

IONOSPHERIC DATA IN JAPAN

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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

APR. 2018

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	42	44	43	42	44	38	44	47	51	55	64	68	75	68	59	62	54	46	54	54	52	52	38	43
2	44	47	47	42	42	44	41	51	54	54	57	58	59	63	63	56	54	48	51	51	54	51	43	41
3	43	43	34	40	40	37	54	46	51	54	52	59	61	63	56	57	54	50	46	50	51	50	50	47
4	47	46	45	48	44	40	42	46	51	54	57	55	56	58	60	55	56	50	51	52	50	47	47	43
5	37	42	38	40	37	38	48	44	49	52	58	63	59	57	64	60	52	50	45	48	48	40	46	47
6	47	43	42	40	40	36	46	40	54	53	46	56	60	55	56	60	61	56	54	51	44	43	43	43
7	43	48	54	54	44	34	46	50	50	59	58	57	59	56	61	55	54	53	55	57	54	54	55	54
8	54	51	52	50	51	51	54	50	54	55	58	59	60	59	59	54	53	52	52	52	54	52	44	40
9	40	47	52	53	51	52	51	52	54	57	66	59	62	A	A	54	59	54	58	67	63	53	47	A
10	42	42	43	32	32	37	40	44	46	50	51	48	62	58	55	58	62	60	63	58	54	50	42	42
11	43	42	41	42	34	40	53	54	50	52	54	A	62	72	56	55	56	51	54	58	51	48	46	A
12	A	38	36	36	34	37	36	50	51	53	56	58	58	56	52	48	51	48	50	54	54	55	51	36
13	36	36	34	34	34	40	42	44	47	50	54	54	53	58	55	51	50	53	51	52	48	48	48	38
14	37	38	36	38	40	40	50	51	60	57	64	56	52	55	60	52	54	53	52	65	66	60	48	43
15	50	52	50	51	54	43	45	44	50	56	59	56	54	55	55	54	54	55	54	57	50	53	53	53
16	50	50	47	46	43	44	46	47	52	60	58	63	57	56	57	60	55	51	52	63	51	54	48	43
17	43	34	42	41	45	44	44	47	51	55	60	60	62	61	58	58	55	58	52	57	51	58	58	52
18	48	48	48	48	48	44	43	49	53	55	58	54	55	58	56	56	54	54	52	58	51	54	49	44
19	47	47	44	45	40	40	38	45	49	50	51	53	53	58	57	59	58	50	47	50	49	47	47	50
20	47	42	44	47	41	45		45	44	54	61	67	59	55	45	55		70	81	78	81	60	47	51
21	42	38	38	A	32	A	37	52	A	A	A	104	42	N	A	46	50	44	40	45	48	43	38	40
22	36	32	34	A	31	34	40	A	46	A	49	A	43	41	51	50	51	50	51	51	51	51	43	37
23	34	32	34	32	34	41	50	50	51	51	51	51	45	57	60	53	60	58	48	51	49	48	46	40
24	40	38	37	37	34	47	45	51	51	58	54	57	56	59	60	65	62	56	50	51	51	51	51	42
25	40	40	39	39	42	42	A	51	54	54	A	62	61	59	58	57	57	58	55	57	54	54	44	43
26	42	41	40	40	40	46	47	50	54	56	57	54	55	56	59	60	60	54	47	55	54	51	54	47
27	31	44	42	42	44		45	42	54	56	60	59	58	56	55	52	51	51	52	58	54	51	43	43
28	37	38	37	37	40	45		50	49	54	55	59	56	54	55	54	51	50	50	57	54	50	54	48
29	42	43	42	39	38	45	46	51	55	64	55	54	49	55	52	55	48	55	55	62	63	52	55	48
30	40	41	40	37	34	45	44	47	50	57	58	57	56		51	55	54	51	52	57	A	53	49	44
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	28	30	28	27	29	29	28	28	28	30	27	28	30	29	30	30	30	29	30	30	28
MED	42	42	42	40	40	42	45	49	51	54	57	58	58	57	56	55	54	52	52	56	51	51	47	43
U Q	47	47	45	46	44	45	48	51	54	56	58	59	60	59	59	58	57	55	54	58	54	54	51	47
L Q	38	38	37	37	34	38	42	45	49	53	54	54	54	55	55	54	51	50	50	51	50	48	44	41

HOURLY VALUES OF fEs AT Wakkanai

APR. 2018

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	G	117	31	G	29	41	47	40	34	34	40	40	38	54	32	26	G	G	G	G	26	28	
2	G	G	G	G	38	G	34	36	34	43	43	40	41	39	34	33	32	36	39	28	G	G	G	G	
3	G	G	G	G	G	G	30	30	35	34	29	45	46	46	39	33	33	26	25	G	G	G	G	G	
4	G	G	G	G	G	G	27	38	29	37	85	46	45	38	33	29	33	G	G	G	G	G	G	G	
5	G	G	G	G	G	G	29	40	90	36	34	40	47	46	34	43	34	31	26	G	G	G	G	24	
6	G	G	G	30	G	G	30	33	36	34	44	34	45	32	37	34	34	G	G	G	G	G	G	G	
7	G	G	G	G	G	G	33	37	35	44	47	43	40	40	34	39	33	23	G	G	G	G	G	G	
8	G	G	G	G	G	G	29	35	36	41	34	46	45	43	47	37	35	32	G	G	G	30	46	G	
9	G	G	G	G	G	G	28	37	35	36	44	46	55	69	76	47	42	29	G	G	26	27	38	43	53
10	28	27	G	G	G	G	G	32	40	36	41	43	40	39	36	36	32	30	G	G	11	G	27	G	G
11	G	24	G	G	G	G	33	52	40	36	44	74	50	37	33	34	34	38	36	31	41	G	27	40	
12	40	33	27	G	G	24	G	36	27	29	32	46	46	34	43	35	32	40	G	27	36	28	25	33	
13	28	69	24	G	G	G	34	38	41	54	46	52	57	40	44	34	34	31	28	G	G	G	G	G	
14	G	G	G	G	170	G	29	33	35	40	146	42	47	44	40	35	32	33	G	G	G	G	G	G	
15	G	G	G	G	11	G	33	31	57	33	32	46	40	47	34	34	24	34	29	28	G	G	G	33	
16	G	G	G	G	G	25	32	26	32	44	40	41	40	84	39	42	25	33	31	28	24	G	G	G	
17	G	G	G	G	G	G	28	111	40	45	46	33	46	40	38	41	34	29	G	24	28	G	G	G	
18	G	G	G	G	G	G	28	32	34	34	35	96	40	40	39	33	34	27	27	28	G	G	G	G	
19	G	G	G	G	11	G	36	40	44	50	43	48	40	47	39	35	33	G	G	26	G	G	G	G	
20	G	G	G	G	36	29	39	35	38	39	45	47	38	33	41	41	29	29	G	G	G	G	G	32	
21	32	34	33	32	58	53	118	46	53	51	44	65	33	31	46	29	39	40	36	34	G	G	G	G	
22	G	G	G	27	G	G	58	48	37	54	45	48	36	95	31	41	33	34	32	27	G	27	29	28	
23	G	G	G	27	G	G	33	35	40	41	41	43	48	43	44	60	39	41	24	30	24	G	G	G	
24	G	G	30	G	G	G	36	92	44	39	115	54	42	52	47	48	33	G	G	G	G	G	G	G	
25	29	27	33	33	30	32	70	46	178	53	59	52	58	115	34	42	46	40	G	38	34	34	34	24	
26	G	G	G	G	115	27	32	33	40	40	41	48	46	46	32	31	34	31	G	G	G	G	G	G	
27	G	G	28	24	G	29	34	40	36	44	44	43	42	39	35	34	35	G	23	G	G	G	G	G	
28	G	G	G	G	G	34	39	36	82	42	40	40	40	40	35	39	36	34	G	24	G	G	G	G	
29	G	G	G	G	G	30	32	34	32	41	40	34	46	65	36	41	30	34	28	G	G	G	G	G	
30	G	G	G	G	G	39	38	125	43	84	48	37	43	39	40	39	36	34	35	34	G	26	39	39	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	29	28	30	30	30	30	30	30	29	30	30	29	30	30	30	30	30	30	30	30
MED	G	G	G	G	G	G	32	37	38	40	43	45	45	42	38	36	34	32	G	24	G	G	G	G	
U Q	G	G	G	G	11	26	34	41	43	45	46	48	47	47	40	41	34	35	28	28	24	G	25	28	
L Q	G	G	G	G	G	G	29	33	35	36	39	40	40	39	34	34	32	27	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Wakkanai

APR. 2018

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

HOURLY VALUES OF fof2 AT Kokubunji

APR. 2018

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	38	36	36	34	31	30	49	49	56	58	62	75	92	91	74	59	52	52	54	51	53	38	32	28	
2	26	36	34	38	21	27	43	43	49	58	66	65	72	69	64	52	51	54	63	55	48	36	34	34	
3	30	34	32	30	31	31	54	49	139	58	65	66	61	57	66	64	53	51	49	50	43	39	39	38	
4	38	32	36	37	30	30	42	49	52	56	56	56	57	62	64	66	54	54	63	50	47	42	36	34	
5	38	36	36	34	34	28	45	47	54	56	61	64	80	75	66	64	50	56	N	52	52	39	36	38	
6	37	37	32	30	27	31	44	49	54	61	61	59	71	69	67	62	66	64	63	54	53	38	37		
7	37	31	38	30			41	47	54	61	58	56	61	66	72	59	58	58	58	54	45		39	25	
8	34	38	36	34	31	32	44	52	54	54	55	68	68	66	62	64	58	60	57	55	54	43	27	36	
9	26	36	A	31	28	32	43	48	54	52	58	61	62	65	57	58	66	63	68	76	73	A	31	36	
10	39	42	42	46	38	36	53	54	52	44	77	62	A	76	72	66	72	78	82	83	40	34	34	35	
11	A	34	32	37	N	28	46	51	59	A	66	86	97	90	84	63	60	56	65	69	A	49	47	A	
12	43	40	38	38	34	34	46	51	54	A	66	67	72	74	70	65	59	56	58	51	64	52	A	47	
13	44	39	38	37	A	41					57	A	71	65	80	70	56	A	A	A	51	A	42		
14	47	39	38	32	26	30	47	55	71	68	57	59	61	55	58	61	59	56	64	80	64	30		35	
15	34	38	41	48	31	30	50	54	59	61	60	62	65	64	61	59	57	59	67	55	52	51	47	48	
16	47	42	47	47		30	48	A	55		74	69	71	65	64	64	65	58	65	57	54	39	39	36	
17	39	38	38	42		30	44	47		52	64	71	70	69	74	75	58	47	54	52	53	54	32	42	
18	36	36	36	38	35	30	46	50	46	56	58	64	59	62	71	72	65	55	59	53	54	44	30	38	
19	38	39	37	37	31	31	49	55	48	54	59	62	72	75	71	74	65	51	47	49	47	43	43	38	
20	43	39	42	36	28	32	40	48	51	51	61	68	71	65	68	69	68	78	97	78	66	49	A	49	
21	48	51	38	41	39	38	51	A	A	A	A	A	A	54	48	56	54	52	A	52	A	A	44	A	
22	A	A	A	A	A	32	42	A	A	A	51	56	56	46	53	56	59	62	63	65	50	37	38	38	
23	A	32	30	27	27	32	45	47	56	56	A	A	48	59	90	84	66	A	49	A	A	A	41	A	
24	38	37	34	34	32	36	45	52	53	56	58	62	67	72	77	75	66	56	47	55	54	54	48	37	
25	30	35	30	31	30	36	47	52	51	56	65	A	70	66	72	77	67	52	58	A	54	43	A	30	
26	38	38	37	37	27	32	49	52		59	64	66	68	75	82	80	57	52	49	A	71	54	43	39	
27	38	36	38	41	30	30	49	63	54	58	64	56	69	69	62	55	55	58	63	67	33	39	36	34	
28	34	34	30	28	30	37	47	52	53	A	54	64	74	72	59	58	58	55	52	50	52	52	48	43	
29	42	38	32	32	32	36	50	59	64	63	52	57	58	55	54	55	53	55	57	66	71	53	46	38	
30	38	36	34	31	27	36	44	55	64	54	64	74	64	62	58	64	71	69	51	53	54	58	35	40	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	27	29	28	29	24	29	29	26	25	23	28	26	28	30	30	30	30	28	27	26	27	25	26	25	
MED	38	37	36	36	30	32	46	51	54	56	61	64	68	66	66	64	58	56	58	54	53	43	38	38	
U Q	42	39	38	38	32	36	49	54	57	59	64	68	71	72	72	70	66	59	64	66	54	52	43	39	
L Q	34	35	33	31	27	30	44	48	52	54	57	59	61	62	61	59	55	53	52	52	48	38	34	34	

HOURLY VALUES OF fEs AT Kokubunji

APR. 2018

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	27	35	36	36	45	36	39	35	33	31	33	31	G	G	11	G	G	G
2	G	G	G	G	29	G	44	32	35	41	34	36	34	30	29	33	20	G	G	11	11	G	G	G
3	G	G	G	G	G	G	47	31	34	43	45	42	35	34	35	28	26	28	G	G	G	G	G	G
4	G	G	G	G	G	G	34	35	33	35	40	39	32	40	40	35	30	33	G	G	G	G	G	G
5	G	G	G	G	G	G	30	28	45	34	G	60	43	39	47	38	34	31	32	31	G	G	G	G
6	G	G	G	G	G	G	29	37	33	35	37	40	38	29	38	37	31	33	37	G	G	G	G	
7	G	G	G	11			G	38	27	46	46	49	47	34	35	34	35	29	G	G	G		G	G
8	G	G	G	G	G	G	31	29	35	35	37	27	29	37	28	34	33	31	34	31	G	G	G	G
9	G	G	35	29	25	G	28	35	45	34	33	G	31	31	30	36	25	G	27	G	61	56	25	28
10	28	G	G	G	G	G	29	40	32	29	36	53	79	68	29	35	32	32	40	35	24	G	G	29
11	35	34	G	G	G	G	28	44	55	82	50	55	78	71	39	31	34	47	42	53	58	33	32	49
12	G	G	G	G	G	G	27	37	46	57	50	49	G	42	45	44	46	60	53	48	53	59	33	29
13	28	G	G	32	29	G					45	68	50	34	31	29	35	57	57	60	43	43	27	G
14	G	G	G	G	G	G	24	37	43	46	47	43	G	42	G	42	49	45	53	50	22	G		G
15	G	G	G	11	G	G	32	36	42	43	35	51	55	37	31	34	31	34	38	28	32	30	29	26
16	G	G	G	42		G	35	49	35		36	34	37	36	36	32	34	45	37	31	21	G	G	23
17	G	G	G	11		G	33	31		35	37	34	34	42	28	29	27	29	32	27	G	24	G	33
18	G	G	G	G	G	G	33	23	34	43	31	39	29	G	37	42	47	38	29	33	26	35	35	G
19	G	G	G	G	G	G	35	40	36	31	33	33	35	46	35	37	G	29	26	33	31	G	G	G
20	G	G	G	G	G	110	35	34	33	48	54	31	30	G	38	28	52	54	50	32	47	29	58	G
21	G	G	G	G	G	G	33	45	54	51	45	52	52	44	42	50	36	54	52	40	58	46	42	41
22	34	34	33	41	34	31	35	86	79	51	G	G	29	42	G	G	47	34	35	26	29	26	31	28
23	43	37	G	G	G	24	33	40	27	53	46	62	48	G	85	55	46	62	31	64	57	60	28	53
24	G	G	G	29	36	G	34	47	50	48	50	52	53	41	46	46	47	40	30	29	G	34	28	G
25	G	G	G	G	G	G	21	26	35	49	63	92	G	48	31	36	39	32	35	114	28	G	32	28
26	27	G	28	29	G	26	35	40		27	G	G	G	G	G	29	32	29	27	71	26	G	G	G
27	G	G	G	G	G	25	33	40	28	34	G	44	36	32	33	31	32	45	34	33	39	11	G	G
28	G	G	G	G	G	G	35	41	43	43	42	36	38	42	36	40	28	36	32	30	38	29	G	G
29	G	G	G	G	G	25	33	33	35	35	36	33	43	43	39	29	34	41	29	23	G	11	G	G
30	G	G	G	G	G	G	37	40	42	G	37	G	37	G	G	42	62	56	60	90	54	42	27	37
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	27	29	29	29	27	28	30	30	30	30	30	30	30	30	30	30	30	29	29	29
MED	G	G	G	G	G	G	33	37	35	42	37	40	36	37	35	34	34	34	33	31	26	11	G	G
U Q	G	G	G	11	G	G	35	40	45	48	46	52	47	42	39	40	46	45	40	48	43	34	30	28
L Q	G	G	G	G	G	G	28	32	33	34	34	33	30	31	29	31	31	31	27	23	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

