F-767

IONOSPHERIC DATA IN JAPAN

FOR NOVEMBER 2012

VOL. 64 NO. 11

CONTENTS

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

NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

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

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

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

IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to replaced a numerical value on the monthly tabulation sheets, if necessary.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.

B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced by, or impossible because the ionization density of the layer is too small to enable it to be made accurately.

H Measurement influenced by, or impossible because of, the presence of a stratification.

K Presence of particle *E* layer.

L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

P Man-made perturbations of the observed parameter; or spur type spread *F* present.

Q Range spread present.

R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

The following letters are entered in the first column before a numerical value on the monthly tabulation sheets, if necessary.

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

When more than one type of *Es* trace are present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple trace is indicated after the type letter.

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.

l A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the part *E* layer minimum virtual height.

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

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

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

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

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

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

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

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

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

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

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

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

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

HOURLY VALUES OF foF2 AT Wakkanai

NOV. 2012

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	39	34	36	43	35	37	44	65	90	67	67	59	59	69	73	75	69	64	54	54	32	34	43	A
2		35	34	34	34	34	34	54	67	80	63	76	70	81	67	81	66	54	37	47	34	44	32	32
3	52	A	A	48	48	34	37	63	59	59	87	70	59	55	76	92	65	A	44	38	34	40	38	34
4	32	34	34	34	32	32	34	67	70	70	61	66	70	67	70	67	66	A	34	32	32	32	38	30
5	38	30	34	34	34	34	42	70	67	67	N	74	59	66	67	68	62	43	37	34	34	42	34	32
6	34	31	34	38	34	40	37	69	67	74	62	90	89	71	70	64	64	53	34	34	34	34	32	32
7	34	32	34	34	34	32	32	64	67	67	90	59	87	68	69	58	67	40	34	31		26	34	32
8	34	32	34	34	32	34	43	63	76	86	68	N	59	68	87	68	68	49	46	47	30	30	32	34
9	32	38	34	37	37	N	40	67		59	59	N	59		70	67	64	34	A	48	43	34	34	34
10	38	34	32	34	50	39	44	64	59	59	59	74	87	70	59	76	67	51	40	28	32	32	34	37
11	31	37	34	37	34	38	44	64	70	85	N	96	70	71	70	68	67	47	34	37	36	34	34	34
12	34	34	34	37	34	34	42	61		59	92	69	82	69	70	70	67	36	34	34	32	34	37	34
13	32	38	34	43	46	34	34	30	69	67	86		59	68	74	70	67	50	53	52	49	43		36
14	36	38	46	36	34	48	35	65	69	107	122	59		59	96	92	59	67	63	34	38	34	52	37
15	34	42	43	48	34	34	34	68	59	63	59	86	N	59	91	69	66	52		38	37	28	32	32
16	43	32	32	32	32	32	37	65	67	99	59	68	70	69	N		65	56	46	34	32	32	34	30
17	34	34	32	31	32	32	38	64	60	59	59	59	70	70	67	72	64	44	47	34	34	32		34
18	29	34	34	34	34	34	34	67	67	81	74	98		70	71	67	65	53	47	34	37	31	31	31
19	32	28	34	34	34	34	32	66	78	92	69	69	70	75	67	70	66	52	37	34	36	32	34	35
20	32	34	36	43	44	34	32	63	68	65	86	69	68	59	74	68	64	54	52	44	34	31	34	28
21	28	30	32	34	37	32	34	54	68	N	59	59	59	59	68	69	64	47	47	35	34	34	42	42
22	32		34	43	34	34		62	67	73	69	90	59	70	83	71	62	46	44	43	32	34	35	34
23	34	32	32	34	38	34	34	64	72	66	88	59	59	46	68	66	63	38	34	34	32	30	29	32
24	32	34	34	34	37	34	32	54	68	64	74	90	68	69	70	66	64	58	32	34	A	A	37	A
25		32	34	37	34	32	32	49	64	69	66	86	62	80	67	67	64	34	43	34	32		32	32
26	34	31	34	34	47	31	30	59	67	67	67	59	69	68	68	68	61	32	36	34	32	26	32	32
27	31	32	34	28	34	34	30	53	67	N	64	59	N	71	68	67	64	32	32	34	23		28	30
28	29	32	34	34	37	N	28	54	64	67	65	70	68	71	68	62	50	36	28	30	A	32	31	29
29	32	30	34	34	34	A	34	54	70	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	53	30	A	29	32	A	32	29
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	27	27	28	29	29	26	28	29	27	26	26	25	24	27	27	27	29	27	26	29	26	25	27	27
MED	34	34	34	34	34	34	34	64	67	67	67	69	68	69	70	68	64	47	38	34	34	32	34	32
U Q	34	34	34	37	37	34	39	65	70	80	86	86	70	71	74	71	66	53	47	40	36	34	37	34
L Q	32	32	34	34	34	32	32	54	67	64	61	59	59	66	68	67	63	36	34	34	32	31	32	31

HOURLY VALUES OF fEs AT Wakkanai

NOV. 2012

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	29	39	G	G	G	G	G	G	G	G	G	G	G	G	G	28	26
2		G	G	G	28	G	G	34	36	50	69	58	55	43	39	G	G	G	G	G	33	34	34	33
3	28	40	37	31	G	G	G	G	G	G	50	G	G	G	41	51	40	40	28	27	G	G	G	G
4	G	G	27	27	G	G	G	G	48	39	G	50	G	38	G	38	35	36	28	G	G	G	G	G
5	G	G	G	G	G	G	G	34	G	G	G	G	G	G	G	G	G	G	27	24	G	G	G	G
6	G	G	27	G	G	G	G	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	49	36	39	40	G	G	G	G	32	G	27	G	G		G	G	G
8	G	G	G	G	G	G	G	44	G	G	40	G	G	G	G	G	G	G	G	G	G	G	G	G
9	G	G	G	G	G	G	G	G		42	39	65	G		G	32	G	G	26	G	G	G	G	G
10	G	28	G	G	G	G	G	29	40	39	38	G	G	38	G	G	G	G	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G	35	37	G	G	G	G	G	G	G	G	G	G	G	G	G	G
12	G	G	G	G	G	G	G	G		38	38	40	G	38	G	G	G	G	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G		G
14	G	G	G	G	G	G	G	G	34	47	G	G		G	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G	G	30	G	50	G	G	G	G	G	G	G	G		G	G	G	G	G
16	G	G	G	G	G	G	G	48	G	G	G	G	G	G	G		11	G	27	G	G	G	G	G
17	G	G	G	G	G	G	G	G	33	G	G	N	G	G	G	G	G	11	G	G	G	G		G
18	G	G	25	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
19	G	G	G	G	G	G	G	G	50	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
20	G	G	G	G	G	G	G	30	48	G	G	G	48	G	G	38	34	32	41	32	G	G	G	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40	G	G	G	G	G	24	G	G
22	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	28	G	G	G	G	G	G
23	G	G	G	G	G	G	G	G	32	G	G	G	G	N	G	36	G	G	G	G	G	G	G	G
24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	32	G	G	33	40	35	33	26
25		G	G	G	G	G	G	30	G	G	G	G	G	39	G	G	G	G	G	G	G		G	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	33	G	G	G	G	G
27	G	G	G	G	G	G	G	46	G	40	G	G	G	G	G	47	G	G	G	G	G		G	G
28	G	G	G	G	G	G	G	28	33	38	G	G	G	G	G	G	G	27	G	G	49	G	G	G
29	G	G	G	33	G	24	G	G	48	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	35	25	G	G	38	28	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	27	29	29	29	29	29	28	29	27	28	28	26	26	26	28	27	29	29	28	29	28	27	27	29
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	30	36	39	19	G	G	G	G	34	G	19	25	G	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

NOV. 2012

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	17	15	14	14	15	14	15	15	14	14	16	20	15	15	14	14	20	15	15	15	15	15	14	14
2		15	16	15	14	15	14	14	14	15	15	17	17	14	14	14	20	15	15	15	14	14	14	14
3	14	14	14	14	15	15	15	14	14	14	15	30	14	14	14	14	14	14	15	16	14	15	15	15
4	14	14	14	14	15	16	14	17	14	14	14	14	14	14	14	14	15	14	14	20	14	15	15	15
5	15	20	14	15	15	15	14	15	14	15	15	14	14	15	14	14	18	14	15	15	15	17	16	15
6	14	15	15	15	15	15	14	14	14	14	14	15	15	14	14	14	17	16	14	15	15	14	15	14
7	15	15	14	15	15	17	15	14	14	14	14	14	14	14	14	17	17	15	15	14		14	14	15
8	15	17	14	15	15	14	14	14	14	14	15	15	33	14	14	14	16	15	16	15	15	17	14	14
9	14	14	15	15	14	15	15	17		14	15	16	14		14	14	15	15	16	15	15	15	15	15
10	14	15	14	15	14	15	14	14	14	14	14	14	16	16	15	14	18	15	14	15	14	14	14	15
11	16	15	14	15	15	14	15	14	14	14	14	14	17	14	14	14	17	15	16	14	15	15	15	15
12	15	15	14	14	15	14	14	20		15	14	14	14	14	14	14	17	15	15	16	20	15	14	14
13	15	14	15	14	15	15	15	20	14	14	14		14	16	14	18	17	14	14	14	15	15		15
14	15	14	15	15	15	14	18	14	14	14	14	14		14	14	17	17	15	15	15	15	16	14	15
15	14	14	15	15	14	14	14	14	14	15	15	16	16	15	18	18	16	15		16	15	17	17	14
16	20	15	14	17	14	14	15	14	14	15	16	16	14	16	15		18	15	14	15	14	14	15	15
17	14	15	20	16	16	14	17	14	14	15	14	14	18	20	15	15	20	16	15	14	15	18		15
18	15	14	14	14	14	15	15	14	14	14	14	15		14	17	14	14	14	15	15	14	15	15	21
19	14	15	14	15	15	14	15	18	14	14	15	18	16	15	14	14	17	14	15	15	15	15	15	15
20	15	15	15	14	15	14	15	14	14	14	14	14	15	15	15	14	14	15	14	14	15	17	15	14
21	15	17	14	17	15	20	15	18	15	14	18	18	18	17	15	14	23	15	15	16	14	16	16	14
22	14	21	15	15	14	14		18	24	17	32	30	34	17	15	26	17	17	18	14	16	15	15	15
23	17	15	16	18	15	15	15	14	14	15	14	18	15	15	14	15	18	15	15	15	15	15	15	15
24	15	15	15	15	14	14	15	16	14	15	15	17	18	17	18	15	14	15	15	15	14	14	15	15
25		15	15	15	15	14	15	15	14	15	16	20	20	15	15	21	17	16	14	15	14		20	14
26	14	14	14	14	15	15	15	20	15	21	33	32	23	20	28	23	16	15	14	15	15	15	14	14
27	15	16	17	17	15	14	17	14	15	14	17	15	15	15	15	14	16	15	15	14	15		18	14
28	14	14	15	14	15	15	14	14	14	15	15	15	14	14	14	14	18	15	17	18	15	15	15	17
29	15	15	15	14	14	16	14	18	14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	15	15	16	15	14	15	15	16
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	27	29	29	29	29	29	28	29	27	28	28	27	26	27	28	27	29	29	28	29	28	27	27	29
MED	15	15	15	15	15	15	15	14	14	14	15	15	15	15	14	14	17	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	15	17	14	15	15	18	18	16	15	17	18	15	15	15	15	16	15	15
L Q	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	15	15	14	14	14	15	14	14

HOURLY VALUES OF foF2 AT Kokubunji

NOV. 2012

LAT. 35°43.0′N LON. 139°29.0′E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	27		N	A	N	30	42	80	87	101	98	91	87	105	110	88	77	69			A			A
2	A	A	A				53	76	114	124	117	107	107	101	94	93	81	63	46	44		21	A	
3			38	27	38			67	80	86	84	96	83	105	101	81	77	55			39	N	N	
4							42	76	76	81	87	94	74	78	82	73	74	63		N			N	
5	N	36	N		N		41	66	80	89	90	92	78	76	78	69	80	46		N	41	31	37	
6	N				N	N	43	67	74	90	88	98	81	87	81	75	81	62	38	28	36			N
7		28	N	N		26	43	66	80	86	C	C	C	C	C	C	78	54	A		34	34	A	
8	N						46	67	77	76	106	104	80	81	104	96	81	53			N			
9	N	32	N	N			N	66	65	77	91	90	83	94	100	72	72	56	N	44				27
10		58				N	39	73	76	81	92	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	83	91	82	84	97	80	68	59			39	36	N	
13			34				25	74	77	100	104	89	95	100	87	78	67	59	47	53				N
14		41						66	111	126	133	131	120	127	121	110	101	78	72		46	38		
15		43		47			46	98	100	92	106	107	105	107	104	89	77	63	55	53		34		
16					32			76	88	97	107	111	108	97	100	96	88	54	44	44		30		
17		N		N		N	43	81	86	86	88	97	107	111	105	91	84	63		46		28		N
18		N	N	27	N	N	41	74	88	85	100	90	96	91	91	86	75	61	44	43	36			
19							44	74	88	85	102	101	86	N	88	81	75	57	49					
20		A		N	N		N	66	84	80	101	87	84	76	91	87	83	55	46	53		43		
21		N		N	36		N	73	84	114	103	102	111	108	86	80	66	53	A	52				
22	25			42	N			78	N	86	106	104	98	101	88	78	73	59	42	35	44	N		
23							N	68	83	87	N	109	97	94	N	84	91	55	N	42	27		N	
24	N						N	59	76	78	75	105	90	90	87	78	64	38	54	45	N		N	32
25				N	39			66	73	90	96	101	87	88	77	80	74	45		36				N
26				N	N	N	N	67	72	88	90	82	90	86	78	74	66	55	43		N			
27		27		N			N	63	76	74	74	98	107	83	77	77	66	52			30			
28				N	34			53	80	72	78	77	80	85	76	76	55		43	A	N			
29		N						55	82	78	77	78	75	80	76	80	56	A		42		A		
30	N	A	27	N	34			54	72	72	77	81	80	74	74	69	54	44				36		
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	7	3	4	6	2	13	28	27	28	27	27	27	26	26	27	28	26	13	15	10	10	1	2
MED	26	36	34	34	35	28	43	67	80	86	92	97	87	90	88	80	75	56	46	44	38	34	37	30
U Q	27	43	38	44	38	30	45	75	87	91	104	104	105	101	100	88	81	62	51	52	41	36	18	32
L Q	25	28	27	27	34	26	41	66	76	79	84	90	81	83	78	76	66	53	43	42	34	30	18	27

HOURLY VALUES OF fEs AT Kokubunji

NOV. 2012

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	25		G	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	26			28
2	70	59	27				G	G	G	G	G	G	G	G	G	43	G	26	G	G		G	32	
3			G	G	G			G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	
4							G	G	G	G	G	G	G	G	G	G	G	G		G			G	
5	G	G	G		G		G	G	G	G	G	G	G	G	G	G	G	19		G	G	G	G	
6	G				G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
7	G	G	G	G		G	G	G	G	G	C	C	C	C	C	C	G	G	37		G	G	27	
8	G	G		G			G	G	G	G	G	G	G	G	G	G	G	G			G			
9	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G				G
10		G				G	G	G	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	G	G			G	G	G	
13	G		G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G
14		G					G	G	G	G	G	G	G	G	G	G	G	G	G		G	G		
15		G	G	G	G		G	G	G	G	G	G	52	G	G	G	G	G	G	G		G		
16					G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
17		G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G		G
18		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	27	G	G		G	
19		G					G	G	G	G	G	G	G	G	G	38	G	G	G			G		
20		34		G	G		G	G	G	G	G	G	G	G	46	45	G	G	G	G		G		
21		G		G	G		G	G	G	G	G	G	G	G	G	G	G	G	28	G				
22	G			G	G			G	G	G	G	G	G	G	G	G	G	28	37	23	G	G		
23							G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	
24	G			G			G	G	G	G	G	G	58	G	G	G	G	36	49	G	G		G	G
25		G		G	G			G	G	G	G	G	G	G	G	G	G	G		G				G
26				G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G			
27		G		G			G	G	G	79	53	G	G	G	G	G	G	G			G			
28				G	G			G	G	G	G	G	G	G	G	49	30		28	27	G			
29		G			G			G	G	G	G	48	G	G	G	G	G	33		G		28		
30	23	30	26	G	24		G	G	G	G	G	G	G	G	G	G	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	11	17	10	18	15	7	22	28	28	28	28	27	27	27	27	27	28	27	19	20	17	14	10	7
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	G	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

NOV. 2012

LAT. 35°43.0′N LON. 139°29.0′E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15		14	13	14	15	20	14	36	39	42	39	40	43	37	39	33	17	15	26	18			14
2	14	13	15				15	36	36	40	42	43	42	36	24	17	34	14	20	33		15	15	
3			17	21	14			34	38	37	42	46	39	44	38	36	31	14		21	14	20	14	
4							14	34	17	37	38	43	40	43	36	40	36	18		18			21	
5	21	14	17		20		17	37	30	40	40	40	42	40	37	30	31	20		20	14	15	15	
6	20				14	21	18	17	34	42	40	39	44	40	18	36	31	14	14	15	14		21	18
7	20	18	15	20		20	13	39	17	18	C	C	C	C	C	C	31	14	14		14	14	15	
8	18	21		22			20	18	39	20	40	62	53	44	37	35	30	18			17			
9	14	17	20	18			14	31	15	38	39	42	42	42	40	18	31	17	17	14				18
10		17				15	22	35	22	42	41	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	40	39	37	42	35	34	33	20			17	14	21	
13	22		21	21			17	13	36	39	42	45	45	42	14	36	18	40	14	18	23			21
14		15					18	39	17	37	42	43	42	45	39	40	44	31	37		14	21		
15		17	17	18	18		18	35	36	40	42	38	34	40	40	42	33	18	18	21		15		
16					22			30	34	38	40	40	44	40	45	39	35	42	34	33	15	15		
17		21		21		22	17	25	39	40	42	42	42	39	42	36	33	17	17	14		20		20
18		20	15	15	20	21	15	36	33	40	43	40	42	42	36	18	34	26	14	15	14		22	
19		21					18	23	38	20	42	43	43	43	43	31	39	17	18			17		
20		14		20	20		14	37	39	40	40	42	38	43	36	40	34	34	14	17		14		
21		18		18	15		18	36	33	39	44	43	43	40	37	35	39	20	17	17				
22	15			18	17			22	39	39	42	42	40	42	40	37	36	18	17	15	15	17		
23							18	34	37	40	40	40	40	39	40	39	36	18	14	14	14		17	
24	18			17			15	37	36	42	39	42	40	38	46	38	34	15	22	15	14		22	18
25		17		21	13			22	42	40	40	40	44	39	40	39	23	20		14				17
26				18	17	18	18	34	15	18	40	42	40	42	39	40	34	17	17		22			
27		21		14			18	40	34	39	38	44	42	42	40	36	23	20			17			
28				15	15			24	13	18	39	40	43	39	25	15	14		17	20	18			
29		15			17			40	13	39	38	33	38	42	38	20	17	14		14		17		
30	14	14	18	15	15		15	34	18	17	40	40	39	40	37	34	41	13				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	11	17	10	18	15	7	22	28	28	28	28	27	27	27	27	27	28	27	19	20	17	14	10	7
MED	18	17	17	18	17	20	18	34	34	39	40	42	42	42	38	36	33	18	17	17	15	15	19	18
U Q	20	20	18	21	20	21	18	36	37	40	42	43	43	43	40	39	35	20	18	20	17	17	21	20
L Q	14	14	15	15	14	15	15	23	17	37	40	40	40	40	36	31	31	15	14	14	14	15	15	17

HOURLY VALUES OF foF2 AT Yamagawa

NOV. 2012

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	34	34	34	34	31	29	32	67	N	77	79	58	68	88	96	59	76	73	63	53	53	44	52	45
2	50	53	52	50	50	53	54	65	77	49	86	69	N	83	81	N	87	55	58	A	53	50	44	42
3	43	47	40	40	50	B	49	52	76	78	74	64	78	93	N	77	82	72	58	48	48	47	40	36
4	28	N		N	34	B	30	53	65	74	78	N	77	70	69	82	74	71	63	44	54	52	38	36
5	36	36	59	30	31	N	28	52	80	75	77	88	70	80	76	58	72	67	52	40	42	44	40	34
6	28	32	32	32	30	30	32	52	78	87	64	70	74	69	69	77	77	66	52	34	34	42	40	32
7	34	36	34	34	32	34	31	54	80	75	88	59	72	79	88	87	74	64	58	42	40	43	37	34
8	36	34	37	36	37	32	37	54	64	66	69	N		72	N	79	77	72	58	42	44	51	40	30
9	34	34	59	36	38	N		53	49	67	78	N	77	N	88	90	80	71	57	43	47	44	37	28
10	28		32	32	B	33	B	53	65	74	83	71	71	61	59	N	92	71	54	A	44	42	32	31
11	26	32	32	32	34	30	59	54	73	70	76	84	78	76	89	58	69	54	55	53	53	42	38	34
12	32	B	34	59	29	N	29	52	67	74	59	78	79	76	89	88	77	79	63	46	44	43	47	34
13	34	34	37	26	32	B	29	54	67	C	C	C	C	C	C	C	65	67	54	54	52	52	42	42
14	34	42	44	42	40	34	40	53	87	49	79	69	72	113	88	76	85	74	50	53	53	N	44	42
15	40	48	50	40	34	B	28	65	40	79	84	70	80	85	80	59	N	72	57	52	53	44	44	34
16	37	37	32	34	32	29	29	52	72	N	N	69	59	69	69	N	58	N	53	53	53	44	37	34
17	34	34	34	32	40	30	36	52	38	69	79	N	72	62	N	59	79	74	54	43	52	40	38	32
18	34	34	34	36	41	29	32	53	78	77	74	75	69	69	78	76	75	74	64	52	53	44	N	44
19	41	34	32	34	32	31	34	53	74	78	75	89	69	N	94	88	77	74	54	53	53	52	43	34
20	34	36	31	34	43	B	29	53	72	74	74	69	79	86	78	79	N	74	67	52	45	54	26	36
21	37	36	37	40	34	29	31	54	80	59	81	86	69	N	93	76	74	73	52	45	52	44		29
22	32	36	34	42	34	B		51	75	N	76	73	61	44	95	N	77	70	54	54	52	53	43	43
23	34	43	36	34	29	30	30	53	76	N	74	63	67	69	78	76	74	76	57	N	53	46	32	N
24	28		34	36	30	B	B	42	N	77	74	69	69	67	63	93	74	67	67	53	52	50	30	N
25	30	30	26	N	34	N	N	52	64	76	69	92	88	69	86	72	77	68	50	44	42	42	36	29
26		31	49	34	36	N	N	47	71	75	78	54	85	70	73	72	75	65	52	44	42	N	28	28
27	30	30	32	34	59	29	30	52	58	74	68	93	62	60	59	91	87	71	54	A	43	42	32	30
28	29	30	34	38	43	N	B	44	71	N	68	75	69	80	76	N	71	61	48	42	28	29	30	
29		B	B	30	34	B	30	50	67	74	70	71	74	69	76	75	76	60	53	54	46	34	N	B
30	N	A	A	29	32	32	29	51	71	73	59	77	58	N	68	72	68	55	54	54	40	32	N	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	27	24	27	28	29	16	23	30	28	25	28	25	27	25	26	24	28	29	30	26	30	28	26	25
MED	34	34	34	34	34	30	31	53	72	74	76	71	72	70	78	76	76	71	54	50	50	44	38	34
U Q	36	36	40	39	40	32	36	54	76	77	79	81	78	81	88	84	78	73	58	53	53	50	43	39
L Q	30	33	32	32	32	29	29	52	65	69	69	69	69	69	69	72	74	65	53	43	43	42	32	30

HOURLY VALUES OF fEs AT Yamagawa

NOV. 2012

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

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

HOURLY VALUES OF fmin AT Yamagawa

NOV. 2012

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	17	15	16	14	18	17	15	15	28	16	18	23	22	22	20	17	14	14	14	16	18	21	17	20
2	17	20	17	16	16	15	15	15	15	15	24	29	26	26	21	18	16	15	14	16	14	16	16	20
3	17	16	14	14	17	B	15	20	16	18	21	21	39	38	21	17	17	17	15	16	15	14	16	15
4	16	20	23	22	14	B	15	17	15	17	18	37	17	23	26	20	15	21	14	14	15	15	15	16
5	15	16	18	17	16	20	17	14	16	17	21	23	36	22	24	18	16	15	15	15	16	15	15	15
6	14	23	21	15	14	15	15	15	15	15	15	17	24	20	17	16	15	14	16	16	20	16	15	15
7	17	16	15	14	15	15	16	15	14	14	18	17	23	17	17	20	15	15	16	20	16	15	15	18
8	20	15	18	17	17	21	15	21	15	15	16	34	91	17	17	14	27	15	15	15	17	16	15	18
9	15	16	15	15	17	16	66	20	14	16	21	42	23	23	20	17	16	20	15	16	15	26	15	20
10	15	66	15	18	B	16	B	18	15	18	18	22	24	21	22	18	16	15	15	16	20	15	16	15
11	17	15	15	17	16	15	17	21	17	17	23	26	34	24	21	18	16	15	15	15	15	15	15	16
12	17	B	18	20	17	66	15	18	15	17	20	22	23	18	20	17	17	21	16	15	16	15	15	15
13	15	17	15	15	16	B	15	21	14	C	C	C	C	C	C	C	17	23	17	17	16	15	15	15
14	17	20	20	16	17	17	17	20	15	16	17	22	24	26	23	18	17	21	16	16	16	15	15	16
15	21	15	17	20	17	B	17	20	15	17	21	27	23	23	21	32	17	17	15	15	16	17	15	17
16	16	15	14	15	17	17	20	21	20	17	22	28	41	47	22	18	16	26	16	15	16	15	15	18
17	17	16	15	16	17	17	15	21	15	20	21	23	24	20	24	15	14	16	20	17	16	14	17	18
18	18	15	17	17	16	15	15	21	17	18	38	27	41	28	21	20	29	20	15	20	16	15	17	15
19	15	17	15	15	17	15	15	17	15	33	21	20	41	39	18	32	17	15	15	18	18	15	15	15
20	16	16	20	18	14	B	16	18	18	20	18	27	26	34	20	17	15	14	16	16	15	15	15	15
21	18	16	15	15	16	22	15	18	15	16	18	24	30	38	26	21	29	23	15	21	27	16	66	18
22	16	17	15	15	14	B	15	18	15	16	18	23	26	22	20	17	15	15	14	15	15	17	17	17
23	15	15	15	15	17	18	16	20	15	16	20	23	26	38	21	20	16	21	15	15	15	15	15	16
24	17	66	15	15	15	B	B	22	15	18	17	18	39	48	29	18	15	21	15	16	14	18	16	16
25	17	18	21	15	16	15	17	17	15	16	18	23	20	38	21	17	16	21	16	17	15	16	15	17
26	17	22	16	15	16	16	16	20	14	21	20	20	21	24	17	17	15	21	15	15	16	17	21	17
27	17	17	16	16	15	15	15	18	14	15	22	20	26	20	21	16	14	16	15	16	15	16	16	20
28	16	17	14	15	15	15	B	18	15	15	20	21	23	20	21	18	18	18	15	17	14	15	16	66
29	66	B	B	15	16	B	17	21	28	17	21	22	23	21	21	18	15	15	15	14	15	15	17	B
30	18	14	14	15	16	14	15	18	14	16	21	20	20	21	17	16	14	16	16	15	16	17	66	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	30	28	29	30	29	22	27	30	30	29	29	29	29	29	29	29	30	30	30	30	30	30	30	28
MED	17	16	15	15	16	16	15	18	15	17	20	23	24	23	21	18	16	16	15	16	16	15	15	16
U Q	17	19	18	17	17	17	17	21	16	18	21	27	35	36	22	19	17	21	16	17	16	16	17	18
L Q	16	15	15	15	15	15	15	17	15	16	18	20	23	20	20	17	15	15	15	15	15	15	15	15

HOURLY VALUES OF foF2 AT Okinawa

NOV. 2012

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	52	53	41	40	37	B		67	88	96	105	122	110	134	139	140	N	107	89	86	88	82	83	66
2	73	67	66	60	52	51	77	84	87	98	95	110	120	131	128	122	133	97	88	70	60	66	51	50
3	52	44	42	38	50	A	B	51	71	78	111	116	116	127	143	132	131	131	118	110	87	104	87	62
4	53	58	40	44	38	N	36	61	82	88	111	117	110	115	123	147	121	111	106	108	84	87	72	53
5	53	57	47	42	34	29	34	54	85	98	97	95	85	90	102	104	91	69	81	66	61	53	52	45
6	34			32	32	B	32	N	80	89	122	118	116	117	107	108	97	88	67	58	62	54	64	43
7	36	34	34	35	32	29	30	54	82	97	104	114	90	98	115	102	90	75	66	52	61	52	64	50
8	43	B	36	41	34	B	30	58	71	87	101	105	86	107	110	118	102	102	81	67	54	74	61	51
9	34	34	32	34	28	34		54	67	76	94	102	107	110	111	116	110	107	88	67	67	72	53	43
10	B	31	31	32	41	26	B	54	67	80	86	102	110	111	122	126	124	119	88	83	81	80	62	52
11	52	B	40	37	47		32	58	74	93	92	87	101	110	130	137	142	132	108	87	87	72	58	50
12	47	42	46	47	50	44	36	60	73	86	97	101	106	110	107	118	110	106	106	87	64	80	77	64
13	43	36	32	30	B	30	29	58	86	104	110	90	90	105	110	107	90	89	88	64	54	70	54	54
14	44	43	52	50	38	B	32	54	88	102	112	108	127	131	134	128	128	128	108	109	87	87	76	60
15	53	54	77	N	A	N	N	72	106	C	C	C	C	C	C	C	C	134	107	87	85	80	72	66
16	64	63	62	51	56		B	54	85	101	115	121	140	142	142	143	121	131	110	75	87	84	66	54
17	53	52	52	66	72	51	44	64	81	93	105	107	125	140	145	144	126	131	108	80	82	85	62	53
18	48		41	40	47	30		53	86	90	99	102	110	120	127	120	117	117	104	75	86	64	77	67
19	52	46	46	46	53	47	34	64	81	88	98	100	97	104	111	110	110	112	87	76	86	83	79	63
20	A	58	60	54	72	38	40	52	80	87	90	104	118	110	113	128	136	131	120	120	107	110	86	66
21	52	48	52	43	34	B	30	51	86	118	118	111	120	130	122	105	92	90	87	54	67	78	52	44
22	41	36	40	43	N	B	B	54	89	111	119	128	127	133	156	148	148	142	143	128	106	106	107	87
23	88	72	53	51	38	32	38	64	86	96	103	111	111	121	134	147	148	151	131	108	107	88	83	64
24	61	53	53	51	29	B		50	84	88	87	116	107	87	95	107	90	81	80	76	72	72	42	34
25	34		34	43	N	B	B	54	85	98	102	107	119	123	131	127	124	127	86	62	66	67	51	48
26	42	34	22	40	49	32	B	50	80	84	105	117	107	116	106	107	103	94	78	52	52	63	53	44
27	30	34	34	37	36	30	30	54	74	81	97	94	112	128	134	147	148	135	108	86	66	54	67	54
28	52	48	48	47	48	N	B	45	72	82	102	104	121	124	121	117	120	110	67	51	60	44	40	28
29	32		37	B	B	N	28	48	76	81	100	90	92	103	107	111	89	98	88	54	60	48	34	29
30	28	N	32	30	B	N	28	46	67	85	102	87	96	102	100	96	87	76	67	80	61	42	47	37
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	23	29	28	24	14	18	29	30	29	29	29	29	29	29	29	28	30	30	30	30	30	30	30
MED	50	48	41	42	40	32	32	54	82	89	102	107	110	116	122	120	118	110	88	76	70	73	63	52
U Q	53	57	52	48	50	44	36	60	86	98	110	116	119	129	134	138	129	131	108	87	87	84	77	63
L Q	38	36	34	37	34	30	30	51	74	84	97	100	99	106	108	107	94	94	81	64	61	63	52	44

HOURLY VALUES OF fEs AT Okinawa

NOV. 2012

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	B	G	G	G	40	G	G	G	G	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	42	64	56	47	48	51	56	44	44	36	G	G	G	G	G	G
3	G	G	G	G	G	29	B	G	G	G	G	G	G	G	G	42	G	G	11	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	48	G	G	32	26	G	G	G
5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	26	24	G
6	G	G	G	G	G	B	G	G	G	40	42	G	G	G	G	G	G	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	28	36	G	44	G	G	63	49	G	42	G	30	35	G	G	G	G
8	G	B	G	G	G	B	G	G	G	G	G	G	G	G	G	54	G	G	G	G	G	G	G	G
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	44	G	45	G	G	G	G	G	G	G
10	B	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	29	G	G	G	G	G
11	G	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	11	48	G	G	G	G
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	50	40	36	G	G	G	G	G	G
13	G	G	G	G	B	G	G	G	G	G	G	G	G	G	56	50	40	G	G	G	G	G	G	G
14	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	26	G	G	G	G	C	C	C	C	C	C	C	C	G	G	G	G	G	G	G
16	G	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	20	48	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	48	G	G	G	G	36	G	11	11	G	G	23	G
18	G	G	G	G	G	G	G	G	G	G	G	G	52	51	49	G	G	G	G	48	34	G	G	G
19	G	G	G	G	G	G	G	G	G	G	G	59	44	52	G	G	G	G	11	G	27	G	G	G
20	36	30	23	31	24	G	G	G	G	G	G	G	51	49	G	G	44	51	32	G	G	G	G	G
21	G	G	G	G	G	B	G	G	G	G	G	G	47	G	43	40	G	G	G	30	40	27	G	G
22	G	G	G	G	G	B	B	G	34	39	47	46	G	66	60	G	48	34	G	24	G	G	G	G
23	G	G	G	G	G	G	G	G	G	G	40	G	47	G	G	G	G	G	11	11	35	G	G	G
24	G	G	G	G	G	B	G	G	G	G	G	G	43	G	G	G	44	58	54	G	G	G	G	G
25	G	G	G	G	G	B	B	G	G	48	46	46	45	50	42	G	G	G	26	G	G	G	G	G
26	G	G	G	G	G	G	B	G	33	G	G	G	G	G	G	G	G	G	11	40	G	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	47	47	43	45	49	35	G	50	G	G	G	G	G
28	G	G	G	G	G	G	B	G	G	G	40	G	G	48	G	G	G	G	19	28	G	G	G	G
29	G	G	G	B	B	G	G	G	G	G	G	46	48	G	46	G	G	G	30	G	G	G	G	G
30	G	G	G	24	B	G	G	G	G	G	G	45	50	48	61	61	36	G	G	G	G	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	29	28	30	29	27	22	23	30	30	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	6	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	20	45	47	48	45	41	41	G	20	28	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

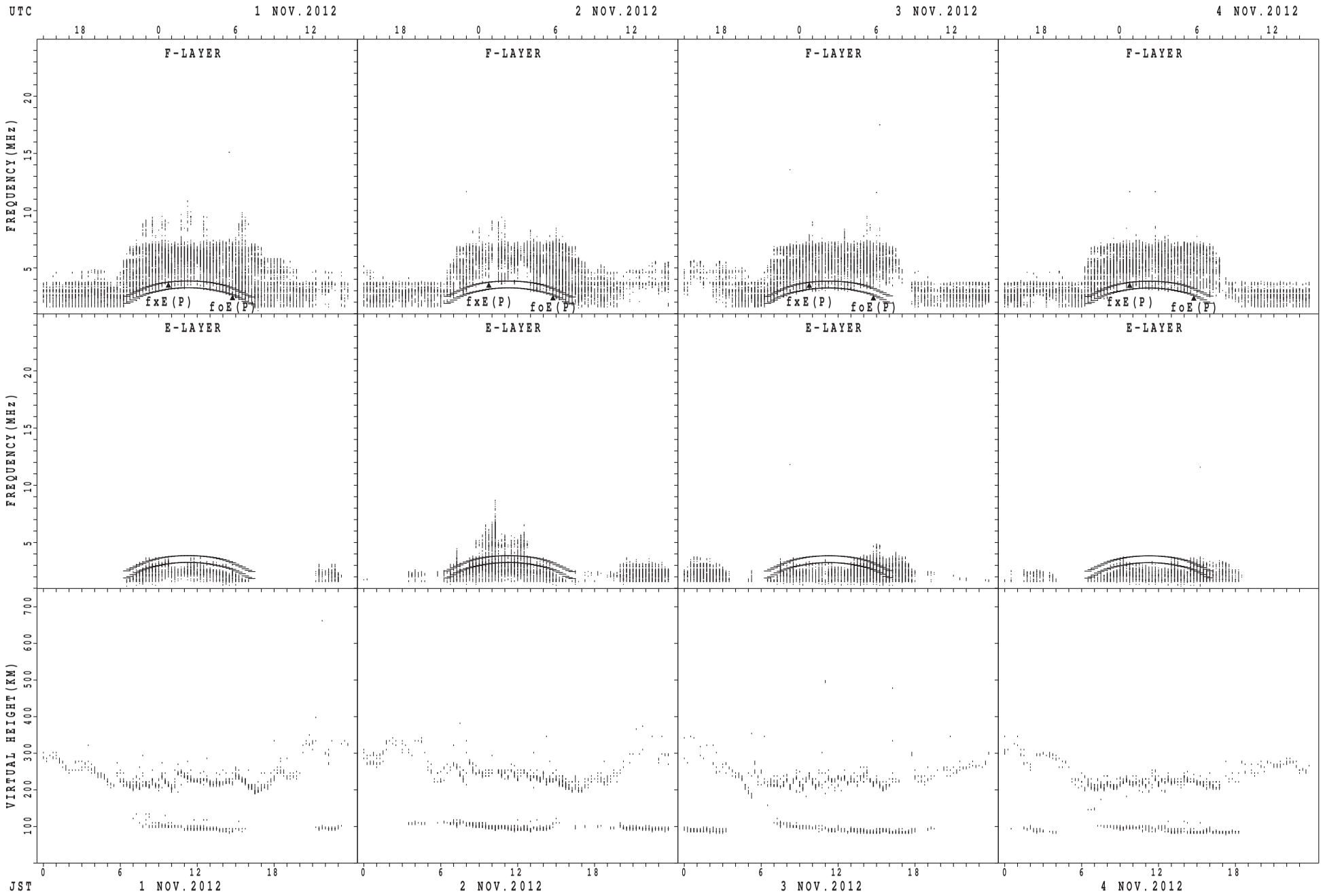
HOURLY VALUES OF fmin AT Okinawa

NOV. 2012

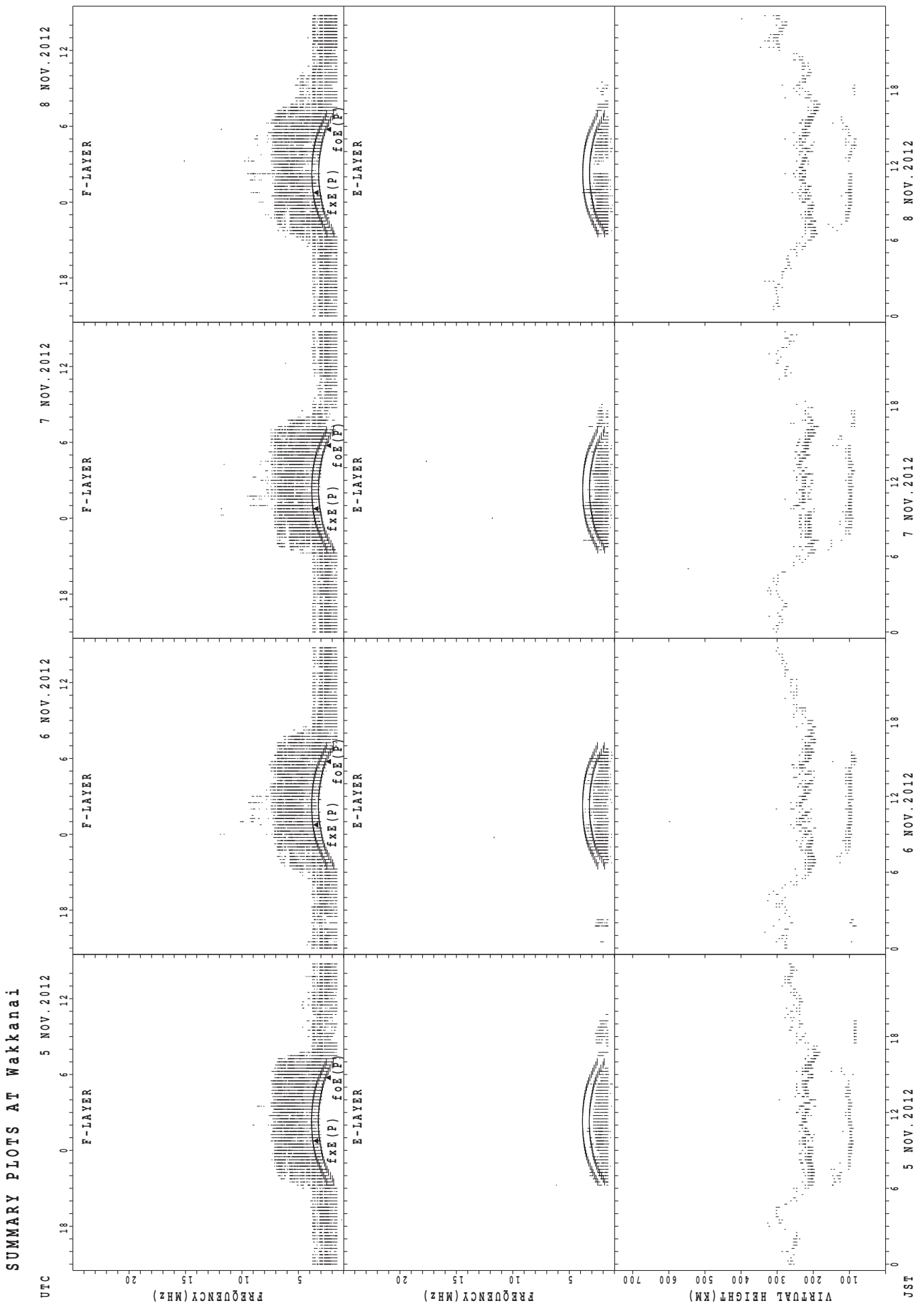
LAT. 26°41.0′N LON. 128°09.0′E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

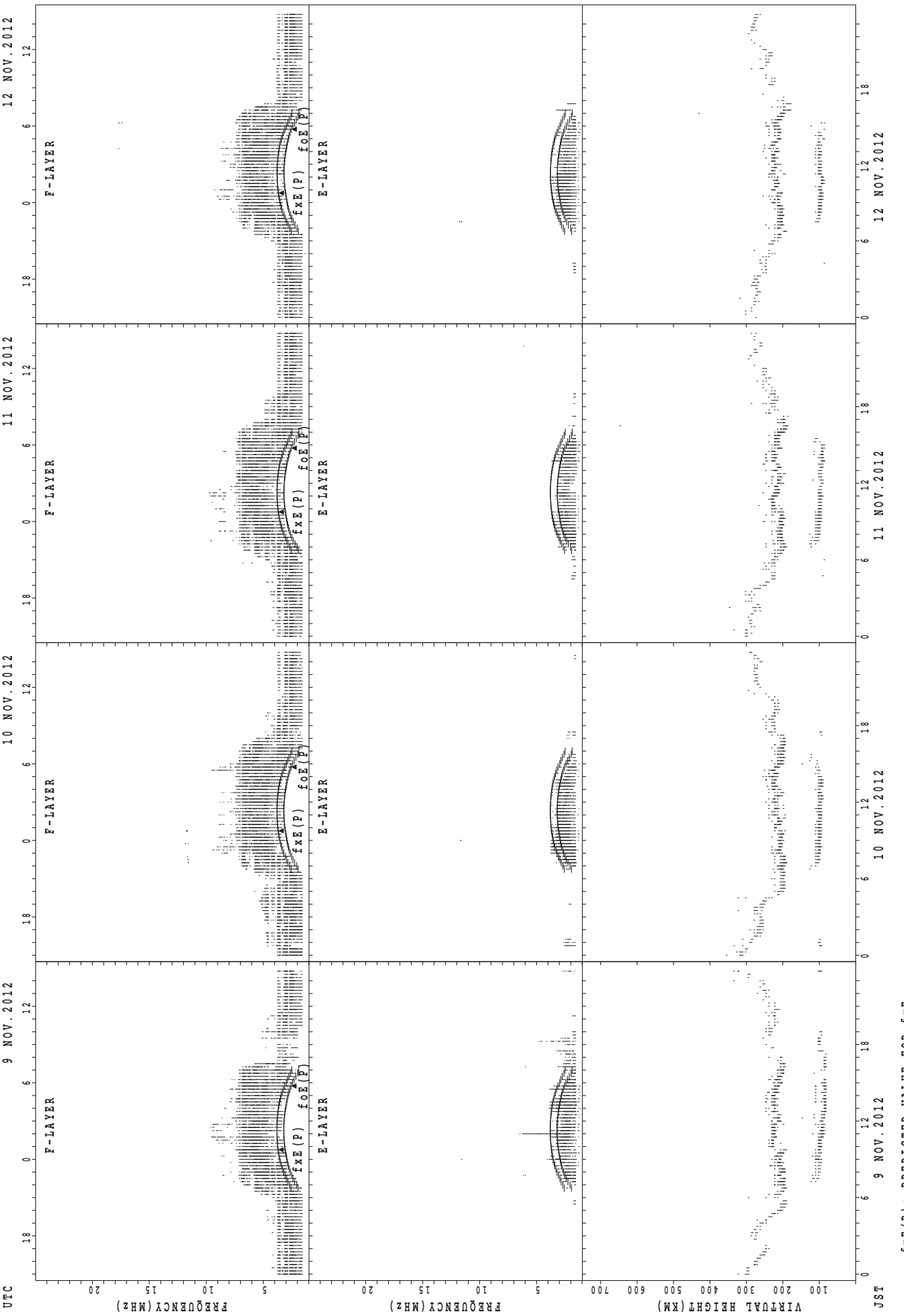
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	18	16	18	B	66	21	18	20	26	41	39	45	42	22	18	14	15	17	20	18	16	15
2	15	17	16	17	14	16	17	14	16	21	32	30	42	32	26	21	16	14	16	15	17	20	20	23
3	16	15	17	15	14	14	B	20	21	39	38	39	42	40	43	22	16	22	17	14	17	18	21	16
4	15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

SUMMARY PLOTS AT Wakkanai

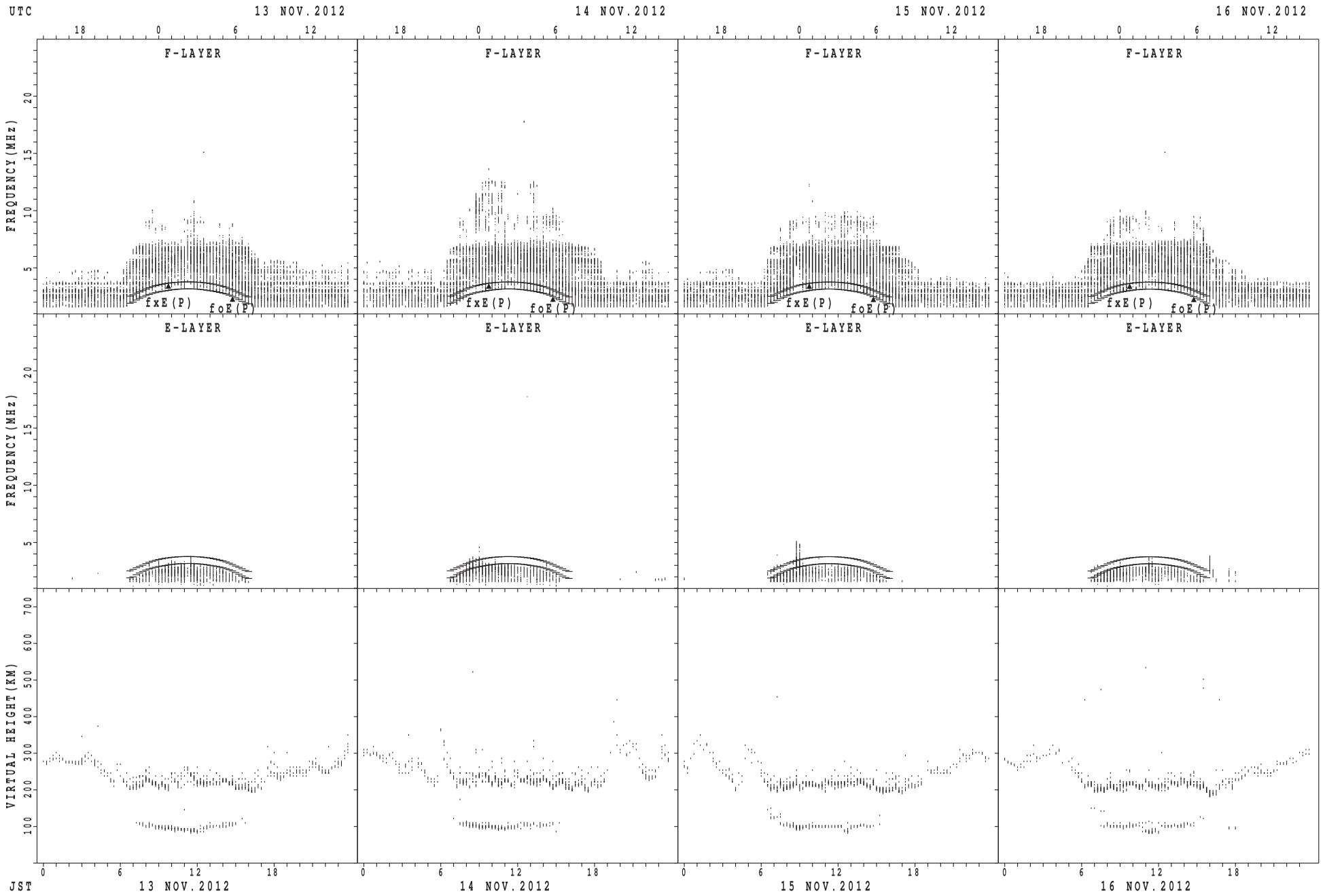


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
5 NOV.2012
6 NOV.2012
7 NOV.2012
8 NOV.2012
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

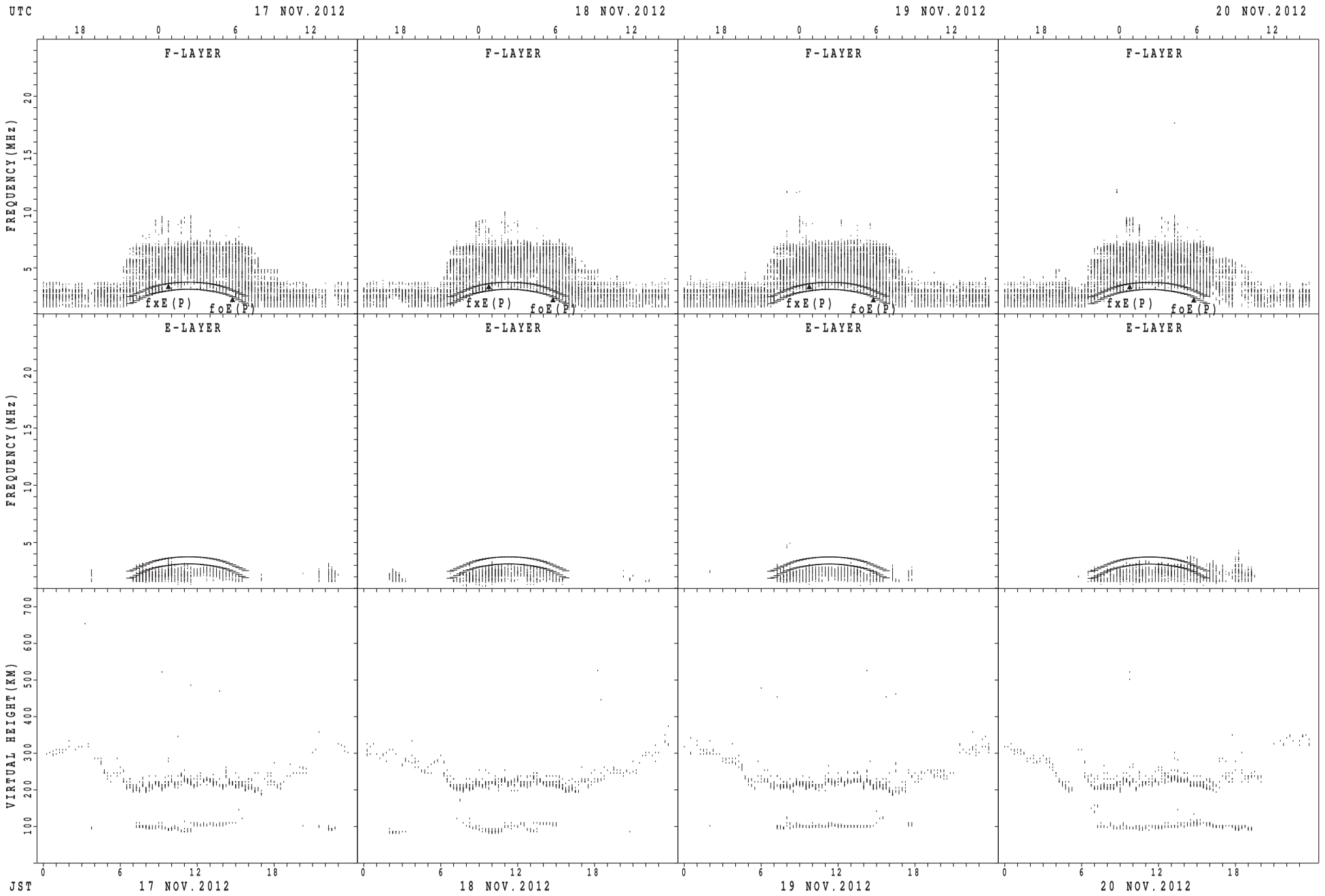

SUMMARY PLOTS AT Wakkanai
UTC
JST
9 NOV.2012
10 NOV.2012
11 NOV.2012
12 NOV.2012
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai

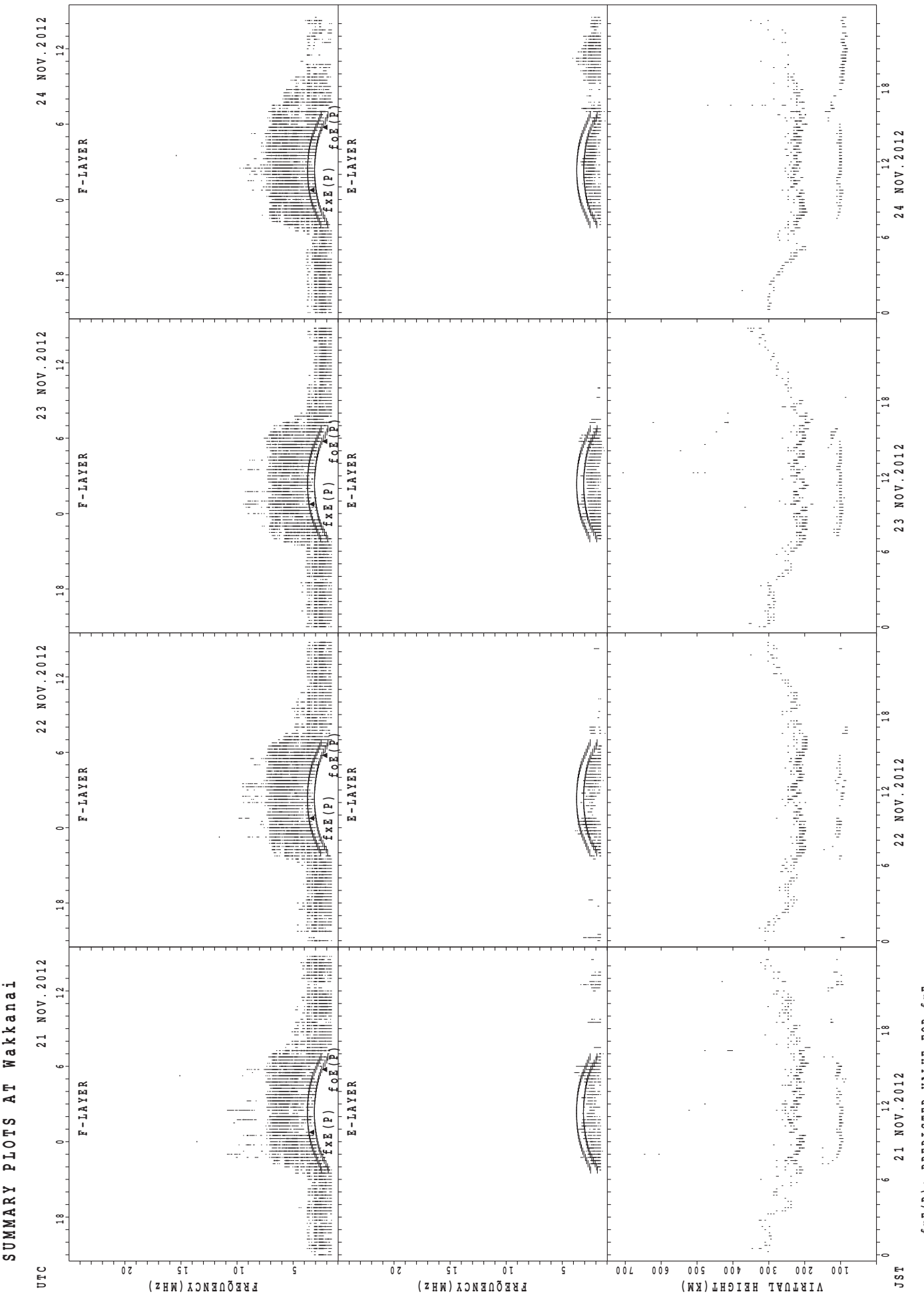


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

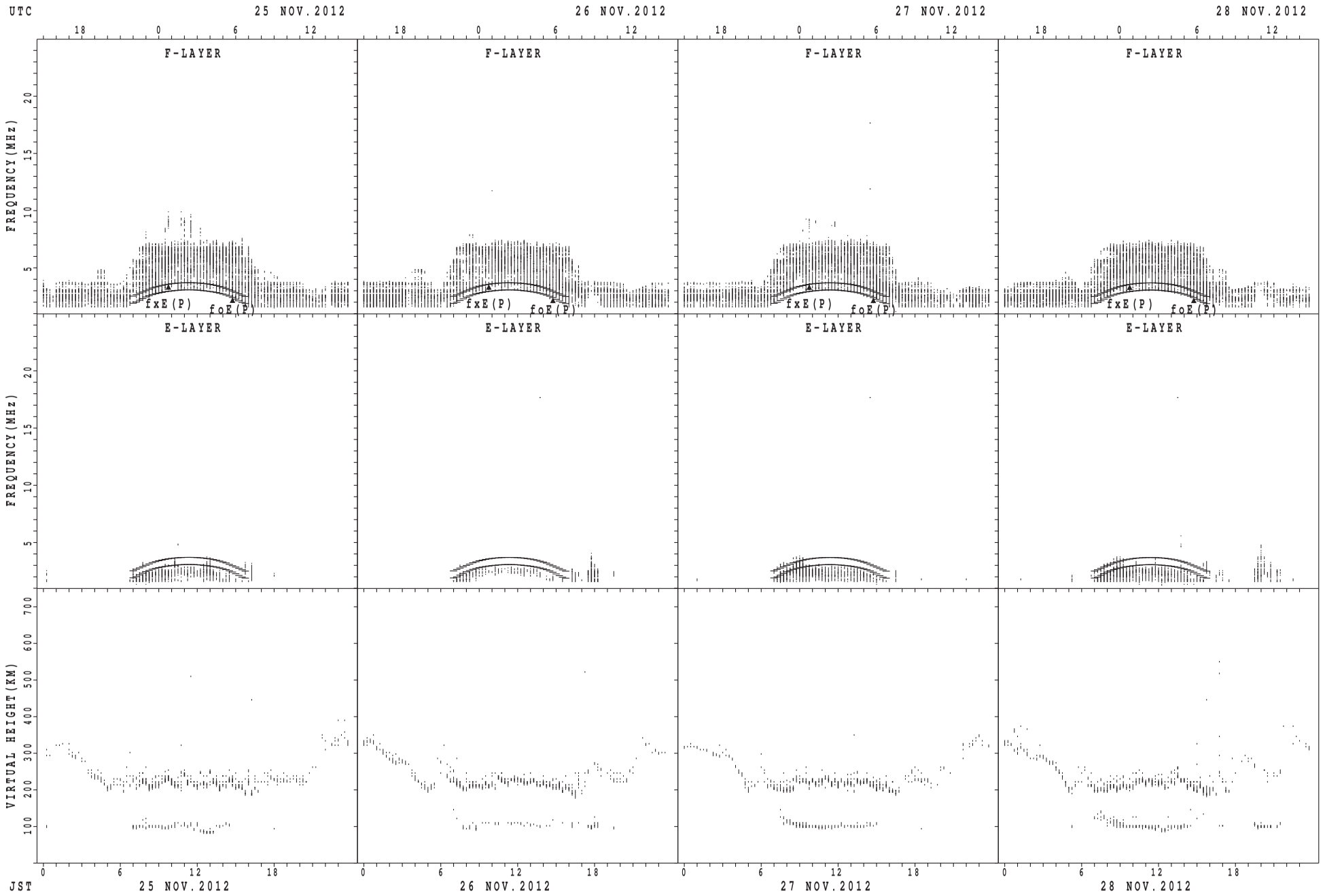
SUMMARY PLOTS AT Wakkanai



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

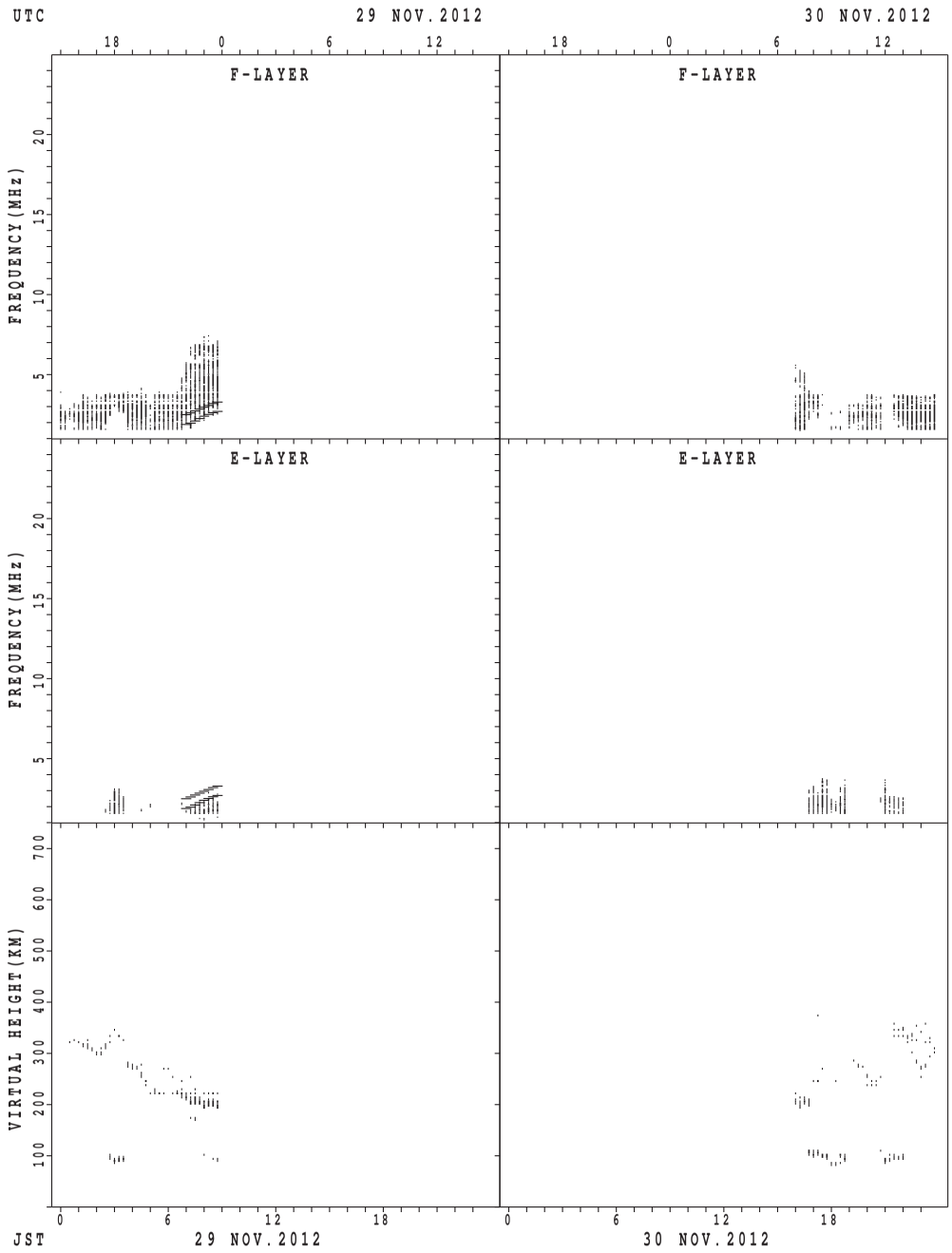

SUMMARY PLOTS AT Wakkanai
UTC
JST
21 NOV.2012
22 NOV.2012
23 NOV.2012
24 NOV.2012
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



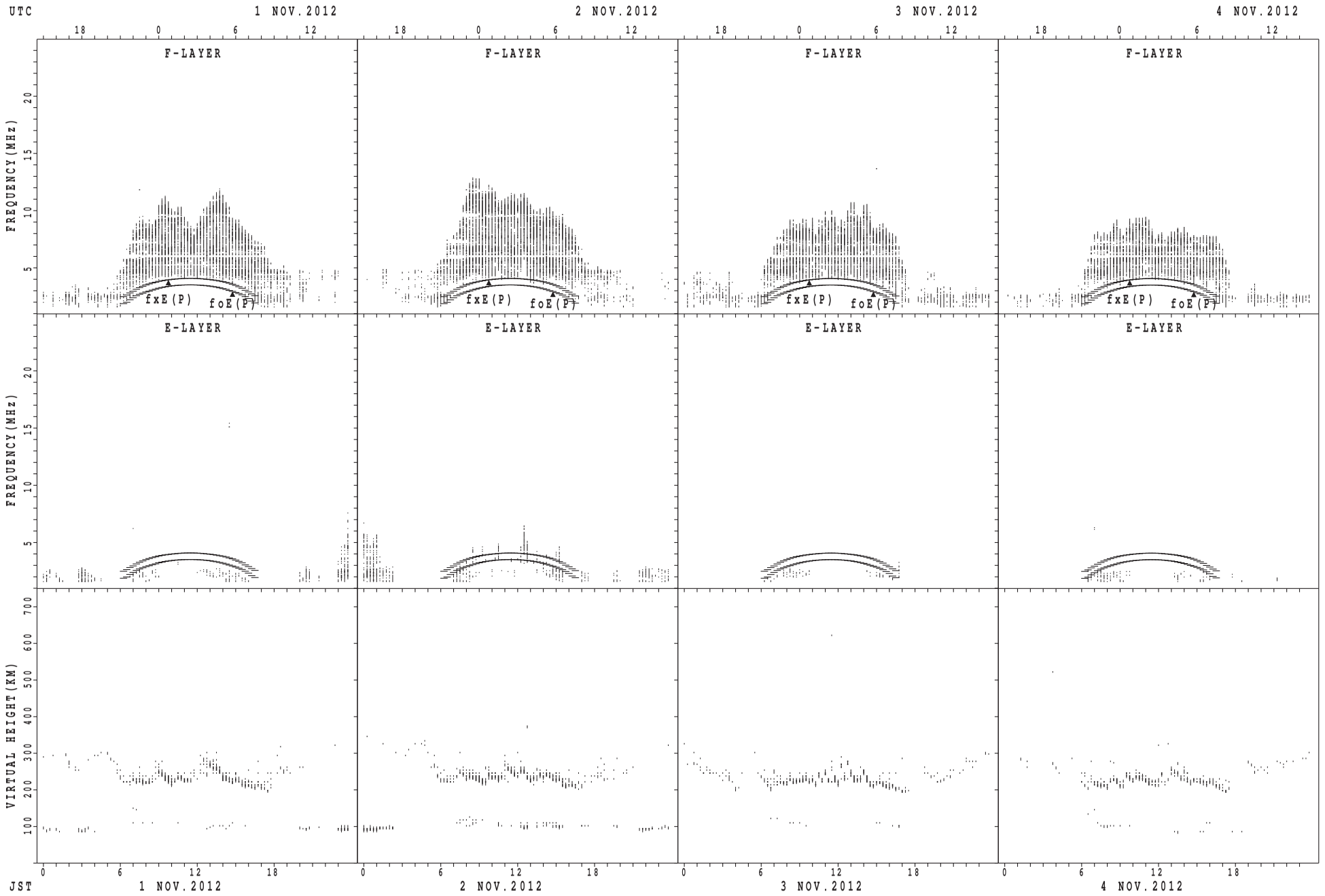
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



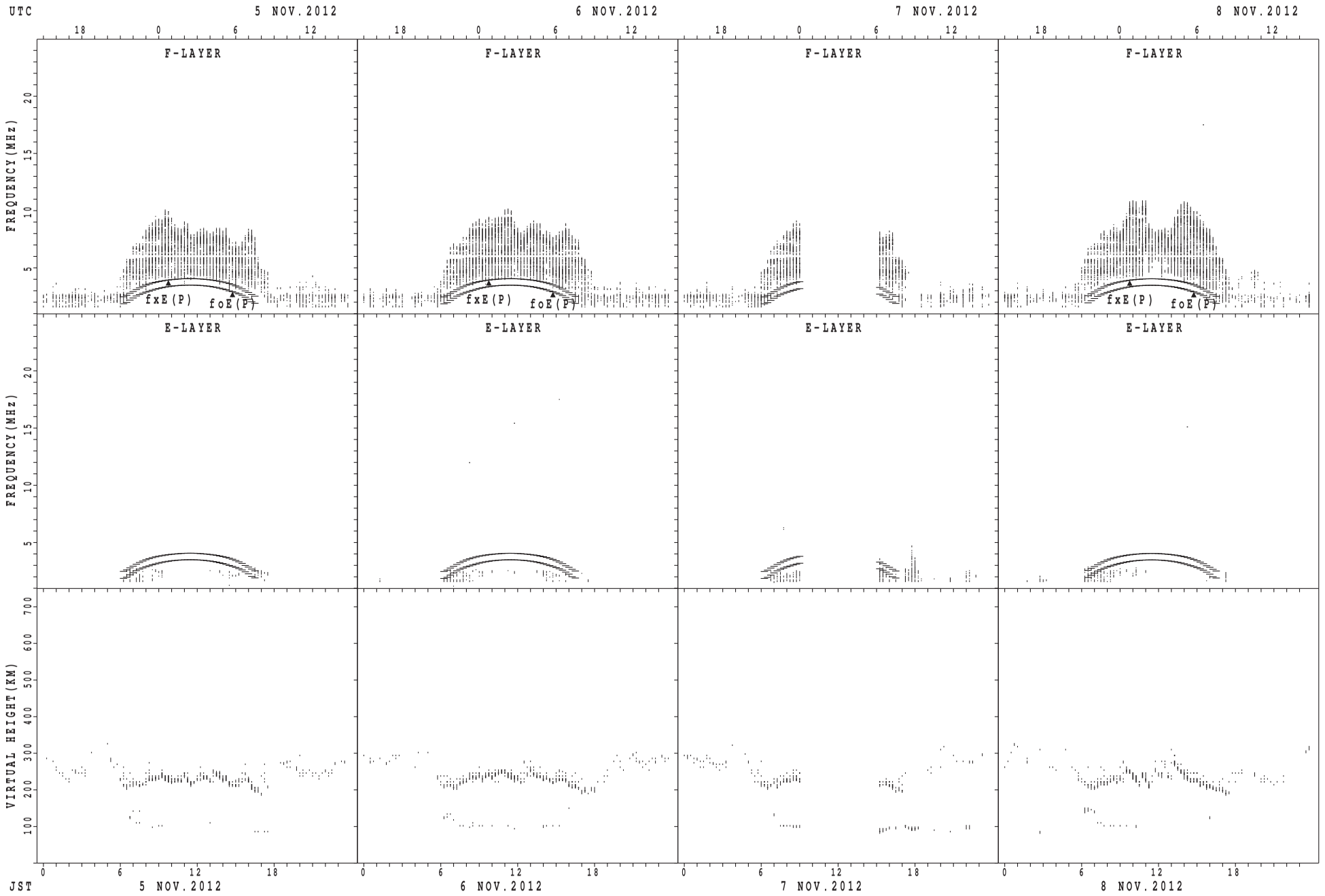
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



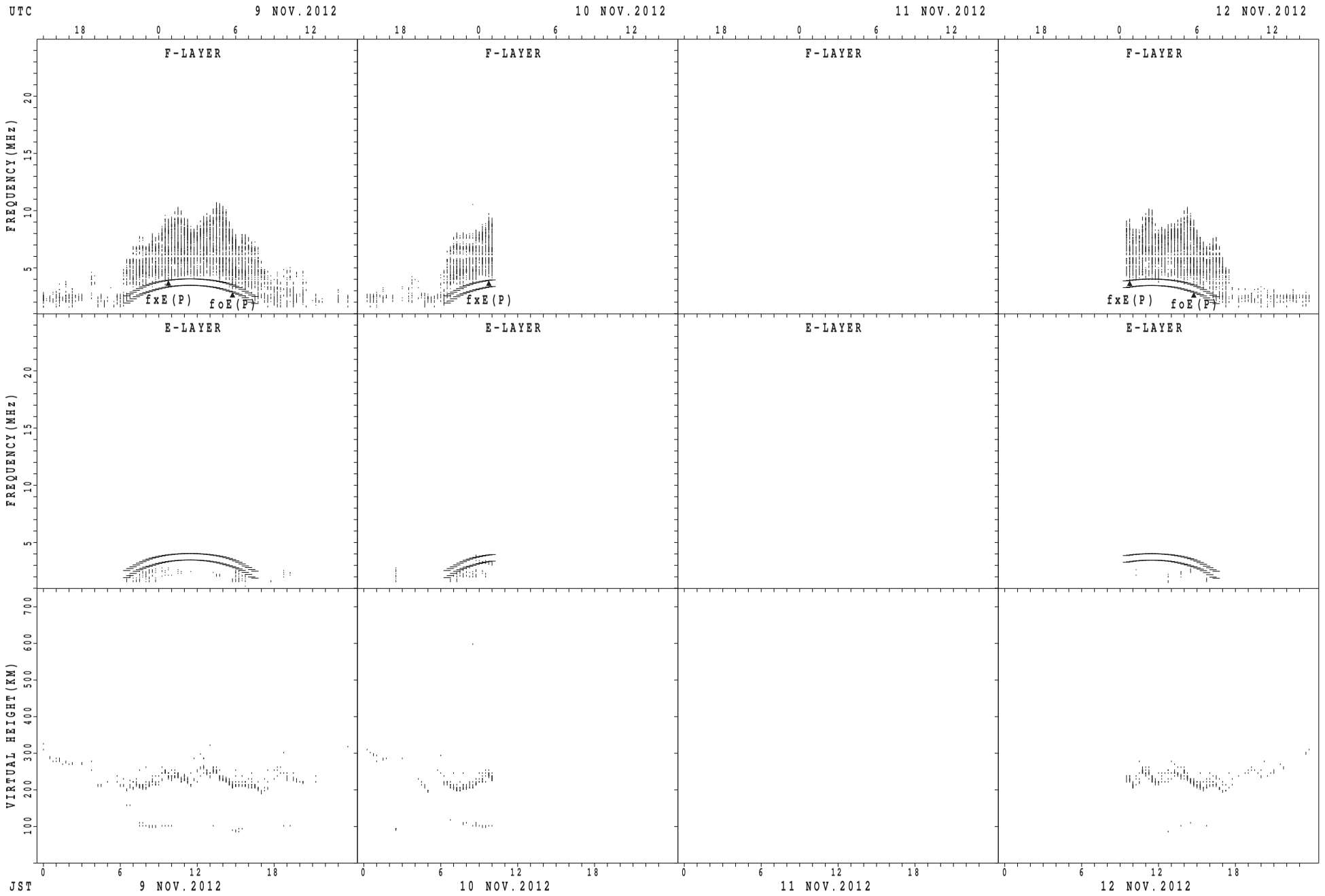
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



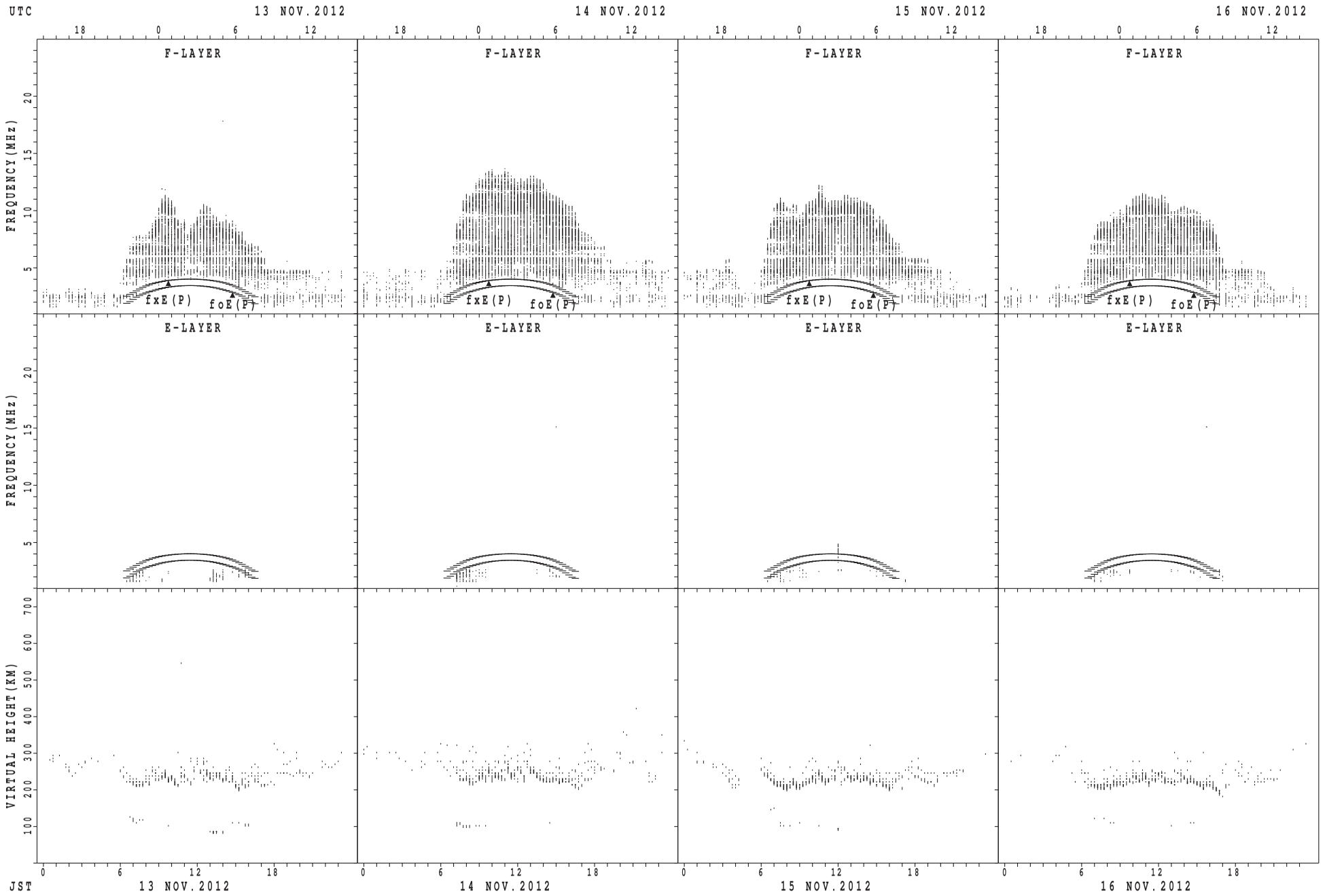
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



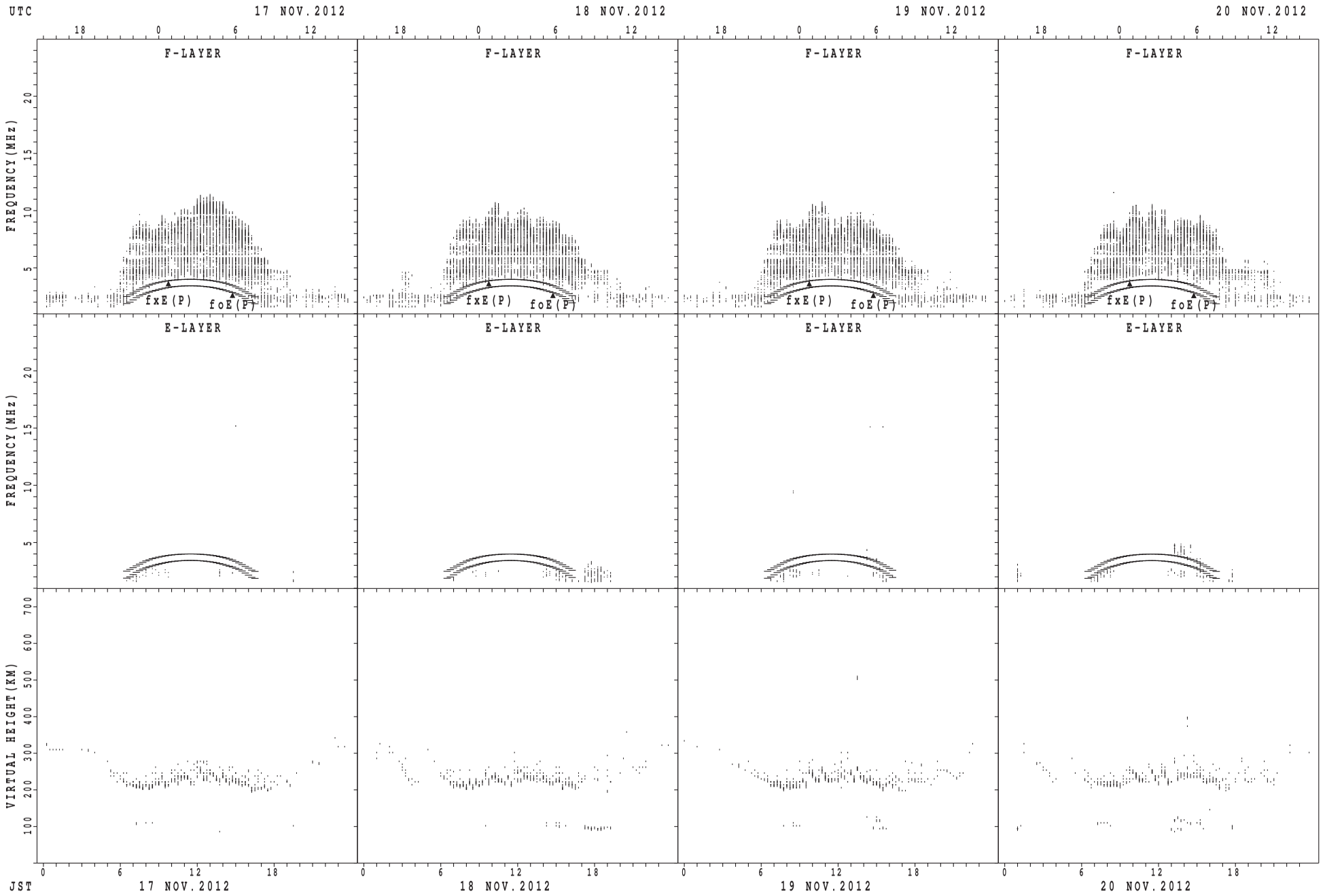
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



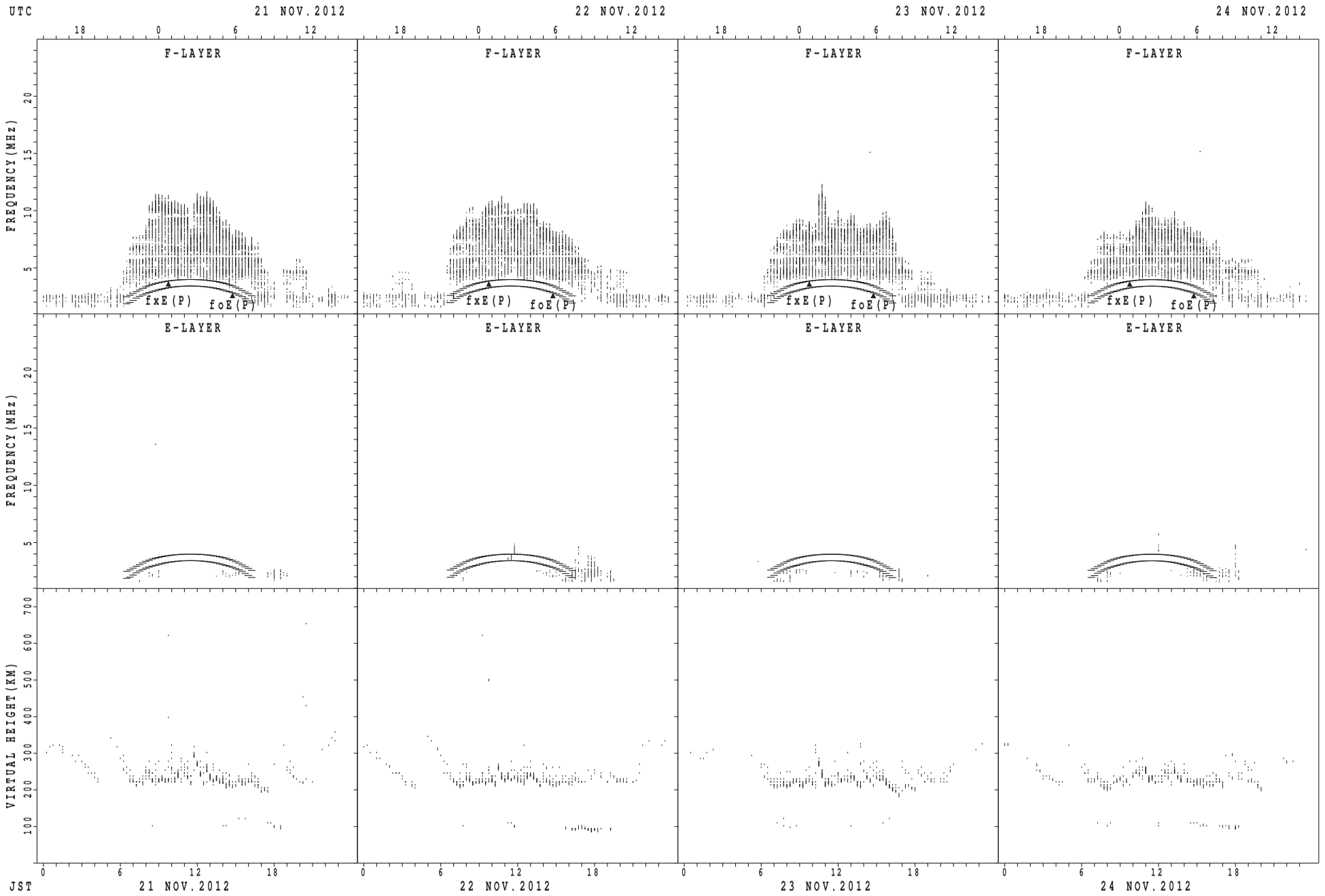
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



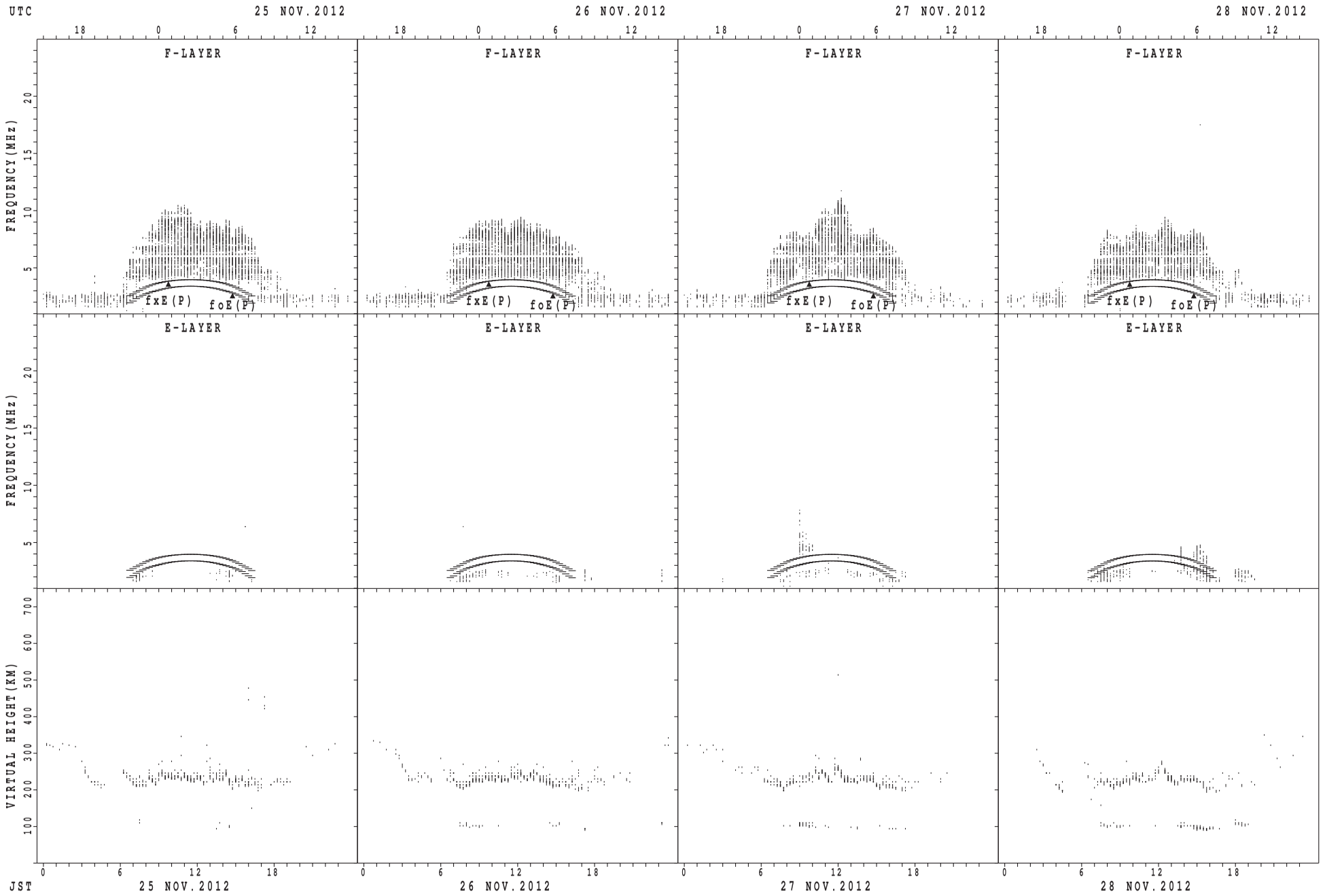
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



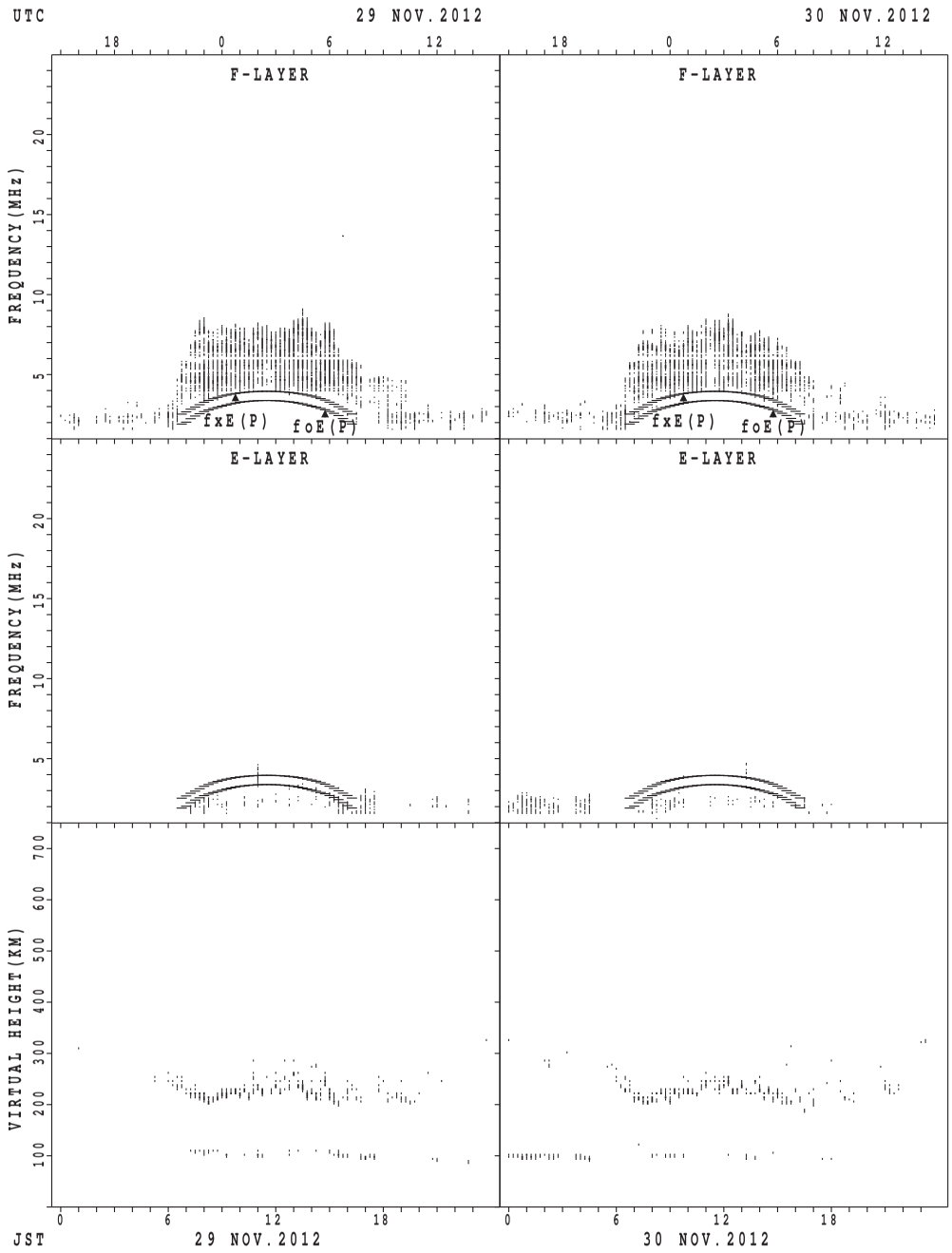
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



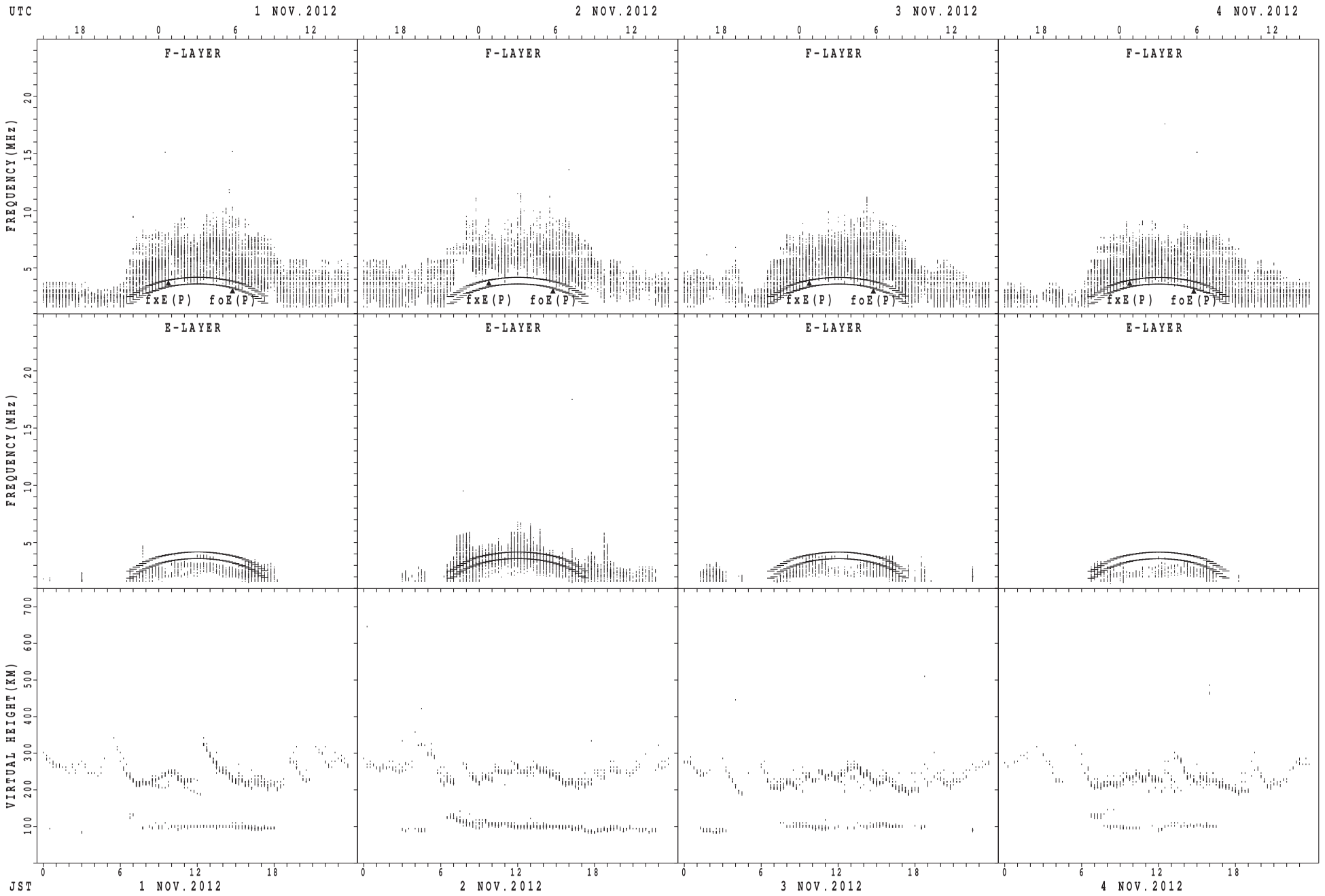
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



