

IONOSPHERIC DATA IN JAPAN

FOR JULY 2013

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« Real Time Ionograms on the Webhttp://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

f_oF2	Ordinary wave critical frequency for the $F2$ layer
fEs	Highest frequency of the Es layer whether it may be ordinary or extraordinary
$fmin$	Lowest frequency which shows vertical iono-spheric reflections
$h'Es$ $h'F$	Minimum virtual height on the ordinary wave for the Es and F layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

- A Impossible measurement because of the presence of a lower thin layer, for example Es (for 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

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

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to 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

JUL. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	53	52	A	A	A	53	53	A	60	66	A	A	A	A	62	61	61	63	63	65	65	64	52	52
2	52	52	A	52	34	58	A	A	A	A	A	A		A	A	A	58	A	A	A	60	A	63	54
3	58	54	54	A	A	58	N	64	A	59	A	A	64	64	62	66	63	60	63	66	66	66	62	62
4	52	60	44	A	57	55	70	60	60	65	A	56		A	A	A	A	63	A	68	66	66	64	62
5	64	61	61	62	62	58	59	64	A	A	A	61	A	A	A	64	A	65	73	67	A	58	62	55
6	59	60	54	51	60	64	65	A	A	A	A	A	A	A	A	A	A	A	A	67	A	67	66	41
7	54	62	A	49	60	62	65	A	A	A	A	A	A	A		A	A	A	56	61	A	53	63	54
8		38	53	52	58	64	60	70	A	65	66	67	A	65	69	63	64	68	68	67	66	66	66	
9	59	60	54	53	54	A	63	A	A	A	A	A	A	A	A	A	A	62		A	A	66	60	52
10	52	55	52	53	47	58	61	A	67	A	64	67	67	68	66	64	66	70	66	65	64	64	46	66
11	63	64	49	55	A	A	56	A	A	A	A	A	A	A	A	A	A	A	61	62	54	62	54	63
12	64	53	34	35	A	52	A	A	A	A	A	60		56	64	63	68	66	64	63	65	60	64	54
13	59	52	62	62	52		69	62	66	67	67	66	66	64	69	A	67	66	65	67	66	64	64	64
14	63	60	63	62	62	50	A	A	A	A	A	A	A	A	A	A	65	63	66		A	A	A	55
15	53	53	37	53	53	49	A	A	A	A	A	A	A	62	A	56	61	66	46	66	65	67	61	
16	54	54	62	56	52	A	A	A	A	A	A	A	A	A	62	A	A	A	A	A	A	64	64	54
17	58	51	53	32	53	A	A	A	A	A	A	A	A	A	A	58	A	62	65		A	65	54	61
18	59	58	60	59	59	A	A	A	A	A	A	A	A	64	A	A	A	A	64	54	54	A	67	64
19	65	63	61	64	61	55	52	A	66	A	A	A	A	59	62	64	A	65	66	67	65	44	66	63
20	64	53	55	53	58	61	59		61	A	A	60	62	65		62	64	66	66	65	65	63	66	A
21	54	A	63	A	60	61	A	59	69	A	64	A	A	68	67	62	62	62		65	A	63	64	52
22	63	52	58	55	61	65	67	A	A	68		A	A	57		66	67	67	66	67	66	64	64	65
23	A	54	63	60	58	64	67	65	63	65	62		A	A	66	62	66	65	67	67	65		54	64
24	62	55	54	N	62	61	62	66	68	A	63	62	64	67	66	70	67	66	62	66	63	64	66	54
25	53	62	63	63	63	67		59	67	66	65	65	62	63		67	A	58	A	65	61	66	63	54
26	63	61	58	56	57	66	63	A	69	A	A	62	62		A	63	63	65	66	61	66	65	62	63
27	54	53	61	60	58	63	65	63	A	A	A	A	A	63	A	A	58	58	63	67	A	65	62	62
28	49	54	A	55	51	61	61	A	A	A	A	A	A	A	A	61	A	A	A	62		54	66	63
29	35	53	47	52	47	48	56	A	A	A	A	A	A	A	A	A	A	A	A	A	63	63	64	A
30	A	A	A	A	50	A	56	67	66	A	A	62	A	A	A	A	A	60	65	64	56	54	49	66
31	66	62	60	54	53	42	65	61	62	A	64	A	A	A		55	62	A	A	66	67	64	63	63
	00	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	26	25	27	24	21	12	13	8	8	11	7	14	12	18	16	22	22	25	21	27	30	26
MED	58	54	56	55	58	60	62	64	66	66	64	62	64	64	65	63	64	65	65	66	65	64	63	62
U Q	63	60	61	60	60	63	65	65	67	66	65	66	66	65	66	64	66	66	66	67	66	66	64	63
L Q	53	53	53	52	52	54	57	60	61	65	63	60	62	62	62	62	61	62	63	63	62	62	61	54

HOURLY VALUES OF fEs AT Wakkanai

JUL. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	34	58	44	38	32	29	32	37	56	51	73	49	33	42	34	G	32	34	24	34	G	G	G	G
2	24	G	32	G	G	34	33	28	34	36	44	60		42	90	86	35	63	117	74	54	70	40	39
3	52	49	35	59	70	49	44	59	75	71	73	72	44	50	52	38	43	49	97	50	48	30	59	28
4	25	G	24	32	G	40	62	56	39	53	68	54		76	68	72	76	52	65	46	60	52	38	27
5	33	34	39	58	40	103	51	50	34	81	72	72	98	156	62	53	80	91	70	49	55	40	34	G
6	G	38	35	29	62	69	51	54	54	76	111	124	110	59	42	72	84	100	107	64	71	56	34	G
7	40	34	40	33	G	35	41	36	61	76	89	61	65	50		51	80	60	48	43	56	54	41	26
8		44	34	32	34	33	54	59	69	57	64	49	63	41	40	39	38	28	37	38	43	50	57	
9	G	24	G	G	G	58	55	73	72	67	112	126	123	41	56	59	103	56	96	72	81	68	68	52
10	40	27	34	26	G	48	60	73	61	71	52	42	55	39	40	45	37	38	34	G	26	27	G	G
11	G	G	G	32	39	40	40	37	52	50	50	59	48	34	33	55	72	72	61	32	G	G	G	G
12	G	G	G	G	39	38	43	45	54	56	34	G		34	34	40	36	45	46	30	68	27	29	26
13	40	29	33	30	26		41	37	32	40	53	39	39	53	60	61	64	40	43	40	44	50	60	51
14	52	45	38	35	32	40	91	89	70	73	77	123	178	80	73	82	48	44	36	60	58	71	71	44
15	28	24	G	G	28	32	33	35	36	38	36	42	65	63	52	58	32	50	51	53	G	58	G	G
16	G	G	34	G	34	42	51	58	69	75	64	51	39	40	37	33	51	103	74	94	61	54	G	48
17	31	27	G	27	G	34	49	61	70	74	73	98	58	65	52	69	83	39	58	93	72	52	36	31
18	36	49	34	28	30	71	91	87	122	81	94	60	67	43	50	76	70	116	38	30	26	60	40	38
19	58	53	26	34	28	33	50	64	90	115	135	106	74	84	50	34	82	59	51	43	52	39	40	32
20	34	28	G	G	G	29	57		66	86	68	100	49	32	34	49	39	50	50	30	G	32	35	55
21	39	55	43	42	34	32	65	75	71	75	65	70	68	36	38	56	58	58	72	95	116	59	60	34
22	29	29	34	38	34	32	50	68	111	73	73	66	53	52	59	53	49	38	92	39	60	40	60	59
23	59	49	39	27	28	27	63	44	62	54	58	77	117	74	60	63	40	60	34	G	44	72	54	59
24	34	29	36	31	26	24	41	54	58	68	65	68	49	36	44	41	32	27	26	50	33	45	30	28
25	G	24	33	G	G	31		46	47	39	36	36	38	40		34	64	69	70	53	86	41	38	G
26	G	36	26	40	38	46	64	69	61	66	70	50	44		52	35	30	G	35	36	38	58	28	24
27	G	27	G	G	G	35	29	49	76	118	94	110	68	48	62	70	44	40	54	58	60	65	29	46
28	59	68	52	G	40	25	39	64	80	60	88	74	72	117	127	52	116	122	102	28	70	59	40	52
29	35	G	G	26	G	23	40	50	41	65	64	69	71	65	34	78	104	71	61	58	33	33	G	66
30	60	44	40	70	41	40	39	40	71	98	111	44	64	70	74	71	83	36	37	30	39	41	34	59
31	40	39	38	41	34	33	59	46	62	86	40	111	63	68	35	56	54	91	82	52	43	45	52	70
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	31	31	30	30	30	31	31	31	31	28	30	29	31	31	31	31	31	31	31	31	30
MED	34	29	34	30	30	34	50	54	62	71	68	66	64	50	52	55	54	52	54	46	52	50	38	33
U Q	40	45	38	38	38	42	59	64	71	76	88	98	71	68	61	70	80	71	74	58	61	59	54	52
L Q	G	24	G	G	G	32	40	44	52	54	53	49	48	40	37	40	38	39	37	32	33	39	29	24

HOURLY VALUES OF fmin AT Wakkanai

JUL. 2013

LAT. 45° 10.0' N LON. 141° 45.0' 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	15	14	14	15	14	14	14	18	15	23	23	24	20	26	20	16	18	15	14	14	15	15	14	15
2	15	14	14	14	20	14	14	18	15	20	21	42		27	33	21	17	14	14	14	14	14	15	15
3	14	14	14	14	14	14	14	15	17	46	20	18	26	26	18	17	14	14	14	14	14	15	14	15
4	14	14	15	14	14	14	14	14	22	30	18	38		42	15	27	15	14	14	14	14	14	14	14
5	14	14	14	14	14	14	15	17	17	18	26	39	24	22	23	21	15	14	14	14	14	14	14	17
6	16	14	14	14	14	14	14	14	18	27	23	22	20	22	22	20	18	14	14	14	14	14	14	14
7	14	14	14	15	14	14	14	17	16	24	38	30	24	38		17	20	16	14	14	15	14	14	14
8		14	14	14	14	15	14	14	15	16	33	18	35	21	18	16	15	14	14	14	14	14	14	
9	15	15	15	15	14	14	14	18	18	18	18	20	28	32	17	15	14	14	14	14	15	14	14	14
10	14	14	14	15	15	14	14	17	20	18	20	30	30	24	21	21	21	15	14	18	16	14	15	15
11	14	15	17	14	14	14	14	15	15	20	16	33	30	21	22	17	15	14	14	14	14	14	14	14
12	15	15	15	14	14	14	14	14	17	28	22	60		52	27	20	15	14	14	14	14	16	14	15
13	15	15	15	14	16		14	14	16	21	20	32	24	26	28	23	17	26	14	15	14	14	14	14
14	14	14	14	16	14	14	15	15	16	18	20	18	23	23	28	21	15	16	14	14	14	14	14	14
15	15	15	15	14	14	14	14	14	14	15	24	27	21	32	21	21	15	14	14	14	15	15	14	42
16	14	14	14	14	14	14	14	14	15	22	30	27	27	17	24	23	18	16	14	14	14	14	15	14
17	14	15	14	14	16	15	15	15	22	24	20	22	33	27	20	17	18	15	14	14	14	14	14	14
18	14	14	14	14	14	14	14	18	17	22	21	21	24	23	20	18	15	14	14	14	16	14	14	14
19	14	14	16	15	14	15	14	14	15	22	24	22	27	24	20	17	15	14	14	14	14	14	14	14
20	15	14	15	15	15	14	14		15	17	21	18	21	21	15	17	14	14	14	14	15	14	14	14
21	14	14	14	14	14	14	14	14	16	20	18	16	27	20	18	18	17	15	14	14	14	14	14	14
22	14	15	14	14	14	14	14	14	16	30	18	29	28	27	15	17	15	14	14	14	14	14	14	14
23	14	14	14	14	14	14	14	14	15	18	17	18	18	20	20	15	15	14	14	14	14	14	14	14
24	15	14	14	14	15	14	14	14	15	17	18	20	28	22	15	20	14	14	14	14	15	14	14	14
25	15	15	14	14	15	14		14	14	15	16	53	24	30		16	18	14	14	14	14	14	14	14
26	14	14	14	14	14	14	14	15	20	16	17	29	30		20	16	16	14	14	14	14	14	14	16
27	14	15	14	15	14	15	15	14	16	16	21	21	23	20	21	18	15	15	14	14	14	14	14	14
28	15	14	15	14	14	14	14	14	14	17	20	20	28	21	20	16	20	14	14	14	14	14	14	14
29	14	14	14	14	14	14	14	14	15	17	28	24	29	27	24	18	14	15	14	14	14	14	14	14
30	14	14	14	14	14	14	14	15	16	20	17	21	24	21	18	17	14	14	14	14	15	14	14	15
31	15	14	14	14	14	14	14	14	14	18	30	21	15	20	15	15	14	14	14	14	14	14	14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	31	31	30	30	30	31	31	31	31	28	30	29	31	31	31	31	31	31	31	31	30
MED	14	14	14	14	14	14	14	14	16	20	20	22	25	24	20	17	15	14	14	14	14	14	14	14
U Q	15	15	15	15	14	14	14	15	17	23	24	30	28	27	22	21	18	15	14	14	15	14	14	15
L Q	14	14	14	14	14	14	14	14	15	17	18	20	23	21	18	16	15	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

JUL. 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	53	52	A	45	51	48	58	73	93	A		65	73	76	A	75	76	80	82	90	87	81	71	66	
2	52	54	53	53		63	56	66	69					A	A	A	65	A	68	68	A	74	48	53	
3	38	66	68	63	61	59	62	75	73	A	A	A	A	A	A	86	88	84	91	89	84	A	52	54	
4			53	64	62	61	66	59	A	72	189	A	A	A	A	A	A	A	82	55	54	63	75	73	
5	76	72	66	58	63	67	68	66	57	68	A	A	A	A	78	91	98	98	104	91	64	55	44	A	
6	64	52	58	53	51	53	70	77	62		A		A	A			69	78	80	80	74	A	77	76	
7	A	76	67	54	72	75	76	67	A			68	A	A	A	A	A		53	59	54	66	64	54	64
8	54	N	52	52	45	54	59	72	78	A	A	A	A	A	74	81	81	88	90	84	87	75	73	67	
9	66	A	54	A	47	51	80	86	77	A	A		A	57	A	A	66	76	80	72	A	62	A	54	
10	67	64	51	58	61	62	72	77	80	74	A	74	81	92	87	90	86	87	81	72	78	73	74	76	
11	77	67	73	66	63	72	87	73				A				59		57	58	55	63	46	54	54	
12	52		53		A	A	55	A	73	74	A	A	A	A	75	82	85	75	74	74	66	67	54	54	
13	67	54	63	57	63	58	68	72	80	73	77	84	90	A	91	80	A	80	71	A	75	66	67	38	
14	47	53	52	54	67	63	A	54	62			A	A		67	76	A	74	A	75		74	77	76	
15	52	67	67	A	65	62	67	63	A	54	73	76	73		76	73	76	74	84	87	55	63	A	A	
16	A	63	53	54	57	52	A	A	A	109	A	A	59	A	68	71	72	75	A	80	A	65	54	55	
17	52	52	53	54	52	54	60	70	A	A	A	68		62	59	A	65	66	68	73	74	52		A	
18	52	53	54	59	47	49	68	73	73		A	A		74	82	86	82	86	90	89	76	79	77	A	
19	52		54	54	67	44	56	73	72	66	A	A		A	A	86	A	86	A	77	A	64	73	67	
20	73	67	67	52	57	54	86	74	72	72	78	84	91	87	86	76	75	77	86	A	72	53	71	A	
21			53	58	A	52	77	74	69	A	63	A	A	76	87	89	85	82	84	81	80	74	N	A	
22	58	A	74	66	58	67	87	81	88	90	80	77	A	87	91	87	80	77	80	90	87	76	A	A	
23	54	54	81	67	63	63	77	73	A	A	A			91	100	87	91	91	90	91	86	80	79	76	
24	77	67	52	74	54	51	72	84	81	A	A	A	82	91	90	102	101	97	84	78	54	66	53	54	
25		A	54	48	56	66	70	74	A	A	A	A		A	A		81	A	74	87	83	A	A	A	
26	A	52	52	67	57	65	51	56	88	101	77	77	A	A	A	82	88	87	78	63	64	A	54	54	
27	A	52	52	52	57	54	64	87	80	72	59	A	A	88	A	85	75	73	A	81	73		53	67	
28	61	54	A	52	51	54	66	81	85	A	A	77	A		64	74	76	A	66	63	54	53	54	A	
29	A	52	53	47	A	A	53	A	A	A	A	A	A		A	A	64	66	51	55	72	55	A	61	
30	52	49	A	45	A		70	74	70	66	63	68	72	72	73	73	72	76	78	80	59	A		73	
31	54	54	52	54	52	44	54	74	78	66	A	76	80	74	74	A	87	A	77	A	A	44	67	66	
CNT	23	23	28	28	26	28	29	28	22	14	9	12	9	14	17	22	25	26	27	28	25	25	23	22	
MED	54	54	54	54	57	56	68	73	75	72	77	76	80	76	78	82	80	78	80	79	73	65	67	65	
U Q	67	67	66	61	63	63	74	76	80	74	79	77	86	88	88	87	86	86	84	87	81	74	74	73	
L Q	52	52	52	52	52	52	58	68	70	66	63	68	72	72	73	75	72	74	71	70	63	55	54	54	

HOURLY VALUES OF fEs AT Kokubunji

JUL. 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	24	50	59	23	G	G	27	G	50	81		64	61	67	126	G	G	27	49	34	30	25	28	G
2	G	G	G	G	G	48	31	31	G					92	72	81	90	76	61	79	60	31	39	G
3	G	35	47	31	28	31	44	60	60	72	68	84	106	130	101	72	64	94	85	93	69	44	35	28
4			29	G	33	36	40	30	89	49	174	80	84	189	147	189	93	155	81	80	31	G	32	26
5	33	G	G	45	37	G	G	G	50	70	62	53	78	60	72	G	70	79	52	51	40	30	45	51
6	33	32	27	G	G	G	30	46	80		60		81	70		G	G	48	45	34	31	94	60	60
7	92	33	26	39	42	33	G	G	83	G		50	62	51	61	84	55	52	54	41	29	29	40	28
8	30	29	28	G	G	G	30	58	60	90	70	91	67	72	52	G	48	51	35	60	48	37	27	58
9	39	29	29	31	G	G	25	60	60	61	84		45	50	64	61	57	37	49	38	40	42	71	46
10	28	50	29	G	29	24	43	72	60	G	65	60	73	70	73	G	42	G	28	30	G	24	55	33
11	26	24	G	G	36	58	54	33				61				G		39	30	G	57	48	25	G
12	G		25		29	70	29	44	G	G	77	78	59	67	G	G	G	49	27	G	26	34	48	44
13	35	43	33	58	55	23	G	G	G	60	G	79	G	67	G	G	81	58	110	94	53	35	26	G
14	G	G	G	G	G	G	38	30	G			68	66	50		57	112	69	72	46		58	33	G
15	33	46	46	79	58	26	40	55	58	52	60	G	G		G	G	60	61	34	58	65	60	84	33
16	29	40	35	38	G	33	67	92	79	95	116	64	G	93	54	50	G	43	80	67	114	60	38	50
17	27	G	40	38	31	27	27	29	73	70	50	G		66	43	51	53	28	40	28	50	G	50	
18	29	27	G	G	G	30	39	53	57	51	53	56	G	57	G	43	43	68	36	31	26	30	29	33
19	27	G	G	G	G	29	25	29	54	51	51	72	G	62	50	57	108	71	96	79	58	G	40	29
20	32	26	27	G	31	29	33	48	42	68	61	G	50	80	51	47	68	60	60	89	31	52	46	28
21			32	34	32	G	26	G	59	66	54	61	79	G	G	62	52	106	65	51	87	49	58	49
22	39	59	34	37	28	G	40		54	71	70	55	111	80	66	53	52	50	54	36	59	50	90	58
23	50	43	29	G	28	G	38	67	89	103	79	64	G	G	G	56	105	70	69	52	50	53	40	54
24	43	50	39	34	29	22	27	61	66	70	61	81	50	48	G	57	55	55	35	71	G	G	43	60
25		59	40	34	G	25	41	51	150	129	107	83		95	85		60	95	51	59	50	59	116	45
26	54	46	30	57	46	50	52	39	52	88	60	65	78	184	163	106	48	80	65	42	49	49	50	59
27	58	31	31	36	G	29	31	60	77	49	G	74	109	80	78	50	87	43	84	52	G		42	34
28	58	30	85	33	29	G	28	47	64	190	192	49	138		G	69	G	61	60	43	31	26	28	112
29	58	48	G	39	33	45	49	59	72	65	80	60	73	G	47	53	52	50	60	60	30	44	33	40
30	31	36	51	40	52	G	G	29	G	G	G	G	G	G	G	G	G	29	50	48	45	59		50
31	43	G	35	33	G	G	30	43	53	51	56	58	61	48	82	123	102	115	46	83	59	40	55	44
CNT	28	28	31	30	31	30	31	31	30	27	26	28	26	27	28	29	30	31	31	31	30	30	30	30
MED	32	32	29	33	29	26	31	44	60	66	62	62	64	67	53	53	55	58	54	51	46	41	41	42
U Q	43	46	39	38	33	33	40	59	73	81	79	76	79	80	75	65	81	76	69	71	58	52	55	51
L Q	27	25	25	G	G	G	27	29	50	51	54	54	45	50	G	G	43	43	40	36	30	29	33	28

HOURLY VALUES OF fmin AT Kokubunji
 JUL. 2013
 LAT. 35° 43.0' N LON. 139° 29.0' E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC 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	15	14	14	14	14	20	20	18	43	39		39	39	38	34	49	49	18	14	13	14	17	14	29
2	18	43	15	18	43	14	15	18	53					39	39	38	35	17	15	14	17	14	14	17
3	15	14	13	13	13	13	13	20	23	42	40	39	40	38	37	37	33	17	14	13	15	14	13	14
4			14	14	13	14	14	17	38	39	38	42	39	39	43	37	31	14	13	14	14	20	14	14
5	14	15	17	14	14	34	42	40	42	38	42	42	42	44	40	52	38	21	13	14	14	14	15	14
6	14	15	15	20	17	39	14	47	40		40		38	42			47	21	14	14	13	13	14	15
7	14	13	14	13	13	13	38	18	35	46		42	40	41	39	37	31	20	14	14	14	15	14	14
8	14	14	14	42	14	13	13	17	35	39	40	42	38	35	34	51	29	15	13	14	13	13	15	14
9	14	13	14	14	14	20	37	21	37	39	64		38	42	35	30	21	15	13	13	14	13	14	14
10	13	14	14	14	13	38	13	18	31	50	38	39	38	40	39	53	49	14	13	13	15	15	14	15
11	14	17	14	13	14	13	13	14				40				48		14	13	23	14	14	14	14
12	14		15		13	13	13	14	50	45	38	39	38	40	54	45	44	14	13	21	17	14	15	14
13	13	14	14	13	13	22	14	21	43	40	53	40	55	42	53	57	34	17	13	14	13	13	14	18
14	15	18	14	13	14	26	14	22	46			40	39	38		31	33	14	13	14		18	15	15
15	14	14	14	13	13	13	13	14	22	39	38	53	53		52	45	34	17	15	14	14	14	14	14
16	14	13	13	14	15	13	15	20	18	22	39	38	52	40	40	39	44	17	13	14	14	14	14	13
17	14	15	18	15	14	14	21	20	33	36	39	60		42	54	38	36	40	15	15	15	14	15	
18	13	14	15	15	17	14	14	18	31	39	39	39		40	47	51	34	31	13	14	14	14	14	13
19	13	15	17	18	14	14	15	21	33	36	35	39	55	42	42	37	36	17	15	14	14	14	13	14
20	14	13	14	20	14	13	14	21	22	36	37	49	38	37	39	40	20	14	13	14	14	14	14	14
21			13	17	13	21	14	39	21	35	36	36	38	54	53	38	22	17	15	14	14	14	14	13
22	13	14	14	13	14	15	20	18	34	33	37	37	54	36	34	31	33	14	13	14	14	17	14	13
23	14	13	14	15	13	13	14	17	21	39	39	39	59	60	55	37	33	25	13	13	14	13	14	13
24	13	13	14	14	13	15	14	20	33	39	34	37	38	33	55	30	18	17	13	14	20	17	14	13
25		13	14	15	18	14	15	15	39	36	37	39		36	39		36	21	15	14	20	20	13	13
26	15	14	15	15	14	13	15	18	36	37	38	39	38	36	31	21	20	15	14	13	13	14	14	14
27	15	17	15	15	18	13	14	17	20	40	55	39	39	40	38	35	24	15	17	15	17		18	15
28	14	15	13	14	14	35	13	18	36	39	42	42	39		54	39	42	15	20	14	14	17	14	14
29	13	14	14	13	13	13	13	18	21	37	39	39	38		40	39	22	18	14	13	15	14	13	14
30	17	14	17	13	14		38	17	22	55	46	54	54	55	42	50	53	14	14	14	14	14		14
31	14	13	14	14	14	21	13	14	39	38	40	39	39	40	42	40	20	18	13	14	15	14	14	13
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	31	30	31	30	31	31	30	27	26	28	26	27	28	29	30	31	31	31	30	30	30	30
MED	14	14	14	14	14	14	14	18	34	39	39	39	39	40	40	39	34	17	13	14	14	14	14	14
U Q	14	15	15	15	14	21	15	21	39	40	40	42	52	42	52	48	38	18	15	14	15	15	14	14
L Q	13	13	14	13	13	13	13	17	22	36	38	39	38	38	38	37	24	14	13	14	14	14	14	13

HOURLY VALUES OF foF2 AT Yamagawa

JUL. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	52	72	58	63	58	50	52	70	84	76	73	72	A	A	74	80	81	A	86	88	87	77	52	54	
2	73	53	67	62	51	52	63	70	87	59	A	A	A	A	A	68	A	74	71	A	77	A	72	71	
3	77	66	52	58	63	63	66	64	66	A	A	A	65	A	A	A	A	A	A	108	78	A	A	76	
4	81	82	81	77	72	55	67	A	A	76	66	A	A	149	A	78	62	97	A	90	78	A	76	77	
5	78	80	77	72	65	60	64	67	A	74	A	A	B	65	72	87	88	94	116	88	77	72	76	84	
6	86	78	59	57	66	70	81	87	78	64	63	A	A	A	71	76	80	92	94	85	76	A	A	67	
7	A	77	72	71	71	78	80	80	78	80	74	77	86	81	74	A	A	62	A	A	77	58	N	A	
8	66	67	67	64	52	48	52	58	67	67	A	A	A	A	A	A	90	A	94	88	78	A	67	70	
9	54	67	58	47	48	48	62	86	75	62	61	A	A	66	69	74	83	94	89	77	72	52	54	54	
10	54	52	72	71	73	67	72	A	A	A	A	A	80	78	90	90	91	90	90	77	77	54	N	72	
11	76	N	75	72	67	77	87	62	A	39	A	A	A	71	A	A	A	64	76	67	52	53	53	54	
12	53	44	54	57	60	53	43	61	68	61	A	A	73	76	79	82	85	81	82	73	64	64	54	54	
13	54	67	70	67	53	50	54	71	73	67	A	77	80	81	84	64	72	78	90	78	46	A	74	54	
14	67	73	75	66	65	63	51	76	77	A	A	B	A	B	A	72	75	77	49	78	73	74	78	44	
15	42	73	66	64	N	52	62	56	64	74	66	81	A	B	77	80	83	80	90	A	77	A	A	55	
16	A	A	72	54	52	45	A	64	A	A	A	A	A	78	59	79	86	84	85	84	77	76	73	73	
17	76	73	54	58	58	54	52	77	74	72	62	B	70	67	72	72	76	75	A	A	80	A	A	73	
18	74	75	73	67	62	58	66	75	65	A	A	A	A	A	A	84	88	90	87	87	80	77	A	73	
19	72	66	58	68	66	67	62	71	64	63	67	68	73	72	77	85	90	90	92	A	A	74	81	A	
20	A	78	72	66	66	62	70	73	76	78	86	77	A	96	A	A	90	91	114	92	74	A	53	55	
21	73	75	76	71	64	63	70	74	68	67	A	A	76	86	91	91	90	92	86	80	78	78	79	76	
22	66	74	72	72	72	74	75	76	N	82	77	A	A	84	88	86	88	88	90	91	87	77	53	67	
23	67	54	66	72	66	58	67	80	75	A	A	A	A	91	86	83	94	96	109	92	95	92	82	78	48
24	75	87	106	80	75	75	67	87	72	A	A	A	A	A	91	97	96	96	90	77	A	A	74	74	
25	A	67	52	66	61	60	66	63	67	A	A	A	A	76	77	80	88	87	90	85	A	A	67	A	
26	65	67	67	67	66	52	60	59	74	97	72	72	76	87	A	A	87	87	81	A	A	66	A	54	
27	A	A	A	52	54	52	60	59	74	A	A	74	88	93	60	A	79	106	90	87	81	A	76	A	
28	72	72	74	62	58	62	63	78	90	71	76	78	59	A	78	A	91	88	75	76	73	53	44	52	
29	53	52	52	54	58	52	51	56	60	A	A	A	A	A	A	A	67	A	58	67	73	54	67	52	
30	54	51	48	47	45	45	54	70	A	67	73	72	71	70	76	77	84	87	88	87	77	64	67	64	
31	67	53	73	63	52	48	54	67	70	A	75	77	78	A	86	87	96	91	77	A	A	A	A	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	26	28	30	31	30	31	30	29	24	20	14	11	13	18	22	22	27	27	27	24	26	19	22	26	
MED	67	70	68	66	62	58	63	70	74	69	72	77	76	78	77	80	87	88	89	85	77	66	70	66	
U Q	75	75	73	71	66	63	67	76	76	76	75	77	83	86	86	87	90	92	90	88	78	77	76	73	
L Q	54	60	58	58	54	52	54	62	67	63	66	72	72	71	72	76	80	80	81	77	73	54	54	54	

HOURLY VALUES OF fEs AT Yamagawa

JUL. 2013

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

$\begin{matrix} \text{H} \\ \text{D} \end{matrix}$	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	40	36	28	54	33	27	23	32	70	56	42	46	62	84	61	71	67	78	36	35	40	G	G	G			
2	G	28	G	G	28	36	33	38	45	43	60	56	60	68	76	47	74	66	50	86	32	50	33	46			
3	32	G	46	50	50	36	50	34	36	81	75	74	58	82	96	136	125	120	156	78	49	48	46	44			
4	39	24	G	G	G	G		31	58	83	72	59	94	55	G	51	72	73	81	93	44	50	60	49	46		
5	50	35	40	49	47	34	32	52	65	49	155	113	B		35	G	60	74	53	52	40	42	32	33	G		
6	23	G	G	G	G	G		33	34	47	55	49	57	65	84	49	G		46	59	49	60	60	72	91	58	
7	70	58	54	36	47	41	45	61	61	65	62	46	58	67	61	84	86	46	77	74		G	36		36	G	
8	33	40	40		G	G		26	33	58	64	77	74	78	103	95	151	73	117	60	52	33	36	34		G	
9	33	G	31	40	34	G		23	49	62	48	54	94	50	48	36	G		35	36	39	32	51	32	36	29	
10	34	28	G	G	28	39	39	79	112	118	76	92	50	65	G		68	43	33	46	32	38	33	24	38	G	
11	30	G	38	G	G	G		32	84	34	43	50	60	59	102	82		95	29	59	50	31	27	26		G	
12	G	G	G	G	G		26	31	53	46	50	84	54	48	59	58	39	54	51	52	34	G	G		35	38	
13	28	26	G	60	58	G		47	49	62	36	95	48	54	56	G	G		64	70	65	60	55	81	53	55	
14	73	38	49	50	46	G		35	55	68	60	50		52	B	35	57	32	54	36	50	40	27	27	30		
15	G	27	40	G	G		31	35	40	54	66	49	G		B	66	70	68	66	40	92	111	84	83	49		
16	73	79	54	69	28	G		72	48	78	75	82	97	75	66	64	46	45	39	49	39	G		28		39	
17	32	G	34	G	28	27		82	61	40	35		B	G	G		44	35	G		47	76	78	50	58	58	33
18	30	41	G	G	G		30	32	38	56	64	73	49	58	68	63	52	49	50	41	31	29	33	80	28		
19	37	36	50	59	60	32	52	28	41	38	36	39	43	47	G	G		34	30	48	80	74	34	40	59	G	
20	46	38	26	33	40	32	33	39	46	60	59	69	88	76	105	77	G		36	40	51	45	44	60	38		
21	G	G	G		39	54	29	32	33	46	58	64	68	62	48	64	G		48	59	51	139	34	34	34	46	G
22	38	46	39	31	24	G		44	70	69	49	50	102	80	68	66	70	60	72	73	46	50	56	43		G	
23	29	28	24	G	G	G		53	42	55	83	95	80	82	61	74	35	59	59	66	83	60	58	39	50		
24	40	49	59	57	G	G		23	50	68	79	104	75	80	90	83	81	63	50	73	56	68	36	27	37		
25	58	32	34	30	29	G		34	37	44	82	74	85	82	52	90	46	49	66	115	61	85	86	73	59		
26	58	53	36	34	32	34		G	54	68	53	64	54	64	108	77	89	41	56	61	116	91	40	68	67		
27	49	79	58	34	35	46	54	39	69	78	180	89	73	38	52	119	106	50	69	36	G	G	40	59	58	70	
28	34	26	25	40	56	29	G		70	44	50	37	36	G		92	34	50	38	31	26		26	30	43	G	
29	32	34	45	40	G	G		34	23	34	61	95	71	96	93	48	58	33	48	81	62	33	22	27	40	G	
30	G	G	34	26	G	G		32	27	74	34	47	38	34	G	G		34	32	31	51	27	59	38	42	49	
31	54	43	G	G	G		30	29	36	31	48	67	68	61	68	80	78	62	46	72	81	79	32	32	78		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	31	31	31	31	31	31	31	31	31	31	31	29	30	29	31	31	31	31	31	31	31	31	31	31	31	31	
MED	34	32	34	33	28	27	32	40	61	58	64	68	60	65	61	57	54	53	52	50	44	36	38	39			
U Q	49	41	45	49	46	34	44	54	69	75	77	90	78	79	77	78	73	66	72	78	60	58	53	50			
L Q	29	G	G	G	G	G		23	34	46	48	49	48	52	48	36	35	41	40	48	35	32	32	30	28		

HOURLY VALUES OF fmin AT Yamagawa

JUL. 2013

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

$\begin{matrix} \text{H} \\ \text{D} \end{matrix}$	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	15	14	14	14	15	15	15	14	20	29	52	28	39	36	35	28	18	16	14	14	17	18	15	15
2	15	15	15	14	15	14	14	14	15	21	29	34	36	30	35	39	20	18	16	16	14	14	16	14
3	15	14	15	16	14	14	14	15	17	38	35	38	28	30	36	35	20	20	15	15	14	15	15	14
4	15	15	23	16	15	14	14	15	17	22	29	30	38	101	29	36	20	15	14	14	15	15	14	14
5	15	14	14	14	15	14	14	15	18	23	36	36	B	53	54	36	20	15	16	15	15	14	14	15
6	15	15	18	16	16	15	14	15	21	18	28	35	34	33	29	53	20	14	14	14	18	14	15	15
7	14	15	14	14	14	15	15	15	16	20	39	36	42	39	38	36	20	18	15	14	14	14	15	16
8	14	14	14	16	15	17	14	15	20	21	24	30	35	34	33	28	20	14	14	14	14	15	15	17
9	16	15	16	15	15	15	15	16	17	20	24	26	27	29	23	54	26	17	14	14	14	14	14	14
10	15	15	15	18	15	14	14	16	17	21	30	34	36	35	55	27	23	17	14	14	14	15	15	14
11	14	16	14	15	16	15	16	14	14	23	24	27	40	40	38	35	23	20	15	14	14	14	15	15
12	15	14	15	15	15	15	15	15	20	20	30	34	38	38	36	24	18	16	14	14	14	16	14	14
13	14	15	15	14	14	16	16	14	17	20	18	40	40	36	54	53	23	15	14	14	14	14	14	15
14	15	14	14	14	14	14	15	17	21	23	28	B	38	B	71	38	20	16	14	14	14	15	15	15
15	15	15	17	15	15	15	14	14	17	18	21	47	36	B	36	27	20	20	15	16	15	15	15	14
16	15	14	14	15	15	15	14	15	17	23	28	35	36	38	34	27	24	17	14	14	15	14	16	14
17	14	15	14	15	14	14	14	14	17	18	26	B	101	55	53	27	36	18	15	14	14	14	15	14
18	14	14	14	15	15	17	15	16	17	26	29	34	34	38	33	36	24	17	15	15	14	15	16	15
19	14	15	14	14	15	14	15	15	18	26	27	28	35	35	55	53	22	18	15	15	15	14	14	14
20	14	14	15	15	14	14	14	16	20	20	27	36	34	35	28	27	27	18	14	14	16	14	14	14
21	15	16	15	15	15	15	14	14	15	26	36	21	26	39	28	21	21	17	14	14	14	14	14	15
22	14	14	14	14	14	15	17	15	14	24	30	33	34	32	30	27	21	17	14	14	14	15	14	16
23	15	14	15	18	14	15	16	15	18	26	28	33	30	27	28	26	21	18	16	14	14	15	15	16
24	14	14	14	14	16	14	16	15	18	24	35	28	30	34	26	28	17	18	16	15	14	14	14	14
25	14	14	16	14	15	15	15	15	18	21	27	34	33	36	39	26	20	15	14	14	17	14	14	14
26	14	15	15	14	14	14	23	14	18	24	23	26	35	38	27	23	18	15	14	15	15	14	15	15
27	14	15	17	15	15	14	14	16	18	21	23	30	38	54	21	35	20	14	15	15	14	14	14	15
28	15	14	14	15	14	15	14	15	16	18	27	29	54	40	27	24	18	22	16	18	14	16	15	14
29	15	14	14	14	14	14	15	14	15	18	26	36	28	81	38	71	18	17	15	15	15	15	15	15
30	15	15	14	15	15	14	15	14	17	20	20	22	26	101	58	23	20	18	16	14	15	15	15	15
31	14	14	15	15	16	15	15	14	17	23	36	36	38	28	36	18	18	16	14	15	15	14	14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	29	30	29	31	31	31	31	31	31	31	31	31	31
MED	15	14	15	15	15	15	15	15	17	21	28	34	36	36	35	28	20	17	14	14	14	14	15	15
U Q	15	15	15	15	15	15	15	15	18	24	30	36	38	40	39	36	23	18	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	17	20	24	28	33	33	28	26	20	15	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Okinawa

JUL. 2013

LAT. 26° 41.0' N LON. 128° 09.0' E SWEEP 1.0 MHz TO 30.0 MHz 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	79	69	72	67	52	53	48	69	A	74	A	74	A	67	A	A	A	A		94	100	A	77	N	78
2	59	73	84	49	64	53	56	79	74	62	A	A	A	A	75	77	77	81	77	71	76	54	54	A	
3	59	A	A	54	A	52	60	67	75	B	B	67	A	A	A	A	113	127	125	106	84	48	99	99	
4	67	59	52	82	84	76	72	72	82	85	A	A	B	59	A	84	90	87	69	89	73	54	54		
5	79	81	82	63	72	49	54	69	72	84	59	A	A	B	73	87	103	106	104	A	A	A	N	87	
6	51	88	83	49	58	52	80	87	82	74	59	75	B	A	A	87	90	108	108	A		72	86	67	53
7	66	A	64	52	A	74	76	83	84	94	A	A	A	107	96	86	85	78	80	81	89	78	54	66	72
8	A	54	73	58	59	B	52	68	67	A	A	A	A	86	94	102	104	113	108	87	88	74	71	52	
9	76	74	74	67	57	52	63	78	82	72	B	B	B	66	59	87	88	106	88	88	88	54	64	73	66
10	67	B	87	A	B	48	82	86	73	A	109	A	A	A	102	88	105	104	103	88	73	54	72	54	
11	A	80	72	73	72	74	89	54	A	B		B	B	74	A	A	A		82	78	81	54	51	A	B
12	52	53	59	60	52	A	54	62	64	89	A	A	A	169	86	A	A	92	100	88	84	54	51	B	39
13		A	53	76	66	B	54	64	70	A	A	A	75	86	86	102	91	98	89	85	54	58	A	A	
14	79	A	70	58	54	B	78	96	77	A	A	A	75	77		93	88	94	88	78	76	52			
15	54	64		52	52	52	51	53	63	A	A	77	89	A	85	B	97	93	102	104	74	53	A	54	
16	B	66	A	57	52	54	B	45	A	A	A	71	A	86	91	90	109	107	108	105	88	79		53	
17	78	67	76	63	52	52	54	72	70	71	67		74	78	77	78	82	88	88	96	77	73		65	
18	52			78	80	60	73	72	67	58	67		73	B	73	87	103	88	86	88	84	52	70	69	
19		66	A	62	65	74	62	65	73	B	70	72	76	A		87	90	107	102	87	81	76	53	54	
20	A	73			67	53	63	69	74	80	82	85	104	107	117	110	92	121	127	94	57	54	74	54	
21	A	54	67	76	58	B	67	73	70	58	A	73	80	84	107	101	104	89	88	86	86	78	67	A	
22	82	A	52	52	80	62	A	73	66	A	A	A	85	A	87	91	A	104	120	107	72	54	54	66	
23	72	39	72	67	54	51	64	72	A	A	B		76	116	107	128	A	134	128	130	49	108	87	N	
24	83	A	84	81	73	73	81	81	65	A	A	A	74	84	A	116	120	96	87	A	84	A	65	53	
25	74	52	70	67	62	60	52	55	68	68		73	77	A	91	87	88	88	105	90	87	65	67	54	
26	67	67	73	A	64	52	54	62	75	75	75	B	A	87	105	102	107	96	78	86	A	A	A	A	
27	A	A		54	44	57	54	109	66	A	78	72	68	82	91	107	A	130	132	98	108	108	86	85	59
28	88	86	87	74	66	B	69	87	88	A	72		72		90	78	106	89	89	86	73	71	73	52	
29	52	52	52	52	58	52	54	67	79	61	A	A	A	B	A	67	71	66	75	73	76	63	54		
30	52	A	57	55	53	58	53	64	57	66	A	B		B		92	91	107	108	86	86	53	54	67	
31	54	A	54	53	54	47	53	67	63	67	A	77	82	87	100	110	122	106	93	99	88	66	88	73	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	23	20	25	28	28	25	29	31	26	18	10	11	17	18	20	25	27	30	31	28	28	28	21	22	
MED	67	66	72	61	58	53	62	69	72	73	71	73	77	86	90	88	92	99	93	88	76	60	67	56	
U Q	79	73	79	70	66	61	74	78	77	80	75	77	87	87	103	102	106	107	108	99	85	75	73	69	
L Q	54	54	55	52	54	52	54	64	67	66	67	71	74	77	81	86	88	88	87	86	72	53	54	53	

HOURLY VALUES OF fEs AT Okinawa

JUL. 2013

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	32	G	76	G	60	56	54	85	98	144	68	58	59	36	25	G
2	G	G	G	G	G	G	G	33	32	52	54	63	58	41	G	52	65	52	57	36	G	36	39	46
3	40	48	36	G	51	52	51	41	41	B	B	66	94	104	63	69	70	G	42	39	G	40	28	G
4	G	G	G	G	G	36	G	28	G	56	81	55	B	G	55	G	49	56	71	36	39	32	35	G
5	G	32	G	27	G	33	24	26	G	G	G	46	96	B	G	G	58	56	62	88	72	69	43	32
6	24	G	G	G	G	G	23	G	46	G	52	G	B	59	62	G	G	42	42	72	25	G	G	G
7	G	53	57	G	35	30	24	45	82	68	51	76	G	G	G	61	61	79	95	48	25	G	43	G
8	29	G	G	G	G	B	30	41	47	51	90	78	83	66	90	90	79	91	85	59	82	40	34	28
9	G	G	G	G	27	26	G	26	35	G	B	B	B	53	G	G	G	49	42	G	50	28	G	32
10	27	B	G	26	B	G	24	55	44	62	92	124	71	128	51	49	51	89	G	G	G	G	G	38
11	43	34	G	G	32	G	35	26	29	B	G	B	B	66	60	71	67	75	62	35	34	G	46	B
12	27	36	G	G	G	G	G	50	45	59	69	59	80	62	69	79	51	28	G	G	G	G	B	G
13	G	28	39	26	36	57	G	35	49	66	67	104	77	62	56	G	51	50	52	34	36	69	53	86
14	41	49	G	G	G	B	24	65	83	G	93	54	G	G	G	G	G	29	61	27	G	G	G	G
15	G	G	G	G	G	G	30	50	52	88	103	G	G	58	59	B	G	50	53	58	36	28	28	G
16	B	43	24	G	G	G	B	39	102	88	70	53	47	61	65	53	66	54	40	58	34	G	G	G
17	G	G	G	G	G	G	35	38	G	G	G	G	G	G	G	G	50	29	61	62	G	G	G	G
18	G	G	G	G	33	36	G	35	48	63	G	G	G	B	G	G	G	G	42	50	46	46	26	43
19	G	32	49	39	40	27	59	72	34	B	G	G	G	51	G	G	G	32	41	69	49	38	38	38
20	27	G	G	G	G	G	G	51	49	52	78	70	G	61	G	G	G	38	40	40	34	50	50	59
21	64	G	36	G	24	B	40	51	50	G	50	68	69	G	48	84	58	66	75	67	82	45	G	26
22	41	28	G	G	G	G	44	43	47	76	79	83	G	108	65	48	68	G	36	35	G	30	27	G
23	G	G	G	G	G	G	G	61	129	82	B	G	G	74	79	68	79	G	61	114	49	40	G	G
24	G	24	G	G	G	G	G	G	48	65	93	96	G	64	60	80	56	89	71	86	45	52	39	39
25	33	G	48	49	G	G	27	26	29	G	G	G	G	79	G	G	G	G	42	48	53	51	50	27
26	28	34	45	53	44	G	38	26	52	G	G	B	64	G	71	77	G	48	53	46	83	92	111	59
27	48	40	57	28	26	40	G	36	138	G	G	66	84	G	G	152	G	G	G	G	G	G	G	27
28	28	34	G	G	G	B	G	G	39	53	51	G	G	G	G	58	G	34	27	39	47	G	G	G
29	40	G	26	G	34	G	G	28	28	G	52	72	106	B	66	G	G	47	42	37	28	G	26	G
30	G	34	G	G	G	G	G	G	36	G	53	B	G	B	G	G	G	G	48	51	32	39	44	46
31	G	51	44	G	G	G	G	27	35	51	57	62	G	59	58	G	52	58	49	28	G	35	58	34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	31	30	27	30	31	31	28	28	27	27	27	31	30	31	31	31	31	31	31	30	30
MED	12	26	G	G	G	G	12	35	45	52	54	59	G	59	54	48	51	48	49	46	34	35	28	26
U Q	33	34	36	G	32	30	30	50	50	64	78	72	77	66	63	71	65	58	62	59	49	45	43	38
L Q	G	G	G	G	G	G	G	26	32	G	G	G	G	G	G	G	G	28	41	35	G	G	G	G

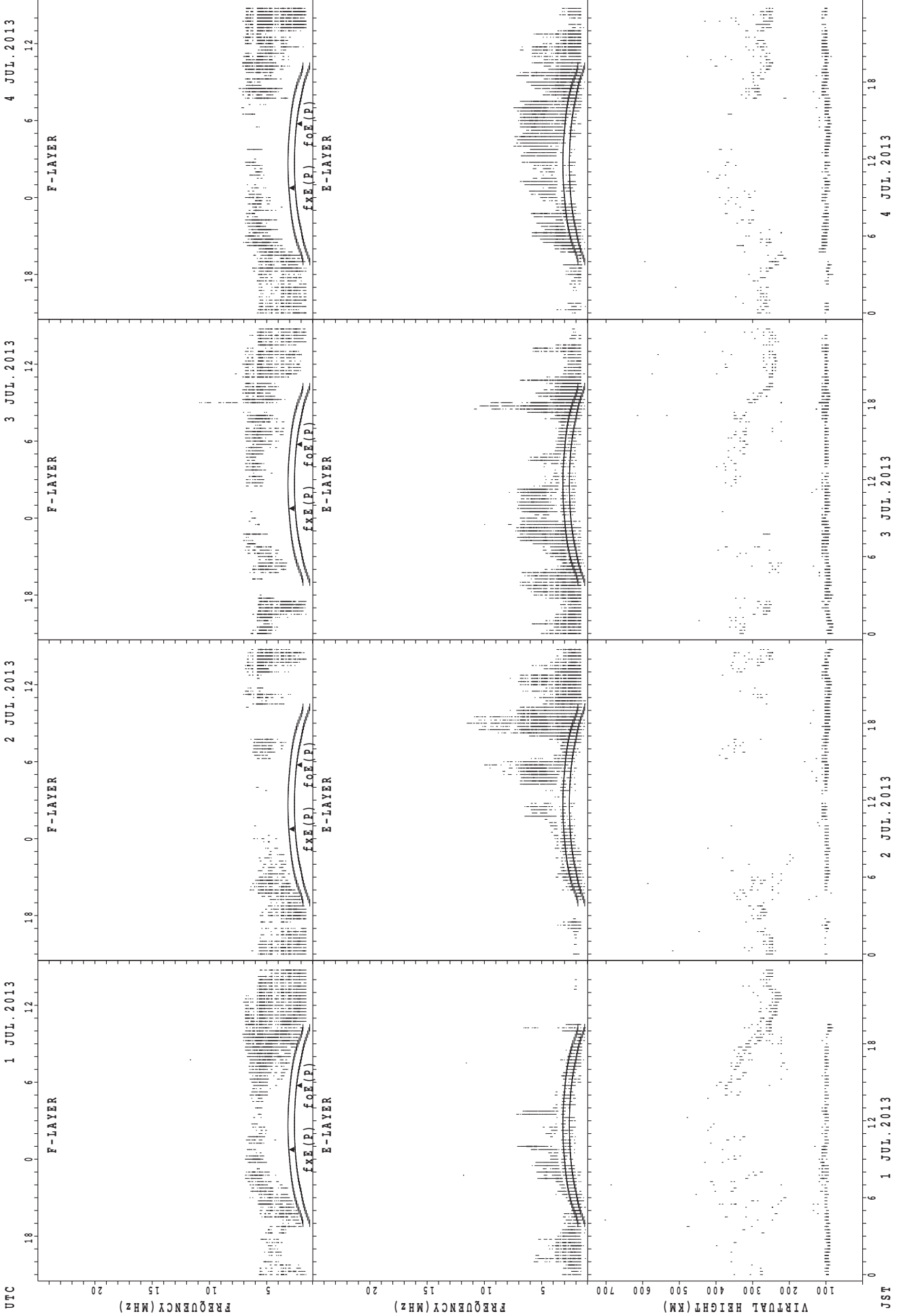
HOURLY VALUES OF fmin AT Okinawa

JUL. 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	41	28	47	26	21	22	81	28	23	53	42	59	42	40	40	43	32	20	24	14	16	15	17	20
2	41	20	15	43	21	17	36	18	22	30	36	40	40	71	53	40	39	35	20	17	21	15	18	15
3	17	16	17	32	18	15	17	17	21	B	B	42	42	43	42	44	40	42	21	14	22	15	15	42
4	17	16	20	16	64	16	40	20	44	35	40	40	B	59	40	62	55	22	15	14	15	16	18	71
5	43	15	20	18	16	17	29	37	42	47	56	81	42	B	58	63	39	30	17	16	15	15	15	18
6	15	27	16	40	40	39	24	36	30	54	40	58	B	40	34	91	54	21	18	15	17	28	39	42
7	18	16	17	26	17	14	16	18	22	39	43	42	63	56	55	39	39	22	20	24	16	18	15	18
8	15	32	28	36	21	B	16	17	18	33	38	43	43	42	40	35	34	20	20	17	17	15	16	41
9	30	41	17	21	27	14	26	18	21	48	B	B	B	40	91	54	52	21	17	22	17	16	20	15
10	15	B	43	18	B	20	17	21	29	36	34	42	42	42	42	30	27	17	17	21	18	46	41	18
11	17	15	22	40	14	26	20	14	18	B	91	B	B	40	42	39	40	21	20	17	15	26	16	B
12	18	15	18	21	37	81	39	20	23	42	40	42	42	43	42	43	35	21	15	21	40	42	B	66
13	42	22	15	15	15	15	23	28	38	30	39	43	42	44	42	59	40	34	18	17	14	14	17	15
14	16	17	29	23	40	B	15	18	22	44	40	42	59	62	59	58	53	44	16	14	20	20	43	66
15	36	20	66	32	20	38	15	18	34	36	42	60	45	44	42	B	47	43	27	17	15	15	15	17
16	B	16	15	22	21	17	B	23	22	38	38	43	40	42	54	42	34	23	18	18	14	16	66	21
17	47	15	18	18	18	18	17	17	42	45	59	91	59	61	64	59	48	44	41	17	17	21	66	35
18	21	71	18	16	16	16	23	18	26	35	53	55	58	B	91	60	55	44	26	17	14	18	44	17
19	71	15	16	17	16	15	17	21	26	B	54	54	59	42	72	53	54	22	18	16	15	15	16	20
20	15	18	23	81	34	17	18	21	22	39	36	42	59	42	57	54	61	22	17	15	14	15	17	16
21	16	18	20	40	35	B	17	21	24	43	81	43	45	62	57	40	39	33	15	15	16	15	15	15
22	15	16	33	30	20	21	26	18	27	36	40	42	61	40	40	49	32	52	21	20	38	15	43	22
23	20	20	14	44	18	20	21	23	33	38	B	101	111	41	40	39	39	43	21	16	15	18	20	43
24	62	16	42	18	18	27	20	36	22	40	42	44	58	40	42	39	30	28	16	21	16	20	17	14
25	15	21	21	18	29	18	18	17	22	60	91	56	63	40	64	56	N	48	22	21	18	17	18	17
26	15	33	17	20	20	22	23	18	45	57	47	B	40	73	42	42	55	33	27	15	17	20	18	16
27	17	15	17	15	17	17	20	35	30	48	59	42	42	63	62	44	54	42	39	21	17	15	44	17
28	17	17	24	27	44	B	18	15	20	29	27	91	62	111	54	57	54	24	21	15	15	43	17	24
29	17	20	17	16	15	16	18	28	21	45	40	39	40	B	42	53	52	29	16	14	14	21	18	42
30	42	15	40	18	20	20	29	38	21	50	29	B	91	B	55	54	54	48	20	21	18	17	39	16
31	30	16	17	32	15	20	17	35	21	39	40	42	111	44	43	62	38	20	21	30	66	15	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	31	30	27	30	31	31	28	28	27	27	27	31	30	30	31	31	31	31	31	30	30
MED	18	17	18	22	20	18	20	20	23	40	40	43	45	43	43	51	40	29	20	17	16	16	18	18
U Q	41	21	28	32	29	22	26	28	30	47	53	58	61	61	58	58	54	43	21	21	18	20	39	41
L Q	16	16	17	18	17	16	17	18	21	36	38	42	42	40	42	40	38	21	17	15	15	15	16	16

SUMMARY PLOTS AT Wakkanai



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

4 JUL. 2013

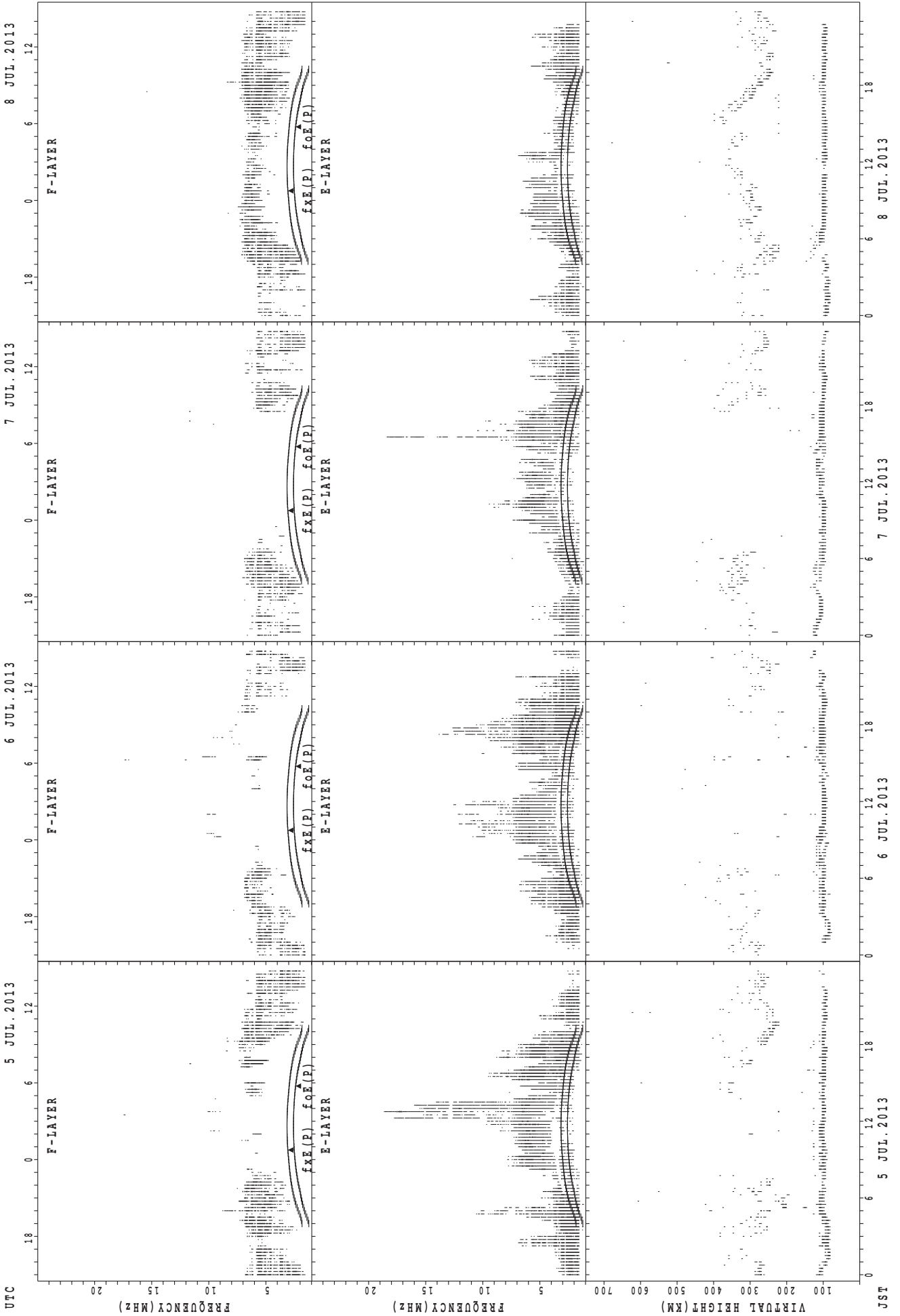
3 JUL. 2013

2 JUL. 2013

1 JUL. 2013

JST

SUMMARY PLOTS AT Wakkanai



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

5 JUL. 2013

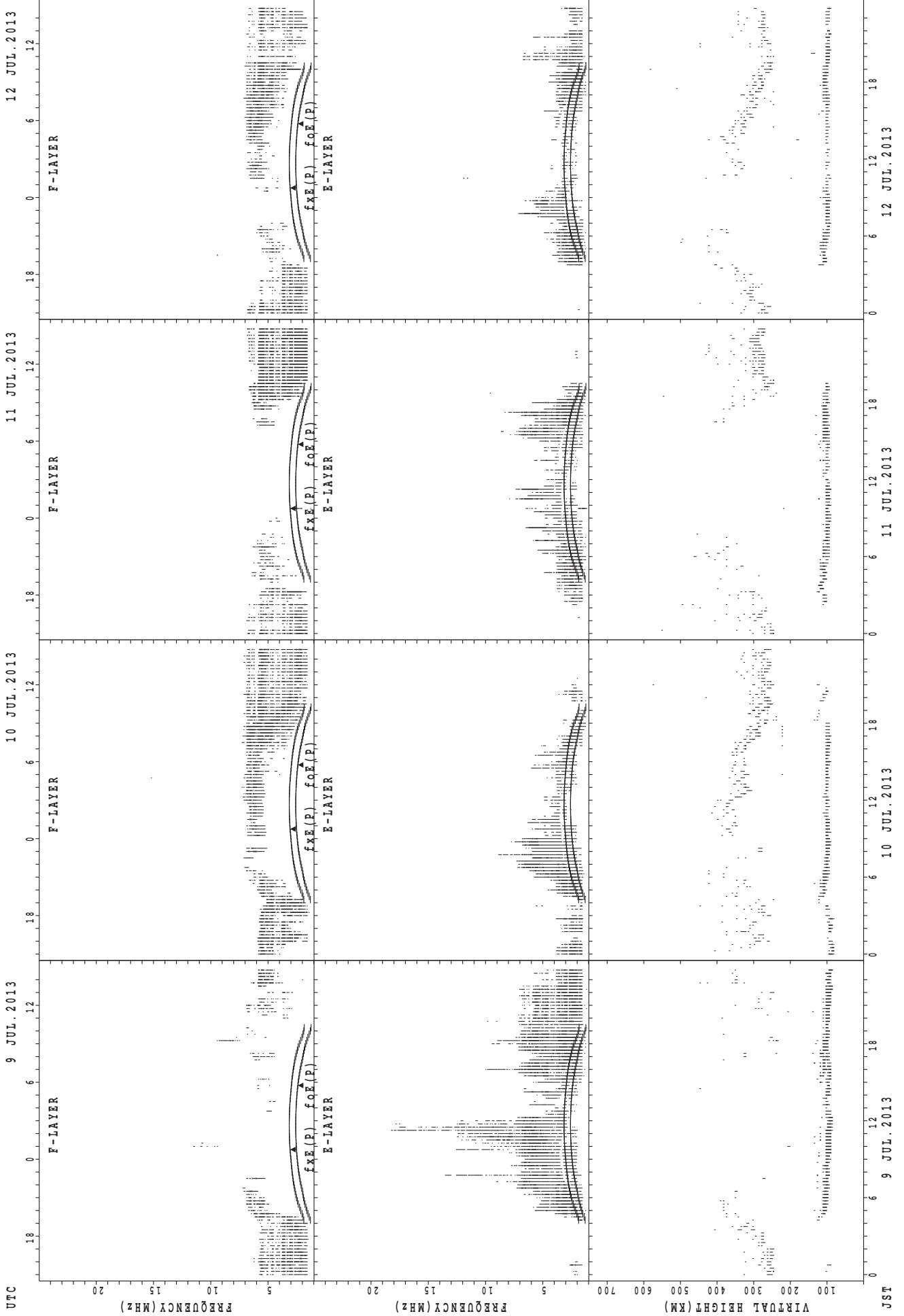
6 JUL. 2013

7 JUL. 2013

8 JUL. 2013

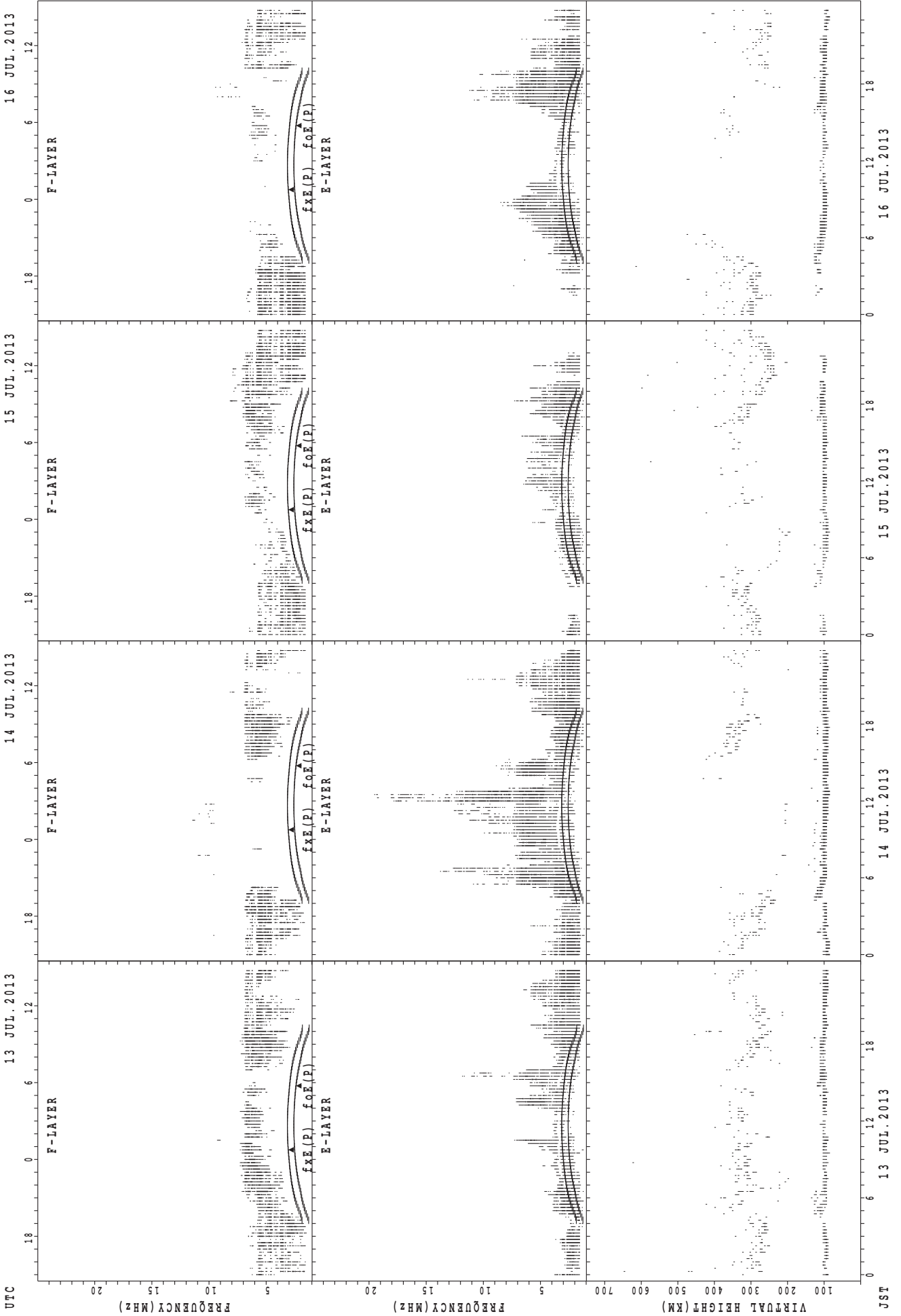
JST

SUMMARY PLOTS AT Wakkanai



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

SUMMARY PLOTS AT Wakkanai



fx E(P); PREDICTED VALUE FOR fx E
foE(P); PREDICTED VALUE FOR foE

16 JUL. 2013

15 JUL. 2013

14 JUL. 2013

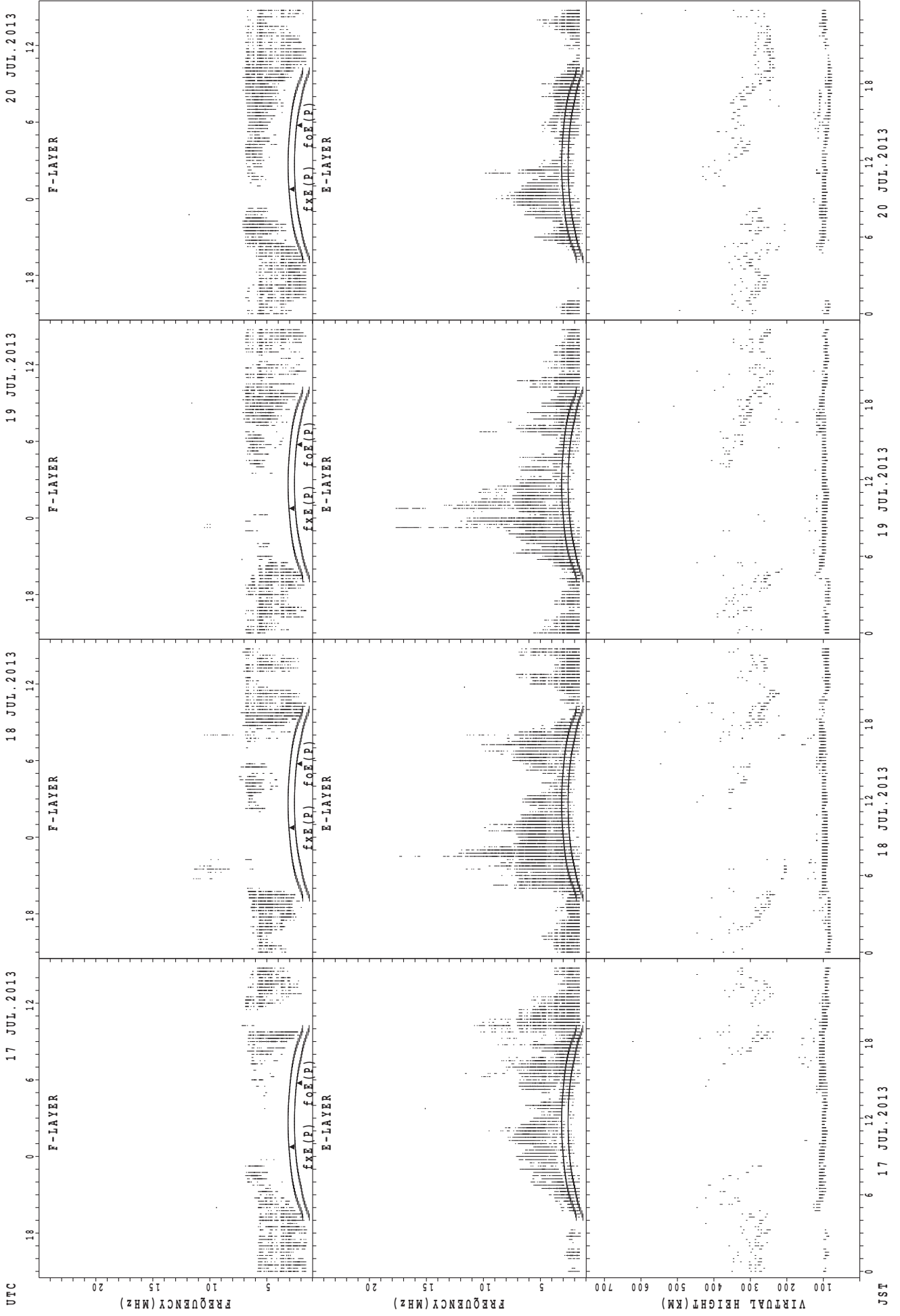
13 JUL. 2013

13 JUL. 2013

14 JUL. 2013

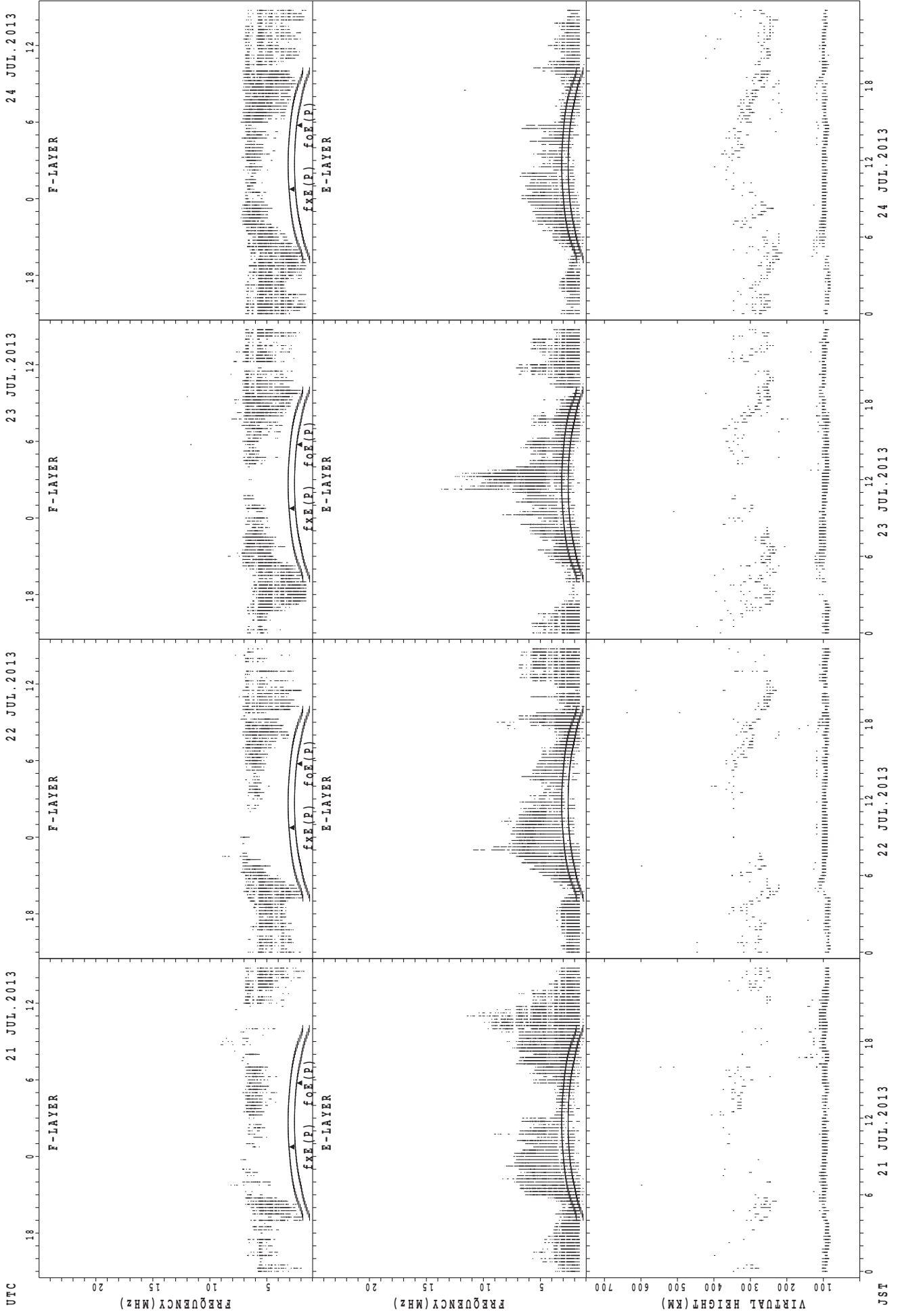
JST

SUMMARY PLOTS AT Wakkanai



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

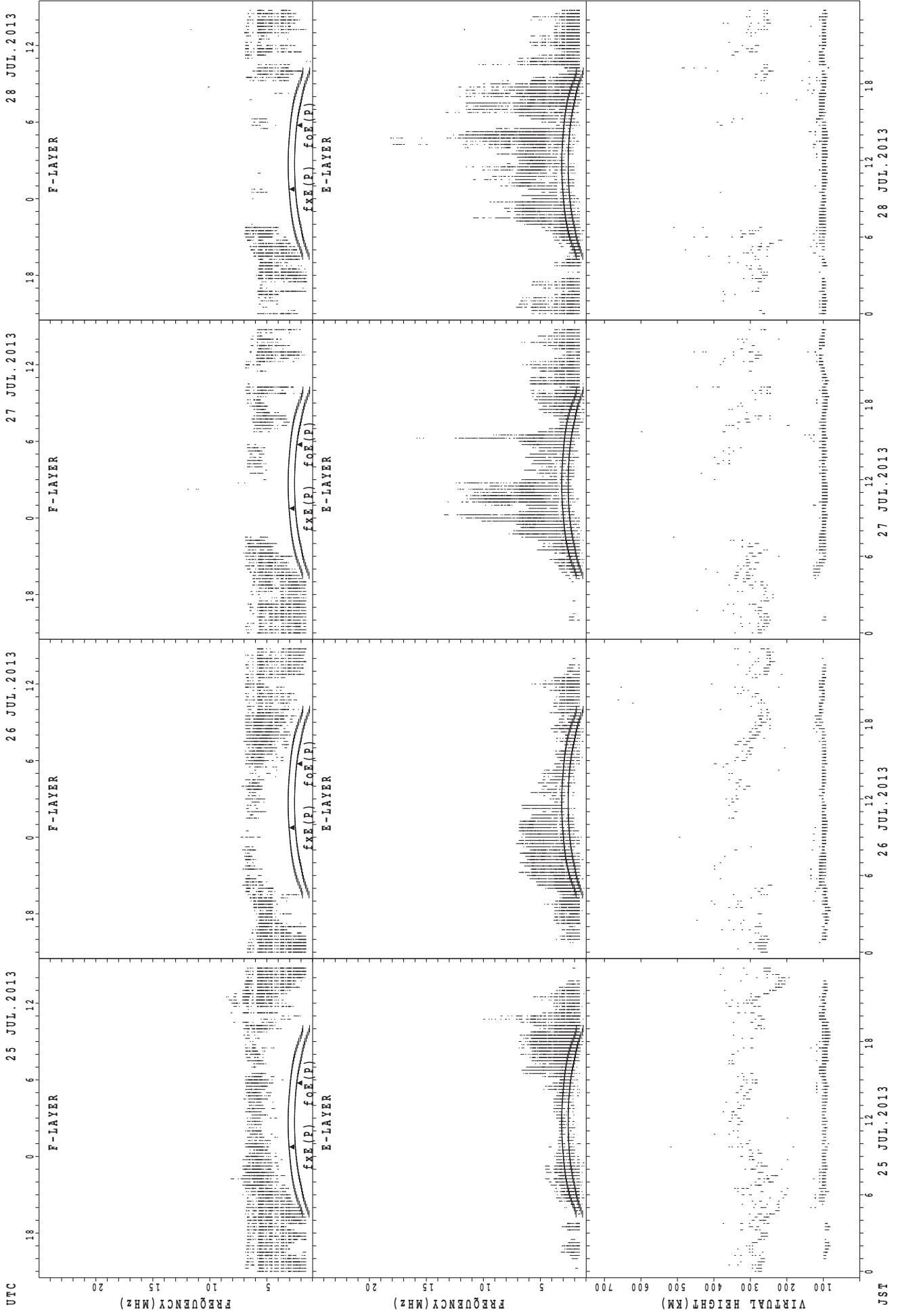
SUMMARY PLOTS AT Wakkanai



JST 21 JUL. 2013 22 JUL. 2013 23 JUL. 2013 24 JUL. 2013

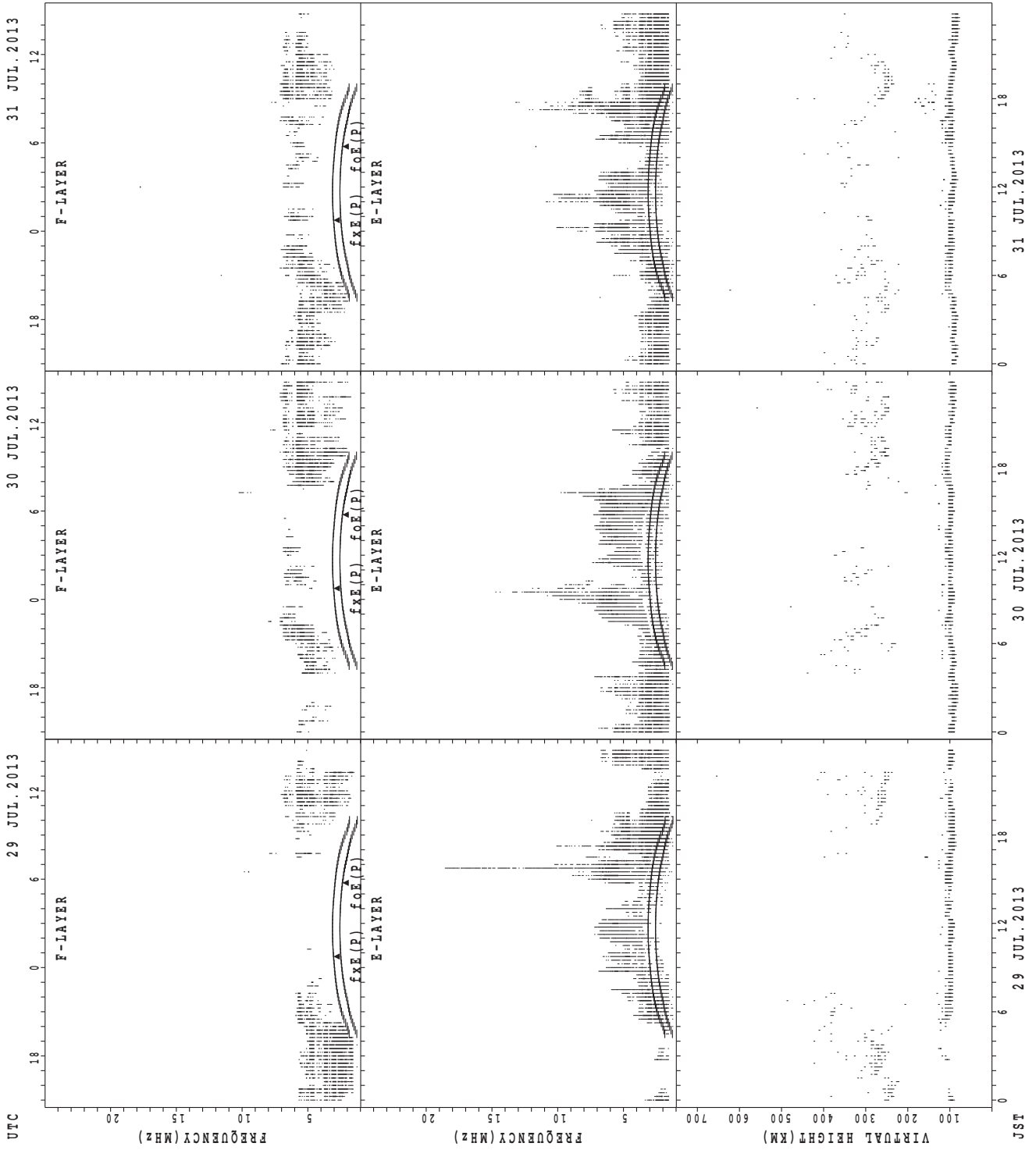
$f_{XE}(P)$; PREDICTED VALUE FOR f_{XE}
 $f_{oE}(P)$; PREDICTED VALUE FOR f_{oE}

SUMMARY PLOTS AT Wakkanai



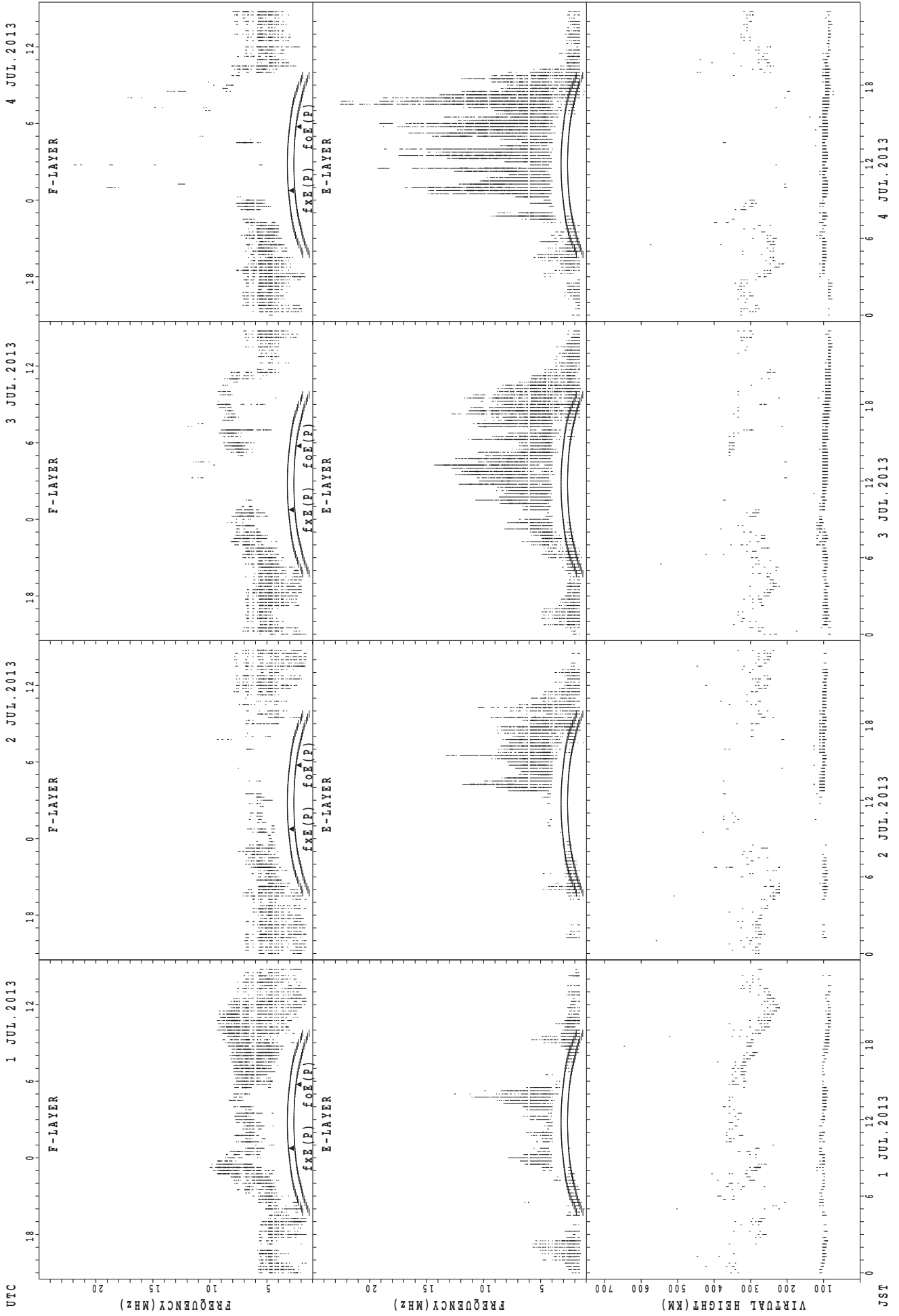
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



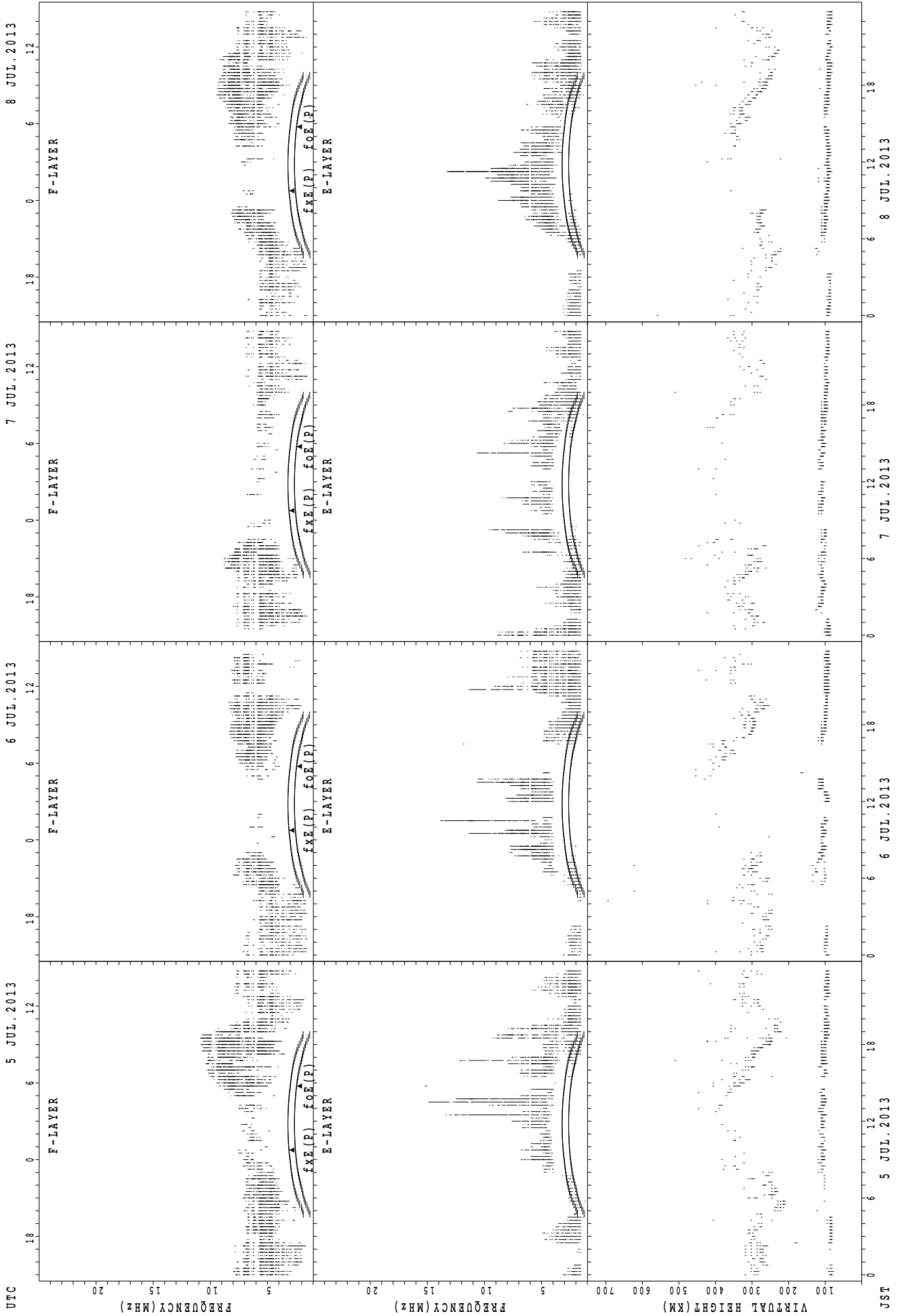
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



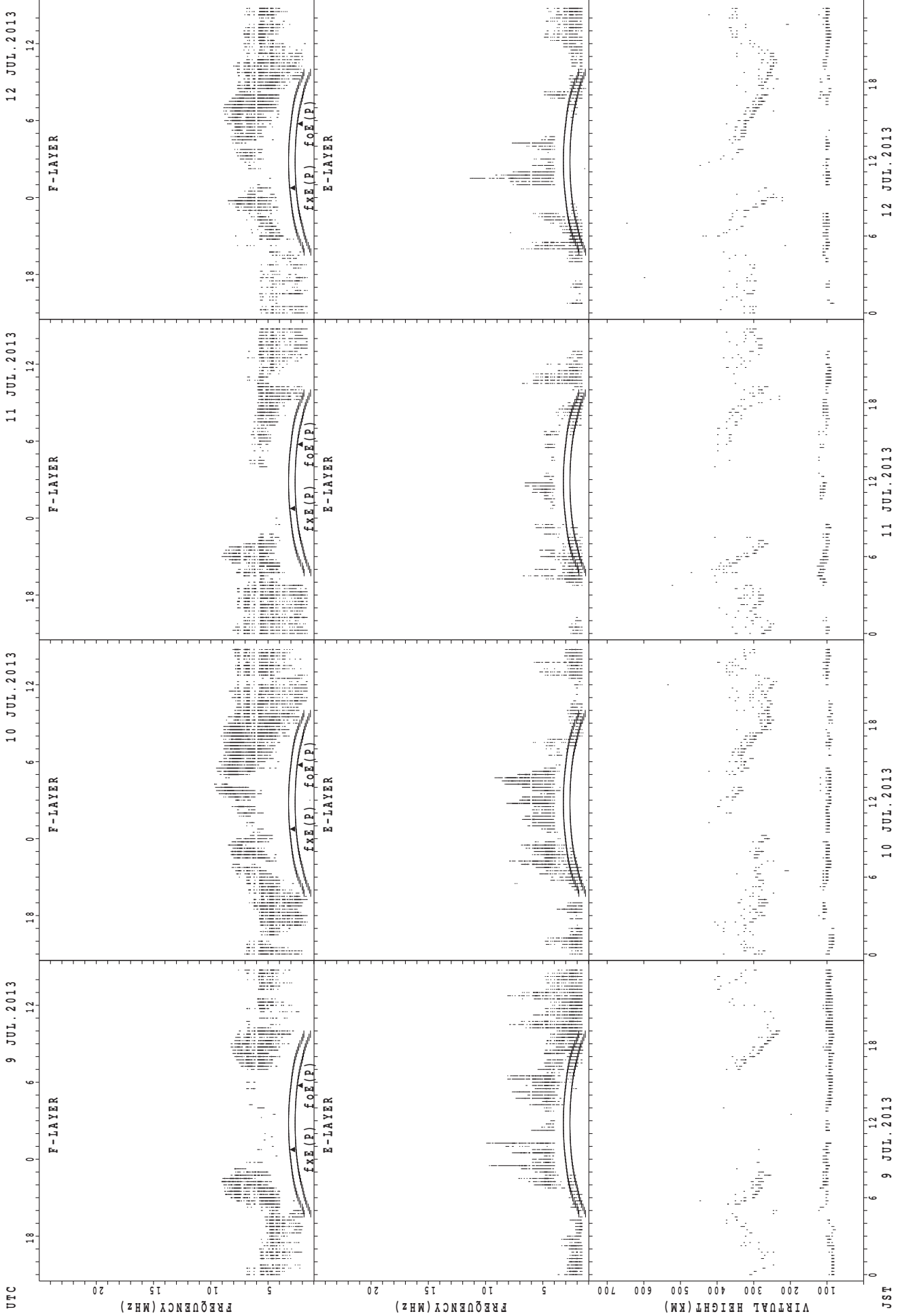
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



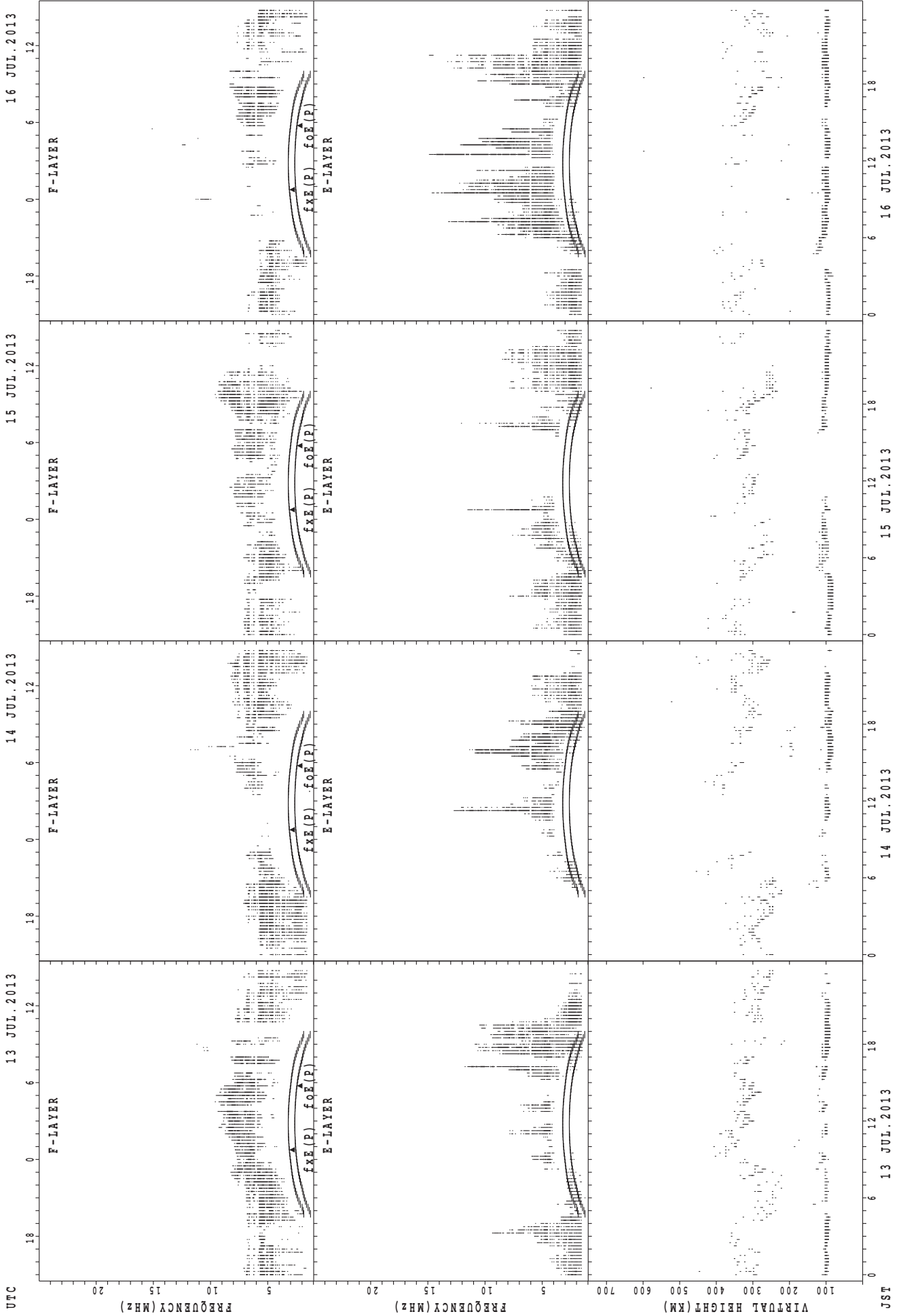
foE(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



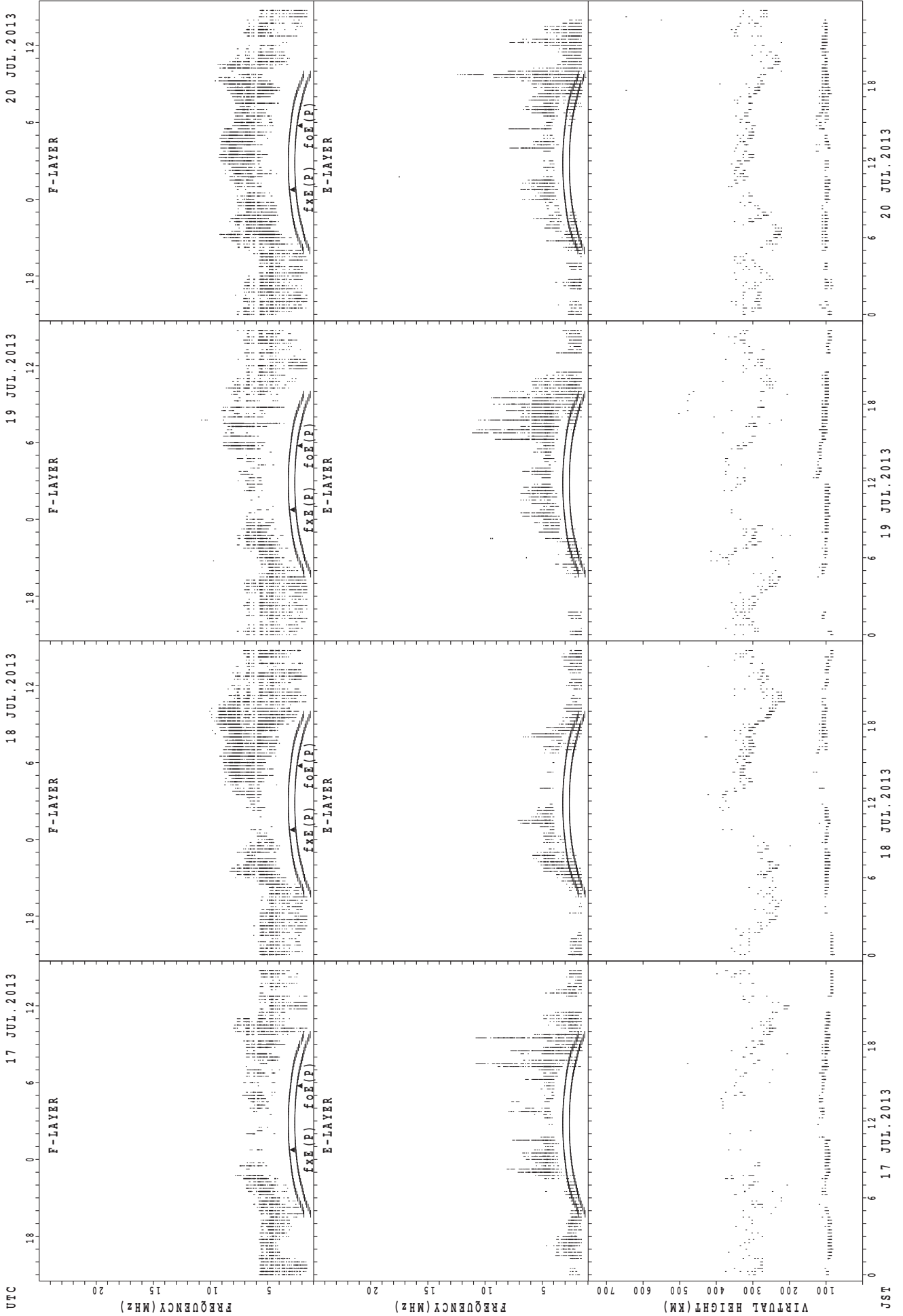
f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



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

SUMMARY PLOTS AT Kokubunji



UTC

FREQUENCY (MHz)

FREQUENCY (MHz)

FREQUENCY (MHz)

FREQUENCY (MHz)

VIRTUAL HEIGHT (KM)

VIRTUAL HEIGHT (KM)

VIRTUAL HEIGHT (KM)

VIRTUAL HEIGHT (KM)

JST

17 JUL. 2013

18 JUL. 2013

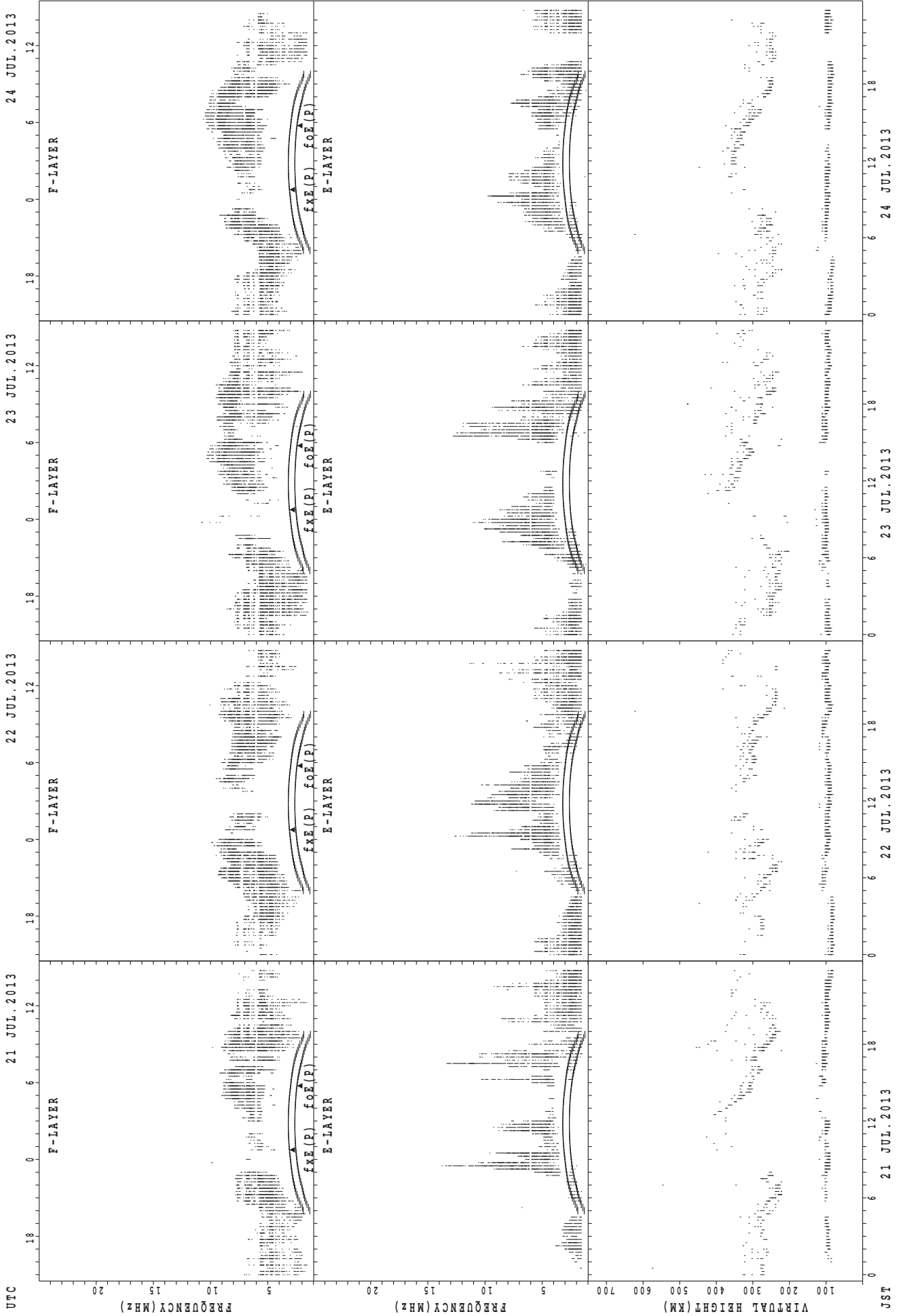
19 JUL. 2013

20 JUL. 2013

fXE(P); PREDICTED VALUE FOR fXE

fOE(P); PREDICTED VALUE FOR fOE

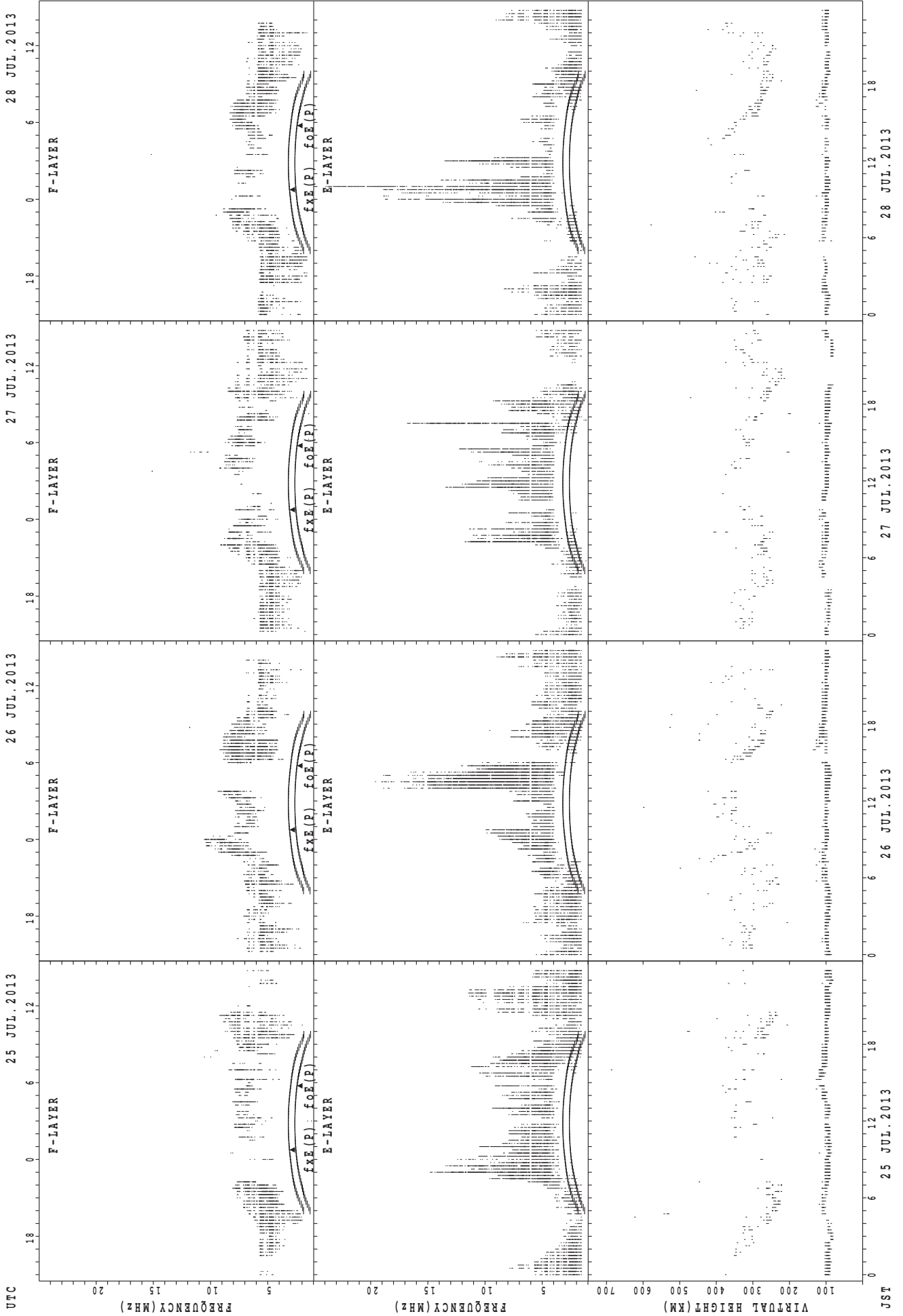
SUMMARY PLOTS AT Kokubunji



JST
 21 JUL. 2013
 22 JUL. 2013
 23 JUL. 2013
 24 JUL. 2013

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

SUMMARY PLOTS AT Kokubunji

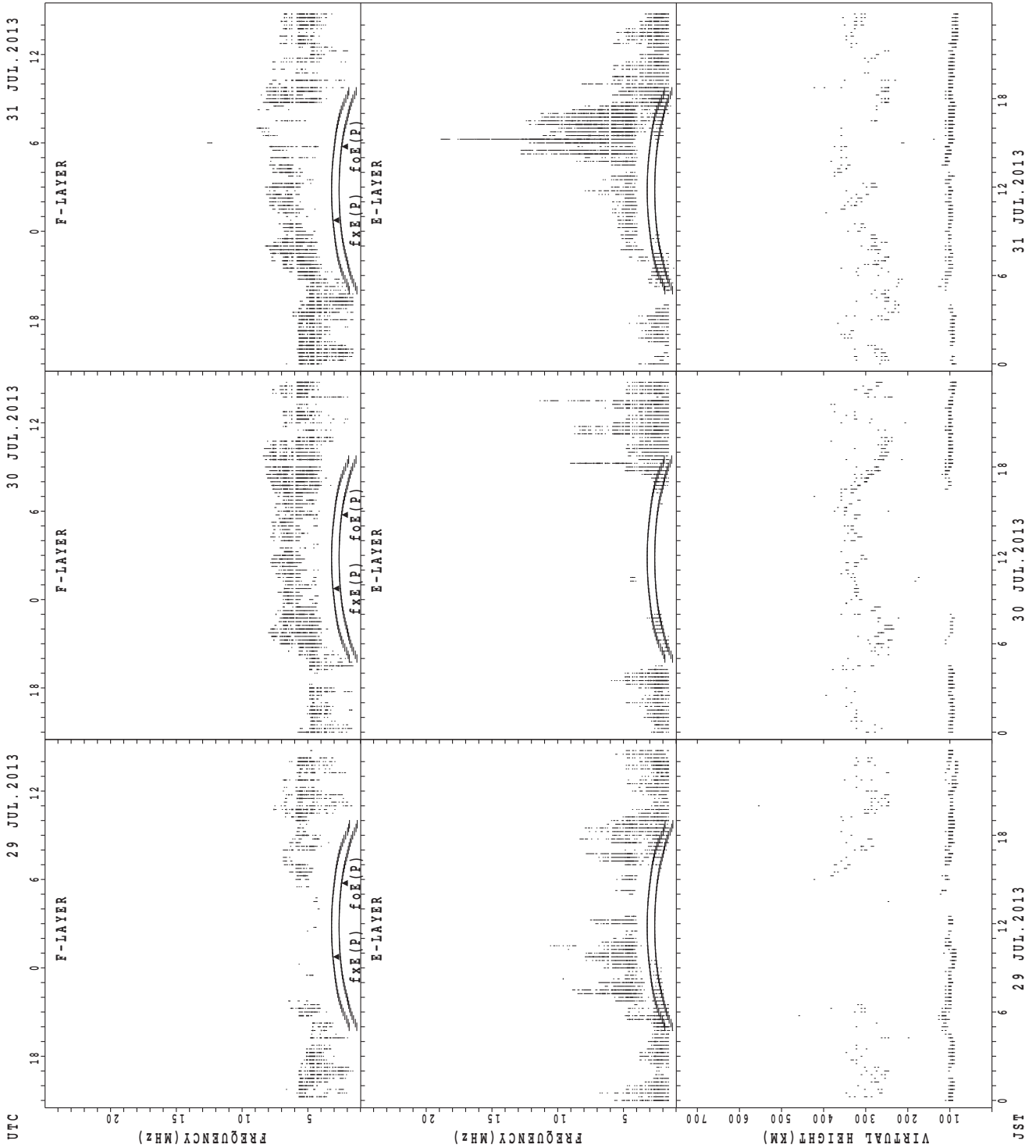


UTC

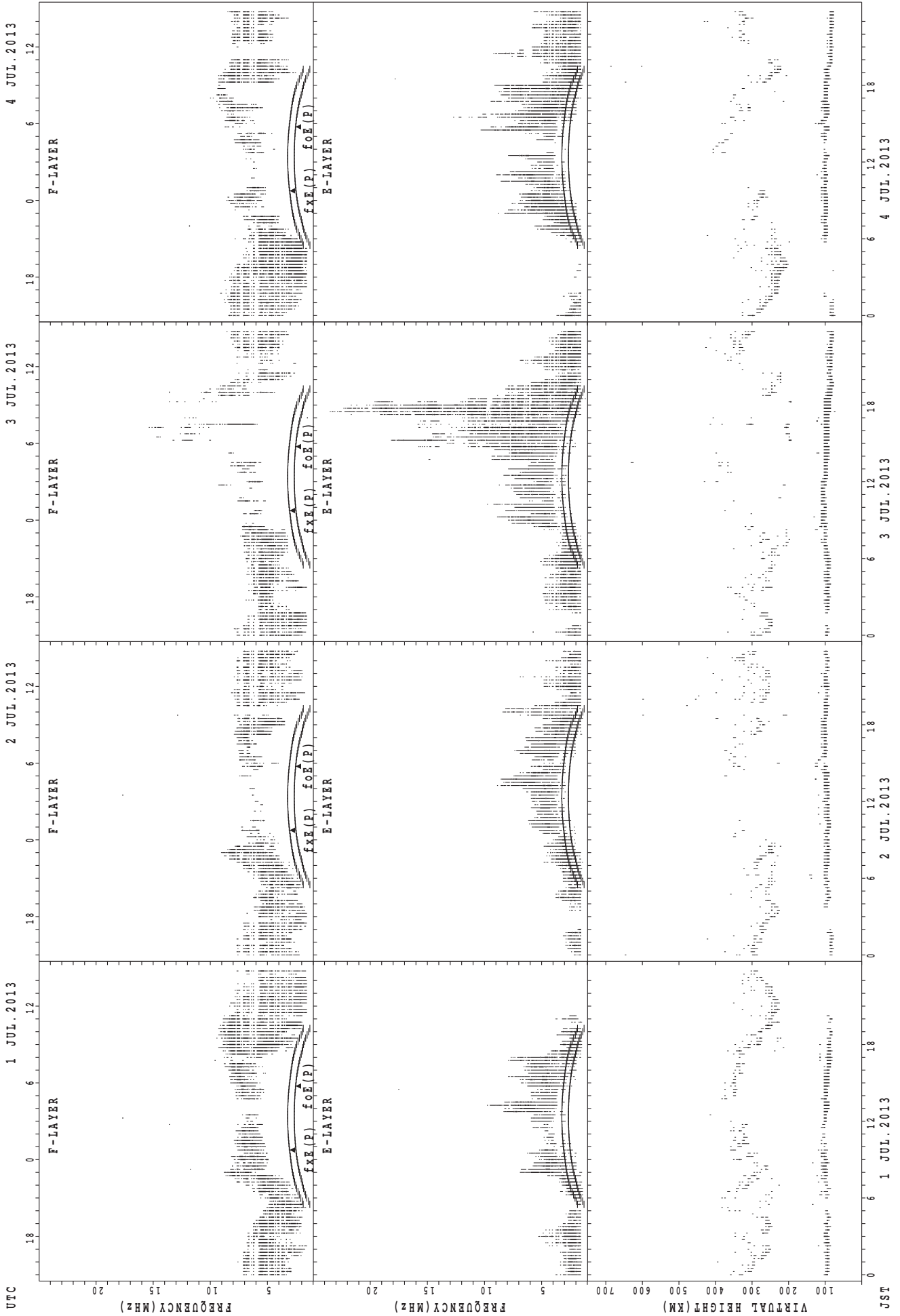
JST

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

SUMMARY PLOTS AT Kokubunji

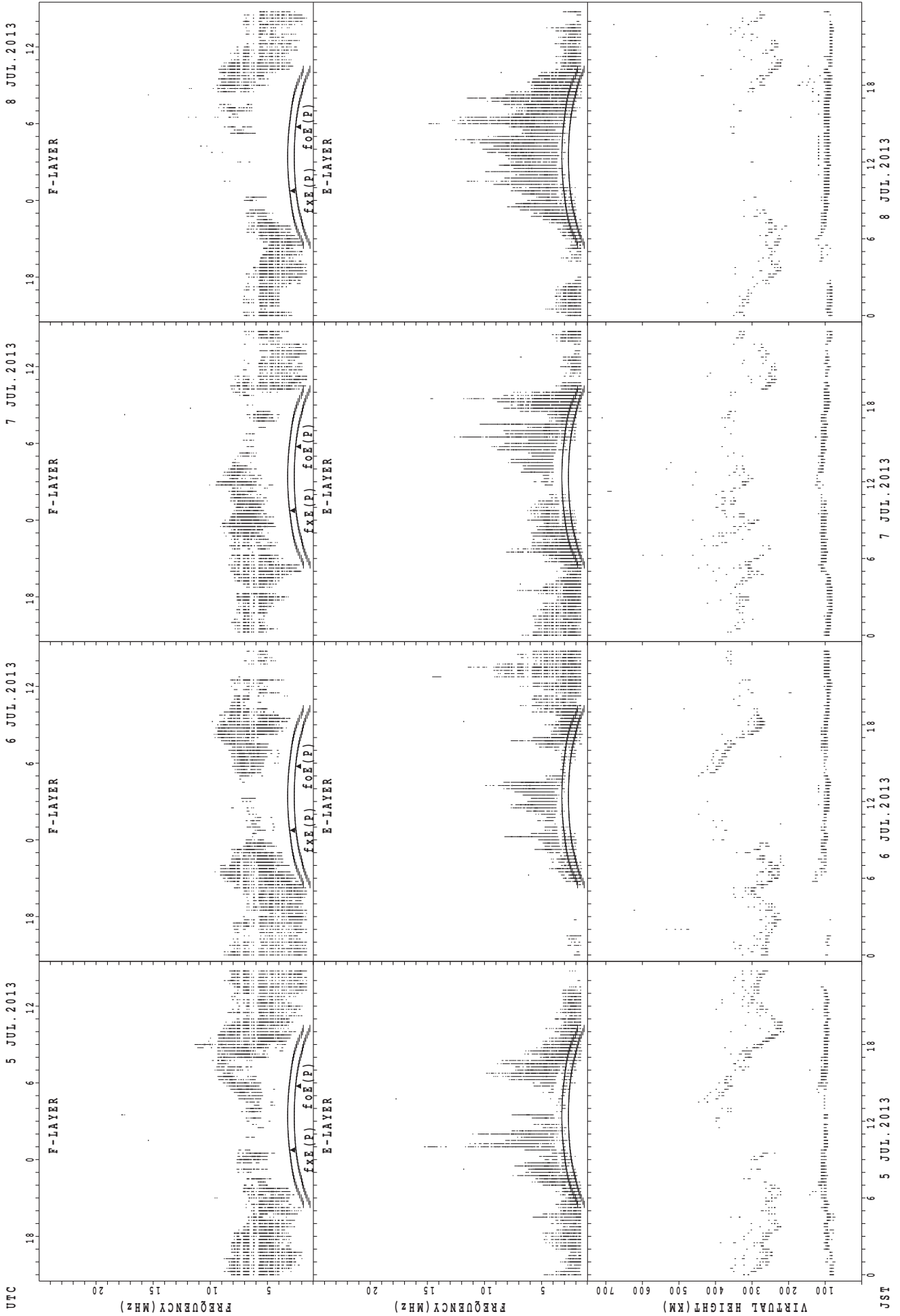


SUMMARY PLOTS AT Yamagawa



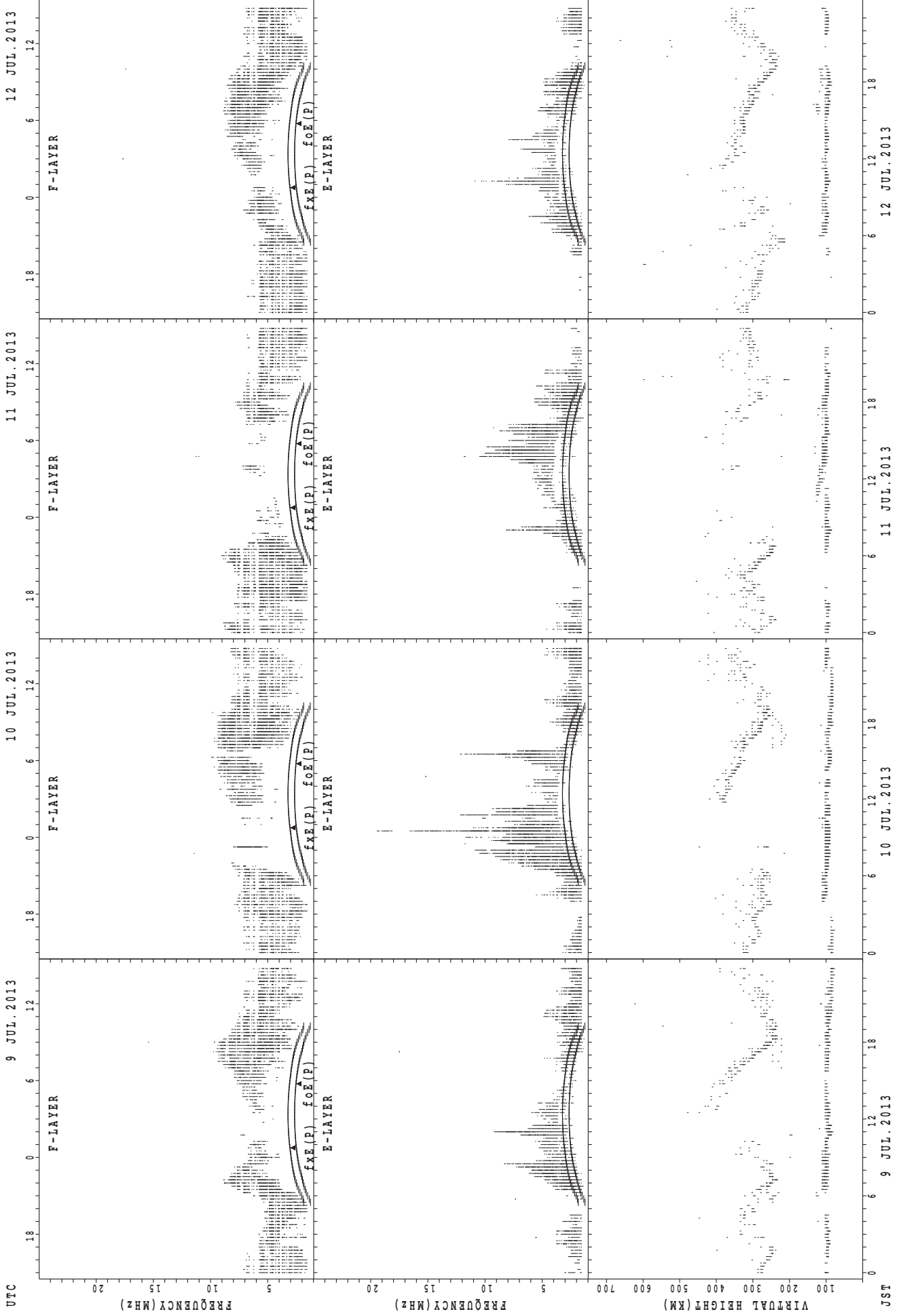
JST 1 JUL. 2013 2 JUL. 2013 3 JUL. 2013 4 JUL. 2013
fx E(P) ; PREDICTED VALUE FOR fx E
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



