

# IONOSPHERIC DATA IN JAPAN

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« Real Time Ionograms on the Web .....[http://wdc.nict.go.jp/index\\_eng.html](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 (  $f_oF2$ ,  $fEs$ ,  $fmin$  ) and monthly medians of two factors (  $h'Es$ ,  $h'F$  ), daily Summary Plots and monthly medians plot of  $f_oF2$ .

#### a. Characteristics of Ionosphere

<b><math>f_oF2</math></b>	Ordinary wave critical frequency for the <b><math>F2</math></b> layer
<b><math>fEs</math></b>	Highest frequency of the <b><math>Es</math></b> layer whether it may be ordinary or extraordinary
<b><math>fmin</math></b>	Lowest frequency which shows vertical iono-spheric reflections
<b><math>h'Es</math></b> <b><math>h'F</math></b>	Minimum virtual height on the ordinary wave for the <b><math>Es</math></b> and <b><math>F</math></b> 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  $f_oF2$  ).
- 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  $f_oF2$ ,  $fEs$  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  $f_xE$  and  $f_oE$  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

<b><math>fxl</math></b>	Top frequency of spread <b><math>F</math></b> trace
<b><math>f_oF2</math></b> <b><math>f_oF1</math></b> <b><math>f_oE</math></b> <b><math>f_oEs</math></b>	Ordinary wave critical frequency for the <b><math>F2</math></b> , <b><math>F1</math></b> , <b><math>E</math></b> , and <b><math>Es</math></b> (including particle type <b><math>E</math></b> ) layers, respectively
<b><math>fbEs</math></b>	Blanketing frequency of the <b><math>Es</math></b> layer, e.g. the lowest ordinary wave frequency visible through <b><math>Es</math></b>
<b><math>fmin</math></b>	Lowest frequency that shows vertical ionospheric reflections
<b><math>M(3000)F2</math></b> <b><math>M(3000)F1</math></b>	Maximum usable frequency factor for a path of 3000 km for transmission by the <b><math>F2</math></b> and <b><math>F1</math></b> layers, respectively
<b><math>h'F2</math></b> <b><math>h'F</math></b> <b><math>h'E</math></b> <b><math>h'Es</math></b>	Minimum virtual height on the ordinary wave for the <b><math>F2</math></b> , whole <b><math>F</math></b> , <b><math>E</math></b> and <b><math>Es</math></b> layers, respectively
<b>Types of <math>Es</math></b>	See below b. (iii)

## b. Symbols

## (i) Descriptive Letters

The following letters are entered after, or used to replace 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 atmospheric.
- 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-associated 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 ( CNT )** 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

SEP. 2013

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

H D	00	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	44	34	46	43	46		56	A	61	64	65	64	64	63	68	A	A	67	62	66	64	53	47
2	42	34	34	47	A	A	61	A	64	A	A	A	59	58	61	56	60	67	66	62	54	63	N	37
3	32	34	34	32	36	34	48	56	63	64	58	A	A	68	66	64	62	60	62	64	66	64	63	52
4	44	42	50	44	38	42	52	60	64	64	61	64	64	60	62	64	67	64	67	A	64	54	59	38
5	34	34	46	34	42	34	58	68	68	66	65	64	65	66	65	66	65	68	67	67	60	62	A	A
6	A	54	59	52	52	50	61	64	66	68	62	64	70	66	62	67	70	67	66	65	64	64	54	61
7	59	54	34	37	48	53	68	68	68	65	62	66	68	68	64	66	67	66	67	67	A	A	A	A
8	A	52	53	53	54	50	68	66	55	62	68	67	68	68	67	67	68	68	66	67	64	54	49	53
9	53	53	44	43	47	48	60	65	64	64	66	64	67	68	68	67	65	67	64	64	62	52	53	54
10	53	52	34	44	36	46	48	65	66	62	A	68	64	64	70	67	60	61	66	66	54	63	62	53
11	54	42	43	34	34	44	54	64	67	65	56	63	66	68	66	68	67	65	64	63	60	N	54	34
12	47	37	38	34	42	50	60	65	65	67	68	67	68	67	68	65	67	66	63	62	64	62	54	37
13	48	34		44	42	44	58	59	59	67	69	66	67	67	68	65	70	66	67	64	63	63	53	59
14	53	46	50	37	34	47	54	60	64	63	61	59	A	60	67	66	70	70	64	63	58	62	62	55
15	54	43	53	47	34	47	64	61	62	59	59	67	66	67	67	64	66	64	65	66	59	55	53	52
16	40	44	48	43	32	37	58	68	67	67	64	64	66	65	70	67	66	67	65	66	54	63	35	38
17	44	32	34	34	43	34	66	68	67	59	68	65	69	69	62	65	64	68	66	65	67	51	46	47
18	42	35	42	34	42	46	61	67	67	64	69	71	69	68	70	67	67	68	66	64	39	54	53	34
19	54	52	47	45	46	47	64	67	67	65	64	67	56	60	69	68	68	67	66	66	63	54	54	54
20	41	54	46	52	52	52	50	62	67	66	69	69	62	68	68	63	65	65	65	63	52	52	54	46
21	36	34	46	37	43	45	60	72	66	64	66	69	70	70	66	67	68	66	64	64	65	62	54	50
22	32	52	52	52	52	52	63	69	62	64	61	66	67	67	67	63	66	64	61	58	61	39	54	52
23	34	48	47	47	47	47	60	68	67	49	68	63	66	66	N	65	68	67	A	A	55	55	53	50
24	34	48	50	46	48	51	63	65	68	66	59	69	70	67	65	67	67	66	54	55	60	38	42	32
25	51		47	19	29	34	63	71	66	69	63	59	69	69	66	68	67	61	64	63	62	54	54	34
26	36	36		A	A	34	64	67	59	59	69	70	66	66	67	68	68	67	64	64	53	54	54	48
27	48	50	34	44	A	34	59	70	65	67	68	67	68	67	68	70	70	65	63	63	50	34	47	44
28	35	34	34	42	34	44	60	66	66	69	67	67	64	68	65	67	69	70	67	61	A	34	A	37
29	38	32	32	32	34	42	64	66	67	64	67	67	66	70	68	67	71	32	66	57	43	34	34	32
30	34	37	32	34	34	34	58	70	65	68	68	70	66	68	67	70	70	66	65	60	34	52	53	53
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	28	29	27	29	29	29	29	29	28	28	28	30	29	30	29	29	29	28	28	28	26	28
MED	42	43	45	43	42	46	60	66	66	64	66	66	66	67	67	67	67	66	65	64	60	54	54	48
U Q	52	52	49	46	47	49	63	68	67	67	68	67	68	68	68	67	68	67	66	65	64	62	54	53
L Q	34	34	34	34	34	35	58	63	64	62	61	64	64	66	65	65	65	64	64	62	54	52	53	37

HOURLY VALUES OF fEs AT Wakkanai

SEP. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G		39	72	46	46	38	39	38	34	56	79	59	40	37	G	42	29	G
2	G	G	G	38	45	55	43	70	50	36	67	43	35	33	34	35	40	52	61	38	23	27	G	27
3	G	26	G	G	34	36	38	35	31	44	39	52	50	38	32	34	34	40	48	40	58	G	G	G
4	G	G	G	G	G	38	40	46	38	39	38	36	36	41	34	50	40	35	34	69	37	41	28	25
5	G	G	G	G	G	33	47	37	39	41	36	42	34	34	34	35	33	36	27	56	32	34	44	38
6	36	28	G	G	G	G	30	36	40	43	32	35	32	40	33	30	27	32	G	G	G	29	24	G
7	G	G	G	G	G	G	32	38	38	38	34	43	36	38	33	36	40	61	29	G	69	61	69	40
8	68	38	23	30	34	34	36	58	67	40	39	64	39	34	32	29	27	32	32	56	34	33	26	33
9	25	29	G	G	G	G	23	33	36	43	42	33	35	41	G	30	27	24	G	G	G	G	G	G
10	G	G	G	G	G	G	G	38	64	53	72	61	40	40	G	28	27	23	G	28	G	39	33	34
11	G	G	G	G	G	27	41	38	33	37	35	32	G	39	32	32	G	G	G	32	44	31	G	G
12	G	G	G	G	G	G	23	32	37	34	49	40	41	39	36	28	39	30	G	27	26	G	G	G
13	G	G	G	G	G	G	28	35	31	38	34	35	34	40	33	37	32	35	G	G	G	29	27	G
14	G	G	G	G	G	G	G	35	29	34	42	33	33	G	37	30	28	24	42	36	G	25	G	G
15	G	G	G	G	G	24	G	26	48	41	50	49	38	34	31	30	26	24	35	25	G	27	30	G
16	23	G	G	G	G	G	G	33	N	36	34	39	38	35	32	34	27	24	36	33	30	27	26	26
17	26	G	G	G	G	G	26	28	34	31	34	33	38	32	31	35	38	G	G	G	28	26	G	G
18	G	G	G	G	G	G	G	35	38	N	44	33	34	34	G	G	26	33	27	G	G	30	28	G
19	G	G	G	G	G	G	39	36	50	40	35	33	G	34	31	28	G	30	G	G	G	28	32	26
20	26	G	G	24	32	39	35	27	32	31	34	34	G	33	32	30	G	35	37	40	38	27	G	G
21	G	G	G	G	G	G	G	32	G	G	G	32	34	32	31	28	34	26	G	G	G	G	G	G
22	G	G	G	G	G	28	G	34	32	33	36	38	35	39	34	34	26	G	G	G	G	G	G	G
23	G	G	G	G	G	G	24	32	29	31	34	35	35	34	32	30	25	G	70	53	G	G	G	G
24	G	G	G	G	G	G	G	33	34	39	41	33	35	35	35	34	32	28	33	G	G	G	G	G
25	25	G	G	30	33	32	G	52	50	40	39	52	35	38	45	50	48	26	G	29	26	G	G	G
26	G	G	G	35	44	24	40	G	28	37	G	32	34	36	36	29	37	42	35	28	29	29	30	G
27	G	G	36	33	40	34	39	35	37	39	33	34	35	32	29	33	39	39	52	34	28	G	31	G
28	26	G	G	G	G	G	38	34	35	32	39	33	34	33	30	34	36	32	G	33	38	G	37	28
29	G	G	G	G	G	G	34	32	29	32	33	33	32	G	38	30	33	51	28	40	32	G	G	G
30	G	G	G	G	G	G	G	G	40	36	32	G	G	32	30	35	29	34	G	30	28	G	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	28	30	30	30	29	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	G	G	G	G	G	G	28	35	37	38	36	35	35	34	32	32	32	32	28	30	26	26	25	G
U Q	23	G	G	G	G	32	38	38	44	40	42	42	38	39	34	35	38	36	36	38	32	30	30	26
L Q	G	G	G	G	G	G	G	32	31	33	34	33	34	33	31	30	27	24	G	G	G	G	G	G

# HOURLY VALUES OF fmin AT Wakkanai

SEP. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	15		14	15	16	18	18	26	27	15	15	14	14	14	14	14	15	15	14
2	15	14	14	14	14	14	14	15	15	20	23	20	18	16	15	14	14	14	14	14	14	15	15	15
3	16	14	15	14	14	14	14	15	16	16	20	21	18	17	18	14	14	14	14	15	15	16	16	16
4	14	15	14	15	15	14	14	15	15	15	22	16	21	21	20	20	16	14	14	14	14	15	15	16
5	14	15	15	15	14	14	14	14	14	14	18	16	15	14	16	15	14	14	18	14	15	15	15	14
6	14	15	15	15	15	14	14	14	14	15	15	17	48	17	20	15	14	14	16	14	15	15	15	15
7	15	15	15	16	14	15	14	14	14	15	17	22	22	21	18	14	14	14	14	14	14	14	14	14
8	14	14	15	14	14	14	15	14	15	16	14	14	14	15	17	17	15	14	14	14	14	14	16	16
9	15	15	20	15	15	15	14	14	17	16	16	15	15	20	14	15	15	15	17	15	14	15	15	14
10	14	15	14	15	14	15	21	15	16	18	27	21	20	15	14	17	15	16	15	15	20	15	15	14
11	15	15	14	16	15	14	14	14	14	15	18	21	18	16	14	14	14	14	15	14	15	14	14	15
12	14	15	14	15	14	17	21	14	14	15	15	16	17	15	14	14	14	14	15	15	14	18	15	15
13	15	15		15	15	16	14	14	15	15	15	17	15	15	17	14	14	14	15	14	16	14	14	15
14	15	16	15	15	15	15	14	14	14	17	15	15	15	14	16	14	14	15	14	15	18	14	16	14
15	18	15	23	16	18	14	15	14	14	14	20	18	17	15	14	15	14	17	15	15	14	15	14	15
16	14	15	15	15	15	14	14	15	14	14	18	20	14	14	15	15	14	16	15	15	15	15	15	15
17	14	18	15	15	16	15	14	14	14	16	16	15	16	17	15	15	14	18	15	15	15	15	15	15
18	15	15	14	15	15	14	17	15	14	16	17	15	14	14	14	15	14	14	14	14	18	14	15	16
19	15	15	14	15	14	14	14	15	14	18	17	24	45	15	14	17	14	14	14	15	14	15	14	16
20	15	15	15	14	14	14	15	14	15	15	20	46	27	22	20	14	14	14	15	14	14	16	15	14
21	15	15	15	14	14	14	23	14	14	15	18	20	26	20	20	17	14	16	14	14	16	14	14	14
22	14	14	14	14	14	14	18	14	14	14	14	14	22	18	22	15	14	20	14	15	15	15	15	14
23	14	15	15	14	14	14	17	14	16	17	15	15	14	14	16	14	14	21	14	15	15	14	15	15
24	15	14	14	14	14	15	15	14	14	15	20	51	15	15	14	14	14	14	14	14	17	15	15	17
25	14		15	14	14	14	14	14	15	14	15	16	17	17	15	14	14	14	15	14	15	15	15	15
26	15	15		14	14	15	16	15	14	17	17	18	18	18	15	15	14	14	14	15	14	14	15	15
27	15	15	14	14	14	14	14	14	14	14	17	20	18	17	15	14	14	14	14	14	14	15	15	15
28	16	18	20	16	14	14	14	14	14	14	15	15	16	16	14	14	15	14	15	15	14	14	14	15
29	16	15	15	15	14	14	14	15	17	18	17	23	21	15	15	17	14	14	15	14	14	15	14	15
30	15	15	15	15	14	15	21	14	14	17	20	17	17	18	15	14	14	14	15	14	14	15	14	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	28	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	15	15	15	14	14	14	14	14	15	17	18	18	16	15	15	14	14	14	14	14	15	15	15
U Q	15	15	15	15	15	15	16	15	15	17	20	21	21	18	17	15	14	15	15	15	15	15	15	15
L Q	14	15	14	14	14	14	14	14	14	15	15	15	15	15	14	14	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

SEP. 2013

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	42	48	58	43	38	49	67	78	76	68	69	68	70	77	83	69	72	66	73	73	76	A	A	A
2	A	N	43	42		44	66	68	54	69	62	61	66	77	71	62	66	72	78	78	58	47	51	
3	44	44	43	46	43	43	53	62	62	69	63	66	71	67	72	67	62	65	72	81	50	54	A	
4	A	46	51	46	43		63	87	78	63	67		78	71	64	66	70	82	91	87	66	A	54	A
5		52	49			44	66	77	78	69	65		72	72		71	76	72	81	74	54		54	52
6	53	52		48	43	46	71	80	72	67	68	73	82	76	71	67	74	83	87	77	54	63	53	53
7	52	54	52	47	46		64	86	76	67		76	72	64	72	72	77	83	88	88	54	52	55	53
8	52	52	53	38	A	42	62	79	73	79	76	77	84	79	81	83	87	74	82	55	67	A	A	54
9	52	52	53	46	38	47	67	72	81	89	80	76	77	68	75	77	75	67	67	73	57	38	53	54
10	58	53	44	43	42	44	59	73	84	73	73	80	83	81	80	77	74	62	67	73	54	67	54	
11	52			46	47		64	74	73	81	77	74	71	75	83	82	75	80	74	54	47	46		
12	47	43	47		46	46	66	72	71	72	77	71	67	77	78	81	69	75	87	78	63	51	44	53
13			44	42	42	38	58	80	90	83	75	68	75	80	78	83	87	80	73	64	54	52		47
14		50	52				61	71	72	63	64	74	80		80	80	81	82	77	54	53	54	52	49
15	51		44	45	N		62	64	72	78	75	73	82	83	78	81	80	77	87	76	54	54	52	54
16	47	42	46	47	36	46	66	72	66	78	74	81	86	80	82	81	86	85	87	77	53	44		50
17		47	46	53	46	47	66	62	87	88	63	77	78	75	75	74	80	91	105	88	28		39	44
18	37	27	38	43	42		59	73	75	81	81	86	91	83	82	82	77	85	80	63	52	43	46	48
19	46				43	47	67	72	78	78		90	91	90	77	73	72	85	87	55	54	58	52	53
20	43	43	39	44		51	73	77	80	81	83	87	90	91	81	76	78	80	86	74	A		46	39
21	44			46	43	36	63	67	72	78	90	87	81	75	71	75	76	81	69	56	53	52		46
22	43	52	52	52	52	54	65	67	68	76	82	82	86	81	81	80	81	76	78	67	51	51	43	43
23		42	46	43	39	39	54	72	77	80	80	74	78	81	80	84	82	76	67	54	44	50	44	43
24	43	38	44	N			69	80	77	66	78	81	77	84	81	78	82	86	78	67	A	53	A	A
25	48	48	44	43	44	49	67	78	82	87	82	90	86	85	83	86	91	100	88	68		53	47	48
26	53	50		31	42	23	58	74	87	91	77	81	87	77	72	78	82	80	88	75	54	53	38	53
27	51	51	50	46	44	44	63	81	82	75	73	81	81	82	83	80	84	81	54	49	A	A		46
28	43	38	44	43	43	36	51	62	76	75	76	81	74	75	80	83	88	99		67	36	36	A	43
29		36	38	39	28	38	58	69	76	76	72	79	80	82	82	85	84	85	81	51	N		38	34
30	34	N	27	39		32	52	62	80	77	81	78	81	81	85	78	85	92	82	54	34	A	A	A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	23	25	25	22	23	30	30	30	30	28	28	30	29	29	30	30	30	29	30	25	21	19	22
MED	47	48	46	44	43	44	64	72	76	76	76	78	80	79	80	78	79	80	81	70	54	52	51	48
U Q	52	52	51	46	44	47	66	78	80	81	80	81	84	82	82	82	84	85	87	77	55	54	53	53
L Q	43	42	43	42	42	38	59	68	72	69	68	73	74	75	73	73	74	75	73	55	50	46	44	44



# HOURLY VALUES OF fEs AT Kokubunji

SEP. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	27	26	G	G	G	G	G	27	G	G	G	G	G	G	G	G	29	29	G	G	G	82	59	31	
2	27	G	G	G	G	G	G	G	53	56	36	48	G	G	G	G	29	42	29	33	35	24	G		
3	G	G	G	G	G	24	23	32	35	G	G	G	G	G	G	G	G	42	35	27	27	G	35		
4	26	G	G	G	G	G	G	27	G	G	G	G	G	G	G	G	G	27	G	36	50	45	33	35	
5	G	G	G			G	G	29	G	G	G	G	G	G	G	G	G	G	G	29	32		G	G	
6	36	35		G	G	G	28	29	G	G	G	G	G	G	G	G	43	28	G	G	G	G	G	G	
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	29	31	G	G	30	37	30	
8	26	G	G	G	33	G	39	48	G	G	G	G	G	51	G	G	29	37	38	58	41	48	38	27	
9	G	29	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
10	G	G	G	G	G	G	23	G	G	G	G	G	G	G	G	G	G	23	G	G	G	G	G		
11	G			25	G	G	G	32	G	G	G	G	G	G	G	G	28	G	G	G	G	29			
12	G	G	G		G	G	23	27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
13		G	G	G	G	G	26	G	G	G	G	G	G	G	40	G	46	36	34		G	G	G	G	
14	G	G	G				G	G	G	G	G	G	G	G	G	50	45	26	27	29		G	G	G	
15	24		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	27	33	24	G	G	
16	G	G	G	G	G	G	G	29	G	G	G	G	G	G	G	G	G	G	G	G	G	33	24	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24	G	G	G		G	G	
18	G	G	G	G	G		G	27	29	G	G	G	G	G	G	G	G	50	39	G	G	G	G	G	
19	G				G	G	G	28	G	G	G	G	G	G	G	G	26	92	52	G	G	G	G	G	
20	G	G	G	G		25	34	29	G	G	G	G	G	G	G	G	G	31	G	31	27		G	G	
21	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	30	G	G	G		G	
22	G	G	G	G	G	G	G	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
23		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	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	49	34	28	30	26	56	27	
25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	31	36	G	24	G	G	
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
27	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G		82	40	G	
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40		34	G	26	37	29	
29		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	38	G		G	G	
30	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	34	28	G	G	30	31	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	27	26	26	26	26	27	30	30	30	30	29	28	30	30	29	30	30	30	29	30	30	26	26	26	
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	26	G	G	G	12	G	G	
U Q	G	G	G	G	G	G	G	29	G	G	G	G	G	G	G	G	28	36	31	29	30	29	33	27	
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

SEP. 2013

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	13	14	18	13	18	14	34	37	40	44	46	49	54	47	44	43	18	21	18	14	13	14	14	14	
2	14	17	18	14	14	15	40	17	29	20	22	42	47	53	44	43	18	14	14	15	14	36	18		
3	15	18	15	15	15	15	37	15	40	44	46	55	53	53	43	42	18	13	13	13	14	33	15		
4	14	14	14	17	15	21	35	13	42	44	49		55	56	39	43	18	14	33	13	14	14	13	14	
5	18	14	14			22	22	14	18	44	55		55	53		46	18	35	14	14	15		14	18	
6	14	14		17	15	15	13	17	15	44	56	52	47	49	45	43	13	18	18	15	14	15	17	20	
7	17	17	21	14	14	17	62	40	41	40		47	48	54	60	43	14	13	17	14	14	14	17	14	
8	13	14	14	14	13	17	17	17	42	50	47	54	50	40	48	43	18	14	14	14	14	13	14	14	
9	17	14	14	18	20	17	43	18	44	40	50	49	52	45	44	42	38	14	17	15	13	22	20	14	
10	15	20	14	14	15	14	37	42	40	45	44	48	54	45	46	43	39	13	18	14	14	14	15		
11	15			14	14	15	14	39	42	44	45	50	52	47	45	41	14	26	18	14	14	15			
12	15	15	13		18	14	13	13	17	44	46	44	46	47	43	40	39	18	20	15	17	15	15	14	
13		20	15	15	14	14	14	14	40	44	52	44	52	45	43	43	17	14	15	14	14	18		34	
14	38	14	14				18	39	40	43	44	45	45	45	51	37	34	14	14	15	17	14	15	17	
15	14		15	14	17	25	29	40	40	43	45	46	50	45	44	39	39	17	18	14	14	14	14	14	
16	14	14	15	14	14	15	14	15	21	44	43	45	47	43	44	21	39	18	15	14	14	18	21	14	
17	20	26	14	17	14	14	37	39	51	42	52	45	44	45	45	42	18	14	18	18	20		14	15	
18	15	17	21	18	14		36	14	35	43	50	44	58	48	43	42	40	14	14	15	15	14	23	17	
19	14				17	17	36	17	39	42	45	44	55	43	44	40	32	13	13	18	14	21	15	14	
20	15	15	15	14		14	13	34	40	44	51	55	45	44	40	39	36	14	14	14	15		26	15	
21	28			15	14	14	21	40	43	37	44	53	45	45	44	40	20	17	14	14	14	14		20	
22	14	18	15	15	13	14	21	17	40	43	42	50	44	42	47	43	18	36	14	14	14	20	14	20	
23		17	14	14	14	17	33	39	39	44	47	53	51	50	43	43	38	25	14	14	15	17	21	21	
24	18	17	14	21	18		35	35	36	39	46	44	57	44	42	40	14	17	14	15	15	15	14	18	
25	14	17	14	17	18	14	22	18	40	42	45	50	47	51	44	43	35	36	14	17	21	36	17	20	
26	14	17	18	14	21	13	22	36	20	43	39	43	45	44	40	39	38	33	14	15	43	15	18	15	
27	14	14	13	43	14	14	21	15	38	42	44	53	55	54	42	39	36	34	40	17	14	17		20	
28	14	17	14	14	15	15	23	38	40	43	44	44	44	55	45	39	36	14		14	21	17	14	14	
29		15	14	14	15	14	21	33	39	40	44	57	49	46	44	39	37	21	14	14	21		20	21	
30	17	15	18	14		14	33	34	38	45	44	44	44	50	42	40	36	14	14	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	27	26	26	26	26	27	30	30	30	30	29	28	30	30	29	30	30	30	29	30	30	26	26	26	
MED	15	16	14	14	15	15	22	26	40	43	45	48	50	46	44	42	33	16	14	14	14	15	15	15	
U Q	17	17	15	17	17	17	36	39	40	44	49	52	54	51	45	43	38	21	18	15	15	18	18	20	
L Q	14	14	14	14	14	14	18	15	36	42	44	44	45	45	43	39	18	14	14	14	14	14	14	14	

HOURLY VALUES OF foF2 AT Yamagawa

SEP. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C										A				
4	34	52	58	N	50	47	54	84	72	62	68	70	78	80	81	78	77	88	90	86	84	66	54	54
5	58	A	52	54	47	44	54	77	75	68	66	71	78	77	83	86	80	74	78	80	55	53	55	63
6	52	62	58	53	46	43	54	78	76	67	66	78	82	86	85	81	77	83	82	78	72	53	54	54
7	52	66	52	46	53	50	53	80	81	71	72	72	72	76	77	81	80	84	90	86	53	53	53	54
8	52	52	45	42	38	40	52	73	76	72	68	76	78	80	92	94	91	92	87	85	78	54	53	A
9		53	52	46	44	46	52	72	77	82	71	74	70	77	78	84	81	80	77	77	77	53	43	54
10	53	54	52	52	45	44	52	67	67	78	72	74	86	88	88	82	81	75	74	76	74	70	64	59
11	52	53	51	52	47	47	52	67	68	78	77	75	72	76	92	88	90	85	76	67	53	52	53	53
12	50	52	53	51	47	43	54	64	72	76	59	70	73	80	87	82	78	80	86	86	74	52	51	34
13	50	49	48	46	36	37	47	78	78	70	75	72	81	90	96	96	98	116	90	72	72	A	53	53
14	53	67	54	53		47	67	77	71	66	71	77	78	85	80	A	77	80	73	58	72	67	67	49
15	52	53	53	53	40	32	43	68	74	78	70	77	86	86	89	80	76	86	88	87	71	52	54	52
16	52	52	52	51	44	42	48	68	62	70	86	87	91	94	97	82	90	94	93	86	77	53	53	53
17	52	51	52	52	48	37	44	66	92	78	72	86	94	92	87	86	89	94	92	72	B	37	43	42
18	42	43	43	48	36	30	45	67	90	78	74	87	95	96	88	90	90	90	89	78	33	50	42	46
19	53	53	52	48	42	50	52	65	72	76	91	97	95	95	86	78	81	92	88	74	52	54	54	52
20	53	51	47	46	47	48	52	67	72	82	85	86	95	96	92	91	91	96	89	78	54	53	52	53
21	44	44	52	53	47	34	44	69	67	75	86	90	95	78	82	80	86	89	76	69	52	52	54	54
22	52	50	48	47	44	42	50	64	71	72	86	96	89	88	86	88	90	84	83	76	62	53	51	48
23	48	47	50	47	41	36	44	73	77	80	76	78	78	81	88	92	82	80	94	76	54	47	44	44
24	42	42	42	43	40	41	53	67	74	72	72	77	87	92	88	91	92	98	88	91	54	54	53	52
25	A	67	46	52	52	52	57	73	86	102	87	94	84	86	88	90	96	99	89	N	54	53	53	54
26	52	53	50	48	43	40	49	67	92	81	86	83	90	88	78	80	90	93	94	85	65	54	54	67
27	52	51	51	44	43	37	46	73	82	81	75	78	84	88	92	87	96	88	84	64	54	54	44	52
28	52	52	53	51	43	38	42	70	80	81	80	86	80	88	88	90	96	97	86	74	44	46	A	44
29	44	53	52	50	45	38	41	55	77	85	78	82	80	93	93	90	97	89	84	A	44	42	41	48
30	52	47	47	43	36	30	41	72	72	N	79	77	90	89	86	91	90	90	88	58	44	46	A	47
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	26	27	26	26	27	27	27	27	26	28	28	28	28	28	27	28	28	28	25	27	27	26	26
MED	52	52	52	49	44	42	52	69	75	77	74	78	83	87	88	86	90	88	88	77	54	53	53	52
U Q	52	53	52	52	47	47	53	73	80	81	82	86	90	91	90	90	91	93	89	85	72	54	54	54
L Q	49	50	48	46	41	37	44	67	72	71	70	74	78	80	82	81	80	81	80	72	52	52	51	48

HOURLY VALUES OF fEs AT Yamagawa

SEP. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
3	C	C	C	C	C	C	C	C	C	C														G				
4	26	28	G	G	G	G	G				37	35	G	G	G		59	48	50	33	124	38	38	36				
5	32	32	G		G	G	G	28	34	30	34		G	G	G		34	34	34	40	40	51	43	26	27	39		
6	G	G	G	G	G	G	G	27	31	37		G	G	G		34	35	33	29	31	24		50	40	G			
7	34	G	G	G	G	G		34	38	34	38		G	G	G		32	34	45	47	53	29	29		G	G		
8	G	G		G	G	G	G	28	32	43		G	G	G	G				35	37	34	35	36	32		G	24	
9	G		G		G		G	42	28				G	G				41	48	45	64	59	33		G	56		
10		40		30		23		32	37	34	35		44		G	G		32	34		G	G	G	G		G	26	
11	32	G	G	G	G	G	G	35	G		38	42	41	34	40	56	48	44	36	G	25	30	33	28		G	G	
12	G	G	G	G	G	G			42	31	35		G	G	G			35	33	34				24	34		G	
13	G	G	G	G	G	G	28	28	34	46	55		G	G	G		49	50	47	42	33	27	40	24	28		G	
14	G	G	G	G	G	G		27	34	34	40	34	46	41	32	32		45	56	44		G	24	48	29		G	
15	G	G	G	G	G	G		26	34		44	43	44		G	G		112	70	72	44	38	39	53	43		G	
16	G	G	G	G	G	G		31	34	35	37	36		G	G	G		34	28	30	36		28	24		G	G	
17	G	G	G	G	G	G		29	36	33	34	36		G	G	G		33	33	29	40	30			G	G	G	
18	G	G	G	G	G	G		34	34	32	32		G	G	G		33	33	32	40	42	28	B		27	26	G	
19	G	G	G	G	G	G		G	32	32		44		G	51		33	35	49	56	40	40		G	G		24	
20	G	G	G	G	G	G		52		33	34		G	G	G		34	30	32	29	38	25		G	G		G	
21	G	G	G	G	G	G		33	35	46	45		G	45		34	33	29	25					28	33		G	
22	28	G	G	G	G	G		26	33	31	41		G		G		35		32	32	38	26		G	G		G	
23	G	G	G	G	G	G		31	35	35	36		G	44	35		32	30	32		G	23			G		G	
24	G	G	G	G	G			24	33	33	34	34		G	G		33	58	28		G			27		G	G	
25	G	G	G	G	G		29	29	29	36	34	45	38	46	41		30		G	46	39	46	58	32	26	40		
26	43	44	24		G	G		32	34	34	35		G	G		33	39	28			24		G	G		G	29	
27	49	40	29	26		G	24	35	28	32	51	51		G	G		32	32	31	26		G	G		G	G	G	
28	G	G	G	G	G	G		G	29	31		36	35		G		34	32	30	27		G	G		G	G	G	
29	G	G	G	G	G	G		29	35	40	39	34		G	44	35	38	42	36	40	28	31	32	34	30		G	
30	27	G	G	G	G	G		G	G		33	35	37	36	39	52	33	35	40	32	55		G	G		G	G	
31	G	G	G	G	G	G		48	32	34	39	42		G	G	G		39	28	36	29		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	27	27	27	27	27	27	27	27	27	27	28	28	28	28	28	28	28	28	28	28	28	27	28	28	28			
MED	G	G	G	G	G	G	G	29	34	34	36	34	G	G	32	34	32	36	32	26	25	24	G	G				
U Q	27	G	G	G	G	G	G	34	35	35	40	37	35	34	34	39	41	44	40	38	38	32	28	25				
L Q	G	G	G	G	G	G	G	26	31	32	34	G	G	G	G	32	29	31	G	G	G	G	G	G				

## HOURLY VALUES OF fmin AT Yamagawa

SEP. 2013

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

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

## HOURLY VALUES OF foF2 AT Okinawa

SEP. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	47		B			B		73	80	76	B	81	90	A	88	87	102	106	98	86	53	A	A	42
2	A	A	B	46	52	A	B	69	77	68	76	77	77	87	90	90	95	105	89	87	49	39	54	53
3		53	A		B	38	44	72	72	71	66	87		B	74	77	81	80	82	80		A	52	B
4	A	N	44	54	43	46	53	80	70	65	72	72	87	104	108	98	106	105	110	108	79	54	B	
5	80		49	52	52	B	54	82	66	63		70	87	90	103	88	83	77	78	73	72	73	A	66
6	A			52	46	40	43	72	76	67		B		99	91	100	90	89	A	A	78	72	59	54
7	52		52	52	46	B	51	77	72	75	77	78	82	88	97	90	97	102	102	72	54	54		64
8	49	B	48	44	34	30	44	67	62	77	64	76		70	106	107	108	118	107	107	86	52	52	70
9			39	44		B	44	80	77	N	81	73	74	88	87	88	88	92	88	80	80	72	54	52
10	62	67		53	B	B	A	66	71	79	71	81	88	90		108	107	102	88	87	79	A	42	B
11	39	52	39	51			48	59	76	80	87	169	80	90	104	109	107	107	93	72	52	52	B	B
12	B	52		42	43		53	63	75	73		77	82	80	A	N		92	93	98	88	52		39
13			53	50	B		43	74	67	77	72	74	86	87	108	108	115	129	131	107	69			59
14		88	81	67	47		86	65	69	63	C	78	83	103	84	87	85	A	A	A	77	A	A	58
15		58	B	B	B	B		60	81	77	68	86	107	119	107	88	88	88	90	85	78	73	54	54
16	42	48	51	51		44		67	66	80	83	83	120	122	114	104	107	106	100	79	73	52		53
17		53	52	64	43		32	71	84	72	81	103	114	108	108	104	A		107	110	A	A	43	B
18	B		54	49	N	B		37	70	81	80	78	B	108	106	107	107	113	104	105	87	A	53	B
19	44		52	47	46	46	40	56	68	84	107	118	111	108	108	104	96	101	90	79	67	54	B	
20		B	B	B		B					N	N											B	B
21	53	B	53	63	B	B		66	81	76	76	87	103	79	107	106	106	94	84	77	54	50	B	
22	B	47	B	52		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
23		47			C	C	C	72	76	72	64	B		C	C		106	59	C	C	C	C	C	
24	30	C	C	C	C	C	C	C	C	C	C	C		69	88	108	109	48	49	49	C	C	B	C
25	C	C	C	C	C	C		73						105	79	107	110	117	122	110	69	88	N	49
26	N		59	67	B	B		37	74	74	88	86	85	102	102	88	87	98	105	88	88	84		67
27	53	52	52	B	36		40	73	83	87	88	83	90	107	106	108	108	110	107	82	67	75	88	53
28	83	80	67	78	64	41		67	84	83	88	84	89	149	108	110	N	110	88	76	79	A	67	67
29	72		73	72	52	31		67	67	90	90	90	A	92	107	117	108	113	87	78	78	54	B	43
30		52		52	B	B	B		64	65	84	87	84	103	89	97	106	108	113	88	55	52	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	13	13	17	22	14	10	17	28	27	26	22	24	24	25	26	28	27	26	26	26	24	16	12	15
MED	52	52	52	52	46	40	44	70	74	77	80	83	90	90	106	105	106	105	92	80	72	54	54	54
U Q	67	62	56	63	52	46	52	73	80	83	87	87	104	106	108	108	108	110	107	87	79	65	60	66
L Q	43	50	48	49	43	37	40	65	68	72	72	77	82	87	90	89	89	94	88	76	54	52	50	53

HOURLY VALUES OF fEs AT Okinawa

SEP. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	B	G	G	B	G	31	G	G	B	G	G	50	58	G	52	58	50	33	G	30	30	26
2	34	51	B	G	G	B	G	G	G	G	G	G	G	58	G	G	G	G	44	32	34	G	G	40
3	G	G	27	G	B	G	G	34	42	48	G	G	G	B	G	G	53	112	67	G	G	48	35	B
4	24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	49	38	34	G	26	B	G
5	G	G	G	G	G	B	G	30	G	G	G	G	G	G	G	G	48	50	57	45	79	49	26	31
6	33	G	G	G	G	G	G	33	G	G	G	B	G	G	G	52	79	84	86	46	50	25	G	G
7	G	G	G	G	G	B	G	G	33	G	G	G	48	G	G	G	48	46	46	40	45	29	G	24
8	G	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	28	G	G	G	G	G	G
9	G	G	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	28	G	30	G	G	G	26
10	G	G	G	24	B	B	24	G	G	G	G	G	G	G	G	G	G	G	30	29	G	34	G	B
11	G	G	G	G	G	G	G	G	G	G	G	57	G	G	G	G	36	41	G	G	G	G	B	B
12	B	G	G	G	G	G	G	37	G	G	G	G	G	G	G	79	65	55	62	53	30	39	45	G
13	G	G	G	G	B	G	G	G	G	G	G	68	G	47	G	G	64	37	36	36	50	G	G	G
14	G	G	G	G	G	G	G	G	G	G	C	G	G	G	G	64	68	79	88	78	34	40	36	35
15	G	G	B	B	B	B	B	G	28	G	G	G	G	G	G	G	G	G	G	G	28	34	G	G
16	G	26	G	G	G	G	G	48	G	G	G	G	G	G	G	G	G	39	44	50	G	G	G	G
17	G	G	G	G	G	G	G	26	G	36	G	G	G	G	G	64	104	85	84	50	82	G	G	B
18	B	G	G	G	G	B	G	41	39	34	G	B	G	G	G	G	G	38	49	39	54	G	B	B
19	G	G	G	G	G	G	G	G	35	G	G	G	G	G	G	G	G	G	36	44	38	34	B	G
20	G	B	B	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	B	B
21	G	B	G	G	B	B	B	26	G	G	G	G	G	G	G	G	G	42	48	31	G	40	B	G
22	B	G	B	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
23	G	G	G	G	C	C	C	34	35	G	G	B	G	C	C	G	G	C	C	C	C	C	C	G
24	G	C	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	47	C	C	B	C
25	C	C	C	C	C	C	C	G	C	C	C	C	48	G	35	G	G	42	39	50	27	G	G	G
26	G	G	G	G	B	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
27	G	G	G	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	27	G	G	G	G	G	G	G	48	46	36	45	45	39	G	G
29	G	G	G	G	G	G	B	G	G	G	G	G	G	G	G	46	G	40	33	G	G	G	B	G
30	G	G	G	G	B	B	B	G	G	G	G	G	G	68	G	G	G	G	G	G	28	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	26	25	23	25	20	17	21	28	27	27	25	24	28	27	28	29	29	28	28	28	27	26	19	21
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40	37	32	27	G	G	G
U Q	G	G	G	G	G	G	G	30	27	G	G	G	G	G	G	G	50	49	49	45	45	34	26	25
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

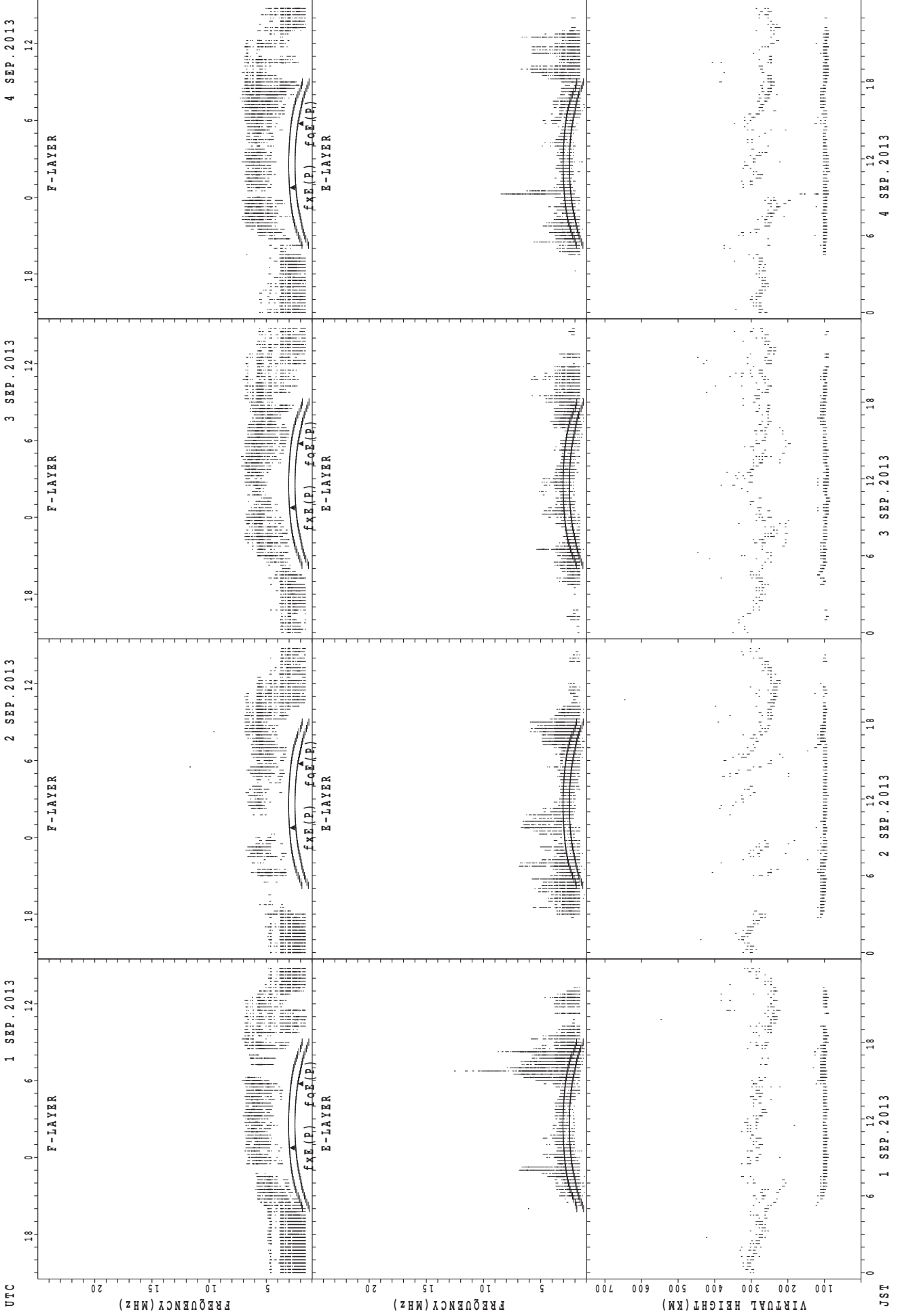
SEP. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	23	22	B	26	66	B	66	15	40	46	B	63	59	81	42	59	38	18	17	15	17	17	15	15
2	16	18	B	22	40	16	B	37	39	42	52	59	64	42	59	54	48	33	15	15	20	18	21	15
3	66	20	17	21	B	15	21	16	23	30	46	53	91	B	50	48	39	21	16	28	44	15	16	B
4	15	22	20	40	27	20	20	27	34	45	53	56	62	59	55	53	46	27	17	15	16	17	B	81
5	22	101	35	36	27	B	21	14	20	53	101	54	63	53	72	47	43	20	21	16	16	17	15	15
6	18	91	81	24	22	18	17	17	16	18	56	B	64	67	54	42	38	18	17	17	17	17	15	41
7	17	33	42	40	20	B	18	28	18	45	54	53	42	70	52	56	33	26	16	15	17	16	26	17
8	22	B	17	18	22	20	20	35	42	39	52	55	60	59	70	51	47	17	23	42	21	26	41	22
9	71	81	44	16	66	B	20	23	30	40	54	60	55	55	59	58	45	20	26	18	18	44	43	17
10	51	20	81	15	B	B	15	28	36	43	55	63	59	71	72	59	42	40	16	15	23	18	36	B
11	40	18	43	17	24	21	16	26	41	45	58	42	56	58	64	58	28	18	39	18	17	17	B	B
12	B	30	71	18	20	71	17	23	34	62	54	49	52	56	42	39	35	18	17	17	18	28	15	91
13	81	45	20	21	B	66	16	29	39	43	45	42	53	60	55	53	30	18	15	15	18	101	81	21
14	51	38	64	18	36	44	21	30	41	42	C	54	62	56	50	39	30	17	15	18	17	18	15	16
15	66	22	B	B	B	B	B	26	40	40	54	62	53	62	55	44	44	38	23	42	17	20	46	46
16	39	18	20	21	81	16	81	30	33	42	50	59	53	62	52	58	43	18	17	17	20	44	66	41
17	81	22	42	21	21	20	20	26	40	42	52	50	60	63	45	39	38	27	16	16	18	66	15	B
18	B	66	21	44	18	B	20	17	18	52	48	B	52	59	63	47	42	40	17	15	17	28	B	B
19	29	81	21	21	28	21	16	28	29	48	53	56	56	47	53	53	43	40	16	18	18	40	B	81
20	66	B	B	B	81	20	17	29	40	42	48	60	58	53	54	52	44	40	35	16	20	21	B	B
21	20	B	29	22	B	B	B	28	40	46	48	56	62	54	N	50	43	18	20	17	17	17	B	66
22	B	43	B	41	22	18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
23	66	20	38	22	C	C	C	26	38	44	49	B	60	C	C	48	44	C	C	C	C	C	C	66
24	21	C	C	C	C	C	C	C	C	C	C	C	C	68	54	46	42	39	34	16	C	C	B	C
25	C	C	C	C	C	C	C	36	C	C	C	C	42	63	29	63	43	27	18	18	28	20	32	24
26	24	45	20	40	B	B	21	30	38	43	48	54	62	60	47	54	44	29	21	22	27	21	18	44
27	16	21	41	B	20	66	18	30	38	44	56	53	56	54	54	53	42	40	39	20	29	18	34	20
28	32	44	21	20	20	21	23	30	40	44	49	61	58	80	52	44	30	29	16	18	20	17	44	42
29	24	21	44	22	20	17	B	30	39	52	50	56	43	69	59	27	24	14	17	20	40	17	B	20
30	66	32	42	18	B	B	B	28	37	44	48	48	53	49	68	50	40	35	26	26	18	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	26	25	23	25	20	17	21	28	27	27	25	24	28	27	27	29	29	28	28	28	27	26	19	21
MED	30	30	38	21	23	20	20	28	38	44	52	56	58	59	54	51	42	26	17	17	18	18	26	24
U Q	66	45	44	31	38	32	21	30	40	46	54	59	62	67	59	55	44	36	23	19	21	28	43	56
L Q	21	20	20	18	20	17	17	24	30	42	48	53	53	54	50	45	36	18	16	15	17	17	15	17

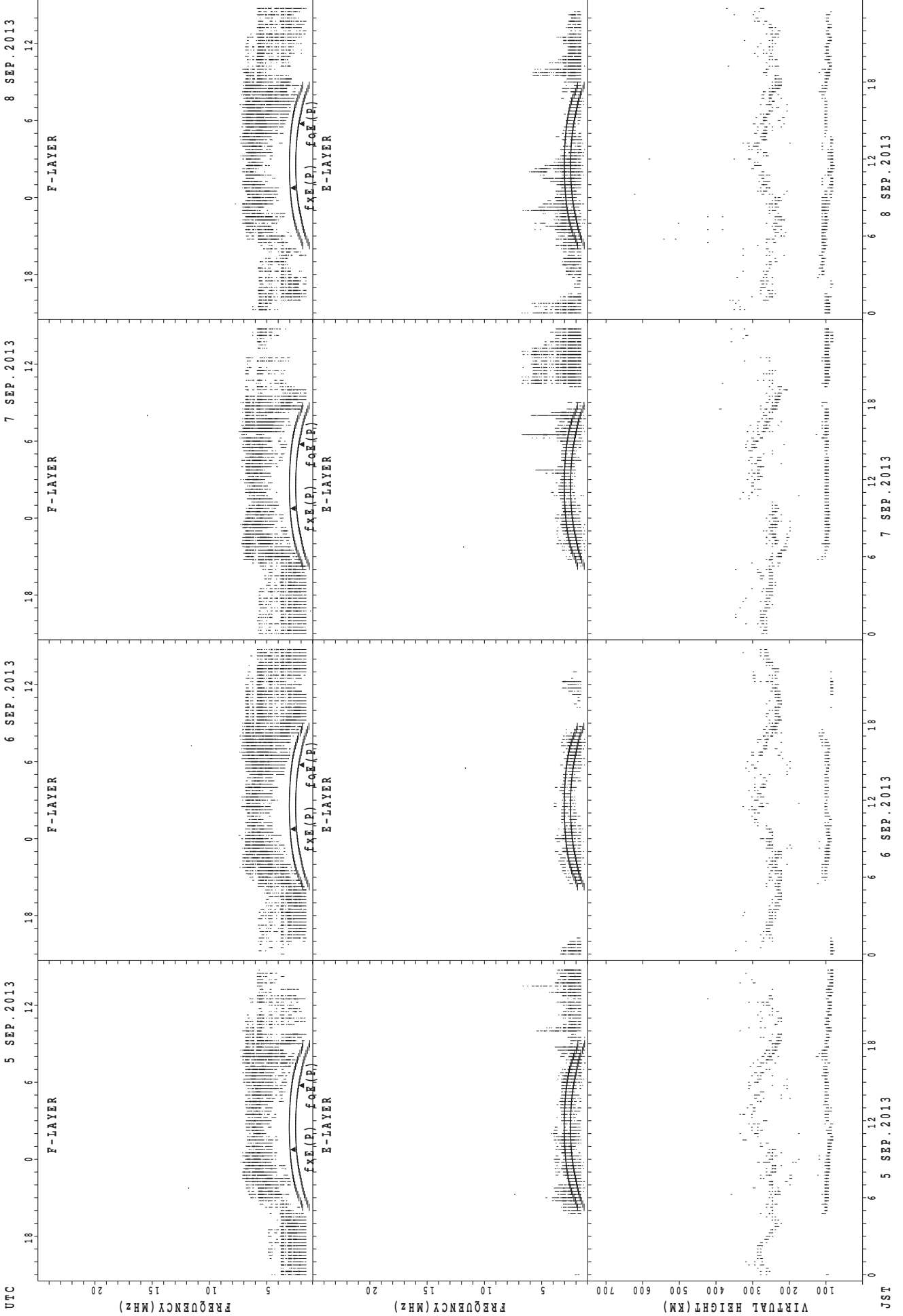


SUMMARY PLOTS AT Wakkanai



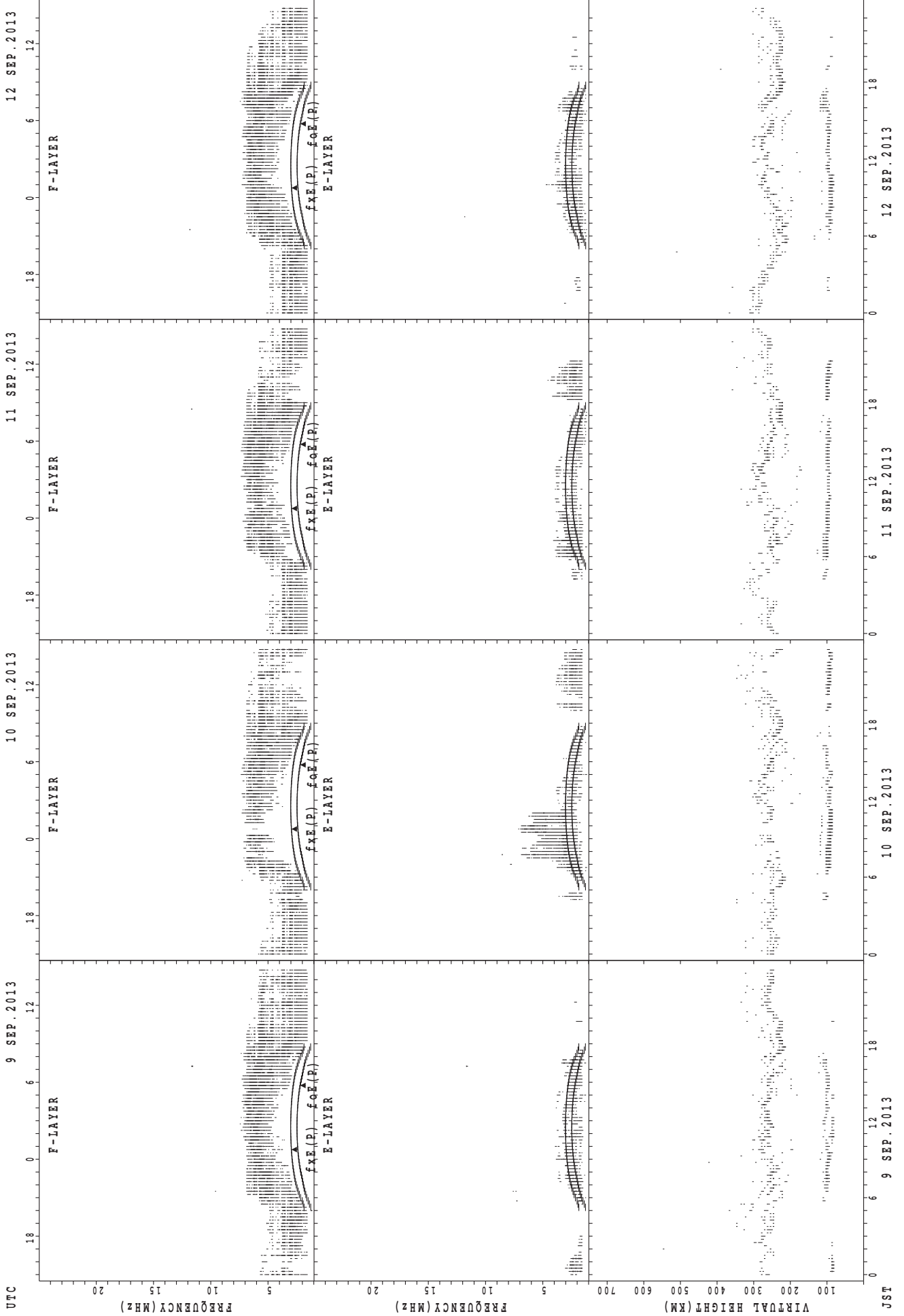
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



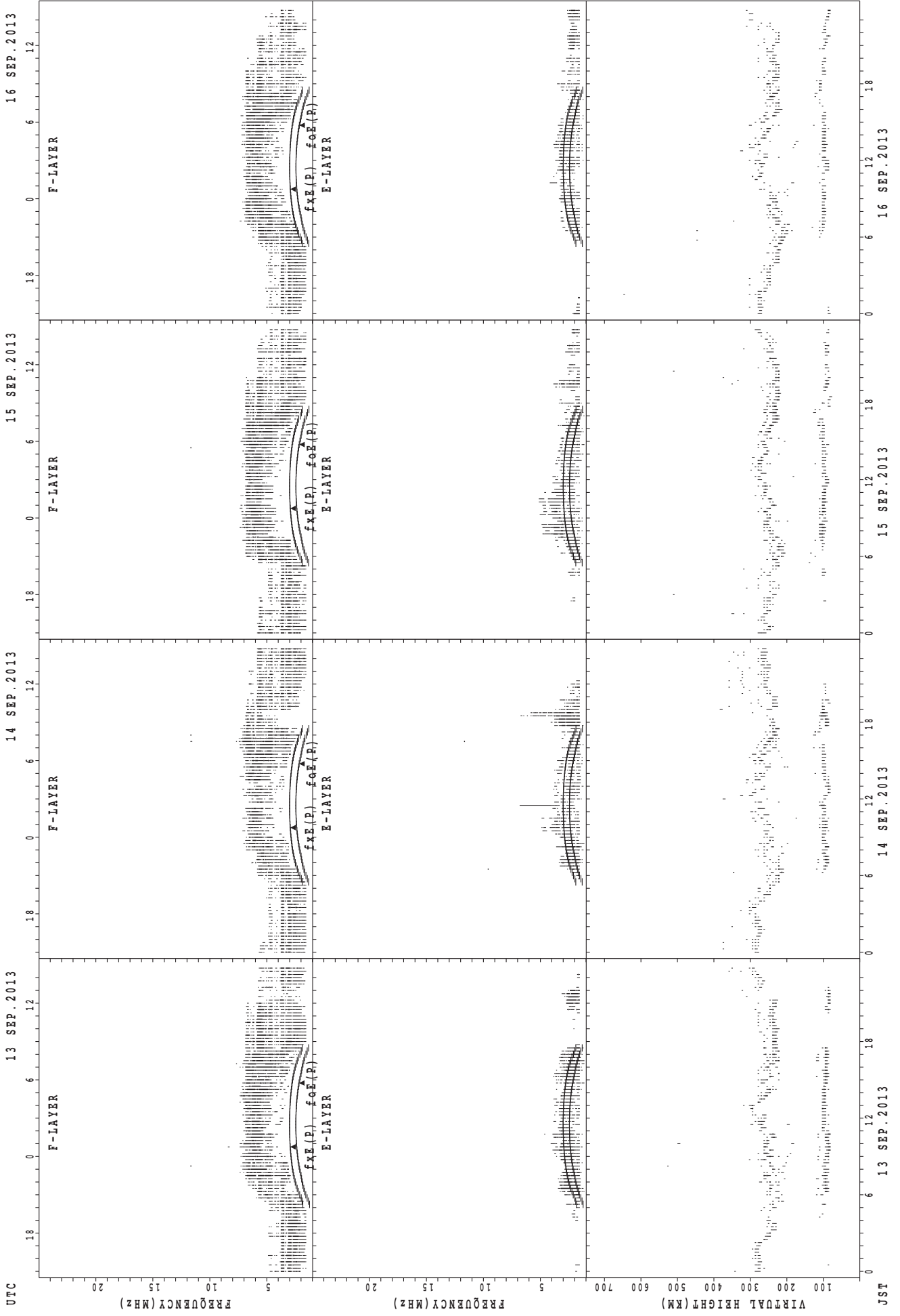
fxE(P) ; PREDICTED VALUE FOR fxE  
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



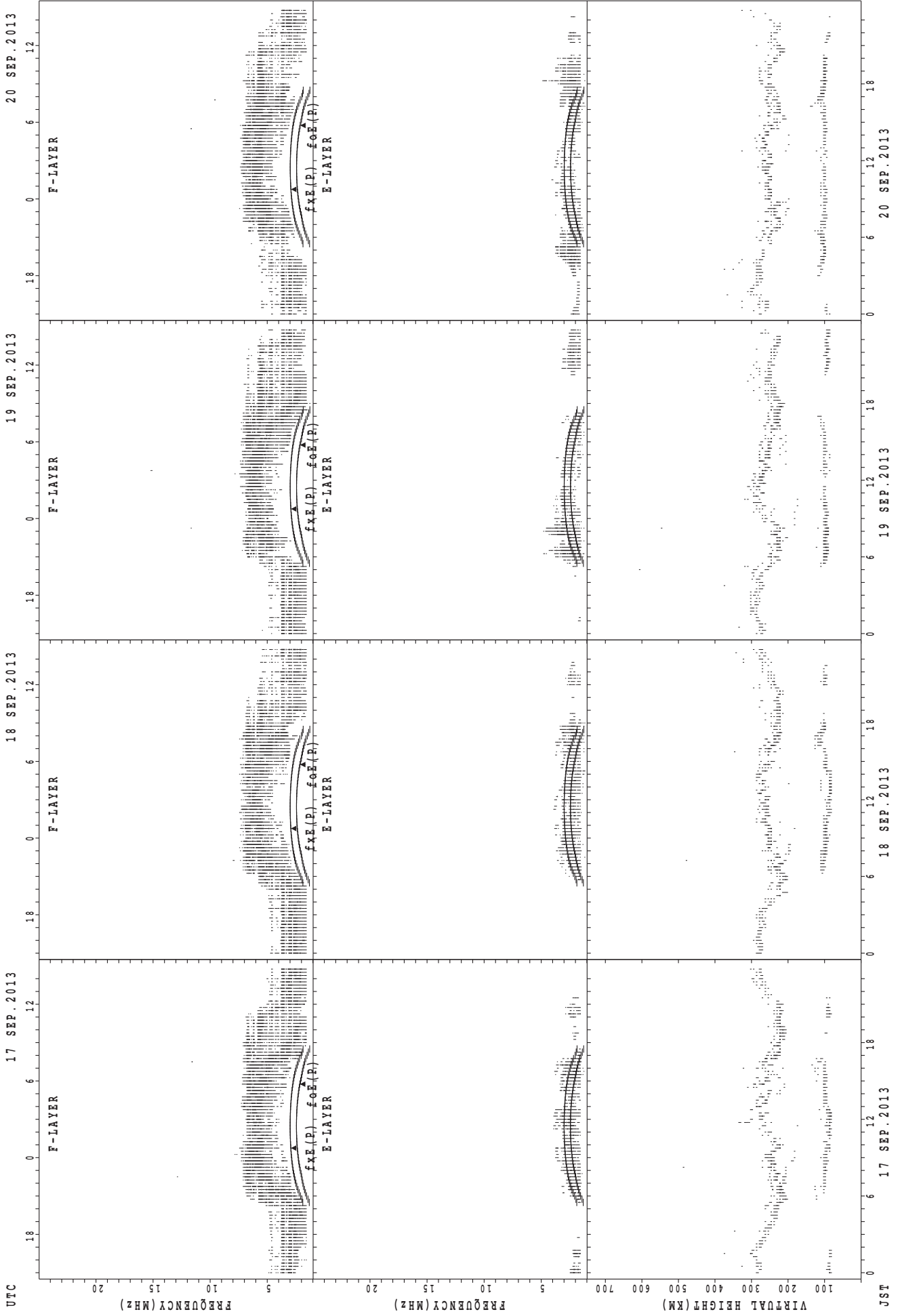
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



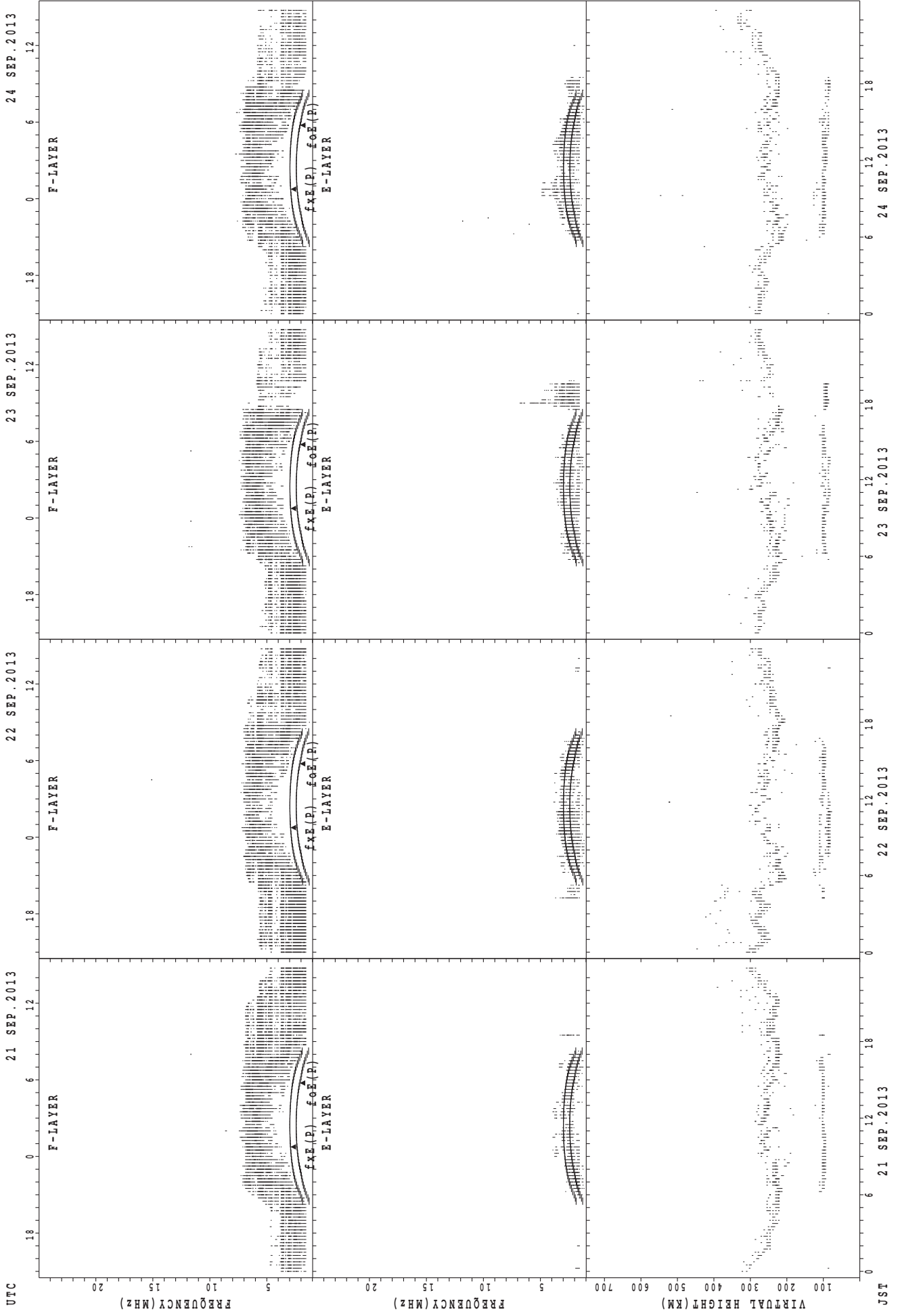
foF2(P); PREDICTED VALUE FOR foF2  
foF2(P); PREDICTED VALUE FOR foF2

SUMMARY PLOTS AT Wakkanai



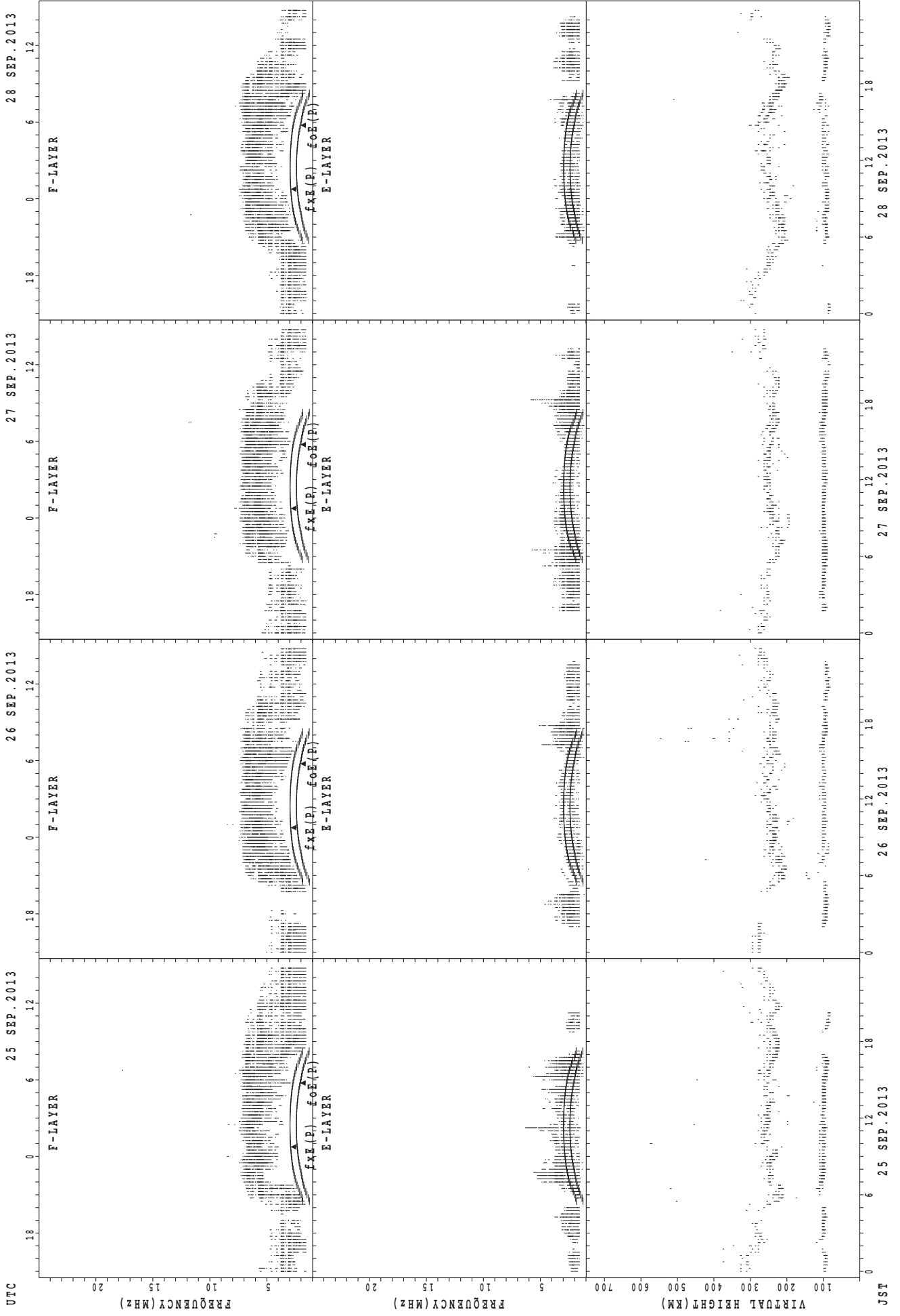
UTC  
17 SEP. 2013  
18 SEP. 2013  
19 SEP. 2013  
20 SEP. 2013  
JST  
17 SEP. 2013  
18 SEP. 2013  
19 SEP. 2013  
20 SEP. 2013  
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



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

SUMMARY PLOTS AT Wakkanai



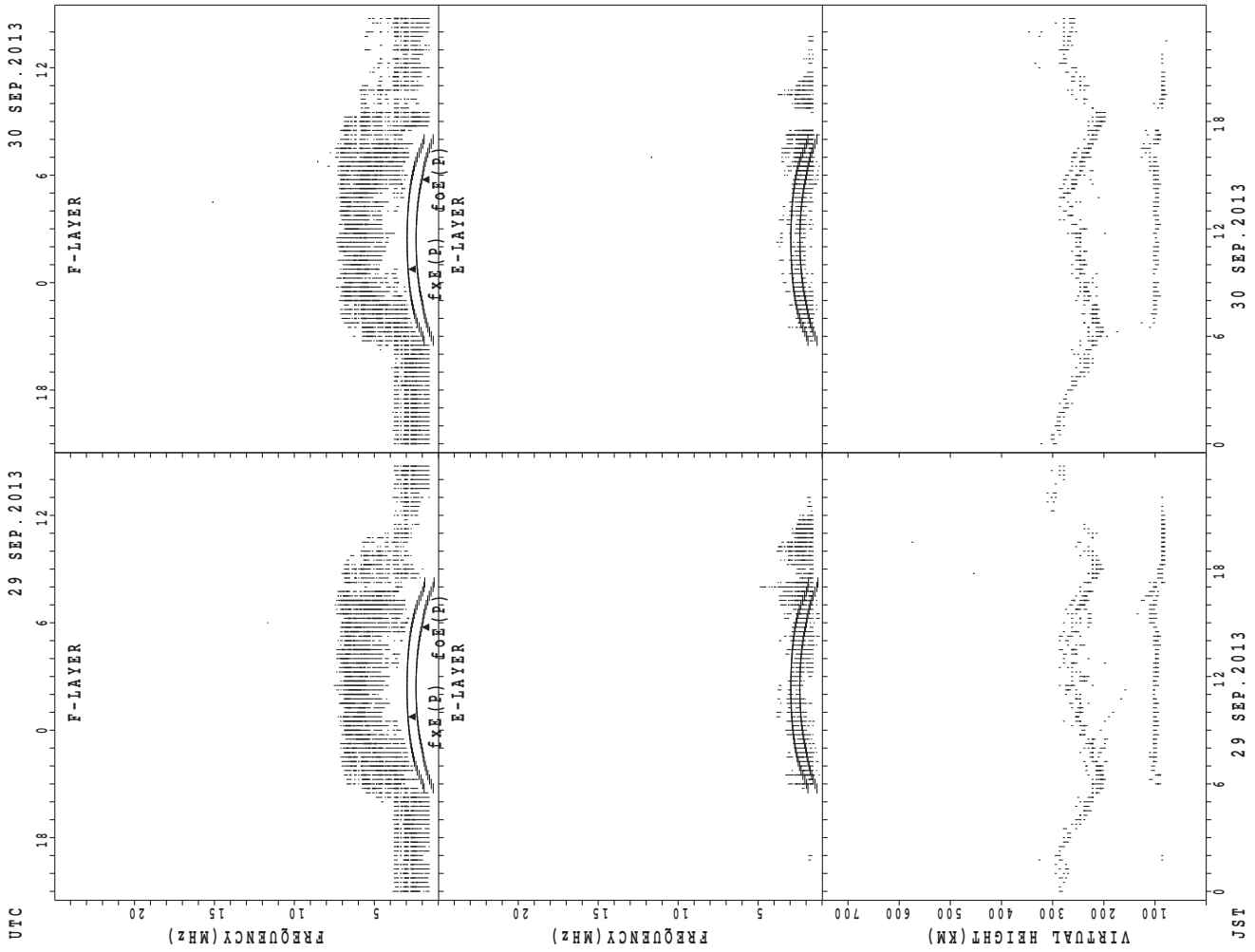
UTC  
 25 SEP. 2013  
 26 SEP. 2013  
 27 SEP. 2013  
 28 SEP. 2013

Virtual Height (KM)  
 Frequency (MHz)  
 Frequency (MHz)  
 Frequency (MHz)

$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

JST  
 00  
 06  
 12  
 18  
 00  
 06  
 12  
 18  
 00  
 06  
 12  
 18  
 00  
 06  
 12  
 18  
 00  
 06  
 12  
 18

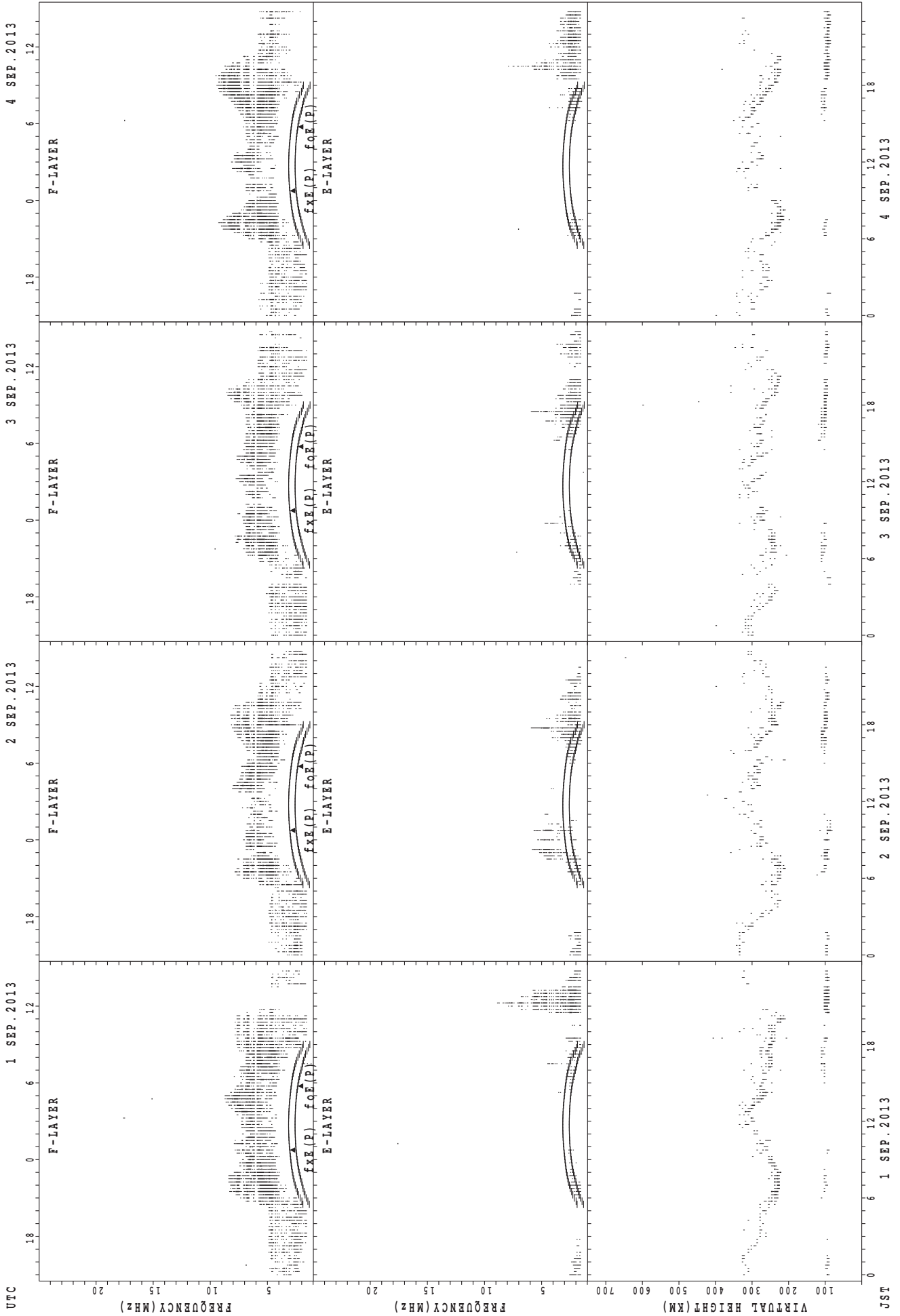
SUMMARY PLOTS AT Wakkanai



JST 29 SEP. 2013 30 SEP. 2013  
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

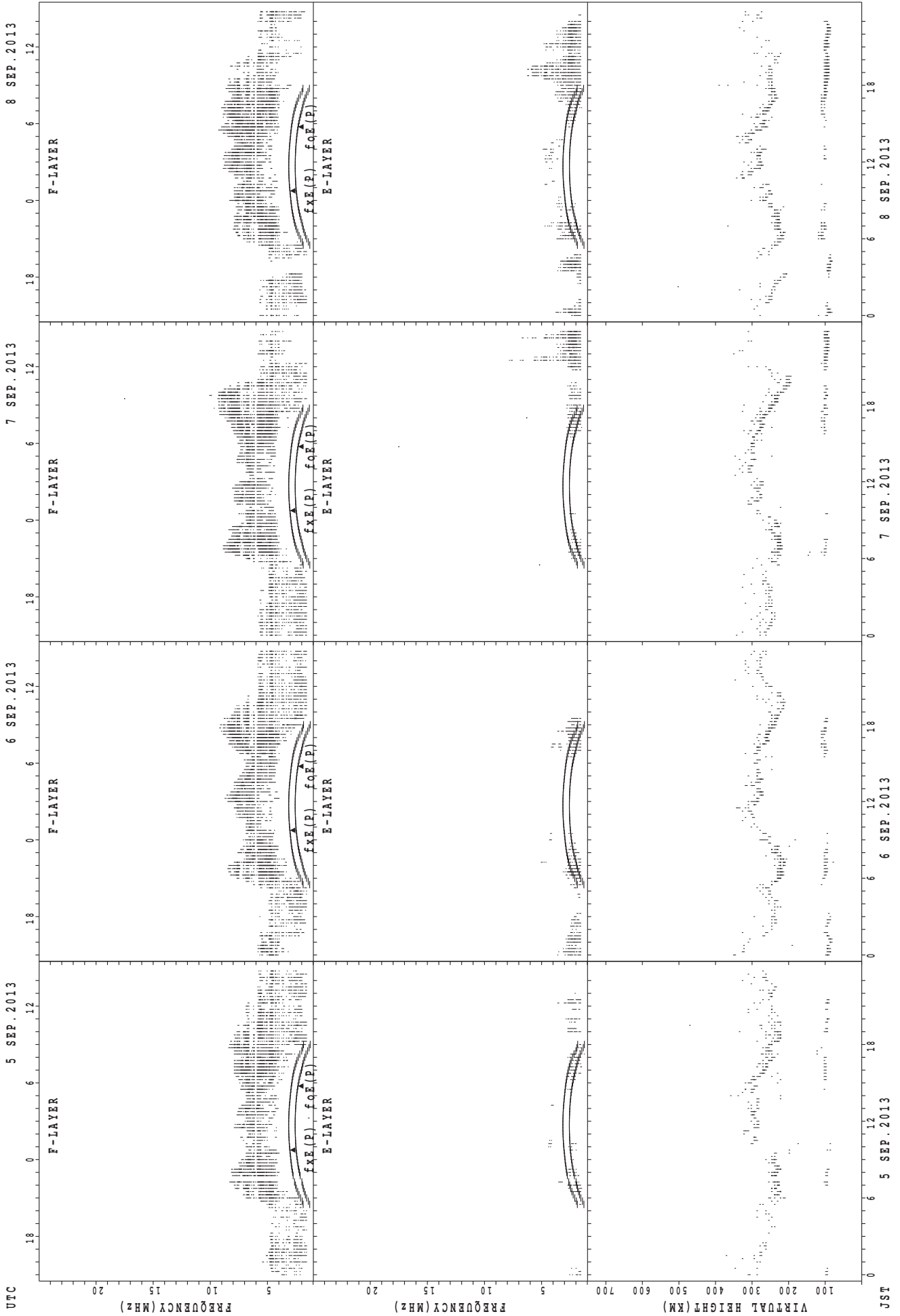


SUMMARY PLOTS AT Kokubunji



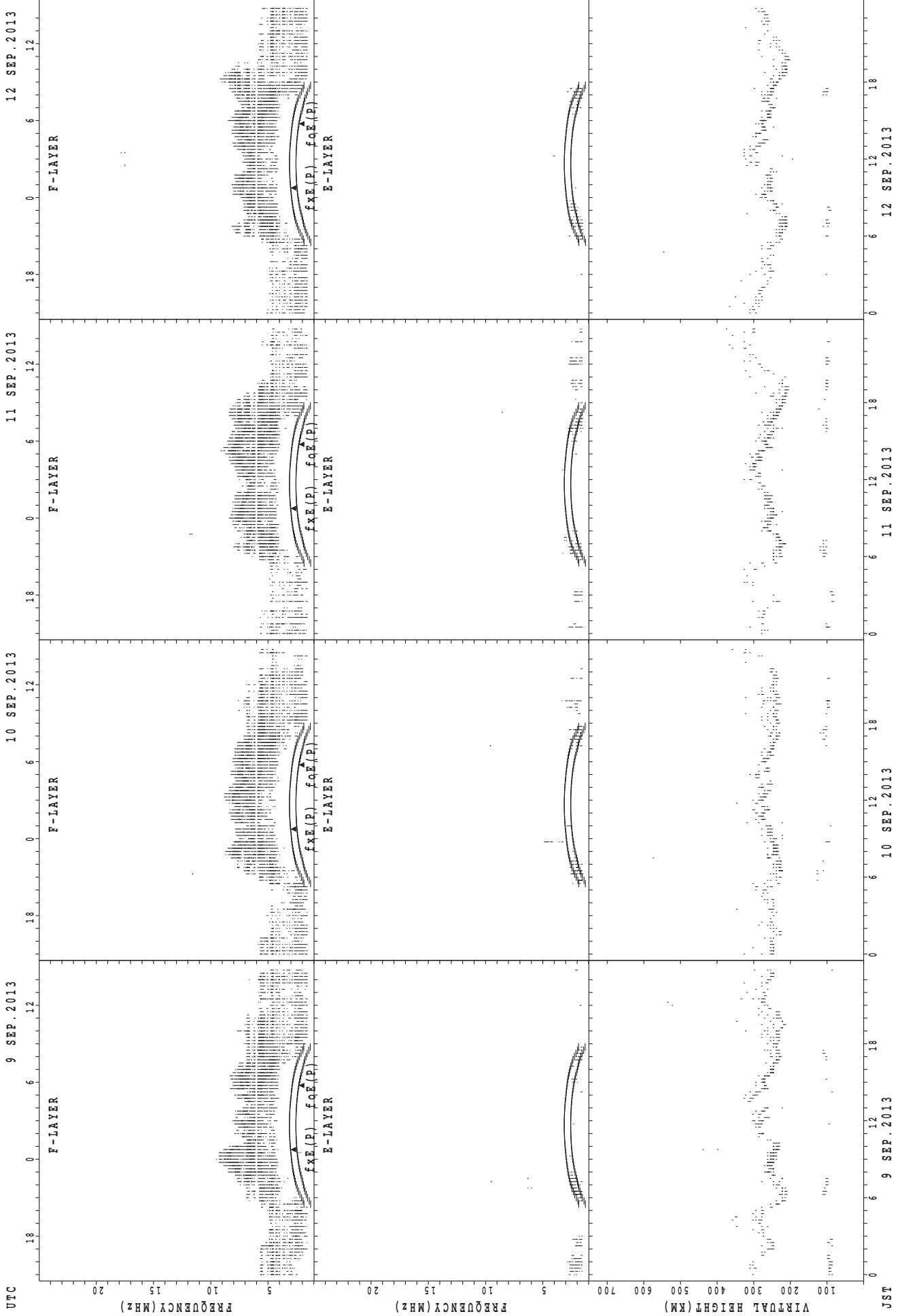
JST  
 1 SEP. 2013  
 2 SEP. 2013  
 3 SEP. 2013  
 4 SEP. 2013  
 $f_{XE}(P)$ ; PREDICTED VALUE FOR  $f_{XE}$   
 $f_{oE}(P)$ ; PREDICTED VALUE FOR  $f_{oE}$

SUMMARY PLOTS AT Kokubunji



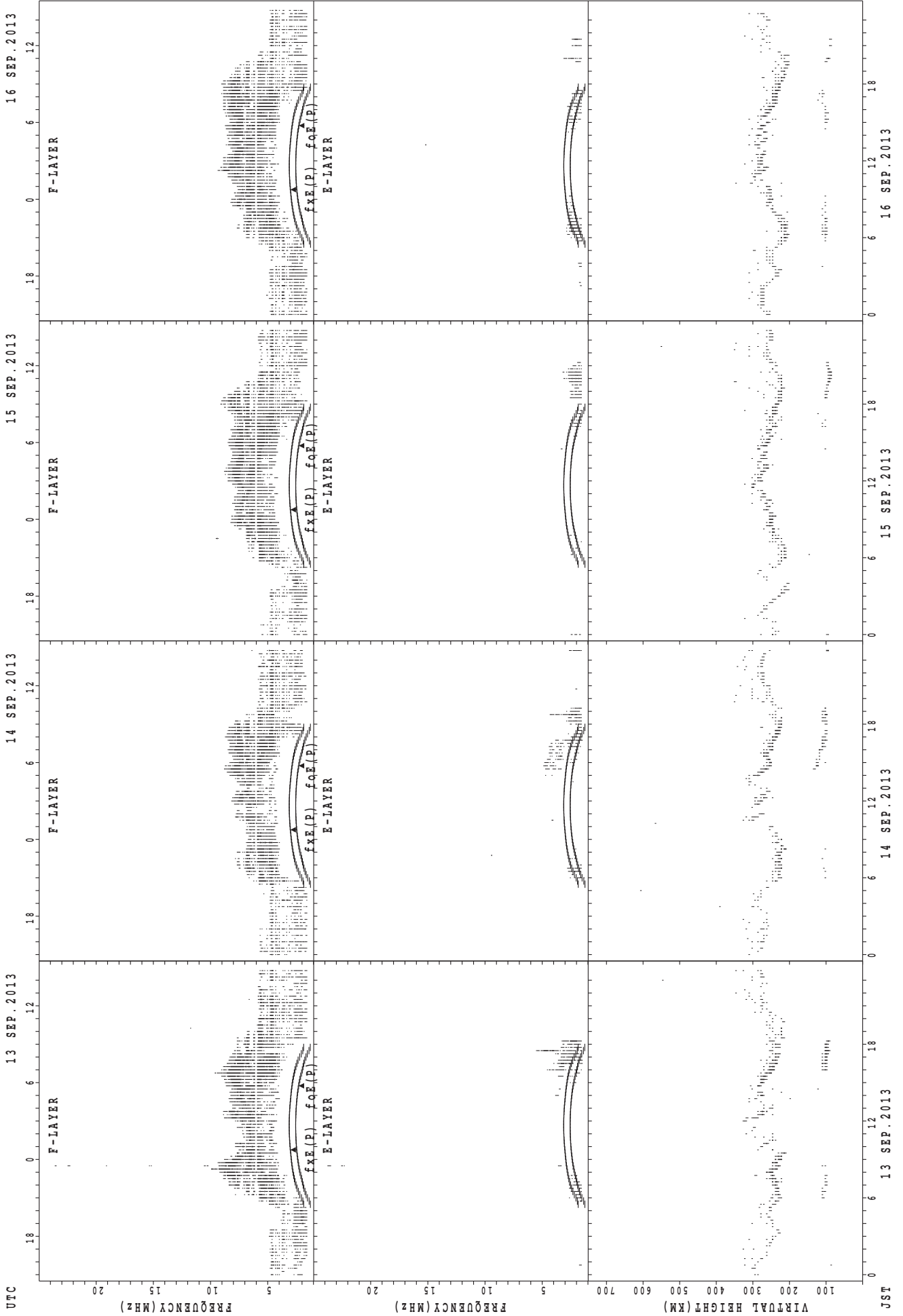
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



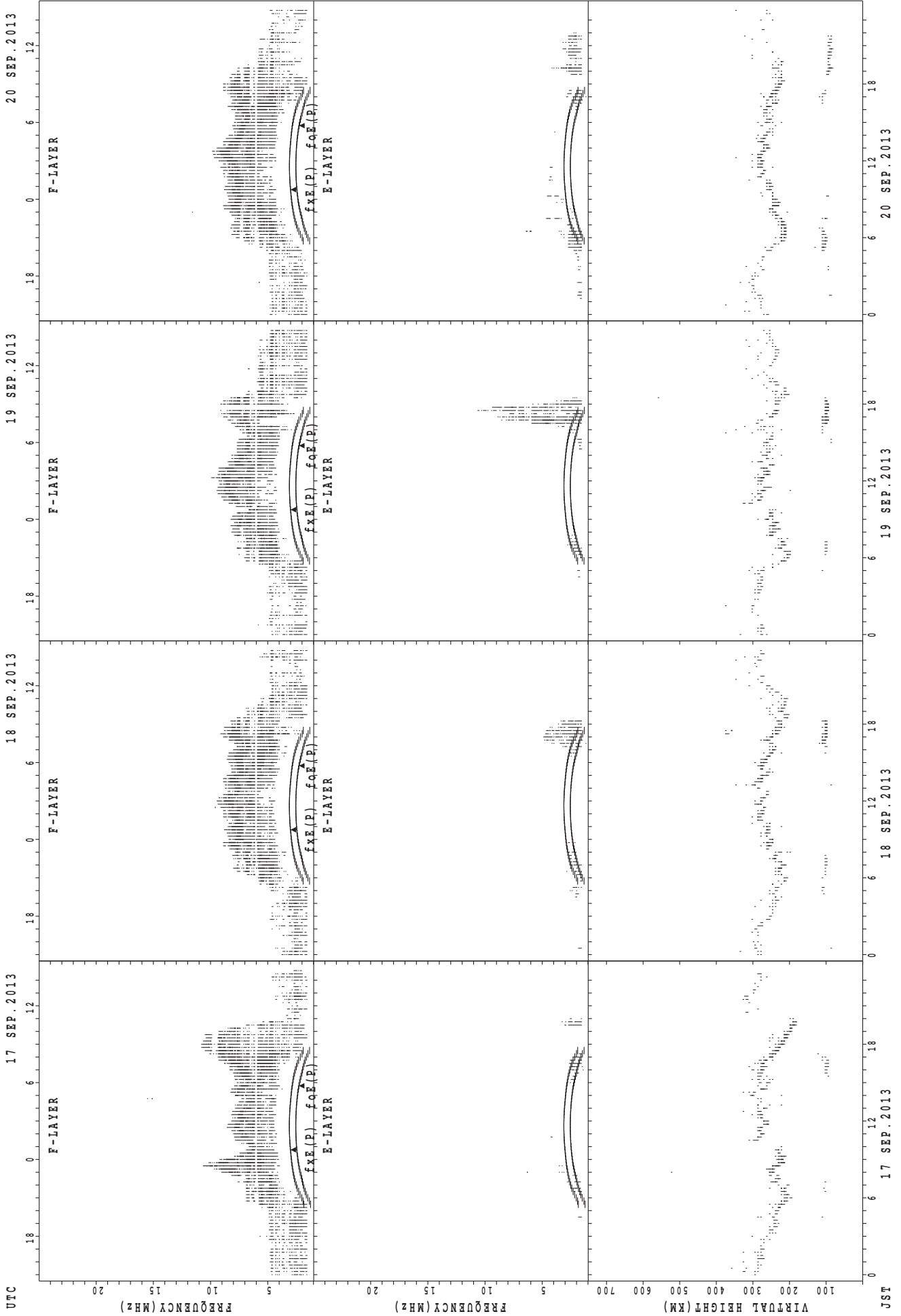
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



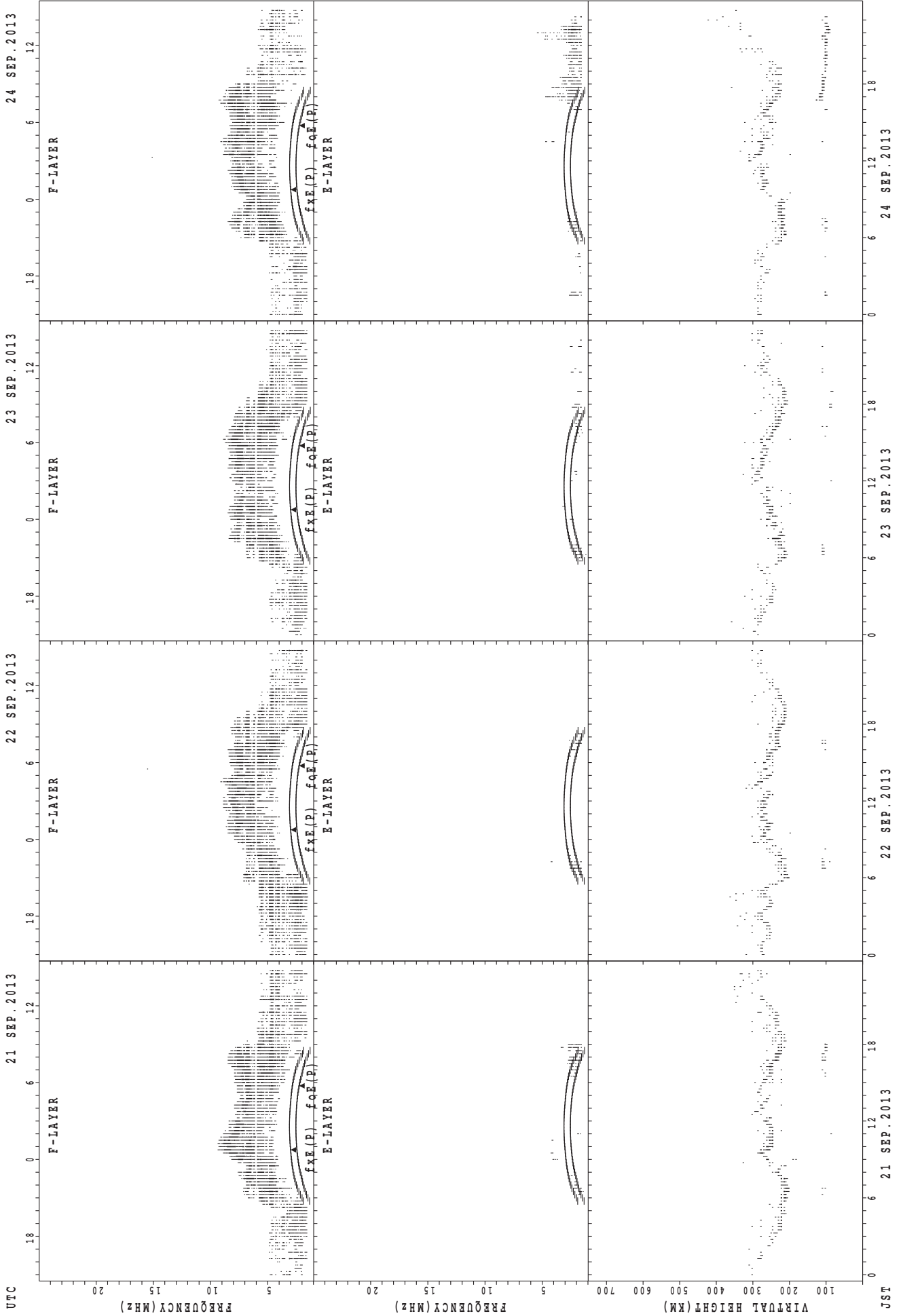
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji



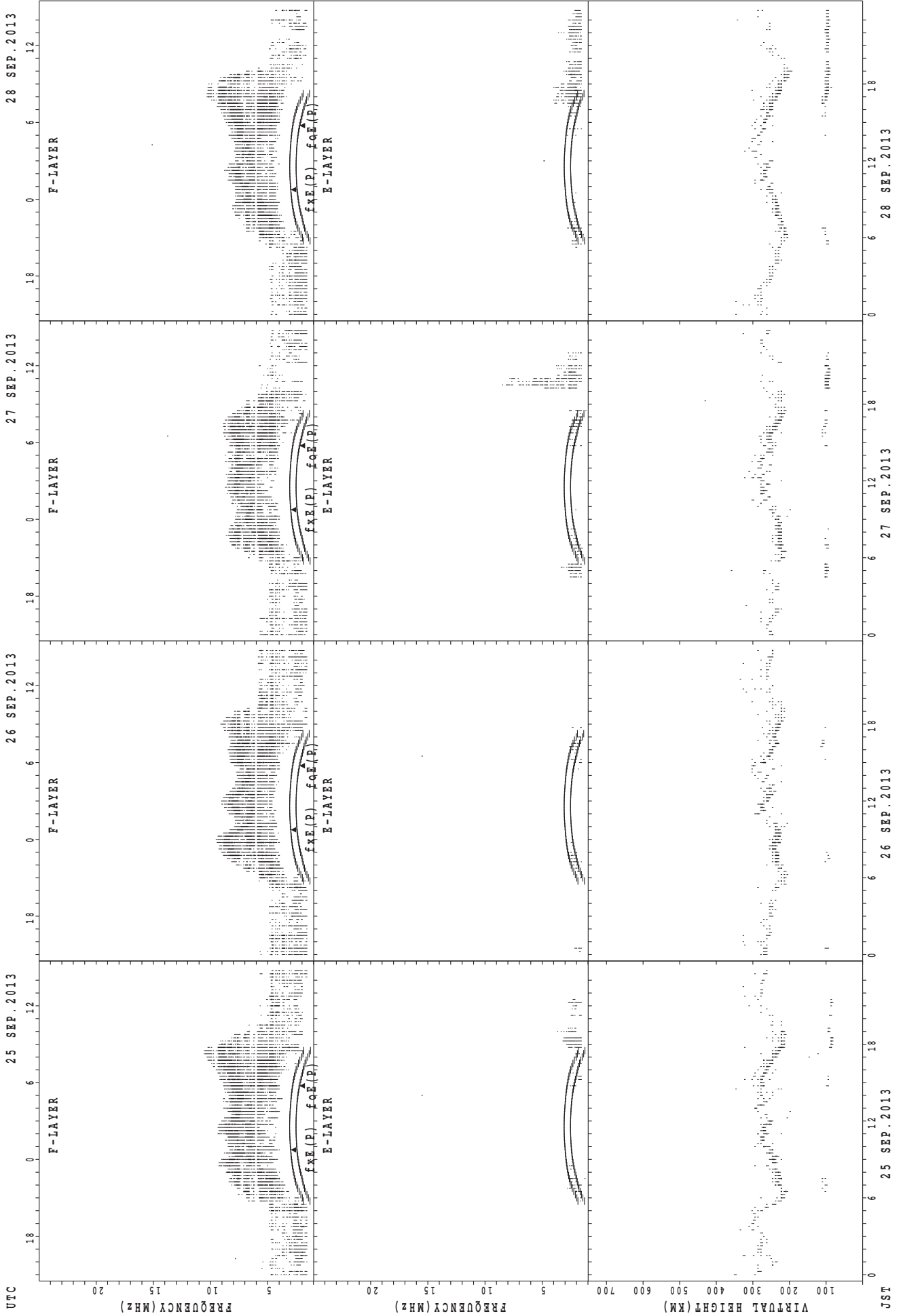
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Kokubunji