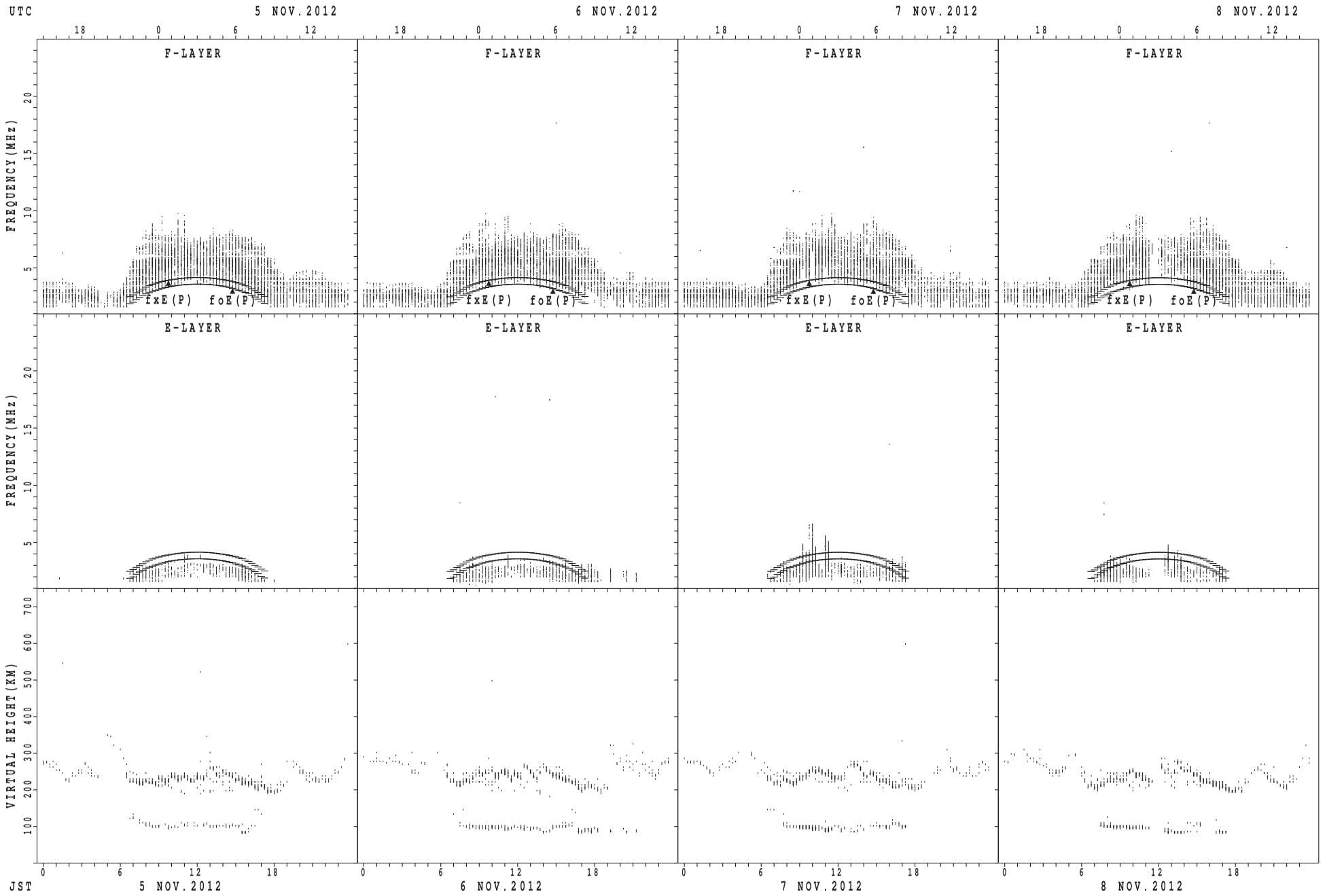
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



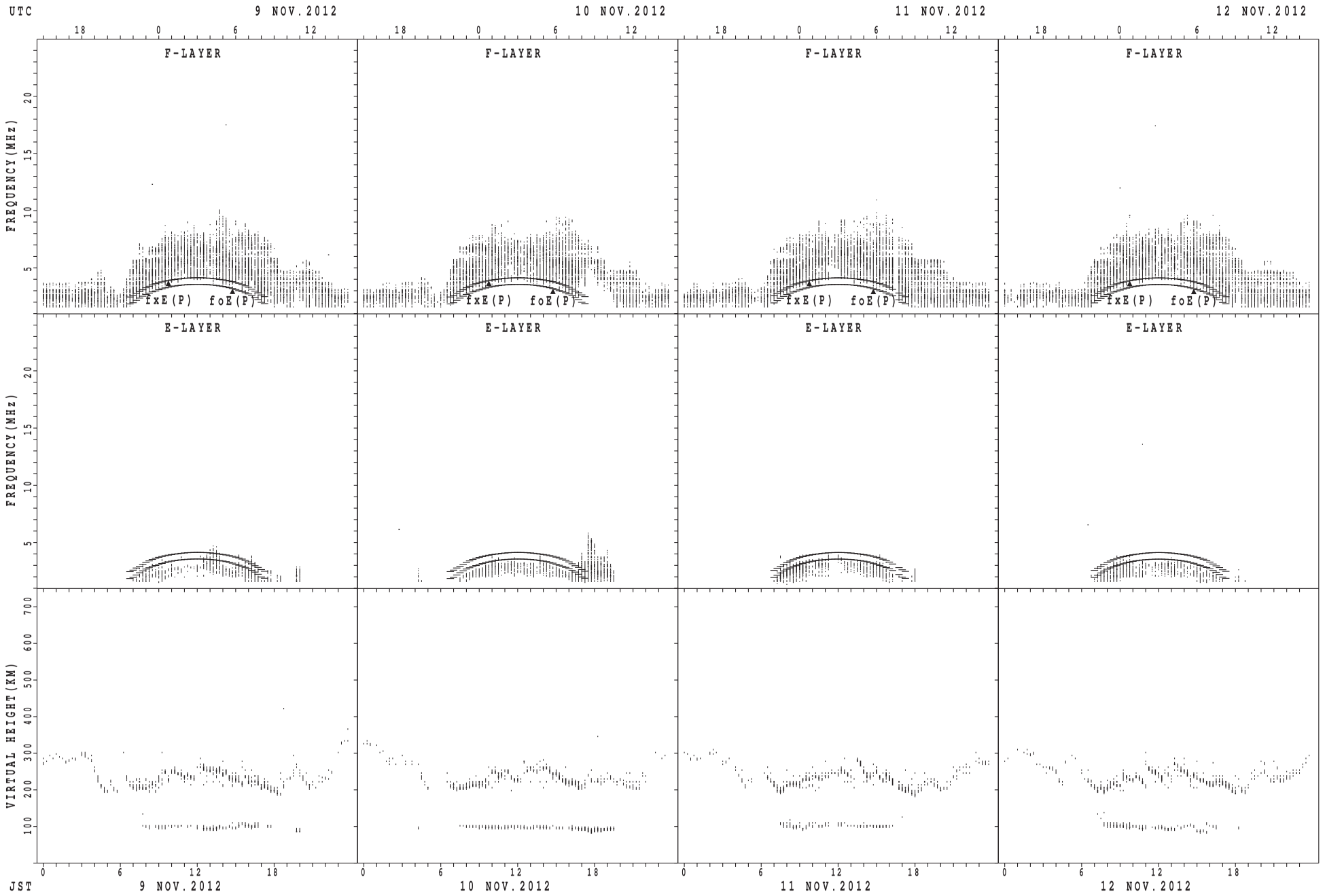
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



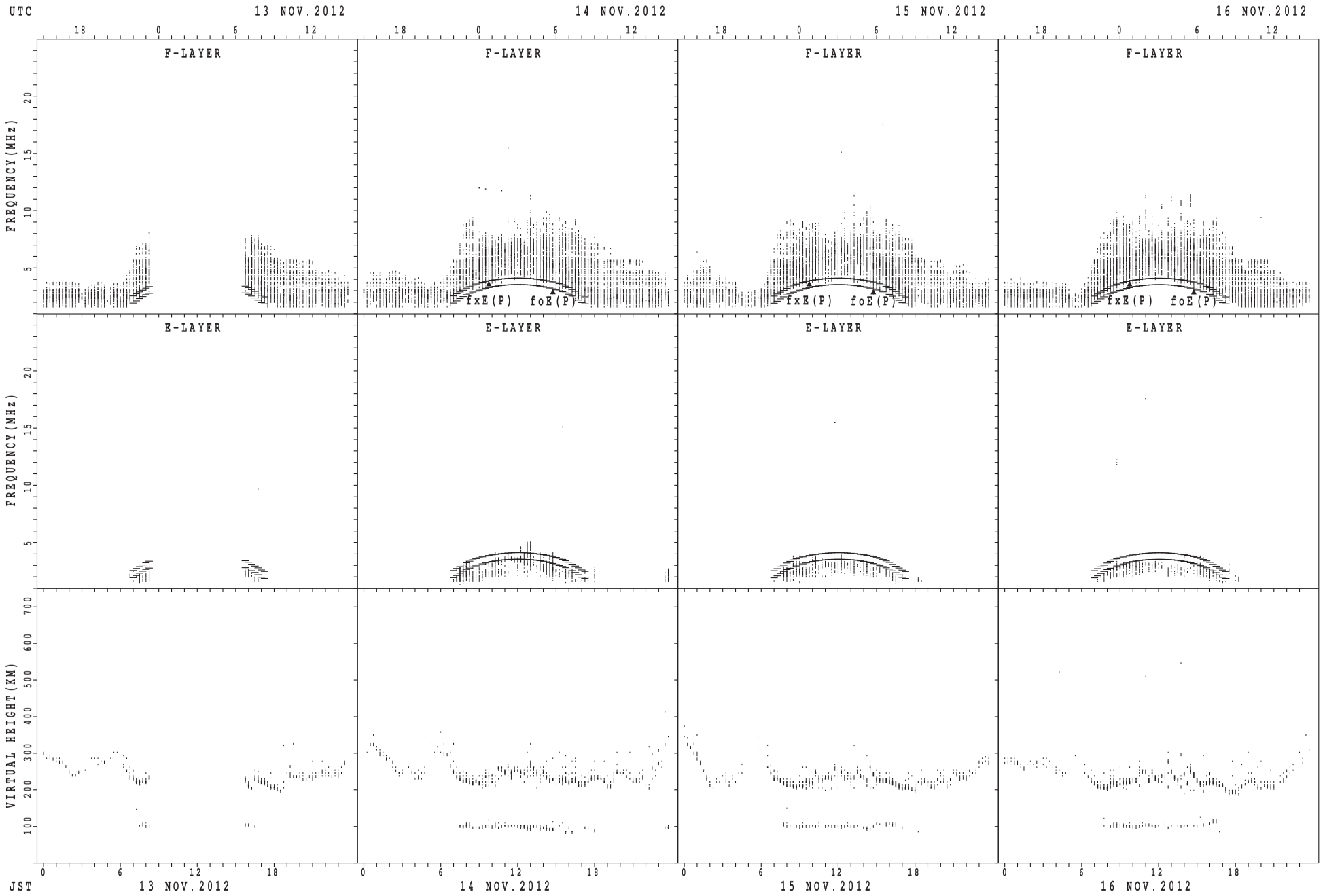
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



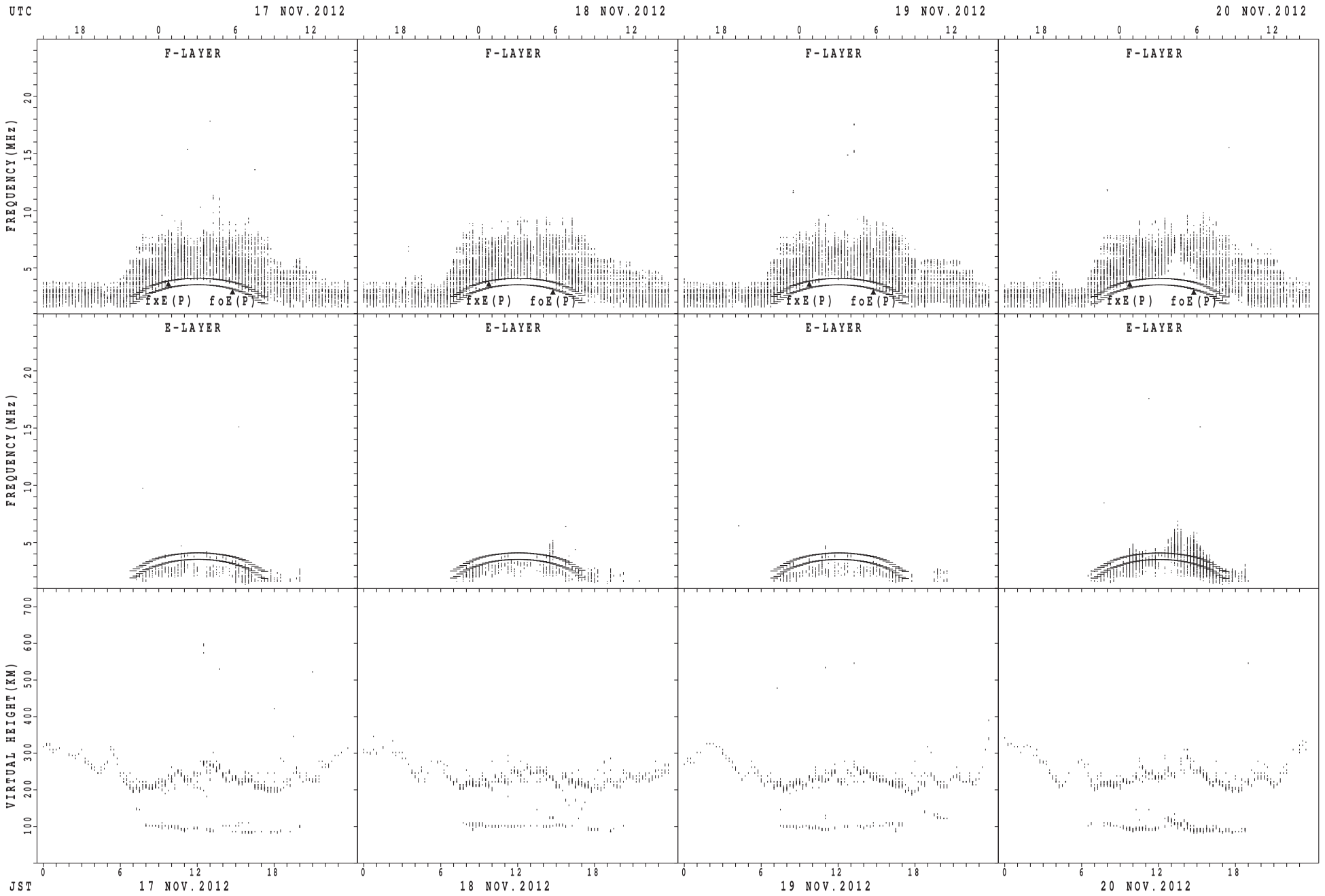
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



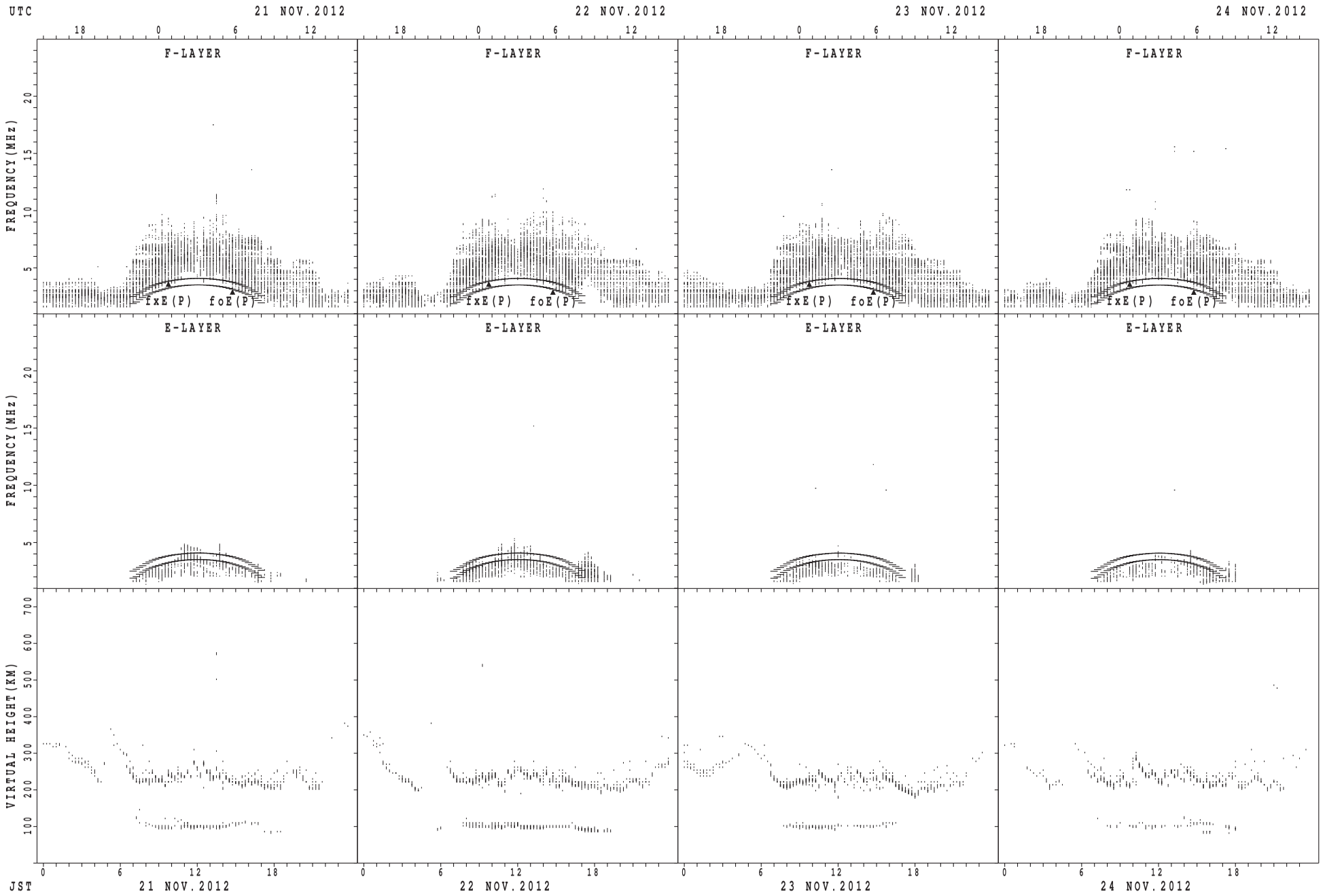
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



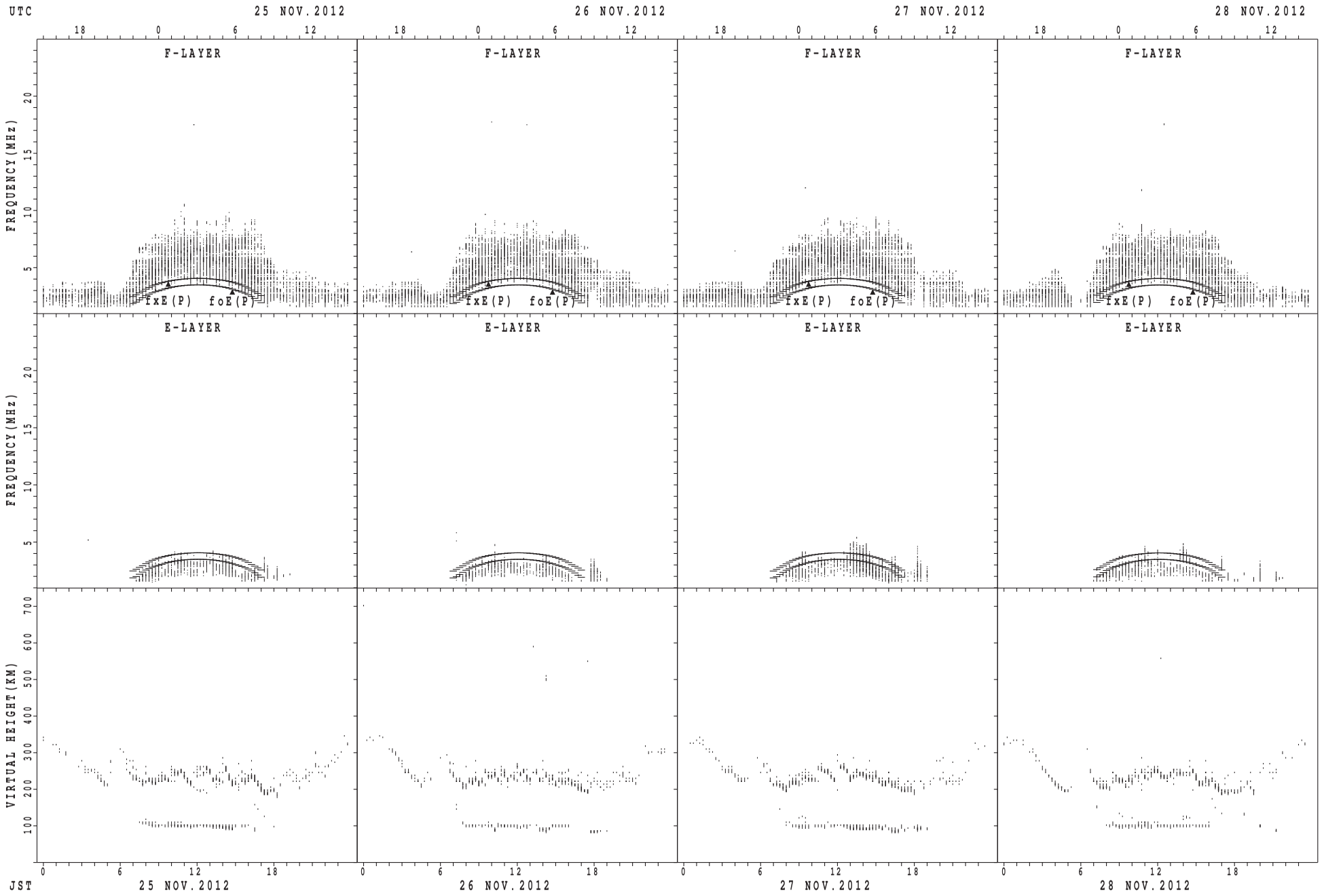
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



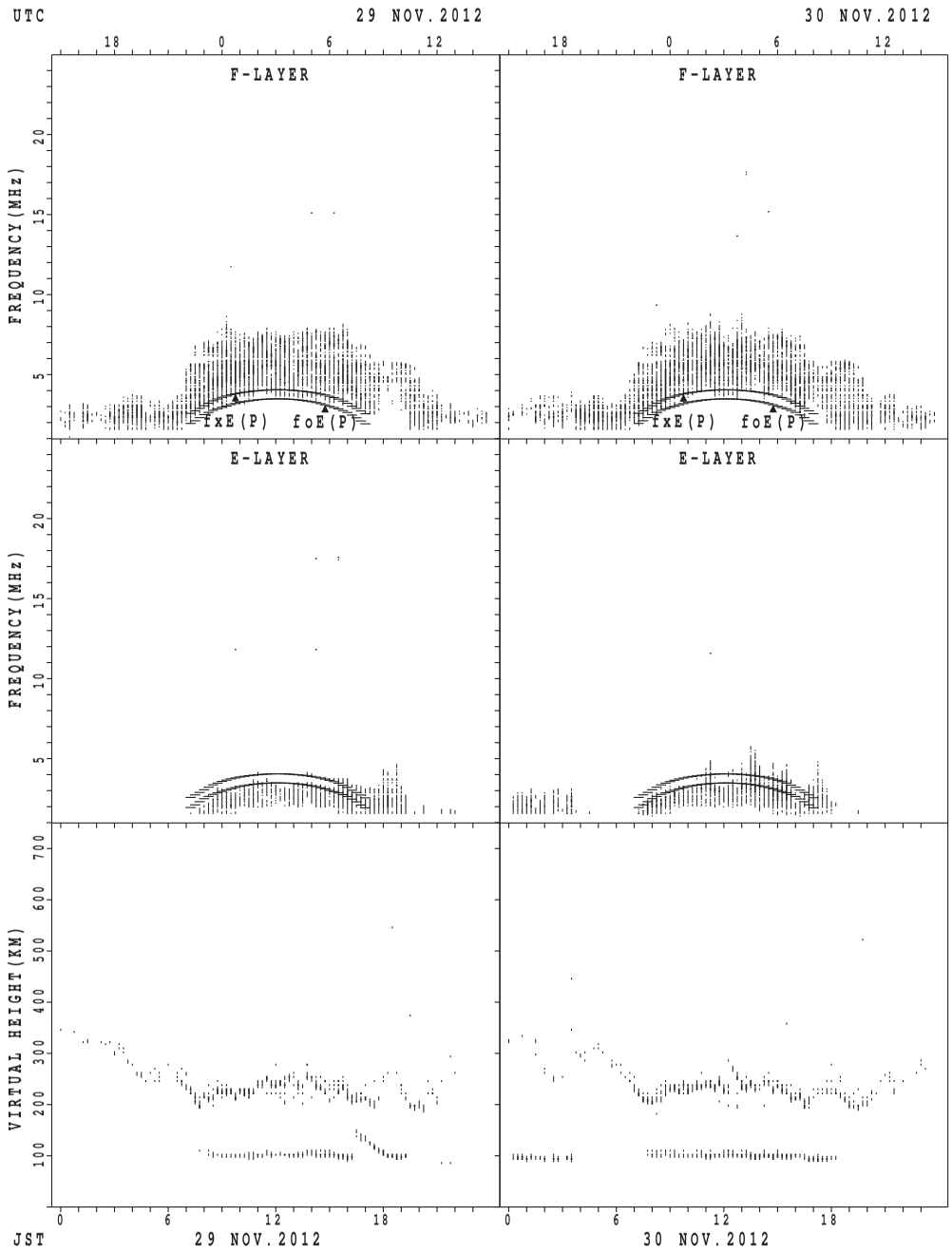
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



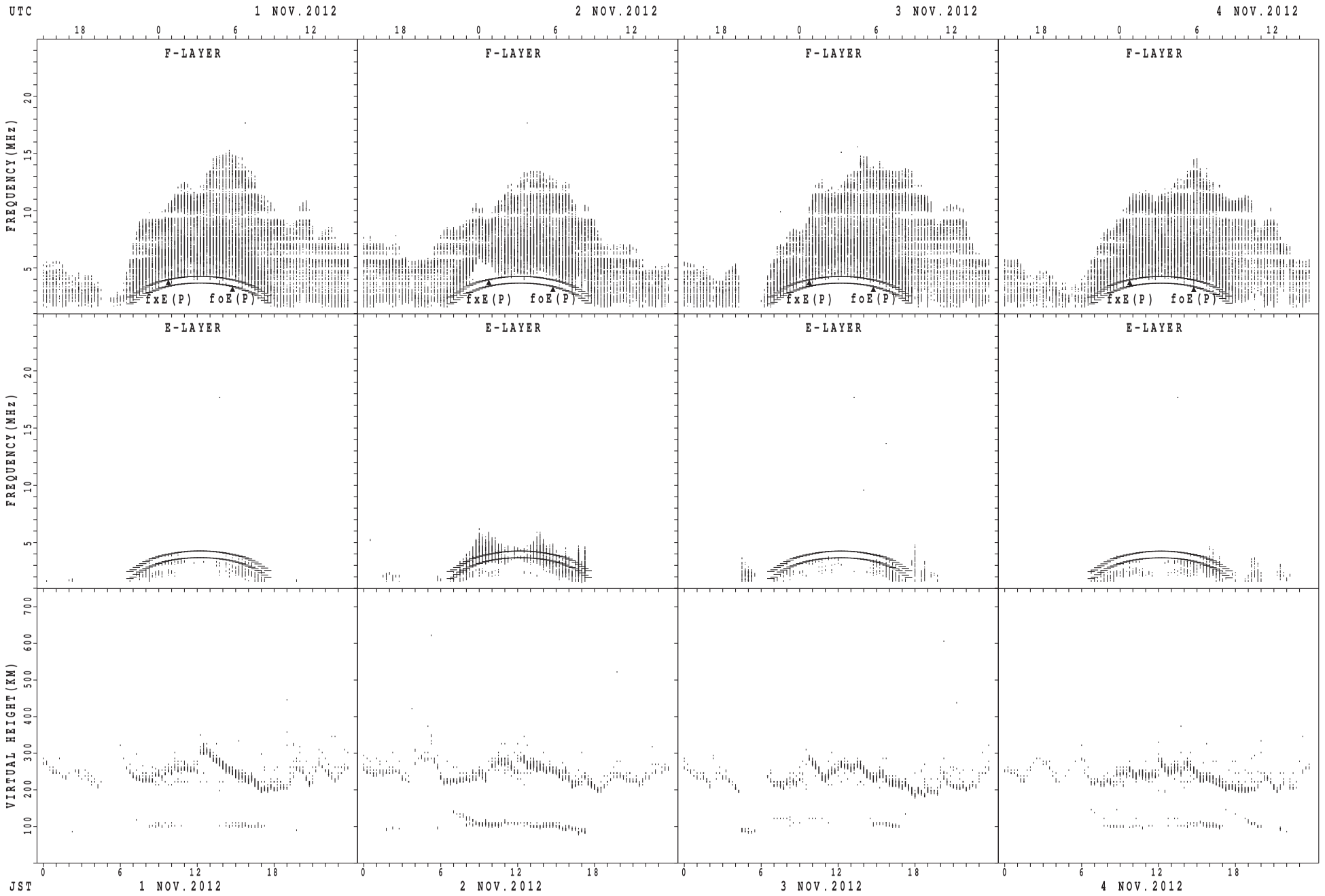
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



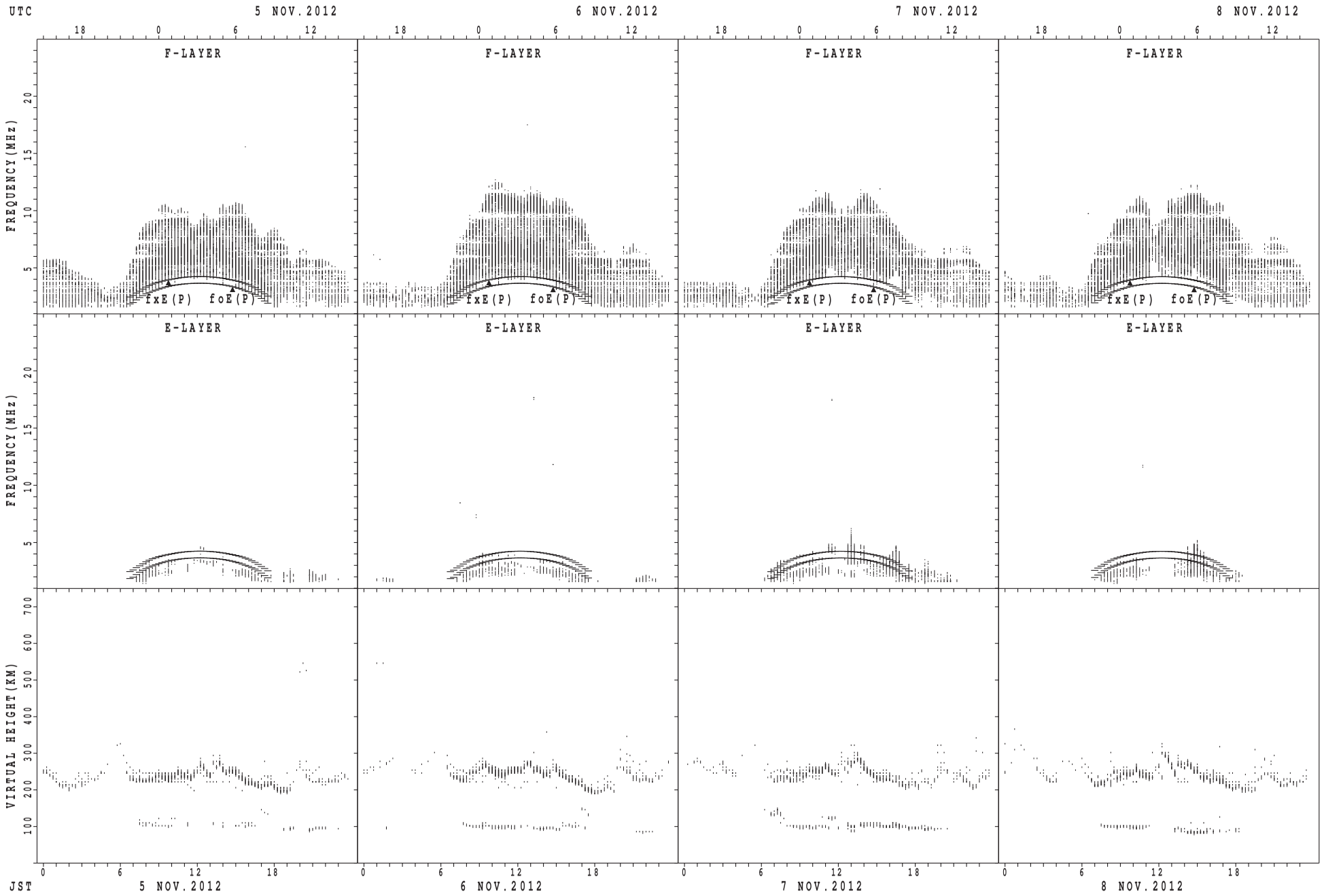
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



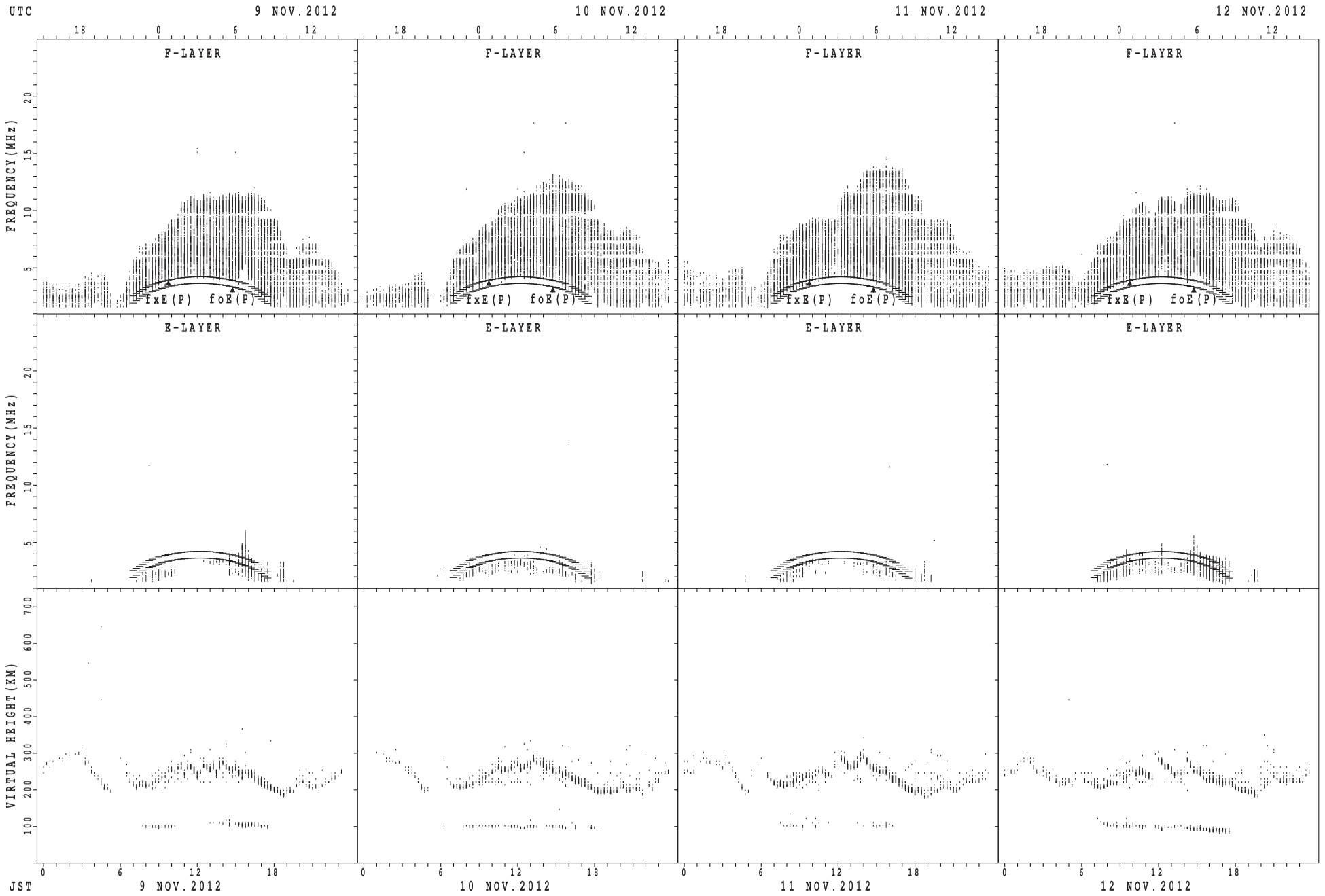
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



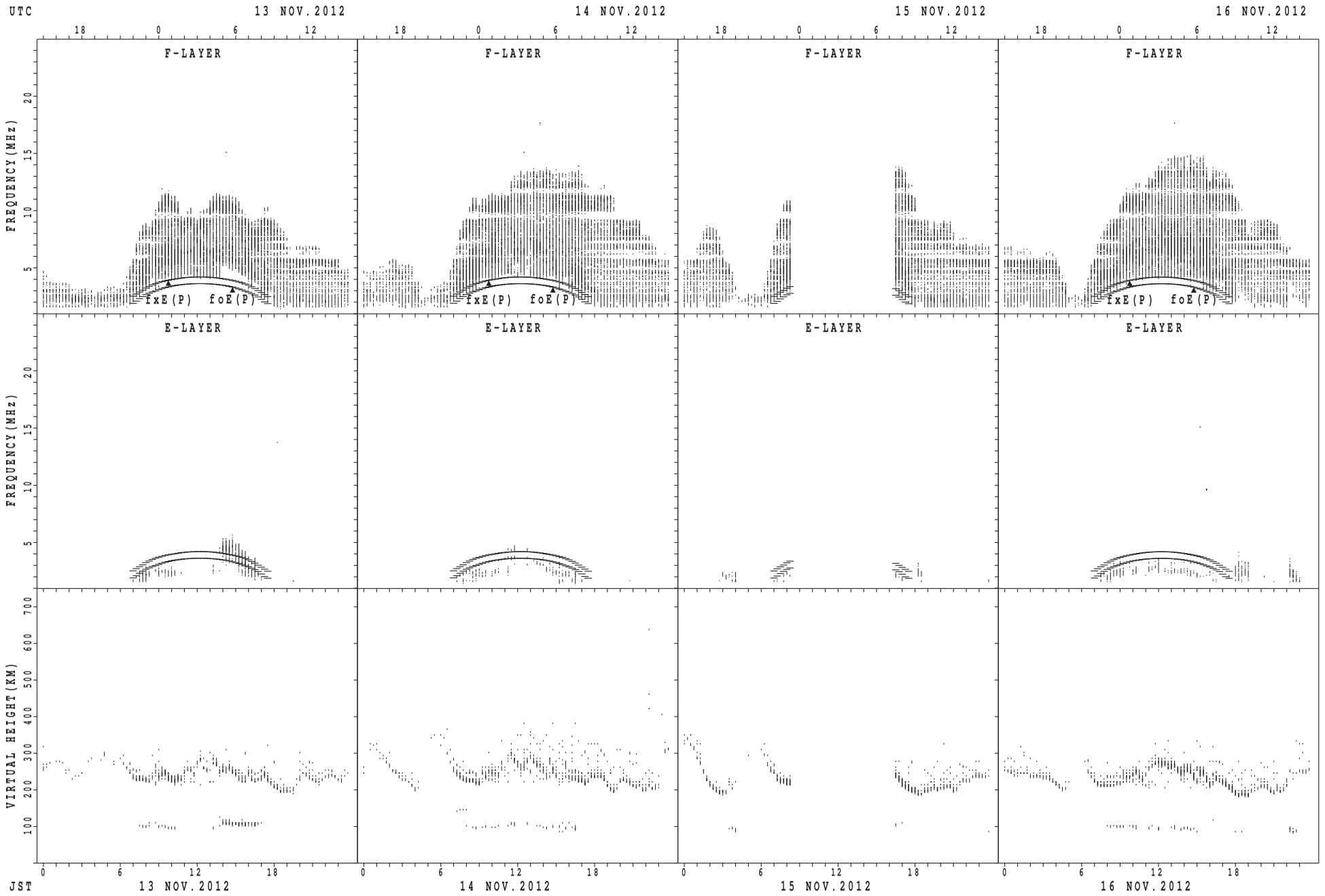
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



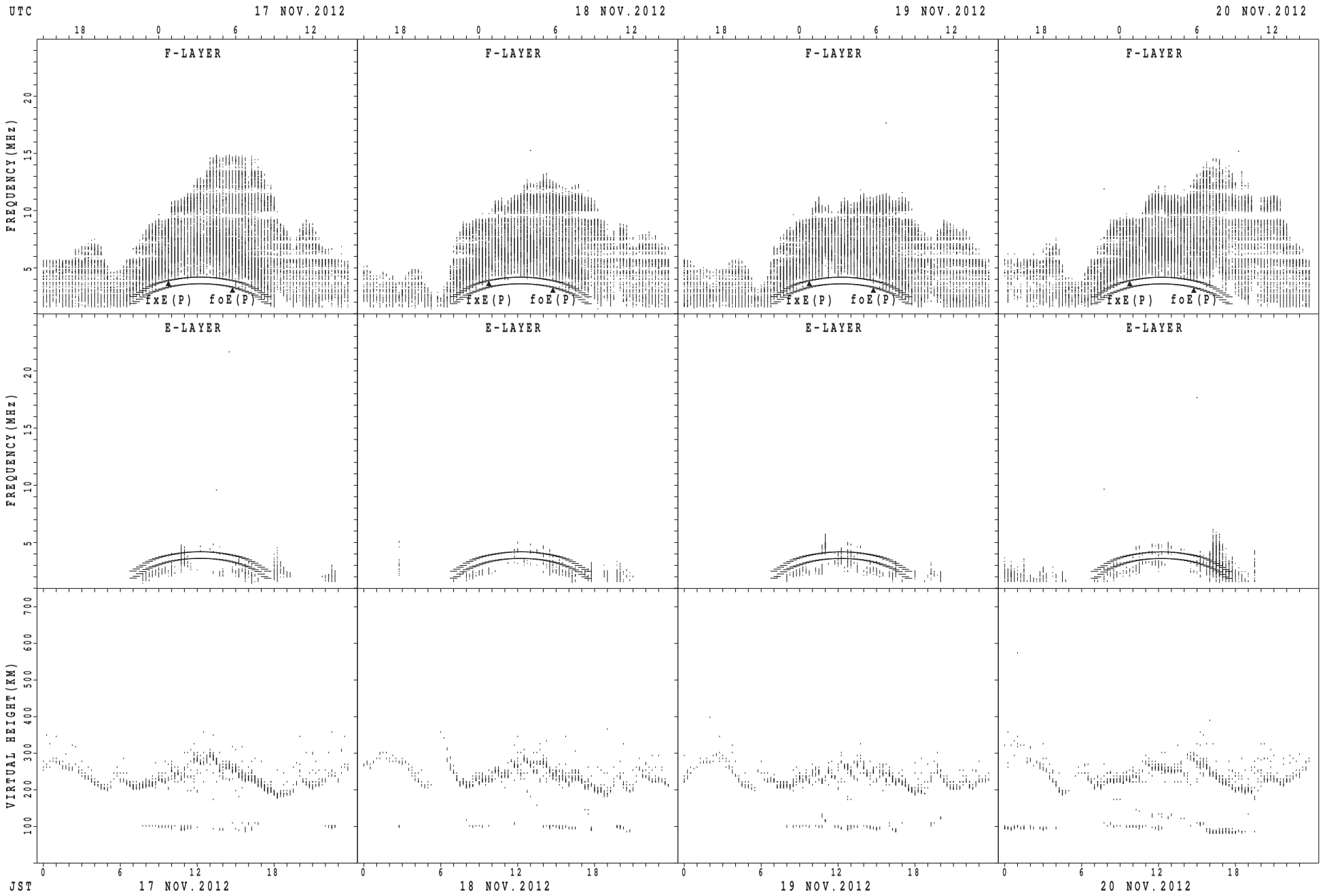
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



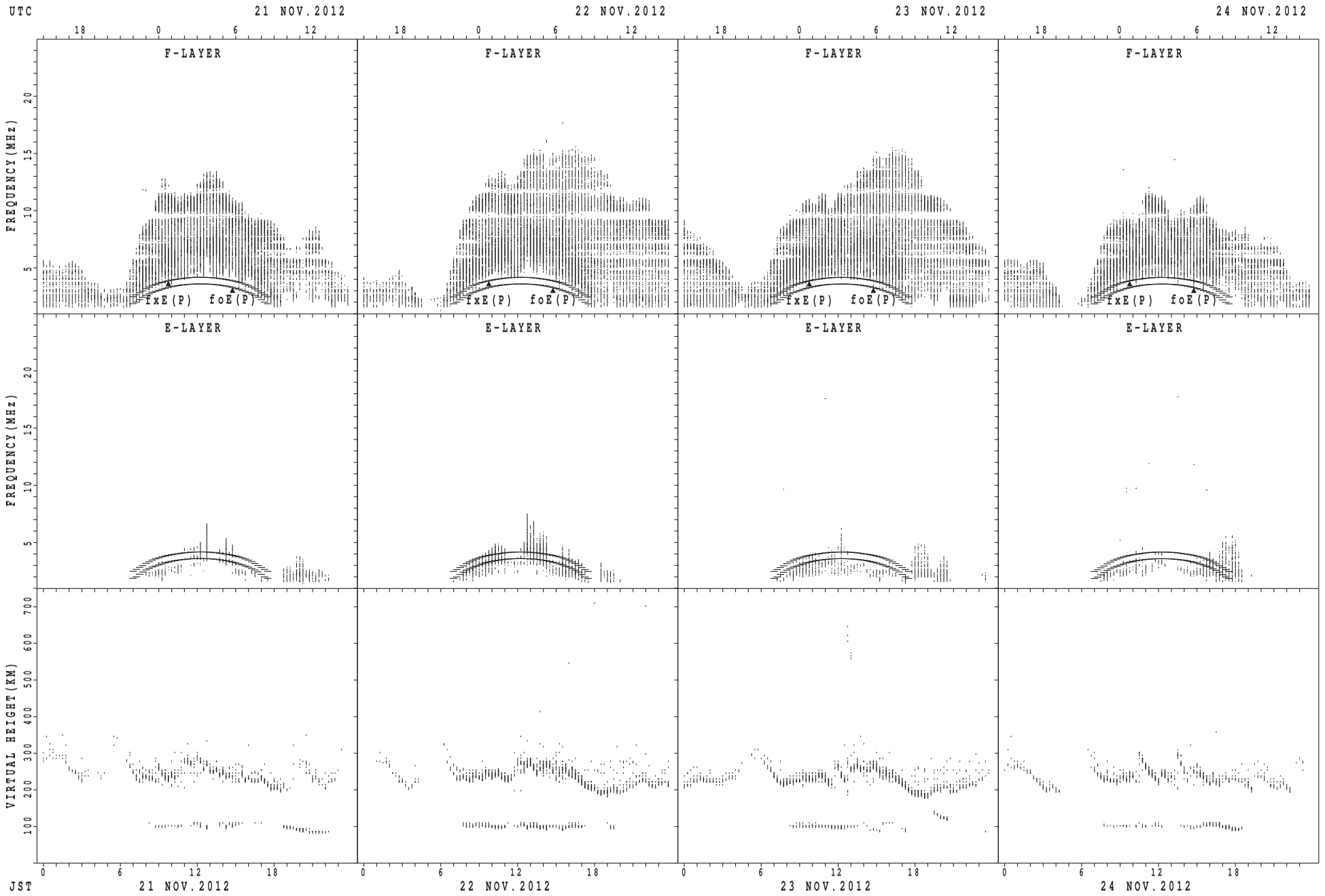
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



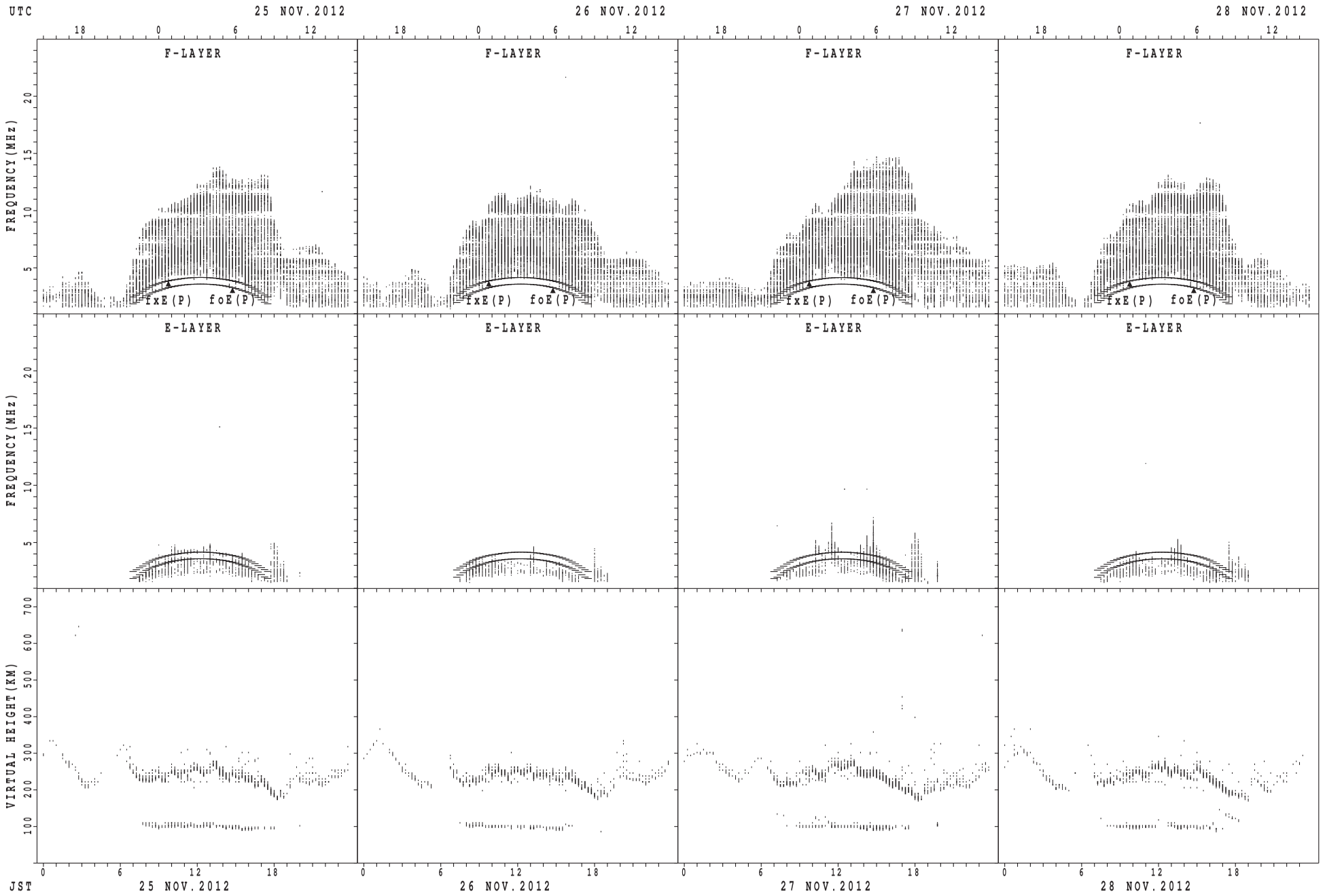
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



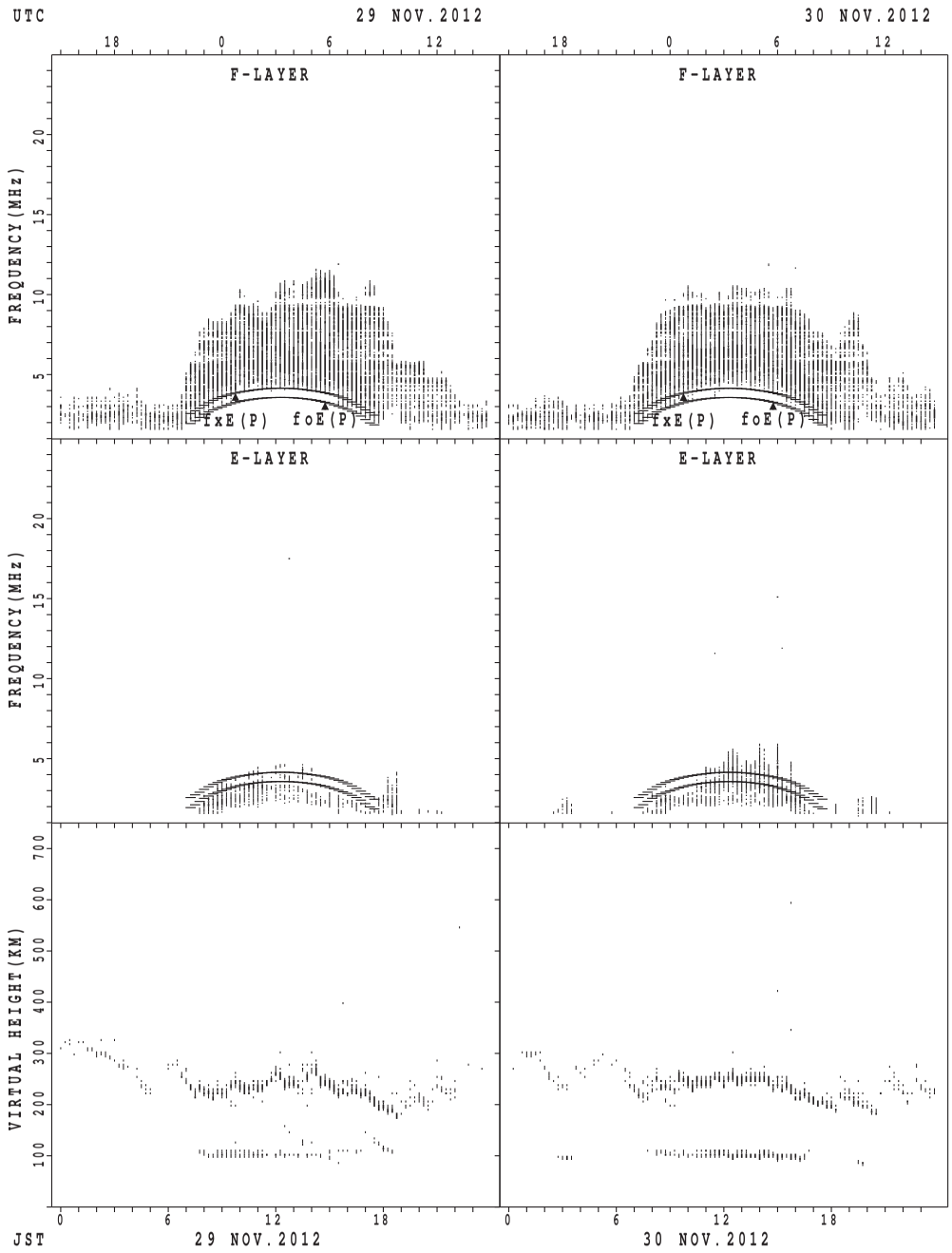
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h′F AND h′Es

NOV. 2012 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								11	27	28	28	27	26	26	27	26	23	1						
MED								230	222	223	226	230	226	231	232	230	228	254						
U Q								248	230	230	234	238	230	238	240	236	238	127						
L Q								218	214	215	217	222	220	226	230	222	222	127						

h′Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	2	4	3	1	1		12	13	11	7	4	2	5	2	9	4	7	8	4	3	4	4	3
MED	93	97	93	89	111	101		137	125	103	101	98	135	91	92	103	99	91	94	95	103	95	96	95
U Q	46	103	97	91	55	50		152	156	107	107	150	175	101	95	130	121	105	101	95	103	118	97	99
L Q	46	91	88	89	55	50		119	107	103	99	94	95	88	89	88	89	85	89	92	91	90	91	95

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								20	26	26	28	26	27	26	27	25	22	3						
MED								231	223	231	234	238	246	246	238	232	235	268						
U Q								242	234	242	238	246	260	256	248	240	242	272						
L Q								224	216	222	225	230	236	236	232	227	228	236						

h′Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	3	2	1	1					1	1	1	2		1	4	1	5	6	2	1	1	2	1
MED	97	97	101	89	101					109	107	103	102		115	110	99	103	98	104	101	95	96	95
U Q	105	99	105	44	50					54	53	51	109		57	118	49	106	103	111	50	47	99	47
L Q	97	93	97	44	50					54	53	51	95		57	101	49	96	95	97	50	47	93	47

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								3	21	29	29	29	21	26	29	29	28	22	6	3	1			
MED								236	230	232	238	238	248	246	250	236	230	225	242	242	258			
U Q								260	249	238	253	246	262	256	255	242	238	238	252	252	129			
L Q								232	222	224	230	230	232	238	240	228	224	218	234	238	129			

h′Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		1	2	3				3	7	5	5	8	6	7	8	6	11	13	14	4	6	1	1	
MED		97	93	91				125	107	105	97	103	104	97	100	103	105	95	96	95	103	95	93	
U Q		48	95	95				127	113	148	105	105	137	103	111	105	109	103	97	98	113	47	46	
L Q		48	91	87				123	105	102	93	99	103	97	95	103	97	92	91	93	95	47	46	

MONTHLY MEDIANS OF h′F AND h′Es

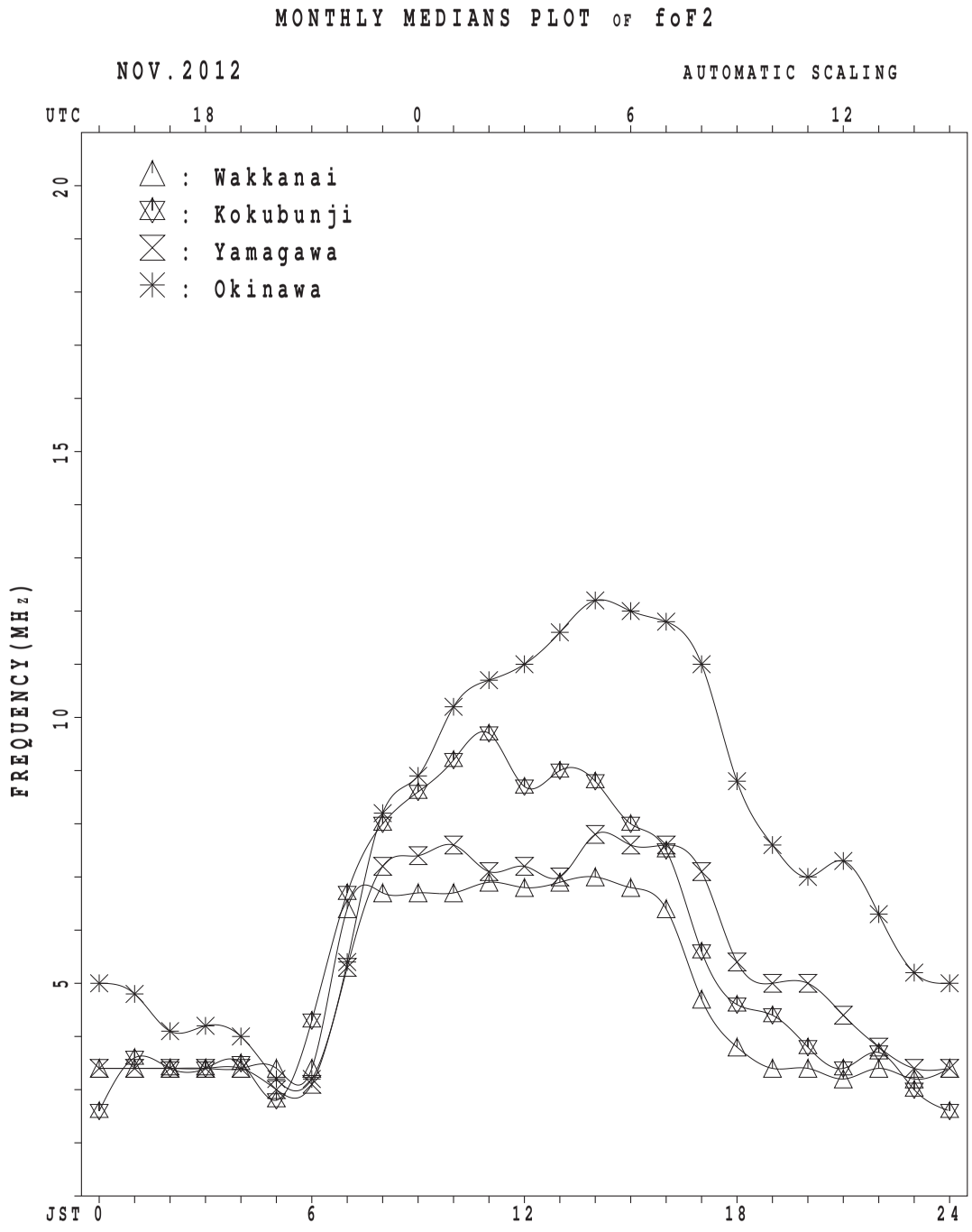
NOV.2012 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	1		1		2		1	3	30	29	29	25	14	18	29	29	29	29	25	18	16	16	8	2
MED	244		244		242		262	264	230	238	246	242	262	254	258	246	232	222	214	229	260	242	256	263
U Q	122		122		248		131	272	240	246	252	256	266	270	263	254	240	229	227	238	284	265	274	264
L Q	122		122		236		131	256	224	233	238	238	256	244	246	238	224	214	203	214	247	232	250	262

h′Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	1	1	2	2	1		1	4	5	7	8	11	10	11	8	12	5	9	9	5	2	2	
MED	97	105	97	97	95	89		135	111	105	103	107	107	104	105	101	102	91	97	175	103	92	101	
U Q	48	52	48	99	99	44		67	131	107	107	114	139	135	113	110	106	103	119	187	126	95	107	
L Q	48	52	48	95	91	44		67	106	103	103	104	105	103	101	96	97	89	94	108	95	89	95	


MONTHLY MEDIANS PLOT OF foF2
NOV.2012
AUTOMATIC SCALING
UTC
18
0
6
12
△ : Wakkanai
: Kokubunji
: Yamagawa
: Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 50	X 50	X 49	X 49	X 51	X 47												X 73	X 63	X 63	X 49	X 52	X 54	X 51
2	X 58	X 53	X 49	X 49	X 49	X 48												X 61	X 54	X 53	X 49	X 51	58	X 57
3	X 57	X 57	X 55	X 56	X 54	X 47	49											X 52	X 51	X 45	X 45	X 46	X 45	X 39
4	X 38	X 40	X 47	X 47	X 48	X 47	X 49											X 53	X 47	X 45	X 45	X 45	X 45	X 45
5	X 44	X 44	X 43	X 39	X 40	X 42	X 48											X 51	X 50	X 48	X 49	X 48	X 45	X 46
6	X 47	X 45	X 46	X 46	X 46	X 46	X 52											X 61	X 43	X 42	X 42	X 41	X 41	X 40
7	X 40	X 41	X 41	X 40	X 40	X 41	X 45											X 55	X 41	X 37	X 39	X 39	X 44	X 42
8	X 42	X 42	X 43	X 44	X 45	X 46												X 56	X 55	X 54	X 43	X 43	48	X 46
9	X 46	X 47	X 47	X 45	X 47	X 49	X 49											X 53	X 56	X 55	X 49	X 45	X 43	X 42
10	X 44	X 47	52	X 52	X 55	X 55	X 49											X 59	X 49	X 49	X 43	X 42	X 42	X 44
11	X 43	X 44	X 45	50	X 51	X 46	51											X 54	X 52	X 48	X 43	X 42	X 43	X 42
12	X 43	X 44	X 47	X 46	X 46	X 43	X 48											X 52	X 47	X 41	X 46	X 42	X 43	X 46
13	X 49	X 49	X 49	X 49	X 51	X 49	X 49											X 57	X 59	X 59	X 58	X 54	X 56	X 56
14	X 57	X 57	X 56	X 54	X 54	X 55												X 87	X 70	X 47	X 51	X 53	X 60	X 48
15	X 49	X 49	X 49	X 53	X 47	X 40	X 45											X 65	X 54	X 48	X 49	X 47	X 45	X 45
16	X 47	X 47	X 46	X 46	X 46	X 46	X 51											X 61	X 52	X 48	X 47	X 43	X 42	X 42
17	X 43	X 45	X 45	X 44	X 45	X 43	X 46											X 51	X 55	X 40	X 40	X 36	X 39	X 40
18	X 42	X 43	X 43	X 42	X 42	X 39	X 41											X 57	X 55	X 44	X 45	X 43	X 43	X 43
19	X 46	X 46	X 47	X 46	X 46	X 48	X 42											X 58	X 49	X 49	X 49	X 38	X 43	X 44
20	X 44	X 44	X 46	X 47	X 52	X 43	X 41											X 63	X 59	X 53	X 40	X 38	X 40	X 40
21	X 41	X 42	X 43	X 45	X 45	X 39	X 41											X 54	X 54	X 52	X 51	X 47	X 47	X 48
22	X 49	X 49	X 49	X 49	X 49	X 47	X 46											X 57	X 52	X 51	X 44	X 44	X 43	X 44
23	X 44	X 45	X 44	X 45	X 46	X 43	X 43											X 47	X 44	X 40	X 38	X 35	X 35	X 39
24	X 39	X 39	X 40	X 41	X 44	X 42	X 38											X 66	X 58	X 47	X 49	X 42	X 44	X 43
25	X 44	X 42	X 44	X 46	X 49	X 48	X 38											X 47	X 48	X 44	X 42	X 35	X 37	X 39
26	X 41	X 43	X 45	X 47	X 51	X 44	X 36											X 51	X 43	X 42	X 40	X 34	X 37	X 40
27	X 39	X 39	X 39	X 41	X 43	X 42	X 35											X 45	X 45	X 42	X 34	X 30	X 34	X 35
28	X 35	X 39	X 39	X 40	X 43	X 46	35										X 58	X 54	X 33	X 34	X 42	X 37	36	X 36
29	X 38	X 39	X 41	X 41	X 42	X 42	X 41			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		X 46	X 34	X 34	X 41	X 41	X 39	41
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	29	29	29	25										1	29	29	29	29	29	29	29
MED	X 44	X 44	X 46	X 46	X 46	X 46	X 45										X 58	X 55	X 52	X 47	X 45	X 42	X 43	X 43
U Q	X 48	X 48	X 49	X 49	X 51	X 48	X 49											X 61	X 55	X 52	X 49	X 46	X 45	X 46
L Q	X 41	X 42	X 43	X 43	X 44	X 42	X 41											X 52	X 46	X 42	X 42	X 38	X 40	X 40

NOV. 2012 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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	44	44	42	42	44	40	46	67	U R 86	U R 82	U R 78	J R 106	Y	R 85	83	J R 91	92	67	56	56	42	45	47	44
2	51	46	42	42	42	41	36	57	66	R 89	88	92	U R 86	J R 81	U R 78	84	70	54	48	46	42	44	F 46	51
3	50	50	49	49	47	40	35	60	U R 69	Y	R 88	U Y 84	J R 88	76	R 80	J R 82	67	45	44	38	38	39	39	32
4	31	33	40	40	41	40	42	66	U R 76	76	U R 78	74	U R 80	75	U R 78	75	74	42	40	39	38	38	38	38
5	37	37	36	33	33	36	41	64	72	74	J R 85	J R 87	J R 83	71	74	72	70	44	43	42	42	41	38	39
6	40	38	39	39	39	39	45	62	72	R 78	U Y 94	92	R 90	74	74	73	72	54	36	35	35	34	34	33
7	33	34	34	33	33	34	38	75	76	74	J R 91	J R 89	86	U R 79	77	82	74	48	34	30	32	32	36	35
8	35	35	36	37	38	38	44	62	R 76	J R 86	J R 87	J R 90	U Y 87	R 81	R 89	U R 80	71	50	48	47	36	36	F 35	39
9	39	40	40	38	40	42	41	66	J R 82	U R 83	92	J R 89	J R 89	J R 81	R 78	75	73	46	49	48	42	38	36	35
10	37	40	F 40	45	47	47	42	68	R 82	R 89	J R 93	J R 89	86	R 86	R 91	80	68	52	42	42	36	35	35	36
11	36	37	38	38	43	39	40	63	R 66	J R 85	J R 89	R 103	R 78	R 76	R 80	77	77	47	46	41	36	34	36	35
12	36	37	40	39	39	36	41	64	J R 81	J R 85	93	78	R 81	R 76	74	R 78	75	45	40	34	39	35	36	39
13	42	42	42	42	44	42	42	63	J R 88	J R 89	R 88	R 90	J R 93	R 79	U R 89	79	71	50	52	52	51	48	49	49
14	50	50	48	47	47	48	42	71	R 86	J R 113	J R 125	J R 126	J R 125	123	J R 119	98	93	80	63	40	44	46	52	41
15	42	J R 42	42	46	40	33	38	74	92	U Y 92	113	U Y 111	U Y 102	95	100	U R 89	76	58	47	41	42	38	38	38
16	40	40	39	39	39	39	44	72	R 85	102	U Y 103	U Y 105	U R 83	J R 87	J R 90	U R 91	71	54	45	41	40	36	35	35
17	36	38	38	37	38	36	39	63	J R 79	J R 94	J R 91	R 100	R 90	J R 93	77	78	72	44	49	33	33	30	32	33
18	36	36	36	35	35	32	34	66	R 76	89	94	102	U R 93	U R 79	82	78	66	50	48	36	38	36	36	36
19	39	39	39	39	39	41	35	65	80	J R 94	85	R 85	90	R 81	73	74	70	51	42	42	42	32	36	37
20	37	38	39	40	45	36	34	63	74	74	U R 96	J R 90	R 76	U Y 92	J R 91	83	71	56	52	R 48	33	32	34	34
21	35	36	36	38	38	32	34	51	U R 99	J R 93	J R 90	J R 93	Y	Y	J R 91	Y	73	48	47	45	44	40	40	41
22	42	42	42	42	42	40	39	68	74	R 76	U Y 80	95	J R 105	U R 85	J R 82	R 80	61	50	46	44	37	37	36	37
23	37	38	R 36	38	39	36	36	64	76	90	89	J Y 80	Y	U Y 83	U R 88	75	65	40	37	33	31	29	29	32
24	32	32	33	34	37	35	31	57	R 74	69	92	91	J Y 82	U R 85	79	74	72	58	51	40	42	36	37	36
25	37	35	37	39	42	41	31	56	R 80	U R 77	J Y 89	R 94	71	U R 87	72	71	68	40	41	37	35	28	30	32
26	34	36	37	40	44	37	29	60	74	74	U Y 76	U R 77	R 77	74	74	72	69	44	36	35	33	27	30	33
27	33	32	33	34	36	35	28	54	65	80	J R 83	93	78	74	75	68	66	38	38	35	R 27	22	27	28
28	29	32	32	34	36	39	F 26	50	64	67	70	R 78	74	73	R 74	V 65	52	47	26	28	35	30	26	29
29	31	32	34	34	35	35	34	57	70	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	54	39	27	27	32	R 32	32	F 29
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	29	29	29	29	29	29	27	28	28	25	27	28	27	29	29	29	29	29	29	29	29
MED	37	38	39	39	39	39	38	63	R 76	R 85	89	R 90	R 86	R 81	R 80	78	71	48	45	40	38	36	36	36
U Q	41	41	41	42	44	40	42	66	R 82	J R 90	93	98	R 90	R 86	R 89	R 82	74	54	48	44	42	38	38	39
L Q	34	35	36	36	38	36	34	58	72	76	85	86	R 79	76	74	74	68	44	39	35	34	32	33	33

NOV. 2012 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L		L								
2										L	A	L	L	L	L									
3										U L 416	U L 404	L	L	L	L									
4										L	352	L		L 340										
5											L	L	L	L										
6												L	L	L			196							
7											U L 404	L	L	L										
8								232					L		L									
9											L	L	L											
10										L	L	L	L											
11												U L 412		L										
12										L	U L 428	L	L	L										
13											L	L			L									
14																								
15												L	L											
16										L	L	L	L	L										
17										L	U L 392	L			L									
18										L	L		U L 412											
19									U L 304				L											
20									288	308	352			L										
21												L		L	324									
22										L	L		L		L	248								
23												L	L		L									
24											L	L	L	L										
25										U L 328		U L 444		L										
26													L											
27											L	L	L	L	L	228								
28												L	L											
29										C	C	C	C	C	C	C	C							
30								C	C	C	C	C	C	C	C	C								
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	2	3	6	2	1	1	1	2	1							
MED								232	296	U L 328	U L 398	U L 428	U L 412	L 340	324	238	196							
U Q										U L 416	U L 404													
L Q										308	352													

NOV. 2012 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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	288	316	312	312	300	272	244	192							
2							B	A	256	A	A	A	A	A	A	224	B							
3								A 180	252	284	292	300	308	276	A	A	A							
4								184	240	A	288	296	304	292	276	A	A							
5								172	240	276	300	312	312	292	276	228	188							
6								164	236	284	308	316	304	288	252	216	B							
7								212	244	U A 272	A	308	312	300	264	236	B							
8							B	180	236	276	A	308	320	280	260	232	B							
9								180	248	U A 260	304	A	312	A	280	236	A							
10								180	A	304	328	324	328	296	272	216	168							
11								200	280	296	316	328	340	308	288	248	168							
12								176	260	288	308	A	312	304	264	232	152							
13								180	248	280	316	328	320	304	284	224	176							
14							B	160	240	A	316	324	324	296	272	248	176							
15								176	248	A	320	316	316	304	280	240	184							
16								A	244	284	308	312	312	300	284	228	B							
17								204	248	292	300	312	308	296	280	236	172							
18								180	228	284	304	324	316	308	296	236	180							
19								200	228	288	300	300	308	292	272	212	B							
20								216	224	268	304	308	312	304	280	208	A							
21								180	240	276	288	312	316	300	268	A	B							
22								188	252	260	280	312	316	308	280	208	B							
23								164	248	276	296	304	308	296	248	216	180							
24								164	240	264	U A 276	304	A	288	260	216	A							
25								176	236	284	296	308	300	276	252	204	168							
26								184	228	284	R 304	316	304	R 296	B	220	B							
27								196	U A 228	A	304	308	296	296	252	196	B							
28								A	252	268	300	312	312	292	248	208								
29								180	212	C	C	C	C	C	C	C	C							
30								C	C	C	C	C	C	C	C	C	176							
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	28	23	25	25	26	26	25	25	13							
MED								180	242	284	304	312	312	296	272	224	176							
U Q								196	250	288	312	316	316	304	280	236	182							
L Q								176	236	272	296	308	308	292	260	214	168							

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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 16	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15	G	32	34	G	G 29	G 31	G 28	G 26	27	J A 20	E B 12	E B 12	E B 12	E B 15	E B 15	J A 20	J A 22
2	20	E B 13	E B 13	E B 14	J A 21	E B 12	J A 15	J A 25	28	J A 43	J A 61	J A 50	J A 50	J A 37	40	G	E B 15	J A 18	J A 19	J A 18	J A 25	J A 25	J A 28	J A 28
3	J A 23	J A 35	J A 35	J A 25	J A 15	E B 15	E B 15	22	26	G 26	33	32	G	32	J A 33	J A 44	J A 33	J A 35	J A 21	J A 21	J A 22	J A 17	J A 13	19
4	18	J A 20	J A 20	J A 20	J A 20	E B 16	E B 16	22	28	J A 31	32	32	G	32	G 23	J A 31	J A 29	J A 29	J A 26	20	E B 13	E B 13	E B 13	E B 13
5	J A 15	J A 13	E B 13	E B 12	E B 14	E B 14	E B 14	26	28	G	32	G	G	G	G	25	G	E B 14	J A 21	J A 17	E B 13	E B 13	E B 13	E B 13
6	E B 15	E B 15	J A 22	J A 11	J A 15	J A 14	E B 16	21	27	G 27	G 27	G 27	34	30	G	J A 25	J A 21	J A 20	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15
7	E B 14	E B 14	E B 14	E B 14	J A 13	17	E B 16	24	26	32	J A 33	G	G	G 23	G	30	J A 17	J A 25	J A 17	J A 16	19	E B 11	E B 11	E B 12
8	E B 16	E B 16	E B 15	E B 15	E B 14	E B 14	E B 14	21	26	32	37	35	G	G	29	G 19	E B 13	E B 14	J A 22	E B 16	E B 16	E B 16	E B 16	E B 15
9	E B 12	18	17	E B 12	E B 12	E B 15	E B 15	22	27	34	34	J A 61	34	J A 35	G J 26	A 27	J A 26	32	25	24	E B 14	E B 14	21	20
10	J A 18	J A 21	E B 15	E B 15	J A 15	E B 15	E B 16	J A 21	J A 34	34	34	36	G 26	G	G	24	G	J A 17	J A 17	24	19	18	18	18
11	18	E B 14	E B 14	E B 14	E B 15	18	J A 11	G 18	G 24	G 26	G	36	G 27	33	G 19	G 24	G	E B 12	24	18	E B 12	E B 12	E B 15	E B 14
12	E B 16	E B 15	E B 15	18	J A 26	19	E B 15	20	G 24	32	34	J A 33	G	G	G 20	G	17	J A 17	15	E B 14	E B 14	E B 14	E B 14	E B 14
13	E B 16	E B 16	J A 13	J A 13	E B 14	E B 15	E B 15	20	G	G 28	35	G 29	G 26	G 26	G 23	25	G	J A 18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
14	E B 14	E B 14	17	E B 14	E B 14	E B 14	E B 14	19	28	J A 39	G 30	G 29	34	G 20	G 18	G 17	G	E B 14	E B 14	J A 23	J A 13	E B 14	E B 14	20
15	J A 13	E B 12	E B 12	E B 15	E B 15	E B 15	E B 15	21	27	J A 53	G 25	G	G	G	G	G	G	E B 12	E B 11	J A 11	E B 11	E B 11	E B 11	E B 11
16	E B 12	E B 12	E B 12	E B 12	E B 13	E B 12	E B 12	22	28	G 28	G	G 30	G 24	G	G	G 18	E B 15	E B 12	J A 20	J A 19	E B 12	E B 12	E B 12	E B 12
17	J A 23	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	G 17	26	G 25	J A 30	35	35	G	31	G	G	E B 12	E B 14	E B 14	E B 14	E B 14	E B 13	J A 17
18	E B 13	J A 13	J A 17	J A 16	E B 13	E B 13	E B 13	G	28	30	34	34	33	G 24	G 19	G 22	G	E B 11	E B 16	J A 17	J A 13	J A 17	J A 19	E B 15
19	E B 12	E B 12	J A 20	E B 12	E B 13	E B 14	E B 14	G 17	G	G 25	35	G	G	G	G 25	25	E B 12	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	20
20	J A 20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	29	34	34	34	33	33	31	J A 26	J A 25	J A 34	J A 27	J A 15	E B 14	E B 14	E B 14
21	E B 15	E B 14	E B 14	20	E B 14	E B 14	E B 14	20	26	32	35	34	33	32	32	J A 33	19	E B 13	E B 15	E B 14	J A 14	J A 14	J A 15	J A 18
22	J A 21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	19	G	31	32	G 25	G	G 19	G 18	23	J A 19	J A 20	J A 16	20	20	J A 17	E B 14	J A 16
23	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15	G	G	31	34	32	34	32	28	27	G	E B 14	J A 16	19	E B 15	E B 15	E B 15	E B 15
24	E B 14	J A 26	E B 14	18	17	19	19	G	27	28	30	G 30	32	30	27	G 20	J A 25	J A 21	J A 18	J A 28	J A 37	J A 29	J A 27	J A 21
25	J A 23	E B 12	E B 12	E B 12	E B 12	16	E B 14	J A 22	25	G	G 25	G	G J 21	A 30	G	G	G	E B 14	J A 17	E B 14	E B 15	E B 14	18	18
26	E B 12	E B 12	E B 12	E B 12	E B 13	E B 13	E B 13	20	G 20	G	G	G	G	G	E B 28	22	E B 15	E B 15	E B 24	J A 13	E B 13	E B 13	E B 13	E B 13
27	E B 14	20	19	E B 14	E B 12	J A 14	E B 12	G	29	J A 32	G 28	G	G	G	27	22	E B 14	21	J A 15	J A 13	E B 12	E B 12	J A 27	E B 12
28	18	19	J A 12	E B 11	E B 12	E B 12	J A 12	J A 21	G 22	32	G 24	G 26	G	G	27	G	E B 16	J A 22	E B 11	J A 16	J A 42	J A 17	E B 12	E B 12
29	E B 14	E B 14	J A 16	J A 26	18	J A 17	E B 12	J A 17	24	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J A 19	J A 26	J A 18	20	E B 12	J A 33	J A 19	J A 17
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	29	29	29	29	29	29	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29
MED	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	20	26	31	32	G	G	G	G	G	G	17	J A 17	17	E B 14	E B 14	E B 15	E B 15
U Q	J A 18	17	J A 17	16	J A 15	16	E B 15	22	28	32	34	34	34	32	28	27	J A 20	J A 22	J A 21	20	18	J A 17	J A 18	18
L Q	E B 14	E B 13	E B 13	E B 12	E B 13	E B 14	E B 14	G	G	G	G	G 30	G	G	G 24	G 22	G	E B 14	E B 14	E B 14	E B 13	E B 13	E B 13	E B 13

NOV. 2012 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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 16	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15	G	G 25	G 27	G	G 24	G 23	G 23	G 22	G 24	G 16	E B 12	E B 12	E B 12	E B 15	E B 15	E B 15	E B 15
2	E B 13	E B 13	E B 13	E B 14	18	E B 12	E B 12	20	G 20	29	40	30	37	29	26	G	E B 15	E B 15	E B 12	E B 12	E B 12	14	18	18
3	17	25	25	19	E B 15	E B 15	E B 15	G 18	G 17	G 17	30	G 30	G	30	29	32	25	26	E B 12	14	E B 12	E B 12	E B 12	E B 12
4	E B 13	E B 13	E B 13	E B 16	E B 16	E B 16	E B 16	20	G 24	24	G 29	31	G	30	G 17	22	22	22	18	E B 13	E B 13	E B 13	E B 13	E B 13
5	E B 14	E B 16	E B 13	E B 12	E B 14	E B 14	E B 14	23	24	G	G 30	G	G	G	G	24	G	E B 14	18	E B 13	E B 13	E B 13	E B 13	E B 13
6	E B 15	E B 15	E B 15	E B 15	E B 13	E B 13	E B 16	20	25	G 23	G 23	G 22	31	G 22	G	22	16	E B 15	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15
7	E B 14	E B 14	E B 14	E B 14	E B 14	E B 16	E B 16	G 21	G 24	28	28	G	G	G 21	G	G 18	E B 14	E B 12	E B 11	E B 11	E B 12	E B 11	E B 11	E B 12
8	E B 16	E B 16	E B 15	E B 15	E B 14	E B 14	E B 14	19	24	29	28	33	G	G	29	G 18	E B 13	E B 14	18	E B 16	E B 16	E B 16	E B 16	E B 15
9	E B 12	E B 12	E B 12	E B 12	E B 12	E B 15	E B 15	20	G 25	31	32	32	32	32	G 20	G 18	18	E B 13	18	18	E B 14	E B 14	E B 14	E B 14
10	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G 13	25	G 24	G 23	35	G 25	G	G	24	G	E B 12	E B 13	E B 12	E B 12	E B 14	E B 14	E B 14
11	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	G 15	G 16	G 15	G	34	G 26	G 30	G 19	G 15	G	E B 12	E B 12	E B 12	E B 12	E B 12	E B 15	E B 14
12	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	19	G 19	30	G 31	31	G	G	G 18	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
13	E B 16	E B 16	E B 13	E B 12	E B 14	E B 15	E B 15	19	G	G 18	G 34	G 24	G 20	G 20	G 20	24	G	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	19	25	27	G 27	G 27	G 32	G 18	G 16	G 16	G	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14
15	E B 12	E B 12	E B 12	E B 15	E B 15	E B 15	E B 15	20	G 24	34	G 24	G	G	G	G	G	G	E B 12	E B 11	10	E B 11	E B 11	E B 11	E B 11
16	E B 12	E B 12	E B 12	E B 12	E B 13	E B 12	E B 12	21	G 24	G 24	G	G 24	G 20	G	G	G 18	E B 15	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12
17	E B 15	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	G 14	G 14	G 17	G 17	32	33	G	30	G	G	E B 12	E B 14	E B 14	E B 14	E B 14	E B 13	E B 13
18	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13	G	26	30	32	G 32	32	G 20	G 18	G 17	G	E B 11	E B 16	E B 14	E B 15	E B 15	E B 15	E B 15
19	E B 12	E B 12	E B 12	E B 12	E B 13	E B 14	E B 14	G 14	G	G 17	32	G	G	G	G 22	22	E B 12	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	24	28	G 30	32	32	32	32	29	22	22	30	18	E B 14	E B 14	E B 14	E B 14
21	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 18	G 24	29	30	G 31	G 30	G 30	29	24	19	E B 13	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14
22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 15	G	G 26	G 27	G 25	G	G 16	G 16	22	E B 15	E B 15	E B 13	E B 14	E B 14	E B 14	E B 14	E B 14
23	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15	G	G	30	32	32	32	31	27	24	G	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15
24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	25	G 26	28	G 26	27	G 26	G 23	G 18	18	E B 16	E B 13	E B 13	21	18	18	E B 15
25	E B 15	E B 12	E B 12	E B 12	E B 12	E B 14	E B 14	G 15	24	G	G 21	G	G 18	G 18	G	G	G	E B 14	E B 14	E B 14	E B 15	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	E B 13	E B 13	20	G 17	G	G	G	G	G	E B 28	G 22	E B 15	E B 15	E B 13	E B 13	E B 13	E B 13	E B 13	E B 13
27	E B 14	E B 14	E B 14	E B 14	E B 12	E B 13	E B 12	G	25	26	G 26	G	G	G	E B 26	E B 21	E B 14	E B 14	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12
28	E B 12	E B 12	11	E B 11	E B 12	E B 12	E B 12	15	G 15	G 26	G 23	G 22	G	G	26	G	E B 16	12	E B 11	12	17	E B 12	E B 12	E B 12
29	E B 14	E B 14	E B 14	14	E B 12	E B 12	E B 12	G	23	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	22	E B 12	E B 12	E B 12	20	E B 12	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	29	29	29	29	29	29	29	29	29	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29
MED	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G 20	G 24	G	G 30	G	G	G	G	G 23	G	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14
U Q	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15	G	G	29	G	G	G	G	26	G	G	15	15	E B 14	E B 15	E B 15	E B 15	E B 15
L Q	E B 13	E B 12	E B 12	E B 12	E B 13	E B 13	E B 14	G 16	G 22	G 24	G 26	G 26	G 28	G 22	G 20	G 18	E B 15	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12

NOV. 2012 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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	16	16	16	16	15	15	15	15	15	15	15	14	11	12	12	12	12	12	12	12	15	15	15	15
2	13	13	13	14	14	12	12	12	12	12	12	12	16	15	15	15	15	15	12	12	12	12	12	13
3	16	15	15	15	15	15	15	12	12	13	12	14	14	14	14	13	13	12	12	12	12	12	12	12
4	13	13	13	16	16	16	16	15	15	15	15	14	14	14	14	14	14	15	15	13	13	13	13	13
5	14	16	13	12	14	14	14	13	12	12	12	16	15	15	15	16	14	14	13	13	13	13	13	13
6	15	15	15	15	13	13	16	13	13	13	15	15	14	14	14	14	16	15	14	16	15	15	15	15
7	14	14	14	14	14	16	16	16	12	12	12	13	12	13	13	14	14	12	11	11	12	11	11	12
8	16	16	15	15	14	14	14	14	14	11	11	14	22	15	13	13	13	14	14	16	16	16	16	15
9	12	12	12	12	12	15	15	15	14	13	14	14	12	12	12	14	14	13	14	14	14	14	14	14
10	16	15	15	15	15	15	16	14	14	14	15	15	15	16	16	16	12	12	13	12	12	14	14	14
11	14	14	14	14	15	15	15	16	15	14	14	14	14	14	12	12	12	12	12	12	12	12	15	14
12	16	15	15	15	15	15	15	10	10	11	11	14	14	14	14	14	14	14	14	14	14	14	14	14
13	16	16	13	12	14	15	15	15	16	16	15	14	18	16	16	16	14	15	14	14	14	14	14	14
14	14	14	14	14	14	14	14	13	11	11	11	11	11	15	14	14	14	14	14	13	14	14	14	14
15	12	12	12	15	15	15	15	12	14	12	11	11	10	10	10	9	12	12	11	10	11	11	11	11
16	12	12	12	12	13	12	12	13	12	15	15	15	14	18	15	15	15	12	12	12	12	12	12	12
17	15	15	14	14	14	14	14	13	12	12	12	11	11	14	14	16	15	12	14	14	14	14	13	13
18	13	13	13	13	13	13	13	13	13	13	12	12	12	13	12	12	12	11	16	14	15	15	15	15
19	12	12	12	12	13	14	14	13	11	11	11	11	11	10	10	10	12	16	15	15	15	15	15	15
20	14	14	14	14	14	14	14	14	14	14	14	16	15	15	15	15	15	15	14	14	14	14	14	14
21	15	14	14	14	14	14	14	14	14	12	12	12	11	11	11	9	13	13	15	15	15	15	14	14
22	14	14	14	14	14	14	14	14	14	14	21	21	15	15	16	15	15	15	13	14	14	14	14	14
23	14	14	14	14	14	15	15	15	15	14	15	15	15	15	15	10	15	14	14	15	15	15	15	15
24	14	14	14	14	14	14	14	14	14	11	14	14	14	14	12	12	13	16	13	13	13	13	15	15
25	15	12	12	12	12	14	14	14	15	14	14	14	14	14	14	14	12	14	14	14	15	14	14	14
26	12	12	12	12	13	13	13	13	13	13	19	19	22	22	28	15	15	15	13	13	13	13	13	13
27	14	14	14	14	12	13	12	12	12	12	16	15	15	15	15	15	14	14	12	12	12	12	12	12
28	12	12	11	11	12	12	12	14	14	14	13	13	16	16	16	16	16	12	11	12	12	12	12	12
29	14	14	14	12	12	12	12	12	12	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	13	12	12	12	12	12	12	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	29	29	29	29	29	29	29	29	29	28	28	28	28	28	28	28	29	29	29	29	29	29	29	29
MED	14	14	14	14	14	14	14	14	14	13	14	14	14	14	14	14	14	14	13	13	14	14	14	14
U Q	15	15	14	15	14	15	15	14	14	14	15	15	15	15	15	15	15	15	14	14	15	14	15	14
L Q	13	12	12	12	13	13	14	13	12	12	12	12	12	14	12	12	12	12	12	12	12	12	12	12

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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	280	280	305	306	312	343	326	353	U R 391	U R 363	U R 374	R	Y	R 359	339	R	353	322	294	312	291	276	291	286
2	293	297	276	277	277	294	334	316	321	R 343	338	335	U R 331	R	U R 356	353	359	342	318	327	309	297	F 293	291
3	296	306	312	310	317	365	353	341	U R 372	Y	R 368	U Y 332	R	358	R 337	R	345	362	339	343	323	309	294	331
4	299	296	301	301	308	312	330	364	U R 375	368	U R 392	373	U R 356	362	U R 356	369	362	390	333	320	315	318	312	308
5	312	316	321	312	305	305	334	367	364	354	R	R	R	331	354	335	360	321	328	327	314	319	315	308
6	292	302	312	288	299	305	331	365	369	R 360	Y	335	R 359	362	337	351	355	341	358	340	330	318	322	317
7	312	298	310	300	300	304	321	371	369	366	R	R	336	U R 346	358	344	363	344	343	330	305	305	295	305
8	292	294	288	309	308	313	340	357	R 373	R	R	R	U Y 372	R 342	R 350	U R 372	356	316	316	343	331	301	F 292	300
9	301	316	317	301	305	369	V 328	362	R	U R 368	357	R	R	R	R 368	348	356	335	333	323	364	335	314	300
10	284	296	F 296	283	307	340	351	373	R 359	R 363	R	R	355	R 338	R 327	364	352	349	339	336	337	320	323	317
11	306	299	304	304	293	326	340	371	R 385	R	R	R 362	R 369	R 382	R 363	353	366	356	329	342	327	320	302	306
12	290	304	288	294	315	331	329	359	R	R	353	345	R 350	R 374	376	R 344	383	326	316	315	324	300	295	302
13	284	284	304	302	290	314	314	339	R	R	R 338	R 331	R	R 350	U R 343	365	359	315	309	310	311	292	309	299
14	295	279	269	279	282	301	275	340	R 352	R	R	R	R	318	R	332	340	317	330	296	264	265	306	288
15	303	R	301	305	333	300	326	348	367	U Y 383	348	U Y 342	U Y 356	359	353	U R 358	333	316	327	305	295	310	290	288
16	297	300	281	293	293	293	330	363	R 355	340	U Y 373	U Y 334	U R 362	R	R	U R 350	367	338	337	325	328	321	309	305
17	300	281	284	286	306	322	315	364	R	R	R	R 364	R 324	R	364	361	360	373	331	336	332	300	289	289
18	278	299	296	300	327	317	300	347	R 363	354	345	350	U R 354	U R 359	347	360	345	312	306	322	316	333	283	283
19	273	273	280	297	297	342	334	359	356	R	R 366	R 338	320	R 343	369	342	353	338	324	303	318	306	280	289
20	289	281	305	295	309	359	311	352	358	356	U R 354	R	R 346	U Y 342	R	326	335	316	329	R 355	328	288	272	272
21	291	285	285	287	312	306	292	321	U R 336	R	R	R	Y	Y	R	Y	334	329	328	329	317	307	305	290
22	279	277	305	323	319	334	338	345	365	R 381	U Y 386	335	R	R 333	J R 334	R 355	344	326	319	330	336	313	292	285
23	282	295	R 309	295	291	318	334	359	374	358	359	J Y 351	Y	U Y 375	U R 344	355	342	352	342	328	323	300	300	281
24	288	288	309	302	310	351	310	348	R 376	358	351	328	J Y 326	U R 348	341	329	339	313	315	310	298	319	317	299
25	291	284	289	294	325	364	341	336	R 369	U R 346	Y	R 367	375	U R 345	342	344	343	347	347	347	359	335	302	279
26	286	283	295	274	334	357	305	338	348	361	U Y 351	U R 378	R 370	348	348	338	351	323	318	330	350	331	284	300
27	283	286	283	301	309	333	331	357	380	359	R	347	372	357	353	350	366	331	335	358	R 339	340	296	287
28	282	291	291	293	295	363	F 390	358	370	358	343	R 370	379	350	R 378	V 333	338	363	334	318	324	373	309	283
29	262	282	291	295	308	333	322	356	383	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	341	323	320	295	322	R 323	281	F 313
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	29	29	29	29	29	29	25	19	17	19	19	23	24	25	29	29	29	29	29	29	29	29
MED	291	292	296	297	308	326	330	357	369	359	354	345	R 356	R 350	352	350	353	331	329	327	323	313	296	299
U Q	298	299	307	303	314	347	336	364	R 374	366	U R 370	R 364	370	359	360	359	360	348	336	338	332	322	309	306
L Q	282	282	286	290	296	306	314	343	357	354	346	335	336	342	342	340	342	319	318	314	312	300	290	286

NOV. 2012 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L	L	L	L		L								
2										L	A	L	L	L	L									
3										U L 368	U L 376	L	L	L	L									
4										L	430	L		L 437										
5											L	L	L	L										
6												L	L	L			396							
7											U L 373	L	L	L										
8								507					L		L									
9											L	L	L											
10										L	L	L	L											
11												U L 401		L										
12										L	U L 389	L	L	L										
13											L	L			L									
14																								
15												L	L											
16										L	L	L	L	L										
17										L	U L 388	L			L									
18										L	L		U L 389											
19									U L 375				L											
20									433	431	424			L										
21												L		L	A 424									
22										L	L		L		L	470								
23												L	L		L									
24											L	L	L	L										
25										U L 431		U L 383		L										
26													L											
27											L	L	L	L	L	496								
28												L	L											
29										C	C	C	C	C	C	C	C							
30								C	C	C	C	C	C	C	C	C								
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	2	3	6	2	1	1	1	2	1							
MED								507	404	U L 431	U L 388	U L 392	U L 389	L 437	A 424	483	396							
U Q										U L 431	424													
L Q										U L 368	U L 376													

NOV. 2012 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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										232	220	224	224	224		232								
2										242	244	244	240	240	240									
3										222	222	222	228	228	230									
4										222	222	222		222										
5											222	236	234	234										
6												254	224	224			224							
7											246	242	242	242										
8								212					220		238									
9											230	230	218											
10										226	226	226	226											
11												226		226										
12										244	240	236	236	234										
13											238	250			242									
14																								
15												244	244											
16										236	236	236	230	230										
17										224	224	228			218									
18										218	218		226											
19									226				226											
20									218	216	222			228										
21												240		240	232									
22										220	220		230		230	228								
23												208	212		242									
24											260	242	232	232										
25										222		234		246										
26													240											
27											232	234	224	224	224	224								
28												224	224											
29										C	C	C	C	C	C	C	C							
30								C	C	C	C	C	C	C	C	C								
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	2	12	17	21	20	15	9	3	1							
MED								212	222	223	226	234	227	230	232	228	224							
U Q										234	239	242	235	240	241	232								
L Q										221	222	225	224	224	227	224								