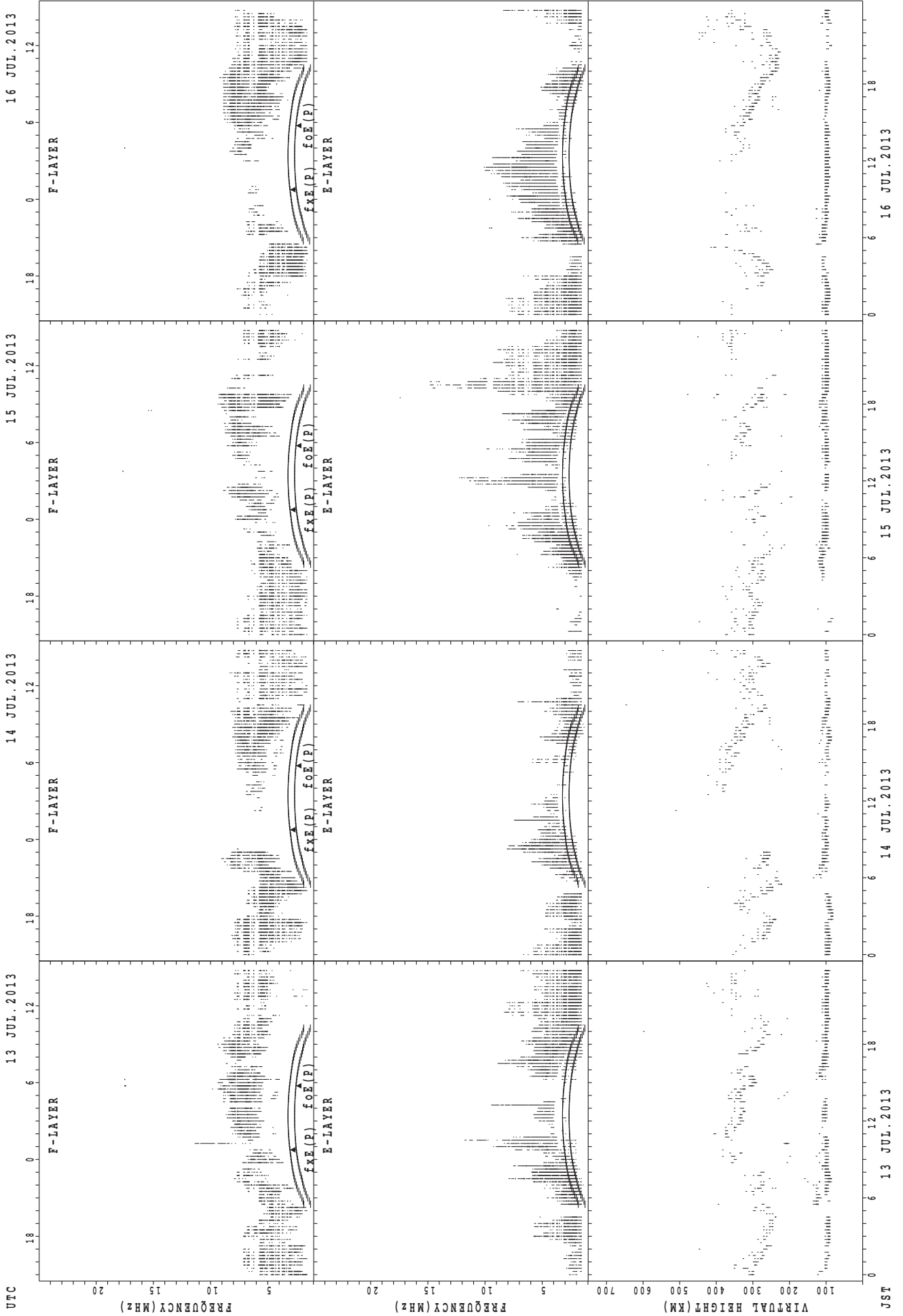
fxe(P) ; PREDICTED VALUE FOR fxe
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



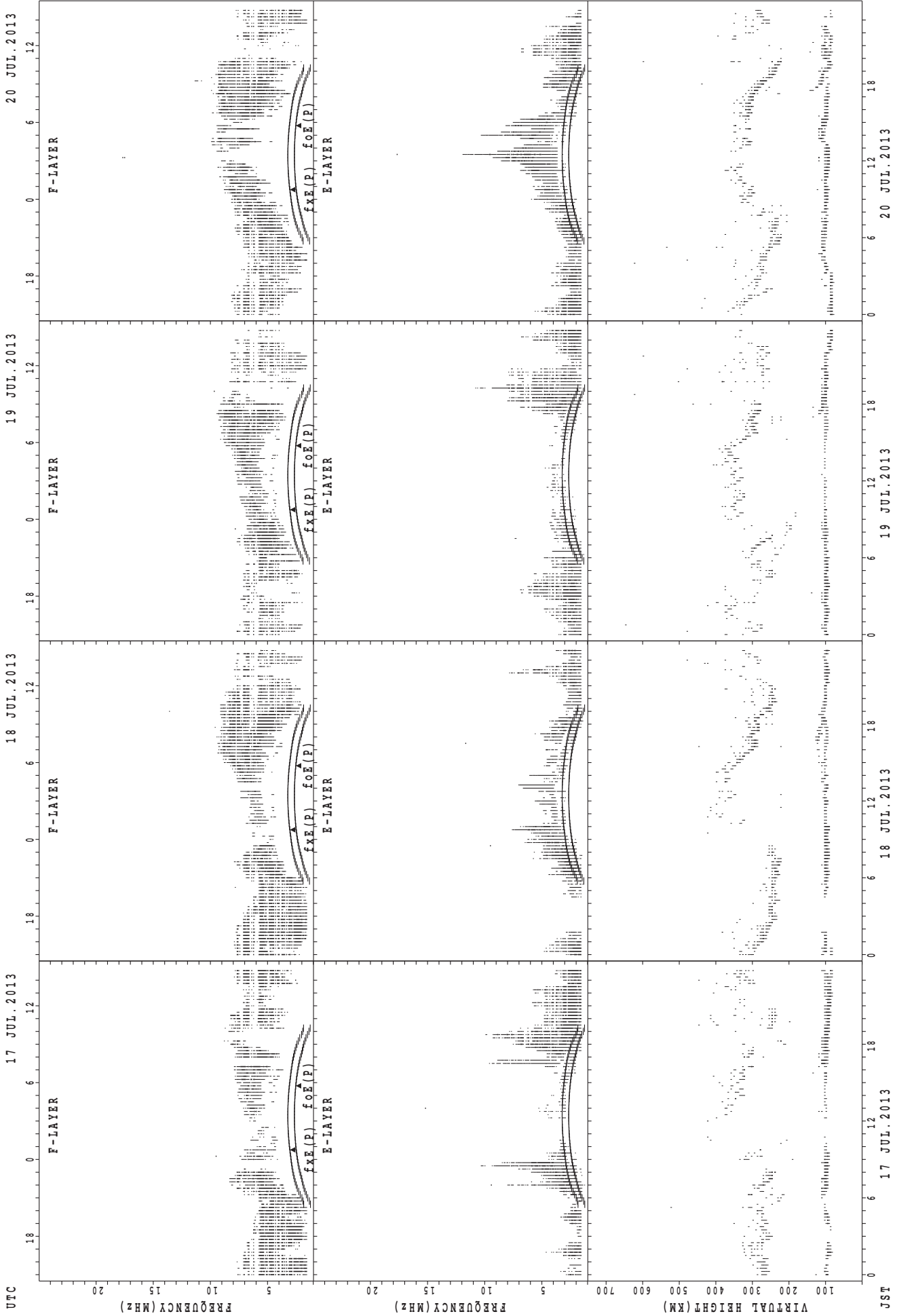
JST 9 JUL. 2013 10 JUL. 2013 11 JUL. 2013 12 JUL. 2013
 fxE(P); PREDICTED VALUE FOR fxE
 foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



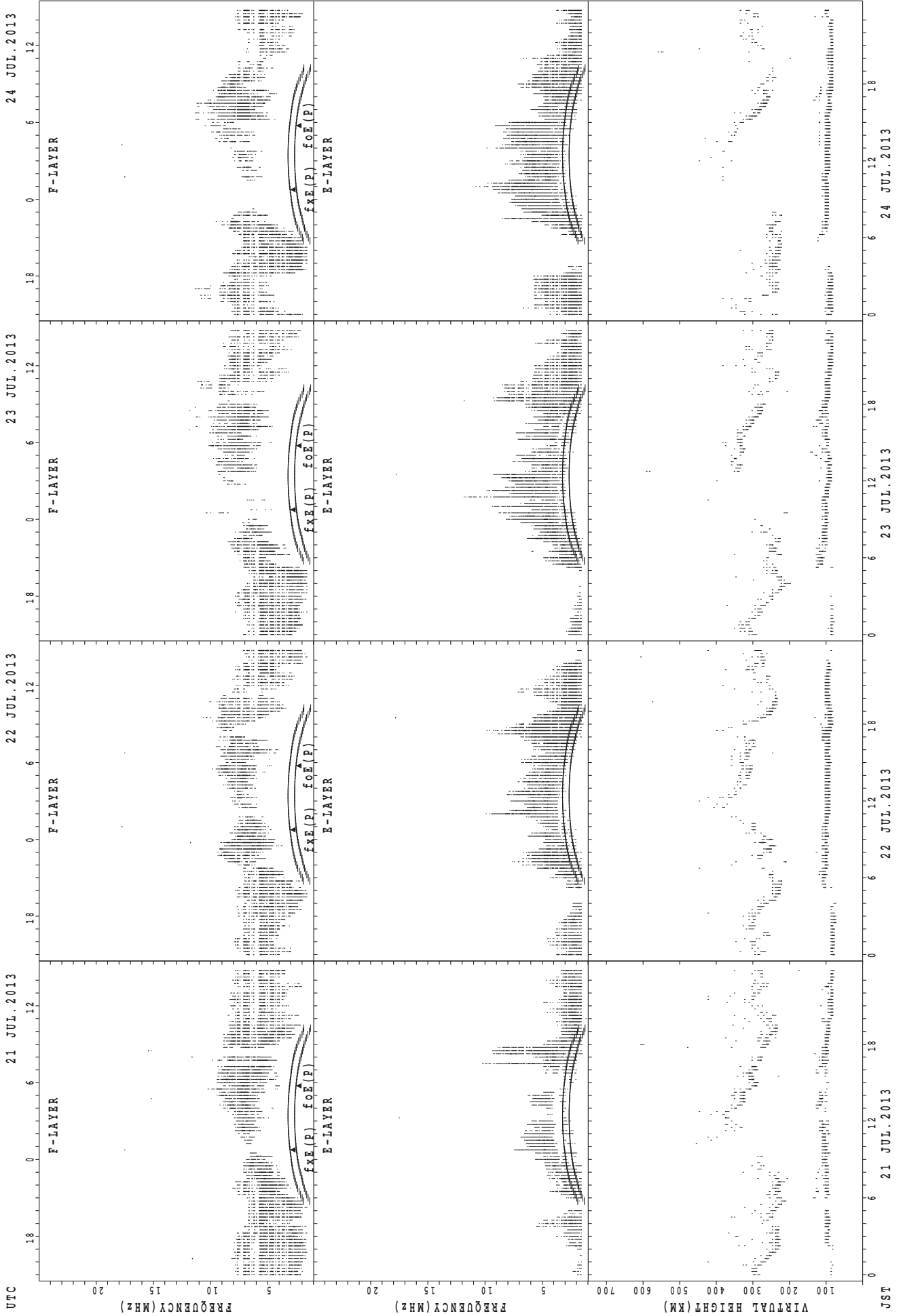
fxe(P) ; PREDICTED VALUE FOR fxe
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



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

SUMMARY PLOTS AT Yamagawa



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

21 JUL. 2013

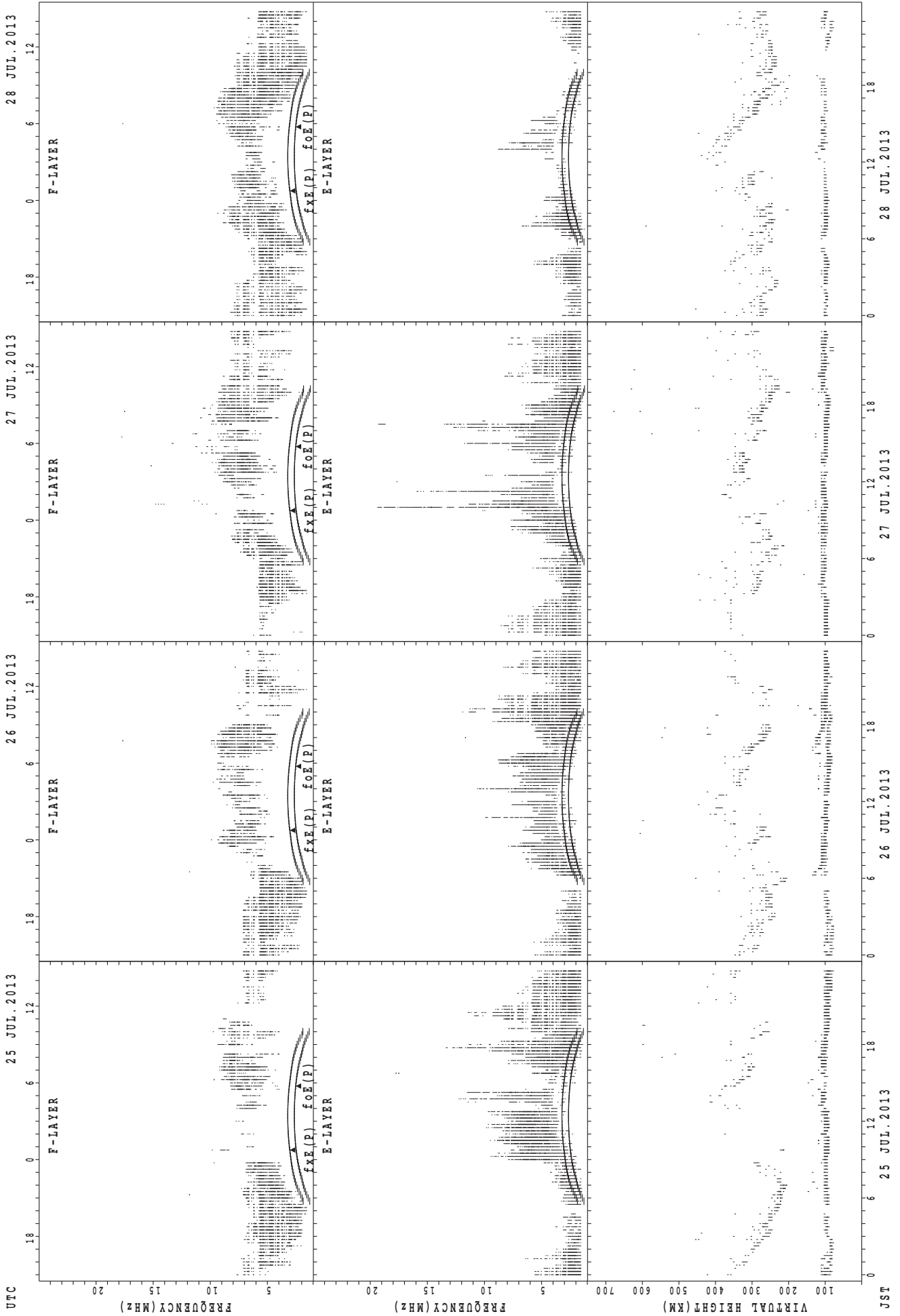
22 JUL. 2013

23 JUL. 2013

24 JUL. 2013

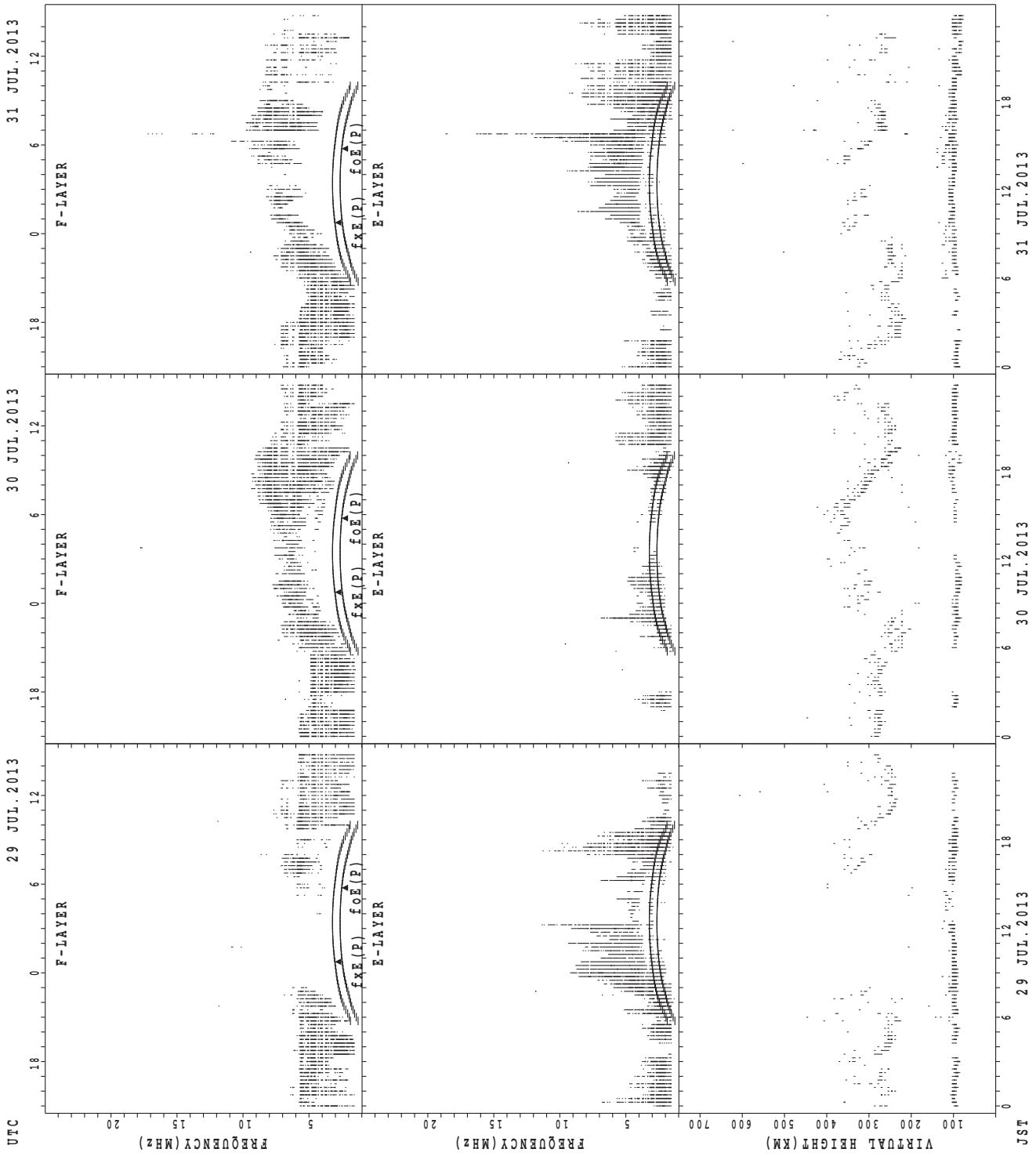
JST

SUMMARY PLOTS AT Yamagawa



JST 25 JUL. 2013 26 JUL. 2013 27 JUL. 2013 28 JUL. 2013
 $f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

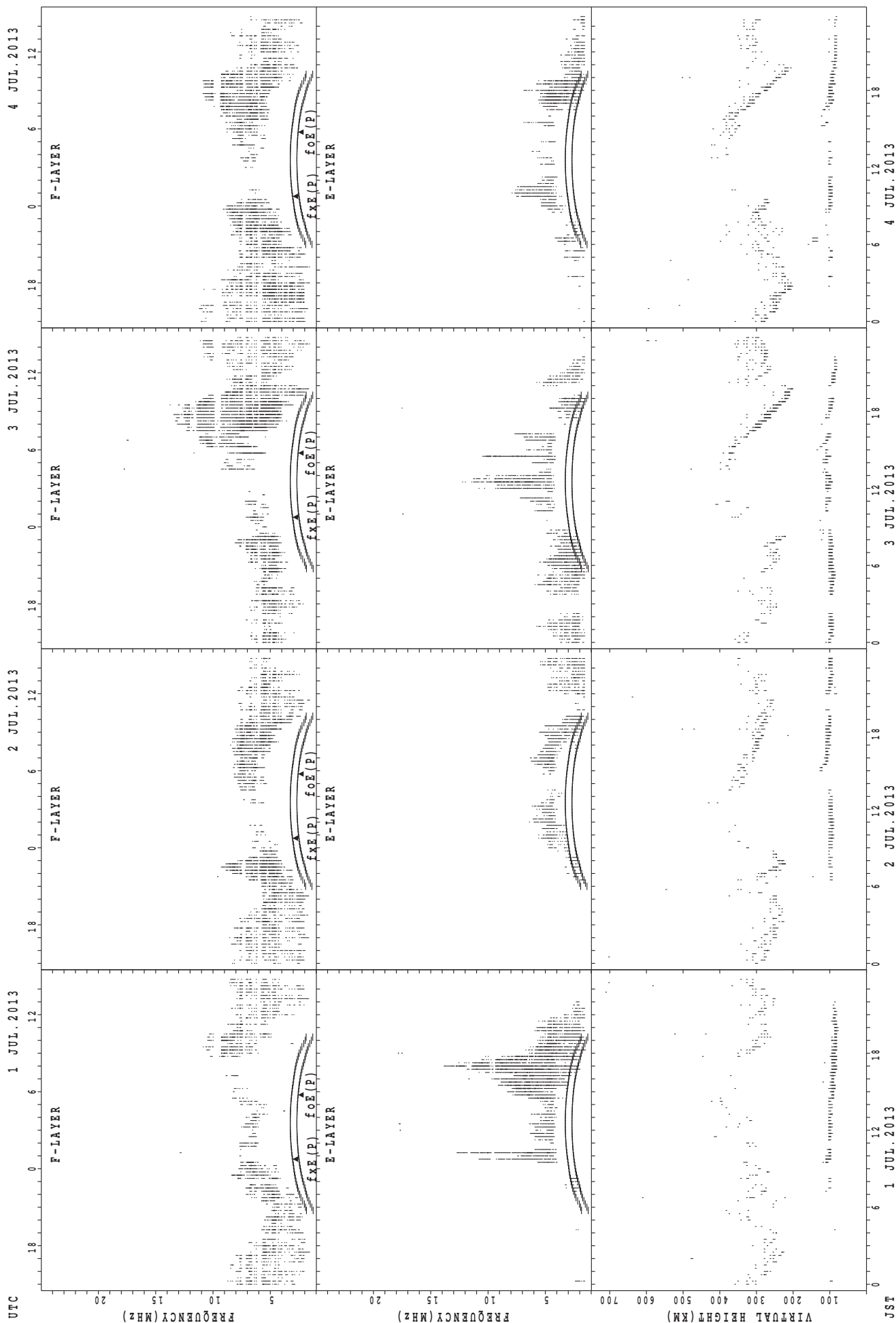
SUMMARY PLOTS AT Yamagawa



JST
29 JUL. 2013
30 JUL. 2013
31 JUL. 2013

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

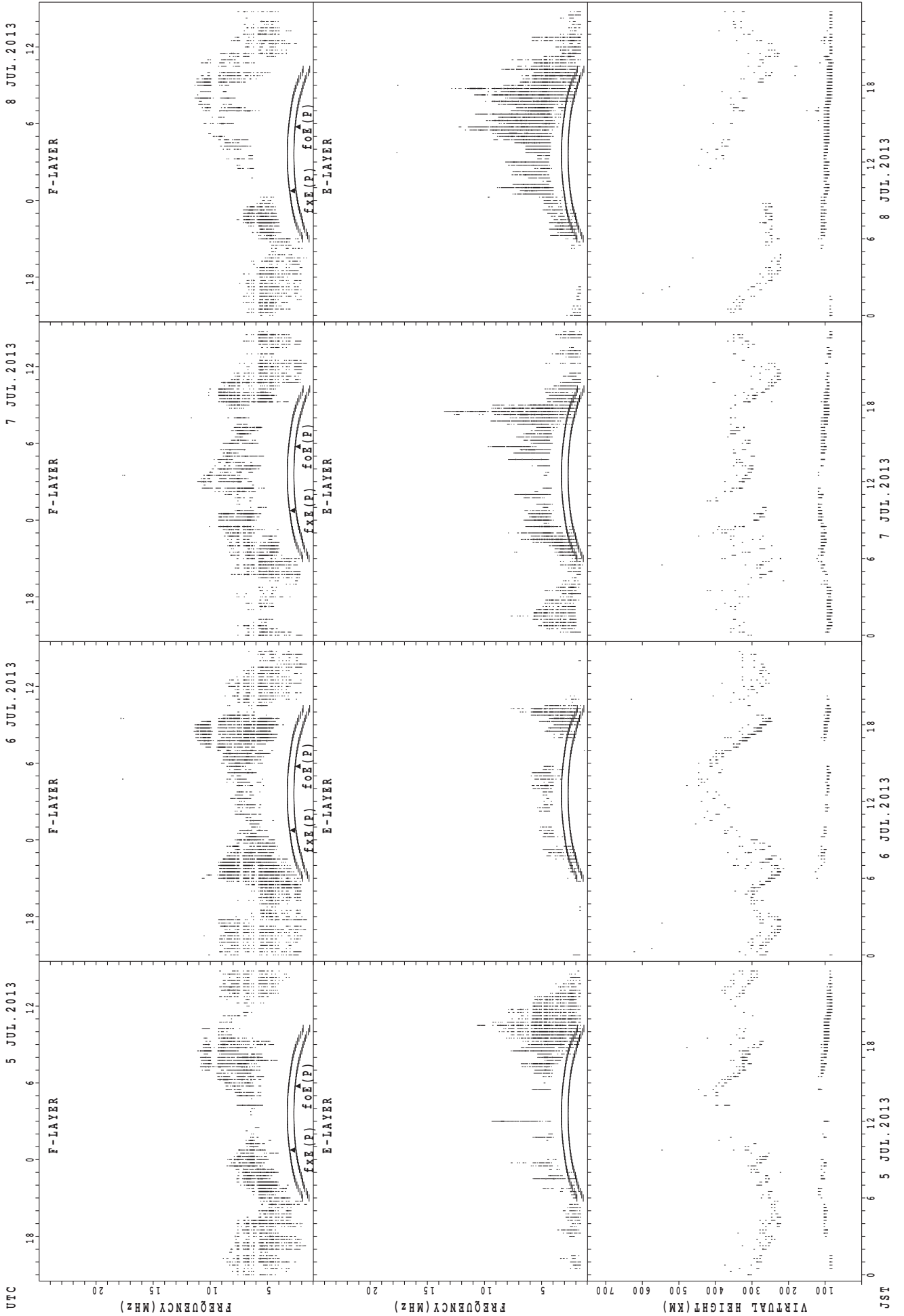
SUMMARY PLOTS AT Okinawa



f_{xe}(P); PREDICTED VALUE FOR f_{xe}
foE(P); PREDICTED VALUE FOR foE

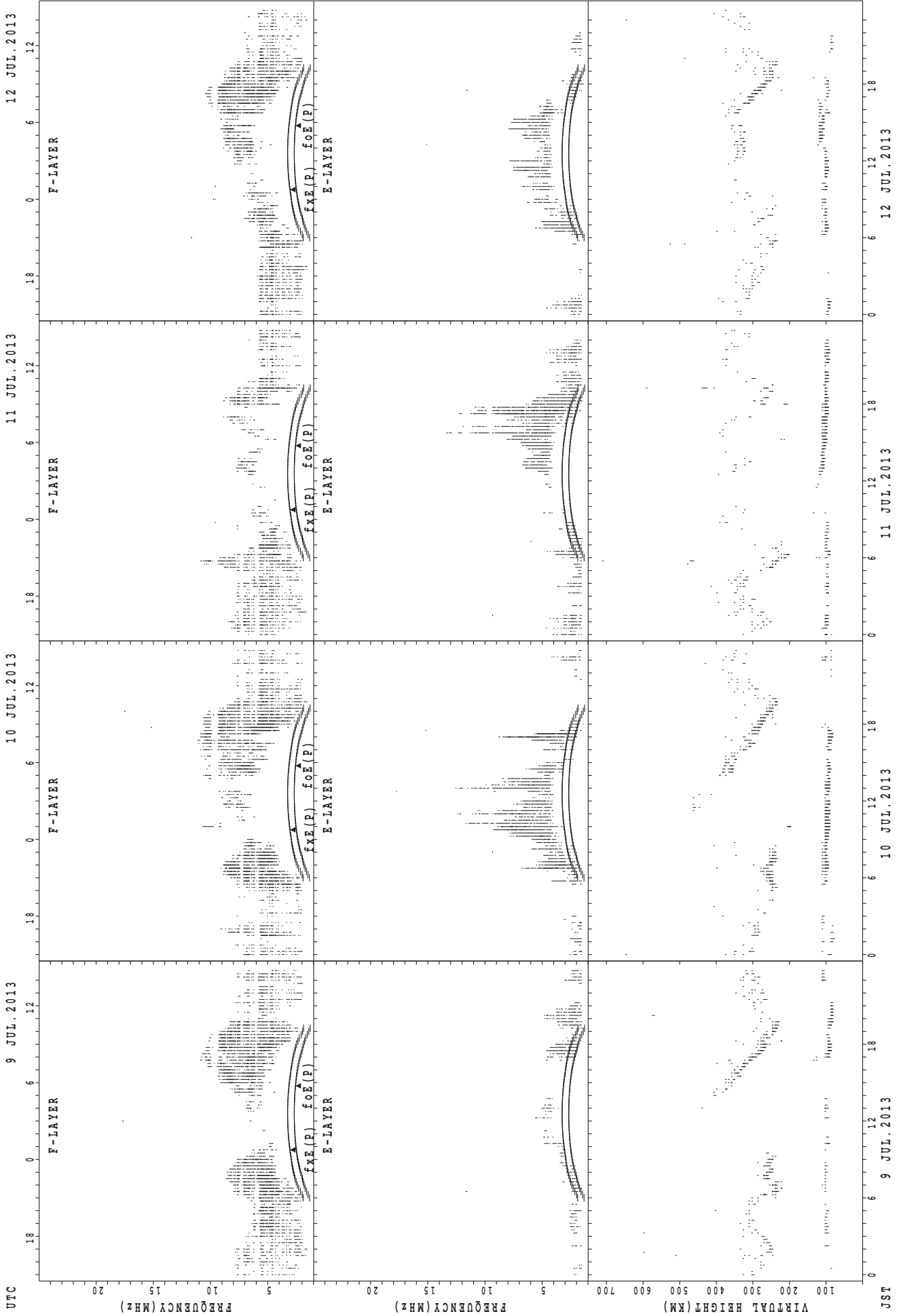
JST

SUMMARY PLOTS AT Okinawa



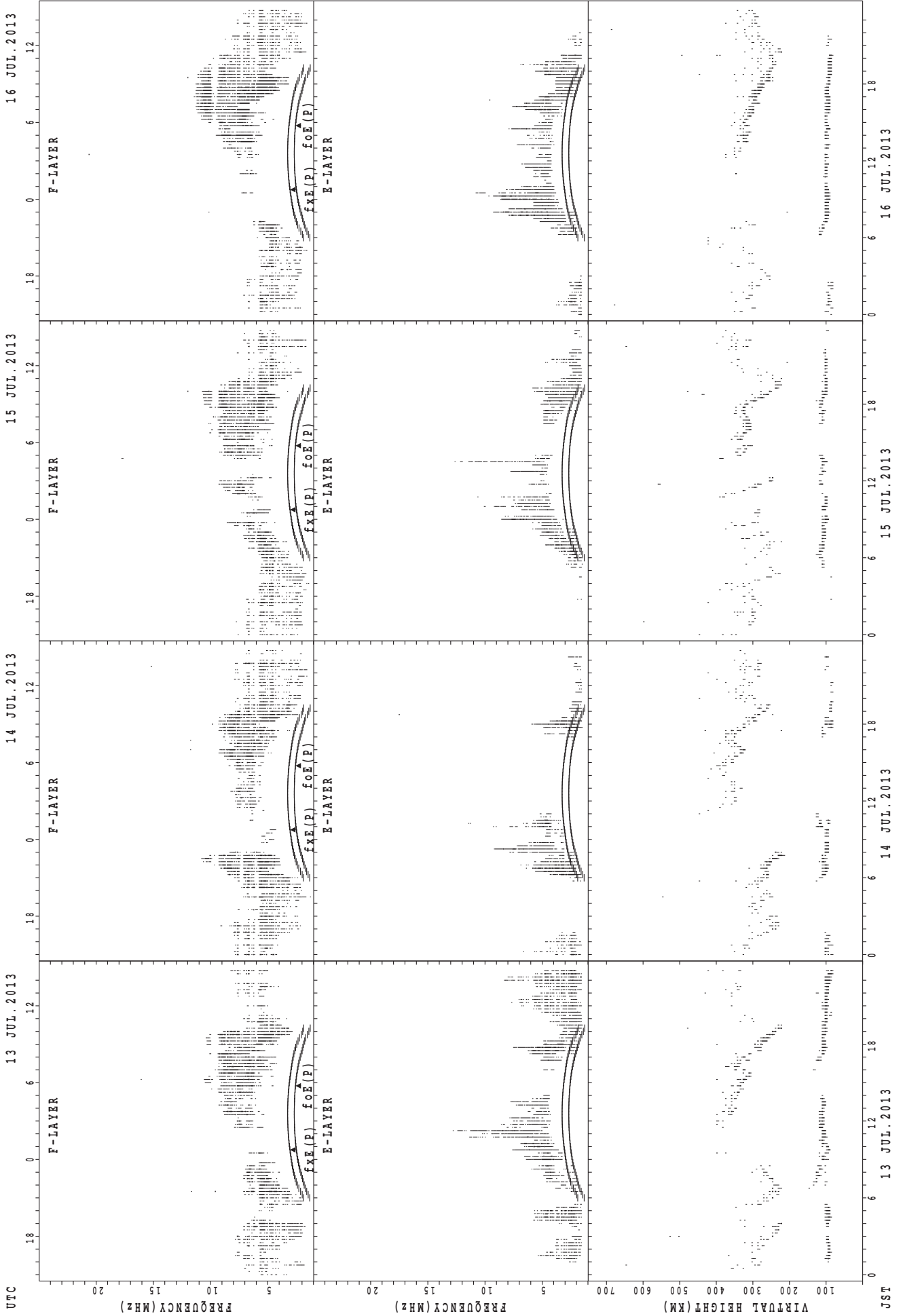
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa

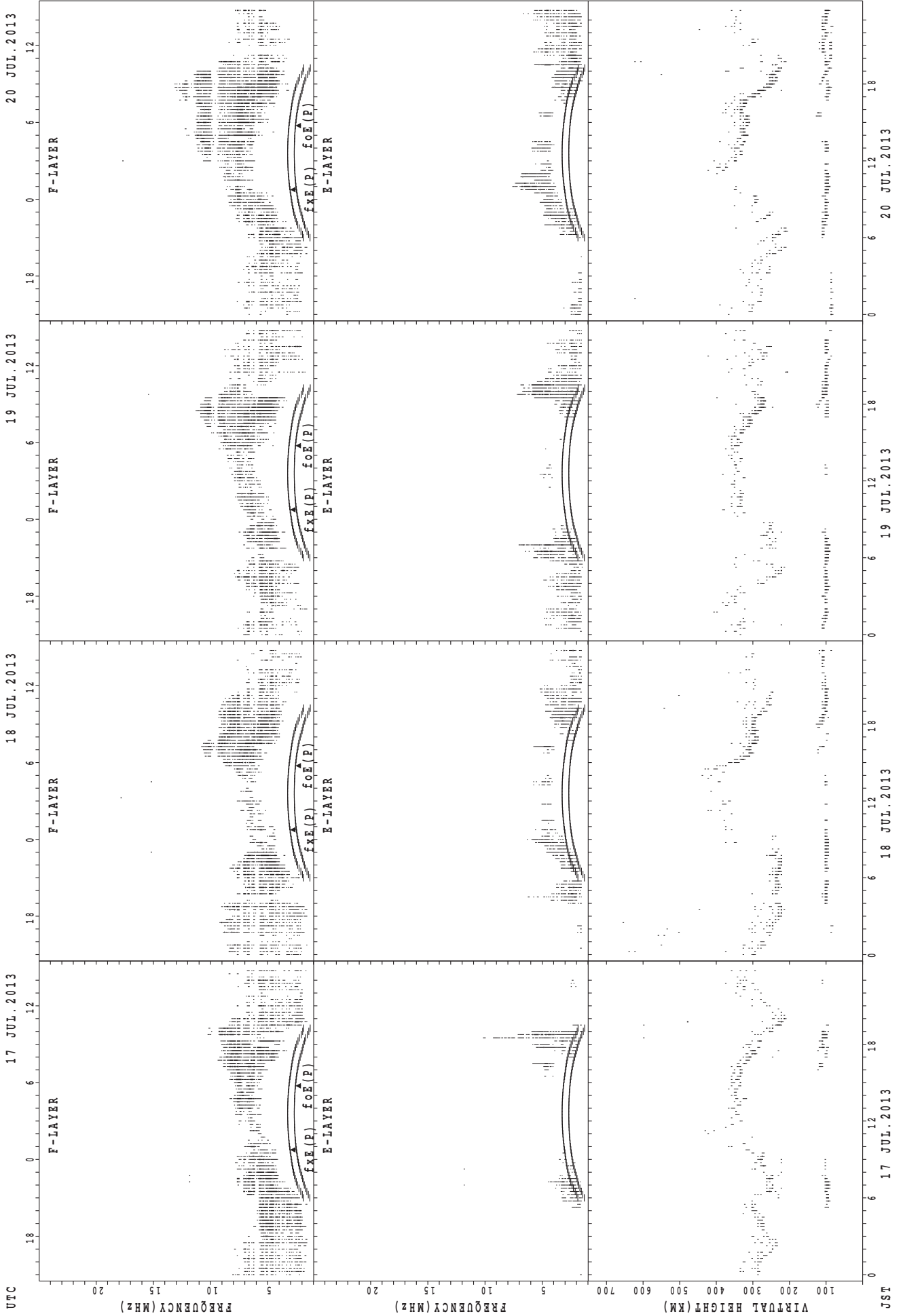


UTC
13 JUL. 2013
14 JUL. 2013
15 JUL. 2013
16 JUL. 2013

JST
13 JUL. 2013
14 JUL. 2013
15 JUL. 2013
16 JUL. 2013

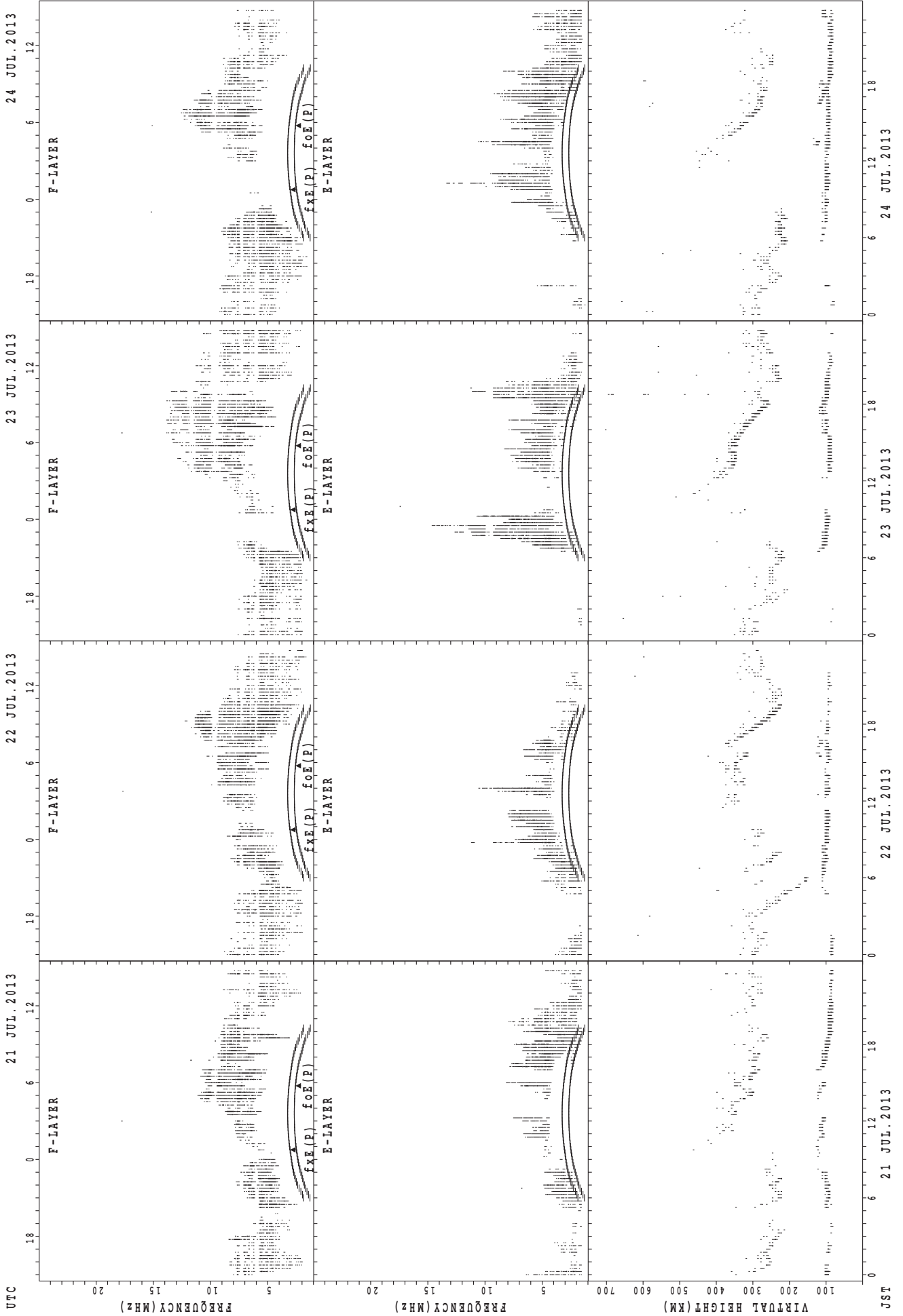
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



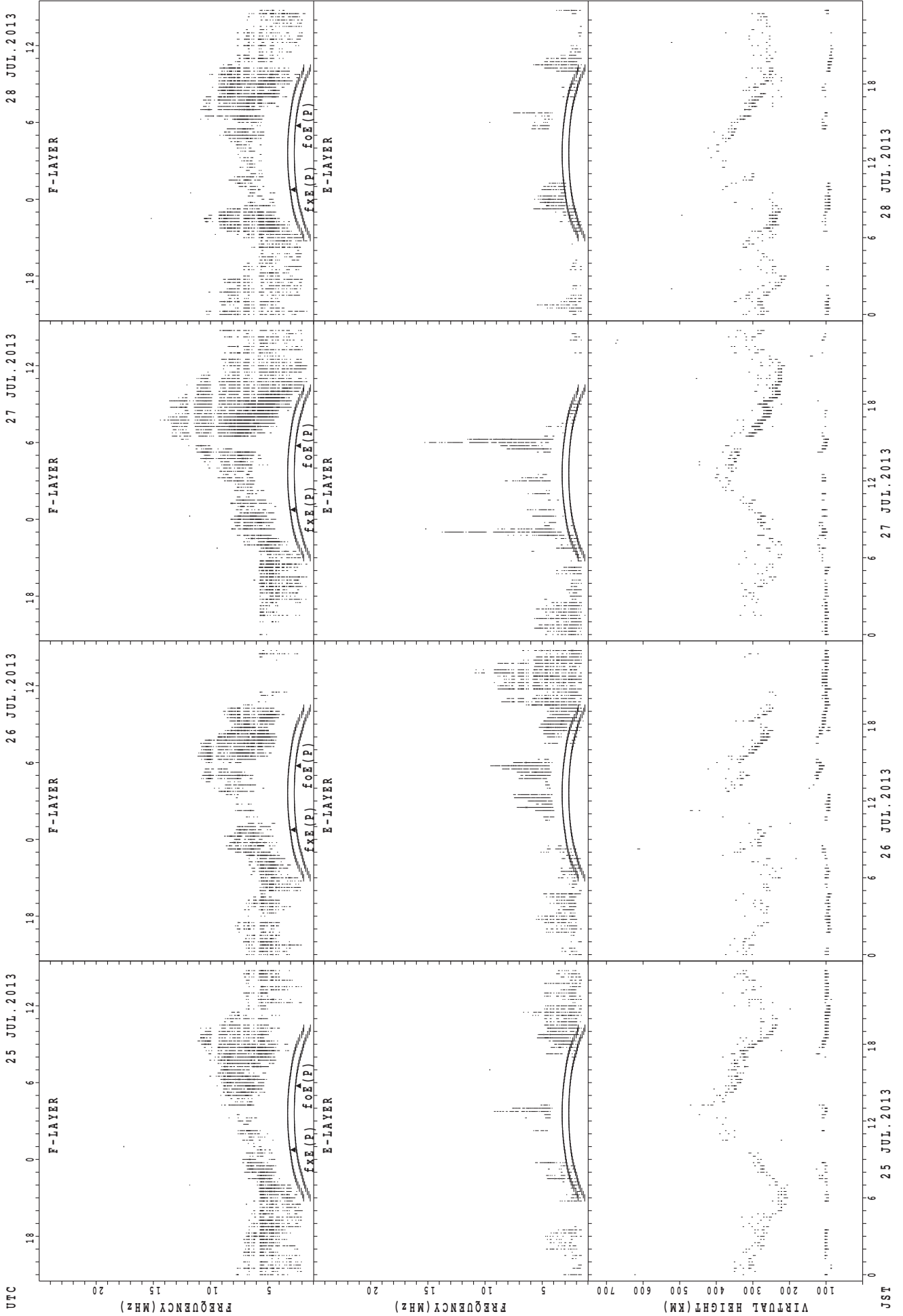
JST
 17 JUL. 2013
 18 JUL. 2013
 19 JUL. 2013
 20 JUL. 2013
 $f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



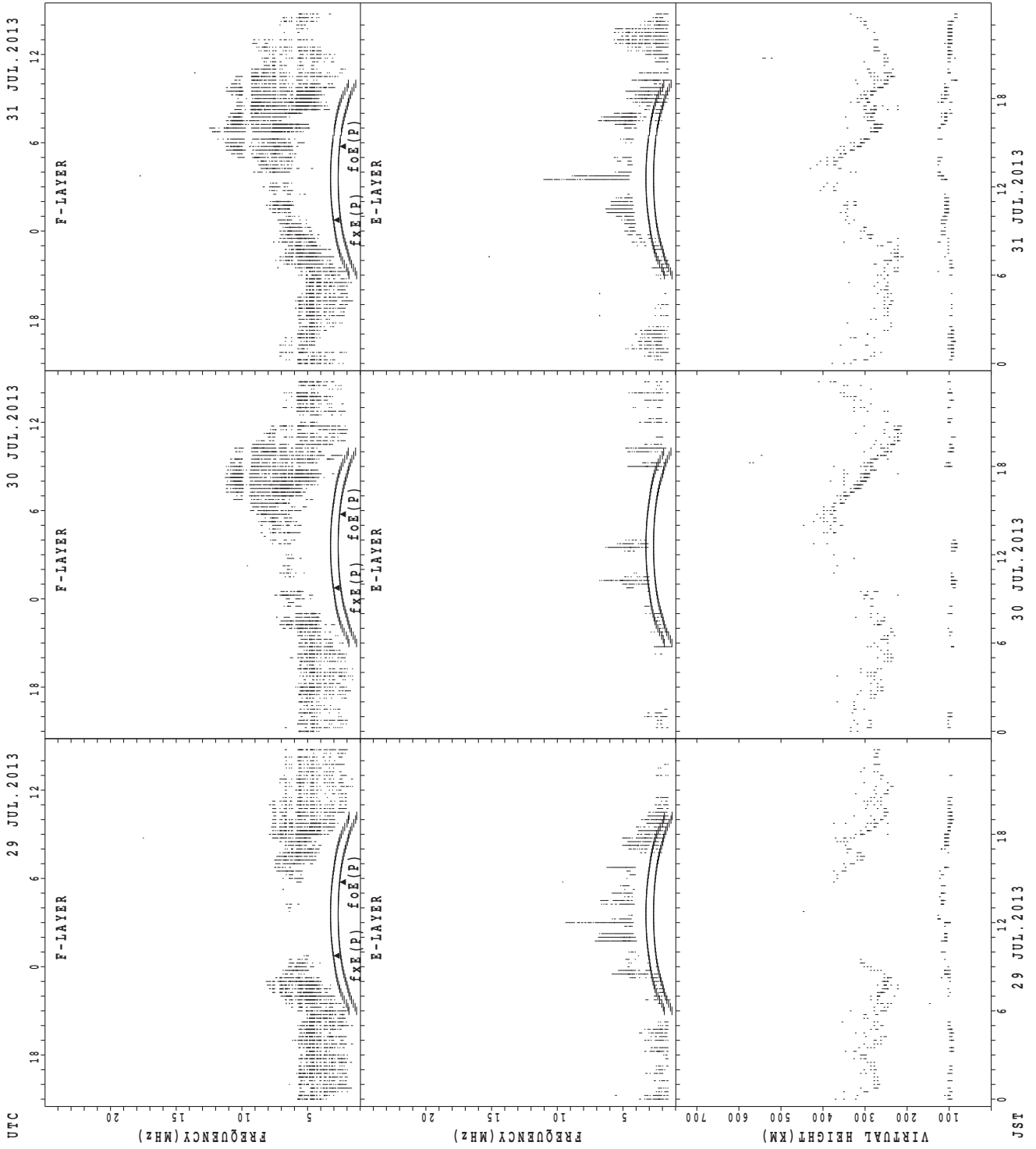
f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		1	1		1	5	6	3										16	17	17	11	9	8	4
MED		338	330		330	296	325	302										327	300	286	280	296	306	336
U Q		169	165		165	302	342	304										342	319	295	290	304	326	367
L Q		169	165		165	263	316	242										313	293	264	272	272	287	308

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	22	25	23	22	21	30	30	30	31	31	31	30	28	30	29	30	31	30	31	29	27	29	25	23
MED	97	95	93	96	97	111	107	106	103	103	103	101	101	101	101	103	105	105	105	103	103	101	101	97
U Q	103	99	101	101	106	113	111	107	105	103	105	105	105	105	105	113	111	111	111	105	103	104	103	103
L Q	93	91	89	91	93	107	105	103	101	99	99	99	99	97	95	97	99	97	101	99	99	95	95	95

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	2	4	1	1	1	10	19										22	21	17	10	5	2	1
MED	324	358	333	290	380	368	288	278										307	292	270	278	314	362	346
U Q	354	396	352	145	190	184	312	304										314	308	287	286	343	364	173
L Q	316	320	301	145	190	184	270	248										294	269	262	270	291	360	173

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	24	22	24	19	19	19	27	25	25	23	23	24	20	24	19	20	24	30	31	29	27	26	30	25
MED	95	96	95	95	97	111	107	105	103	103	99	103	99	101	103	104	103	105	103	99	99	99	97	97
U Q	99	99	97	97	105	115	111	110	110	105	103	105	103	111	111	110	111	111	105	105	103	103	99	100
L Q	92	91	89	89	91	99	103	102	101	97	97	99	97	95	97	101	98	101	95	94	97	95	93	91

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	9	6	6	2	3	8	16	18									22	24	21	13	3	7	3
MED	312	316	283	289	307	334	267	261	266									296	278	262	274	330	342	330
U Q	326	366	310	344	342	334	285	267	284									308	287	289	294	330	366	330
L Q	306	311	268	272	272	262	260	248	254									278	270	248	254	318	306	264

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	26	23	22	19	19	18	27	31	31	31	31	28	28	26	26	26	30	31	31	30	27	29	28	24
MED	97	91	96	95	97	99	109	105	103	105	103	103	101	100	101	105	104	105	103	99	97	97	97	97
U Q	101	99	97	99	101	105	119	113	107	105	103	105	105	107	107	113	111	111	105	103	103	101	97	98
L Q	91	87	89	89	95	97	103	101	101	99	99	98	97	97	97	101	97	97	95	97	93	90	89	89

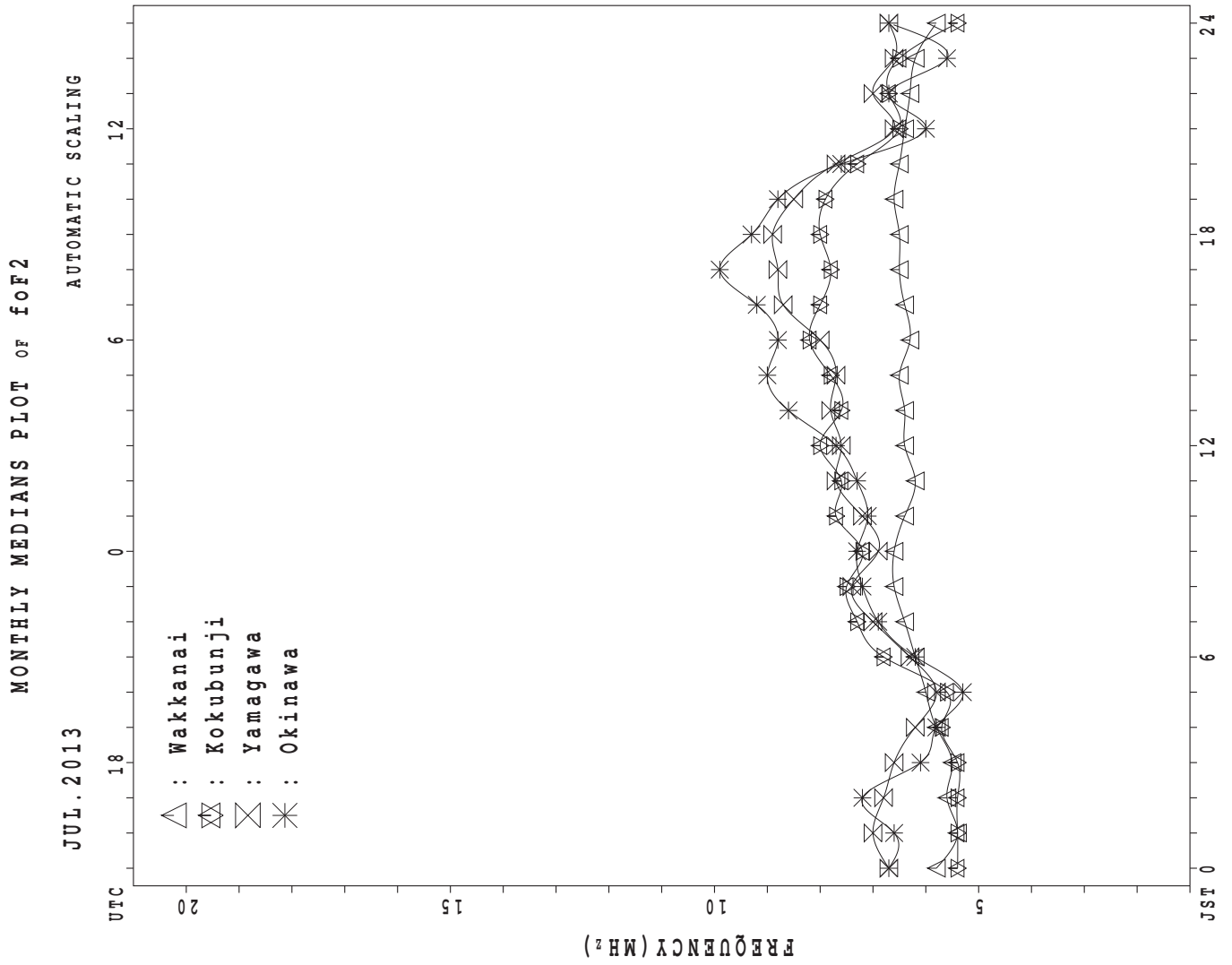
MONTHLY MEDIANS OF h'F AND h'Es
 JUL. 2013 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

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	9	8	8	4	4	4	6	17	18									29	30	23	12	7	8	6
MED	324	311	285	259	271	274	256	258	264									302	278	256	259	304	319	334
U Q	347	327	308	264	294	302	274	291	294									318	306	268	281	312	337	350
L Q	309	295	272	248	268	254	234	245	246									290	264	246	244	256	306	314

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	15	16	11	7	11	9	15	26	28	16	20	18	13	19	18	16	18	24	28	27	22	20	20	16
MED	97	97	97	103	97	99	113	104	105	100	101	104	103	103	107	105	107	104	103	97	97	93	98	103
U Q	99	100	103	109	103	103	121	111	107	105	108	111	106	109	115	112	123	111	108	103	101	102	102	105
L Q	89	88	95	97	97	96	97	101	103	97	96	97	96	97	97	97	95	99	99	91	91	89	89	92



IONOSPHERIC DATA STATION Wakkanai

JUL. 2013 f_{XI} (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 57	X 57	X 55	X 53																	X 83	X 78	X 69	X 69	
2	X 67	X 62	X 56	X 57																		X 73	A	73	73
3	X 68	X 67	X 60	X 60																		X 83	X 82	X 77	X 71
4	X 67	X 65	X 65	X 63																		X 78	X 76	X 76	X 75
5	X 70	X 70	X 68	X 69	72		72															X 81	X 71	X 69	X 69
6	X 64	X 65	X 61	X 63	64		69															X 82	X 80	X 78	X 71
7	X 69	X 68	X 64	X 58																		0 64	X 70	X 72	X 70
8	X 65	X 63	X 58	X 61																		X 83	X 80	X 76	X 70
9	X 67	X 66	X 59	X 60																		X 77	X 76	X 71	X 67
10	X 62	X 62	X 62	X 62																		X 79	X 81	X 82	X 79
11	X 77	X 73	X 66	X 63																		X 64	X 67	X 70	X 70
12	X 70	X 61	X 61	X 55																		X 80	X 75	X 71	X 71
13	X 70	X 68	X 68	X 66																		X 81	X 79	X 79	X 75
14	X 72	X 72	X 70	X 70																		X 81	X 83	X 79	X 73
15	X 71	X 68	X 62																			X 84	X 79	X 75	X 71
16	X 68	X 70	X 70	X 65																		X 80	X 77	X 75	X 70
17	X 64	X 64	X 61	X 60																		X 75	X 76	X 71	X 68
18	X 66	X 66	X 66	X 66																		X 84	X 83	X 81	X 78
19	X 76	X 69	X 69	X 70																		X 80	X 80	X 79	X 79
20	X 72	X 71	X 70	X 63																		X 82	X 80	X 78	X 71
21	X 70	X 70	X 70	X 64																	X 89	X 91	X 93	X 85	X 76
22	X 72	X 70	X 67	X 63	X 65																	X 88	X 89	X 83	X 84
23	X 70	X 71	X 71	X 66																		X 89	X 90	X 90	X 76
24	X 73	X 72	X 70	X 68																		X 83	X 81	X 81	X 72
25		X 71	X 70	X 70																	X 79	X 84	X 89	X 86	X 86
26	X 70	X 70	X 67	X 66	66																	X 75	X 75	X 77	X 76
27	X 71	X 70	X 65	X 64																	X 73	X 73	X 71	X 68	X 67
28	X 64	X 59	X 60	X 65																		X 73	X 74	X 73	X 69
29	X 65	X 61	X 53	X 56	53																X 66	X 76	X 75	X 72	X 68
30	X 62	X 58	X 58	X 56	56																	X 81	X 82	X 81	X 74
31	X 72	X 69	X 66	X 62	X 56																	X 78	X 71	X 71	X 66
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	31	31	30	7		2														4	31	30	31	31
MED	X 70	X 68	X 65	X 63	64		70														X 76	X 81	X 79	X 76	X 71
U Q	X 71	X 70	X 69	X 66	66																X 84	X 83	X 82	X 81	X 76
L Q	X 65	X 63	X 60	X 60	56																X 70	X 76	X 75	X 71	X 69

JUL. 2013 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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

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	50	50	48	46	R 44	51	51	V 62	67	64	A	60	U R 57	60	62	60	62	62	66	69	76	72	62	62
2	60	55	49	50	47	57	52	J R 53	J R 47	57	58	A U R 53	54	A U R 56	57	A	59	A	66	A	66	60	F 60	F 60
3	F 57	F 57	53	53	A	56	57	V 70	68	U R 68	65	62	64	64	66	65	63	65	70	77	76	76	70	64
4	60	58	R 56	56	57	57	Z 66	64	64	66	63	61	V 63	A	65	63	68	70	71	74	71	66	68	F 66
5	63	F 60	F 58	F 60	F 63	R 84	F 62	R 70	60	A	A	68	A	A	67	70	A	75	R 85	R 76	74	65	62	62
6	57	57	54	56	J R 56	R 63	F 61	R 55	50	A	A	A	A	58	59	A	57	A	A	69	75	73	71	64
7	62	61	57	51	60	68	68	U R 48	A	A	A	A	A E G U R 49	49	A	A	A	51	55	56	57	64	65	63
8	58	R 56	51	50	56	68	70	74	81	74	74	69	64	66	68	64	66	73	78	R 82	76	74	69	64
9	60	59	52	53	52	62	68	U A 72	A 62	A	A	A	A	Y	53	54	R A	59	A	67	71	69	64	F 57
10	F 56	55	54	F 51	46	56	59	A	71	A	66	69	73	74	R 74	72	73	75	69	72	72	74	75	72
11	70	66	59	56	51	R 53	J R 55	A E G 55	E G 46	45	A U R 50	50	50	46	49	51	A	58	58	54	59	F 59	F 59	F 59
12	63	54	54	48	46	49	R E G 52	R J R 42	52	55	54	65	65	60	68	69	70	69	R 68	69	73	68	64	64
13	63	61	61	59	55	53	62	69	73	73	75	74	72	71	U R 71	64	67	68	70	74	74	72	72	68
14	F 65	65	F 61	F 59	59	55	A	49	A	56	A	A	A E G 48	A	62	66	64	68	70	73	76	F 69	F 66	
15	64	61	55	54	52	48	47	E G U R 51	45	54	67	63	62	69	62	63	62	67	72	75	R 77	72	F 63	F 62
16	F 62	F 62	F 60	58	51	51	R 51	A	A	A	55	U R 47	58	R 52	62	58	58	A	60	66	72	70	68	62
17	57	57	54	53	V 51	51	55	61	66	A	A	A	R 50	A	R 55	58	58	60	64	68	68	70	F 65	57
18	59	F 57	F 59	F 59	57	62	A	A	A	65	A	61	69	72	71	69	70	67	71	75	77	77	75	71
19	69	62	61	63	58	52	54	57	65	A	A	A	A	57	65	68	64	66	67	76	74	74	72	73
20	65	64	63	56	56	58	68	R 68	67	A	62	64	67	69	62	61	63	65	71	73	75	73	72	64
21	63	F 62	F 61	57	56	62	64	J R 78	V J R 69	67	68	64	64	71	68	64	68	68	71	J R 84	R 86	F 73	F 67	
22	66	64	60	56	58	63	73	U R 75	A U R 76	74	65	62	63	64	67	69	66	72	80	R 80	82	F 74	F 72	
23	F 64	F 60	F 60	59	56	61	R 78	71	62	66	67	71	70	70	69	69	68	72	74	80	82	83	83	69
24	66	65	63	61	60	59	60	J R 66	80	72	69	67	70	73	73	74	70	70	68	73	76	74	74	66
25	64	62	63	63	62	66	66	74	73	70	66	66	66	68	70	68	62	64	68	72	77	82	F 76	F 61
26	F 60	F 60	F 57	F 56	F 55	71	68	J R 70	79	77	69	67	68	70	62	68	64	64	66	65	68	68	69	69
27	65	63	58	57	57	61	68	62	61	A	A	A U R 56	63	62	61	58	59	64	66	65	64	61	60	
28	57	52	53	F 51	50	56	64	65	A	57	A	61	A	60	A	60	A	A	A	62	F 64	F 64	66	63
29	58	F 50	46	49	F 44	48	52	J R 54	50	50	49	A	A	A	A	A	A	55	55	59	69	68	65	61
30	55	F 50	F 48	F 49	F 47	50	56	70	72	A	66	68	67	R 73	74	A	A	57	64	70	74	F 76	J R 74	68
31	65	62	59	55	49	51	62	65	69	66	63	A	64	69	60	63	Z 66	61	72	71	70	64	64	59
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	30	31	29	29	24	20	20	20	23	26	27	27	25	26	28	30	31	30	31	31
MED	62	60	57	56	56	57	62	65	66	66	66	65	64	65	65	64	64	66	68	72	74	72	69	64
U Q	65	62	60	59	57	62	68	70	72	71	68	68	68	70	69	68	68	69	71	75	76	76	73	68
L Q	58	56	53	51	50	51	54	54	60	56	60	62	U R 58	58	62	60	60	61	64	67	69	68	64	61

JUL. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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	L	U	A	U	R	A		R				L	L	L			
2									436	428	464		484		480	464	460	464	444	388				
3									436	436	464	432		456	476		A	A			A			
4						A			A	A	R	A		A	L	R		L	U	L				
5							448							492	492	492	488	476	428	388				
6							L	A	A					A	A	A	A	A	U	A	A			
7									464	476		A	484					A	U	A	A			
8											A	A	A	A	A	A	U	A	A	A	A			
9																								
10																								
11																								
12																								
13																								
14																								
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28																								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2	7	17	18	14	9	10	13	13	19	20	19	19	18	14					
MED					254	348	396	436	454	464	480	488	492	492	488	476	460	432	390					
U Q						372	442	448	476	488	504	500	502	500	494	488	476	444	400					
L Q						336	382	420	440	460	476	482	476	484	464	464	444	416	388					

JUL. 2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 2013 f_oE (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					A	216	268	300	U	A	U	A	U	A	A	R	R	280	228	A				
2					B	212	260	300	328	344	368	384	372	368	A	A	344	324	U	A	A			
3					A	A	284	A	A	A	U	U	A	A	A	A	A	U	A	A	A			
4					A	U	A	A	U	U	A	U	R	B	A	U	A	A	U	A	A			
5					B	216	272	308	336	368	388	392	396	A	A	A	U	A	A	A	A			
6					A	A	U	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
7					176	188	244	304	316	336	A	A	U	A	U	R	344	320	272	216	A			
8					B	220	272	316	320	348	A	U	A	U	A	A	A	316	284	196	A			
9					U	R	A	U	U	A	A	A	A	A	A	A	340	352	312	296	236	A		
10					A	232	276	316	332	A	A	A	A	A	A	A	A	A	284	224	172			
11					A	196	276	296	336	A	U	A	A	A	R	356	356	344	312	292	232	A		
12					A	224	268	312	328	U	A	U	A	R	A	R	368	368	348	332	288	252	A	
13					R	168	216	260	300	336	356	356	360	364	A	U	A	U	A	A	A			
14					A	212	276	A	328	A	A	A	A	A	A	A	A	A	A	A	A			
15					B	A	208	256	300	304	332	348	A	A	A	A	A	324	284	236	A			
16					A	224	272	312	336	A	U	A	A	A	A	A	352	308	284	248	A			
17					B	208	252	300	324	344	A	A	A	A	U	R	364	352	312	280	A			
18					A	A	A	A	A	A	A	A	A	A	A	A	340	328	292	252	A			
19					A	A	272	316	324	A	A	A	A	A	A	A	R	352	332	296	A			
20					B	228	A	300	332	A	A	A	A	R	A	360	344	328	A	A	A			
21					A	A	280	308	336	344	U	A	A	A	A	A	A	A	A	A	A			
22					U	A	200	264	308	316	A	A	A	A	A	A	A	A	A	296	A			
23					A	232	268	308	348	372	A	A	A	A	A	A	324	A	252	A				
24					B	212	272	308	332	360	U	A	A	A	R	A	A	324	284	228	A			
25	A				B	180	260	300	320	336	U	A	A	R	R	A	A	344	A	A	A			
26					A	U	A	272	272	296	320	336	348	A	A	A	U	A	336	312	288	232	A	
27					B	196	256	308	348	A	A	A	A	A	U	A	A	A	A	A	A			
28					A	200	256	312	U	U	A	U	A	A	A	A	360	324	276	A	A			
29					B	192	252	304	312	328	A	A	A	U	A	A	340	312	A	A	A			
30					A	A	316	328	A	A	A	R	U	A	U	A	A	A	288	216	A			
31					A	A	192	304	320	A	A	A	A	A	A	348	356	316	268	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					3	25	27	28	29	18	13	9	8	6	11	18	22	22	18	1				
MED					168	212	268	308	332	350	356	372	370	362	352	346	324	288	234	172				
U Q					176	224	276	312	336	356	368	388	382	368	360	352	328	292	248					
L Q					U	R	198	260	300	320	336	348	364	360	356	344	344	312	284	228				

JUL. 2013 f_oE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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

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

JUL. 2013 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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 12	12	26	25	20	22	G 24	G 28	43	43	A A 65	G U Y 37	39	39	38	34	G 28	G 23	G	20	E B E B E B E B 11 12 14 14					
2	E B E B 14 14	16	E B E B 14 14	E B E B 15	22	26	30	35	38	43	A A 53	39	39	A A 90	52	33	A A 62	29	A A 73	26	A A 64	27	16			
3	30	26	17	40	A A 63	30	32	50	57	58	56	55	44	44	44	36	34	G 34	29	33	22	22	18	18		
4	E B E B E B E B 14 14 14 14	14	14	14	14	24	42	44	36	41	55	42	58	A A 68	53	53	60	40	50	39	35	23	18	11		
5	16	16	20	20	26	26	G 27	G 30	A A A A 40	A A A A 72	64	54	A A A A 98	151	44	A A 46	A A 66	46	46	29	35	20	19	E B 14		
6	E B 15	16	16	16	35	42	35	41	41	A A A A 67	105	116	102	52	40	A A 72	48	A A A A 98	109	41	53	32	18	E B 12		
7	18	19	28	22	G 16	22	G 24	31	A A A A 53	A A A A 69	74	53	56	43	41	A A A A 50	119	35	30	27	39	38	26	16		
8	16	23	E B 13	17	18	24	40	47	56	46	48	40	44	44	37	33	G 25	G 28	23	24	26	26	36	E B 11		
9	E B E B E B E B 13 12 12 12				G	46	46	61	58	A A A A 60	113	118	116	A A 41	46	46	A A 95	A A 40	A A 102	56	21	18	17	17		
10	24	11	20	E B 13	15	38	42	A A 68	A A 63	40	40	51	37	37	38	33	G 23	G 22					E B E B E B 14 14 14			
11	E B E B E B E B 14 14 14 14	18	28	29	32	32	A A 51	38	39	A A 56	47	40	38	41	35	A A 67	31	16			E B E B E B E B 11 11 12 12					
12	E B E B E B E B 14 14 14 14	29	29	29	G 31	49	56	38																16		
13	26	E B 15	21	16	15	28	30	33	A A 34	38	42	39	U Y 39	39	52	52	46	33	32	31	30	34	40	24		
14	26	26	22	E B 13	16	25	A A 82	41	A A 63	50	A A A A 66	116	203	44	A A 71	54	38	34	27	36	35	38	18	23		
15	17	E B E B E B 13 14 14	14	17	G 16	23	G 30	31	U Y 36	36	38	52	52	44	42		G 40	32	30	16	18	E B E B 12 14				
16	E B E B E B 14 14 14	14	14	17	U Y 33	36	42	A A A A 61	69	50	40	37	37	36	38	42	A A 105	50	26	42	24	16	26			
17	E B E B E B E B 12 12 12 15	12	22	27	G 30	34	A A A A 68	74	94	46	57	42	50	40	35	28	27	34	30	27	20					
18	18	30	24	19	18	44	A A A A 82	87	115	53	90	48	52	41	42	60	65	54	26	17	17	20	24	20		
19	30	19	E B 13	17	E B 13	21	35	45	52	A A A A 111	129	97	65	41	41	38	52	34	28	33	40	22	22	20		
20	20	17	E B E B E B 15 14 14	14	G 22	43	33	35	A A 81	52	50	38									E B 11	13	21	39		
21	21	36	30	28	18	21	51	47	54	58	52	52	44	U Y 33	36	41	39	43	53	30	60	25	26	17		
22	17	17	17	17	17	20	38	56	A A 104	58	58	55	45	44	46	41	36	G 22	G 36	21	19	28	26	16		
23	27	27	E B 21	16	15	G 15	32	34	37	40	41	65	56	56	42	46	36	G 29	G 20	17	22	30	25	26		
24	23	18	17	17	17		28	40	40	49	52	52	42	30	36	35	G 25	G 28	25	25	23	28	20	19		
25	E B E B E B 14 14 14	18	E B E B 14 14	14	19	19	32	32	36	36	36	34	U G U G 36	35	35	28	G 49	G 46	G 42	34	19	18	18	E B 12		
26	E B E B E B E B 14 14 14 14	17	24	34	52	53	53	58	58	48	40	40	40	44	33	G 25	G 28	G 25	21	23	32	15	13			
27	E B E B E B E B E B 15 15 14 14 11	20	26	28	G 51	113	63	103	46	48	48	48	48	48	48	33	29	44	22	21	39	E B 14	31			
28	E B 14	22	E B E B E B 14 14 14	14	18	28	61	A A 73	48	A A 79	52	A A 65	52	121	38	A A A A 109	A A A A 109	A A A A 96	18	42	18	20	17			
29	18	E B E B E B E B 12 12 12 12	12	12	G 18	26	32	32	45	43	A A A A 68	64	65	48	A A A A 76	A A A A 110	A A A A 44	43	24	E B E B E B 16 16 15	45					
30	42	24	24	27	24	26	26	35	A A 54	93	43	37	52	60	69	A A A A 70	A A A A 76				26	19	19	22	21	30
31	22	22	22	22	20	20	20	32	42	43	39	A A 103	50	50	E B 13	40	52	57	25	23	23	28	28	36		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MED	17	16	16	16	17	22	32	35	51	56	52	52	47	43	42	41	39	35	30	25	23	23	19	17		
U Q	23	22	21	19	20	29	42	47	A A A A 56	68	66	68	58	52	48	52	A A A A 60	A A A A 46	44	33	35	30	26	24		
L Q	E B E B E B E B 14 14 14 14	14	14	14	14	G 20	G 26	G 31	36	43	42	40	40	39	37	38	G 33	G 29	26	20	19	18	E B E B 16 14			

JUL. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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

$\begin{matrix} H \\ D \end{matrix}$	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	12	12	12	14	11	11	9	9	16	20	16	16	19	17	19	17	16	16	16	11	11	12	14	14
2	14	14	14	14	15	14	14	14	13	13	13	15	21	18	20	20	17	15	12	14	14	12	12	12
3	13	13	16	14	12	12	14	14	14	28	17	16	16	16	16	17	16	16	15	14	14	12	12	12
4	14	14	14	14	14	14	14	14	14	24	18	17	42	20	16	15	15	13	14	14	12	11	11	11
5	12	12	12	13	12	12	12	12	12	12	19	18	18	18	18	18	14	14	14	14	14	14	14	14
6	15	15	15	16	12	15	15	15	15	15	15	20	15	14	15	15	15	12	12	10	12	12	12	12
7	13	12	12	12	12	12	12	12	12	12	15	13	16	17	16	15	14	14	15	15	15	11	11	11
8	13	13	13	14	14	11	14	13	12	10	16	12	12	17	15	15	15	15	15	14	11	11	11	11
9	13	12	12	12	12	12	12	13	16	17	15	20	18	20	18	16	14	14	14	14	11	11	12	12
10	12	11	13	13	14	14	14	15	14	16	16	23	22	19	19	17	16	15	15	15	14	14	14	14
11	14	14	14	14	12	12	12	12	12	14	12	31	27	15	16	13	13	13	13	14	11	11	12	12
12	14	14	14	14	14	14	14	13	13	15	14	22	18	18	17	17	17	16	16	16	12	11	11	11
13	15	15	14	14	12	14	14	14	15	15	14	14	19	16	16	16	16	16	16	13	13	12	12	12
14	13	13	13	13	13	13	13	13	14	13	16	16	18	16	22	15	15	15	15	14	14	14	14	14
15	13	13	14	14	14	14	14	14	14	14	14	14	14	19	16	18	17	16	14	14	12	12	12	14
16	14	14	14	14	14	14	11	11	11	11	13	18	20	16	18	17	16	16	15	14	14	14	12	12
17	12	12	12	12	12	12	12	12	12	14	14	17	20	21	16	15	15	14	14	14	14	14	14	14
18	15	15	15	12	13	12	12	12	13	13	16	16	16	16	16	14	14	14	14	14	13	13	13	13
19	13	13	13	13	13	14	17	12	13	20	20	16	17	22	20	16	14	14	14	14	11	11	11	11
20	15	15	15	14	14	14	14	14	14	14	20	14	14	14	13	12	12	12	11	11	11	10	13	12
21	12	12	12	12	12	12	12	12	12	12	12	12	20	15	15	15	16	17	16	16	12	15	16	14
22	14	14	14	14	14	14	14	13	13	19	19	18	17	17	17	14	14	13	12	12	15	15	15	15
23	13	13	14	16	14	14	14	14	14	14	13	18	18	16	16	16	16	13	12	12	12	15	15	15
24	15	15	15	15	13	12	12	12	16	16	16	19	13	14	12	13	12	12	12	12	14	14	14	14
25	14	14	14	14	14	14	13	13	13	12	14	14	12	13	12	12	12	12	10	9	12	12	12	12
26	14	14	14	14	13	13	13	12	12	12	12	12	25	19	19	16	15	15	15	15	13	13	13	13
27	15	15	14	14	11	11	13	13	14	14	16	16	18	18	13	13	13	13	14	13	14	14	14	14
28	14	14	14	14	12	11	11	11	11	11	11	16	16	17	14	14	14	14	12	12	12	12	12	12
29	12	12	12	12	12	12	12	12	12	12	14	19	22	17	17	17	17	17	16	16	16	16	15	15
30	15	15	15	12	12	12	12	12	12	15	16	16	16	16	15	15	15	12	12	12	12	12	10	10
31	14	14	14	14	12	12	12	12	12	12	25	16	13	12	13	13	13	13	12	8	8	17	17	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	14	14	14	14	13	12	13	13	13	14	15	16	18	17	16	15	15	14	14	14	12	12	12	12
U Q	14	14	14	14	14	14	14	14	14	16	16	18	20	19	18	17	16	16	15	14	14	14	14	14
L Q	13	12	13	13	12	12	12	12	12	12	13	14	16	16	15	14	14	13	12	12	12	11	12	12

JUL. 2013 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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	302	283	285	300	289	295	358	279	339	306		298	275	291	303	292	284	297	307	305	304	310	307	300	
2	302	316	295	293	299	306	335			305	316		259	307		285	297		295		308		280	302	
3	307	286	299	297		324	321	301	329	296	310	297	286	297	317	309	296	299	310	335	306	308	293	292	
4	296	298	300	292	327	300	313	322	322	320	317	282	324		291	296	300	314	313	314	325	297	296	294	
5	301	292	284	278	280	344	345	352	301			320			284	285		285	305	341	342	290	293	296	
6	291	291	282	291	282	356	295	302	269						272	267					302	290	308	289	283
7	289	287	273	264	262	267	280	273							292				283	285	293	292	287	284	283
8	288	287	304	288	288	317	309	308	302	319	335	310	281	299	314	283	300	306	317	321	327	292	306	286	
9	305	297	302	288	292	270	281	336							241	269			311		308	308	302	305	271
10	293	291	281	293	291	284	289		326		296	284	288	312	312	295	292	310	318	291	290	306	304	285	
11	293	280	279	274	262	280	256						242	263			239	287		300	299	278	253	272	303
12	277	282	280	263	257	287	285		257		325	303	305	311	308	305	323	304	301	304	311	287	287	288	
13	283	285	294	291	295	284	274	301	318	317	340	315	321	307	331	303	301	301	302	328	299	302	296	275	
14	283	285	294	302	311	342				291						276	297	280	280	280	297	268	290	275	
15	282	279	268	259	282	301	262	326			248	299	319	316	294	313	309	301	298	320	290	291	295	279	275
16	276	277	285	283	287	259	264	294			294	305	294	285	294	308	286			300	307	289	297	296	
17	287	286	289	295	284	268	251	262	326				306		291	310	300	308	309	294	311	303	264	281	
18	277	276	281	285	308	307				292		292	305	304	308	311	302	298	315	309	346	328	303	309	
19	307	272	274	275	300	289	273	284	297					332	284	305	320	316	302	316	318	302	292	299	
20	282	276	284	278	276	323	305	319	324		306	297	296	313	292	298	298	296	322	313	308	315	324	303	
21	284	277	288	288	288	314	330		311		304	295	273	307	306	328	313	304	301	293		302	283	306	
22	287	293	308	289	315	323	299	337		313	326	305	302	300	317	305	321	302	301	297	330	321	306	302	
23	299	287	295	299	296	294	337	328	367	309	318	320	312	311	300	300	289	303	312	307	312	299	285	302	
24	307	298	295	308	310	316	310	297		316	300	309	291	306	306	304	313	305	314	305	319	314	321	293	
25	285	295	293	293	299	326	299	362	330	328	318	312	317	305	314	322	292	294	301	323	288	278	300	338	
26	290	292	284	291	294	312	307	285		315	323	301	299	315	293	314	307	328	319	310	294	287	304	304	
27	276	291	280	286	280	295	305	315	320			303	297	294	324	305	304	291	304	311	302	285	290		
28	300	293	297	297	297	308	302	300			315		301		300					315	293	291	294	302	
29	316	301	309	305	303	281	307	305	281	280	262							303	303	306	303	298	293	294	
30	299	289	274	287	310	268	291	326	339		304	335	307	312	309					314	312	306	304	287	307
31	299	296	296	303	303	288	301	315	329	327	344		311	334	301	288	294	287	314	323	280	293	294	301	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	30	31	29	25	20	17	20	20	23	26	27	27	25	26	27	30	30	30	30	31	
MED	291	287	288	291	293	300	301	305	321	309	313	305	302	304	301	303	300	303	307	306	306	298	294	296	
U Q	301	293	296	297	303	317	312	326	329	318	324	315	311	311	312	309	306	308	314	315	312	306	304	302	
L Q	283	282	281	283	282	284	280	290	299	292	300	297	286	294	291	288	292	297	301	299	293	289	285	285	

JUL. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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	L	A	U R	A		R					L	L	L				
2								L			A	A									A			
3					A			A	A	R	A	A					L	L						
4						L	A	A			A	A					A	A	A	A				
5						U L	L	L		A	A	A	A				A	A	A	A				
6								A			A	A	A				A	A	A	A				
7					U L				A	A	A	A					A	A						
8									A	A	A	A												
9					L	A	A	A	A	A	A	A												
10						A	A	A	A	A														
11						A	A	R	A															
12					A																			
13						L	L	L	L	Y	R													
14						A	A	A	A	A	A	A												
15																								
16																								
17						U L		R	U R	A	A	A	A											
18																								
19																								
20					L	L	U R			A	A	A												
21						L	A	A	A	A	A	A												
22																								
23					L																			
24																								
25						L	L	L	L															
26																								
27						L	L	L	A	A	A	A	A											
28						L																		
29																								
30						L	L	U R	A	A														
31						L	L																	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2	7	16	16	11	6	7	11	12	17	16	16	17	16	12					
MED					298	337	360	368	384	395	391	393	386	379	378	370	360	349	344					
U Q						352	367	378	398	400	432	401	397	393	388	380	366	360	353					
L Q						326	347	356	368	391	379	387	368	364	363	361	350	344	327					

JUL. 2013 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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						304	262	386	292	344	A	E Y	360	452	384	338	362	350	348	302	276			
2						314	300	300	472	362	350	A	536	376	A	A	368	A		A				
3					A		336	336	304	382	364	376	346	374	338	338	334	332	312					
4						306	280	302	302	302	E A	358	406	342	A	362	374	364	288	288	A			
5						260	238	244	370	A	A	312	A	A	A	370	370	A	338	280				
6							352	358	486	A	A	A	A	A	472	468	A	Y	A	A				
7					330	330	336	478	A	A	A	A	A	G	408	A	A	402	356					
8							306	306	300	288	332	402	350	326	354	354	304	282						
9					E A	320	366	346	296	A	A	A	A	Y	E A	516	458	A	334	A	A			
10						328	350	A	A	A	A	348	364	364	338	332	332	296	276	276				
11						342	416	350	A	G	A	A	580	508	G	560	414	A	326	312				
12					A	386	354	400	G	A	A	380	348	364	336	352	334	334	308	308	300			
13						352	368	300	300	306	308	308	316	324	310	E A	352	352	310	294				
14						262	A	A	A	E A	A	A	A	G	A	E A	398	360	360	348	332			
15						332	474	332	G	552	358	328	344	344		320	322	322	306					
16					E Y	426	424	388	A	A	A	E A	370	418	398	438	368	368	368	A	A			
17					L	374	456	444	312	A	A	A	E A	A	A	396	374	374	334	310	304			
18					A	280	A	A	A	A	A	A	382	350	350	322	356	388	346	302	284			
19						L	386	386	346	A	A	A	A	A	372	370	328	330	320	320				
20					326	272	366	314	306	A	E A	360	360	362	314	354	354	348	336	288				
21						284	284	258	E A	A	A	332	348	432	334	334	306	306	306	306	A			
22						274	326	292	A	A	A	316	304	346	346	392	346	346	312	312	308			
23					306		266	266	258	334	296	A	322	340	340	340	340	340	310	298				
24							326	272	282	306	320	362	334	314	300	E A	300	300	282					
25						274	294	250	280	298	308	332	332	332	332	298	E A	366	332					
26							308	338	338	330	328	342	348	326	344	328	316	294	294					
27						296	296	296	E A	A	A	A	386	358	358	300	328	294						
28						294	320	A	A	Y	A	E A	352	A	A	A	368	A	A	A				
29						376	376	382	410	E A	E A	478	498	A	A	A	A	A	A	E A	A			
30					L	386	268	300	284	A	312	308	340	332	394	A	A	A	310	310				
31						288	294	290	290	290	294	A	354	300	340	340	340	416	272					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					5	24	27	27	22	18	20	19	23	26	26	26	24	26	24	7				
MED					326	305	336	314	305	331	324	347	351	351	342	344	340	321	302	304				
U Q					358	353	376	382	346	382	359	364	398	384	370	368	365	338	311	332				
L Q					313	282	294	296	292	302	307	328	342	334	334	328	325	306	288	276				

JUL. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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	262	306	324	A	260	234	224	216	A	E	A	A	216	216	214	240	222	216	216	254	254	252	248	248	
2	260	260	260	270	272	262	204	204	204	204	A	A	204	218	A	A	222	A	244	A	252	A	328	282	
3	A	300	274	E	A	A	254	254	A	A	A	A	E	A	A	A	234	232	238	238	254	254	254	254	
4	288	280	280	280	254	248	A	A	214	A	A	A	A	A	A	A	A	A	A	A	262	262	262	262	
5	262	262	284	284	280	246	210	196	196	A	A	A	A	A	A	A	A	A	A	A	240	240	240	270	
6	300	292	292	294	294	282	244	A	240	A	A	A	A	A	A	A	A	A	A	A	E	A	286	252	
7	A	272	278	306	320	324	286	246	230	A	A	A	A	A	A	A	A	E	A	E	A	E	A	282	
8	280	300	278	278	276	234	270	A	A	A	A	222	222	218	218	218	218	222	222	222	222	234	256	256	
9	256	256	256	262	262	A	A	A	A	A	A	A	A	Y	A	A	A	A	A	A	A	A	238	242	
10	282	282	284	274	274	A	A	A	A	A	208	208	A	208	208	208	208	220	220	250	252	252	252	254	
11	254	258	258	286	356	A	E	A	290	238	206	196	A	A	A	A	A	A	A	A	266	266	272	282	
12	274	280	282	298	A	E	A	E	A	A	A	234	202	216	216	216	216	E	A	A	270	270	270	270	
13	286	286	282	282	272	272	260	216	216	Y	242	236	236	236	A	A	A	A	H	A	254	254	278	284	
14	310	302	288	288	264	A	A	A	A	A	A	A	A	A	A	A	228	228	234	A	310	330	294	304	
15	286	288	288	316	312	294	272	246	212	212	212	212	A	A	A	260	260	234	E	A	276	276	254	254	
16	282	282	284	284	288	A	A	A	A	A	A	216	200	200	200	234	A	A	A	A	266	276	276	274	
17	284	284	284	276	276	254	232	E	A	282	232	A	A	A	A	A	E	A	A	A	288	270	256	262	
18	286	334	314	290	256	A	A	A	A	A	A	E	A	A	A	A	A	A	A	A	232	250	250	250	
19	280	314	308	308	274	248	292	E	A	A	A	A	A	A	A	A	256	A	228	258	264	264	264	266	
20	272	278	278	272	282	244	264	E	A	222	222	A	A	A	Y	216	216	232	232	A	230	256	256	256	
21	298	336	306	296	296	266	A	A	A	A	A	A	212	212	212	212	A	A	A	A	236	326	248	250	
22	262	262	262	274	274	234	A	A	A	A	A	A	E	A	A	A	256	226	226	A	260	260	260	260	
23	274	300	272	272	270	264	E	A	242	224	E	A	224	202	A	A	222	222	222	222	258	258	274	274	
24	298	274	274	274	250	246	238	A	A	A	A	A	224	224	222	212	212	212	212	A	240	256	262	254	
25	272	272	272	272	272	222	220	220	220	220	200	192	192	192	192	200	A	A	A	276	276	276	284	246	
26	250	250	268	268	286	284	A	A	A	A	A	A	194	228	A	220	220	220	220	248	274	312	264	264	
27	288	276	276	262	264	264	250	246	A	A	A	A	A	A	A	A	238	238	E	A	268	E	A	308	
28	254	296	294	282	282	266	240	A	A	A	A	A	A	A	A	A	236	A	A	A	E	A	290	290	
29	252	252	268	268	286	270	228	228	228	A	A	A	A	A	A	A	A	A	A	A	264	264	264	E	A
30	A	324	348	344	302	246	230	248	A	A	A	248	174	A	A	A	A	A	A	204	232	248	248	270	
31	296	292	292	292	276	234	234	232	280	A	220	A	A	A	A	220	232	312	A	232	238	238	286	336	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	29	25	22	16	12	7	8	11	10	15	16	16	16	16	19	27	31	30	31	30	
MED	280	282	282	282	275	254	238	228	220	209	216	210	211	219	219	229	223	222	231	258	258	262	262	266	
U Q	288	300	292	296	287	271	E	A	264	242	230	234	238	222	224	228	240	238	233	238	258	266	274	278	
L Q	262	272	272	272	267	245	230	218	213	204	204	202	200	212	213	214	219	218	222	248	252	254	254	256	

JUL. 2013 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUL. 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						120	120	116	116	116	114	114	114	114	114	114	114	114	114					
2					B	124	124	124	124	124	106	106	108	108		108	108	108	A	A				
3					A		108				108	108						108		A				
4					A	108	108	106	106	106	106	106	B	A		A	A	106	106					
5					B	106	106	106	106	106	106	106	106	106		106	106		A		A			
6					A	A	118	116	116	116		A	A	A		A		112	A	112				
7					124	124	124	106	106	106		A	A	106	106	106	106	106	106	106				
8					B	118	112	112	112	114		104	104					110	110		A			
9					E B	240	122	120	118	106	106		A	A		106	106	106	110	110				
10						114	114	112	112			A			A	A	A		112	112	112			
11					A	112	112	112	112		108		A		110	110	110	110	110	110				
12					A	114	114	114	116		108	108	108	108	108	108	108	108	108	108				
13					124	116	116	116	114	108	108	108	108	A	A		108	108	108	108				
14						112	112		112		A	A	A			A	A	A		A				
15					B	A	112	112	112	110	110	110			A		A	110	108	108				
16					A	108	108	108	108		108				A	A	110	110	110	110				
17					B	118	118	116	116	116		A			114	114	114	114		A				
18					A	A	A	A			A	A	A				120	120	120	120				
19					A		120	120	112	112			A	A	A	A	112	112	112		A			
20					B	116		116	108		A	A	A	A		104	104	104	104		A	A		
21					A	A	104	104	104	104	104		A	A			A		A	104				
22						110	112	112	112								A		116			A		
23						116	114	114	114	112								112		118				
24					B	116	116	116	112	112	112			A	112	A		112	112	112				
25					B	112	112	112	112	112	112						112		A					
26						112	112	112	112	112	112			A	110		110	118	114	114				
27					B	114	114	114	114		A				112		A	A		A				
28					A	112	122	118	106	108		A	A			A	108	108	108		A			
29					B	112	112	112	112	112				A	112		112	112			A			
30						A		112	112			A							112	112				
31						114		114	114		A	A			A	112	112	112	112					
	00	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	25	27	28	29	19	14	9	8	10	11	18	22	22	18	1				
MED					124	114	114	113	112	112	108	108	108	109	110	110	110	110	110	112				
U Q					E B	240	117	118	116	114	114	112	110	110	112	112	112	112	112					
L Q					124	112	112	112	108	106	106	106	106	106	106	108	108	108	108					

JUL. 2013 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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

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	96	96	96	94	94	136	136	130	124	118	118	108	112	112	182	136	110	110	G	102	B	B	B	102
2	102	106	106	B	B	128	128	128	146	126	126	118	118	118	116	112	132	120	112	106	102	102	102	110
3	110	106	106	104	102	102	118	118	118	116	116	116	116	116	114	114	114	114	114	114	114	114	116	116
4	102	108	108	108	108	106	106	106	106	106	106	106	106	104	104	104	104	106	106	106	106	106	106	106
5	110	106	102	108	108	108	108	128	124	112	112	112	112	112	112	112	112	112	112	112	112	112	108	108
6	98	98	98	98	98	98	100	112	112	112	112	114	112	108	108	108	108	108	108	108	108	108	108	B
7	122	122	122	122	122	122	118	118	118	116	112	104	114	124	188	122	122	126	114	114	114	114	114	114
8	102	102	102	102	102	136	122	120	120	110	104	104	104	104	104	104	104	128	118	110	108	108	108	108
9	108	106	106	106	G	106	106	106	104	104	104	104	98	108	108	120	128	126	126	116	116	108	108	108
10	106	104	102	102	120	120	120	114	110	108	108	108	108	108	108	108	108	108	126	G	126	126	126	B
11	B	138	132	120	120	120	120	114	110	110	110	110	110	128	128	126	120	120	120	110	B	B	110	B
12	B	128	B	B	122	126	122	118	110	110	114	G	G	G	146	130	130	124	116	116	116	114	110	110
13	110	110	106	106	106	106	110	118	118	118	112	112	112	112	112	112	112	112	112	110	104	104	104	104
14	102	102	102	102	102	112	112	144	112	112	114	108	116	96	96	108	108	108	108	108	108	108	108	108
15	122	110	110	B	110	118	120	120	120	120	120	118	104	104	104	104	G	114	114	114	114	114	114	B
16	B	134	122	122	122	122	122	122	108	108	108	108	108	108	108	234	126	126	120	120	120	120	116	110
17	110	110	110	106	B	112	112	112	110	110	110	110	110	108	122	122	116	116	110	104	104	104	102	112
18	106	104	102	102	98	98	98	98	98	100	102	102	102	110	120	120	110	110	110	110	110	104	104	104
19	104	104	104	102	100	114	114	114	108	108	108	106	108	106	106	192	126	126	124	108	108	108	108	104
20	100	100	100	B	B	156	104	124	124	110	110	110	110	G	134	134	130	130	120	104	104	104	104	104
21	104	104	100	100	100	110	110	110	110	110	114	106	106	106	106	106	112	112	112	112	112	112	112	110
22	94	94	94	94	94	124	124	112	112	114	116	108	108	106	106	108	108	108	118	128	120	110	110	110
23	100	100	100	100	104	122	124	124	120	120	118	108	110	106	106	102	122	122	112	112	112	112	112	112
24	98	98	98	98	98	G	116	116	116	116	106	106	108	108	106	106	106	136	136	96	96	96	96	96
25	104	102	102	102	102	124	120	120	116	116	116	108	108	106	106	106	106	106	118	118	118	114	114	112
26	B	110	108	108	108	124	124	124	122	120	112	112	112	110	110	110	110	132	132	120	114	114	114	112
27	B	106	106	B	132	132	134	122	108	108	108	108	108	108	108	108	108	108	104	104	104	104	110	110
28	110	110	110	B	110	132	124	122	114	114	108	106	106	128	108	120	118	118	114	118	102	102	102	112
29	108	108	B	108	B	130	130	130	112	112	112	112	102	112	112	116	116	116	106	144	144	110	118	114
30	114	114	102	102	102	100	100	120	114	110	112	112	112	112	112	108	108	G	108	108	108	108	108	108
31	106	102	102	102	102	102	102	102	102	102	104	104	100	B	116	116	114	114	114	114	114	114	114	106
	00	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	31	29	25	26	30	31	31	31	31	31	30	30	29	30	31	30	30	30	30	29	29	30	27
MED	105	106	102	102	103	120	118	120	114	112	112	108	108	108	108	112	112	115	114	111	112	108	109	110
U Q	110	110	108	108	110	126	124	124	120	116	114	112	112	112	116	122	122	126	120	116	115	114	114	112
L Q	102	102	101	101	100	106	108	112	110	108	108	106	106	106	106	108	108	110	110	108	105	104	106	106

JUL. 2013 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUL. 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

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	F2	F4	F4	F6	L4	CL12	C1	C1	C1	C1	C2	C1	C1	C2	H1	H1	L1	L1		L2				F1
2	F1	F1	F2			HL22	CL22	CL22	CL11	CL11	CL11	C2	C1	C1	CC12	CC2	C1	C2	LQ21	LQ6	F3	F3	F5	FF13
3	F4	F3	F2	FF32	L2	L3	C2	CL22	CL22	L1	C2	CO21	C1	C1	C1	C1	C2	C2	LQ31	LQ31	F3	F3	F2	F2
4	F1	F1	F1	FF11	C1	C3	C1	C2	C1	C1	C1	C1	C1	C2	C2	L2	CL31	C2	C4	C4	F3	FO31	FO21	F1
5	F2	F2	FO21	FF32	CL22	C2	C2	H1	C1	C2	C1	C2	C2	C3	C1	C1	C3	CO31	CO31	L3	FO41	F3	F2	F1
6	F1	F1	F4	F2	C4	C2	C2	C2	C2	C2	CH22	C21	C2	C1	CL11	C2	C2	C4	C4	C8	F6	F4	F3	
7	F8	F3	F5	F3	L1	CL21	C1	C1	C1	C2	C2	C2	C2	C1	H1	C2	C2	HC22	C3	L3	F6	F4	F8	F2
8	F3	F5	F2	F2	L2	HL11	C2	C2	C3	C1	C1	C1	C1	L1	L1	L1	L2	CL12	CL12	L3	F5	F4	F4	F1
9	F2	F1	F1	F1		C2	C2	CL21	C2	C2	C2	LQ21	L3	CL11	C1	CL11	CL22	CL21	CL41	L5	F5	F2	FO31	F4
10	F3	FF11	F2	F1	C1	C2	C2	C2	C2	C1	C1	C1	C1	L1	L1	L2	L2	L2	C2		F2	F1	F1	
11		F1	F1	F3	L8	C4	C2	C1	C1	C1	C2	C2	C1	HL11	C1	C1	C2	C2	C3	C3			F1	
12		F1			C3	C3	C3	C1	C1	CL11	C1				H1	C1	C1	C1	C1	C4	F5	F2	F2	F2
13	F4	F2	F3	FO11	L1	CL31	C2	C1	C1	C1	C1	C1	C1	C1	L1	C1	C1	C1	C2	C5	F4	F6	F3	F3
14	FO31	FO31	F3	F2	C2	C3	C4	HC12	C3	C2	C2	C2	CLQ12	LQ11	L3	CL13	L2	L2	L3	CL33	F5	F5	F2	F3
15	FF21	F1	FF11		L2	L2	C1	C1	C1	C1	C1	C1	C1	C1	L1	L1		C2	C6	L7	F1	F2	F1	
16	F1	F3	F1	F1	C2	C2	C2	C2	C2	C3	C2	C1	C1	C1	C1	HL11	HC21	C6	C3	C3	C4	F3	F1	F3
17	F2	F2	F1	F1		CL21	C2	C2	C1	C1	C1	L2	L1	LQ11	C1	C2	CO21	C2	C2	LQ31	FO31	FF13	F3	FF13
18	F4	F4	F2	F2	L2	CL21	C4	C2	LQ21	L2	LQ21	L1	L1	CL11	CL11	CL21	C2	C2	C2	C2	F3	FO31	FO31	FO31
19	FO31	F2	F2	F2	L1	C2	C4	C2	CO11	CO21	L2	L2	L2	L2	L1	H1	C2	C2	C2	L6	F5	F3	F2	F2
20	F3	F2	F1		HL12	C2	C1	C1	C2	C2	CL11	L1			HL11	CL11	CL12	CL23	CL23	CL23	F1	F2	F2	F4
21	F4	F4	F4	F3	L3	L2	C3	C2	C2	C2	C1	L1	L1	L2	L1	L1	CL22	CL23	C3	FO31	FO61	FO31	F5	F3
22	F4	F2	F2	F3	F2	C2	C2	C2	C3	C2	C3	CO11	L1	L1	L1	L2	L2	L2	CL22	CL23	FF32	F3	FF14	FF31
23	F3	FO31	FO21	F1	C1	L3	C2	C1	C1	C1	C2	CLQ12	L2	L1	L2	L2	CL11	CL12	L2	L2	F4	FO31	FO31	FO31
24	FF32	F2	F3	F2	L1		C3	C2	C2	C1	C1	C2	C1	C1	C2	C3	L1	CL11	CL22	C3	F3	F4	F4	F2
25	L1	F2	F3	F2	L1	C1	L2	C2	C1	C1	L1	L1	L1	L1	L2	C1	CL22	L2	LLQ23	FFQ23	FO31	F2	F4	F1
26		F1	F1	F3	LC31	CL33	CL32	C2	C3	C2	C2	C1	C1	C1	C1	C1	L1	H1	C2	C2	F2	F3	F3	F1
27		F1	F1		C1	C2	CL11	C1	C2	C2	CO11	CO21	L1	C1	C2	L2	L2	C2	L4	FQ41	F3	F4	F2	F5
28	F2	F3	F2		L3	CL11	CL22	C3	C3	C2	C2	L2	L1	CL12	LQ21	C1	C3	C2	C4	L3	F8	F4	F3	FF12
29	F3	F1		F1		C1	C2	C2	C1	C1	C1	C2	C2	C2	C1	C2	C2	C3	C3	L12	HLQ13	FFQ2	FF11	FF42
30	F3	F3	F3	FF23	L3	L4	L2	C2	C2	C2	CL11	L1	C2	L2	C2	L2	L3		C2	C2	F3	F4	F3	F3
31	F3	F3	F5	FF32	C3	L2	L2	C1	C1	C1	CL21	C1	C1			C1	C1	C3	L2	FO11	F6	F3	F4	F3
	00	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																								