$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji

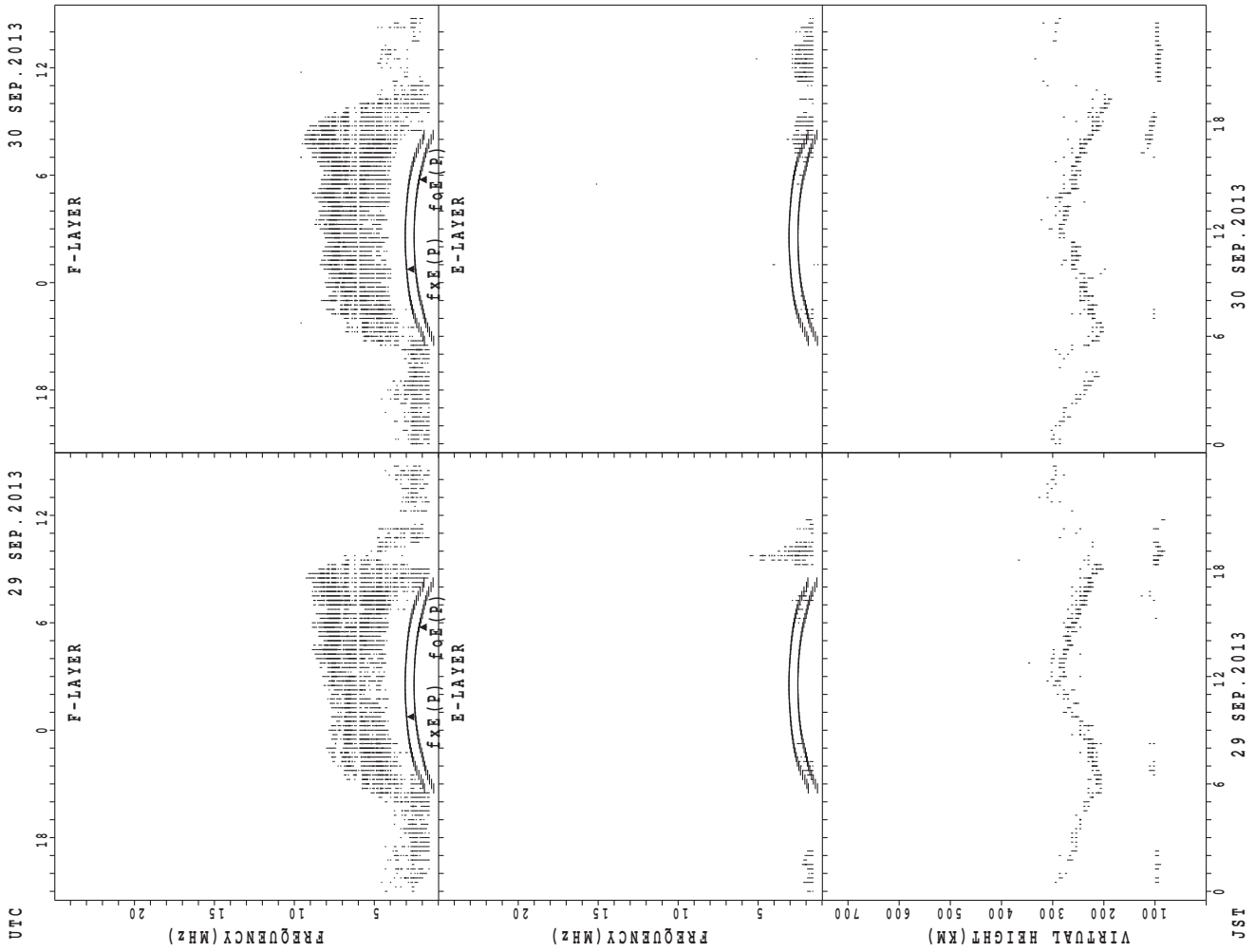


UTC  
 25 SEP. 2013  
 26 SEP. 2013  
 27 SEP. 2013  
 28 SEP. 2013

JST  
 25 SEP. 2013  
 26 SEP. 2013  
 27 SEP. 2013  
 28 SEP. 2013

$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

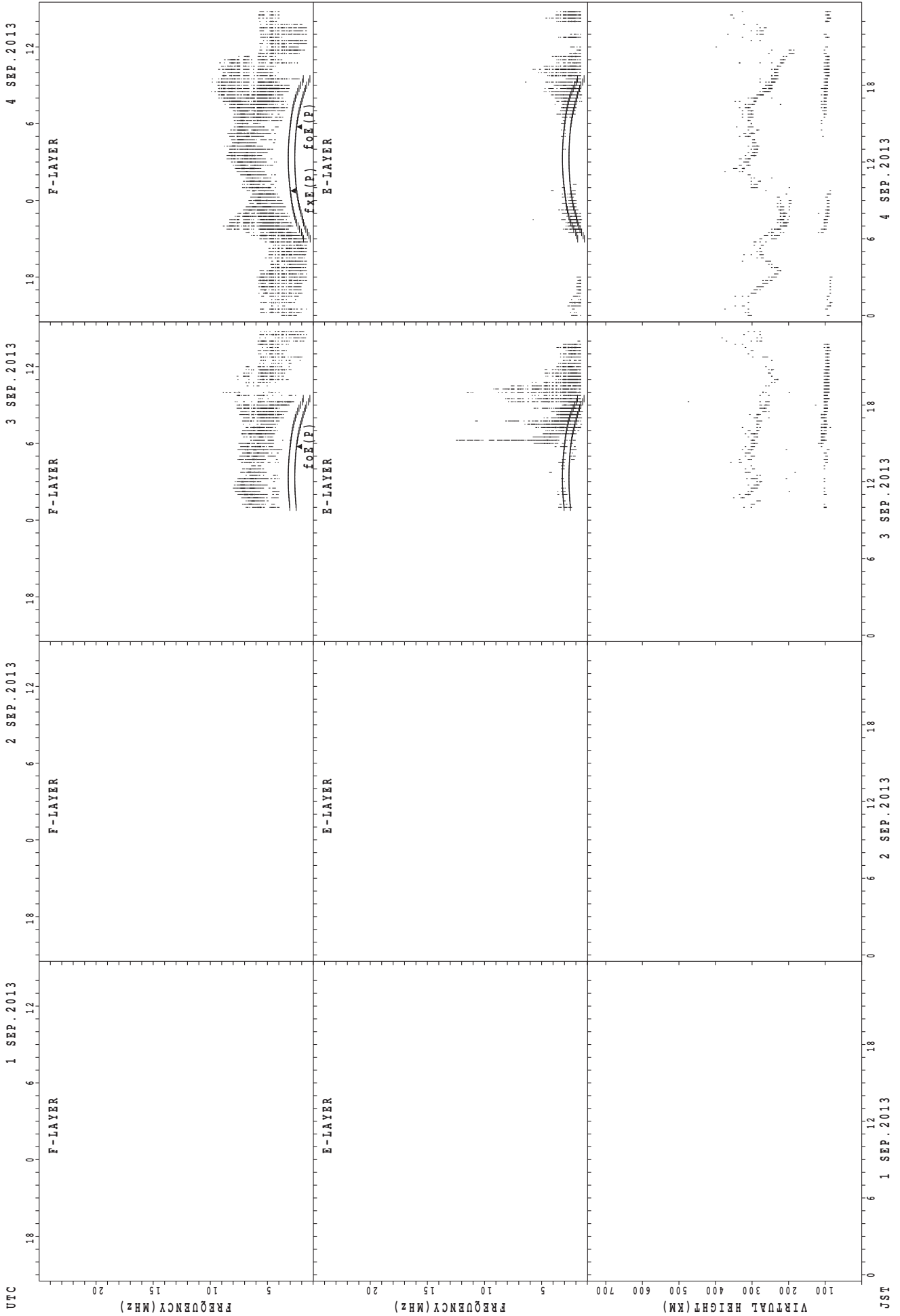
### SUMMARY PLOTS AT Kokubunji



foF2(P); PREDICTED VALUE FOR foF2  
foE(P); PREDICTED VALUE FOR foE

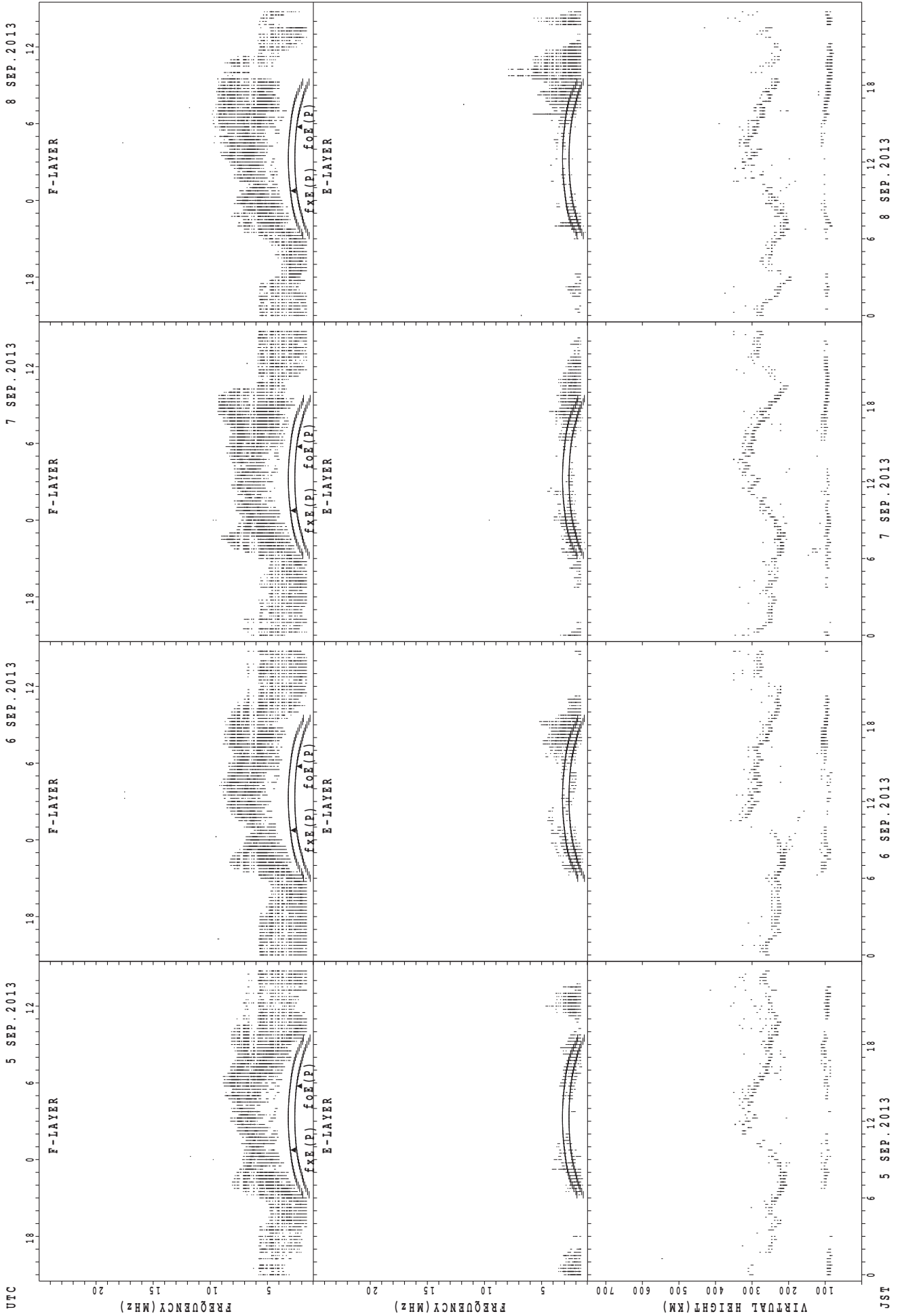


SUMMARY PLOTS AT Yamagawa



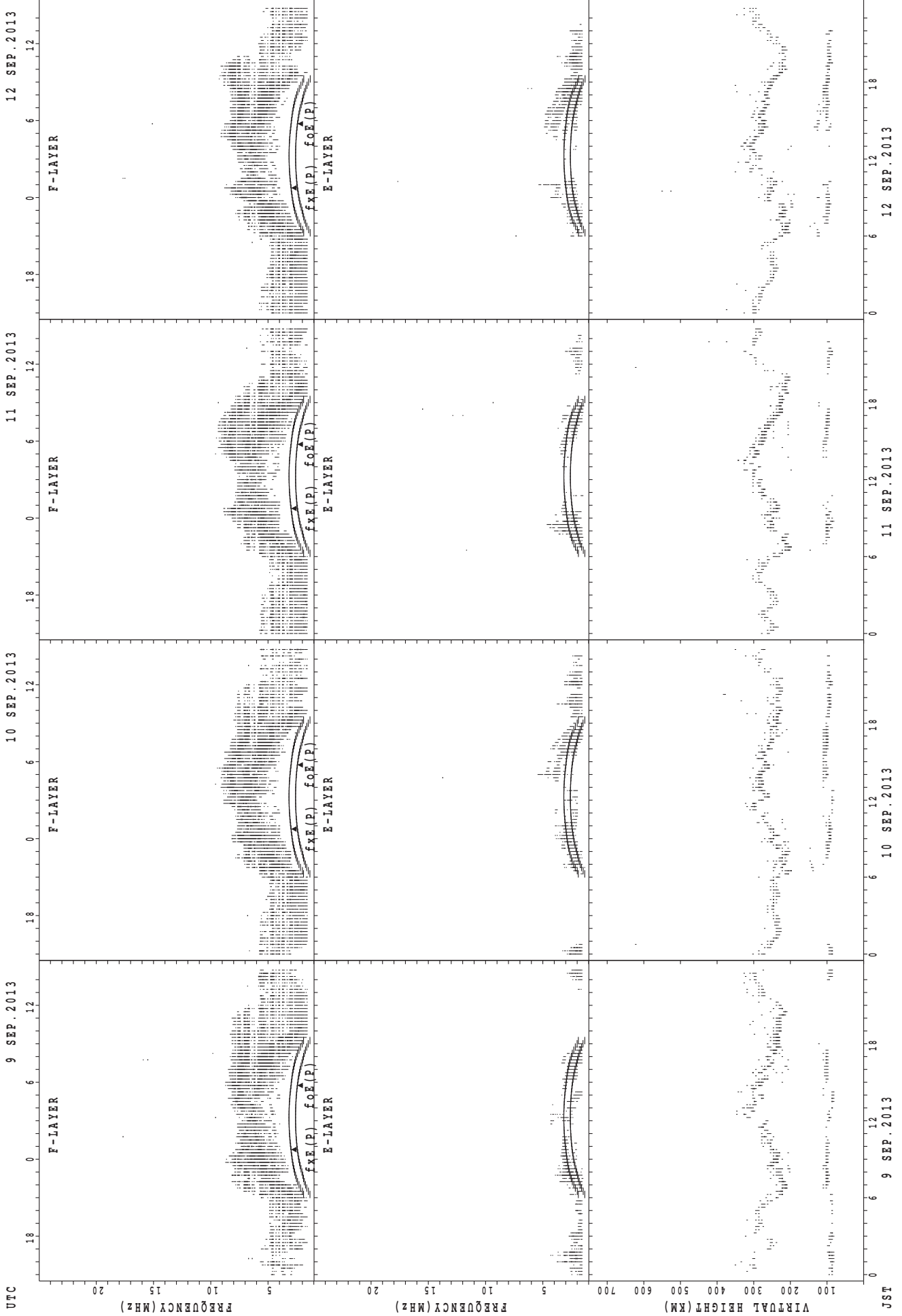
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



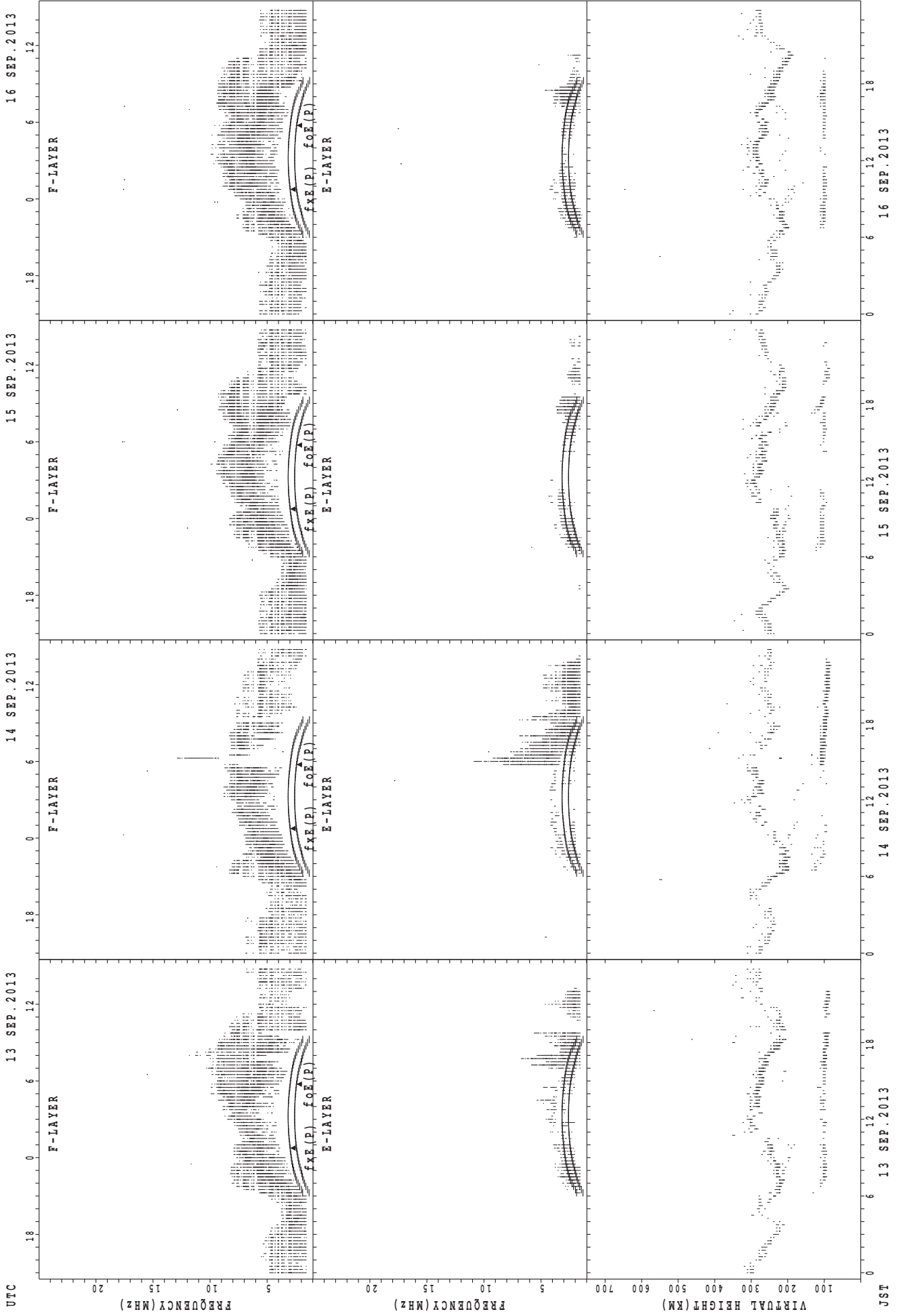
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Yamagawa



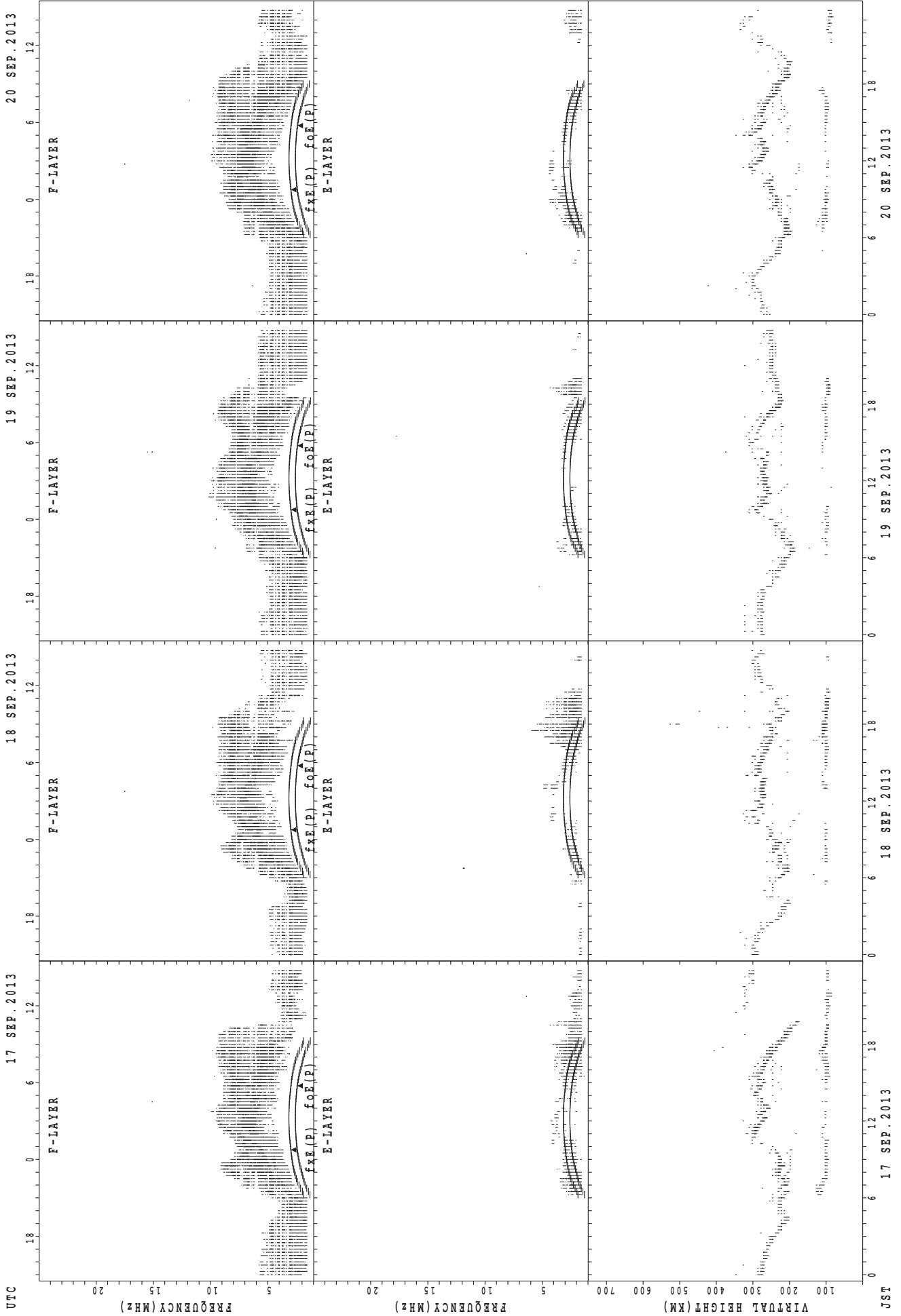
f<sub>xe</sub>(P) ; PREDICTED VALUE FOR f<sub>xe</sub>  
f<sub>oE</sub>(P) ; PREDICTED VALUE FOR f<sub>oE</sub>

SUMMARY PLOTS AT Yamagawa



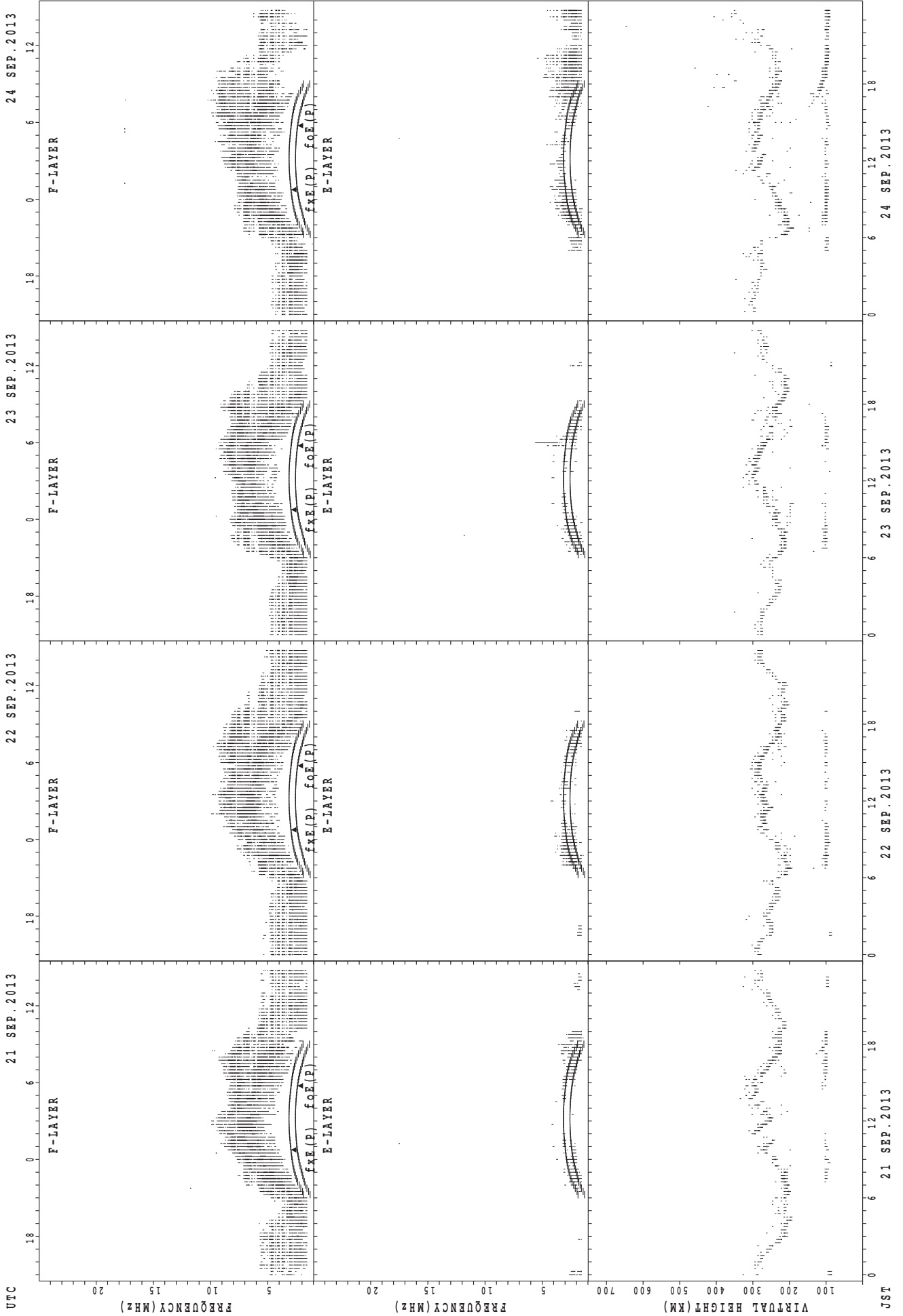
foF2(P); PREDICTED VALUE FOR foF2  
foF2(P); PREDICTED VALUE FOR foF2

SUMMARY PLOTS AT Yamagawa



$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Yamagawa



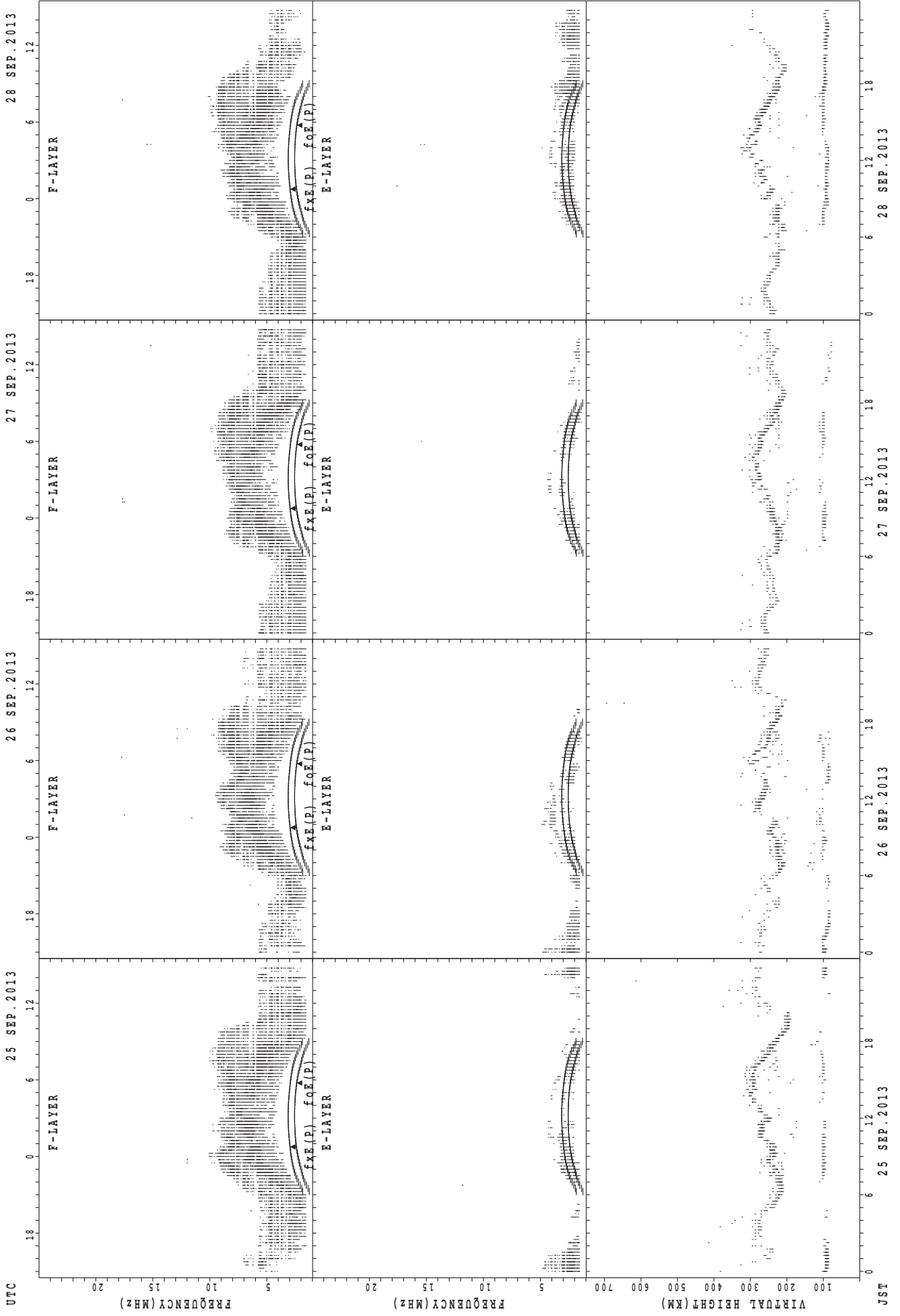
UTC  
 21 SEP. 2013  
 22 SEP. 2013  
 23 SEP. 2013  
 24 SEP. 2013

Virtual Height (KM)  
 Frequency (MHz)  
 F-LAYER  
 F-LAYER

JST  
 21 SEP. 2013  
 22 SEP. 2013  
 23 SEP. 2013  
 24 SEP. 2013

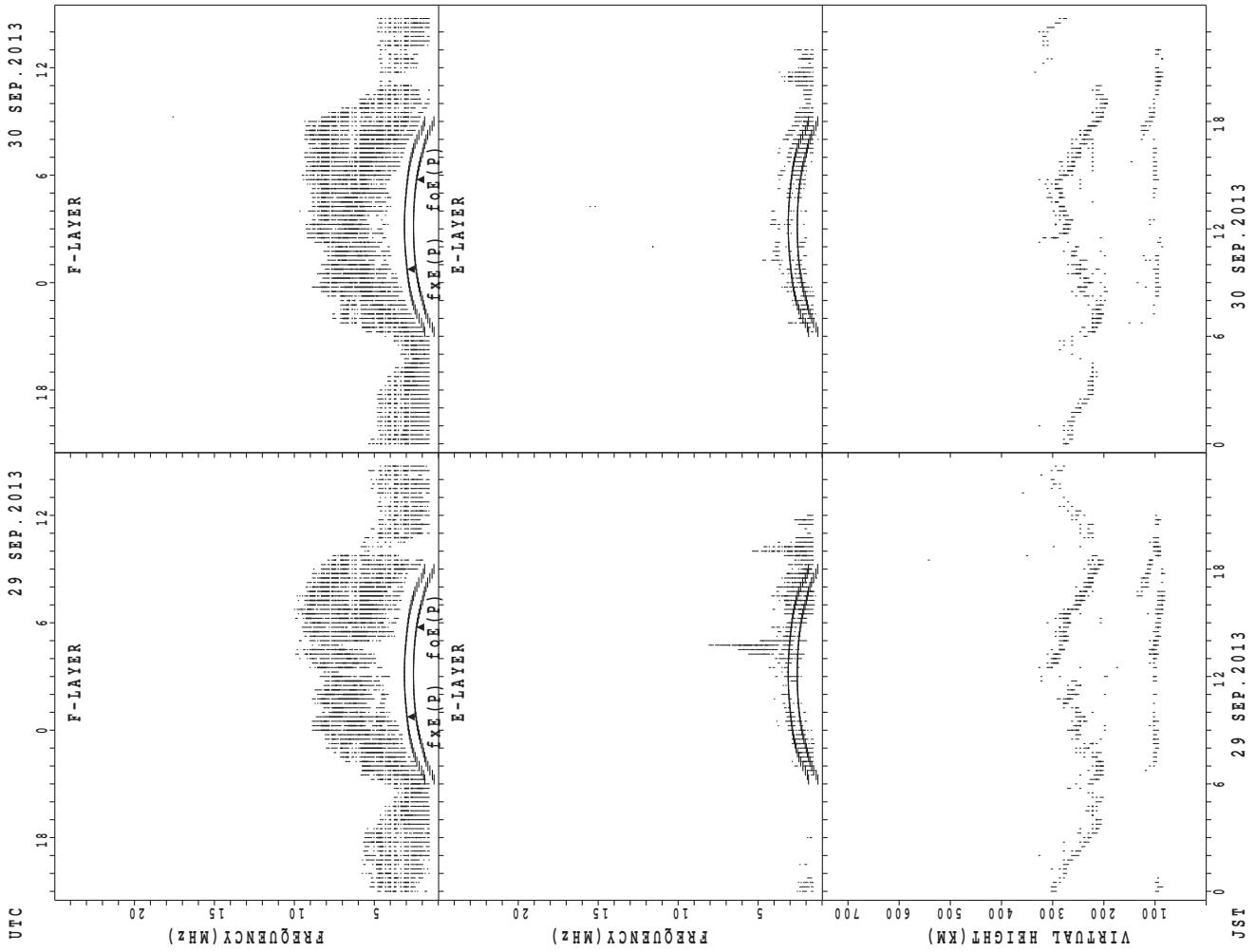
$f_{x E}(P)$ ; PREDICTED VALUE FOR  $f_{x E}$   
 $f_o E(P)$ ; PREDICTED VALUE FOR  $f_o E$

SUMMARY PLOTS AT Yamagawa



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

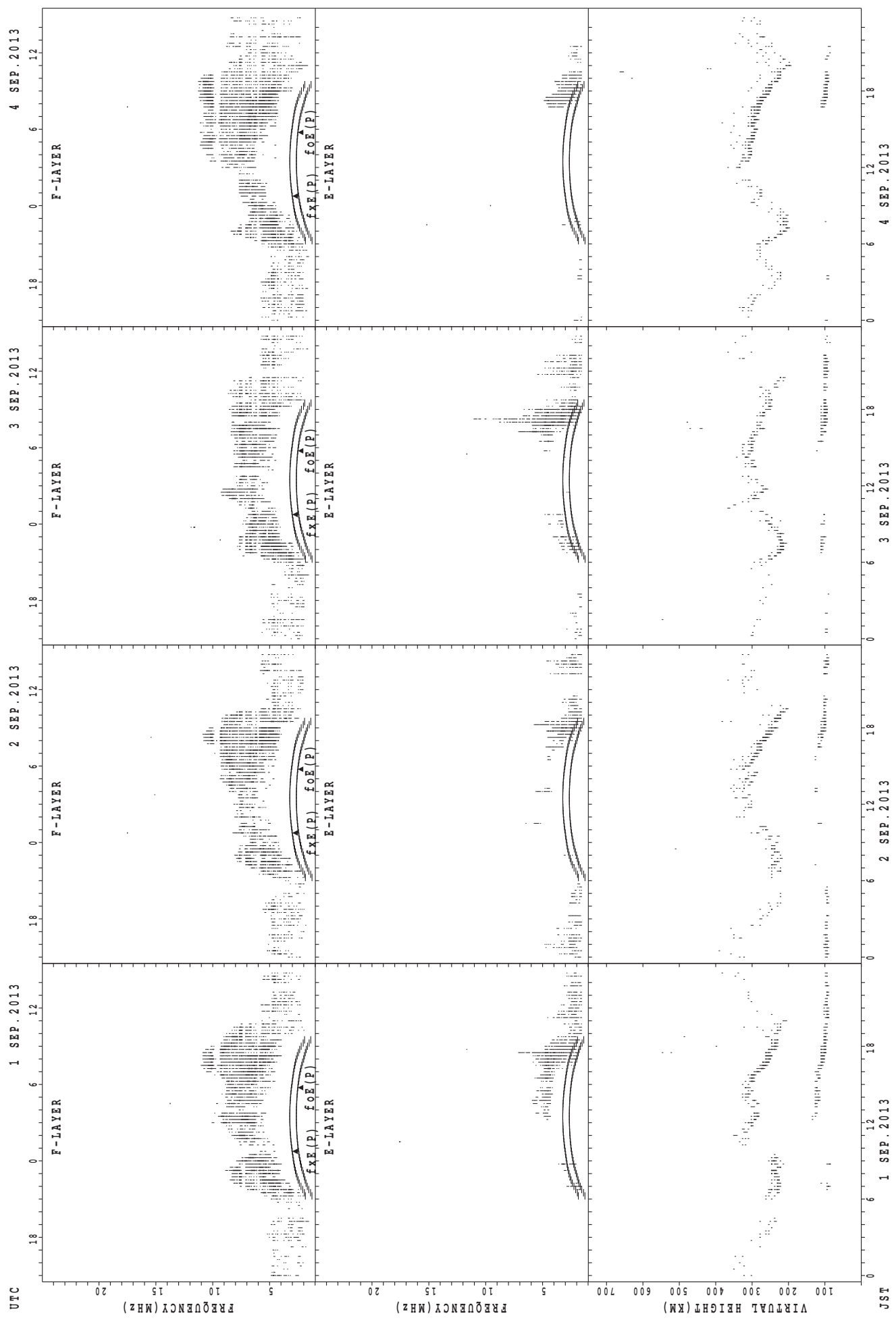
SUMMARY PLOTS AT Yamagawa



UTC 29 SEP. 2013 30 SEP. 2013  
JST 29 SEP. 2013 30 SEP. 2013  
 $f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

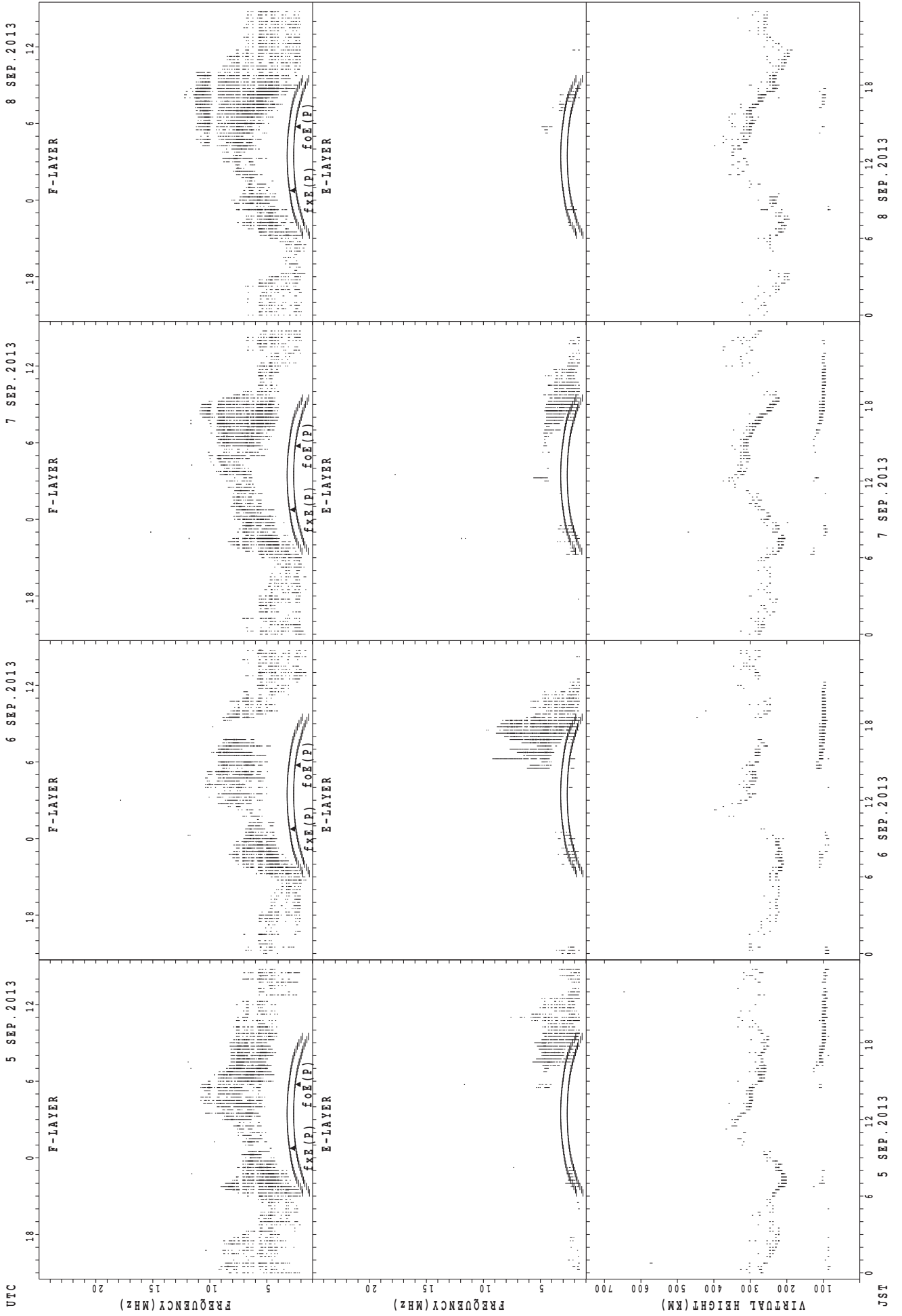


SUMMARY PLOTS AT Okinawa



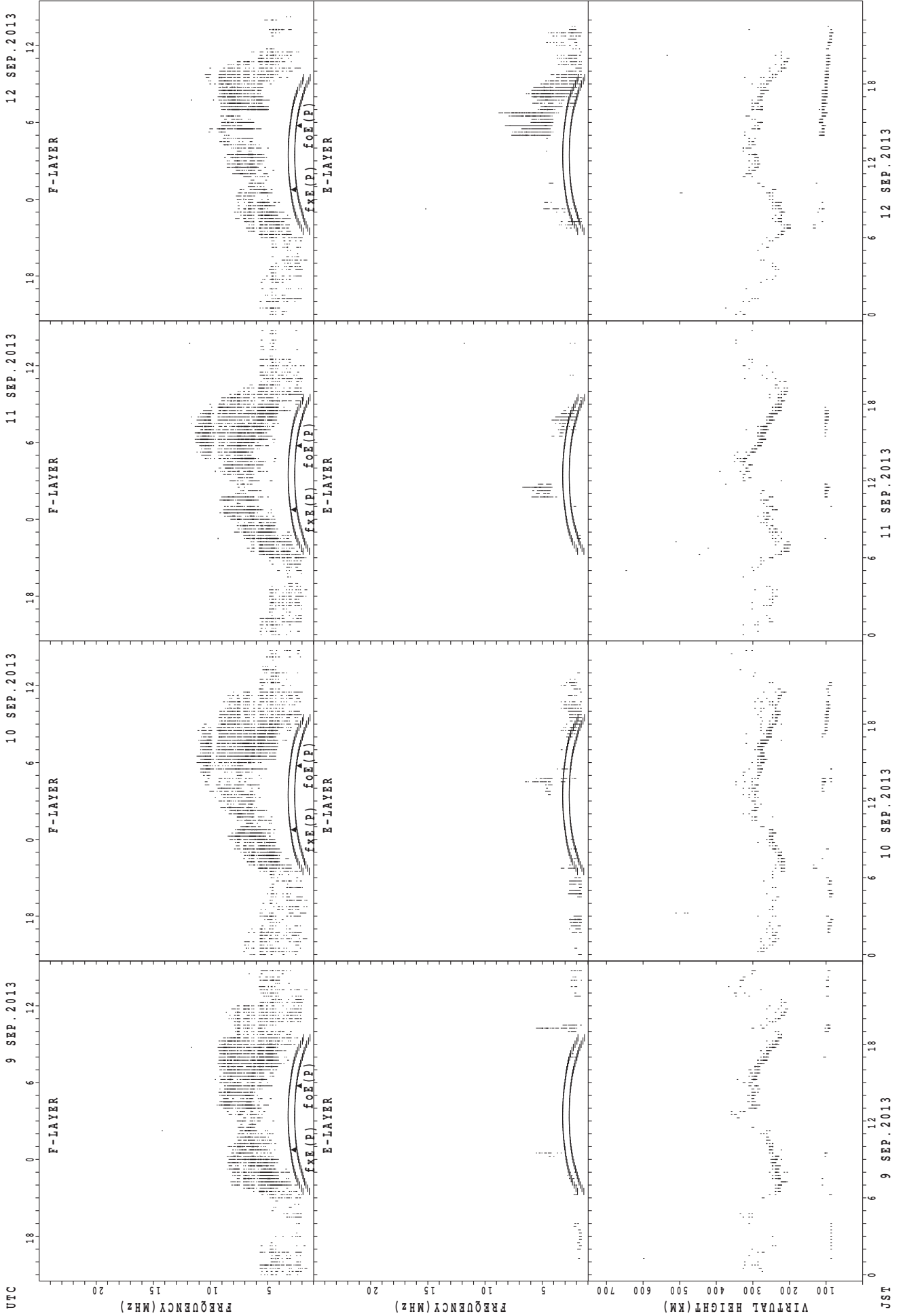
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Okinawa



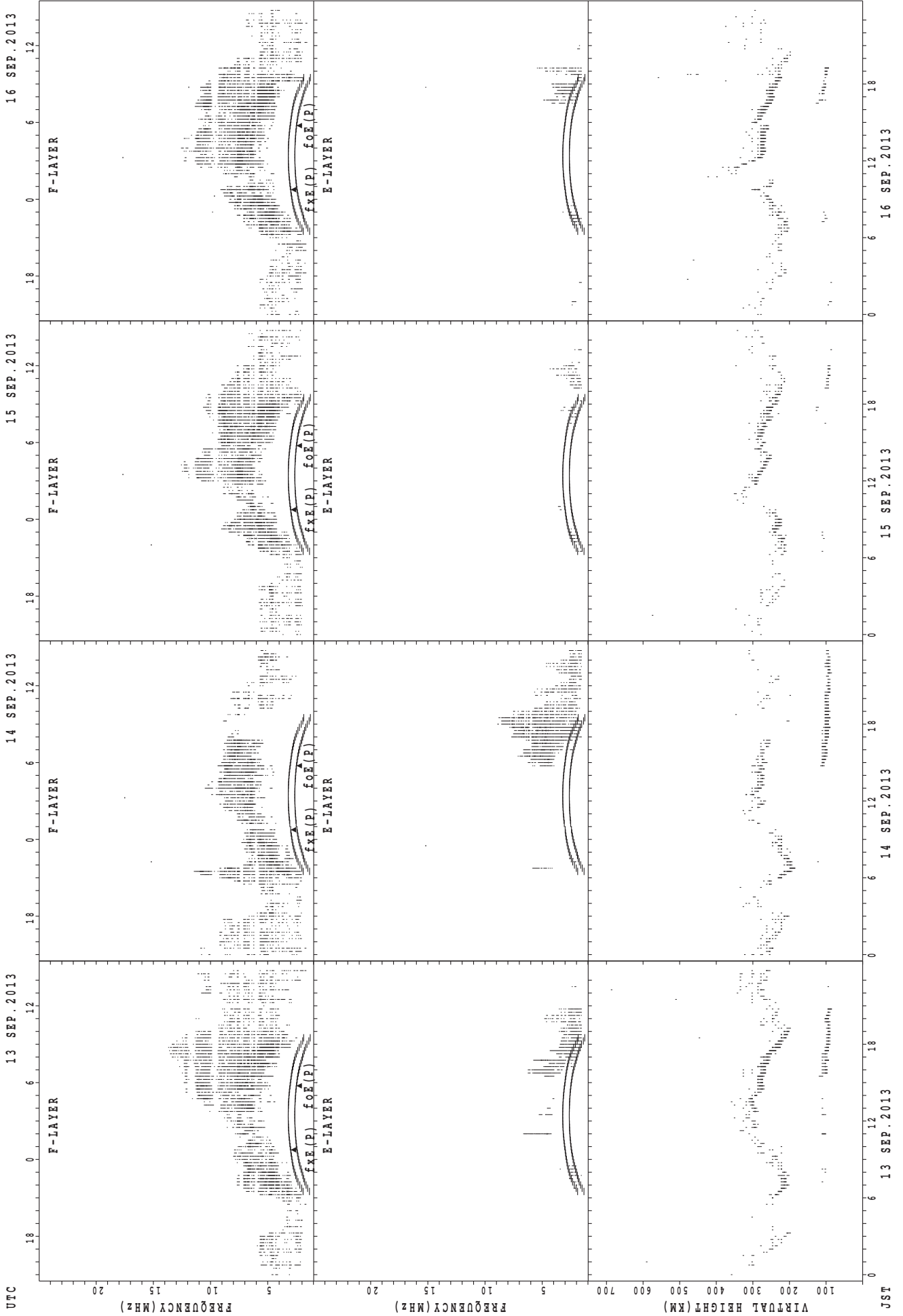
$f_{xe}(P)$ ; PREDICTED VALUE FOR  $f_{xe}$   
 $f_{oE}(P)$ ; PREDICTED VALUE FOR  $f_{oE}$

SUMMARY PLOTS AT Okinawa



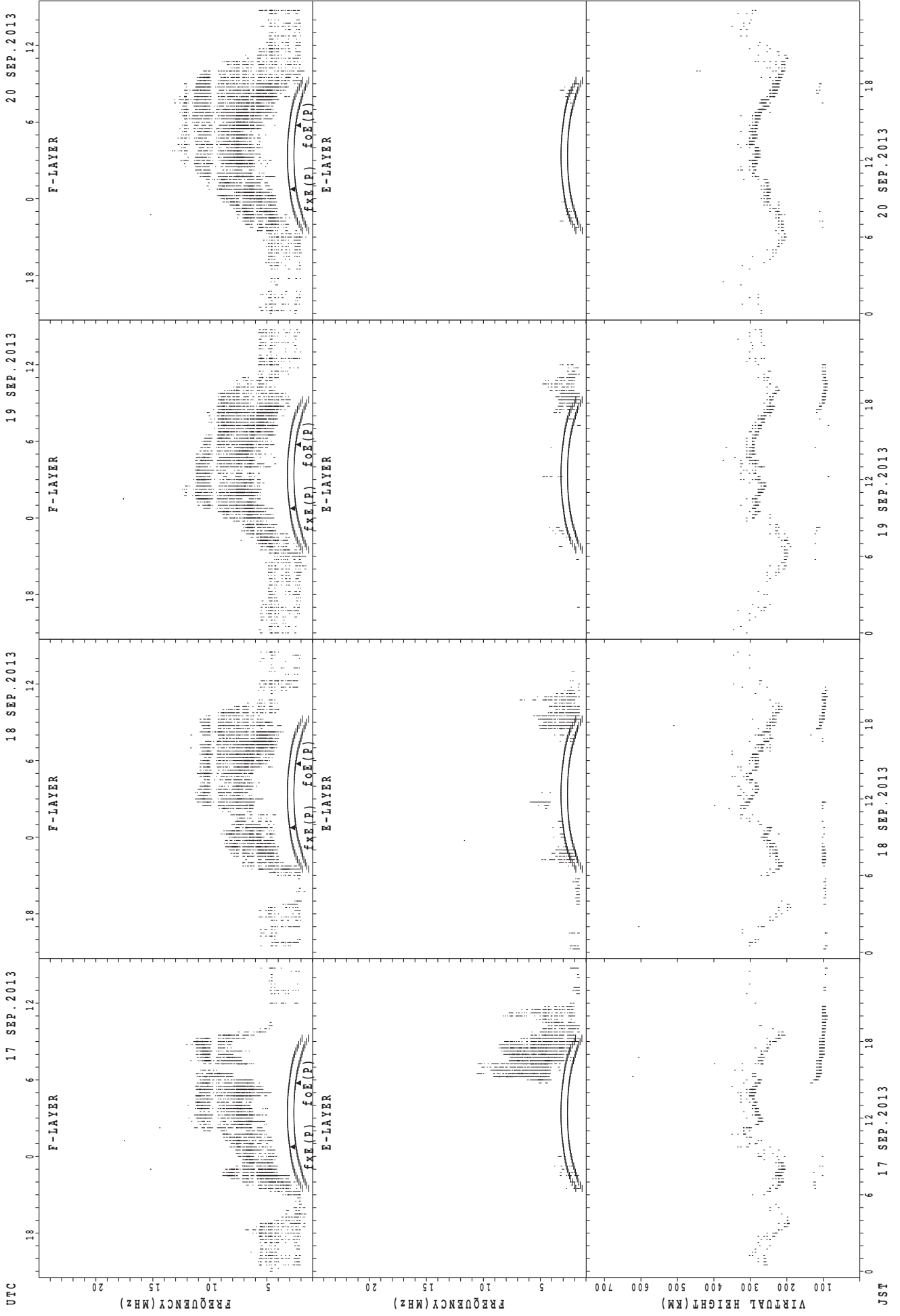
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Okinawa



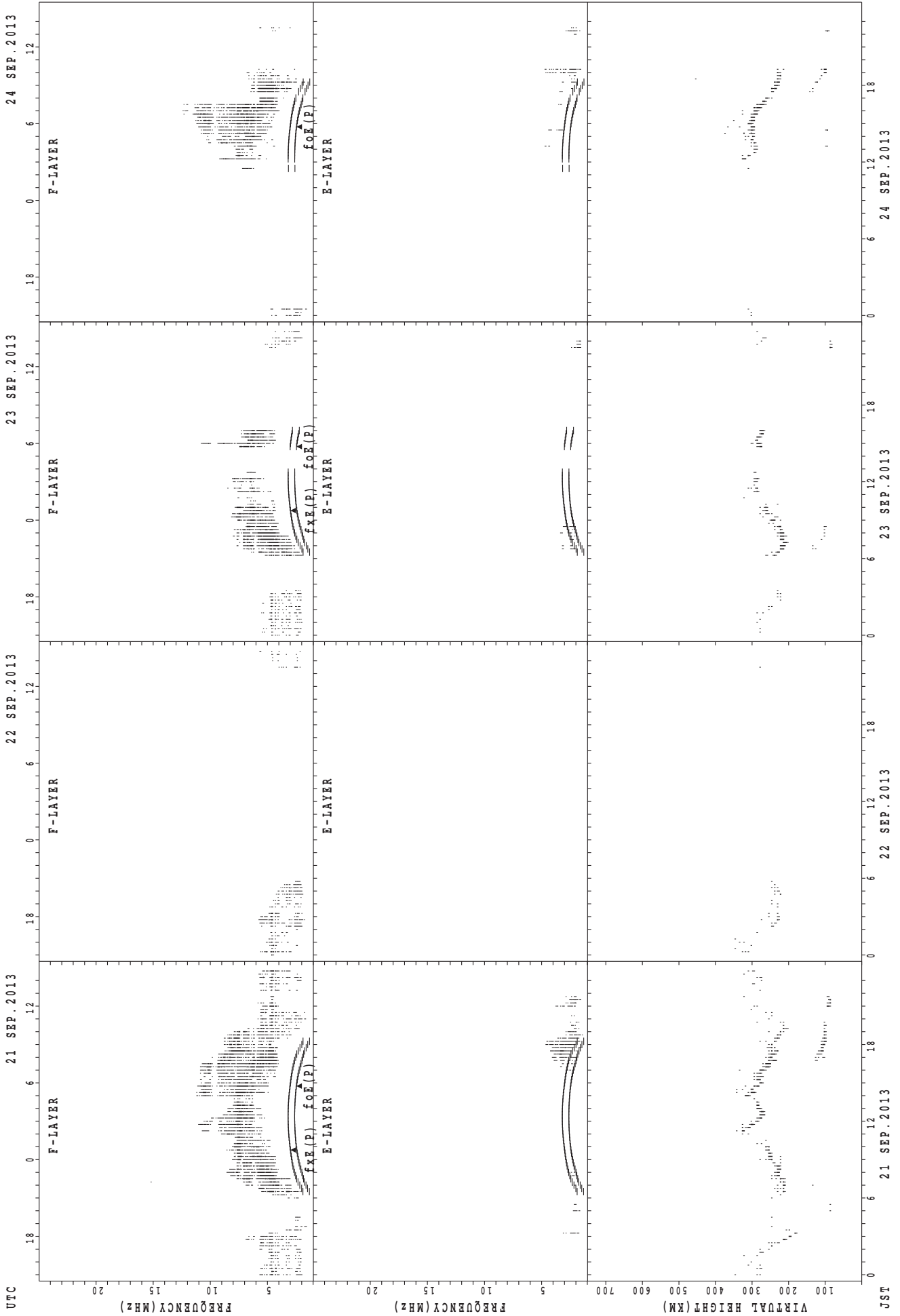
JST 13 SEP.2013 14 SEP.2013 15 SEP.2013 16 SEP.2013  
fXE(P); PREDICTED VALUE FOR fXE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



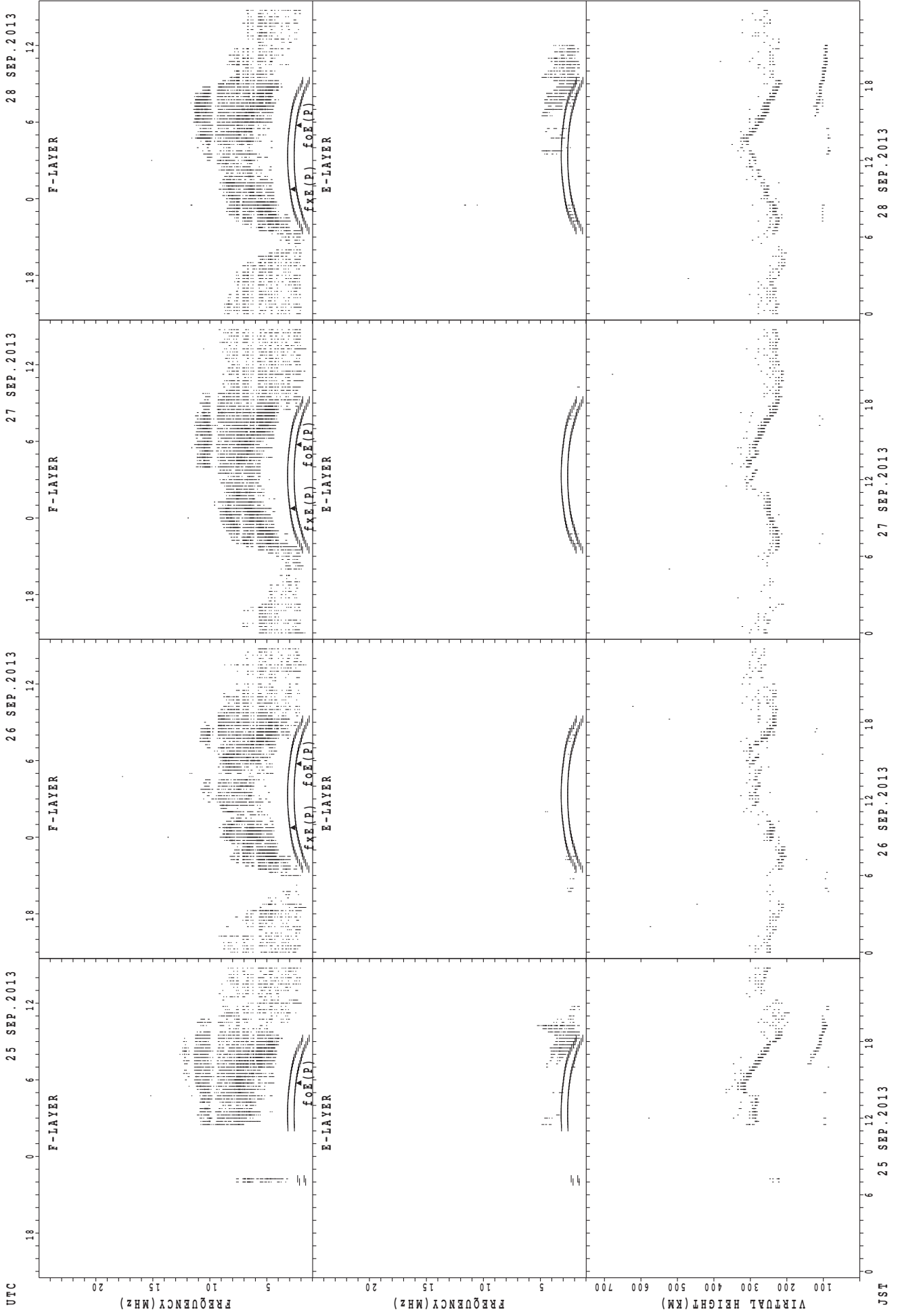
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
 f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Okinawa



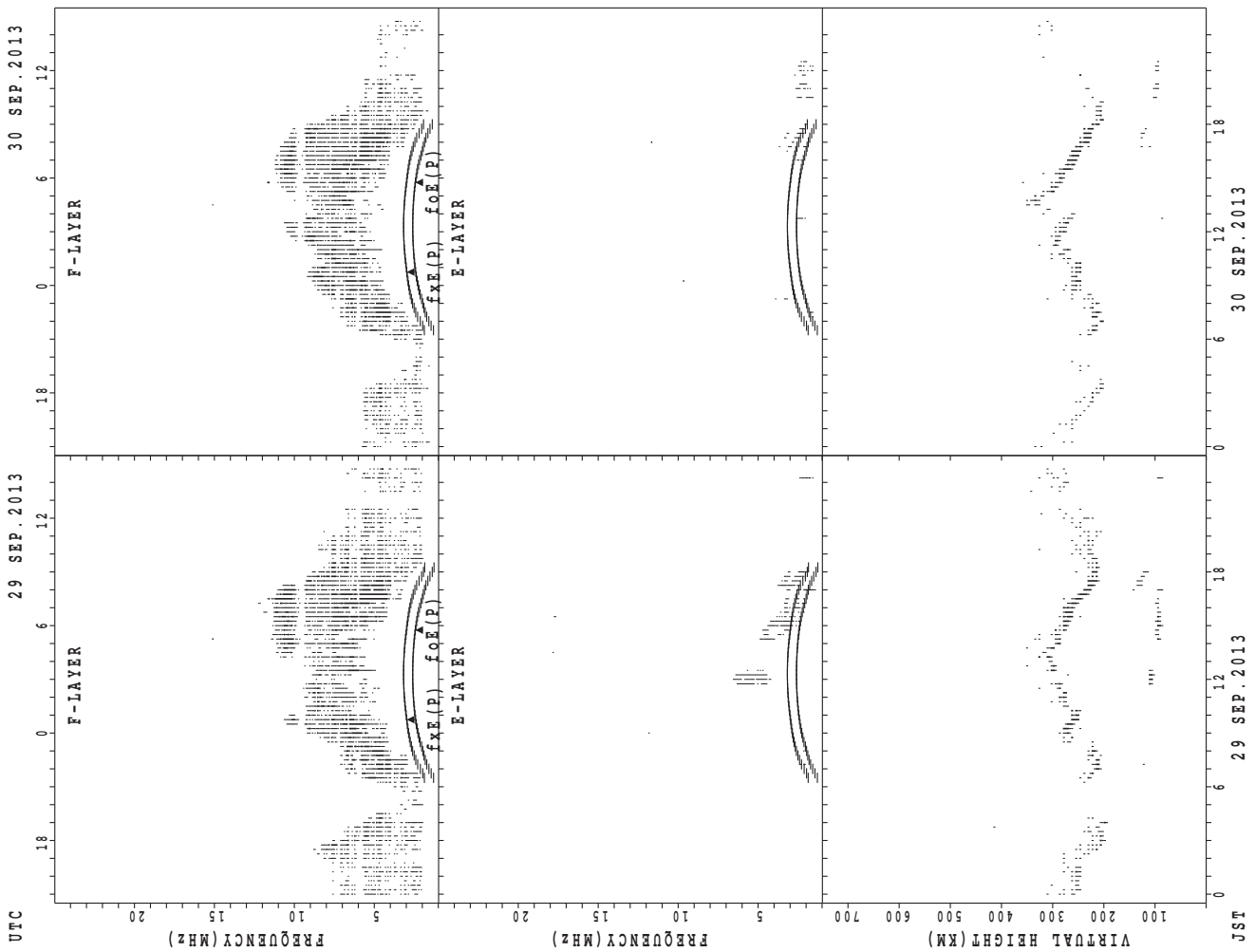
foE(P); PREDICTED VALUE FOR fxE  
foF(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Okinawa



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



MONTHLY MEDIANS OF h'F AND h'Es  
 SEP. 2013 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							6	26	15							17	25	25	18	9	7	3		
MED							243	246	242							272	264	258	261	268	288	286		
U Q							252	260	250							279	281	267	264	288	306	320		
L Q							238	238	238							262	261	252	248	253	272	268		

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	8	4	2	6	7	12	19	28	28	27	28	28	26	26	25	28	27	26	17	20	17	17	16	9
MED	91	93	92	108	103	104	105	105	101	101	99	101	101	101	101	103	107	107	99	98	95	95	94	93
U Q	96	97	95	111	107	105	115	107	106	103	104	107	101	119	107	109	113	113	104	101	99	97	98	97
L Q	88	89	89	97	101	102	99	100	97	97	95	96	95	99	99	101	105	97	95	96	91	92	91	90

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							15	25	18							10	25	29	25	13	3			
MED							242	234	242							271	254	254	248	254	254			
U Q							254	240	248							280	271	276	257	271	264			
L Q							230	225	232							264	252	245	241	243	230			

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	3		1	1	3	6	14	3	1	1	1		1	1	1	9	18	12	12	10	13	8	7
MED	96	91		89	89	105	106	105	105	95	91	107		105	181	121	107	105	103	98	95	99	97	97
U Q	99	95		44	44	113	111	109	109	47	45	53		52	90	60	112	111	104	101	101	102	98	97
L Q	95	89		44	44	101	103	103	99	47	45	53		52	90	60	104	105	101	96	95	95	94	95

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	17	25								25	23	28	19	7	1		
MED							256	224	230								270	252	241	246	250	296		
U Q							128	231	241								275	258	259	256	278	148		
L Q							128	219	222								262	238	232	232	224	148		

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	8	5	3	3		2	4	23	24	25	23	15	9	8	15	24	27	26	19	18	15	16	13	9
MED	95	89	97	87		94	95	119	103	101	103	105	111	108	103	105	105	105	101	99	95	95	93	95
U Q	96	94	97	89		99	112	131	107	104	111	109	182	128	109	111	107	111	105	105	97	96	97	100
L Q	92	89	89	85		89	91	105	101	97	99	101	103	104	99	103	101	103	97	97	95	95	91	92

MONTHLY MEDIANS OF h'F AND h'Es  
 SEP. 2013 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	3	3	2			1	19	24	5							17	26	25	20	10	2	1	3
MED	290	280	260	248			252	228	234	258							270	261	238	241	259	275	278	290
U Q	302	282	280	260			126	244	240	264							277	270	248	257	266	286	139	292
L Q	278	274	248	236			126	222	224	241							264	246	230	232	240	264	139	252

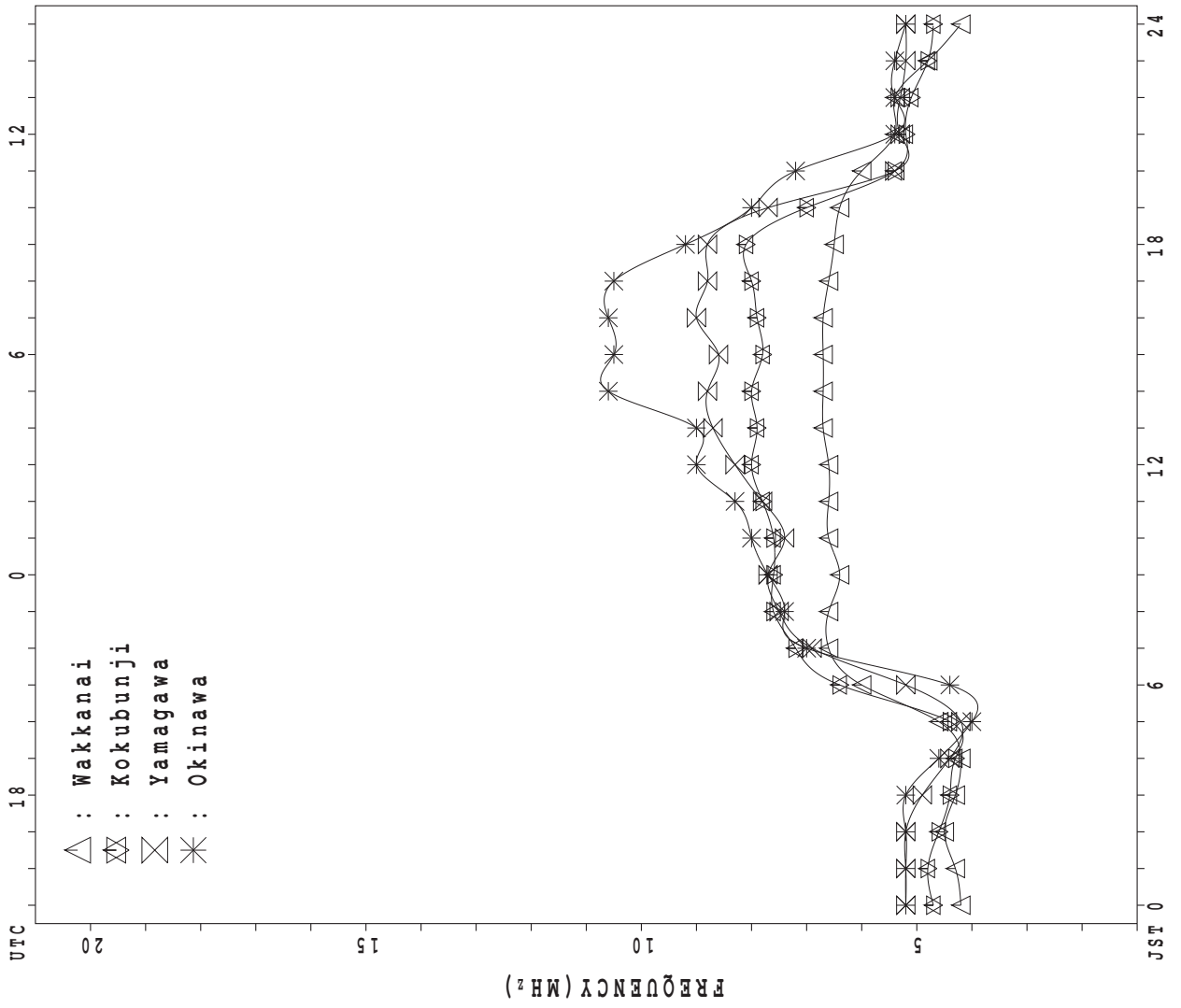
h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	2	1	1		1	1	10	7	3		2	3	3	3	5	12	19	19	19	14	12	5	6
MED	97	96	97	97		97	95	120	109	109		105	111	129	111	115	112	107	103	101	97	96	95	97
U Q	99	99	48	48		48	47	135	113	109		107	131	129	119	120	115	113	107	103	103	99	98	97
L Q	95	93	48	48		48	47	105	99	103		103	99	111	97	102	105	103	101	99	97	94	91	97

MONTHLY MEDIANS PLOT OF fOF2

SEP. 2013

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Wakkanai

SEP. 2013 f<sub>XI</sub> (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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 51	X 51	X 49	X 52	X 48														X 79	X 83	X 77	X 57	X 55		
2	X 53	X 52	X 52	X 57	X 54														X 72	X 73	X 69	X 58	X 50		
3	X 48	X 49	X 49	X 49	X 50														X 78	X 72	X 72	X 70	X 62		
4	X 59	X 58	X 58	X 55	X 50														X 81	X 79	X 76	X 63	X 57		
5	X 55	X 51	X 50	X 51	X 49	X 51													X 79	X 73	X 70	X 64	X 65		
6	X 61	X 61	X 61	X 59	X 57														X 82	X 82	X 76	X 71	X 66		
7	X 65	X 63	X 61	X 59	X 56														X 85	X 77	X 75	X 70	X 67		
8	X 66	X 66	X 60	X 61	X 58														X 83	X 73	X 73	X 65	X 61		
9	X 61	X 58	X 56	X 56	X 53														X 73	X 70	X 69	X 67	X 66		
10	X 63	X 57	X 56	X 53	X 52														X 75	X 71	X 69	X 68	X 68		
11	X 61	X 56	X 56	X 51	X 51		X 60												X 71	X 67	X 61	X 60	X 57		
12	X 55	X 54	X 54	X 52	X 52	X 54													X 75	X 74	X 69	X 62	X 55		
13	X 56	X 53	X 53	X 52	X 49													X 76	X 78	X 75	X 72	X 63	X 59		
14	X 59	X 57	X 56	X 52	X 52														X 75	X 67	X 67	X 65	X 63		
15	X 63	X 63	X 57	X 55	X 50														X 81	X 80	X 76	X 66	X 57		
16	X 55	X 54	X 54	X 52	X 53														X 80	X 72	X 70	X 56	X 53		
17	X 52	X 52	X 51	X 51	X 52														X 79	X 75	X 58	X 54	X 53		
18	X 53	X 52	X 52	X 51	X 52	X 53													X 75	X 72	X 62	X 59	X 58		
19	X 59	X 56	X 55	X 52	X 52														X 76	X 73	X 74	X 73	X 60		
20	X 57	X 57	X 57	X 57	X 58	X 56													X 73	X 77	X 76	X 66	X 52		
21	X 49	X 51	X 51	X 51	X 49														X 72	X 73	X 74	X 70	X 64	X 58	
22	X 60	X 64	X 64	X 64	X 64	X 65													X 75	X 67	X 65	X 65	X 62	X 60	
23	X 59	X 56	X 56	X 55	X 55	X 52													X 70	X 61	X 61	X 59	X 58	X 57	
24	X 57	X 56	X 55	X 54	X 54	X 55													X 67	X 66	X 62	X 62	X 59	X 57	
25	X 59	X 56	X 56	X 53	X 52	X 53													X 79	X 74	X 73	X 63	X 59	X 55	
26	X 53	X 53	X 52	X 51	X 51	X 50													X 79	X 73	X 67	X 64	X 60	X 57	
27	X 56	X 56	X 55	X 53	X 51	X 51													X 76	X 72	X 57	X 51	X 51	X 52	
28	X 52	X 51	X 51	X 52	X 51	X 53													X 86	X 68	X 60	X 50	X 47	X 47	
29	X 46	X 46	X 46	X 46	X 47	X 48													X 82	X 69	X 52	X 43	X 45	X 45	
30	X 45	X 45	X 47	X 47	X 48	X 47													X 79	X 67	X 61	X 58	X 59	X 58	
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	29	13	1												13	30	30	30	30	30	
MED	X	X	X	X	X	X	X	X											X	X	X	X	X	X	
U Q	60	57	56	55	54	54													X	X	X	X	X	X	
L Q	X	X	X	X	X	X													X	X	X	X	X	X	
	53	52	51	51	50	50													74	72	67	62	58	55	

IONOSPHERIC DATA STATION Wakkanai

SEP. 2013 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	44	44	42	43	41	43	53	54		A	62	63	66	68	65	62	70	A	59	64	72	76	70	50	48	
2	46	45	45	50 <sup>V</sup>	47		58	60	64	U <sup>R</sup>	56 <sup>R</sup>	54 <sup>R</sup>	57	62	U <sup>R</sup>	57	60	55	60	63	65	65	66	62	51 <sup>R</sup>	44
3	42	42	42	42	43	45	53	62	63	64	58	59	64	70	64	63	61	58	63	71	66	65	63	55		
4	52	51	51	48	43	42	51	65	68	62	66	63	68	62	62	65	67	69	75	74 <sup>R</sup>	72	69	56	50		
5	48	44	43	44	42	44 <sup>R</sup>	60	65	74	72	66	68	64	65	64	66	65	76	75	72	66	65	58	58		
6	54	54	54	52	50	50	60	70	68	72 <sup>R</sup>	68	70	69	69	61	68	70	74	75	75	75	68	64	58 <sup>F</sup>		
7	58 <sup>F</sup>	57 <sup>F</sup>	54	52 <sup>V</sup>	49	50	70	74	74	72	62	67	71	70	67	72	73	73	76	77	70	68	63	58		
8	56 <sup>F</sup>	54 <sup>F</sup>	53	54	51	47	67	70	74	68	74	67	74	74	74	73	70	76	74	76	66	66	58	55		
9	54	51	49	49	46	45	60	67	66	65	68	72	73	71	71	68	66	72	66	66	63	62	60	59		
10	56	50	49	46	45	47	53	69	64	69	71	J <sup>R</sup>	73	69	68	74	69	65	67	66	68	64	62	62	61	
11	53	49	49	44	44	44	53	71	66	64	61	63	72	74	71	71	66	65	64	64	60	55	54	50		
12	48	47	47	45	45	47	57	64	66	70	68	U <sup>R</sup>	73	70	70	72	66	69	74	71	68	67	62	55 <sup>R</sup>	48	
13	49	46	45	44	42	44	56	64	U <sup>Y</sup>	74	75	J <sup>Y</sup>	77	69	70	73	74	72	72	68	69	71	68	65	56	52
14	52	50	49	45	45	46	55	56	66	68	68	64	64	68	69	67	72	75	76	68	60	60	58	56		
15	56	56	52	48	44	47	63	65	67	U <sup>Y</sup>	76 <sup>J</sup>	81	73	67	69	73	71	70	70	74	73	70	59	56	50	
16	48	47	47	45	46	46	59	64	72	68	64	J <sup>R</sup>	65	73	71	75	72	68	71	70	73	65	63	49	46	
17	46	45	44	44	45	44	64	71	71	U <sup>R</sup>	77	70	66	70	75	70	71	72	75	76	72	68	51	48	46	
18	46	45	45 <sup>R</sup>	44	45	46	59	71	74	73	73	J <sup>R</sup>	72	75	72	74	72	74	74	72	68	65	54	52	51	
19	52	50	48	45	45	48	63	73	69	66	67	74	U <sup>R</sup>	75	77	76	74	71	69	66	66	67	66	64	53	
20	50	50	50	50	51	49	54	61	68	72	76	76	Y	74	74	70	66	66	66	66	70	68	59	54	45	
21	43	44	44	44	42	43	58	73	70	67	73	J <sup>R</sup>	84	76	75	72	68	70	66	62 <sup>F</sup>	64 <sup>F</sup>	64 <sup>F</sup>	62 <sup>F</sup>	52 <sup>F</sup>	48 <sup>F</sup>	
22	48 <sup>F</sup>	50 <sup>F</sup>	51 <sup>F</sup>	50 <sup>F</sup>	50 <sup>F</sup>	50 <sup>F</sup>	60	68	67	69	65	72	73	73	74	69	68	70	67	60	58	57	51 <sup>F</sup>	49 <sup>F</sup>		
23	49 <sup>F</sup>	48 <sup>F</sup>	47 <sup>F</sup>	46 <sup>F</sup>	45 <sup>F</sup>	45	57	70	71	75	73	68	73	72	J <sup>R</sup>	79	72	73	69	64	54	54	53	51	50	
24	50	48 <sup>F</sup>	48	47	47	48	60	71	74	72	73	76	76	74	73	74	74	74	73	68	60	59	55	55	52	
25	52	49	49	46	45	46	61	68	73	U <sup>Y</sup>	83	J <sup>R</sup>	91	82	79	73	74	74	75	72	67	66	56	53	48	
26	46	46	45	44	A	43	63	68	76	R <sup>J</sup>	85	R <sup>J</sup>	87	76	74	73	74	76	74	75	72	66	60	58	53	50
27	49	49	48	46	44	44	63	68	70	74	74	73	75	74	74	73	74	71	69	65	50	44	44	45		
28	45	44	44	45	44	46	60	65	72	75	74	74	71	74	67	74	76	R	78	78	61	53	43	40	40	
29	39	39	39	39	40	41	64	67	72	71	73	74	72	74	72	74	76	83	75	62	45	37	38	38		
30	38	38	40	40	41	40	58	65	70	72	74	76	72	75	U <sup>R</sup>	76	R	77	80	79	72	61	55	51	52	51
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	29	29	30	30	29	30	29	30	29	30	30	30	29	30	30	30	30	30	30	30	30	
MED	49	48	48	45	45	46	60	68	70	72	70	72	72	72	72	71	70	72	70	68	66	61	54	50		
U Q	52	50	49	48	46	47	63	70	74	74	74	74	74	74	74	73	74	75	75	72	68	65	58	55		
L Q	46	45	44	44	43	44	56	64	66	67	66	66	68	69	67	68	66	68	66	64	60	55	51	48		

SEP. 2013 foF2 (0.1MHz)

## IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	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	A						L	L	A	A	A					
2						A	L	A		U R	U R							L	A					
3							U L	L		L	L		L	L	L	U L	L			A				
4						L	L	A	U L	L	L	L	U L	L	L	L	L	L	L					
5							U L	L		L	L		L	L	L	U L	L			L				
6							L	L	U L	L	L		L	L	L	U L	L	L	L					
7							L	L	L	U L	U L	L	L	U L	U L	U L	U L	U L	A					
8							L	L	L	L	U L	U L	R	U L	L	L	L	L	L					
9							L	L	U L	L	L	L	L	L	L	L	L	L	L					
10							L	A	A	A	A	A	L	U L	U L	U L	U L							
11							L	L	U L	L	L	U L	U L	U L	U L	L	L	L						
12							L	U L	L	L	L	L	U L	U L	L	L	L	L						
13							L	L	L	L	L	L	L	L	L	L	L	L						
14							L	L	R	U R	L	L	L	L	L	L	L	L	L					
15							A	L	L	L	L	L	L	L	L	L	L	L						
16							L	L	U L	U L	L	L	L	L	L	L	L	L						
17							L	L	U R	L	L	L	L	L	L	L	L	L						
18							L	L	U L	U L	L	L	L	L	L	L	L	L	L					
19							L	L	U L	L	L	L	L	L	L	L	L	L	L					
20							L	L	L	U A	L	L	L	L	L	L	L	L						
21							L	L	L	L	L	L	L	L	L	L	L	L						
22							U L	L	L	L	L	L	L	L	L	L	L	L						
23							L	L	L	L	L	L	L	L	L	L	L	L						
24							L	L	L	U L	L	L	L	L	L	L	L	L						
25							L	L	L	L	L	L	L	L	L	L	L	L						
26							L	L	L	L	L	L	L	L	L	L	L	L						
27							L	L	L	L	L	L	L	L	L	L	L	L						
28							L	L	L	U L	U L	L	L	L	L	L	L	L						
29							L	L	L	U L	L	L	L	L	L	L	L	L						
30							L	L	L	U L	U L	L	L	L	L	L	L	L						
31							L	L	L	L	L	L	L	L	L	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							5	6	7	17	22	18	23	20	13	12	1							
MED							244	376	432	452	464	480	480	480	476	452	432							
U Q							246	416	436	456	468	484	488	490	480	458								
L Q							232	352	424	448	460	464	468	466	458	430								

SEP. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	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	220	268	U A	A	A	A	352	A	348	328	288	232	A	A					
2						B	204	268	308	320	U A	U A	344	344	336	320	276	232	A						
3						A	A	284	A	A	A	A	A	A	328	320	280	232	U A	A					
4						A	A	A	A	A	A	A	A	A	A	316	300	A	A						
5							A	A	A			R	372	364	344	316	288	228						A	
6						B	240	272		A	A	344	344	364	356	332	312	276	228	B					
7						B	212	U A	292	R	332	340	A	U R	352	340	336	288	A	A					
8						A	U A	A	U A	A	A	344	364	360	340	312	280	212			A				
9						B	224	276	312	A	A	332	360	344	352	332	300	272	212			B			
10						B	196	276		A	A	A	A	356	344	332	312	280	220			B			
11						B		A	U A	A	A	A	348	348	344	332	284	276	212	148					
12							196	260	300	332		A	336	344	340	328	304	276			A	B			
13						B	A	200	280	304	336	348	352	356	348	324	292	268							
14						B	196	A	304	316	328	328	340	340	316	304	276	204						A	
15						B	228	268	288	328	332	U A	A	340	340	320	292	256	204						
16						B	196	272	304	R	332	352	356	A	336	324	292	260	188					B	
17						B	212	268	296	312	320	340	340	348	328	296	248	192	A						
18							208	256	A	304	R	336	340	U R	R	R	292	264	200	U A	A				
19						B	A	A	A	324	344	364	R	U R	R	316	292	264	A						
20							A	248	288	332	336		A	352	344	316	300	256	A						
21						B	176	244	292	340	R	R	360	360	320	296	276	176							
22							200	280	R	R	R	R	368	368	356	324	292	256	192						
23							188	252	300	316	352	352	356	348	328	296	260	176							
24							200	240	300	328	352	U A	360	360	336	320	308	248	192					A	
25							B	U A	U A	U A	A	336	344	344	328	A	A	A	184						
26							180	236	296	308	320	360	360	312	316	288	256	A							
27							A	260	A	A	340	R	U R	360	324	316	284	248	A						
28							A	260	A	328	344	356	340	340	316	292	256	A							
29							A	264	296	324	356	U R	R	R	A	284	236	A	A						
30								184	232	292	324	R	U R	R	356	340	328	288	228	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							20	24	21	22	24	23	27	26	27	29	29	19	1						
MED							200	266	300	328	340	352	352	344	328	296	268	204	148						
U Q							216	272	U A	308	332	352	360	360	348	332	312	278	228						
L Q							196	250	294	316	334	344	344	340	316	292	256	192							

SEP. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 14	B 14	B 14	B 14	E 14	B 14	B 17	J 26	A 32	J 64	A 38	A 38	40	40	E 13	B 48	J 97	A 54	J 32	A 32	J 15	A 37	J 20	A 15	
2	E 13	B 13	B 20	J 29	A 40	J 51	A 35	J 63	A 40	J 37	A 60	J 44	39	G	G	36	35	J 47	A 56	J 29	A 15	J 19	20	J 19	
3	J 19	A 19	J 13	A 14	J 30	A 31	J 31	A 28	J 29	A 37	J 39	A 46	42	38	G	G	34	J 31	A 45	J 37	A 61	J 27	A 13	B 13	
4	E 18	B 14	B 14	B 18	J 15	A 34	J 34	A 39	J 36	A 37	J 37	A 37	37	39	34	42	34	J 27	A 27	J 62	A 31	J 37	A 30	J 17	
5	J 15	A 13	A 15	B 12	J 15	A 27	J 39	A 29	J 32	A 30	J 33	A 41	40	40	G	38	33	28	J 18	A 50	J 27	A 27	A 40	J 39	
6	J 35	A 21	A 14	B 14	J 14	A 14	B 22	G 26	J 34	A 35	J 27	G 24	G	G	38	G 26	G 30	E 26	B 14	18	J 18	A 18	J 21	A 13	
7	E 19	B 12	B 12	B 12	E 12	B 12	B 25	30	J 32	A 40	J 32	A 38	32	38	G	32	32	60	J 22	A 23	J 74	A 59	J 63	A 43	
8	J 65	A 46	A 16	J 21	A 26	J 29	A 51	J 59	A 40	J 37	A 56	J 38	23	20	G	33	G	25	J 25	A 51	J 31	A 28	J 20	A 25	
9	J 23	A 27	J 19	A 19	E 18	B 14	G	30	J 30	A 35	E 15	J 40	26	37	J 37	34	G	24	J 16	A 15	J 15	A 13	J 17	A 17	
10	E 16	B 15	B 14	B 14	E 14	B 16	22	J 32	A 56	A 47	J 72	A 53	41	38	G	25	34	G	E 24	B 11	J 26	18	J 36	A 26	
11	J 17	A 10	B 18	E 12	J 14	A 21	J 37	A 31	J 32	A 35	J 35	A 38	27	G	G	23	22	20	G	J 22	A 35	J 26	A 13	A 13	
12	E 14	B 14	B 16	J 16	A 14	B 23	28	J 34	A 35	J 41	A	G	40	39	37	33	31	23	E 12	J 22	A 19	J 18	A 16	A 20	
13	20	E 11	B 11	B 11	J 14	A 22	24	J 34	A 23	J 29	A 32	J 28	40	38	35	30	30	J 27	A 19	J 15	J 17	A 19	A 24	A 19	
14	E 18	B 14	B 14	B 15	E 15	B 15	22	J 26	A 33	A 35	J 41	A 38	38	36	36	34	G	23	J 39	A 34	20	J 23	A 15	B 15	
15	E 11	B 11	B 14	J 14	A 14	B 17	G	30	39	40	42	42	38	39	35	32	29	22	J 53	A 25	J 19	A 18	J 22	A 13	
16	J 15	A 18	B 17	E 14	B 14	B 14	20	J 32	A 32	A 36	G	J 38	38	32	G 36	34	29	23	J 40	A 30	J 25	A 23	A 19	A 19	
17	J 24	A 17	22	E 12	B 12	B 12	22	J 28	A 34	A 36	J 28	A 31	37	G 36	35	34	24	J 16	A 16	J 25	A 25	E 13	B 13	B 13	
18	E 14	B 14	B 14	20	E 13	B 13	22	J 28	A 32	A 34	J 37	A 25	38	31	G 29	33	30	26	J 20	A 17	J 17	A 24	J 23	A 12	
19	E 11	B 20	E 11	B 11	E 11	B 11	J 31	A 30	A 42	J 33	A 41	G	41	G	21	35	34	G	25	E 16	J 24	E 12	A 19	J 19	
20	J 17	A 13	20	J 15	A 24	J 32	29	J 28	A 31	G	39	35	37	G	34	32	27	J 27	A 28	A 34	J 32	A 19	A 18	A 16	
21	E 24	B 12	B 18	E 12	B 12	B 12	20	J 28	A	G	39	40	40	39	19	33	32	J 24	A 21	J 17	E 12	B 11	B 11	B 11	
22	E 12	B 12	B 12	J 13	A 14	B 21	G	G	34	A 38	25	J 38	39	39	38	26	20	G	G	14	A 17	J 14	20	A 19	
23	E 13	B 13	B 13	B 13	E 13	B 13	23	J 28	A	G	34	A 38	22	18	G	34	29	G	J 64	A 53	J 18	A 18	A 24	A 14	
24	E 19	B 12	B 12	B 12	E 18	B 12	18	J 28	A 34	A 39	J 40	A 43	37	37	J 36	30	28	J 22	A 29	J 23	A 20	J 17	A 14	A 14	
25	25	J 21	A 14	J 23	A 29	J 25	20	J 44	A 43	A 42	J 41	A 44	36	36	J 37	43	41	J 27	A 22	J 22	J 22	A 14	A 14	A 14	
26	E 14	B 17	J 19	A 32	J 41	A 24	23	J 28	A 32	A 37	J 36	A 38	38	37	35	32	31	J 40	A 27	A 20	J 23	A 22	A 24	A 16	
27	E 14	B 20	J 33	A 32	J 35	A 34	J 31	A 30	J 30	A 34	G 32	G 32	38	34	G 27	G	J 32	A 32	J 52	A 27	A 21	A 21	A 25	A 24	
28	J 18	A 18	A 14	20	J 15	A 14	J 31	A 24	J 31	A 26	39	J 27	G	G	24	34	34	29	J 26	A 13	J 51	A 34	J 17	A 23	
29	20	E 18	B 19	B 18	E 15	B 14	26	G	G	34	A 40	A 40	37	36	30	32	32	J 46	A 21	A 40	A 25	A 21	A 21	A 18	
30	E 12	B 12	B 12	B 12	E 12	B 12	21	J 26	A 32	A 36	G	35	38	G	G 24	31	30	J 28	A 12	A 24	J 22	A 17	20	A 18	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E 17	B 14	B 14	B 14	E 14	B 16	23	J 28	A 32	A 36	J 37	A 38	38	36	34	33	30	J 26	A 22	A 24	J 20	A 21	A 21	A 17	
U Q	J 20	A 18	B 18	A 19	J 18	A 25	J 31	A 32	J 36	A 38	J 40	A 41	39	38	36	34	32	J 28	A 32	A 34	J 27	A 26	A 24	A 19	
L Q	E 14	B 12	B 13	B 12	E 14	B 13	G	J 28	A 31	A 34	J 33	G	G	G	G	G	G	J 27	A 23	G	J 20	A 17	A 18	A 14	

SEP.2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	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	E	B	E	B	E	B	G	A	A				E	B	A	A			E	B	E	B	E	B		
2	E	B	E	B	E	B	E	B	A	A					G	G					E	B	E	B	E	B	E	B
3	E	B	E	B	E	B	E	B							G	G					E	B	E	B	E	B	E	B
4	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
5	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
6	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
7	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
8	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
9	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
10	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
11	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
12	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
13	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
14	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
15	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
16	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
17	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
18	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
19	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
20	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
21	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
22	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
23	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
24	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
25	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
26	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
27	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
28	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
29	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
30	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E	B	E	B	E	B	E	B	G												E	B	E	B	E	B	E	B
UQ	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B
LQ	E	B	E	B	E	B	E	B													E	B	E	B	E	B	E	B

SEP. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

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

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

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

SEP. 2013 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

SEP. 2013 M(3000)F2 (0.01) 135° E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
1	262	275	284	295	311	306	335	328		A	334	340	325	344	320	335	329		A	330	310	311	329	338	319	285					
2	290	279	284	299	V	309		A			U	R	324	287	R	298	316	U	R	334	307	296	299	321	323	316	313	318	304	R	294
3	282	282	288	299	301	299	320	334	357	356	R	331	324	316	333	332	339	334	315	305	311	296	299	301	303						
4	293	288	300	285	299	289	307	335	357	357	R	324	336	318	310	307	307	318	326	314	328	R	323	326	312	303					
5	301	313	311	319	325	R	324	331	343	359	358	R	329	339	349	335	340	332	320	331	326	303	325	284	296	296					
6	319	298	303	313	312	325	330	338	345	R	361	R	336	327	330	330	327	309	324	330	327	326	327	300	308	295	F				
7	293	292	306	305	301	303	352	340	342	347	358	332	324	326	305	320	320	335	322	338	324	315	298	273							
8	F	F		V	305	336	319	355	352	366	342	342	336	325	331	340	332	330	326	333	327	307	314	317	286						
9	290	305	310	292	306	299	317	334	356	358	346	R	346	341	331	332	342	334	328	326	329	317	293	305	303						
10	304	310	304	308	307	321	327	327	352	333	339			331	344	343	341	327	324	340	329	301	297	287	289						
11	312	297	310	289	281	292	332	344	346	358	323	R	341	323	332	339	341	338	338	344	327	307	303	298	290	R					
12	289	297	295	298	310	300	341	352	349	342	330	U	R	373	344	326	337	334	320	335	322	322	315	315	324	291					
13	290	299	299	307	304	324	330	350	U	Y		Y	320	329	323	358	342	340	336	319	311	315	316	296	291						
14	291	301	299	294	301	305	351	343	349	363	344	Y	346	299	338	334	320	319	342	340	326	311	295	303	293						
15	305	295	292	316	323	303	353	343	U	Y		Y	333	336	319	340	338	341	327	329	337	326	312	301	303						
16	297	299	299	309	323	318	365	348	342	361	341	J	R	339	R	U	R	332	334	333	328	330	342	302	320	304	296				
17	297	303	303	306	304	311	347	350	U	R		392	340	343	328	330	325	321	353	346	343	327	312	284	293						
18	296	299	301	306	319	330	329	356	342	348	346	R		355	332	327	341	331	342	330	334	320	320	297	305						
19	297	285	289	295	295	301	333	364	370	332	324	330	U	R	350	R	346	338	330	334	323	298	295	302	311	317					
20	302	300	288	287	287	312	329	337	V	357	353	343	345		Y	351	341	344	329	327	329	312	334	318	309	301					
21	288	292	295	296	311	332	347	362	364	337	338	R		331	342	332	329	324	336	333	324	F	F	F	F	F	F	F			
22	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
23	275	302	285	270	269	269	349	355	358	340	317	325	364	357	327	331	335	329	344	299	309	305	301	288							
24	279	284	287	296	299	316	349	348	344	354	338	H	327	330	333	R	333	330	340	324	314	311	318	307	292						
25	290	295	299	293	296	306	345	346	R	V		363	348	332	340	335	333	333	327	332	305	293	304	291	263						
26	271	279	277	294	298	295	350	337	U	Y	343	Y	R	U	Y	R	345	345	337	332	332	327	330	314	314	295	300	293			
27	302	303	303	305	A	312	343	341	R	R		R	353	342	325	344	330	335	333	321	319	297	306	306	301						
28	298	295	300	311	319	317	358	362	361	344	362	345	335	342	342	338	334	332	341	339	324	291	291	284							
29	297	299	296	291	296	326	366	364	349	336	339	339	332	318	323	340	343	353	R	352	322	324	313	304	304						
30	293	292	295	300	299	343	363	368	355	V	354	349	327	353	339	327	323	356	332	368	344	332	291	286	290						
31	293	293	290	306	315	314	374	370	R	358	351	373	339	332	318	U	R	R	R	347	348	347	351	316	312	300	295	296			
	00	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	29	29	30	30	29	29	26	26	29	30	29	30	29	30	30	30	30	30	30	30	30						
MED	293	296	298	299	304	312	344	345	355	353	340	338	332	332	335	333	331	332	330	323	315	309	301	294							
U Q	298	300	303	306	314	322	352	355	358	358	346	345	344	340	340	340	335	336	340	329	324	318	307	301							
L Q	289	292	289	294	298	300	330	337	344	341	330	327	327	326	327	329	322	327	323	312	307	299	296	290							

SEP. 2013 M(3000)F2 (0.01)

## IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	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	A		L			L	L	A	A	A						
2						A	L	A	A	U	R	U	R	3	8	4	3	5	3	6				
3							U	L	L		L	L	L	L	L	U	L	L		A				
4						L	L	A	U	L	L	L	L	U	L	L	L	L	L					
5							U	L	L		L	L	L	L	L	U	L	L						
6							L	L	U	L	L	L	L	L	L	U	L	L	L	L				
7							L	L	L	U	L	U	L	L	U	L	U	L	U	L	A			
8							L	L	L	L	U	L	U	L	R	U	L	L	L	L				
9							L	L	U	L				L	U	L	L	L	L					
10						4	1	0	L	A	A	A	A	L	U	L	U	L	U	L				
11							L	L	U	L	L	L	U	L	U	L	L	L	L					
12							L	U	L	L	L	L	U	L	U	L	L	L	L					
13							L	L	L	U	L			L	L	L	L	L						
14							L	L	L	R	U	R	L		L	L	L	L						
15							A	4	2	1	4	0	4	L	U	L	L	L						
16							L	L	U	L	U	L	L	L	L	L	U	L	L					
17							L	L	U	R	L	U	L	L	L	L	L	L	L					
18							L	L	U	L	U	L	U	L	U	L	L	L	L	L				
19							L	L	U	L	L	L	L	U	L	U	L	L	L					
20							L	L	L	U	A	L	U	L	U	L	L	L	L					
21							L	L	L	L	L	L	U	L	L	L	L	U	L					
22							U	L	L	L		L	U	L	L	L	L	L	L					
23							4	3	3	L	L	L	L	U	L	U	L	L	L					
24							L	L	L	U	L	L	L	L	L	L	L	L	L					
25									L	L	L	L	L	L	L	L	L	L						
26							4	8	9	L	L	L	L	U	L	L	L	L	L					
27									L	L	L	L	L	L	L	L	L	L						
28									L	L	L	U	L	U	L	L	L	U	L					
29									L	L	L	U	L	L	L	L	L	L	L					
30							4	5	8	4	5	6	L	L	U	L	U	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							5	6	7	17	22	18	23	20	13	12	1							
MED							4	3	3	4	1	2	3	8	5	3	9	2	4	0	0	3	9	8
U Q							4	7	4	2	2	4	0	3	4	0	4	0	8	4	0	2	4	0
L Q							4	1	8	3	7	8	3	6	3	7	4	3	6	8	3	5	7	

