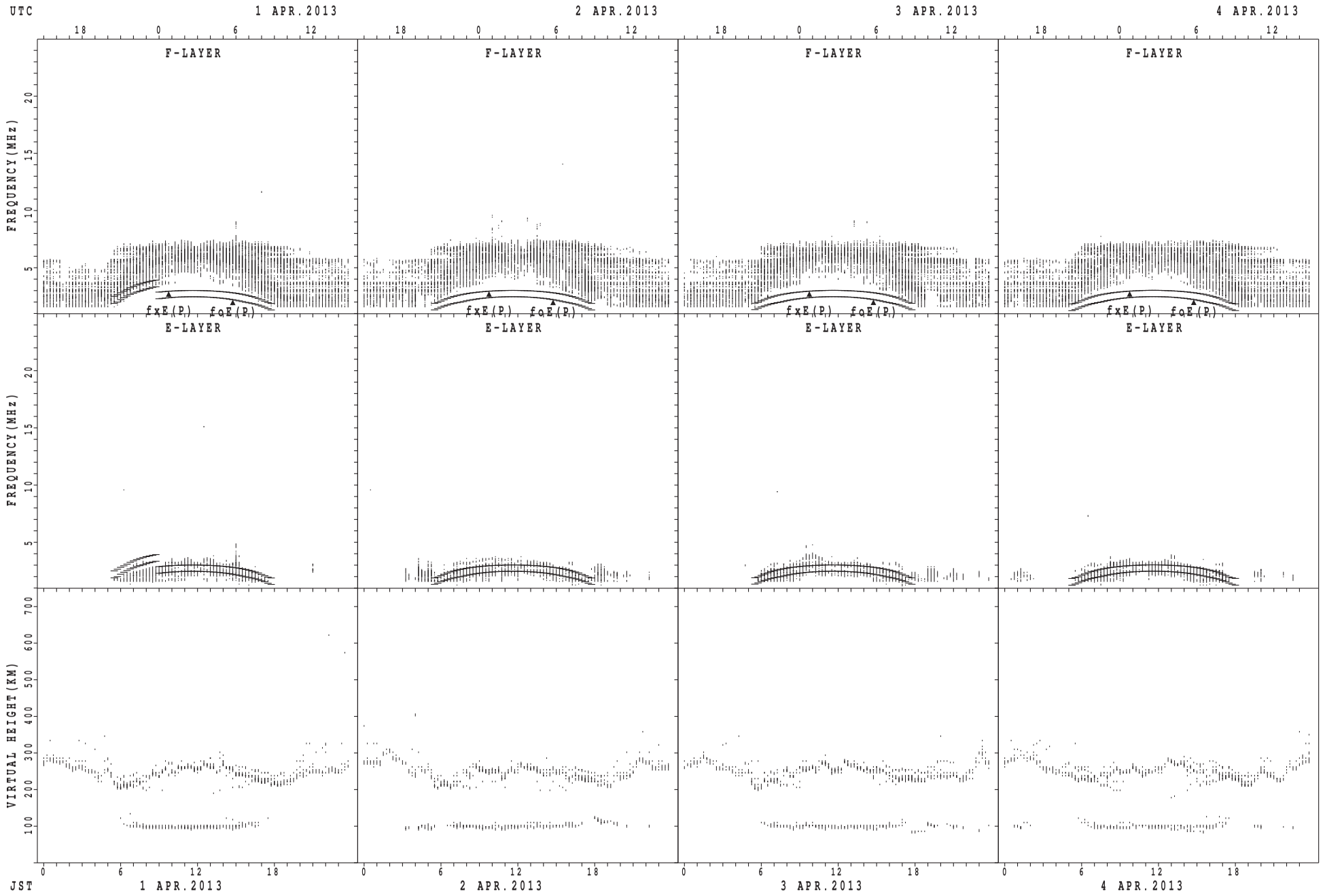
HOURLY VALUES OF fmin AT Okinawa

APR. 2013

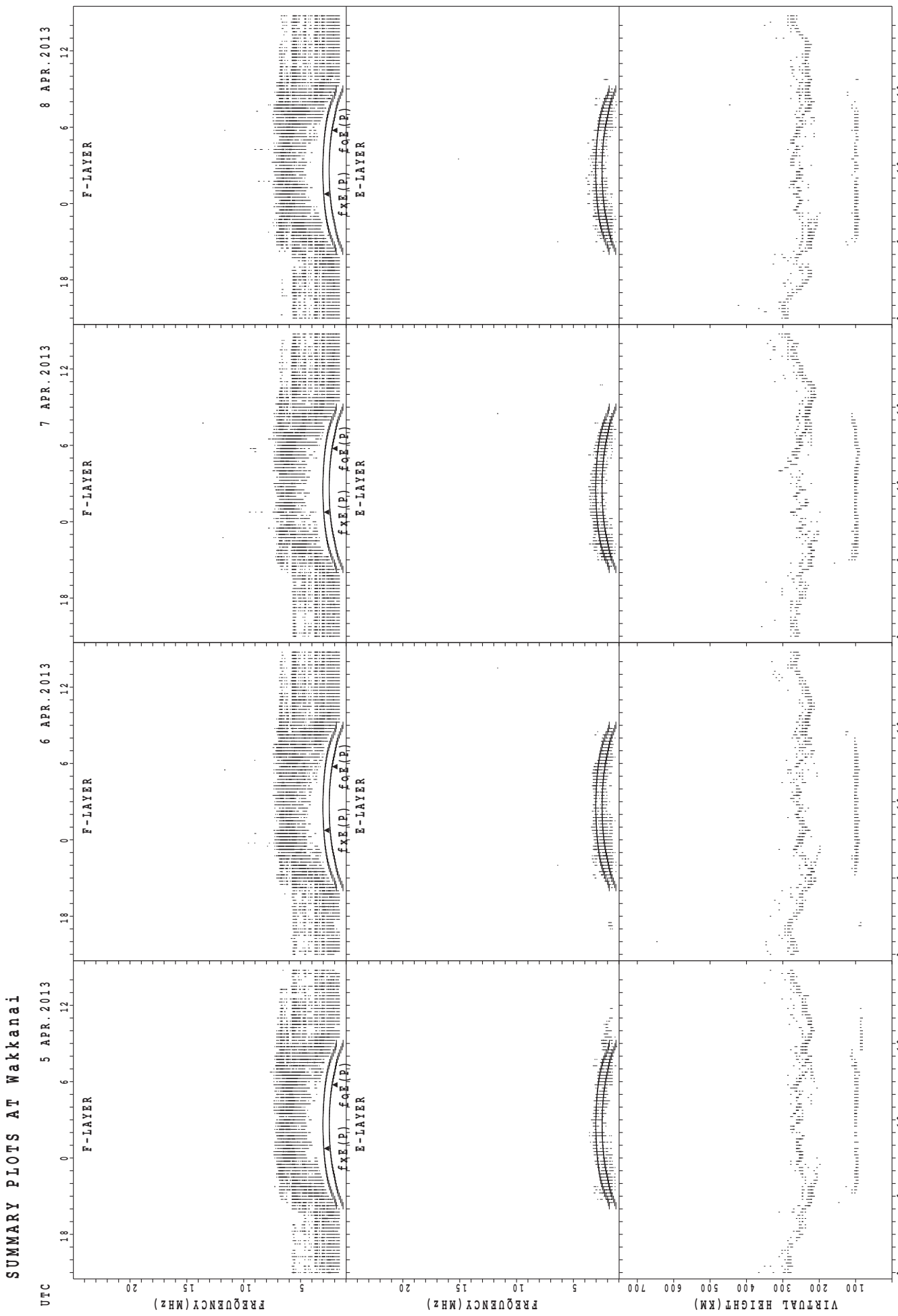
LAT. 26°41.0′N LON. 128°09.0′E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

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	20	15	21	18	18	17	26	18	21	46	52	50	55	53	43	43	18	24	18	15	38	15	15
2	20	16	17	17	17	17	16	27	20	41	43	52	54	52	54	48	39	20	18	16	15	40	16	17
3	16	18	21	15	18	B	15	20	21	21	40	49	42	38	35	40	21	20	27	15	16	15	17	21
4	18	17	22	16	15	15	16	26	18	23	35	54	53	59	51	46	23	18	17	14	15	16	21	40
5	35	20	15	15	18	18	15	27	22	39	44	53	55	52	49	44	50	20	16	18	17	17	16	16
6	42	16	20	16	16	17	18	27	21	44	30	54	53	54	53	49	42	30	21	15	17	16	17	17
7	20	17	17	15	16	17	15	27	20	40	46	48	50	59	56	49	42	14	14	15	15	16	17	18
8	22	15	17	16	15	17	17	28	20	39	47	52	60	53	53	48	42	38	24	15	17	18	B	17
9	15	18	18	15	17	17	18	18	38	42	43	52	53	63	58	56	43	35	29	18	17	24	16	44
10	15	20	17	41	16	15	17	27	21	26	46	53	60	56	53	52	40	34	20	21	20	16	18	B
11	20	16	16	17	16	16	17	28	20	41	48	50	58	59	53	44	44	42	30	17	18	16	15	15
12	17	17	15	15	16	16	15	27	38	40	45	54	53	60	49	50	39	35	29	22	16	42	16	22
13	15	21	16	17	24	20	20	27	21	40	47	52	57	52	50	52	44	32	22	17	15	20	20	66
14	42	17	21	20	15	16	15	17	21	42	49	52	57	60	46	50	40	36	23	15	15	18	22	18
15	18	16	20	17	18	20	20	15	20	26	45	49	54	56	49	38	38	21	18	15	16	15	15	40
16	17	15	15	16	17	16	17	20	18	26	39	40	52	40	40	39	33	40	16	14	14	17	17	B
17	71	22	18	17	20	15	14	16	22	30	44	54	53	44	42	48	33	27	16	15	20	16	21	42
18	22	38	20	20	21	20	15	15	20	21	46	57	42	42	42	40	34	24	18	18	20	16	23	44
19	20	21	16	14	17	20	14	18	22	28	46	45	43	60	53	45	21	17	27	17	14	18	18	21
20	15	B	18	14	17	B	14	14	18	21	50	30	39	35	59	55	21	40	23	15	15	20	15	52
21	18	18	16	15	17	18	18	27	33	44	49	53	59	60	53	58	57	40	22	17	17	20	42	18
22	17	18	17	21	27	16	14	17	18	22	53	39	60	72	66	54	42	17	14	18	17	39	23	18
23	20	22	17	16	16	16	17	15	40	23	51	54	62	42	55	49	45	29	22	15	17	14	20	43
24	18	20	21	21	16	66	20	29	21	34	B	56	53	53	68	50	40	16	15	15	16	21	20	20
25	17	17	17	20	23	17	20	28	20	43	40	60	59	50	49	47	38	30	17	15	18	15	20	16
26	18	18	18	18	15	17	18	29	18	40	50	66	55	53	54	54	39	28	20	18	17	18	17	16
27	15	15	14	17	17	20	20	17	41	39	40	50	58	43	53	52	44	38	17	18	15	15	16	14
28	15	15	16	17	15	27	16	20	30	44	40	63	43	73	43	42	38	34	20	15	17	18	30	20
29	18	23	17	18	20	18	18	27	33	39	43	42	43	59	60	53	45	40	29	15	15	14	39	20
30	21	38	15	18	18	14	21	20	23	38	40	54	54	60	68	64	50	28	18	21	17	15	41	75
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	30	30	28	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	29	28
MED	18	18	17	17	17	17	17	26	21	39	45	52	54	54	53	49	40	30	20	16	16	17	18	20
U Q	20	20	18	18	18	19	18	27	23	41	47	54	58	60	55	52	44	36	24	18	17	20	21	41
L Q	17	16	16	15	16	16	15	17	20	26	40	49	50	50	49	44	38	20	17	15	15	16	16	17

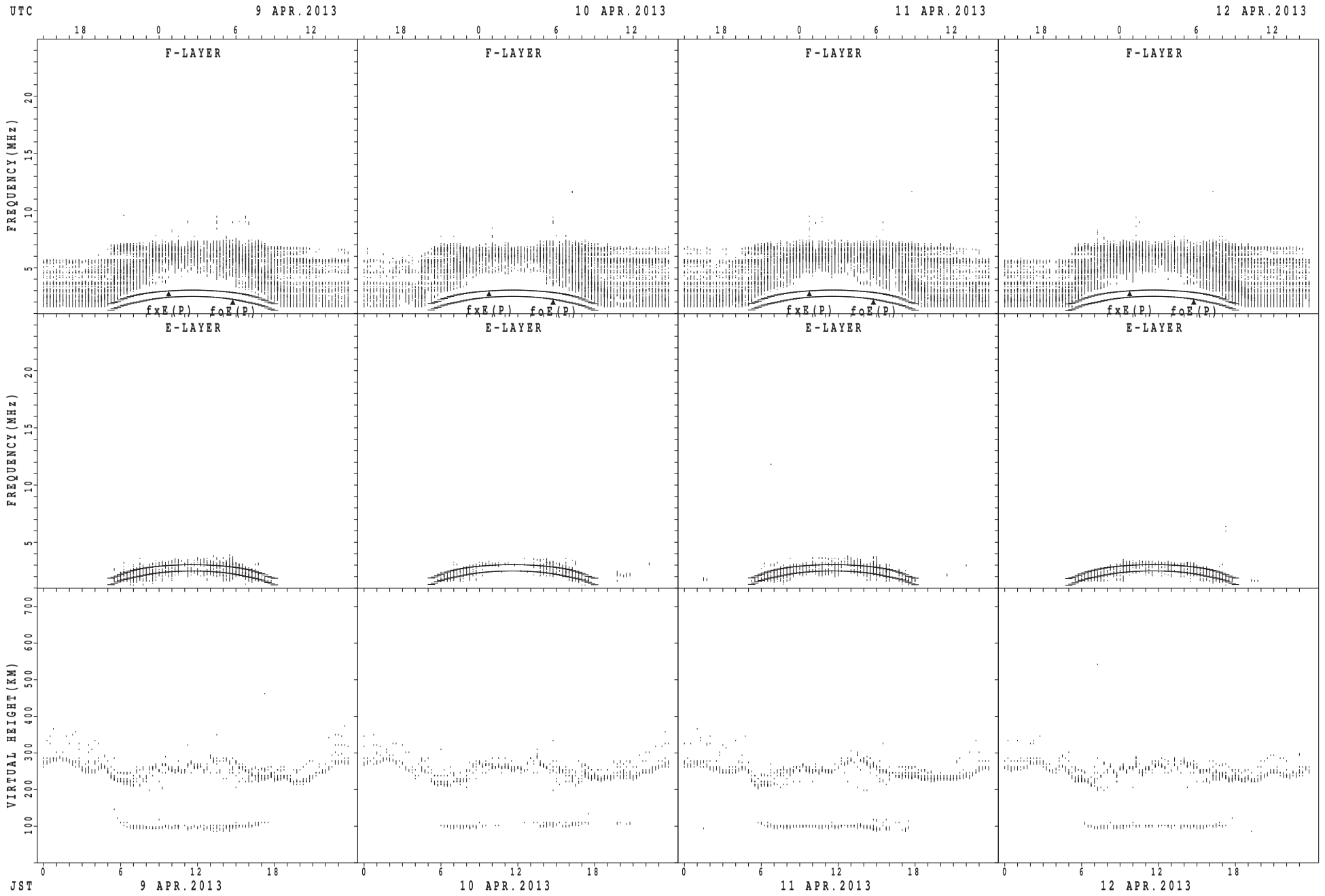
SUMMARY PLOTS AT Wakkanai



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

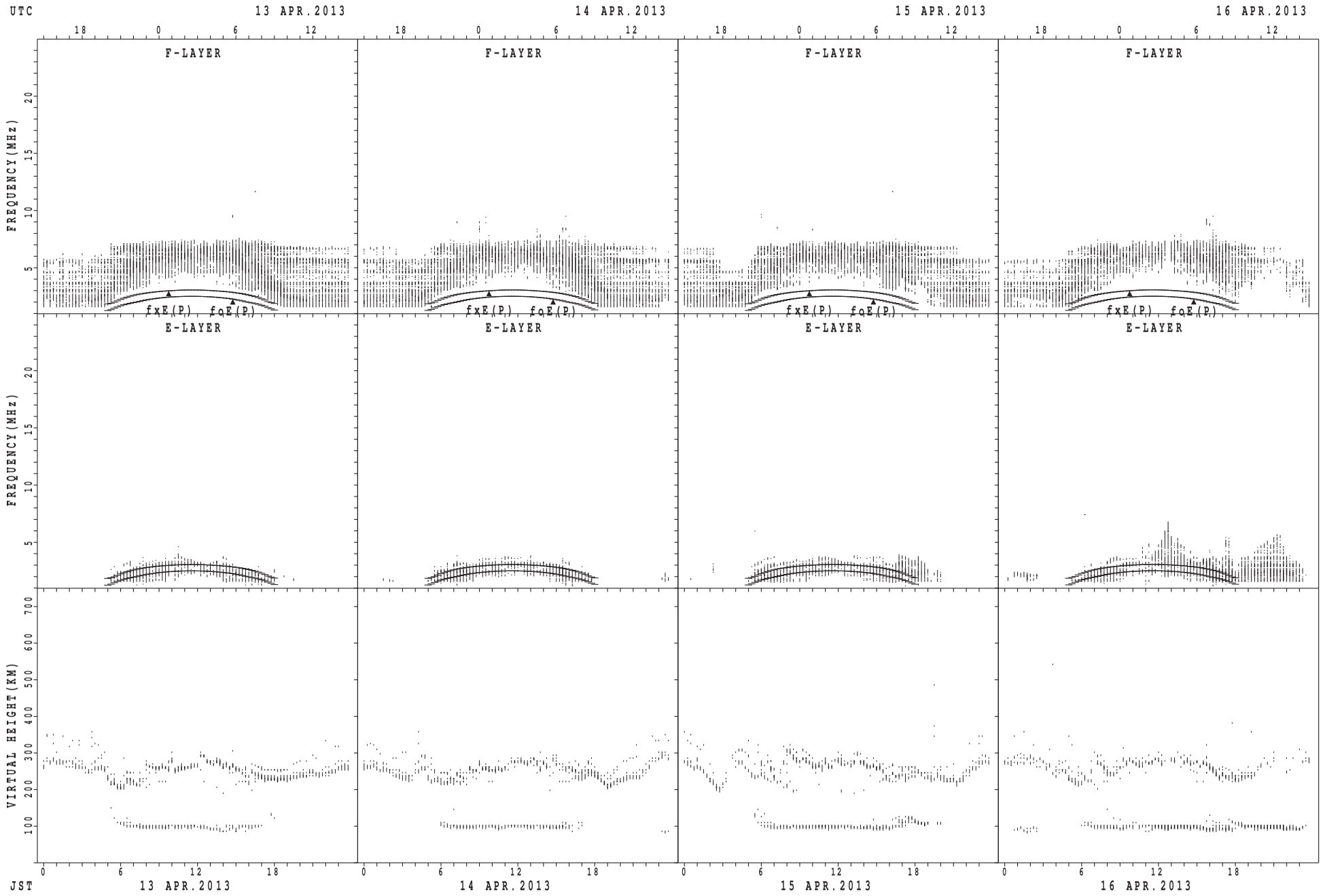

SUMMARY PLOTS AT Wakkanai
UTC
JST
5 APR.2013
6 APR.2013
7 APR.2013
8 APR.2013
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



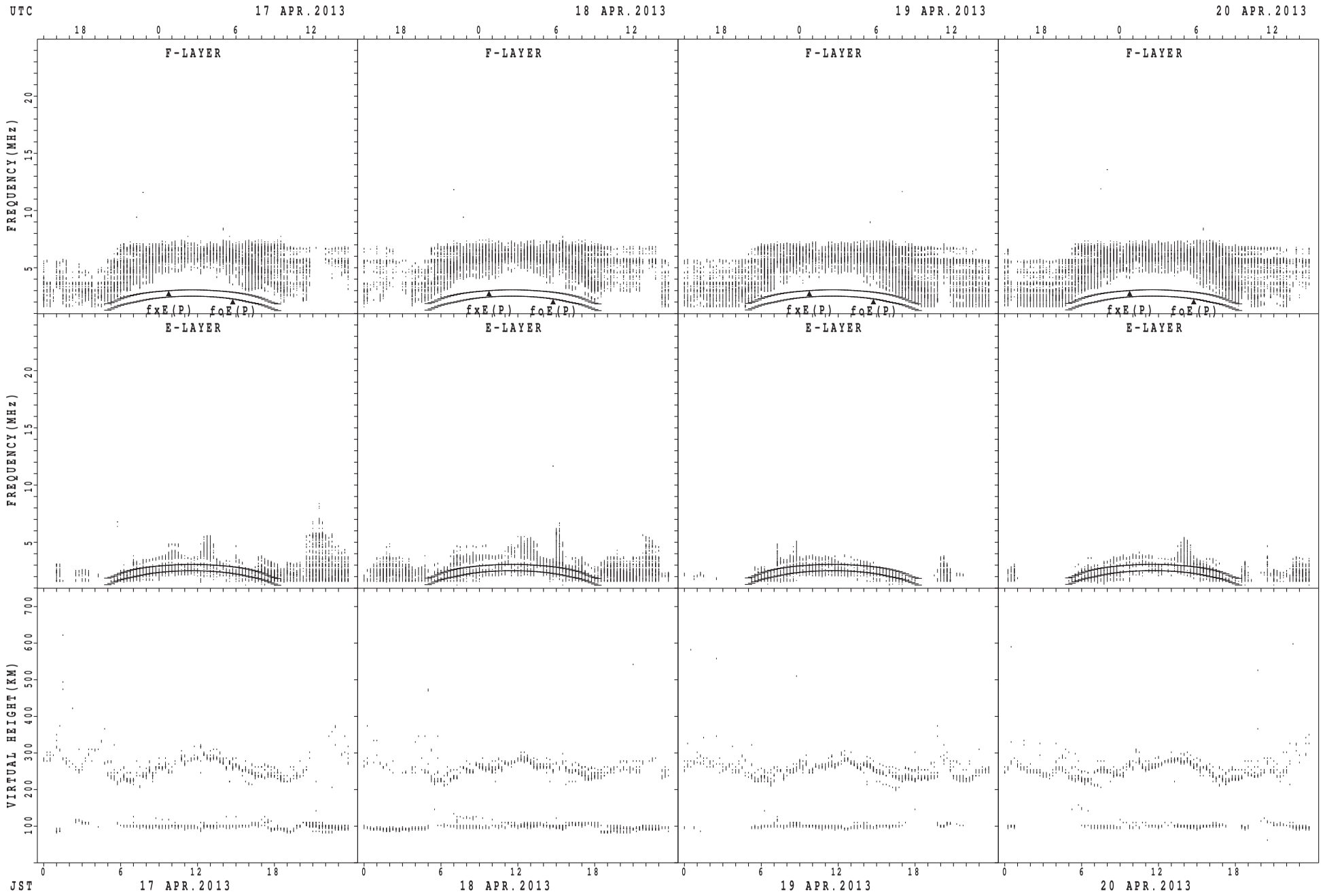
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



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

SUMMARY PLOTS AT Wakkanai



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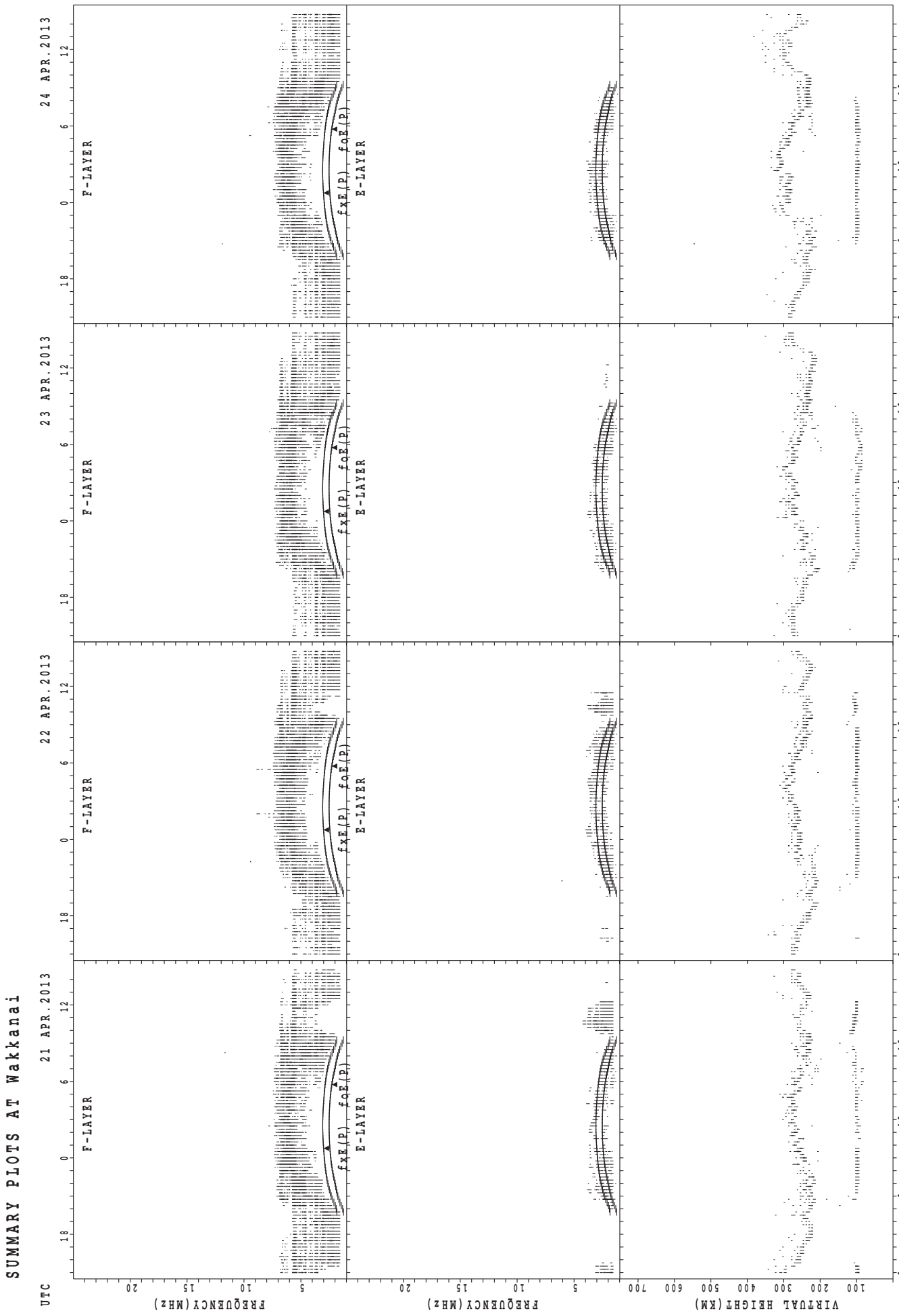
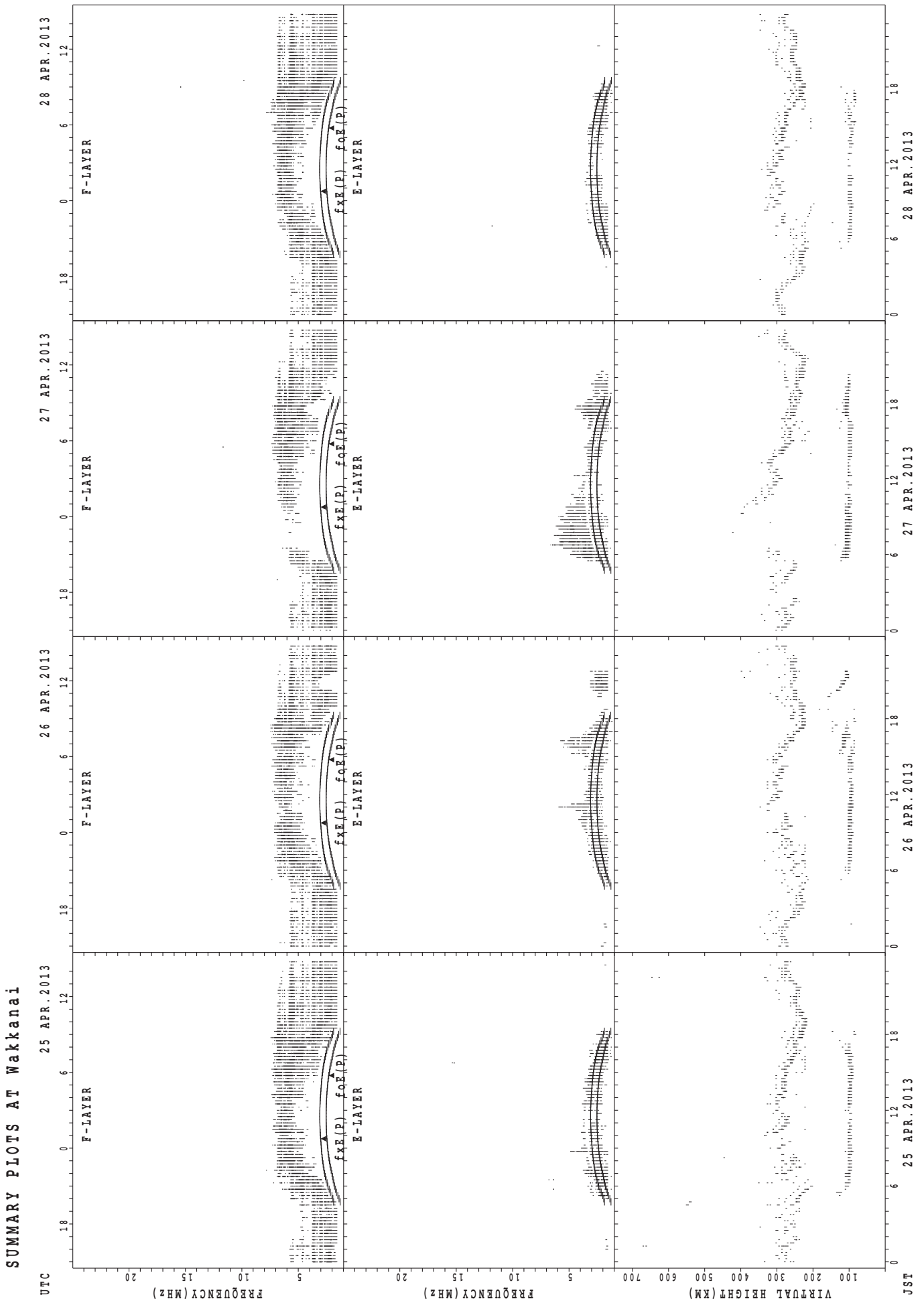
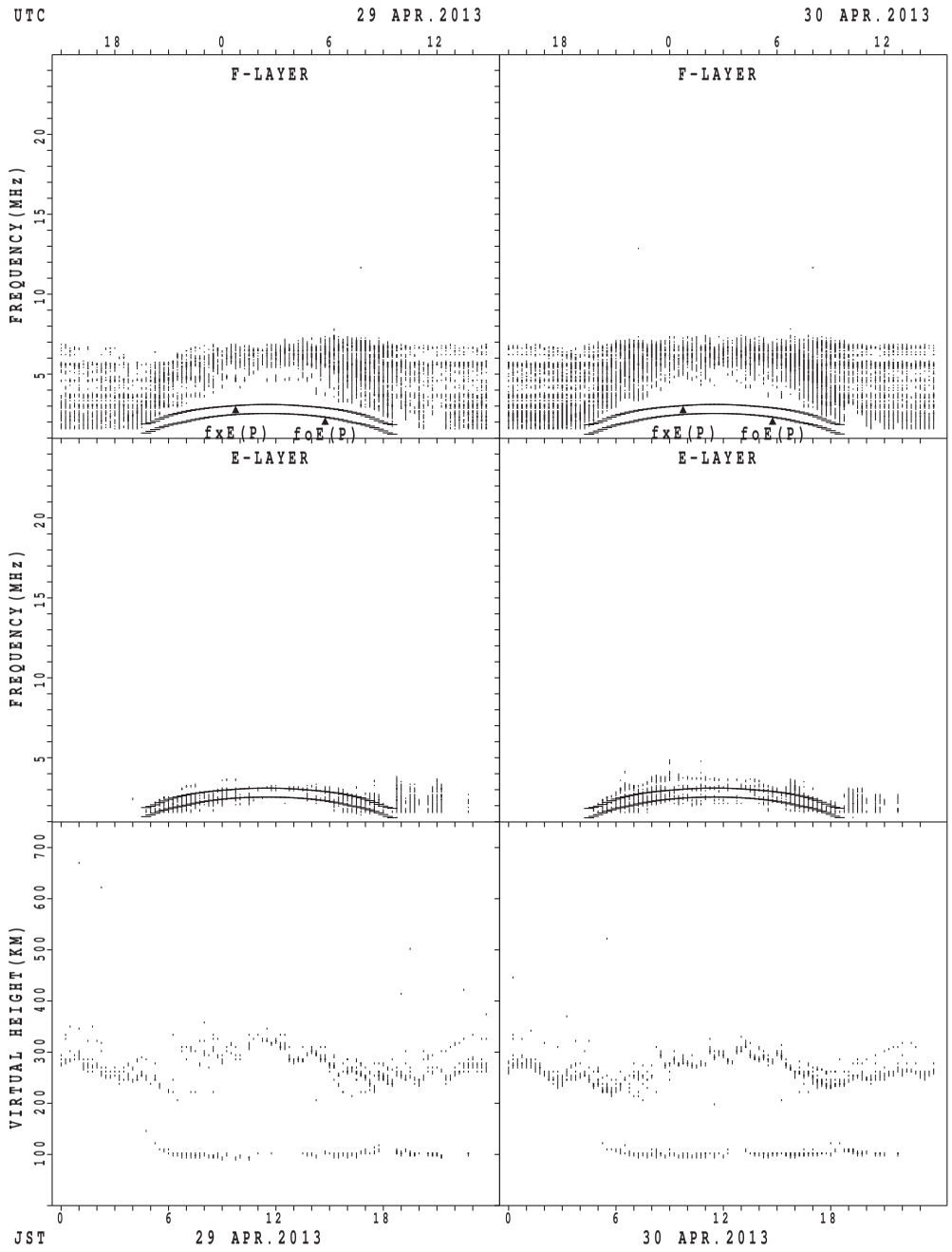
foE(P); PREDICTED VALUE FOR foE

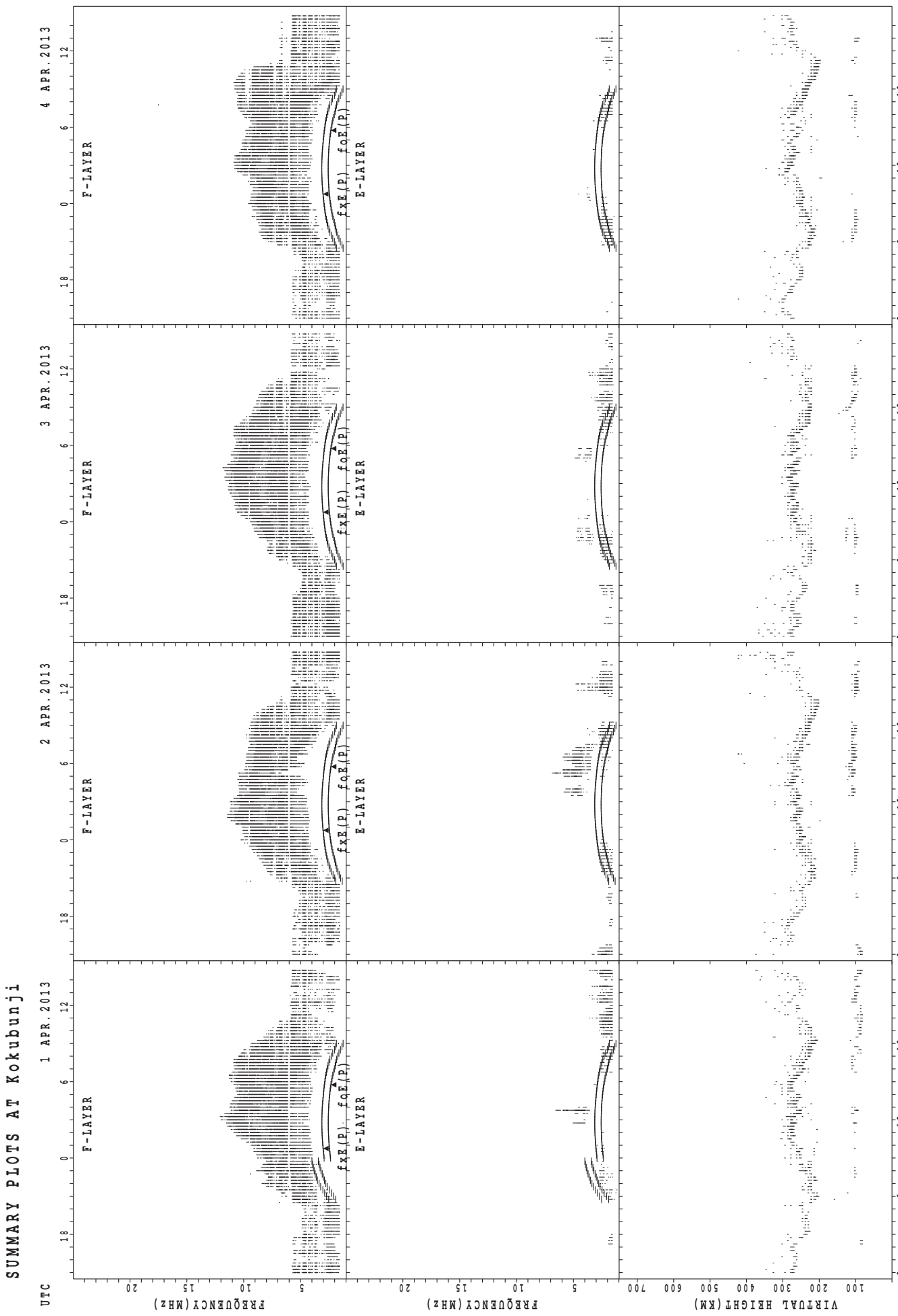

SUMMARY PLOTS AT Wakkanai
UTC
JST
21 APR.2013
22 APR.2013
23 APR.2013
24 APR.2013
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
25 APR.2013
26 APR.2013
27 APR.2013
28 APR.2013
F-LAYER
E-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

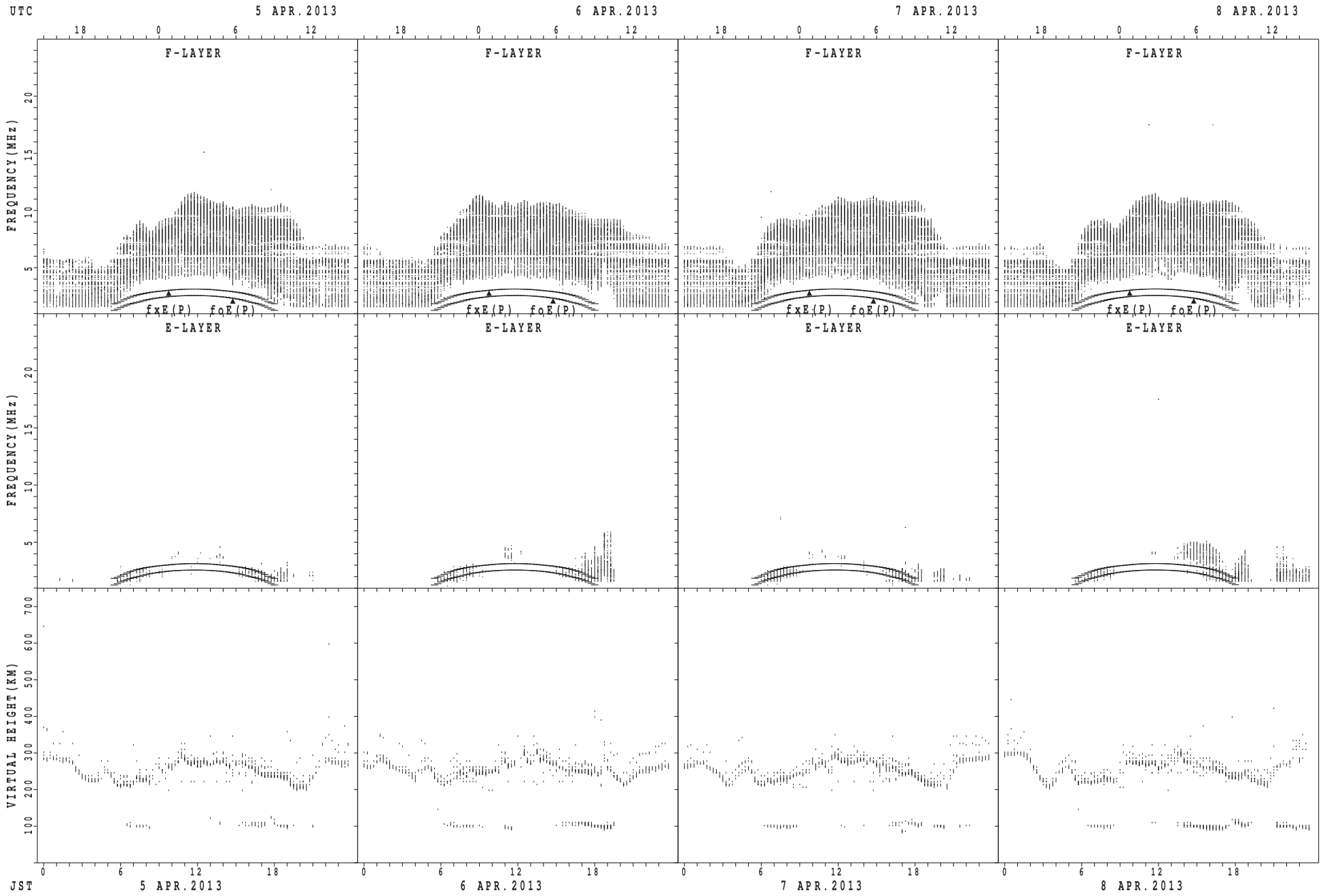
SUMMARY PLOTS AT Wakkanai



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

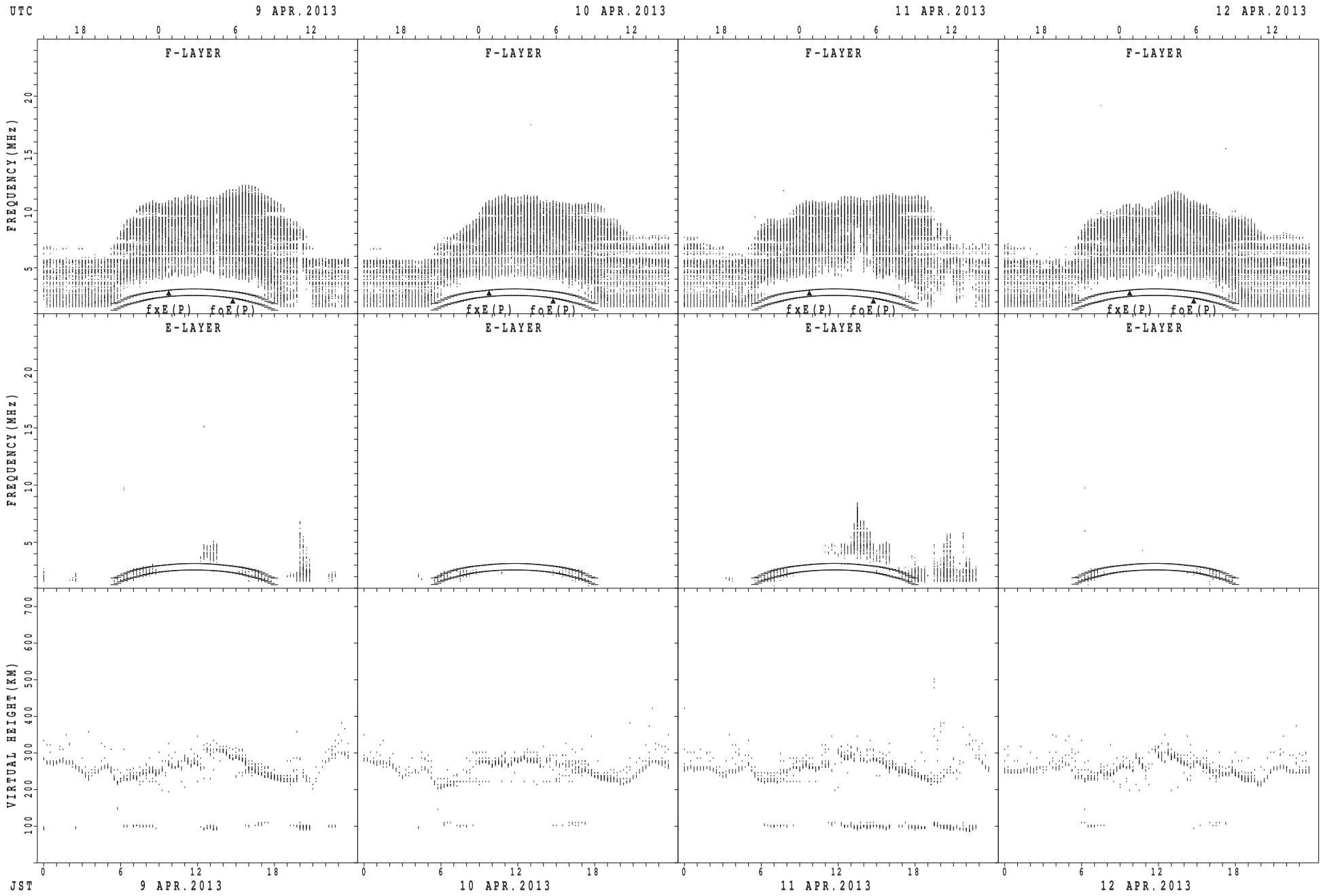

SUMMARY PLOTS AT Kokubunji
UTC
JST
1 APR.2013
2 APR.2013
3 APR.2013
4 APR.2013
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



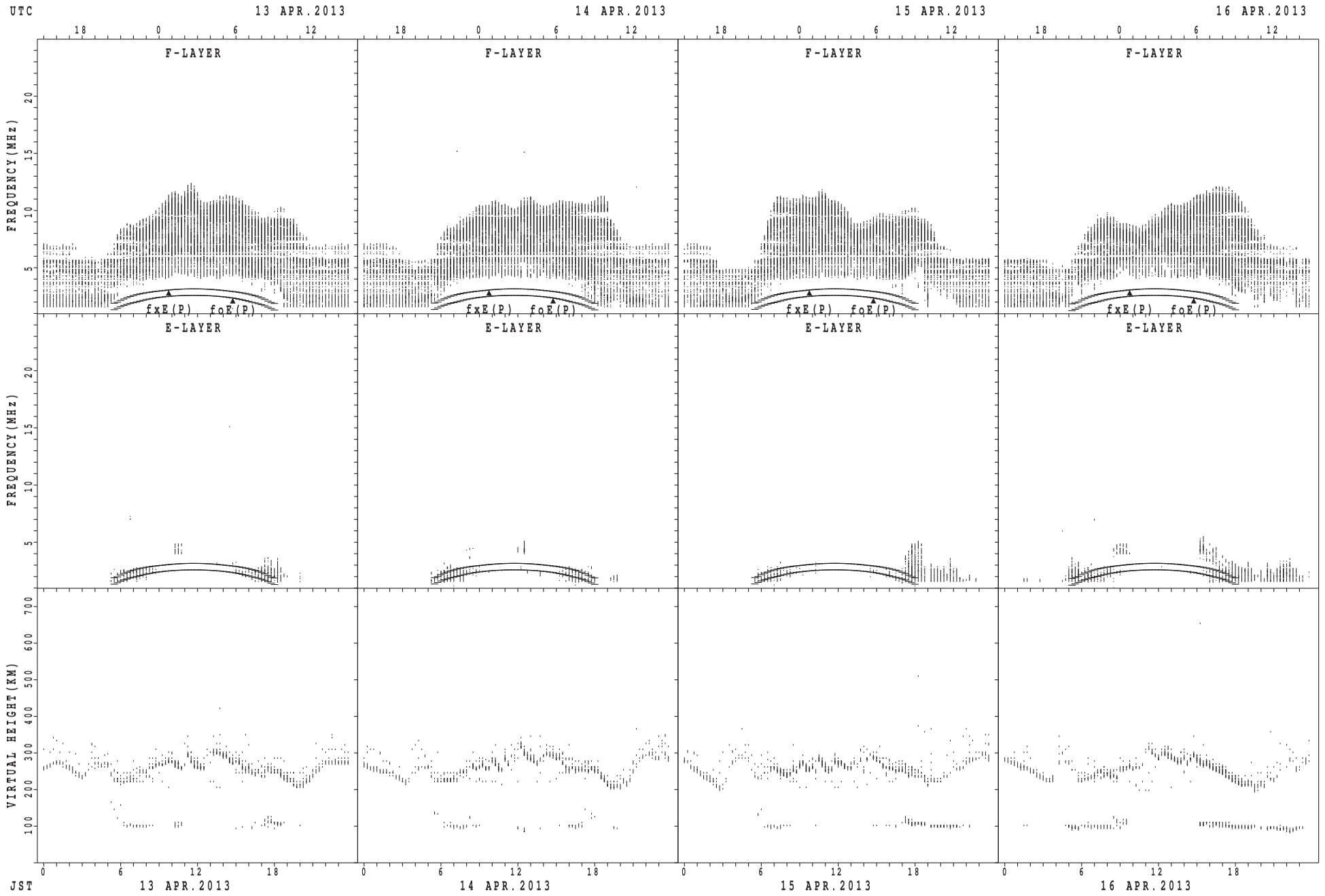
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



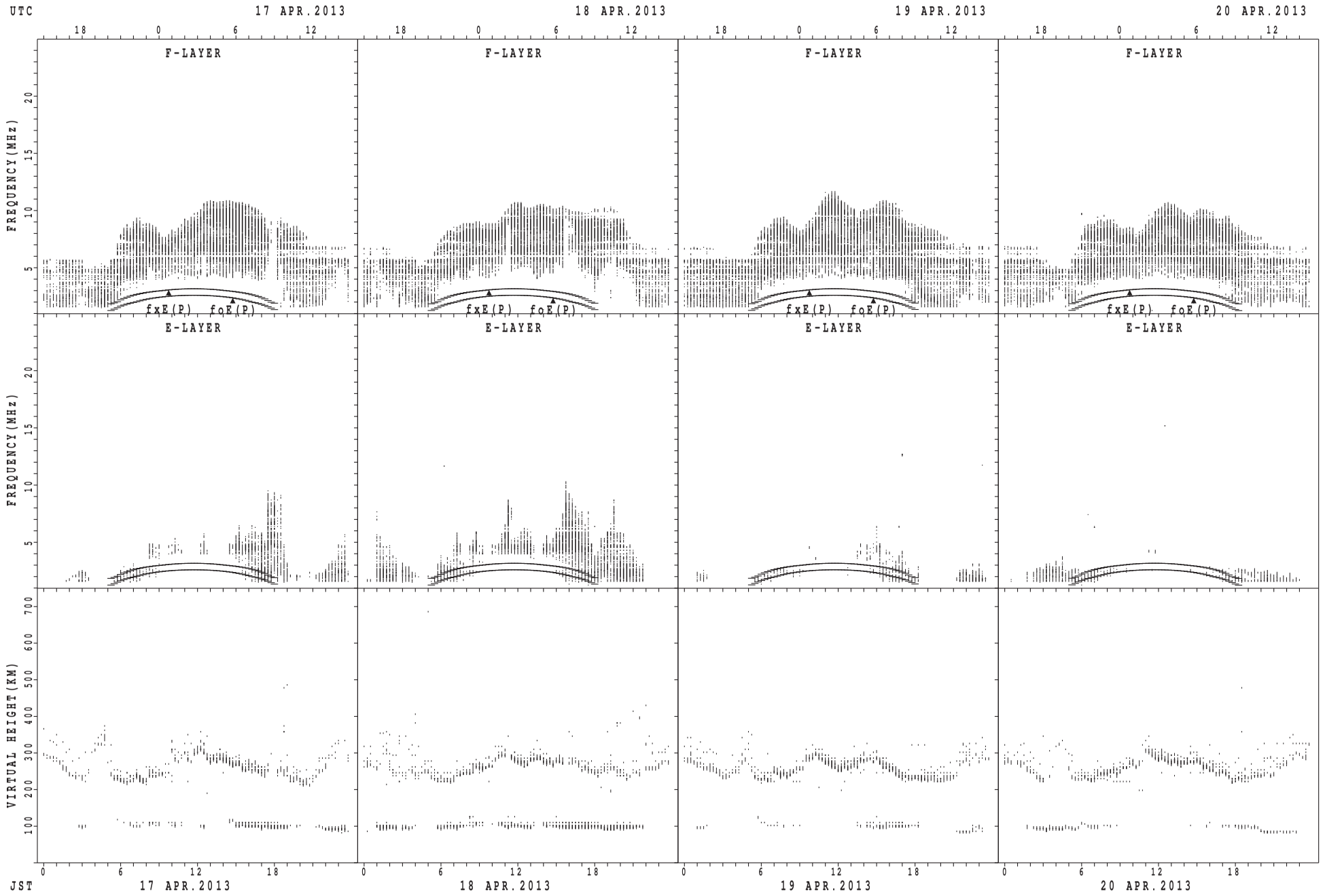
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



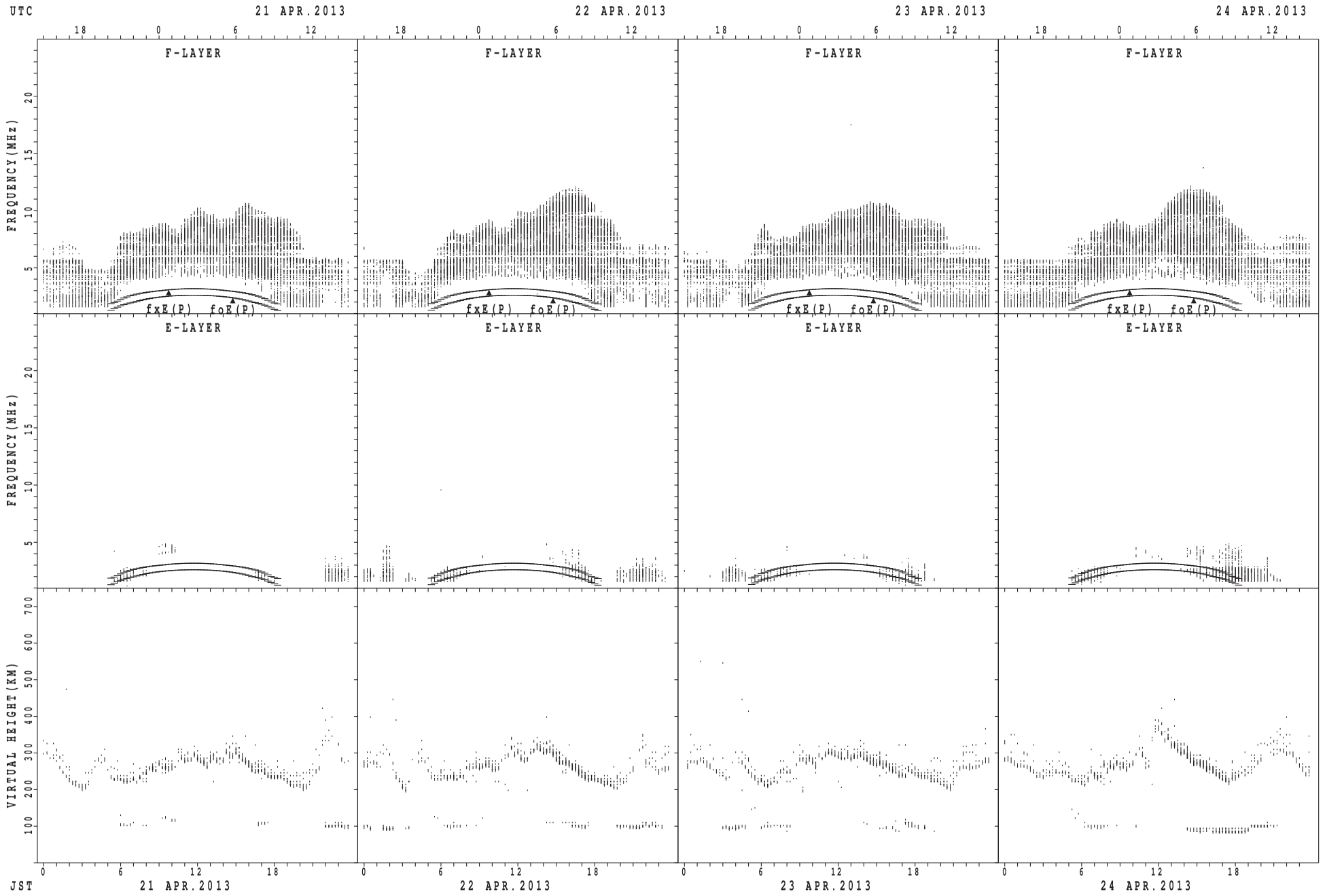
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



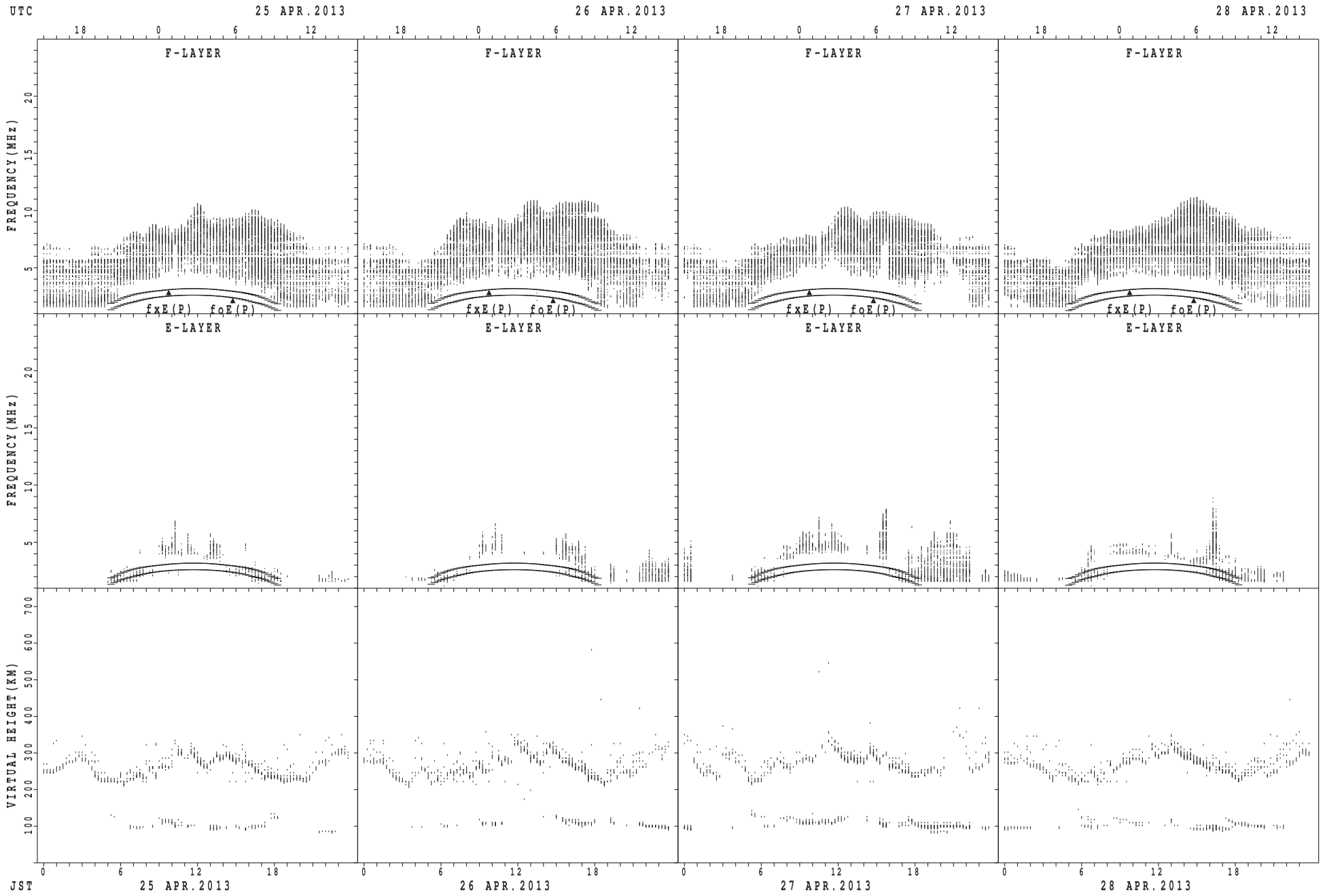
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



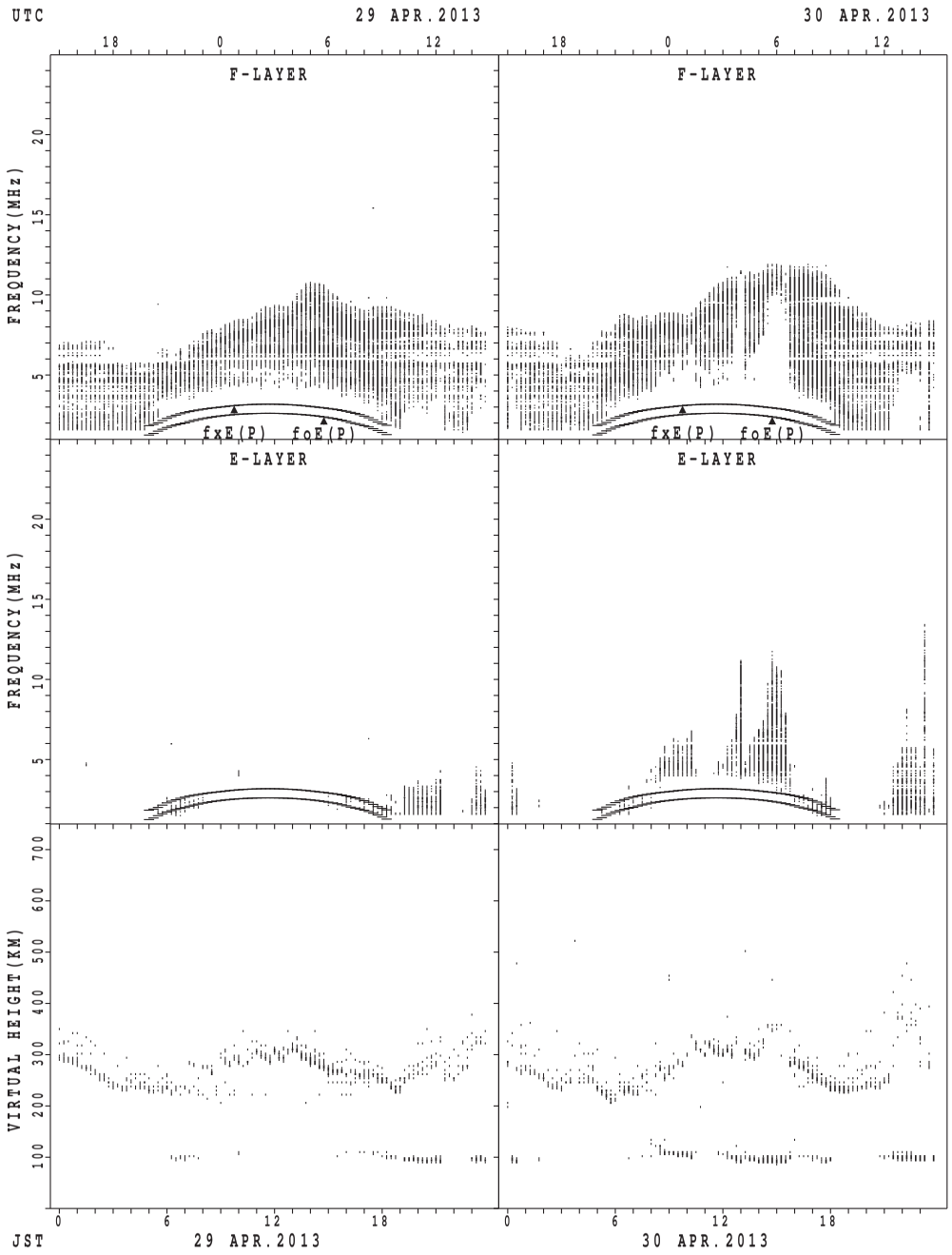
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

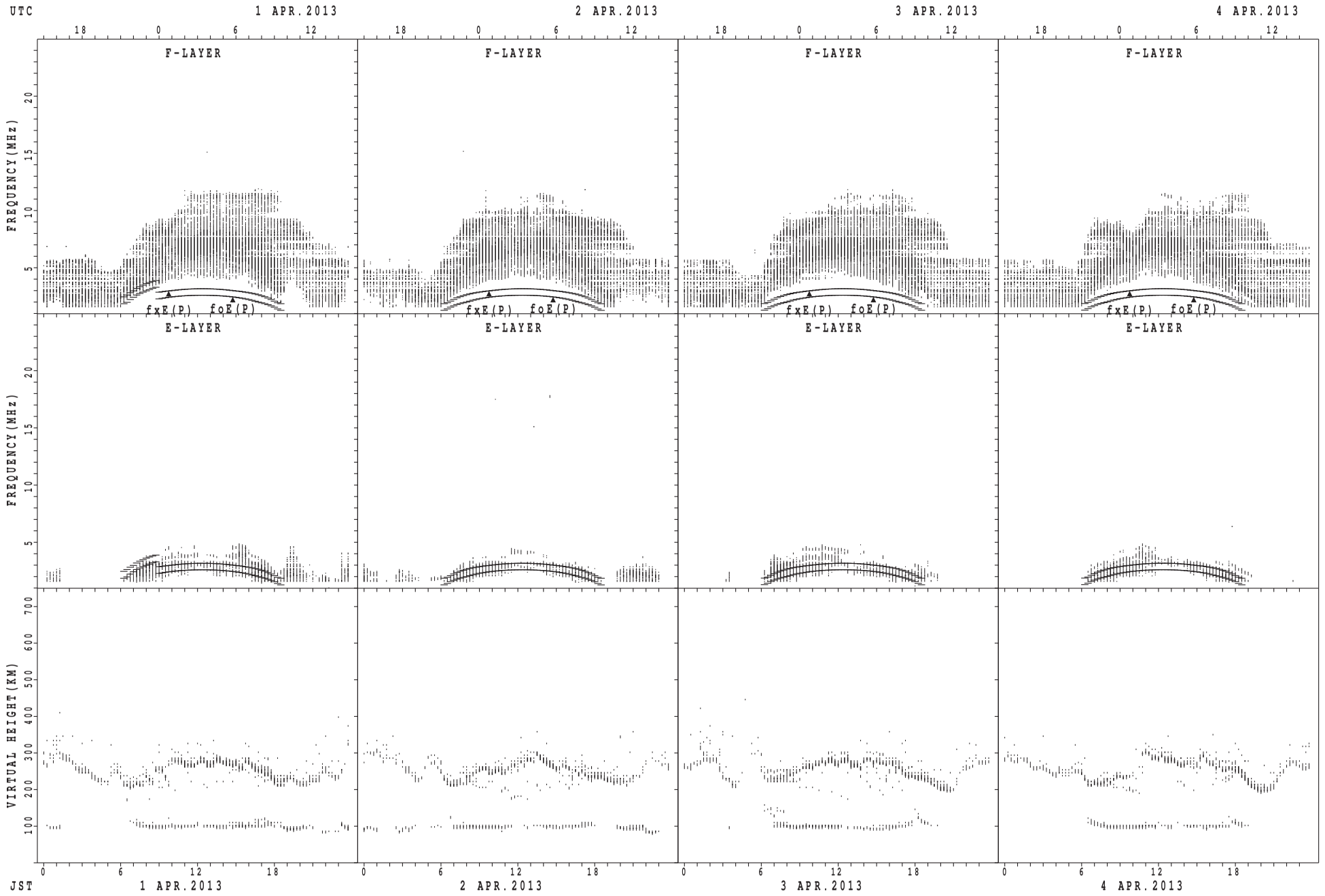


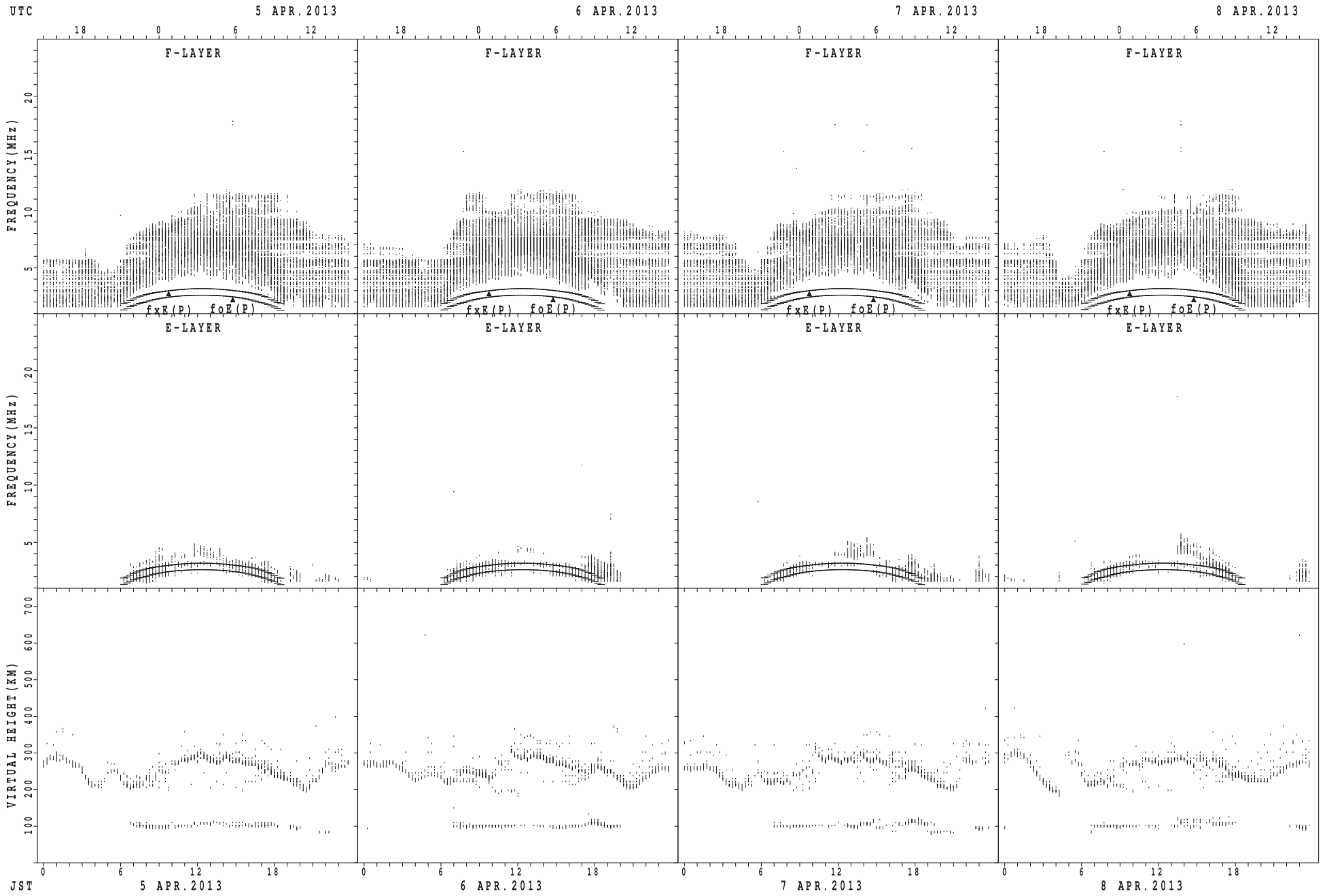
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

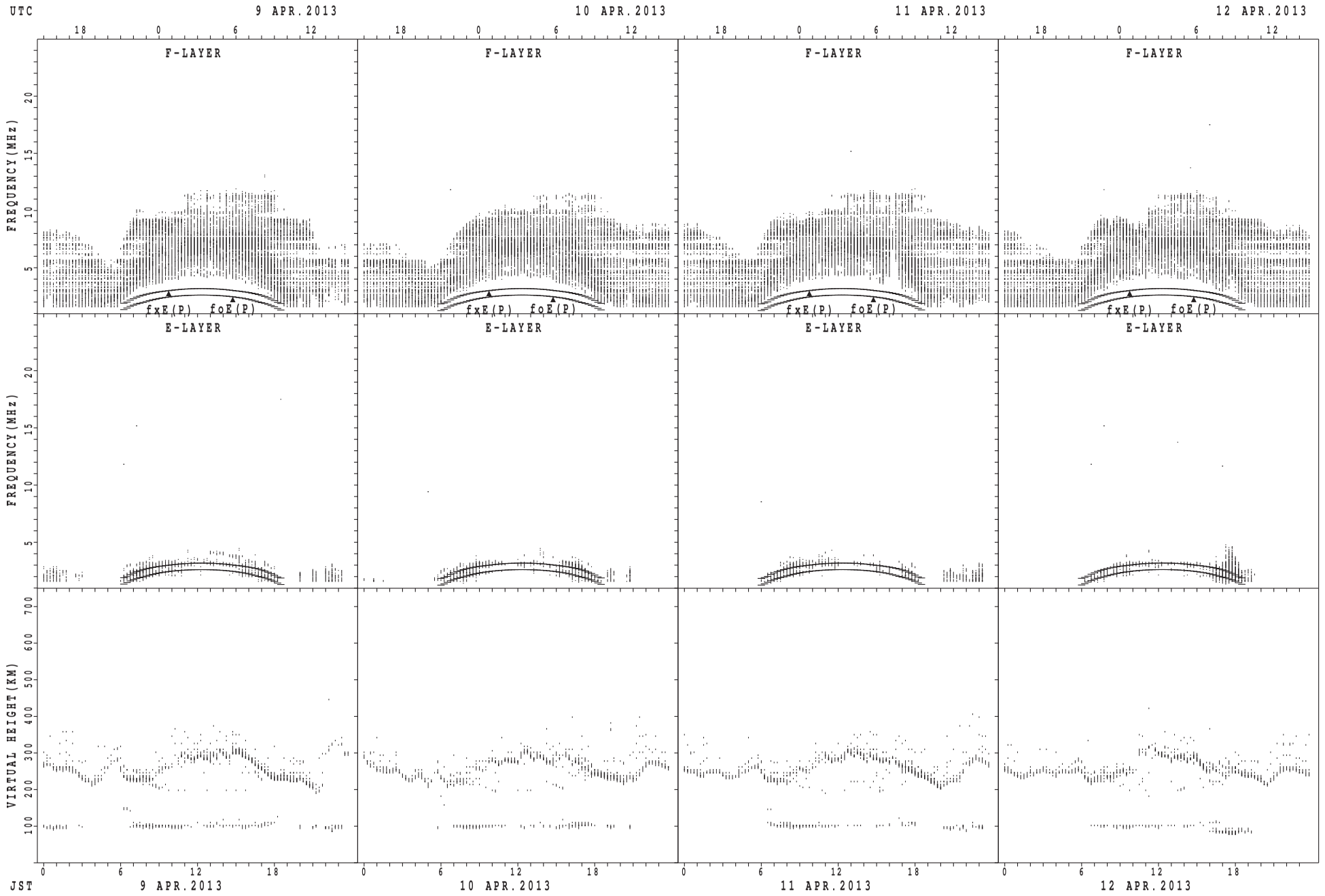


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Yamagawa
UTC
1 APR.2013
2 APR.2013
3 APR.2013
4 APR.2013
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

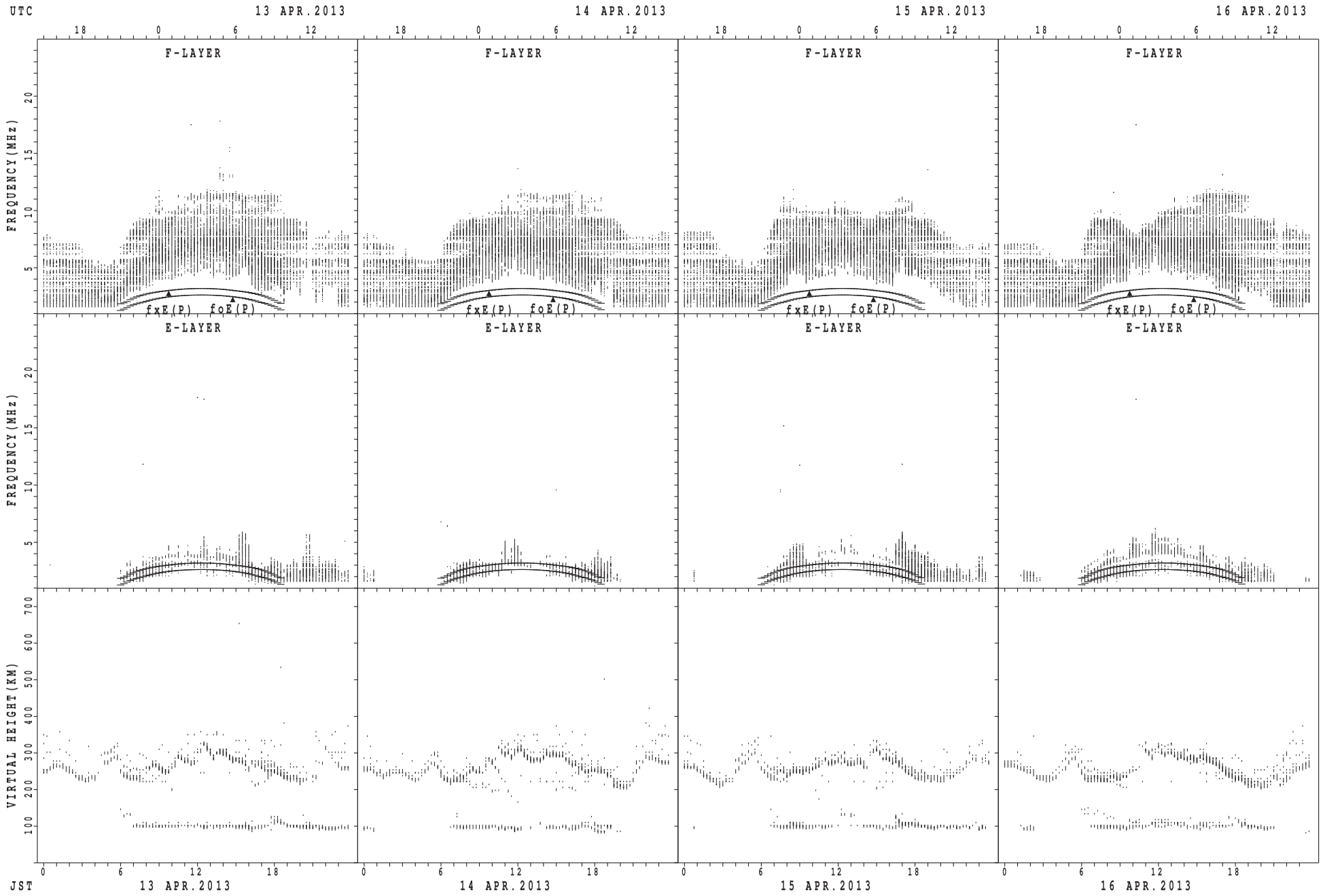

SUMMARY PLOTS AT Yamagawa
UTC
5 APR.2013
6 APR.2013
7 APR.2013
8 APR.2013
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

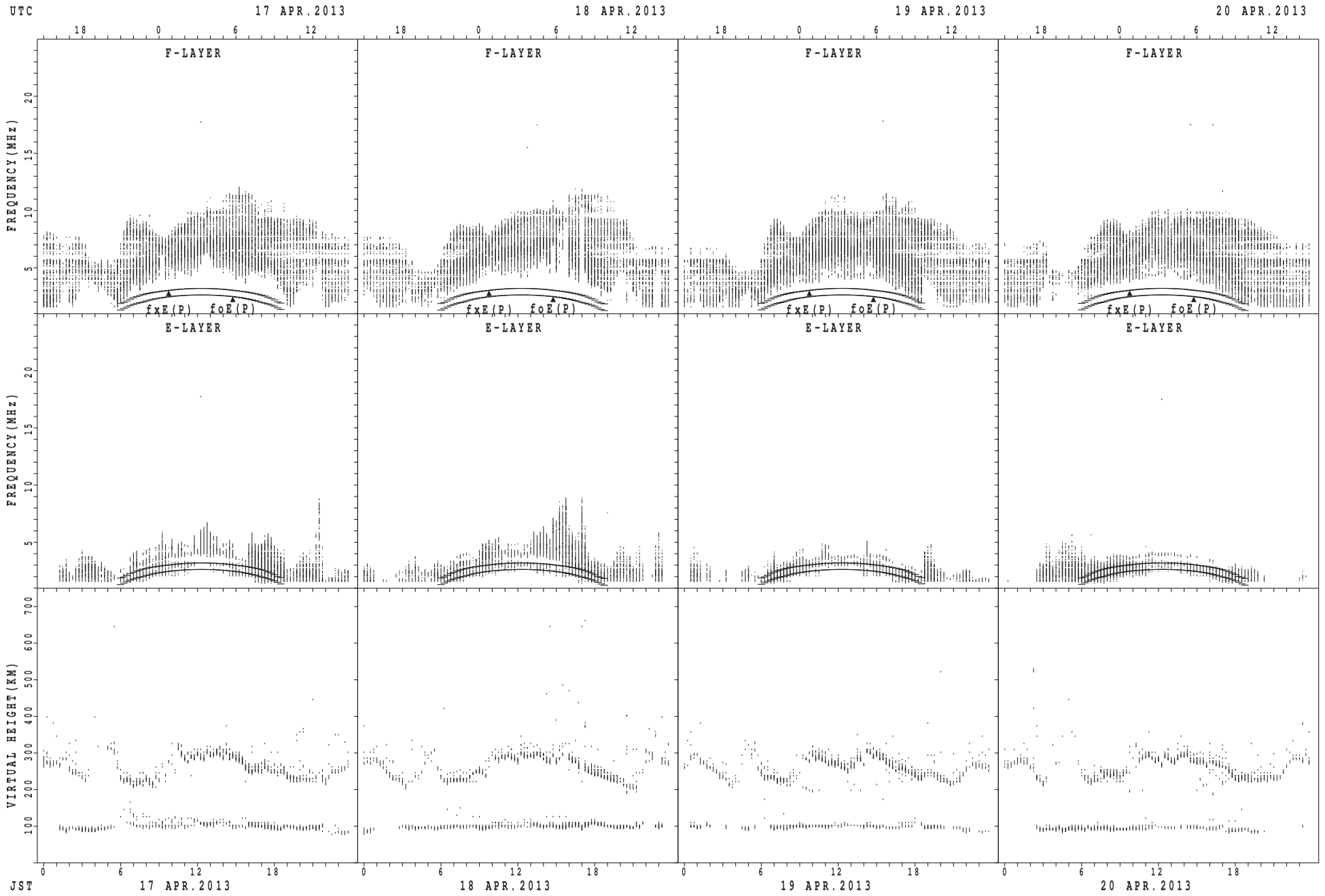


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

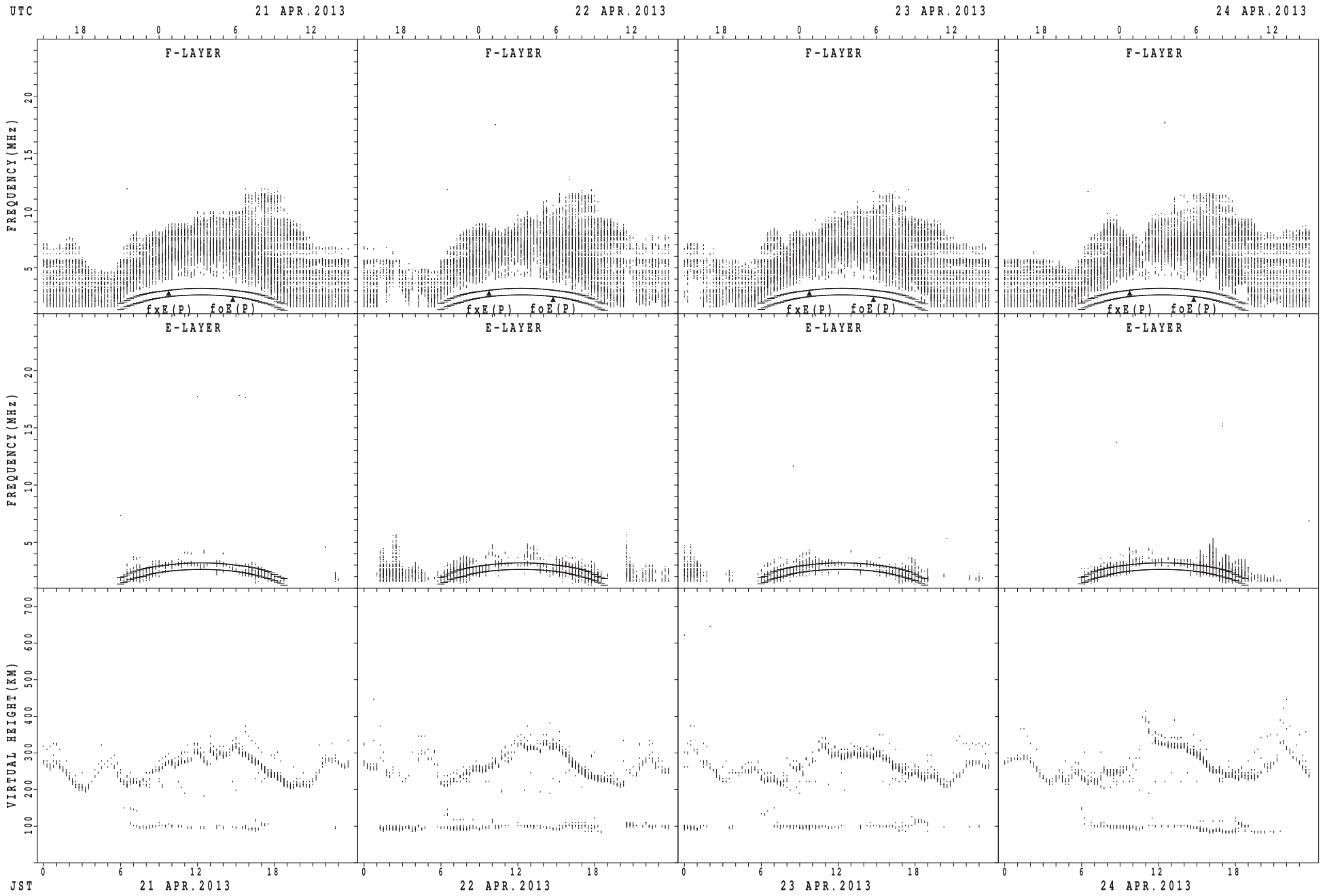
SUMMARY PLOTS AT Yamagawa



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

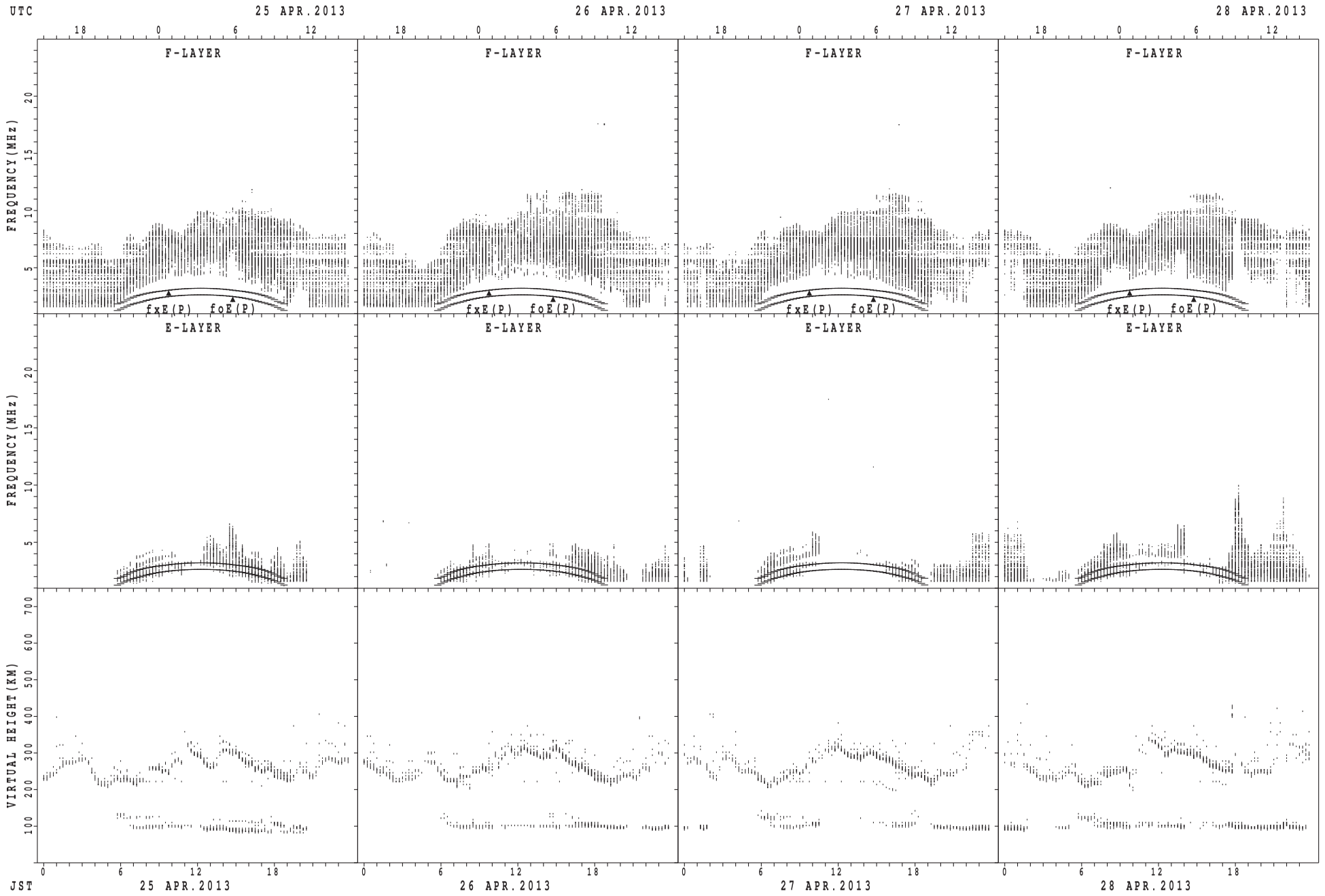

SUMMARY PLOTS AT Yamagawa
UTC
17 APR.2013
18 APR.2013
19 APR.2013
20 APR.2013
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

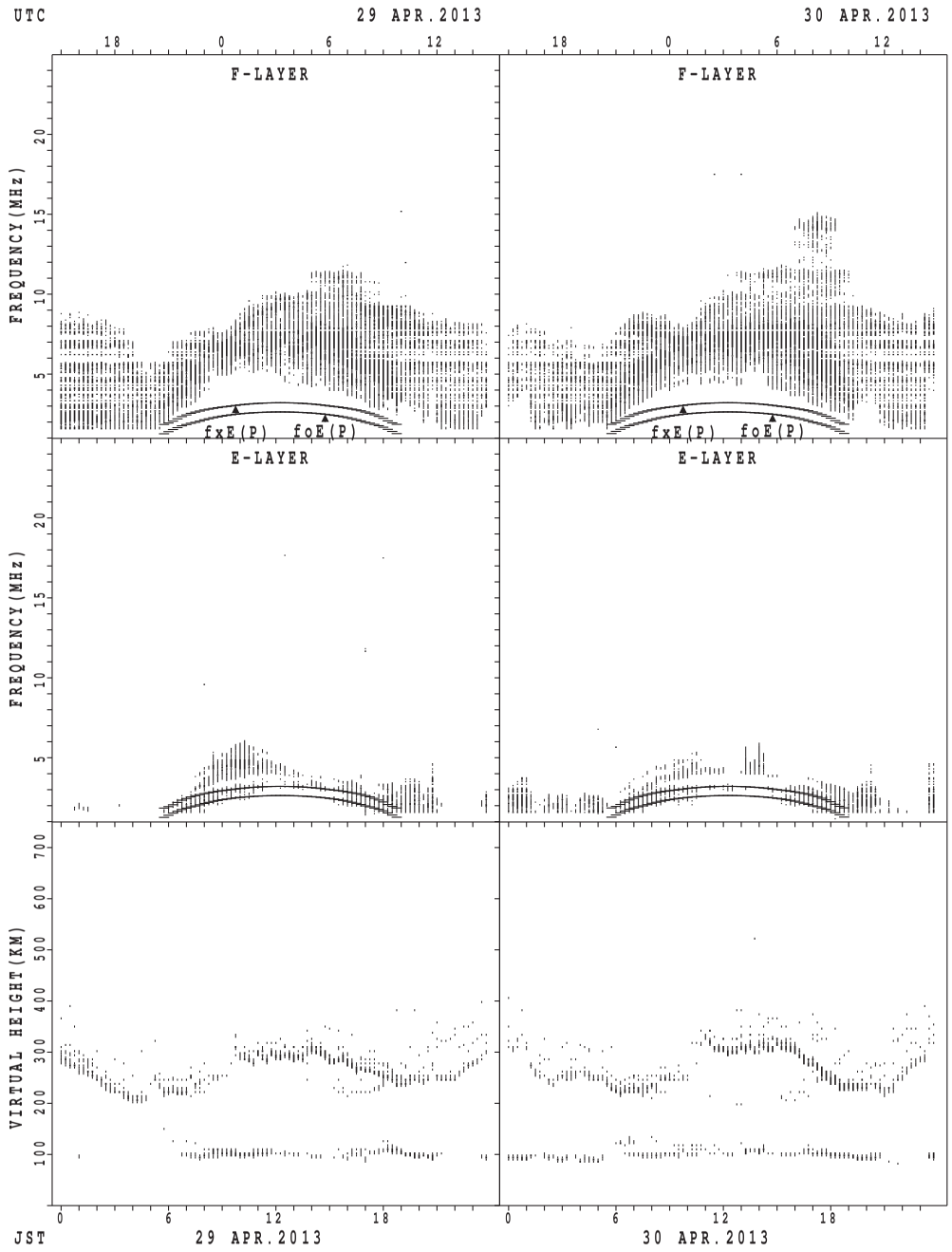


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

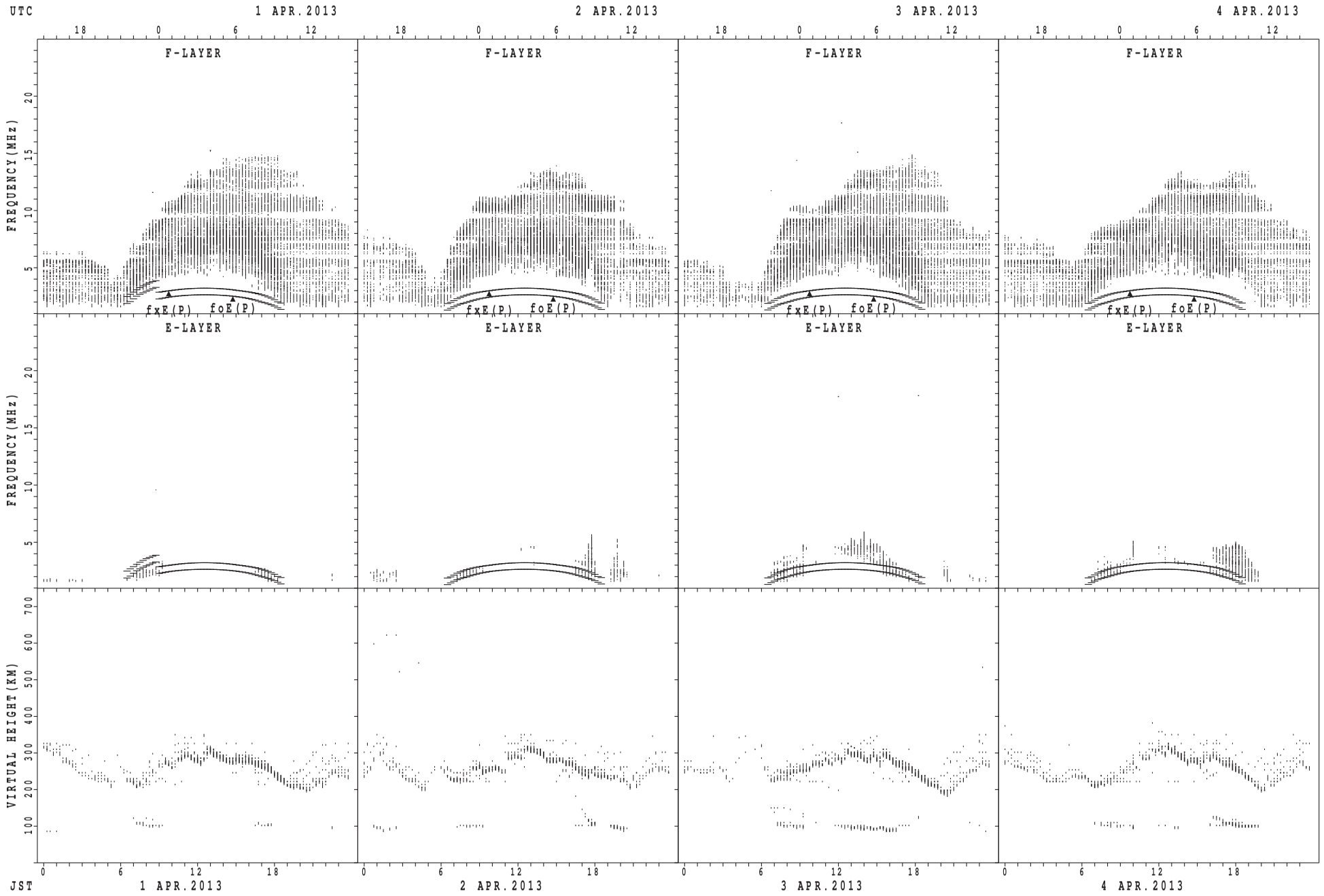
SUMMARY PLOTS AT Yamagawa



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

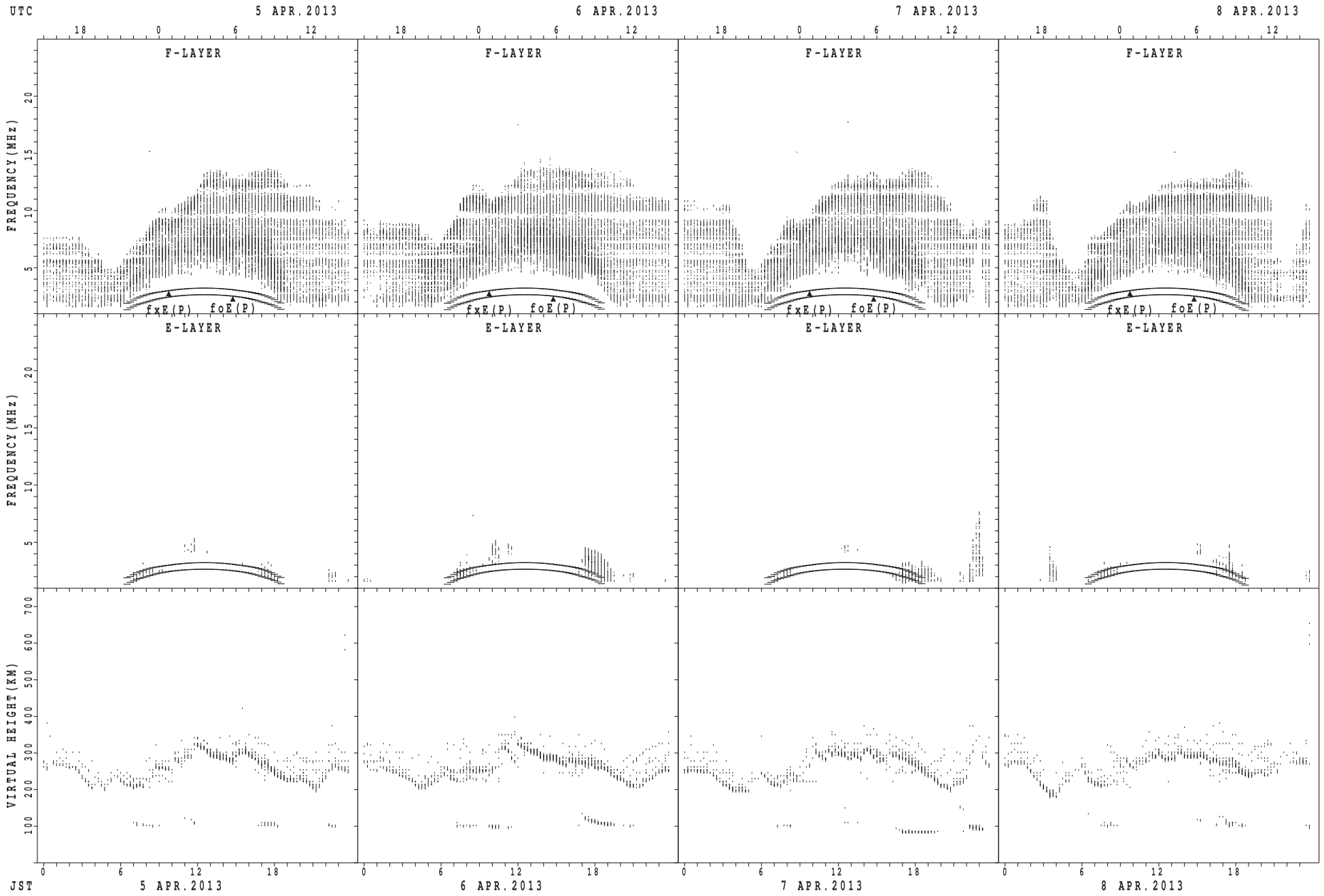

SUMMARY PLOTS AT Yamagawa
UTC
29 APR.2013
30 APR.2013
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
JST
29 APR.2013
30 APR.2013
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