NOV. 2012 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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	282	282	274	274	264	238	236	222	218	218	214	214	214	214	214	214	212	212	232	232	242	308	308	308
2	284	284	296	296	306	278	240	264	240	234	A	A 234	A	234	232	232	222	216	216	216	216	246	272	272
3	272	272	272	272	264	214	214	214	222	208	208	208	208	208	208	224	224	224	230	230	230	230	242	242
4	290	298	282	282	280	250	228	220	220	206	206	206	216	200	210	210	210	210	210	226	242	244	268	264
5	264	264	254	258	274	258	232	224	224	224	222	206	208	208	214	214	214	210	222	230	234	234	252	252
6	266	266	266	266	266	262	224	214	214	214	214	214	214	214	214	214	B 214	214	214	214	240	250	262	272
7	290	286	284	290	290	288	218	218	218	218	218	218	218	218	218	218	218	214	214	222	248	248	278	278
8	280	284	284	284	276	248	230	164	202	222	222	222	222	222	222	222	216	208	238	224	224	260	Q 292	292
9	282	280	248	266	256	206	206	206	206	206	204	204	204	216	218	218	216	216	260	254	228	228	232	232
10	304	304	290	274	274	216	216	216	216	216	216	208	208	208	208	208	204	204	212	212	212	248	248	248
11	270	278	278	278	268	242	236	208	208	208	204	204	204	204	214	220	212	212	212	212	240	240	272	272
12	276	276	276	276	266	256	236	220	212	214	212	212	212	212	212	212	212	212	212	224	228	228	280	280
13	264	270	270	270	270	228	228	226	226	216	214	214	214	214	216	216	216	216	240	240	246	260	260	262
14	284	292	292	262	262	238	308	246	236	236	228	228	228	228	222	222	222	222	222	222	302	312	236	242
15	256	294	294	252	206	278	254	222	220	216	216	212	212	220	216	208	208	206	206	234	234	248	270	282
16	282	276	276	276	280	266	238	206	206	206	206	206	206	206	216	216	208	216	216	228	236	236	260	280
17	292	292	292	292	292	252	248	208	208	212	212	H 198	208	214	214	214	214	190	214	214	244	268	304	304
18	304	304	298	282	282	252	252	210	H 210	210	210	228	212	212	216	216	214	216	226	230	232	240	262	282
19	304	304	304	292	286	230	230	220	220	H 216	216	H 214	214	216	216	216	216	216	222	244	244	244	272	278
20	300	300	294	290	258	194	260	204	196	196	208	212	212	216	216	216	216	222	248	244	244	296	316	316
21	300	300	296	296	244	246	246	238	230	228	228	228	228	228	A	226	226	226	226	234	234	244	252	282
22	276	302	280	250	258	232	232	220	218	218	218	210	210	210	210	210	210	210	222	222	222	256	272	272
23	298	298	288	288	280	222	226	216	216	216	220	216	188	222	H 196	200	212	204	204	238	254	254	274	298
24	306	306	298	280	258	218	242	240	220	218	218	218	218	218	218	208	216	216	216	216	258	258	272	276
25	276	308	308	304	246	226	224	224	222	214	214	214	214	H 210	212	212	222	222	222	222	222	224	294	306
26	310	310	296	292	250	210	228	228	226	226	224	224	224	224	224	222	214	212	222	236	236	236	292	292
27	300	300	300	300	254	214	226	226	226	226	226	226	228	228	224	178	192	192	220	220	224	228	274	330
28	330	326	306	306	272	220	220	216	216	216	H 210	210	210	216	218	218	218	218	218	238	242	242	268	308
29	308	308	308	308	274	252	250	228	214	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	212	A 228	228	256	256	A 256	310	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	29	29	29	29	29	29	29	29	29	28	27	28	27	28	27	28	29	29	29	29	29	29	29	29
MED	284	294	290	282	268	238	232	220	218	216	214	214	212	215	216	216	214	214	222	228	236	246	272	280
U Q	302	304	297	292	280	254	244	226	223	220	220	220	218	221	218	219	217	217	227	237	244	257	286	295
L Q	276	279	276	271	258	219	225	212	211	211	210	208	208	210	212	211	212	210	214	221	228	236	260	268

NOV. 2012 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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	124	120	120	118	118	118	118	118	116	E A 142							
2							B		136		A		A	A		124	B							
3								A	134	130	114	114	106	106		A	A							
4								106	106	A	106	100	100	100	112	A								
5								112	120	116	116	116	116	116	116	116	E B 174							
6								116	116	116	116	116	116	116	116	116	B							
7								122	114	114	A	114	114	114	114	114	B							
8							B	112	116	114	A	114	114	114	114	124	B							
9								134	118	108	108	A	110		110	110								
10								138	A	132	130	128	122	120	118	118	152							
11								148	140	134	122	122	120	116	116	110	E B 184							
12								142	138	138	128		114	112	112	112	120							
13								116	116	120	128	126	124	118	118	118	140							
14							B	140	138		118	118	118	116	116	116	E B 208							
15								152	142	A	118	118	118	112	112	112	E B 202							
16									132	124	120	118	116	116	116	124	B							
17								160	130	130	132	130	130	112	112	112	B 180							
18								152	118	108	106	106	106	106	106	130	E B 190							
19								A 146	116	128	120	120	108	108	108	112	B							
20								136	112	112	112	112	112	112	112	112	A							
21								134	130	120	120	120	120	120	120	A	B							
22								152	124	124	124	124	118	116	116	116	B							
23								116	116	116	116	116	112	112	112	112	172							
24								E B 162	124	122	118	118	A	130	128	128	A							
25								E A 154	136	114	114	114	114	114	114	114	E B 166							
26								142	128	128	126	122	122	114	B	120	B							
27								160	122	A	126	112	112	112	112	112	B							
28								A	128	128	128	126	126	126	126	126								
29								164	112	C	C	C	C	C	C	C	C							
30								C	C	C	C	C	C	C	C	C	168							
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								25	28	23	25	25	26	26	25	25	13							
MED								138	123	120	118	118	116	114	114	116	E B 172							
U Q								152	133	128	126	122	120	116	117	122	E B 187							
L Q								119	116	114	115	114	112	112	112	112	147							

NOV. 2012 h′E (KM)

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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	B	G	118	118	G	114	108	108	108	208	106	B	B	B	B	B	106	106
2	106	B	B	B	106	B	124	124	118	116	110	106	104	102	102	G	B	102	102	102	102	102	102	102
3	106	102	102	102	102	B	B	154	120	112	190	190	G	164	90	90	90	90	90	90	90	90	90	90
4	90	96	96	96	96	B	B	146	160	100	180	180	G	188	94	94	94	94	94	94	B	B	B	B
5	104	104	B	B	B	B	B	128	128	G	176	G	G	G	G	168	G	B	92	92	B	B	B	B
6	B	B	94	94	94	94	B	142	142	118	118	118	206	114	G	92	92	92	B	B	B	B	B	B
7	B	B	B	B	92	92	B	160	160	128	114	G	G	110	G	104	104	104	104	100	98	B	B	B
8	B	B	B	B	B	B	B	146	174	176	104	194	G	G	210	116	B	B	96	B	B	B	B	B
9	B	98	98	B	B	B	B	212	148	110	186	94	144	94	94	94	94	94	102	102	B	B	102	102
10	110	110	B	B	102	B	B	108	108	108	108	190	102	G	G	142	G	100	100	100	100	100	100	100
11	100	B	B	B	B	100	100	110	110	110	G	194	108	190	104	94	G	B	94	94	B	B	B	B
12	B	B	B	100	104	102	B	162	112	190	186	104	G	G	104	G	104	94	94	B	B	B	B	B
13	B	B	96	96	B	B	B	162	G	114	194	102	102	102	102	154	G	90	B	B	B	B	B	B
14	B	B	90	B	B	B	B	162	164	114	114	110	210	96	96	96	G	B	B	106	106	B	B	106
15	98	B	B	B	B	B	B	154	154	106	106	G	G	G	G	G	G	B	B	96	B	B	B	B
16	B	B	B	B	B	B	B	156	156	94	G	94	94	G	G	106	B	B	104	110	B	B	B	B
17	130	B	B	B	B	B	B	122	116	116	108	182	182	G	178	G	G	B	B	B	B	B	B	112
18	B	106	98	98	B	B	B	G	204	174	194	178	172	94	94	112	G	B	B	100	100	98	94	B
19	B	B	112	B	B	B	B	112	G	112	200	G	G	G	106	130	B	B	B	B	B	B	B	114
20	114	B	B	B	B	B	B	G	156	182	182	166	166	166	122	122	120	114	108	108	108	B	B	B
21	B	B	B	100	B	B	B	200	182	166	128	154	148	148	138	116	152	B	B	144	114	138	110	110
22	94	B	B	B	B	B	B	106	G	116	116	116	G	104	104	192	94	94	94	94	94	104	B	104
23	B	B	B	B	B	B	B	G	G	190	170	146	174	174	172	138	G	B	98	98	B	B	B	B
24	B	94	B	104	104	104	104	G	182	132	130	116	112	112	112	112	148	130	104	104	104	100	98	98
25	110	B	B	B	B	98	B	106	150	G	112	G	108	100	G	G	G	B	100	B	B	B	100	100
26	B	B	B	B	B	B	B	166	114	G	G	G	G	G	B	142	B	B	108	B	B	B	B	B
27	B	102	102	B	B	106	B	G	124	118	116	G	G	G	208	166	B	106	106	106	B	B	102	B
28	102	102	132	B	B	B	114	122	124	124	108	108	G	G	168	G	B	102	B	102	102	102	B	B
29	B	B	102	102	102	102	B	114	164	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
30	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	92	104	104	104	B	104	104	104
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	12	9	11	9	9	8	4	23	25	25	24	21	16	17	20	22	12	15	19	20	11	9	11	13
MED	105	102	98	100	102	101	109	146	148	116	123	118	128	110	105	116	99	100	100	101	102	102	102	104
U Q	110	105	102	102	104	103	119	162	162	149	184	181	173	165	153	142	113	104	104	105	106	104	104	108
L Q	99	97	96	96	95	96	102	114	118	111	111	107	106	101	99	96	93	94	94	95	98	99	98	100

IONOSPHERIC DATA STATION Wakkanai

NOV. 2012 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									C 1	C 1		L 1	L 1	L 2	L 2	HL 11	L 1						F 1	F 1
2	F 1				F 2		C 1	C 2	L 1	C 2	L 2	LC 11	LC 21	L 2	L 2			F 1	F 1	F 1	FQ 11	FQ 21	FQ 31	F 2
3	FQ 21	F 3	FQ 21	FQ 21	F 1			HL 11	L 2	L 2	H 1	H 1		HL 11	L 2	L 2	L 3	F 3	F 1	F 1	F 1	F 1	F 1	F 1
4	F 1	F 1	FQ 11	F 1	F 2			H 1	H 1	L 2	H 1	H 1		HL 12	L 1	L 2	L 2	F 3	F 2	F 1				
5	F 1	F 1						C 2	CL 11		H 1					H 1			F 2	F 2				
6			F 1	F 1	F 1	F 1		CL 11	CL 11	L 2	L 2	L 2	HL 11	L 1		LF 22	L 1	F 1						
7					F 1	F 1		H 1	H 1	C 1	C 1			L 1		L 1	L 1	F 1	F 1	F 1	F 1			
8								H 1	H 1	H 1	L 2	HL 11			HL 11	L 1			F 2					
9		F 1	F 1					H 1	H 1	C 3	HL 11	L 2	HL 11	L 2	L 2	L 2	L 1	F 1	F 1	F 2			F 2	F 1
10	F 1	F 1			F 1			L 2	L 2	L 2	L 2	HL 12	L 2			H 1		F 1	F 1	F 1	F 1	F 1	F 1	F 1
11	F 1					F 1	F 1	L 1	L 1	L 1		HL 11	L 1	H 1	L 1	L 1			F 1	F 1				
12				FF 11	FF 11	F 1		H 1	L 2	HL 12	HL 12	LQ 11			L 1		L 1	F 1	F 1					
13			F 1	F 1				H 1		L 1	HL 12	L 1	L 1	L 1	L 1	HL 11		F 1						
14			F 1					HL 11	HL 11	L 1	L 1	L 1	HL 11	L 1	L 1	L 1				F 1	F 1			F 1
15	F 1							CL 11	HL 11	LC 31	L 1									F 1				
16								CL 11	HL 11	L 1		L 1	L 1			L 1			F 1	F 1				
17	F 1							L 1	L 2	L 1	LH 21	HL 12	HL 11		HL 11									F 1
18		F 1	F 2	FF 11					H 1	H 1	HL 12	HL 12	HL 12	L 1	L 1	L 1				F 1	F 1	F 1	F 1	
19			F 1					L 1		L 1	H 1				L 1	CL 11								F 1
20	F 1								HL 11	H 1	HL 11	HL 11	HL 11	HL 11	C 1	C 2	C 3	F 3	F 3	F 2	F 1			
21				F 1				H 1	H 2	H 2	C 1	HL 11	H 1	H 1	HL 11	L 2	H 1			F 1	F 1	F 1	F 1	F 1
22	F 1							L 1		CL 11	C 1	L 1		L 1	L 1	HL 11	L 1	F 1	F 1	F 1	F 1	F 1		F 1
23										HL 11	HL 11	H 1	H 1	H 1	H 1	C 2			F 1	F 1				
24		F 1		F 1	F 1	F 1	F 1		H 1	H 1	C 1	L 1	L 1	L 1	L 1	L 1	C 3	F 1	F 1	F 2	F 3	F 2	F 2	F 1
25	FF 11					F 1		L 1	HL 11		L 1		L 1	L 1					F 1				F 1	F 1
26								H 1	L 1							HL 11			FQ 11					
27		F 1	F 1			F 1			C 2	C 1	L 1				H 1	H 1		F 1	F 1	F 1			F 1	
28	F 1	F 1	F 1				F 1	C 1	L 1	CL 11	L 1	L 1			H 1			F 1		F 1	F 3	F 1		
29			F 1	F 4	F 1	F 1		L 1	H 1															
30																	L 1	F 2	F 2	F 1		F 3	F 2	F 1
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																								

NOV. 2012 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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 41	X 40	X 42	X 41	X 40	X 41												X 77	X 56	X 57	X 53	X 50	X 50	X 55
2	X 48	O X 57	X 53	X 51	X 51	X 52												X 70	X 56	X 56	X 50	X 44	X 46	X 47
3	X 48	X 48	X 49	X 44	X 44	X 35												X 61	X 43	X 49	X 47	X 40	X 40	X 40
4	X 39	X 40	X 40	X 40	X 39	X 36												X 70	X 42	X 46	X 44	X 42	X 42	X 40
5	X 40	X 42	X 40	X 38	X 35	X 35												X 52	X 40	X 42	X 47	X 48	X 46	X 41
6	X 43	X 42	X 41	X 41	X 40	X 39												X 69	X 47	X 40	X 42	X 42	X 42	X 42
7	X 42	X 43	X 43	X 41	X 38	X 42					C	C	C	C	C	C		X 61	X 50	X 43	X 42	X 41	X 43	X 43
8	X 42	X 43	X 43	X 42	X 44	X 42												X 66	X 47	X 50	X 53	X 47	X 41	X 41
9	X 42	X 43	X 44	X 43	X 49	X 41												X 62	X 48	X 53	X 52	X 47	X 41	X 38
10	X 44	X 42	X 44	X 45	X 48	X 40						C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C								X 65	X 43	X 46	X 48	X 42	X 40	X 40
13	X 41	X 42	X 44	X 42	X 42	X 40	X 43											X 70	X 55	X 61	X 59	X 53	X 52	X 52
14	X 52	X 53	X 54	X 52	X 54	X 51												X 87	X 79	X 70	X 59	X 59	X 67	X 54
15	X 55	X 57	X 56	X 59	X 52	X 40												X 72	X 68	X 63	X 50	X 50	X 45	X 43
16	X 43	X 41	X 40	X 42	X 41	X 39												X 62	X 56	X 56	X 53	X 46	X 39	X 39
17	X 42	X 41	X 42	X 42	X 43	X 44												X 72	X 53	X 54	X 42	X 43	X 40	X 42
18	X 43	X 43	X 44	X 48	X 40	X 40												X 69	X 57	X 53	X 41	X 44	X 44	X 41
19	X 40	X 41	X 43	X 43	X 42	X 45												X 64	X 58	X 52	X 47	X 48	X 39	O X 38
20	X 41	X 41	X 42	X 44	X 40	X 37												X 70	X 54	X 61	X 58	X 53	X 45	X 46
21	X 46	X 45	X 45	X 46	X 43	X 35												X 66	X 48	X 59	X 61	X 37	X 37	X 38
22	X 43	X 45	X 46	X 48	X 41	X 35												X 67	O X 56	X 53	X 52	X 45	X 36	X 35
23	X 38	X 38	X 36	X 40	X 37	X 37												X 62	X 49	X 50	X 44	X 37	X 37	X 38
24	X 38	X 40	X 42	X 44	X 43	X 34												X 67	X 62	X 63	O X 54	X 42	X 42	X 41
25	X 43	X 41	X 41	X 44	X 47	X 34												X 58	X 47	X 46	X 34	X 36	X 36	X 36
26	X 37	X 37	X 37	X 42	X 41	X 36												X 64	X 50	X 46	X 42	X 32	X 33	X 35
27	X 37	X 39	X 39	X 41	X 41	X 38												X 60	X 43	X 42	X 41	X 31	X 30	X 32
28	X 32	X 33	X 36	X 38	X 46	X 27												X 50	X 50	X 47	X 32	X 35	X 34	X 32
29	X 35	X 35	X 37	X 37	X 38	X 40												X 48	X 54	X 50	X 34	X 36	X 31	X 36
30	X 36	X 40	X 39	X 37	X 39	X 37												X 52	X 47	X 42	X 35	X 43	X 36	X 33
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	28	28	28	28	28	1											28	28	28	28	28	28	28
MED	X 42	X 42	X 42	X 42	X 42	X 39	X 43											X 66	X 50	X 51	X 47	X 43	X 40	X 40
U Q	X 43	X 43	X 44	X 44	X 45	X 41												X 70	X 56	X 56	X 53	X 48	X 44	X 42
L Q	X 38	X 40	X 40	X 41	X 40	X 36												X 61	X 47	X 46	X 42	X 38	X 36	X 37

NOV. 2012 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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	35	34	36	35	34	35	48	79	88	101	99	94	89	104	110	90	78	71	50	51	47	44	44	49
2	42	51	47	45	45	46	54	76	110	124	120	107	108	101	94	93	83	63	50	50	44	38	40	41
3	42	42	43	38	38	29	41	66	80	84	89	96	V 91	103	101	84	78	55	37	43	40	34	33	33
4	32	34	34	34	33	30	40	77	75	84	87	93	77	78	81	73	74	63	36	40	38	36	35	34
5	34	35	34	32	28	29	42	66	79	87	90	88	80	76	79	69	82	46	34	36	40	42	40	35
6	37	36	35	35	34	33	41	67	75	89	88	98	83	87	82	74	81	63	41	34	36	36	36	36
7	36	37	37	35	32	36	43	66	79	87	C	C	C	C	C	C	78	55	44	37	36	35	37	37
8	36	36	37	36	38	36	47	70	76	82	105	105	81	85	104	96	82	60	41	44	46	41	35	35
9	36	37	38	37	43	34	38	65	70	76	92	92	85	95	102	77	73	56	42	47	46	41	34	32
10	38	36	37	39	42	34	40	73	76	83	93	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	86	96	83	86	97	79	70	59	36	40	41	36	34	34
13	35	36	38	36	36	34	37	74	76	99	105	91	95	99	88	84	69	64	49	55	53	46	46	46
14	46	47	48	46	48	45	46	72	111	126	136	137	128	126	121	111	101	81	73	64	52	53	61	48
15	49	51	50	53	46	34	46	99	98	93	106	108	104	107	104	91	78	66	62	57	44	44	39	37
16	36	35	34	36	35	33	40	76	88	96	108	112	109	97	100	96	89	56	50	50	46	40	33	33
17	36	35	36	36	37	38	43	82	87	86	91	98	107	110	105	92	84	66	47	47	36	36	34	36
18	37	37	38	42	34	34	42	74	88	87	100	93	95	91	92	88	75	62	51	47	35	38	38	35
19	34	35	37	37	36	38	45	79	89	86	103	100	87	94	89	83	76	57	52	46	40	42	32	32
20	35	34	36	38	33	31	35	64	85	79	101	88	88	84	90	89	84	64	48	55	52	46	39	40
21	40	39	39	39	37	29	37	73	87	114	105	102	112	109	94	80	70	60	41	53	55	31	31	32
22	37	39	40	42	35	29	36	76	95	93	106	105	97	102	90	79	73	61	50	47	46	39	30	29
23	32	32	30	34	31	30	35	66	83	93	85	110	97	94	87	85	92	56	43	44	38	30	30	31
24	32	34	36	37	37	28	34	60	76	78	84	104	94	92	88	78	69	61	56	57	48	36	36	35
25	37	35	35	38	41	28	32	66	73	91	94	102	86	89	V 83	79	75	52	40	40	28	30	30	30
26	31	31	31	36	34	30	32	67	80	88	90	84	88	86	83	74	66	58	44	39	36	26	27	29
27	30	33	33	34	35	32	32	62	75	74	77	98	107	83	77	78	67	54	36	36	35	25	23	26
28	26	27	30	32	40	21	24	53	79	71	80	78	80	86	77	80	56	44	44	40	26	29	28	26
29	29	29	31	31	32	34	31	62	82	77	78	79	74	81	78	79	57	42	48	44	27	30	25	30
30	30	34	33	31	33	31	35	63	75	71	77	82	81	72	73	70	61	46	41	36	29	37	29	27
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	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	28	28	28	28	28	28	28	28
MED	36	35	36	36	36	33	40	68	80	87	92	98	89	92	90	80	76	60	44	45	40	36	34	34
U Q	37	37	38	38	39	34	43	76	88	93	105	105	104	102	101	90	82	63	50	50	46	42	38	36
L Q	32	34	34	34	34	30	35	66	76	80	86	91	83	85	82	78	70	55	41	40	36	32	30	30

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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		A	L	L	L	L								
2											A													
3										L	L	U L 4 6 8	L	U L 4 5 6	L	L								
4												L		L										
5										L	L	L	L	L	L									
6											L	A	A	L										
7											C	C	C	C	C	C								
8										L	L	L	L		L	L								
9												L	L											
10											L	C	C	C	C	C	C							
11							C	C	C	C	C	C	C	C	C	C	C							
12							C	C	C	C	L	L	A	L	L									
13										L	L	L	L	L	A									
14												L	L	L										
15											L			L	L									
16											L	L												
17										L		L	L	L	A									
18															L									
19												L		L										
20											L													
21												L	L	A	A									
22											L	L	A	A	L									
23												A	L	L	L									
24												L												
25											A	L	L		L	L								
26												L	L											
27													A											
28													L	L										
29											A	A		A										
30												L	U L 4 4 0	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	1	1										
MED												U L 4 6 8	U L 4 4 0	U L 4 5 6										
U Q																								
L Q																								

NOV. 2012 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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							B	208	A	A	A	A	R	A	R	R	A							
2							B	U R 224	A	A	A	A	A	R	A	A	R							
3							B	212	R	R	R	R	R	R	R	R	B							
4							B	A	A	R	R	R	R	A	A	A	R							
5							B	A	A	A	A	A	R	R	R	R	A							
6							B	A	A	A	A	A	A	A	A	U R 256	176							
7							B	212	R	A	C	C	C	C	C	C	A							
8							B	204	R	R	R	A	R	R	R	R	A							
9							B	200	R	A	A	R	R	A	R	R	R							
10							B	B	A	A	A	C	C	C	C	C	C							
11							C	C	C	C	C	C	C	C	C	C	C							
12							C	C	C	C	R	R	A	A	A	R	R							
13								U R 228	R	R	R	R	A	R	A	R	A							
14							B	R	R	R	A	R	R	R	R	R	R							
15							B	A	R	A	R	R	A	R	R	R	B							
16							B	204	R	R	A	A	A	A	R	R	R							
17							B	200	R	R	R	R	R	A	A	A	R							
18							B	R	R	R	R	R	R	R	R	R	A							
19							B	184	R	A	R	R	R	R	U A 320	A	A							
20							B	204	R	R	A	R	R	A	A	A	R							
21							B	192	A	R	A	A	R	A	A	A	R							
22							B	180	A	A	R	A	A	A	R	R	U R 216							
23							B	188	304	A	A	R	A	R	R	R	A							
24							B	U R 200	R	R	A	R	A	R	A	R	A							
25							B	U R 208	R	R	A	R	R	R	R	R	184							
26							B	R 184	R	R	A	R	R	R	R	R	U R 188							
27							B	U R 200	A	A	A	A	A	A	A	R	A							
28							B	196	A	A	R	A	R	R	A	A	A							
29							B	U R 204	A	A	A	A	A	A	R	A	A							
30							B	172	R	R	A	A	A	A	R	R	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								21	1						1	1	4							
MED								200	304						U A 320	U R 256	186							
U Q								208									U R 202							
L Q								190									180							

NOV. 2012 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 22	J A 29	19	J A 28	J A 20	21	E B 15	25	34	36	40	41	G	39	G	G 23	J A 26	E B 15	E B 15	E B 15	J A 22	E B 16	E B 15	J A 50
2	J A 69	J A 54	J A 29	20	E B 14	E B 14	E B 14	G	36	41	39	36	J A 42	G	34	J A 39	G	J A 31	J A 21	J A 29	J A 26	J A 21	J A 33	J A 33
3	J A 19	J A 18	E B 15	E B 15	E B 15	E B 15	E B 15	26	G	G 27	G	G	G	G	G	G	24	E B 14	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14
4	E B 15	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15	32	34	G	G	G	G	36	37	32	G	E B 14	22	20	E B 15	E B 15	E B 15	E B 15
5	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14	E B 14	29	34	36	J A 33	37	G	G	G	G	34	J A 24	J A 19	E B 15	E B 14	E B 14	E B 14	E B 15
6	E B 16	E B 15	E B 15	E B 15	E B 15	E B 14	E B 17	26	35	40	38	40	40	39	34	G	23	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14
7	E B 16	E B 15	E B 14	E B 14	E B 14	E B 13	E B 15	G	G 22	34	C	C	C	C	C	C	24	E B 13	J A 41	20	E B 15	20	J A 22	22
8	E B 15	E B 14	E B 15	20	E B 14	E B 16	E B 16	27	G	G 27	G	J A 42	G	G	G	G	24	E B 15	E B 14	E B 14	E B 14	E B 14	E B 13	E B 14
9	E B 15	E B 15	E B 16	22	J A 18	E B 14	E B 14	25	G	35	39	G	G	40	G	G 24	G	E B 14	J A 20	J A 22	E B 15	E B 15	21	E B 14
10	E B 14	E B 15	E B 15	J A 22	21	E B 14	20	24	35	37	40	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	G	G	37	40	36	G	G	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
13	E B 15	E B 15	E B 14	E B 14	E B 14	E B 13	21	G	G	G	G	G	40	G	40	G	26	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14
14	E B 14	E B 15	E B 14	E B 14	E B 15	E B 15	E B 14	G	G	G	40	G	G	G	G	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14
15	E B 14	E B 14	E B 14	23	E B 15	E B 15	E B 15	30	G	37	G	G	J A 50	G	G	G	E B 17	19	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
16	E B 14	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14	25	G	G	39	38	39	39	G	G	G	E B 14	E B 14	E B 14	E B 16	E B 15	E B 14	E B 14
17	E B 15	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	24	G	G	G	G	G	42	36	34	G	E B 14	E B 14	E B 14	J A 18	E B 15	E B 15	E B 14
18	E B 16	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	G	G	G	G	G	G	G	G	G	25	J A 31	J A 29	J A 30	E B 15	E B 14	E B 15	E B 15
19	E B 15	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	24	G 24	38	G	G	G	G	38	38	28	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14	E B 13
20	E B 14	J A 30	E B 14	E B 15	E B 15	E B 14	E B 15	24	G	G	42	G	G	34	J A 43	J A 42	G	E B 15	E B 20	E B 14	E B 14	E B 14	E B 15	E B 14
21	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14	E B 15	26	34	G	38	40	G	39	37	35	G	E B 14	J A 26	J A 21	J A 25	E B 14	E B 14	E B 15
22	E B 15	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15	23	36	40	G	39	J A 42	39	G	G	G 19	J A 27	J A 36	J A 19	20	E B 15	E B 15	E B 15
23	E B 15	E B 14	E B 15	E B 15	E B 14	E B 14	E B 14	23	41	38	37	38	40	G	G	G	22	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14
24	E B 15	E B 14	E B 15	E B 14	E B 15	E B 14	E B 15	G	G 22	G	40	G	J A 77	G	39	G	24	J A 35	J A 43	E B 14	E B 14	E B 14	E B 16	E B 15
25	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	G	G	G	39	G	G 27	G	G	G	G	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14	E B 14
26	E B 15	E B 15	E B 14	E B 16	E B 15	E B 15	E B 14	G	G	G	39	G	G	G	G	G	G	J A 24	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14
27	E B 16	J A 18	20	J A 18	E B 15	E B 14	E B 14	G	33	J A 75	J A 48	45	J A 44	36	38	G	24	J A 23	21	23	J A 18	E B 15	E B 14	E B 15
28	J A 23	E B 14	E B 15	E B 15	E B 14	E B 14	E B 14	23	36	38	G	40	G	G	33	J A 44	J A 38	J A 24	J A 26	J A 22	E B 14	E B 16	E B 15	E B 15
29	E B 14	E B 14	E B 15	E B 15	E B 14	E B 14	E B 15	G	29	36	35	J A 46	36	41	G	36	25	J A 27	E B 16	E B 15	E B 14	E B J 24	A E B 15	20
30	J A 22	J A 28	J A 24	22	J A 25	22	E B 15	22	G	G 26	J A 36	41	38	J A 40	G 26	G	25	E B 14	J A 23	E B 14	19	E B 15	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	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	28	28	28	28	28	28	28	28
MED	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	24	G	G	36	G	G	G	G	G	22	E B 15	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15
U Q	J A 16	J A 15	15	19	15	E B 15	E B 15	26	34	38	39	40	J A 40	39	37	34	25	J A 24	J A 22	J A 20	J A 17	A E B 15	E B 15	15
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	G	G	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14

NOV. 2012 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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	16	E B 14	20	E B 14	E B 14	E B 15	24	30	34	35	38	G	36	G	G 21	20	E B 15	E B 15	E B 15	17	E B 16	E B 15	19
2	25	38	20	16	E B 14	E B 14	E B 14	G	34	35	36	34	38	G	34	34	G	22	E B 15	15	18	E B 15	25	20
3	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	25	G	G 27	G	G	G	G	G	G	21	E B 14	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14
4	E B 15	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15	29	29	G	G	G	G	34	34	31	G	E B 14	17	E B 15	E B 15	E B 15	E B 15	E B 15
5	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14	E B 14	26	30	33	33	35	G	G	G	G	30	20	16	E B 15	E B 14	E B 14	E B 14	E B 15
6	E B 16	E B 15	E B 15	E B 15	E B 15	E B 14	E B 17	24	32	39	32	37	37	36	30	G	22	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14
7	E B 16	E B 15	E B 14	E B 14	E B 14	E B 13	E B 15	G	G 21	33	C	C	C	C	C	C	23	E B 13	32	E B 16	E B 15	E B 15	E B 15	E B 15
8	E B 15	E B 14	E B 15	E B 15	E B 14	E B 16	E B 16	25	G	G 26	G	32	G	G	G	G	22	E B 15	E B 14	E B 14	E B 14	E B 14	E B 13	E B 14
9	E B 15	E B 15	E B 16	E B 14	E B 14	E B 14	E B 14	24	G	34	37	G	G	37	G	G 22	G	E B 14	17	E B 16	E B 15	E B 15	E B 15	E B 14
10	E B 14	E B 15	E B 15	E B 15	16	E B 14	E B 14	23	30	35	36	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	G	G	34	35	33	G	G	E B 14	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
13	E B 15	E B 15	E B 14	E B 14	E B 14	E B 13	E B 14	G	G	G	G	G	35	G	34	G	22	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14
14	E B 14	E B 15	E B 14	E B 14	E B 15	E B 15	E B 14	G	G	G	36	G	G	G	G	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14
15	E B 14	E B 14	E B 14	19	E B 15	E B 15	E B 15	26	G	32	G	G	45	G	G	G	E B 17	17	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
16	E B 14	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14	24	G	G	36	35	34	35	G	G	G	E B 14	E B 14	E B 14	E B 16	E B 15	E B 14	E B 14
17	E B 15	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	23	G	G	G	G	G	36	34	32	G	E B 14	E B 14	E B 14	E B 14	E B 15	E B 15	E B 14
18	E B 16	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	G	G	G	G	G	G	G	G	G	22	20	18	19	E B 15	E B 14	E B 15	E B 15
19	E B 15	E B 14	E B 14	E B 15	E B 14	E B 14	E B 14	22	G 23	35	G	G	G	G	36	36	25	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14	E B 13
20	E B 14	18	E B 14	E B 15	E B 15	E B 15	E B 14	23	G	G	37	G	G	31	39	36	G	E B 15	14	E B 14	E B 14	E B 15	E B 15	E B 14
21	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14	E B 15	23	32	G	32	37	G	37	34	33	G	E B 14	20	16	16	E B 14	E B 14	E B 15
22	E B 15	E B 15	E B 14	E B 14	E B 14	E B 15	E B 15	22	30	36	G	35	38	36	G	G	G 18	19	28	16	E B 15	E B 15	E B 15	E B 15
23	E B 15	E B 14	E B 15	E B 15	E B 14	E B 14	E B 14	22	34	37	35	36	37	G	G	G	20	E B 14	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14
24	E B 15	E B 14	E B 15	E B 14	E B 15	E B 14	E B 15	G	G 20	G	38	G	43	G	34	G	21	19	30	E B 14	E B 14	E B 14	E B 16	E B 15
25	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	G	G	G	36	G	G 26	G	G	G	G	E B 14	E B 13	E B 14	E B 14	E B 14	E B 14	E B 14
26	E B 15	E B 15	E B 14	E B 16	E B 15	E B 15	E B 14	G	G	G	34	G	G	G	G	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14
27	E B 16	E B 15	E B 14	E B 15	E B 15	E B 14	E B 14	G	29	26	34	42	40	30	36	G	22	19	16	E B 16	17	E B 15	E B 14	E B 15
28	E B 15	E B 14	E B 15	E B 15	E B 14	E B 14	E B 14	22	31	34	G	35	G	G	31	40	30	19	17	19	E B 14	E B 16	E B 15	E B 15
29	E B 14	E B 14	E B 15	E B 15	E B 14	E B 14	E B 15	G	25	33	33	38	33	38	G	32	23	25	E B 16	E B 15	E B 14	20	E B 15	E B 14
30	E B 15	19	16	E B 15	E B 15	E B 15	E B 15	20	G	G 24	34	36	37	28	G 25	G	23	E B 14	17	E B 14	E B 15	E B 15	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	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	28	28	28	28	28	28	28	28
MED	E B 15	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	22	G	G	33	G	G	G	G	G	20	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14
U Q	E B 15	15	E B 15	E B 15	E B 15	E B 15	E B 15	24	30	34	36	36	37	36	34	32	22	19	17	16	15	E B 15	E B 15	E B 15
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	G	G	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14

NOV. 2012 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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	303	320	324	314	294	304	344	360	350	345	355	349	306	322	350	349	356	345	309	316	305	269	277	304
2	297	305	287	283	282	296	337	332	332	350	333	322	326	336	337	354	349	357	313	329	328	311	297	286
3	304	313	324	318	378	291	331	345	365	363	341	346	V 320	346	347	352	362	367	309	340	332	315	313	323
4	311	316	321	309	321	310	352	370	364	357	355	374	327	352	355	343	356	362	300	312	331	315	326	304
5	318	334	336	329	309	299	346	368	364	358	368	360	343	332	352	371	369	371	309	331	321	334	326	317
6	294	304	300	304	301	303	356	377	352	351	349	347	349	342	350	340	374	351	352	316	325	313	327	306
7	294	299	301	319	293	326	345	352	355	347	C	C	C	C	C	C	353	354	303	326	306	312	318	311
8	325	298	295	299	330	296	341	373	363	338	354	367	342	308	341	348	365	372	321	313	344	349	327	312
9	291	304	315	311	348	328	346	371	356	345	345	345	332	322	331	358	357	354	323	336	343	329	318	303
10	278	317	292	314	330	371	336	378	365	348	357	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	355	344	341	332	342	366	332	365	330	328	328	332	298	291
13	297	308	340	314	322	314	327	364	347	331	352	359	321	335	331	364	341	337	299	314	315	305	304	291
14	286	294	285	297	289	302	297	309	322	326	317	307	308	312	310	309	323	305	308	308	276	291	316	292
15	273	297	302	308	340	301	324	365	376	355	351	342	324	335	334	338	357	329	325	348	318	321	305	292
16	300	294	315	299	297	308	326	365	368	355	341	354	335	332	337	347	352	325	310	335	337	341	305	300
17	279	304	284	296	303	311	337	377	365	336	346	341	324	332	339	337	354	335	329	345	315	317	304	282
18	299	296	292	312	340	317	312	352	358	359	343	333	333	349	355	341	348	355	323	333	301	331	321	294
19	286	286	293	288	314	317	331	364	366	342	343	367	328	340	357	351	347	331	320	333	322	334	301	343
20	292	290	297	327	328	295	334	353	357	335	346	329	330	310	329	332	337	341	303	337	314	309	285	275
21	288	280	298	302	336	288	308	350	324	335	312	334	324	341	346	330	331	323	312	320	345	342	297	287
22	283	291	315	351	374	283	324	353	347	356	353	336	332	339	336	339	343	330	322	326	332	337	286	294
23	290	312	311	297	294	299	327	372	367	355	359	374	343	343	332	329	367	330	315	325	337	321	319	301
24	300	280	329	354	338	291	325	351	368	360	337	349	331	319	340	350	341	351	318	331	342	289	331	295
25	288	295	281	323	354	326	315	363	345	335	340	349	330	344	V 331	363	367	355	356	353	325	310	296	291
26	279	286	301	315	339	365	310	362	344	349	346	347	345	346	349	342	349	362	336	320	334	302	293	291
27	282	286	289	304	315	313	318	380	340	370	329	349	335	358	351	366	353	358	358	340	356	311	289	299
28	296	290	284	334	381	344	305	374	365	369	352	349	347	365	343	346	379	328	342	373	291	311	321	303
29	291	301	290	308	318	322	327	359	382	378	360	366	360	349	349	376	347	342	367	360	335	340	287	289
30	295	303	314	311	299	310	340	375	380	363	374	357	341	369	361	370	370	345	344	389	317	346	334	304
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	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	28	28	28	28	28	28	28	28
MED	293	298	300	311	322	309	329	364	360	350	348	349	332	339	342	348	353	348	320	331	326	316	305	297
U Q	300	306	315	318	340	320	340	372	366	358	355	359	342	346	350	363	364	358	333	340	336	334	321	304
L Q	286	290	291	300	300	298	321	352	347	340	341	341	324	332	334	339	345	330	309	320	315	310	296	291

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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		A	L	L	L	L								
2											A													
3										L	L	U L 393	L	U L 337	L	L								
4												L		L										
5										L	L	L	L	L	L									
6											L	A	A	L										
7											C	C	C	C	C	C								
8										L	L	L	L		L	L								
9												L	L											
10											L	C	C	C	C	C	C							
11							C	C	C	C	C	C	C	C	C	C	C							
12							C	C	C	C	L	L	A	L	L									
13										L	L	L	L	L	A									
14												L	L	L										
15											L			L	L									
16											L	L												
17										L		L	L	L	A									
18															L									
19												L		L										
20											L													
21												L	L	A	A									
22											L	L	A	A	L									
23												A	L	L	L									
24												L												
25											A	L	L		L	L								
26												L	L											
27													A											
28													L	L										
29											A	A		A										
30												L	U L 404	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	1	1										
MED												U L 393	U L 404	U L 337										
U Q																								
L Q																								

NOV. 2012 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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										254		234	272	272	246	236								
2											236													
3										230	232	244	232	246	246	226								
4												234		264										
5										238	228	242	242	230	232									
6											242	252	232	262										
7											C	C	C	C	C	C								
8										240	240	234	256		264	236								
9												228	254											
10											246	C	C	C	C	C	C							
11							C	C	C	C	C	C	C	C	C	C	C							
12							C	C	C	C	222	252	228	262	258									
13										250	238	244	272	246	234									
14												274	260	280										
15											244			252	250									
16											246	236												
17										228		242	270	246	246									
18															242									
19												240		250										
20											254													
21												250	270	236	232									
22											234	234	232	242	238									
23												218	244	244	250									
24												258												
25											240	242	240		252	234								
26												238	252											
27													262											
28													254	234										
29											230	232		262										
30												248	248	238	236									
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	14	21	18	17	14	4								
MED										239	239	242	253	246	246	235								
U Q										250	244	249	262	262	250	236								
L Q										230	232	234	240	240	236	230								

NOV. 2012 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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 278	E A 278	E B 262	E A 282	E B 262	E B 264	228	226	218	214	220	A	204	216	200	204	210	206	202	E B 234	E A 246	E B 326	E B 308	E A 290
2	E A 280	E A 300	E A 300	E A 272	E B 292	E B 290	222	214	230	228	A	210	230	224	226	232	216	202	218	220	228	E B 250	E A 312	E A 304
3	E B 268	E B 250	E B 242	218	204	E B 286	232	214	216	198	200	176	196	206	190	192	208	198	E B 208	E B 238	214	226	E B 246	E B 256
4	E B 274	E B 272	E B 252	E B 272	E B 244	E B 264	220	210	206	208	224	196	196	210	222	216	220	200	212	E B 254	E B 244	E B 236	E B 248	E B 256
5	E B 260	E B 254	220	228	E B 262	E B 292	220	208	208	200	194	188	200	194	200	206	220	186	E A 236	E B 248	236	E B 234	228	E B 250
6	E B 268	E B 260	E B 260	E B 270	E B 250	E B 278	212	208	216	222	202	A	A	210	234	222	212	196	E B 198	E B 224	E B 252	E B 262	E B 250	E B 272
7	E B 274	E B 268	E B 266	E B 246	E B 306	E B 252	212	208	226	218	C	C	C	C	C	C	216	198	E A 238	228	E B 254	E B 272	E B 262	E B 262
8	E B 248	E B 298	E B 266	E B 280	E B 246	E B 262	216	206	214	202	206	202	206	212	206	200	208	196	208	E B 240	220	212	E B 222	E B 256
9	E B 294	E B 264	E B 258	E B 252	230	202	210	202	204	204	214	188	202	224	224	210	212	192	216	222	216	212	214	E B 270
10	E B 282	E B 276	E B 268	E B 268	236	196	222	204	204	210	202	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	186	190	A	202	218	214	212	196	198	228	232	236	E B 236	E B 284
13	E B 284	E B 274	E B 242	E B 232	E B 242	E B 268	E B 250	220	214	204	204	196	206	214	A	208	206	212	210	238	224	E B 230	E B 250	E B 254
14	E B 288	E B 286	E B 286	E B 260	E B 248	E B 252	E B 270	232	222	214	218	208	206	208	218	222	220	200	220	220	E B 274	E B 264	E B 240	220
15	E B 304	E B 264	E B 258	240	202	E B 238	E B 246	220	208	208	204	208	220	206	214	216	202	204	228	210	214	E B 236	234	E B 250
16	E B 276	E B 272	E B 266	E B 266	E B 266	E B 254	222	208	206	212	208	204	224	224	222	220	212	184	E B 230	216	214	222	E B 248	E B 274
17	E B 296	E B 286	E B 288	E B 288	E B 286	E B 260	220	210	212	198	218	214	186	206	A	222	218	204	202	214	212	E B 246	E B 260	E B 290
18	E B 294	E B 280	E B 284	E B 252	212	E B 278	232	206	212	214	216	212	220	222	210	214	210	208	222	228	E B 228	E B 238	E B 242	E B 262
19	E B 292	E B 288	E B 292	E B 284	E B 248	E B 246	224	214	212	210	230	204	222	204	222	218	214	198	216	214	224	224	E B 230	E B 290
20	E B 298	E A 312	E B 284	E B 244	210	E B 252	220	214	214	212	218	224	214	212	230	E A 236	218	198	216	214	E B 232	210	E B 276	E B 312
21	E B 284	E B 294	E B 288	E B 262	224	E B 294	E B 274	218	224	220	224	204	202	A	A	210	208	198	E A 264	E A 250	218	202	E B 282	E B 320
22	E B 298	E B 282	E B 254	220	208	E B 286	E B 258	220	216	218	200	194	A	A	196	210	214	208	E A 240	224	218	214	E B 286	E B 296
23	E B 300	E B 266	E B 278	E B 260	E B 272	E B 272	236	206	212	218	218	A	208	200	200	218	212	182	200	220	218	E B 242	E B 262	E B 292
24	E B 300	E B 306	E B 276	226	216	E B 270	E B 256	212	206	226	224	210	214	212	228	216	210	208	E A 252	218	206	E B 248	E B 250	E B 280
25	E B 292	E B 296	E B 296	E B 264	214	E B 234	E B 264	218	212	218	A	204	204	226	208	204	214	200	200	214	202	E B 246	E B 288	E B 300
26	E B 308	E B 308	E B 298	E B 256	218	216	E B 240	224	208	224	212	194	202	232	220	212	206	200	E B 220	216	E B 216	E B 240	E B 298	E B 292
27	E B 316	E B 304	E B 294	E B 272	E B 252	236	220	214	212	218	210	E A 240	A	222	228	214	212	202	204	228	220	E B 252	E B 288	E B 320
28	E B 328	E B 324	E B 312	E B 260	214	194	228	206	224	216	226	210	208	200	218	216	200	210	218	206	E B 246	E B 306	E B 240	E B 306
29	E B 304	E B 304	E B 314	E B 292	E B 260	E B 236	230	226	210	216	A	A	230	A	218	220	204	208	214	208	200	E A 254	E B 328	E B 298
30	E B 292	E A 280	E A 268	E B 280	E B 284	E B 280	E B 240	212	208	206	220	190	190	196	204	218	214	200	226	E B 204	E B 276	E B 234	212	E B 272
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	28	28	28	28	28	28	28	28	28	25	23	23	24	24	27	28	28	28	28	28	28	28	28
MED	E B 292	E B 281	E B 272	E B 261	E B 245	E B 261	224	213	212	214	214	204	206	211	218	215	212	200	211	218	218	E B 237	E B 250	E B 282
U Q	E B 299	E B 299	E B 290	E B 272	E B 262	E B 278	E B 243	219	216	218	220	210	220	222	223	220	215	205	E A 227	E B 231	E B 240	E B 251	E B 284	E B 297
L Q	E B 277	E B 270	E B 259	245	215	237	220	208	208	207	203	194	202	205	205	210	208	197	206	214	215	225	238	E B 259

NOV. 2012 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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							B	116	114	114	116	A	124	A	116	110	A							
2							B	118	118	116	A	A	A	116	A	A	118							
3							B	118	116	116	114	122	124	126	126	124	B							
4							B	124	114	114	114	114	116	118	114	A	114							
5							B	122	116	A	A	A	112	120	122	122	A							
6							B	122	112	108	A	A	A	A	A	112	114							
7							B	122	116	A	C	C	C	C	C	C	A							
8							B	114	114	114	114	A	118	118	122	128	124							
9							B	122	112	A	A	110	110	A	110	114	118							
10							B	B	A	A	A	C	C	C	C	C	C							
11							C	C	C	C	C	C	C	C	C	C	C							
12							C	C	C	C	116	118	118	A	A	116	114							
13								122	124	124	118	118	A	116	A	116	A							
14							B	114	114	114	A	118	122	122	124	124	122							
15							B	120	118	A	110	116	A	118	126	124	B							
16							B	118	118	118	A	A	A	A	112	120	122							
17							B	112	120	120	120	120	116	116	116	116	122							
18							B	126	128	120	120	122	128	118	120	112	A							
19							B	116	118	A	116	112	116	114	116	112	112							
20							B	114	118	120	122	120	116	A	122	114	112							
21							B	116	116	116	A	A	116	120	120	116	118							
22							B	116	116	118	120	A	A	A	120	120	112							
23							B	116	118	A	A	112	A	120	120	126	A							
24							B	126	118	118	A	118	A	118	118	118	A							
25							B	120	122	118	A	118	118	116	116	118	118							
26							B	118	116	116	A	118	118	118	118	116	116							
27							B	120	116	A	A	A	A	A	A	112	A							
28							B	116	114	118	118	A	118	118	A	A	A							
29							B	120	A	A	A	A	A	A	120	A	A							
30							B	120	120	116	A	A	A	A	116	116	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								27	26	19	13	15	16	17	21	23	15							
MED								118	116	116	116	118	118	118	120	116	118							
U Q								122	118	118	120	120	120	120	122	122	122							
L Q								116	114	114	114	114	116	116	116	114	114							

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 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	98	98	94	94	94	94	B	140	130	110	112	104	G	104	G	104	104	B	B	B	102	B	B	102
2	96	94	94	94	B	B	B	G	116	118	102	108	106	G	106	106	G	106	108	108	104	98	98	96
3	100	100	B	B	B	B	B	146	G	104	G	G	G	G	G	G	112	B	B	B	B	B	B	B
4	B	B	B	B	B	B	B	124	124	G	G	G	G	122	120	106	G	B	90	88	B	B	B	B
5	B	B	B	B	B	B	B	132	128	106	102	106	G	G	G	G	104	92	92	B	B	B	B	B
6	B	B	B	B	B	B	B	126	124	112	108	106	102	106	106	G	148	B	B	B	B	B	B	B
7	B	B	B	B	B	B	B	G	106	104	C	C	C	C	C	C	92	B	98	98	B	90	98	98
8	B	B	B	88	B	B	B	142	G	106	G	98	G	G	G	G	124	B	B	B	B	B	B	B
9	B	B	B	96	88	B	B	148	G	102	100	G	G	106	G	94	G	B	100	106	B	B	92	B
10	B	B	B	98	98	B	98	114	106	102	100	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
12	C	C	C	C	C	C	C	C	C	C	G	G	112	92	104	G	G	B	B	B	B	B	B	B
13	B	B	B	B	B	B	100	G	G	G	G	G	106	G	88	G	104	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	G	G	G	102	G	G	G	G	G	G	B	B	B	B	B	B	B
15	B	B	B	96	B	B	B	126	G	108	G	G	98	G	G	G	B	100	B	B	B	B	B	B
16	B	B	B	B	B	B	B	146	G	G	106	104	104	104	G	G	G	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	156	G	G	G	G	G	116	118	120	G	B	B	B	112	B	B	B
18	B	B	B	B	B	B	B	G	G	G	G	G	G	G	G	G	102	100	98	96	B	B	B	B
19	B	B	B	B	B	B	B	156	108	106	G	G	G	G	130	120	116	B	B	B	B	B	B	B
20	B	92	B	B	B	B	B	162	G	G	120	G	G	98	120	118	G	B	98	B	B	B	B	B
21	B	B	B	B	B	B	B	136	114	G	106	104	G	112	126	120	G	B	100	98	100	B	B	B
22	B	B	B	B	B	B	B	158	122	114	G	106	108	104	G	G	98	98	96	96	92	B	B	B
23	B	B	B	B	B	B	B	146	148	104	104	102	104	G	G	G	114	B	B	B	B	B	B	B
24	B	B	B	B	B	B	B	G	104	G	108	G	108	G	116	G	106	104	100	B	B	B	B	B
25	B	B	B	B	B	B	B	G	G	G	106	G	104	G	G	G	G	B	B	B	B	B	B	B
26	B	B	B	B	B	B	B	G	G	G	104	G	G	G	G	G	G	104	B	B	B	B	B	B
27	B	106	102	98	B	B	B	G	122	108	102	104	100	98	106	G	102	98	96	96	92	B	B	B
28	130	B	B	B	B	B	B	162	122	126	G	106	G	G	104	102	100	96	110	112	B	B	B	B
29	B	B	B	B	B	B	B	G	106	104	104	106	106	106	G	106	104	102	B	B	B	96	B	92
30	104	98	98	98	100	102	B	156	G	104	106	108	108	108	100	G	106	B	98	B	94	B	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	5	6	4	8	4	2	2	18	15	17	17	13	13	13	13	10	16	10	13	9	7	3	3	4
MED	100	98	96	96	96	98	99	146	122	106	104	106	106	106	106	106	104	100	98	98	100	96	98	97
U Q	117	100	100	98	99			156	124	111	107	106	108	110	120	120	113	104	100	107	104	98	98	100
L Q	97	94	94	94	91			132	106	104	102	104	103	101	104	104	102	98	96	96	92	90	92	94

NOV. 2012 h'Es (KM)

IONOSPHERIC DATA STATION Kokubunji

NOV. 2012 TYPES OF Es

135°E MEAN TIME (G.M.T. + 9 H)

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

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

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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 42	X 42	X 40	X 40	X 38	X 35	X 39												X 75	X 59	X 68	X 57	X 63	X 61
2	X 61	X 61	X 58	X 56	X 55	X 61	X 68												X 68	X 61	X 60	X 56	X 52	X 49
3	X 51	X 52	X 47	X 48	X 63	X 34	X 36												X 64	X 55	X 62	X 58	X 48	X 42
4	X 41	X 38	X 37	X 39	X 40	X 34	X 37												X 76	X 54	X 64	X 57	X 46	X 42
5	X 44	X 44	X 41	X 36	X 36	X 33	X 34												X 58	X 46	X 52	X 51	X 48	X 41
6	X 40	X 40	X 39	X 39	X 39	X 36	X 39												X 64	X 40	X 49	X 49	X 47	X 43
7	X 43	X 42	X 43	X 41	X 39	X 40	X 38												X 60	X 49	X 48	X 49	X 46	X 43
8	X 44	X 42	X 44	X 43	X 45	X 40	X 45												X 66	X 51	X 56	X 58	X 46	X 39
9	X 40	X 40	X 40	X 41	X 46	X 40	X 32												X 70	X 50	X 56	X 56	X 43	X 35
10	X 36	X 38	X 40	X 40	X 43	X 42	X 32												X 71	X 57	X 58	X 58	X 40	X 38
11	X 38	X 40	X 38	X 40	X 44	X 38	X 37												X 67	X 66	X 64	X 48	X 43	X 40
12	X 39	X 39	X 40	X 41	X 42	X 34	X 37												X 71	X 51	X 58	X 59	X 54	X 46
13	X 42	X 41	X 43	X 39	X 40	X 40	X 40			C	C	C	C	C	C	C			X 73	X 62	X 63	X 59	X 52	X 49
14	X 50	X 51	X 51	X 49	X 48	X 42	X 49												X 97	X 89	X 72	X 69	X 59	X 51
15	X 51	X 56	X 57	X 48	X 41	X 33	X 35												X 75	X 70	X 63	X 58	X 52	X 45
16	X 48	X 46	X 43	X 42	X 42	X 37	X 36												X 70	X 65	X 68	X 58	X 45	X 43
17	X 42	X 42	X 42	X 44	X 46	X 42	X 46												X 71	X 56	X 65	X 59	X 47	X 42
18	X 43	X 42	X 43	X 42	X 47	X 39	X 42												X 76	X 66	X 63	X 58	X 57	X 50
19	X 44	X 41	X 40	X 42	X 44	X 39	X 42												X 71	X 68	X 68	X 60	X 57	X 41
20	X 41	X 42	X 43	X 45	X 50	X 36	X 36												X 88	X 72	X 78	X 75	X 52	X 48
21	X 45	X 42	X 45	X 45	X 41	X 37	X 38												X 70	X 60	X 68	X 58	X 38	X 36
22	X 39	X 40	X 43	X 48	X 41	X 30	X 34												X 93	X 78	X 73	X 72	X 61	X 58
23	X 56	X 52	X 43	X 40	X 37	X 37	X 37												X 78	X 65	X 62	X 55	X 44	X 37
24	X 36	X 38	X 40	X 43	X 36	X 31	X 33												X 76	X 68	X 66	X 58	X 37	X 38
25	X 38	X 40	X 39	X 41	X 44	X 33	X 33												X 57	X 52	X 50	X 49	X 44	X 40
26	X 39	X 39	X 40	X 42	X 43	X 33	X 32												X 60	X 52	X 51	X 48	X 37	X 38
27	X 38	X 38	X 40	X 42	X 44	X 36	X 36												X 70	X 54	X 53	X 49	X 38	X 37
28	X 37	X 38	X 41	X 44	X 50	X 30	X 26												X 56	X 49	X 37	X 39	X 37	X 36
29	X 36	X 36	X 37	X 38	X 40	X 37	X 36												X 60	X 66	X 54	X 40	X 32	X 32
30	X 35	X 37	X 39	X 37	X 38	X 38	X 38												X 61	X 69	X 46	X 39	X 34	X 33
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
MED	X 42	X 41	X 41	X 42	X 42	X 37	X 37												X 70	X 60	X 62	X 58	X 46	X 42
U Q	X 44	X 42	X 43	X 44	X 46	X 40	X 39												X 75	X 66	X 66	X 58	X 52	X 46
L Q	X 38	X 39	X 40	X 40	X 40	X 34	X 34												X 64	X 52	X 53	X 49	X 40	X 38

NOV. 2012 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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	36	36	34	34	32	29	33	R 72	82	86	U R 110	96	78	U R 110	J R 118	U R 100	85	84	69	53	62	51	57	55
2	55	55	52	50	49	55	62	72	R 99	R 98	92	U R 107	R 118	J R 113	R	J R 112	89	82	62	55	54	50	46	43
3	45	46	41	42	57	28	30	58	77	80	88	100	R 101	97	J R 104	98	R 90	80	58	49	56	52	42	36
4	35	32	31	33	34	28	31	60	72	78	R 88	R 86	80	75	96	R 85	81	76	70	48	58	51	40	36
5	38	38	35	30	30	27	28	59	81	84	88	90	76	R 81	84	81	73	71	52	40	46	45	42	35
6	34	34	33	33	33	30	33	60	79	90	U R 96	U R 102	90	90	82	84	80	67	58	34	43	43	41	37
7	37	36	37	35	33	34	32	56	80	86	R 93	R 98	87	85	94	91	81	67	54	43	42	43	40	37
8	38	36	38	37	39	34	39	60	76	83	98	R 100	U R 83	U R 84	97	U R 110	90	80	60	45	50	52	40	33
9	34	34	34	35	40	34	26	54	63	72	86	U R 92	87	U R 92	R 102	92	87	78	64	44	50	50	37	29
10	30	32	34	34	37	36	26	55	72	75	86	92	R 80	R 92	R 95	U R 110	96	76	65	51	52	52	34	32
11	32	34	32	34	38	32	31	62	74	77	84	87	93	U R 80	R	J R 108	U R 110	R 88	61	60	58	42	37	34
12	33	33	34	35	36	28	31	60	68	75	82	88	97	U R 87	98	94	83	88	65	45	52	53	48	40
13	36	35	37	33	34	34	34	60	76	C	C	C	C	C	C	C	U R 67	78	R 67	56	57	53	46	43
14	44	45	45	43	42	38	43	59	R 94	R 96	J R 113	U R 110	U R 118	U R 119	U R 119	J R 108	U R 106	97	91	83	66	63	53	45
15	45	50	51	42	35	27	29	69	R 102	91	94	R	R	U R 96	U R 104	U R 101	U R 100	88	69	64	57	52	46	39
16	42	40	37	36	36	31	30	61	80	97	R 105	R 116	U R 116	R 118	U R 110	R 110	100	95	64	59	62	52	39	37
17	36	36	36	38	40	36	40	58	80	R 90	R 89	R 94	U R 98	U R 116	R	U R 102	U R 105	88	65	50	59	53	41	36
18	37	36	37	38	41	33	36	59	83	R 82	88	86	U R 93	U R 95	R 97	U R 83	94	R 87	70	60	57	52	51	44
19	38	35	34	36	38	33	36	60	75	84	U R 89	R 96	U R 87	R 78	101	97	88	86	65	62	62	54	51	35
20	35	36	37	39	44	30	30	52	78	80	82	R	96	94	U R 92	U R 96	102	U R 94	82	66	72	69	46	42
21	39	36	39	39	35	31	32	60	78	J R 96	U R 110	95	U R 93	U R 110	U R 110	92	82	80	64	54	62	52	32	30
22	33	V 34	37	42	35	24	28	57	U R 90	104	116	U R 90	R	R	R 116	R	R	R 115	87	72	67	66	55	52
23	50	46	37	34	31	31	31	57	75	92	91	102	R	R 96	R 86	94	R 110	95	72	59	56	49	38	31
24	30	32	34	37	30	25	27	49	79	83	R 83	100	R	U R 92	R	92	76	72	70	62	60	52	31	32
25	32	34	33	35	38	27	27	52	R 78	86	96	R 104	95	U R 110	96	80	92	91	51	46	44	43	38	34
26	33	33	34	36	37	27	26	50	73	R 83	92	96	R 93	86	U R 86	R 80	86	68	54	46	45	42	31	32
27	32	32	34	36	38	30	30	52	63	77	77	98	U R 88	R 96	96	101	90	78	64	48	47	43	32	31
28	31	32	35	38	44	24	20	44	66	89	78	84	91	R 86	84	94	78	66	50	43	31	33	31	30
29	30	30	31	32	34	31	30	50	68	80	U R 78	78	78	82	86	77	77	65	54	60	48	34	26	26
30	29	31	33	31	32	32	32	51	72	78	82	R 84	74	87	V 74	78	71	56	55	63	40	33	28	27
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	29	29	27	25	28	25	28	29	30	30	30	30	30	30	30
MED	36	35	35	36	36	31	31	58	78	84	89	96	91	R 92	R 96	94	88	80	64	54	56	52	40	36
U Q	38	36	37	38	40	34	33	60	80	90	R 96	R 100	R 96	U R 104	U R 104	R 102	R 98	88	69	60	60	52	46	40
L Q	32	33	34	34	34	28	28	52	72	79	84	88	82	86	86	84	80	72	58	46	47	43	34	32

NOV. 2012 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	U L 476	L	U L 508	L	L	L							
2								A	A	L	L	L	L	L	L	L								
3								208	L	L	L	U L 472	L	L	L	L		216						
4										L	L	L	L	L	L	L	L							
5									L	L	L	L 480	U L 480	L	L	L								
6									L	L	L	U L 476	L	U L 468	L	L	L							
7									284	L	A	A	L	L	L	L								
8									L	L	U L 476	U L 472		L	L	L	L							
9									L	L	L	L	L	U L 480	L	L								
10									324	L	L	L	L	L	L	L	L							
11								208	U L 336	L	L	L	L	L	L	L	L							
12										L	L	L	U L 500	L	L	L	L							
13										C	C	C	C	C	C	C	296							
14										L	L	U L 428	L	L	L	L								
15											L	L	L	L	L	L		204						
16										L	L	L	L	U L 520	U L 472	L								
17									L 332	L	L	L	L	L	L	L								
18								204	296	L 360	L	U L 456	L	L	L	L								
19								204	L	L	L	L	L	L	L	L	L								
20										L		L	L	A	L	L								
21									L	L	L	L	L	L	L	L								
22									272	L	L	L	L	L	L	L	U L 296							
23									264	L	L	U L 480	L	L	L	L	L							
24									U L 296	L	468	L	L	U L 484	L									
25									L	L 336	L	L	L	L	L	L	L							
26									U L 308	L	U L 428	L	L	L	L	L	L							
27										L	L	U L 480	L	L	L	L	L							
28									L 280	L	L	L	U L 476	U L 464	A	L	280							
29									L	L	L	U L 420	U L 456	L	L	L	A							
30									L	L	L	L	L	U L 460	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								4	10	2	3	10	4	7	1		3	2						
MED								206	296	L 348	U L 468	U L 474	U L 478	U L 480	U L 472		296	210						
U Q								208	L 324		U L 476	U L 480	U L 490	U L 508			U L 296							
L Q								204	280		U L 428	U L 456	U L 466	U L 464			280							

NOV. 2012 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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								UA 176	260	288	UA 316	UA 328	R 344	344	328	304	A	A						
2								UA 200	A 252	A 300	A 328	A 332	UA 336	UA 324	UA 332	A	A	A						
3								172	256	UA 280	UA 272	332	R 344	R 340	324	A 296	UA 252	208						
4								196	264	296	320	UR 324	R 332	R 332	UA 308	304	A	188						
5								A 180	256	300	320	336	336	UA 312	328	300	248	204						
6								184	264	300	324	332	R 340	R 332	R 320	296	244	216						
7								200	256	A 288	UA 300	A	R 336	R 332	R 320	300	252	A						
8								176	UA 228	UA 260	A	320	R	UR 320	312	300	260	A						
9								192	260	300	308	A	A	A	340	UA 284	UA 240	A						
10								192	244	308	R 348	340	352	352	A	304	R 264	A						
11								180	268	A 308	328	A 336	A 360	UR 376	R 352	UA 308	260	B						
12								168	268	296	A	UR 332	R 360	R 360	R 360	308	256	200						
13								200	252		C	C	C	C	C	C	UA 264	B						
14								192	264	R 312	A 320	R 328	328	UA 296	336	R 312	256	200						
15								200	UA 264	A 312	340	R 356	R 344	R 356	UR 352	304	R 272	184						
16								180	R 264	308	R 340	R 352	R 356	R 344	A 308	312	272	A						
17								R 180	UA 232	304	320	360	A	392	360	324	264	A						
18								B	252	UA 292	364	380	384	372	336	300	284	200						
19								188	236	320	UA 328	R 364	384	372	340	304	244	B						
20								188	256	UA 292	A	UR 372	364	364	340	396	A	A						
21								B	252	296	R 332	340	324	UA 292	UA 296	300	UR 292	188						
22								188	A 260	320	UA 324	UA 332	A 340	A	R 336	300	R 268	A						
23								176	228	300	UA 324	340	R 348	R 332	324	R 300	256	184						
24								172	248	296	340	352	328	R 348	336	UR 320	UA 256	184						
25								A	244	A 300	UA 324	R 336	R 340	A	A	A	244	B						
26								180	244	304	332	340	352	348	R 340	R 296	248	180						
27								176	228	288	320	344	A 328	A	A	292	236	176						
28								180	232	292	A 308	UA 344	A 336	344	332	288	240	B						
29								UR 164	232	288	320	UA 324	332	332	316	A 288	UA 216	UA 184						
30								164	220	280	308	UA 308	UA 324	UA 332	UA 308	A	252	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								27	30	29	26	27	26	25	26	26	26	14						
MED								180	252	300	324	336	340	344	332	300	256	188						
U Q								192	260	306	332	R 352	352	358	R 340	308	R 264	200						
L Q								176	236	290	AU 320	332	332	UA 332	A 320	296	244	184						

NOV. 2012 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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	J A 17	E B 16	18	J A 24	20	E B 16	E B 16	22	27	30	34	39	37	G	G	G 27	J A 29	J A 28	J A 28	E B 16	E B 16	E B 16	E B 16	J A 18
2	J A 20	J A 18	21	J A 19	J A 18	21	20	J A 36	J A 62	J A 42	J A 45	38	J A 63	J A 62	J A 41	J A 34	J A 31	J A 27	J A 38	J A 46	J A 29	J A 25	J A 26	J A 19
3	E B 16	J A 20	J A 28	J A 26	20	E B 16	E B 16	19	29	31	J A 35	40	37	G	34	32	J A 34	G 19	J A 22	J A 21	E B 16	22	J A 18	E B 16
4	J A 22	19	18	E B 16	E B 16	E B 16	E B 16	27	30	34	33	G 22	G 34	G	33	G	29	21	E B 16	E B 16	18	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	30	32	35	36	G	33	G	G	27	G	E B 16	20	E B 16	E B 16	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	G	G	34	G 32	G 31	G 28	G 31	32	28	J A 29	J A 24	J A 18	J A 22	J A 20	19	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	22	28	34	68	J A 52	G 34	G 30	G 26	32	30	J A 43	J A 19	J A 19	22	19	18	E B 16
8	E B 16	E B 16	21	E B 16	E B 16	E B 16	E B 16	19	J A 30	J A 30	37	G 25	G	G 28	G 28	G 21	G 19	J A 26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	20	E B 16	E B 16	G	G 22	31	32	30	32	J A 40	G 29	30	28	19	22	E B 16	J A 26	J A 20	E B 16	E B 16
10	E B 16	E B 16	E B 16	E B 16	J A 20	J A 16	22	G	26	33	39	37	G 32	G 28	33	G 26	G 24	J A 36	J A 50	J A 42	J A 24	E B 16	20	E B 16
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 22	29	34	36	37	40	G	G	J A 35	G	21	20	E B 16	E B 16	E B 16	E B 16	E B 16
12	E B 16	E B 16	22	E B 16	E B 16	E B 16	E B 16	J A 26	G	32	38	37	G 32	38	G	34	G 18	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	C	C	C	C	C	C	C	28	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
14	E B 16	E B 16	E B 17	E B 16	E B 16	E B 16	E B 16	G	J A 28	G 24	35	39	38	J A 46	G 32	G 28	29	G 19	J A 28	E B 16	E B 16	E B 16	E B 16	E B 16
15	J A 21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	30	35	38	40	35	G 33	39	G	G	J A 24	J A 22	E B 16	E B 16	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 22	32	G 26	G	G	G	32	34	28	J A 22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	34	G	40	32	41	39	36	28	J A 24	J A 24	21	J A 23	E B 16	E B 16	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17	28	31	38	40	41	39	34	31	35	26	J A 25	J A 22	24	20	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	34	G 28	42	40	40	36	33	29	21	20	18	J A 22	19	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 20	28	30	J A 44	41	41	49	J A 45	J A 48	J A 32	J A 26	J A 26	J A 26	J A 18	18	18	E B 16
21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	27	31	G	45	40	34	36	32	G	23	J A 19	E B 16	E B 16	19	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	18	21	G	28	G	34	36	J A 43	J A 42	36	G	G	J A 32	J A 32	J A 18	19	J A 18	17	E B 16
23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	24	33	36	36	36	G	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
24	E B 16	19	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 21	33	G	38	40	38	36	G 18	28	J A 21	J A 28	18	E B 16	E B 16	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 20	G	32	J A 36	37	G	38	J A 34	33	G	22	J A 17	20	E B 16	E B 16	E B 16	E B 16
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	27	32	36	38	38	G 24	J A 43	35	26	20	J A 34	20	19	E B 16	E B 16	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	18	20	G	25	33	34	37	36	J A 44	J A 44	32	24	J A 27	J A 24	J A 32	18	19	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	J A 33	34	J A 42	J A 43	G 30	44	33	26	19	E B 16	22	J A 30	E B 16	20	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	32	36	38	34	35	36	33	J A 33	26	J A 39	J A E B 28	E B 16	22	19	E B 16
30	19	J A 24	J A 25	J A 21	21	E B 16	18	22	26	G 24	G 26	39	36	J A 42	J A 41	J A 42	G 25	J A 42	J A 34	E B 16	20	18	20	19
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	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	32	35	38	36	34	34	32	28	22	J A 22	18	17	E B 16	E B 16	E B 16
U Q	16	16	17	16	16	16	16	22	28	34	38	40	40	J A 40	J A 39	34	J A 29	J A 27	J A 28	J A 21	J A 22	19	18	E B 16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	30	G 32	36	G	G	G	G	G	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

NOV. 2012 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	U Y 27	U Y 30	U Y 34	36	36	G	G	G 27	26	23	28	E B 16	E B 16	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	34	56	39	43	36	40	59	39	34	26	20	32	38	20	20	22	17
3	E B 16	E B 16	21	20	E B 16	E B 16	E B 16	18	29	31	35	36	37	G	34	31	32	G 19	20	E B 16	E B 16	E B 16	E B 16	E B 16
4	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	30	34	U Y 33	G 22	G 34	G	33	G	27	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	32	35	36	G	U Y 33	G	G	27	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	G	G	34	G 32	G 31	G 28	G 31	32	27	23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	27	34	64	51	G 34	G 30	G 26	32	29	28	16	E B 16	E B 16	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	28	30	32	G 25	G	G 28	G 28	G 21	G 19	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 22	31	U Y 32	U Y 30	U Y 32	37	G 29	30	28	U Y 19	E B 16	E B 16	20	E B 16	E B 16	E B 16
10	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	U Y 26	33	G 35	36	G 32	G 28	U Y 33	G 26	G 24	31	34	20	18	E B 16	E B 16	E B 16
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	28	32	36	36	40	G	G 32		G	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	G	32	38	U Y 37	G 32	38	G 32		G 18	G 20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	C	C	C	C	C	C	C	27	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
14	E B 16	E B 16	E B 17	E B 16	E B 16	E B 16	E B 16	G	27	G 24	34	38	U Y 38	38	U Y 32	G 28	29	G 19	18	E B 16	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	28	34	37	37	U Y 35	G 33	36	G	G	G 18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 22	32	G 26	G	G	G	U Y 32	33	28	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	G 30	G	40	U Y 32	41	39	35	28	22	20	E B 16	20	E B 16	E B 16	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17	28	31	38	40	41	U Y 39	U Y 34	U Y 31	35	22	20	20	19	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	34	G 28	42	40	40	36	32	28	20	E B 16	18	20	E B 16	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	28	U Y 30	42	41	41	U Y 49	44	G 39	30	21	23	16	E B 16	E B 16	E B 16	E B 16
21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	27	31	G	44	39	U Y 34	36	31	G	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 26	G	34	36	39	37	36	G	G	26	23	18	E B 16	E B 16	E B 16	E B 16
23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	24	33	34	36	36	G	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 21	31	G	U Y 38	40	38	36	G 18	27	19	20	E B 16	E B 16	E B 16	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 30	36	37	G	36	33	30	G	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	27	31	36	36	38	G 24	G 33	35	26	G 18	24	E B 16	E B 16	E B 16	E B 16	E B 16
27	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	31	U Y 34	36	36	40	39	30	24	19	20	E B 16	E B 16	E B 16	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	30	34	37	38	G 30	44	33	26	E B 16	E B 16	16	E B 16	E B 16	E B 16	E B 16
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	30	34	38	U Y 34	35	36	32	33	26	28	22	E B 16	E B 16	E B 16	E B 16
30	E B 16	E B 16	17	E B 16	E B 16	E B 16	E B 16	17	23	G 24	G 26	38	36	36	38	31	U Y 25	28	B E 16	E B 16	E B 16	E B 16	E B 16	E B 16
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	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	31	35	36	36	34	33	32	26	20	B E 16	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	28	32	36	38	39	38	36	G 35	28	22	20	16	16	E B 16	E B 16	E B 16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	G 30	34	36	G	G	G	G 30	G	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

NOV. 2012 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

NOV. 2012 fmin (0.1MHz)

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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	301	315	315	317	322	291	309	R 369	371	349	U R 339	363	300	R 214	J R	U R 356	348	341	346	286	319	263	293	293
2	297	314	297	294	287	288	330	358	R 345	R 361	335	R 322	R 343	J R	R	J R	352	352	336	310	335	317	305	312
3	303	329	324	313	378	283	319	370	367	349	372	364	R 354	342	J R	352	R 357	369	344	324	335	324	318	311
4	314	315	301	313	357	288	310	360	368	360	R 352	R 369	372	348	352	R 327	354	363	361	315	325	327	314	310
5	308	315	349	324	343	287	301	349	371	363	357	366	362	R 337	346	370	357	358	350	317	313	330	345	331
6	314	309	314	307	324	296	319	358	365	351	U R 358	U R 354	351	350	334	346	361	368	360	357	302	304	315	316
7	305	308	322	313	312	296	308	347	364	353	R 344	R 376	344	327	342	354	358	355	353	314	298	316	321	313
8	310	295	308	311	335	307	319	372	362	355	355	R 363	U R 317	U R 322	339	U R 348	363	367	348	294	312	341	339	312
9	310	301	303	295	326	323	302	363	374	355	342	U R 366	333	U R 355	R 348	341	360	354	368	314	328	341	342	295
10	290	294	308	309	311	383	326	374	372	376	342	335	R 361	R 340	R 338	U R 337	352	363	336	343	333	340	330	302
11	292	296	299	317	323	331	318	376	361	362	350	360	331	U R 358	R	J R	U R 341	R 369	352	325	344	320	324	303
12	305	295	303	328	345	313	329	376	343	354	370	332	374	U R 319	341	348	348	349	345	331	292	322	321	303
13	298	300	329	321	301	296	298	347	356	C	C	C	C	C	C	C	U R 373	334	338	303	323	327	313	319
14	280	280	296	302	322	281	284	308	R 338	R 361	R	R	U R 327	U R 335	R	J R	U R 313	334	313	331	302	298	325	308
15	265	293	356	323	345	284	299	342	R 381	366	334	R	R	U R 355	U R 333	U R 352	U R 359	350	354	341	325	310	332	297
16	297	305	308	305	328	319	310	348	347	357	R 347	R 367	U R 330	R 352	U R 319	R 346	337	357	340	325	323	337	317	296
17	281	290	291	300	320	291	329	369	386	R 345	R 356	R 368	U R 340	U R 330	R	U R 367	U R 343	346	357	312	317	333	311	294
18	290	291	291	297	340	311	303	336	350	R 362	344	362	U R 360	U R 345	R 353	U R 352	335	R 338	348	334	310	319	324	303
19	308	289	287	294	327	313	349	348	373	362	U R 348	R 354	U R 374	R 356	333	336	350	358	334	305	321	313	329	316
20	278	289	288	305	346	294	312	340	372	361	331	R	342	354	U R 308	U R 335	343	U R 353	339	314	311	325	282	264
21	276	287	297	305	332	271	299	339	336	J R	U R 341	346	U R 345	U R 357	R	339	334	345	332	300	332	337	301	284
22	282	V 285	320	356	394	270	285	341	U R 355	344	345	U R 347	R	R	R 322	R	R	R 331	345	346	338	326	318	287
23	293	315	319	313	304	289	307	349	369	358	360	365	R	R 355	R 368	335	R 336	370	343	334	323	329	299	302
24	288	296	324	340	362	296	303	340	366	340	R 328	356	R	U R 354	R	356	357	340	325	318	328	338	318	295
25	278	295	298	302	329	346	301	327	R 352	339	337	R 362	333	U R 345	322	337	336	390	372	326	323	298	316	301
26	283	275	292	321	350	340	315	339	357	R 380	354	371	R 335	346	R	R 362	351	378	341	336	309	330	295	295
27	288	278	294	318	340	317	322	347	374	348	351	352	R	R 378	354	349	350	356	355	307	318	340	314	297
28	282	268	286	325	371	402	303	349	370	377	351	356	337	R 349	338	368	354	363	356	349	326	340	316	292
29	284	291	296	295	315	324	316	351	358	368	U R 370	345	348	346	349	352	372	368	346	352	370	374	332	305
30	296	304	323	327	297	298	310	344	368	357	382	R 351	375	374	333	359	368	363	325	366	356	327	347	332
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	28	28	26	24	27	20	25	29	30	30	30	30	30	30	30
MED	292	295	303	313	328	296	310	348	366	358	349	361	344	R 348	338	349	352	356	346	324	323	327	318	302
U Q	305	308	320	321	345	319	319	363	371	362	356	R 366	360	U R 355	348	356	358	367	354	336	332	337	329	312
L Q	282	289	296	302	320	288	302	341	355	350	342	351	333	U R 337	333	338	342	346	338	312	312	317	313	295

NOV. 2012 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	U L 403	L	U L 357	L	L	L							
2								A	A	L	L	L	L	L	L	L								
3								436	L	L	L	U L 387	L	L	L	L		A						
4										L	L	L	L	L	L	L	L							
5									L	L	L	L 389	U L 395	L	L	L								
6									L	L	L	U L 377	L	U L 382	L	L	L							
7									425	L	A	A	L	L	L	L								
8									L	L	U L 379	U L 396		L	L	L	L							
9									L	L	L	L	L	U L 374	L	L								
10									437	L	L	L	L	L	L	L	L							
11								442	U L 430	L	L	L	L	L	L	L	L							
12										L	L	L	U L 369	L	L	L	L							
13										C	C	C	C	C	C	C	425							
14										L	L	U L 421	L	L	L	L								
15											L	L	L	L	L	L		407						
16										L	L	L	L	U L 375	U L 393	L								
17									L 410	L	L	L	L	L	L	L								
18								421	457	L 428	L	U L 412	L	L	L	L								
19								412	L	L	L	L	L	L	L	L	L								
20										L		L	L	A	L	L								
21									L	L	L	L	L	L	L	L								
22									A	L	L	L	L	L	L	L	U L 400							
23									455	L	L	U L 393	L	L	L	L	L							
24									U L 411	L	399	L	L	U L 381	L									
25									L	L 462	L	L	L	L	L	L	L							
26									U L 426	L	U L 403	L	L	L	L	L	L							
27										L	L	U L 381	L	L	L	L	L							
28									L 421	L	L	L	U L 390	U L 395	A	L	448							
29									L	L	L	U L 447	U L 392	L	L	L	A							
30									L	L	L	L	L	U L 378	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								4	9	2	3	10	4	7	1		3	1						
MED								428	L 426	L 445	U L 399	U L 394	U L 391	U L 378	U L 393		425	407						
U Q								439	446		U L 403	U L 412	U L 394	U L 382			448							
L Q								416	L 416		U L 379	U L 387	U L 380	U L 374			U L 400							

NOV. 2012 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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	234	248	218	240	292	246	220	214							
2								216	258	218	228	250	260	260	252	236								
3								202	220	246	220	230	234	252	236	216		200						
4										224	236	226	230	228	250	224	234							
5									224	234	238	234	232	266	252	228								
6									228	246	246	244	236	246	266	244	226							
7									226	232	252	242	232	270	240	230								
8									220	232	252	226		240	252	244	224							
9									206	232	252	234	262	254	244	230								
10									208	220	252	254	228	262	262	244	222							
11								212	214	220	236	238	260	240	248	248	232							
12										216	228	274	238	244	250	234	212							
13										C	C	C	C	C	C	C	210							
14										218	240	244	254	270	250	236								
15											222	234	242	232	234	228		200						
16										218	222	248	226	250	244	226								
17									208	222	232	230	228	268	240	232								
18								218	210	212	258	220	246	250	250	210								
19								206	208	222	226	252	226	242	250	236	220							
20										218		248	234	242	310	262								
21									232	228	238	236	260	250	240	222								
22									222	230	240	218	264	234	238	224	224							
23									208	232	232	230	270	248	224	230	226							
24									216	230	258	240	224	248	264									
25									220	222	256	234	244	246	286	218	234							
26									206	212	238	240	264	228	228	214	230							
27										232	230	246	244	224	238	238	222							
28									206	220	222	234	250	238	236	228	212							
29									218	226	230	236	236	254	254	238	214							
30									204	232	224	238	226	232	246	238								
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	22	28	28	29	28	29	29	28	16	2						
MED								212	217	225	237	236	239	248	248	230	223	200						
U Q								217	222	232	250	245	257	257	252	238	228							
L Q								204	208	219	228	230	231	239	239	224	214							

NOV. 2012 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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	280	254	238	254	236	290	272	224	216	208	210	204	190	190	224	220	212	214	208	232	238	260	272	276
2	262	254	256	246	252	290	220	A	A	A	A	214	228	248	224	228	218	214	220	282	240	244	278	254
3	264	240	252	262	204	238	230	A 210	H 206	H 192	220	200	H 202	H 184	210	216	220	A	198	204	222	216	232	252
4	254	252	280	274	220	294	268	206	214	210	H 190	208	180	206	182	H 210	216	210	194	192	232	210	218	262
5	264	246	208	234	228	312	278	218	220	212	210	188	204	H 188	H 192	H 186	214	210	190	214	242	224	216	232
6	270	262	262	262	242	256	254	220	218	216	H 196	190	H 198	192	H 196	H 178	H 156	194	194	188	260	250	248	238
7	270	258	242	248	266	288	232	216	224	212	A	A	198	200	222	214	214	204	198	216	246	248	230	240
8	264	284	266	246	236	250	234	204	220	208	202	206	218	210	198	210	210	210	192	210	248	216	200	230
9	262	278	268	286	248	190	H 238	206	202	204	198	218	194	206	212	218	220	204	196	210	230	200	224	260
10	308	292	264	270	262	196	240	204	194	208	204	196	190	188	208	218	210	198	210	210	222	200	214	270
11	276	270	288	254	246	206	256	204	198	206	210	188	226	216	220	210	232	200	184	210	196	230	240	264
12	270	278	278	246	238	240	240	206	202	200	214	208	194	198	208	206	216	216	188	202	236	216	232	244
13	280	272	238	228	262	260	272	228	218	C	C	C	C	C	C	C	208	220	200	226	230	226	234	234
14	278	296	278	228	222	252	292	248	224	214	216	200	214	206	204	212	216	210	230	204	240	216	210	268
15	328	280	208	218	218	286	280	226	214	214	204	196	204	212	212	206	222	E A 230	196	210	216	234	224	256
16	264	260	256	260	242	236	248	216	202	202	194	200	220	214	188	H 196	216	212	186	218	200	202	230	258
17	290	288	286	272	240	256	236	196	H 188	200	220	220	204	226	242	232	220	204	196	210	232	218	250	266
18	288	288	296	274	232	238	254	214	190	202	202	204	228	238	214	212	218	212	202	222	210	226	230	230
19	246	266	302	288	242	242	220	230	198	216	210	218	224	230	222	216	216	208	192	226	208	230	216	226
20	308	292	296	260	218	236	250	202	214	204	216	232	224	A	226	240	218	210	200	216	228	206	244	302
21	300	302	284	266	232	328	278	232	222	218	210	226	192	228	H 204	H 216	220	214	202	236	234	200	238	306
22	320	302	244	224	196	354	290	234	A	214	172	198	198	208	196	208	216	206	202	200	196	222	210	246
23	260	238	230	254	262	292	262	228	180	H 212	212	H 202	H 178	H 178	194	206	H 214	200	180	192	210	210	234	264
24	296	292	244	228	210	284	270	236	206	214	H 202	232	222	204	H 194	222	208	210	228	212	222	218	256	256
25	308	302	276	254	234	202	280	226	212	180	218	226	196	H 182	202	214	220	198	190	232	198	228	228	266
26	308	320	298	254	220	230	258	238	204	218	208	220	182	214	202	212	214	198	208	204	218	208	270	278
27	296	308	294	248	230	224	244	212	196	H 176	216	208	202	202	232	206	218	198	188	196	222	208	224	282
28	312	322	294	250	210	190	328	222	204	H 190	210	210	H 196	214	A	H 202	190	188	188	214	208	222	252	288
29	322	310	302	294	262	226	258	232	194	206	182	H 182	200	H 154	214	208	A	212	224	214	194	202	232	280
30	300	290	256	248	282	292	260	232	H 156	H 192	H 192	216	202	198	216	214	214	202	212	196	198	226	226	244
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	28	28	27	28	29	28	28	29	29	29	30	30	30	30	30	30
MED	280	282	267	254	236	251	257	220	205	208	210	207	202	206	209	212	216	209	197	210	222	218	231	259
U Q	308	296	288	266	248	290	272	231	217	214	214	218	219	214	221	217	219	212	208	218	236	228	244	270
L Q	264	260	244	246	220	230	240	206	197	201	198	199	194	H 191	197	206	213	200	190	204	208	208	224	244

NOV. 2012 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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								130	102	96	96	96	102	104	100	108	A	A						
2								132	102	112	104	102	102	102	102	A	A	A						
3								106	108	100	96	106	104	94	96	102	104	144						
4								144	100	102	104	104	102	96	100	104	A	150						
5								122	104	98	98	98	100	102	104	104	104	132						
6								122	102	96	102	102	104	102	102	96	102	104						
7								142	100	96	96	94	106	104	104	102	108	A						
8								130	100	96	A	100	96	104	104	108	108	A						
9								140	110	98	102	A	A	A	110	108	104	A						
10								160	102	98	98	108	108	106	A	110	110	A						
11								124	100	98	100	96	110	102	100	104	102	B						
12								B	102	100	A	104	104	104	102	104	104	E B 138						
13								138	100	C	C	C	C	C	C	C	104	B						
14								142	120	110	108	108	106	100	112	108	108	E B 170						
15								132	126	114	94	110	110	108	110	108	106	E B 152						
16								E B 138	116	100	104	102	102	96	102	116	110	A						
17								E B 138	102	106	98	A	A	A	102	102	106	A						
18								B	122	102	100	106	106	104	104	104	102	118						
19								132	110	112	110	108	108	108	104	102	106	B						
20								E B 140	A	106	A	A	H	114	112	A	A	A						
21								B	102	104	100	100	100	98	98	A	114	E B 146						
22								E B 146	102	100	98	98	106	A	106	104	102	A						
23								E B 146	100	106	100	110	110	104	102	104	106	E B 166						
24								E B 182	112	104	98	102	98	104	102	102	110	116						
25								A	104	100	100	102	98	A	A	A	104	B						
26								E B 188	110	110	110	108	108	104	104	104	110	E B 152						
27								E B 150	108	110	108	106	100	96	A	104	104	E B 170						
28								E B 156	118	108	108	106	102	104	102	106	102	B						
29								E B	102	102	100	104	102	102	102	102	100	E B 144						
30								E B 202	110	106	106	104	102	100	100	A	118	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								25	29	29	26	26	26	25	26	24	26	14						
MED								135	102	102	100	104	103	104	102	104	105	E B 145						
U Q								E B 148	110	107	104	106	106	104	104	108	108	E B 152						
L Q								131	102	98	98	100	102	100	102	102	104	132						

NOV. 2012 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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	92	B	92	84	94	B	B	128	126	118	110	100	102	G	G	98	96	96	96	B	B	B	B	96
2	94	94	96	90	92	94	146	120	112	110	106	108	100	98	98	100	100	98	86	90	92	92	92	92
3	B	92	88	88	88	B	B	134	192	104	94	96	160	G	118	106	100	98	100	100	B	92	98	B
4	108	86	86	B	B	B	B	124	138	126	150	94	90	G	106	G	104	106	B	B	88	B	B	B
5	B	B	B	B	B	B	B	118	116	114	114	122	G	102	G	G	168	G	B	92	B	B	B	B
6	B	B	B	B	B	B	B	132	G	G	190	94	96	94	88	172	154	88	92	92	94	92	90	B
7	B	B	B	B	B	B	146	148	160	104	96	90	96	90	92	120	114	98	90	90	88	90	86	B
8	B	B	106	B	B	B	B	166	98	98	96	96	G	90	88	88	88	86	B	B	B	B	B	B
9	B	B	B	B	98	B	B	G	100	138	124	98	98	96	96	108	102	102	102	B	88	84	B	B
10	B	B	B	B	92	92	94	G	130	176	100	98	100	96	98	98	98	94	92	94	134	B	88	B
11	B	B	B	B	B	B	B	146	122	108	108	110	106	G	G	100	G	126	96	B	B	B	B	B
12	B	B	92	B	B	B	B	90	G	120	98	100	98	94	G	90	86	86	B	B	B	B	B	B
13	B	B	B	B	B	B	B	G	G	C	C	C	C	C	C	C	108	146	B	B	B	B	B	B
14	B	B	B	B	B	B	B	G	102	96	110	104	106	96	96	94	94	94	88	B	B	B	B	B
15	104	B	B	B	B	B	B	G	144	124	126	102	104	100	96	G	G	94	92	B	B	B	B	B
16	B	B	B	B	B	B	B	G	104	106	96	G	G	G	122	118	136	90	B	B	B	B	B	B
17	B	B	B	B	B	B	B	G	102	100	G	168	92	184	150	154	164	86	88	90	98	B	B	B
18	B	B	B	B	B	B	B	B	184	106	188	186	172	170	174	158	158	152	90	130	108	94	B	B
19	B	B	B	B	B	B	B	G	142	192	96	122	164	176	168	148	110	102	90	134	124	126	B	B
20	B	B	B	B	B	B	B	112	184	112	92	136	130	114	112	90	90	88	88	92	120	86	84	B
21	B	B	B	B	B	B	B	120	126	124	G	102	100	100	100	152	G	164	88	B	B	88	B	B
22	B	B	B	B	B	90	92	G	124	G	108	102	104	98	98	G	G	92	90	90	90	90	92	B
23	B	B	B	B	B	B	B	98	126	192	106	126	160	G	G	G	G	G	B	B	B	B	B	B
24	B	90	B	B	B	B	B	G	102	164	G	192	160	134	126	92	108	86	96	88	B	B	B	B
25	B	B	B	B	B	B	B	106	G	108	104	156	G	102	98	100	G	136	94	96	B	B	B	B
26	B	B	B	B	B	B	B	G	210	194	184	100	184	96	92	100	188	166	84	84	106	B	B	B
27	B	B	B	B	B	104	102	G	142	122	130	124	106	94	94	96	116	94	90	90	90	88	B	B
28	B	B	B	B	B	B	B	G	148	98	116	106	102	100	114	174	182	134	B	126	102	B	90	B
29	B	B	B	B	B	B	B	G	G	176	132	102	114	112	106	104	96	128	106	100	B	92	84	B
30	106	94	92	98	100	B	114	106	112	98	100	100	106	104	98	102	102	96	96	B	88	92	88	90
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	5	7	4	6	4	6	15	25	27	26	28	25	23	24	24	24	28	22	17	15	13	10	3
MED	104	92	92	89	93	93	108	120	126	114	108	102	104	100	98	101	106	97	91	92	94	92	89	92
U Q	107	94	96	94	98	99	146	134	146	138	126	123	145	112	116	134	145	127	96	100	108	92	92	96
L Q	93	88	88	86	92	91	94	106	108	104	98	99	99	96	96	97	97	91	88	90	88	88	86	90

NOV. 2012 h'Es (KM)

IONOSPHERIC DATA STATION Yamagawa

NOV. 2012 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		F1	F3	F1			C2	C1	C1	C1	C1	L1			L1	L2	L3	F4					F1
2	F1	F1	F1	F2	F2	F1	F1	C3	C4	CL21	C2	C1	C2	C3	C2	L2	L2	L2	F4	F4	FQ21	F2	F2	F1
3		F1	F3	FQ21	F1			H1	HL11	C1	C2	LH11	HL11		C1	C1	C1	L2	FF31	F1		F1	FF11	
4	F1	F1	F1					C2	H1	CL21	HL11	L1	L1		CL11		L1	L1			F1			
5								C2	C1	C1	C1	C1		C1			HL11			F1				
6								C2			HL11	L1	L1	L1	L1	HL11	H1	L3	F1	F1	F1	F1	F1	
7							F1	C2	H1	C1	C2	C2	L1	L1	L1	C1	CL11	L4	F1	F1	F1	F1	F1	
8			F1					H1	C2	C2	L1	L1		L1	L1	L1	L1	L2						
9					F1				L2	H1	CL11	L1	L1	L1	L1	CL11	C2	L1	F1		F2	F1		
10					F1	F1	F1		H1	H1	C1	L1	L1	L1	L1	L1	L1	L3	F3	F3	F1		F2	
11								LH11	C1	C1	C1	C1	C1			L1		C1	F1					
12			F1					LH12		C1	L1	L1	L1	L1		L1	L1	L1						
13																	C1	H1						
14									L1	L1	CL11	CL11	CL11	C1	L2	L1	L1	L1	F2					
15	F1								HL11	CL11	C1	L1	L1	L1	L1			L1	F1					
16									L1	C1	L1				CL11	CL11	HL11	L1						
17									C1	L1		HL11	L1	HL11	HL11	HL11	HL12	L1	F2	F1	F2			
18									HL11	C1	HC11	HC11	HC11	HL11	HL11	HL11	HL11	HL11	F2	FFF22	F3	F1		
19									HL11	HL11	L1	CL11	HL11	HL11	HL11	H1	C1	C1	F1	F1	F3	F1		
20								L1	HL11	CL11	L2	HL11	HL11	CL21	CL21	LC22	LQ11	L3	F2	F2	F1	F1	F1	
21								C1	H1	CL11		C1	C2	C1	C1	HL11		HL21	F3			F1		
22						F1	F2		C1		C1	C1	C1	L1	L1			L4	FQ31	F2	F1	F1	F1	
23								L1	C1	HL11	C1	CL11	HL11											
24		F1							L1	H1		HL11	HC11	HL11	HL11	L1	CL22	L1	F2	F1				
25								L1		C1	C1	HC11		L1	L3	L1		C1	F1	F2				
26									HL11	HL11	HL11	L1	HL11	L1	L2	L1	HL11	H1	F4	F2	F1			
27						F1	F1		HL11	CL21	CL11	CL11	C1	C1	C2	L2	CL12	LH11	F2	F2	F1	F1		
28									HL11	LH11	CL11	CL11	C1	L1	C1	HL11	H1	C1		F1	FF21		F1	
29										H1	H1	CL11	C1	C1	C1	C1	C3	C3	F4	F3		F1	F1	
30	F1	F3	F3	FQ21	F1		F1	L1	CL11	L1	L1	CL11	C1	C1	C2	L2	L2	L3	F2		F2	F1	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																								

NOV. 2012 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 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 58	X 59	X 48	X 49	X 44	X 32	X 36												X 110	X 103	X 111	X 100	X 93	X 81
2	X 80	X 78	X 71	X 68	X 60	X 65	X 84												X 94	X 74	X 74	X 73	X 57	X 55
3	X 58	X 53	X 49	X 44	X 57	A	X 32												X 136	X 118	X 102	X 112	X 94	X 69
4	X 64	X 65	X 46	X 50	X 44	X 39	X 41												X 120	X 128	X 98	X 106	X 78	X 59
5	X 61	X 64	X 54	X 47	X 40	X 36	X 39												X 88	X 72	X 67	X 66	X 58	X 52
6	X 43	X 42	X 42	X 40	X 40	X 37	X 39												X 72	X 68	X 69	X 74	X 67	X 48
7	X 43	X 40	X 41	X 41	X 39	X 37	X 37												X 72	X 69	X 67	X 72	X 70	X 55
8	X 49	X 42	X 42	X 48	X 42	X 38	X 37												X 91	X 77	X 71	X 80	X 69	X 58
9	X 40	X 40	X 39	X 41	X 48	X 40	X 31												X 100	X 74	X 76	X 78	X 62	X 50
10	X 38	X 38	X 38	X 39	X 46	X 34	X 30												X 112	X 95	X 96	X 88	X 69	X 60
11	X 60	X 54	X 48	X 46	X 54	X 40	X 38												X 121	X 104	X 100	X 86	X 69	X 59
12	X 57	X 51	X 50	X 56	X 56	X 50	X 42												X 114	X 102	X 103	X 88	X 89	X 72
13	X 51	X 42	X 40	X 36	X 37	X 37	X 38												X 98	X 80	X 73	X 77	X 67	X 62
14	X 52	X 51	X 58	X 57	X 46	X 38	X 40												X 124	X 137	X 114	X 104	X 94	X 72
15	X 64	X 75	X 90	X 68	X 37	X 34	X 36			C	C	C	C	C	C	C	C		X 116	X 100	X 99	X 86	X 79	X 76
16	X 72	X 70	X 70	X 65	X 64	X 33	X 34												X 125	X 103	X 100	X 100	X 78	X 69
17	X 68	X 65	X 66	X 73	X 79	X 58	X 52												X 124	X 95	X 104	X 94	X 75	X 69
18	X 59	X 52	X 47	X 45	X 52	X 39	X 35												X 113	X 106	X 96	X 97	X 86	X 84
19	X 68	X 56	X 54	X 57	X 62	X 54	X 39												X 98	X 84	X 95	X 94	X 87	X 70
20	X 70	X 66	X 68	X 70	X 78	X 45	X 46												X 144	X 144	X 127	X 134	X 103	X 80
21	X 62	X 58	X 58	X 50	X 41	X 36	X 37												X 94	X 72	X 78	X 86	X 68	X 52
22	X 46	X 45	X 47	X 48	X 32	X 28	X 31												X 172	X 142	X 119	X 117	X 116	X 104
23	X 98	X 80	X 71	X 58	X 44	X 42	X 44												X 156	X 130	X 116	X 106	X 90	X 77
24	X 68	X 63	X 61	X 56	X 36	X 28	X 30												X 85	X 85	X 79	X 78	X 57	X 43
25	X 41	X 40	X 44	X 50	X 32	X 29	X 30												X 101	X 70	X 73	X 75	X 63	X 53
26	X 48	X 42	X 44	X 46	X 52	X 38	X 30												X 85	X 65	X 64	X 68	X 60	X 50
27	X 44	X 42	X 42	X 44	X 42	X 37	X 36												X 118	X 94	X 92	X 82	X 72	X 64
28	X 59	X 55	X 53	X 55	X 54	X 26	X 24												X 73	X 57	X 65	X 52	X 44	X 41
29	X 41	X 41	X 42	X 43	X 44	X 34	X 34												X 96	X 65	X 66	X 55	X 44	X 36
30	X 36	X 36	X 40	X 38	X 36	X 35	X 36												X 74	X 88	X 67	X 49	X 54	X 44
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	30												30	30	30	30	30	30
MED	X 58	X 52	X 48	X 48	X 44	X 37	X 36												X 106	X 91	X 94	X 86	X 70	X 60
U Q	X 64	X 64	X 58	X 57	X 54	X 40	X 39												X 121	X 104	X 102	X 100	X 87	X 72
L Q	X 44	X 42	X 42	X 44	X 40	X 34	X 32												X 91	X 72	X 71	X 74	X 62	X 52