SEP. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2013 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							264	290		298	290	302	300	296	290	290	A	A						
2						A	272	E A 336	288	332	392	392	334	284	336	364	298	298						
3								288	248	248	306	306	312	308	288	288	278		280					
4						326	326	272	250	250	282	282	294	280	312	312	282	276						
5								262	252	252	274	280	280	290	290	290		268						
6								248	248	252	256	278	282	282	276	288	288	252						
7								250	250	250	250	292	292	292	290	290	282	280						
8								228	232	232	232	256	266	298	298	280	280	272	272					
9								272	250	248	248	256	256	258	272	272	272	270	262					
10								224	224	230	E A 252	274	268	272	272	272	268							
11								248	260	250	260	268	284	284	280	268	266							
12								242	242	260	286	240	268	270	270	270	270							
13								266	254	254	254		258	284	246	258	258							
14								244	258	252	252	280	270	270	270	270	270	246						
15									256	256	246	262	262	278	270	270	264							
16								238	238	238	240	262	276	290	272	272								
17								232	232	232	228	248	266	276	272	272	272							
18									252	252	256	256	256	260	268	262	262	238						
19								238	236	254	262	262	268	268	268	260	260							
20								258	246	252	252	252	268	264	264	252								
21								232	232	232	246	258	258	264	264	264	256							
22									232	232	254		280	262	262	262	258	258						
23								246		246	246	246	246	258	270	268	268	262						
24									246	246	246	246	266	266	266	266	264							
25										262	262	262	262	262	262	266								
26								226	232	240	240	246	252	252	252	252	252							
27									232	232	238	242	244	244	270	264								
28									242	242	242	252	252	252	252	254								
29									236	236	242		242	258	274	274	256							
30								220	220	224	224	236	242	242	268	268	254	254						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	10	23	28	30	29	28	30	30	30	30	21	10	1					
MED						326	239	245	246	250	255	262	267	271	270	269	266	270	280					
U Q							272	262	251	254	268	280	282	284	280	280	275	280						
L Q							226	232	234	242	246	252	258	264	266	260	259	252						

SEP. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

**IONOSPHERIC DATA STATION Wakkanai**

**SEP. 2013** h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	284	284	284 <sup>O</sup>	284	274 <sup>O</sup>	260	250	234	A	234	222	212	212	246	216	A	A	A	A	252	252	252	246	244	244	
2	300	308	308	290	300 <sup>A</sup>	A	226	A	E A	236	214	212	218	218 <sup>E Y</sup>	250	212	212	A	A	262	262	250	250	250	260	
3	282	290	290	286	286	268	248	240	H	180	182	210	226	220	220	220	220	242	A	250	258	258	252	252		
4	270	270	270	270	270	276	A	A	A	236	212	204	210	210	210	210	E A	250	252	252	268	266	254	252	252	
5	258	268	276	276	250	250	246	210	210	194	194	192	210	210	210	220	220	222	230	A	276	222	246	274 <sup>A</sup>	274	
6	278	266	266	262	256	250	248	220	218	208	206	206	222	194	202	202	222	222	234	234	234	234	234	242	242	
7	256 <sup>A</sup>	262	262	262	254	254	240	228	222	200	200	198	198	210	210	212	212	A	230	230	234	236	E A	A	294	
8	344	290	282	278	250	252	232	232	232	224	214	212	212	212	212	222	222	224	224	240	240	240	240	254	254	
9	256	256	256	258	258	272	238	238	A	228	200	196	196	246	184 <sup>H</sup>	190	196	212	224	224	224	238	264	264	264	
10	262	248	248	248	248	248	228	226	A	A	A	A	A	H	190	190	H	H	240	240	240	246	278	278	278	
11	252	252	252	258	292	278	256	232	206	206	198	198	198	198	198	196	180	196	218	218	224	248	248	254	254	
12	286	286	286	282	256	256	242	218	216	196	196	192	192	192	210	210	210	230	230	230	230	230	230	230	236	
13	284	284	284	270	262	258	232	232	228	210	198	198	198	198	198	204	204	226	228	228	228	228	228	262	262	
14	270	280	280	280	280	260	230	194	194	194	194	198	216	206	206	198	232	232	232	234	234	256	256	256	256	
15	262	262	262	254	254	252	232	232	A	210	E A	232	212	212	212	204	204	204	216	224	224	224	224	224	226	
16	248	250	250	250	234	234	218	216	216	216	204	204	202	218	218	218	218	238	238	238	238	238	238	222	262	
17	286	286	286	272	242	242	234	230	222	218	218	206	206	206	214	214	214	218	218	218	220	220	252	256	256	
18	270	270	270	270	252	238	224	224	210	210	188	188	188	188	206	206	220	228	228	228	228	228	240	254	254	
19	260	260	282	282	282	266	244	240	A	200	186	196	196	196	196	206	206	220	220	230	250	250	250	246	246	
20	250	250	278	278	278	276	246	220	220	214	214	218	192	204	204	202	H	212	216	246	246	246	246	246	246	
21	280	280	270	266	244	238	216	218	218	218	218	214	194	194	194	194	208	218	224	230	230	230	230	246	246	
22	284 <sup>O</sup>	264 <sup>O</sup>	264 <sup>O</sup>	264 <sup>O</sup>	264 <sup>O</sup>	264 <sup>O</sup>	222	212	212	210	210	204	238	238	228	226	220	222	222	226	226	248 <sup>O</sup>	248	248	248	
23	266	266	266	266	258	256	178	242	220	220	212	212	212	212	212	212	212	220	234	246	246	246	246	264	264	
24	264	264	264	264	264	264	234	214	210	210	210	A	190	228	228	196	H	234	234	234	234	244	260	262	290	
25	286	290	290	290	290	288	254	252	H	252	250	250	224	210	210	210	H	232	232	232	232	232	232	240	252	
26	264	264	264	264	A	264	174	174	H	196	210	210	198	198	198	220	220	220	232	232	232	232	244	244	244	
27	266	266	266	264	264	264	232	230	212	212	204	194	200	202	202	206	224	224	224	224	224	244	244	244	246	
28	268	268	272	272	266	250	214	214	214	206	200	196	196	208	220	220	226	226	226	226	226	226	248	256	256	
29	292	292	292	292	258	236	226	218	218	218	216	238	226	218	H	222	H	224	226	224	224	224	256	264	264	
30	286	286	280	270	240	240	184	184	200	204	204	204	204	204	204	234	234	234	220	230	230	250	254	254	254	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	29	29	30	28	26	29	29	28	30	30	30	29	29	27	29	30	30	30	30	30	30	
MED	270	268	271	270	258	256	232	225	216	210	208	204	205	206	210	208	220	226	230	231	234	246	248	254	254	
U Q	284	286	284	280	276	265	246	232	222	217	215	212	212	212	214	220	224	232	234	240	246	250	256	262	262	
L Q	262	262	264	264	251	249	224	215	210	202	198	197	196	198	202	200	211	220	224	226	228	232	240	246	246	

**SEP. 2013** h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

SEP. 2013 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	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	112	112	112	A	A	A	112	A	112	112	112	112						
2						B	108	108	108	108	108	108	108	108	108	108	108	108	A					
3							108	118			A		A	A	116	112	112	112						
4						A	A	A	A				A	A		112	112							
5							A	112		112	112	106	106	106	106	106	106	112		A				
6						B	124	124			114	114	114	114	114	114	114	114		B				
7						B	122	114	114	130	118		118	A	114	114	114							
8						A	108		108	108		108	114	114	114	114	114	114						
9						B	114	114	126		106	106	106	106	106	106	106	110		B				
10						B	116	116	A	A			116	116	112	112	112	112		B				
11						B		112	112			110	110	110	110	110	110	122	136					
12							106	106	106	106		106	106	106	106	106	106		A	B				
13						B	A	112	112	112	112	112	112	112	118	118	118		A					
14						B	118		114	114	112	108	108	108	108	108	108	108		A				
15						B	110	110	110	110	110		110	110	110	110	110	E A	138					
16						B	136	114	108	108	108	108	108	114	114	114	114	114		B				
17						B	104	104	104	104	104	108	108	108	108	108	108		A	B				
18							114	114	A	114	114	112	112	112	112	112	112	112		A				
19						B	A	A	A		112	112	112	112	112	112	112		A					
20							A	112	112	112	112	112	112	112	106	106	112	114						
21						B	110	110	110	122	110	110	112	112	112	112	112	116	116					
22							116	116	116	116	116	116	116	116	116	116	116	116	116					
23							114	114	114	114	112	112	110	110	110	110	110	110						
24							148	122	122	118	118	106	106	106	106	118	118	118		A				
25							B	114	114	114	114	114	114	114		A	A							
26							124	122	114	112	110	110	110	110	110	110	110		A					
27							A	112	A	A		118	118	118	118	118	118	120		A				
28							A	120		120	108	108	108	108	108	108	108		A	A				
29							A	118	118	118	118	114	98	98		98			A	A				
30								126	120	120	114	114	E A	138	120	116	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							20	26	21	22	23	24	28	26	27	29	28	18	1					
MED							114	114	112	113	112	110	111	110	112	112	112	112	136					
U Q							123	118	115	116	114	113	114	114	114	114	114	116						
L Q							109	112	109	110	110	108	108	108	108	108	109	112						

SEP. 2013 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Wakkanai

SEP. 2013 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	B	B	B	B	B	130	130	120	100	100	100	100	168	102	B	112	112	112	112	112	112	112	112	B	
2	B	B	122	122	122	120	118	118	118	118	118	112	182	G	G	170	144	112	112	106	106	106	106	106	
3	106	106	106	110	110	110	110	110	110	110	146	108	106	106	G	G	120	120	120	120	120	112	B	B	
4	100	B	B	122	122	108	108	108	108	108	108	108	108	108	110	116	116	116	114	112	104	104	116	108	
5	102	102	B	114	114	114	112	112	108	104	104	170	156	192	G	206	206	136	112	106	106	106	98	98	
6	92	92	B	B	B	B	102	102	102	102	102	102	102	182	G	108	146	144	B	100	100	100	98	B	
7	98	B	B	B	B	B	154	110	176	186	96	96	96	96	G	96	106	106	106	106	106	106	106	106	
8	98	98	96	114	114	114	114	120	120	120	88	88	88	88	152	G	134	118	116	112	110	110	106	106	
9	106	100	100	100	100	B	G	138	114	104	B	184	88	172	182	190	G	134	94	94	94	B	100	100	
10	B	B	B	B	B	B	132	100	100	100	100	98	182	182	102	164	G	142	B	118	114	106	106	106	
11	106	B	86	B	108	108	108	108	110	110	108	184	100	G	G	100	100	102	G	102	102	102	B	B	
12	B	B	102	102	B	B	138	194	194	194	96	G	182	182	168	142	134	126	B	104	102	102	102	100	
13	96	B	B	B	114	114	140	106	102	102	102	102	194	190	190	96	128	96	108	108	102	102	102	102	
14	94	B	B	B	B	B	148	98	188	130	130	130	156	150	132	132	G	132	114	114	102	102	B	B	
15	B	B	B	104	B	104	G	124	108	108	108	108	108	186	136	136	136	136	118	106	106	102	102	102	
16	90	90	90	B	B	B	154	198	182	118	G	166	116	106	160	138	138	138	114	110	102	102	102	102	
17	96	96	94	B	B	B	172	150	122	180	96	96	96	168	168	140	140	182	106	100	100	100	B	B	
18	B	B	B	120	B	B	140	124	102	178	178	92	182	92	92	126	126	126	120	120	102	102	102	B	
19	B	100	B	B	B	B	98	98	98	146	176	G	G	G	96	152	204	G	108	B	108	B	104	102	102
20	102	102	102	124	108	108	108	118	118	G	178	110	168	G	168	172	170	122	118	118	114	112	102	102	
21	100	B	100	B	B	B	194	202	G	G	200	200	190	174	98	134	202	128	94	120	116	B	B	B	
22	B	B	B	116	B	114	G	G	180	180	90	90	170	170	188	112	112	G	G	B	112	102	102	B	
23	B	B	B	96	B	B	162	162	G	G	162	G	118	94	94	G	224	170	G	106	106	106	104	B	
24	98	B	B	B	104	B	104	208	158	138	128	124	124	162	178	112	166	170	90	90	112	112	B	B	
25	98	98	102	102	102	102	114	114	114	114	114	114	114	114	114	112	112	112	112	108	106	B	B	B	
26	B	106	106	106	104	104	164	164	180	116	116	180	176	118	156	142	G	128	104	104	104	104	104	104	
27	B	102	102	102	102	102	102	102	102	102	102	102	186	128	106	G	106	106	106	106	106	106	106	106	
28	106	106	B	106	114	B	104	104	104	104	192	92	G	92	146	142	138	118	B	114	110	110	106	106	
29	104	104	92	92	B	B	92	G	G	114	178	170	150	150	106	212	138	108	102	92	92	92	92	92	
30	B	B	B	B	B	B	168	168	188	160	G	156	144	G	100	168	152	102	B	110	106	102	100	98	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	18	14	14	17	14	14	27	28	27	29	26	28	27	26	22	28	25	28	22	29	28	26	23	19	
MED	99	101	101	106	109	109	118	118	114	116	108	109	150	123	141	141	134	119	112	108	106	104	102	102	
U Q	104	104	102	118	114	114	154	156	176	161	146	161	176	172	168	171	145	135	118	114	111	106	106	106	
L Q	96	98	94	102	104	104	108	107	102	104	100	99	106	98	106	112	114	107	106	104	102	102	102	100	

SEP. 2013 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Wakkanai

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

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

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

SEP. 2013 TYPES OF Es  
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

SEP. 2013 f<sub>XI</sub> (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

H	00	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 53	X 52	X 55	X 55	X 54														X 80	X 85	X 84	X 64	X 58	X 52	
2	X 52	X 49	X 49	X 50	X 51														X 84	X 85	X 72	X 62	X 60	X 58	
3	X 56	X 55	X 56	X 58	X 48														X 79	X 88	X 77	X 66	X 65	X 64	
4	X 61	X 62	X 61	X 59	X 56														X 99	X 100	X 81	X 64	X 62	X 56	
5	X 60	X 57	X 59	X 55	X 52														X 89	X 83	X 75	X 72	X 69	X 66	
6	X 63	X 66	X 66	X 62	X 55														X 95	X 86	X 74	X 72	X 70	X 71	
7	X 69	X 67	X 62	X 60	X 59														X 102	X 101	X 71	X 61	X 63	X 64	
8	X 61	X 61	X 62	X 58	X 51	X 53													X 89	X 83	X 76	X 65	X 65	X 64	
9	X 60	X 60	X 60	X 54	X 54														X 76	X 79	X 73	X 70	X 69	X 70	
10	X 67	X 63	X 58	X 56	X 52														X 73	X 79	X 77	X 74	X 66	X 64	
11	X 63	X 60	X 60	X 56	X 51														X 81	X 72	X 57	X 58	X 56	X 58	
12	X 56	X 55	X 56	X 54	X 52														X 94	X 85	X 71	X 66	X 61	X 61	
13	X 59	X 57	X 56	X 55	X 50														X 79	X 76	X 66	X 66	X 68	X 65	
14	X 62	X 65	X 61	X 59	X 56														X 86	X 70	X 66	X 65	X 65	X 64	
15	X 62	X 58	X 56	X 58	X 45														X 93	X 84	X 71	X 65	X 63	X 62	
16	X 57	X 56	X 55	X 55	X 51														X 92	X 86	X 66	X 59	X 59	X 59	
17	X 56	X 56	X 55	X 55	X 52														X 110	X 100	X 44	X 42	X 48	X 50	
18	X 49	X 48	X 49	X 51	X 48														X 88	X 76	X 61	X 58	X 58	X 60	
19	X 58	X 56	X 55	X 54	X 55														X 94	X 72	X 68	X 69	X 64	X 60	
20	X 56	X 55	X 52	X 53	X 53														X 92	X 82	X 67	X 62	X 61	X 60	
21	X 54	X 52	X 54	X 52	X 50														X 76	X 68	X 67	X 64	X 61	X 61	
22	X 60	X 61	X 64	X 67	X 66	X 59													X 85	X 74	X 62	X 58	X 56	X 55	
23	X 52	X 51	X 51	X 52	X 47														X 74	X 68	X 57	X 58	X 56	X 56	
24	X 54	X 52	X 52	X 52	X 48														X 85	X 75	X 60	X 62	X 60	X 59	
25	X 61	X 61	X 56	X 53	X 52														X 104	X 77	X 64	X 61	X 61	X 61	
26	X 59	X 59	X 56	X 52	X 51														X 95	X 81	X 69	X 69	X 69	X 69	
27	X 64	X 62	X 58	X 56	X 52														X 73	X 66	X 63	X 60	X 52	X 52	
28	X 54	X 55	X 52	X 51	X 52														X 106	X 77	X 54	X 52	X 48	X 49	
29	X 49	X 48	X 47	X 45	X 45														X 90	X 64	X 53	X 48	X 46	X 48	
30	X 48	X 46	X 50	X 49	X 38														X 88	X 65	X 50	X 51	X 52	X 54	
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	2													30	30	30	30	30	30	
MED	X 58	X 56	X 56	X 55	X 52	X 56													X 88	X 79	X 67	X 63	X 61	X 60	
U Q	X 61	X 61	X 60	X 58	X 54														X 94	X 85	X 73	X 66	X 65	X 64	
L Q	X 54	X 52	X 52	X 52	X 50														X 80	X 72	X 61	X 58	X 56	X 56	

SEP. 2013 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

SEP. 2013 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D\H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	47	46	49	49	48	50	72	78	76	70	71	70	73	78	83	72	70	66	74	79	78	58	52	F
2	F	43	42	44	45	44	68	70	60	71	64	65	65	78	70	66	65	71	78	79	66	56	54	52
3	50	49	50	52	42	43	57	70	66	71	66	68	72	68	73	66	62	64	73	82	70	60	59	58
4	55	56	55	53	50	48	62	87	79	63	67	71	79	71	65	65	71	82	93	94	74	58	56	50
5	54	51	53	49	46	44	66	76	78	70	66	70	72	71	68	71	76	72	83	77	69	66	63	60
6	57	60	60	56	49	49	73	80	73	68	70	73	80	76	71	68	73	84	89	80	68	66	64	64
7	63	61	55	54	53	51	71	86	77	69	69	76	72	70	72	71	77	84	96	95	65	55	56	58
8	55	55	56	52	45	47	68	78	74	80	77	78	83	79	81	84	87	81	83	78	69	58	58	58
9	54	54	54	48	47	48	68	70	82	92	82	76	76	72	76	77	75	65	70	73	67	64	63	64
10	61	57	52	50	45	45	60	72	84	72	71	81	84	81	80	77	76	68	67	73	71	68	60	58
11	57	54	54	50	45	45	65	74	71	80	77	73	72	75	85	83	74	80	75	66	51	52	50	52
12	50	49	50	48	46	46	67	72	70	72	77	71	68	76	78	81	70	75	87	79	64	60	55	55
13	53	51	50	49	43	43	60	82	90	86	75	69	76	80	80	84	87	80	73	70	60	60	61	59
14	56	59	55	53	50	52	64	74	74	65	66	74	79	70	80	79	81	83	80	64	60	58	59	57
15	56	52	50	52	39	39	61	64	71	78	75	74	82	83	78	80	79	77	87	78	65	58	57	56
16	51	50	49	49	45	45	66	71	68	79	72	86	85	80	82	82	86	86	86	80	60	53	52	53
17	50	50	49	49	46	48	66	68	86	89	69	76	78	74	74	73	79	92	104	94	38	36	42	44
18	43	42	43	45	42	43	60	73	75	81	84	86	90	83	82	80	77	86	82	70	55	52	52	54
19	51	50	49	48	48	48	69	73	78	79	73	90	90	90	78	72	72	85	87	66	62	63	58	53
20	50	49	46	47	46	52	74	78	79	82	84	87	90	90	81	77	78	80	86	76	61	56	55	54
21	48	46	48	46	44	38	64	69	72	78	90	87	80	76	71	75	75	81	70	61	61	58	55	55
22	54	55	58	F	F	53	68	66	67	76	82	81	86	81	79	80	80	76	79	68	56	52	50	49
23	46	45	45	46	40	39	65	71	75	80	80	74	78	81	80	83	81	77	68	62	51	51	50	49
24	48	46	46	46	44	46	68	80	76	66	78	81	82	86	82	78	82	86	79	69	53	56	54	53
25	55	55	50	46	46	50	68	79	81	88	83	90	86	85	83	86	92	99	96	71	58	55	55	55
26	53	52	49	46	45	43	60	74	87	93	77	81	86	78	74	78	81	80	89	75	63	63	63	63
27	58	56	52	50	46	45	62	77	81	74	73	82	81	81	84	80	85	82	67	60	57	54	46	46
28	48	49	46	45	46	44	58	67	76	75	76	82	75	75	80	84	88	97	100	71	48	46	42	S 43
29	43	42	41	39	39	41	58	70	77	74	72	79	80	82	82	84	83	85	84	58	47	42	40	42
30	42	40	43	42	32	36	59	68	80	76	80	79	81	80	86	78	84	92	82	59	44	45	46	48
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29
MED	53	50	50	49	45	45	66	73	76	76	75	77	80	78	80	78	78	81	82	73	61	57	55	54
U Q	56	55	54	51	46	48	68	78	80	80	80	82	84	81	82	82	83	85	87	79	67	60	59	58
L Q	48	46	46	46	44	43	60	70	72	71	70	73	75	75	74	72	74	76	74	66	55	52	50	50

SEP. 2013 foF2 (0.1MHz)

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## IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	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	LU	LU	LU	LU	L	L	L								
2								L	528	496	480	A	448	484	476	LU	L	A							
3							A	L	L	468	LU	L	504	504	528	460	L	A	A						
4							L	A	L	LU	L	512	LU	L	LU	L	L	A	A						
5							L		LU	LU	L	LU	L	L	L	L	L	A							
6									LU	LU	L	LU	LU	LU	LU	LU	L	L							
7								A	L	A	LU	L	L	LU	L	LU	L	L	L						
8								A	A	L	L	520	484	A	LU	L	L								
9								L	L	A	484	500	LU	L	484	L	L	A							
10								A	LU	LU	LU	LU	LU	L	L	L	L								
11								L	LU	L	496	484	496	488	488	L	L								
12								L	LU	LU	LU	LU	LU	L	L	A	L								
13								L	A	508	A	LU	L	L	L	A	A								
14								A	L	LU	L	480	L	L	A	A	A	A							
15								L	LU	LU	LU	LU	LU	L	L	L	A	L							
16								A	L	L	LU	LU	LU	L	L	L	A								
17									A	LU	L	492	L	LU	L	A	LU	A							
18								A	LU	L	480	LU	LU	LU	L	L	L	A	A						
19								L	L	A	L	L	LU	L	L	L	L	A							
20								L	LU	LU	LU	LU	LU	L	L	L	L								
21								L	LU	LU	L	A	LU	LU	L	L	L	L	A						
22									A	LU	LU	LU	L	L	L	L	L								
23									A	LU	L	504	L	L	L	L									
24								L	L	L	L	L	LU	L	A	L									
25								A	A	LU	L	LU	LU	LU	L	A	L								
26								L	A	L	L	A	A	L	L	L									
27									LU	L	A	L	L	L	L	A									
28									A	L	LU	L	L	L	L	A	L								
29								L	L	LU	LU	LU	L	A	L	A	A								
30								L	LU	LU	L	L	LU	L	L	A									
31									504	484					460										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									1	6	15	18	21	15	9	2	2								
MED									528	478	492	494	500	504	488	480	440								
U Q										LU	LU	LU	LU	LU	LU	LU	LU								
L Q										488	508	504	512	512	498										
										472	480	484	494	488	468										

SEP. 2013 foF1 (0.01MHz)

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## IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							BUR 216	R	A	A	A	R	A	A	A	R	R	A						
2							BUR 220	A	A	A	A	A	R	A	R	R	A	A						
3							B	A	A	A	A	A	R	R	A	A	A	A						
4							B 212	A	R	R	R	R	R	R	R	R	R	A	A					
5							BUR 228	A	R	R	A	A	A	A	A	A	R	A	A					
6							BUR 220	A	R	A	R	A	A	A	A	A	A	A						
7							B 204	292	A	A	A	A	A	A	A	A	A	A	R					
8							A	A	A	A	A	A	A	A	A	A	A	A						
9							BUR 216	A	R	R	A	A	A	A	A	A	A	A						
10							B 204	A	A	R	A	R	A	A	A	A	A	AUR 240						
11							B	A	A	A	A	A	A	A	A	A	A	A						
12							B	B	A	R	A	A	R	A	A	R	R	A	A					
13							B	A	A	A	A	A	R	AUR 356	A	R	R	A	A					
14							B	A	A	A	R	A	A	R	A	A	A	A						
15							B 176	R	A	A	R	A	A	A	A	A	R	A	A					
16							B	A	268	A	R	R	R	R	A	A	R	A	A					
17							BUR 176	A	A	A	A	R	R	R	R	A	A	R	A					
18							BUR 204	A	A	A	R	R	R	R	A	A	A	A						
19							BUR 184	A	R	A	R	R	A	A	R	R	A	A						
20							B	A	A	A	A	R	R	R	A	A	A	A						
21							B 184	A	A	A	R	R	R	R	R	R	R	A	A					
22							UR 208	A	R	A	A	A	A	R	R	A	R	B						
23							BUR 212	A	A	R	A	A	R	A	R	R	UR 200							
24							B	B	A	A	R	A	R	R	A	A	R	A	A					
25							BUR 216	R	A	R	A	R	R	A	R	A	AUR 196							
26							BUR 200	R	A	A	R	R	A	A	R	R	A	B						
27							BUR 200	A	R	A	A	A	R	A	R	A	A	A						
28							B	A	R	A	A	A	A	A	A	A	A	A						
29							BUR 188	R	R	R	A	R	A	A	R	A	A	A						
30							BUR 192	R	A	R	R	A	R	R	R	AUR 260	A	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							20	2								1		1	3					
MED							UR 204	280							UR 356		UR 260	AUR 200						
U Q							UR 216												UR 240					
L Q							UR 190												UR 196					

SEP. 2013 foE (0.01MHz)

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## IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	20	E	B	E	B	E	B	E	B	E	B	G	G																	
2	15	E	B	E	B	E	B	E	B	E	B	G	G	40	38	35	G	G	28	18	E	B	E	B						
3	15	E	B	E	B	E	B	E	B	E	B	G	G	40		G	G	35	35	20	18	22	E	B						
4	18	E	B	E	B	E	B	E	B	E	B	G	G	G	G	G	G	38	31	E	B	30	31	17	20	26				
5	18	E	B	E	B	E	B	E	B	E	B	G	G																	
6	24	22	16	E	B	E	B	E	B	E	B	G	G	41	40	39	38	38	35	28	16	E	B	E	B					
7	15	E	B	E	B	E	B	E	B	E	B	G	G	41	41	38	39	34	G	18	E	B	E	B						
8	21	E	B	E	B	E	B	E	B	E	B	G	G	41	39	39	42	39	34	31	30	25	41	30	E	B				
9	20	21	16	E	B	E	B	E	B	E	B	G	G	39	41	40	39	39	34	35	26	E	B	E	B					
10	14	E	B	E	B	E	B	E	B	E	B	G	G																	
11	16	E	B	E	B	E	B	E	B	E	B	G	G	37	38	39	36	38	35	30	24	19	15	14	16	15	14			
12	14	E	B	E	B	E	B	E	B	E	B	G	G	40	40		G	G	32	24	16	16	14	15	13	16				
13	15	E	B	E	B	E	B	E	B	E	B	G	G	38		G	G	36	28	27	15	15	15	15	15	14				
14	15	E	B	E	B	E	B	E	B	E	B	G	G	40	40		G	38	41	41	36	28	21	22	14	14	15	14		
15	15	E	B	E	B	E	B	E	B	E	B	G	G	36	38		G	40	40	39	37									
16	15	E	B	E	B	E	B	E	B	E	B	G	G	41	37		G	36	24	E	B	E	B	22	18	15	14			
17	15	E	B	E	B	E	B	E	B	E	B	G	G	G	G		G	39	35		24	16	15	15	13	14	13			
18	15	E	B	E	B	E	B	E	B	E	B	G	G	G	G		G	37	36	33	40	30	15	15	15	15	16			
19	15	E	B	E	B	E	B	E	B	E	B	G	G	37	36		G	G												
20	15	E	B	E	B	E	B	E	B	E	B	G	G	37	38	35														
21	15	E	B	E	B	E	B	E	B	E	B	G	G	G	G	G														
22	14	E	B	E	B	E	B	E	B	E	B	G	G	G	G															
23	15	E	B	E	B	E	B	E	B	E	B	G	G	38	27	39														
24	15	E	B	E	B	E	B	E	B	E	B	G	G	40	40		G	32	30	24	21									
25	15	E	B	E	B	E	B	E	B	E	B	G	G	38																
26	14	E	B	E	B	E	B	E	B	E	B	G	G	41	37		G	G	31	20	E	B	E	B	15	14	15	14		
27	15	E	B	E	B	E	B	E	B	E	B	G	G	40		G														
28	15	E	B	E	B	E	B	E	B	E	B	G	G	39	36	38	38	38	38	36	38	27	30	24	20	16	E	B	E	B
29	15	E	B	E	B	E	B	E	B	E	B	G	G	G	G															
30	16	E	B	E	B	E	B	E	B	E	B	G	G	38		G	G	38	35	21	15	32	18	15	15	15	16			
31	16	E	B	E	B	E	B	E	B	E	B	G	G	42		G	G	34	31	26	19	E	B	E	B	15	19	20	E	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E	B	E	B	E	B	E	B	E	B	E	B	G																	
UQ	16	E	B	E	B	E	B	E	B	E	B	G	G	35	38	39	40	39	39	38	36	35	30	22	18	18	17	19	16	
LQ	E	B	E	B	E	B	E	B	E	B	E	B	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
	15	15	14	14	14	14																								

SEP. 2013 fbEs (0.1MHz)

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## IONOSPHERIC DATA STATION Kokubunji

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

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

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

SEP. 2013 fmin (0.1MHz)

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## IONOSPHERIC DATA STATION Kokubunji

SEP. 2013 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	289	285	282	302	292	303	335	366	372	344	330	322	327	319	333	330	332	332	324	312	328	327	279	F	
2	F	269	288	304	323	332	345	353	309	341	338	334	308	326	316	340	315	322	329	326	325	279	293	285	
3	283	275	287	323	323	310	339	351	349	341	335	327	327	309	341	325	317	335	306	326	332	285	298	281	
4	291	277	293	301	299	298	327	364	371	376	340	315	321	321	310	324	317	312	322	343	346	290	286	286	
5	286	291	286	308	313	309	345	364	366	359	313	316	333	333	309	321	331	325	325	312	304	295	303	308	
6	281	310	310	301	315	312	362	383	359	355	333	320	334	325	329	328	319	320	321	317	312	289	289	291	
7	294	313	314	296	296	303	335	371	352	357	318	324	340	320	322	319	321	315	322	346	346	287	283	287	
8	298	307	319	346	293	308	364	362	352	343	338	318	328	336	304	322	329	325	329	319	332	266	302	295	
9	285	286	311	284	295	307	355	342	346	349	369	343	339	328	317	331	333	337	322	324	316	298	283	303	
10	303	310	306	308	300	303	359	356	359	343	344	341	333	338	324	334	342	334	324	315	312	307	308	288	
11	299	297	313	301	278	296	351	369	348	350	341	335	320	320	312	326	327	347	339	335	294	288	284	282	
12	286	293	295	305	306	313	362	376	354	346	342	362	308	331	328	337	335	324	326	341	317	310	293	295	
13	280	293	305	309	310	315	339	333	352	353	338	328	310	343	324	323	338	340	325	322	308	298	297	303	
14	302	294	308	297	282	301	347	357	373	369	350	343	340	319	326	335	343	343	336	326	298	292	286	287	
15	315	299	299	336	320	311	383	366	357	359	341	323	333	337	326	344	343	327	329	340	328	306	298	305	
16	305	297	298	317	310	317	371	379	352	353	342	320	323	314	318	334	337	333	339	337	339	302	293	299	
17	292	294	295	303	322	337	372	363	358	372	320	333	334	337	317	320	323	323	348	365	356	320	290	307	
18	297	304	300	316	328	329	379	357	339	344	334	323	319	314	341	334	345	333	345	334	310	300	299	286	
19	296	297	287	300	295	305	371	366	352	344	297	321	322	341	337	334	313	329	335	335	291	312	304	302	
20	294	293	282	293	300	323	359	363	353	357	341	321	317	332	329	323	325	334	339	341	313	304	289	298	
21	290	294	308	320	335	353	376	367	358	340	349	338	343	335	320	320	336	344	341	319	311	288	282	294	
22	286	297	306	F	F	300	349	354	348	341	339	339	333	312	339	332	348	334	339	336	321	313	296	299	
23	292	304	314	317	321	317	363	353	344	351	351	338	329	333	316	325	338	343	338	321	311	305	302	290	
24	288	303	304	309	288	293	349	370	378	353	338	336	317	321	326	309	325	339	340	322	311	278	283	265	
25	289	297	287	286	302	292	352	354	343	355	340	327	339	322	313	309	315	329	347	333	291	290	286	299	
26	300	300	289	316	310	321	360	348	359	359	354	321	339	342	322	333	339	326	333	339	299	298	301	312	
27	304	312	310	317	321	298	371	370	371	360	333	336	320	329	331	331	343	352	329	317	307	320	305	308	
28	296	300	300	316	330	322	367	372	359	354	346	331	340	321	320	323	330	341	349	355	296	300	331	S	302
29	297	311	322	325	325	334	369	368	374	348	338	342	330	325	327	335	339	341	361	351	300	310	296	290	
30	307	310	305	318	324	303	369	364	366	365	345	331	329	333	331	331	334	348	356	353	298	282	291	286	
31																									
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	
MED	294	297	302	308	310	310	360	364	356	353	340	330	329	327	324	329	332	334	334	334	312	298	293	295	
U Q	300	304	310	317	322	321	369	369	366	359	344	338	334	335	329	334	339	341	340	341	328	307	301	302	
L Q	287	293	289	301	296	303	347	354	349	344	334	321	320	320	317	323	323	325	325	321	300	288	286	286	

SEP. 2013 M(3000)F2 (0.01)  
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## IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	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	LU	LU	LU	LU	L	L	L								
2								L		UL	UL	UL	UL	UL	UL	UL	UL	A							
3							A	L	L		LU	LU	LU	LU	LU	LU	LU	A	A						
4							L	A	L	LU	LU	LU	LU	LU	LU	LU	LU	A	A						
5							L			LU	LU	LU	LU	LU	LU	LU	LU	L	L	A					
6										LU	LU	LU	LU	LU	LU	LU	LU	L	L						
7								A	L	A	UL	UL	UL	UL	UL	UL	UL	L	L						
8								A	A	L	L				A	UL	L	L							
9										L	L	A			LU	LU	L	A							
10										A	LU	LU	LU	LU	LU	LU	L	L							
11									L	LU	LU	LU	LU	LU	LU	LU	L	L							
12									L	LU	LU	LU	LU	LU	LU	LU	L	L	A	L					
13									L	A		A	UL	UL	L	L	L	A	A						
14									A	L	LU	LU	L	L	A	A	A	A							
15									L	LU	LU	LU	LU	LU	L	L	L	A	L						
16								A	L	L	LU	LU	LU	LU	L	L	L	A							
17										A	LU	LU	L	L	LU	LU	A	UL	A						
18								A	LU	L	LU	LU	LU	L	L	L	L	A	A						
19								L	L	A	L	L	LU	LU	L	L	L	L	A						
20									L	LU	LU	LU	LU	LU	L	L	L	L							
21								L	LU	LU	L	A	LU	LU	L	L	L	L	A						
22										A	LU	LU	L	L	L	L	L	L							
23										A	LU	LU	L	L	L	L	L	L							
24									L	L	L	L	LU	LU	A	L	L								
25								A	A	LU	L	LU	LU	L	L	A	L								
26									L	A	L	L	A	A	L	L	L								
27										LU	L	A	L	L	L	L	A								
28									A	L	LU	L	L	L	L	A	L								
29									L	L	LU	LU	LU	A	L	A	A								
30									L	LU	LU	L	L	LU	LU	L	A								
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									1	6	15	18	21	15	9	2	2								
MED									367	397	398	394	384	375	376	374	356								
U Q										408	411	408	398	394	384										
L Q											381	389	387	375	368	370									

SEP. 2013 M(3000)F1 (0.01)

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## IONOSPHERIC DATA STATION Kokubunji

SEP. 2013 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								244	232	258	268	288	292	304	278	276	276							
2								232	358	268	278	312	322	298	300	270	310	276						
3							238	250	248	272	270	314	302	328	280	290	276	278						
4							284	226	230	238	292	314	294	280	298	292	300	278						
5							256		236	242	292	298	286	292	336	300	280	240						
6									244	262	282	300	286	284	292	298	292	264						
7								230	252	238	296	282	270	304	304	302	284	272						
8								224	232	268	272	314	276	266	316	268	264							
9									258	254	240	284	278	270	300	276	252							
10									244	246	258	278	278	280	288	274	254							
11									264	258	272	262	308	302	288	274	260							
12									254	274	262	244	288	284	288	280	250	278						
13									256	234	272	250	314	250	280	276	256	244						
14									226	230	256	276	280	262	290	258	260	236						
15									246	256	264	270	282	266	270	266	256	258						
16								218	242	252	262	292	278	296	290	274	264							
17									226	270	274	262	266	304	262	284	258							
18								218	250	254	268	280	280	284	270	276	250	252						
19								238	258	258	298	282	278	262	268	268	274	254						
20									252	238	256	280	280	268	270	276	266							
21								218	240	264	256	246	262	274	282	276	268	236						
22									260	264	268	270	260	264	274	252								
23									254	248	268	294	280	274	276	250								
24									228	234	272	278	304	276	266	266								
25								234	236	244	262	270	256	294	280	272	276							
26									240	240	236	288	262	258	268	274	264							
27									240	246	266	280	280	278	272	248								
28									238	240	262	274	256	294	290	272	266							
29									230	250	262	272	282	280	274	264	248							
30									246	244	264	256	284	278	270	266	262							
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	11	26	30	30	30	30	30	30	30	29	14						
MED							256	230	244	251	264	278	280	280	281	274	264	258						
U Q							284	238	252	258	272	288	292	294	292	276	276	276						
L Q							238	218	236	240	258	268	276	266	270	268	253	244						

SEP. 2013 h'F2 (KM)

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IONOSPHERIC DATA STATION Kokubunji

SEP.2013 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	EAE	BE	BE	BE	BE	BE	BE	BE																	
2	302	300	296	262	256	262	224	208	202	196	192	194	190	194	194	196	202	242	242	240	216	EAE	EAE	EAE	EAE
3	EAE	BE	BE	BE	BE	BE																			
4	278	278	264	248	254	282	224		A	196	196	196	208	204	202	202	204								
5	EAE	BE	BE	BE	BE	BE																			
6	274	274	264	242	222	256	214	224	194	198	192	184	202	206	206	204	208								
7	EAE	BE	BE	BE	BE	BE																			
8	320	290	250	228	222	246	226	216	190	178	180	214	216	210	204	204	212	230	238	218	210	EAE	EAE	EAE	EAE
9	EAE	BE	BE	BE	BE	BE																			
10	258	244	242	242	244	254	214		A	198		198	212	204	204	212	202	214	238	244	216	198	250	308	286
11	EAE	BE	BE	BE	BE	BE																			
12	274	252	236	210	304	252	216																		
13	EAE	BE	BE	BE	BE	BE																			
14	284	278	250	256	260	268	212	216	210	208		198	198	192	200	198									
15	EAE	BE	BE	BE	BE	BE																			
16	242	244	234	236	236	264	226	226			200	196	200	202	192	202	214	210	220	228	234	228	236	238	264
17	EAE	BE	BE	BE	BE	BE																			
18	262	276	254	238	296	292	220	218	208	200	196	198	198	202	216	214	216	228	218	216	204	280	292	286	
19	EAE	BE	BE	BE	BE	BE																			
20	286	276	272	250	256	250	224	214	198	198	204	198	196	204	216	204									
21	EAE	BE	BE	BE	BE	BE																			
22	270	276	262	238	230	242	224	240	210		180		202	216	190	200									
23	EAE	BE	BE	BE	BE	BE																			
24	270	264	258	252	280	264	222	222		182	182	190	196	202											
25	EAE	BE	BE	BE	BE	BE																			
26	240	228	254	222	204	246	214	210	192	200	192	196	204	202	204	212									
27	EAE	BE	BE	BE	BE	BE																			
28	248	262	262	228	226	234	214																		
29	EAE	BE	BE	BE	BE	BE																			
30	272	274	270	254	228	228	200	204	240		196	184	208	204	206		214								
31	EAE	BE	BE	BE	BE	BE																			
32	272	280	280	234	232	228	212			200	194	196	190	202	198	206	206								
33	EAE	BE	BE	BE	BE	BE																			
34	264	272	284	284	272	262	210	198	200		210	204	188	184	202	200	218								
35	EAE	BE	BE	BE	BE	BE																			
36	258	264	290	282	270	244	214	214	198	188	192	180	186	192	200	202	216	230	226	214	222	246	264	242	
37	EAE	BE	BE	BE	BE	BE																			
38	262	284	258	238	220	216	210	182	186	184	192		196	206	204	212	222								
39	EAE	BE	BE	BE	BE	BE																			
40	262	258	246	272	242	262	208	210	220		202	200	184	190	198	208	206	226	218	212	214	224	250	258	
41	EAE	BE	BE	BE	BE	BE																			
42	268	272	262	238	232	250	218	216	214		204	192	198	210	210	202	210	222	214	208	218	262	256	266	
43	EAE	BE	BE	BE	BE	BE																			
44	272	272	272	264	268	268	220	216	196	192	194	204	198	192		206	240	230	222	230	228	284	318	312	
45	EAE	BE	BE	BE	BE	BE																			
46	290	230	270	248	274	270	218			190	194	198	192	198	204		230	240	212	208	214	268	264	264	
47	EAE	BE	BE	BE	BE	BE																			
48	256	260	246	246	234	230	212	216	202		188	204				204	208	212	234	224	210	226	238	252	252
49	EAE	BE	BE	BE	BE	BE																			
50	238	242	224	228	228	258	220	222	222	200	196		204	214	204	212									
51	EAE	BE	BE	BE	BE	BE																			
52	254	274	272	240	232	224	206	206		190	196	186	196	206	212		226	234	218	200	206	232	264	270	
53	EAE	BE	BE	BE	BE	BE																			
54	264	272	256	250	240	224	208	214	198	200	196	192	182		208										
55	EAE	BE	BE	BE	BE	BE																			
56	276	274	258	230	214	258	212	214	206	192	194	186	184	198	216	210									
57																									
CNT	30	30	30	30	30	30	29	24	25	23	29	26	29	27	28	25	18	20	30	30	30	30	30	30	30
MED	EAE	BE	BE	BE	BE	BE	BE	BE																	
UQ	270	273	262	243	235	253	214	214	200	196	194	198	198	202	204	206	214	227	224	215	216	247	263	264	
LQ	EAE	BE	BE	BE	BE	BE																			
UQ	278	278	272	254	260	264	221	217	210	200	196	204	202	206	209	211	222	232	232	222	226	262	280	276	
LQ	EAE	BE	BE	BE	BE	BE																			
LQ	258	260	250	236	228	240	211	209	196	190	192	190	194	192	202	202	210	224	216	210	212	238	252	252	

SEP.2013 h'F (KM)

## IONOSPHERIC DATA STATION Kokubunji

SEP. 2013 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	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	120	114	A	A	A	118	A	A	A	116	116	A							
2						B	116	A	A	A	A	A	116	A	116	114	118	A							
3						B	116	A	A	A	A	A	116	118	110	A	116	A							
4						B	120	A	112	114	116	122	124	124	124	124	A	A							
5						B	120	114	114	110	A	A	A	A	A	114	A	112							
6						B	114	A	116	A	114	A	A	A	A	A	104	A							
7						B	120	116	A	A	A	A	A	A	A	A	A	120							
8							A	A	A	A	A	A	A	A	A	A	A	A							
9						B	116	A	118	118	A	A	A	A	A	A	118	118							
10						B	116	118	118	122	A	124	A	A	A	A	A	124							
11						B	118	116	A	A	A	A	A	A	A	A	A	118							
12						B	B	A	122	A	A	122	A	A	122	122	118	118							
13						B	A	A	A	A	A	A	128	A	120	126	A	A							
14						B	A	116	A	116	A	120	122	A	A	112	112	A							
15						B	126	122	118	118	116	116	118	122	114	116	116	116							
16						B	A	116	A	120	120	120	126	A	A	116	116	116							
17						B	118	118	A	A	A	116	116	118	120	A	120	A							
18						B	120	A	A	A	118	126	122	122	122	A	118	A							
19						B	114	A	116	A	118	120	A	A	120	114	118	A							
20						B	A	A	A	A	114	120	122	A	A	A	114	114							
21						B	112	A	A	A	120	124	124	124	126	122	116	A							
22							114	A	116	A	A	A	A	118	116	A	122	B							
23						B	118	A	122	124	124	A	118	118	118	114	110	120							
24						B	B	A	A	114	A	122	122	118	122	120	120	118							
25						B	118	116	A	116	A	122	122	A	120	A	118	122							
26						B	118	110	A	A	114	116	A	A	122	122	116	B							
27						B	120	126	118	A	122	A	128	118	122	A	A	118							
28						B	A	116	A	A	A	A	A	A	A	A	A	A							
29						B	112	114	120	122	A	124	A	A	A	A	114	112							
30						B	126	120	114	112	112	112	122	126	122	118	120	120							
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							22	15	13	12	12	17	16	11	18	15	21	15							
MED							118	116	118	117	117	120	122	118	120	116	116	118							
U Q							120	118	119	121	120	123	124	124	122	122	118	120							
L Q							116	114	115	114	114	117	118	118	118	114	115	116							

SEP. 2013 h'E (KM)

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## IONOSPHERIC DATA STATION Kokubunji

SEP. 2013 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	94	94	94	94	B	B	G	G	106	102	100		98	108	104	G	G	108	106	B	102	98	102	98
2	100	98	96	B	B	B	G	106	104	100	96	104	G	100	G	G	116	106	106	102	102	102	102	B
3	102	B	B	B	94	100	118	106	102	106	102	104	G	G	112	104	118	106	104	100	100	100	100	96
4	96	94	B	96	B	B	142	104	G	G	G	G	G	G	G	G	110	106	B	94	92	94	94	94
5	94	96	B	96	B	B	G	114	G	G	98	100	100	106	108	G	106	124	112	102	98	B	98	B
6	94	84	96	92	B	108	116	102	98	96	G	104	96	96	98	102	120	106	108	98	B	B	B	B
7	B	B	B	100	B	108	140	132	104	104	100	104	104	102	102	102	106	G	106	96	102	98	100	100
8	98	98	B	92	94	92	108	104	102	104	106	98	102	98	102	106	108	108	104	98	100	100	100	94
9	90	92	94	94	B	B	G	104	G	G	104	102	100	106	102	106	118	126	B	B	98	98	B	B
10	B	B	B	B	B	B	140	122	120	G	96	G	104	104	108	106	102	G	B	104	96	92	94	B
11	94	100	92	88	B	100	112	114	104	104	106	104	104	106	102	102	104	124	112	112	B	104	98	96
12	B	B	B	100	98	B	104	104	102	102	98	G	106	102	G	G	112	118	B	B	B	B	B	104
13	96	94	B	B	B	B	104	108	108	106	106	110	G	106	G	G	102	102	102	96	B	B	B	B
14	B	B	B	B	B	B	106	126	106	G	106	118	G	96	104	124	122	106	102	102	B	102	100	B
15	96	B	B	B	B	B	146	G	122	116	G	114	120	118	116	G	120	120	108	102	92	92	B	92
16	B	B	110	B	110	114	104	152	106	G	G	G	G	106	106	G	118	120	B	B	102	94	B	B
17	B	B	B	B	B	B	138	116	104	108	104	G	G	G	112	98	G	102	94	94	94	B	B	B
18	B	B	B	B	110	110	G	108	104	104	110	G	G	G	116	106	120	108	108	B	106	98	B	98
19	B	B	B	92	B	108	G	102	G	108	G	G	104	102	G	G	116	104	104	B	B	B	B	B
20	98	B	92	92	92	110	108	108	108	98	G	G	G	92	104	104	116	118	B	96	96	92	92	B
21	B	B	B	B	B	B	138	104	106	106	G	124	G	G	G	G	118	108	100	B	B	102	B	B
22	B	B	B	B	B	92	G	108	G	110	106	104	106	G	G	G	108	118	B	B	B	B	B	B
23	98	B	B	B	B	B	G	108	124	G	G	104	98	128	G	G	G	G	92	92	B	116	116	112
24	98	126	B	B	106	108	146	106	106	G	106	G	G	116	118	G	126	118	114	110	104	104	100	100
25	B	B	B	B	B	B	G	132	104	G	106	G	G	100	G	G	104	116	134	90	94	90	90	B
26	B	102	B	B	B	B	G	G	100	100	G	G	100	112	G	G	114	110	B	B	B	B	B	B
27	B	B	B	B	B	G	G	G	100	102	110	G	122	G	G	110	108	130	B	104	102	98	100	B
28	B	B	B	B	B	96	98	G	96	102	102	104	110	102	106	104	106	102	100	98	102	98	98	98
29	98	98	98	B	B	B	G	G	G	G	104	G	100	100	104	102	114	118	B	98	98	90	B	B
30	B	B	B	B	B	B	G	G	122	G	G	114	G	G	G	116	118	114	112	B	106	94	94	96
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	12	8	11	7	13	17	24	23	19	20	17	16	23	18	17	26	27	20	20	20	22	17	13
MED	96	97	95	94	98	108	116	108	104	104	104	104	103	104	105	104	116	110	105	98	100	98	100	98
U Q	98	99	97	96	110	109	140	119	108	106	106	112	105	108	112	107	118	120	108	102	102	102	100	100
L Q	94	94	93	92	94	97	105	104	102	100	100	104	100	100	102	102	108	106	101	96	96	94	94	95

SEP. 2013 h'Es (KM)

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## IONOSPHERIC DATA STATION Kokubunji

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

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

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

SEP. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

SEP. 2013 f<sub>XI</sub> (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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
3	C	C	C	C	C	C	C	C	C	C											X	X	X	X	X
4	X	X	X	X	X	X														88	82	71	65	64	
5	X	X	X	X	X	X														102	90	61	64	64	
6	X	X	X	X	X	X														X	X	X	X	X	
7	X	X	X	X	X	X														X	X	X	X	X	
8	X	X	X	X	X	X														X	X	X	X	X	
9	X	X	X	X	X	X														X	X	X	X	X	
10	X	X	X	X	X	X														X	X	X	X	X	
11	X	X	X	X	X	X														X	X	X	X	X	
12	X	X	X	X	X	X														X	X	X	X	X	
13	X	X	X	X	X	X														X	X	X	X	X	
14	X	X	X	X	X	X														X	X	X	X	X	
15	X	X	X	X	X	X														X	X	X	X	X	
16	X	X	X	X	X	X														X	X	X	X	X	
17	X	X	X	X	X	X														X	X	X	X	X	
18	X	X	X	X	X	X														X	X	X	X	X	
19	X	X	X	X	X	X														X	X	X	X	X	
20	X	X	X	X	X	X														X	X	X	X	X	
21	X	X	X	X	X	X														X	X	X	X	X	
22	X	X	X	X	X	X														X	X	X	X	X	
23	X	X	X	X	X	X														X	X	X	X	X	
24	X	X	X	X	X	X														X	X	X	X	X	
25	X	X	X	X	X	X														X	X	X	X	X	
26	X	X	X	X	X	X														X	X	X	X	X	
27	X	X	X	X	X	X														X	X	X	X	X	
28	X	X	X	X	X	X														X	X	X	X	X	
29	X	X	X	X	X	X														X	X	X	X	X	
30	X	X	X	X	X	X														X	X	X	X	X	
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	27	27	27	27														28	28	28	28	28	
MED	X	X	X	X	X	X														X	X	X	X	X	
U Q	62	60	59	57	52	48														86	71	64	64	64	
L Q	X	X	X	X	X	X														X	X	X	X	X	
	65	64	63	60	54	54														94	80	70	68	66	
	X	X	X	X	X	X														X	X	X	X	X	
	58	58	56	54	48	44														81	64	58	58	58	

SEP. 2013 f<sub>XI</sub> (0.1MHz)

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## IONOSPHERIC DATA STATION Yamagawa

SEP. 2013 f<sub>o</sub>F<sub>2</sub> (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

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

SEP. 2013 f<sub>o</sub>F<sub>2</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C	C	C	C	C	C	C	C	C	C	C	C	C					
2							C	C	C	C	C	C	C	C	C	C	C	C	C					
3							C	C	C	C	L	L	R	L		L	L	L	L					
4							L	L	L	L	L	L	L	L	L	R	L	L	L	L				
5										L	L	L	L	L	L	R	L	L	L	L				
6								L	L	L	L	L	L	L	L	L	L	L	L	L	A			
7								L	L	L	L	L	L	L	L	L	L	L	L	L	L			
8								L	L	L	L	L	L	L	L	L	L	L	L	L				
9								248		L	L	L	L	L	L	L	L	L	L	L	L			
10										L	L	L	L	L	L	L	L	L	L	L	L			
11								L	L	L	L	L	L	L	L	L	L	L	L	L	L			
12								268		L	A	L	L	L	L	L	L	L	L	L	L			
13									L	L	L	L	L	L	L	L	L	L	L	L	A			
14									L	L	L	L	L	L	L	L	L	L	L	L	A			
15								276		L	L	L	L	L	L	L	L	L	L	L	L			
16								264		L	L	L	L	L	L	L	L	L	L	L	L			
17									L	L	L	L	L	L	L	L	L	L	L	L	L			
18									L	L	L	L	L	L	L	L	L	L	L	L	L			
19									L	L	L	L	L	L	L	L	L	L	L	L	L	224		
20								252		L	L	L	L	L	L	L	L	L	L	L	L			
21									L	L	L	L	L	L	L	L	L	L	L	L	L			
22									L	L	L	L	L	L	L	L	L	L	L	L	L			
23									L	L	L	L	L	L	L	L	L	L	L	L	L			
24								264		L	L	L	L	L	L	L	L	L	L	L	L			
25								256		L	L	L	L	L	L	L	L	L	L	L	L			
26									L	L	L	L	L	L	L	L	L	L	L	L	L			
27									L	L	L	L	L	L	L	L	L	L	L	L	L	184		
28								272		L	L	L	L	L	L	L	L	L	L	L	L			
29									L	L	L	L	L	L	L	L	L	L	L	L	L			
30									L	L	L	L	L	L	L	L	L	L	L	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								8	1	8	22	26	27	26	25	21	14	2	2					
MED								264	372	462	488	502	516	516	504	488	462	382	204					
U Q								270		472	492	528	528	524	516	496	468							
L Q								254		454	484	492	500	500	498	476	448							

SEP. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C	C	C	C	C	C	C	C	C	C	C	C	C					
2							C	C	C	C	C	C	C	C	C	C	C	C	C					
3							C	C	C	C	R	U	A	A	A	368	364	328	312	U	A	A		
4							B			R	R	U	R	B	R	R	R	U	A	A				
5							B	248	288	328	344	352		R	R	R	R	U	A	A				
6							B	248	288	324	340	348		R	R	R	R	U	A	A				
7							A	244	292	324	332	332	372	R	R	R	R	U	A	A				
8							A	A		U	A	U	R	R	R	R	A	U	A	A				
9							A	U	A	U	A	A	R	R	R	R	R	R	R					
10							B	216	296	320	344	368		A	R	R	R	U	A	A				
11							B	256	300	332	356	372		A	R	R	R	U	A	A				
12							B	244	288	308	344	360	364	368	328	324	300	216	180					
13							B	A		U	A	U	A	R	R	R	R	U	A	A				
14							B	224	288	328	348	380	376	376	368	340	304	256	172					
15							B	U	A	U	A	U	A	U	A	U	A	U	A					
16							B	228	284	316	348	356	372	368	368	336	308	264						
17							B	A		U	R	U	A	U	R	B	R	A						
18							B	236	292	324	344	356	368	364	372	336	300	248						
19							B	A	U	A	U	A	U	A	U	A	U	A						
20							B	236	280	312	332	336	336		360	328	304	252	172					
21							B	236	A	R	R	A		388	364	360	320	304	264					
22							B	236	268	316	340	352	356	360	360	348	304	256						
23							B	240	288	324			R	R	R	R	U	A						
24							B	244	300	292	A	A	R	B	372	364	336	312	260					
25							B	A	U	A	U	A	U	A	R	R	R	R						
26							B	212	288	316	316				360	336	292	252						
27							B	232	292	316	R	U	R	R	R	R	R							
28							B	A	A	A		R	R	R	R	R	R							
29							B	240	300		360	364	380	376	368	336	300	248						
30							B	248	296	328	364	364	372	360	364	336	288	244	196					
31							A	248	R	304	A	364	A	372	364	320	304	252						
32							A	220	296	320	U	A	A	R	R	R	R							
33							A	216	292	328	356	360	372	376	372	336	304	236	172					
34							B	228	292	328	348	364	364		364	336	304	232						
35							B	220	288	328	R	R	360	364	R	R	368	336	296	240				
36							A	232	276	336	R	R	A	376	380	360	332	300	240					
37							B	224	288	320	R	R	368	364	R	A	404	344	292	236				
CNT								26	26	26	25	21	16	24	28	28	28	27	9					
MED								236	288	322	348	364	370	364	364	336	304	252	180					
U Q								244	296	328	R	R	360	366	374	372	368	346	312	264	194			
L Q								224	288	316	U	A	U	352	364	362	360	332	300	244	172			

SEP. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
3	C	C	C	C	C	C	C	C	C	C	40	37	34	34	38	J	A	J	A	J	A	J	A	J	A	
4	J	A	J	A	20	20	18	E	B	E	B	26	J	A	G	22	G	E	B	40	39	24	21	35		
5	J	A	J	A	J	A	E	B	E	B	E	B	26	30	36	38	31	27	27	31	27	22				
6	E	B	E	B	E	B	E	B	E	B	E	B	16	16	18	26	33	34	38	30	32	26	39	38		
7	J	A	J	A	E	B	J	A	J	A	J	A	30	16	16	20	18	E	B	J	A	J	A	J	A	
8	22	18	J	A	J	A	18	18	16	17	38	31	G	38	38	37	36	J	A	J	A	J	A	J	A	
9	J	A	J	A	J	A	J	A	J	A	J	A	34	35	G	G	G	G	G	G	G	G	G	G	G	
10	J	A	27	20	E	B	16	18	E	B	16	18	J	A	30	32	36	J	A	41	40	34	40	34	40	
11	E	B	E	B	E	B	E	B	E	B	E	B	26	35	23	37	20	21	18	35	34	32	26	20	19	
12	E	B	E	B	E	B	E	B	E	B	E	B	20	25	31	44	52	40	22	24	42	43	40	34	26	
13	E	B	E	B	E	B	E	B	E	B	E	B	22	21	26	32	34	40	38	46	41	28	36	38	50	
14	E	B	E	B	E	B	E	B	E	B	E	B	26	33	36	37	38	40	43	40	108	63	65	37	32	
15	18	E	B	E	B	18	21	E	B	E	B	27	J	A	29	34	36	36	35	E	B	43	G	34	G	
16	J	A	19	18	19	E	B	J	A	17	18	J	A	G	J	A	22	29	G	G	G	G	G	G	G	
17	18	E	B	E	B	E	B	E	B	E	B	18	18	41	30	33	G	G	G	G	G	G	G	G	G	
18	J	A	16	21	18	18	20	20	20	20	26	32	34	G	21	30	44	37	36	34	44	50	42	34	20	
19	E	B	E	B	J	A	E	B	16	16	18	22	26	32	32	33	22	E	B	43	39	G	G	G	G	
20	J	A	E	B	E	B	E	B	J	A	E	B	27	30	38	34	29	30	22	39	G	G	G	G	G	
21	J	A	23	20	20	20	E	B	E	B	E	B	26	32	34	28	40	G	G	G	G	G	G	G	G	
22	E	B	E	B	20	17	E	B	E	B	J	A	30	33	40	38	G	G	G	G	G	G	G	G	G	
23	E	B	E	B	E	B	E	B	E	B	E	B	26	31	18	G	G	G	G	J	A	51	G	G	G	
24	E	B	E	B	E	B	E	B	E	B	E	B	23	30	33	38	38	45	40	30	30	34	38	33	45	
25	J	A	J	A	J	A	20	20	18	20	25	33	35	34	33	G	39	23	39	32	27	20	17	16		
26	J	A	J	A	J	A	J	A	J	A	28	32	38	44	44	42	43	40	35	32	26	G	J	A	22	
27	E	B	E	B	E	B	E	B	E	B	E	B	24	31	36	30	24	G	G	G	G	G	G	G	G	
28	E	B	E	B	E	B	E	B	E	B	E	B	23	30	33	38	33	29	37	40	37	34	30	J	A	
29	J	A	24	21	16	16	16	20	18	21	30	26	23	36	41	44	49	37	36	33	26	50	16	18	18	
30	18	E	B	E	B	E	B	E	B	E	B	26	31	34	39	41	42	38	42	38	33	29	22	22	J	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	27	27	27	27	27	27	27	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	18	E	B	E	B	17	16	16	17	26	32	34	36	34	35	37	37	36	34	J	A	J	A	J	A	
UQ	J	A	J	A	J	A	19	18	20	20	27	33	36	38	38	41	40	40	38	36	J	A	J	A	J	A
LQ	E	B	E	B	E	B	E	B	E	B	E	B	25	30	32	G	G	G	G	G	G	G	G	G	G	

SEP. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

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

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

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

SEP. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	20	22	26	24	20	16	16	16	15	16	16	16	16	16
4	16	16	16	16	16	16	16	16	16	16	18	20	40	27	21	18	16	16	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	16	17	17	21	22	21	20	16	16	16	16	16	16	16	16	16
6	16	16	16	16	16	16	16	16	16	16	18	20	22	20	19	16	17	16	16	16	16	16	16	16
7	16	16	16	16	16	16	16	14	16	16	17	20	16	20	18	18	16	16	16	16	16	16	16	16
8	16	16	16	16	16	16	16	14	16	16	20	20	22	21	22	19	16	16	15	16	16	16	16	16
9	16	16	16	16	16	16	16	16	16	17	20	24	26	17	16	21	17	16	16	16	16	16	16	16
10	16	16	16	16	16	16	16	16	16	16	20	20	20	26	20	27	19	16	14	16	16	16	16	16
11	16	16	16	16	16	16	16	16	16	16	16	16	16	16	22	21	16	16	16	16	16	16	16	16
12	16	16	16	16	16	16	16	16	16	20	17	32	20	20	21	16	16	16	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	16	16	20	23	24	29	22	20	16	16	14	16	16	16	16	16
14	16	16	16	16	16	16	15	16	16	16	20	20	22	19	20	16	16	16	16	16	16	16	16	16
15	16	16	16	16	16	16	16	16	16	20	17	17	24	43	20	20	16	16	16	16	16	16	16	16
16	16	16	16	16	16	16	16	14	16	16	17	20	20	21	20	16	16	16	16	16	16	16	16	16
17	16	16	16	16	16	16	16	15	16	16	19	20	20	18	23	16	16	16	16	16	16	16	16	16
18	16	16	16	16	16	16	16	16	19	16	18	18	22	30	22	16	16	16	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	16	16	20	16	43	28	31	19	16	16	16	16	16	16	16	16
20	16	16	16	16	16	16	16	16	16	19	18	22	21	19	19	20	16	16	18	16	16	16	16	16
21	16	16	16	16	16	16	16	16	16	16	20	29	31	24	27	20	17	16	16	16	16	16	16	16
22	16	16	16	16	16	16	16	16	16	19	19	20	20	17	18	20	16	16	16	16	16	16	16	16
23	16	16	16	16	16	16	16	16	16	16	20	21	21	20	27	18	16	16	16	16	16	16	16	16
24	16	16	16	16	16	16	16	16	16	20	24	24	24	29	22	20	16	16	16	16	16	16	16	16
25	16	16	16	16	16	16	16	16	16	16	20	20	20	20	17	20	16	16	16	16	16	16	16	16
26	16	16	16	16	16	16	16	16	16	20	22	21	22	26	17	16	16	14	16	16	16	16	16	16
27	16	16	16	16	16	16	16	16	16	16	18	20	20	28	21	17	16	16	16	16	16	16	16	16
28	16	16	16	16	16	16	16	15	16	19	20	20	19	17	23	19	16	16	14	16	16	16	16	16
29	16	16	16	16	16	16	16	16	16	16	20	22	21	20	17	18	16	16	16	16	16	16	16	16
30	16	16	16	16	16	16	16	16	16	16	21	20	17	16	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	27	27	27	27	27	27	27	27	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	16	16	16	16	16	16	16	16	16	16	20	20	22	20	20	18	16	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	19	20	22	24	26	22	20	16	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	16	16	18	20	20	19	18	16	16	16	16	16	16	16	16	16

SEP. 2013 fmin (0.1MHz)

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# IONOSPHERIC DATA STATION Yamagawa

SEP. 2013 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
3	C	C	C	C	C	C	C	C	C	C	327	321	341	325	325	331	326	319	320	320	336	318	288	291	
4	284	285	295	331	309	295	330	383	393	347	337	308	308	323	315	306	307	312	331	351	360	289	295	283	
5	299	306	322	314 <sup>R</sup>	325	315	348	384	382	363	326	316	317	307	323	325	333	326	320	302	306	307	309	295	
6	305	312	305	321	322	333	344	378	386	355	314	316	315	324	325	324	316	329	327	321	305	288	292	294	
7	290	314	309	305	314	310	321	370	396	351	342	321	329	318	314	311	310	311	340	352	296	290	291	295	
8	297	310	342	356	307	333	341	372	385	363	346	335	302	322	309	299	313	317	340	319	335	325	300	312	
9	292	290	311	300	296	299	313	352	358	360	340	349	317	311	324	328	327	324	330	322	329	313	292	290	
10	304	315	312	316	314	329	342	354	363	362	343	323	337 <sup>R</sup>	327	327	321	334	329	323	325	317	330	305	293	
11	313	308	312	318	298	292	330	352	348	332	346	339	329	310	315	327	328	350	344	336	325	289	289	292	
12	288	292	298	317	309	303	352	353	367	337	367	327	328	315	327	329	334	321	324	341	341	305	295	291	
13	287	310	308	337	317	308	342	378	373	344	366	330	319	322	312	324	330	336	354	332	327	300	303	290	
14	296	304	315	301	289	302	343	395	390	359	340	336	320	333	322		A	334	337	323	308	310	313	314	307
15	307	301	306	351	336	343	347	372	371	369	320	329	321	323	337	333	319	332	334	346	332	296	310	296	
16	303	306	309	331	323	323	343	371	381	330	348	329	316	322	329	329	329	343	341	337	371	301	293	293	
17	301	301	307	318	353	333	343	381	368	374	322	306	328	338	308	316	323	331	349 <sup>R</sup>	373	293	289	277	292	
18	292	299	318	339	371	320	343	354	357	357	318	301	321 <sup>R</sup>	330	313	312	325	337	348	361	335	297	293	290	
19	300	297	299	301	314	341	357	363	349	339	330	338	323 <sup>R</sup>	324	315	314	314	328	355	336	310	302	305	303	
20	300	294	287	290	314	333	361	381	345	355	333	300	326 <sup>R</sup>	325	306	324	324	341	354	355	326	291	289	289	
21	299	299	315	351	358	365	357	370	377	352	339	311	343 <sup>R</sup>	316	320	321	335	356	351	343	317	299	297	293	
22	290	299	305	315	333	341	344	364	351	336	331	337	335	335	316	324	329	339	345	337	321	338	307	292	
23	299	294	305	332	325	318	326	367	369	371	353	340	317	322	319	335	327	321	343	340	331	303	301	304	
24	288	295	298	302	307	302	331	378	361	358	350	316	325	312	318	310	324	331	335	354	328	280	297	285	
25	291	315	291	300	296	325	343	356	352	359	337	337	349	310	315	314	314	324	346	361	314	282	289	301	
26	303	303	315	313	338	318	328	369	364	357	362	320	333	327	307	322	327	328	346	342	290	276	297	303	
27	304	299	322	308	320	312	332	374	376	361	346	324	324	323	321	316	334	339	345	314	312	305	313	309	
28	319	309	305	313	333	346	336	353	365	348	333	325	316	311	314	313	331	341	346	348	329	305	304	292	
29	291	301	310	337	352	357	344	361	363	356	348	348	310	314	320	321	345	346	346	360	316	292	292	277	
30	304	309	325	332	353	311	338	373	350	364	357	313	326	321	317	328	331	338	362	357	327	283	293	284	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	27	27	27	27	27	27	27	27	27	27	28	28	28	28	28	27	28	28	28	28	28	28	28	28	
MED	299	301	309	317	320	320	343	370	367	357	340	324	324	322	318	322	327	331	344	340	326	300	296	292	
UQ	304	309	315	332	336	333	344	378	381	362	348	336	329	325	324	328	332	339	347	353	332	306	304	298	
LQ	291	297	305	305	309	308	331	356	357	347	330	316	317	314	314	314	321	324	330	324	311	289	292	290	

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C	C	C	C	C	C	C	C	C	C	C	C	C					
2							C	C	C	C	C	C	C	C	C	C	C	C	C					
3							C	C	C	C	L	L	R	L		L	L	L	L					
4							L	L	L	L	L	L	L	L	L	R	L	L	L					
5									LU	LU	L	L	L	LU	R	LU	L	L	L					
6								L	L	L	L	L	L	L	L	L	L	L	L	A				
7								L	L	LU	LU	L	L	L	L	L	L	L	L					
8								L	L	L	L	L	L	L	L	L	L	L	L					
9								546		L	L	L	L	L	L	LU	LU	L	L	L				
10										LU	L	L	L	L	L	LU	L	L	L	L				
11								L	L	LU	LU	L	L	L	L	L	LU	L	L					
12								499		L	AU	L	L	U	LU	L	L	L	L	L				
13									L	L	L	L	L	L	L	L	L	L	A					
14									L	L	LU	L	LU	RU	L	L	A	A	A					
15								453		LU	L	L	L	L	L	LU	L	L	L					
16								A		L	L	U	LU	L	L	LU	L	L	L					
17									L	LU	LU	L	L	L	L	LU	L	L	L					
18									L	L	LU	LU	L	A	LU	L	L	L	L					
19									L	L	376	385	385	387	380	356								529
20								495		L	LU	L	L	LU	L	L	L	L	L					
21										LU	L	U	LU	L	LU	LU	L	L	L					
22									L	LU	L	LU	L	RU	LU	L	L	L	L					
23										L	L	LU	L	L	L	L	L	L	L					
24								459		LU	L	L	LU	L	L	U	L	L	L					
25								495		LU	L	U	L	L	LU	L	L	L	L					
26									L	LU	LU	LU	L	L	LU	L	L	L	L					
27									L	L	L	L	L	U	L	LU	L	L	L					
28								420		L	L	LU	LU	L	L	L	LU	L	L					
29									L	LU	L	LU	R	R	LU	L	L	L	L					
30										L	L	LU	LU	LU	LU	L	L	L	L					
31											396	402	367	384	364	363								
	00	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	1	8	22	26	27	26	25	21	13	2	2					
MED								495	440	400	399	391	391	383	371	369	367	375	472					
U Q								499		410	406	402	399	392	378	377	374							
L Q								453		386	392	379	371	372	362	364	360							

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SEP. 2013 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C	C	C	C	C	C	C	C	C	C	C	C	C					
2							C	C	C	C	C	C	C	C	C	C	C	C	C					
3							C	C	C	C	302	308	276	296	296	288	286	292	262					
4						258	208	212	228	288	308	312	288	308	302	300	286	250						
5								214	234	240	316	312	318	300	282	258	250	252						
6								216	214	232	328	310	286	290	282	284	288	262	248					
7								218	214	236	256	294	284	312	306	300	292	264	246					
8								218	236	248	270	322	278	302	286	270								
9								210	234	234	254	258	260	306	276	278	272	262	242					
10									246	256	264	278	282	282	268	262	238	236						
11								212	248	248	234	276	280	286	290	274	260	236						
12								204	216	260	238	308	286	308	278	270	268	268	256					
13								218	230	238	242	296	300	282	284	268	266	252						
14								208	208	240	270	282	304	278	288	A	264	262						
15								212	222	238	266	276	292	278	268	264	258	258						
16								206	214	248	262	270	282	284	262	260	274	240						
17									228	222	242 <sup>H</sup>	296	274	258	296	268	272	256						
18									248	242	258	274	286	274	294	280	264	246						
19									238	252	276	254	264	266	264	302	284	260	220					
20								206	228	232	248	254 <sup>H</sup>	278	262	310	270	272	246						
21									214	242	262	298	254	260	296	276	260	236						
22									234	250	276	266	266	266	282	282	262	230						
23									214	236	262	266	292	284	282	266	276	236						
24								206	216	232	242	256	276	292	276	286	270	262						
25								216	230	234	238	264	246	280	294	292	288	250						
26									226	234	230	288	264	254	266	280	260	250						
27									224	222	236	246	282	276	282	280	270	252	242	220				
28									210	224	258	248	272	272	302	292	276	260	238					
29									204	234	254	248	254	286	292	276	268	246						
30									214	228	248	254	270	278	284	274	256	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							1	16	26	27	28	28	28	28	28	27	28	26	10					
MED							258	210	222	236	251	275	279	282	284	276	267	250	247					
U Q								216	230	248	264	296	289	292	296	286	275	262	252					
L Q								206	214	234	242	264	271	276	277	268	260	240	236					

SEP. 2013 h'F2 (KM)

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# IONOSPHERIC DATA STATION Yamagawa

**SEP. 2013 h'F (KM)**
**135°E MEAN TIME (G.M.T. + 9 H)**
**LAT. 31°12.0'N LON. 130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING**

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
3	C	C	C	C	C	C	C	C	C	C						<sup>H</sup>	<sup>A</sup>									
4	286	302	274	238	238	270	236	186	<sup>H</sup> 206	192	178	186	182	198	206	200	204	222		<sup>A</sup>	224	204	212	266	288	
5	280	262	242	236	220	242	234	208	208	188	164	196	196	<sup>H</sup> 206	188	180	220	212	222	230	230	234	248	260		
6	254	252	224	224	222	224	234	212	204	190	182	168	216	<sup>A</sup> 218	206	206	212	250		<sup>A</sup>	224	220	218	276	278	
7	290	246	240	236	242	224	236	214	<sup>H</sup> 152	206	206	200	194	194	198	202	212	222	242	212	222	250	284	280		
8	272	256	222	190	240	238	226	216	202	180	204	188	174	<sup>H</sup> 174	212	210	200	252	234	256	224	212	260	266		
9	280	290	254	266	268	272	234	136	202	202	194	190	178	184	200	192	208	216	226	228	226	224	264	282		
10	264	240	228	230	234	232	232	216	206	202	208	204	192	220		<sup>A</sup>	202	218	214	<sup>H</sup> 190	226	236	228	250	276	
11	258	254	250	236	276	276	232	204	204	194	184	182	176	194	192	202	206	216	220	210	200	266	310	280		
12	286	282	268	238	242	248	222	146	214		162	188	182	198	260	<sup>A</sup> 258	<sup>A</sup> 248	<sup>A</sup> 238	242	212	212	218	256	280		
13	290	272	258	224	216	258	236	218	210	196	182	184	214	204	202	216	218		<sup>A</sup>	218	206	214	252	272		
14	272	246	240	230	272	262	250	216	200	190	180	178	180	<sup>H</sup> 204	212		<sup>A</sup>	<sup>A</sup>	<sup>A</sup>		234	238	236	266	252	240
15	238	250	262	220	214	230	214	182	192	192	198	182	180	224	194	216	218	214	<sup>H</sup> 238	212	206	208	250	262		
16	274	264	256	226	214	228	222		<sup>A</sup> 178	<sup>H</sup> 192	166	170	212	186	204	214	214	232	234	214	194	210	260	268		
17	268	266	256	236	210	210	218	210	202	188	188	182	172	168	208	222	218	<sup>H</sup> 226	228	198	188	304	310	290		
18	280	280	266	218	198	238	226	206	202	202	198	176	196		<sup>A</sup> 206	216	218	238	250	200	206	250	274	280		
19	270	270	270	268	238	228	208	198	216	<sup>H</sup> 184	200	216	204	186	192	<sup>H</sup> 190	226	242	136	226	234	244	238	242		
20	252	268	280	290	254	222	218	160	200	202	176	184	170	214	198	<sup>A</sup> 210	216	218	226	208	208	250	282	292		
21	272	274	252	206	206	204	210	206	208	<sup>H</sup> 188	178	184	170	174	208	208	214	224	224	216	220	236	252	274		
22	274	272	240	254	236	226	230	206	196	190	194	196	176	198	186	212	226	216	220	218	212	208	240	270		
23	268	270	262	230	224	240	234	216	210	200	192	194	204	200	178		<sup>A</sup>	214	194	226	204	204	238	256	258	
24	284	284	282	272	264	272	234	196	204	188	188	194	186	198	190	216	224	232	226	210	226	248	272	320		
25	322	246	260	260	268	236	216	168	212	212	190	178	172	204	184	<sup>H</sup> 248	226	228	228	198	196	250	278	272		
26	270	274	260	252	220	242	230	208	212	202	216	194	164	224	194	198	204	218	228	220	206	274	264	258		
27	250	250	236	226	232	242	242	164	<sup>H</sup> 212	200	196	190	182	178	190	216	216	218	<sup>E B</sup> 220	206	222	236	228	242		
28	232	246	256	242	216	206	222	174	<sup>H</sup> 178	<sup>H</sup> 204	190	192	192	182	210	226	220	224	218	202	202	244	260	286		
29	276	270	250	224	204	204	226	206	192	198	206	190	194	212	224	208	246	228	214	232	216	232	270	290		
30	268	258	240	218	210	254	234	208	198	204	206	196	214	186	234	240	222	222	210	194	198	284	296	306		
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	27	27	27	27	27	26	27	26	28	28	28	27	27	25	27	26	26	28	28	28	28	28		
MED	272	266	256	236	232	238	230	206	204	195	191	189	184	198	202	210	217	222	226	213	213	240	262	275		
U Q	280	274	262	252	242	254	234	212	210	202	201	194	200	206	210	216	222	232	234	226	223	250	275	284		
L Q	264	250	240	224	214	224	222	182	<sup>H</sup> 198	190	181	182	176	184	192	202	212	216	220	206	204	221	252	264		

**SEP. 2013 h'F (KM)**
**NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN**

## IONOSPHERIC DATA STATION Yamagawa

SEP. 2013 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C	C	C	C	C	C	C	C	C	C	C	C	C					
2							C	C	C	C	C	C	C	C	C	C	C	C	C					
3							C	C	C	C	100	100	A	A	A		94	96	98	A				
4							B	98	108	108	100	102	B	104	104	104	102	102	A					
5							B	108	102	98	96	102	102	102	100	102	102	100	102					
6							B	106	106	102	98	A	A	98	102	102	100	98	100					
7							A	112	112	114	108	108	A	A	96	96	96	98	A					
8							A	A	98	94	100	100	100	100	100	100	98	98	A					
9							A	102	96	96	98	98	96	106	106	104	102	102	118					
10							B	118	106	110	110	104	A	104	102	108	100	100	A					
11							B	110	96	96	96	98	102	110	102	104	100	100	114					
12							B	114	106	106	104	116	106	106	106	104	100	100	B					
13							B	106	98	98	100	100	102	104	108	106	106	98	A					
14							B	108	102	98	108	106	100	96	98	98	100	102	A					
15							B	102	104	102	102	100	102	B	98	100	100	100	B					
16							B	120	A	102	98	96	98	98	98	98	98	100	B					
17							B	106	100	98	98	96	102	102	102	100	100	102	B					
18							B	118	102	102	96	100	106	108	106	100	100	100	B					
19							B	116	100	100	A	A	B	106	112	102	100	102	B					
20							B	104	100	98	96	A	A	A	98	100	98	100	B					
21							B	106	96	96	102	104	106	106	104	104	102	102	B					
22							B	118	112	96	98	96	96	100	96	98	98	98	B					
23							B	104	102	100	104	98	98	100	102	100	98	102	140					
24							A	136	A	98	A	102	A	106	106	106	102	108	B					
25							A	104	98	98	98	A	98	100	100	100	100	100	B					
26							A	108	100	104	100	100	100	100	104	102	102	102	B					
27							B	112	100	108	108	104	104	106	102	102	100	100	A					
28							B	110	110	110	106	106	106	106	102	100	100	100	A					
29							A	126	110	110	108	98	98	100	98	96	102	102	B					
30							B	114	108	108	106	106	104	98	96	98	100	102	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								26	25	27	26	24	20	24	28	28	28	28	5					
MED								109	102	100	100	100	102	103	102	100	100	100	114					
U Q								116	107	108	106	104	104	106	105	104	102	102	129					
L Q								106	99	98	98	98	98	100	98	99	99	100	101					

SEP. 2013 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

SEP. 2013 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C														
4	90	88	88	88	90	B	B	168	94	92	92	164	108	104	104	166	110	110	110	110	96	96	94	94
5	92	92	88	82	B	B	B	140	114	106	106	96	96	96	94	94	94	90	G	102	100	96	92	90
6	B	B	B	B	B	B	B	114	132	102	106	104	96	92	90	156	130	114	104	100	96	94	94	B
7	94	88	B	94	96	96	90	126	118	92	108	102	160	112	116	128	116	106	98	96	96	96	102	100
8	100	98	96	94	94	B	94	88	164		162	G	118	112	118	106	102	94	94	90	88	88	90	90
9	90	88	90	90	90	88	94	104	104	104		G	G	G	90	84		G	G	G	84	88	106	96
10	90	94	B	94	B	92	106	134	160	146	94	132	88	116	102	106	106	104	154	96	94	92	94	96
11	B	B	B	B	B	B	B		152	104	88	106	88	88	88	106	106	104	96	122	100	96	92	92
12	B	B	B	B	B	B	B	122	136	138	122	108	140	94	92	140	118	112	110	100	98	92	92	96
13	B	B	B	B	B	B	B	96	114	136	104	106	108	110	110	100	126	112	98	96	112	96	94	90
14	B	B	B	B	B	B	B	124	124	122	120	106	118	168	132	106	106	100	98	96	96	92	90	92
15	94	B	B	110	108	B	B	110	110	106	104	104	106	B	G		G	132	106	106	90	92	100	98
16	96	92	90	B	102	118	102	102	108		G	G	100	172		G	G	138	108	102	104	96	B	B
17	94	B	B	B	B	B	126	142	92	106	116	G	118	108	92	G	142	124	116	102	98	98	92	92
18	92	92	88	92	94	100	112	166	154	176	G	88	100	102	108	156	106	110	104	102	98	100	B	90
19	B	B	90	90	B	114	114	146	186	104	96	94	B	132	G	G	178	172	100	94	94	94	96	94
20	92	B	B	B	104	110	B	114	106	100	100	100	96	90	188	G	G	G	B	B	B	B	B	88
21	90	90	90	88	B	B	B	126	132	164	96	120	G	98	172	G	G	130	104	100	B	B	96	92
22	B	B	90	92	B	B	B	106	124	142	116	108	G	168	90	188	202	G	G	108	100	B	B	B
23	B	B	B	B	B	116	B	166	172	90	G	G	120	94	G	100	G	G	144	B	88	88	88	134
24	B	B	B	90	B	96	98	184	148	148	98	176	100	132	100	96	150	126	112	104	98	96	96	94
25	94	92	92	106	98	92	96	152	124	104	100	98	G	156	94	180	176	140	116	106	B	B	86	100
26	100	98	88	86	88	90	90	126	120	120	110	112	116	132	138	136	166	138	G	82	86	B	B	130
27	B	B	B	B	B	B	B	160	182	96	96	94	G	G	G	94	G	144	88	106	92	88	80	80
28	B	B	B	B	B	B	B	162	168	90	90	92	90	90	154	138	124	112	96	96	96	94	92	92
29	92	92	B	92	B	92	92	102	156	98	96	104	114	110	108	150	146	116	112	94	98	98	96	B
30	84	B	B	B	B	B	B	156	122	128	124	114	114	140	190	146	136	120	108	102	94	92	94	B
31																								
CNT	16	12	11	15	10	14	16	27	27	25	23	23	22	25	22	23	21	23	26	26	23	21	22	22
MED	92	92	90	92	95	96	104	134	124	106	104	104	107	104	117	118	116	110	102	98	96	92	92	94
U Q	94	93	90	94	102	114	114	156	156	122	108	114	118	124	156	142	142	130	110	102	96	95	96	96
L Q	90	89	88	88	90	92	94	114	106	97	96	96	96	91	100	106	106	104	98	96	92	92	90	92

SEP. 2013 h'Es (KM)

## IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1																									
2																									
3											HC 11	C 1	C 1	C 1	HL 11	C 2	C 1	C 1	CL 13	F 4	FO 31	F 4	F 3	F 2	
4	F 2	F 5	F 2	F 4	F 1			H 1	L 1	L 1	L 1			C 1	L 1	L 1	CL 11	CL 21	L 2	F 2	F 3	F 3	F 1	F 1	
5	F 2	F 2	F 2	F 2				HL 11	CL 11	CL 11	CL 11	L 1	L 1	L 1	L 1	L 1	L 1	C 3	FF 11	F 2	F 3	F 3			
6							C 1	HC 12	CL 12	CL 11	C 1	L 1	L 1	L 1	HL 11	CL 11	C 1	C 3	C 4	F 4	F 3	F 1			
7	F 2	F 1		F 1	F 2	F 2	L 2	CL 22	CL 11	LH 11	CL 11	CL 11	HL 11	CL 11	C 1	C 1	C 1	C 2	L 4	F 4	F 5	FF 21	FO 11	F 2	
8	F 1	F 1	F 4	FF 11	F 1		L 1	L 4	H 1		H 1		C 1	C 1	C 1	C 1	C 1	L 4	L 7	F 5	F 3	F 2	F 1	F 3	
9	F 1	F 4	F 2	F 3	F 2	F 2	L 1	CL 21	C 1	C 1				L 1	L 1				L 1	F 1		F 1		F 1	
10	F 4	F 1		F 1		F 1	C 1	HL 11	HL 11	HL 11	LH 11	HL 11	L 1	C 1	C 1	C 1	C 1	C 2	HC 11	F 1	F 6	F 3	F 2	F 1	
11								HL 11	C 2	L 1	CL 11	L 1	L 1	L 1	L 1	C 1	C 2	L 3	C 1	F 1	F 1	F 2	F 4	F 1	
12						C 2	HL 22	HL 11	CL 11	CL 11	H 1	L 1	L 1	L 1	HL 11	CL 11	C 2	C 3	C 6	F 2	F 3	F 1	F 2	F 1	
13					F 1	C 1	HL 21	C 1	C 1	C 1	C 1	C 1	C 1	C 1	L 1	CL 11	CL 11	CL 3	L 4	FF 12	F 2	F 2	F 2	FF 11	
14							CL 11	C 1	C 1	CL 11	CL 11	C 1	H 1	H 1	C 2	C 2	C 3	C 6	F 8	FO 41	FO 41	F 3	F 3	FO 11	
15	F 1			F 1	F 1		C 1	C 1	C 1	CL 11	CL 11	C 1				C 1		H 1	C 6	F 1	F 3	F 2	F 1	F 1	
16	F 1	F 1	F 1		F 1	F 1	C 1	L 1	C 2			L 1	H 1				H 1	C 2	C 3	F 1	F 1				
17	F 1				F 1	H 1	LC 12	C 1	C 1		C 1	CL 11	L 1			HL 11	C 2	C 5	C 3	F 2	F 3	F 4	F 2		
18	F 2	F 2	F 2	F 1	F 1	F 1	C 1	HL 11	H 1	HL 11		L 1	L 1	C 1	CL 11	H 1	C 2	C 1	C 3	F 1	F 4	F 2		F 2	
19			F 1	FF 11		F 1	C 1	HL 12	H 1	C 1	L 1	L 1		H 1			H 1	H 1	C 2	F 9	F 2		F 1	F 1	
20	F 1			F 1	F 1		C 2	C 1	C 1	C 1	L 1	L 1	L 1	L 1	H 1								F 2	F 2	
21	F 3	F 1	F 1	F 2			C 2	H 1	H 1	L 1	C 1		L 1	H 1			H 1	C 3	F 1				F 1	F 1	
22			F 2	F 1		C 1	CL 21	HC 11	C 1	C 1		H 1	L 1	H 1	H 1			C 2	FF 31						
23					F 1		H 1	H 1	L 1			C 1	L 1			C 2			HL 11		F 1	F 2	F 1	FF 11	
24				F 1	F 2	L 2	HC 11	HL 11	HL 11	L 2	HC 11	L 1	HL 11	L 1	L 1	L 2	H 1	C 2	C 4	FQ 11	F 3	F 3	F 3	F 4	
25	F 3	F 3	F 2	F 1	F 1	L 1	H 1	C 1	CH 11	C 1	L 1		HL 11	L 1	HL 11	H 1	H 1	C 1	C 1	FF 11			F 2	F 1	
26	F 3	F 2	F 3	F 3	F 1	F 3	L 2	C 1	C 1	CL 11	C 1	CL 11	CL 11	H 1	HL 11	HL 11	HL 11	HL 11	HCL 11	F 2	F 1			F 1	
27							HL 11	H 1	L 1	L 1	L 1					L 1		H 1	L 1	FF 11	F 1	F 1	F 2	F 2	
28							HL 11	HL 11	L 1	L 2	L 1	L 1	L 1	L 1	H 1	H 1	C 1	C 5	L 3	F 3	F 2	F 4	F 3	F 2	
29	F 1	F 1		F 2	F 1	L 1	C 1	HL 12	L 1	L 1	C 1	C 1	C 1	C 1	H 1	HL 12	CL 31	CL 52	F 8	F 2	F 1	F 1	F 1		
30	F 1						H 1	CL 11	CL 11	CL 11	CL 11	CL 11	HL 11	H 1	H 1	H 1	C 2	C 3	F 1	F 5	F 4	F 2			
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

SEP. 2013 TYPES OF Es  
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

SEP. 2013 f<sub>XI</sub> (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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	X 59	X 56	X 55	X 56	X 54	X 46															X 76	X 62	X 60	X 59		
2	X 62	X 56	X 54	X 55	X 62	X 42																X 67	X 61	X 64	X 65	
3	X 63	X 60	X 58	X 55	X 52	X 46																X 90	X 65	X 66	X 65	
4	X 64	X 64	X 63	X 66	X 56	X 52																X 101	X 104	X 108	X 111	
5	X 112	X 112	X 103	X 81	X 69	X 60																X 84	X 80	X 78	X 78	
6	X 75	X 74	X 70	X 68	X 54	X 48																X 80	X 74	X 73	X 76	
7	X 74	X 75	X 70	X 60	X 57	X 51																X 72	X 67	X 70	X 72	
8	X 74	X 70	X 70	X 53	X 42	X 43																X 104	X 89	X 86	X 83	
9	X 71	X 63	X 61	X 50	X 50	X 50																X 96	X 81	X 67	X 70	
10	X 74	X 75	X 72	X 60	X 56	X 52																X 95	X 76	X 64	X 66	
11	X 63	X 65	X 57	X 59	X 51	X 50																X 64	X 62	X 61	X 63	
12	X 61	X 60	X 60	X 60	X 50	X 51																X 79	X 64	X 60	X 58	
13	X 59	X 63	X 70	X 64	X 45	X 42																X 123	X 120	X 122	X 127	
14	X 127	X 122	X 106	X 85	X 63	X 62					C											X 90	X 88	X 69	X 67	
15	X 64	X 65	X 64	X 58	X 56	X 42																X 95	X 84	X 80	X 82	
16	X 74	X 66	X 61	X 62	X 53	X 51																X 82	X 66	X 70	X 73	
17	X 73	X 71	X 68	X 73	X 50	X 36																A0 58	X 58	X 58	X 58	
18	X 60	X 59	X 62	X 68	X 35	X 33																X 68	X 59	X 59	X 60	
19	X 61	X 61	X 65	X 54	X 53	X 52																X 76	X 68	X 70	X 70	
20	X 64	X 61	X 56	X 52	X 55	X 56																X 87	X 60	X 58	X 60	
21	X 62	X 59	X 63	X 70	X 37	X 33																X 65	X 62	X 66	X 64	
22	X 60	X 58	X 61	X 60	X 50	X 46	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	X 68	
23	X 62	X 60	X 59	X 55	C	C	C							C	C				C	C	C	C	C	C	X 56	
24	X 52	C	C	C	C	C	C	C	C	C	C	C	C									C	C	C	C	
25	C	C	C	C	C	C	C	C	C	C	C	C										X 134	X 124	X 122	X 124	
26	X 120	X 113	X 112	X 85	X 56	X 44															X 99	X 101	X 93	X 89	X 97	
27	X 82	X 102	X 78	X 56	X 50	X 46															X 108	X 104	X 113	X 119	X 113	
28	X 110	X 98	X 90	X 86	X 72	X 48																X 92	X 94	X 95	X 82	X 81
29	X 92	X 90	X 97	X 79	X 65	X 39																X 87	X 94	X 84	X 94	X 82
30	X 67	X 64	X 65	X 63	X 39	X 34	X 41															X 72	X 64	X 54	X 57	X 56
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	28	28	27	27	1														5	26	27	27	29	
MED	X 64	X 64	X 64	X 60	X 53	X 46	X 41														X 92	X 88	X 74	X 70	X 70	
U Q	X 74	X 75	X 71	X 69	X 56	X 51															X 104	X 96	X 89	X 86	X 82	
L Q	X 62	X 60	X 60	X 56	X 50	X 42															X 80	X 76	X 62	X 61	X 62	

SEP. 2013 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

SEP. 2013 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	53	50	49	50	48	40	48	73	80	76	68	81	98	98	88	88	103	106	99	87	70	56	54	53	
2	56 <sup>R</sup>	50	48	49	56	36	39	65	78	70	80	78	82	88	95	92	98	105	101	89	61	55	58	59	
3	57	54	52	49	46	40	45	74	74	71	66 <sup>R</sup>	87	82	78	76	78	81	80	82	81	84	59	60	59	
4	58 <sup>J R</sup>	58 <sup>R</sup>	57	60	50	46	52	82	66	66	74	74	92	104	112	108	107	107	113	114	95	98	102 <sup>R</sup>	105 <sup>R</sup>	
5	106 <sup>R</sup>	106 <sup>R</sup>	97 <sup>R</sup>	75	63	54	64	84	72	68	68	74	91	104	104	101 <sup>R</sup>	84	78	79	77	78	74	72	72 <sup>R</sup>	
6	69	68	64	62	48	42	45	72	76	68	65	74	98 <sup>R</sup>	103	100	96	97	82	82	84	74	68	67	70	
7	68	69	64	54	51	45	51	78	74	75	78	79	87	98	101	96	96	103	104	71	66 <sup>U R</sup>	61	64	66	
8	68	64	64 <sup>R</sup>	47	36	37	45	69	64	77	69	78	87	99	109	111	114	124 <sup>R</sup>	113	117	98	83 <sup>R</sup>	80	77	
9	65	57	55	44	44	44	47	79	76	86	82	74 <sup>R</sup>	74	94	94	90	90	92	96	83	90	75	61	64	
10	68	69	66	54	50	46	47	66	71	80	73	80	92	100	111	113	113	110	104	98	89	70 <sup>R</sup>	58 <sup>R</sup>	60 <sup>R</sup>	
11	57	59	51	53	45	44	51	62	76	80	88	78	80	96	109	118	113	110	100	78	58	56	55	57	
12	55	54	54	54	44	45	54	64	75	75	67	77	84	89	98	93	88	93	100	100	73	58	54	52	
13	53	57	64	58	39	35	43	74	69	76	72	76	87	100	119	122	128	142 <sup>R</sup>	149 <sup>R</sup>	131 <sup>R</sup>	117	114	116	121	
14	121	116	100	79	57 <sup>R</sup>	56	93	70	66	70	C	78	92	104	95	89	86	81	A	A	84	82	63	61	
15	58 <sup>R</sup>	59	58	52	50	36	40	65	80	77	69	86	113	127	110	94	96	98	101	99	89	78	74	76	
16	68	60	55	56	47	45	46	66	71	81	91	93	122	125	119 <sup>R</sup>	107	108	106	103	95	76	60	64	67	
17	67	65	62	67	44	30	36	71	84	73	82	103	120	120	118 <sup>R</sup>	110	107 <sup>R</sup>	110	118	64	A	52 <sup>R</sup>	52	52	
18	54	53	56	62	29	27	38	69	80	86	78	92	114	113	113	108	105	105	106	94	62	53	53	54	
19	55 <sup>R</sup>	55	59	48	47	46	41	57	69	85	109	123	119	121 <sup>R</sup>	113	108	98	100	96	90	70	62	64	64	
20	58	55	50	46	49	50	46	66	74	92	100	112	135	138	142 <sup>R</sup>	135 <sup>R</sup>	130	128	124 <sup>R</sup>	107 <sup>J R</sup>	81	54	52	54	
21	56	53	57	64	31	27	34	65	82	80	C	97	C	C	C <sup>J R</sup>	124	108	108	94	86	79	59	56 <sup>R</sup>	60	58
22	54	52	55	54	44	40	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	62	
23	56	54	53	49	C	C	C	75	78	C	C	C	C	C	C	106	C	C	C	C	C	C	C	50	
24	46	C	C	C	C	C	C	C	C	C	C	C	C	C	C	104	114	126	C	C	C	C	C	C	
25	C	C	C	C	C	C	C	73	C	C	C	C	107	112	114	125	127	130	139	126	128	118	116	118	
26	114	107	106 <sup>R</sup>	79	50	38	42	74	74	89	86	88	102	104	100	92	100	106	101	93	95	87	83	88 <sup>F</sup>	
27	76	96 <sup>R</sup>	72 <sup>R</sup>	50	44	40	42	73	82	88	88	84	103	110	116	118	116	112	110	102	98	107 <sup>R</sup>	113	107	
28	104	92	84	80	66	42	38	69	85	83	89	93	102 <sup>R</sup>	107	117	122	118	113	96	86	88	89	76	75	
29	86	84	91	73	59	33	39	68	70	89	100 <sup>R</sup>	94	102	104	113	118	118	109	86	81	88	78 <sup>R</sup>	F	72 <sup>F</sup>	
30	61	58	59	57	33	28	35	64	70	84	88	86	103	91	104	109	110	104	94	66	58	48 <sup>R</sup>	51	50	
31																									
CNT	29	28	28	28	27	27	26	28	27	26	24	26	26	26	28	29	28	27	26	26	26	27	26	29	
MED	58	58	58	54	47	40	45	70	74	78	79	82	98	104	110	108	107	106	101	90	82	68	64	64	
U Q	68	69	65	63	50	45	48	74	80	85	88	93	107	112	115	116	115	110	110	100	90	83	76	76	
L Q	56	54	54	50	44	36	39	66	70	73	69	78	87	98	100	94	96	94	96	81	70	56	55	56	

## IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	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	U	U	L	A	L	L	A	A					
2								L	L		L	U	U	U	L	504	480	L	L	A				
3								L	L	L	U	U	A	B	B	L	L	L	A	A				
4							L	L	L		L	L				504	492	468	L	L				
5									L	L	U	L				L	L	L	L					
6									L	L	L	L	L	U	U	L	L	A	A	A				
7								L	U	L	U	L	U	L	L	L	L	L	L					
8									L	L	L	L	U	R	U	R	L	L	L	L				
9								L	L	L	L	U	L			L	L	L	L					
10									L	L	U	L	U	L	A	L	L	L	L					
11									L	L		A	R	L	R	L	U	U	L					
12									L	U	L	U	L	U	L	A	A	A	A	A				
13									L	L	L	U	L	L	A	U	L	L	A	U	L			
14									L	L	C	U	L	U	L	L	A	A	A	A	A			
15									L	L	L	U	L	R	L	L	L	L	L					
16									L	L	L	L	L	L	L	U	L	L	L	L				
17									L	L	U	L	L	L	A	U	L	A	A	A	A			
18									L	U	L	U	L	U	L	L	L	L	L	L				
19									L	U	L	L	L	U	L	U	L	L	L	L				
20									L	L	U	L	L	U	L	L	L	L	L	L				
21									L	L	U	L	L	L	L	L	L	L	L	A				
22								C	C	C	C	C	C	C	C	C	C	C	C	C				
23									L	U	L	U	L	U	L	C	C	U	L	L	C	C		
24								C	C	C	C	C	C	L	L	L	L	L	L					
25							C		C	C	C	C	L	L	L	L	L	L	L					
26									L	L	L	L	L	U	L	L	L	L	L					
27									L	L	L	U	L	U	L	L	L	L	L	L				
28									L	L	L	U	L	U	L	L	L	L	L	A				
29									L	U	L	L	L	A	U	L	L	L	L	L				
30									L	U	L	L	L	L	L	L	L	L	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										7	16	23	24	17	23	24	13	2						
MED										U	L	U	L	U	L	L	L	L	L	L				
U Q										496	498	520	522	516	512	500	468	424						
L Q										U	L	L	L	L	L	L	L	L	L					
										516	506	536	532	528	524	510	480							
										U	L	L	L	L	L	L	L	L	L					
										472	482	504	506	502	504	496	468							

SEP. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



# IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	AU	RU	A	B	B	B	B	B	B	U	A	A	A				
2							B	244	272	264		B	B	B	R	B	B	U	R	A				
3							B	U	A	U	A	A	A	B	B	B	B	B	A	A	B			
4							B	208	268	R	R	B	B	B	B	B	R	336	280	A	A			
5							B	248	292	320	U	R	B	B	B	B	U	R	U	A	A			
6							B	A	U	A	R	A	B	R	R	B	R	332	280	A	A			
7							B	244	A	320		B	A	B	R	B	R	324	284	A	A			
8							B	U	A	U	R	R	B	B	B	B	U	R	U	A			B	
9							B	228	292	A	A	B	A	R	B	B	332	304		200				
10							A	232			R	R	R	A	A	A	R	328	288	200	A			
11							B	220	300		R	R	R	A	A	A	R	316	276	A	A			
12							B	240	296		U	R	B	R	B	R	A	A	A			B		
13							B	220	268	320	U	R	B	B	B	B	A	U	A	A	A			
14							B	212	280	332	348	U	R	A	B	B	B	312	264	A	A			
15							B	232	276		B	C	B	B	B	B	U	R		A	A			
16							B	212	296	336		A	A	A	B	B	B	R	304	276	180			
17							B	240	276	332	352	B	B	B	B	B	B	R	304	264	A	A		
18							B	U	A	U	R	B	A	B	B	B	A	384	320	256	A	A		
19							B	A	A	A	A	R	A	B	B	B	U	R		A	A			
20							B	216	280	R	R	B	R	R	B	B	U	R		A	A			
21							B	A	A	A	B	B	B	B	B	B	U	R		A	B			
22							B	236	284	B	B	B	B	B	B	B	R	332	264	A	A			
23								C	C	C	C	C	C	C	C	C	C	C	C	C				
24								220	A	R	R	B	B	C	C	U	R	A	C	C				
25								C	C	C	C	C	C	A	A	A	B	U	R		A			
26							A	228	300	348	U	R	B	U	R	R	R	B	256	A				
27							B	232	288	B	B	B	B	B	B	B	U	R	R		R			
28							B	236	284	R	B	R	R	A	A	U	R	340	292	252	180			
29							B	228	264	336	U	R	B	B	A	B	A	A	A	A				
30								220	292	324	R	R	U	R	R	B	B	324	248	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								24	22	15	4	1		2	1	9	26	24	8					
MED								228	280	U	R	U	R		372	380	U	R	344	320	264	192		
U Q								236	292	U	R						U	A	364	328	278	202		
L Q								220	272	U	R	U	R				U	R	342	312	256	180		

## IONOSPHERIC DATA STATION Okinawa

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

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

H	00	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	J	A	E	B	J	A	J	A	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A						
2	J	A	J	A	J	A	J	A	G		G	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A					
3	J	A	J	A	J	A	J	A	J	A	J	A	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A				
4	J	A	E	B	J	A	E	B	G		G	E	B	E	B	E	B	G	J	A	J	A	J	A	J	A	J	A				
5	J	A	J	A	J	A	J	A	E	B	G		G	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A			
6	J	A	E	B	E	B	E	B	E	B	J	A	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A				
7	E	B	J	A	E	B	E	B	E	B	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A				
8	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	J	A	G	J	A	E	B	E	B	E	B			
9	J	A	J	A	J	A	J	A	E	B	G		E	B	E	B	E	B	G	G	J	A	J	A	J	A	J	A	J	A		
10	J	A	J	A	J	A	J	A	E	B	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A		
11	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A		
12	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A		
13	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A		
14	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A		
15	J	A	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	G	J	A	J	A	J	A	J	A	J	A	J	A	
16	J	A	J	A	J	A	J	A	E	B	E	B	E	B	E	B	E	B	G	J	A	J	A	J	A	J	A	J	A	J	A	
17	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A		
18	J	A	J	A	E	B	J	A	J	A	J	A	E	B	E	B	E	B	G	J	A	J	A	J	A	J	A	J	A	J	A	
19	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	G	J	A	J	A	J	A	J	A	J	A	J	A	
20	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	G	E	B	E	B	E	B	E	B	E	B	E	B	
21	J	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A	J	A
22	E	B	E	B	E	B	E	B	E	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
23	E	B	E	B	E	B	E	B	E	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
24	J	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
26	E	B	E	B	J	A	J	A	J	A	J	A	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A	J	A
27	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	G	G	G	G	E	B	E	B	E	B	E	B	E	B
28	E	B	E	B	E	B	E	B	E	B	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A	J	A
29	E	B	E	B	J	A	J	A	J	A	G		E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A	J	A
30	J	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A	J	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	29	28	28	28	27	27	26	28	27	27	26	27	28	28	28	29	29	28	28	28	27	27	28	29								
MED	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A	J	A
UQ	J	A	J	A	J	A	J	A	J	A	E	B	E	B	E	B	E	B	J	A	J	A	J	A	J	A	J	A	J	A	J	A
LQ	E	B	E	B	E	B	E	B	E	B	G	G	G	G	E	B	E	B	G	E	B	E	B	E	B	E	B	E	B	E	B	

SEP. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	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	18	19	E B	E B	E B	E B	G			E B	E B	E B	44	53	52	42	42	44	37	24	16	21	20	19			
2	E B	14	14	20	E B	E B	E B	G			E B	E B	E B	46	50	43	38	38	36	39	22	E B	E B	E B	E B			
3	E B	14	14	14	14	14	14	26	34	40	42	49	E B	E B	E B	E B	E B	E B	E B	14	20	17	19	E B				
4	E B	14	14	14	14	14	14	25	G		E B	E B	E B	44	43	44	45	44	43	G		E B	21	21	19			
5	E B	30	21	21	16	E B	E B	G			E B	E B	E B	44	46	44	G					40	42	49	38			
6	E B	14	14	14	14	14	14	25	32	38	41	35	U Y	U Y	U Y	E B	48	71	76	74	32	20	22	E B	E B			
7	E B	14	14	14	14	14	14	G			E B	U Y	E B	47	46	44	43	41	39	38	32	27	20	E B	E B			
8	E B	14	14	14	14	14	14	26	G		E B	E B	E B	44	44	42	42	36	28	G		E B	E B	E B	E B			
9	E B	14	19	20	18	16	E B	G			E B	42		E B	E B	E B	G					E B	E B	E B	19			
10	E B	14	19	14	14	21	E B	G			E B	G										19	24	20	E B			
11	E B	14	14	14	14	14	14	G			G		U Y	E B	G							E B	E B	E B	E B			
12	E B	14	14	14	14	14	14	30	34	34	41	46	44	45	72	61	48	53	46	23	22	37	30	23				
13	E B	14	14	14	14	14	14	24	G		G		E B	44	47	41	44	52	30	27	30	36	27	E B	E B			
14	E B	14	14	14	14	14	14	26	30	34		C E	E B	E B	E B	E B	57	61	70	A A A A		18	30	26	20			
15	E B	14	14	14	14	14	14	24	G		U Y	37	44	43	U Y	E B	E B	G				19	24	20	E B			
16	E B	22	17	E B	E B	E B	E B	G			G	E B	E B	E B	E B	E B	E B	G				E B	E B	E B	E B			
17	E B	14	14	14	14	14	14	24	32	38	39	41	E B	U Y	E B		57	95	77	70	40	A A	79	20	E B	E B		
18	E B	14	14	14	14	14	14	26	33	39	40	24	44	40	41	42	G					34	26	23	E B	E B		
19	E B	14	14	14	14	14	14	24	34	28	30	45	U G	U G	E B	E B	E B	G				32	28	33	30	E B	E B	
20	E B	14	14	14	14	14	14	23	32	32	42	43	43	42	41	40	G					28	22	14	14	E B	E B	
21	E B	14	14	14	14	14	14	22	31	40	42	43	50	44	42	40	U Y					E B	E B	E B	E B	E B		
22	E B	14	14	14	14	14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E B	E B
23	E B	14	14	14	14	C	C	C	26	31	34	E B	E B	C	C	G						C	C	C	C	C	C	19
24	E B	14	C	C	C	C	C	C	C	C	C	C	C	C	E B	U Y	U G	G				C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	22	C	C	C	C	C	45	40	35	42	41	35	31	41	21	17	E B	E B	E B		
26	E B	14	14	14	14	21	20	G			E B		U G	E B	44	U Y						E B	E B	E B	E B	E B		
27	E B	14	14	14	14	14	14	G			E B	E B	E B	E B	E B	E B	E B	G				E B	E B	E B	E B	E B		
28	E B	14	14	14	14	14	14	G			E B	U G	26	46	44	44	41	41	38	28	39	31	29	19	E B	14		
29	E B	14	14	17	14	14	14	G			E B	E B	E B	E B	E B	44	41	36	33	25	14	14	14	14	14	14		
30	E B	14	14	14	14	14	14	24	32	36	U G	U G	U G	E B								E B				E B	E B	
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	29	28	28	28	27	27	26	28	27	27	26	27	28	28	28	29	29	28	28	28	28	27	27	28	29			
MED	E B	E B	E B	E B	E B	E B	E B	24	31	33	E B	41	41	44	44	44	42	36	33	28	23	19	20	E B	E B			
U Q	14	14	14	14	14	14	14	26	32	38	43	45	45	46	44	43	41	40	39	32	27	24	20	19				
L Q	E B	E B	E B	E B	E B	E B	E B	G	G	G	U G	U G	U G	U G	E B		G				E B	E B	E B	E B	E B			

## IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	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	15	16	19	44	42	42	41	40	39	22	15	13	14	14	14	14	14
2	14	14	14	14	14	14	14	15	16	19	45	42	46	31	43	35	22	16	14	14	14	14	14	14
3	14	14	14	14	14	14	14	14	16	23	24	36	55	63	41	41	21	15	14	14	14	14	14	14
4	14	14	14	14	14	14	14	14	19	23	44	43	44	45	44	33	22	20	13	14	14	14	14	14
5	14	14	14	14	14	14	14	14	14	22	41	41	44	46	44	33	16	16	20	14	14	14	14	14
6	14	14	14	14	14	14	14	14	14	18	24	33	24	20	45	19	20	16	15	14	14	14	14	14
7	14	14	14	14	14	14	14	17	18	20	42	28	41	26	44	21	21	18	15	14	14	14	14	14
8	14	14	14	14	14	14	14	14	15	29	43	43	44	44	42	24	23	15	14	14	14	14	14	14
9	14	14	14	14	14	14	14	15	14	24	41	27	29	44	45	43	24	20	14	14	14	14	14	14
10	14	14	14	14	14	14	14	16	18	20	21	24	22	41	24	25	22	21	14	14	14	14	14	14
11	14	14	14	14	14	14	14	19	20	24	18	42	20	50	36	24	20	16	14	14	14	14	14	14
12	14	14	14	14	14	14	14	17	20	21	41	42	42	43	42	26	22	15	14	14	14	14	14	14
13	18	14	14	14	14	14	14	14	17	20	28	41	44	40	41	38	22	18	14	14	14	14	14	14
14	14	14	14	14	14	14	14	15	20	32	C	40	45	38	43	25	21	15	14	14	14	14	14	14
15	14	14	14	14	14	14	14	14	16	23	23	36	38	40	48	43	22	16	14	14	14	14	14	14
16	14	14	14	14	14	14	14	14	18	26	24	42	42	44	43	41	20	16	14	14	14	14	14	14
17	14	14	14	14	14	14	14	14	19	22	39	38	44	40	44	27	21	16	14	14	14	14	14	14
18	14	14	14	14	14	14	14	14	16	25	32	22	40	40	41	42	20	16	14	14	14	14	14	14
19	14	14	14	14	14	14	14	17	23	22	22	45	24	28	42	41	20	20	14	14	14	14	14	14
20	14	14	14	14	14	14	14	14	20	24	42	43	43	42	41	40	21	17	14	14	14	14	14	14
21	14	14	14	14	14	14	14	18	19	40	42	43	50	44	42	40	24	14	15	14	14	14	16	14
22	14	14	14	14	14	14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	14
23	14	14	14	14	C	C	C	14	21	23	34	46	43	C	C	24	23	C	C	C	C	C	C	14
24	14	C	C	C	C	C	C	C	C	C	C	C	C	43	26	26	20	19	14	14	C	C	14	C
25	C	C	C	C	C	C	C	14	C	C	C	C	C	34	24	27	42	16	16	14	14	14	14	14
26	14	14	14	14	14	14	14	14	20	28	43	23	23	43	21	29	31	16	14	14	14	14	14	14
27	14	14	14	14	14	14	14	15	18	39	46	42	44	44	41	26	21	17	14	14	14	14	14	14
28	14	14	14	14	14	14	14	16	15	22	43	22	24	22	20	20	21	18	14	14	14	14	14	14
29	14	14	14	14	14	14	14	14	20	21	47	44	40	45	25	25	19	13	14	14	14	14	14	14
30	14	14	14	14	14	14	14	14	15	22	24	23	23	22	53	37	21	16	14	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	29	28	28	28	27	27	26	28	27	27	26	27	28	28	28	29	29	28	28	28	27	27	28	29
MED	14	14	14	14	14	14	14	14	18	23	41	41	42	42	42	33	21	16	14	14	14	14	14	14
U Q	14	14	14	14	14	14	14	16	20	25	43	43	44	44	44	40	22	18	14	14	14	14	14	14
L Q	14	14	14	14	14	14	14	14	16	21	24	28	26	34	38	25	20	16	14	14	14	14	14	14

SEP. 2013 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

SEP. 2013 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	288	274	294	301	322	330	331	356	359	364	310	296	304	314	301	305	315	339	343	340	330	298	285	283	
2	275 <sup>R</sup>	276	289	305	333	372	330	345	357	327	335	313	315	282	303	304	313	328	342	344	305	279	285	283	
3	285	285 <sup>J</sup>	308 <sup>R</sup>	304	305	308	321	373	375	356	329	321	316	299	319	319	327	323	328	313	338	315	280	282	
4	278 <sup>J</sup>	290 <sup>R</sup>	302	327	325	299	322	384	379	335	339	321	291	306	302	302	302	311	325	341	340	297	285 <sup>R</sup>	296	
5	294 <sup>R</sup>	307	334 <sup>R</sup>	331	321	313	342	386	378	360	312	304	287	303	306	326 <sup>R</sup>	325	321	321	294	299	306	288	299 <sup>R</sup>	
6	302	300	317	322	331	330	347	369	383	348	330	287	301	305	307	316	326	322 <sup>A</sup>	321 <sup>A</sup>	317	324	288	289	290	
7	294	307	325	308	320	312	325	373	375	344	328	317	289	296	299	294	308	321 <sup>R</sup>	347	334		287	278	284	
8	307	308	328 <sup>R</sup>	365	313	328	340	378	353	367	331	302	301	295	300	305	302	316	326	321	341	296	295	302	
9	295	294	301	320	299	293	316	371	355	371	358	332	296	313	312	297	307	320	333	321	324	324	292	285	
10	302	324	332	318	320	331	329	357	354	357	344	317	320	310	317	323	304	320	323	317	337	321	288	270 <sup>R</sup>	
11	281	316	321	329	291	294	333	358	362	335	343	347	303	289	298	319	320	335	335	350	298	289	282	290	
12	288	292	297	320	308	316	340	369	364	357	341	317	315	309	311	321	321	317	319	339	346	296	286	286	
13	275	298	324	354	299	323	341	391	381	340	337	315	296	307	315	318	325	330	340	351	320	307	304	302	
14	307	315	331	343	289	292	350	395	361	385		299	326	322	318	336	329	335			312	326	304	296	
15	296 <sup>R</sup>	295	302	330	361	359	328	365	355	369	328	291	310	329	322	319	319	313	336	327	326	305	293	292	
16	301	304	318	348	332	340	347	367	368	345	338	277	315	323	324 <sup>R</sup>	308	328	342	340	342	357	289	291	295	
17	302	304	323	351	373	356	311	373	388	336	323	298	311	315	308	322	322 <sup>R</sup>	335	364	333		305	287	290	
18	288	292	309	356	354	321	333	359	355	350	314	294	306	311	307	298	315	311	343	360	305	297	282	285	
19	296 <sup>R</sup>	291	313	311	313	361	372	363	348	321	320	326	308	299		300	296	312	332	327	341	312	292	298	299
20	299	297	305	289	317	349	355	370	353	337	327	309	312	313	311	315	322	340	342	348	299	286	279	277	
21	299	291	302	390	327	352	335	373	374	343		279										293	316	293	295
22	293	290	316	343	336	340																			287
23	297	290	313	336					376	374															304
24	290																								
25																									
26	316	314	306 <sup>R</sup>	316	356	339	317	376	377	359	348	310	312	317	311	311	302	327	332	319	306	280	295	296	
27	304	309 <sup>R</sup>	320 <sup>R</sup>	311	328	330	327	359	365	355	348	303	297	297	304	309	321	325	328	331	329	317	319	314	
28	324	323	315	334	345	354	317	355	358	341	331	316	302	296	305	321	326	341	348	316	310	308	295	306	
29	304	313	333	366	366	354	312	376	368	333	346 <sup>R</sup>	326	300	297	308	314	327	344	340	316	311	313		312	
30	305	301	324	353	334	329	326	370	352	345	357	309	318	299	293	311	327	347	366	350	299	304	279	291	
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	28	28	27	27	26	28	27	26	24	26	26	26	28	29	28	27	26	26	25	27	26	29	
MED	296	299	316	330	325	330	330	370	364	346	333	310	306	306	306	311	320	327	338	334	320	304	288	292	
U Q	303	308	324	350	336	352	341	376	375	359	344	317	315	313	312	319	326	339	343	344	334	313	295	300	
L Q	288	291	304	314	313	313	322	359	355	337	328	298	300	297	300	302	309	320	327	319	305	289	285	285	

SEP. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	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	U L	A	A	L	356	353	L	A	A					
2								L	L		L	L	U L	U L	361	365	348	L	A						
3								L	L	L	U L	A	B	B	L	L	L	A	A						
4							L	L	L		L				371	363	359	L	L						
5									L	L	U L	U L	B	L	L	L	L	L							
6									L	L	L	L	L	U L	U L	A	A	A	A						
7									L	U L	U L	U L	U L	A	L	L	L	L							
8									L	L	L	U R	U R	359	370	346	L	L	L	L					
9								L	L	L	L	L	L	364	370	L	L	L	L						
10									L	L	U L	U L	A	358	355	L	L	L	L						
11									L	L	A	R	L	R	L	U L	U L	L							
12									L	U L	U L	U L	A	A	A	A	A	A							
13									L	L	L	A	U L	U L	A	U L	L	A	U L						
14									L	L	C	U L	B	L	U L	A	A	A	A	A					
15									L	L	L	L	R	L	L	L	L	L	L						
16									L	L	L	L	L	L	U L	L	L	L	L						
17									L	L	L	L	A	B	A	A	A	A	A						
18									L	U L	U L	U L	L	L	L	L	L	L	L						
19									L	U L	U L	L	L	U L	U L	U L	U L	U L	L						
20									L	L	L	L	L	L	L	L	L	L	L						
21									L	L	L	L	L	L	L	L	L	L	L	A					
22								C	C	C	C	C	C	C	C	C	C	C	C	C					
23									L	U L	U L	U L	L	C	C	U L	L	C	C						
24									C	C	C	C	C	L	L	L	L	L	L						
25							C		C	C	C	C	L	L	L	L	L	L	L						
26									L	L	L	L	L	L	L	L	L	L	L						
27									L	L	L	L	L	L	L	L	L	L	L						
28									L	L	L	L	L	L	L	L	L	L	L	A					
29									L	U L	L	L	A	U L	U L	U L	U L	L	L						
30									L	U L	L	L	L	L	B	L	L	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										7	16	22	23	16	22	23	13	2							
MED										U L	U L	U L	U L	L	L	L	U L	U L	L						
U Q										383	386	382	381	374	362	358	359	374							
L Q										U L	U L	L	L	L	L	L	L	L							
										393	396	392	393	388	369	363	365								
										U L	U L	U L	U L	L	L	L	L	L							
										362	376	369	369	363	359	353	351								

SEP. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

SEP. 2013 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								234	240	240	312 <sup>L</sup>	324	302	292	316	314	286	254	240					
2								254	250		262	324	292	332	318	314	290	270	238					
3								222	226	252	274	290	274	324	298	302	292	280	260					
4							264	214	216		276	306	324	304	304	288	294	278	258					
5								222	248			318	338	306	296	274	264	280						
6								220	230	268 <sup>L</sup>	346	314	304	292	286	276	330 <sup>E A E A</sup>	322						
7								232	256	272	282	342	312	308	314	294	272							
8								220	236	270 <sup>L</sup>	332	314	328	304	300	302	276	236						
9								230	240	240	250	266	340	298	298	308	292	266	240					
10								230	250	264	296	290	296	286	274	280	256	242						
11								242	264		256	326	318	316	282	266	250							
12								222	240	272	308	288	310	302	278	280	282	268						
13								218	246	246	310	296	298	294	280	270	264							
14								234	224		332 <sup>C</sup>	272	288	278	270	270	292 <sup>A</sup>			A	A			
15								246	228	262	326	294	272	256	272	276	264	244						
16								230	256	260	346	302	276	274	296	270	248							
17								212	238 <sup>L</sup>	286	302	274	292	294	278 <sup>E A</sup>	310	264	232						
18								236	260	270	308	302	286	300	280	272	276							
19								234	296	284	278	282	270	292	296	278	264							
20								230	260	258	296	290	284	288	288	268	242							
21								230	252	256	304	288	282	314	276	272	250	242						
22								C	C	C	C	C	C	C	C	C	C	C						
23									218	242	260	294	294		C	C	280	274		C	C			
24								C	C	C	C	C			292	298	310	290		C				
25							C		C	C	C	C			288	286	316	314	290	264				
26								214	244	244	304	282	280	278	294	304	254							
27								232	242	250	256	298	314	284	284	266	246							
28								234	256	256	274	290	308	302	274	260	240							
29								220	274	256	278	278	304	288	278	264	234							
30									260	246	274	280	264	320	286	262	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							1	5	26	25	24	27	28	28	28	29	29	27	12					
MED							264	230	230	248	262	304	293	297	298	286	276	264	242					
U Q								244	234	258	272	324	308	309	306	301	291	276	259					
L Q								218	220	240	256	278	285	285	288	278	269	250	239					

SEP. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

SEP. 2013 h'F (KM)

135° E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	284	322 <sup>A</sup>	298	260	234	228	244	222	210	202	222	E B 190	E A 270	A	A	A E 240	A 272	A	A	230	206	242	A 286	A 306	
2	310	318	300	272	224	206	234	210	218	228	226	B 204	E B 260	E A 290	B 216	210	240	248	A	218	216	252	294	280	
3	286	276	254	248	238	246	264	220	210	218	208	A	B	B	B	B E 216	A 226	A 242	A	250	224	216	294	284	
4	304	294	274	228	228	262	250	210	204	200	Y B 230	B 200	E B 204	E A 240	B 236	A 258	226	A	246	228	202	212	260	268	
5	262	250	228	210	224	224	240	212	210	H 186	190	E Y 176	E A 204	E B 244	B 234	B 210	A 244	A 260	A 258	266	A 268	A 262	258	276	
6	266	262	234	220	218	216	228	212	212	202	190	E Y 290	E A 192	E B 216	B 242	A	A	A	A	246	228	258	274	274	
7	274	260	226	224	234	236	252	218	208	204	188	E Y 246	E A 268	A	E B 242	A 240	A E 256	A 266	A 236	228	A 258	A 274	286	292	
8	260	254	218	196	246	238	238	210	206	Y B 224	B 216	B 200	B 210	B 198	B 242	B 214	B 210	B 220	B 222	B 228	B 202	B 196	B 242	B 252	
9	254	280	256	244	296	282	262	218	210	208	202	208	184	204	B E 242	B E 230	B E 226	B E 226	B E 230	B E 232	B E 228	B E 202	B E 268	B E 300	
10	274	236	224	236	234	242	242	218	210	192	204	202	202	A E 252	A 246	A 214	A 230	A 222	A 232	A 228	A 222	A 262	A 290		
11	286	246	250	234	256	282	252	202	220	214	248	A 188	188	B	E A 212	E A 270	E A 234	E A 210	E A 226	E A 210	E A 224	E A 292	E A 304		
12	298	282	270	234	228	258	234	206	216	E Y 228	202	E A 262	E A 242	E A 242	A	A	A	A	A	222	200	A E 254	A E 282	A E 310	
13	306	288	246	210	214	246	244	212	204	212	200	E A 260	E A 214	A	196	260	A	212	232	204	240	232	264	262	
14	254	248	210	204	264	278	226	202	194	202	C	E B 186	E B 252	E B 176	E B 236	A	A	A	A	A	244	242	248	264	
15	266	276	254	214	202	214	226	214	224	210	206	190	210	206	B	B	B	220	220	236	222	208	224	256	
16	268	268	248	224	208	222	228	210	214	218	172	206	192	E B 246	E B 226	B 220	B 210	B 230	B 238	B 222	B 206	B 222	B 266	B 262	
17	260	254	238	226	190	224	254	218	208	A 206	182	202	210	B 224	A E 224	B 224	A	A	A	228	A 274	A 278	A 288		
18	284	276	254	210	192	250	248	212	212	218	200	Y 206	202	Y	E B 206	E B 236	B 222	B 230	B 236	B 220	A 250	A 246	A 294	A 280	
19	282	278	254	246	246	208	200	198	216	196	196	274	222	Y 218	Y 200	B 222	B 214	B 240	B 246	B 222	B 248	B 244	B 250	B 260	
20	260	272	268	292	254	224	208	216	204	190	202	B 200	B 198	B 208	B 210	B 224	B E 242	B E 234	B E 228	B E 212	B 198	B 236	B 292	B 286	
21	274	274	250	192	220	214	228	214	214	212	B 200	184	B 252	B 210	B 222	B 242	Y 236	Y 216	A	216	212	A 266	A 280	264	
22	276	284	252	224	220	220	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	262	
23	268	274	250	214	C	C	C	C	C	C	C	C	C	C	C	C	186	216	C	C	C	C	C	264	
24	284	C	C	C	C	C	C	C	C	C	C	C	C	C	208	226	Y 212	Y 244	Y 240	Y 236	Y 234	C	C	266	
25	C	C	C	C	C	C	C	224	C	C	C	C	C	C	E Y 202	Y 258	Y 236	B 230	B 264	B 252	B 238	B 220	B 210	B 256	B 258
26	244	240	230	218	204	228	244	220	212	212	212	B 246	Y 214	Y 210	A 244	Y 242	Y 218	Y 238	Y 236	Y 224	Y 226	Y 228	Y 264	Y 268	
27	258	244	226	238	226	236	248	228	218	226	236	B 206	E B 196	E B 234	B 210	B 218	B 216	B 234	B 226	B 222	B 206	B 218	B 228	B 220	
28	228	222	230	218	202	200	246	228	222	214	E B 228	Y E 200	E A 250	E A 224	E A 256	E A 236	E A 256	A	220	238	228	226	246	234	
29	256	244	238	202	196	196	252	212	212	210	B 214	B 214	A	B	A E 216	A E 230	A E 226	A 232	A 218	A 224	A 206	A 212	A 272	A 264	
30	268	254	230	208	194	232	242	206	218	214	Y 212	198	194	206	B	B	B	B	B	B	B	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	29	28	28	28	27	27	26	28	27	27	25	25	25	20	24	24	24	20	20	27	26	27	28	29	
MED	268	270	249	224	224	228	243	213	212	210	202	202	200	211	220	226	224	233	234	224	224	236	266	268	
U Q	284	279	254	237	238	246	250	218	216	218	219	243	B E 232	E A 243	E B 242	A 240	A 244	A 240	A 237	A 232	A 228	A 254	A 286	A 289	
L Q	260	249	230	210	204	216	228	210	208	202	194	199	195	207	211	219	217	227	224	220	206	218	257	262	

SEP. 2013 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



IONOSPHERIC DATA STATION Okinawa

SEP. 2013 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	108	108	102	B	B	B	B	B	B	108	A	A	A				
2							B	114	106	104	B	B	B	110	B	B	108	112	112	A				
3							B	112	106	106	106	B	B	B	B	B	110	A	A	B				
4							B	108	106	106	B	B	B	B	B	116	112	108	A	A				
5							B	110	108	108	B	B	B	B	B	116	108	108	A	A				
6							B	A	108	108	A	B	A	A	B	A	108	108	A	A				
7							B	114	A	108	B	A	B	104	B	108	108	108	A	A				
8							B	110	110	112	B	A	B	B	B	112	108	A	110	B				
9							B	116	A	A	B	A	104	B	B	B	108	110	112	A				
10							A	116	116	A	112	108	A	A	A	110	110	110	A	A				
11							B	130	108	108	114	B	A	B	114	A	A	A	114	B				
12							B	114	108	108	B	B	B	B	A	110	110	110	A	A				
13							B	110	108	108	110	A	B	B	B	B	110	106	A	A				
14							B	114	106	B	C	B	B	B	B	106	108	108	A	A				
15							B	110	112	110	A	A	A	B	B	B	110	110	114	A				
16							B	112	112	112	110	B	B	B	B	B	106	108	A	A				
17							B	110	110	110	B	A	B	B	B	114	108	108	A	A				
18							B	A	A	A	A	A	A	B	B	B	106	106	A	A				
19							B	122	116	A	A	B	A	A	B	B	110	112	A	A				
20							B	A	A	A	B	B	B	B	B	B	110	110	A	B				
21							B	126	110	B	B	B	B	B	B	B	110	108	A	A				
22							C	C	C	C	C	C	C	C	C	C	C	C	C					
23							108	A	106	122	B	B	C	C	110	A	C	C						
24							C	C	C	C	C	C	C	B	A	A	110	112	126	A				
25							C	A	C	C	C	C	A	A	A	B	112	110	116	A				
26							A	116	108	112	B	A	A	B	A	112	B	106	A					
27							B	116	110	B	B	B	B	B	B	110	108	108	140					
28							B	112	114	108	B	A	A	A	A	108	108	108	A					
29							B	114	114	110	B	B	A	B	A	A	A	110	A					
30							130	106	106	A	A	A	104	B	B	110	110	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								24	22	19	6	1	1	3	1	12	25	24	8					
MED								114	108	108	111	108	104	104	114	110	108	108	114					
U Q								116	112	110	114			110		113	110	110	121					
L Q								110	108	106	110			104		109	108	108	112					

SEP. 2013 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

### IONOSPHERIC DATA STATION Okinawa

SEP. 2013 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	102	94	94	B	94	96	96	96	110	112	B	B	146	124	120	130	122	110	106	102	102	102	98	98
2	100	100	104	98	100	98	100	G	126	G	B	B	B	126	B	154	132	118	110	106	102	104	B	100
3	98	100	100	100	98	116	120	112	108	108	108	108	B	B	B	B	114	104	104	104	104	100	100	100
4	100	98	B	98	94	94	B	148	G	G	B	B	B	B	B	134	G	108	104	100	100	92	100	100
5	94	98	94	94	94	96	B	G	166	G	B	B	B	B	B	G	124	114	106	104	100	100	100	100
6	96	B	B	B	B	B	114	110	110	110	110	106	98	94	B	114	110	110	108	104	104	100	100	100
7	B	100	100	98	B	B	B	G	98	116	B	B	128	128	B	124	116	110	106	106	102	102	100	104
8	B	B	B	B	B	B	B	154	96	G	B	B	B	B	B	110	108	104	G	96	B	B	B	B
9	96	94	94	94	94	94	B	G	110	108	B	106	G	B	B	B	G	G	G	104	104	102	100	100
10	100	102	96	96	96	96	98	132	100	138	98	96	120	112	114	116	114	110	102	102	102	94	94	B
11	94	B	B	B	B	B	B	G	154	G	94	106	92	B	G	112	106	104	140	102	102	98	94	96
12	94	92	B	B	B	B	B	130	118	142	B	180	142	140	116	116	114	110	106	102	98	96	96	88
13	B	B	B	B	B	B	B	136	G	G	G	108	B	108	B	124	108	106	100	98	100	96	B	B
14	B	B	B	B	B	B	B	132	118	114	C	B	B	B	B	112	108	104	104	104	104	100	100	98
15	98	B	B	90	B	B	B	180	G	G	108	110	112	112	B	B	G	130	116	106	102	96	96	98
16	98	96	96	92	B	B	B	162	106	G	G	B	B	B	B	B	G	118	110	108	104	100	B	B
17	B	92	B	B	B	B	B	114	110	106	B	112	B	112	B	124	114	112	108	130	102	102	98	98
18	98	98	B	104	102	100	100	100	98	100	102	100	106	112	B	B	G	128	112	106	102	102	98	98
19	B	B	96	B	B	B	B	144	116	106	100	B	B	102	B	B	G	124	106	102	100	100	B	B
20	B	B	B	B	B	B	B	108	108	108	B	B	B	B	B	B	G	118	110	B	B	B	B	B
21	98	B	B	B	94	92	B	134	132	B	B	B	B	B	B	B	140	120	110	106	106	98	96	B
22	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
23	B	B	B	B	C	C	C	128	108	108	G	B	B	C	C	G	108	C	C	C	C	C	C	92
24	94	C	C	C	C	C	C	C	C	C	C	C	C	B	100	100	G	148	138	120	C	C	102	C
25	C	C	C	C	C	C	C	120	C	C	C	C	100	96	98	B	148	122	114	106	102	94	B	B
26	B	B	102	100	96	96	96	G	132	120	B	114	96	B	174	176	164	120	94	90	B	B	B	B
27	B	B	B	B	B	B	B	G	G	B	B	B	B	B	B	G	G	G	G	90	B	B	B	B
28	B	B	B	B	B	B	B	G	104	G	B	96	190	170	146	128	114	114	110	104	100	96	96	B
29	B	B	94	92	92	92	98	G	110	G	B	B	112	B	108	98	160	136	116	B	104	102	102	106
30	98	B	B	B	B	B	B	164	134	126	100	98	96	96	B	168	144	128	116	110	102	100	102	B
31																								
H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	12	11	12	11	11	8	19	23	15	8	14	14	14	8	17	20	26	25	26	23	23	19	16
MED	98	98	96	97	94	96	99	132	110	110	101	106	109	112	115	124	114	114	108	104	102	100	100	99
U Q	99	100	100	99	98	98	107	148	126	120	108	110	128	126	133	132	136	122	113	106	104	102	100	100
L Q	95	94	94	93	94	94	97	112	106	108	99	98	96	102	104	112	109	110	105	102	100	96	96	98

SEP. 2013 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F		F	F	L	L	CL	C			H	CH	C	C	C	C	C	L	F	F	F	F	
2	F	F	F	F	F	F	L		CL	CL				C		H	H	C	C	CL	F	F		F	
3	F	F	F	F	F	F	C	C	C	C	C	C	C				C	C	C	L	F	F	F	F	
4	F	F		F	F	F		H								H		C	L	L	F	F	F	F	
5	F	F	F	F	F	F			HL								CL	CL	C	L	F	F	F	F	
6	F						C	C	CL	CL	C	C	L	L		CL	C	C	C	L	F	F	F	F	
7		F	F	F					L	C		L	C	C		C	C	C	C	C	F	F	F	F	
8								H	L							C	C	C		L					
9	F	F	F	F	F	F			C	C		C								L	F	F	F	F	
10	F	F	F	F	F	L	H	L	HL	L	L	L	CL	C	CL	C	C	C	L	L	F	F	F		
11	F							H		L	C	L	C			C	C	L	HL	L	F	F	F	F	
12	F	F					H	C	H		H	H	H	H	C	C	C	C	C	C	F	F	F	F	
13							H				C			C		C	C	C	L	L	F	F			
14							H	C	C							C	C	C	C	L	F	F	F	F	
15	F			F			H				C	C	C				H	C	C	C	F	F	F	F	
16	F	F	F	F			H	C										C	C	C	F	F			
17		F					C	C	C		C			C		C	C	C	C	CL	F	F	F	F	
18	F	F		F	F	L	L	L	L	L	L	L	C	C				C	C	C	F	F	F	F	
19			F				HC	C	L	L	L	L	L	L				C	C	L	F	F			
20							C	C	C									C	C						
21	F			F	F		H	HL									H	C	C	L	F	F	F		
22																									
23							C	C	C								C							F	F
24	F													L	L	L	L	H	H	CL			F		
25							C						L	L	L		HL	C	C	CL	F	F			
26			F	F	F	L		H	C		CL	L	L	HL	H	H	C	L	L	F					
27																					F				
28									L			L	HL	HL	HL	CL	C	C	C	F	F	F	F	F	
29			F	F	F	L		CL			C		C	C	L	HL	HL	CL		F	F	F	F	F	
30	F						H	H	C	L	L	L	L	L		H	H	C	C	F	F	F	F	F	
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
◊	f <sub>o</sub> F <sub>2</sub> , f <sub>o</sub> F <sub>1</sub> , f <sub>o</sub> E
×	f <sub>x</sub> F <sub>2</sub>
*	DOUBTFUL f <sub>o</sub> F <sub>2</sub> , f <sub>o</sub> F <sub>1</sub> , f <sub>o</sub> E
⊗	f <sub>b</sub> E <sub>s</sub>
└	ESTIMATED f <sub>o</sub> F <sub>1</sub>
†, ‡	f <sub>min</sub>
^	GREATER THAN
∨	LESS THAN

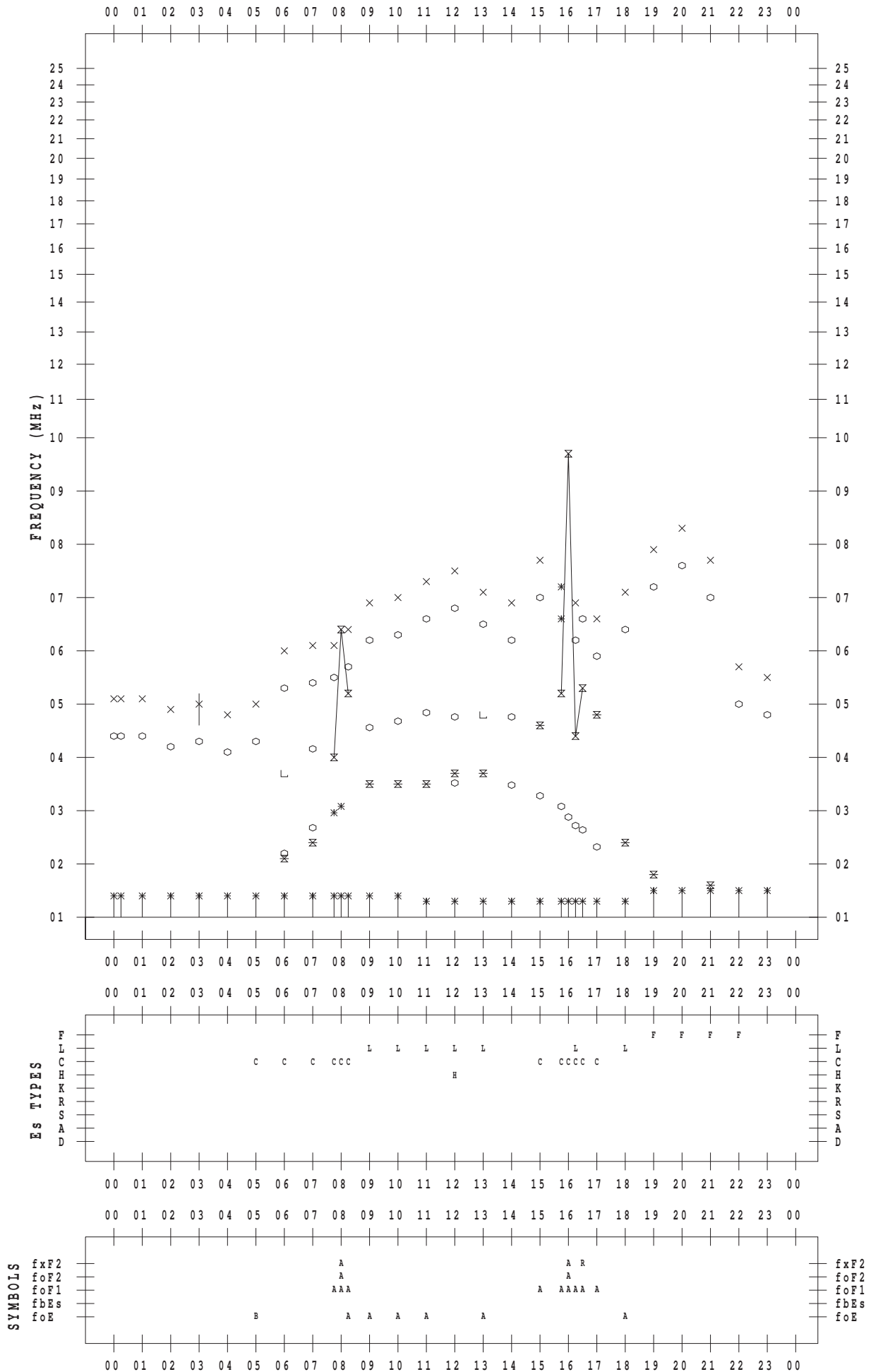
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/ 1

135 ° E MEAN TIME



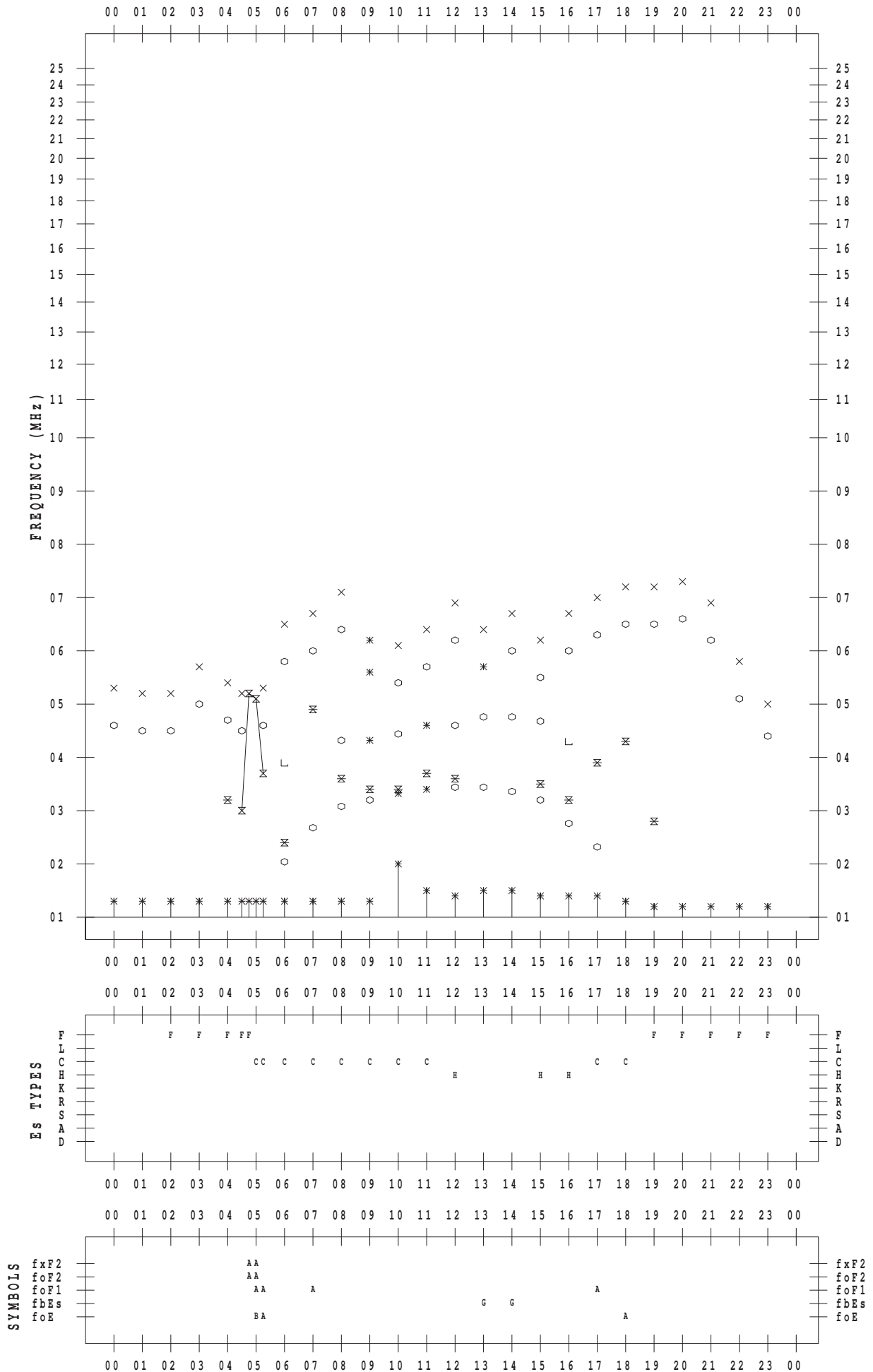
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/ 2

135 ° E MEAN TIME



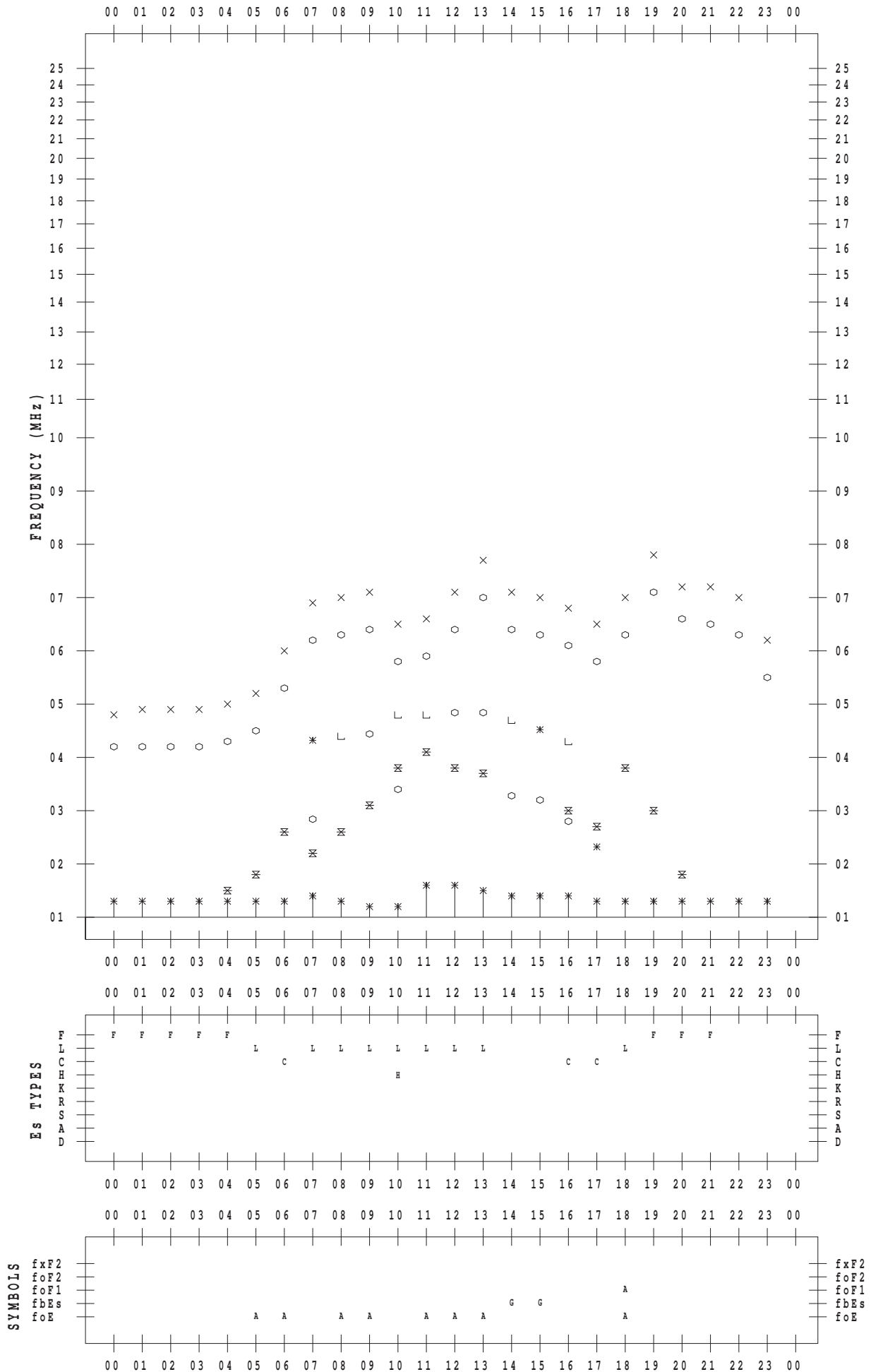
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/ 3

135 ° E MEAN TIME



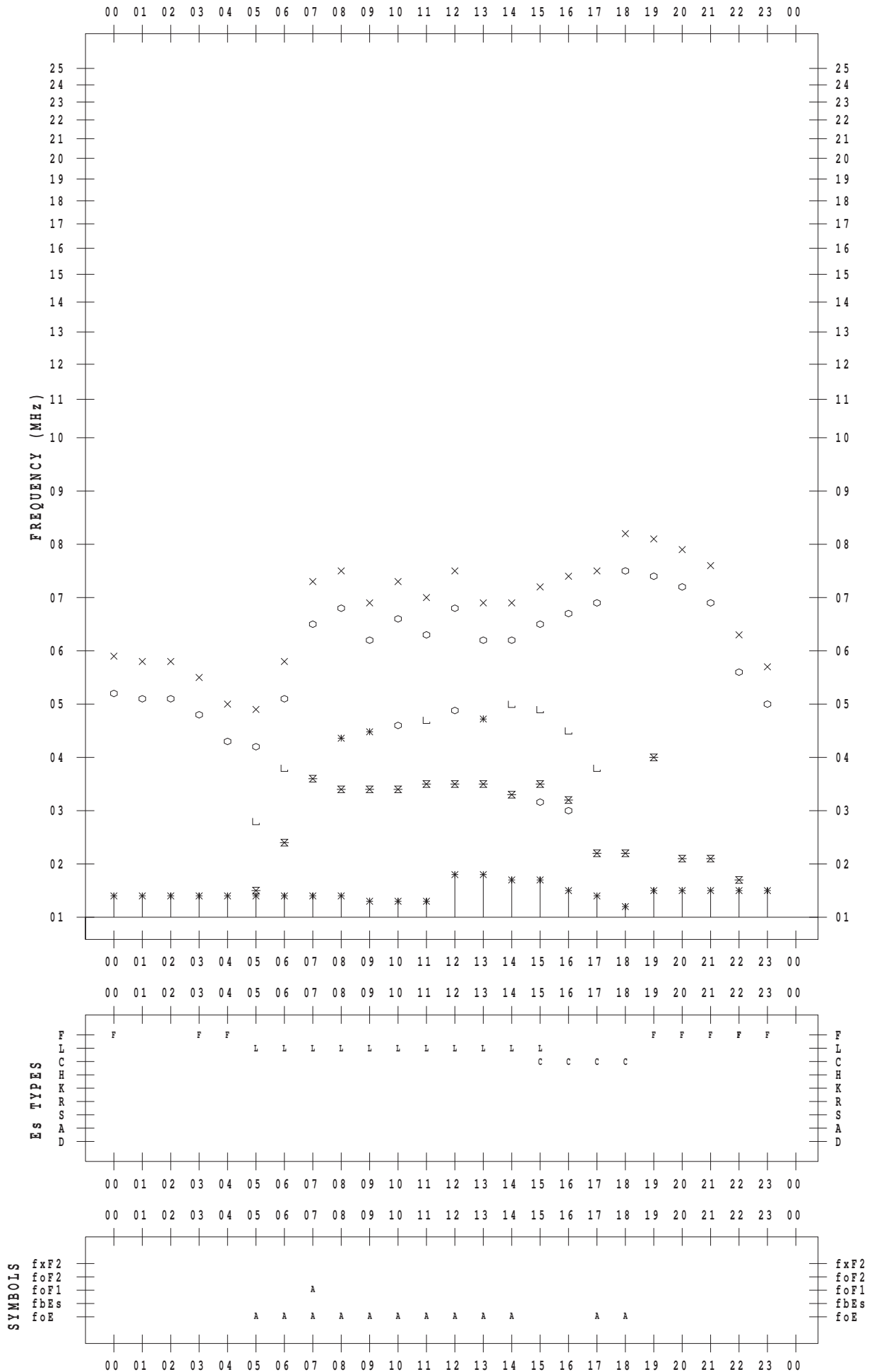
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/ 4

135 ° E MEAN TIME





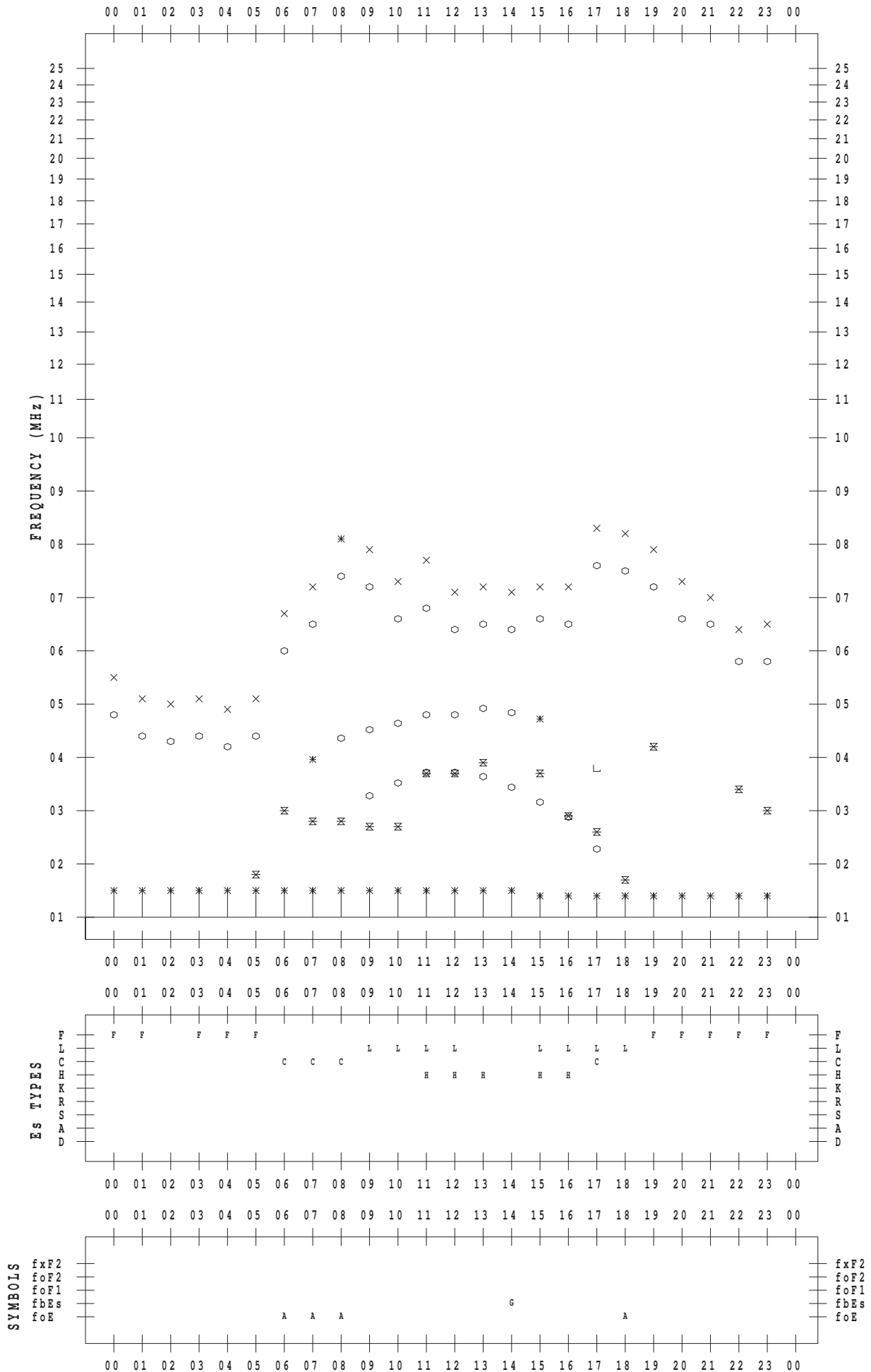
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 9 / 5

135 ° E MEAN TIME



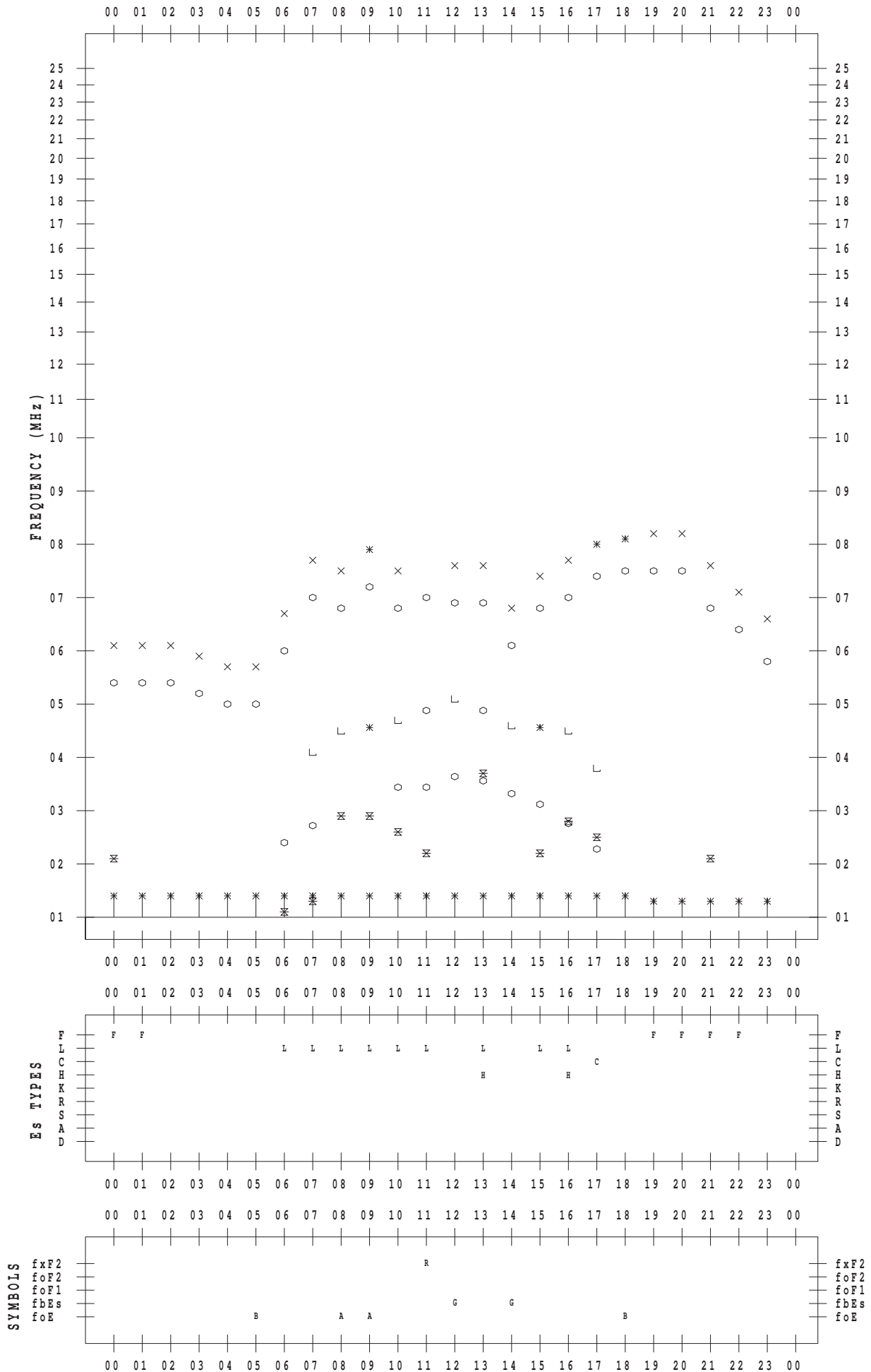
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/ 6

135 ° E MEAN TIME



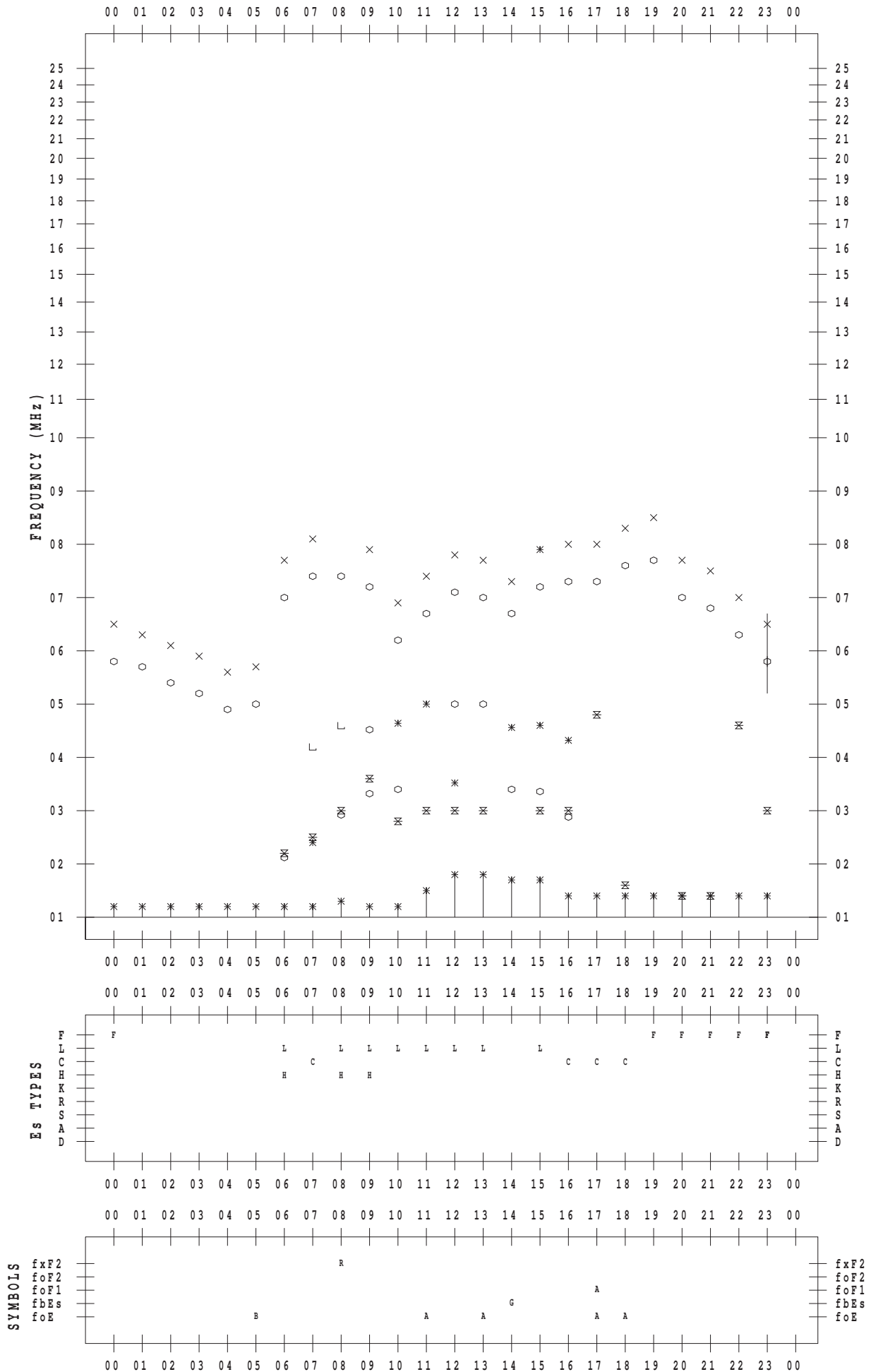
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 9 / 7

135 ° E MEAN TIME



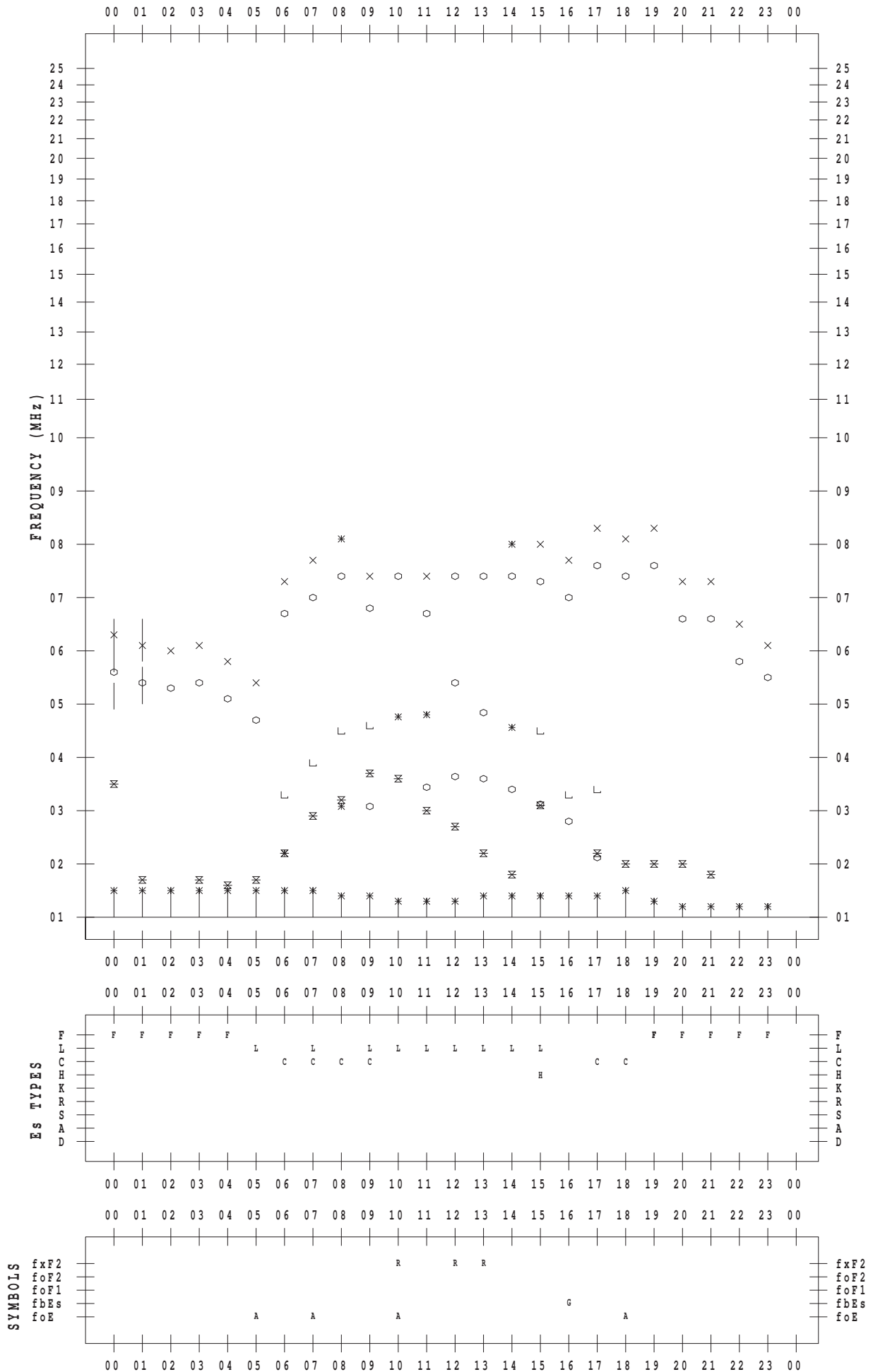
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/ 8

135 ° E MEAN TIME



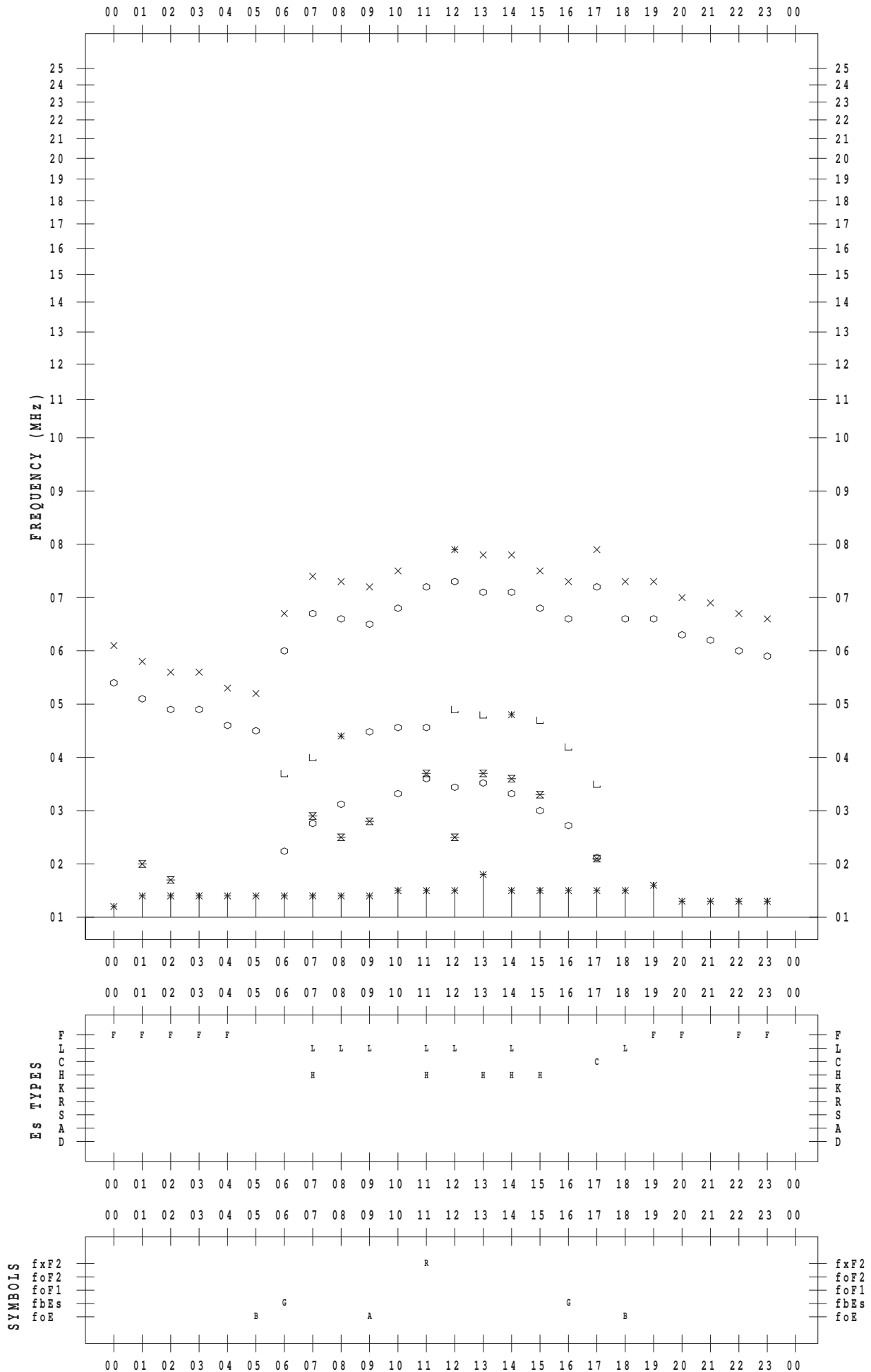
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/ 9

135 ° E MEAN TIME



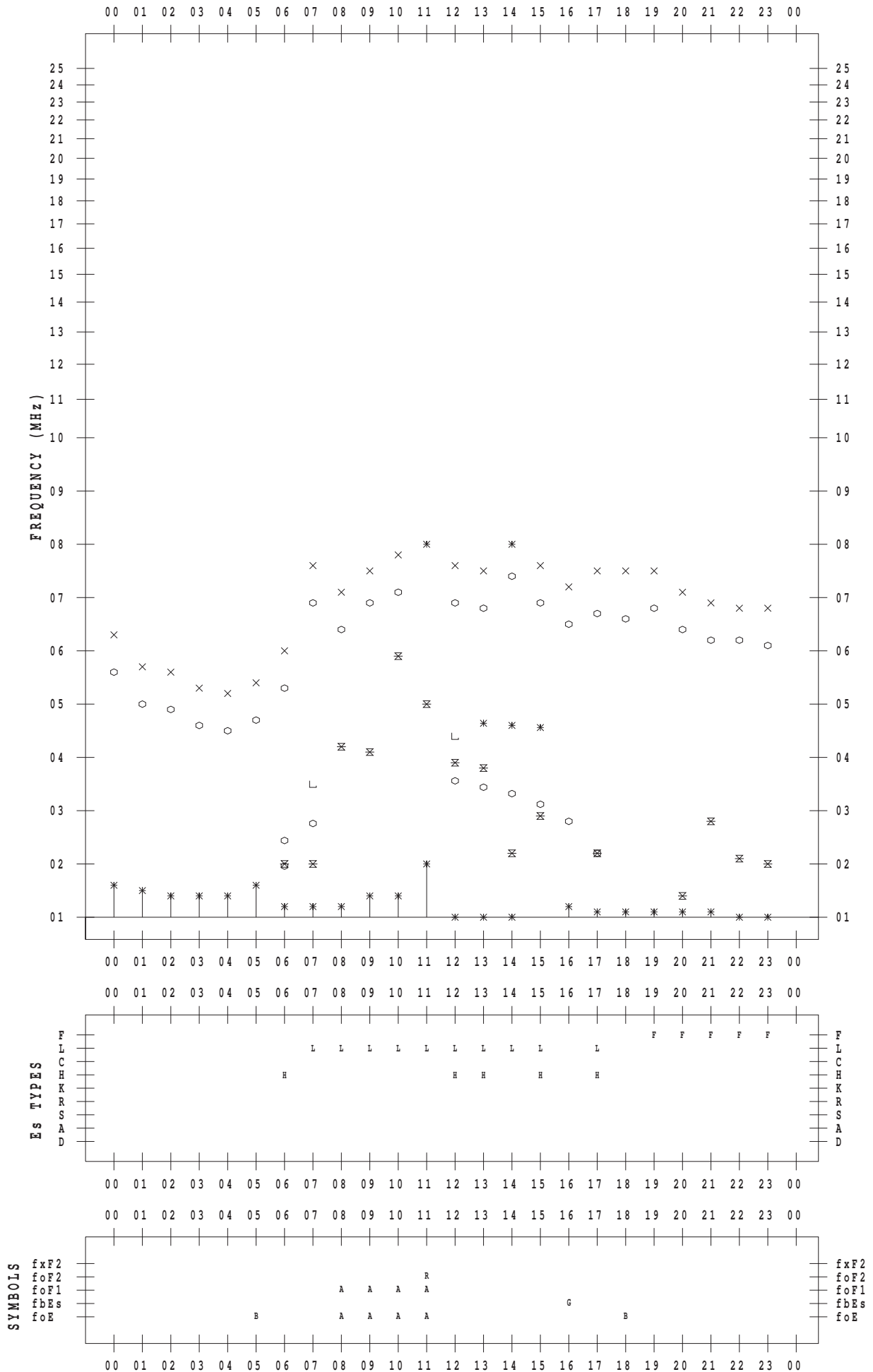
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/10

135 ° E MEAN TIME



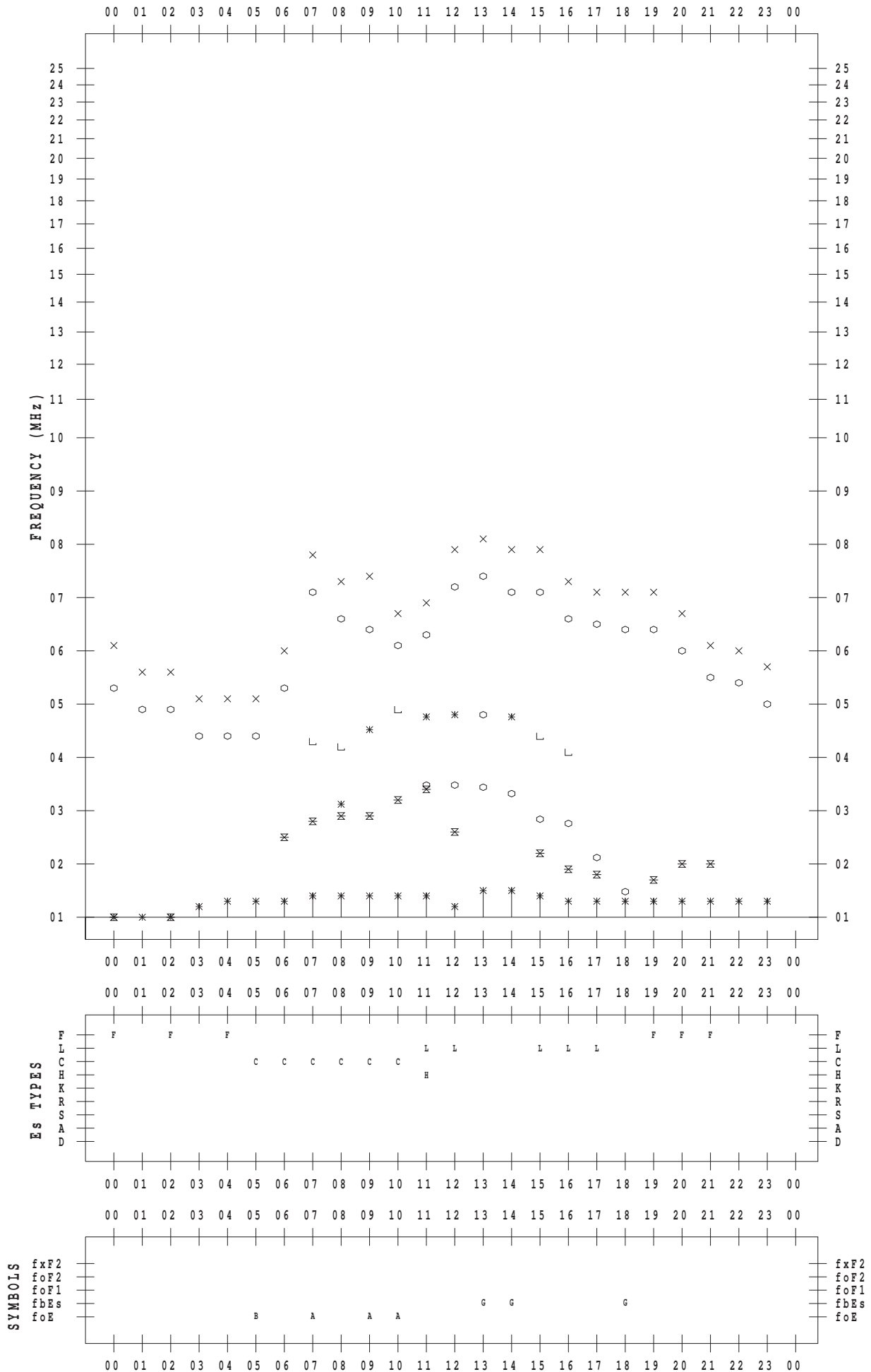
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/11

135 ° E MEAN TIME



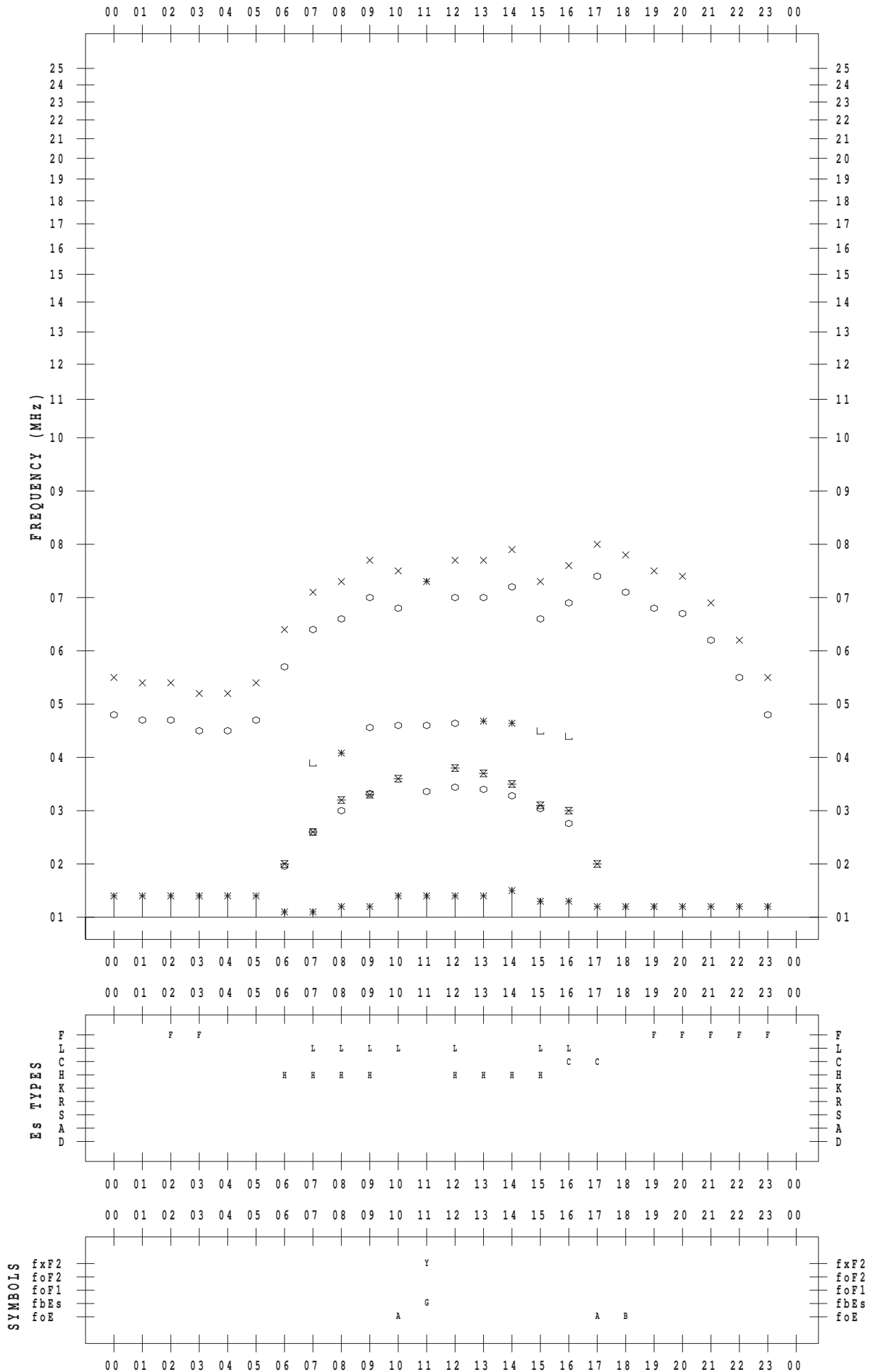
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/12

135 ° E MEAN TIME





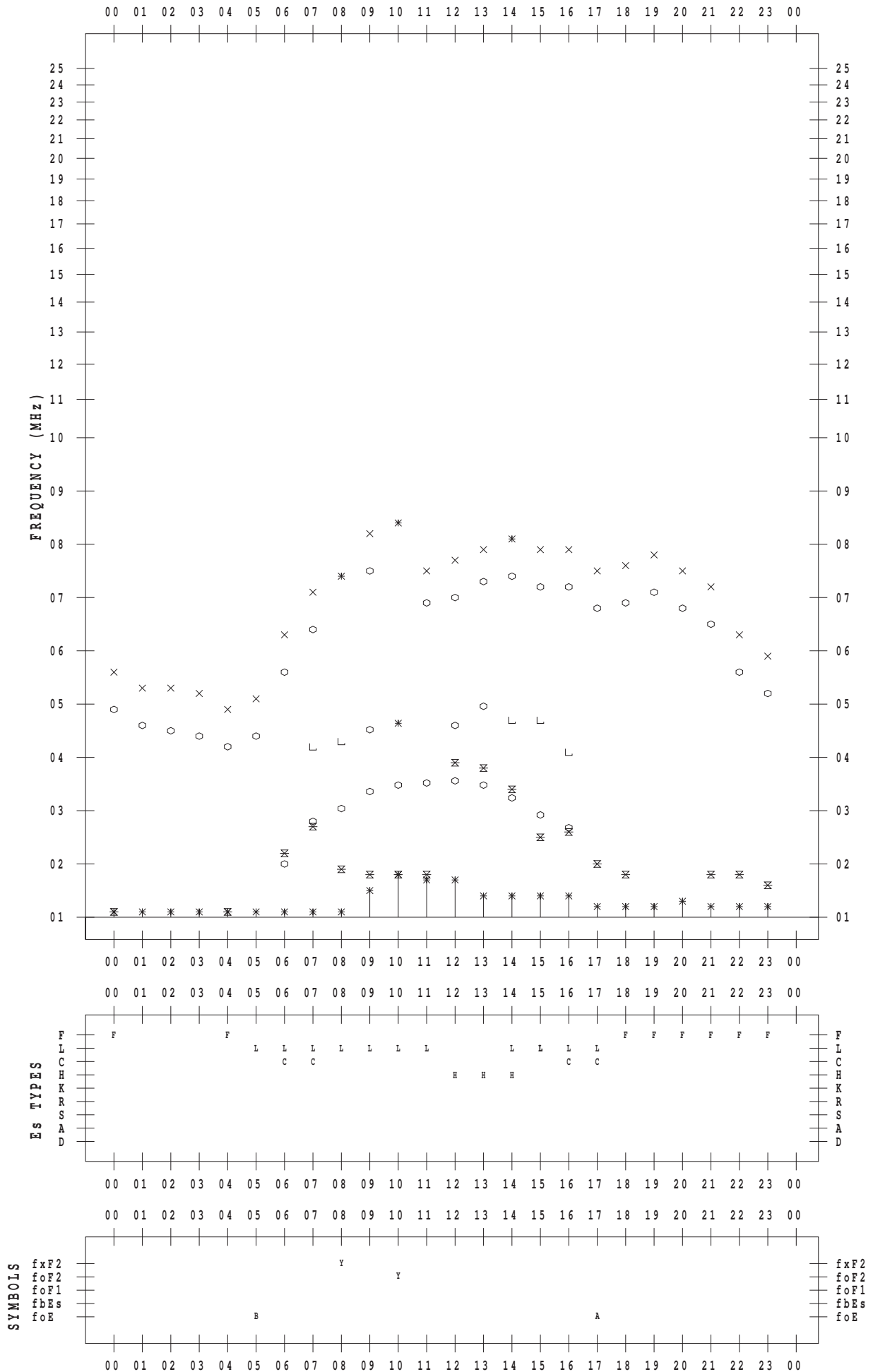
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/13

135 ° E MEAN TIME



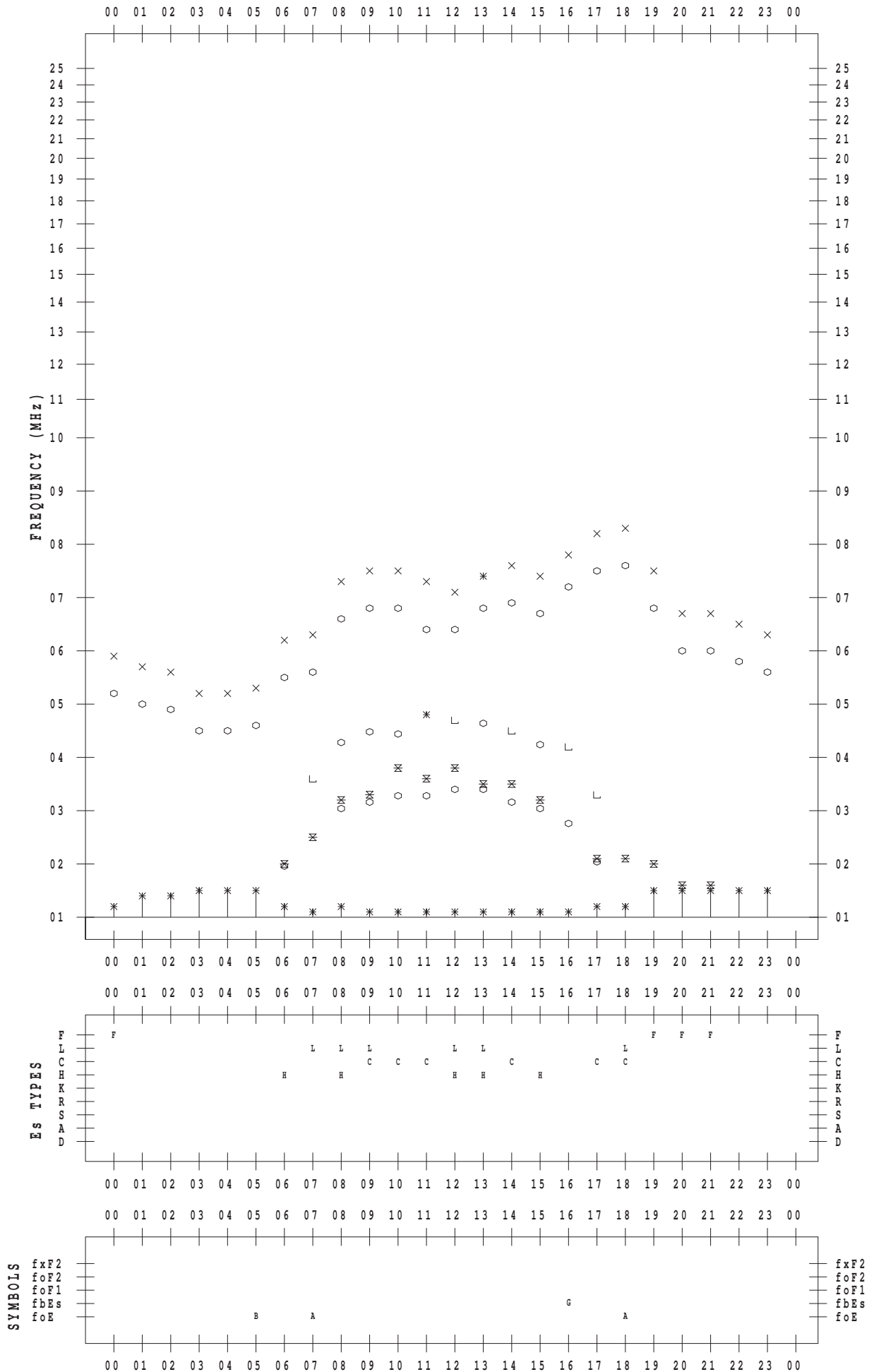
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/14

135 ° E MEAN TIME



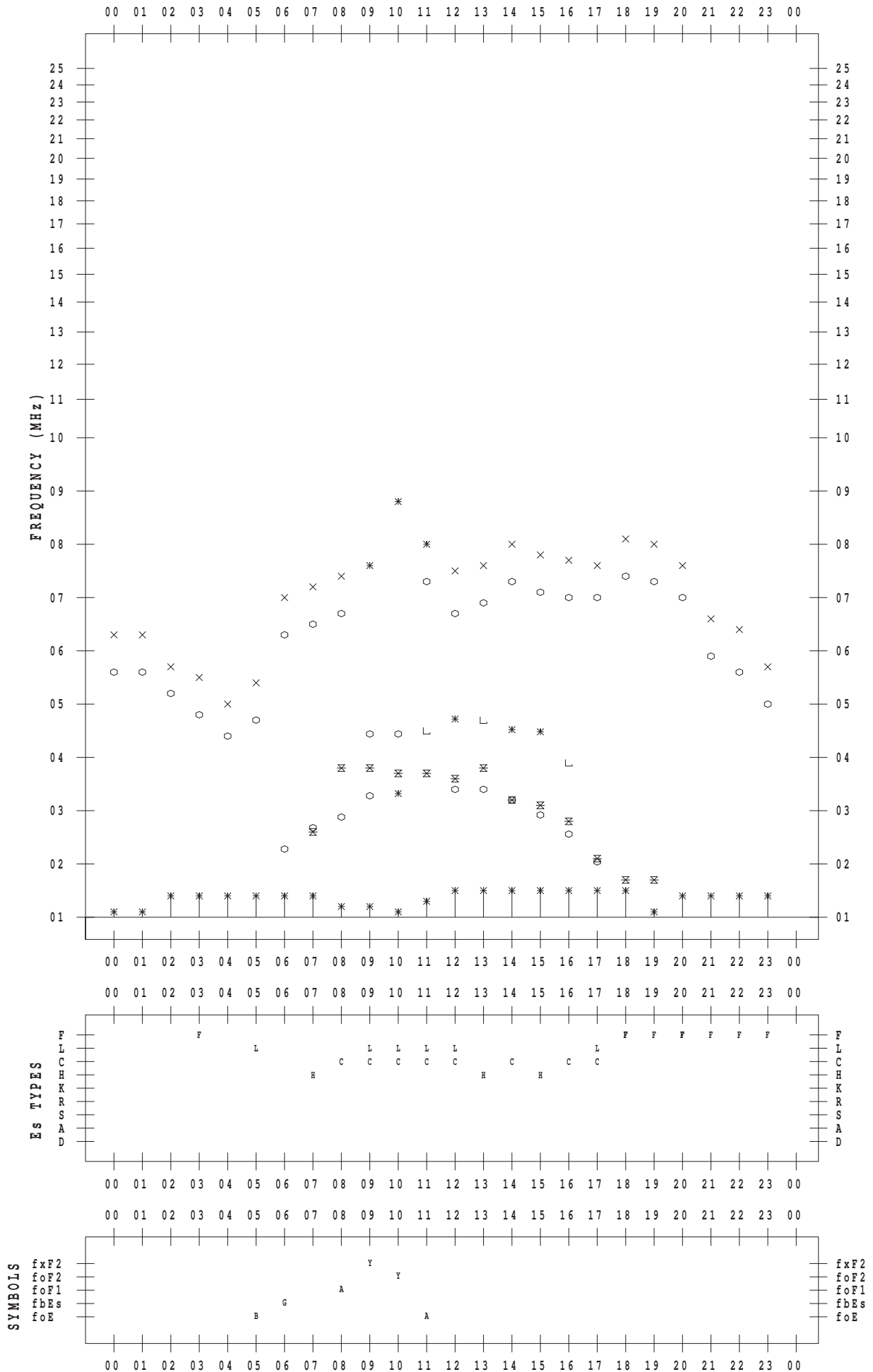
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/15

135 ° E MEAN TIME



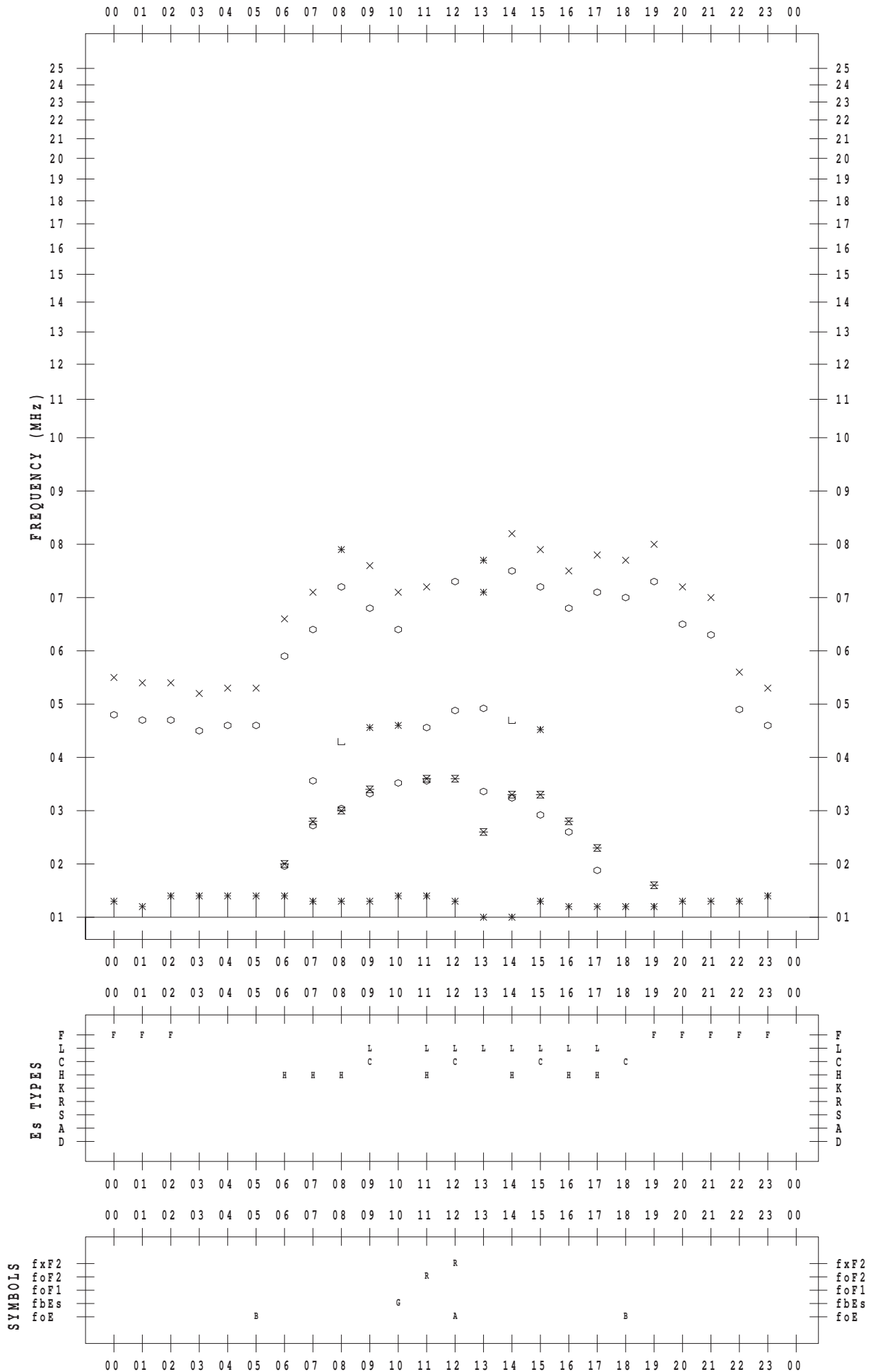
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/16