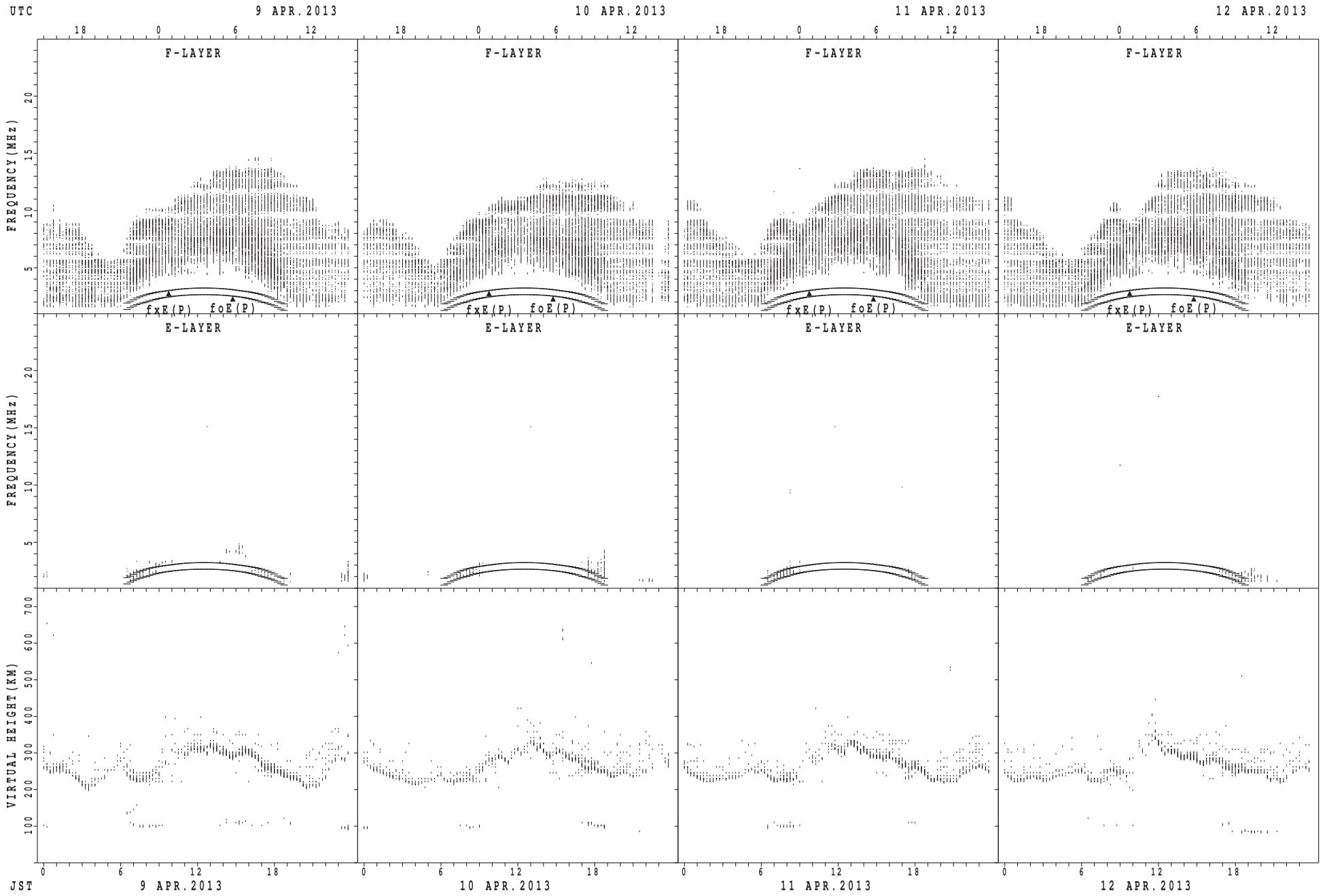
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



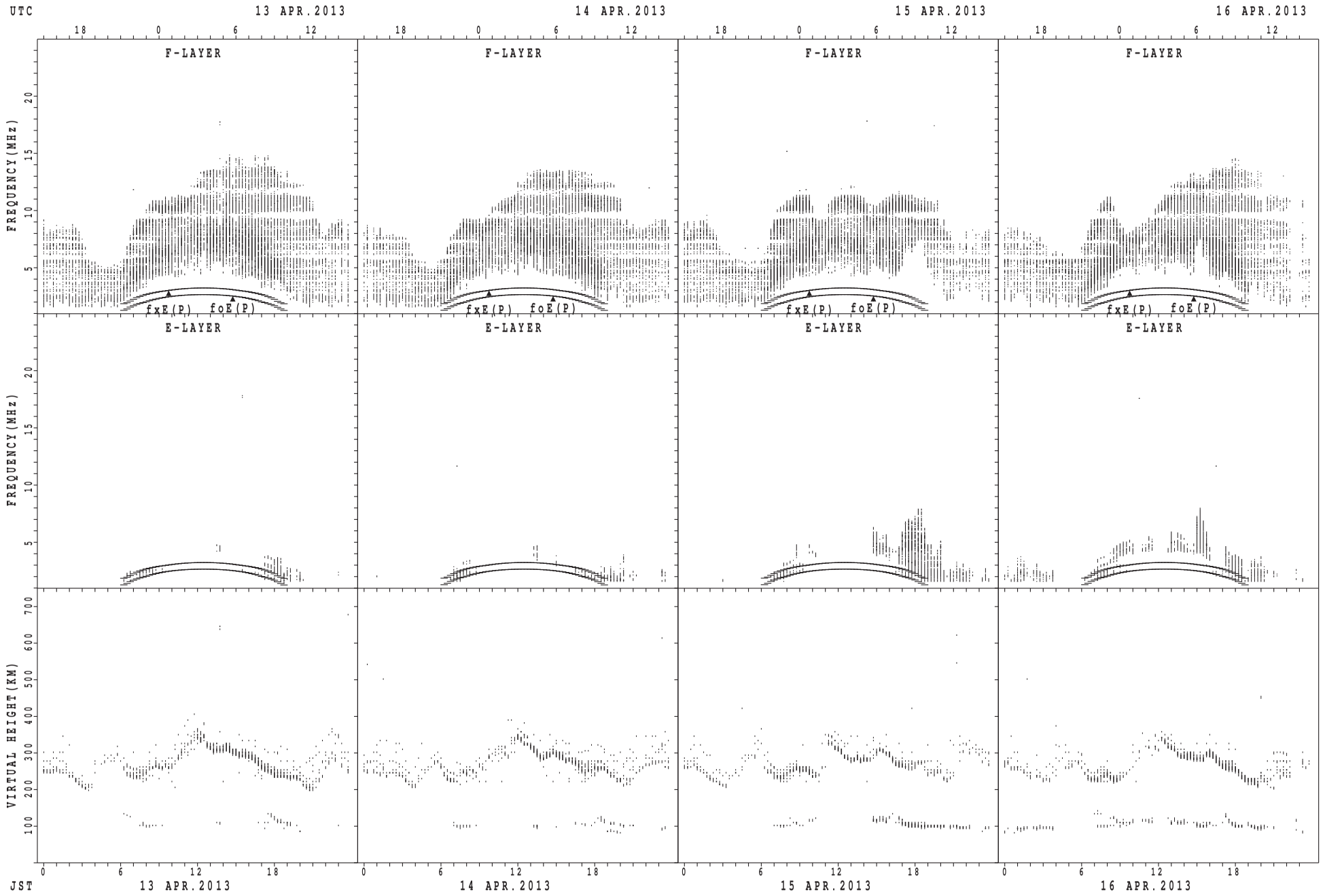
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



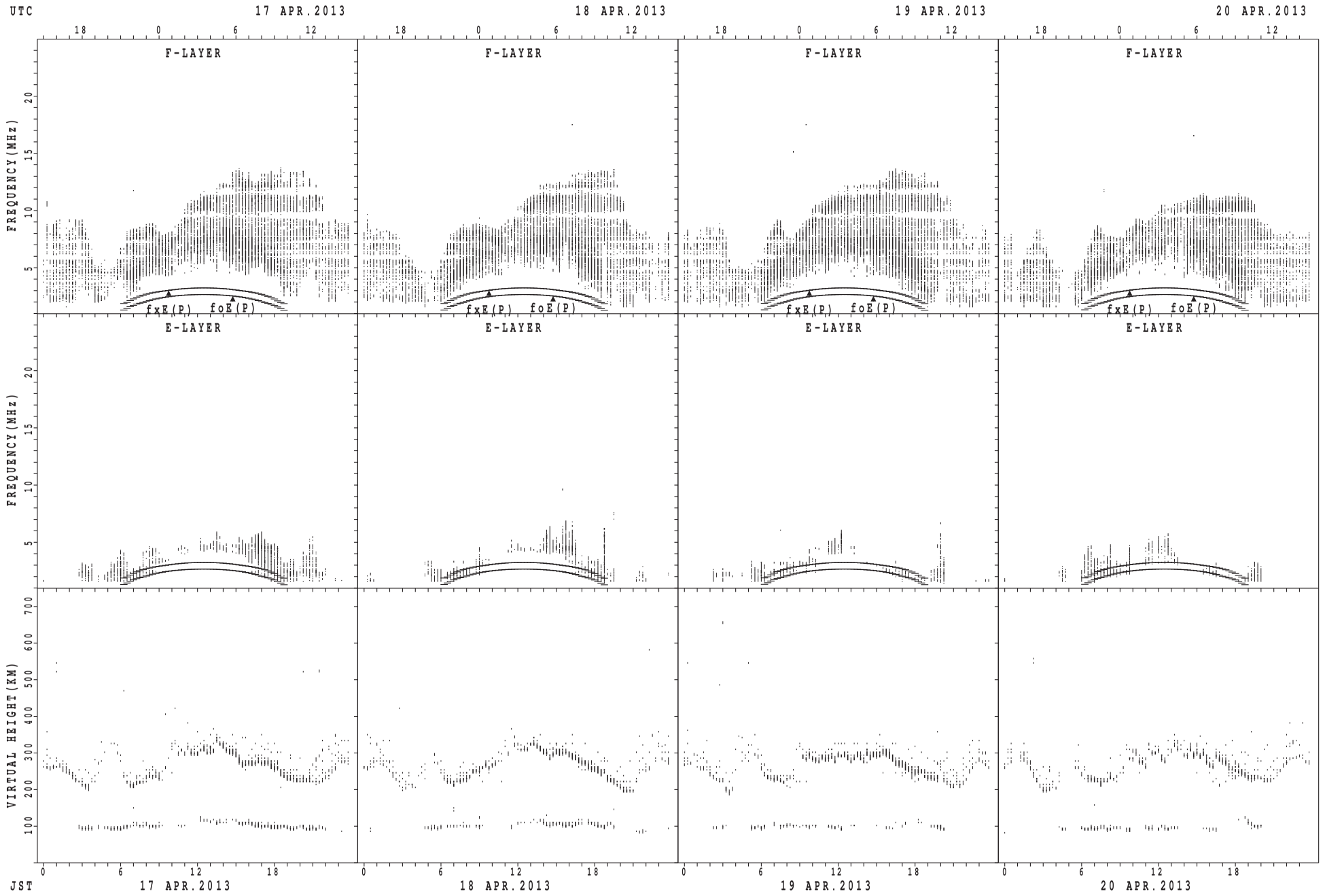
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



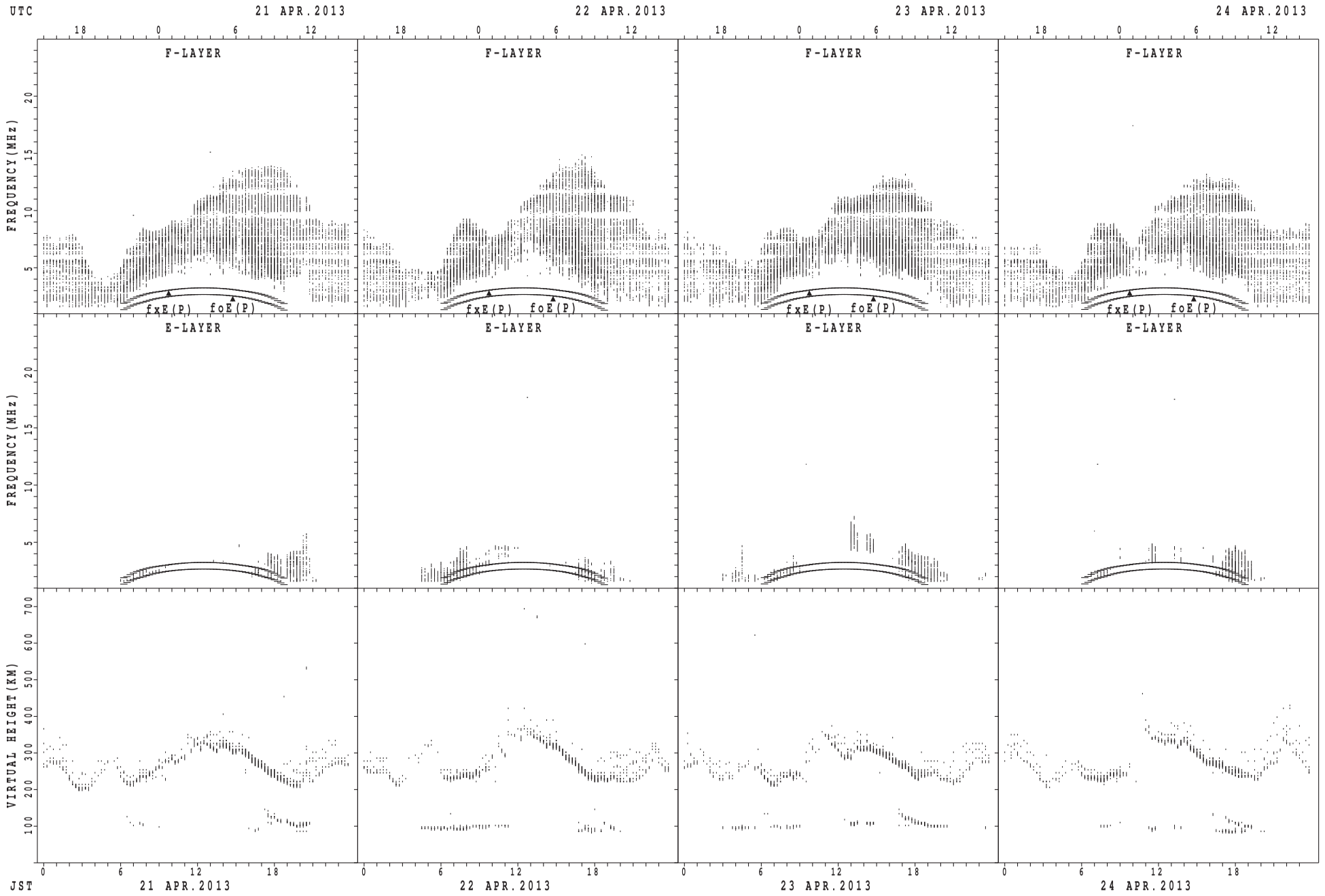
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



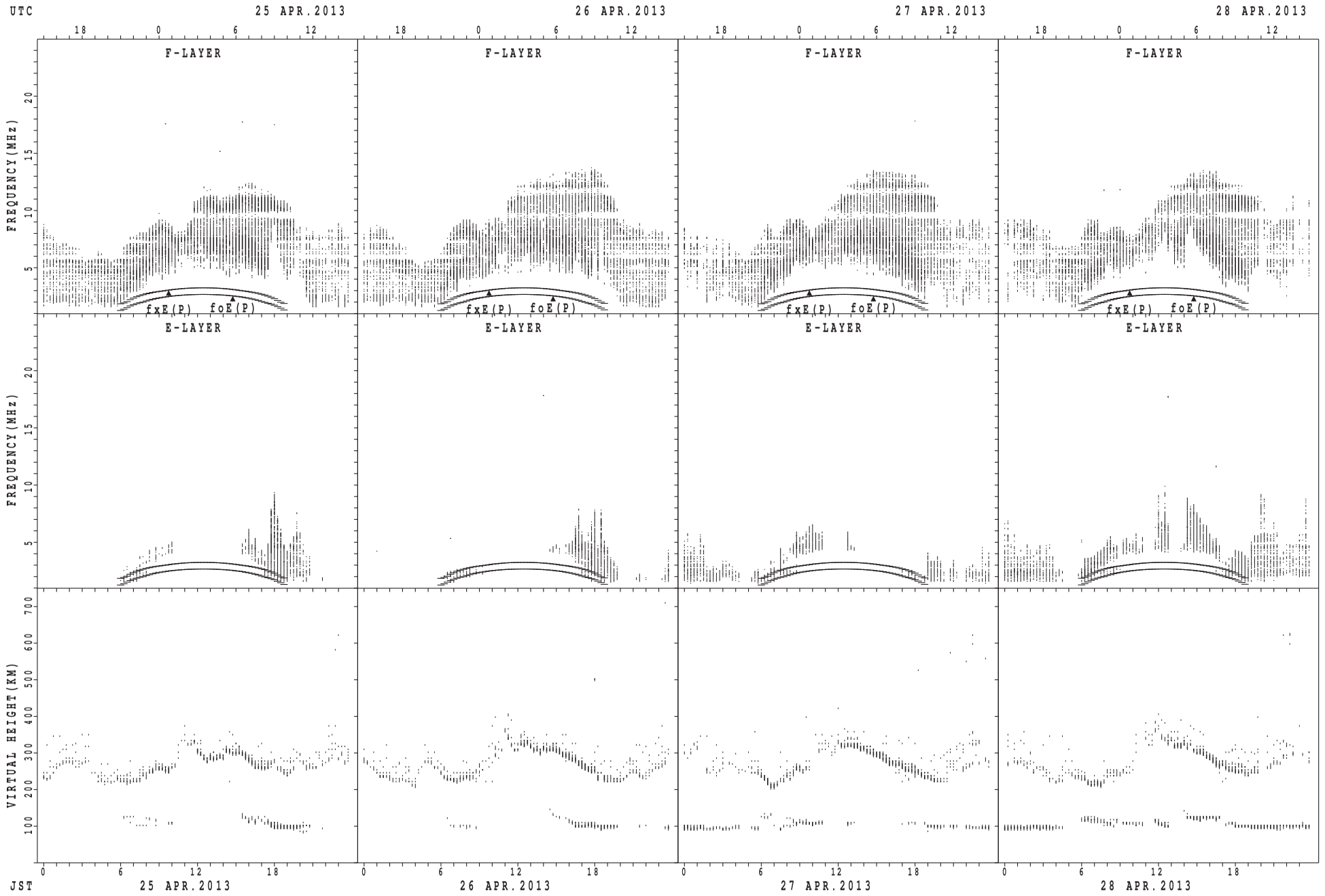
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



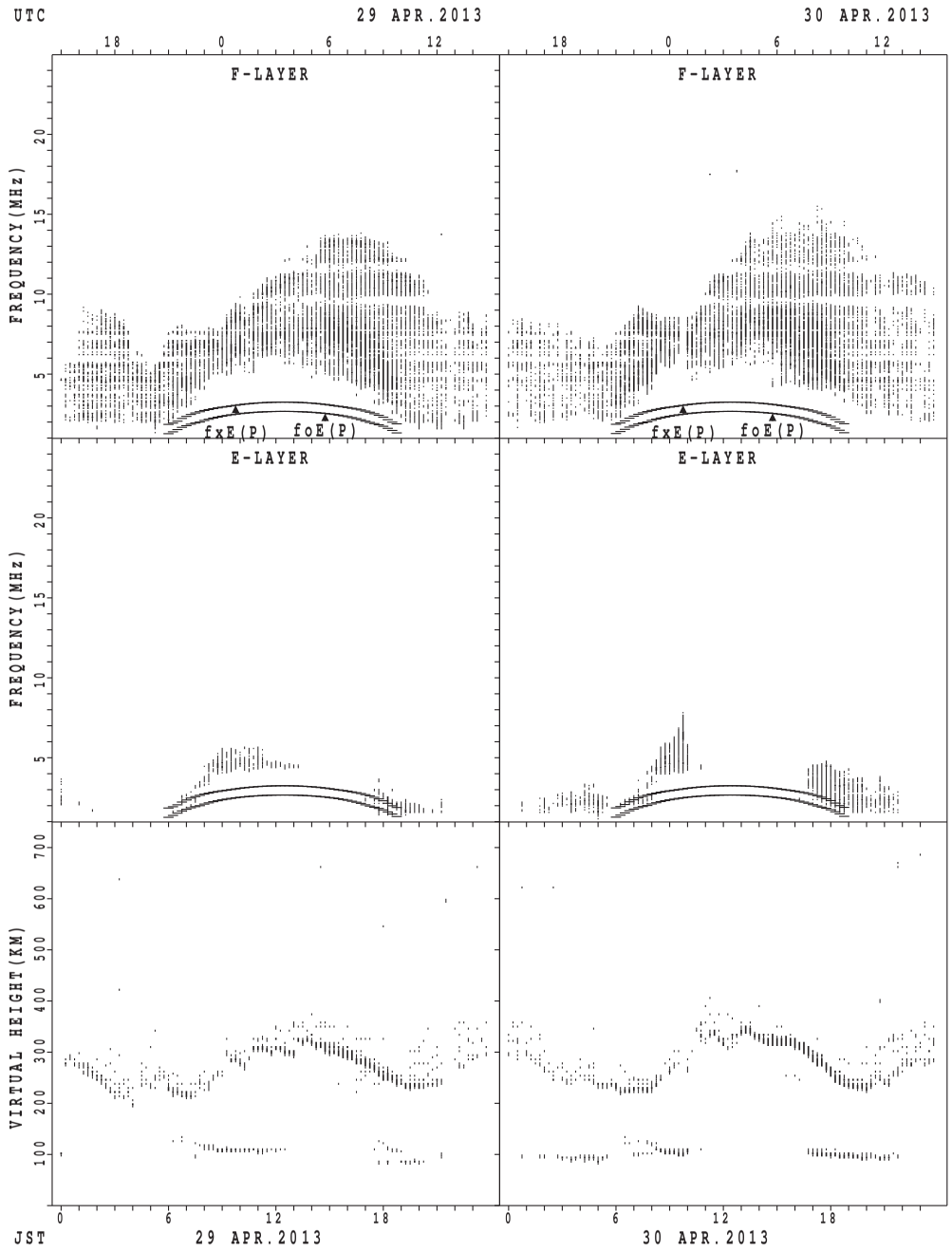
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			1	1		1	20	23	1								29	29	28	24	14	11	2	2
MED			324	338		266	248	256	258								258	262	262	270	279	284	306	333
U Q			162	169		133	261	258	129								264	268	263	273	290	304	308	348
L Q			162	169		133	242	246	129								253	255	255	262	272	280	304	318

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	4	5	4	2	1	4	21	26	27	26	26	27	26	27	26	30	28	22	12	13	12	10	4	5
MED	97	95	99	104	97	105	119	104	107	102	101	99	100	101	101	100	104	110	103	103	107	104	101	95
U Q	98	105	119	113	48	133	155	111	113	107	107	105	103	103	103	105	107	113	110	110	110	107	106	97
L Q	96	92	92	95	48	96	113	101	103	101	99	97	99	99	101	95	101	105	90	95	102	101	96	94

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	1	1	1			1	19	28	6								30	30	29	26	16	2	4	3
MED	316	314	274			274	244	248	241								262	254	248	254	254	300	316	326
U Q	158	157	137			137	254	256	246								268	258	255	266	265	312	339	334
L Q	158	157	137			137	240	233	238								256	246	242	242	248	288	305	316

h′Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	3	2	4	4	2	11	15	13	7	9	4	5	8	9	11	19	24	19	12	15	12	12	9
MED	97	97	97	98	97	99	151	105	105	111	111	105	111	100	109	103	105	105	105	100	103	100	98	99
U Q	98	101	99	99	97	103	161	107	120	119	114	109	117	106	111	107	113	113	111	105	103	104	103	104
L Q	91	95	95	96	96	95	113	103	100	111	108	101	100	97	104	97	99	99	99	98	97	96	95	95

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	7	5	6	7	2		2	27	29								2	29	30	30	27	11	8	9
MED	312	314	303	258	269		244	240	240								266	258	246	246	248	280	314	322
U Q	332	323	304	278	282		248	250	247								274	266	256	248	254	288	335	342
L Q	304	284	300	252	256		240	232	238								258	254	238	240	232	250	291	307

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	9	8	5	6	5	6	12	28	29	30	29	25	22	20	27	24	27	29	29	22	19	14	11	12
MED	95	97	95	93	93	96	131	119	103	103	105	105	105	106	105	101	107	103	109	99	99	97	95	96
U Q	99	97	102	95	94	99	135	137	112	107	107	105	107	110	111	107	113	107	113	105	101	101	103	97
L Q	94	95	95	93	90	95	112	106	100	99	101	103	99	103	101	98	101	102	100	99	97	97	89	95

MONTHLY MEDIANS OF h′F AND h′Es

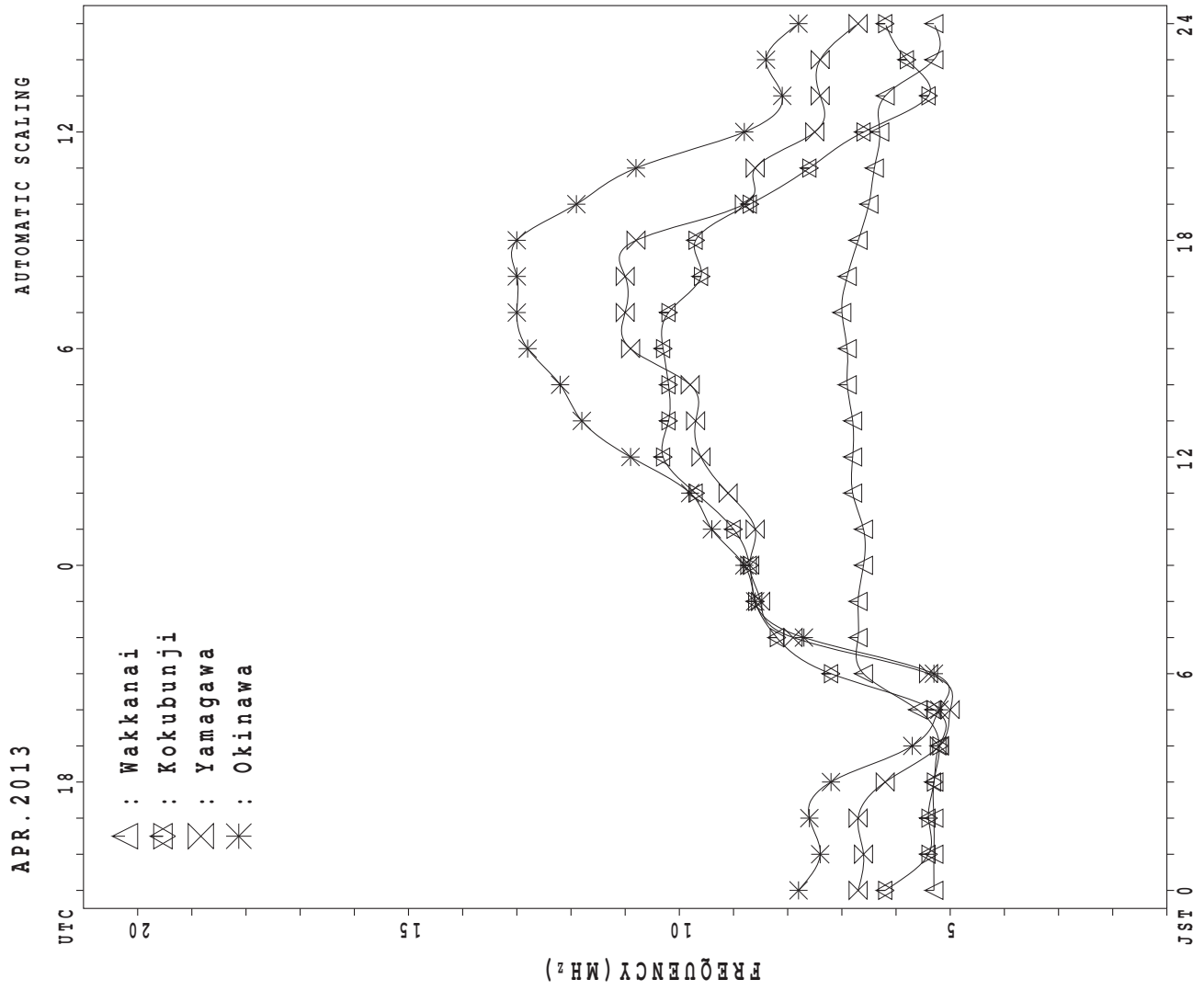
APR.2013 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	12	16	14	11	3	1	3	25	30									30	30	30	27	26	21	18
MED	301	307	284	266	232	258	256	240	245									266	252	247	248	255	288	316
U Q	316	319	288	278	244	129	258	247	254									270	262	254	264	282	305	338
L Q	279	297	272	240	224	129	256	230	238									262	242	236	238	246	278	298

h′Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	4	4	7	5	5	6	15	25	16	10	6	5	8	5	7	10	20	24	18	15	8	4	3
MED	98	96	95	97	99	97	97	119	105	105	108	107	111	110	113	107	113	108	105	103	99	101	99	97
U Q	103	97	96	99	142	98	101	139	113	108	111	121	112	113	129	123	115	123	113	107	101	105	103	101
L Q	95	95	95	95	97	93	95	107	103	103	105	105	99	102	104	103	105	103	102	99	97	99	97	95


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

IONOSPHERIC DATA STATION Wakkanai

APR. 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 59	X 59	X 59	X 57	X 55															X 74	X 72	X 67	X 66	X 65
2	X 63	X 63	X 61	X 61	X 61															X 78	X 71	X 68	X 66	X 67
3	X 67	X 63	X 61	X 59	X 57															X 83	X 79	X 75	X 66	X 64
4	X 63	X 65	X 64	X 63	X 60															X 84	X 79	X 77	X 67	X 67
5	X 67	X 65	X 64	X 61	X 59															X 89	X 81	X 77	X 73	X 71
6	X 71	X 66	X 66	X 65	X 61															X 87	X 81	X 76	X 73	X 71
7	X 71	X 67	X 64	X 64	X 61															X 84	X 75	X 75	X 75	X 71
8	X 68	X 67	X 69	X 69	X 58															X 82	X 78	X 77	X 70	X 70
9	X 71	X 68	X 68	X 67	X 65															X 94	X 82	X 74	X 72	X 72
10	X 71	X 69	X 69	X 69	X 63															X 87	X 81	X 81	X 79	X 77
11	X 75	X 74	X 73	X 72	X 69															X 85	X 85	X 80	X 73	X 69
12	X 67	X 66	X 65	X 64	X 62															X 86	X 81	X 81	X 79	X 73
13	X 67	X 67	X 66	X 66	X 63															X 81	X 82	X 79	X 75	X 75
14	X 72	X 72	X 72	X 68	X 63															X 94	X 79	X 79	X 72	X 70
15	X 73	X 73	X 74	X 59	X 53															X 83	X 82	X 76	X 66	X 65
16	X 65	X 64	X 64	X 63	X 59															X 82	X 79	X 73	X 62	X 61
17	X 60	X 60	X 59	X 57	X 55															X 83	X 75	X 79	73	X 73
18	X 69	X 69	X 70	X 60	X 56															X 83	X 78	X 82	X 79	X 71
19	X 66	X 64	X 62	X 60	X 60															X 81	X 78	X 78	X 74	X 69
20	X 66	X 66	X 65	X 62	X 60															X 80	X 80	X 78	X 71	X 71
21	X 71	X 71	X 70	X 68	X 63															X 79	X 79	X 75	X 71	X 69
22	X 69	X 67	X 67	X 67	X 56															X 84	X 76	X 77	X 76	X 67
23	X 62	X 60	X 59	X 60	X 57															X 84	X 83	X 79	X 65	X 63
24	X 62	X 62	X 62	X 60	X 57															X 71	X 78	X 73	X 69	X 69
25	X 60	X 63	X 53	X 53	X 53															X 77	X 76	X 76	X 73	X 69
26	X 69	X 67	X 67	X 63	X 57																X 80	X 76	X 70	X 66
27	X 65	X 63	X 61	X 55	X 54															X 79	X 78	X 73	X 63	X 63
28	X 62	X 60	X 59	X 59	X 56															X 77	X 79	X 79	X 79	X 75
29	X 75	X 73	X 72	X 67	X 60																X 81	X 80	X 78	X 75
30	X 76	X 74	X 72	70	X 67															X 82	O X 81	X 81	X 81	X 81
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30															28	30	30	30	30
MED	X 67	X 66	X 65	X 63	X 60															X 83	X 79	X 77	X 72	X 70
U Q	X 71	X 69	X 69	X 67	X 62															X 84	X 81	X 79	X 75	X 72
L Q	X 63	X 63	X 61	X 60	X 56															X 80	X 78	X 75	X 67	X 67

APR. 2013 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	52	52	R 52	50	48	50	66	68	73	74	Y	U R 86	U Y 80	U Y 87	J Y 90	R 90	J Y 81	79	76	67	65	60	59	58
2	56	56	54	54	55	57	71	72	Y	J Y 86	96	U R 80	U R 81	U R 88	U R 81	U R 77	76	78	80	71	65	61	59	60
3	60	56	54	52	50	53	63	72	U R 76	U R 83	Y	U Y 89	Y	J Y 91	U R 87	U Y 85	U Y 80	76	77	76	72	68	59	58
4	56	58	57	56	53	54	64	70	R 73	U Y 78	J R 89	Y	77	Y	U R 80	76	77	78	86	77	72	69	61	60
5	60	58	57	54	52	53	62	65	R 75	Y	U R 77	R 78	U R 80	Y	U R 80	J R 86	77	R 79	R 87	82	74	70	66	64
6	64	59	59	58	54	57	69	72	U R 76	U R 96	Y	J Y 91	Y	U Y 82	U Y 78	J Y 86	77	76	U R 85	84	74	69	66	64
7	64	60	58	57	54	58	76	U Y 78	R 77	R 78	J R 94	Y	U Y 82	J R 81	J R 92	J R 92	R 85	J R 86	85	77	68	68	68	65
8	62	61	62	62	51	55	73	R 74	U R 76	U Y 87	Y	Y	Y	U Y 87	R 88	U Y 88	J Y 90	78	77	75	72	70	64	63
9	64	61	61	60	58	62	72	77	Y	U Y 84	J R 98	92	J Y 87	Y	J R 92	R 99	J R 93	U R 85	85	J R 87	75	67	65	65
10	64	62	62	62	57	64	75	R 81	R 75	U R 97	U Y 99	Y	Y	U Y 78	J R 91	R 87	86	81	80	80	74	74	72	70
11	68	68	66	65	62	70	74	75	J R 85	J R 92	Y	J R 93	Y	Y	Y	R 89	U Y 80	U R 80	87	U R 78	78	73	66	62
12	60	59	58	57	55	60	R 74	U R 74	U R 77	J R 92	Y	Y	U R 98	Y	98	U Y 84	R 84	J R 86	R 80	79	75	74	72	66
13	60	60	59	59	56	63	72	73	U Y 79	U R 90	U R 100	Y	U Y 82	Y	Y	U R 84	79	R 79	75	74	75	72	69	67
14	65	65	65	61	56	58	76	U R 76	U R 77	R 102	U R 92	Y	U Y 87	J R 91	Y	J R 81	J R 87	J R 87	R 94	J R 87	75	72	67	64
15	66	66	67	52	46	49	70	70	72	R 77	J R 82	Y	U Y 77	75	Y	R 76	76	72	77	76	74	69	58	58
16	58	57	57	56	52	60	65	71	J R 84	68	Y	R 76	U Y 77	R 76	U R 76	U R 82	J R 88	85	81	76	72	66	55	54
17	53	R 53	U R 52	50	R 48	52	72	73	73	J R 80	77	76	R 74	J R 81	U R 86	Y	78	76	78	76	68	U R 68	F 64	66
18	62	62	63	54	49	57	70	73	U R 81	J R 86	U R 81	U Y 80	Y	88	U Y 79	R 77	76	76	76	77	71	75	73	64
19	59	57	55	53	53	59	73	74	U R 74	R 76	R 78	78	75	Y	U Y 79	J R 84	76	72	72	74	71	71	67	62
20	59	59	58	55	53	60	74	75	U R 79	U Y 79	75	Y	U Y 78	R 78	R U 79	U Y 80	U R 80	71	69	73	72	72	64	64
21	64	64	64	61	56	59	74	74	73	U R 78	U Y 80	U Y 80	U R 80	76	J R 89	U R 77	76	72	74	73	72	68	64	62
22	62	60	60	60	49	54	60	68	74	R 78	U Y 78	88	U R 80	U Y 80	U R 80	U Y 80	80	78	80	80	71	70	67	60
23	56	54	52	53	50	56	68	74	73	U R 72	75	Y	R 75	78	R 80	Y	R 77	71	75	77	76	72	58	56
24	55	55	55	53	50	56	64	65	66	R 74	U R 82	R 79	R 78	U R 86	J Y 87	J R 85	U R 82	72	71	64	70	66	62	62
25	53	56	46	46	46	52	56	70	R 70	70	69	75	70	74	76	75	76	75	76	70	69	69	66	62
26	62	60	60	56	50	52	67	70	68	72	69	70	J R 70	R 76	76	U R 76	U R 83	J R 88	74	70	73	69	63	59
27	58	56	54	48	47	50	54	54	54	R 55	64	68	70	70	R 76	76	74	74	74	72	71	66	56	56
28	55	53	52	52	49	59	53	61	60	66	69	70	U R 75	U R 78	75	76	78	R 78	70	70	72	72	72	68
29	68	66	65	60	53	53	51	59	63	66	64	69	R 72	U R 78	R 77	R 76	74	76	75	74	74	73	70	68
30	69	67	66	F 60	60	70	75	74	72	J R 70	U Y 75	76	U R 78	U Y 78	81	Y	U R 86	J R 87	R 80	75	74	74	74	74
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	28	29	23	20	24	23	26	27	30	30	30	30	30	30	30	30
MED	60	59	58	56	52	57	70	72	R 74	R 78	78	78	U 78	78	R 80	R 82	80	78	77	76	72	70	66	62
U Q	64	62	62	60	55	60	74	74	U R 77	R 86	R 92	87	U Y 80	87	J R 88	R 86	R 84	J R 81	81	78	74	72	68	65
L Q	56	56	54	53	49	53	64	70	72	72	75	76	R 75	76	78	76	76	75	75	73	71	68	61	60

APR. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2013 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	U L 484	L	L	L 488	U L 488	L	L							
2									L	U L 464	L	L 500	L	L	L	L	L							
3							244		L 444	L	U L 516	U L 512	U L 508	L	L	L	L							
4								L	L	U L 464	U L 492	L	L	U L 500	U L 500	L								
5									L	L	L	L	U L 484	U L 496	L	L								
6								L	L	L	U L 492	U L 496	L	L	L	L								
7								L	L	L	U L 512	U L 520	L	U L 560	L	L	L							
8									L	L	L	L	L	U L 488	L	L	L							
9							264	L	L	L	U L 512	L	U L 500	L	L	U L 532	L							
10										U L 516	L	U L 536	U L 536	L	U L 516	L	L	L						
11									L	L	L	L	L	U L 520	L 524	L	L							
12								L	L	L	L	L	U L 508		L	L	L							
13								L	L	L	L 544	U L 524	L	U L 520	L 456	L	L							
14									L	U L 520	L	L	L	L	L	L	L	L						
15								L	L 500	L	U L 500	L 500	U L 520	L	U L 484	U L 476								
16									U L 440	U L 512	508	U L 516	U L 520	L	L	L	L	L						
17									L	L 476		U L 492	L	U A 468	L 484	L	L							
18								L	L	U L 480	L	L 496	A	L	L	A	L	L						
19							L	L	L	L	L	L 492	U L 492	L 492	L	L 480	L	L 296						
20								L	U L 448	L	L 464	L	488	L 496	A	L	L	L						
21						216		L	L	U L 464	U L 484	L	L 528	L 464	L 468	U L 464	L 436							
22								L	L 460	U Y 452	U L 484	L 488	U L 500	L 500	500	A 468	U L 444							
23							L	L	L	L	L 488	488	U L 488	U L 504	L 480	L 480	L	L						
24								L	L 464	468	U L 492	496	L 496	U L 516	L 512	U L 480	L							
25								L	L	U L 484	U L 500	L 500	U L 516	U L 512	A 492	L	L	L						
26							L 412	U L 444	L 460	488	L	A	U L 484	U L 496	L 480	L 480	L	L						
27							A	A	A	A	488	L 500	U Y 500	L	L 496	L	L	A						
28							L	U L 456	U L 456	L 500	U L 504	U R 500	500	R 512	L	U L 476	L	L						
29								U L 476	L 476	L 492	U R 492	U L 540	L 540	L	U L 540	L	U L 448	L						
30								L	L	L	U L 528	L	L 524	L 528	U L 528	L 528	L	L						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	3	3	9	14	19	18	19	18	16	10	3	1						
MED						216	264	U L 456	L 460	U L 482	U L 492	L 500	U L 500	U L 500	L 494	L 480	U L 444	L 296						
U Q							L 412	U L 476	L 470	U L 500	U L 512	U L 516	L 520	U L 516	U L 514	U L 480	U L 448							
L Q							244	U L 444	U L 446	U L 464	U L 488	L 496	U L 492	L 492	L 482	U L 476	L 436							

APR. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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 216	268	296	332	352		R	R	A	352	320	280	224	B					
2						B 200	272	304	316	336	348	A	U A 344	A	344	316	280	236	A					
3						B 216	280	324	340	U A 364	A		A	364	340	328	272	232	A					
4						B 216	280	316	U R 344	R 360	R		R 376	360	336	316	296	240	A					
5						B H 232	280	R 308	344	364	A		384	U R 360	344	316	288	244	A					
6						B 228	276	316	340	A	U R 368		R 372	352	344	324	284	232	B					
7						156	228	280	316	344	380	384	A	R 352	328	296	244	172						
8						B 220	280	304	348	356	R 360		A	A 352	332	304	232	A						
9						B 224	288	332	344	U R 364	R		380	U R 388	356	336	280	248	180					
10						B 220	280	320	A	J R 304	R		U R 376	A	U A 356	U A 316	288	244	A					
11						B 236	288	316	R 332	356	U A 356		U A 356	A	348	328	304	256	176					
12						B 256	284	328	336	364	U R 368		U R 380	U R 368	352	336	292	260	176					
13						U R 164	248	288	320	352	376		R	R 368	356	324	284	236	A					
14						180	232	276	328	340	352		A	A 356	340	320	284	244	164					
15						184	220	288	308	U A 328	U A 356		A	R	R 344	R 324	296	252	A					
16						B 228	R 296	312	336	A	U A 344		A	A	A	A 316	A	U A 252	A					
17						172	240	296	324	344	348	A	U A 352	A	336	316	296	248	A					
18						A 244	284	308	340	344	360		U A 356	A 348	332	A	A	A	A					
19						U R 176	240	288	320	336	A	A 340	A	R 352	U A 340	320	A	232	180					
20						184	212	284	316	340	U A 364	U A 372	U A 364	A	A 328	A	A	A 224	180					
21						164	236	284	324	344	360	A	U R 356	348	352	324	308	264	A					
22						172	236	268	316	U R 324	344	A	U A 352	A	A	A	A	A	A					
23						A 232	292	320	352	U R 352	U A 356		R	U R 364	356	312	292	236	A					
24						160	240	288	324	U A 352	U R 356	A	A	348	348	320	292	240	196					
25						180	244	308	324	332	U A 344	R 352	U A 356	R	340	328	292	252	200					
26						180	252	288	316	U A 340	A	A	A	360	356	336	304	264	192	B				
27						180	256	296	324	336	U A 348	A	A	R	348	A	304	260	A					
28						188	248	296	324	340	U R 356	U R 364	U R 360	R	352	328	288	264	A					
29						176	248	300	U R 312	344	U R 356	U R 376	U R 376	U R 368	U R 352	340	308	260	U A 192	A				
30						188	256	316	348	356	360	A	A	A 356	A	340	A	248	A 200					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						16	30	30	30	29	26	14	16	16	27	26	24	28	12					
MED						178	234	286	318	340	356	U 360	U 362	360	348	324	292	244	180					
U Q						182	244	292	324	344	364	U 368	U R 376	U R 366	352	328	300	254	194					
L Q						168	220	280	312	336	348	A 352	U A 356	352	340	316	284	236	176					

APR. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	33	G	40	37	G 33	37	39	J A 45	G	G	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14
2	J A 15	J A 13	E B 12	E B 12	J A 14	J A 30	22	30	33	35	37	37	37	36	G	G	G	G	24	24	J A 16	J A 14	E B 14	E B 14
3	J A 14	E B 15	E B 15	E B 15	J A 13	E B 15	23	G	G	36	44	37	35	G	36	37	G	G	J A 19	J A 24	J A 14	J A 22	E B 14	J A 20
4	J A 12	J A 19	J A 17	E B 15	E B 15	E B 15	24	30	G 26	36	41	G	G	G 27	36	G 18	G 24	G 22	J A 21	J A 14	J A 21	E B 12	J A 15	E B 12
5	E B 13	E B 12	E B 15	E B 15	E B 15	E B 14	G	G 22	G 24	G 24	G	38	G	G 32	G 28	G 21	G	G	J A 19	J A 19	J A 18	19	E B 12	E B 12
6	E B 14	E B 14	19	19	E B 14	E B 14	26	G 25	G 25	G 25	36	G	G 30	G	G	G 30	G	27	E B 12	E B 12	E B 12	E B 14	E B 14	E B 14
7	E B 14	E B 15	E B 15	E B 15	E B 15	G	25	G	32	G 27	G	G	37	G 34	41	G 23	G	G	G	J A 19	E B 13	E B 13	E B 13	E B 13
8	E B 12	E B 16	J A 19	E B 15	E B 15	E B 15	25	30	33	39	39	G	39	36	G	G	G	25	J A 18	J A 18	J A 18	E C 16	E B 13	E B 12
9	E B 13	E B 13	E B 13	E B 13	E B 14	E B 14	24	G	G 26	G 25	G 28	G 33	G 35	G 35	38	G 30	G 25	G 22	G	E B 13	E B 12	E B 12	E B 13	E B 13
10	E B 13	E B 13	E B 13	E B 13	E B 18	E B 16	G	31	G 28	37	G	G	G	37	38	34	G	28	J A 24	E B 16	J A 17	E B 14	E B 14	E B 14
11	E B 14	19	19	E B 14	E B 14	E B 14	G	G 23	34	G	38	38	37	38	38	36	G 24	G 20	G	E B 16	E B 16	E B 14	E B 14	E B 14
12	E B 15	E B 15	E B 15	E B 12	E B 14	E B 15	G	G 22	G 24	G 26	G 26	G 32	G 28	G 24	G	G	G 20	G	G	J A 13	E B 15	E B 16	E B 15	E B 15
13	E B 15	E B 15	E B 12	E B 12	E B 12	G	27	30	G	G	G	G 36	G 33	G 31	G 24	G 25	G	G	20	20	19	E B 15	E B 15	E B 15
14	E B 15	E B 15	18	E B 15	E B 15	G	26	30	36	36	38	38	39	39	G 32	G 29	G 25	25	G	19	E B 16	J A 16	E B 14	E B 14
15	18	E B 16	18	E B 14	E B 14	G	28	33	33	36	36	38	G 35	G 33	38	34	34	34	J A 29	J A 21	J A 20	E B 14	J A 11	E B 14
16	21	J A 17	24	23	E B 14	E B 14	G 20	G	37	38	38	39	J A 45	J A 48	43	35	35	J A 33	J A 29	J A 32	J A 44	J A 50	J A 39	J A 27
17	E B 14	J A 27	18	J A 21	J A 17	G	27	35	36	40	45	42	40	J A 50	G	40	G	34	J A 33	J A 31	J A 27	J A 64	J A 53	J A 43
18	J A 25	J A 33	J A 42	J A 30	J A 21	22	26	36	42	42	41	48	J A 52	J A 49	38	J A 57	34	J A 33	J A 22	J A 33	J A 33	J A 32	J A 49	56
19	J A 18	J A 16	E B 12	E B 12	E B 12	G 17	G 24	32	36	39	40	40	36	39	36	34	26	G 19	G	E B 14	J A 33	19	E B 12	E B 14
20	E B 13	J A 13	E B 13	19	E B 13	G	28	32	35	38	42	41	37	38	J A 49	35	32	25	G	J A 25	J A 19	J A 19	J A 19	J A 33
21	J A 28	E B 12	E B 12	E B 12	E B 14	19	27	33	35	37	39	39	G 35	G 33	G 28	35	G 21	29	22	J A 25	J A 38	J A 26	E B 13	E B 13
22	E B 14	J A 16	J A 16	E B 14	J A 15	20	26	30	33	38	39	38	38	38	37	35	J A 35	J A 28	22	J A 25	J A 20	E B 15	E B 15	E B 15
23	J A 13	E B 14	E B 14	E B 14	E B 14	20	25	34	37	38	38	38	G 34	G 33	38	G 28	31	28	20	E B 12	J A 16	J A 16	J A 13	E B 12
24	E B 12	E B 12	E B 12	E B 12	E B 15	19	28	31	34	38	G	37	39	40	G 28	34	G 26	G	G	J A 19	19	E B 15	E B 15	E B 15
25	18	18	18	E B 15	E B 15	G	28	32	36	40	37	G	38	G 35	G 34	G 29	G 21	G 22	26	J A 19	J A 14	E B 14	E B 14	E B 14
26	J A 16	E B 12	E B 12	17	J A 13	20	G	31	34	36	43	J A 55	39	G	39	39	J A 50	32	23	18	J A 18	J A 26	E B 12	E B 12
27	E B 13	E B 13	E B 13	E B 13	E B 13	21	J A 43	J A 53	J A 53	J A 54	46	44	40	G 33	40	34	35	37	30	J A 25	J A 18	18	E B 14	E B 14
28	E B 13	E B 13	E B 13	E B 14	18	21	26	32	36	G	38	G	40	G 32	G 30	G 24	32	J A 25	22	J A 15	E B 14	E B 14	E B 14	E B 14
29	E B 14	E B 14	E B 14	E B 14	E B 14	22	27	34	G	38	39	G	G	G	G 25	G	35	30	23	J A 31	J A 17	J A 33	J A 15	E B 11
30	E B 14	E B 14	E B 14	E B 14	E B 14	22	29	33	40	43	41	40	40	40	39	G 31	37	26	25	J A 26	26	J A 19	E B 16	E B 12
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 14	E B 14	E B 14	E B 14	E B 14	G	26	30	34	36	38	38	37	G	36	G	G	25	20	J A 19	J A 18	16	E B 14	E B 14
U Q	J A 15	J A 16	18	15	15	20	27	33	36	38	41	39	39	38	38	35	34	29	24	J A 25	J A 20	J A 19	J A 15	15
L Q	E B 13	E B 13	E B 13	E B 13	E B 14	E B 15	G	G	G	G	G 36	G	G 35	G 33	G 34	G 29	G 26	G	G	E B 15	E B 15	E B 14	E B 13	E B 13

APR. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

APR. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

APR. 2013 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	294	294	R 297	299	311	309	351	344	335	355	Y	U R 340	U Y 340	U Y 328	Y	R 328	Y	340	343	317	307	295	297	301
2	295	297	278	281	291	302	362	359	Y	Y	332	U R 356	U R 337	U R 341	U R 336	U R 348	344	351	343	320	310	297	285	292
3	297	295	294	299	311	319	329	340	U R 359	U R 341	Y	U Y 335	Y	Y	U R 349	U Y 340	U Y 346	331	330	326	316	313	301	283
4	294	284	283	304	299	302	335	351	R 361	U Y 375	R	Y	340	Y	U R 356	333	331	336	331	338	298	310	277	282
5	282	284	277	296	294	307	344	328	R 337	Y	U R 355	R 343	U R 342	Y	U R 337	R	342	R 319	R 321	327	314	301	289	290
6	285	282	282	288	299	306	334	342	U R 330	U R 332	Y	Y	Y	U Y 333	U Y 336	Y	341	337	U R 311	318	309	306	301	298
7	290	286	286	300	297	298	363	U Y 356	R 355	R 354	R	Y	U Y 332	R	R	R	R 336	R	330	324	305	293	282	289
8	283	278	291	310	318	306	346	R 361	U R 348	U Y 341	Y	Y	Y	U Y 341	R 338	U Y 331	Y	327	331	317	325	305	300	294
9	287	290	292	294	287	311	375	348	Y	Y	R	320	Y	Y	R	R	R	U R 325	R 318	R	338	301	289	285
10	287	287	287	289	288	312	337	R 343	R 334	U R 322	U Y 345	Y	Y	U Y 333	R	R 335	327	320	325	323	320	317	301	292
11	291	285	294	298	297	305	360	349	R	R	Y	R	Y	Y	Y	R 324	U Y 353	U R 326	317	U R 331	329	317	303	289
12	289	294	282	288	287	299	R 361	U R 353	U R 356	R	Y	Y	U R 326	Y	313	U Y 341	R 338	R	R 318	321	313	303	310	305
13	287	285	290	292	297	318	350	351	U Y 343	U R 323	U R 330	Y	U Y 324	Y	Y	U R 345	332	R 344	328	325	319	302	296	286
14	295	297	298	316	292	298	334	U R 360	U R 356	R 326	U R 336	Y	U Y 322	R	Y	J R 322	J R 322	J R 322	R 332	J R 306	309	293	287	279
15	283	299	327	305	284	298	328	341	325	R 330	R	Y	U Y 337	329	Y	R 357	328	337	324	330	327	307	301	286
16	288	293	295	296	299	304	327	324	R	337	Y	R 332	U Y 349	R 334	U R 342	U R 333	R	340	342	350	325	323	309	291
17	291	R 287	U R 296	290	R 269	286	320	331	351	R	329	333	R 331	J R 333	U R 330	Y	340	322	331	336	305	U R 354	F 291	290
18	289	303	315	304	301	319	341	353	U R 344	R	U R 350	U Y 348	Y	327	U Y 343	R 327	328	333	332	324	318	313	314	313
19	288	291	300	298	296	302	351	346	U R 357	R 346	R 350	337	327	Y	U Y 334	J R 346	337	328	325	320	305	317	324	299
20	311	303	305	314	298	305	343	352	U R 369	U Y 353	332	Y	U Y 341	R 332	R 335	U Y 349	U R 357	353	320	317	315	317	297	297
21	287	287	314	310	299	305	327	362	337	U R 360	U Y 351	Y	U R 346	353	R	U R 353	347	329	333	334	330	314	299	295
22	295	294	298	316	321	328	329	329	343	R 352	U Y 358	325	U R 330	U Y 329	U R 349	U Y 333	338	325	314	331	313	307	322	298
23	294	290	298	303	321	336	329	357	351	U R 310	U R 347	Y	R 351	R 312	R 333	Y	R 346	329	322	328	330	323	317	288
24	292	290	300	311	304	327	349	319	320	R 335	U R 327	R 336	R 311	U R 313	Y	V	U R 336	332	333	310	270	271	277	298
25	291	275	307	306	306	315	328	338	R 350	332	307	346	317	314	331	325	343	339	337	342	311	311	293	291
26	293	285	288	310	303	322	339	332	341	331	324	306	R	R 323	327	U R 334	U R 327	R	334	312	303	313	291	285
27	286	284	294	276	282	306	321	A 317	A 294	A 321	293	307	318	301	R 338	339	326	330	324	319	316	317	312	294
28	296	282	286	307	312	344	354	324	322	313	331	314	U R 326	U R 326	330	327	325	R 346	329	330	311	311	302	272
29	270	274	281	302	296	311	317	322	324	337	336	302	R 321	U R 326	R 326	R 339	332	335	314	316	304	309	305	297
30	287	283	288	F 303	296	324	325	330	323	R	U Y 353	314	U R 335	U Y 332	331	Y	U R 330	J R 327	R 318	323	322	306	293	289
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	26	22	19	17	22	20	20	22	26	27	30	29	30	30	30	30
MED	290	287	294	301	298	306	338	344	343	336	U 336	333	U 332	329	R 336	R 334	336	331	328	324	314	310	300	291
U Q	294	294	298	307	304	319	351	353	U R 355	352	U Y 350	U R 342	U 340	333	U R 340	U R 345	343	339	332	330	322	317	305	297
L Q	287	284	286	294	292	302	328	330	330	326	329	314	324	324	330	R 328	328	R 326	320	318	307	302	291	286

APR. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2013 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	U L 368	L	L	L 377	U L 369	L	L							
2									L	U L 381	L	L 381	L	L	L	L	L							
3							490		L 381	L	U L 364	U L 372	U L 375	L	L	L	L							
4								L	L	U L 380	U L 385	L	L	U L 379	U L 348	L								
5									L	L	L	L	U L 382	U L 373	L	L								
6								L	L	L	U L 393	U L 390	L	L	L	L								
7								L	L	L	U L 378	U L 378	L	U L 351	L	L	L							
8									L	L	L	L	L	U L 399	L	L	L							
9							498	L	L	L	U L 369	L	U L 378	L	L	U L 351	L							
10										U L 356	L	U L 362	U L 362	L	U L 358	L	L	L						
11									L	L	L	L	L	U L 356	L 353	L	L							
12								L	L	L	L	L	U L 382		L	L	L							
13								L	L	L	L 356	U L 371	L	U L 365	L 401	L	L							
14									L	U L 353	L	L	L	L	L	L	L	L						
15								L	L 346	L	U L 366	L 383	U L 370	L	U L 374	U L 333								
16									U L 373	U L 373	L 377	U L 371	U L 368	L	L	L	L	L						
17									L	L 388		U L 393	L	A	L 347	L	L							
18								L	L	U L 369	L	L 384	A	L	L	A	L	L						
19							L	L	L	L	L	L 391	U L 391	L 383	L	H 345	L	L 392						
20								L	U L 373	L	L 409	L	388	L 380	A	L	L	L						
21						448		L	L	U L 378	U L 379	L	L 348	L 396	L 385	U L 365	L 362							
22								L	L 365	Y	U L 380	L 377	U L 377	L 365	365	A 369	U L 353							
23							L	L	L	L	L 364	385	Y	U L 365	L 370	L 354	L	L						
24								L	L 373	370	U L 368	366	L 378	U L 346	L 346	U L 352	L							
25								L	L	U L 369	U L 358	L 358	Y 353	U L 350	A 362	L	L	L						
26							L 344	U L 356	L 371	361	L	A	U L 379	U L 370	L 382	L 350	L	L						
27							A	A	A	A	A 337	A 349	Y	L	L 352	L	L	A						
28							L	U L 363	U L 380	L 365	U L 365	U R 378	372	R 363	L	U L 345	L	L						
29								U L 339	L 364	L 371	U R 382	U L 348	L 348	L	U L 348	L	U L 358	L						
30								L	L	L	U L 365	L	L 368	L 364	U L 356	L 349	L	L						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	3	3	9	13	19	18	17	17	16	10	3	1						
MED						448	490	U L 356	L 373	U L 370	U L 368	L 378	U L 375	U L 365	L 360	L 350	U L 358	L 392						
U Q							498	U L 363	U L 376	U L 379	U L 380	L 384	U L 380	L 380	L 372	L 354	L 362							
L Q							L 344	U L 339	L 364	L 363	L 364	L 366	L 365	U L 360	L 350	U L 345	U L 353							

APR. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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									244	244	244	268	266	266	266	250	250							
2									250	250	250	242	248	248	248	248	244							
3							220		250	254	258	274	256	256	256	256	256							
4								246	244	244	254	254	260	264	264	264								
5									256	256	256	256	256	256	256	256								
6								252	270	270	244	254	258	260	260	260								
7								238	244	248	250	256	266	290	282	268	260							
8									274	268	262	260	272	272	272	272	262							
9							220	226	232	246	256	256	264	286	286	286	258							
10										274	274	270	270	282	282	282	260	260						
11									260	260	248	248	256	274	274	274	252							
12								246	246	248	252	252	266		268	268	268							
13								234	258	258	272	266	266	274	270	266	254							
14									254	266	266	266	272	274	274	274	272	266						
15								246	302	288	286	282	282	282	282	266								
16									254	260	266	274	278	284	284	284	272	268						
17									250	252		272	274	294	280	270	262							
18								246	256	256	256	272	276	276	274	A 274	264	252						
19							244	244	248	272	258	258	262	264	264	264	264	232						
20								252	252	252	262	262	262	278	278	276	264	240						
21						240		240	246	246	262	264	266	266	270	270	260							
22								260	264	266	266	266	274	290	290	290	264							
23							242	248	248	264	268	268	268	290	274	270	268	262						
24								L 286	292	292	292	292	304	310	300	290	270							
25								278	278	284	326	272	294	294	292	290	262	262						
26							262	268	268	298	286	E A 334	314	314	296	296	288	258						
27							292	E A 350	E A 398	E A 358	358	324	292	322	290	266	266	266						
28							L 254	300	290	306	298	328	312	300	294	274	274	258						
29								290	304	288	290	318	318	286	300	292	278	260						
30								260	260	268	272	282	288	302	302	302	274	270						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	7	20	29	30	29	30	30	29	30	30	26	13						
MED						240	244	248	255	261	262	266	269	282	276	271	264	260						
U Q							262	273	272	274	280	274	282	292	290	284	270	266						
L Q							220	245	248	252	255	256	262	266	268	266	260	255						

APR. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	264	270	270	270	248	250	218	218	218	218	192	210	214	206	206	206	212	224	224	224	238	248	248	248
2	268	268	292	292	248	248	218	218	218	214	214	214	210	210	198	198	200	220	220	220	224	232	268	268
3	268	268	268	268	254	254	202	226	226	224	E A 216	202	202	208	H 198	206	214	228	228	228	228	244	244	280
4	266	290	290	270	254	252	234	234	214	208	206	208	208	196	198	H 198	210	216	238	226	244	244	244	254
5	268	274	274	262	260	252	238	230	230	228	212	212	212	212	H 194	210	220	220	234	234	234	238	250	262
6	260	260	268	268	264	258	234	H 208	208	208	208	208	208	202	202	202	212	220	232	232	232	232	252	260
7	262	262	262	256	240	260	226	226	216	214	214	214	Y 214	214	E A 234	234	234	234	234	232	232	244	256	260
8	286	286	286	242	242	258	226	226	220	228	228	228	212	212	210	H 210	212	212	234	234	238	238	238	258
9	282	282	282	266	256	256	162	212	212	212	212	214	208	H 176	H 176	202	222	228	228	228	228	230	250	270
10	272	274	274	274	242	246	216	226	224	214	224	Y 214	214	212	212	212	214	220	236	236	236	236	248	256
11	270	270	270	264	262	258	224	224	224	224	224	224	216	216	214	214	224	226	242	242	242	238	238	246
12	256	256	256	256	256	256	240	228	226	226	222	222	214	232	228	228	228	228	228	228	228	242	242	242
13	252	270	270	270	264	242	216	216	216	216	216	216	216	194	194	216	216	238	238	238	238	238	238	248
14	266	266	266	240	240	240	236	236	200	206	A 206	206	E Y 240	206	206	206	214	228	232	226	226	226	244	262
15	272	272	238	218	258	258	258	238	234	220	Y 252	210	210	210	210	210	220	234	234	234	234	234	234	260
16	266	272	272	272	244	240	234	228	A 226	Y 226	208	208	E A 228	E A 242	A	238	240	A 238	238	238	A 256	254	254	284
17	284	306	264	264	268	244	242	232	216	216	254	202	208	A	208	E A 246	230	232	232	232	232	E A 342	E A 330	A 308
18	262	280	256	246	246	246	240	E A 232	E A 248	E A 232	E A 232	A	A	A	192	A	216	A	230	238	244	256	262	E A 324
19	278	278	278	272	252	252	238	232	220	212	A	210	210	210	H 198	H 188	214	222	224	224	268	258	246	246
20	262	262	262	262	262	256	236	228	228	228	218	Y	216	216	A	216	220	220	226	244	244	244	250	268
21	276	276	256	240	240	184	226	226	226	212	212	212	210	210	204	204	204	238	238	238	256	256	256	258
22	260	264	264	232	224	224	224	212	212	Y	212	212	212	210	210	210	210	236	236	236	236	238	238	238
23	268	268	268	266	254	222	222	212	218	212	212	208	Y	208	208	208	208	208	236	236	236	236	230	284
24	284	284	272	242	242	242	234	H 208	208	208	208	210	210	210	210	218	218	232	232	234	292	292	292	256
25	250	252	252	252	252	252	216	218	218	218	232	228	Y	202	202	H 202	216	216	230	218	232	234	240	268
26	268	288	286	240	240	240	230	220	220	210	A	A	210	210	A 222	222	A	230	230	230	248	248	248	254
27	294	278	274	274	274	272	A	A	A	A	A	A	Y	Y	226	226	226	A	226	226	226	226	242	272
28	272	284	284	252	252	236	226	226	224	222	222	216	Y	216	Y 224	218	218	222	222	234	244	246	246	272
29	274	282	282	262	258	258	236	232	234	232	216	194	254	Y 264	Y 260	E Y 262	226	226	252	252	252	268	268	280
30	280	280	274	258	258	254	232	232	A 224	A 224	Y 226	E Y 252	206	206	216	216	224	228	228	246	246	246	252	254
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	29	29	28	27	26	25	27	28	29	29	28	30	30	30	30	30	30
MED	268	273	270	262	253	252	230	226	220	216	215	212	211	210	208	210	216	227	232	234	237	242	248	260
U Q	276	282	278	270	258	256	236	232	226	225	224	216	215	214	215	220	224	232	236	238	244	248	254	272
L Q	262	268	264	246	242	242	220	218	216	212	212	208	209	206	198	205	212	220	228	228	232	236	242	254

APR. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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 108	112	110	110	120	120		A		120	122	118	118	B					
2						B 108	112	112	112	112	110	110	110	110	110	110	110	110	A					
3						B 110	110	110	110	110	110	A	110	112	108	108	108		A					
4						B 122	110	110	110	110	110	110	110	110	110	110	A 136	136						
5						B 128	118	110	110	110	110	108	108	108	108	108	108	108	A					
6						B 114	114	114	114	114	106	106	106	106	106	116	118	118	B					
7						E B 210	E A 154	116	116	116	116	116	A	A	116	112	112	112	E B 196					
8						B 114	114	114	114	114	106	A	A	106	106	106	106							
9						E B 112	112	112	112	110	A	110	110	110	116	116	128	E B 186						
10						B 126	104	114	114	114	114	114	A	114	114	114	114		A					
11						B 114	114	114	104	112	112	110	A	110	110	110	110	132						
12						B 108	112	112	112	112	112	112	108	108	108	108	108	164						
13						B 122	118	104	104	104	104	A	110	110	110	110	110		A					
14						156	120	120	120	110	110	110	110	110	116	116	116	116	134					
15						152	126	110	110	110	110	A	A	A	134	128	120	120	A					
16						B 128	116	116	114	A	102	A	A	A	A	A	A	112	A					
17						E B 192	118	118	110	110	110	110	110	A	110	110	110	110	A					
18							110	110	110	110	110	110	110	110	110	110		A	A					
19						A	E A 154	112	110	110	A	110		110	110	110	A	116	132					
20						134	126	112	112	112	112	112	112	112	112	A		A	130					
21						144	120	120	120	114	114	A	114	114	114	114	114	114						
22						134	114	114	114	112	108		108		A	A			A					
23						A 110	110	110	110	112	112	110	A	110	110	110	110	110	A					
24						122	116	116	112	112	110	106	A	114	114	114	122	124	130					
25						130	122	122	116	114	112	112	112	A	112	112	112	126	140					
26						E B 156	106	106	106	106	A			106	110	110	110	110	112	B				
27						122	122	122	114	104	104		A	A	104	A	104	104	A					
28						B 156	116	104	108	108	108	108	A	A	108	108	108	108						
29						132	130	110	110	110	110	110	110	110	110	110	110	110	110	A				
30						118	114	114	114	108	108			108		114	114	116						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						14	30	30	30	30	27	23	16	18	27	26	25	27	11					
MED						135	116	113	112	110	110	110	110	110	110	110	110	112	131					
U Q						B 156	126	116	114	112	112	112	112	110	114	114	116	118	E B 164					
L Q						130	112	110	110	110	110	108	110	108	110	110	109	110	130					

APR. 2013 h′E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 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	B	B	B	B	G	G	184	G	184	100	100	100	210	108	G	G	B	B	B	B	B	B
2	104	98	B	B	98	110	172	172	152	142	114	114	114	114	G	G	G	G	114	114	114	114	B	B
3	110	B	B	B	130	B	178	G	G	126	110	110	110	G	186	204	G	G	90	118	118	110	B	104
4	108	108	114	B	B	B	190	154	102	112	194	G	G	100	186	96	96	96	90	106	106	B	106	B
5	B	B	B	B	B	B	G	106	106	106	G	114	G	102	102	102	G	G	100	98	96	96	B	B
6	B	B	94	94	B	B	156	112	104	104	110	G	110	G	G	110	G	138	B	B	B	B	B	B
7	B	B	B	B	B	G	122	G	152	104	G	G	104	104	188	102	G	G	G	102	B	B	B	B
8	B	B	104	B	B	B	166	166	162	126	126	G	116	116	G	G	G	160	104	104	104	C	B	B
9	B	B	B	B	B	B	150	G	102	102	102	102	102	102	170	114	112	112	G	B	B	B	B	B
10	B	B	B	B	B	B	G	184	104	112	G	G	G	112	112	118	G	220	94	B	114	B	B	B
11	B	106	106	B	B	B	G	106	160	G	122	120	120	108	196	204	94	94	G	B	B	B	B	B
12	B	B	B	B	B	B	G	100	100	100	100	100	100	100	G	G	100	G	G	94	B	B	B	B
13	B	B	B	B	B	G	166	166	G	G	G	100	100	100	100	100	G	G	122	98	98	B	B	B
14	B	B	98	B	B	G	154	154	214	124	120	120	120	186	100	100	100	164	G	88	B	118	B	B
15	106	B	102	B	B	G	124	124	122	122	122	114	106	106	190	156	132	124	124	110	110	B	116	B
16	104	100	100	98	B	B	110	G	136	128	118	118	102	102	102	122	122	122	122	116	112	112	110	110
17	B	98	96	110	110	G	164	130	130	130	110	110	110	110	G	126	G	126	94	94	94	104	104	104
18	102	96	96	96	96	96	166	138	132	122	122	122	114	114	114	108	108	108	108	108	108	108	108	108
19	98	98	B	B	B	148	104	146	126	126	110	110	110	172	124	170	104	104	G	B	104	142	B	B
20	B	106	B	106	B	G	154	150	134	134	120	120	120	120	116	106	106	190	G	106	106	106	106	106
21	106	B	B	B	B	164	158	156	146	146	124	102	102	102	102	198	90	194	154	122	114	110	B	B
22	B	110	108	B	106	150	152	124	130	206	120	120	118	118	118	118	116	110	124	122	122	B	B	B
23	110	B	B	B	B	110	184	160	160	198	120	118	108	108	188	92	188	212	166	B	98	96	96	B
24	B	B	B	B	B	144	144	144	142	120	G	108	108	192	96	112	110	G	G	110	100	B	B	B
25	102	102	102	B	B	G	132	134	134	120	120	G	112	104	104	104	104	104	96	96	B	B	B	B
26	96	B	B	96	96	176	G	128	128	118	110	108	106	G	132	132	128	138	192	180	152	128	B	B
27	B	B	B	B	B	132	130	124	116	116	116	116	110	110	208	104	126	126	120	120	118	94	B	B
28	B	B	B	B	94	162	136	162	134	G	110	G	188	106	106	102	208	90	128	110	B	B	B	B
29	B	B	B	B	B	140	160	168	G	128	126	G	G	G	106	G	212	138	130	106	106	104	104	B
30	B	B	B	B	B	144	144	134	122	116	116	114	114	114	114	108	108	108	118	118	118	118	B	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	10	11	6	7	12	24	25	27	26	25	22	26	26	25	26	20	22	20	23	21	15	8	5
MED	104	101	102	97	98	144	154	144	132	122	120	114	110	108	116	109	109	125	119	108	108	110	106	106
U Q	108	106	106	106	110	156	166	161	152	128	122	118	114	114	187	126	127	160	126	118	116	118	109	109
L Q	102	98	96	96	96	121	134	124	116	112	110	108	104	102	103	102	102	108	98	98	102	104	104	104

IONOSPHERIC DATA STATION Wakkanai

APR. 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									H 1		HL 11	L 1	L 1	L 1	HL 11	CL 21								
2	F 1	F 1			F 1	L 2	H 1	HL 11	HL 11	HL 11	C 1	C 1	C 1	C 1					C 2	F 1	F 1	F 1		
3	F 1				F 1		H 1			C 1	C 1	C 1	C 1		H 1	HL 11			L 2	F 3	F 1	F 2		F 2
4	F 1	F 1	F 1				H 1	H 1	L 1	C 1	H 1			L 1	HL 11	L 1	L 1	L 1	L 1	F 1	F 2		F 2	
5								L 1	L 1	L 1		C 1		C 1	L 1	L 1			L 2	FF 31	F 2	F 1		
6			F 1	F 1			HL 11	L 1	L 1	L 1	C 1		L 1			L 1		H 1						
7							L 1		HL 11	L 1			L 1	L 1	HL 11	L 1				F 1				
8			F 1				H 1	HL 12	HL 11	C 1	CL 11		CL 11	C 1				H 1	LC 11	FC 11	F 1			
9							H 1		L 1	L 1	L 1	L 1	L 1	L 1	HL 11	L 1	L 1	L 1						
10								H 1	L 1	C 1				C 1	C 1	C 1		H 1	L 1		F 1			
11		F 1	F 1					L 2	H 1		CL 11	CL 11	CL 11	C 1	HL 11	HL 11	L 1	L 1						
12								L 1	L 1	L 1	L 1	L 1	L 1	L 1			L 1			F 1				
13							H 1	H 1				L 1	L 1	L 1	L 1	L 1			CL 21	F 1	F 1			
14			F 1				H 1	HL 11	HL 11	C 1	C 1	CL 11	CL 11	HL 11	L 1	L 1	L 2	HL 11		F 1		F 1		
15	F 1		F 1				C 2	C 2	CL 11	CL 11	CL 11	C 1	L 1	L 1	HL 11	HL 11	HL 11	CL 21	C 4	F 2	F 1		F 1	
16	F 1	F 2	F 2	F 1			L 1		H 1	HL 11	C 1	CL 11	C 1	C 2	C 2	CL 12	CL 23	CL 23	CL 21	F 3	F 4	F 3	F 3	F 3
17		F 3	F 1	F 2	F 1		H 1	C 1	C 1	C 1	C 1	CL 11	C 1	C 2		C 2		C 2	LC 21	F 4	F 5	FF 52	FF 52	F 5
18	FF 21	F 2	F 4	F 3	F 2	L 2	H 1	C 2	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 2	C 1	C 2	C 2	FF 33	FF 42	F 5	F 4	F 4
19	F 2	F 1				L 1	L 2	H 1	C 1	C 1	C 1	C 1	L 1	HL 11	C 1	HL 11	L 1	L 1			F 3	FF 11		
20		F 1		F 1			H 1	C 1	C 1	C 1	CL 11	CL 11	C 1	C 1	C 2	L 2	L 2	HL 11		F 2	F 1	F 3	F 3	F 2
21	F 2					H 1	H 1	H 1	HL 11	HL 11	HL 11	C 1	L 1	L 1	L 1	HL 11	L 1	HL 11	C 1	F 5	F 4	F 3		
22		F 1	F 1		F 1	C 1	H 1	C 1	CL 11	H 1	C 1	C 1	C 1	C 1	C 1	C 1	C 2	L 1	C 2	F 5	F 3			
23	F 1					L 4	H 1	H 1	H 1	H 1	CL 11	CL 11	L 1	L 1	HL 11	L 2	HL 11	H 1	H 1		F 1	F 1	F 1	
24						C 1	H 1	HL 11	HL 11	C 1		C 1	C 1	HL 11	L 1	CL 11	L 1			FF 11	F 1			
25	F 1	F 1	F 1				H 2	CL 11	CL 11	C 1	C 1		C 1	L 1	L 2	L 2	L 1	L 2	L 1	F 1				
26	F 2			F 1	F 1	H 1		C 1	CL 11	C 1	C 1	L 2	L 2		CL 11	HL 11	CL 21	HL 21	HL 11	H 1	F 1	F 3		
27						C 1	C 2	C 2	C 2	C 2	C 1	C 1	C 1	L 1	H 1	CL 12	CL 21	C 2	C 3	F 3	F 1	F 1		
28					F 1	H 1	HL 11	HL 11	HL 11		C 1		HL 11	L 1	L 1	L 2	HL 11	L 2	C 2	F 1				
29						C 1	H 1	H 1		H 1	C 1				L 1		HL 11	H 1	C 2	C 5	FF 21	F 3	F 1	
30						H 2	H 2	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 1	L 1	L 2	L 2	CL 22	C 3	F 3	F 2		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

APR. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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 63	X 60	X 57	X 59	X 53	X 49														X 81	X 70	X 66	X 65	68
2	X 61	X 60	X 59	X 58	X 55	X 55														X 92	X 72	X 65	X 62	X 59
3	67	68	X 57	X 57	54	X 52														X 88	X 78	O X 53	X 63	X 63
4	X 62	X 60	X 62	X 61	X 57	X 58														X 108	X 83	X 71	X 71	X 70
5	X 69	X 66	X 66	X 65	X 57	X 57														X 106	X 88	X 71	X 74	X 74
6	X 72	X 70	X 67	X 66	X 61	X 62														X 98	X 95	X 84	X 81	X 77
7	X 75	X 71	X 72	X 70	X 58	X 57														X 101	X 80	X 70	X 72	X 74
8	X 72	X 70	X 70	X 72	X 58	X 57														X 97	X 85	X 76	X 73	X 72
9	X 72	X 71	X 70	X 69	X 66	X 66														X 100	X 93	X 70	X 66	X 69
10	X 69	X 70	X 68	X 63	X 60	X 62														X 100	X 92	X 82	X 81	X 82
11	X 80	X 80	X 76	X 72	X 68	X 70														X 110	X 94	X 80	X 74	X 74
12	X 74	X 71	X 70	X 63	X 63	X 65														X 97	X 87	X 82	X 84	X 81
13	X 76	X 72	X 72	X 65	X 66	X 66														X 103	X 85	X 75	X 74	X 74
14	X 74	X 75	X 72	X 66	X 59	X 60														X 111	X 81	X 73	X 74	X 75
15	X 76	X 76	X 72	X 55	X 52	X 53														X 94	X 74	X 68	X 65	X 66
16	X 68	X 67	X 66	X 62	X 55	X 57														X 102	X 85	X 74	X 72	X 66
17	X 67	X 67	X 68	X 61	X 54	X 55														X 92	X 88	X 74	X 74	X 73
18	X 72	X 72	70	X 63	X 59	X 59														X 104	X 98	X 77	X 72	X 72
19	X 68	X 69	X 69	X 66	X 61	X 61														X 88	X 83	X 74	X 74	X 72
20	X 73	X 71	X 71	X 65	X 56	X 57														X 83	X 81	X 74	X 74	X 72
21	X 70	X 70	X 74	X 60	X 51	X 53														X 96	X 82	X 67	X 65	X 68
22	X 68	X 66	X 66	X 66	X 49	X 52														X 98	X 80	X 71	X 72	X 72
23	X 69	X 66	X 66	X 66	X 56	X 61														X 98	X 94	X 72	X 74	X 70
24	X 66	X 66	X 64	X 62	X 60	X 66														X 81	X 74	X 78	X 81	X 83
25	X 78	X 71	X 69	X 68	X 71	X 69														X 88	X 82	X 73	X 75	X 72
26	X 74	X 74	X 73	X 67	X 58	X 62														X 92	X 82	X 80	X 74	X 73
27	X 72	X 71	X 69	X 58	X 60	X 68														X 92	X 80	X 74	X 78	X 76
28	X 73	X 69	X 65	X 62	X 57	X 62														X 89	X 89	X 82	X 80	X 77
29	X 77	X 76	X 74	X 70	X 65	X 63														X 94	X 91	X 89	X 85	X 82
30	X 84	X 81	X 80	X 70	X 69	X 77														X 100	X 93	X 84	X 84	X 87
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30														30	30	30	30	30
MED	X 72	X 70	X 69	X 65	X 58	X 60														X 97	X 84	X 74	X 74	X 72
U Q	X 74	X 72	X 72	X 67	X 61	X 65														X 101	X 91	X 80	X 78	X 76
L Q	X 68	X 67	X 66	X 61	X 55	X 57														X 92	X 80	X 71	X 72	X 70

APR. 2013 fxI (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 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	57	54	51	53	47	43	63	80	84	84	91	104	117	108	101	108	104	102	90	75	64	59	59	F
2	55	54	53	52	49	49	70	79	87	98	98	110	108	99	100	95	92	93	93	86	66	59	56	53
3	F	F	51	51	F	46	64	75	84	92	104	106	110	113	106	103	104	98	88	82	72	S 47	57	57
4	56	54	55	55	51	52	75	81	90	93	89	92	104	100	97	92	96	102	104	101	77	65	65	64
5	63	60	60	59	51	51	68	78	82	87	92	108	110	105	102	98	100	98	99	100	82	65	68	68
6	66	64	61	60	55	56	73	84	97	110	103	104	102	100	102	101	97	93	91	92	89	78	74	70
7	69	65	66	64	52	51	72	86	90	88	95	100	108	103	104	107	104	103	106	94	74	64	66	68
8	66	64	64	66	52	51	76	87	88	86	100	110	108	102	107	105	103	104	101	91	79	70	67	66
9	66	65	64	63	60	60	79	94	102	102	106	108	108	108	112	115	118	113	106	94	86	64	60	63
10	63	64	62	57	54	56	71	75	84	96	106	110	108	109	105	104	101	101	102	94	86	76	75	76
11	74	74	70	66	62	64	84	91	91	101	105	104	105	108	104	109	110	108	110	104	88	74	68	68
12	68	65	64	57	57	59	80	91	96	96	100	99	106	111	109	102	99	92	96	91	80	76	78	75
13	70	66	66	59	60	60	80	83	90	98	112	114	113	104	109	108	100	92	96	97	79	69	68	68
14	68	69	66	60	53	54	74	82	90	101	105	101	100	107	99	103	104	101	105	105	75	67	68	69
15	70	70	66	49	46	47	69	103	107	107	108	112	104	92	86	92	94	95	98	88	68	62	59	60
16	62	61	60	56	49	51	70	84	93	87	84	86	93	102	102	109	115	117	111	96	79	68	66	60
17	61	61	62	55	48	49	76	87	86	V 78	81	88	94	104	104	103	100	95	A	86	82	68	68	66
18	66	66	F	57	53	53	71	78	86	88	87	96	103	100	101	97	98	94	97	98	92	71	66	66
19	62	63	63	60	55	54	78	89	88	80	90	107	109	99	96	100	104	91	84	82	77	68	68	66
20	67	65	65	59	50	50	76	84	89	82	81	84	96	102	94	95	96	90	82	77	75	68	68	66
21	64	64	68	54	45	46	72	77	82	85	81	88	99	92	90	96	102	96	90	90	76	61	59	62
22	62	60	60	60	42	47	66	79	76	84	87	83	95	94	101	111	116	115	101	92	74	65	66	65
23	63	60	60	60	50	55	81	74	73	78	86	89	96	97	101	101	101	87	88	92	87	66	68	64
24	60	60	58	56	54	60	72	79	85	86	81	84	92	105	114	116	112	101	84	75	68	72	75	77
25	72	65	62	62	65	63	69	78	77	81	78	84	102	90	88	90	95	94	88	82	76	67	69	66
26	68	68	67	61	52	56	64	84	94	89	85	88	96	105	97	100	104	105	103	86	76	74	68	67
27	66	65	63	52	54	62	64	65	72	72	73	80	96	98	89	95	94	93	90	86	74	68	72	70
28	67	63	58	56	51	56	68	75	75	78	82	81	89	93	103	107	100	94	91	83	82	76	74	71
29	71	70	68	64	59	56	61	61	73	76	81	86	91	92	102	98	91	87	91	88	84	83	79	76
30	78	75	74	64	63	71	79	82	82	86	84	95	104	108	110	116	113	114	106	94	87	78	78	80
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	29
MED	66	64	63	59	52	54	72	82	86	87	90	98	104	102	102	102	101	97	96	91	78	68	68	66
U Q	68	66	66	61	56	59	76	86	90	96	103	107	108	107	105	108	104	103	104	94	84	74	72	70
L Q	62	60	60	55	50	50	68	78	82	82	82	86	96	98	97	97	97	93	90	86	74	65	66	64

IONOSPHERIC DATA STATION Kokubunji

APR. 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	L								
2										L		U L 504	L	A	A	A	A							
3									L	L	L	L	L	U L 520	A	L	L							
4									L	L	L	L	L	L	L	L	L							
5									L	L	L	U L 564	L	L	L	484	L							
6									A	L	L	L	L	L	L	L								
7										L	L	L	L	L	L	L								
8										L	L	L	L	L	L	A		A						
9								L	L	L	U L 540	L	L	L	U L 556	L								
10									L	L	L	U L 560	U L 548	L	L	L	L							
11									L	L	L	L	L	U L 584	L	L	A	A						
12										L	U L 508		U L 540	U L 540	U L 512	L	L							
13									L	L	L	L	U L 532	L	U L 524	L	A							
14									L	L	L	L	L	U L 536	L	L	L	L						
15								L		L	U L 508	U L 532	U L 524	L	L	L	L	L						
16									L		L	U L 552	L	U L 540	L	L	L	A						
17										L	U L 580	U L 548	U L 556	U L 504	L	A	L	A	A					
18									L	U L 504	U L 488	A	A	U L 516	A	A	A	A	A					
19								L	A	L	U L 512	488	504	U L 480	U L 488	L	L	A						
20									L	L	U L 500	U L 536	U L 520	L	U L 504	L	L	L						
21									L	L	A	528	U L 512	U L 508	A	L	L	L						
22								L	L	U L 484	U L 484	U L 524	U L 556	U L 536	504	L	A	L						
23								L	L	L	U L 500	L	U L 520	496	480	L	L							
24								L	L	U L 488	L	U L 492	U L 580	U L 500	U L 508	A	L	A						
25									L	L	L	L	U L 520	A	L	L	L							
26									L	U L 500	U L 540	U L 524	U L 560	492	L	A	A	A						
27								L	A	A	A		A	U L 532	L	L	L	A						
28										L	U L 528	U L 528	504	A	U L 520	U L 492	A	A						
29								A	L	L	U L 532	L	U L 576	L	U L 528	A	L	A						
30									L	A	A	U L 596	U L 552	A	A	A	L	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										4	12	14	16	14	10	2								
MED										U L 494	U L 510	U L 530	U L 536	U L 518	U L 510	488								
U Q										U L 502	U L 536	U L 552	U L 556	U L 536	U L 524									
L Q										U L 486	U L 500	U L 524	U L 520	500	504									

APR. 2013 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 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							184	R	R	R	R	A	A	A	A	R	A	U R 244	B					
2							196	R	A	R	A	R	R	A	A	A	A	A	B					
3							204	280	A	R	A	R	R	R	A	A	R	252	B					
4							U A 204	A	A	A	A	A	A	A	A	A	A	U R 248	B					
5							200	R	R	A	A	R	R	A	A	R	R	A	B					
6							216	320	A	A	A	A	A	R	R	R	R	A	B					
7							216	R	A	A	A	A	A	R	R	R	R	A	B					
8							176	R	A	A	A	R	A	R	A	A	A	A	B					
9							U R 220	A	A	A	A	A	A	A	R	R	R	R	B					
10							196	R	R	A	R	A	A	R	R	A	A	U R 280	B					
11							U R 200	R	A	A	A	A	A	A	A	A	A	A	B					
12							204	R	A	R	R	R	R	R	R	R	R	R	B					
13							228	A	A	A	A	R	A	R	R	A	A	U A 244	B					
14							204	A	A	A	R	R	A	R	R	R	A	U A 248	B					
15							A	A	A	A	R	R	R	A	R	A	R	A	B					
16							212	288	A	A	A	A	A	A	A	A	A	A	B					
17							224	A	A	A	A	A	A	R	R	A	A	A	A					
18							A	A	A	A	A	A	A	A	A	A	A	A	B					
19							U R 228	U R 312	A	A	R	R	R	R	A	A	A	A	B					
20							208	A	A	R	A	R	R	R	R	R	A	A	B					
21							232	A	A	A	A	R	R	R	A	R	R	R	B					
22							240	R	A	A	A	R	R	R	R	R	A	A	U R 176					
23							232	R	A	A	R	R	A	A	A	R	R	A	B					
24							236	R	A	R	R	R	A	R	A	A	A	A	A					
25							236	A	R	A	A	A	A	A	A	A	R	U R 244	B					
26							U R 252	A	A	A	A	R	A	R	A	A	A	A	B					
27							A	A	A	A	A	A	A	A	A	R	A	A	B					
28							A	A	A	A	A	A	A	A	A	A	A	A	B					
29							240	A	R	A	A	R	R	R	R	A	R	A	B					
30							U A 252	A	A	A	A	R	A	A	A	A	A	A	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							26	4										7	1					
MED							216	300										U R 248	U R 176					
U Q							232	316										252						
L Q							204	284										U 244						

APR. 2013 foE (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 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 15	E B 15	20	20	E B 15	E B 15	24	G	G	G	G	42	44	J A 45	43	G	36	29	J A 26	27	J A 37	J A 20	J A 24	J A 22
2	J A 32	22	21	20	21	20	G	G	37	G	J A 44	G	G	J A 55	J A 54	J A 48	J A 47	38	22	E B 15	E B 15	J A 40	J A 38	J A 21
3	E B 16	J A 19	20	J A 20	J A 24	E B 15	25	34	41	G	43	G	G	G	J A 44	40	G	32	J A 27	J A 25	J A 29	J A 27	20	J A 20
4	22	20	E B 15	E B 14	E B 16	E B 15	26	37	37	39	42	40	41	40	40	40	33	G 21	E B 16	E B 15	22	20	J A 40	19
5	E B 15	E B 14	18	E B 15	E B 14	E B 15	24	G	G	41	41	G	G	42	44	G	G 26	32	22	J A 32	E B 15	J A 23	E B 15	E B 14
6	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	30	G	39	40	39	J A 44	38	G	G	G	G	33	J A 44	J A 62	19	E B 15	E B 14	E B 14
7	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15	G	G 26	39	39	42	42	46	G	G	G	G	30	22	J A 16	J A 23	20	20	E B 14
8	E B 14	E B 15	E B 15	E B 14	E B 15	E B 15	25	G 26	36	40	41	G	40	G	J A 48	J A 46	J A 45	J A 34	J A 28	J A 28	E B 14	19	J A 45	J A 26
9	J A 24	E B 15	21	E B 15	E B 15	E B 14	G	33	36	41	44	43	45	J A 47	G	G	G 26	G	E B 16	22	J A 79	J A 20	E B 15	E B 15
10	E B 14	E B 15	E B 15	E B 14	20	E B 15	25	G	G 28	40	G	42	44	G	G	38	37	G	E B 17	E B 14	E B 15	E B 15	E B 15	E B 15
11	E B 15	E B 15	E B 14	E B 14	20	E B 15	25	G 26	39	42	42	43	43	J A 50	J A 65	J A 43	J A 46	36	J A 37	25	J A 39	J A 46	J A 50	20
12	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	26	G 26	39	G	G	G	G	G	G	G	G	G	E B 16	E B 14	E B 15	E B 14	E B 15	E B 14
13	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	28	38	39	42	43	G	J A 46	G	G	42	40	34	30	J A 16	J A 20	E B 15	E B 15	E B 15
14	E B 15	E B 15	E B 15	E B 14	E B 13	E B 14	27	35	J A 40	40	G	G	42	G	G	G	34	30	20	21	20	E B 15	E B 14	E B 14
15	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	29	33	39	41	G	G	G	43	G	40	G	33	J A 47	21	J A 21	J A 25	20	E B 15
16	E B 14	E B 15	E B 15	E B 15	19	J A 31	G	34	40	J A 47	42	44	44	42	41	42	J A 39	33	J A 29	J A 29	J A 22	23	J A 31	22
17	J A 18	E B 15	22	J A 21	18	E B 15	27	36	J A 36	43	44	J A 44	43	G	G	J A 53	J A 55	J A 54	J A 94	J A 27	J A 16	J A 22	J A 23	J A 45
18	E B 15	J A 81	J A 48	J A 28	J A 19	22	J A 36	J A 42	39	42	44	J A 63	J A 50	J A 65	J A 46	J A 59	J A 90	J A 74	J A 35	J A 60	J A 80	J A 41	J A 31	20
19	E B 14	J A 20	19	E B 14	E B 14	E B 14	G	G	J A 40	J A 44	G	G	G	G	41	J A 52	J A 38	J A 38	J A 24	E B 15	E B 15	E B 13	J A 24	J A 30
20	20	20	J A 19	J A 24	J A 31	J A 21	26	34	39	G	41	G	G	G	G	G	G	29	J A 28	J A 20	J A 21	J A 18	20	20
21	E B 15	E B 15	E B 16	E B 14	E B 13	E B 15	29	33	41	41	J A 50	G	G	G	42	G	G	G	E B 16	E B 13	E B 15	E B 15	J A 35	J A 39
22	J A 24	22	J A 44	18	J A 18	E B 15	28	G	37	40	43	G 30	G	G	G	G	37	J A 31	G	E B 14	J A 24	J A 26	J A 29	J A 25
23	J A 30	E B 14	J A 17	J A 19	J A 32	22	28	G 24	36	39	G	G	42	43	41	G	G	31	24	21	20	E B 15	E B 15	E B 15
24	E B 15	E B 14	E B 15	E B 15	E B 14	E B 16	27	G 25	41	G	G	G	42	G	42	J A 44	J A 37	J A 43	J A 45	J A 28	J A 26	22	E B 15	E B 15
25	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	28	38	G	43	J A 52	45	J A 45	J A 57	J A 44	38	G	G 23	22	J A 16	E B 13	E B 14	21	20
26	21	21	E B 15	20	21	20	31	36	J A 40	44	J A 52	G	41	G	46	J A 51	J A 46	J A 39	J A 39	21	E B 14	E B 14	37	J A 25
27	J A 45	J A 20	E B 14	E B 15	21	19	32	39	43	50	J A 54	54	55	46	46	G	37	35	J A 32	41	J A 60	J A 58	J A 48	20
28	J A 22	J A 18	21	20	E B 14	E B 16	35	40	40	46	47	44	43	J A 56	41	J A 39	J A 50	35	J A 32	J A 28	32	J A 18	E B 14	E B 15
29	E B 15	E B 15	E B 14	E B 14	E B 15	E B 16	32	39	G 34	41	45	G	G	G	G	40	G	36	22	J A 20	J A 33	J A 44	J A 19	J A 26
30	J A 26	E B 15	J A 27	E B 15	E B 14	E B 16	35	36	40	J A 52	J A 60	G	48	J A 108	J A 67	J A 108	31	33	28	E B 15	E B 15	E B 20	J A 68	J A 48
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	27	33	39	41	42	G	42	G	41	40	35	33	26	21	20	20	20	20
U Q	J A 22	20	20	20	20	16	29	36	40	43	J A 44	43	44	J A 46	J A 44	J A 44	J A 40	J A 36	J A 32	J A 28	J A 29	J A 25	J A 35	J A 25
L Q	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	G 25	G	G 36	G 39	G	G	G	G	G	G	G	G 29	E B 22	E B 15	E B 15	E B 15	E B 15	E B 15