APR. 2018

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	21	14	14	14	14	17	14	14	14	21	22	21	23	22	21	15	17	17	14	14	14	14	14	14
2	14	14	14	14	14	18	21	14	17	17	18	22	20	21	18	17	28	23	14	14	14	14	13	14
3	18	14	14	14	14	15	21	13	15	17	21	21	22	21	18	13	17	15	15	14	14	14	18	17
4	14	20	14	14	15	14	17	13	15	15	20	23	21	21	44	18	14	14	17	14	14	13	13	14
5	14	14	15	15	15	15	14	15	18	15	44	30	30	20	22	21	20	14	14	13	20	14	18	14
6	15	14	14	14	14	14	14	14	15	20	21	21	25	44	21	17	26	14	14	17	22	20	13	
7	14	20	13	14			21	15	20	21	22	25	22	22	23	18	17	13	17	14	14		14	14
8	14	17	20	20	14	20	14	13	15	20	22	44	20	22	42	38	20	13	13	13	14	14	18	14
9	18	14	15	13	14	15	14	14	14	21	43	44	24	21	44	17	17	14	18	13	14	13	15	14
10	14	14	14	13	14	15	15	14	14	18	20	30	30	24	22	21	13	13	13	14	15	15	15	13
11	14	14	14	14	17	14	17	14	21	17	20	21	22	21	20	18	14	13	13	13	13	17	14	13
12	14	13	14	13	14	14	15	14	15	20	21	23	45	22	25	20	13	20	13	14	15	14	13	15
13	14	15	14	13	14	14					21	21	24	22	21	17	15	14	14	14	14	13	14	15
14	15	14	14	14	20	14	15	14	20	20	21	28	43	17	43	18	18	20	13	14	18	14		17
15	14	20	13	14	14	14	15	13	14	17	29	26	21	30	18	18	17	22	13	13	13	13	14	13
16	14	22	13	14		14	17	17	18		21	43	26	21	20	20	17	21	13	13	14	14	14	13
17	14	15	18	13		14	14	14		21	21	22	26	25	22	21	17	13	14	13	13	14	15	13
18	14	14	13	14	14	14	17	29	15	21	20	46	45	45	43	20	14	17	14	13	14	13	14	14
19	15	14	14	14	15	14	18	14	18	21	23	22	23	25	26	30	13	13	14	14	13	13	18	15
20	15	17	14	17	14	14	15	15	15	21	23	45	23	45	22	21	15	17	14	13	14	15	14	14
21	14	13	14	18	15	15	17	15	15	29	21	26	28	30	21	21	18	14	14	13	14	14	15	13
22	14	14	15	14	14	13	18	21	26	22	44	44	45	44	44	42	14	13	14	15	13	15	14	14
23	13	13	17	13	13	14	15	14	18	21	22	36	31	45	31	20	20	20	13	13	13	14	13	13
24	15	14	14	14	13	17	18	15	22	20	21	23	30	30	22	21	15	15	14	13	14	14	14	14
25	18	14	22	14	18	14	14	13	22	20	22	30	46	31	20	22	20	14	14	14	13	14	13	13
26	13	17	14	13	14	15	18	23		17	44	45	47	45	28	21	14	13	18	14	14	15	14	14
27	14	14	14	14	18	17	14	14	18	21	42	30	24	22	22	22	14	14	14	14	14	13	13	14
28	14	14	14	14	14	14	14	14	15	20	21	46	30	28	22	30	18	14	14	14	13	14	14	14
29	21	18	14	14	13	14	14	13	17	21	17	45	24	29	22	41	18	13	13	14	14	14	14	14
30	14	14	15	14	14	15	15	14	15	44	28	45	23	45	44	21	15	14	13	13	13	14	17	13
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	27	29	29	29	27	28	30	30	30	30	30	30	30	30	30	30	30	29	29	29
MED	14	14	14	14	14	14	15	14	15	20	21	29	24	24	22	20	17	14	14	14	14	14	14	14
U Q	15	17	15	14	15	15	17	15	18	21	23	44	30	31	31	21	18	17	14	14	14	14	15	14
L Q	14	14	14	14	14	14	14	14	15	17	21	22	23	21	21	18	14	13	13	13	13	13	13	13

HOURLY VALUES OF foF2 AT Yamagawa

APR. 2018

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	32	34	34	32	30	28	34	54	54	54	64	78	97	104	90	80	70	58	54	54	N	36	32	31	
2	34	34	32	31	30	B	31	45	51	57	62	72	77	80	72	54	55	66	54	54	53	34	32	32	
3	32	32	31	31	31	B	32	50	54	149	64	61	61	67	75	74	61	54	52	52	52	N	30		
4	34	34	34	34	30	26	34	50	54	50	56	56	61	66	72	66	45	58	54	54	76	42	28	32	
5	31	30	32	28	49	B	34	50	52	56	60	54	67	87	86	74	67	64	70	69	51	A	32	32	
6	36	34	32	28	28	29	37	47	53	55	58	61	75	98	104	82	65	71	75	71	36	37	34	34	
7	34	34	42	52	49	N	34	50	54	65	55	61	67	75	78	76	66	71	63	53	46	30	34	34	
8	36	37	34	37	28	N	31	51	54	56	61	65	75	77	66	68	59	58	67	73	N	49	B	49	
9	25	23	25	26	B	N	35	52	49	48	58	64	62	72	78	77	77	72	76	80	72	A	49	49	
10	28	30	59	32	30	30	40	54	48	A	77	75	68	71	86	78	78	83	86	86	44	30	30	28	
11	31	26	30	34	N	N	35	50	54	54	A	81	104	90	84	85	68	64	65	72	54	A	A	A	
12	A	37	37	28	32	B	42	52	52	A	67	64	80	90	85	81	78	54	54	A	80	51	A	A	
13	36	38	31	34	34	B	38	52	66	66	56	71	81	91	104	102	70	55	52	67	70	46	32	32	
14	31	32	35	34	B	B	38	64	64	65	56	60	71	71	66	66	73	A	74	86	75	A	A	A	
15	A	31	32	30	B	59	34	51	53	57	64	67	74	81	77	71	64	72	64	52	52	47	44	43	
16	38	42	42	47	B	B	36	48	53	62	71	71	86	84	80	78	77	70	66	54	53	38	34	35	
17	43	42	43	34	B	B	35	46	51	56	63	72	82	88	90	78	57	52	55	54	A	53	A	38	
18	38	37	40	40	40	34	47	52	51	55	67	68	72	77	85	90	84	72	55	52	52	38	38	38	
19	29	34	34	31	28	25	40	49	52	53	58	68	85	90	98	90	81	55	51	50	30	43	40	40	
20	38	41	42	42	28	28	40	53	52	55	64	58	72	81	85	90	90	90	90	80	52	47	43	48	
21	42	43	36	38	38	48	64	53	53	54	60	A	A	71	73	63	57	54	55	53	52	44	A	46	
22	47	42	40	42	28	29	40	54	54	55	62	67	68	61	62	66	68	72	56	52	A	A	A	A	
23	A	A	A	34	N	A	40	53	52	58	56	56	61	72	80	78	70	56	55	52	53	A	A	43	
24	34	41	25	31	24	25	41	47	52	52	58	61	76	85	86	85	71	55	52	54	A	66	37	38	
25	34	37	34	34	28	30	47	46	54	56	66	72	85	88	90	90	75	60	64	72	54	A	A	A	
26	35	37	31	N	B	B	40	54	50	60	60	59	75	85	94	73	A	A	54	72	86	54	A	32	
27	32	32	28	30	N	N	42	53	52	60	57	70	75	84	81	68	76	58	57		71	50	49	34	
28	34	31	31	26	26	N	44	52	49	51	56	67	169	82	80	77	74	58	54	67	71	55	A	51	
29	47	42	38	34	30	29	38	62	N	54	52	60	68	68	65	66	52	55	54	56	52	54	36	36	
30	35	36	34	32	28	N	42	54	64	46	65	65	77	79	85	81	86	86	A	73	66	53	43	A	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	27	29	29	29	21	13	30	30	29	28	29	29	29	30	30	30	29	28	29	28	25	22	19	23	
MED	34	34	34	34	30	29	38	52	53	56	60	65	75	81	82	78	70	59	55	55	53	46	34	36	
U Q	38	39	39	35	33	32	41	53	54	59	64	71	81	88	86	82	77	71	66	72	71	53	43	43	
L Q	32	32	31	30	28	27	34	50	51	54	56	60	68	72	75	68	62	55	54	53	52	38	32	32	

HOURLY VALUES OF fEs AT Yamagawa

APR. 2018

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G			G	G	G															G	G	G	
2	G	G	G	G		B	G	35	37	70	57	51	64	44	63	45	42	41	29	29	25		G	G	
3	G	G	G	G	G	B	G	34	40	38	40	41	41	43	40	39	32	28	29	28	21	11		G	
4	G	G	G	G	G	G	G	28	40	38	41	44	43	51	39	42	40	29	28	27	G	19		G	
5	G	G	G	G	G	B	G	40	38	42	42	42	44	40	47	32	36	32	33	G		27	41	27	24
6	G	G	G	G	G	G	G	34	40	36	53	48	46	50	57	50	29	30	29	33	11	39	G	G	
7	G	G	G			G		39	40	44	46	32	44	46	43	41	40	34		24			G	G	G
8	G	G	G	G	G	G	G	37	40	48	48	50	48	53	60	50	43	32	26	41	35		G	G	G
9	G	G	G	G	B	G	G	41	34	37	41	41	38	32	29	44	43	40	35	G	48		B	G	
10	G	G	G	G				33	38	37	36	34	39	47	46	44	52	39	40	77	58	65	32	26	
11	G	G	G	G	G	G	G	33	34	38	40	48	46	47	40	46	34	31		11	40		G	G	
12	G	G	G	G	G	G	G	40	40	50	79	46	57	41	44	31	38	32	27	28	35	36	72	46	
13	45	40	35	29	G	B		28	35	42	58	53	42	48	47	63	46	59	58	47	58	50	37	37	29
14	26	G	G	G	G	B		30	36	43	45	43	48	42	34	32	38	26	30	32	38	G	39	G	G
15	G	G	34	G	B	B		29	38	44	43	47	46	51	50	46	43	50	60	70	36	46	70	58	126
16	34	G	G	25	B	G		26	36	44	48	47	44	65	58	38	39	36	27	28	37	29	24	38	G
17	G	G	G	G	B	B		28	40	44	43	36	41	46	45	37	44	28	28	32	29	29	G	G	G
18	G	G	G	37	B	B		38	40	44	48	41	42	44	42	44	32	35	32	28	49	28	35	34	
19	G	26	G	G	G	G		34	30	33	31	41	32	47	45	40	28	28	G	G	39	34	28	28	
20	G	25	G	G	26	G		32	40	49	45	40	49	40	54	47	29	28	40	45	39	39	38	35	G
21	G	G	G	41	G	G		29	36	39	49	42	48	48	42	48	31	44	40	35	30	24	G	G	G
22	29	G	G	G	G	G		26	28	47	40	46	49	79	56	59	46	38	29	G	30	25	34	46	40
23	32	31	G	G	27	G		32	33	43	32	46	50	38	32	31	28	22	23	29	67	53	57	40	
24	56	41	46	G	G	32		27	28	33	44	46	48	40	58	55	50	40	43	38	35	41	55	44	G
25	40	G	G	G	G	G		28	35	41	44	52	53	47	46	47	44	43	33	G	28	41	24	40	26
26	G	G	G	G	G	G		27	35	32	43	50	47	56	61	61	50	48	43	45	50	58	70	53	40
27	32	28	32	29	B	B		28	28	32	39	44	48	46	56	39	52	79	55	56	54	50	24	31	26
28	G	G	G	G	G	G		G	36	36	32	41	48	35	46	45	35	33	40	33		25	40	G	G
29	G	G	G	G	G	G		31	38	39	49	48	48	44	33	39	36	35	40	38	34	29	30	55	27
30	G	G	G	G	G	G		26	36	44	40	48	45	44	41	49	38	49	45	49	53	44	28	G	G
31	G	G	G	G	G	G		30	38	47	41	40	41	45	47	50	32	44	56	116	53			40	54
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	24	21	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	29	29	
MED	G	G	G	G	G	G	26	36	40	43	45	46	46	46	46	42	39	34	32	30	35	29	31	G	
U Q	26	G	G	G	6	G	28	38	43	45	48	48	48	51	50	46	44	41	40	40	46	39	42	31	
L Q	G	G	G	G	G	G	G	34	36	38	40	41	42	42	39	36	32	30	27	28	25	G	G	G	

HOURLY VALUES OF fmin AT Yamagawa

APR. 2018

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	14	14	15	14	15	15	15	20	21	21	21	24	21	20	17	15	14	14	15	16	15	18
2	15	14	15	15	14	B	16	15	14	17	17	20	18	22	21	18	14	14	15	14	14	14	14	15
3	14	14	14	15	15	B	14	15	15	17	20	20	21	20	20	16	15	15	15	14	14	15	17	
4	15	14	17	15	15	15	14	16	14	17	18	18	21	21	22	20	18	15	15	15	15	15	14	16
5	15	14	18	16	14	B	14	16	15	15	17	21	24	23	18	20	18	14	17	14	14	14	15	15
6	20	15	15	15	15	15	15	15	14	15	18	21	23	21	22	21	18	15	20	15	15	17	14	15
7	14	15	14	14	15	16	15	14	16	17	20	21	21	22	23	20	20	14	14	14	14	18	15	14
8	15	14	15	14	14	15	14	14	14	16	17	21	21	22	20	20	16	14	15	15	14	14	B	14
9	14	15	14	15	B	15	15	15	15	16	18	23	24	21	20	20	21	15	15	18	14	14	15	15
10	16	15	14	15	15	14	15	15	14	16	20	22	21	21	21	21	17	15	20	15	14	17	16	15
11	17	15	14	15	15	17	15	15	14	17	17	18	20	24	20	20	17	14	14	14	21	16	15	15
12	14	14	15	15	15	B	14	18	14	20	18	21	23	22	20	20	17	14	15	14	20	15	15	15
13	16	15	16	14	21	B	16	15	16	18	20	23	22	21	21	20	17	15	15	14	16	15	23	23
14	15	15	15	15	B	B	14	14	14	17	21	20	21	21	21	18	21	14	15	15	15	14	15	14
15	15	15	15	14	B	18	16	14	14	18	21	22	30	22	21	20	17	15	15	14	15	15	15	15
16	15	14	14	15	B	B	17	14	15	18	21	21	23	23	27	20	17	26	16	14	15	15	14	16
17	14	14	15	15	B	B	14	15	15	18	21	21	21	22	21	22	20	15	15	14	14	14	14	15
18	14	15	15	15	14	14	17	14	16	17	20	21	22	20	22	18	28	15	20	14	14	14	15	14
19	15	15	14	15	14	14	14	14	15	17	21	20	22	34	34	34	20	24	15	14	15	15	15	14
20	15	15	15	14	15	14	14	14	15	17	21	22	22	23	21	21	18	18	16	14	15	18	15	15
21	14	15	15	17	15	15	16	14	17	18	18	24	22	23	22	21	18	14	14	14	17	15	14	15
22	15	15	15	18	15	14	15	15	16	16	21	23	23	22	23	20	20	26	22	14	14	15	15	15
23	16	15	15	15	17	14	14	14	17	20	21	21	22	21	21	20	20	17	14	14	14	14	15	16
24	15	17	14	15	15	15	15	15	15	20	20	21	21	20	21	21	21	15	22	14	14	15	14	17
25	15	17	14	14	15	15	14	14	15	20	21	23	21	22	23	22	18	15	14	14	14	15	15	15
26	14	14	14	14	B	B	14	14	18	18	20	21	21	22	22	20	17	15	14	14	14	16	14	16
27	15	15	16	15	17	15	18	15	16	17	21	23	23	23	24	23	20	16	15		15	15	23	18
28	17	14	14	14	15	15	14	16	17	17	18	20	24	21	33	20	18	15	16	14	14	14	14	14
29	14	16	15	14	15	15	17	15	15	20	20	22	26	20	20	18	17	15	15	14	14	14	15	14
30	15	21	15	17	15	15	15	14	17	18	21	20	26	24	22	21	17	15	14	15	15	15	14	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	24	21	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	29	29
MED	15	15	15	15	15	15	15	15	15	17	20	21	22	22	21	20	18	15	15	14	14	15	15	15
U Q	15	15	15	15	15	15	16	15	16	18	21	22	23	23	22	21	20	15	16	14	15	15	15	16
L Q	14	14	14	14	15	14	14	14	14	17	18	20	21	21	21	20	17	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Okinawa

APR. 2018

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	A	34	32	32	B	N	29	28	54	61	67	86	101	111	120	121	121	86	84	77	50	34	34	34	
2	34	32	34	32	28		N	45	54	64	69	81	86	90	90	90	82	82	63	63	47	34	26	28	
3	28	49	28	26	28	B	N	48	55	69	75	66	71	84	98	101	72	62	64	66	52	34	29	29	
4	30	30	30	31	B	B		28	48	54	59	64	57	72	81	86	86	74	71	72	86	74	A	N	59
5	25	26	28	28	N	B	B		66	52	60	61	58	61	91	106	110	104	96	90	97	71	A	A	34
6	41	50	50	47	34	32	37	51	51	56	139	72	84	111	131	120	107	104	110	108	67	54	52	54	
7	53		64	58	34	N	32	39	A	90	60	N	A	100	107	91	86	80	80	40	47	A	A	32	
8	34	34	32	38	B	N	28	47	53	65	66	74	85	91	86	78	72	80	97	86	54		A	B	
9	N	B	N		N	B		54	55	60	59	61	64	78	91	90	96	92	84	86	72	A	A	A	
10	26	26	49	29	26	A	64	46	53	55	78	81	71	82	105	99	86	91	182	88	41	28	28	28	
11	29	30	26	34	N	B	32	50	55	67	65	78	111	102	98	106	91	80	77	80	72	42	A	A	
12	32	A	A	34	B	B	32	64	52	67	68	78	91	106	121	118	106	98	90	100	102	A	34	34	
13	32	34	A	A	26		34	54	65	67	70	80	95	108	131	126	88	62	72	86	81	36	30	30	
14	30	32	38	30	B	B	34	53	65	51	61	66	86	96	95	94	84	78	98	88	A	A	A	A	
15	A	A	A	29	69		34	50	60	61	64	76	91	100	102	104	97	76	82	77	59	42	40	41	
16	42	41	54	51	A	B	31	50	63	49	72	78	96	101	106	106	97	88	77	52	50	43	41	42	
17	50	50	34	59	N	B	30	65	55	67	77	90	95	111	108	91	86	64	71	81	72	50	28	34	
18	34	29	30	34	30	N	37	48	54	55	64	77	86	97	105	112	110	98	78	67	51	A	34	36	
19	37	34	34	49	A	N	39	51	51	56	64	80	158	120	124	120	110	78	55	A	51	41	38	37	
20	38	36	40	37	N	N	36	49	54	54	67	63	86	107	122	138	140	107	101	95	66	47	A	44	
21	A	43	42	38	36	45	54	53	56	67	70	61	78	95	97	91	67	60	65	70	64	54	50	48	
22	47	A	50	50	A	N	36	50	54	58	72	70	82	83	86	85	88	72	66	68	66	B	A	32	
23	A	A	A	A	A	A	A	48	52	57	61	61	70	90	95	85	80	58	55	62	64	A	A	A	
24	39	A	A	A	A		28	37	51	54	58	58	67	81	90	98	97	78	70	71	74	88	67	A	A
25	34	34	36	A	A	26	40	51	54	57	66	72	91	101	106	104	98	91	84	81	71	A	A	32	
26	A	38	32	36	B	A	36	54	55	57	59	59	85	100	97	78	71	68	72	78	90	50	A	N	
27	26	B	B	28	B	B	37	54	60	61	67	83	99	111	121	111	106	91	72	75	79	40	A	32	
28	30	28	B	30	25	25	37	47	54	39	64	73	91	102	108	101	101	78	71	80	86	48	A	42	
29	42	42	42	39	32	30	37	65	63	55	56	66	94	104	111	122	91	72	A	A	85	54	40	32	
30	34	37	40	42		B	37	54	66	66	65	72	86	98	107	108	112	104	90	80	52	63	38	34	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	24	22	22	26	11	6	25	30	29	30	30	29	29	30	30	30	30	30	29	28	29	19	15	23	
MED	34	34	35	34	30	29	36	50	54	60	66	72	86	100	106	102	91	80	77	80	66	43	34	34	
U Q	40	41	42	42	34	32	37	54	58	66	70	79	94	106	111	112	106	91	90	86	76	54	40	42	
L Q	30	30	32	30	26	26	32	48	53	56	61	64	79	90	97	91	82	71	71	69	51	36	29	32	