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 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	52	53	42	40	38	26	30	69	92	96	105	122	118	142	163	152	135	114	104	97	105	94	87	75
2	74	72	65	62	54	59	78	82	88	98	95	116	121	132	130	124	120	98	88	68	68	67	51	49
3	52	47	43	38	51	A	26	57	74	79	111	115	116	131	151	138	140	140	130	112	96	106	88	63
4	58	59	40	44	38	33	35	61	80	92	112	118	110	121	R 128	R 144	129	120	114	122	92	100	72	53
5	55	58	48	41	34	30	33	60	84	98	96	95	85	88	101	104	90	71	82	66	61	60	52	46
6	37	36	36	34	34	31	33	59	81	96	122	118	112	117	107	108	100	89	66	62	63	68	61	42
7	37	34	35	35	33	31	31	54	83	97	104	112	96	100	115	102	92	75	66	63	61	66	64	49
8	43	36	36	42	36	32	31	60	73	92	100	104	85	107	110	119	101	101	85	71	65	74	63	52
9	34	34	33	35	42	34	25	53	68	75	88	104	107	112	111	115	115	108	94	68	70	72	56	44
10	32	32	32	33	40	28	24	54	69	79	86	103	110	113	124	128	125	121	106	89	90	82	63	54
11	54	R 48	42	40	48	34	32	63	73	86	90	94	101	117	132	141	142	134	115	98	94	80	63	53
12	51	45	44	50	50	44	36	59	72	86	96	101	106	110	108	118	115	106	108	96	97	82	R 83	66
13	45	36	34	30	31	31	32	59	86	104	111	94	92	106	112	108	92	94	92	74	67	71	61	56
14	46	45	52	51	40	32	34	57	96	102	112	114	R 131	139	140	130	133	132	118	131	108	98	R 88	66
15	58	69	84	62	31	28	30	72	106	C	C	C	C	C	C	C	C	138	110	94	93	80	73	70
16	66	64	64	59	58	27	28	59	84	102	115	121	140	149	R 152	R 150	138	135	119	97	94	94	72	63
17	62	59	60	67	73	52	46	63	80	94	105	112	125	144	U Y 152	U R 154	U R 150	R 144	118	89	98	88	69	63
18	53	46	41	39	46	33	29	62	85	92	100	102	114	124	130	122	118	118	107	H 100	90	91	80	78
19	62	52	48	51	56	48	33	66	79	93	98	100	97	R 104	113	110	110	110	92	78	89	88	81	64
20	64	60	62	64	72	39	40	59	80	92	93	104	118	113	110	129	142	R 142	138	138	121	128	97	74
21	56	52	52	44	35	30	31	57	86	118	118	113	120	135	123	106	V 95	94	88	66	72	80	62	46
22	40	39	41	42	26	22	25	57	95	113	128	130	128	160	U R 166	U R 162	U R 168	U R 170	U R 166	136	113	111	110	98
23	92	74	65	52	38	36	38	63	85	96	103	111	115	124	137	R 148	U R 156	U R 178	150	124	110	100	84	71
24	62	57	55	50	30	22	24	50	83	88	88	116	109	90	Z 96	108	92	82	79	79	73	72	51	37
25	35	R 34	38	44	26	23	24	54	85	98	103	107	119	124	135	R 130	130	128	95	64	67	69	57	47
26	R 42	36	38	40	46	32	24	49	79	85	104	117	108	119	106	107	102	96	79	59	58	62	54	44
27	38	36	36	38	36	31	30	55	75	77	97	94	114	128	143	R 148	R 148	144	112	88	R 86	76	66	58
28	53	49	47	49	48	20	18	45	72	82	R 103	104	124	125	122	115	127	110	67	51	59	46	38	35
29	35	35	36	37	38	28	28	48	76	80	99	89	98	99	107	111	96	R 99	90	59	60	49	38	30
30	30	30	34	32	30	29	30	46	69	87	102	92	96	101	100	95	87	75	68	82	61	43	48	38
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	30	30	30	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30
MED	52	46	42	42	38	31	30	59	80	92	103	107	112	119	123	122	120	112	100	85	88	80	64	54
U Q	58	58	52	51	48	34	33	62	85	98	111	116	120	132	138	R 142	139	135	115	98	96	94	81	66
L Q	38	36	36	38	34	28	26	54	74	86	96	100	100	106	109	108	98	96	85	66	65	68	56	46

NOV. 2012 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	U L 500	U L 500	L	L							
2										A	L	L	L	U L 516	L	L	L							
3									288	L	U L 484	L	L	L	L 468	L	L							
4										L	L	L	L	L	L	L	A	L						
5										L	L	L	U L 476	U L 484	U L 472	U L 440	L							
6										L	L	U L 484	L	L	L 464	U L 472	U L 316							
7										L	L	L	L	L	L	L	L							
8									L	L	L	L	L	U L 480	L	L	L	L						
9									L		L	L	L	U L 496	L	L	L							
10											L	U L 504	L	L	U L 504	L								
11										L	L	U L 496	L	L	U L 532	L	L							
12								208		L	L	L	L	L	L	L	L							
13									L	L	L	L	L		L	A	L							
14											L	L	L	L	L		L	216						
15										C	C	C	C	C	C	C	C							
16											L	L	U L 524	U L 568	L	L	324							
17									L		L	460	L	U L 580	L	L	L							
18										L		L	L	L	L	L								
19										L	L	A	L		L									
20											L	L	L	L	L	L	L							
21									L	L	L	L	L	L	L									
22										L	L	L	L	L	L	L	L							
23									272	L	L	U L 480	L	L	L	L	L							
24										L	L	U L 472	L	L	L	L								
25									L	L	L	L	U L 512	L	U L 468	L								
26									L	L	L	L	U L 496	L	L		304							
27										L	L	L	U L 528	L	L	L	L	236						
28								172			L	U L 472	U L 492	L	U L 460	L								
29								188	L 288	L 432	L 476	U L 480	L	L	L									
30								L	300	U L 372	U L 460	L	L	U L 476	U L 464	U L 412								
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	4	2	3	8	6	8	9	3	3	2						
MED								188	288	L 402	U L 476	U L 480	U L 504	U L 498	U L 468	U L 440	316	226						
U Q								208	294		U L 484	U L 490	U L 524	U L 542	U L 502	U L 472	324							
L Q								172	280		U L 460	U L 472	U L 492	U L 482	U L 464	U L 412	304							

NOV. 2012 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 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								192	272	U A 292	U A 304	U A 316	R 340	U A 324	316	308	A	A						
2								A	264	296	324	A	A	A	A	A	A	A						
3								192	268	300	U A 328	344	344	B	324	312	A	224						
4								A	252	304	316	328	340	U A 344	U A 340	A	A	A						
5								176	U A 268	U A 296	324	336	332	A	A	312	276	224						
6								184	248	292	304	U A 304	A	336	A	308	264	236						
7								A	240	312	324	344	352	A	A	A	276	220						
8								188	A	A	A	A	B	U R 356	A	A	U A 264	216						
9								172	260	312	U R 336	B	R	A	A	U A 312	A	A						
10								200	R 260	312	U R 332	352	U R 360	356	U R 364	324	284	200						
11								180	236	300	312	U R 364	R	U R 368	348	324	R 284	212						
12								180	264	308	336	U R 356	A	U R 348	348	A	A	A						
13								188	252	304	328	B	R	U R 372	352	324	A	216						
14								192	240	312	332	U A 340	U A 340	U A 316	A	308	272	204						
15								188	256	C	C	C	C	C	C	C	C	220						
16								176	256	316	316	U R 352	U R 364	U R 364	A	A	284	212						
17								184	256	316	U A 316	A	U R 404	U R 384	R	324	R 284	204						
18								192	252	312	U R 352	U R 356	A	400	380	332	276	220						
19								A	260	R 288	A	U A 380	A	400	360	316	296	196						
20								192	252	308	336	U R 396	U R 396	U R 352	U R 332	320	A	A						
21								172	256	U R 304	328	352	336	320	U A 308	U A 304	B	204						
22								188	A	312	A	A	A	A	A	A	A	A						
23								180	248	304	A	U R 360	A	U R 360	U R 356	312	280	A						
24								B	232	300	316	U A 332	A	U R 344	336	328	A	192						
25								B	236	324	352	A	A	A	A	A	A	A						
26								B	A	A	336	U R 344	356	R	340	A 300	252	208						
27								172	260	292	328	U A 364	A	A	A	A	272	A						
28								B	236	292	A	A 352	U R 376	A 340	332	296	288	216						
29								B	228	A	328	352	368	356	332	312	268	188						
30								B	232	296	324	352	A	A	A	A	A	180						
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								20	27	26	24	22	14	19	16	19	16	20						
MED								186	252	304	328	U 352	354	U 356	340	312	276	212						
U Q								192	260	312	334	U R 356	U R 368	U R 368	354	324	284	220						
L Q								178	240	296	316	U A 340	340	A 340	332	308	270	202						

NOV. 2012 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 14	E B 14	J A 20	J A 19	E B 14	E B 14	E B 14	22	G	34	36	36	G	35	G	G	J A 28	J A 23	E B 14	E B 14	20	E B 14	E B 14	E B 14
2	E B 14	18	J A 20	J A 19	E B 14	18	J A 14	23	35	J A 58	J A 53	J A 43	J A 42	J A 45	J A 51	J A 44	J A 40	J A 32	19	E B 14	J A 17	E B 14	E B 14	19
3	E B 14	E B 14	E B 14	E B 14	E B 14	J A 29	E B 14	J A 31	G	32	37	39	38	E B 41	35	37	29	G 20	J A 17	E B 14	E B 14	E B 14	E B 14	E B 14
4	18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	21	31	34	36	36	G	38	37	35	J A 47	J A 21	J A 20	J A 27	J A 28	J A 18	J A 23	E B 14
5	E B 14	E B 14	E B 14	E B 14	17	E B 14	E B 14	20	27	33	35	37	38	39	35	G 28	G	G 19	J A 18	J A 21	E B 14	J A 22	J A 18	20
6	19	J A 14	J A 18	E B 14	E B 13	E B 14	18	G	28	34	38	35	36	G 31	36	G 26	G	G 20	E B 14	J A 16	E B 14	J A 20	J A 18	J A 14
7	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	26	30	34	38	39	G 28	J A 58	J A 43	J A 34	J A 36	25	J A 26	J A 31	J A 20	J A 18	21	E B 14
8	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	29	32	33	38	E B 45	G 25	41	J A 49	J A 28	G	J A 22	E B 19	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	18	E B 14	J A 16	20	G	34	G	E B 42	G 26	44	J A 39	35	J A 39	25	E B 14	E B 14	E B 14	E B 14	E B 14	20
10	E B 14	E B 14	E B 14	E B 14	E B 14	18	J A 20	G	G	33	G	G	G	G 34	G	36	G 25	G	J A 26	E B 14	E B 14	E B 14	E B 14	E B 14
11	18	18	E B 14	E B 14	E B 14	E B 14	E B 14	G	26	32	36	G	G 34	G	G	35	G 22	G	E B 14	E B 14	E B 14	E B 14	E B 14	19
12	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	30	33	36	G 28	41	G 29	G J 32	J A 45	J A 34	J A 37	E B 14	J A 16	E B 14	E B 14	E B 14	E B 14
13	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	28	G 26	G	E B 43	G 25	40	J A 50	J A 44	33	G	E B 14	J A 18	E B 14	E B 14	E B 14	18
14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	26	G 25	G 29	41	40	36	36	G 26	G 23	G	E B 14	18	E B 14	18	19	E B 14
15	E B 14	E B 14	18	18	J A 22	E B 14	E B 14	G	28	C	C	C	C	C	C	C	C	G	E B 14	E B 14	E B 14	18	E B 14	E B 14
16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	28	G 28	36	G 28	G 32	G 29	39	34	G 26	G J 18	J A 19	19	E B 14	E B 14	J A 21	J A 23
17	19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G 22	36	42	J A 42	47	46	28	G 27	G 23	23	J A 21	J A 16	E B 14	E B 14	J A 16	J A 17
18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	G 27	41	G	45	44	42	36	G 24	26	J A 23	19	J A 29	J A 20	18	E B 14
19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	19	G 23	G	34	J A 53	38	44	41	G 29	35	22	E B 14	J A 24	J A 20	J A 17	18	18
20	J A 36	J A 25	J A 19	J A 26	J A 21	E B 14	E B 14	G	29	35	39	41	44	42	39	36	J A 40	J A 48	J A 28	J A 20	J A 14	18	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	18	G	G	G	G	40	40	35	38	34	E B 32	24	J A 16	J A 30	J A 35	J A 24	J A 22	E B 14
22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	28	36	J A 42	J A 41	40	J A 61	J A 56	35	J A 43	J A 28	E B 14	J A 25	J A 16	J A 17	18	E B 14
23	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	J A 36	G	J A 45	G 34	G	G 25	G	23	E B 14	19	J A 31	18	18	J A 18
24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 17	28	33	36	38	39	G	G 30	G 29	J A 38	J A 56	J A 53	J A 22	E B 14	E B 14	E B 14	E B 14
25	J A 17	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	J A 17	26	J A 49	J A 44	40	39	J A 45	J A 36	J A 31	J A 29	22	J A 20	19	J A 23	E B 14	E B 14	E B 14
26	E B 14	E B 14	E B 14	E B 14	18	E B 14	E B 14	E B 16	J A 28	J A 33	36	G 29	G 34	35	G 28	G 26	27	G	E B 14	E B 14	18	E B 14	E B 14	E B 14
27	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	34	42	40	40	J A 41	J A 46	J A 29	J A 21	E B 14	J A 17	19	19	E B 14	E B 14
28	E B 14	19	E B 14	E B 14	E B 14	J A 16	E B 14	E B 14	26	32	J A 35	37	41	41	G 32	G 27	32	G 20	J A 19	18	E B 14	E B 14	E B 14	18
29	18	E B 14	E B 14	19	E B 14	19	E B 14	E B 14	G	J A 30	G	J A 40	43	40	40	34	G	22	J A 24	J A 14	J A 18	J A 16	E B 14	E B 14
30	E B 14	E B 14	E B 14	J A 25	17	18	18	E B 14	28	J A 31	36	39	J A 46	J A 44	J A 56	J A 55	J A 32	G	J A 14	J A 20	J A 18	J A 20	E B 14	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	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30
MED	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	33	36	38	39	40	37	34	29	22	J A 16	J A 18	14	15	E B 14	E B 14
U Q	14	14	14	14	14	14	14	19	28	34	38	41	42	J A 44	J A 41	J A 36	J A 36	J A 25	J A 21	J A 20	J A 20	J A 18	J A 18	18
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G 34	G	G	G	G	G 28	G	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14

NOV. 2012 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 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	21	G	32	35	36	G	34	G	G	27	20	E B 14	E B 14	20	E B 14	E B 14	E B 14
2	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	22	32	42	48	38	42	40	41	31	28	24	E B 14	E B 14	E B 14	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	A A 29	E B 14	14	G	32	35	38	37	E B 41	35	36	28	G 19	E B 14	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	20	30	33	36	35	G	36	36	34	31	19	18	21	E B 14	E B 14	22	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	20	G 24	32	35	37	38	39	34	G 23	G	G 18	E B 14	E B 14	E B 14	16	E B 14	E B 14
6	E B 14	E B 14	E B 14	E B 14	E B 13	E B 14	E B 14	G	28	33	38	35	35	G 30	35	G 23	G	G 17	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
7	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	23	29	33	38	39	G 25	48	40	33	32	24	21	19	E B 14	E B 14	E B 14	E B 14
8	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	29	31	33	37	E B 45	U G 25	40	39	G 21	G	18	E B 14	E B 14	E B 14	E B 14	E B 14
9	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	20	G	34	G	E B 42	G 25	37	37	33	32	24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
10	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	32	G	G	G	G 29	G	35	G 24	G	22	E B 14	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	26	32	36	G	U G 34	G	G	34	G 22	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
12	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	29	33	36	G 27	41	G 28	G 29	42	31	27	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
13	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	28	G 24	G	E B 43	U G 25	40	44	42	31	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	26	G 22	G 25	41	40	U Y 36	36	G 24	G 20	G	E B 14	E B 14	E B 14	E B 14	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	28	C	C	C	C	C	C	C	C	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
16	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	28	G 28	36	G 28	G 29	G 27	38	34	G 22	G 17	E B 14	E B 14	E B 14	E B 14	E B 14	16
17	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G 20	36	42	39	47	45	27	G 25	G 22	22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
18	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	27	G 26	41	G	45	44	42	36	G 21	24	22	E B 14	23	E B 14	E B 14	E B 14
19	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	19	G 20	G	34	50	38	44	40	G 26	35	22	E B 14	17	19	E B 14	E B 14	E B 14
20	19	18	E B 14	E B 14	18	E B 14	E B 14	G	29	34	39	41	42	42	39	36	33	30	20	E B 14	E B 14	E B 14	E B 14	E B 14
21	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	39	38	U Y 35	38	33	E B 32	24	E B 14	E B 13	22	18	20	E B 14
22	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	28	35	37	40	39	44	39	33	30	24	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
23	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	35	G	41	G 29	G	G 22	G	21	E B 14	19	28	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	E B 14	E B 17	28	32	36	38	39	G	G 24	G 22	31	G 15	24	E B 14	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	E B 14	E B 14	G 19	G 22	G 32	39	39	41	35	30	28	22	16	E B 14	E B 14	E B 14	E B 14	E B 14
26	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 16	26	30	35	G 28	G 28	U Y 35	G 27	G 25	27	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
27	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	34	40	39	39	35	32	G 27	20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
28	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	25	32	34	37	41	40	G 30	G 22	31	G 15	18	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	E B 14	E B 14	E B 14	G	30	G	37	42	40	40	34	G	22	22	E B 14	E B 14	E B 14	E B 14	E B 14
30	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	28	30	36	39	40	40	34	32	30	G	E B 13	E B 14	E B 14	E B 14	E B 14	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	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30
MED	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	26	32	35	38	38	38	35	33	28	20	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14
U Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	28	33	36	40	41	41	40	34	31	24	18	14	14	E B 14	E B 14	E B 14
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	G	G	G	G	G	G	G	G	G 25	G 26	G	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14

NOV. 2012 fbEs (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	14	14	14	16	16	21	22	20	23	20	21	15	14	14	14	14	14	14	14
2	14	14	14	14	14	14	14	14	14	20	20	30	21	21	23	21	14	14	14	14	14	14	14	14
3	14	14	14	14	14	14	14	14	15	20	22	23	24	41	22	20	17	16	14	14	14	14	14	14
4	14	14	14	14	14	14	14	14	14	17	17	20	21	21	21	20	16	14	14	14	14	14	14	14
5	14	14	14	14	14	14	14	14	14	15	20	22	22	22	21	20	18	15	14	14	14	14	14	14
6	14	14	14	14	13	14	14	14	14	15	18	17	21	26	23	20	15	14	14	14	14	14	14	14
7	14	14	14	14	14	14	14	14	14	15	21	21	20	18	21	20	16	14	13	13	14	14	14	14
8	14	14	14	14	14	14	14	14	14	14	16	22	45	20	20	16	15	17	14	14	14	14	14	14
9	14	14	14	14	14	14	14	14	14	16	17	42	24	21	24	22	14	14	14	14	14	14	14	14
10	14	14	14	14	14	14	14	14	17	21	21	23	22	20	22	22	18	14	14	14	14	14	14	14
11	14	14	14	14	14	14	14	14	14	16	22	21	27	21	21	20	21	14	14	14	14	14	14	14
12	14	14	14	14	14	14	14	14	14	15	21	22	21	21	24	20	15	14	14	14	14	14	14	14
13	14	14	14	14	14	14	14	14	14	20	18	43	21	22	21	26	20	15	14	14	14	14	14	14
14	14	14	14	14	14	14	14	14	16	15	16	23	22	24	21	22	13	15	14	14	14	14	14	14
15	14	14	14	14	14	14	14	14	16	C	C	C	C	C	C	C	C	14	14	14	14	14	14	14
16	14	14	14	14	14	14	14	14	16	18	20	21	22	22	21	15	14	15	14	14	14	14	14	14
17	14	14	14	14	14	14	14	14	16	16	20	23	24	24	20	20	15	14	14	14	14	14	14	14
18	14	14	14	14	14	14	14	14	17	21	23	30	26	24	23	22	15	15	14	14	14	14	14	14
19	14	14	14	14	14	14	14	14	15	17	18	23	22	24	21	21	16	14	14	15	14	14	14	14
20	14	14	14	14	14	14	14	14	15	19	20	31	23	26	22	21	15	14	14	14	14	14	14	14
21	14	14	14	14	14	14	14	14	20	16	22	21	25	22	20	20	32	14	14	13	13	14	14	14
22	14	14	14	14	14	14	14	14	16	18	20	21	21	21	21	20	16	14	14	14	14	14	14	14
23	14	14	14	14	14	14	14	14	17	18	21	21	21	21	20	17	20	14	14	14	14	14	14	14
24	14	14	14	14	14	14	14	17	15	20	21	21	22	21	22	20	16	14	14	14	14	14	14	14
25	14	14	14	14	14	14	14	14	14	14	19	20	21	20	22	18	17	14	14	14	14	14	14	14
26	14	14	14	14	14	14	14	16	14	18	20	20	21	20	21	18	15	15	14	14	14	14	14	14
27	14	14	14	14	14	14	14	14	15	16	21	20	21	21	21	19	15	14	14	14	14	14	14	14
28	14	14	14	14	14	14	14	14	15	16	17	21	22	21	18	18	15	14	14	14	14	14	14	14
29	14	14	14	14	14	14	14	14	14	15	18	18	20	20	20	19	21	14	14	14	14	14	14	14
30	14	14	14	14	14	14	14	14	14	15	16	20	21	20	21	15	14	14	13	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	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30
MED	14	14	14	14	14	14	14	14	15	16	20	21	22	21	21	20	15	14	14	14	14	14	14	14
U Q	14	14	14	14	14	14	14	14	16	18	21	23	24	24	22	21	18	15	14	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	14	15	18	20	21	20	20	18	15	14	14	14	14	14	14	14

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 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	279	306	313	322	350	284	290	347	362	347	321	334	289	306	326	327	322	326	319	285	295	285	294	298
2	298	304	297	310	279	282	325	355	352	342	325	316	310	323	326	323	350	317	354	314	320	336	325	309
3	309	332	369	335	391	A	303	368	347	345	334	348	323	322	339	324	330	326	349	344	302	329	358	289
4	313	326	301	306	341	295	312	355	365	348	358	342	319	307	R 311	R 335	328	340	343	355	295	342	321	305
5	316	338	356	364	344	299	305	337	361	360	365	353	335	322	339	333	348	342	355	362	287	334	336	343
6	318	312	297	306	326	295	292	339	338	327	345	340	331	325	333	334	345	368	353	325	284	314	318	315
7	313	318	323	320	335	287	306	331	348	341	342	336	312	309	335	332	354	364	350	319	287	305	338	336
8	307	284	297	315	354	303	311	352	349	347	339	347	315	335	312	332	325	352	325	325	299	329	330	308
9	315	291	290	308	350	393	320	364	375	355	342	337	334	323	317	328	324	348	363	336	305	334	326	328
10	288	297	304	322	349	380	311	364	364	350	334	336	327	308	323	319	338	350	330	335	302	328	315	302
11	308	R 280	290	298	334	316	312	351	369	362	351	347	312	317	313	321	335	347	334	317	316	341	320	291
12	306	291	305	308	347	349	334	353	356	349	345	347	318	332	304	321	332	331	348	327	269	296	R 303	319
13	303	311	327	310	307	300	299	337	361	330	353	333	309	303	321	325	332	319	331	330	296	316	308	327
14	292	284	301	321	348	267	276	310	327	329	326	299	R 300	296	295	292	294	309	304	322	291	304	R 287	266
15	238	284	350	379	376	305	302	334	362	C	C	C	C	C	C	C	C	345	349	322	312	323	311	306
16	302	290	299	315	350	359	306	350	357	331	336	313	316	322	R 318	R 321	308	328	334	307	312	318	305	293
17	274	288	299	305	337	337	319	369	361	358	334	316	307	300	U Y 322	U R 327	U R 310	R 336	339	327	264	318	289	282
18	281	274	296	299	345	368	274	342	379	345	337	333	314	317	310	315	303	336	319	H 292	320	261	306	312
19	302	257	270	269	323	352	322	344	366	355	337	318	312	R 306	323	310	335	333	332	305	319	308	323	311
20	263	286	282	298	356	300	308	337	343	364	347	316	327	320	293	300	312	R 323	320	327	293	313	284	274
21	269	269	298	320	308	265	293	332	332	329	341	306	297	322	324	317	V 321	331	335	340	293	331	330	276
22	279	291	322	362	344	265	283	321	354	349	343	337	306	325	U R 316	U R 320	U R 320	U R 327	U R 344	335	312	303	326	310
23	322	318	331	324	319	276	299	343	361	349	344	365	327	326	317	R 325	U R 336	U R 333	350	326	330	317	323	305
24	276	285	295	375	398	271	285	320	356	354	345	338	330	337	Z 332	322	337	314	316	339	306	341	341	308
25	285	R 297	310	339	377	292	301	329	351	350	331	330	321	318	327	R 324	325	344	356	294	305	314	329	316
26	R 286	269	292	309	344	378	294	333	351	334	330	338	336	339	324	327	336	346	344	327	295	321	322	311
27	299	290	292	321	345	316	300	348	366	331	340	324	321	317	329	R 326	R 336	344	357	319	R 290	316	334	296
28	282	276	292	332	379	410	322	348	357	348	R 338	327	316	325	320	316	337	376	351	302	346	321	336	307
29	295	284	292	310	321	327	320	325	372	370	371	362	327	340	316	338	322	R 348	364	340	338	319	308	308
30	306	304	318	342	324	316	319	339	335	344	362	355	336	329	343	345	360	357	338	343	358	304	349	337
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	30	30	30	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30
MED	298	290	299	318	344	303	306	342	357	348	341	336	318	322	322	324	332	338	344	326	302	318	322	308
U Q	308	306	318	332	350	350	319	352	364	354	346	347	327	326	328	330	337	348	351	336	316	329	330	315
L Q	281	284	292	308	326	286	294	333	349	338	334	321	311	308	314	320	322	327	331	317	293	308	308	296

NOV. 2012 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	U L 370	U L 362	L	L							
2										A	L	L	L	U L 356	L	L	L							
3									435	L	U L 369	L	L	L	U L 381	L	L							
4										L	L	L	L	L	L	L	A	L						
5										L	L	L	U L 404	U L 398	U L 371	U L 386	L							
6										L	L	U L 382	L	L	U L 380	U L 374	U L 407							
7										L	L	L	L	L	L	L	L							
8									L	L	L	L	L	U L 379	L	L	L	L						
9									L		L	L	L	U L 386	L	L	L							
10											L	U L 383	L	L	U L 372	L								
11										L	L	U L 388	L	L	U L 360	L	L							
12								416		L	L	L	L	L	L	L	L							
13									L	L	L	L	L		L	A	L							
14											L	L	L	L	L		L	435						
15										C	C	C	C	C	C	C	C							
16											L	L	U L 384	U L 359	L	L	431							
17									L		L	418	L	U L 351	L	L	L							
18										L		L	L	L	L	L								
19										L	L	A	L		L									
20											L	L	L	L	L	L	L							
21									L	L	L	L	L	L	L									
22										L	L	L	L	L	L	L	L							
23									433	L	L	U L 396	L	L	L	L	L							
24										L	L	U L 383	L	L	L	L								
25									L	L	L	L	U L 376	L	U L 395	L								
26									L	L	L	L	U L 387	L	L		438							
27										L	L	L	U L 366	L	L	L	L	435						
28								404			L	U L 395	U L 380	L	U L 385	L								
29								411	L 408	L 408	L 395	U L 397	L	L	L									
30								L	444	U L 412	U L 380	L	L	U L 387	U L 381	U L 399								
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	4	2	3	8	6	8	9	3	3	2						
MED								411	434	L 410	U L 380	U L 392	U L 382	U L 374	U L 380	U L 386	431	435						
U Q								416	440		L 395	U L 396	U L 387	U L 386	U L 383	U L 399	438							
L Q								404	420		U L 369	U L 383	U L 376	U L 358	U L 366	U L 374	U L 407							

NOV. 2012 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 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									232	244	248	264	258	294	262	240	224							
2										232	270	280	284	266	260	254	230							
3									220	228	274	230	266	260	252	234	222							
4										248	242	240	290	252	264	242	228	212						
5										244	234	234	254	240	256	248	220							
6										262	252	242	254	272	240	254	230							
7										246	254	262	256	270	260	236	234							
8									234	242	246	240	268	262	266	254	226	220						
9									212		258	248	240	256	280	264	244							
10											256	258	270	268	268	254								
11										244	238	242	280	264	294	258	238							
12								216		246	256	242	286	252	L 258	254	236							
13									232	242	232	258	272		262	244	252							
14											254	266	274	294	260		242	224						
15										C	C	C	C	C	C	C	C							
16											244	246	272	268	260	260	214							
17									216		258	242	286	296	274	254	232							
18										226		240	270	272	278	248								
19										238	254	230	L 260		268									
20											246	282	264	254	248	280	248							
21									236	264	244	280	294	258	248									
22										236	240	230	274	278	266	268	246							
23									220	228	232	228	272	262	266	262	242							
24										240	244	264	224	242	252	252								
25									234	244	254	254	260	268	244	242								
26									224	224	248	246	256	258	248		238							
27										230	256	246	270	272	244	238	222	206						
28								238			244	236	262	242	246	266								
29								244	224	224	236	232	264	244	270									
30								228	228	236	244	244	238	244	250	240								
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	22	28	29	29	27	29	24	20	4						
MED								233	226	241	247	244	268	262	260	254	233	216						
U Q								241	233	244	255	260	274	272	267	259	242	222						
L Q								222	220	230	243	238	257	252	249	242	225	209						

NOV. 2012 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	266	242	228	224	206	314	290	236	226	216	202	206	204	198	198	208	216	200	200	206	252	214	252	232
2	254	236	242	228	266	282	234	224	234	A	A	H 214	A 224	214	222	H 190	226	216	208	216	230	220	226	246
3	258	228	208	230	206	A	276	214	204	194	184	216	190	E B 232	202	216	214	210	186	196	204	208	202	224
4	250	236	234	260	220	230	250	216	226	218	212	H 190	188	H 178	208	H 198	A	160	204	200	200	208	214	220
5	250	222	202	206	216	242	272	230	224	220	212	216	182	218	192	208	218	208	210	194	248	216	208	218
6	232	256	258	262	238	252	280	236	228	226	230	204	200	206	202	200	194	216	196	202	254	230	224	220
7	252	254	232	252	232	298	250	224	230	226	236	218	210	A	248	224	228	216	214	214	240	220	218	222
8	234	290	280	228	218	248	248	216	212	206	198	208	E B 236	204	212	E A 242	A 204	228	202	198	230	230	210	214
9	240	268	278	268	232	200	244	218	210	218	224	234	230	206	H 200	H 184	216	220	202	190	212	200	214	232
10	296	292	270	256	234	190	256	210	212	216	216	202	194	198	228	234	240	220	196	194	204	202	182	224
11	242	224	262	248	234	188	254	218	214	218	212	204	216	218	212	230	236	218	190	184	202	198	226	220
12	232	246	264	232	222	214	238	220	214	214	198	210	208	206	210	A 238	210	218	204	194	192	234	216	218
13	256	254	228	234	250	266	256	236	226	212	210	B 222	206	222	A 238	A	204	230	208	198	226	226	234	228
14	246	286	258	230	196	288	314	252	226	220	220	222	228	Y 218	218	230	218	202	238	210	220	214	196	208
15	324	282	216	194	194	258	272	246	220	C	C	C	C	C	C	C	C	220	198	198	198	200	224	236
16	248	234	234	234	216	206	258	226	216	210	214	214	200	206	226	218	212	222	192	188	208	190	212	246
17	250	270	250	238	216	200	222	204	206	232	234	202	240	228	230	200	224	214	192	188	230	208	212	222
18	258	264	276	266	226	204	304	246	214	216	228	208	246	234	234	226	H 210	224	202	186	228	194	236	224
19	220	250	262	262	236	210	238	224	212	218	210	A	204	246	244	210	240	218	188	198	236	204	226	220
20	248	276	270	254	212	H 194	242	206	224	224	222	216	228	224	208	222	240	222	198	204	212	228	224	234
21	274	272	254	218	246	274	288	246	230	218	210	206	H 192	E Y 234	210	216	234	234	206	204	256	226	206	232
22	290	272	252	220	216	376	298	242	232	230	224	218	198	232	204	H 198	222	220	206	188	192	206	224	216
23	206	222	220	214	224	276	272	236	202	218	206	212	200	210	216	H 192	218	218	190	184	200	196	206	218
24	244	260	238	208	198	342	304	252	232	222	220	194	216	220	232	226	222	206	226	214	234	210	206	248
25	264	304	260	218	214	322	290	246	226	232	220	212	208	222	202	210	222	230	186	182	224	216	216	232
26	266	320	290	246	222	210	308	244	224	H 184	218	224	198	E Y 244	212	232	200	208	186	180	230	228	214	228
27	256	280	290	248	228	234	254	230	222	204	208	218	202	224	208	212	218	204	180	192	200	204	212	232
28	252	292	278	236	202	202	E B 338	B	220	228	210	210	210	222	196	206	226	204	184	158	214	192	214	242
29	282	292	280	268	246	210	254	210	210	200	H 182	H 192	234	226	220	240	220	224	196	182	202	224	208	258
30	264	272	260	230	248	268	264	E B 234	190	198	206	230	228	218	210	210	216	208	196	210	190	222	218	230
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	30	29	30	28	28	28	29	28	29	28	28	30	30	30	30	30	30	30
MED	252	266	258	234	222	242	259	228	221	218	212	212	207	218	212	212	218	218	198	195	217	212	214	226
U Q	264	282	270	254	234	279	290	243	226	223	221	218	228	227	227	228	226	222	206	204	230	224	224	232
L Q	244	242	234	224	214	205	250	217	212	211	207	205	199	206	203	H 203	213	208	190	188	202	202	208	220

NOV. 2012 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 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								126	110	108	108	108	108	108	108	108	A	A						
2								A	108	108	108	A	A	A	A	A	A	A						
3								118	110	110	112	110	110	B	110	110	A	142						
4								A	108	108	108	108	108	108	108	A	A	A						
5								116	108	112	110	110	110	A	A	110	110	142						
6								122	110	110	108	108	A	112	A	108	108	148						
7								A	114	112	110	110	108	A	A	A	A	108						
8								150	A	A	A	A	B	E Y 124	A	A	108	118						
9								130	108	108	108	B	114	A	A	112	A	A						
10								168	110	110	108	108	108	110	110	110	116	108						
11								136	108	108	108	108	A	110	110	110	110	110						
12								132	112	110	110	108	A	108	112	A	A	A						
13								152	114	114	110	B	A	A	110	114	112	112						
14								138	120	114	114	108	110	108	A	112	112	114						
15								146	110	C	C	C	C	C	C	C	C	110						
16								128	110	122	108	110	112	108	A	106	114	118						
17								182	124	110	108	A	110	118	110	112	112	114						
18								158	110	120	112	112	A	112	112	110	112	114						
19								A	118	110	A	110	A	A	110	110	110	114						
20								166	116	116	116	A	A	116	112	112	A	A						
21								152	116	112	110	110	110	108	108	106	B	116						
22								156	A	A	A	A	A	A	A	A	A	A						
23								154	108	108	A	110	A	114	112	112	112	A						
24								B	110	114	110	110	A	110	112	114	A	116						
25								B	112	112	112	A	A	A	A	A	A	A						
26								B	A	A	A	108	108	A	108	112	112	122						
27								132	114	110	110	110	A	A	A	A	122	A						
28								B	110	110	A	112	120	112	112	112	112	116						
29								B	108	A	108	110	110	110	110	110	110	114						
30								B	114	114	112	112	A	A	A	A	A	114						
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								20	27	25	23	21	14	17	17	20	16	20						
MED								142	110	110	110	110	110	110	110	110	112	114						
U Q								155	114	114	112	110	110	113	112	112	112	118						
L Q								129	108	109	108	108	108	108	109	110	110	113						

NOV. 2012 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	94	96	B	B	B	162	G	110	108	108	G	114	G	G	106	106	B	B	94	B	B	B
2	B	98	98	98	B	98	102	138	120	116	110	114	108	108	108	122	108	96	92	B	102	B	B	96
3	B	B	B	B	B	96	B	94	G	122	116	116	112	B	120	112	108	106	104	B	B	B	B	B
4	90	B	B	B	B	B	B	140	138	126	118	128	G	116	116	112	108	106	134	118	106	104	94	B
5	B	B	B	B	96	B	B	140	116	118	116	116	110	110	108	106	G	112	102	100	B	98	96	96
6	96	104	102	B	B	B	116	G	128	114	108	104	102	102	100	100	G	100	B	98	B	118	94	94
7	B	B	B	B	B	B	B	138	142	150	134	130	102	102	104	106	120	110	102	98	94	92	96	B
8	B	B	B	B	B	B	B	G	100	102	100	100	B	96	96	94	96	G	96	96	B	B	B	B
9	B	B	B	B	100	B	100	168	G	186	G	B	106	110	110	112	110	102	B	B	B	B	B	92
10	B	B	B	B	B	98	106	G	G	182	G	G	G	106	G	156	102	G	102	B	B	B	B	B
11	92	98	B	B	B	B	B	G	130	132	112	G	108	G	G	192	104	G	B	B	B	B	B	92
12	B	B	B	B	B	B	B	G	200	136	114	104	104	104	100	100	98	96	B	116	B	B	B	B
13	B	B	B	B	B	B	B	G	160	104	G	B	98	146	114	110	104	G	B	98	B	B	B	94
14	B	B	B	B	B	B	B	G	148	102	102	110	110	110	100	100	98	G	B	94	B	94	96	B
15	B	B	96	102	96	B	B	G	170	C	C	C	C	C	C	C	C	G	B	B	B	94	B	B
16	B	B	B	B	B	B	B	G	146	106	124	102	98	100	116	118	94	94	94	94	B	B	106	102
17	88	B	B	B	B	B	B	G	106	210	182	100	192	184	98	98	98	168	112	98	B	B	108	108
18	B	B	B	B	B	B	B	G	190	106	188	G	164	176	154	206	100	158	98	94	104	92	90	B
19	B	B	B	B	B	B	B	138	104	G	106	116	100	170	162	100	210	200	B	110	128	120	96	108
20	104	102	102	100	100	B	B	G	190	166	154	146	134	128	118	114	92	94	92	134	90	90	B	B
21	B	B	B	B	B	B	102	G	G	G	G	120	106	114	108	112	B	192	136	100	96	92	90	B
22	B	B	B	B	B	B	B	G	106	182	104	100	112	106	106	106	106	106	B	114	98	96	104	B
23	B	B	B	B	B	B	B	G	G	G	106	G	104	104	G	96	G	98	B	94	132	146	116	96
24	B	B	B	B	B	B	B	B	174	138	126	110	102	G	104	102	106	106	98	98	B	B	B	B
25	96	B	B	B	B	B	B	166	110	102	108	106	104	102	100	100	100	100	100	124	108	B	B	B
26	B	B	B	B	90	B	B	B	110	108	198	104	104	100	100	100	150	G	B	B	138	B	B	B
27	B	B	B	B	B	B	B	G	G	G	174	122	104	100	100	102	98	104	B	132	90	92	B	B
28	B	92	B	B	B	116	B	B	170	192	106	176	124	104	102	100	174	94	124	112	B	B	B	90
29	90	B	B	98	B	96	B	B	G	106	G	108	176	152	126	168	G	146	120	110	100	94	B	B
30	B	B	B	102	106	106	106	B	184	108	190	174	110	108	104	102	102	G	98	110	98	98	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	7	5	5	6	6	6	6	9	22	25	24	23	25	26	25	28	24	22	17	22	15	15	12	11
MED	92	98	98	99	98	98	104	140	140	118	115	110	106	108	106	106	104	106	102	100	100	94	96	96
U Q	96	103	102	102	100	106	106	164	170	158	144	122	112	116	116	113	108	112	116	114	108	104	105	102
L Q	90	95	95	98	96	96	102	138	110	106	107	104	103	102	100	100	98	98	97	98	94	92	94	92

IONOSPHERIC DATA STATION Okinawa

NOV. 2012 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				H1		C1	C1	C1		C1			C1	C1			F1			
2		F1	F2	F1		F1	F1	H1	C1	C1	C2	C1	C1	C1	CQ11	CL11	C1	L3	F1		F1			F1
3						F3		L1		C1	C1	C1	C1		C1	C1	C1	L1	F1					
4	F1							H1	H1	C1	C1	C1		C1	C1	C1	C2	C1	F1	FF31	F1	F1	F2	
5					F1			H1	C1	C1	C1	C1	C1	C1	C1	L1		L1	F1	F1		F4	F2	F1
6	F1	F1	F2				F1		C1	C1	C1	C1	L1	L1	L1	L1		L1		F1		FF11	F2	F1
7								H1	H1	H1	H1	H1	L1	CL21	C1	C1	CL11	CL11	F2	FQ21	F1	F1	F1	
8									L1	L1	L1	L1		L1	L1	L2	L1		F2	F1				
9					F1		F1	H1		H1			L1	C1	C1	C1	C1	L1						F1
10						F1	F1			H1				L1		HL11	L1		F3					
11	F1	F1							H1	H1	C1		L1			H1	L1							F1
12									H1	H1	C1	L1	L1	L1	L1	L2	L1	L2		F1				
13									HL11	L1			L1	HL11	C1	C1	C1			F1				F1
14									HL11	L1	L1	C1	C1	C1	L1	L1	L1			F1		F1	F1	
15			F1	F1	FQ11				H1													F1		
16									H1	L1	C1	L1	L1	L1	CL11	CL11	L1	L1	F1	F1			F1	F1
17	F1								L1	H1	HC11	L1	HL11	HL11	L1	L1	L1	H1	FF11	F1			F1	F1
18									H1	L1	H1		HC11	HL11	HL11	HL11	L1	HL11	F3	F3	F2	F1	F1	
19								H1	L1		L1	CL11	L1	HL11	HL11	L1	H1	H1		FF11	F5	F1	F1	F1
20	F3	F3	F2	F3	F2				HHL11	HL11	HL11	HL11	HL11	CL11	CL11	C1	L2	L2	F3	FF11	F1	F1		
21							F1					C1	C1	C1	C1	C1		H1	F1	FF61	FQ31	F3	F3	
22									C2	HC11	C1	L1	C1	L2	L1	L1	L1	L2		F3	F1	F2	F1	
23											L1		L1	L1		L1		L1		F1	F6	F1	F1	F1
24									HC11	HL11	C1	C1	C1		L1	L1	C1	LH21	F3	F1				
25	F1							H1	C1	L1	C1	C1	C1	C1	L1	L1	L2	L1	F1	F1	F1			
26					F1				C2	C1	HL11	L1	L1	L1	L1	L1	HL11				F1			
27											HL11	C1	C1	C1	C1	L1	L2	L1		F1	F1	F1		
28		F1				F1			H1	H1	CH11	HL11	CL11	C1	L1	L1	HL11	HL11	F1	F1				F1
29	F1			F1		F1				C1		C1	H1	H1	C1	HL11		HL11	F2	F1	F1	F2		
30				F3	F1	F1	F1		H1	C1	H1	HC11	C1	C1	C2	C3	C2		F1	FF11	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																								

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

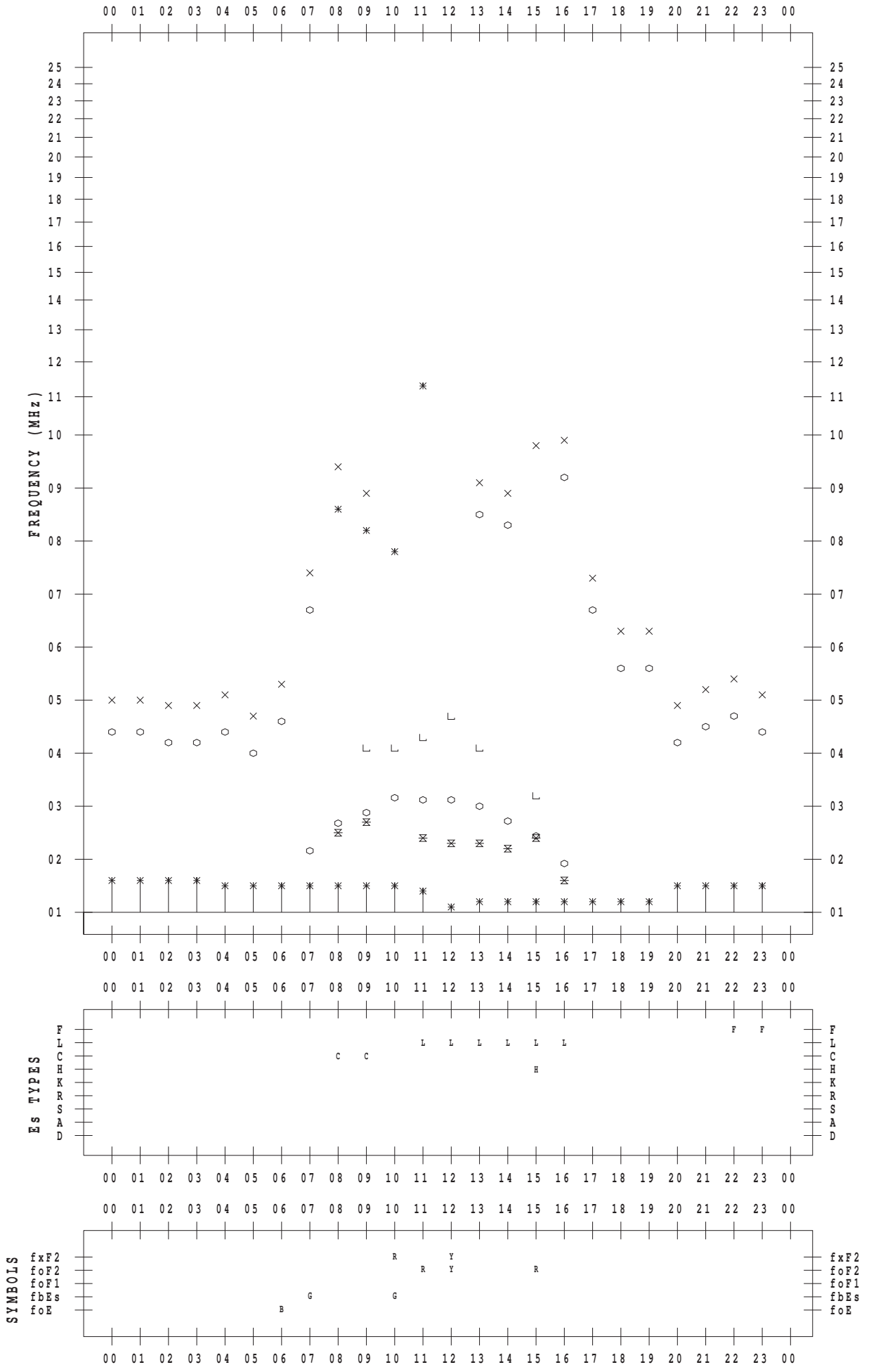
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 1

135 °E MEAN TIME



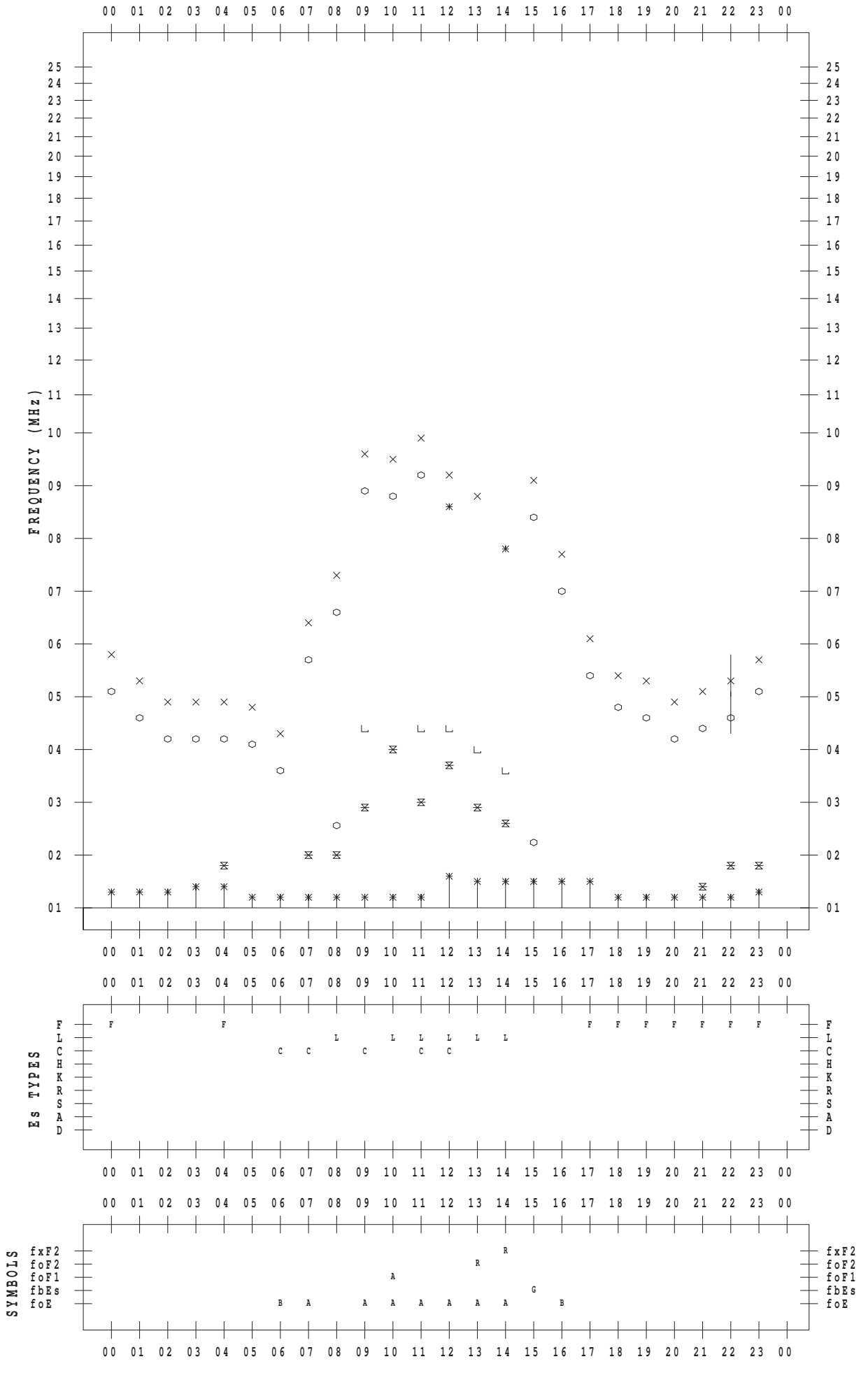
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 2

135 °E MEAN TIME



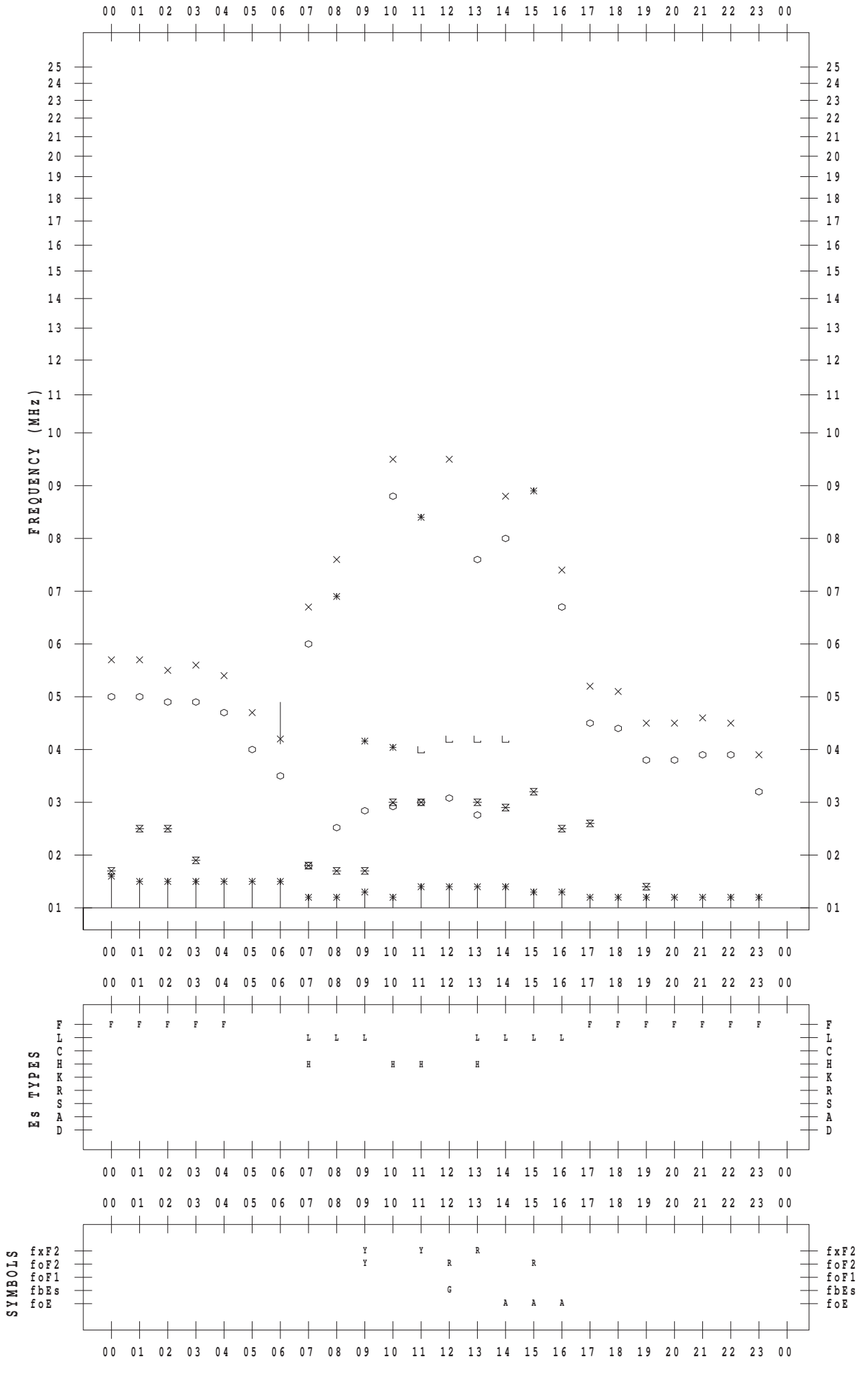
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 3

135 °E MEAN TIME



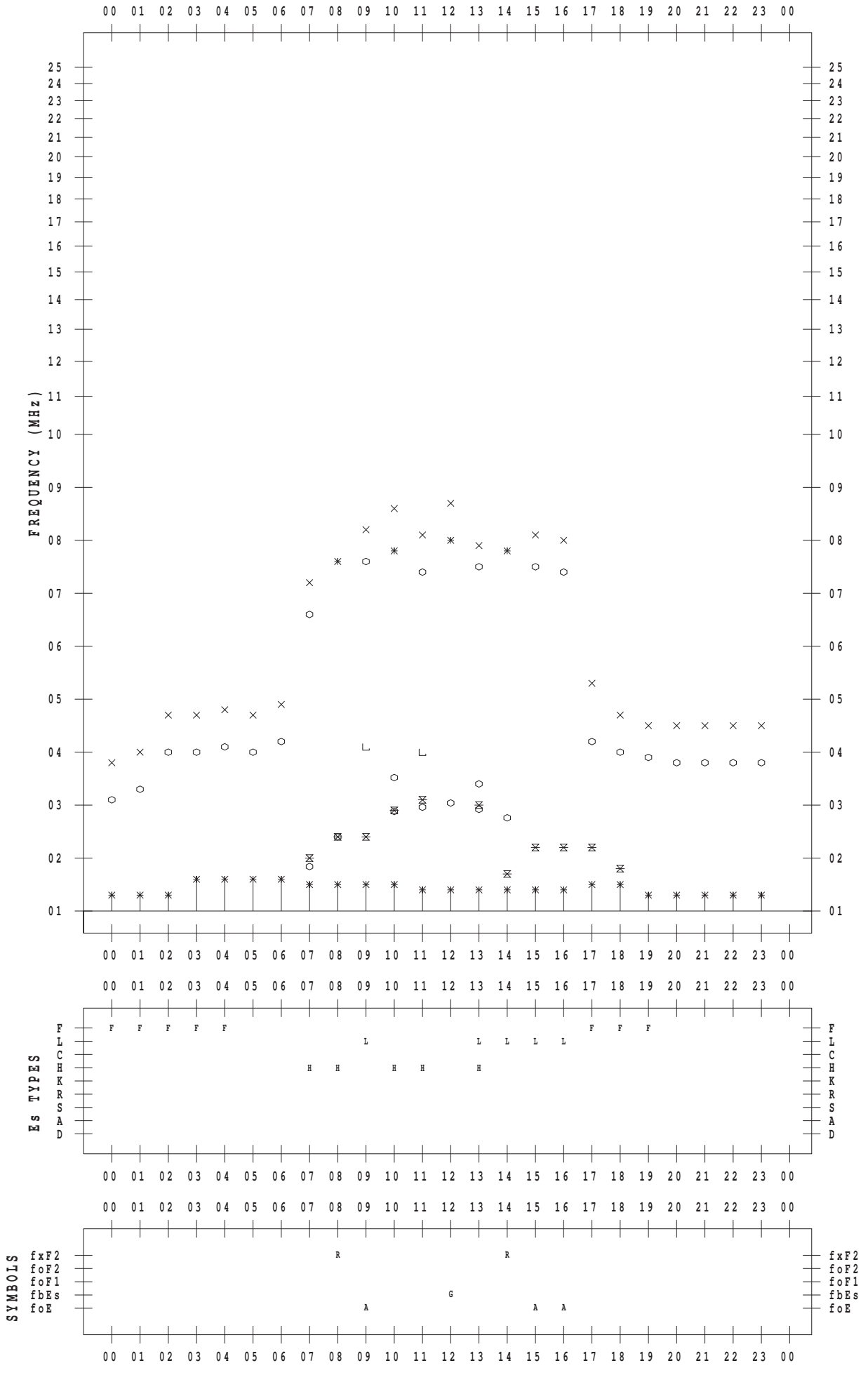
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 4

135 °E MEAN TIME



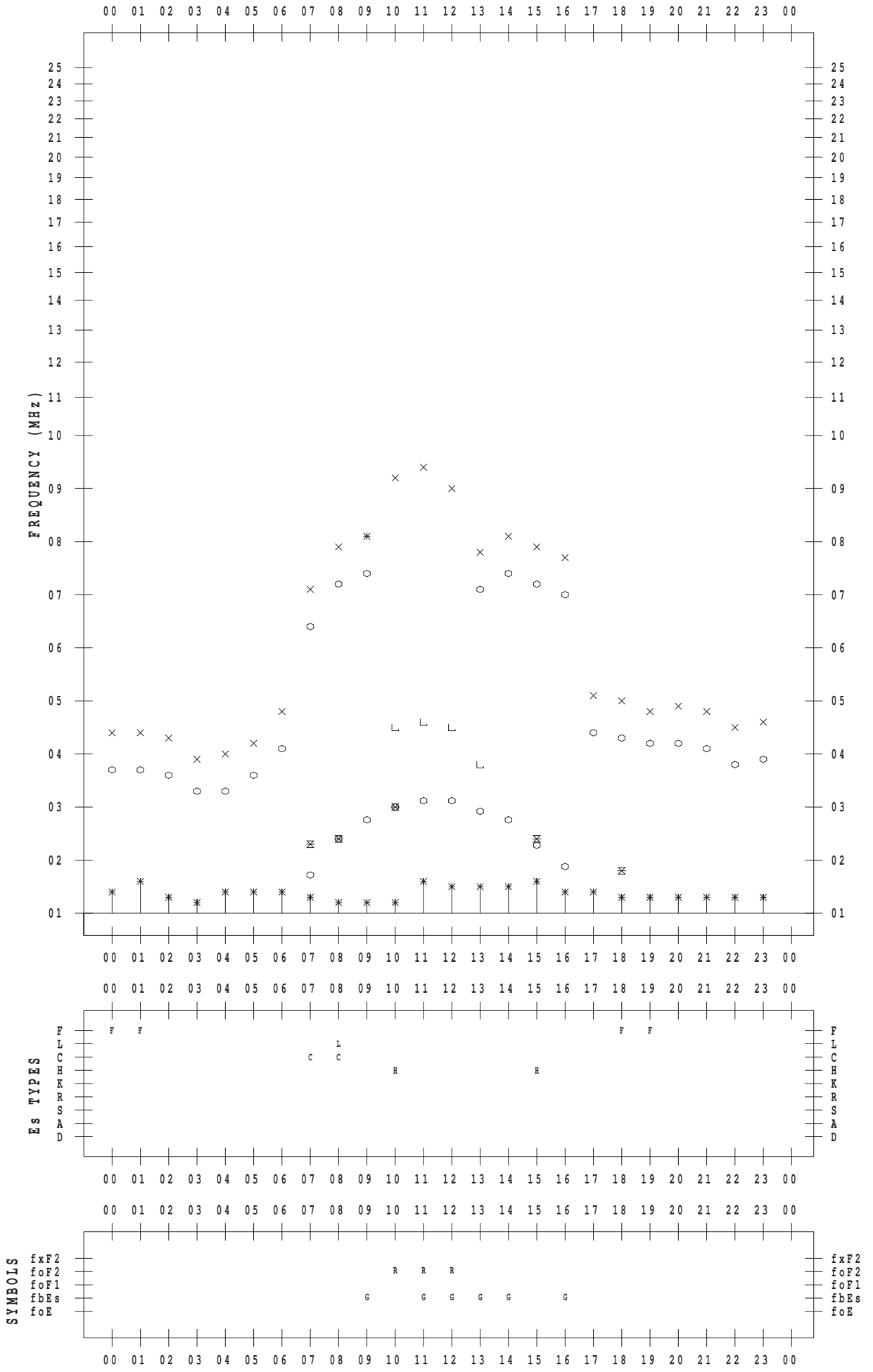
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 5

135 °E MEAN TIME



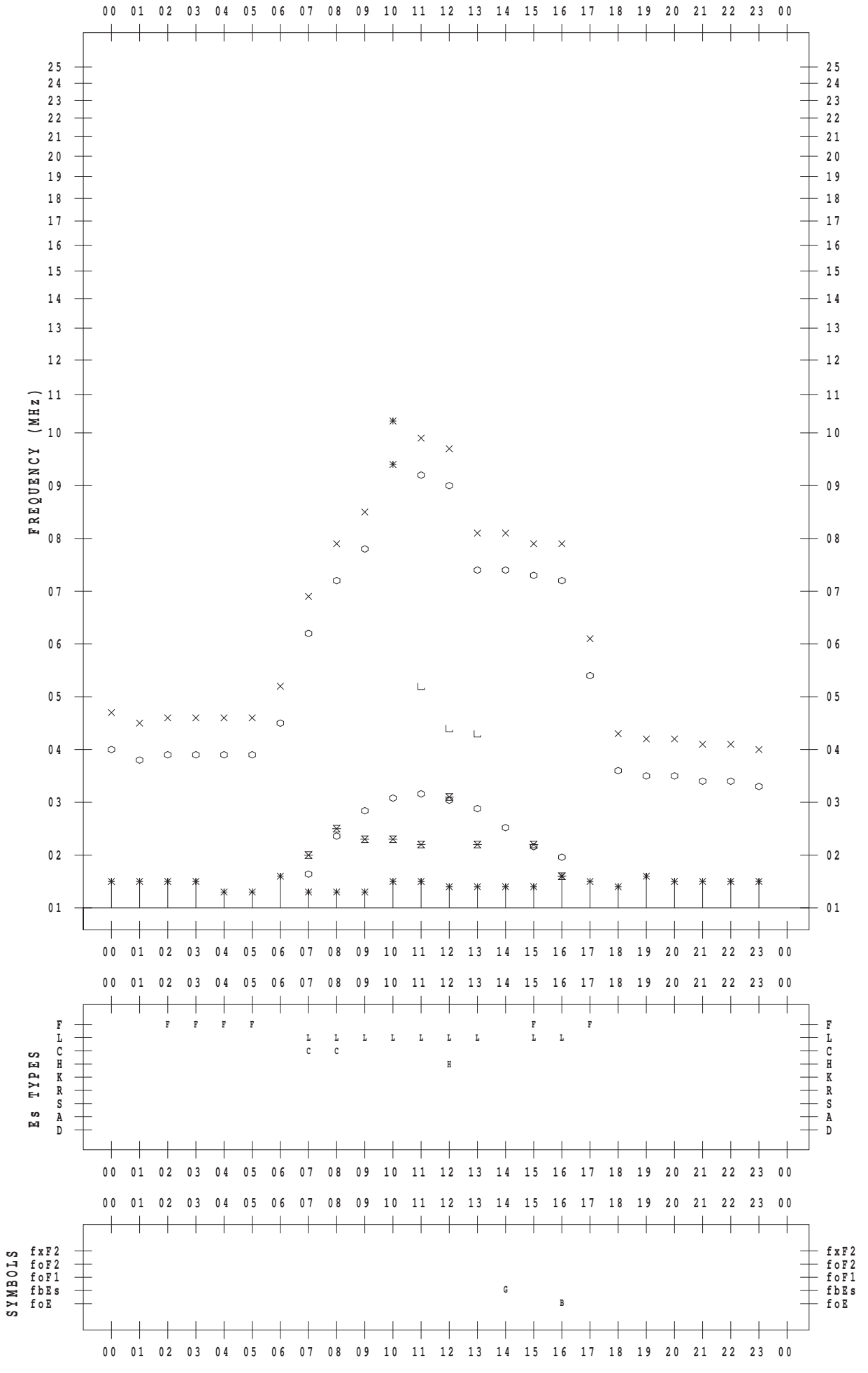
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 6

135 °E MEAN TIME



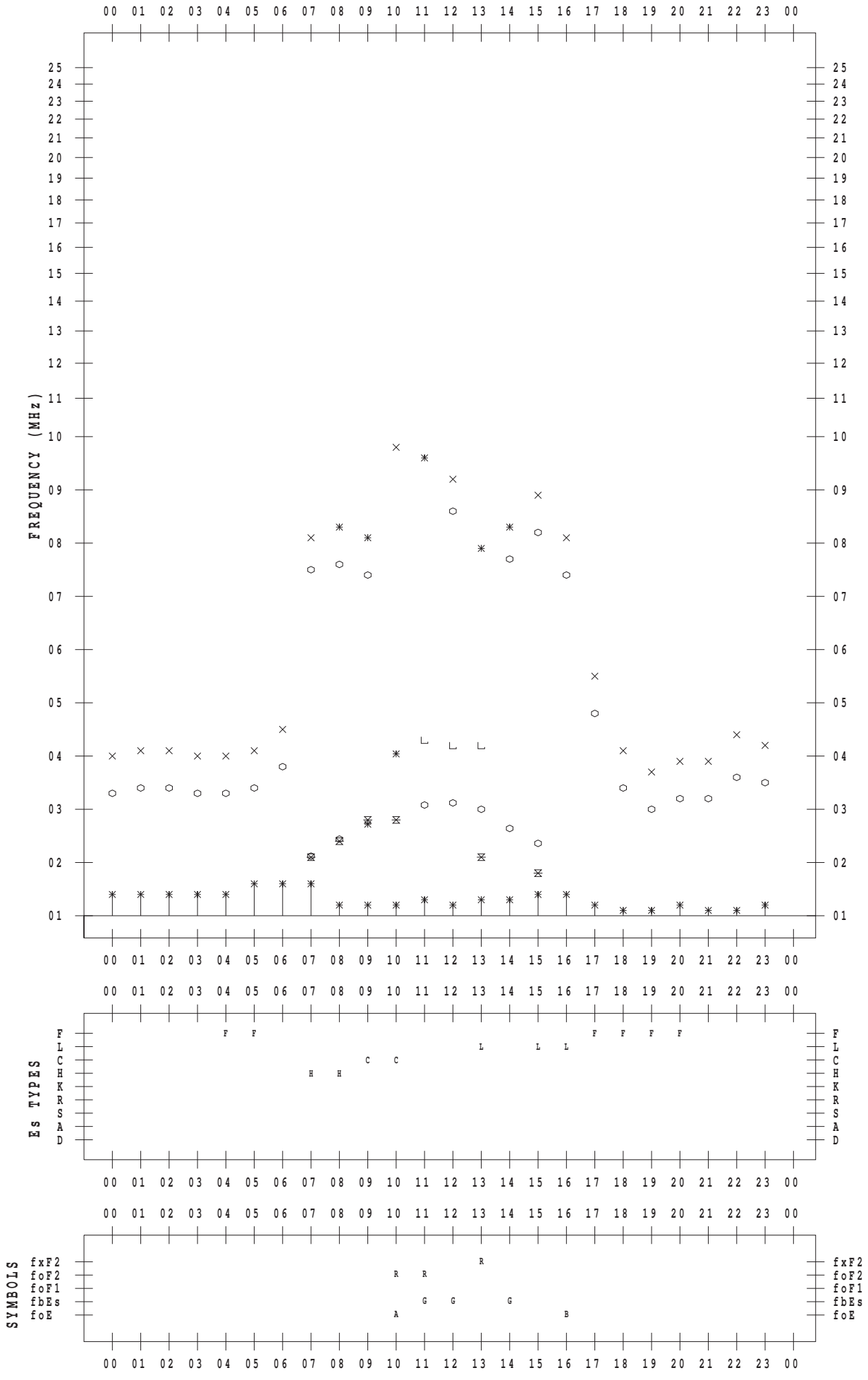
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 7

135 °E MEAN TIME



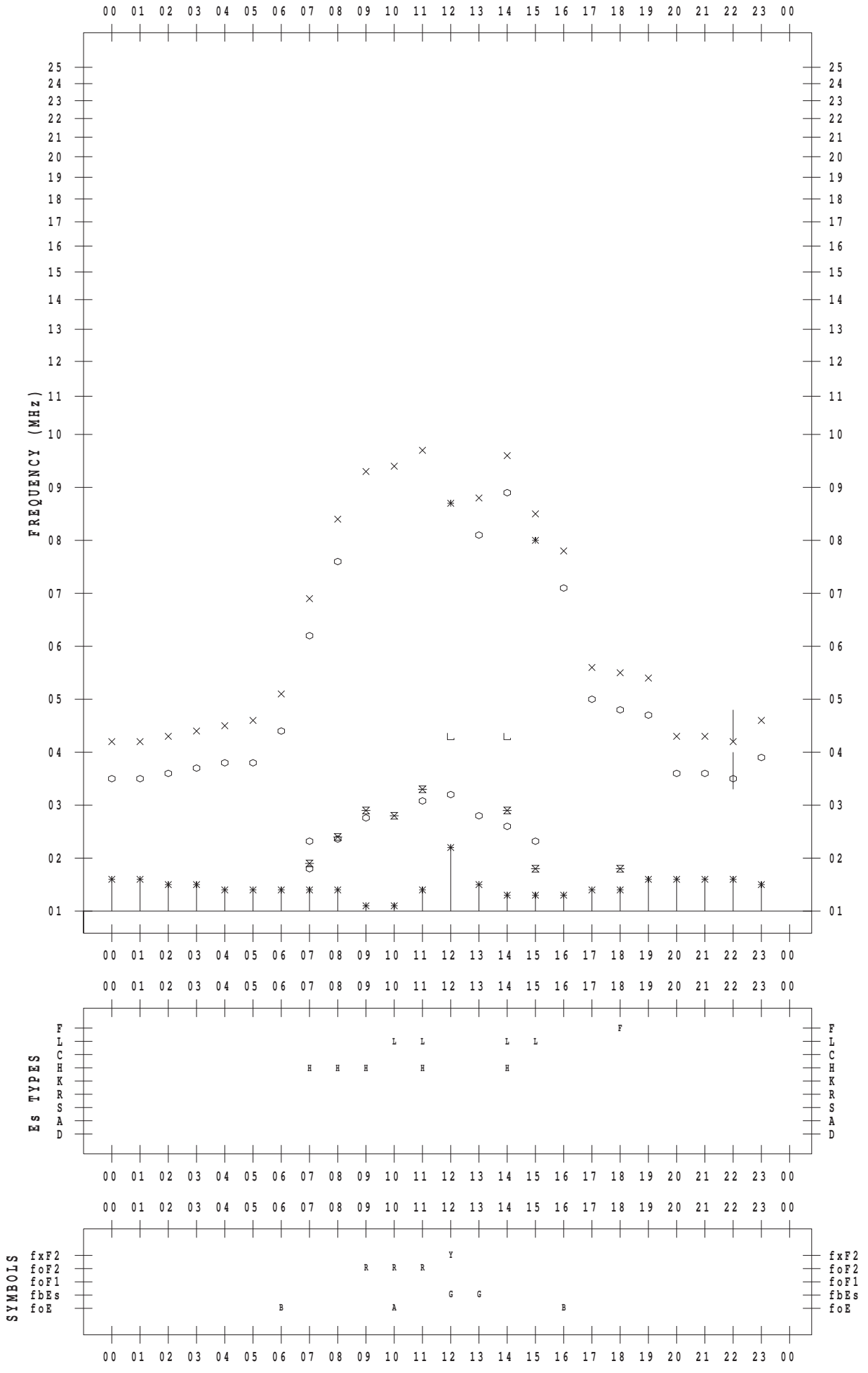
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 8

135 °E MEAN TIME



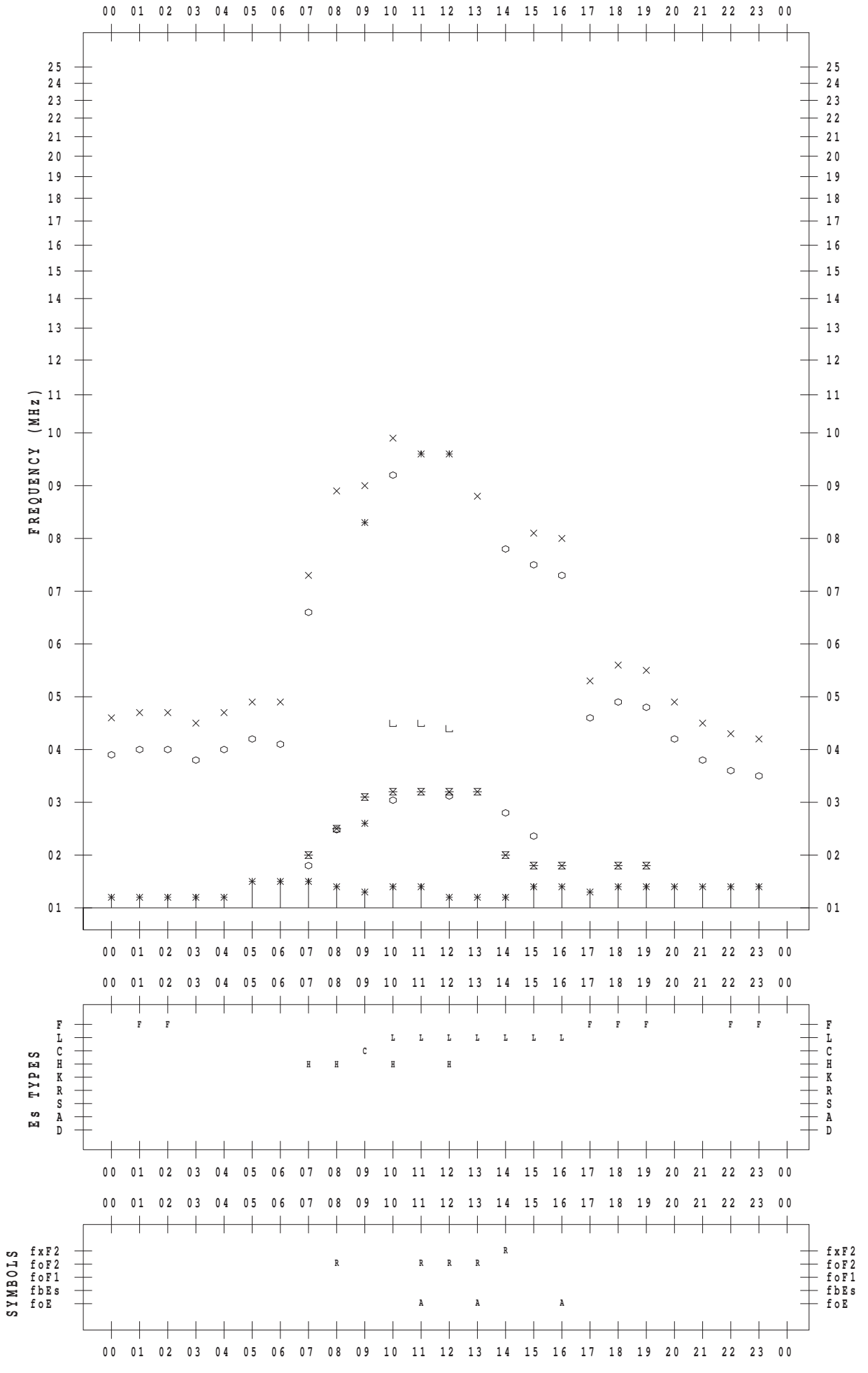
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/ 9

135 °E MEAN TIME



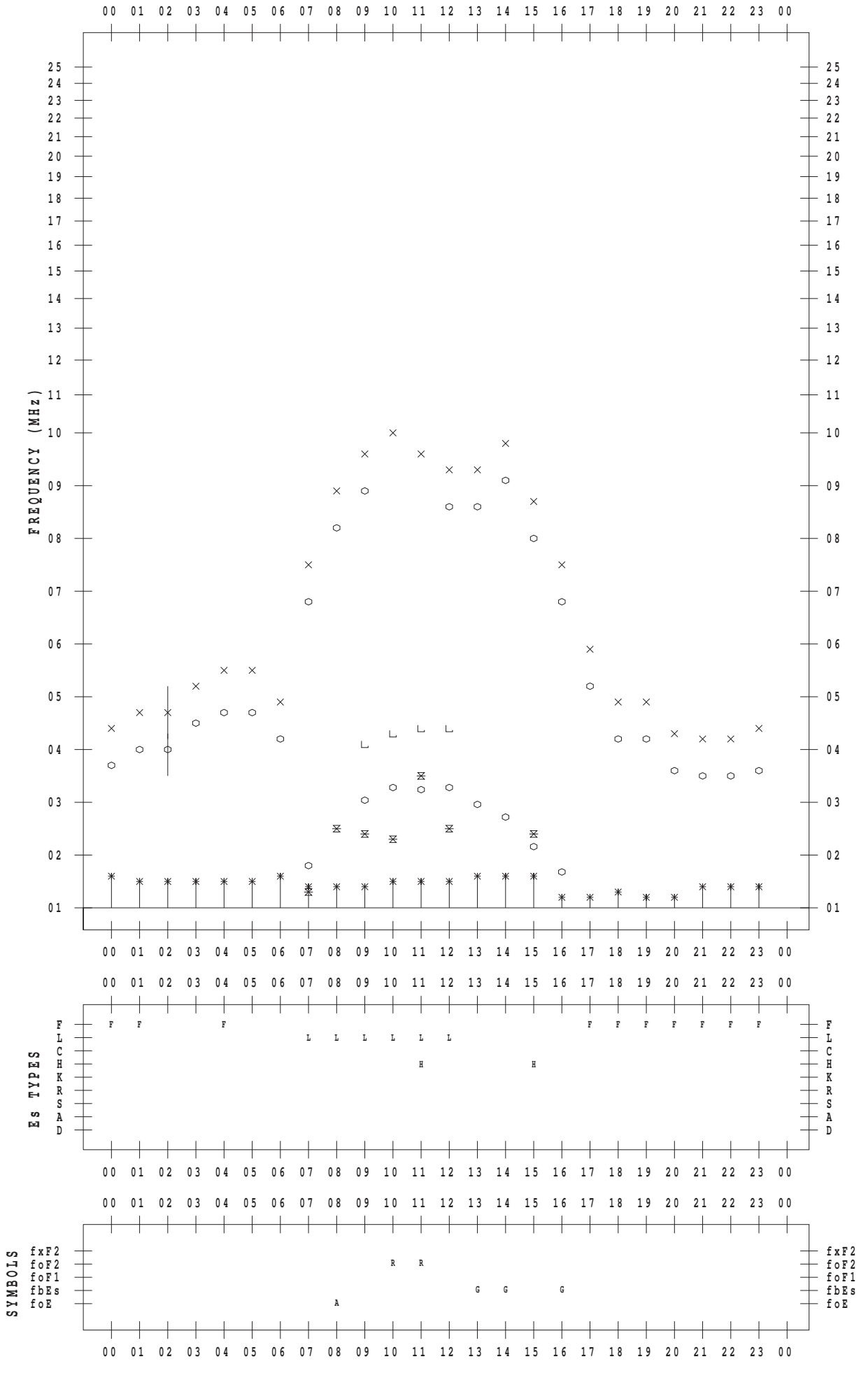
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/10

135 °E MEAN TIME



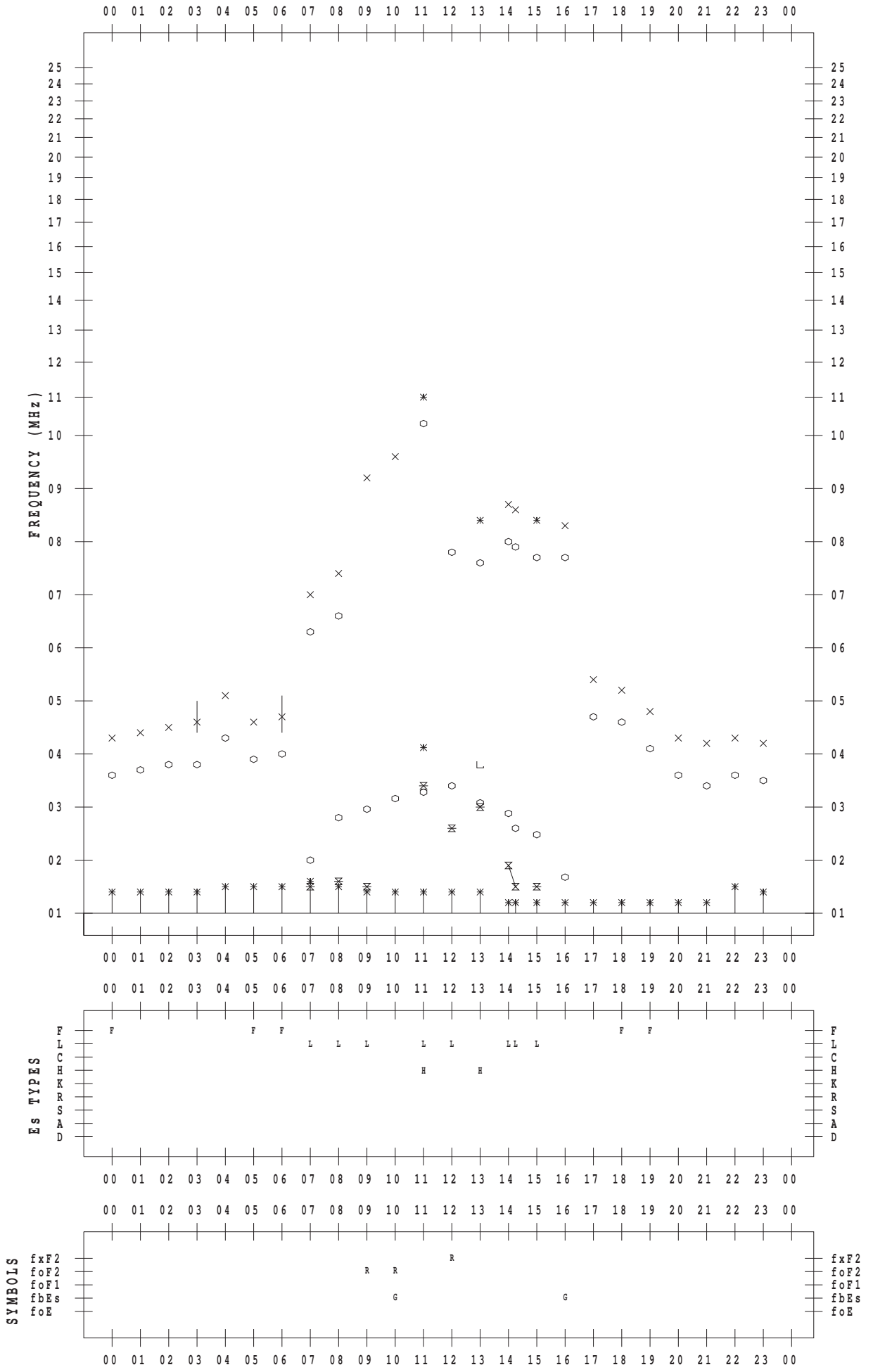
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/11

135 °E MEAN TIME



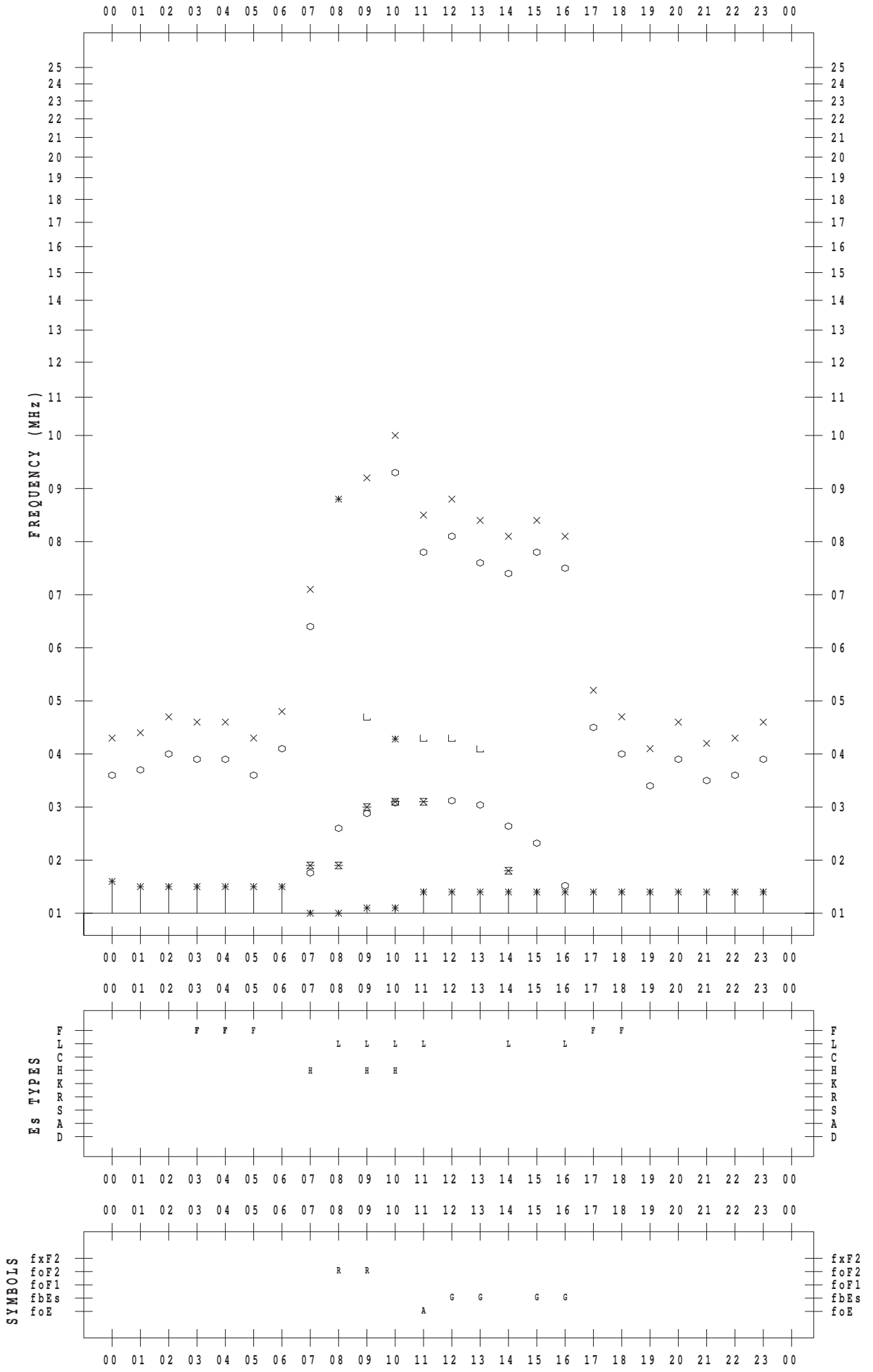
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/12

135 °E MEAN TIME



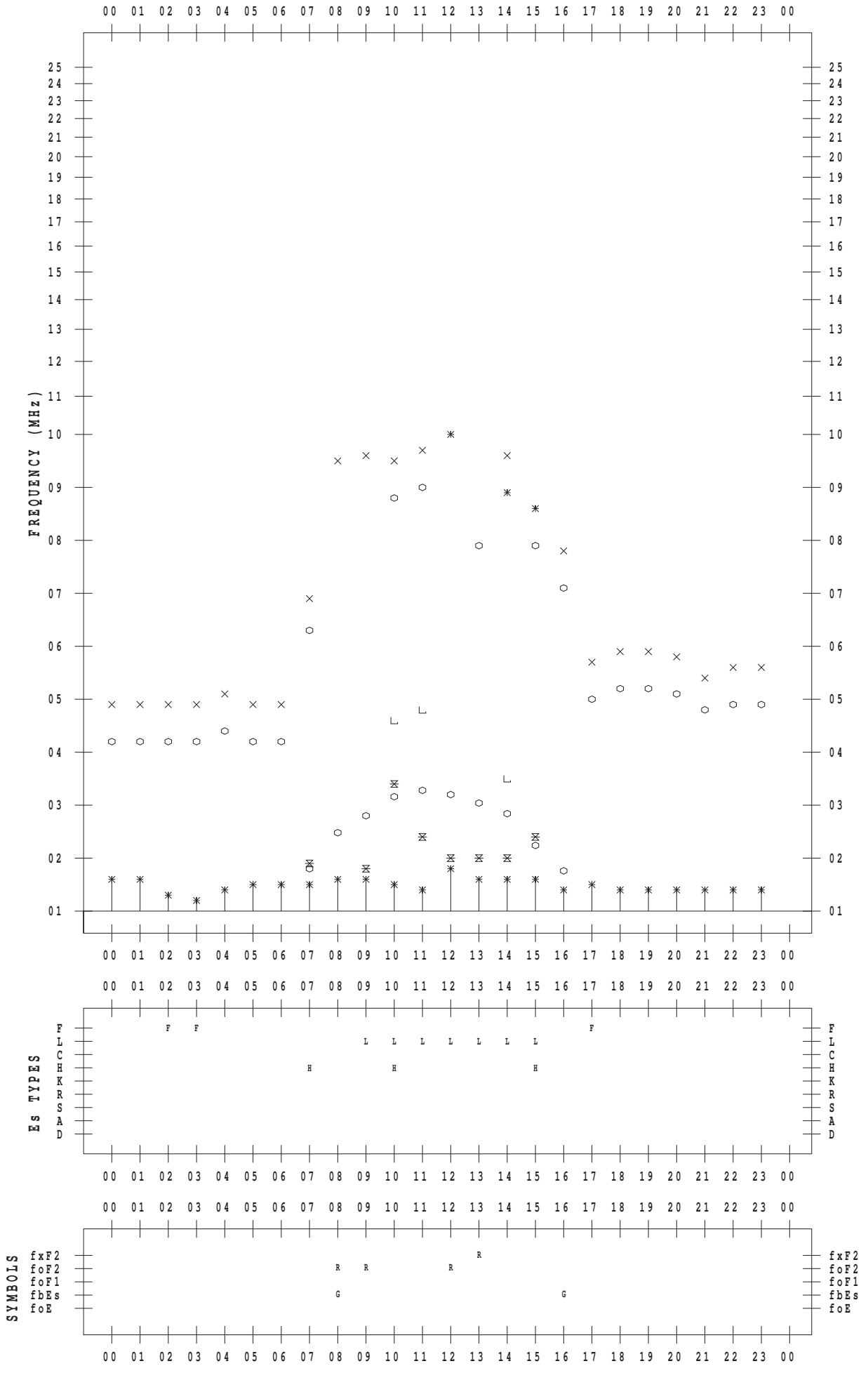
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/13

135 °E MEAN TIME



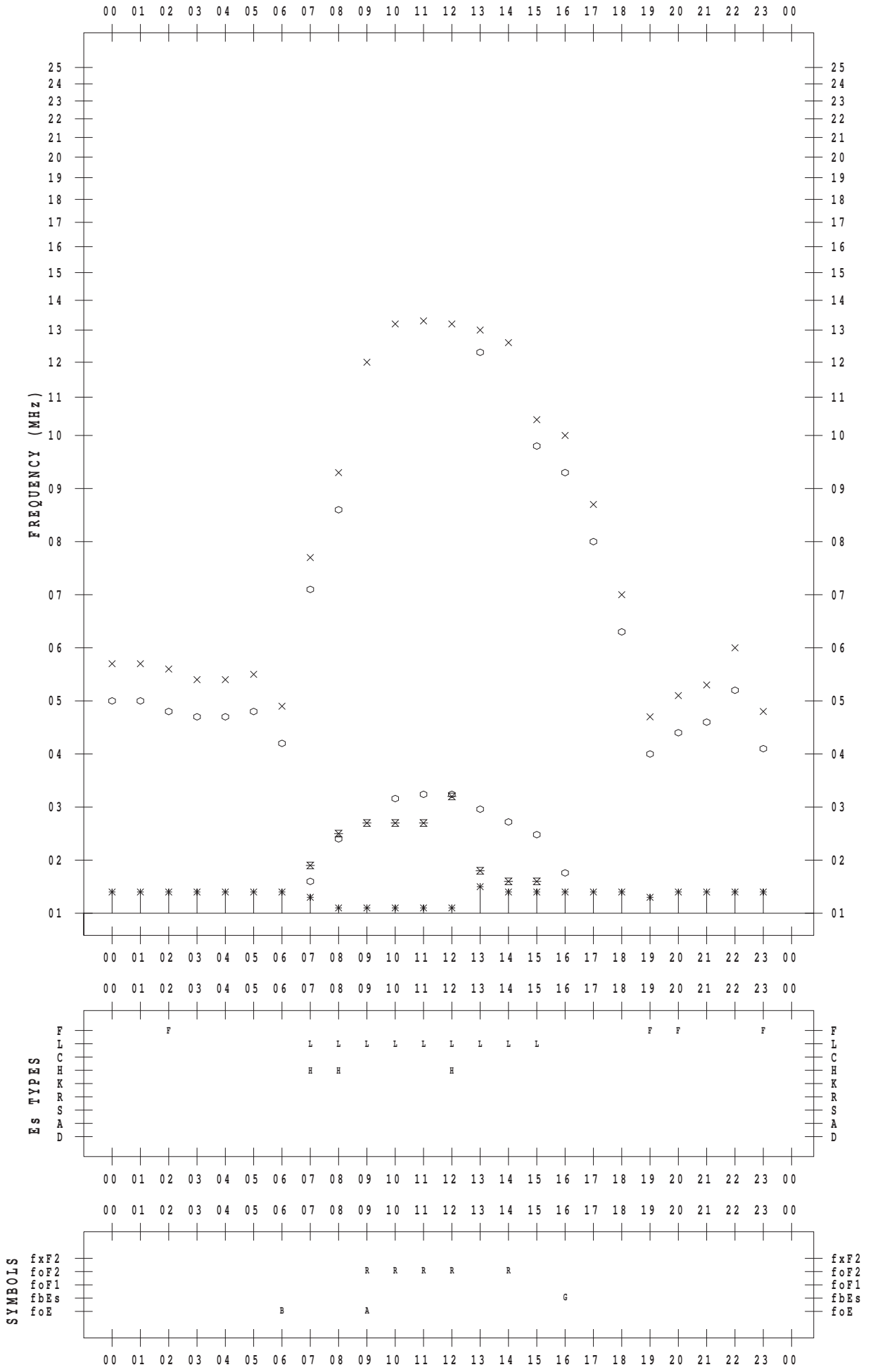
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/14