APR. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2013 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	22	G	G	G	G	41	42	39	39	G	32	28	17	20	27	E B 15	17	E B 14
2	21	E B 15	E B 15	E B 14	E B 14	E B 15	G	G	32	G	40	G	G	51	44	44	43	32	19	E B 15	E B 15	16	E B 16	E B 15
3	E B 16	E B 15	16	E B 15	18	E B 15	23	33	38	G	40	G	G	G	40	36	G	30	21	20	24	E B 15	E B 15	E B 16
4	E B 15	16	E B 15	E B 14	E B 16	E B 15	22	31	33	36	40	38	38	37	36	36	31	G 20	E B 16	E B 15	E B 15	E B 15	21	E B 15
5	E B 15	E B 14	E B 15	E B 15	E B 14	E B 15	22	G	G	38	38	G	G	38	42	G	G 24	27	20	23	E B 15	E B 15	E B 15	E B 14
6	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	23	G	37	35	38	40	34	G	G	G	G	30	38	35	E B 15	E B 15	E B 14	E B 14
7	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15	G	G 25	35	37	40	40	41	G	G	G	G	30	20	E B 15	18	14	E B 15	E B 14
8	E B 14	E B 15	E B 15	E B 14	E B 15	E B 15	22	G 24	32	37	38	G	38	G	42	44	40	30	19	23	E B 14	E B 14	17	E B 15
9	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14	G	28	33	38	41	41	42	42	G	G	G 25	G	E B 16	E B 15	51	E B 14	E B 15	E B 15
10	E B 14	E B 15	E B 15	E B 14	E B 14	E B 15	24	G	G 26	37	G	40	41	G	G	36	33	G	E B 17	E B 14	E B 15	E B 15	E B 15	E B 15
11	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	22	G 24	35	38	41	40	41	44	39	36	40	34	31	E B 15	17	28	36	E B 14
12	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	24	G 24	36	G	G	G	G	G	G	G	G	G	E B 16	E B 14	E B 15	E B 14	E B 15	E B 14
13	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	25	34	35	39	41	G	41	G	G	37	39	30	27	E B 15	E B 15	E B 15	E B 15	E B 15
14	E B 15	E B 15	E B 15	E B 14	E B 13	E B 14	25	32	36	38	G	G	41	G	G	G	30	27	18	E B 15	E B 15	E B 15	E B 14	E B 14
15	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	24	32	35	39	G	G	G	39	G	37	G	29	37	E B 14	17	19	E B 15	E B 15
16	E B 14	E B 15	E B 15	E B 15	E B 15	E B 16	G	30	36	41	40	41	42	41	40	38	34	29	25	20	18	E B 15	25	E B 15
17	E B 14	E B 15	E B 15	18	E B 15	E B 15	26	32	35	40	42	39	40	G	G	46	34	30	A A 94	22	E B 16	E B 15	22	40
18	E B 15	E B 14	24	23	15	E B 15	30	37	36	40	41	60	46	41	44	54	59	47	28	53	35	30	E B 15	E B 15
19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	35	38	G	G	G	G	38	33	31	30	18	E B 15	E B 15	E B 13	18	20
20	E B 15	E B 14	E B 15	18	20	17	24	32	32	G	38	G	G	G	G	G	G	28	19	19	E B 15	E B 14	E B 16	E B 14
21	E B 15	E B 15	E B 16	E B 14	E B 13	E B 15	25	31	38	40	42	G	G	G	39	G	G	G	E B 16	E B 13	E B 15	E B 15	18	E B 15
22	E B 15	16	34	E B 14	E B 14	E B 15	28	G	35	38	40	G 30	G	G	G	G	34	27	G	E B 14	18	19	E B 15	E B 14
23	E B 14	E B 14	E B 15	18	20	E B 15	26	G 24	34	38	G	G	40	40	40	G	G	30	22	E B 14	E B 15	E B 15	E B 15	E B 15
24	E B 15	E B 14	E B 15	E B 15	E B 14	E B 16	26	G 24	38	G	G	G	39	G	37	39	32	32	30	20	19	E B 14	E B 15	E B 15
25	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	26	34	G	42	43	41	40	45	38	35	G	G 22	19	E B 14	E B 13	E B 14	E B 14	E B 14
26	E B 16	E B 15	E B 15	E B 16	E B 14	E B 16	26	33	36	41	42	G	38	G	43	47	42	33	24	E B 14	E B 14	E B 14	32	21
27	32	E B 14	E B 14	E B 15	E B 14	16	31	34	40	48	50	50	53	43	42	G	32	31	24	34	40	43	36	E B 15
28	15	E B 15	E B 14	E B 15	E B 14	E B 16	34	35	36	42	43	43	41	51	39	35	36	32	27	20	24	E B 15	E B 14	E B 15
29	E B 15	E B 15	E B 14	E B 14	E B 15	E B 16	27	35	G 31	40	42	G	G	G	G	40	G	32	20	E B 15	30	33	E B 15	E B 15
30	E B 16	E B 15	E B 15	E B 15	E B 14	E B 16	29	34	38	49	56	G	44	58	60	74	30	31	22	E B 15	E B 15	17	40	E B 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	24	30	35	38	40	G	40	G	38	36	31	30	20	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	15	15	E B 16	26	33	36	40	42	40	41	41	40	39	34	31	27	20	19	16	18	E B 15
L Q	E B 15	E B 14	E B 15	E B 14	E B 14	E B 15	G 22	G	G 32	G 36	G	G	G	G	G	G	G	G 27	E B 18	E B 14	E B 15	E B 14	E B 15	E B 14

APR. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2013 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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	299	293	301	320	309	308	359	374	360	330	315	311	311	310	304	314	317	332	348	324	309	292	307	F
2	282	273	273	295	303	304	351	352	341	345	315	327	319	308	314	316	323	321	329	332	314	298	295	271
3	F	F	293	300	F	290	340	350	333	324	322	316	307	307	305	311	321	323	326	330	328	S 348	292	290
4	283	276	289	308	299	294	360	358	349	342	327	302	312	316	309	308	315	316	322	341	353	278	287	297
5	273	289	285	308	322	301	347	344	357	327	311	313	317	312	317	315	313	318	319	330	328	288	283	290
6	292	288	304	309	294	304	335	331	322	328	322	308	299	303	303	307	313	318	316	308	320	298	297	292
7	291	288	299	323	304	306	334	349	346	341	313	315	313	301	305	307	307	312	326	328	310	281	284	279
8	273	277	290	325	307	300	341	351	347	314	315	308	317	301	307	307	303	320	319	318	319	287	285	293
9	289	288	286	300	292	300	324	333	331	316	309	305	299	288	290	293	308	314	321	324	325	298	280	276
10	289	292	294	289	294	298	352	340	331	313	316	318	300	300	293	297	301	306	311	321	313	296	283	290
11	290	290	297	304	292	298	333	336	322	316	312	301	295	304	302	304	304	312	311	331	315	301	279	286
12	292	303	291	289	297	292	331	327	322	316	302	294	294	299	310	306	313	312	314	315	300	290	298	296
13	296	291	303	296	288	296	334	329	326	312	312	295	313	293	299	302	307	310	311	324	323	289	280	284
14	296	305	306	319	290	295	327	335	327	315	315	309	287	305	299	300	301	307	312	334	311	279	274	277
15	292	306	318	292	286	293	294	324	326	314	317	325	322	325	315	322	322	317	329	326	315	289	290	287
16	288	299	314	316	284	292	336	335	343	331	329	295	305	314	306	313	315	325	339	334	315	302	296	288
17	287	290	307	338	277	280	351	341	339	V 345	323	310	302	308	309	311	316	333	A	317	325	293	302	295
18	294	294	F	305	317	299	347	340	345	336	302	306	318	304	315	311	312	311	324	322	336	309	299	292
19	298	296	301	306	302	288	335	335	344	329	307	321	328	321	312	315	324	329	323	319	317	309	287	291
20	290	291	309	329	294	300	338	346	345	337	339	297	314	317	314	319	321	326	329	304	302	295	285	275
21	282	301	327	344	305	307	355	357	339	327	333	315	317	306	299	300	323	320	319	332	337	292	272	273
22	295	302	311	360	294	304	340	356	339	334	340	299	299	290	298	305	315	330	337	332	323	287	284	302
23	294	296	299	331	287	310	349	348	347	312	329	309	306	308	309	310	325	323	316	319	327	292	296	284
24	290	300	307	310	308	332	364	356	341	336	309	256	264	285	294	306	321	339	323	314	278	275	280	293
25	297	292	290	283	315	335	354	337	311	342	312	304	325	315	315	313	319	325	327	316	315	294	282	281
26	286	285	310	312	295	323	336	329	341	335	313	312	291	300	295	300	308	315	323	324	300	299	296	284
27	277	303	306	280	274	331	331	332	345	321	330	292	302	316	303	321	320	325	324	319	317	273	294	290
28	299	286	289	299	301	331	356	348	334	332	323	308	306	296	308	313	315	316	328	305	303	296	280	278
29	278	281	292	304	301	329	363	343	332	318	323	310	306	297	316	317	313	313	313	309	299	287	287	284
30	283	284	294	303	290	324	315	341	324	317	290	287	291	296	293	294	295	306	313	302	297	286	266	279
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	29
MED	290	291	299	307	295	300	340	341	339	328	315	308	306	304	306	309	315	318	323	323	315	292	286	287
U Q	294	300	307	320	304	310	352	350	345	336	323	313	317	312	312	314	321	325	328	330	325	298	296	292
L Q	283	287	290	299	290	295	334	335	327	316	312	299	299	299	299	304	308	312	315	316	309	287	280	279

APR. 2013 M(3000)F2 (0.01)

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APR. 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	L								
2										L		U L 397	L	A	A	A	A							
3									L	L	L	L	L	U L 377	A	L	L							
4									L	L	L	L	L	L	L	L	L							
5									L	L	L	U L 358	L	L	L	387	L							
6									A	L	L	L	L	L	L	L								
7										L	L	L	L	L	L	L								
8										L	L	L	L	L	L	A		A						
9								L	L	L	U L 373	L	L	L	U L 353	L								
10									L	L	L	U L 355	U L 366	L	L	L	L							
11									L	L	L	L	L	U L 348	L	L	A	A						
12										L	U L 397		U L 369	U L 366	U L 363	L	L							
13									L	L	L	L	U L 377	L	U L 358	L	A							
14									L	L	L	L	L	U L 354	L	L	L	L						
15								L		L	U L 382	U L 364	U L 378	L	L	L	L	L						
16									L		L	U L 364	L	U L 354	L	L	L	A						
17										L	U L 352	U L 361	U L 350	U L 373	L	A	L	A	A					
18									L	U L 360	U L 393	A	A	U L 371	A	A	A	A	A					
19								L	A	L	U L 361	395	380	U L 385	U L 395	L	L	A						
20									L	L	U L 391	U L 373	U L 387	L	U L 372	L	L	L						
21									L	L	A	371	U L 387	U L 368	A	L	L	L						
22								L	L	U L 380	U L 387	U L 372	U L 343	U L 364	363	L	A	L						
23								L	L	L	U L 374	L	U L 366	400	395	L	L							
24								L	L	U L 378	L	U L 408	U L 328	U L 388	U L 352	A	L	A						
25									L	L	L	L	U L 367	A	L	L	L							
26									L	U L 387	U L 368	U L 379	U L 343	399	L	A	A	A						
27								L	A	A	A		A	U L 361	L	L	L	A						
28										L	U L 383	U L 375	401	A	U L 354	U L 352	A	A						
29								A	L	L	U L 376	L	U L 339	L	U L 355	A	L	A						
30									L	A	A	U L 344	U L 382	A	A	A	L	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										4	12	14	16	14	10	2								
MED										U L 379	U L 379	U L 372	U L 368	U L 370	U L 360	370								
U Q										U L 384	U L 389	U L 379	U L 381	385	U L 372									
L Q										U L 369	U L 370	U L 361	U L 346	U L 361	U L 354									

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APR. 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									250	272	270	280	280	268	266	286								
2										254		260	272	264	262	268	252							
3									264	270	270	274	272	274	258	278	262							
4									250	256	256	270	272	268	284	268	274							
5									242	270	270	284	272	276	276	274	270							
6									252	254	254	286	280	278	286	276								
7										248	278	270	292	278	284	274								
8										270	284	270	264	284	280	276		254						
9								244	250	256	270	288	276	308	310	294								
10									262	288	272	276	284	284	276	286	282							
11									264	272	264	268	302	292	286	288	262	254						
12										266	260		294	288	278	278	272							
13									256	270	276	272	266	300	290	286	266							
14									260	268	284	288	304	292	292	288	276	274						
15								264		260	264	264	274	262	288	284	270	262						
16									258		262	278	290	292	294	282	272	250						
17										244	302	304	302	280	282	268	276	240	A					
18									248	258	274	292	276	284	276	276	262	246	240					
19								252	246	262	290	274	256	264	280	286	266	236						
20									246	252	272	308	286	278	268	282	260	254						
21									256	268	256	278	290	278	278	302	270	262						
22								238	266	266	264	290	306	304	306	290	270	252						
23								248	262	286	276	292	294	288	290	272	260							
24								244	254	262	272	264	362	326	308	276	266	236						
25									282	264	286	290	280	278	288	280	280							
26									252	266	292	282	324	282	282	302	274	258						
27								282	266	E A 262	278		306	286	280	288	270	258						
28										268	288	278	286	320	296	278	264	254						
29								240	276	298	286	302	302	306	284	272	274	264						
30									260	266	E A 272	304	308	304	298	300	288	260						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								8	23	29	29	28	30	30	30	30	25	17	1					
MED								246	256	266	272	279	286	284	284	281	270	254	240					
U Q								258	264	270	284	290	302	292	290	288	274	261						
L Q								242	250	257	264	271	274	278	278	276	263	248						

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APR. 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 264	E B 260	E B 258	232	228	230	206	222	212	204	198	200	210	226	206	202	226	228	216	218	232	E B 252	E A 260	E B 250
2	E A 290	E B 274	E B 280	E B 262	E B 238	E B 244	220	216	214	208	224	192	202	A	A	A	A	230	228	214	198	226	E B 244	E B 292
3	E B 266	E B 252	E B 254	E B 252	234	E B 262	216	216	218	204	194	196	196	192	A	204	210	218	222	222	216	212	E B 256	E B 270
4	274	E B 296	E B 276	E B 258	E B 250	E B 254	226	218	210	198	198	192	196	196	200	208	210	236	234	210	204	224	E A 276	E B 266
5	E B 282	E B 280	E B 274	E B 236	218	E B 234	212	220	200	206	190	190	192	188	206	202	210	E A 238	238	222	202	216	E B 266	E B 264
6	E B 264	E B 268	E B 264	E B 252	220	E B 256	216	218	A	206	194	192	198	204	200	204	218	230	242	E A 250	222	228	E B 244	E B 250
7	E B 262	E B 260	E B 254	222	222	E B 244	220	218	210	194	194	190	196	192	210	206	220	232	236	216	204	E B 242	E B 270	E B 272
8	E B 288	E B 292	E B 274	214	E B 216	E B 258	218	214	214	210	200	208	200	190	216	A	E A 242	A	232	224	214	E B 230	E A 264	E B 274
9	E B 272	E B 272	E B 272	E B 242	E B 234	E B 260	218	186	210	212	198	204	208	194	212	210	232	230	234	216	E A 250	204	E B 264	E B 286
10	E B 278	E B 268	E B 268	E B 228	E B 234	E B 244	208	212	204	210	206	198	196	198	198	210	208	236	232	E B 226	216	E B 220	E B 258	E B 268
11	E B 252	E B 252	E B 252	E B 240	E B 238	E B 260	220	216	212	212	204	188	204	204	206	212	A	A	240	224	208	E A 236	E A 296	E B 276
12	E B 250	E B 242	E B 244	E B 244	E B 250	E B 260	228	224	218	196	194	228	198	198	202	206	208	230	242	222	214	E B 244	E B 248	E B 238
13	E B 250	E B 268	E B 260	E B 236	E B 262	E B 262	218	218	214	204	202	200	198	198	212	228	A	228	E A 238	220	204	E B 230	E B 264	E B 260
14	E B 264	E B 250	E B 238	216	E B 232	E B 254	216	220	202	206	210	202	212	204	216	204	206	224	252	212	200	E B 236	E B 284	E B 282
15	E B 276	E B 248	E B 220	206	E B 272	E B 278	226	216	220	200	194	206	202	202	202	216	202	218	224	212	216	E A 248	E B 264	E B 280
16	E B 270	E B 264	E B 250	226	E B 238	E B 268	220	216	210	228	200	192	202	204	210	212	216	A	222	210	204	210	E A 258	E B 252
17	E B 290	E B 274	E B 242	216	E B 300	E B 260	228	224	216	192	218	200	196	200	214	A	234	A	A	228	214	210	E A 256	E A 296
18	E B 262	E B 250	E A 252	232	E B 234	E B 242	214	218	202	208	214	A	A	214	A	A	A	A	A	E A 248	222	E A 234	E B 244	E B 252
19	E B 270	E B 258	E B 252	230	E B 244	E B 264	222	214	A	202	206	194	202	204	192	196	216	A	228	E B 226	E B 220	E B 224	E A 268	E A 270
20	E B 272	E B 264	E B 248	216	E A 286	E A 252	226	220	202	206	200	190	176	206	188	210	212	226	222	222	234	E B 238	E B 260	E B 284
21	E B 290	E B 272	224	202	E B 240	E B 248	228	220	208	204	A	190	192	192	A	206	214	218	230	216	E B 204	220	E A 304	E B 302
22	E B 262	E A 264	E A 278	206	E B 252	E B 242	226	216	214	186	204	202	224	196	214	210	A	208	228	218	206	E A 246	E B 268	E B 240
23	E B 252	E B 268	E B 260	E A 232	E A 252	E A 242	218	220	208	208	222	210	212	206	208	212	210	E A 236	244	E B 230	216	208	E B 254	E B 258
24	E B 274	E B 258	E B 248	E B 230	E B 238	E B 236	220	216	210	204	206	190	198	208	202	A	216	A	230	230	E A 272	E B 290	E B 298	E B 266
25	E B 246	E B 250	E B 270	E B 278	E B 230	220	220	218	222	216	230	206	204	A	198	208	228	A 232	234	214	224	E B 236	E B 256	E B 284
26	E B 274	E B 272	E B 252	218	230	228	216	226	214	206	214	202	202	194	230	A	A	A	228	218	234	234	E A 262	E A 284
27	E A 312	E B 256	E B 240	E B 266	E B 274	222	220	226	A	A	A	E A 278	A	218	206	222	214	A	232	E A 240	E A 238	E A 326	E A 296	E B 250
28	E A 274	E B 266	E B 266	E B 254	E B 222	226	222	228	214	210	204	206	196	A	218	212	A	A	232	236	E A 250	E B 248	E B 256	E B 288
29	E B 290	E B 284	E B 266	E B 234	E B 232	228	230	A	202	204	202	212	216	228	198	A	212	A	246	E B 226	E B 256	E A 276	E B 250	E B 288
30	E B 274	E B 262	E B 248	E B 228	E B 244	E B 234	214	216	204	A	A	194	192	A	A	A	200	A	240	228	E B 236	E B 238	E A 318	E B 284
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	29	27	28	27	29	28	26	25	22	23	18	28	30	30	30	30	30
MED	E B 272	E B 264	E B 254	E B 232	E B 238	E B 246	220	218	210	206	202	199	199	201	206	209	213	229	232	219	210	E 234	E B 263	E B 271
U Q	E B 278	E B 272	E B 268	E B 244	E B 250	E B 260	226	220	214	209	210	206	204	206	213	212	220	A 232	239	228	E A 234	E A 244	E A 270	E B 284
L Q	E B 262	E B 256	E B 248	218	230	234	216	216	204	203	198	192	196	194	200	204	210	224	228	216	204	220	E B 256	E B 258

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APR. 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	112	114	118	122	A	A	122	120	A	118	B					
2							118	112	A	114	A	118	126	A	124	A	A	A	B					
3							120	118	118	118	112	114	116	116	A	A	120	112	B					
4							116	118	A	A	A	A	A	A	A	A	A	122	B					
5							122	122	118	A	114	114	118	A	A	120	122	A	B					
6							122	114	A	A	A	A	A	116	114	114	118	A	B					
7							116	118	A	A	116	118	A	118	112	114	114	116	B					
8							114	120	A	A	A	120	A	118	A	A	A	A	B					
9							126	A	A	A	A	A	A	A	122	124	118	118	B					
10							112	114	114	A	120	A	A	112	114	A	A	118	B					
11							122	118	A	A	A	A	A	A	A	A	A	A	B					
12							114	118	A	120	120	124	116	122	122	116	114	116	B					
13							118	114	A	A	A	114	A	114	112	A	A	116	B					
14							112	114	114	114	112	116	A	120	120	112	A	118	B					
15							116	116	A	112	114	114	116	A	124	A	116	114	B					
16							116	118	118	118	114	114	A	A	114	A	A	A	B					
17							114	A	A	A	A	A	A	124	110	A	A	A	A					
18							A	A	A	A	112	A	A	A	A	A	A	A	B					
19							120	120	A	A	122	122	120	122	A	A	A	A	B					
20							110	112	A	112	A	120	120	122	114	116	116	A	B					
21							116	116	112	114	112	116	112	128	114	118	114	118	B					
22							116	112	A	118	122	116	118	128	112	112	A	A	134					
23							122	124	A	A	118	122	A	A	122	122	112	114	B					
24							122	118	A	120	124	124	A	128	A	A	A	A	A					
25							112	114	116	116	118	A	A	A	A	A	110	120	B					
26							114	112	114	110	A	114	A	122	124	124	120	A	B					
27							118	112	112	116	A	A	A	122	122	124	A	A	B					
28							126	112	110	118	118	116	A	A	A	A	A	A	B					
29							116	A	116	120	122	126	124	126	130	118	116	120	B					
30							120	118	114	A	A	118	A	A	A	A	A	A	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							29	26	13	16	18	21	10	17	19	14	13	14	1					
MED							116	117	114	116	118	118	118	122	120	118	116	118	134					
U Q							121	118	117	118	120	122	120	125	122	122	119	118						
L Q							114	114	112	114	114	114	116	117	114	114	114	116						

APR. 2013 h′E (KM)

IONOSPHERIC DATA STATION Kokubunji

APR. 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	90	90	B	B	150	G	G	G	G	118	108	102	118	G	108	134	100	94	94	94	102	104
2	90	92	100	100	100	100	G	G	104	G	106	G	G	108	116	108	104	108	104	B	B	104	102	96
3	B	102	104	98	100	B	156	148	122	G	114	G	G	G	108	102	G	140	116	112	104	102	92	94
4	90	98	B	B	B	B	128	130	104	108	104	108	104	102	100	106	102	104	B	B	108	100	98	88
5	B	B	98	B	B	B	150	G	G	100	116	G	G	112	106	G	106	106	110	102	B	104	B	B
6	B	B	B	B	B	B	142	G	104	104	106	102	102	G	G	G	G	106	104	98	104	B	B	B
7	B	B	B	B	B	B	G	100	102	100	118	114	108	G	G	G	G	126	106	106	106	106	102	B
8	B	B	B	B	B	B	146	106	104	106	104	G	104	G	106	106	100	98	112	106	B	106	104	102
9	96	B	104	B	B	B	G	110	104	104	104	104	106	104	G	G	100	G	B	102	102	102	B	B
10	B	B	B	B	100	B	156	G	100	102	G	106	104	G	G	108	106	G	B	B	B	B	B	B
11	B	B	B	B	102	B	144	104	106	108	106	106	102	104	104	104	102	102	102	98	108	94	96	98
12	B	B	B	B	B	B	162	102	104	G	G	G	G	G	G	G	G	G	B	B	B	B	B	B
13	B	B	B	B	B	B	150	120	104	106	102	G	104	G	G	108	104	124	110	110	108	B	B	B
14	B	B	B	B	B	B	136	120	126	124	G	G	102	G	G	G	100	128	122	96	94	B	B	B
15	B	B	B	B	B	B	126	118	106	118	G	G	G	96	G	104	G	122	106	108	104	102	102	B
16	B	B	B	B	106	106	G	144	116	118	118	114	98	104	120	108	106	106	106	106	100	100	98	96
17	104	B	102	98	102	B	148	98	102	102	104	104	104	G	G	104	102	100	102	96	102	102	92	96
18	B	104	102	98	98	98	98	98	102	106	116	102	102	102	108	104	106	100	98	96	96	96	100	96
19	B	96	98	B	B	B	G	G	110	116	G	G	G	G	104	106	104	106	104	B	B	B	86	98
20	98	94	102	98	92	96	148	126	104	G	108	G	G	G	G	G	G	108	108	104	92	92	90	88
21	B	B	B	B	B	B	144	114	130	124	120	G	G	G	112	G	G	G	B	B	B	B	108	102
22	104	100	94	96	96	B	140	G	102	118	114	104	G	G	G	G	108	110	G	B	104	106	110	108
23	100	B	102	104	102	104	152	104	98	102	G	G	104	106	106	G	G	122	106	98	94	B	B	B
24	B	B	B	B	B	B	148	104	104	G	G	G	104	G	100	96	98	96	92	90	100	106	B	B
25	B	B	B	B	B	B	140	112	G	120	116	104	106	100	94	98	G	98	122	118	B	B	86	86
26	96	98	B	100	98	106	132	114	124	122	106	G	108	G	124	128	120	108	108	94	B	B	106	104
27	102	108	B	B	100	126	124	132	120	116	108	108	110	124	122	G	106	102	108	102	96	100	102	104
28	100	98	98	114	B	B	122	118	130	118	118	104	106	110	104	100	100	100	116	104	104	100	B	B
29	B	B	B	B	B	B	148	100	102	122	112	G	G	G	G	120	G	130	110	100	94	96	102	98
30	100	B	94	B	B	B	130	122	124	106	106	G	108	98	98	98	104	102	98	B	B	102	102	102
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	10	13	10	12	7	25	23	27	24	22	14	20	14	18	18	20	26	24	22	20	20	20	18
MED	100	98	100	98	100	104	144	114	104	108	108	105	104	104	106	105	104	106	106	102	102	102	102	98
U Q	102	102	102	100	102	106	150	122	120	118	116	108	107	108	116	108	106	122	110	106	104	104	102	102
L Q	96	96	96	98	98	98	131	104	102	104	106	104	103	102	104	102	101	102	103	96	95	98	94	96

IONOSPHERIC DATA STATION Kokubunji

APR. 2013 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1			F2	F2			H2					C2	L2	L2	C1		L2	C1	L2	F3	F2	F1	F2	F2
2	F3	F2	F1	F1	F1	F1			L2		L1			L2	C2	L2	L3	L2	L2			F2	F2	F1
3		F2	F1	F2	F2		H2	HL21	CL22		C2				L2	L1		H1	C3	F2	F5	F2	F1	F1
4	F2	F1					C2	C2	L2	L2	L2	L2	L2	L2	L2	L2	L1	L2			F1	F1	F3	F1
5			F1				H2			L2	CL12			L2	L2		L2	L2	L2	F4		F1		
6							H2		L2	L2	L2	L2	L2					L1	L3	F3	F1			
7								L2	L2	L2	C2	C1	L2					CL22	L2	F2	F2	F1	F2	
8							H1	L2	L2	L2	L2		L2		L2	L2	L2	L2	L2	F4		F1	F3	F2
9	F4		F1					L2	L2	L2	L2	L2	L2	L2			L1			F1	F4	F2		
10					F1		H2		L2	L2		L1	L2			L1	L1							
11					F1		H2	L1	L1	L2	L2	L1	L2	L2	L2	L2	L2	L2	L3	F2	F2	F3	F3	F1
12							H2	L2	L2															
13							H2	C2	L2	L2	L2		L2			L2	L2	C1	L3	F1	F1			
14							H2	C2	CL11	CL11			L2				L2	C1	C1	F2	F1			
15							C2	CL11	L2	C2				L2		L2		C1	L3	F1	F2	F4	F1	
16					F1	F2		H2	CL12	CL12	C2	C1	L2	L2	C2	L2	L1	L2	L3	F3	F3	F2	F3	F2
17	F1		F1	F3	F1		H1	L1	L1	L2	L2	L1	L1			L2	L2	L2	L3	F3	F1	F1	F3	F3
18		F2	F3	F5	F3	F1	L3	L2	L2	L2	C2	L2	L2	L2	L2	L3	L3	L3	L3	F5	F3	F3	F3	F1
19		F2	F1						L2	C1					L2	L2	L2	L2	L2				F3	F2
20	F1	F2	F2	F3	F3	F4	H1	C2	L2		L2							L2	L2	F3	F2	F3	F2	F2
21							H2	C2	C2	C2	C2				C1								F2	F2
22	F2	F2	F3	F1	F3		H2		L2	C2	C2	L2					L2	L2			F3	F3	F3	F2
23	F1		F1	F4	F3	F1	HL22	L2	L2	L2			L2	L2	L2			C1	L2	F1	F1			
24							H2	L2	L2				L2		L2	L2	L2	L2	L2	F3	F3	F1		
25							H2	C1		CL22	C2	L1	L2	L3	L2	L2		L1	C2	F1			F2	F2
26	F1	F1		F1	F1	F1	C2	C2	C2	C2	L2		L2		C1	C2	C2	L2	L3	F1			F5	F4
27	F5	F1			F1	F1	C1	CL11	C2	C1	L2	L2	L2	C2	C2		L2	L2	L2	F3	F4	F4	F5	F1
28	F3	F2	F2	F1			C1	C1	C1	C2	C1	C1	L1	L2	L2	L2	L2	L2	C2	F3	F3	F1		
29							H2	L2	L1	C1	C1					C1		C1	C2	F2	F4	F3	F2	F2
30	F2		F2				C1	C2	C1	L2	L2		L1	L3	L2	L2	L2	L1	L2			F2	F5	F2
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

APR. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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 58	61	64	X 62	X 57	X 49														X 116	X 98	X 82	X 75	X 67
2	X 59	X 58	X 58	X 57	X 52	X 48														X 102	X 91	X 72	X 64	X 64
3	X 65	X 62	X 59	X 64	X 50	X 46														X 113	X 94	X 63	X 64	X 63
4	X 61	X 59	X 59	X 59	X 56	X 54														X 126	X 100	X 76	X 74	X 73
5	X 69	X 67	X 67	X 70	X 61															X 120	X 100	X 88	X 85	X 82
6	X 77	X 72	X 70	X 70	X 66	X 62														X 119	X 118	X 100	X 93	X 89
7	X 86	X 82	X 80	X 79	X 73															X 123	X 105	X 82	X 81	X 78
8	X 77	X 75	X 74	X 82	X 58															X 119	X 101	X 94	X 94	X 92
9	X 93	X 90	X 83	X 78	X 69	X 62														X 114	X 104	X 88	X 70	X 74
10	X 74	X 76	X 73	X 70	X 63	X 56															X 104	X 90	X 90	X 92
11	X 100	X 94	X 83	X 76	X 69																O X 109	X 100	X 93	X 91
12	X 87	X 84	X 76	X 72	X 66	X 62														X 111	X 102	X 91	X 91	X 90
13	X 84	X 77	X 77	X 72	X 58																X 106	X 79	X 80	X 83
14	X 83	X 80	X 73	X 71	X 64															X 120	X 96	X 80	X 82	X 84
15	X 84	X 84	X 84	X 69	X 59																X 84	X 77	X 73	X 76
16	X 75	X 77	X 77	X 69	X 61															X 127	X 113	X 113	103	X 89
17	92	X 82	X 78	X 78	X 58	X 60														X 117	X 110	X 100	X 85	X 84
18	X 83	X 79	X 79	X 78	X 55	X 48															X 118	X 78	X 68	X 71
19	X 73	X 70	X 70	X 70	X 55	X 52															X 98	X 85	X 75	X 75
20	X 73	X 71	X 70	X 73	X 49																X 88	X 84	X 78	X 76
21	X 76	X 74	X 80	X 67	X 52																X 90	X 76	X 72	X 72
22	X 71	X 67	X 70	X 59	X 51	X 50															X 94	X 77	X 78	X 79
23	X 75	X 75	X 71	X 65	X 60																X 93	X 80	X 75	X 75
24	X 70	X 67	X 67	X 67	X 57																X 87	X 84	X 88	X 92
25	X 88	X 77	X 74	X 71	X 76																X 91	X 79	X 84	X 83
26	X 80	X 82	X 75	X 67	X 60																X 89	X 86	X 82	X 76
27	X 75	X 73	X 73	X 66	X 65																X 89	X 82	X 78	85
28	87	X 86	81	70	X 64															X 105	X 100	X 88	X 86	93
29	97	101	92	X 86	X 75															X 109	X 98	X 91	X 86	X 86
30	X 80	X 84	X 82	X 75	X 73															X 130	X 116	X 100	X 94	X 92
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	12														16	30	30	30	30
MED	X 77	X 76	X 74	X 70	X 60	X 53														X 118	X 99	X 84	X 82	X 82
U Q	X 86	X 82	X 80	X 75	X 66	X 61														X 122	X 105	X 91	X 88	X 89
L Q	X 73	X 70	X 70	X 67	X 56	X 48														X 112	X 91	X 79	X 75	X 75

APR. 2013 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	F 51	50	54	56	51	43	48	68	86	90	95	113	R 118	119	U R 124	R 125	U R 126	R 126	122	110	92	76	69	61
2	53	52	52	51	46	42	52	74	92	99	102	103	U R 106	R 106	R 119	105	103	101	96	96	85	66	58	58
3	58	55	53	58	44	40	44	74	88	90	96	R 102	105	118	111	113	113	114	106	107	88	57	58	57
4	55	53	53	53	50	48	59	88	90	88	78	95	U R 103	R 114	104	104	108	108	118	120	93	70	68	67
5	63	61	61	64	55	R 46	52	73	81	87	92	99	116	117	116	117	114	116	116	114	94	82	78	76
6	71	66	64	64	60	56	58	80	111	118	102	104	119	R 122	130	125	119	105	104	113	112	94	87	83
7	80	76	74	73	67	51	54	79	84	85	91	105	116	118	118	118	114	114	116	118	99	76	74	72
8	71	69	68	76	52	41	55	78	84	86	100	108	R 112	113	115	114	112	118	115	113	95	89	88	86
9	88	84	77	72	63	56	65	93	102	98	98	J R 114	U R 118	118	J R 118	J R 127	135	133	116	108	98	82	64	J R 68
10	68	70	67	64	57	50	56	72	85	95	101	107	105	111	115	111	113	115	113	111	98	84	84	86
11	93	88	77	70	63	59	70	89	92	95	98	U Y 106	R 112	118	120	118	118	119	119	122	103	94	87	85
12	81	78	70	66	60	56	64	84	97	97	88	94	J R 112	J R 115	118	R 120	111	105	108	105	96	85	85	84
13	78	71	71	66	52	52	58	84	95	109	104	116	R 114	J R 128	R 130	R 126	118	118	117	115	100	73	74	77
14	77	74	67	65	58	52	60	83	90	92	95	108	116	116	115	114	116	112	106	114	91	74	76	78
15	78	78	78	63	53	52	56	90	105	R 104	102	R 104	104	102	92	94	100	109	102	98	78	71	67	70
16	69	71	70	63	55	52	63	96	97	88	79	86	96	104	111	114	119	R 127	124	121	107	107	F 96	83
17	F 78	76	72	72	52	54	67	90	88	74	78	92	100	108	111	117	118	105	104	111	104	95	79	78
18	77	73	73	71	49	42	57	80	82	84	79	91	96	103	110	106	111	117	117	120	112	72	62	65
19	67	64	64	64	48	46	58	89	79	74	90	104	114	104	98	R 106	112	109	104	92	92	79	69	69
20	67	66	64	67	43	42	54	74	88	85	78	90	98	99	100	100	98	96	96	92	82	78	72	70
21	70	68	74	61	46	45	59	76	74	78	85	87	98	101	101	106	118	R 123	119	104	84	70	66	66
22	65	58	64	52	44	44	56	66	81	86	82	83	92	101	106	R 111	128	R 126	113	96	88	71	72	73
23	J R 69	69	65	59	54	50	66	81	68	80	80	92	101	102	104	R 110	120	112	R 100	92	87	74	69	69
24	64	61	60	61	51	46	60	76	93	82	Y 75	86	95	U R 100	J R 111	U Y 119	J R 125	112	103	96	82	78	83	86
25	82	70	67	64	69	54	61	71	74	86	80	80	102	R 100	93	102	106	98	97	92	85	73	78	77
26	74	76	69	61	53	50	62	81	87	90	88	89	102	112	115	113	120	121	118	106	83	80	76	70
27	69	67	67	60	59	59	76	73	82	83	81	84	100	R 106	104	110	116	112	104	101	83	76	72	76
28	F 78	Z 79	74	F 60	58	55	68	75	86	82	75	81	97	104	R 109	116	116	107	102	99	94	82	80	80
29	89	F 89	85	80	68	52	62	67	74	72	86	R 96	103	103	111	116	118	108	106	103	92	85	80	79
30	74	78	76	69	66	64	72	83	82	80	78	95	108	113	116	R 122	R 139	146	144	124	110	94	88	86
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	71	70	68	64	54	50	59	80	86	86	88	96	104	110	111	114	116	113	110	108	92	78	75	76
U Q	78	76	74	69	60	54	64	84	92	95	98	105	114	117	118	R 118	119	119	117	114	99	85	83	83
L Q	67	64	64	60	50	45	56	74	82	82	79	89	100	103	104	106	112	108	104	98	85	73	69	69

APR. 2013 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

APR. 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								304	L	L	L	L 532	L	L	U L 532	L 532	L	L						
2									L	L	L	L	U L 500	U L 540	U L 540	L	L	L						
3									L	L	L 504	L 508	U L 504	L 504	U L 560	L	L	L						
4									L	L	L	L 556	U L 532	L 532	U L 524	L	U L 476	L						
5									L	L	L	L 536	U L 536	U L 536	U L 544	U L 528	U L 504	L	L					
6									L	L	L	L	L	L	U L 552	L	L	L						
7									L	L	L	L 544	L 544	L	L 552	L	L	L						
8									L	L	U L 532	U L 548	L 540	U L 540	L	L	L	L						
9								288	L	L	L	U L 532	L 552	L	L 584	L 568	L	L						
10								292	L	L	L	L 560	L 556	L 552	U L 552	L	U L 548	L						
11									L	L	L	U L 544	U L 552	U L 612	L 552	U L 544	L	L						
12									L	L	U L 488	L 532	U L 552	U L 548	L 548	U L 540	L	L						
13									L	L	U L 500	U L 500	L	L 544	U L 544	U L 544		L						
14									L	U L 464	L 492	L 516	L	L 536	U L 528	L 528	U L 504	L						
15								L	L	L	L	L 508	U L 520	U L 516	L 512	L 516	U L 500	A	A					
16									L	L	A	L 556	U L 552	U L 548	L 520	U L 516	A 512	U L 472	L					
17									L	L	L	U L 512	U L 540	U A 500	L	L 524	L							
18									L	L	U L 516	L 512	L 508	L 508	A	L	U L 500	A						
19								L	L	L	L 528	L 512	L 508	L 504	U L 500	L 500	U L 496	U L 472						
20									L	L	L 520	L 524	U L 520	L 516	L 512	L 508	L	L						
21										L	L 504	L 488	L 532	U L 572	L 504	L 524	L 492	L	L					
22									L	L 464	L 468	L 512	L 520	L 516	U L 568	L 524	L 496	L 448	L					
23									L	L 464	L 504	L 516	L 532	L 508	L 504	L 500	L 476	L	L					
24									U L 448	U L 456	U L 476	L 580	L 548	L 536	L 540	L 520	L 464	L						
25									L	U L 484	L	U L 608	L 560	L 524	L 524	L 520	L	L						
26								L	L	L	L	U L 532	L 532	L 572	L 532	L 528	U L 528	L						
27									L	L	L	U L 536	L 556	L 544	L 544	L 516	L 512	U L 464						
28									L	L	L	L	U L 568	U L 564	A	U L 548	U L 504	U L 464	A					
29											A	L 540	L 540	U L 540	L 552	U L 548	U L 548	L						
30									L	L	L	U L 600	L 600	L 536	L	L 584	L 524	U L 500	L					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	1	5	12	27	26	26	25	22	17	6						
MED								292	U L 448	U L 464	L 504	L 532	L 540	L 536	L 540	L 526	U L 504	U L 468						
U Q								304		U L 474	L 518	L 548	L 552	U L 548	U L 552	U L 544	U L 518	U L 472						
L Q								288		L 460	L 490	L 512	U L 520	L 516	L 522	L 516	L 494	L 464						

APR. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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 228		308	344	356	372	A	U A 376	R 376	A	U A 328	U A 276	212					
2							B 220		288	344	368	372	R 368	368	364	352	340	264	A 188					
3							J R 152	244	292	U A 328	A	A	A	R	R 380	368	324	272	204					
4							B 252		304	U A 328	A	A	A	A	376	364	312	288	A					
5						B	164	252	296	A 336	360	372	376	A	U A 376	352	348	304	224					
6							B 240		300	348	376	U R 380	R	R 384	R 380	360	328	284	204					
7						B	168	244	300	R 336	U R 372	R	U R 372	A	364	U R 348	328	296	204					
8						B	164	244	A 292	U R 344	388	A 368	380	R 376	376	360	328	292	212					
9							184	248	R 316	R 352	U R 356	R	R 400	A 392	U A 380	356	340	288	228					
10							192	244	300	344	380	388	392	376	U A 372	U A 360	324	292	224	B				
11						B	188	252	312	A	U R 368	R	392	R	376	R	348	312	A	B				
12							B 260		304	348	376	U R 388	U R 396	U R 388	R	364	336	288	A					
13						B	180	236	308	344	U A 352	U A 372	A	A	A	A	A	272	220	B				
14						B	184	248	292	U A 328	356	A	A	R 372	372	360	332	276	U A 204					
15						B	188	240	284	A	348	R	R 372	U R 388	R 384	R 340	324	276	200	A				
16						B	U R 144	252	300	336	356	368	U R 400	384	356	352	316	284	220					
17							208	260	304	344	R 376	376	384	376	A 372	340	324	U A 284	A					
18							A 288		304	A 348	A	R 364	U A 376	U A 376	344	332	320	A	A	A				
19							184	268	296	A	356	A	A	A	A	A	312	276	220	A				
20						B	A 264		U R 288	R 332	348	380	384	U A 380	R 368	R 364	328	288	216	A				
21						B	172	248	308	344	R 372	R	R	R 364	R	340	332	296	216	B				
22							A 232	252	328	R 316	A	384	404	A	R 388	A	A	A	228	A				
23						B	A 252		292	A 340	A 352	R	R	R 392	368	344	324	284	208	B				
24						B	172	256	316	A	A	A 376	R	A	A	U R 340	A	A	A	A				
25						B	A 276		308	332	U A 364	U R 372	R 372	A	A	A	A 320	292	220	B				
26						B	A 280		308	U A 340	A	A	368	U R 380	372	368	344	304	A	B				
27						B	A 272		312	344	U A 364	U R 368	B	B	R 376	360	348	300	228	B				
28						A	A 284		332	A 348	U R 356	U A 364	A	A	A	U R 356	336	304	U A 228					
29						B	208	268	312	U R 344	U A 368	376	A	A	R 392	U R 360	336	296	240					
30						A	212	272	324	356	376	B	U A 380	384	376	364	336	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							18	30	30	26	24	18	17	17	23	24	27	26	22					
MED							184	252	304	344	364	372	380	380	376	358	328	288	218					
U Q							192	268	312	344	374	380	R 394	R 386	R 380	362	336	296	224					
L Q							168	244	296	336	356	368	R 372	376	368	346	324	276	204					

IONOSPHERIC DATA STATION Yamagawa

APR. 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	22	J A 26	E B 15	E B 15	E B 15	E B 15	E B 15	27	33	G	43	42	42	42	G	41	38	32	G 19	J A 32	J A 26	J A 22	J A 21	20
2	J A 27	J A 21	J A 20	J A 20	J A 16	E B 13	J A 16	26	30	G 30	G 31	40	39	39	40	38	G	32	26	J A 16	J A 21	J A 24	J A 26	J A 25
3	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	J A 33	36	36	38	42	42	G	43	G 29	G 26	31	27	J A 28	E B 15	J A 17	E B 14	E B 14
4	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	E B 14	G	G	36	40	J A 44	39	40	G	G 28	G	G 25	J A 25	J A 20	E B 15	E B 15	E B 15	E B 15
5	E B 12	E B 12	E B 12	E B 12	E B 12	E B 13	G	G	32	40	40	41	41	45	41	G	G	G	23	J A 20	J A 26	A E B 12	23	J A 14
6	21	E B 13	E B 13	E B 12	E B 12	E B 12	E B 16	28	G 27	G	G	G	G 34	46	42	40	G 28	33	32	J A 26	J A 19	A E B 14	E B 14	E B 13
7	E B 12	E B 12	E B 12	E B 12	E B 12	E B 13	G	26	G 26	G	44	G	44	J A 46	43	G 28	36	32	J A 31	J A 22	J A 19	21	E B 14	J A 34
8	J A 16	18	E B 14	E B 14	E B 14	J A 12	G	G	32	G	G	41	41	42	47	44	40	33	G	J A E 14	E B 12	E B 12	19	J A 26
9	J A 26	J A 26	A E B 13	23	E B 13	E B 13	G	27	G	G 32	G	G 33	G	44	42	42	38	G	25	E B 16	J A 19	J A 19	J A 23	J A 23
10	21	J A 18	E B 14	E B 14	E B 14	E B 14	G 17	27	33	G	G	G	41	42	44	40	36	30	23	J A 28	E B 15	J A 16	E B 16	19
11	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	37	G	G	G	G	40	G	G	32	24	E B 14	J A 16	J A 20	J A 21	J A 28
12	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G	G	41	44	G 32	G 29	G	G	G 23	35	J A 36	J A 24	E B 15	E B 15	E B 15	E B 15
13	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	20	26	33	37	40	41	42	40	41	J A 42	J A 42	31	31	J A 26	J A 19	J A 35	J A 29	J A 24
14	J A 24	J A 19	A E B 15	E B 15	E B 15	E B 15	G	28	34	36	G	J A 46	J A 43	G 32	G	G 29	G 26	31	J A 34	J A 34	19	E B 12	E B 12	E B 12
15	E B 12	J A 16	E B 12	E B 12	E B 12	E B 12	G	27	34	J A 44	G	G 34	41	49	G	G	38	J A 56	J A 40	J A 38	J A 22	J A 21	21	J A 34
16	J A 16	18	J A 20	20	G	E B 12	20	30	38	37	51	45	49	43	43	41	36	G	27	J A 25	J A 26	J A 22	A E B 15	14
17	J A 16	E B 12	J A 28	J A 38	J A 34	J A 22	G	34	36	42	J A 49	44	45	J A 54	46	39	J A 46	J A 44	J A 44	J A 30	J A 34	J A 34	E B 13	J A 30
18	J A 26	E B 13	E B 15	J A 21	J A 36	J A 22	J A 26	G 29	36	39	43	43	44	45	J A 59	J A 69	J A 69	J A 88	J A 36	J A 26	J A 43	J A 22	E B 13	J A 66
19	E B 15	J A 38	J A 26	J A 18	J A 14	J A 26	20	J A 38	32	J A 39	G	J A 43	40	40	40	38	38	G 26	G	J A 44	J A 25	J A 17	J A 24	J A 18
20	19	16	18	J A 28	J A 34	J A 47	J A 42	J A 31	J A 31	J A 32	40	43	43	43	43	G 34	G 29	G 22	J A 25	J A 26	21	J A 15	A E B 12	21
21	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	20	32	32	36	G	G 34	G 32	G	G 32	G 28	G 28	G	G	E B 11	E B 11	E B 13	E B 13	20
22	E B 15	J A 30	J A 88	J A 28	J A 27	J A 15	G 20	28	33	G 28	42	G 36	G	40	44	43	34	30	24	J A 22	18	J A 28	J A 29	J A 18
23	J A 49	J A 41	A E B 14	J A 17	A E B 14	E B 14	22	30	33	36	40	G 35	G 34	44	39	G	G	33	30	J A 23	E B 14	E B 14	E B 14	J A 20
24	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	21	28	G	37	37	42	G 36	38	38	G 33	J A 44	J A 32	30	J A 24	J A 19	22	E B 16	E B 16
25	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	J A 23	29	36	37	43	G 35	40	J A 52	J A 41	J A 55	38	G 29	G J A 35	J A 19	A E B 48	E B 13	E B 13	E B 13
26	18	E B 12	E B 12	E B 12	E B 12	J A 12	20	G 24	35	38	39	40	G 27	45	44	41	40	J A 41	J A 38	40	J A 25	20	J A 27	J A 34
27	J A 30	J A 28	J A 28	A E B 14	E B 14	J A 16	J A 25	36	36	38	J A 55	41	E B 44	E B 42	42	G	40	34	29	J A 16	J A 25	J A 22	J A 32	J A 53
28	J A 55	J A 66	18	18	19	J A 20	J A 26	33	J A 43	J A 48	42	42	J A 43	J A 43	J A 60	40	37	G	J A 84	50	J A 45	J A 60	J A 71	J A 37
29	E B 13	22	19	19	19	E B 14	G	29	39	J A 48	J A 55	J A 48	47	46	G 38	39	36	32	30	J A 28	J A 30	A E B 28	E B 14	E B 14
30	J A 32	J A 36	J A 19	J A 23	J A 18	J A 21	G 21	30	36	40	44	44	44	44	J A 54	41	G	33	J A 28	J A 24	J A 29	22	18	E B 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	E B 14	E B 15	E B 14	E B 14	G	G	33	36	40	41	41	42	42	38	36	32	28	J A 24	J A 20	J A 20	16	J A 20
U Q	J A 24	J A 26	J A 19	J A 20	J A 16	J A 15	G	30	36	39	43	43	43	45	44	41	38	33	J A 34	J A 28	J A 26	J A 22	J A 23	J A 28
L Q	E B 14	E B 13	E B 13	E B 13	E B 13	E B 13	20	27	G 30	G	G	G	G	G 40	G 38	G	G	G	24	J A 20	E B 16	E B 15	E B 14	E B 15

APR. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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 14	16	E B 15	E B 15	E B 15	E B 15	E B 15	24	32	G	37	G 37	38	G 38	G	37	37	30	G 18	28	18	E B 15	E B 15	E B 15
2	16	15	15	E B 13	E B 13	E B 13	E B 13	24	G 29	G 28	G 27	38	38	39	40	38	G	28	24	E B 15	12	14	15	12
3	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	26	30	34	34	37	37	G	41	G 28	G 24	28	24	E B 15	E B 15	E B 16	E B 14	E B 14
4	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	E B 14	G	G	35	36	36	36	U Y 38	G	G 27	G	G 19	21	18	E B 15	E B 15	E B 15	E B 15
5	E B 12	E B 12	E B 12	E B 12	E B 12	E B 13	G	G	32	38	38	40	40	40	40	G	G	G	G 19	E B 15	E B 13	E B 12	E B 12	E B 12
6	E B 14	E B 13	E B 13	E B 12	E B 12	E B 12	E B 16	26	G 22	G	G	G	U G 33	44	42	40	G 26	32	30	22	18	E B 14	E B 14	E B 13
7	E B 12	E B 12	E B 12	E B 12	E B 12	E B 13	G	26	G 25	G	42	G	41	41	39	G 24	33	30	28	17	E B 10	E B 10	E B 14	31
8	16	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	31	G	G	39	40	42	43	42	38	30	G	11	E B 12	E B 12	E B 12	14
9	17	E B 13	E B 13	E B 13	E B 13	E B 13	G	G 23	G	G 28	G	G 32	G	40	40	40	36	G	24	E B 16	E B 16	E B 16	E B 16	E B 16
10	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 15	26	32	G	G	G	41	40	41	G 36	35	G 24	G 19	18	E B 15	E B 15	E B 16	E B 13
11	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	34	G	G	G	G	38	G	G	32	23	E B 14	E B 14	17	17	E B 14
12	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G	G	39	41	G 30	G 28	G	G	G 23	32	29	18	E B 15	E B 15	E B 15	E B 15
13	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	19	25	31	35	37	38	38	38	38	38	41	29	27	24	18	18	21	18
14	17	E B 15	E B 15	E B 15	E B 15	E B 15	G	26	32	35	G	38	38	G 31	G	G 28	G 24	28	28	21	18	E B 12	E B 12	E B 12
15	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	G	G 24	G 28	41	G	U G 34	39	41	G	G	37	53	40	32	18	17	17	18
16	E B 10	E B 13	18	E B 12	G	E B 12	18	26	33	35	47	42	42	40	40	38	34	G	24	18	17	17	E B 14	E B 14
17	E B 13	E B 12	17	34	24	20	G	30	36	40	41	41	42	50	43	38	41	41	38	E B 14	16	16	E B 13	E B 12
18	20	E B 13	E B 15	17	18	E B 13	20	G 24	32	G 33	39	42	41	42	49	45	35	68	25	18	20	20	E B 13	20
19	E B 15	18	18	E B 14	E B 14	23	19	G 19	G 19	33	G	38	38	39	39	37	37	G 21	G	18	18	E B 12	17	E B 15
20	E B 12	E B 12	E B 12	17	16	28	21	G 20	G 20	G 20	38	G 38	G 38	39	39	G 28	G 26	G 20	G 18	17	E B 12	E B 12	E B 12	E B 12
21	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	18	26	32	G 33	G	U G 33	U G 32	G	U G 32	G 26	G 23	G	G	E B 11	E B 11	E B 13	E B 13	E B 13
22	E B 15	E B 15	E B 15	18	22	E B 15	G 15	28	G 28	G 28	42	G 34	G	35	43	34	33	29	G 17	18	E B 17	E B 17	E B 13	E B 13
23	E B 14	24	E B 14	E B 14	E B 14	E B 14	20	27	32	G 34	G 35	U G 34	U G 34	42	38	G	G	30	25	18	E B 14	E B 14	E B 14	17
24	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	20	28	G	34	34	41	U G 36	U Y 38	36	G 29	40	30	24	19	16	16	E B 16	E B 16
25	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	20	G 27	33	35	38	G 32	39	42	40	42	34	G 21	30	17	32	E B 13	E B 13	E B 13
26	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	20	G 18	34	35	35	U Y 38	G 24	42	41	39	39	38	32	27	20	E B 15	17	26
27	25	E B 14	E B 14	E B 14	E B 14	E B 14	22	34	34	35	43	41	E B 44	E B 42	41	G	37	32	27	E B 15	20	18	17	27
28	15	22	E B 14	E B 14	E B 14	16	20	G 27	34	40	40	40	40	40	55	39	36	G	79	39	40	27	E B 14	E B 14
29	E B 13	E B 13	E B 11	E B 14	E B 14	E B 14	G	29	35	43	50	46	44	43	G 36	38	36	G 29	27	24	25	19	E B 14	E B 14
30	15	19	17	18	16	17	G 17	30	34	36	39	44	44	44	50	38	G	29	23	21	20	E B 12	E B 15	E B 15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	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	G	26	32	34	36	38	38	40	40	G	34	29	24	18	16	E B 15	E B 14	E B 14
U Q	15	15	15	15	15	15	20	G	33	35	39	41	41	42	41	38	37	32	28	21	18	17	16	16
L Q	E B 12	E B 12	E B 12	E B 12	E B 13	E B 13	E B 17	G 24	G	G 34	G	G 37	G 37	G 38	G 36	G 34	G	G 28	G	E B 15	E B 14	E B 13	E B 13	E B 13

APR. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 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	14	14	15	15	15	15	15	15	15	15	15	17	18	18	18	18	18	16	15	15	15	15	15	15
2	13	13	13	13	13	13	13	13	13	20	20	21	20	20	21	18	17	16	15	15	10	10	12	12
3	14	14	14	14	14	14	14	14	14	14	21	20	20	19	20	20	15	15	15	15	15	16	14	14
4	12	12	12	12	12	12	14	14	14	16	17	16	21	17	16	16	16	16	16	15	15	15	15	15
5	12	12	12	12	12	13	13	13	12	16	20	20	20	26	22	22	16	15	16	15	13	12	12	12
6	14	13	13	12	12	12	16	15	15	15	15	19	25	20	18	17	18	14	14	14	13	14	14	13
7	12	12	12	12	12	13	13	13	13	15	15	20	26	23	19	18	17	16	14	10	10	10	14	14
8	14	14	14	14	14	14	14	14	14	19	19	28	23	22	22	22	20	17	12	11	12	12	12	12
9	13	13	13	13	13	13	13	12	12	14	16	22	22	22	20	20	19	16	16	16	16	16	16	16
10	14	14	14	14	14	14	14	14	14	16	16	22	22	22	18	18	15	15	15	15	15	15	16	13
11	14	14	14	14	14	14	14	14	14	14	16	18	20	20	20	20	20	20	14	14	14	14	14	14
12	15	15	15	15	15	15	15	15	15	20	20	19	19	22	19	19	17	13	13	15	15	15	15	15
13	15	15	15	15	15	15	15	14	16	16	17	21	20	20	20	20	16	15	15	15	14	14	15	15
14	15	15	15	15	15	15	15	13	13	13	20	20	20	22	22	18	18	16	12	12	12	12	12	12
15	12	12	12	12	12	12	12	12	10	14	14	16	20	21	22	17	17	12	12	12	12	12	12	12
16	10	13	11	12	12	12	12	12	11	15	16	16	16	18	18	18	16	16	14	14	14	14	14	14
17	13	12	12	12	12	12	12	14	14	14	14	16	16	22	22	17	16	14	14	14	14	14	13	12
18	13	13	15	15	15	13	13	13	13	11	17	18	18	26	19	17	16	13	12	14	14	14	13	13
19	15	14	14	14	14	14	14	14	14	16	23	23	25	28	18	20	17	17	17	12	13	12	12	15
20	12	12	12	12	12	13	12	12	12	14	14	17	21	24	24	21	16	16	16	15	12	12	12	12
21	12	12	12	12	12	12	12	12	12	16	16	27	27	26	24	16	15	16	10	11	11	13	13	13
22	15	15	15	15	15	15	15	15	15	15	28	24	23	23	22	20	18	17	17	17	17	17	13	13
23	14	14	14	14	14	14	12	12	12	13	20	20	20	22	22	20	18	15	15	14	14	14	14	14
24	15	14	14	14	14	14	14	14	14	17	17	31	31	33	23	22	19	15	15	15	15	16	16	16
25	13	13	13	13	13	13	13	14	14	16	19	24	29	26	21	20	15	17	16	13	13	13	13	13
26	12	12	12	12	12	12	15	15	15	15	18	17	18	17	16	16	18	15	15	15	15	15	15	15
27	14	14	14	14	14	14	14	14	14	16	22	26	44	42	26	25	24	16	15	15	15	14	14	14
28	14	14	14	14	14	14	14	14	14	14	15	22	22	22	21	17	17	16	12	13	14	14	14	14
29	13	13	11	14	14	14	14	14	16	16	18	23	22	27	27	20	20	14	14	14	13	13	14	14
30	12	12	12	12	12	13	13	12	14	18	18	39	28	28	28	24	19	16	15	15	15	12	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	14	13	14	14	14	14	14	14	14	15	17	20	21	22	21	20	17	16	15	14	14	14	14	14
U Q	14	14	14	14	14	14	14	14	14	16	20	23	25	26	22	20	18	16	15	15	15	15	15	15
L Q	12	12	12	12	12	13	13	13	13	14	16	18	20	20	19	17	16	15	14	13	13	12	13	13

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APR. 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	F 309	286	280	299	332	311	325	345	351	333	309	315	R 320	318	U R 314	R 311	U R 310	R 314	326	326	329	307	295	299
2	302	288	289	304	319	293	316	352	343	323	338	328	U R 320	R 313	R 318	316	317	317	324	325	336	333	302	298
3	290	301	292	311	345	294	286	342	347	334	316	R 314	316	325	303	300	302	319	321	330	335	321	301	289
4	289	283	305	305	310	310	316	337	353	353	314	303	U R 313	R 317	323	305	308	308	319	349	329	297	292	295
5	298	290	295	307	339	R 310	335	359	339	322	307	314	305	318	300	299	304	300	315	322	339	305	289	297
6	296	297	297	297	305	307	310	319	326	339	312	304	297	R 312	303	306	303	310	301	317	328	321	294	292
7	301	299	302	326	345	332	315	345	336	332	306	303	308	306	304	302	297	307	308	327	331	299	277	287
8	279	281	292	328	380	296	330	354	329	321	314	306	R 311	309	311	294	296	313	321	313	308	297	290	293
9	294	303	299	312	311	290	295	341	344	320	302	R	U R 304	300	R	R	298	312	311	317	329	348	269	R
10	295	302	308	309	311	304	323	334	324	317	311	307	301	305	298	293	302	297	313	324	321	297	285	294
11	300	314	297	305	298	298	308	341	331	318	308	U Y 300	R 298	297	304	306	298	305	313	330	321	302	281	282
12	297	309	304	297	298	303	308	324	337	331	305	287	R	R	317	R 324	303	297	303	313	327	291	294	298
13	299	298	298	316	294	283	303	333	322	333	301	304	R 298	R	R 291	R 300	293	297	312	320	349	306	290	294
14	302	312	305	315	313	301	319	345	332	325	313	297	293	310	294	295	308	311	307	322	338	287	277	284
15	284	300	315	304	302	285	284	318	344	R 343	328	R 315	309	314	319	296	308	322	336	316	326	305	293	279
16	297	299	313	315	294	302	306	330	335	351	328	302	295	310	308	302	325	R 324	316	337	333	293	F 294	290
17	F 291	287	301	321	281	277	324	349	363	351	300	315	309	304	297	312	326	299	321	332	321	322	292	295
18	296	285	307	341	332	301	329	349	356	350	311	298	307	310	307	310	313	314	315	330	352	329	281	281
19	290	295	296	319	319	291	317	344	362	313	310	326	313	317	296	R 308	312	321	327	330	330	322	293	301
20	305	293	298	358	293	303	320	343	345	337	325	301	309	325	311	312	306	316	329	326	318	313	286	289
21	301	287	326	347	313	291	333	356	347	340	330	318	295	298	307	294	309	R 329	338	341	317	299	295	293
22	289	319	316	324	296	296	343	332	341	337	322	308	279	293	285	R 293	304	R 329	335	336	312	305	292	306
23	J R 321	295	313	319	308	305	326	356	346	346	315	291	307	314	307	R 302	311	321	R 319	311	331	303	290	292
24	289	293	295	335	318	328	336	355	335	344	Y 321	253	295	U R 304	R	U Y 319	R	326	327	312	290	283	267	293
25	312	289	294	292	322	335	327	356	330	342	334	286	306	R 334	302	301	316	327	337	321	300	299	277	291
26	294	311	318	308	310	290	319	340	336	324	300	302	297	302	299	296	313	317	326	334	310	302	295	285
27	289	289	296	274	286	295	349	345	336	340	321	299	286	R 316	305	299	310	320	317	326	310	296	285	269
28	F 299	Z 305	298	F 326	310	301	331	350	338	335	312	290	294	301	R 305	301	321	314	315	322	313	280	279	277
29	276	F 290	299	321	329	298	322	339	323	322	318	R 313	312	314	302	309	305	305	311	313	308	305	295	288
30	289	288	297	298	300	300	337	339	341	349	293	289	296	293	300	R 294	R 288	294	307	326	311	301	288	290
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	29	28	28	29	29	30	30	30	30	30	30	29
MED	296	295	298	314	310	300	321	344	338	334	312	303	305	310	304	302	308	314	318	326	326	302	290	292
U Q	301	302	307	324	322	305	330	350	346	343	321	314	310	316	310	310	312	321	326	330	331	313	294	295
L Q	289	288	296	304	298	293	310	337	332	323	307	298	296	303	300	296	302	305	312	317	312	297	281	286

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APR. 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								418	L	L	L	L 358	L	L	U L 358	L 358	L	L						
2									L	L	L	L	U L 399	U L 370	U L 360	L	L	L						
3									L	L	L 380	L 385	U L 399	L 402	U L 362	L	L	L						
4									L	L	L	L 356	U L 372	L 372	U L 360	L	U L 369	L						
5									L	L	L	L 382	U L 383	U L 383	U L 366	U L 358	U L 368	L	L					
6									L	L	L	L	L	L	U L 351	L	L	L						
7									L	L	L	L 358	L 358	L	L 354	L	L	L						
8									L	L	U L 380	U L 369	L 374	U L 374	L	L	L	L						
9								477	L	L	L	U L 388	L 375	L	L 354	L 339	L	L						
10								456	L	L	L	L 357	L 359	L 362	U L 362	L	U L 344	L						
11									L	L	L	U L 371	U L 365	U L 329	L 352	U L 355	L	L						
12									L	L	U L 398	L 367	U L 355	U L 357	L 357	U L 359	L	L						
13									L	L	U L 388	U L 401	L	L 369	U L 358	U L 342		L						
14									L	U L 382	L 393	L 390	L	L 354	U L 363	L 363	U L 356	L						
15								L	L	L	L	L 391	U L 382	U L 385	L 383	L 364	U L 345	A	A					
16									L	L	A	L 350	U L 353	U L 355	L 360	U L 363	A 353	U L 352	L					
17									L	L	L	U L 355	U L 354	A	L	L 350	L							
18									L	L	U L 372	L 375	L 377	A 377	A	L	U L 351	A						
19								L	L	L	L 360	L 373	L 376	L 386	U L 389	L 371	U L 342	U L 356						
20									L	L	L 360	L 381	U L 368	380	L 381	L 355	L	L						
21										L	L 373	L 414	H 381	U L 351	384	L 353	L 339	L	L					
22									L	L 379	L 403	L 374	L 369	L 371	U L 337	L 342	L 345	L 352	L					
23									L	L 391	L 373	L 364	L 370	408	L 388	L 366	L 357	L	L					
24									U L 378	U L 394	U L 372	L 340	L 343	L 347	L 340	L 342	A 381	L						
25									L	U L 369	L	H 335	L 342	L 367	L 367	L 344	L	L						
26								L	L	L	L	U L 375	L 376	L 350	369	L 334	U L 332	L						
27									L	L	L	U L 374	L 351	L 358	L 358	L 372	L 353	H 338						
28									L	L	L	L	U L 345	U L 348	A	U L 333	U L 350	U L 381	A					
29											A	L 363	L 364	U L 364	L 356	H 349	U L 339	L						
30									L	L	L	U L 345	L 344	386	L	L 324	L 347	U L 323	L					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	1	5	12	27	26	25	25	22	17	6						
MED								456	U L 378	U L 382	L 376	L 371	L 368	L 369	L 360	L 354	U L 350	U L 352						
U Q								477		L 392	L 390	L 382	U L 376	L 382	L 368	L 363	U L 356	U L 356						
L Q								418		L 374	L 372	L 357	L 354	U L 354	L 355	L 342	U L 343	338						

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APR. 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								220	228	252	266	266	266	266	270	270	270	254						
2									250	252	252	252	260	282	282	274	272	272						
3									256	256	264	278	278	276	276	278	278	266						
4									238	238	238	290	290	290	284	284	278	270						
5									240	250	266	278	296	294	292	290	290	284	262					
6									262	258	246	258	286	286	286	286	284	262						
7									242	244	248	278	286	286	286	288	288	288						
8									248	268	270	284	284	284	284	292	292	280						
9								248	240	248	256	284	292	292	296	302	302	272						
10								222	254	258	272	280	282	292	292	292	292	290						
11									252	254	260	284	284	308	298	298	292	290						
12									256	256	256	298	298	290	290	290	276	276						
13									266	266	268	274	290	298	298	294		272						
14									262	260	270	288	310	290	290	296	288	270						
15								270	244	252	260	278	278	278	276	304	292	276	244					
16									246	242	250	304	310	310	294	294	292	274	254					
17									242	242	304	296	298	300	304	300	264							
18									244	244	286	286	286	294	294	294	294	294						
19								232	232	288 L	294	292	286	284	280	290	278	276						
20									252	250	274	296	292	292	292	288	288	288						
21										266	268	276	296	306	306	310	306	270	250					
22									262	262	262	280	316	316	322	322	286	252	244					
23									240	256	270	310	310	304	304	304	286	270	268					
24									254	254	266	392	336	336	334	302	270	256						
25									262	262	268	368	298	266	306	306	280	262						
26								242	242	252	256	290	304	304	302	306	290	280						
27									246	246	282	300	314	304	304	304	296	272						
28									248	248	248	304	312	312	312	310	270	270	E A 288					
29											288	294	294	294	300	292	290	286						
30									258	258	L 326	328	324	324	324	324	314	286	264					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	28	29	30	30	30	30	30	30	29	29	8					
MED								237	248	254	266	287	293	293	294	294	288	272	255					
U Q								248	256	259	272	298	310	304	304	304	292	285	266					
L Q								222	242	248	256	278	286	286	286	290	278	270	247					

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APR. 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	258	280	280	266	240	226	232	198	214	214	214	184	194	194	A 216	216	216	226	226	226	226	226	244	244
2	276	292	292	276	254	254	254	224	224	224	214	214	202	194	194	H 196	196	196	236	236	236	236	250	268
3	280	280	280	246	220	280	276	230	230	224	214	212	198	192	220	220	H 208	H 208	234	232	222	222	248	268
4	276	276	276	276	250	250	250	230	222	222	198	198	198	202	210	210	210	228	244	236	206	206	266	266
5	264	280	280	270	218	244	244	228	222	222	212	210	196	196	206	206	210	230	238	238	232	232	254	254
6	266	266	266	266	234	234	234	234	234	228	224	196	H 196	226	H 204	218	218	226	244	244	238	220	228	256
7	256	256	256	244	234	220	246	226	214	214	214	214	214	A 214	214	220	220	224	246	246	226	218	282	302
8	270	278	276	224	204	268	256	226	220	220	208	H 190	202	202	A 236	236	236	236	236	236	236	238	258	268
9	270	270	266	240	232	254	254	168	218	218	214	200	196	196	196	196	H 196	228	228	228	228	222	260	298
10	290	252	252	252	240	220	232	194	220	220	216	216	212	212	212	212	212	226	228	228	228	228	272	272
11	250	250	250	250	250	250	250	230	230	224	222	208	208	212	212	H 206	206	212	238	238	224	224	256	272
12	252	252	252	252	252	252	252	230	230	230	200	200	200	204	204	204	214	224	244	244	240	240	250	250
13	258	266	264	226	226	270	264	244	240	236	214	200	200	200	200	200	250	230	252	242	234	226	284	270
14	270	254	254	254	246	258	258	244	238	212	206	206	H 180	H 184	204	204	204	220	242	242	224	224	284	284
15	272	272	236	230	240	268	268	256	236	A 236	216	186	158	216	216	216	216	A	A	226	226	226	268	278
16	264	264	262	248	242	272	258	244	222	222	A	222	224	224	A 244	H 208	H 208	224	224	222	222	224	Q 224	244
17	Q 278	278	278	236	288	298	242	224	224	A 224	E 252	A 246	232	A	H 240	226	A	232	240	240	240	226	226	242
18	272	272	238	224	224	274	246	242	232	232	224	224	A 224	E 236	A	A 260	A 240	A	240	240	228	222	260	278
19	258	274	272	250	240	A 312	260	232	228	216	208	208	208	208	208	196	214	214	236	236	236	230	254	258
20	260	264	264	220	264	A 316	246	236	232	232	224	212	214	204	204	204	204	210	226	226	226	226	266	278
21	278	278	246	210	216	258	230	230	230	230	214	210	H 202	Y 214	202	202	202	218	H 220	220	220	220	274	274
22	266	266	252	244	290	290	216	216	216	216	216	204	204	226	226	214	222	222	222	222	222	222	268	268
23	272	290	276	220	234	248	246	234	224	208	208	208	210	200	200	200	216	232	232	232	232	232	264	268
24	256	278	278	240	238	234	234	234	210	210	210	210	210	H 206	218	218	A	222	234	234	234	256	310	268
25	234	240	266	276	240	226	226	226	226	226	A 226	H 222	216	E A 244	224	E A 262	226	224	246	244	254	244	282	282
26	262	262	256	246	246	270	260	224	224	224	206	206	200	200	216	230	A 230	230	232	232	232	232	256	292
27	286	286	254	270	270	268	232	232	A 232	A 220	E A 260	218	226	220	220	220	220	H 212	232	232	238	238	260	A 330
28	272	272	266	248	246	246	234	234	234	A 234	208	208	208	208	A	222	222	222	A	242	244	254	278	278
29	Q 284	E Y 278	Q 262	244	232	232	230	230	230	246	A	A 230	230	208	208	H 208	208	216	236	236	236	238	248	274
30	284	284	264	264	264	242	242	240	232	A 222	222	212	212	212	A	224	216	216	236	236	236	236	248	286
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	28	30	30	29	27	30	28	28	28	30	30	30	30	30
MED	270	272	264	247	240	254	246	230	227	223	214	209	206	206	212	212	215	224	236	236	232	226	260	271
U Q	276	278	276	264	250	270	256	234	232	230	222	214	214	215	220	220	221	228	241	240	236	236	272	278
L Q	258	264	254	236	232	242	234	226	222	218	208	200	198	200	204	204	208	216	230	228	226	222	250	266

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IONOSPHERIC DATA STATION Yamagawa

APR. 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 118	118	116	114	108		A 108	108			108	108	E A 150					
2							B 114	114	108	108	108	108	108	108	108	108	108	108	A					
3							B 108	132	110	A		A 110	110	110	110	110	110	110	110					
4							B 110	110	110		110	A 110	A 110	110	110	122								
5						B	E B 180	110	110	110	110	110	110	A 110	110	110	110	110	E A 154					
6							B 114	114	114	114	110	A 110	110	110	110	114	106	106						
7						B	E B 214	112	122	114	114	110	110	A 110	112	112	112	112	112					
8						B	E B 170	108	A	108	108	A 108	108	108	108	108	108	114	114					
9							142	112	112	112	108	A 108	108	108	108	108	108	108	108					
10							E A 160	E A 160	110	110	110	108	108	108	108	108	108	114	130	B				
11						B	148	108	108	A	108	108	108	108	108	108	108	108	A	B				
12							B 110	110	110	110	110	110	110	108	108	108	108	108	A					
13						B	132	120	116	116	112	112	A		A		112	112	112	B				
14						B	148	132	106	106	106	A		110	110	110	110	110	110					
15						B	136	118	118	116	114	A	114	114	114	104	104	104	104					
16						B	144	122	114	114	114	114	112	112	112	112	112	112	114					
17							122	122	118	118	108	108	108	108	108	108	108	108	A					
18								E A 146	110	110	A	110	110	110	110	110	110	A		A				
19							132	A 132	130	A	120	A	A	A	114		114	116	116	A				
20						B	A	116	116	116	116	104	104	104	104	104	106	106	108	A				
21						B	114	114	114	114	114	A	A	112	A	112	112	112	112	B				
22							E A 140	A	138	122	A	122	124	A	118	A	118	A	128	A				
23						B	A	112	E A 136	A	A	A	A	112	112	110	110	110	110	B				
24						B	140	122	116	A	A	A	A			116		A	A	A				
25						B	A	116	116	116	112	118	118	A	A		110	110	110	B				
26						B	A	112	112	112	A	108	108	108	108	108	108	108	A	B				
27						B	A	112	112	114	114	114	B	B	114	114	114	114	122	B				
28						A		108	108	108	108	108	A	A		108	108	108	108					
29						B	128	124	124	108	108	108	A	108	112	112	112	112	112					
30						A	128	A 128	112	112	112	B	112	112	112	112	112	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							17	29	29	26	23	20	17	20	25	25	29	26	21					
MED							136	114	114	112	112	110	110	108	110	110	110	110	111					
U Q							E B 154	122	118	116	114	111	112	111	112	112	112	112	119					
L Q							130	111	110	110	108	108	108	108	108	108	108	108	109					

APR. 2013 h′E (KM)

IONOSPHERIC DATA STATION Yamagawa

APR. 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	98	98	B	B	B	B	B	178	178	G	116	116	116	116	G	116	116	132	114	108	108	108	106	96
2	96	96	96	96	96	B	106	146	168	106	106	124	128	128	170	188	G	124	164	112	104	104	104	104
3	B	B	B	B	B	B	G	122	144	120	114	108	108	G	146	98	98	194	152	120	B	96	B	B
4	B	B	B	B	B	B	B	G	G	108	108	108	108	108	G	108	G	108	108	108	B	B	B	B
5	B	B	B	B	B	B	G	G	150	130	130	130	130	122	122	G	G	G	116	102	102	B	88	88
6	108	B	B	B	B	B	B	158	112	G	G	G	112	170	184	192	108	136	132	112	112	B	B	B
7	B	B	B	B	B	B	G	200	108	G	192	G	120	106	106	104	126	144	132	124	94	94	B	94
8	104	104	B	B	B	104	G	G	176	G	G	128	128	128	120	120	120	142	G	126	B	B	122	118
9	106	106	B	102	B	B	G	156	G	108	G	108	G	108	108	110	114	G	148	B	114	108	108	108
10	98	98	B	B	B	B	98	184	184	G	G	G	118	118	118	118	118	118	118	112	B	112	B	94
11	B	B	B	B	B	B	G	G	G	94	G	G	G	G	126	G	G	126	110	B	122	108	108	108
12	B	B	B	B	B	B	B	G	G	G	182	182	98	98	G	G	98	216	86	86	B	B	B	B
13	B	B	B	B	B	B	154	150	146	128	116	116	116	116	116	116	116	182	130	118	116	104	104	104
14	106	102	B	B	B	B	G	148	126	126	G	104	100	100	G	100	100	194	114	114	96	B	B	B
15	B	96	B	B	B	B	G	144	128	114	G	102	128	128	G	G	130	122	118	116	106	106	106	106
16	134	130	104	110	G	B	152	146	126	126	110	122	120	120	118	118	118	G	118	110	110	106	106	B
17	104	B	102	102	102	102	G	134	134	126	116	116	116	116	116	116	116	116	110	110	110	110	B	108
18	98	B	B	98	98	98	98	98	126	126	124	122	122	116	108	108	108	108	108	108	108	108	B	108
19	B	110	110	110	110	108	156	108	126	104	G	104	104	104	116	110	152	118	G	114	114	108	106	106
20	94	94	94	94	94	94	94	94	94	94	118	118	118	118	118	98	98	98	98	98	98	98	B	98
21	B	B	B	B	B	B	154	154	154	142	G	108	106	G	106	106	106	G	G	B	B	B	B	106
22	B	122	122	112	98	98	98	136	104	102	114	114	G	104	198	122	122	116	114	114	114	114	114	114
23	106	106	B	106	B	B	134	142	142	142	140	114	106	180	134	G	G	146	136	118	B	B	B	110
24	B	B	B	B	B	B	140	140	G	110	110	192	100	106	106	90	90	90	118	106	102	94	B	B
25	B	B	B	B	B	B	120	148	132	130	114	114	114	98	98	98	116	100	120	96	96	B	B	B
26	128	B	B	B	B	128	128	112	144	124	110	116	100	158	146	146	142	122	118	116	112	112	112	104
27	104	114	114	B	B	114	134	130	130	130	122	124	B	B	124	G	206	204	136	136	118	112	108	100
28	104	104	102	130	104	104	122	122	122	120	120	120	114	114	114	182	142	G	108	108	100	100	100	100
29	B	106	106	102	102	B	G	144	120	112	114	114	108	108	108	116	116	116	126	124	116	118	B	B
30	110	106	106	106	106	102	120	130	130	128	120	120	120	120	114	132	G	128	112	106	102	102	100	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	16	10	12	9	10	16	25	25	24	21	26	26	26	25	24	24	25	27	27	23	21	15	20
MED	104	105	105	104	102	103	125	144	130	122	116	116	115	116	118	116	116	124	118	112	108	108	106	105
U Q	107	108	110	110	105	108	146	152	148	128	123	122	120	122	130	121	124	145	132	118	114	111	108	108
L Q	98	98	102	100	97	98	102	126	124	108	112	108	106	106	108	105	107	116	110	108	102	101	104	99

APR. 2013 h'Es (KM)

IONOSPHERIC DATA STATION Yamagawa

APR. 2013 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0′N LON.130°37.0′E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F1	F2						H1	HL11		C1	C1	C1	C1		C1	C1	C1	L1	F6	F5	F1	F2	F1
2	F3	F2	F1	F1	F1		L1	HL11	HL11	L1	L1	HL11	HL11	HL11	H1	H1		C1	HL21	F1	F3	F2	F2	FQ11
3								C2	CL11	C1	C1	C1	C1		HL11	L1	L1	HL11	C2	FF11		F1		
4										C1	C1	C1	C1	L1		L1		L1	L2	F1				
5									H1	C1	CL11	C1	C1	C1	C1				L1	FF11	F1		F2	F1
6	F1							HL11	L1				L1	H1	H1	H1	L1	C1	C3	F3	F1			
7								H1	L1		H1		C1	C1	C1	L1	CL11	CL11	C3	FF21	F2	F2		F4
8	F1	F1				L1			HL11			CL11	CL11	C1	C1	C1	C2	CL11		F1			F1	F2
9	L1	F2		F2				H1		L1		L1		C1	C1	C1	C1		H1		F1	F1	F2	F1
10	F2	F1					L1	HL11	HL11				C1	C1	C1	C1	C1	L1	L1	L3		F1		F1
11										L1					H1			C1	C1		F1	F2	F2	FF21
12											HL11	HL11	L1	L1			L1	HL12	L3	F2				
13							H1	H1	CL11	C1	C1	C1	C1	C1	C1	CL11	CL21	HL11	CL21	L5	F2	F3	F3	F2
14	F2	F2						HL11	CL11	C1		C1	L1	L1		L1	L1	HL11	CL32	F2	F1			
15		F1						HL11	CL11	C1		L1	H1	C1			C1	C3	C3	C4	F3	F2	F1	F3
16	F1	F1	F2	F1			C1	CL11	C1	C1	C2	C1	C1	C1	C1	C1	C1		C2	F4	F3	F1	F1	
17	F1		F2	F5	F6	F2		C3	C3	C3	C1	C1	C1	C2	C1	C1	C2	C3	L4	FQ31	F3	F3		F3
18	F2			F1	F3	F2	C4	L1	C1	CL11	CL11	C1	C1	C1	C1	C2	C2	C2	C3	L3	F5	F3		F3
19		F2	F2	F1	F1	F3	H1	L2	CL11	L1		L1	L1	L1	CL11	L1	HL11	L1		L5	F3	F1	F1	F1
20	F1	F1	F1	F3	F3	L4	L2	L1	L1	L1	CL11	C1	C1	CL11	CL11	L1	L2	L2	L3	L3	F1	F1		F1
21							H1	H1	H1	H1		L1	L1		L1	L1	L1							F1
22		F1	FF23	F2	F3	F1	L1	HL12	L2	L1	CL11	L1		L1	HL11	CL11	CL11	CL11	L3	L1	F1	F3	F1	F1
23	F2	F2		F1			C1	H1	HL11	HL11	HL11	L1	L1	H1	H1			HL11	C2	CL21				F2
24							C2	C1		C1	C1	HL11	L1	L1	L1	L1	C2	L3	CL13	L2	F2	F2		
25							C2	CL11	CL11	CL11	C1	L1	C1	L2	L1	L3	CL12	L2	C4	LC21	FF41			
26	F1					C1	C2	L1	H1	C1	C1	C1	L1	HL11	HL11	HL11	C1	C2	C5	C5	F5	F1	F3	F7
27	F7	F1	F1			L1	C2	C2	C1	C1	C1	C1			C1		H1	H1	CL21	C1	F7	F3	F3	F6
28	F3	F3	F1	F1	F1	L2	C2	C2	C2	C1	C1	C1	C1	C1	C2	H1	H1		C5	F4	F6	F3	F4	F3
29		F1	F1	F1	F1			HL11	CL21	C1	C1	C1	C1	C1	L1	C1	CL11	CL11	CL11	F3	F3	FF12		
30	F2	F6	F2	F3	F2	L4	L1	CL11	C1	C1	C1	C1	C1	C1	C1	H1		C1	C2	F4	F4	F1	F1	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

APR. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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 69	X 66	X 65	68	62	X 51	49													X 172	X 154	X 134	X 117	X 111
2	X 96	X 82	X 88	X 80	X 69	X 48														X 125	X 115	X 94	X 85	X 75
3	X 68	X 66	X 60	X 54	X 45	X 44														X 158	X 140	X 120	X 106	X 97
4	X 86	X 82	X 78	X 79	X 69	X 59														X 146	X 124	X 118	X 113	X 92
5	X 84	X 83	X 83	X 78	X 68	X 55														X 138	X 139	X 135	X 126	X 120
6	X 107	X 97	X 98	X 101	X 100	86	79	94												X 150	X 159	X 146	X 134	X 132
7	X 123	X 118	X 116	X 116	X 90	X 58														X 149	X 128	X 114	X 101	X 100
8	X 102	X 102	X 114	X 126	X 73	X 54														X 138	X 136	128	122	125
9	X 110	X 111	X 98	93	74	X 62														X 152	X 144	X 128	X 113	X 105
10	X 103	X 103	X 103	X 89	X 74	X 61														X 134	X 118	X 115	X 106	103
11	114	X 114	X 93	X 82	X 73	X 68															X 158	X 150	X 141	X 126
12	X 130	X 112	X 97	X 82	X 70	X 64															X 130	X 127	X 108	X 100
13	X 101	X 92	X 90	X 81	X 59	X 57															X 150	X 122	X 102	X 102
14	X 96	X 91	X 84	X 84	X 64	X 57															X 121	X 102	X 103	X 104
15	X 97	X 97	X 94	X 72	X 63	X 60															X 107	X 86	X 87	X 88
16	X 90	X 90	X 85	X 77	X 66	X 66															O X 162	O X 162	O X 157	132
17	X 123	X 110	115	X 99	70	69	72														X 150	X 140	X 117	X 104
18	X 97	X 92	X 88	X 71	X 57	X 49															X 124	X 99	X 93	X 88
19	X 88	X 90	X 92	X 93	X 55	X 57															X 138	X 111	X 99	X 92
20	X 89	X 92	88	X 82	X 57	X 48															X 99	X 89	X 87	X 83
21	X 83	X 79	X 82	X 71	X 49	X 46															X 127	X 122	X 114	X 103
22	X 94	X 78	X 76	X 56	X 51	X 49															X 132	X 124	X 94	X 90
23	X 84	X 80	X 79	X 69	X 62	X 60															X 105	X 100	X 86	X 82
24	X 74	X 72	X 70	X 70	X 56	X 49															X 98	X 93	X 89	X 95
25	X 98	X 82	X 76	X 70	X 69	X 63															X 93	X 92	X 92	X 93
26	X 91	X 92	X 85	X 72	X 58	X 58															X 106	X 99	X 95	X 92
27	X 87	X 81	X 83	X 77	X 70	X 68															X 104	X 106	X 110	X 109
28	X 104	X 104	X 96	X 92	X 77	X 70															X 116	X 118	X 128	X 140
29	X 128	115	104	101	76	62	78														X 122	X 108	X 100	X 96
30	X 91	X 89	X 88	X 88	X 79																X 157	X 147	X 141	X 138
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	4	1												10	30	30	30	30
MED	X 96	X 92	X 88	X 80	X 68	X 58	75	94												X 148	X 128	X 118	X 106	X 101
U Q	X 104	X 103	X 97	X 92	X 73	X 64	78													X 152	X 144	X 128	X 117	X 111
L Q	X 87	X 82	X 82	X 71	X 58	X 50	60													X 138	X 115	X 100	X 94	X 92

IONOSPHERIC DATA STATION Okinawa

APR. 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	63	60	59	61	52	45	42	69	80	95	106	120	134	R 144	U R 154	158	R 157	R 165	U R 176	U R 166	R 148	128	111	R 105
2	90	76	82	74	63	42	46	75	89	111	109	110	118	132	141	134	134	128	114	119	109	88	79	69
3	62	60	54	48	39	38	40	69	94	100	97	106	114	128	137	R 143	U R 148	U R 148	R 154	R 152	134	114	100	91
4	80	76	72	73	63	53	57	79	84	88	93	99	116	129	134	128	123	128	136	140	118	112	R 107	86
5	78	77	77	72	62	49	50	67	79	96	97	105	120	136	137	129	134	137	139	132	133	R 129	120	114
6	101	91	92	95	94	F 80	F 72	86	113	118	113	121	133	149	152	152	142	139	R 142	Y	R 153	140	128	126
7	117	112	110	110	84	52	50	69	87	87	98	112	124	128	128	130	128	132	141	R 143	122	108	95	94
8	96	96	108	120	67	48	51	76	82	96	102	106	120	123	127	128	128	128	137	132	J R 130	F 120	U F 116	U F 112
9	104	F 104	92	F 85	F 66	56	58	88	98	97	104	115	128	137	144	R 144	R 149	150	R 145	U R 146	138	122	R 107	99
10	97	97	97	83	68	55	55	72	89	96	104	110	111	118	128	123	127	125	125	128	112	109	100	U F 96
11	108	108	87	76	67	62	68	91	92	87	100	109	121	130	142	142	144	144	149	154	R 152	U R 144	135	120
12	R 124	R 106	91	76	64	58	63	76	94	99	90	104	127	139	140	145	135	133	130	129	124	121	102	94
13	95	86	84	75	53	51	52	84	97	108	110	114	128	R 145	R 150	153	R 150	156	U R 148	R 145	R 144	116	96	96
14	R 90	85	78	78	58	51	56	76	92	93	100	110	124	137	137	143	138	136	R 128	132	115	96	97	98
15	91	91	88	66	57	54	54	92	106	114	101	R 98	114	R 118	109	101	111	115	109	106	101	80	81	82
16	84	84	79	71	60	60	64	94	110	86	82	91	102	119	127	131	135	141	U R 151	U Y 153	U Y 156	U Y 156	U R 151	F
17	R 117	104	F 104	93	F 63	F 62	F 65	81	88	80	80	98	111	115	126	138	132	131	140	146	J R 144	134	111	98
18	91	86	82	65	51	43	54	76	82	85	82	88	102	110	121	121	128	131	140	J R 147	118	93	87	82
19	82	84	86	87	49	51	54	86	74	82	98	106	114	R 120	124	R 125	R 139	140	134	132	R 132	105	93	86
20	83	R 83	F 78	76	51	R 42	50	80	74	75	86	91	R 102	99	108	112	108	110	112	111	93	83	81	77
21	77	73	76	65	43	40	50	68	80	80	90	89	107	118	126	134	R 147	R 154	R 152	R 144	121	116	R 108	97
22	88	72	70	50	45	43	48	76	92	80	77	84	98	114	127	137	J R 146	156	136	123	126	118	88	84
23	78	74	73	63	56	54	63	76	82	70	76	90	110	111	114	122	131	128	118	107	99	94	80	76
24	68	66	64	64	50	43	52	82	84	78	70	86	103	113	121	130	129	130	123	111	92	87	83	89
25	92	76	70	64	63	57	62	74	78	88	83	82	111	116	108	117	121	117	113	104	87	86	86	87
26	85	86	79	66	52	52	60	82	90	84	91	J R 103	119	127	130	130	134	137	141	124	100	93	89	86
27	81	75	R 77	71	64	62	76	74	88	91	81	92	110	122	130	136	136	134	130	128	98	100	104	103
28	98	98	90	86	71	64	74	90	80	83	80	92	109	120	126	131	135	R 130	121	122	110	112	U R 122	R 132
29	U R 122	F 107	F 96	F 90	F 64	F 50	F 70	74	79	79	95	101	114	119	130	142	R 143	143	137	131	116	102	94	90
30	85	83	82	82	73	69	72	84	85	82	82	101	119	131	R 154	U R 158	Y	Y	U R 169	R 167	151	141	U R 135	132
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	30	29	30	30	30	29
MED	90	84	82	74	62	52	56	76	88	88	94	102	114	122	129	132	135	134	137	132	122	112	100	94
U Q	98	97	91	85	66	58	64	84	92	96	101	110	121	132	140	143	R 144	144	R 145	R 146	R 138	122	111	104
L Q	81	76	76	65	52	45	50	74	80	82	82	91	110	118	126	128	128	128	125	122	109	94	88	86

APR. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2013 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0′N LON.128°09.0′E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	U L 568	U L 540	U L 584	U L 548	L	U L 552	L	L					
2										L	L	L	U L 572	U L 568	L	U L 536	L	L						
3									L	L	L	U L 544	U L 588	L	A	U L 544	U L 536	L						
4										L	L	U L 520	U L 568	U L 560	L	U L 524	L 504	L						
5									L	L	L	U L 576	U L 576	U L 540	U L 556	U L 596	U L 532	L						
6										L	L	U L 584	L	U L 588	U L 584	U L 544	L	L						
7									L	L	L	U L 532	U L 524	L	L	L	L	L	L					
8										L	U L 528	U L 540	U L 580	U L 544	U L 556	L	L	L	L					
9										L	L	U L 560	U L 572	L	U L 552	U L 596	U L 548	L	L					
10										L	L	U L 556	L	L	U L 564	L	L	L	L					
11									L		L	L	L	U L 600	L	U L 584	L	L	L					
12									L	L	U L 488	L	U L 560	U L 592	U L 548	U L 556	L	L						
13									L	L	L	L 520	U L 604	U L 552	U L 580	U L 580	U L 548	L						
14									L	L	U L 520	U L 532	U L 616	U L 576	L	L 524	L	L	L					
15								L	L	L	U L 488	L	U L 540	U L 524	U L 544	L	U L 512	A	A					
16									L	L	L	U L 552	U L 540	A	U L 544	A	L 492	L	L					
17										A	U L 580	U L 524	U L 524	A	L 528	U L 520	L							
18									L	L	U L 504	U L 548	U L 552	L	L	L	L	L	L					
19								L	L	L	L 488	U L 504	U L 524	U L 564	L 492	484	480	U L 464	L					
20									L	U L 464	A	488	A	U L 496	496	L 516	U L 464	L	L					
21									L	U L 480	L 520	U L 544	U L 576	U L 532	L 552	L 512	U L 500	U L 448						
22									L	L	U L 528	U L 480	L	B	U Y 540	L 488	U L 452	L	L					
23										U Y 440	504	528	U L 516	A	U L 532	500	L 492	L						
24								L	L	L		508	L	536	U L 576	U L 508	L	L						
25										L	L	U L 568	U L 548	U L 544	U L 528	U L 516	L	L						
26									L	L		L	U L 560	528	U L 544	L	L	A						
27									L	A	A	L	L	U L 572	U L 552	U L 524	U L 512	L	L					
28										L	L	556	552	U R 504	L	A	A	L	A					
29											A	L	U L 544	U L 572	548	564	U L 552	L	L					
30										A	A	U L 568	U L 552	U L 640	556	U L 568	U L 560	L						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										3	10	23	23	21	23	21	16	2						
MED										U L 464	U L 512	U L 544	U L 552	U L 560	U L 548	U L 524	U L 512	U L 456						
U Q										U L 480	U L 528	U L 560	U L 576	U L 580	U L 556	U L 566	U L 548							
L Q										U Y 440	U L 488	L 520	U L 540	U 534	L 540	L 514	L 492							

APR. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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							B	228	UA 280	UA 316	R 352	UR 376	B	B	UR 404	UR 380	320	284	220					
2							B	232	284	336	R 368	B	B	UR 416	B	UR 360	B	284	A					
3							B	204	288	340	UR 372	UR 380	B	B	A	A	A	276	208					
4							B	224	300	R 348	A	UR 368	A	A	A	R 368	344	288	A					
5							B	252	304	352	UR 364	B	R	B	R	R 376	A	UA 292	A					
6							B	220	312	344	A	A	B	B	B	B	UR 356	308	220					
7							B	240	UR 304	B	B	B	B	A	B	R	328	A	A					
8							B	240	304	R 340	R 376	B	B	B	B	B	328	UA 292	232					
9							B	216	296	R	UR 376	UR 376	B	B	B	UR 376	UA 344	R 312	224					
10							B	252	296	UR 360	B	B	B	B	B	B	B	A	A					
11							B	252	312	R 360	R 376	B	B	B	B	UR 360	B	B	228	B				
12							B	236	UR 304	UR 368	R 368	B	R	B	B	R	R 352	R 316	H 240	A				
13							B	248	R 296	UR 352	B	B	B	B	B	A	UR 340	R 284	224	A				
14							B	240	292	344	B	B	B	A	A	A	R 332	284	216	A				
15							B	244	296	332	A	B	B	B	B	A	328	A	A	A				
16							B	244	304	UA 340	A	UR 392	B	B	B	UR 364	320	308	A	A				
17							A	232	A	A	A	A	B	B	B	B	324	UA 276	A	A				
18							A	A	R 304	UA 336	A	A	B	B	B	A	A	A	A	A				
19							A	UA 256	A	A	B	A	A	A	R	A	R	284	228	B				
20							A	A	A	336	A	A	A	A	A	R 340	A	R 272	220	A				
21							184	248	300	332	A	B	B	A	A	B	R	312	224	A				
22							A	A	A	UA 332	A	A	A	B	A	R	UR 336	A	UA 224	B				
23							172	256	A	R	B	B	B	A	B	A	356	300	228	A				
24							A	248	304	UA 336	B	A	A	A	A	B	R 332	A 316	A	A				
25							176	272	308	R 336	A	B	B	B	B	B	UR 340	300	A	A				
26							B	256	296	344	R 356	B	B	B	B	R 388	340	UA 292	UA 240	A				
27							B	UA 256	308	UA 360	A	B	B	B	B	B	UR 356	304	R 244	A				
28							A	UA 256	316	340	B	B	B	B	B	B	356	304	A	A				
29							UA 160	256	R 308	B	B	B	B	B	A	B	R	296	244	A				
30						A	R 192	A	320	R 364	A	B	B	B	B	B	B	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							5	26	25	24	9	5		1	1	9	19	23	17					
MED							176	246	304	340	R 368	UR 376		UR 416	UR 404	UR 368	340	292	224					
U Q							188	256	308	UR 352	R 376	UR 386				UR 378	R 352	308	236					
L Q							166	232	296	336	R 360	UR 372				UR 360	328	284	220					