HOURLY VALUES OF fEs AT Okinawa

APR. 2018

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	87	G	G	G	B	24	G	164	124	46	50	62	53	52	50	58	47	43	48	36	21	G	G	G	
2	G	G	G	G	30	G	G	30	144	44	45	46	50	44	43	36	39	41	41	28	27	G	G	G	
3	G	G	G	G	G	B	G	39	33	37	39	38	41	46	44	40	35	38	48	26	26	G	G	G	
4	G	G	G	G	B	B	G	32	38	42	45	44	43	43	54	45	44	40	66	60	38	30	G	G	
5	27	G	G		G	B	B	29	44	47	47	48	46	53	48	56	41	40	34	28	40	32	46	G	
6	G	G	G	G	G		G	134	125	146	43	44	38	38	46	44	46	52	48	45	22	48	28	G	40
7	28		G	48	21	36	26	35	56	77	105	63	128	41	40	36	37	39	49	46	69	89	60	34	
8	26	G	G	40	B	G	G	30	30	38	39	46	46	39	46	36	35	35	35	58	52	G	26	B	
9	G	B	G	G	G	B		30	117	55	48	45	49	49	50	50	46	57	39	38	55	34	39	34	
10	G	G	G	G	25	25	29	29	108	48	50	53	48	39	46	36	41	40	40	29	39	24	G	G	
11	G	G	G	G	143	B	G	32	40	46	53	33	34	33	32	36	39	27	39	G	27	33	30	41	
12	G	48	40	G	B	B		114	33	38	54	48	49	56	52	54	50	44	49	50	60	25	47	33	33
13	24	32	34	28	G	G		23	35	41	39	43	92	43	42	38	37	35	32	32	26	11	33	G	G
14	G	G	G	33	B	B		25	37	43	55	52	59	40	49	52	47	44	52	53	39	79	80	110	69
15	134	69	58	G	G		G	29	42	46	47	44	71	58	45	49	37	30	32	40	G	31	26	G	
16	23	31	34	47	50	B		23	38	40	54	55	46	48	55	59	50	46	41	41	29	G	G	25	G
17	132	G	G	G	G	B	G	30	38	44	43	46	49	106	46	45	39	36	32	23	21	31	25	24	
18	G	G	G	G	30		G	46	38	45	38	38	149	49	38	43	35	28	27	21	25	54	25	23	
19	25	156	29	70	59	26	36	34	40	47	51	56	166	47	47	40	34	30	34	57	34	55	32	31	
20	G	G	G	40	G	G		24	35	39	70	37	48	48	50	46	44	40	33	28	20	25	33	50	37
21	158	28		G	G	G		24	35	40	43	44	47	45	44	54	40	29	32	38	24	G	32	150	
22	43	46	34	G	31	26	26	37	40	49	45	42	47	39	34	36	28	34		26	11	B	55	33	
23	48	56	46	58	78	89	43	33	38	47	47	48	48	52	45	38	36	33	30	28	60	73	60	45	
24	135	72	60	33	40	G		25	35	41	41	49	49	50	46	47	76	51	34	35	36	31	40	46	50
25	G	47	33	60	40		G	24	41	41	107	39	54	56	40	43	47	52	50	43	36	60	67	72	60
26	46	40	G	11	B	31	27	38	39	46	39	46	62	42	36	45	41	44	32	35	56	47	46	G	
27	G	B	B	G	B	B		24	32	39	38	46	46	50	48	44	36	36	34	35	30	27	28	34	G
28	24	G	B	G	G	G		26	40	41	48	50	46	49	48	47	46	44	43	43	40	37	50	38	26
29	G	39	25	G	27	G		26	39	40	45	44	48	59	53	52	57	60	57	92	110	58	66	34	G
30	G	G	G	G	G	B		30	42	44	41	43	48	46	43	40	40	40	37	32	34	91	50	G	G
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	27	28	30	23	18	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	29	
MED	12	G	G	G	21	G	24	35	40	46	46	46	48	46	46	45	40	38	37	34	32	33	32	24	
U Q	43	46	33	33	40	26	26	39	44	49	50	49	56	52	48	50	44	43	45	40	55	52	46	38	
L Q	G	G	G	G	G	G	G	30	38	42	43	44	46	42	43	37	36	33	32	26	25	26	G	G	

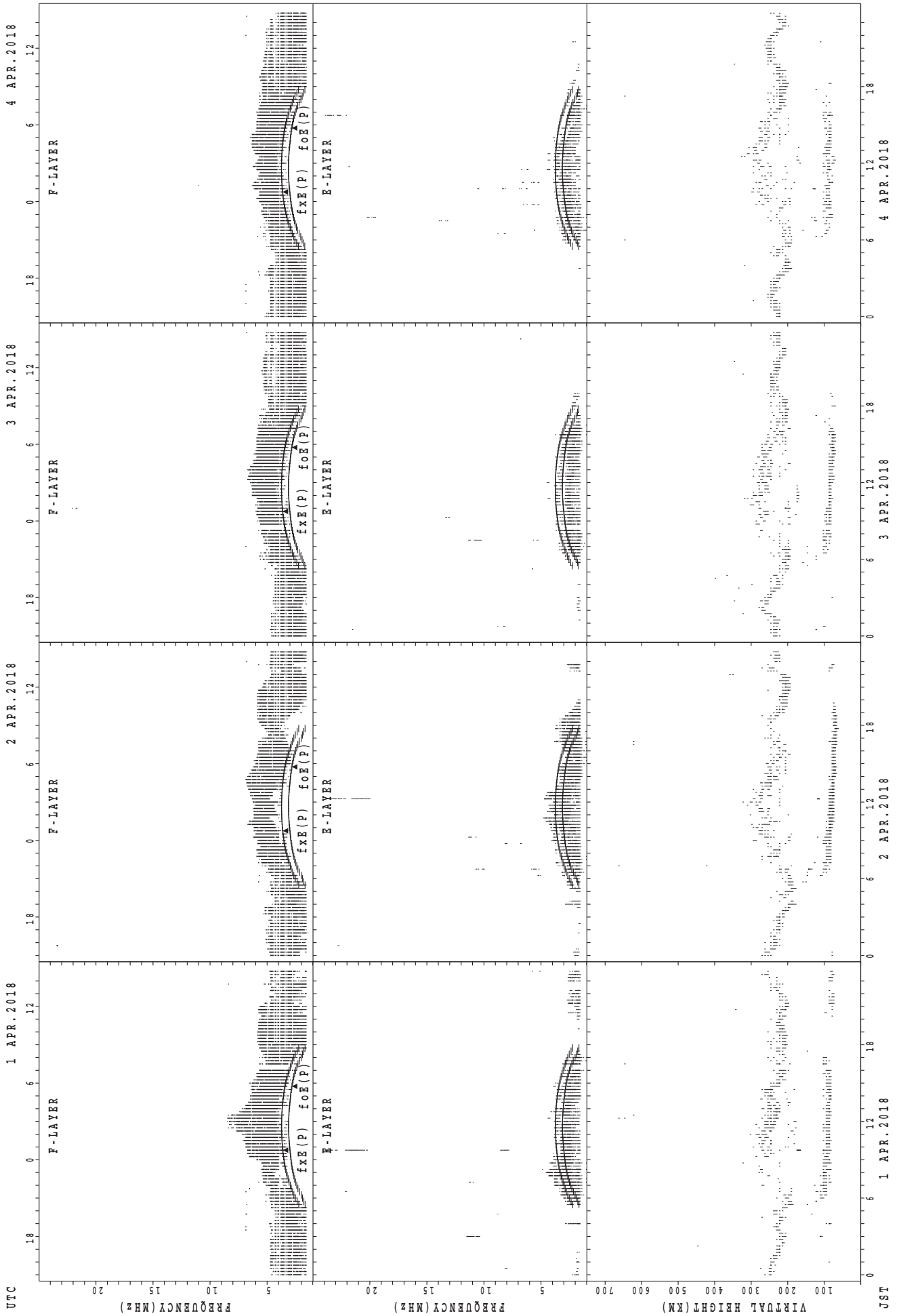
HOURLY VALUES OF fmin AT Okinawa

APR. 2018

LAT. 26°41.0'N LON. 128°09.0'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	14	15	14	14	B	15	15	14	14	14	14	16	20	15	21	17	17	14	14	14	14	14	14	15
2	14	14	14	14	14	17	15	14	14	14	14	18	17	18	17	17	14	14	14	14	14	14	14	15
3	14	14	14	14	15	B	14	14	14	14	14	18	18	18	18	15	14	14	14	14	15	14	15	14
4	14	14	14	15	B	B	14	14	14	14	17	18	17	17	15	14	14	14	14	14	14	14	17	14
5	14	15	15	14	15	B	B	14	14	14	14	16	20	16	17	17	15	14	14	14	14	14	14	15
6	14	14	14	14	14	14	14	14	14	14	15	18	22	20	16	15	14	14	14	14	14	14	14	14
7	14		14	14	14	14	14	14	14	14	15	16	17	20	20	17	14	14	14	14	14	14	14	14
8	14	14	14	14	B	14	14	14	14	14	16	17	18	18	20	17	14	14	14	14	15	18	15	B
9	15	B	15	14	14	B		14	14	14	16	20	22	22	15	17	14	14	14	14	14	14	14	14
10	15	15	14	16	15	14	14	14	14	15	18	18	17	22	17	20	18	14	14	14	14	14	15	14
11	14	14	14	14	14	B	14	14	14	14	15	21	18	16	18	14	15	15	14	14	14	20	14	15
12	18	14	15	17	B	B	14	14	14	15	16	18	17	20	17	15	14	28	14	16	14	15	16	14
13	14	14	15	15	16	66	14	14	15	15	16	18	18	20	20	16	15	14	14	14	14	14	14	15
14	17	15	14	16	B	B	15	14	14	15	17	17	20	20	17	16	14	14	14	14	14	14	14	14
15	14	15	14	14	16		17	14	14	15	17	20	18	18	18	17	14	14	14	14	14	15	15	15
16	14	14	14	14	15	B	14	14	15	15	17	17	18	20	18	17	15	14	14	14	14	14	14	14
17	14	15	14	14	14	B	14	14	14	15	17	18	21	20	17	17	15	14	14	14	14	15	17	14
18	14	14	14	14	14	16	14	15	14	15	17	18	20	18	21	17	14	14	14	14	14	14	15	14
19	14	14	15	14	14	14	14	14	14	14	15	18	22	20	18	15	16	14	14	14	14	14	14	15
20	14	15	16	14	14	14	15	14	14	15	18	20	18	18	18	17	14	14	14	15	20	14	14	14
21	14	14	14	16	14	14	14	14	14	15	17	20	20	21	20	17	15	14	14	14	14	14	14	14
22	14	14	16	18	14	17	16	14	15	15	17	18	18	20	20	18	15	14	23	14	17	B	16	14
23	14	14	14	14	14	14	14	14	14	15	17	18	18	17	18	17	15	14	14	14	14	14	15	14
24	16	14	14	14	14	14	17	14	14	16	18	18	21	17	18	21	14	14	14	14	14	14	14	14
25	16	15	15	14	14	14	15	14	14	17	16	20	23	20	18	16	14	14	14	14	14	14	14	14
26	14	14	14	14	B	14	14	14	14	15	17	18	18	21	18	18	14	14	14	14	14	15	15	15
27	15	B	B	15	B	B	15	14	14	15	17	18	20	22	20	20	14	14	14	14	14	14	14	14
28	14	15	B	15	14	14	14	14	14	15	16	20	21	20	17	16	16	14	14	14	14	14	14	14
29	14	15	14	14	14	14	14	14	14	15	18	20	18	22	18	14	14	14	14	14	14	14	14	14
30	14	14	14	14	15	B	14	14	14	15	18	17	20	18	17	18	14	14	14	14	14	14	14	14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	27	28	30	23	18	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	29
MED	14	14	14	14	14	14	14	14	14	15	17	18	18	20	18	17	14	14	14	14	14	14	14	14
U Q	14	15	15	15	15	15	15	14	14	15	17	20	20	20	20	17	15	14	14	14	14	14	15	15
L Q	14	14	14	14	14	14	14	14	14	14	15	18	18	18	17	16	14	14	14	14	14	14	14	14