JUL. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 2013 f_{XI} (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	67	65	X	X	X															X	X	X	X	X
2	X	X	X	X	X															X	X	X	X	X
3	73	73	70	69	70															77	81	82	74	81
4	X	X	X	X	X															X	X	X	X	X
5	74	73	76	71	67															98	93	75	72	72
6	X	X	X	X	X															X	X	X	X	X
7	73	74	72	73	69															84	82	78	79	82
8	X	X	X	X	X															X	X	X	X	X
9	82	79	74	74	70															101	77	74	81	80
10	X	X	X	X	X															X	X	X	X	X
11	77	74	73	65	61															87	87	82	84	83
12	X	X	X	X	X															X	X	X	X	X
13	78	81	80	79	80	83	90													69	75	75	73	72
14	X	X	X	X	X															X	X	X	X	X
15	72	68	65	64	61															97	95	82	80	75
16	X ⁰	X	X	X	X															X	X	X	X	X
17	71	62	60	58	55															80	74	68	67	76
18	77	75	66	67	69															X	X	X	X	X
19	X	X	X	X	X															84	88	85	80	82
20	85	74	80	78	69															X	X	X	X	X
21	X	X	X	X	X															69	71	69	72	70
22	74	69	67	64	57															X	X	X	X	X
23	X	X	X	X	X															80	78	76	76	72
24	74	73	69	70	69															A	X	X	X	X
25	X	X	X	X	X															X	X	X	X	X
26	70	69	69	70	74															81	85	84	87	83
27	X	X	X	X	X															X	X	X	A	X
28	77	77	75	72	74															100	97	76		71
29	X	X	X	X	X															X	X	X	X	X
30	70	70	69	68	64															87	82	84	84	72
31	69	70	68	63	57															X	X	X	X	X
32	X	X	X	X	X															80	81	66	65	64
33	65	65	66	66	60															X	X	X	X	X
34	X	X	X	X	X															103	92	87	86	79
35	78	75	76	73	74															X	X	X	X	X
36	X	X	X	X	X															90	82	78	79	75
37	80	75	74	69	67															A	X	X	X	X
38	X	X	X	X	X															X	X	X	X	X
39	73	71	70	69	62															90	86	80	81	88
40	92	87	79	72	71															X	X	X	X	X
41	X	X	X	X	X															98	100	91	87	78
42	81	83	88	80	68															X	X	X	X	X
43	X	X	X	X	X															98	93	88	86	87
44	92	80	80	81	69															X	X	X	X	X
45	X	X	X	X	X															84	81	79	77	71
46	70	72	74	74	68															X	X	X	X	X
47	79	78	80	75	66															93	99	78	78	80
48	X	X	X	X	X															X	X	X	X	X
49	72	70	66	65	65															75	72	72	72	71
50	X	X	X	X	X															X	X	X	X	X
51	69	68	65	65	60															90	81	77	79	76
52	70	67	59	55	50															X	X	X	X	A
53	X	X	X	X	X															69	72	70	67	
54	60	56	53	50	54															X	X	X	X	X
55	X	X	X	X	X															68	78	75	72	68
56	73	69	67	70	58															X	X	X	X	X
57	70	69	66	65	60															87	82	76	77	79
58	X	X	X	X	X															X	X	X	X	X
59	70	69	66	65	60															83	79	74	73	77
60	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	1	1													29	31	31	30	30
MED	X	X	X	X	X															X	X	X	X	X
U Q	73	73	70	69	67	83	90													87	82	78	78	76
L Q	X	X	X	X	X															X	X	X	X	X
	78	75	76	73	69															96	92	82	81	80
	X	X	X	X	X															X	X	X	X	X
	70	69	66	65	60															80	78	75	73	72

JUL. 2013 f_{XI} (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

JUL. 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	F	F	53	53	50	38	59	80	94	86	72	72	75	78	78	75	75	80	82	90	95	82	72	70	
2	67	67	64	63	64	62	57	66	67	R	62	62	62	65	67	63	66	67	68	71	75	76	68	75	
3	68	66	F	65	60	60	65	75	74	73	69	A	A	A	82	86	87	89	93	92	87	68	66	66	
4	66	68	66	66	F	60	64	63	A	72	A	A	A	70	A	85	A	A	88	78	75	72	72	76	
5	76	73	68	F	64	68	67	66	64	67	66	71	72	72	80	92	98	99	104	95	71	68	75	74	
6	70	68	67	59	55	60	69	76	66	60	62	63	A	A	67	71	73	78	79	81	81	76	78	77	
7	72	75	74	73	74	F	F	70	62	58	56	64	62	61	58	56	54	55	60	63	69	69	67	66	
8	66	62	59	57	55	55	63	72	80	A	67	A	69	75	76	81	80	88	90	90	89	75	74	69	
9	65	56	54	52	49	53	79	84	77	69	65	59	56	63	A	65	67	76	80	74	68	61	61	F	
10	F	F	F	F	F	65	68	78	78	74	66	75	86	94	91	90	86	86	84	78	82	79	74	76	
11	79	68	74	72	63	74	87	72	60	A	47	A	53	60	61	61	59	60	60	62	65	63	66	64	
12	68	63	61	58	51	A	54	60	74	73	63	A	72	79	80	85	86	75	73	74	72	70	70	66	
13	68	67	62	64	63	62	65	71	80	74	78	83	90	92	91	80	74	80	77	A	76	72	73	70	
14	64	63	63	F	67	61	53	60	63	57	55	R	A	A	67	70	76	A	74	71	75	79	78	81	77
15	71	70	69	66	68	63	67	63	61	62	V	74	76	75	65	76	72	75	74	85	94	91	69	A	65
16	64	64	63	62	58	54	A	A	62	A	66	65	66	A	70	71	73	74	80	80	76	F	78	66	
17	F	F	F	56	51	54	57	68	74	65	62	65	R	63	71	66	65	66	67	74	75	60	59	58	
18	58	58	60	59	53	50	68	73	71	61	62	64	69	81	84	86	87	86	92	97	86	81	79	72	
19	72	69	70	67	68	54	55	72	71	67	62	66	72	68	75	86	87	84	A	84	76	72	73	69	
20	74	69	68	63	61	64	86	74	73	73	77	84	91	87	87	77	75	78	86	A	82	74	70	71	
21	67	65	64	63	56	59	76	74	70	66	64	69	71	74	87	90	86	81	84	83	80	74	F	F	
22	F	F	73	66	65	68	85	81	87	93	80	80	A	86	90	87	81	78	80	92	94	F	F	F	
23	F	F	82	F	62	62	74	72	A	A	A	76	86	91	99	94	90	91	91	92	87	82	80	F	
24	86	F	74	75	F	55	71	84	84	A	70	80	84	93	98	102	101	98	85	78	75	73	71	F	
25	64	F	F	F	61	65	69	76	A	62	A	74	66	77	74	79	79	73	74	87	93	72	72	F	
26	F	F	F	F	F	66	66	58	86	102	80	78	82	94	A	82	88	86	79	69	66	66	F	65	
27	F	F	F	59	58	55	69	87	80	73	70	71	A	86	86	82	76	72	74	84	75	70	69	70	
28	63	F	59	F	54	54	66	80	80	85	72	76	74	66	72	81	78	72	66	63	66	64	F	A	
29	F	61	53	48	44	43	64	A	56	61	A	A	A	R	R	61	59	65	65	59	62	72	69	66	62
30	54	50	47	44	F	49	69	73	70	69	72	71	72	73	73	71	70	75	79	81	76	F	F	F	
31	F	F	F	F	52	49	58	74	78	66	65	76	78	74	76	A	86	87	79	78	72	68	67	71	
	00	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	20	24	23	26	29	29	29	28	25	27	24	23	28	27	30	29	30	30	29	31	28	25	23	
MED	68	66	64	63	59	60	67	73	74	69	66	72	72	74	76	80	78	78	80	80	76	72	72	70	
U Q	72	68	70	66	64	64	70	77	80	74	72	76	82	86	87	86	86	86	85	90	86	76	74	74	
L Q	64	62	60	57	53	54	61	67	65	62	62	65	66	66	71	71	72	73	73	74	72	68	67	66	

JUL. 2013 foF2 (0.1MHz)

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JUL.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							U L 392	464		A	A	L	A	A	A	A	468	460	U L 424	L				
2							U L 436	440	468	U L 500	U L 488	U L 516		A	A	A	A	A	A	A				
3							L	A	A	A	A	A	A	A	A	A	A	A	A	A				
4								A	A	A	A	A	A	A	A	A	A	A	A	A				
5							L	L	L	A	A	A	A	A	U L 540	U L 476		A	A	A				
6							A		A	A	U L 516	U L 500		A	U L 468	U L 496	452	416		A				
7						A	L	L	A		U L 500	U L 552		A	A	A	A	A	A	A				
8								A		A	A	A	A	A	A	A	472	464		A	L			
9						L	U L 408	A	A	A	U L 568	U L 504		A	A	A	A	A	A	A	A			
10							A	A			A	A	A	A	A	A	496	472		L	L			
11							A	A	U L 456	A	U L 460		A	U L 484	U L 468	U L 492	456		A	424		L		
12						A	380	448	468	492	U L 492		A	A	A	U L 500	U L 484	U L 476		A	L			
13								L		A		U L 508	U L 524	U L 512		A	496	508		A	A			
14								432	472	468	U L 468		A	A	U L 496	516		A	A	A	A			
15						L	L	A	U L 516	A	A	U L 516	520	U L 508	500		L	A	U L 468		L			
16							300	A	A	A	A	U L 568	504		A	A	496	460	U L 444		A			
17								U L 420	A	A	U L 536	U L 524	U L 508		A	U L 512	496	524		L	A			
18						L	L	A		U L 480	U L 484	U L 524	U L 536	U L 512		A	A	A	A	A	A			
19							416	444		A	U L 528	U L 516		A	A	A	A	A	A	A	A			
20						L	L	L	A	A	U L 540	U L 528	U L 512		A	A	A	A	A	A	A			
21							L	L	A	A		508		A	U L 520		A	A	A	L	L			
22						L	L	A	A	A		A	A	A		A	U L 464		L	A				
23							L	A	A	A	A	A	U L 516	504	504		A	A	A	A				
24							L	L	A	A	A	A	U L 512		U L 492		A	A	A	A				
25								A	A		A	460	A	U L 496		A	A	L	U L 476		A	A		
26						A		A	A	A	A	A	A	A	A	A	L		A	A				
27							L	L	L	U L 484	U L 512		A	A	504		A	A	A	L	A			
28						L		448		A	A	A	508		A	U L 512	468	452		A	A			
29							A	A	A	A	A	A	A	A	U L 528		A	A	U L 408		A			
30						L	L	L	U L 556	476	492	508	508	496	U L 516	516	476	416		A				
31								A	A	U L 480	A	A		U L 508	520	508		A	A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	5	8	10	11	13	12	12	10	13	11	13	7						
MED						300	U L 408	446	470	480	U L 512	U L 520	U L 510	U L 506	U L 500	496	464	424						
U Q							426	456	480	492	530	532	512	520	514	496	476	444						
L Q							386	436	464	468	496	508	506	496	492	472	458	416						

JUL.2013 foF1 (0.01MHz)

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JUL. 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						U R 188	R	A	A	A	A	A	A	A	A	A	R	R	A					
2						A	A	A	A	A	A	R	A	A	A	A	A	A	A					
3						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
4						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
5						U R 220	R	A	A	A	A	A	A	A	A	A	A	A	A					
6						R	A	A	A	A	A	R	A	A	R	R	A	A	A					
7						A U 252	A	A	A	A	A	A	A	A	A	A	A	A	A					
8						R	A	A	A	A	A	A	A	A	A	A	A	A	A					
9						A	A	A	A	A	A	R	A	A	A	A	A	A	A					
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
11						A	A	A	A	A	A	A	A	R	A	R	A	A	A					
12						B	A	A	A	R	A	A	A	A	A	R	R	A	A					
13						U A 192	A	A	A	A	A	A	R	A	A	R	A	A	A					
14						B	A	A	A	A	A	A	A	A	R	A	A	A	A					
15						A	A	A	A	A	A	R	R	R	A	R	A	A	A					
16						B	A	A	A	A	A	A	R	A	A	A	A	A	A					
17						A	A	A	A	A	A	A	R	A	A	A	A	A	A					
18						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
19						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
20						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
21						B	A	R	A	A	A	A	A	A	A	A	A	A	A					
22						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
23						B	A	A	A	A	A	A	R	A	A	A	A	A	A					
24						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
25						B	A	A	A	A	A	A	A	A	A	R	A	A	A					
26						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
27						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
28						B	A	A	A	A	A	A	A	A	A	A	A	R	A	A				
29						B	A	A	A	A	A	A	A	R	A	A	A	A	A					
30						B	A	R	A	R	R	R	R	R	R	A	A	R	A					
31						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	1																	
MED						U R U A 192 252																		
U Q						U R 220																		
L Q						U R 188																		

JUL. 2013 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	E B	15	30	29	E B	E B	G	G	39	42	70	44	46	48	52	59	40	G	G	24	26	20	E B	19	E B			
2	E B	14	E B	E B	E B	E B	19	30	34	36	39	40	G	43	56	55	58	43	41	34	20	42	22	24	E B			
3	E B	15	27	33	21	18	21	30	40	52	59	55	A A	A A	A A	A A	54	50	44	67	41	55	43	29	28	25		
4	20	20	23	E B	E B	32	30	34	38	A A	A A	A A	A A	A A	A A	57	A A	74	A A	A A	A A	64	45	22	18	17	26	
5	E B	24	E B	18	31	28	G	G	35	38	53	45	50	60	50	42	37	55	51	42	31	21	E B	16	22	32		
6	E B	15	E B	16	E B	E B	G	34	39	53	40	44	G	A A	A A	A A	G	G	37	34	37	26	22	45	41	51		
7	56	19	18	27	34	24	28	33	48	38	42	43	53	48	50	46	45	38	44	31	E B	14	19	32	21			
8	18	23	18	17	E B	G	29	44	39	A A	86	58	85	52	60	47	36	38	38	28	29	26	29	17	26			
9	27	25	21	20	18	20	29	50	48	51	42	G	38	48	A A	65	51	42	37	28	22	22	24	44	37			
10	E B	14	40	20	15	17	20	36	61	42	38	58	50	63	60	64	40	37	32	23	20	E B	16	16	E B	26		
11	17	E B	E B	E B	E B	26	32	44	40	38	44	42	A A	A A	43	G	40	G	41	32	26	19	38	27	E B	E B		
12	E B	15	24	E B	E B	E B	A A	75	28	38	34	G	A A	50	55	40	G	G	37	25	20	18	27	30	34			
13	16	29	23	38	30	22	29	33	37	49	41	41	G	53	43	G	60	40	53	A A	95	19	21	E B	E B			
14	E B	E B	E B	E B	E B	20	31	32	37	40	41	A A	A A	A A	42	G	49	A A	109	49	57	36	28	22	17	E B		
15	22	24	39	22	41	21	31	38	37	39	50	G	G	G	41	G	53	33	26	20	19	23	A A	85	19			
16	22	31	28	20	E B	25	A A	A A	A A	A A	99	54	45	40	88	45	42	36	36	70	56	20	20	22	32			
17	E B	E B	E B	28	30	20	20	27	30	50	45	43	41	G	47	42	41	43	31	31	E B	14	22	E B	38	19		
18	18	18	E B	E B	E B	18	30	40	40	37	43	41	42	51	41	42	42	38	31	23	16	19	17	23				
19	18	16	E B	E B	E B	22	29	32	46	41	43	55	44	56	50	47	51	52	A A	93	32	32	E B	15	27	17		
20	E B	20	E B	18	15	19	20	25	36	40	44	40	39	44	70	43	45	46	41	45	A A	90	22	34	32	25		
21	E B	14	16	23	24	24	E B	28	G	46	59	41	52	53	42	43	58	42	32	26	20	19	23	24	37			
22	40	50	28	29	20	20	34	35	45	58	54	51	A A	106	58	54	52	37	31	37	30	28	32	53	34			
23	20	34	E B	E B	E B	18	30	57	A A	A A	A A	A A	76	59	G	40	38	46	44	39	31	19	30	32	32	37		
24	26	33	29	24	21	20	27	32	A A	76	51	53	45	48	40	47	44	46	29	45	17	E B	15	15	35			
25	27	40	22	27	19	24	34	41	A A	146	39	101	62	41	58	50	G	36	56	37	40	32	41	38	34			
26	37	20	22	27	28	35	34	37	43	72	52	55	62	79	A A	187	43	38	69	61	31	33	36	37	21			
27	40	19	22	19	E B	19	30	36	55	39	42	54	A A	111	41	62	46	44	31	56	25	E B	15	20	21	21		
28	18	19	42	E B	15	20	E B	28	35	63	58	67	43	57	45	39	64	G	54	49	38	22	20	18	A A	116		
29	34	24	E B	15	28	22	18	36	A A	57	46	48	A A	A A	A A	A A	G	44	46	42	34	38	27	E B	15	32	26	20
30	16	22	18	E B	15	32	E B	30	25	37	G	G	G	G	G	G	40	40	G	37	40	22	30	37	28			
31	E B	33	E B	29	E B	E B	18	29	37	39	42	47	49	40	43	41	A A	117	57	46	32	42	42	31	28	19		
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT		31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MED		18	20	21	18	19	20	30	37	43	44	45	50	48	51	43	45	42	38	37	30	22	23	26	25			
U Q		27	29	28	27	26	22	34	40	52	59	58	A A	A A	A A	A A	58	54	50	46	49	49	40	30	31	37	34	
L Q		E B	E B	E B	E B	E B	18	28	33	38	39	42	41	40	42	40	37	37	32	28	20	E B	19	19	17	E B		

JUL. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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

$\begin{matrix} H \\ D \end{matrix}$	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	15	15	15	15	14	14	15	16	18	21	22	20	22	24	30	18	18	18	14	14	14	14	14	14
2	14	15	15	15	15	16	14	14	17	19	19	20	22	24	23	19	20	14	12	14	16	14	14	15
3	15	14	14	14	14	13	14	15	14	24	22	23	24	28	24	19	15	14	14	14	15	13	15	14
4	14	15	14	16	15	14	14	14	16	18	25	23	26	22	24	24	18	15	14	15	14	14	15	14
5	14	15	16	14	15	14	17	17	21	20	22	20	25	23	22	22	18	13	14	14	14	16	14	15
6	15	15	15	15	15	14	13	17	18	18	18	20	20	24	24	22	20	13	14	14	14	15	15	15
7	15	14	14	15	14	14	16	16	19	16	18	21	19	18	17	17	16	14	12	14	14	14	14	15
8	16	15	15	14	14	15	15	16	13	17	21	27	21	16	24	17	17	16	14	14	15	13	14	15
9	14	15	14	14	14	13	14	14	18	18	22	24	20	20	20	20	16	14	14	13	15	16	15	15
10	14	15	15	14	14	15	14	17	21	22	20	25	26	23	21	18	18	13	14	14	16	14	15	14
11	14	14	15	15	14	15	14	13	14	17	16	16	21	21	18	16	17	14	15	14	15	14	14	15
12	15	15	15	20	14	14	14	15	15	18	21	21	19	22	14	16	14	13	14	15	15	15	14	16
13	15	15	14	15	15	14	14	18	18	20	19	26	23	24	24	20	18	13	14	14	15	14	15	15
14	16	15	15	14	16	14	14	15	22	16	19	23	23	21	20	20	19	13	12	15	16	16	14	15
15	15	15	14	14	14	15	13	14	15	16	16	18	29	24	21	21	18	17	13	14	15	15	15	15
16	16	15	14	14	14	15	14	18	15	20	23	24	17	23	24	20	18	16	15	15	15	16	15	15
17	15	15	14	15	14	14	14	17	18	19	18	18	22	20	26	17	16	15	14	14	16	15	16	13
18	14	15	15	15	15	13	14	14	18	16	21	20	22	20	13	16	16	14	14	14	15	15	14	14
19	15	14	15	13	15	14	14	16	19	16	22	22	24	24	22	24	22	14	13	14	14	15	15	14
20	15	15	14	15	16	15	12	14	16	20	21	21	19	18	22	21	15	13	14	14	15	14	15	14
21	14	15	15	16	14	16	14	12	19	16	16	20	24	24	20	20	17	13	14	14	14	14	14	16
22	14	14	14	15	15	14	15	14	16	22	25	26	36	28	26	24	19	14	14	14	14	13	16	14
23	15	16	15	15	15	14	14	14	16	24	24	24	22	24	17	20	17	16	14	13	14	15	14	15
24	15	15	14	14	14	16	14	16	14	19	22	28	28	23	18	20	18	14	12	14	14	15	15	15
25	16	15	15	14	14	14	13	15	17	18	20	21	27	24	24	20	17	15	15	15	15	15	14	15
26	14	15	15	14	14	14	14	13	18	19	20	20	23	28	21	17	16	15	15	14	15	15	14	14
27	16	15	14	15	15	14	15	15	14	17	20	28	25	24	24	21	15	14	12	15	15	13	14	16
28	16	15	15	15	14	17	13	17	16	17	23	20	21	19	18	18	18	12	14	14	12	15	15	15
29	14	15	15	14	14	14	15	12	12	14	18	23	20	20	15	19	18	14	15	12	15	15	14	15
30	16	15	15	15	14	16	14	15	18	19	20	21	29	26	22	22	21	14	12	14	15	14	14	13
31	15	14	14	14	15	15	14	12	21	20	20	21	22	19	20	20	18	13	15	15	15	14	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	15	15	15	15	14	14	14	15	17	18	20	21	22	23	22	20	18	14	14	14	15	15	14	15
U Q	15	15	15	15	15	15	14	16	18	20	22	24	25	24	24	21	18	15	14	14	15	15	15	15
L Q	14	15	14	14	14	14	14	14	15	17	19	20	21	20	18	18	16	13	13	14	14	14	14	14

JUL. 2013 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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		F	F	276	293	293	344	292	291	317	324	276	288	301	288	299	303	299	296	288	295	309	305	296	297	
2		275	291	286	293	298	343	309	321	332	R	304	307	323	315	324	314	318	322	313	292	292	307	296	305	
3		309	290	F	295	325	309	310	307	313	311	309	A	A	A	294	291	308	299	314	313	325	295	284	286	
4		287	290	284	290	F	322	314	311	A	321	A	A	A	281	A	293	A	A	316	292	308	299	292	285	
5		285	292	295	F	301	335	334	346	340	305	299	315	302	273	283	291	291	293	315	342	290	279	260	298	
6		286	289	307	301	278	287	303	331	345	269	291	287	A	A	268	269	277	295	296	289	288	273	280	279	
7		270	287	276	265	267	F	F	284	275	303	247	298	A	265	290	288	297	310	286	292	306	280	287	279	270
8		277	292	291	297	290	320	311	323	325	A	300	A	292	277	298	292	289	296	308	316	311	286	287	301	
9		290	312	312	280	279	293	296	307	314	301	316	280	A	236	292	A	289	305	309	322	316	296	272	251	
10		F	F	F	F	F	283	309	319	328	347	269	284	A	277	286	278	290	290	299	307	289	284	289	265	273
11		286	270	276	279	262	267	293	334	256	A	304	A	255	285	282	299	293	298	295	303	279	277	275	277	
12		271	274	275	270	269	A	279	284	317	353	310	A	296	297	303	300	311	326	318	303	300	287	263	267	
13		276	280	292	293	292	307	303	310	323	283	283	281	A	293	302	313	316	296	308	304	A	286	272	283	303
14		293	283	279	F	284	306	305	290	319	271	255	R	A	293	278	302	A	291	280	290	277	267	279	280	
15		258	263	272	276	267	281	330	341	278	254	300	316	316	301	309	306	306	292	286	303	313	306	A	268	
16		280	274	275	290	284	266	A	A	325	A	314	285	319	A	319	309	314	310	320	319	280	F	300	288	
17		F	F	F	300	285	301	288	314	327	334	285	312	R	287	312	312	302	305	319	310	303	286	271	280	
18		282	280	286	301	327	303	320	352	329	320	307	267	285	306	284	296	293	300	301	318	297	289	282	280	
19		284	272	273	280	300	286	292	312	313	306	294	306	321	313	283	310	301	312	A	299	296	272	291	266	
20		279	274	281	297	279	296	325	291	322	306	290	292	304	297	305	314	307	299	304	A	319	283	282	290	
21		289	286	296	299	293	315	347	331	336	332	301	290	287	292	298	302	320	304	319	303	296	283	F	F	
22		F	F	322	300	275	307	308	321	301	327	319	306	A	291	309	307	295	300	287	306	333	F	F	F	
23		F	F	303	F	307	308	332	354	A	A	A	269	281	282	297	291	289	306	306	314	304	294	293	F	
24		296	F	F	F	F	300	313	338	343	A	288	292	278	278	276	291	298	313	323	300	292	286	309	F	
25		274	F	F	F	F	307	334	341	354	338	A	299	339	296	284	282	310	323	289	298	327	321	285	F	
26		F	F	F	F	F	307	343	326	284	304	301	289	284	289	A	288	304	321	321	318	291	287	F	290	
27		F	F	F	284	295	287	299	305	288	318	312	275	A	296	311	297	298	315	302	311	319	288	282	297	
28		295	F	295	F	275	293	345	321	281	323	266	297	305	279	289	298	322	317	322	322	296	290	F	A	
29		F	295	294	300	322	308	285	A	269	294	A	A	A	R	R	246	288	298	324	299	283	302	297	294	287
30		299	294	287	274	F	312	341	351	313	313	314	309	322	310	309	293	289	303	309	309	294	F	F	F	
31		F	F	F	F	292	308	318	337	328	318	301	320	333	291	290	A	311	325	314	321	293	291	285	284	
		00	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	20	24	23	26	29	29	29	28	25	27	24	23	28	27	30	29	30	30	29	31	28	25	23	
MED		284	286	286	293	291	307	310	321	318	313	300	292	296	291	297	297	301	304	308	306	296	287	283	285	
U Q		290	292	295	300	300	314	331	338	328	326	309	306	319	297	309	306	310	315	318	316	309	294	292	297	
L Q		276	274	276	280	278	290	298	307	294	302	285	284	281	284	283	291	293	298	296	296	290	281	277	277	

JUL. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL.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							U L 347 361		A A	L A	A A	A A	A A	A A	A A	404 347	U L 343	L							
2							U L 329 365	388	U L 390 424	U L 395	U L 395	A A	A A	A A	A A	A A	A A	A A	A A						
3							L A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A						
4								A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A						
5							L L	L A	A A	A A	A A	A A	A A	A U L U L 329 354	A A	A A	A A	A A	A A						
6							A 368	L L	A A	A U L U L 384 364	A A	A U L U L 372 336	A A	A A	A A	A A	349 357	A							
7						A	L L	A A	404	U L U L 377 341	A A	A A	A A	A A	A A	A A	A A	A A	A A						
8								A 380	A A	A A	A A	A A	A A	A A	A A	A A	378 347	A L							
9						L U L 345	A A	A A	A U L U L 332 395	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A						
10							A A	390 425	A A	A A	A A	A A	A A	A A	A A	362 347	L L								
11							A A	U L 382	A U L 414	A U L 392 351	U L U L 372 380	A A	A A	A A	A A	A A	A A	346	L						
12						A	361 371	357 390	U L 390	A A	A A	A A	A U L U L 329 385	U L U L 348	A A	A A	A A	A A	A L						
13								L 374	A A	403 367	382	A A	A U L 379 365	A A	A A	A A	A A	A A	A A						
14							360 374	U L 388	A A	A A	A A	A U L 387 373	A A	A A	A A	A A	A A	A A	A A						
15						L L	A U L 354	A A	A U L 380 370	U L 389 391	A A	A A	A A	A A	A A	A A	L A U L 323	L							
16						321	A A	A A	A A	A U L 328 382	A A	A A	A A	A A	A A	364 369	U L 350	A							
17							U L 403	A A	A U L U L 349 395	U L U L 339	A U L U L 401 363	U L U L 375	A A	A A	A A	A A	A A	A A	A A						
18						L L	A A	U L U L 365 421	U L U L 380 381	U L U L 401	A A	A A	A A	A A	A A	A A	A A	A A	A A						
19							349 366	A U L U L 359 391	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A A						
20						L L	L A	A A	A U L U L 369 367	U L U L 399	A A	A A	A A	A A	A A	A A	A A	A A	A A						
21							L L	A A	A A	A A	A A	A U L 367	A A	A A	A A	A A	A A	A L L							
22						L L	A A	A A	A A	A A	A A	A A	A A	A A	A A	A U L 376	L A								
23							L A	A A	A A	A A	A U L 384 393	365	A A	A A	A A	A A	A A	A A	A A						
24							L L	A A	A A	A A	A U L 368	384	A A	A A	A A	A A	A A	A A	A A						
25								A A	A A	417	A U L 397	A A	A A	A A	A A	A A	L U L 320	A A	A A						
26						A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A L	365	A A	A A						
27							L L	L U L U L 409 369	A A	A A	A A	A A	A A	A A	A A	A A	A A	A L A							
28						L	383	A A	A A	A A	A A	A U L 400	359 401	A A	A A	A A	A U L 370	A A	A A						
29							A A	A A	A A	A A	A A	A A	A U L 362	A A	A A	A A	A U L 375	A A	A A						
30						L L	L U L 335 417	409	U L 382	386 373	U L U L 352 334	U L U L 354 364	A A	A A	A A	A A	A A	A A	A A						
31							A A	A U L 403	A A	A A	A A	A A	U L 366 388	357	A A	A A	A A	A A	A A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						1	5	8	10	11	13	12	12	10	13	11	13	7							
MED						321	U L 347 367	374	U L U L 404 381	U L U L 380	U L U L 383 374	U L U L 372 364	U L U L 354 350												
U Q							355 377	382 417	406 395	394 388	388 380	370 364													
L Q							U L 337 363	U L U L 357 390	U L U L 369 366	U L U L 366 369	U L U L 362 354	U L U L 354 347	U L U L 343												

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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							348	334	290	E A 276	370	332	334	344	E A 308	326	322	294	298					
2							326	312	300	364	384	342	324	E A 342	E A 308	E A 340	314	296	286					
3							296	260	288	E A 316	E A 306					328	326	300	E A 314	E A 264				
4								276		A 292				E A 362	E A 356				E A 272					
5							292	272	260	E A 346	256	318	358	E A 382	E A 356	326	310	296	258					
6							260	294	E A 272	E A 394	384	398				402	402	352	324	294				
7						310	296	286	402	338	E A 518	386	484	E A 386	E A 378	370	350	390	E A 324					
8								270	276		E A 352			E A 378	E A 364	336	330	330	292	270				
9						338	302	284	276	E A 310	336	416	398	R 378			364	336	308	268				
10							290	272	284	262	E A 430	362	E A 350	E A 326	E A 338	328	326	298	264					
11								318	266	384		R 390			422	400	390	360	360	334	296			
12						A	398	356	318	248	E A 364					356	330	330	314	294	266	282		
13								290	280	318	346	354	308	312	298	300	336	E A 300	E A 272					
14								354	314	482	E A 442					380	386	334		E A 328	E A 364			
15						322	284	270	418	262	326	312	298	320	332	322	312	340	304					
16							A	A		320	E A 322	408	320			300	336	296	308	E A 298				
17								312	282	288	356	346	380	376	328	334	334	326	272					
18						292	276	232	278	276	334	400	372	326	322	308	310	308	290					
19							372	298	292	324	342	362	314	316	364	306	306	E A 286	E A 286					
20						292	262	316	270	312	358	326	320	E A 340	310	306	306	308	276					
21							252	238	252	E A 298	364	368	350	370	330	300	278	296	270					
22						278	272	242	296	268	278	316			336	302	296	306	296	290				
23							E A 278	A 258				E A 396	E A 340	E A 338	314	320	312	290	274					
24							270	262	246		E A 330	330	346	344	334	312	282	270	252					
25								224		280		E A 340	E A 288	E A 324	E A 340	340	306	E A 286	E A 300					
26					264		258	336	284	306	340	352	344			A	332	304	300	E A 284				
27						302	284	362	304	312	E A 378				E A 324	E A 298	314	300	294	E A 298				
28					322		292	E A 372	310	E A 414	E A 334	E A 326	E A 398	370	E A 338	286	E A 282	E A 262						
29							304		E A 412	E A 362					A	400	420	382	336	298	E A 294			
30						314	268	252	314	316	320	334	308	326	336	352	348	300	272					
31								258	280	310	E A 260	308	282	356	336		E A 290	E A 266	250					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						10	21	29	28	26	27	24	24	28	28	30	29	30	30					
MED						312	292	272	288	300	U 334	342	336	340	331	328	310	297	275					
U Q						322	311	296	328	324	E A 384	382	365	377	360	340	335	308	296					
L Q						292	271	258	277	280	320	331	317	326	312	314	300	292	270					

JUL. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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	E 324	BE 334	AE 348	AE 260	AE 262	AE 228	AE 220	AE 238	A	A	A	A	A	A	A	212	212	210	220	E 260	AE 246	AE 220	E 244	AE 262
2	E 268	BE 276	AE 268	AE 266	AE 234	AE 224	AE 226	AE 230	212	208	192	196	A	A	A	A	A	A	AE 246	AE 298	AE 252	AE 278	AE 254	
3	228	E 282	AE 284	AE 254	AE 230	AE 238	AE 226	A	A	A	A	A	A	A	A	A	A	A	AE 258	AE 250	AE 232	E 276	AE 294	
4	E 286	AE 280	AE 268	AE 254	AE 216	AE 230	AE 228	A	A	A	A	A	A	A	A	A	A	A	AE 248	AE 238	AE 240	AE 270	AE 290	
5	E 274	AE 258	BE 268	AE 274	AE 254	AE 222	AE 224	AE 214	AE 202	A	A	A	A	AE 264	AE 224	A	A	A	AE 218	AE 214	AE 266	AE 300	AE 296	
6	E 278	BE 258	AE 246	AE 250	AE 278	AE 246	A	AE 236	A	A	AE 230	AE 230	A	A	AE 224	AE 212	AE 214	AE 236	AE 286	AE 258	AE 306	AE 310	AE 330	
7	E 370	AE 264	AE 302	AE 308	AE 330	A	AE 220	AE 226	A	AE 198	AE 226	AE 222	A	A	A	A	A	A	AE 278	AE 254	AE 272	AE 298	AE 286	
8	E 278	AE 278	AE 268	AE 260	AE 234	AE 230	AE 220	A	AE 210	A	A	A	A	A	A	AE 214	AE 218	A	AE 222	AE 236	AE 246	AE 230	AE 244	AE 274
9	E 296	AE 248	AE 256	AE 300	AE 318	AE 236	AE 224	A	A	A	AE 198	AE 206	A	A	A	A	A	A	AE 230	AE 234	AE 284	AE 398	AE 308	
10	E 274	BE 306	AE 282	AE 272	AE 262	AE 234	A	A	AE 220	AE 194	A	A	A	A	A	AE 222	AE 222	AE 216	AE 222	AE 256	AE 262	AE 246	AE 300	AE 316
11	E 272	AE 246	AE 290	AE 274	AE 330	AE 348	A	A	AE 206	AE 220	A	AE 220	AE 232	AE 208	AE 222	A	AE 234	AE 228	AE 276	AE 306	AE 306	AE 292	AE 278	
12	E 280	BE 292	AE 290	AE 302	AE 304	A	AE 232	AE 228	AE 222	AE 206	A	A	A	A	AE 204	AE 224	AE 216	A	AE 224	AE 248	AE 242	AE 284	AE 318	AE 324
13	E 288	AE 294	AE 300	AE 314	AE 286	AE 232	AE 218	AE 206	AE 192	A	AE 188	AE 214	AE 206	A	AE 226	AE 224	A	A	AE 252	AE 268	AE 266	AE 248	AE 248	
14	E 242	BE 274	BE 294	BE 260	BE 260	AE 218	AE 222	AE 218	AE 216	AE 218	A	A	A	AE 210	AE 206	A	A	A	AE 290	AE 282	AE 302	AE 282	AE 252	
15	E 298	AE 302	AE 332	AE 290	AE 350	AE 280	AE 234	A	AE 220	A	AE 188	AE 196	AE 204	AE 204	AE 208	A	AE 240	AE 238	AE 236	AE 234	AE 218	A	AE 322	
16	E 302	AE 324	AE 280	AE 286	AE 272	AE 308	A	A	A	A	A	AE 244	AE 216	A	AE 224	AE 210	AE 218	A	AE 264	AE 240	AE 304	AE 244	AE 282	
17	E 280	BE 272	BE 290	BE 274	BE 278	AE 250	AE 214	AE 206	A	AE 238	AE 198	AE 216	A	AE 196	AE 216	AE 230	AE 210	A	AE 250	AE 236	AE 204	AE 320	AE 284	
18	E 302	AE 298	AE 276	AE 232	AE 222	AE 236	AE 220	A	AE 232	AE 184	AE 202	AE 210	AE 196	A	AE 242	A	A	A	AE 242	AE 214	AE 244	AE 266	AE 282	
19	E 292	AE 294	AE 300	AE 280	AE 228	AE 230	AE 230	AE 210	A	AE 220	AE 194	A	A	A	AE 204	AE 204	AE 204	AE 204	AE 258	AE 238	AE 264	AE 274	AE 306	
20	E 284	AE 282	AE 284	AE 242	AE 288	AE 246	AE 216	AE 200	A	AE 202	AE 202	AE 206	A	AE 204	AE 204	AE 204	AE 204	A	AE 218	AE 254	AE 296	AE 278	AE 278	
21	E 258	BE 266	BE 258	BE 262	BE 282	AE 248	AE 214	AE 194	A	AE 206	A	AE 206	AE 216	A	AE 216	AE 216	AE 230	AE 210	AE 214	AE 222	AE 228	AE 246	AE 302	AE 308
22	E 278	AE 280	AE 264	AE 272	AE 300	AE 244	AE 230	A	AE 204	AE 204	AE 204	AE 204	AE 204	AE 204	AE 204	AE 204	AE 218	AE 214	AE 250	AE 228	AE 302	AE 268	AE 348	
23	E 308	AE 306	AE 248	AE 240	AE 216	AE 226	AE 208	A	AE 204	AE 204	AE 204	AE 204	AE 194	AE 194	AE 214	A	AE 204	AE 204	AE 238	AE 242	AE 264	AE 242	AE 302	
24	E 270	AE 304	AE 270	AE 238	AE 224	AE 232	AE 214	AE 200	A	AE 204	AE 204	AE 204	AE 218	AE 210	A	AE 204	AE 204	AE 204	AE 270	AE 242	AE 240	AE 232	AE 300	
25	E 308	AE 354	AE 308	AE 282	AE 266	AE 236	AE 230	A	AE 204	AE 204	AE 204	AE 204	AE 204	AE 204	AE 214	AE 218	A	AE 204	AE 272	AE 238	AE 226	AE 318	AE 306	
26	E 308	AE 302	AE 284	AE 248	AE 242	A	AE 224	A	AE 204	AE 204	AE 204	AE 204	AE 204	AE 204	AE 254	AE 216	A	AE 204	AE 236	AE 280	AE 306	AE 306	AE 268	
27	E 344	AE 294	AE 292	AE 278	AE 238	AE 248	AE 226	AE 220	AE 232	AE 200	AE 222	A	AE 214	A	AE 204	AE 204	AE 204	AE 214	AE 250	AE 214	AE 226	AE 282	AE 264	
28	E 262	AE 284	AE 326	AE 250	AE 266	AE 256	AE 226	AE 214	A	AE 206	AE 206	AE 206	AE 236	AE 216	A	AE 222	A	AE 252	AE 252	AE 236	AE 278	AE 278	AE 278	
29	E 312	AE 264	AE 246	AE 294	AE 250	AE 236	A	AE 204	AE 204	AE 204	AE 204	AE 204	AE 204	AE 198	A	AE 204	AE 204	AE 220	AE 274	AE 248	AE 264	AE 262	AE 270	
30	E 270	AE 294	AE 296	AE 292	AE 342	AE 230	AE 218	AE 208	AE 204	AE 186	AE 190	AE 194	AE 194	AE 204	AE 242	AE 234	AE 222	AE 218	AE 250	AE 230	AE 276	AE 326	AE 260	
31	E 252	AE 254	AE 322	AE 250	AE 224	AE 248	AE 216	A	AE 212	A	AE 208	AE 226	AE 216	A	AE 204	AE 204	AE 204	AE 204	AE 236	AE 290	AE 268	AE 296	AE 290	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	28	26	16	12	11	14	12	12	10	13	14	13	12	7	29	31	31	30	30
MED	E 280	AE 282	AE 284	AE 272	AE 262	AE 233	AE 223	AE 214	AE 214	AE 204	AE 204	AE 206	AE 207	AE 210	AE 211	AE 220	AE 218	AE 216	AE 222	AE 250	AE 242	AE 264	AE 282	AE 288
UQ	E 302	AE 302	AE 300	AE 286	AE 288	AE 248	AE 226	AE 227	AE 221	AE 212	AE 226	AE 218	AE 216	AE 226	AE 225	AE 224	AE 222	AE 227	AE 228	AE 267	AE 254	AE 284	AE 302	AE 306
LQ	E 270	AE 266	AE 268	AE 250	AE 234	AE 230	AE 218	AE 206	AE 205	AE 194	AE 194	AE 197	AE 196	AE 204	AE 205	AE 214	AE 215	AE 214	AE 222	AE 237	AE 234	AE 236	AE 266	AE 270

JUL. 2013 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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						114	116	114	114	A	114	A	A	A	A	A	114	114	A					
2						A	A	A	A	A	A	120	120	A	A	A	A	A	A					
3						A	A	120	120	A	A	A	A	A	A	A	A	A	A					
4						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
5						124	118	112		A	A	A	A	A	A	A	124	A	A	A				
6						122	114	120	114	A	A	114	A	A	116	124	120	A	A					
7						A	118	A	A	114	116	116	A	116	A	A	A	A	A					
8						118	120	A	A	A	A	A	A	A	A	A	A	A	A					
9						120	112	A	A	A	A	116	A	A	A	A	A	A	A					
10						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
11						A	A	A	A	A	124	A	124	122	122	122	112	110	A					
12						B	118	A	A	118	A	A	A	A	A	118	114	110	116					
13						122	110	112	112	A	A	A	112	A	112	126	L	A	A	A				
14						B	A	A	114	112	A	A	A	A	110	A	A	A	A					
15						A	116	112	112	112	A	112	116	118	118	118	A	A	A					
16						B	A	A	A	A	A	A	118	A	A	A	A	A	A					
17						A	120	A	A	A	A	A	114	A	114	A	A	A	A					
18						A	A	A	A	A	A	A	A	122	122	128	122	A	A					
19						B	112	A	A	A	A	A	A	122	126	124	A	A	A					
20						A	A	A	A	A	A	A	A	A	A	124	118	A	A					
21						B	A	116	A	A	A	A	A	122	120	120	112	A	A					
22						B	A	A	A	A	A	A	A	A	A	A	A	A	A					
23						B	114	A	A	A	A	A	118	A	A	A	A	A	A					
24						B	112	A	A	A	A	A	A	A	A	A	A	A	A					
25						B	A	A	A	A	A	A	A	A	A	110	114	A	A					
26						B	A	120	A	A	A	A	A	A	A	A	112	A	A					
27						B	110	A	A	A	A	A	A	A	A	A	A	A	A					
28						B	A	118	A	A	A	A	A	A	A	A	116	A	A					
29						B	116	A	A	A	A	A	122	122	A	A	A	A	A					
30						B	112	120	A	126	122	122	126	128	128	124	122	124	A					
31						B	A	112	A	A	A	A	A	A	A	A	A	A	A					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						6	16	11	6	5	4	6	8	8	11	12	11	4	1					
MED						121	115	116	114	114	119	116	118	122	120	124	114	112	116					
U Q						122	118	120	114	122	123	120	122	122	122	124	120	119						
L Q						118	112	112	112	112	115	114	115	120	114	119	112	110						

JUL. 2013 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUL. 2013 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	108	108	100	100	B	G	G	124	118	106	110	108	106	102	100	100	G	G	96	88	88	86	88	90	
2	92	B	102	B	B	102	100	102	104	98	102	G	118	104	102	102	104	104	104	102	100	98	98	102	
3	88	94	94	96	96	98	96	118	116	106	106	104	104	100	100	100	100	96	96	92	92	88	86	86	
4	90	88	88	88	102	102	102	104	102	102	102	102	100	100	102	104	98	98	96	94	96	88	88	88	
5	92	88	86	88	88	G	G	120	106	106	108	102	106	106	104	112	102	104	104	100	100	102	98	96	
6	96	98	98	102	102	G	126	122	116	106	104	G	98	106	G	G	114	108	104	102	98	98	100	100	
7	98	98	124	114	108	106	118	102	104	122	114	114	106	118	108	104	104	102	100	100	94	98	100	96	
8	96	92	92	92	90	G	114	104	102	100	98	98	94	94	98	102	100	100	96	94	90	90	92	90	
9	90	88	88	94	90	116	126	108	104	112	104	G	104	100	98	98	98	94	96	94	94	98	98	98	
10	94	86	84	114	110	116	104	96	104	100	98	104	96	98	96	100	100	102	96	94	92	98	102	100	
11	102	104	B	104	110	110	106	106	104	98	118	108	110	G	126	G	118	122	106	108	100	102	98	B	
12	94	90	98	B	102	104	116	104	104	G	102	100	100	100	100	G	G	116	118	112	106	104	102	102	
13	102	96	98	96	94	132	130	126	124	106	104	104	G	108	120	G	104	106	98	94	102	96	106	96	
14	94	B	B	B	B	146	98	104	118	114	104	100	98	98	G	98	92	92	100	90	100	96	94	98	
15	96	98	92	92	92	106	116	114	116	110	106	G	G	G	116	G	106	108	108	104	100	98	98	98	
16	106	96	96	98	B	122	108	104	106	100	100	104	102	G	98	100	102	102	100	102	102	102	106	100	100
17	96	98	94	94	96	96	114	108	98	98	98	106	G	108	114	106	106	106	102	102	100	B	90	90	
18	86	86	B	B	102	102	102	102	100	100	100	100	108	120	122	128	118	108	106	106	106	106	100	100	
19	88	112	112	B	B	112	114	106	102	104	102	102	102	122	122	116	106	106	104	102	100	B	98	98	
20	92	106	102	96	104	110	104	102	102	102	98	104	102	94	100	118	114	108	102	100	104	104	104	108	
21	98	90	100	100	100	B	106	G	104	100	100	108	102	120	120	110	118	106	104	104	98	102	102	96	
22	90	90	90	90	90	102	104	104	104	100	104	102	96	96	96	94	96	108	104	100	94	94	108	98	
23	92	96	96	96	96	102	114	104	104	102	104	106	G	104	98	114	102	104	104	100	100	94	94	94	
24	98	98	88	92	82	122	122	106	104	104	100	100	100	100	100	100	G	98	92	92	92	92	B	96	96
25	100	98	98	92	92	106	106	102	100	98	98	98	100	100	106	G	118	104	104	104	104	98	102	96	
26	96	100	100	100	94	94	106	120	104	100	100	100	102	96	96	106	130	108	108	108	104	104	104	100	
27	102	102	100	96	B	106	116	106	104	112	104	108	102	100	100	102	G	98	98	100	98	B	98	86	86
28	102	100	100	106	106	B	110	118	100	100	98	100	100	102	106	100	G	108	104	102	102	104	102	102	
29	104	104	104	102	100	112	118	106	106	106	96	102	104	G	118	110	110	106	102	104	96	96	94	100	
30	98	100	100	102	100	B	138	98	102	G	G	G	G	G	G	G	110	110	108	104	102	98	100	100	96
31	96	96	96	96	96	110	108	112	104	106	104	104	106	106	108	106	100	98	98	98	98	94	94	94	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	29	28	26	25	24	29	30	31	29	30	26	26	27	28	25	28	30	31	31	30	28	31	30	
MED	96	98	98	96	96	106	110	106	104	102	102	103	102	100	102	104	104	105	102	100	100	98	98	97	
U Q	100	100	100	102	102	114	117	114	106	106	104	106	106	106	115	110	112	108	104	104	102	102	102	100	
L Q	92	90	92	92	92	102	104	104	102	100	100	100	100	98	100	100	100	100	98	94	94	95	94	94	

JUL. 2013 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUL. 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

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	F2	F3	F4	F2				C1	C2	L2	L2	L2	L2	L2	L2	L2			L2	F3	F4	F2	F2	F2
2	F2		F2			L2	L2	L2	L1	L2	L2		C2	L2	L2	L2	L2	L2	L2	F2	F4	F4	F4	F2
3	F2	F3	F3	F3	F5	L3	L2	C2	CL2	L2	L2	L2	L3	L2	L2	L2	L2	L3	L3	F3	F2	F2	F2	F2
4	F2	F2	F2	F1	F4	L2	L2	L2	L2	L1	L3	L2	L2	L2	L2	L2	L3	L3	L3	F3	F3	F2	F3	F3
5	F2	F2	F1	F2	F3			C1	L2	L2	L2	L1	L2	L2	L2	C1	L2	L2	L2	F2	F2	F2	F2	F3
6	F2	F2	F2	F1	F1		C1	C1	C2	L2	L2		L2	L2			C1	L2	L3	F3	F3	F3	F4	F4
7	F4	F3	F3	F6	F5	L2	C2	L2	L2	C1	C1	C1	L2	C1	L1	L2	L3	L2	L2	F2	F2	F2	F5	F3
8	F3	F3	F2	F2	F1		C1	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	F2	F2	F3	F2	F4
9	F3	F3	F2	F2	F2	C1	C1	L2	L2	L2	L2		L2	L1	L3	L2	L2	L2	L2	F2	F2	F2	F3	F4
10	F2	F3	F3	F2	F3	C2	L2	L3	L2	L2	L2	L2	L2	L2	L2	L2	L2	L1	L2	F2	F2	F2	F2	F4
11	F1	F1		F1	F8	L3	L2	L2	L2	L2	C1	L2	C1		C1		C1	C1	L2	F2	F5	F4	F2	
12	F2	F4	F1		F2	L3	C1	L2	L2		L2	L2	L2	L2	L2			C2	C1	F4	F2	F4	F3	F6
13	F3	F5	F3	F6	F6	C2	C2	C2	CL1	L2	L2	L2		L2	C2		L4	L3	L3	F4	F2	F2	F2	F2
14	F1				H2	L2	L2	C2	C1	C1	L2	L2	L2	L2		L2	L3	L3	L3	F3	F2	F2	F2	F1
15	F4	F4	F4	F3	F3	L2	C2	C1	CL2	C1	L2				C1		L2	L2	L2	F2	F2	F3	F3	F3
16	F3	F3	F3	F2		C2	L2	L3	L2	L3	L2	L2	L3	L2	L2	L2	L1	L2	L2	F4	F3	F4	F3	F3
17	F2	F2	F4	F3	F2	L2	C1	L1	L3	L2	L2	L2		L2	C1	L2	L2	L2	F2	F1	F2		F3	F2
18	F2	F2			F1	L2	L2	L2	L2	L2	L2	L1	L2	C2	C2	C1	C2	L2	L2	F4	F2	F2	F3	F3
19	F2	F2	F2			C3	C1	L2	L2	L2	L2	L2	L2	C2	C2	C2	L2	L2	L2	F3	F4		F4	F2
20	F4	F1	F2	F2	F2	L2	L2	L2	L2	L2	L2	L1	L1	L2	L2	C2	CL2	L2	L3	F6	F3	F3	F3	F3
21	F2	F1	F4	F4	F4		L2		L2	L2	L2	L2	L2	C1	C1	C2	C2	L2	L2	F2	F2	F3	F2	F3
22	F2	F3	F3	F3	F2	L2	L2	L1	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	F2	F3	F3	F3	F3
23	F2	F2	F2	F2	F1	L2	CL2	L4	L3	L3	L2	L2		L2	L2	L2	L2	L2	L3	F2	F2	F4	F4	F3
24	F3	F3	F2	F3	F2	C1	C1	L2	L2	L3	L1	L2	L2	L2	L2	L2	L2	L3	L3	F3	F2		F2	F3
25	F3	F3	F2	F3	F2	L2	L2	L2	L3	L2	L3	L2	L2	L2	L2		C2	L3	L3	F3	F4	F4	F3	F3
26	F2	F3	F5	F5	F3	L3	L2	C2	L2	L3	L2	L2	L2	L2	L3	L2	C1	L2	L3	F3	F2	F3	F3	F3
27	F3	F2	F2	F2		L1	C2	L2	L2	L2	L2	L2	L3	L2	L2	L2	L2	L2	L2	F2		F1	F2	F2
28	F2	F3	F3	F2	F3		L1	C2	L3	L2	L2	L2	L2	L2	L1	L2		L2	L3	F4	F3	F3	F3	F4
29	F3	F3	F2	F4	F3	L2	C2	L2	L2	L2	L2	L2	L2		C1	L2	L2	L2	L2	F2	F2	F3	F2	F2
30	F2	F3	F2	F2	F3		C1	L1	L2							C1	C1	L1	L3	F2	F5	F5	F5	F3
31	F5	F1	F3	F3	F1	L1	L2	C2	L2	L1	L2	L2	L2	L2	L2	L2	L2	L2	L3	F3	F4	F3	F3	F2
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

JUL. 2013 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 2013 f_{XI} (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	X 74	X 75	X 74	X 73	X 64	56															X 95	X 88	X 82	X 79
2	X 79	X 74	X 75	X 74	X 63																X 84	X 79	X 82	X 79
3	X 83	X 74	X 69	X 71	X 69																X 86	X 79	X 82	X 89
4	X 98	X 92	X 92	X 92	X 81																X 87	X 85	X 83	X 86
5	X 89	X 89	X 86	X 84	X 71																X 88	X 88	X 89	X 92
6	X 92	X 90	X 90	X 79	X 72																X 88	X 86	X 83	X 78
7	X 80	X 86	X 81	X 79	X 80					88											X 85	X 76	X 74	X 66
8	X 74	X 76	X 72	X 70	X 64																X 88	X 85	X 76	X 78
9	X 74	X 73	X 63	X 57	X 54	55															X 79	X 74	X 72	X 71
10	X 71	X 76	X 77	X 78	X 81																X 87	X 81	X 84	X 84
11	X 89	X 87	X 81	X 80	X 78																X 70	X 71	X 71	X 71
12	X 69	X 69	X 69	X 69	X 64																X 75	X 72	X 72	X 72
13	X 72	X 75	X 76	X 74	X 67																X 78	X 79	X 79	X 78
14	X 82	X 84	X 81	X 78	X 72																X 80	X 83	X 88	X 84
15	X 81	X 81	X 74	X 71	X 70																X 87	X 78	X 78	X 77
16	X 78	X 78	X 83	X 70	X 59	54															X 86	X 82	X 79	X 79
17	X 83	X 82	X 72	X 68	X 67																X 89	X 76	X 76	X 79
18	X 82	X 83	X 78	X 76	X 67																X 93	X 85	X 84	X 82
19	X 78	X 78	X 72	X 74	X 78																X 87	X 85	X 86	X 82
20	X 82	X 84	X 81	X 78	X 72																X 88	A	X 80	X 80
21	X 82	X 82	X 83	X 78	X 72																X 88	X 87	X 88	X 86
22	X 82	X 80	X 76	X 79	X 79																104	X 84	X 82	X 76
23	X 74	X 75	X 76	X 77	X 72																107	X 94	X 106	X 98
24	X 84	X 107	X 122	X 98	X 92																X 79	X 77	X 79	X 83
25	X 82	X 76	X 80	X 75	X 71	X 64															X 105	X 78	X 75	X 76
26	X 77	X 73	X 75	X 74	X 72	X 64															X 78	X 76	X 81	X 76
27	X 71	X 70	X 67	X 60	X 60	X 57															X 92	X 86	X 82	X 83
28	X 86	X 86	X 84	X 68	X 65	X 68															X 80	X 79	X 67	X 70
29	X 72	X 71	X 62	X 65	X 65	X 60															X 80	X 78	X 75	X 66
30	X 66	X 63	X 56	X 53	X 50	X 51															X 84	X 76	X 74	X 72
31	X 74	X 75	X 77	X 68	X 58	X 54															X 87	X 86	X 80	X 71
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	10				1											31	30	31	31
MED	X 80	X 78	X 76	X 74	X 70	X 56				88											X 87	X 80	X 80	X 79
U Q	X 83	X 84	X 81	X 78	X 72	X 64															X 88	X 85	X 83	X 83
L Q	X 74	X 74	X 72	X 69	X 64	X 54															X 80	X 77	X 75	X 72

JUL. 2013 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

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	68	69	68	64 ^F	58	48	51	68	84	76	74	73	70	73	75	80	83	84	89	94	89	82	76	73	
2	73	68	69	68	57	58	59	69	86	59	70	60	63	69	71	69	71	75	72	A	78	73	76	73	
3	77	68	63	63 ^F	63	61	64	66	68	68	A	68	70	80	A	A ^{J R}	101	A	A	108	80	73	76	83	
4	92	86	86	86 ^F	72 ^F	63 ^F	62	62	71	81	66	A	66	70	78	84	90	97	96	92	81	79	77	80	
5	83	83 ^V	80 ^V	78	65	61 ^F	62	65	73	74	72	A ^{U R}	67	68	75	88	96	102	113	92	82	82	83	86	
6	86	84 ^R	84	73	66	71	87	90	79	65	65	66 ^R	70	68 ^R	74	78	83	93	97	85	82	80	77 ^R	68 ^F	
7	71 ^F	80	75	73	74	80	82	82	84	81	77	79 ^F	91 ^V	84 ^V	75	70	64	62	68	76	79	70	68	60	
8	68	70	66	64	58	48	54	64	66	68	63	65 ^R	A	A	79	A	93	A	98	97	82	79	70	72 ^F	
9	68	67	57	51	48	48 ^F	58	85	76	62	64	A	57	65	69	76	84	94	94	79	73	68	66	64 ^F	
10	65	70	71	72	75	69	71	78	A	68	68	U ^R	73	85	89	96	96	95	96	94	84	82	75	78	78
11	83	81	75	74 ^V	72	78	86	62 ^F	A	53	48 ^{E G}	A	60	70	A	61	65	66	75	66	64	65	65	65	
12	63	63	63	63	58	58	45	60	70	60	62	64	73	78	82	83	85	82	82	73	69	66	66	66	
13	66	69	70	68	61	48	55	70	73	67	A	78	83	88	90	94	82	81	88	78	72	73	73	72	
14	74 ^F	74 ^F	73	70 ^F	64 ^F	62	57	83	78	53	47 ^{E G}	47 ^{E G}	61	67	67	73	75	77	76	81	74	77	82	78	
15	75	75	68	65	64	60	62	57	65	74	66	81	73	64	79	80	84	81	91	A	81	72	72	67 ^F	
16	70 ^F	68 ^F	72 ^F	64 ^F	53	46	A	64	63	A	65	62	72	79	74	83	87	86	86	86	80	76	73	71 ^F	
17	76 ^F	74 ^F	66	62 ^F	59 ^F	55	58	79	73	72	62	62	63	70	72	73	76	75	75	82	83	70	70	73	
18	74 ^F	75 ^F	72	69 ^F	61	58	66	75	65	59	64	63	68	70	75	86	95	91	87	91	87	79	78	76	
19	72	72	66	68	72	67	63	70	64	64	68	68	74	73	77	85	89	91	91	85	80	79	80	76	
20	75 ^F	78	75	72 ^F	66 ^F	66	71	74	76	83	84	90	95	102	102	98	96	96	110	99	U ^R	82	A	74	72 ^F
21	76	76	77	71 ^F	62 ^F	64	66	76	70	67	64	73	76	88	94	96	95	93	86	84	82	81	82	80	
22	76	74	70	73	73	74	70	75	97	83	77	A	79	89	98	92	95	89	98	104	98	78	76	70	
23	68	68	70	71	64 ^F	63 ^F	72	80	75	68	A	77	92	97	107	107	113	116	110	108	101	88	98	92	
24	78	100 ^F	116 ^F	92 ^F	86 ^F	80 ^V	67	86	72	A	A	71	80	87	98	108	116	104	92	77	73	71	73	77	
25	76	70	72	68 ^F	64 ^F	58	63	62	66	A	67	72	76	76	78	84	92	88	90	95	99	72	69	70	
26	71	67	69	68	66	58	56	58	74	96	77	U ^R	75	84	96	97	95	96	93	78	68	72	70	73	67 ^F
27	65	62 ^F	59 ^F	54	54	51	59	60	73	72	A	77	90	93	101	A	113	109	106	103	86	80	76	77	
28	80	80	78	62	59	63	62	86	86	72 ^R	77	79	65	A	79	92	97	92	77	76	74	73	61	64	
29	64 ^F	62 ^F	55	55 ^F	54	54	55	54	61	A	57	A	A	A	A	60	67	66	59	67	74	72	69	60	
30	60	57	50	47	44	45	54	68	60	67	74	73	70	72	76	78	85	90	89	91	78	70	68	66	
31	68	68	71	62	52	48	54	70	70	63	75	77	81	75	89	102	104	91	84	86	81	80	74	65	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	30	31	29	27	26	25	29	28	28	28	31	29	30	29	31	30	31	31	
MED	73	70	70	68	63	60	62	70	73	68	66	73	73	76	78	84	90	91	89	85	81	74	74	72	
U Q	76	78	75	72	66	66	67	79	77	74	74	77	82	88	95	94	96	95	96	94	82	79	77	77	
L Q	68	68	66	63	58	51	56	62	66	63	64	64	66	70	75	77	83	81	78	78	74	71	69	66	

JUL. 2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.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						L	L	L	A				A	A	A	A	A	A	L	L				
2							L	L		U	L	A	A	A	A		A	A	L	A				
3							L	L	L	A	A	A	U	R	A	A	A	A	A	A				
4							256	L	L	L	L	L	A	U	A	R	U	A	U	A	A	A	L	
5								A	L		A	A		U	R	U	R	A		L	L			
6						L	L	L	L	U	A	R	U	R	A	A	U	R	A	A	L	L		
7							A	R	A	R	U	L	A	A	A	A	A	A	A	L	L			
8								L	A		A	A	A	A	A	A	A	A	A	A	A			
9							L	U	L	A	L		A	U	R	U	R	U	R	U	R	U	L	L
10							L	A	A	A	L	A		A	U	R	A	L	L	U	L	L	L	
11							U	L	L	A		A	A	A	A	A	A	A	L	A				
12							420	456	L	L	U	A	U	A	524	516	504	500	496	472	408			A
13							432	A	L	A	U	R		A	R		A	A	A	A				A
14								A	A		A		A	U	Y	U	Y	U	R	L	U	L		
15							L	L	L	L	L		A	R	A	A	A	A	A	L	A			A
16							A		A	A	A	A	A	A	A	L	U	R	U	L	L			
17							408	L	U	L	U	R		U	R	U	R	U	R	L	A	A		
18							L	L	U	L	L	A	U	R	A	A	A	500	476	464	416	L	L	L
19							L	U	L	L	R		516	524	516	508	500	484	472	416				A
20							L	L	L	L	L	A	A	A	A	A	A	L	U	L	A			
21								L	L	A	A	A	L	528	524	A	468	480	452	A				
22								A	A	U	L	L	A	A	A	L	A	488	A	A				
23							A	L	A	A	A	A	A	U	R	A	476	A	A					
24							L	L	A	A	A	U	R	A	A	A	A	480	440	A	A			
25								L	L	A	A	528	A	A	U	R	520	496	476					
26								A	L	U	R	A	R	U	R	A	A	472	404	A				
27									A	A	A	504	500	508	508		A	A	464	A				
28							L	L	U	L	L		528	516	A	492	488	472	436	L	R			
29								U	L	A	A	A	A	A	A	A	472	452	432	L	L			
30							L	L	U	L	R	L	U	R	U	R	U	R	L	L				
31								L	U	L	L	A	A	520	A	A	A	468	440	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	10	12	17	15	16	16	12	17	18	21	20	10	1				
MED							292	420	456	488	500	512	518	516	504	496	480	450	408	248				
U Q								428	462	504	512	520	524	518	508	500	490	464	412					
L Q								416	450	478	488	504	512	504	496	484	472	440	400					

JUL.2013 foF1 (0.01MHz)

IONOSPHERIC DATA STATION Yamagawa

JUL.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						B	224	288	332	328	376	380	384	380	372	348				A				
2						A	212	272	320	344		J	468				384	340	308	264				
3						A	288	324	392	388	388	412	400											
4						B	216	260	316		352		392	400	380	380			A	U	A	U	A	A
5						A	244	292	340	360	388	388	392	396			372	352	304	208				
6						A	220	288	328	356	368	380	376				364	348	312					
7						B	220	268	324	356	368	372	412	400	400	368	352	312	240					
8						B	212	276	320	360	364	368					312							
9						B	200	280	340	360	372				J	B	388			A			248	
10						B	208	280	316	336		364	372		352					A			296	256
11						B	192	260		352	368	400	404	396	388	376	336	300	256					
12						A	208	272	308	348	360	372	388	396	376	352	312	312	268					B
13						B	200	284	332	352	376	384	396	388	384	340	360	316	252					B
14						A	212	276	320	352	348	388	376			368	340		256					
15						B	212	284	320	348	376	372	376	372	372		360	316	268					
16						B	208	276	324	352	368	372	380						304					
17						A	172	268	308		364	396		428	380	368	352	308	252					A
18						B	244	292		364	372	380		380	372	368	312	260						B
19						B	272	312	352	376	396	388	384	376			360	308	256					B
20						B	184	260	324	344	364	380	372	376	404	420			312	252				B
21						A	188	268	320	352	376	404	400	408	400	364	356	312						A
22						A	180	276	316	352	364	372	376					332						A
23						B	216	280	320	352	376					372	352	320	256					A
24						A	196	276	312	352	372													A
25						A	236	324	348	348	360				388	384	356	324	252					A
26							200	280	312	336	372	376	376		J	R		348	312	240				A
27						U	180	264	324	392	392	392	404	400	392	396	340	300		184				A
28						U	204	264				392		R	404	384	368	336	308	248				B
29							188	268	308	332	352	372	384	392	392	364	336	296	216					A
30							208	264		344			376	384	384	352	332	304	240					A
31						R	224	280	316	348	376	388	396	400	376	384	352	320	244					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							27	31	28	27	27	25	24	18	19	22	22	25	23	1				
MED							208	276	320	352	368	380	386	396	384	370	350	312	252	184				
U Q							216	280	324	356	376	390	398	400	392	384	356	316	256					
L Q							192	264	314	344	364	372	376	384	376	364	336	304	244					

JUL.2013 foE (0.01MHz)

IONOSPHERIC DATA STATION Yamagawa

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

IONOSPHERIC DATA STATION Yamagawa

JUL. 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	E B 16 24	E B 16 30	E B 16 19	E B 16 22	G 30	61	42	41	45	54	66	52	50	53	54	26	G 25	28	16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	
2	E B 16 20	E B 16 16	E B 16 16	E B 16 16	E B 16 21	23	31	33	40	53	54	52	60	65	40	64	61	35	A A 80	22	30	16	E B 16 16	
3	E B 20 16	E B 24 35	20	24	28	30	34	62	A A 70	64	49	65	A A A A 94 131	102	A A A A 184 215	40	24	40	35	28				
4	27	19	16	16	E B 16 16	E B 16 23	35	37	42	43	A A 89	54	G 46	44	50	70	56	20	30	58	36	36		
5	E B 32 16	E B 23 28	E B 16 20	E B 16 26	E B 16 43	50	41	50	110	42	G 49	G 44	36	28	24	26	16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	
6	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 23	31	37	47	41	43	56	60	43	G 39	49	28	28	56	44	65	41			
7	48	36	40	24	29	18	36	42	46	48	45	39	55	59	54	68	49	35	55	23	E B 16 18	E B 16 16	29	
8	18	23	20	E B 16 16	E B 16 16	E B 16 23	30	45	43	54	58	A A A A 94 97	74	149	A A 54	110	46	43	21	20	24	E B 16 16	E B 16 16	
9	E B 16 16	E B 20 20	E B 18 16	E B 22 37	E B 52 38	44	87	43	43	36	U Y 38	58	40	26	27	21	23	21	E B 16 16	E B 16 16	E B 16 16	E B 16 16		
10	20	18	20	E B 16 19	30	28	68	106	54	46	54	42	52	38	58	40	26	27	21	23	21	E B 16 16	E B 16 16	
11	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 23	U Y 28	A A 77	38	40	49	53	52	95	51	51	35	54	35	20	17	E B 16 16	E B 16 16	
12	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 22	40	35	42	42	45	42	44	49	39	46	35	34	26	E B 16 16	E B 16 16	E B 16 16	E B 16 16	
13	E B 16 16	E B 16 16	E B 16 32	E B 24 16	E B 30 31	51	38	89	42	48	54	40	U Y 40	G 52	55	56	46	41	16	16	16	16	16	
14	20	20	19	37	30	E B 16 26	48	44	44	43	45	50	U Y 40	58	50	53	52	33	109	E B 16 16	E B 16 16	E B 16 16	E B 16 16	
15	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 24	30	34	43	43	U Y 39	57	40	58	50	53	52	33	109	E B 16 16	E B 16 16	E B 16 16	E B 16 16	
16	23	32	38	E B 16 16	E B 16 16	A A 66	38	47	71	54	55	51	56	46	44	38	32	39	30	E B 16 16	E B 16 16	E B 16 16	E B 16 16	
17	E B 16 16	E B 16 20	E B 16 16	E B 16 16	E B 16 16	E B 16 21	36	39	38	38	G 43	G 38	G 37	G 34	G 64	51	28	32	54	E B 16 16	E B 16 16	E B 16 16	E B 16 16	
18	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 22	28	36	43	53	42	51	62	58	44	46	41	31	22	20	25	68	20	
19	28	30	34	21	24	22	24	G 34	37	39	42	43	42	G 42	G 34	G 35	70	28	E B 16 16	E B 16 16	E B 16 16	E B 16 16	54	
20	32	27	17	29	18	23	24	30	36	44	46	57	78	66	97	72	40	32	44	32	29	61	28	16
21	E B 16 16	E B 16 16	E B 16 16	E B 16 21	E B 16 16	24	32	38	51	57	60	50	45	52	A 40	G 36	40	36	40	29	22	18	22	31
22	25	34	28	20	20	E B 16 26	50	54	40	43	A A 102	62	55	48	50	35	60	53	32	35	20	22	E B 16 16	
23	16	16	16	E B 16 16	E B 16 16	E B 16 42	35	47	58	89	A A 63	74	47	70	39	53	46	56	48	38	41	30	30	
24	17	30	45	30	E B 16 16	E B 16 22	41	58	74	108	46	54	56	60	72	47	38	63	49	65	26	20	20	
25	20	20	24	20	20	E B 16 24	28	37	76	56	47	57	55	45	46	36	49	52	40	85	66	45	36	
26	32	26	19	20	19	E B 16 21	45	45	41	57	45	50	89	67	82	39	35	46	34	23	22	32	E B 16 16	
27	36	43	35	17	24	16	33	28	41	49	A A 192	50	50	G 46	A A 142	59	38	61	28	20	43	25	21	
28	26	17	E B 16 16	24	20	E B 16 21	36	32	42	40	U Y 42	G A 88	42	43	36	G 26	20	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	21	
29	E B 16 16	E B 16 24	E B 16 26	E B 16 19	E B 16 21	E B 16 29	52	95	52	92	A A A A 89 48	52	38	39	36	29	20	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16		
30	E B 16 16	E B 16 19	E B 16 16	E B 16 16	E B 16 20	E B 16 27	36	31	39	41	37	44	42	36	28	G 31	G 25	30	20	21	32			
31	40	30	E B 16 16	E B 16 16	E B 16 19	G 21	30	35	40	61	58	49	61	55	58	42	39	56	43	65	23	19	42	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31
MED	18	18	19	17	E B 16 16	23	31	41	43	46	49	51	54	49	44	42	37	40	30	28	20	21	19	
U Q	27	27	24	26	20	19	26	40	51	51	A A A A 57 60	56	61	60	58	52	52	56	43	38	40	30	30	
L Q	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 16	E B 16 22	30	36	40	42	42	43	44	42	G 38	37	34	29	24	E B 16 16	E B 16 16	E B 16 16	E B 16 16	

JUL. 2013 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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

$\begin{matrix} H \\ D \end{matrix}$	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	16	16	16	16	16	16	14	16	16	16	20	21	26	24	21	21	18	16	16	16	16	16	16	16
2	16	16	16	16	16	16	14	15	16	16	21	24	26	24	22	21	19	16	16	16	16	16	16	16
3	16	16	16	16	16	16	16	16	16	28	24	21	24	21	21	20	20	18	16	16	16	16	16	16
4	16	16	16	16	16	16	16	16	16	21	22	30	25	27	24	24	16	16	14	15	16	16	16	16
5	16	16	16	16	16	16	16	16	16	19	24	24	34	25	24	20	20	16	16	16	16	15	16	16
6	16	16	16	16	16	16	16	16	17	16	19	25	21	19	22	21	16	16	16	16	16	16	16	16
7	16	16	16	16	16	16	15	16	16	20	28	21	19	25	31	25	20	17	16	15	16	16	16	16
8	16	16	16	16	16	16	16	16	16	17	18	20	36	24	22	26	17	16	16	15	16	16	16	16
9	16	16	16	16	16	16	16	16	16	19	19	22	24	22	20	20	19	17	14	13	16	16	16	16
10	16	16	16	16	16	16	16	16	16	20	22	27	29	36	22	20	21	16	16	16	16	16	16	16
11	16	16	16	16	16	16	16	16	13	18	16	24	22	26	20	21	18	20	16	15	16	16	16	16
12	16	16	16	16	16	16	16	16	17	19	19	21	24	27	22	21	17	16	13	16	16	16	16	16
13	16	16	16	16	16	16	16	14	16	20	18	22	20	25	29	18	18	16	16	15	16	16	16	16
14	16	16	16	16	16	16	16	18	16	23	21	36	30	29	27	24	19	16	16	14	16	16	16	16
15	16	16	16	16	16	16	16	16	16	17	19	21	22	26	28	21	20	19	16	16	16	16	16	16
16	16	16	16	16	16	16	16	16	18	20	21	25	29	37	26	21	20	16	16	16	16	16	16	16
17	16	16	16	16	16	16	14	15	16	17	21	30	31	24	22	22	21	16	16	15	15	16	16	16
18	16	16	16	16	16	16	16	16	16	20	20	28	28	39	26	28	22	16	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	16	20	26	22	22	27	26	25	19	17	16	16	16	16	16	16
20	16	16	16	16	16	16	16	16	16	16	20	30	24	32	22	20	16	16	16	15	16	16	16	16
21	16	16	16	16	16	16	14	16	16	18	23	19	21	24	20	20	17	16	16	14	16	16	16	16
22	16	16	16	16	16	16	16	16	16	20	20	24	25	29	27	22	21	16	16	15	16	16	16	16
23	16	16	16	16	16	16	16	16	16	21	21	29	24	25	29	27	18	19	16	16	16	16	16	16
24	16	16	16	16	16	16	16	16	17	19	29	22	24	32	23	21	16	16	16	16	16	16	16	16
25	16	16	16	16	16	16	16	16	16	17	20	22	24	32	24	21	18	16	16	16	16	16	16	16
26	16	16	16	16	16	16	16	16	17	16	19	20	21	18	25	21	16	16	16	15	16	16	16	16
27	16	16	16	16	16	16	16	16	17	20	21	24	37	31	20	20	18	16	16	16	16	16	16	16
28	16	16	16	16	16	16	16	16	16	20	23	21	26	21	21	20	16	16	16	17	16	16	16	16
29	16	16	16	16	16	16	16	14	16	16	21	24	24	24	29	20	16	16	16	15	16	16	16	16
30	16	16	16	16	16	16	16	16	16	19	19	22	23	25	24	21	20	16	17	15	16	16	16	16
31	16	16	16	16	16	16	16	16	16	16	17	18	22	21	22	19	16	16	16	16	16	16	16	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	16	16	16	16	16	16	16	16	16	19	21	22	24	25	23	21	18	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	20	22	25	28	29	26	22	20	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	16	17	19	21	22	24	22	20	16	16	16	15	16	16	16	16

JUL. 2013 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		284	299	305	304 ^F	310	279	284	304	329	302	303	304	301	290	296	288	295	276	292	300	302	302	303	287
2		286	314	304	316	313	290	296	310	356	360	343	299	279	296	302	301	306	298	315	A	296	279	291	278
3		296	306	296	290 ^F	300	321	329	321	332	322	A	303	276	283	A	A	R	A	A	330	316	276	276	276
4		293	314	339	327 ^F	332 ^F	318 ^F	313	313	313	335	306	A	274	281	281	287	305	291	325	334	318	281	287	289
5		293	305 ^V	301 ^V	306	321	315 ^F	332	350	320	332	325	A	290	293	277	275	299	291	306	347	294	276	281	283
6		295	298 ^R	329	299	295	281	340	337	302	298	285	273 ^R	279	267 ^R	259	272	273	296	319	293	281	275	277 ^R	277 ^F
7		285 ^F	300	281	285	282	281	303	257	282 ^F	296 ^F	277	278 ^F	306 ^V	307 ^V	314	297	326	294	305	301	308	291	275	292
8		269	286	296	313	332	333	319	347	333	319	289	273 ^R	A	A	284	A	295	A	308	329	317	312	271	285 ^F
9		289	306	299	297	288	289 ^F	310	338	333	323	347	A	256	288	286	289	290	311	327	313	314	296	298	289 ^F
10		280	290	284	283	307	296	314	325	A	266	277	285 ^{U R}	264	279	274	284	289	307	308	310	298	262	268	261
11		289	308	275	277	260	281	335	302	A	310	G	A	265	309	A	291	282	262	312	309	300	268	280	272
12		263	286	280	284	282	309	327	315	339	331	321	284	288	303	306	301	304	308	315	324	297	282	277	260
13		280	289	301	308	331	299	318	333	338	298	A	287	292	292	283	307	296	292	324	306	294	273	275	272
14		299 ^F	308 ^F	321	331 ^F	289	299	301	337	343	328	G	G	296	293	273	287	286	298	290	299	271	268	282	279 ^F
15		266	273	277	270	293	282	314	292	291	323	325	331	348 ^R	339	300	312	306	293	295	A	360	270	278	275 ^F
16		287 ^F	286 ^F	300 ^F	287 ^F	297	274	A	293	309	A	305	287	290	324	288	307	309	300	313	323	303	288	285	274 ^F
17		307 ^F	296 ^F	297	297 ^F	304 ^F	297	292	331	361	315	352	291	291	293	309	299	307	307	311	310	325	289	287	284
18		286 ^F	304 ^F	303	309 ^F	318	322	351	367	354	328	300	292	292	279	279	287	311	299	296	302	305	293	271	284
19		284	284	265	283	295	316	299	319	319	292	304	312	302	306	289	298	308	311	312	297	295	272	295	278 ^F
20		280 ^F	285	297	303 ^F	293 ^F	318	315	347	318	296	299	280 ^R	294 ^R	295 ^R	296	298	296	305	305 ^{U R}	331 ^{U R}	335 ^{U R}	A	289	294
21		287	303	325	307 ^F	309 ^F	316	328	357	313	320	276	296	279	285	294	313	313	316	313	317	298	284	287	301
22		297	305	291	288	302	328	307	289	332	337	321	A	281	290	294	298	298	289	299	322	333	303	282	295
23		293	274	291	312	320	315 ^F	339	352	333	344	A	262	274	282	285 ^{U R}	283 ^{U R}	294	307	318	307	340	294	298	320
24		293	287 ^F	348 ^F	324 ^F	327 ^F	309 ^V	331	344	369	A	A	279	275	266	276	300 ^{U R}	313 ^{U R}	322 ^R	331	324	305	299	287	275
25		276	282	300	320	309	324	352	373	337	A	308	297	303	293	274	295	301	291	287	325	337	319	285	290
26		288	302	296	308	307	291	316	330	285	317	339	259 ^{U R}	266	280	288 ^R	296	301	337	330	296	318	286	283	289 ^F
27		293	288 ^F	268 ^F	275	307	297	319	368	353	322	A	297	302	291	292 ^R	A	316	295	J	330 ^{U R}	317	303	292	286
28		302	291	317	295	282	287	291	327	314	310 ^R	314	317	294	A	285	286	315	333	328	310	297	307	310	295
29		293 ^F	312 ^F	299	296 ^F	311	326	323	323	335	A	327	A	A	A	A	286	313	325	294	298	302	311	305	300
30		287	304	294	301	292	303	330	343	381	319	311	311	283	286	284	279	284	299	310	322	306	306	296	271
31		293	288	321	325	318	307	326	342	358	282	309	308	311	273	290 ^R	316 ^{U R}	340 ^{U R}	317	315	310	304	302	307	300
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		31	31	31	31	31	31	30	31	29	27	26	25	29	28	28	28	30	29	29	29	31	30	31	31
MED		288	298	299	301	307	303	318	331	333	319	307	291	290	290	287	296	302	299	312	310	305	288	285	284
U Q		293	305	305	312	318	318	330	347	348	328	325	304	298	296	295	300	311	311	318	324	318	302	295	292
L Q		284	286	291	287	293	289	307	313	314	298	289	278	276	282	280	286	295	292	302	302	297	276	277	275

JUL. 2013 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL.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						L	L	L	A				A	A	A	A	A	A	L	L				
2							L	L		U	A	A	A	A	A		A	A	L	A				
3							L	L	L	A	A	A	A	A	A	A	A	A	A	A				
4							427	L	L	L	L	A	A	409	397	392	U	A	A	A	L			
5								A	L		A	A	U	R	U	R	A			L	L			
6						L	L	L	L	U	A	R	A	A	U	R		338	364	357	L	L		
7							A	R	A	R	U	L	A	A	A	A	A			A	L			
8							L	A		A	A	A	A	A	A	A	A	A	A	A	A			
9							L	U	L	A	L		A	U	R	U	R	U	R	U	L	L		
10							L	A	A	A	L	A		A	U	R	A	L	U	L	L	L		
11							U	L	L	A		A	A	A	A	A	A	L	A					
12								A	L	L	U	A	U	A		A		U	L	L	A			
13								U	L	A	L	A	U	R	A	R		A	A	A	A			
14								A	A	A				Y	U	Y	U	R	L	U	L			
15							L	L	L	L	L		A	R	A	A	A	A	A	L	A			
16							A		A	A	A	A	A	A	L	U	R	U	L	L				
17							L	U	L	U	R	U	R	U	R	U	R	U	L	A	A			
18							L	L	U	L	L	A	U	R	A	A		A	L	U	L	L		
19							L	U	L	L	R	R	U	R	U	R	L	L	L	L	A			
20							L	L	L	L	L	A	A	A	A	A	L	U	L	A				
21								L	L	A	A	A	A	A	A	391	369	393	A					
22								A	A	U	L	L	A	A	A	E	A	A	A	A				
23								A	L	A	A	A	A	A	A	A	405	A	A	A				
24							L	L	A	A	A	U	R	A	A	A	A	A	L	A	A			
25								L	L	A	A		A	A	U	R	A	A	A					
26								A	L	U	R	A	R	A	A	A		357	354	A				
27									A	A	A	A	A	R	A	A	A	A	L	A				
28							L	L	U	L	L	R		A	402	364		355		L	R			
29								U	L	A	A	A	A	A	A	A	A	409	378	365	L	L		
30							L	L	U	L	R	L	U	R	U	R	U	R	L					
31								L	U	L	L	A	A	A	A	A	A	L	U	L	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	9	11	17	15	15	12	11	15	17	17	19	10	1				
MED							394	U	L	L	L			R	U	R		L	L	R				
U Q							370	U	L	U		U	R	R	R		372	368	361					
L Q							351	L	L	L		A		A			L	L	L					

JUL.2013 M(3000)F1 (0.01)

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JUL. 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						328	376	310	278	330	332	320	324	E A 388	346	348	318	334	284	276					
2							326	288	246	256	290	372	A 426	360	364	352	A 350	A 328	268	A					
3							268	296	E A 268	A 326		A	A 394	A 360	A	A	A	A	A	A	240				
4							232	306	312	282	308		A 422	382	368	344	308	332	268	232					
5								228	318	286	304		A 396	A 360	380	368	324	306	276	216					
6						298	234	234	312	380	398	426	394	A 440	420	380	364	322	270	284					
7							284	396	Q 344	284	392	362	316	320	324		A 308	364	328	278					
8								236	262	304	396	E A 438	A	A 414	E A	A	A	320	A	266	242				
9							296	250	254	284	282		506	390	372	360	340	294	254	240					
10							268	A 292	A	416	362	386	382	360	352	326	324	290	278	258					
11							258	282	A	358	G	A 476	E A 338	A	A	374	384	324	290						
12								316	260	298	320	404	366	332	322	326	310	300	274	240					
13								272	258	348	A	370	328	332	336	294	332	318	266	260					
14								260	258	280	G	G	396	380	418	366	366	322	304						
15							272	342	356	294	290	292	260	284	336	306	306	322	292	A					
16							A 316	332	A	352	418	360	300	336	320	302	302	286	276						
17							350	268	240	314	274	378	398	366	326	340	322	312	A 322	272					
18							242	230	244	302	368	384	374	E A 392	378	336	300	304	286	256					
19							292	282	258	364	352	324	336	332	358	330	292	294	280	A 334					
20							224	240	272	318	304	336	A 350	E A 316	392	316	308	302	272						
21								232	252	282	E A 408	360	354	344	326	288	290	276	260						
22								326	252	252	294	A	368	330	312	318	310	316	304						
23							250	248	258	278	A	412	A 374	338	336	336	318	288	268						
24							246	242	236	A	A	398	350	390	352	316	280	256	258	242					
25								208	276	A	330	352	326	336	388	334	306	322	310						
26								272	328	282	A 266	376	392	A	330	352	300	264	250						
27									240	276	A	342	324	324	322	A	266	284	266						
28							320	264	258	304	322	298	372	A	360	328	288	258	232	256					
29								298	294	A	A 328	A	A	A	A	396	334	296	330	290					
30							260	250	232	326	332	326	392	A 354	364	364	336	306	280						
31								244	246	350	328	324	310	422	334	302	262	266	274	260					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						2	18	30	29	27	26	24	29	27	28	27	30	29	30	18					
MED						313	268	270	258	300	328	368	370	346	346	336	310	304	275	257					
U Q							296	298	303	330	368	401	395	382	375	360	332	322	290	276					
L Q							246	242	249	282	304	331	332	332	332	318	300	287	266	240					

JUL. 2013 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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

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	298	280	248	268	252	E B 306	244	226		E A 226	194	E A 222	A	A	A	A	A	A	238	E A 274	246	228	244	264	
2	280	268	260	236	232	262	236	226	200	202	A	A	A	A	A	230	A	A	E A 256	A	262	284	250	274	
3	276	242	278	288	254	240	224	210	204	A	A	A	A	A	A	A	A	A	A	A	200	302	316	322	
4	286	256	230	228	202	O 220	O E A 214	242	190	H 248	228	A	A	188	238	236	A	A	A	236	E A 232	352	302	306	
5	306	246	252	254	208	232	232	A	A	A	204	A	A	180	H E A 204	240	E A 290	A	A	A	228	226	260	278	276
6	258	256	238	236	240	E B 290	234	214	198	E A 276	H 184	172	A	A	E A 228	H 208	226	A	A	232	A	A	E A 318	346	
7	350	294	322	304	304	286	A	A	252	A	208	222	220	A	A	A	A	A	228	A	246	238	232	250	310
8	304	294	272	240	232	236	224	208	A	224	A	A	A	A	A	A	A	A	A	A	A	210	228	282	280
9	268	256	244	278	300	294	240	E A 242	A	194	218	A	A	194	192	182	216	216	216	206	A	264	236	262	260
10	314	278	286	278	248	272	238	A	A	A	E A 282	A	A	198	A	212	242	210	220	256	254	276	314	312	
11	284	238	284	286	298	294	252	228	A	A	A	A	A	A	A	A	A	A	222	A	266	254	288	286	298
12	310	290	284	276	264	226	236	A	H E A 206	E A 220	214	210	210	210	A	H 212	A	A	E A 250	A	232	268	298	308	
13	290	286	256	256	240	258	252	226	A	A	H 198	204	A	A	A	212	214	A	A	A	272	276	280	296	
14	294	276	254	248	312	248	234	A	A	E A 224	E A 234	A	A	Y 220	A	H 266	214	232	230	276	296	300	290	274	
15	294	294	284	298	284	270	244	212	222	256	224	192	A	198	A	A	A	A	248	A	250	376	296	318	
16	332	328	300	264	258	332	A	E A 290	A	A	A	A	A	A	E A 264	E A 238	230	216	A	240	232	250	254	294	
17	260	264	270	246	262	274	220	E A 256	E A 234	188	198	198	188	168	180	192	H 238	216	A	A	234	258	E A 384	280	
18	286	266	256	236	236	234	230	204	184	218	A	184	A	A	A	E A 280	A	E A 262	224	242	232	244	A	280	
19	306	302	356	290	274	242	246	214	206	188	190	200	226	204	202	218	H 218	216	260	A	246	264	256	350	
20	316	304	250	272	272	250	218	208	218	250	240	A	A	A	A	A	A	A	220	226	236	222	298	254	
21	278	268	230	226	240	242	222	226	222	A	A	A	A	A	A	204	H 224	220	A	238	240	270	272	268	
22	270	286	284	282	254	226	218	A	A	232	214	A	A	A	A	A	202	A	A	246	230	224	260	264	
23	278	302	272	240	200	234	A	234	A	A	A	A	A	E A 252	A	178	A	A	A	258	234	270	270	242	
24	238	282	228	232	238	224	224	A	A	A	E A 240	A	A	A	A	A	A	E A 246	A	E A 346	268	278	292		
25	294	300	282	254	254	228	220	H 150	200	A	A	280	A	A	E A 250	A	238	A	A	256	282	330	338	322	
26	308	290	266	240	246	254	210	A	A	E A 232	E A 246	A	A	A	A	A	250	A	A	290	242	264	338	278	
27	308	314	330	302	274	246	240	216	A	A	A	A	A	H E A 188	258	A	A	E A 234	A	240	212	260	274	292	
28	272	268	242	234	268	274	230	234	220	214	176	224	212	A	202	264	220	H 206	226	186	234	244	246	284	
29	256	232	268	318	248	242	224	212	A	A	A	A	A	A	A	200	E A 226	224	226	258	244	242	252	250	
30	276	262	288	260	276	258	218	216	212	182	188	198	E A 212	306	222	184	H 208	220	226	250	234	230	258	342	
31	304	320	224	226	228	256	222	218	202	188	A	A	A	A	A	A	A	E A 242	A	314	258	236	302		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	28	24	16	20	16	15	8	11	14	16	16	19	14	18	31	30	30	31	
MED	290	280	268	256	254	248	230	218	206	208	206	204	200	201	206	212	222	219	228	247	239	262	276	292	
U Q	306	294	284	282	274	274	239	234	219	232	224	234	212	228	240	237	238	232	248	258	262	284	298	310	
L Q	276	262	248	236	238	234	221	212	200	196	192	198	191	188	202	202	217	216	226	240	232	244	256	274	

JUL. 2013 h'F (KM)

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JUL. 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						B	112	112	98	98	98	96	98	98	102	100	96	A	108	A				
2						A	124	120	116	110		A	A	A	96	98	98	98	100	100	A			
3						A	A	124	114	102	100	96	98	98	98	96	96	100	A	A				
4						B	A	98	94	94	98	100	100	100	100	100	94	96	98	A				
5						A	120	100	100	100	100	100	108	100	100	98	96	96	100	A				
6						A	108	110	100	94	94	98	98	94		98	98	96	98	A				
7						B	108	98	100	100	100	98	100	100	110	106	98	98	100	A				
8						B	116	100	98	98	96	98		A	A	A		98	A	A	A			
9						B	114	98	96	98	98		A	A	A	96	98	100	A	108	A			
10						B	106	102	98	98	98	102	102		102		A	A	100	114	A			
11						B	126	96	A	96	96	100	96	100	98	98	98	100	100	A				
12						A	102	100	100	96	98	98	98	102	100	98	96		112	B				
13						B	120	120	118	98	96	98	98	98	104	98	98	96	100	B				
14						A	114	116	98	100	100		104	100	102	100	104	A	104	A				
15						B	114	98	98	98	98	98	98	102	102	100	100	100	110	A				
16						B	110	100	98	100	98	100	102		102	100	100	100	A	A				
17						A	106	96	96	96	98	104	104	102	100	100	100	100	100	A				
18						B	A	100	98	A	100	100	102		102	104	102	118	96	B				
19						B	A	100	100	100	102	102	102	102	100	104	98	100	100	B				
20						B	B	100	100	98	98		100		98	98	98	A	110	B				
21						A	A	96	96	98	98	96	96	100	98	98	98	100	104	A				
22						A	B	102	96	100	100	102	98		A	A	A	A	108	A				
23						B	E	116	106	100	100	100	102		A	A	A	100	98	100	A			
24						A	A	114	98	100	100		102	102		A	A	A	A	A	A			
25							A	100	98	98	98	96	100		A	98	98	96	98	102	A			
26							118	102	100	98	98	98	98		A	A	A	118	104	106	A			
27							106	104	100	100	98	102		102	96	98	96	104	A	B				
28							108	98	A	A	A	100	100	100	98	106	96	98	104	B				
29							A	126	122	102	94	96	100	98	100	102	96	98	98	100	A			
30							E	A	144	108	A	106		A	A	104	94	94	108	108	100	116		
31							116	116	98	98	98	96	102	98	98	96	96	98	104	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							23	31	28	29	27	26	26	20	25	25	28	24	25					
MED							114	100	99	98	98	100	100	100	100	98	98	100	102					
U Q							120	110	100	100	100	102	102	101	102	100	100	100	108					
L Q							108	98	98	98	98	98	98	98	98	98	96	98	100					

JUL. 2013 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUL. 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	96	94	94	96	94	94	94	122	102	102	112	108	102	100	100	96	94	90	90	88	88	88	88	B
2	84	84	88	96	96	92	102	96	92	94	92	94	104	106	102	122	102	102	104	98	98	98	102	94
3	96	106	92	92	92	94	94	122	122	110	102	106	106	98	98	96	94	118	94	88	88	88	86	84
4	82	104	98	100	80	B	196	98	98	98	102	100	100	G	102	112	94	100	100	96	86	84	86	84
5	84	96	96	96	98	96	100	114	106	110	98	98	110	G	G	108	108	104	98	96	92	94	94	94
6	94	92	96	90	B	90	122	150	112	104	106	102	94	92	94	G	114	100	98	94	92	92	92	104
7	94	94	88	88	90	110	106	106	106	106	104	110	120	112	112	106	102	108	94	94	110	90	94	90
8	88	88	88	88	90	108	126	112	102	100	96	94	96	94	94	94	94	92	108	102	88	86	86	86
9	100	100	98	96	96	92	124	106	104	108	102	92	96	98	98	G	98	102	96	96	94	116	96	86
10	86	86	86	112	108	104	102	100	100	96	96	96	98	96	102	92	92	92	90	90	90	88	106	102
11	100	100	98	100	B	B	108	164	94	138	132	120	110	110	106	104	104	112	102	96	96	96	98	100
12	B	92	106	96	98	94	108	100	106	110	100	102	104	102	100	134	118	94	114	114	112	112	100	108
13	120	100	100	94	94	B	120	126	114	128	104	110	106	102	128	G	110	108	102	102	98	100	106	98
14	98	94	96	86	92	84	126	112	106	104	96	122	98	98	G	110	98	92	108	96	96	100	100	98
15	104	90	88	104	102	112	110	112	108	106	108	122	100	102	100	102	108	108	108	102	118	112	98	98
16	112	96	96	102	106	134	106	108	102	102	98	98	98	96	96	100	100	136	94	98	100	90	92	94
17	96	98	96	98	96	100	110	100	98	102	136	G	G	116	G	124	124	114	104	98	96	92	90	100
18	106	102	B	92	90	102	102	102	96	98	98	102	98	98	98	110	120	118	108	106	102	100	96	102
19	100	100	98	100	96	98	96	G	106	106	142	130	102	102	G	G	G	126	108	102	100	100	98	86
20	86	86	86	104	102	106	104	102	104	100	100	98	94	96	108	110	104	96	112	108	104	106	104	90
21	88	86	84	96	96	98	130	122	110	104	104	106	110	126	112	G	118	110	100	94	108	90	88	86
22	84	82	82	82	80	82	104	102	102	104	104	96	94	96	96	94	96	106	110	110	98	102	96	94
23	88	82	84	88	86	146	112	112	108	100	102	98	90	110	128	122	102	112	102	94	94	90	90	96
24	98	90	90	86	88	88	116	102	102	100	100	112	96	96	94	94	92	124	88	88	94	86	88	88
25	104	110	110	118	96	86	94	96	126	104	96	102	98	102	108	144	118	114	104	98	94	94	94	98
26	92	94	94	94	94	98	158	112	104	104	100	100	98	96	94	90	128	112	108	100	102	98	98	98
27	98	98	98	102	110	108	104	112	108	108	104	104	104	G	108	100	100	100	94	110	106	104	104	102
28	102	100	102	100	98	104	164	100	104	98	98	176	G	108	116	106	108	G	118	204	96	94	94	104
29	104	98	96	92	B	96	102	124	106	100	102	100	104	176	110	122	106	102	100	98	98	98	96	B
30	B	B	96	100	98	B	96	154	88	92	90	90	92	164	164	94	94	G	106	116	100	98	96	96
31	92	94	104	94	100	94	98	114	120	110	104	102	104	100	100	114	114	114	104	102	100	100	84	98
	00	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	31	28	27	31	30	31	31	31	30	29	28	27	26	30	29	31	31	31	31	31	29
MED	96	94	96	96	96	98	106	112	104	104	102	102	100	101	102	106	103	108	102	98	98	96	96	96
U Q	101	100	98	100	98	106	122	122	108	108	104	110	104	109	110	114	114	114	108	102	102	100	98	100
L Q	88	90	88	92	91	92	102	102	102	100	98	98	96	96	98	96	96	100	96	94	94	90	90	89

JUL. 2013 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

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

IONOSPHERIC DATA STATION Okinawa

JUL. 2013 f_{XI} (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 90	X 96	X 91	X 76	X 66																X 97	X 92	X 92	X 92	
2	X 94	X 89	X 95	X 82	X 74																	X 82	X 81	X 80	X 76
3	X 78	X 79	X 76	X 70	X 68																	X 96	X 111	X 124	X 132
4	X 135	X 141	X 136	X 97	X 91																	X 84	X 81	X 85	X 83
5	X 91	X 94	X 91	X 84	X 80																	X 101	X 103	X 100	X 106
6	X 112	X 115	X 110	X 102	X 101			100														X 92	X 98	X 88	X 78
7	X 78	X 80	X 77	X 83	X 84				98													X 93	X 79	X 77	X 79
8	X 79	X 79	X 79	X 77	X 72																	X 107	X 88	X 82	X 79
9	X 87	X 86	X 86	X 76	X 68																	X 87	X 82	X 83	X 83
10	X 82	X 87	X 102	X 102	X 106	100	93	94														X 83	X 82	X 84	X 85
11	X 87	X 91	X 81	X 82	X 84																	X 69	X 68	X 69	X 72
12	X 68	X 71	X 70	X 68	X 66																	X 77	X 76	X 76	X 75
13	X 75	X 80	X 84	X 83	X 70																	X 77	X 79	X 82	X 88
14	X 88	X 84	X 96	X 77	X 86																	X 83	X 85	X 85	X 81
15	X 80	X 83	X 77	X 71	X 67																	X 84	X 78	X 80	X 80
16	X 67	X 76	X 76	X 72	X 64	62	55															X 116	X 96	X 89	X 92
17	X 86	X 86	X 89	X 72	X 67	66	66															X 89	X 78	X 82	X 86
18	X 95	X 97	X 103	X 107	X 97																	X 97	X 80	X 78	X 82
19	X 80	X 79	X 68	X 75	X 78																	X 89	X 90	X 91	X 80
20	X 84	X 84	X 80	X 80	X 74																	X 93	X 88	X 84	X 88
21	X 88	X 89	X 87	X 88	X 68	66																X 94	X 90	X 89	X 89
22	X 91	X 89	X 82	X 81	X 90	X 68																X 99	X 90	X 88	X 82
23	X 79	X 77	X 78	X 78	X 67	X 63																X 123	X 122	X 117	X 108
24	X 110	X 103	X 108	X 97	X 88	X 90																X 92	X 81	X 80	X 86
25	X 84	X 78	X 76	X 74	X 72	X 66																X 99	X 80	X 77	X 78
26	X 80	X 78	X 80	X 77	X 72	X 64																A	A	A	82
27	X 72	X 66	X 70	X 66	X 67	X 65																X 139	X 119	X 101	X 96
28	X 109	X 100	X 103	X 81	X 75	X 68																X 90	X 83	X 82	X 74
29	X 69	X 72	X 66	X 67	X 66	X 62																X 83	X 81	X 78	X 78
30	X 69	X 69	X 66	X 64	X 66	X 65																X 92	X 75	X 74	X 72
31	X 73	X 72	X 72	X 64	X 66	X 57																X 110	X 98	X 107	X 84
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	14	3	2	1												30	30	30	31	
MED	X	X	X	X	X																X	X	X	X	
U Q	84	84	81	77	72	66	66	97	98												92	82	84	82	
L Q	X	X	X	X	X	X															X	X	X	X	
	91	91	95	83	84	68	93														99	92	89	88	
	X	X	X	X	X																X	X	X	X	
	78	78	76	72	67	63	55														84	80	80	78	

JUL. 2013 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.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	84	90	85	70	60	54	52	68 ^R	71	74	78	74	74 ^{J R}	73	74	84		A	A	102	106	91	86 ^R	86	86	
2	88	83	89	76	68	58	56	80	75	64	62 ^R	64 ^R	62	72	77	79	80	82	79	76	76	75	74 ^R	70		
3	72	73 ^{U R}	70 ^R	64	62	57	61	69	76	60	69	71		A ^{U R}	84	95 ^{U R}	102 ^{U R}	118	130	131	110	90 ^{U R}	105 ^{U R}	118	126	
4	129	135 ^{U F}	124 ^F	88 ^F	85	78	74	82 ^F	83	87	68		A	69	78	82	89	93	100	104	102	78	75 ^R	79 ^R	77	
5	85	88	85	78 ^R	74	60	59	70	74	83	72	67		A	74	79	92	106	107	104	104	95	97 ^R	94	100	
6	106	109	104	94	93	94	104 ^F	90 ^F	85	77	70	77	80	79	86	88	97	112	114	80	86	92	82	72		
7	72	74	71	77 ^Z	78 ^{J R}	78	76	87	86 ^F	104	65	99 ^R	110	96	91	86	80	82	87	100	87	73	71	73		
8	71 ^F	73 ^V	73	71 ^R	66	45	54	63	69	60		A		76	92	95	103	106	112	114	101	101	82	76	73	
9	81	80	80	70	62	62 ^V	68	79	84	74	58	58 ^{J R}	62	68	74	88	96	108	99	94	81	76	77	77		
10	76	81	96	96	100	87 ^F	85 ^F	86 ^F	73	68		A		88	94 ^{R J R J R}	104	103	110	106	103	100	77	76	78	79	
11	81	85	75	76	78	84	96	55	54	58	61 ^{R E G}	49 ^R	65	76	69	67	70	85	85	76	63	62	63	66		
12	62	65	64	62	60	58	54	62	64	67	65	62	83	87	92	90	91	101	94	86	71	70 ^{J R}	70	69		
13	69 ^{J R}	74	78	77	64	56	60	64	72		A		71	83	92	98	104	94	99	100	91	71	73	76	82	
14	82	80	90	71 ^{U R J R}	80 ^R	67	78	95	83	57	60	67	77	79	76	84	89	88	93	85	77	79	79	75		
15	74	77	71	63 ^F	61	58	56	59	66		A	66	80	92		86	92	100	94	102	105	78	72	74	74	
16	61 ^R	70	70	66	58	55 ^F	48 ^F	64		61	66 ^{J R}	71 ^V	75	88	97	101	112	114	111	108	110 ^{J R}	90	83	86		
17	80 ^{J R}	80	83	66	61 ^F	58 ^F	58 ^F	70	70	76	67	65	77	79	78	81	83	90	88	100	83	74	76	80		
18	89	91	97	101	91	72	73	77	66	63	68	71	75	73	78	94	104	97	92	94	91	74	72 ^R	76		
19	74	73 ^F	61 ^F	66	71	74	62	68	72	62	72	76	79	82	88	93	102	108	107	90	83	84	85 ^{U R}	74		
20	78	78	74	74	68	58	64	66	74	84	87	93	106	110	118	116	116 ^R	132	131	114	87	82 ^{U R}	78	82		
21	81 ^F	80 ^F	81	82	62	56	67	74	69	65	68	79	86	94	107	107	104	98	93	94	88	84	83	83		
22	85	83	76	75	84	62	52	74	70	82	77	78	89		A	98	101	98 ^R	106	121	111	93	84	82	76	
23	73	71	72	72	61	57	65	73		A	A	70	81 ^{J R}	100	120	132	141	148	152	144	136	117 ^R	116	111	102	
24	104 ^{R U R}	97	102	91	82	84	83	82	65	59	68		A	80	90	106	117	124	107	93	89	86 ^{U R}	75	74	80	
25	78	72	70	68	66	60	61	60	67	69	66	74	81	85	94	96	97	94	109	108	93	74	71	72		
26	74	72	74	71	66	58	58	62	75	86	76	73	81	98	105	104	109	97	78	89		A	A	A	70 ^F	
27	64 ^F	58 ^F	62 ^F	58 ^F	61 ^F	56 ^F	50	67		A	79	78 ^{J R}	72	90	99	110		A	141 ^{R J R J R}	149	145	132	133	113	95	90
28	103	94	97	75	69	62	70	96	93	64	73	74	75	80	90	103	107	101	95	95	84	77	76	68		
29	63	62 ^F	57 ^F	58 ^F	60 ^F	54 ^F	55	69	78	62	57		A	62	63	67	72	67	76	74	77	75	72	72		
30	63	63	60	58	60	59	54	65	67	72	65	69	72	77	85	94	107	112	111	104	87	69	68	66		
31	66	66 ^F	64 ^F	58	57 ^F	48 ^F	53	69	63	68	73	78	83	89	100	122	124	107	104	110	104 ^R	92	101	78		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	28	28	28	26	28	29	31	30	30	30	31	31	30	30	30	31		
MED	78	78	75	71	66	58	61	69	72	68	68	72	80	84	91	94	103	104	102	100	86	76	78	76		
U Q	85	85	89	77	78	72	73	80	77	78	72	78	87	93	100	103	110	112	111	108	93	86	83	82		
L Q	71	72	70	66	61	56	54	64	67	62	65	67	75	76	78	88	93	94	93	89	78	74	74	72		

JUL.2013 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.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	U	L	U	L	A	A	A	A	A	A	A	A					
2								U	L	L	U	L	U	L	A	U	R	A	A	A					
3								U	L	U	L	A	A	A	A	A	A	A	U	L					
4								L	U	L	U	A	A	A	A	A	A	U	L	A	L				
5								L	U	L	L			A	R	U	R	U	A	A					
6									L	U	L	U	L	A	A	A	A	A	A	A					
7							L	L	U	L	A	A	A	U	L	U	L	A	A	A					
8								U	L			A	A	A	A	A	A	U	A	A					
9							L	L	U	L	U	L	A	A	U	R	R	A	A	L	L				
10							L	A	L	A	A	A	A	A	A	R	A	A	A	L					
11									L	U	L			A	A	A	A	A	A	A					
12								L	L	L	U	A	A	U	A	A	A	U	L	U	L				
13									L	A	A	A	A	A	A	L	U	L	U	L	L				
14								L	A	L	A	L	U	R	U	R	U	L	A	A	L				
15									A	A	L	544	A	A	A	J	L	U	L	A					
16							L	400	A	A	A	A	R	A	A	A	A	A	L						
17								L	L	U	L	U	L	500	536	540	504	504	496	496	492	472	L		
18							L	L	L	L	L	U	R	U	R	516	516	484	492	460	436	U	L		
19							A	A	U	L	528	516	528	536	528	520	504	492	488	L					
20								L	U	L	A	A	L	A	A	L	L	512	468	L					
21								L	L	L	540	A	A	B	A	A	A	A	A	A					
22							A	L	L	A	A	A	508	A	A	520	A	468	412	A					
23								A	A	A	U	L	508	528	512	R	A	A	A	A					
24								L	L	A	A	A	508	A	U	A	A	A	A	A					
25								L	L	U	L	U	L	U	L	A	488	484	U	L	U	L			
26								L	U	L	U	L	U	L	A	R	A	A	L						
27								L	A	L	A	A	A	U	R	U	Y	A	R	L					
28								L	U	L	U	L	U	R	U	L	L	L	U	L	L				
29								L	440	464	A	A	A	R	A	A	476	468	U	L					
30							L		L	L	U	R	U	L	A	500	484	484	444	L					
31								L	L	L	L	A	544	A	U	A	484	476	A	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								3	13	17	15	15	17	14	21	20	24	21	7						
MED								U	L	U	L	L	400	456	484	484	508	516	508	496	512	492	486	468	408
U Q								U	L	U	L	U	L	U	L	U	L	U	L	U	L	U	L	U	L
L Q								U	L	U	L	U	L	U	R	R	U	L	U	L	U	L	U	L	U
								392	442	472	492	496	492	492	492	494	484	476	448	392					

JUL.2013 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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	204	252	A	A	A	B	B	B	B	A	A	A	A					
2						B	196	256	A	A	A	A	A	A	B	U R	380	348	300	A	A			
3						A	A	A	U	U	R	U	R	A	A	A	U	R	U	R	A	A		
4						A	B	276	U	R	A	A	B	A	B	B	U	R	396	308	A	A		
5						A	A	284	316	A	U	R	A	B	B	R	U	R	A	A	A			
6						B	U	A	U	A	A	A	A	A	A	A	R	356	356	A	A	A		
7						B	A	A	U	U	A	B	B	B	B	B	A	A	A	A	A			
8						B	A	U	A	U	A	A	A	A	A	A	A	A	A	A	A			
9						A	R	R	A	A	A	A	A	A	A	R	U	R	368	344	316	A	A	
10						B	A	A	A	A	A	B	A	A	A	A	A	A	A	A	248	180		
11						B	A	256	304	A	A	R	U	R	A	U	R	R	364	352	304	240	A	
12						B	A	A	A	A	A	A	A	A	B	A	A	A	R	308	252	172		
13						A	A	R	A	A	A	A	A	A	B	B	B	U	R	364	320	252	A	
14						B	A	A	296	R	A	U	R	U	R	B	B	R	A	A	A			
15						B	A	U	A	A	A	B	B	B	B	U	R	U	R	B	312	260	A	
16						B	A	U	A	U	A	A	B	A	B	A	A	A	A	A	A			
17						B	A	A	296	A	R	R	B	B	B	B	356	300	R	252	168	A		
18						A	A	A	A	A	A	B	B	A	A	396	356	R	260	A				
19						B	A	A	A	R	U	R	U	R	B	B	B	U	R	372	356	320	260	A
20						B	A	A	A	A	A	B	B	A	U	R	U	R	U	R	A	A		
21						A	A	A	U	A	U	R	R	B	B	U	R	U	R	A	A	A		
22						A	U	A	U	A	A	A	A	A	A	A	A	A	A	U	A	A	A	
23						192	256	296	320	U	A	A	B	B	A	A	A	A	A	A	252	A		
24						A	272	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A		
25						A	260	312	A	U	R	B	B	B	B	B	R	348	320	248	A			
26						A	236	296	348	368	U	R	U	R	B	A	B	B	U	R	308	248	A	
27						A	260	312	A	A	A	A	A	B	R	A	U	R	352	292	244	172		
28						192	252	A	A	A	R	B	B	B	R	U	R	U	R	372	320	A	A	A
29						172	248	292	332	360	R	R	A	B	B	B	U	R	U	R	U	A	A	
30						A	A	A	U	R	A	A	A	A	A	R	R	R	320	A	A			
31						A	U	A	U	A	B	R	B	B	B	U	R	368	344	312	260	A		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	20	18	10	9	3	1	1	4	15	17	19	15	4				
MED							192	258	304	352	372	396	392	436	384	372	356	312	252	172				
U Q							196	268	312	360	384	408			400	388	356	320	260	176				
L Q							172	252	296	340	366	384			380	368	348	304	248	170				