APR. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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	J A 18	19	18	18	E B 14	E B 14	E B 14	24	33	35	G	G	E B 44	E B 43	G	G	G	G	24	E B 14	E B 14	E B 14	E B 14	J A 20
2	E B 14	J A 26	J A 22	E B 14	E B 14	E B 14	E B 14	G	G	G	G	E B 43	E B 42	48	46	G	E B 40	35	J A 30	E B 14	J A 30	J A 19	E B 14	J A 18
3	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	J A 14	28	35	38	G	G	42	J A 50	J A 55	J A 44	37	G	24	18	E B 14	E B 14	E B 14	19
4	19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	33	G	J A 47	G	J A 43	44	42	G 30	G	J A 42	J A 46	J A 31	18	E B 14	E B 14	E B 14
5	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	44	G	45	G	G	40	33	J A 24	19	E B 14	18	E B 14	19
6	J A 20	J A 16	E B 14	E B 14	E B 14	E B 14	E B 14	26	34	G	J A 49	J A 46	E B 45	E B 44	E B 44	E B 42	G	36	J A 39	J A 29	J A 16	J A 19	E B 14	19
7	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	E B 36	E B 43	E B 43	E B 46	47	E B 44	G	G	33	J A 25	J A 27	20	E B 14	J A 19	J A 79
8	J A 18	18	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	E B 46	E B 44	E B 44	43	44	38	34	G E 22	E B 14	E B 14	E B 14	E B 14	E B 14
9	J A 24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	25	32	G 33	G	G	E B 44	E B 44	44	45	39	G 26	24	E B 14	E B 14	19	E B 14	J A 16
10	J A 20	19	E B 14	18	E B 14	J A 22	E B 14	G	G	G	E B 43	E B 46	E B 43	E B 42	E B 42	E B 44	E B 39	36	J A 28	J A 18	E B 14	E B 14	18	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	G	G	E B 42	E B 44	E B 44	E B 44	G	E B 42	E B 41	G	E B 14	E B 14	E B 14	E B 14	E B 14
12	E B 14	18	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	E B 43	34	E B 43	E B 42	31	G 25	G	G J 18	A J 22	A J 20	20	E B 14	E B 14
13	E B 14	E B 14	E B 14	E B 14	J A 20	E B 14	J A 16	27	G	G	E B 42	E B 43	E B 45	44	E B 42	41	G	G 23	30	J A 25	J A 22	20	18	J A 28
14	E B 14	J A 19	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	E B 41	E B 43	E B 42	46	44	40	G	G	25	J A 18	J A 32	A J 22	E B 14	J A 18
15	E B 14	21	E B 14	19	E B 14	E B 14	E B 14	G	35	38	44	E B 43	E B 43	E B 43	E B 42	J A 56	41	J A 55	J A 70	J A 44	J A 48	A J 28	J A 25	J A 20
16	J A 20	J A 32	J A 19	J A 20	J A 20	E B 14	E B 14	27	34	J A 44	J A 46	48	44	J A 55	J A 49	J A 68	J A 41	34	J A 35	J A 22	J A 37	J A 24	J A 20	19
17	J A 16	18	J A 21	J A 31	J A 24	J A 21	J A 40	28	J A 42	45	42	J A 46	E B 44	J A 51	J A 48	J A 44	J A 44	J A 56	J A 44	J A 29	J A 29	J A 62	J A 27	E B 14
18	J A 20	J A 21	E B 14	E B 14	E B 14	E B 34	J A 24	29	G	40	42	40	J A 51	J A 47	J A 50	J A 50	J A 68	J A 35	J A 29	A J 29	E B 14	E B 14	J A 23	J A 29
19	J A 23	J A 17	J A 28	J A 29	E B 14	J A 20	J A 28	J A 29	J A 34	J A 36	44	J A 46	J A 43	A J 43	G 36	J A 38	G 29	G	G J 20	A J 19	J A 64	E B 14	J A 20	J A 17
20	J A 20	19	E B 14	E B 14	J A 20	J A 23	J A 23	J A 32	J A 40	36	40	45	J A 52	J A 44	J A 40	G 27	37	G 21	G J	A J 24	J A 26	18	E B 14	E B 14
21	E B 14	E B 14	E B 14	18	E B 14	E B 14	G	27	33	36	37	E B 43	E B 46	44	45	E B 45	26	36	33	J A 38	J A 38	21	17	E B 14
22	E B 14	E B 14	E B 14	E B 14	E B 14	J A 22	J A 28	29	J A 42	36	J A 41	J A 43	J A 42	E B 55	46	G 29	G	34	26	J A 22	20	J A 19	18	E B 14
23	E B 14	J A 16	J A 19	J A 18	J A 29	A J 17	G	27	34	32	E B 41	E B 44	E B 48	J A 63	46	42	40	41	35	J A 34	J A 20	A E 14	B E 14	J A 16
24	E B 14	E B 14	E B 14	E B 14	19	E B 14	18	28	32	40	34	42	45	46	45	E B 44	40	35	J A 43	J A 32	J A 18	A E 14	B E 14	J A 17
25	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	36	J A 42	J A 46	E B 44	E B 44	E B 44	E B 44	E B 43	J A 58	40	J A 88	J A 39	J A 60	19	J A 22	E B 14
26	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	19	G 21	35	G	G	E B 45	E B 41	47	E B 45	48	J A 46	J A 63	J A 74	J A 42	E B 14	20	J A 16	19
27	J A 52	J A 46	J A 30	J A 34	J A 32	A J 16	20	29	39	49	J A 61	47	E B 53	49	E B 44	E B 43	G	G	G	J A 37	J A 30	A J 36	J A 27	J A 20
28	J A 66	J A 50	J A 46	J A 38	J A 28	A J 16	J A 28	34	J A 48	J A 43	J A 48	45	J A 92	E B 44	51	J A 72	J A 53	34	J A 39	J A 33	J A 104	A J 96	J A 48	J A 60
29	J A 62	J A 20	J A 18	J A 18	J A 15	E B 14	23	29	40	J A 51	55	J A 52	50	51	44	E B 41	G 28	G 21	30	21	J A 17	J A 19	J A 15	E B 14
30	J A 18	J A 16	J A 23	J A 23	J A 34	A J 24	G	29	40	J A 55	J A 54	E B 45	E B 45	E B 48	44	E B 42	E B 42	J A 41	J A 41	A J 42	J A 29	J A 38	J A 22	18
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	16	E B 14	E B 14	E B 14	E B 14	G	26	34	36	42	44	E B 44	44	44	40	E G 38	34	30	J A 24	J A 20	19	16	18
U Q	J A 20	J A 19	J A 19	J A 18	J A 20	A J 17	J A 20	29	36	J A 40	J A 46	46	46	48	46	J A 44	J A 41	A J 40	J A 39	A J 33	J A 30	A J 21	J A 20	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	43	43	E B 44	42	G	G	G	G E 24	B E 18	E B 14	B E 14	E B 14	E B 14

APR. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2013 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0′N LON.128°09.0′E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	24	31	34	G	G	E B 44	E B 43	G	G	G	G	24	E B 14	E B 14	E B 14	E B 14	E B 14
2	E B 14	E B 14	18	E B 14	E B 14	E B 14	E B 14	G	G	G	G	E B 43	E B 42	48	46	G	E B 40	35	25	E B 14	20	E B 14	E B 14	E B 14
3	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	26	32	38	G	G	42	46	53	42	35	G	24	E B 14	E B 14	E B 14	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	32	G	46	G	42	44	42	G 26	G	40	44	28	E B 14	E B 14	E B 14	E B 14
5	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	43	G	44	G	G	40	32	24	E B 14	E B 14	E B 14	E B 14	E B 14
6	20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	26	33	G	46	43	E B 45	E B 44	E B 44	E B 42	G	36	38	26	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	E B 14	G	G	E B 36	E B 43	E B 43	E B 46	47	E B 44	G	G	32	24	21	E B 14	E B 14	18	54
8	17	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	E B 46	E B 44	E B 44	43	44	38	32	G E 18	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	25	32	U G 33	G	G	E B 44	E B 44	44	45	38	G 24	24	E B 14	E B 14	E B 14	E B 14	E B 14
10	16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	E B 43	E B 46	E B 43	E B 42	E B 42	E B 44	E B 39	34	24	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	G	G	E B 42	E B 44	E B 44	E B 44	G	E B 42	E B 41	G	E B 14	E B 14	E B 14	E B 14	E B 14
12	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	E B 43	U G 34	E B 43	E B 42	U G 31	G 24	G	G 17	20	17	19	E B 14	E B 14
13	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	26	G	G	E B 42	E B 43	E B 45	43	E B 42	40	G	G 21	30	23	20	E B 14	E B 14	19
14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	E B 41	E B 43	E B 42	45	44	40	G	G	24	17	22	18	E B 14	E B 14
15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	34	38	43	E B 43	E B 43	E B 43	E B 42	51	40	51	67	41	40	E B 14	18	19
16	19	26	E B 14	E B 14	E B 14	E B 14	E B 14	27	33	43	44	46	44	54	48	68	40	34	33	20	31	E B 14	E B 14	E B 14
17	E B 14	E B 14	E B 14	21	17	E B 14	25	28	34	38	41	43	E B 44	50	48	43	40	54	42	26	18	28	22	E B 14
18	E B 14	17	E B 14	E B 14	E B 14	E B 14	20	29	G	40	40	39	50	46	48	48	48	34	28	17	E B 14	E B 14	E B 14	17
19	E B 14	E B 14	16	E B 14	E B 14	E B 14	21	G 22	32	36	42	42	42	42	U G 36	37	U G 29	G	G E 20	B 14	31	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	22	20	28	32	35	U Y 40	45	51	44	40	G 27	34	G 21	G	23	23	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	27	33	36	37	E B 43	E B 46	44	44	E B 45	U Y 26	35	31	36	35	E B 14	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	23	29	33	36	41	42	41	E B 55	U Y 46	U G 29	G	32	25	E B 14	E B 14	E B 14	E B 14	E B 14
23	E B 14	E B 14	E B 14	E B 14	16	E B 14	G	27	U Y 34	U Y 32	E B 41	E B 44	E B 48	62	46	41	40	38	33	32	17	E B 14	E B 14	E B 14
24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	18	28	32	40	U Y 34	42	45	44	43	E B 44	39	34	36	28	E B 14	E B 14	E B 14	E B 14
25	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	35	40	44	E B 44	E B 44	E B 44	E B 44	E B 43	46	39	84	34	31	E B 14	18	E B 14
26	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	18	G 20	32	G	G	E B 45	E B 41	47	E B 45	48	44	47	47	38	E B 14	E B 14	E B 14	E B 14
27	30	20	21	22	E B 14	E B 14	19	29	38	48	55	47	E B 53	48	E B 44	E B 43	G	G	G	34	29	E B 14	19	18
28	26	22	23	17	18	E B 14	24	33	40	41	46	45	48	E B 44	48	69	51	34	37	29	57	36	19	38
29	22	E B 14	E B 14	E B 14	E B 14	E B 14	19	28	40	50	54	52	50	51	44	E B 41	U G 28	G 18	29	20	E B 14	E B 14	E B 14	E B 14
30	E B 14	E B 14	17	22	25	19	G	29	39	54	54	E B 45	E B 45	E B 48	44	E B 42	E B 42	39	39	36	24	22	18	E B 14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	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	26	32	36	40	42	E B 44	44	44	40	E G 38	34	26	20	16	E B 14	E B 14	E B 14
U Q	14	14	14	14	14	E B 14	19	28	34	40	44	45	46	48	46	44	40	38	37	29	24	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	42	42	E B 44	42	G	G	G	G E 24	B 14	E B 14	E B 14	E B 14	E B 14

APR. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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	17	16	20	22	32	44	43	24	23	21	15	14	14	14	14	14	14
2	14	14	14	14	14	14	14	14	18	20	28	43	42	30	42	27	40	17	16	14	14	14	14	14
3	14	14	14	14	14	14	14	14	14	18	26	24	37	36	33	30	20	14	14	14	14	14	14	14
4	14	14	14	14	14	14	14	14	15	19	26	26	32	32	30	21	20	16	14	14	14	14	14	14
5	14	14	14	14	14	14	14	14	19	21	24	40	31	40	31	24	23	19	14	14	14	14	14	14
6	14	14	14	14	14	14	14	14	21	24	27	26	45	44	44	42	20	21	16	14	14	14	14	14
7	14	14	14	14	14	14	14	14	21	36	43	43	46	40	44	23	20	14	14	14	14	14	14	14
8	14	14	14	14	14	14	14	14	16	23	26	46	44	44	41	38	21	17	16	14	14	14	14	14
9	14	14	14	14	14	14	14	14	21	26	22	26	44	44	42	21	20	20	20	14	14	14	14	14
10	14	14	14	14	14	14	14	14	16	20	43	46	43	42	42	44	39	22	17	14	14	14	14	14
11	14	14	14	14	14	14	14	14	18	23	32	42	44	44	44	31	42	41	17	14	14	14	14	14
12	14	14	14	14	14	14	14	18	26	25	20	43	32	43	42	22	21	20	14	14	14	14	14	14
13	14	14	14	14	14	14	14	16	20	23	42	43	45	41	42	28	24	16	14	14	14	14	14	14
14	14	14	14	14	14	14	14	16	18	23	41	43	42	37	32	26	24	16	14	14	13	14	14	14
15	14	14	14	14	14	14	14	14	18	21	32	43	43	43	42	34	24	20	16	14	14	14	14	14
16	14	14	14	14	14	14	14	17	16	20	23	22	41	41	40	28	23	19	16	14	13	14	14	14
17	14	14	14	14	14	14	14	14	20	21	30	24	44	43	43	36	23	16	14	14	14	14	14	14
18	14	14	14	14	14	14	14	14	19	20	27	27	40	40	40	24	31	20	16	14	14	14	14	14
19	14	14	14	14	14	14	14	15	20	22	32	36	34	33	35	24	21	16	14	14	14	14	14	14
20	14	14	14	14	14	14	14	14	15	20	23	26	30	29	32	24	19	16	15	14	14	14	14	14
21	14	14	14	14	14	14	14	14	20	22	26	43	46	36	30	45	20	15	14	14	14	14	14	14
22	14	14	14	14	14	14	14	14	15	21	26	25	32	55	37	23	17	16	14	14	14	14	14	14
23	14	14	14	14	14	14	14	14	20	20	41	44	48	41	42	33	23	20	13	14	14	14	14	14
24	14	14	14	14	14	14	14	15	18	22	32	32	35	36	32	44	21	16	14	14	14	14	14	14
25	14	14	14	14	14	14	14	15	15	20	26	44	44	44	44	43	20	22	15	14	14	14	14	14
26	14	14	14	14	14	14	14	14	16	22	24	45	41	44	45	24	23	18	15	14	14	14	14	14
27	14	14	14	14	14	14	14	14	20	23	41	42	53	42	44	43	28	20	14	14	14	14	14	14
28	14	14	14	14	14	14	14	16	20	21	41	41	41	44	42	42	24	20	16	15	14	14	14	14
29	14	14	14	14	14	14	14	14	24	38	45	42	42	43	33	41	22	16	13	12	14	14	14	14
30	14	14	14	14	14	12	14	20	21	24	33	45	45	48	41	42	42	20	18	14	14	14	14	14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	14	14	14	14	14	14	14	14	18	22	28	42	42	42	42	29	22	18	14	14	14	14	14	14
U Q	14	14	14	14	14	14	14	15	20	23	41	43	44	44	42	42	24	20	16	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	16	20	26	26	37	37	33	24	20	16	14	14	14	14	14	14

IONOSPHERIC DATA STATION Okinawa

APR. 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	266	291	306	328	322	346	295	360	332	316	307	307	313	R 307	U R 323	314	R 318	R 330	U R 337	U R 344	R 332	312	291	R 294
2	292	293	290	313	337	300	308	344	334	337	322	301	303	298	311	306	313	317	315	321	324	325	274	296
3	307	317	312	313	282	284	294	334	345	343	320	307	305	304	310	R 302	U R 321	U R 331	R 337	R 345	347	288	288	282
4	289	290	299	322	335	309	331	363	347	330	319	298	297	304	313	306	296	305	319	336	317	299	R 270	287
5	301	297	289	320	316	325	332	349	330	329	309	295	293	308	307	296	301	305	327	312	320	R 322	281	290
6	293	295	308	317	313	F 316	F 310	311	323	325	300	292	289	302	317	310	304	301	R 306	Y	R 338	308	305	295
7	294	291	300	324	345	308	313	349	343	319	292	293	299	300	291	299	288	296	307	R 319	321	303	272	286
8	289	284	300	349	309	316	311	361	328	320	319	295	300	300	299	300	298	301	308	314	J R 294	F 306	F	F
9	294	F 310	312	F 329	F 321	297	289	336	330	313	291	292	291	289	299	R 295	299	308	R 312	U R 315	332	305	R 284	282
10	291	301	324	321	324	311	315	342	333	324	304	308	287	283	296	289	299	308	305	319	303	289	285	F
11	318	320	323	307	306	298	313	346	353	306	293	282	293	292	299	300	306	306	312	332	R 318	U R 312	301	295
12	R 297	R 299	304	321	306	299	319	344	327	334	285	268	290	299	310	306	295	304	304	316	310	307	295	295
13	308	302	318	336	286	289	294	327	324	315	301	285	285	R 292	R 295	306	R 310	314	U R 317	R 312	R 325	304	273	292
14	R 317	305	310	326	321	296	310	338	336	314	288	281	283	301	304	305	310	309	R 303	316	319	285	284	294
15	297	304	332	325	304	280	276	333	329	332	350	R 281	299	R 306	311	292	309	319	316	321	328	290	279	291
16	301	309	308	315	299	297	300	338	350	338	307	287	279	301	310	312	306	317	U R 336	Y	Y	Y	U R 314	F
17	R 308	273	F 303	352	F 304	F 293	F 307	344	326	347	298	285	300	296	299	309	314	306	313	321	J R 329	322	294	287
18	298	290	307	332	309	298	313	366	358	346	332	284	292	289	305	301	302	312	324	J R 338	345	300	280	284
19	294	299	316	350	286	296	311	353	343	302	310	307	308	R 313	302	R 308	R 305	318	317	321	R 325	319	283	292
20	292	R 317	F 305	342	341	R 310	325	364	355	336	309	311	R 303	296	303	304	303	307	317	330	316	300	287	285
21	303	298	331	344	316	302	320	346	352	336	321	293	291	297	296	297	R 311	R 322	R 345	R 346	334	294	R 292	286
22	300	311	327	318	296	286	324	353	358	351	315	272	274	284	289	301	J R 325	327	330	317	323	305	288	294
23	304	299	310	325	300	300	327	351	351	352	301	275	300	302	298	302	313	318	320	312	319	308	295	293
24	293	286	308	339	323	311	333	354	357	345	294	261	278	283	287	307	310	322	329	322	296	282	266	282
25	318	292	290	285	308	326	332	353	341	341	326	282	305	312	298	296	316	312	327	318	305	287	287	286
26	294	314	321	313	313	299	311	343	337	320	286	J R 277	286	302	298	300	307	313	331	324	310	296	283	291
27	292	281	R 297	293	294	297	336	362	344	341	301	282	281	296	300	307	310	315	322	324	308	288	286	286
28	291	298	301	314	303	312	330	361	345	338	292	282	278	289	296	302	314	R 313	311	318	317	279	R	R 305
29	U R 310	F 327	F 326	F 334	F 355	F 333	F 334	360	339	311	322	301	302	294	299	300	R 306	313	315	321	312	292	286	281
30	281	291	300	305	308	310	331	336	347	331	305	280	289	289	R 299	U R 302	Y	Y	U R 335	R 320	304	293	U R 296	285
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	30	28	29	29	28	27
MED	296	298	308	323	309	300	313	348	342	332	306	286	292	298	299	302	307	313	317	321	319	300	286	290
U Q	304	309	318	334	322	311	330	360	350	341	319	298	300	302	310	306	313	318	R 329	327	328	308	293	294
L Q	292	291	300	314	303	297	308	338	330	319	294	281	286	292	298	300	302	306	312	316	310	290	280	285

APR. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2013 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	U L 354	U L 359	U L 340	U L 362	L	U L 354	L	L					
2										L	L	L	U L 364	U L 340	L	U L 353	L	L						
3									L	L	L	U L 359	U L 357	L	A	U L 352	U L 354	L						
4										L	L	U L 386	U L 355	U L 355	L 346	U L 357	L 369	L						
5									L	L	L	U L 355	U L 363	U L 359	U L 351	U L 355	U L 352	L						
6										L	L	U L 350	L	U L 343	U L 341	U L 352	L	L						
7									L	L	L	U L 367	U L 404	L	L	L	L	L	L					
8										L	U L 377	U L 372	U L 342	U L 368	U L 353	L	L	L	L					
9										L	L	U L 362	U L 367	L	U L 360	U L 330	U L 334	L	L					
10										L	L	U L 359	L	L	U L 354	L	L	L	L					
11									L		L	L	L	U L 329	L	U L 329	L	L	L					
12									L	L	U L 414	L	U L 358	U L 331	U L 351	U L 350	L	L						
13									L	L	L	L 400	H 343	U L 360	U L 339	U L 326	U L 329	L						
14									L	L	U L 370	U L 371	H 333	U L 330	L	L 351	L	L	L					
15								L	L	L	U L 388	L	U L 397	U L 370	U L 353	L	U L 346	A	A					
16									L	L	L	U L 353	U L 359	A	U L 346	A	L 357	L	L					
17										A	H 351	U L 368	U L 376	A	A 349	U L 340	L							
18									L	L	U L 369	U L 358	A	L	L	L	L	L	L					
19								L	L	L	L 377	U L 374	U L 368	U L 323	L 383	387	357	U L 359	L					
20									L	U L 396	A	A	A	U L 394	390	L 358	U L 374	L	L					
21									L	U L 377	L 362	U L 358	U L 348	U L 371	H 357	L 352	U L 336	U L 357						
22									L	L	U L 367	U L 409	L	B	Y	L 365	U L 351	L	L					
23										Y	380	382	B	A	A 333	366	L 348	L						
24								L	L	L		398	L	353	U L 323	B 340	L	L						
25										L	L	U L 353	U L 356	U L 355	U L 358	U L 355	L	L						
26									L	L		L	U L 352	367	B 355	L	L	A						
27									L	A	A	L	L	U L 333	U L 349	U L 359	U L 341	L	L					
28										L	L	369	356	U R 390	L	A	A	L	A					
29											A	L	A 363	A 349	362	341	Y 333	L	L					
30										A	A	U L 365	U L 386	U L 322	360	U L 348	U L 330	L						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										2	10	22	21	21	22	21	16	2						
MED										U L 386	U L 374	U L 366	U L 359	U L 353	U L 353	U L 352	U L 350	U L 358						
U Q											U L 380	L 374	U L 368	U L 368	360	L 358	L 356							
L Q											L 367	U L 358	U L 354	U L 332	U L 346	U L 340	U L 335							

APR. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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										274	266	298	284	308	288	284	280	266	242					
2										264	264	256	294	310	296	284	278	250						
3									248	256	272	286	292	298	286	286	288	266						
4										264	278	288	314	308	284	278	288	284						
5									232	268	254	300	324	298	290	298	300	272						
6										256	262	318	326	306	288	286	286	282						
7									248	254	284 L	288	300	288	306	298	308	296	272					
8										276	266	282	304	290	294	296	280	282	272					
9										248 L	308	302	316	326	304	296	304	274	256					
10										262	286	282	314	336	310	308	292	276	264					
11									232		294	280 L	310	330	312	292	294	272	268					
12									258	248	256	304 L	326	306	288	282	282	276						
13									256	264	266	280	348	316	312	300	294	266						
14									248	272	288	300	348	320	288	294	288	262	266					
15								252	248	258	240	338 L	312	282	286	308	296	270	262					
16									244	234	300	324	314	318	292	286	296	264	256					
17										234	320	302	298	302	318	296	274							
18									236	252	270	320	314	328	304	306	296	276	258					
19								234	234	316	286	286	296	282	280	296	292	270	250					
20									228	248	286	264	308	290	296	304	270	282	260					
21									242	262	286	292	326	320	324	308	294	270						
22									238	242	288	294	366	340	332	318	286	254	232					
23										246	314	348	312	290	312	306	286	266						
24								238	234	244		366	336	334	334	300	274	270						
25										262	264	332 L	306	292	290	306	284	272						
26									240	264		364	316	316	314	308	290	270						
27									250	258	E 274	A L 326	334	322	314	296	278	268	254					
28										246	270 L	344	350	326	326	304	286	274	252					
29											278	310	312	298	318	304	296	278	254					
30										264	264	326	320	340	326	320	316	292						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	17	28	28	30	30	30	30	30	30	29	16					
MED								238	242	258	276	301	314	309	304	298	288	272	257					
U Q								252	248	264	287	326	326	326	314	306	296	277	265					
L Q								234	234	248	265	286	306	298	288	292	282	266	253					

APR. 2013 h'F2 (KM)

IONOSPHERIC DATA STATION Okinawa

APR. 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	304	294	264	238	226	220	254	222	208	214	212	206	B 228	200	200	E Y 228	198	226	236	214	206	202	218	238
2	230	276	262	240	214	204	258	226	228	216	210	206	184	E A 260	E A 286	218	236	232	242	236	224	212	230	252
3	248	250	242	250	246	288	284	224	232	222	214	208	198	A 208	A	E A 224	210	220	246	216	198	196	232	260
4	266	260	254	232	222	228	234	214	212	214	A 232	198	210	220	220	220	226	A 256	258	230	202	210	234	266
5	256	264	264	234	206	210	226	210	202	216	202	194	198	214	224	216	222	220	248	226	230	206	236	258
6	254	252	252	236	210	212	240	232	228	214	E A 236	192	H 236	220	B 230	E B 234	226	232	266	252	230	206	220	244
7	246	250	244	214	196	190	244	214	210	202	214	206	196	E A 246	230	Y 254	216	220	248	244	208	212	228	310
8	268	270	248	208	182	216	266	218	212	208	200	B 214	206	212	206	224	224	228	248	242	242	Q 256	Q 254	Q 266
9	260	Q 246	240	Q 214	214	240	278	232	222	Y 220	220	206	190	216	216	A 242	208	250	244	240	224	204	230	282
10	272	254	240	226	210	218	240	220	226	212	B 224	E B 234	192	192	192	B 234	B 224	230	248	244	242	232	246	Q 290
11	258	232	222	224	228	248	256	230	218	216	184	182	210	204	228	210	228	B	234	238	228	222	248	264
12	246	222	234	224	236	236	250	224	224	228	198	184	216	B 208	200	216	222	H 214	244	250	246	228	232	254
13	248	250	236	208	230	268	278	236	228	218	214	188	H 204	202	214	H 200	212	232	242	236	226	200	250	270
14	248	244	240	236	208	252	262	224	220	208	204	206	H 192	A 250	254	218	212	220	238	248	218	230	262	270
15	254	256	226	208	234	280	274	236	222	216	A 220	H 194	176	234	222	A	248	A	A	242	244	230	282	280
16	266	258	234	222	234	256	260	230	224	A 224	A 226	A 236	224	A	E A 272	A	E A 244	238	252	222	222	194	238	Q 270
17	256	258	240	214	214	Q 286	270	214	212	A	H 210	A 220	222	A	E A 286	A 258	234	272	262	232	220	212	226	260
18	260	264	246	198	190	250	250	218	222	214	214	202	A	A 242	A	A	A	246	246	230	208	198	244	282
19	270	262	240	216	196	270	258	226	212	200	A 214	214	212	A 212	Y 214	198	H 190	H 196	218	234	224	210	218	272
20	254	Q 266	Q 252	200	200	A 268	240	228	214	196	A	A	A	A 220	210	196	218	216	234	232	228	224	268	286
21	258	266	230	198	214	258	238	214	220	204	200	210	222	226	H 210	E B 260	E Y 272	236	242	220	212	218	250	264
22	262	244	236	208	254	288	248	230	228	208	198	194	H 198	B	Y	202	E Y 256	238	222	222	222	222	240	272
23	258	264	246	224	238	260	246	216	240	Y	204	206	B	A	E A 288	A 214	E A 240	E A 248	236	240	228	214	246	276
24	272	286	258	216	224	238	242	228	222	216	Y 224	198	A	A 236	A 250	E B 272	244	236	246	238	234	264	322	284
25	234	256	272	262	228	222	224	226	230	232	E A 236	202	212	B 214	B 230	B 236	A	252	274	240	254	258	274	282
26	274	240	230	222	204	268	242	228	212	202	210	H 214	212	252	E B 224	E A 294	E A 278	A	252	226	220	246	226	256
27	A 274	A 288	240	A 256	254	242	238	212	A	A	A	E A 260	E B 296	E A 274	B 218	B 220	212	214	238	236	220	246	252	268
28	274	266	250	236	206	234	232	218	232	E A 220	A 218	204	E A 258	214	E A 266	A	A	218	A	242	254	264	274	286
29	Q 270	Q 264	Q 242	212	190	218	230	218	224	A 252	A	A	E A 256	E A 250	212	232	E Y 258	234	246	240	230	238	266	282
30	288	274	262	246	248	232	230	228	224	A	A	206	194	E B 252	224	200	E B 242	A 254	262	240	232	234	262	270
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	29	26	26	28	26	26	27	26	27	27	28	30	30	30	30	30
MED	259	259	242	223	214	241	247	224	222	214	212	206	206	216	219	218	219	232	246	237	225	220	245	270
U Q	270	266	252	236	234	268	260	228	228	220	A 220	212	222	E A 246	E A 250	236	E 244	246	250	242	232	234	262	282
L Q	254	250	236	212	206	220	238	218	212	208	204	196	196	212	212	214	212	220	238	230	220	206	230	260

APR. 2013 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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							B 118	112	110	110	110		B 110	B	110	110	110	110	110					
2							B 110	110	110	110	B	B 110		B 110	B	110	B	110	A					
3							B 116	108	108	110	110	B	A	A	A	A	A	110	112					
4							B 112	110	108	A 108		A	A	A	108	108	110	A						
5							B 110	110	110	106	B 108		B	110	110	A	110	A						
6							B 110	110	110	A	A	B	B	B	B	110	110	110						
7							B 108	108	B	B	B	B	A	B	110	108	A	A						
8							B 108	110	110	110	B	B	B	B	B	110	110	112						
9							B 110	110	A	110	110	B	B	B	108	108	110	114						
10							B 114	110	110	B	B	B	B	B	B	112	B	A						
11							B 110	110	110	110	B	B	B	B	110	B	B	110	B					
12							B 110	112	112	110	B	A	B	B	A	106	108	H 112	A					
13							B 110	110	110	B	B	B	B	B	A	110	112	112	A					
14							B 110	110	108	B	B	B	A	A	A	110	110	110	A					
15							B 110	110	110	108	B	B	B	B	A	108	A	A	A					
16							B 130	108	108	A	108	B	B	B	108	108	108	A	A					
17							A 110	A	A	A	A	B	B	B	B	110	108	A	A					
18							A	A 108	108	A	A	B	B	B	A	A	A	A	A					
19							A 126	A	A	B	A	A	A	A	A	A	108	128	B					
20							A	A	A 108	A	A	A	A	A	A 114	A	110	114	A					
21							132	112	110	110	A	B	B	A	A	B	A	110	114	A				
22							A	A	A 114	A	A	A	A	B	A	A 110	A	A	B					
23							134	130	A	A	B	B	B	A	B	A 114	112	112	A					
24							A	112	110	110	B	A	A	A	A	B	110	110	A	A				
25							132	110	110	110	A	B	B	B	B	B	110	110	A	A				
26							B	112	110	108	108	B	B	B	B	110	110	110	110	A				
27							B	114	114	A	A	A	B	B	B	B	112	112	112	A				
28							A	114	108	108	B	B	B	B	B	B	108	110	A	A				
29							140	120	106	B	B	B	B	B	A	B	A	106	114	A				
30						A	128	A	116	112	A	B	B	B	B	B	B	A	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							5	26	25	23	10	5	1	1	2	10	19	24	16					
MED							132	111	110	110	110	110	108	110	110	110	110	110	112					
U Q							137	114	110	110	110	110				110	110	110	114					
L Q							130	110	109	108	108	108				108	108	110	110					

APR. 2013 h′E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 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	88	90	90	90	B	B	B	176	116	118	G	G	B	B	G	G	G	G	150	B	B	B	B	96
2	B	100	96	B	B	B	B	G	G	G	G	B	B	184	162	G	B	148	110	B	100	100	B	90
3	B	B	B	B	B	B	B	142	138	142	G	G	104	104	100	100	96	G	146	94	B	B	B	108
4	88	B	B	B	B	B	B	G	166	G	102	G	102	100	102	100	G	118	112	106	92	B	B	B
5	B	B	B	B	B	B	B	G	G	G	G	116	G	116	G	G	116	114	104	98	B	94	B	106
6	90	92	B	B	B	B	B	156	132	G	104	102	B	B	B	B	G	134	118	112	108	104	B	94
7	B	B	B	B	B	B	B	G	G	B	B	B	B	148	B	G	G	94	92	92	90	B	142	100
8	100	100	B	B	B	B	B	G	G	G	G	B	B	B	126	118	120	120	112	B	B	B	B	B
9	108	B	B	B	B	B	B	146	142	106	G	G	B	B	116	114	114	110	144	B	B	96	B	104
10	98	98	B	98	B	98	B	G	G	G	B	B	B	B	B	B	B	110	108	106	B	B	90	B
11	B	B	B	B	B	B	B	G	G	G	G	B	B	B	B	G	B	B	G	B	B	B	B	B
12	B	90	B	B	B	B	B	G	G	G	G	B	104	B	B	102	102	G	92	92	92	90	B	B
13	B	B	B	B	94	B	142	144	G	G	B	B	B	112	B	114	G	100	122	112	112	94	94	104
14	B	100	B	B	B	B	B	G	G	G	B	B	B	104	104	102	G	G	126	94	108	104	B	98
15	B	98	B	102	B	B	B	G	116	116	116	B	B	B	B	118	122	116	110	108	106	106	104	96
16	90	102	100	98	100	B	B	138	124	112	112	116	124	116	114	110	110	158	108	108	102	98	94	92
17	106	90	106	102	104	102	102	150	108	104	108	106	B	116	114	118	114	108	104	104	102	102	98	B
18	108	96	B	B	B	100	102	142	G	122	120	104	116	114	114	112	110	114	108	108	B	B	108	106
19	96	96	104	102	B	104	104	112	104	102	104	104	102	106	106	104	100	G	108	108	102	B	102	94
20	88	90	B	B	108	100	100	100	98	102	98	178	98	100	100	100	98	98	G	112	106	92	B	B
21	B	B	B	100	B	B	G	170	146	138	100	B	B	104	100	B	98	150	126	118	108	88	90	B
22	B	B	B	B	B	100	100	138	102	126	106	104	104	B	114	100	G	112	140	108	90	90	90	B
23	B	98	104	100	102	102	G	152	104	104	B	B	B	112	118	118	158	126	112	110	106	B	B	104
24	B	B	B	B	90	B	134	148	140	112	100	98	102	102	100	B	140	132	116	106	90	B	B	104
25	B	B	B	B	B	B	G	G	118	116	110	B	B	B	B	B	118	114	106	104	104	92	96	B
26	B	B	B	B	B	B	140	104	106	G	G	B	B	192	B	128	116	108	106	104	B	106	104	104
27	102	100	98	98	102	102	126	130	122	112	110	124	B	112	B	B	G	G	G	106	104	104	104	102
28	102	102	102	102	100	100	120	114	114	114	110	110	114	B	142	128	128	128	106	106	104	104	106	106
29	106	100	100	100	106	B	136	128	116	110	110	110	110	110	104	B	100	96	122	106	92	104	102	B
30	102	102	100	98	98	98	G	138	120	112	112	B	B	B	126	B	B	106	106	102	100	100	98	92
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	18	10	12	10	10	11	19	20	18	16	12	11	18	18	17	18	23	27	25	21	19	16	19
MED	100	98	100	100	101	100	120	142	117	112	109	108	104	112	114	112	114	114	110	106	102	100	100	102
U Q	106	100	104	102	104	102	136	150	135	118	111	116	114	116	118	118	120	128	122	108	106	104	104	104
L Q	90	92	98	98	98	100	102	128	107	106	103	104	102	104	102	101	100	108	106	103	92	92	94	94

APR. 2013 h'Es (KM)

IONOSPHERIC DATA STATION Okinawa

APR. 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	F1	F2	F2				H1	C1	C1									H1					F1
2		F4	F2											H1	H1			H1	C2		F2	F1		F1
3							C1	H1	H1	H1			C1	C1	C1	L1	L		H1	F1				F1
4	F1								H1		C1		L1	L1	L1	L1		C1	C2	F3	F1			
5												C1		C1			C1	C1	C1	F1		F1		F1
6	F1	F1						H1	H1		L1	L1						H1	C1	F2	F1	F1		F1
7														HC11				L1	L2	F2	F1		FF22	F4
8	F1	F1													C1	C1	C1	C1	L1					
9	F2							H1	H1	L1					C1	C1	C1	L1	H1			F1		F1
10	F2	F1		F1		F2												C1	C1	F1			F1	
11																								
12		F1											L1			L1	L1		L1	L2	F1	F1		
13					F1		H1	H1						C1		C1		L1	CL11	C1	FF11	F1	F1	F1
14		F1												L1	L1	L1			C1	L1	FF11	F1		F1
15		F1		F1					C1	C1	C1					C1	C1	C3	C4	C3	F6	F2	F3	F2
16	F2	FF31	F1	F2	F2			H1	C1	C1	C1	C1	C1	C1	C1	C3	C1	H1	C3	L1	F6	F1	F1	F1
17	FF11	F1	F1	F3	F2	F2	L5	H1	C1	C1	C1	L1		C1	C1	C1	C1	C2	L2	L5	F1	F3	F2	
18	FF11	F1				F3	L2	HL11		CL11	C1	L1	L1	C1	C1	C1	C3	C1	C1	CQ11			FF11	F1
19	F1	F1	F1	F3		F1	L2	LH11	L1	L1	L1	L1	L1	L1	L1	L1	L1		L1	L1	F4		F1	F1
20	F2	F1			F1	F1	L2	LH11	L2	L1	L1	HL11	L2	L1	L1	L1	L1	L1		C1	F2	F1		
21				F1				H1	HL11	HL11	L1			L1	L1		L1	HL11	CL21	CL51	FF21	F2	F1	
22						F4	L2	HL11	L2	CL11	L1	L1	L1		C1	L1		CL11	HL11	C1	F1	F1	F1	
23		F1	F1	F1	F3	F2		HL11	L1	L1				C1	C1	C1	H1	C1	C3	CL31	F1			F1
24					F1		H1	H1	H1	C1	C1	L1	L1	L1	L1		H1	HL12	CL33	L3	F1			F1
25									C1	C1	C1						C2	C1	C5	L2	FF31	F1	F1	
26							H1	L1	C1					H1		C1	C1	C4	C2	L4		F1	F1	F1
27	F4	F4	F3	F3	F2	F1	C1	HL11	CL11	CL11	C1	C1		C1						CL21	F2	F2	F3	F2
28	F4	F4	F3	F2	F2	F1	C3	C1	C1	C1	C1	C1	C1		H1	C2	C2	C1	C1	C3	F4	F3	F1	F3
29	F3	F2	F1	F1	F1		H1	CL11	C1	C2	C1	C1	C1	C1	L1		L1	L1	CL11	CL11	F1	FF11	F1	
30	F1	F1	F2	F2	F3	L5		HCL11	CL11	C1	C1				C1			C1	C1	L4	F4	F4	F1	F1
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

APR. 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

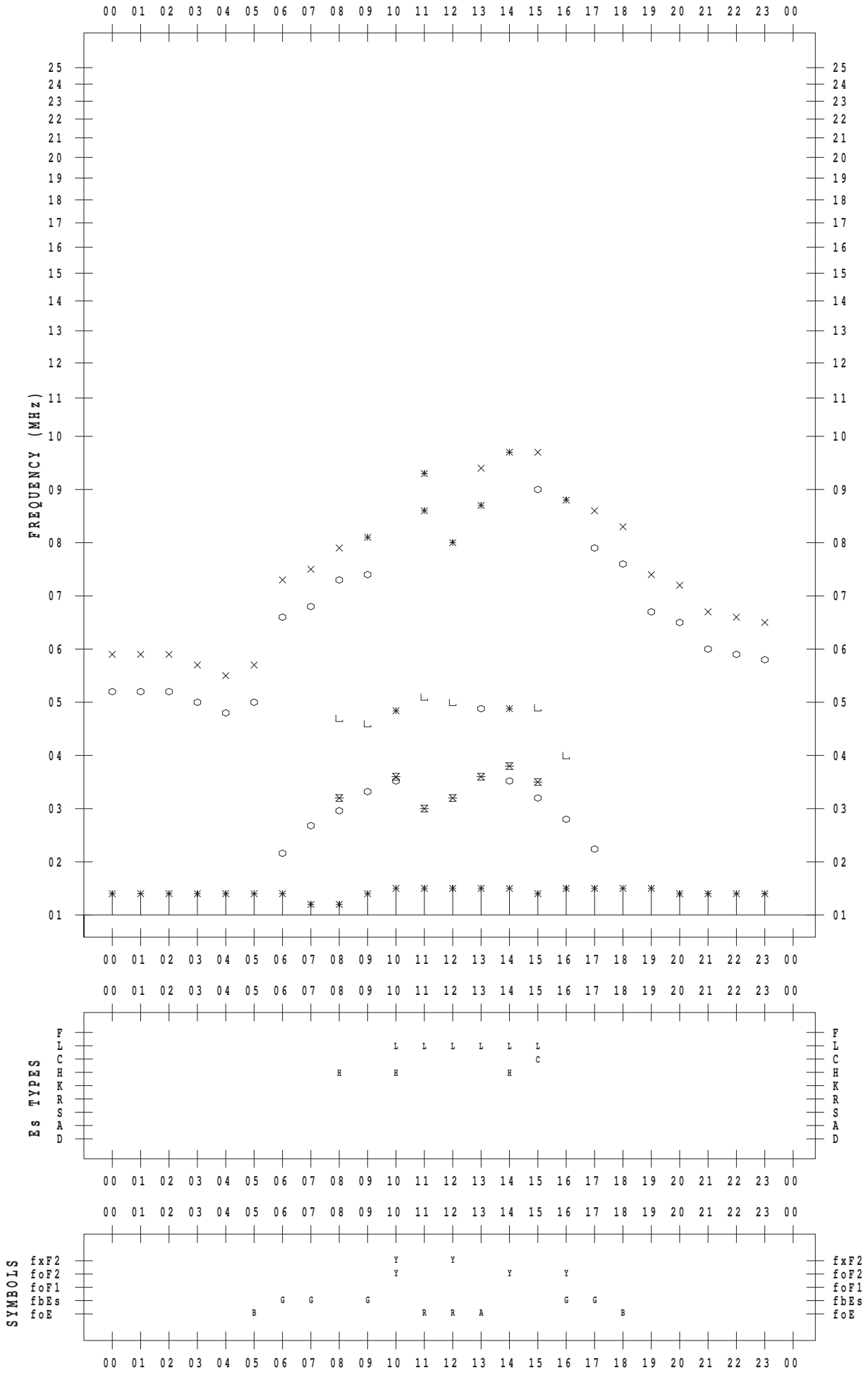
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 1

135 °E MEAN TIME



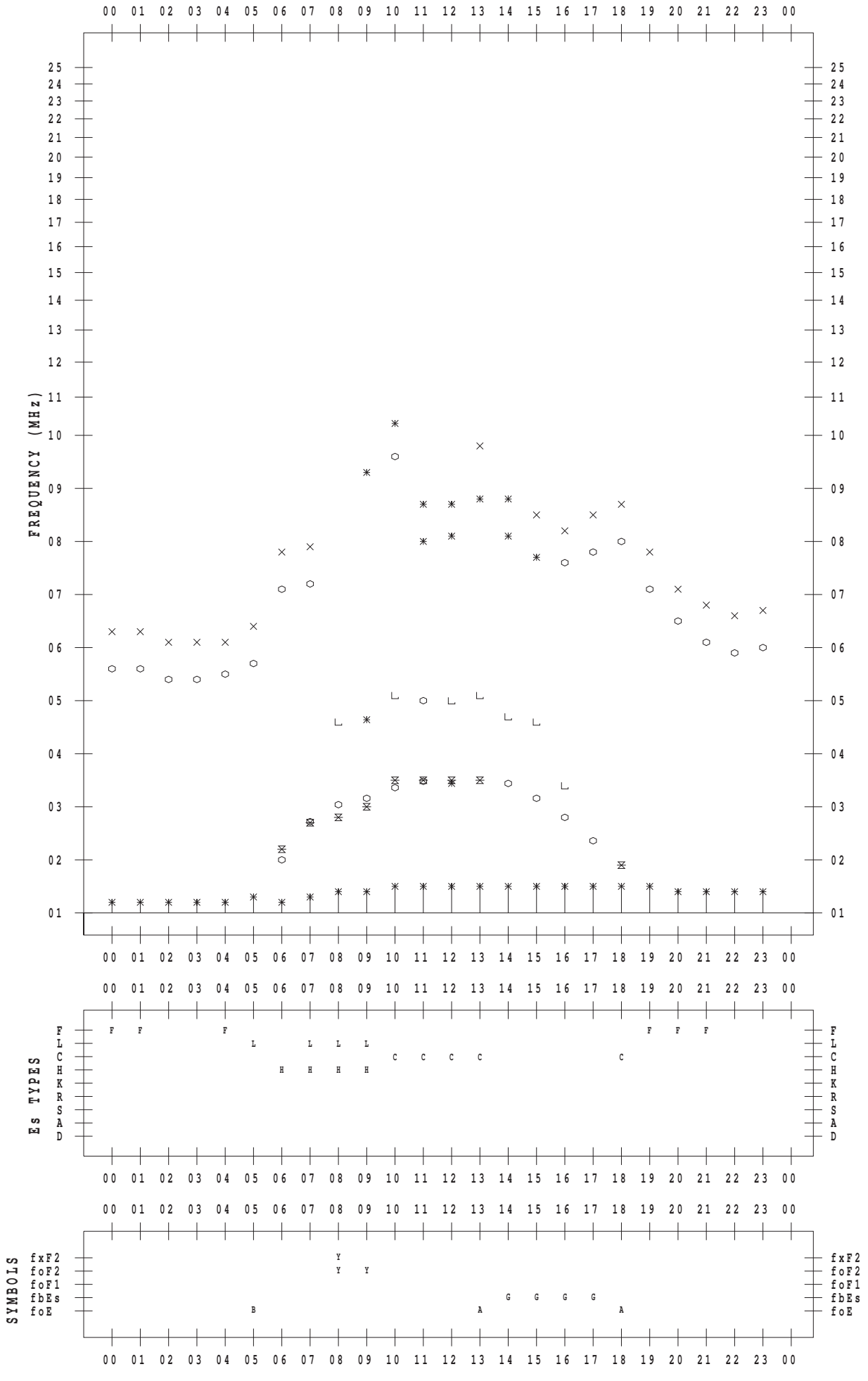
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 2

135 °E MEAN TIME



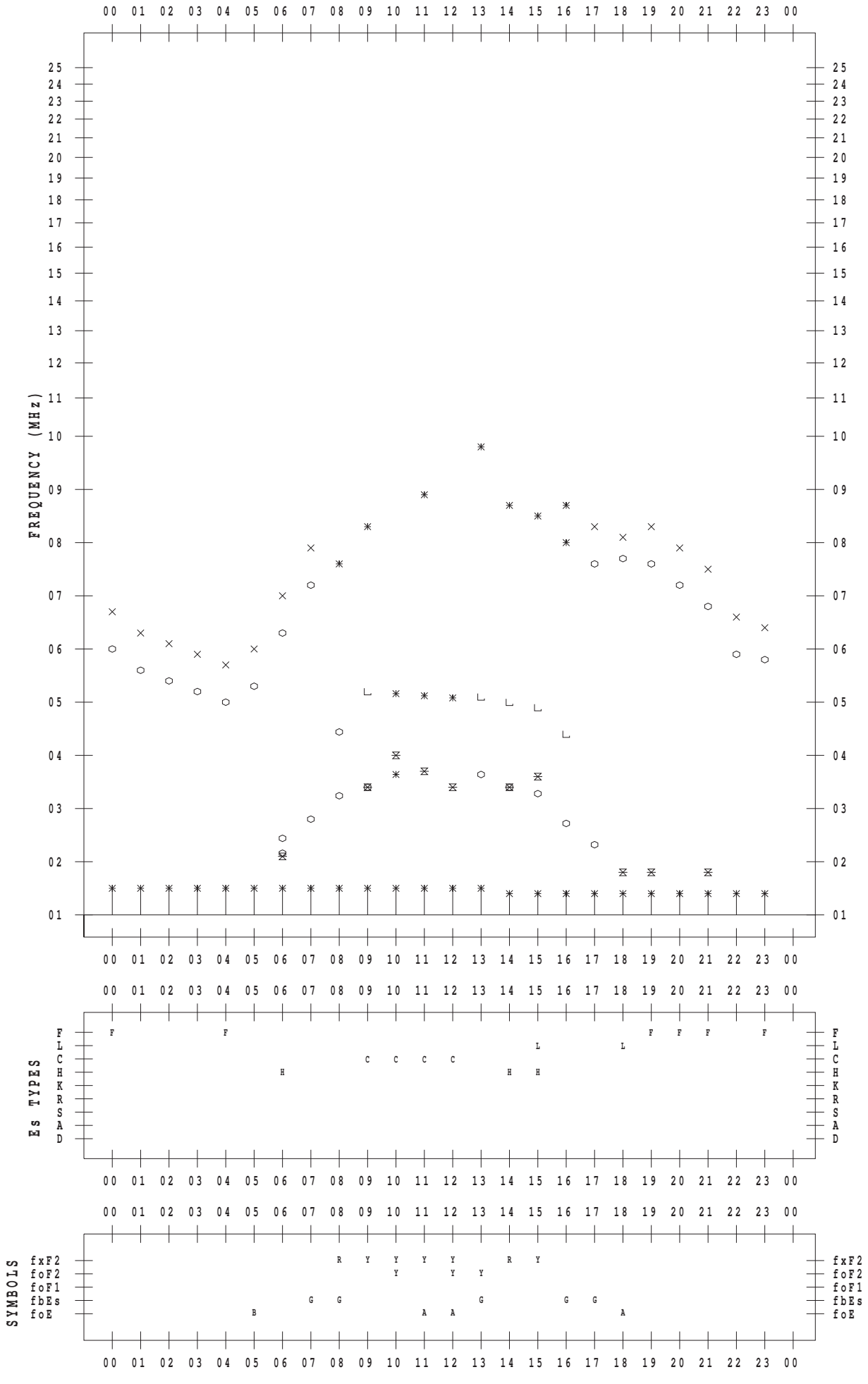
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 3

135 °E MEAN TIME



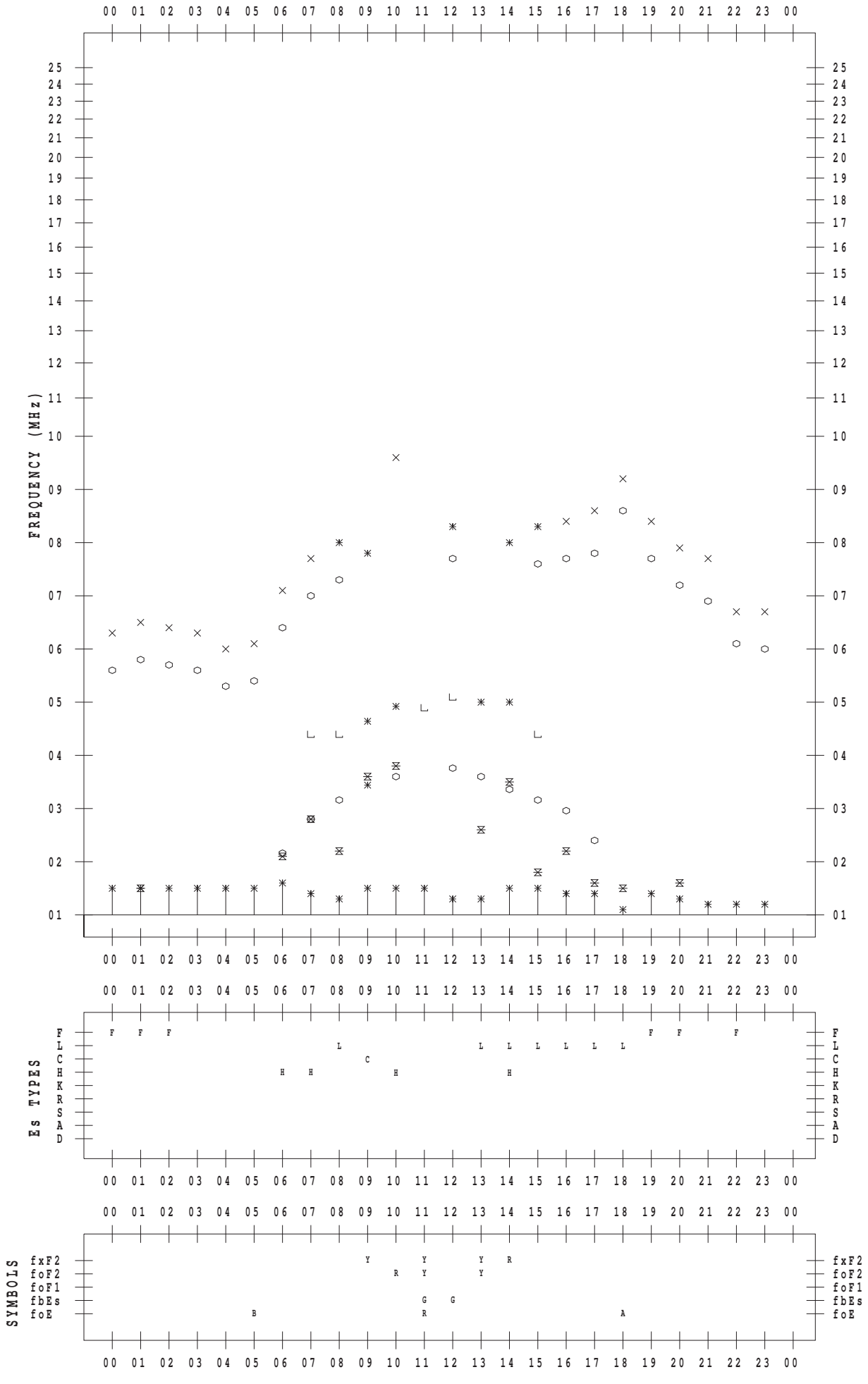
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 4

135 °E MEAN TIME



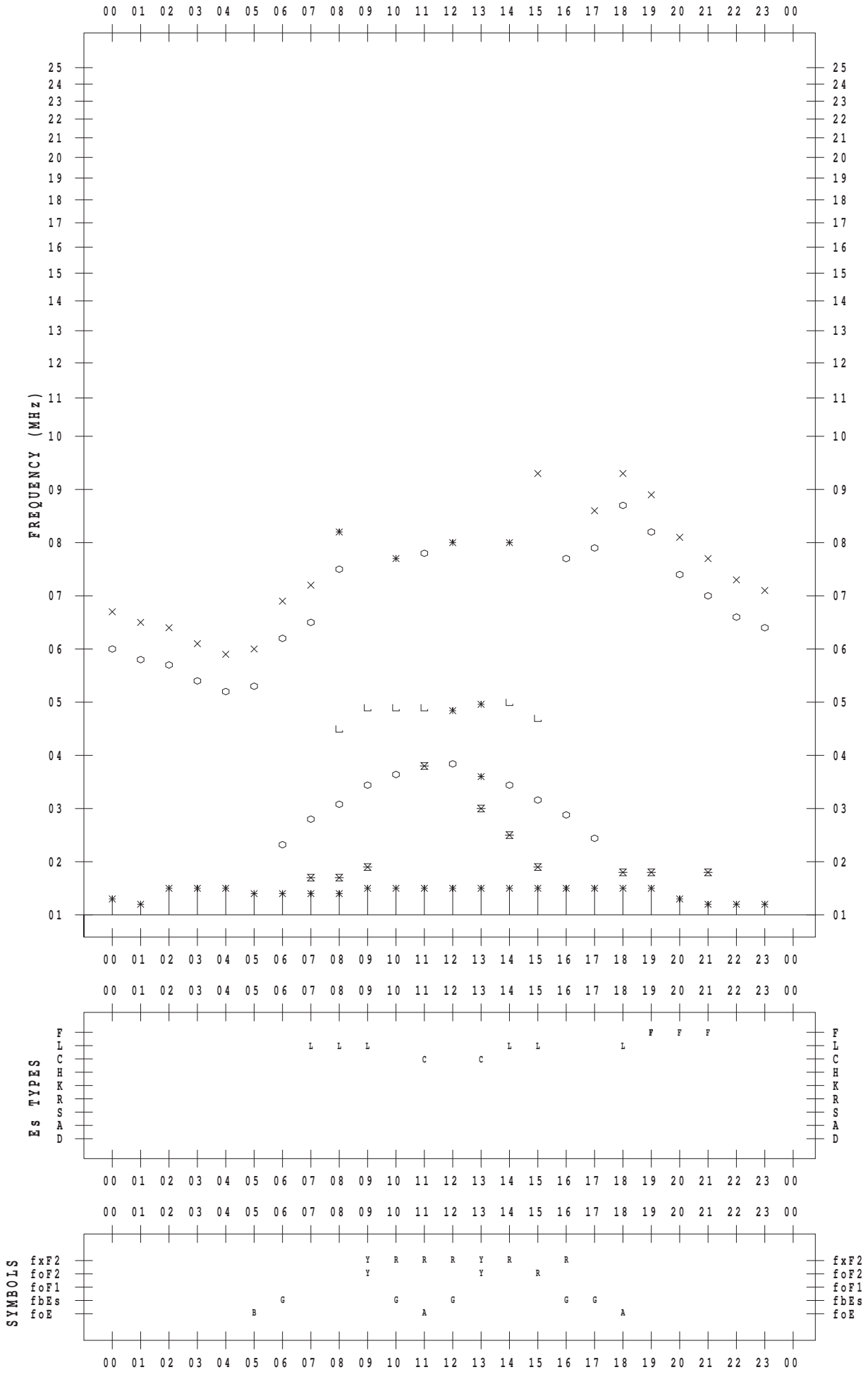
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 5

135 °E MEAN TIME



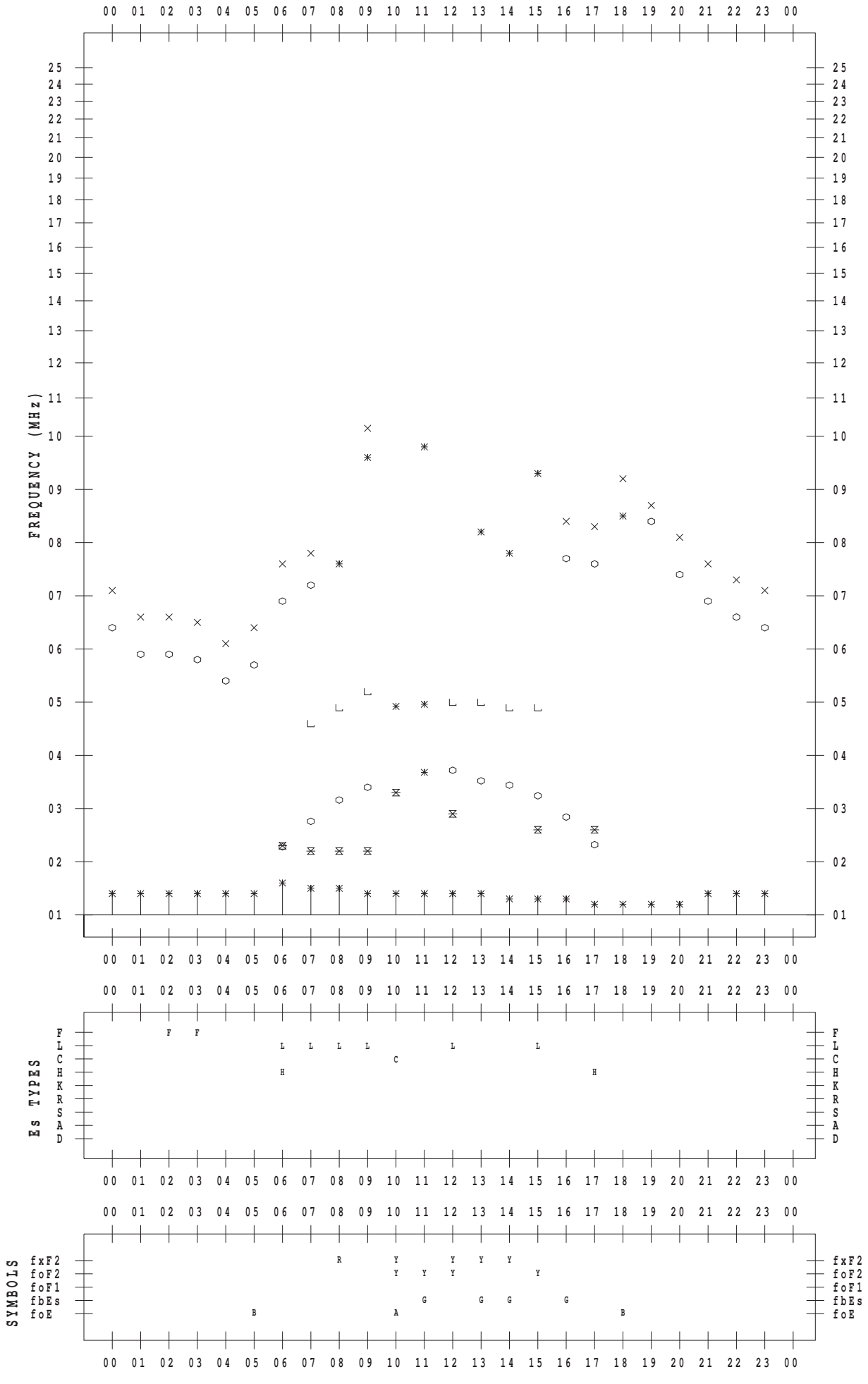
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 6

135 °E MEAN TIME



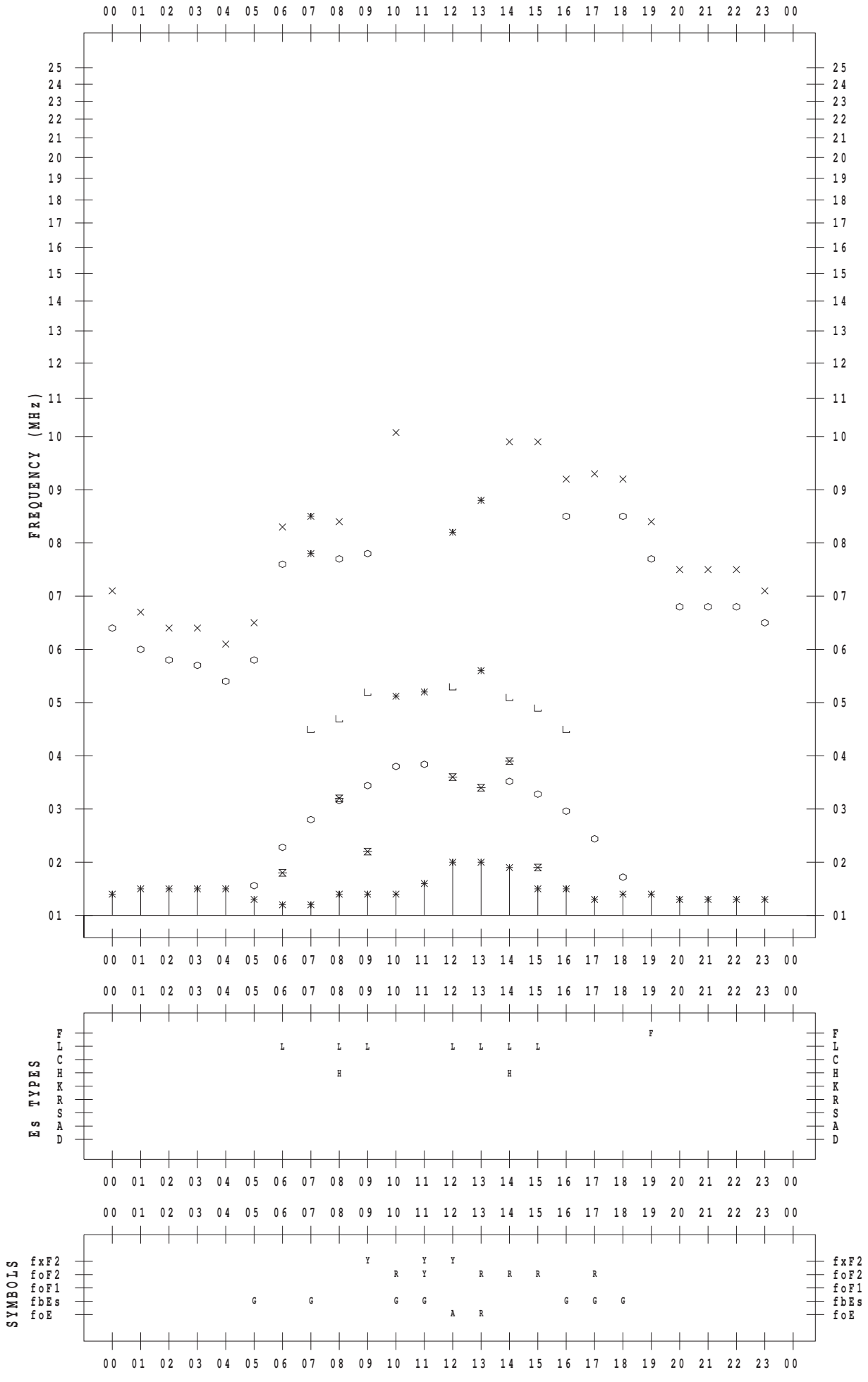
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 7

135 °E MEAN TIME



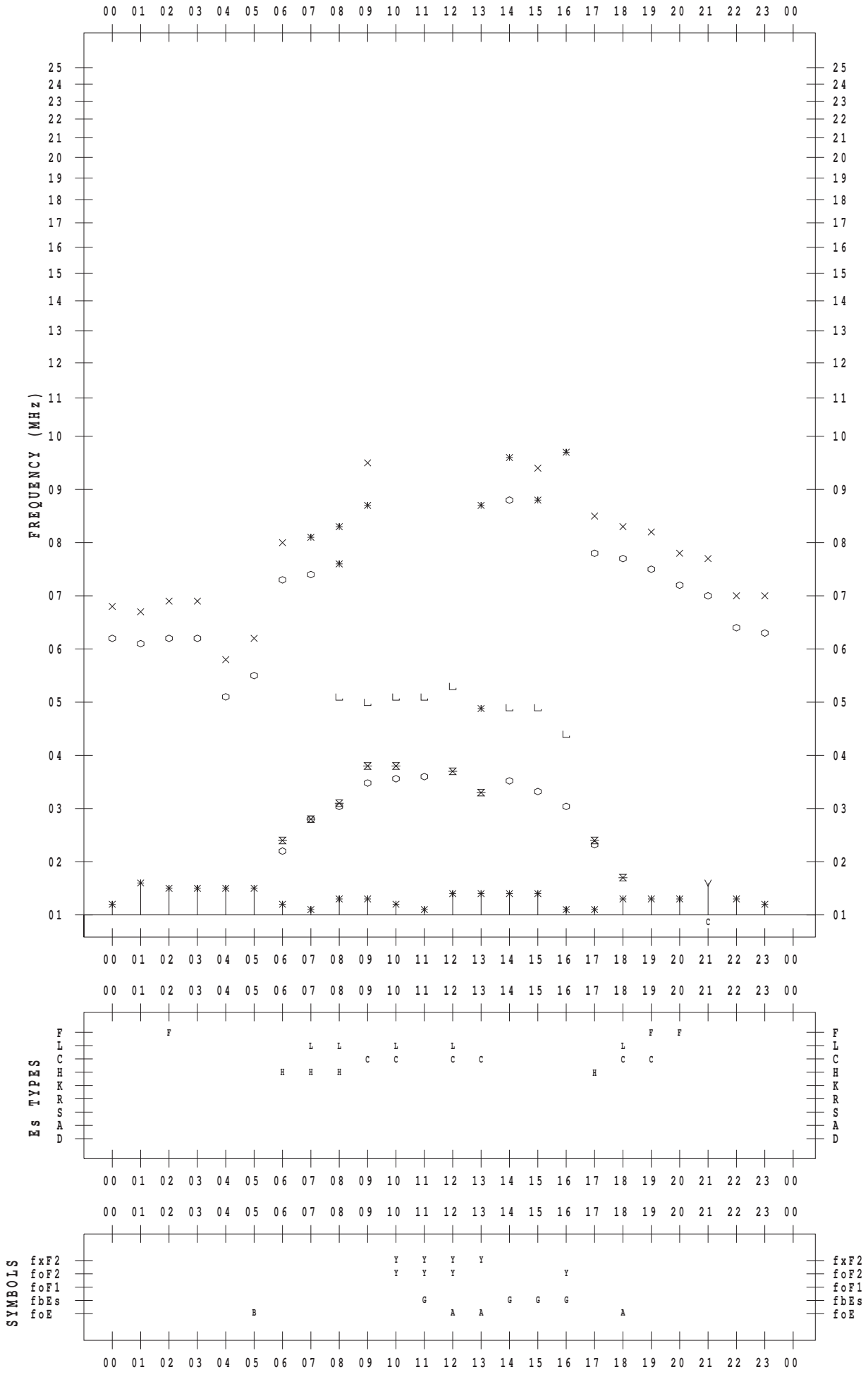
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 8

135 °E MEAN TIME



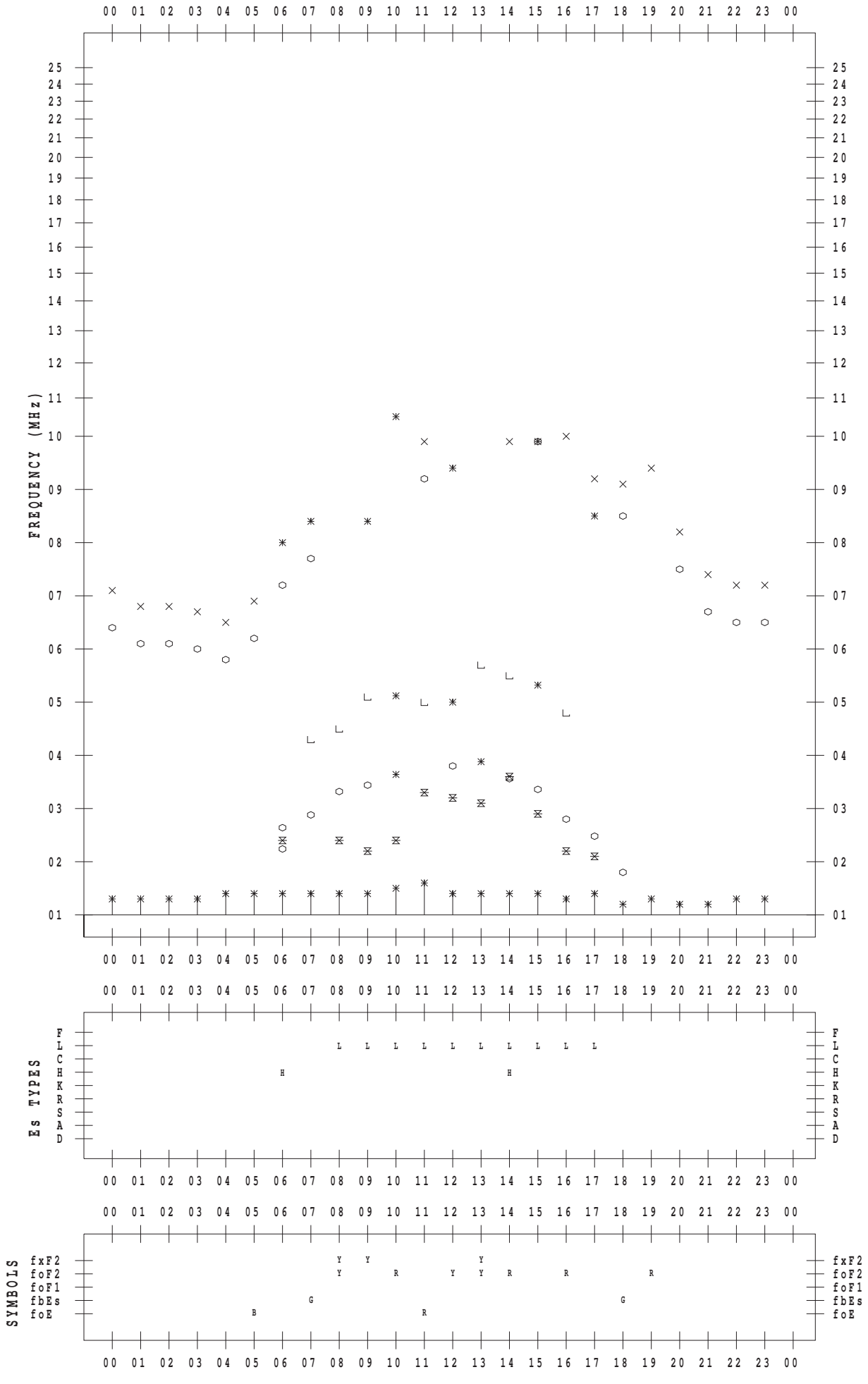
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/ 9

135 °E MEAN TIME



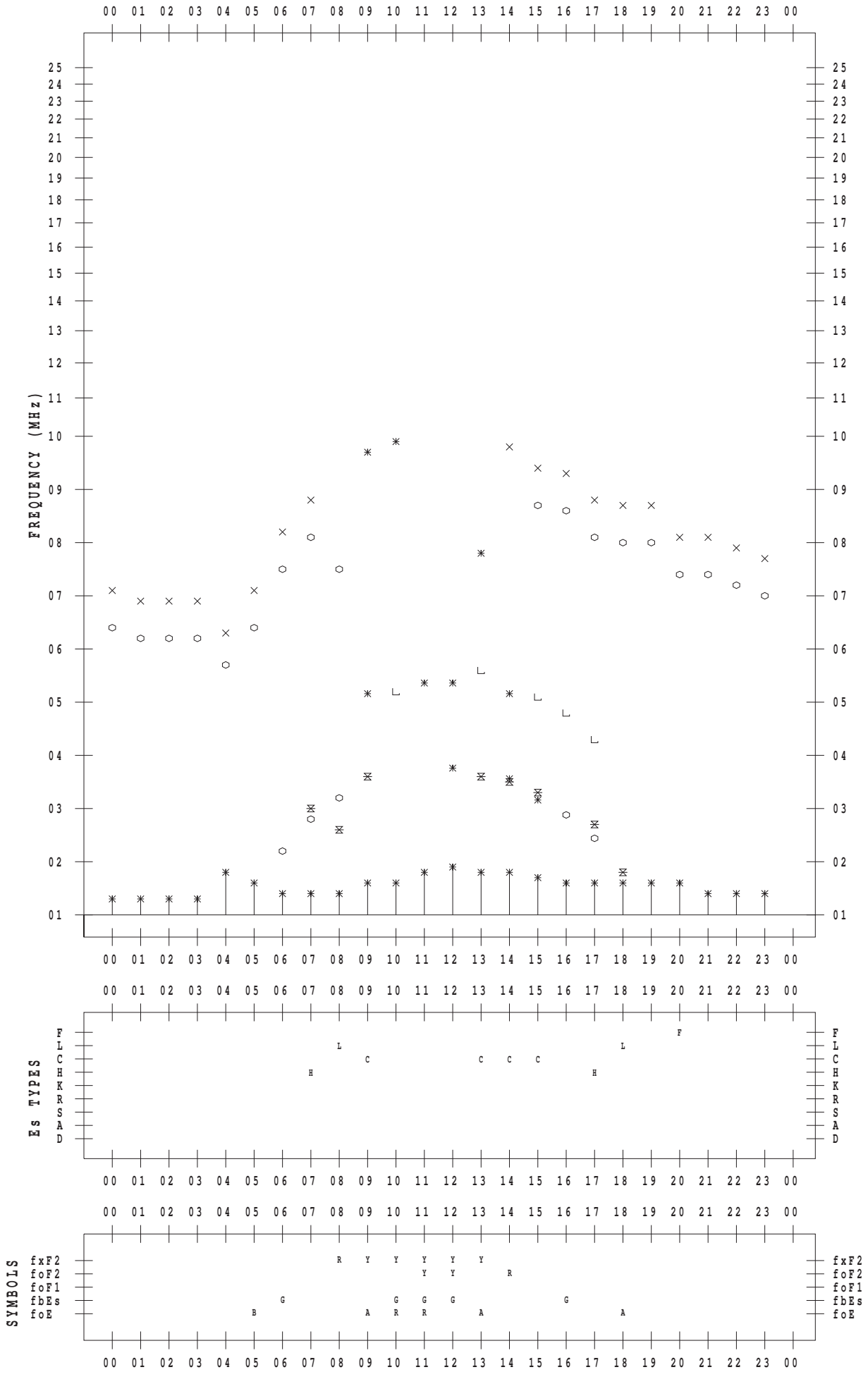
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/10

135 °E MEAN TIME



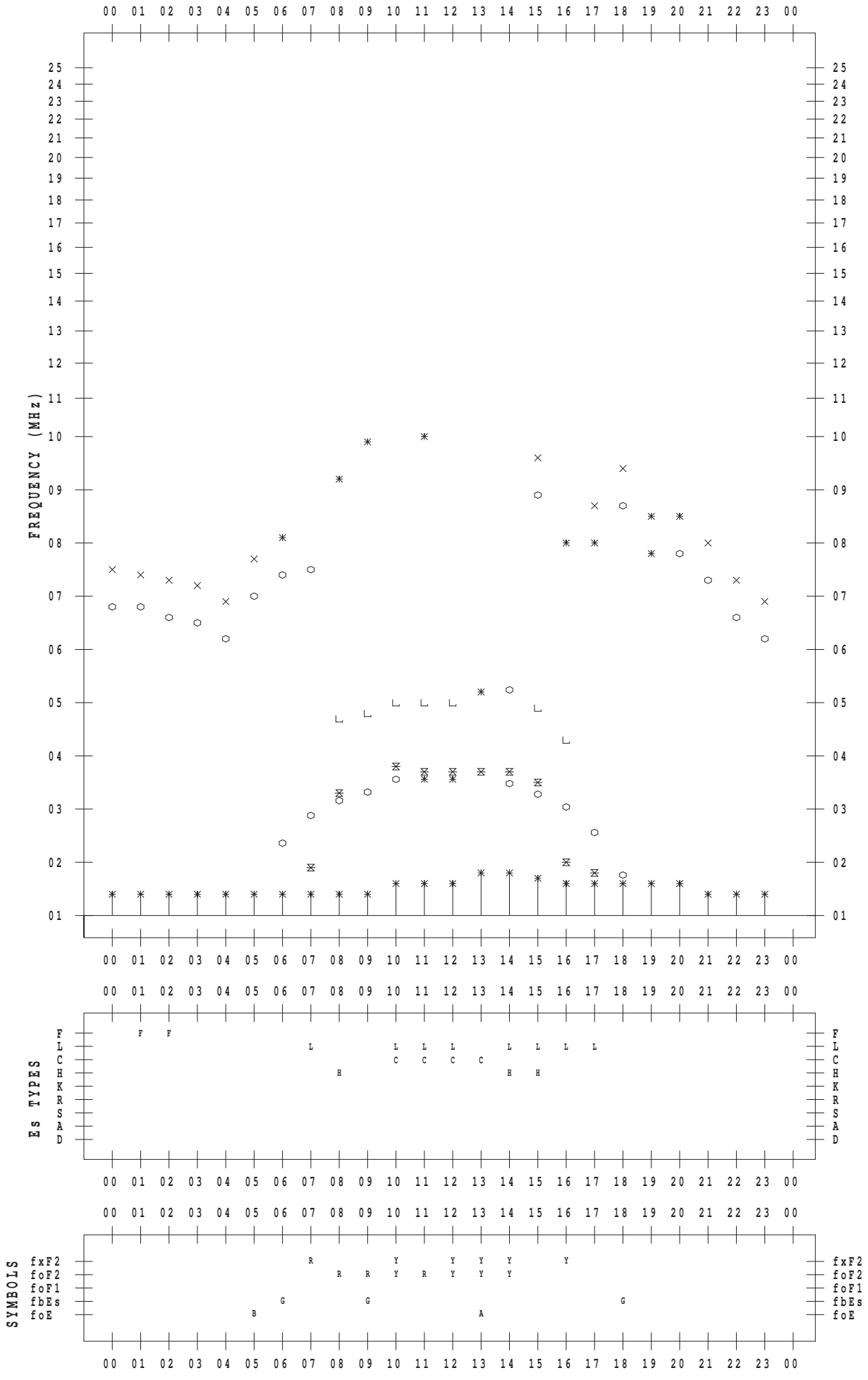
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/11

135 °E MEAN TIME



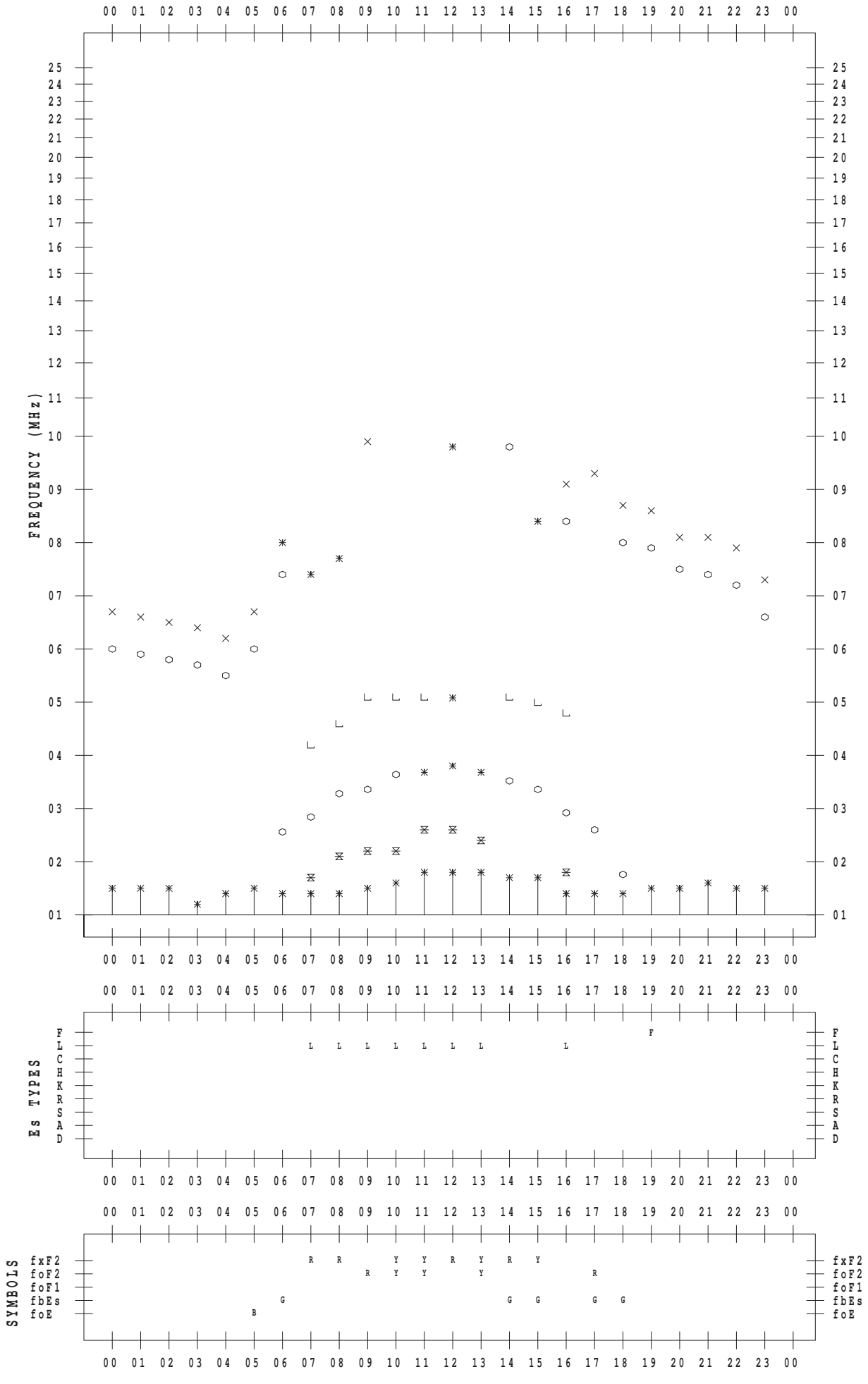
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/12

135 °E MEAN TIME



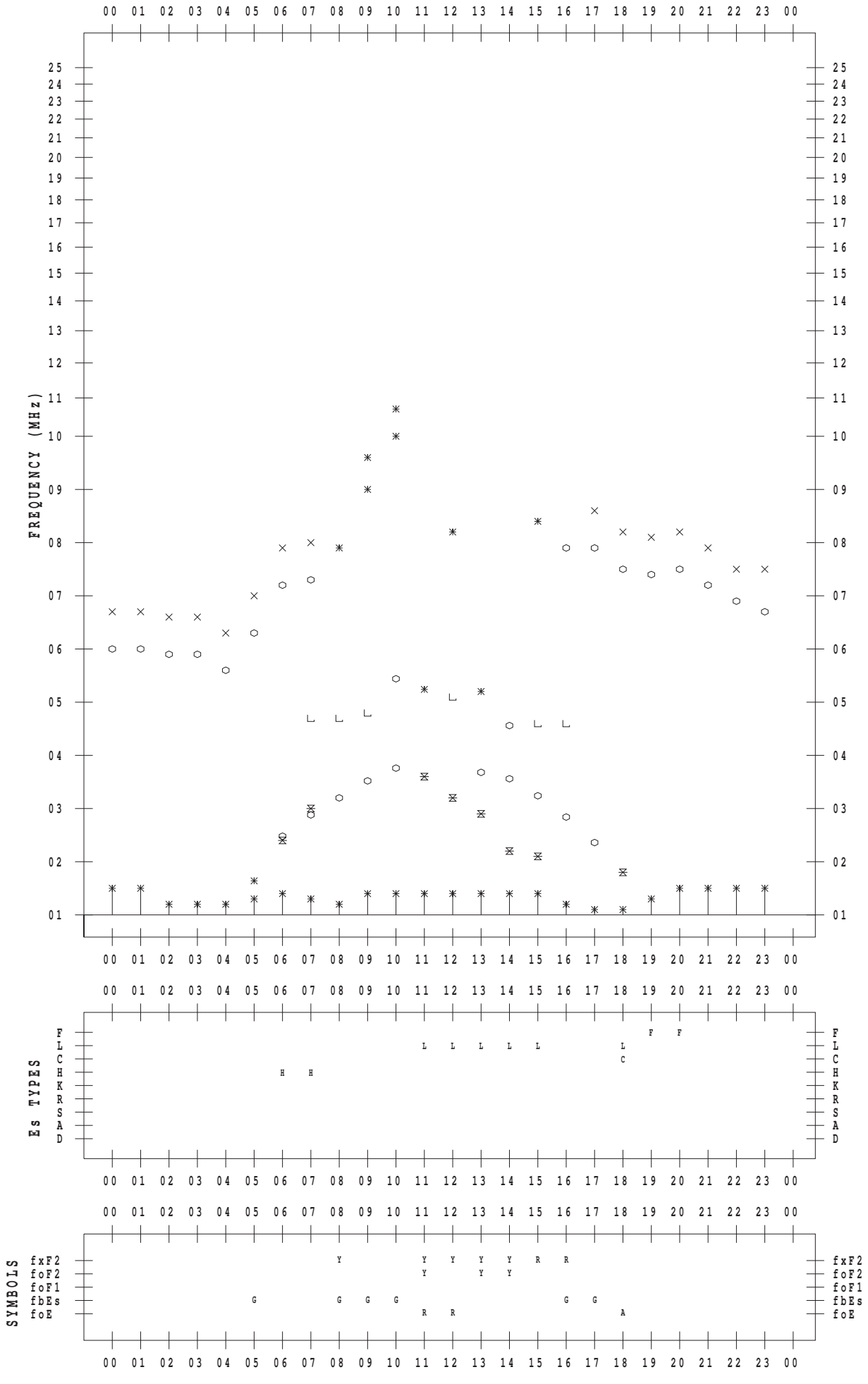
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/13

135 °E MEAN TIME



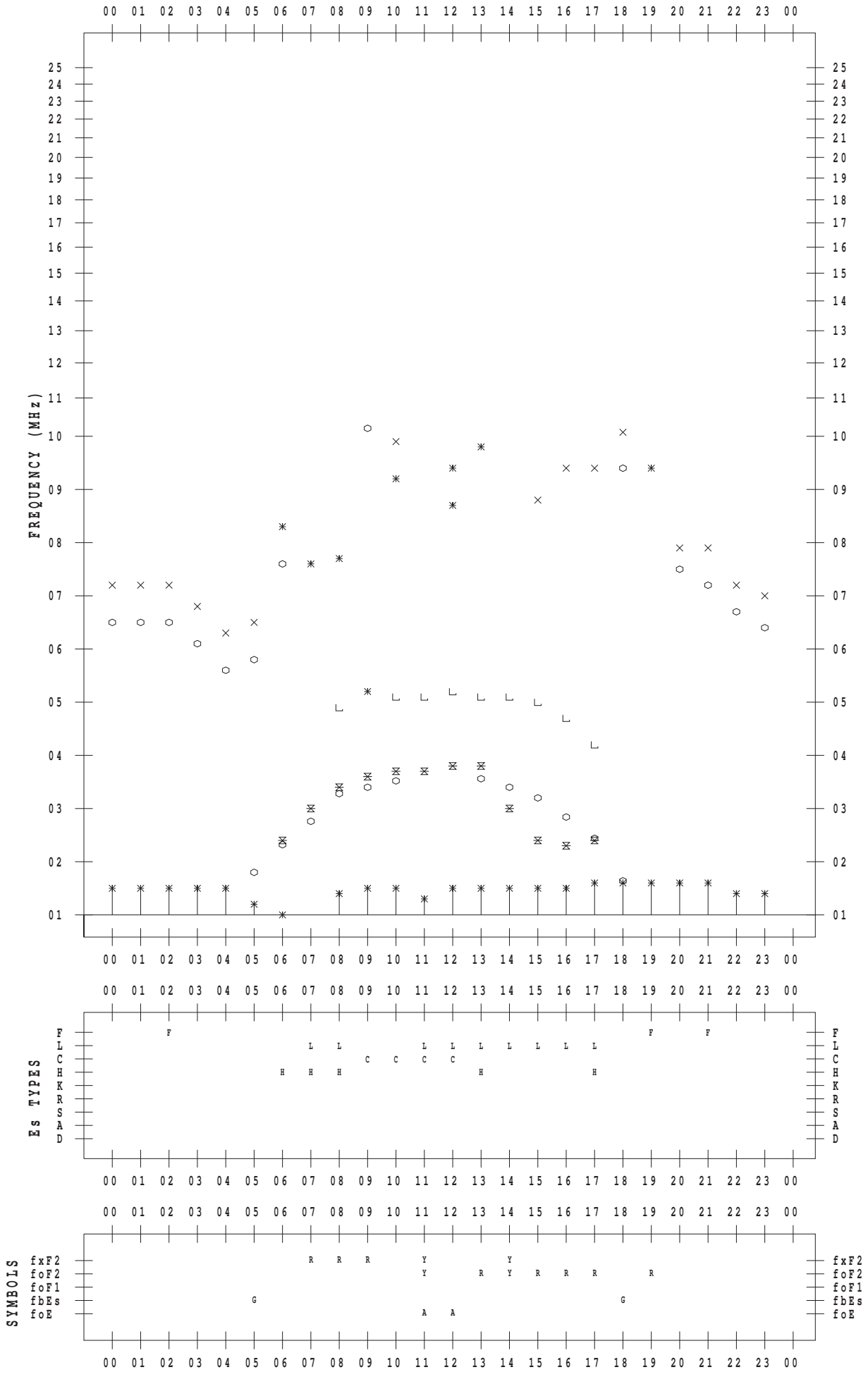
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/14

135 °E MEAN TIME



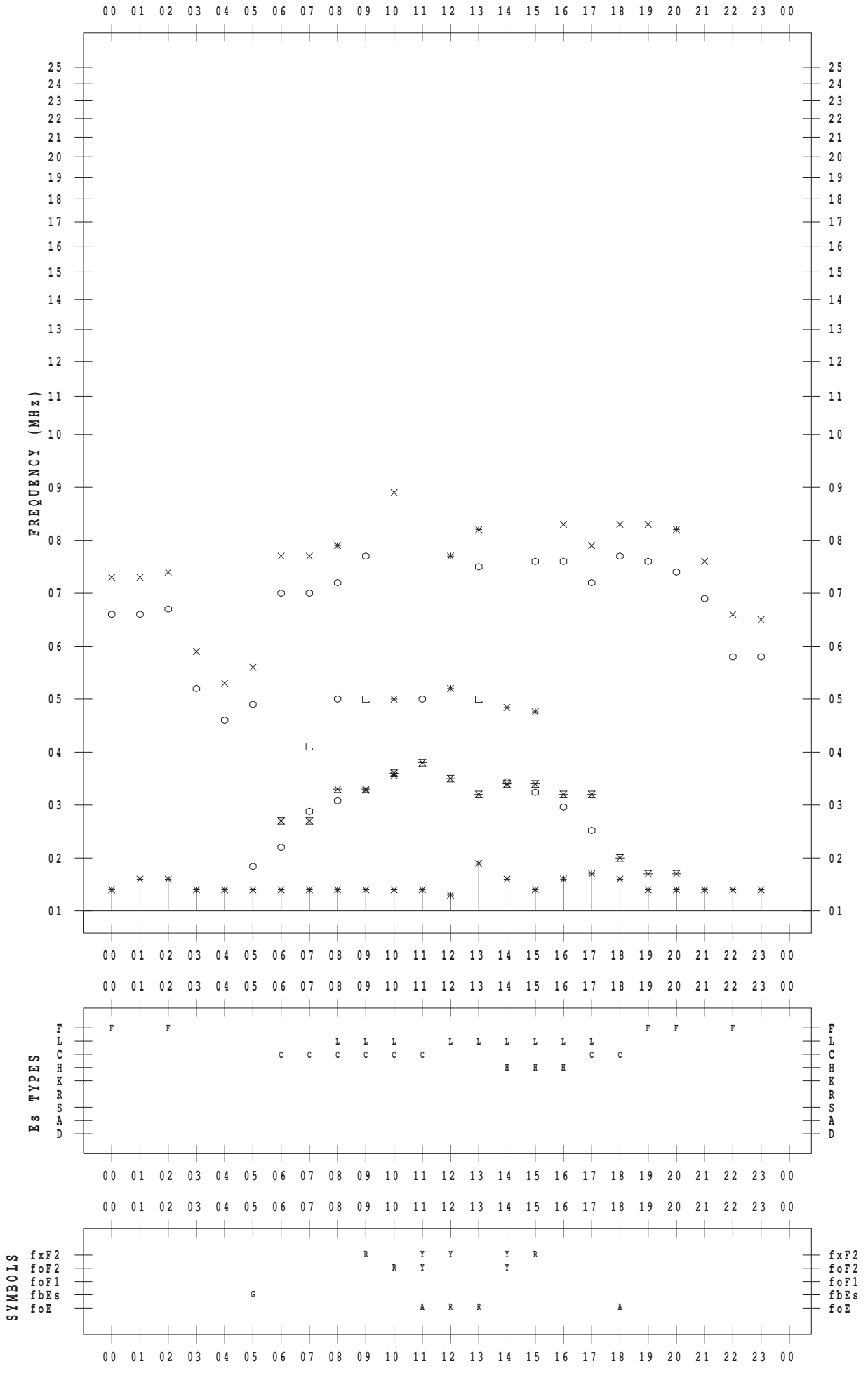
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/15