SUMMARY PLOTS AT Wakkanai

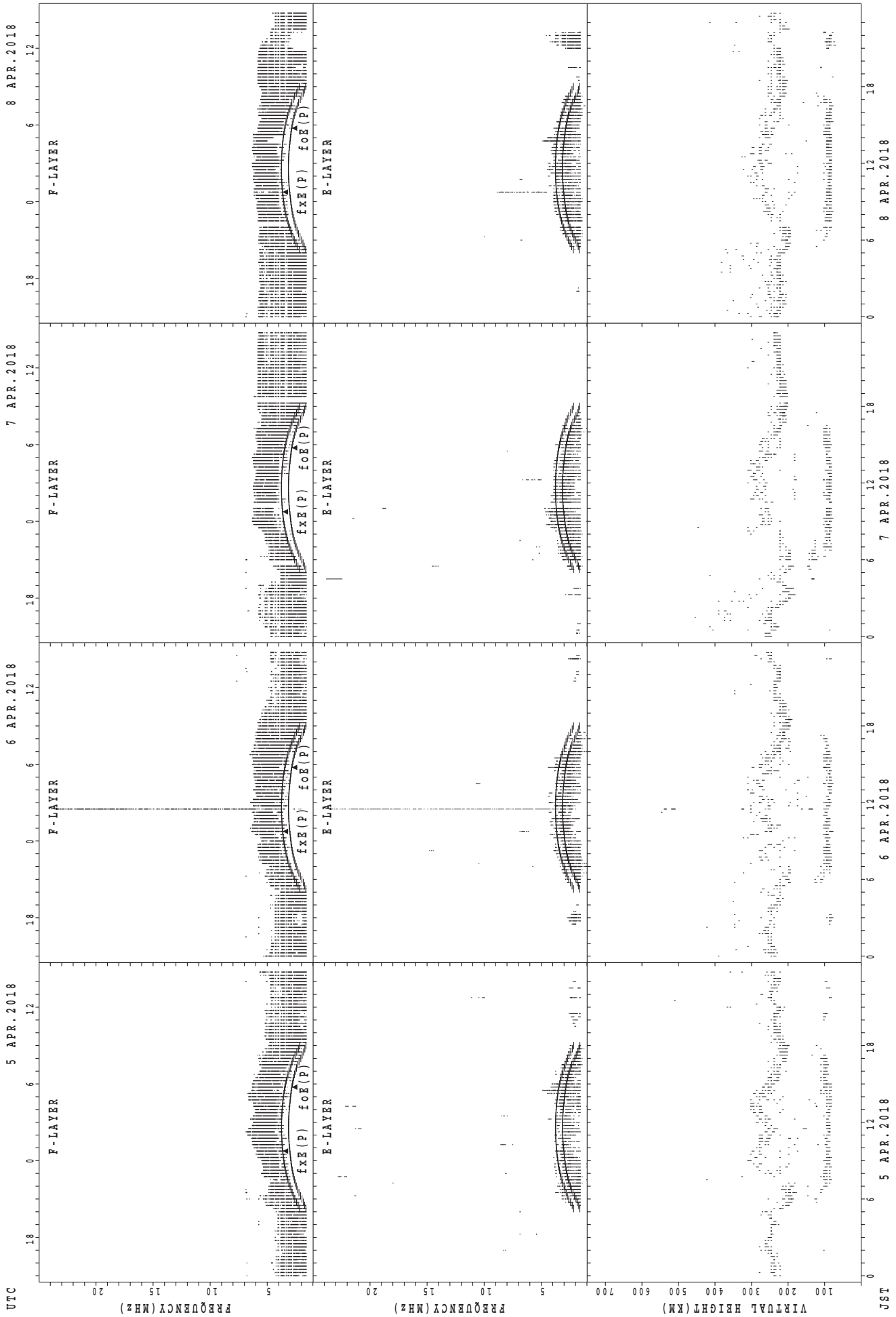


UTC
1 APR. 2018
2 APR. 2018
3 APR. 2018
4 APR. 2018

JST
1 APR. 2018
2 APR. 2018
3 APR. 2018
4 APR. 2018

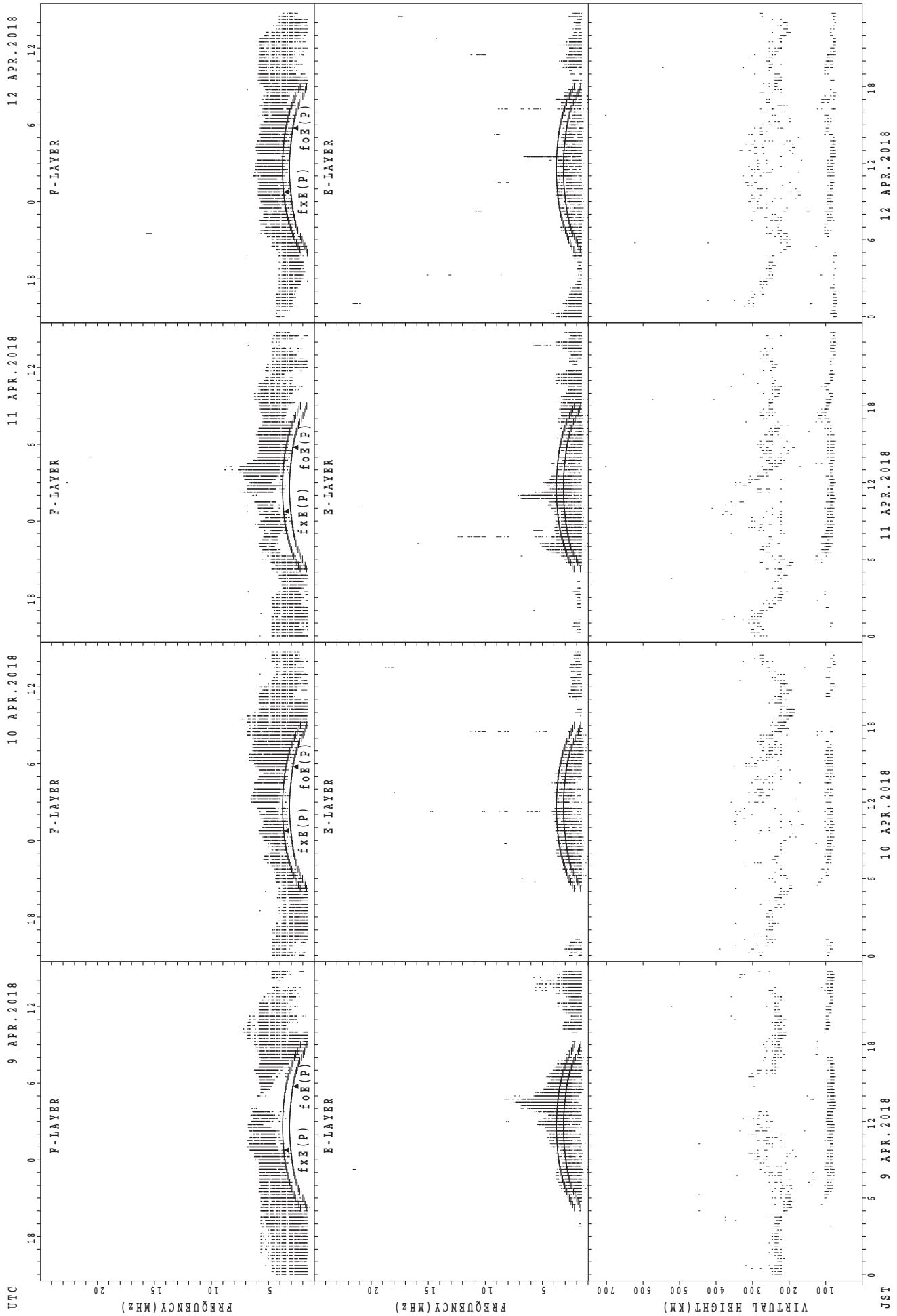
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



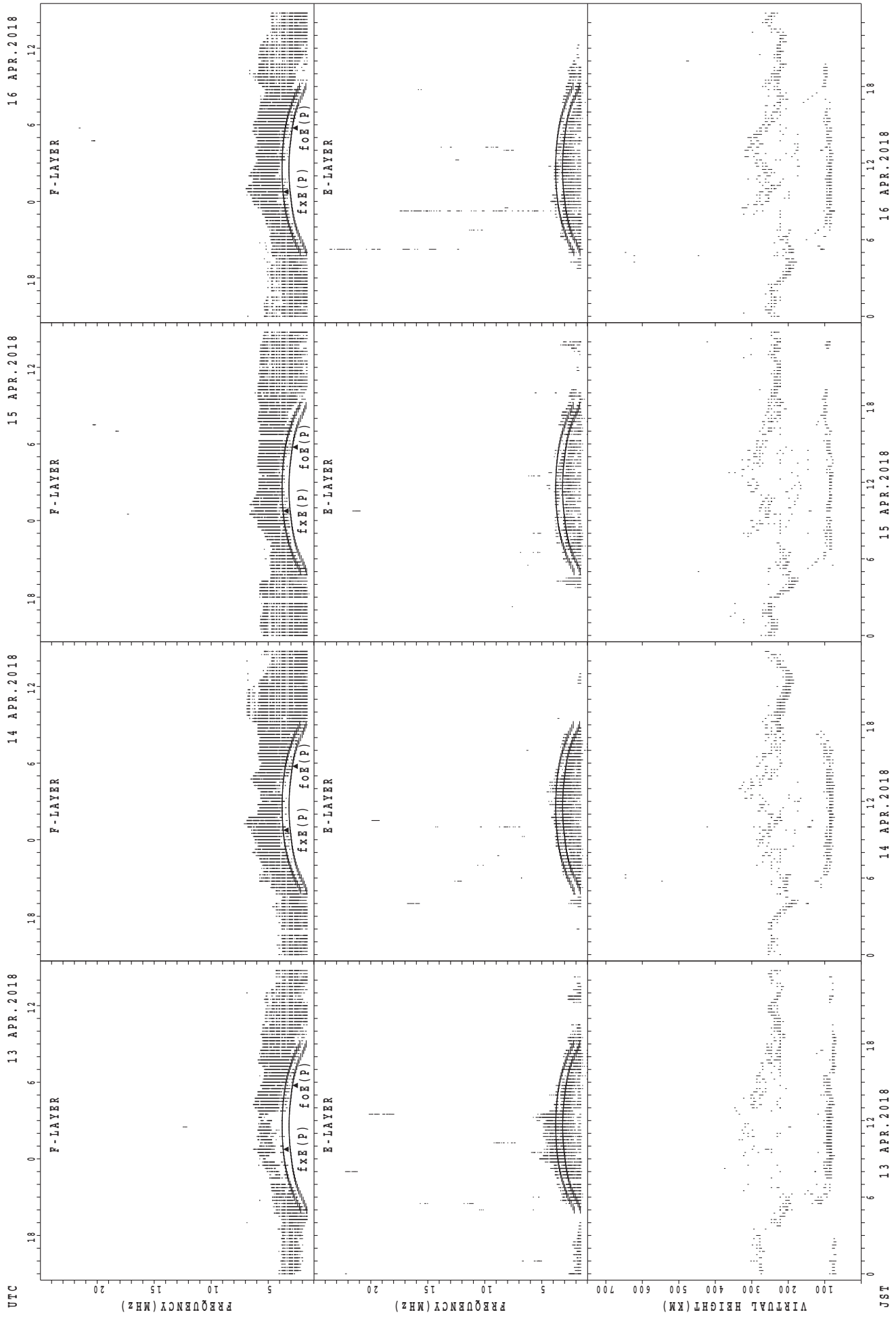
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



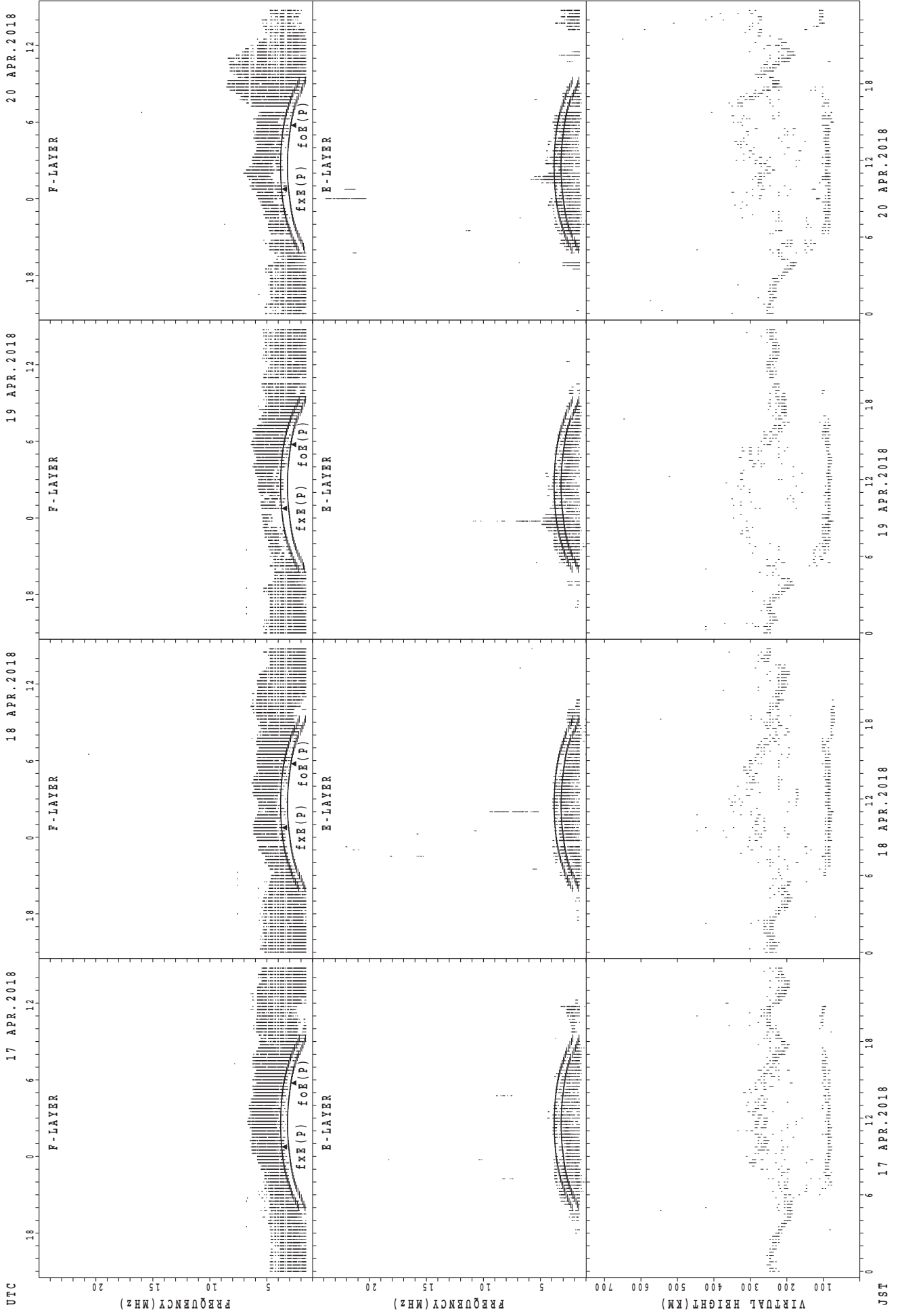
UTC
 9 APR. 2018
 10 APR. 2018
 11 APR. 2018
 12 APR. 2018
 JST
 fxe(P); PREDICTED VALUE FOR fxe
 foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