135 ° E MEAN TIME



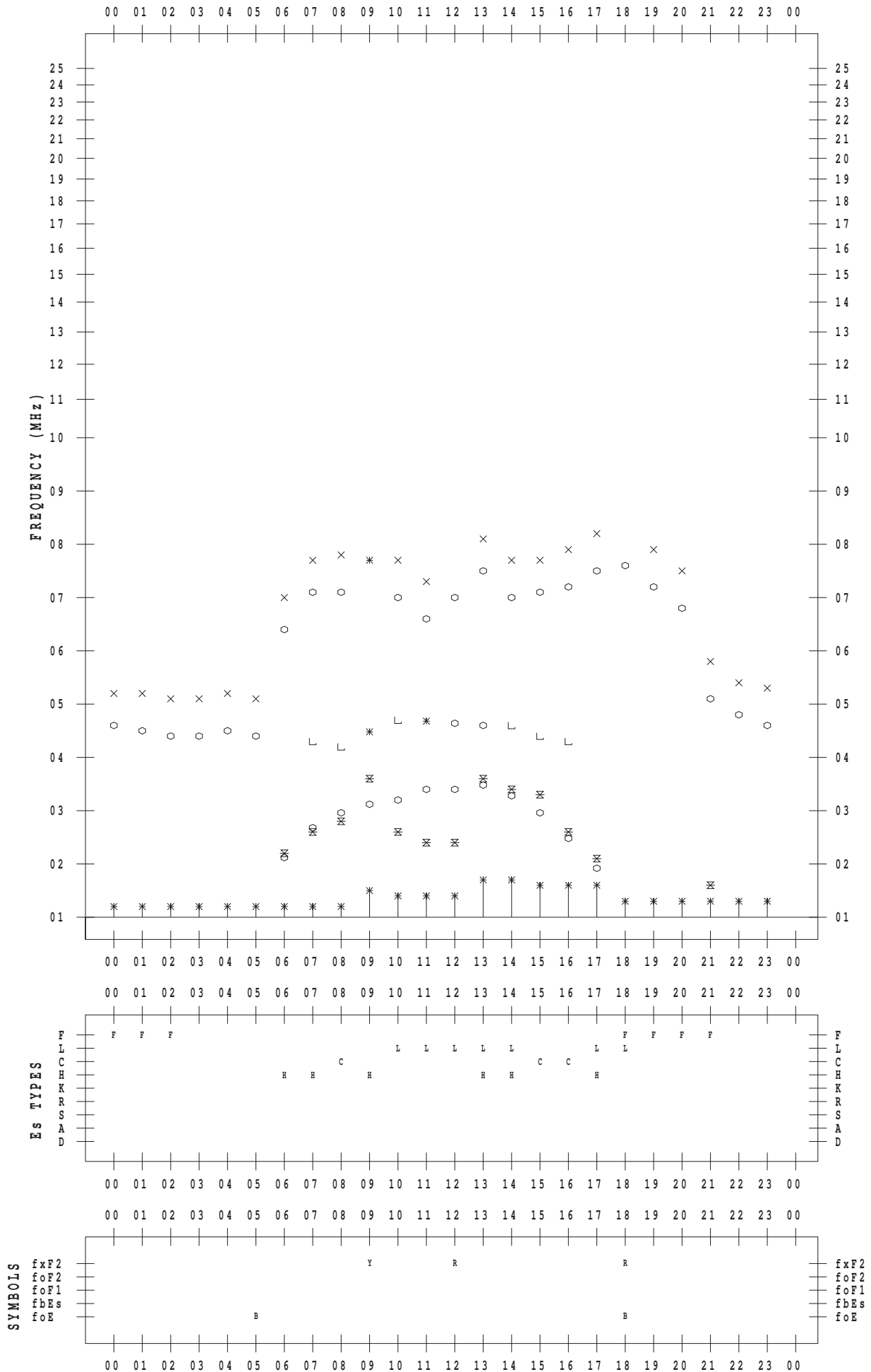
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/17

135 ° E MEAN TIME



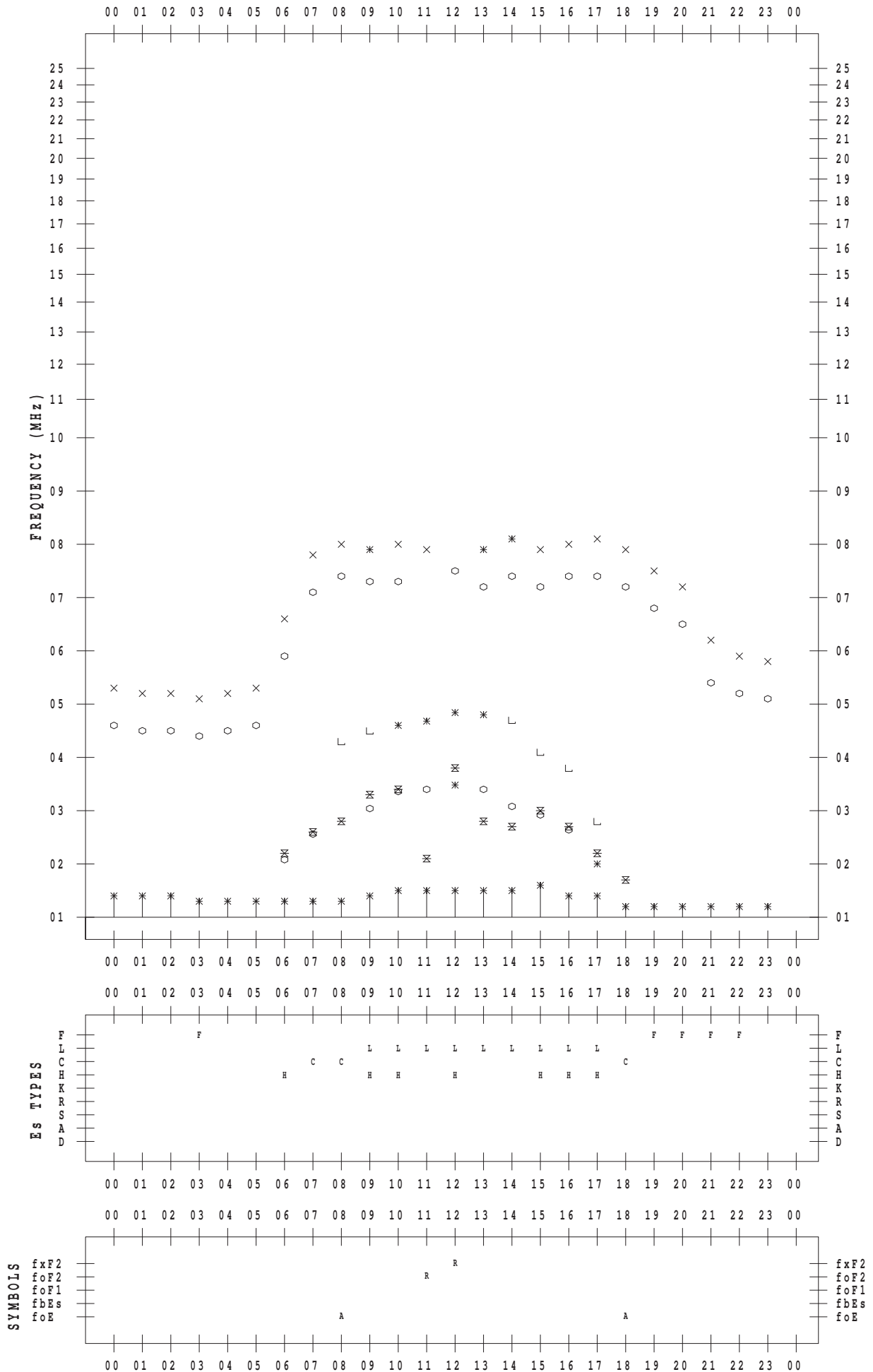
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/18

135 ° E MEAN TIME



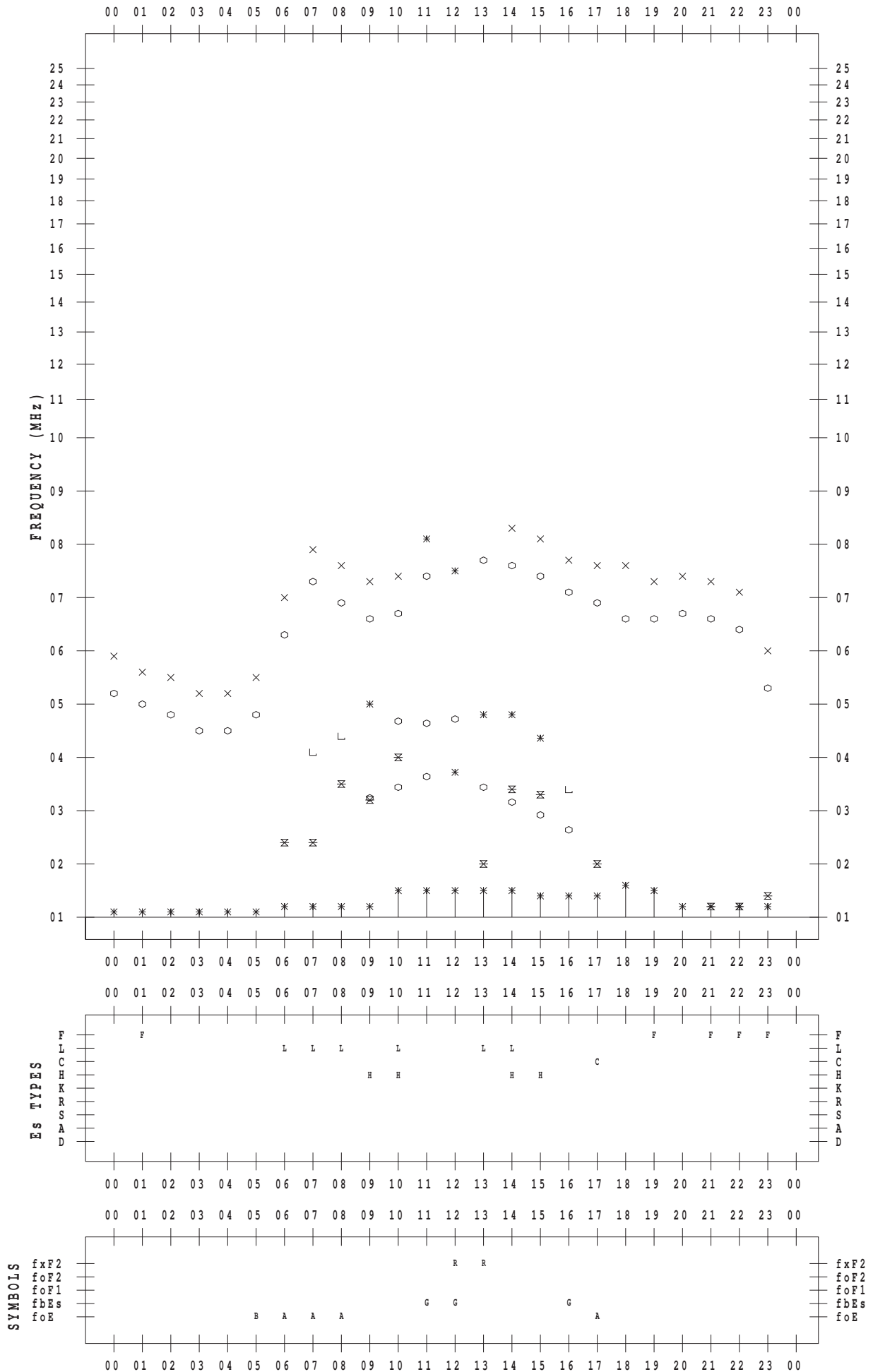
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/19

135 ° E MEAN TIME



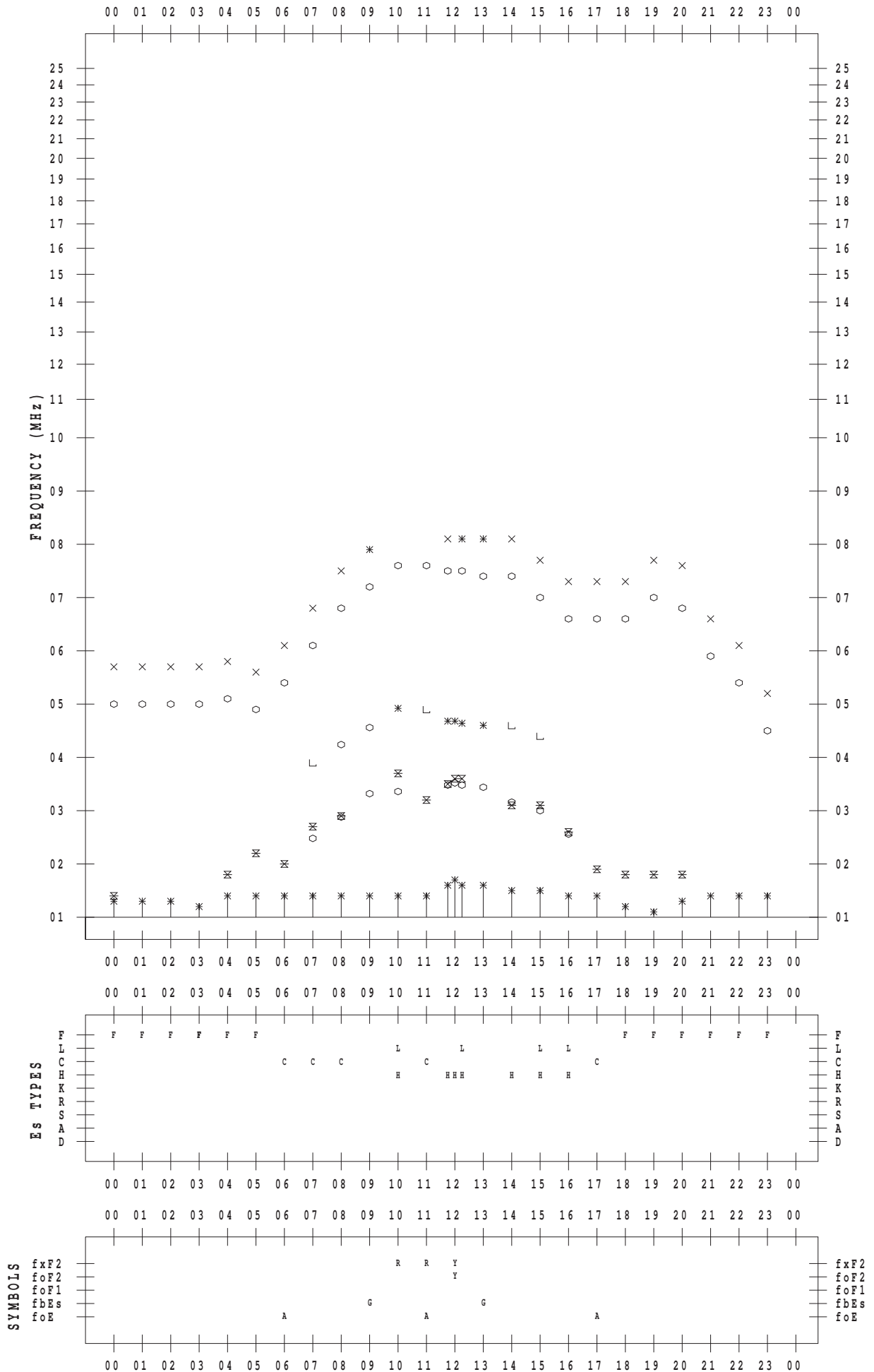
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/20

135 ° E MEAN TIME





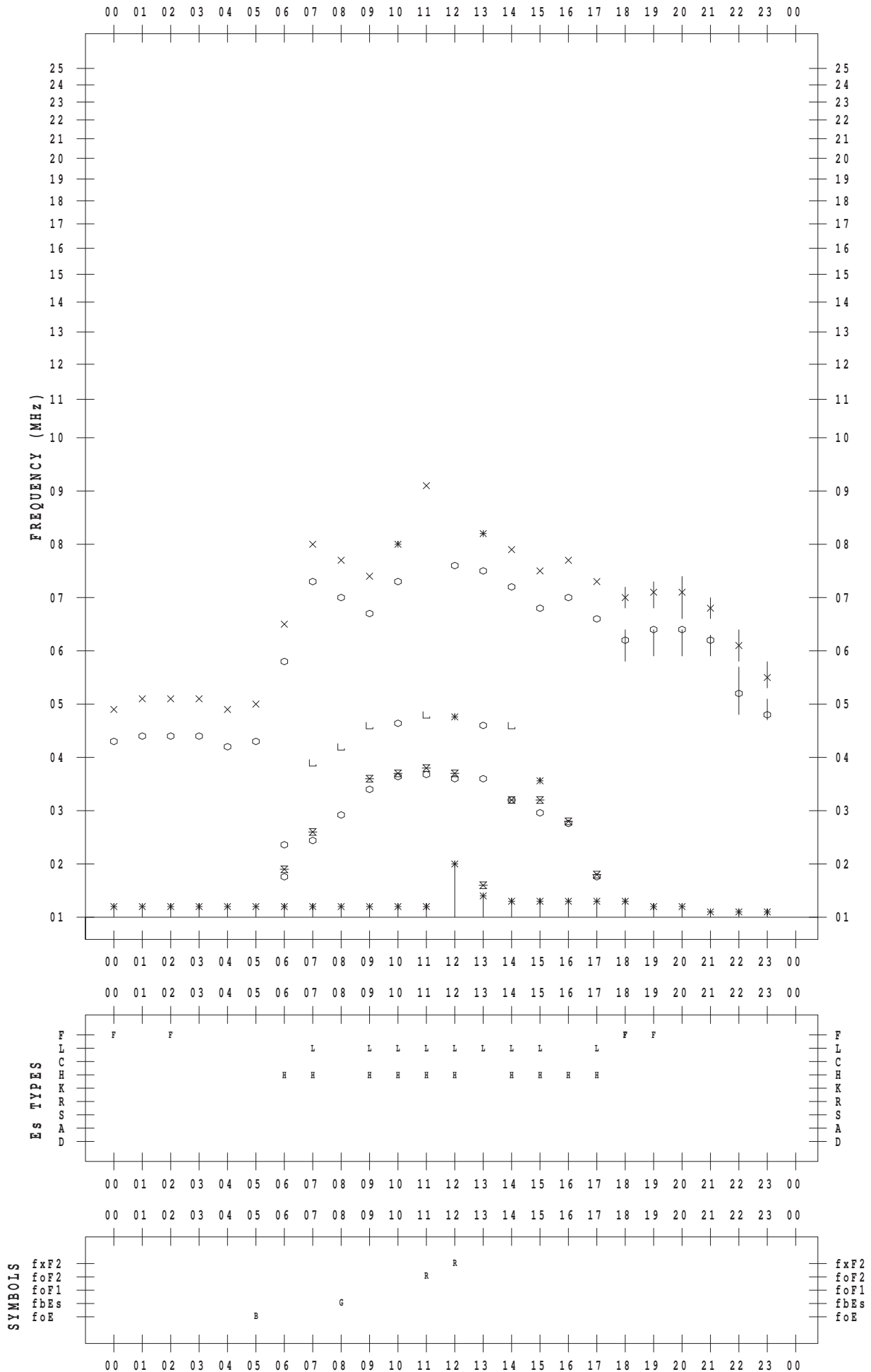
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/21

135 ° E MEAN TIME



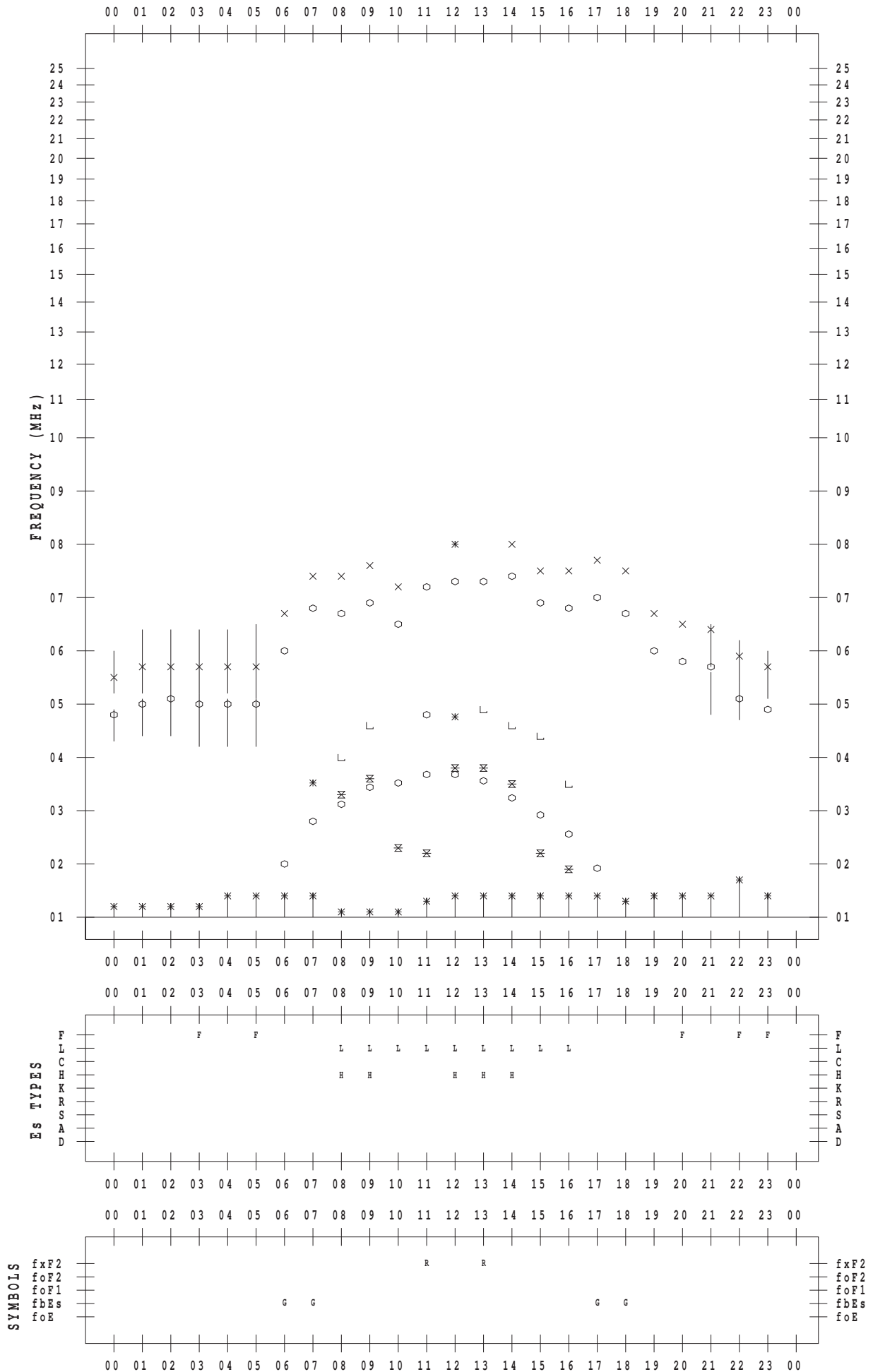
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/22

135 ° E MEAN TIME



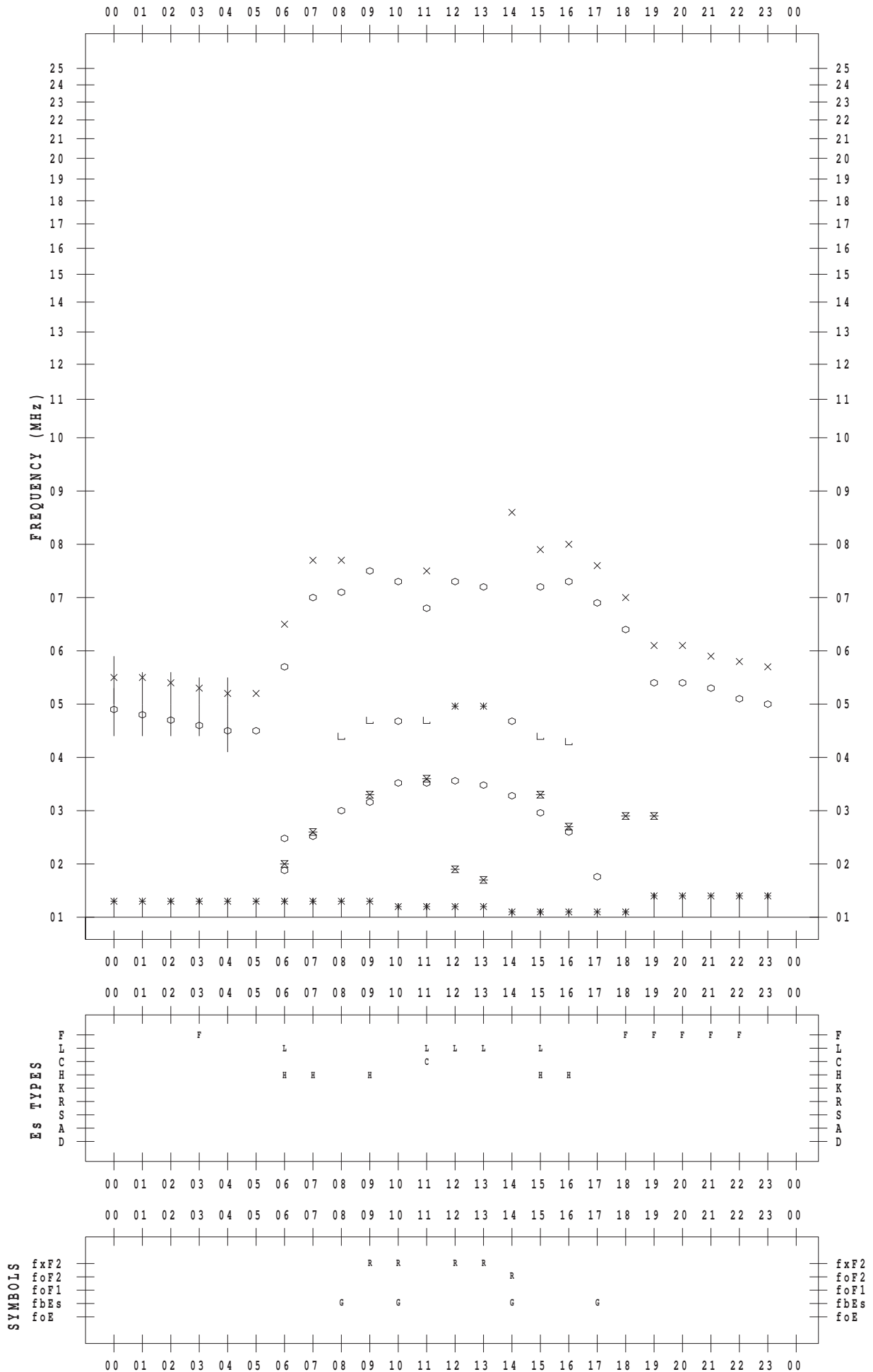
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/23

135 ° E MEAN TIME



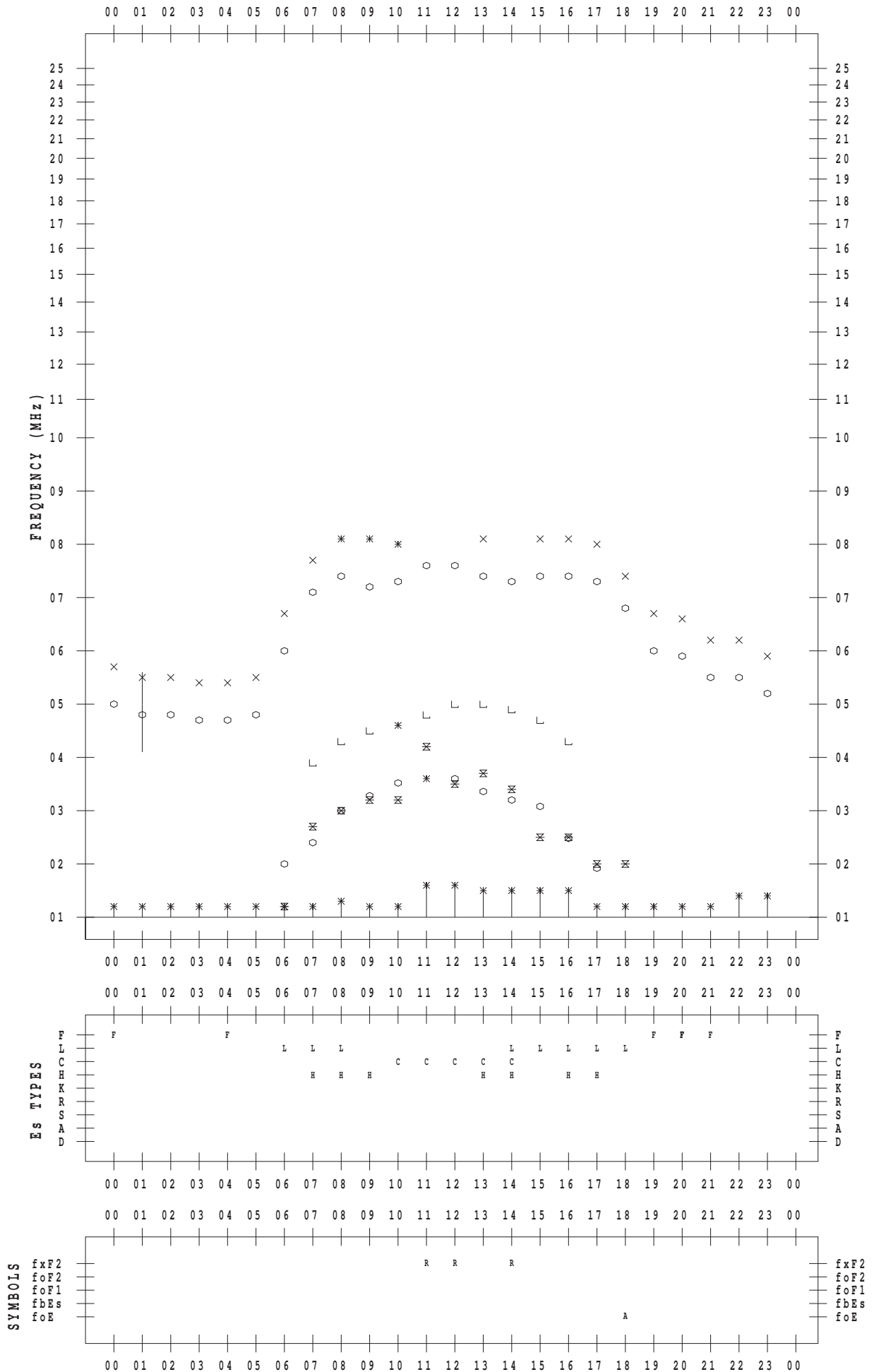
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/24

135 ° E MEAN TIME



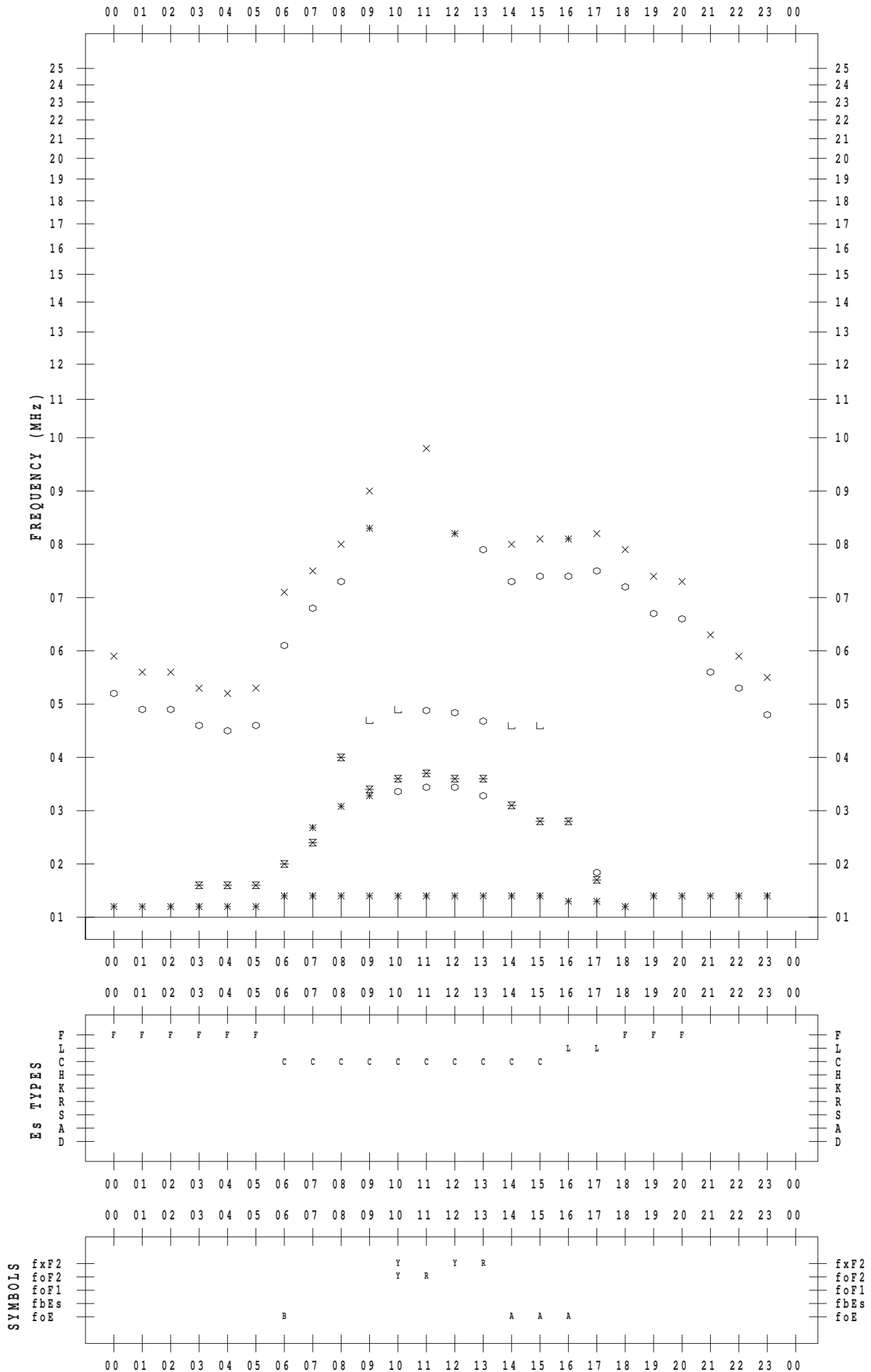
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/25

135 ° E MEAN TIME



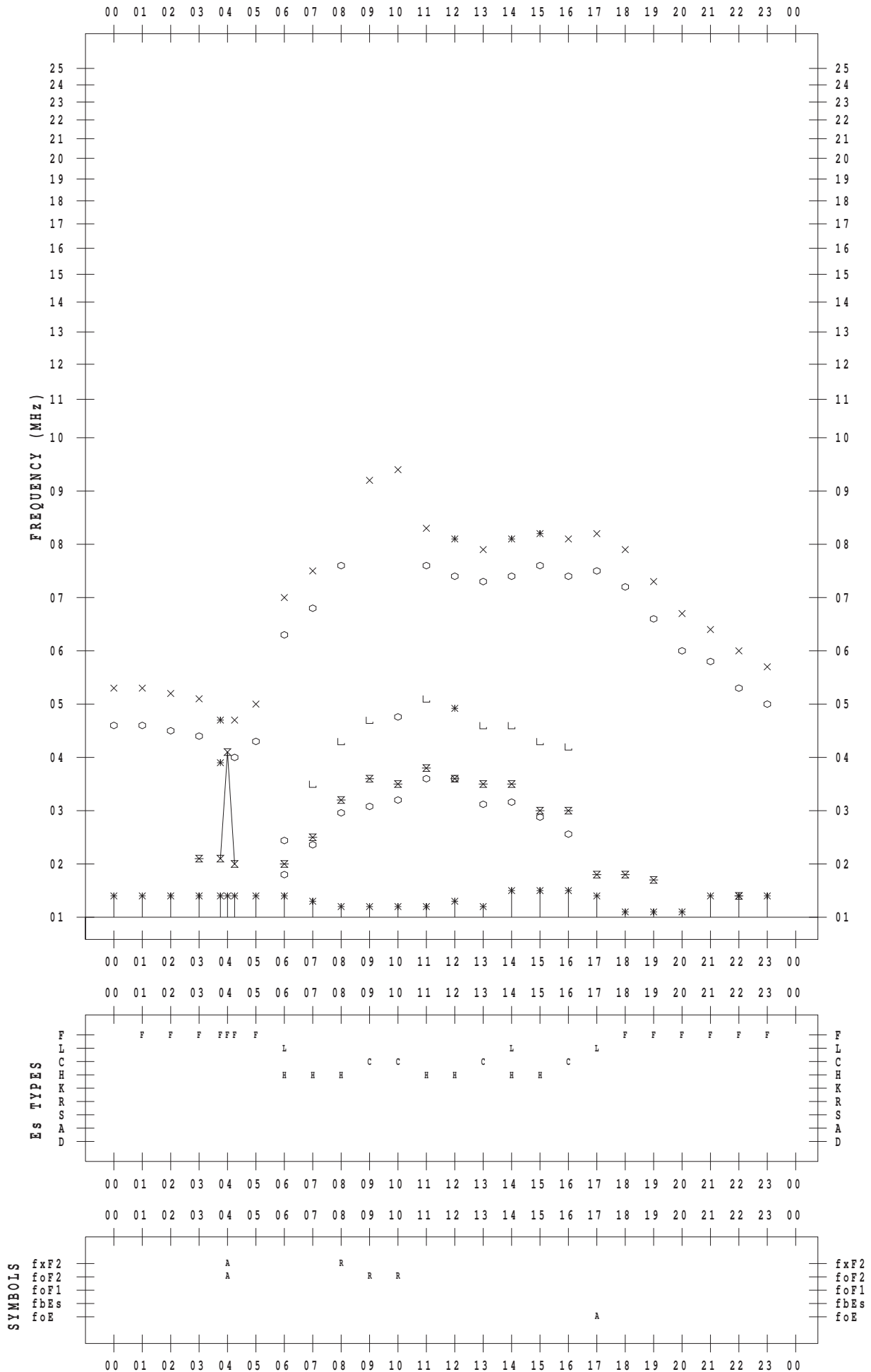
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 9 / 26

135 ° E MEAN TIME



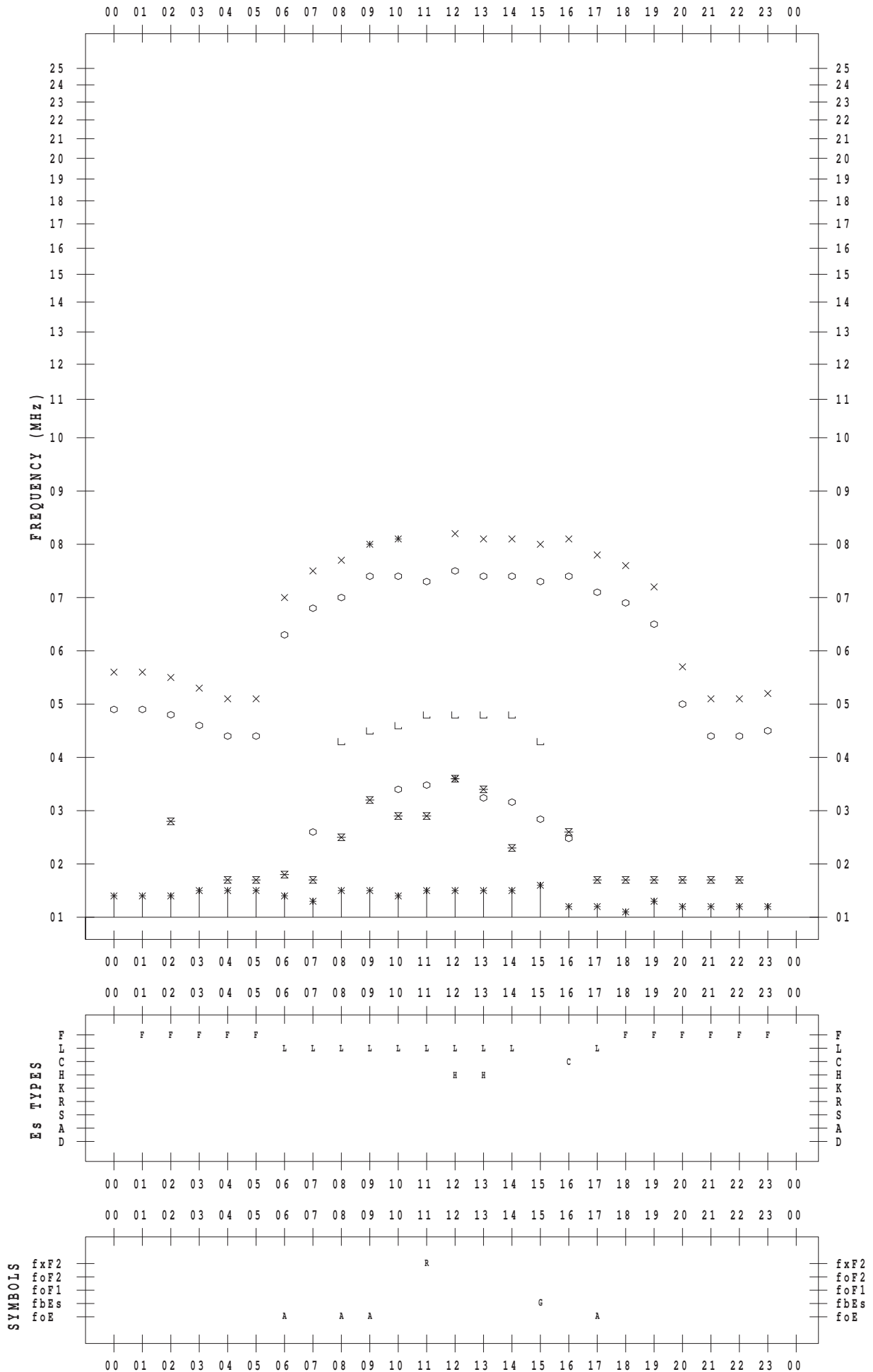
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/27

135 ° E MEAN TIME



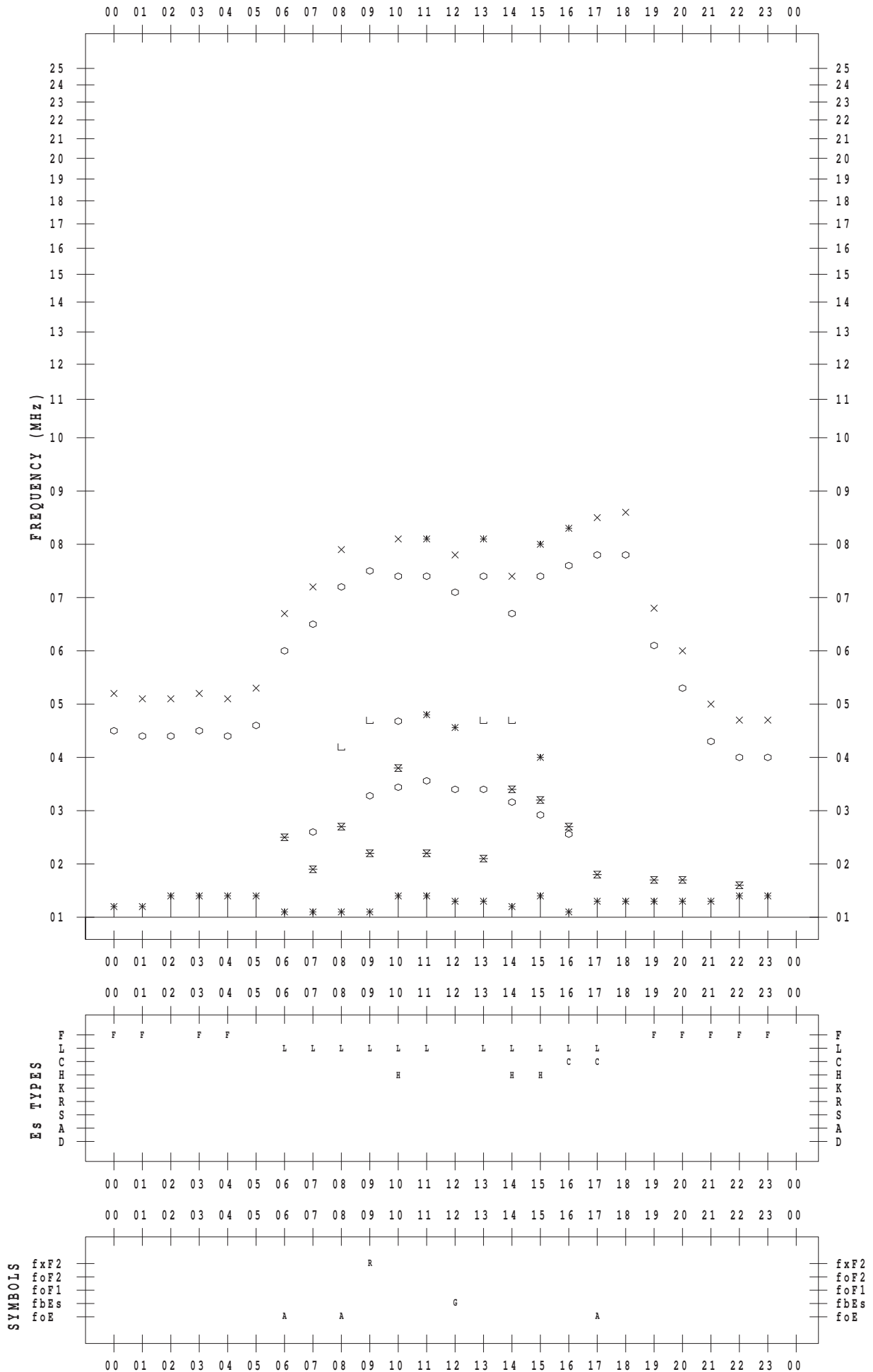
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/28

135 ° E MEAN TIME





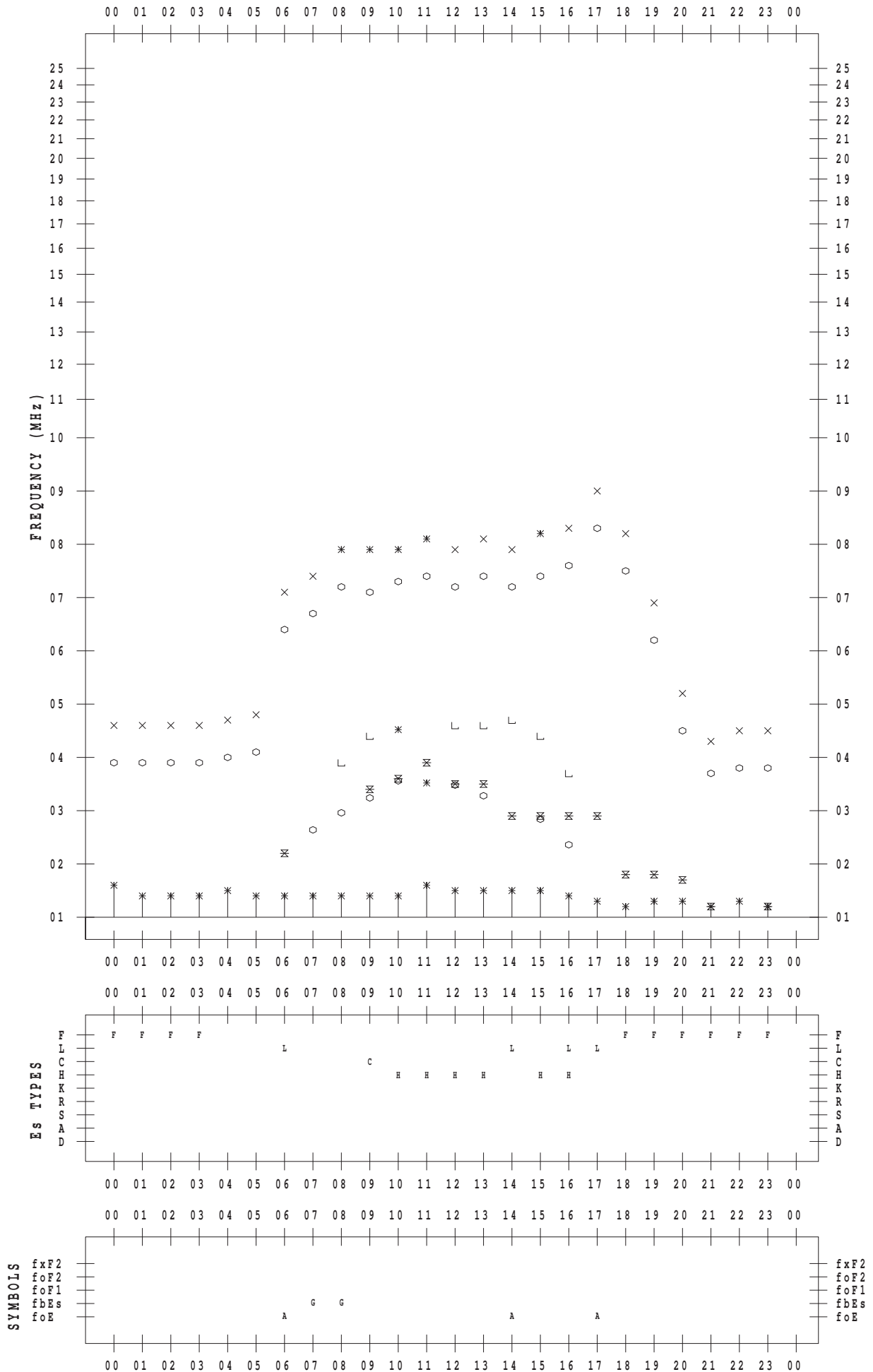
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/29

135 ° E MEAN TIME



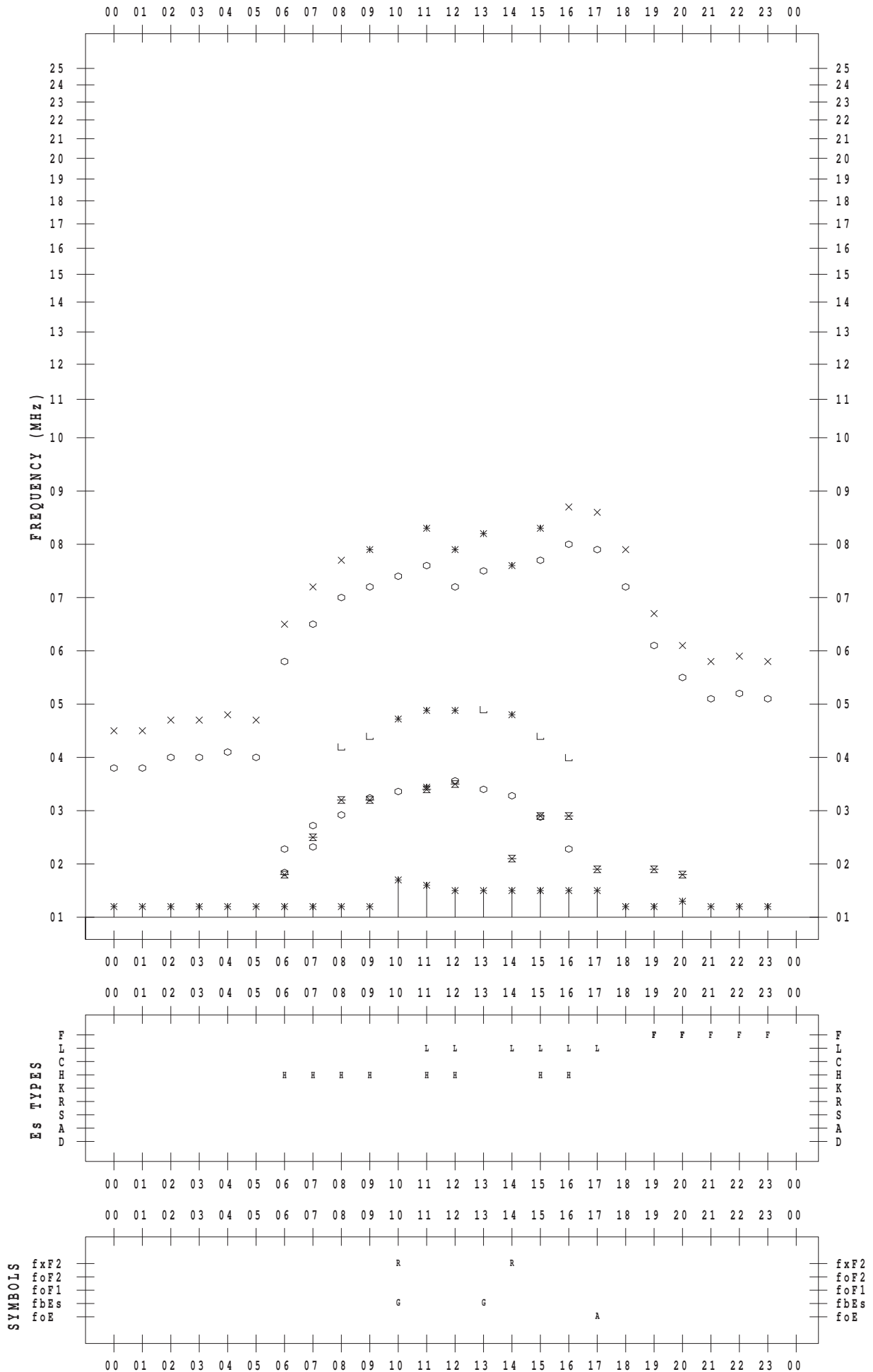
# f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 9/30

135 ° E MEAN TIME



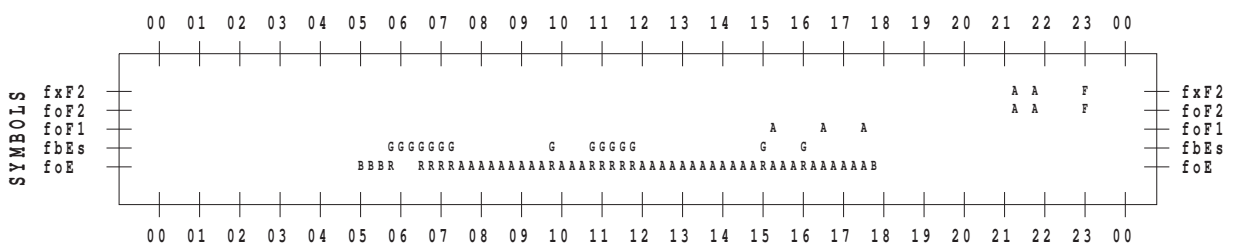
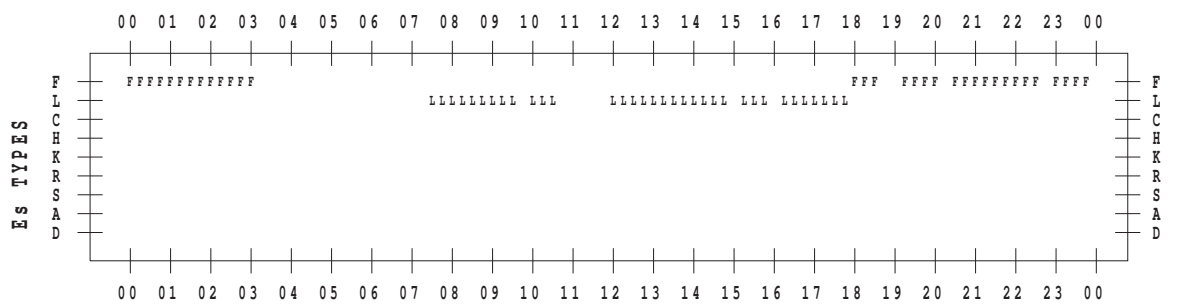
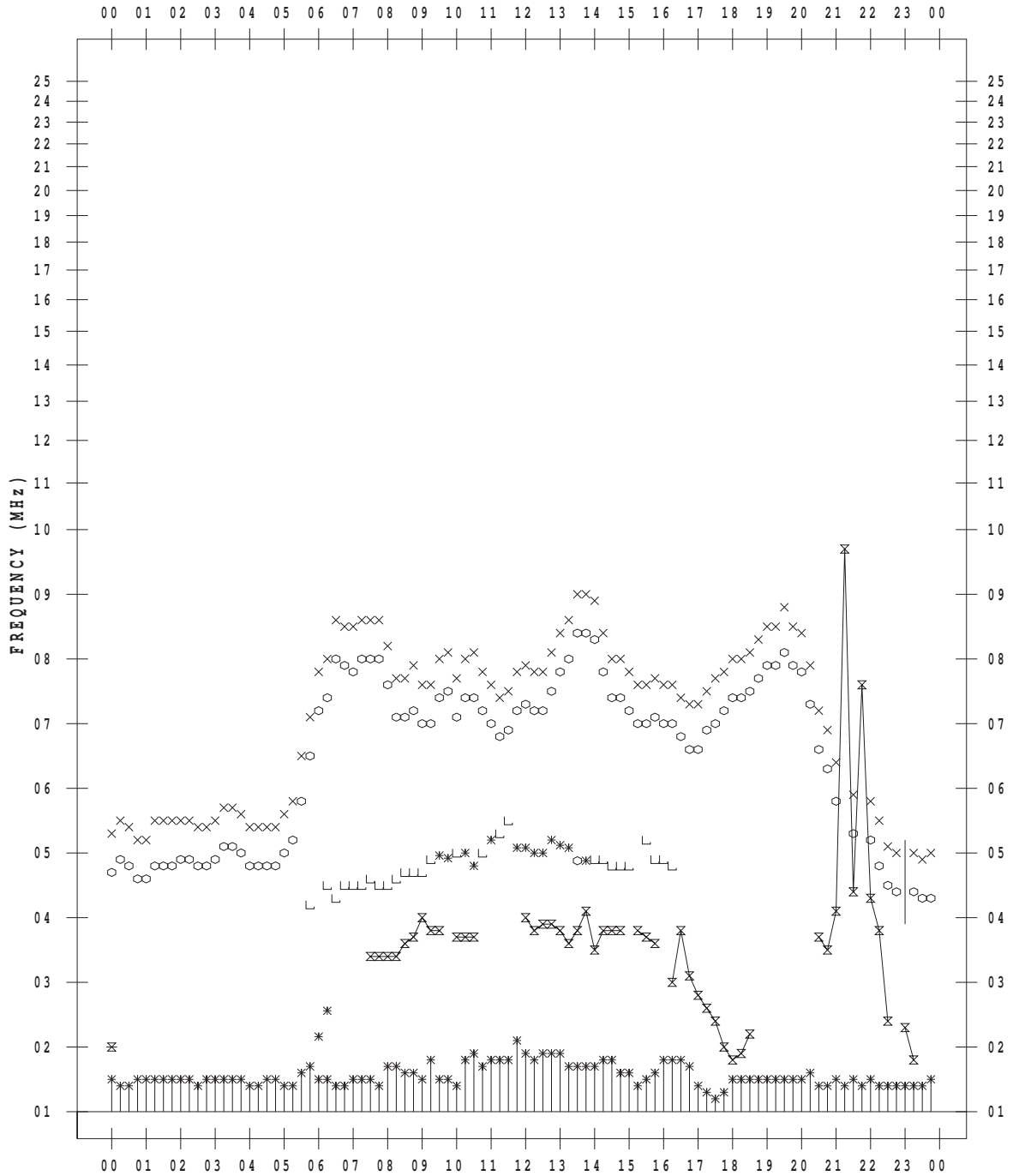
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 1

135 ° E MEAN TIME



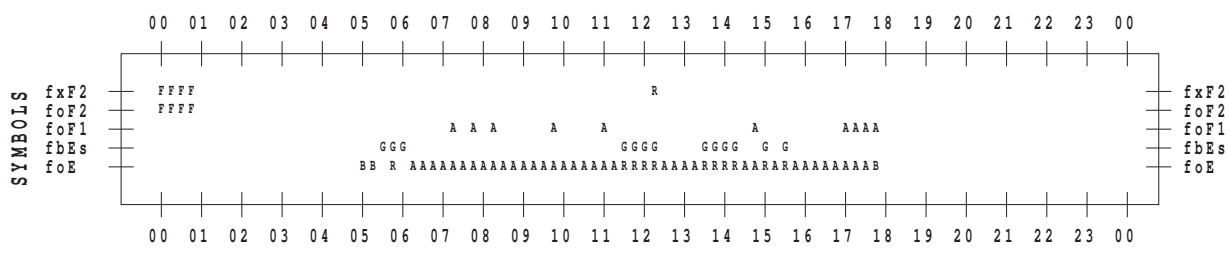
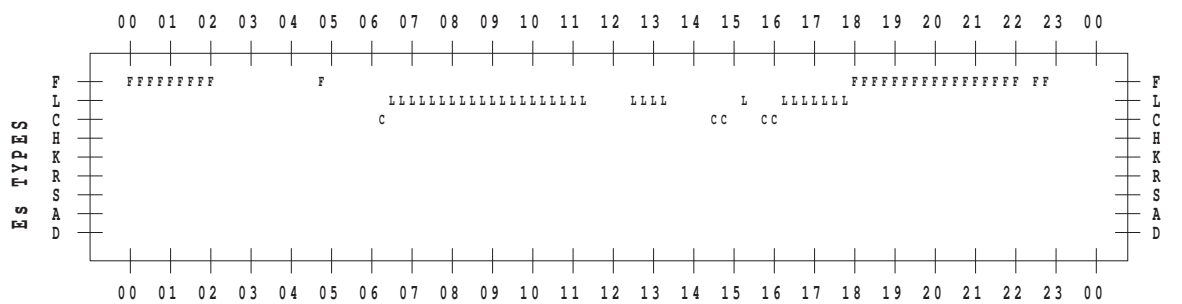
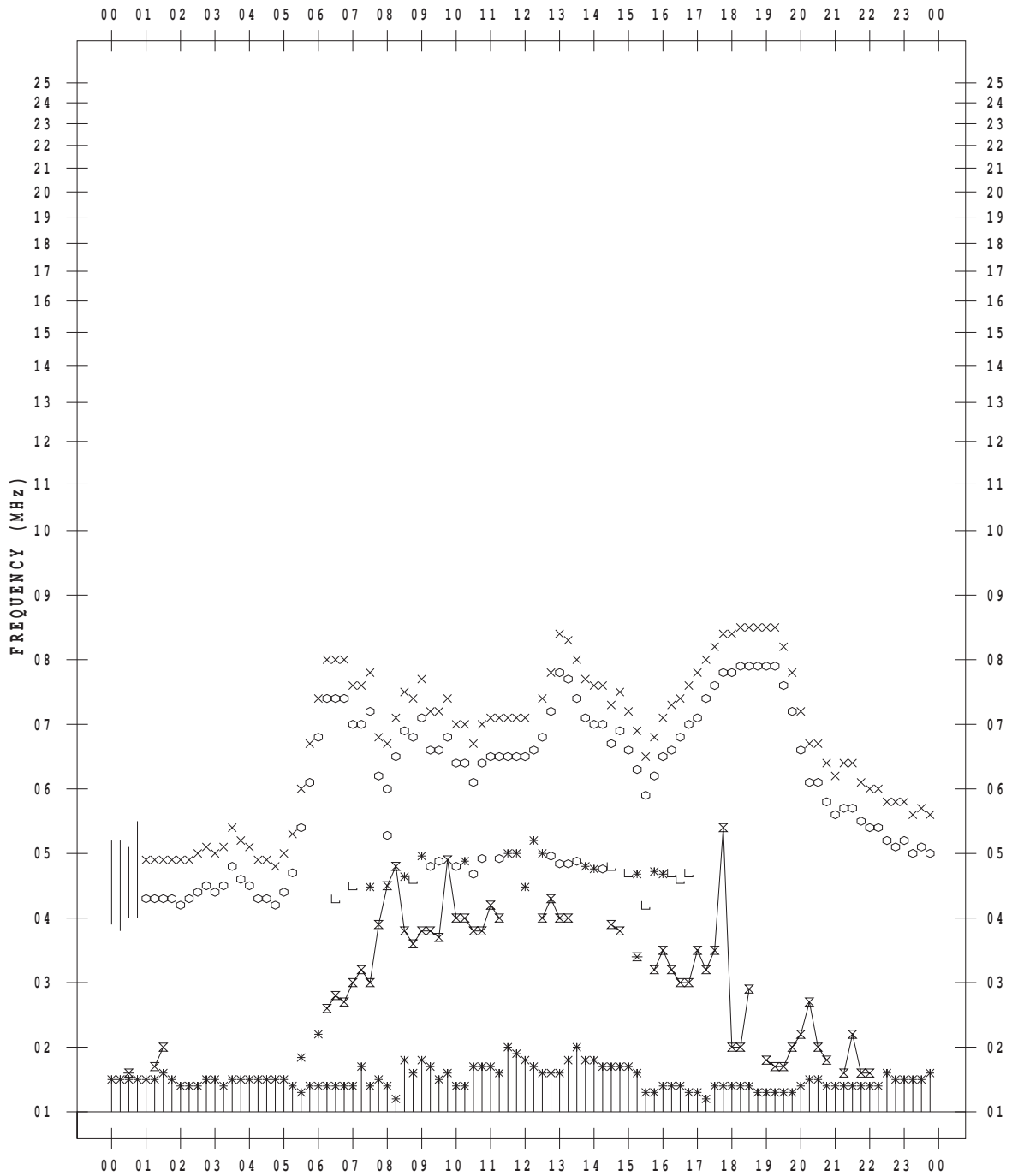
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 2

135 ° E MEAN TIME



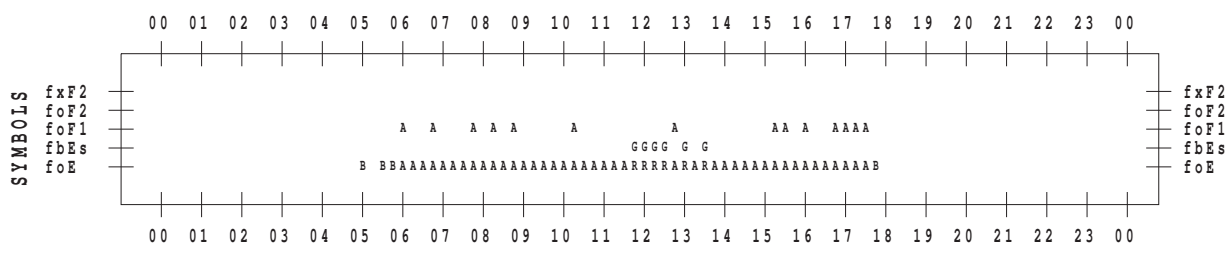
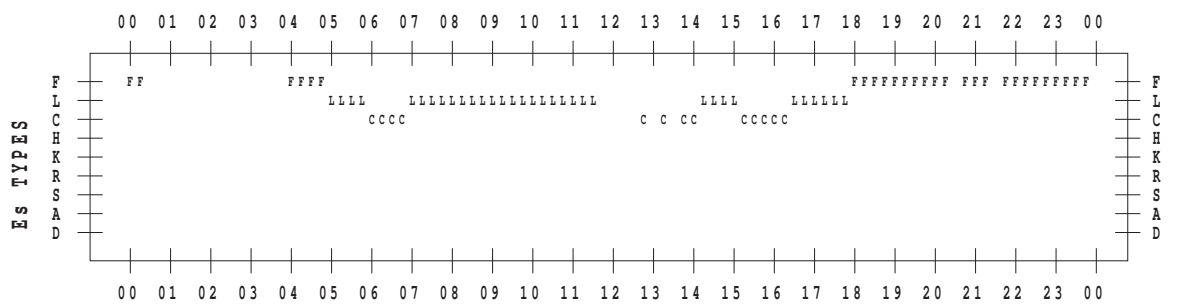
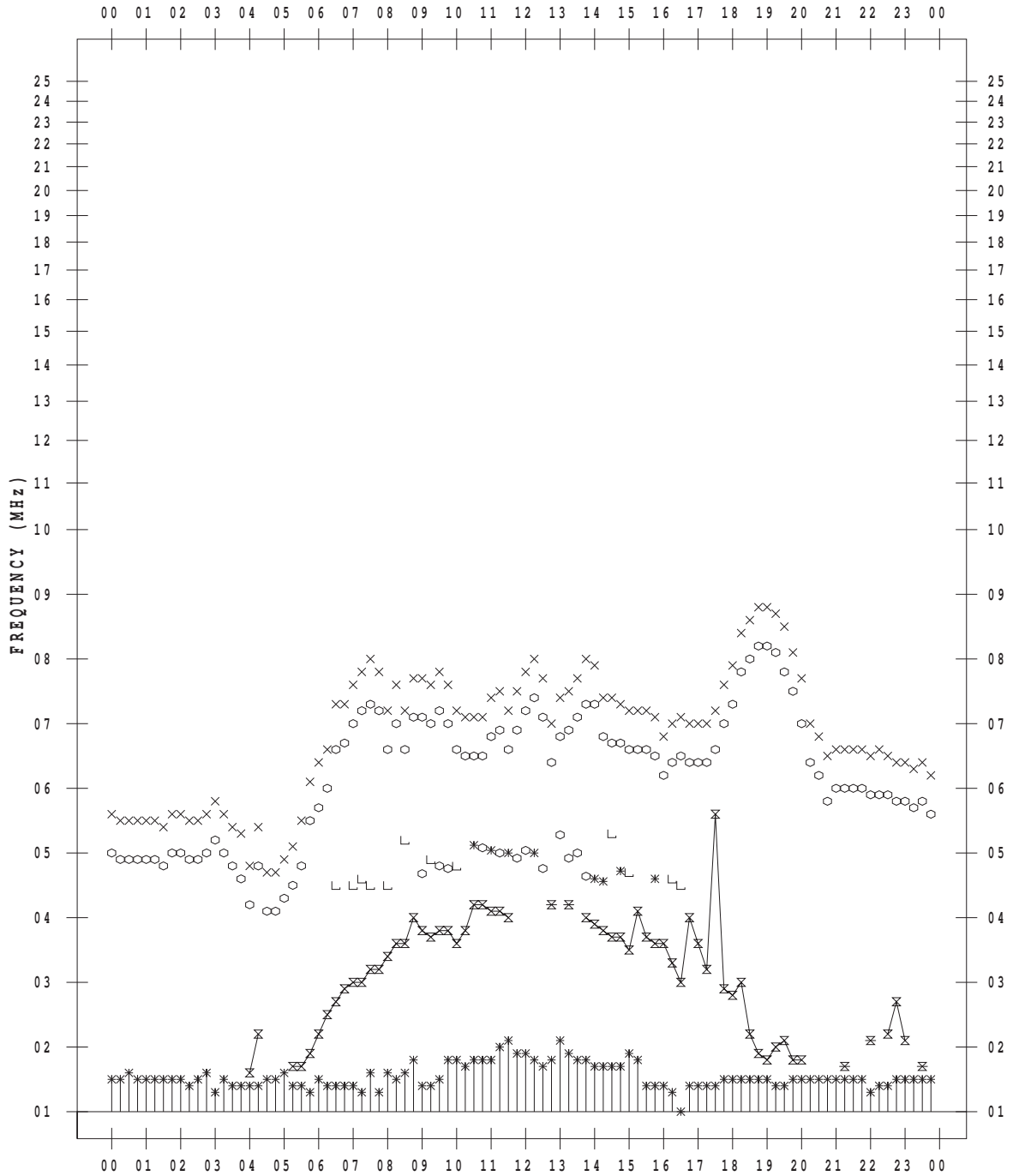
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 3

135 ° E MEAN TIME



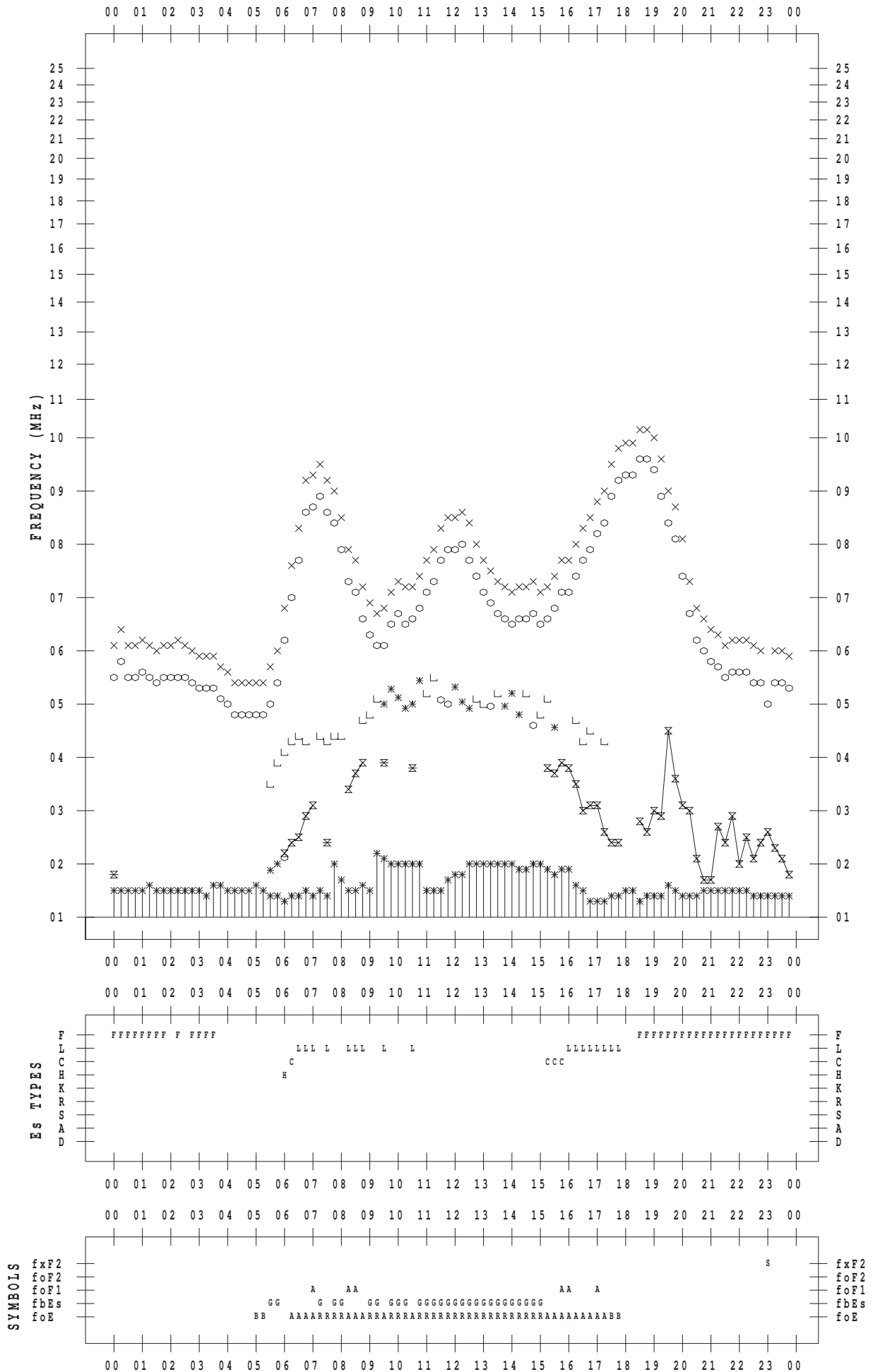
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 4

135 ° E MEAN TIME



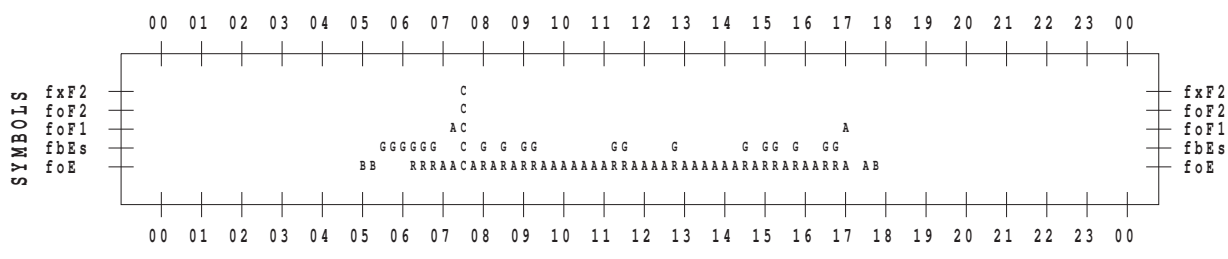
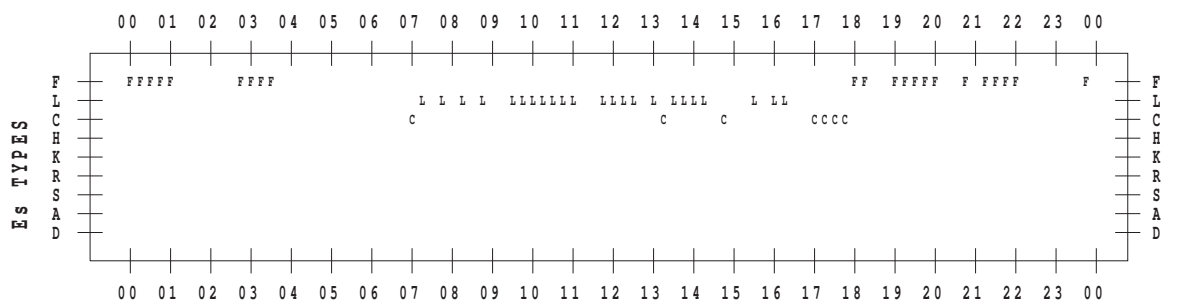
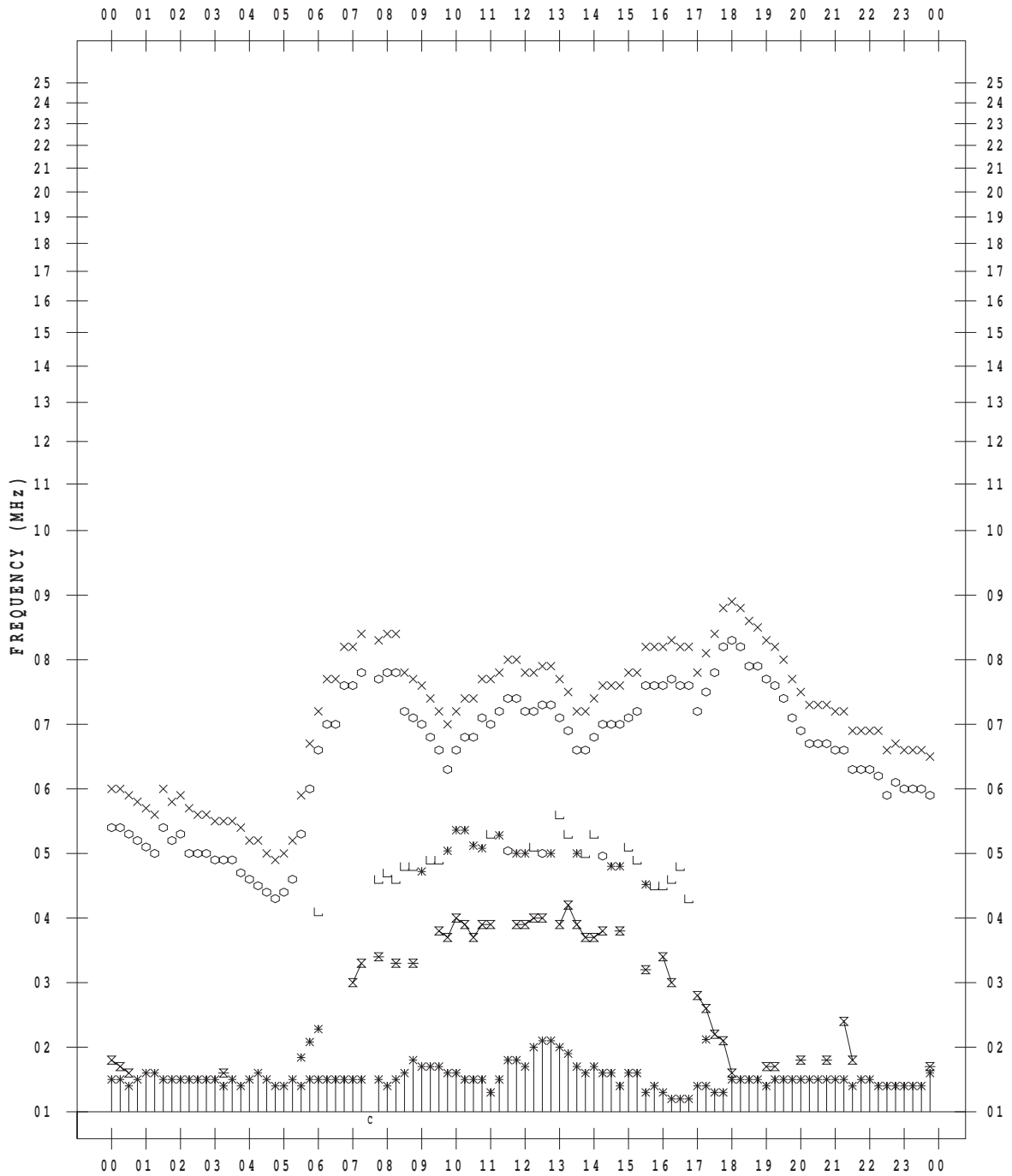
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 5

135 ° E MEAN TIME



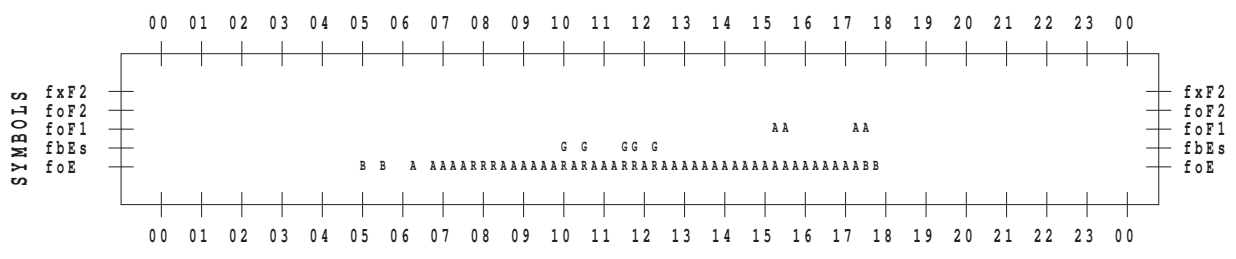
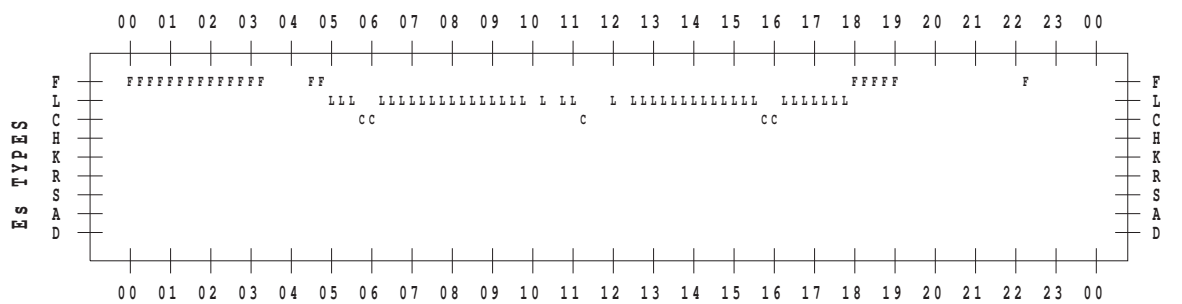
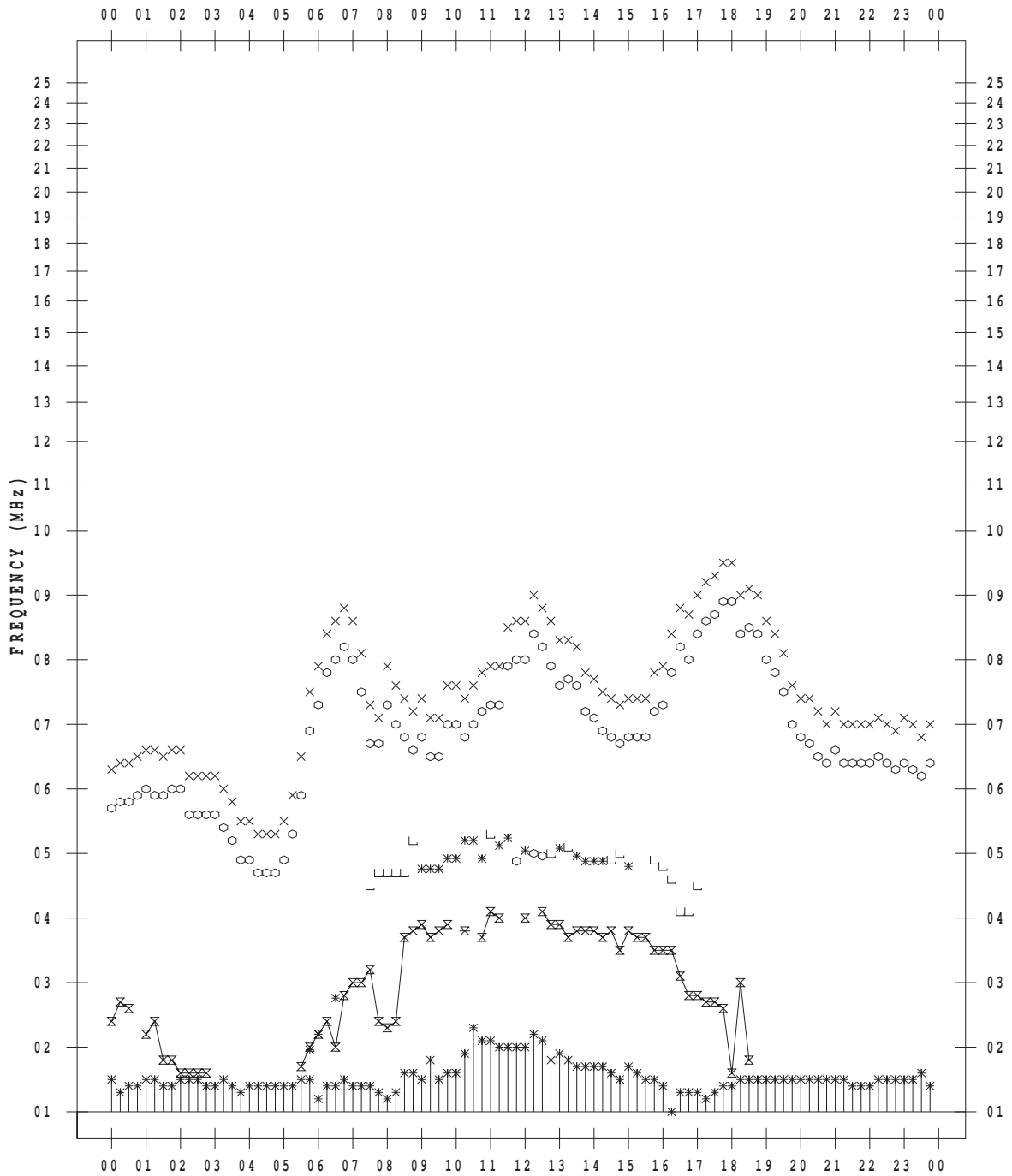
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 6

135 ° E MEAN TIME





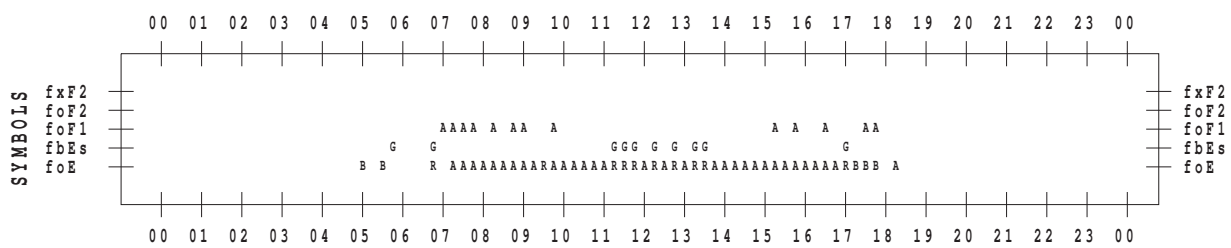
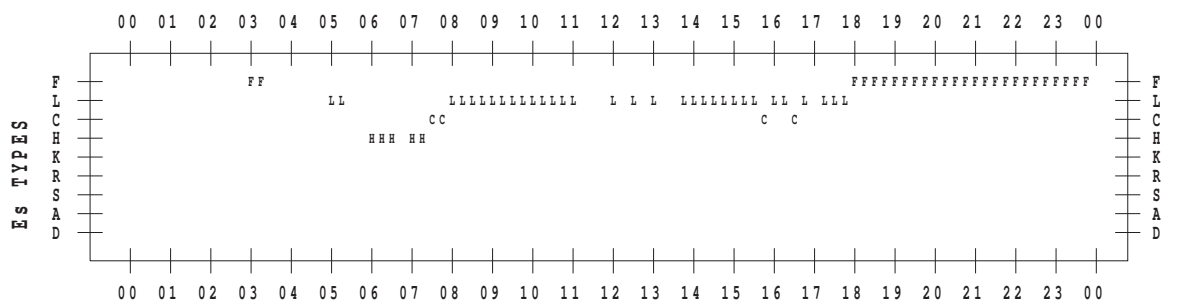
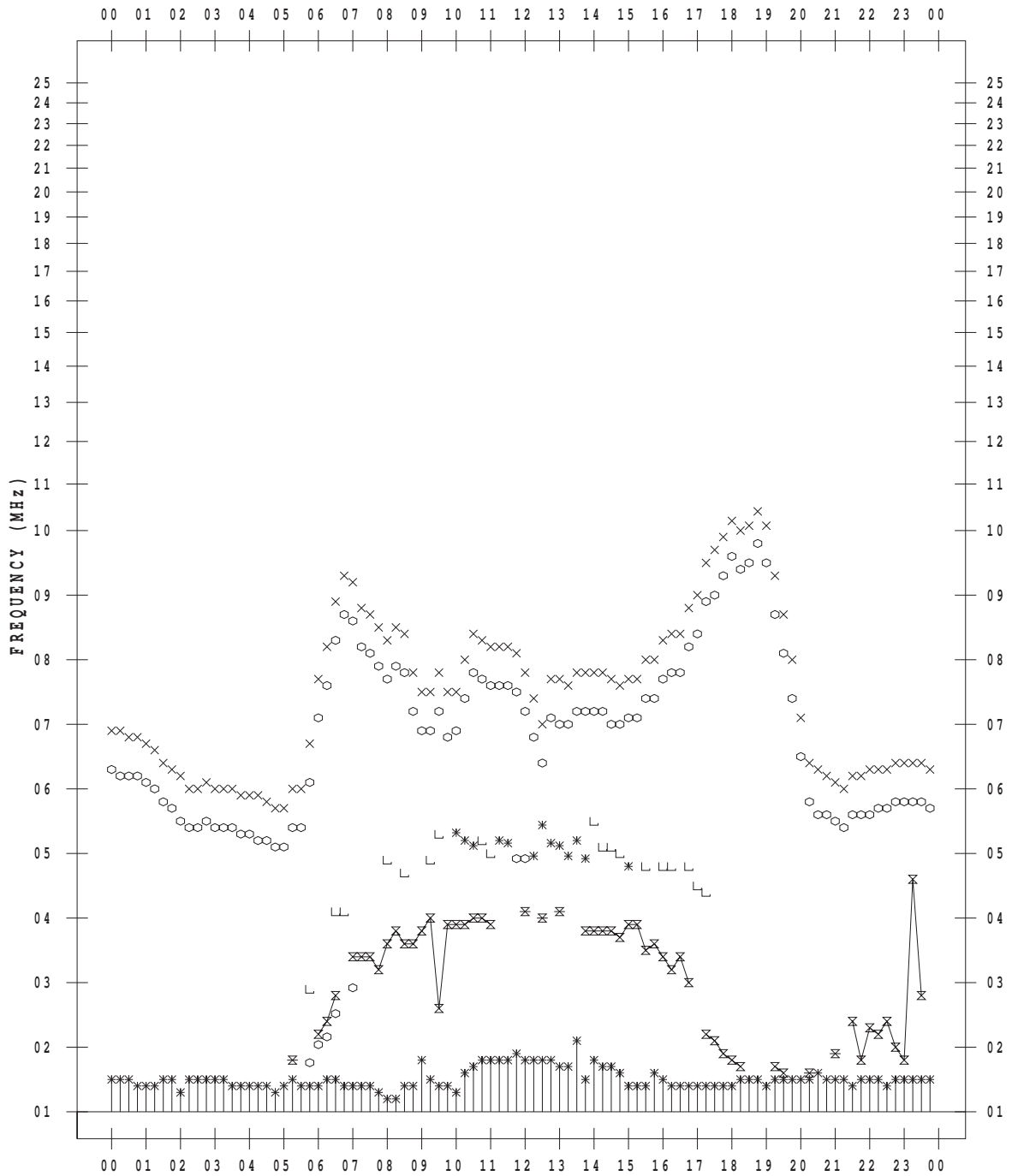
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 7

135 ° E MEAN TIME



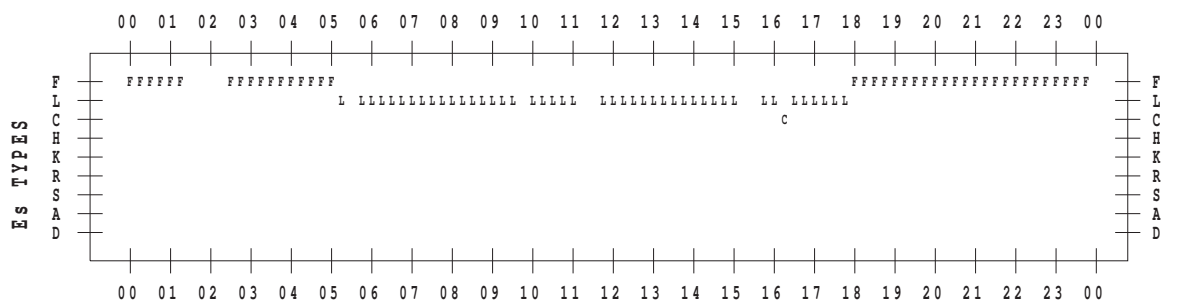
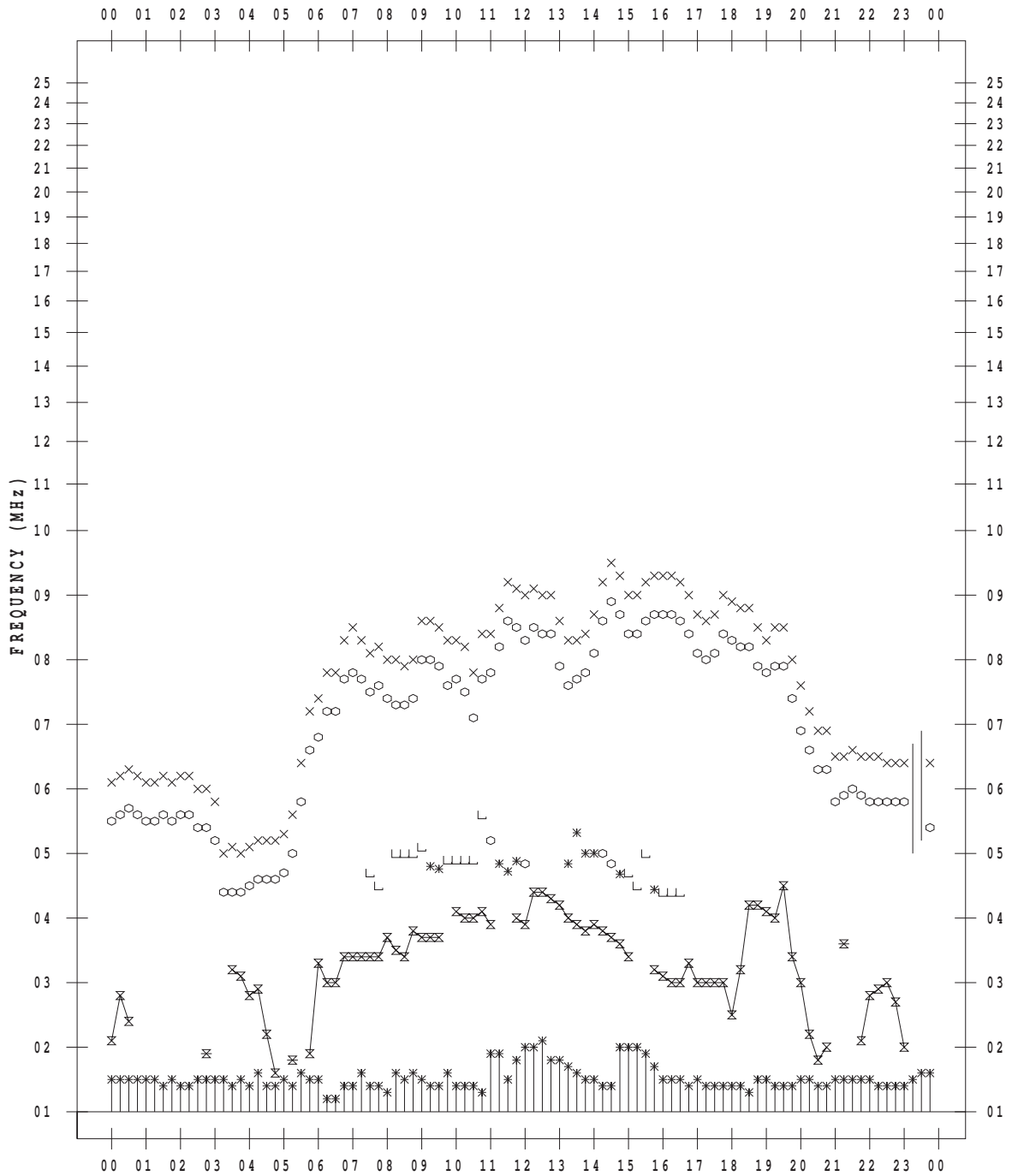
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 8

135 ° E MEAN TIME



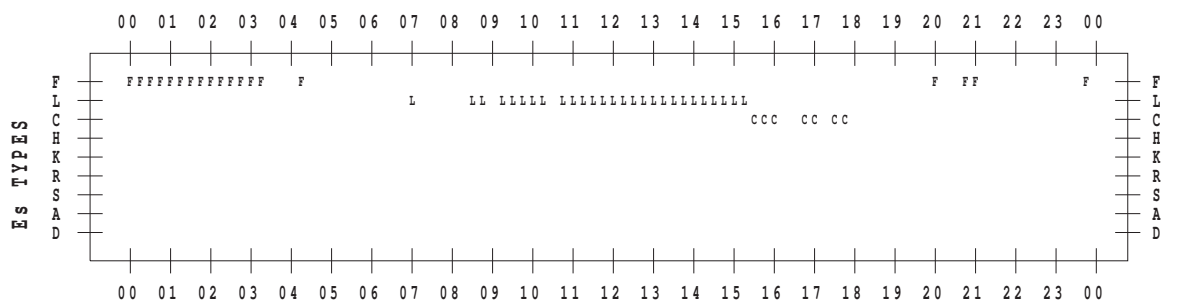
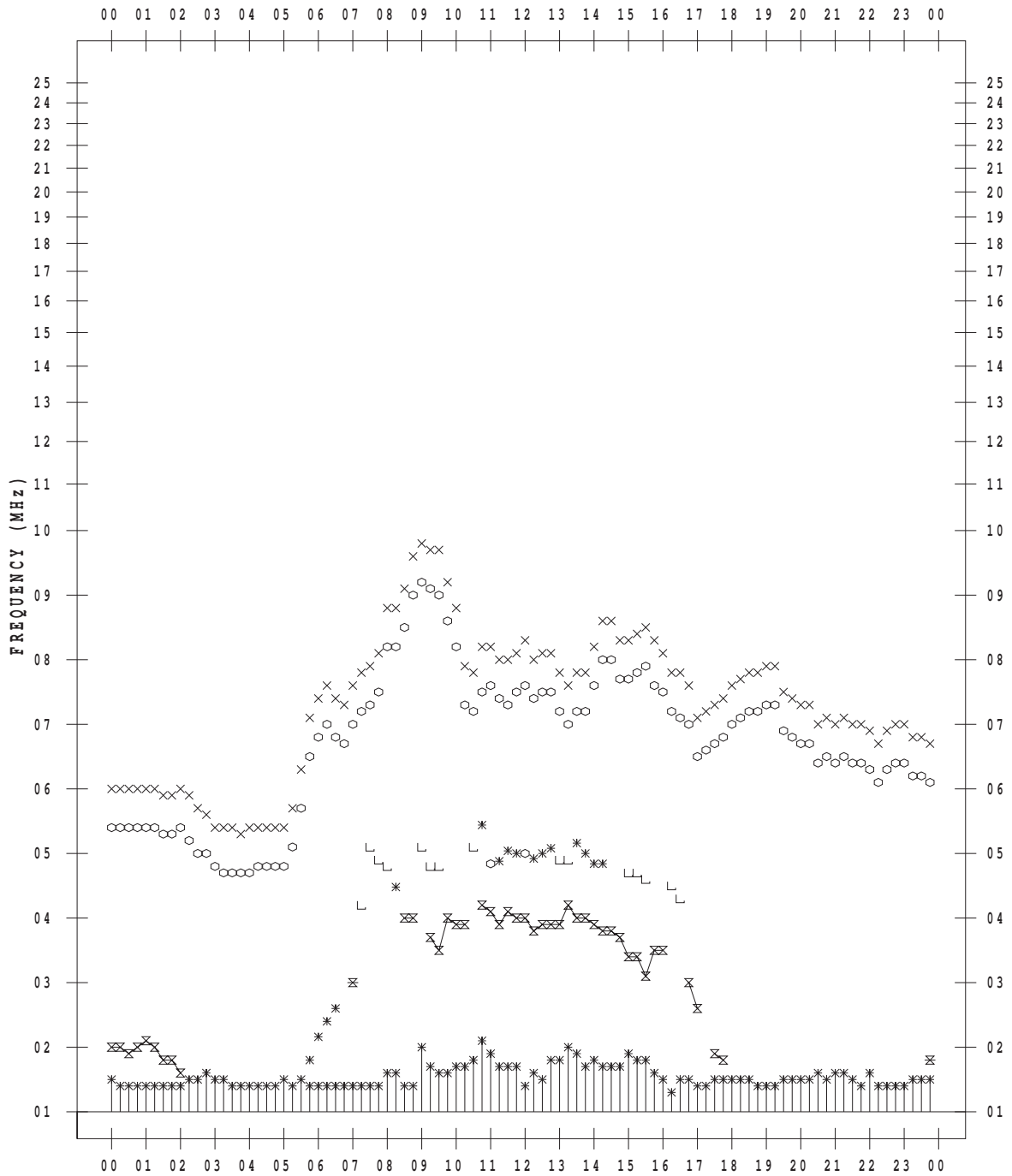
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/ 9