135 °E MEAN TIME



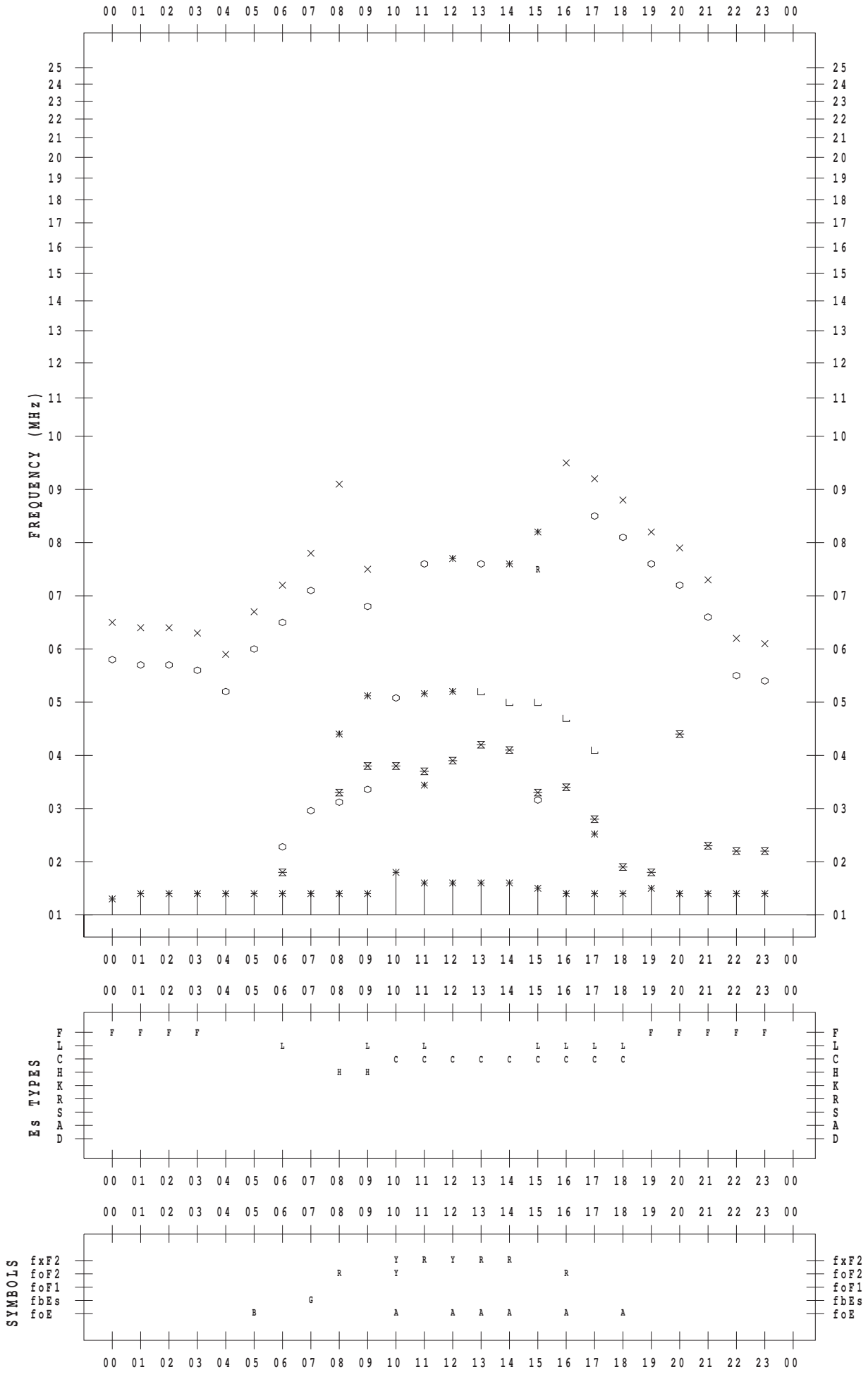
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/16

135 °E MEAN TIME



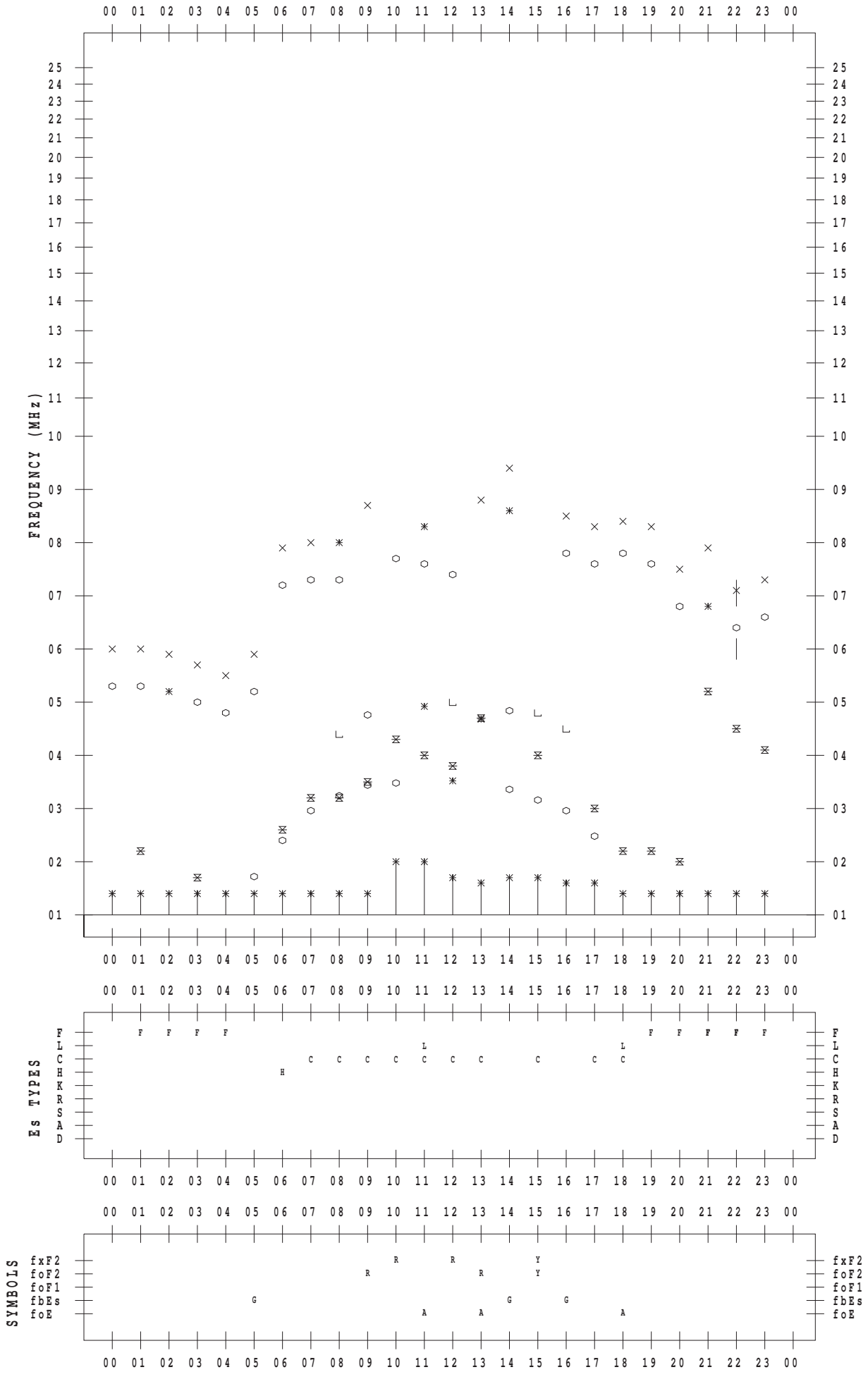
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/17

135 °E MEAN TIME



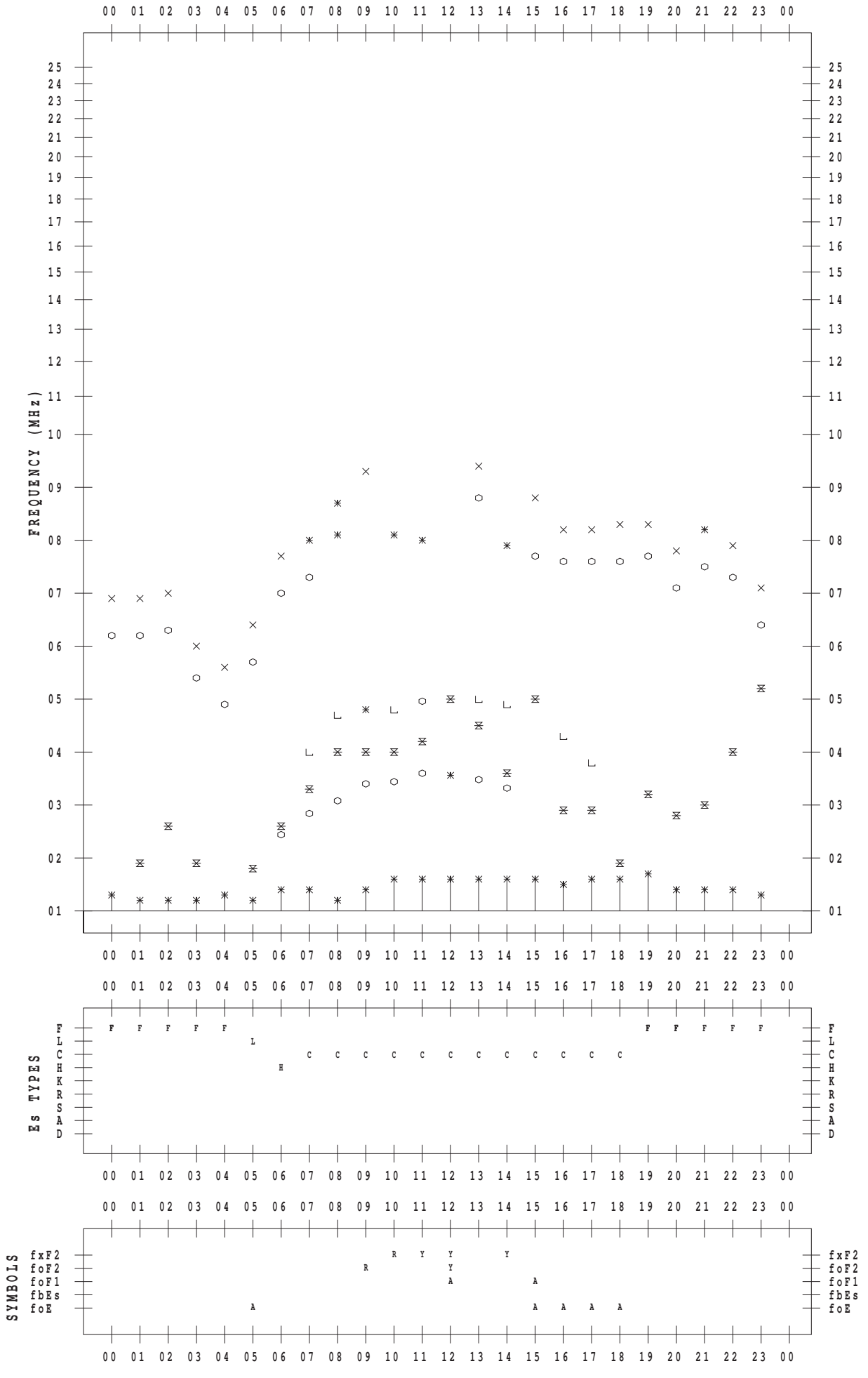
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/18

135 °E MEAN TIME



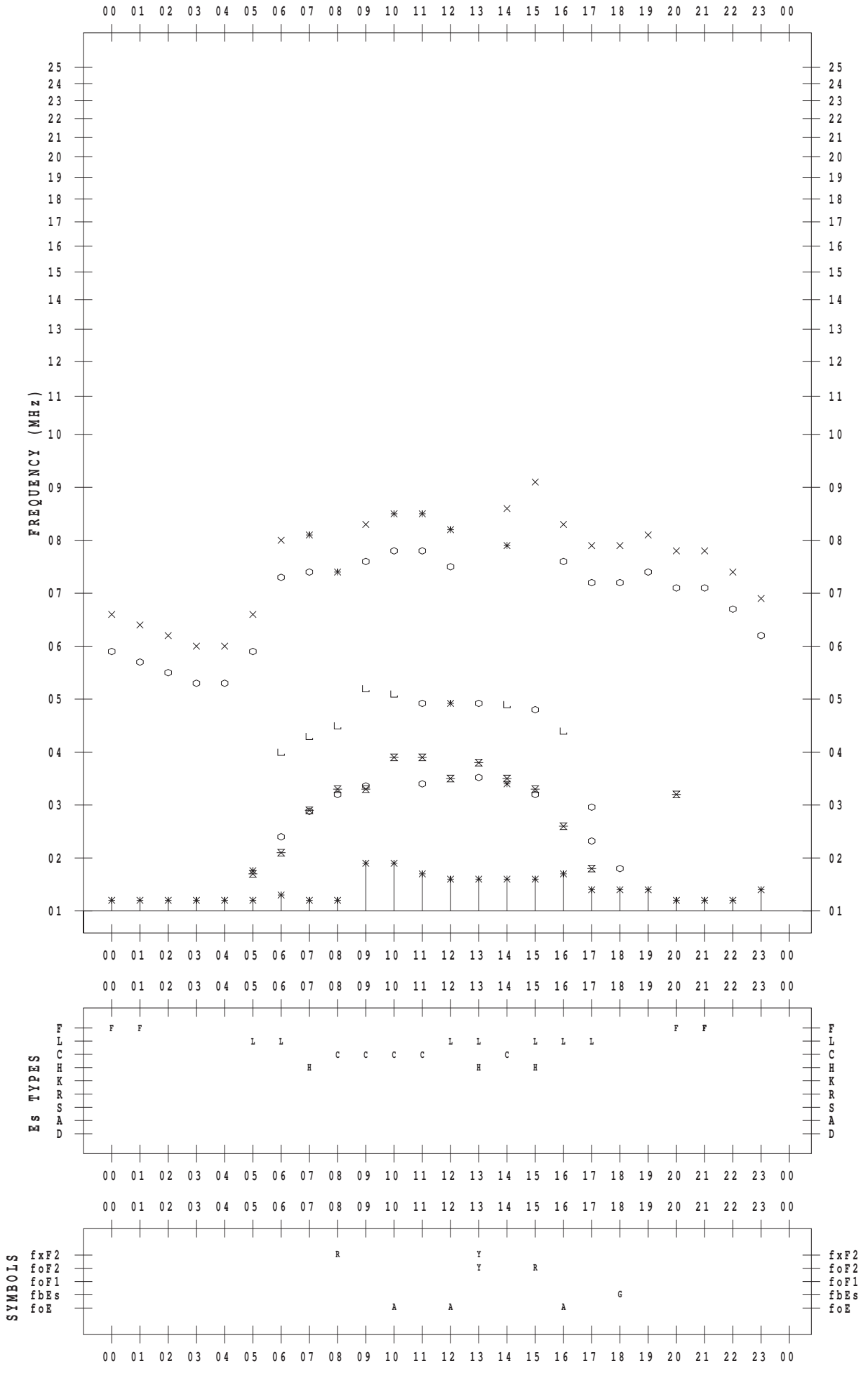
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/19

135 °E MEAN TIME



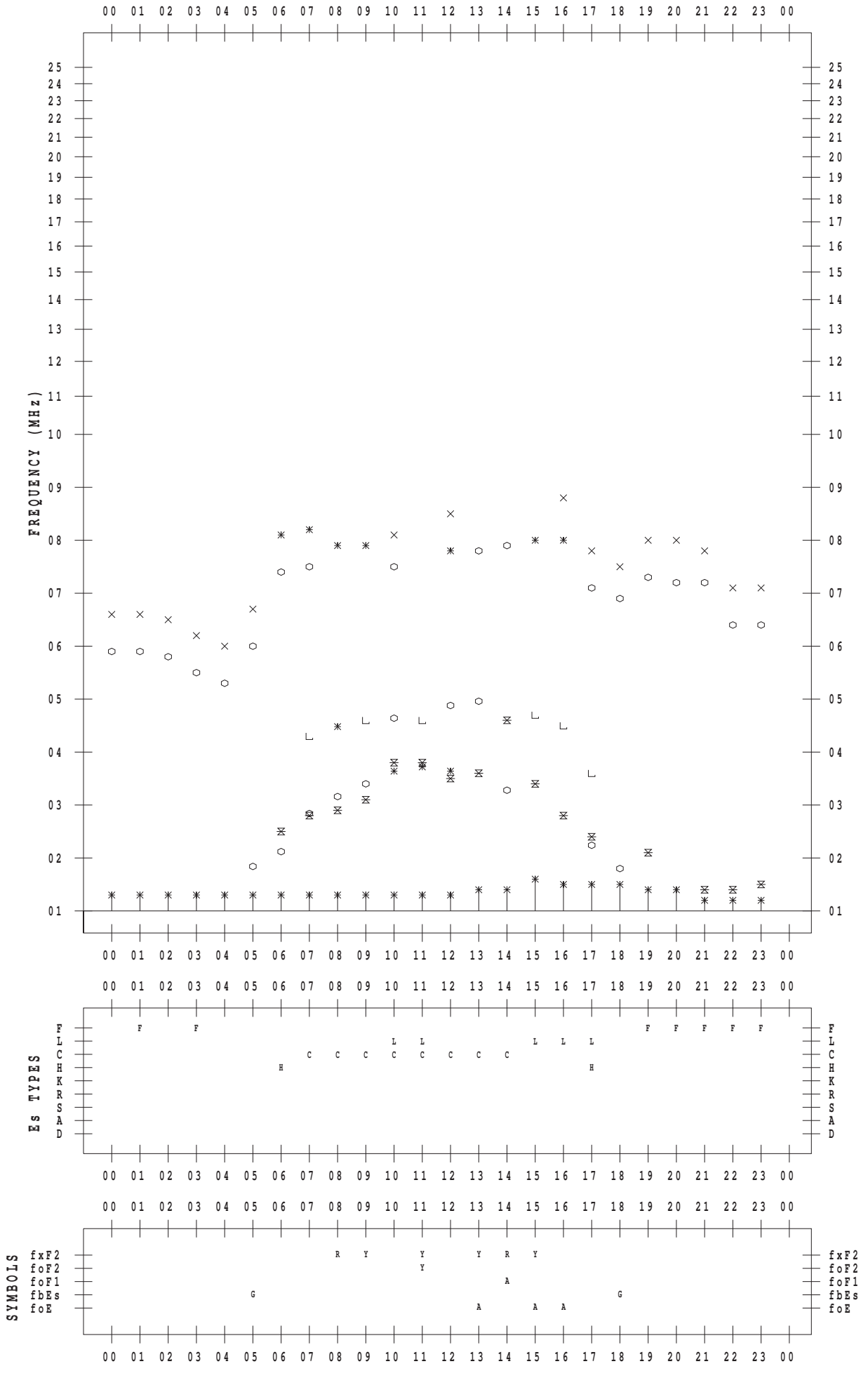
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/20

135 °E MEAN TIME



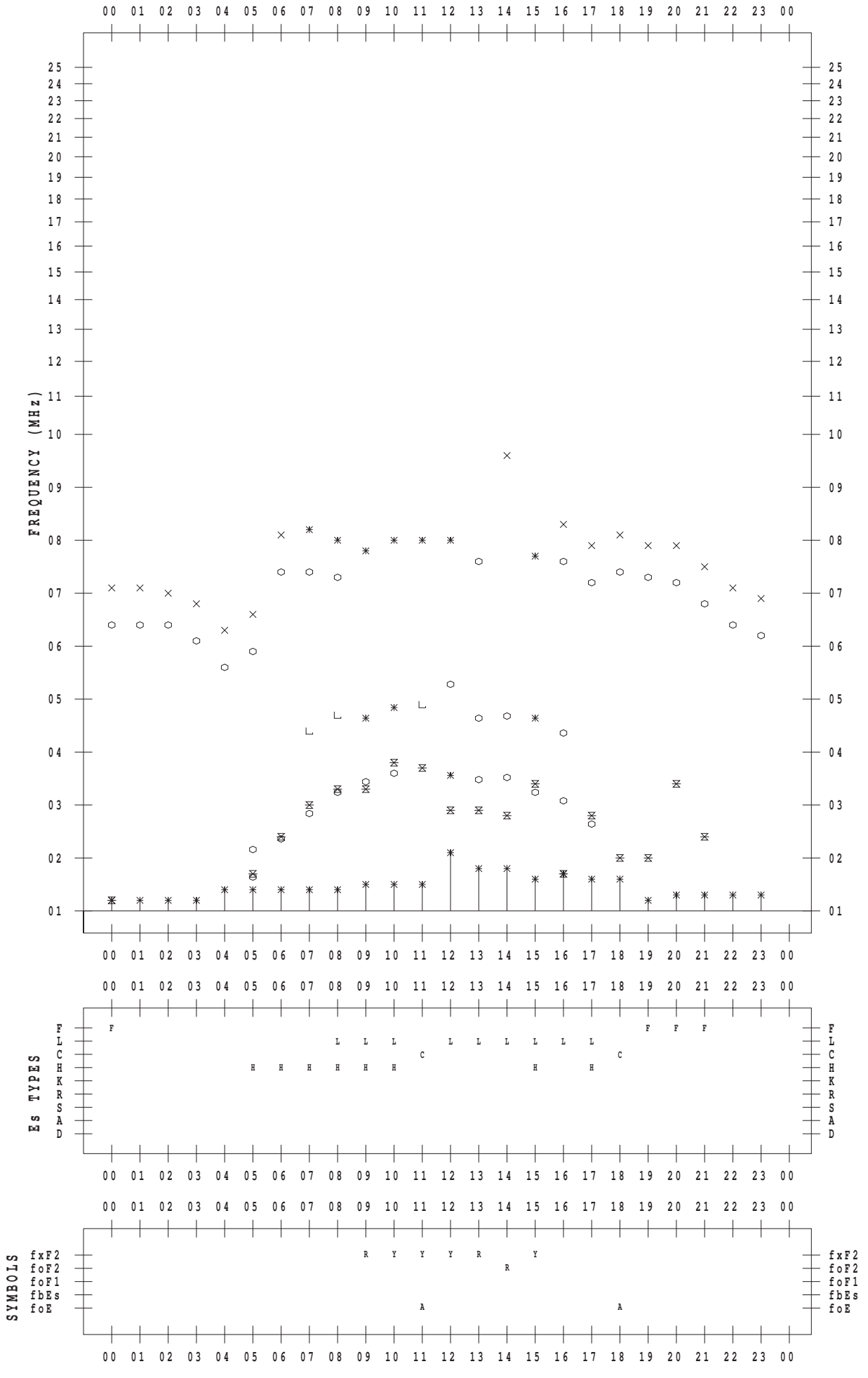
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/21

135 °E MEAN TIME



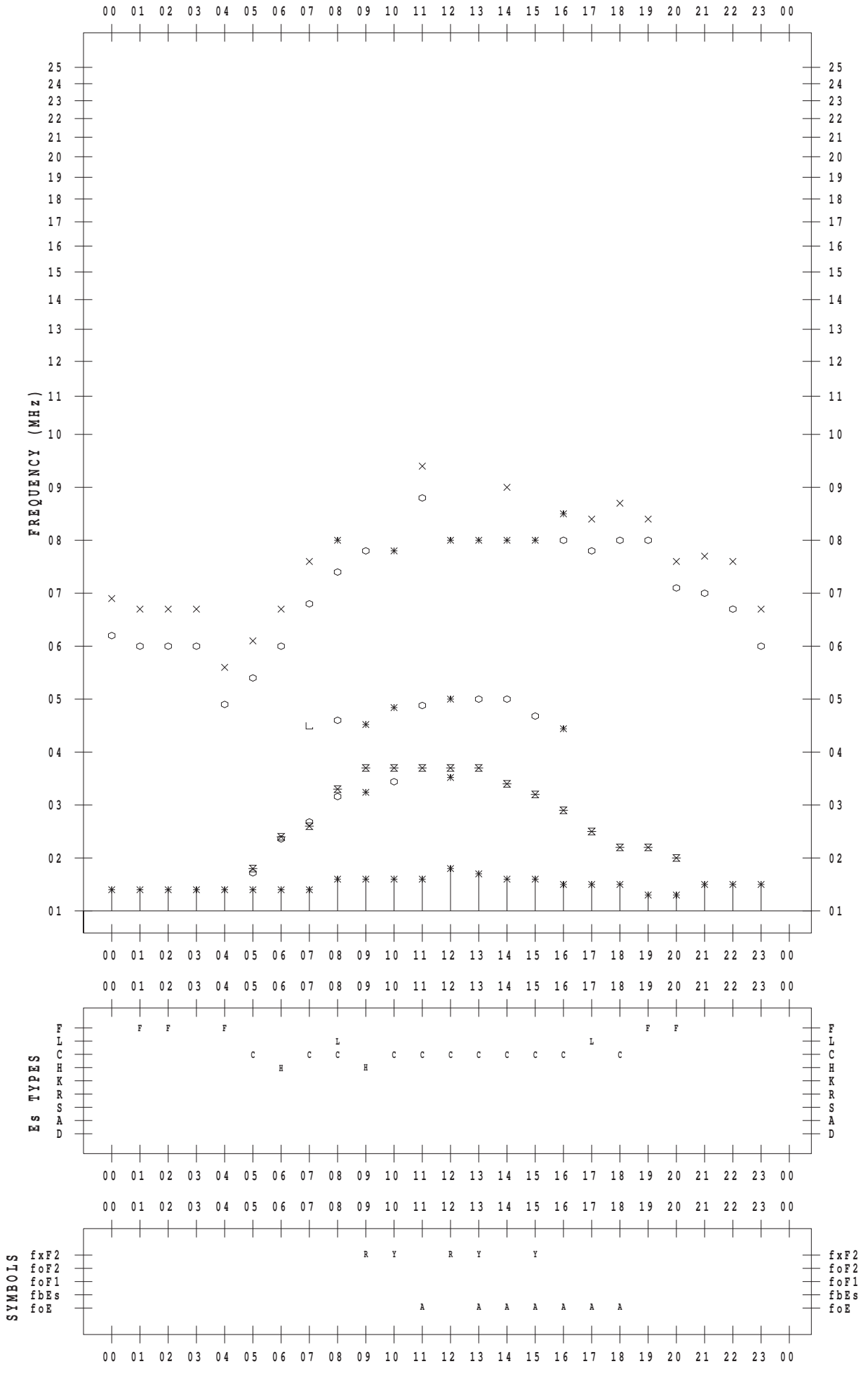
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/22

135 °E MEAN TIME



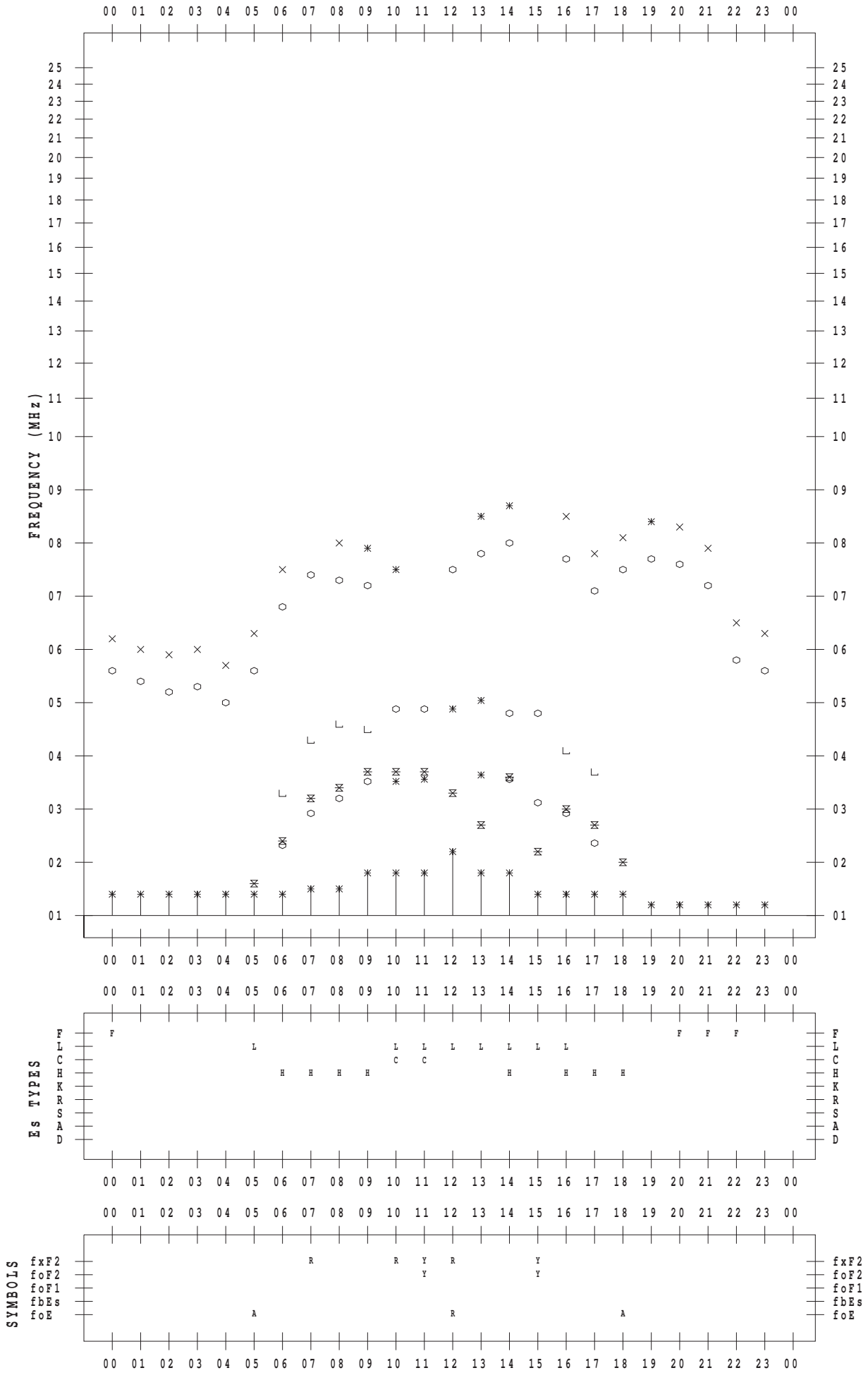
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/23

135 °E MEAN TIME



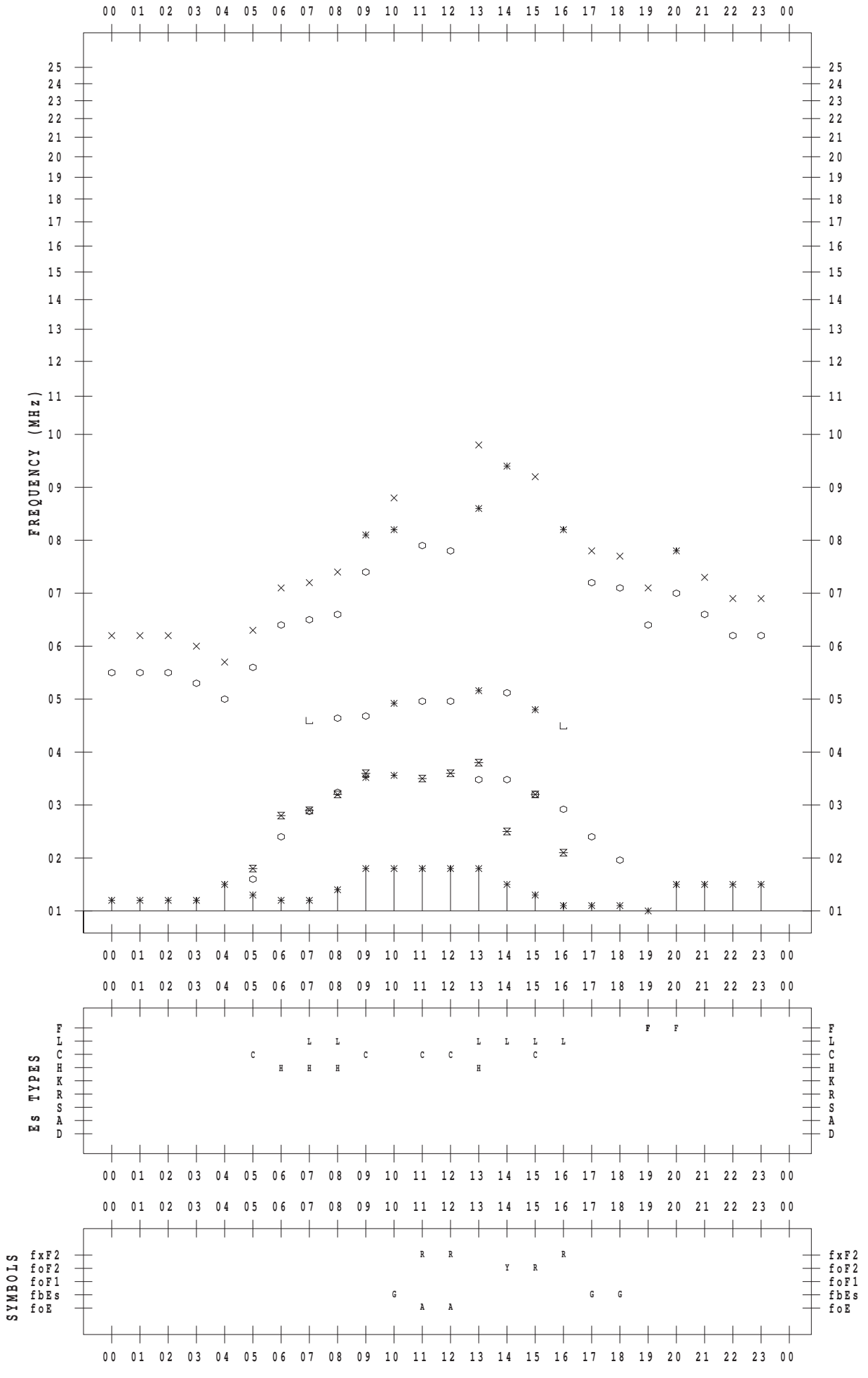
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/24

135 °E MEAN TIME



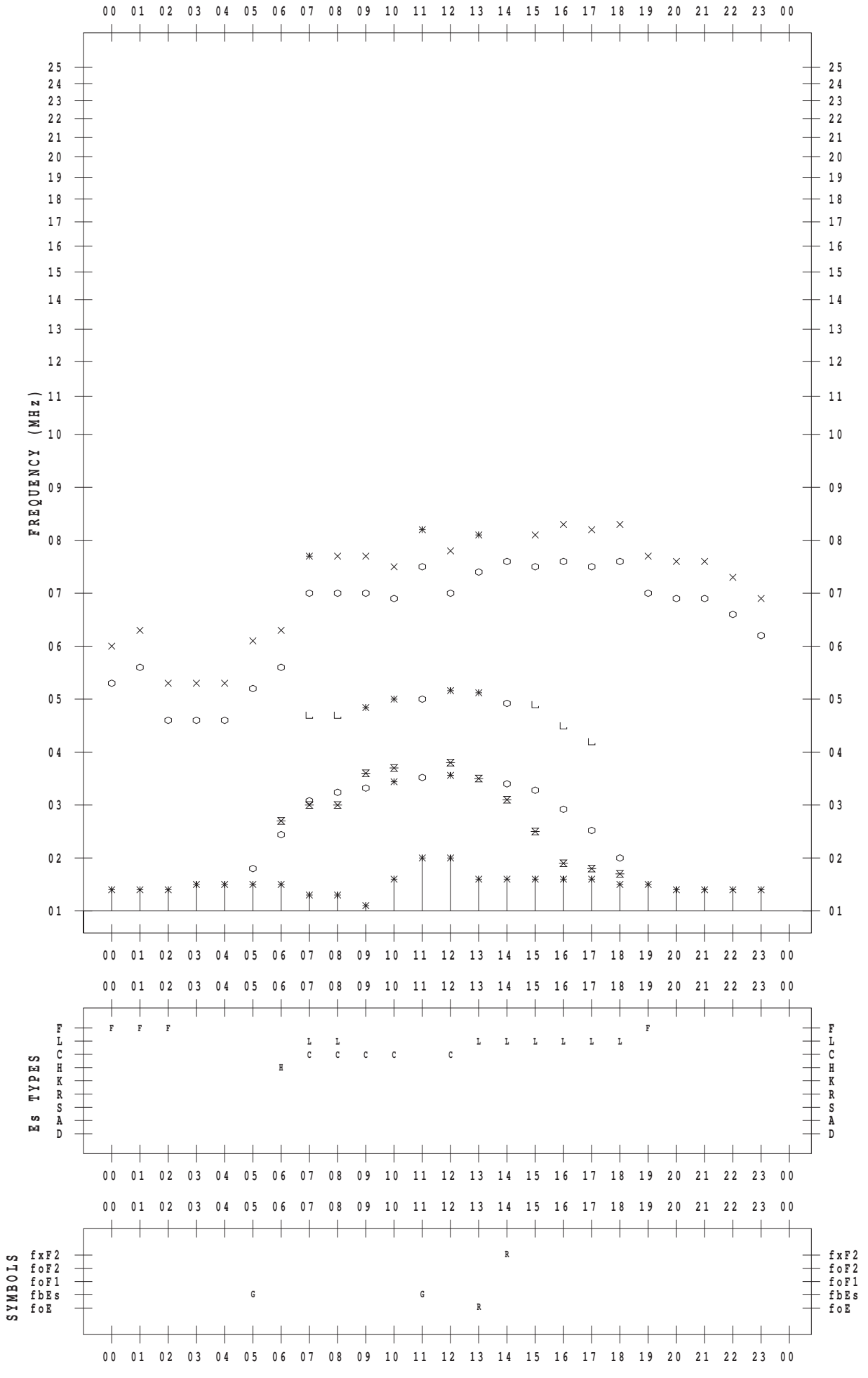
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/25

135 °E MEAN TIME



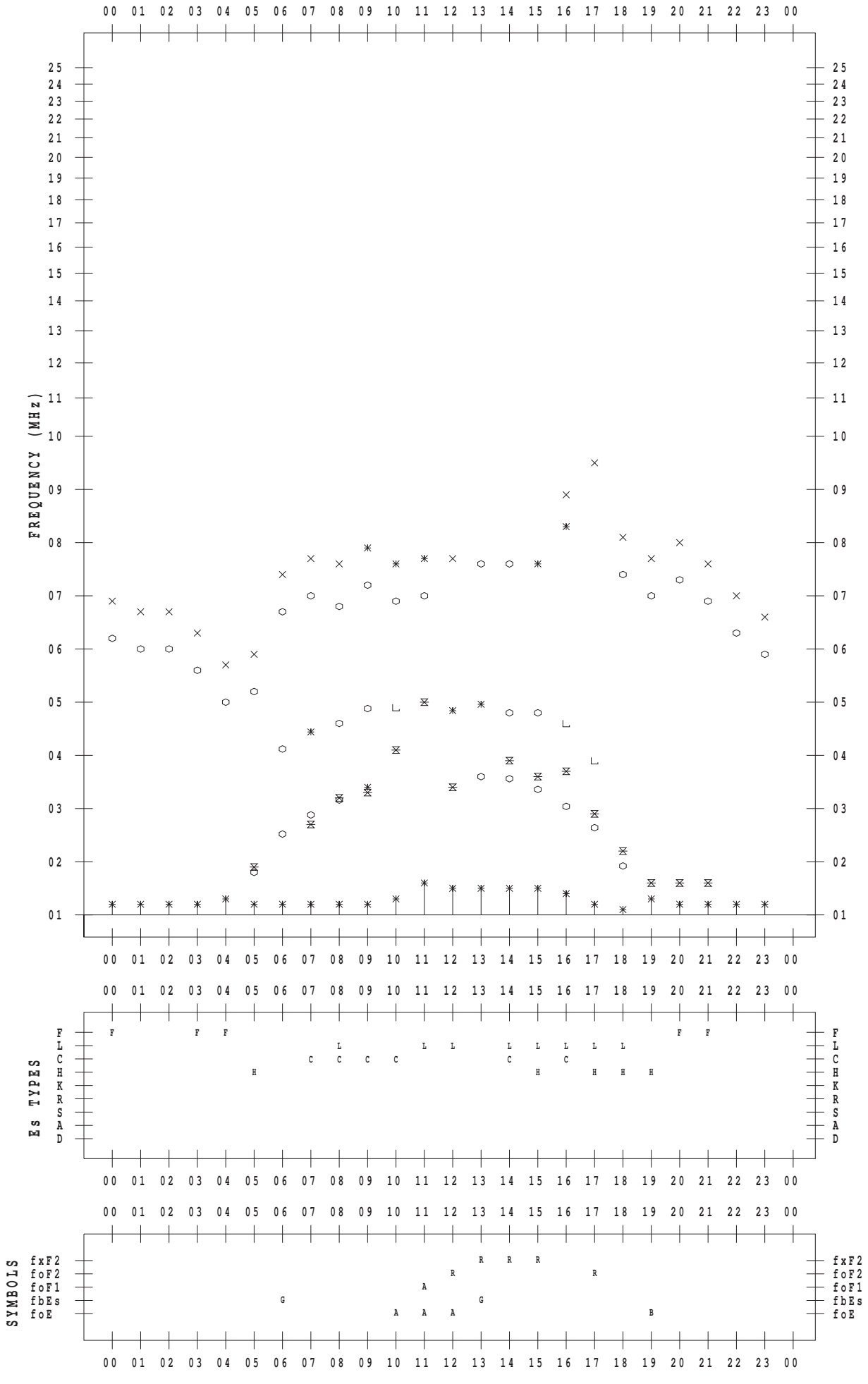
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/26

135 °E MEAN TIME



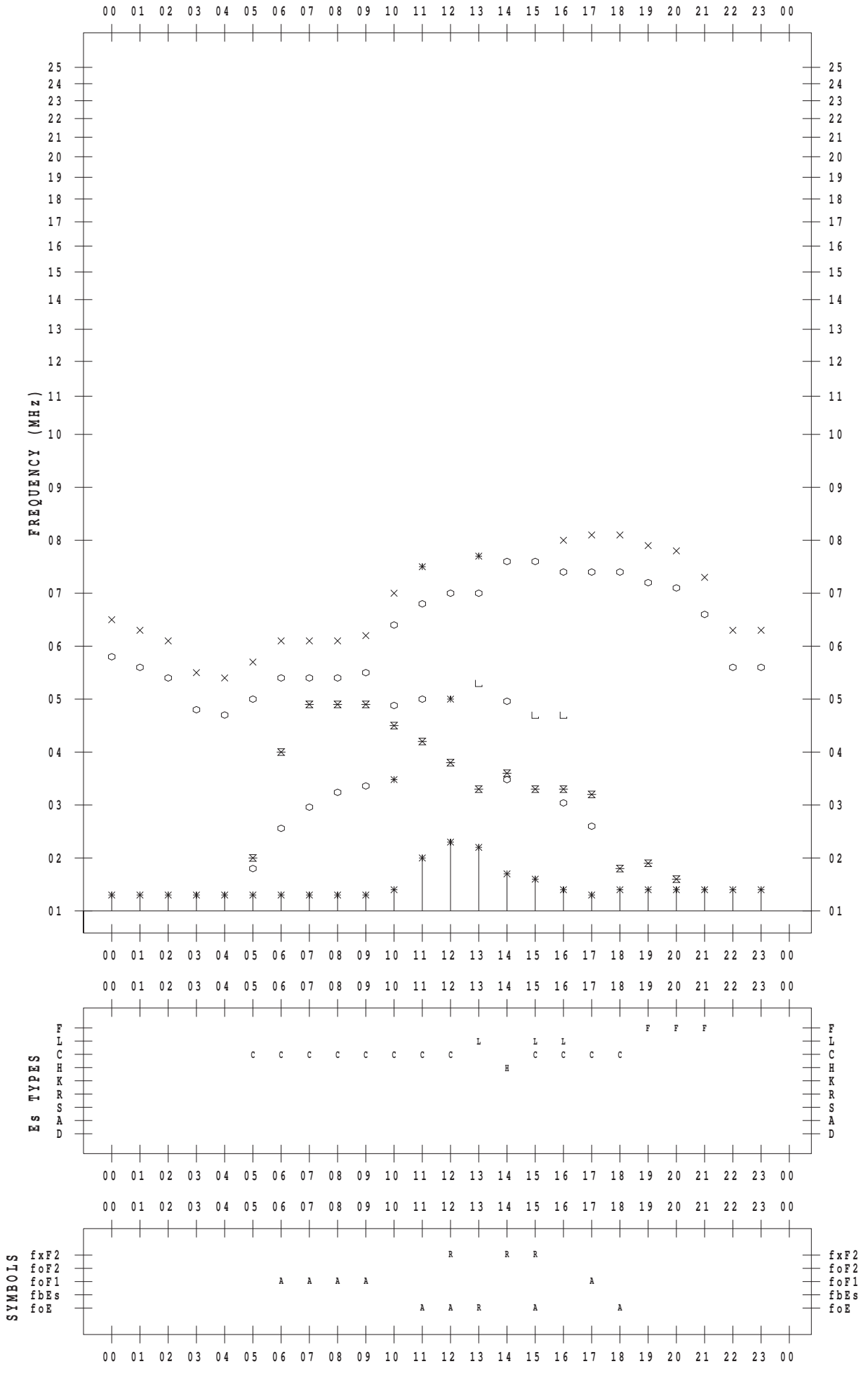
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/27

135 °E MEAN TIME



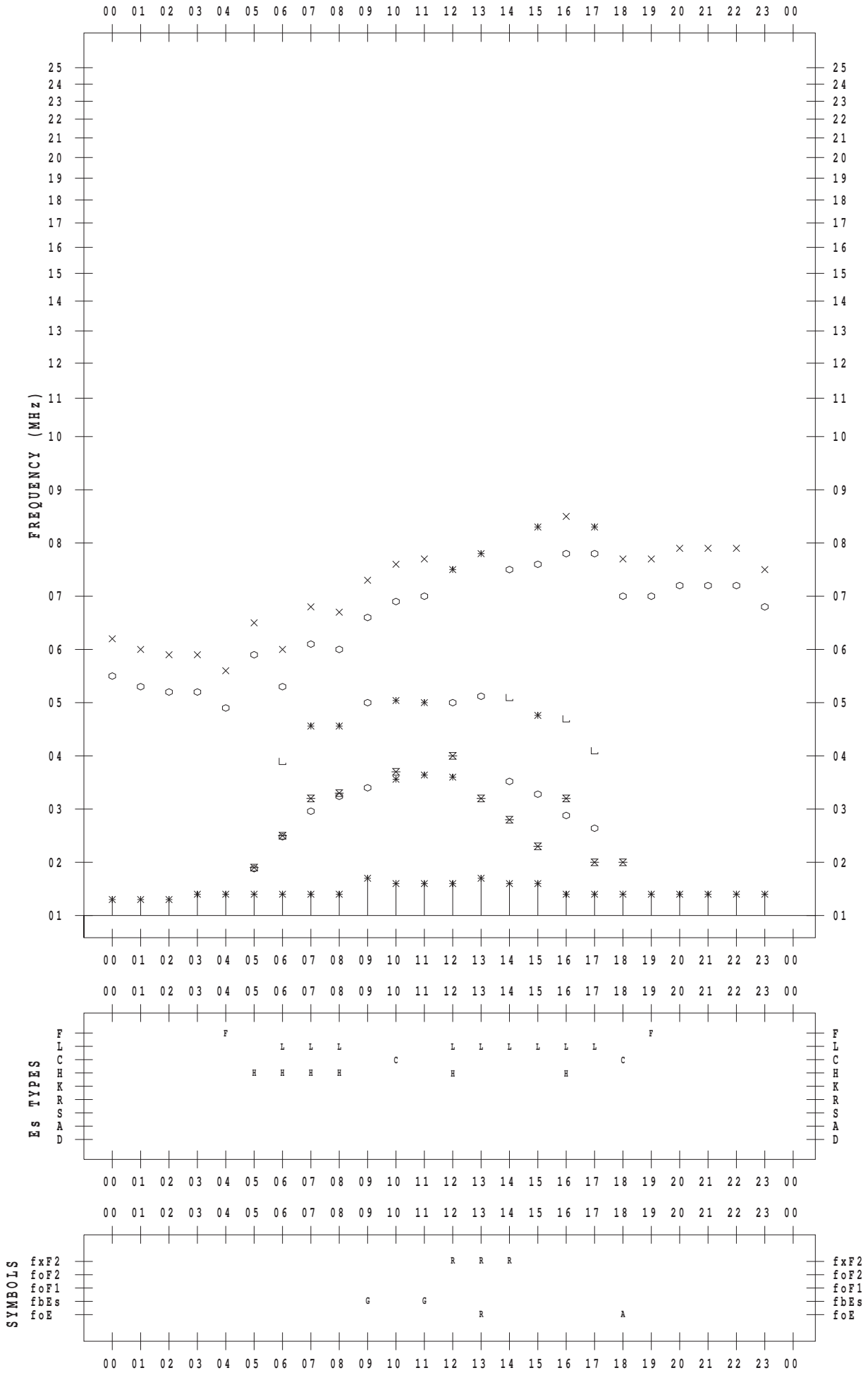
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/28

135 °E MEAN TIME



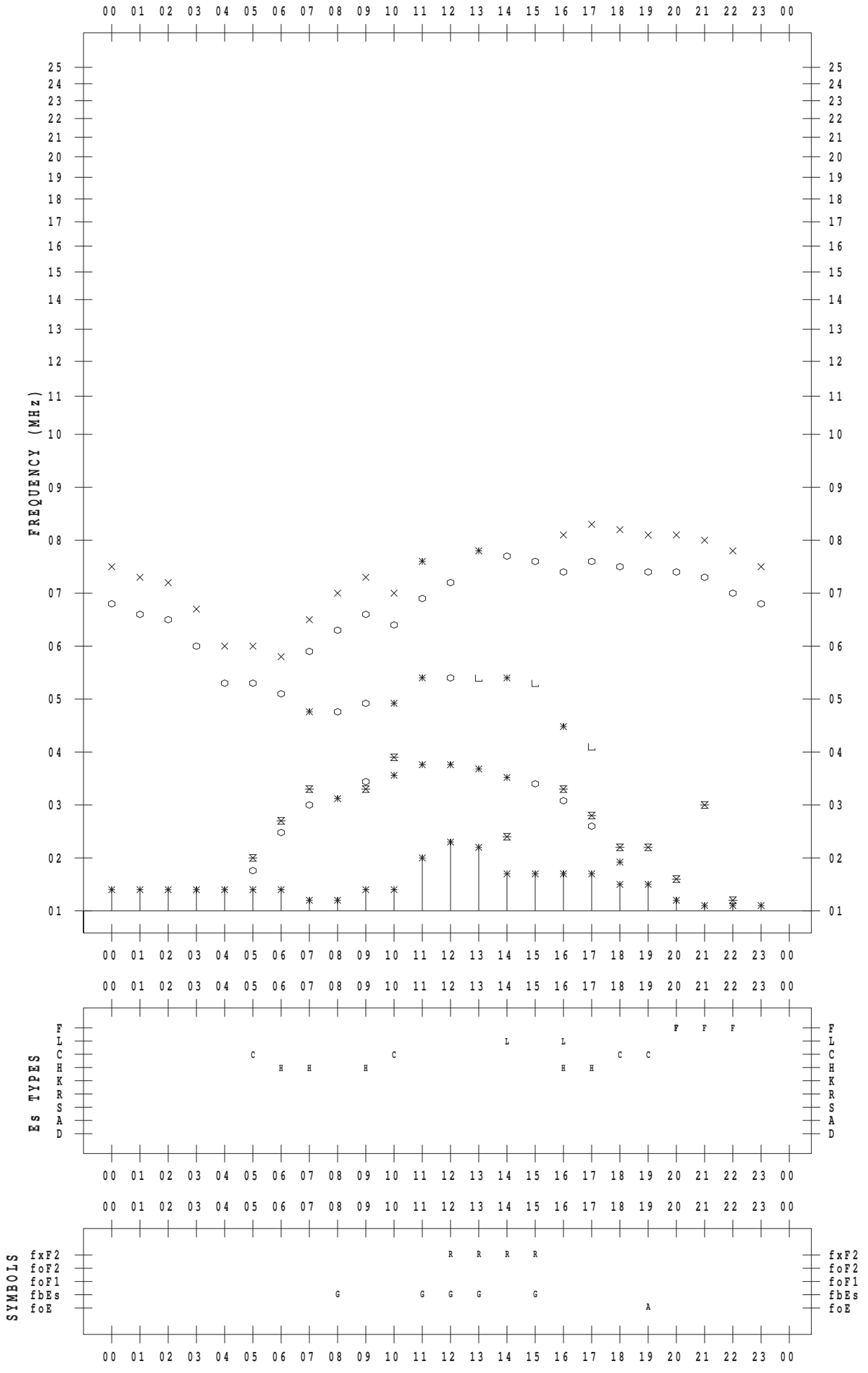
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/29

135 °E MEAN TIME



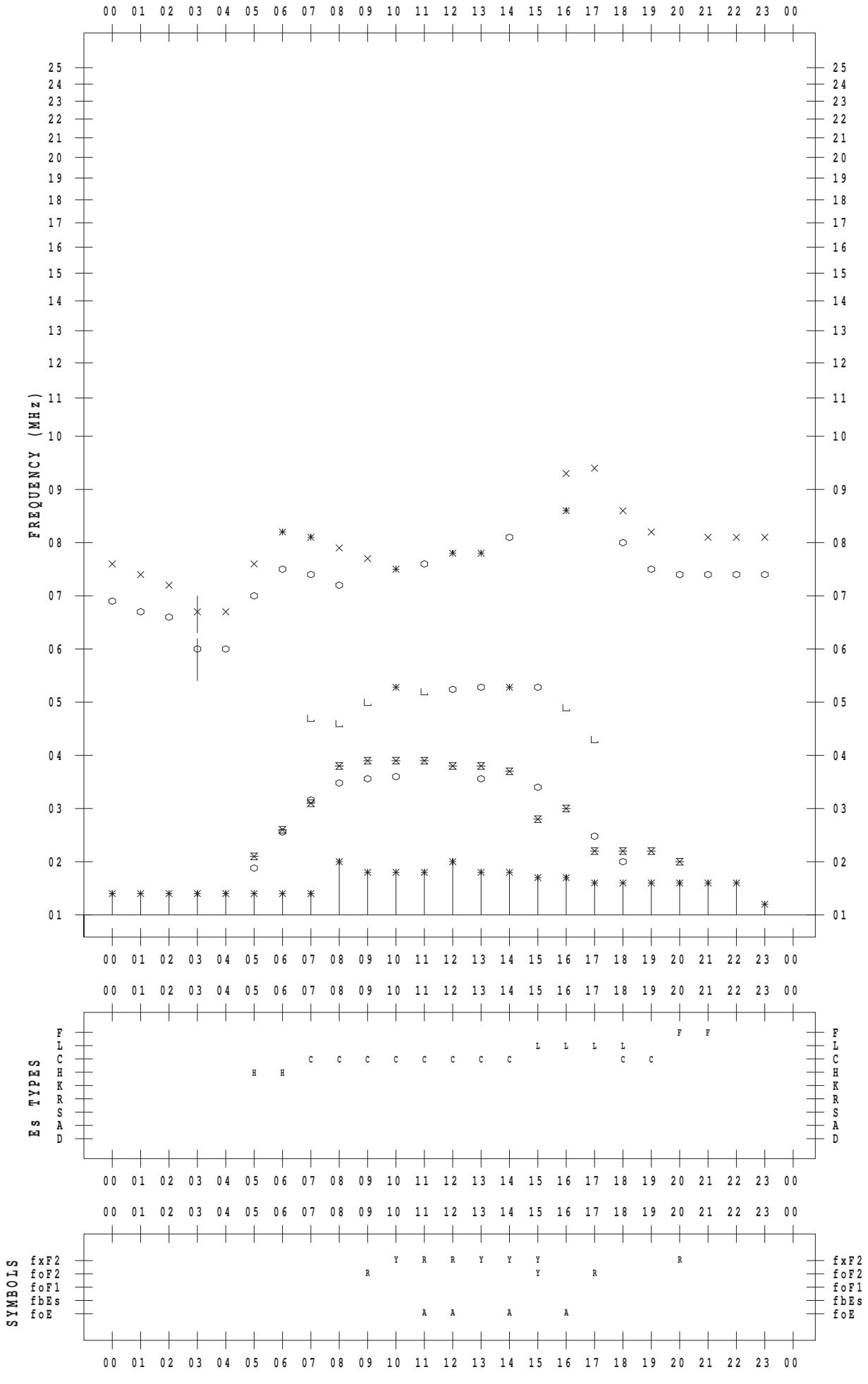
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 4/30

135 °E MEAN TIME



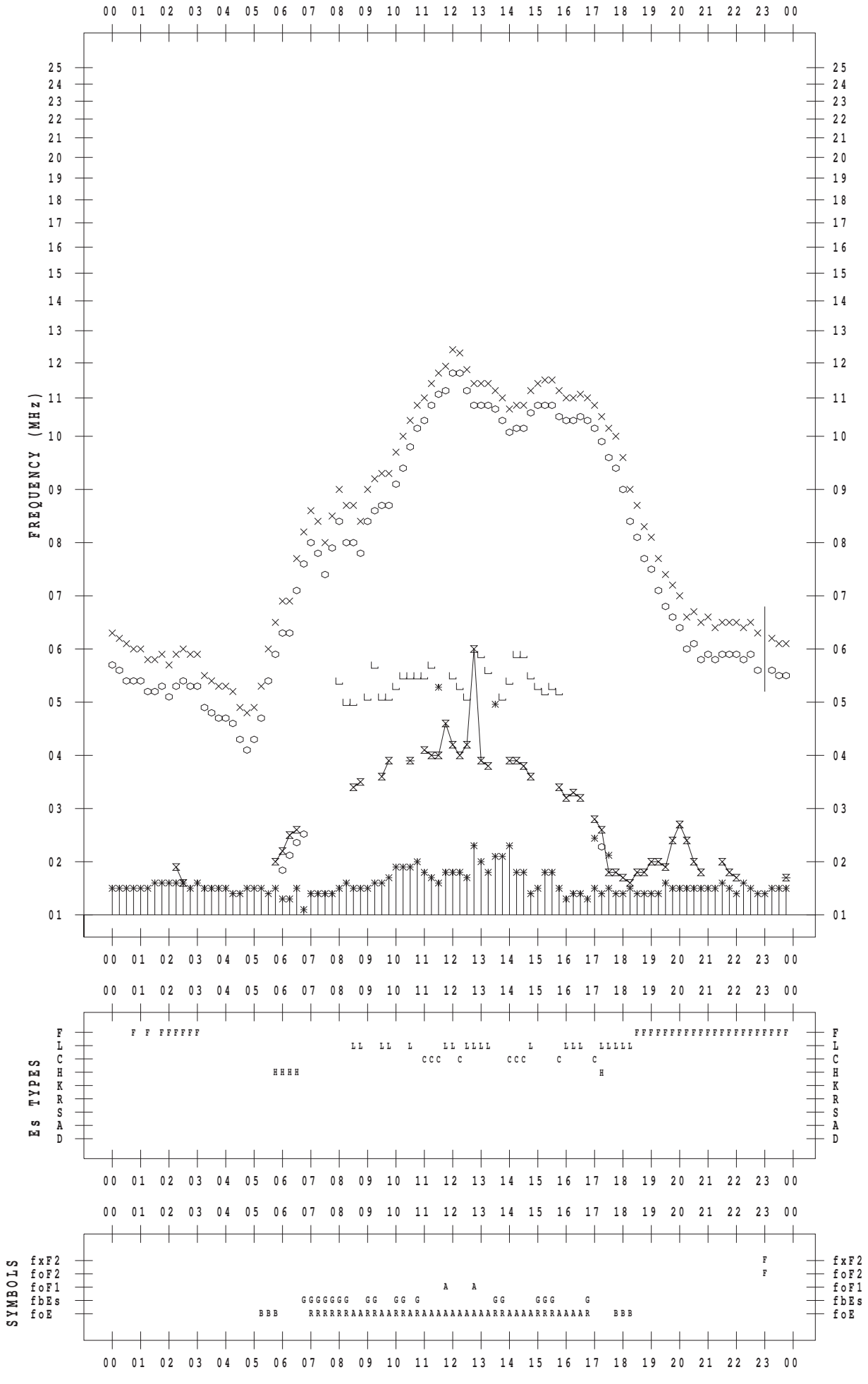
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/ 1

135 °E MEAN TIME



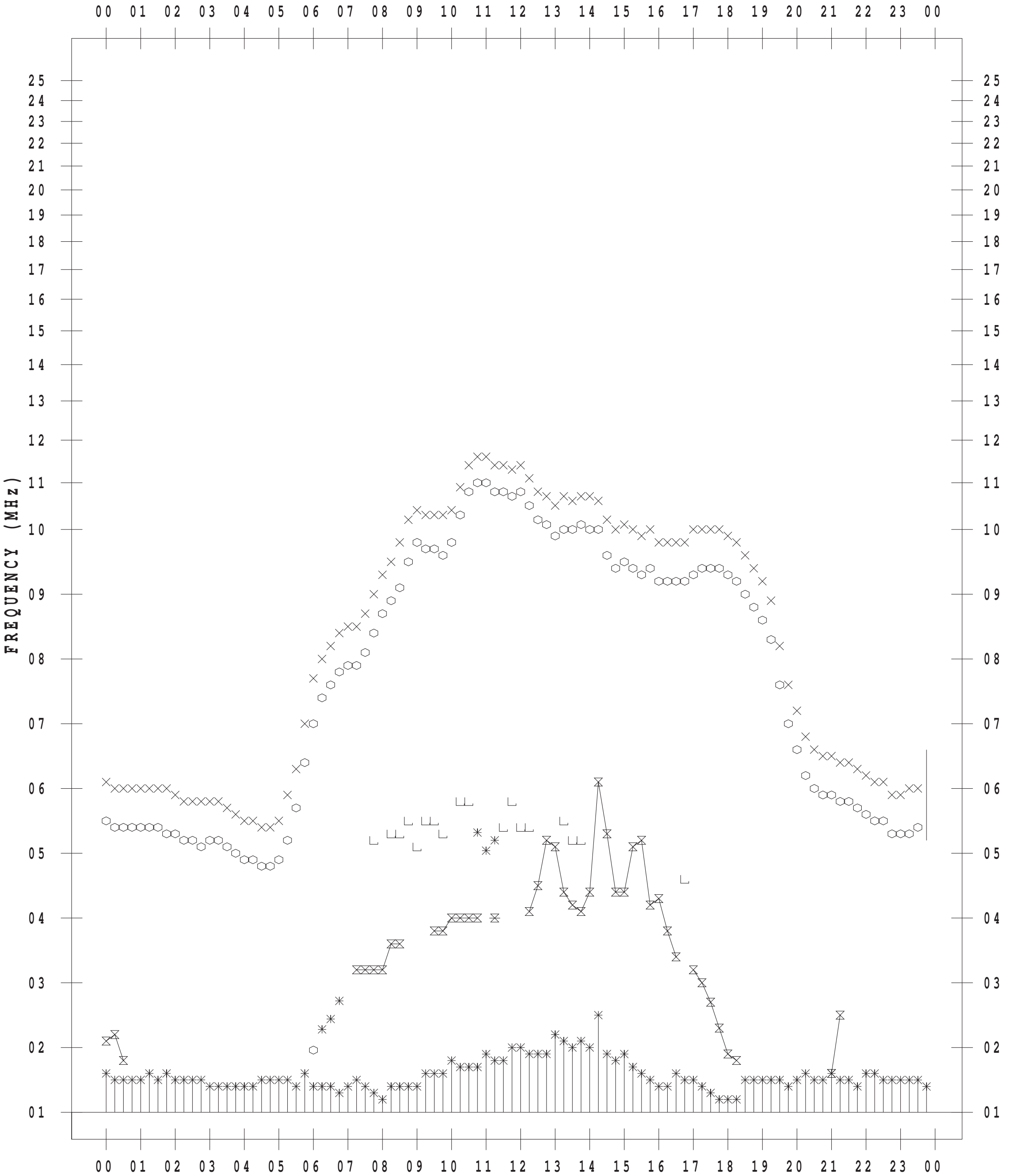
f-PLOT DATA

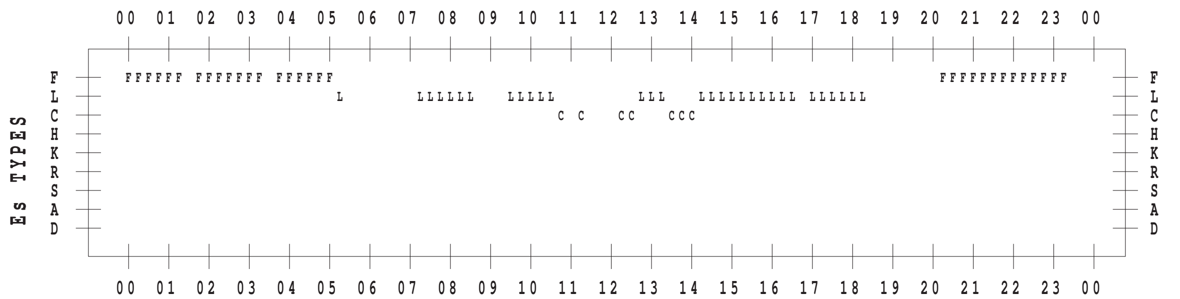
SCALER : I.NISHIMUTA

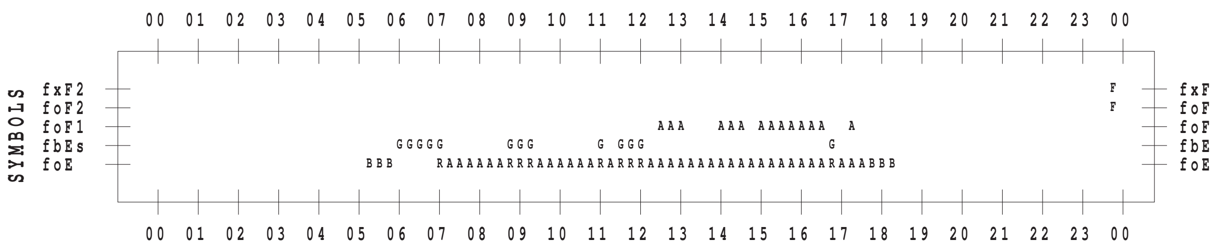
STATION : Kokubunji

DATE : 2013/ 4/ 2

135 °E MEAN TIME







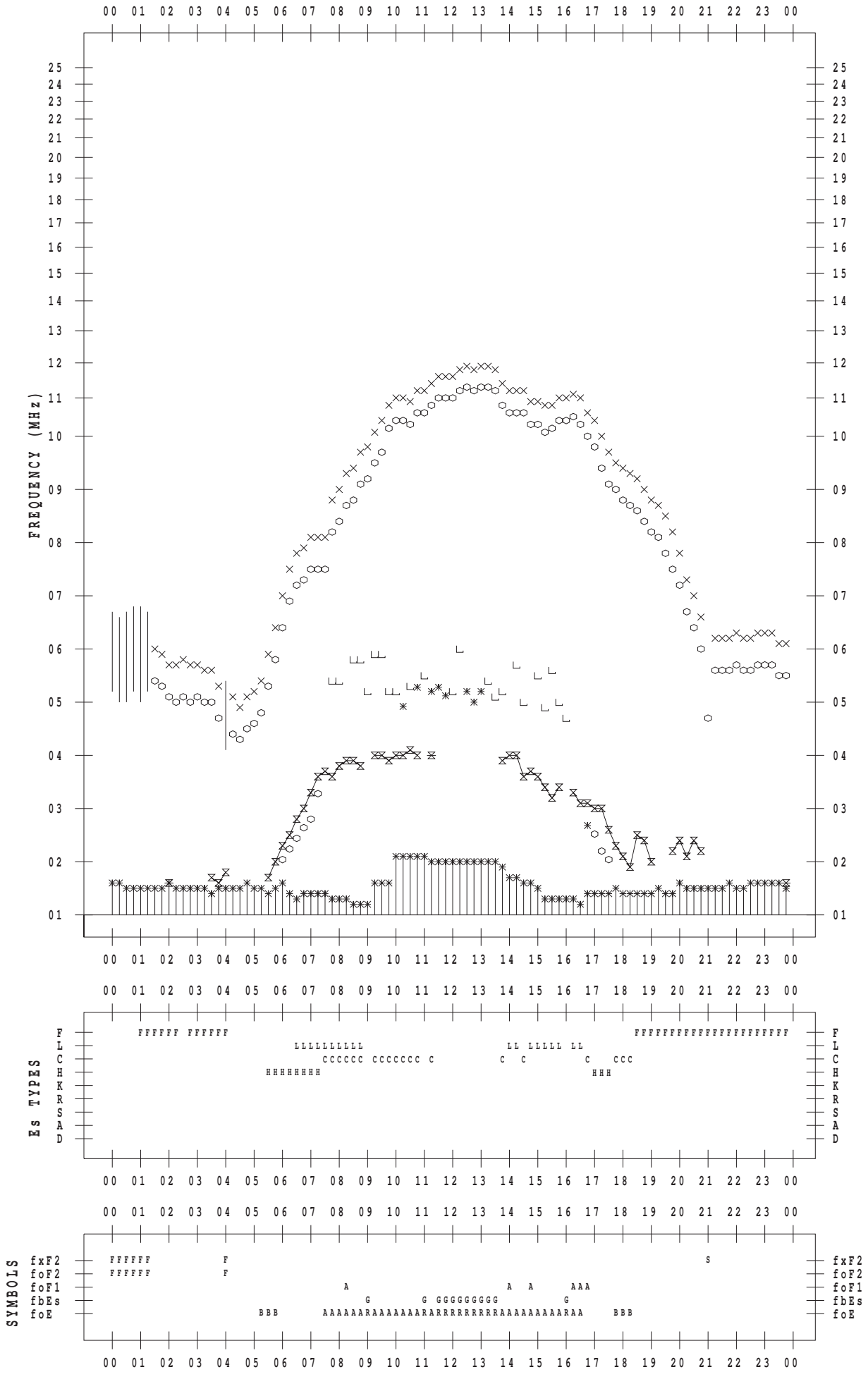
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/ 3

135 °E MEAN TIME



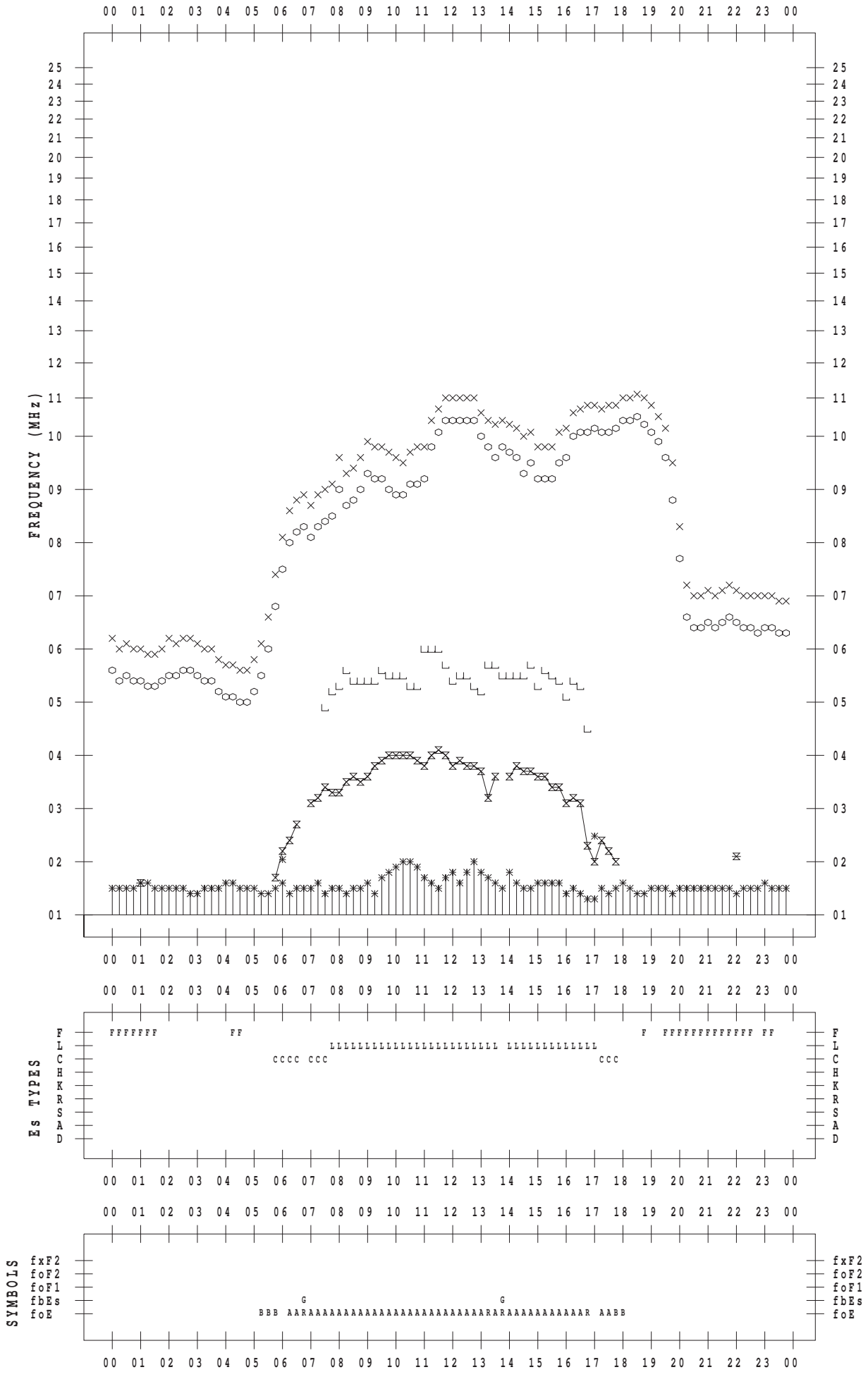
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/ 4

135 °E MEAN TIME



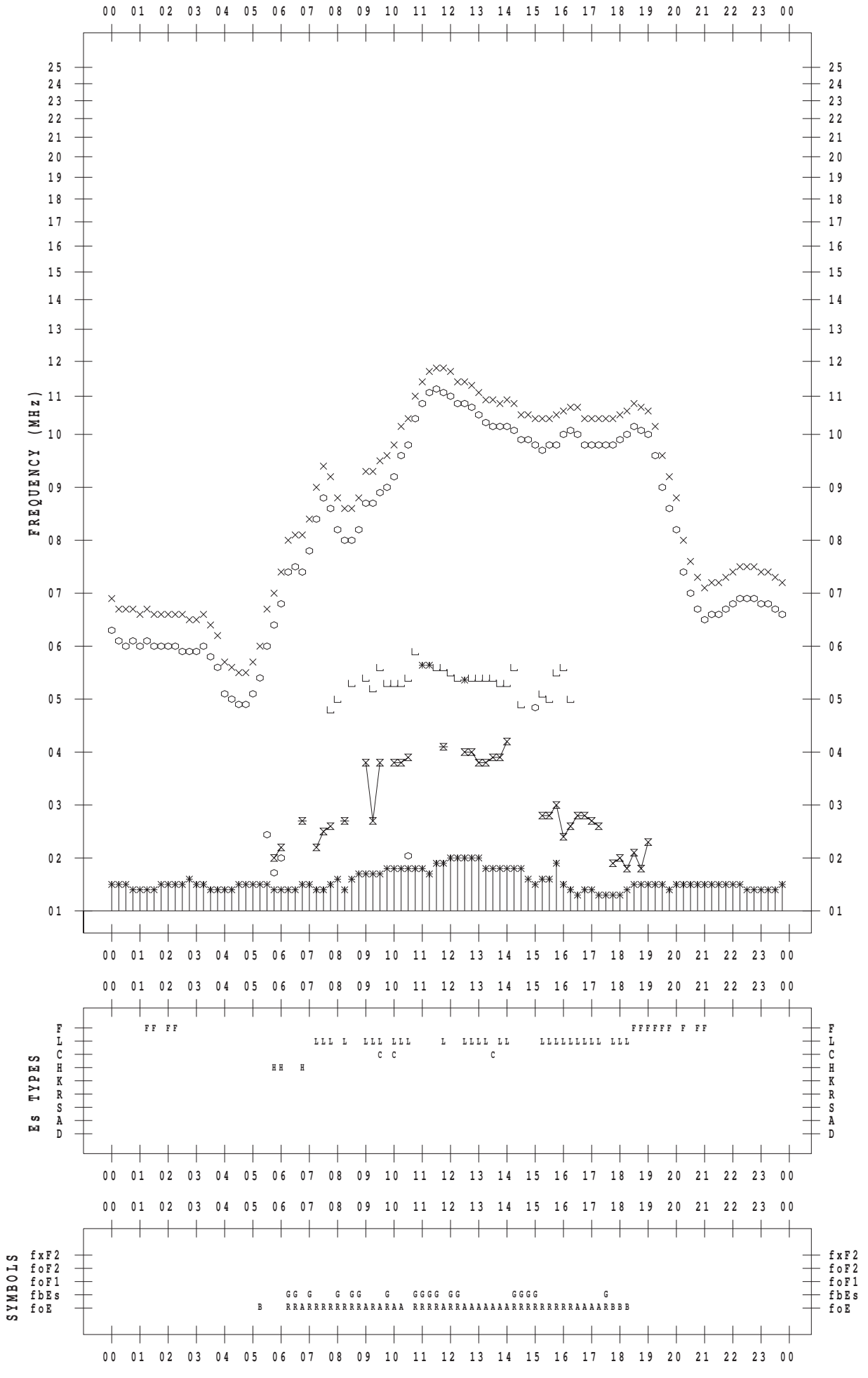
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/ 5

135 °E MEAN TIME



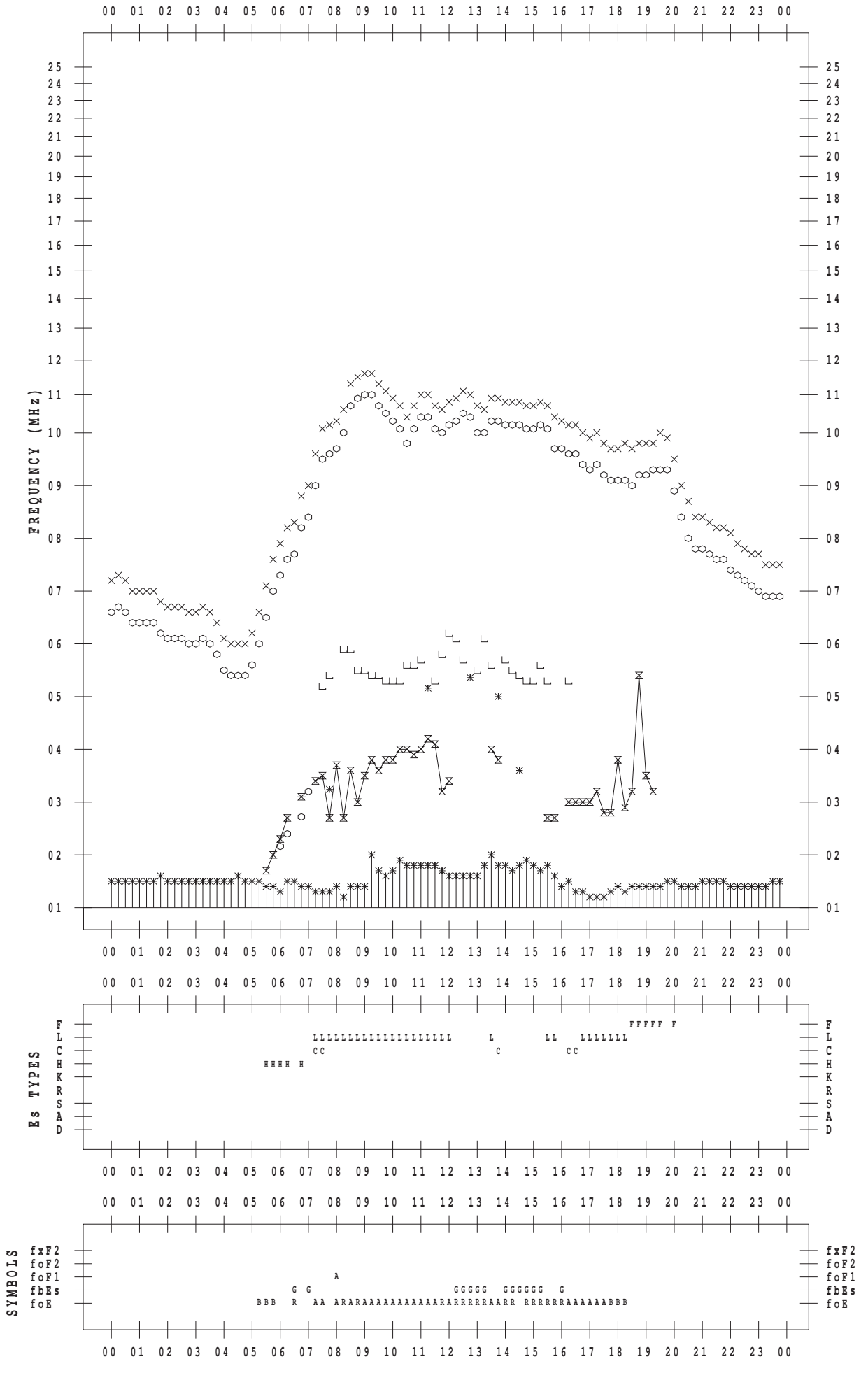
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/ 6

135 °E MEAN TIME



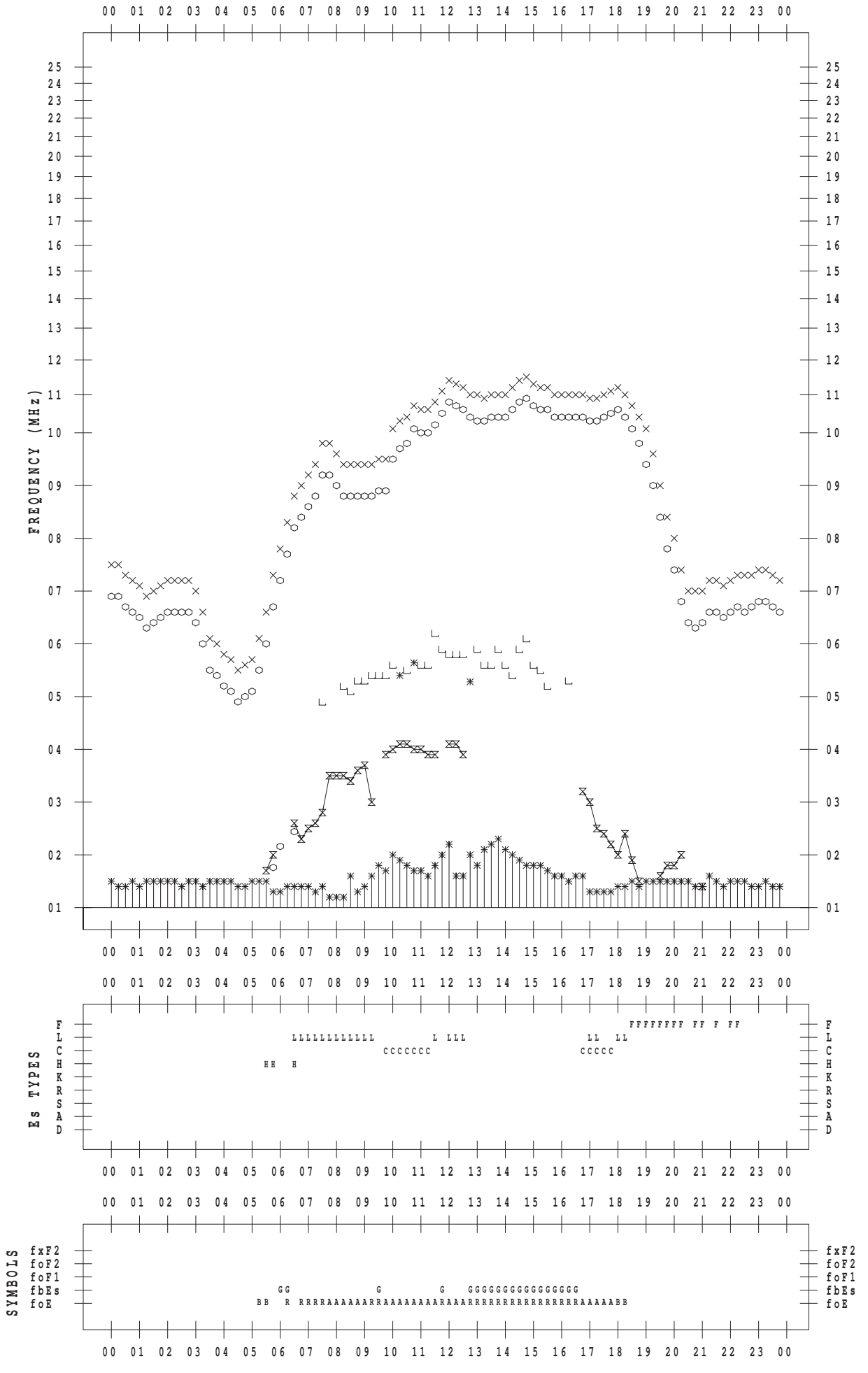
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/ 7

135 °E MEAN TIME



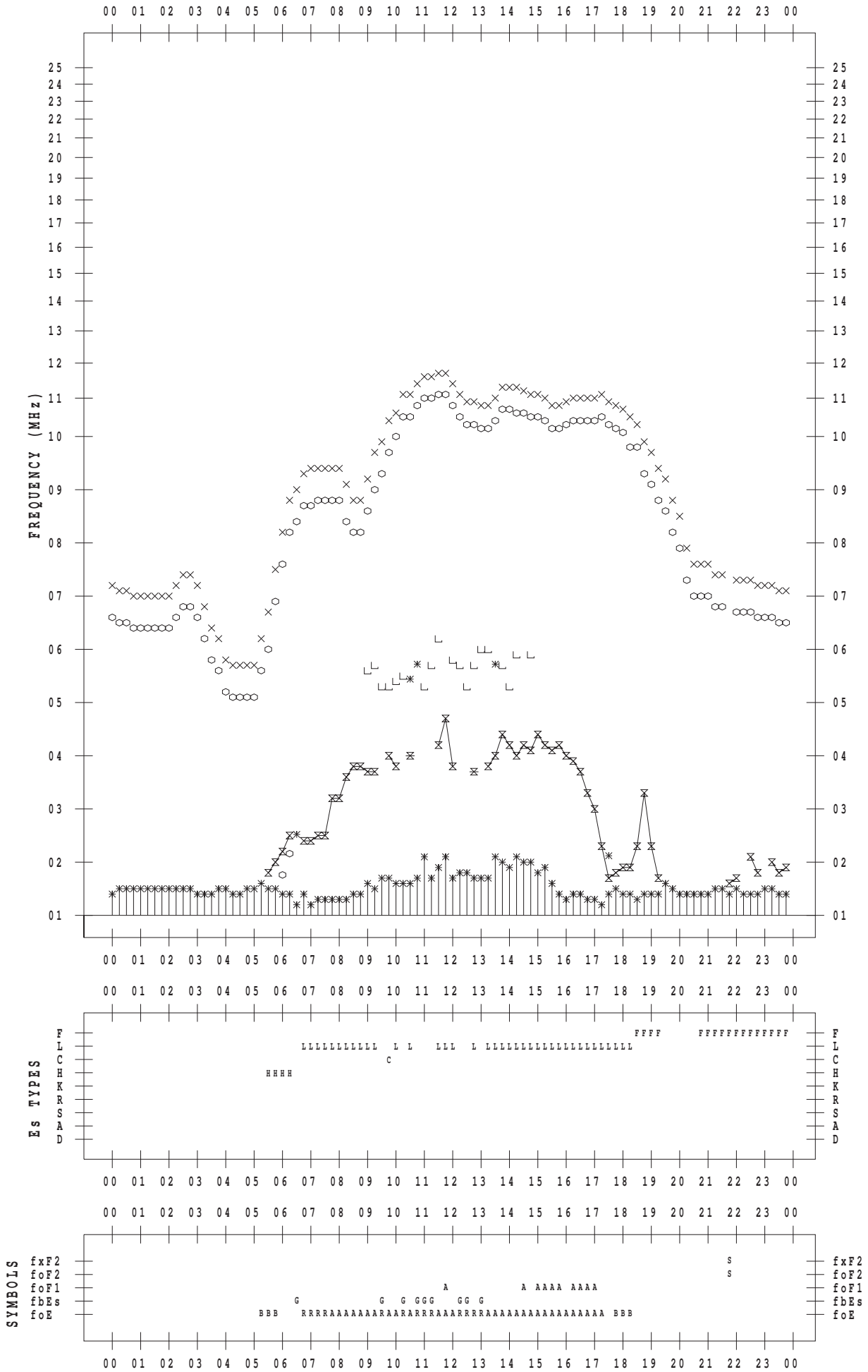
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/ 8

135 °E MEAN TIME



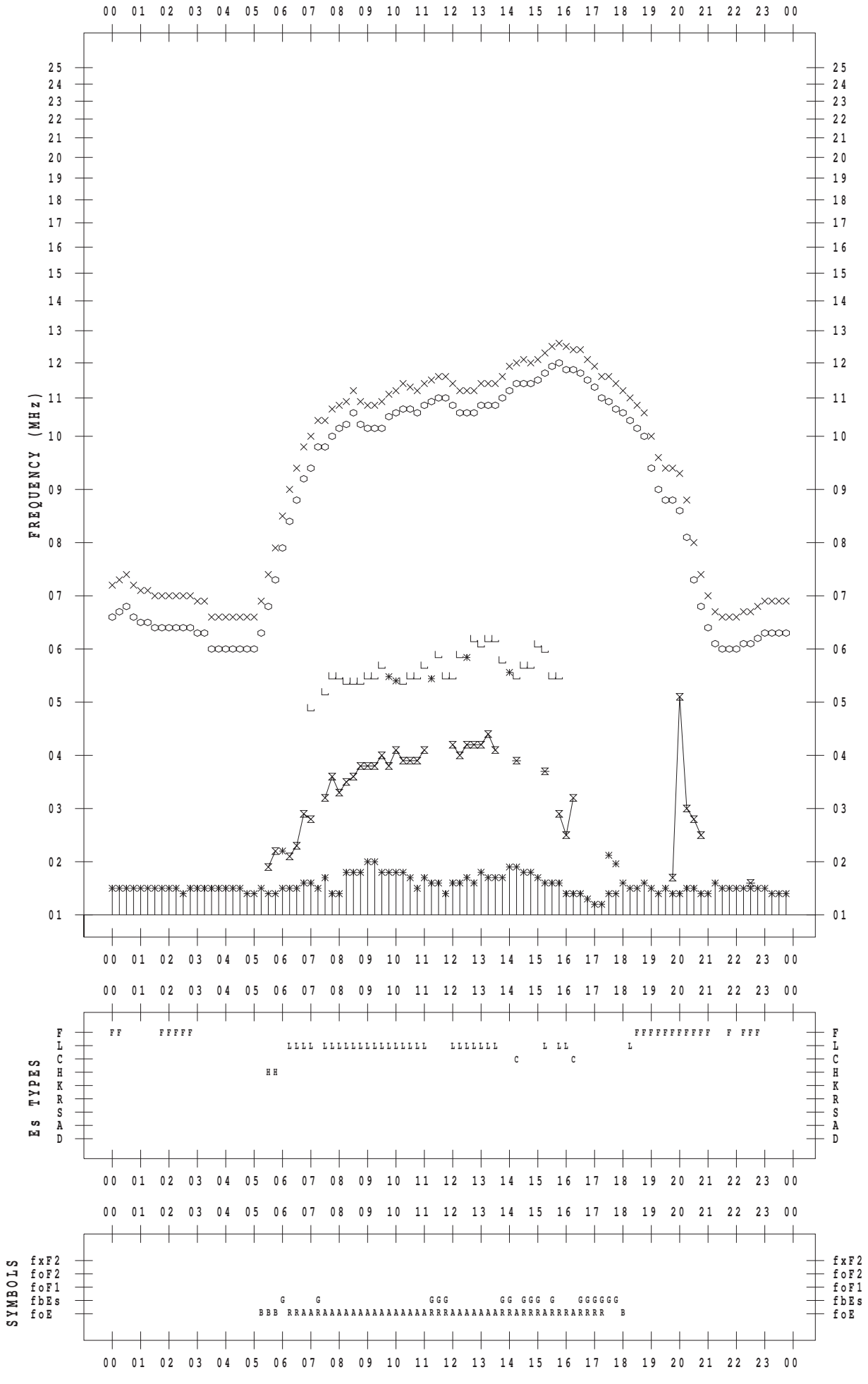
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/ 9

135 °E MEAN TIME



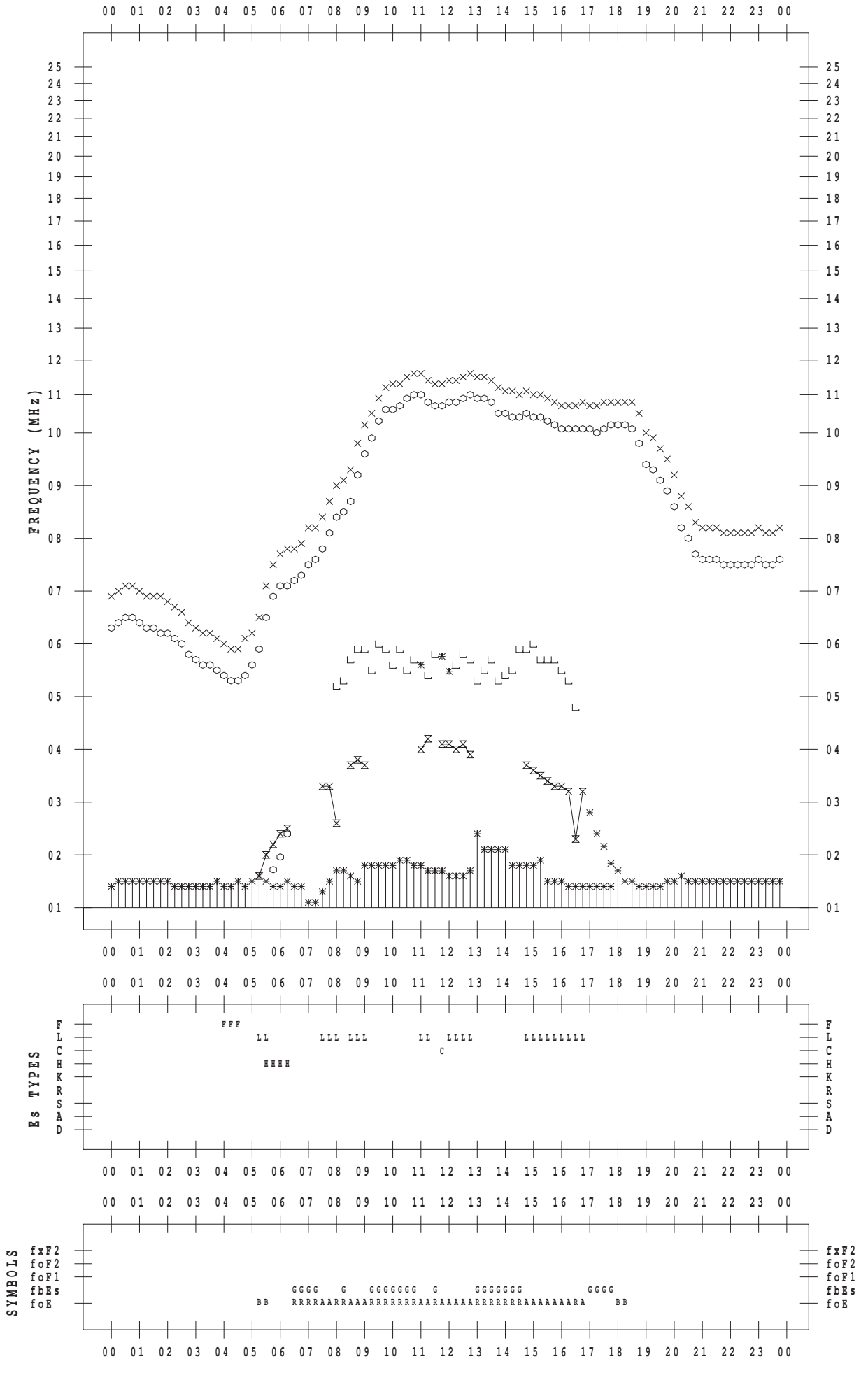
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/10

135 °E MEAN TIME



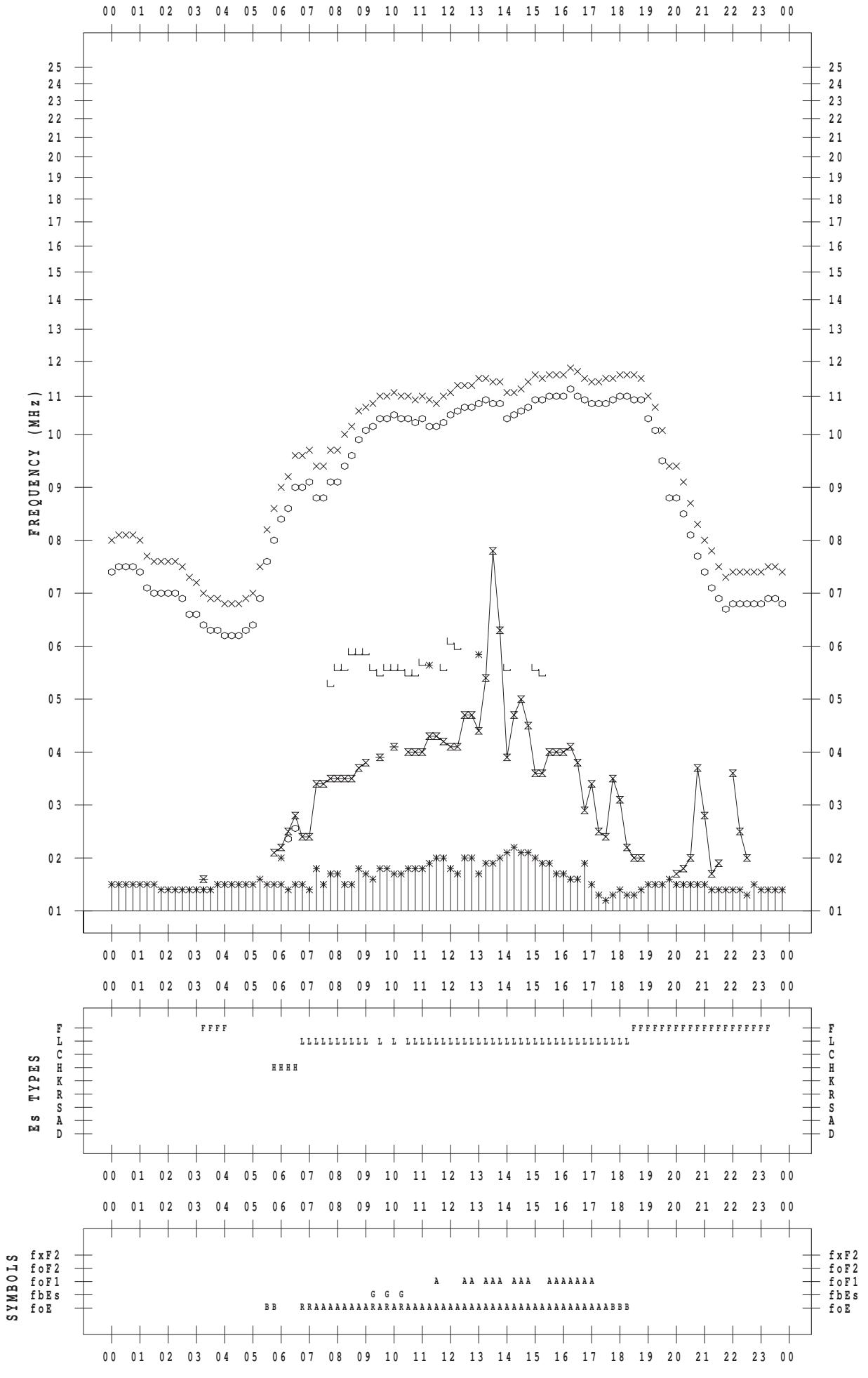
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/11