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

SUMMARY PLOTS AT Wakkanai

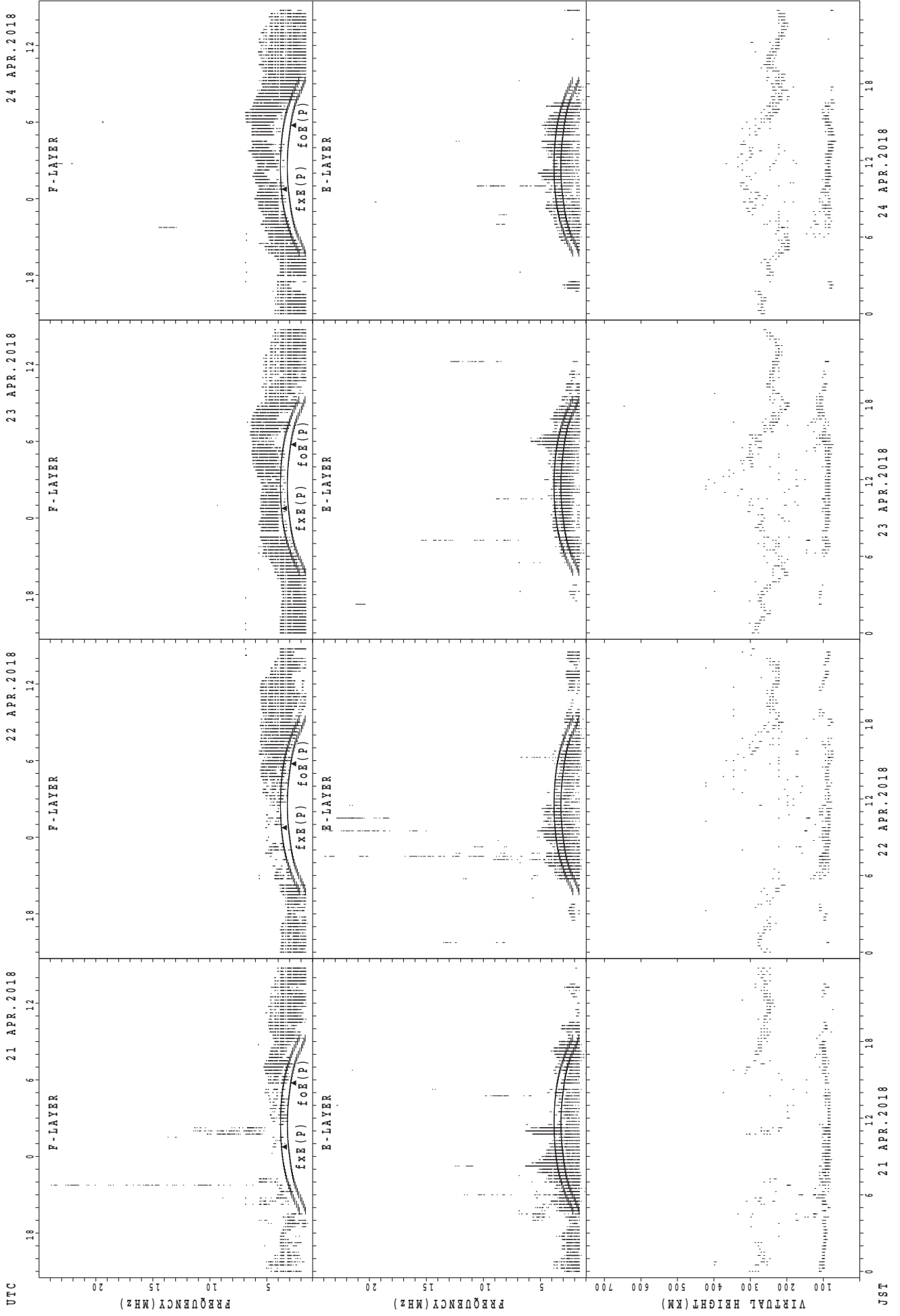


UTC
17 APR. 2018
18 APR. 2018
19 APR. 2018
20 APR. 2018

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

UTC
17 APR. 2018
18 APR. 2018
19 APR. 2018
20 APR. 2018

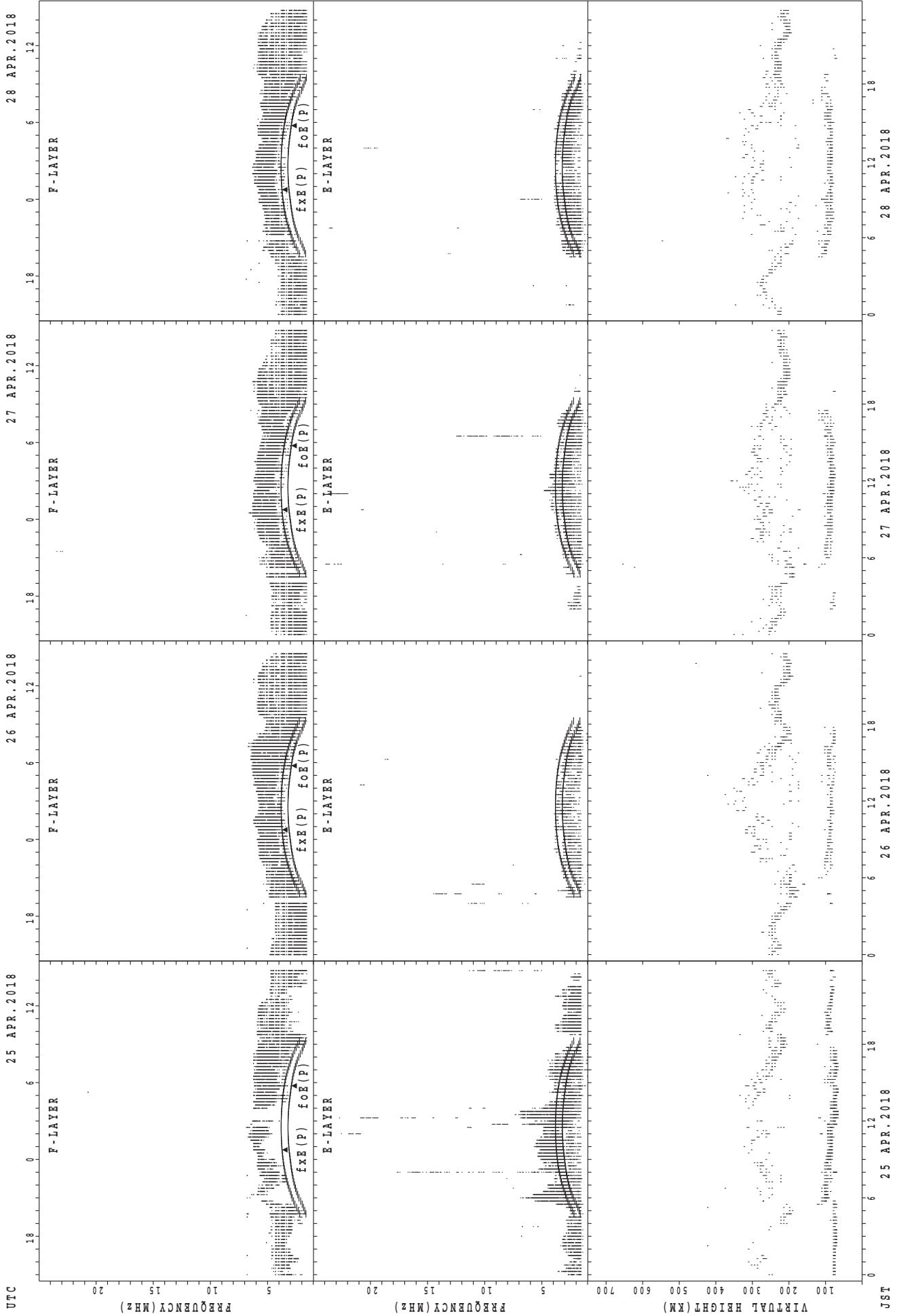
SUMMARY PLOTS AT Wakkanai



UTC
21 APR. 2018
22 APR. 2018
23 APR. 2018
24 APR. 2018

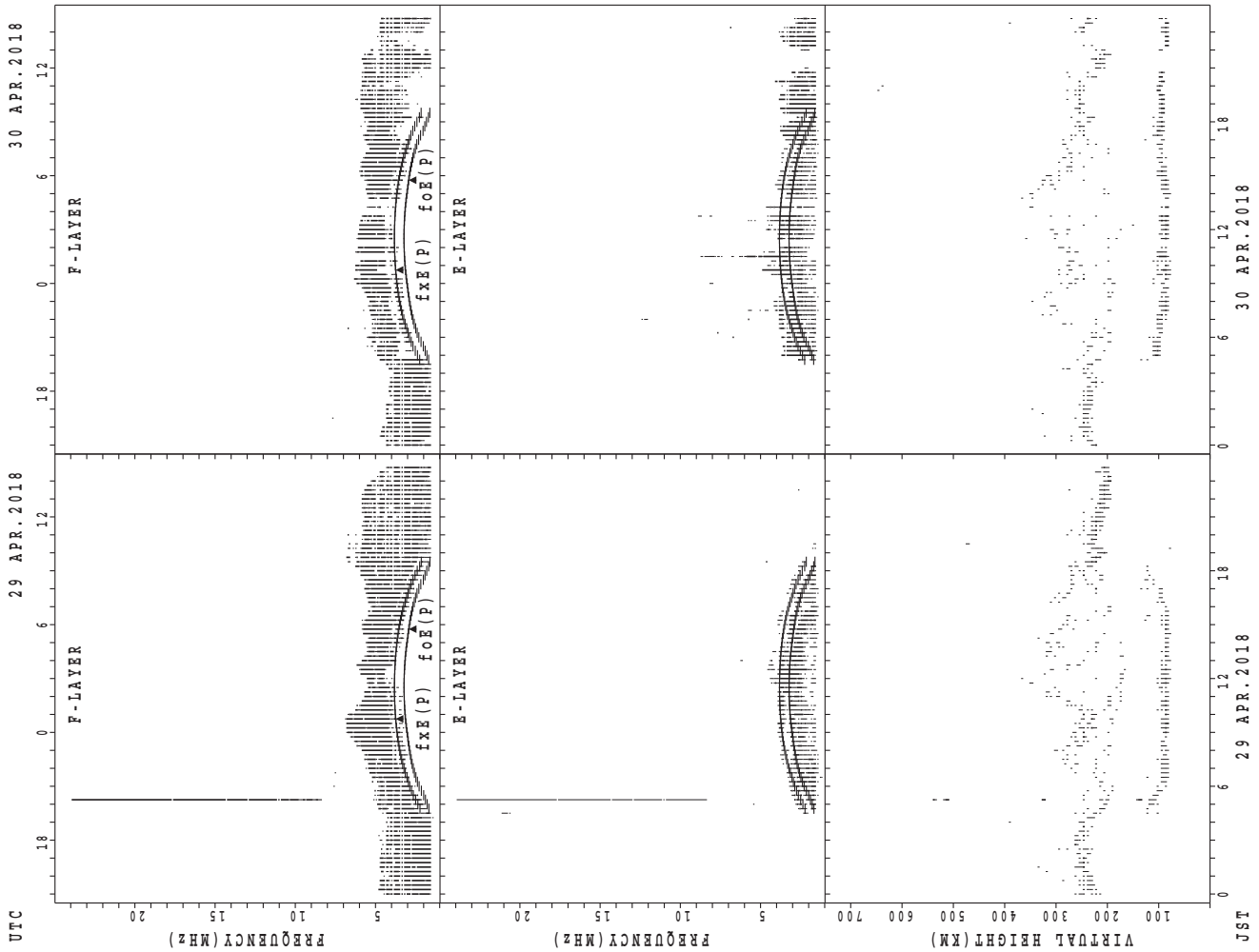
JST

SUMMARY PLOTS AT Wakkanai

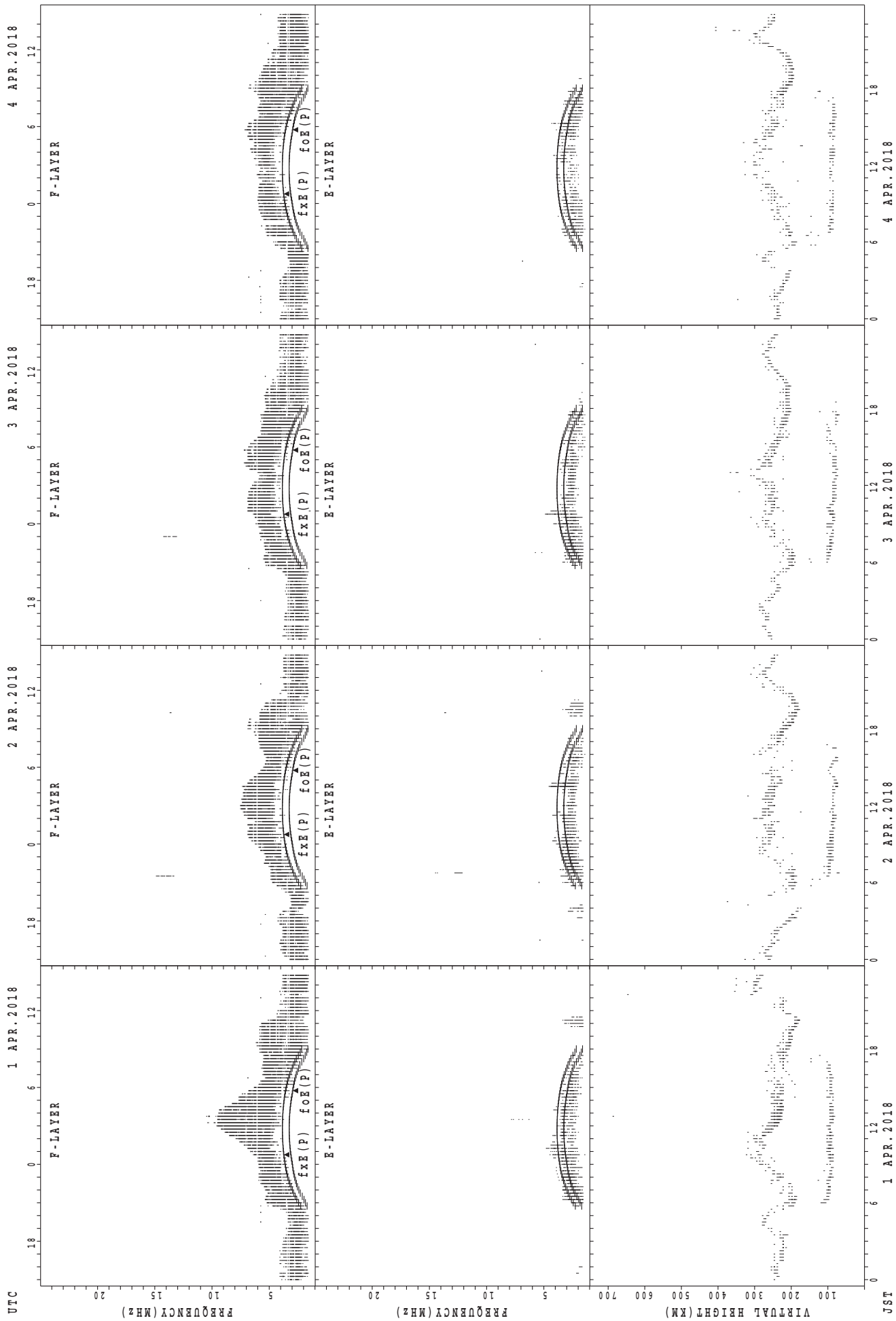


UTC
 25 APR. 2018
 26 APR. 2018
 27 APR. 2018
 28 APR. 2018
 JST
 fxe(P); PREDICTED VALUE FOR fxe
 foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai

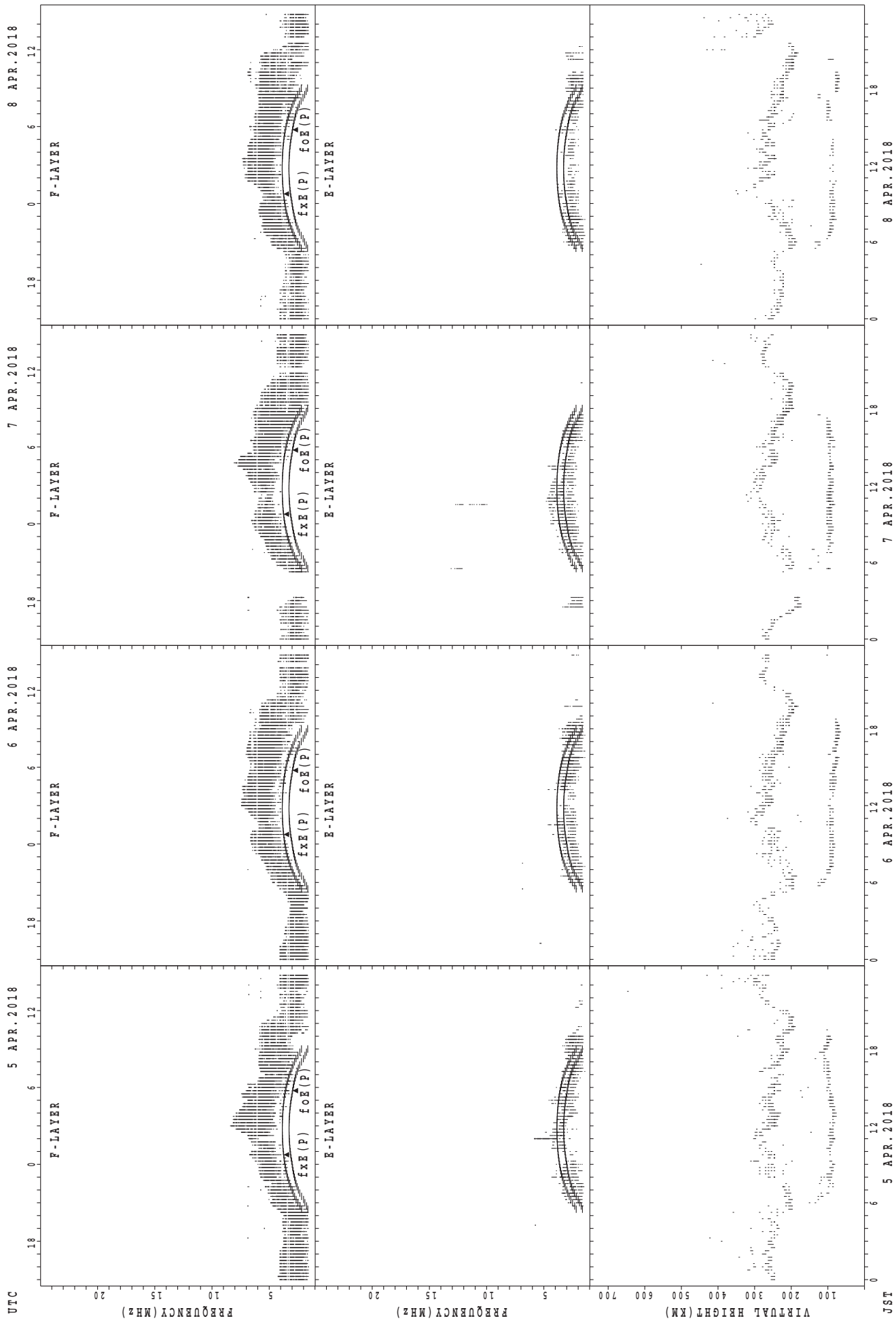


SUMMARY PLOTS AT Kokubunji



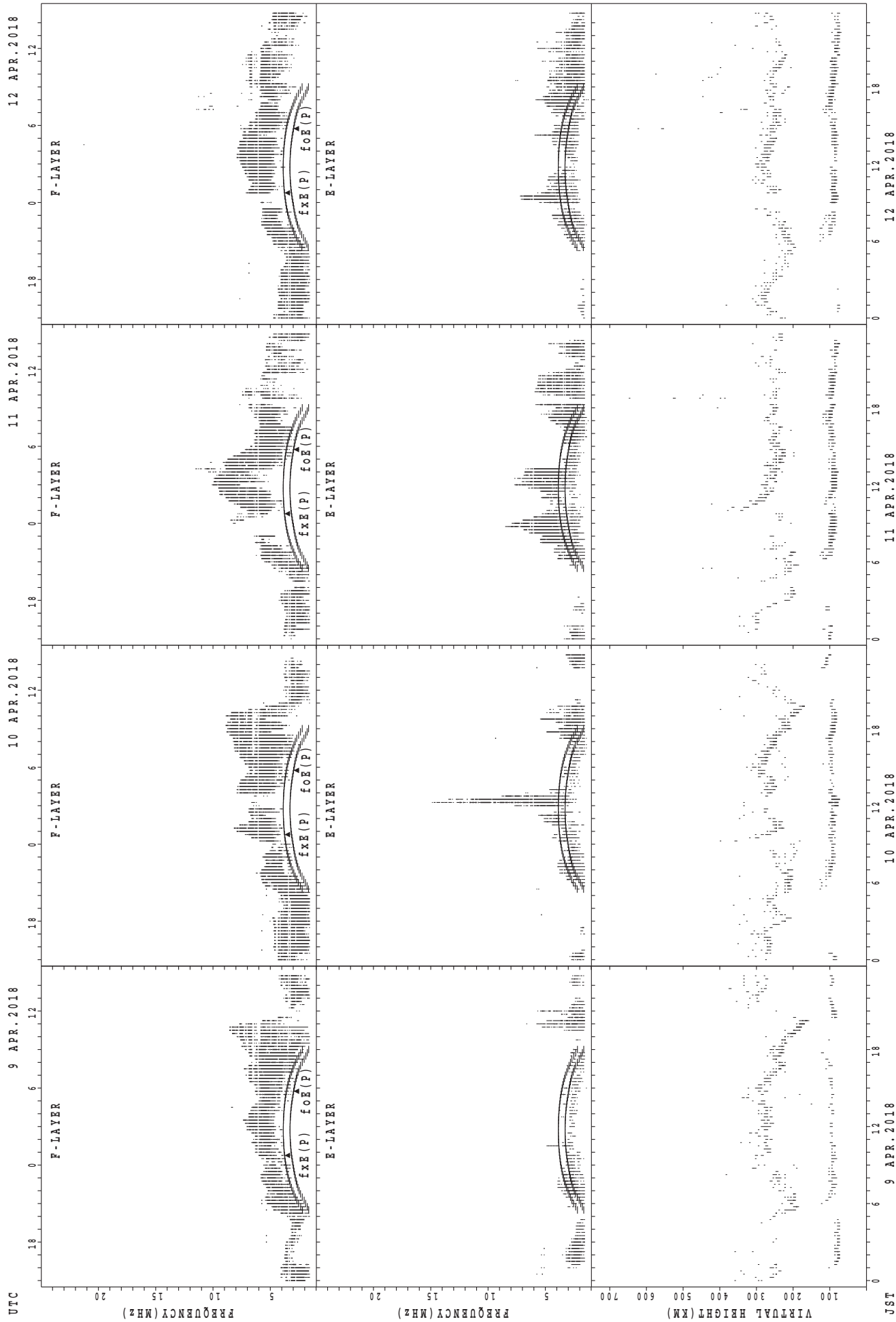
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