135 ° E MEAN TIME



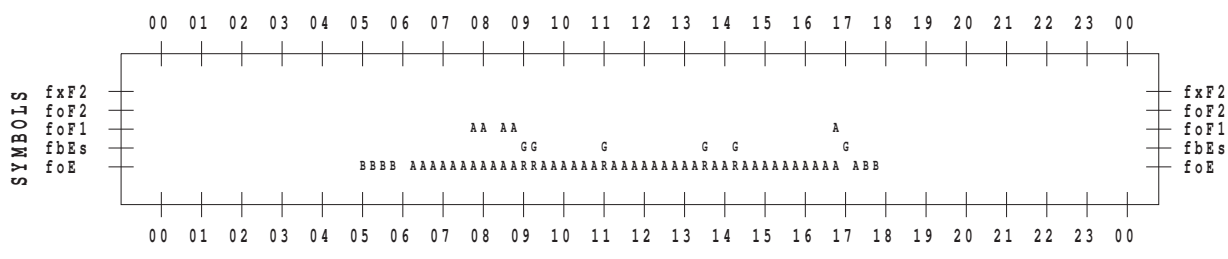
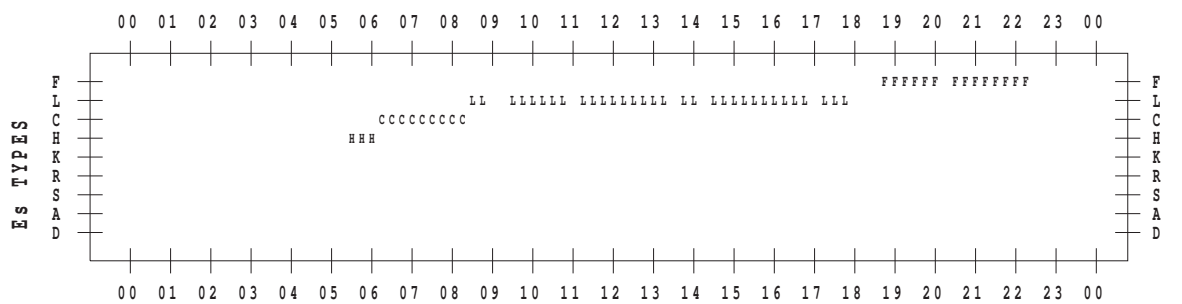
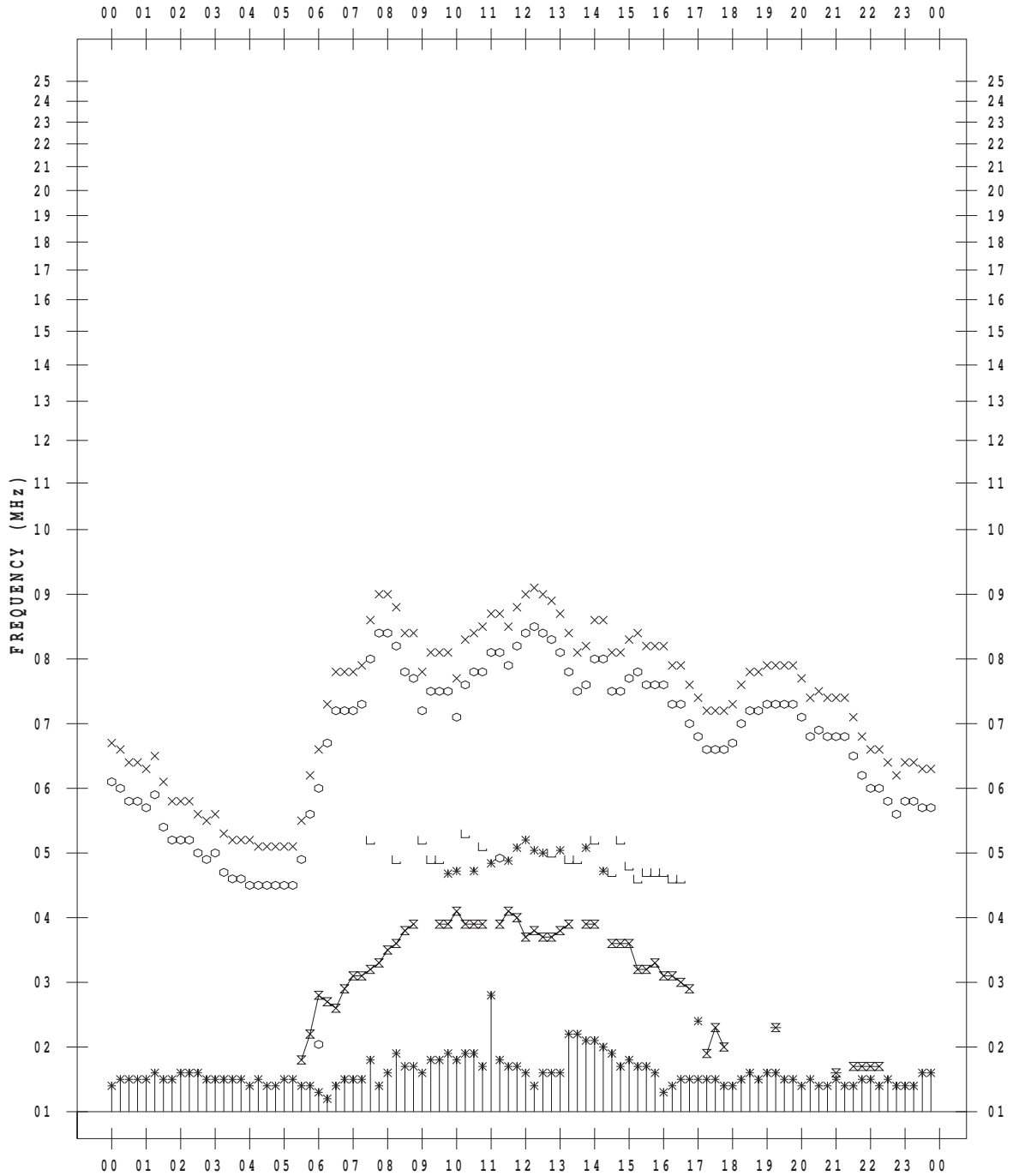
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/10

135 ° E MEAN TIME



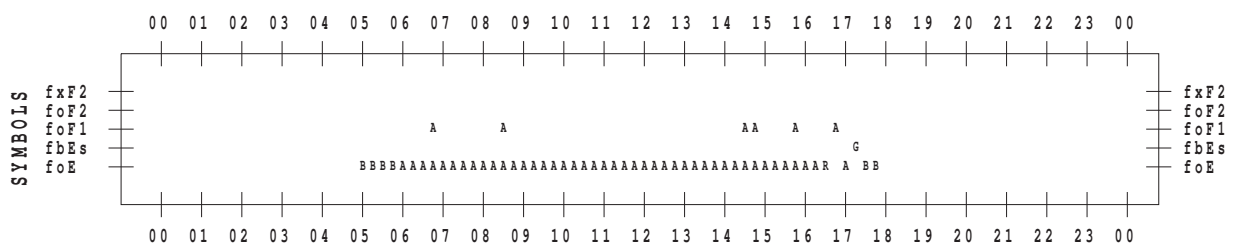
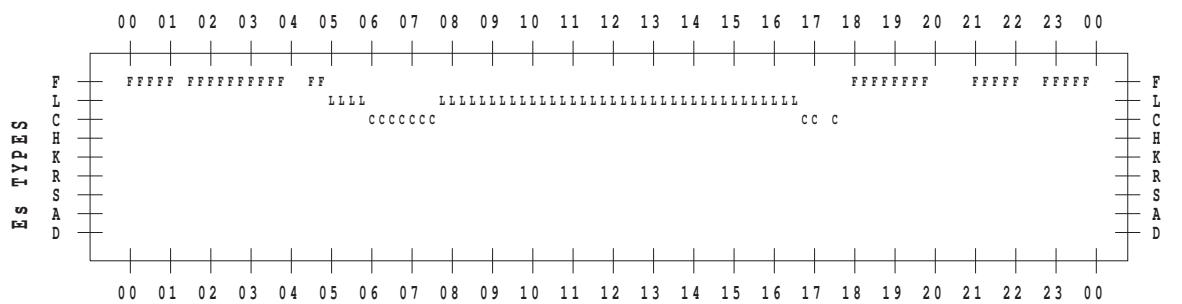
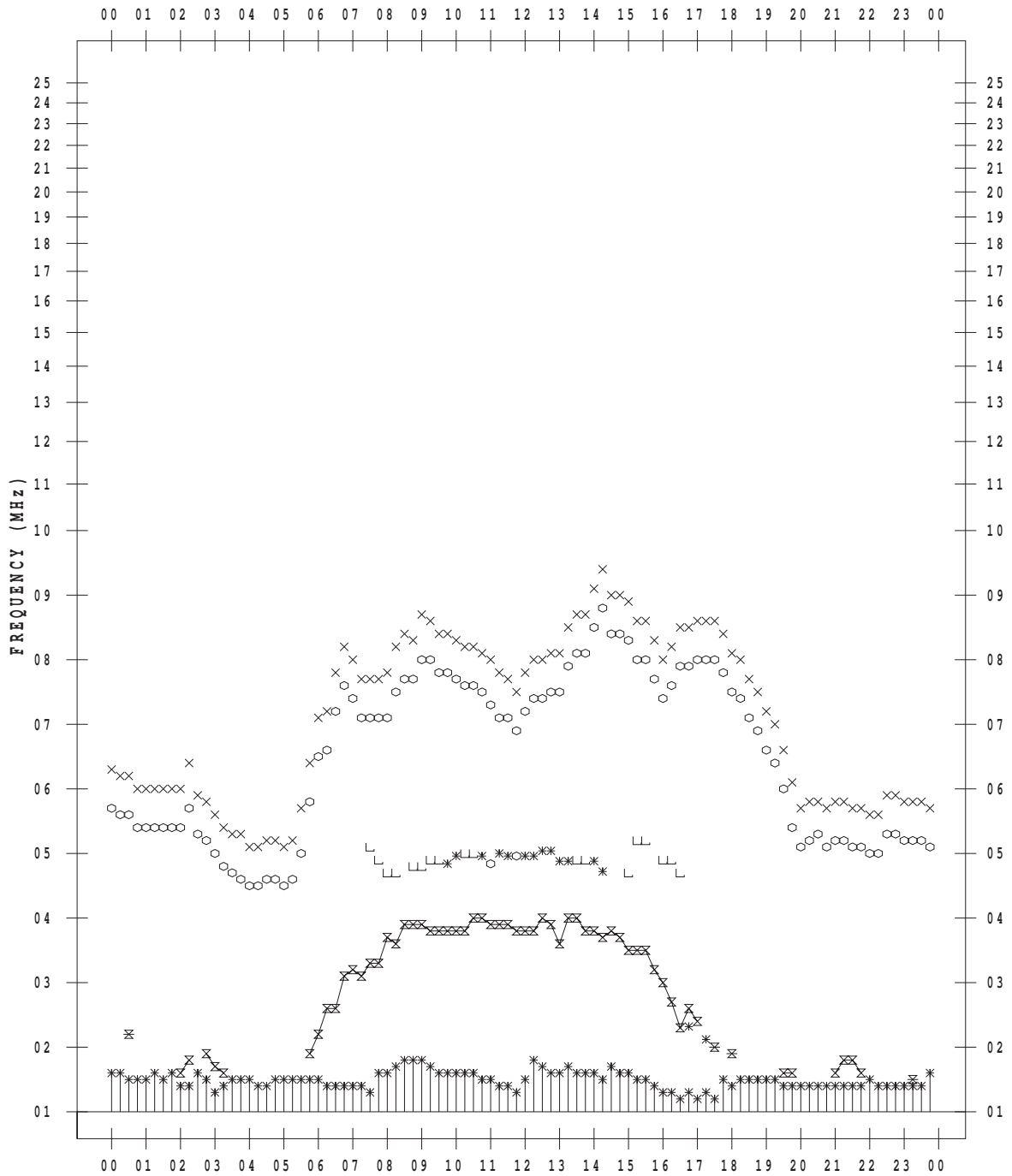
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/11

135 ° E MEAN TIME











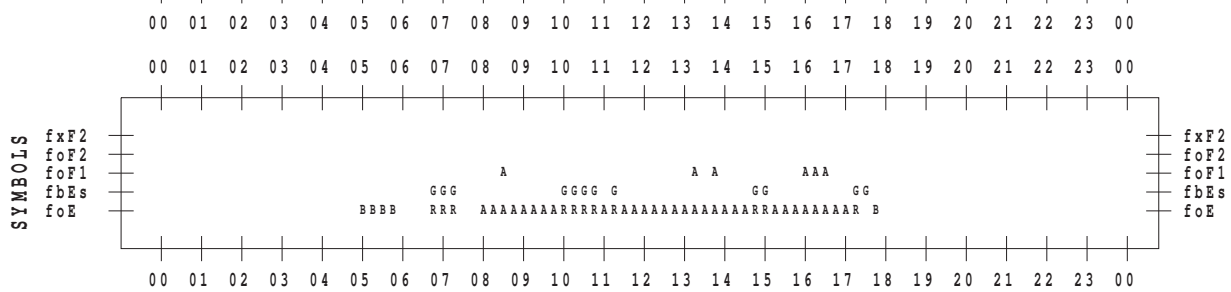
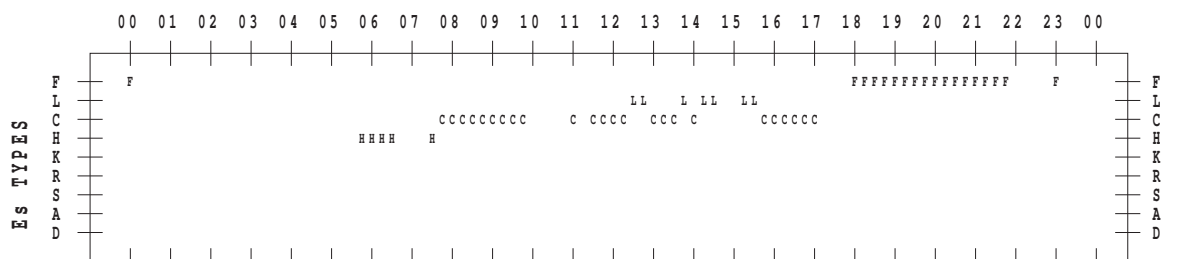
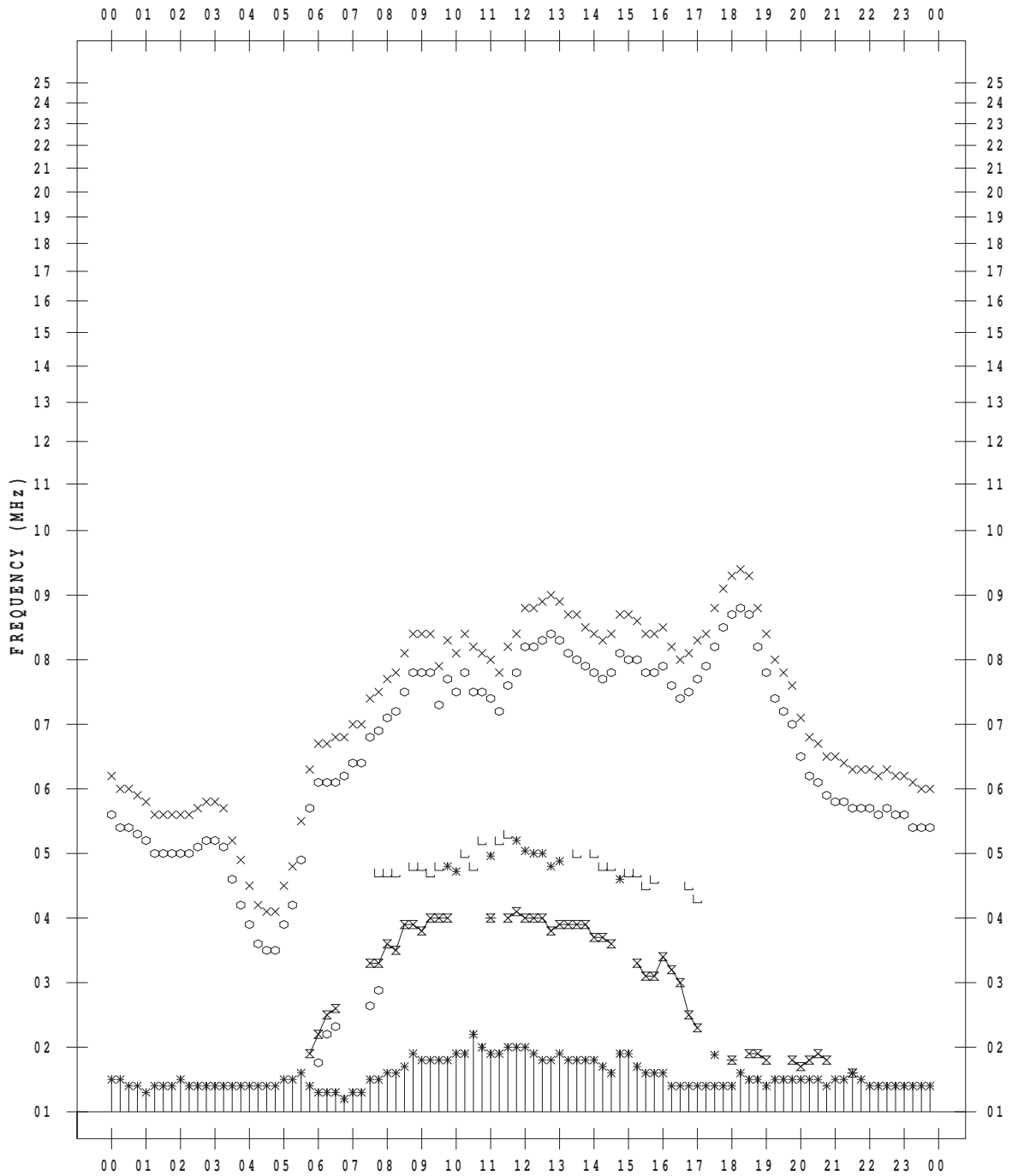
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/15

135 ° E MEAN TIME



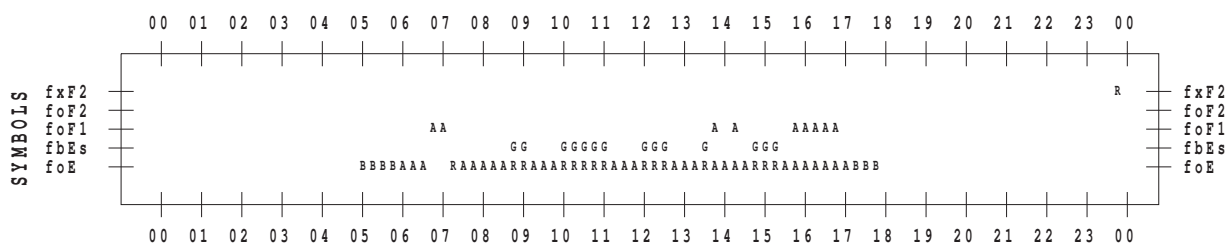
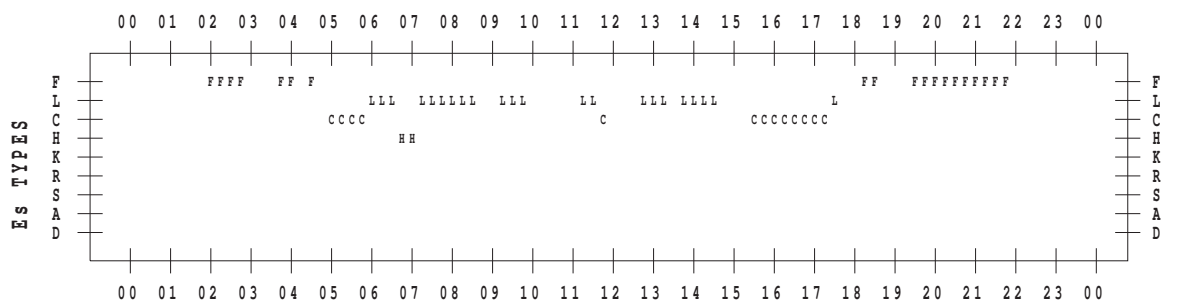
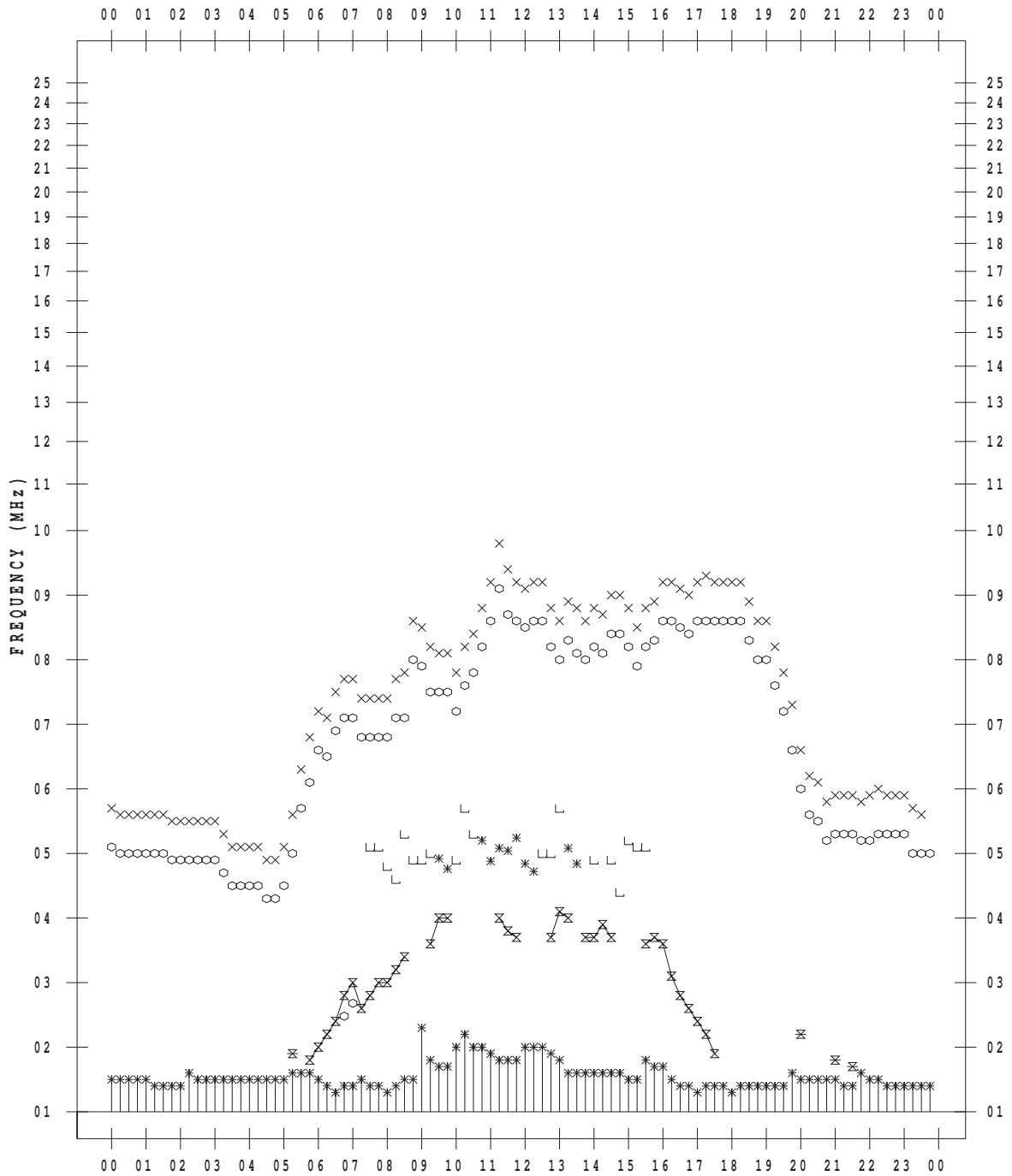
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/16

135 ° E MEAN TIME



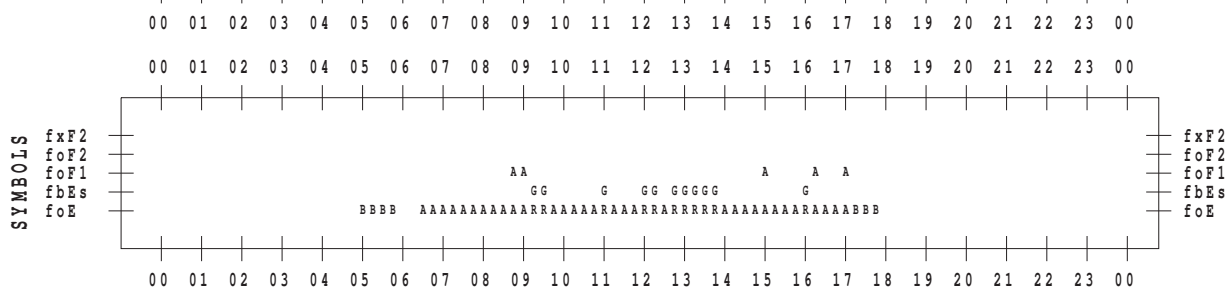
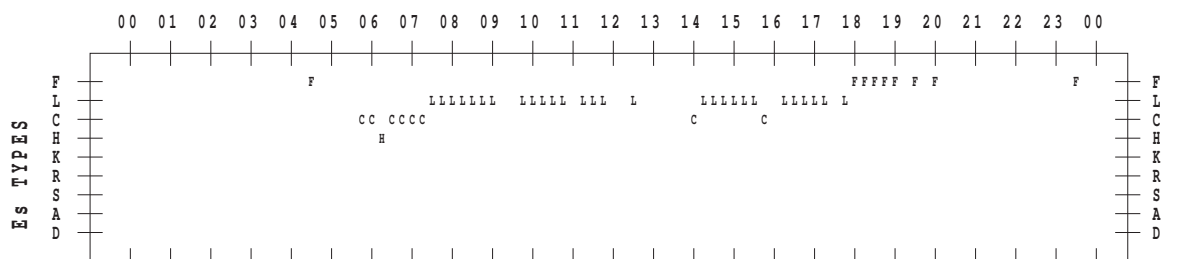
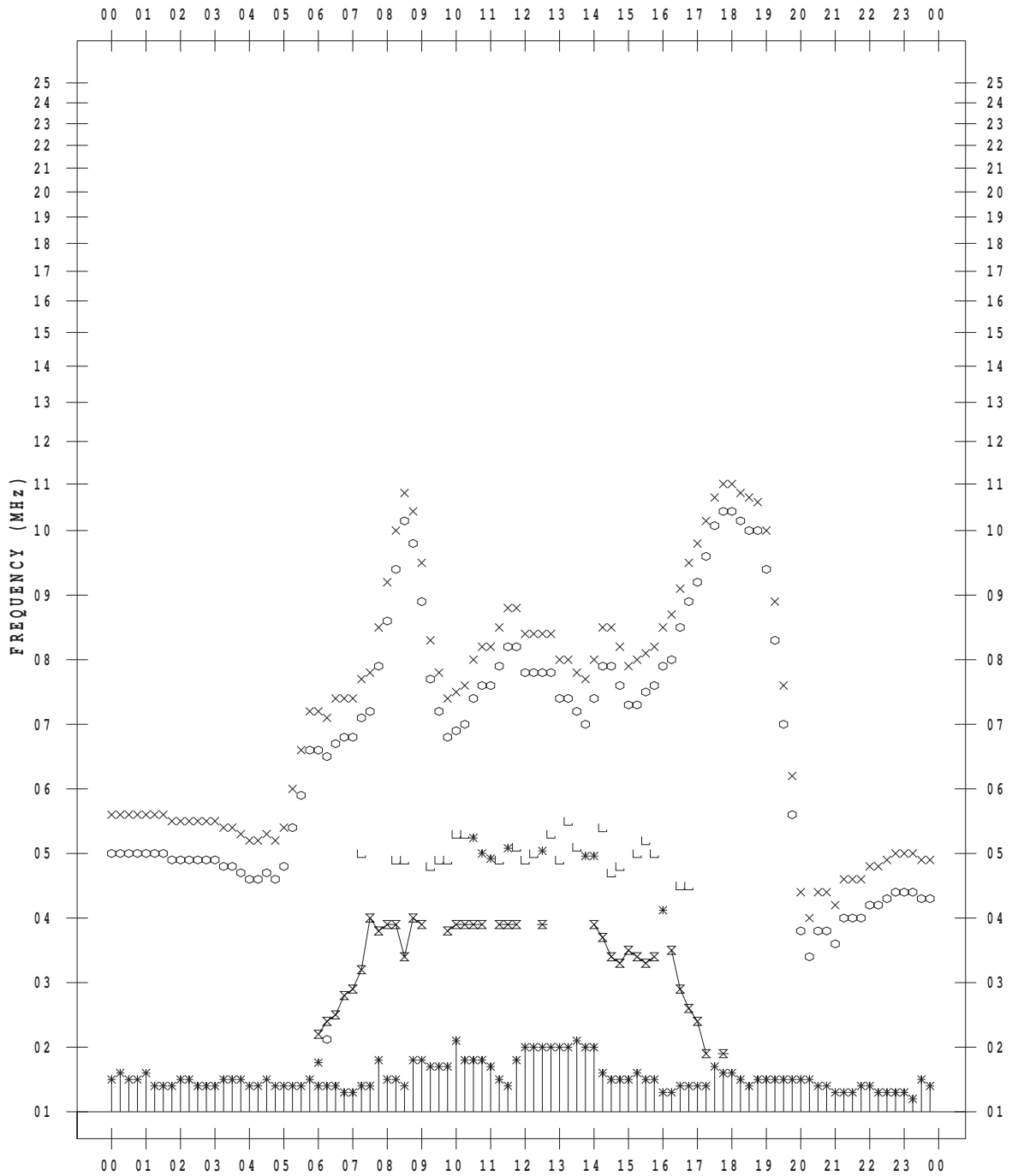
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/17

135 ° E MEAN TIME





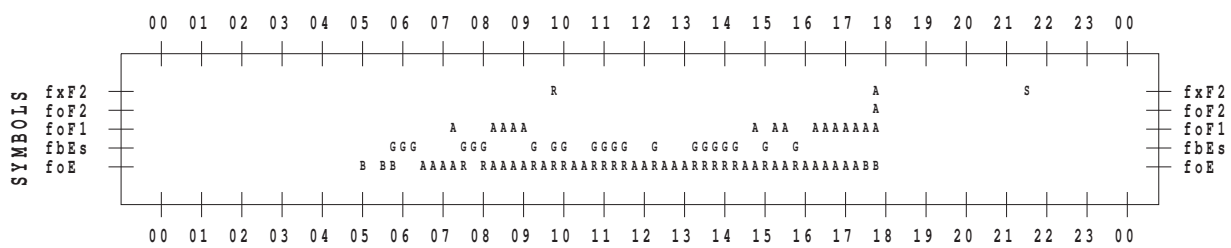
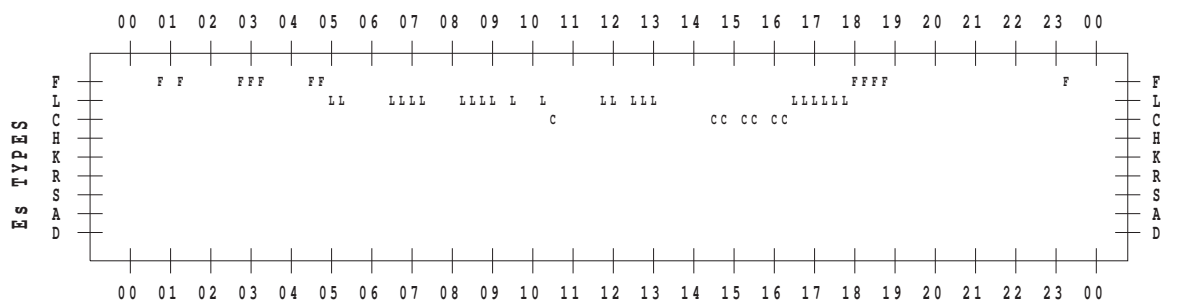
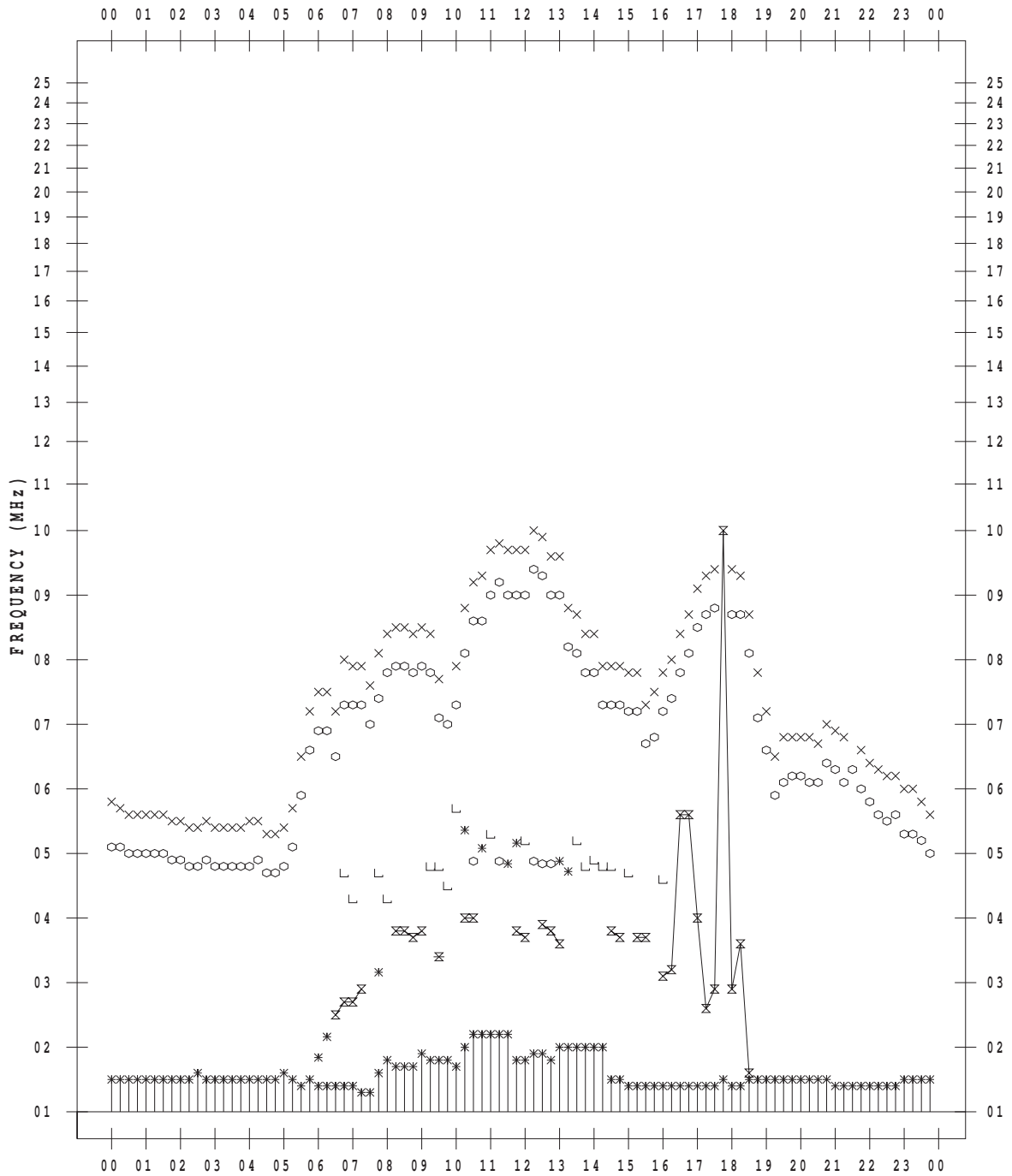
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/19

135 ° E MEAN TIME



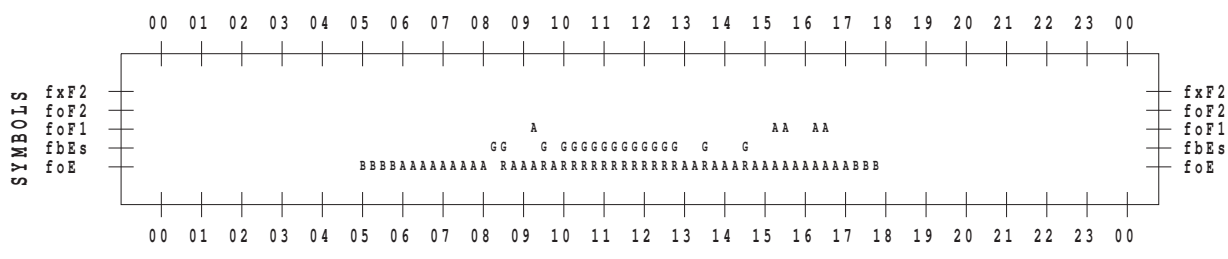
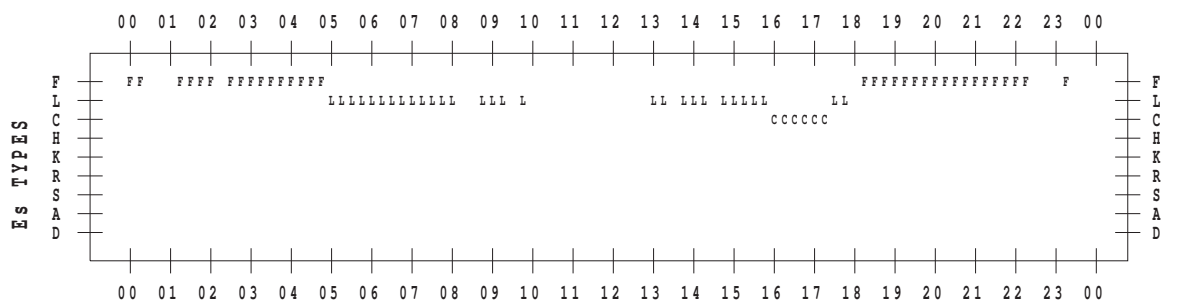
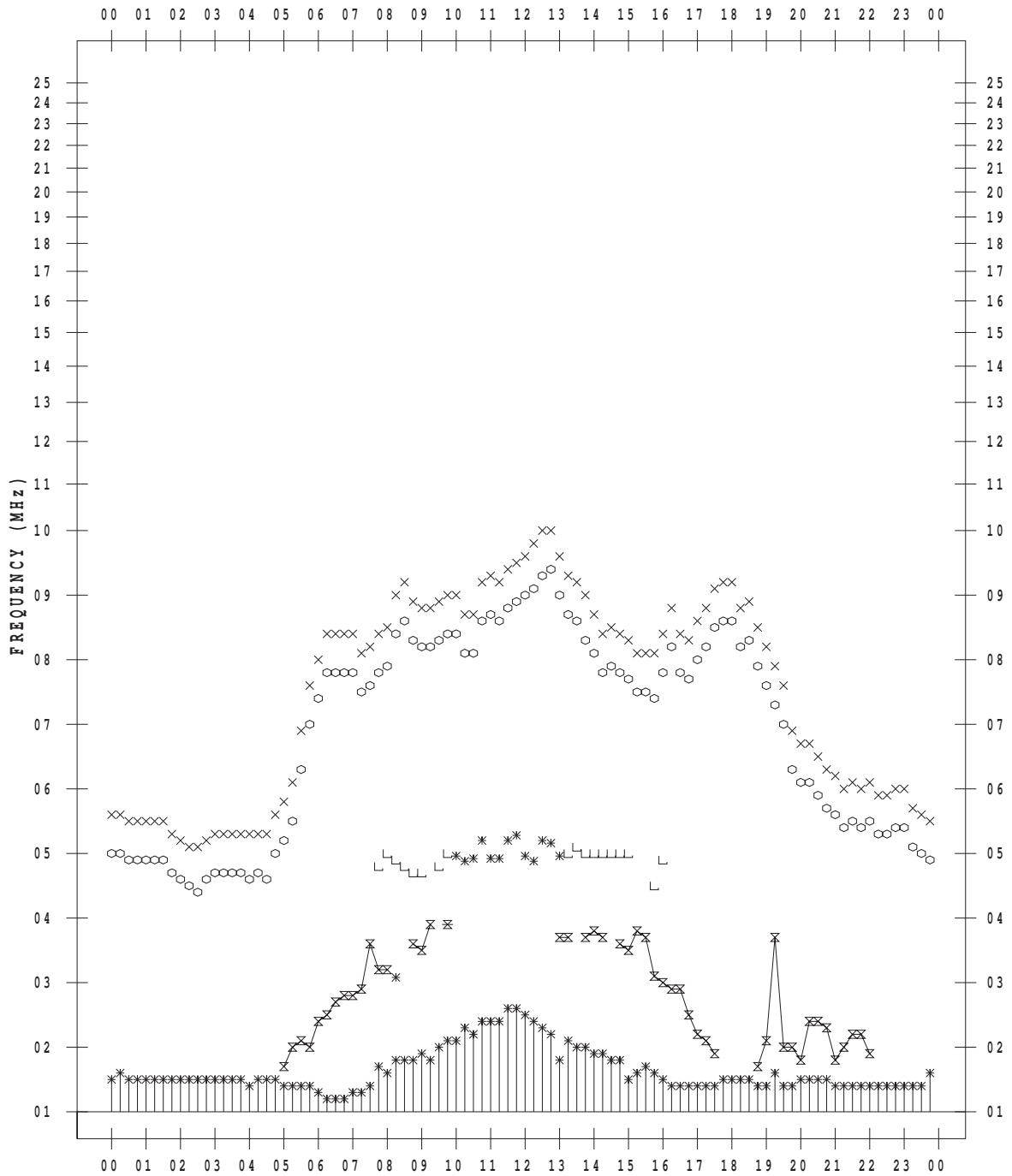
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/20

135 ° E MEAN TIME



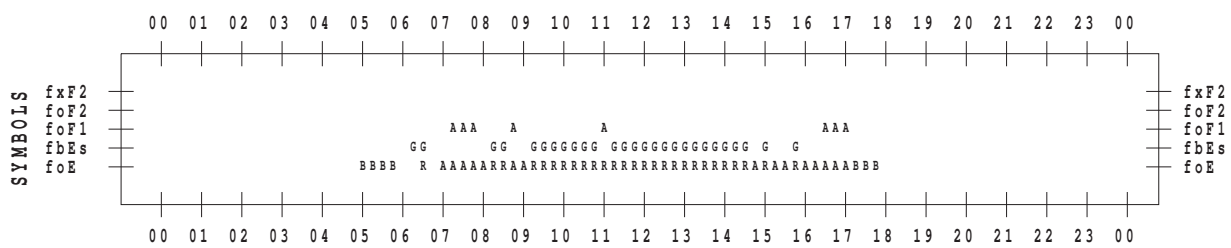
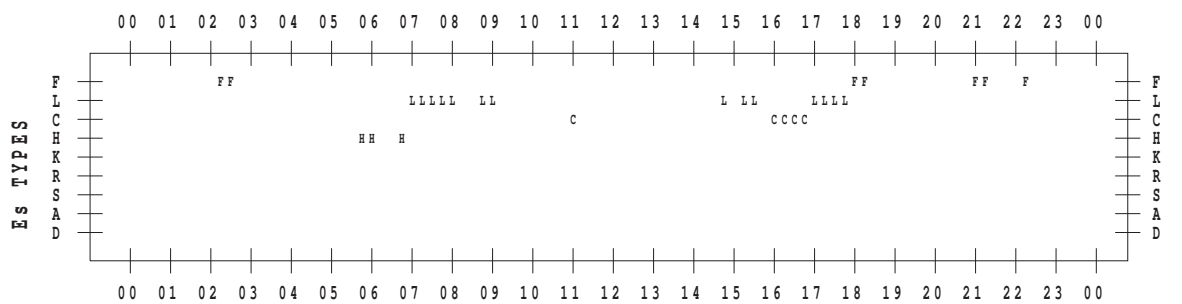
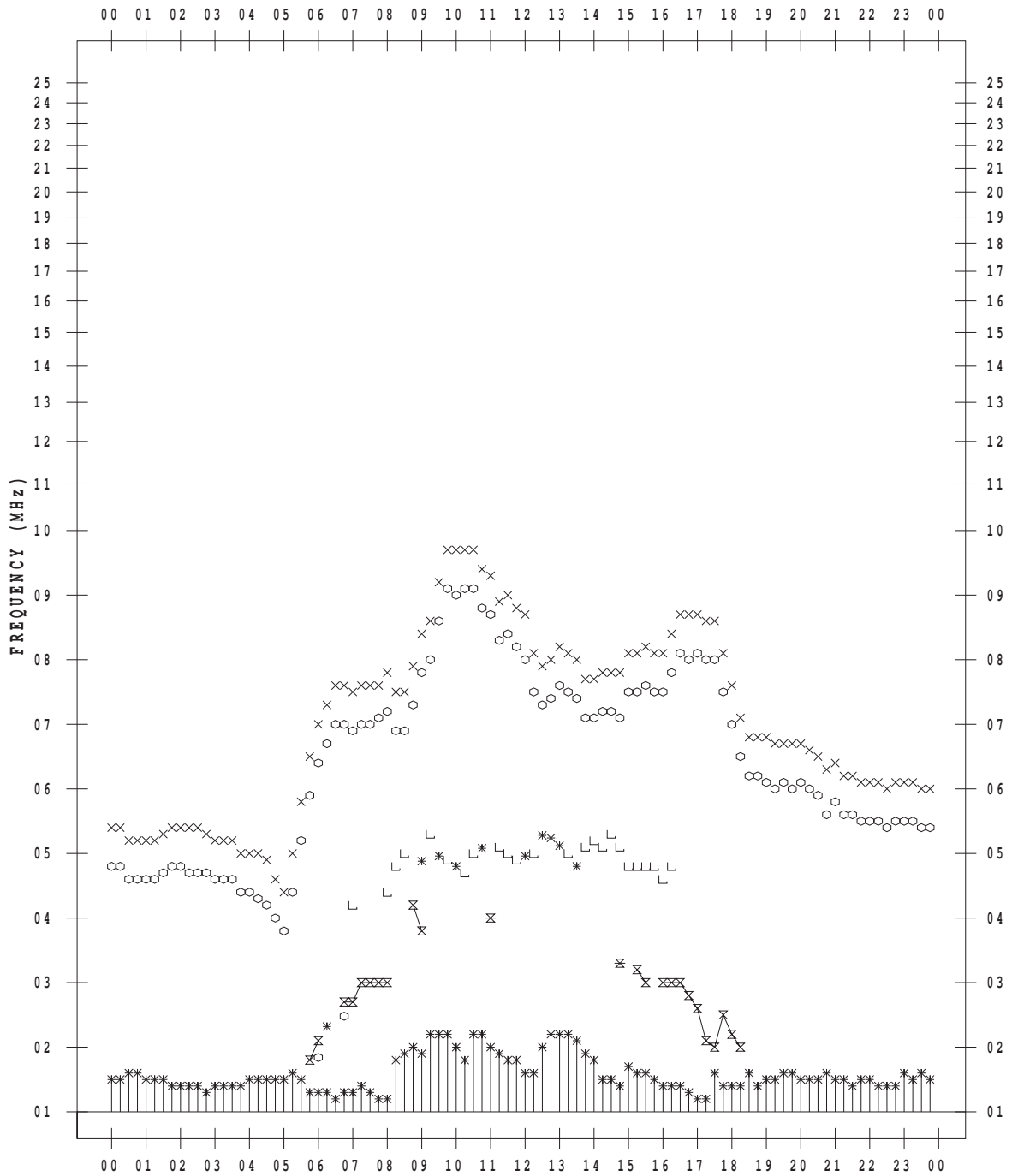
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/21

135 ° E MEAN TIME



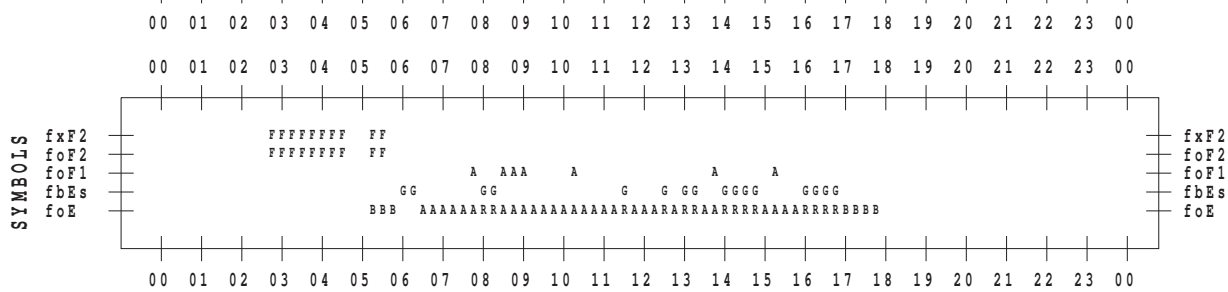
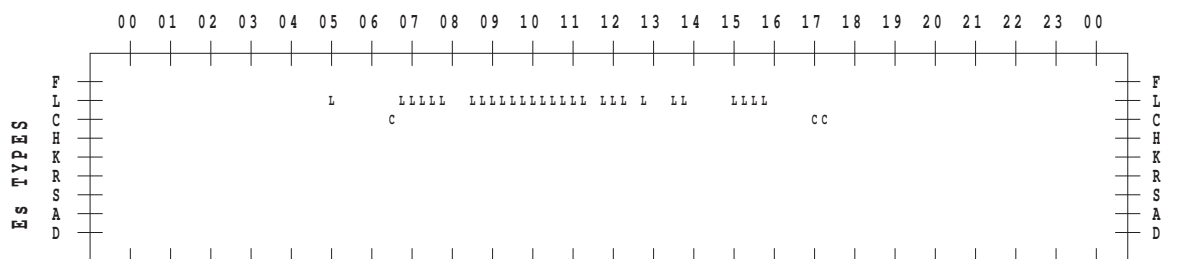
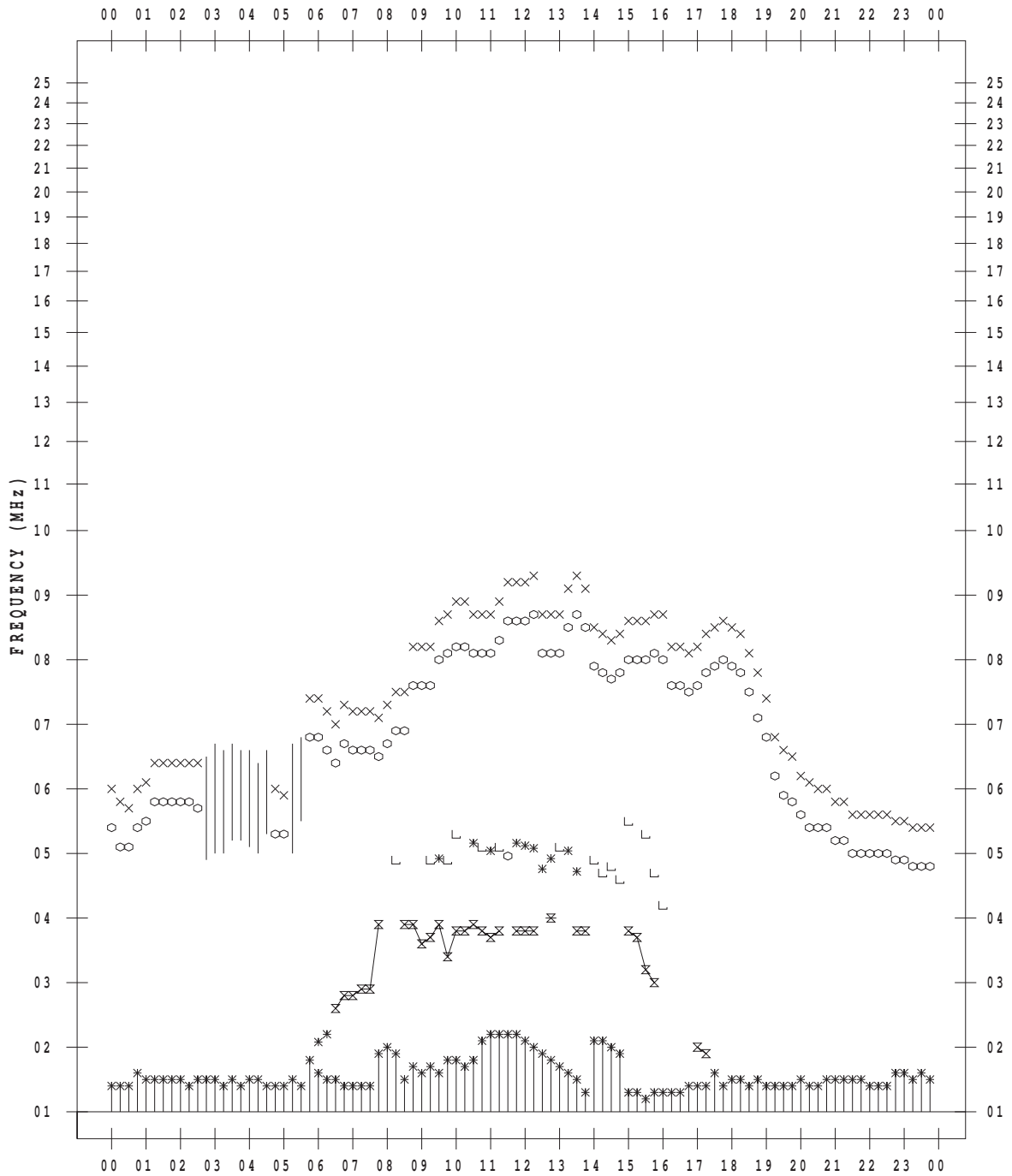
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/22

135 ° E MEAN TIME





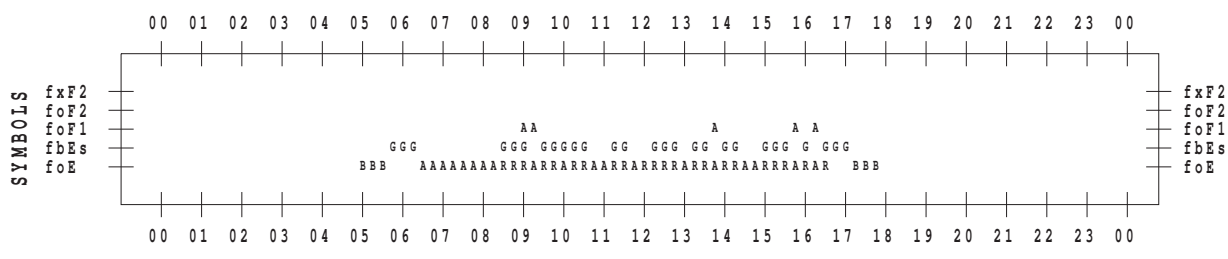
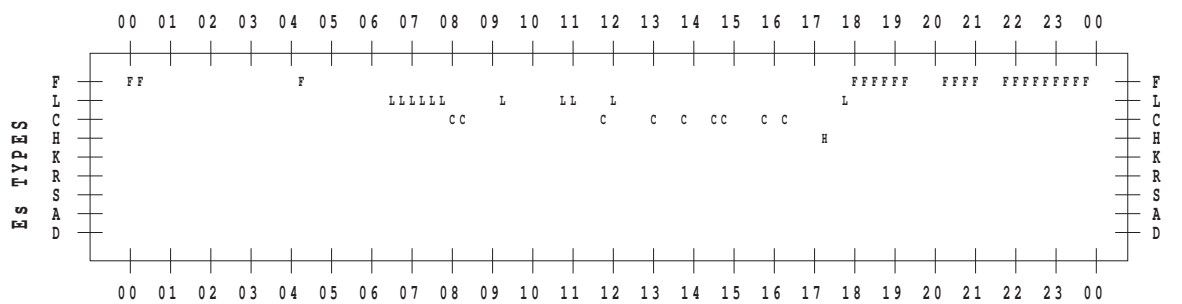
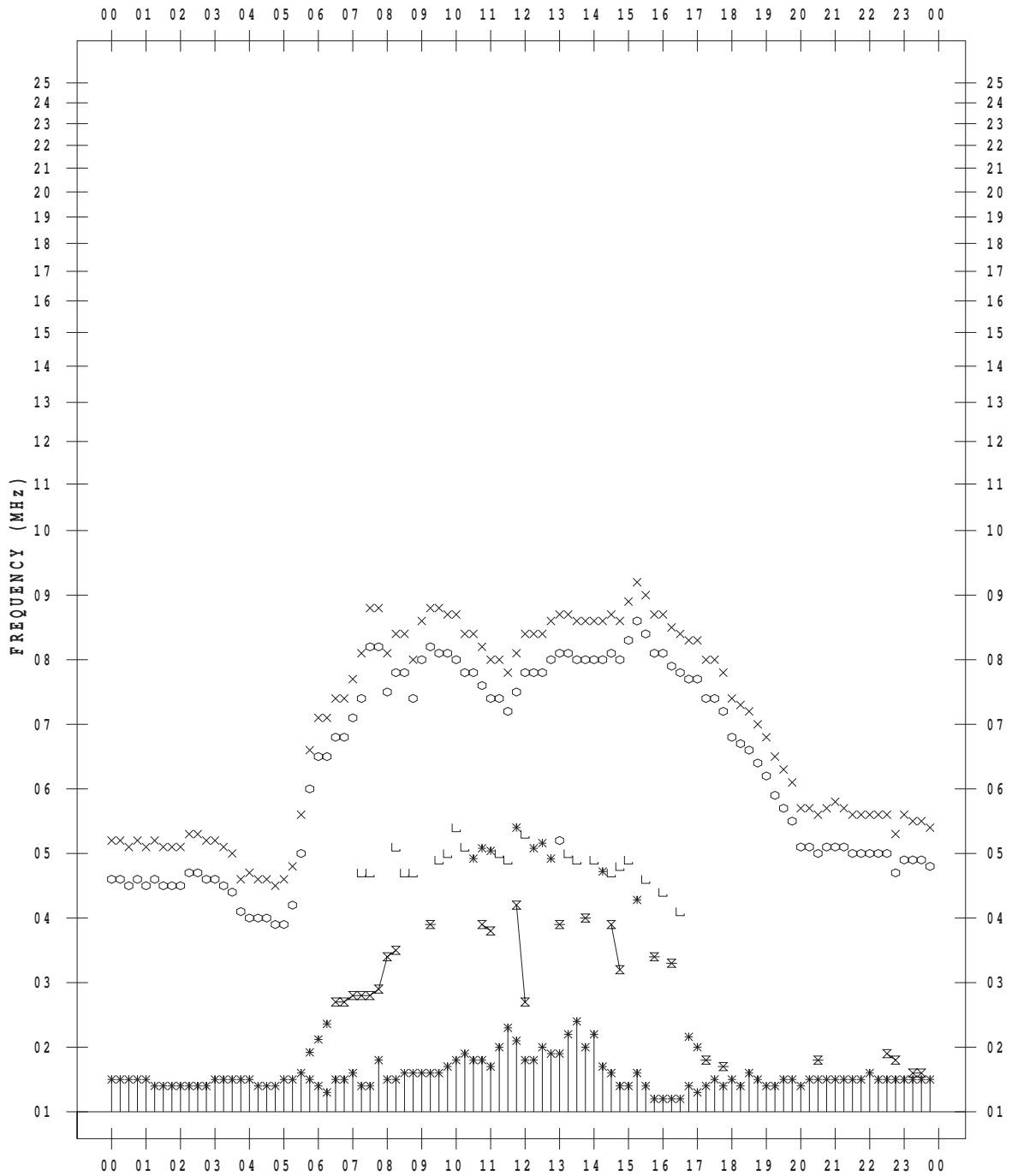
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/23

135 ° E MEAN TIME



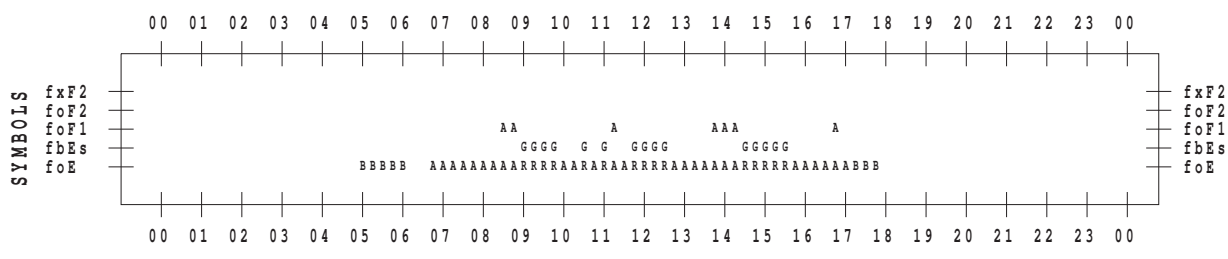
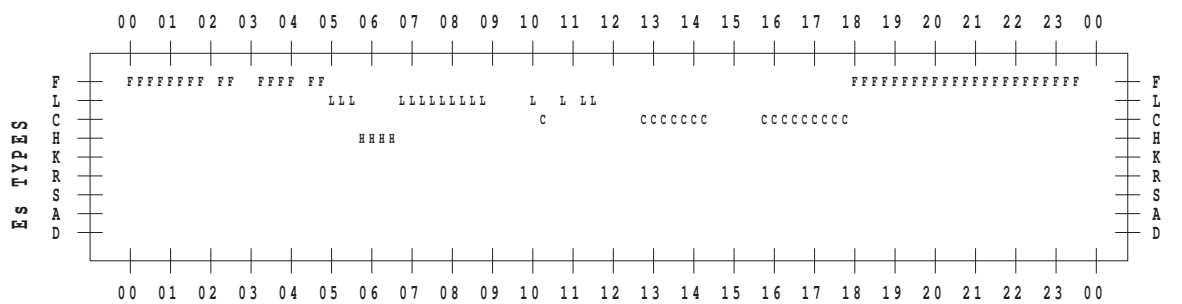
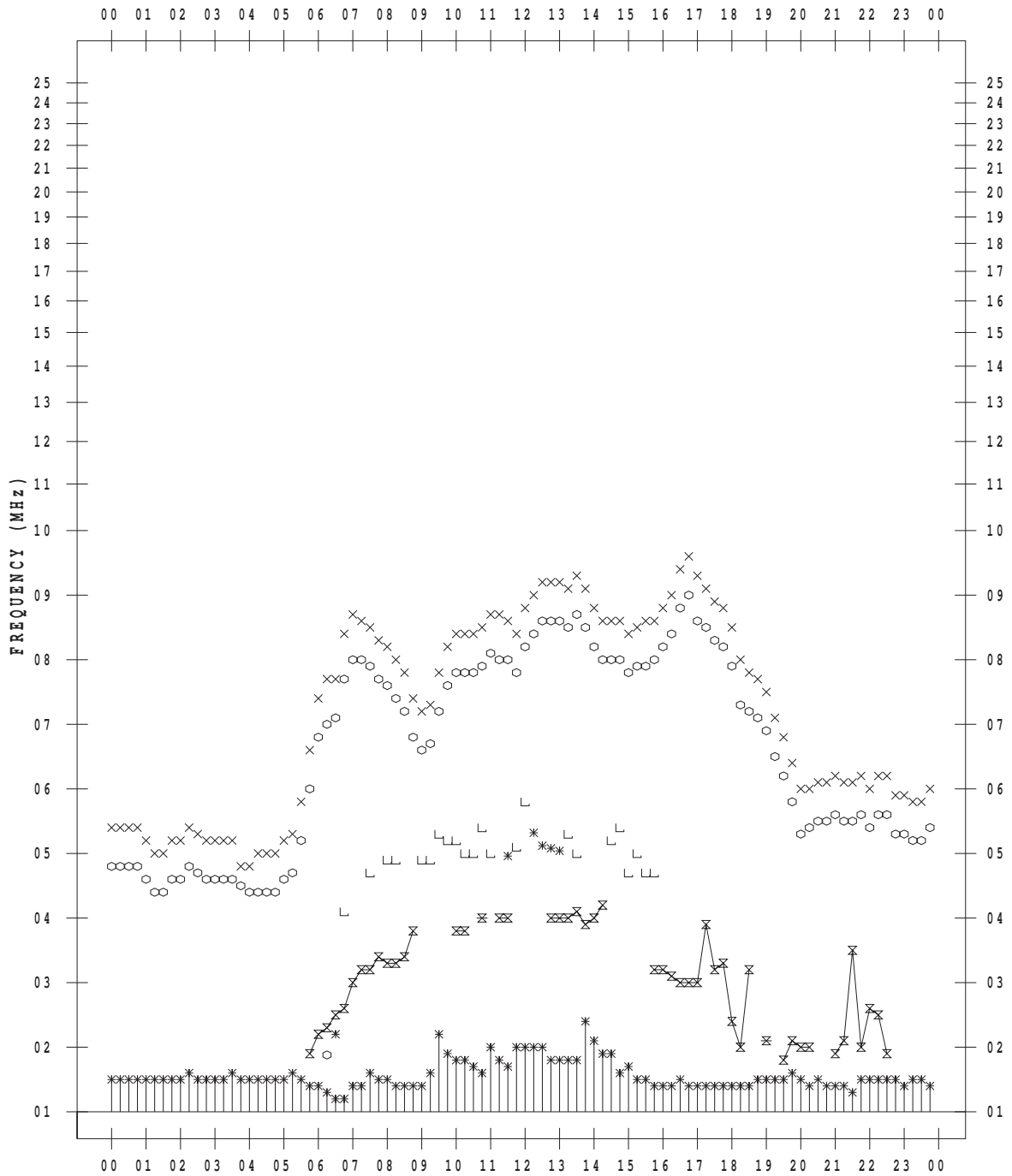
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/24

135 ° E MEAN TIME



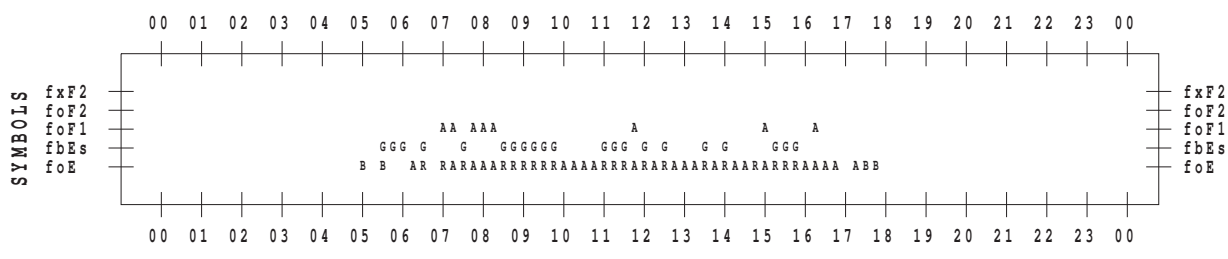
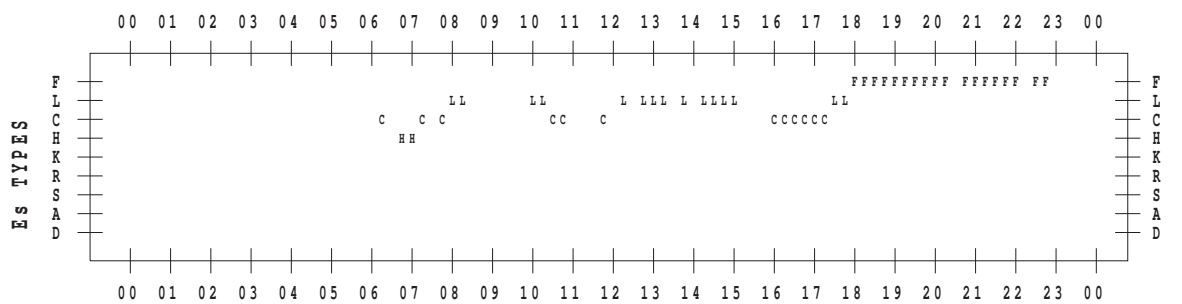
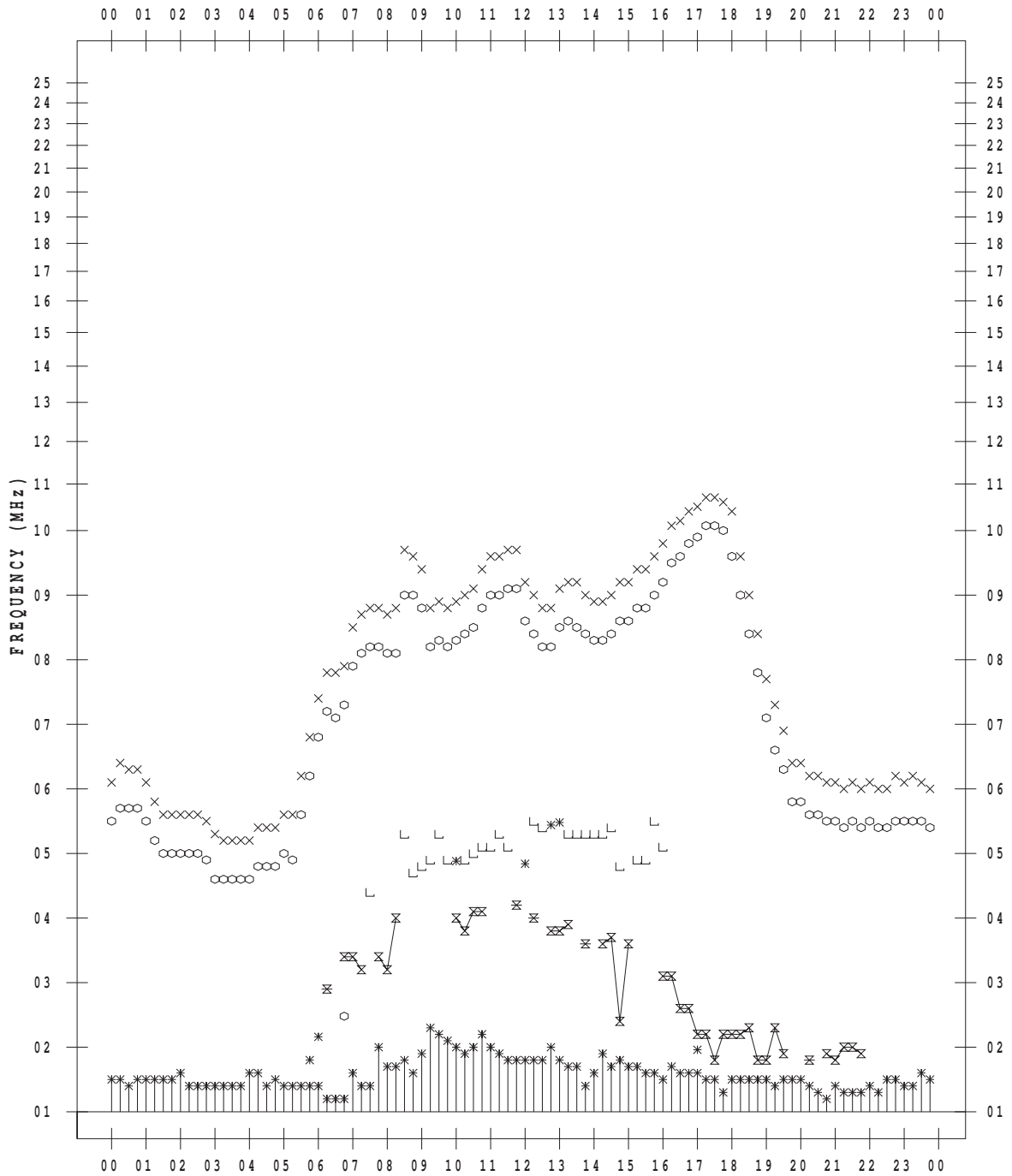
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/25

135 ° E MEAN TIME







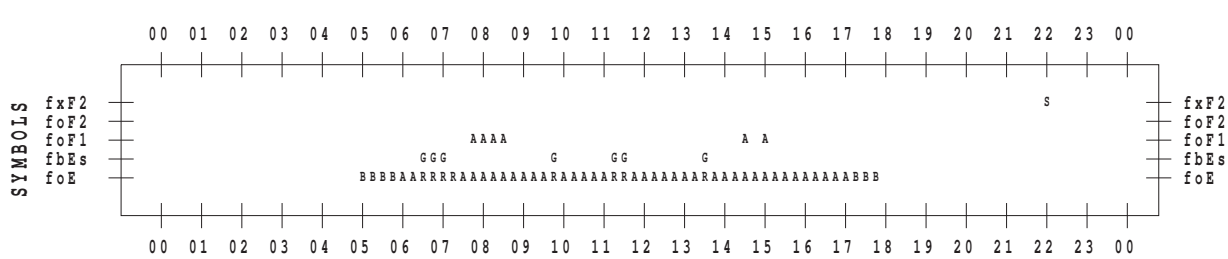
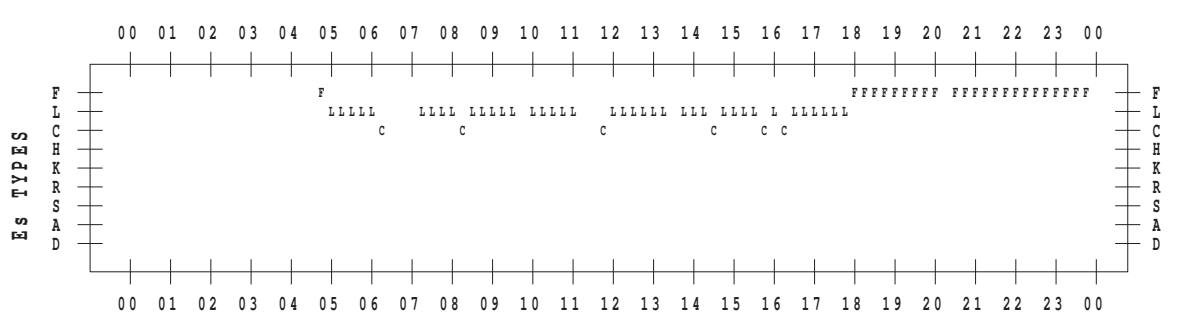
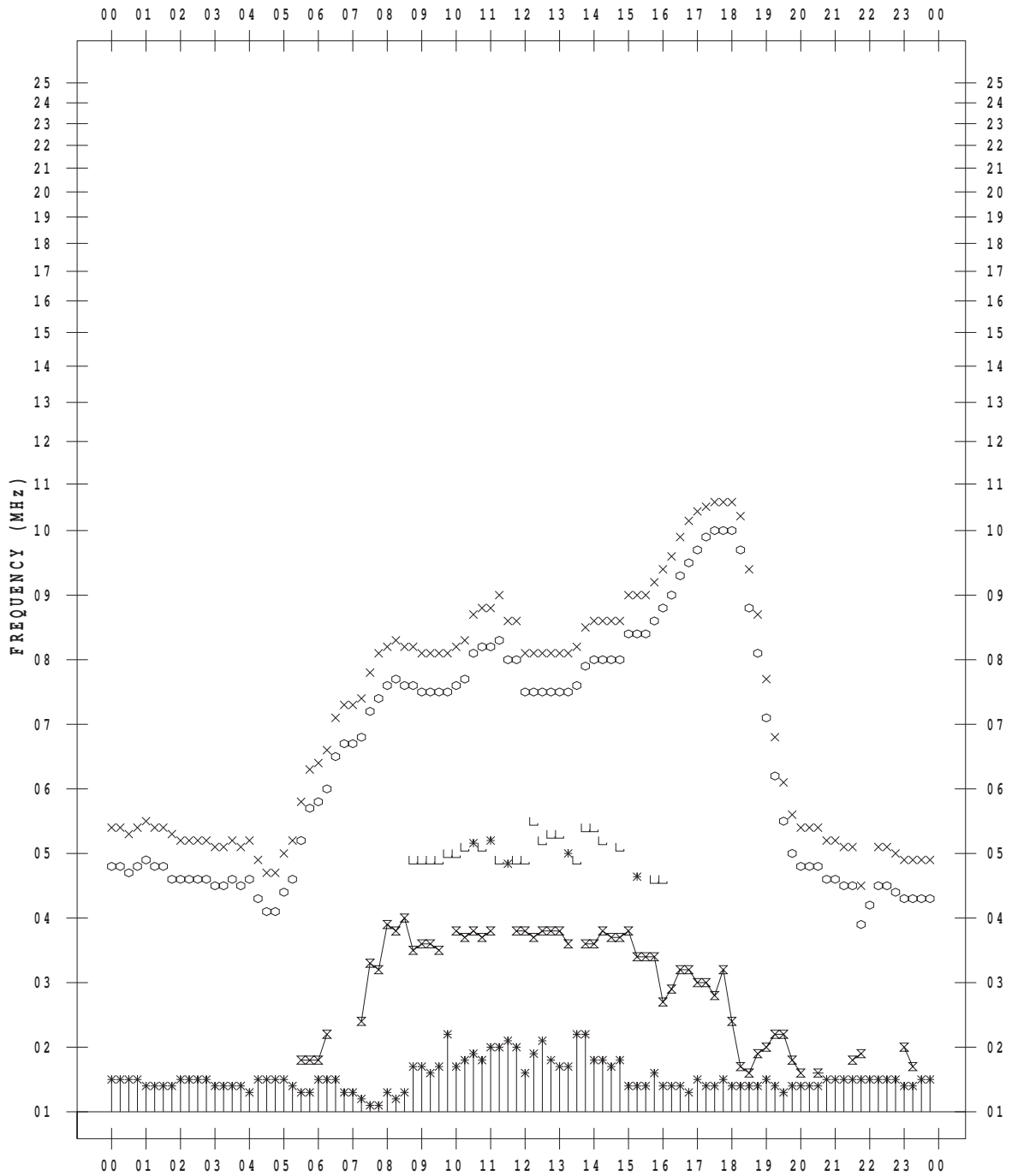
# f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 9/28

135 ° E MEAN TIME











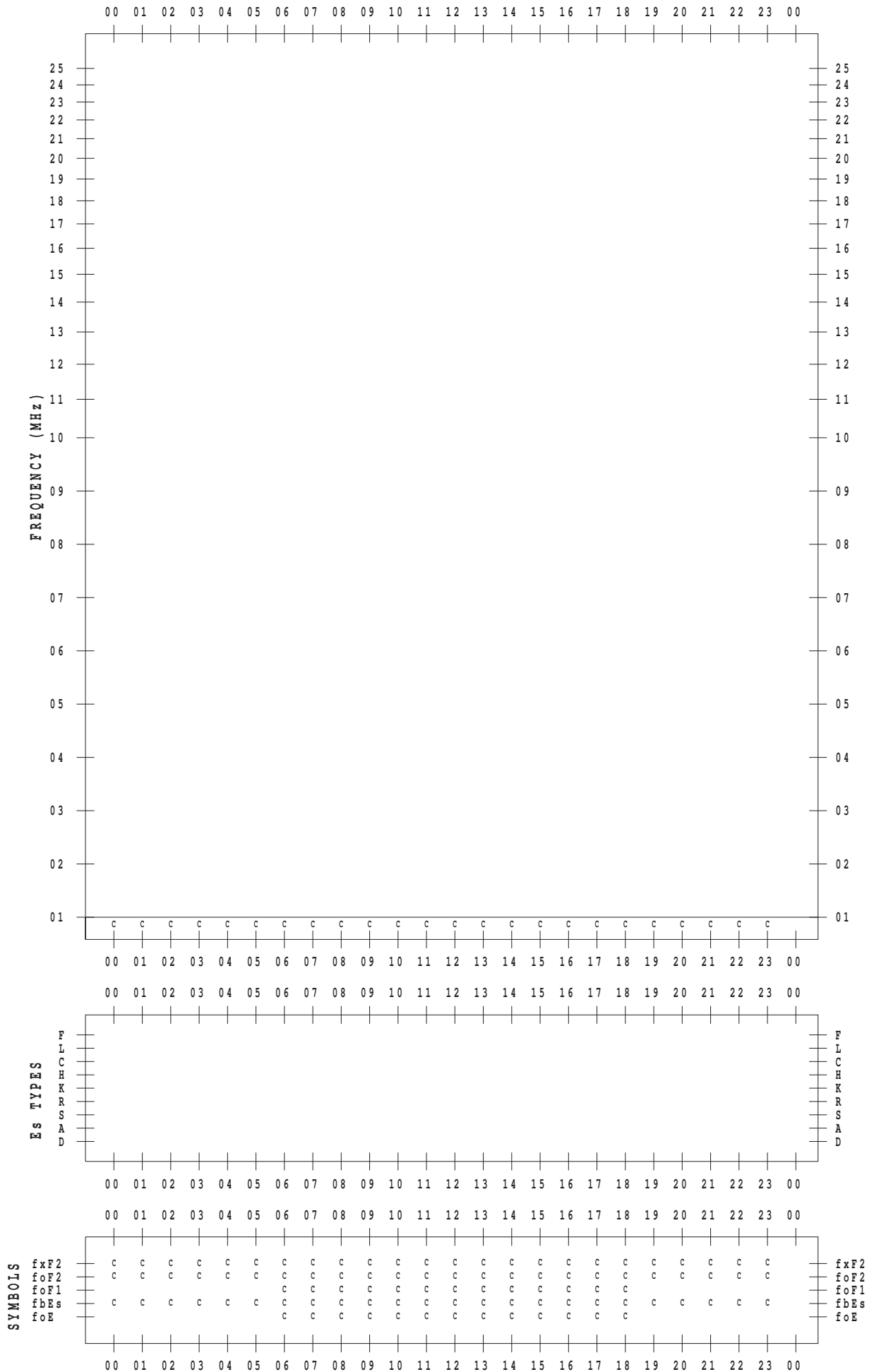
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013 / 9 / 2

135 ° E MEAN TIME



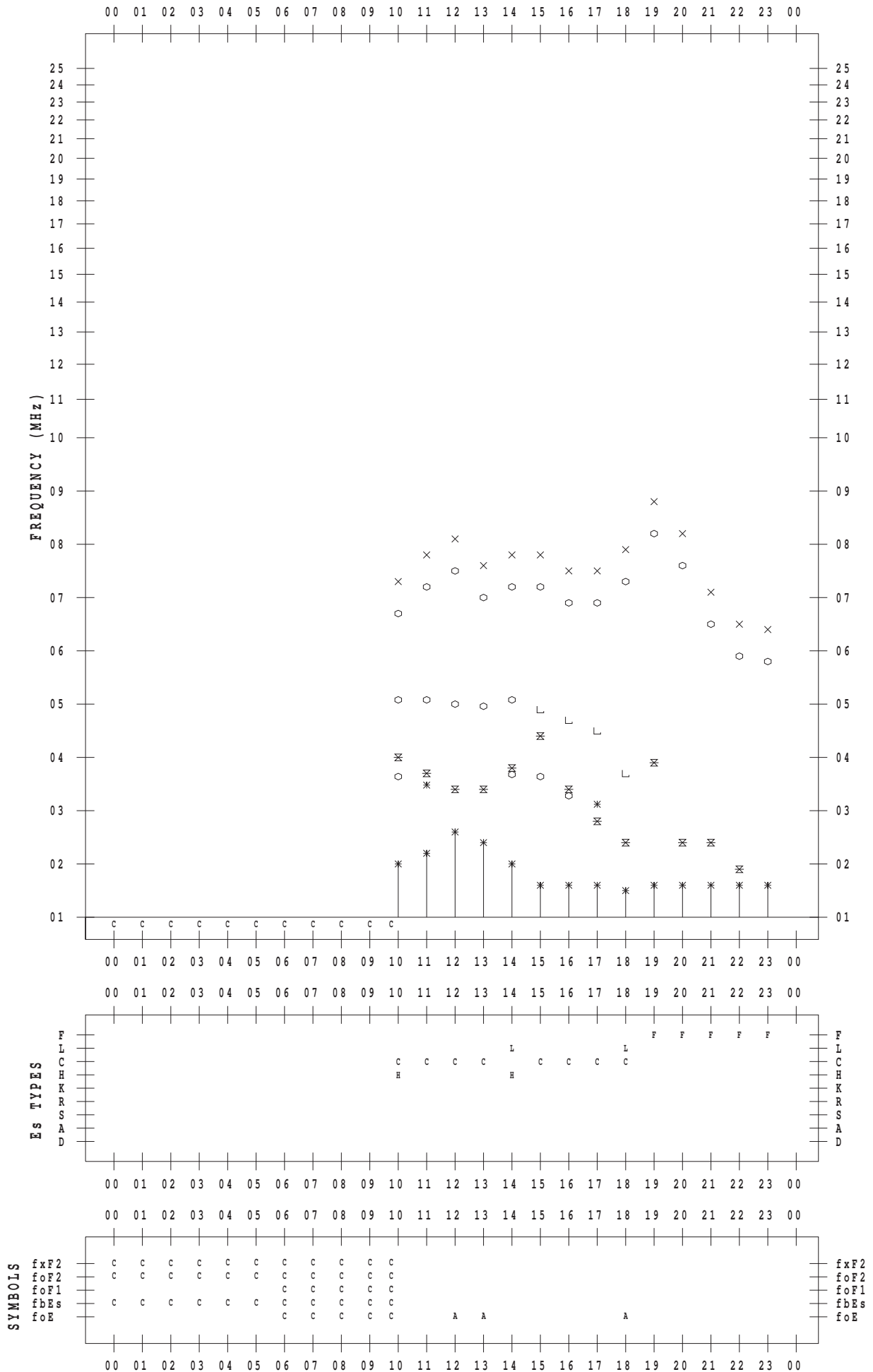
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/ 3

135 ° E MEAN TIME



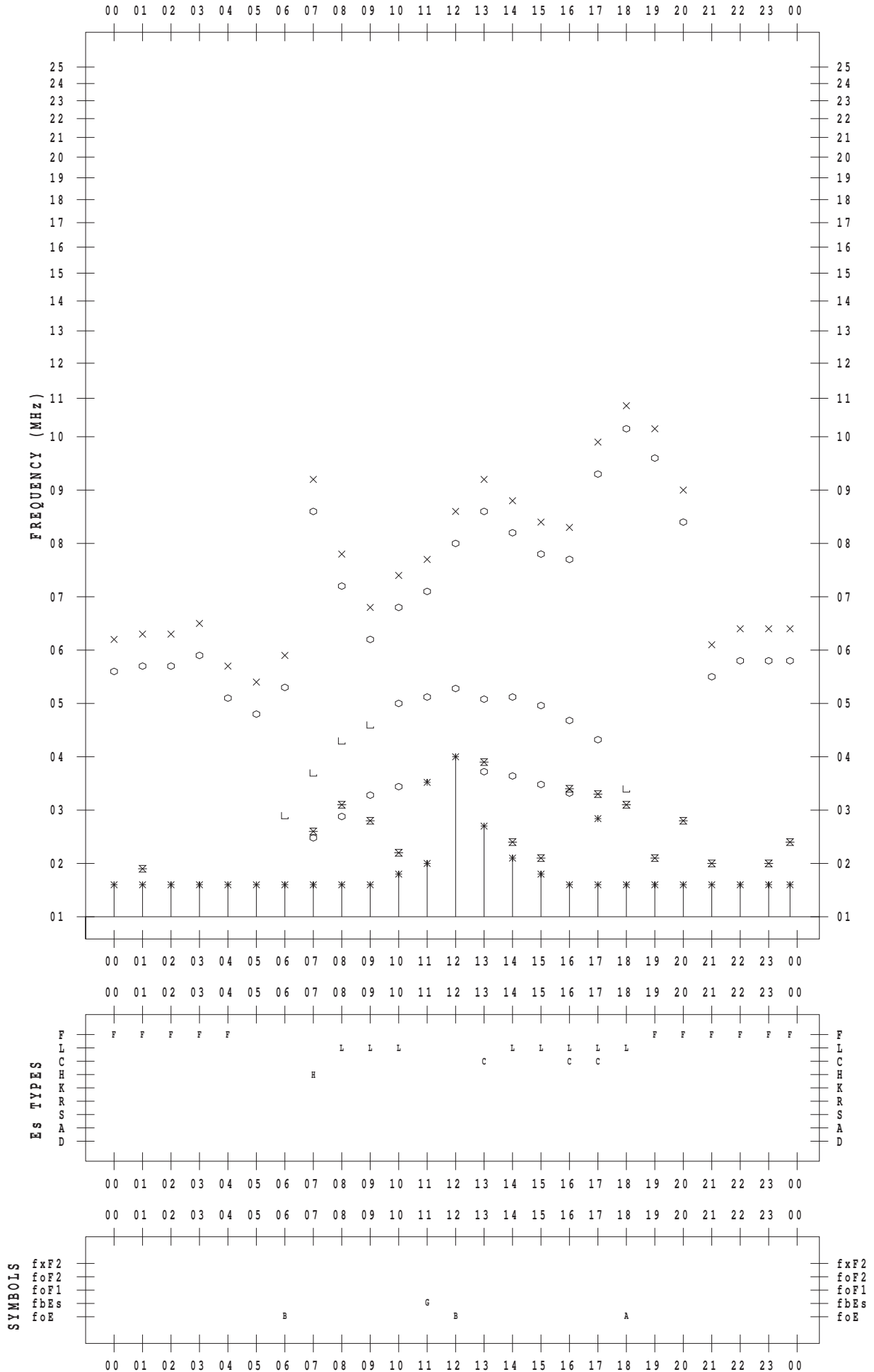
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/ 4

135 ° E MEAN TIME



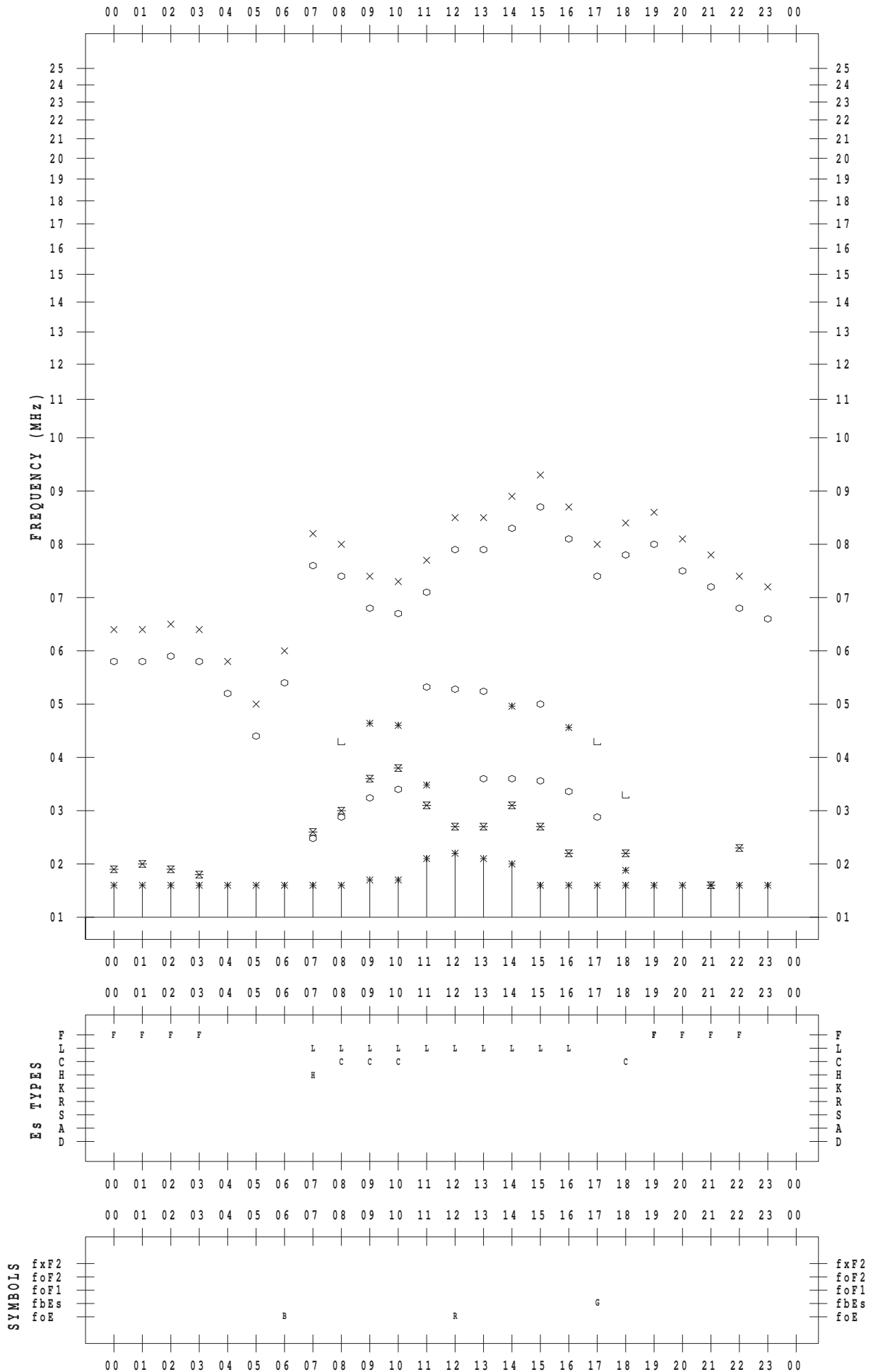
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/ 5

135 ° E MEAN TIME



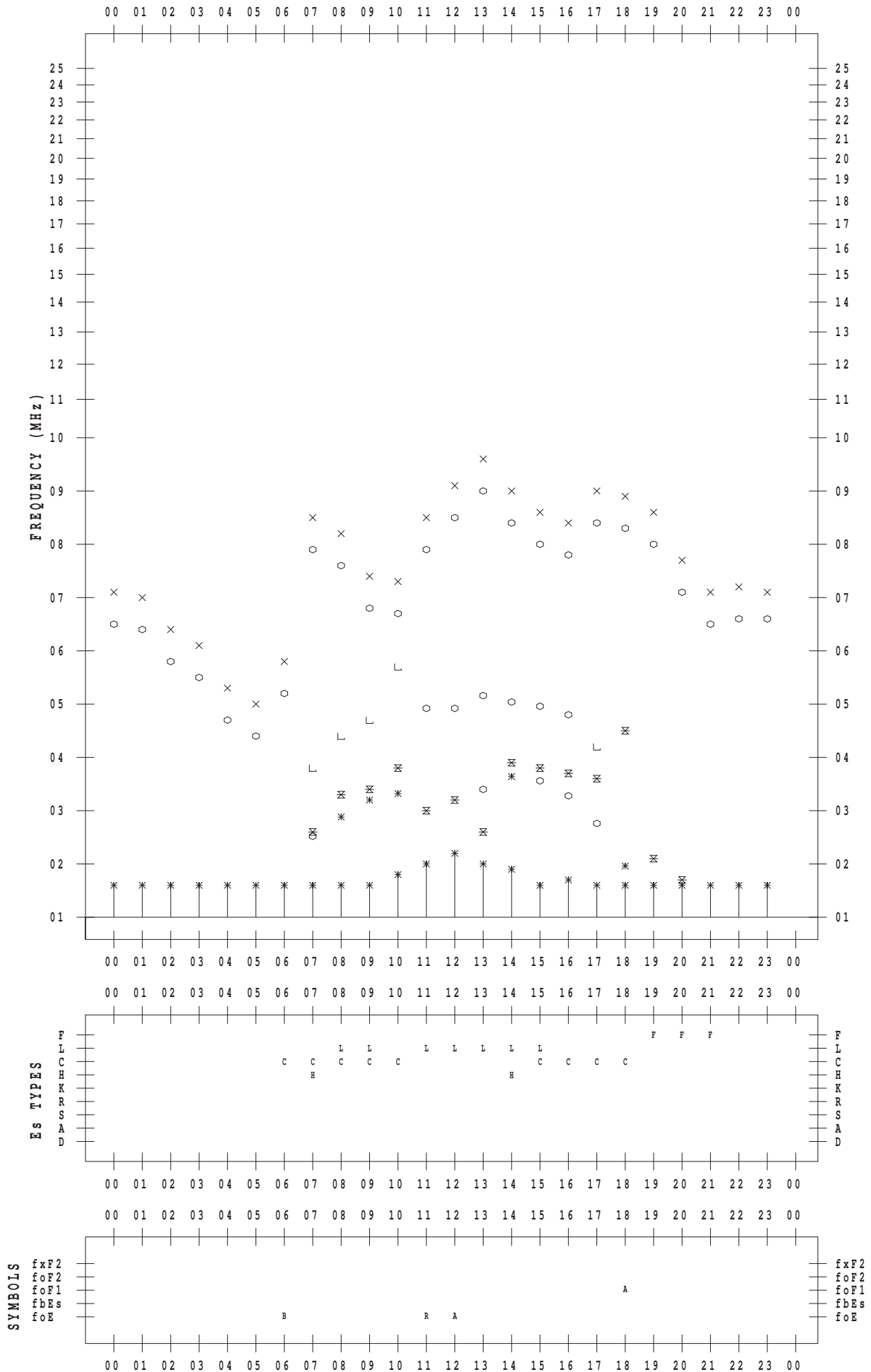
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/ 6