135 °E MEAN TIME



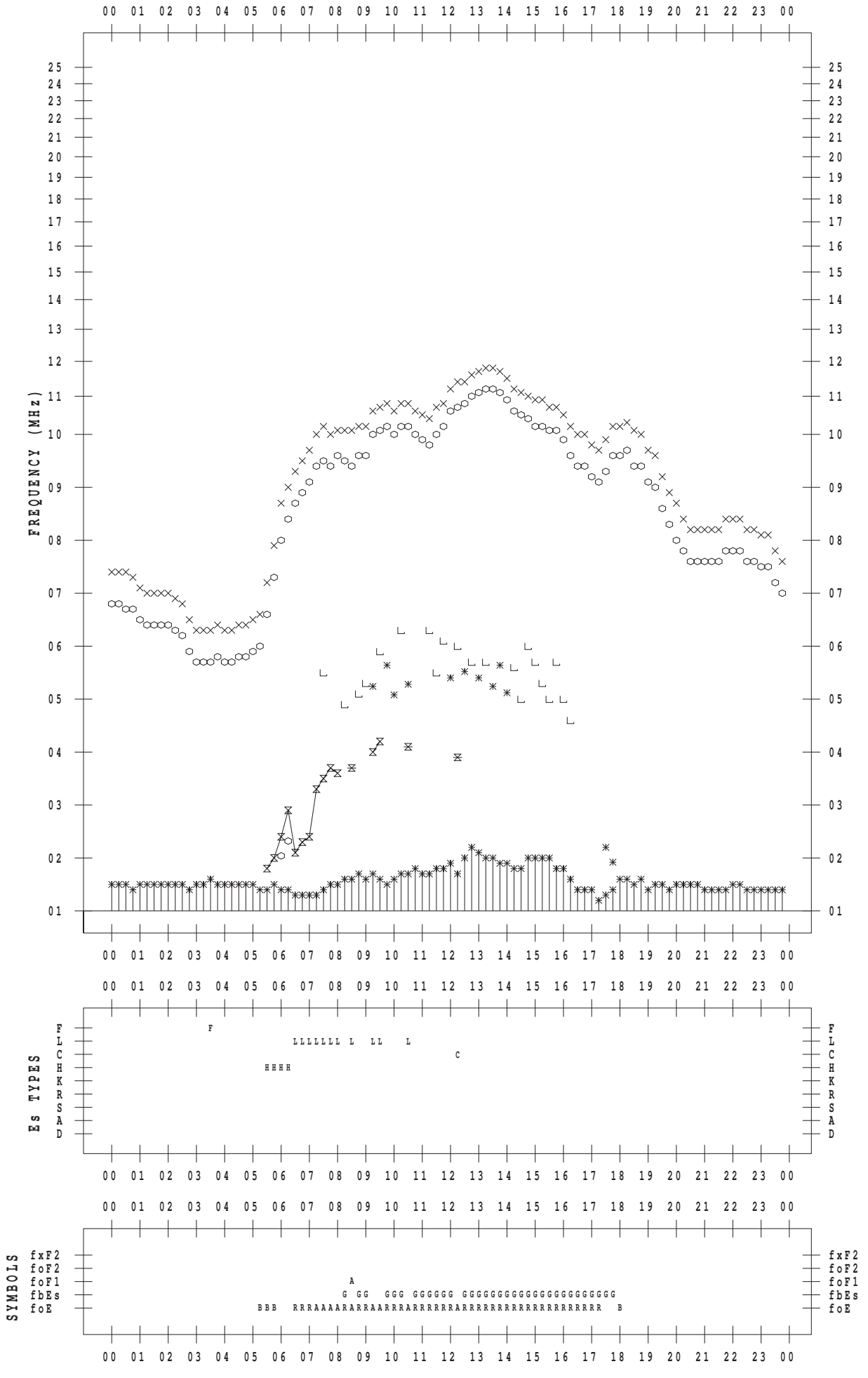
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/12

135 °E MEAN TIME



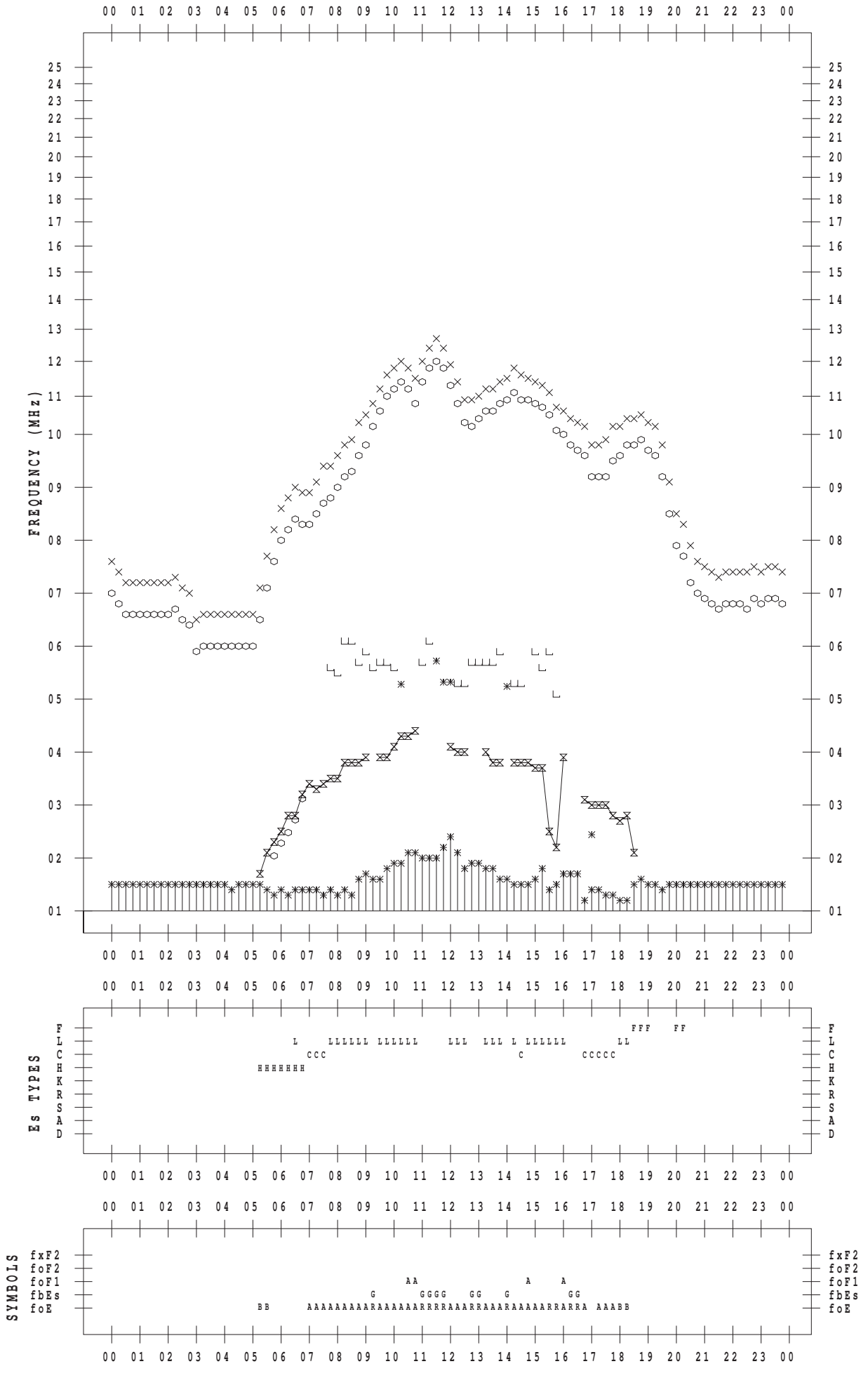
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/13

135 °E MEAN TIME



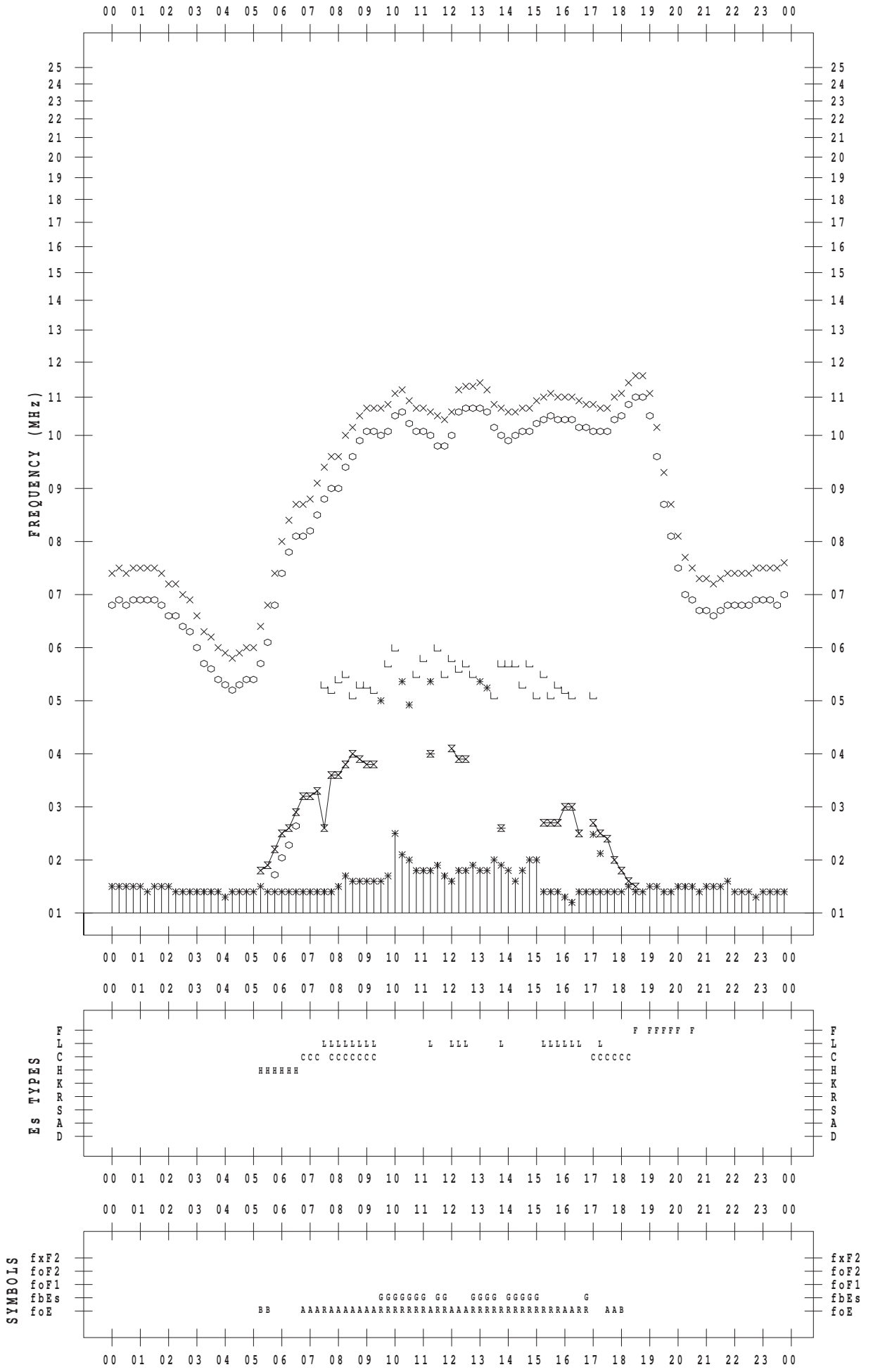
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/14

135 °E MEAN TIME



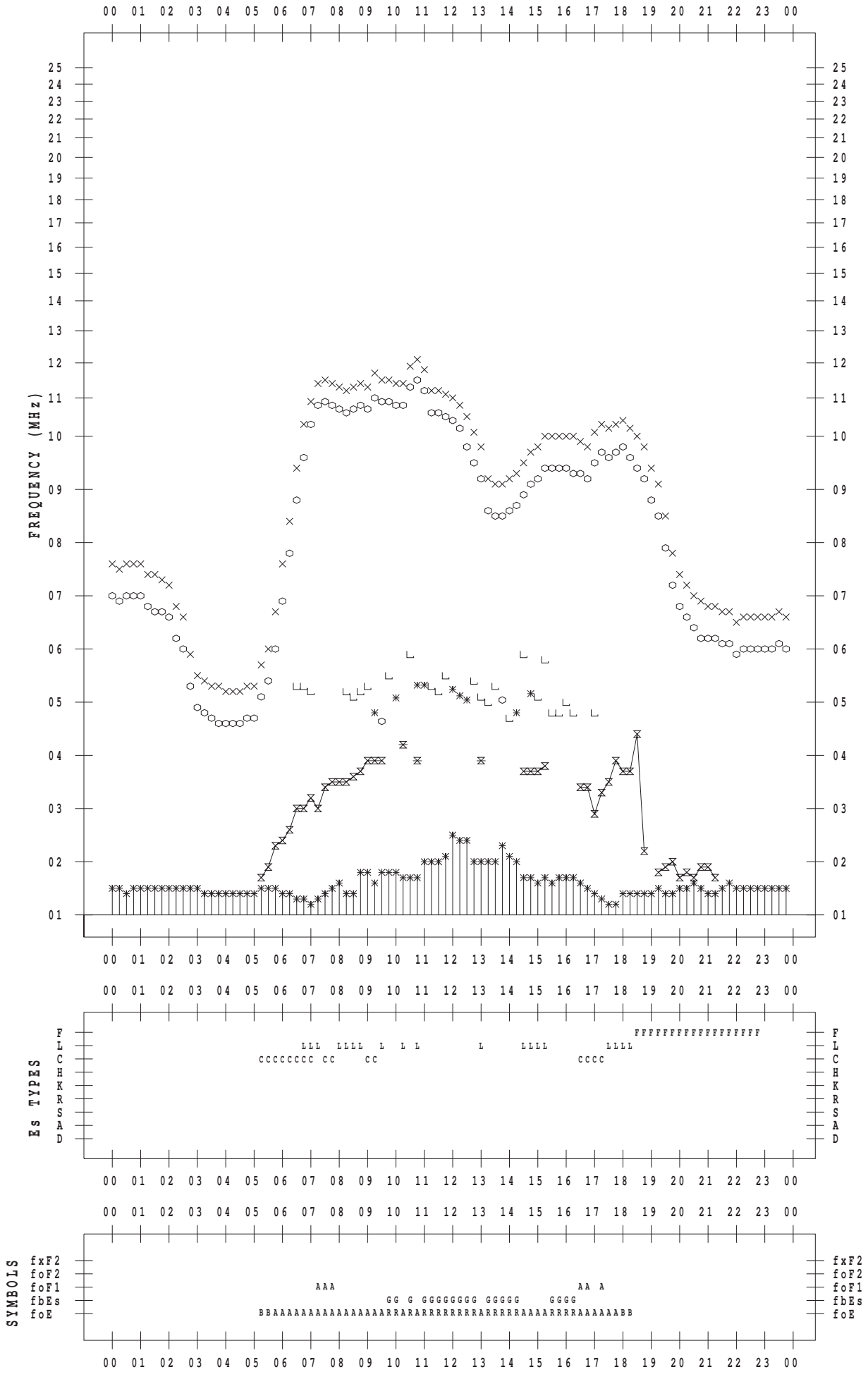
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/15

135 °E MEAN TIME



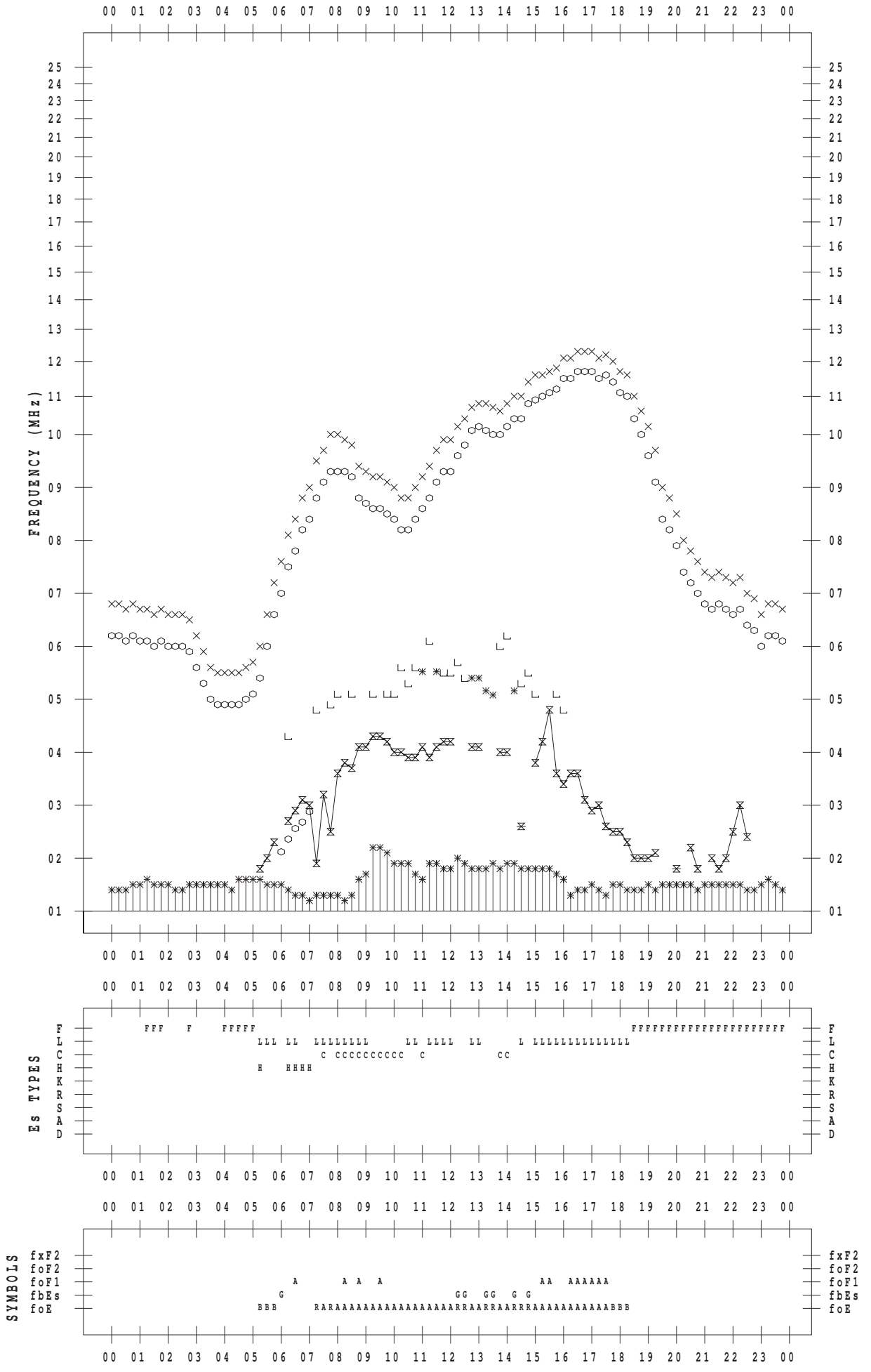
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/16

135 °E MEAN TIME



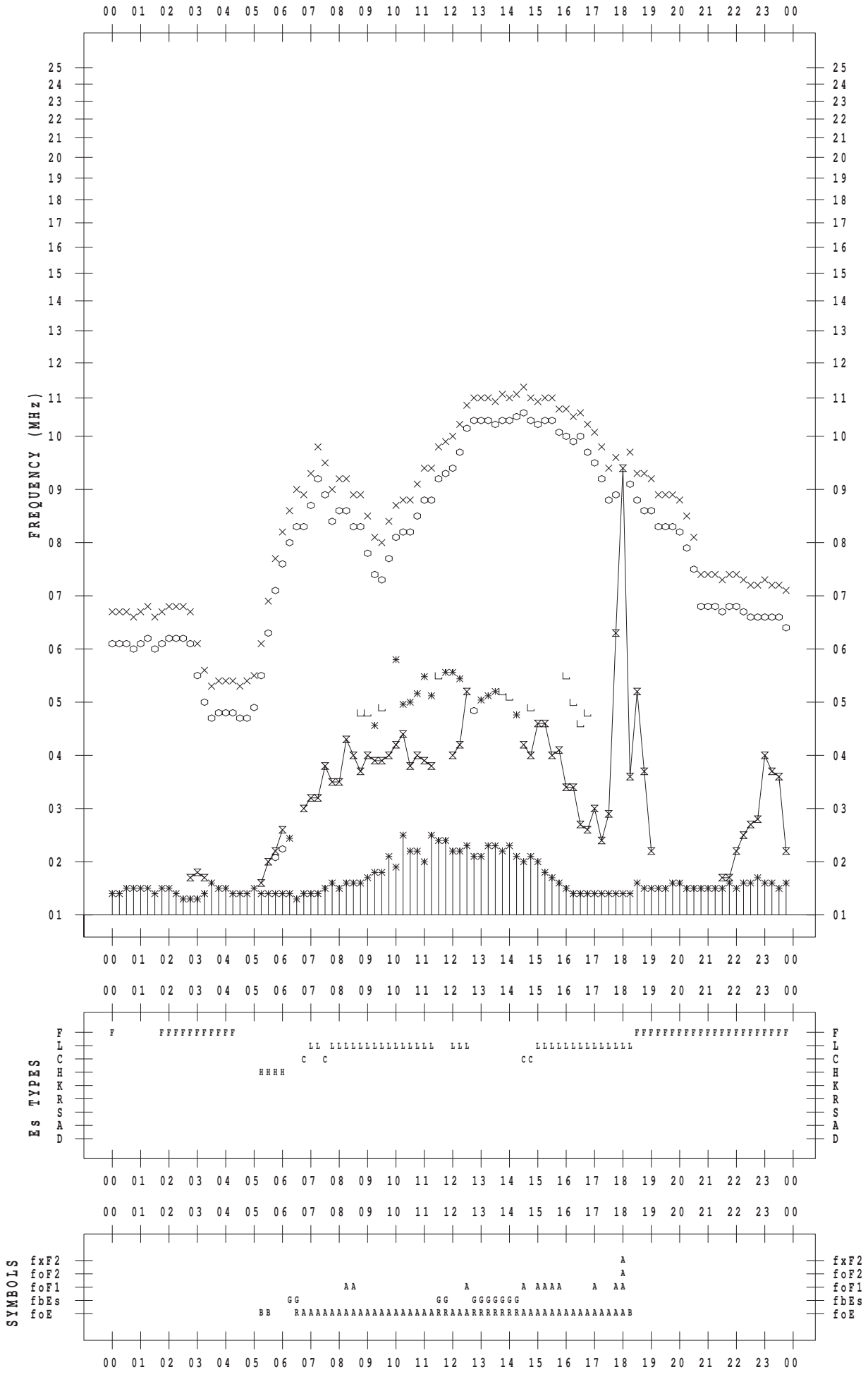
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/17

135 °E MEAN TIME



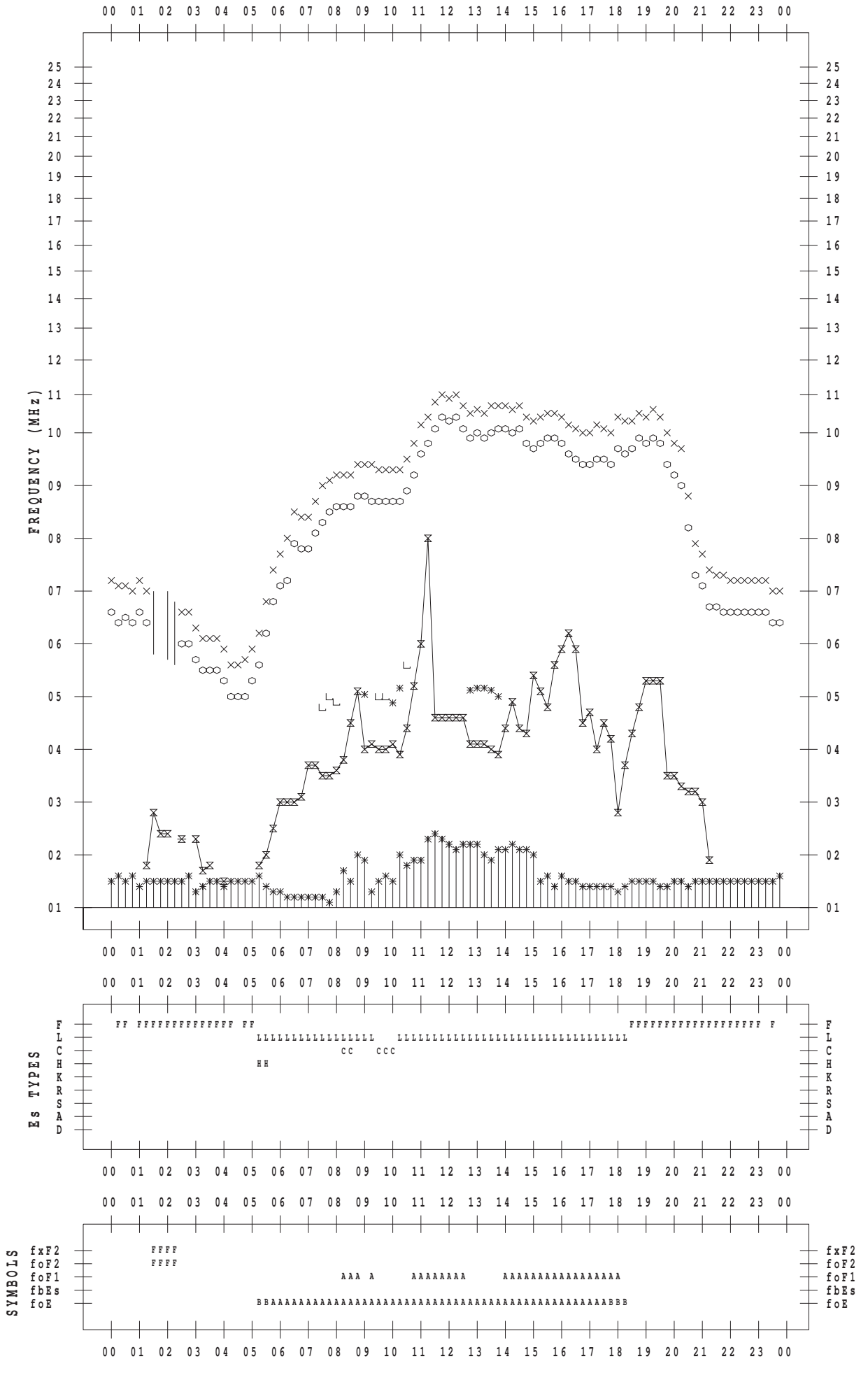
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/18

135 °E MEAN TIME



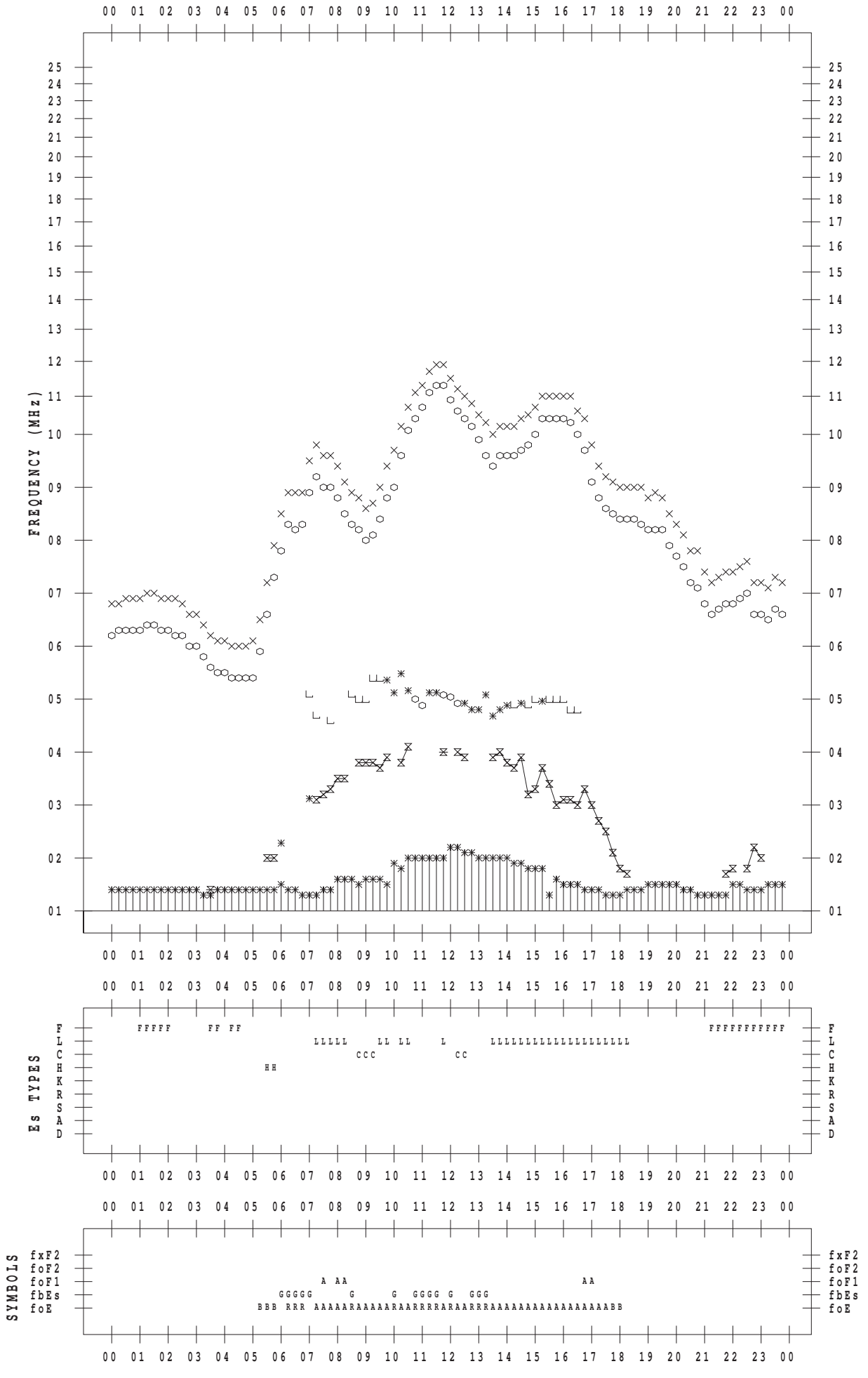
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/19

135 °E MEAN TIME



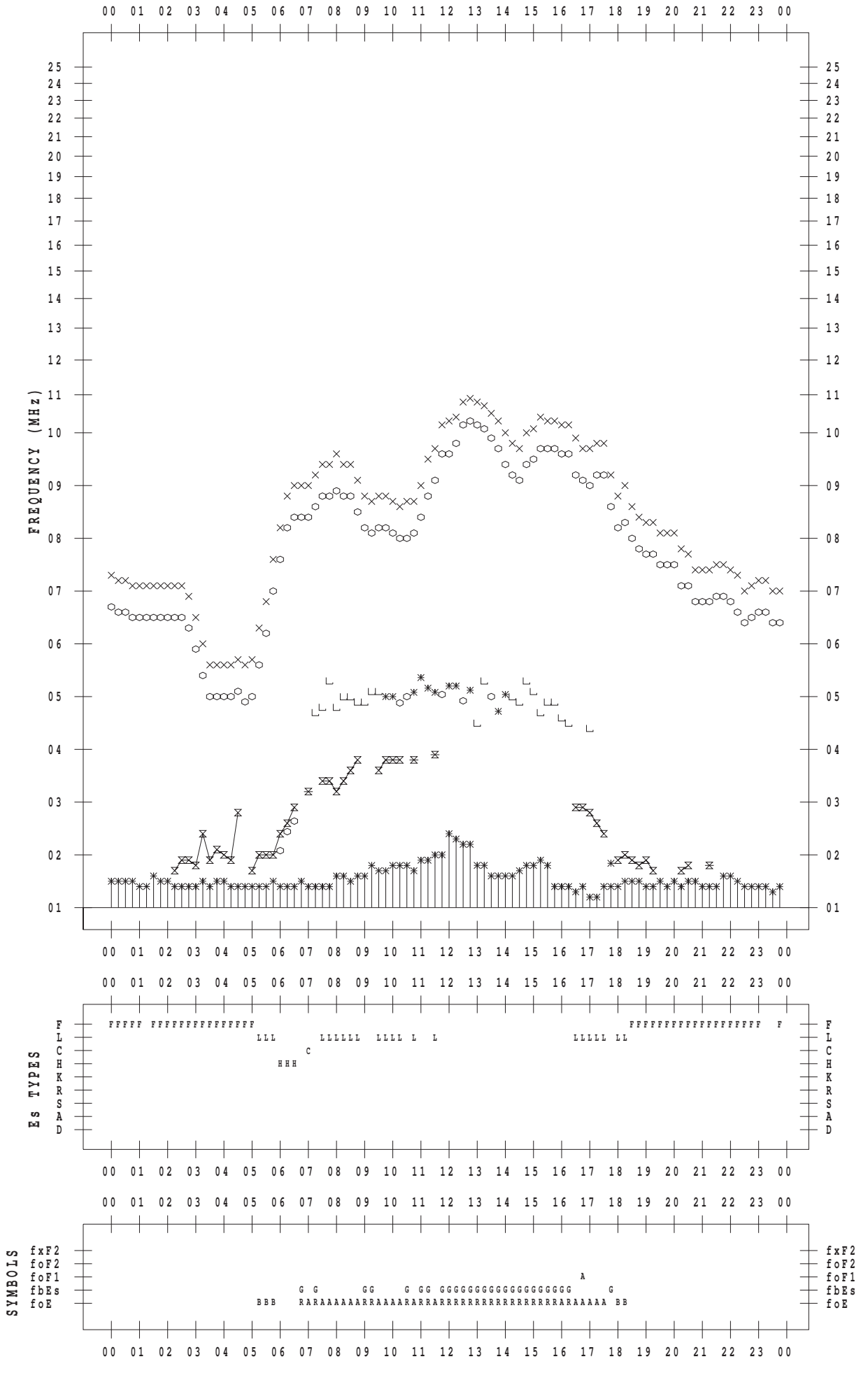
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/20

135 °E MEAN TIME



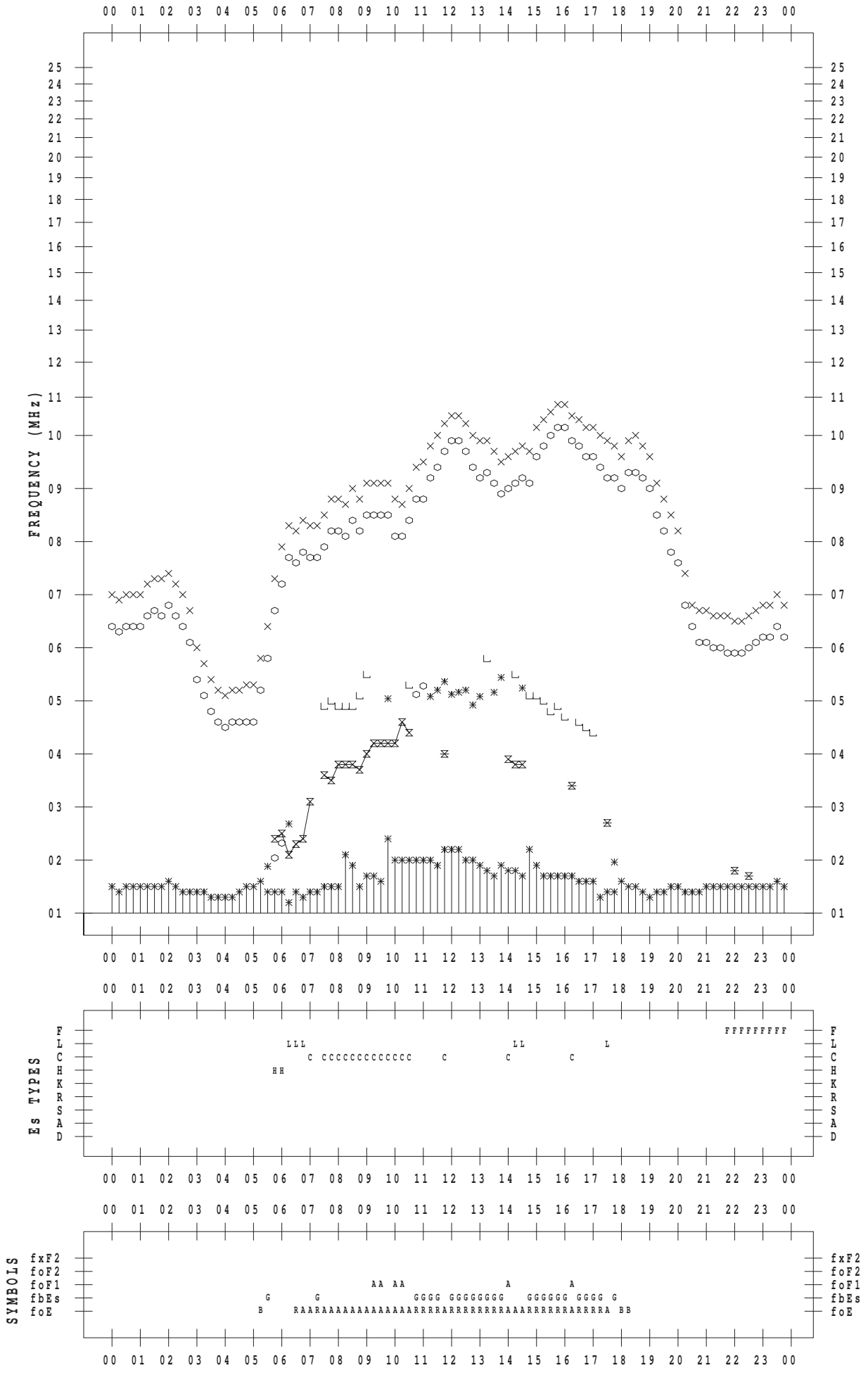
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/21

135 °E MEAN TIME



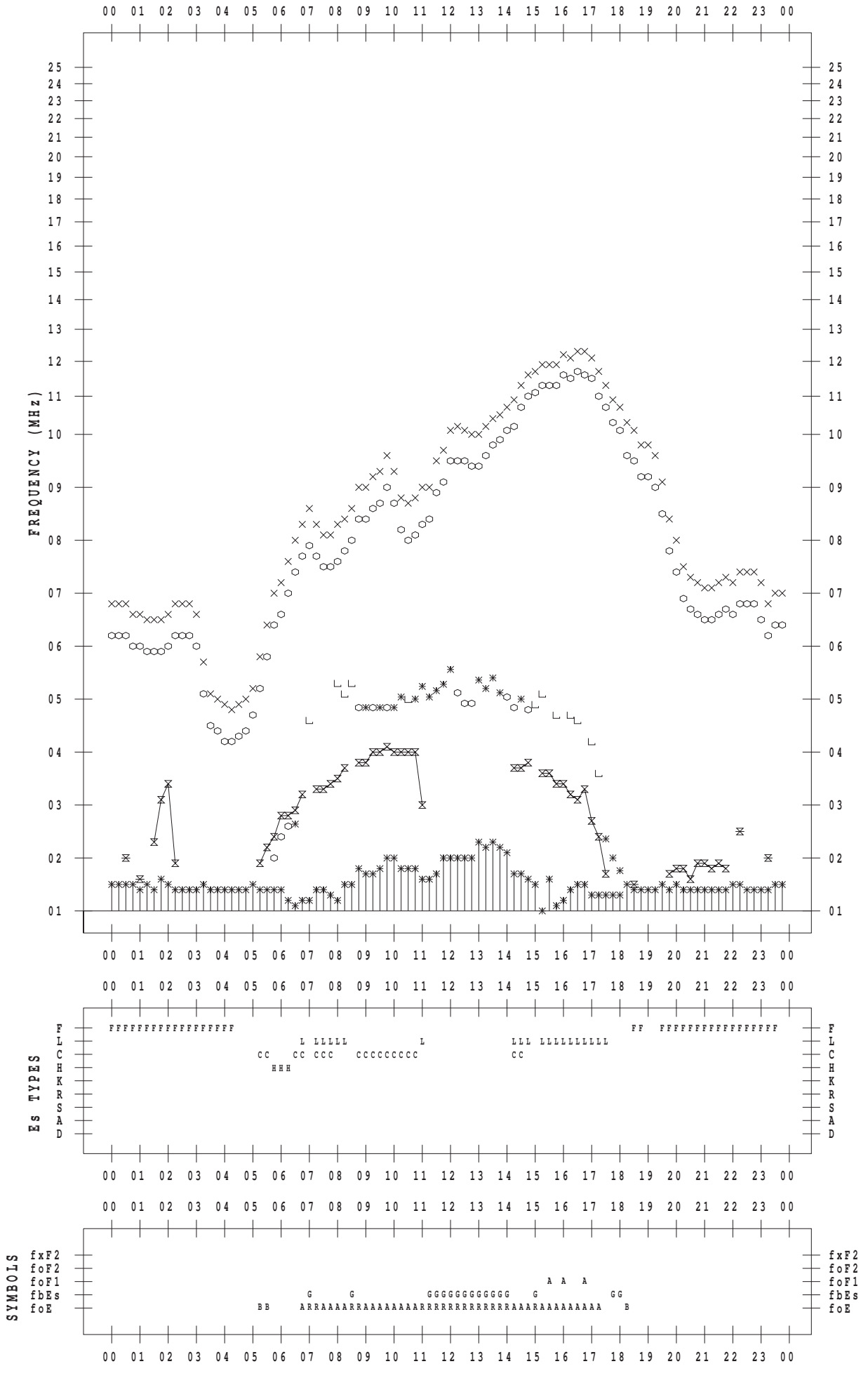
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/22

135 °E MEAN TIME



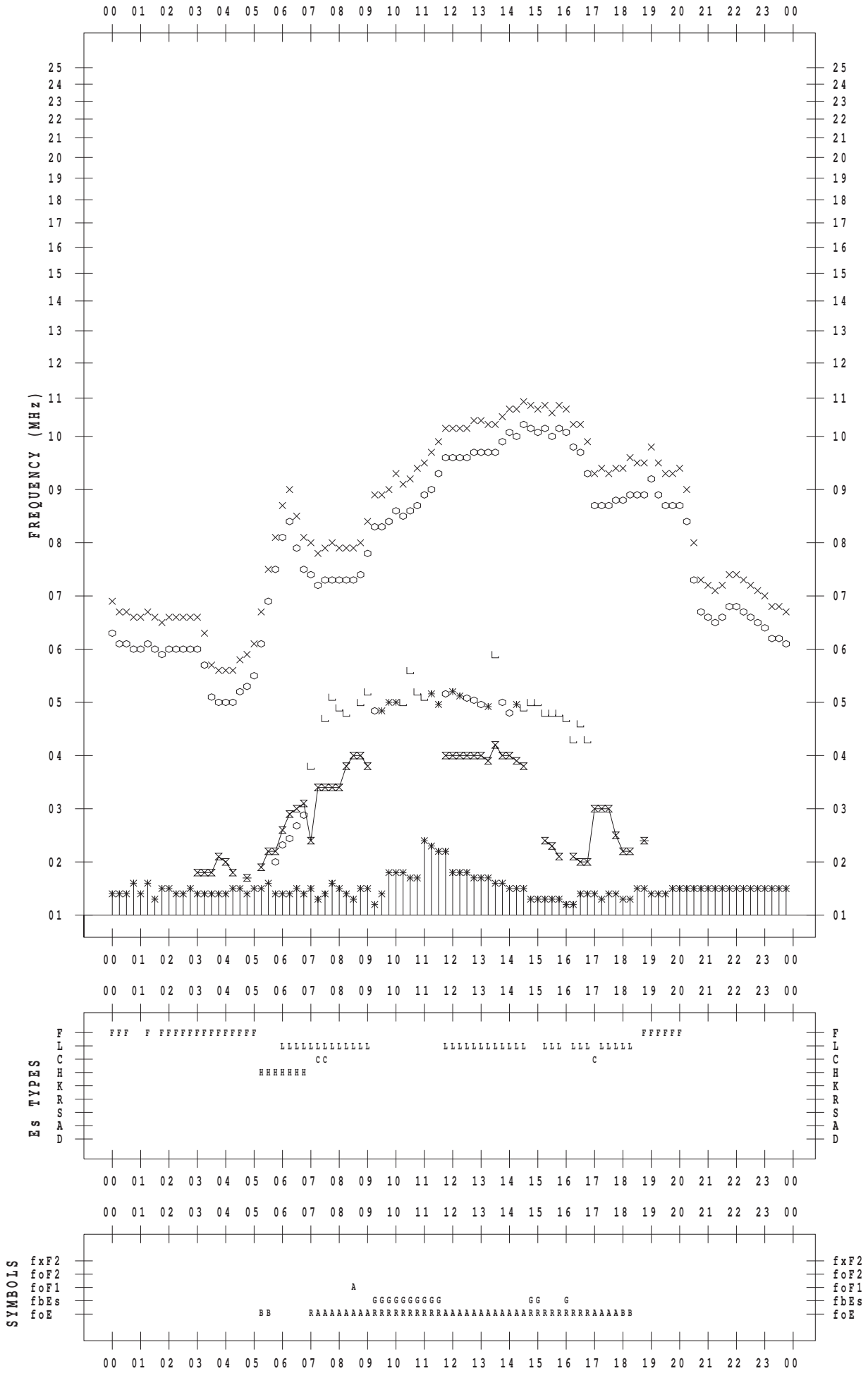
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/23

135 °E MEAN TIME



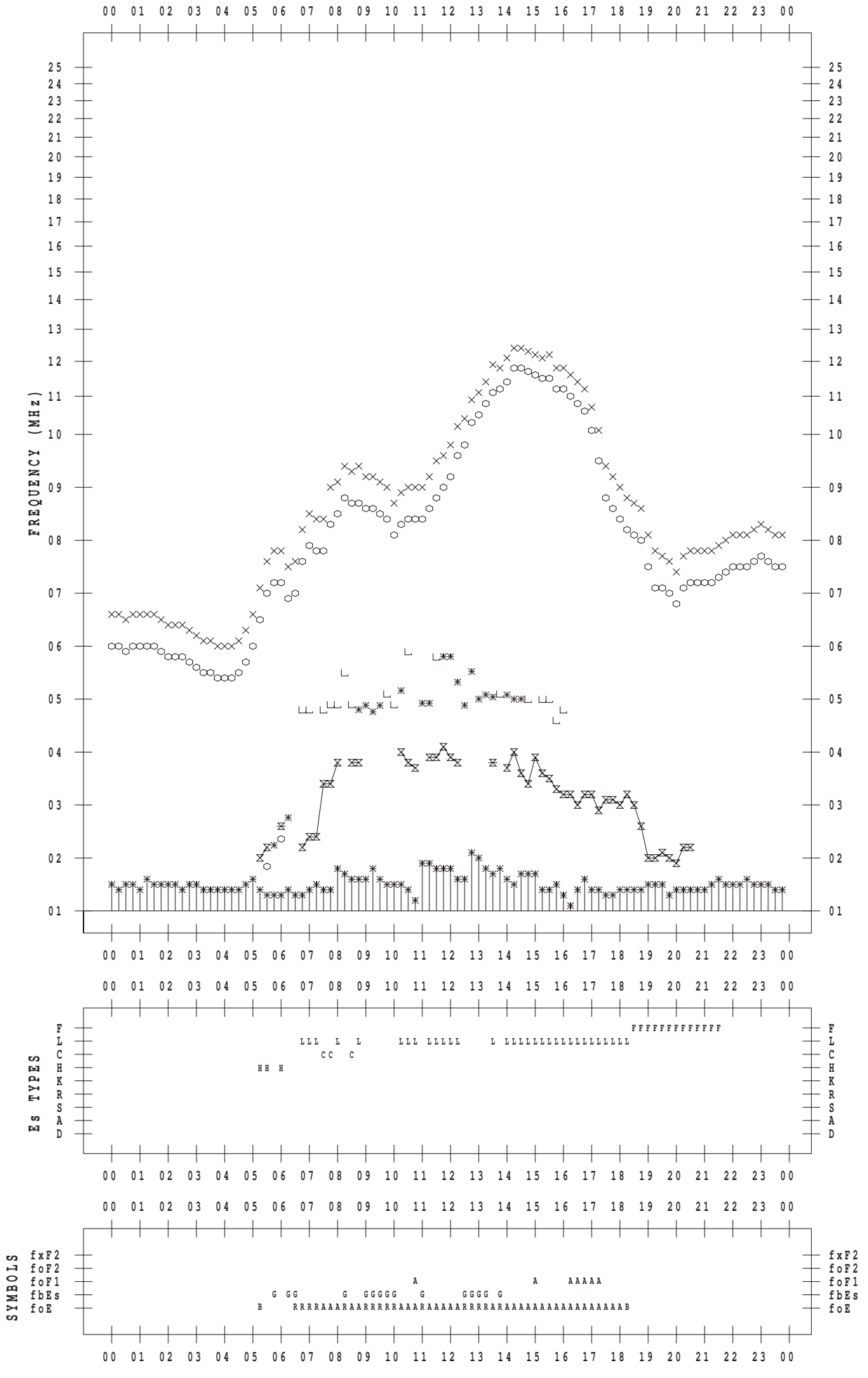
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/24

135 °E MEAN TIME



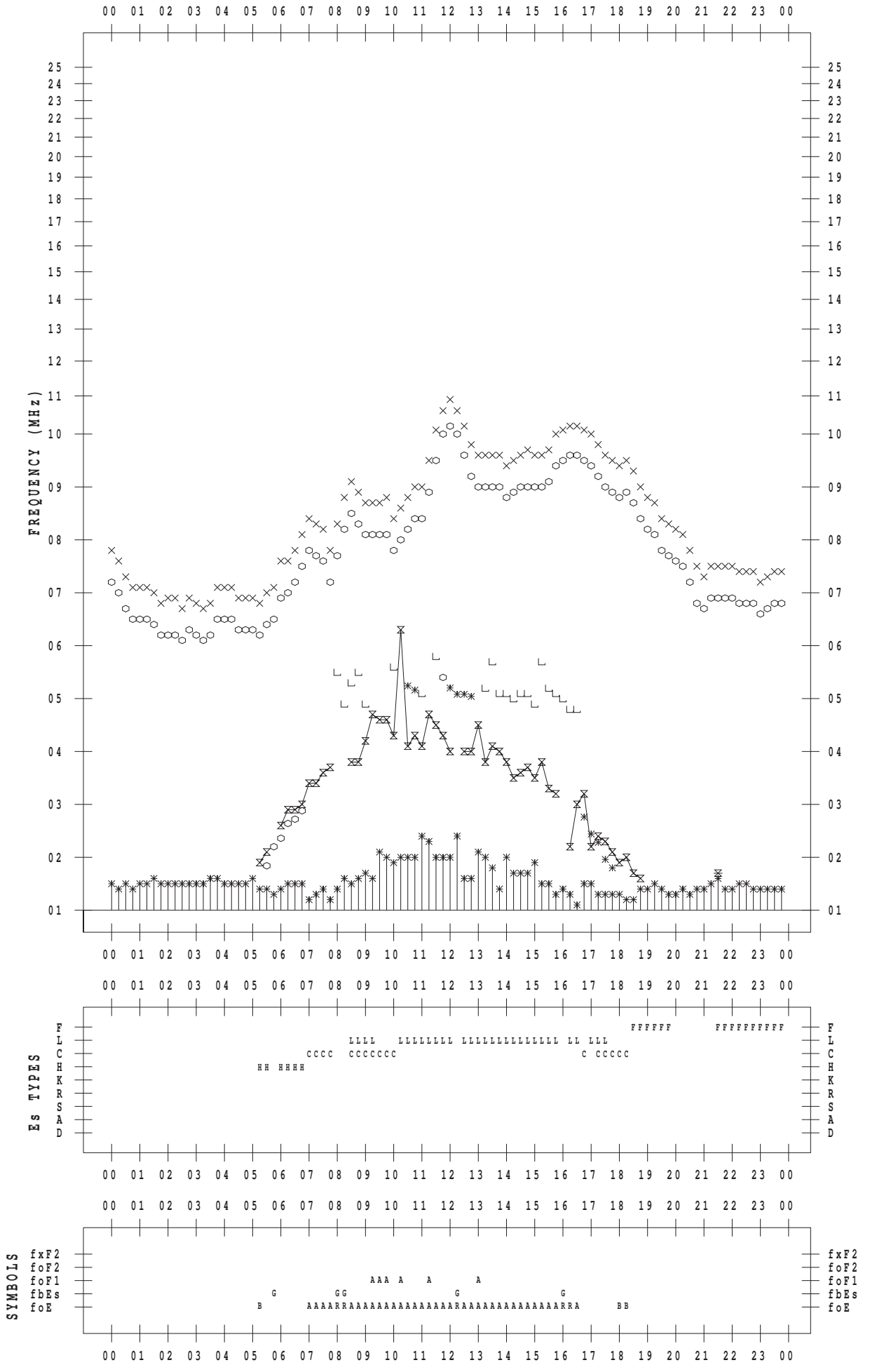
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/25

135 °E MEAN TIME



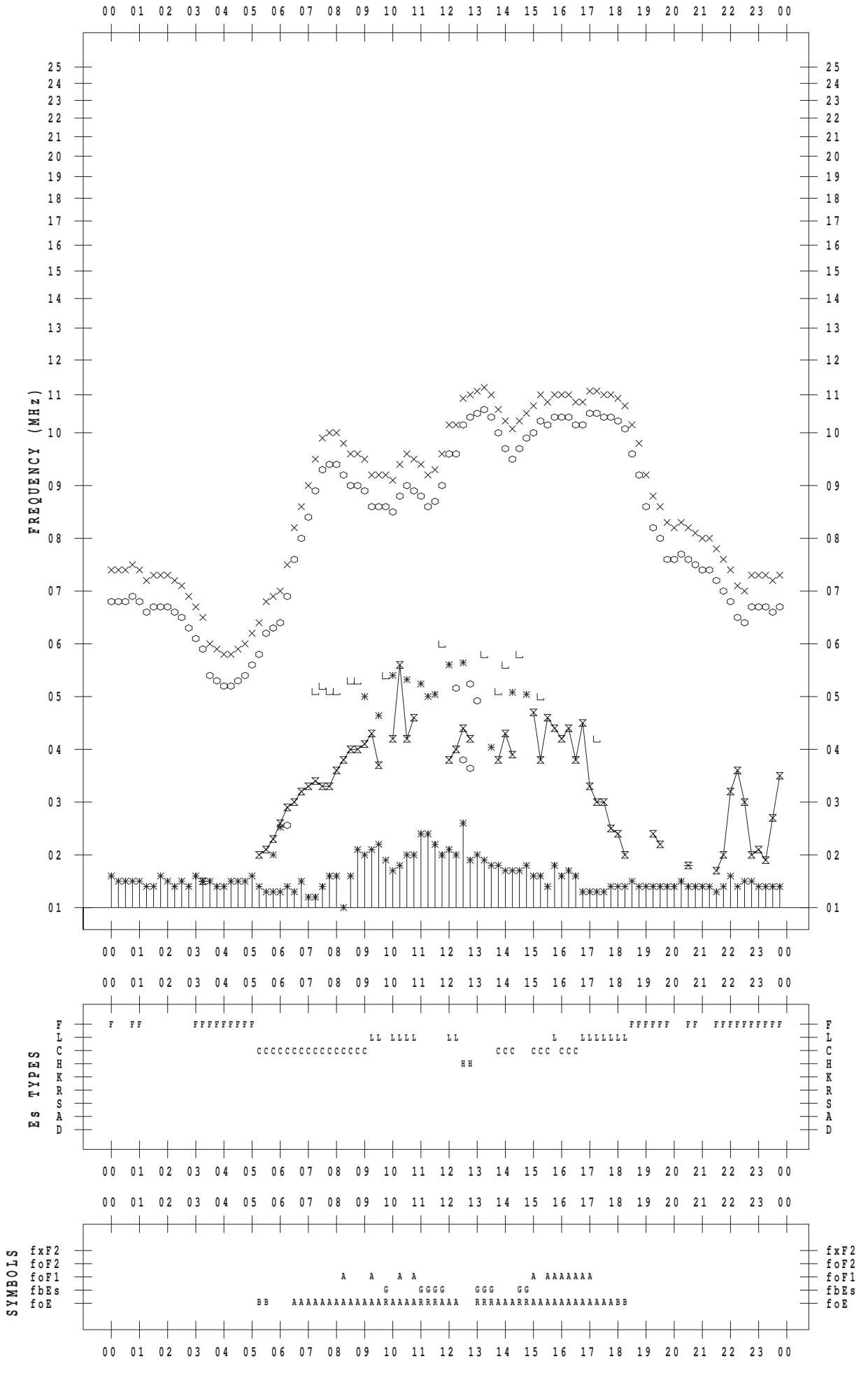
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/26

135 °E MEAN TIME



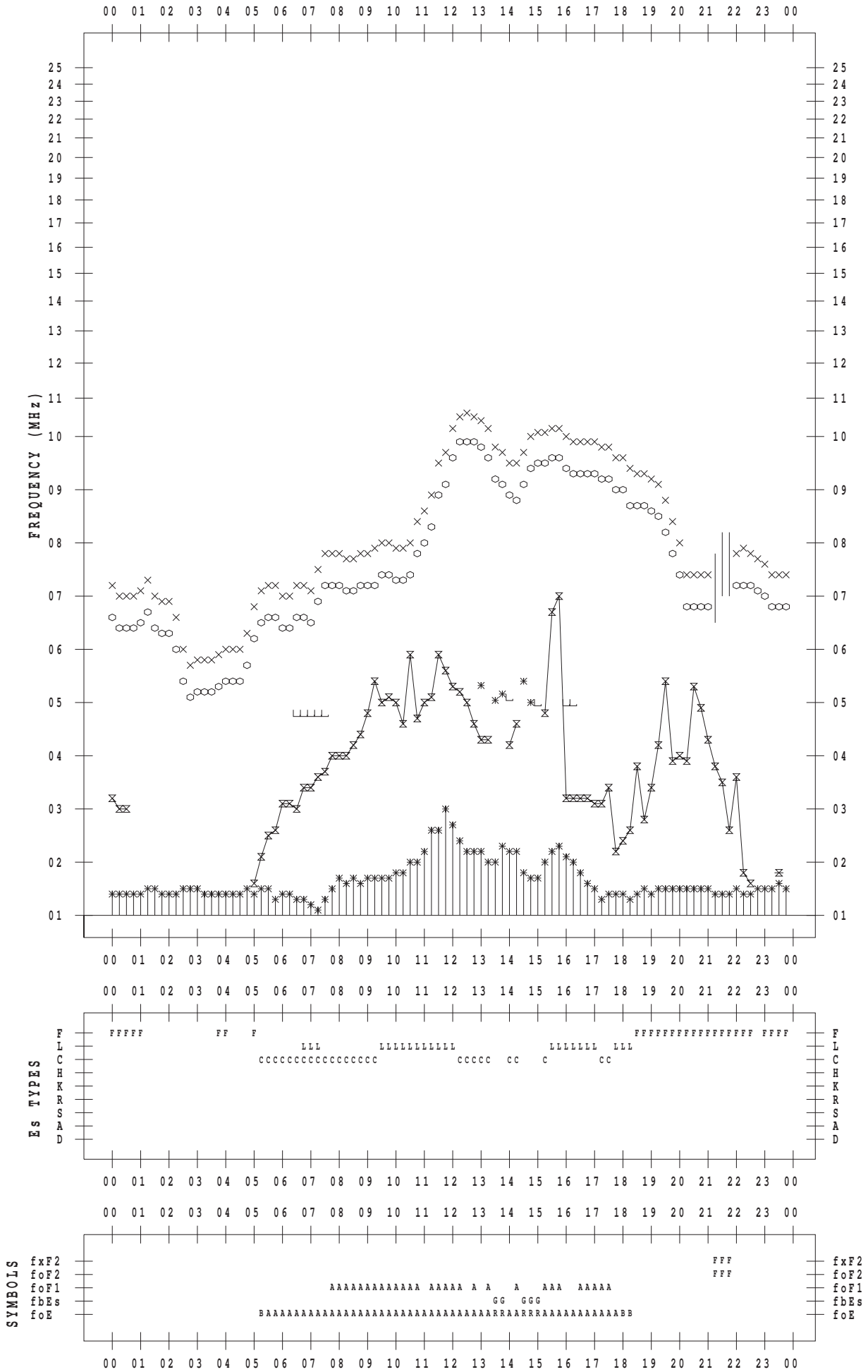
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/27

135 °E MEAN TIME



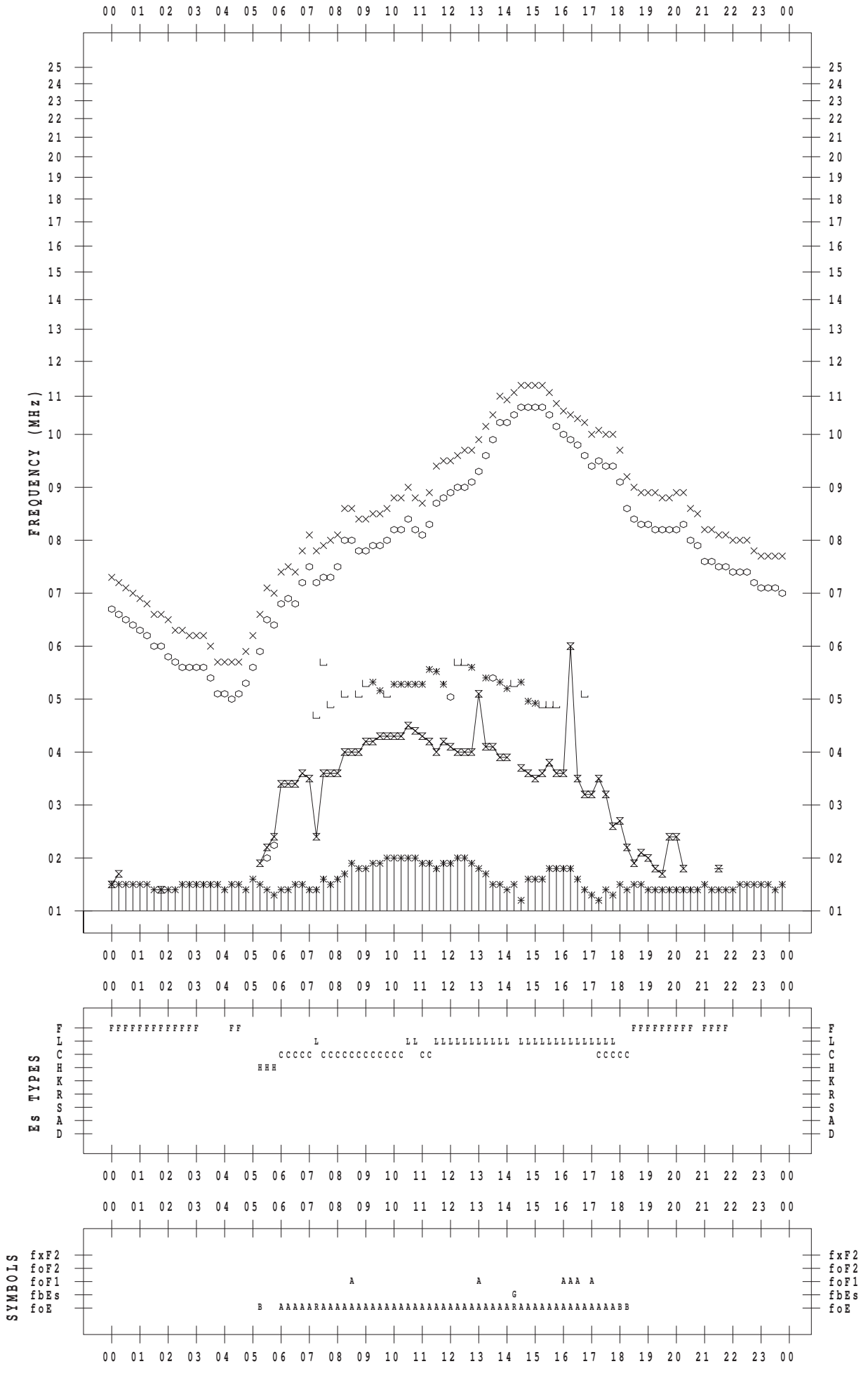
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/28

135 °E MEAN TIME



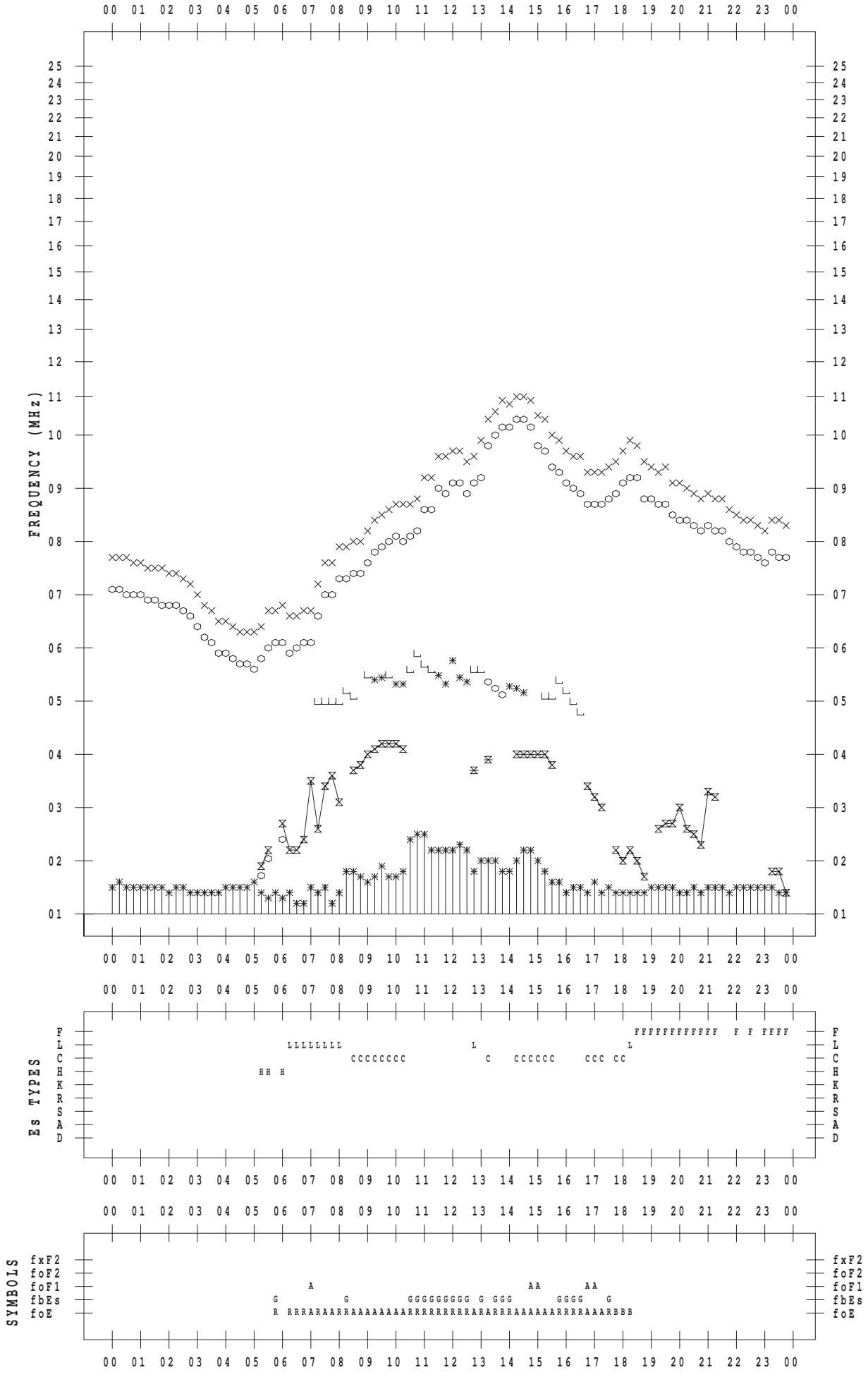
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/29

135 °E MEAN TIME



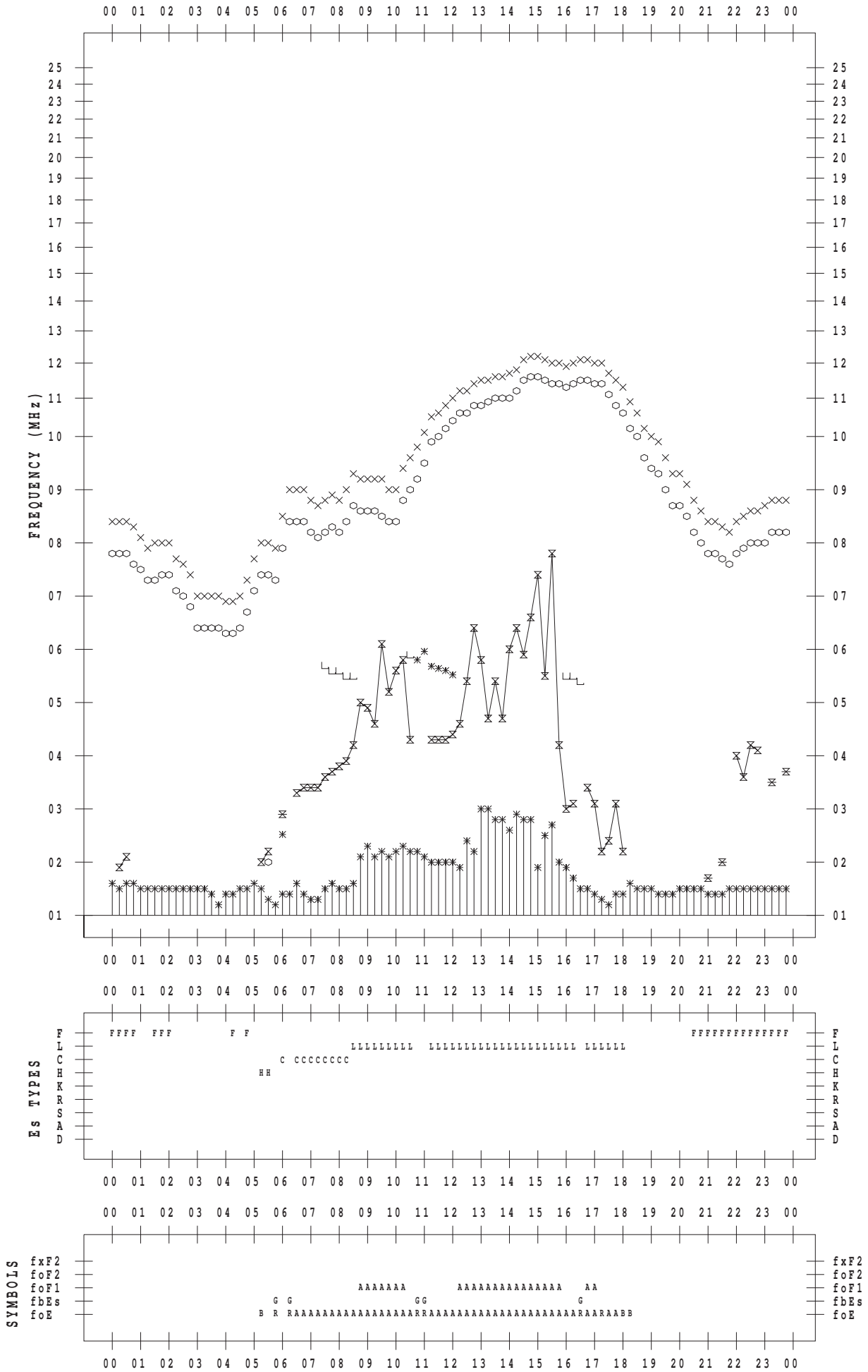
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 4/30

135 °E MEAN TIME



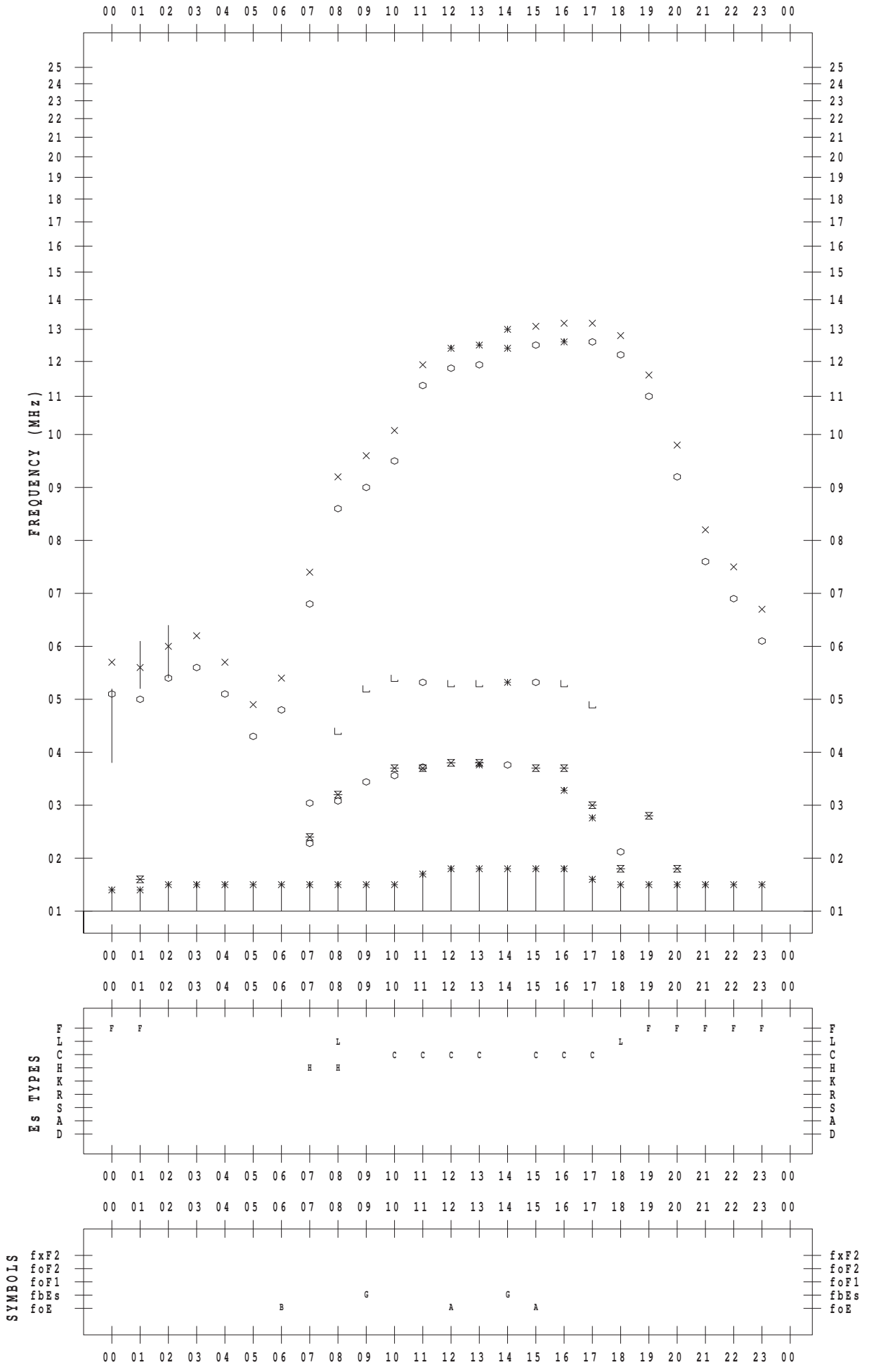
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 1

135 °E MEAN TIME



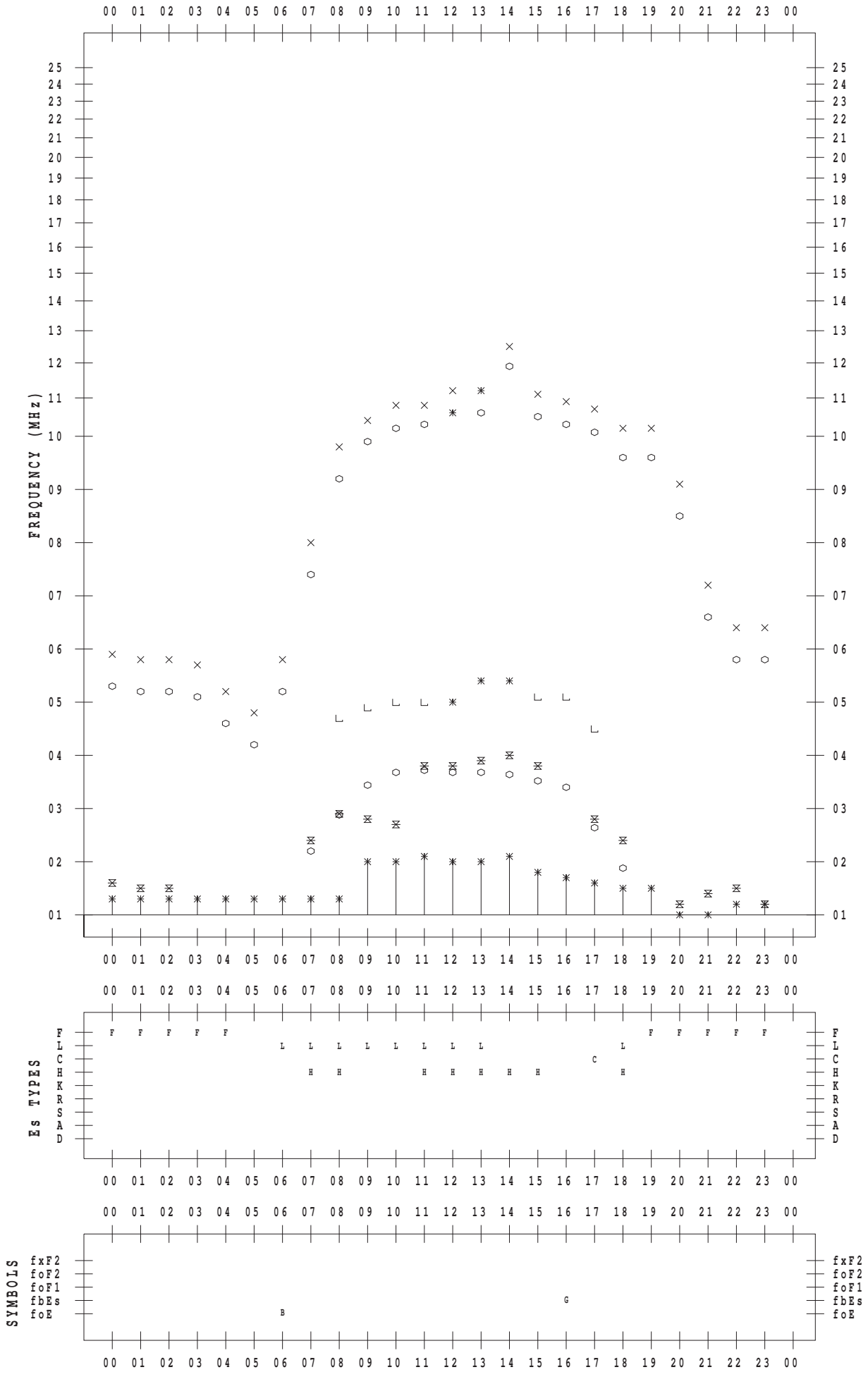
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 2

135 °E MEAN TIME



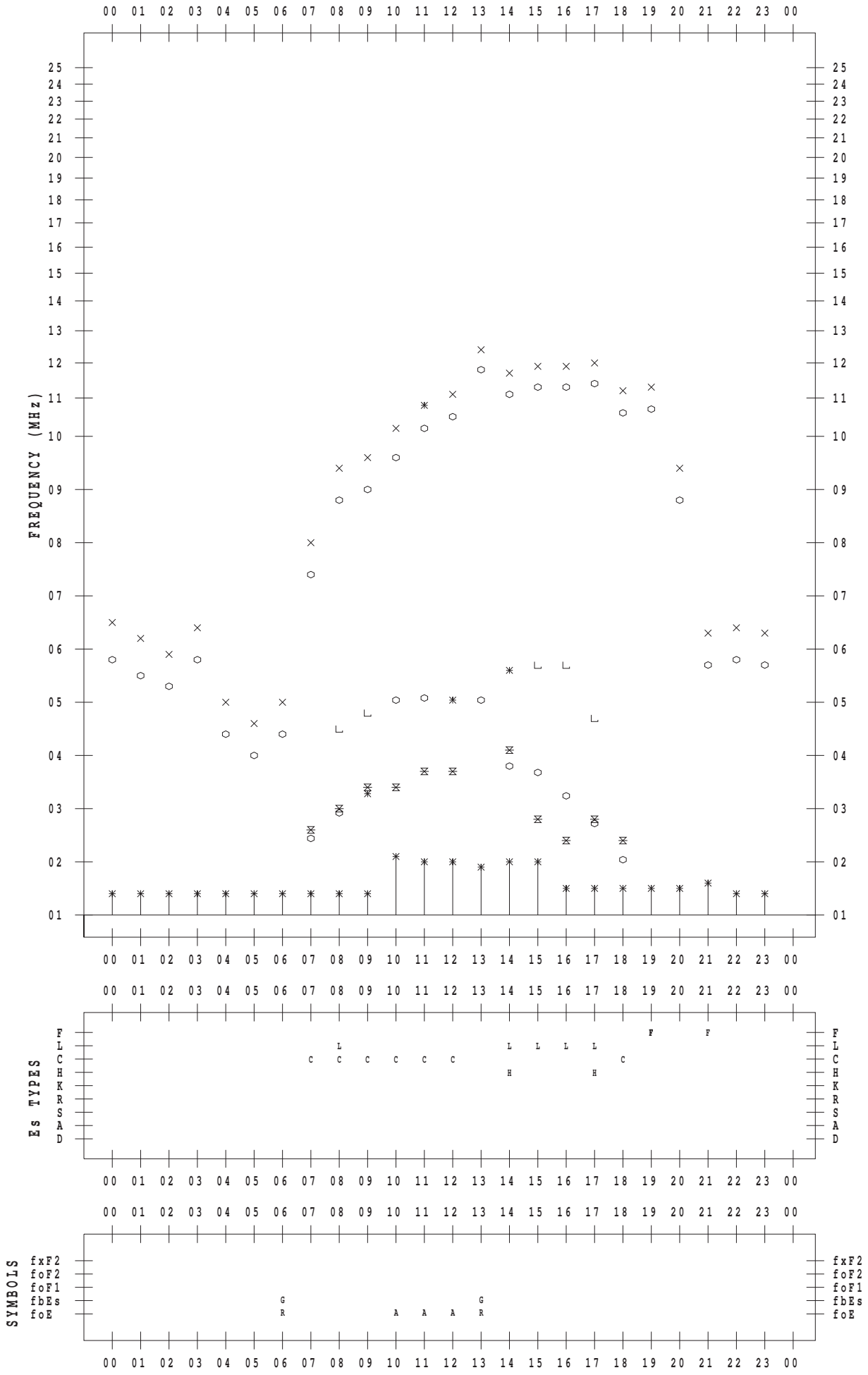
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 3

135 °E MEAN TIME



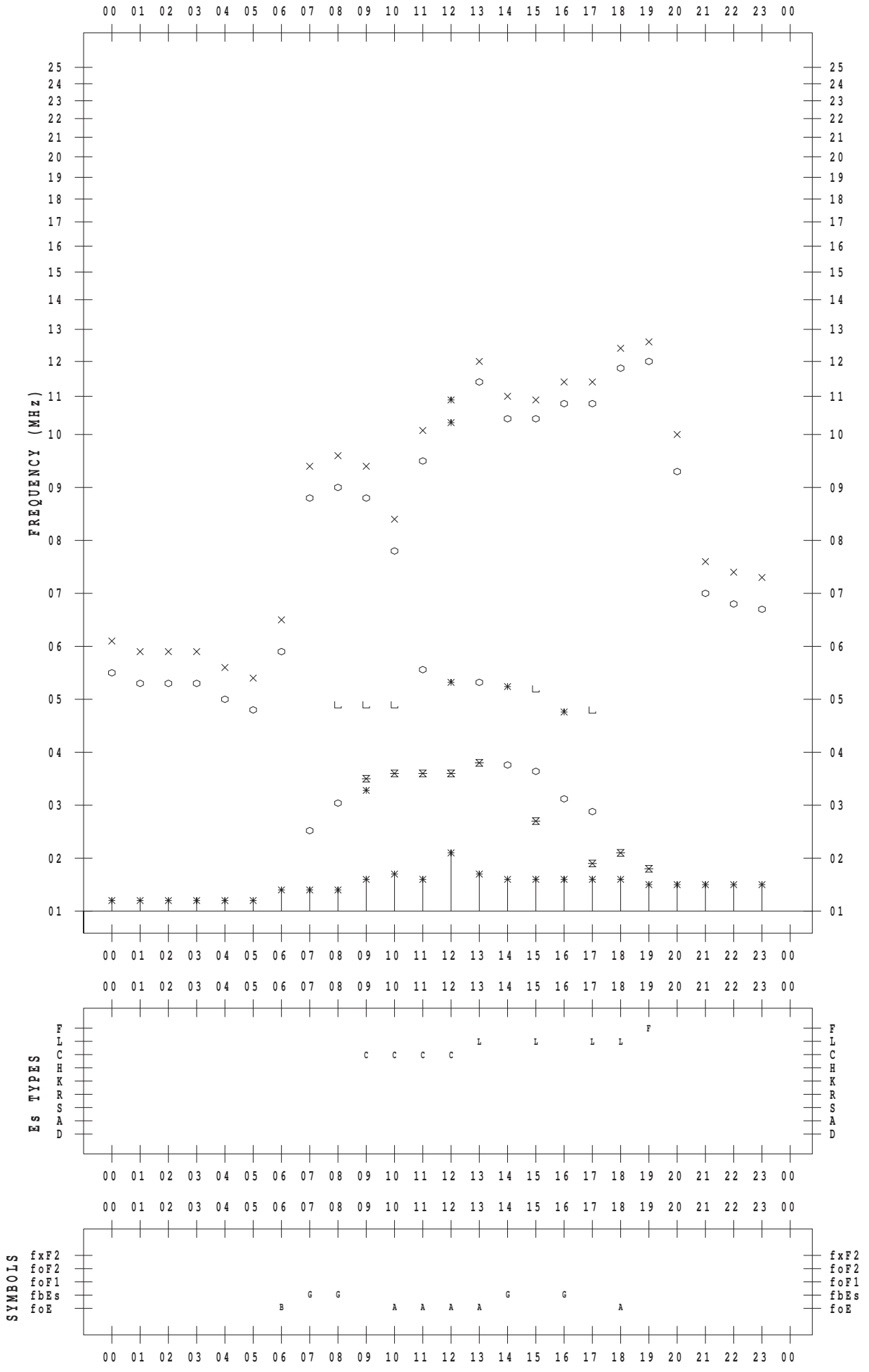
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 4

135 °E MEAN TIME



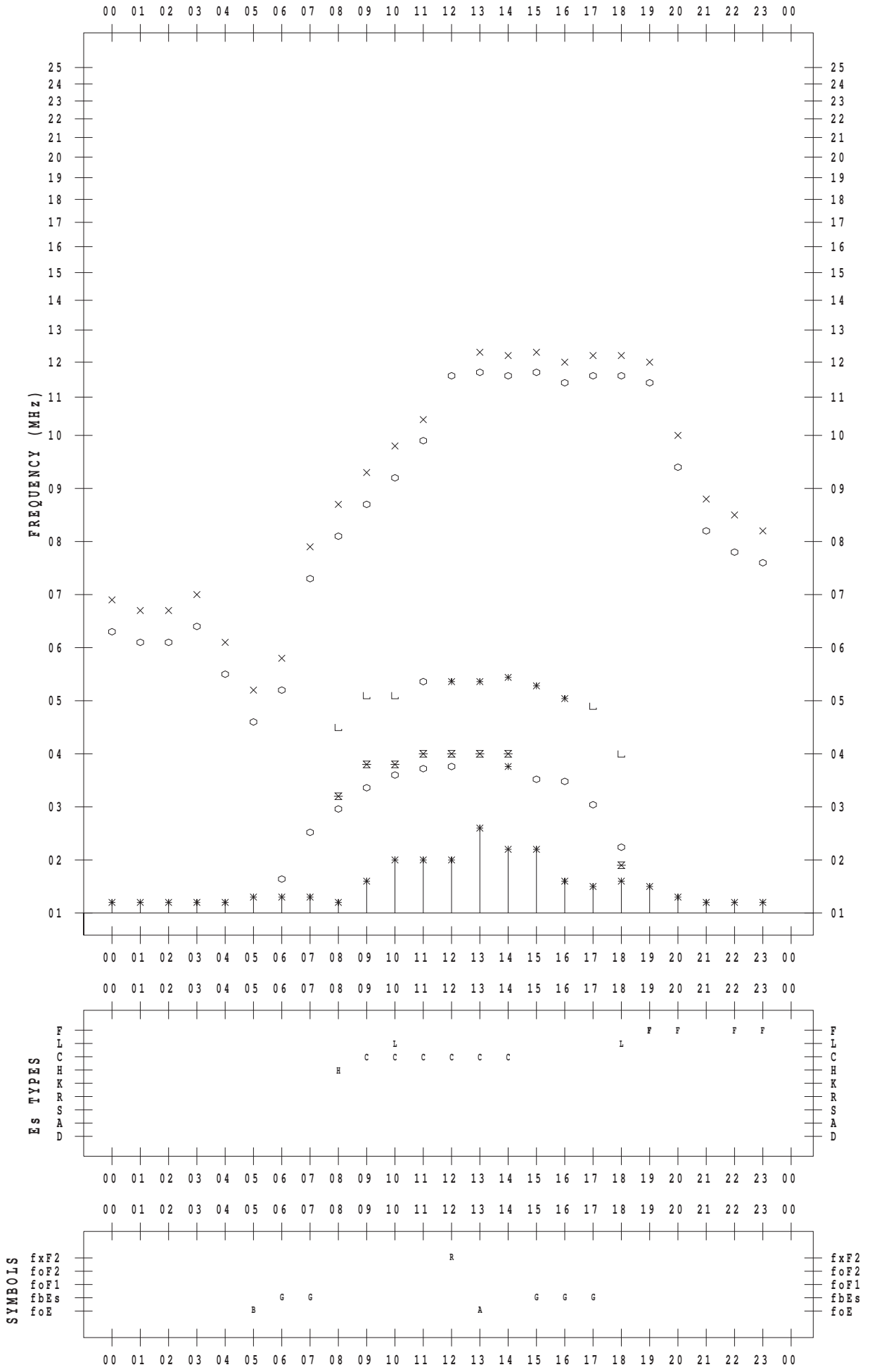
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 5

135 °E MEAN TIME



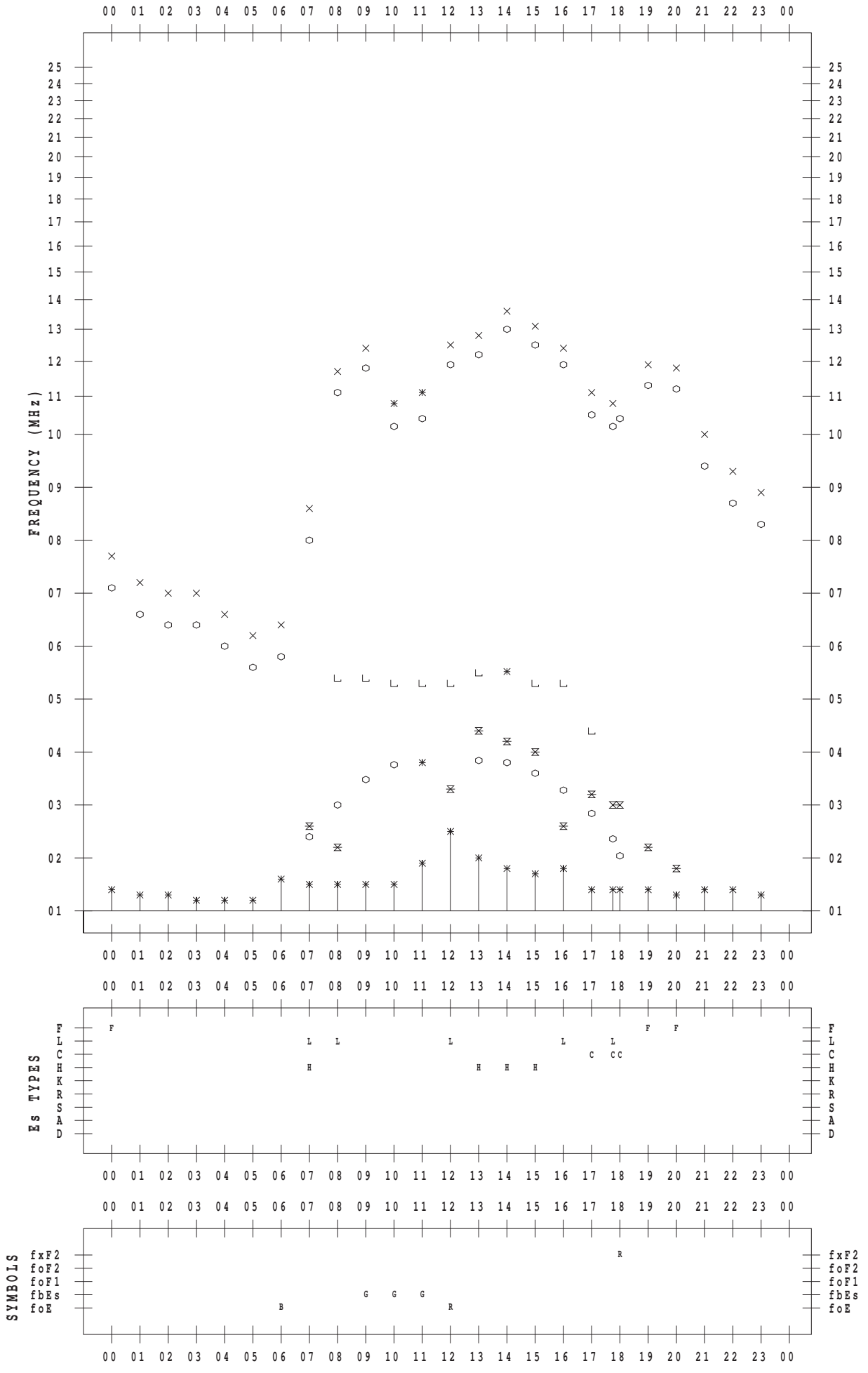
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 6

135 °E MEAN TIME



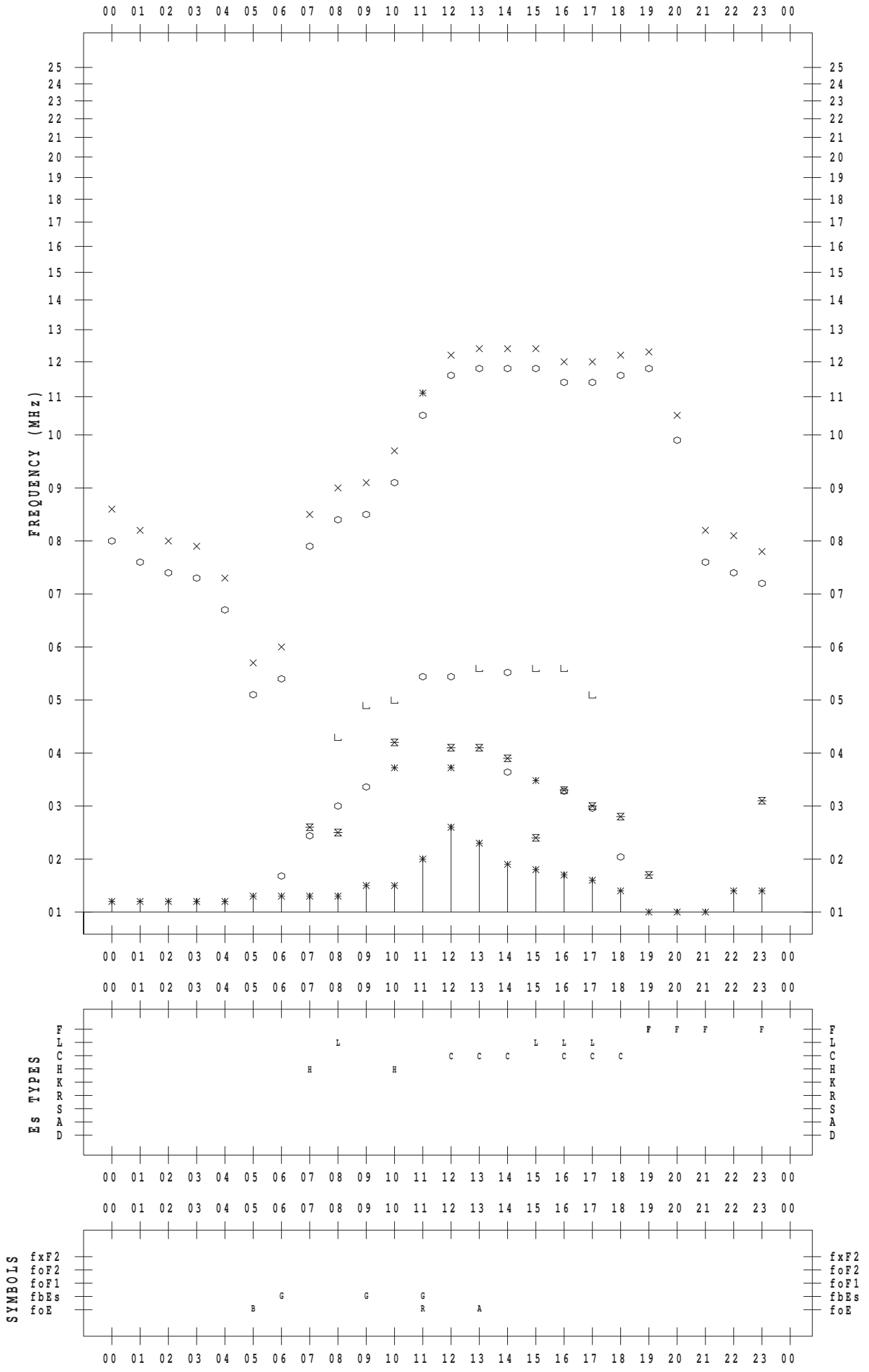
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 7