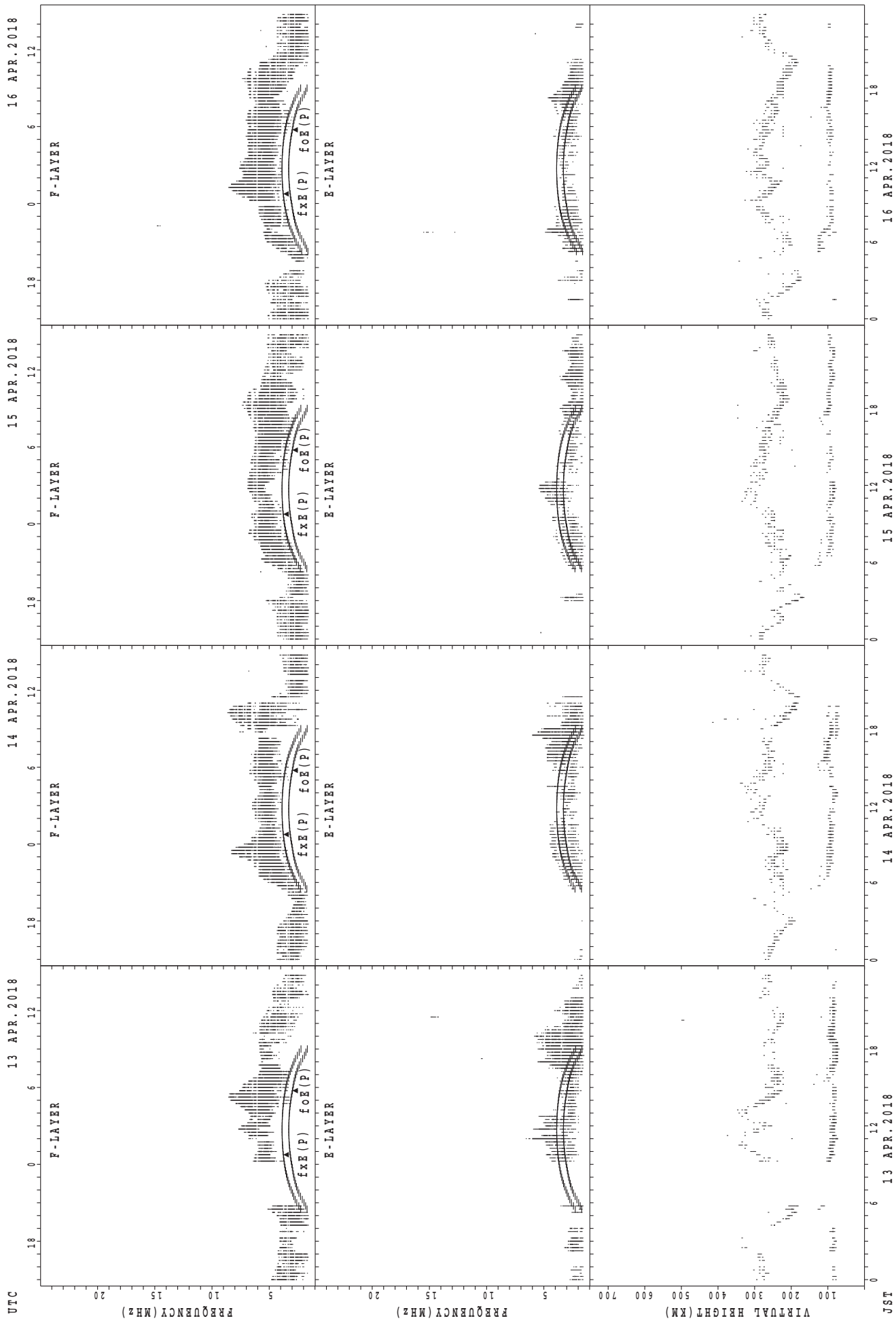
foF2(P); PREDICTED VALUE FOR foF2
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



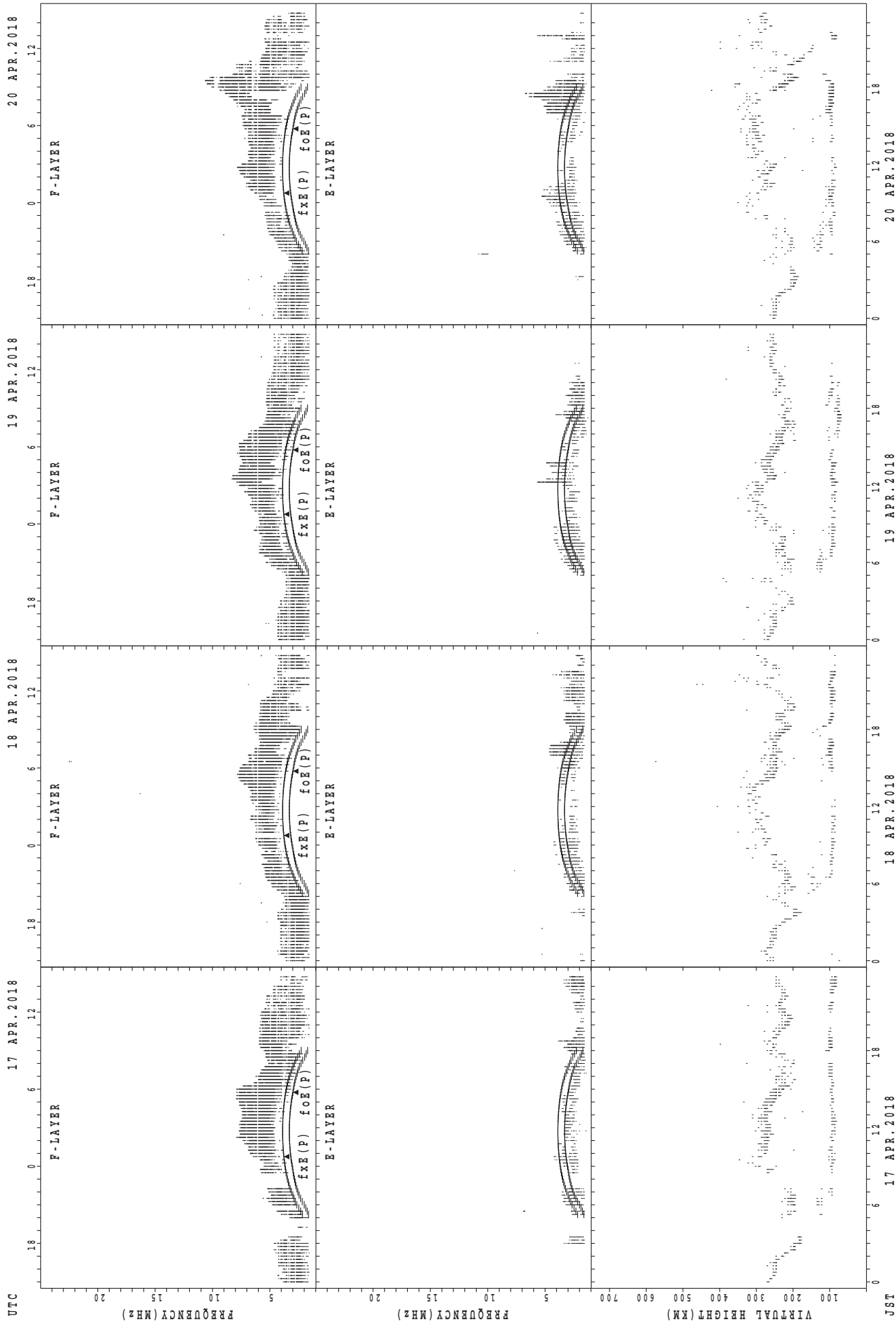
$f_{xE}(P)$; PREDICTED VALUE FOR f_{xE}
 $f_{oE}(P)$; PREDICTED VALUE FOR f_{oE}

SUMMARY PLOTS AT Kokubunji



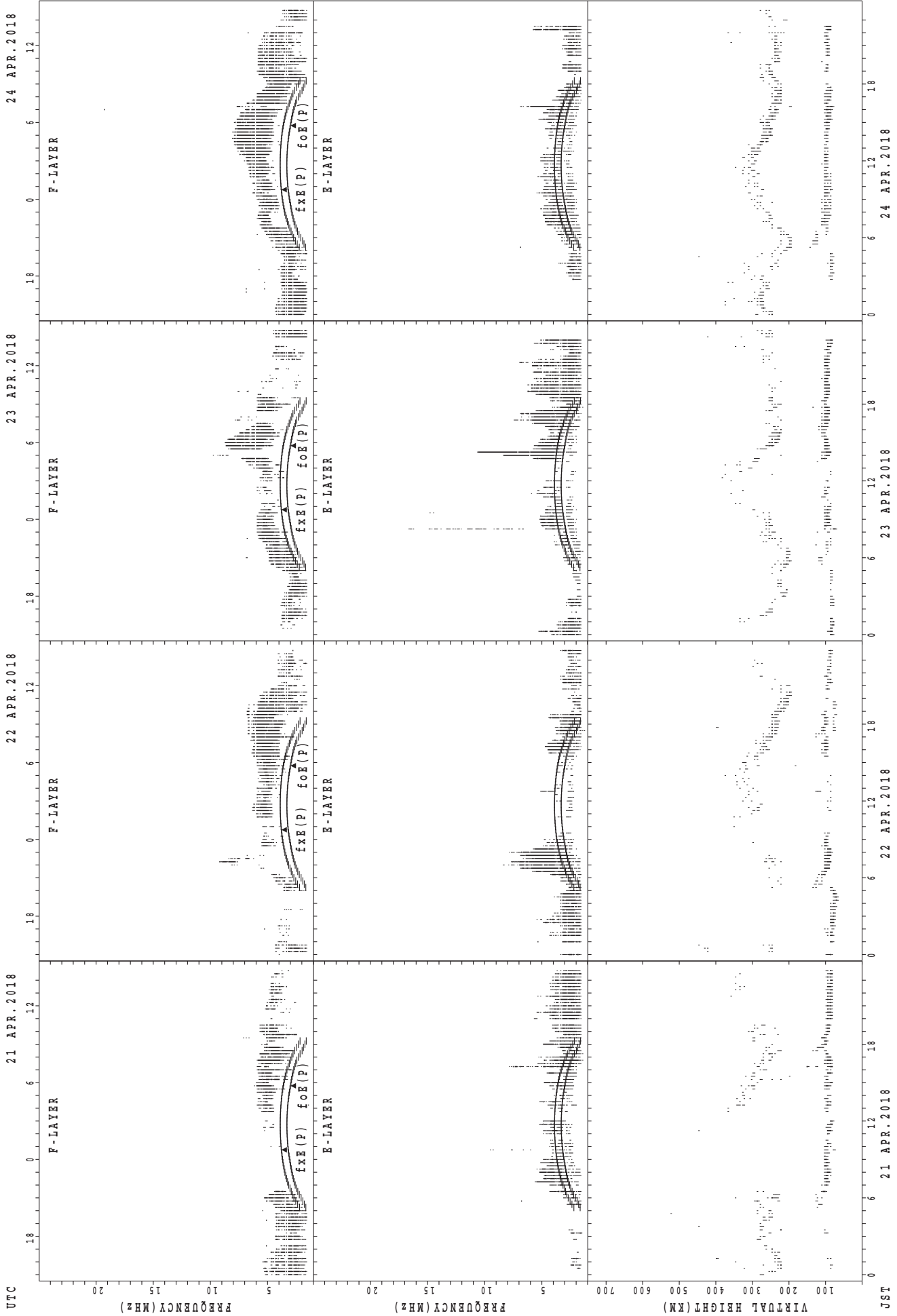
$f_{x E}(P)$; PREDICTED VALUE FOR $f_{x E}$
 $f_{o E}(P)$; PREDICTED VALUE FOR $f_{o E}$

SUMMARY PLOTS AT Kokubunji



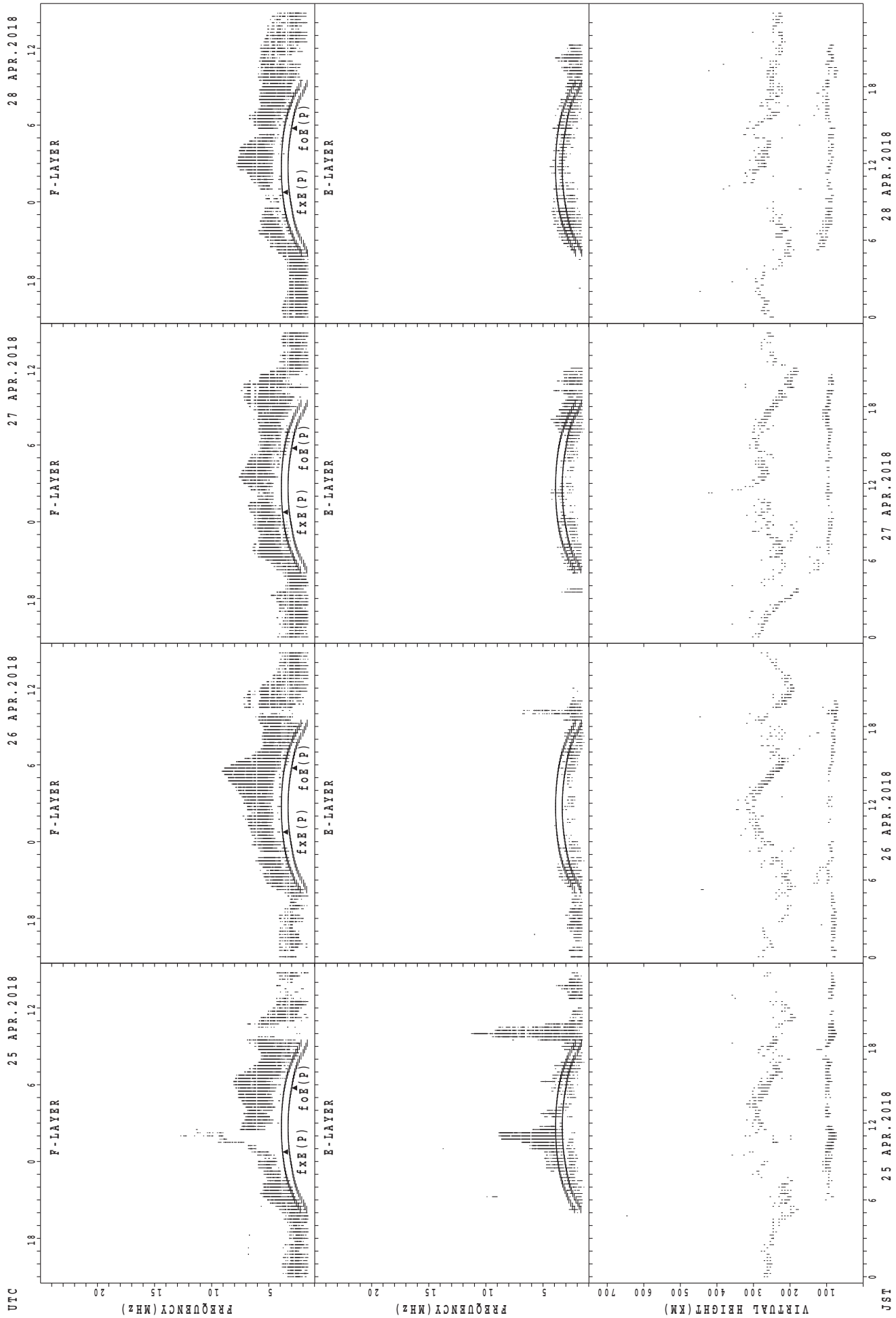
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



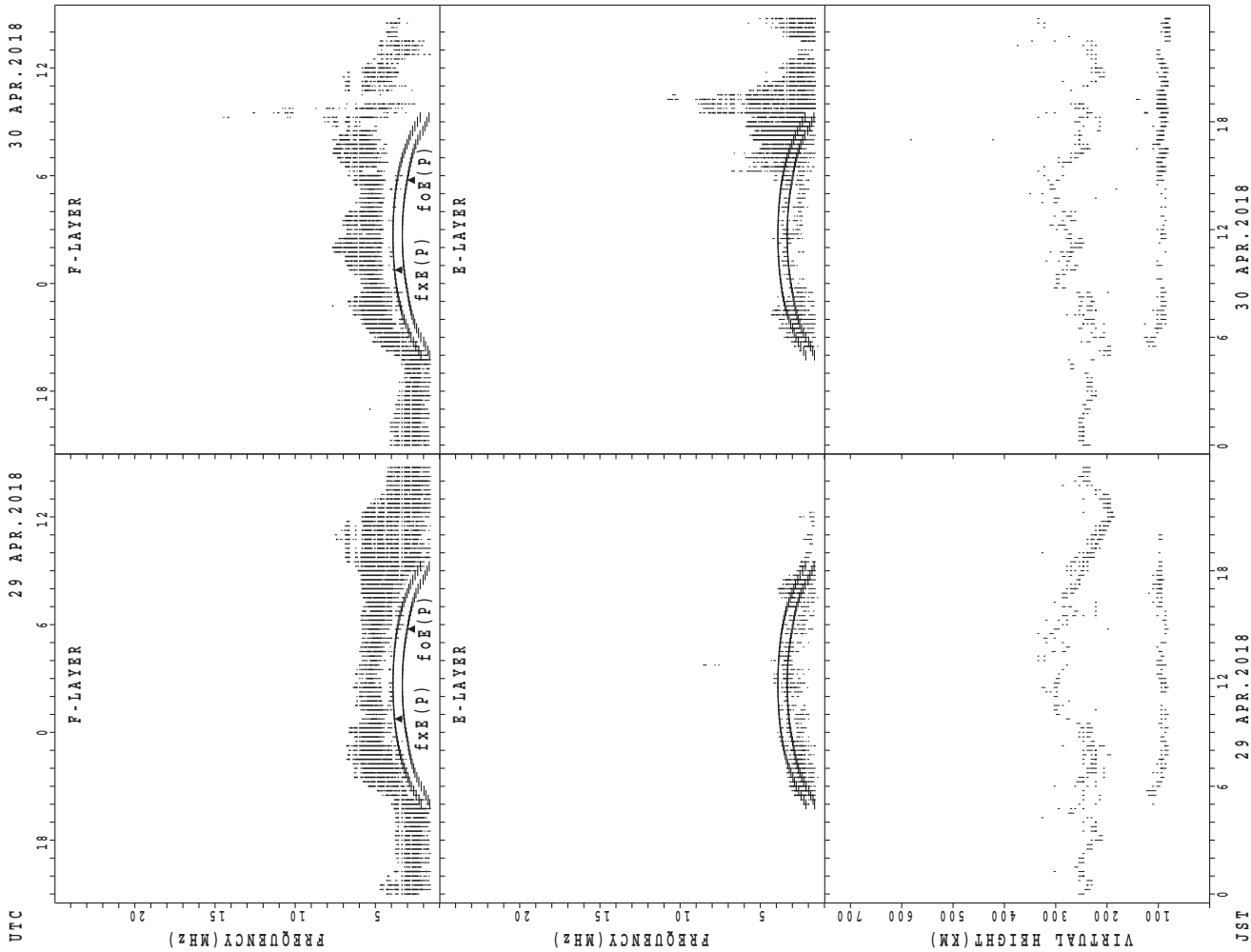
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