135 °E MEAN TIME



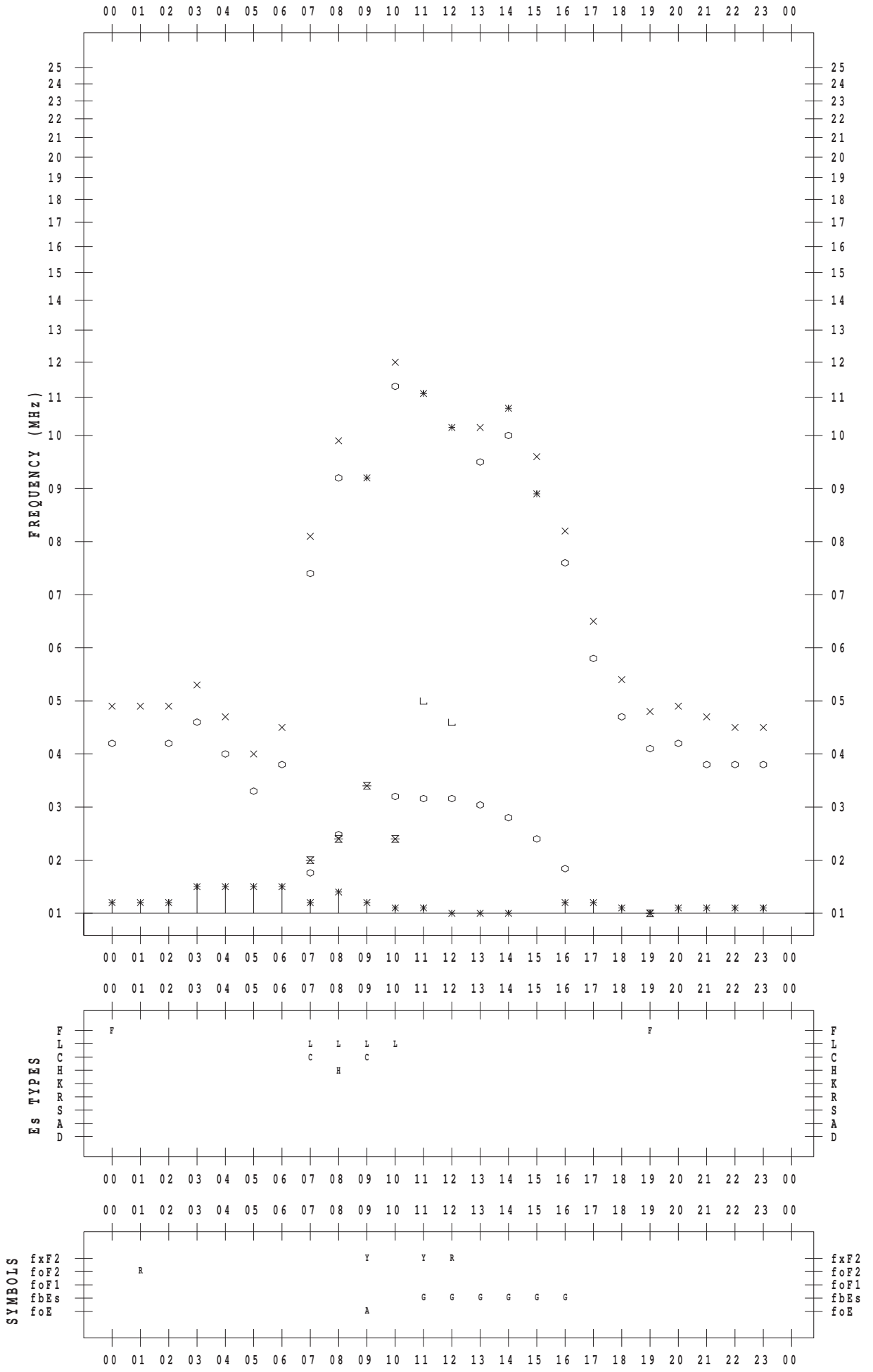
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/15

135 °E MEAN TIME



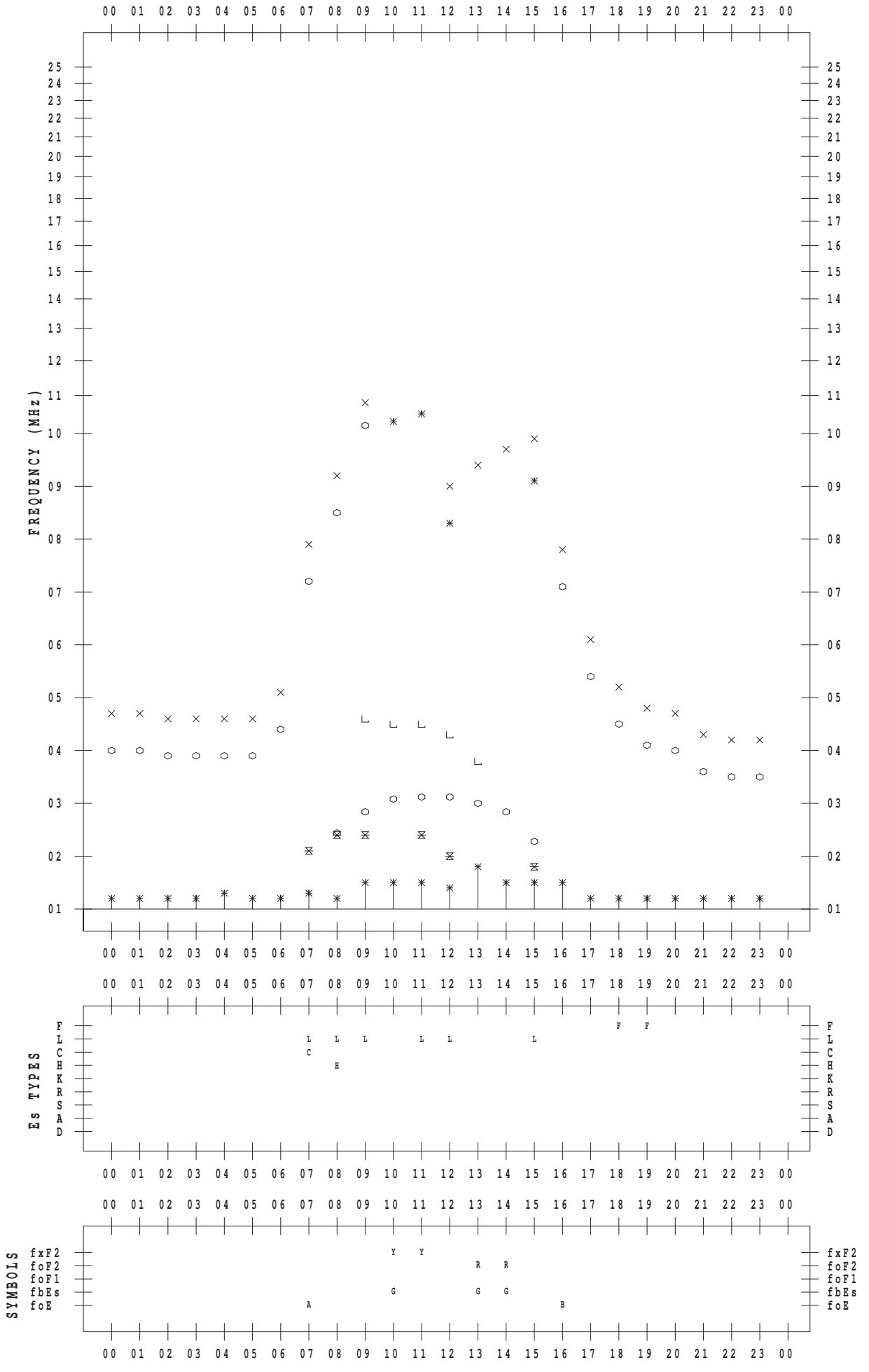
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/16

135 °E MEAN TIME



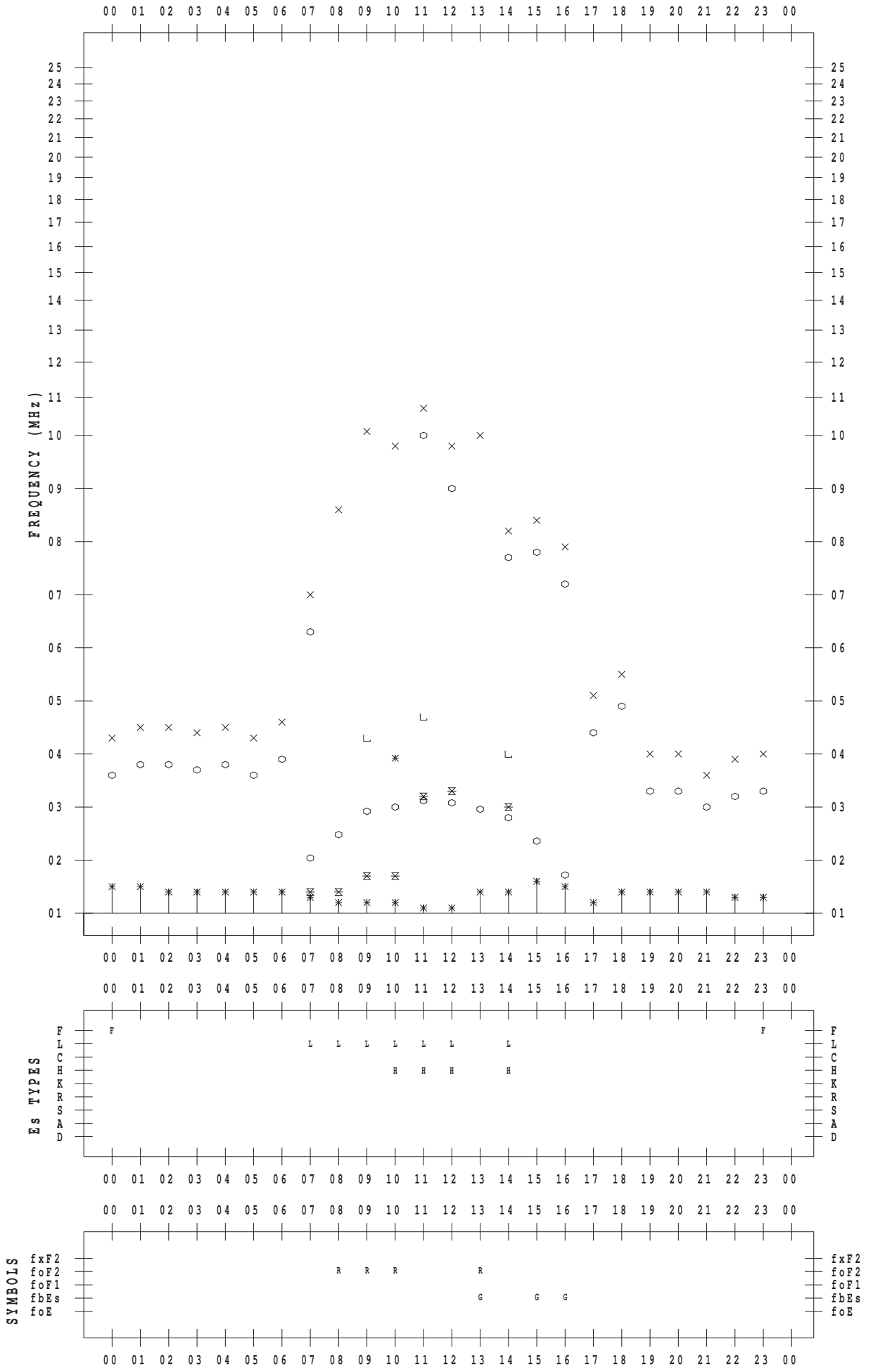
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/17

135 °E MEAN TIME



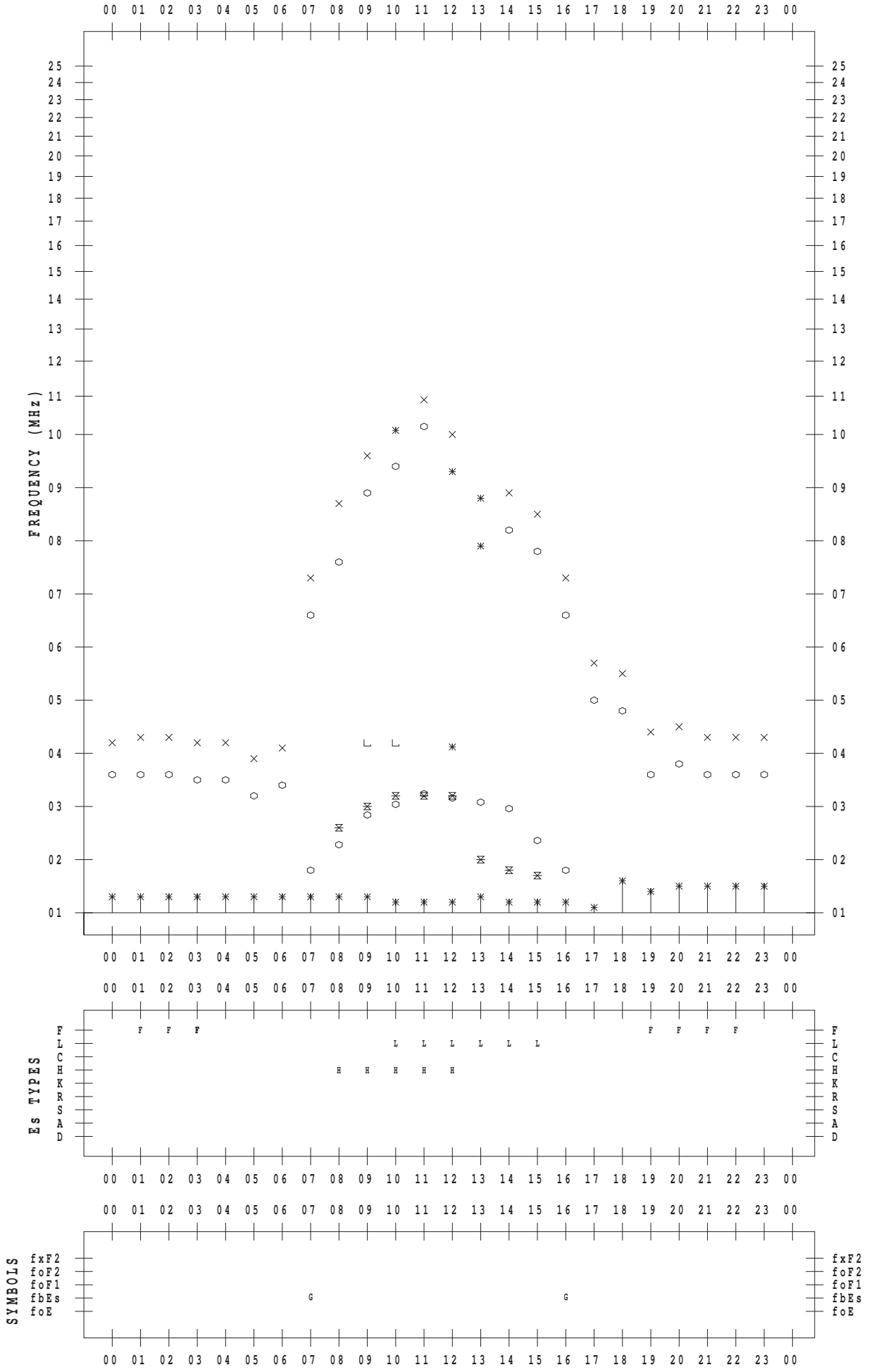
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/18

135 °E MEAN TIME



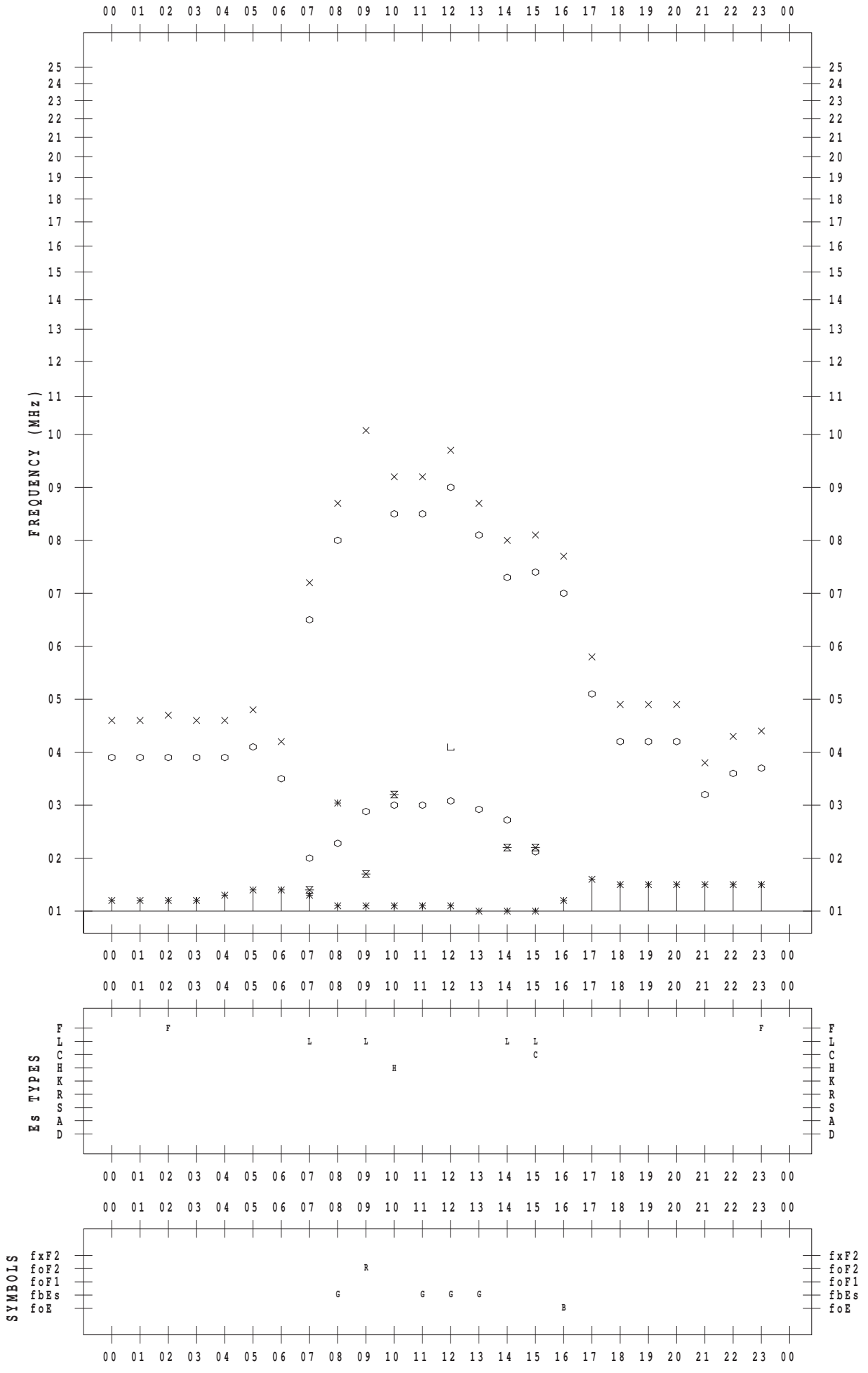
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/19

135 °E MEAN TIME



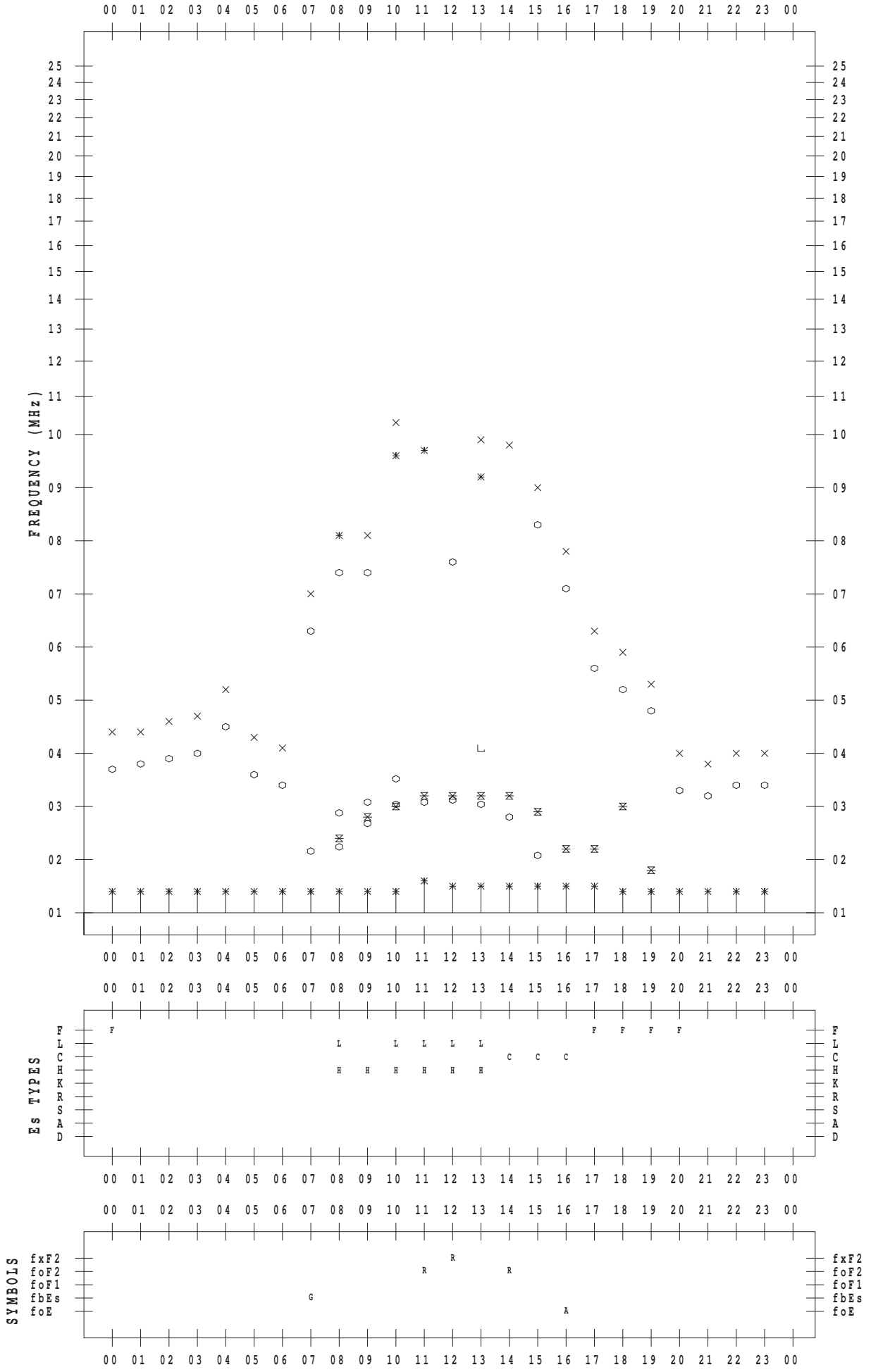
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/20

135 °E MEAN TIME



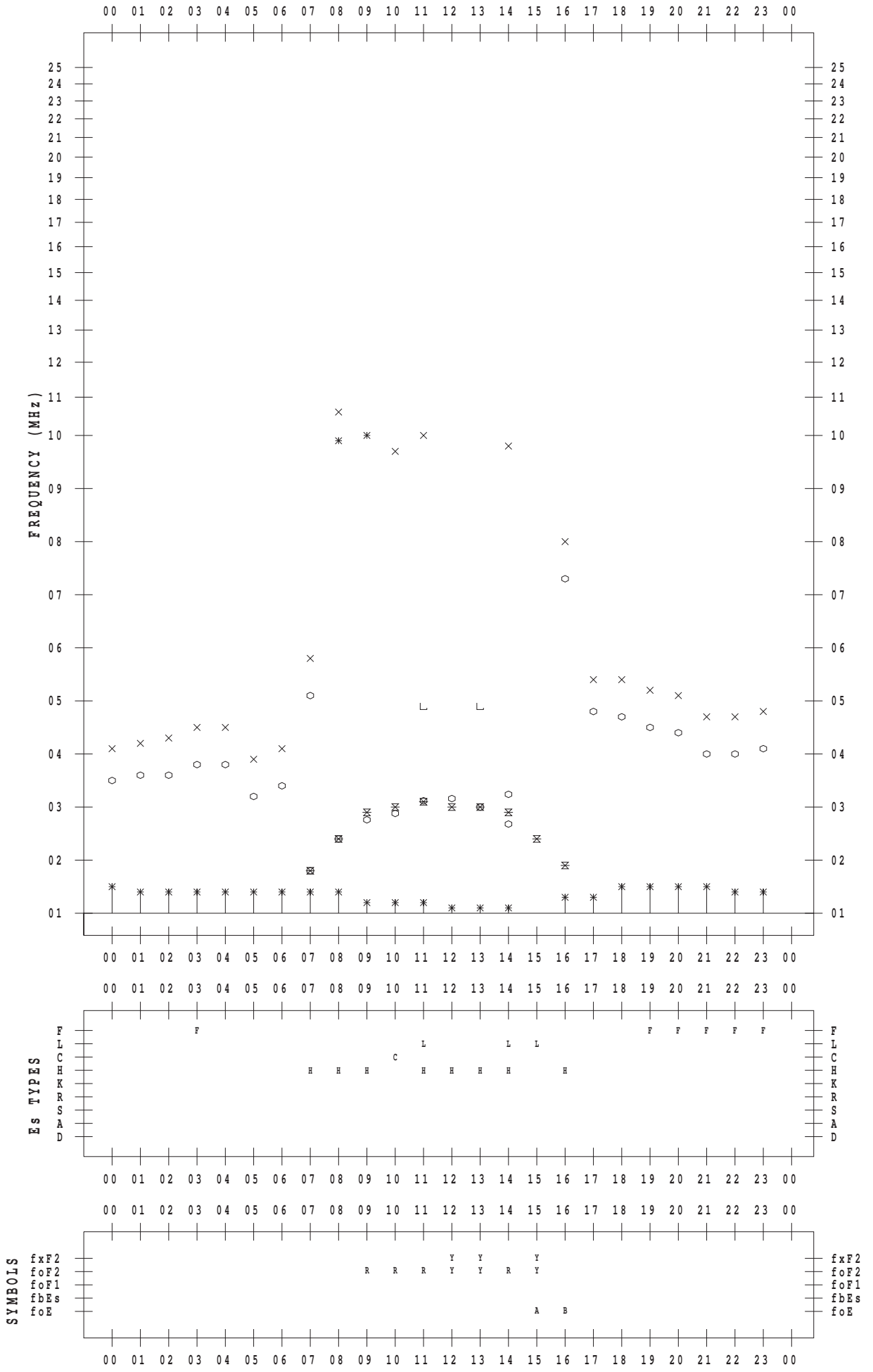
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/21

135 °E MEAN TIME



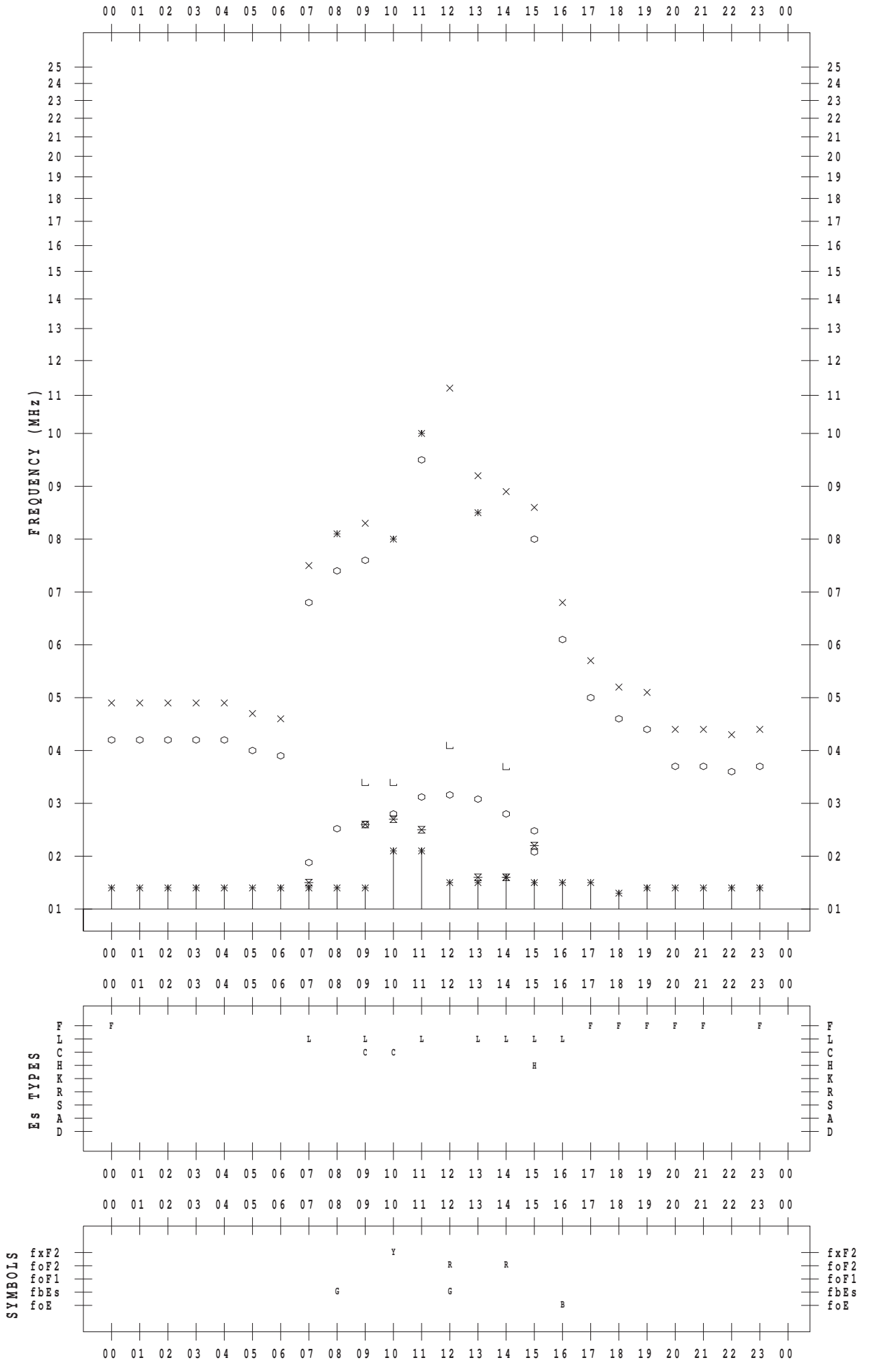
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/22

135 °E MEAN TIME



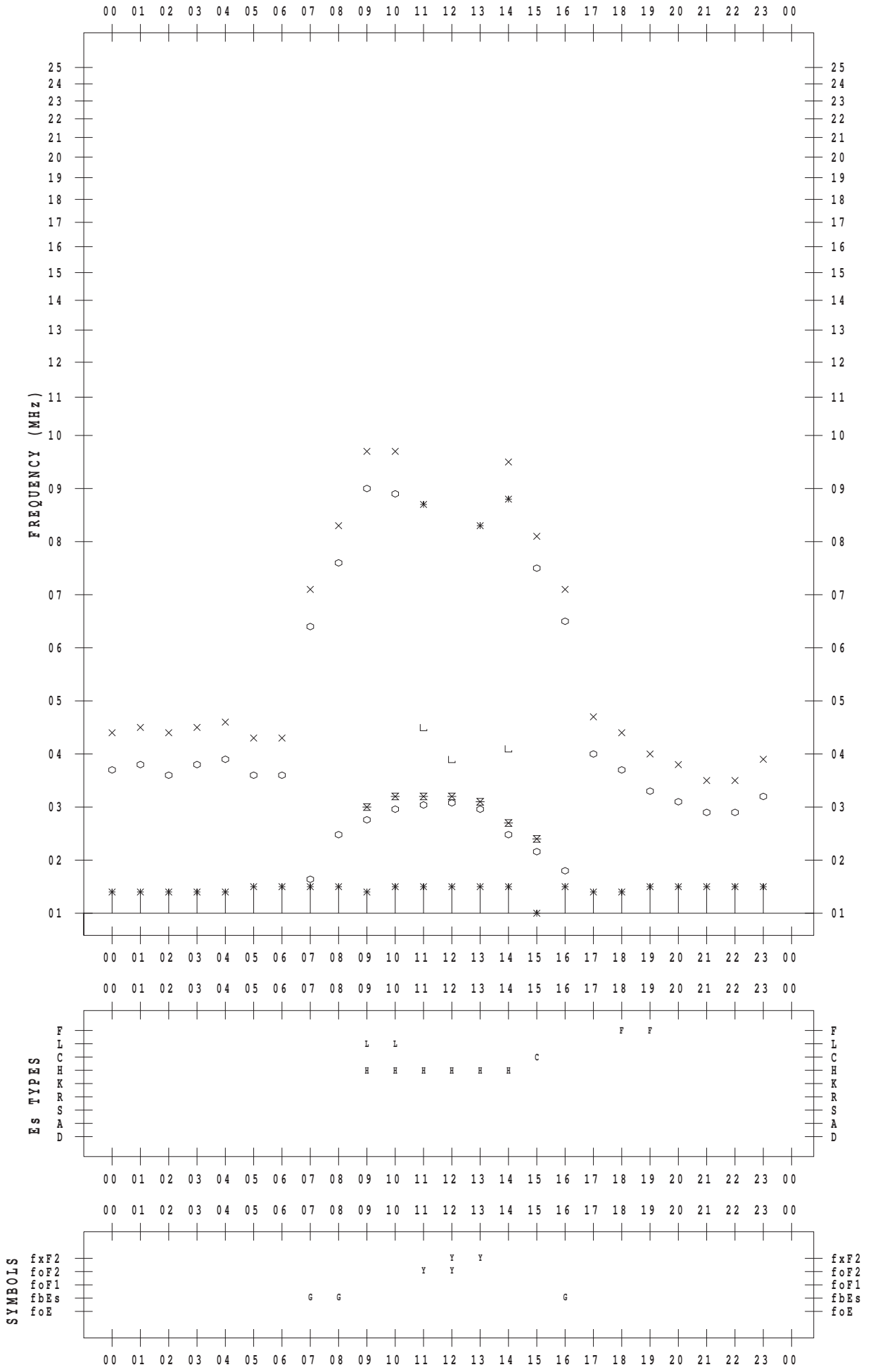
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/23

135 °E MEAN TIME



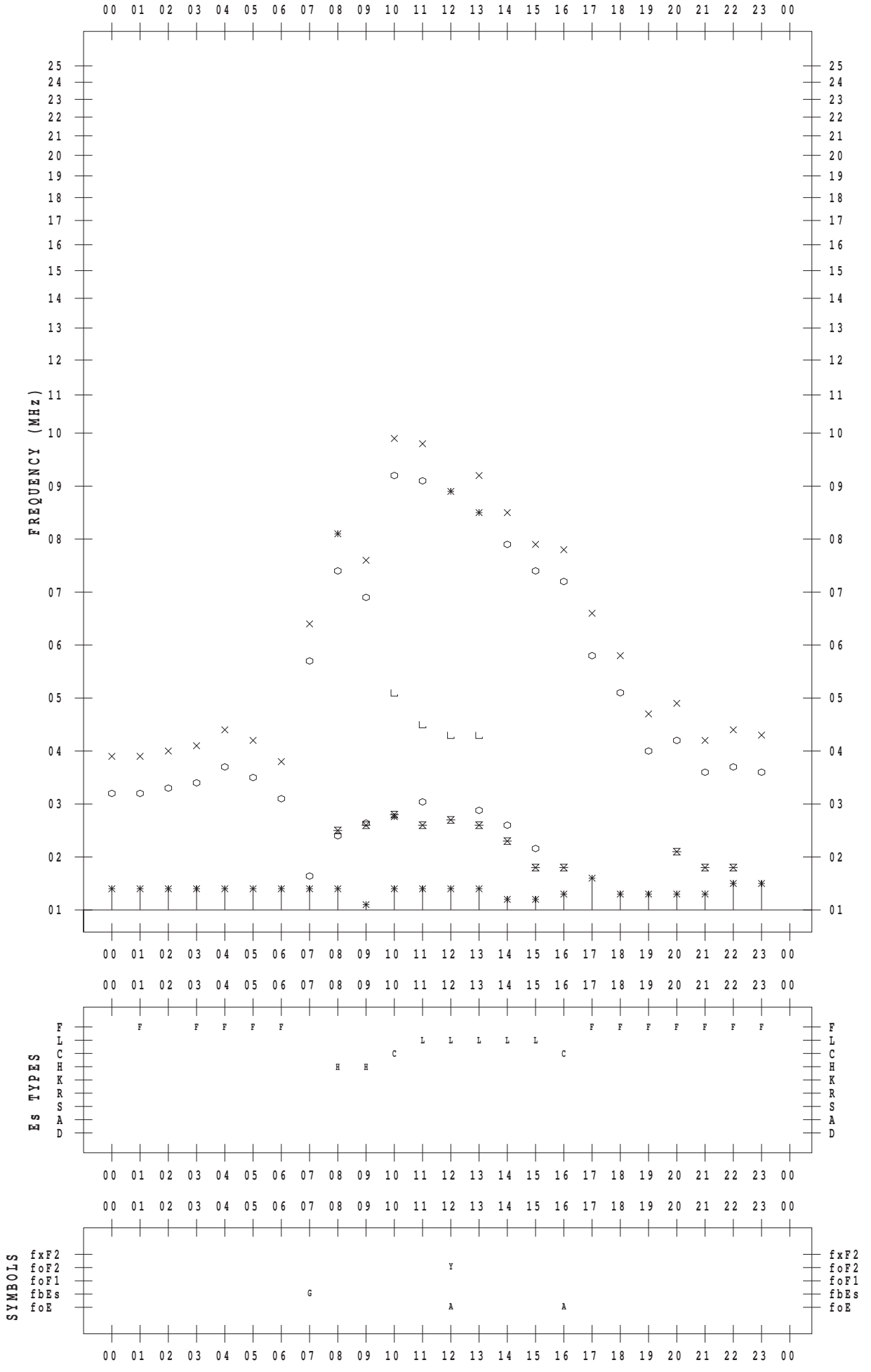
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/24

135 °E MEAN TIME



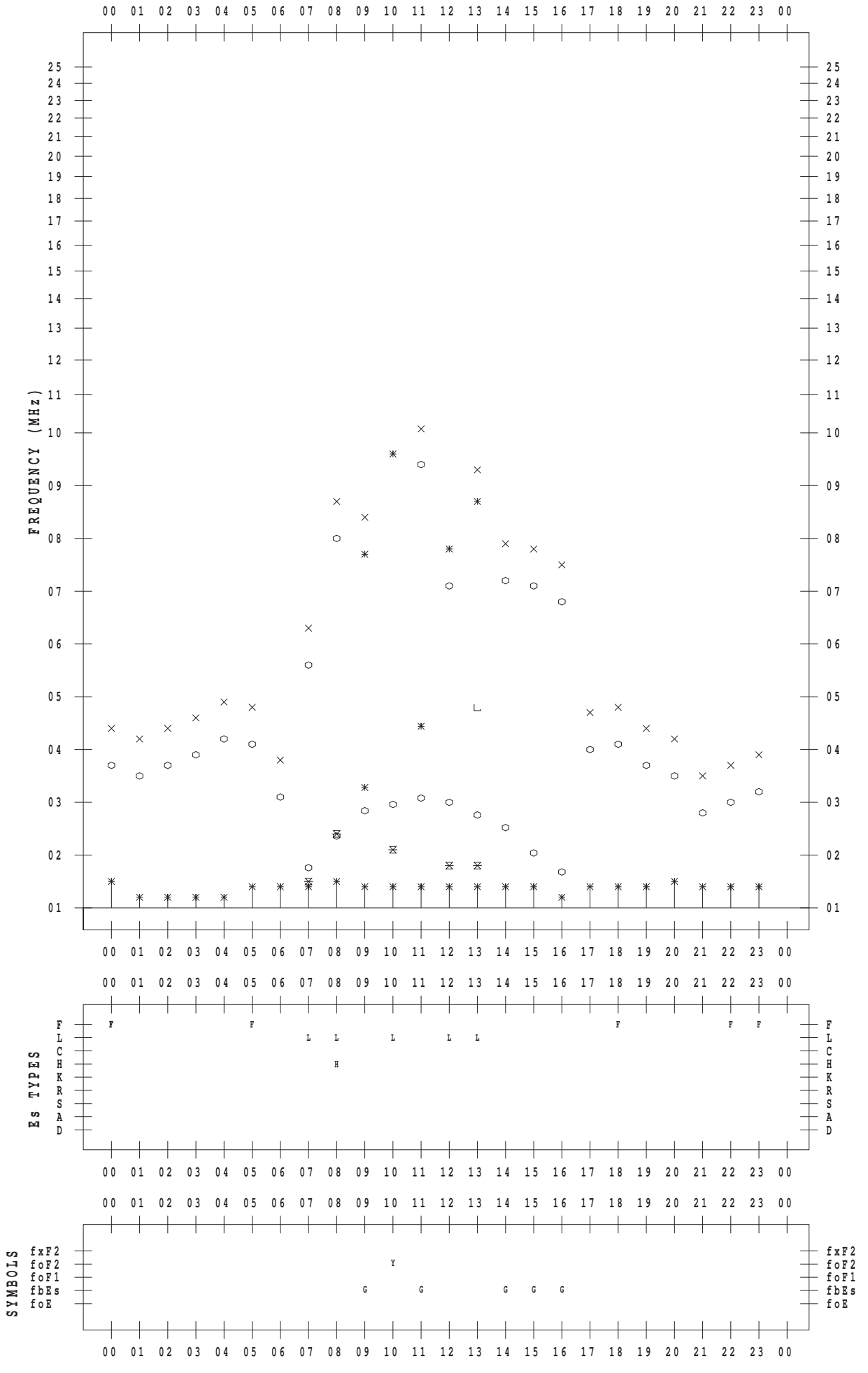
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/25

135 °E MEAN TIME



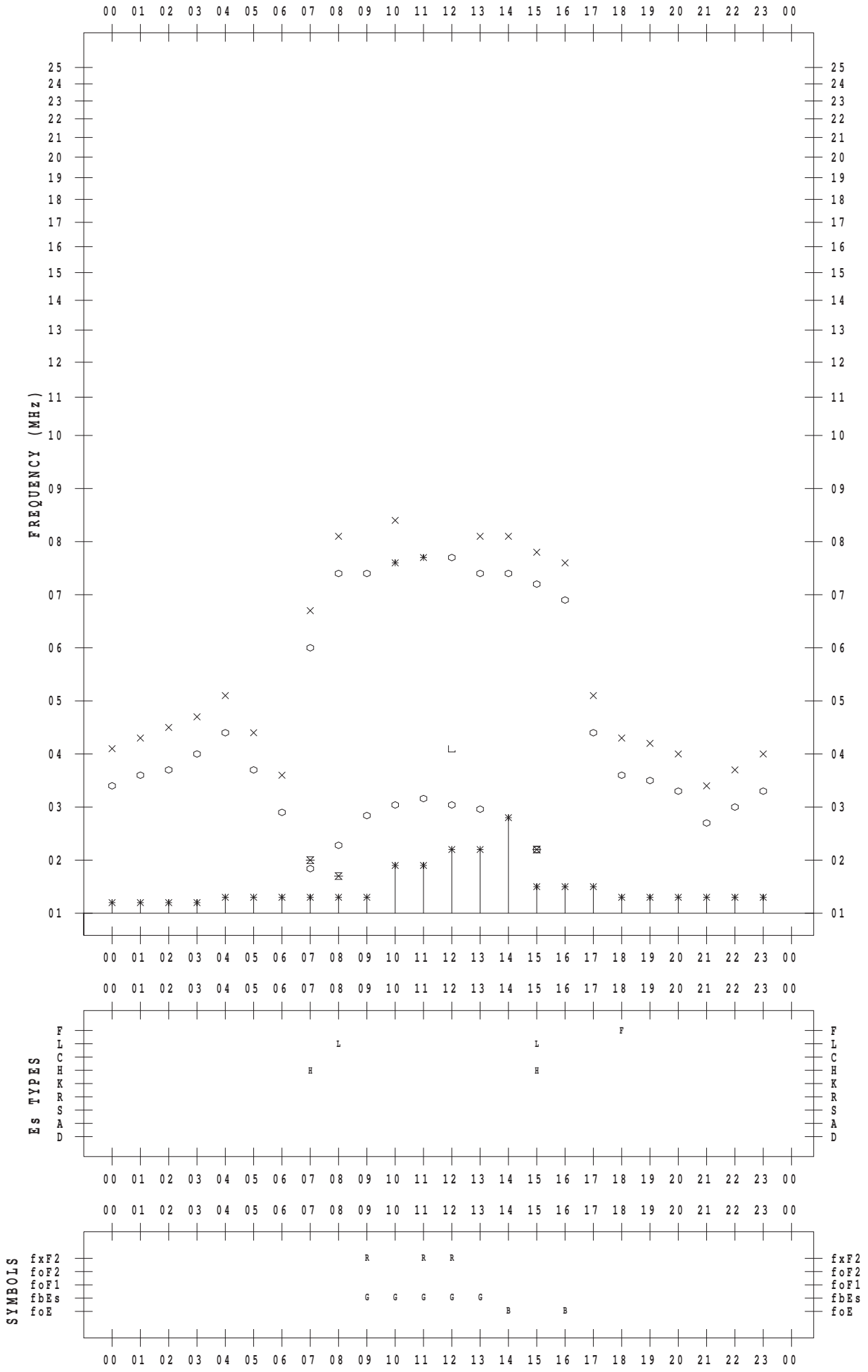
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/26

135 °E MEAN TIME



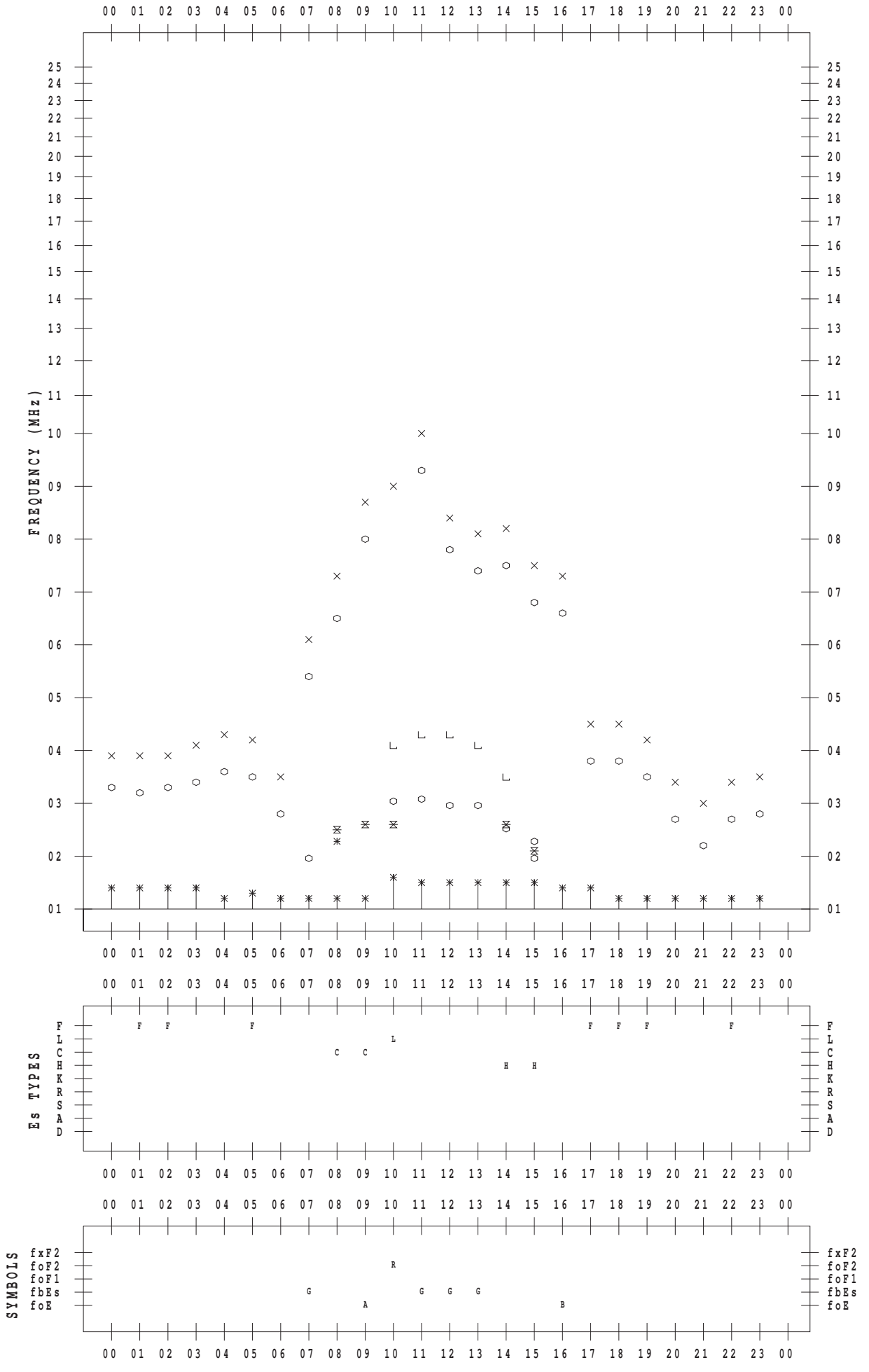
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/27

135 °E MEAN TIME



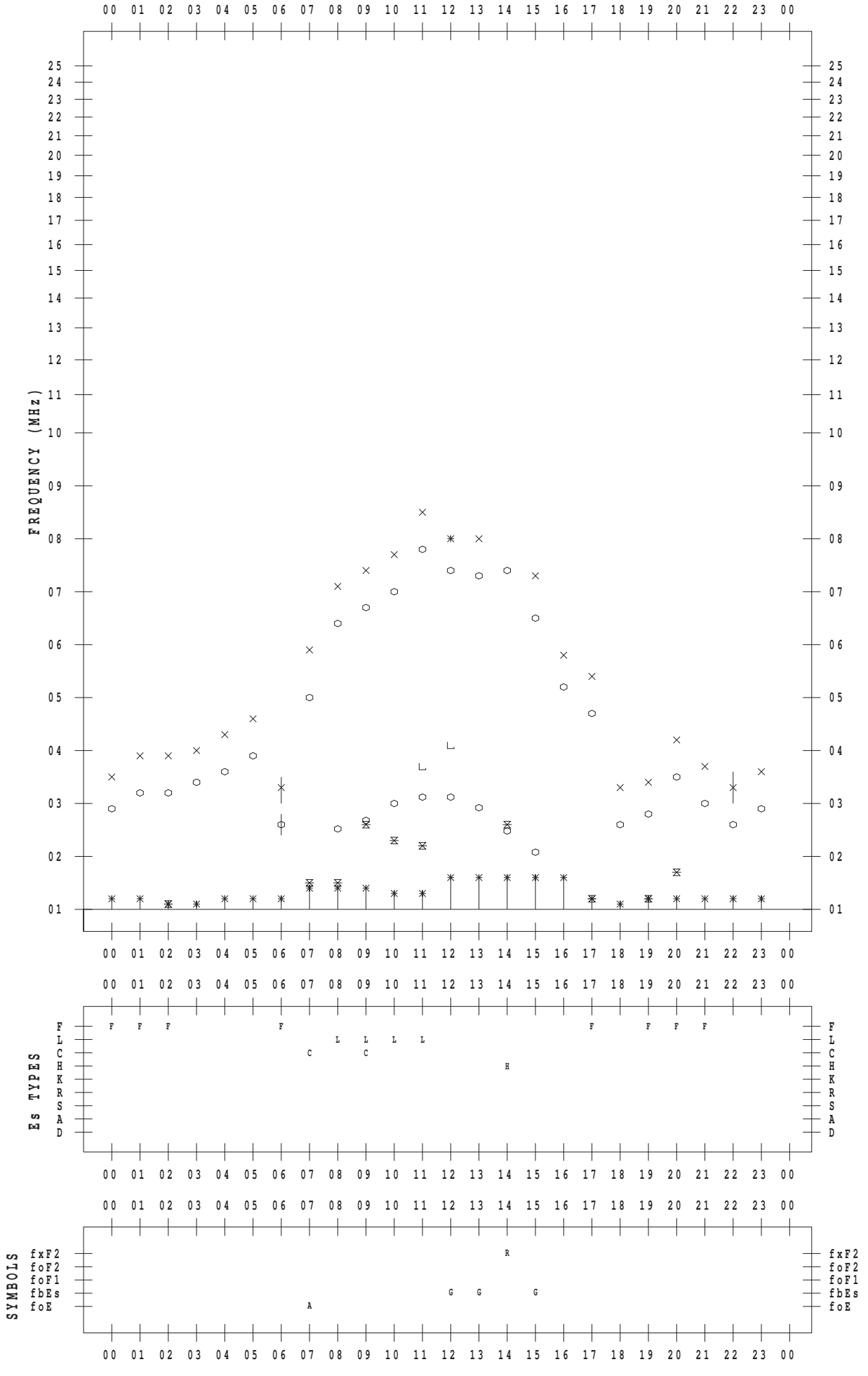
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/28

135 °E MEAN TIME



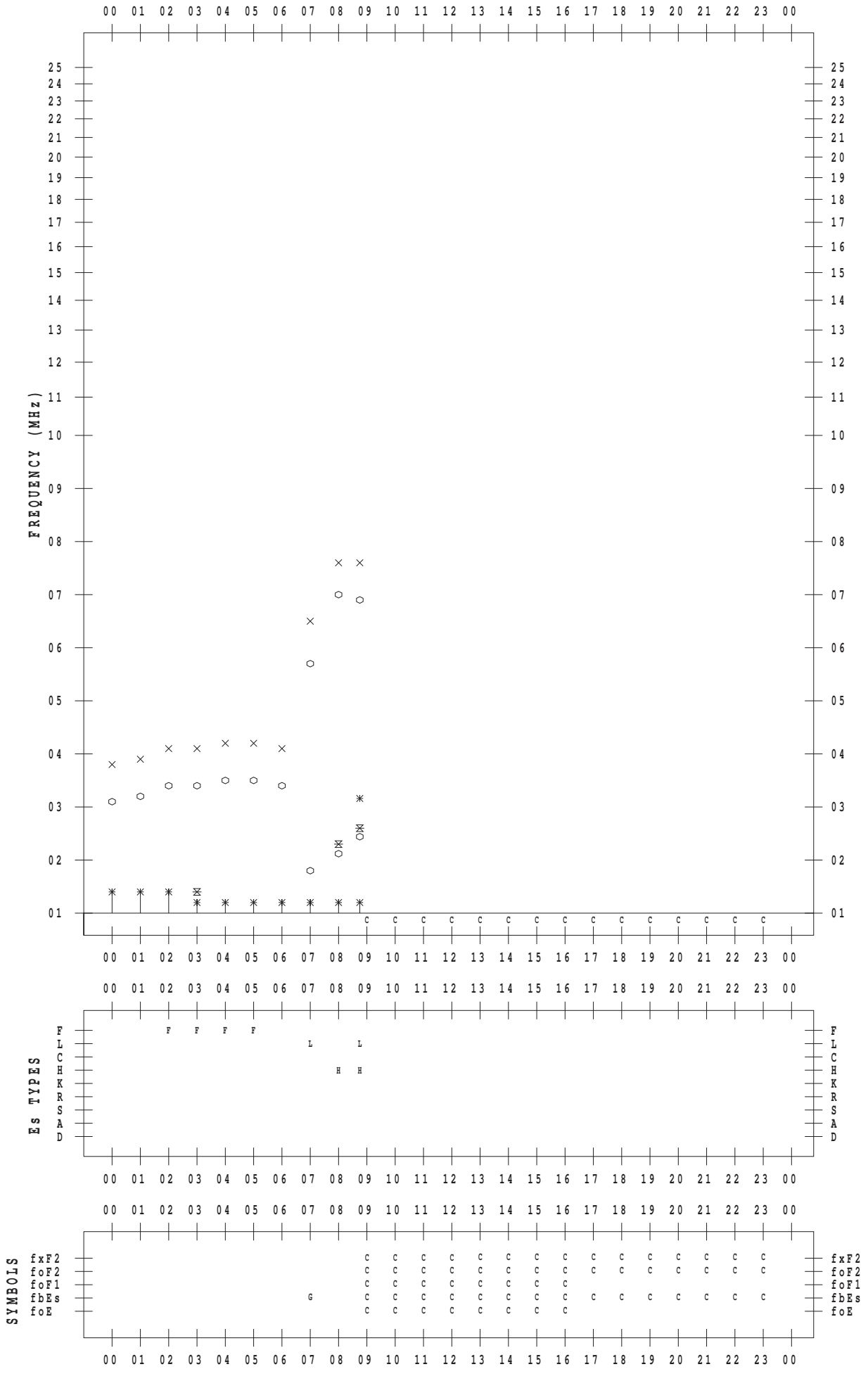
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/29

135 °E MEAN TIME



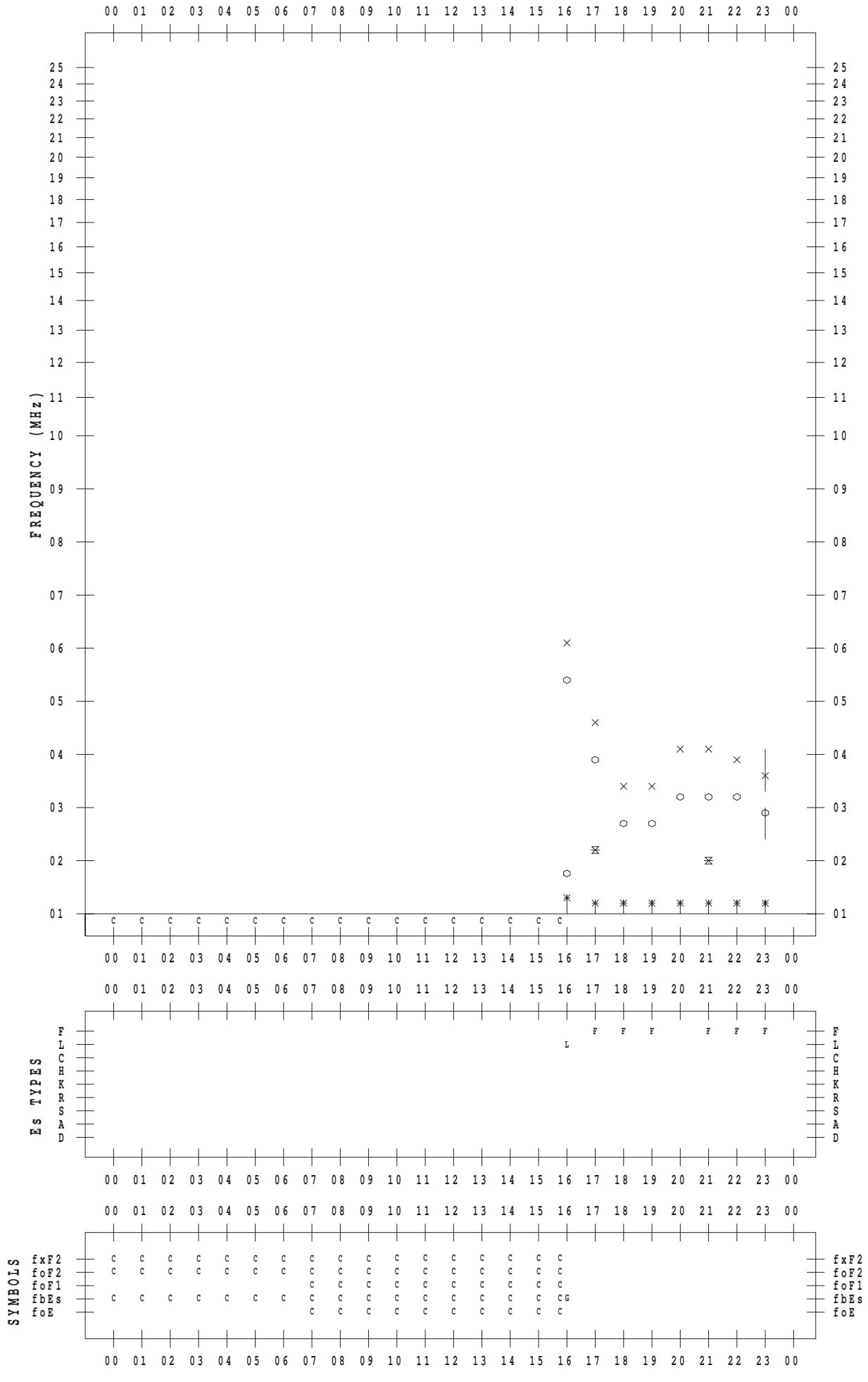
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2012/11/30

135 °E MEAN TIME



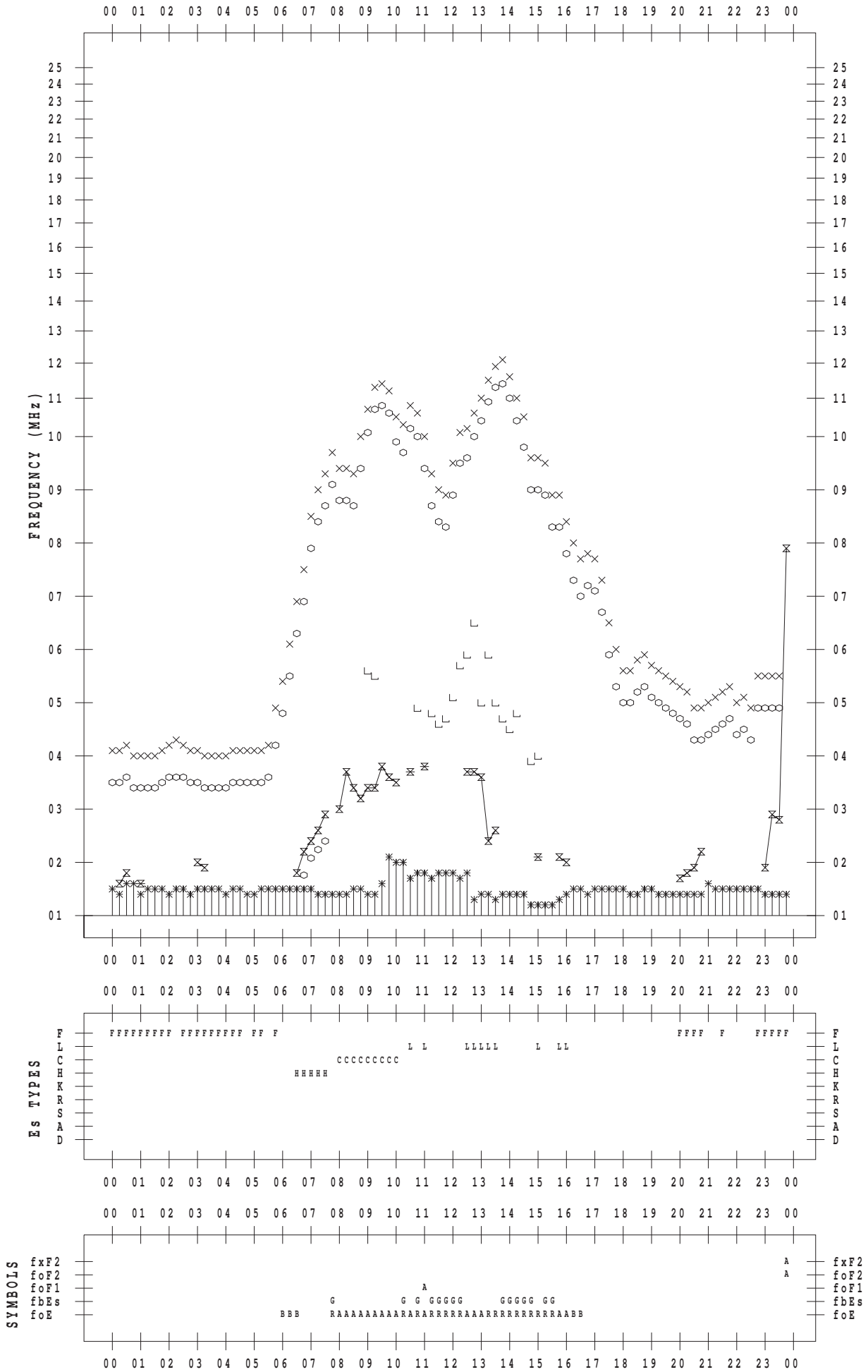
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 1

135 °E MEAN TIME



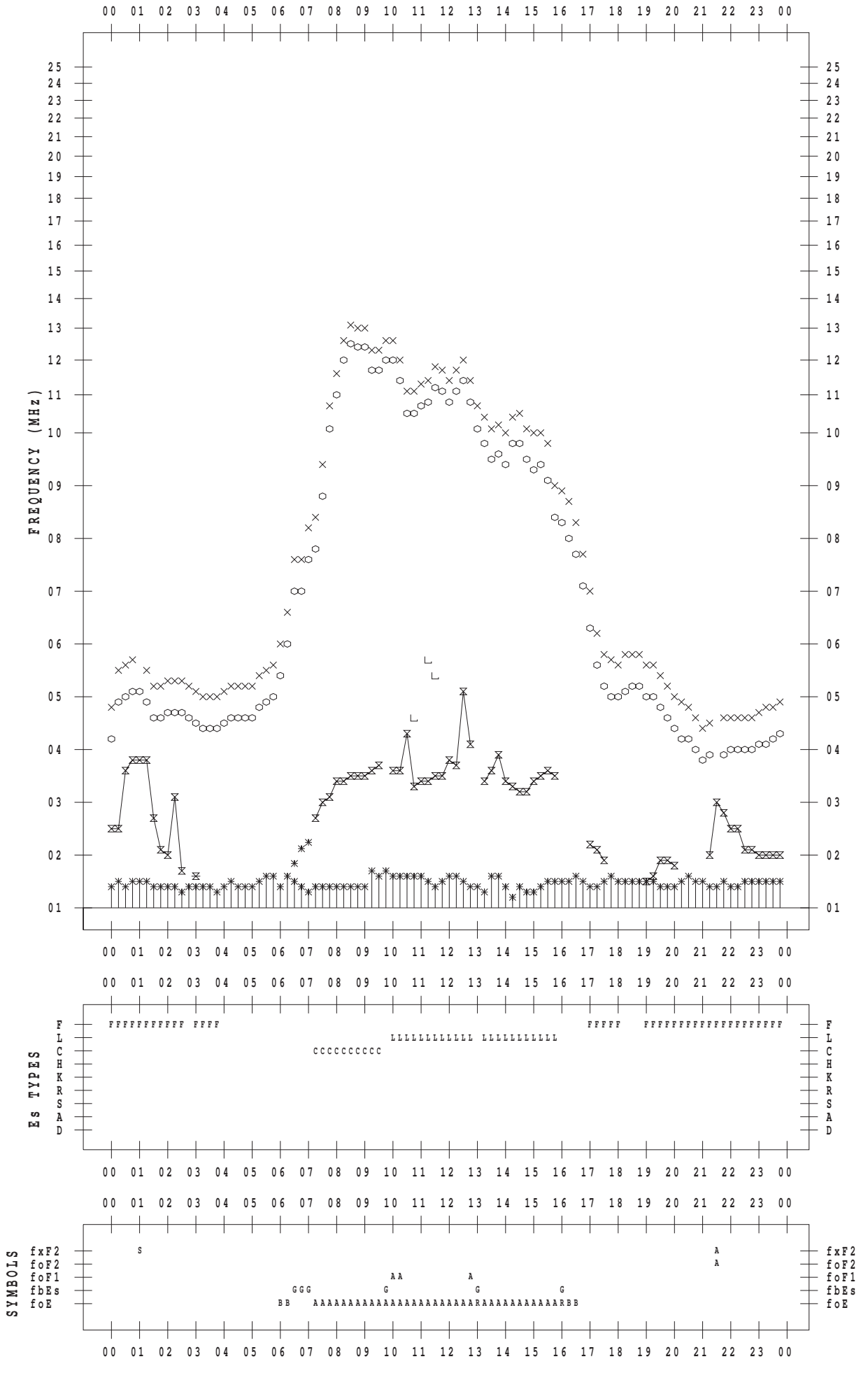
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 2

135 °E MEAN TIME



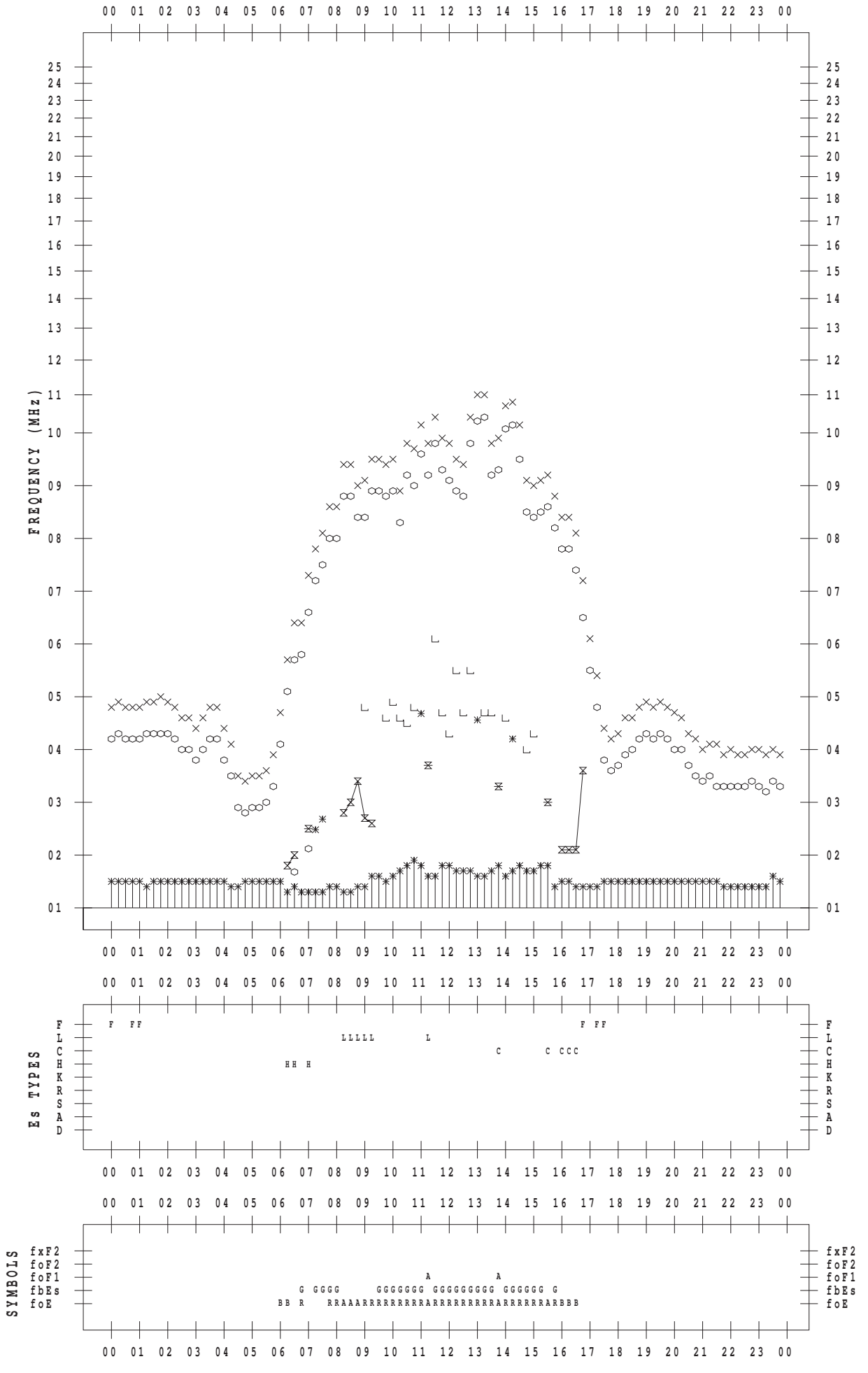
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 3

135 °E MEAN TIME



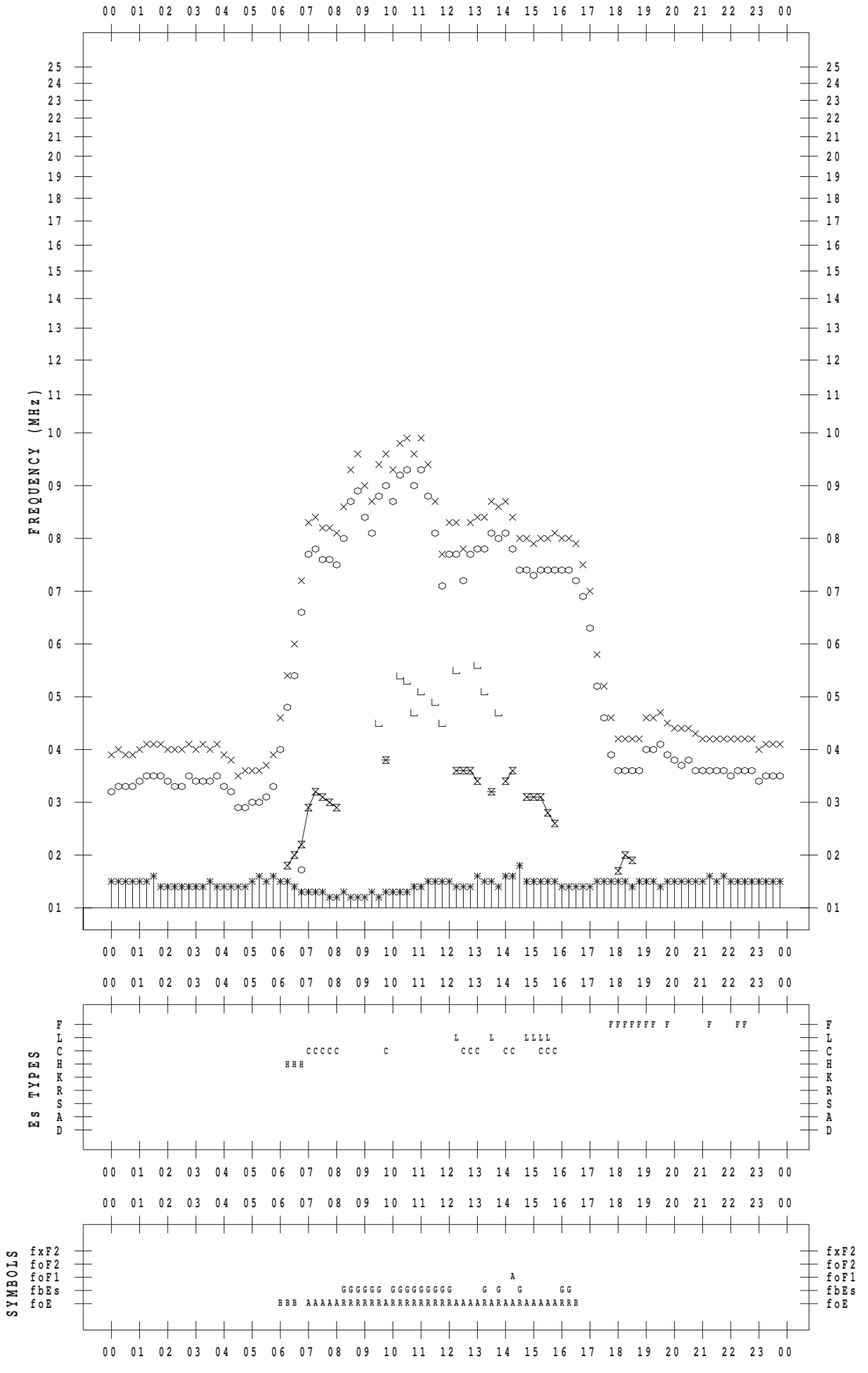
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 4

135 °E MEAN TIME



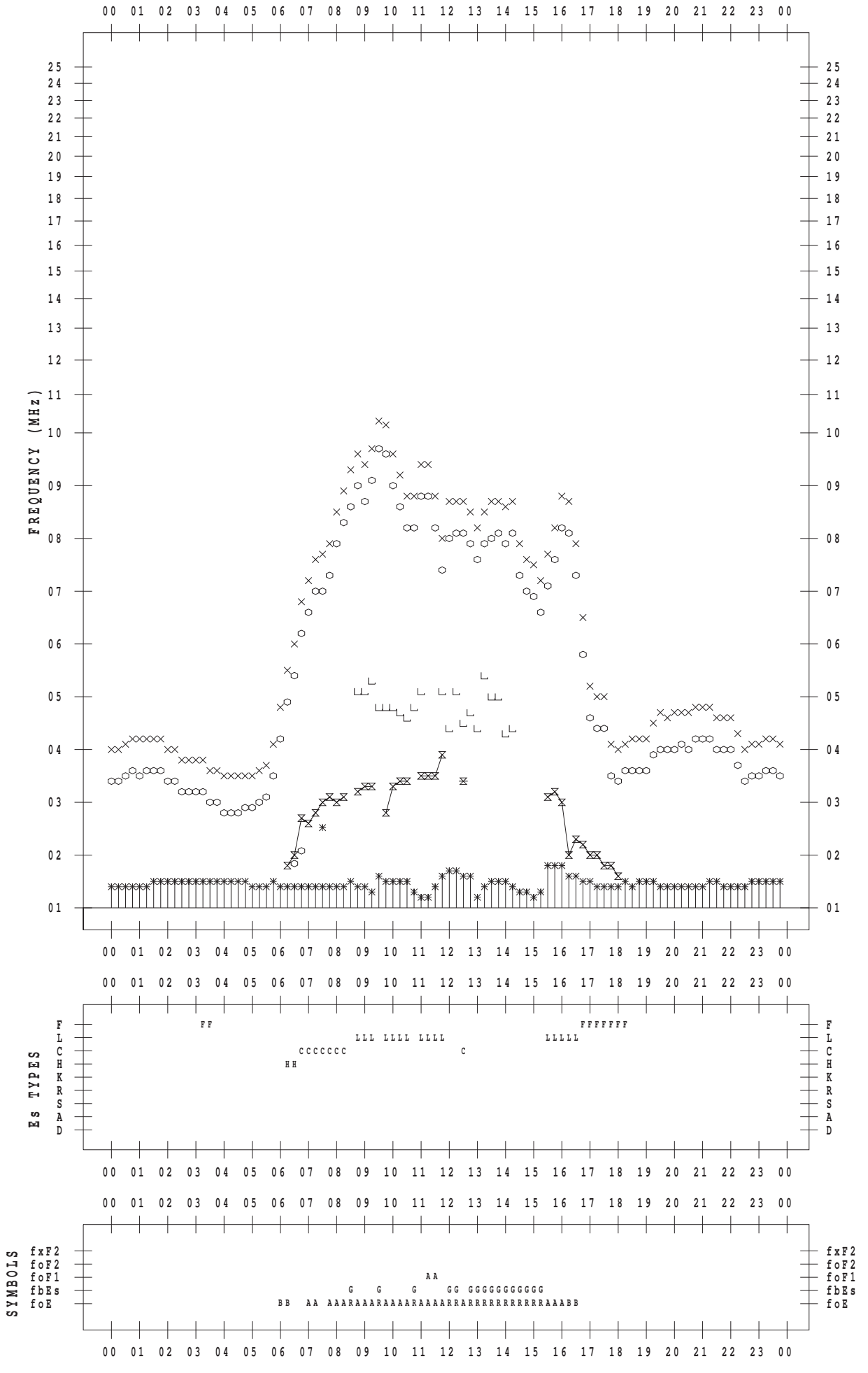
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 5

135 °E MEAN TIME



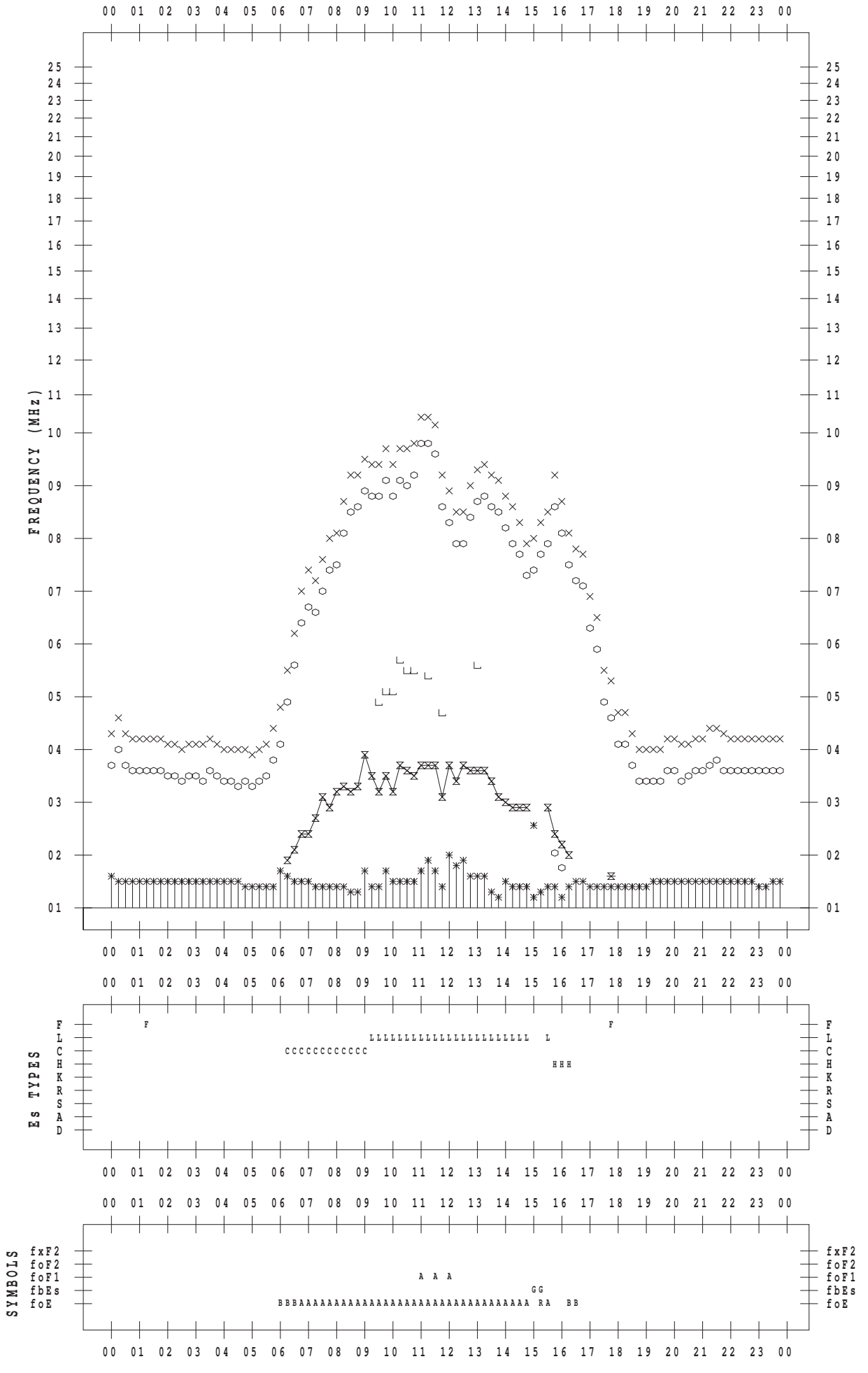
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 6

135 °E MEAN TIME



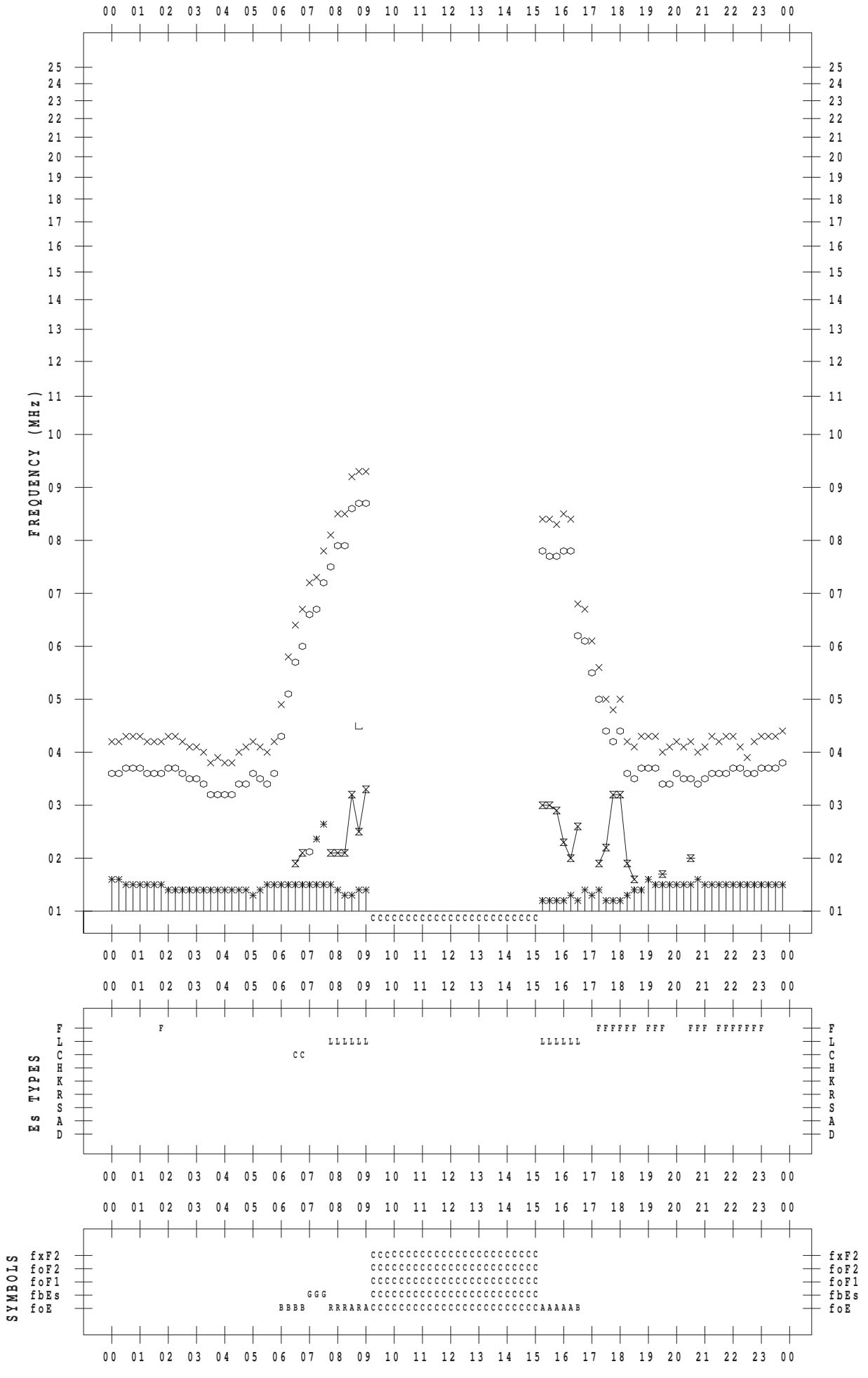
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 7

135 °E MEAN TIME



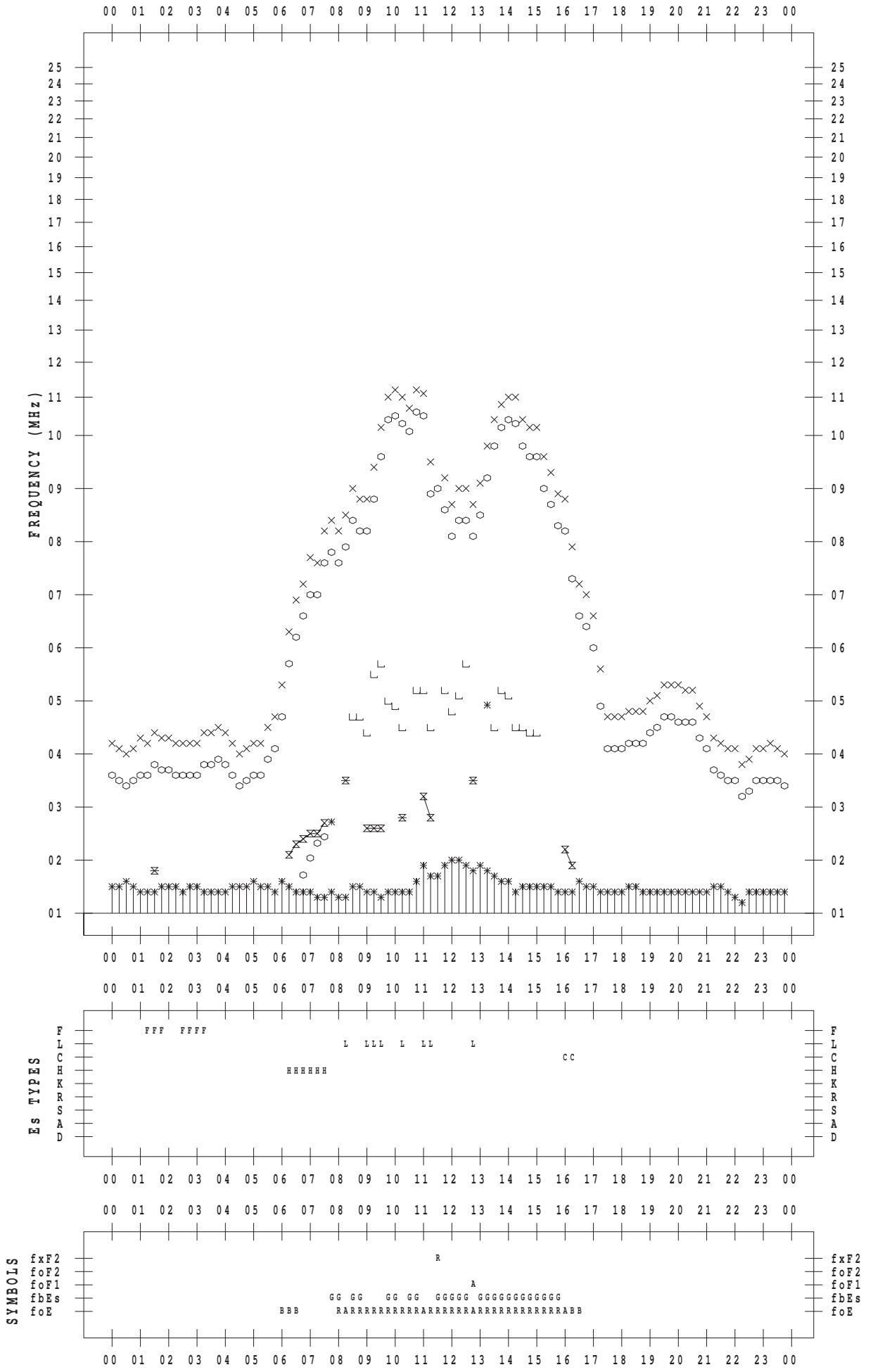
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 8

135 °E MEAN TIME



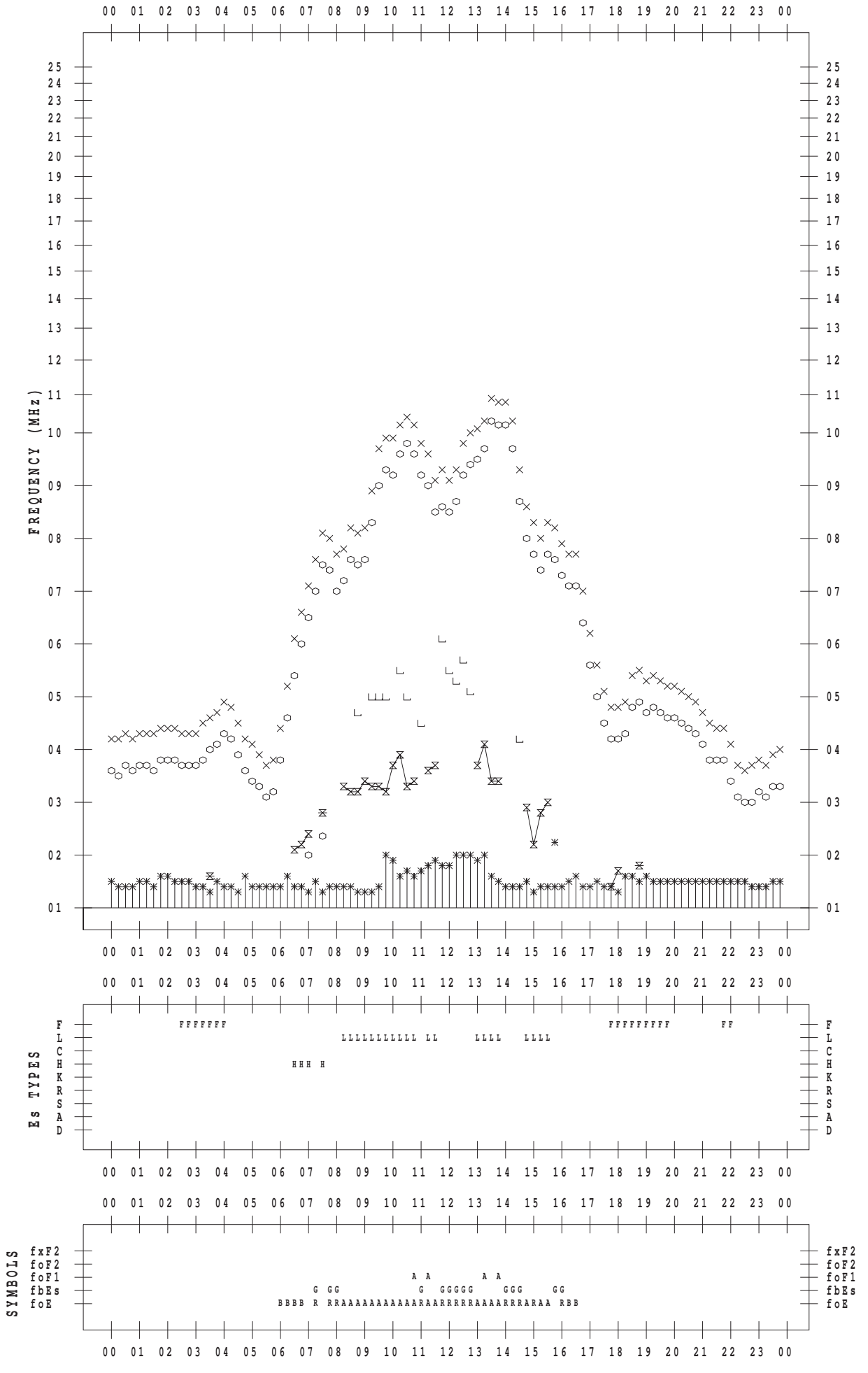
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/ 9

135 °E MEAN TIME



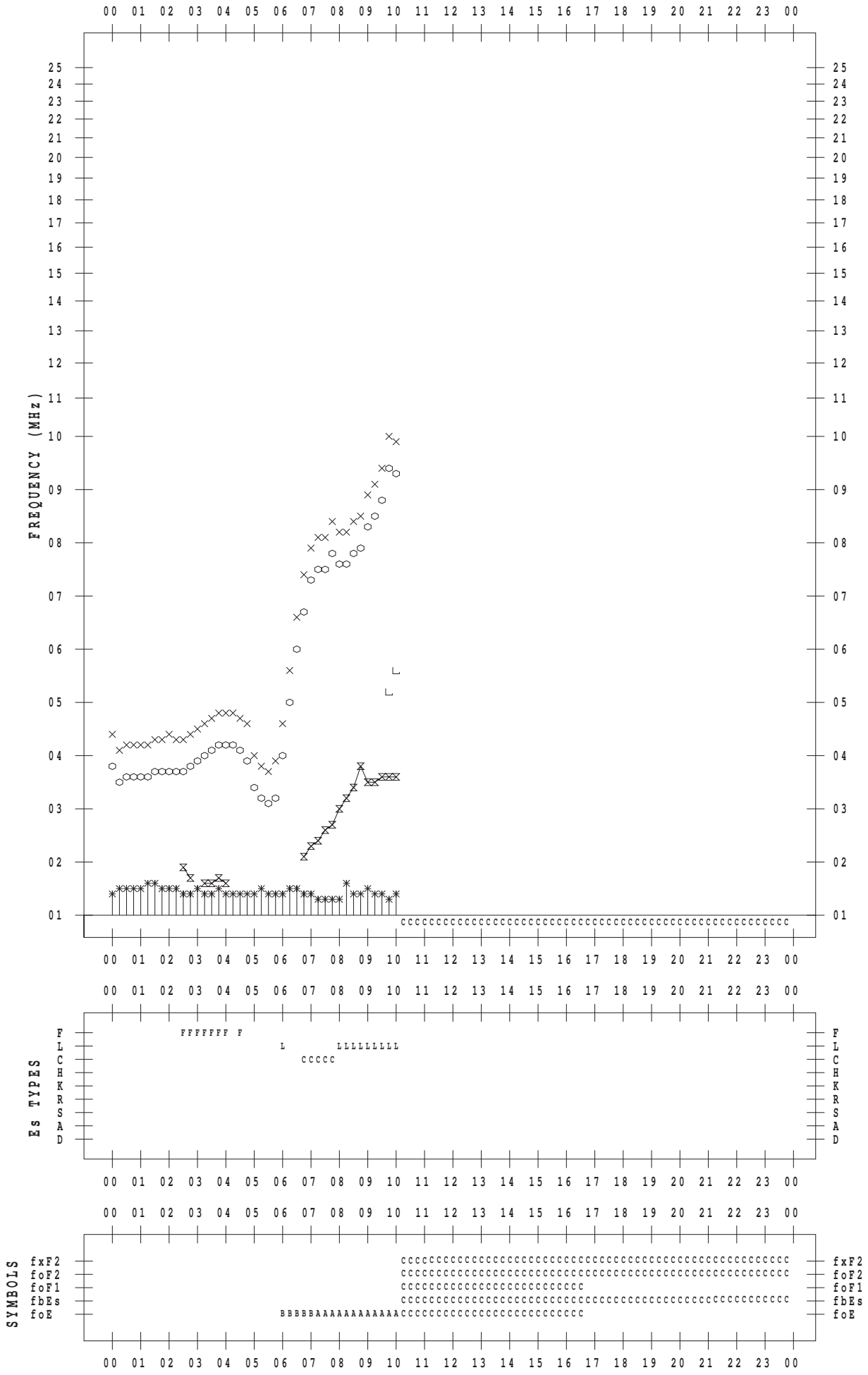
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/10

135 °E MEAN TIME



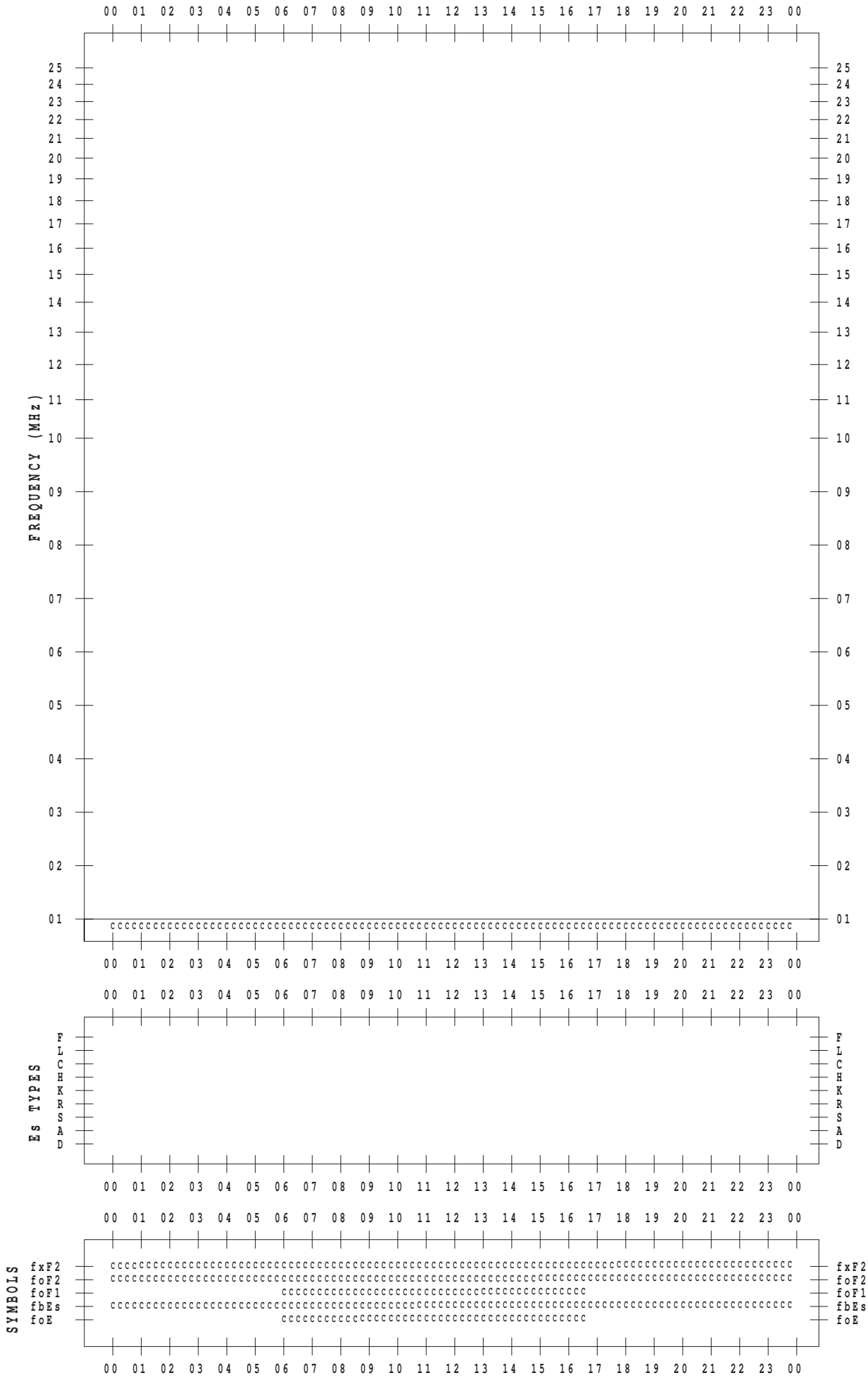
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/11