135 °E MEAN TIME



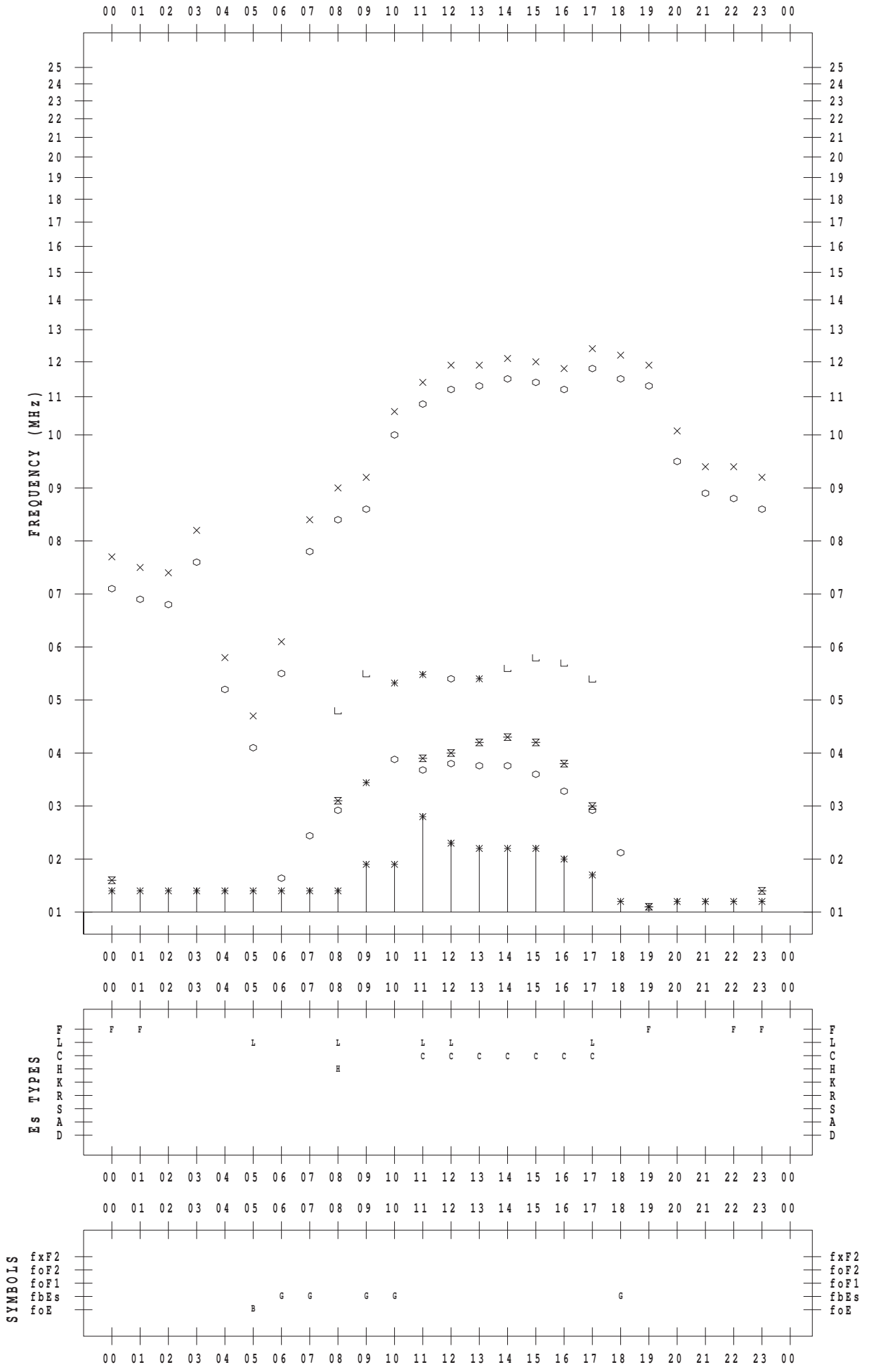
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 8

135 °E MEAN TIME



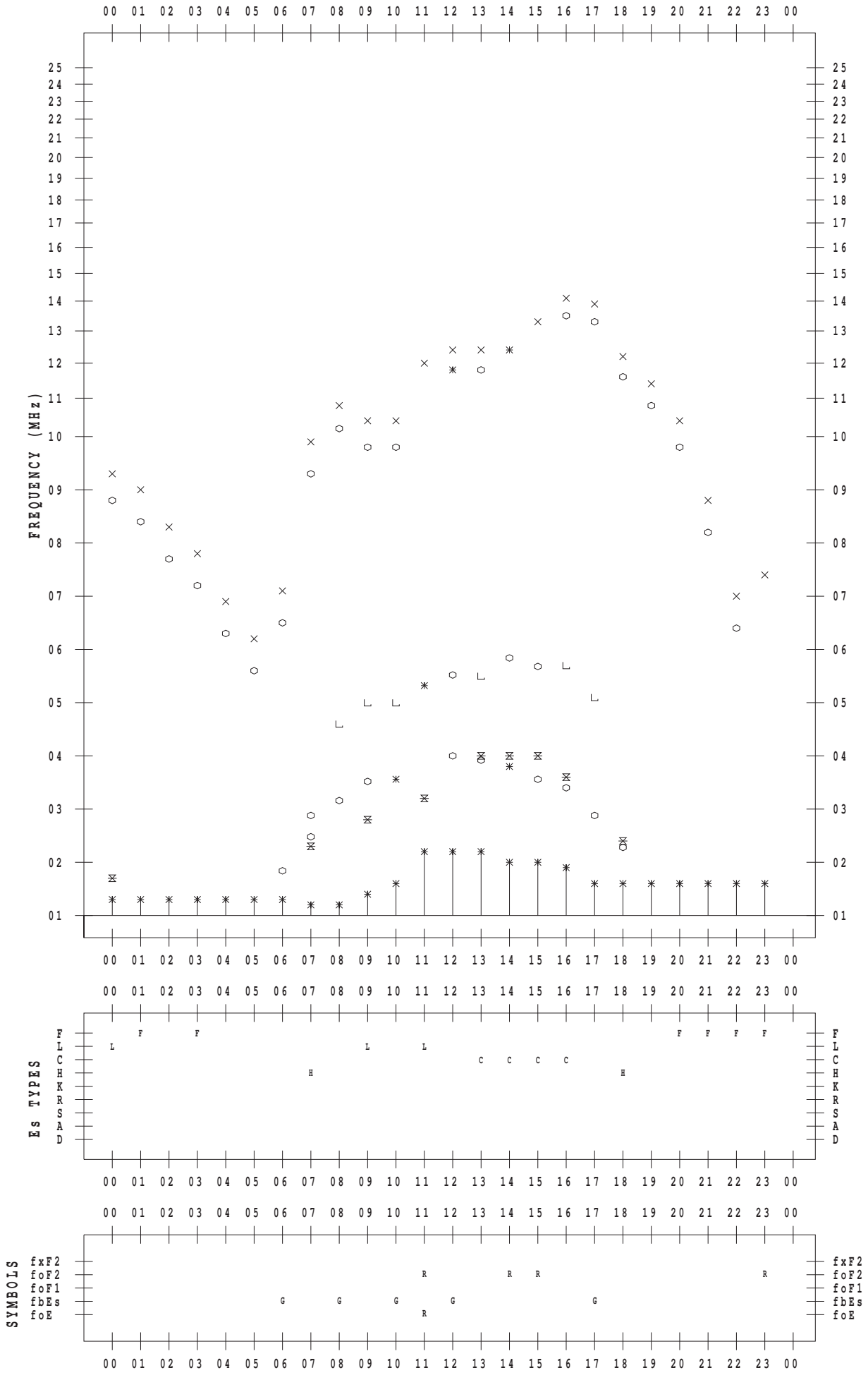
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/ 9

135 °E MEAN TIME



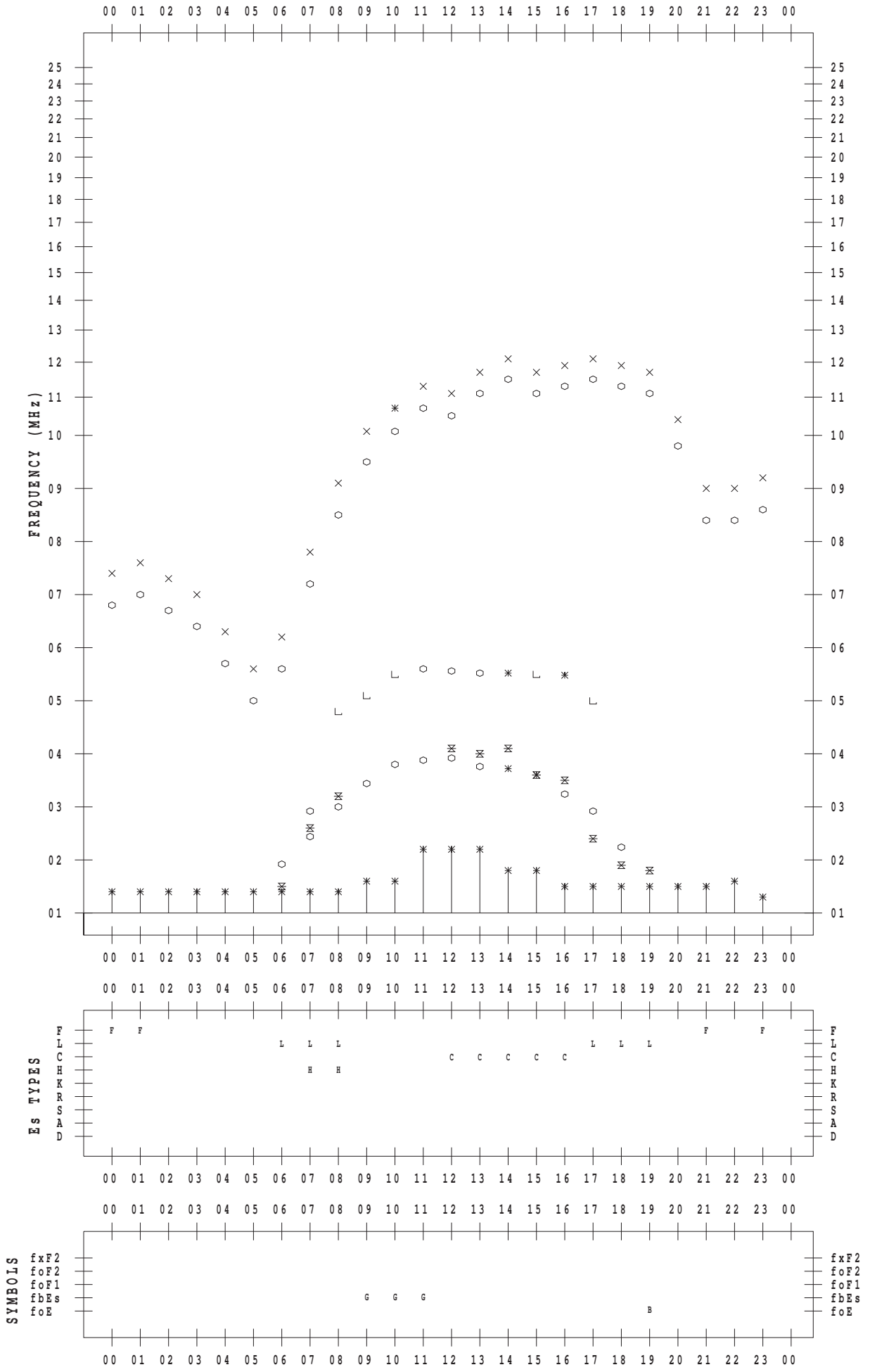
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/10

135 °E MEAN TIME



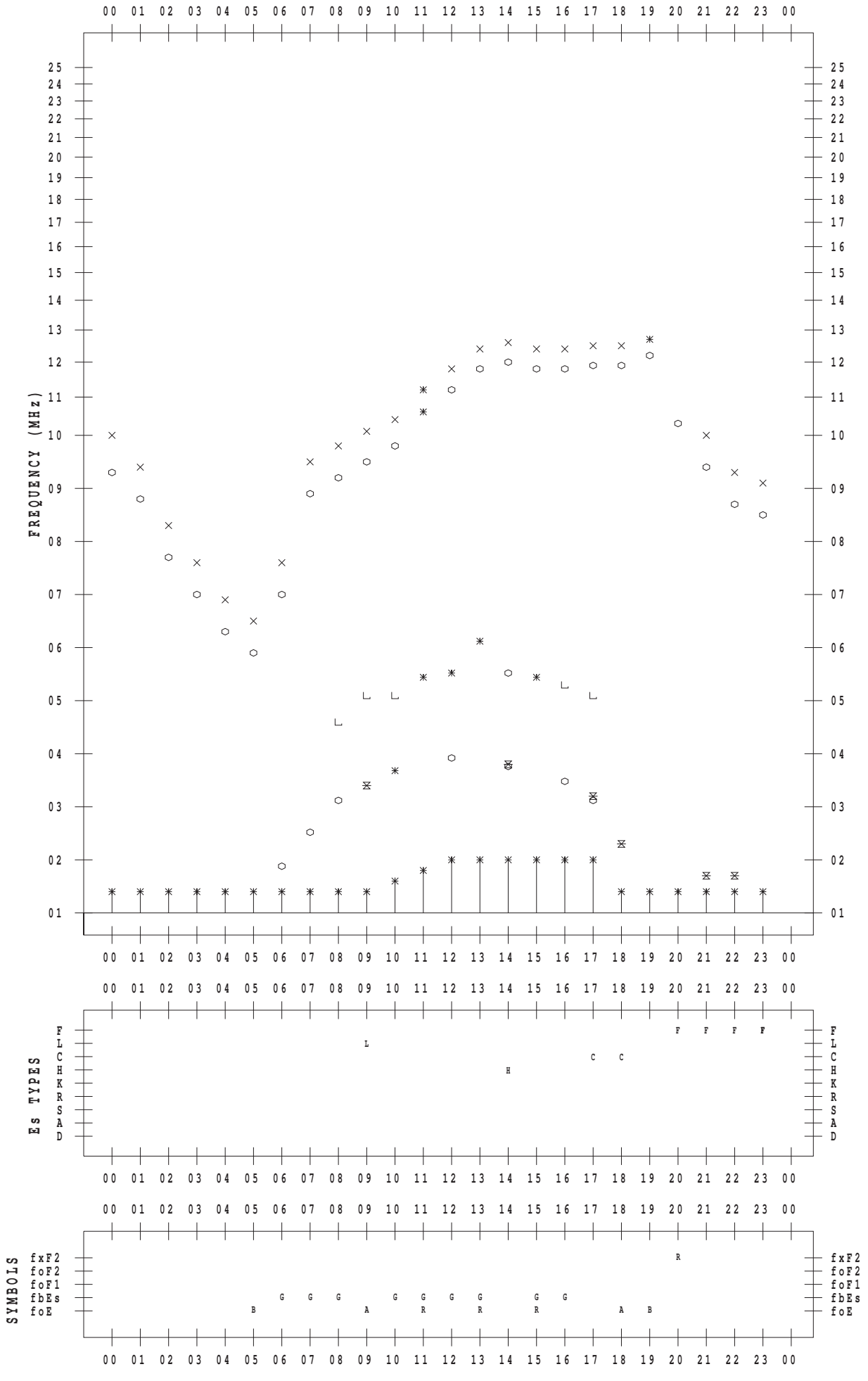
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/11

135 °E MEAN TIME



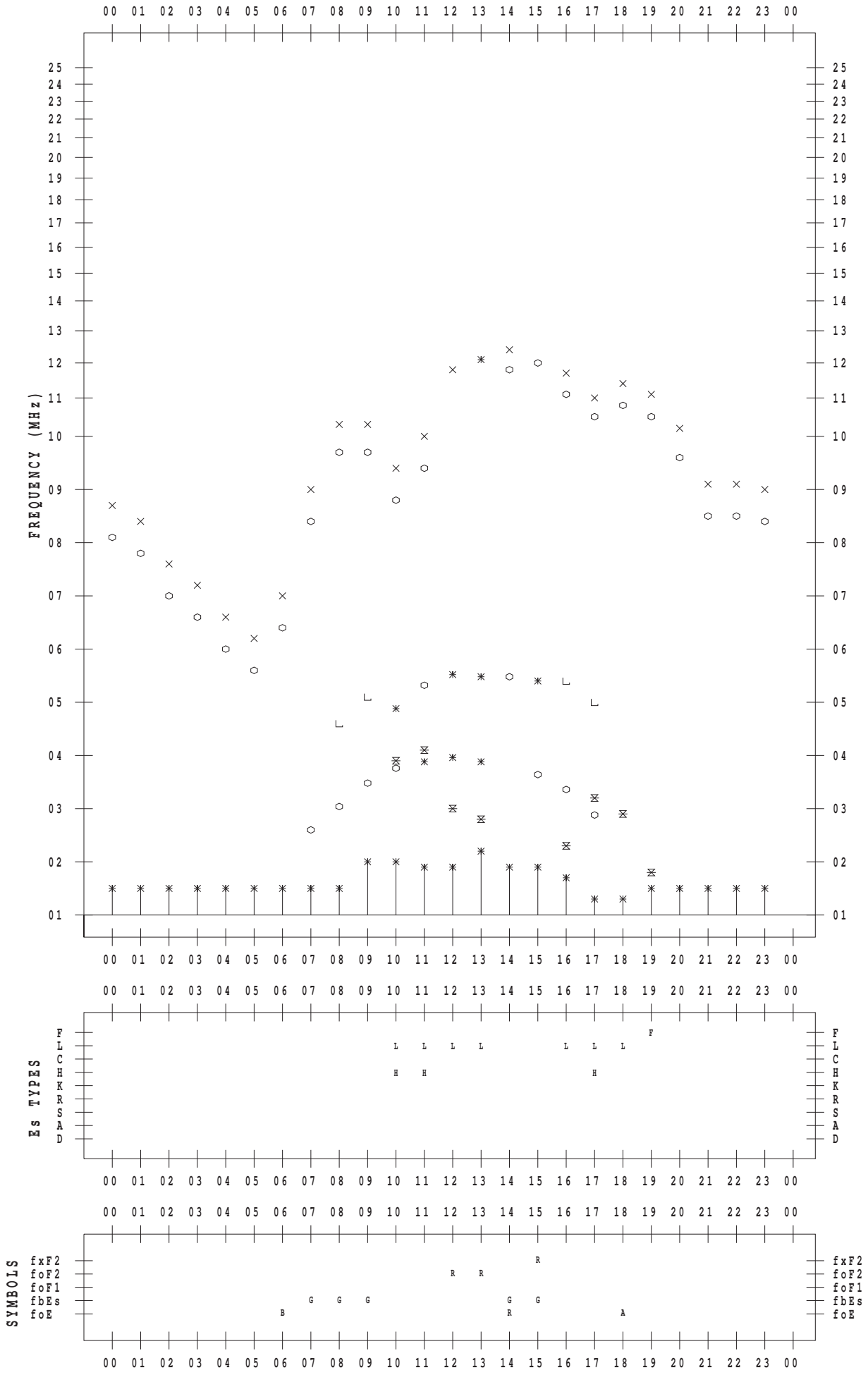
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/12

135 °E MEAN TIME



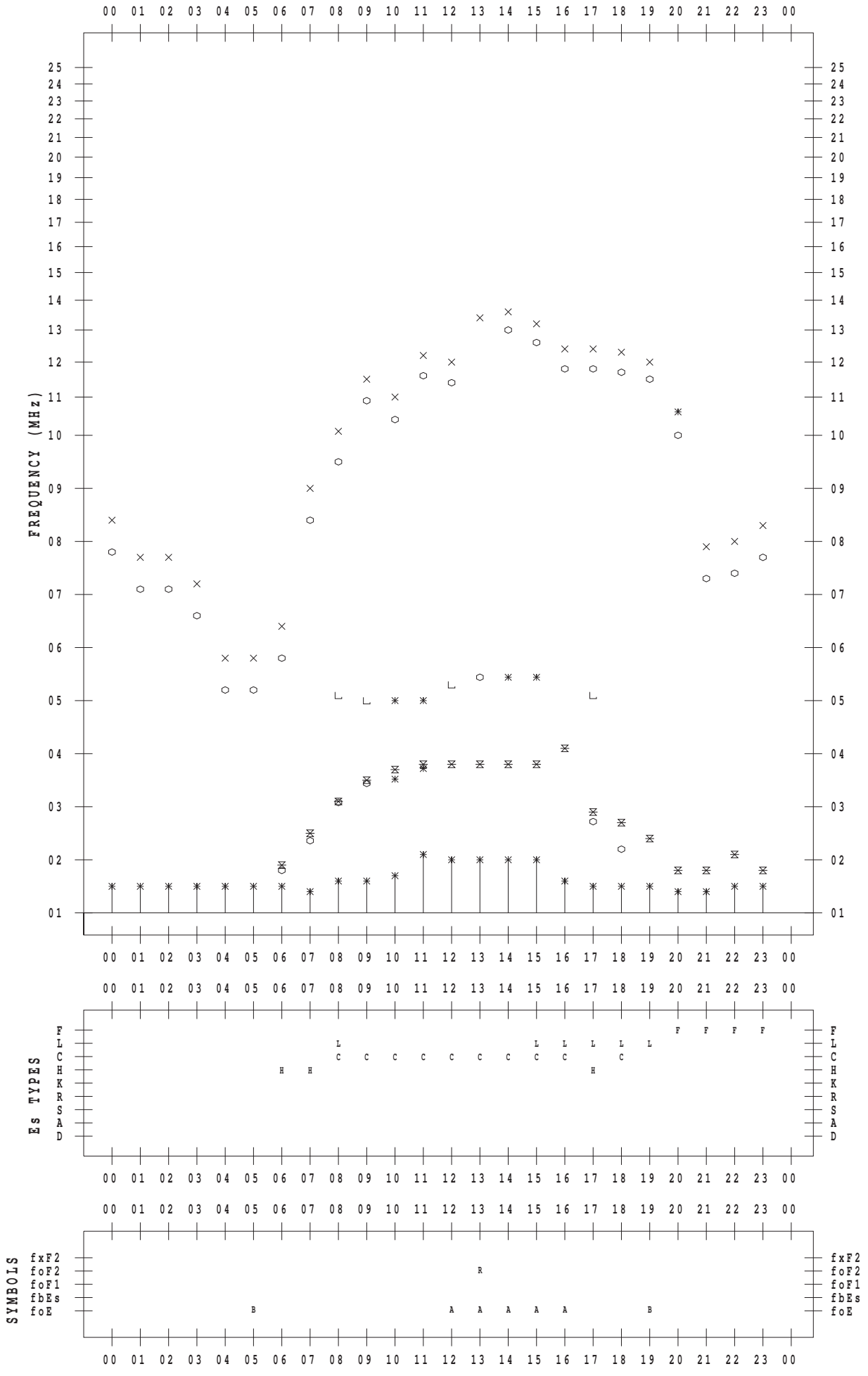
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/13

135 °E MEAN TIME



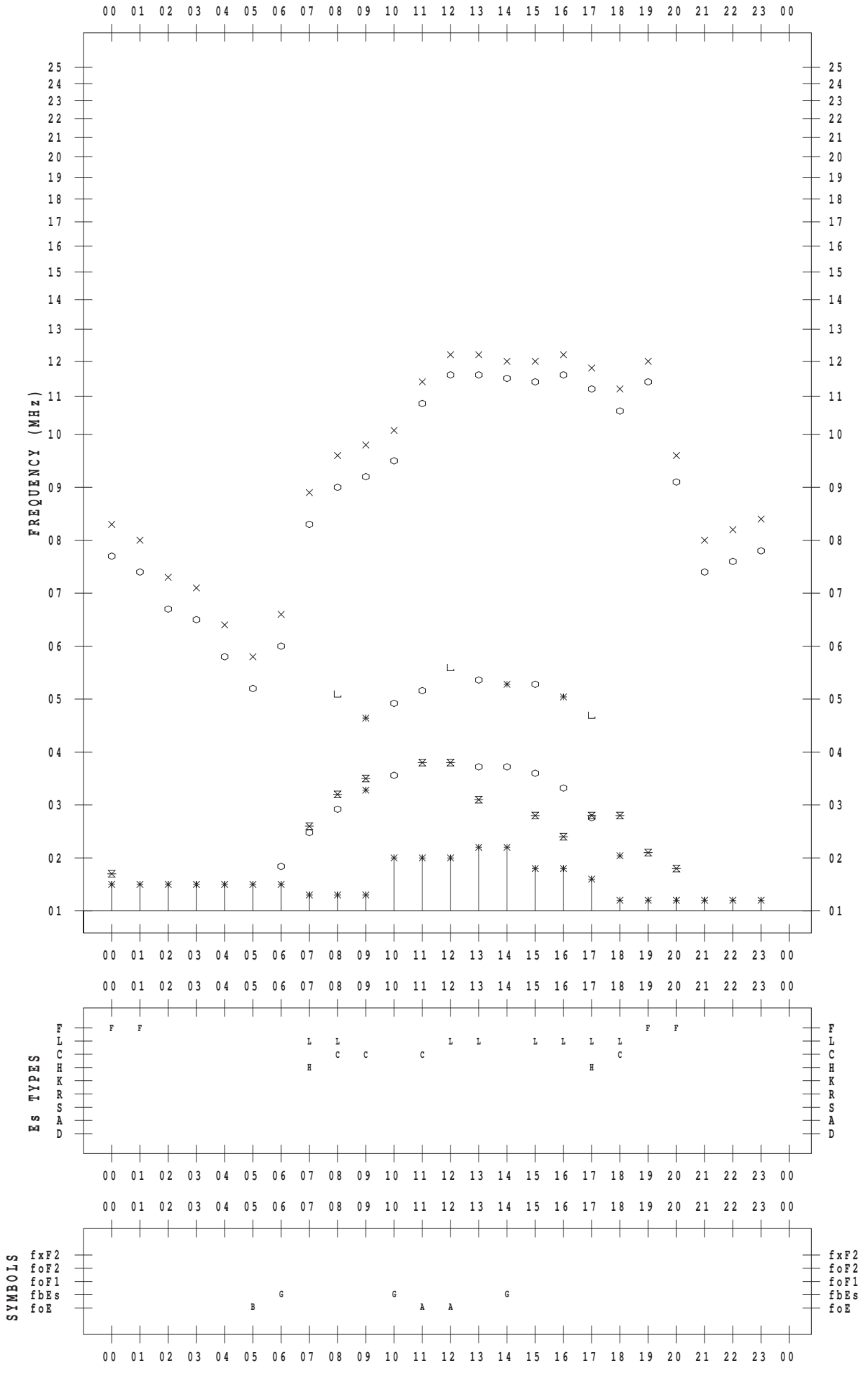
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/14

135 °E MEAN TIME



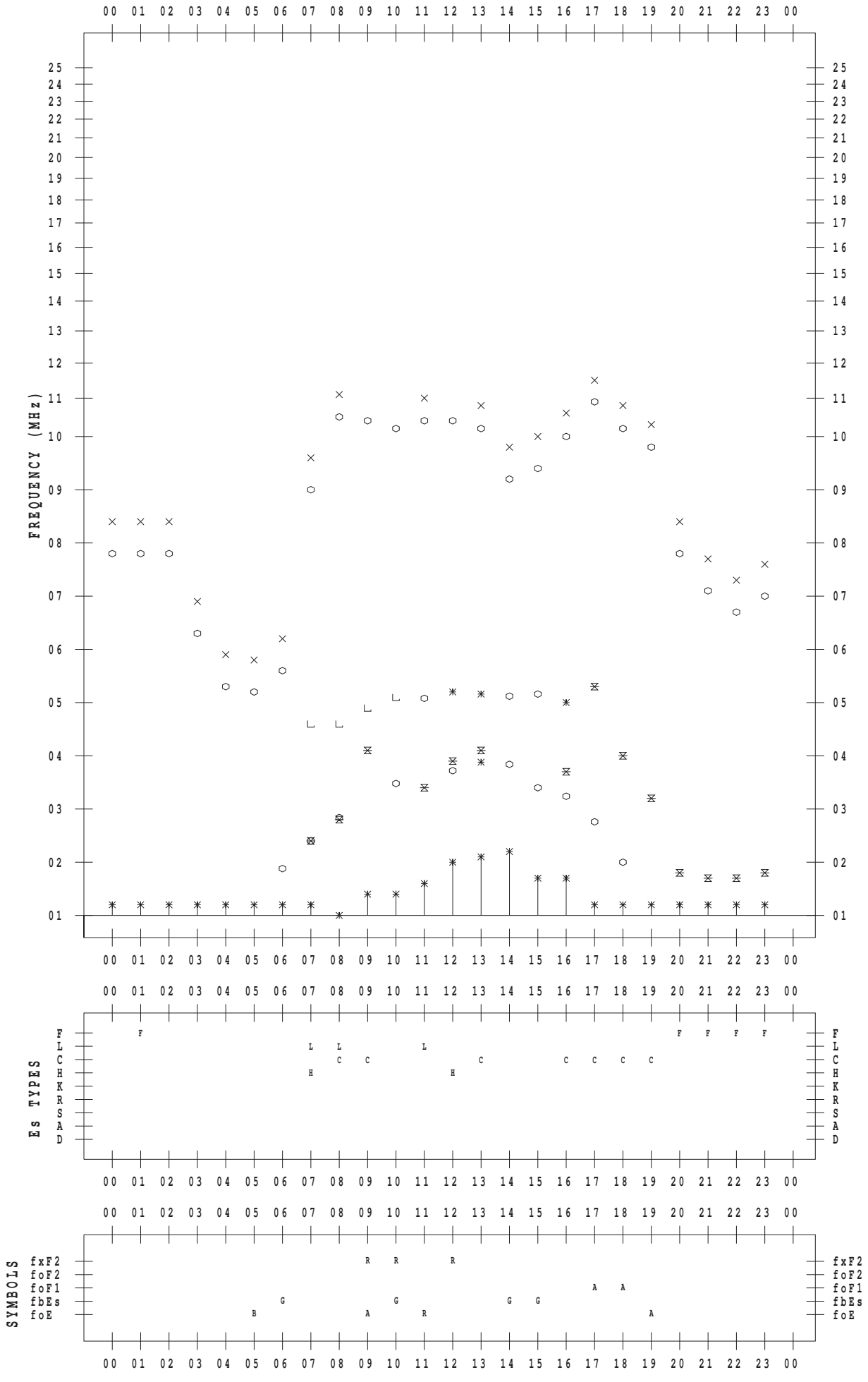
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/15

135 °E MEAN TIME



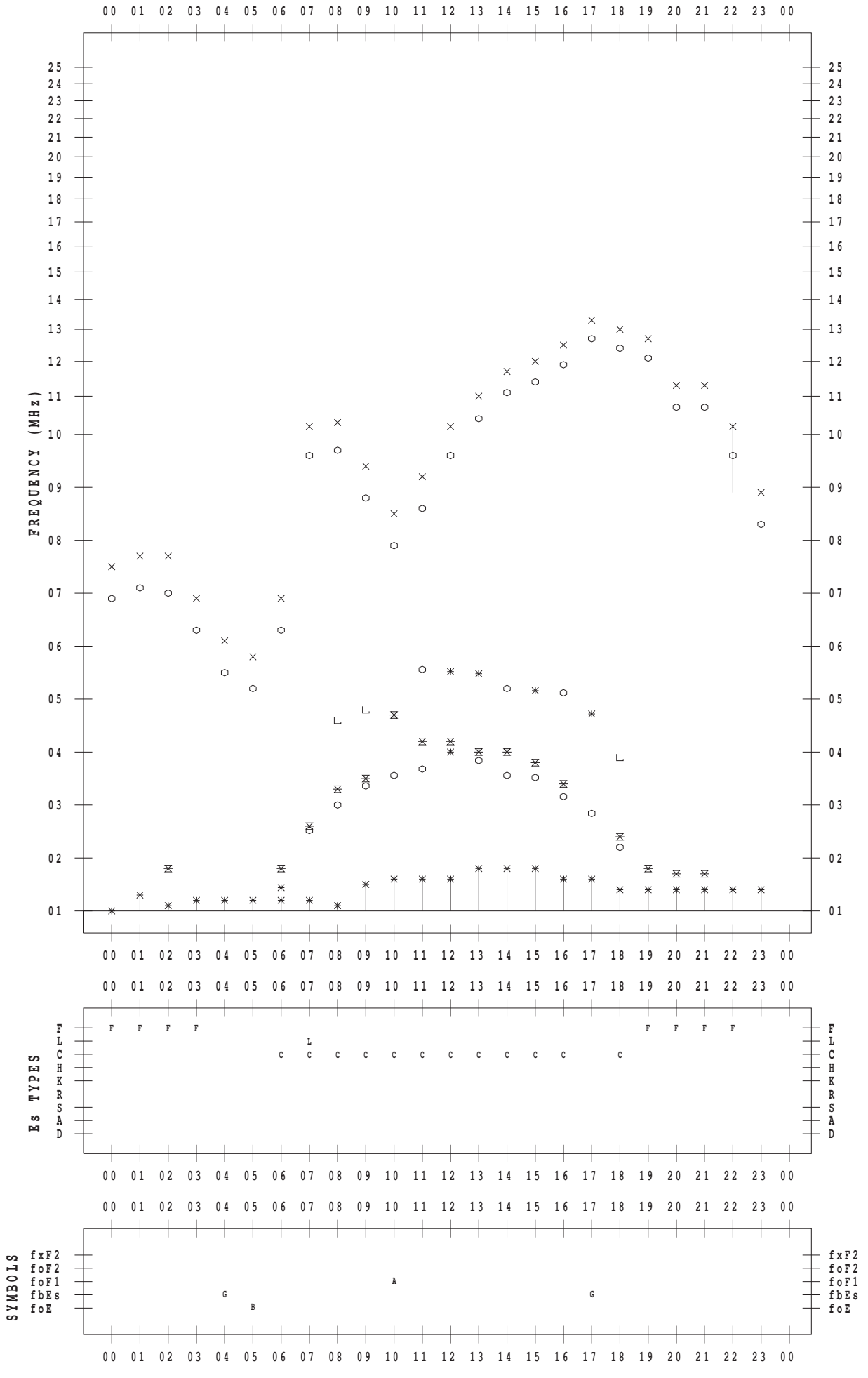
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/16

135 °E MEAN TIME



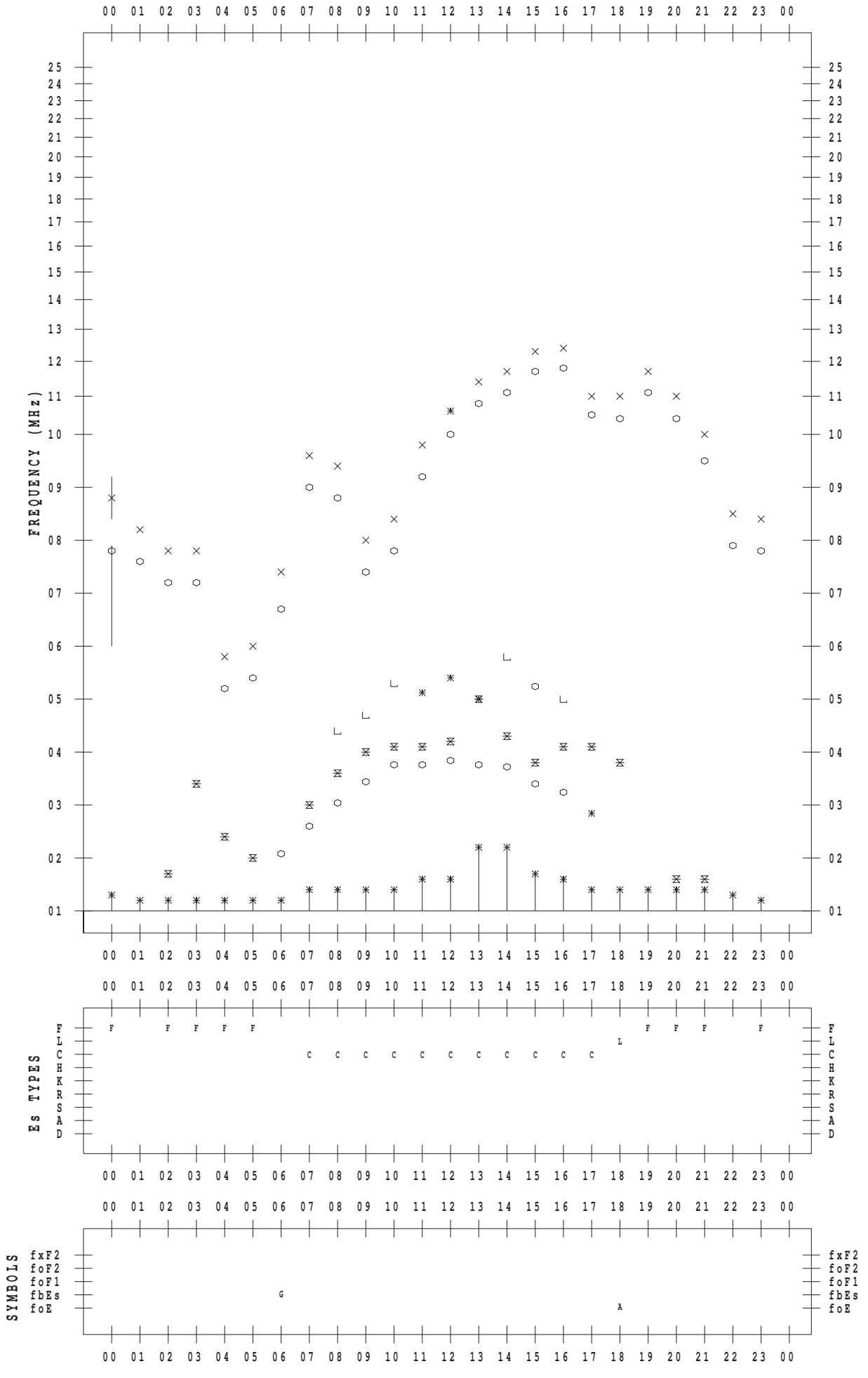
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/17

135 °E MEAN TIME



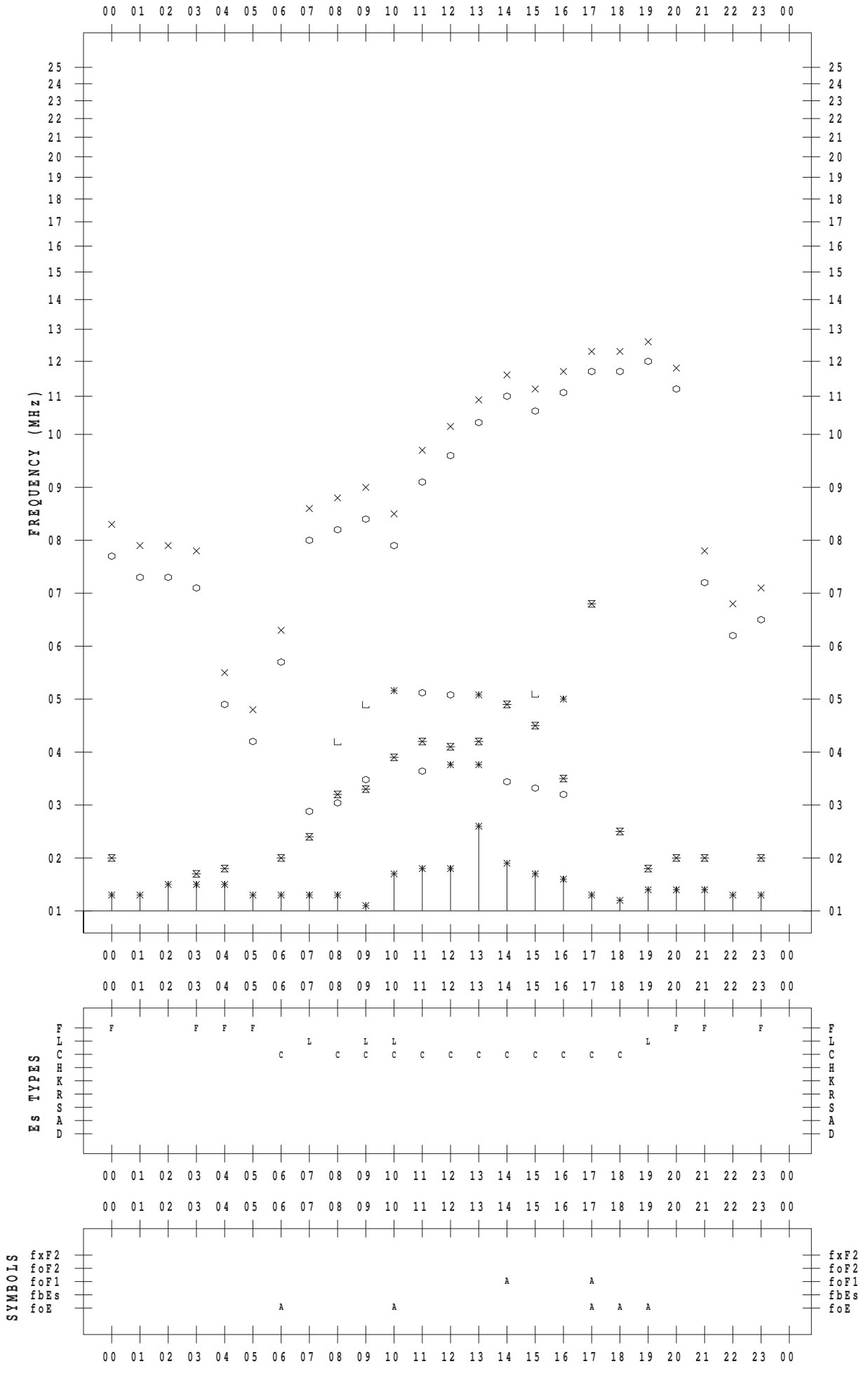
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/18

135 °E MEAN TIME



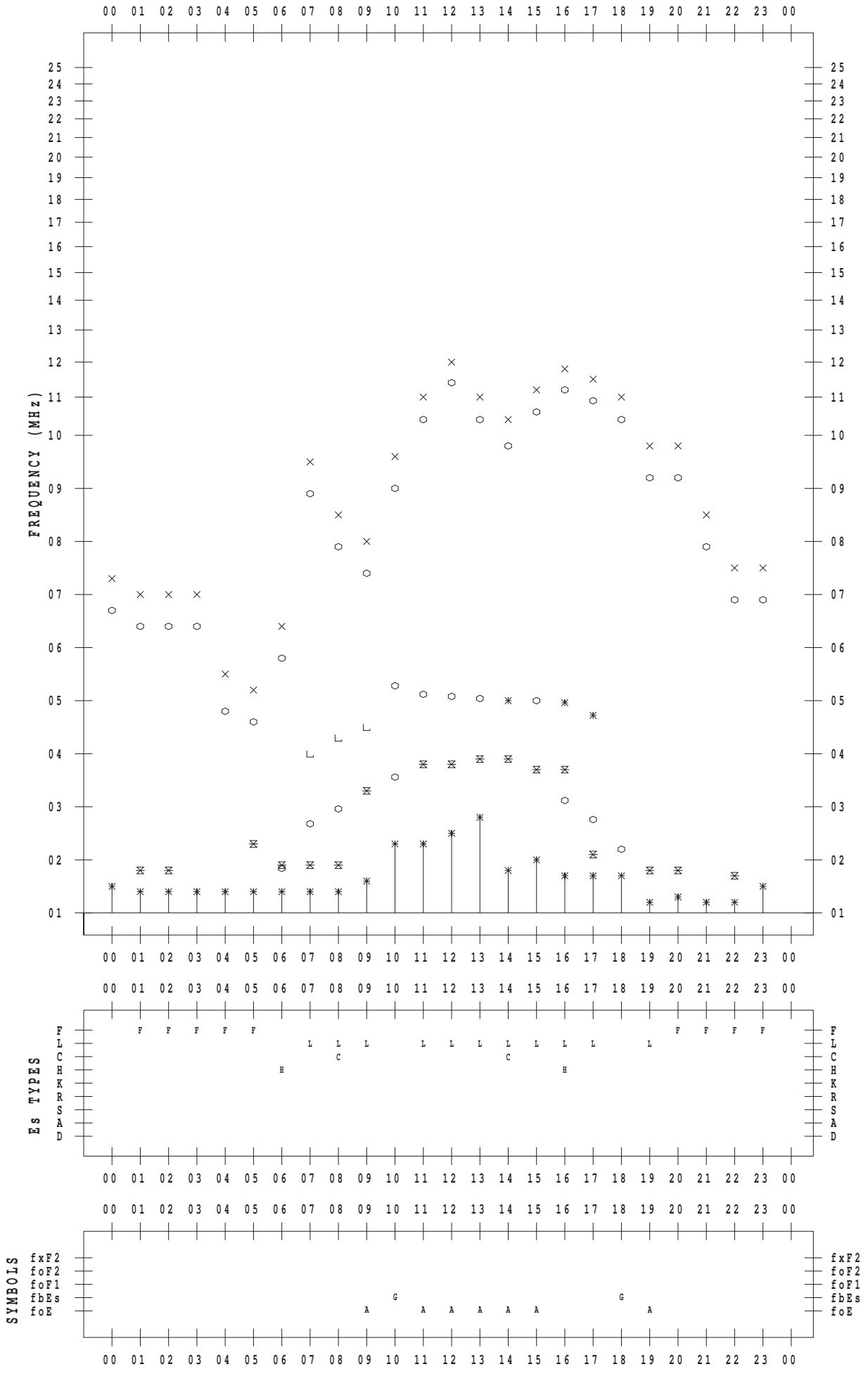
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/19

135 °E MEAN TIME



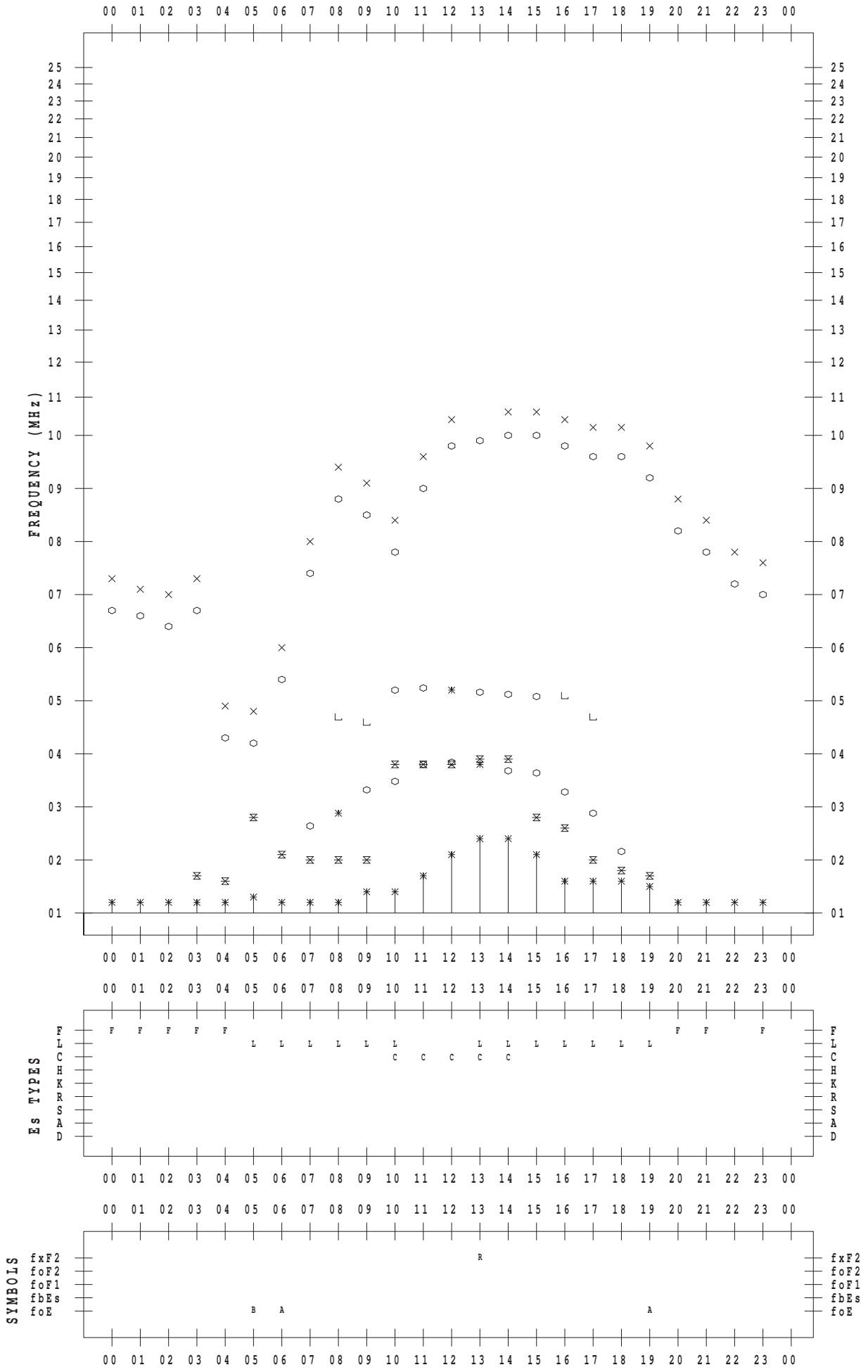
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/20

135 °E MEAN TIME



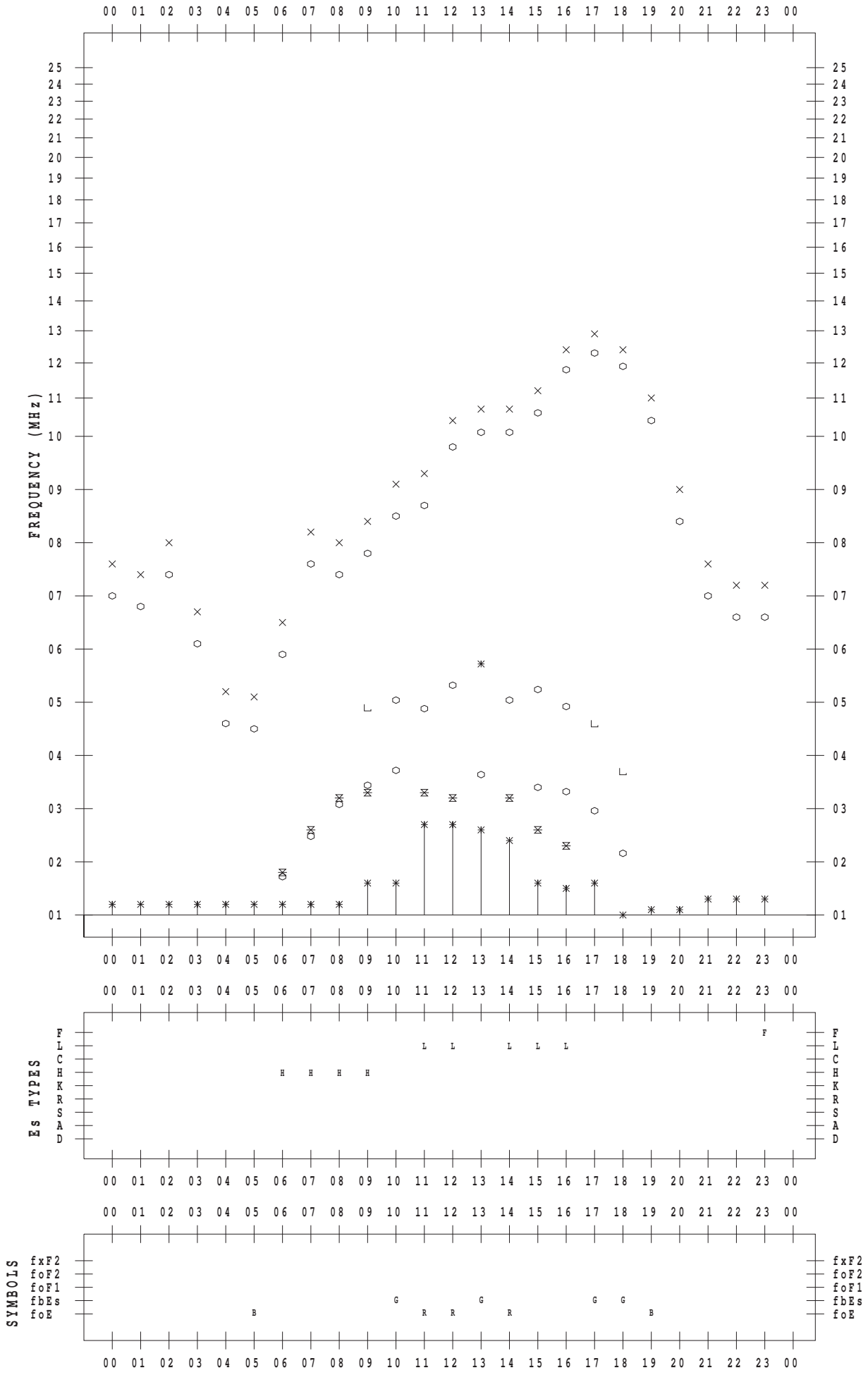
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/21

135 °E MEAN TIME



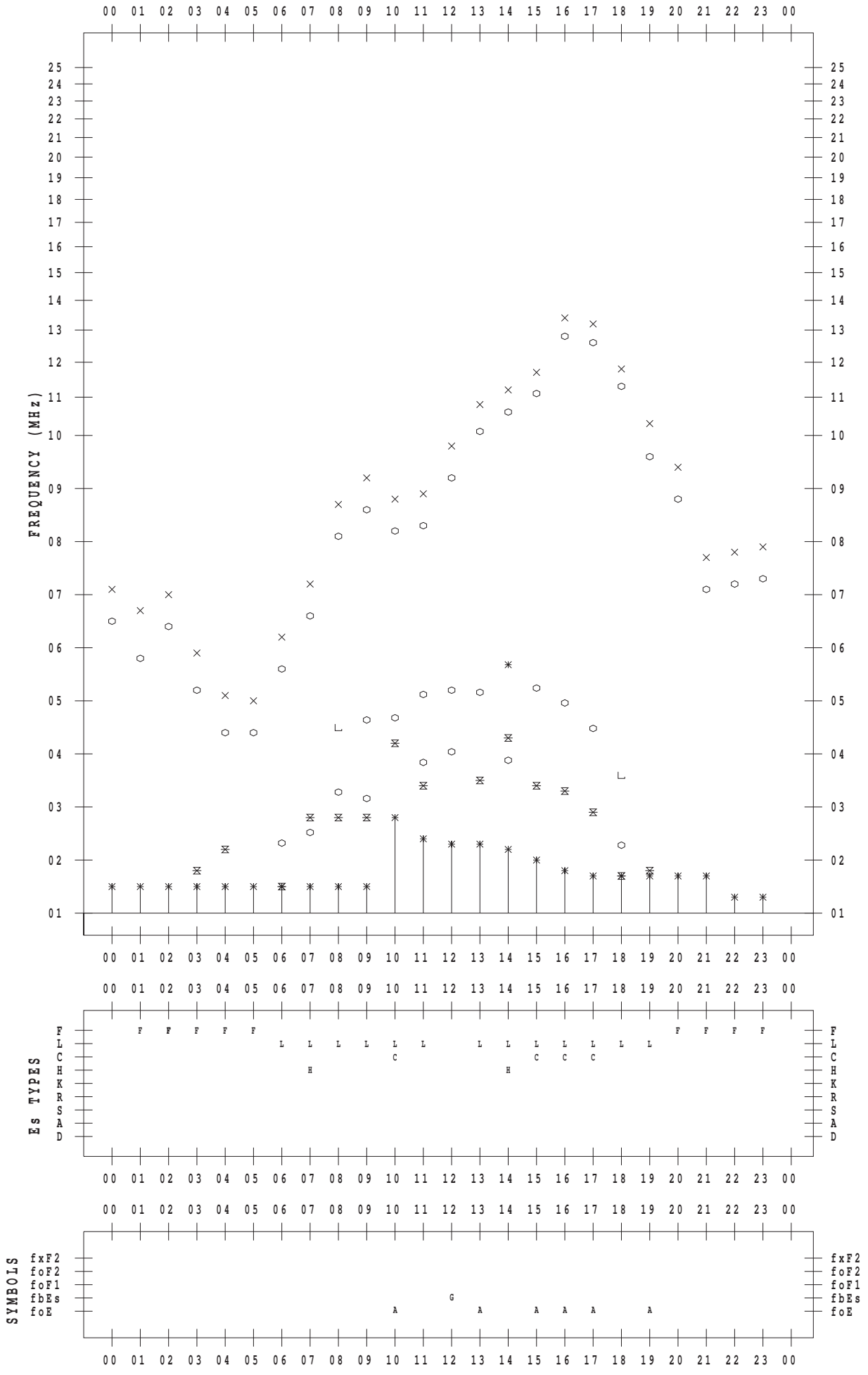
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/22

135 °E MEAN TIME



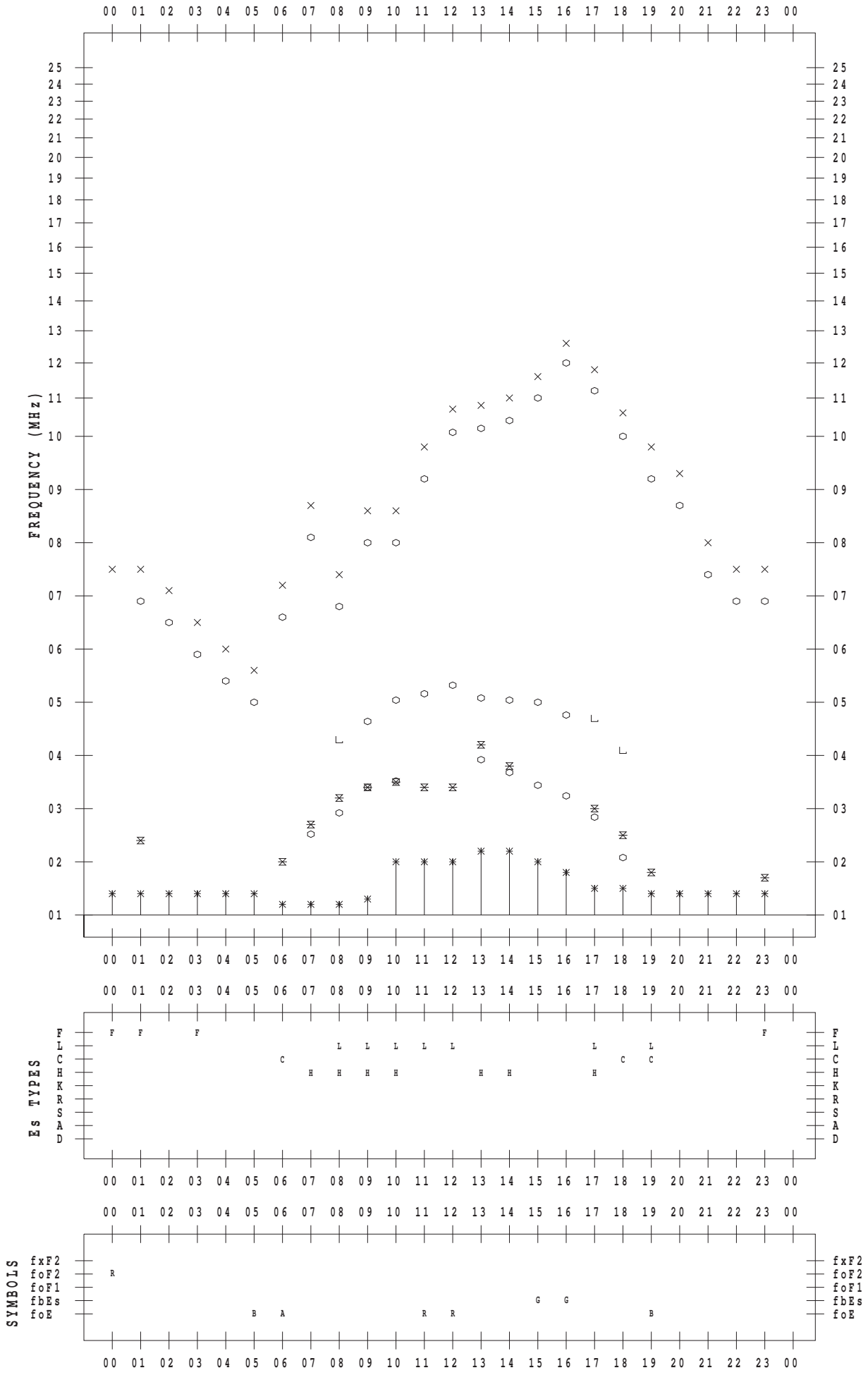
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/23

135 °E MEAN TIME



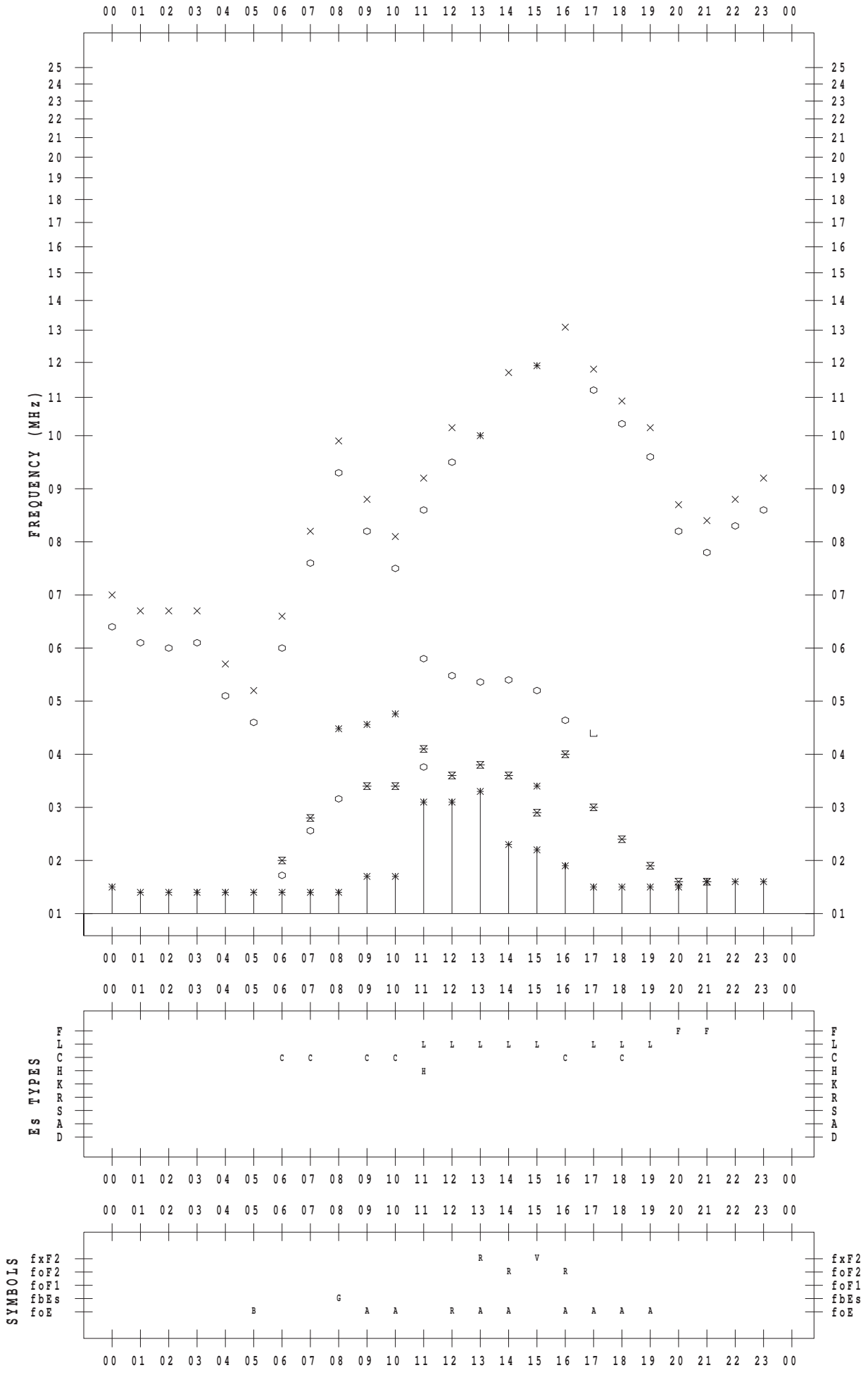
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/24

135 °E MEAN TIME



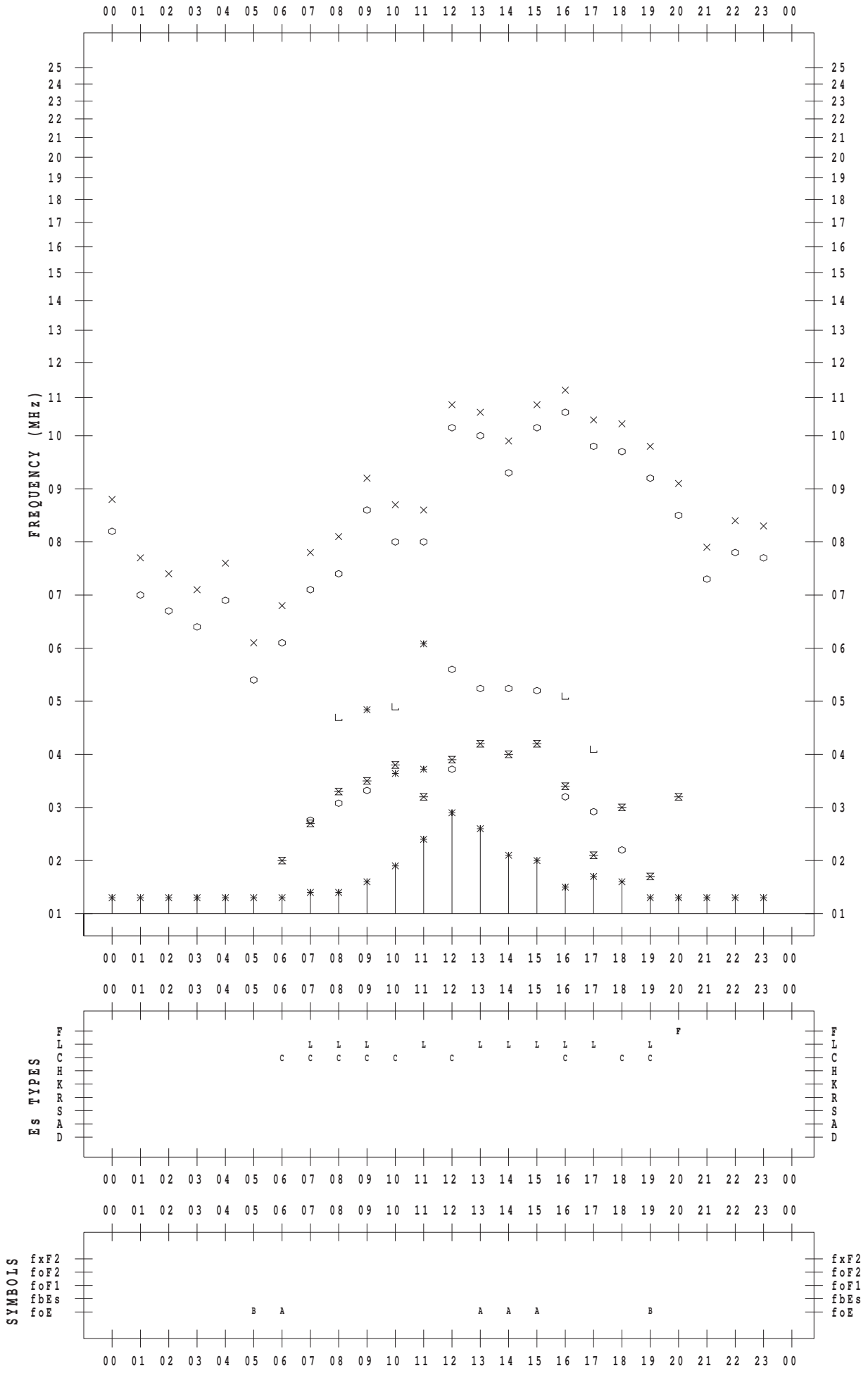
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/25

135 °E MEAN TIME



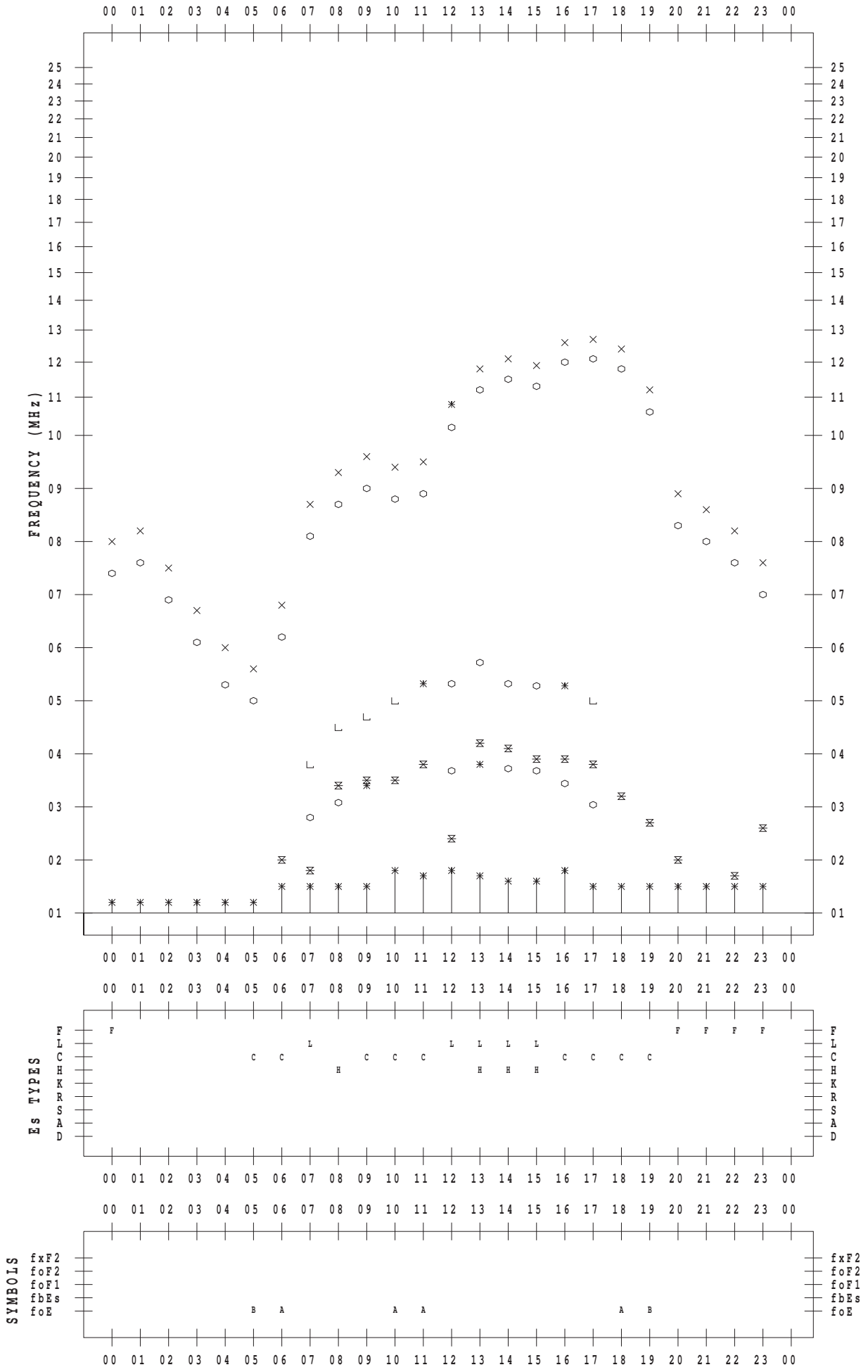
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/26

135 °E MEAN TIME



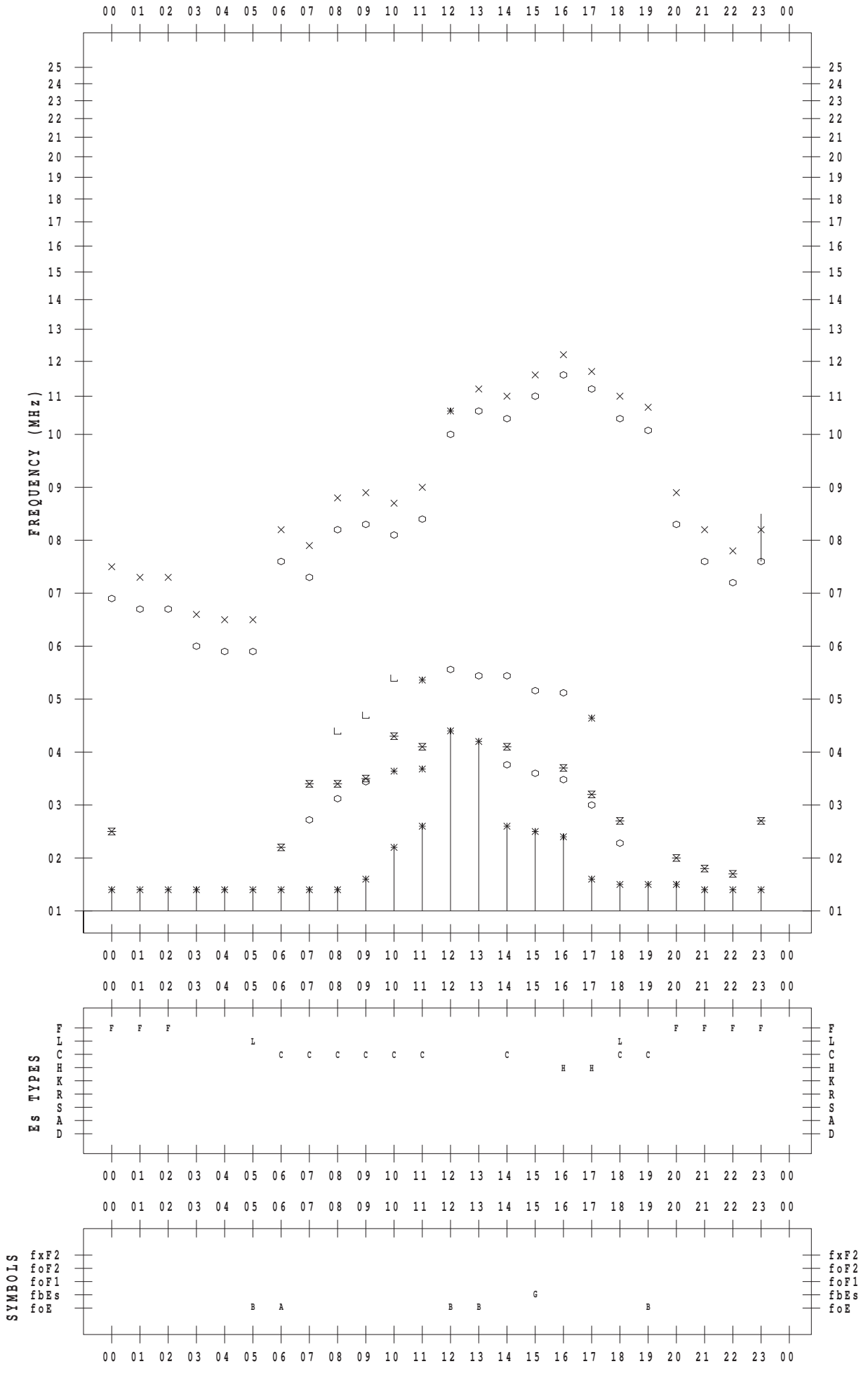
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/27

135 °E MEAN TIME



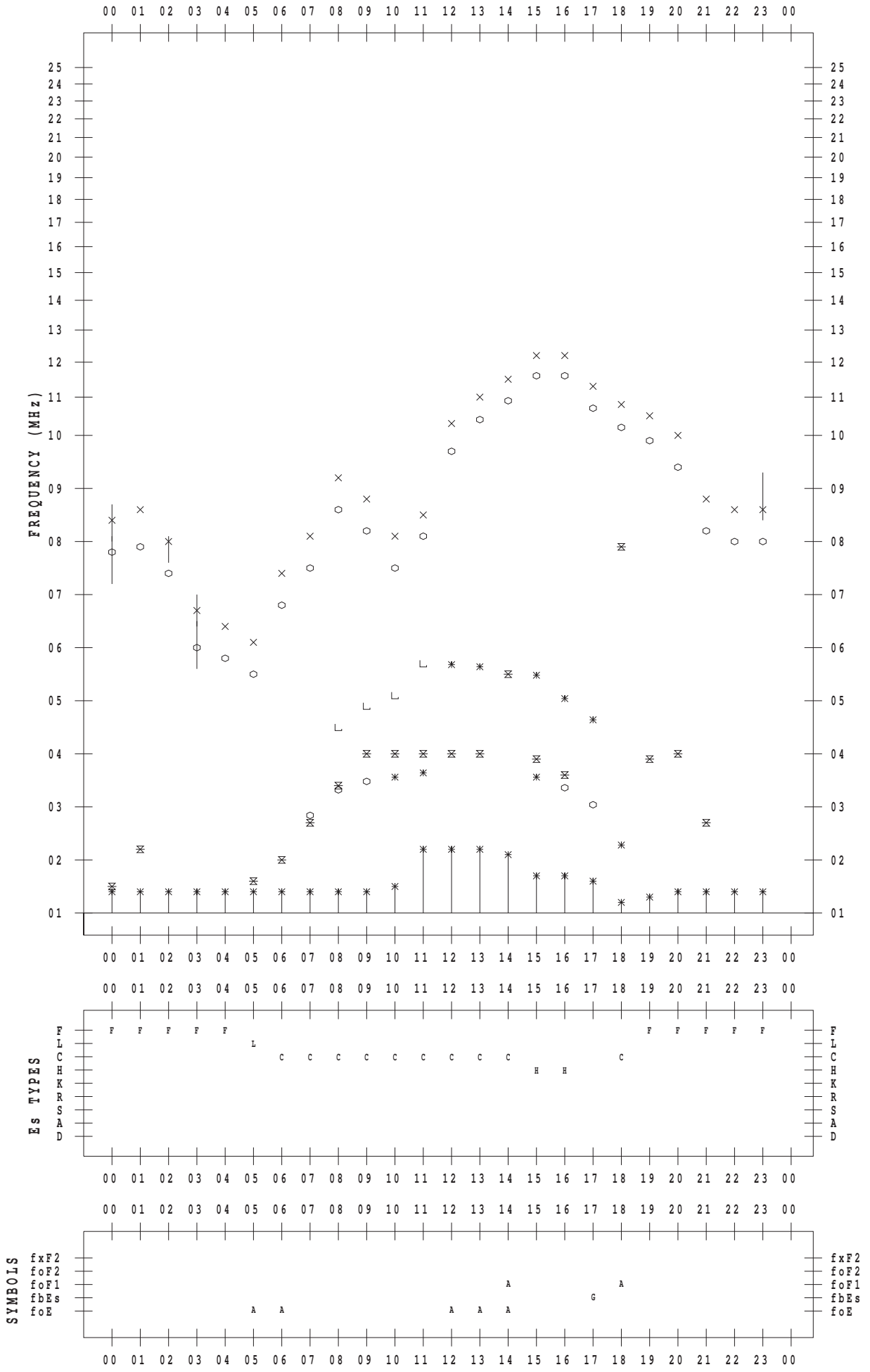
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/28

135 °E MEAN TIME



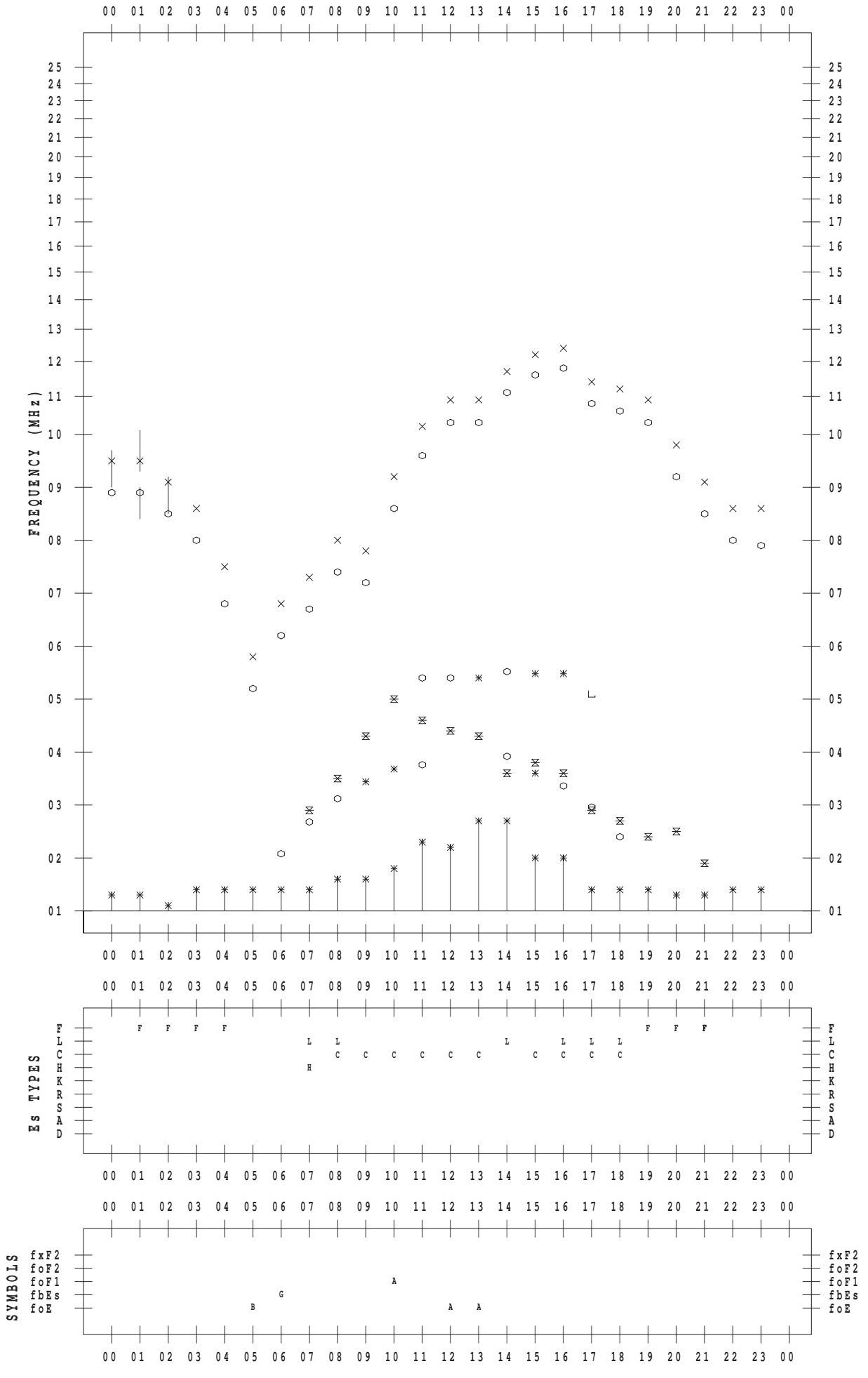
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/29

135 °E MEAN TIME



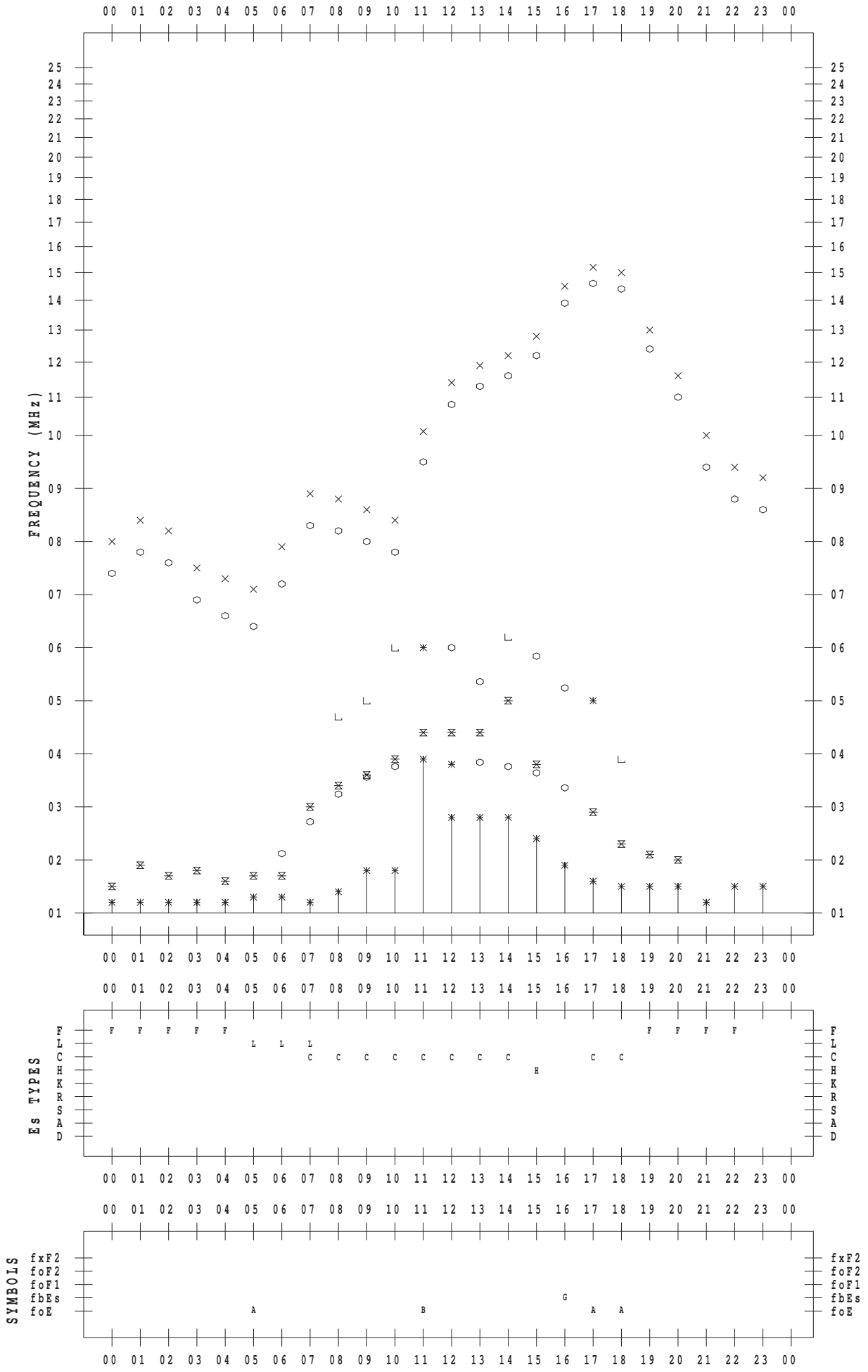
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 4/30

135 °E MEAN TIME



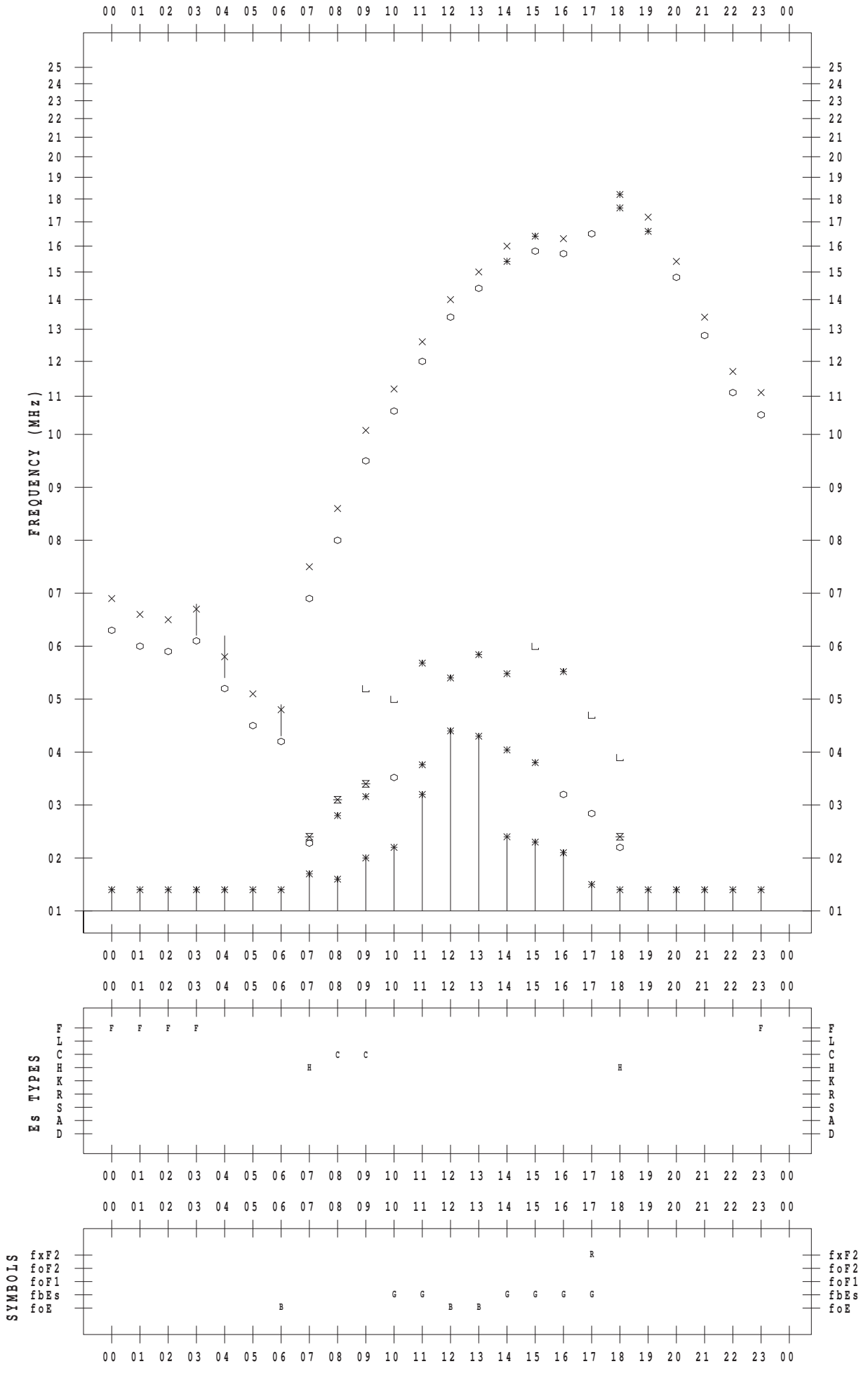
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 1

135 °E MEAN TIME



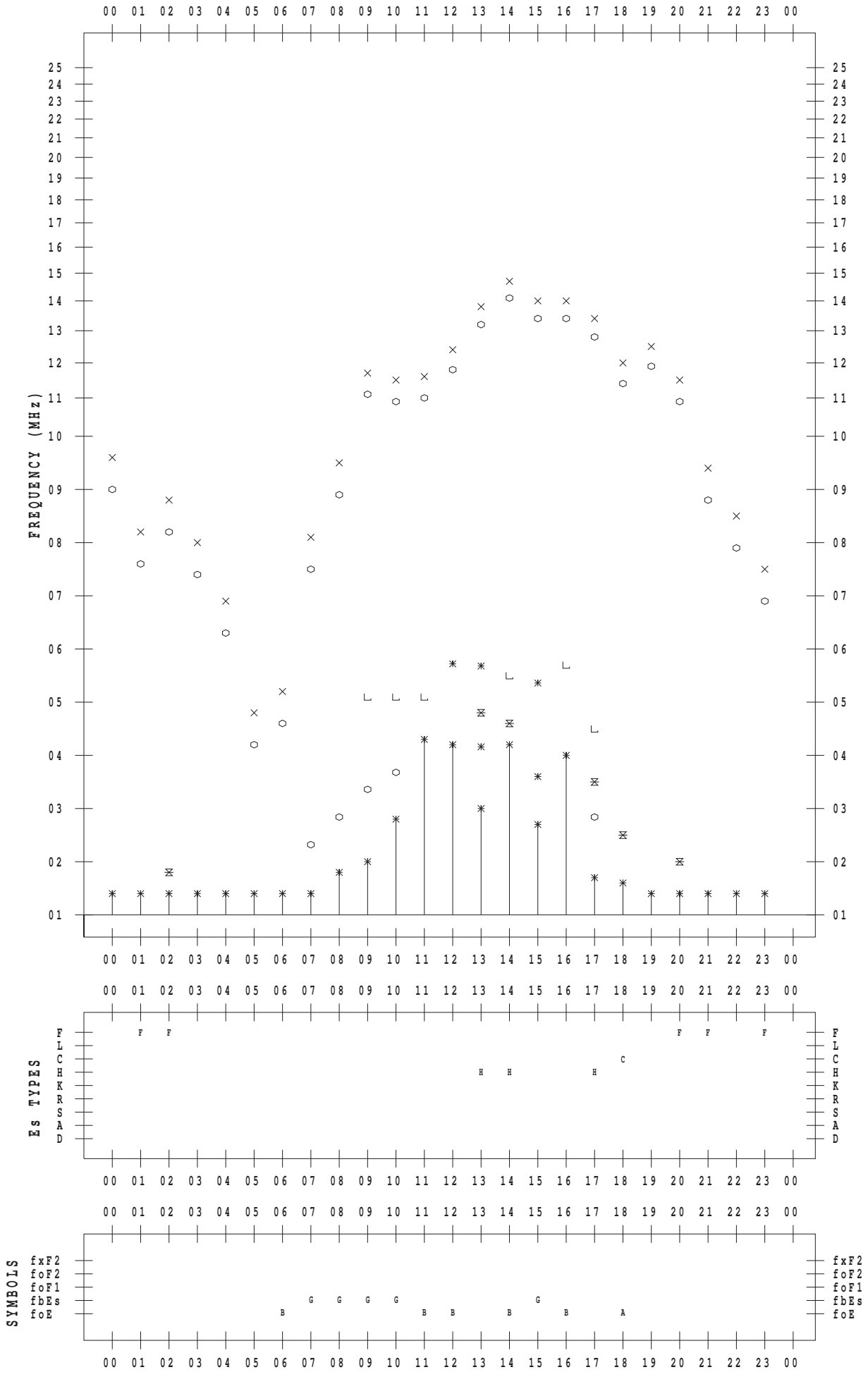
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 2

135 °E MEAN TIME



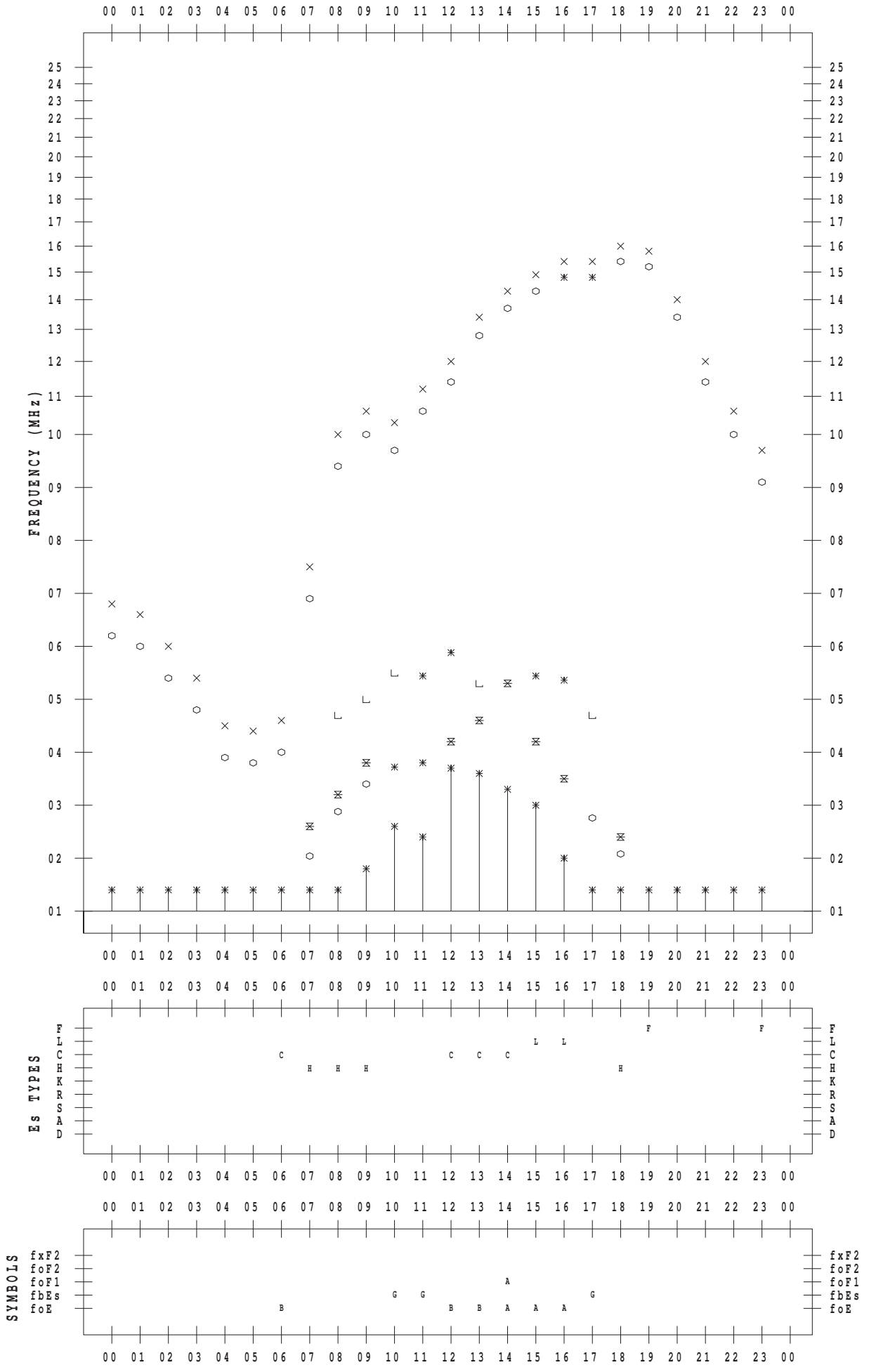
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 3