IONOSPHERIC DATA STATION Okinawa

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

IONOSPHERIC DATA STATION Okinawa

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	20	E B	E B	E B	E B	E B	G	17	28	36	42	62	51	53	58	46	A	A	A					E B	
2	E B	E B	E B	E B	E B	E B		21	30	36	40	40	50	54	42	E B	48	48	43	47	26	21	21	28	30
3	34	37	31	E B				39	31	37	43	47	61	108	64	64	U	Y						E B	
4	E B	E B	E B	E B	E B	E B			G			A	A	E B	E B	E B	E B	43	42	40	23	23	19	20	20
5	18	20	14	E B	E B	E B			G		G	A	A	E B	E B	G	43	47	43	43	44	40	30	28	21
6	18	E B	E B	E B	E B	E B	E B		G								G	G					E B	E B	E B
7	E B	14	31	29	21	E B	E B					U	Y										E B	E B	E B
8	23	E B	E B	E B	E B	E B	E B				A	A	A												
9	17	E B	E B	E B	E B	E B		G	G	U	Y	U	Y			U	G	G	G				E B	E B	
10	19	26	21	16	E B	E B	E B				A	A	A							G	G	E B	E B	E B	E B
11	19	19	14	14	22	E B	E B		G			U	G	U	Y										
12	19	23	14	E B	E B	E B	E B													G		E B	E B	E B	E B
13	E B	14	21	30	14	14	32			A	A	A				E B	E B	43	42	40	24	32	29	36	32
14	31	34	21	E B	E B	E B	E B			U	G		U	G		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			A	A					A	A	E B	E B					E B	E B
16	19	29	17	E B	E B	E B	E B		A	A													E B	E B	E B
17	E B	E B	E B	E B	E B	E B	E B				G	U	G	E B	E B	E B	E B	E B	E B		G		E B	E B	E B
18	E B	E B	E B	E B	E B	E B							E B	E B					U	G			E B	E B	E B
19	E B	14	22	20	18	20	E B				G		43	45	45	E B	44	43	U	Y					
20	21	E B	E B	E B	E B	E B	E B									G	G								
21	42	18	28	29	19	17	31						E B	E B											
22	23	22	14	14	14	14	39							A	A									E B	E B
23	E B	14	18	14	14	14	14		G	A	A	A	E B												
24	20	24	20	E B	E B	E B	E B		G			A	A												
25	E B	14	17	18	E B	E B	E B								E B	E B	E B		G						
26	18	20	37	41	28	18	20		G			G	E B	42	54	46	62	71	24	42	44	37	104	107	134
27	24	17	19	E B	E B	E B			A	A					E B	E B	G	A	A	G	G				
28	20	22	16	E B	14	19	E B		G	G			U	G	E B	E B	E B	E B		G				E B	E B
29	E B	14	17	E B	14	17	14					A	A	A									E B	E B	E B
30	E B	14	20	E B	E B	E B	E B				G					U	G	U	G	U	G				
31	18	32	30	E B	E B	E B	E B								G							E B	E B	E B	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	19	19	E B	E B	E B	E B		20	30	37	42	45	51	46	52	46	44	43	37	36	33	24	21	21	18
U Q	20	23	21	16	19	19	24	32	40	50	56	61	61	59	55	62	48	48	45	46	38	30	28	23	
L Q	E B	E B	E B	E B	E B	E B	G	G	34	39	41	43	44	45	43	42	41	35	30	26	E B	E B	E B	E B	

IONOSPHERIC DATA STATION Okinawa

JUL. 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

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

JUL. 2013 fmin (0.1MHz)

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1		285	302	333	299	325	280	278	296 ^R	303	318	294	322	286	305 ^{J R}	267	287		A	A	289	303	305	298 ^R	291	286		
2		286	299	303	330	312	308	291	323	358	327	311 ^R	291 ^R	267	285	298	300	311	312	307	296	295	288	295 ^R	300			
3		276	309 ^{U R}	318 ^R	320	303	306	320	345 ^F	370	280	303	276		A ^{U R}	263	271 ^{U R}	279	288	308	330	340	277 ^{U R}	301 ^R	292	293		
4		291	328 ^{U F}	351 ^F	358 ^F	312	301	296	298 ^F	302	336	305		A	265	276	272	278	273	291	305	331	293	280 ^R	289	298		
5		294	295	297	304 ^R	333	321	319	314 ^F	321	342	322	299		A	281	266	271	288	291	285	296	301	267 ^R	277	285		
6		291	302	315	323	304	300	331	311 ^F	311	310	286	269	265	258	257	258	268	293	329	301	276	291	286	281			
7		273	290 ^Z	278	287 ^{J R}	295	318	270	273 ^F	272	311	353	269 ^R	294	300	306	308	298	289	289	313	331	295	278	272			
8		266 ^F	281 ^V	294	326 ^R	329	338	351	327	359	319		A	A	279	267	280	279	284	298	317	309	330	298	284	286		
9		289	293	306	286	281	286 ^V	307	349 ^F	352	356	350	260 ^{J R}	280	278	275	276	285	302	304	316	297	289	292	289			
10		284	288	285	309	329	325 ^F	312 ^F	329 ^F	333	303		A	A	251	260 ^{R J R J R}	263	276	289	299	300	323	289	270	266	263		
11		276	306	275	272	265	300	379	306	301	312	318		R	G	283	306	309	285	277	310	322	311	290	265	267	268	
12		263	270	277	290	282	298	334	316	322	315	290	261	305	298	298	286	280	301	321	299	297	289	280 ^{J R}	263			
13		271	302 ^{J R}	302	310	301	287	322	326	331			A	289	275	285	281	284	279	291	306	335	288	272	281	275		
14		279	284	321	316 ^{U R J R}	298	289	299	332	380	338	255	274	294	304	282	282	293	263	289	284	269	270	272	284			
15		261	279	278	272 ^F	284	295	289	328	324		A	309	296	362 ^R		298	284	299	289	290	319	294	272	264	268		
16		301 ^R	276	279	308	275	271 ^F	272 ^F	322 ^F		290	300 ^{J R}	302	291	303	296	290	303	303	311	318	297 ^{J R}	291	280	255			
17		276 ^{J R}	285	311	302	295	289 ^F	304 ^F	330	309	333	314	276	304	295	298	297	290	297	298	322	322	279	279	280			
18		279	309	308	312	330	337 ^R	339	363	352	318	291	292	288	282	262	287	296	301	286	299	313	279	283 ^R	284 ^R			
19		278	286	264 ^F	274 ^F	300	359	303	332	348	283	308	310	290	290	287	275	286	296	304	299	281	279	296				
20		277	280	300	298	303	321	330	308	312	307	283	264	281	285	291	293	289 ^R	307	335	333	315	288	270	279			
21		291 ^F	313 ^F	327	347	323	283	342	344	335	317	268	279	272	276	306	292	305	303	295	302	295	289	284	302			
22		292	296	304 ^R	292	326	379	317	330	343	315	289	270	285		281	283	283 ^R	287	307	326	315	294	282	296 ^R			
23		281	286	296	326	305	319	355	346			296	240	264	281	291	289	297 ^{J R U R J R R R R R R R}	313	326	326	323	311	298	325			
24		303 ^{R U R}	296	308	319	297	330	355	355	379		A	298		A	269	256	272	293	312	322	309	300	319	316	278	288	
25		279	282	296	311	293	329	351	359	336	350	290	280	278	261	270	282	284	289	301	323	329	289	286	290			
26		287	290	305	315	310	307	326	312	307	317	287	265	261	282	293	286	307	322	293	323		A	A	A	294 ^F		
27		305 ^F	290 ^F	295 ^F	291 ^F	300	310	322	329		A	332	307	297 ^{J R}	264	275	282		A	R J R J R R	313	329	322	307	318	310	284	283
28		295	310	322	322	299	279	283	333	360	320	287	318	279	264	277	284	299	303	306	313	309	293	299	291			
29		278	306	304 ^F	291 ^F	303	308	310	337	348	336	306			A	291	289	297	303	299	301	314	292	294	290	295		
30		305	286	290	304	284	332	328	316	332	334	303	294	284	274	268	264	276	298	303	308	319	311	287	277			
31		288	296 ^F	317 ^F	308	321	331	328	349	339	319	291	304	276	281	277	301	318	305	292	319	307 ^R	300	292	301			
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT		31	31	31	31	31	31	31	31	28	27	28	26	28	29	31	30	30	30	31	31	30	30	30	30			
MED		284	293	303	308	303	308	320	329	334	318	299	280	280	281	281	284	290	300	304	313	299	289	284	286			
U Q		291	302	315	320	321	329	334	344	352	334	308	297	289	293	296	292	303	307	317	323	318	298	291	294			
L Q		276	285	290	291	295	289	299	314	312	311	290	269	268	270	271	279	284	291	293	301	292	279	278	277			

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JUL.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	U	L	U	L	A	A	A	A		A	A	A	A				
2								U	L	L	U	L	H	A	A	A		A	A	A	A				
3								U	L				A	A	A	A		A	U	L					
4								L	U	L	L	A	A	A		A			A	A			L		
5								L	U	L	L				U	R			A	A					
6									L		U	L	R		A										
7							L	L	U	L	A	A	U	L	U	L		A	A	A	A				
8								U	L			A	A	A	A	A		A	A	A	A				
9							L	L		U	L	H	U	R	R						L	L			
10							L	A	L	A	A	A	A	A	A	R	H	A	A	L					
11									L	U	L			A	A	A	A	A	A	A					
12								L	L	L		A	A	A	A	A		A	U	L	L				
13									L	A	A	A	A	A	A		402	347	333		L	L			
14								L	A	L	A	L	U	R	U	R			L	A	L				
15									A	A	L		A	A	A	A			U	L	A				
16							L		A	A	A	A	R	A	U	A	A	A	A	L					
17								L		L	U	L	U	L					U	L	L				
18							L	L	L	L	L		U	R				A		U	L				
19							A	A	U	L			U	L				Y		L					
20								L		U	L	A	A	A				L		L					
21								L		L		A	A	B	A		A	A	A	A					
22							A	L	L	A	A	A		A	A			A	A	A					
23								A	A	A	U	L		A	A	A		A	A	A					
24								L	L	A	A	A			A	A		A	A	A					
25								L	L	U	L	U	L	U	L			U	L	U	L				
26								L		U	L	U	L	A	R	A	A		L						
27								L	A	L		A	A	U	R	Y	A	R		L					
28								L	U	L	U	L	U	R			A	L	U	L	L				
29								L			A	A	A	R	A	A		U	L						
30							L		L		U	R	U	L	A				L						
31								L	L	L	L	A	Y	A	A	A		A	A	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								3	13	16	15	13	16	13	16	16	20	18	7						
MED								U	L	U	L	L													
U Q								356	376	370	382	392	398	392	387	374	354	346	349						
L Q								U	L	L															
								386	384	376	392	408	412	408	402	390	358	354	352						
								U	L	U	L	U													
								345	364	362	363	380	388	383	371	362	342	339	347						

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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							372	290	306	296	338	A	310	366	E A	324	394	E A	394	A	A				
2								282	234	316	328	382	452	380	336	332	310	300	296						
3								252	238	404	336	E A	398	A	406	382	400	Y	332	294	254				
4								294	298	278	310	A	440	378	390	360	360	314	276	244					
5								286	294	268	312	364	A	384	394	372	322	322	280						
6									312	288	360	392	404	412	408	392	364	314	270						
7								384	344	348	290	264	378	324	302	298	312	340	330	326					
8									256			A	A	394	382	372	346	330	304	280					
9								292	242	250	250	270	510	426	410	402	362	334	292	270	244				
10							G	252	256	248	302	A	A	E A	420	440	372	354	322	302	282				
11									360	344	348	G	404	340	320	388	386	312	274						
12								282	300	320	378	494	342	326	322	348	342	306	270						
13									260		A	A	376	370	350	340	330	328	328	278	240				
14								260	222	276	L	504	440	350	330	380	358	326	352	312	270				
15									256		A	296	354	254	A	338	326	308	318	318					
16								372	298		E A	E A	E A	342	372	332	318	326	302	296	276				
17								252	270	278	348	420	334	356	336	334	334	312	306						
18								238	224	238	306	374	356	366	382	416	344	312	288	306					
19								E A	332	252	246	402	336	328	354	346	342	336	328	310	280				
20								L	312		292	324	378	348	342	318	312	336	298	250					
21									254		244	434	358	364	362	306	330	288	292	E A	310				
22								E A	276	278	228	292	342	E A	426	340	A	344	342	328	336	278			
23									248		A	A	308	460	388	364	348	352	326	296	262				
24									228	224	E A	E A	426	368	A	366	422	364	320	286	276	278			
25									244	278	268	346	366	376	420	376	336	350	318	296					
26									258	330	288	254	358	394	340	316	338	296	262						
27									292	A	284	312	342	366	344	340	A	284	260	272					
28									242	234	258	372	298	356	400	358	346	314	278	274					
29									270	252	290	296	A	A	A	398	388	368	332	338	308				
30									266		L	258	284	344	360	376	380	358	376	344	302	286			
31									250	268	296	338	322	376	320	360	308	270	282	298					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							9	25	26	27	28	26	28	29	31	30	30	30	30	4					
MED							284	258	257	289	338	366	368	363	358	344	328	303	280	244					
U Q							372	288	298	316	354	420	394	399	382	362	336	318	306	257					
L Q							259	249	238	278	311	354	352	340	336	330	310	292	274	242					

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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	300	264	236	256	240	306	250	234	224	238	A	A	A	A	E A	A	A	A	A	268	264	272	246	278			
2	274	268	250	234	228	244	244	242	206	204	172	A	A	186	220	B	A	A	A	274	266	276	262	290			
3	A	280	258	240	A	A	242	208	224	242	A	A	A	A	A	A	A	222	242	224	214	266	268	276			
4	278	246	236	200	230	240	254	234	214	A	A	A	206	E B	A	B E	A	A	A	228	218	280	280	290			
5	280	272	260	244	222	228	248	214	210	E A	192	232	A	A	A	200	218	232	A	A	270	262	290	314	288		
6	268	252	224	222	262	276	248	214	202	206	E A	182	230	A	A	A	E Y	266	242	E A	E A	282	274	266	250	284	
7	300	284	296	292	286	246	222	226	234	A	A	A	294	236	228	A	A	A	A	272	230	230	298	304			
8	308	306	262	236	222	198	228	210	220	214	A	A	A	A	A	A	A	A	A	242	240	240	292	318			
9	294	254	250	260	288	298	238	212	202	212	Y	Y	H	A	Y	206	220	238	218	218	246	254	264	290			
10	304	298	274	280	246	230	218	A	220	A	A	A	A	A	A	H E	A	A	A	236	252	240	292	316	322		
11	298	244	294	296	304	274	220	222	204	216	226	214	A	A	A	A	A	A	A	250	288	324	354	304			
12	326	314	292	272	266	228	240	246	228	266	234	A	A	A	A	A	E A	A	A	226	250	236	274	294	318		
13	320	278	268	242	226	324	242	232	228	A	A	A	A	A	A	198	272	298	A	A	288	312	322	316			
14	A	302	238	230	262	256	254	228	A	196	A	E A	270	240	220	G B	252	236	248	240	256	294	312	282	272		
15	334	294	288	294	310	238	264	234	A	A	A	236	218	A	A	A	A	262	242	A	252	208	296	308	304		
16	310	312	288	246	288	302	262	244	A	A	A	A	A	206	A E	A E	A	A	A	234	254	244	236	270	288		
17	280	278	242	254	264	282	234	210	202	214	198	204	200	218	218	E B	230	230	218	254	254	212	242	272	288		
18	290	260	242	222	222	222	234	202	206	204	206	200	210	208	200	206	E A	284	208	248	266	254	258	294	300		
19	290	292	336	326	270	216	A	A	204	198	188	192	224	212	178	H	E Y	226	250	228	242	296	284	298	262	292	
20	316	274	268	264	248	220	244	266	E A	A	A	A	A	A	A	220	226	240	216	248	234	214	304	310	296		
21	A	300	254	246	222	230	254	226	224	228	222	208	A	A	B E	A	A E	A	A	A	284	264	274	270	258		
22	274	254	260	276	234	196	A	H	194	210	A	A	A	A	A	A	212	A	244	234	240	232	238	264	268		
23	290	290	272	224	234	236	220	A	A	A	210	196	212	A	A	A	A	A	228	A	286	224	232	242	254		
24	260	276	256	220	260	228	218	214	220	A	A	A	186	A	A	A	A	A	A	A E	A	318	246	236	284	308	
25	A	294	294	274	242	252	220	208	210	210	212	222	214	202	A	190	B	226	210	234	250	246	232	274	304	290	
26	290	296	278	260	260	248	232	194	202	202	212	182	A	246	A	A	A	252	A E	A	278	258	A	A	A	288	
27	284	296	264	292	252	240	228	216	A	210	194	A	A	212	Y	A	A	242	210	220	232	222	216	250	296		
28	266	266	242	208	244	278	248	232	202	E A	238	202	206	214	204	204	E A	260	278	220	212	H	250	244	250	248	254
29	296	262	272	288	246	254	256	232	214	198	A	A	A	220	A	A	E A	228	248	232	216	262	258	234	260	264	
30	272	302	278	256	264	234	238	214	204	224	230	206	176	A	Y	Y	Y	218	210	220	216	230	242	220	234	266	304
31	328	284	280	238	238	238	242	216	204	236	A	A	E Y	238	A	A	A E	A	A	260	242	252	230	250	256	264	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	31	31	31	31	31	31	29	28	26	22	17	14	16	13	16	17	20	17	18	30	30	30	30	31			
MED	294	278	264	246	252	240	240	218	210	213	209	204	208	214	217	218	E	256	228	236	252	242	266	271	290		
U Q	308	296	278	276	264	276	248	233	224	232	228	214	227	227	240	231	E A	274	241	248	270	264	290	298	304		
L Q	280	262	246	230	234	228	227	211	204	204	196	192	201	206	208	209	E A	241	217	226	242	224	238	262	276		

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL.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	126	112		A	A	B	B	B	B	A	A	A	A	A				
2						B	118	118		A	A	A	A	A	B	112	110	110		A	A			
3						A	A	A			110	108		A	A	A	108	108	108		A	A		
4						A	B				A	A	B	A	B	B	B		A	A	A			
5						A	A				A			B	B					A	A			
6						B	128	114	112		A	A	A	A	A	A	108	108		A	A	A		
7						B	A	A				B	B	B	B	B	A	A	A	A	A			
8						B	A				A	A	A	A	A	A	A	A	A	A	A			
9						A					A	A	A	A	A	A					A	A		
10						B	A	A			A	A	B	A	A	A	A	A			110	120		
11						B	A				A	A	A	A	A	A	108	108	108	108				
12						B	A	A			A	A	A	A	A	B	A	A		112	112	112		
13						A	A				A	A	A	A	B	B	B							
14						B	A	A			A	A		A		B	B			A	A	A		
15						A	A				A	B	B	B	B									
16						B	A				A	B	A	B	A	A	A	A	A	A	A			
17						B	A	A			A	A	B	B	B	B								
18						A	A	A			A	A	B	B	A	A								
19						B	A	A			A	A		B	B	B								
20						B	A	A			A	A	B	B	A									
21							A	A			A	A		B	B									
22							A				A	A	A	A	A	A	A	A						
23							128	112	108	108		A	B	B	A	A	A	A	A					
24							A				A	B	A	A	A	A	A	A	A	A	A			
25							A				A		B	B	B	B								
26							A				A		B	A	B	B	A							
27							A				A	A	A	A	B									
28							140	112			A	A	A	B	B									
29							E B	180	112	108	110	110		A	B	B	B							
30							A	A			A	A	A	A	A	A	A	A						
31							A						B		B	B								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	20	16	10	9	4	2	1	6	14	19	18	14	3				
MED							127	112	110	110	110	110	108	108	110	110	110	110	110	110	120			
U Q							140	113	110	110	110	110			110	110	110	112	110	154				
L Q							118	110	108	110	108	110			108	108	108	110	110	112				

JUL.2013 h'E (KM)

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JUL. 2013 h'Es (KM)

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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		100	B	B	B	96	98	100	162	106	110	108	110	106	106	104	100	98	98	96	94	92	92	94	B
2		B	B	92	B	B	B	142	144	102	104	100	102	104	102	B	122	114	108	108	106	108	108	106	108
3		108	100	100	B	100	98	102	102	122	122	118	110	110	110	114	114	110	118	102	102	106	96	90	90
4		84	106	B	B	106	104	152	152	G	104	102	106	110	B	104	B	122	114	106	100	96	110	106	110
5		92	88	92	100	104	104	112	G	114	110	G	108	104	B	G	128	112	108	106	102	102	94	94	92
6		92	92	B	B	92	B	120	G	108	110	104	104	102	98	100	G	G	110	104	96	96	B	B	88
7		B	92	94	96	110	110	120	106	108	120	118	118	134	120	120	110	110	106	104	100	102	98	96	98
8		90	96	90	90	94	B	114	108	108	108	104	104	102	102	102	102	126	98	96	96	106	92	104	92
9		94	94	106	106	106	102	G	G	108	110	98	104	100	100	106	G	104	128	96	108	92	94	96	114
10		98	110	114	114	B	116	106	106	106	106	102	102	102	100	100	98	98	96	100	G	98	94	94	110
11		106	106	118	102	102	102	120	104	144	100	134	102	118	114	114	110	110	110	108	106	104	104	102	102
12		100	98	B	B	100	102	114	106	106	108	106	104	106	106	118	116	118	158	102	122	94	94	94	B
13		B	100	98	100	100	100	132	134	124	116	116	112	116	116	116	B	132	120	110	108	108	108	104	108
14		108	100	106	98	B	102	118	106	106	106	126	124	102	G	B	B	116	112	108	96	100	90	108	100
15		100	100	96	92	94	116	118	114	112	108	108	112	116	114	116	184	B	114	118	108	108	110	108	108
16		102	98	92	90	114	114	122	112	104	104	104	104	106	104	102	104	102	102	100	98	96	98	98	94
17		94	92	B	B	B	102	100	100	154	104	G	104	B	B	B	B	120	G	114	110	100	98	98	110
18		100	98	92	B	104	106	106	102	102	102	106	108	B	110	108	G	124	102	114	108	104	108	112	114
19		110	120	106	106	106	106	104	102	106	G	G	110	108	104	B	108	148	178	120	112	108	104	104	104
20		92	92	92	92	B	114	110	102	104	104	104	106	104	B	G	G	126	102	114	110	110	110	106	106
21		104	100	98	98	88	92	100	102	110	114	122	112	112	B	122	112	122	110	104	98	96	96	96	90
22		92	92	98	102	B	106	152	110	110	106	104	102	108	98	100	100	100	120	100	96	96	96	98	B
23		B	90	90	96	B	B	G	110	110	104	106	B	114	98	98	96	110	124	112	104	100	98	96	92
24		94	88	108	B	B	B	116	110	108	104	104	104	104	102	102	98	100	116	118	96	96	96	94	94
25		108	92	106	104	B	B	102	102	118	118	124	116	120	118	B	B	G	138	110	104	102	98	104	104
26		104	100	94	100	100	98	100	104	106	G	G	B	100	138	128	122	98	122	114	108	110	106	108	108
27		104	106	106	106	106	104	112	114	110	120	108	110	110	B	G	106	G	G	102	G	B	B	142	112
28		104	100	100	108	100	110	G	G	106	102	102	102	B	B	G	112	110	112	108	100	92	90	90	108
29		104	102	104	100	98	100	G	136	122	110	112	116	112	126	118	120	128	116	110	100	102	B	100	88
30		112	104	106	106	102	104	102	104	100	G	98	98	98	98	96	96	96	G	106	100	96	110	104	104
31		104	102	102	102	96	B	98	138	122	114	114	108	G	124	124	126	124	116	112	114	112	104	108	104
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		27	29	26	22	22	23	27	27	30	28	27	29	27	24	22	22	27	28	31	29	30	28	30	28
MED		100	100	99	100	100	104	114	108	108	108	106	106	106	105	107	110	112	113	108	102	101	98	101	104
U Q		104	102	106	106	106	106	120	114	114	112	116	111	112	115	118	120	124	120	112	108	106	107	106	108
L Q		94	92	92	96	96	100	102	104	106	104	104	104	102	101	102	100	102	107	102	98	96	94	96	93

JUL. 2013 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUL. 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

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	F1			F2	L1	L1	H1	L2	C1	C2	C1	C1	C1	L1	L2	L4	L6	L4	L4	F4	F3	F1			
2			F1			H1	HL11	L1	L1	L1	L1	L1	L1		C1	CL21	C2	C2	C3	F1	FF42	F2	FF22		
3	F5	F3	F2	F2	L2	L2	L2	CL11	C1	C1	C2	C2	C1	C1	CL11	C2	C1	C1	L3	F4	F4	F2	F1		
4	F1	F1		F1	L3	H1	H1		C2	L2	L1	C1		C1		C1	CL31	C2	L3	F2	FF22	FF23	FF12		
5	F1	F3	F1	F2	L2	C1		C1	C1		C1	L2			C1	C1	C2	C4	LQ31	F4	F5	F3	F2		
6	F2	F1		F1		C1		C1	C1	C1	L1	L1	L1	L1			C1	C2	LQ51	F3				F1	
7		F3	F4	F4	FF22	C2	C1	C1	C2	C3	C1	C2	H1	C1	C1	C2	C1	C3	L3	L2	F1	F1	F4	F1	
8	F3	F1	F2	F1	F1	C1	C1	C1	C1	L2	L2	L1	L1	L1	L3	L3	CLH22	HL6	L7	L7	FF44	F2	FF13	F2	
9	F1	F1	F1	F2	L3			C1	C1	L1	L1	L1	L1	L1	L1		L1	CL21	L2	CL11	F6	F4	F2	F1	
10	F3	FF12	FF11	FF11		C1	C1	C2	C1	C2	C4	L2	L1	L2	L1	L1	L1	L4	L1		F1	F1	F1	FF21	
11	FF21	F2	FF11	F1	F5	L1	CL32	LL12	HL11	L1	HL11	L1	L1	L1	L1	C3	C2	C4	C4	C2	F2	F2	F5	F2	
12	F2	F3		F1	C1	C1	C2	C1	C1	C1	C1	C2	LC11	C1	C1	CL21	CL11	HL11	L1	CL11	F1	F1	F1		
13		F3	F7	F2	F4	LQ41	H1	H1	CL11	CL11	CL22	C2	C1	C2	C1		H1	C1	C3	C1	F2	F4	F4	FF23	
14	FF12	FF21	F1	F1		L1	C1	C3	C2	L1	CL31	C1	L1			C1	C1	CL22	L1	F1	F3	FF11	FF2		
15	F1	F1	F1	F1	F3	C1	CL21	C1	C2	C3	C1	C1	C1	C1	H1		C1	C1	C1	F6	F4	F4	F1		
16	FF21	F2	F2	F1	F1	C1	C1	C1	C4	C3	L2	L1	C1	L1	L2	L1	L2	L1	L4	F3	F1	F1	F1		
17	F1	F1			C1	L2	L2	H1	L1	L1	L1					C1		CL21	CL51	F1	F1	F1	F2		
18	F1	F1	F2		F3	C2	L1	L1	L1	L1	C1	C1		C1	C1		C1	L1	C1	C4	F4	FF21	FF32	FF31	
19	FF21	FF15	F6	F2	F4	L5	L4	L2	C1			C1	C1	C1		C1	H1	HL11	CL11	C5	F7	F3	F3	F3	
20	F4	F2	F1	F1		C1	C2	C2	C1	L2	L1	C1	L1	L1			C1	L1	CL11	CL21	FF12	FF23	FF22	FQ21	
21	F4	F3	F2	F1	F1	L2	L2	CL11	CL11	C1	C1	C1		C1	C2	C1	C2	CL21	L7	F5	F3	F3	F3		
22	F3	F3	F1	F1		FF11	HC21	C2	C1	C3	L2	L2	L1	L2	LH11	L1	L2	CL11	L1	L2	F3	F3	F3		
23		F2	F2	F1				C3	C5	C2	C1		C1	L2	L2	L2	CL21	CL11	CL41	L8	F3	F3	F2	F1	
24	F1	F2	FF11			C1	C1	C1	L2	L2	L2	L1	L1	L1	L21	L1	L1	CL21	CL51	L7	F3	F4	F2	F4	
25	F2	F1	F2	F2		L1	L1	C1	C1	C1	C1	C1	CL12					HCH11	L1	F5	F7	F5	FF21		
26	F2	FF21	FF21	F2	F2	F1	L1	L1	C1				L1	H1	C4	CL31	L1	CL11	CL12	CL31	F3	F3	F4	F5	
27	F2	F2	F2	F1	F2	F6	C1	C1	C2	C1	C1	C2				L3			L1			FF21	FF1		
28	F3	F3	F1	F1	F1	F1			C1	L2	L1	L1				C1	C1	C1	L1	L1	F4	F2	F1	FF21	
29	F3	F1	F2	F2	F3	F1		HL11	CL11	C1	C1	C2	C1	C1	C1	CL11	C1	C1	L2	F1		F1	F1		
30	F1	F3	F1	F1	F1	F1	L1	L1	L1		L2	L1	L1	L1	L1	L1	L1	L3	L2	F1	F2	F2	F3		
31	F1	F2	F3	F1	F2		L2	HL11	C1	C1	C2	C1		C1	C1	C1	C1	CL21	C2	CL11	F1	F3	F3	F3	
	00	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 _o F ₂ , f _o F ₁ , f _o E
×	f _x F ₂
*	DOUBTFUL f _o F ₂ , f _o F ₁ , f _o E
⊗	f _b E _s
└	ESTIMATED f _o F ₁
†,‡	f _{min}
^	GREATER THAN
∨	LESS THAN

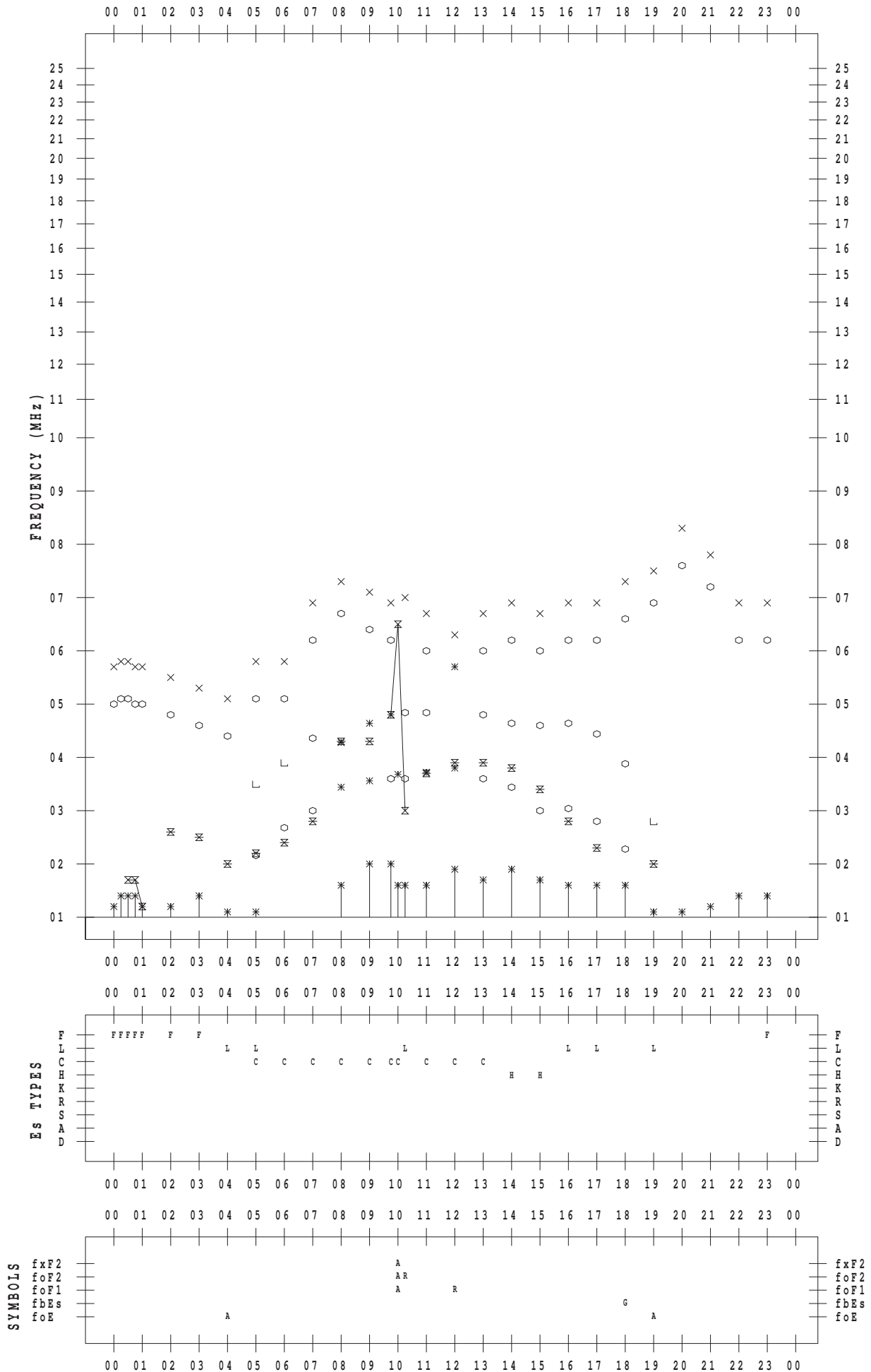
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/ 1

135 ° E MEAN TIME



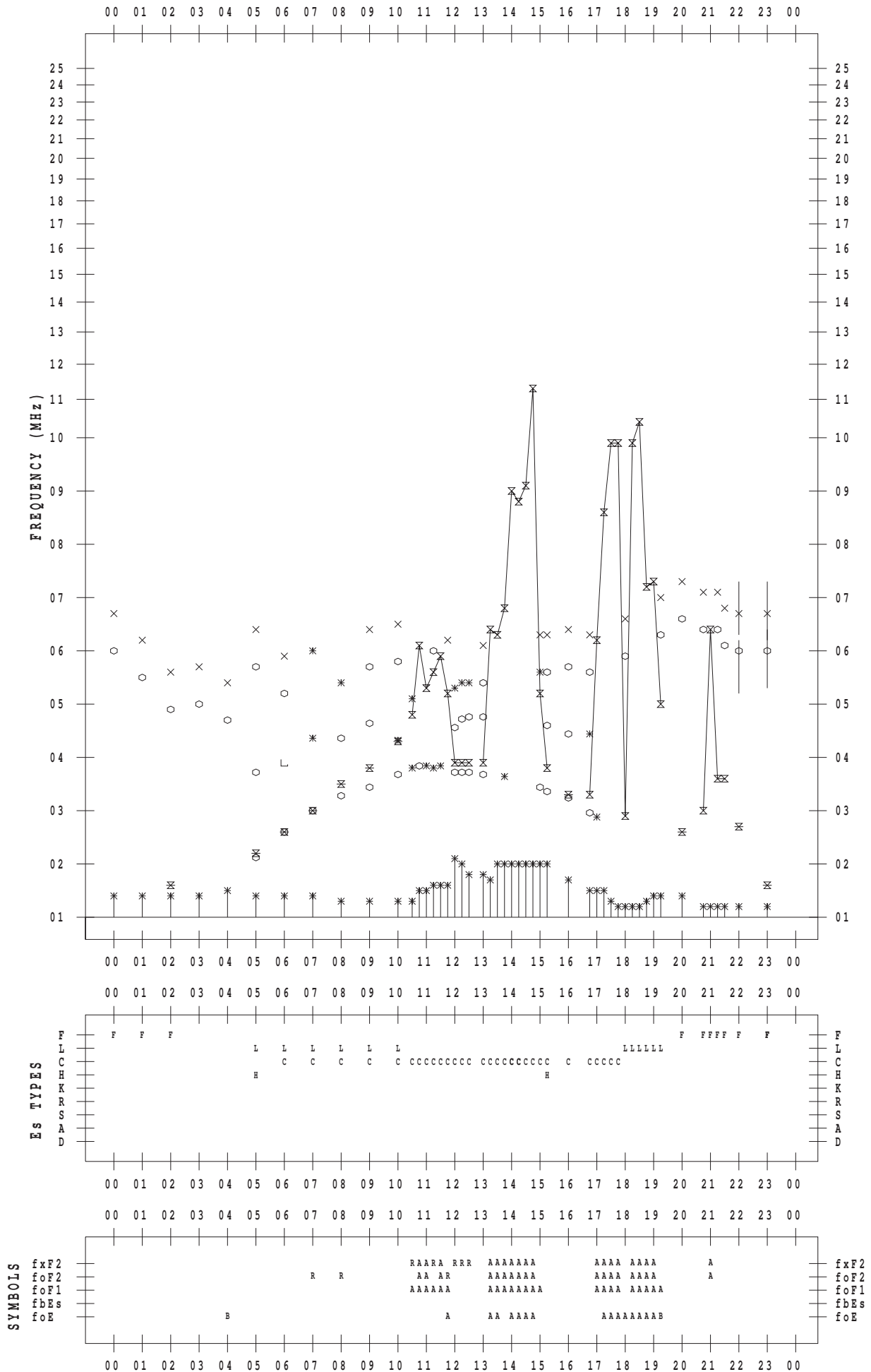
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/ 2

135 ° E MEAN TIME



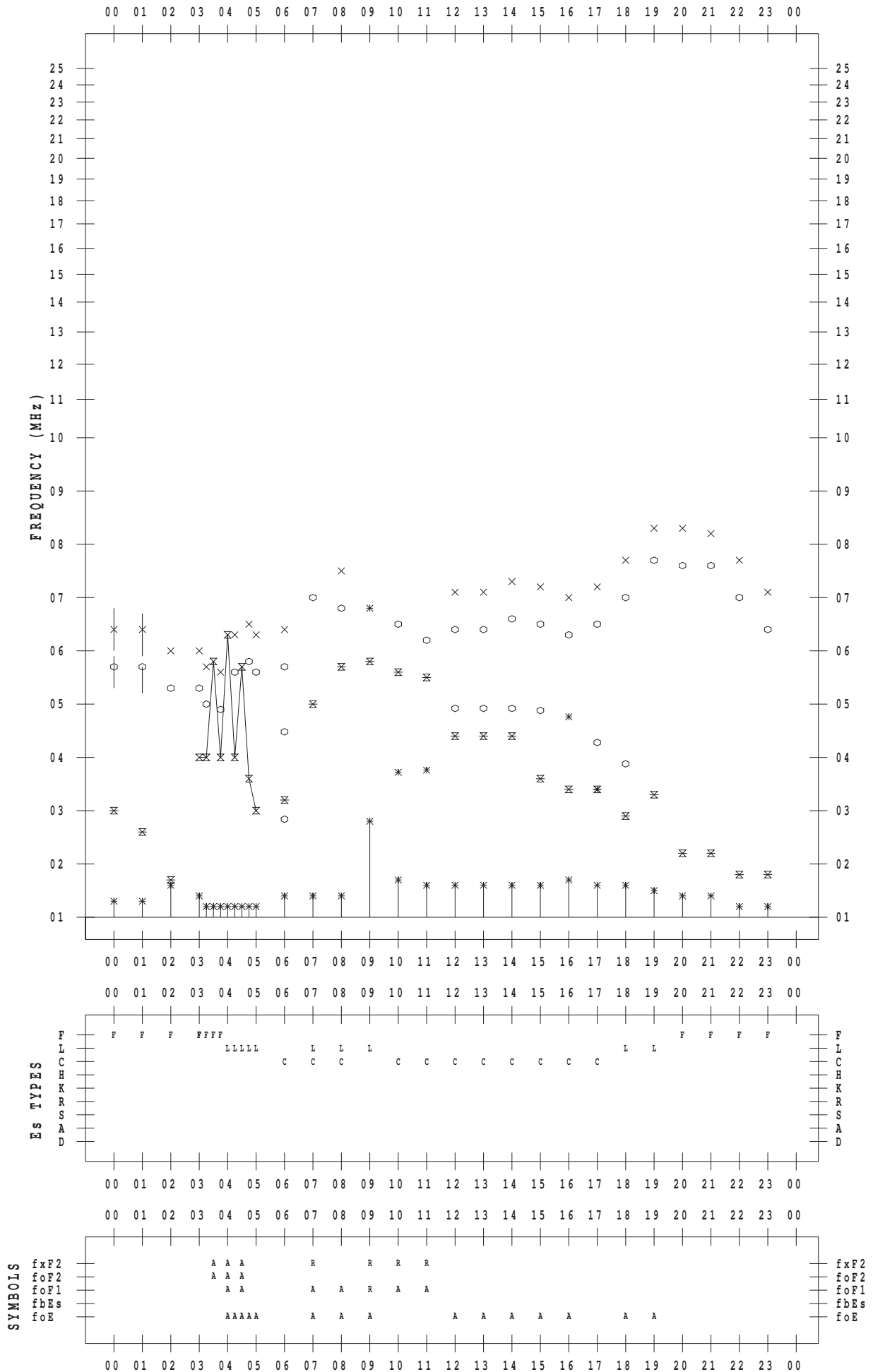
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 7 / 3

135 ° E MEAN TIME



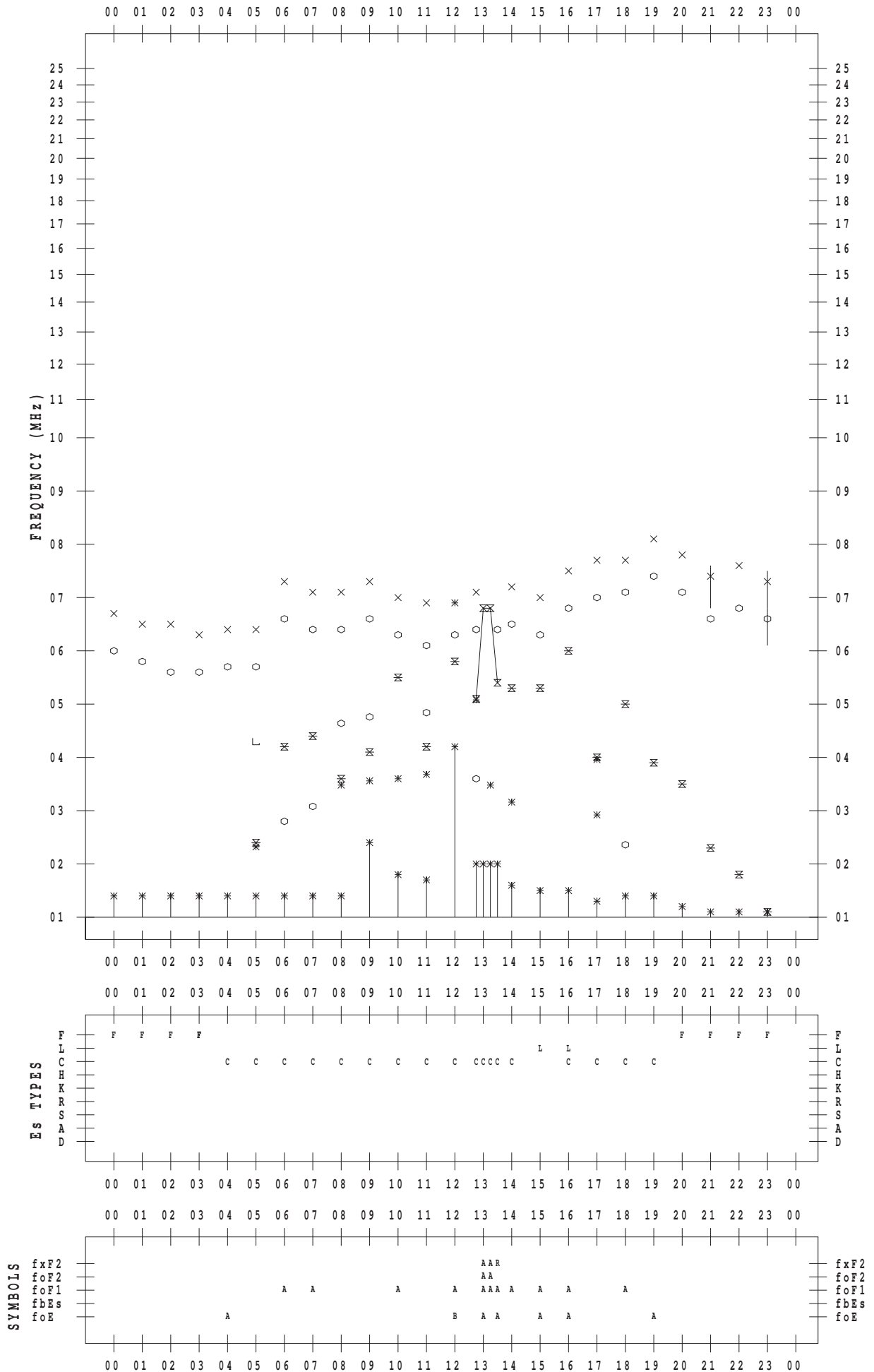
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 7 / 4

135 ° E MEAN TIME



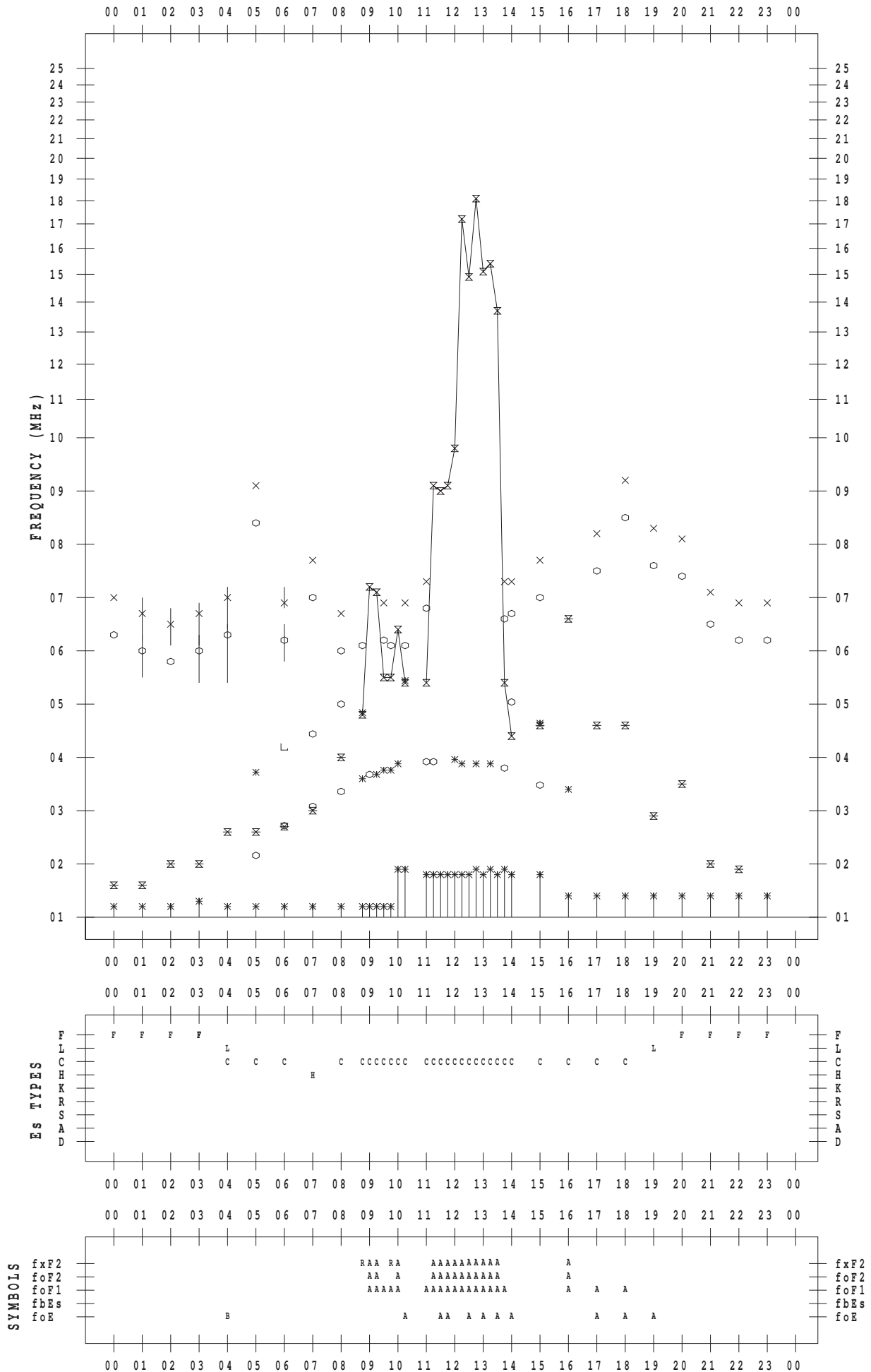
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/ 5

135 ° E MEAN TIME



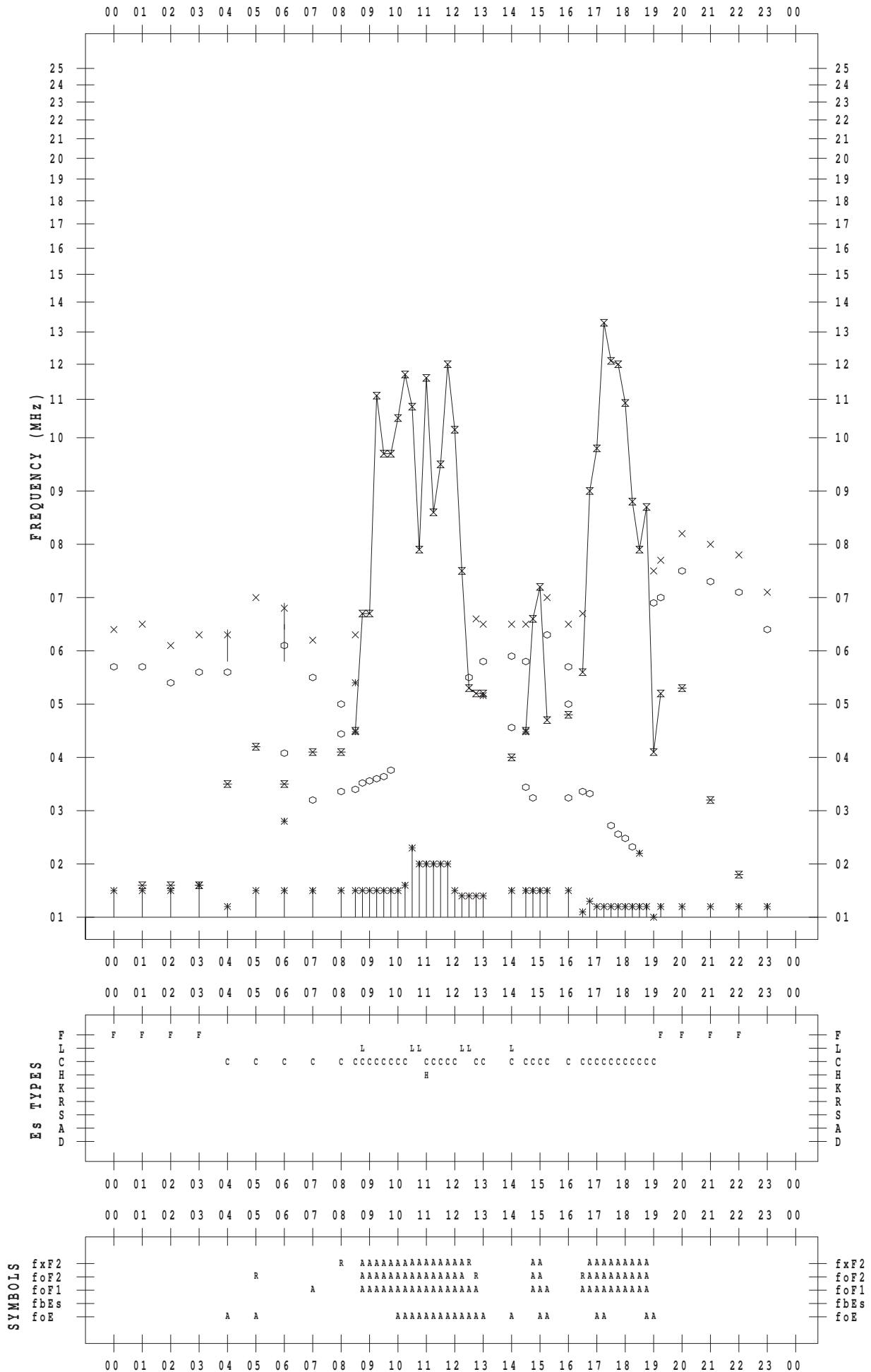
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/ 6

135 ° E MEAN TIME



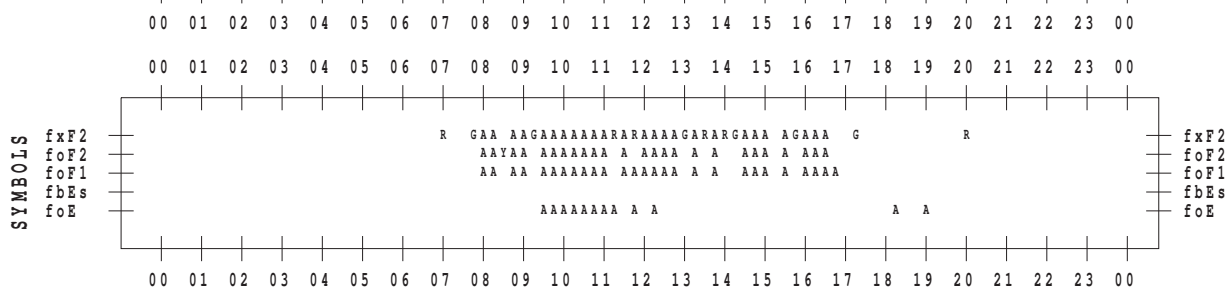
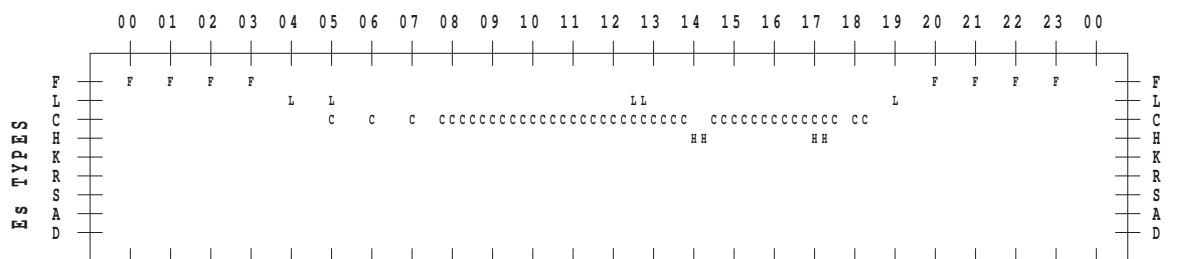
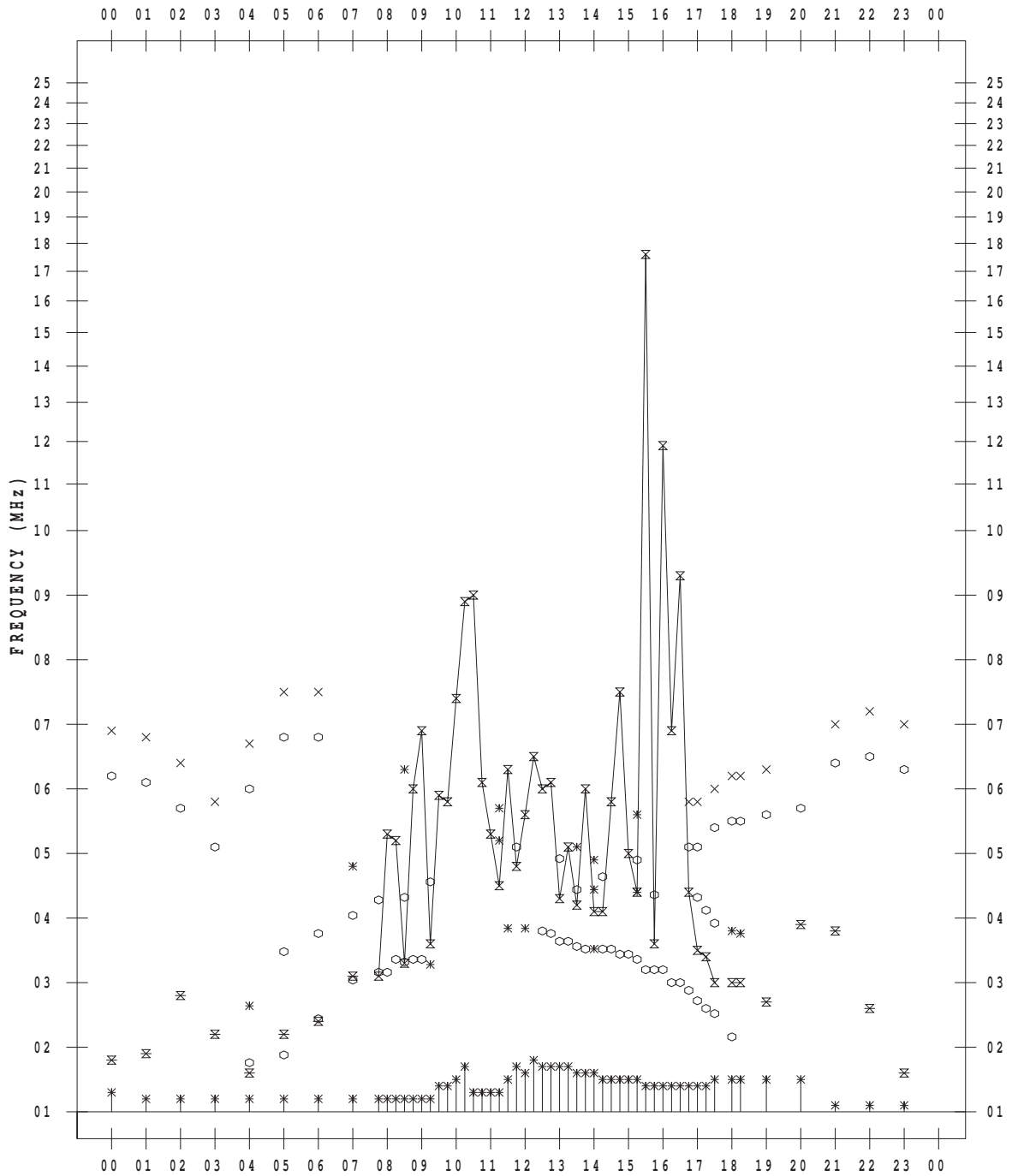
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 7 / 7

135 ° E MEAN TIME



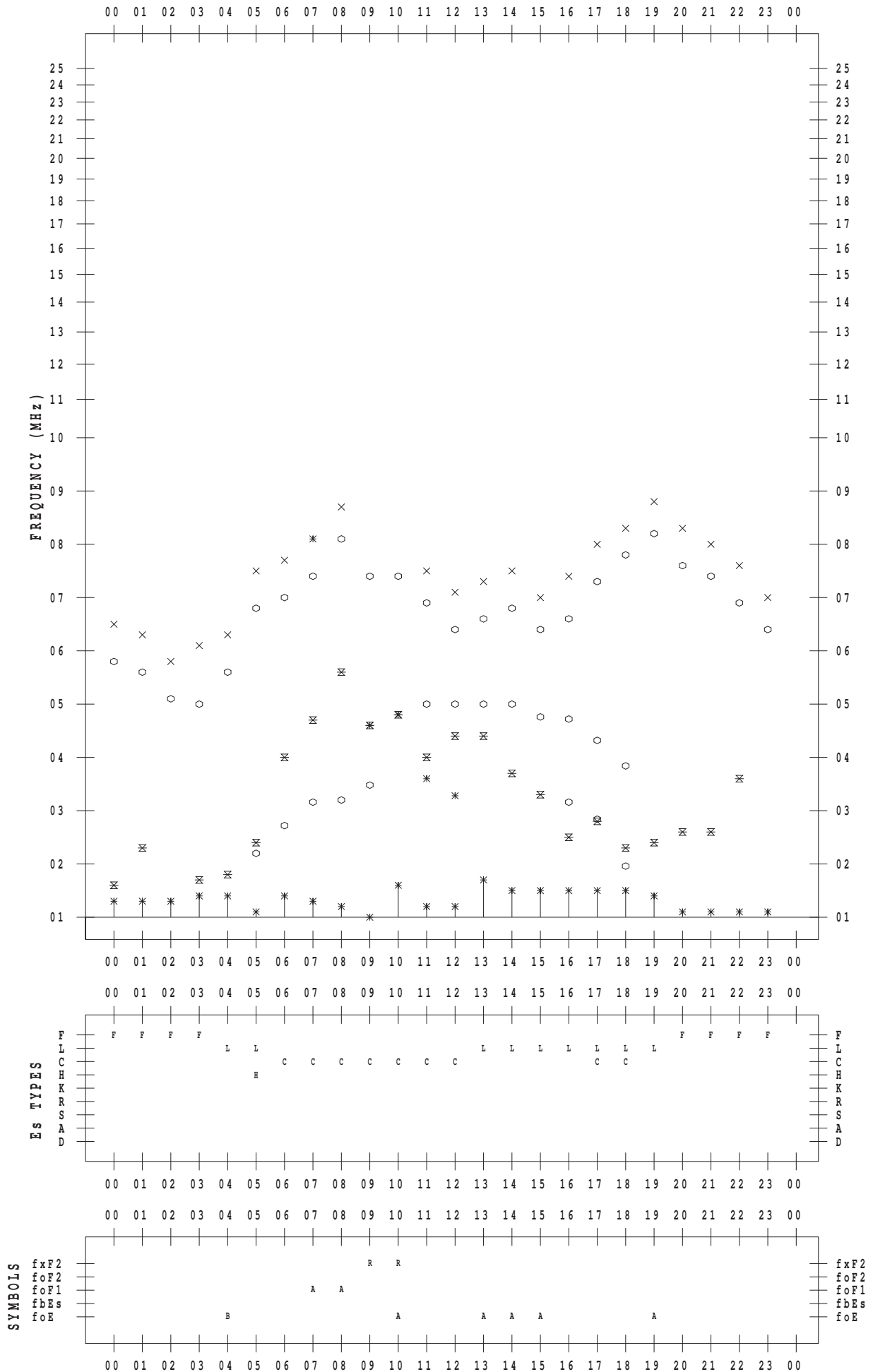
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/ 8

135 ° E MEAN TIME



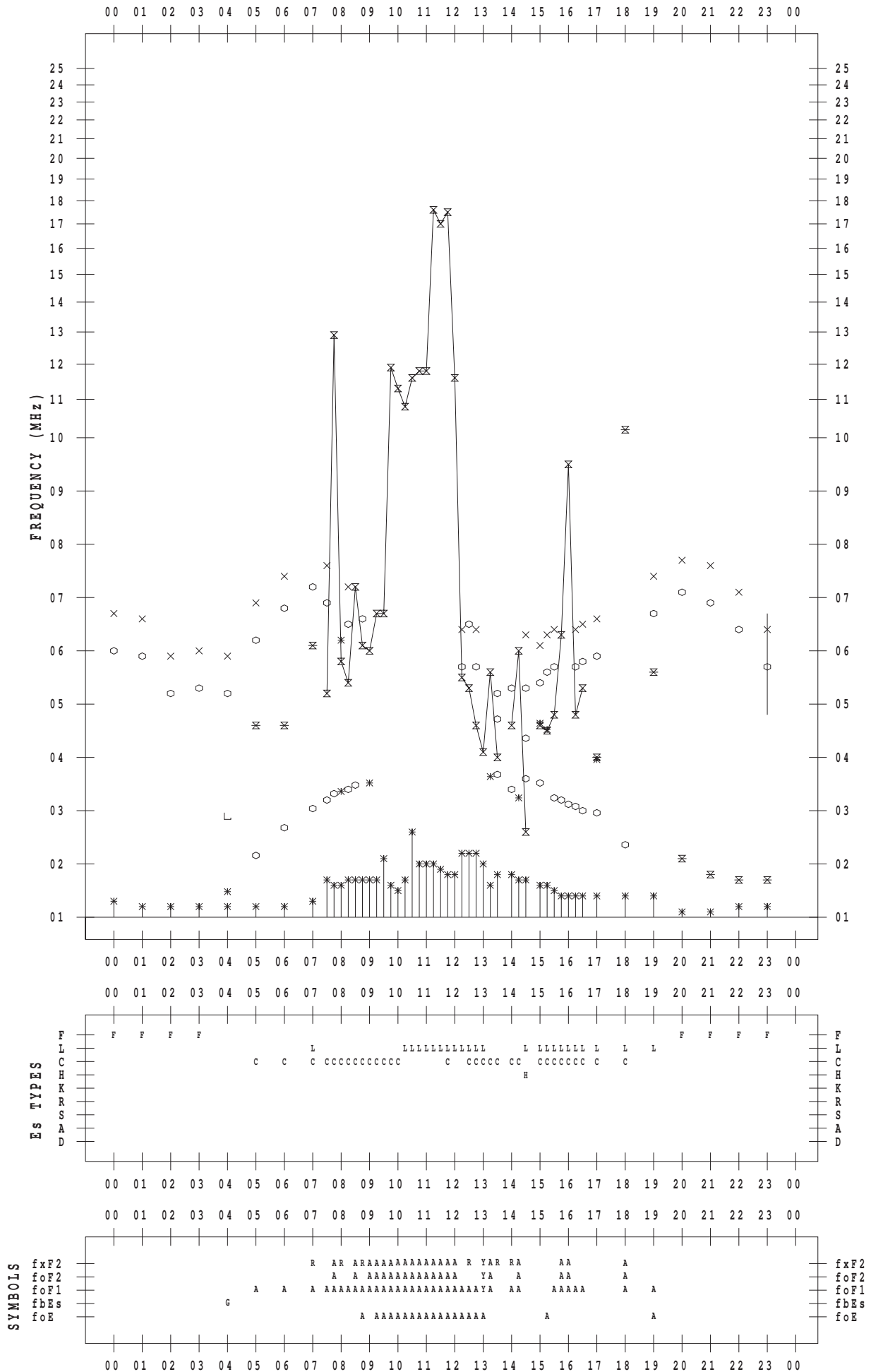
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 7 / 9

135 ° E MEAN TIME



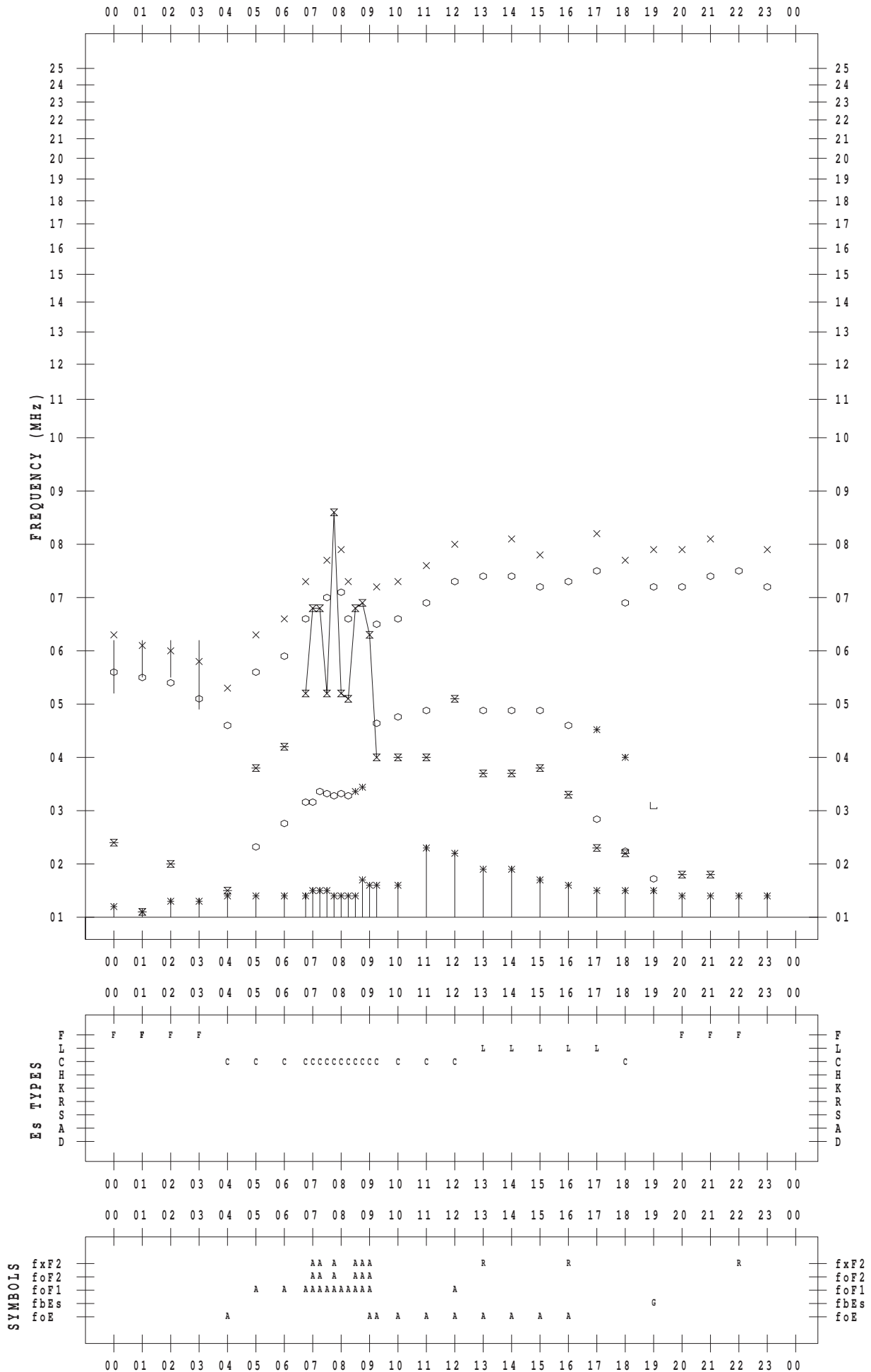
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/10

135 ° E MEAN TIME



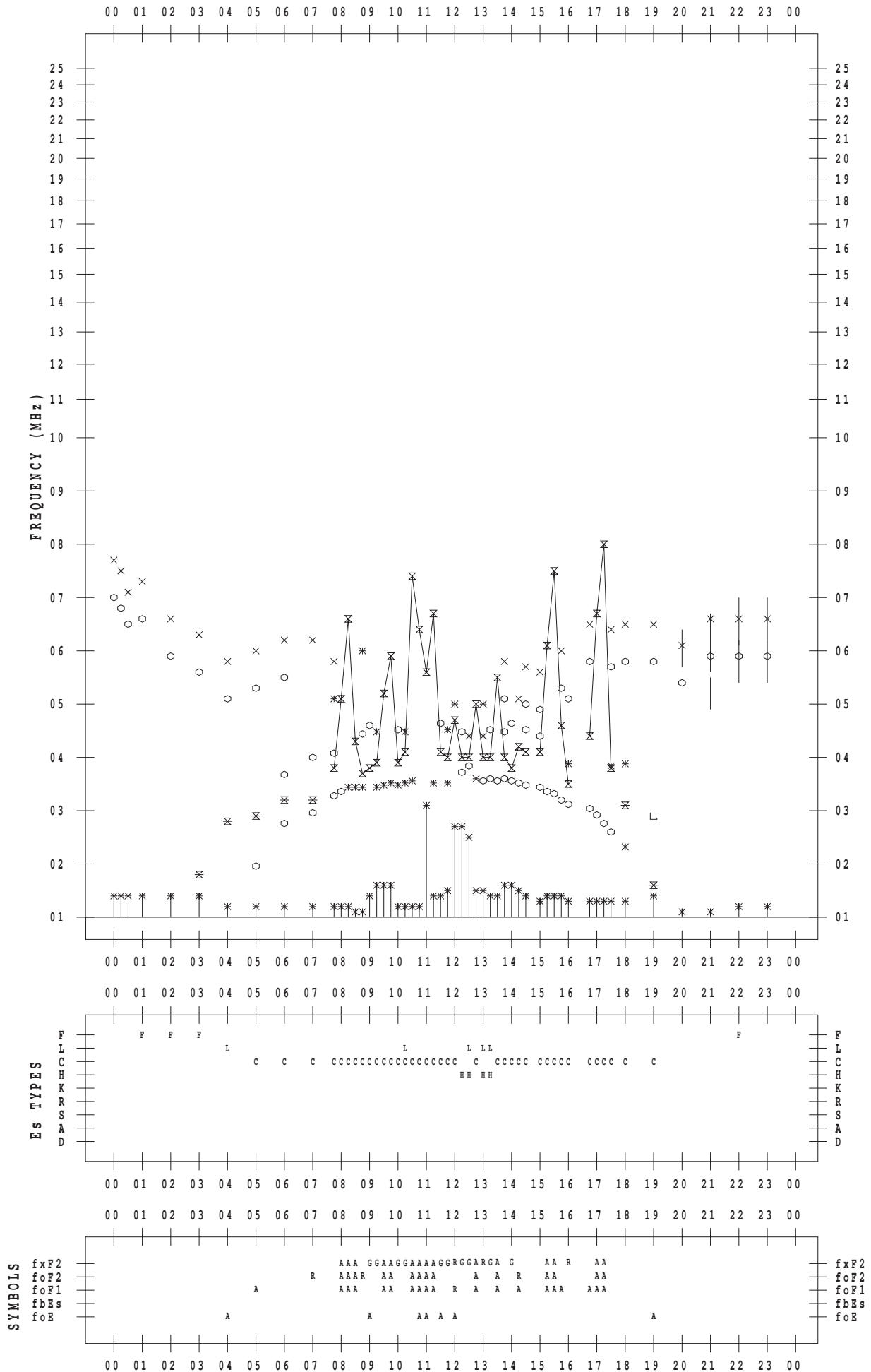
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/11

135 ° E MEAN TIME



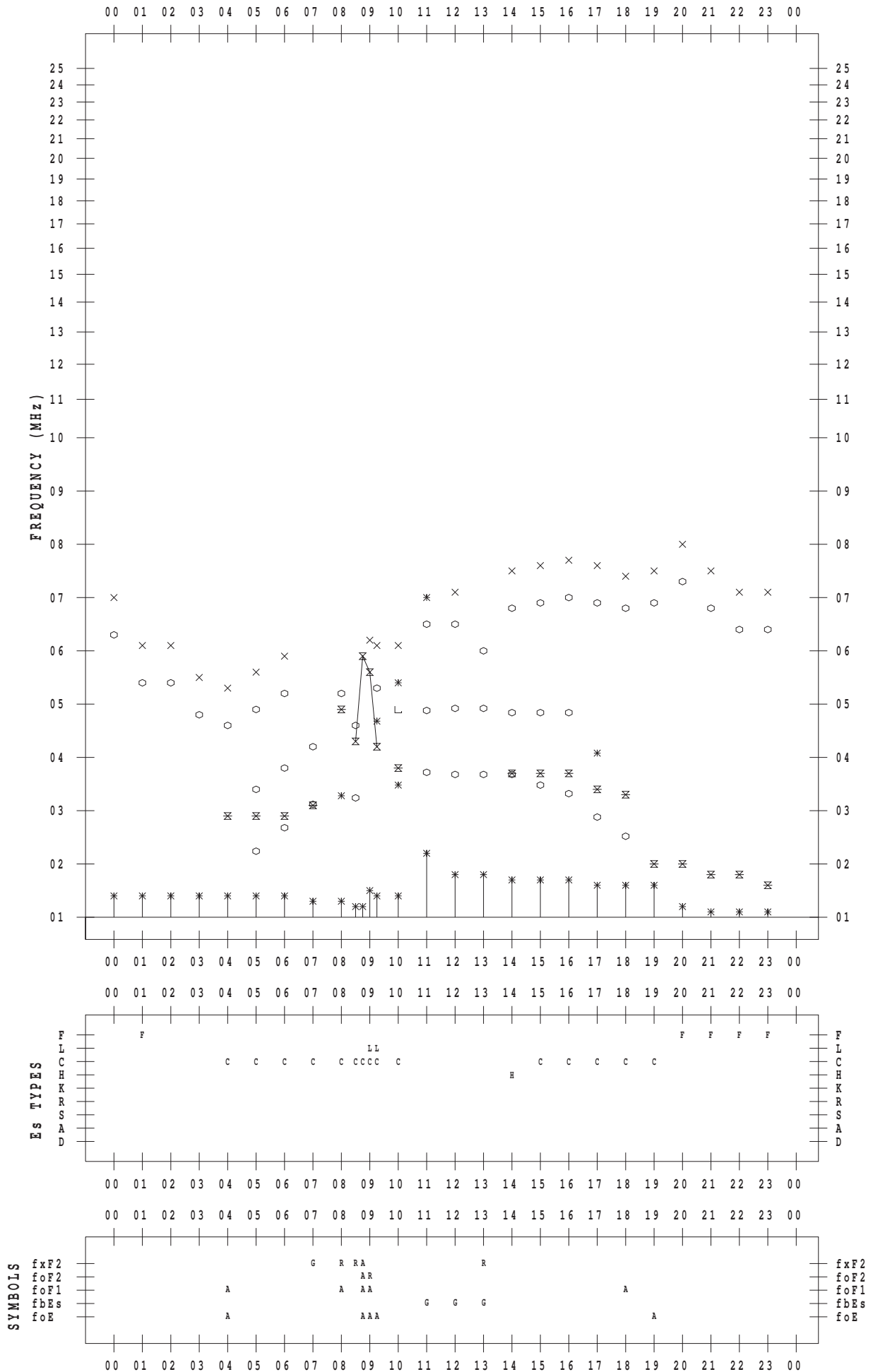
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/12

135 ° E MEAN TIME



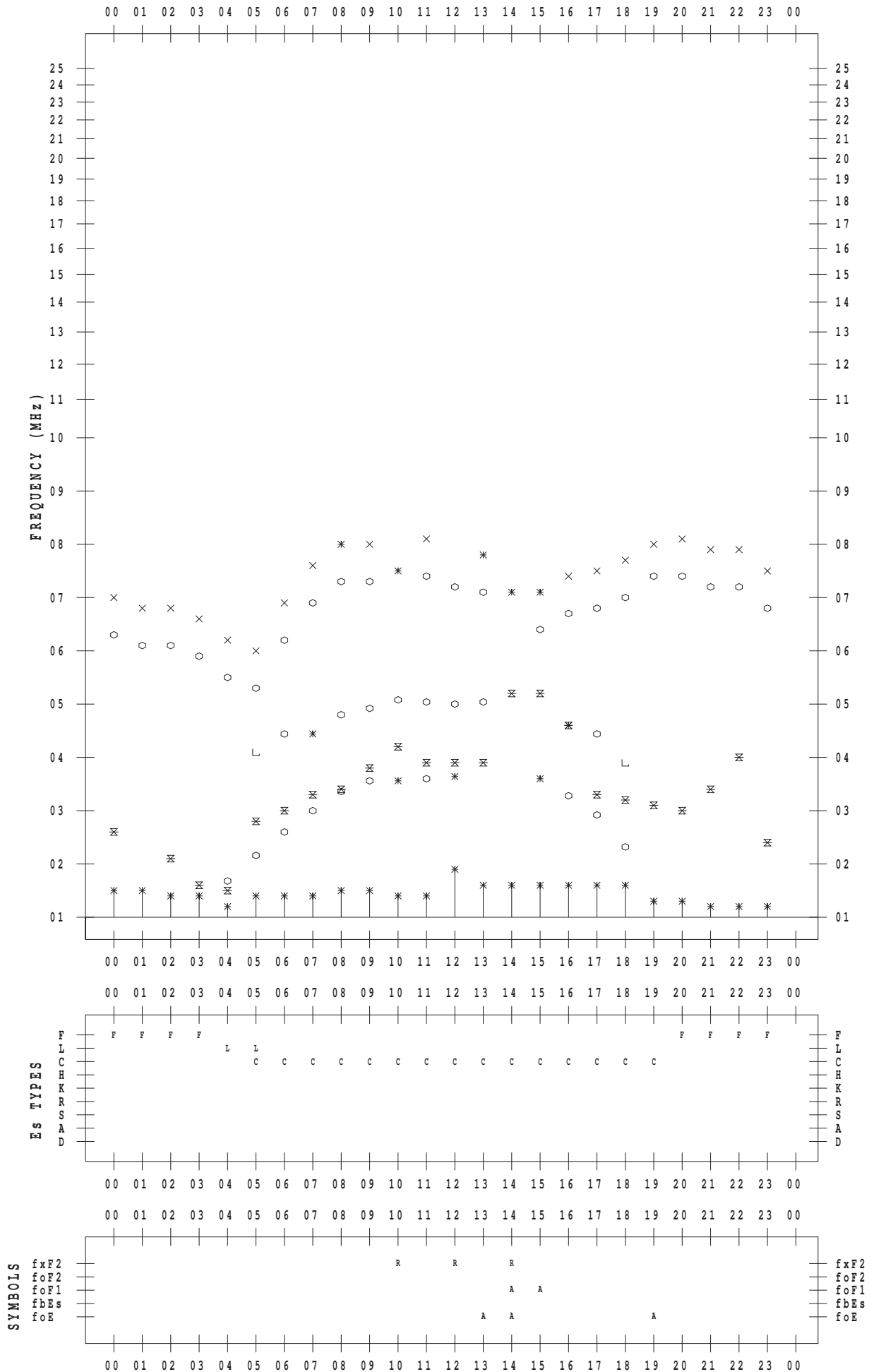
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/13

135 ° E MEAN TIME



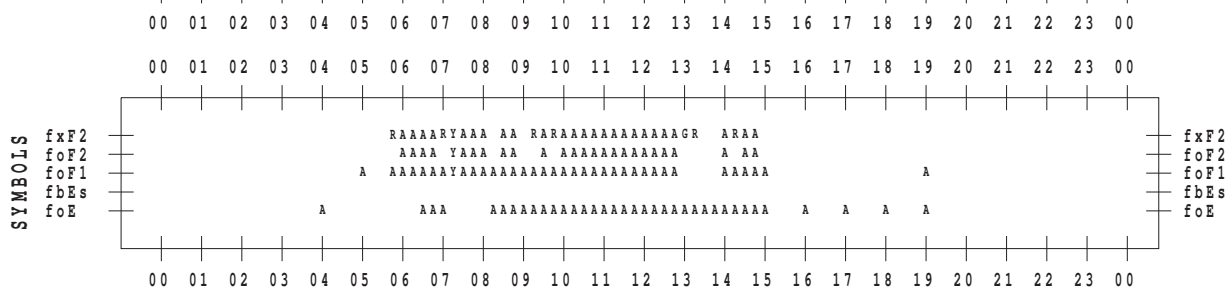
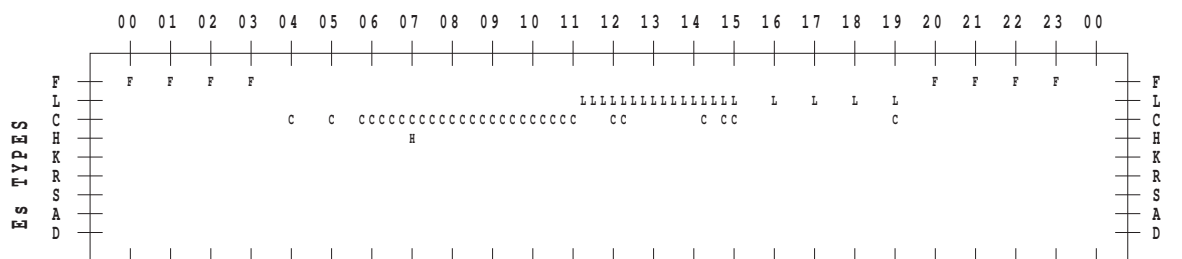
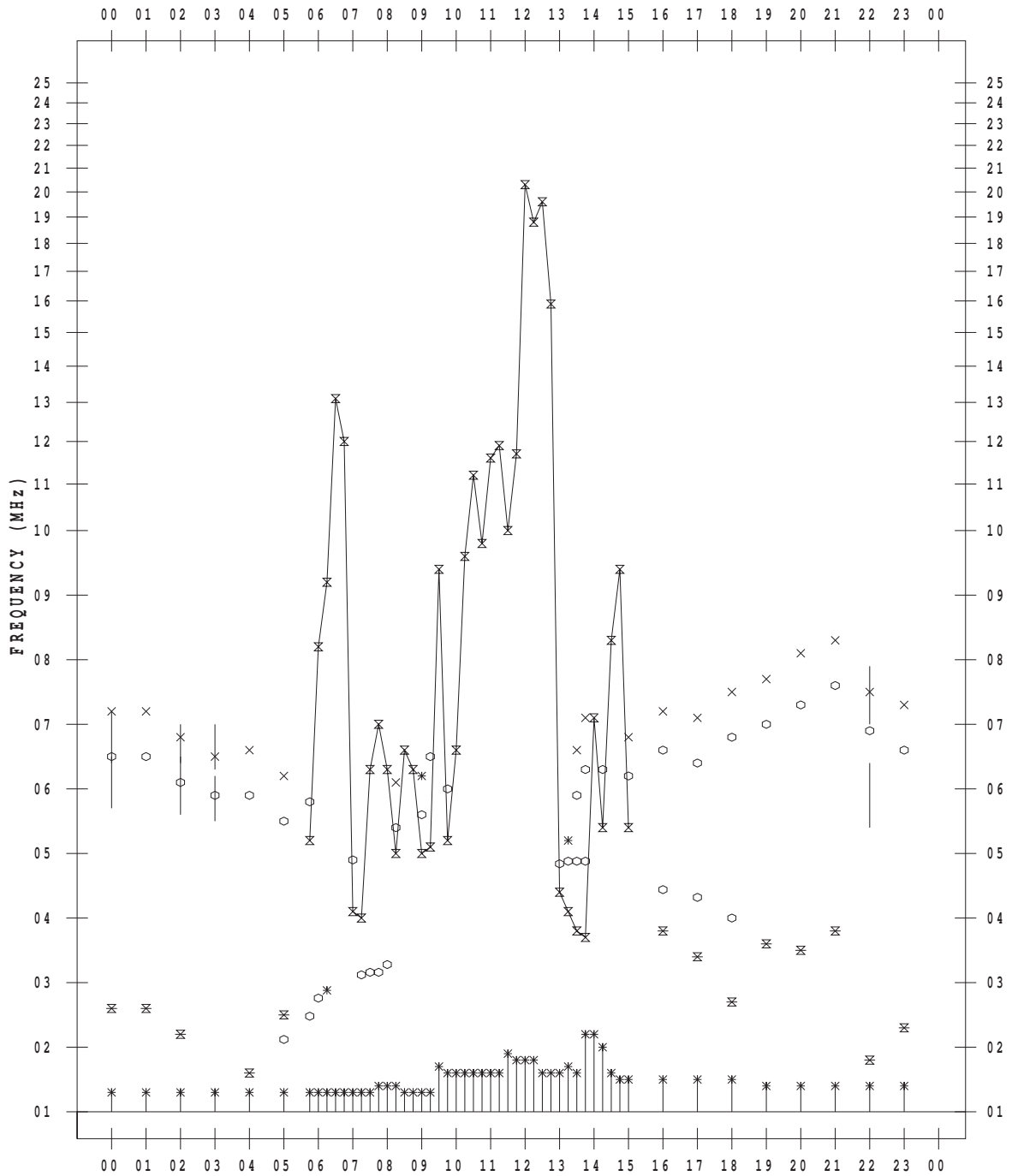
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/14

135 ° E MEAN TIME



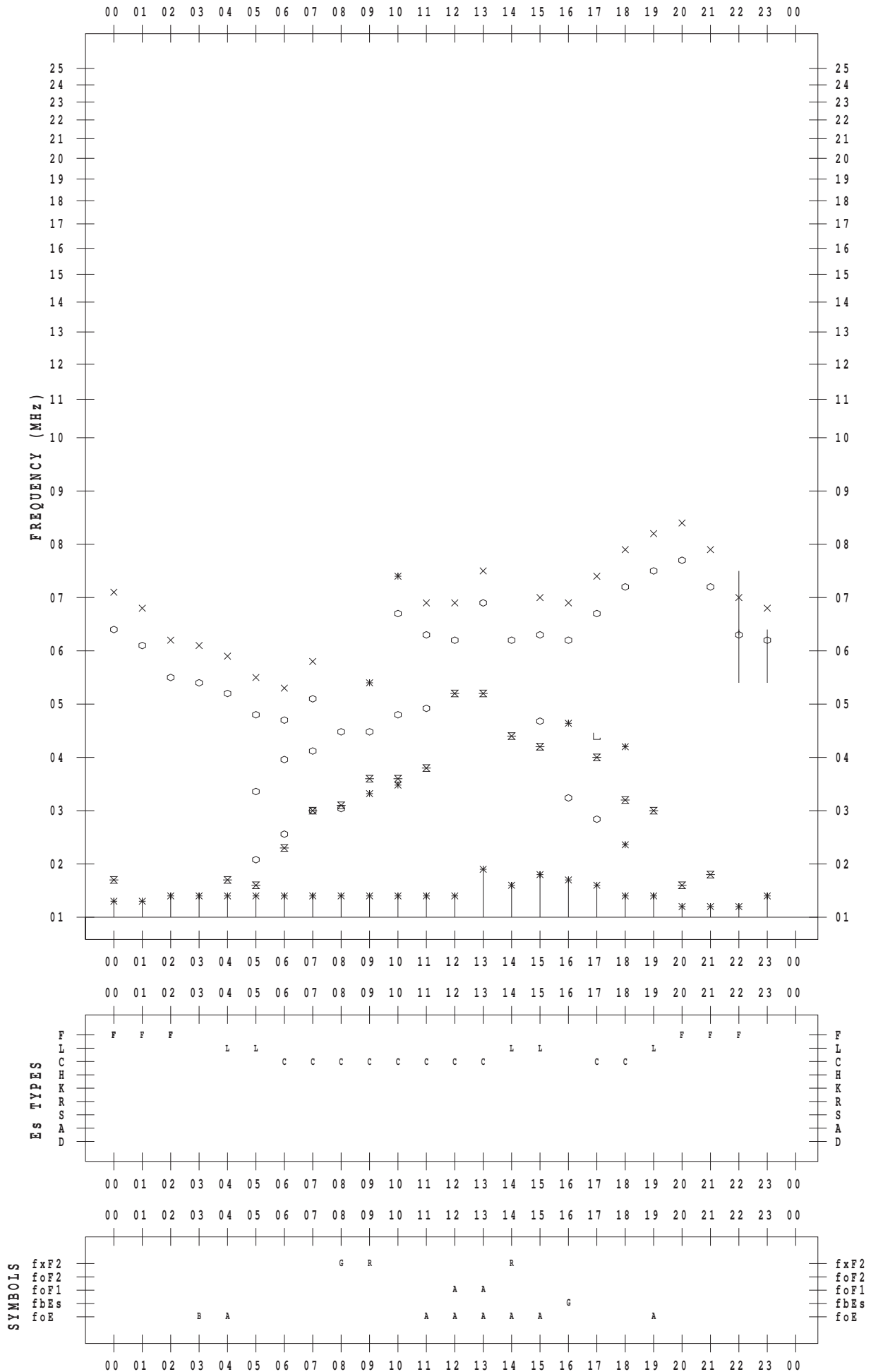
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/15

135 ° E MEAN TIME



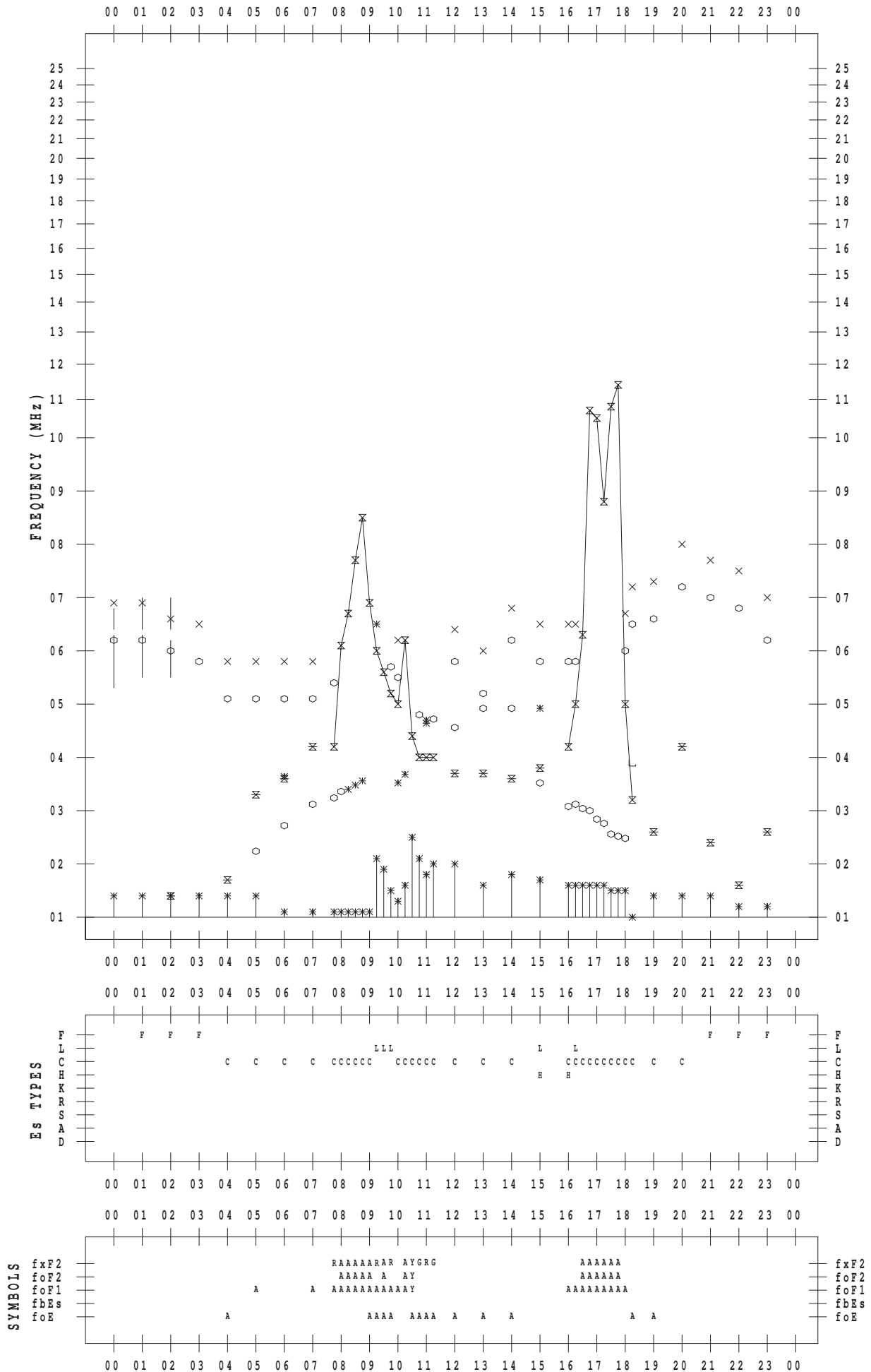
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/16

135 ° E MEAN TIME



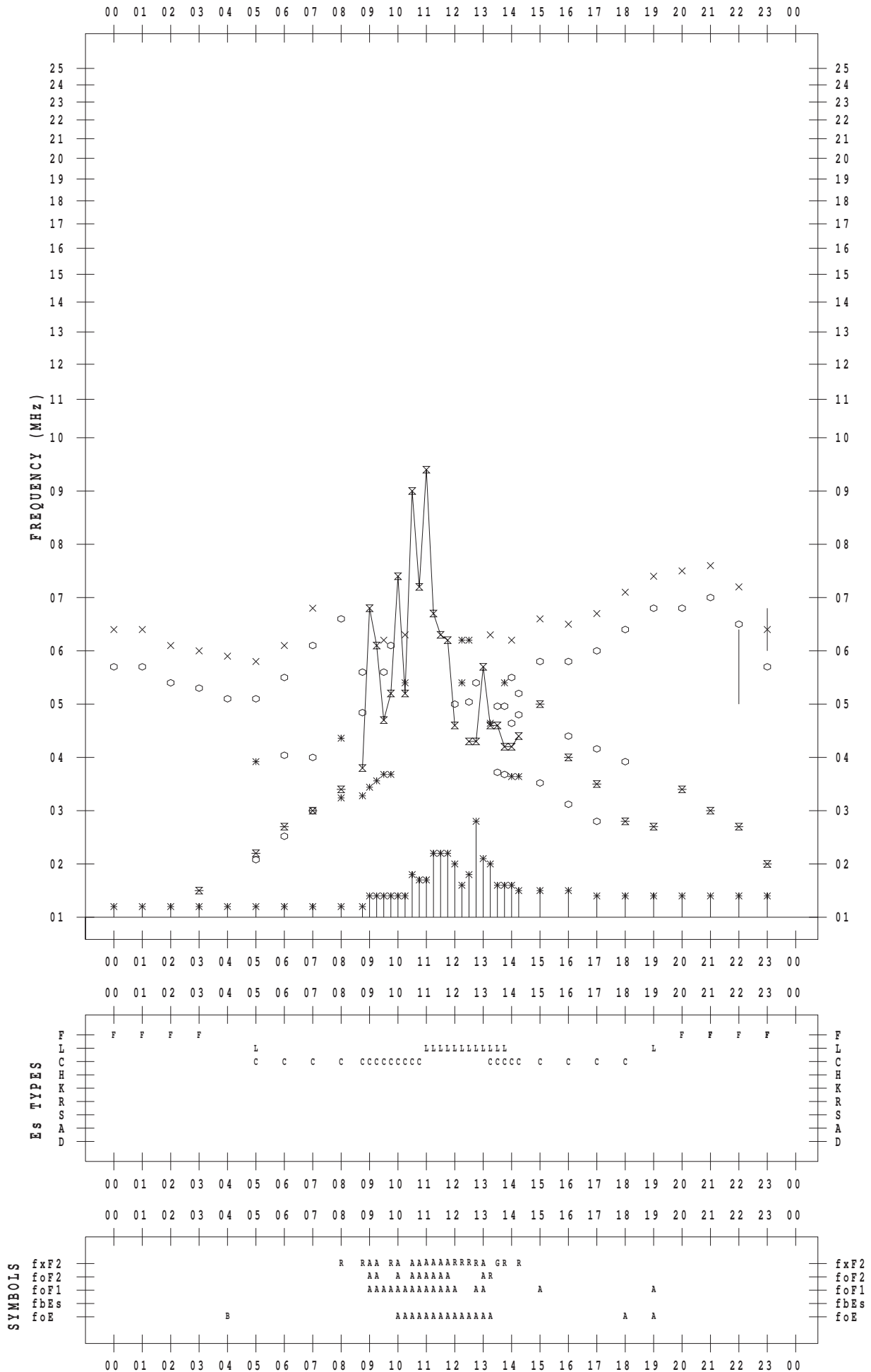
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/17

135 ° E MEAN TIME



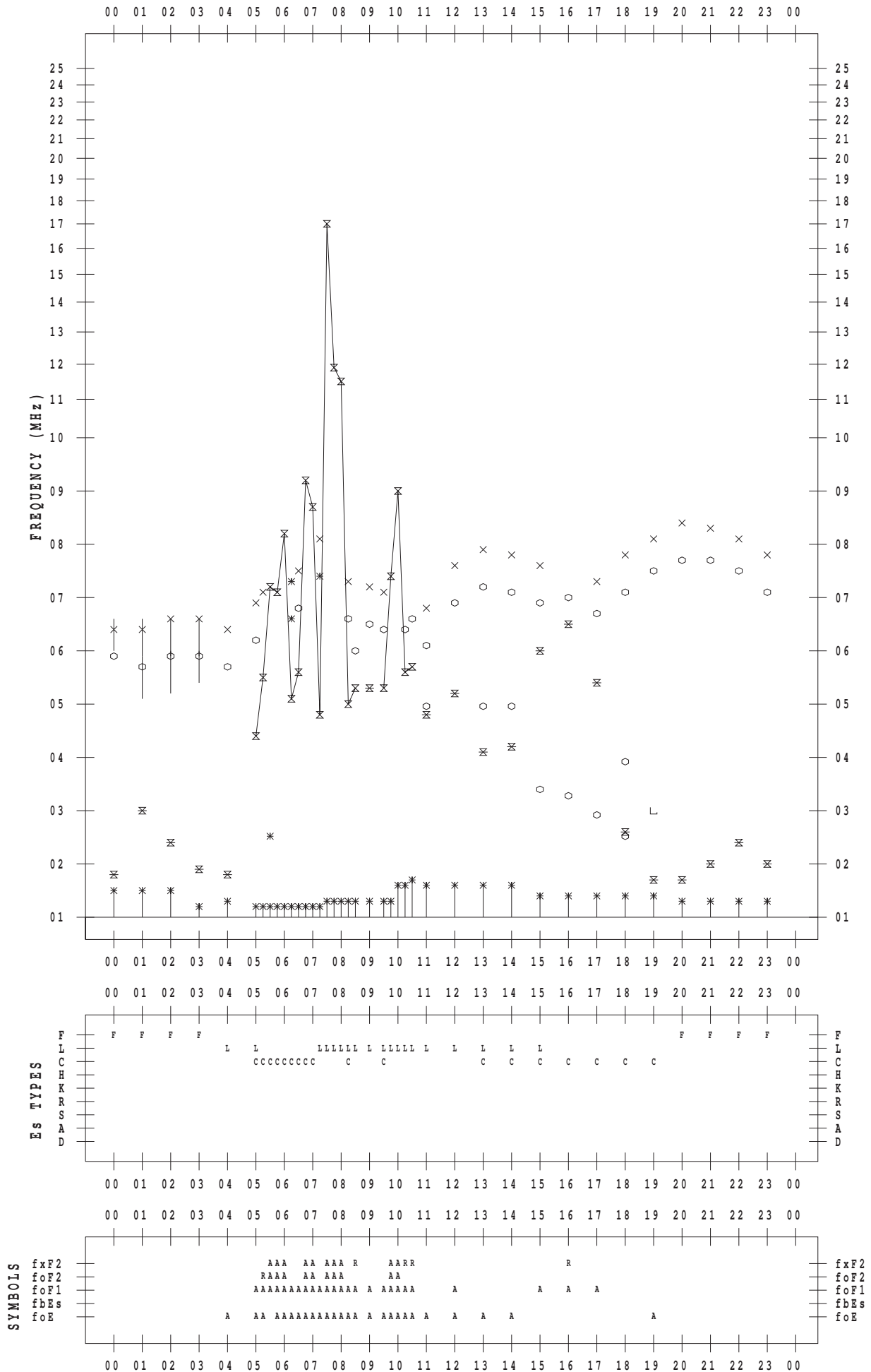
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/18

135 ° E MEAN TIME



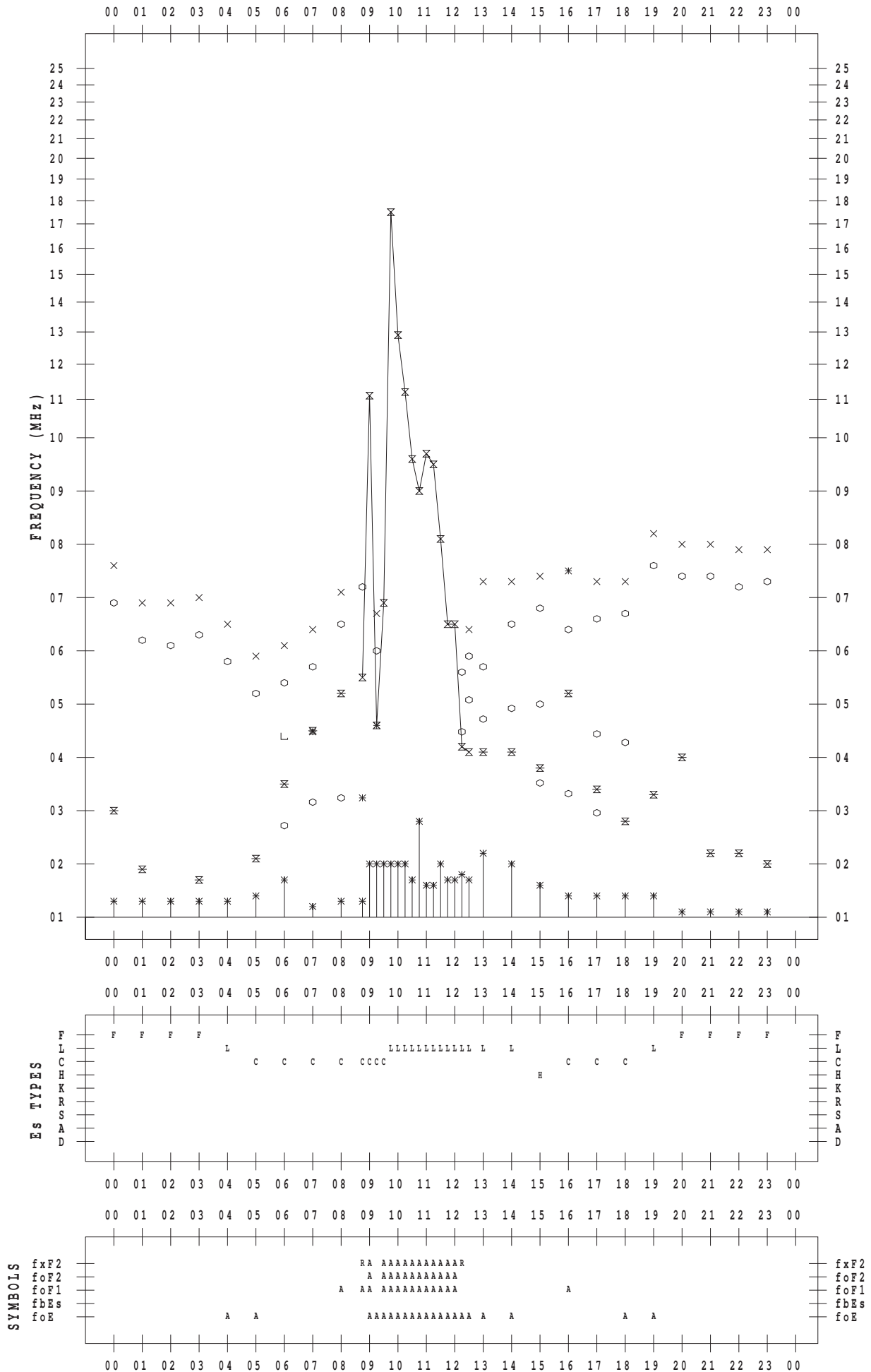
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/19

135 ° E MEAN TIME



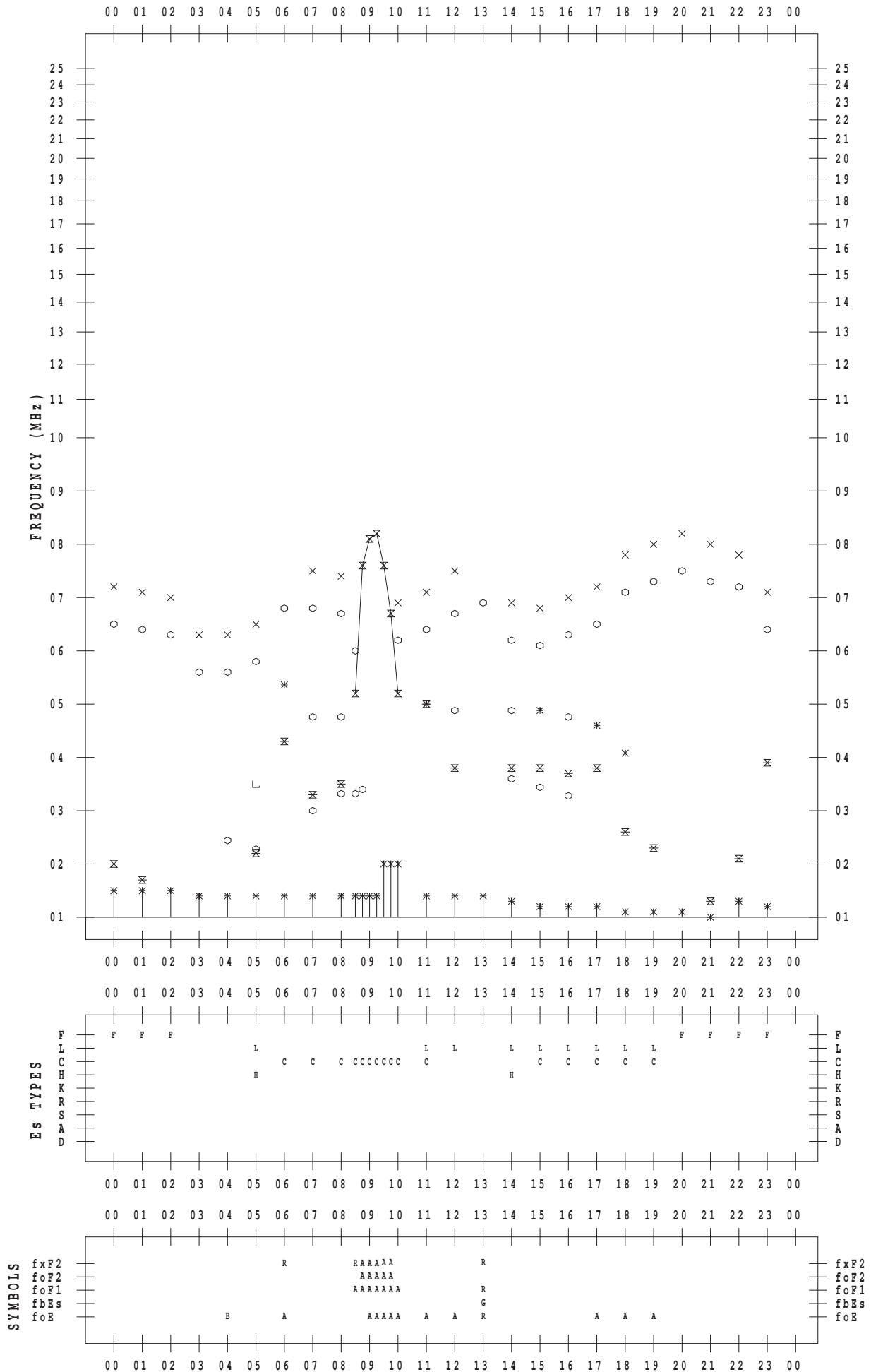
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/20

135 ° E MEAN TIME



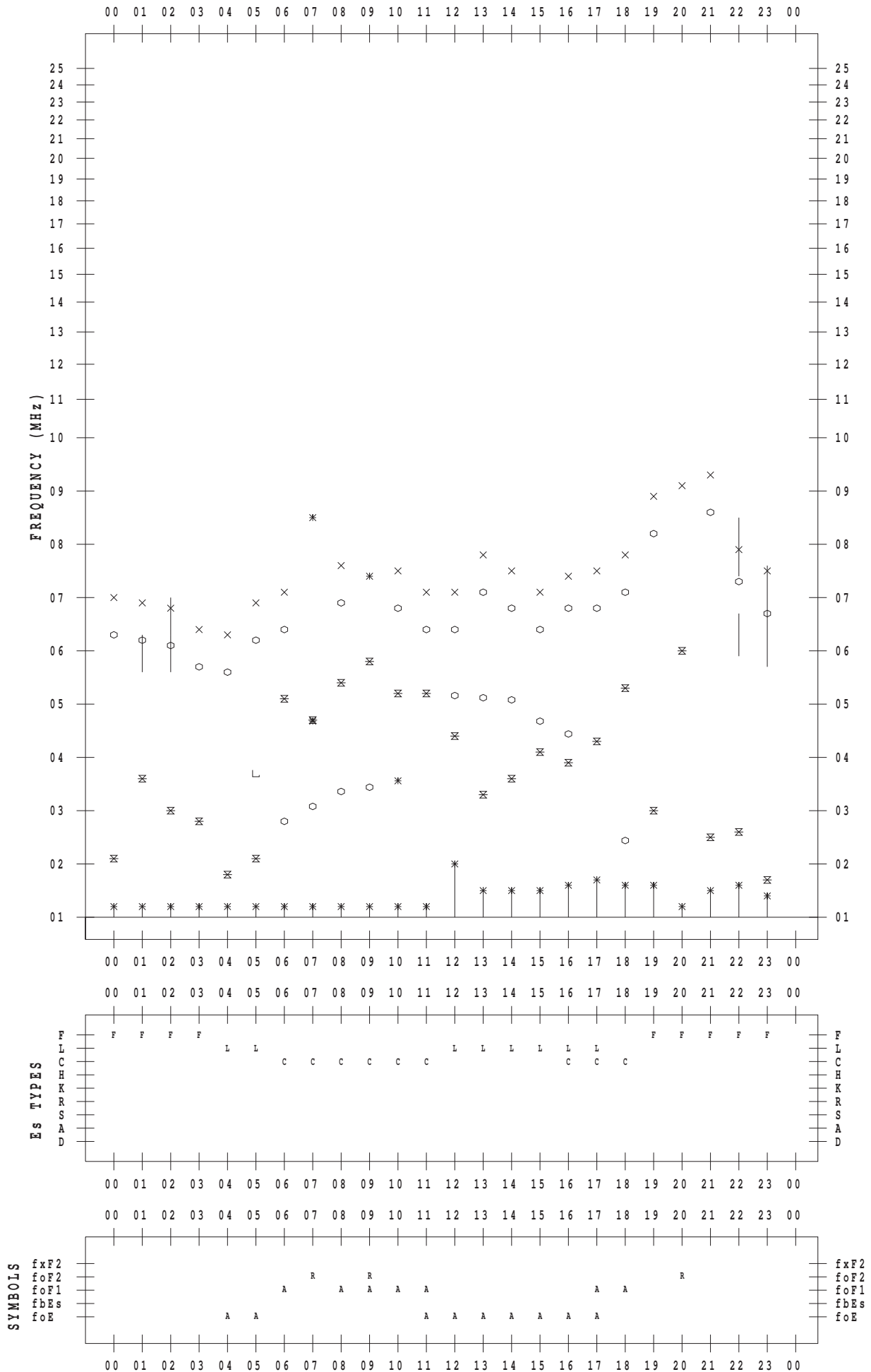
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/21