135 °E MEAN TIME



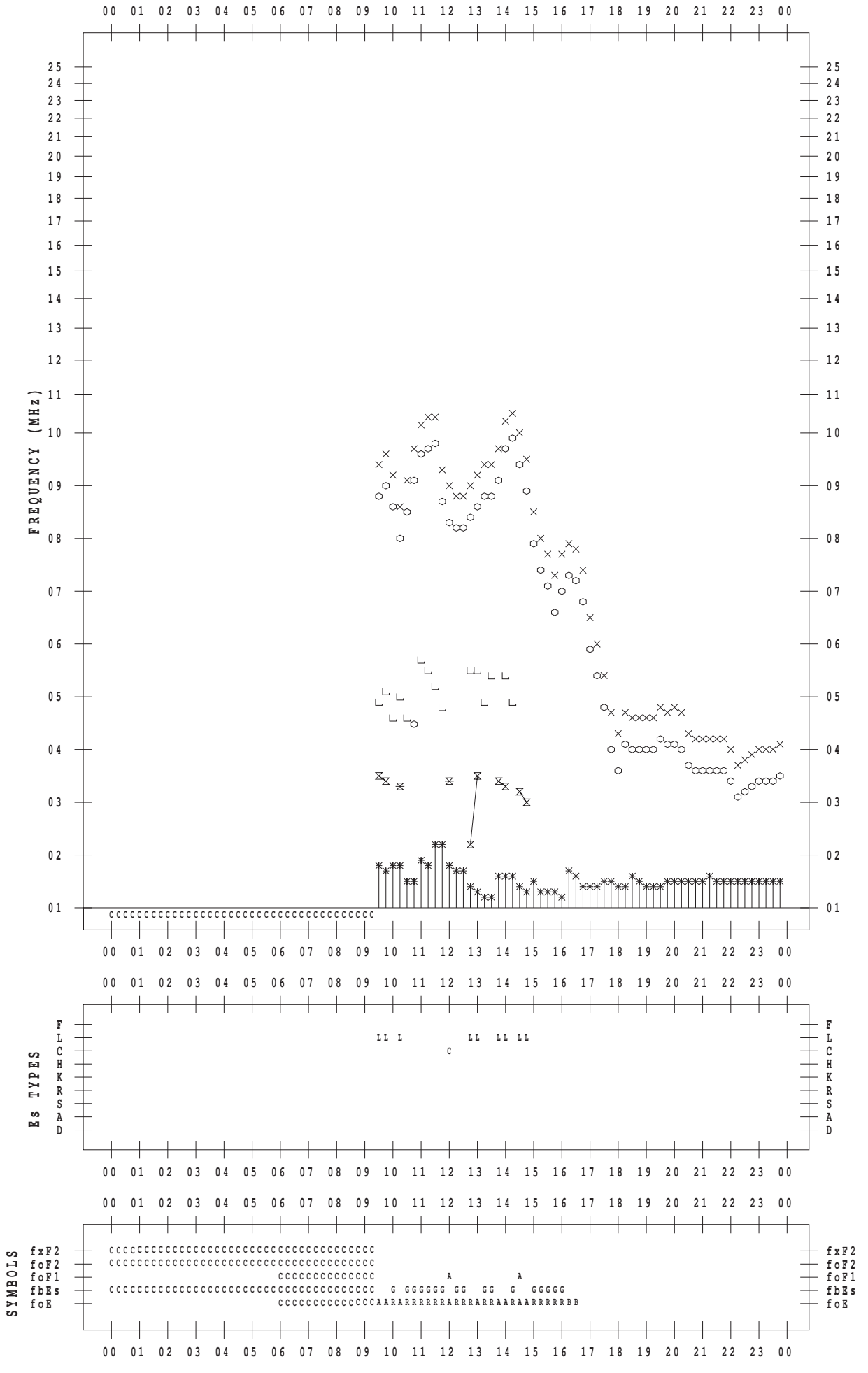
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/12

135 °E MEAN TIME



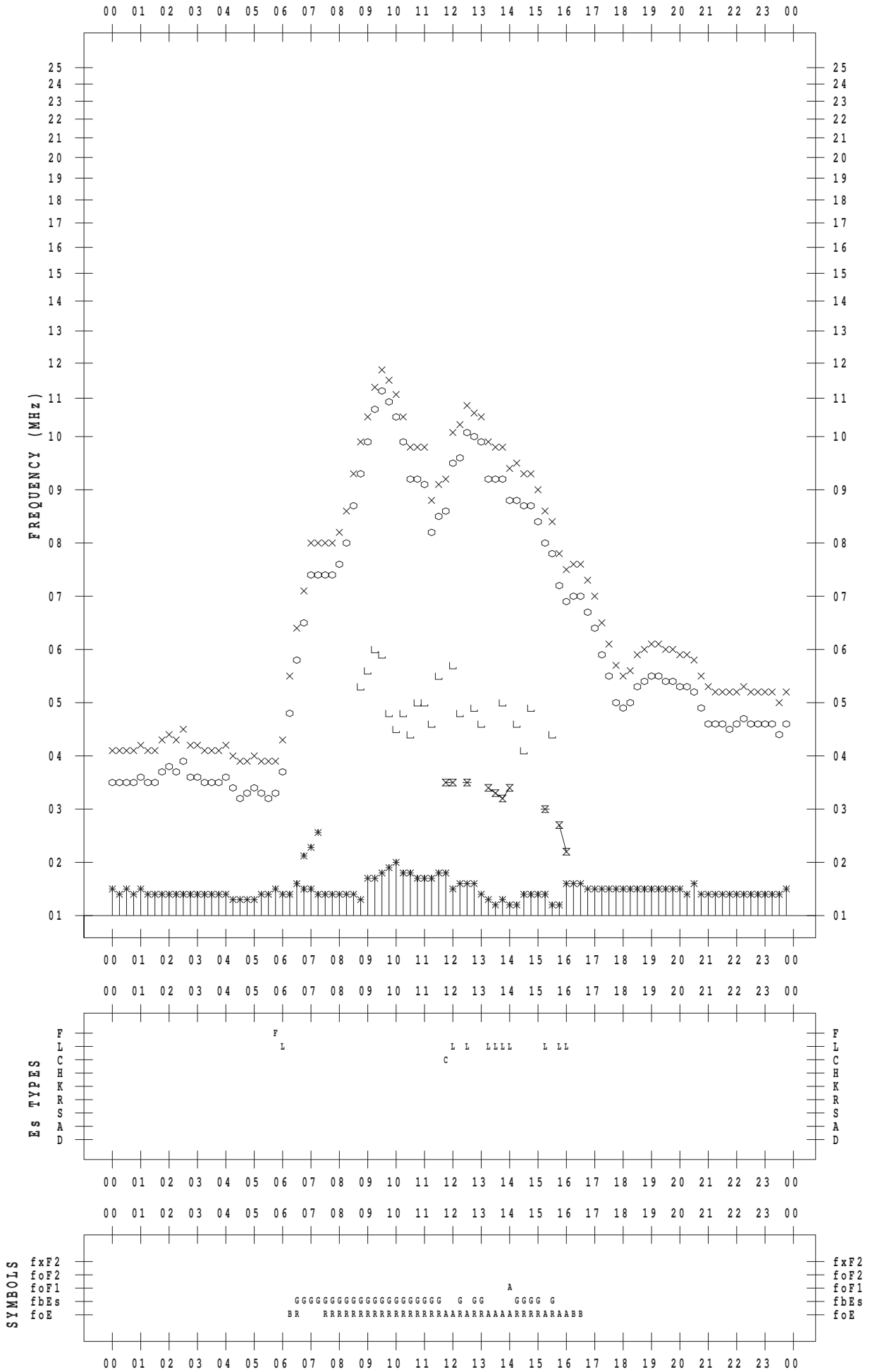
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/13

135 °E MEAN TIME



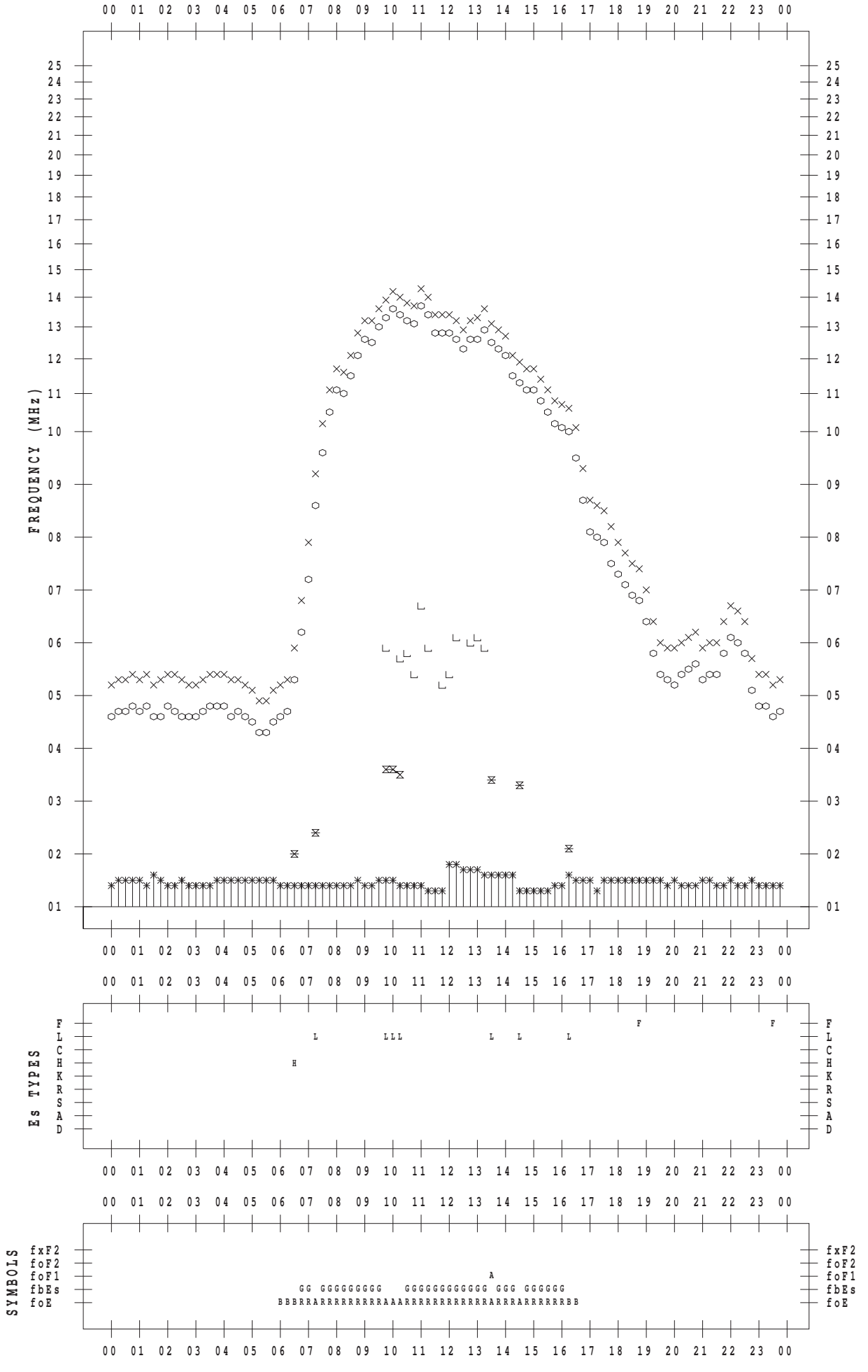
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/14

135 °E MEAN TIME



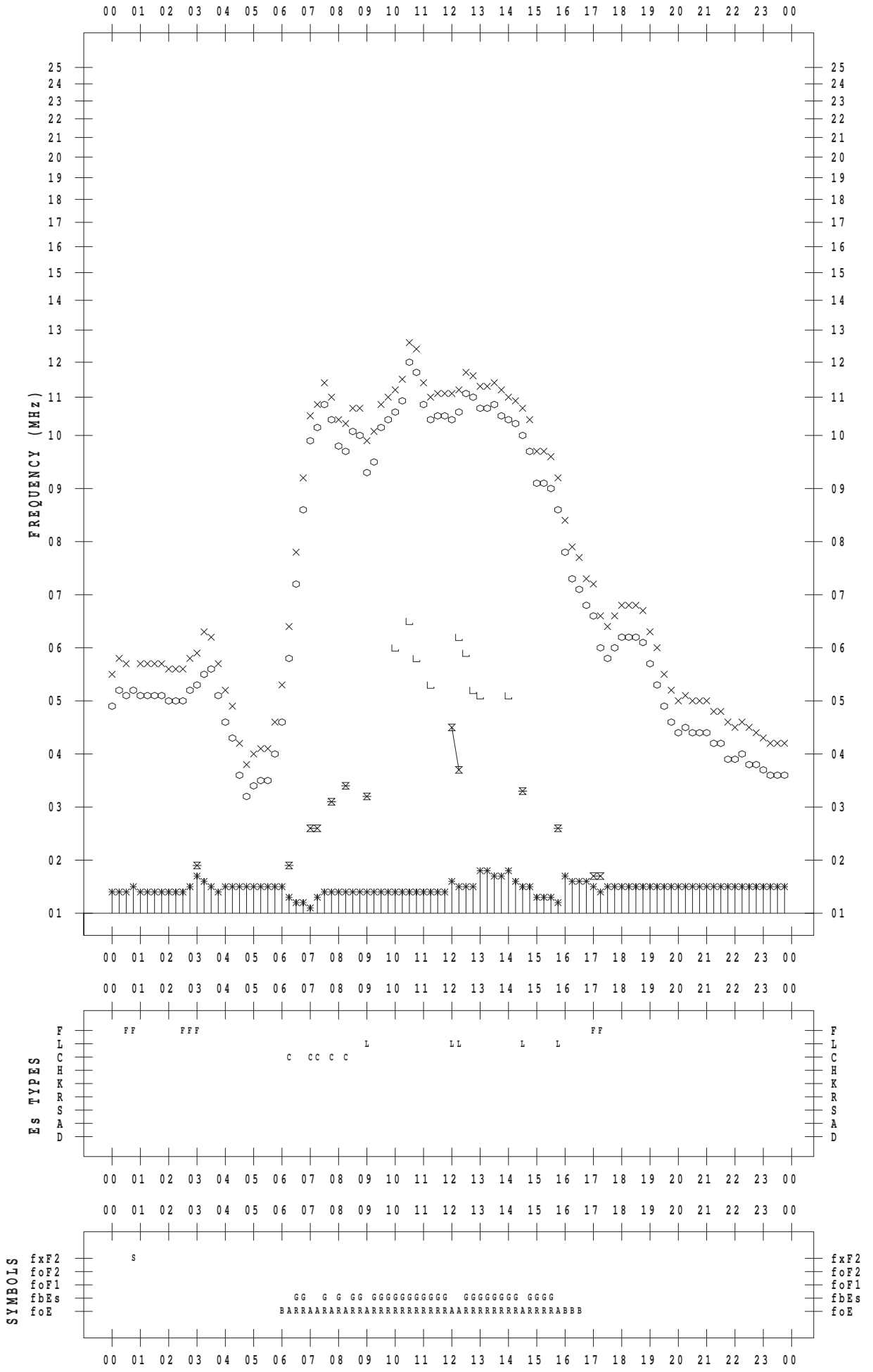
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/15

135 °E MEAN TIME



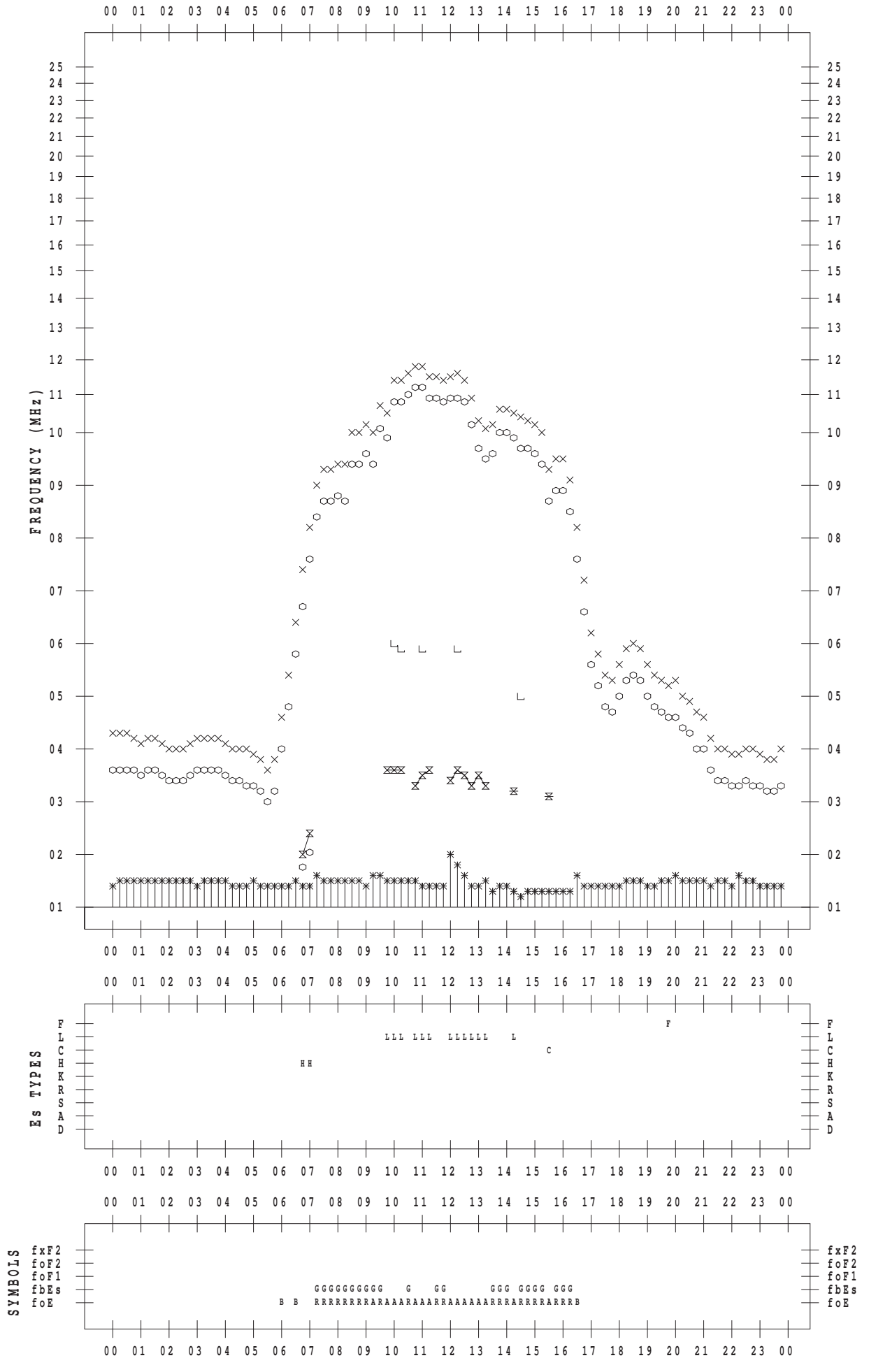
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/16

135 °E MEAN TIME



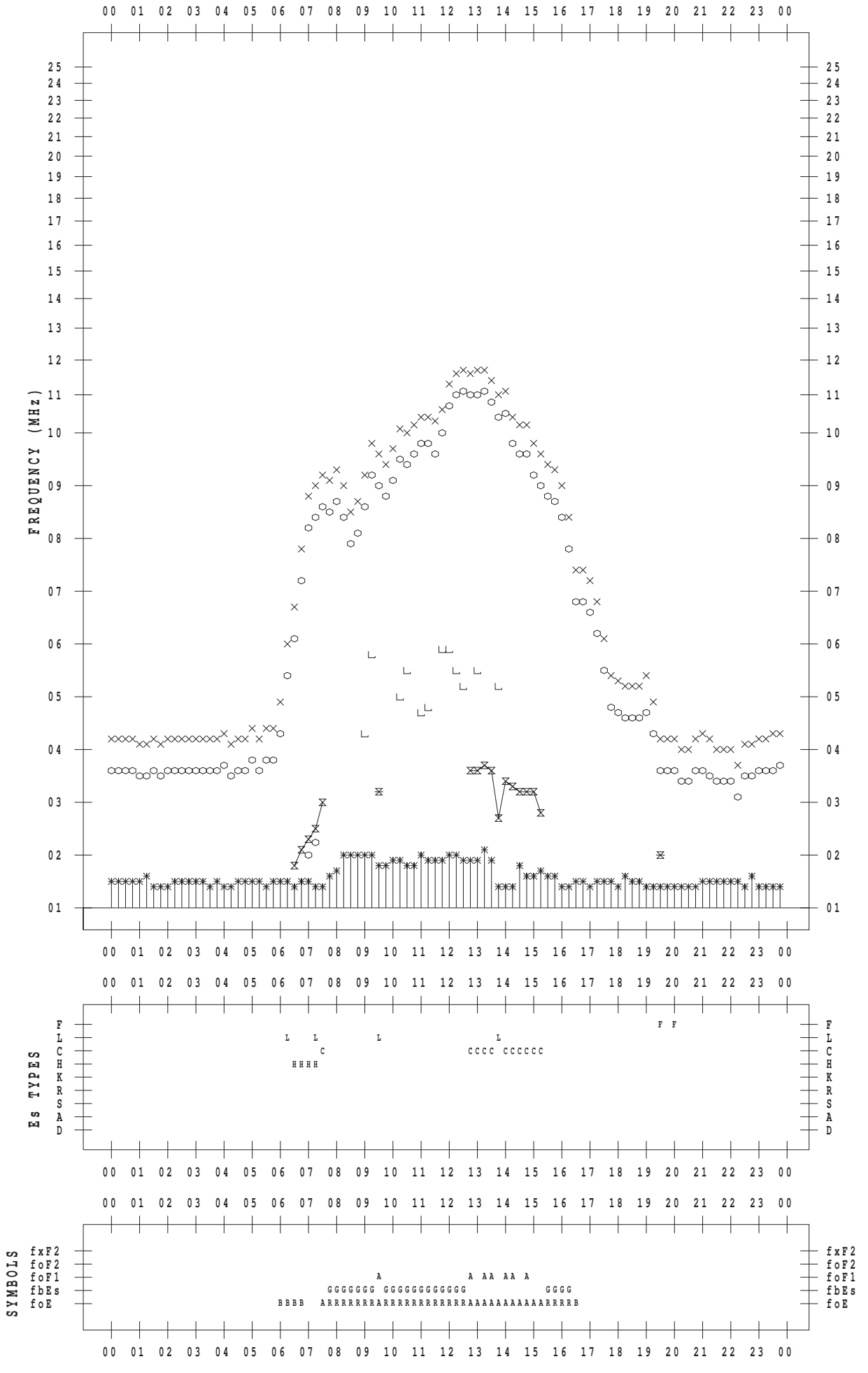
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/17

135 °E MEAN TIME



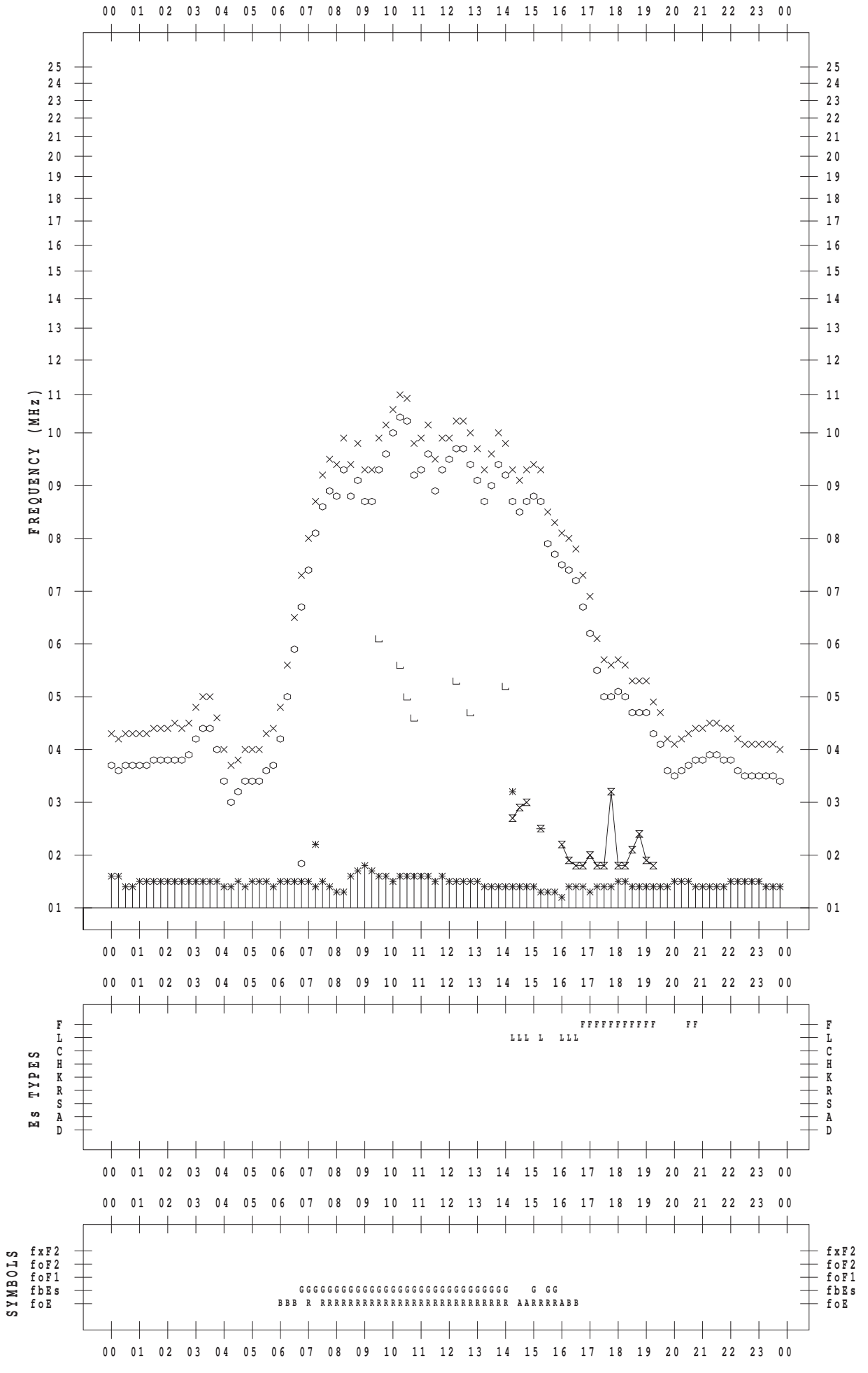
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/18

135 °E MEAN TIME



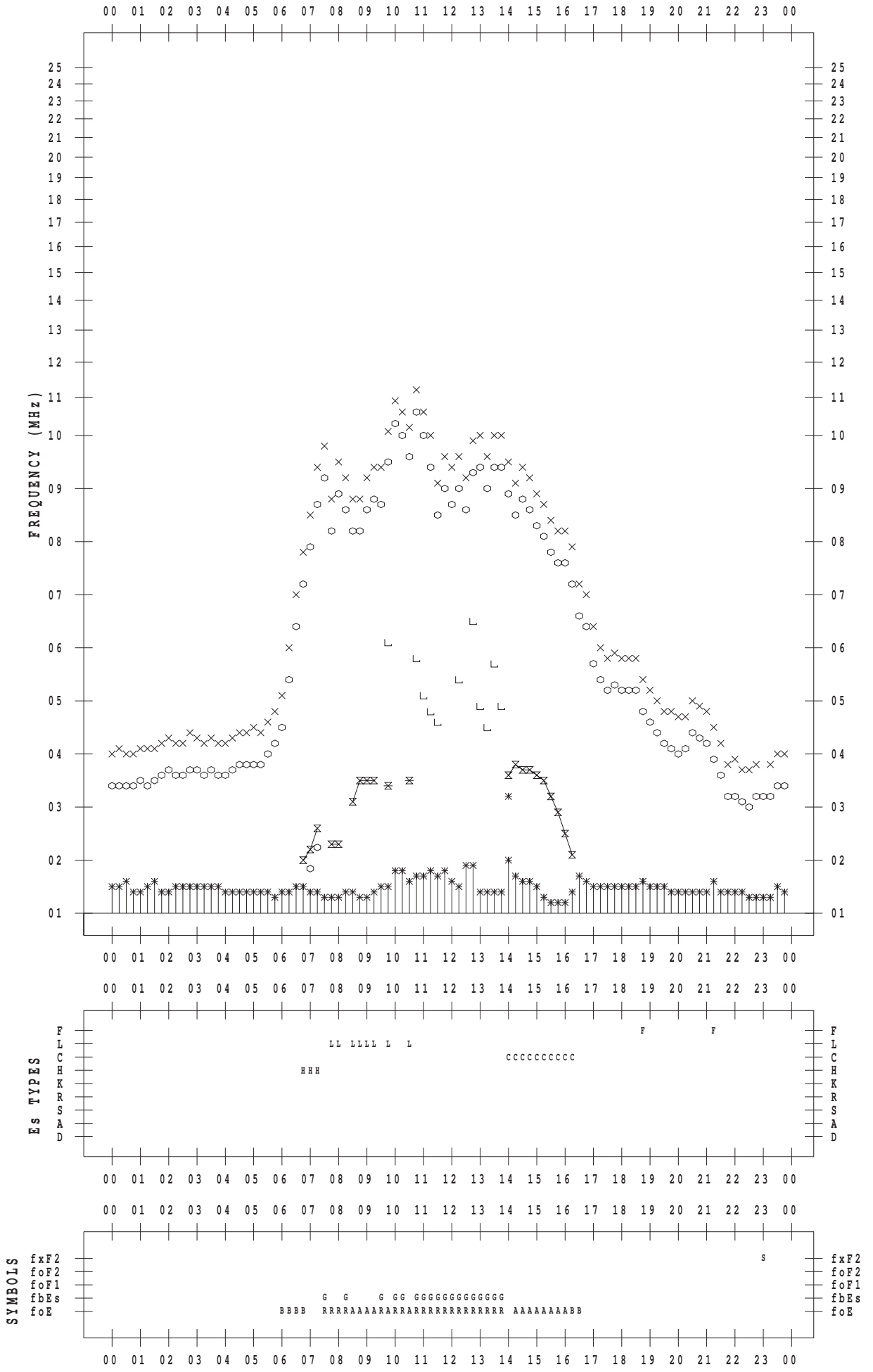
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/19

135 °E MEAN TIME



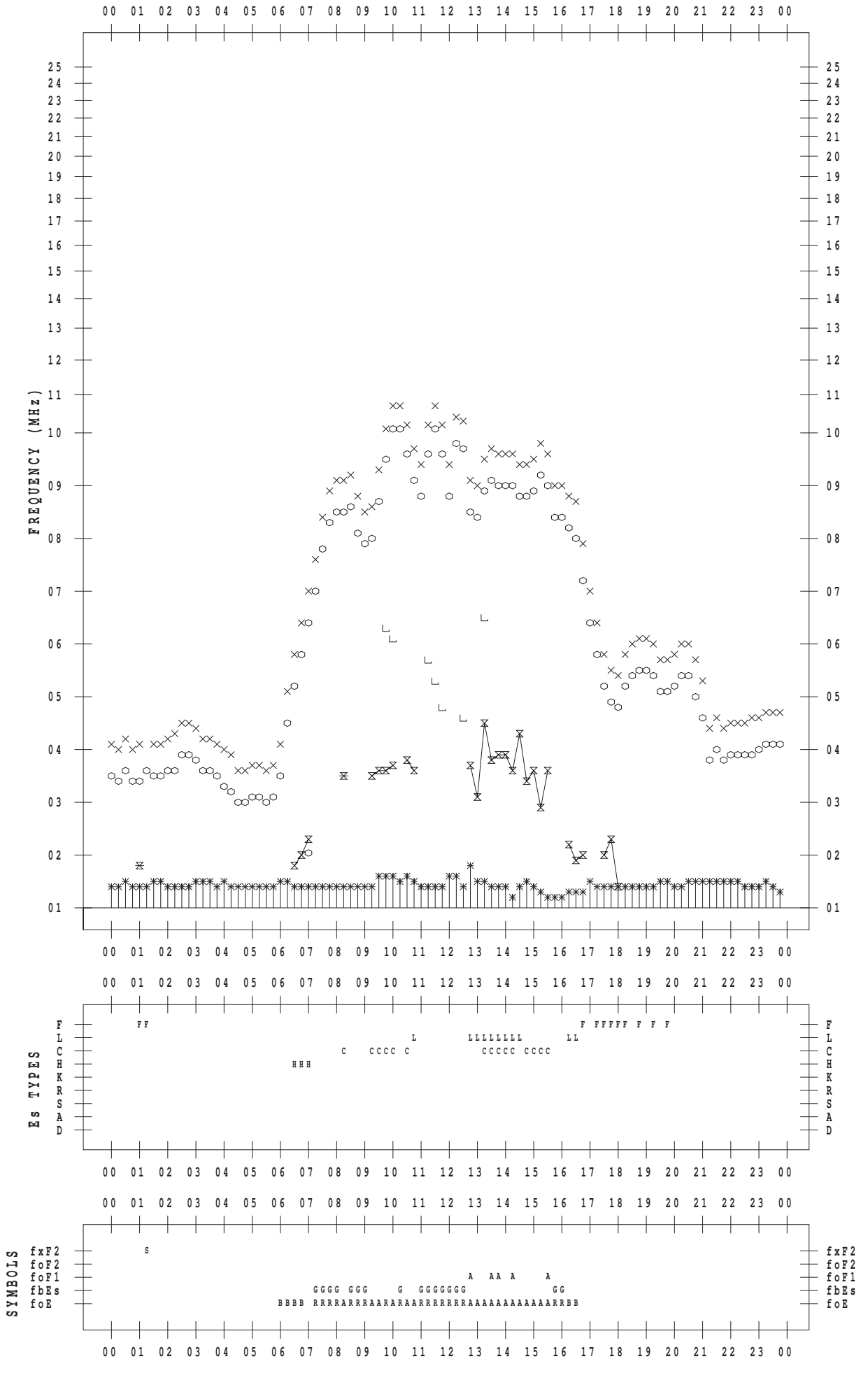
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/20

135 °E MEAN TIME



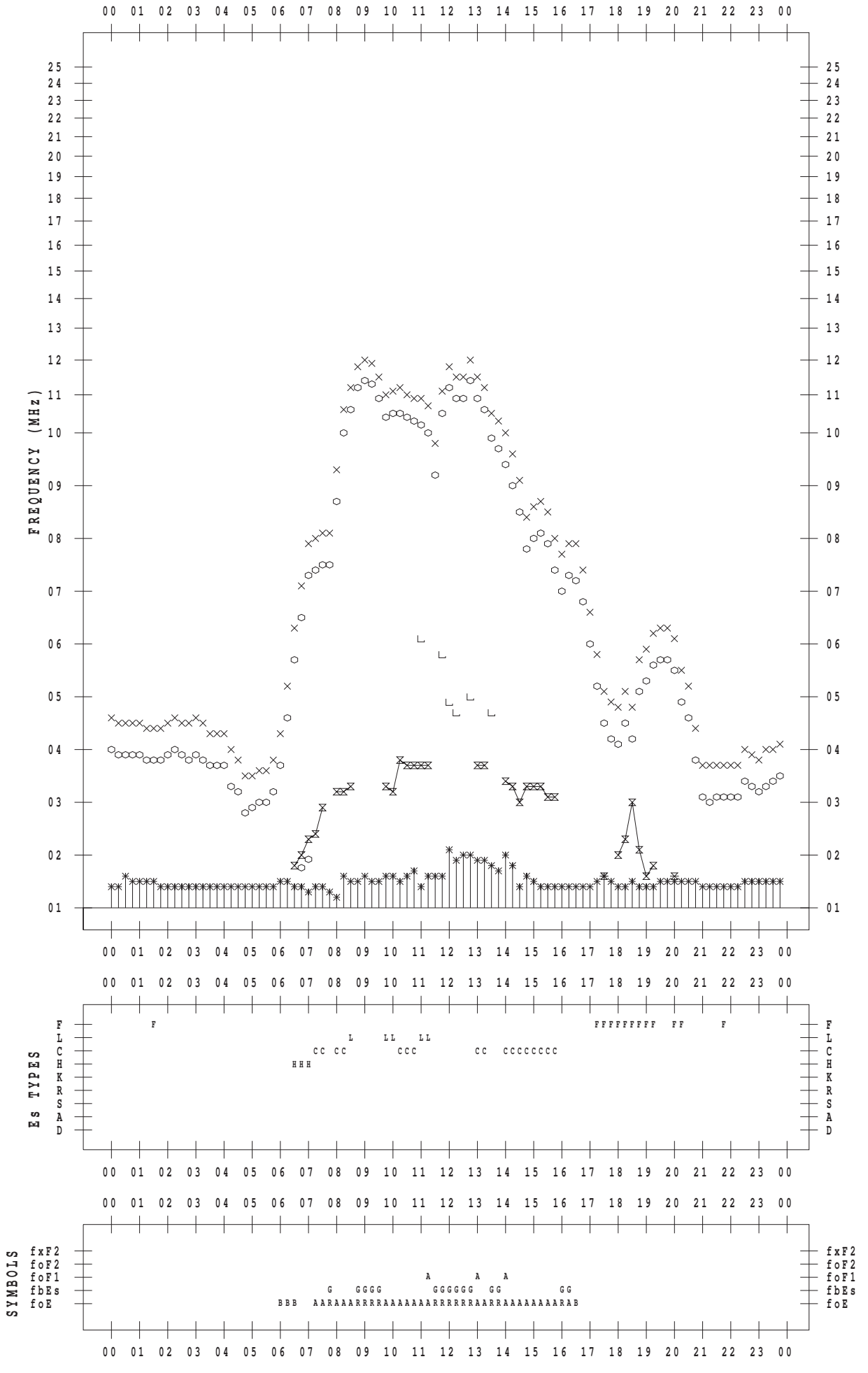
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/21

135 °E MEAN TIME



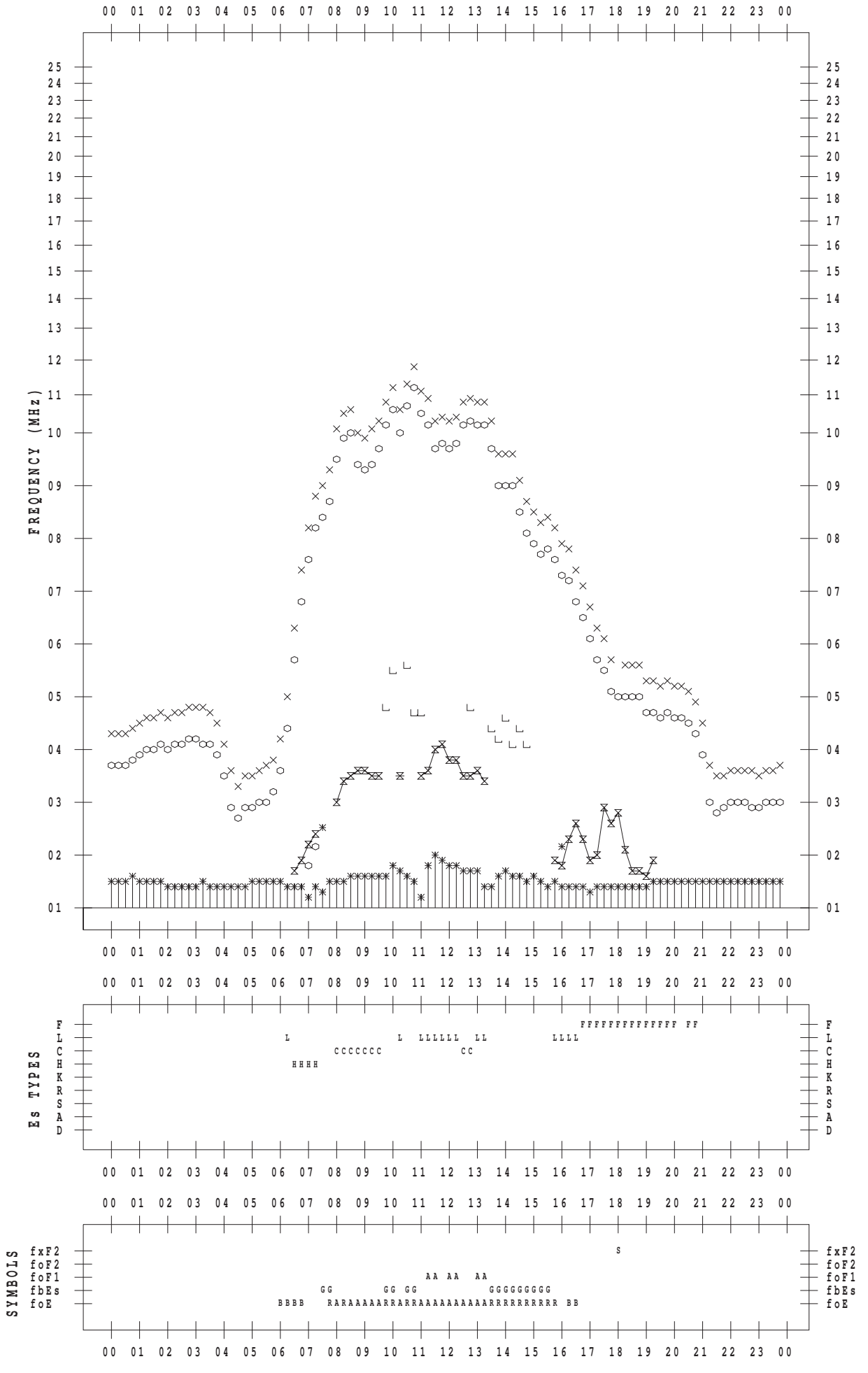
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/22

135 °E MEAN TIME



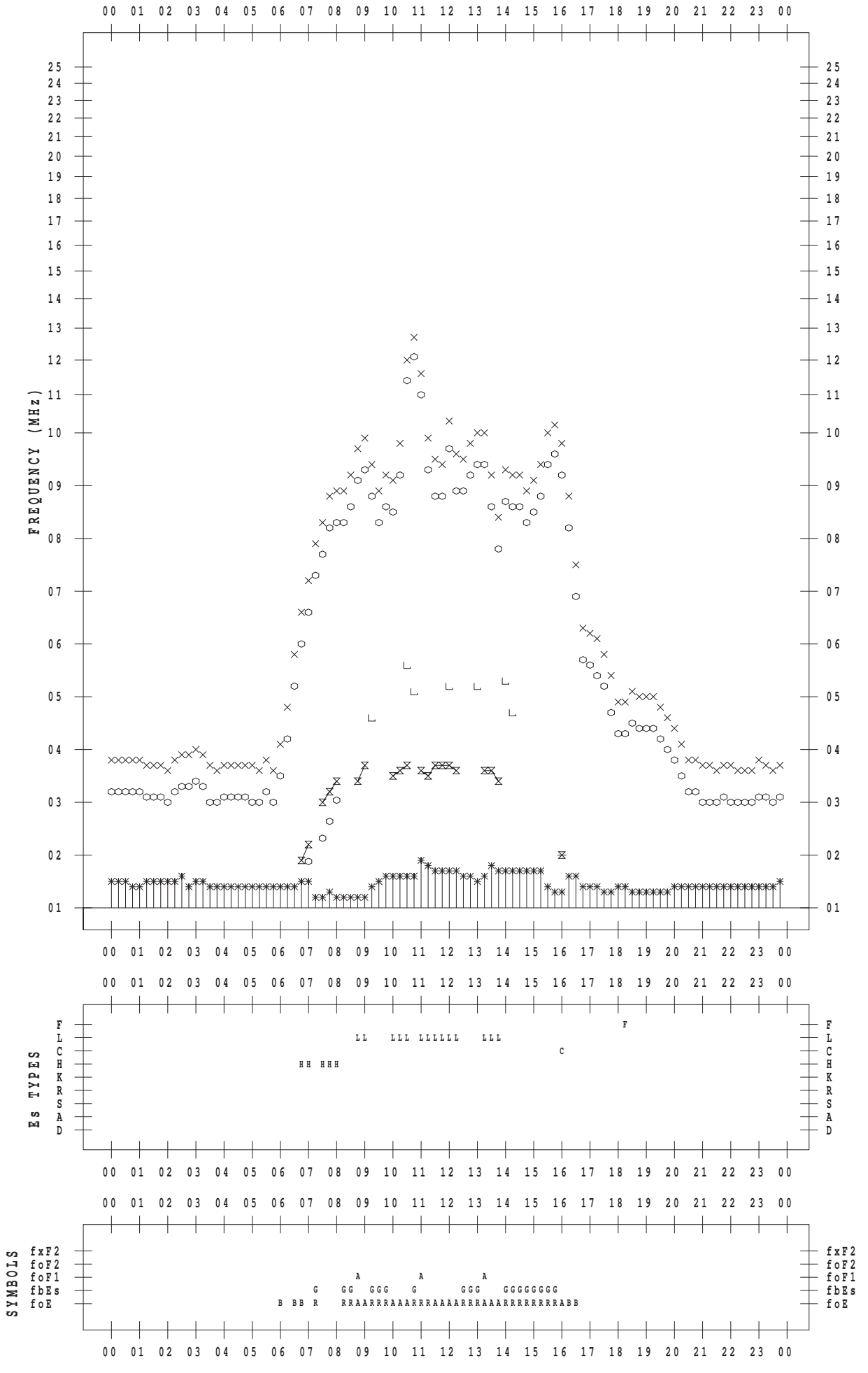
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/23

135 °E MEAN TIME



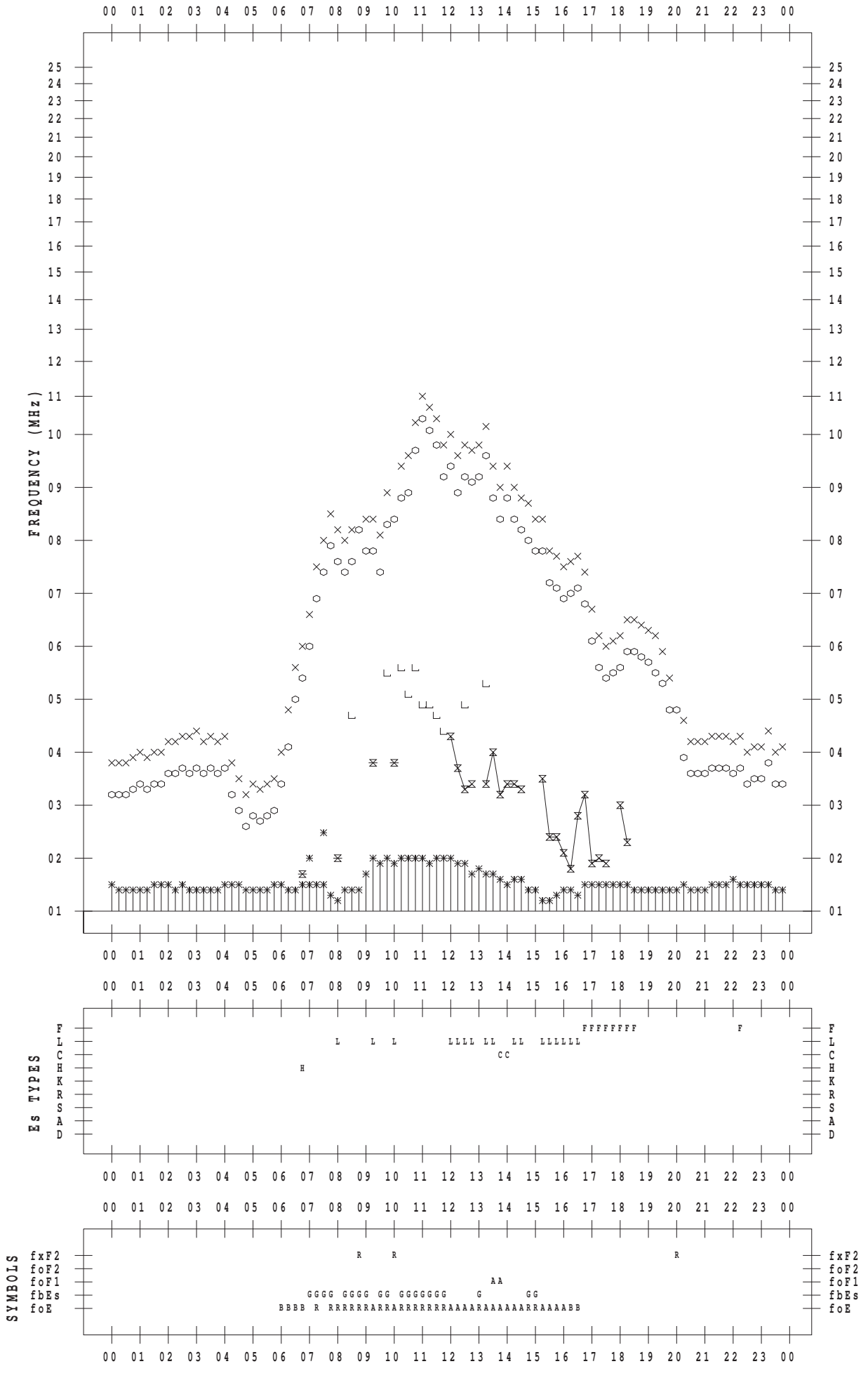
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/24

135 °E MEAN TIME



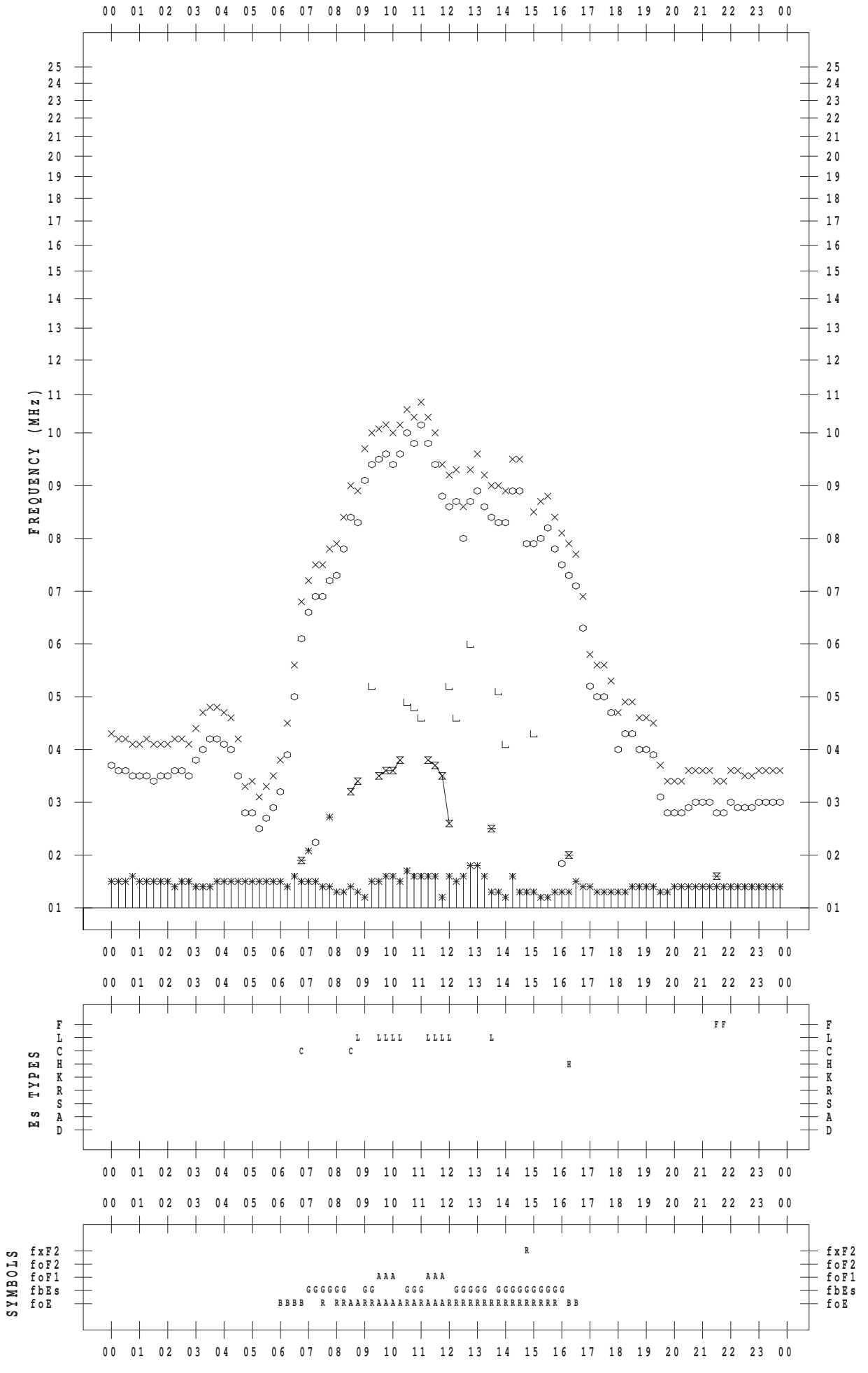
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/25

135 °E MEAN TIME



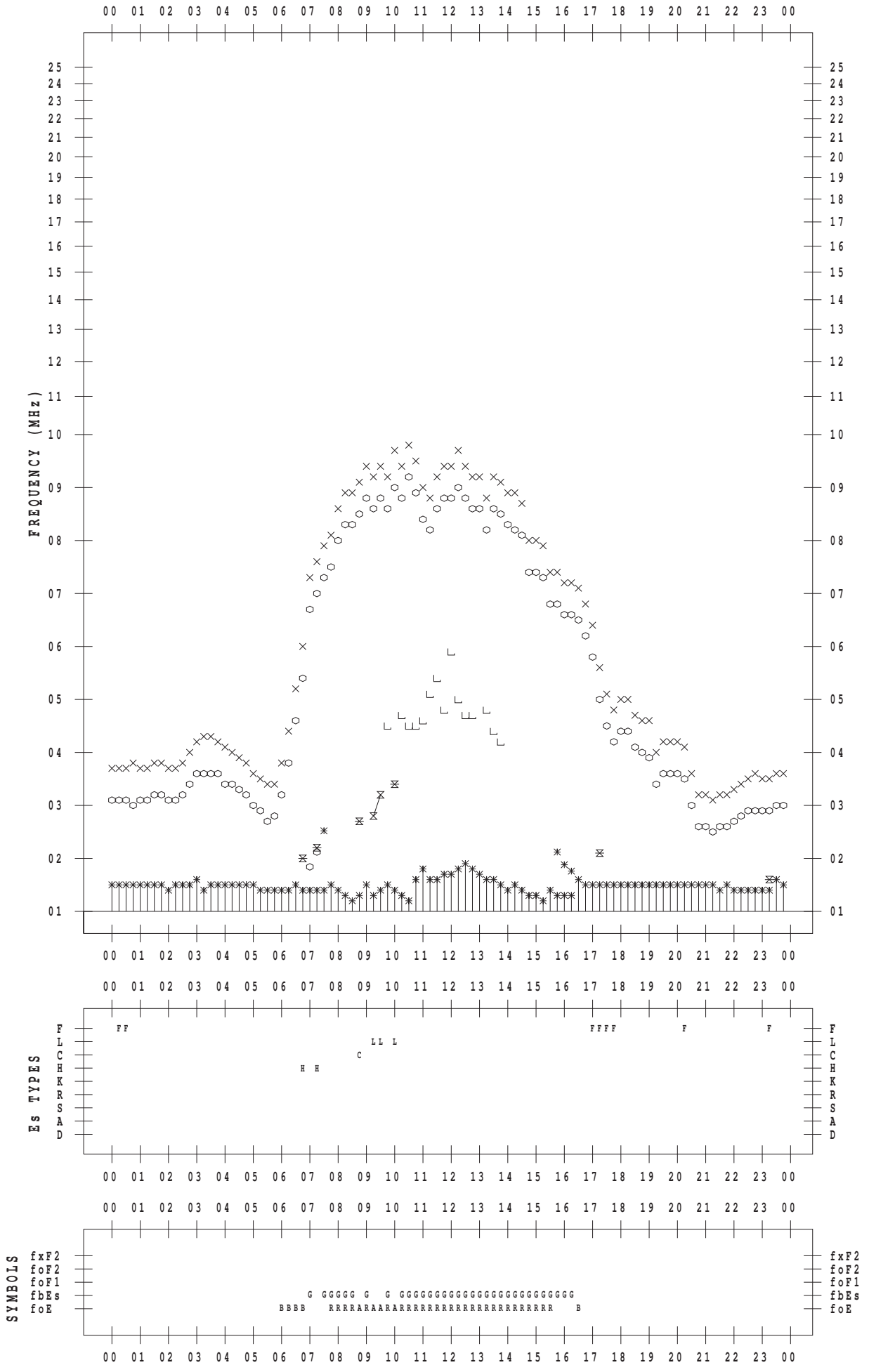
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/26

135 °E MEAN TIME



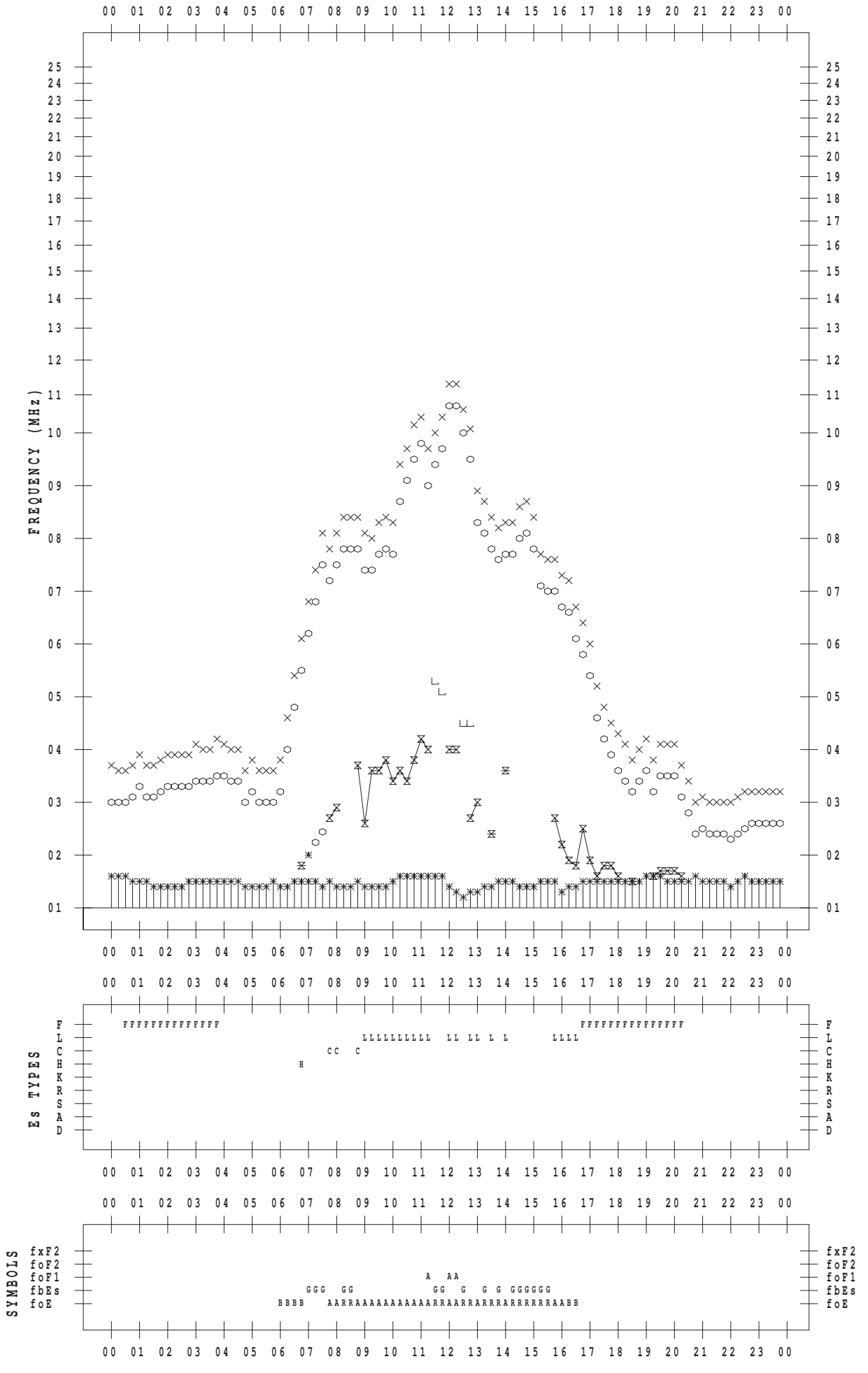
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/27

135 °E MEAN TIME



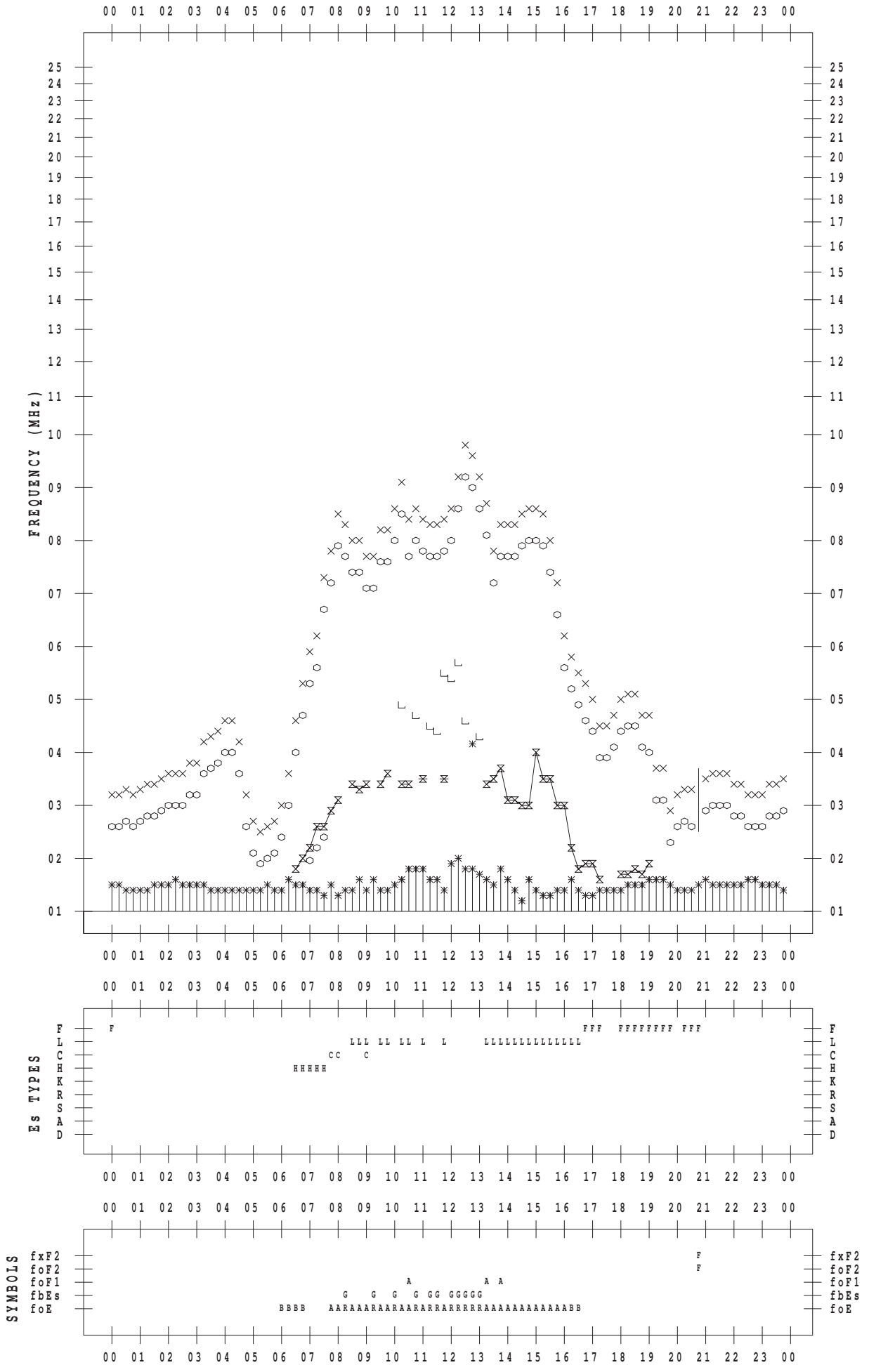
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/28

135 °E MEAN TIME



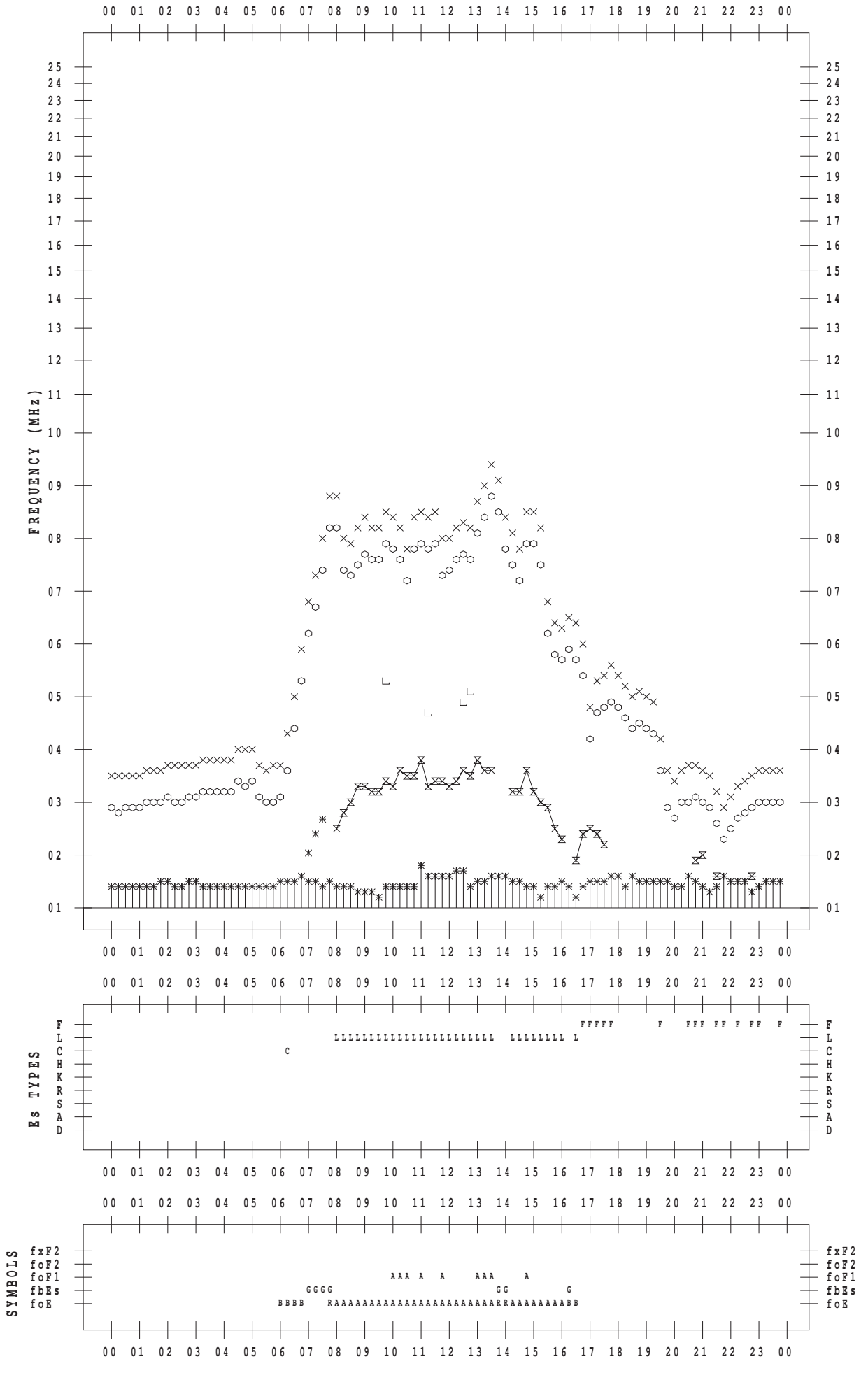
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/29

135 °E MEAN TIME



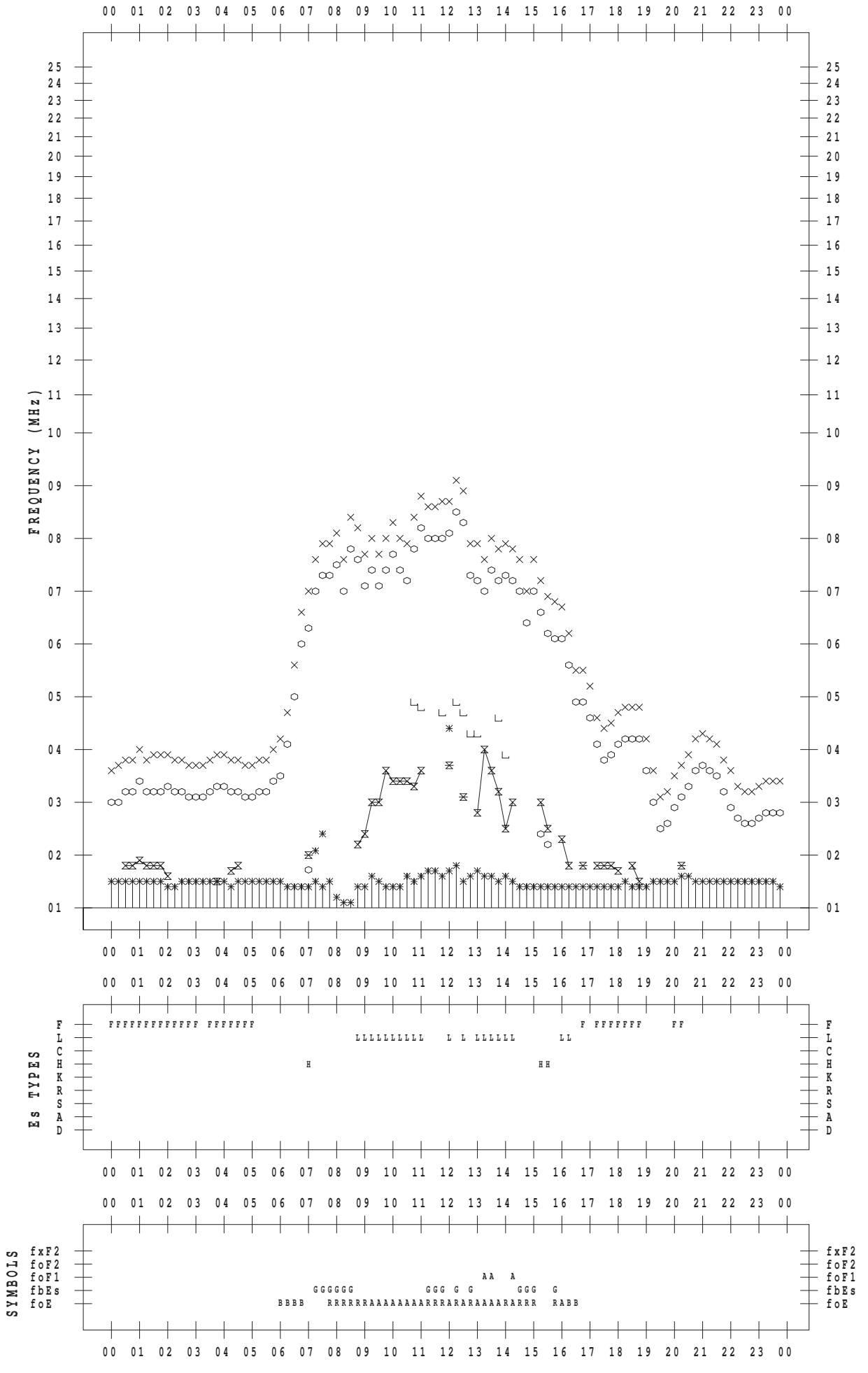
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2012/11/30

135 °E MEAN TIME



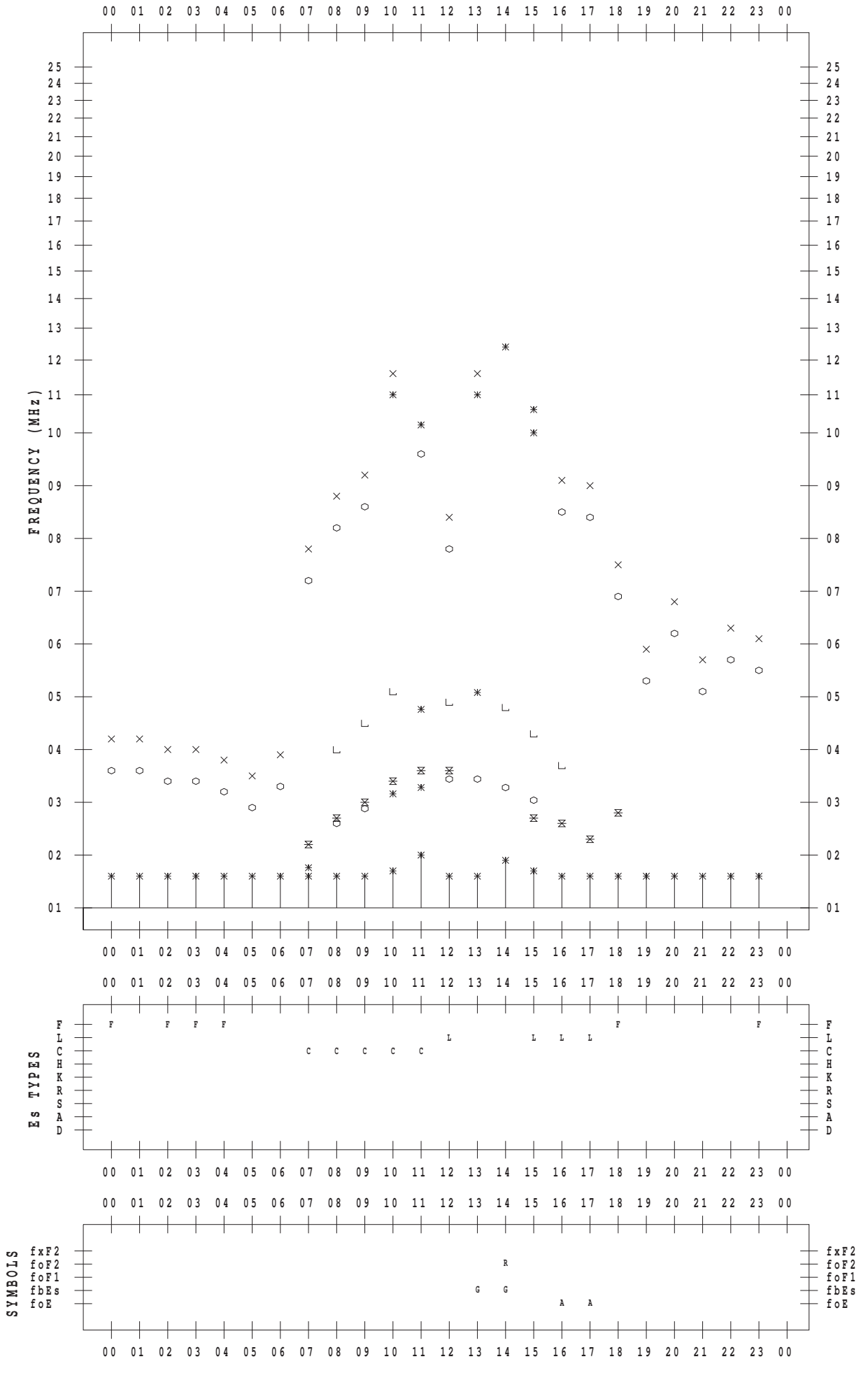
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 1

135 °E MEAN TIME



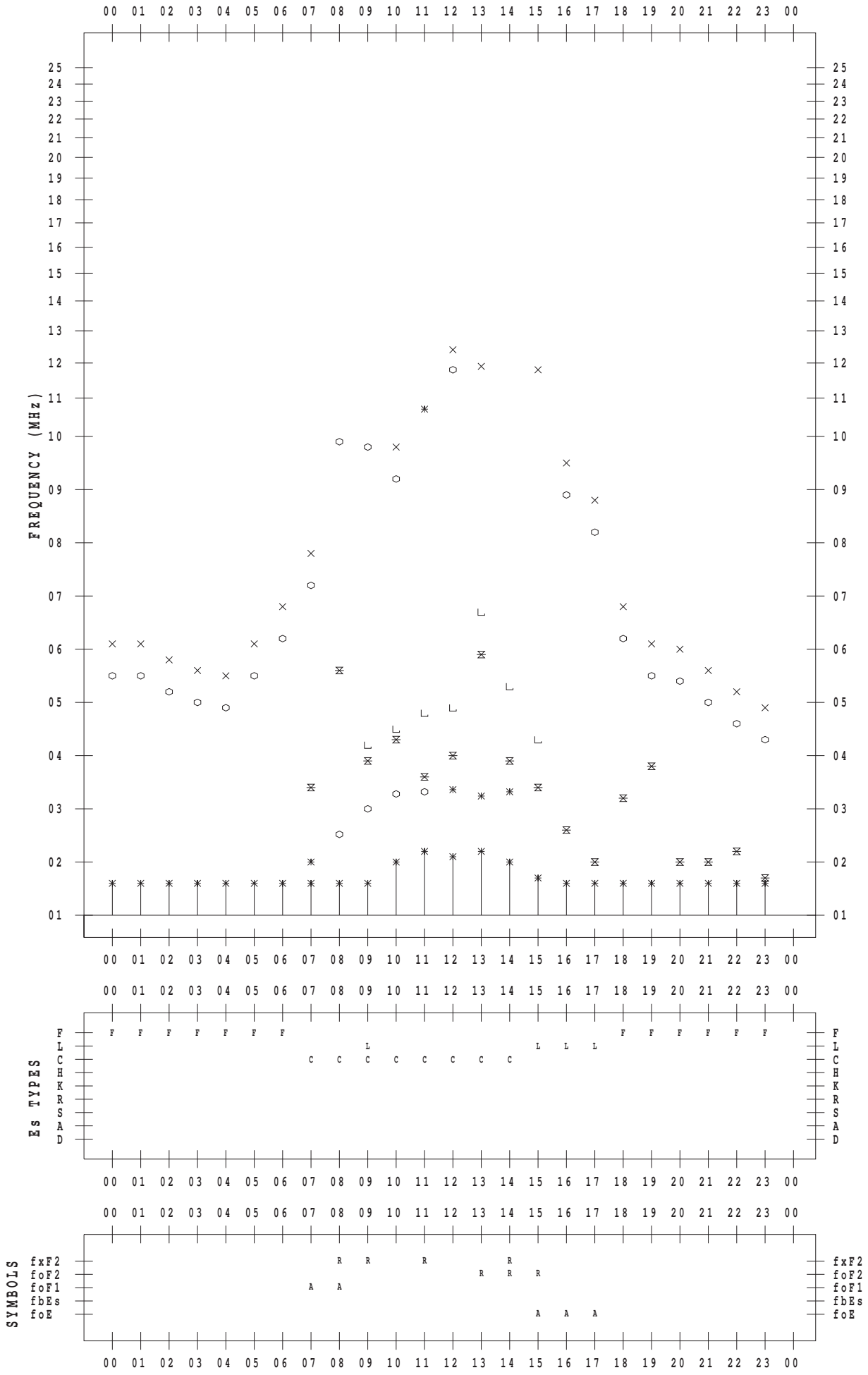
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 2

135 °E MEAN TIME



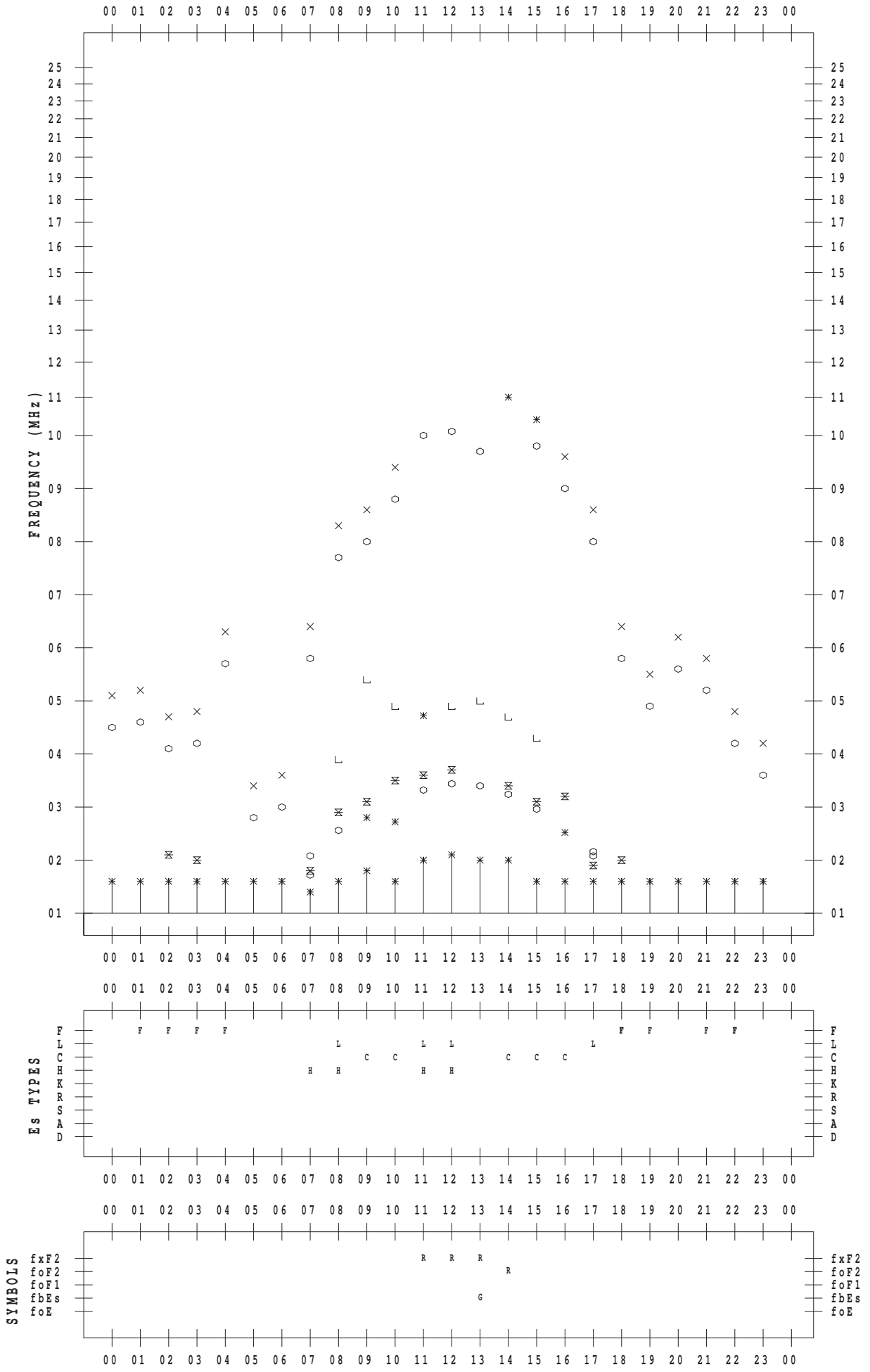
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 3

135 °E MEAN TIME



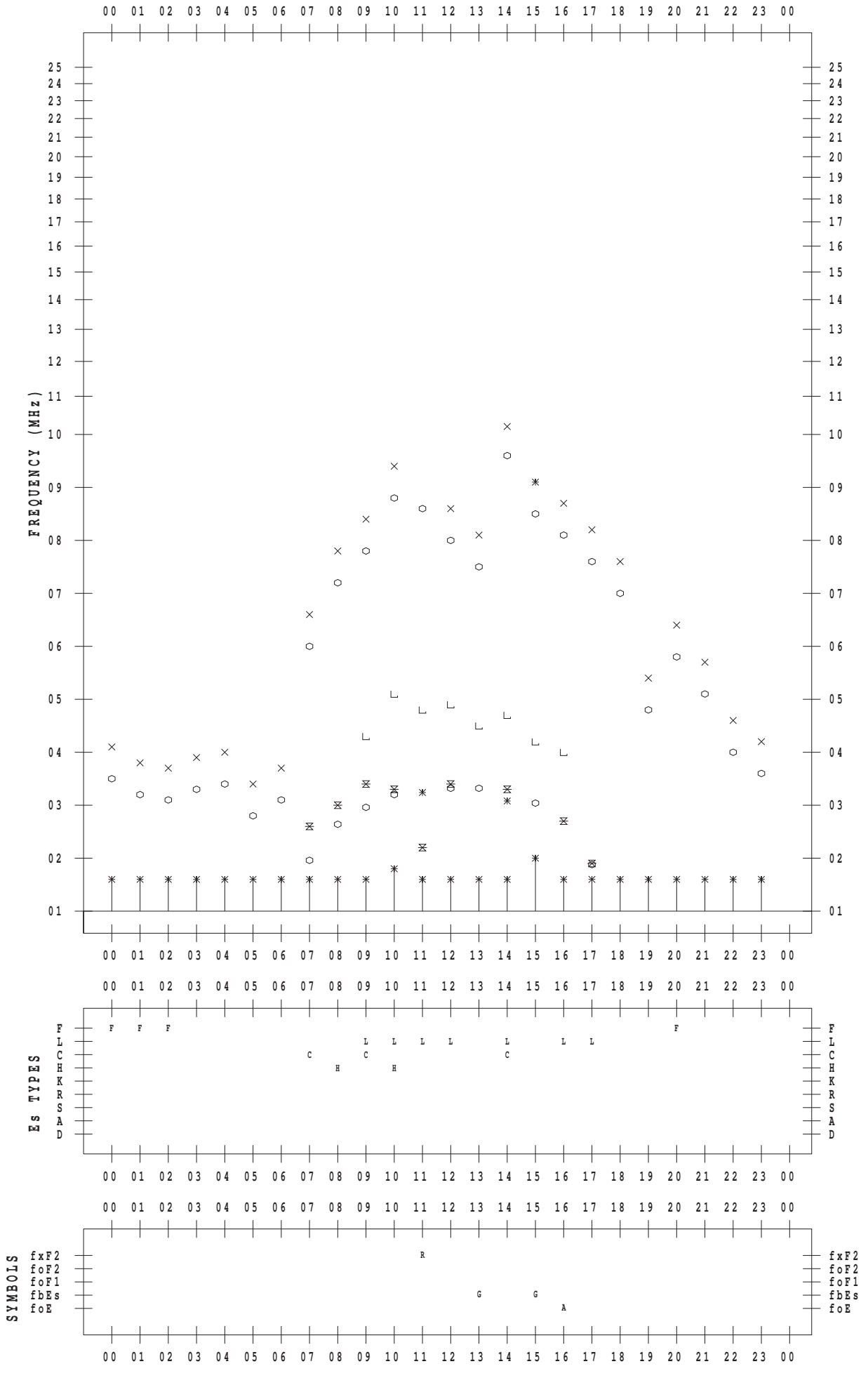
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 4

135 °E MEAN TIME



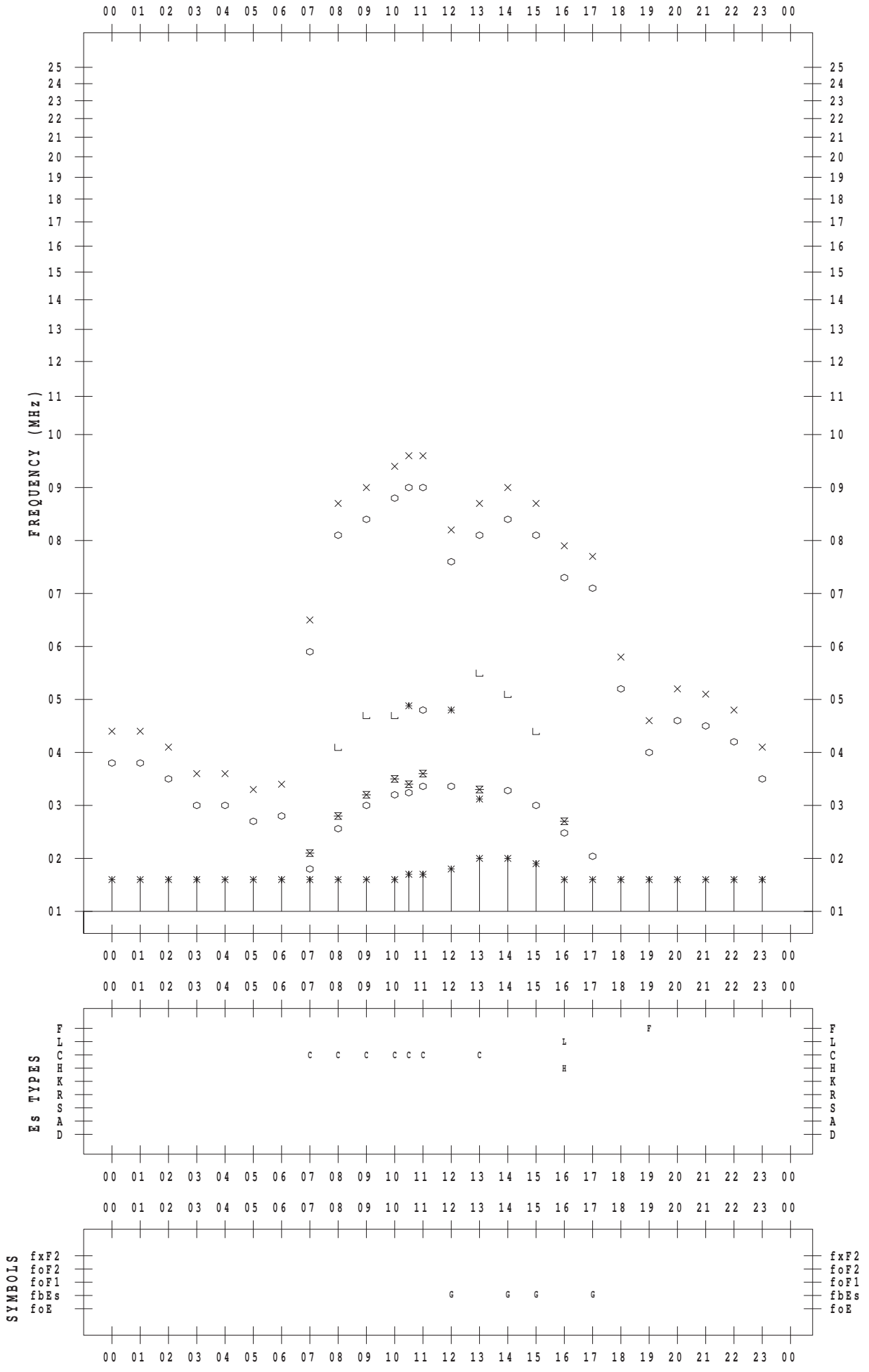
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 5

135 °E MEAN TIME



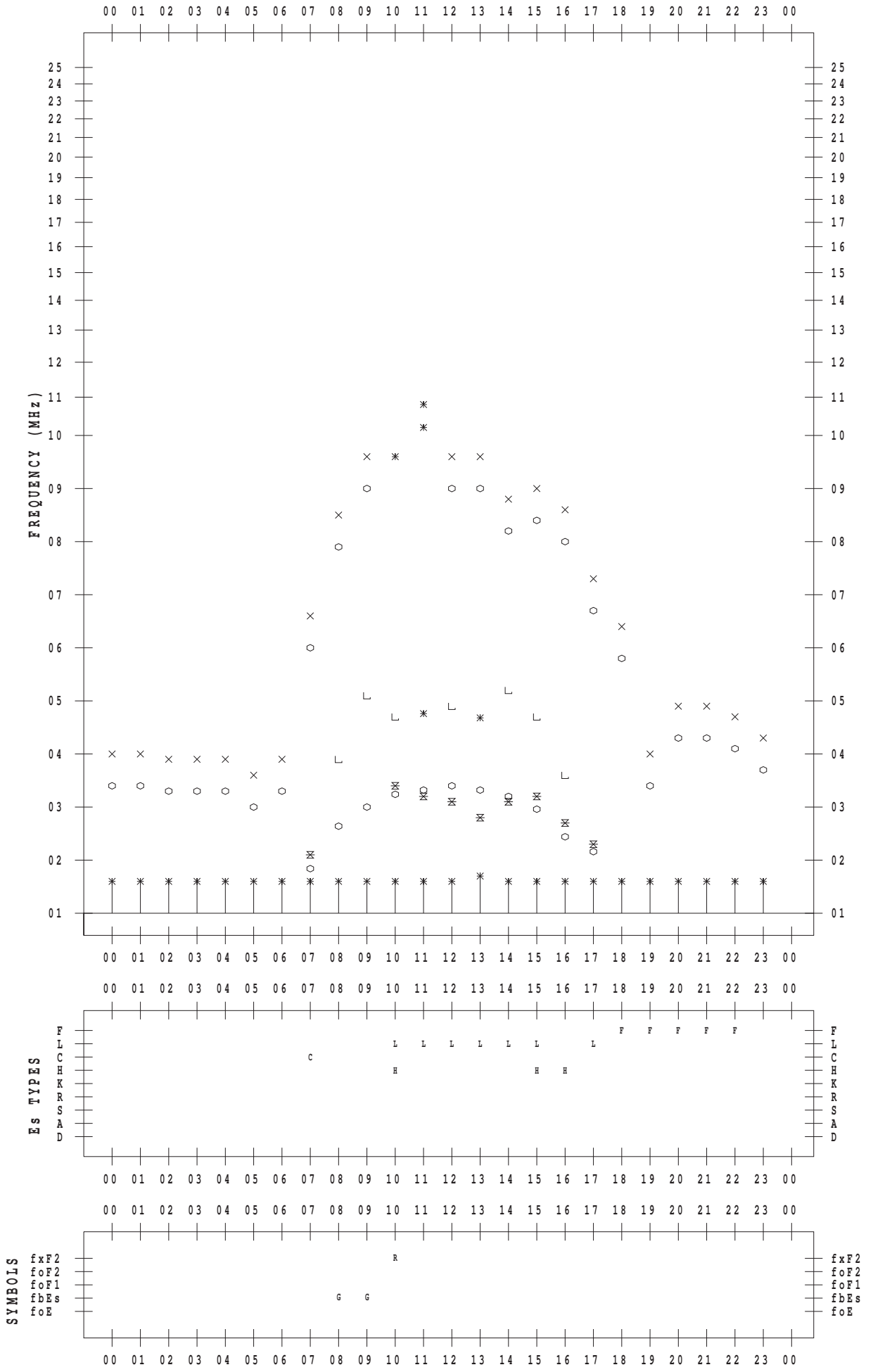
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 6

135 °E MEAN TIME



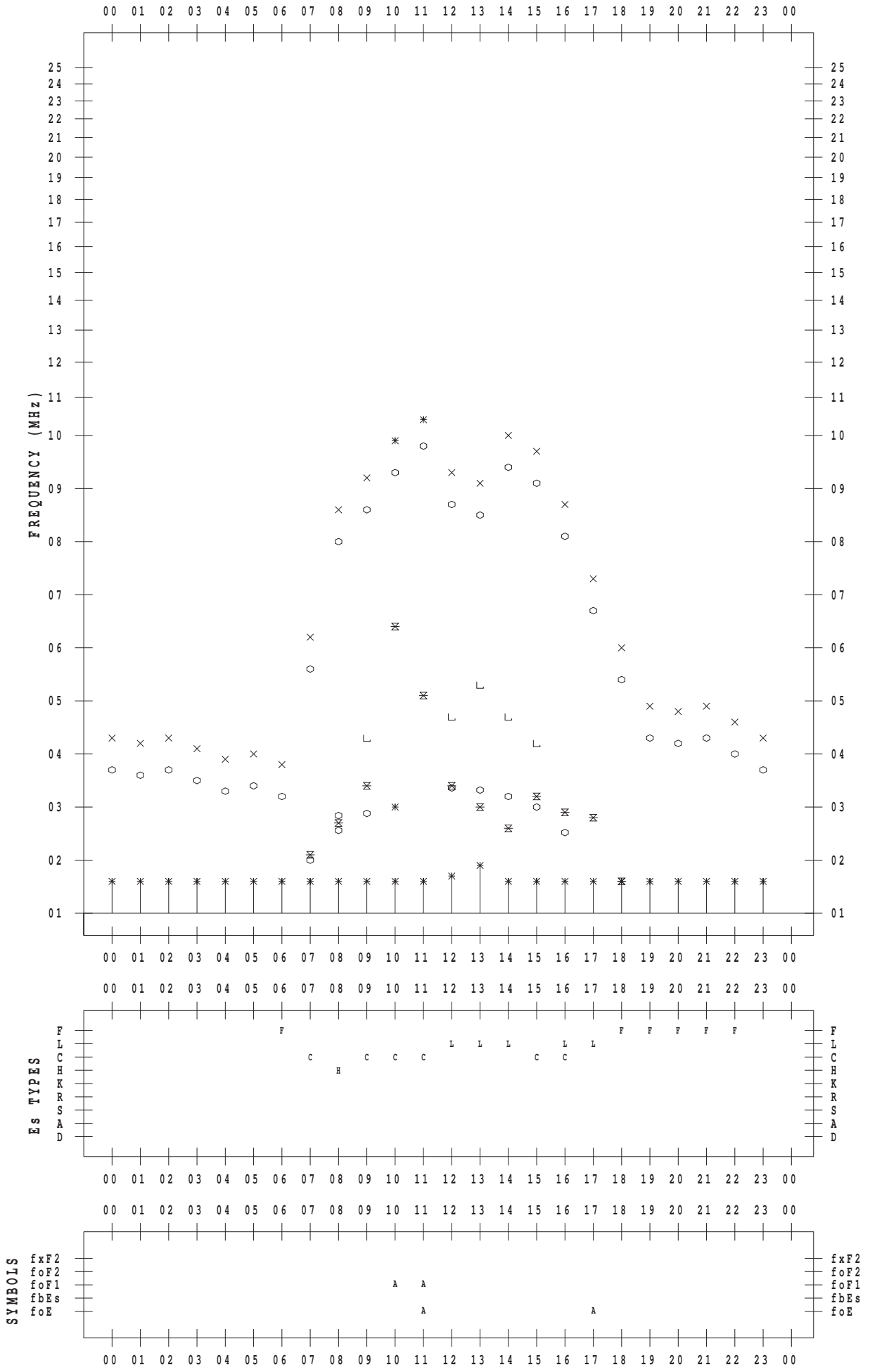
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 7