135 ° E MEAN TIME



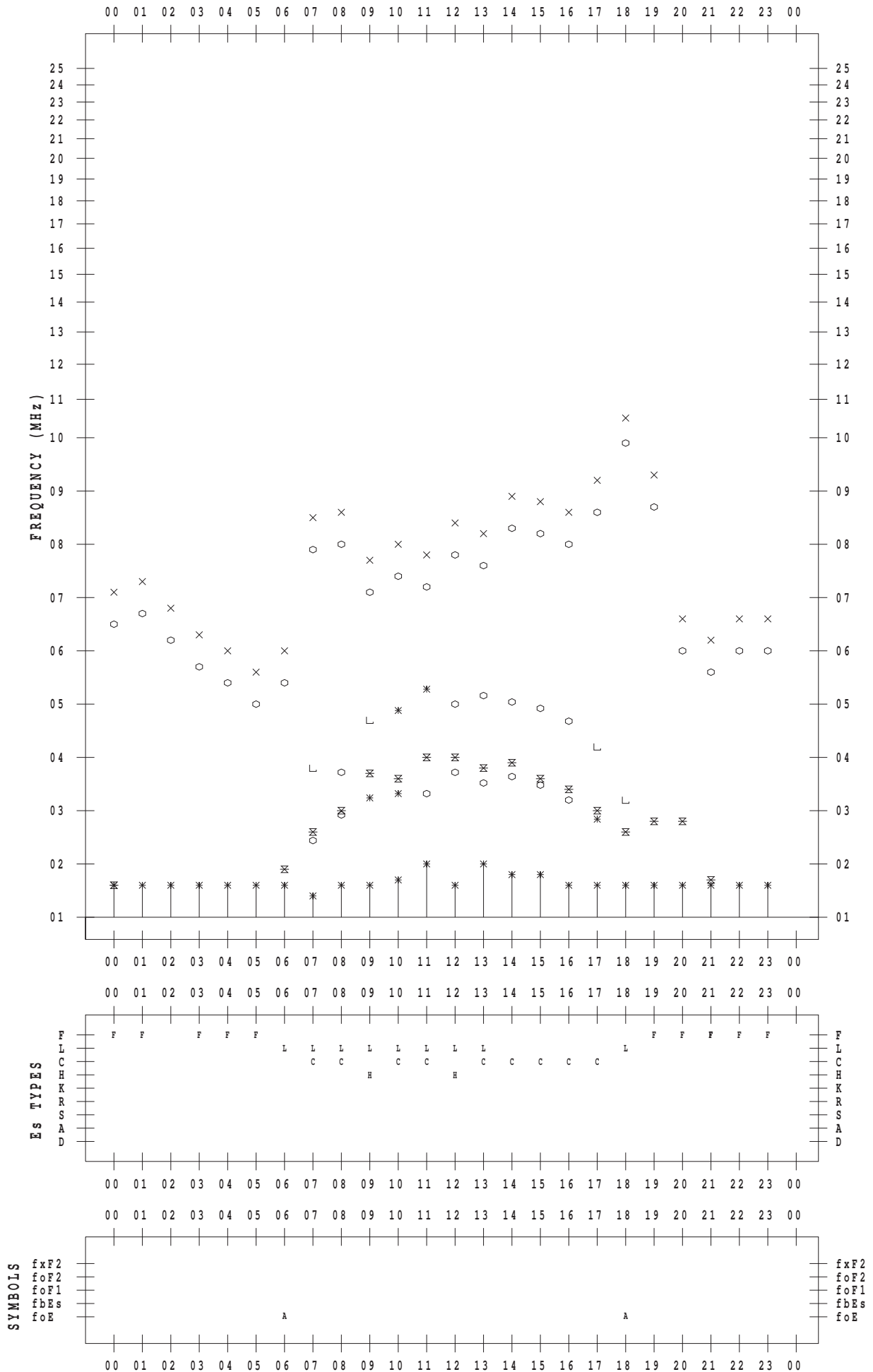
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/ 7

135 ° E MEAN TIME



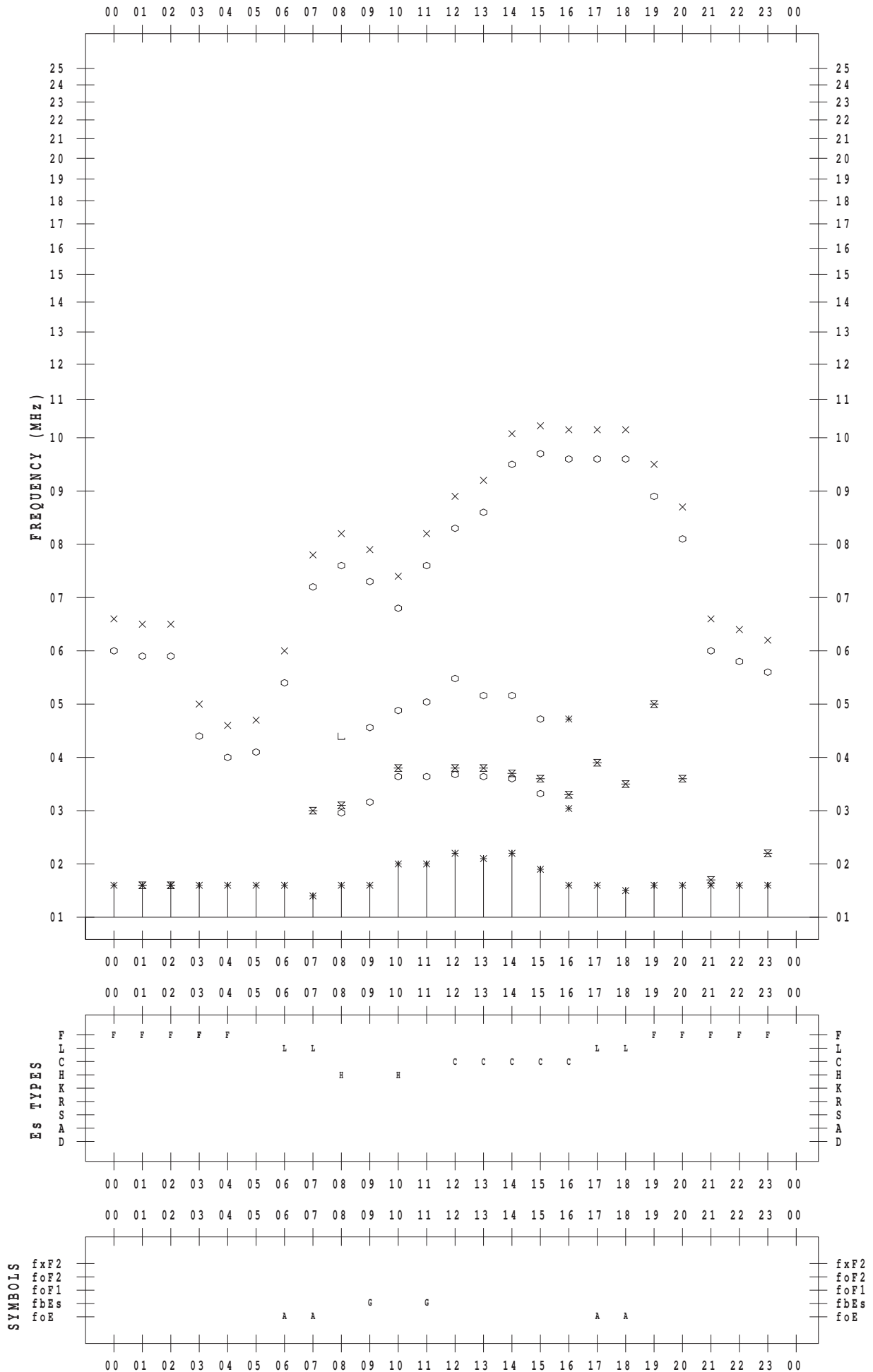
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/ 8

135 ° E MEAN TIME





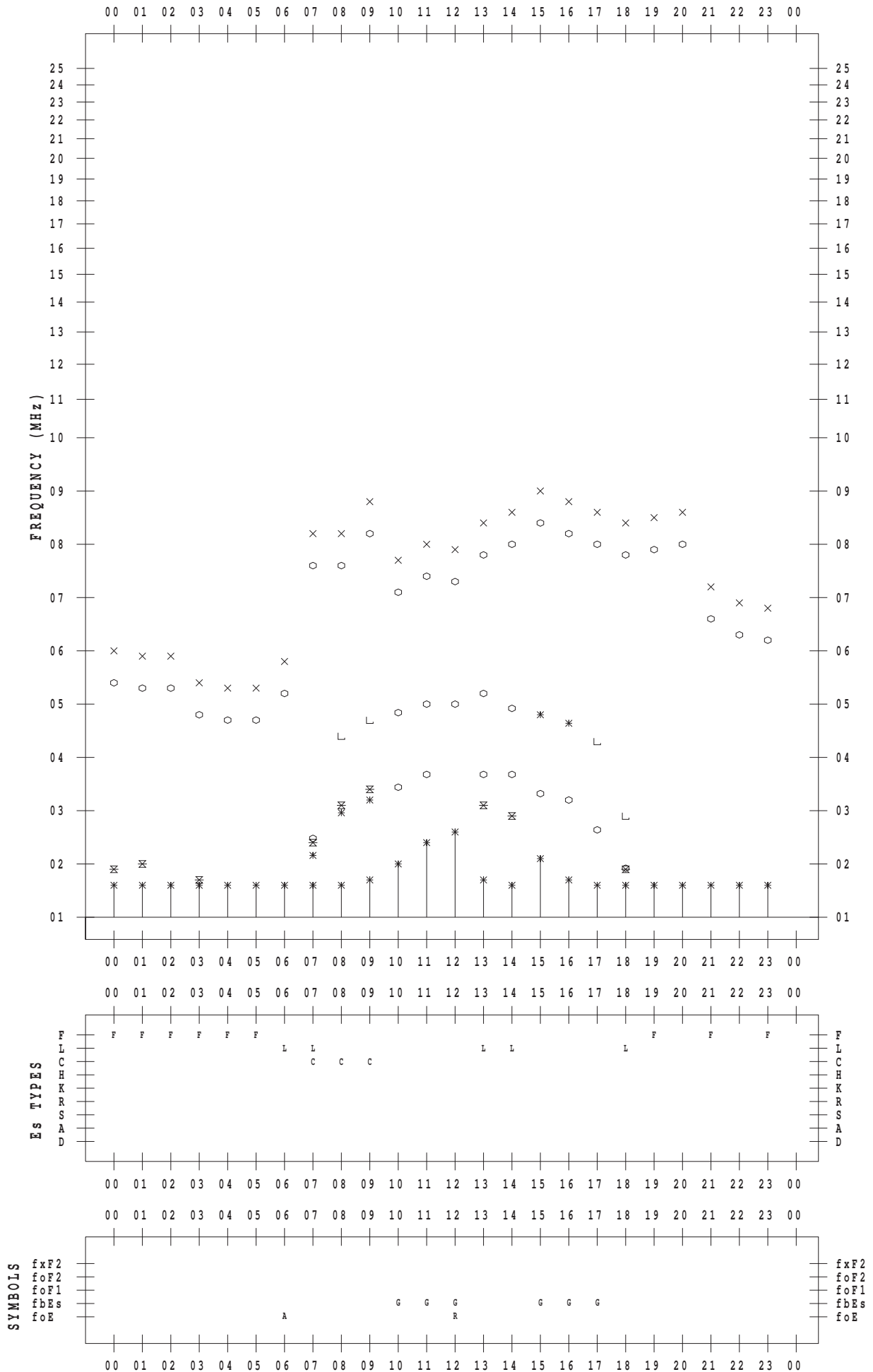
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/ 9

135 ° E MEAN TIME



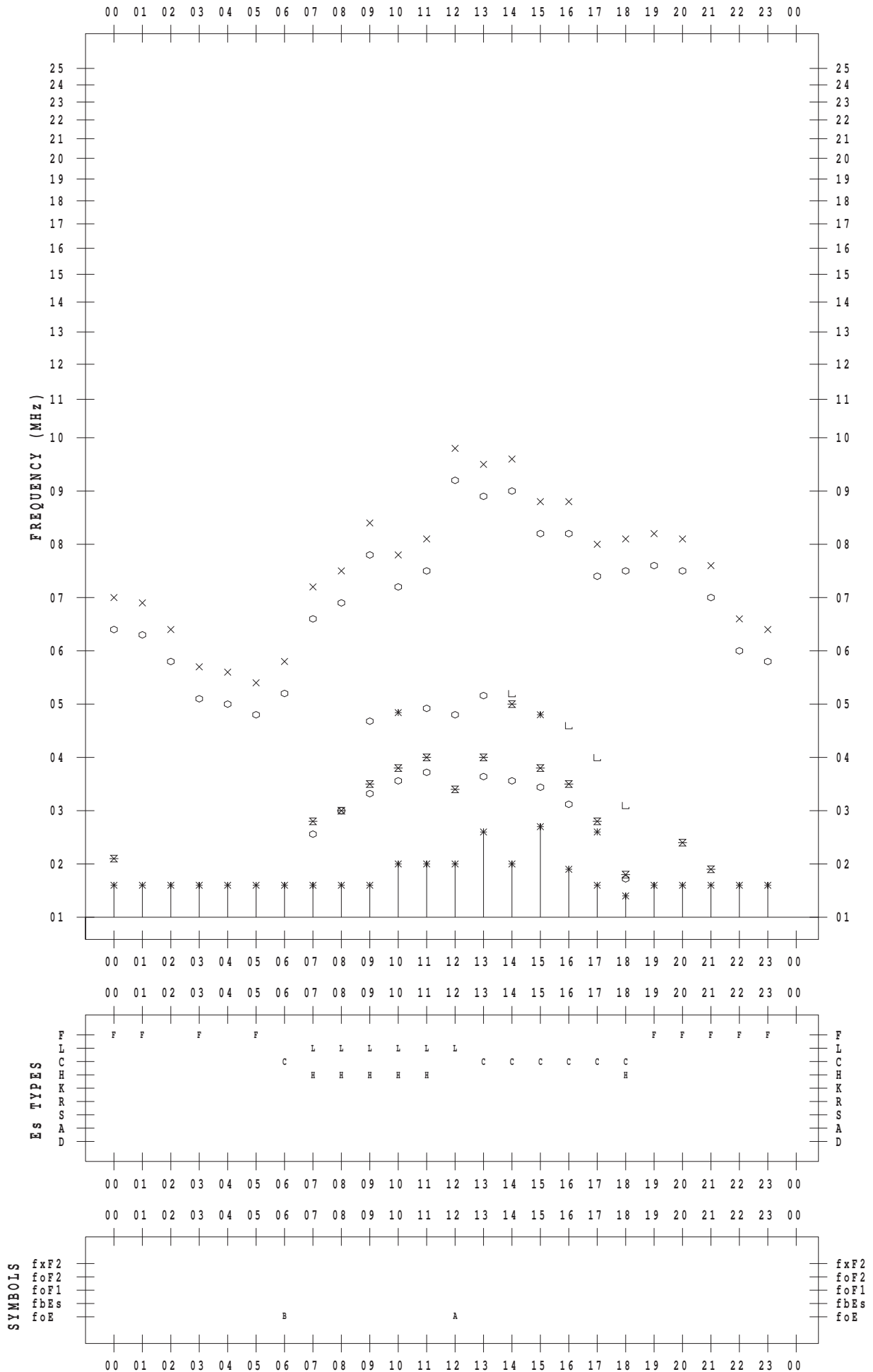
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/10

135 ° E MEAN TIME



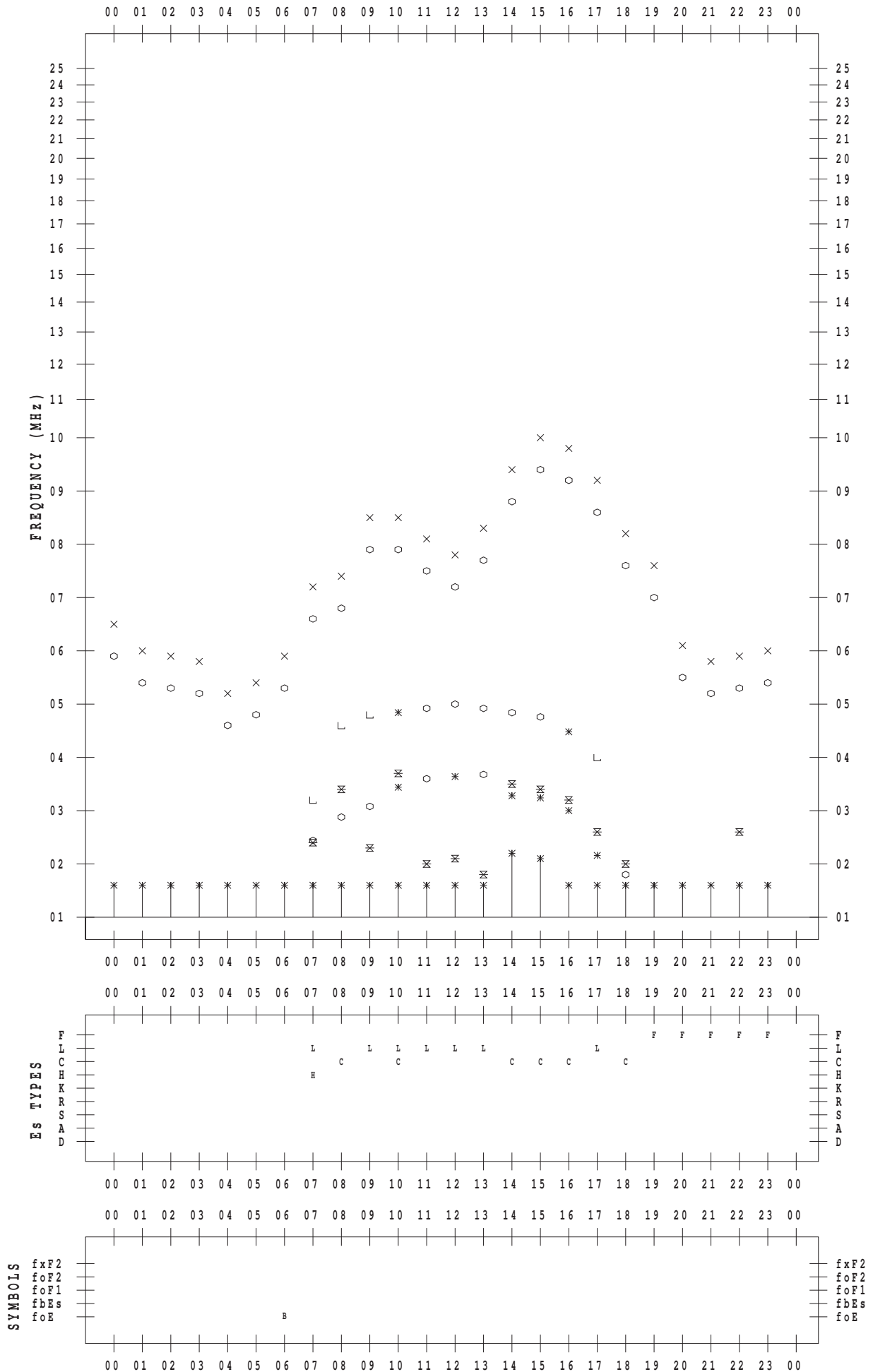
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/11

135 ° E MEAN TIME



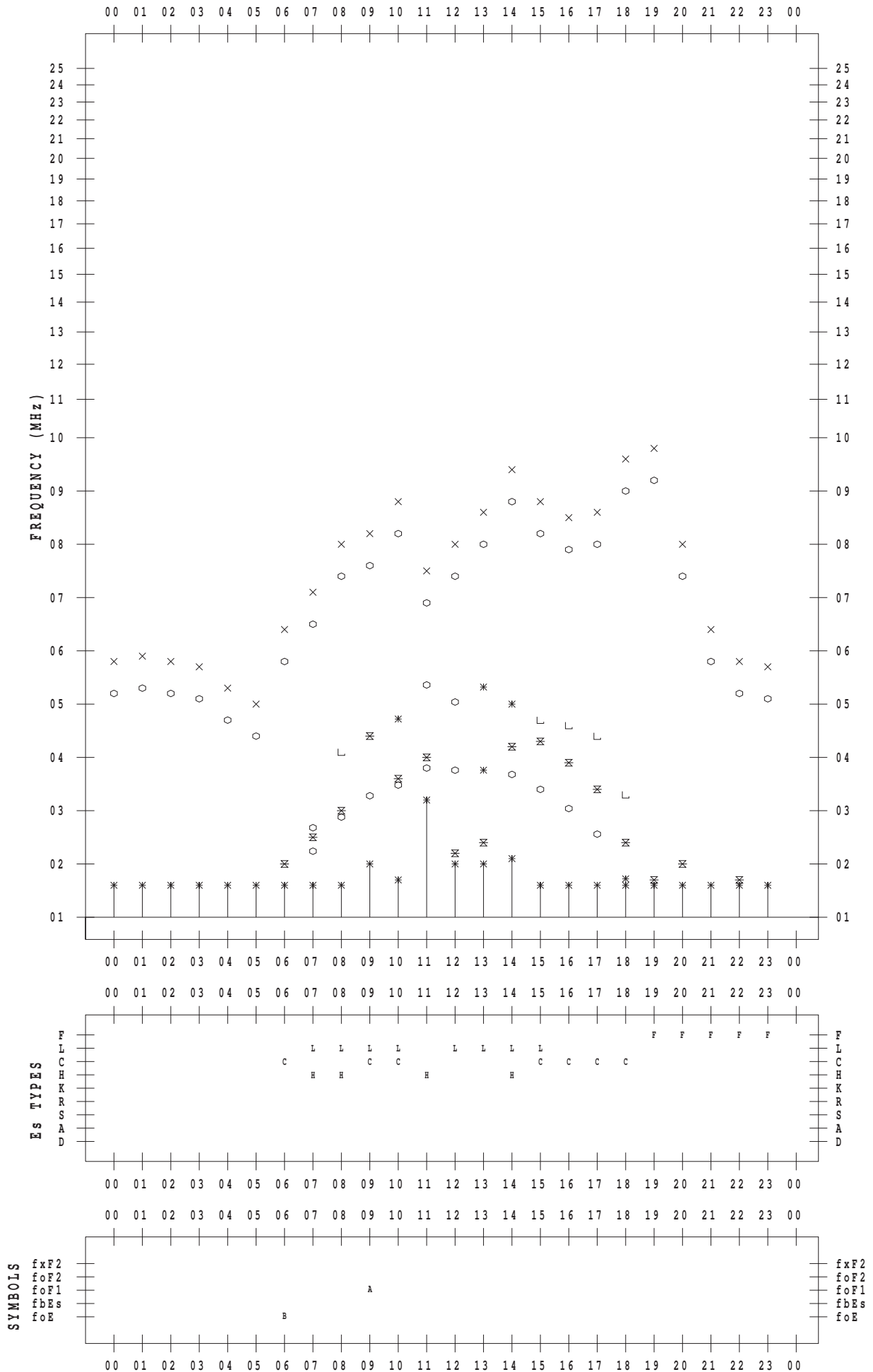
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/12

135 ° E MEAN TIME



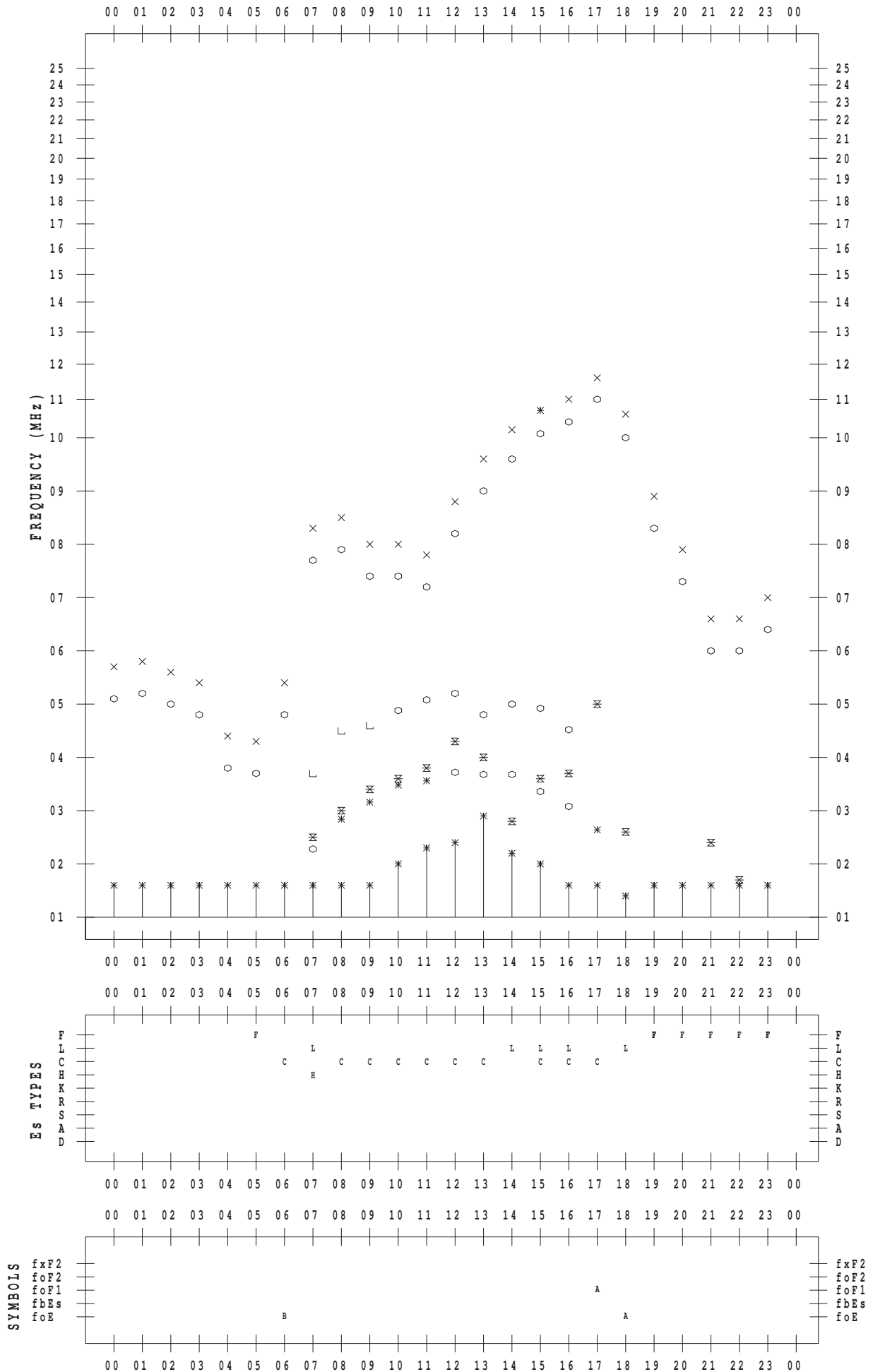
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/13

135 ° E MEAN TIME



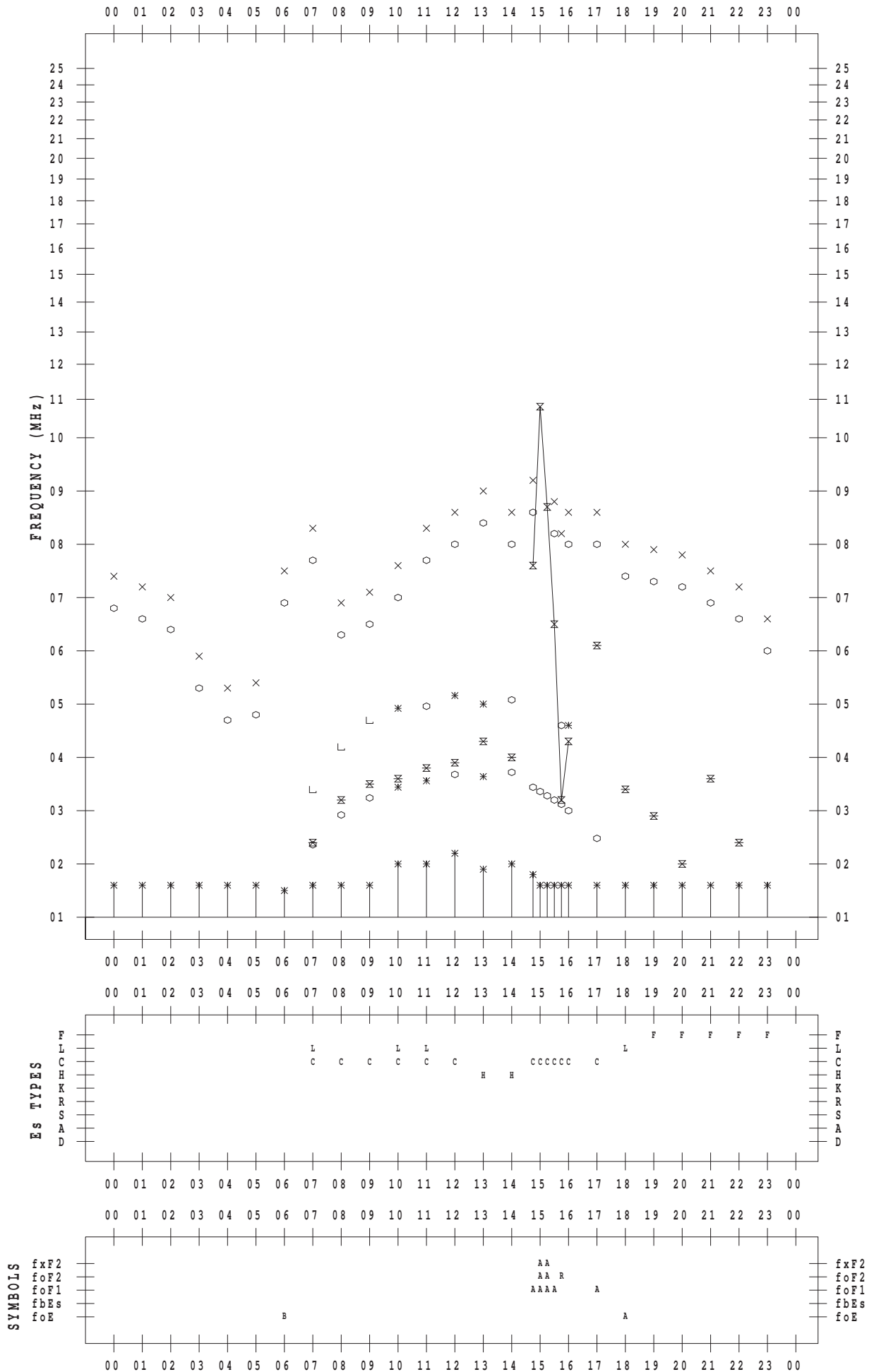
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/14

135 ° E MEAN TIME



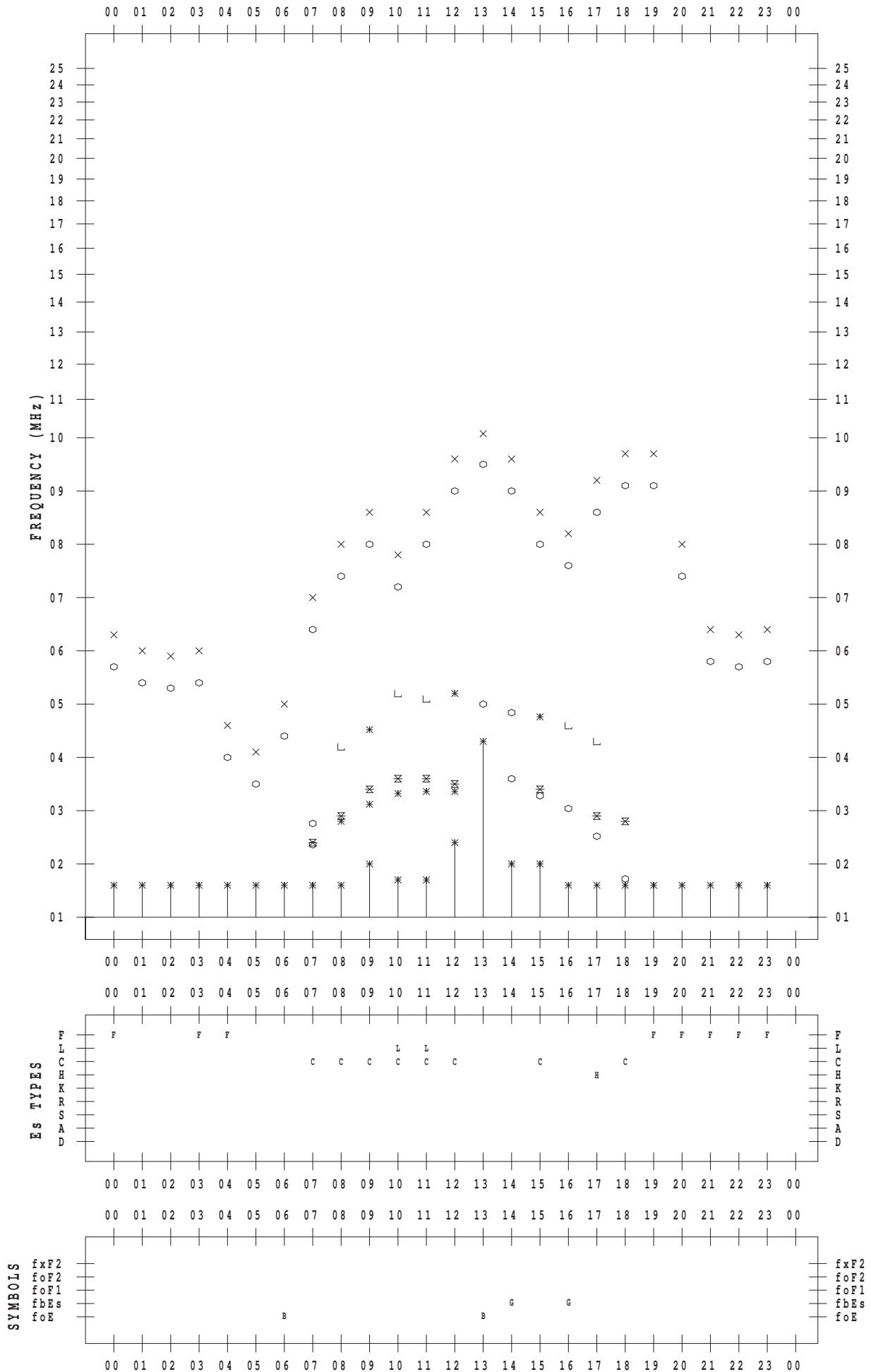
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/15

135 ° E MEAN TIME



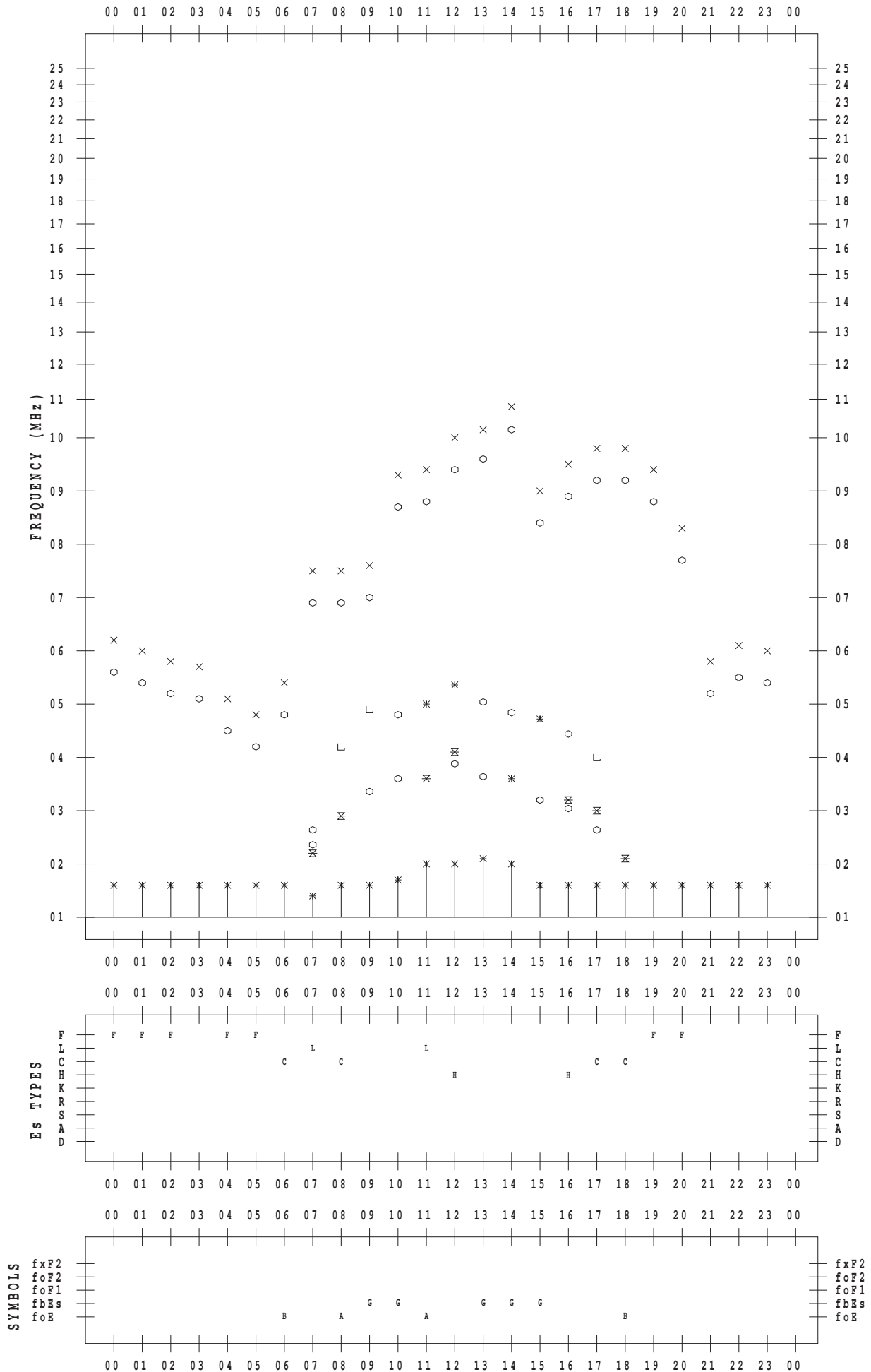
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/16

135 ° E MEAN TIME





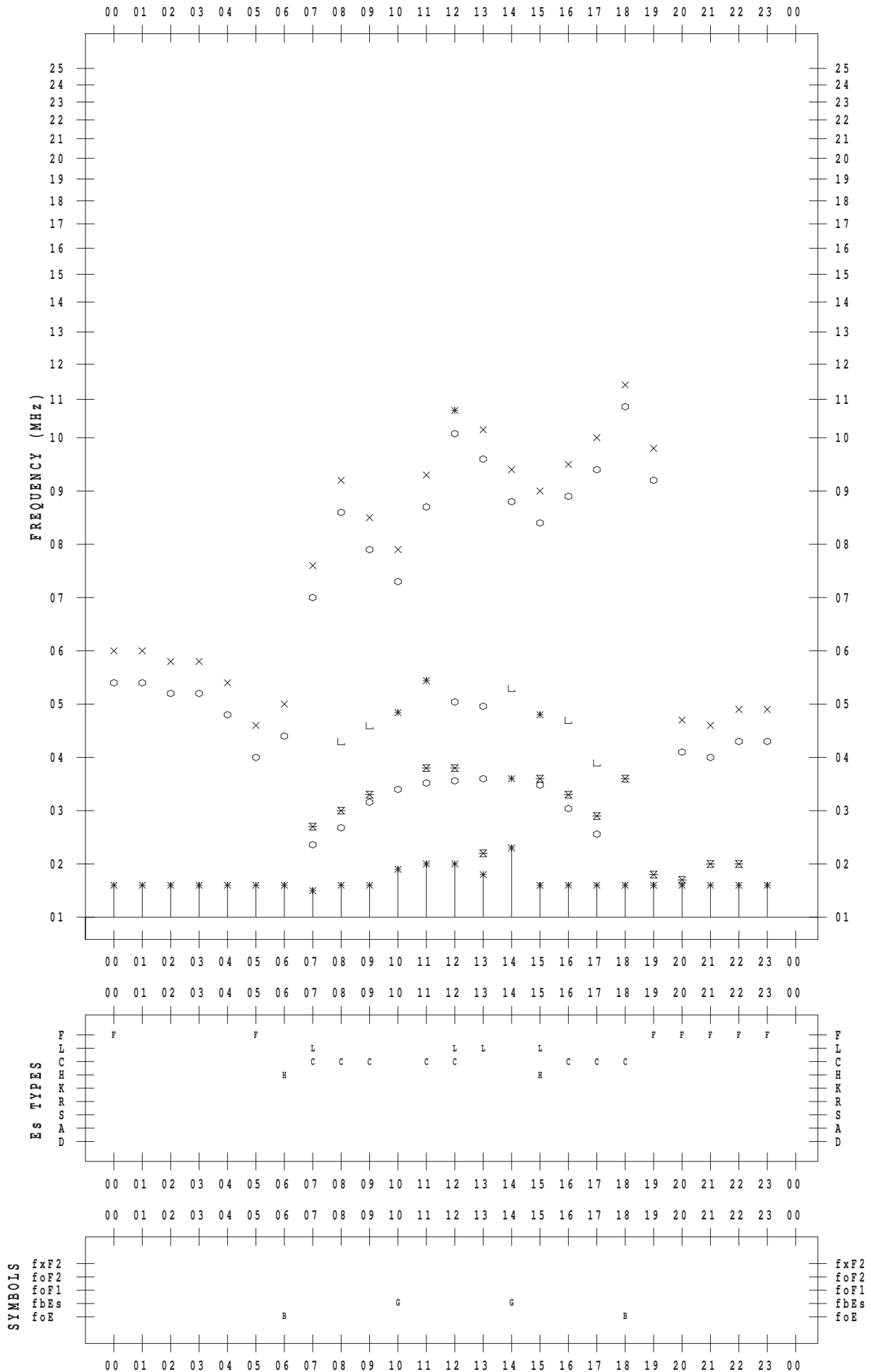
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/17

135 ° E MEAN TIME



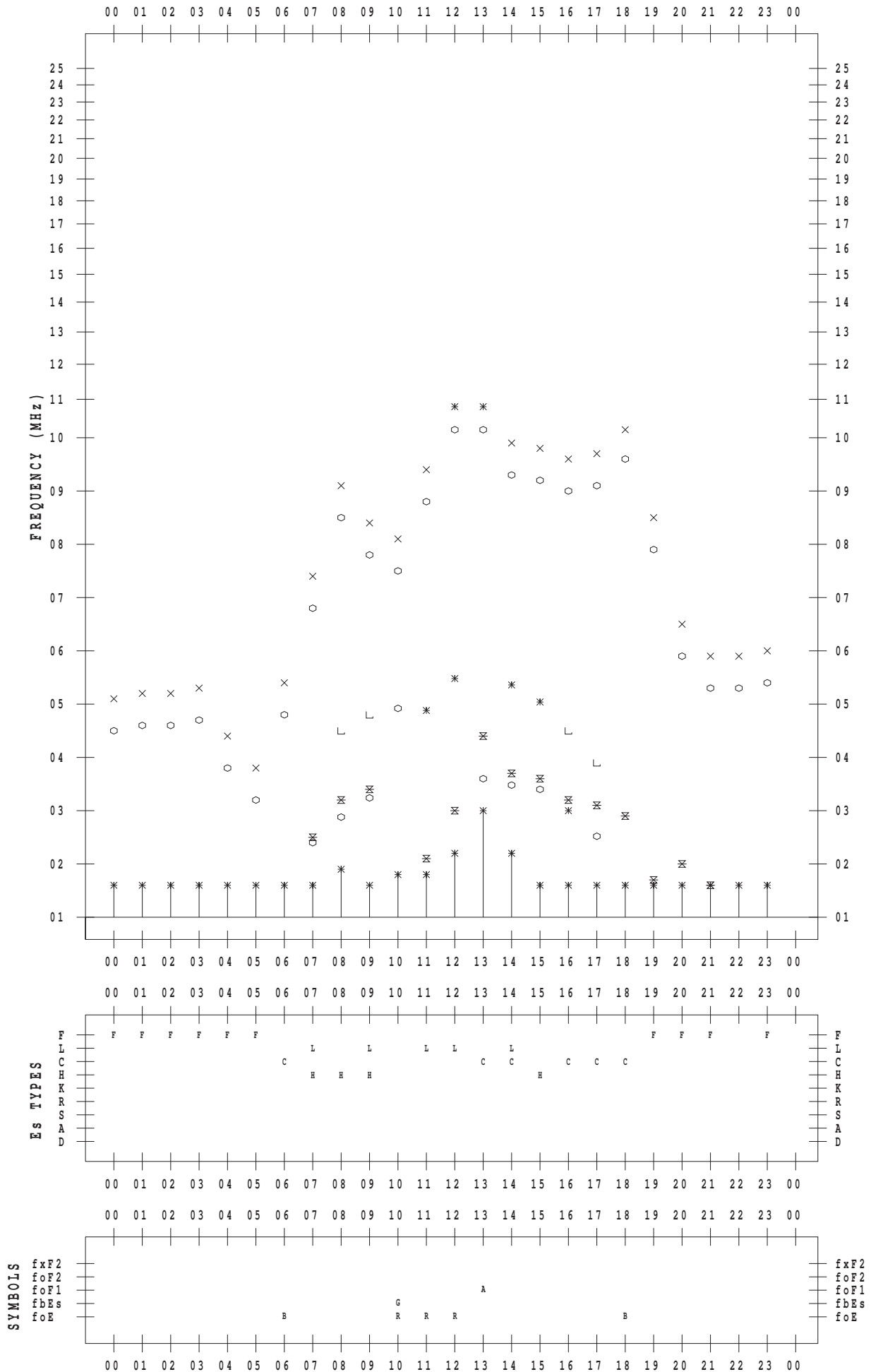
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/18

135 ° E MEAN TIME



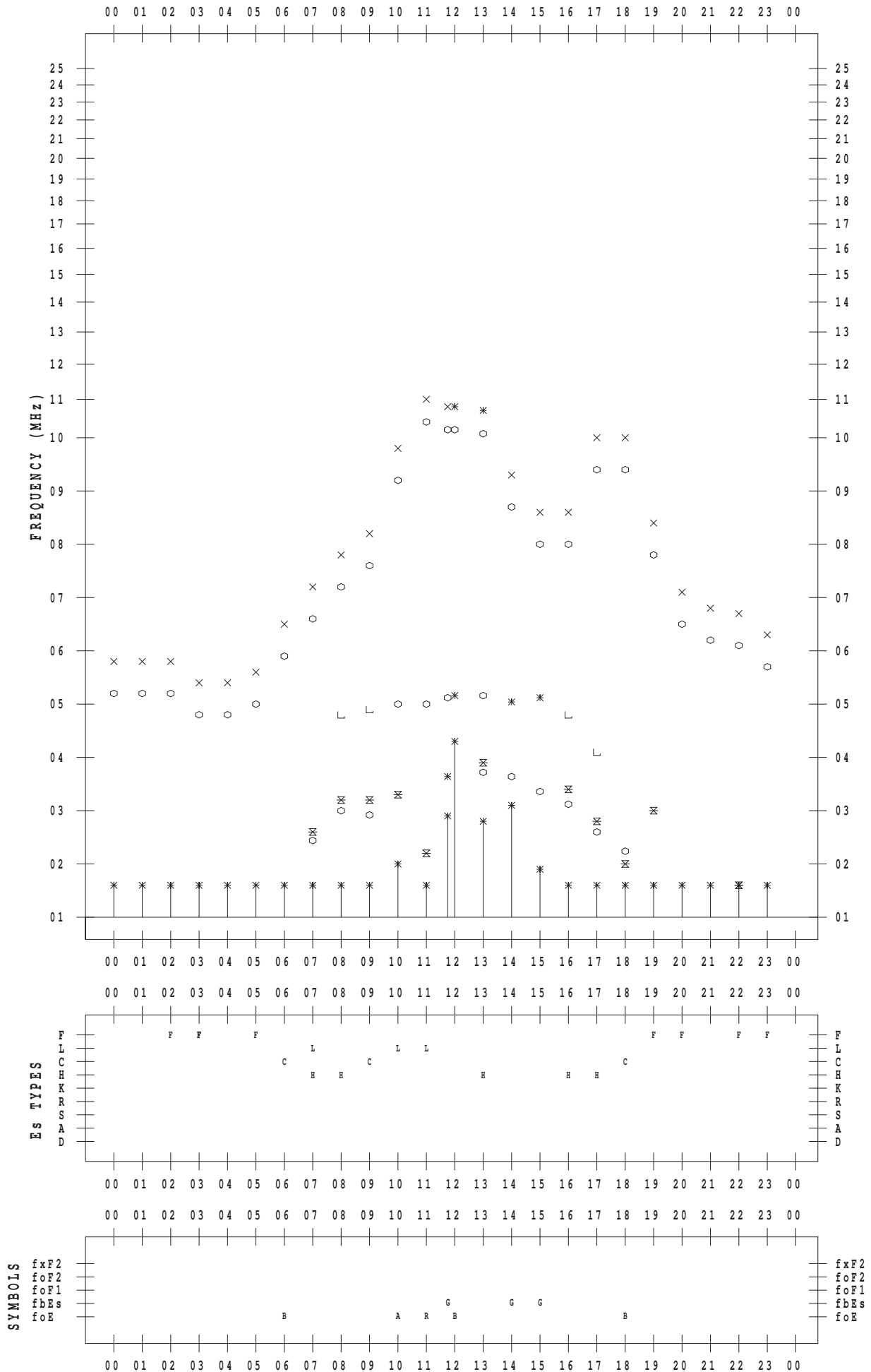
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/19

135 ° E MEAN TIME



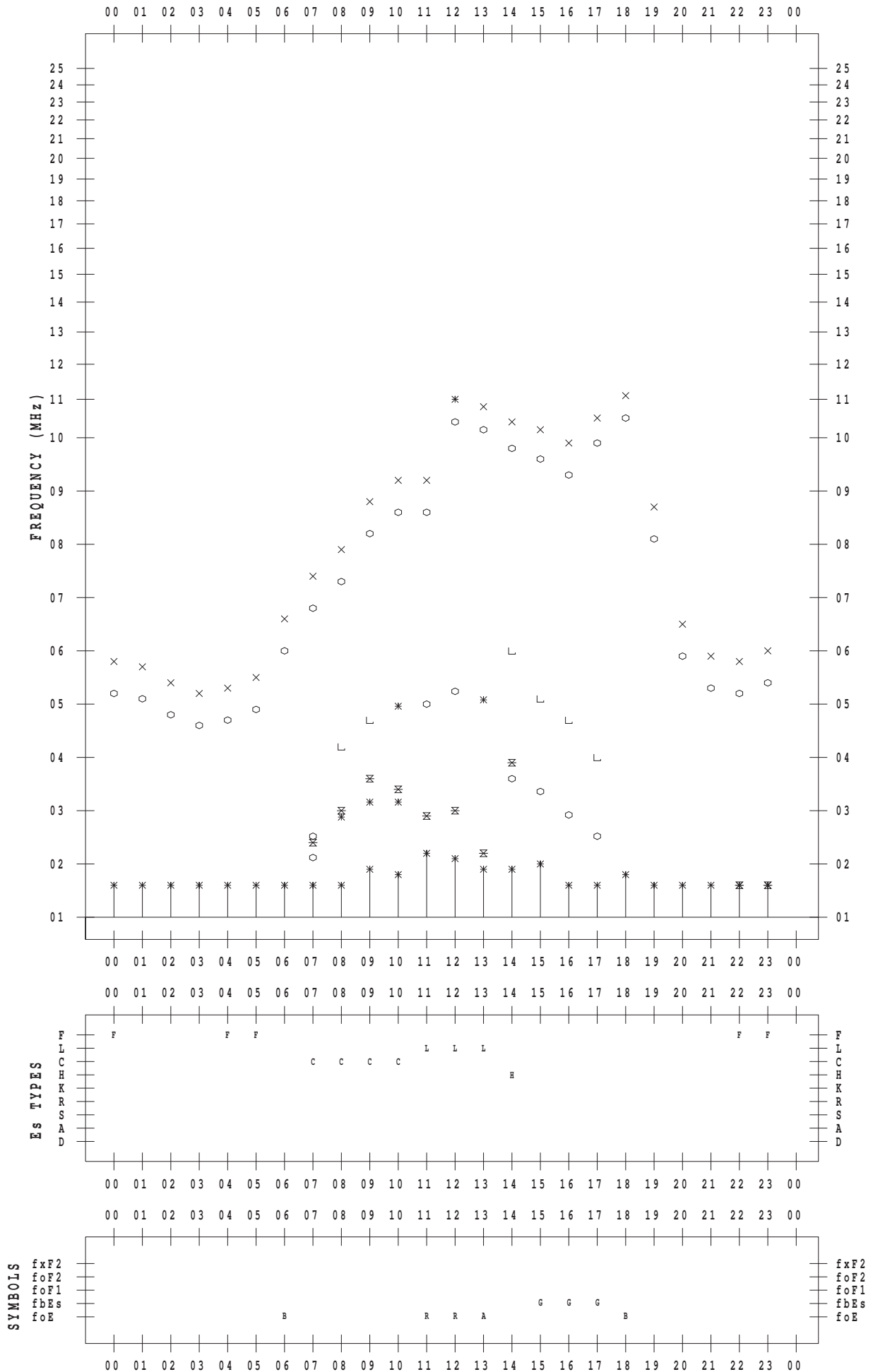
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/20

135 ° E MEAN TIME



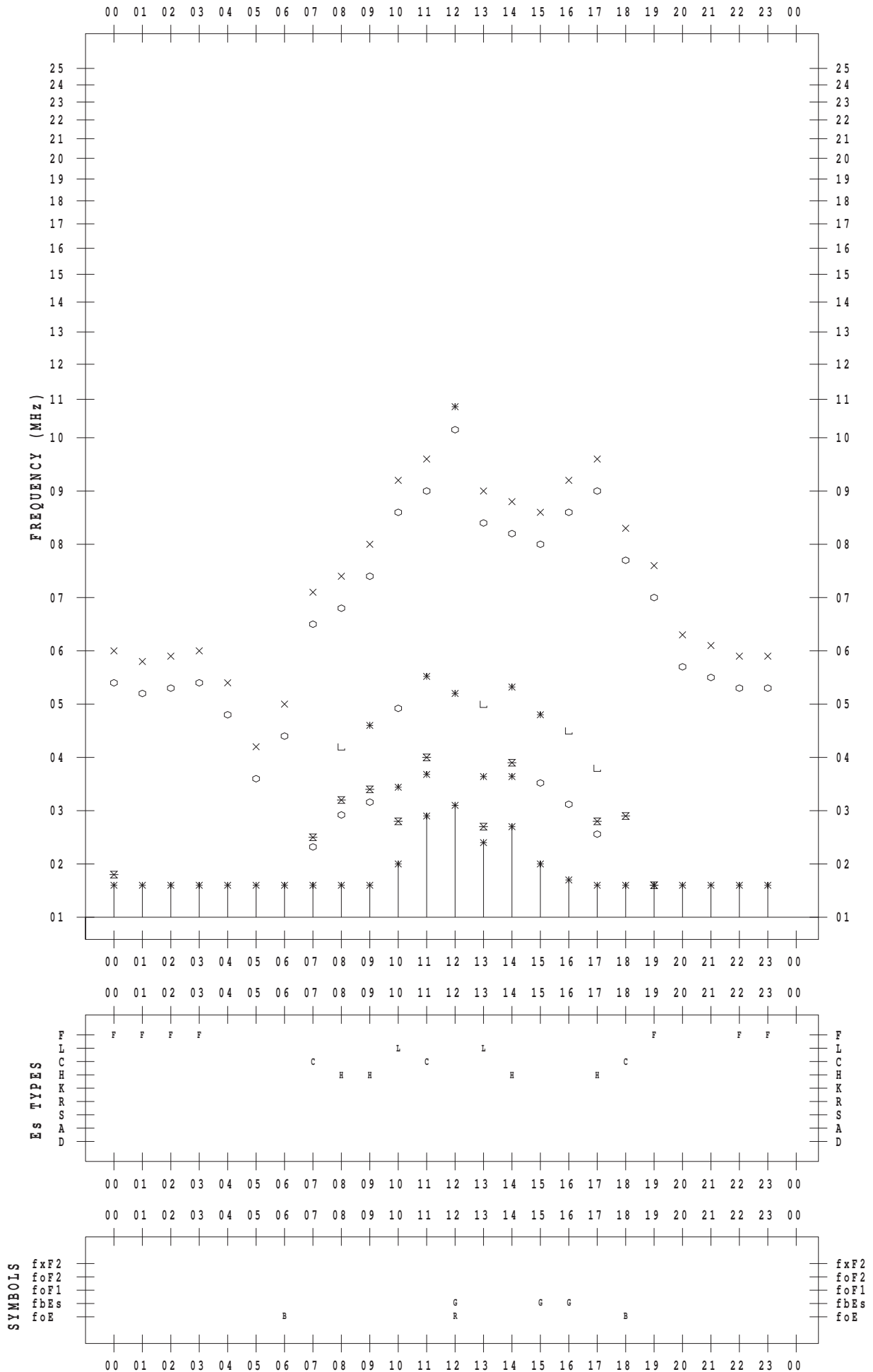
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/21

135 ° E MEAN TIME



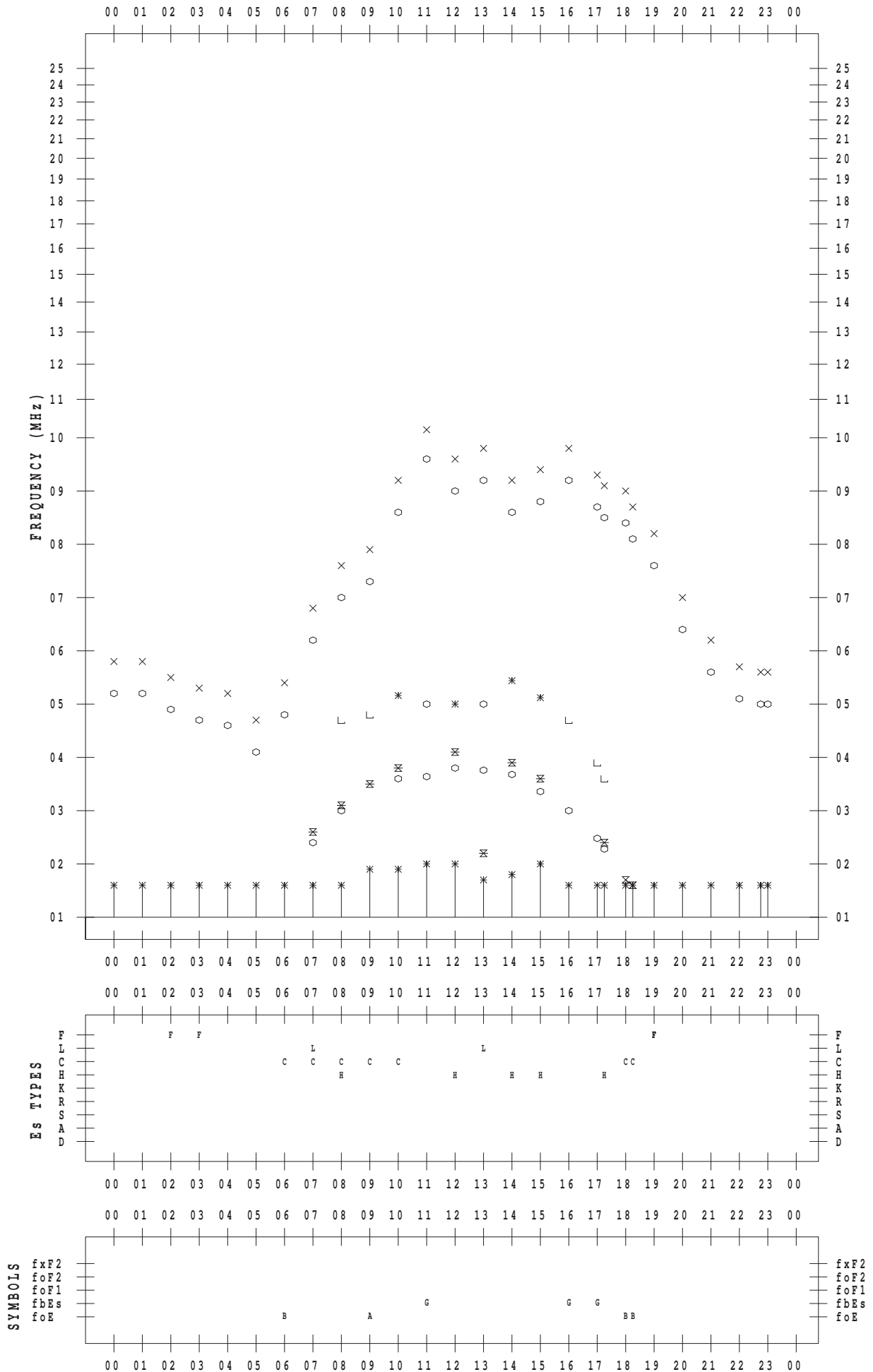
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/22

135 ° E MEAN TIME



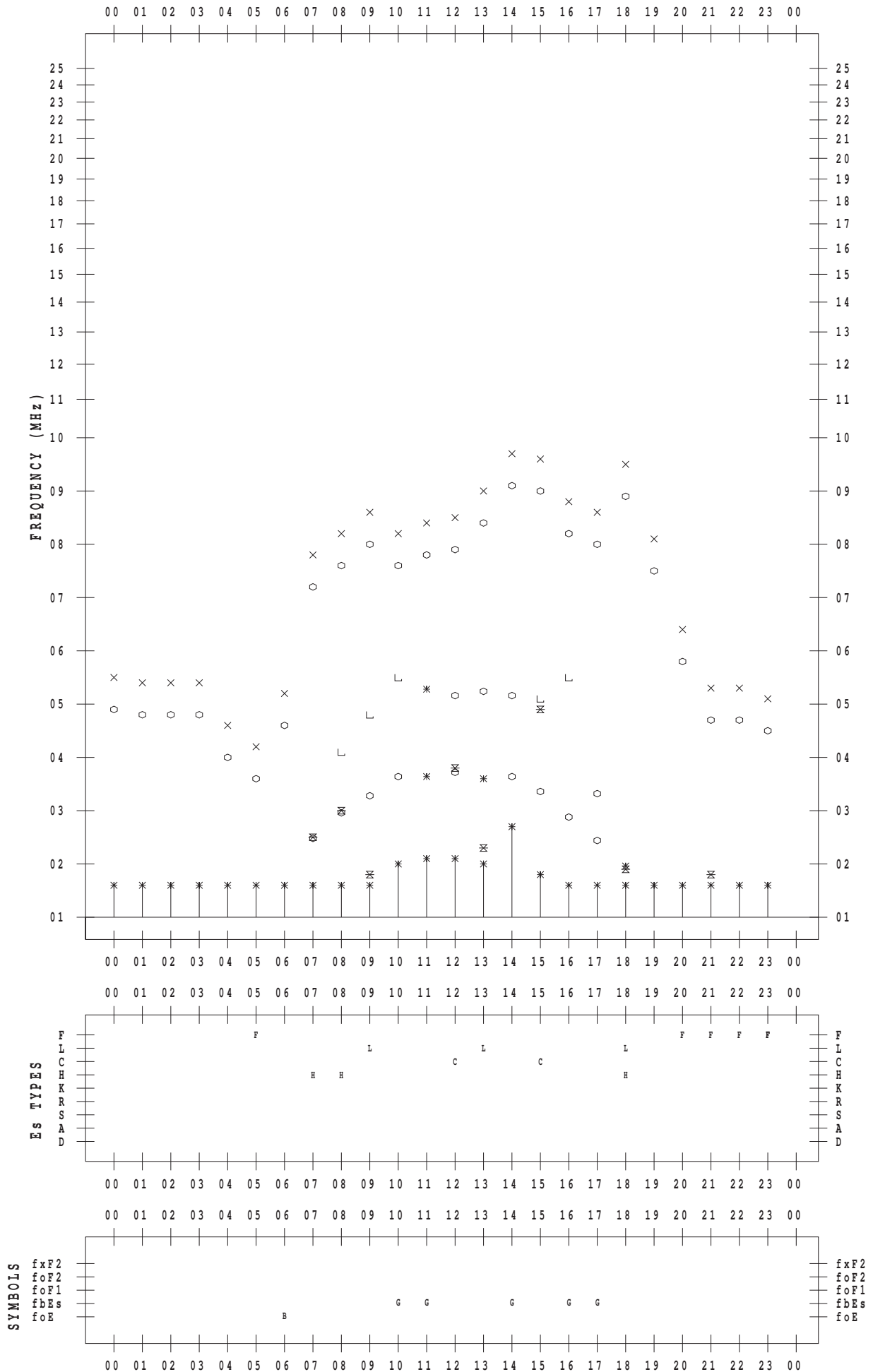
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/23

135 ° E MEAN TIME



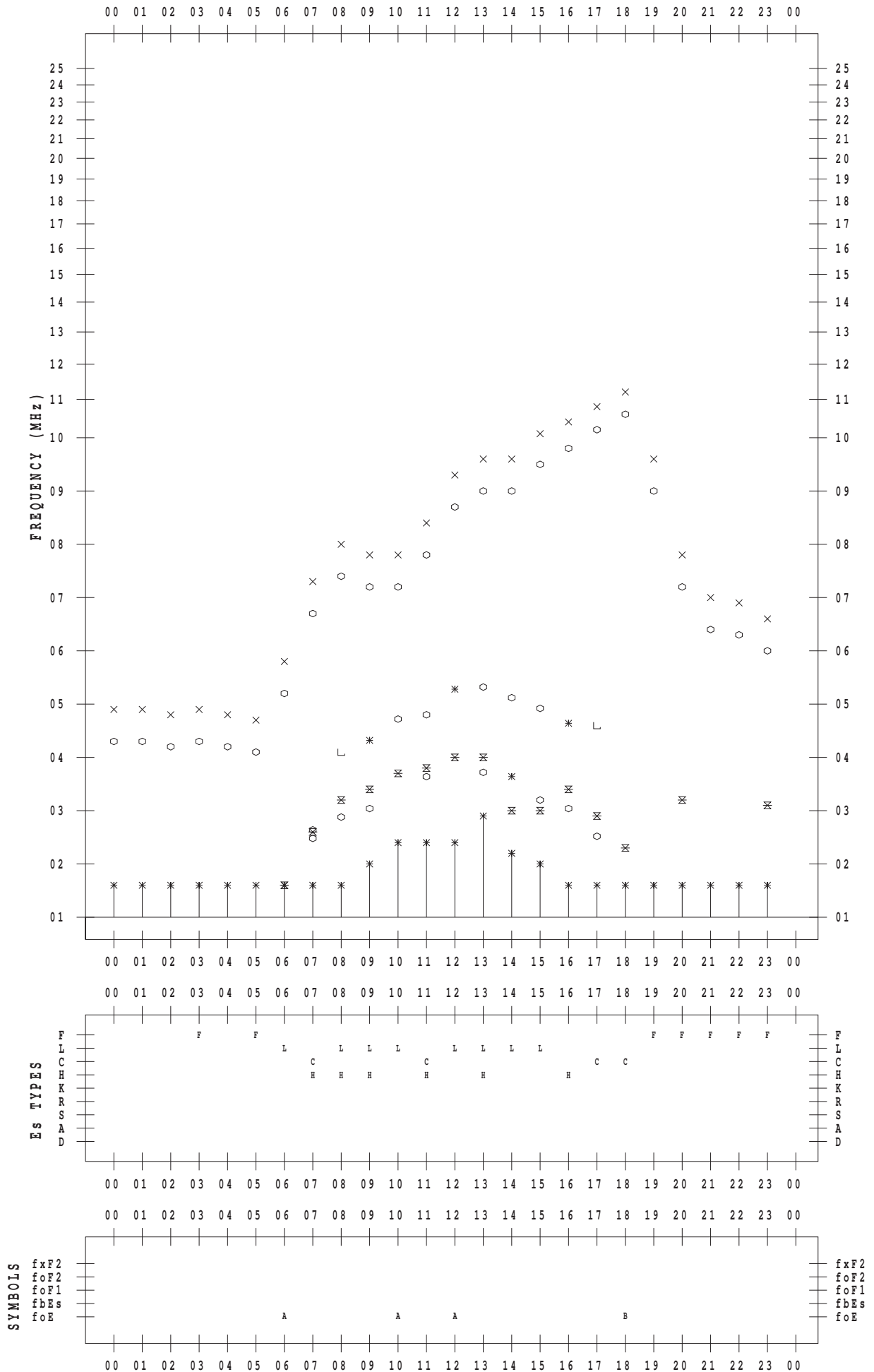
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/24

135 ° E MEAN TIME





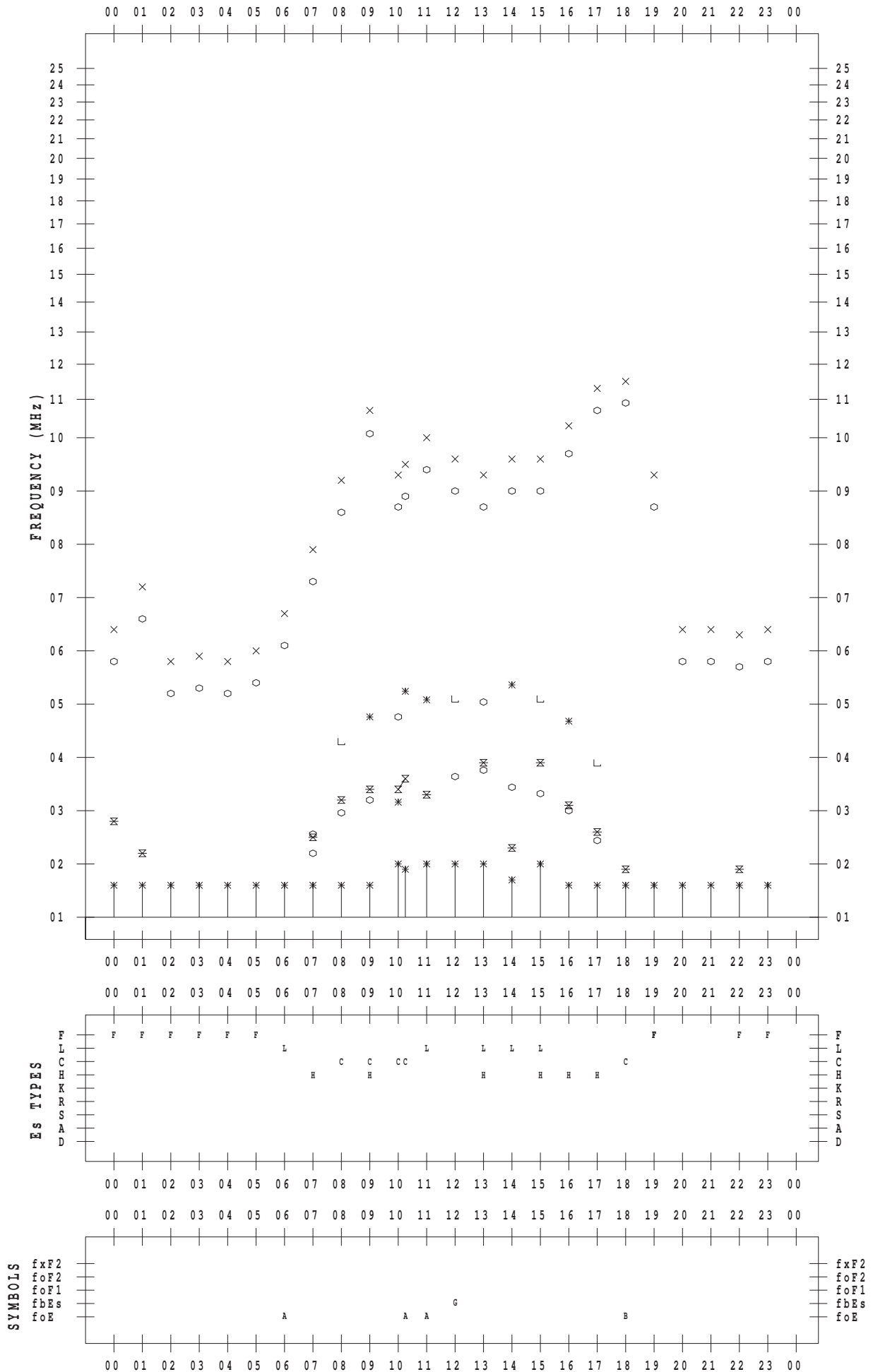
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/25

135 ° E MEAN TIME



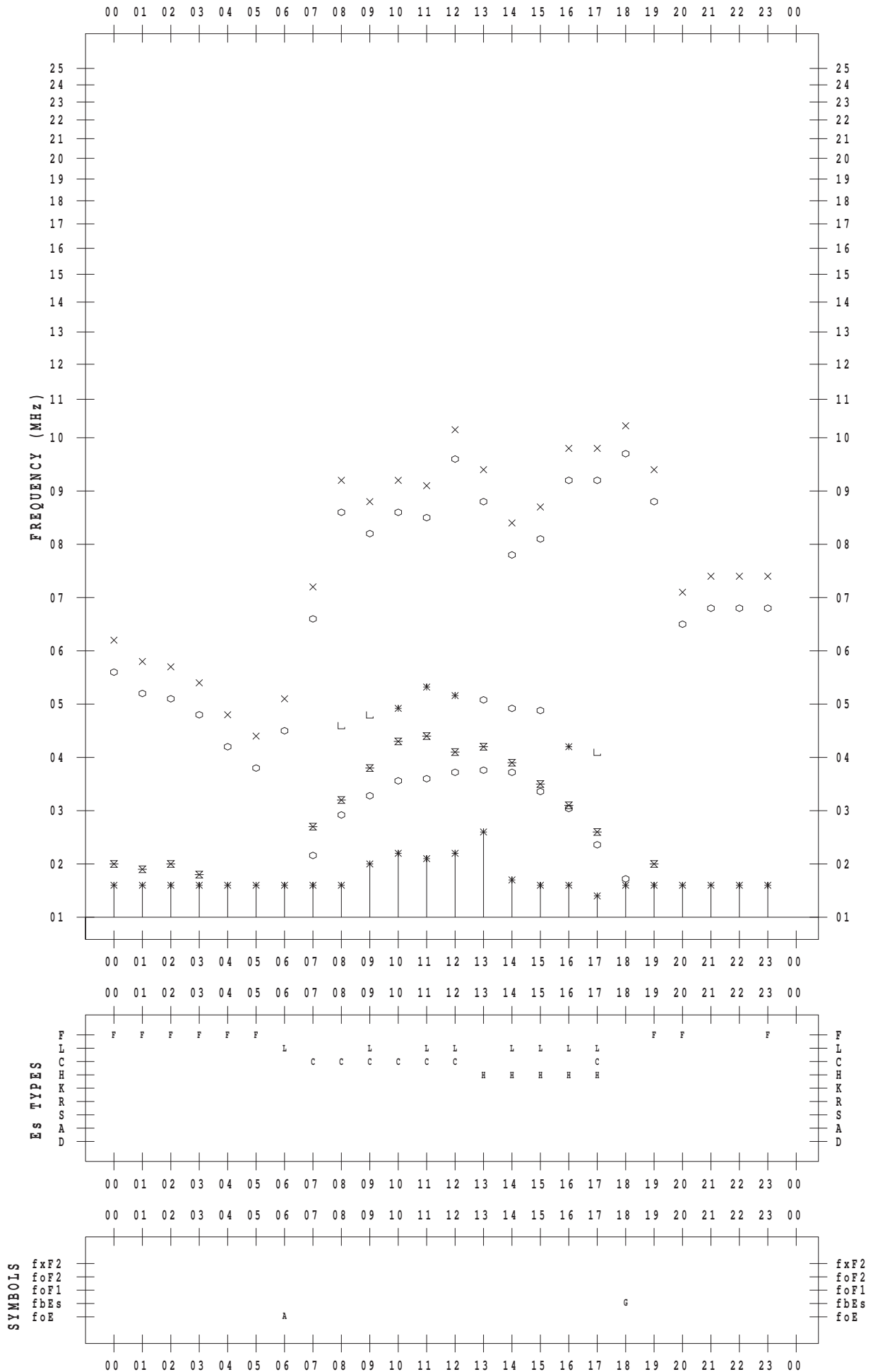
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/26

135 ° E MEAN TIME



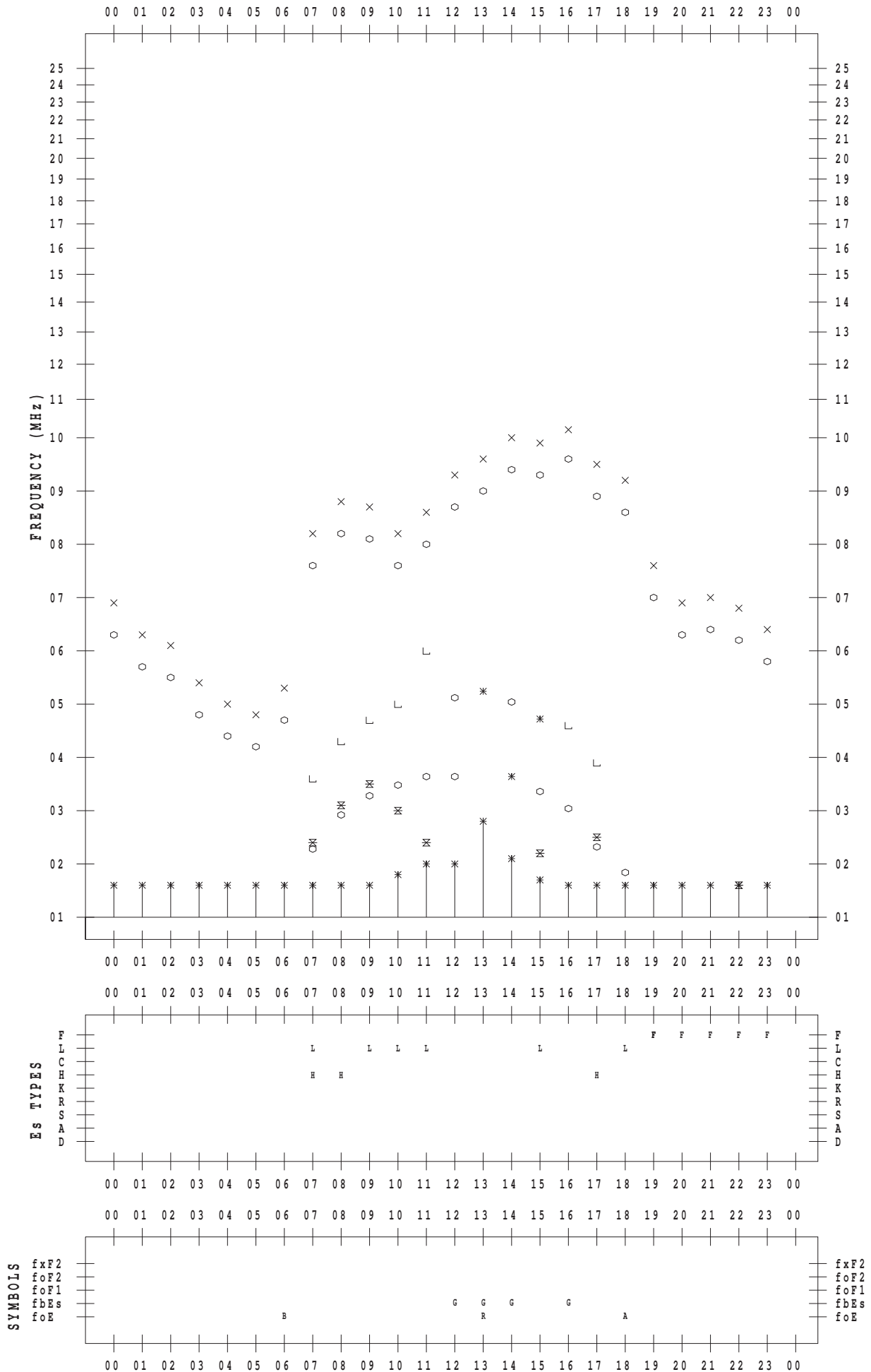
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/27

135 ° E MEAN TIME



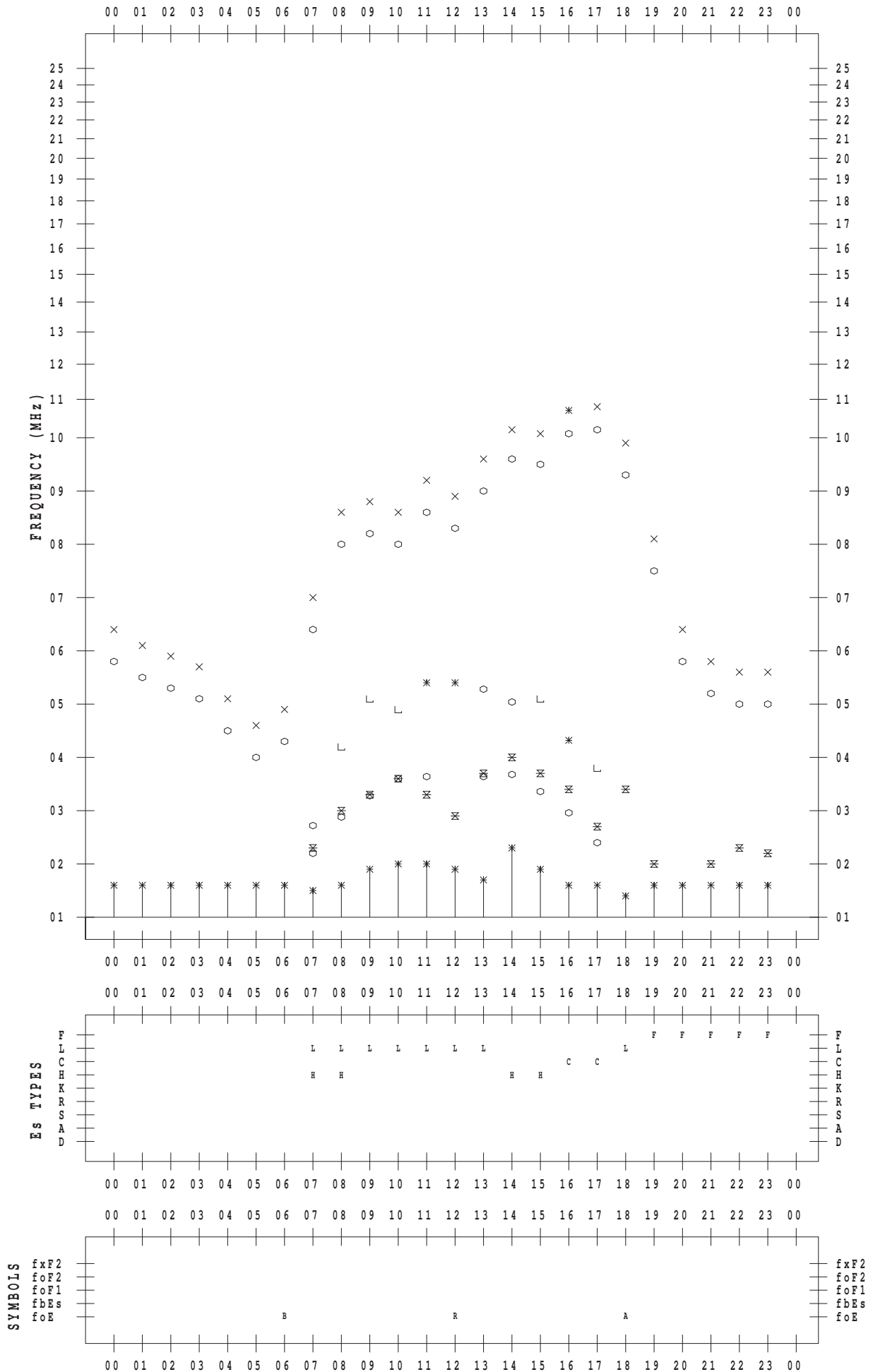
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/28

135 ° E MEAN TIME



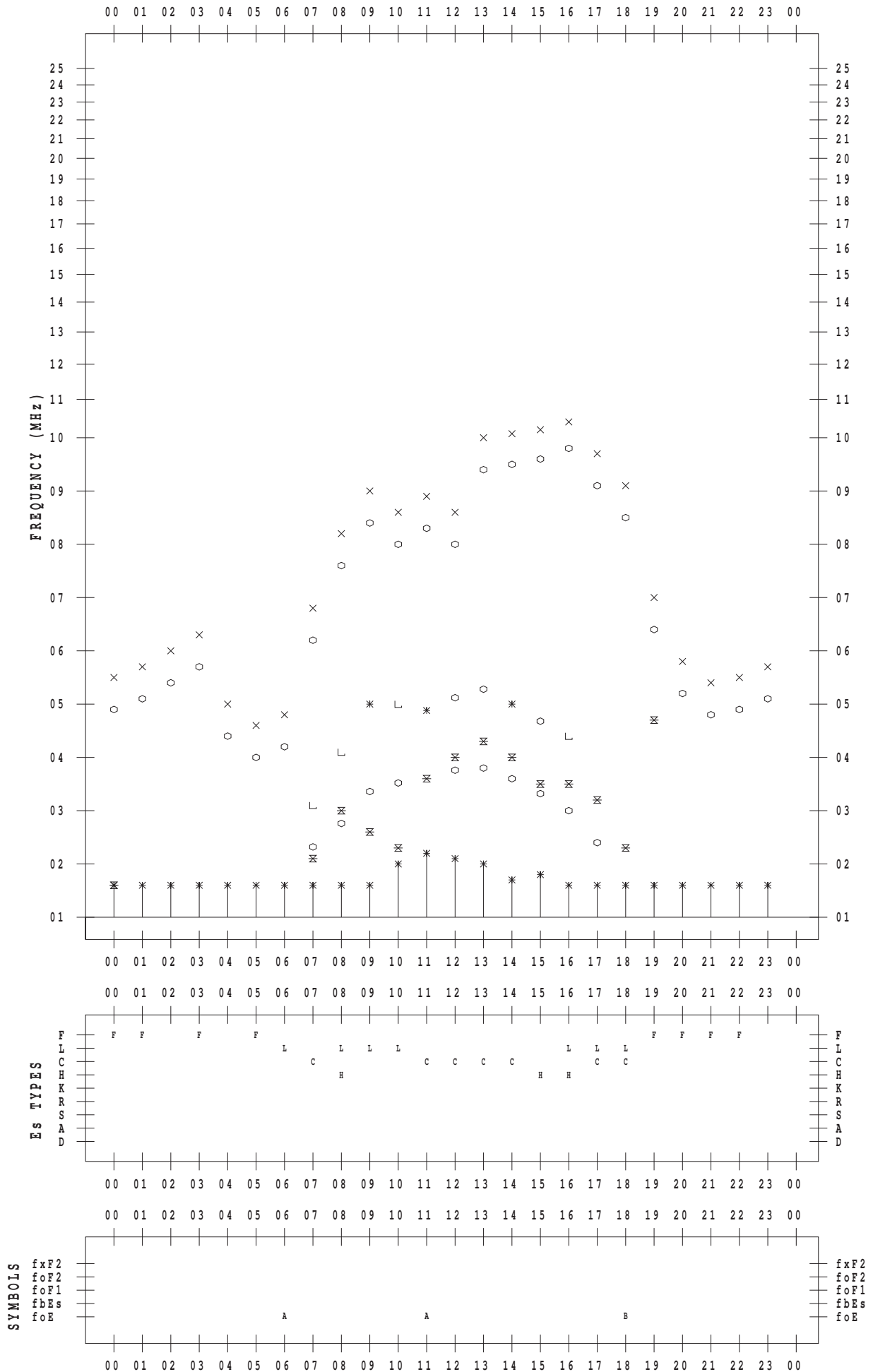
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/29

135 ° E MEAN TIME



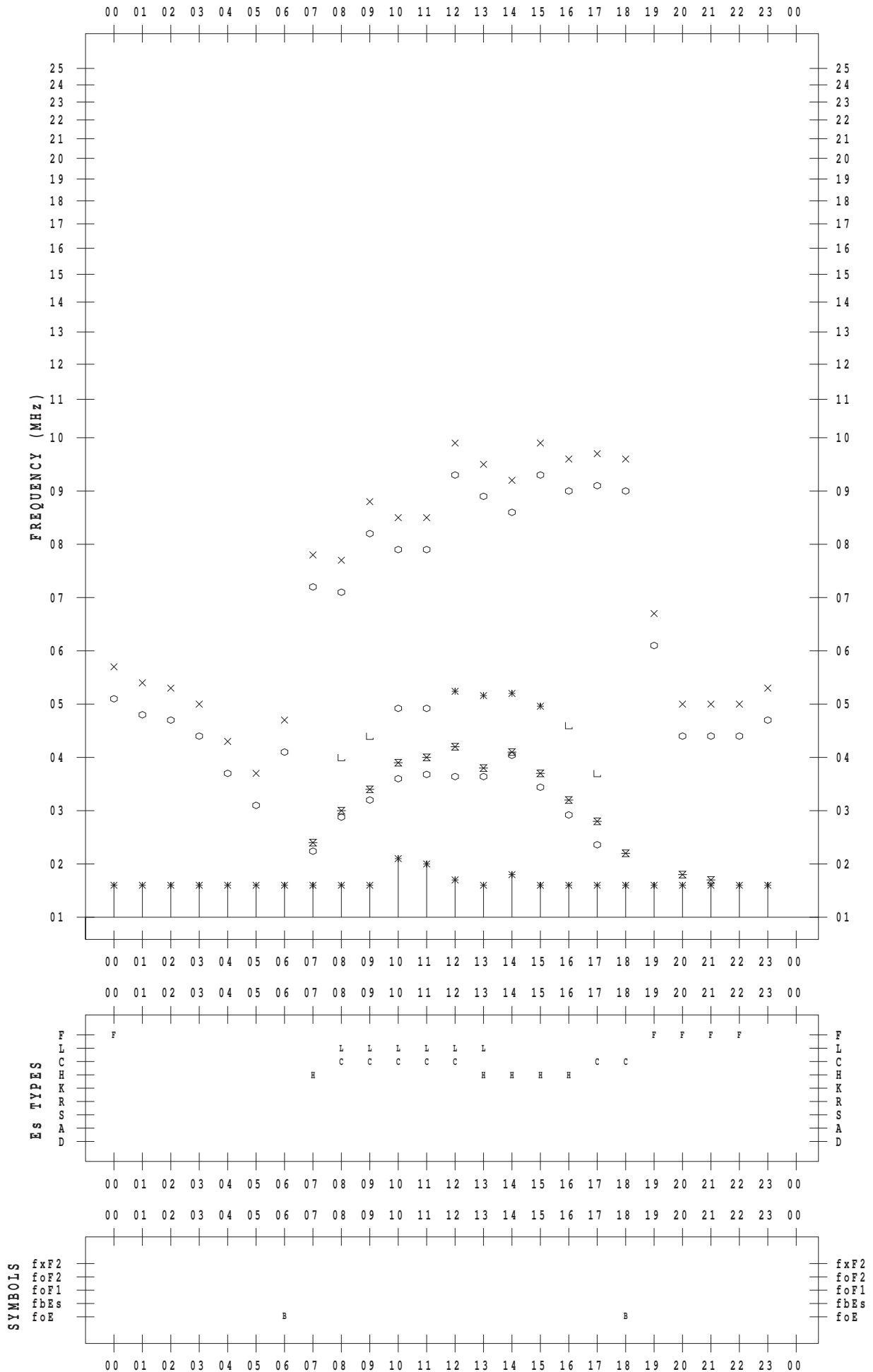
# f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 9/30

135 ° E MEAN TIME



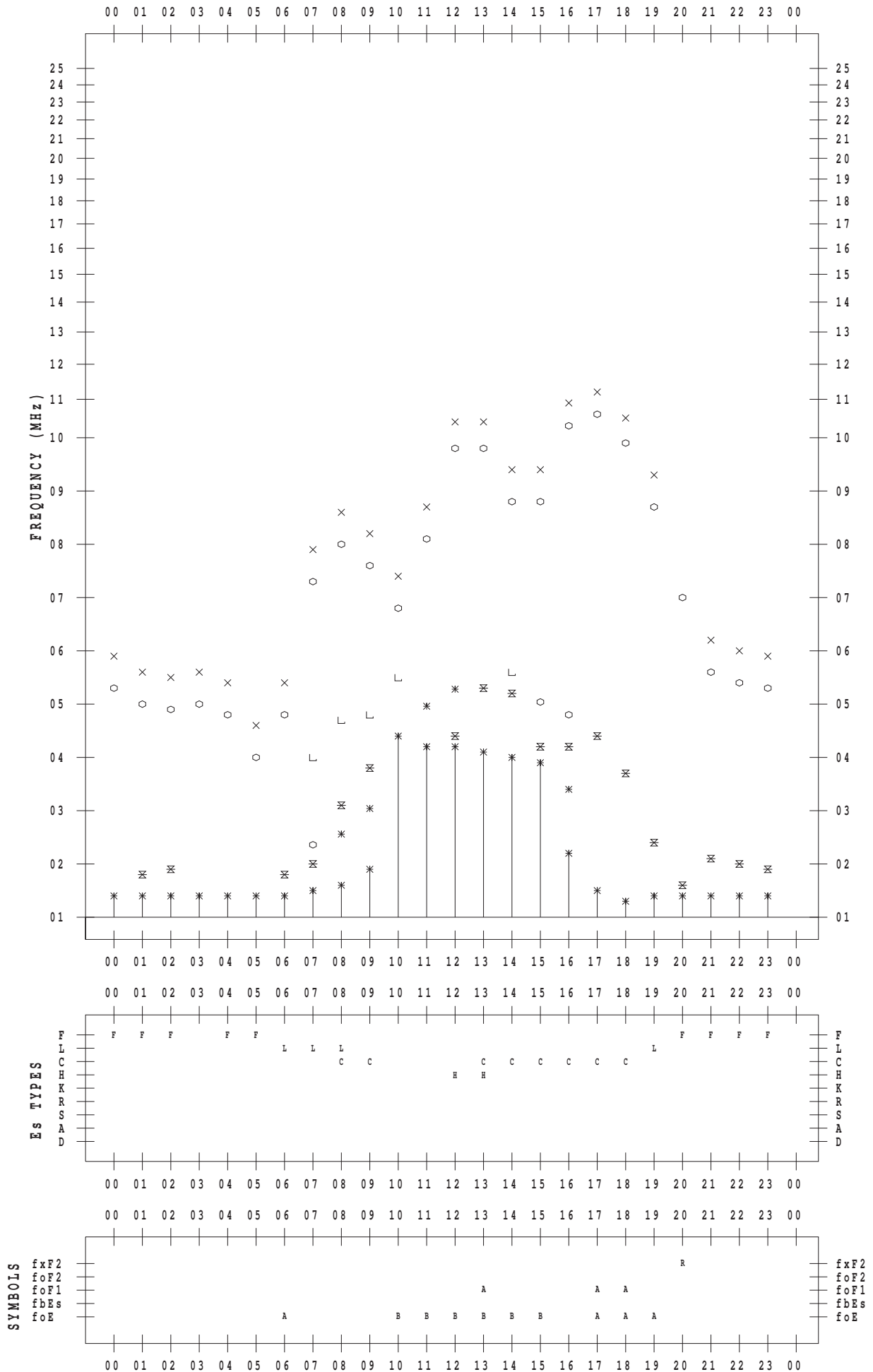
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 1

135 ° E MEAN TIME



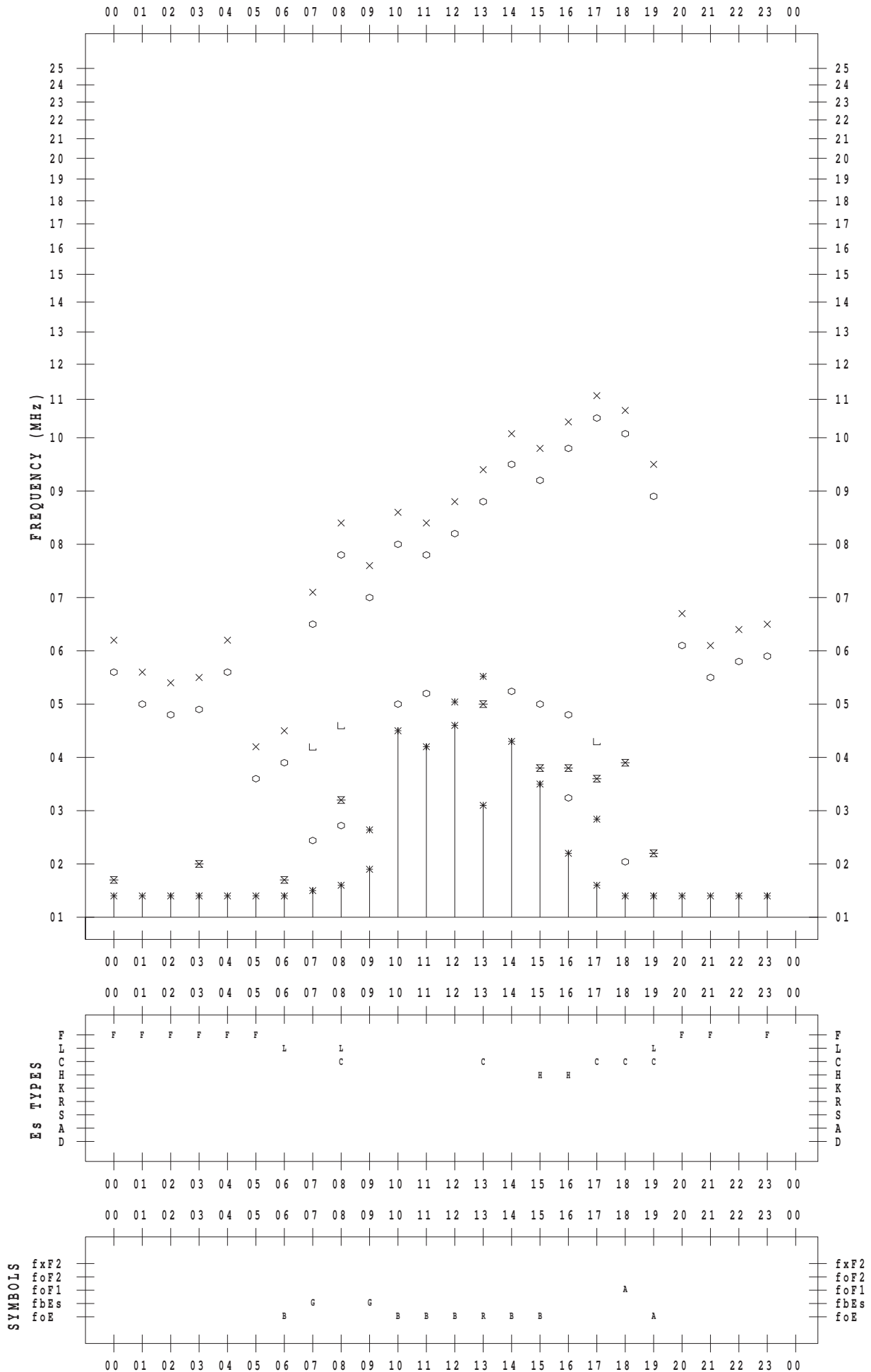
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 2

135 ° E MEAN TIME





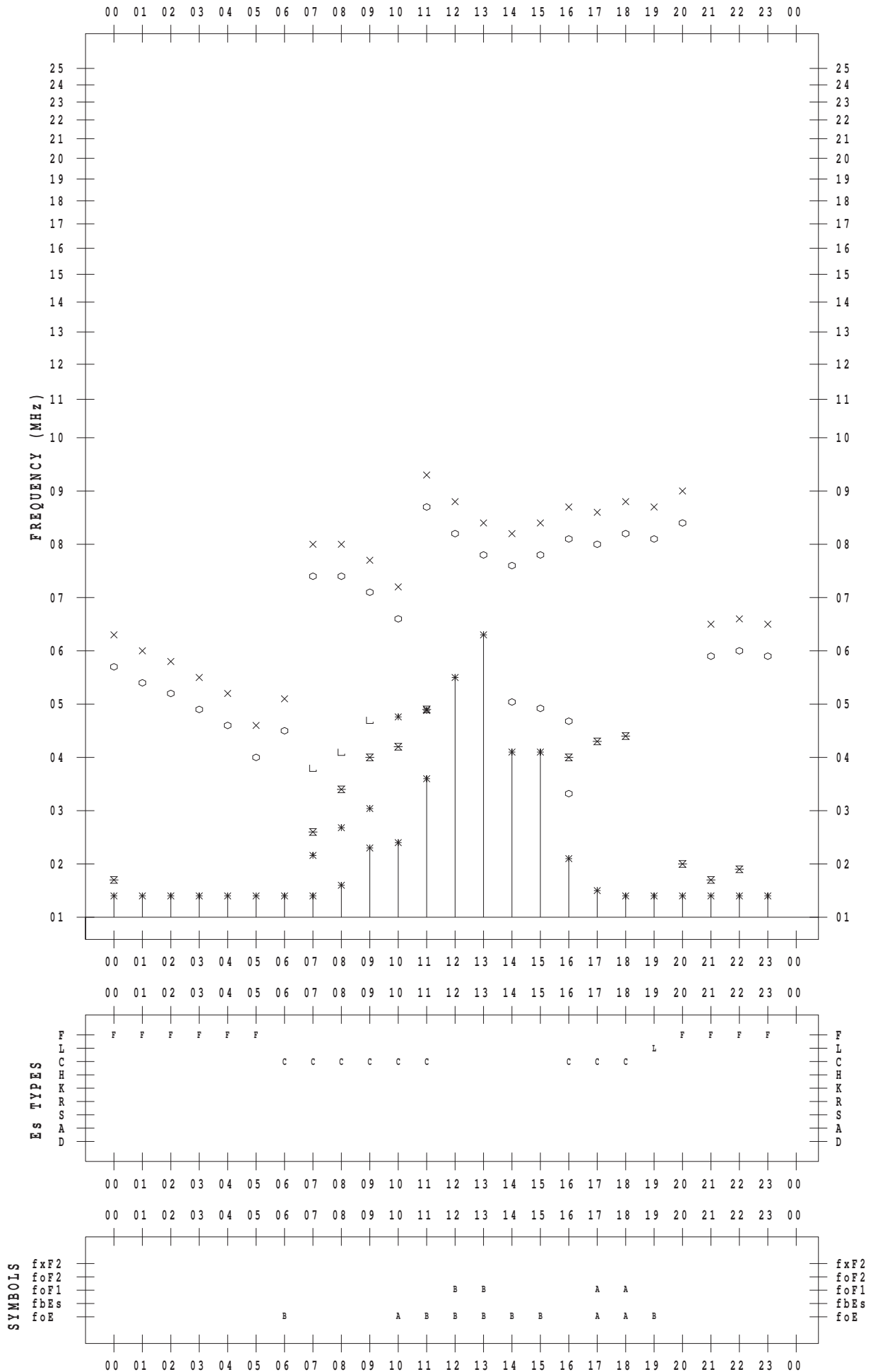
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 3