135 ° E MEAN TIME



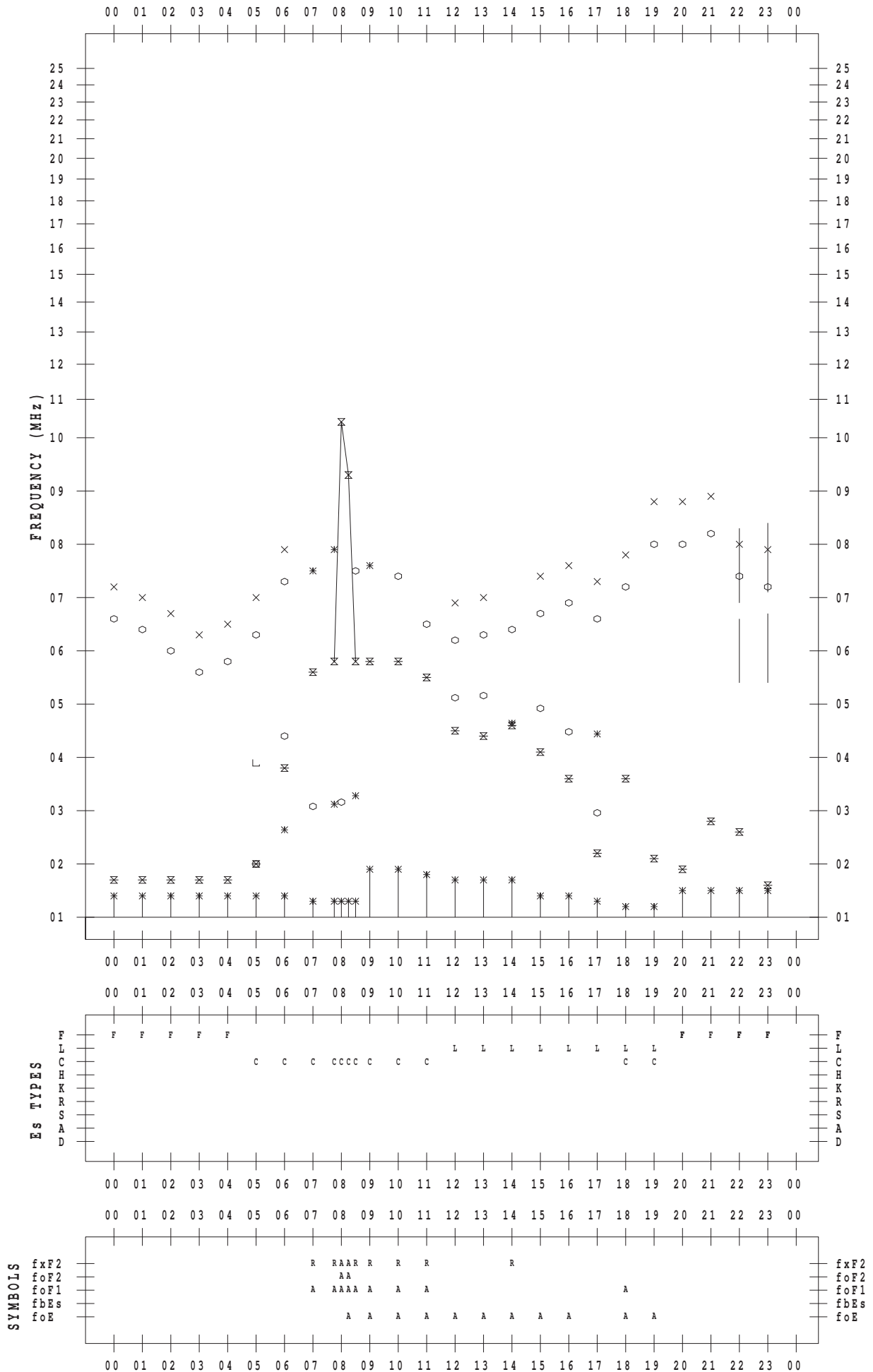
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/22

135 ° E MEAN TIME



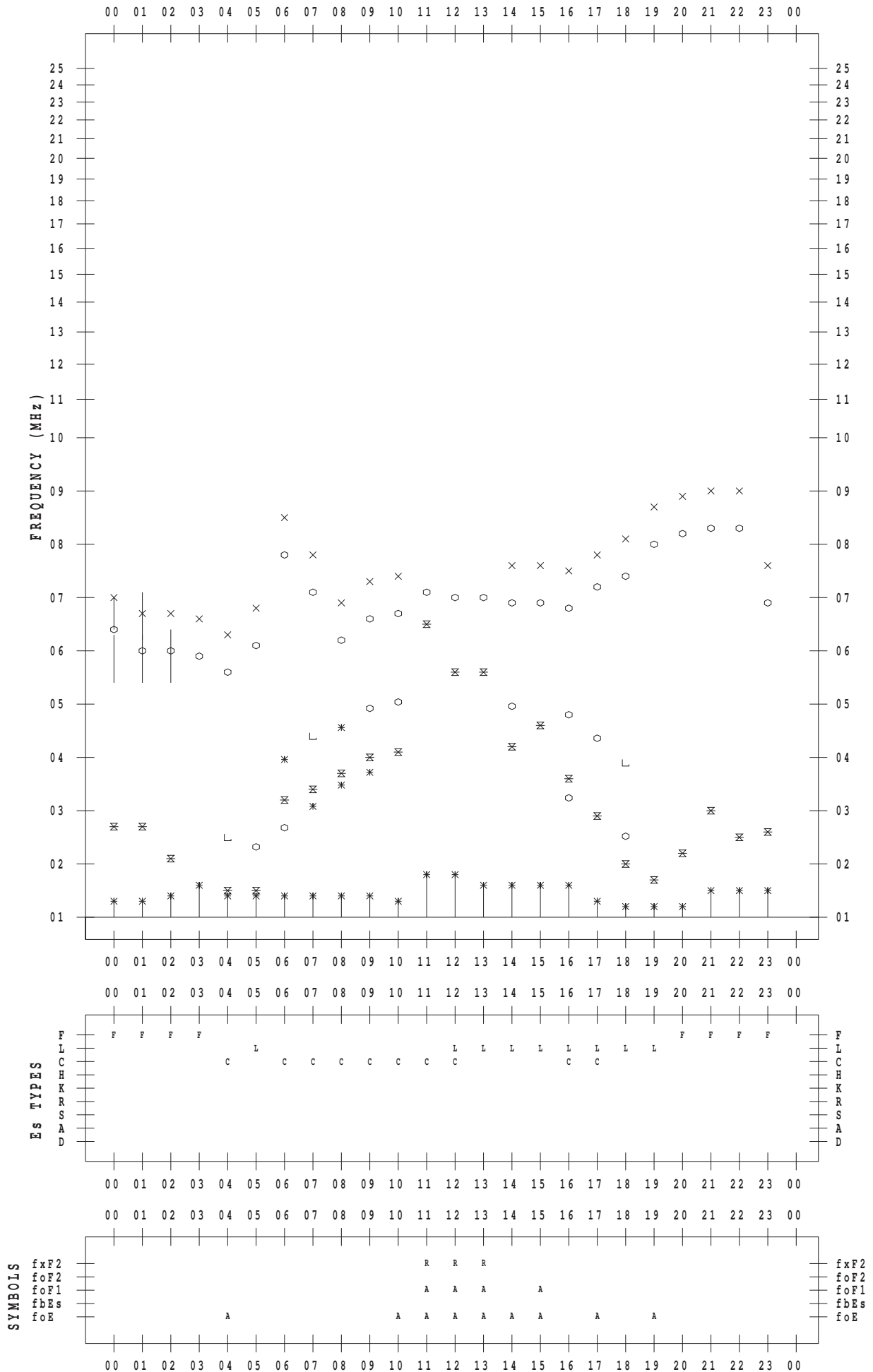
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/23

135 ° E MEAN TIME



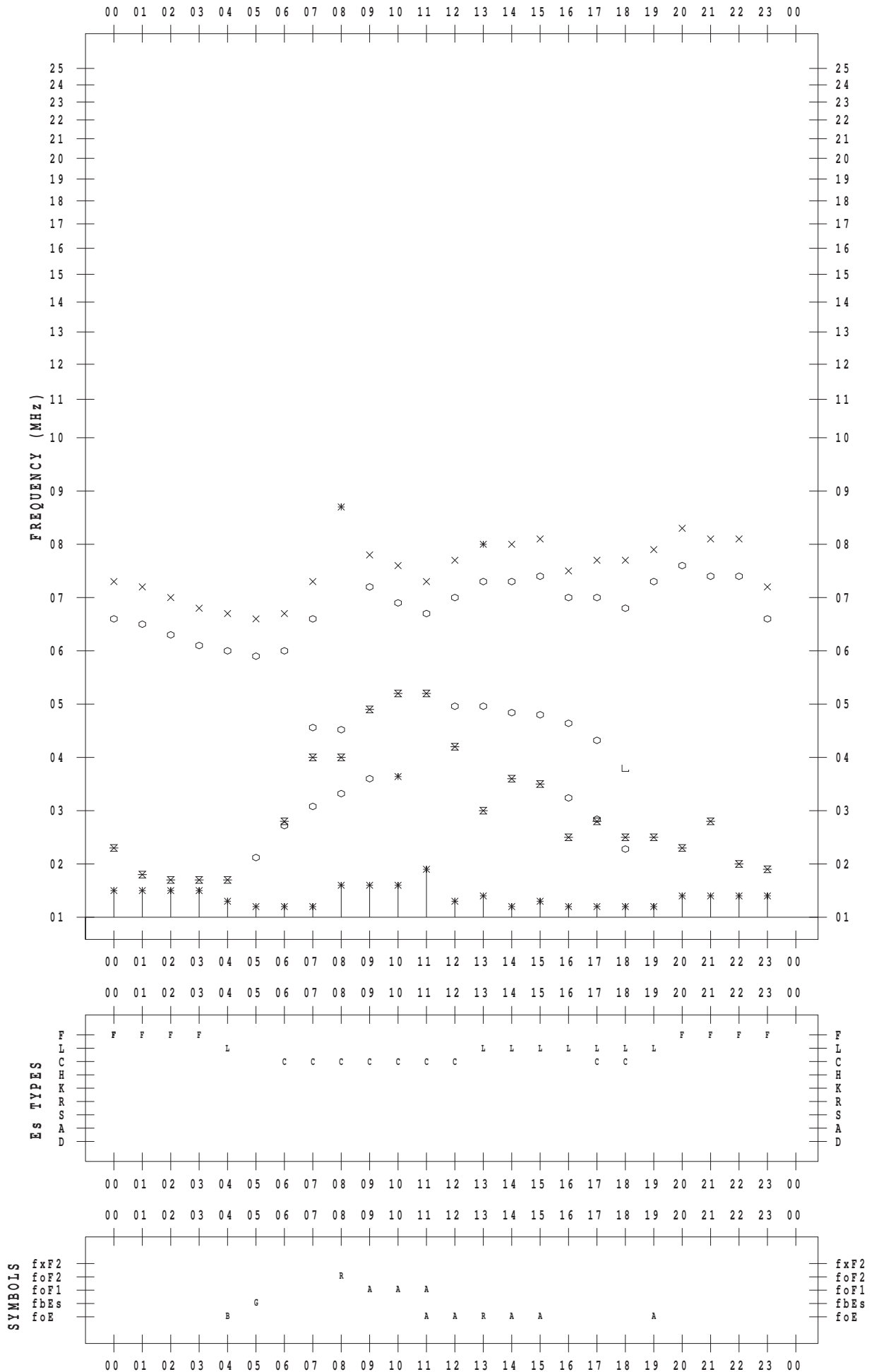
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 7 / 24

135 ° E MEAN TIME



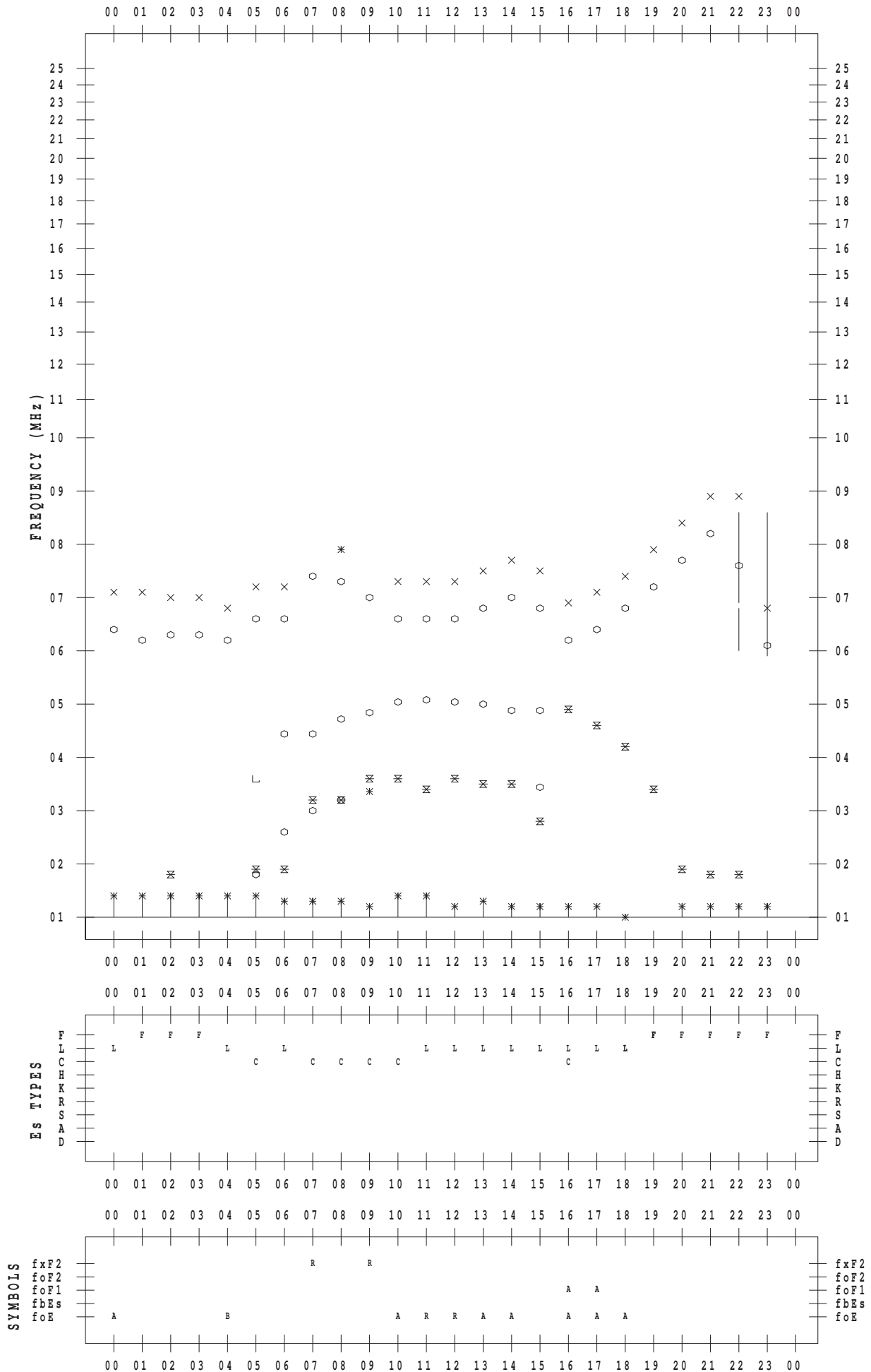
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/25

135 ° E MEAN TIME



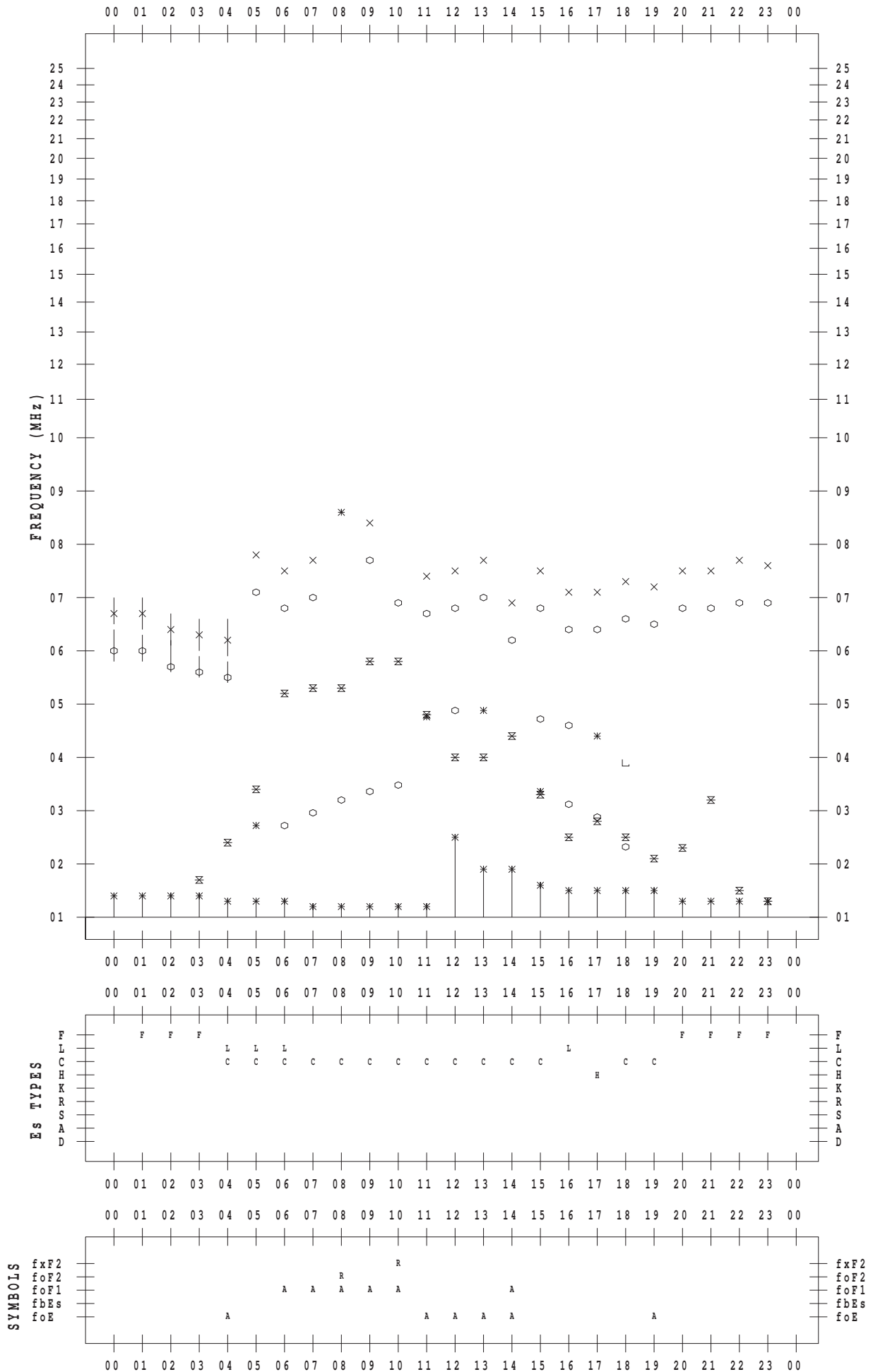
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013 / 7 / 26

135 ° E MEAN TIME



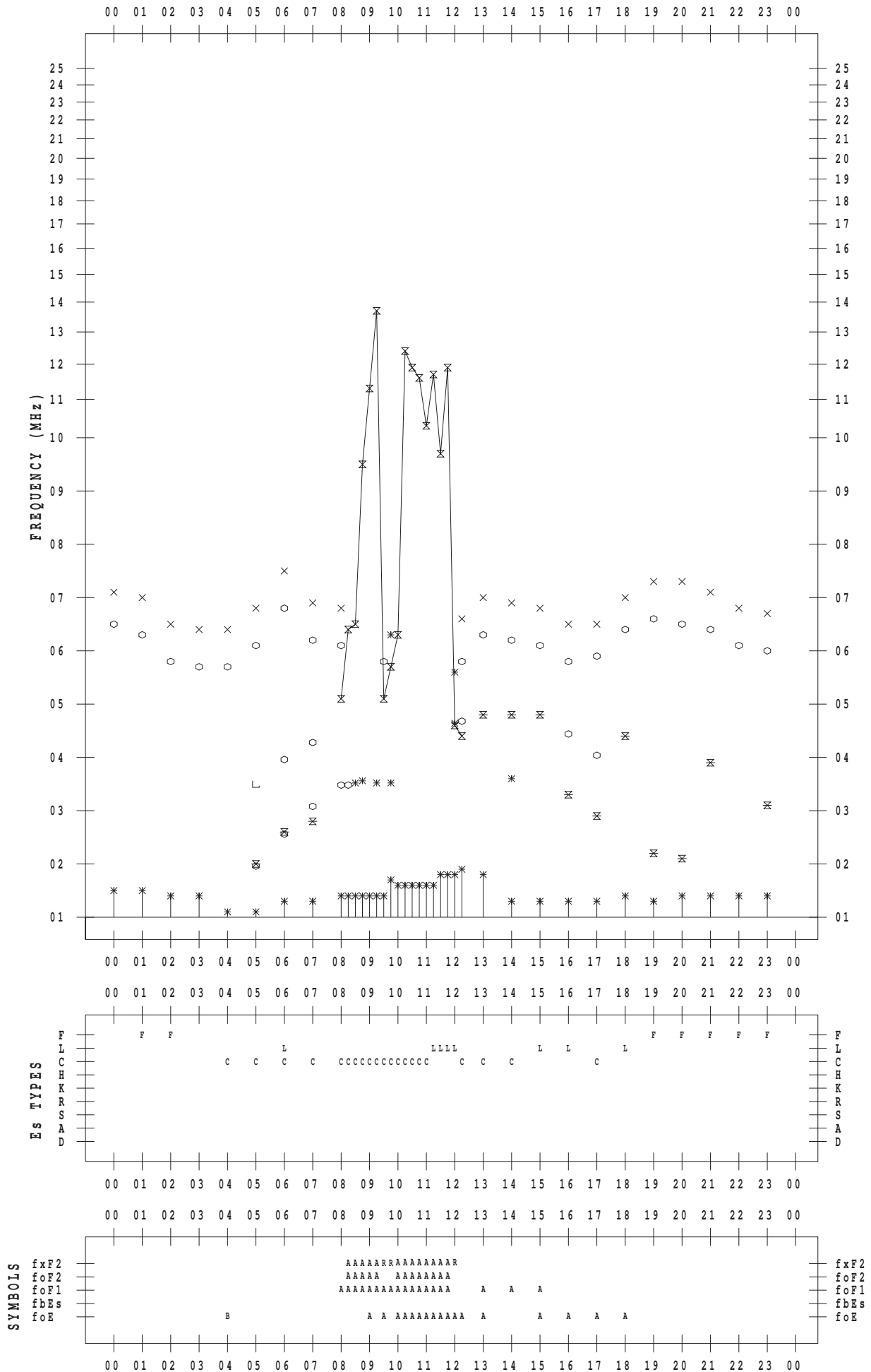
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/27

135 ° E MEAN TIME



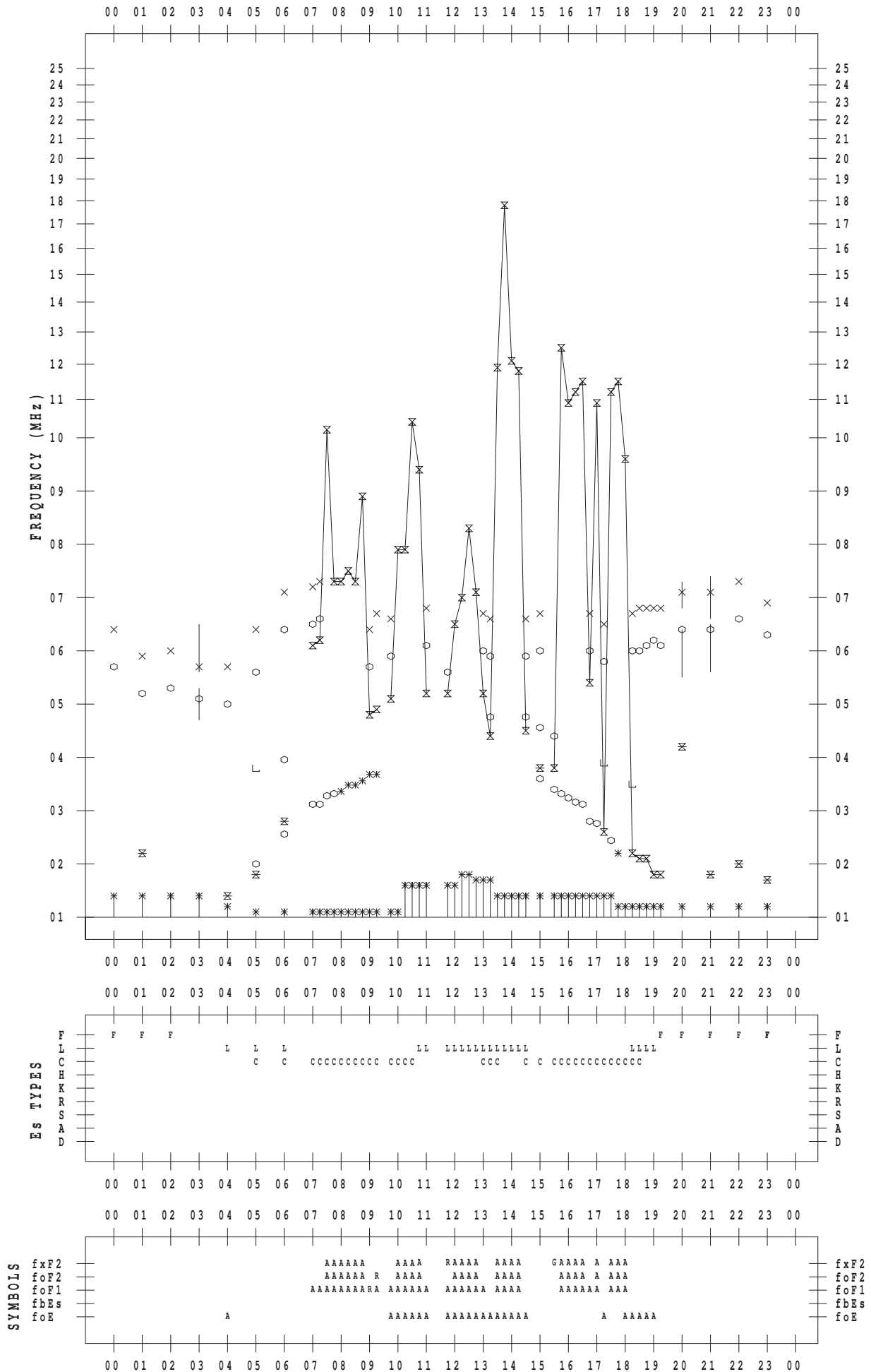
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/28

135 ° E MEAN TIME



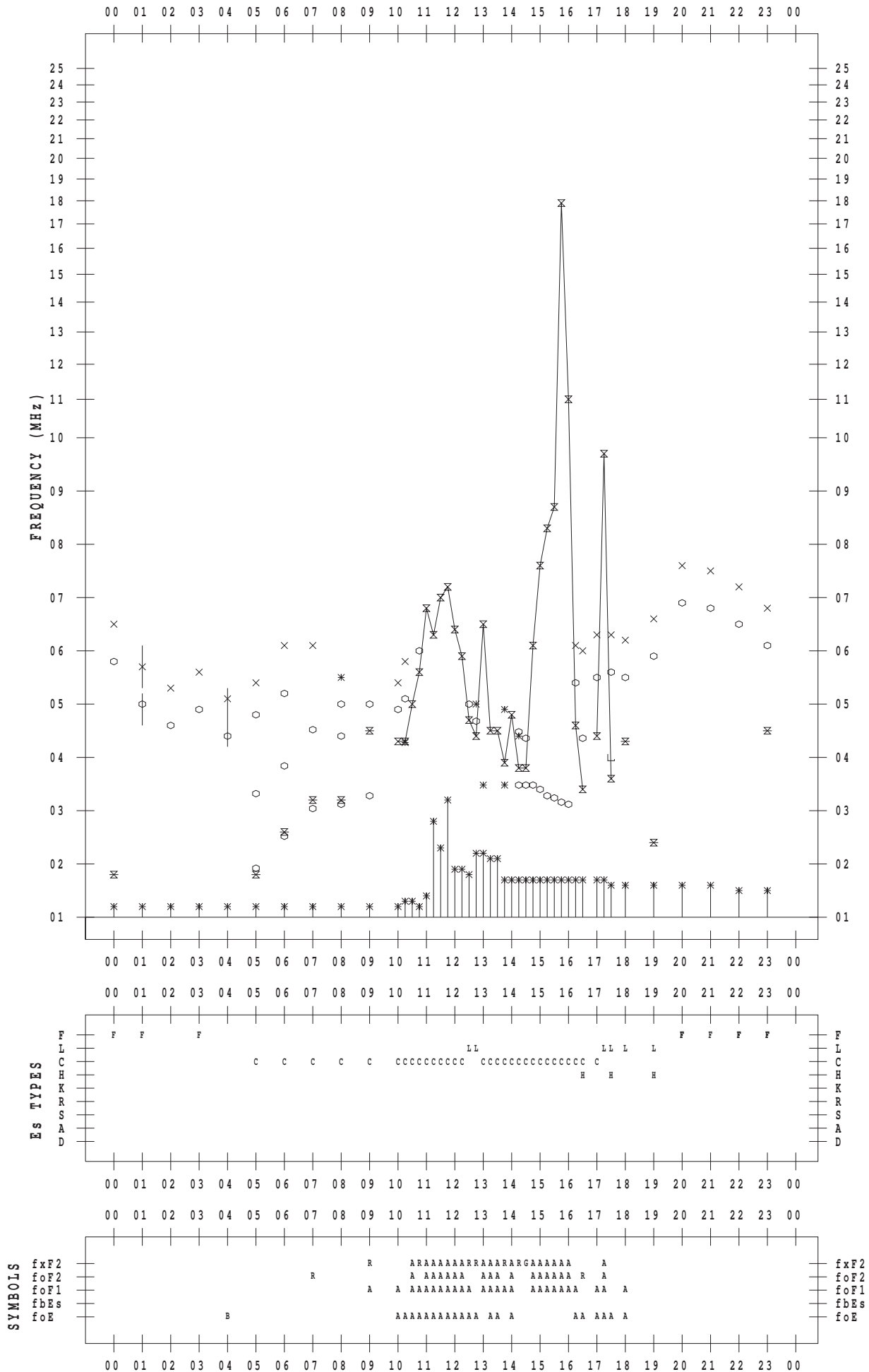
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/29

135 ° E MEAN TIME



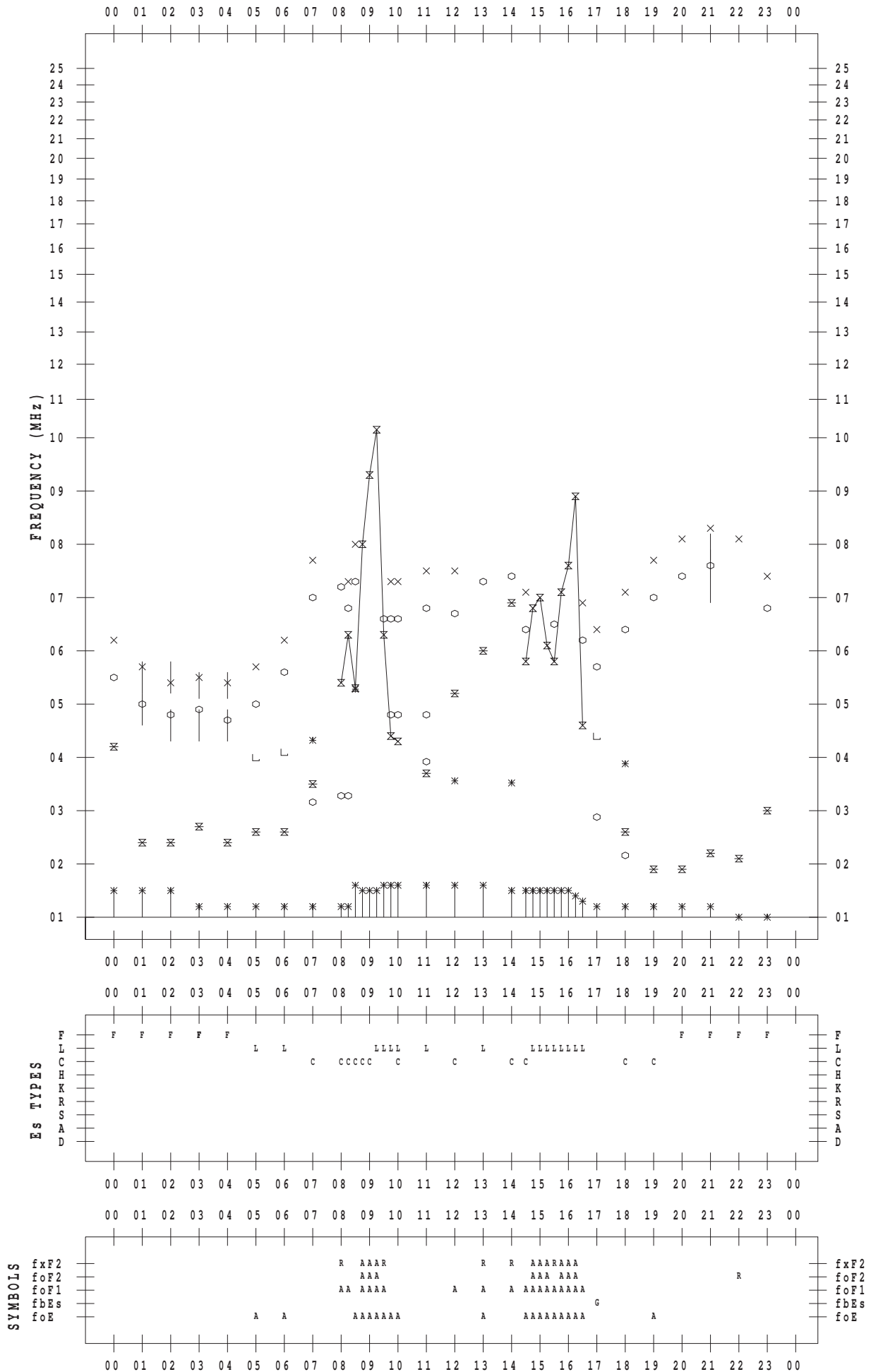
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/30

135 ° E MEAN TIME



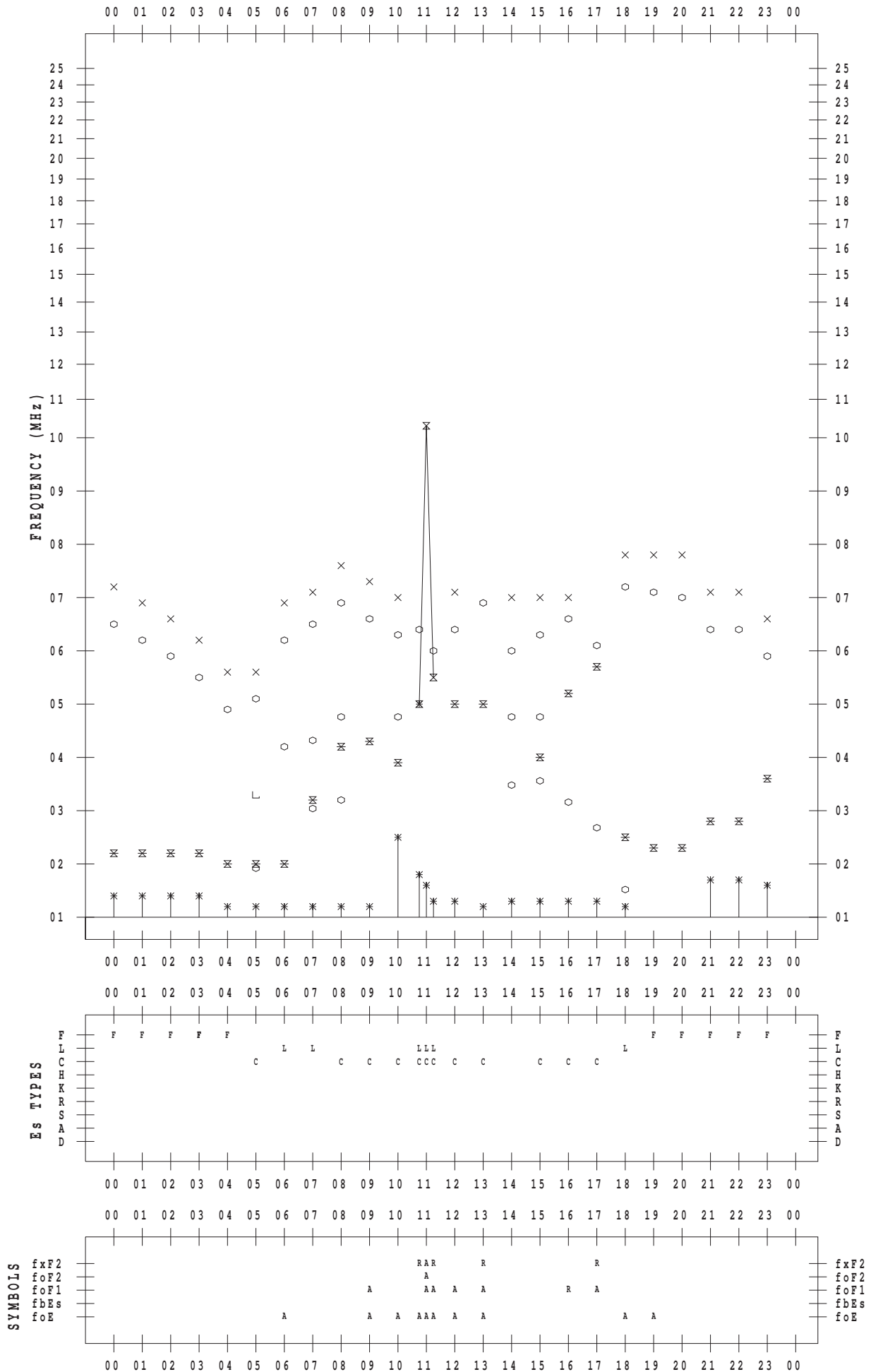
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2013/ 7/31

135 ° E MEAN TIME



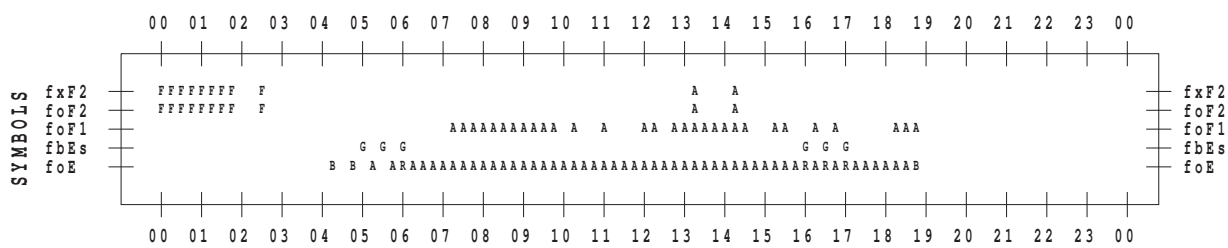
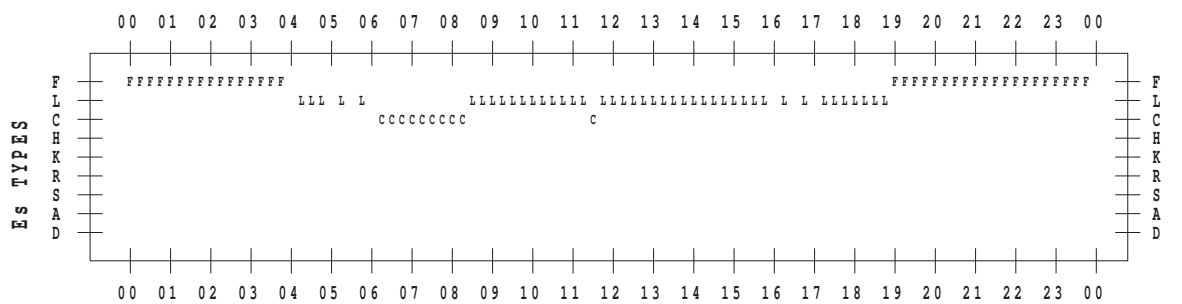
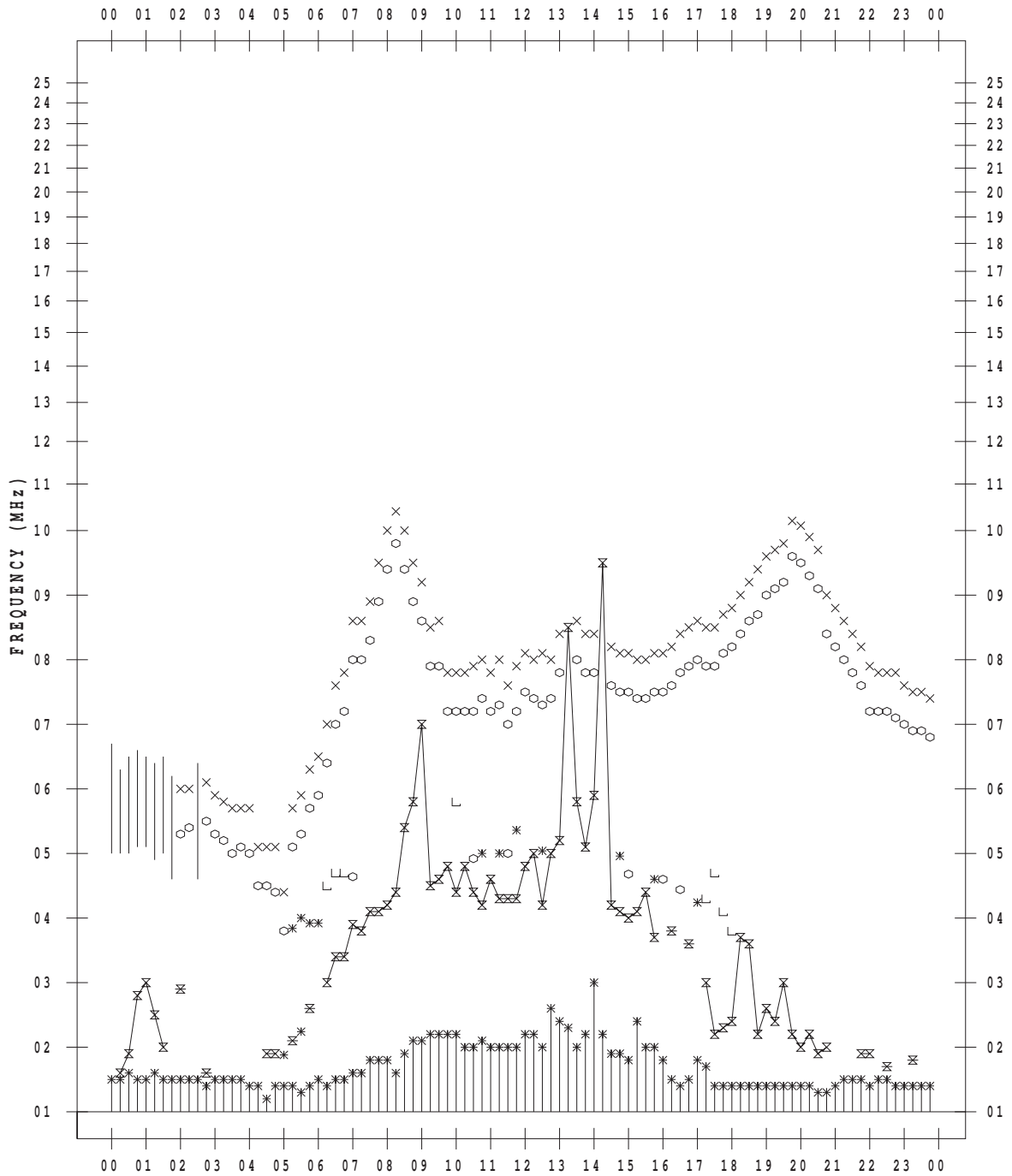
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/ 1

135 ° E MEAN TIME



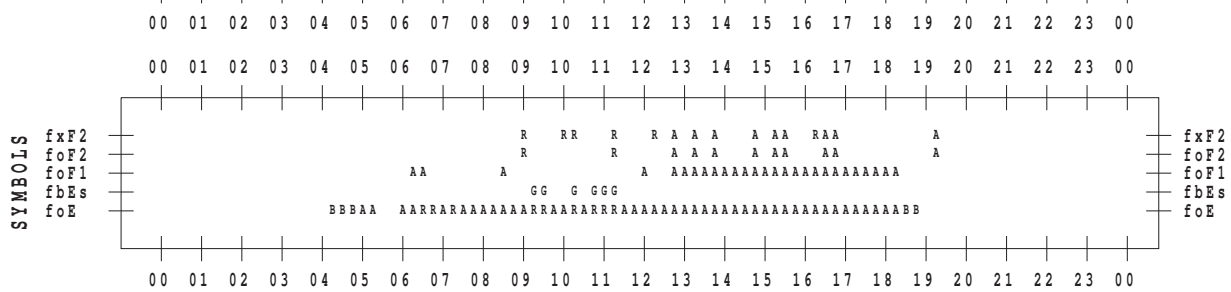
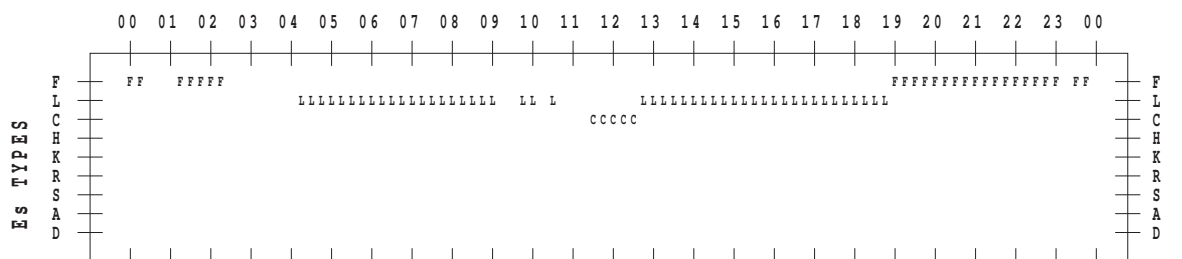
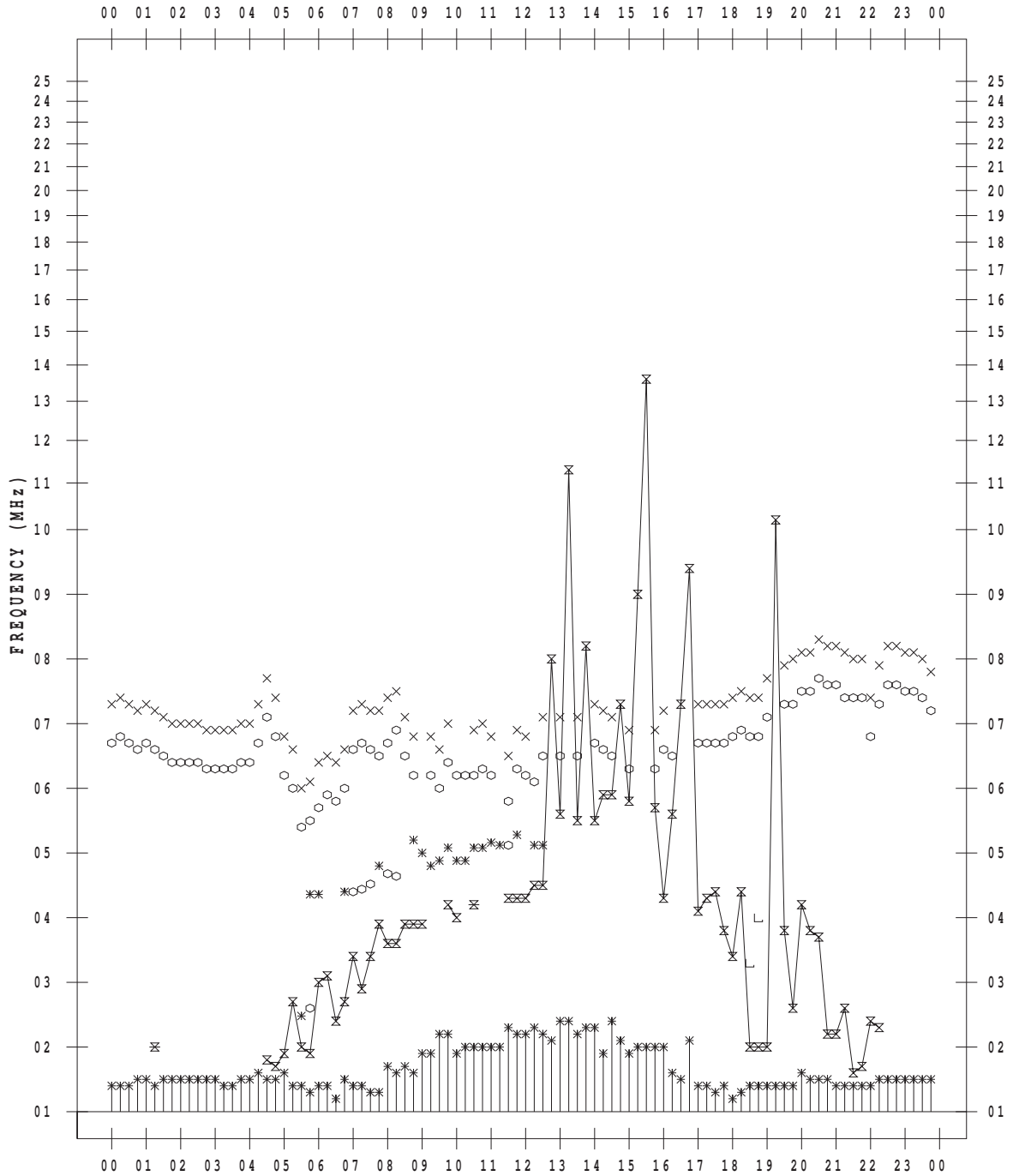
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/ 2

135 ° E MEAN TIME



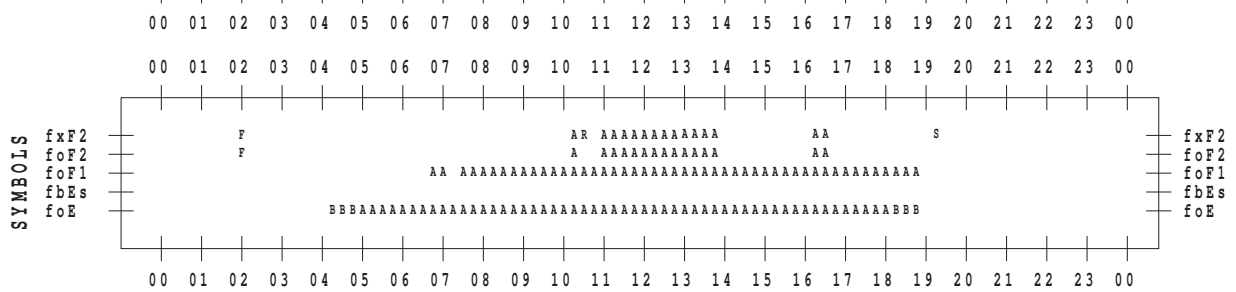
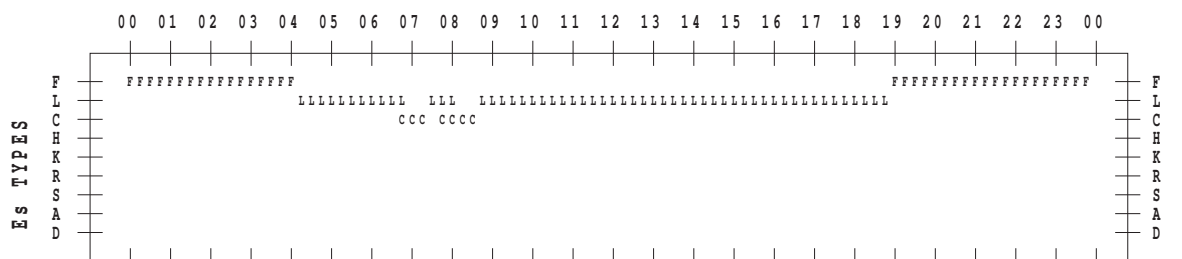
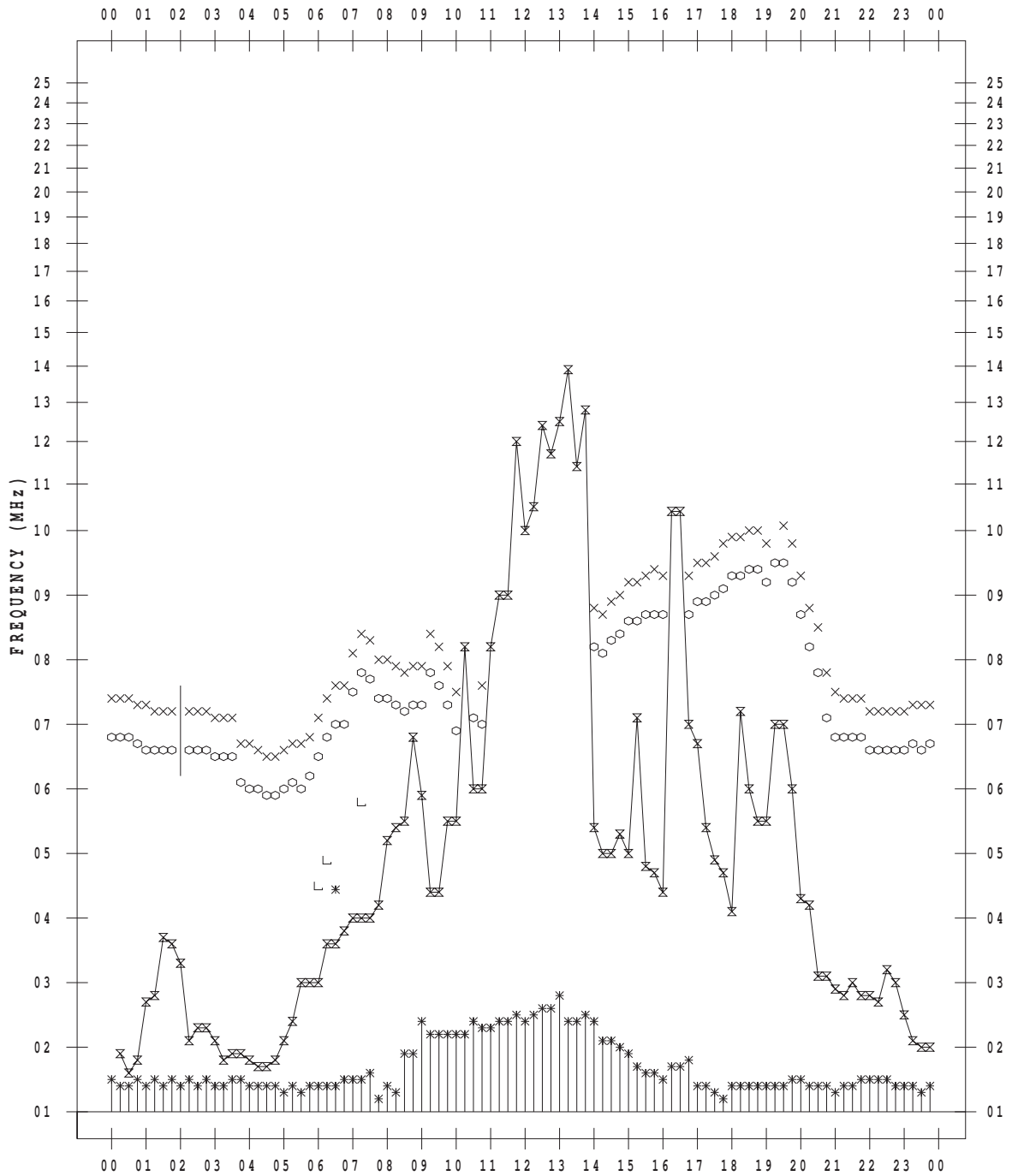
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/ 3

135 ° E MEAN TIME



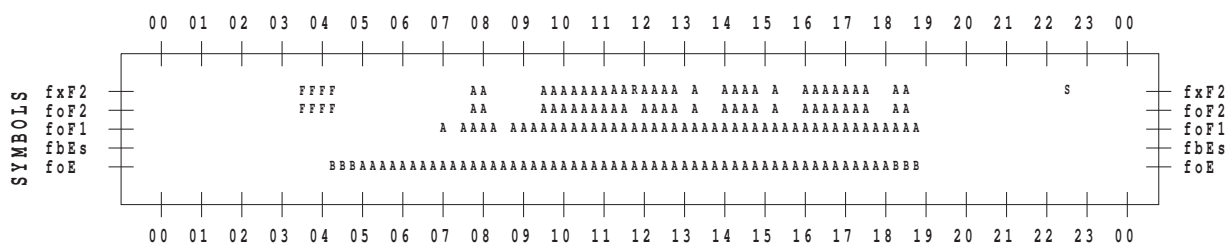
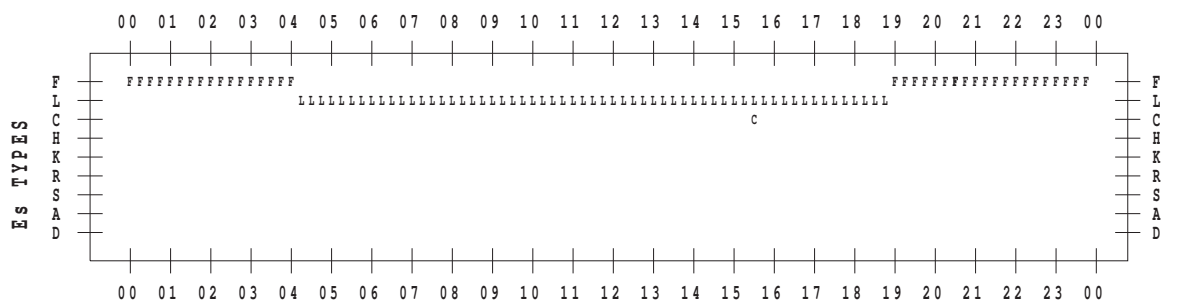
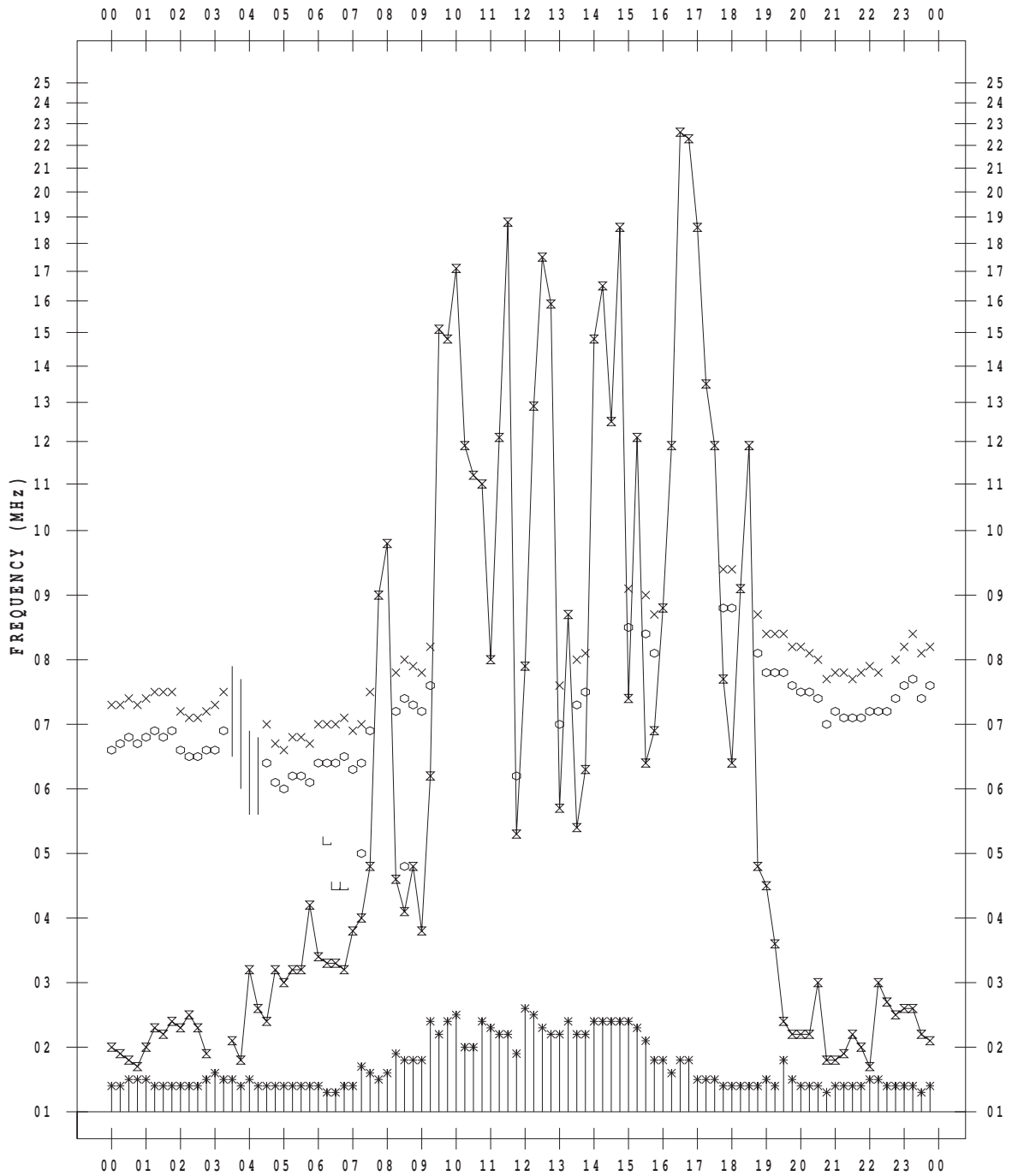
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/ 4

135 ° E MEAN TIME



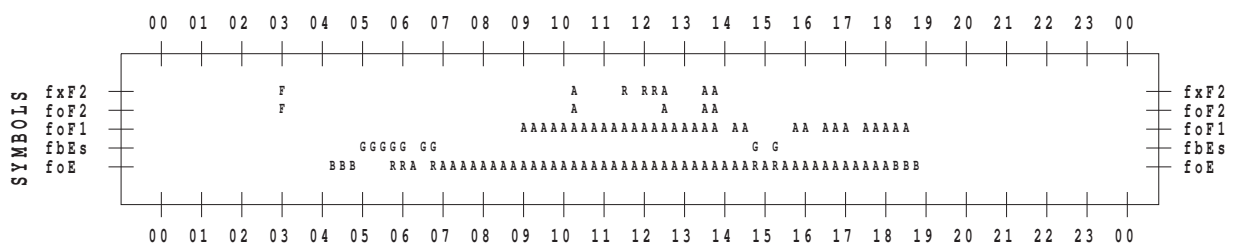
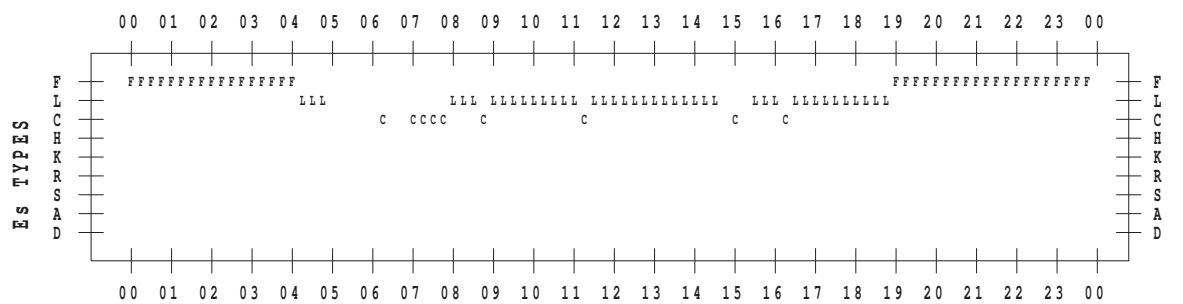
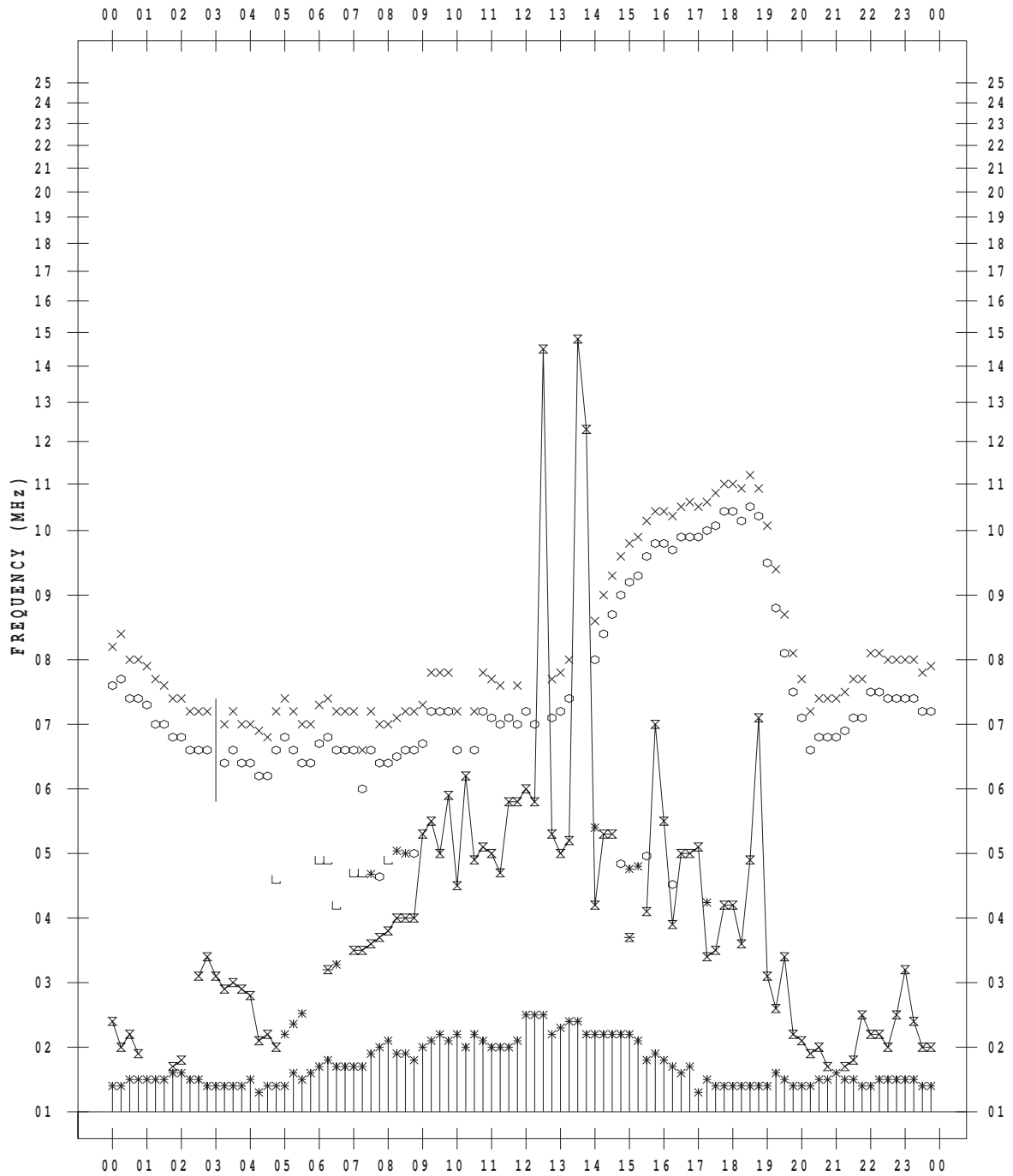
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013 / 7 / 5

135 ° E MEAN TIME



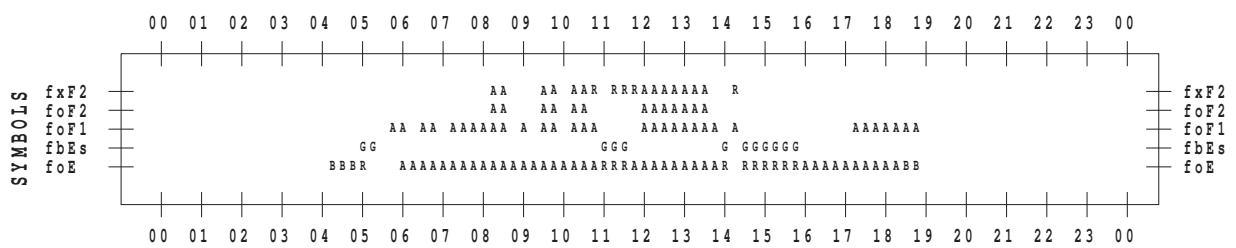
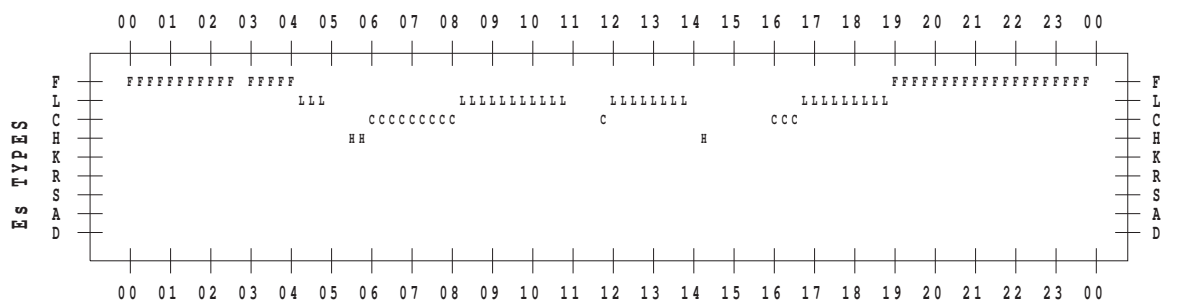
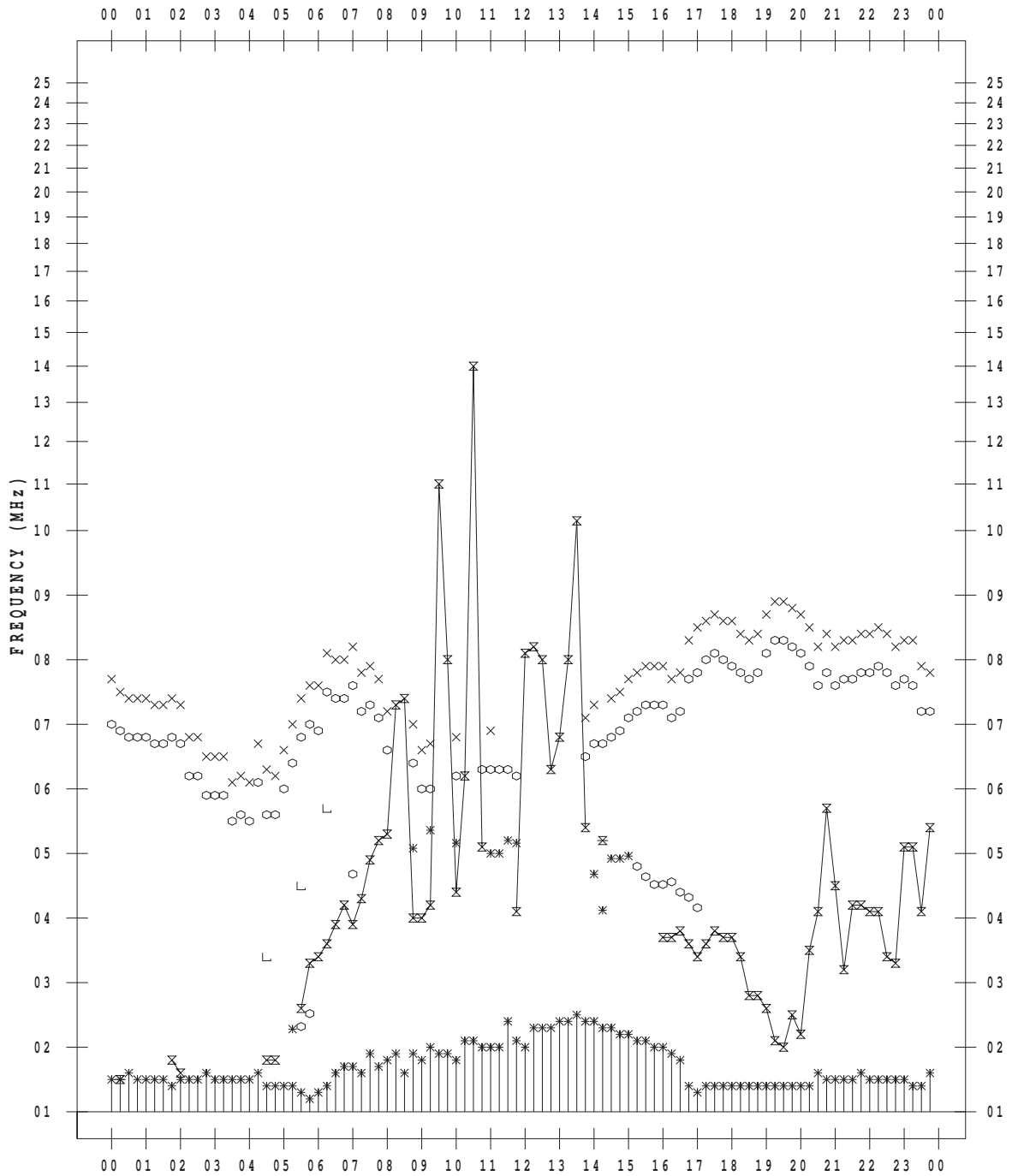
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/ 6

135 ° E MEAN TIME



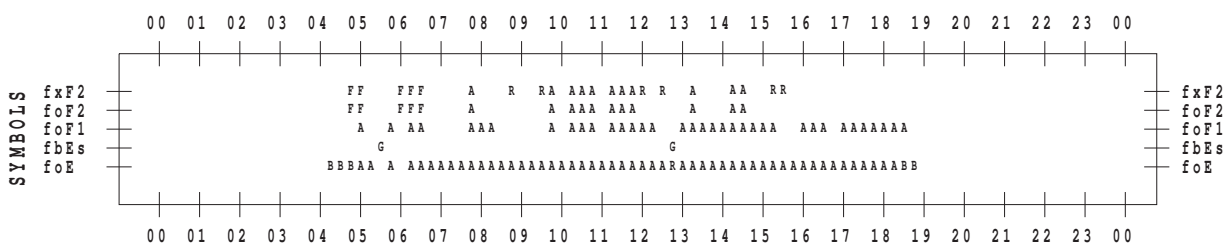
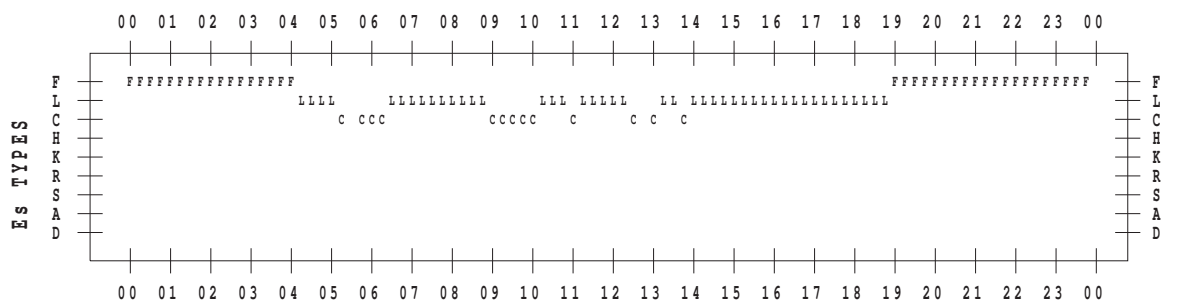
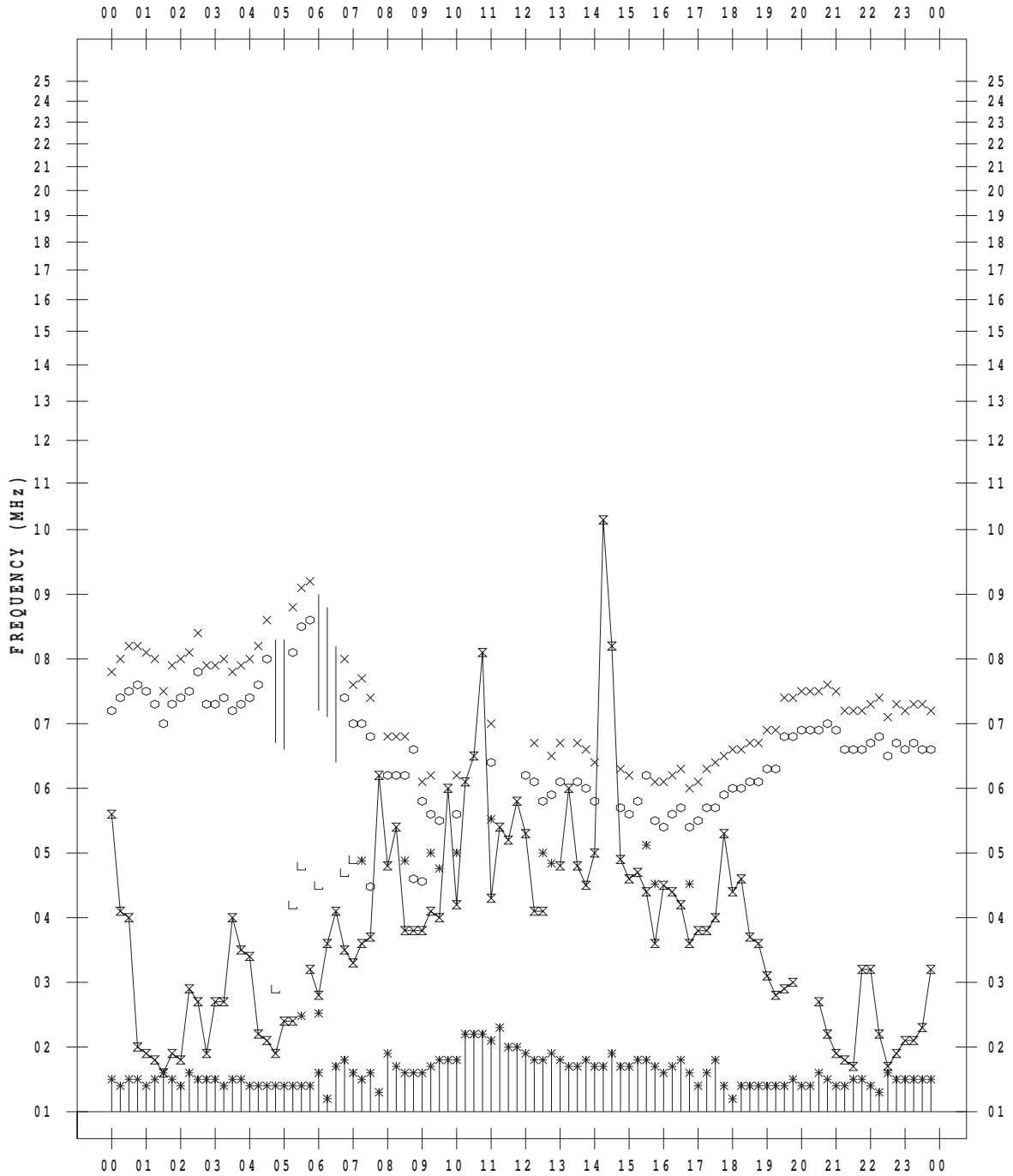
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/ 7

135 ° E MEAN TIME



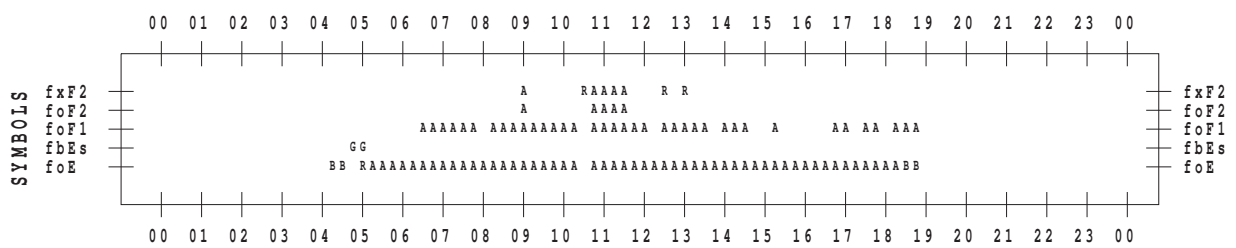
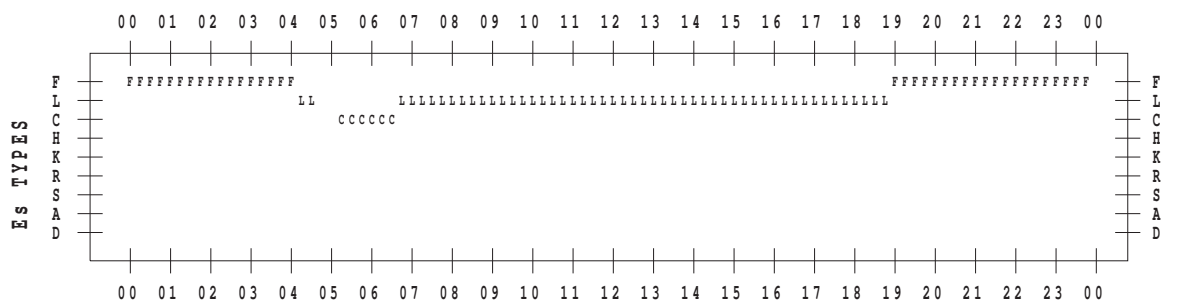
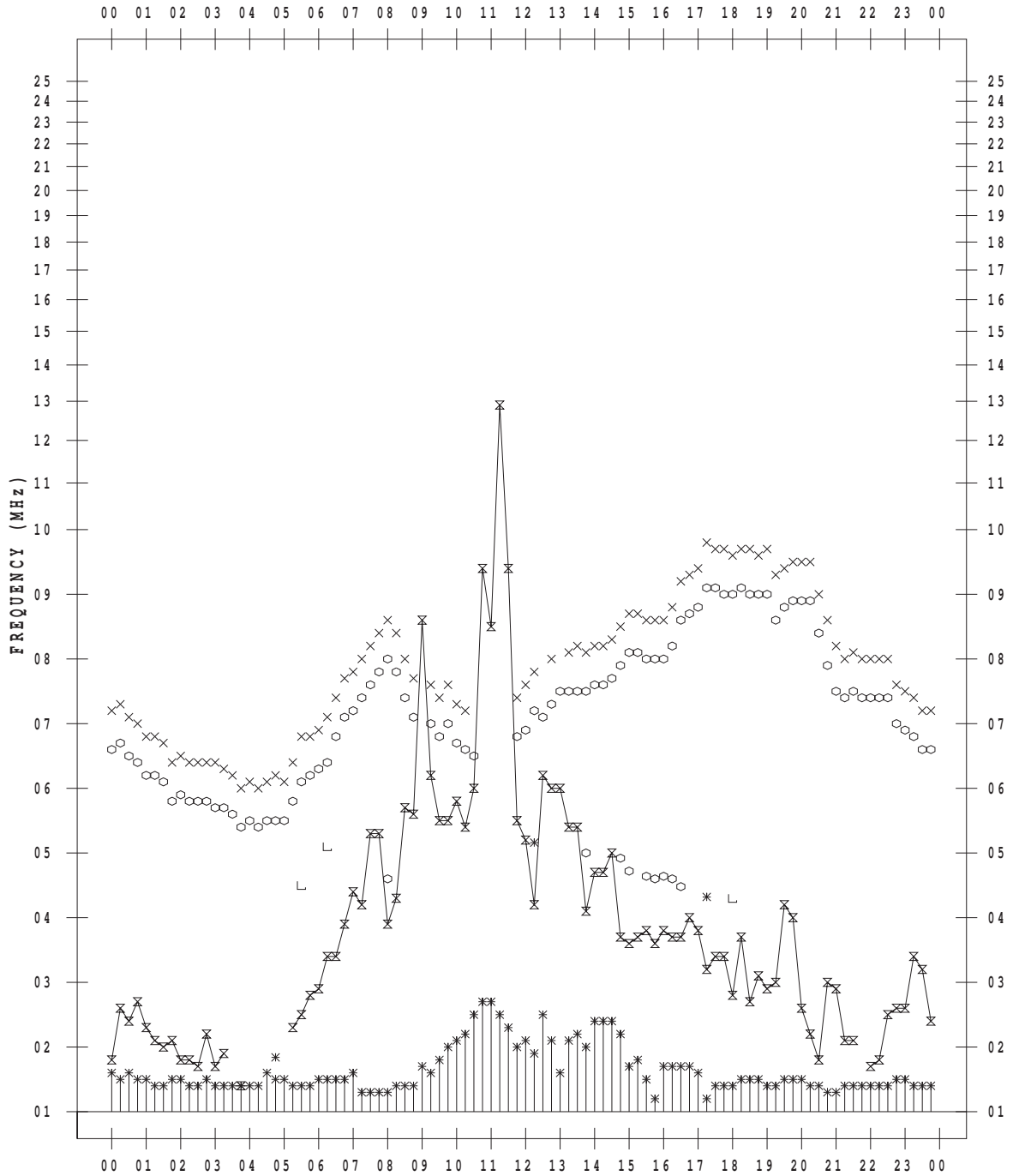
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013 / 7 / 8

135 ° E MEAN TIME



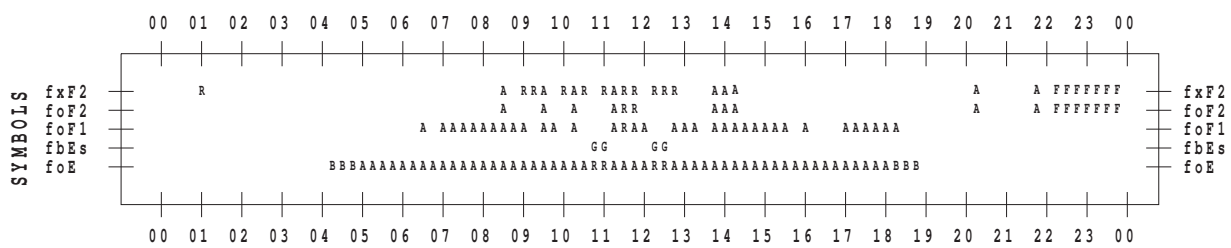
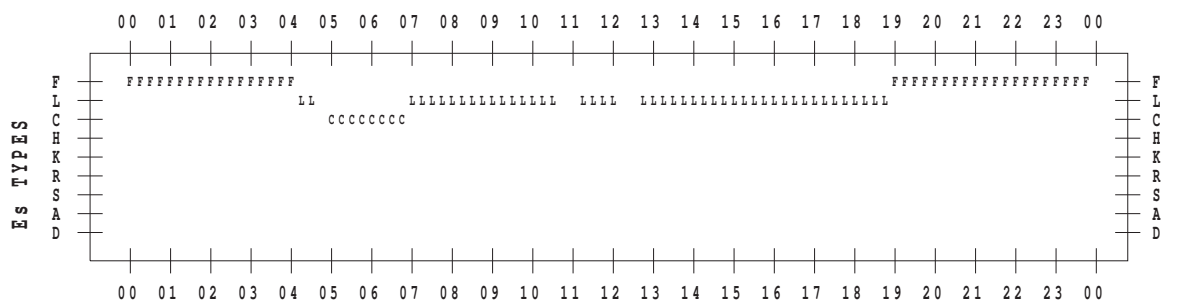
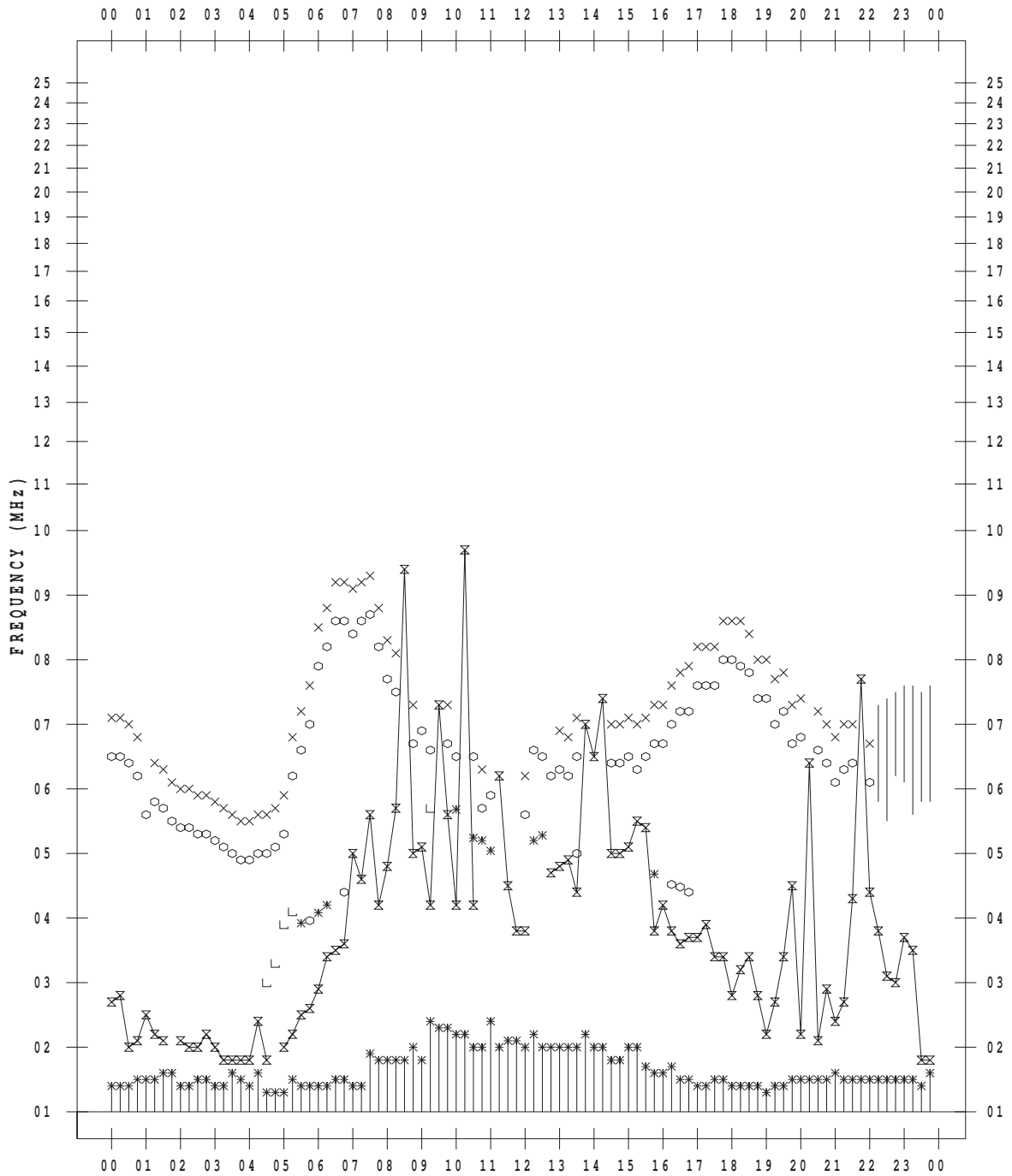
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/ 9

135 ° E MEAN TIME



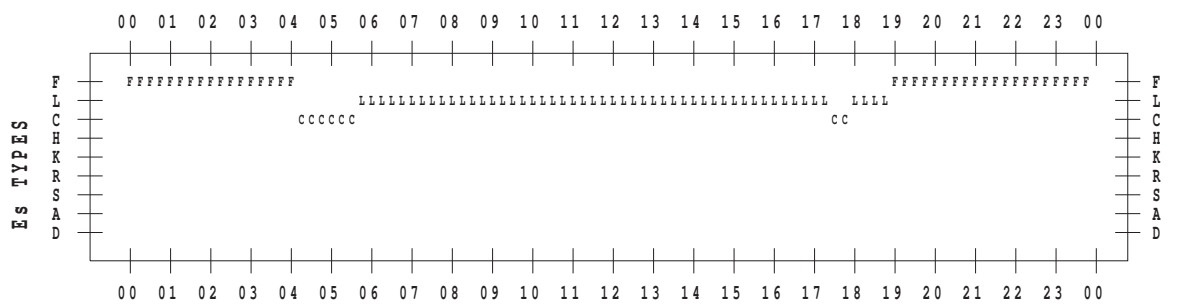
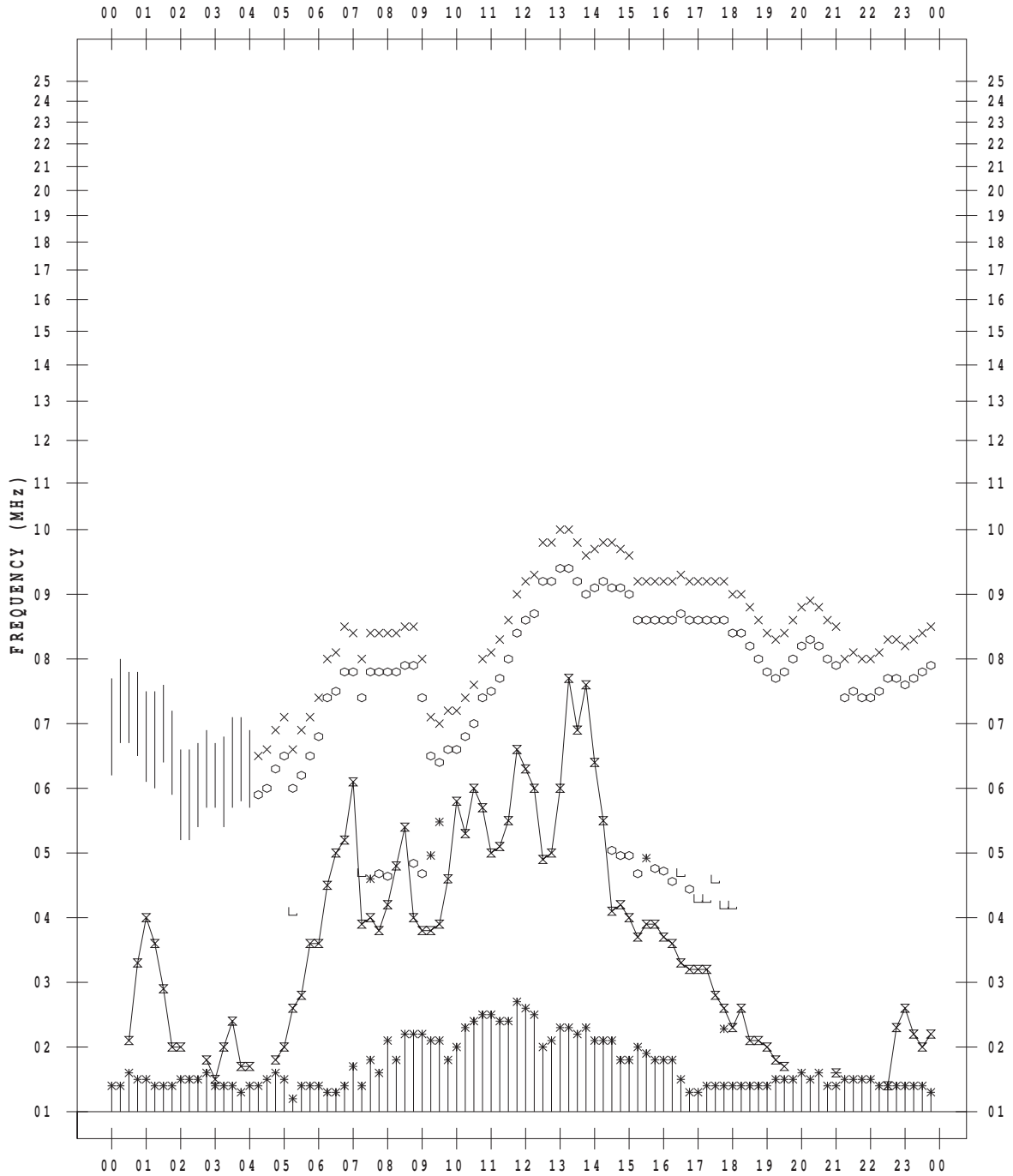
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/10

135 ° E MEAN TIME



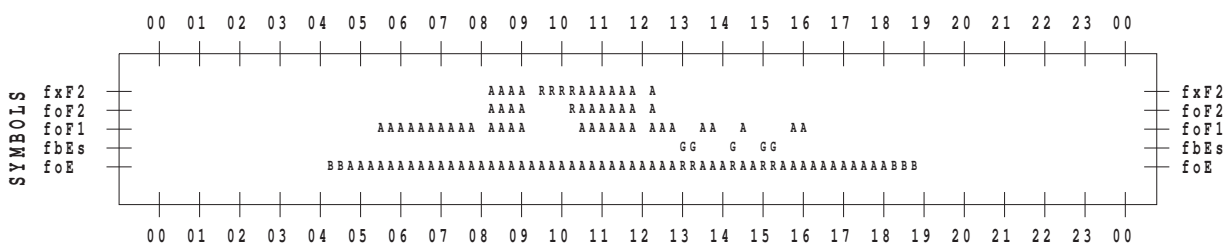
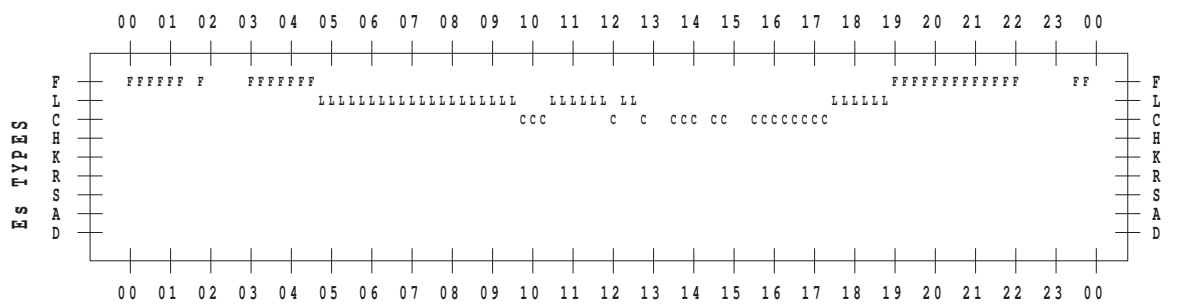
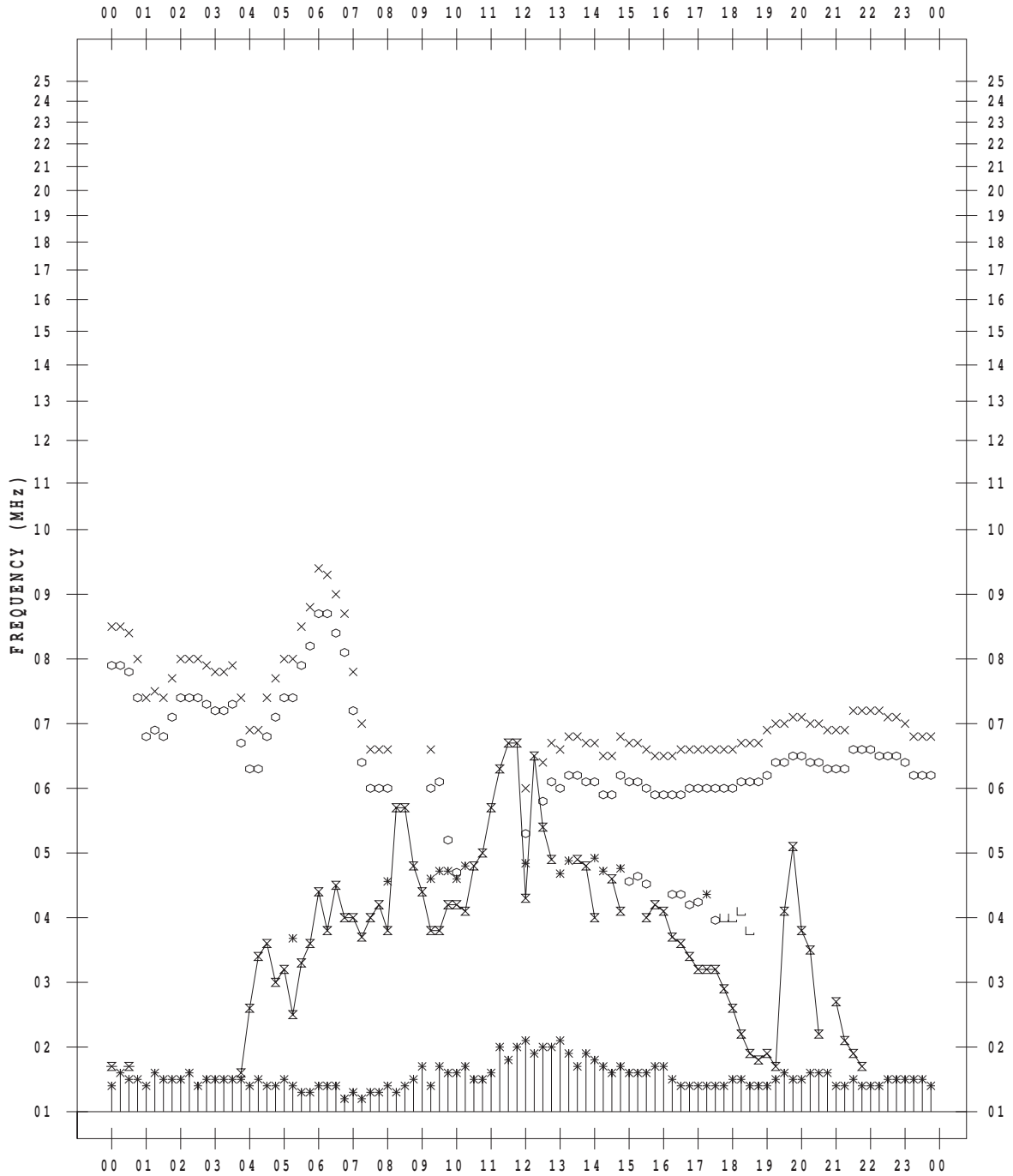
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/11

135 ° E MEAN TIME



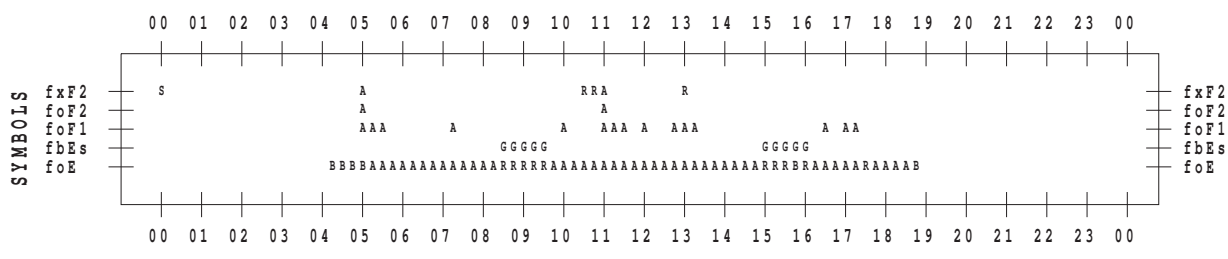
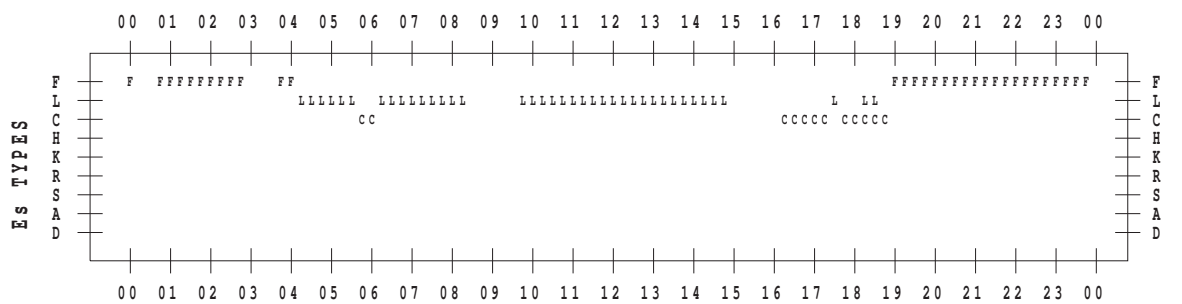
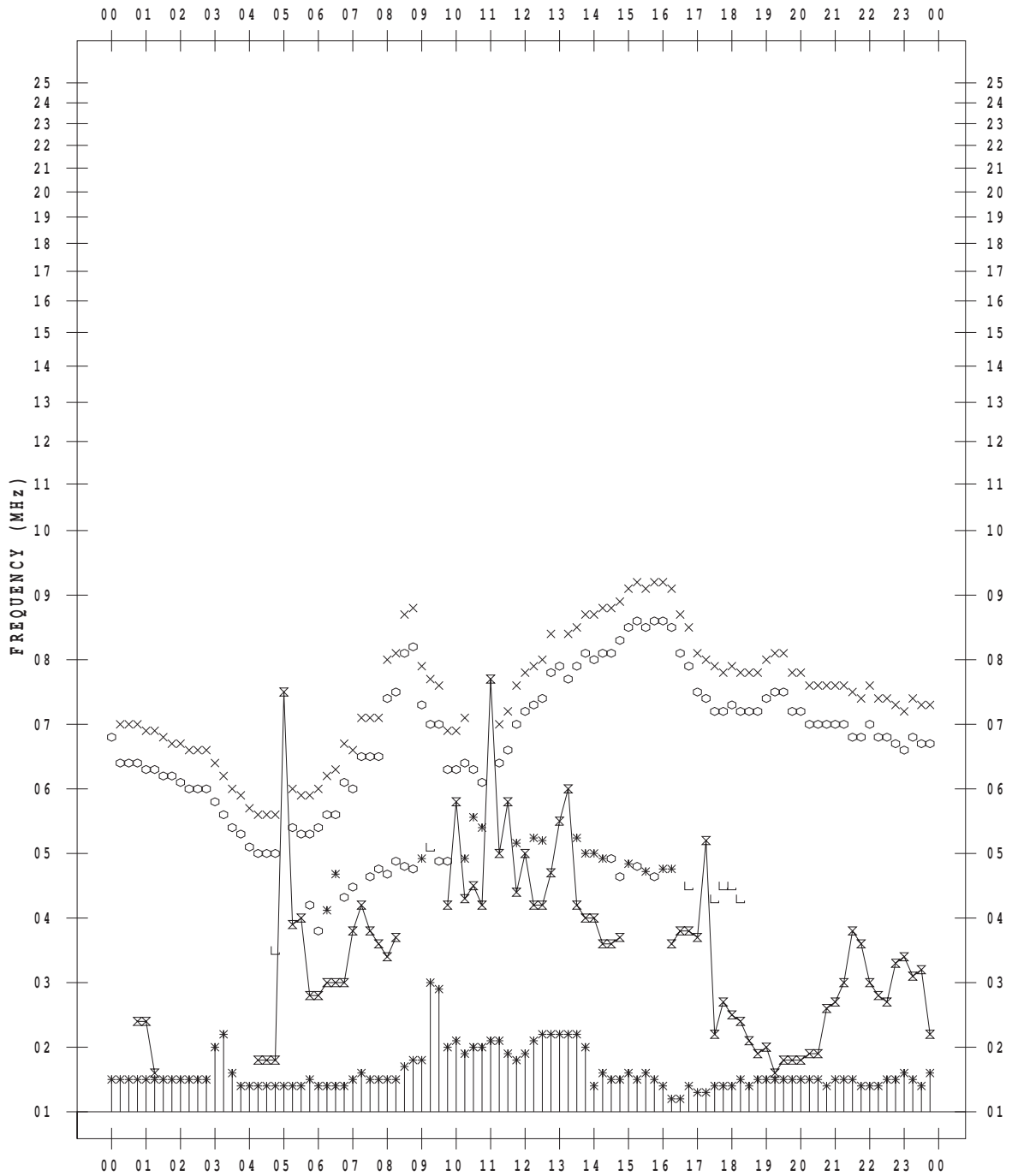
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/12

135 ° E MEAN TIME



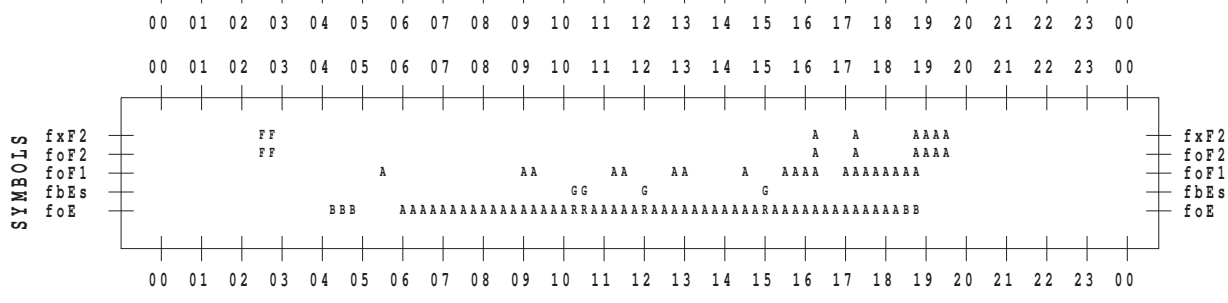
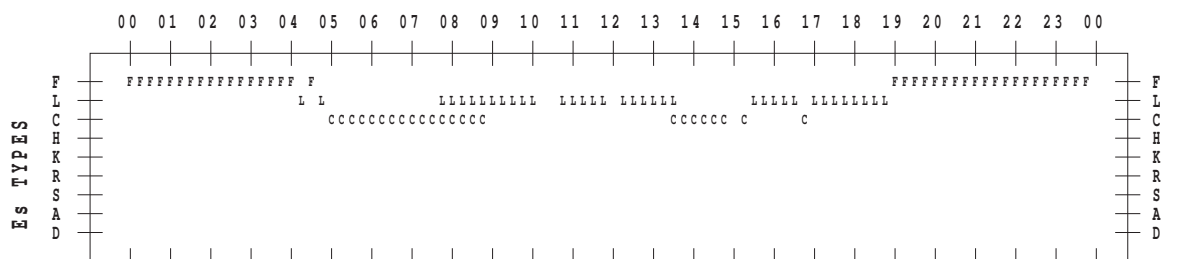
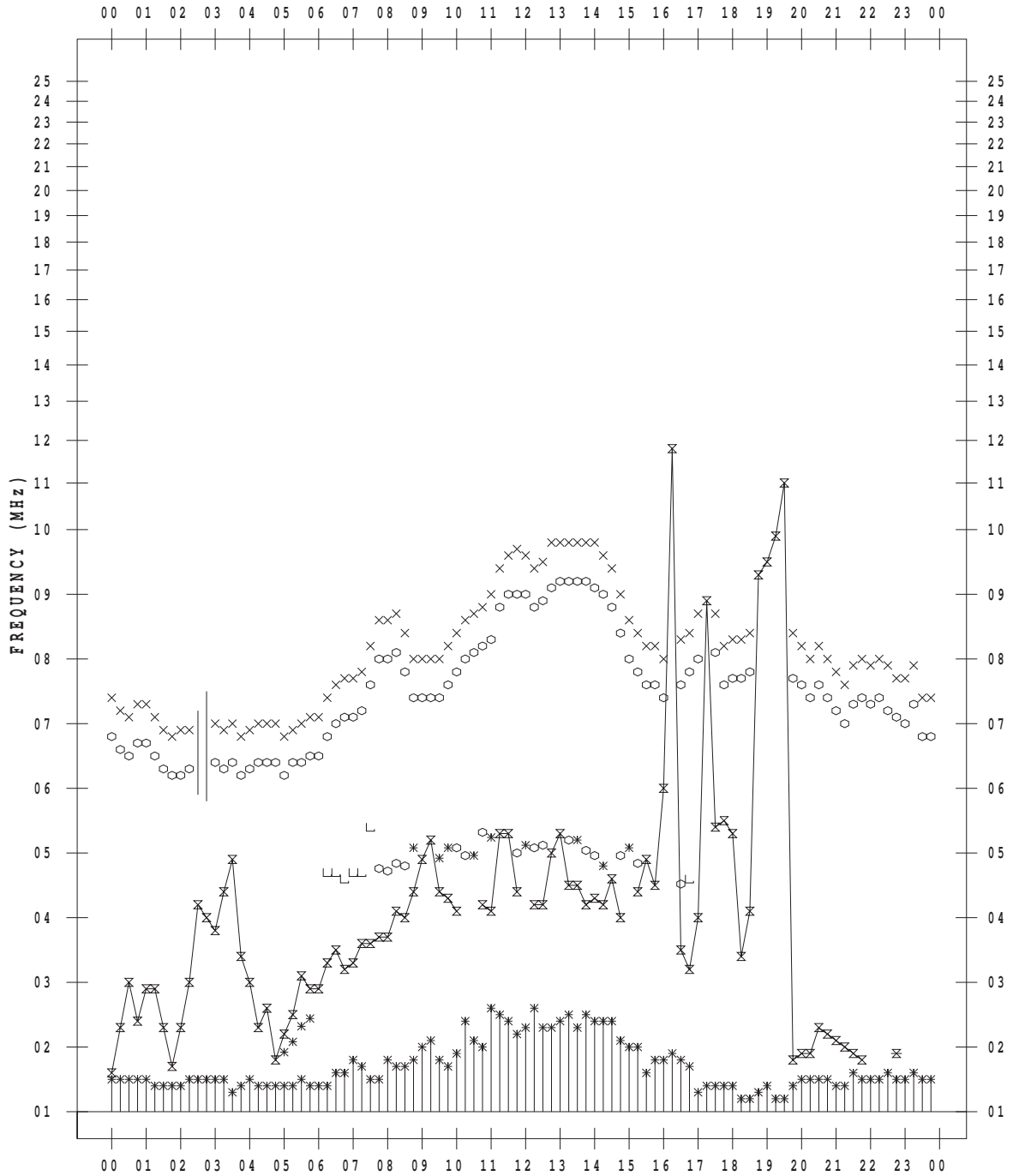
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/13