135 °E MEAN TIME



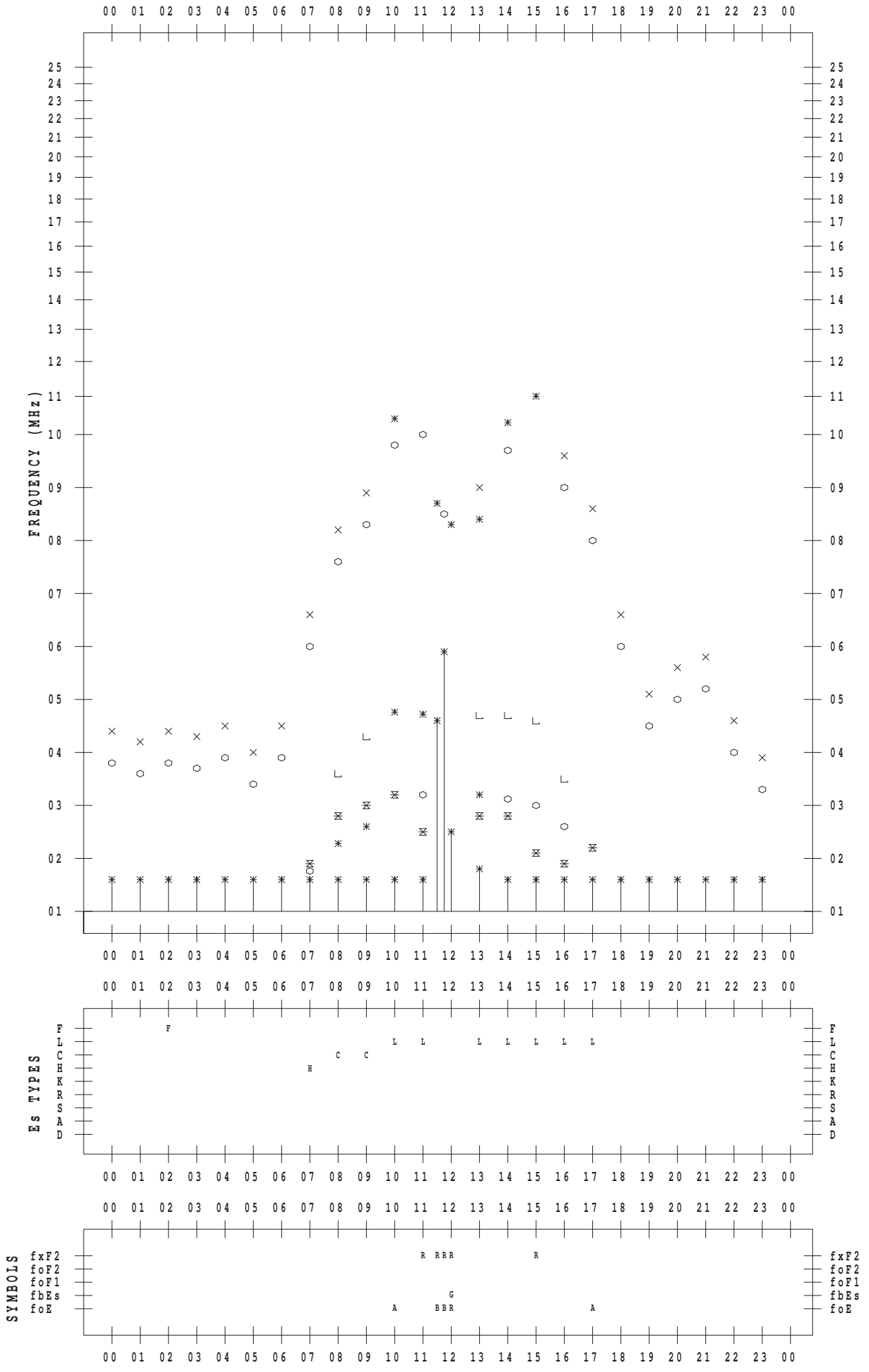
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 8

135 °E MEAN TIME



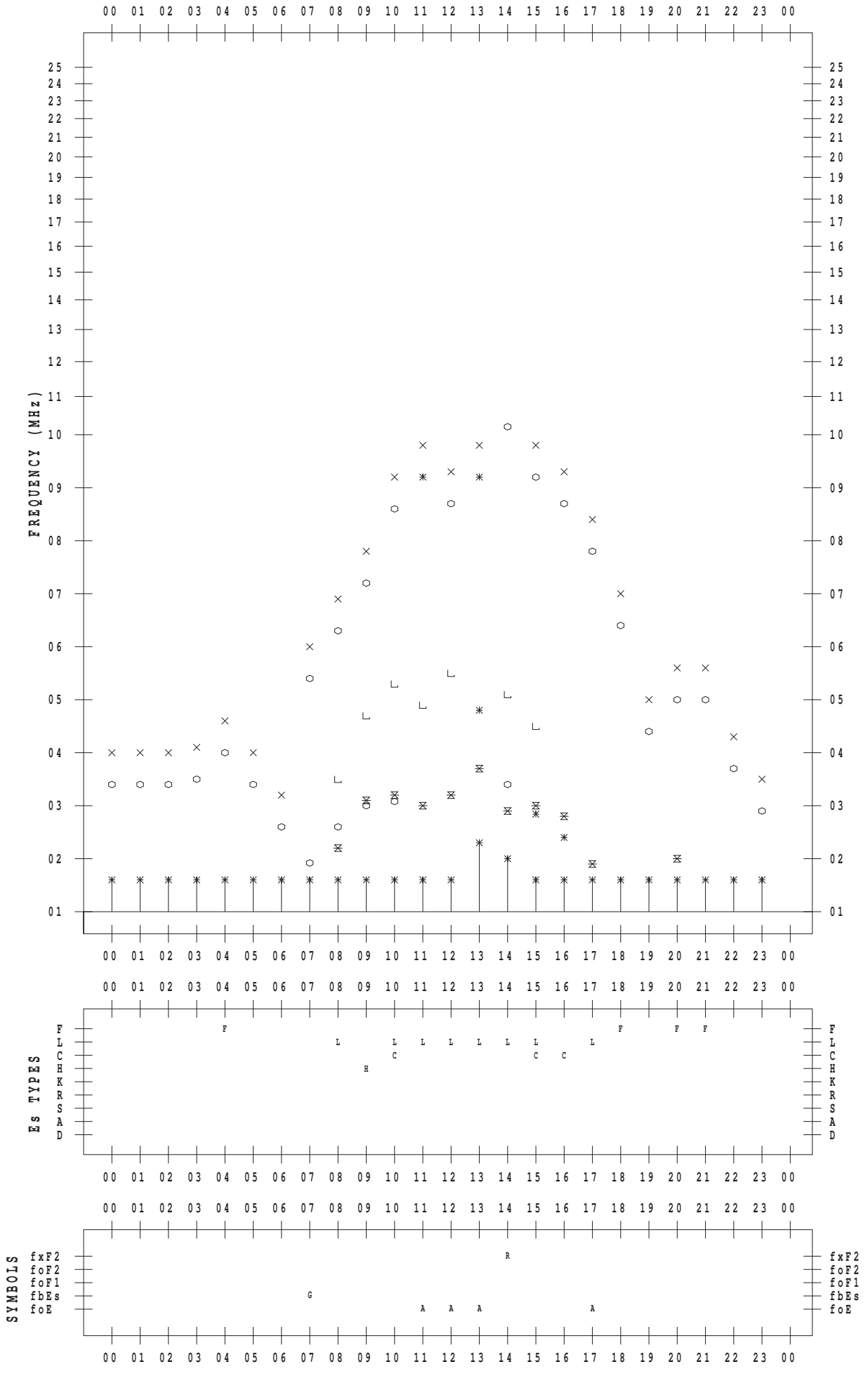
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/ 9

135 °E MEAN TIME



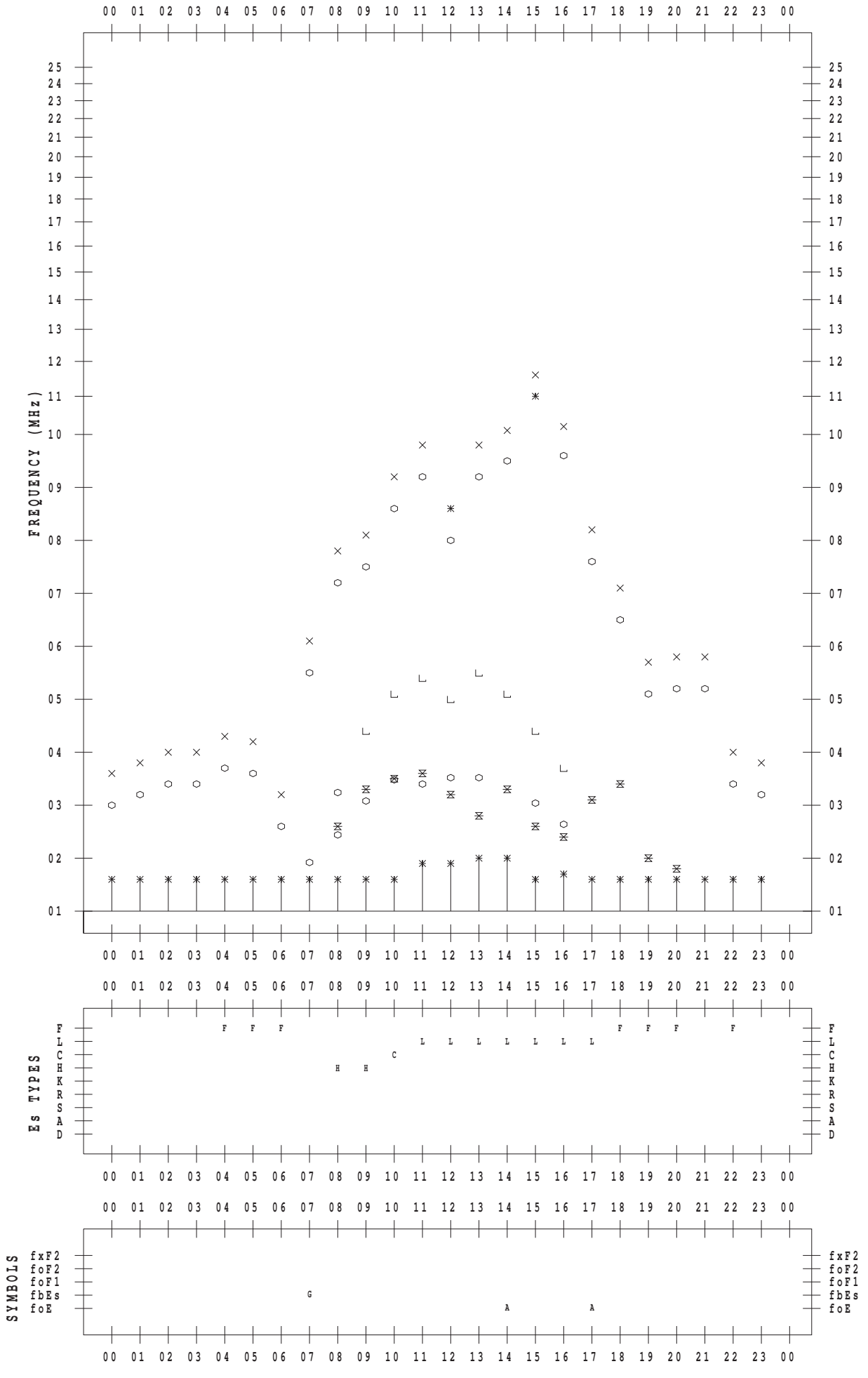
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/10

135 °E MEAN TIME



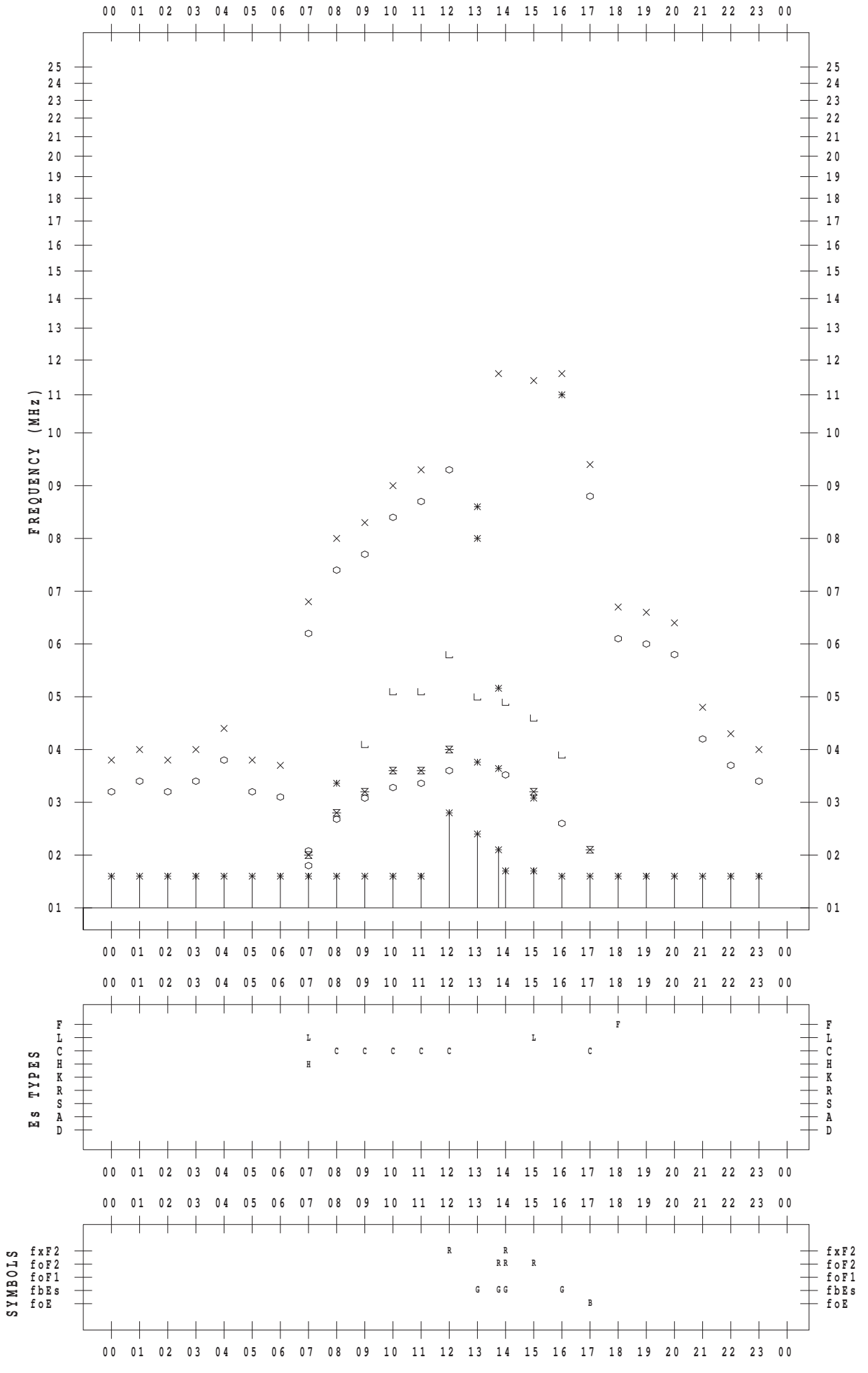
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/11

135 °E MEAN TIME



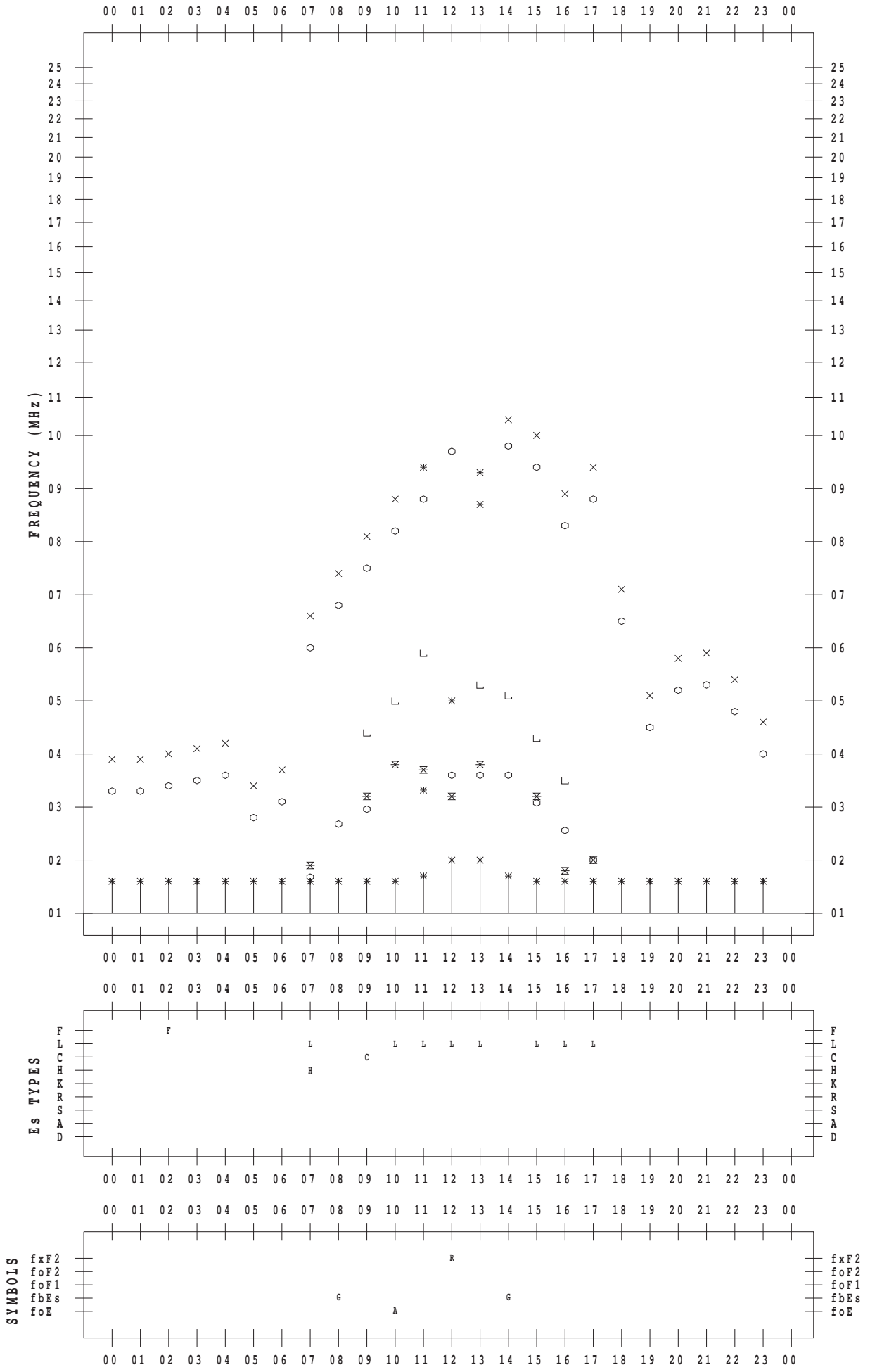
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/12

135 °E MEAN TIME



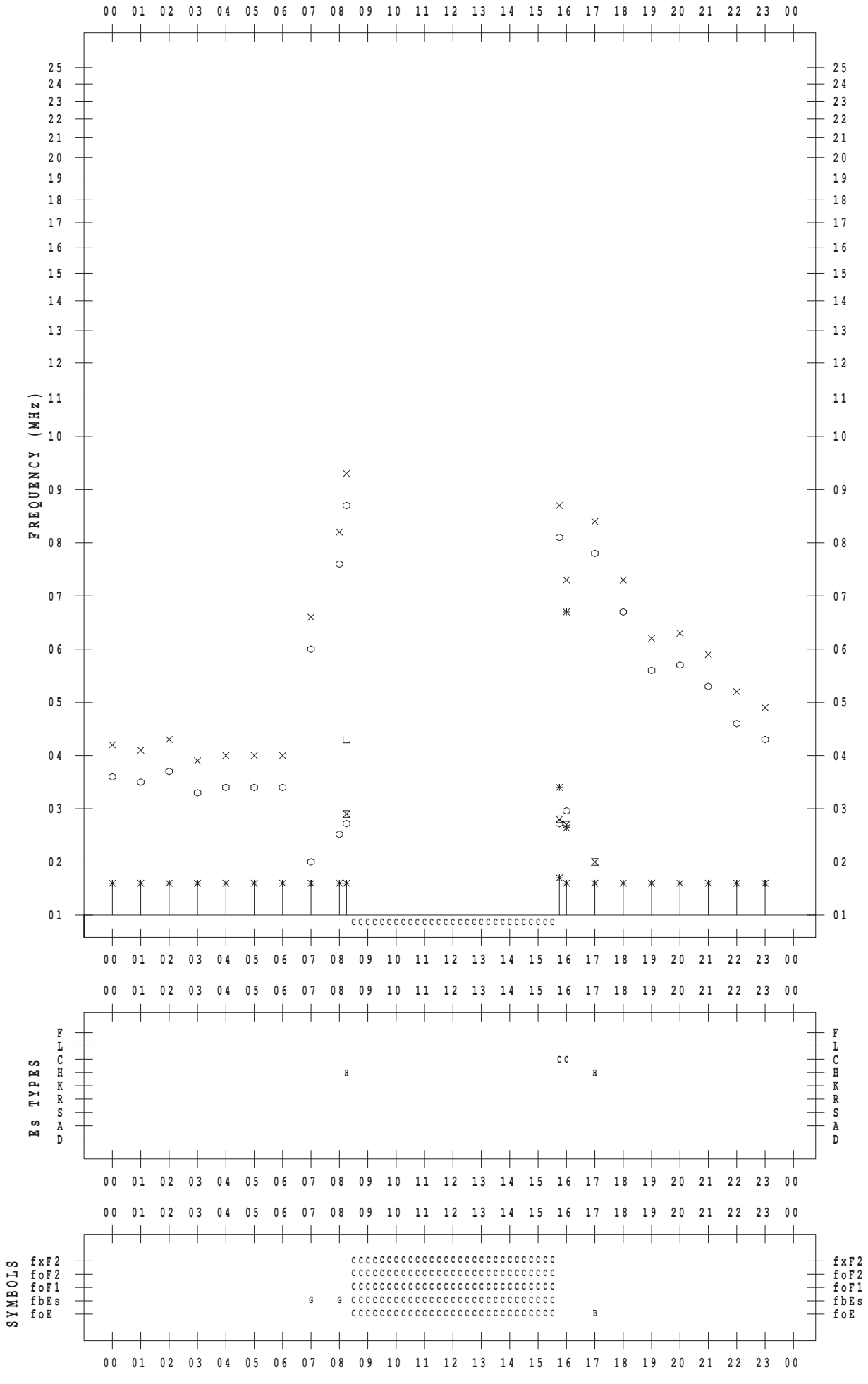
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/13

135 °E MEAN TIME



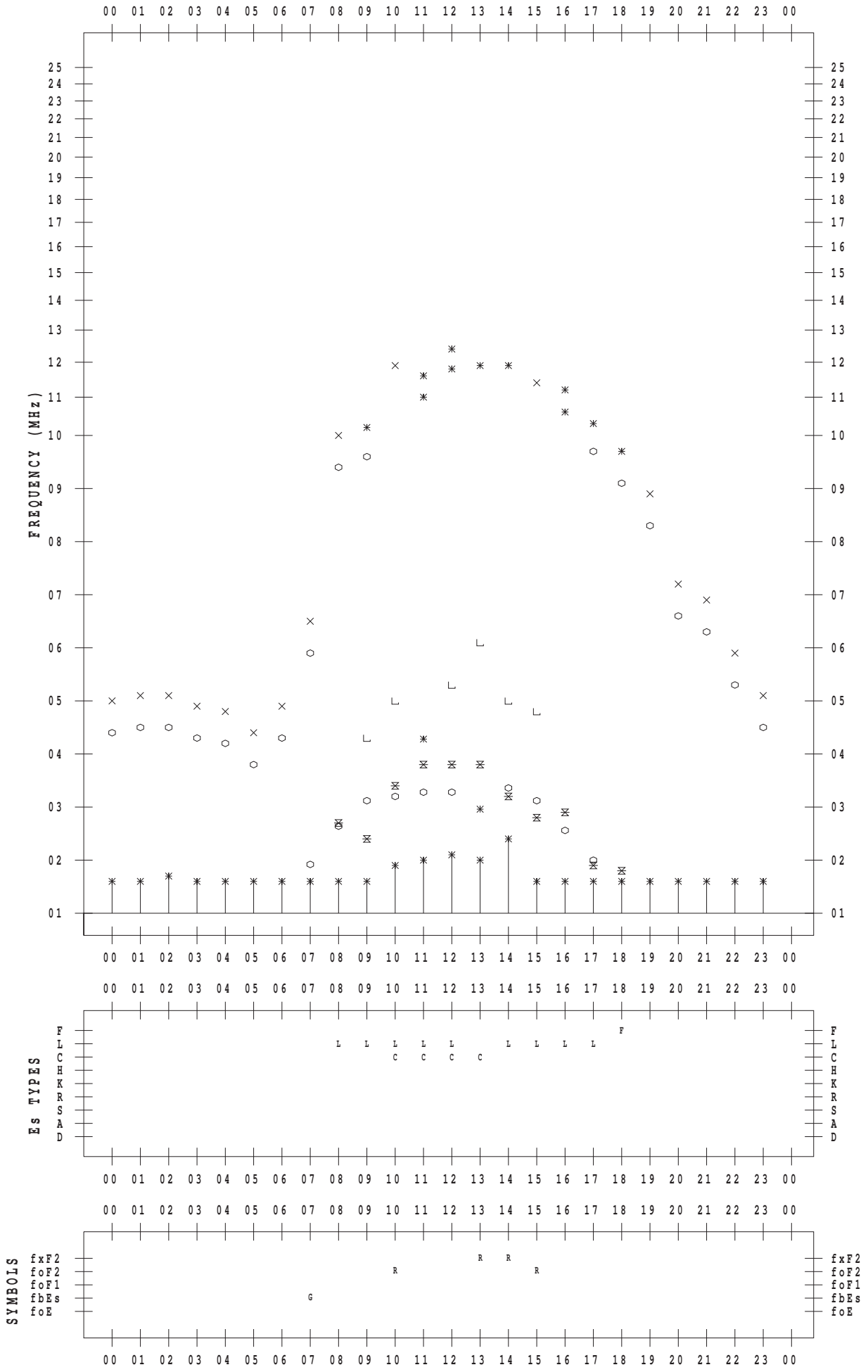
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/14

135 °E MEAN TIME



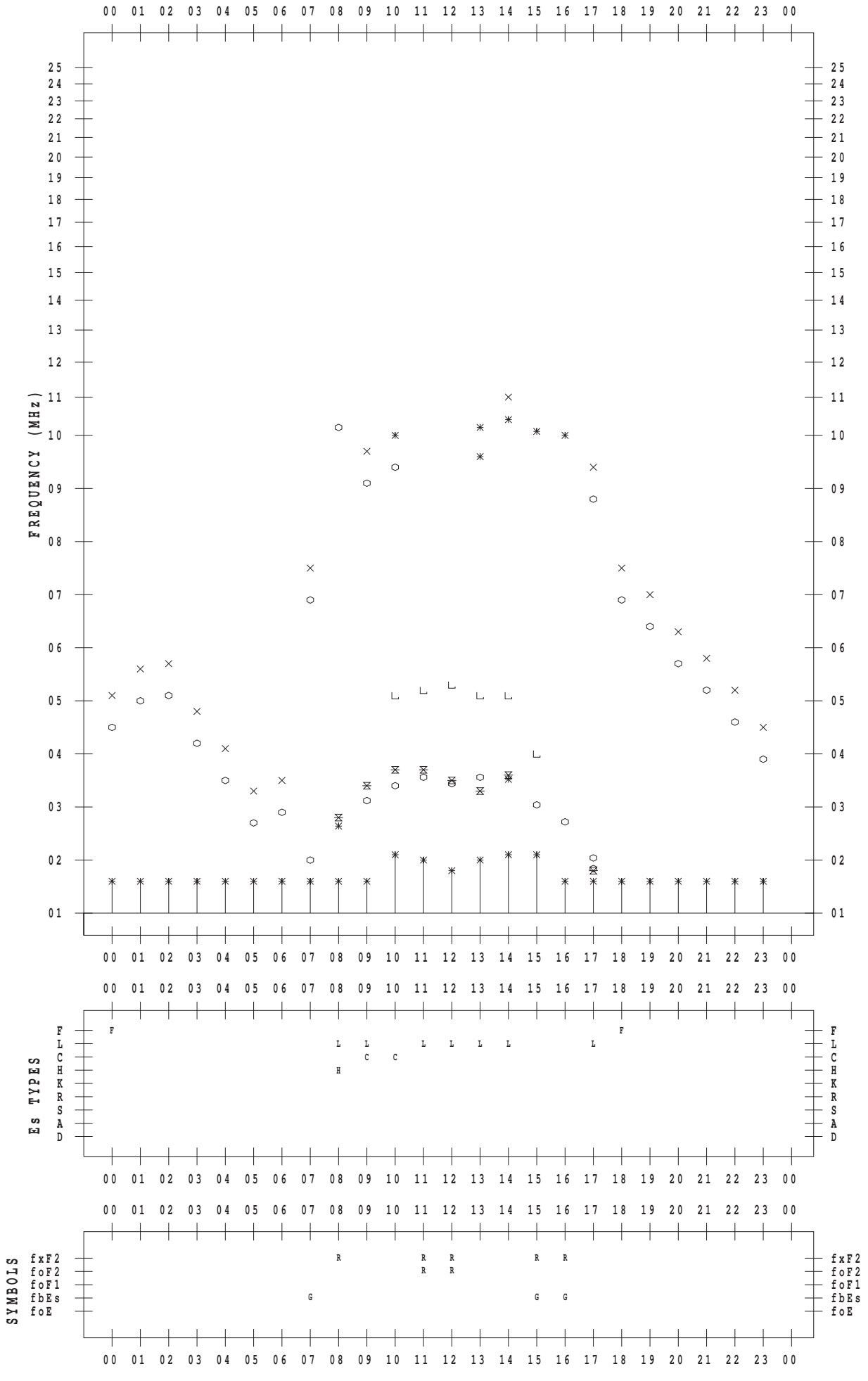
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/15

135 °E MEAN TIME



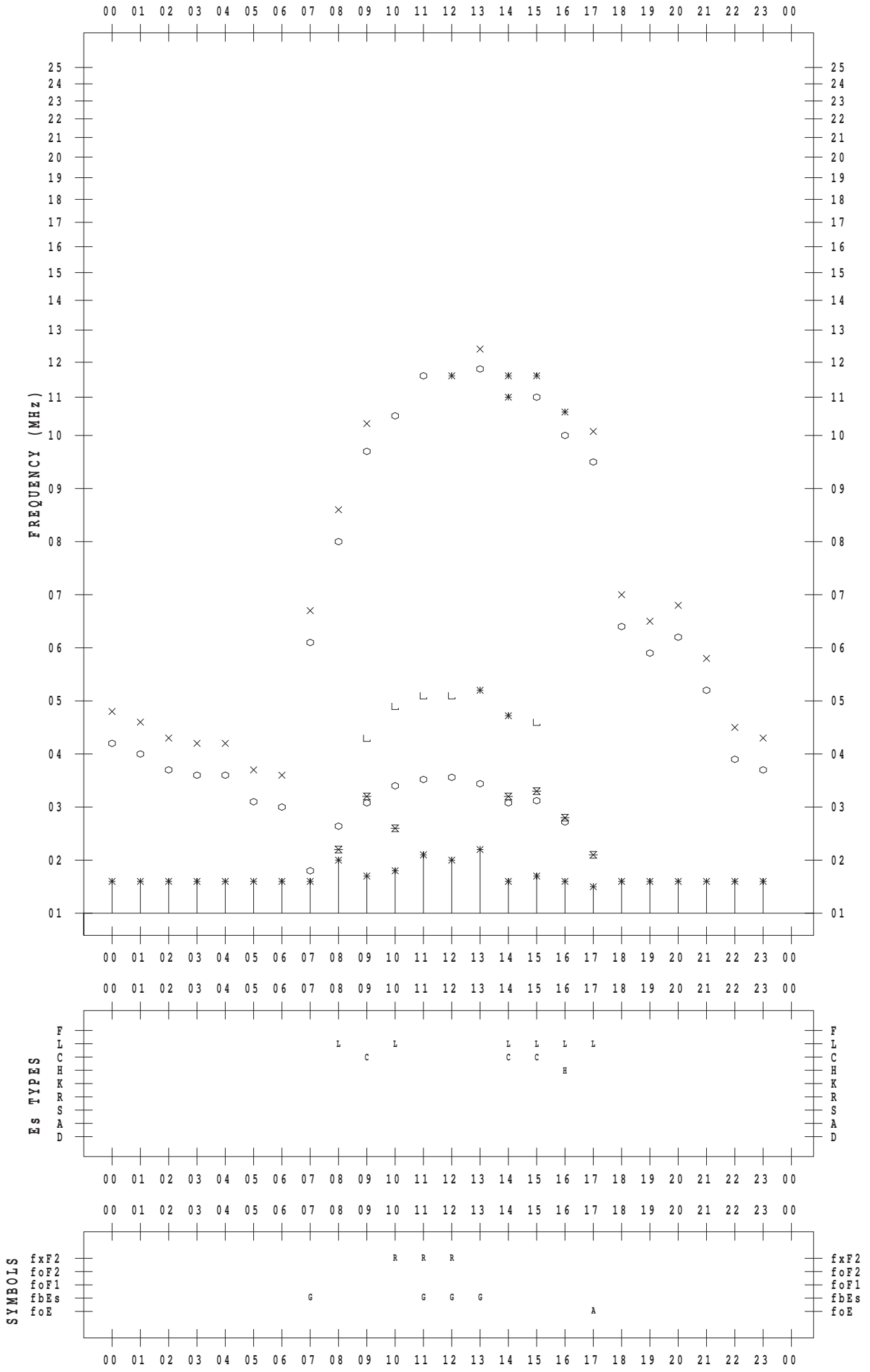
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/16

135 °E MEAN TIME



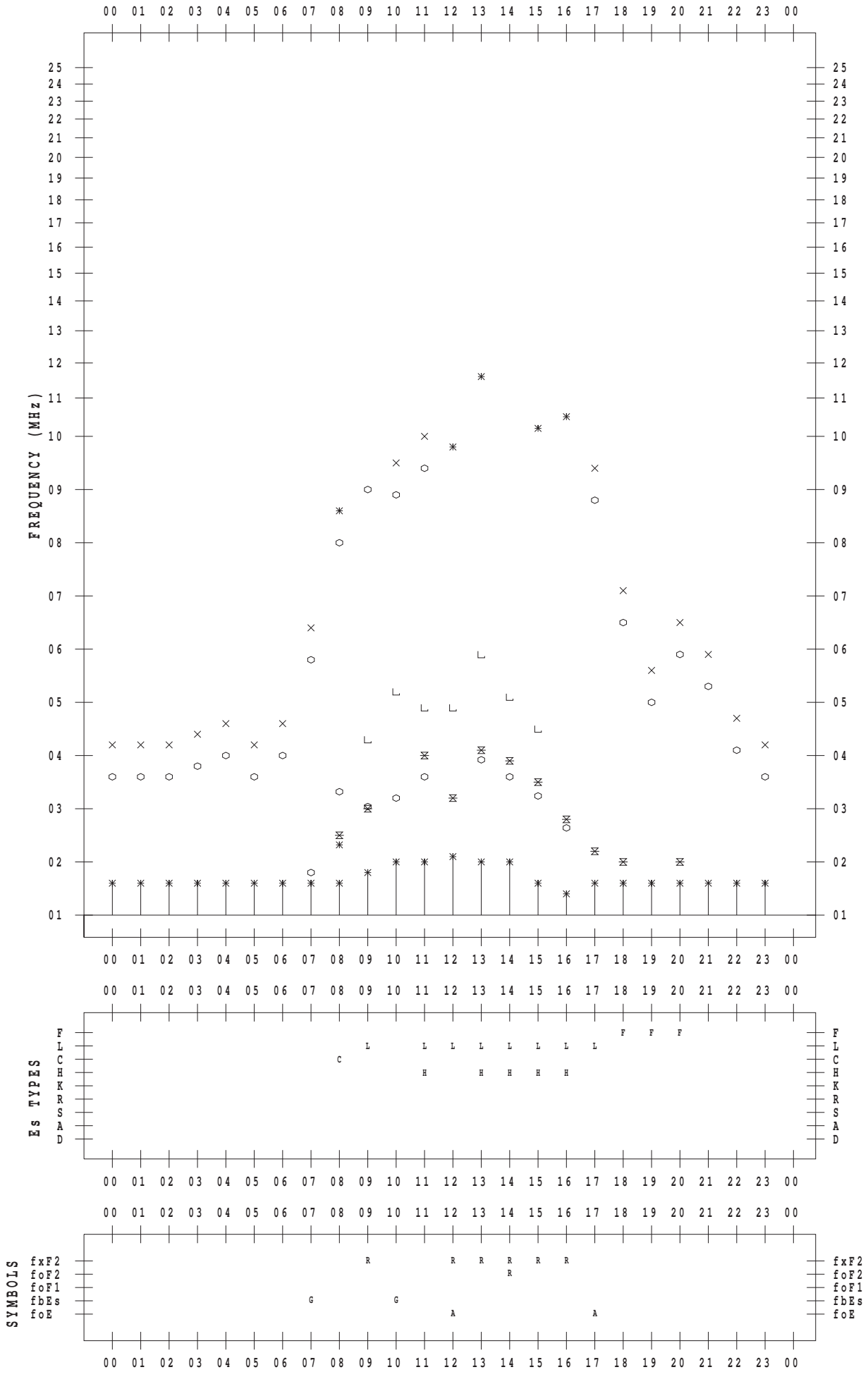
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/17

135 °E MEAN TIME



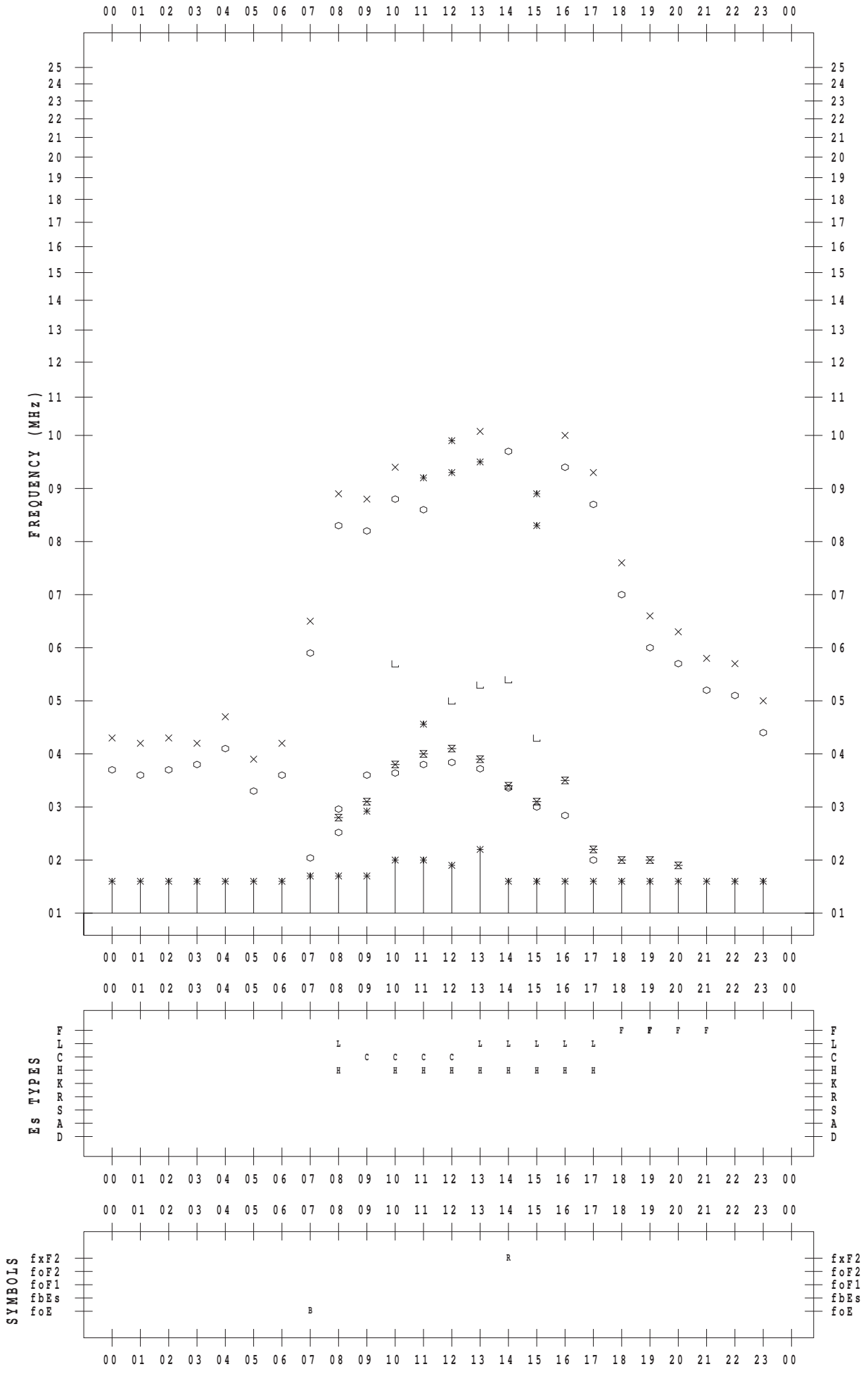
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/18

135 °E MEAN TIME



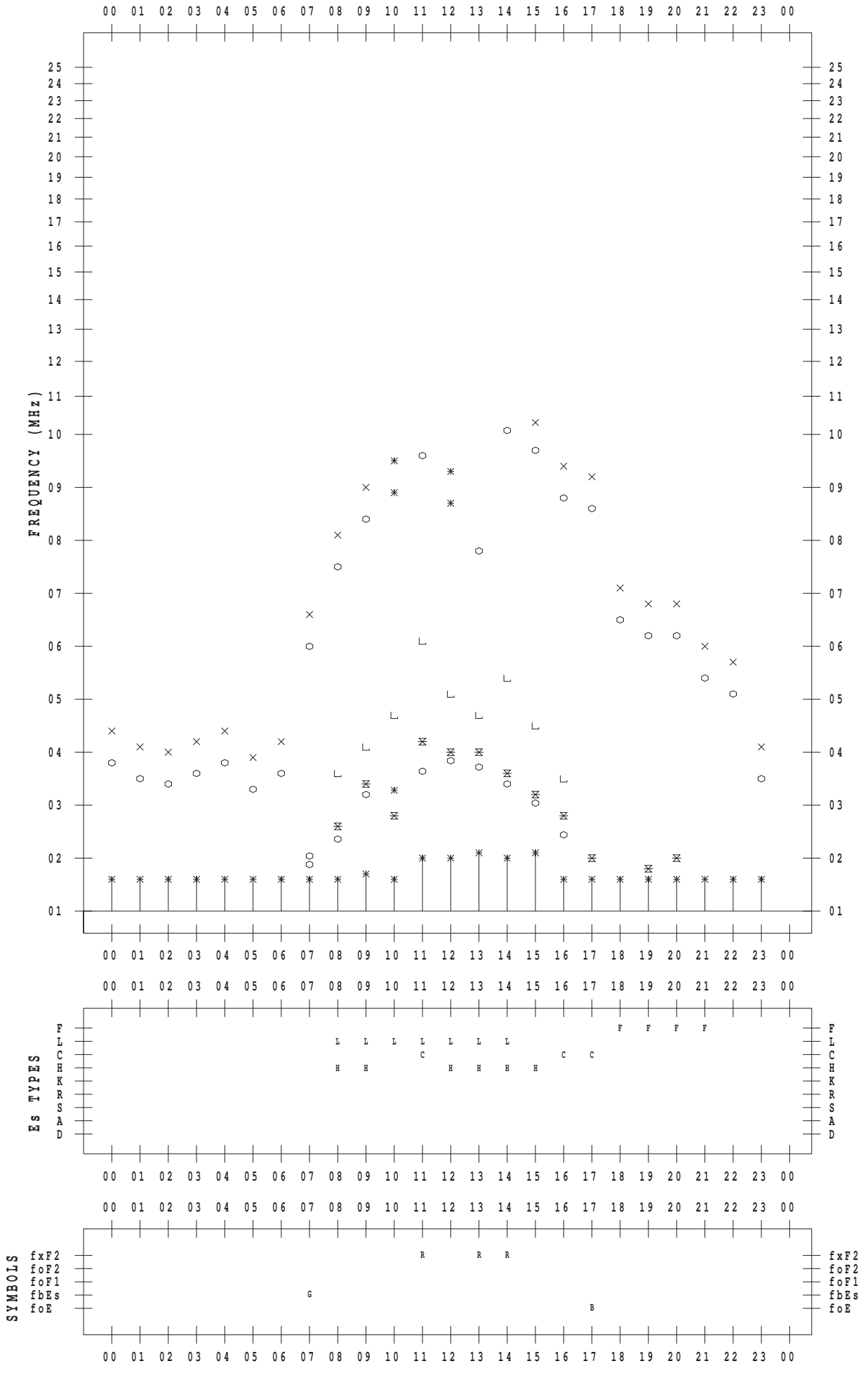
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/19

135 °E MEAN TIME



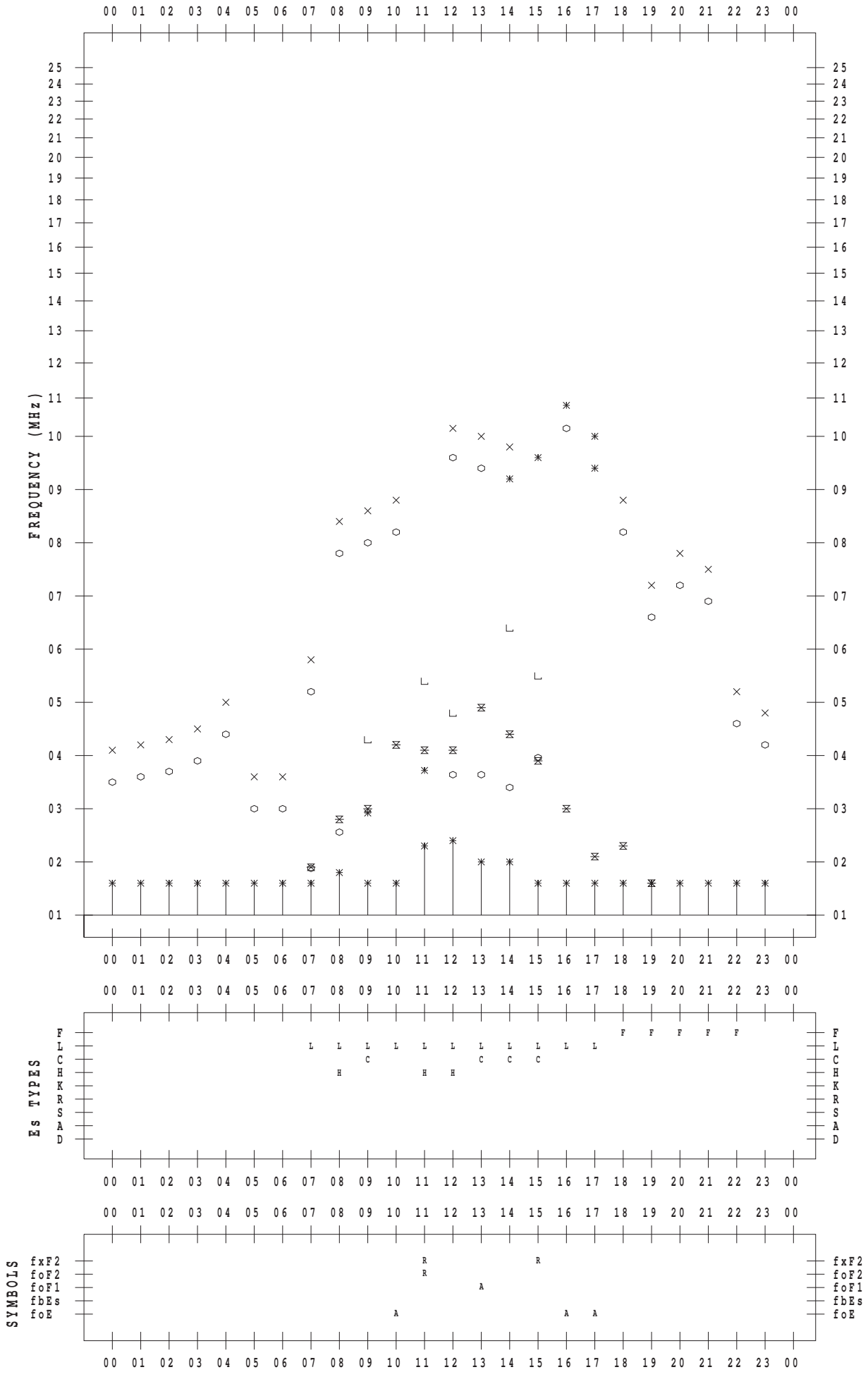
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/20

135 °E MEAN TIME



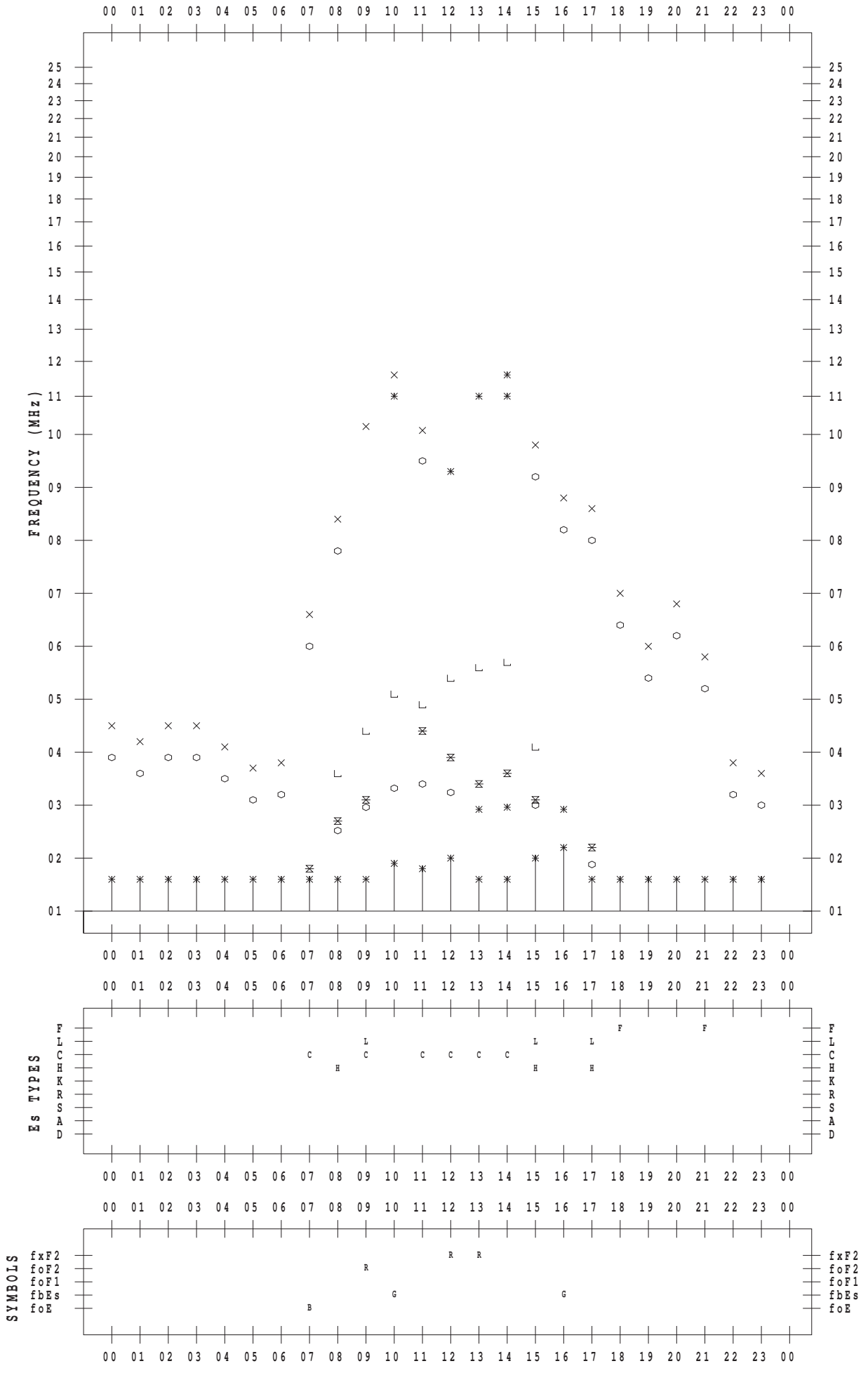
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/21

135 °E MEAN TIME



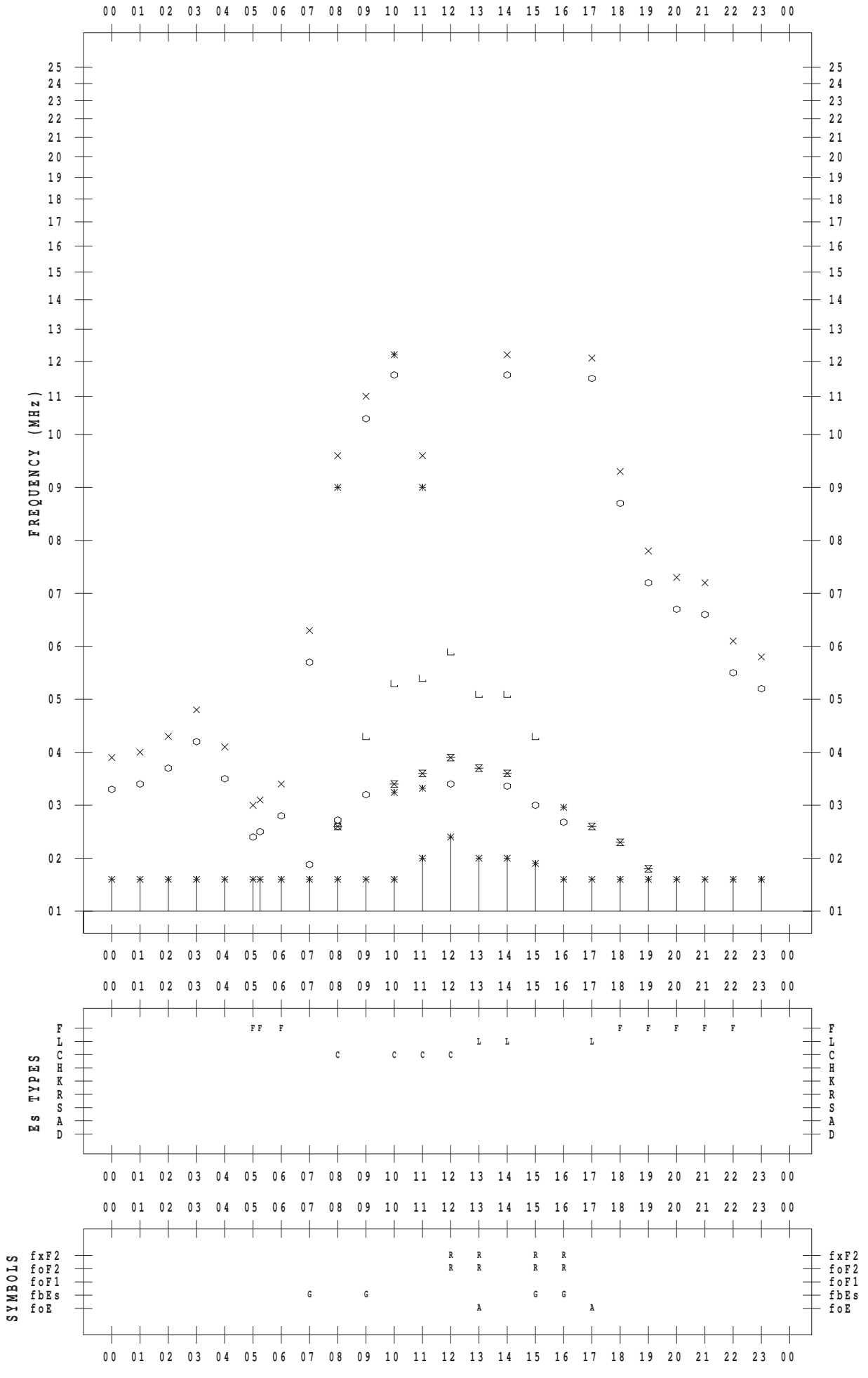
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/22

135 °E MEAN TIME



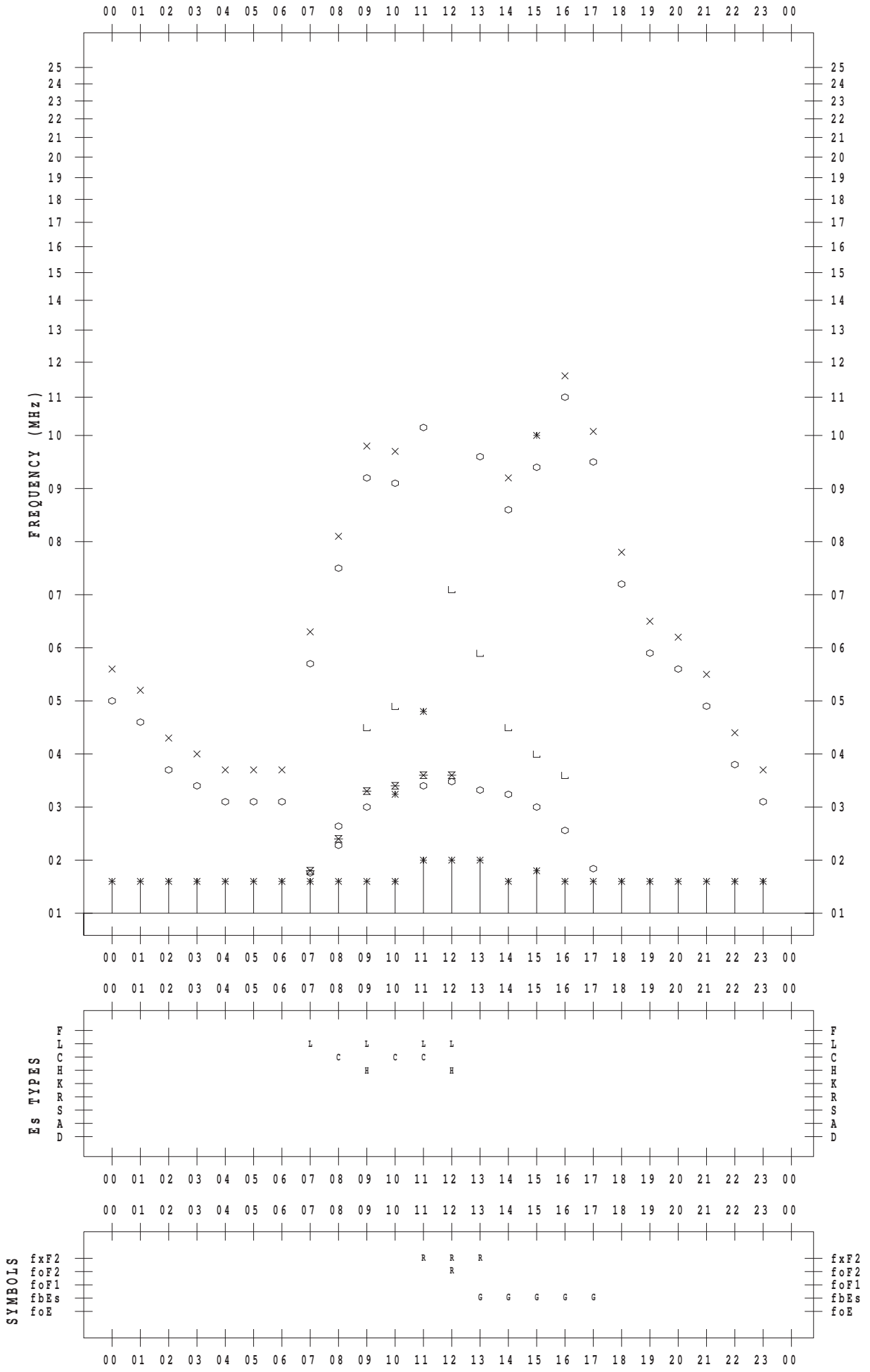
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/23

135 °E MEAN TIME



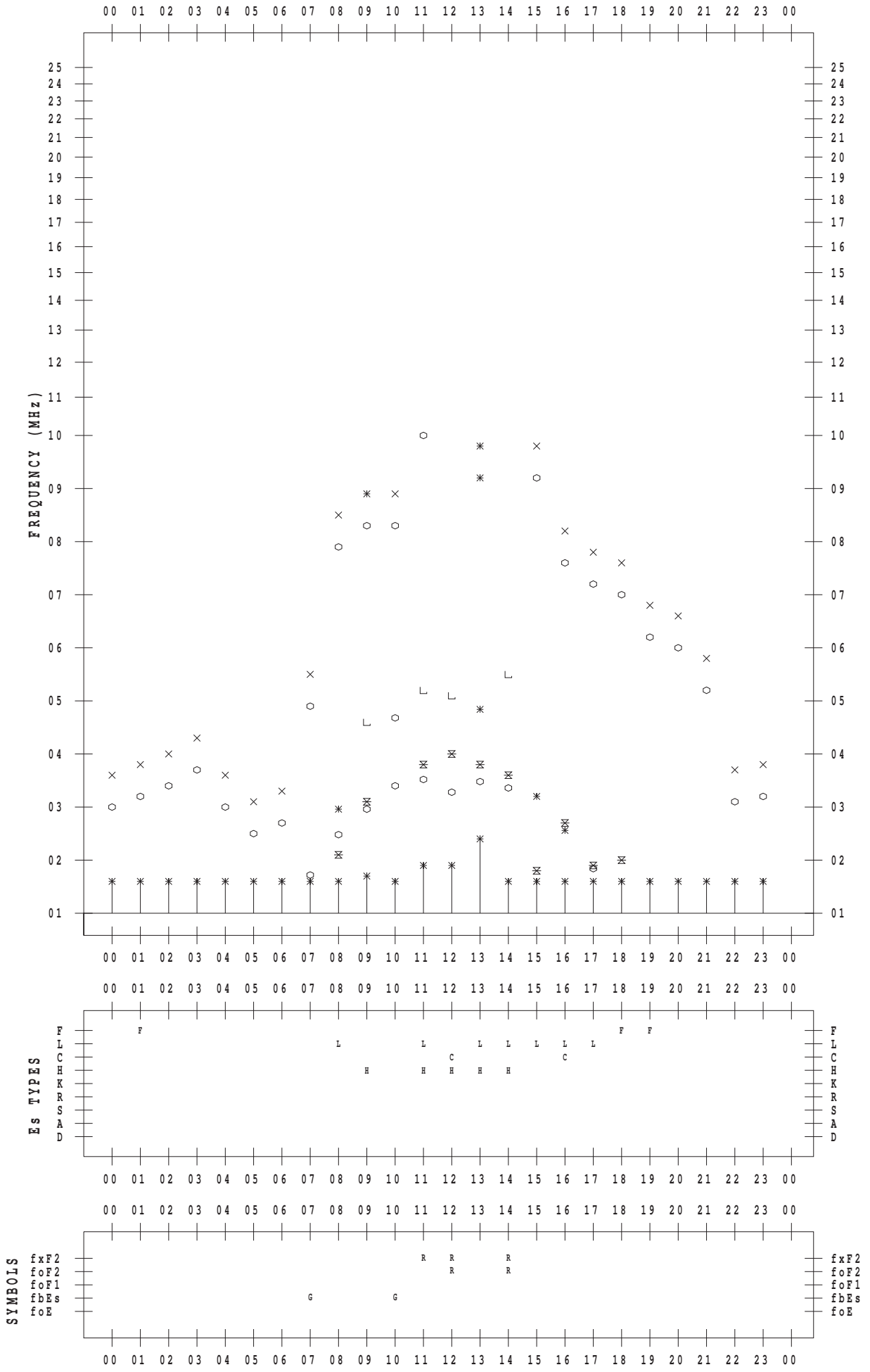
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/24

135 °E MEAN TIME



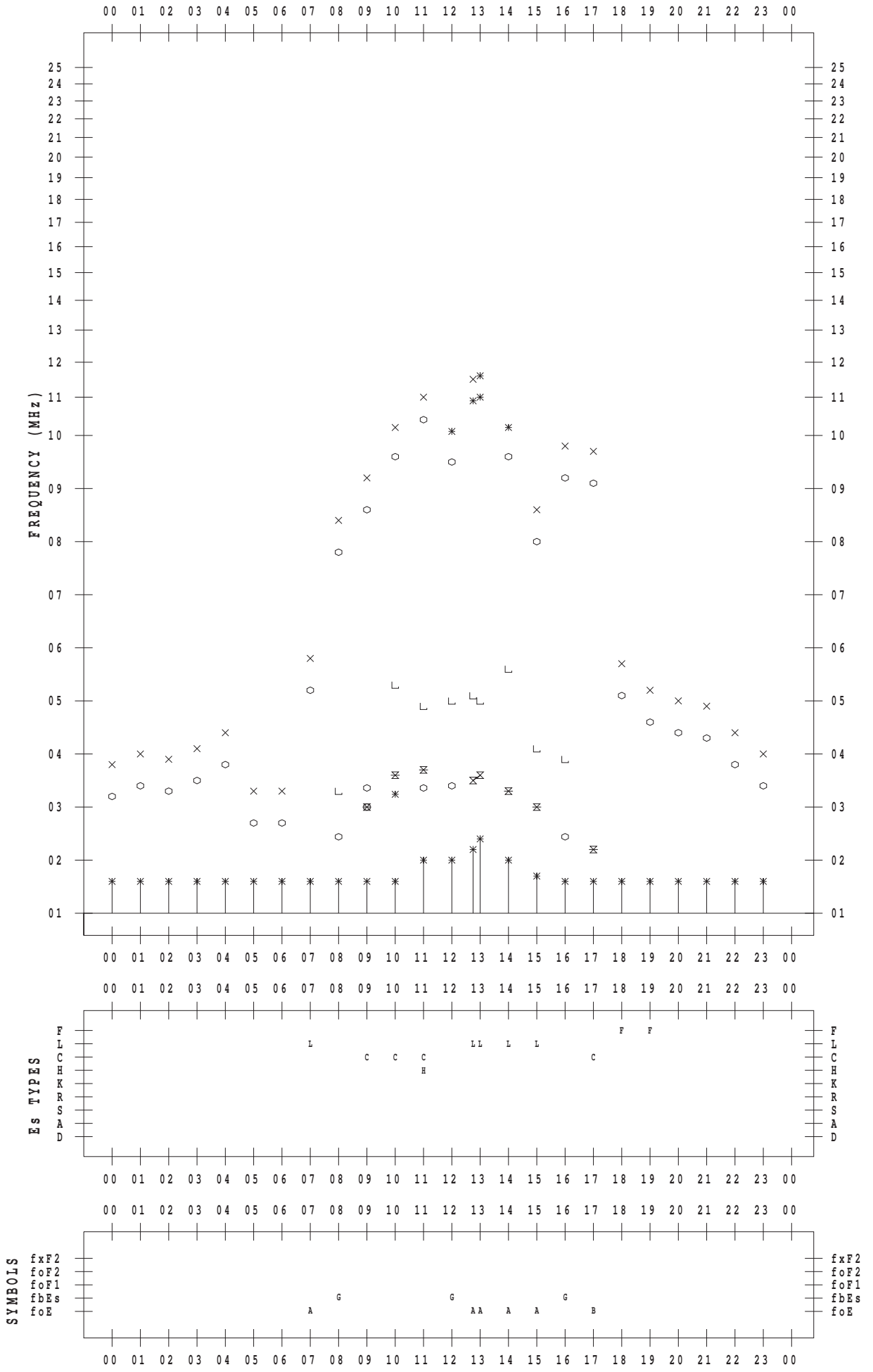
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/25

135 °E MEAN TIME



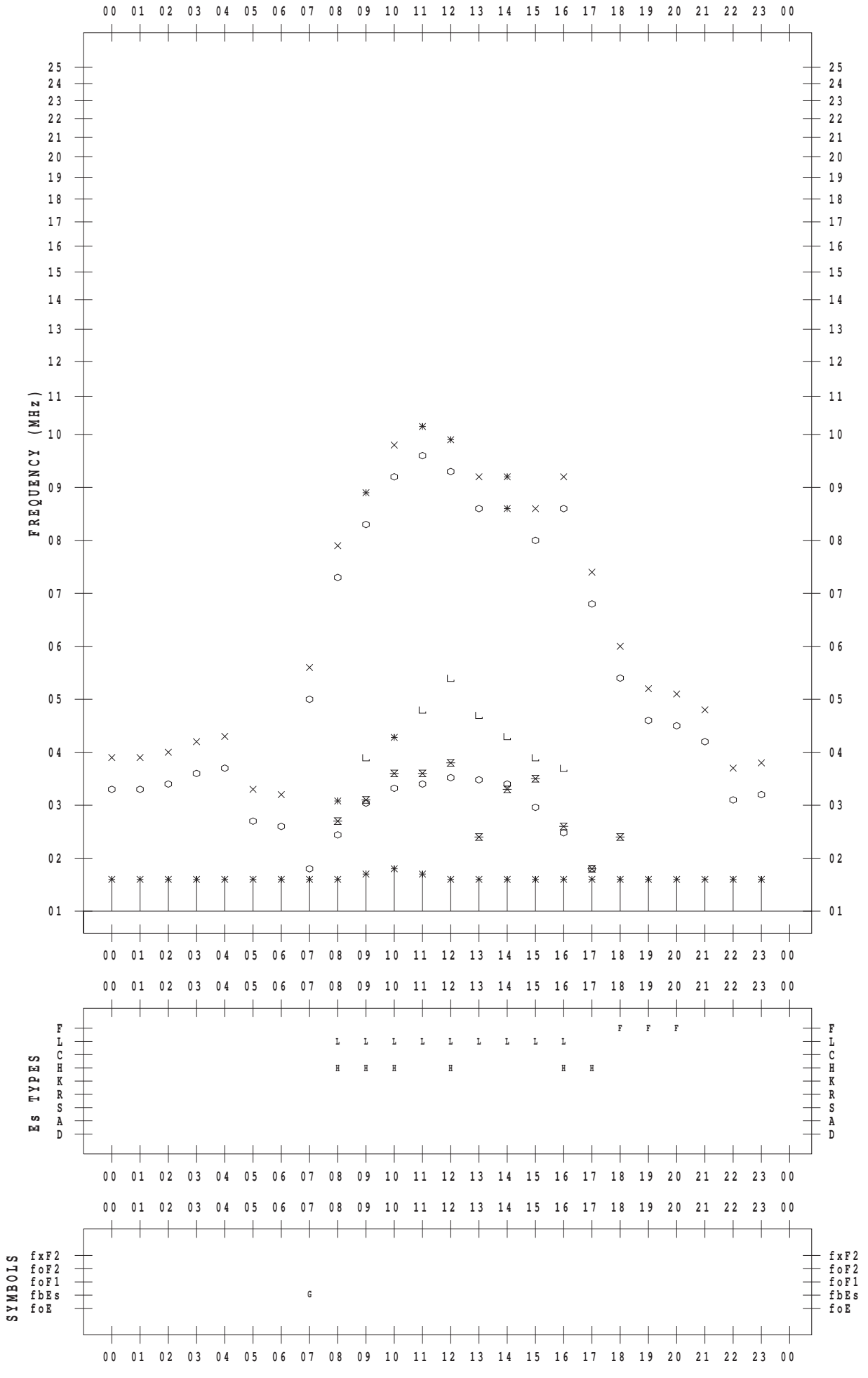
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/26

135 °E MEAN TIME



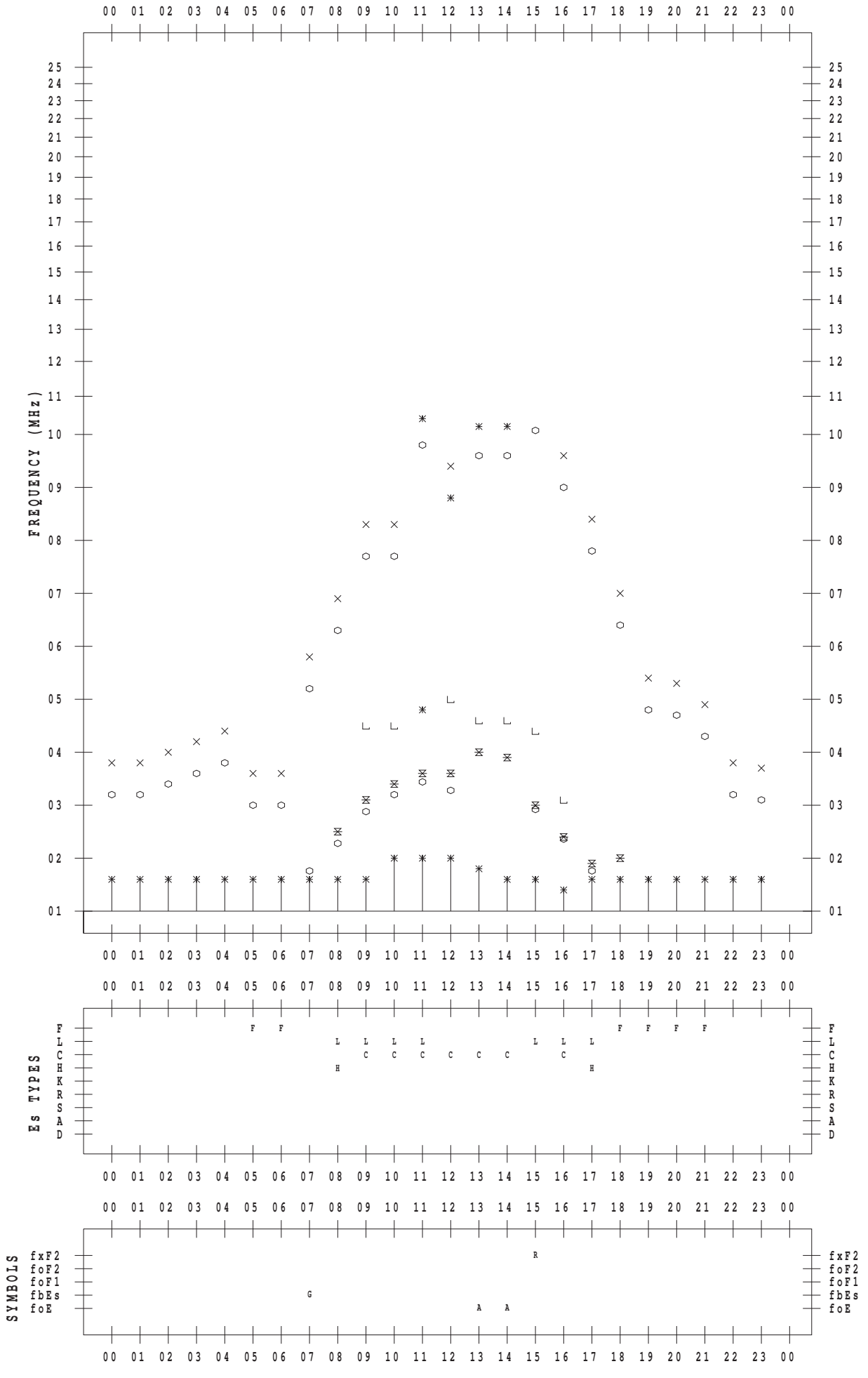
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/27

135 °E MEAN TIME



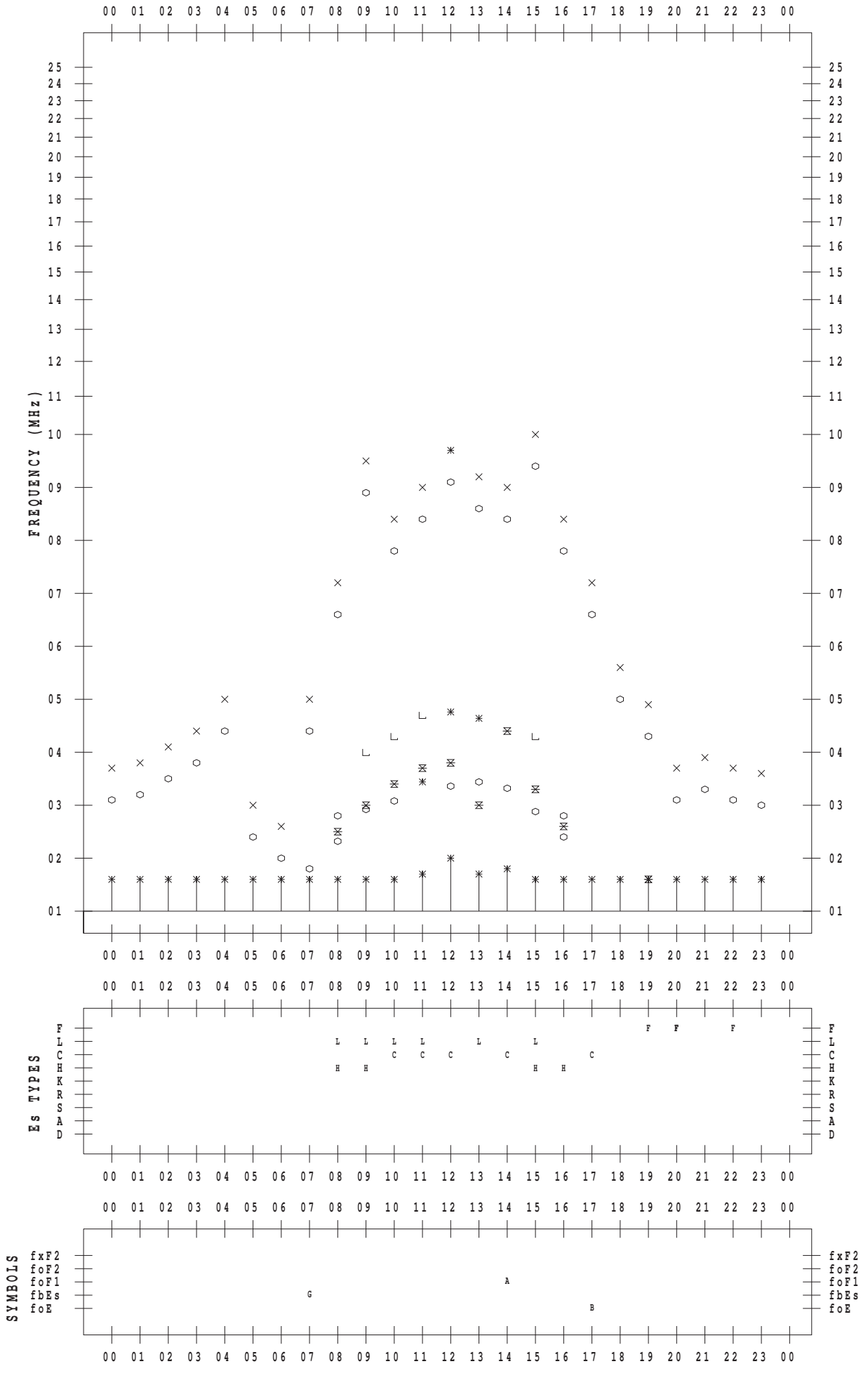
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/28

135 °E MEAN TIME



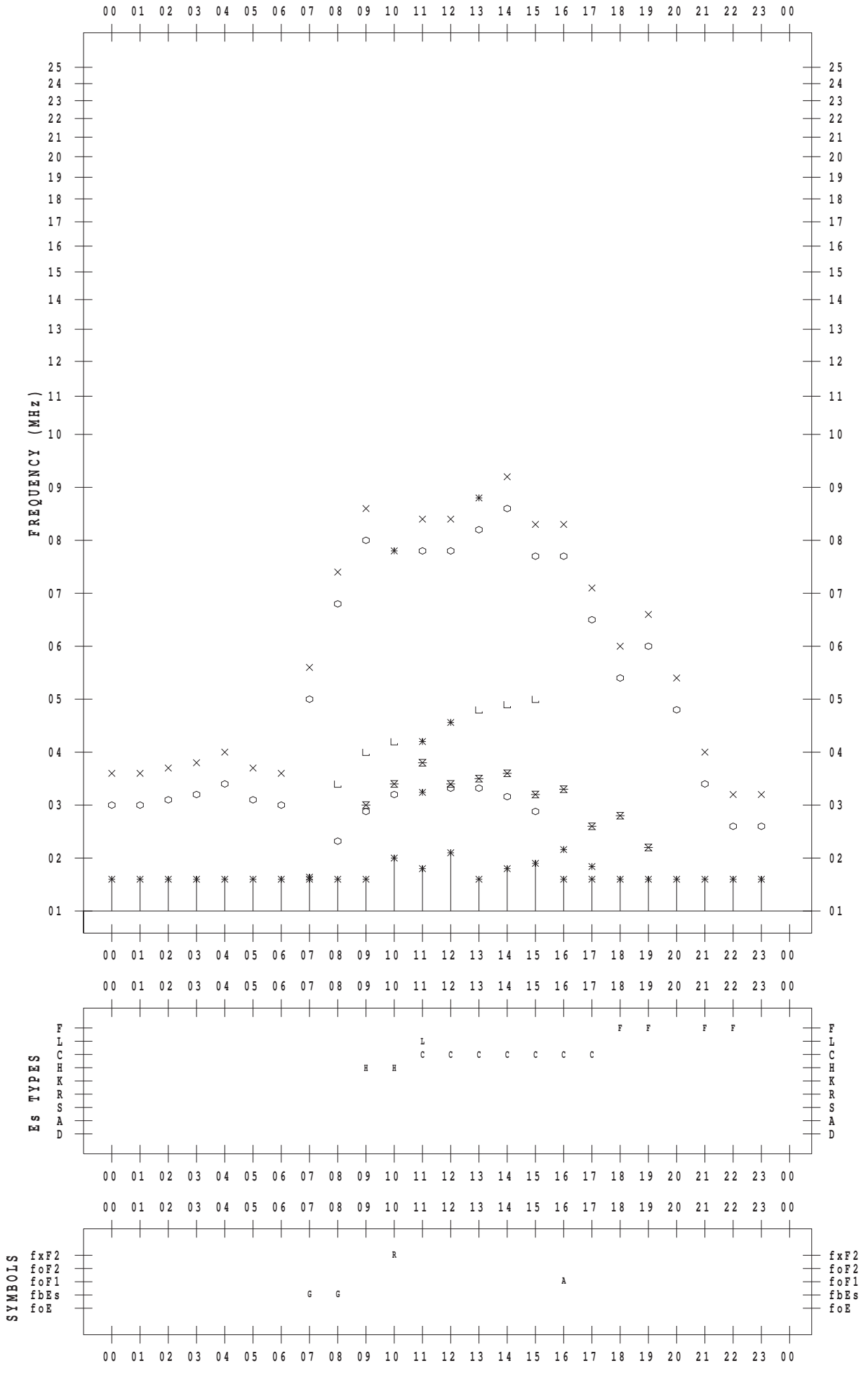
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/29

135 °E MEAN TIME



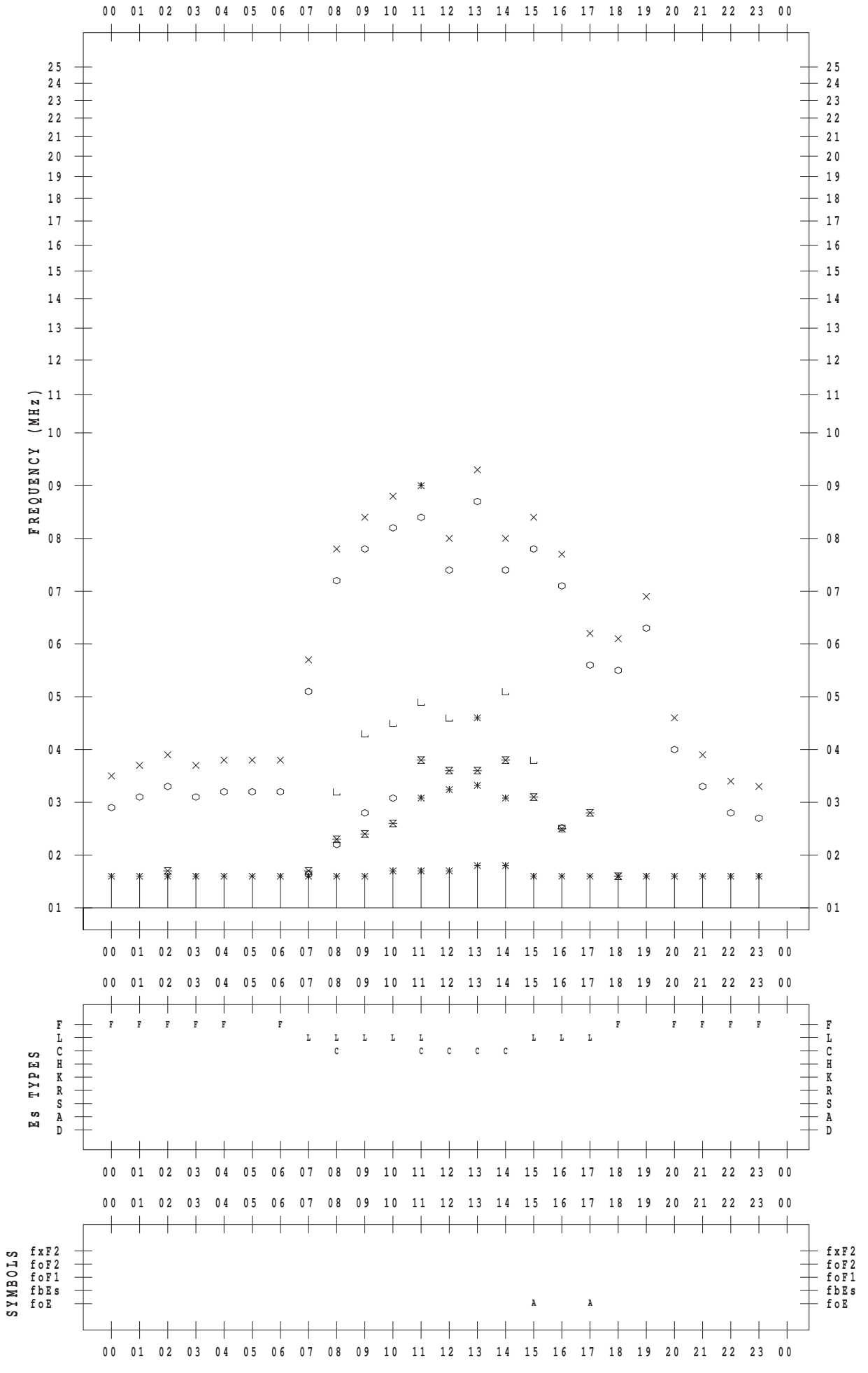
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2012/11/30

135 °E MEAN TIME



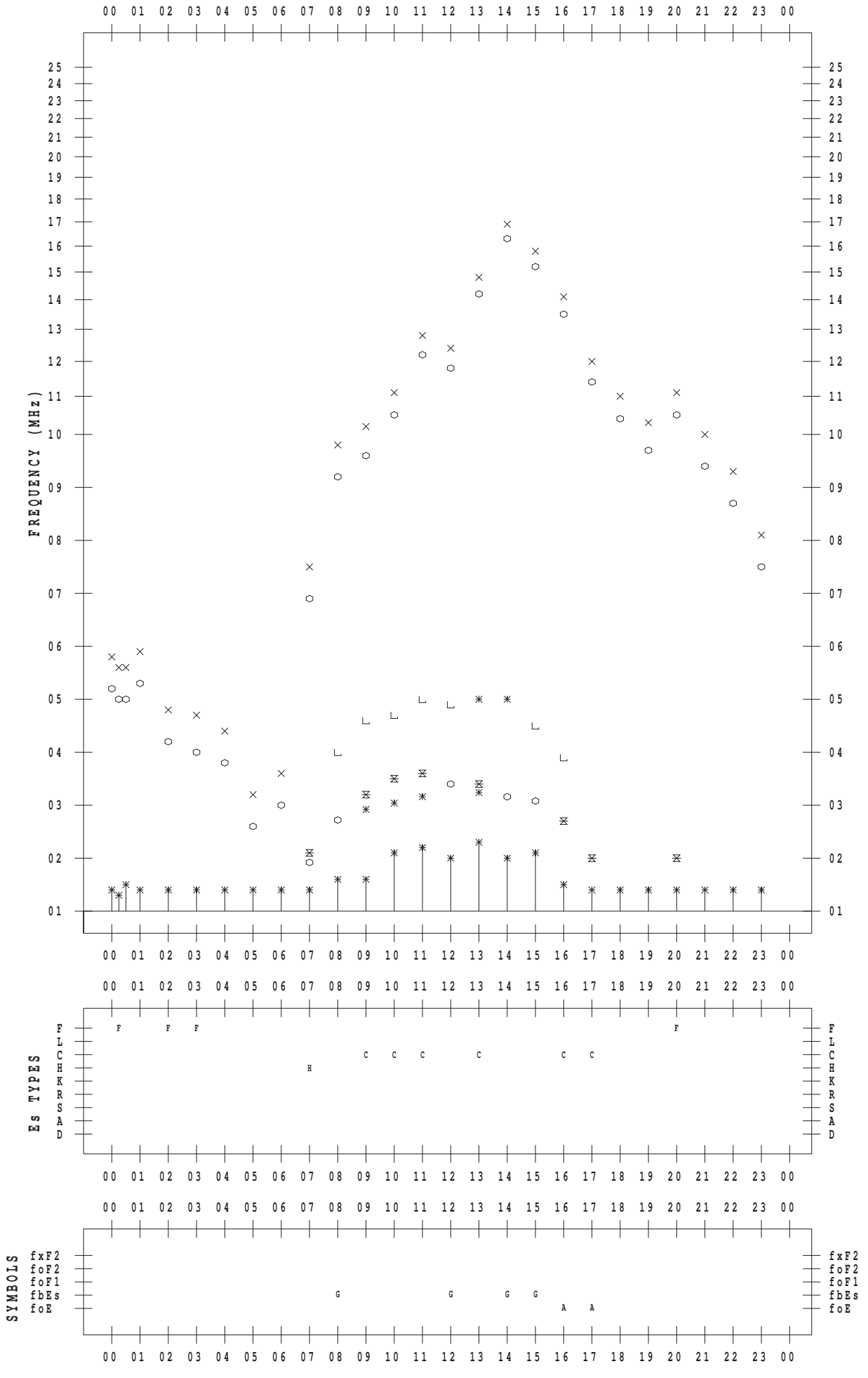
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 1

135 °E MEAN TIME



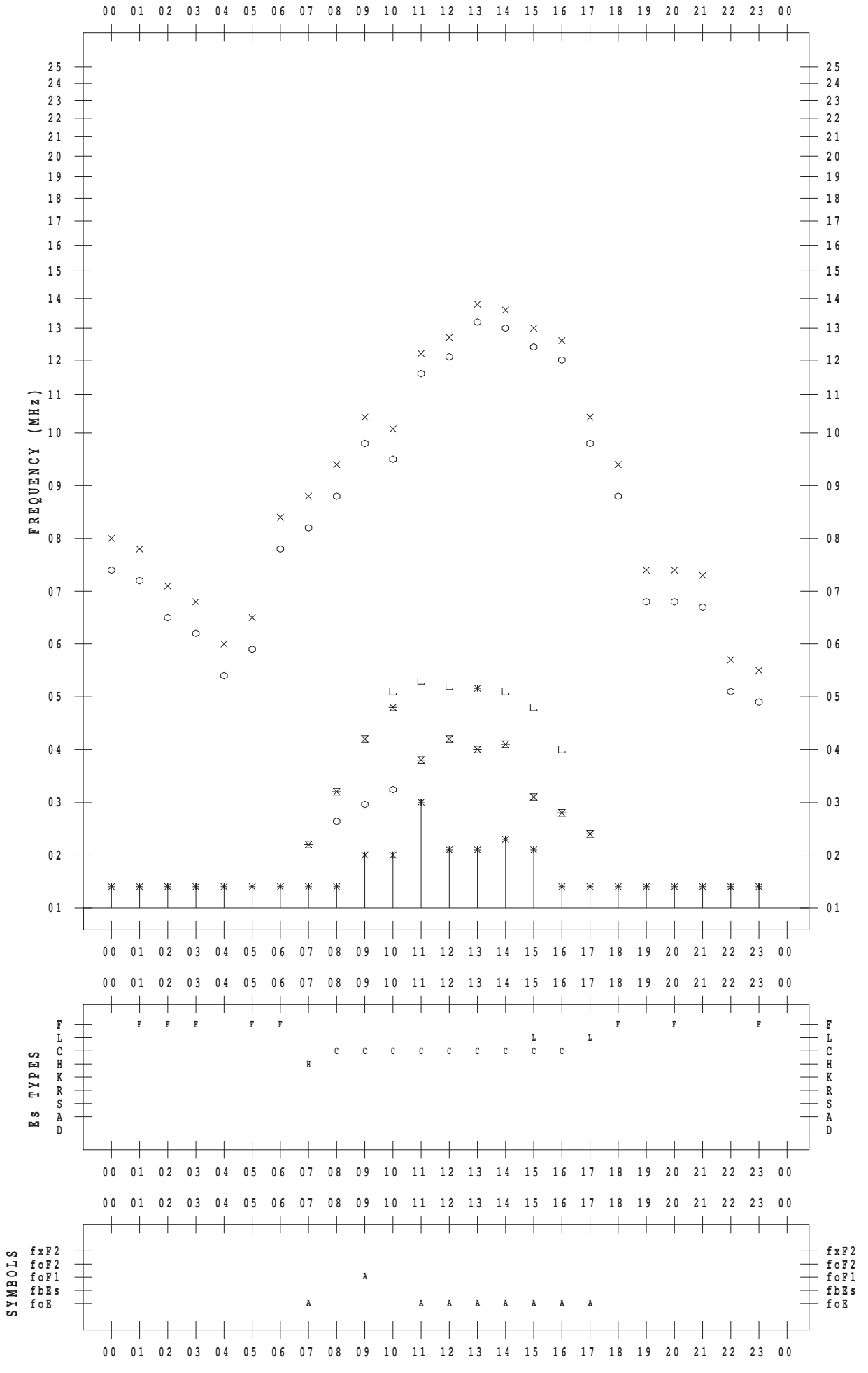
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 2

135 °E MEAN TIME



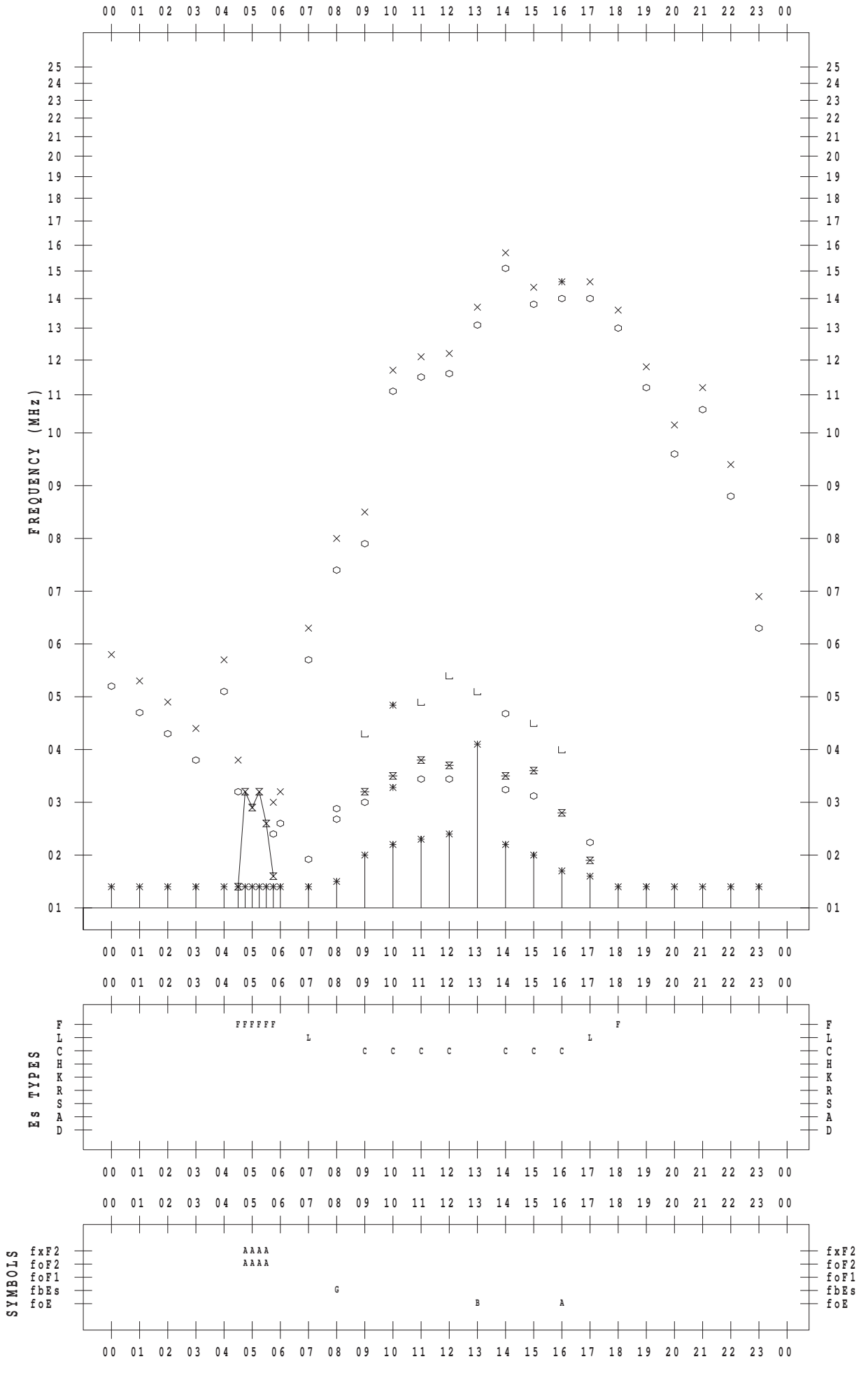
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 3