135 °E MEAN TIME



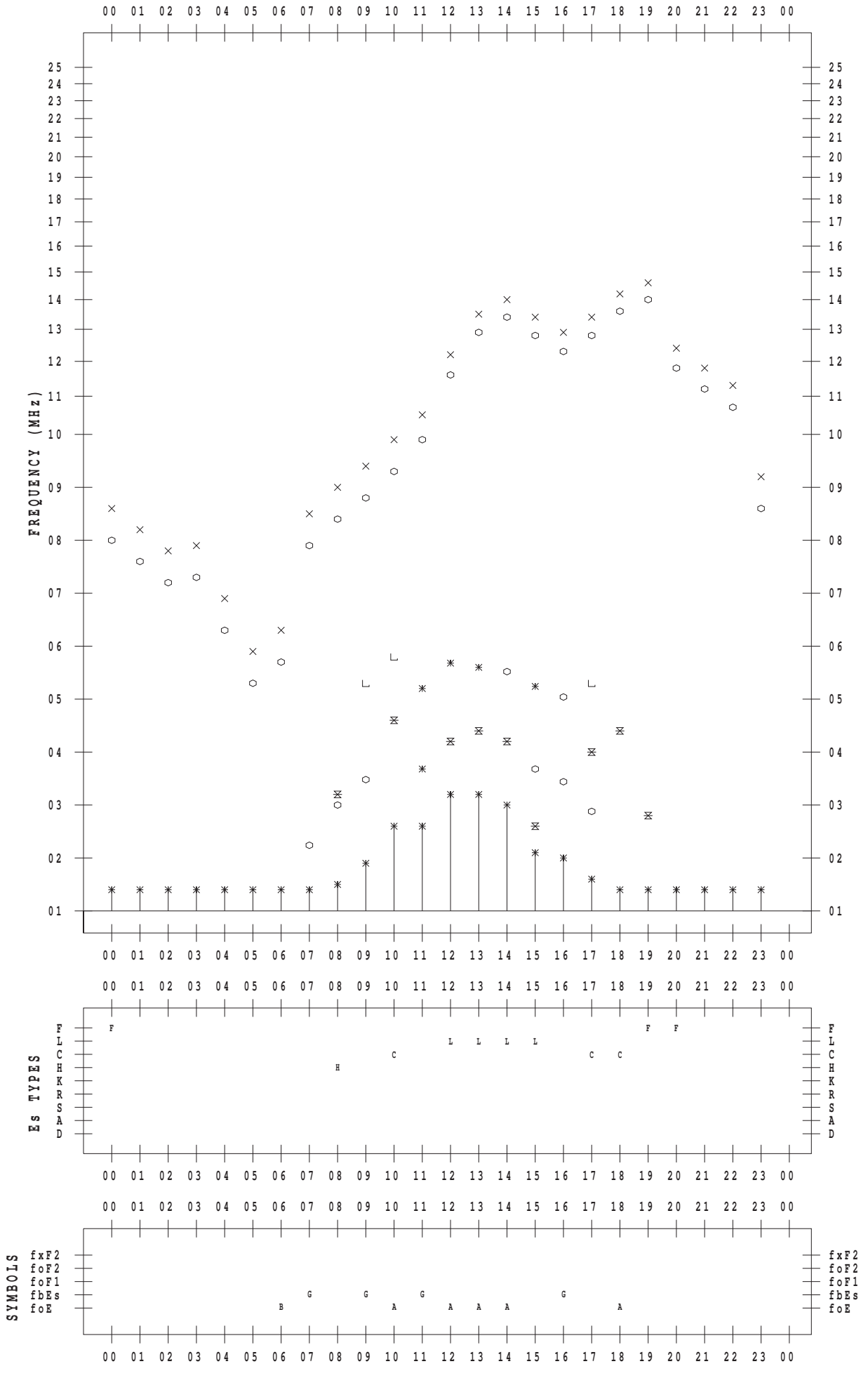
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 4

135 °E MEAN TIME



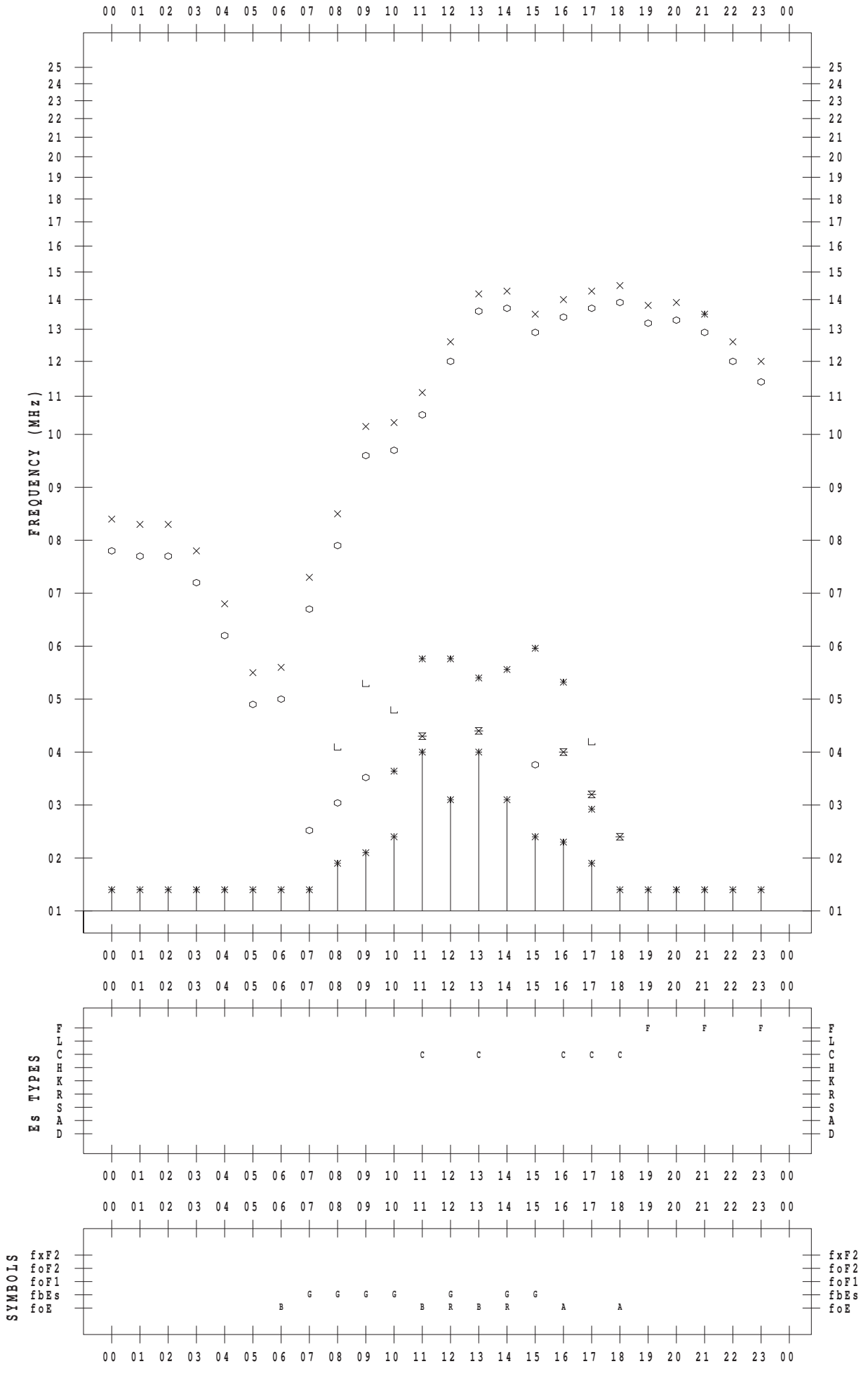
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 5

135 °E MEAN TIME



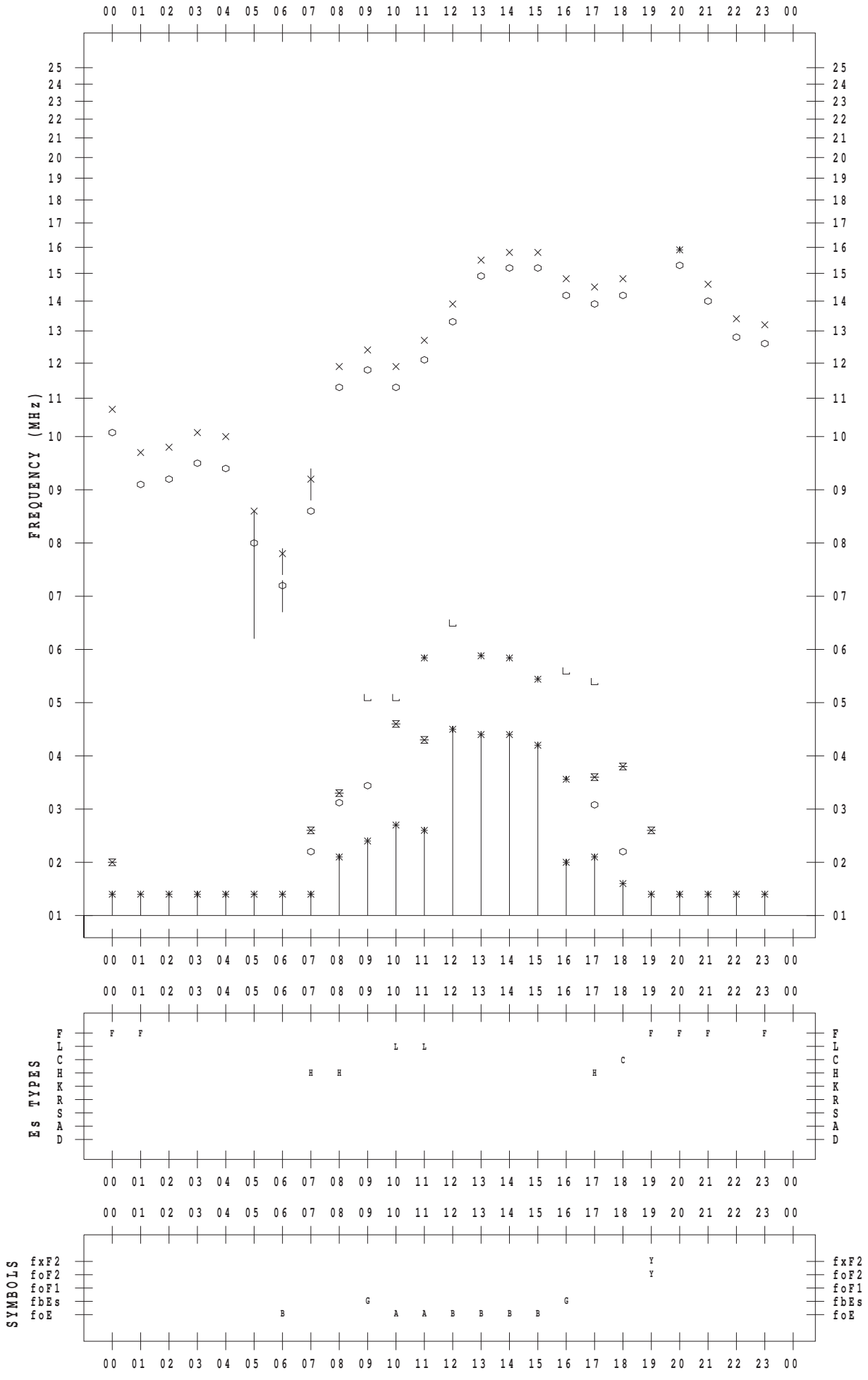
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 6

135 °E MEAN TIME



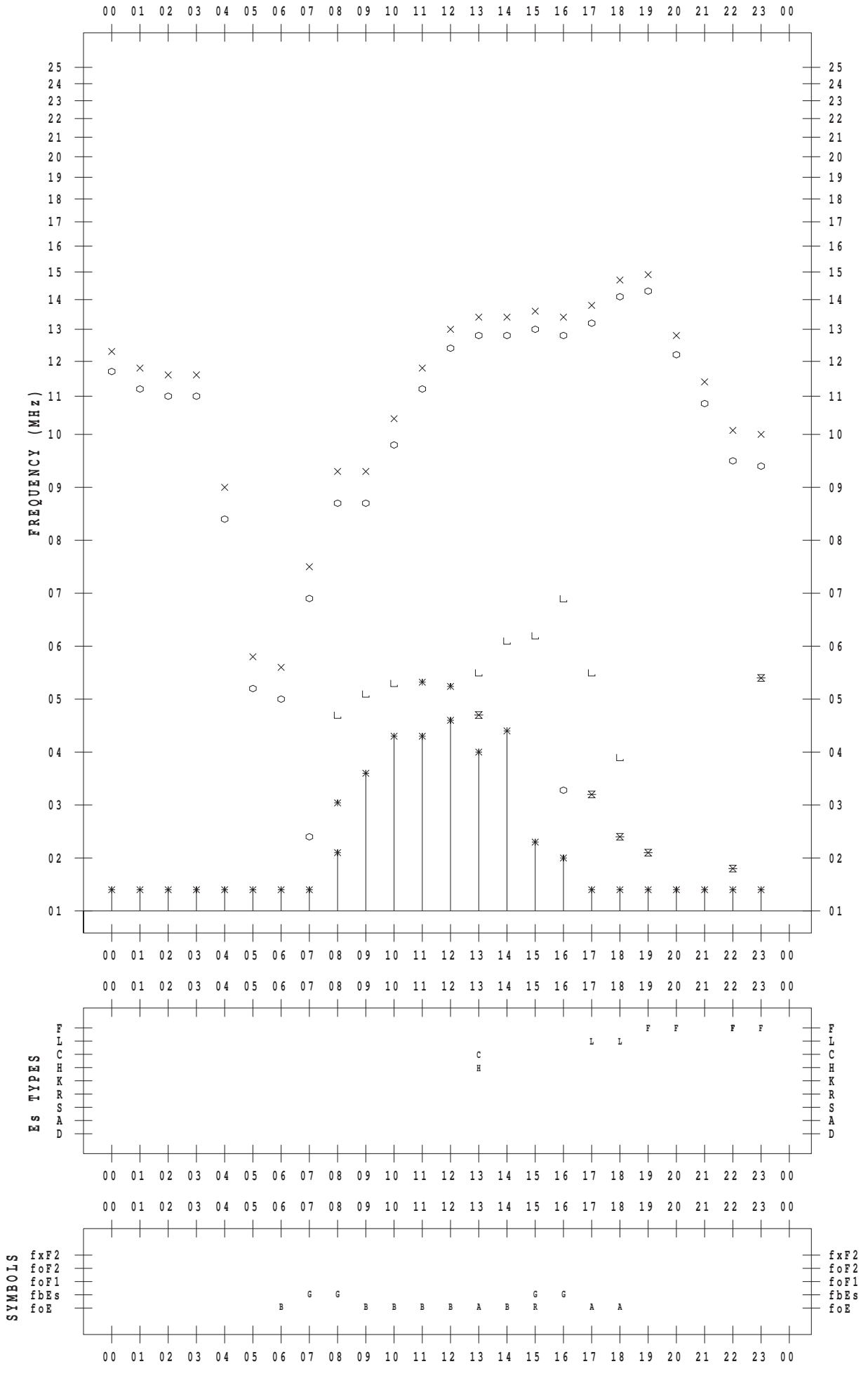
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 7

135 °E MEAN TIME



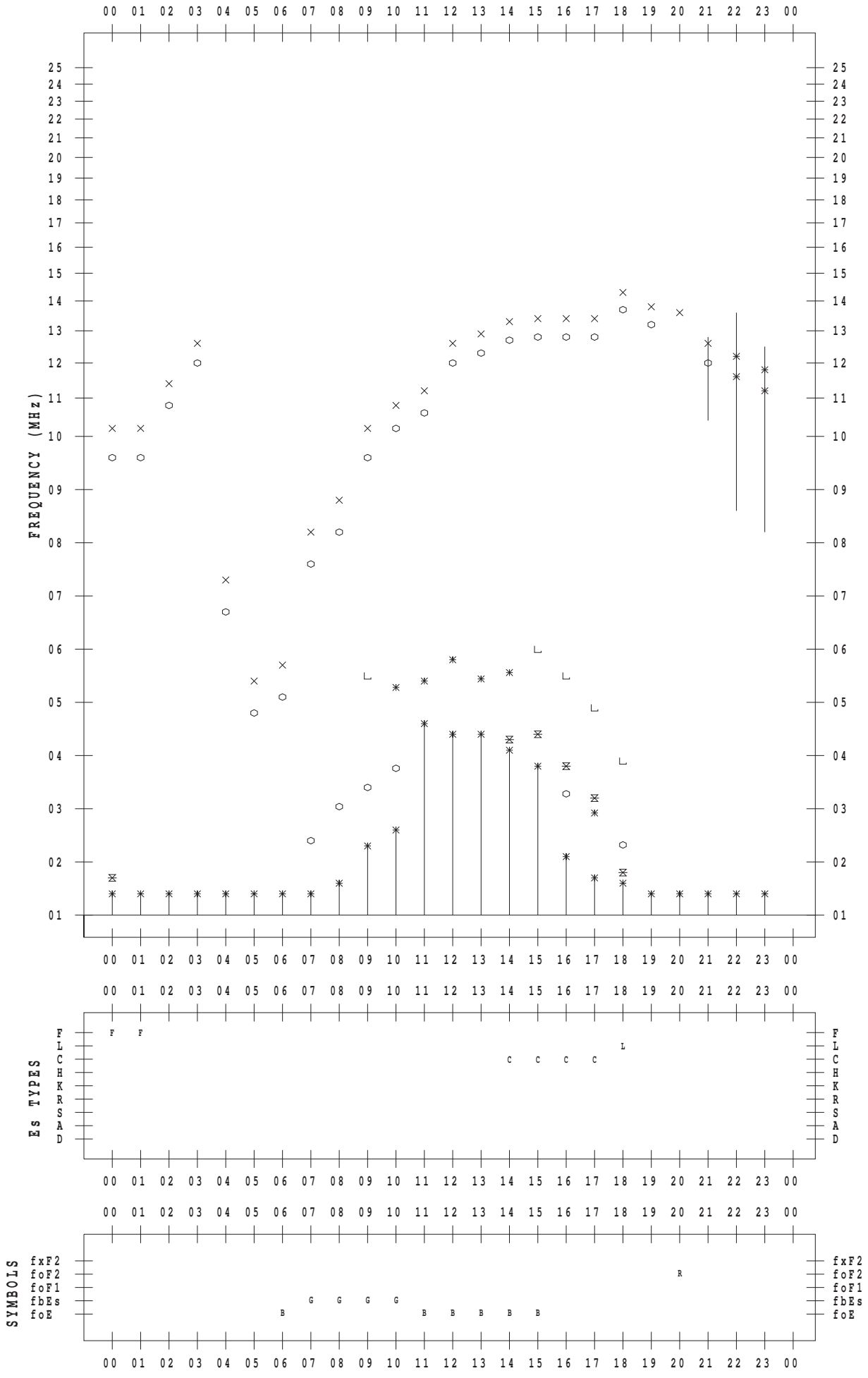
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 8

135 °E MEAN TIME



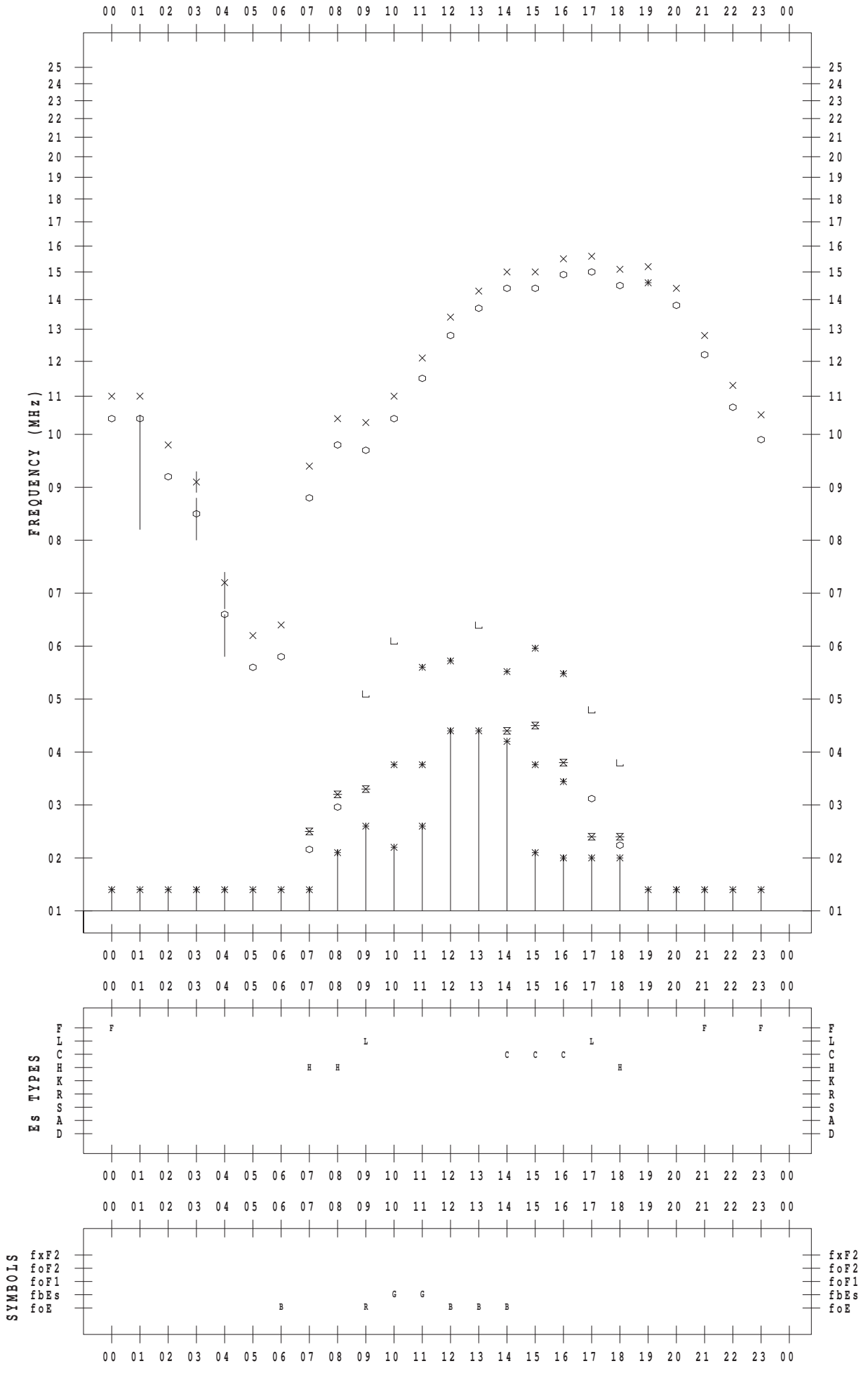
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/ 9

135 °E MEAN TIME



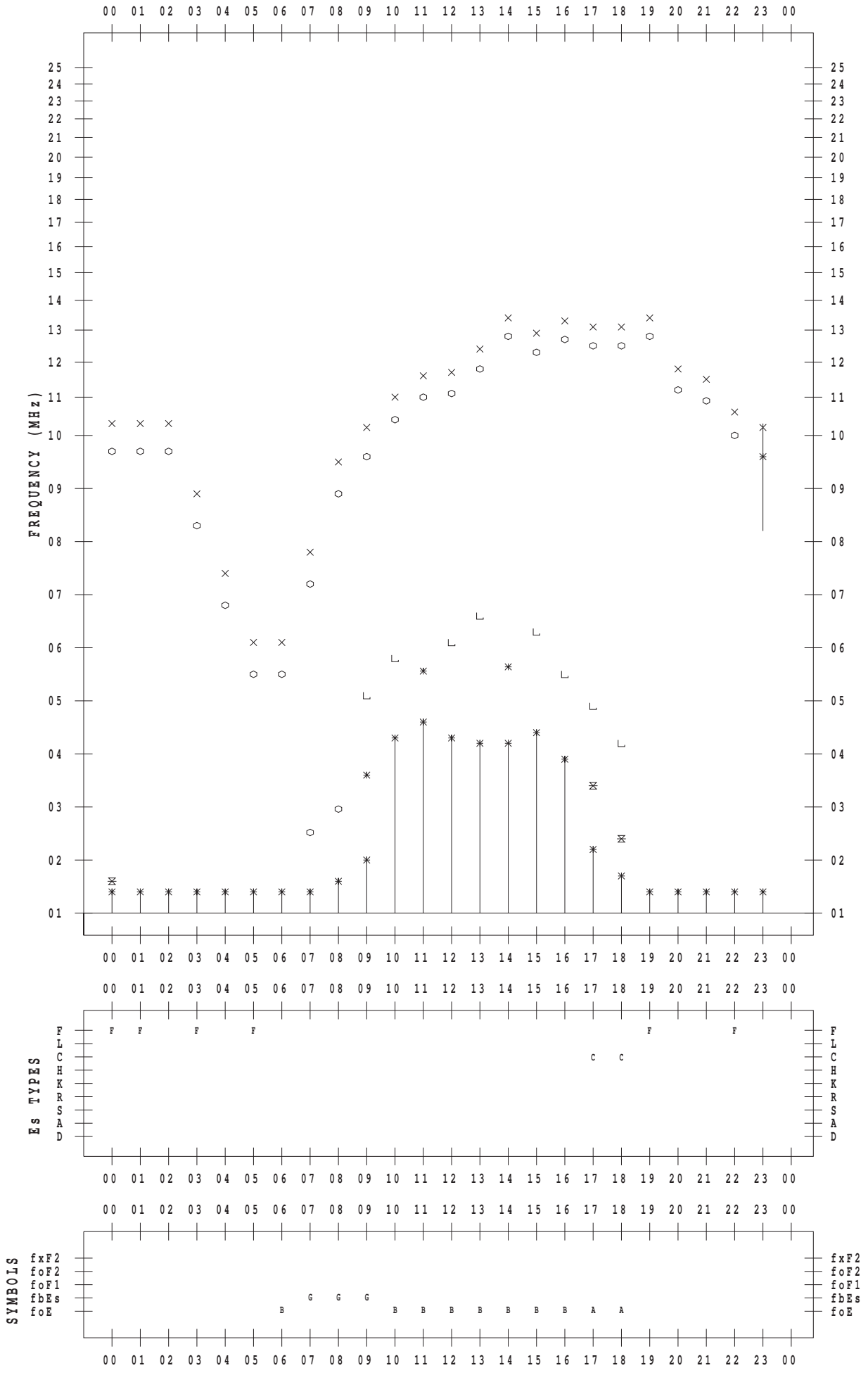
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/10

135 °E MEAN TIME



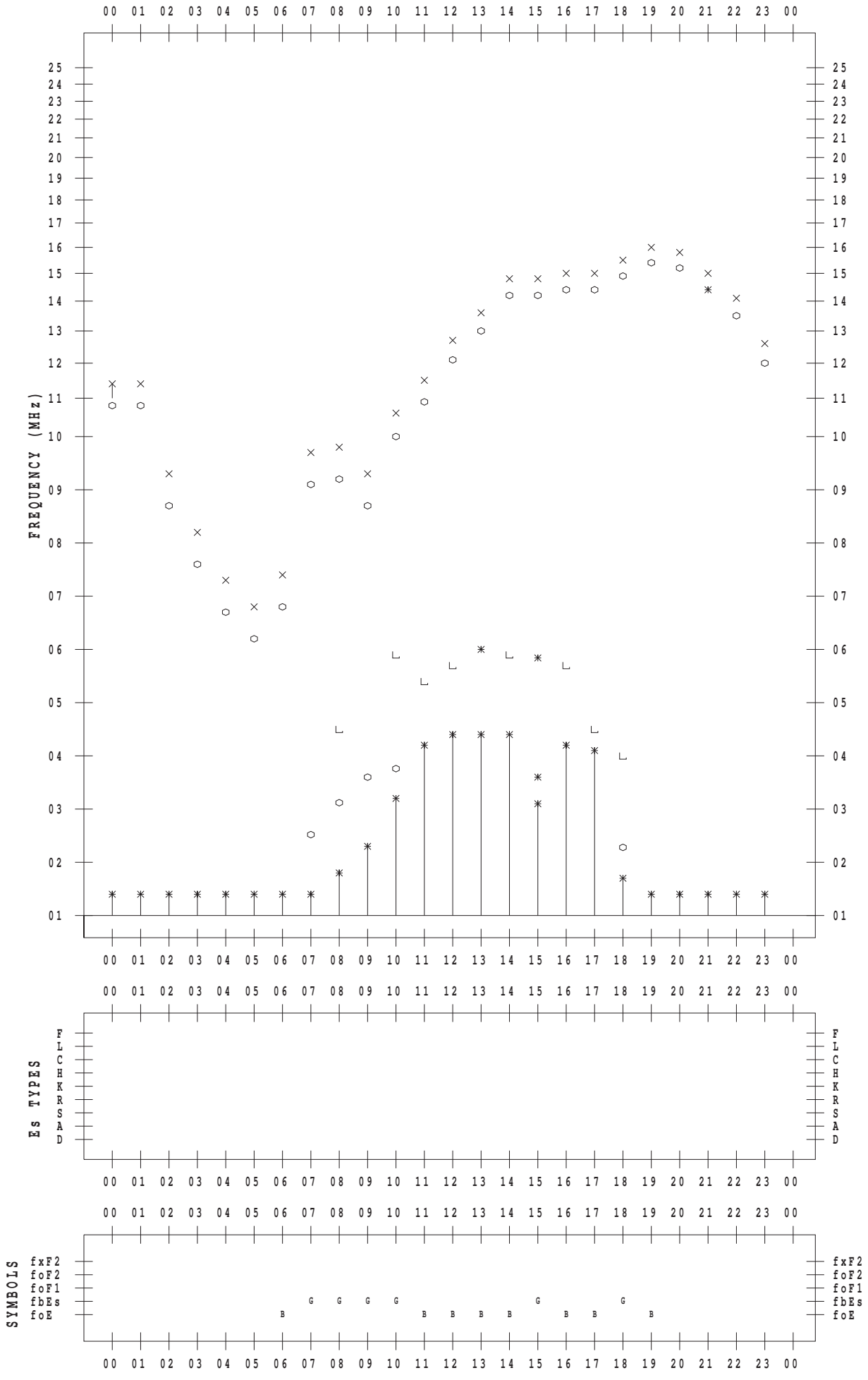
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/11

135 °E MEAN TIME



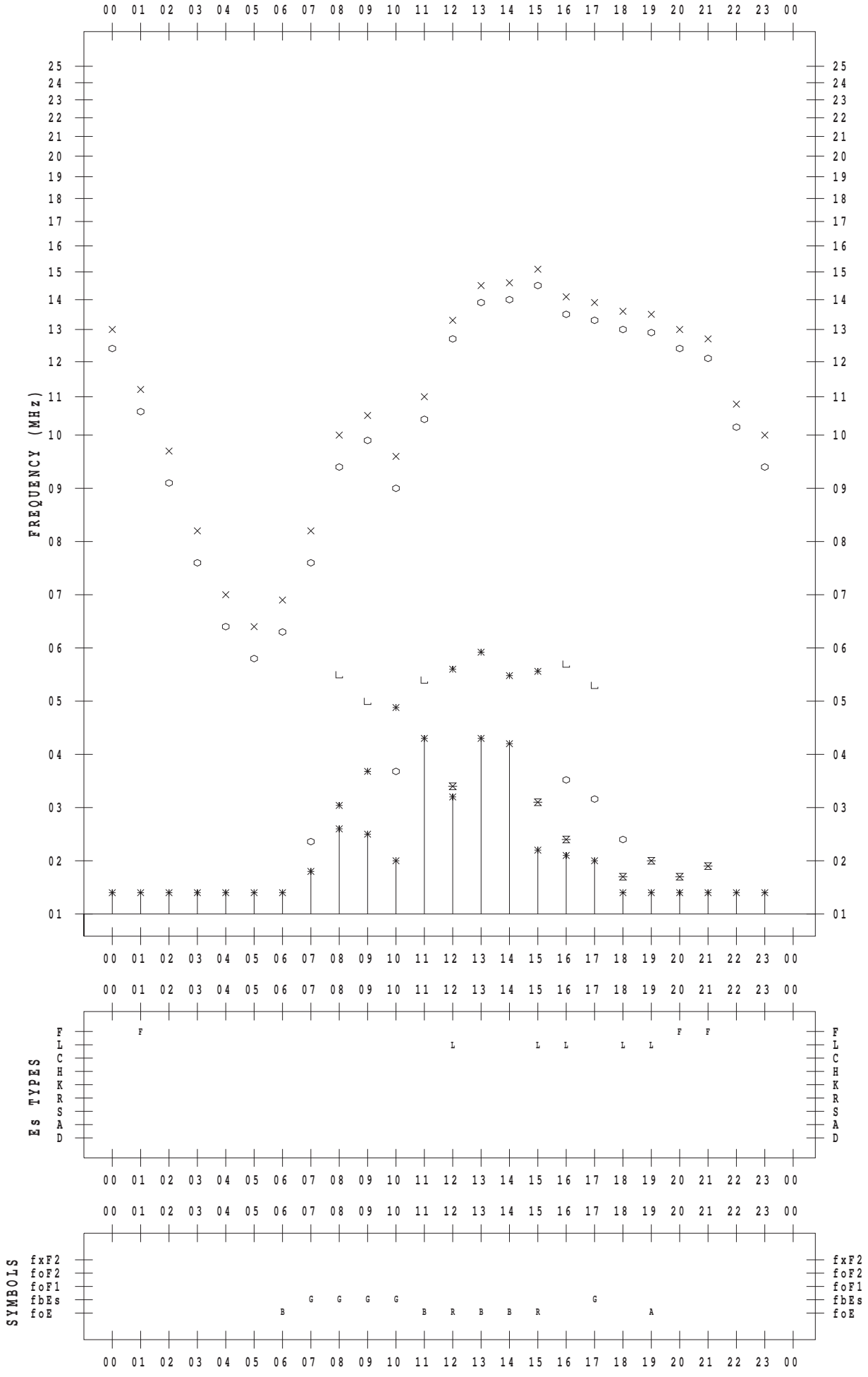
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/12

135 °E MEAN TIME



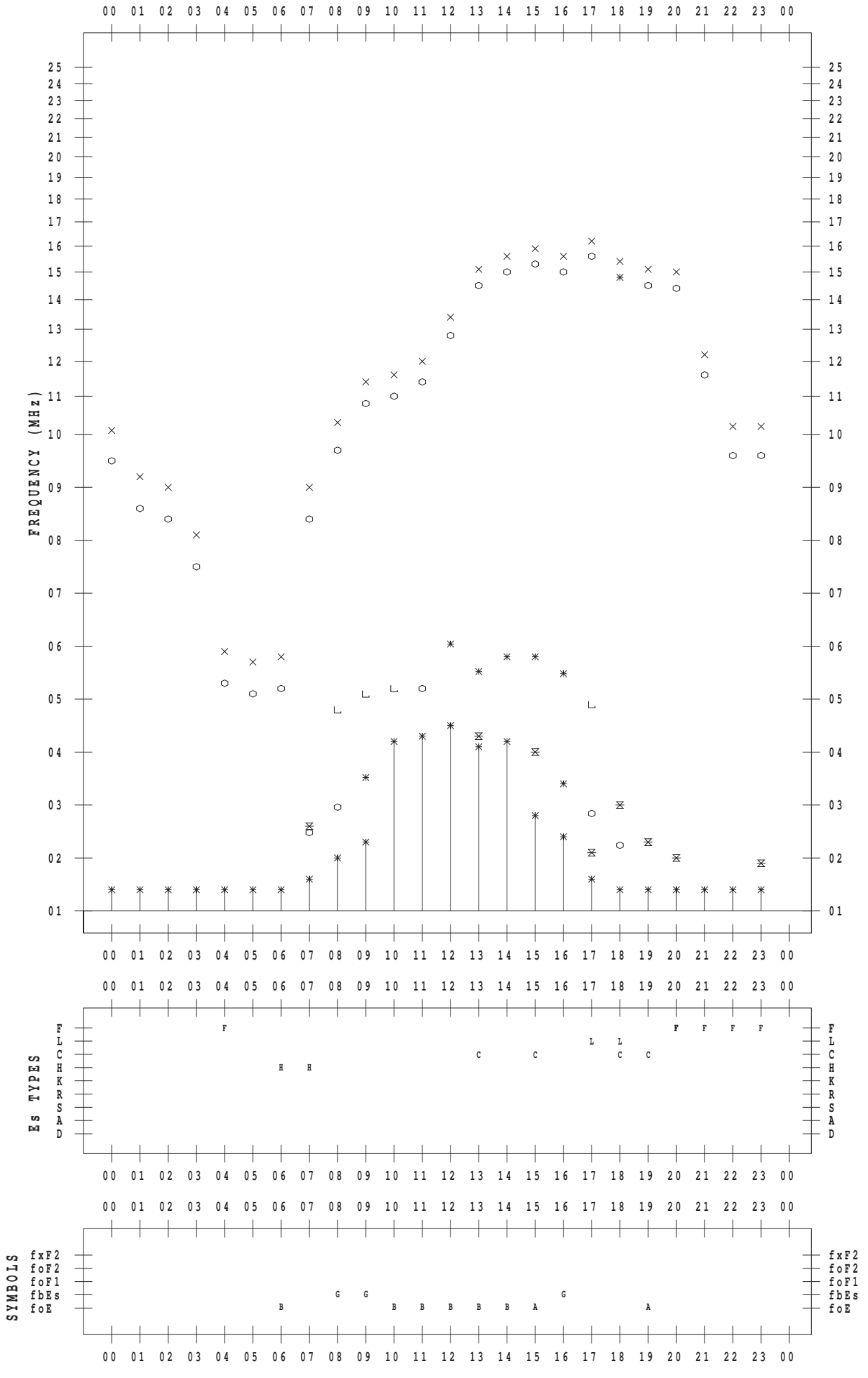
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/13

135 °E MEAN TIME



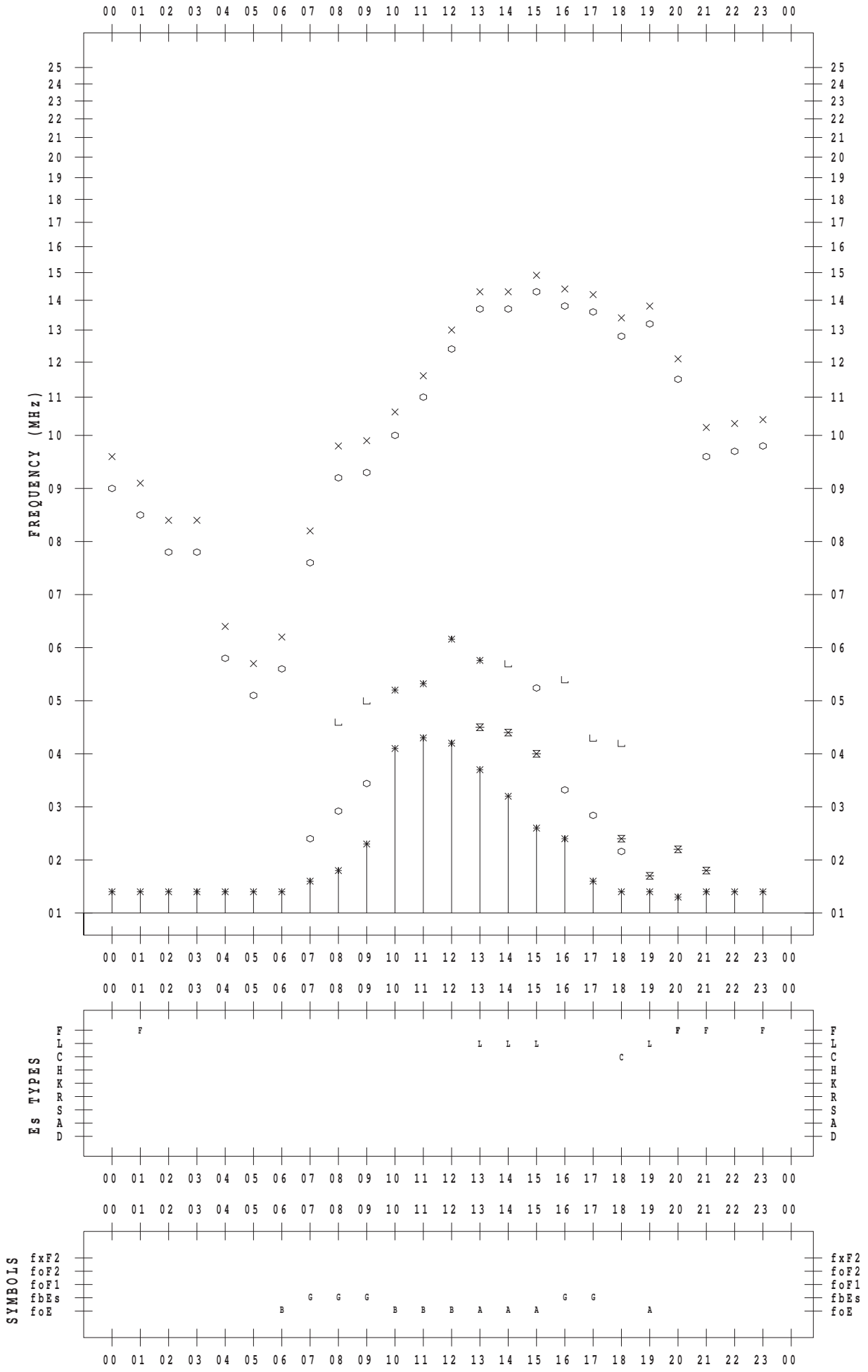
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/14

135 °E MEAN TIME



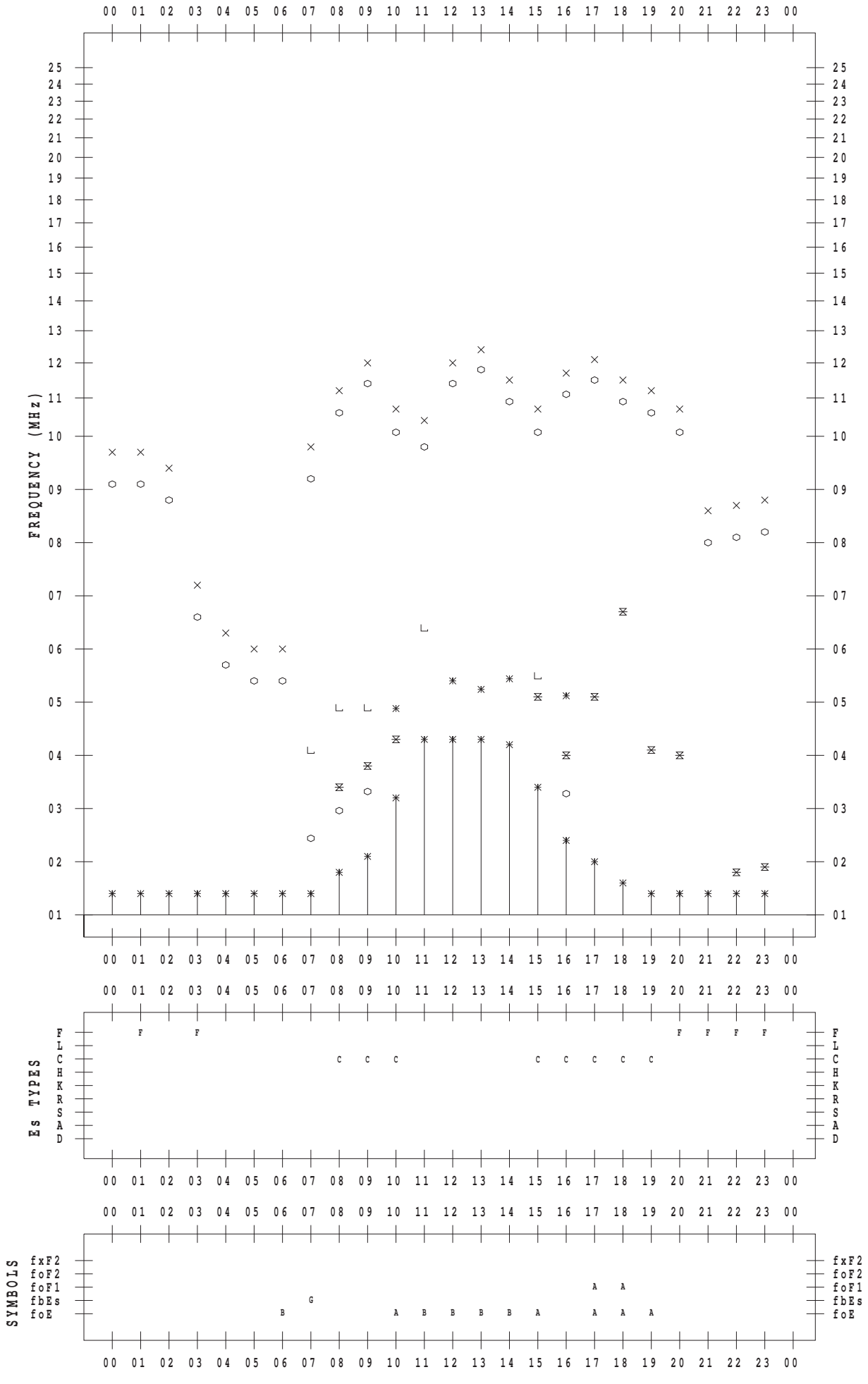
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/15

135 °E MEAN TIME



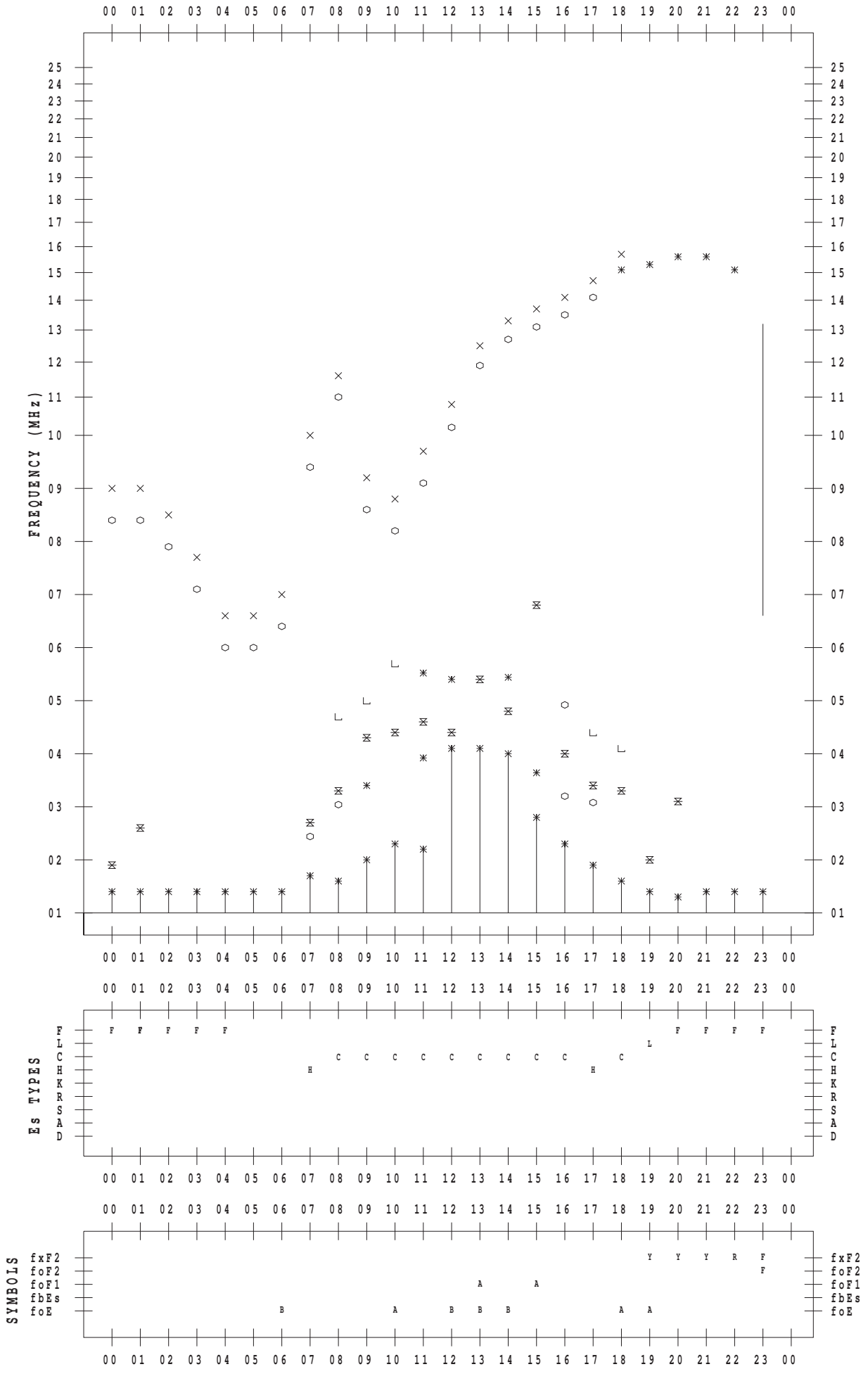
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/16

135 °E MEAN TIME



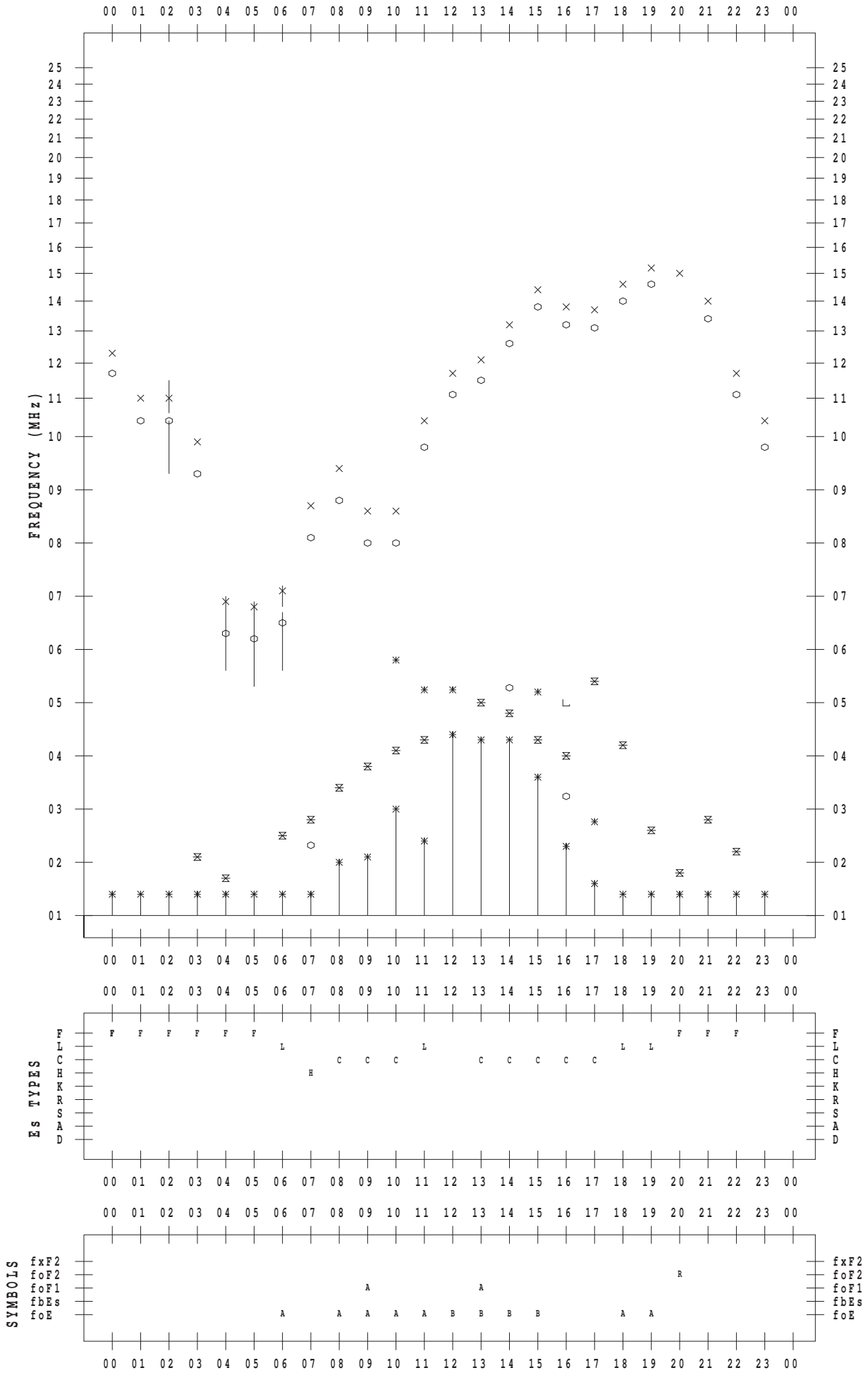
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/17

135 °E MEAN TIME



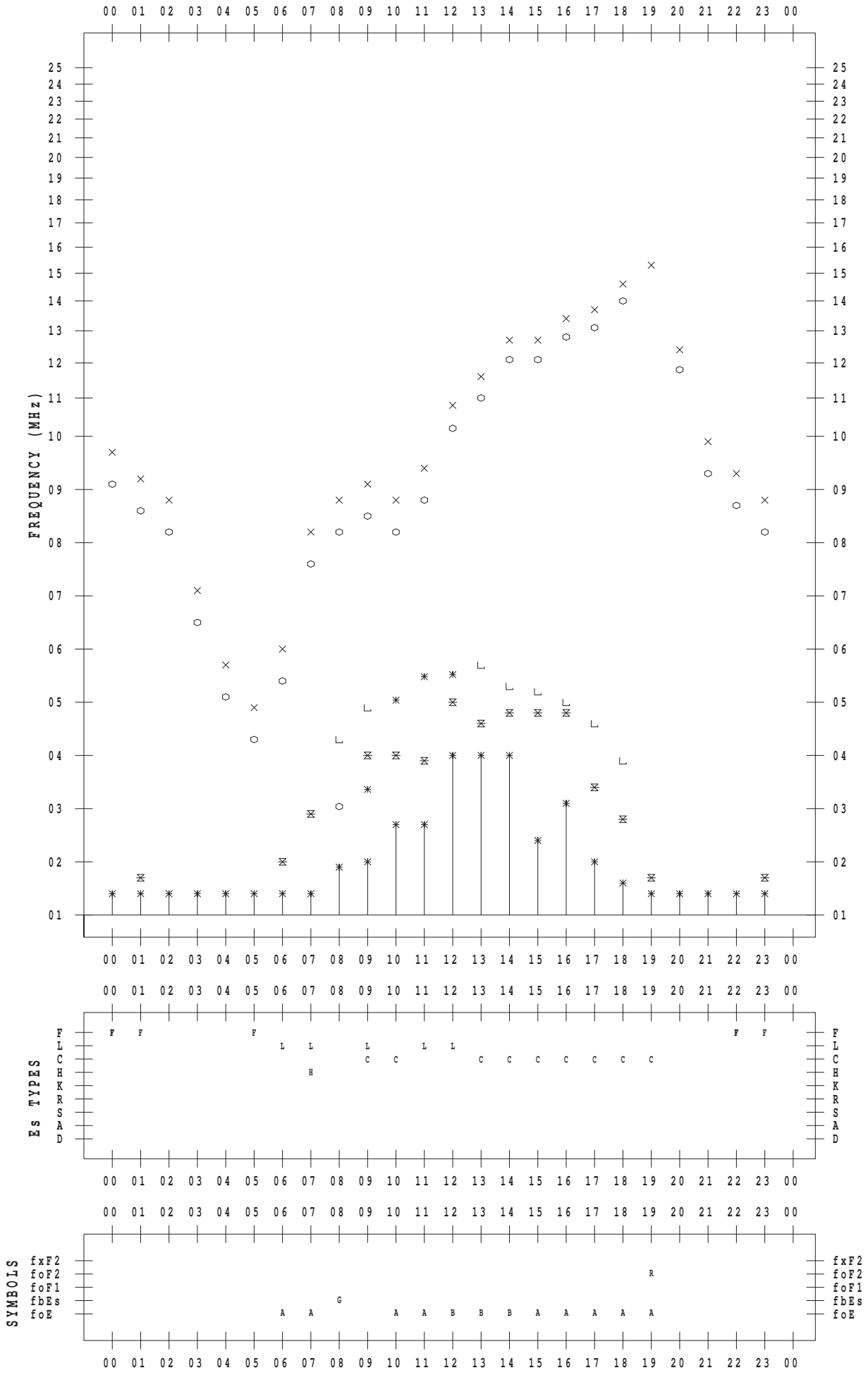
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/18

135 °E MEAN TIME



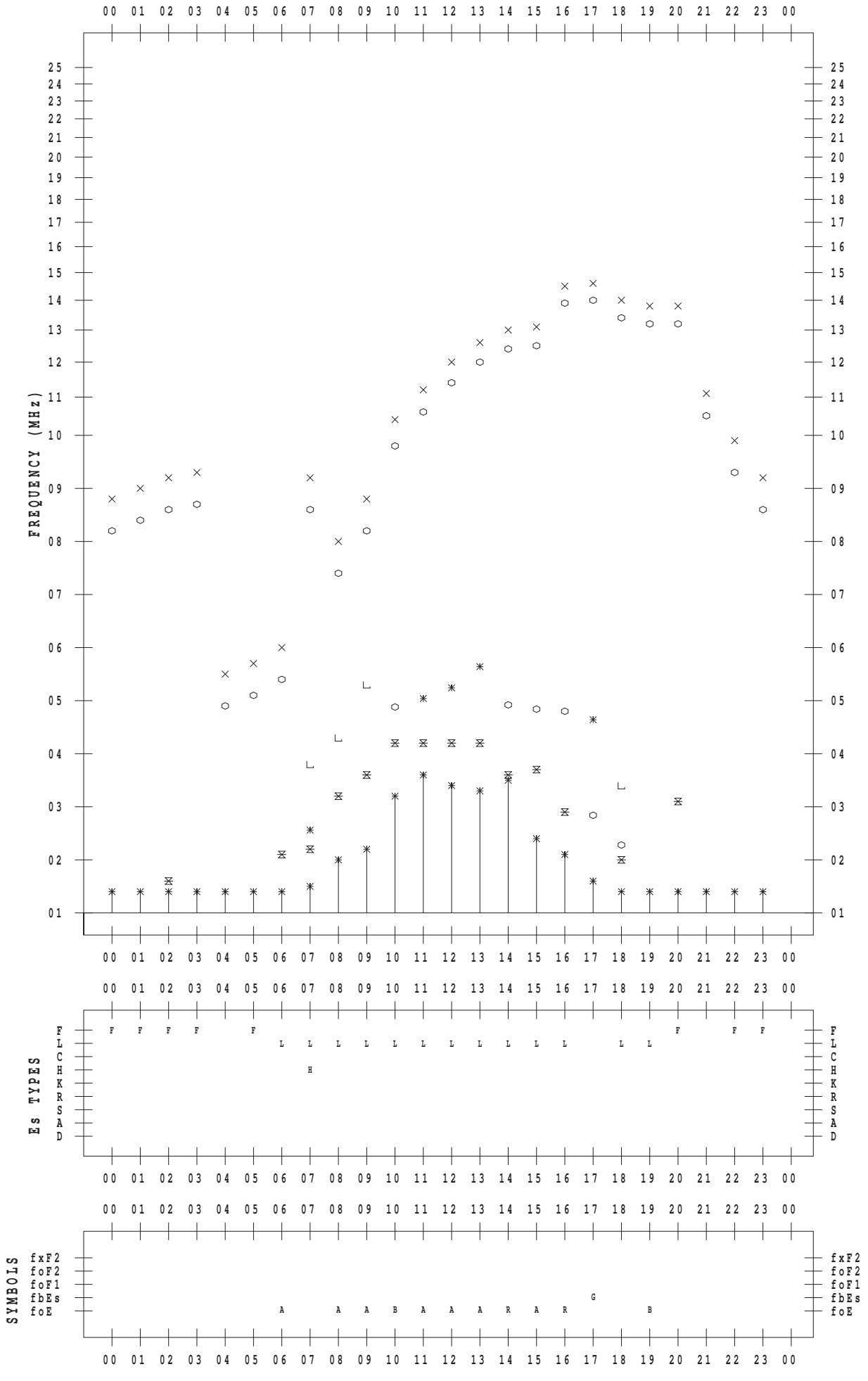
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/19

135 °E MEAN TIME



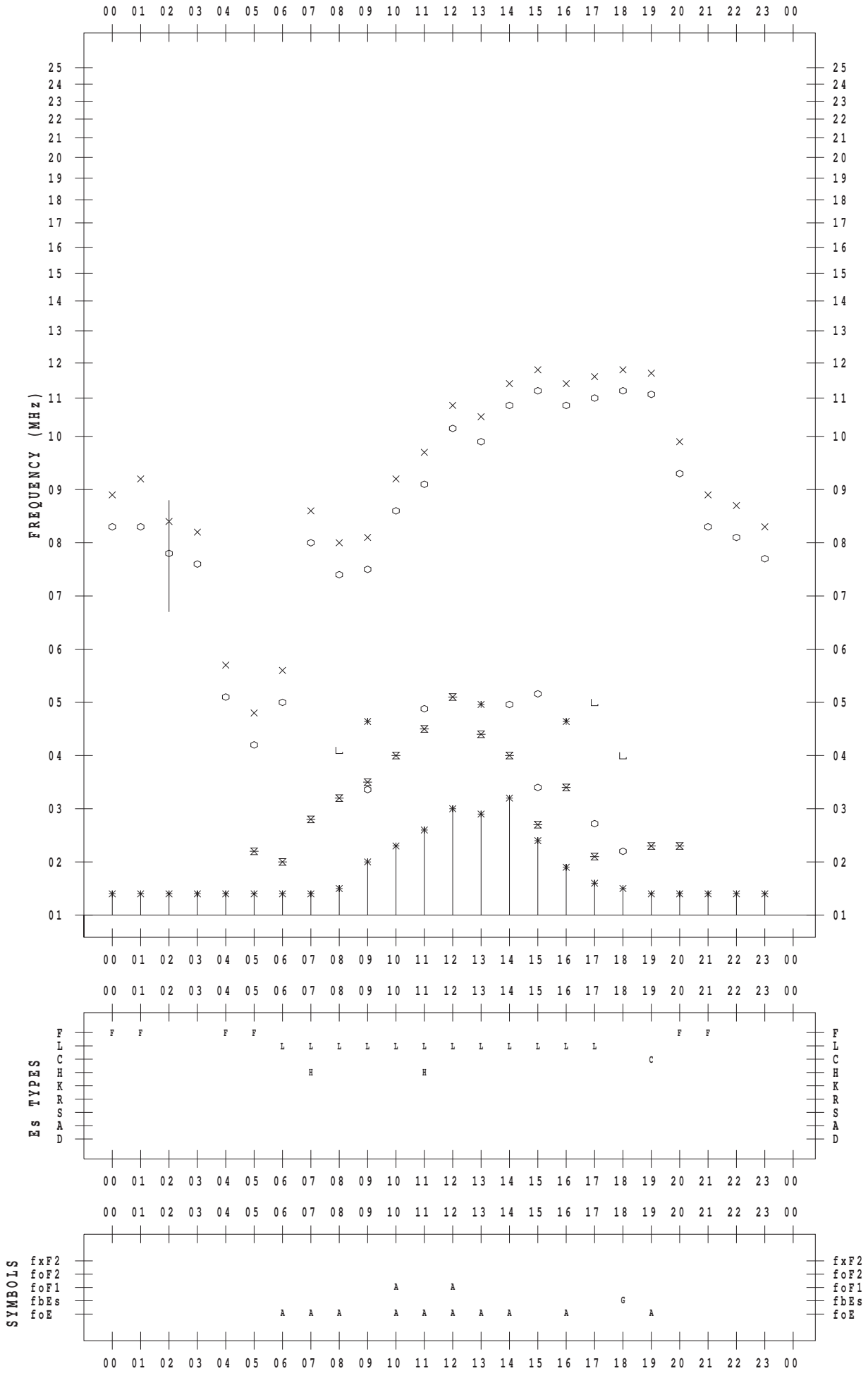
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/20

135 °E MEAN TIME



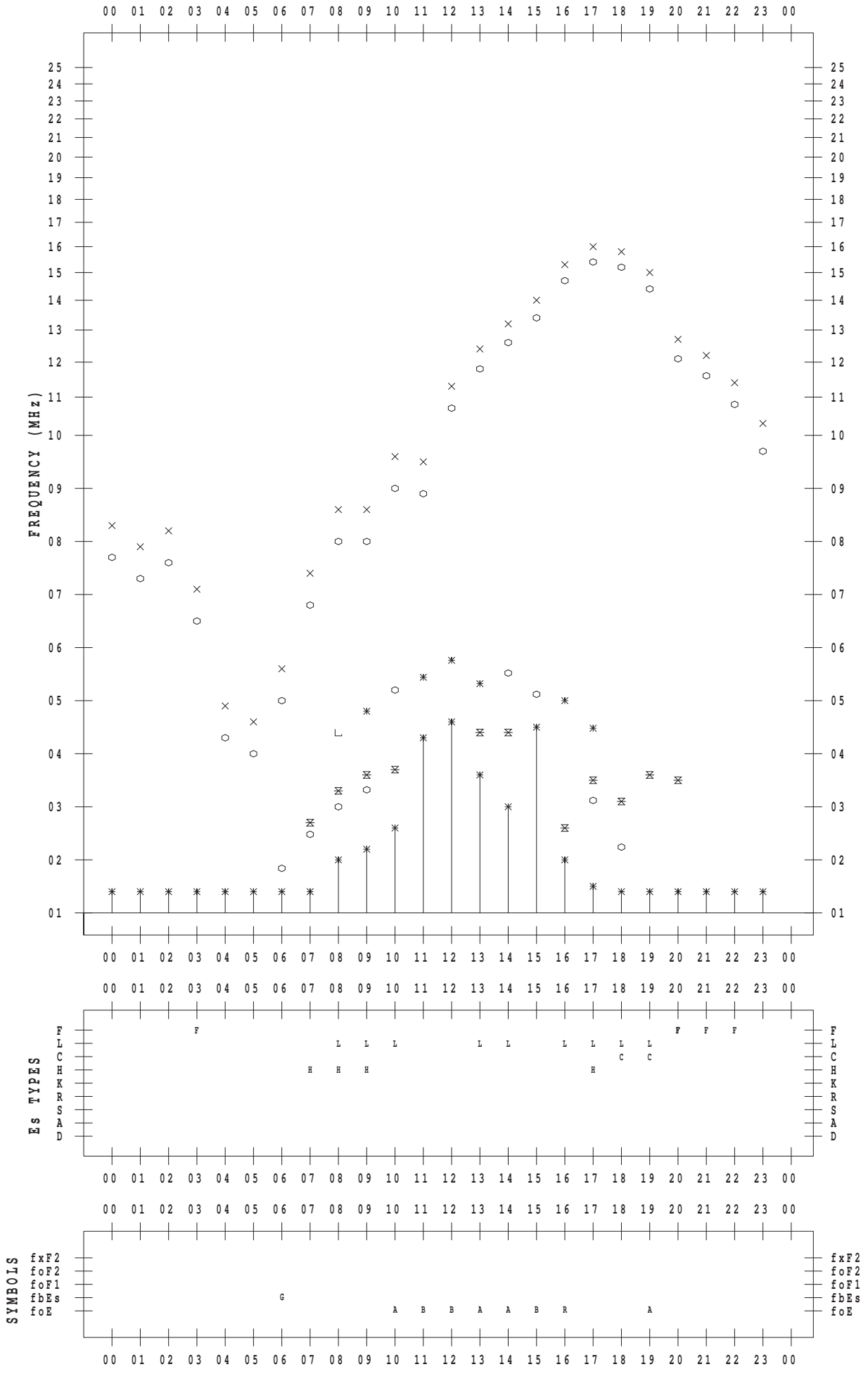
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/21

135 °E MEAN TIME



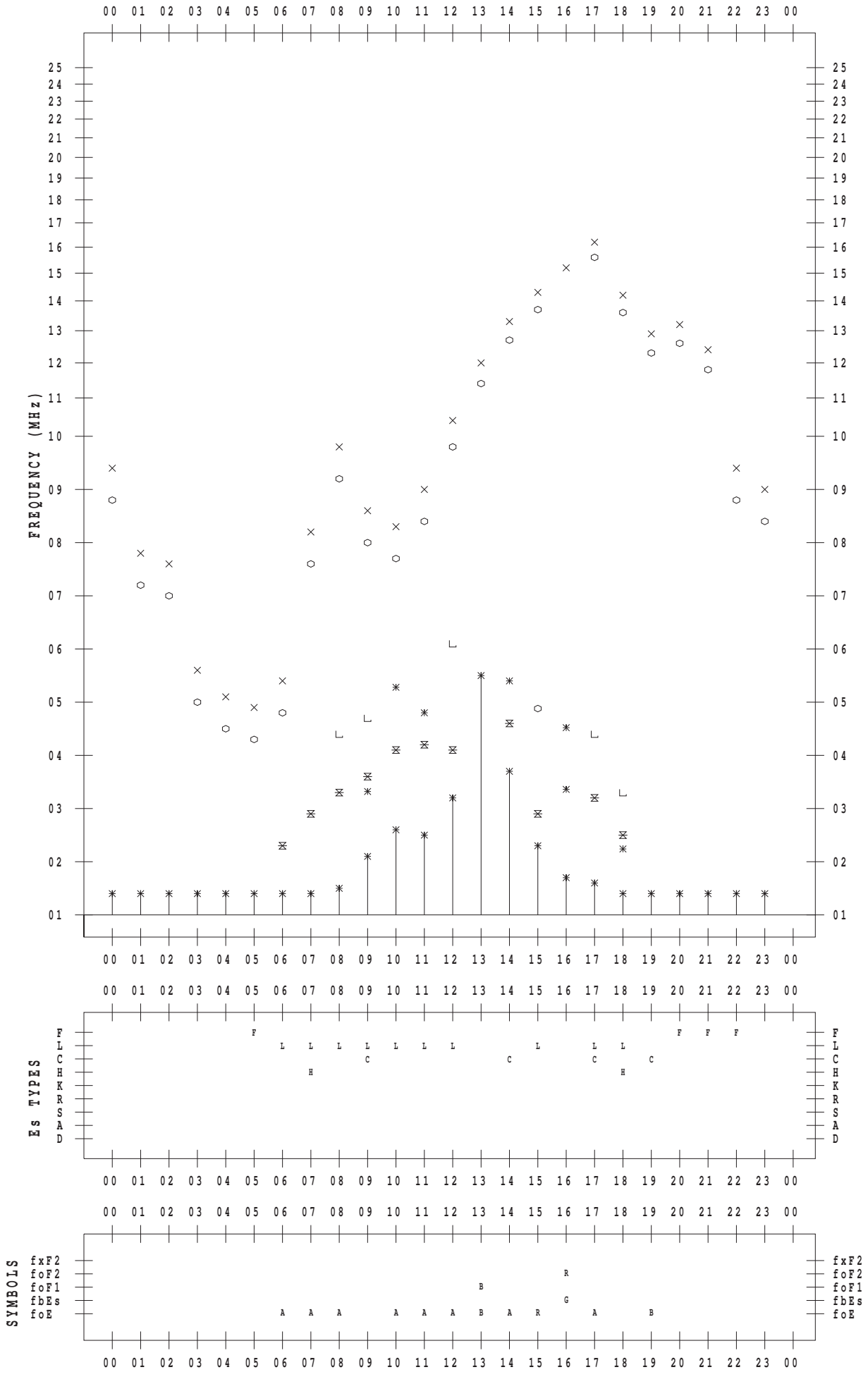
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/22

135 °E MEAN TIME



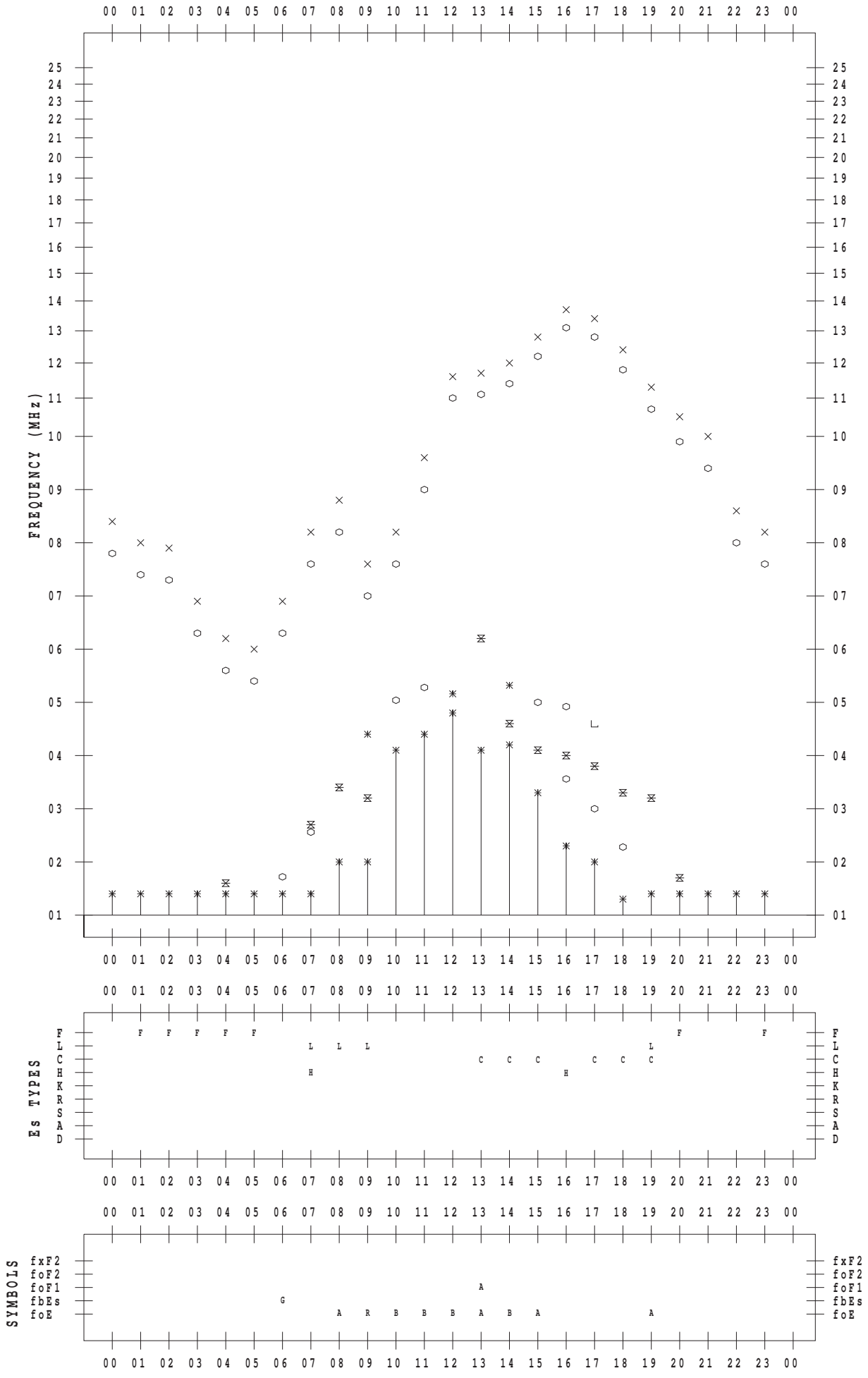
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/23

135 °E MEAN TIME



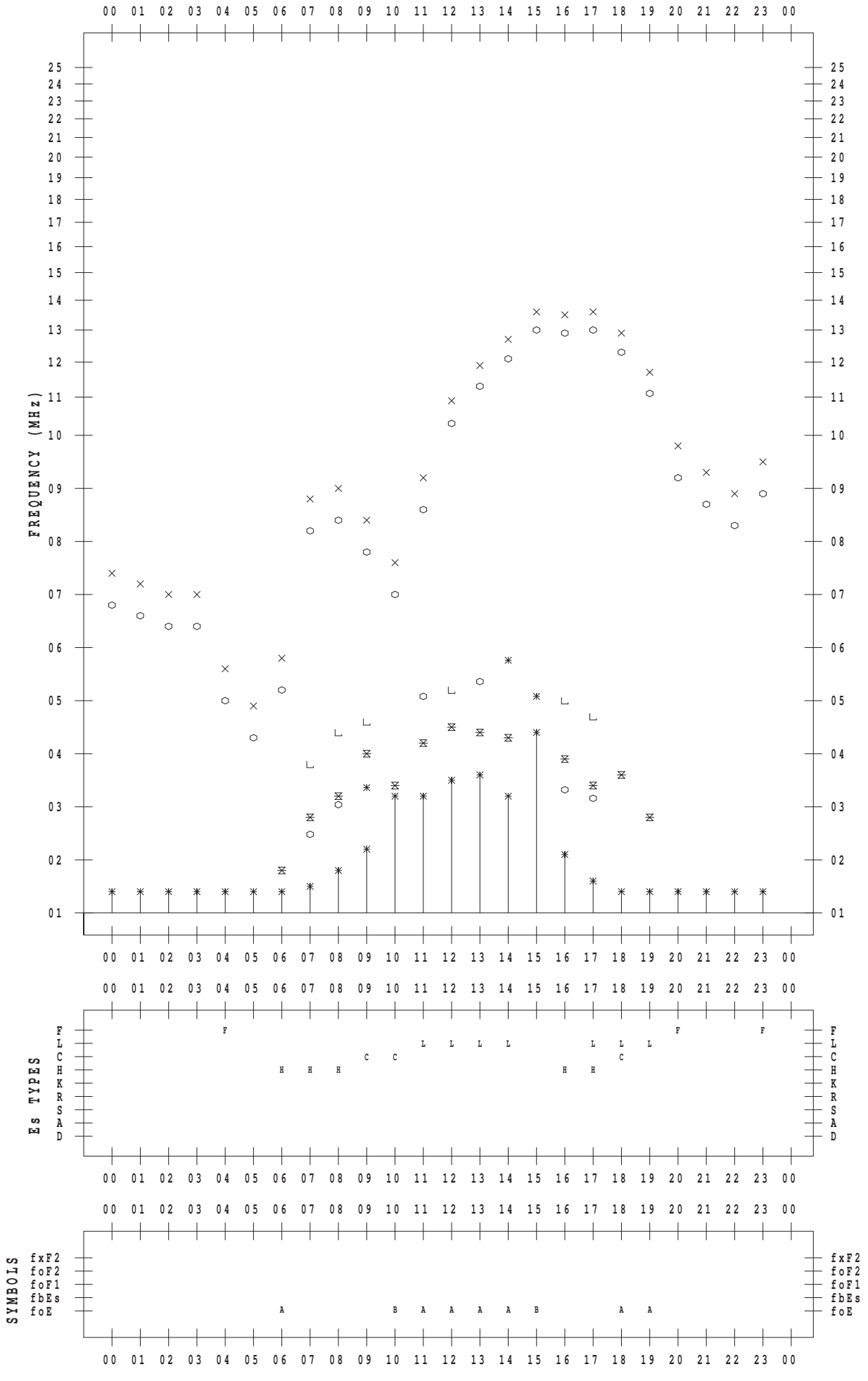
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/24

135 °E MEAN TIME



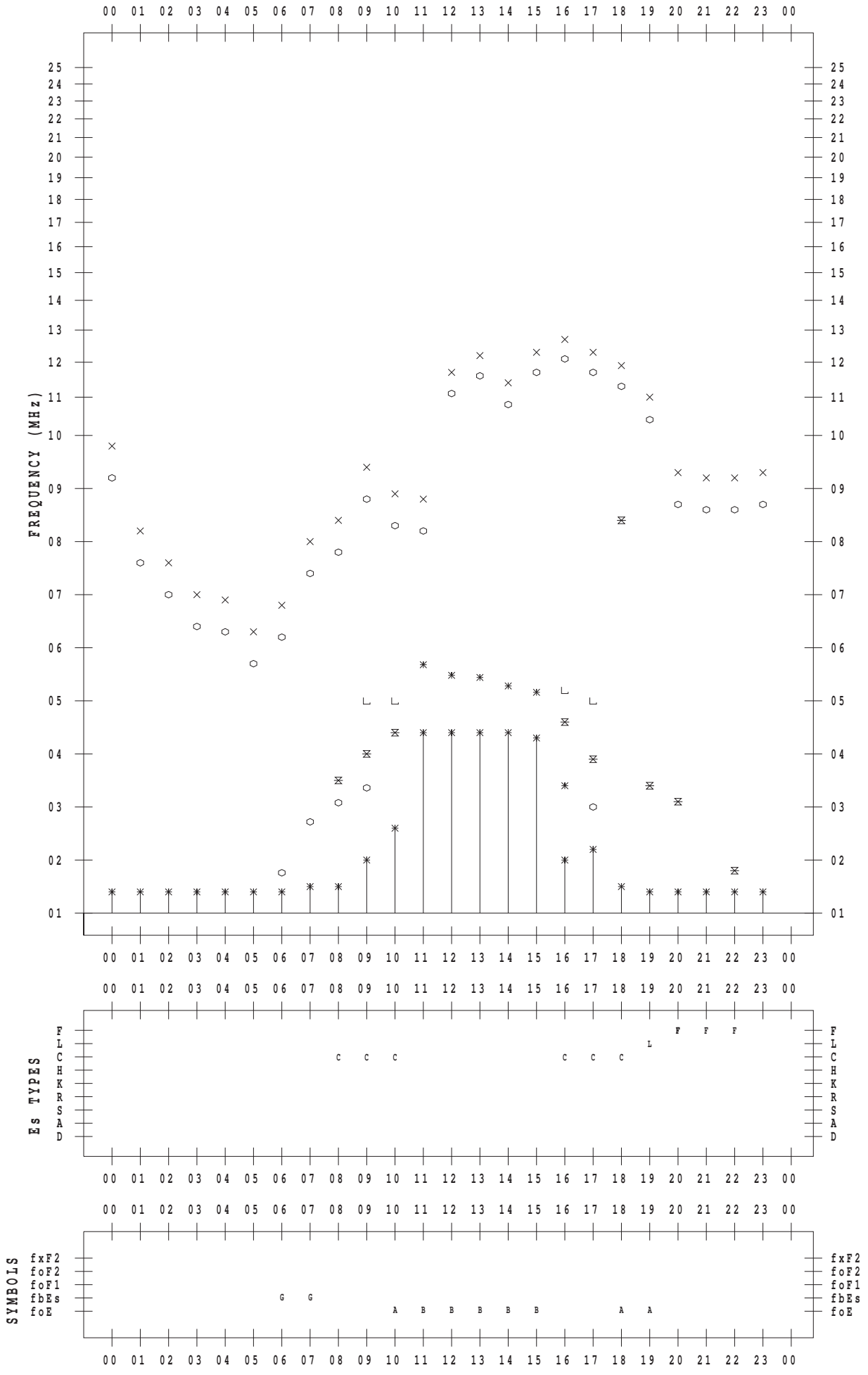
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/25

135 °E MEAN TIME



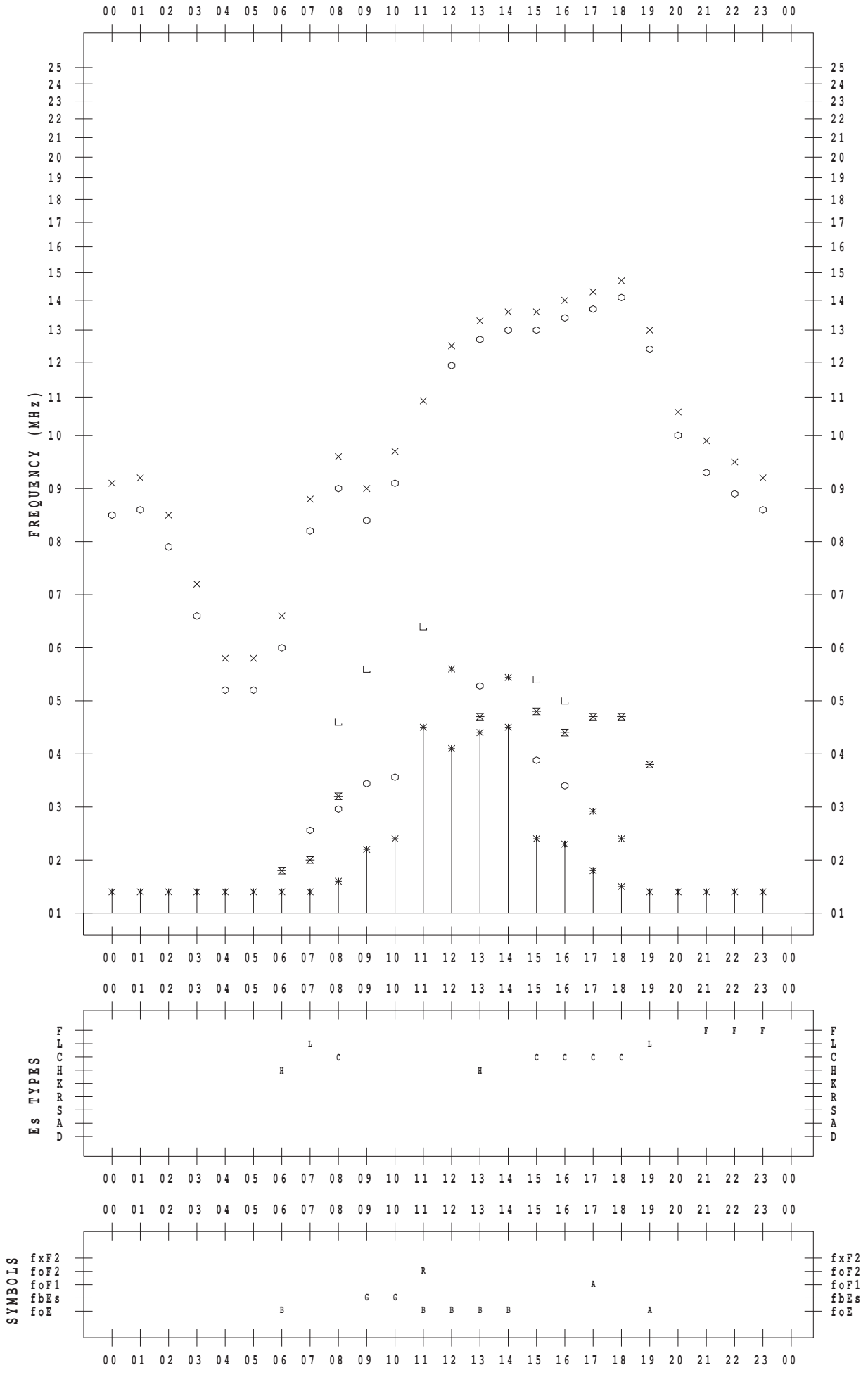
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/26

135 °E MEAN TIME



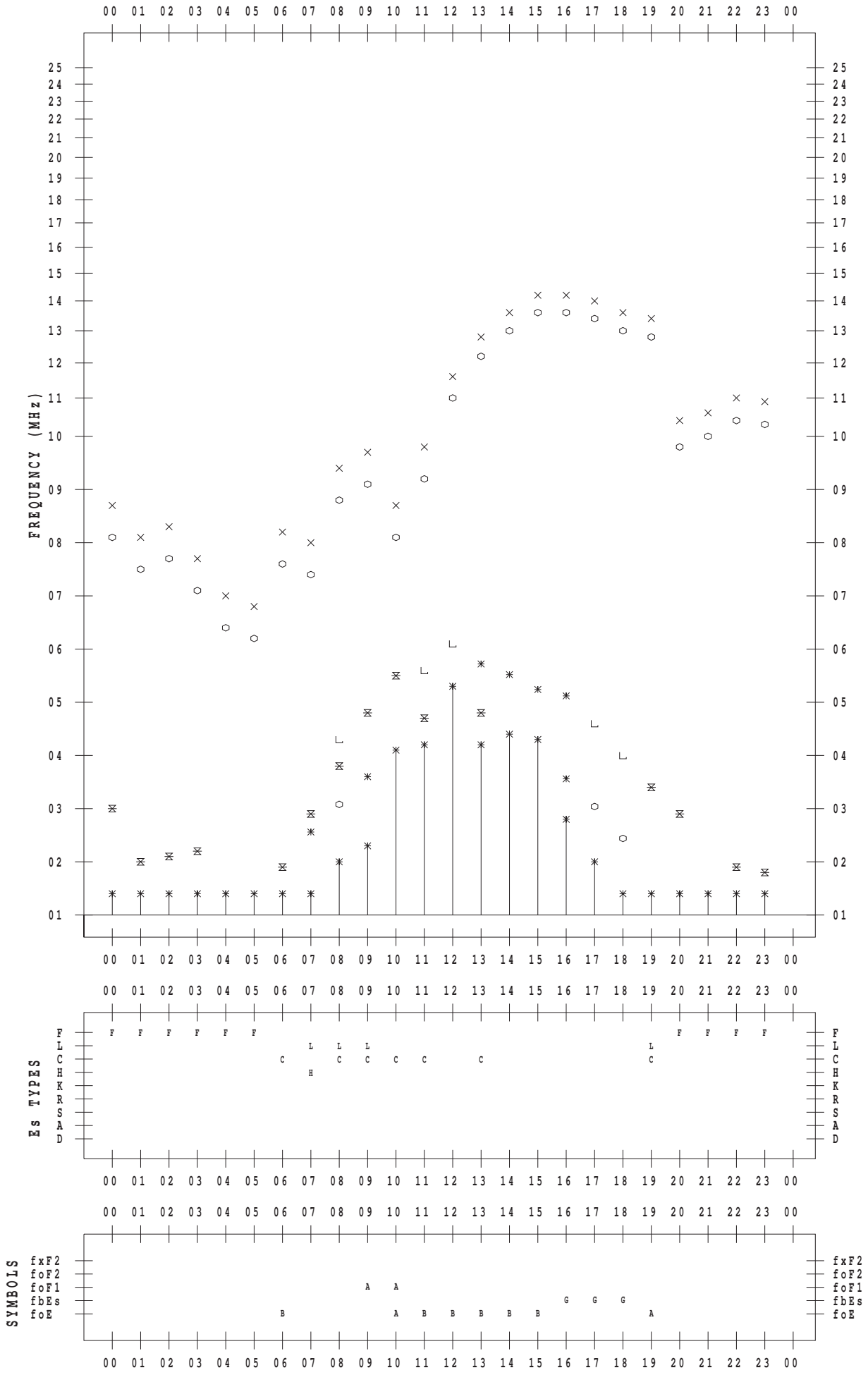
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/27

135 °E MEAN TIME



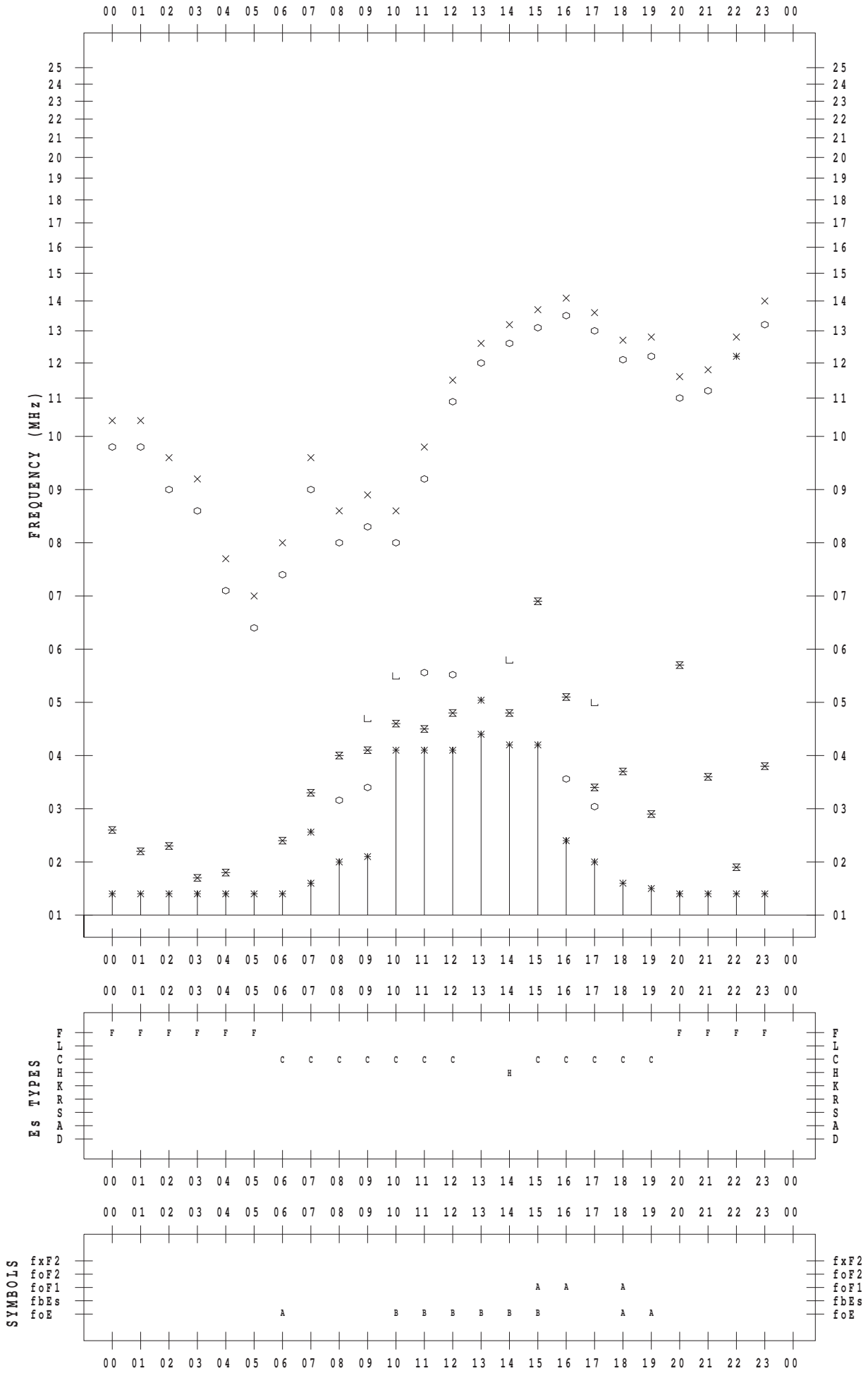
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/28

135 °E MEAN TIME



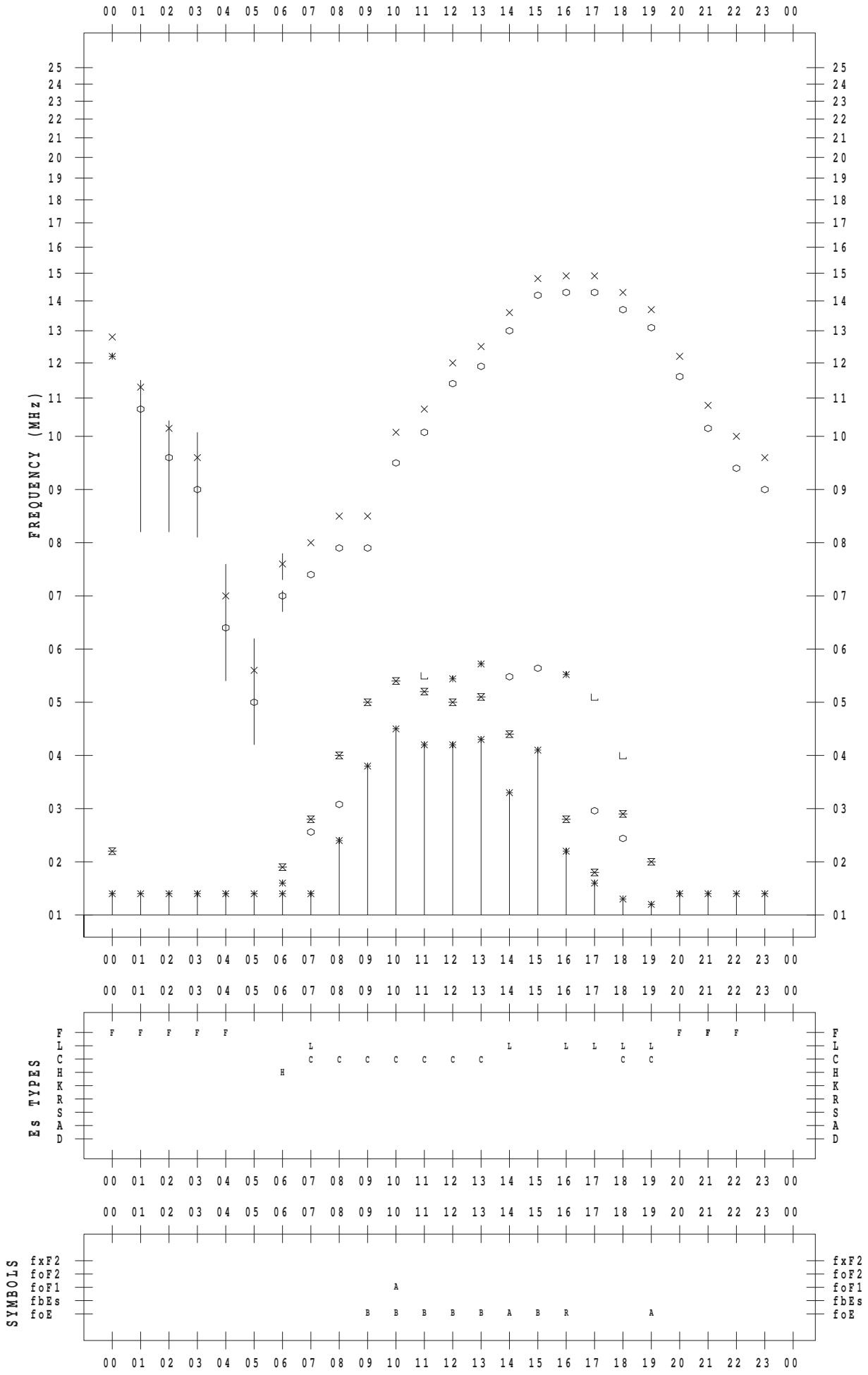
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/29

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 4/30

135 °E MEAN TIME