135 ° E MEAN TIME



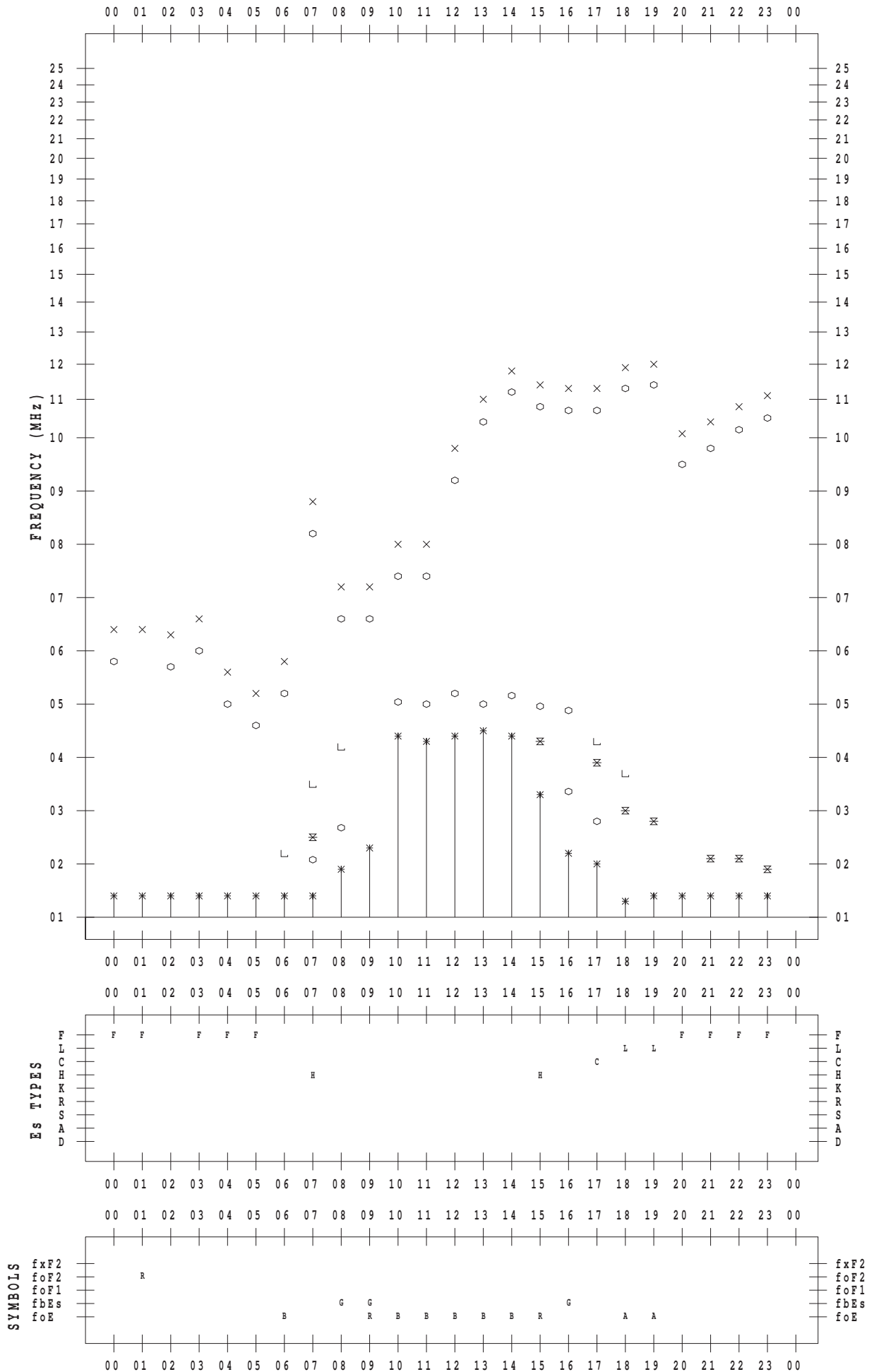
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 4

135 ° E MEAN TIME



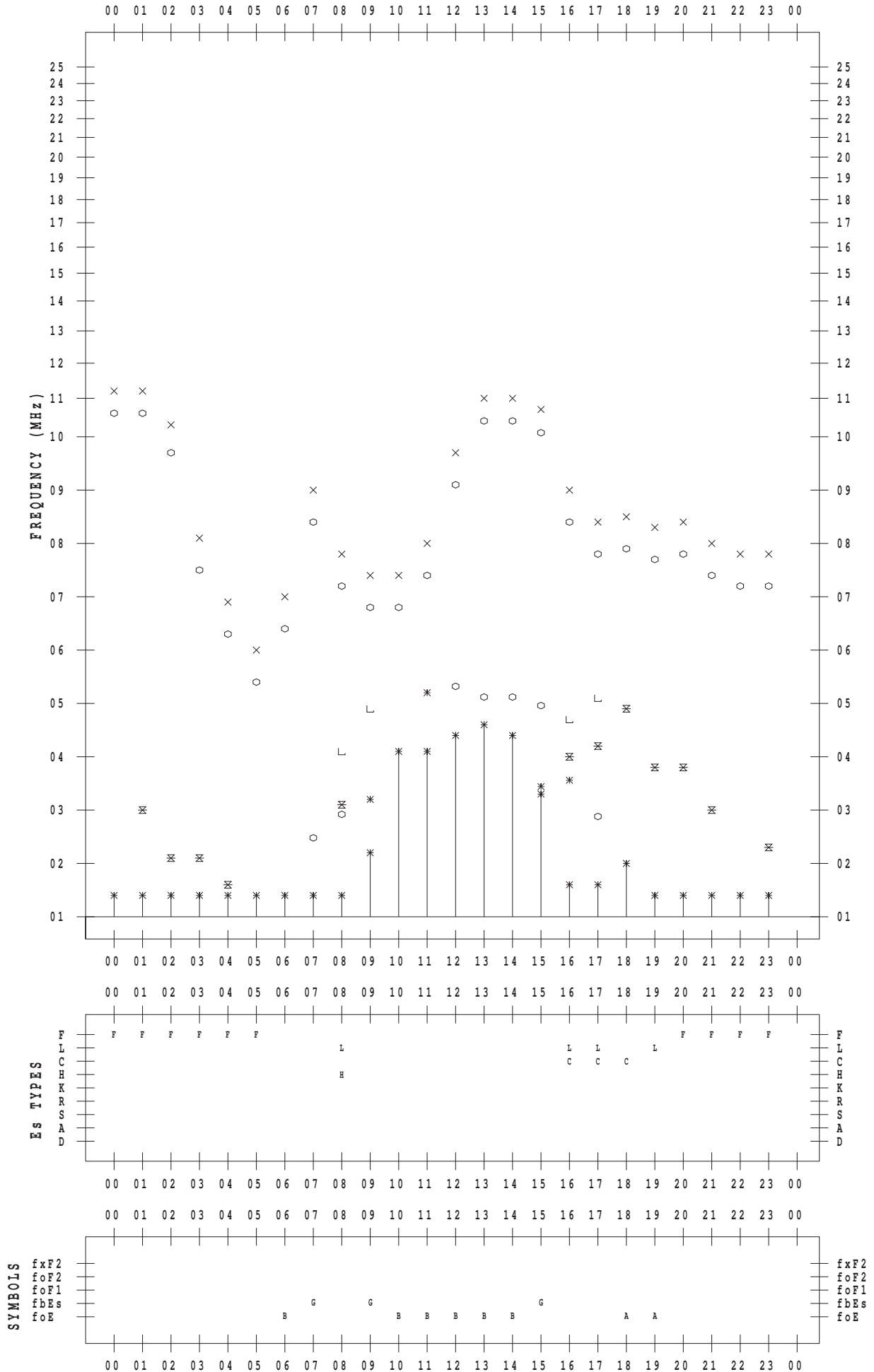
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 5

135 ° E MEAN TIME



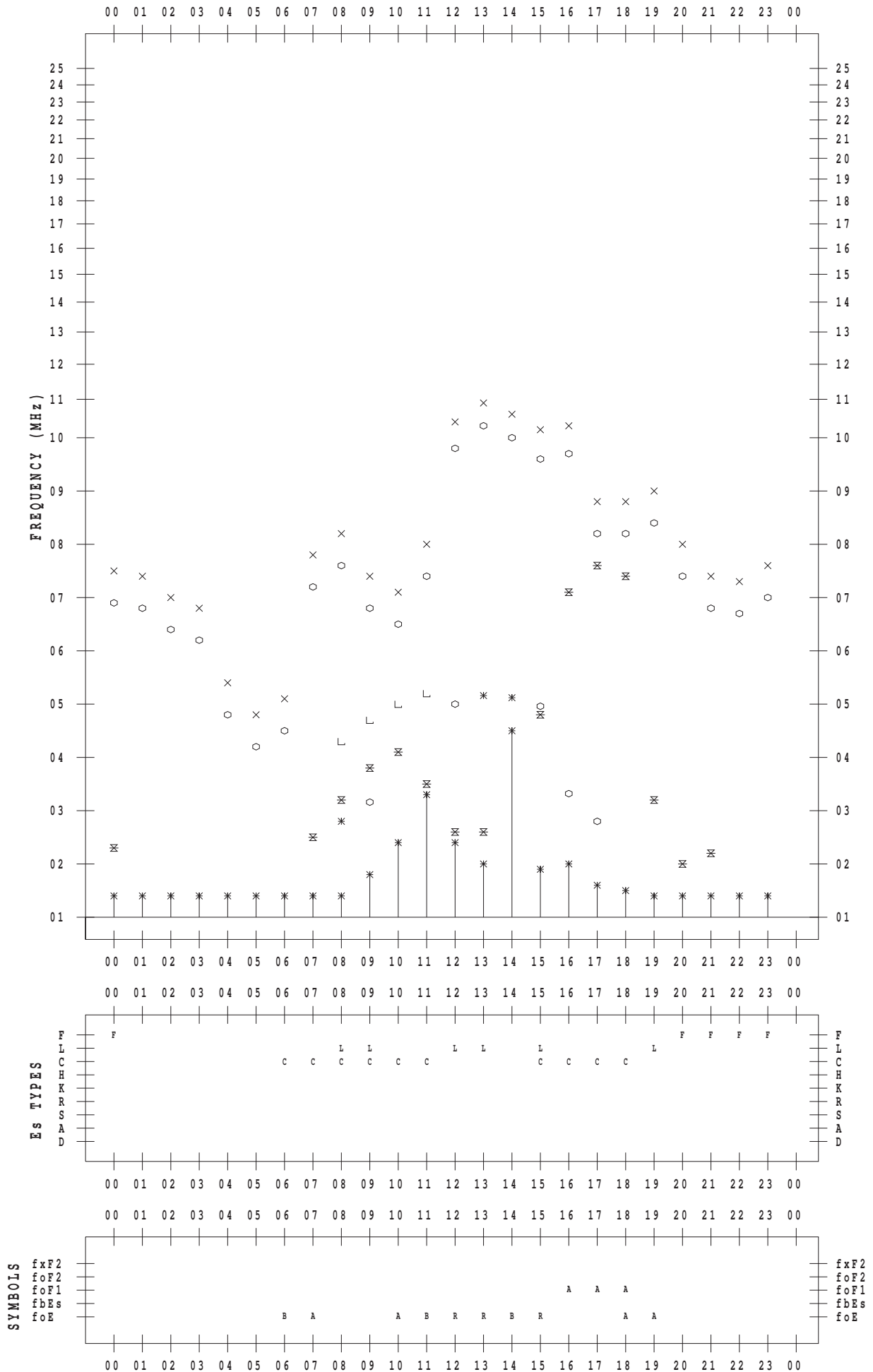
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 6

135 ° E MEAN TIME



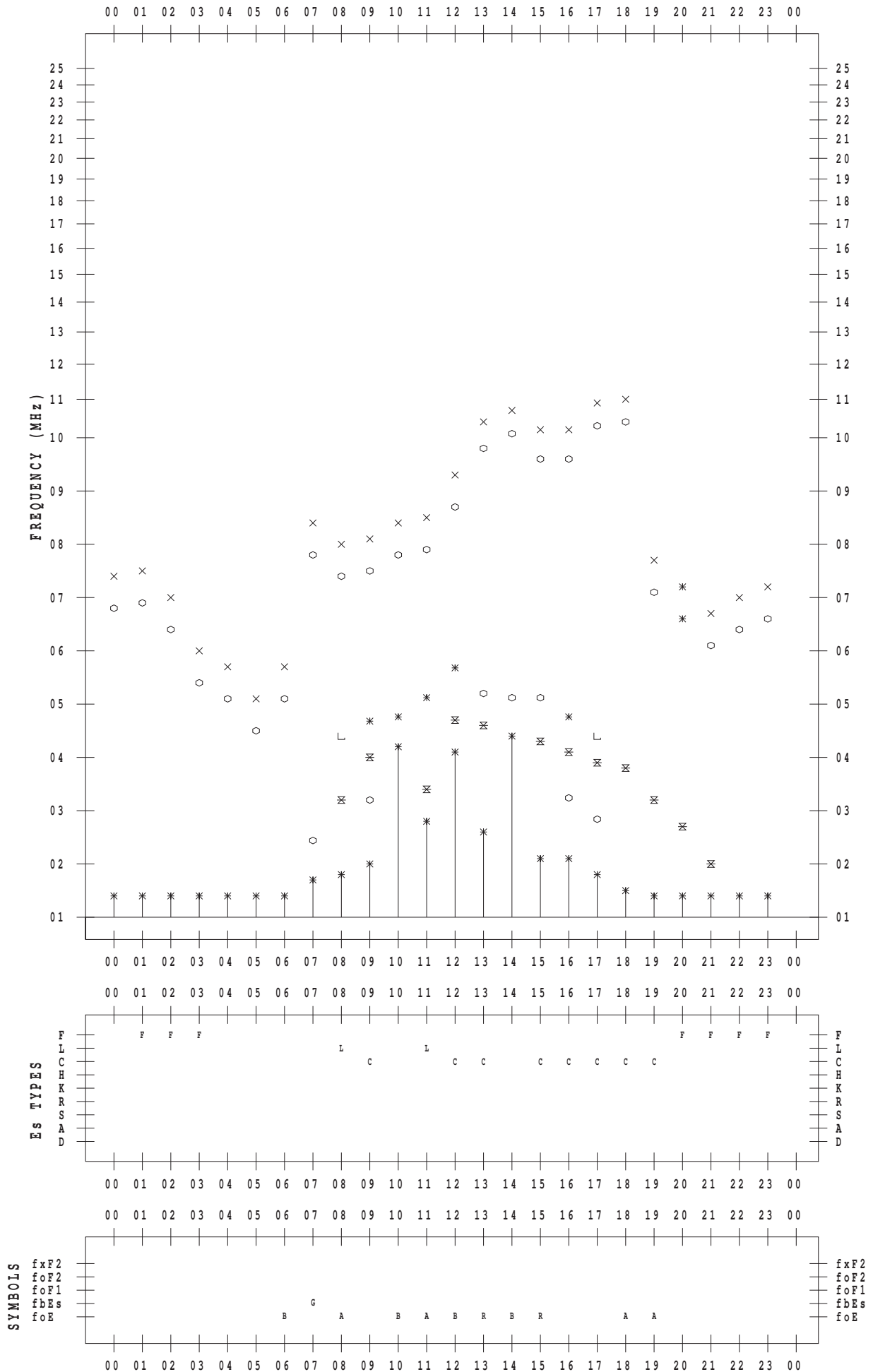
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 7

135 ° E MEAN TIME



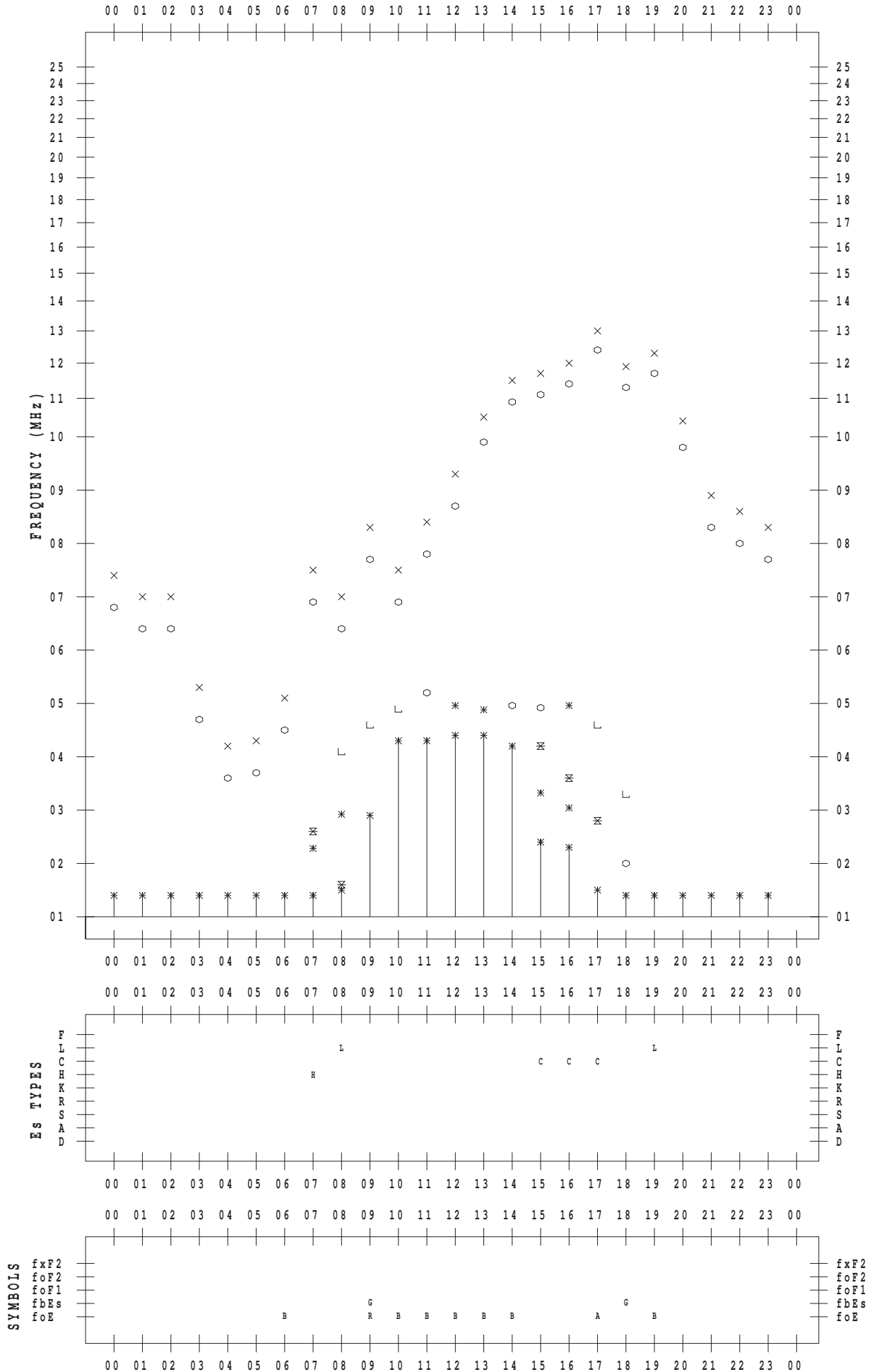
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 8

135 ° E MEAN TIME



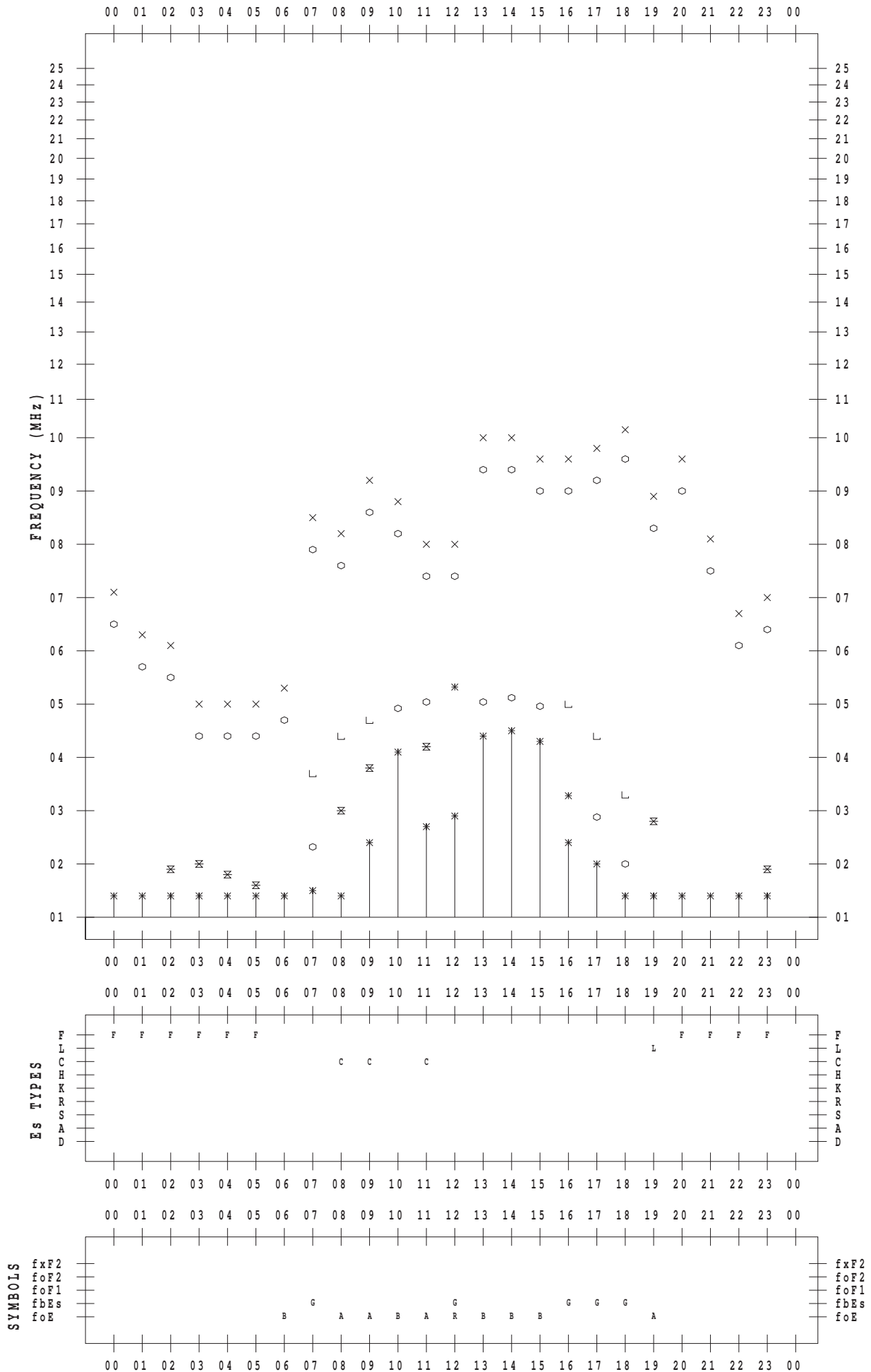
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/ 9

135 ° E MEAN TIME



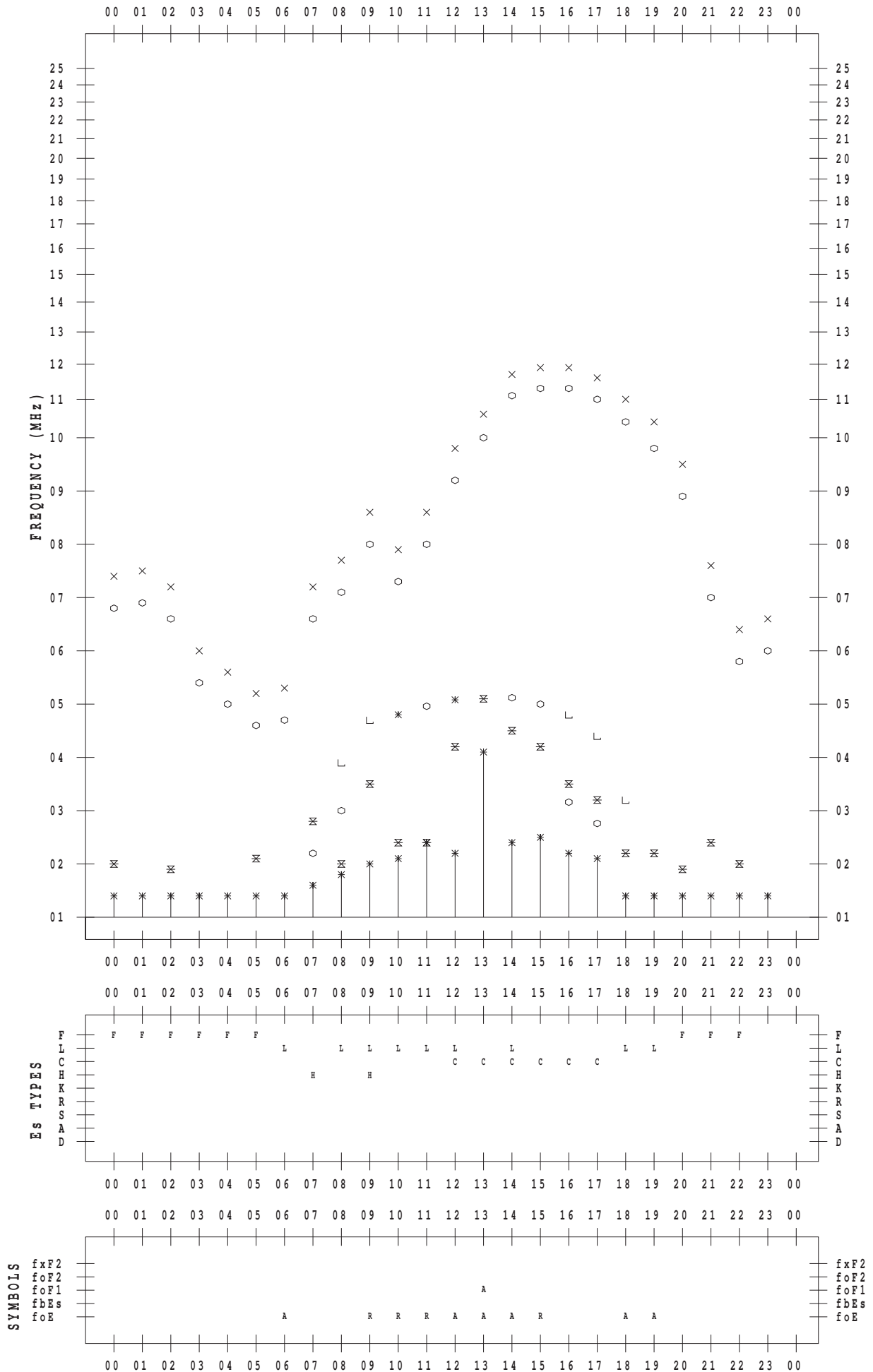
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/10

135 ° E MEAN TIME





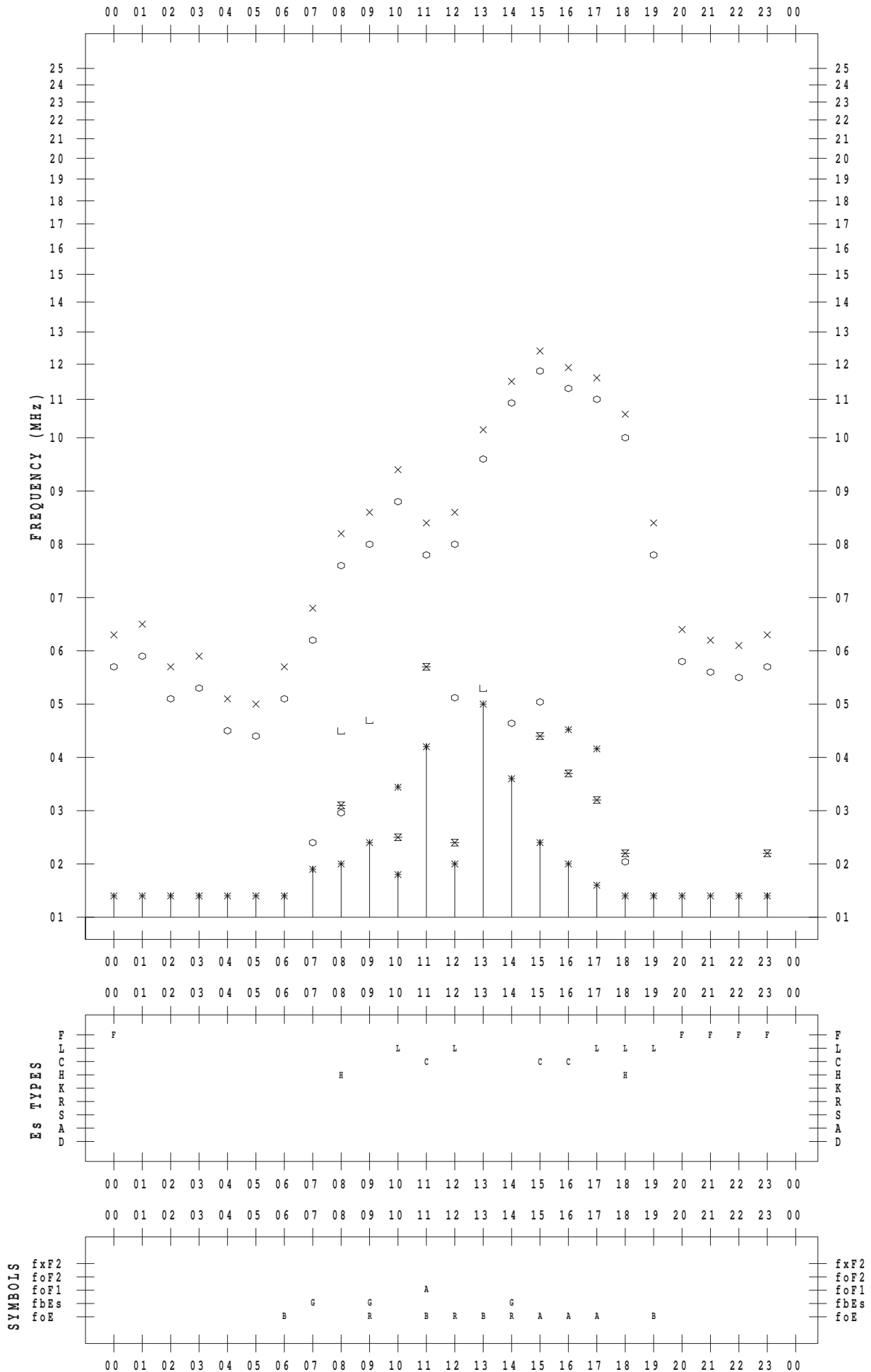
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/11

135 ° E MEAN TIME



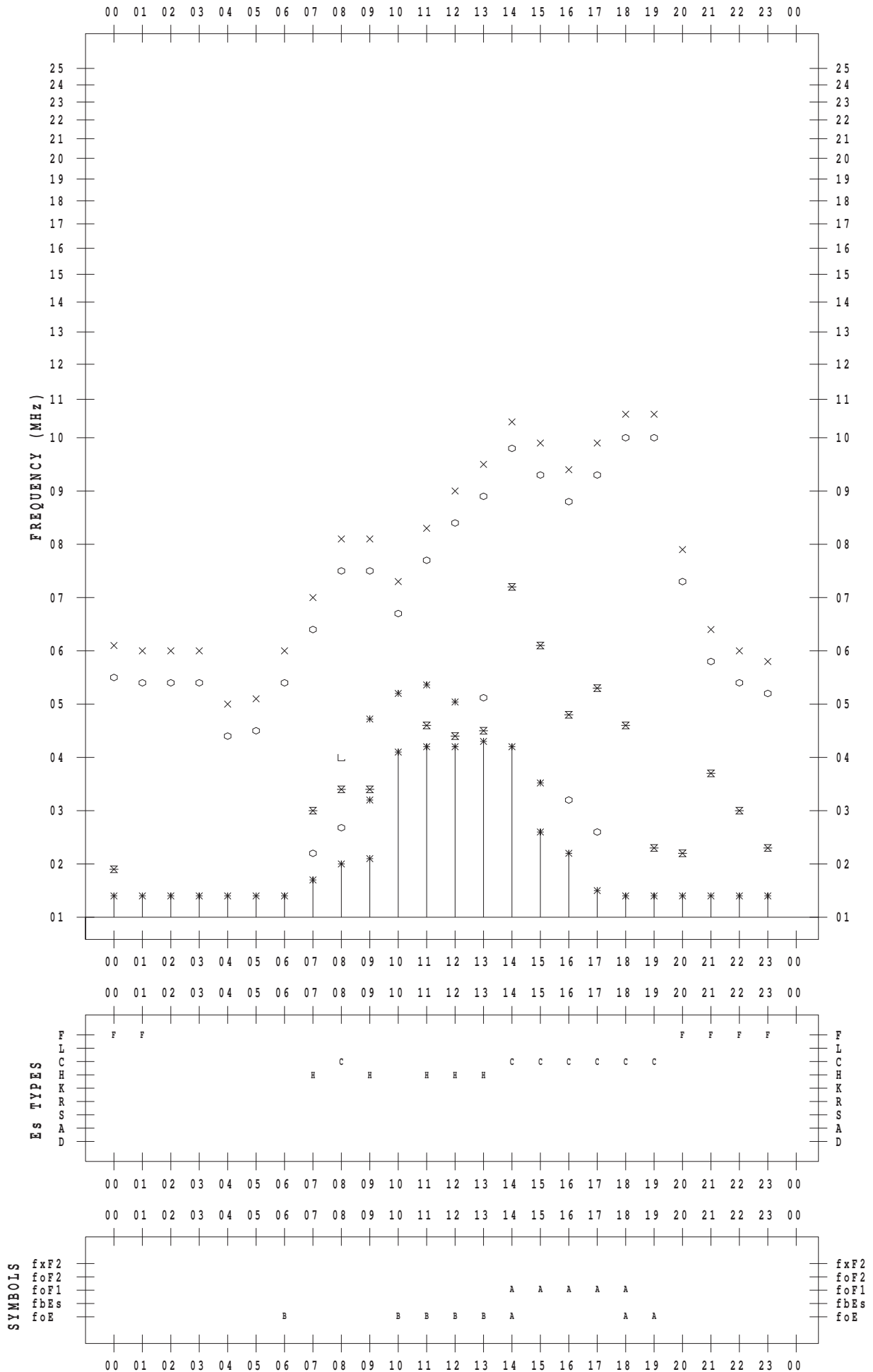
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/12

135 ° E MEAN TIME



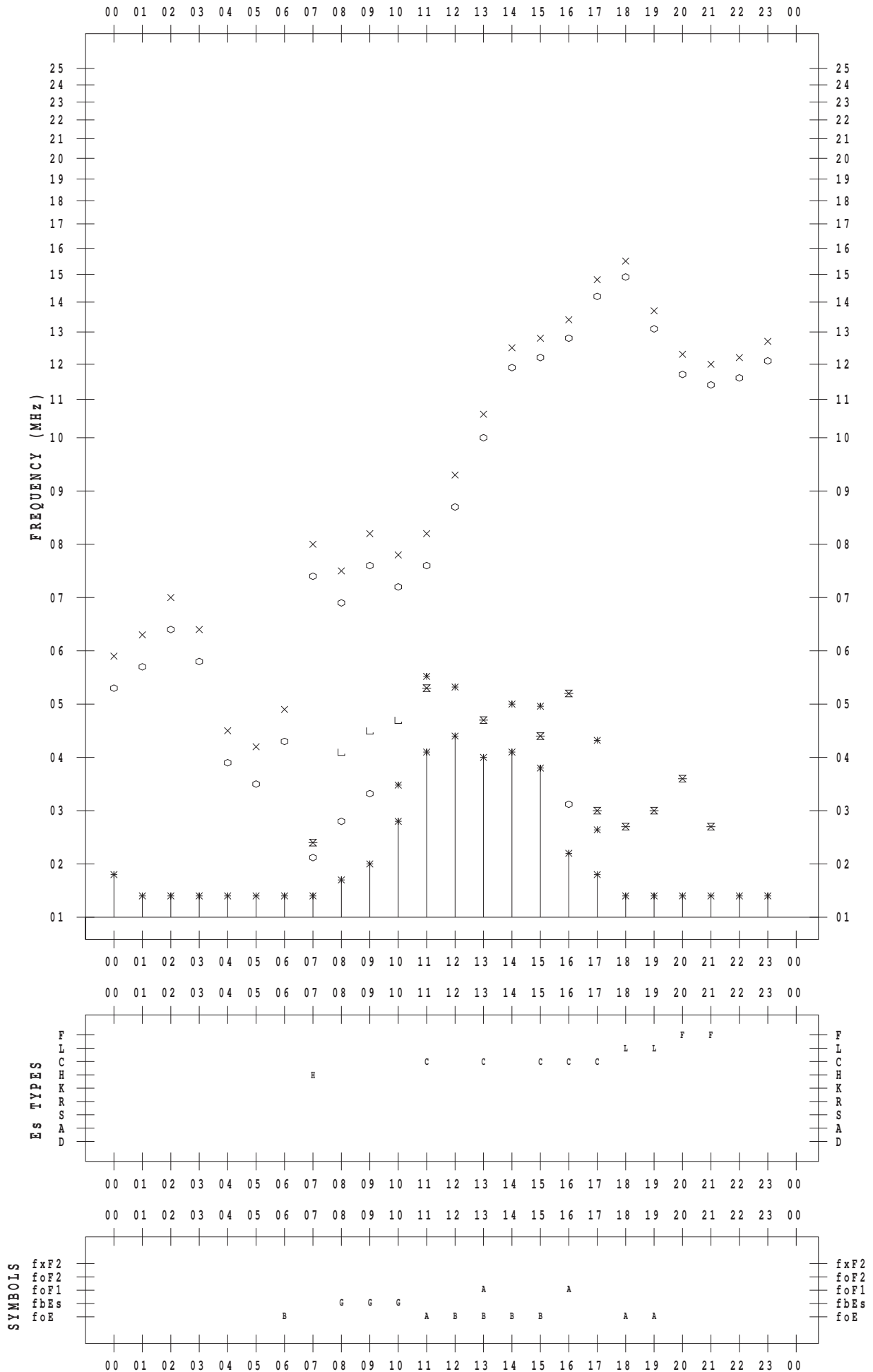
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/13

135 ° E MEAN TIME



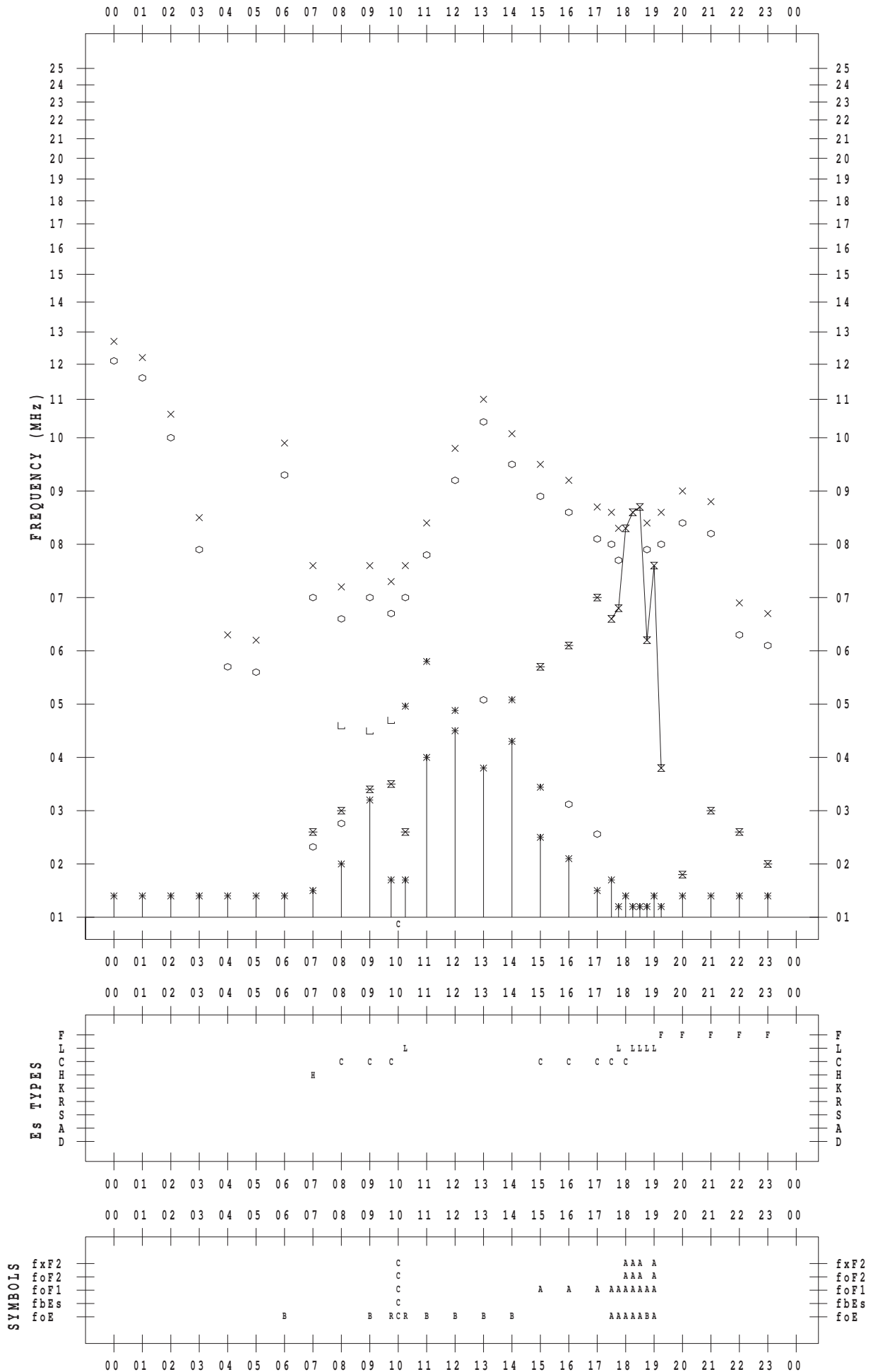
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/14

135 ° E MEAN TIME



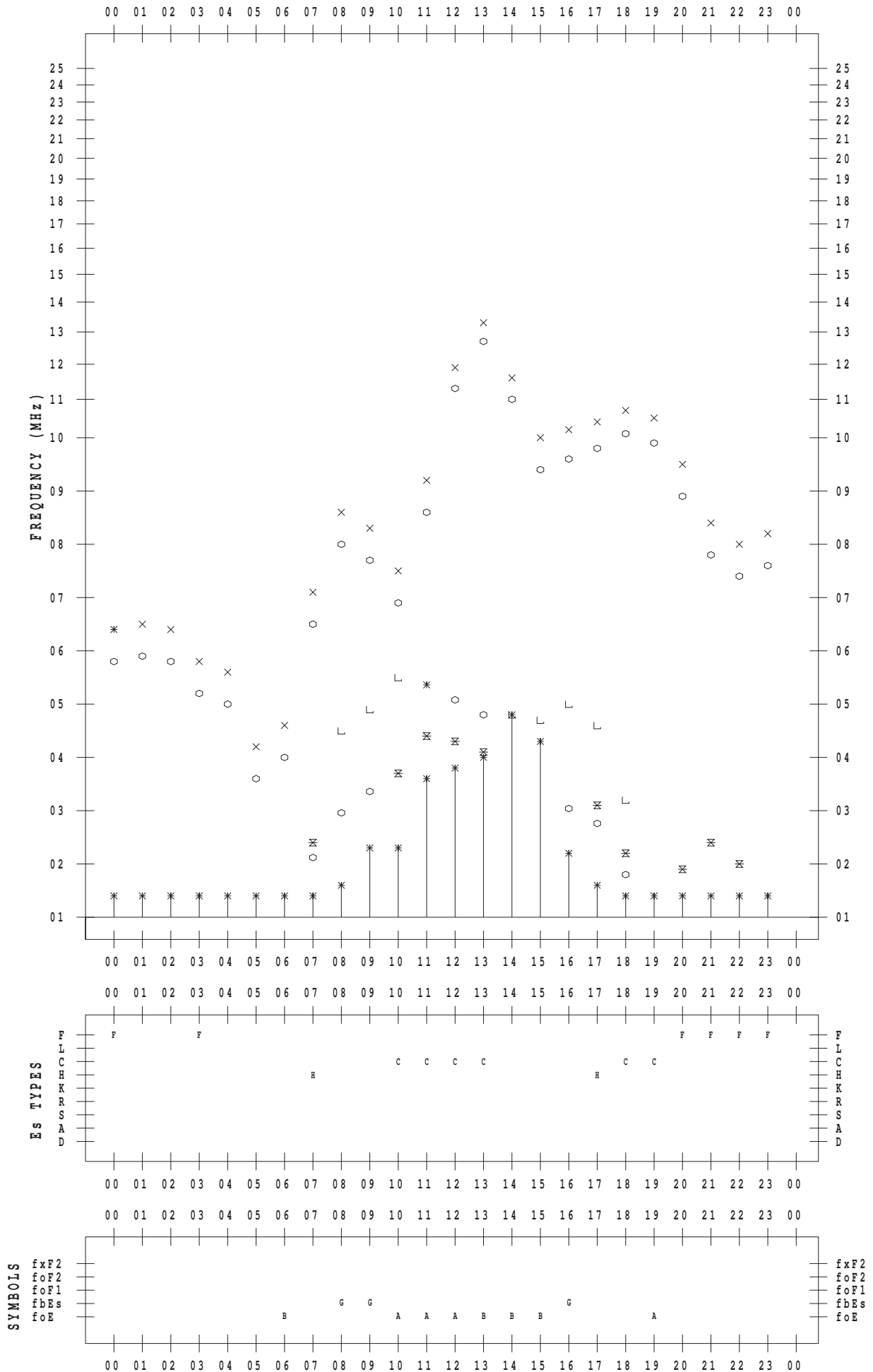
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/15

135 ° E MEAN TIME



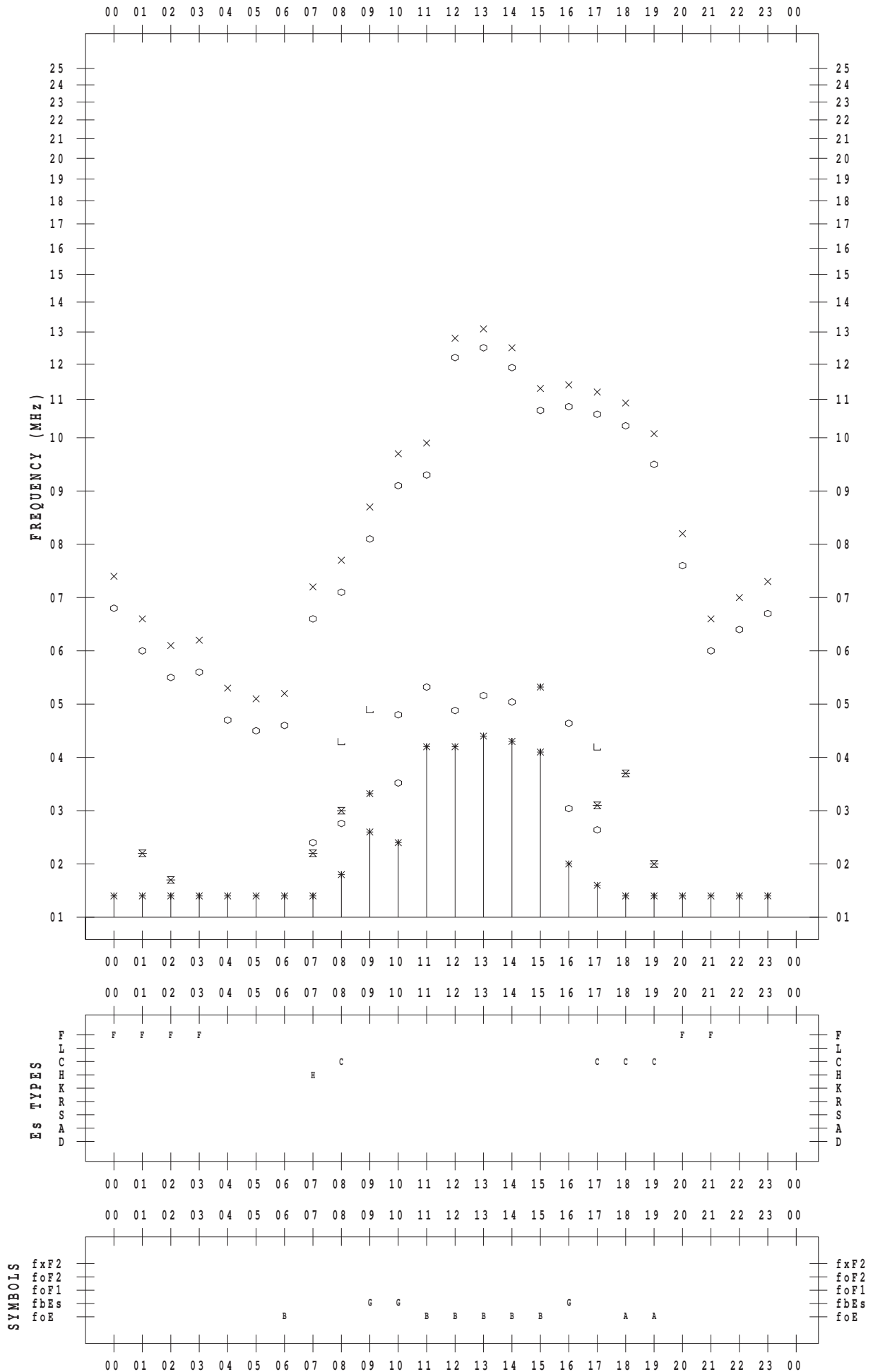
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/16

135 ° E MEAN TIME



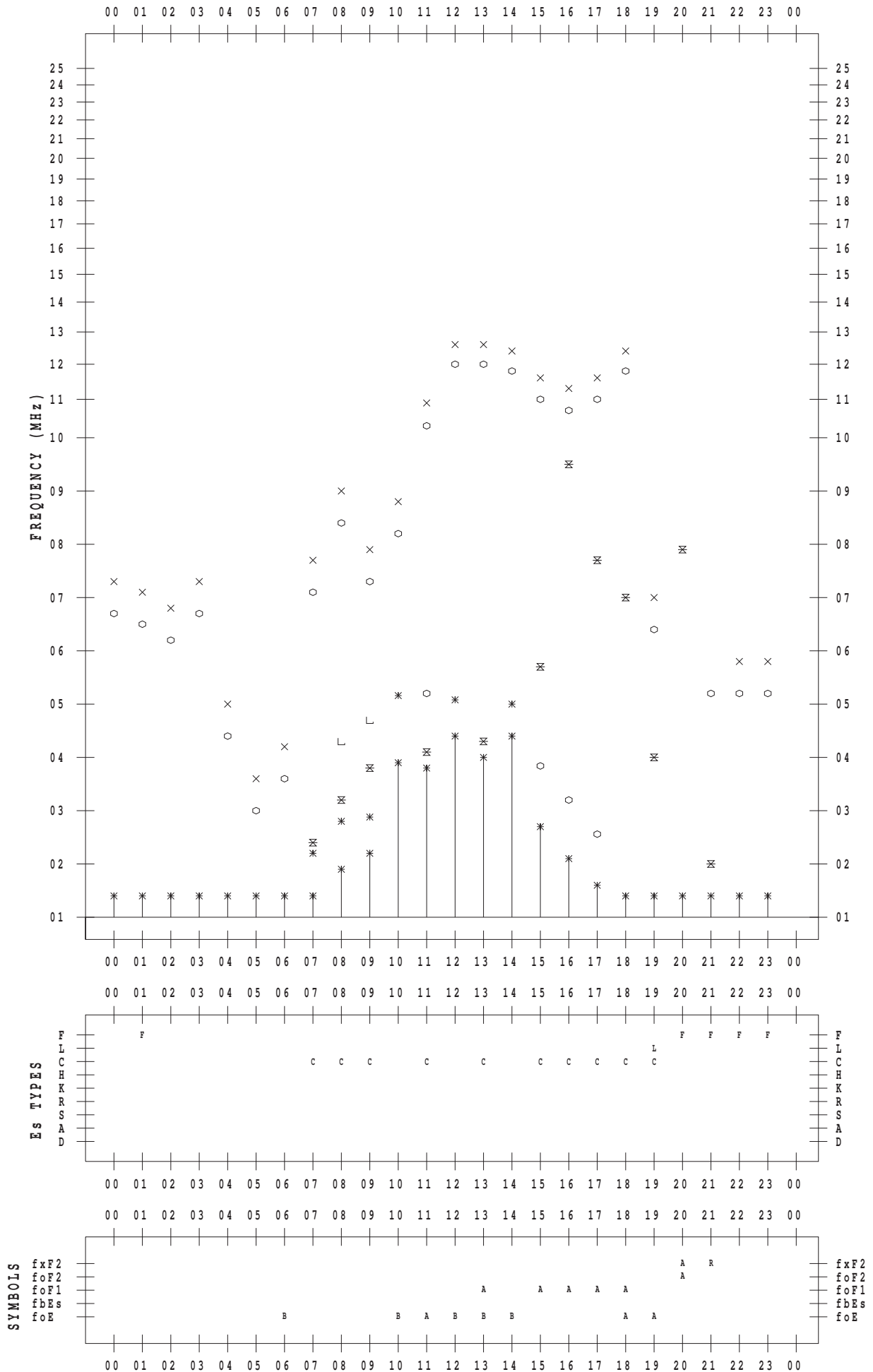
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/17

135 ° E MEAN TIME



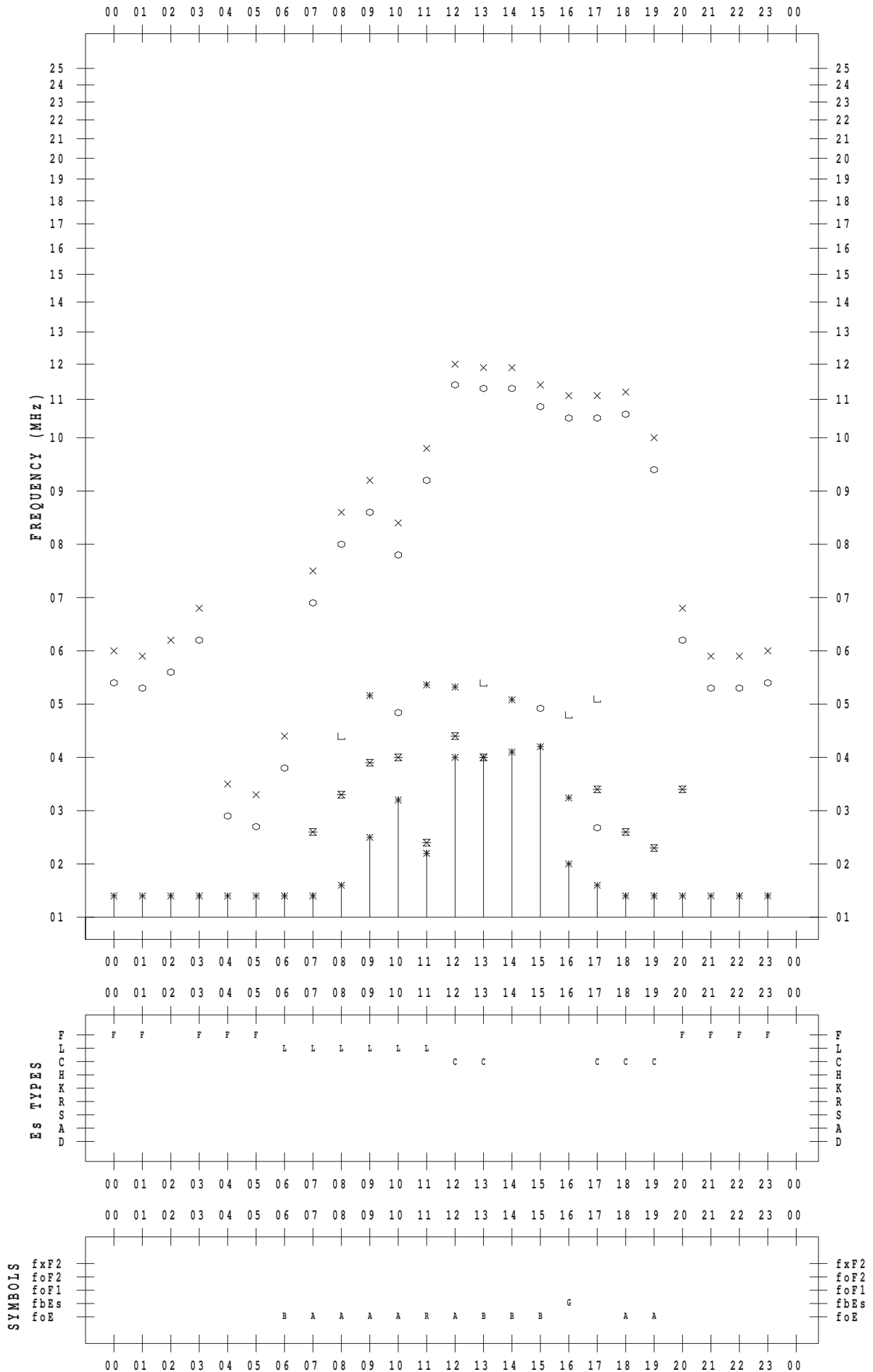
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/18

135 ° E MEAN TIME





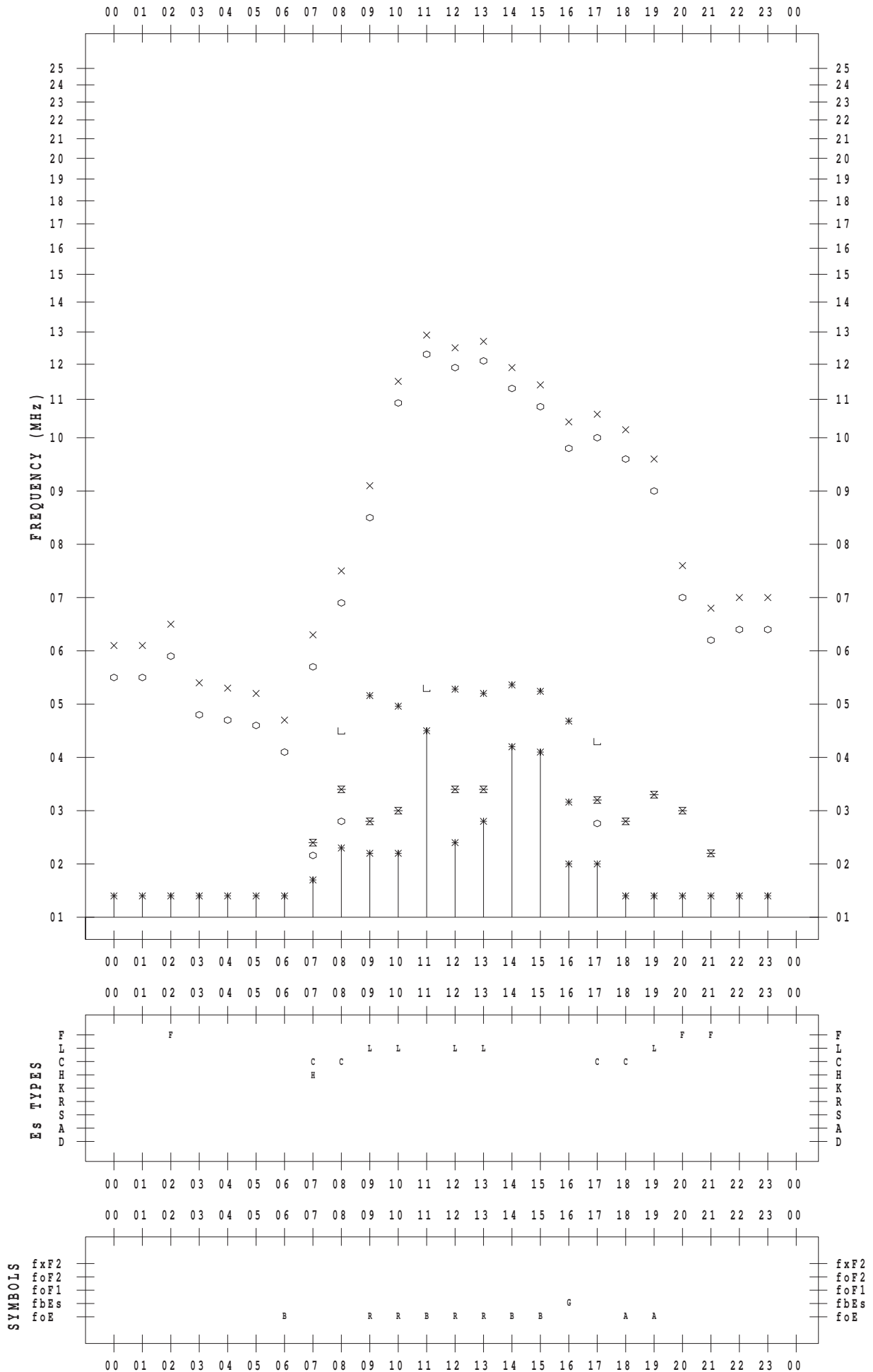
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/19

135 ° E MEAN TIME



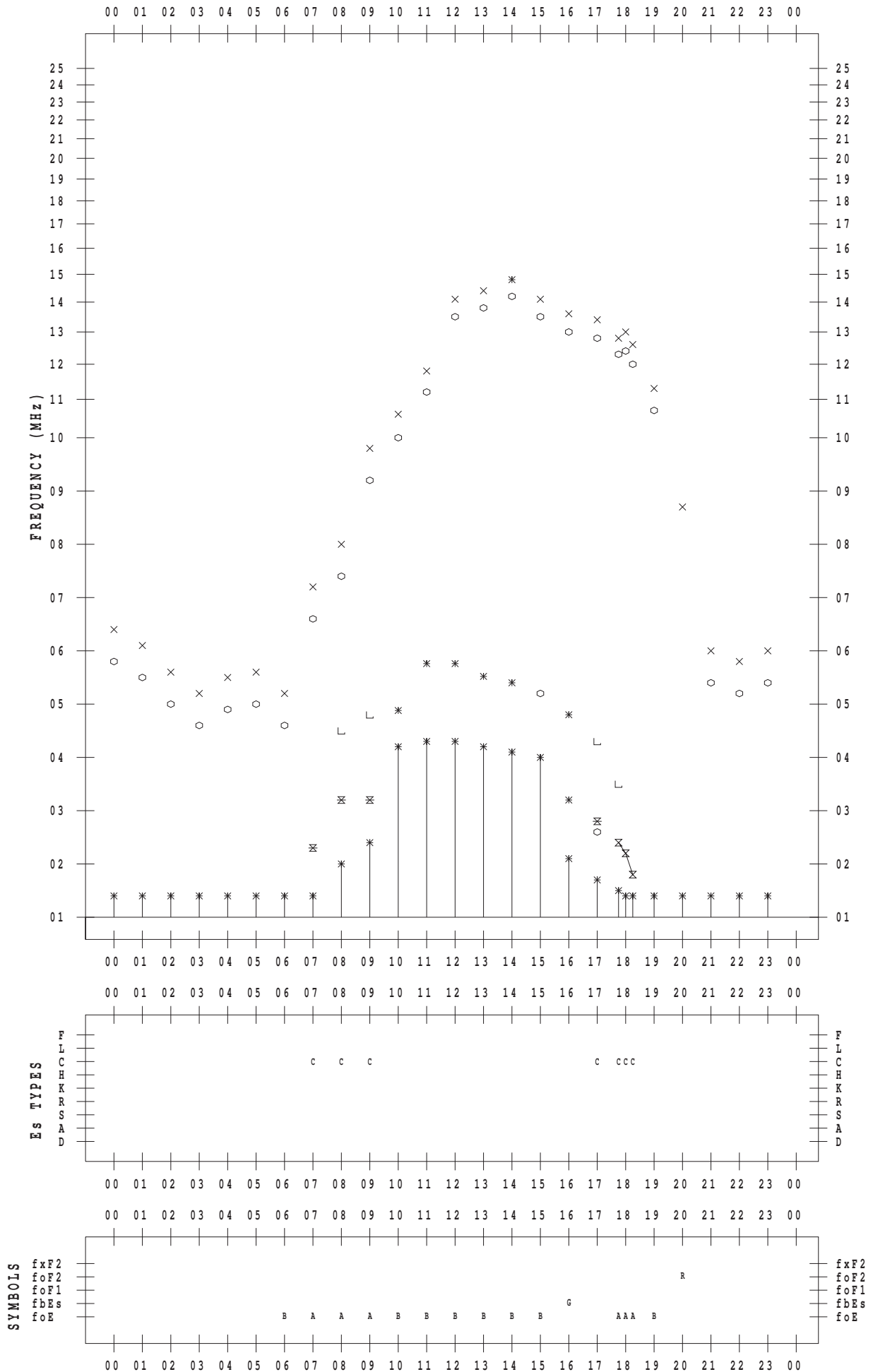
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/20

135 ° E MEAN TIME



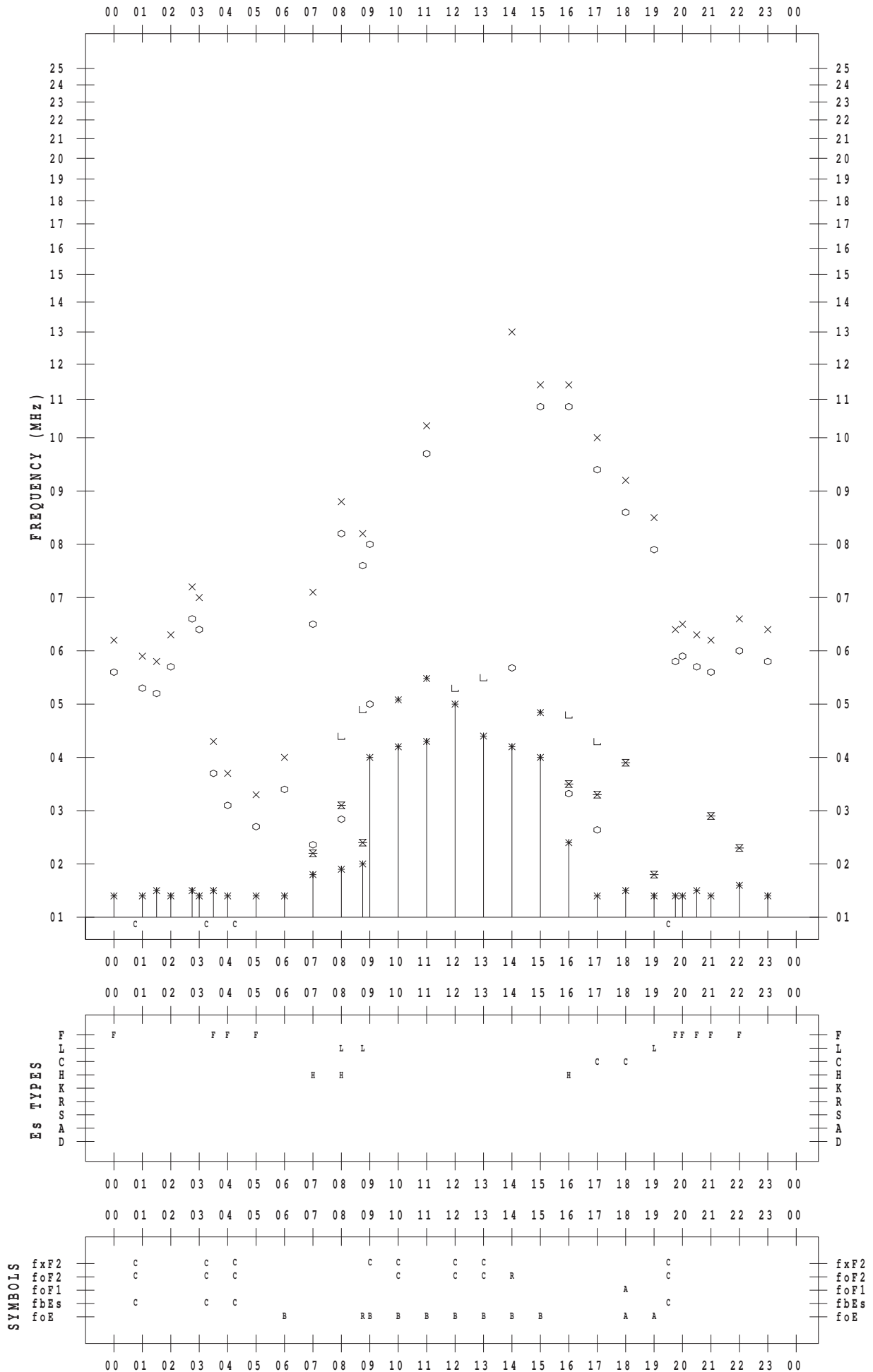
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/21

135 ° E MEAN TIME



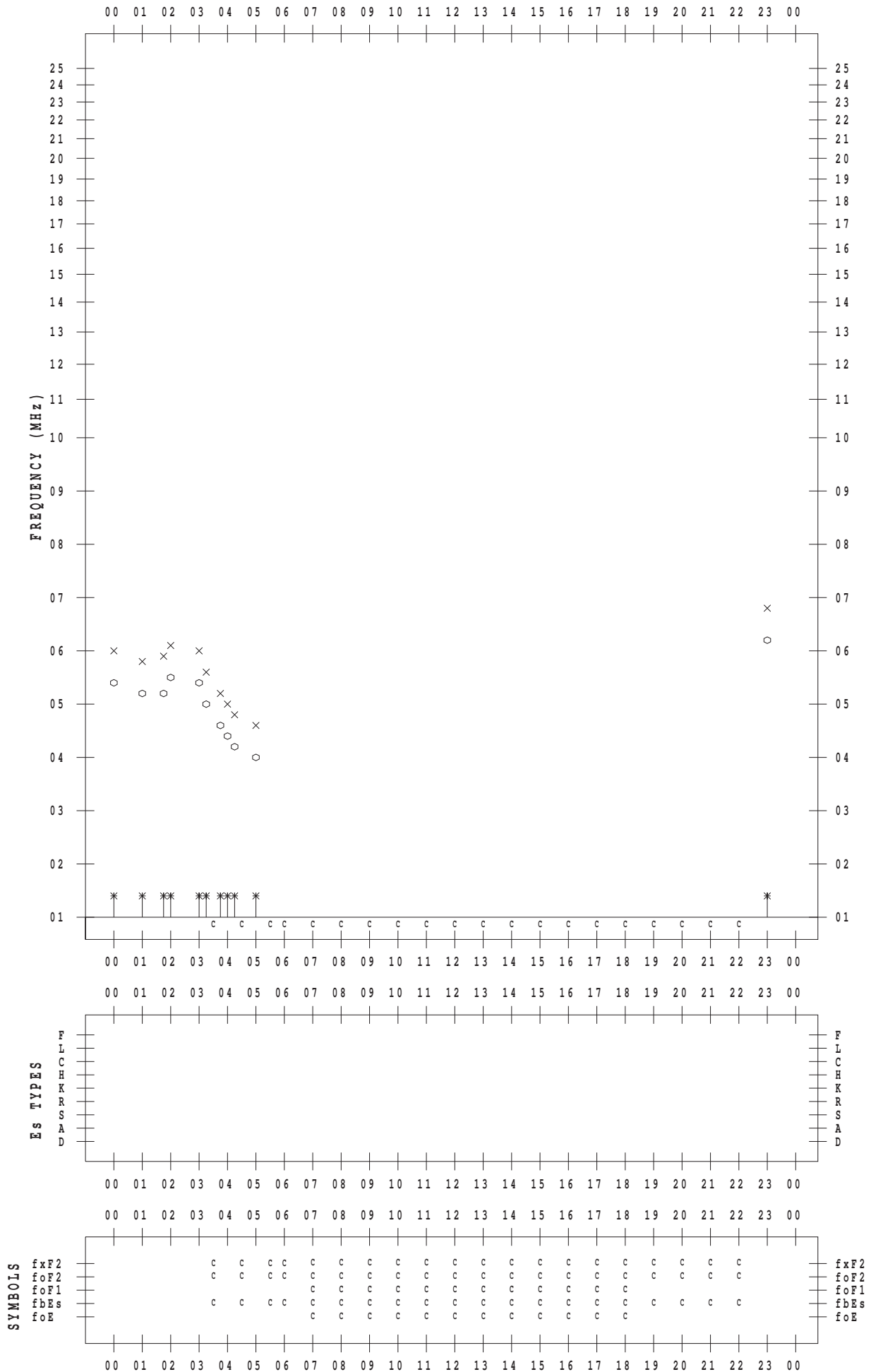
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/22

135 ° E MEAN TIME



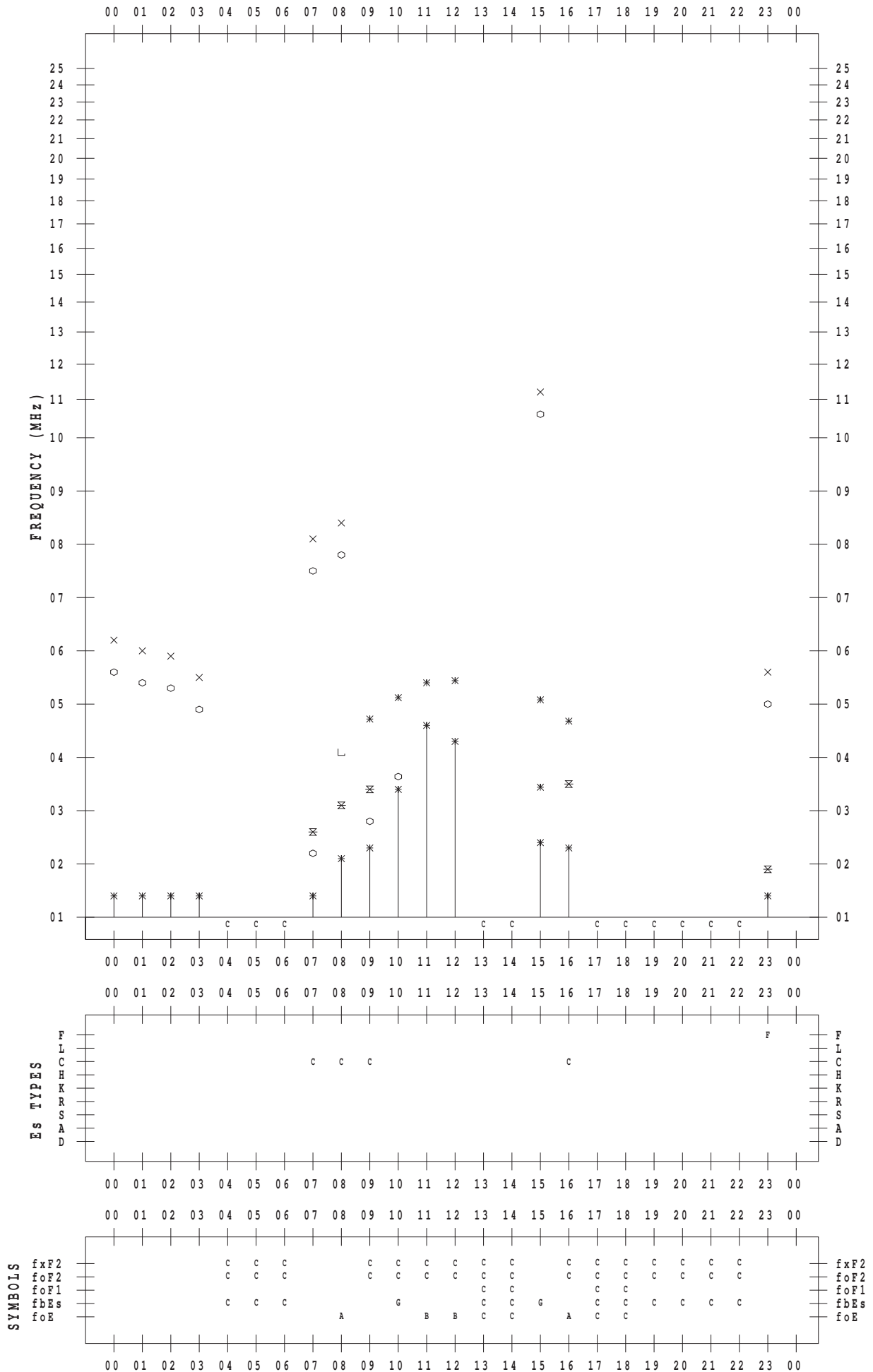
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/23

135 ° E MEAN TIME



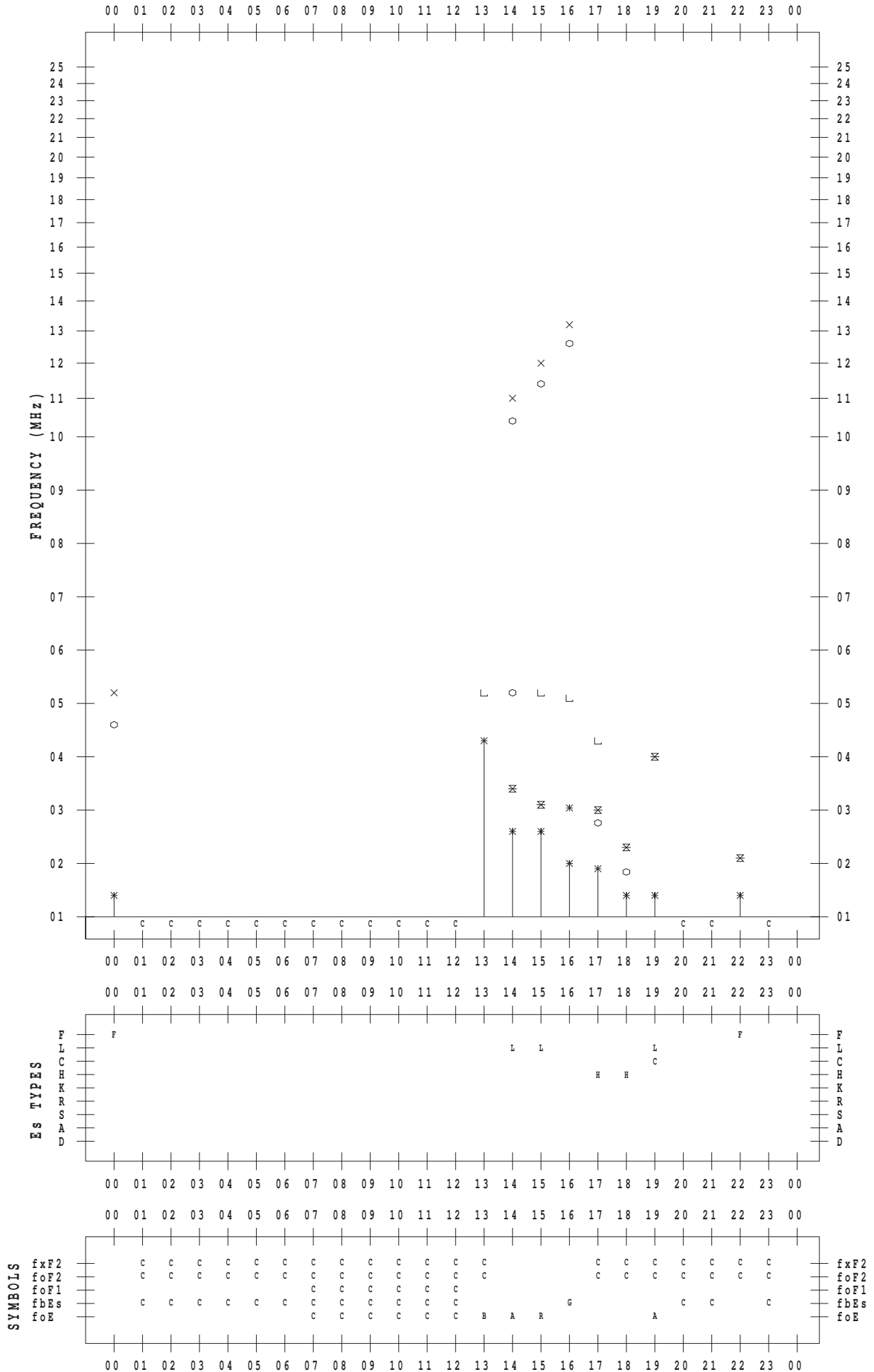
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/24

135 ° E MEAN TIME



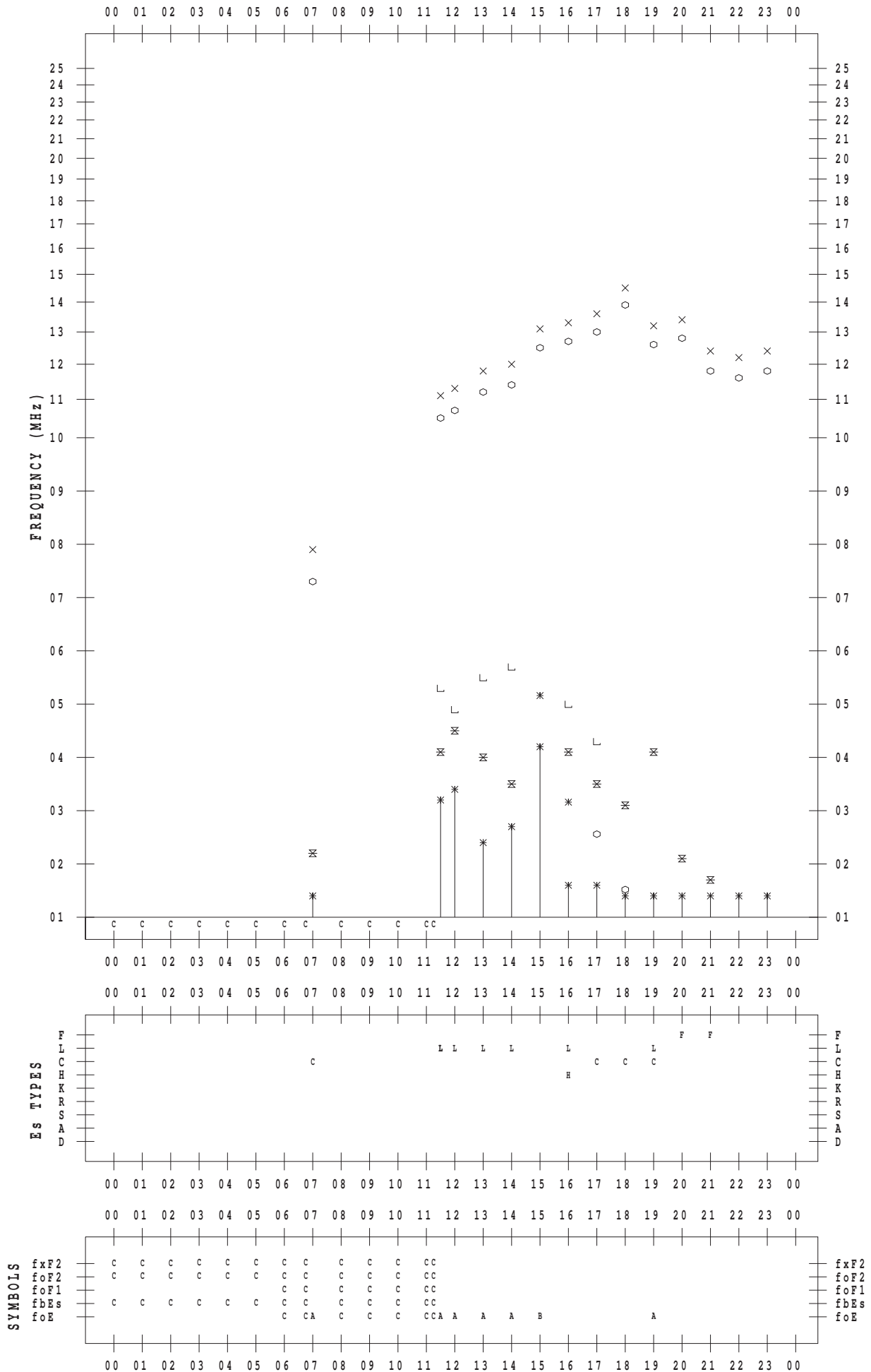
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/25

135 ° E MEAN TIME



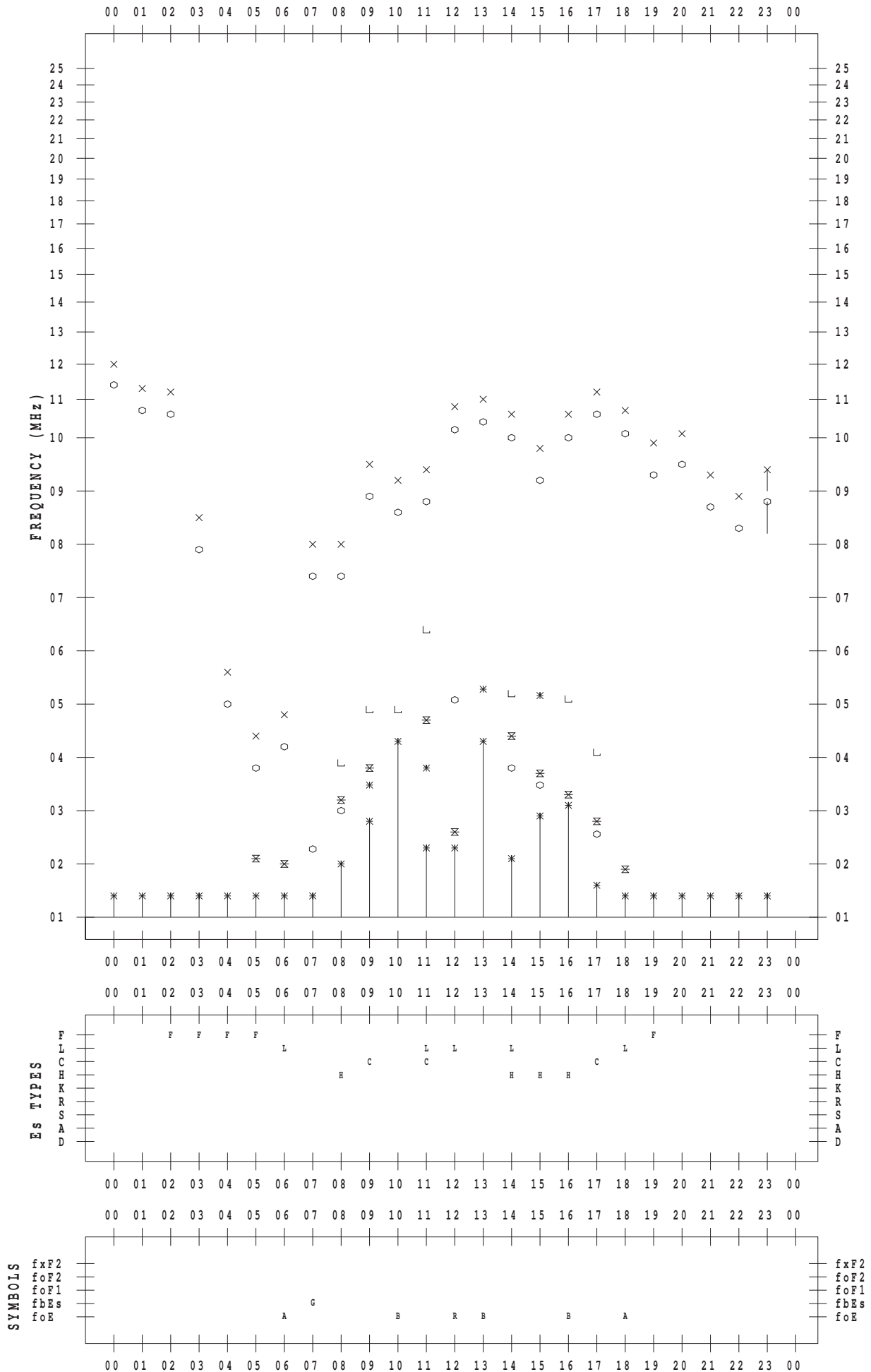
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/26

135 ° E MEAN TIME





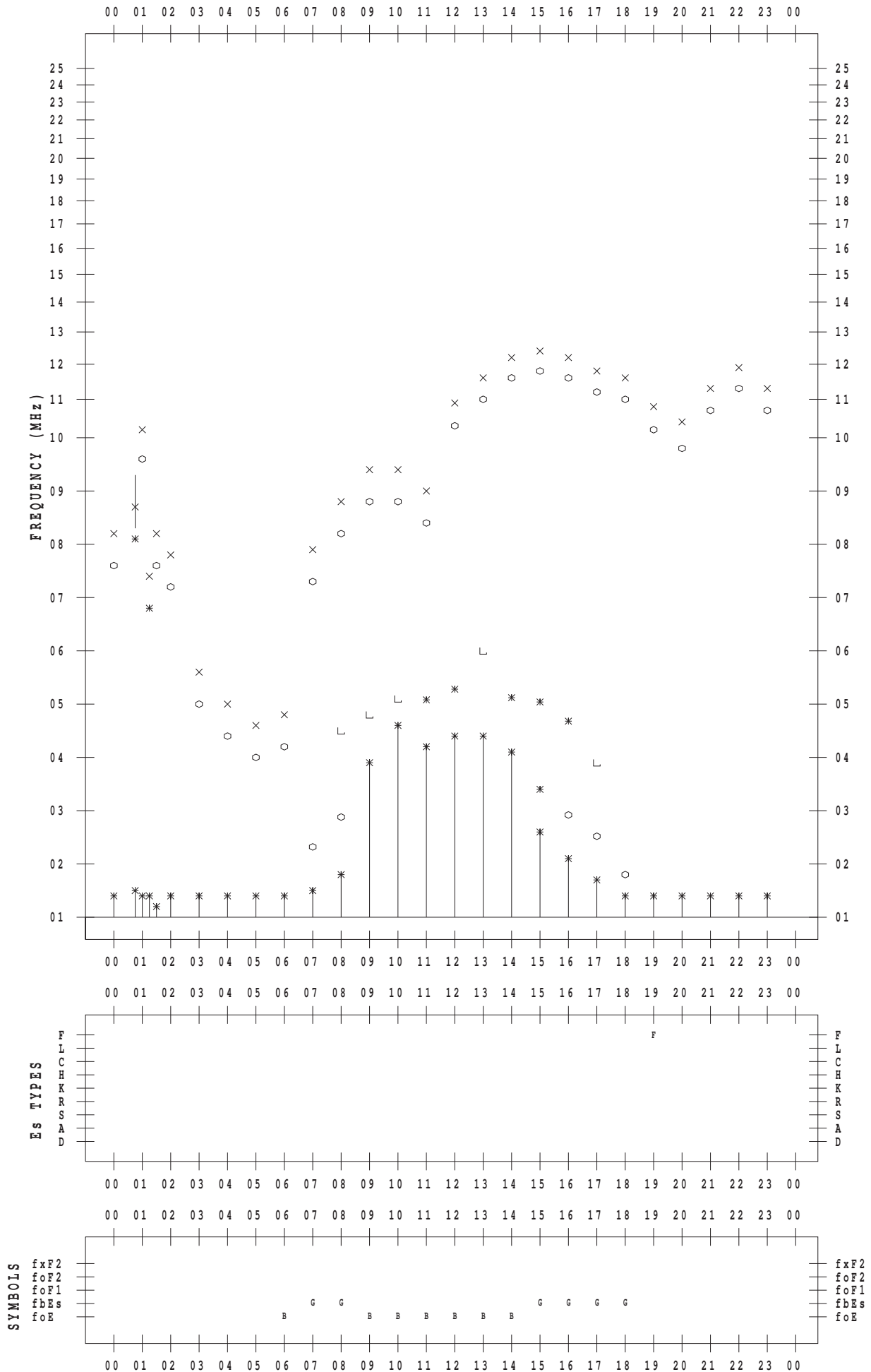
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/27

135 ° E MEAN TIME



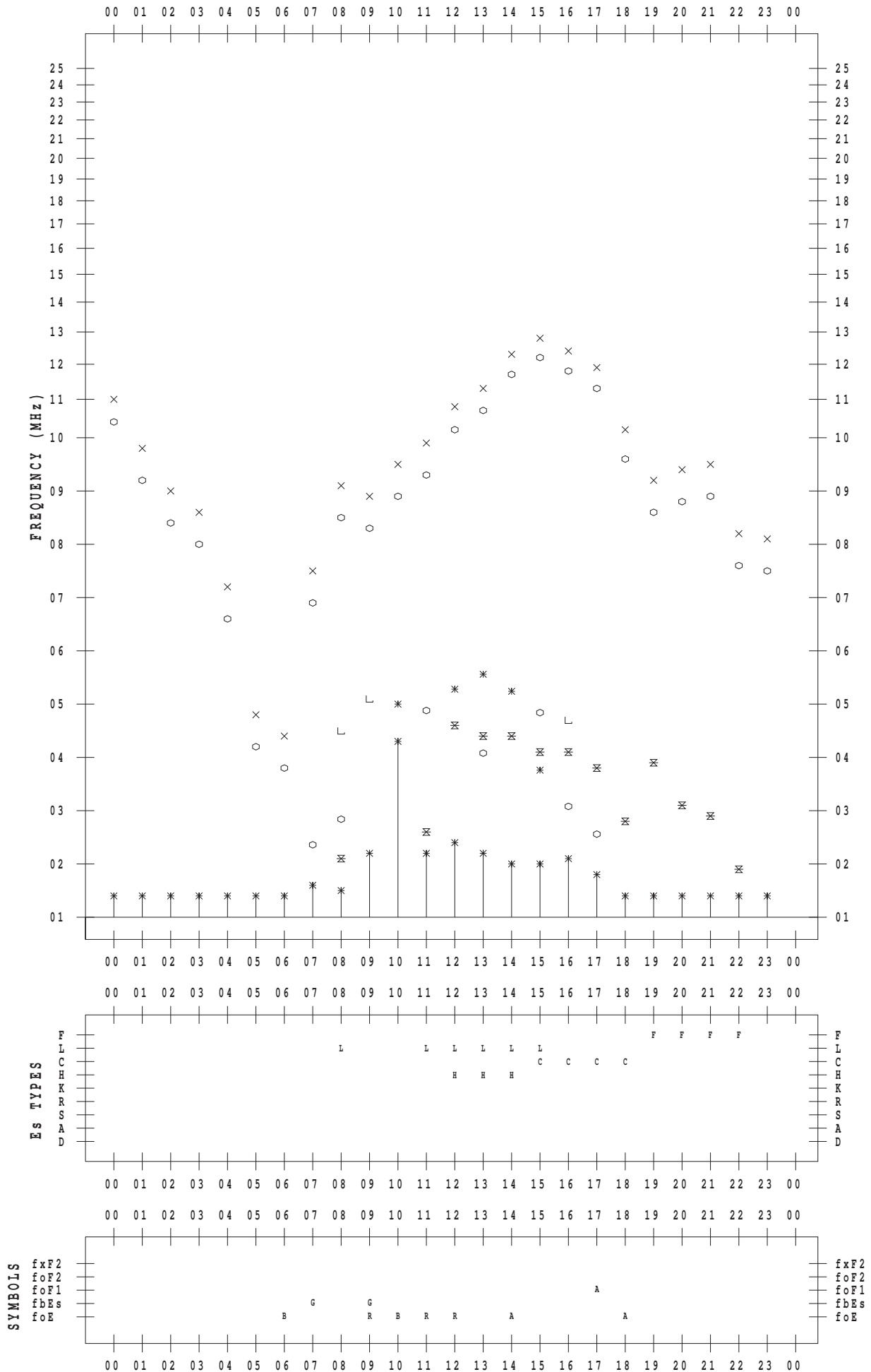
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/28

135 ° E MEAN TIME



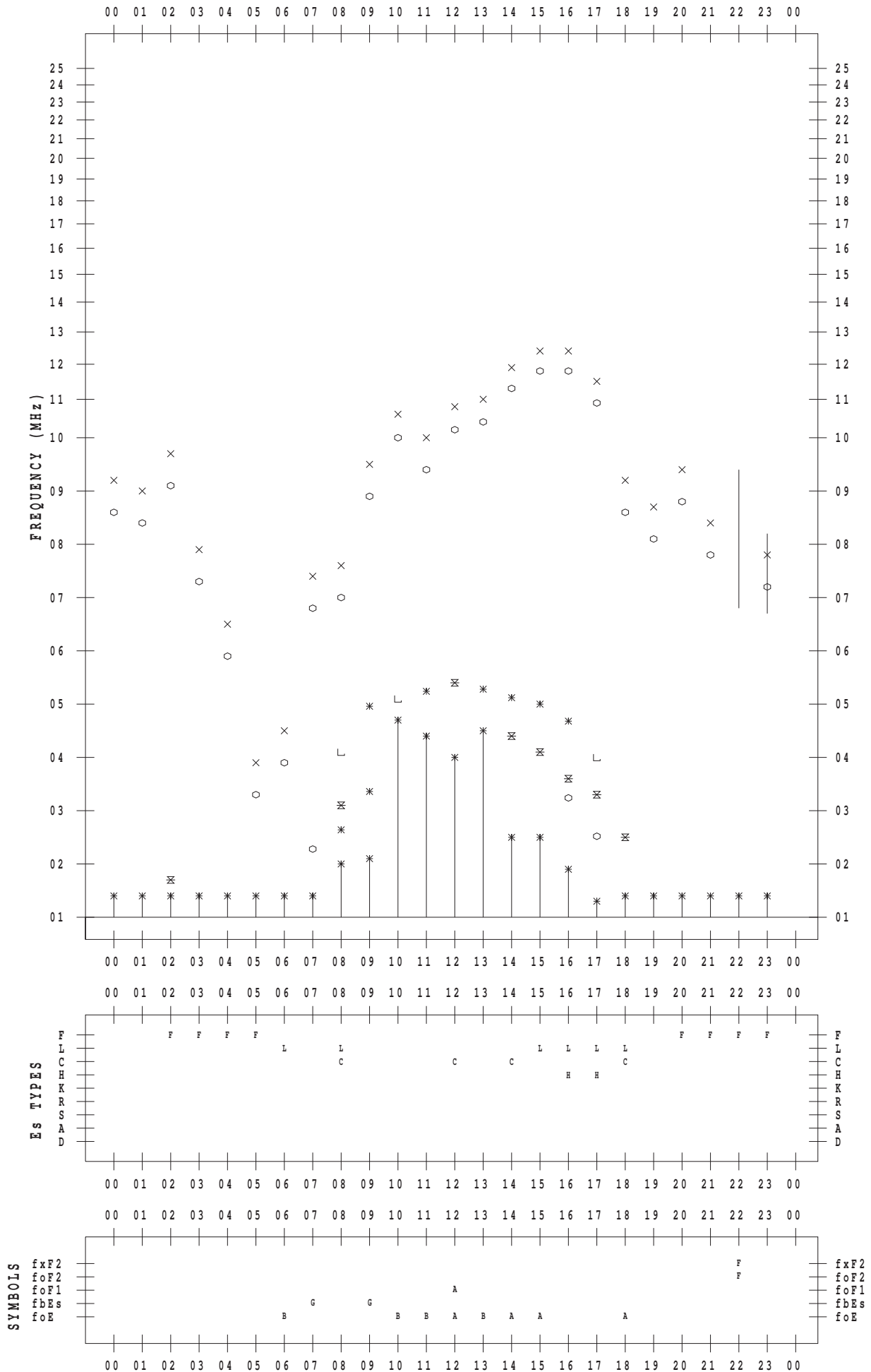
# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/29

135 ° E MEAN TIME



# f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 9/30

135 ° E MEAN TIME