135 °E MEAN TIME



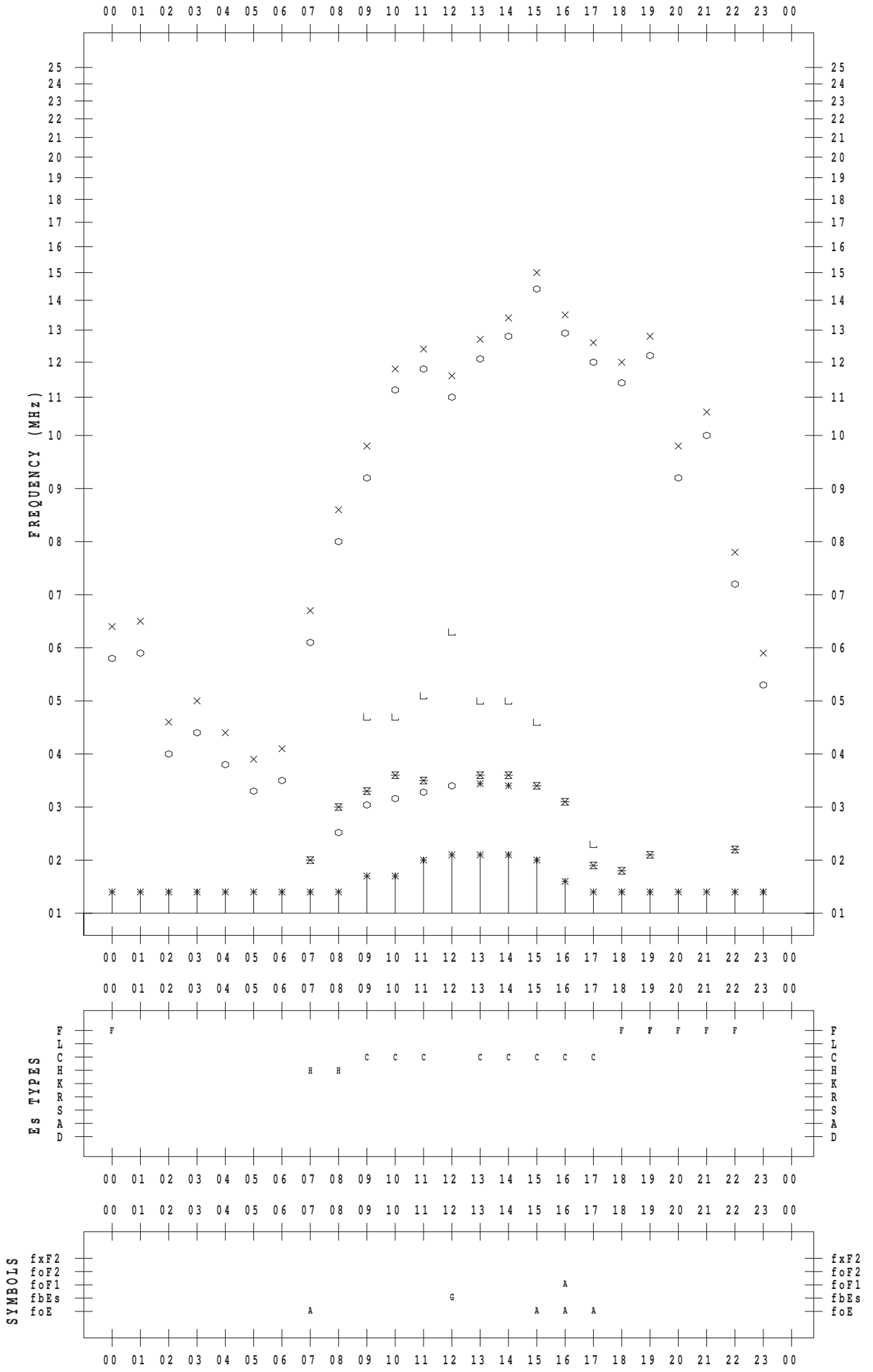
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 4

135 °E MEAN TIME



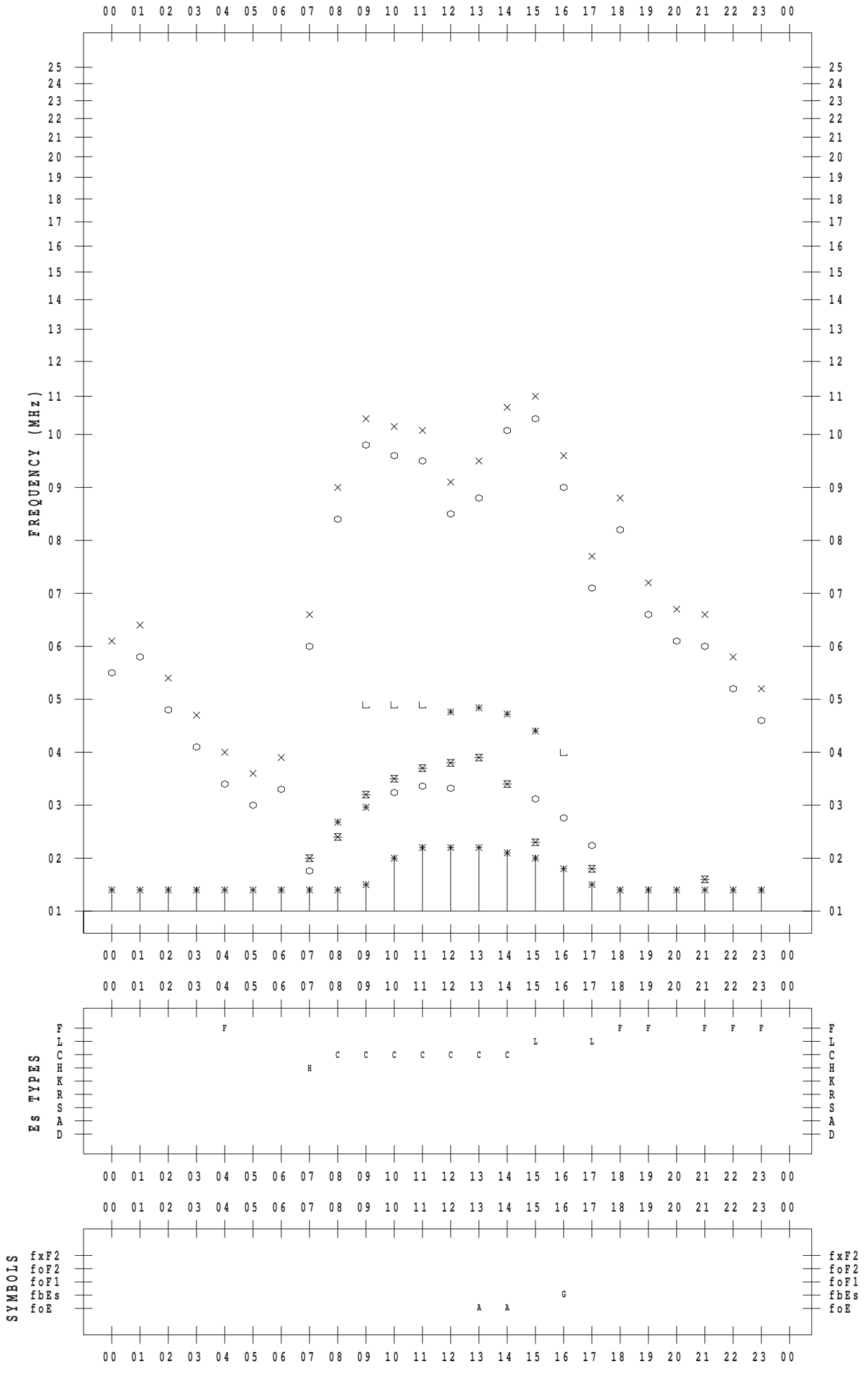
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 5

135 °E MEAN TIME



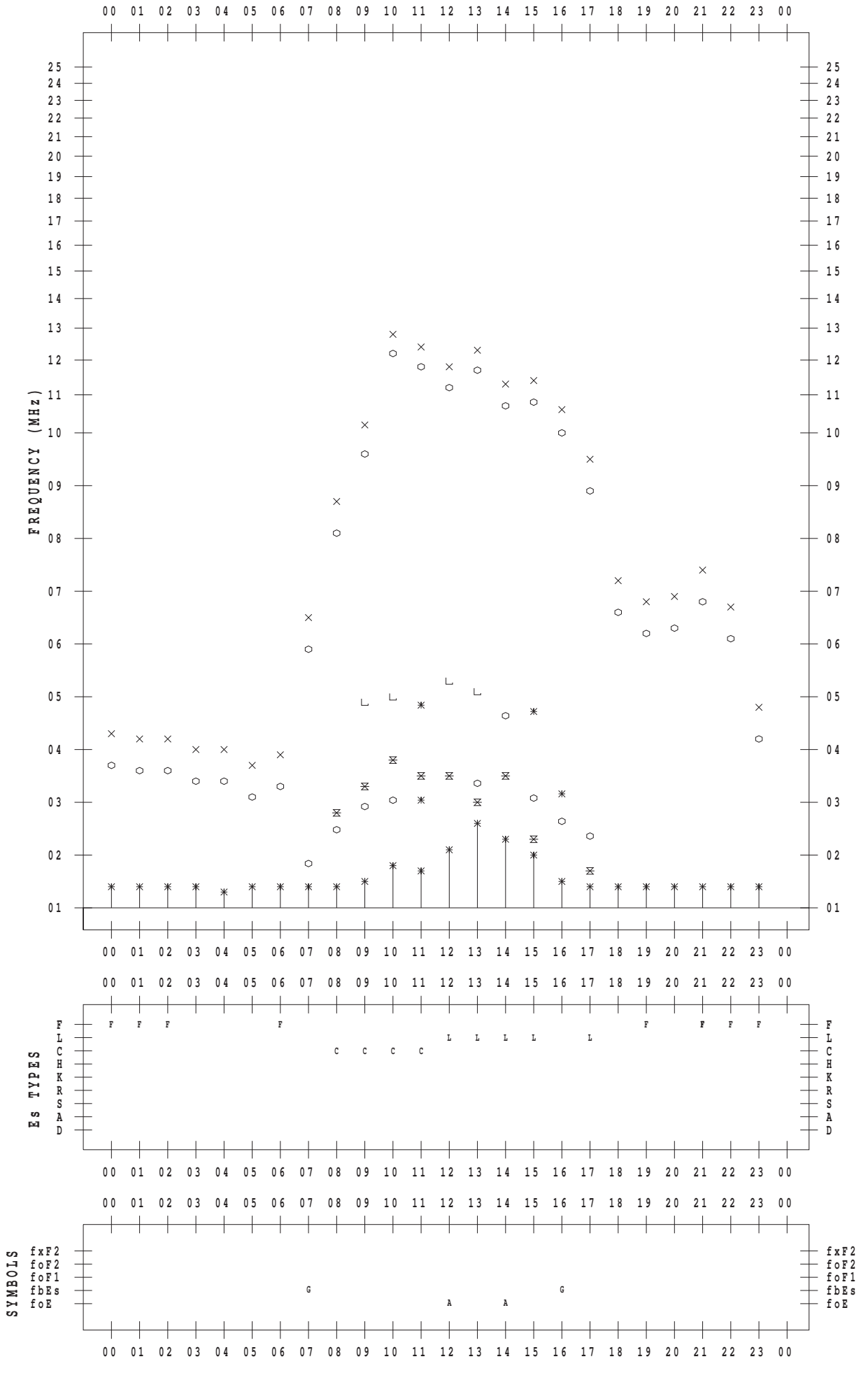
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 6

135 °E MEAN TIME



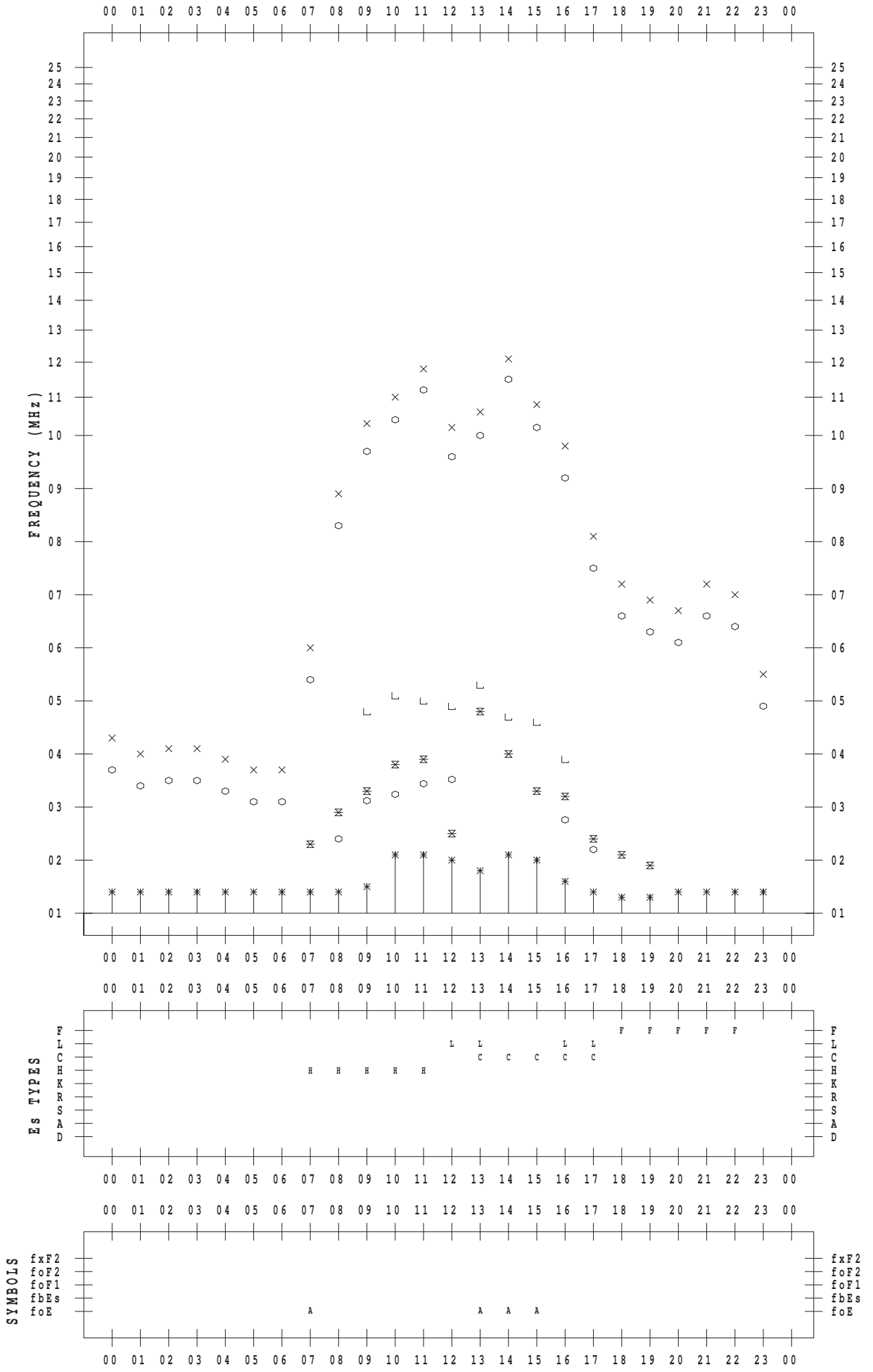
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 7

135 °E MEAN TIME



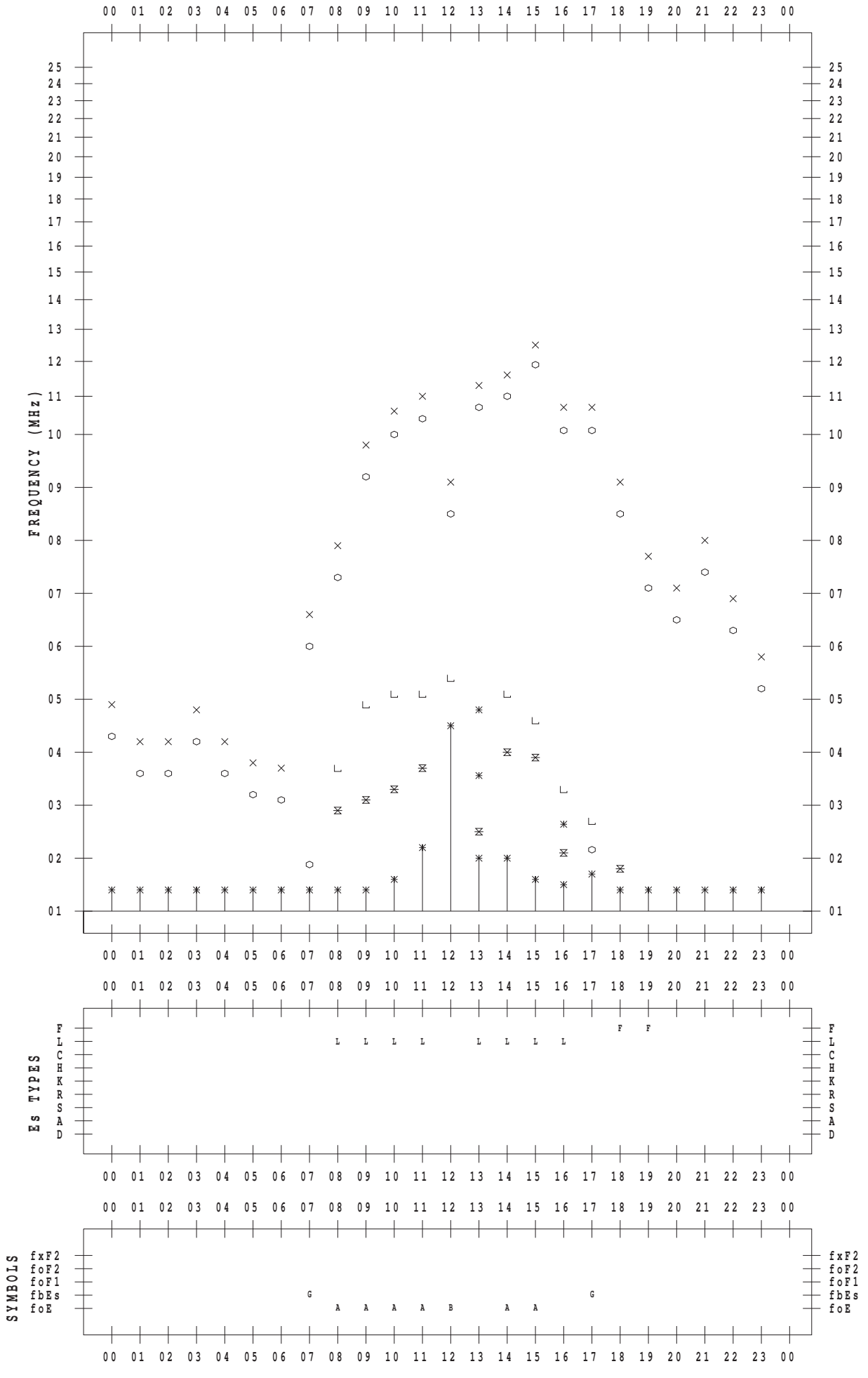
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 8

135 °E MEAN TIME



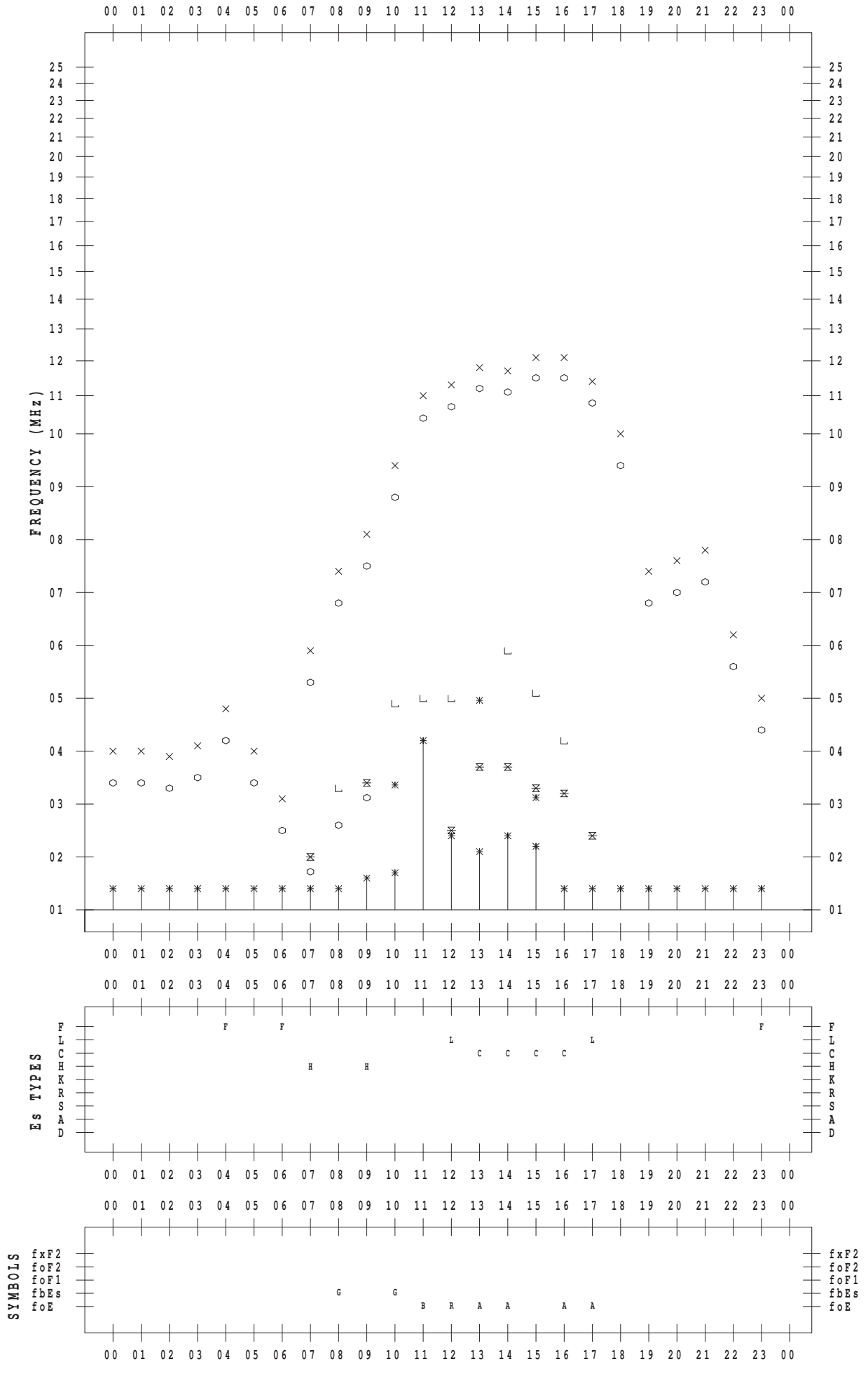
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/ 9

135 °E MEAN TIME



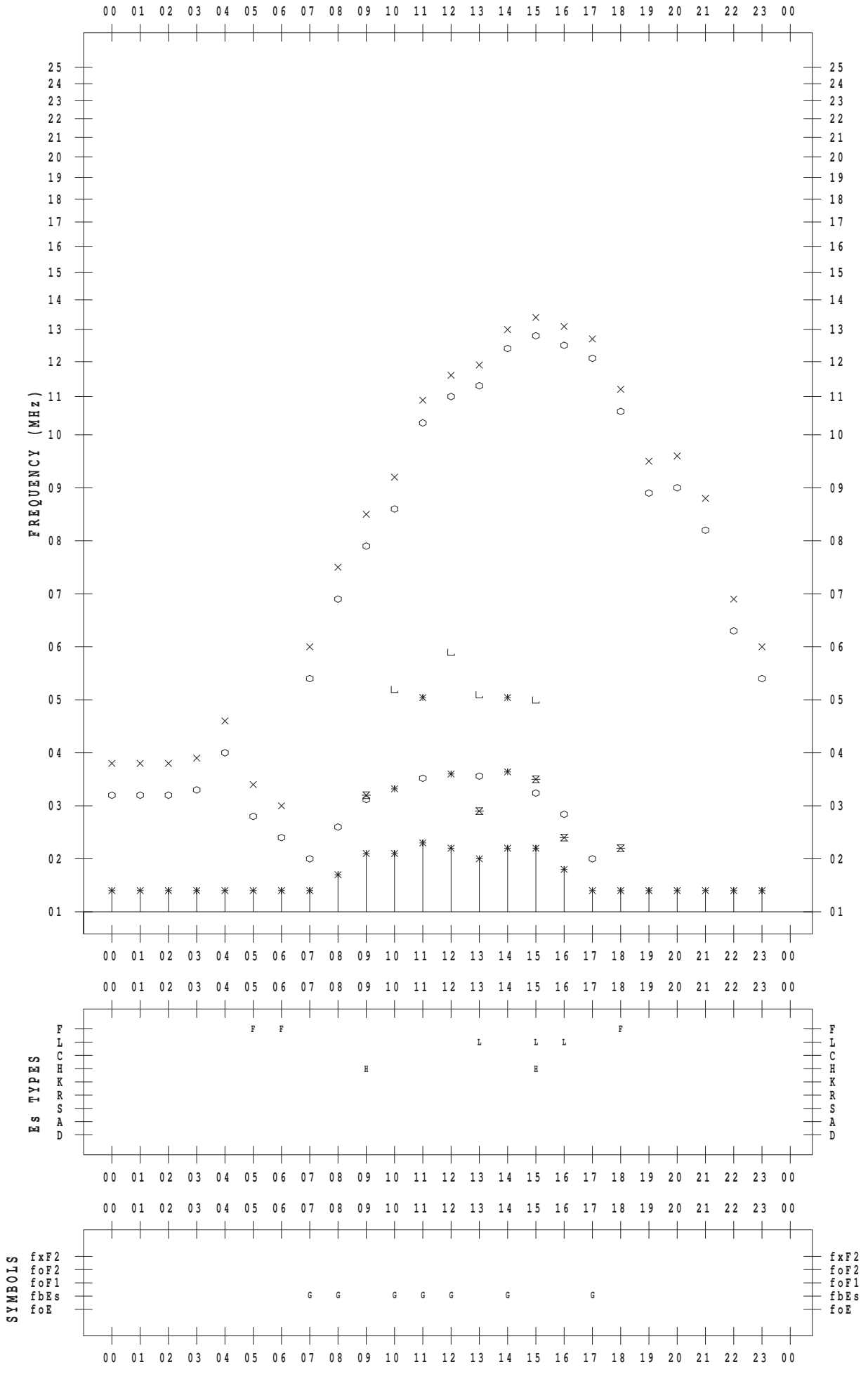
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/10

135 °E MEAN TIME



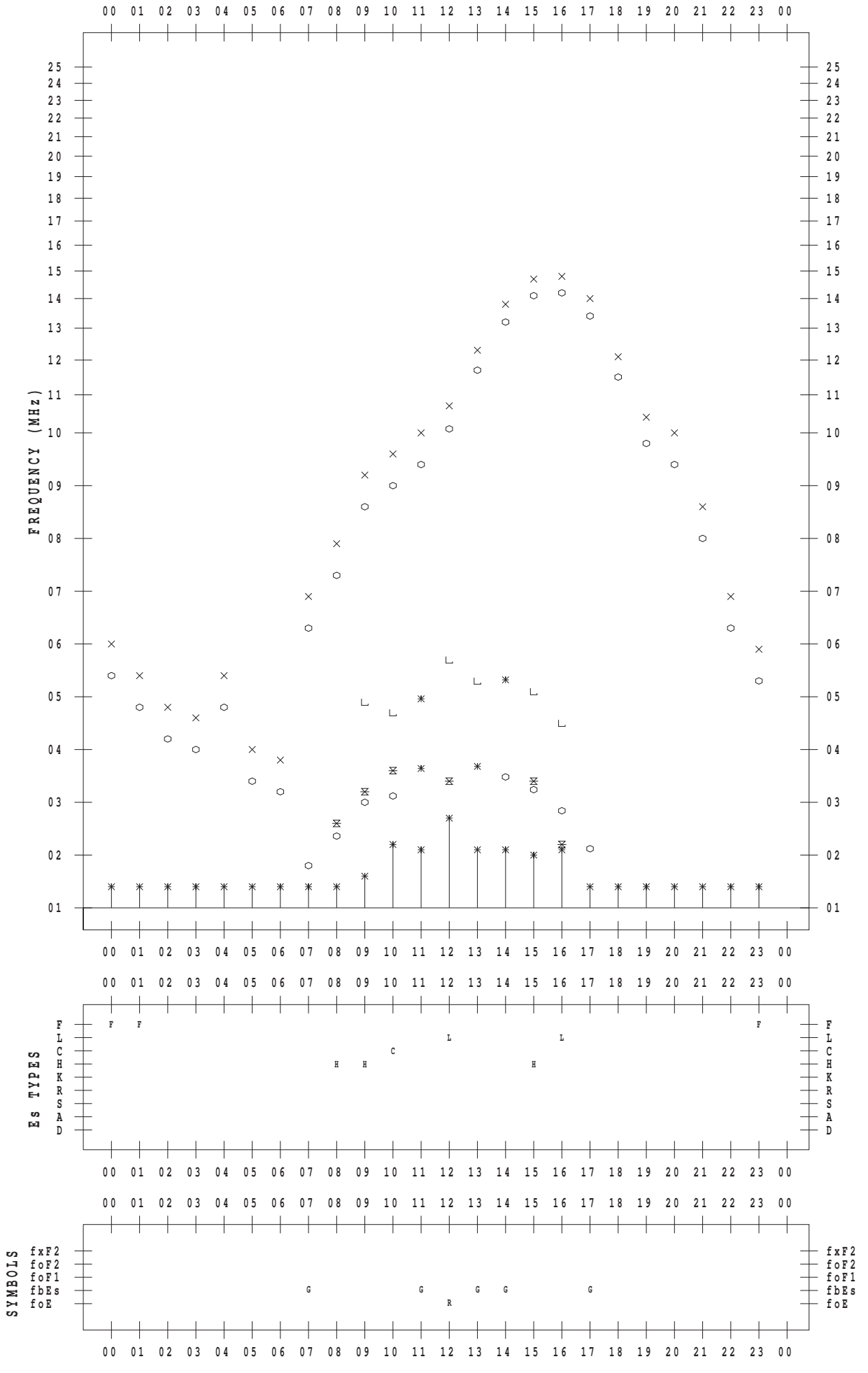
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/11

135 °E MEAN TIME



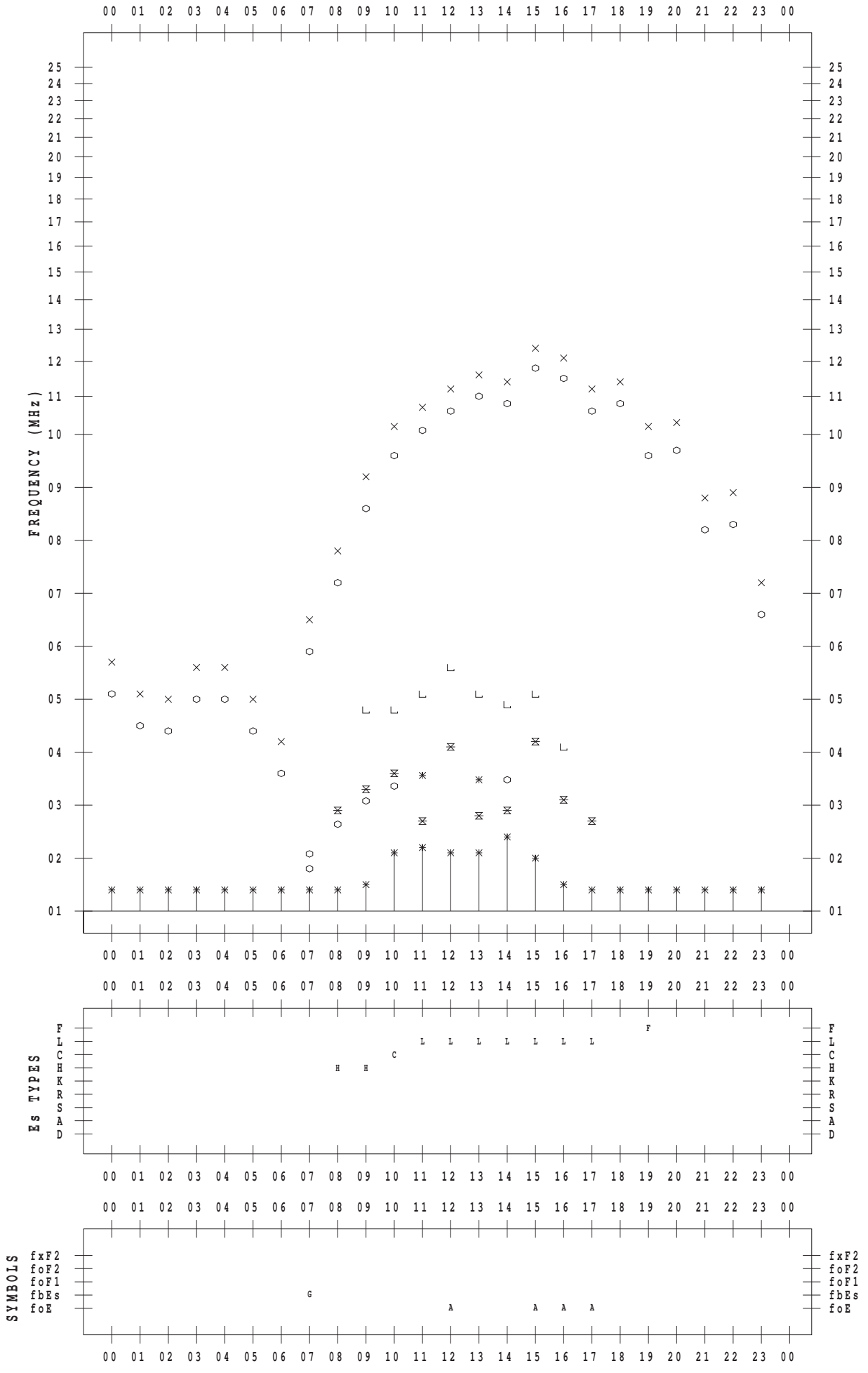
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/12

135 °E MEAN TIME



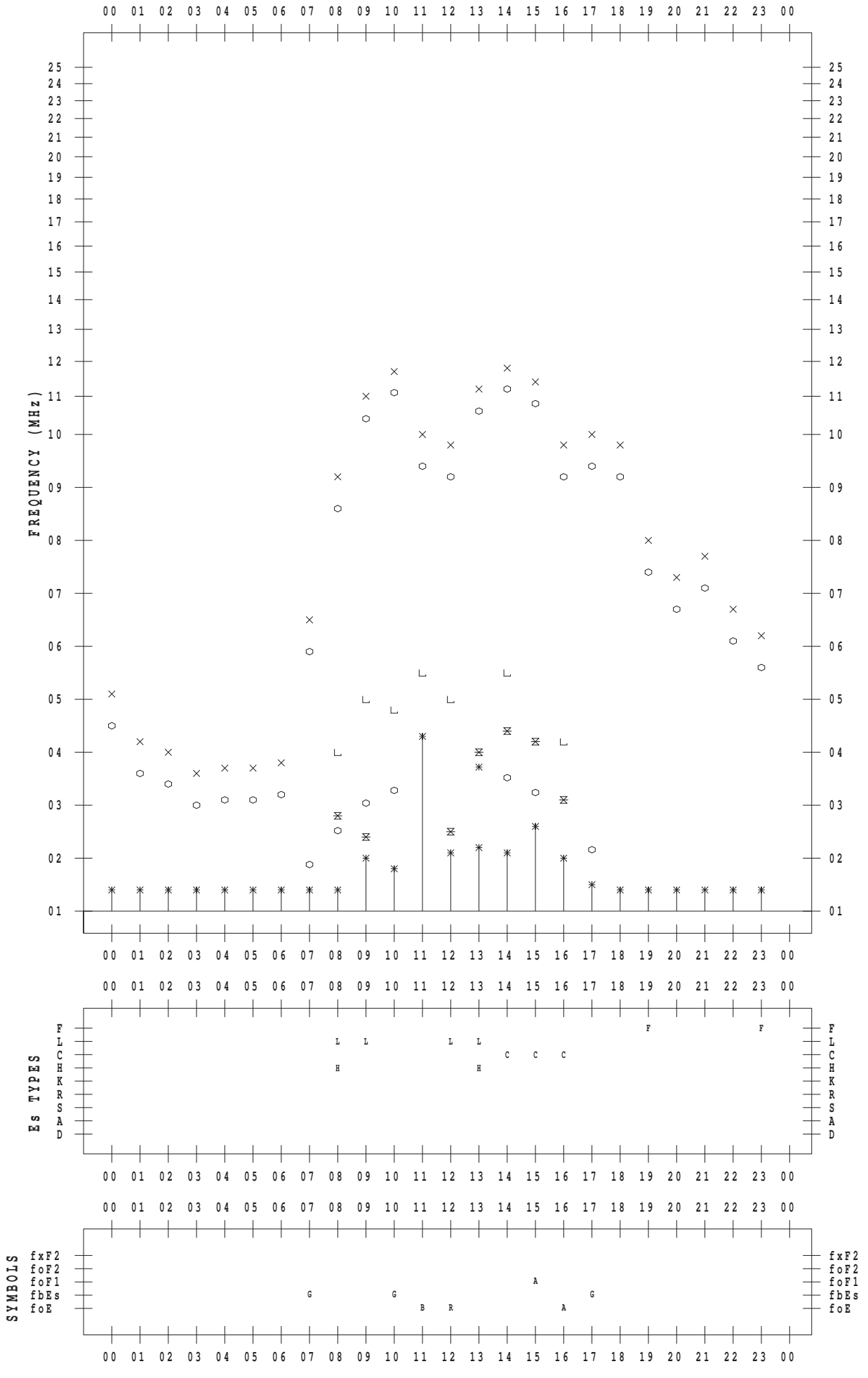
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/13

135 °E MEAN TIME



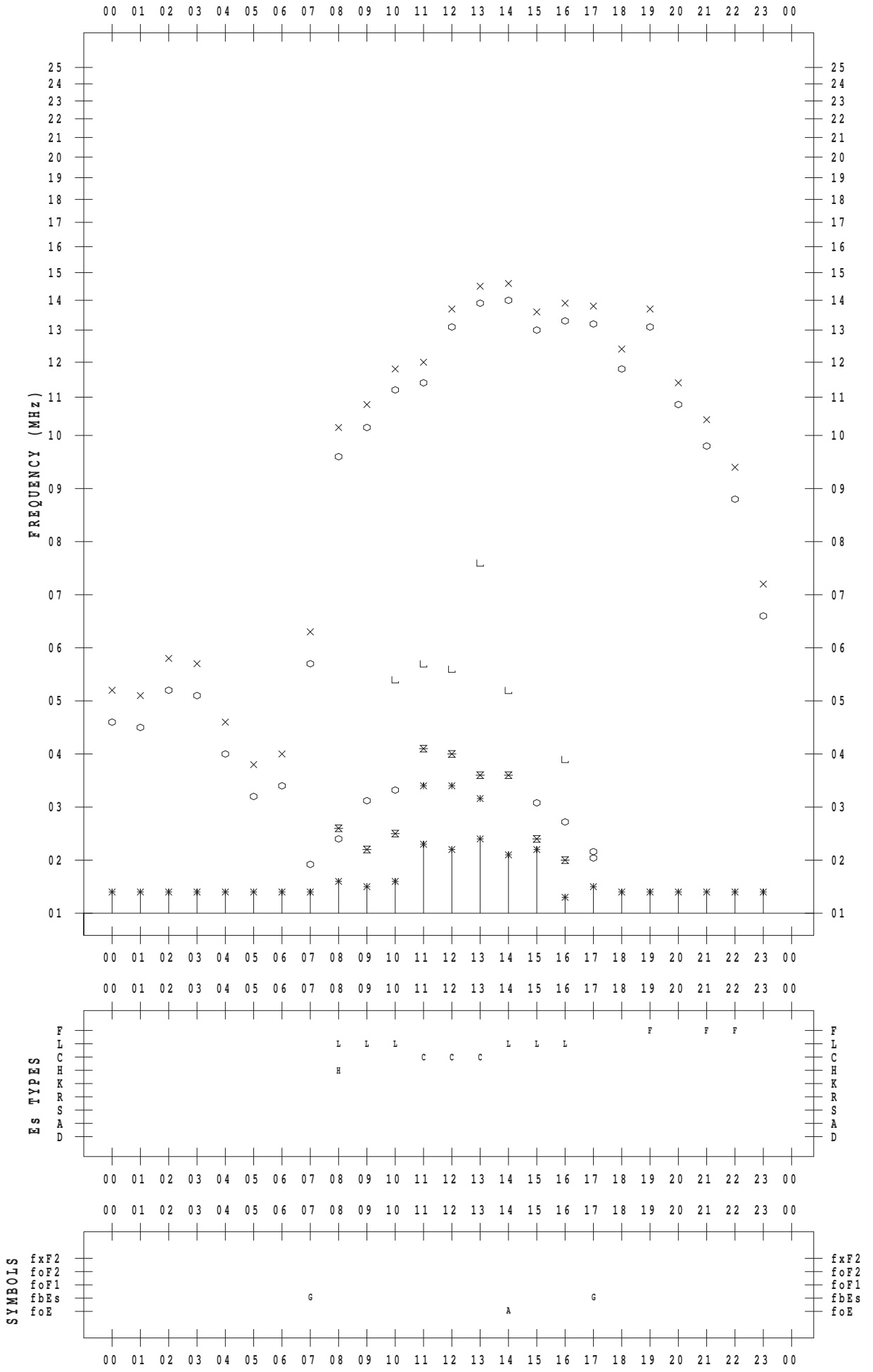
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/14

135 °E MEAN TIME



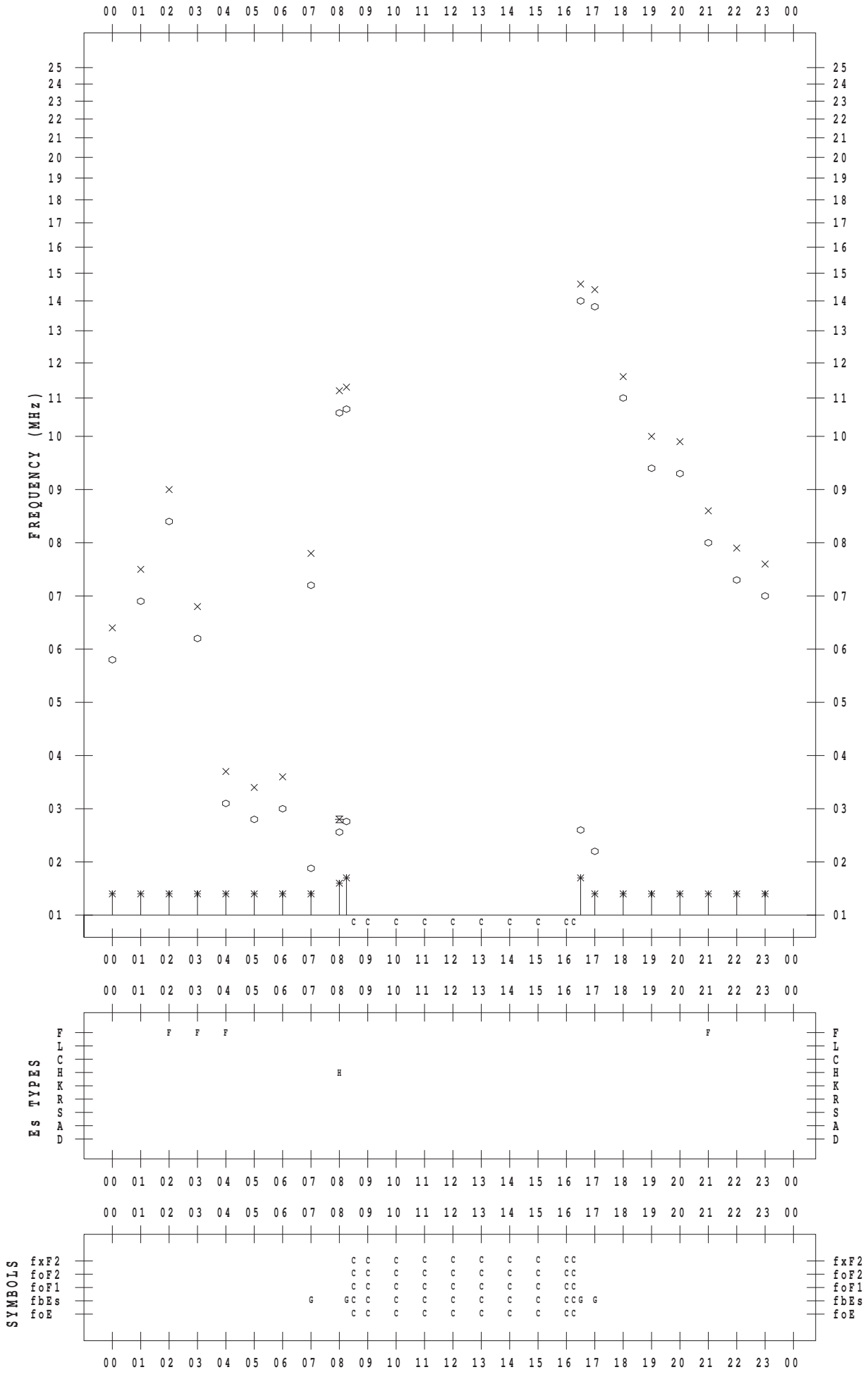
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/15

135 °E MEAN TIME



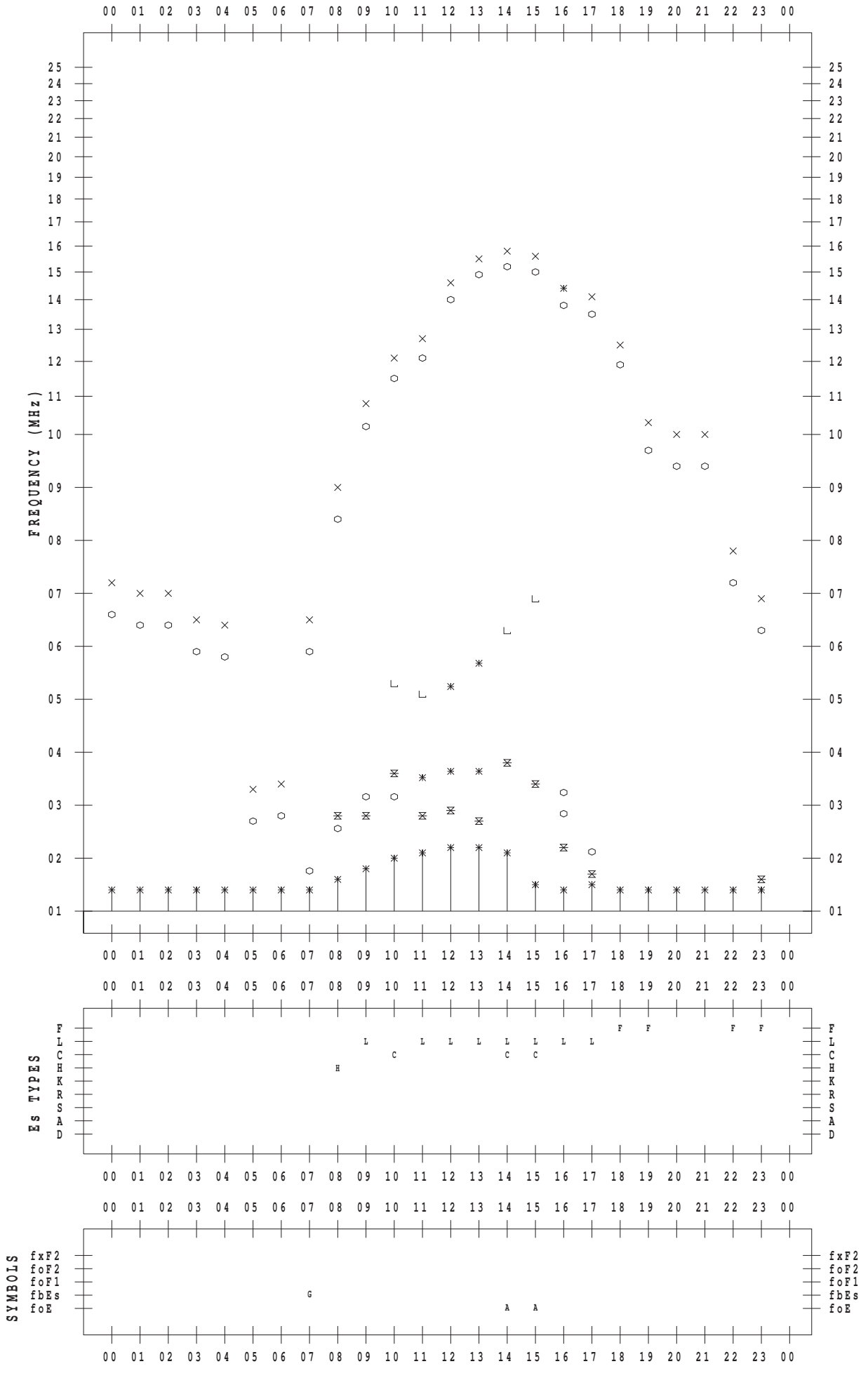
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/16

135 °E MEAN TIME



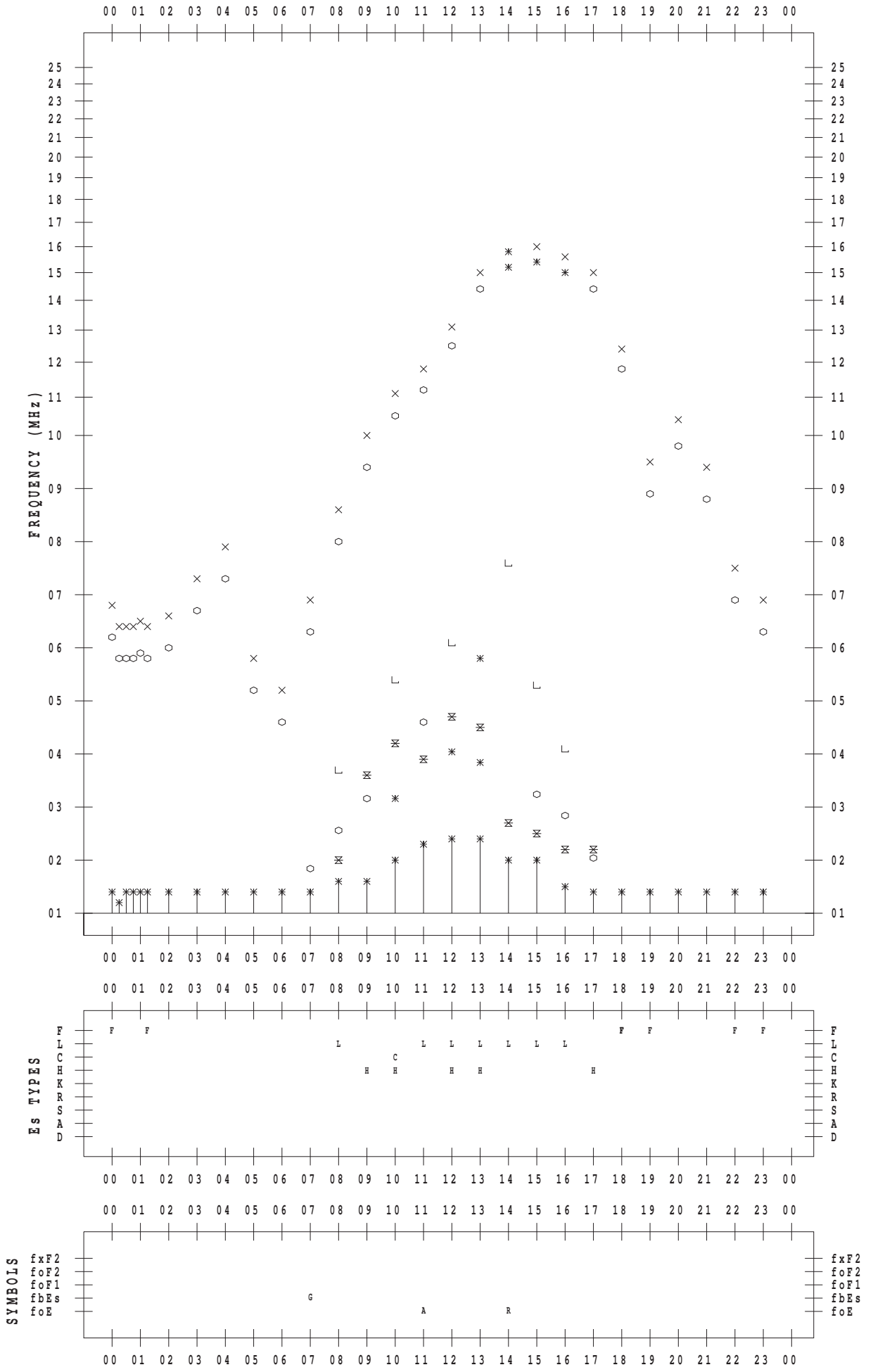
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/17

135 °E MEAN TIME



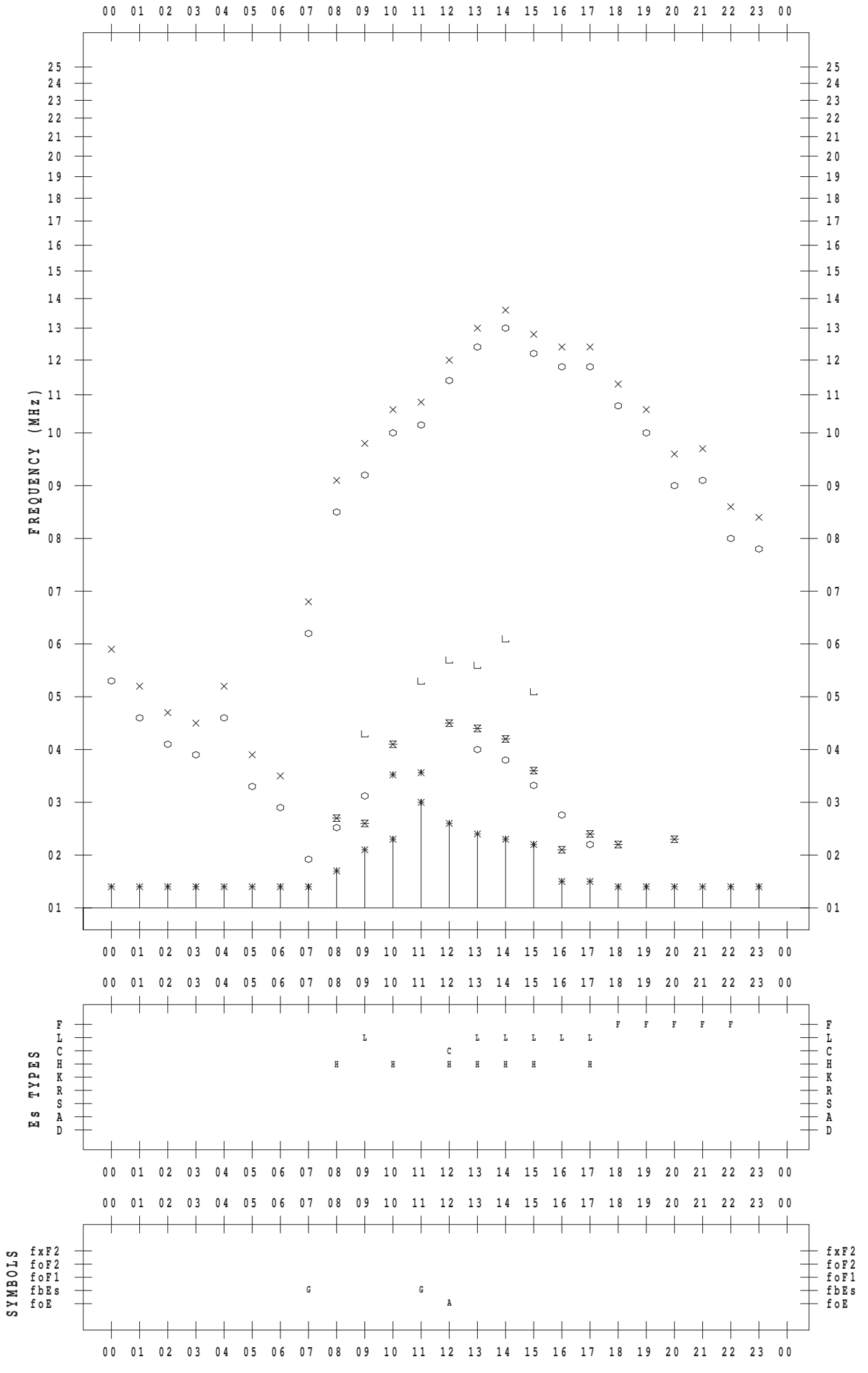
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/18

135 °E MEAN TIME



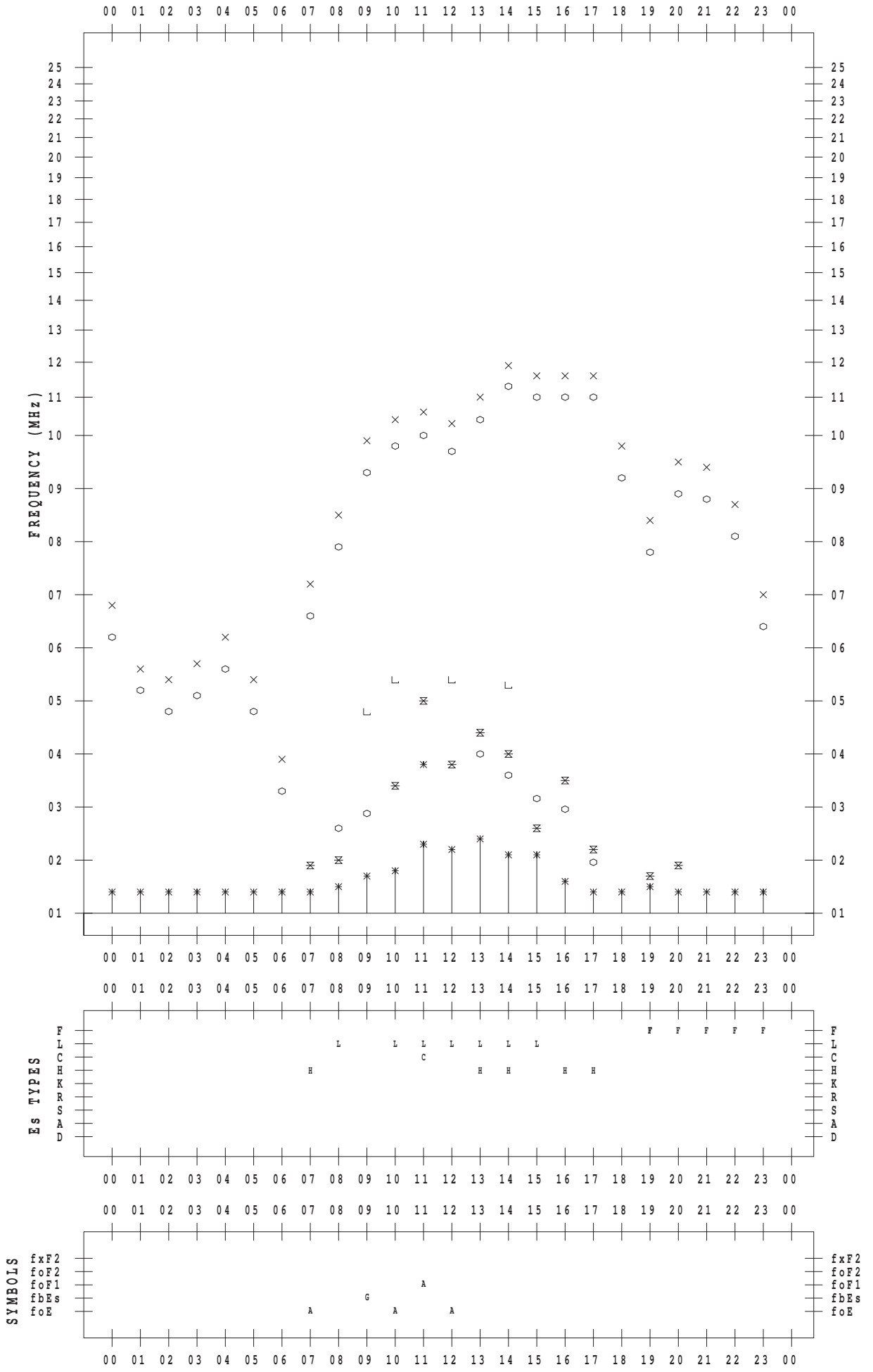
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/19

135 °E MEAN TIME



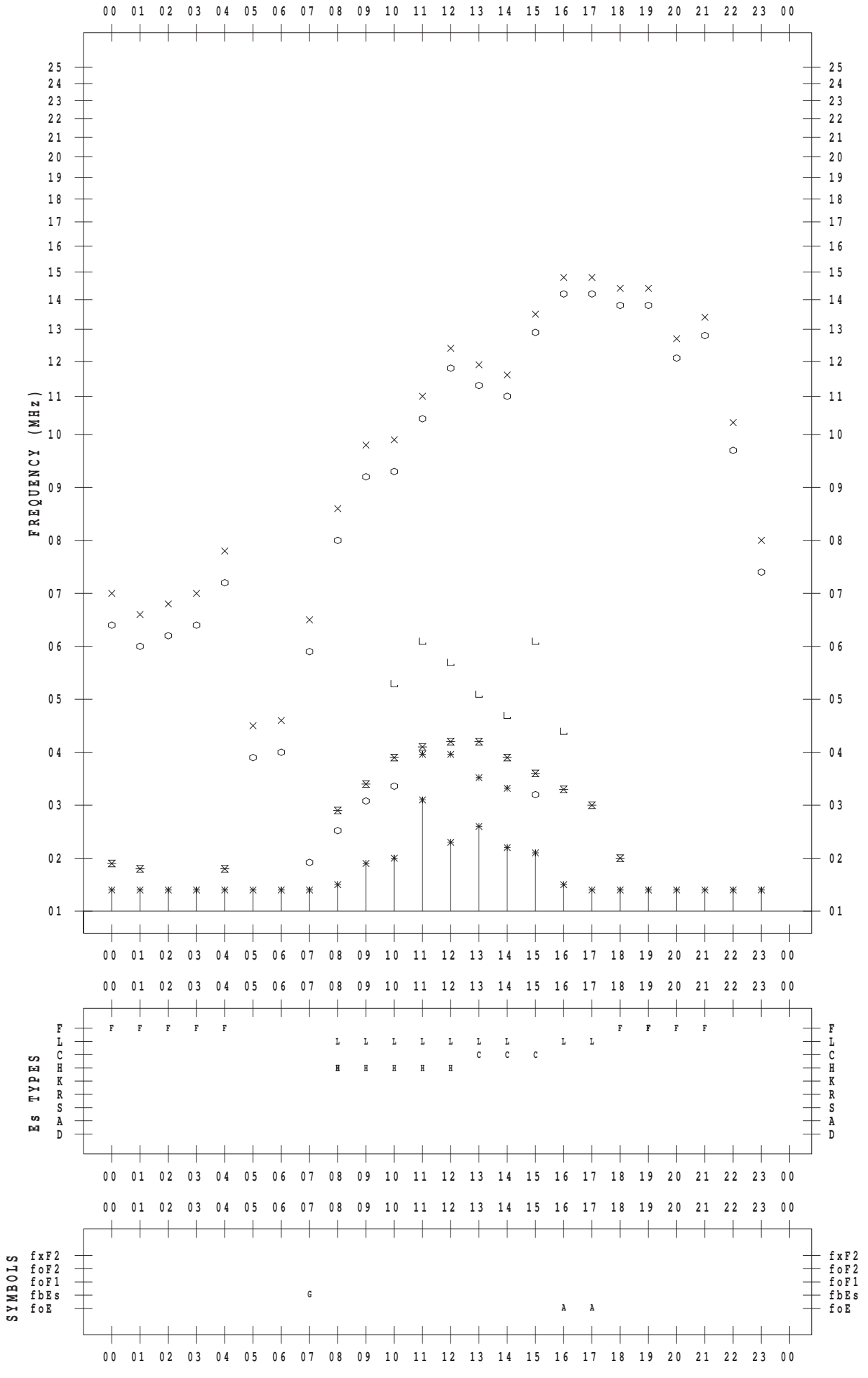
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/20

135 °E MEAN TIME



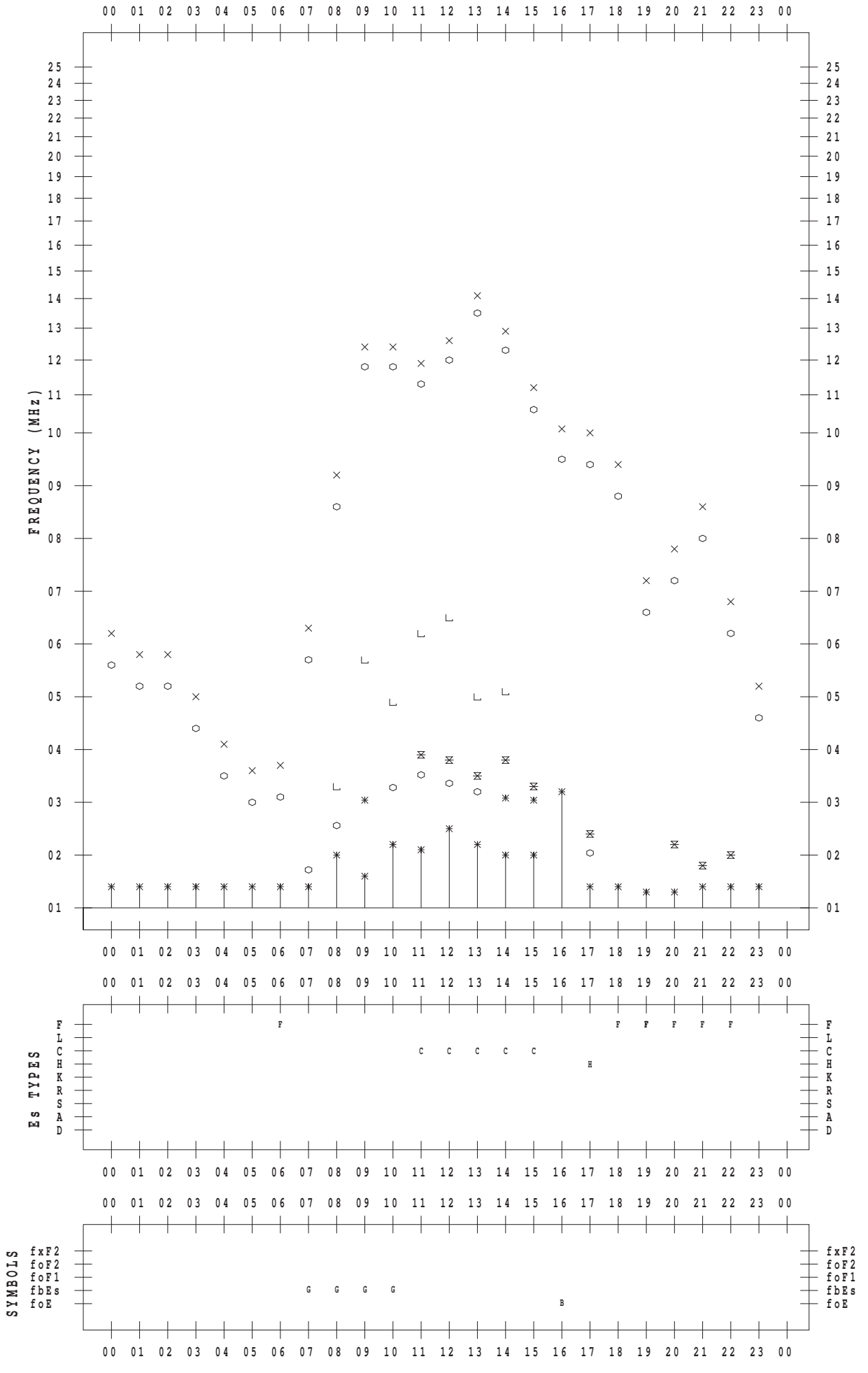
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/21

135 °E MEAN TIME



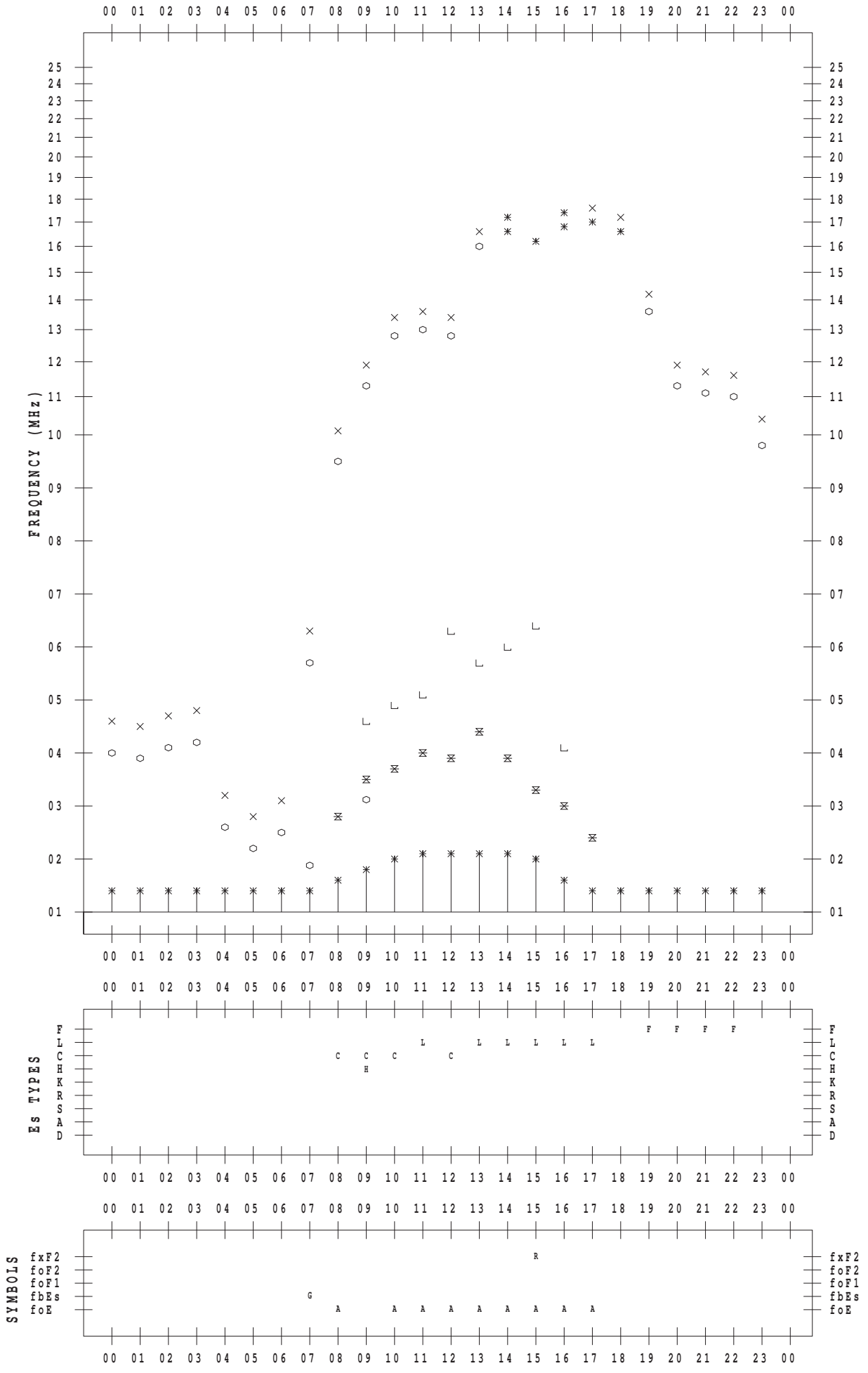
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/22

135 °E MEAN TIME



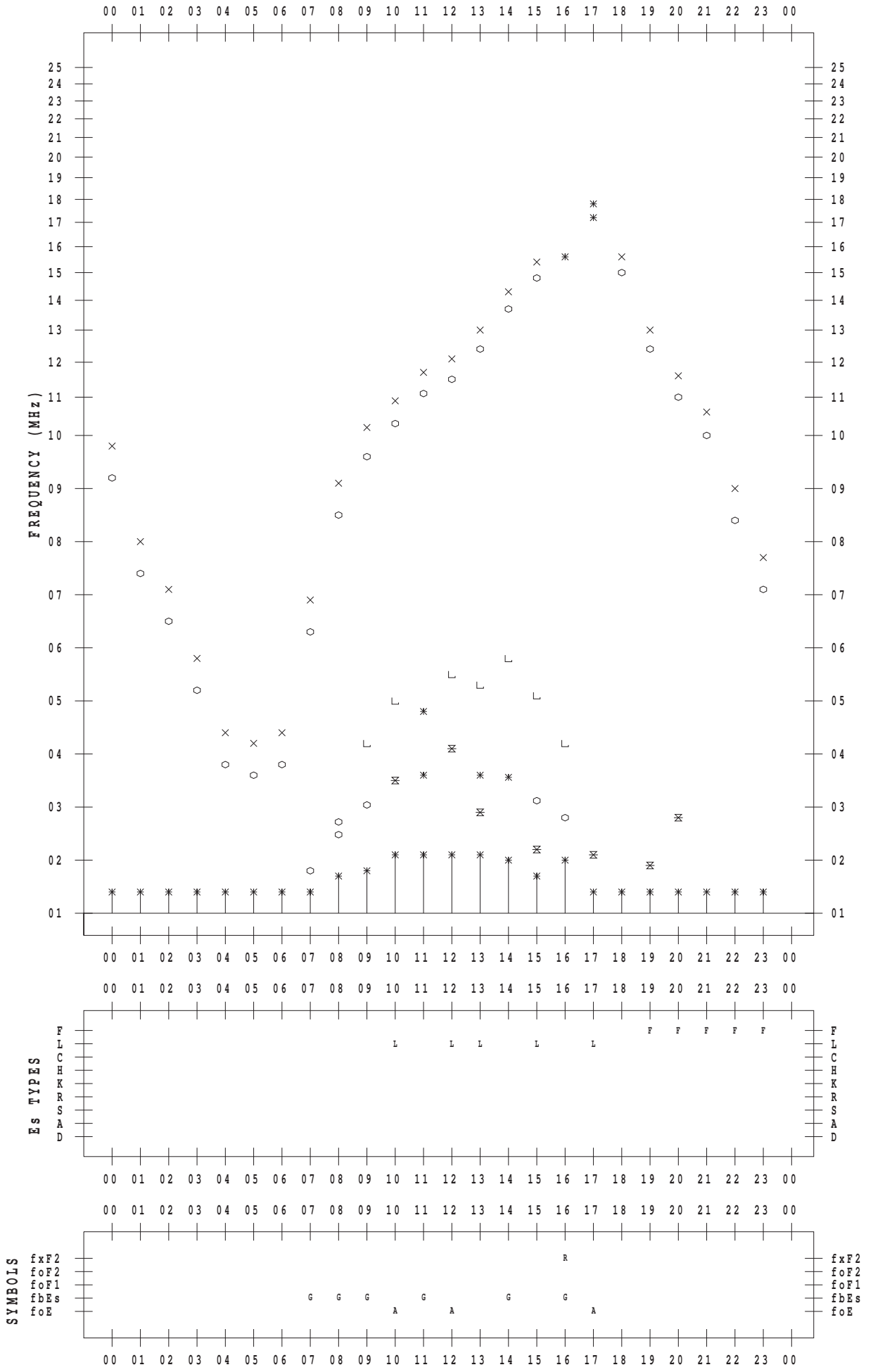
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/23

135 °E MEAN TIME



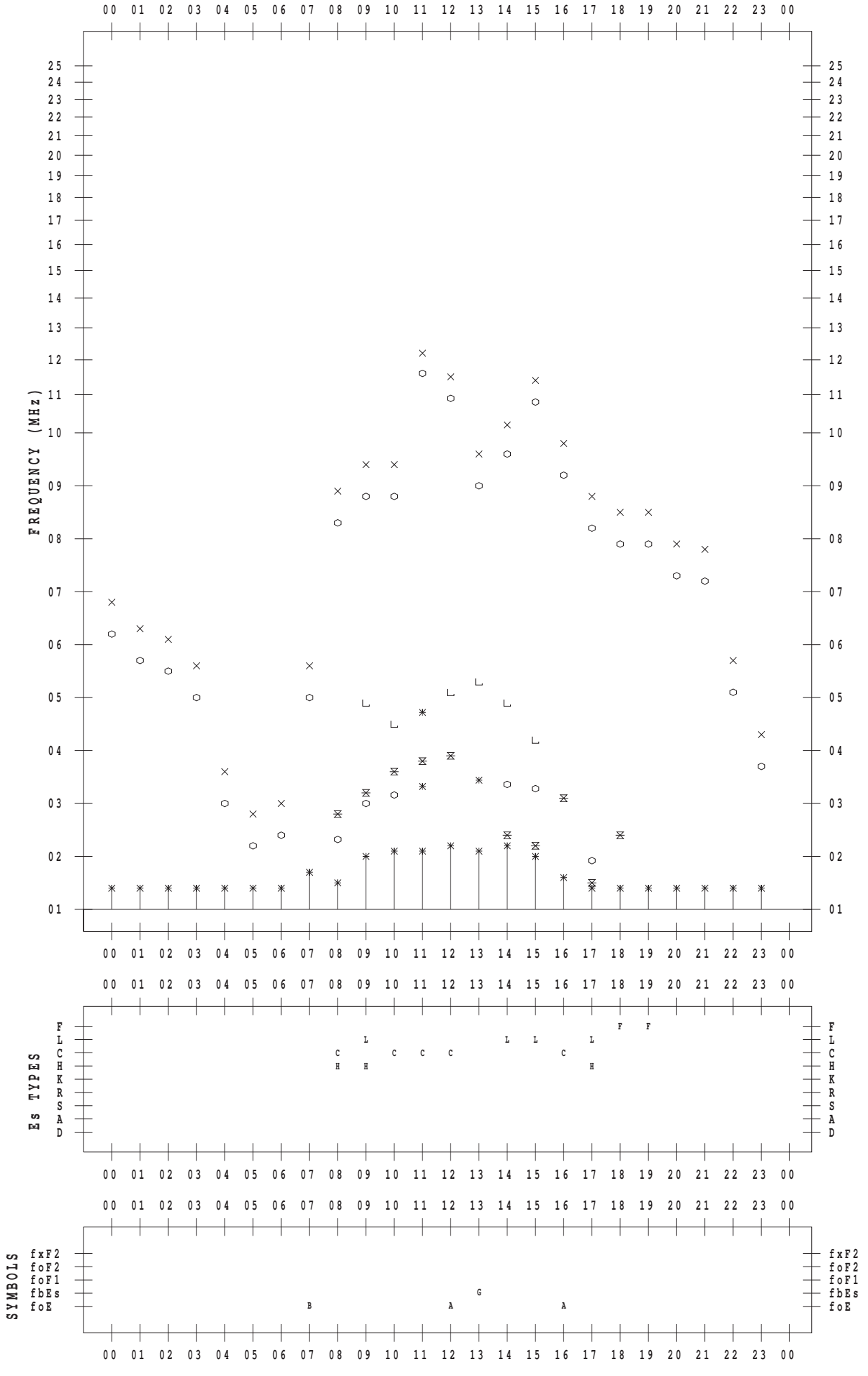
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/24

135 °E MEAN TIME



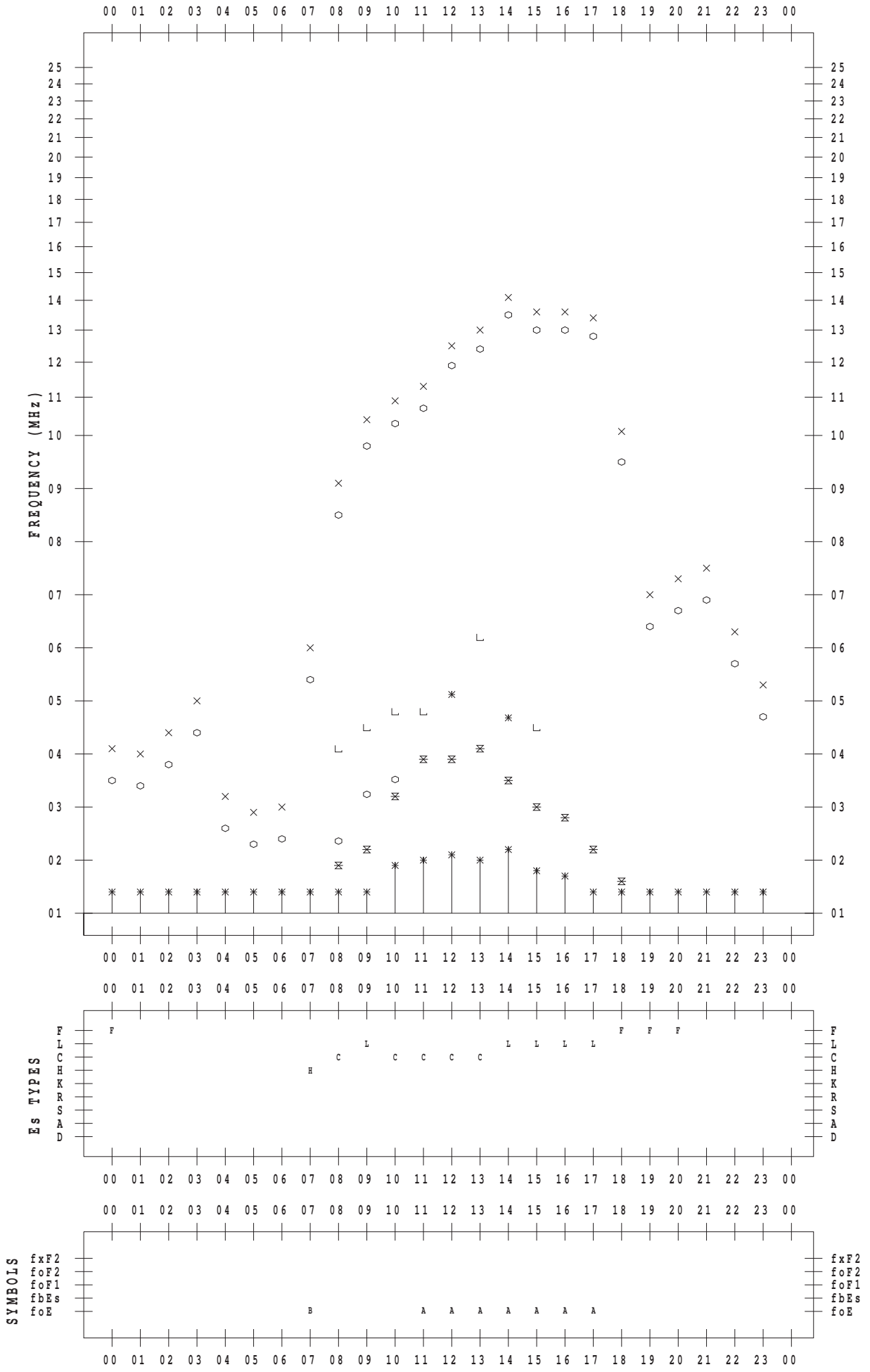
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/25

135 °E MEAN TIME



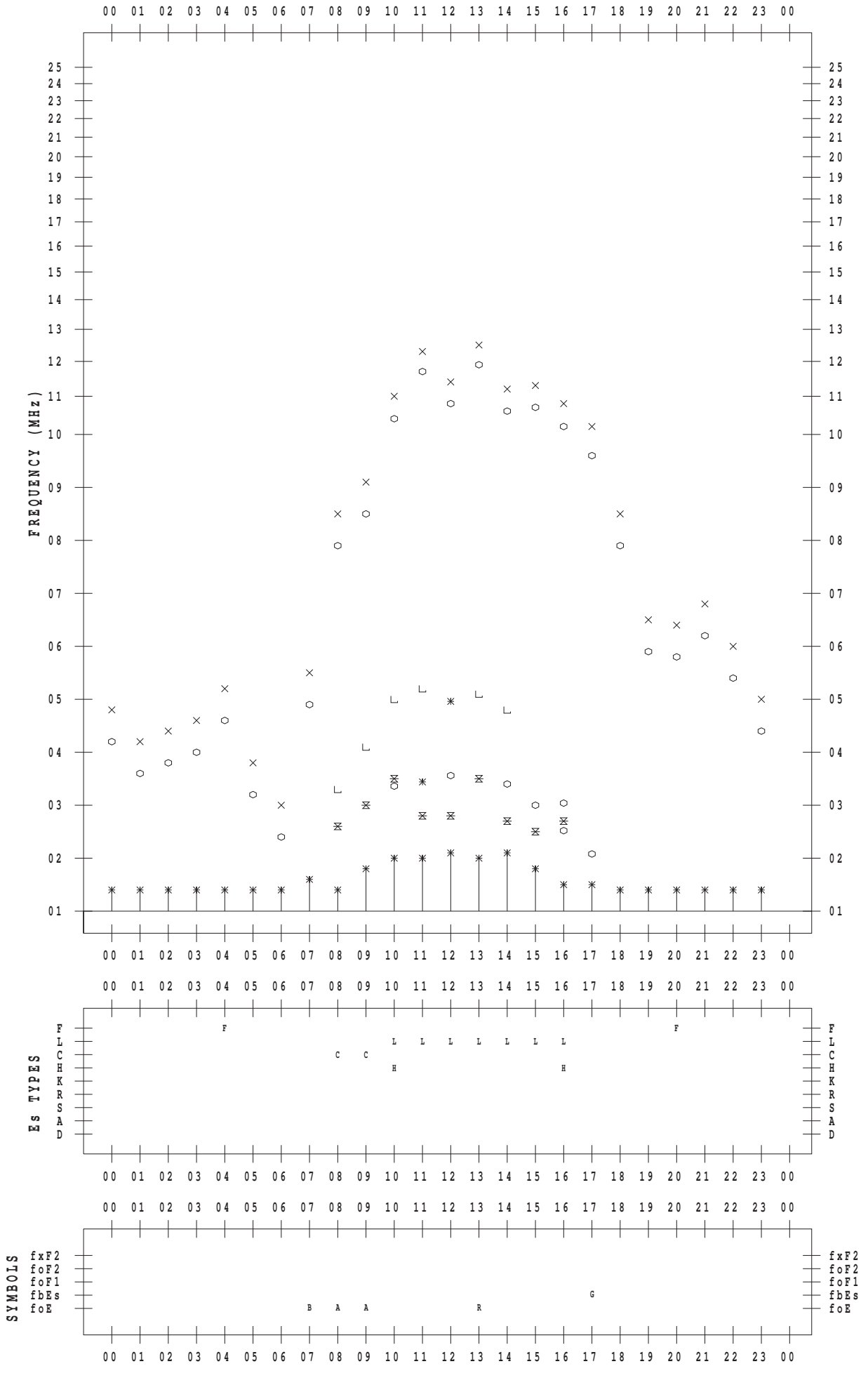
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/26

135 °E MEAN TIME



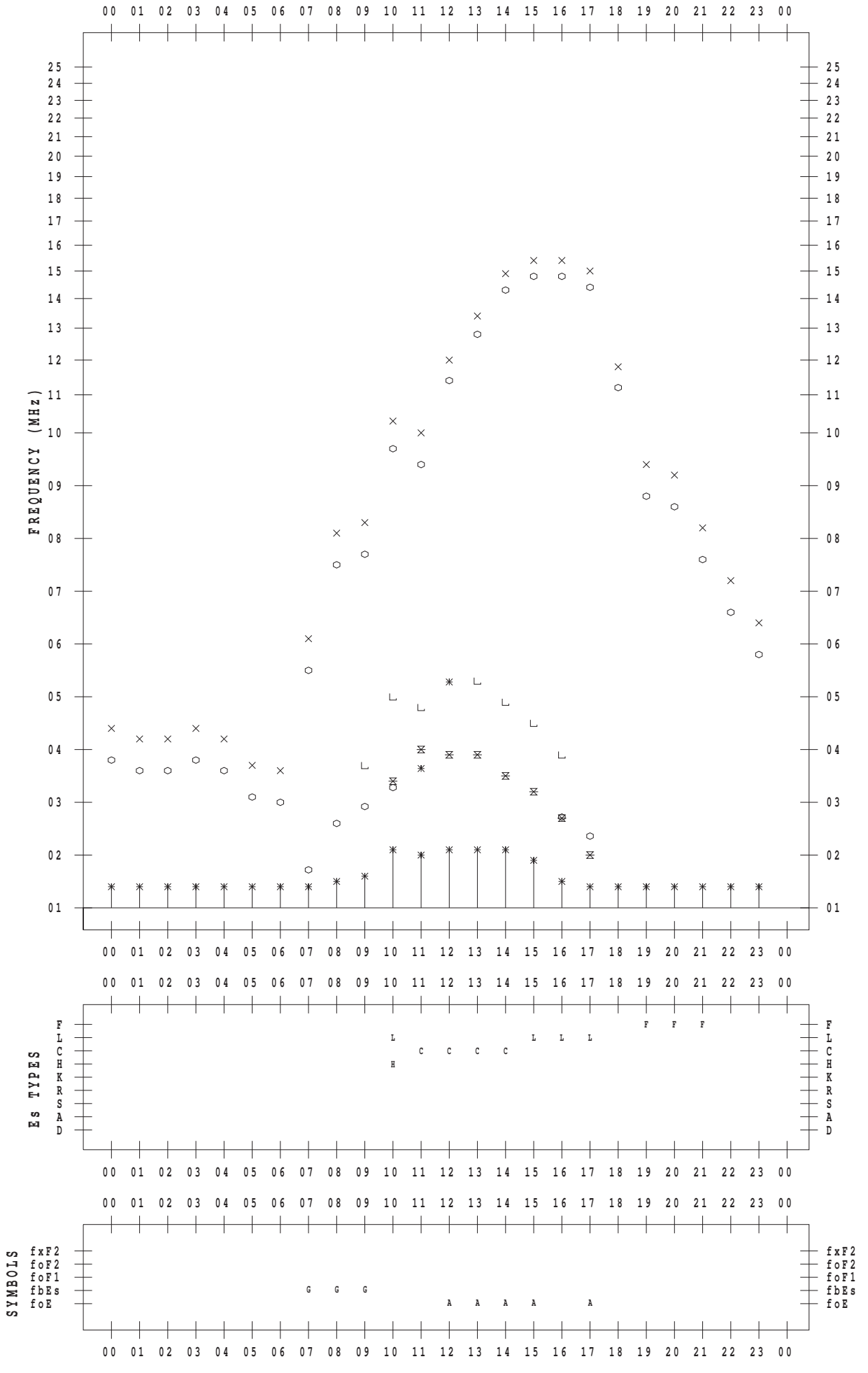
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/27

135 °E MEAN TIME



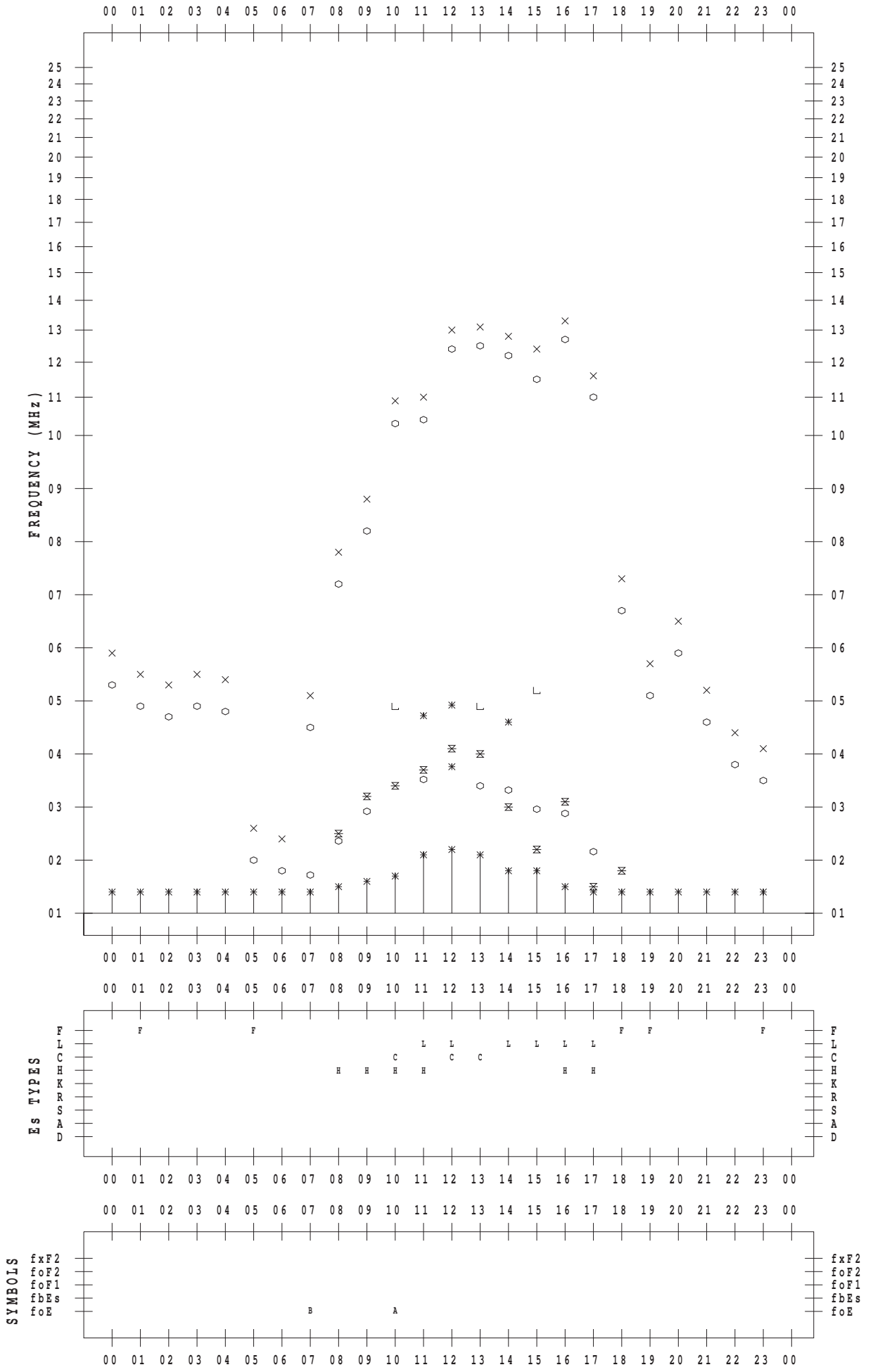
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/28

135 °E MEAN TIME



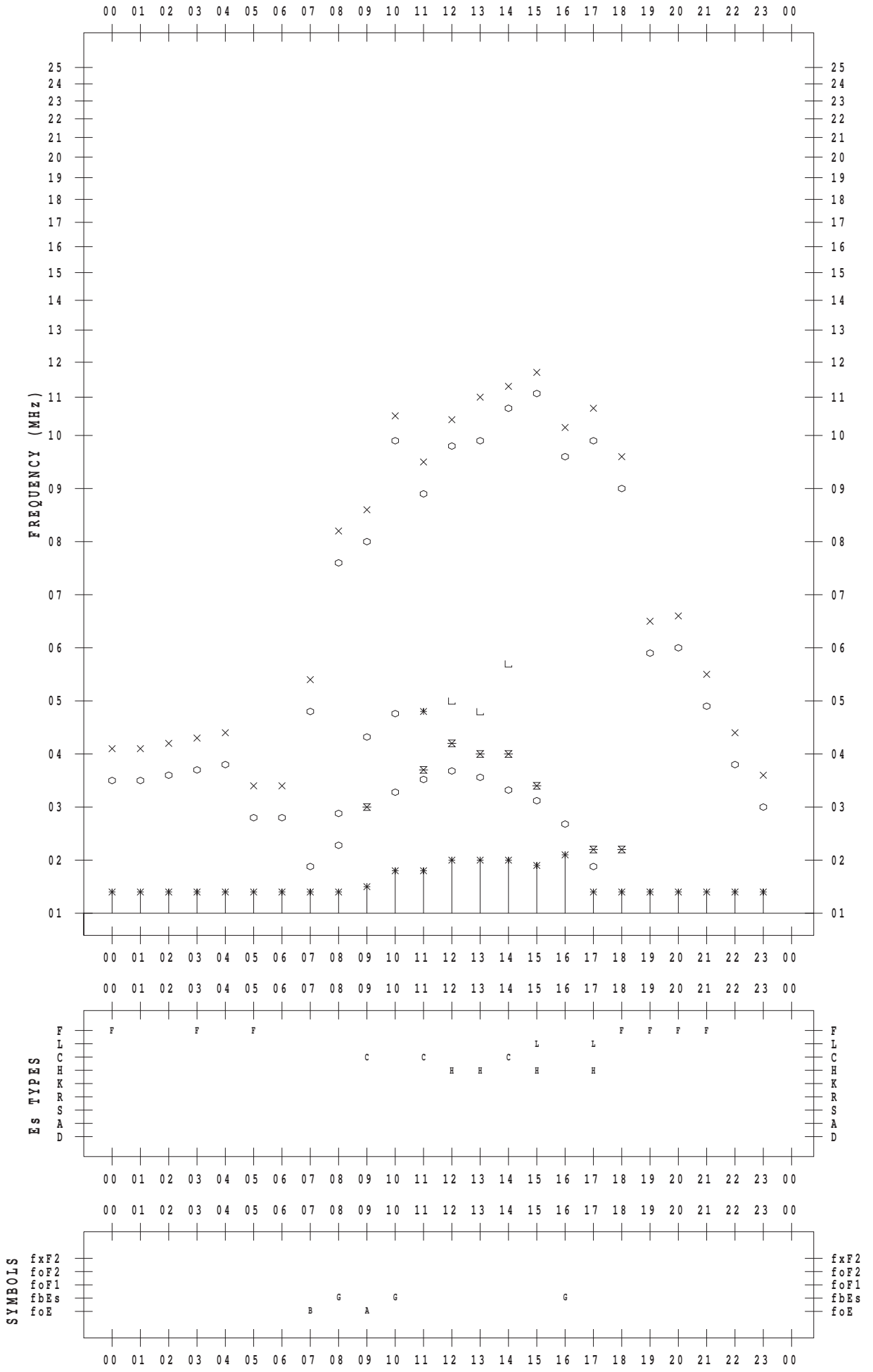
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/29

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2012/11/30

135 °E MEAN TIME