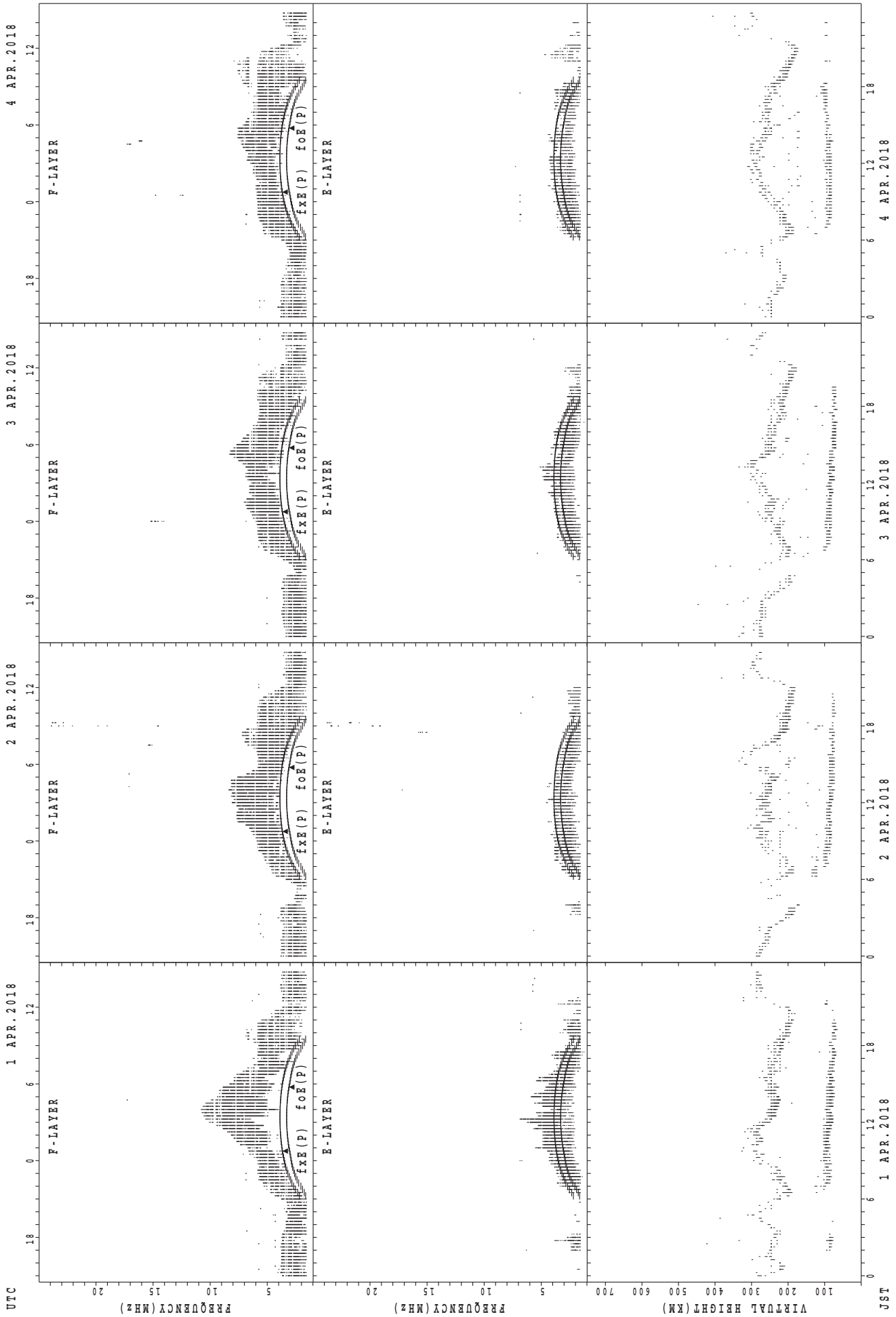
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



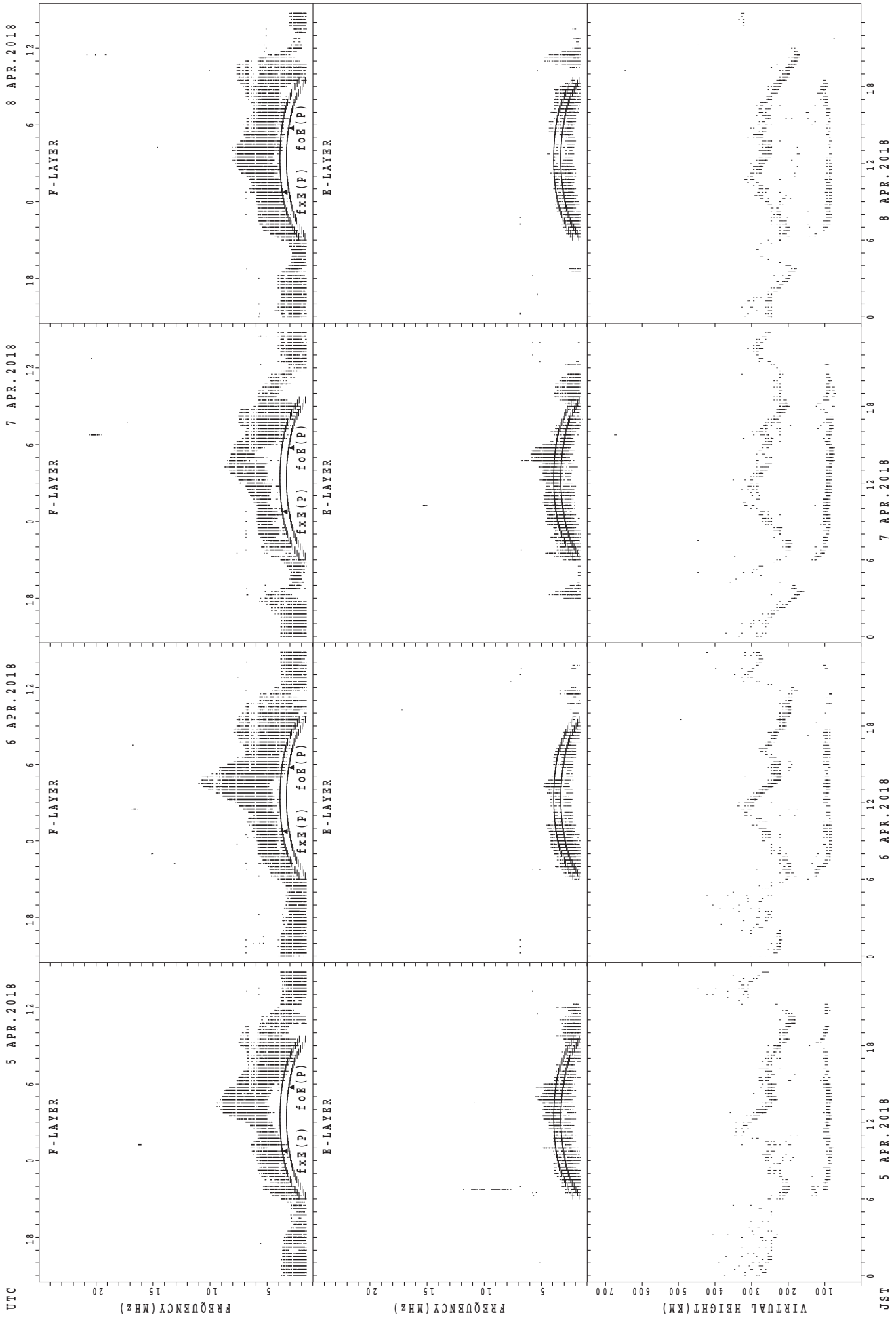
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



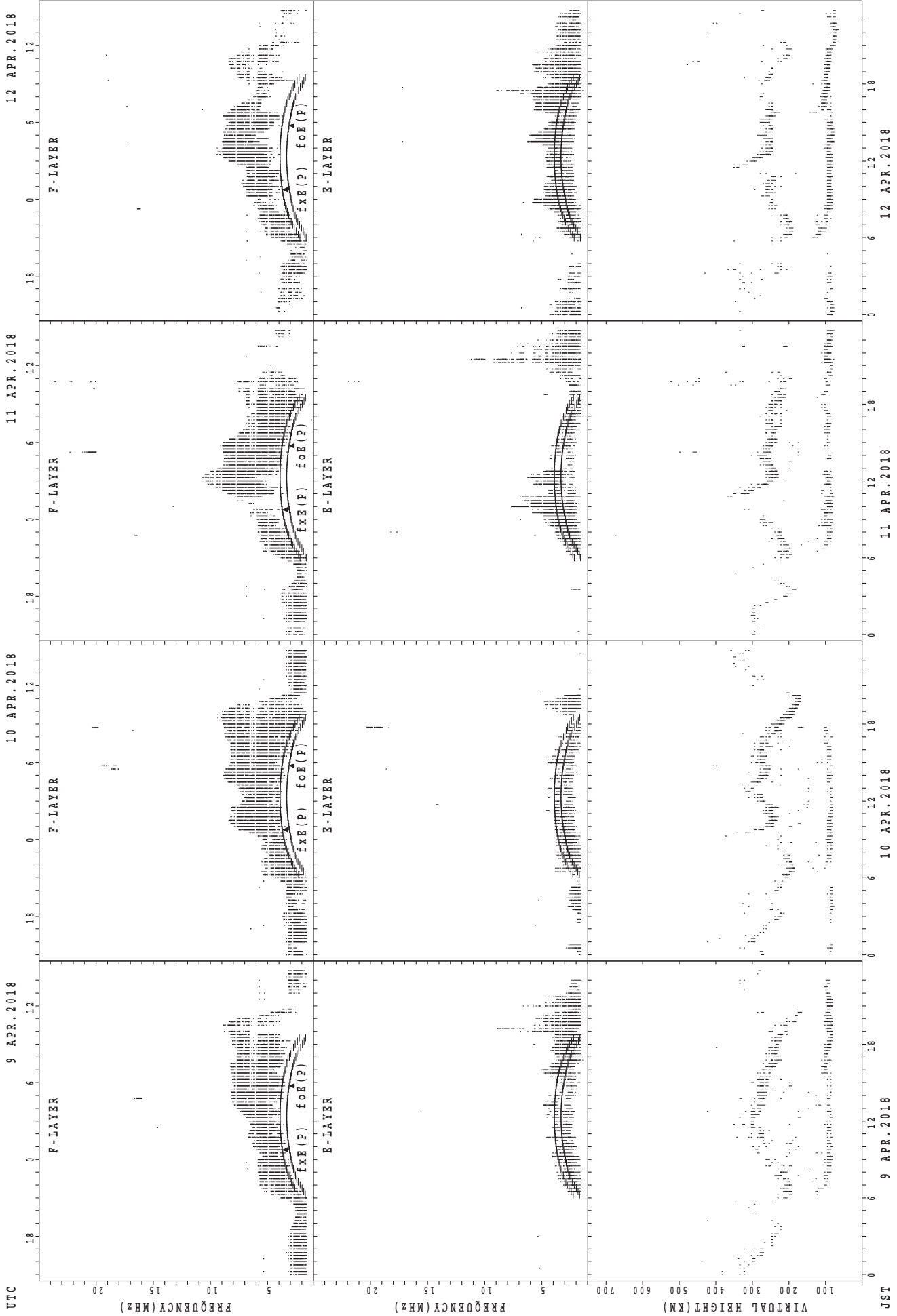
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



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

SUMMARY PLOTS AT Yamagawa



UTC
 9 APR. 2018
 10 APR. 2018
 11 APR. 2018
 12 APR. 2018

F-LAYER
 F-LAYER
 F-LAYER
 F-LAYER

E-LAYER
 E-LAYER
 E-LAYER
 E-LAYER

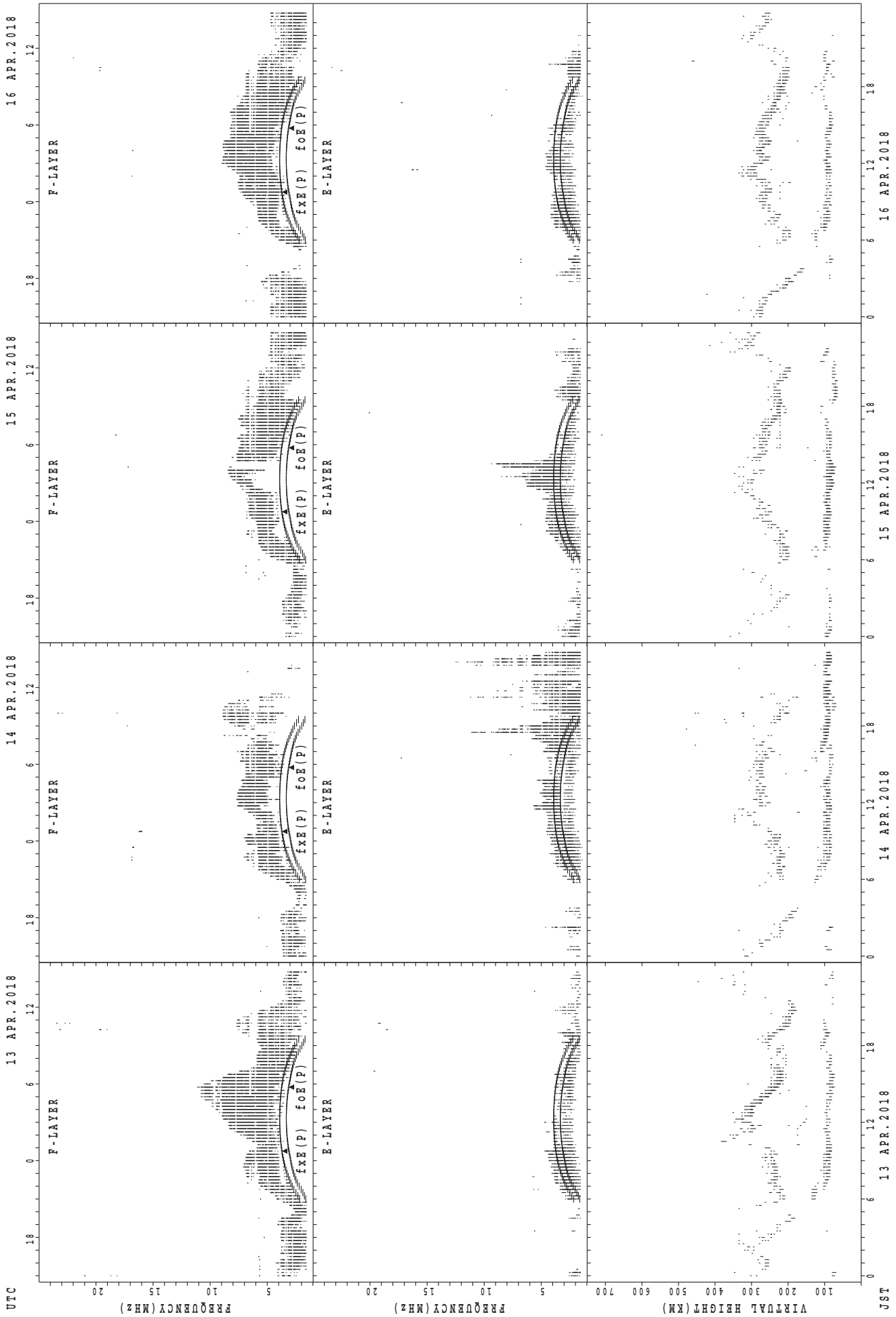
fxe(P) foE(P)
 fxe(P) foE(P)
 fxe(P) foE(P)
 fxe(P) foE(P)

VIRTUAL HEIGHT (KM)
 FREQUENCY (MHZ)
 FREQUENCY (MHZ)
 FREQUENCY (MHZ)