135 ° E MEAN TIME



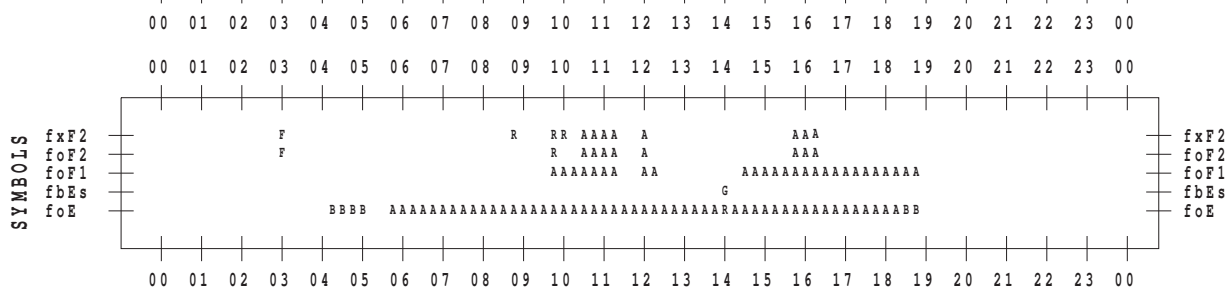
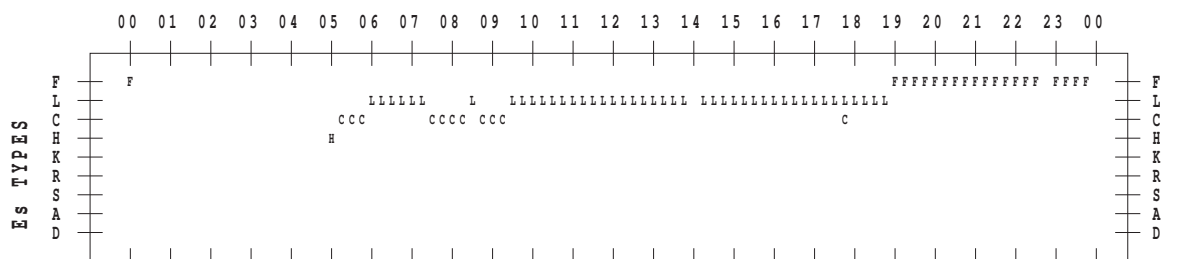
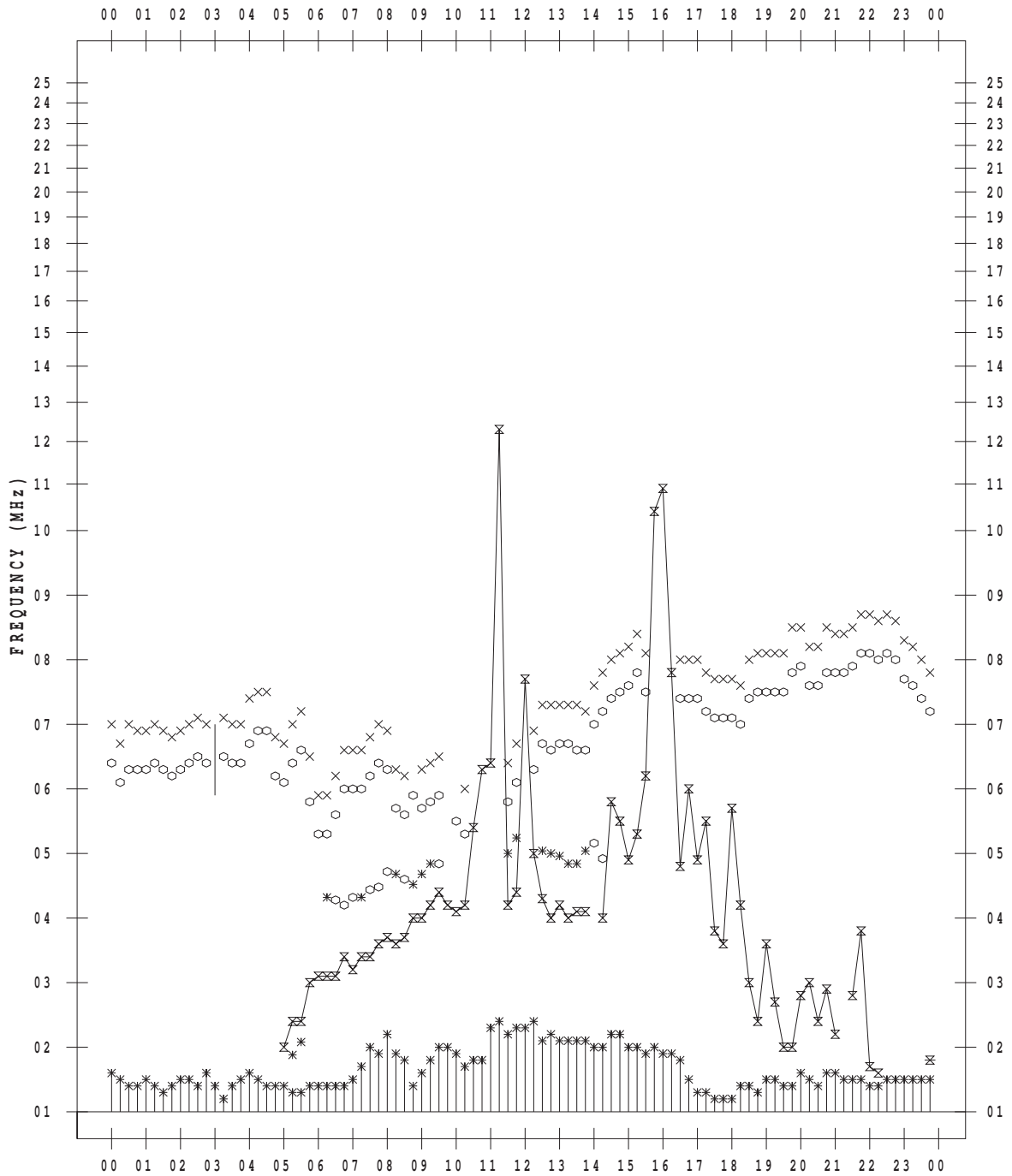
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/14

135 ° E MEAN TIME



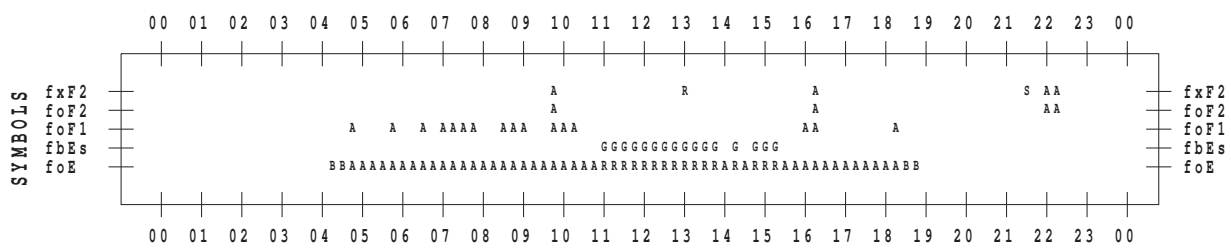
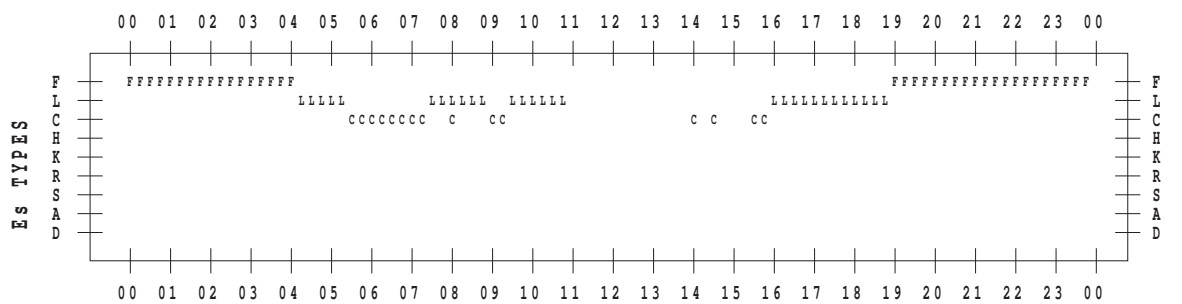
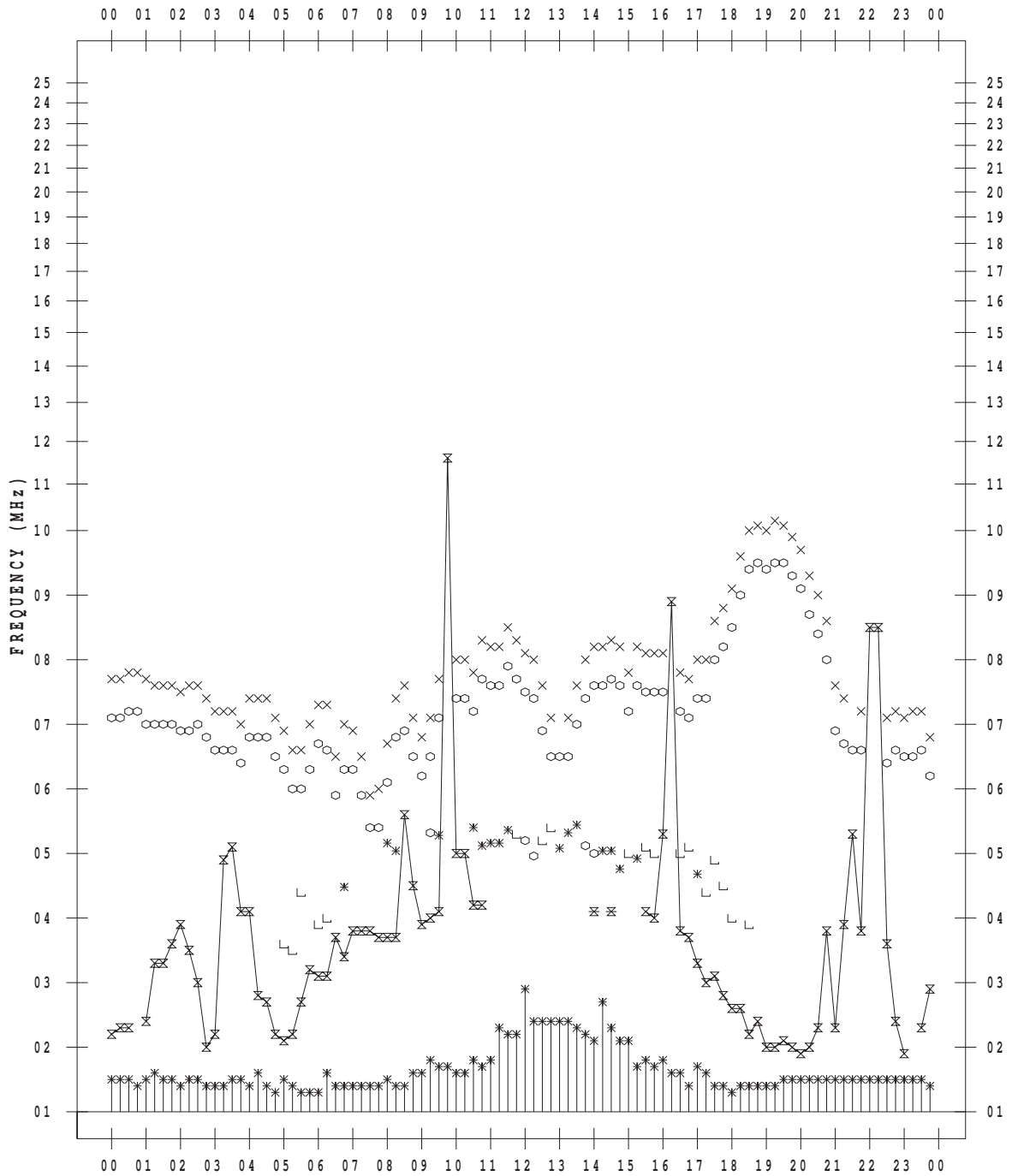
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/15

135 ° E MEAN TIME



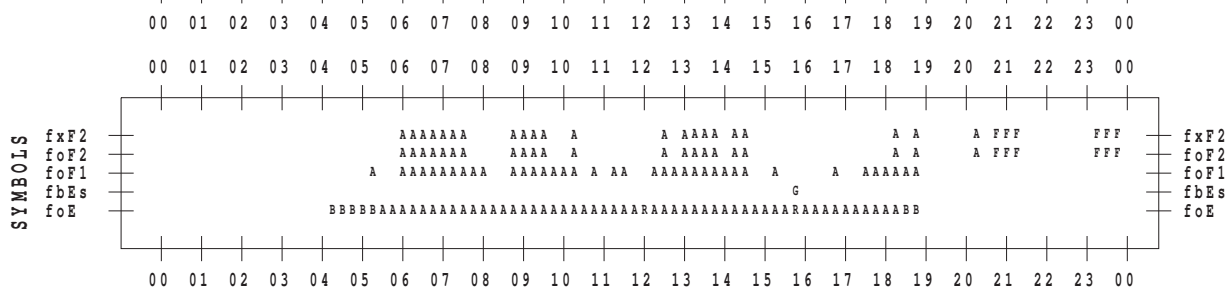
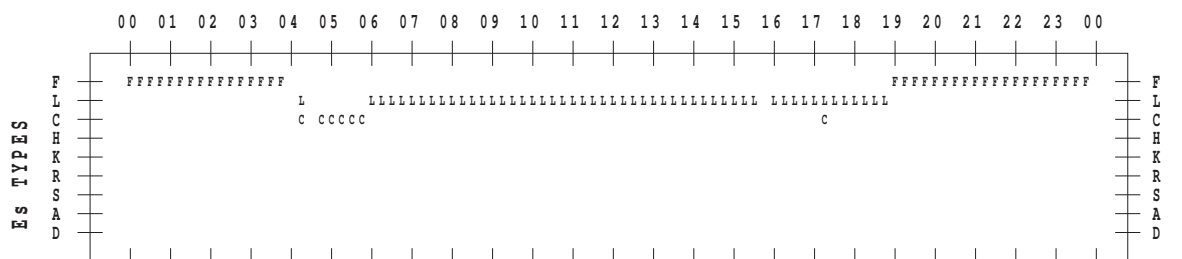
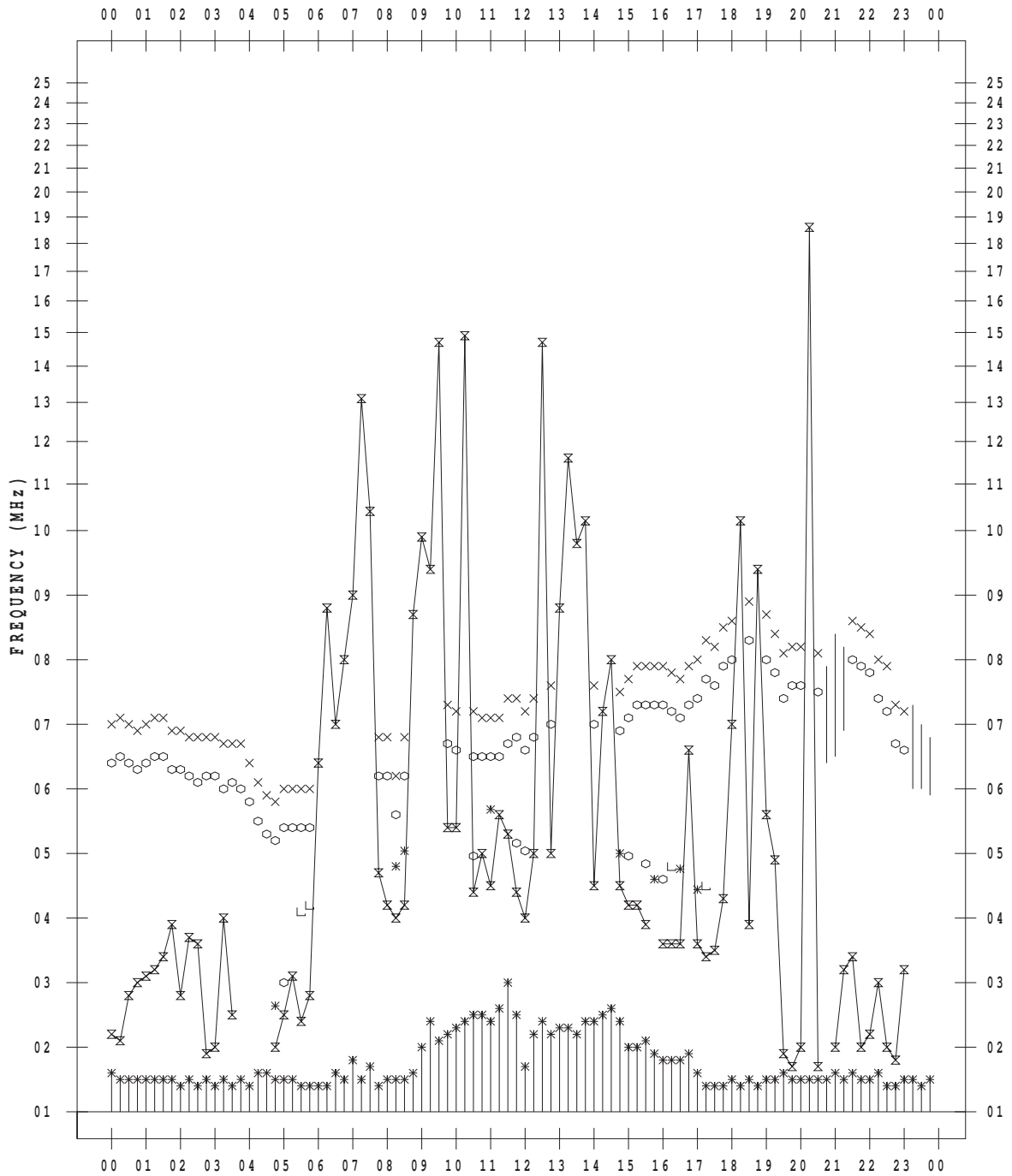
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/16

135 ° E MEAN TIME



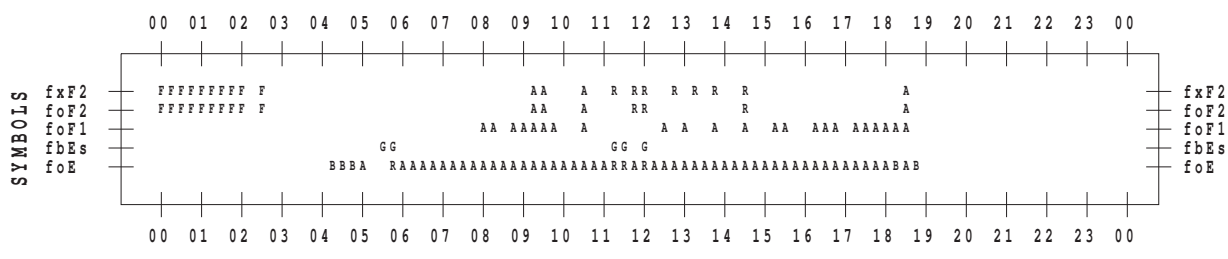
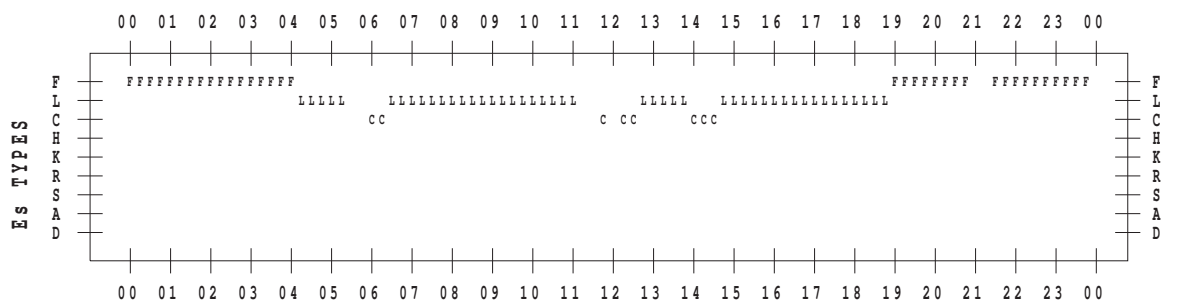
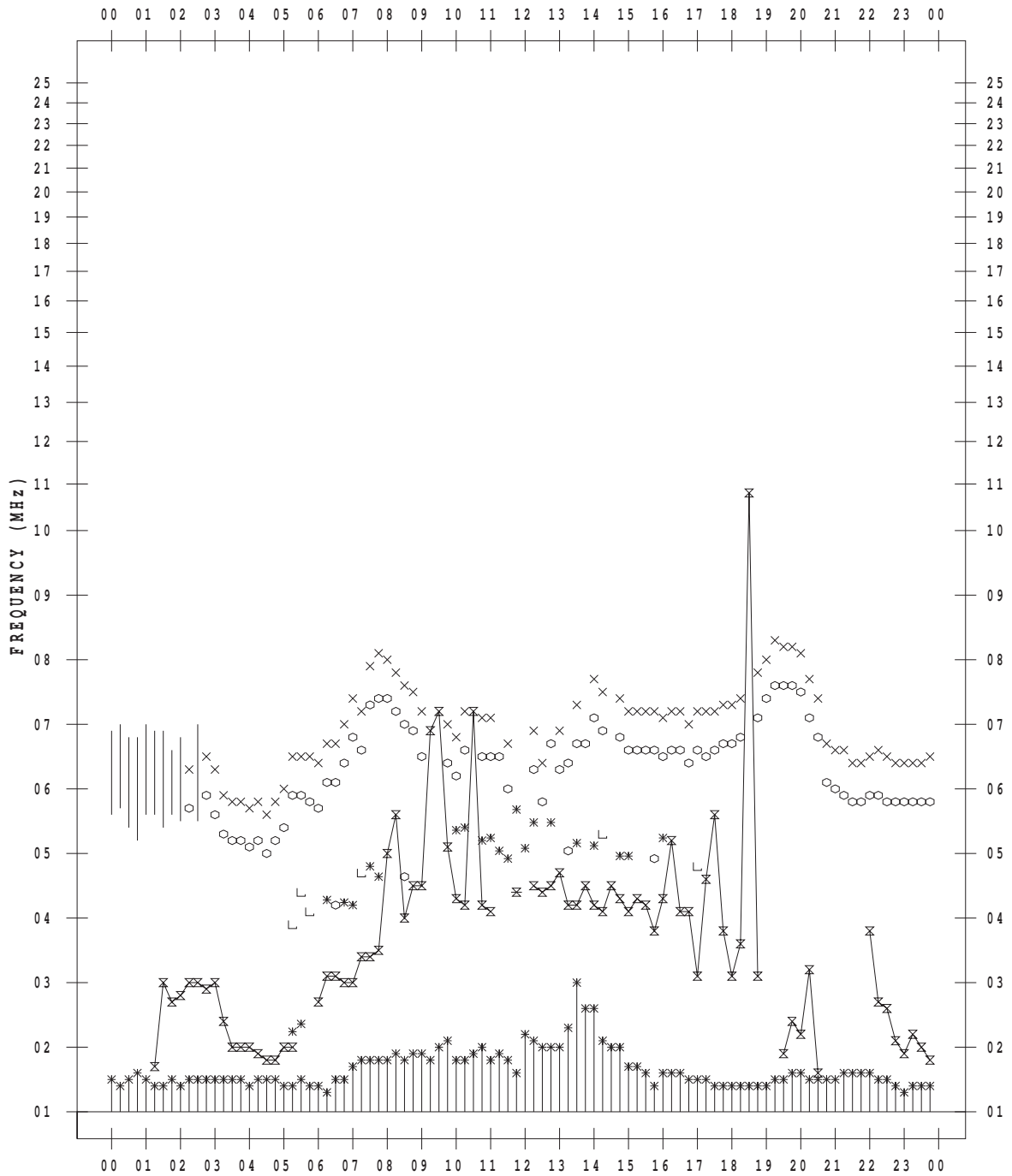
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/17

135 ° E MEAN TIME



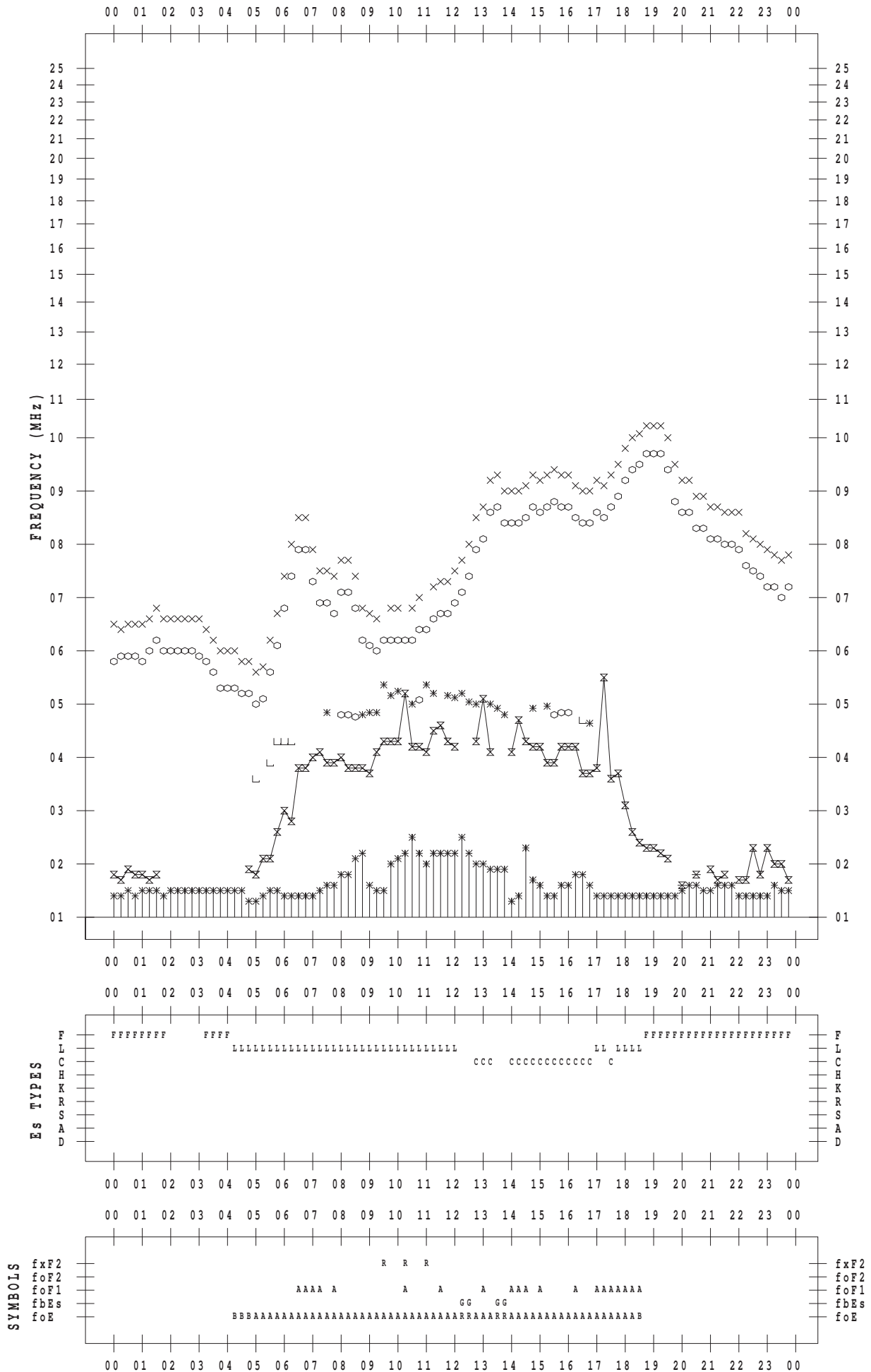
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/18

135 ° E MEAN TIME



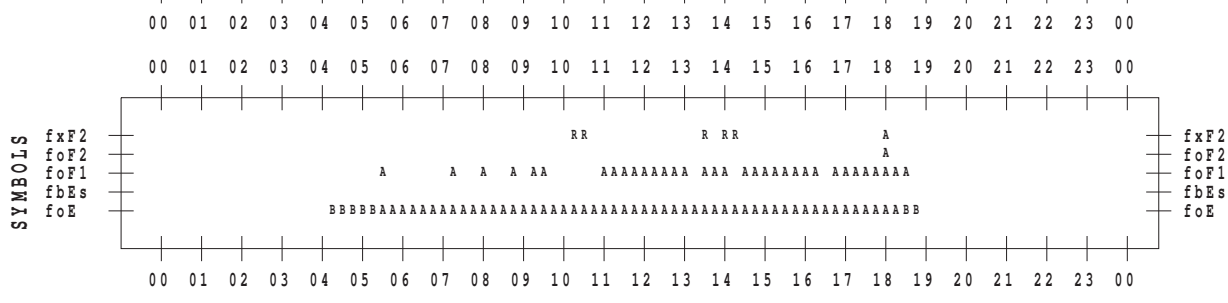
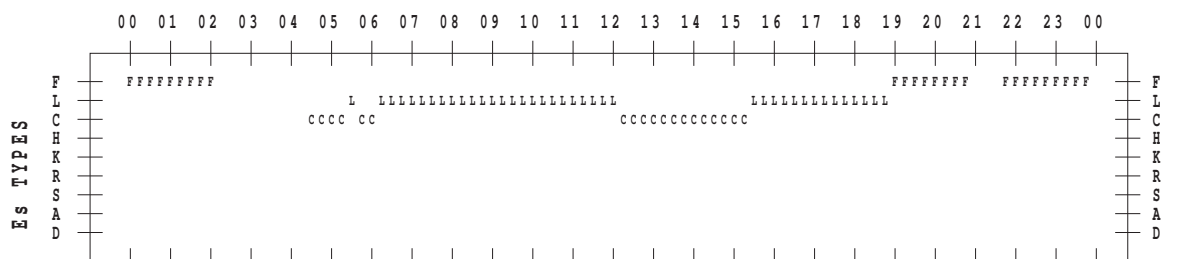
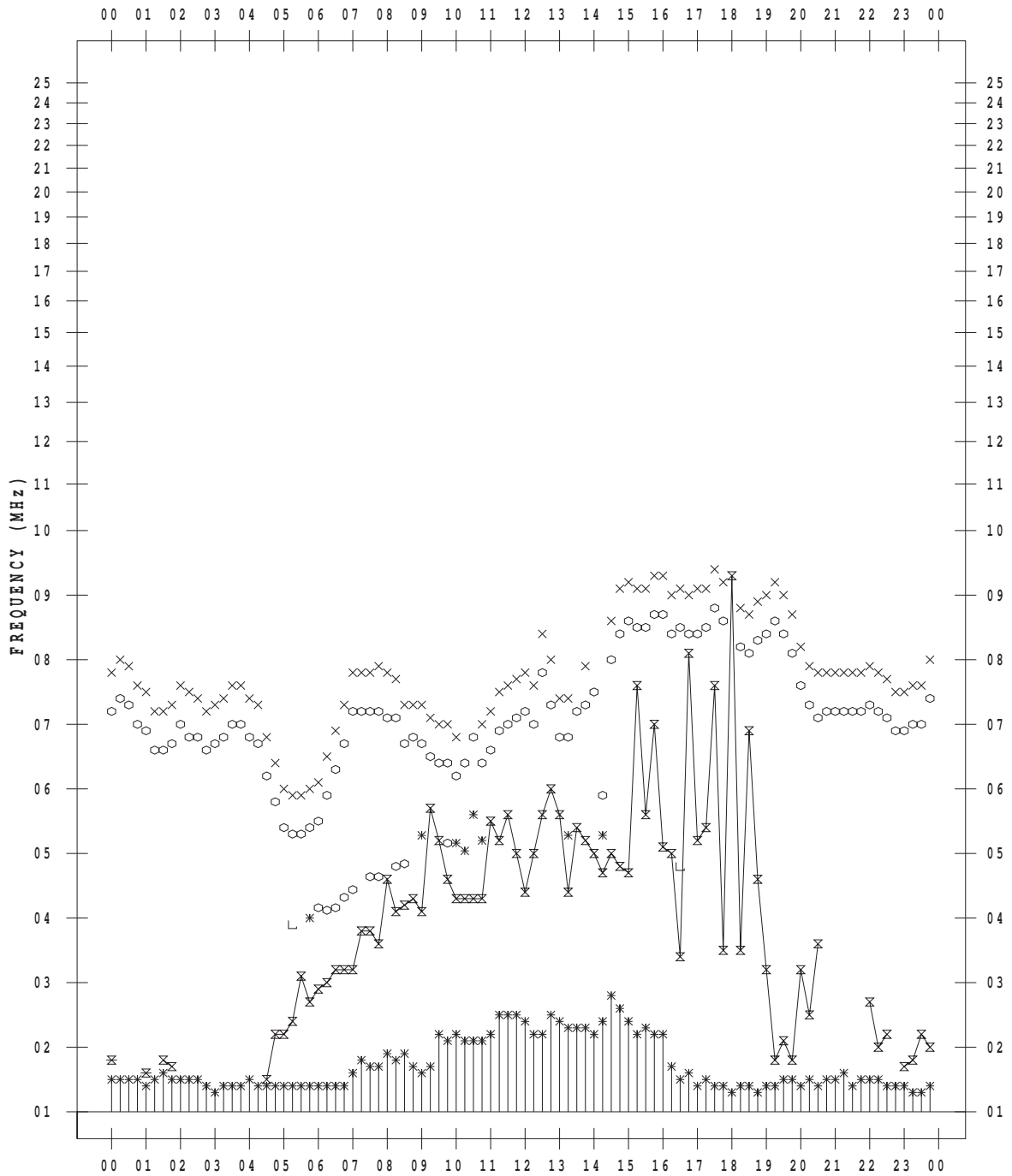
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/19

135 ° E MEAN TIME



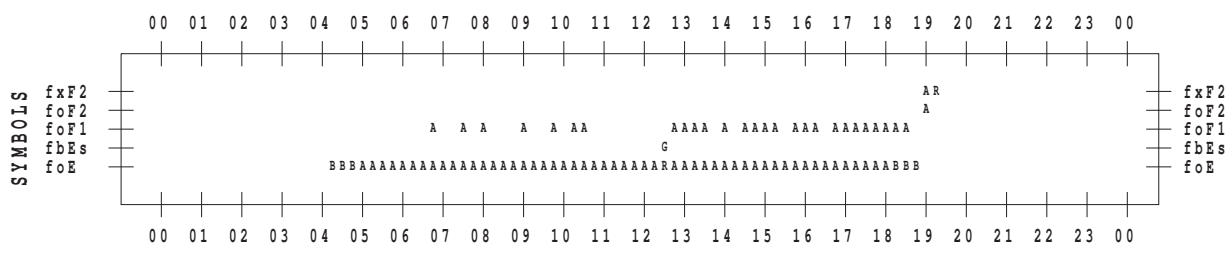
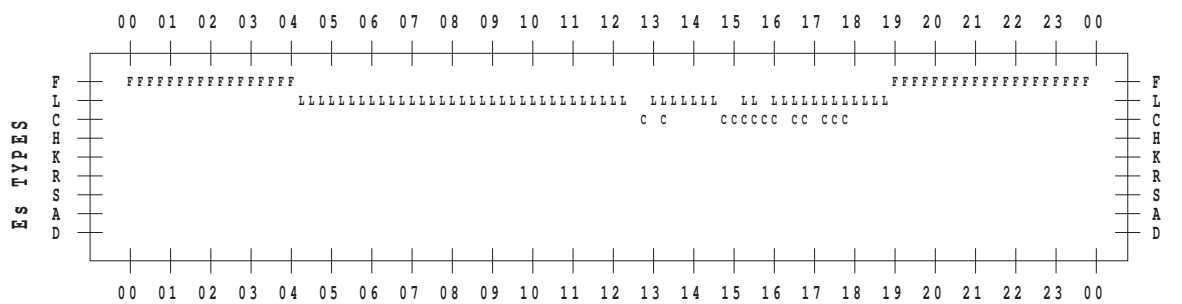
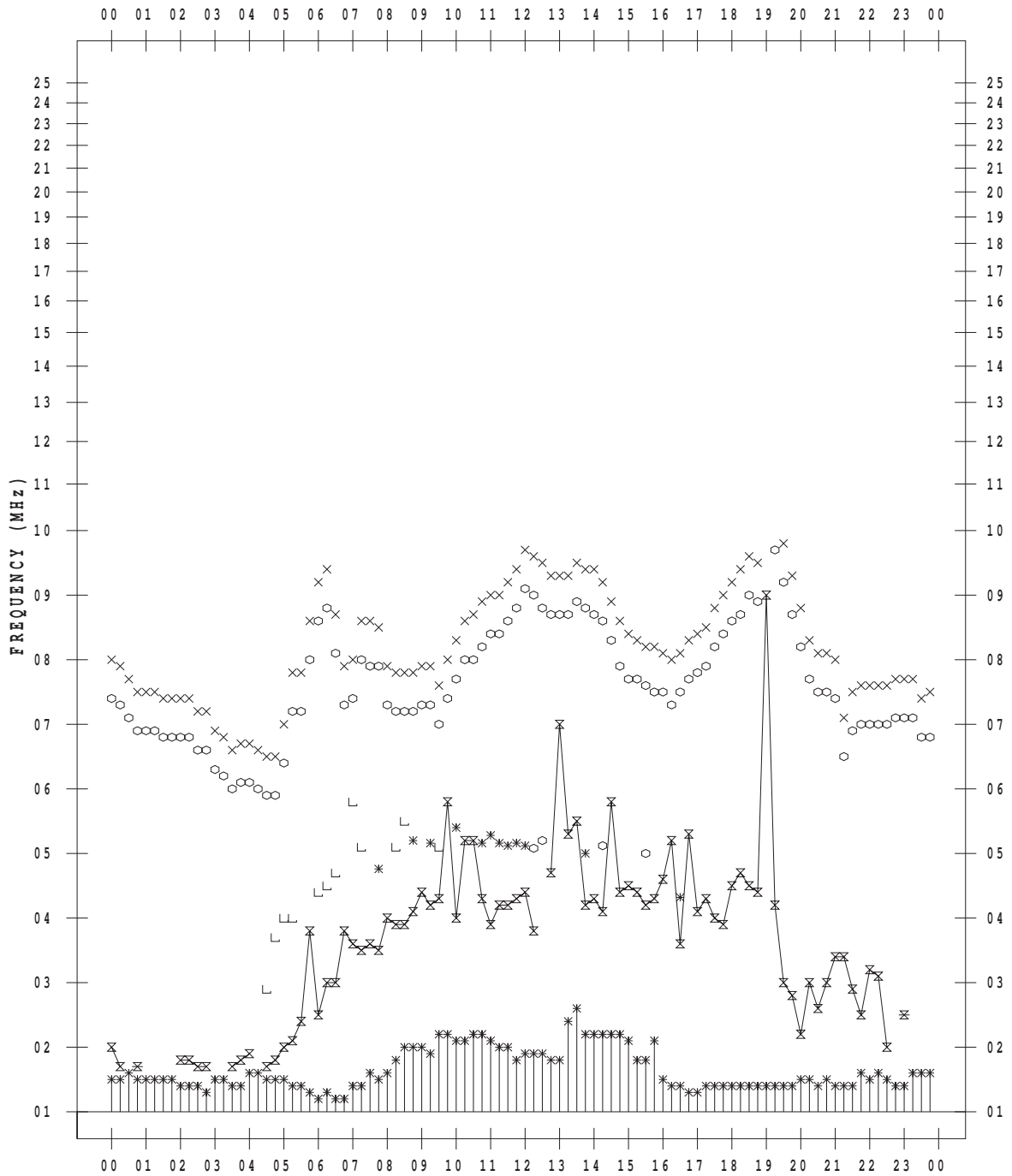
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/20

135 ° E MEAN TIME



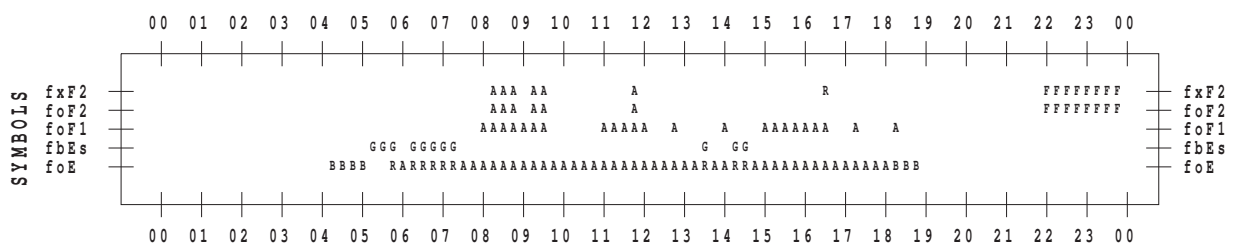
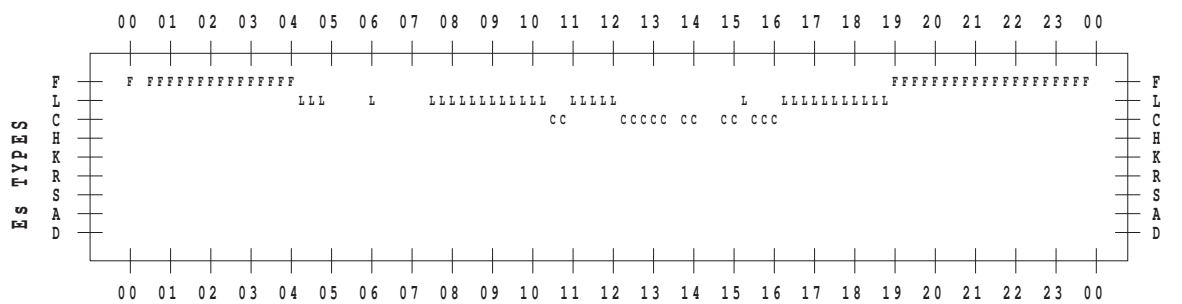
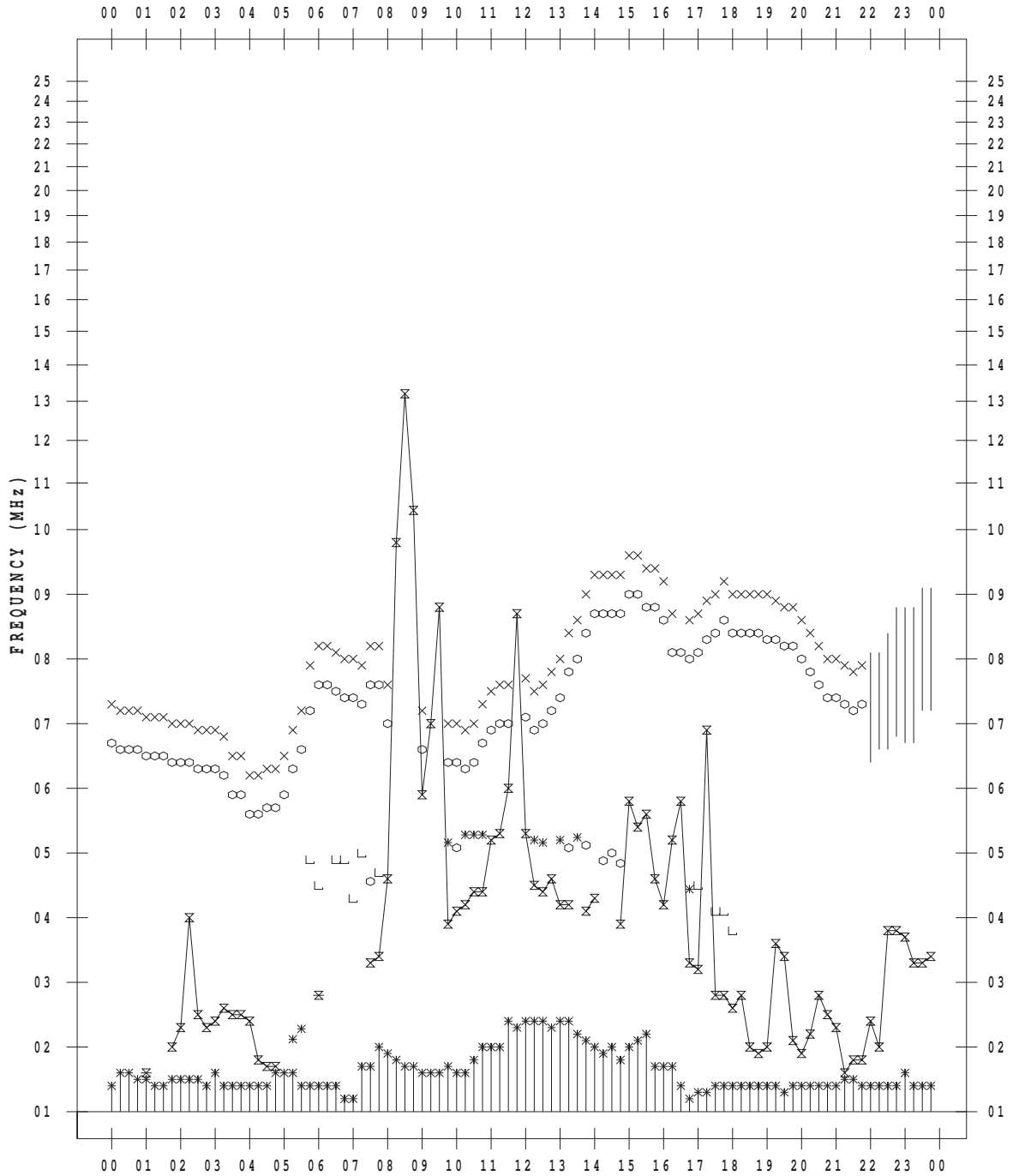
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/21

135 ° E MEAN TIME



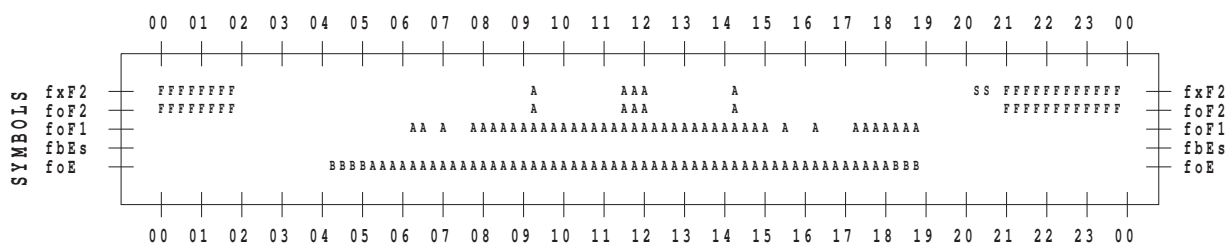
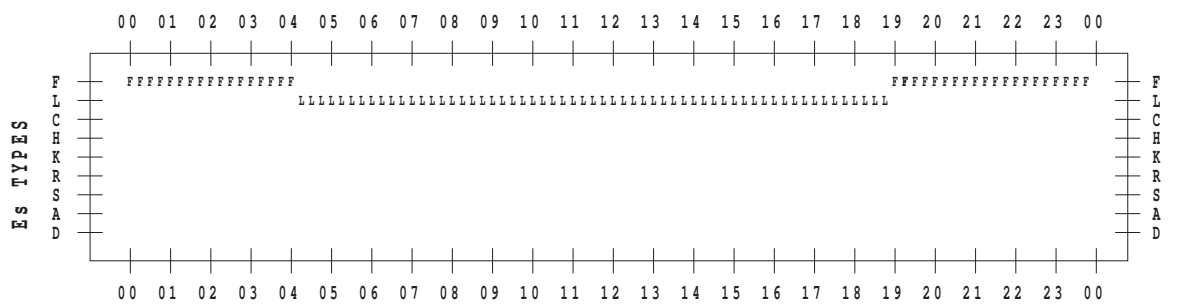
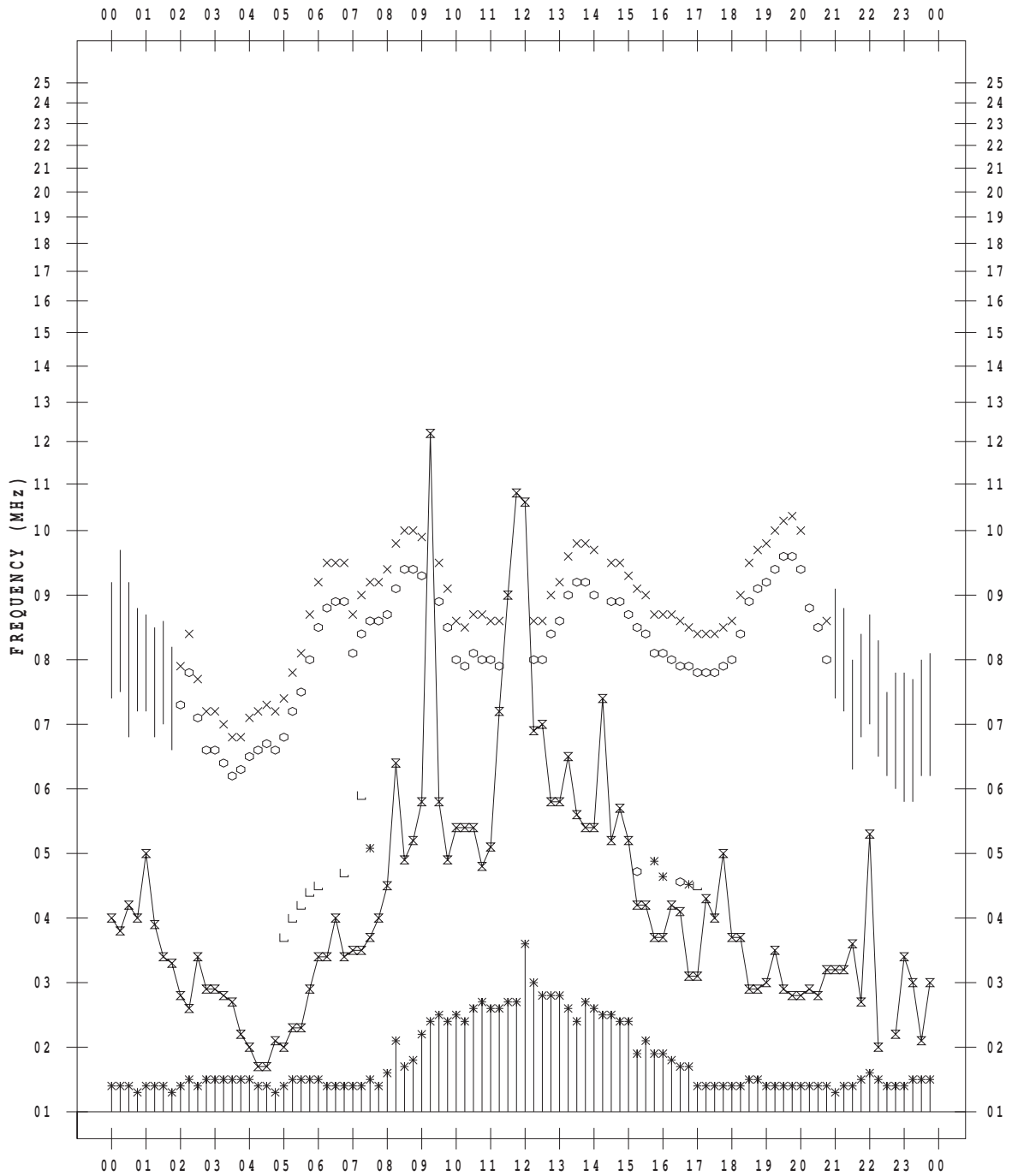
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/22

135 ° E MEAN TIME



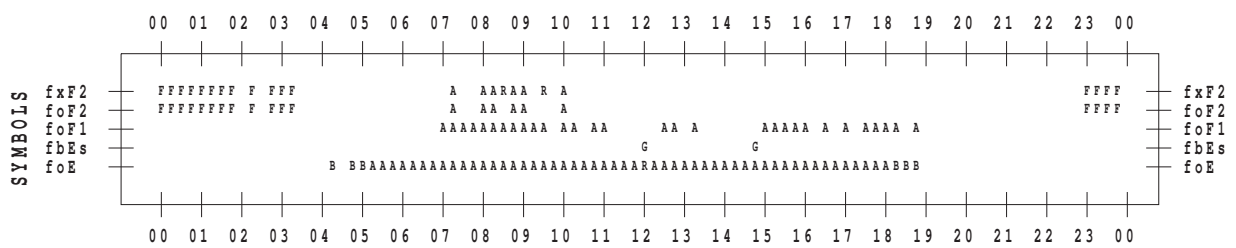
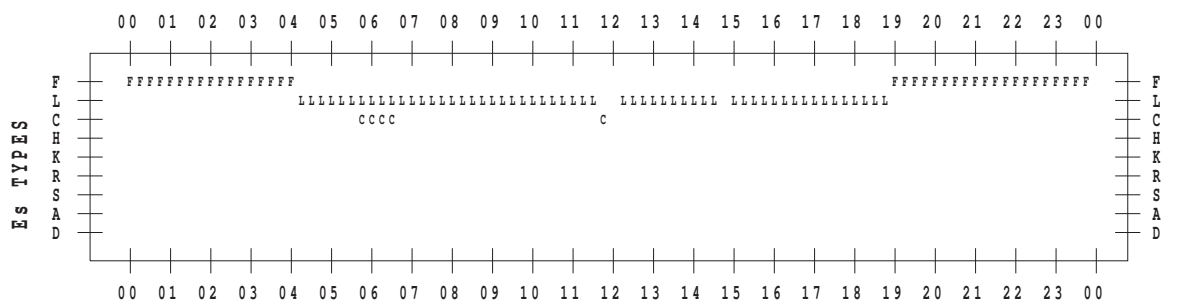
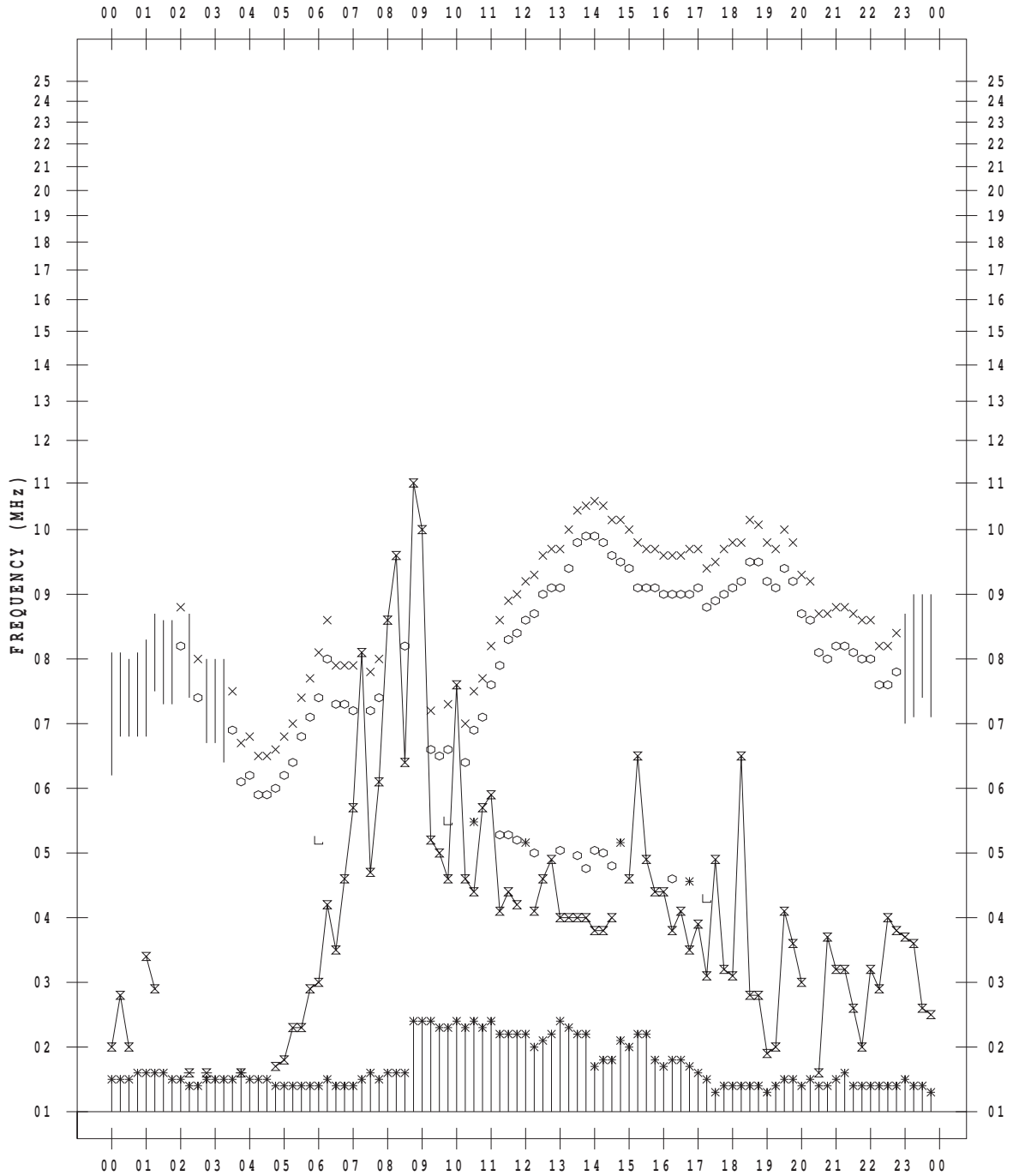
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/23

135 ° E MEAN TIME



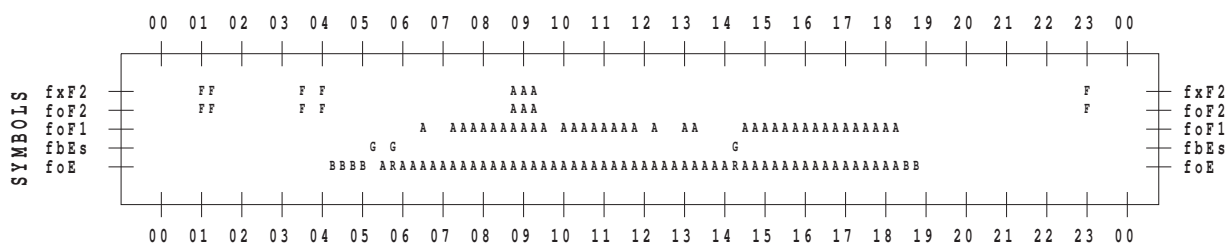
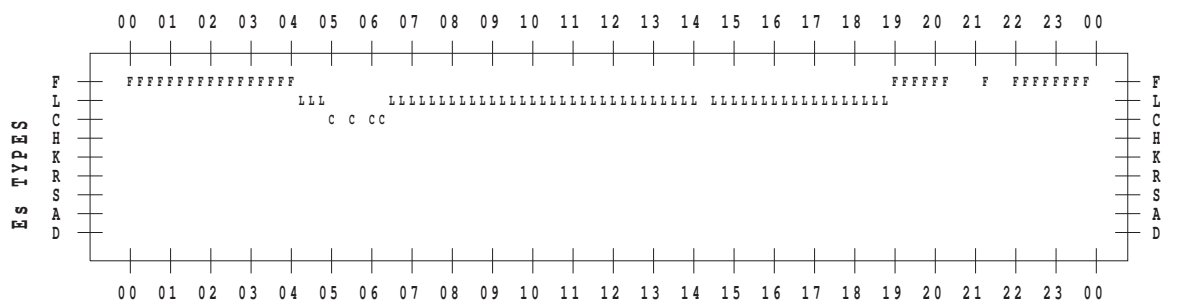
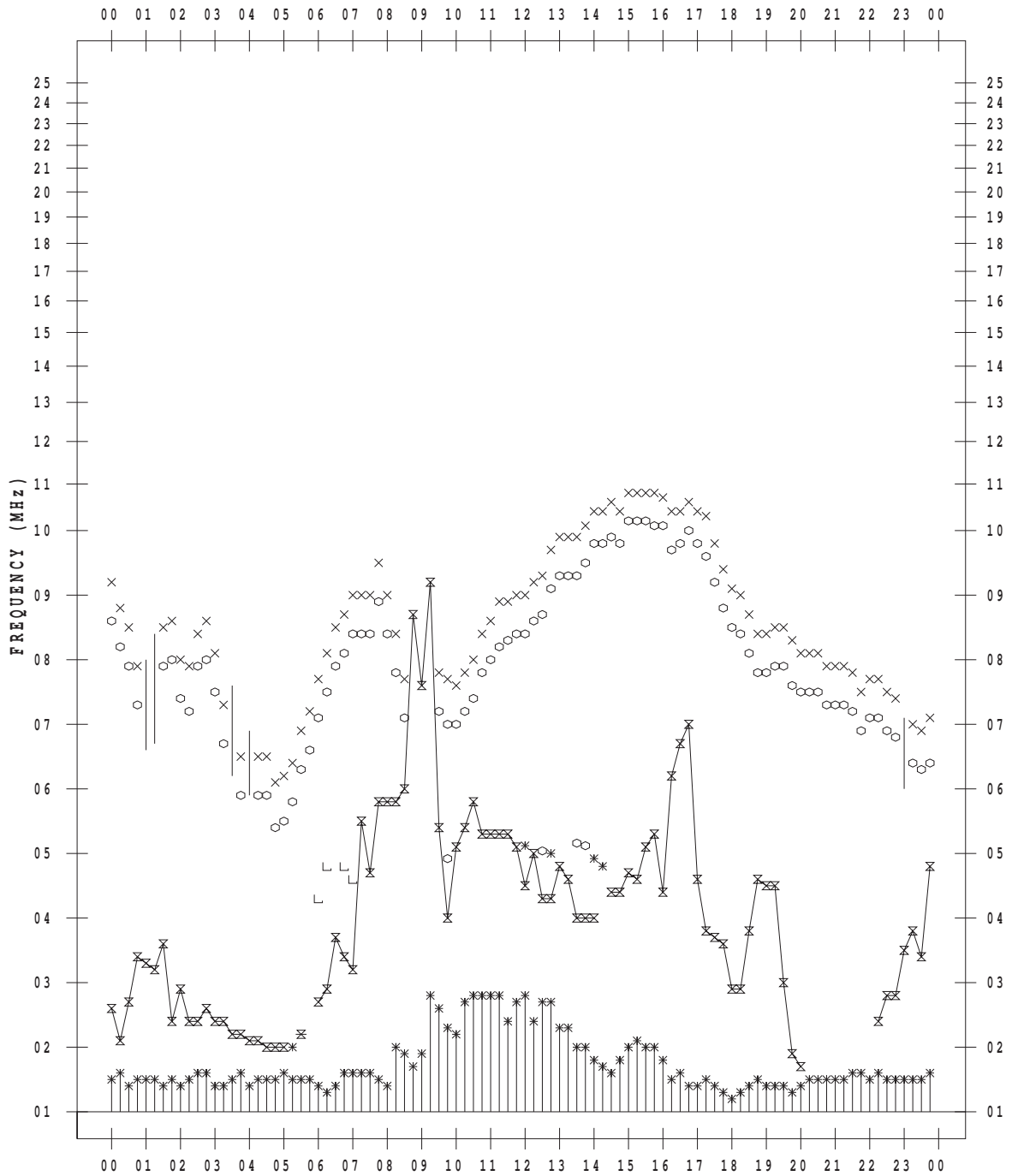
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/24

135 ° E MEAN TIME



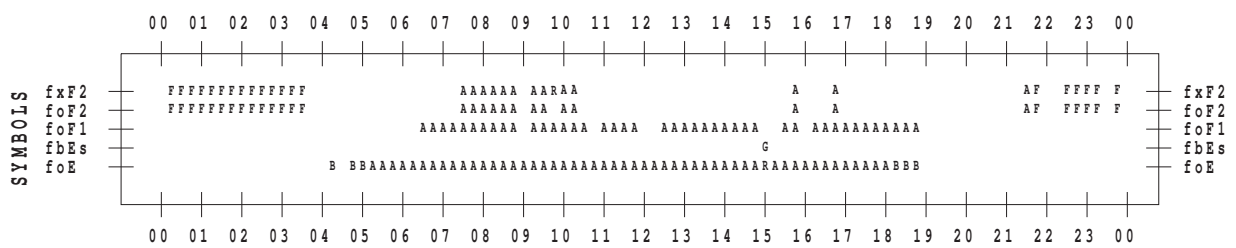
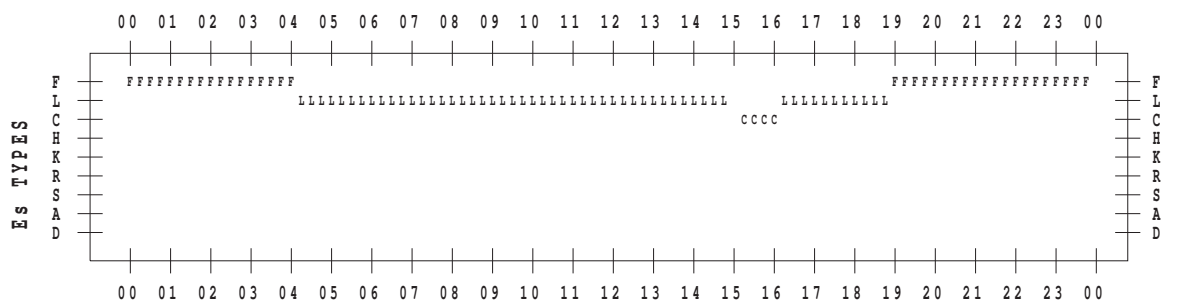
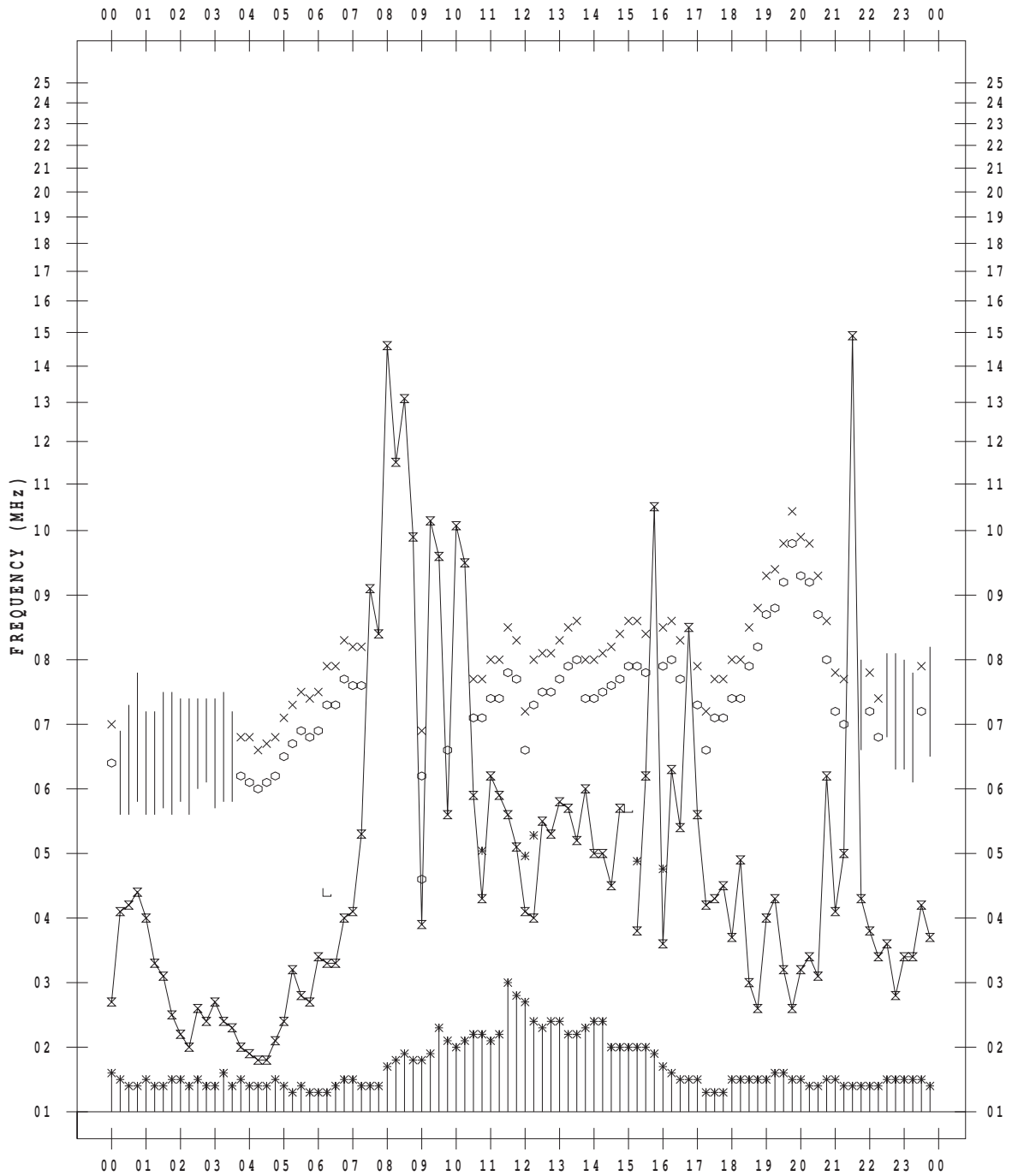
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/25

135 ° E MEAN TIME



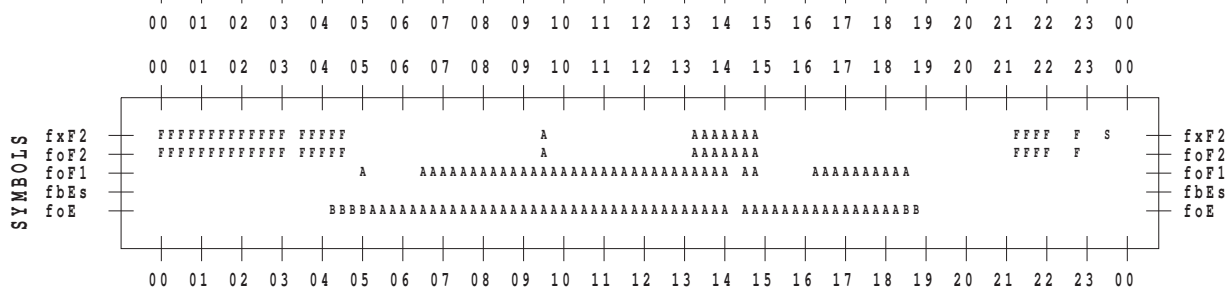
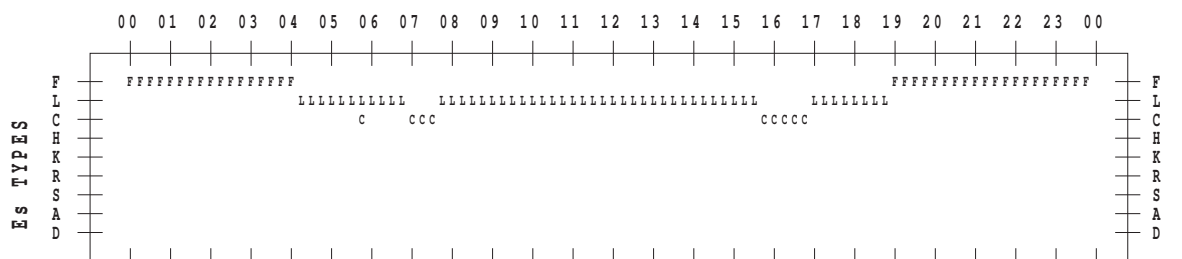
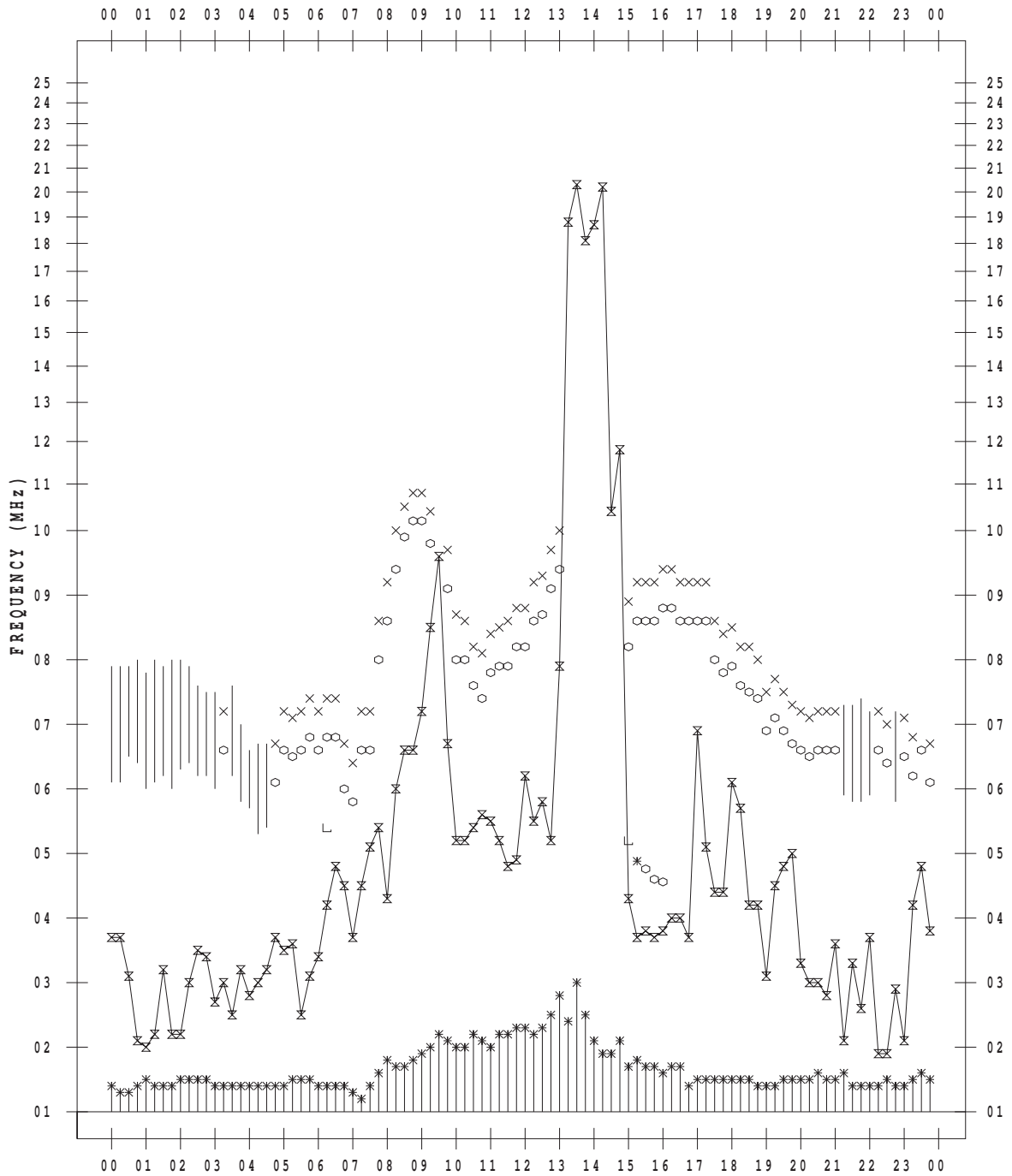
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/26

135 ° E MEAN TIME



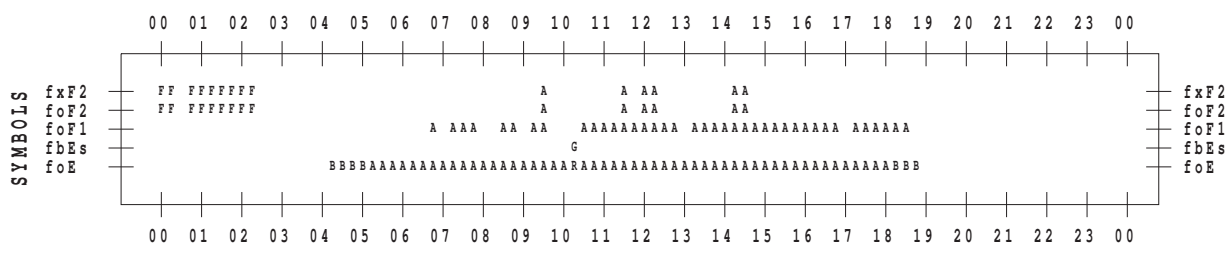
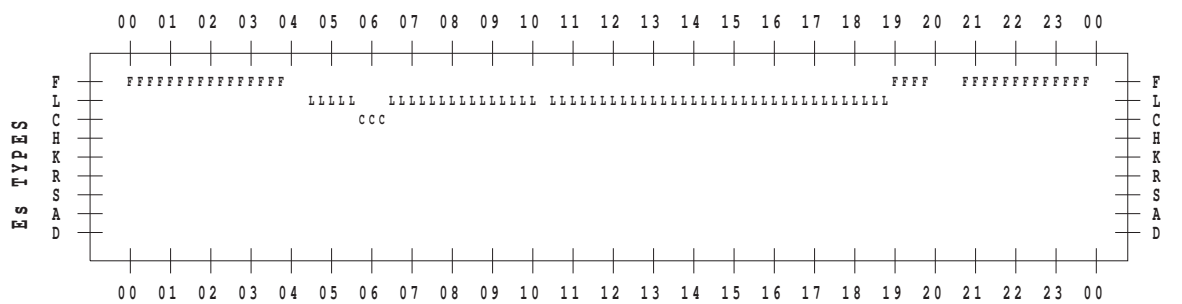
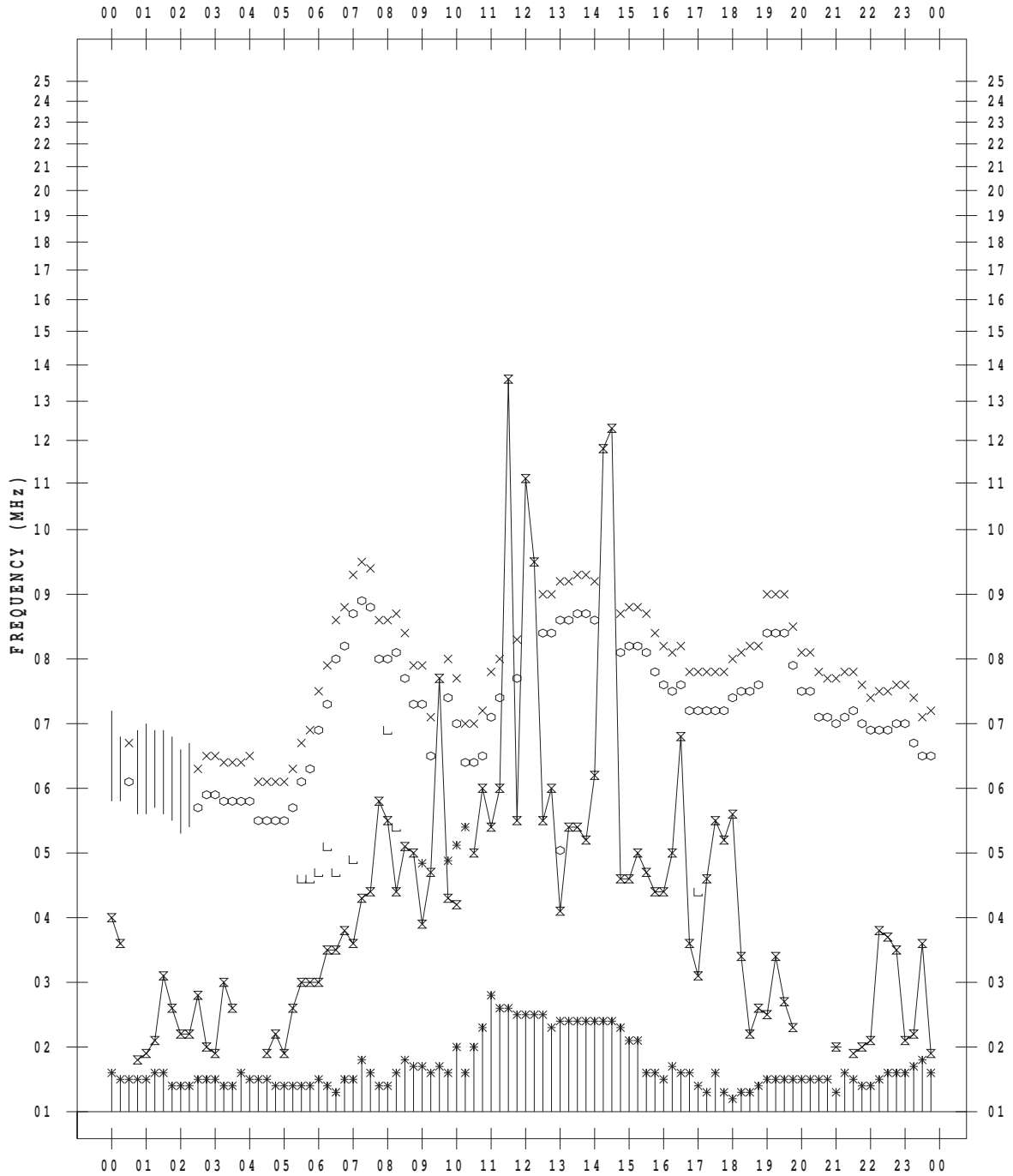
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/27

135 ° E MEAN TIME



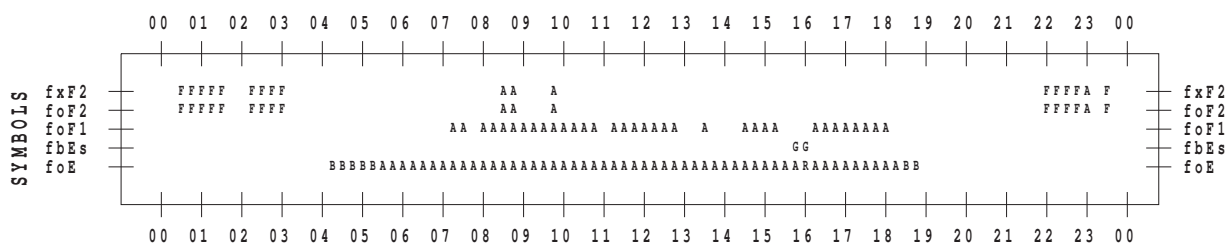
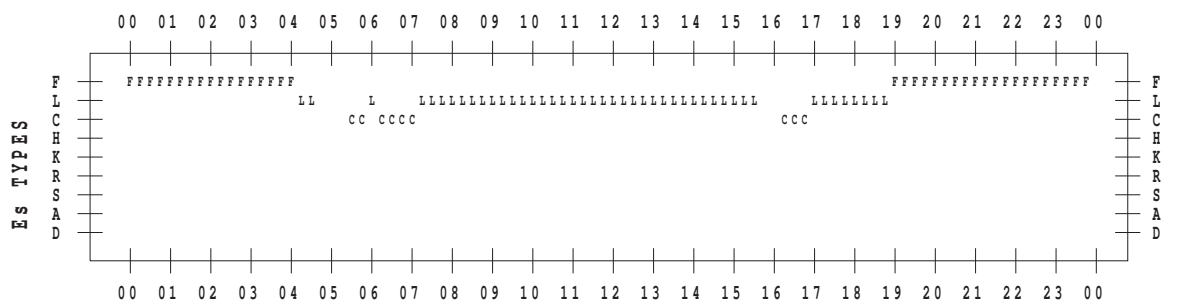
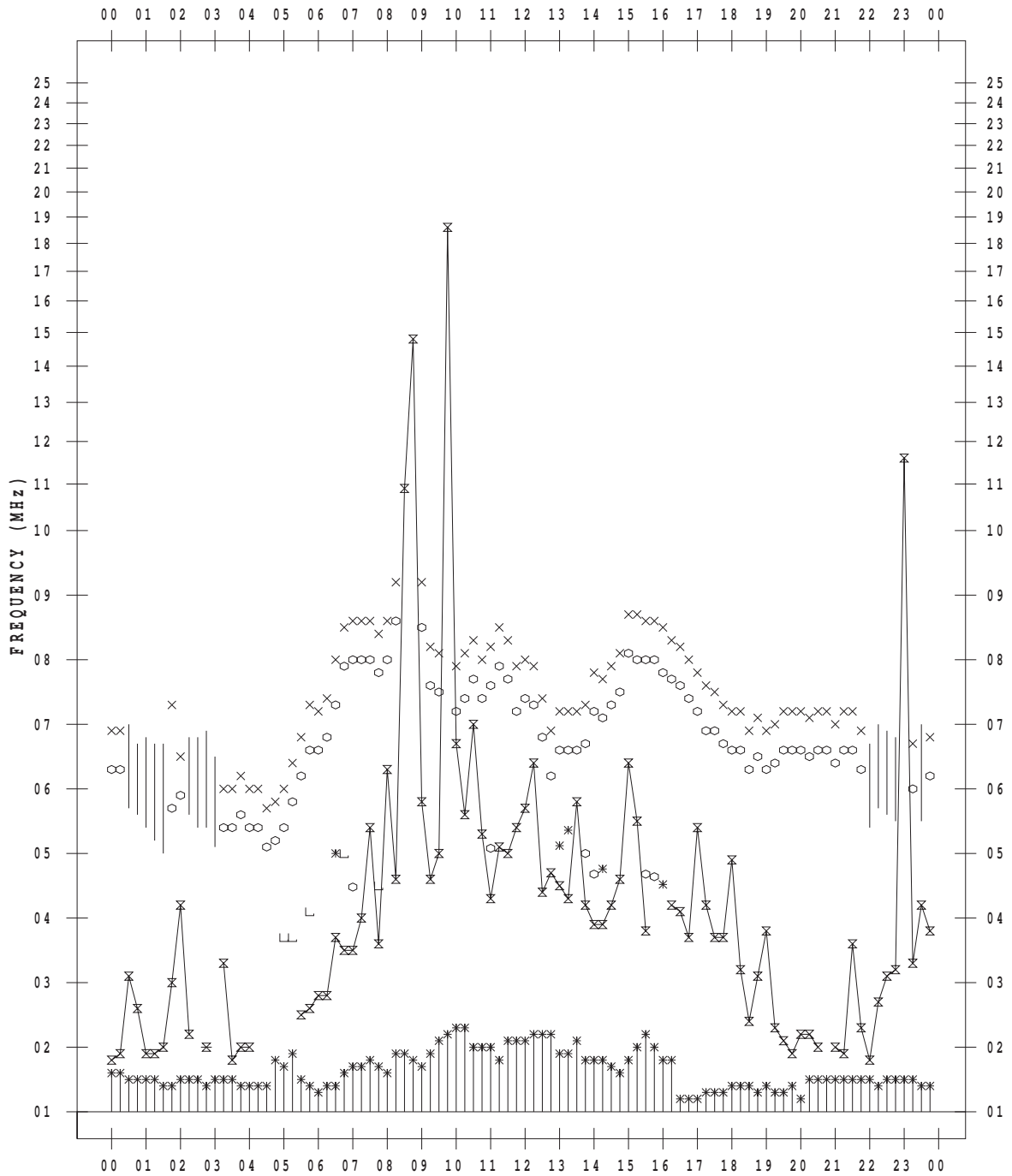
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/28

135 ° E MEAN TIME



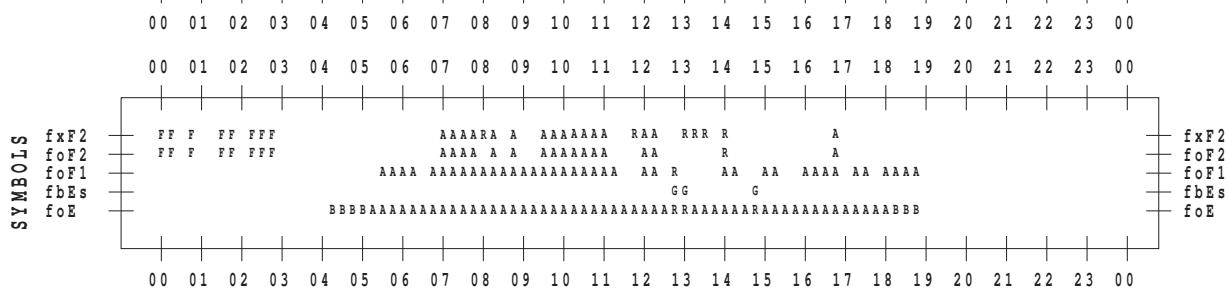
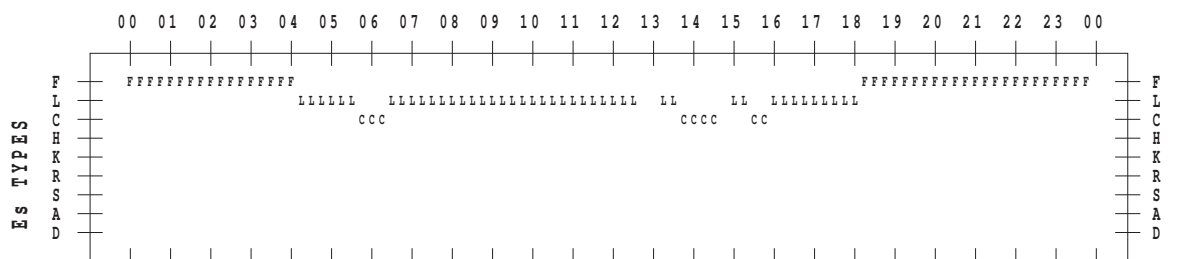
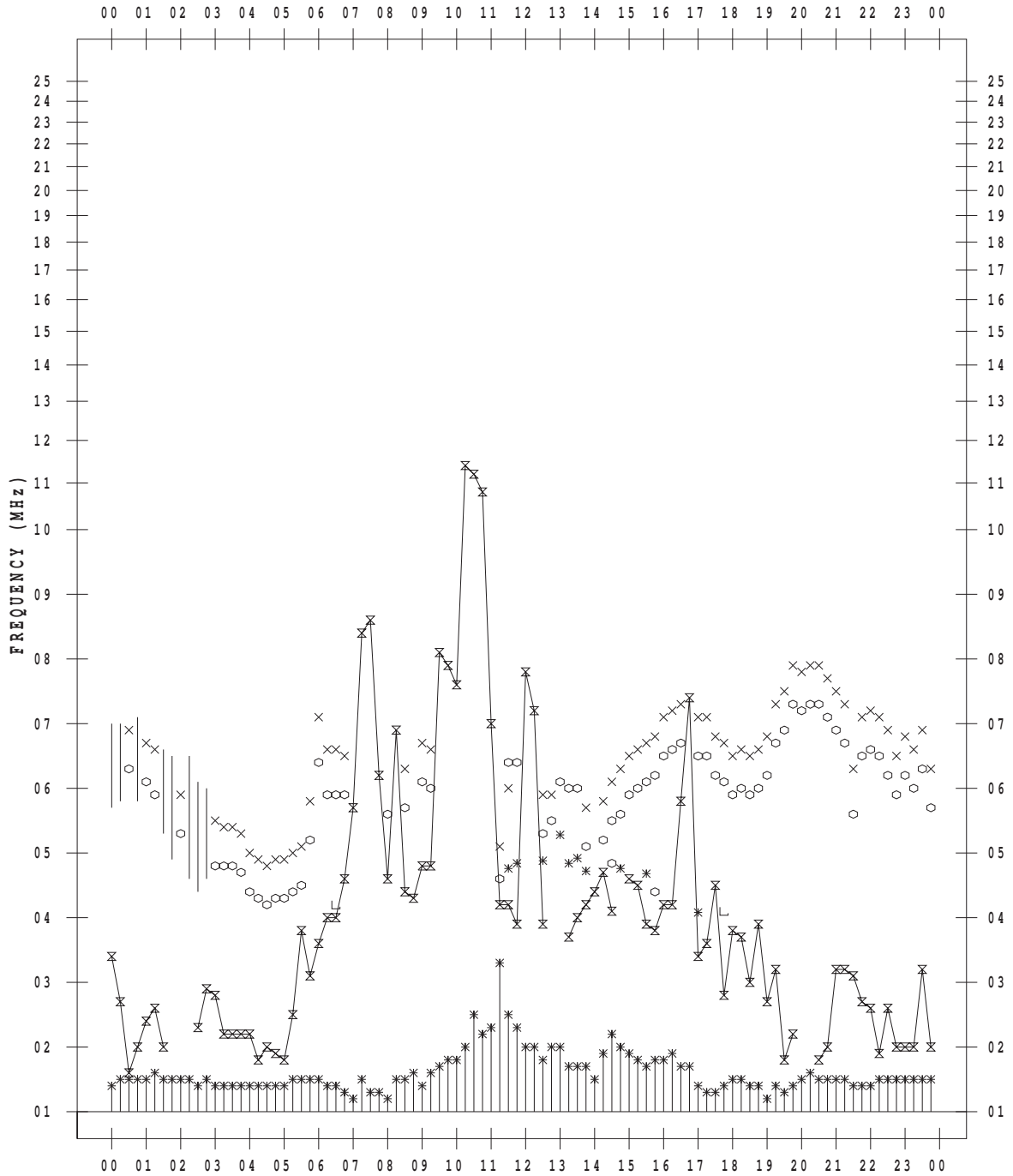
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/29

135 ° E MEAN TIME



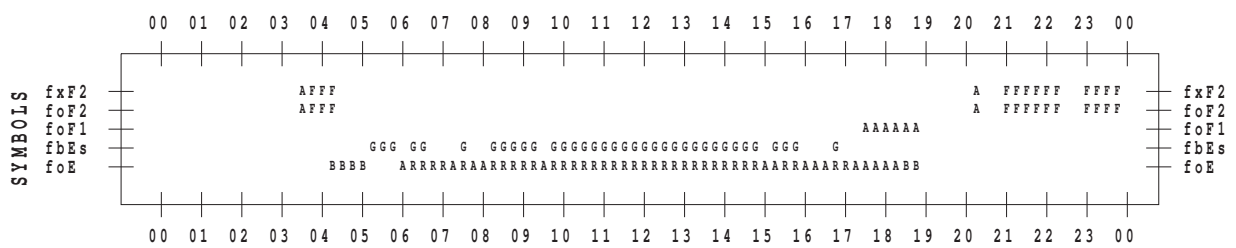
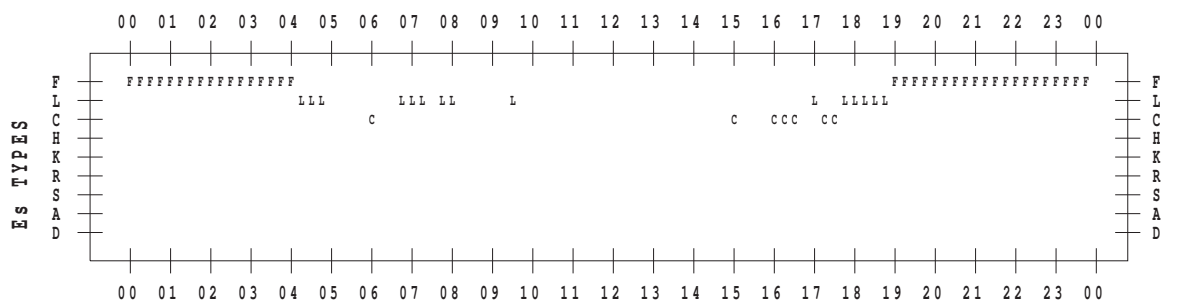
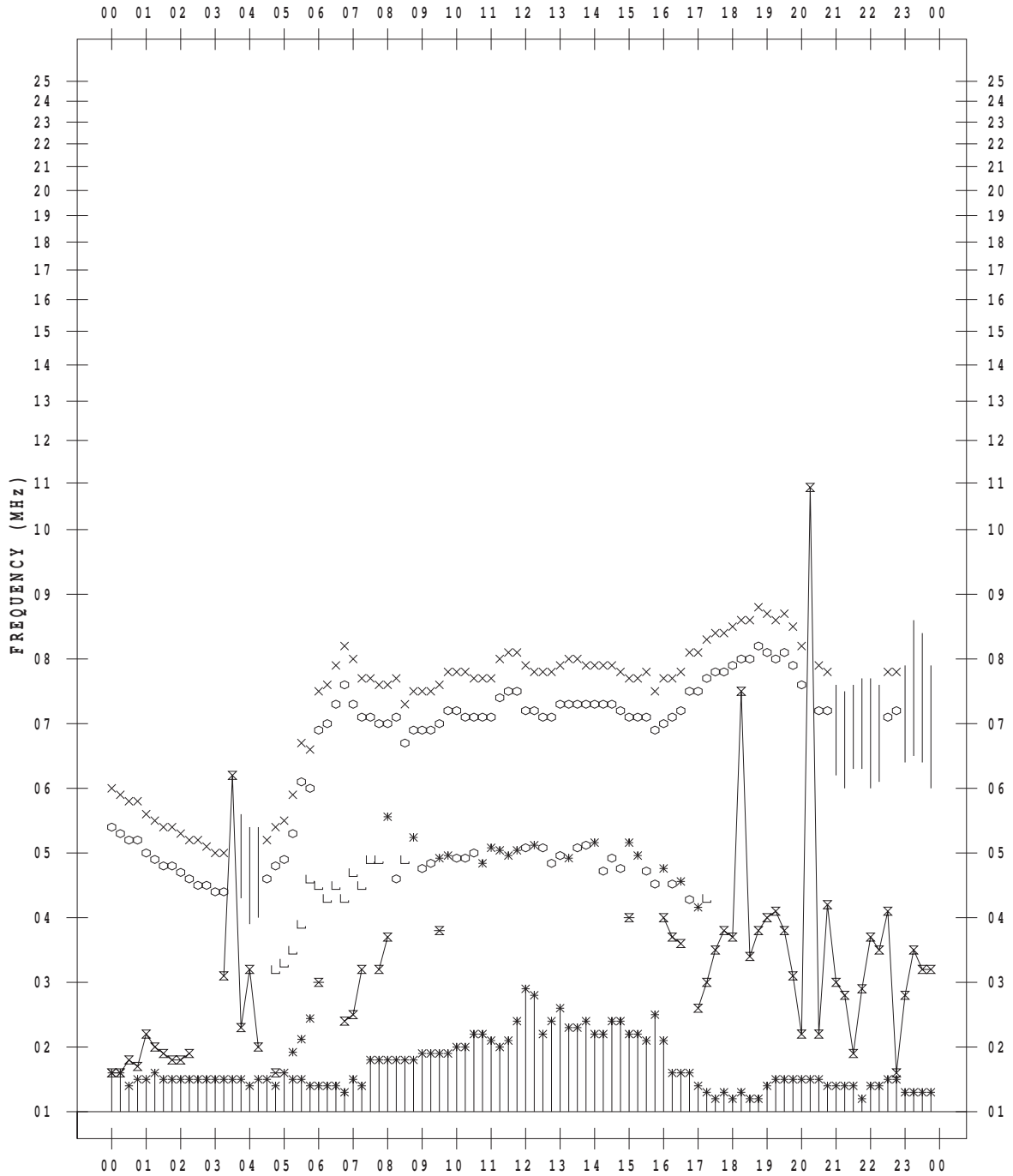
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/30

135 ° E MEAN TIME



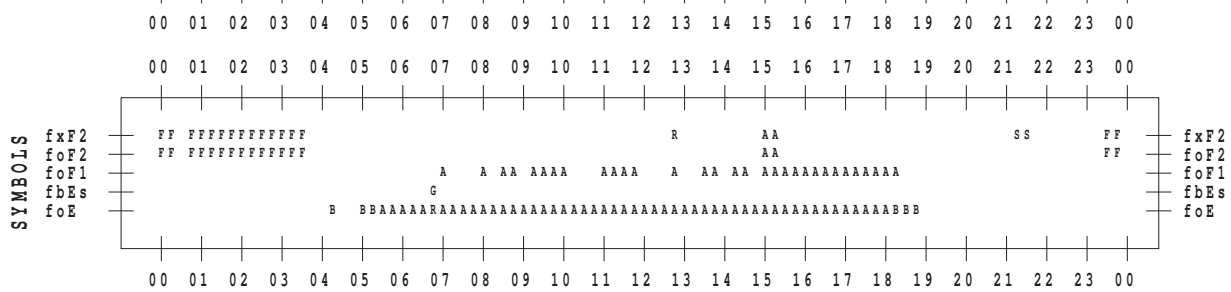
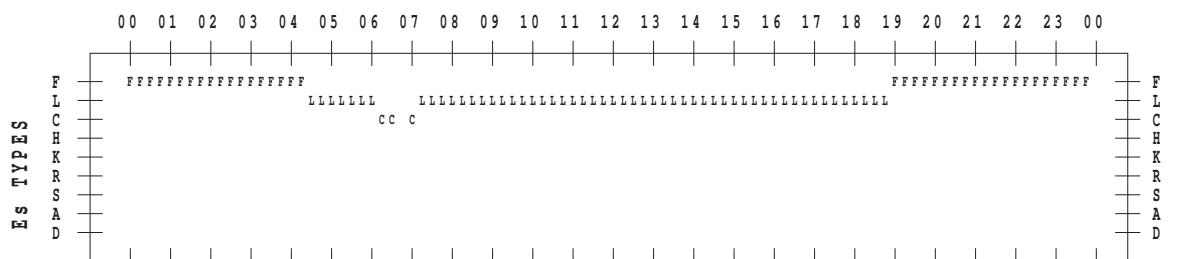
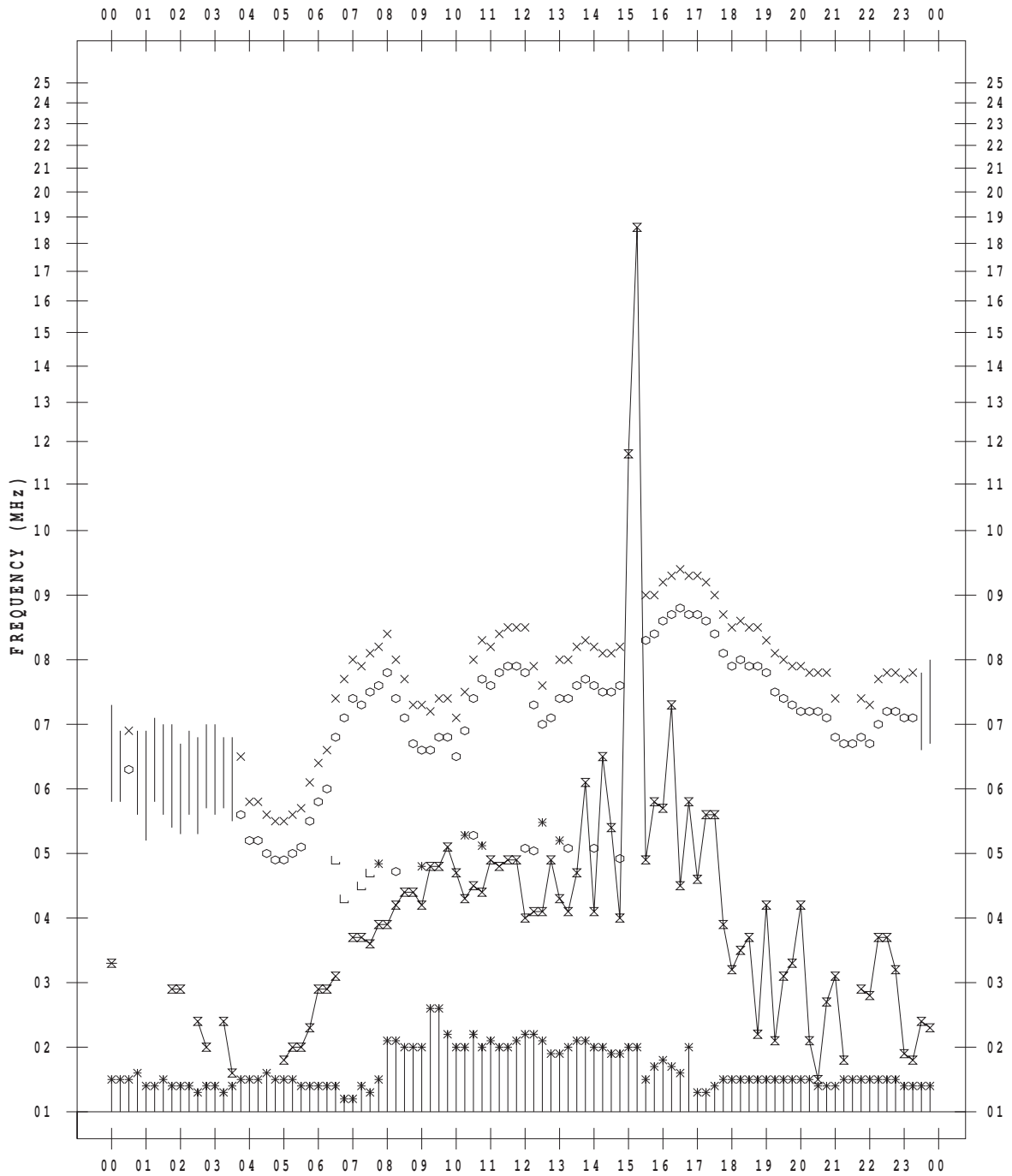
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2013/ 7/31

135 ° E MEAN TIME



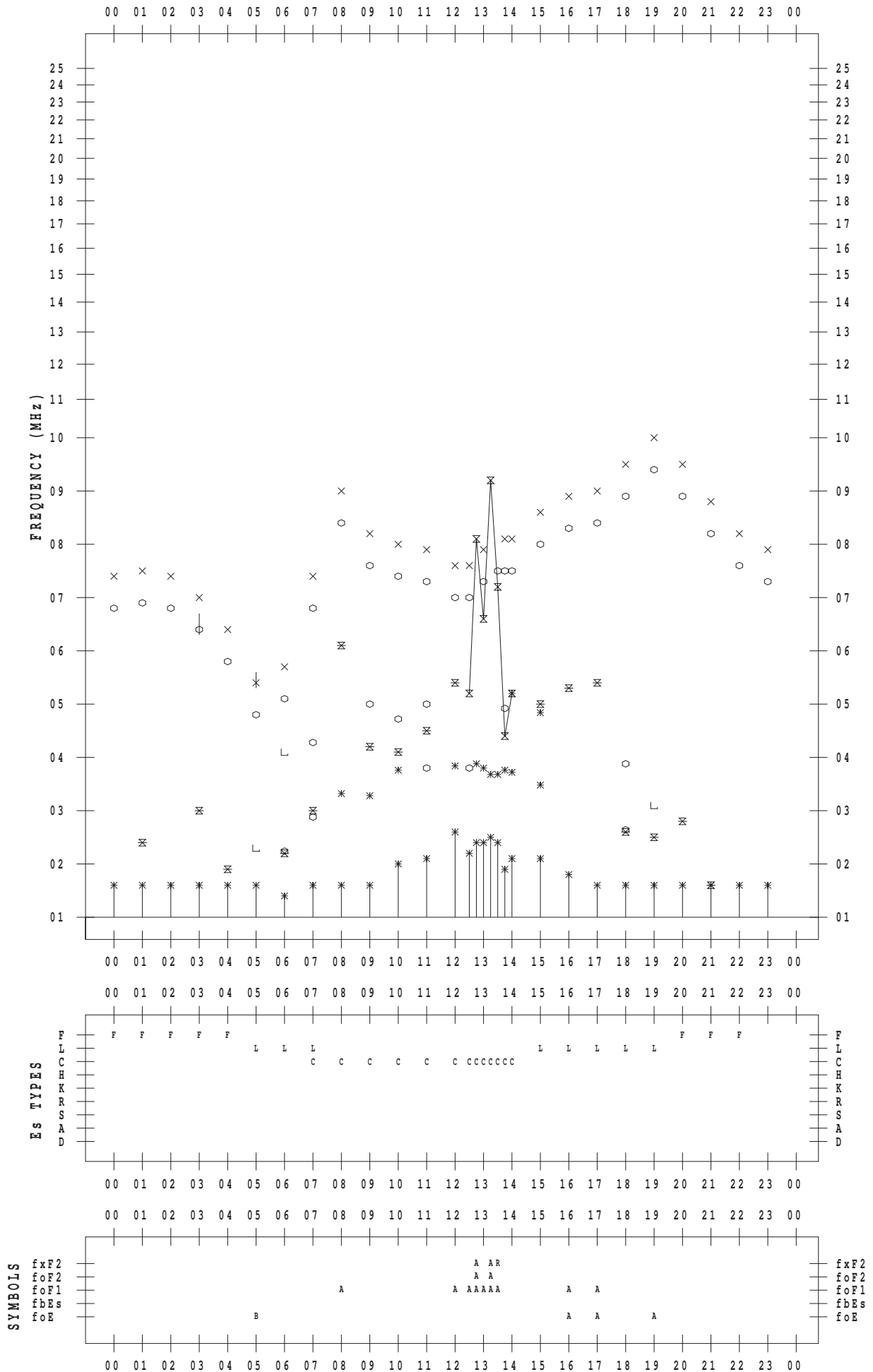
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/ 1

135 ° E MEAN TIME



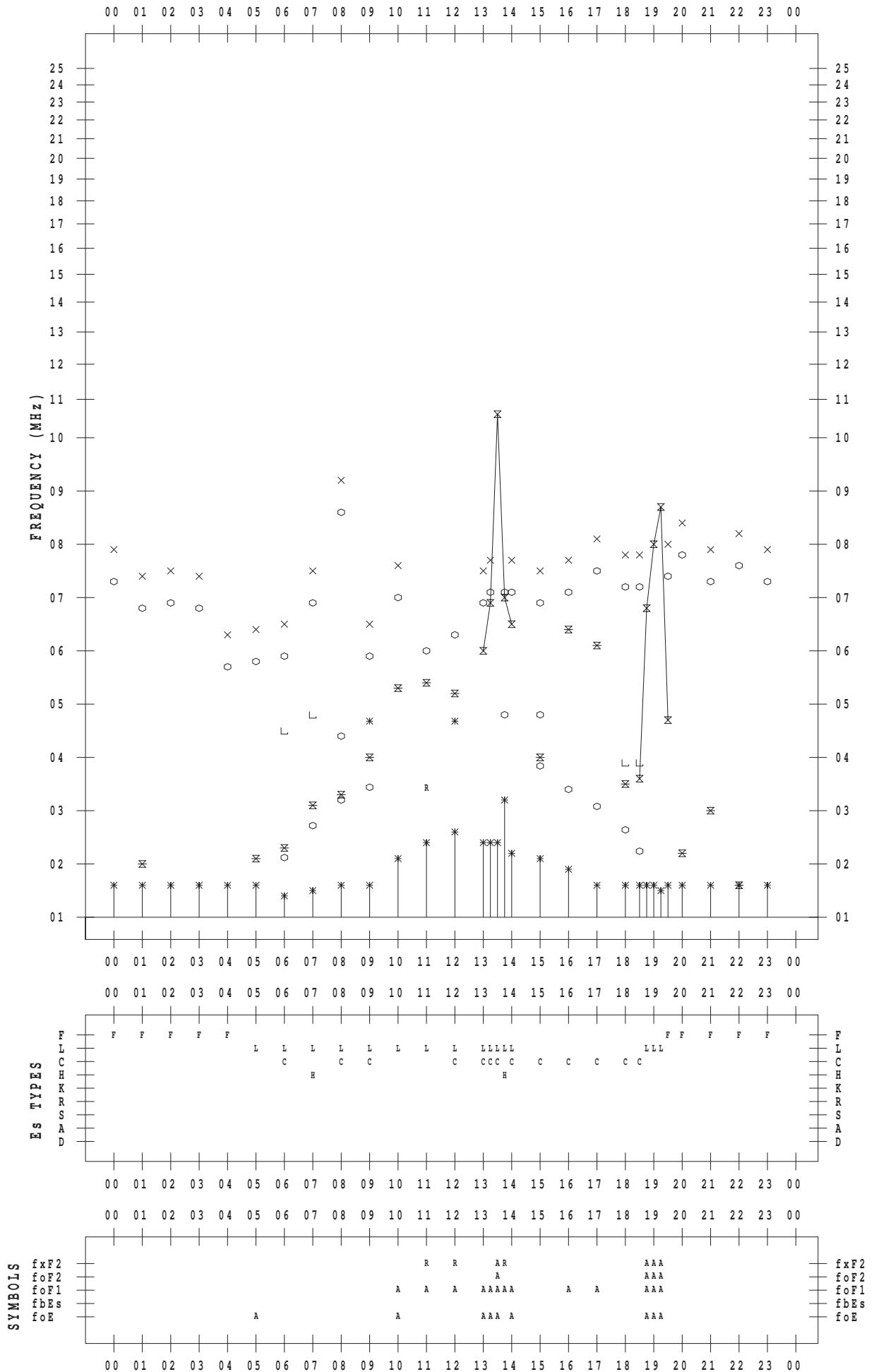
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/ 2

135 ° E MEAN TIME



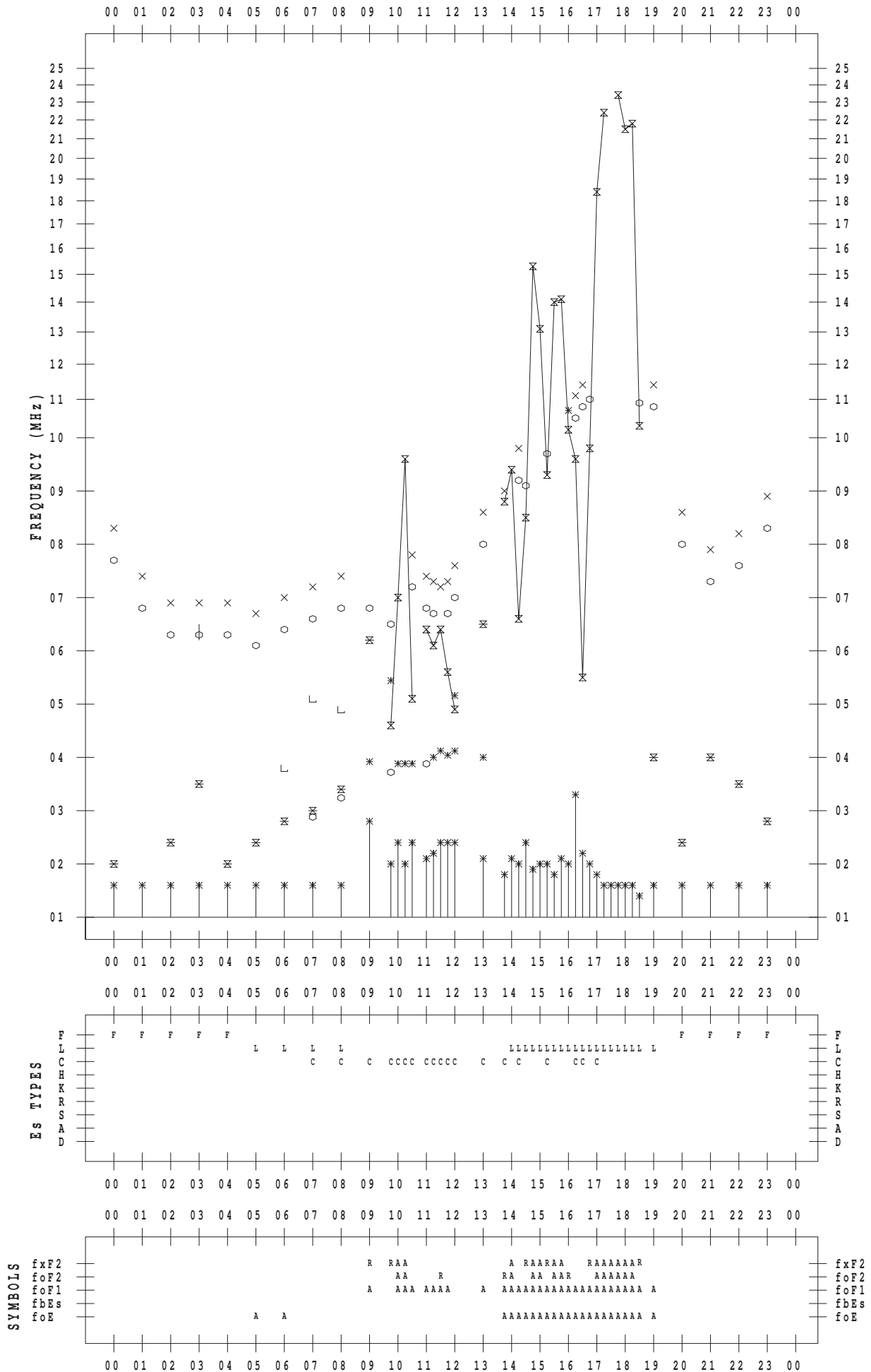
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/ 3

135 ° E MEAN TIME



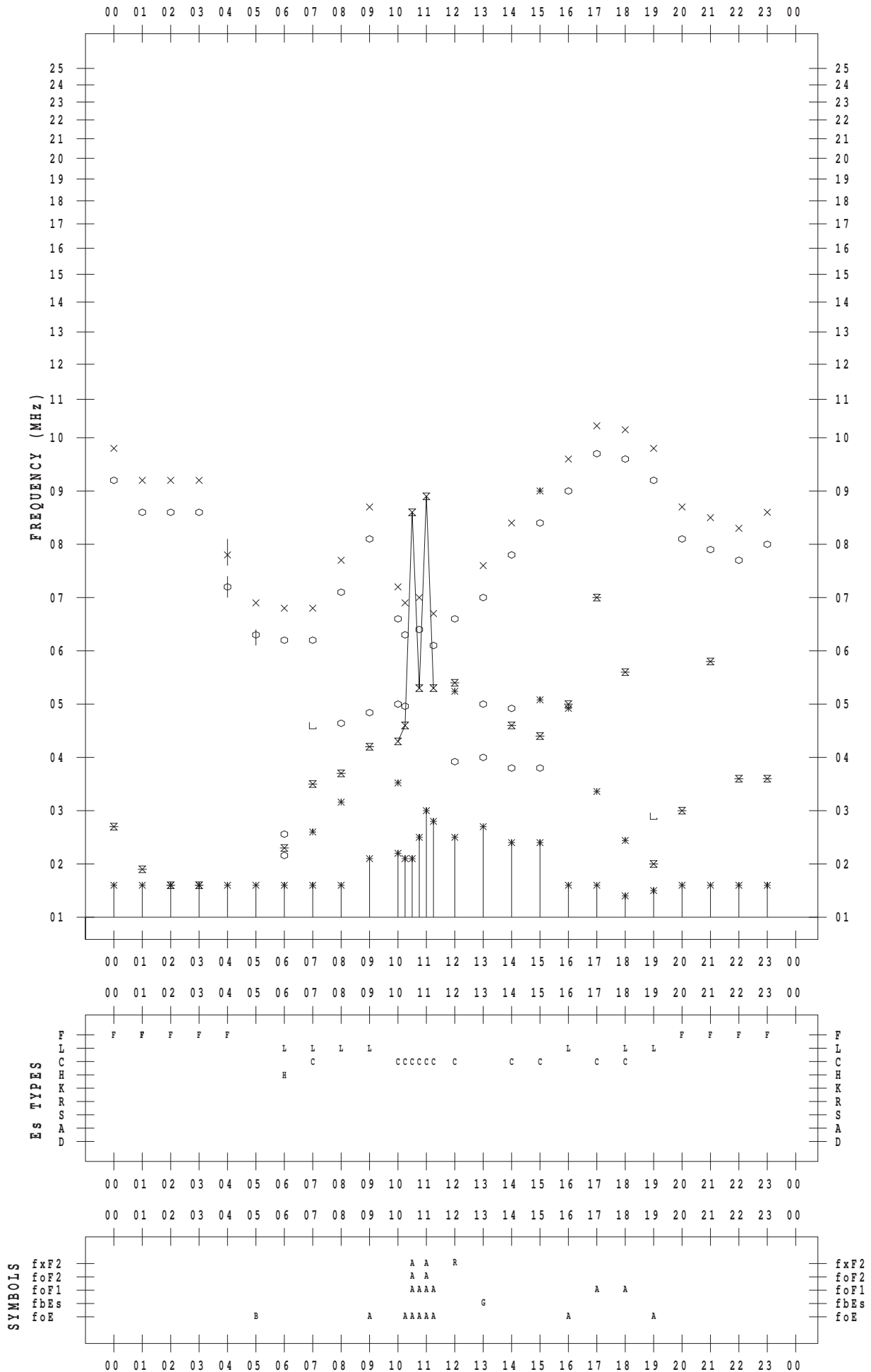
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/ 4

135 ° E MEAN TIME



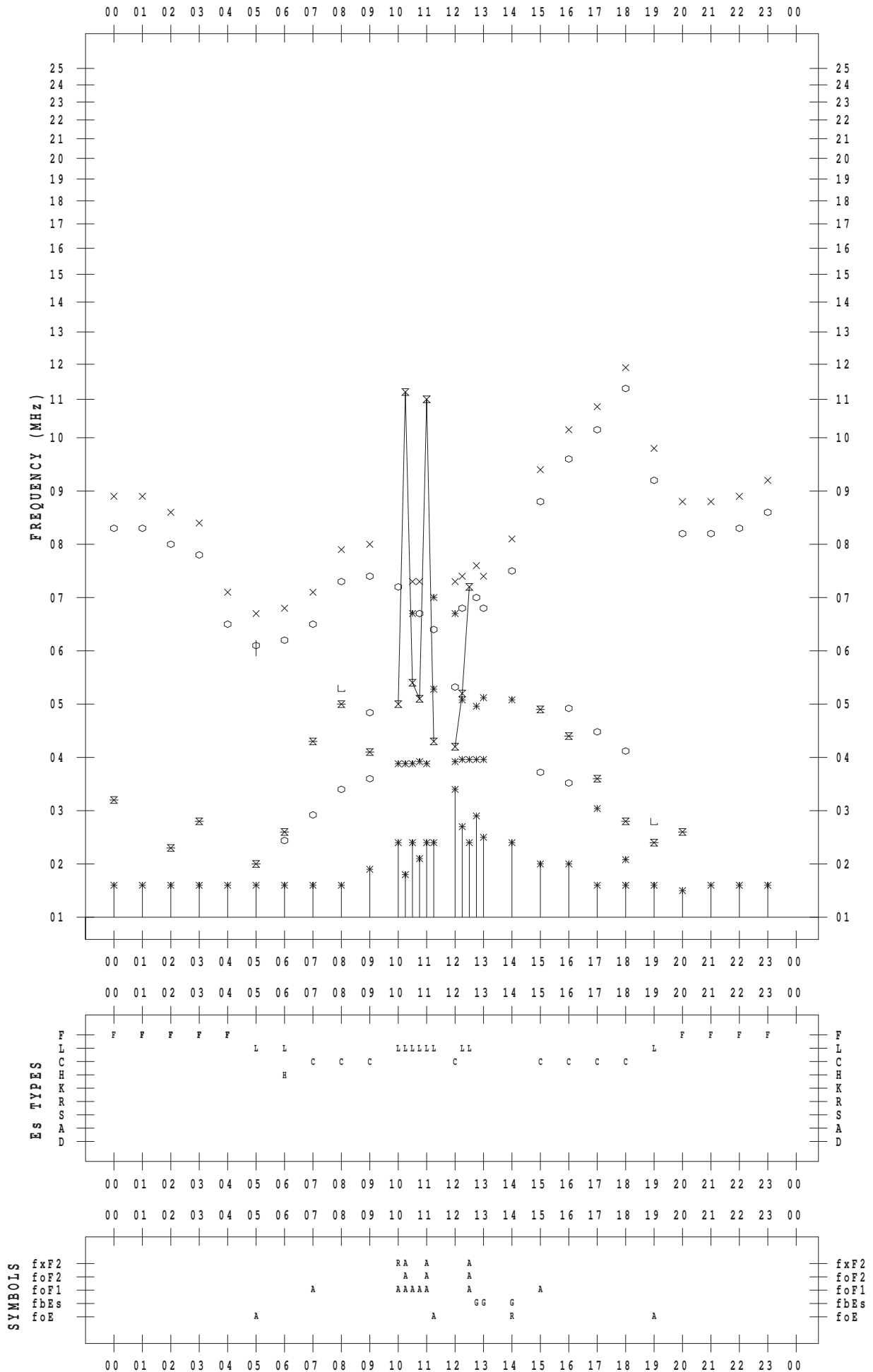
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/ 5

135 ° E MEAN TIME



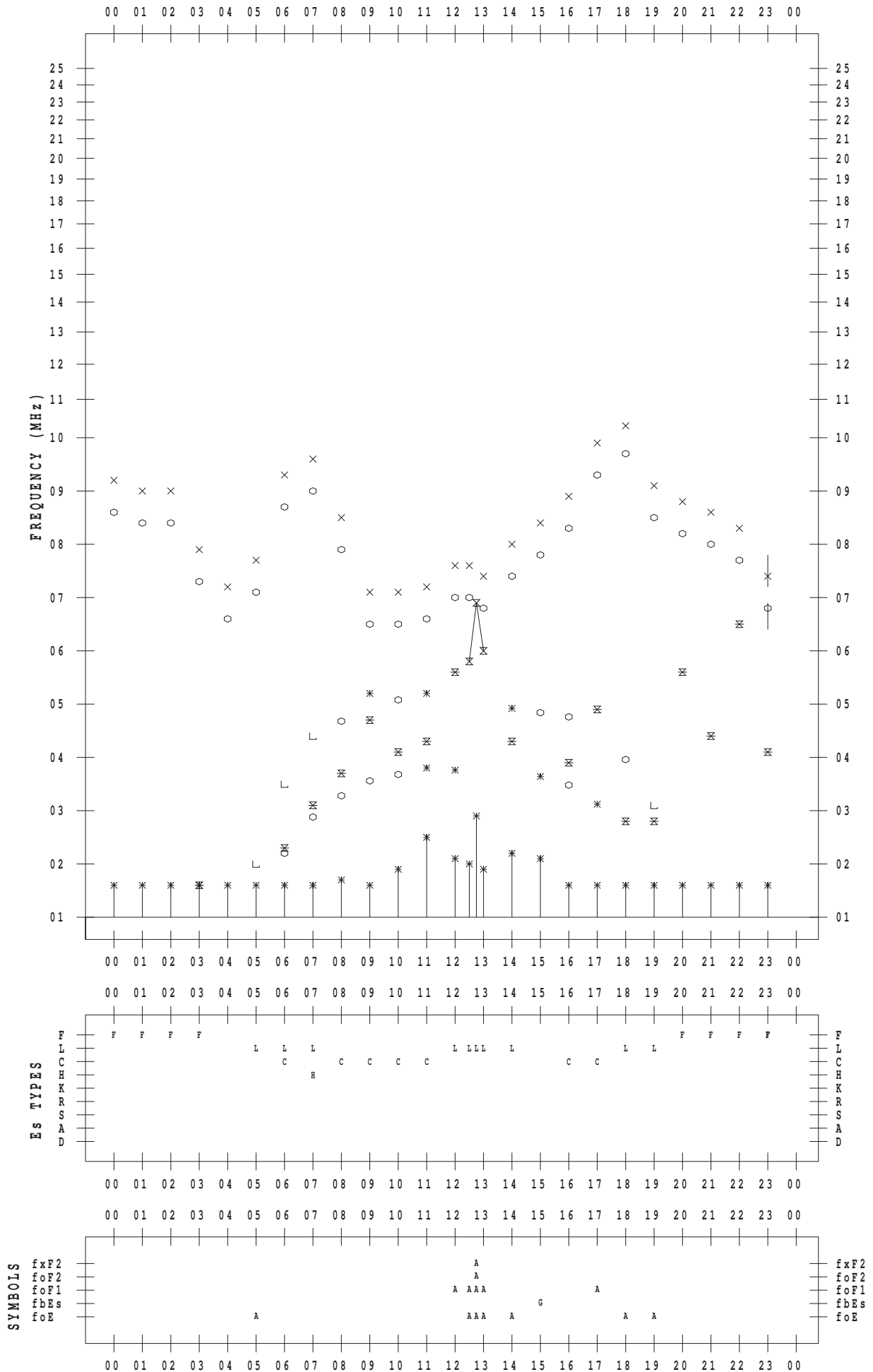
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/ 6

135 ° E MEAN TIME



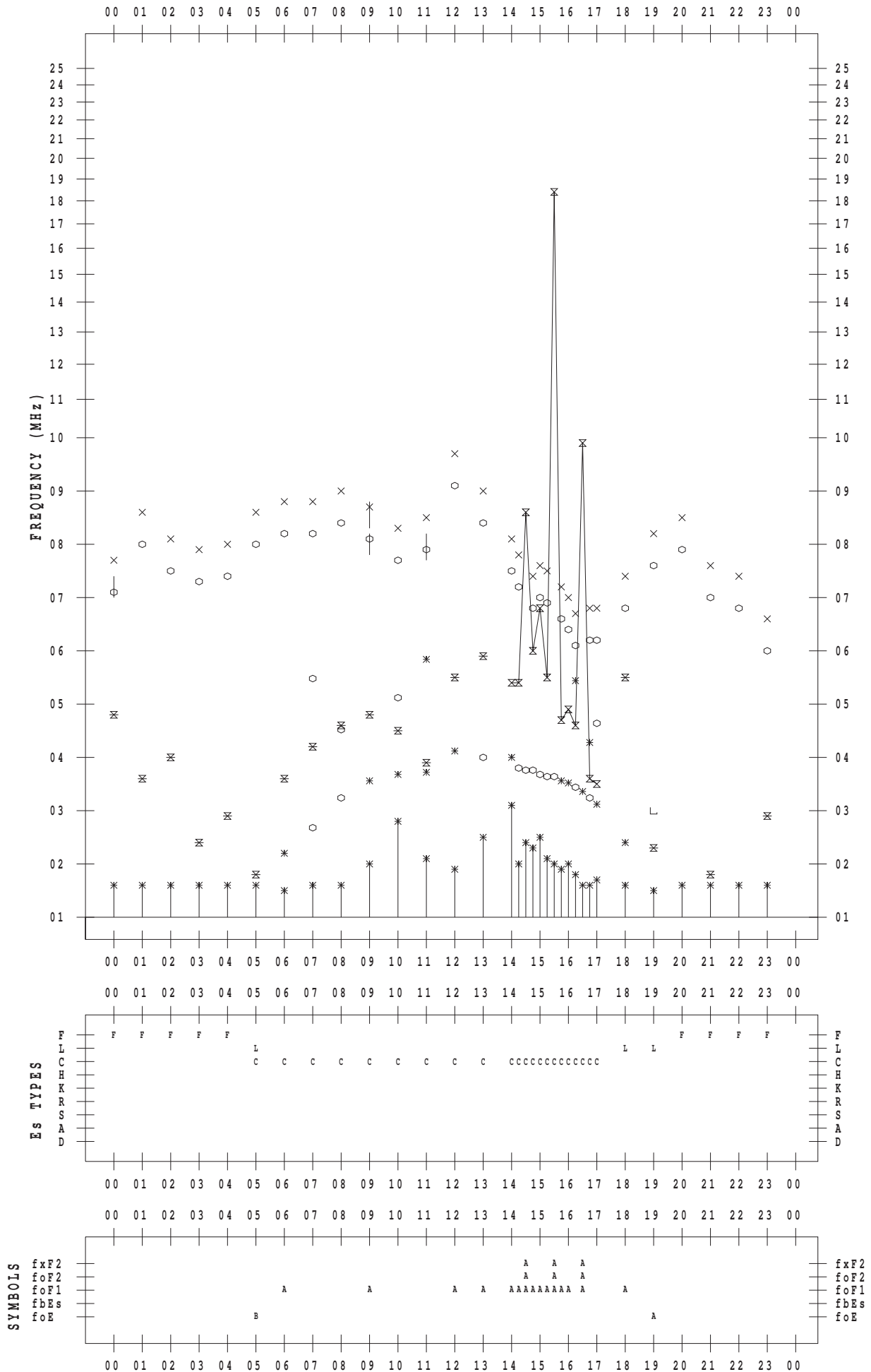
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013 / 7 / 7

135 ° E MEAN TIME



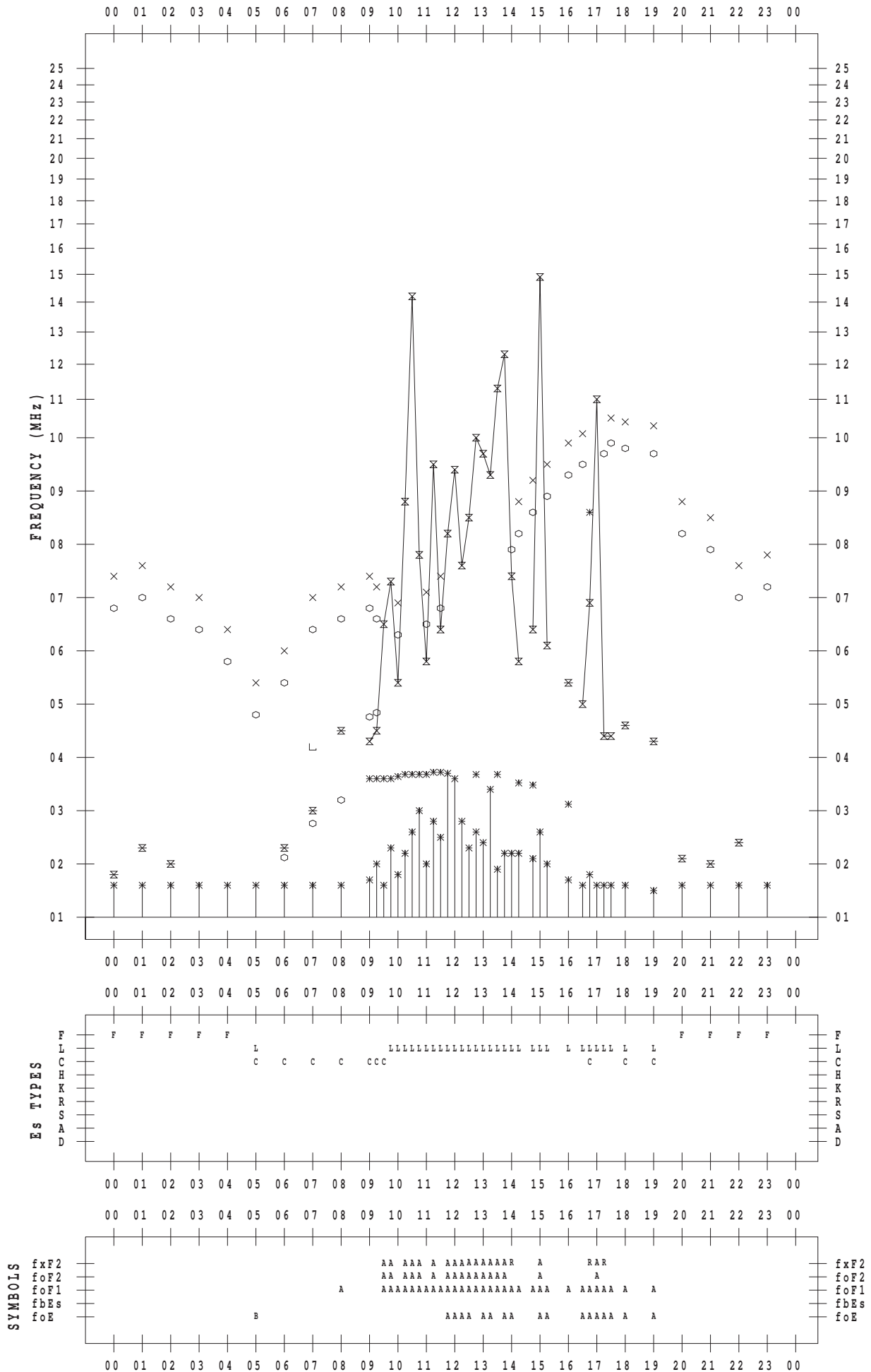
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013 / 7 / 8

135 ° E MEAN TIME



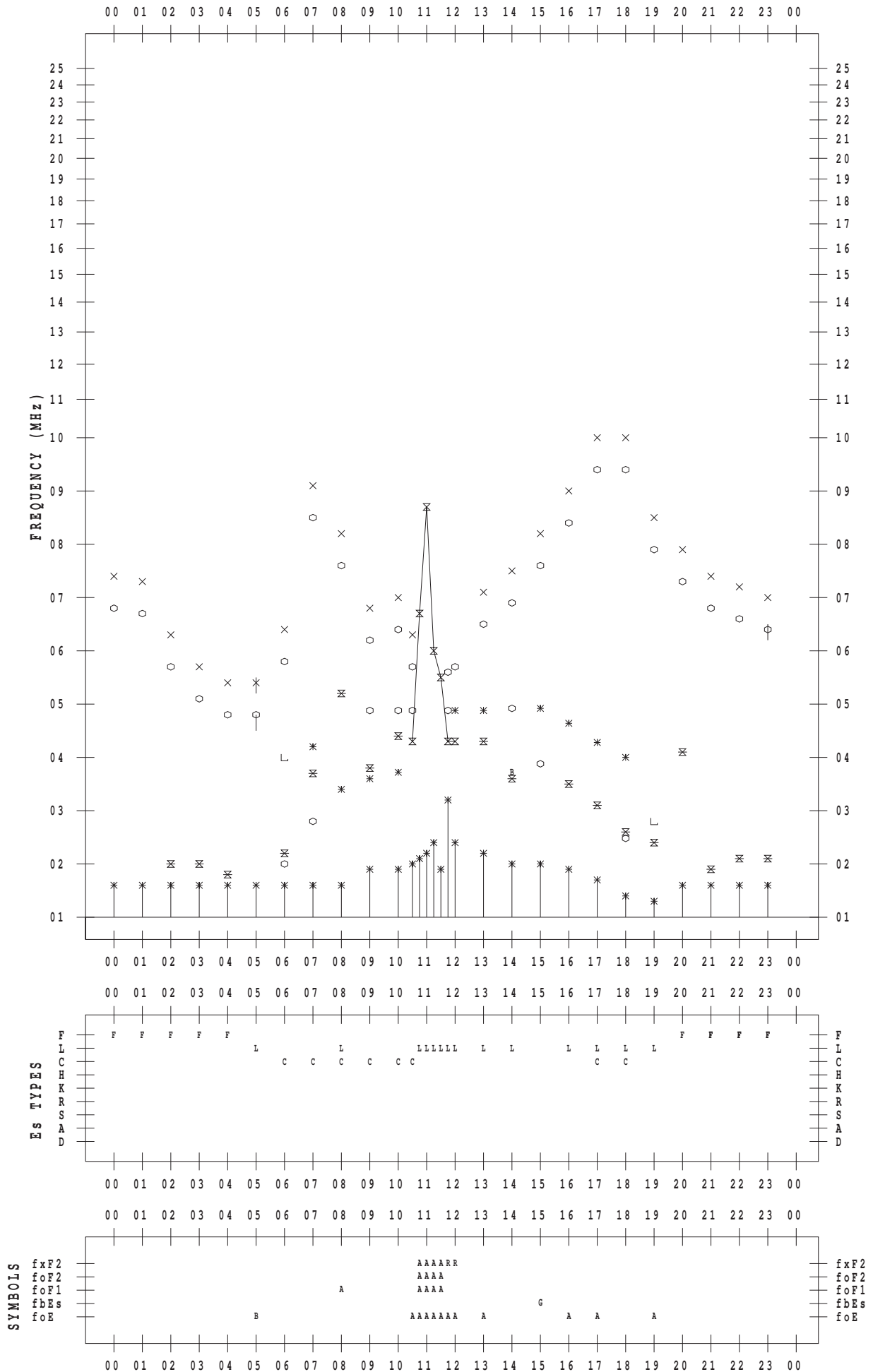
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/ 9

135 ° E MEAN TIME



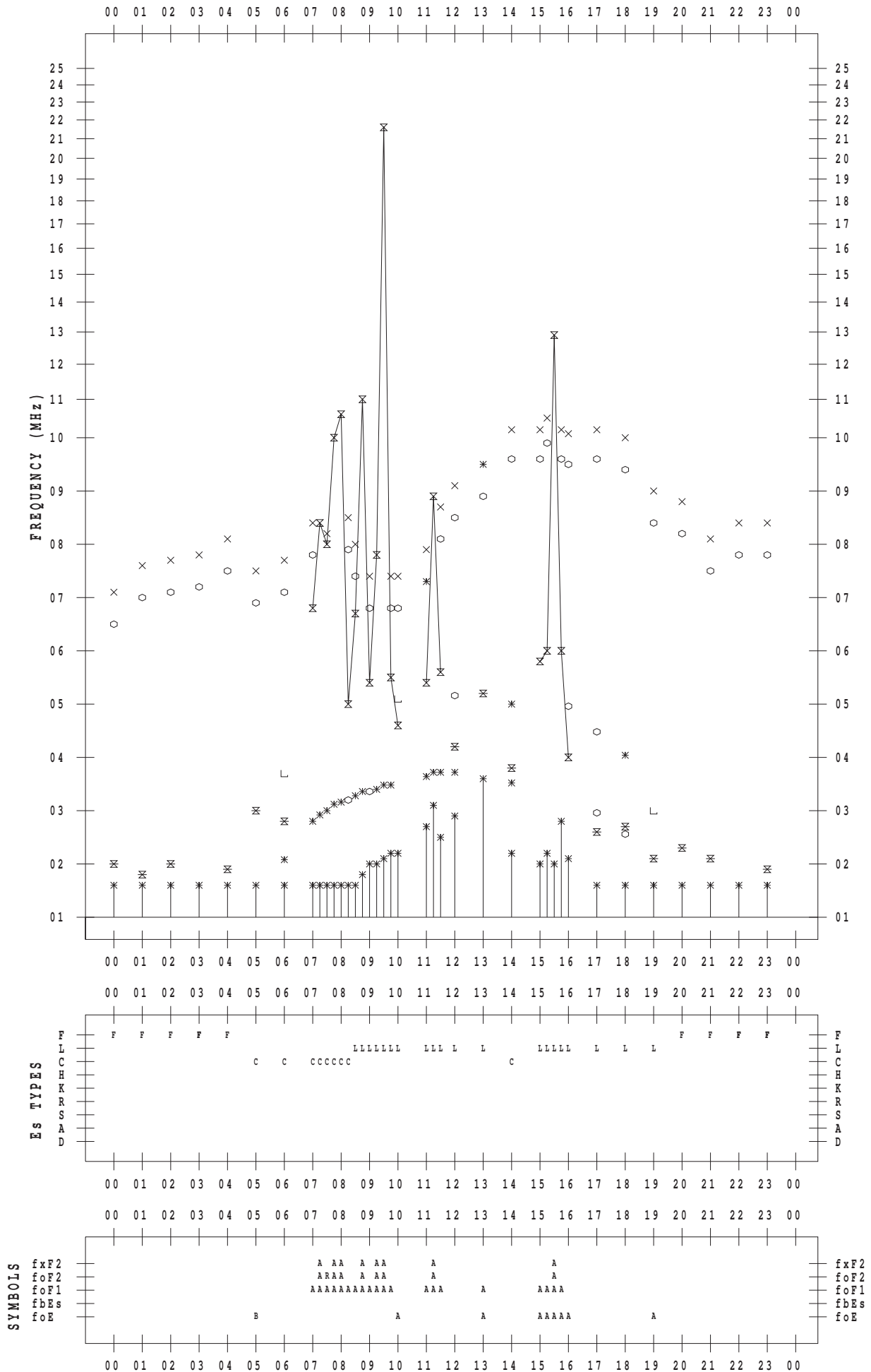
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/10

135 ° E MEAN TIME



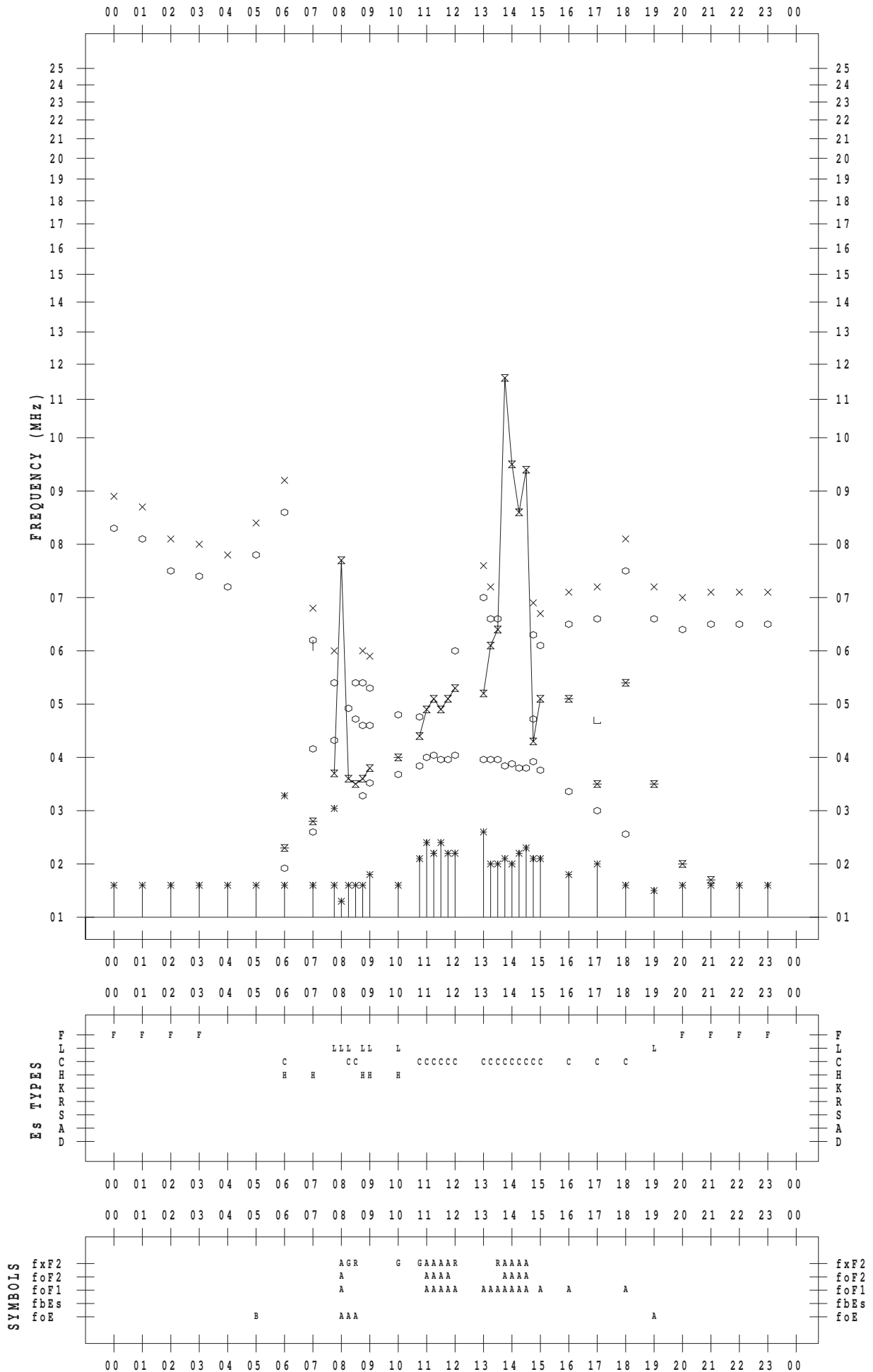
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/11

135 ° E MEAN TIME



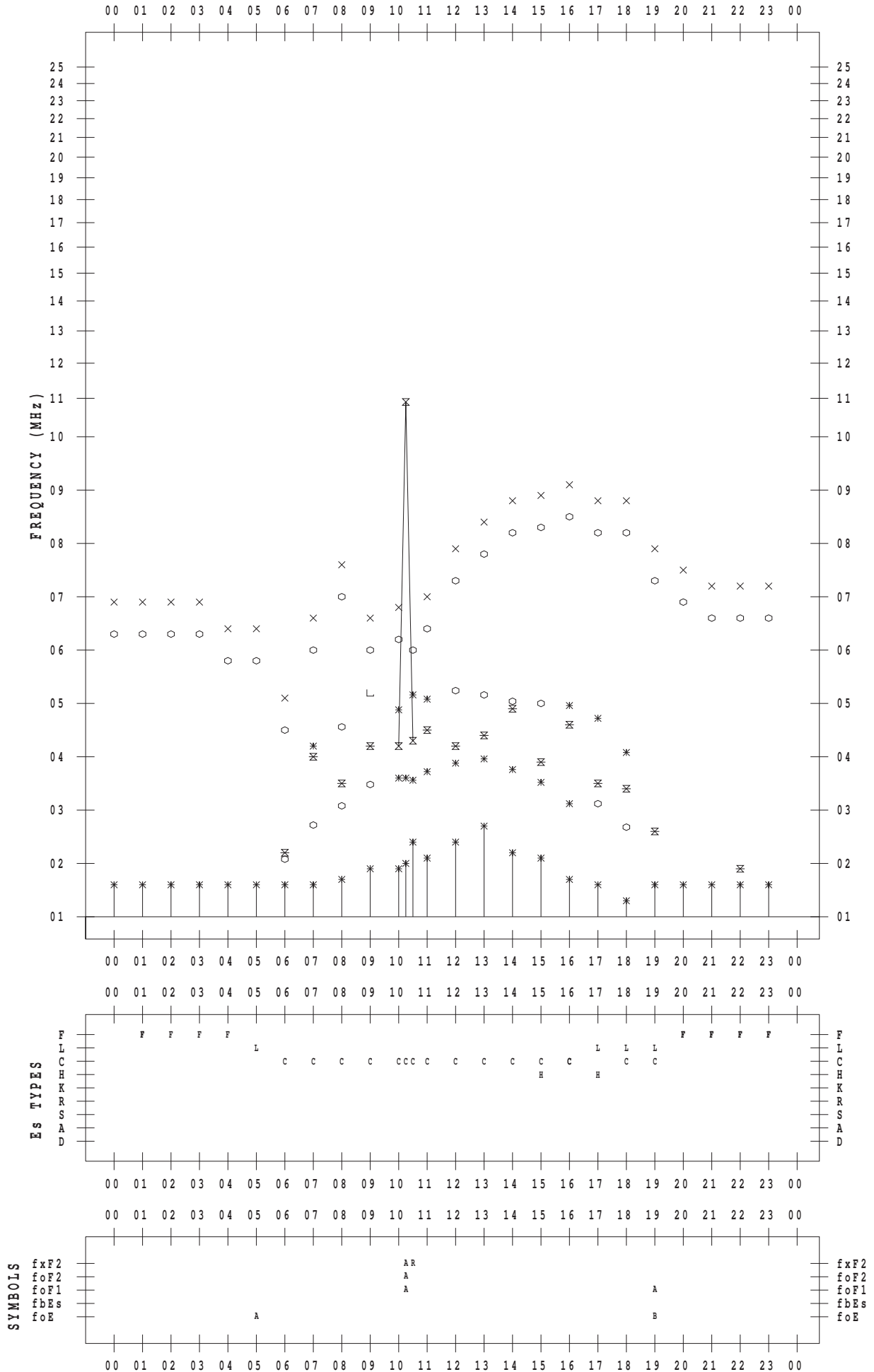
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/12

135 ° E MEAN TIME



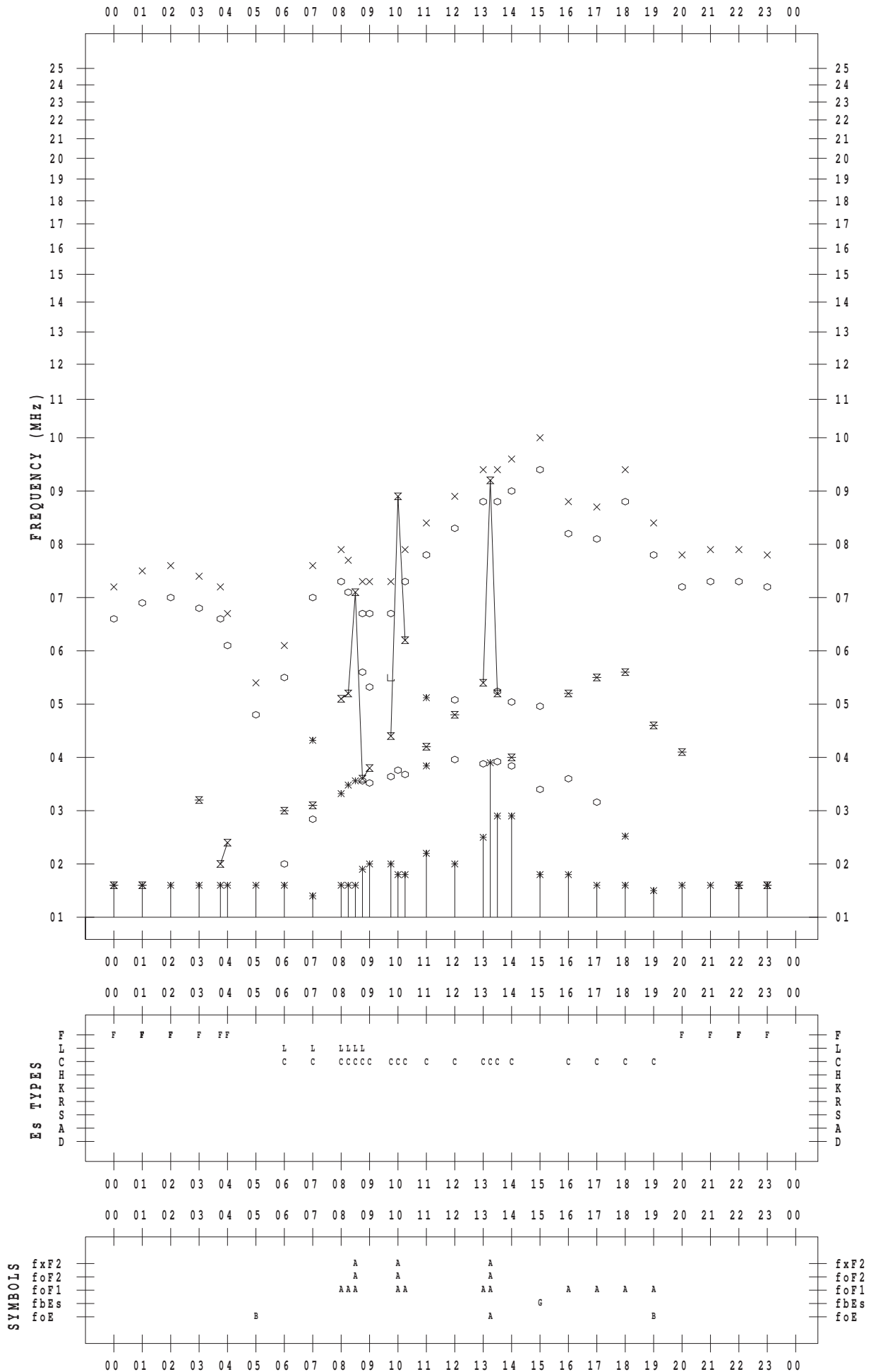
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/13

135 ° E MEAN TIME



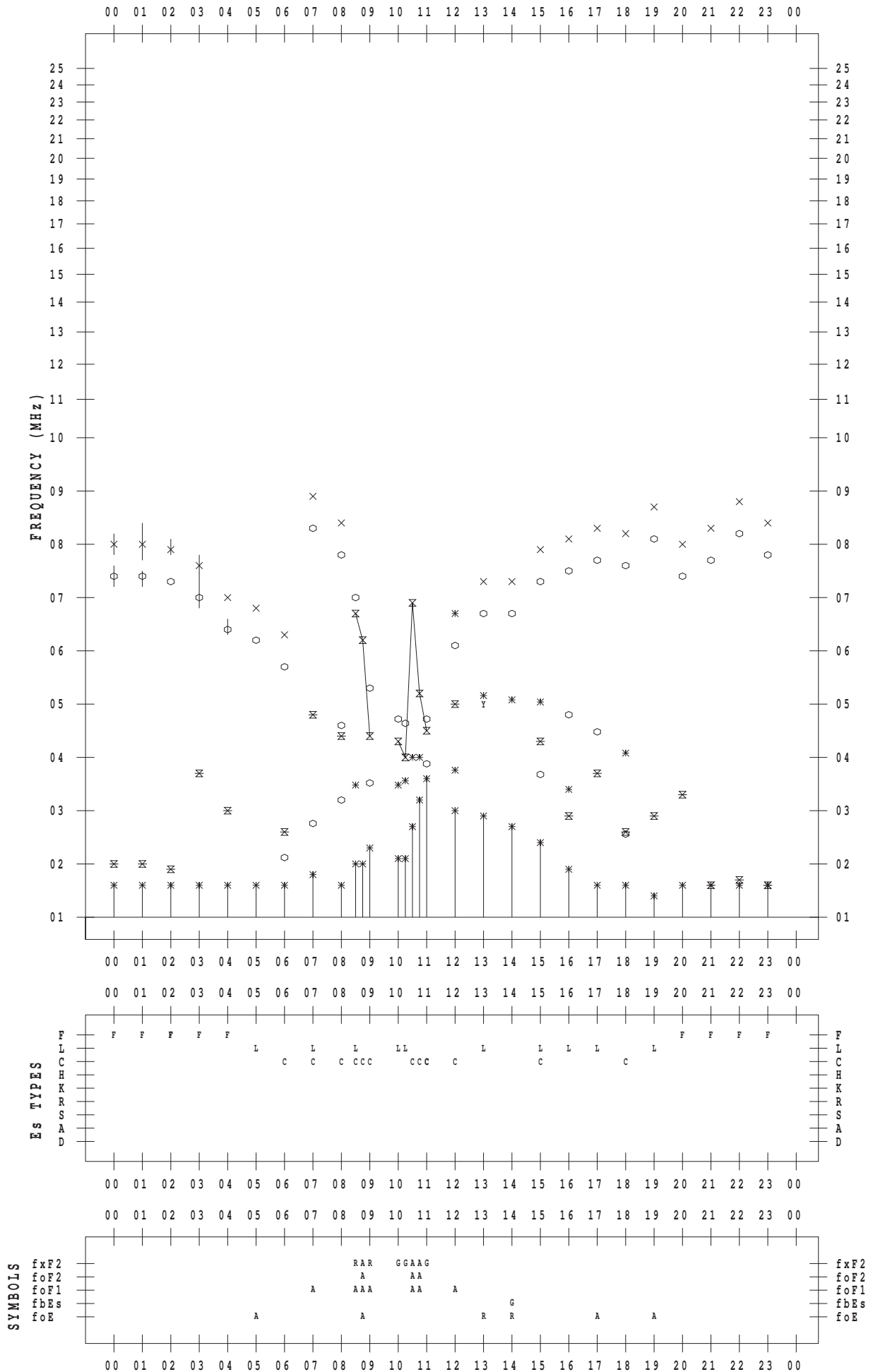
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/14

135 ° E MEAN TIME



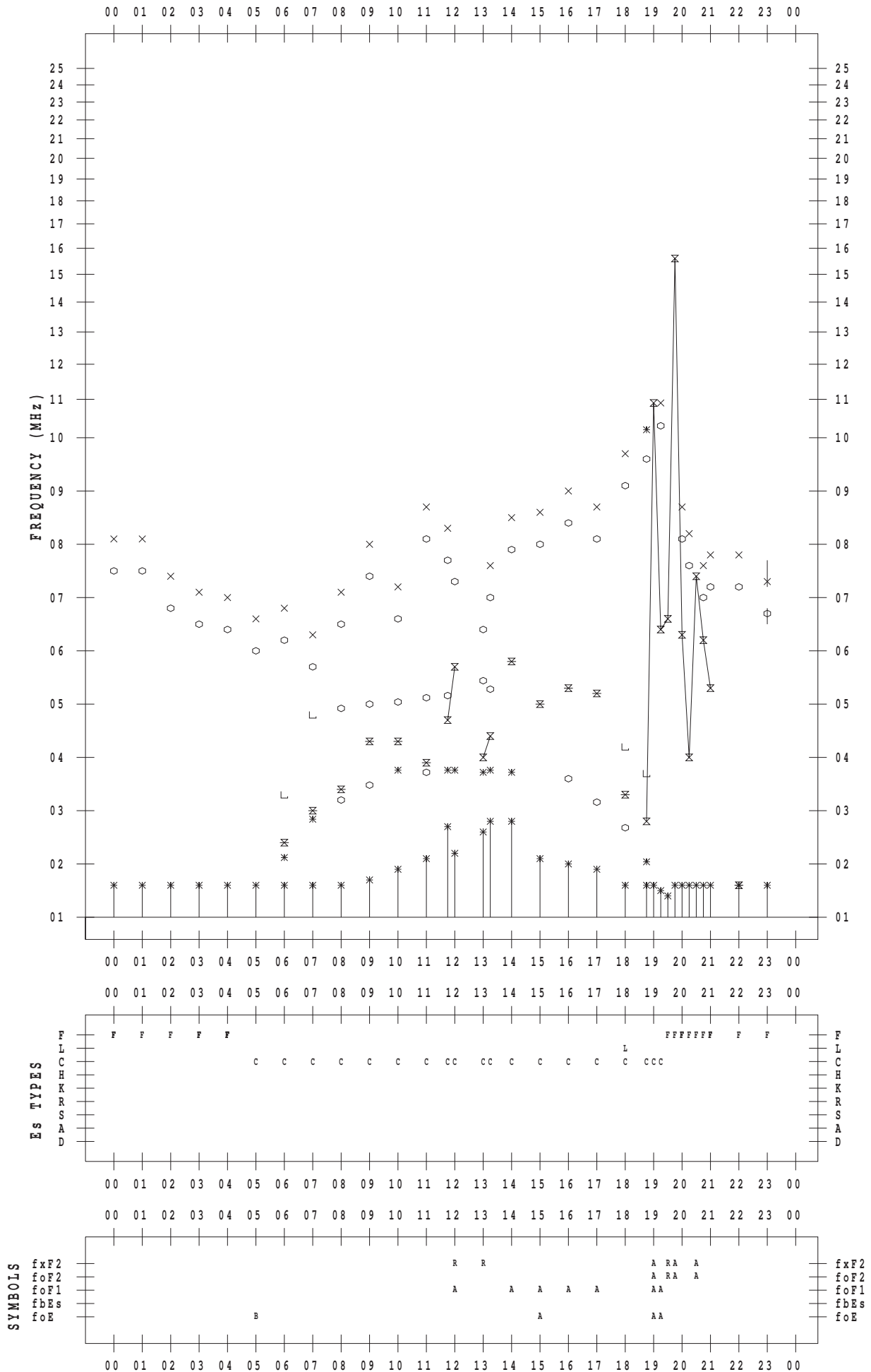
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/15

135 ° E MEAN TIME



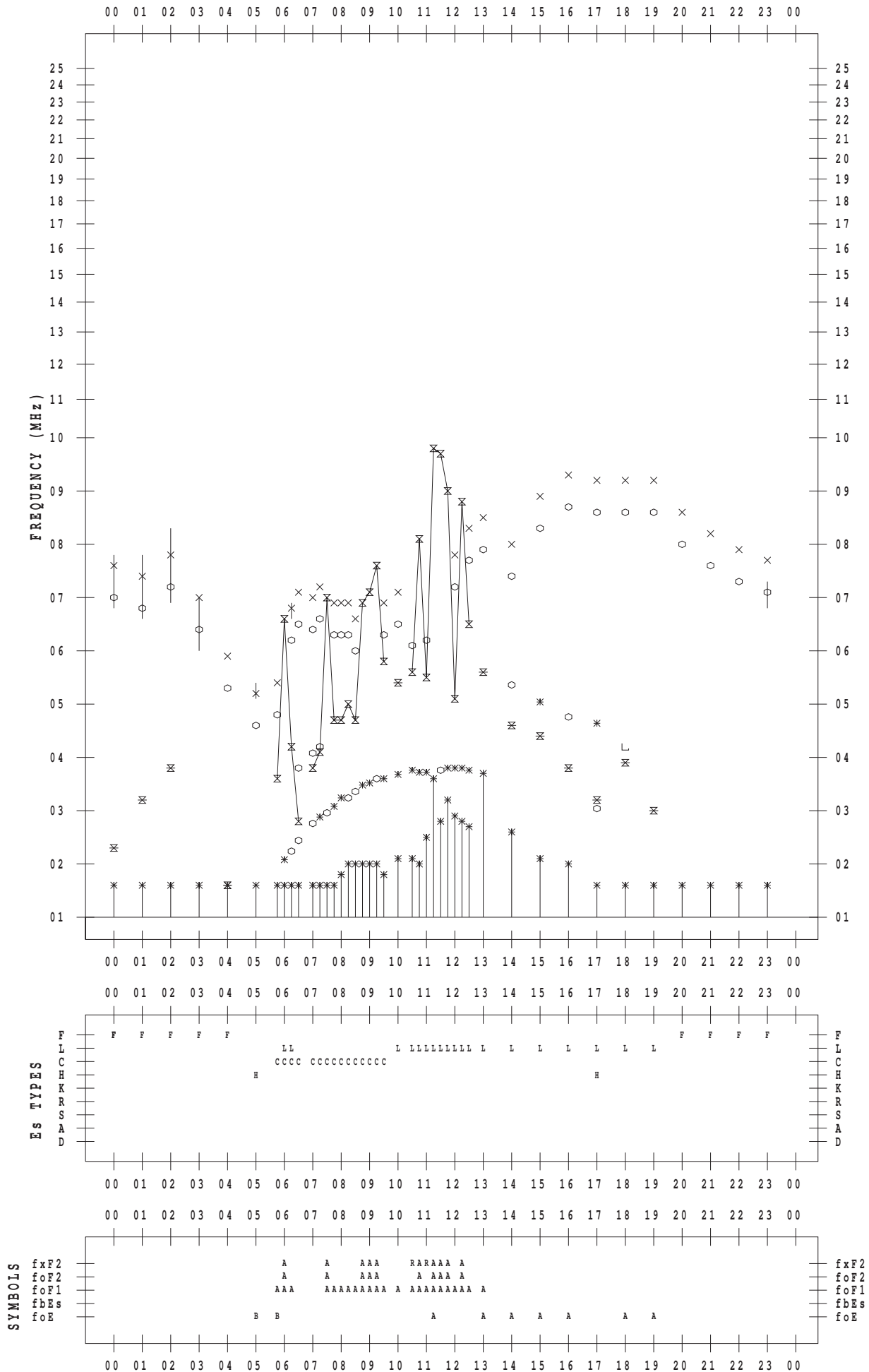
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/16

135 ° E MEAN TIME



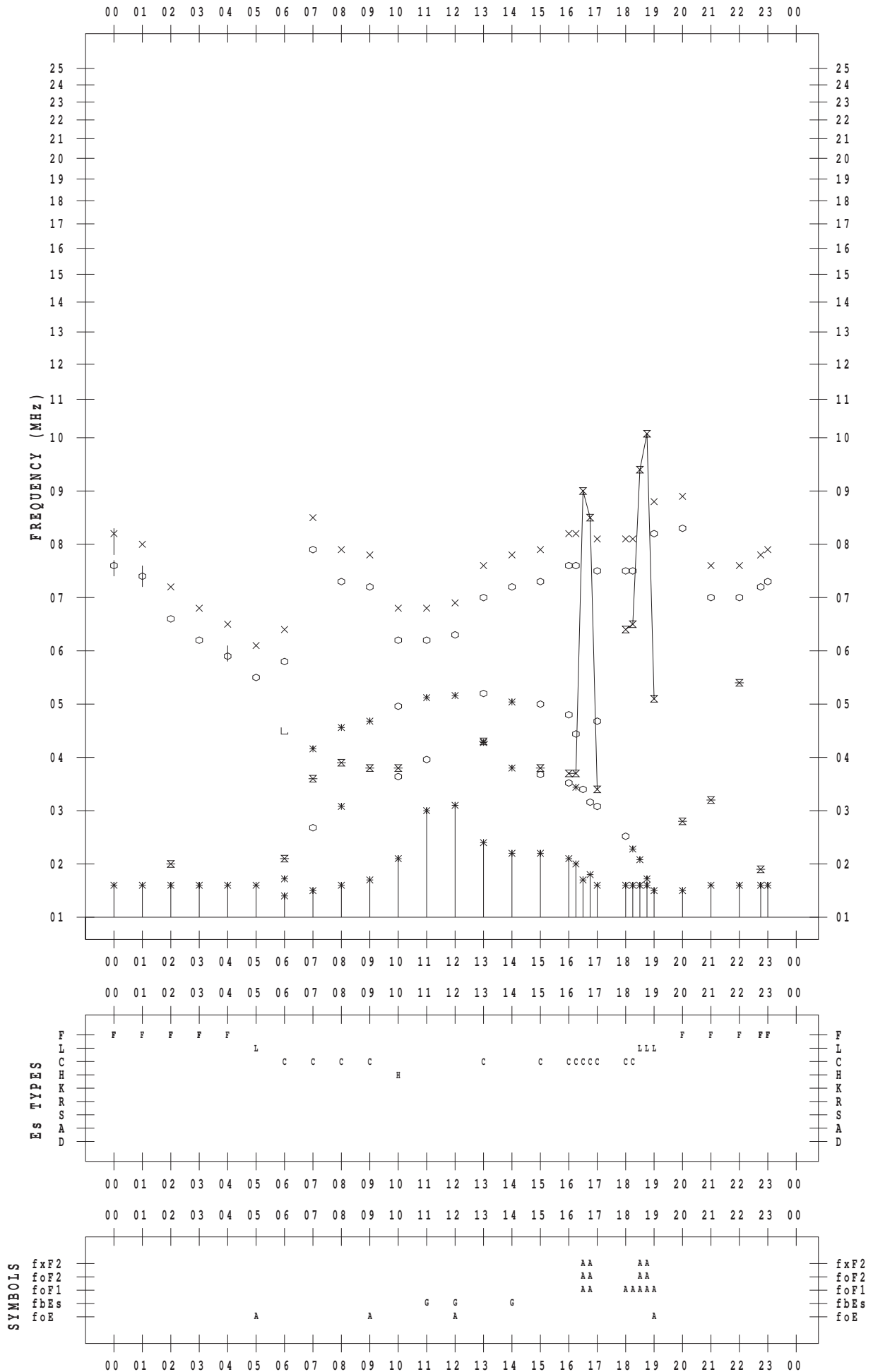
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/17

135 ° E MEAN TIME



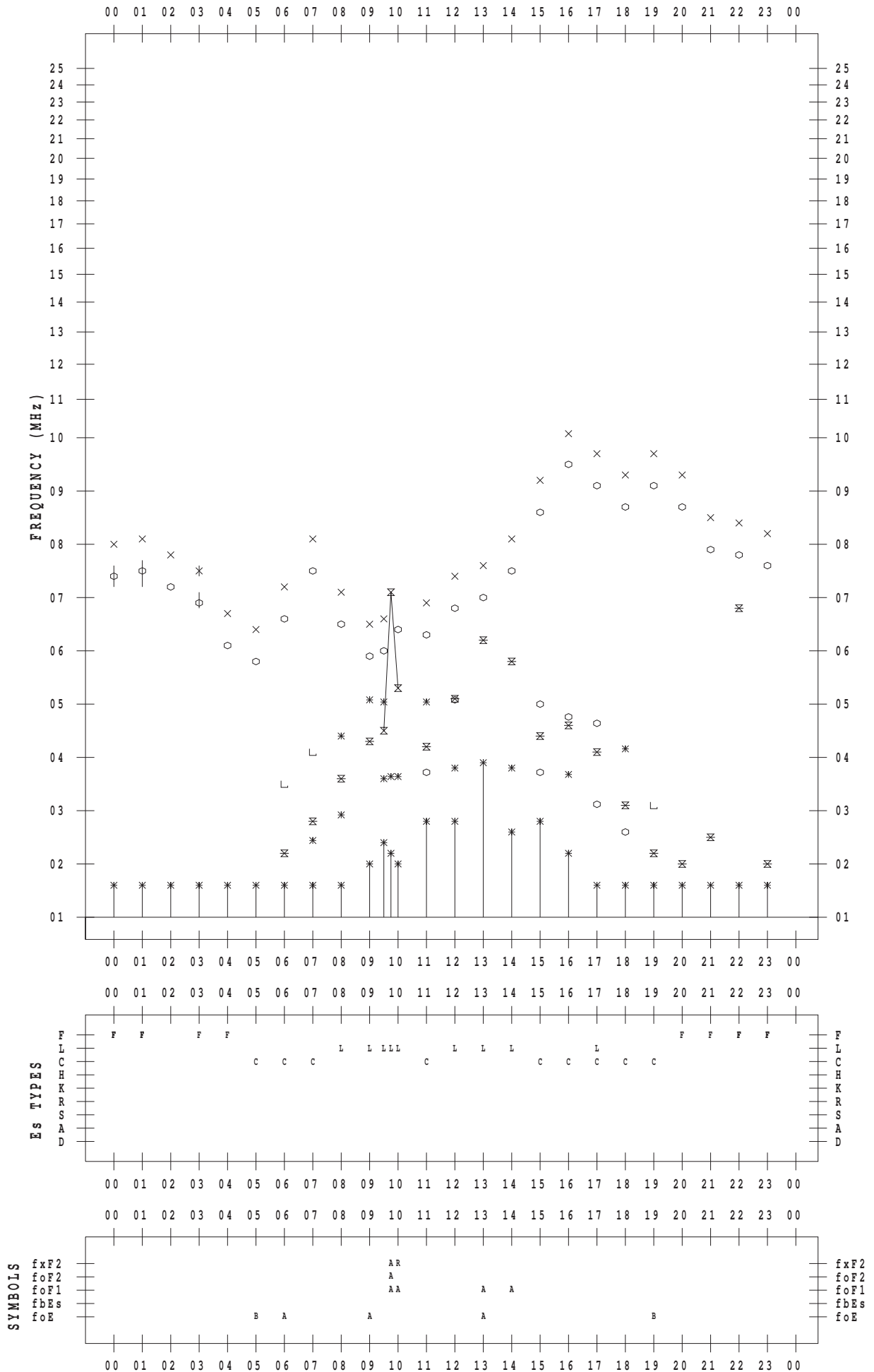
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/18

135 ° E MEAN TIME



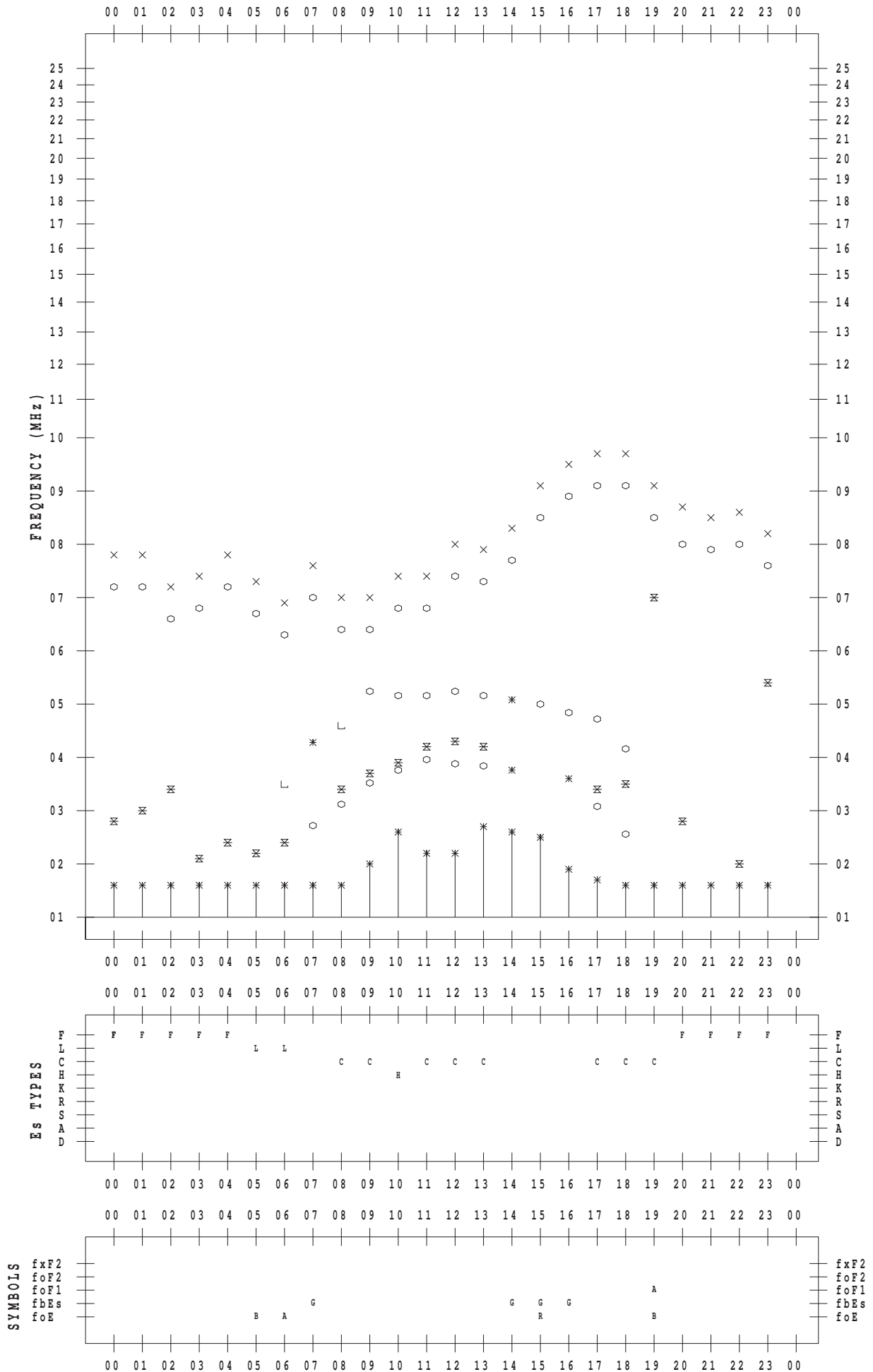
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/19

135 ° E MEAN TIME



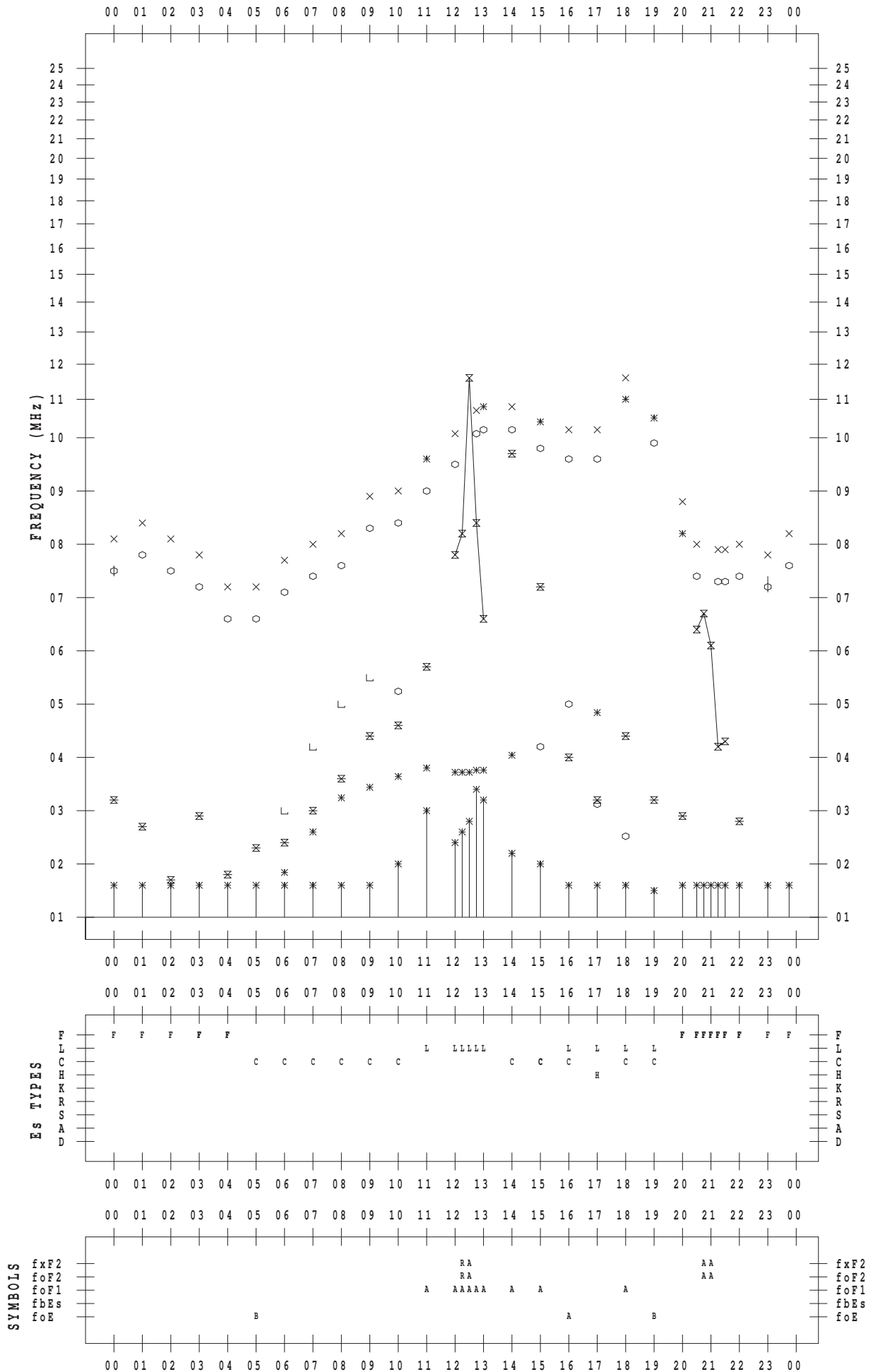
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/20

135 ° E MEAN TIME



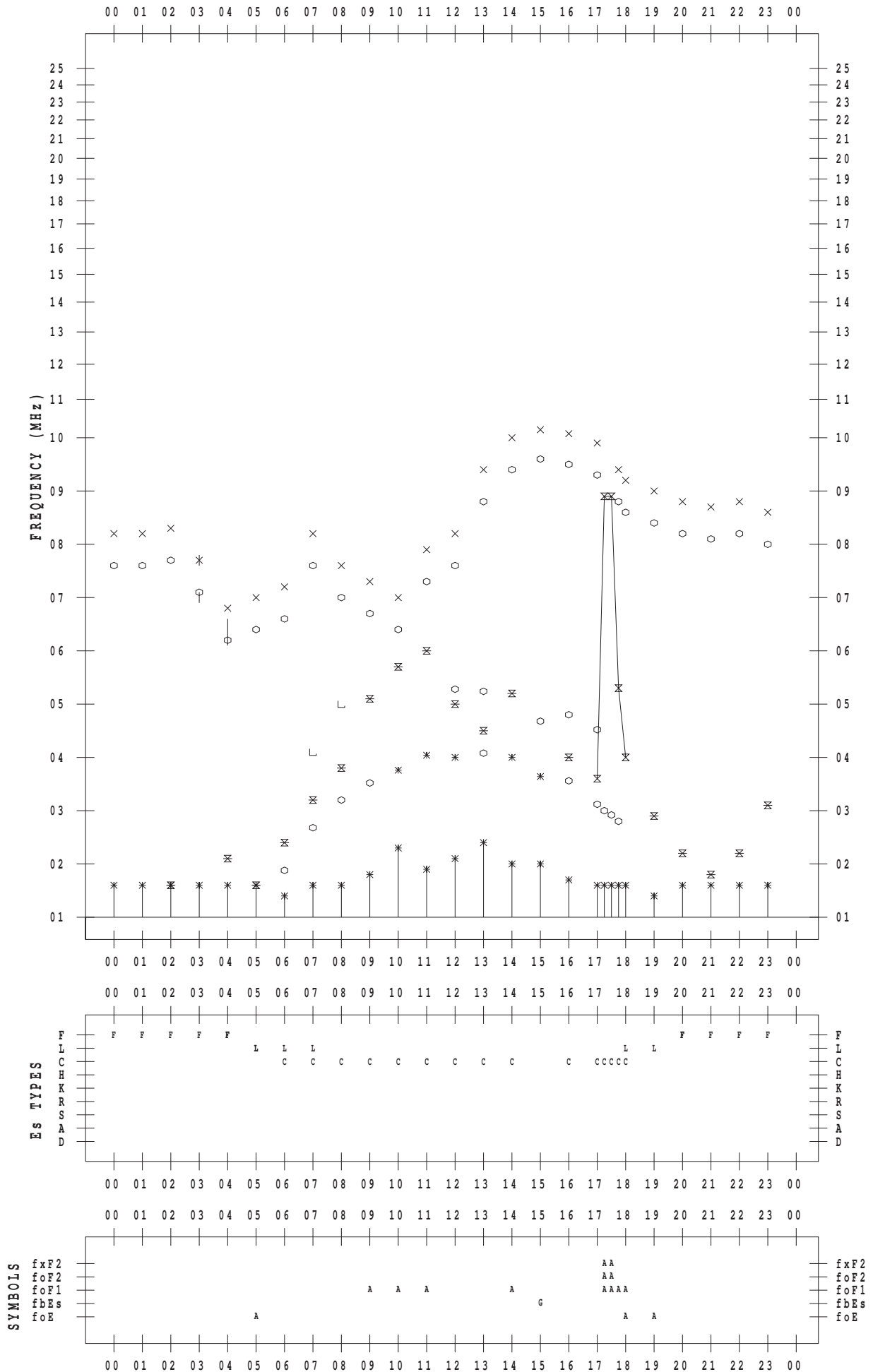
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/21

135 ° E MEAN TIME



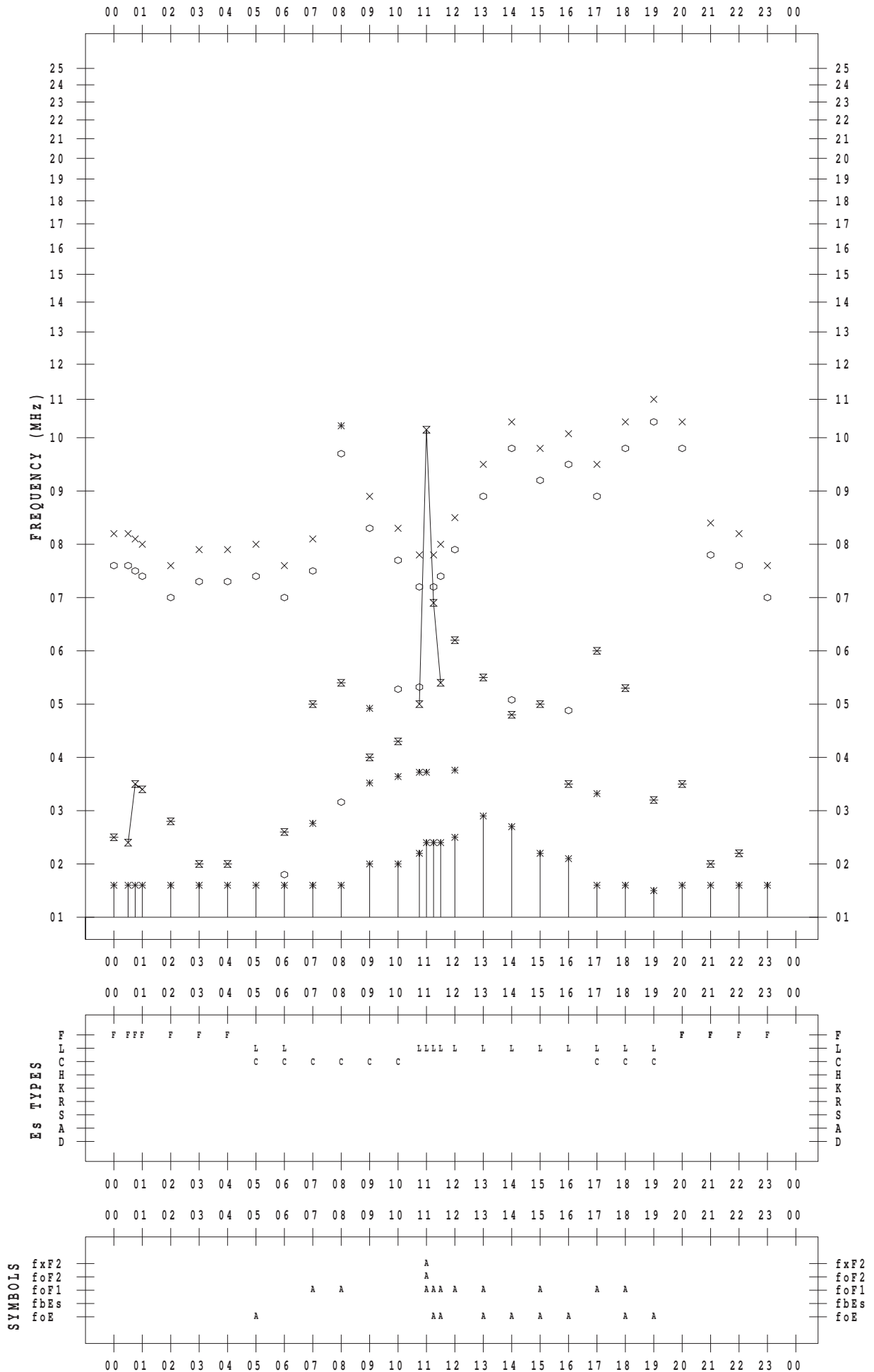
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/22

135 ° E MEAN TIME



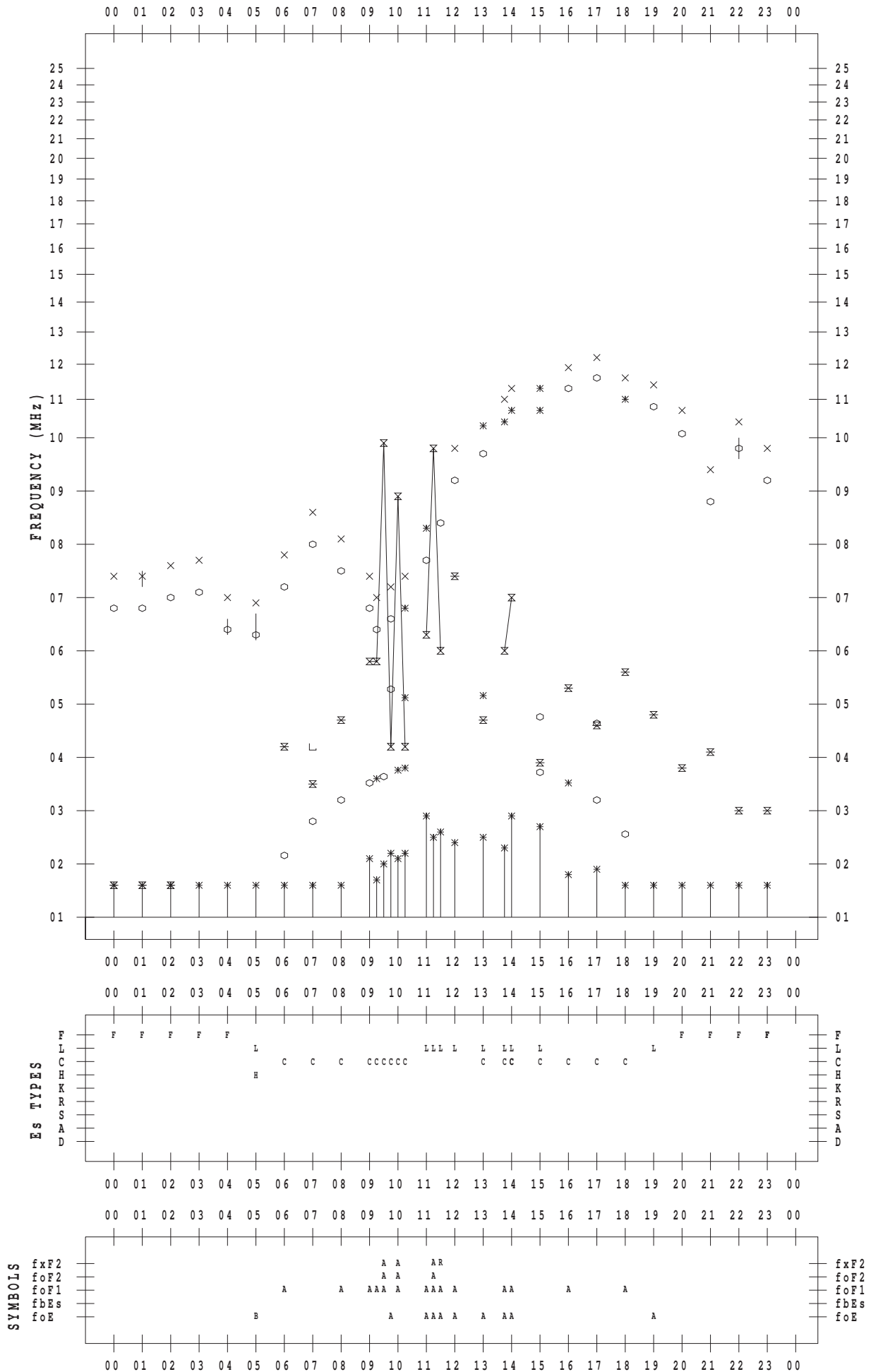
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/23

135 ° E MEAN TIME



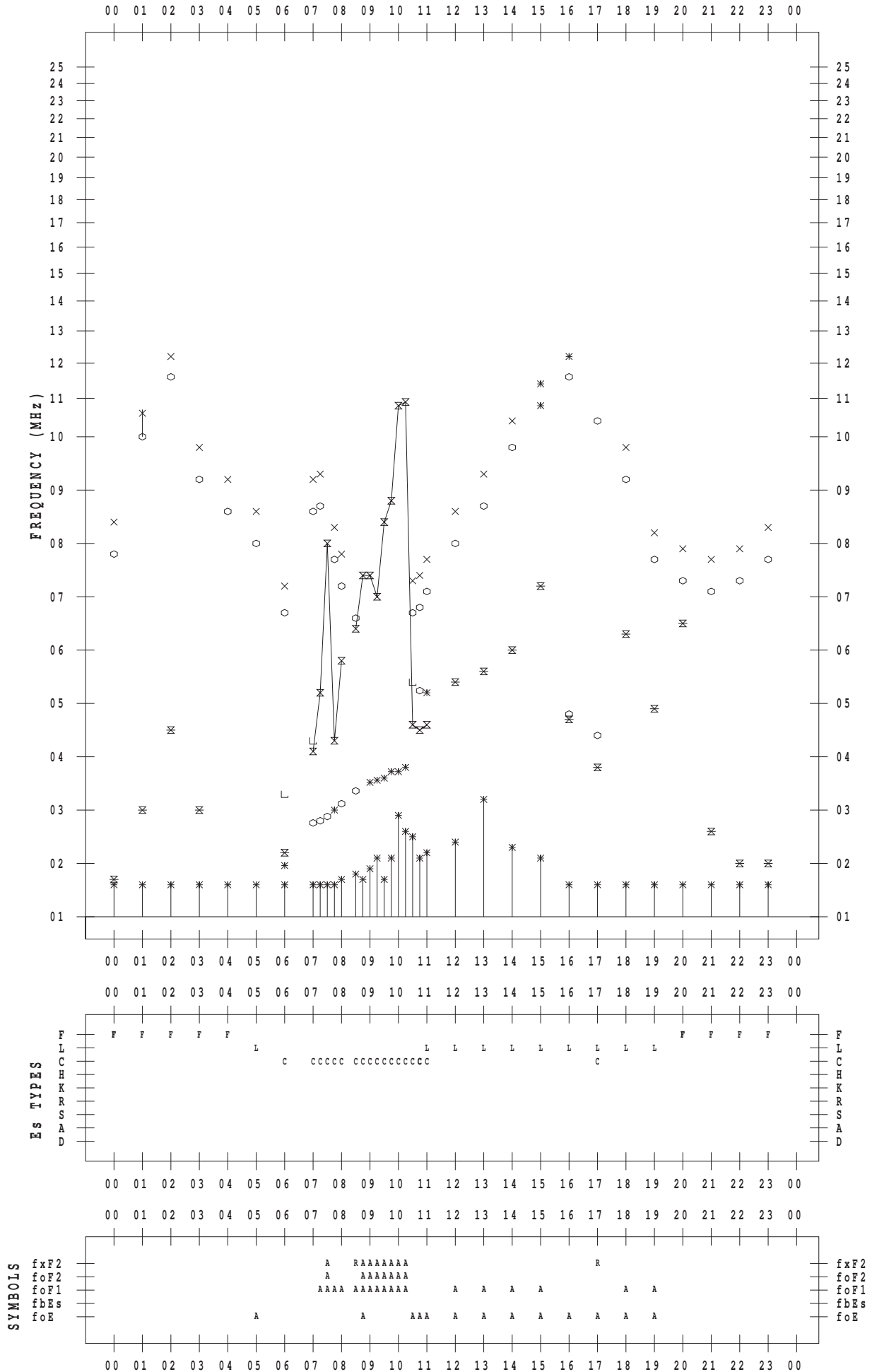
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/24

135 ° E MEAN TIME



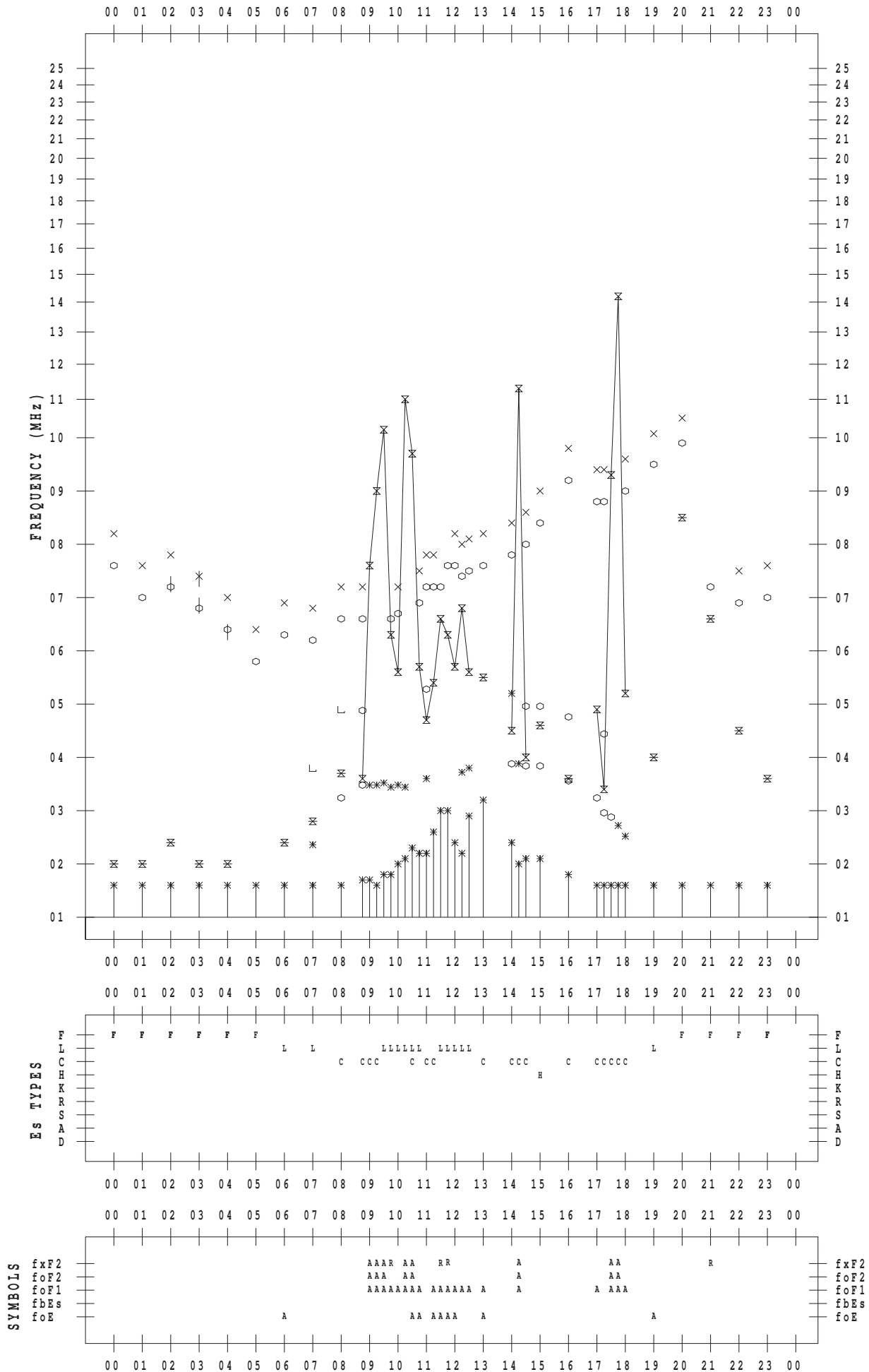
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/25

135 ° E MEAN TIME



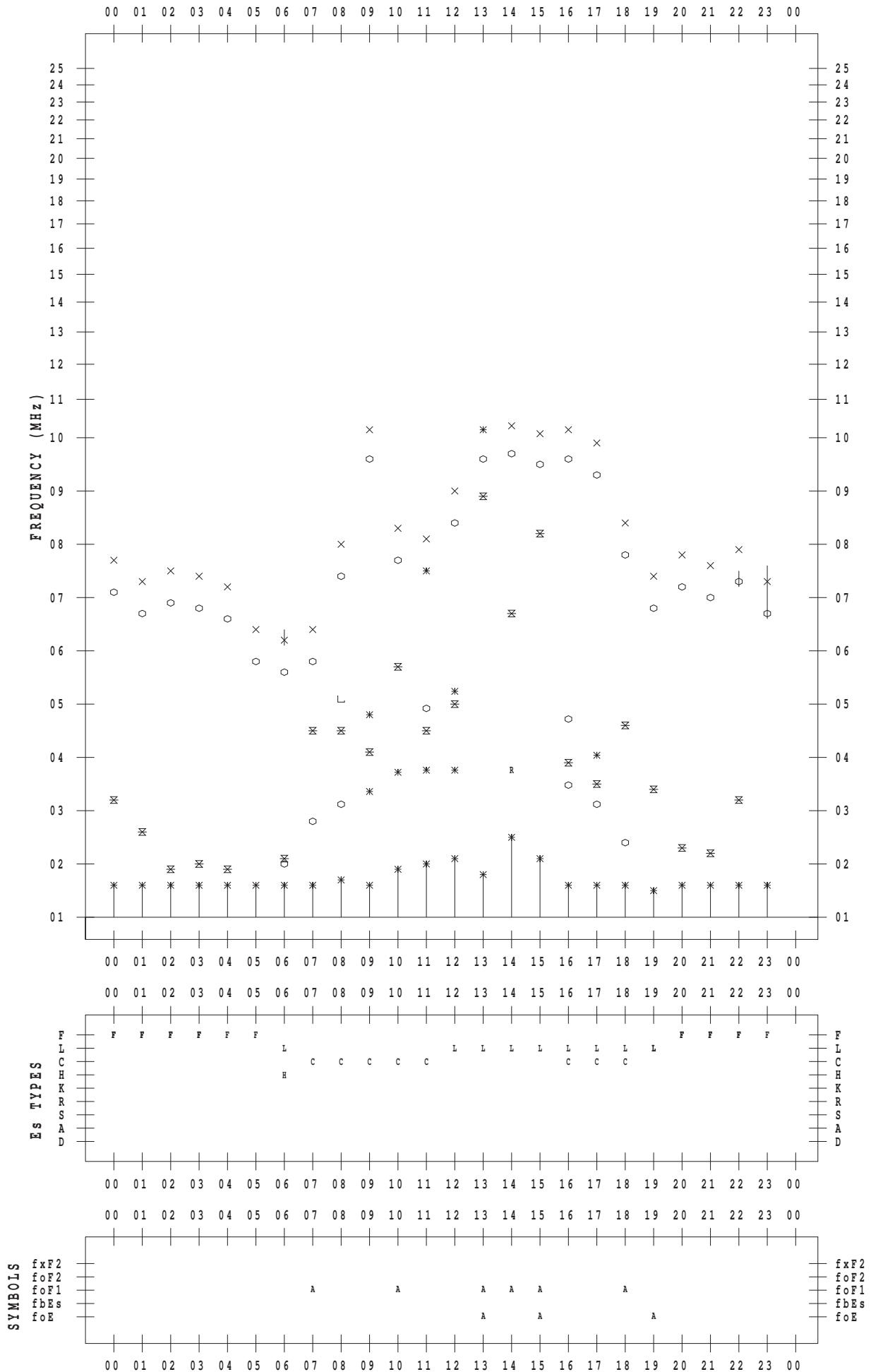
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/26

135 ° E MEAN TIME



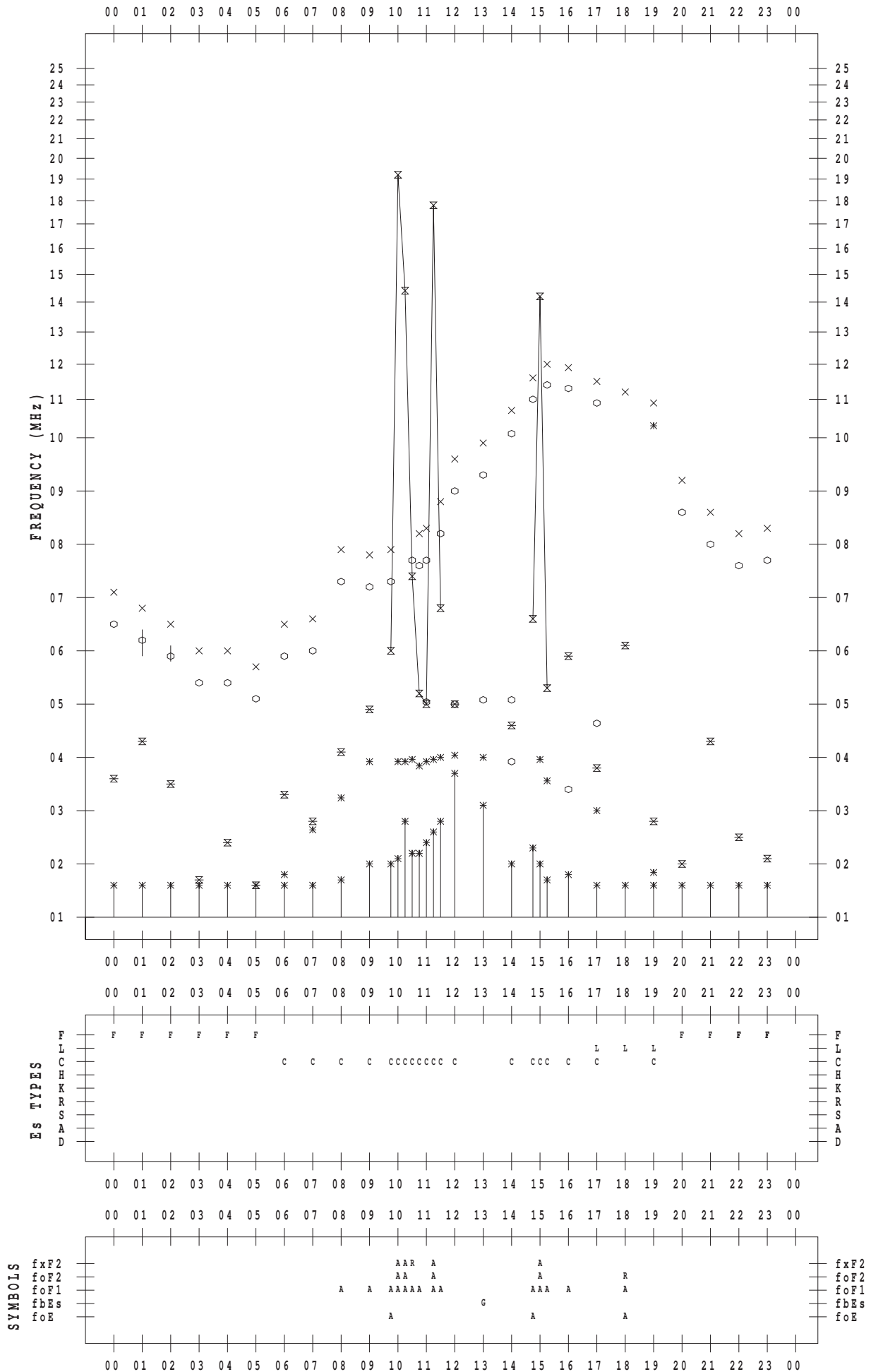
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/27

135 ° E MEAN TIME



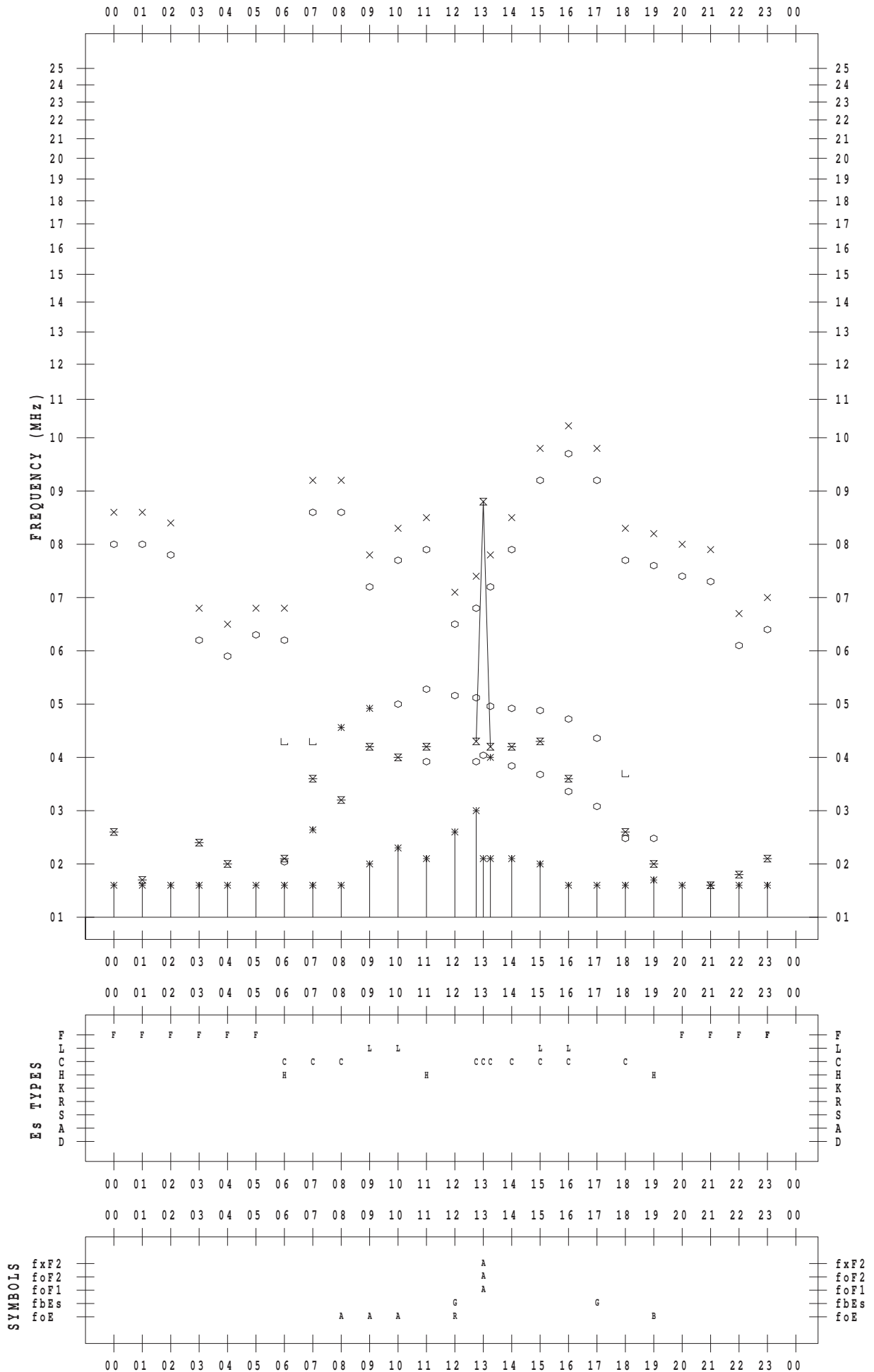
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SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/28

135 ° E MEAN TIME



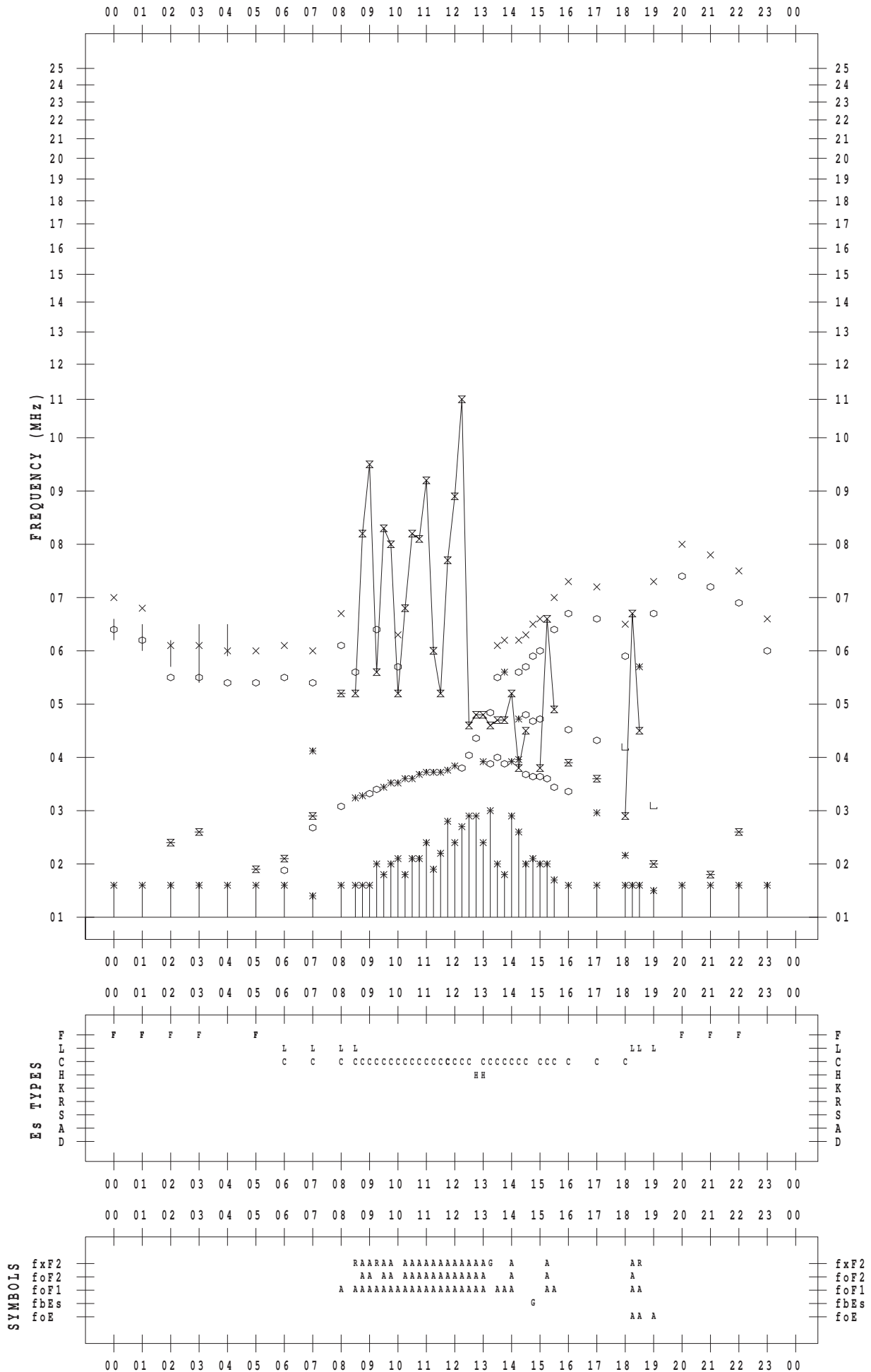
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/29

135 ° E MEAN TIME



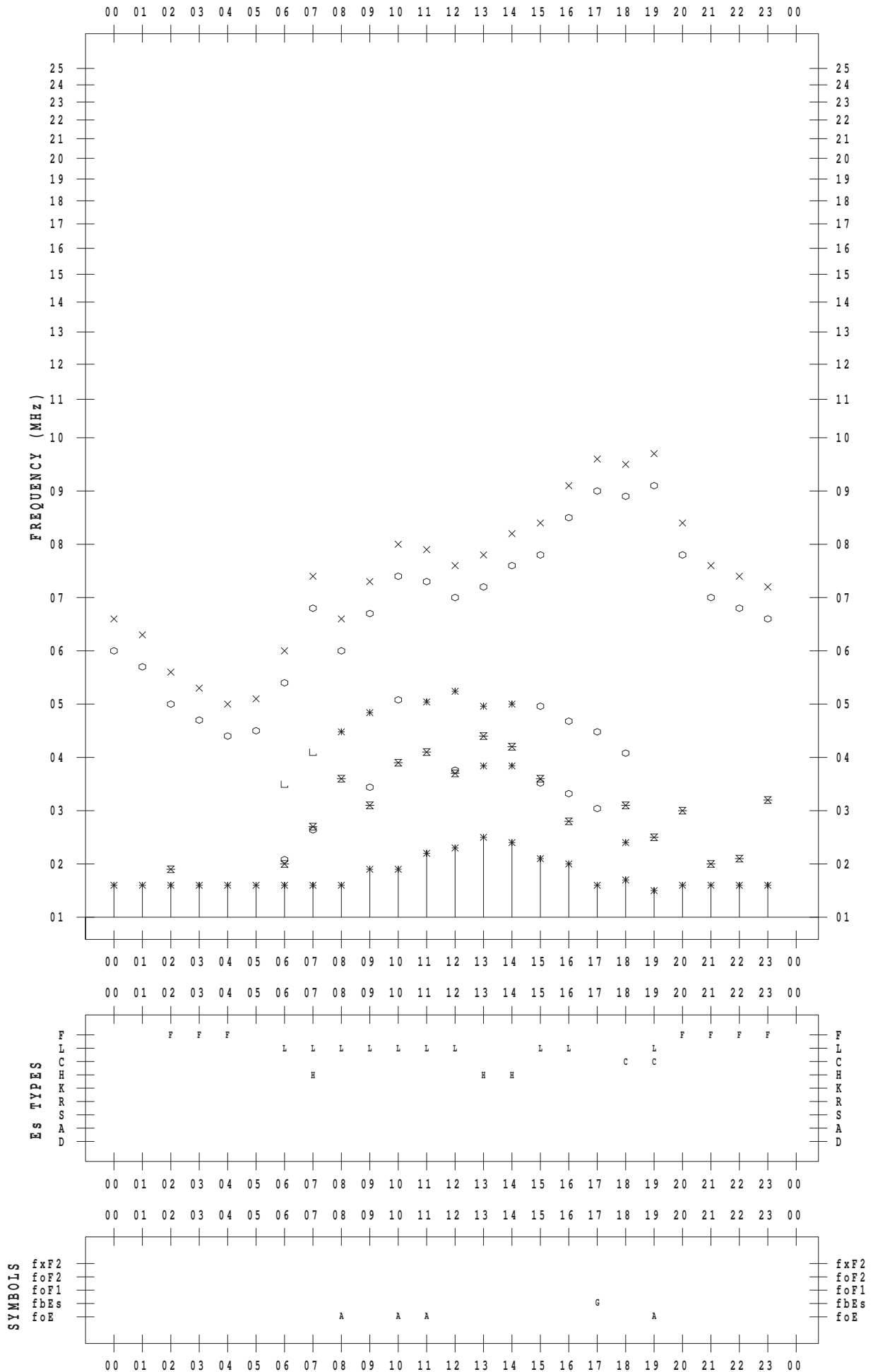
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/30

135 ° E MEAN TIME



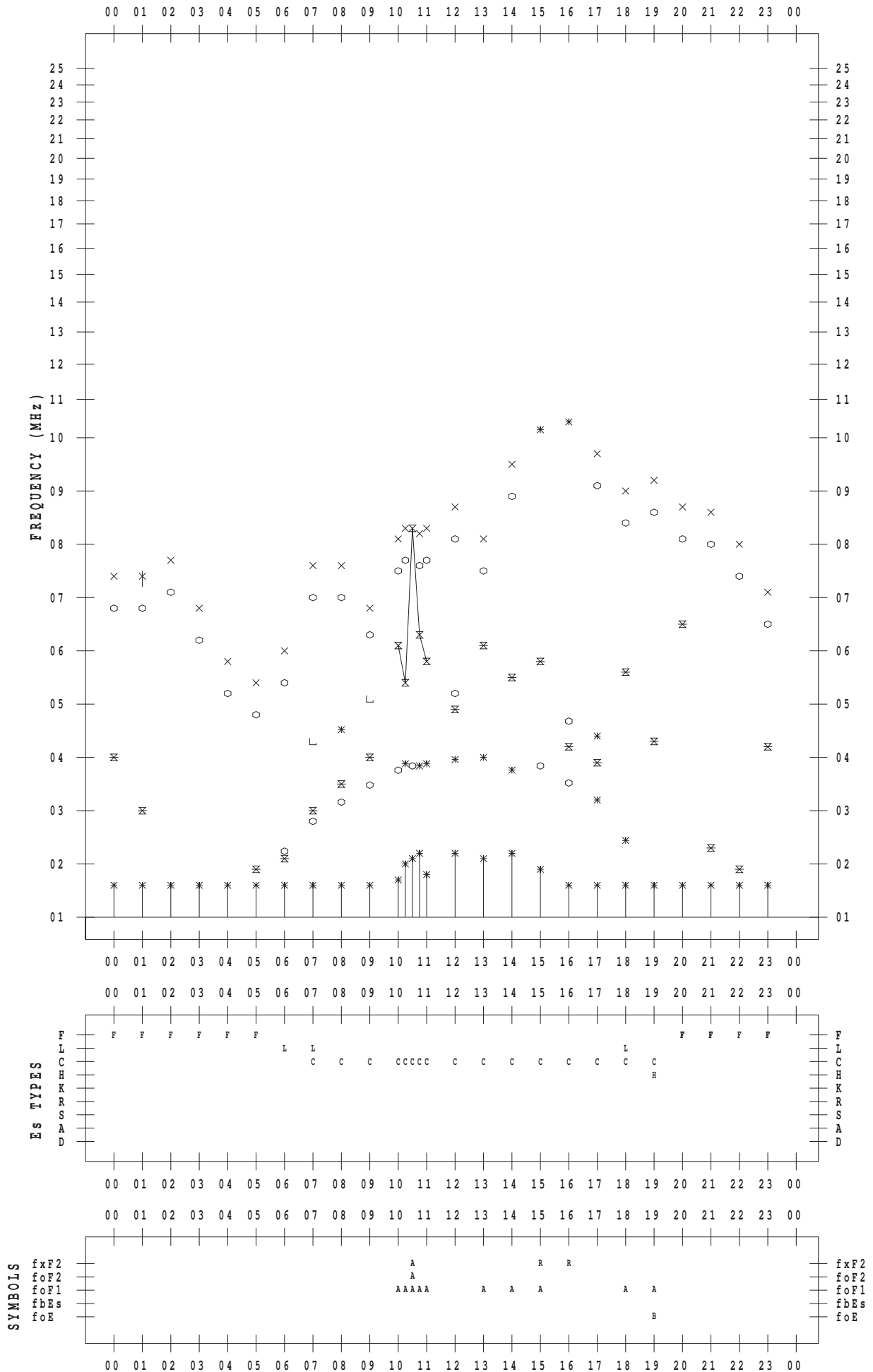
f-PLOT DATA

SCALER : M.NISHIDA

STATION : Yamagawa

DATE : 2013/ 7/31

135 ° E MEAN TIME



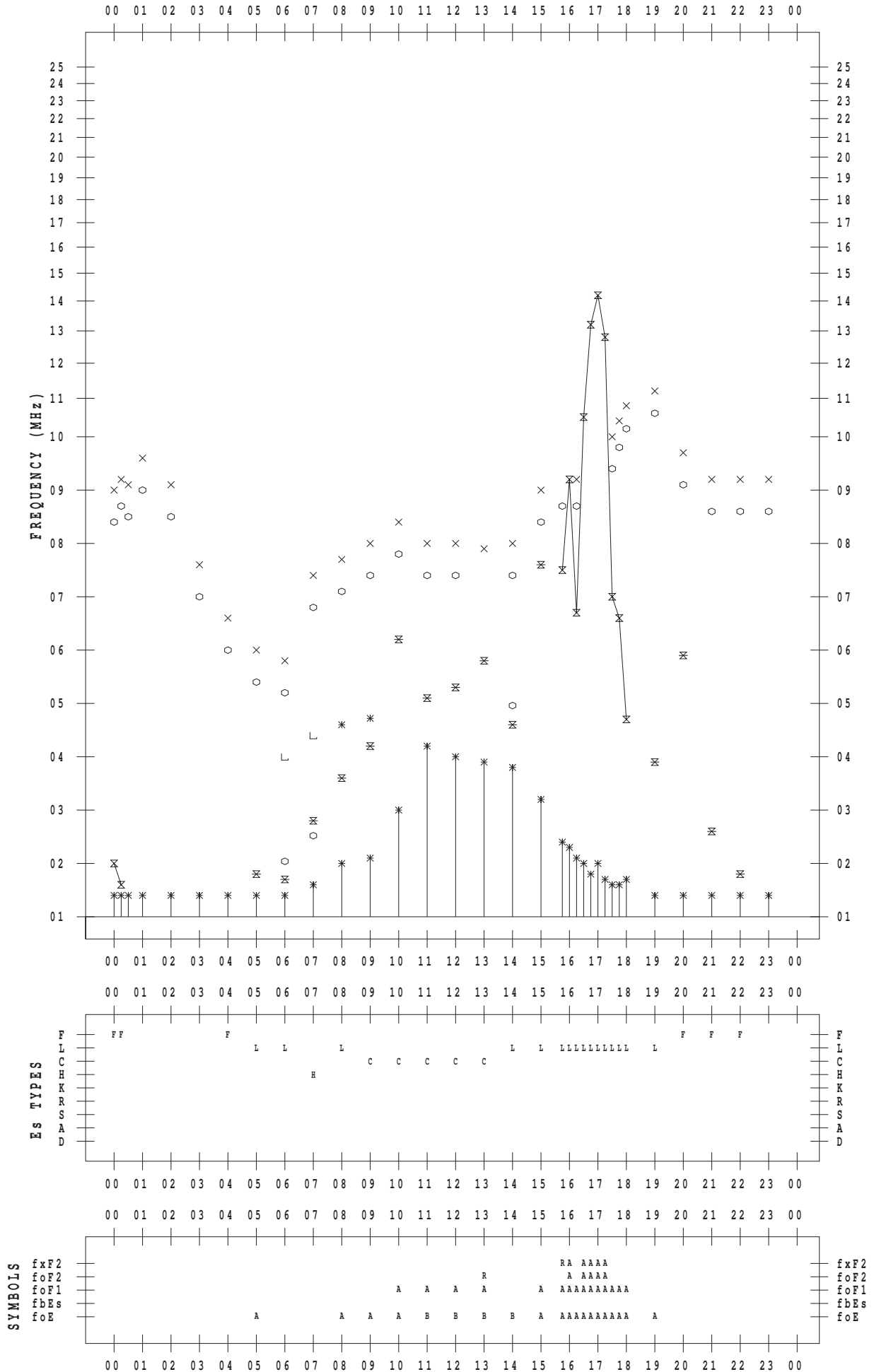
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/ 1

135 ° E MEAN TIME



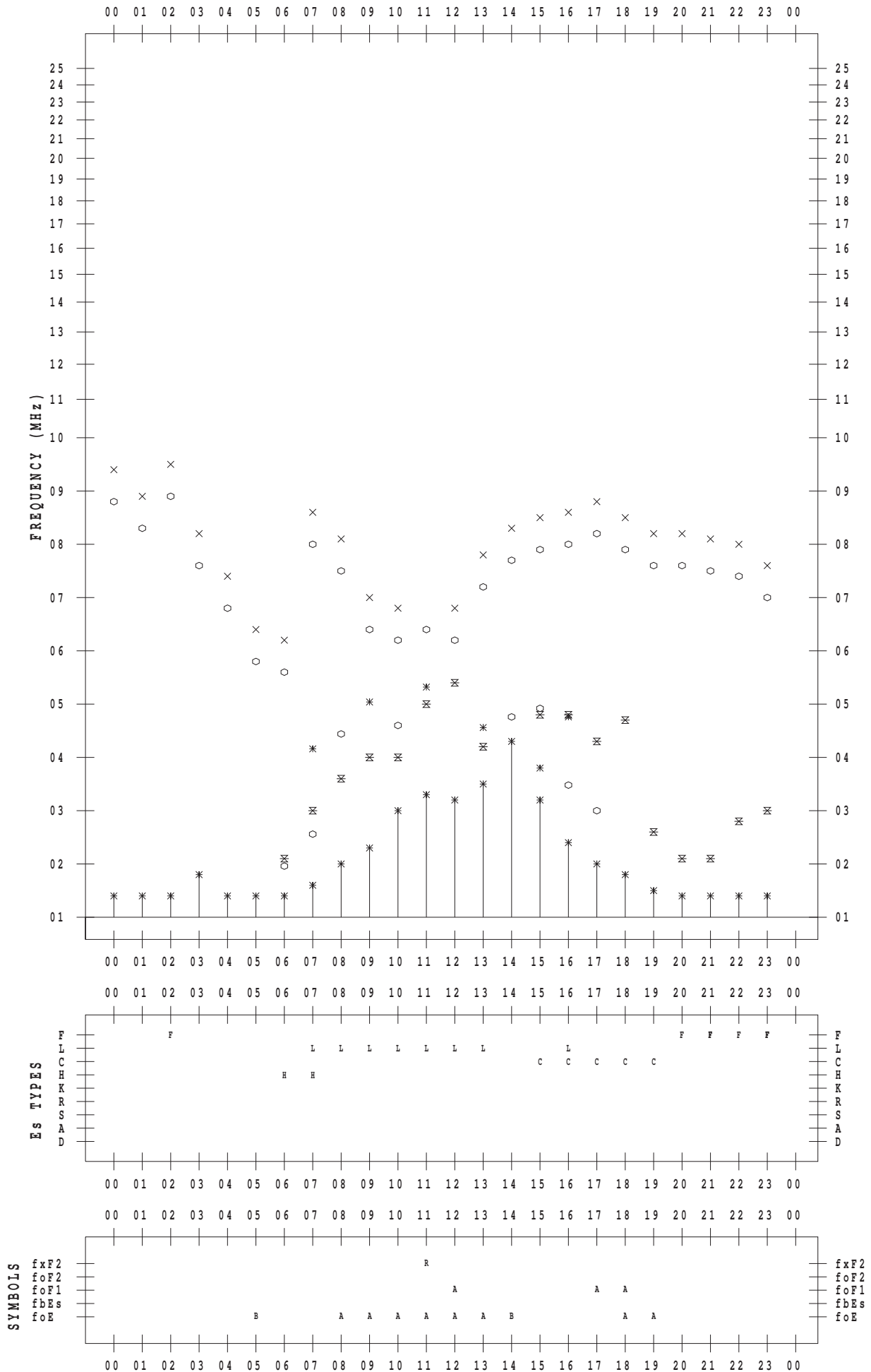
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/ 2

135 ° E MEAN TIME



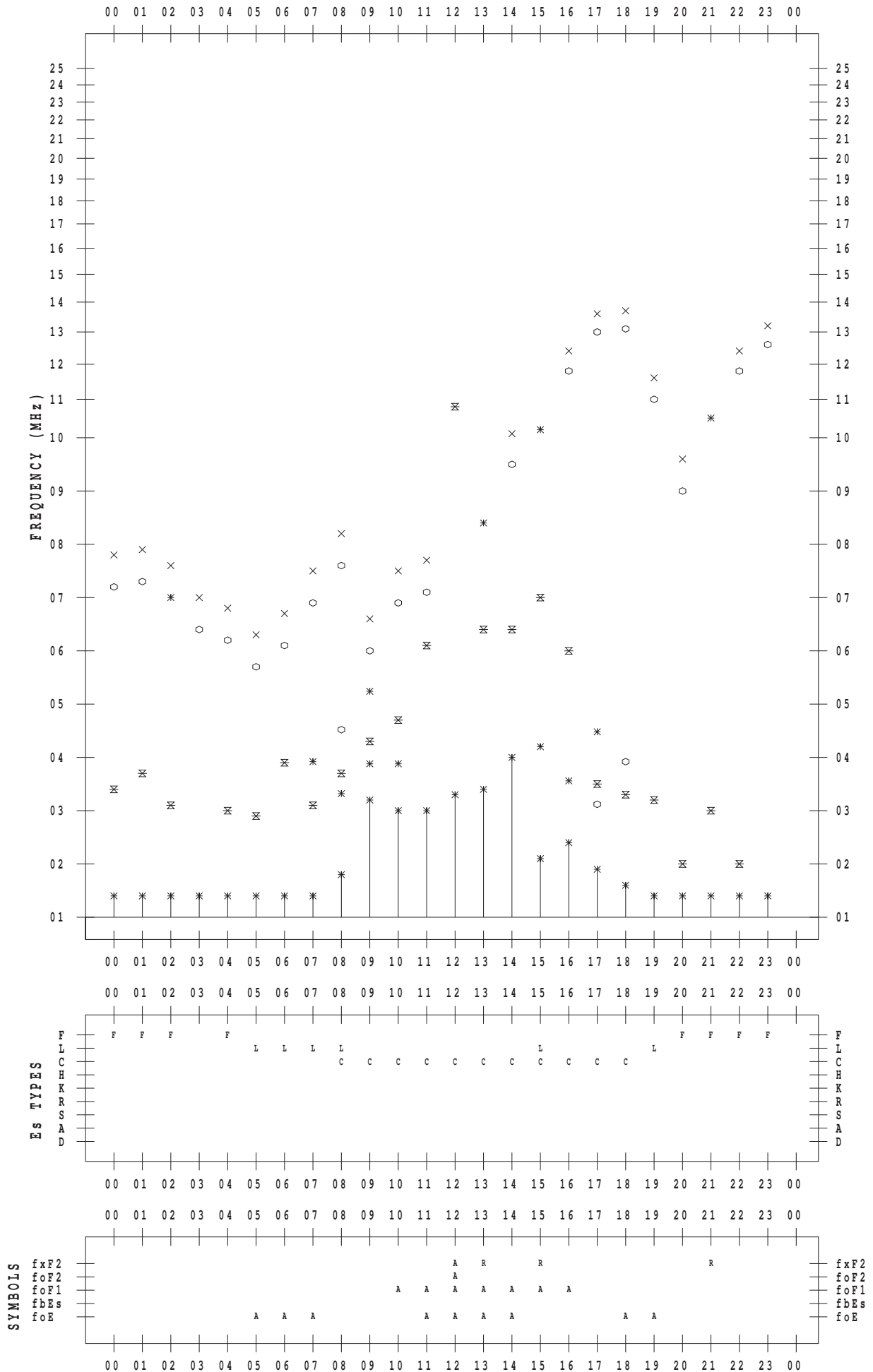
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/ 3

135 ° E MEAN TIME



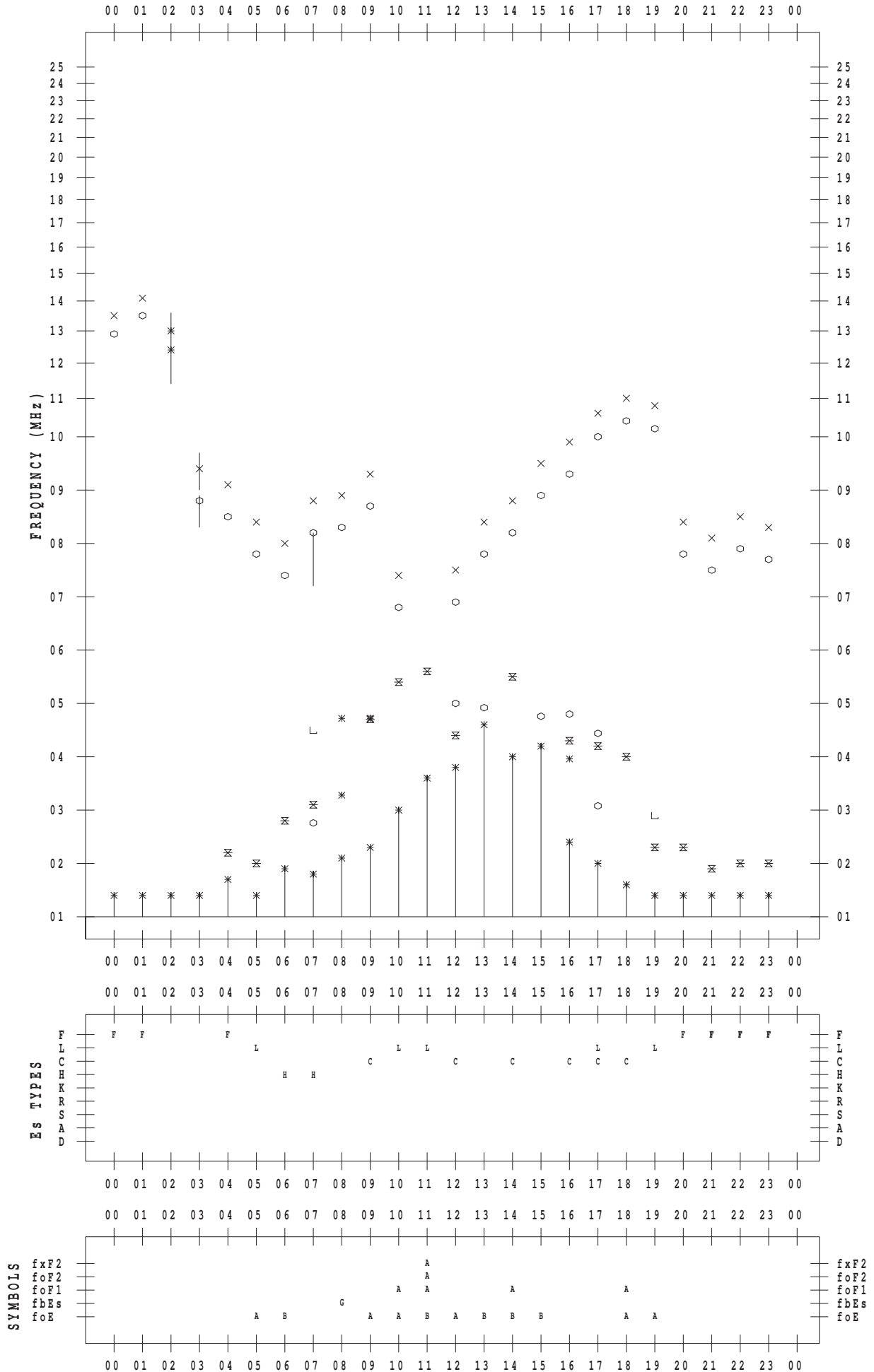
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/ 4

135 ° E MEAN TIME



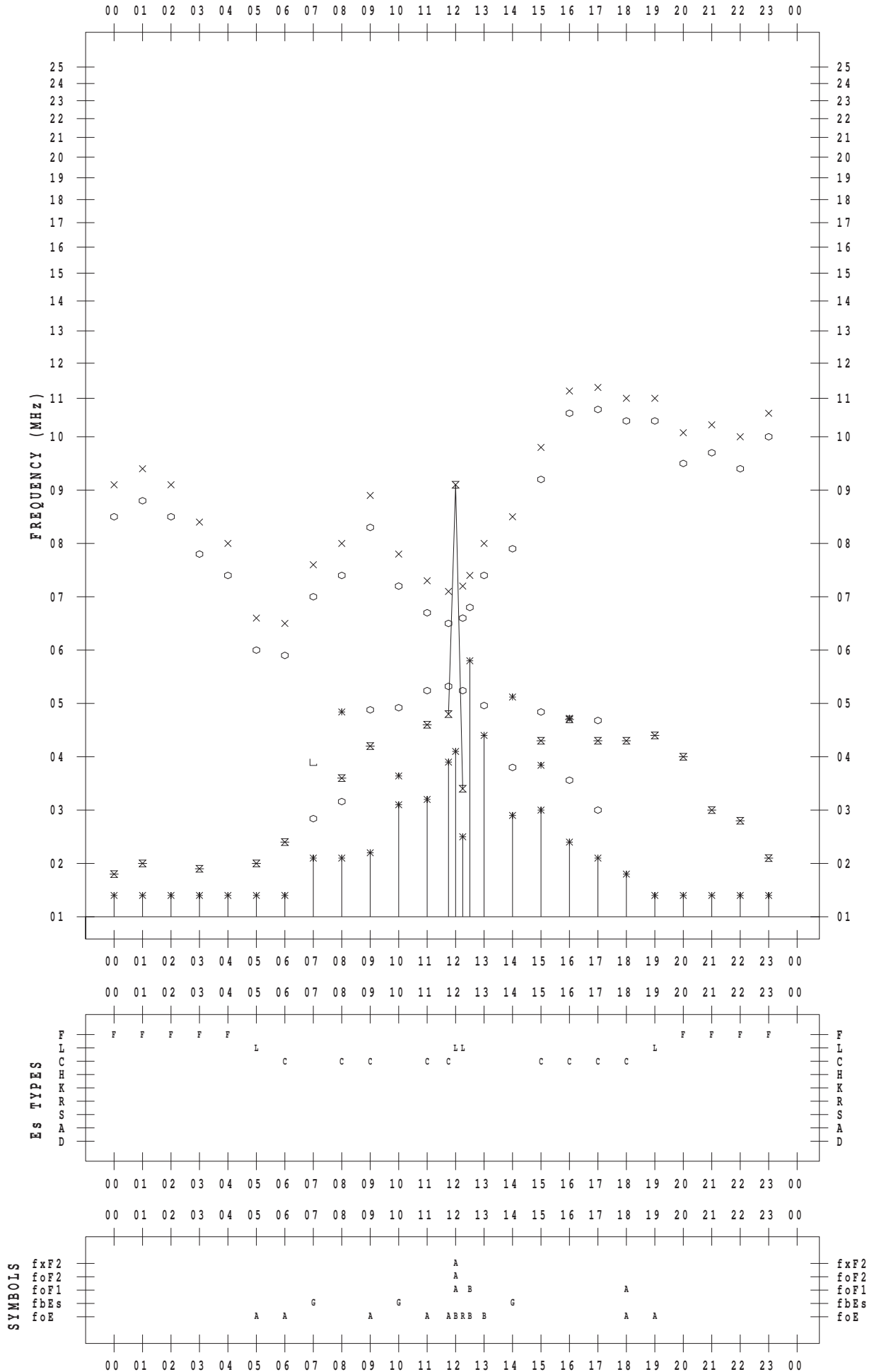
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/ 5

135 ° E MEAN TIME



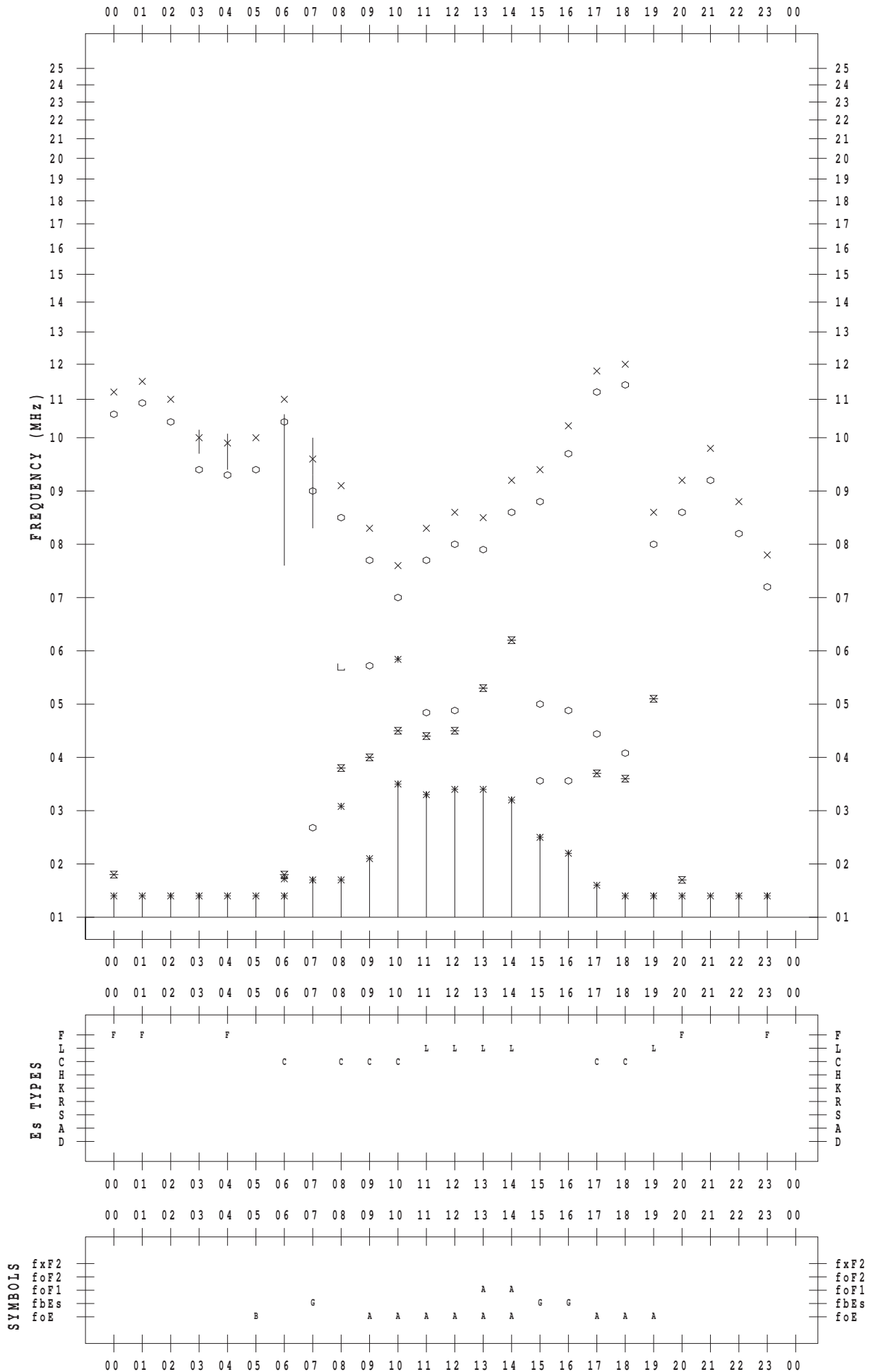
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/ 6

135 ° E MEAN TIME



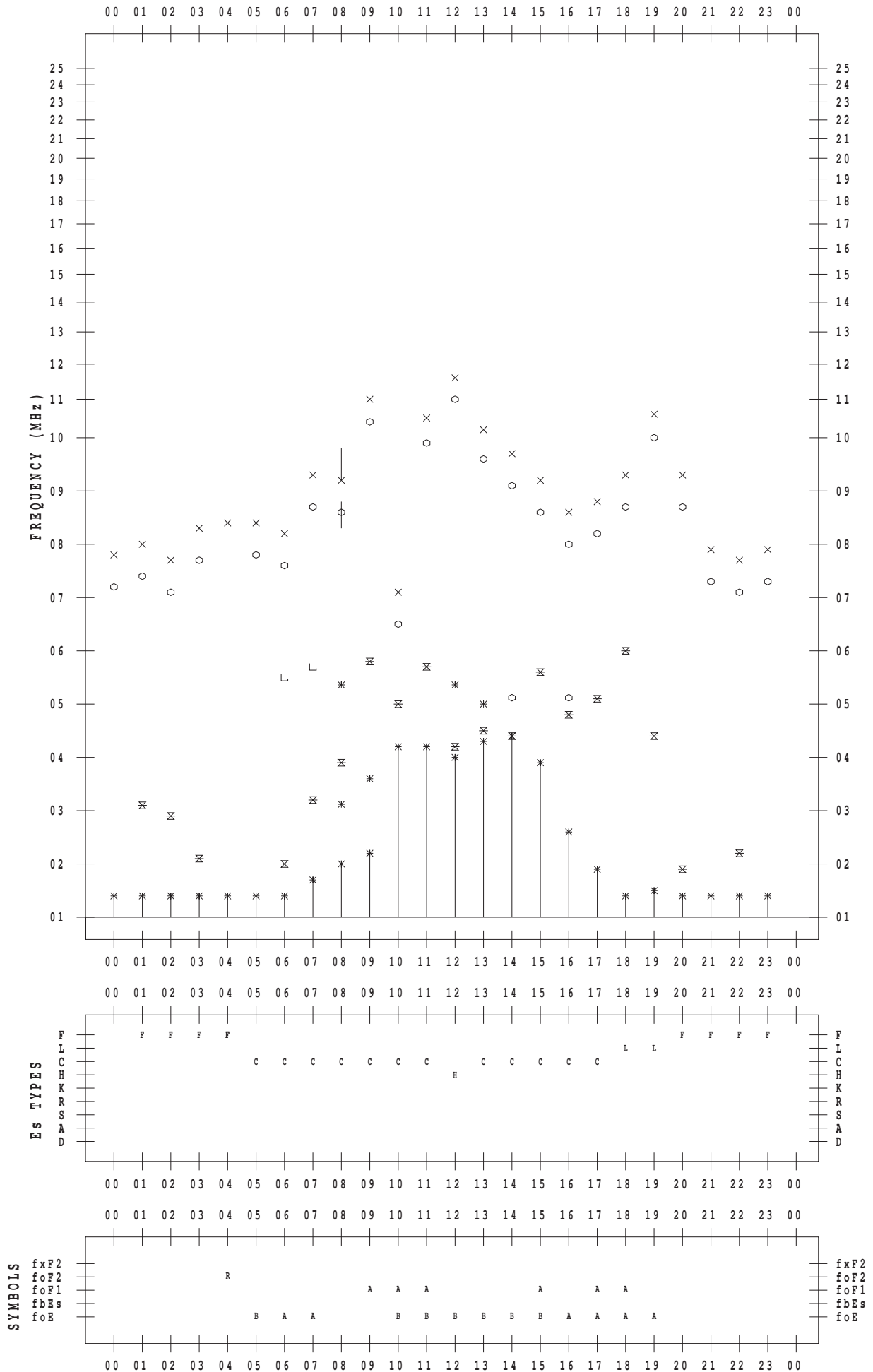
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013 / 7 / 7

135 ° E MEAN TIME



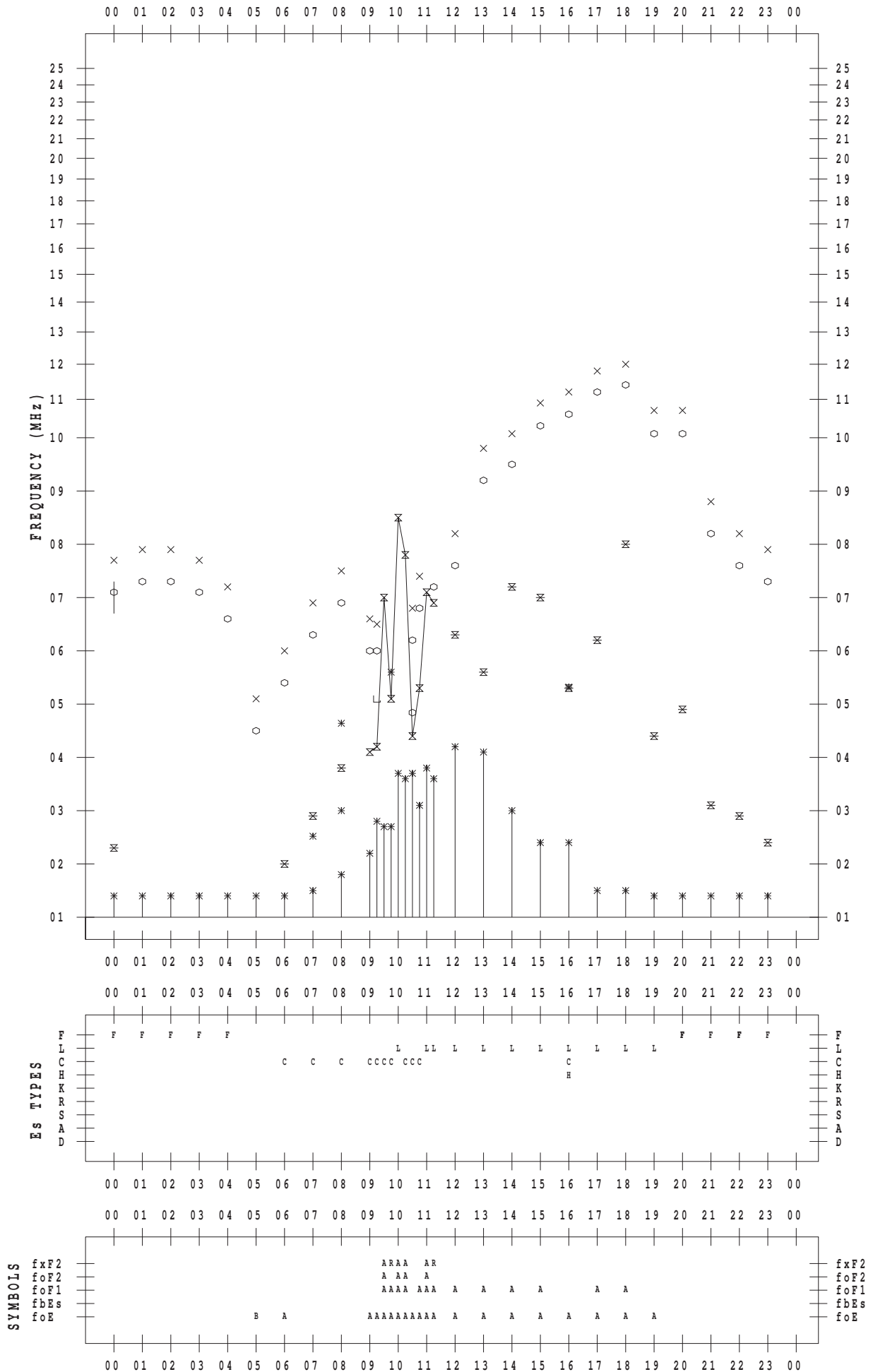
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/ 8

135 ° E MEAN TIME



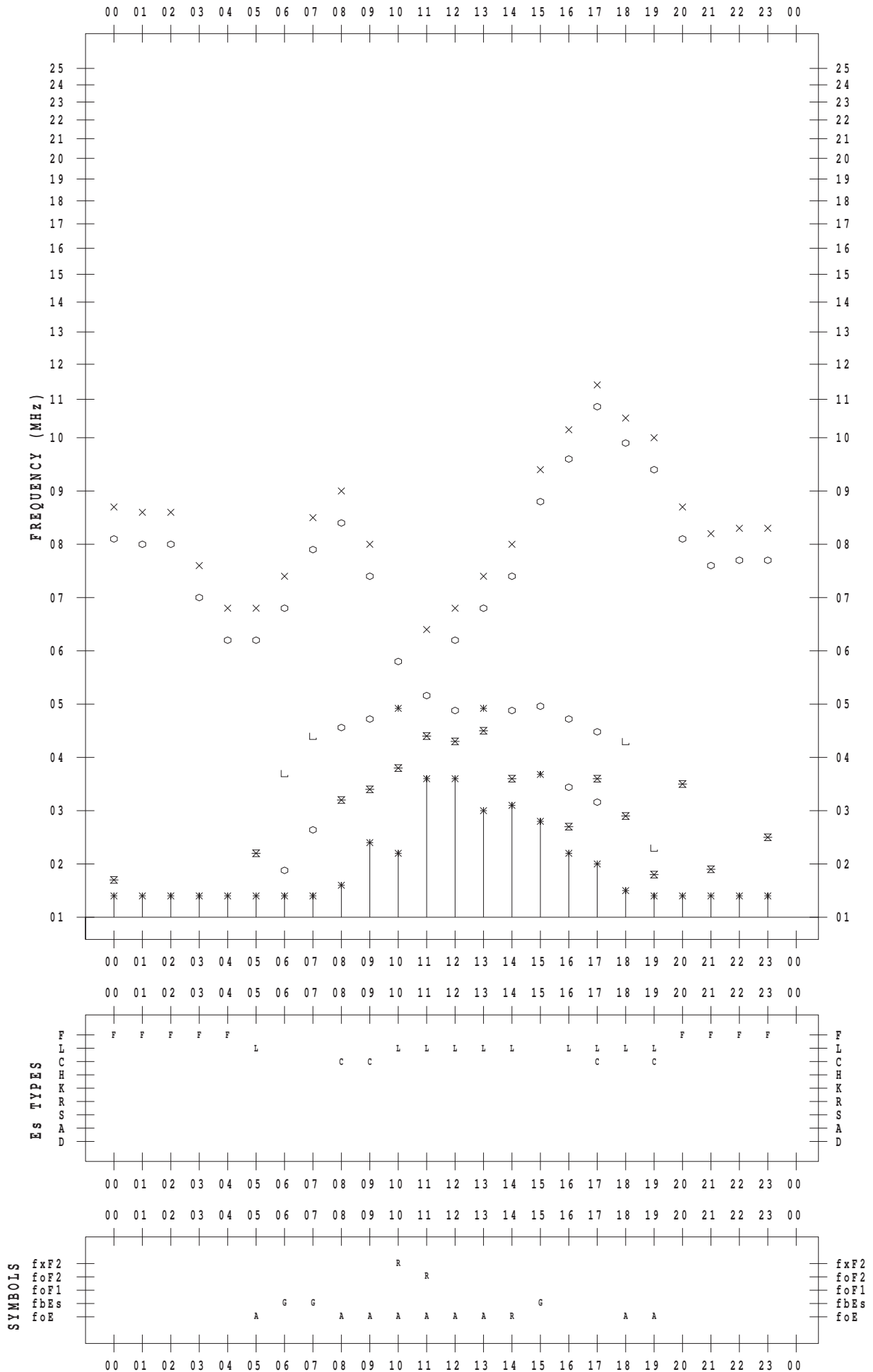
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/ 9

135 ° E MEAN TIME



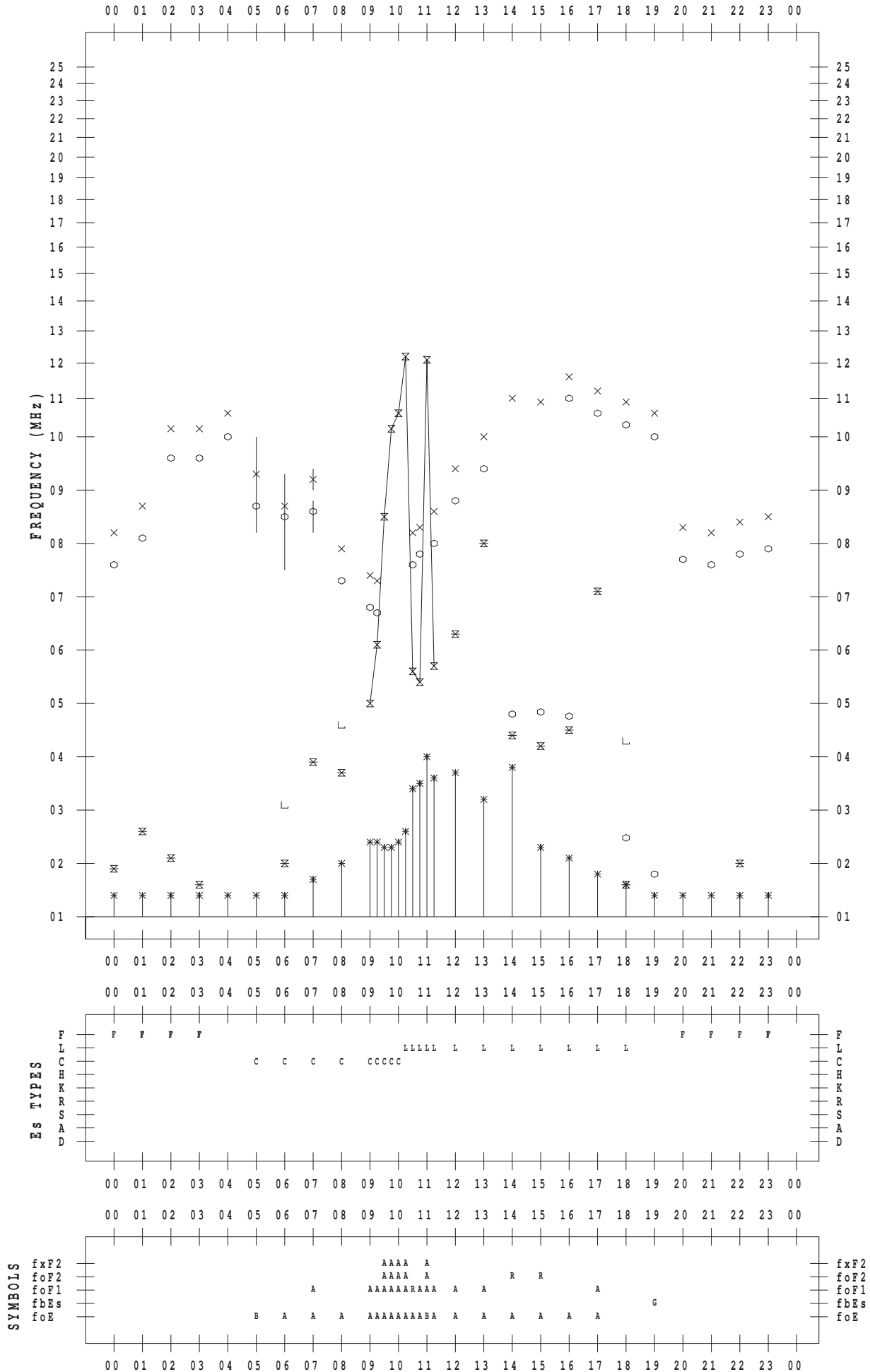
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/10

135 ° E MEAN TIME



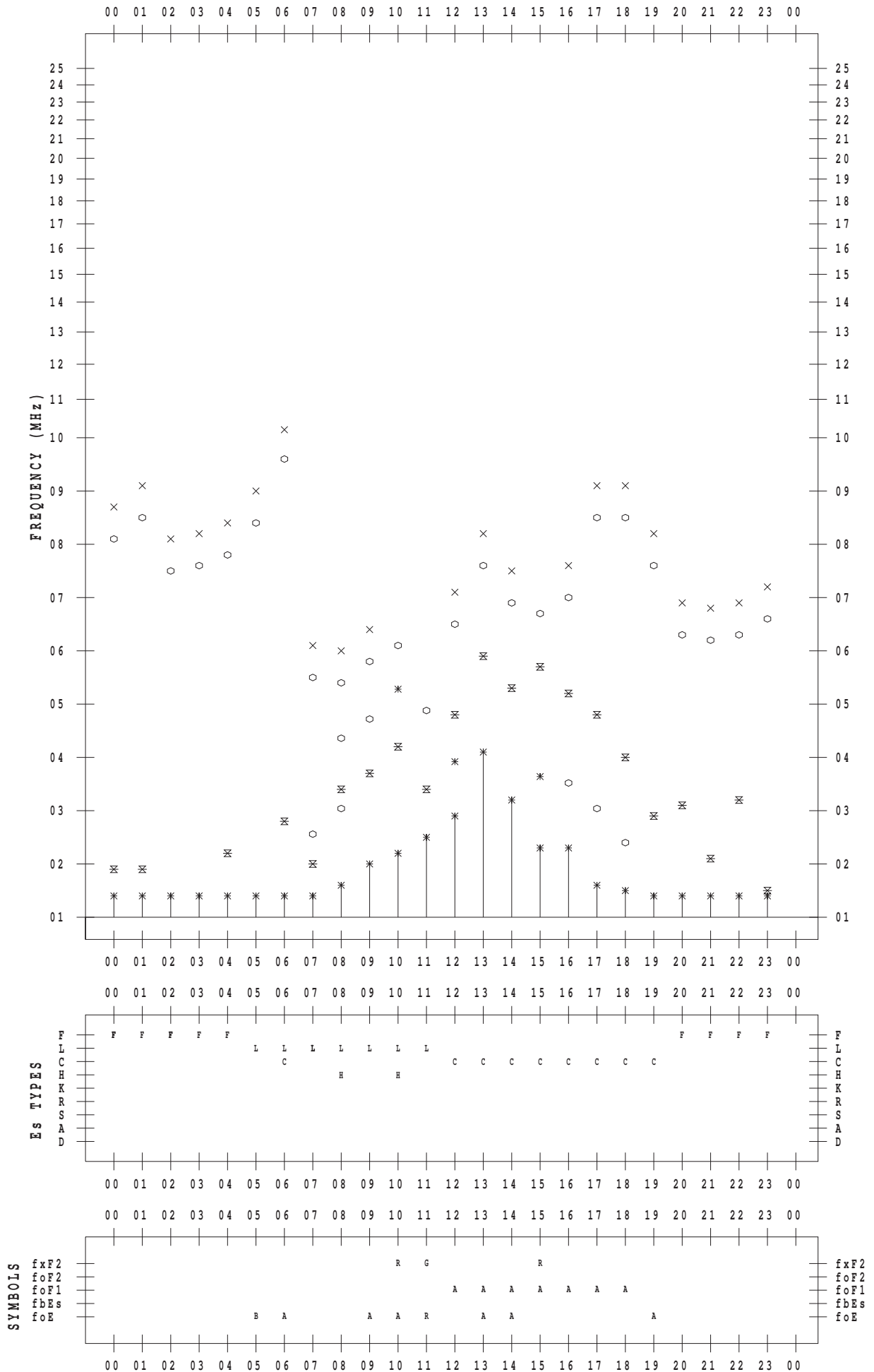
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/11

135 ° E MEAN TIME



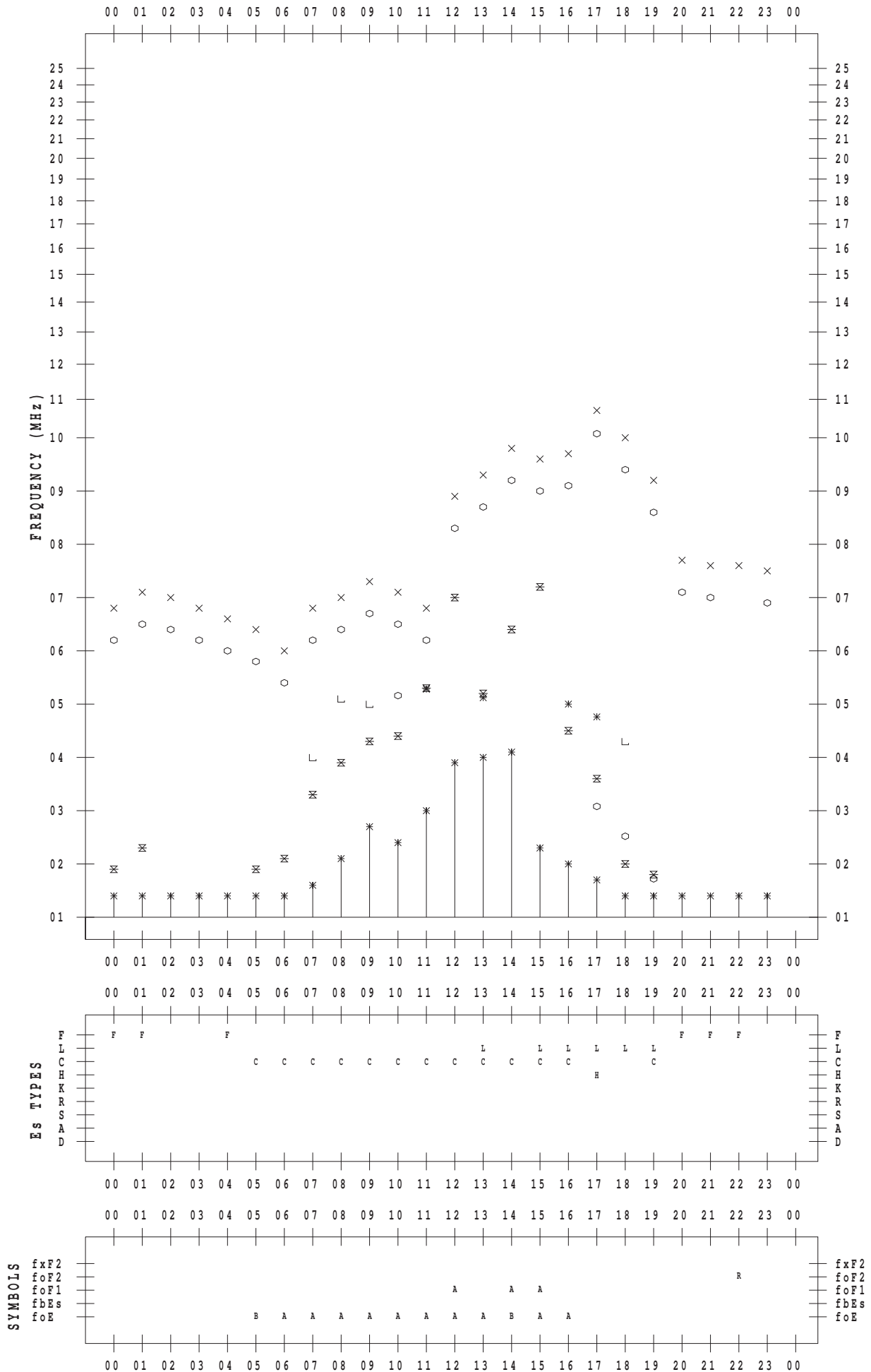
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/12

135 ° E MEAN TIME



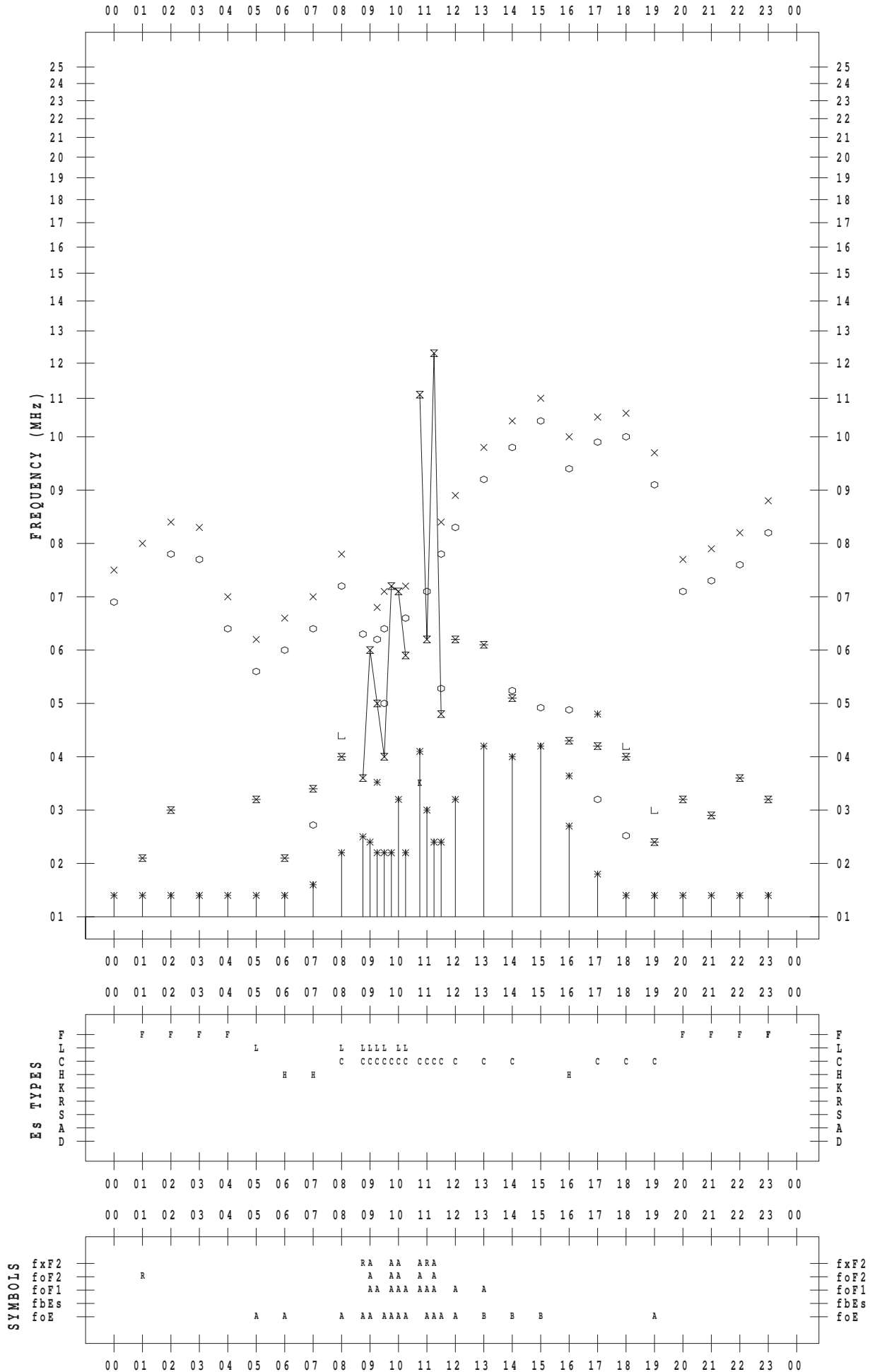
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/13

135 ° E MEAN TIME



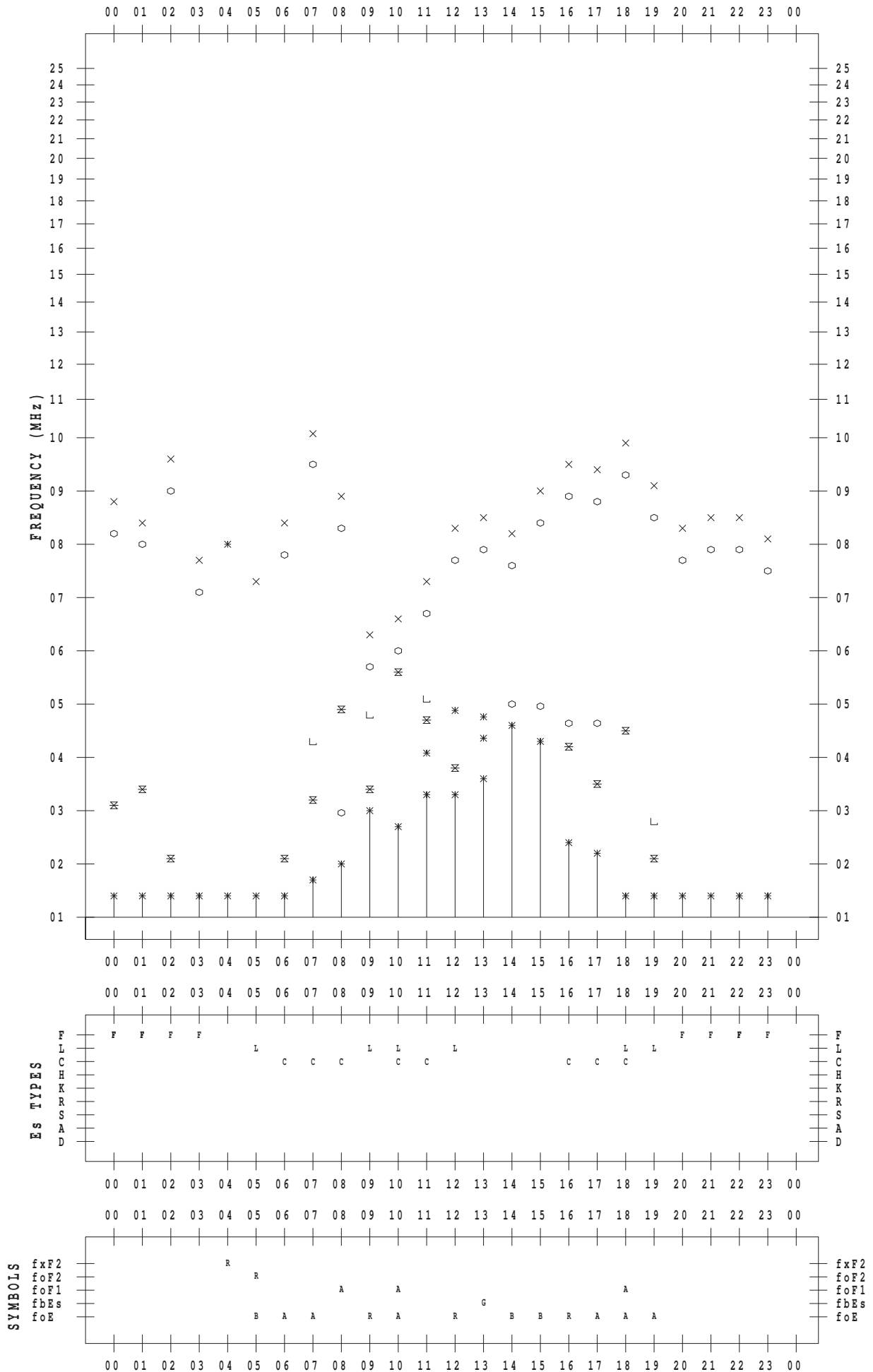
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/14

135 ° E MEAN TIME



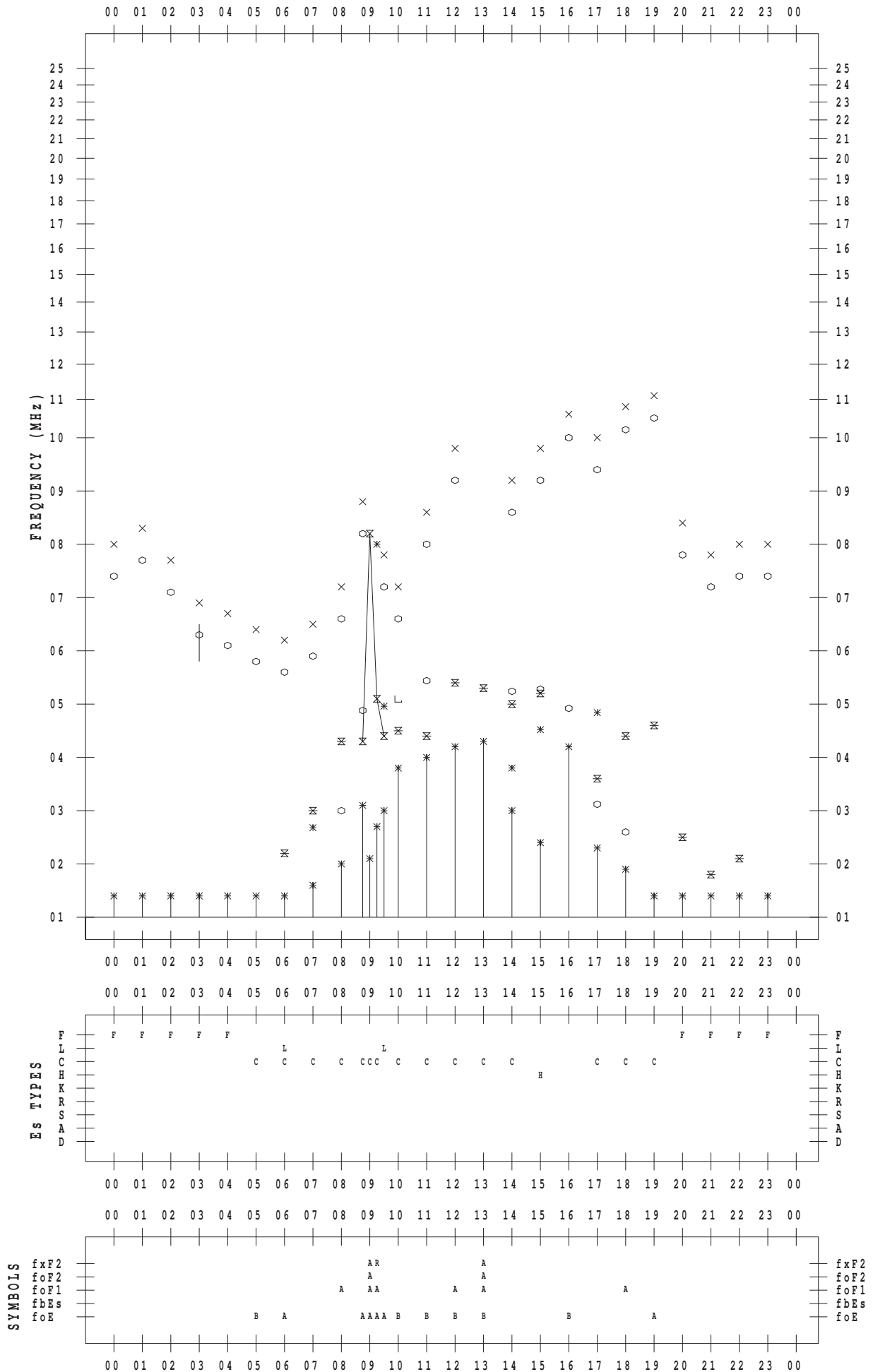
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/15

135 ° E MEAN TIME



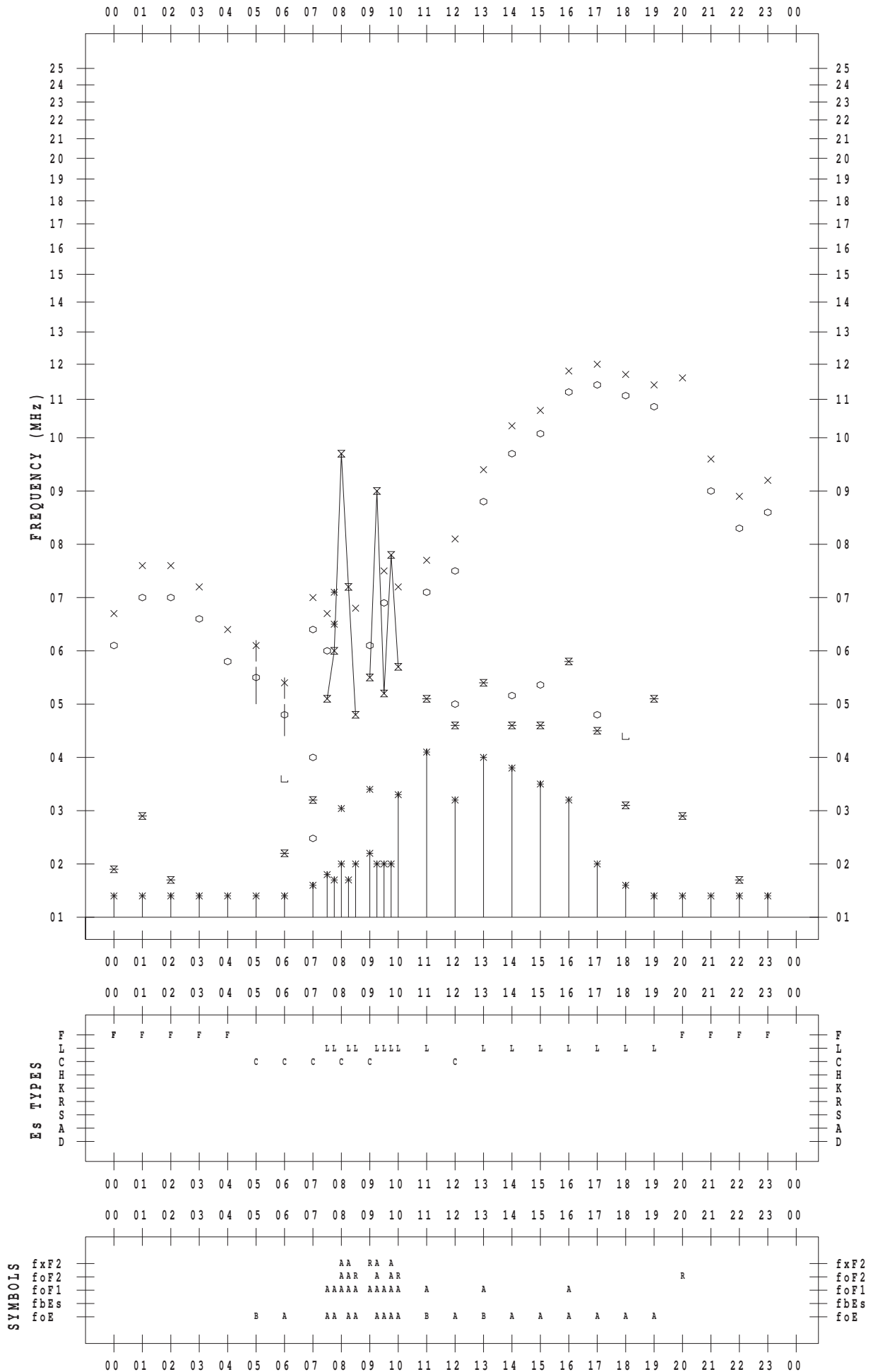
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/16

135 ° E MEAN TIME



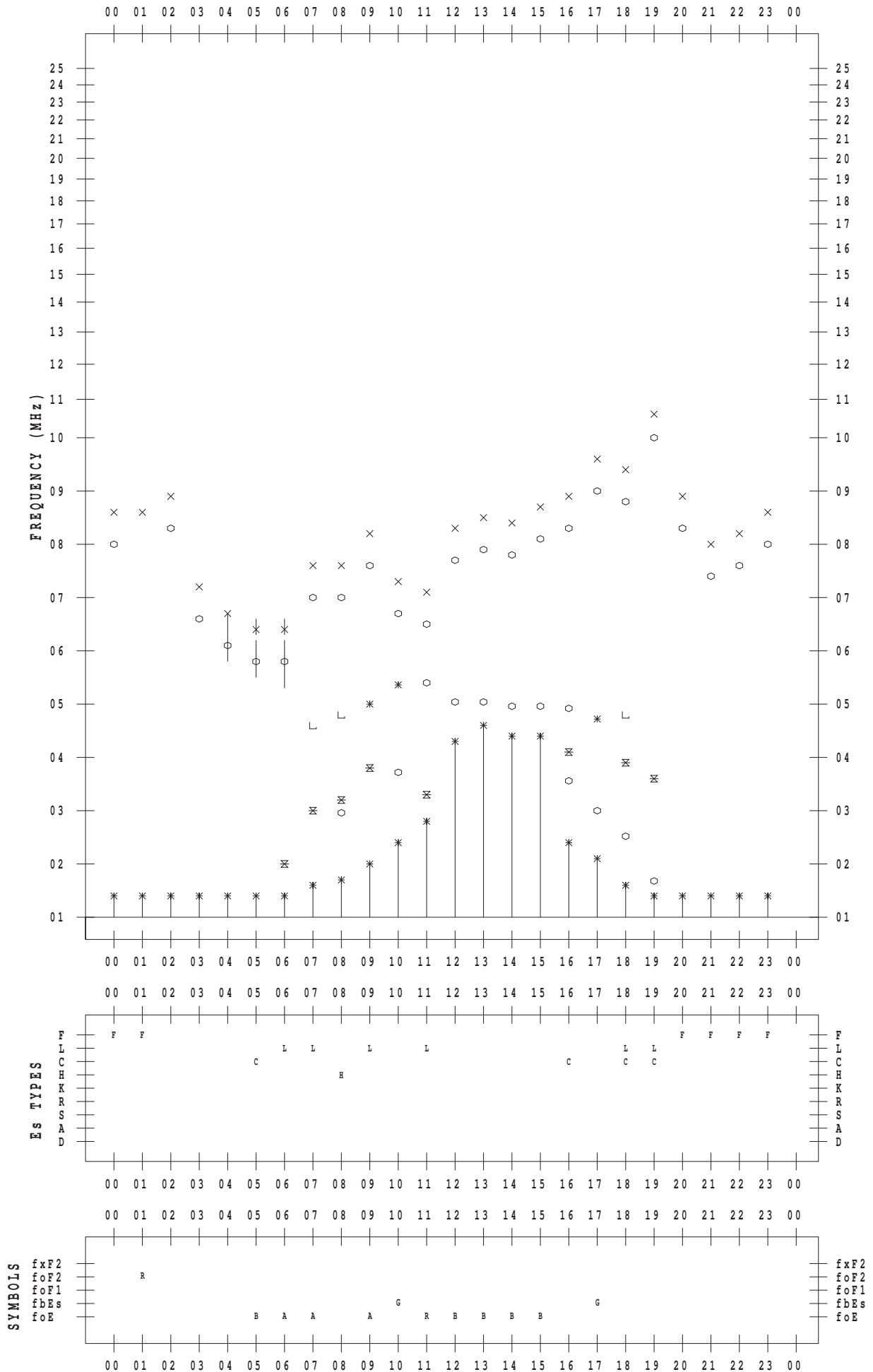
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/17

135 ° E MEAN TIME



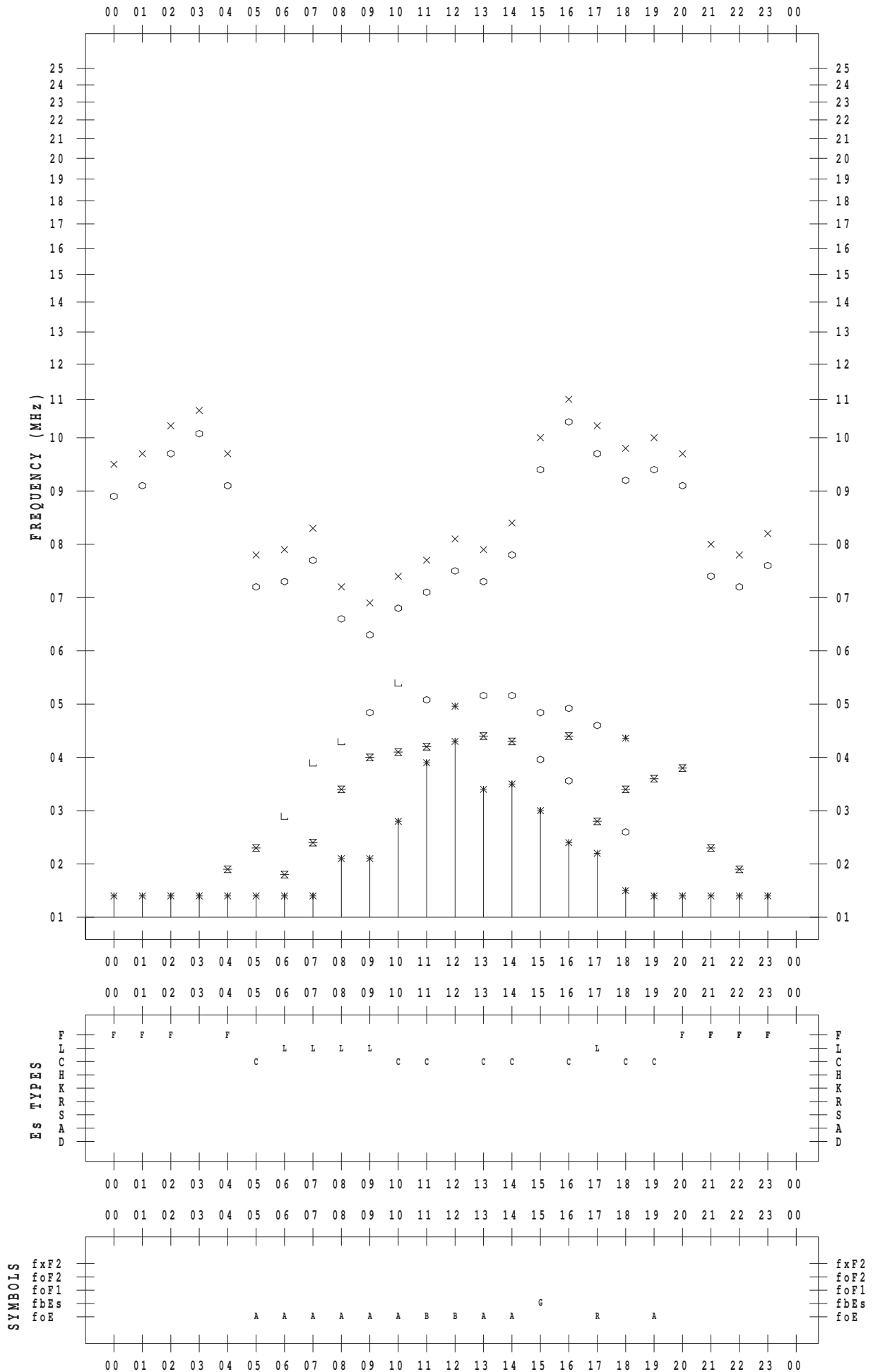
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/18

135 ° E MEAN TIME



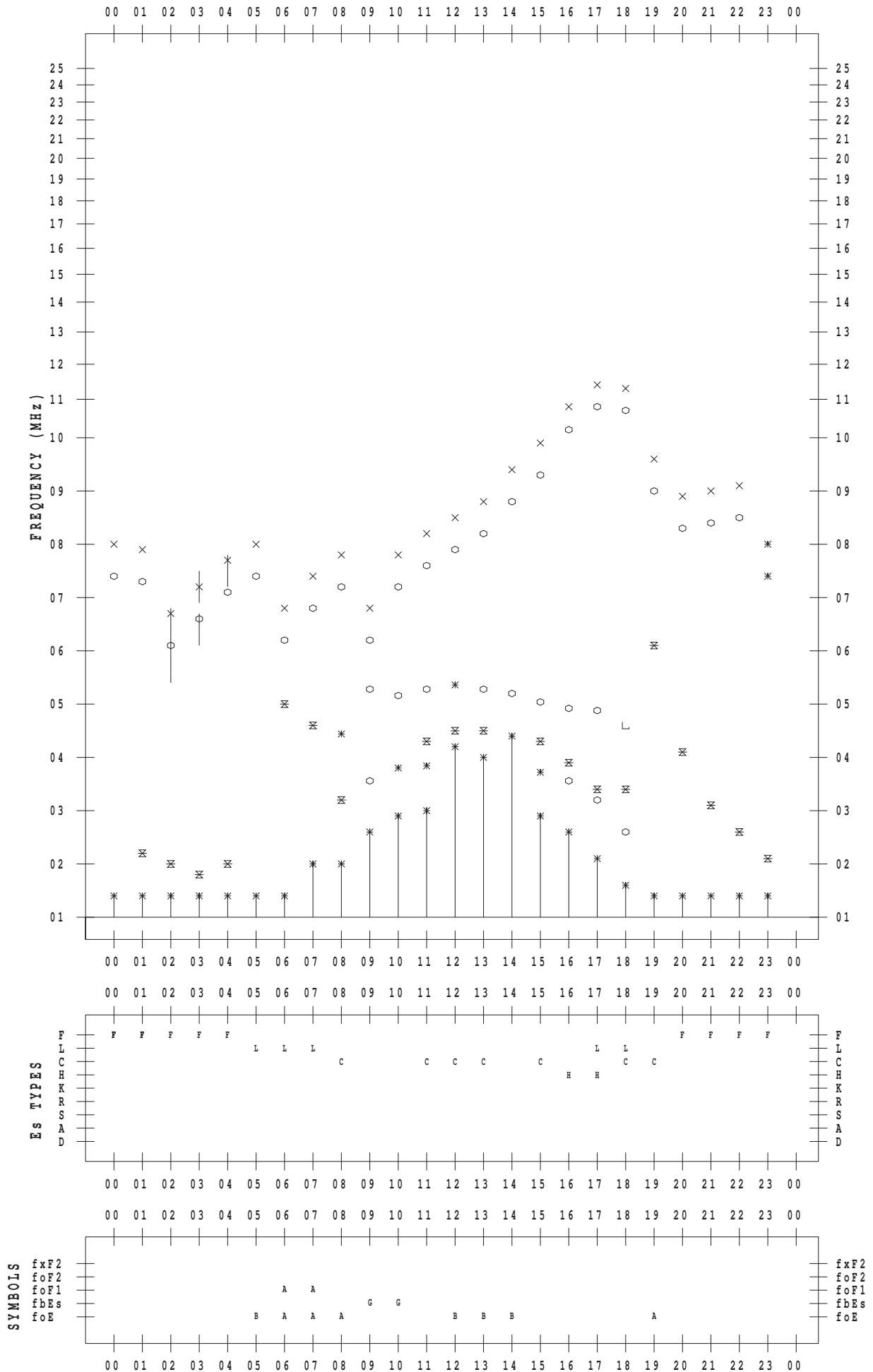
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/19

135 ° E MEAN TIME



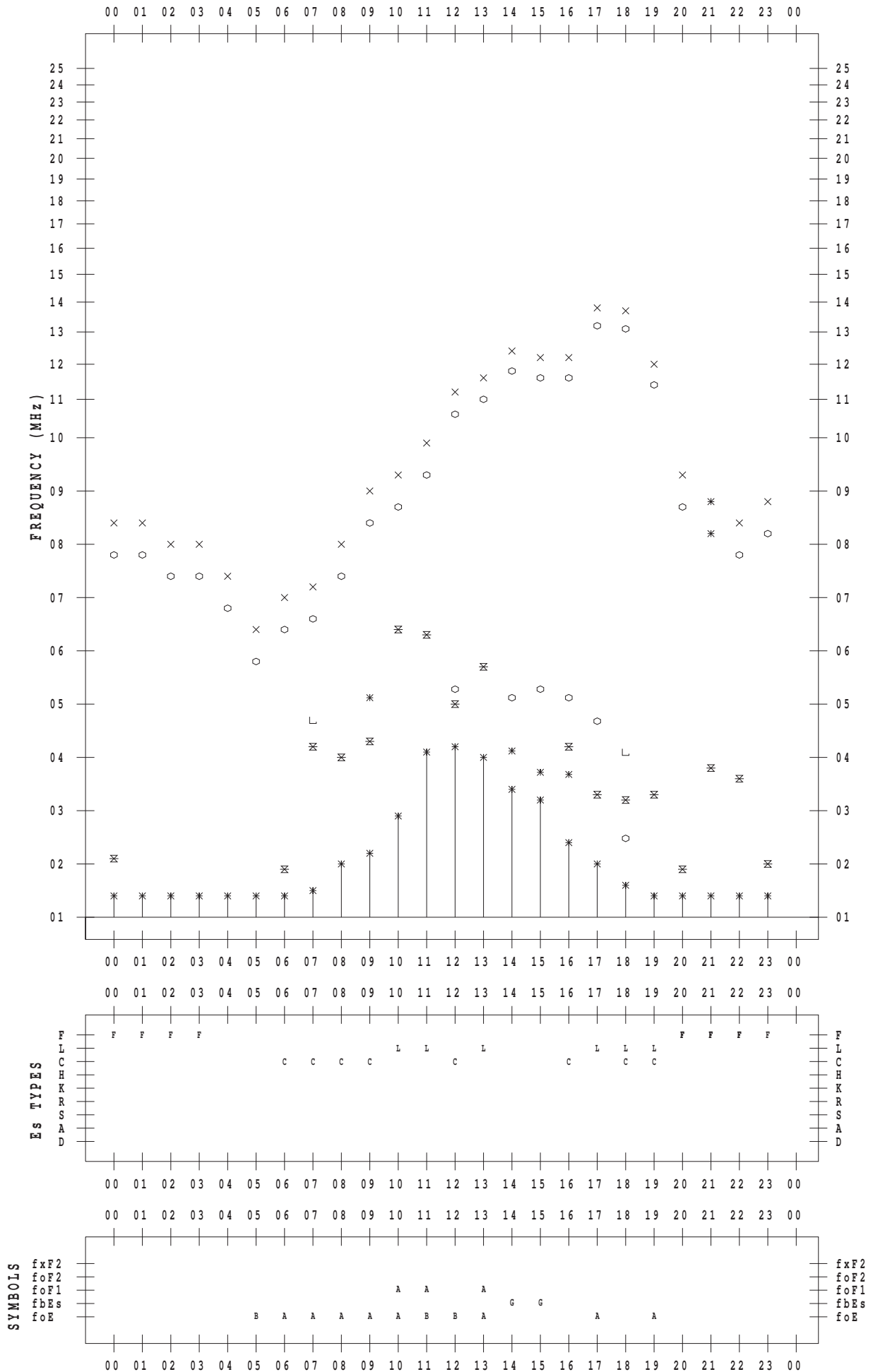
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/20

135 ° E MEAN TIME



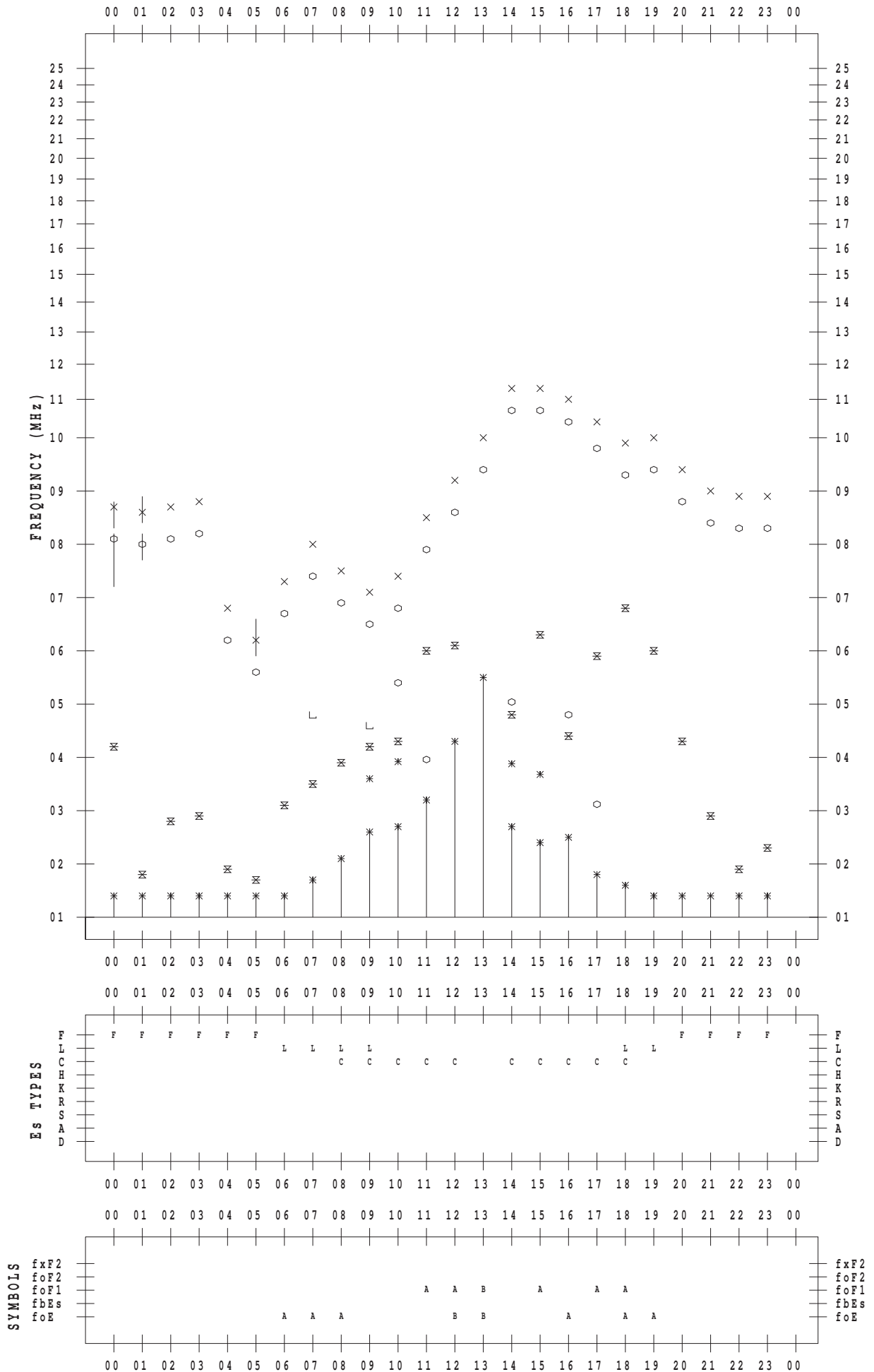
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/21

135 ° E MEAN TIME



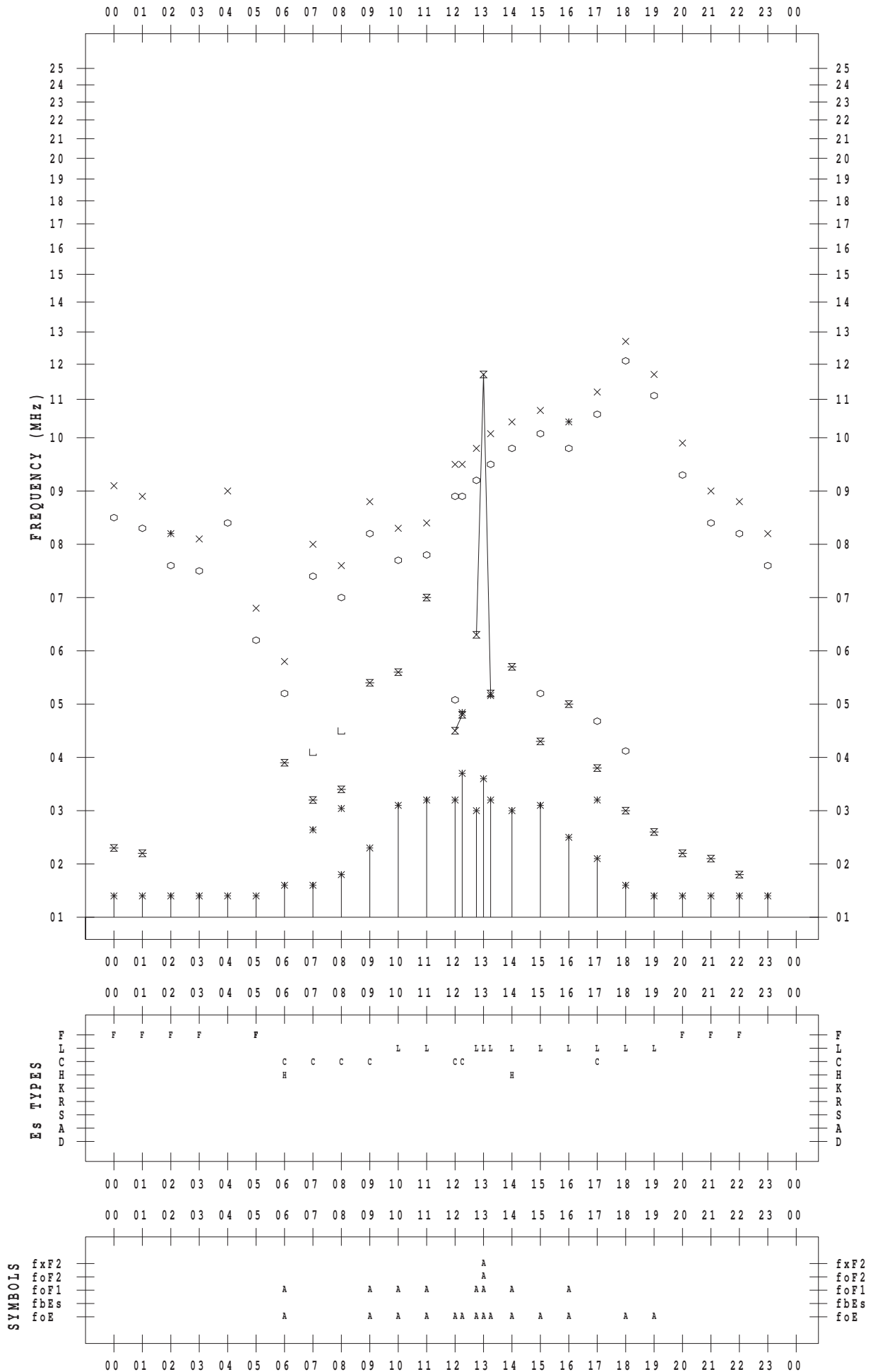
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/22

135 ° E MEAN TIME



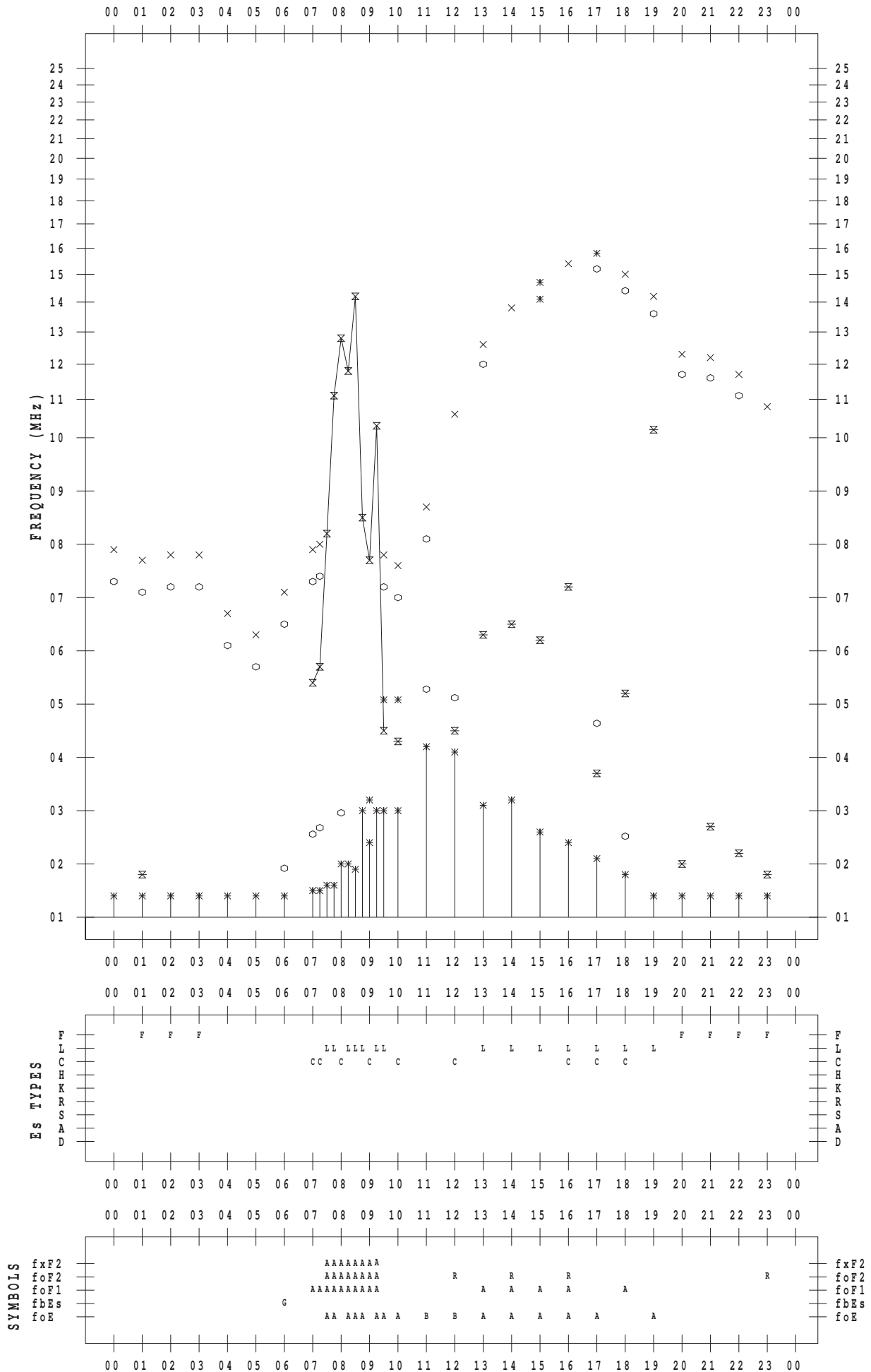
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/23

135 ° E MEAN TIME



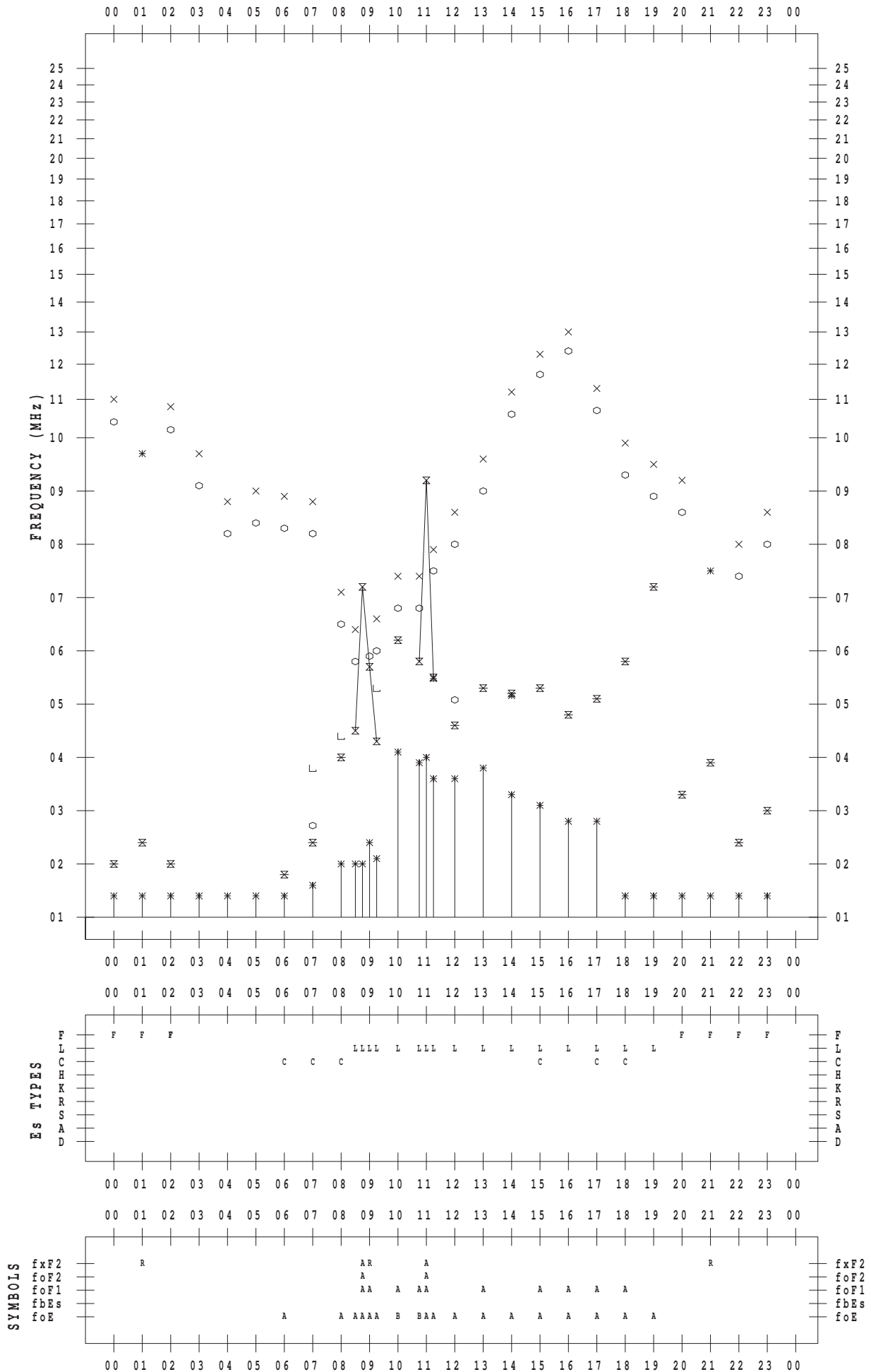
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/24

135 ° E MEAN TIME



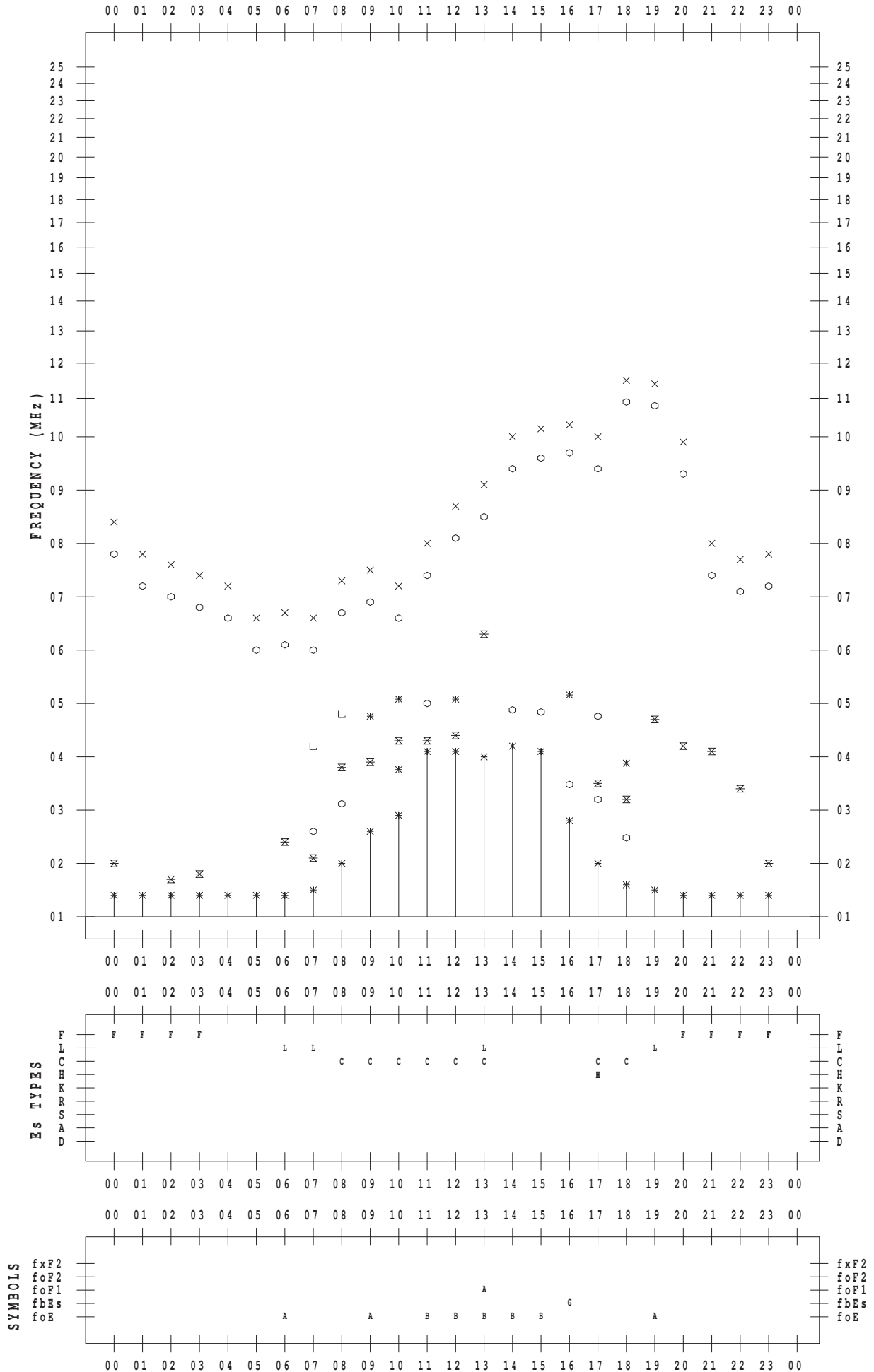
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/25

135 ° E MEAN TIME



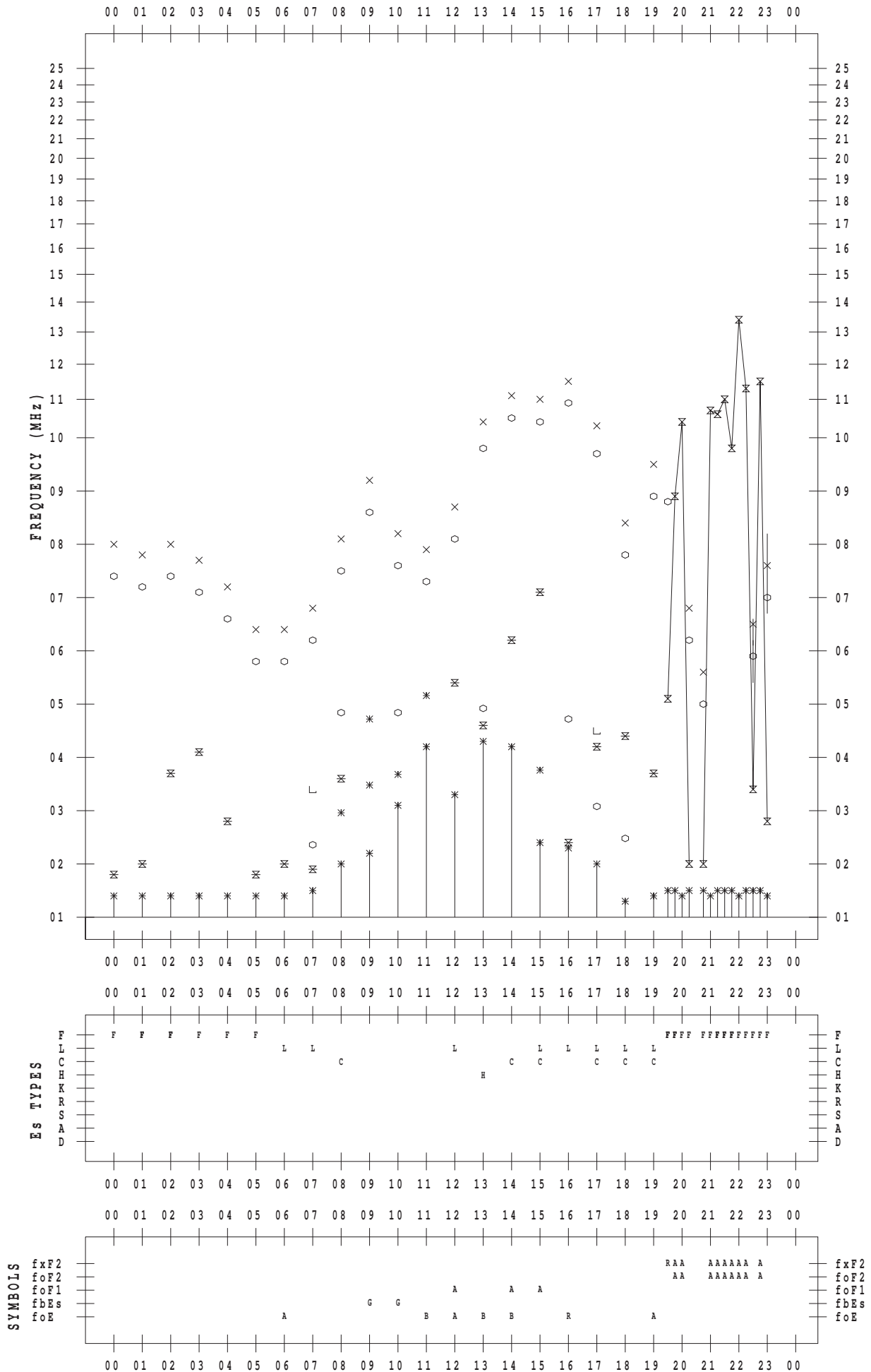
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/26

135 ° E MEAN TIME



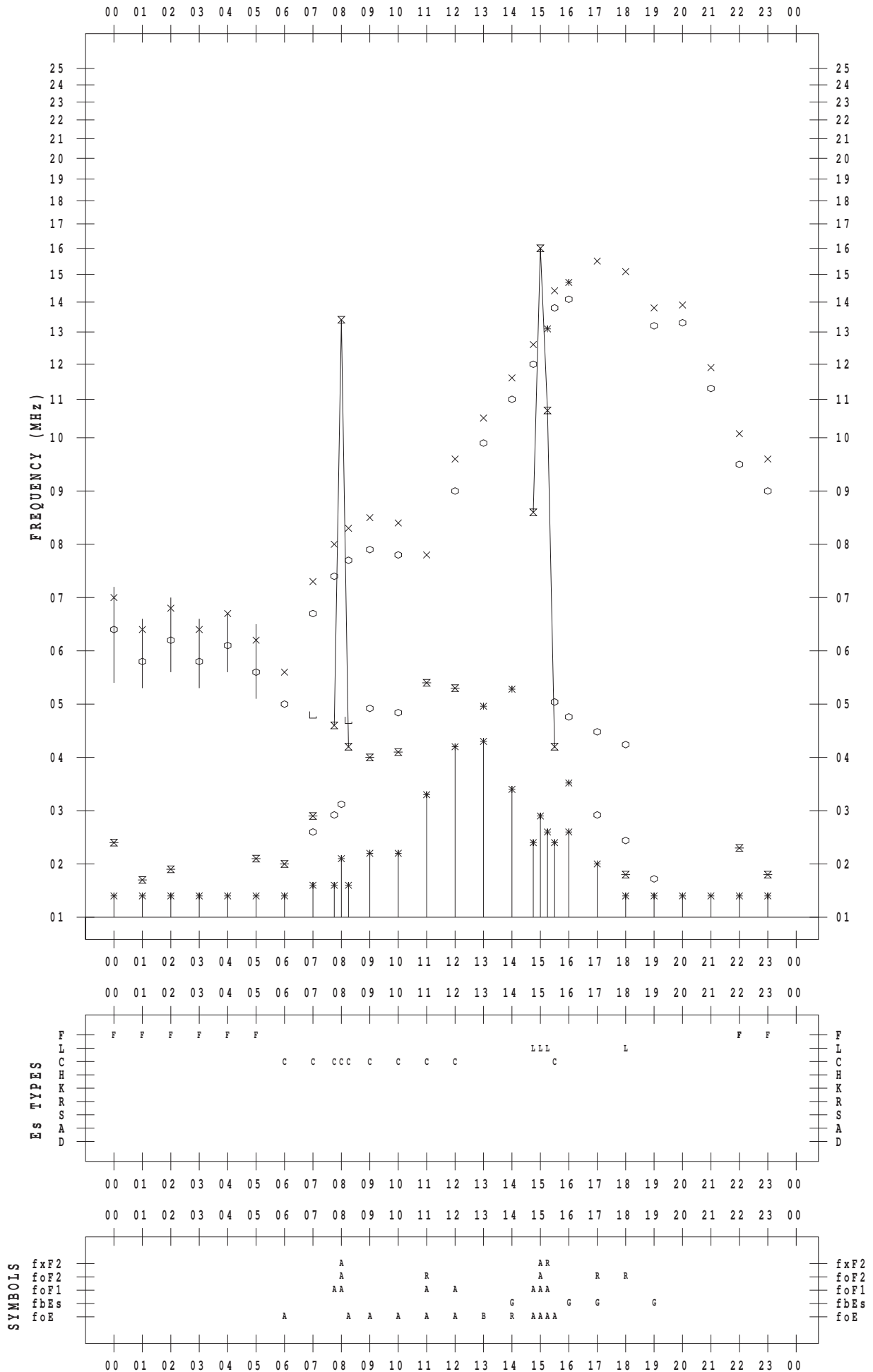
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/27

135 ° E MEAN TIME



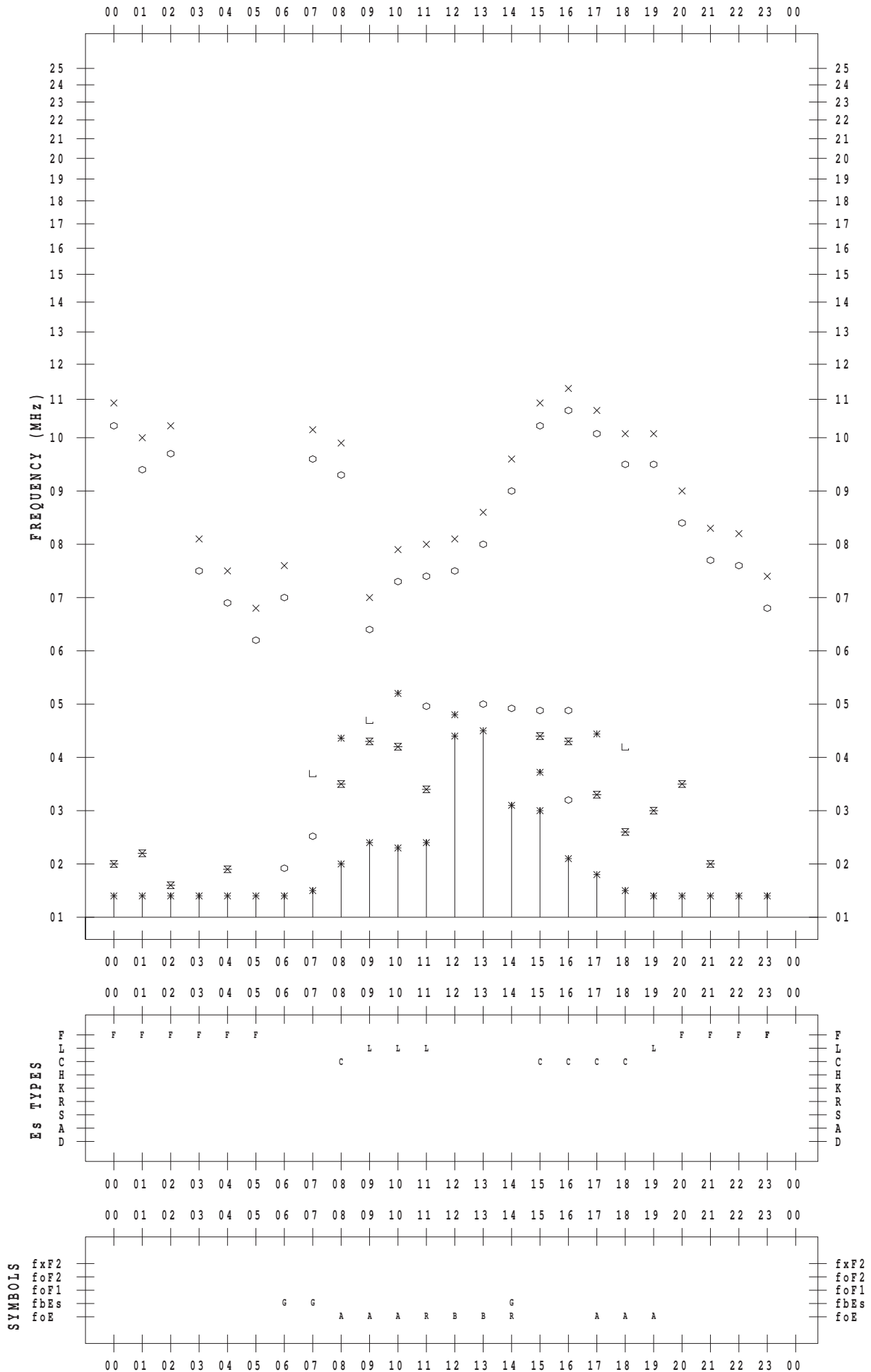
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/28

135 ° E MEAN TIME



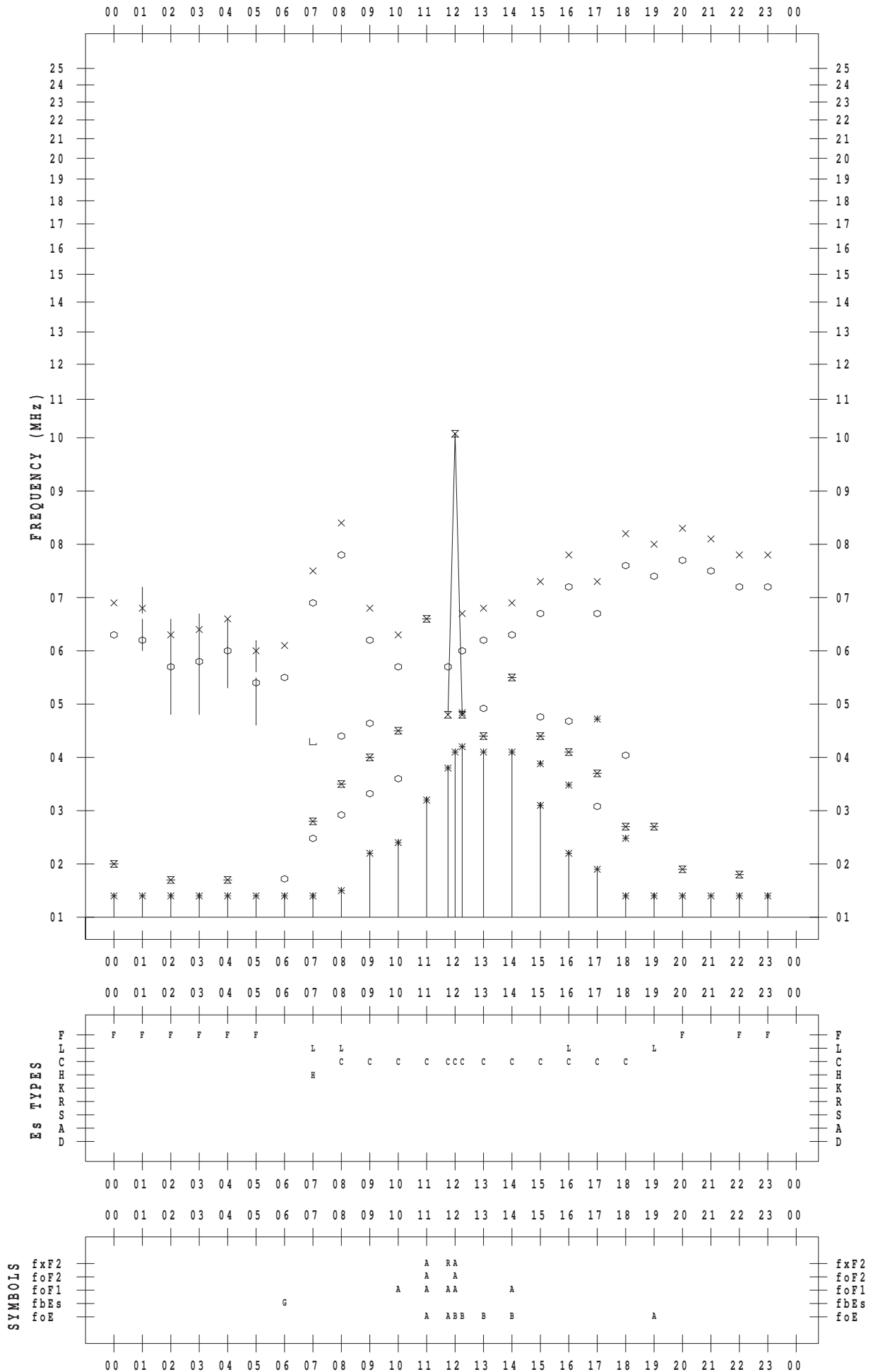
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/29

135 ° E MEAN TIME



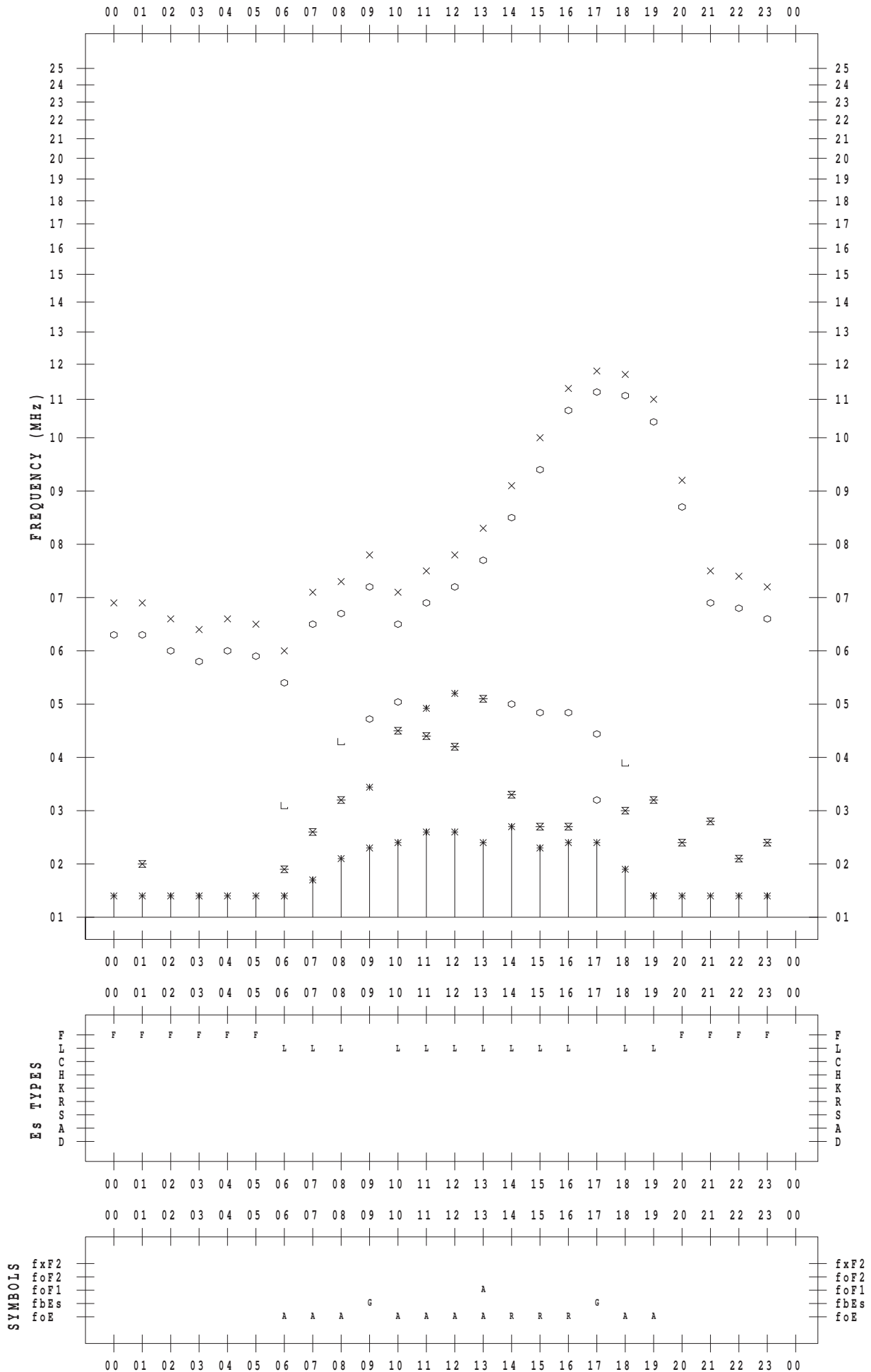
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/30

135 ° E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2013/ 7/31

135 ° E MEAN TIME