JST
 9 APR. 2018
 10 APR. 2018
 11 APR. 2018
 12 APR. 2018

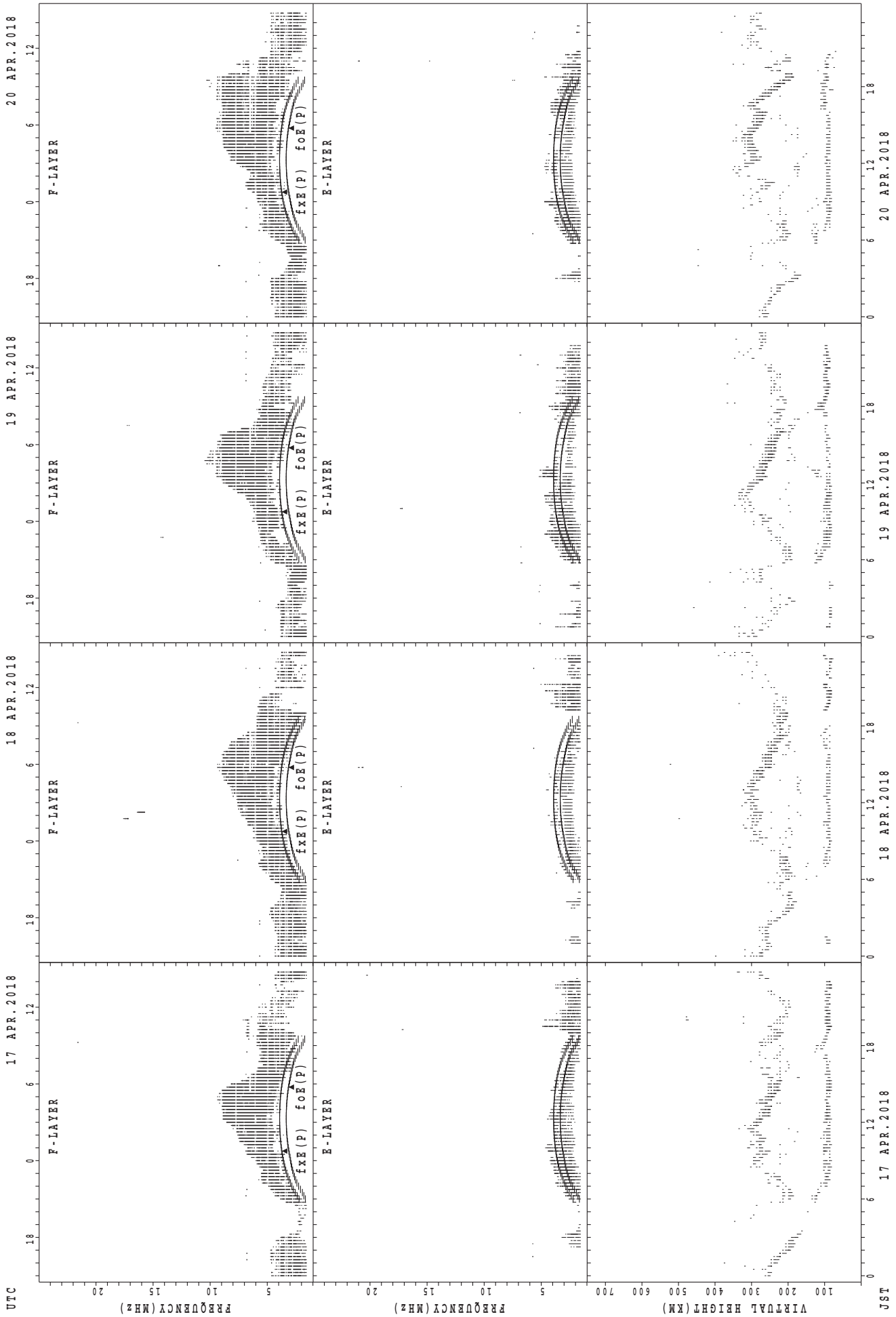
fxe(P); PREDICTED VALUE FOR fxe
 foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



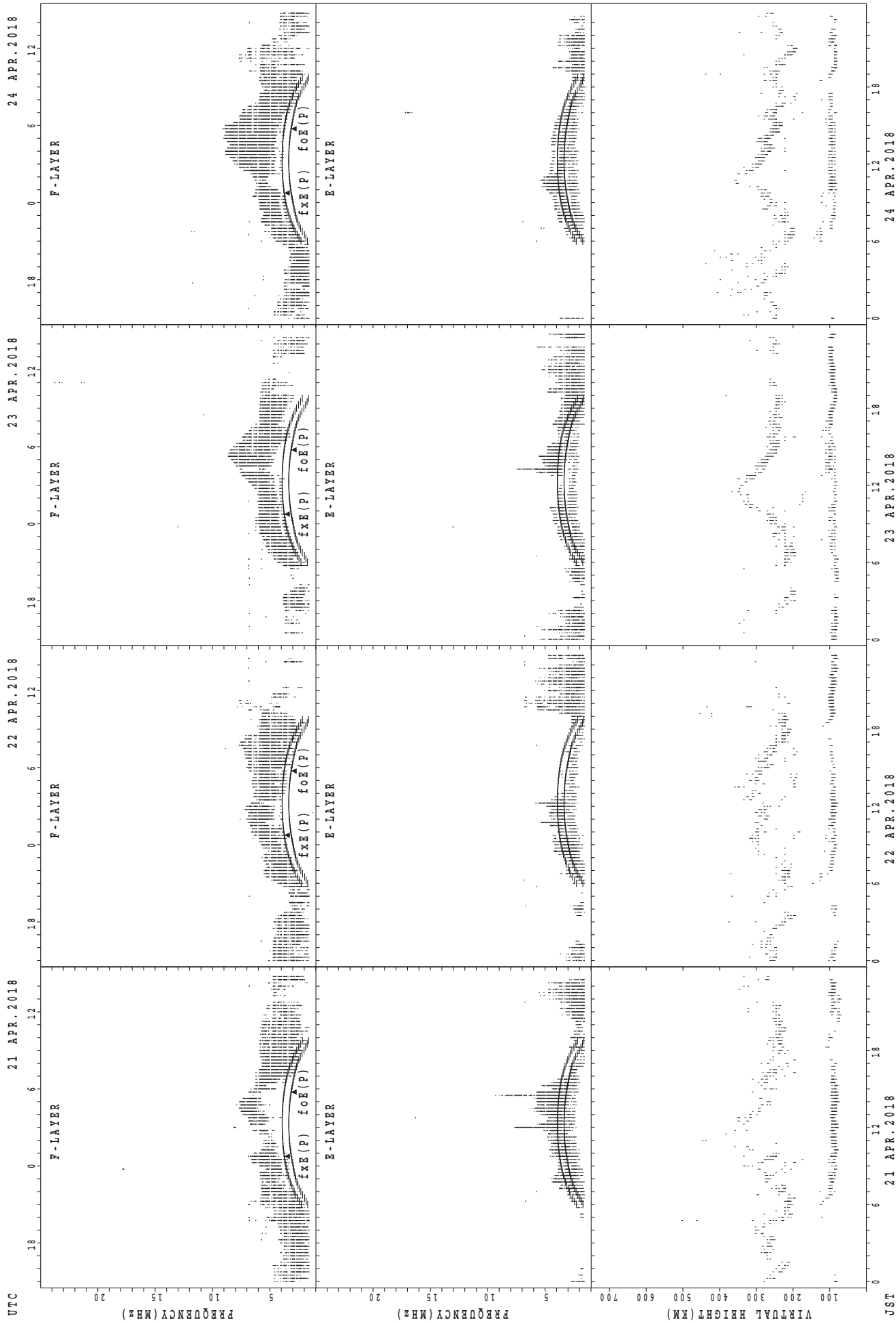
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



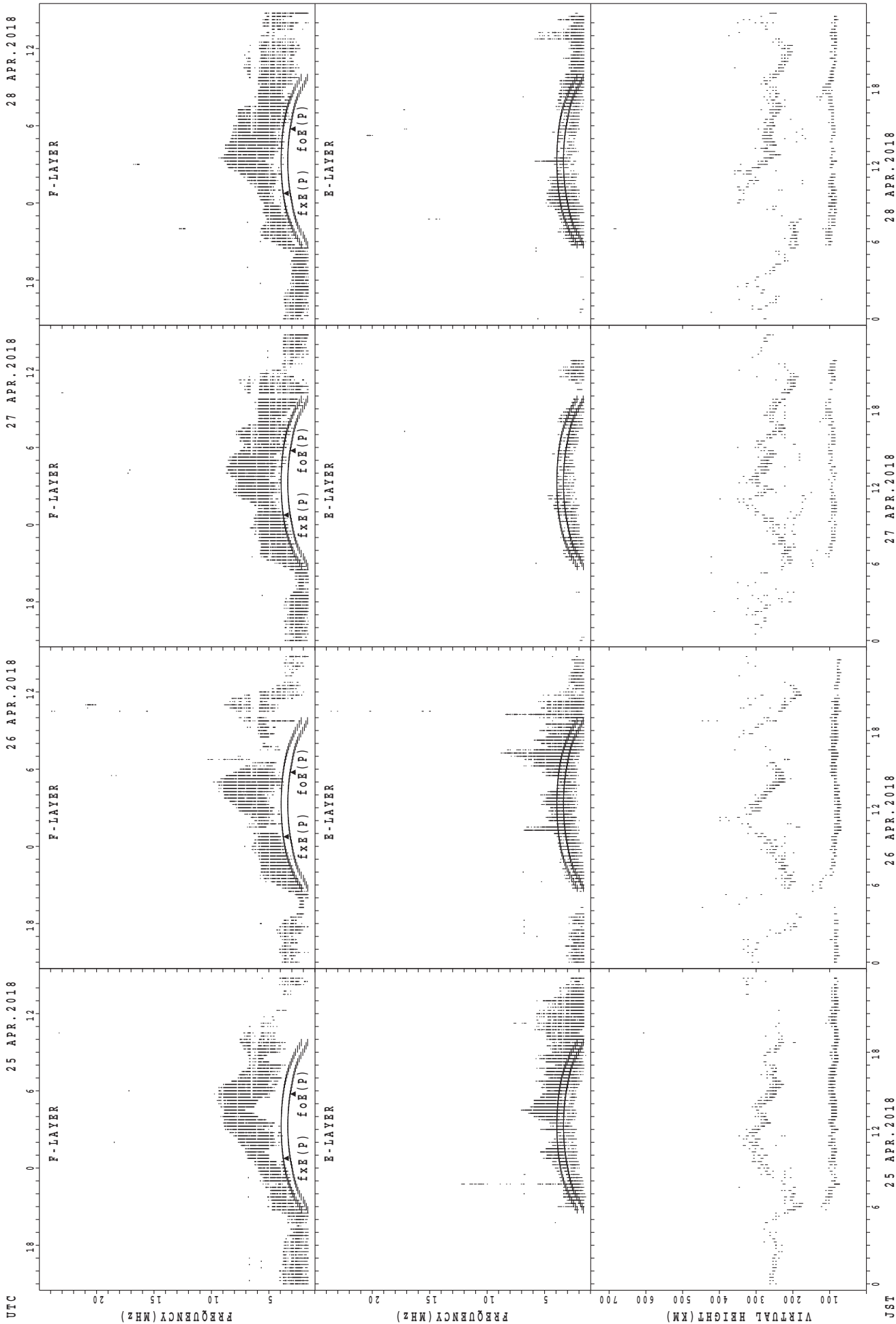
$f_{x E}(P)$; PREDICTED VALUE FOR $f_{x E}$
 $f_{o E}(P)$; PREDICTED VALUE FOR $f_{o E}$

SUMMARY PLOTS AT Yamagawa



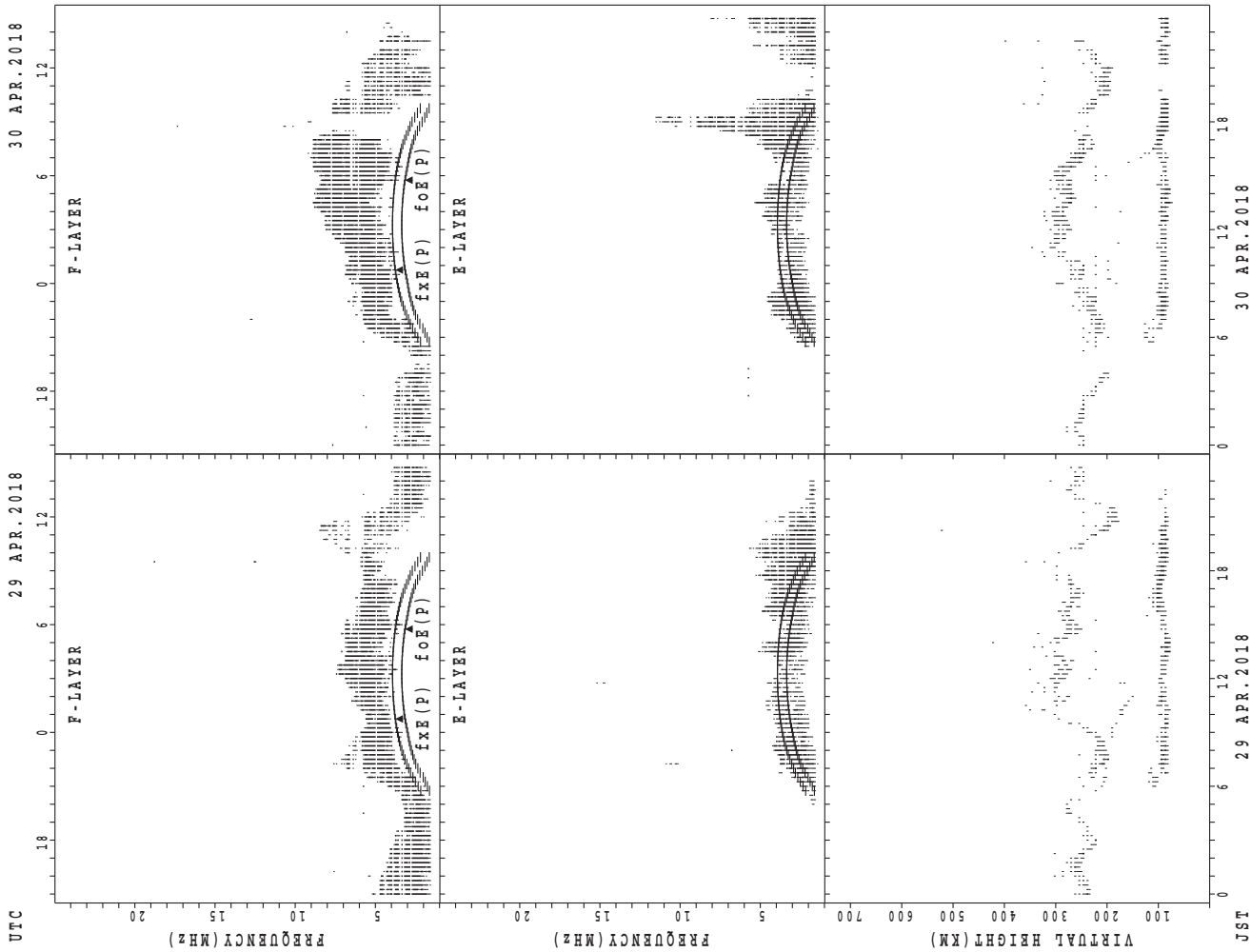
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



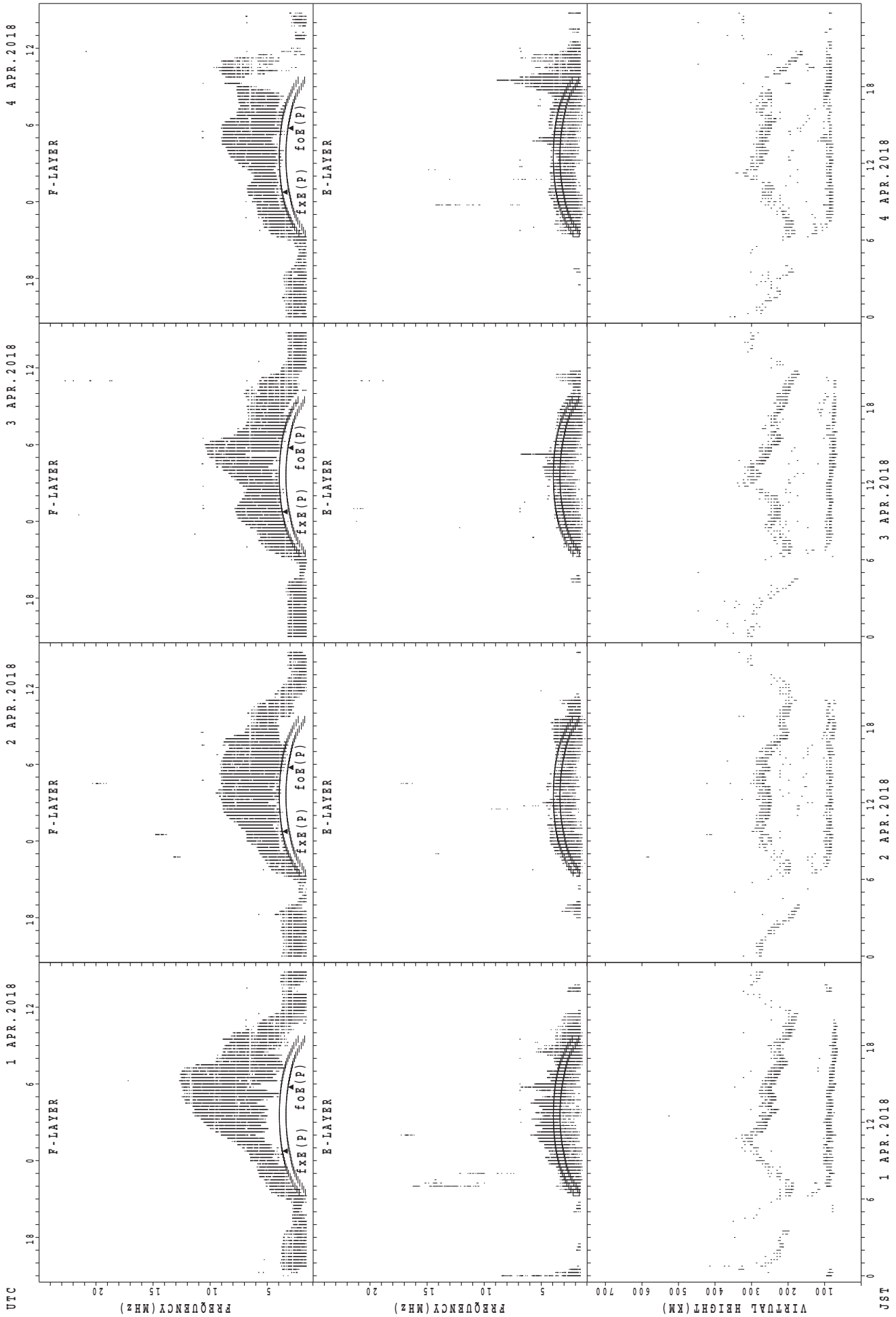
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



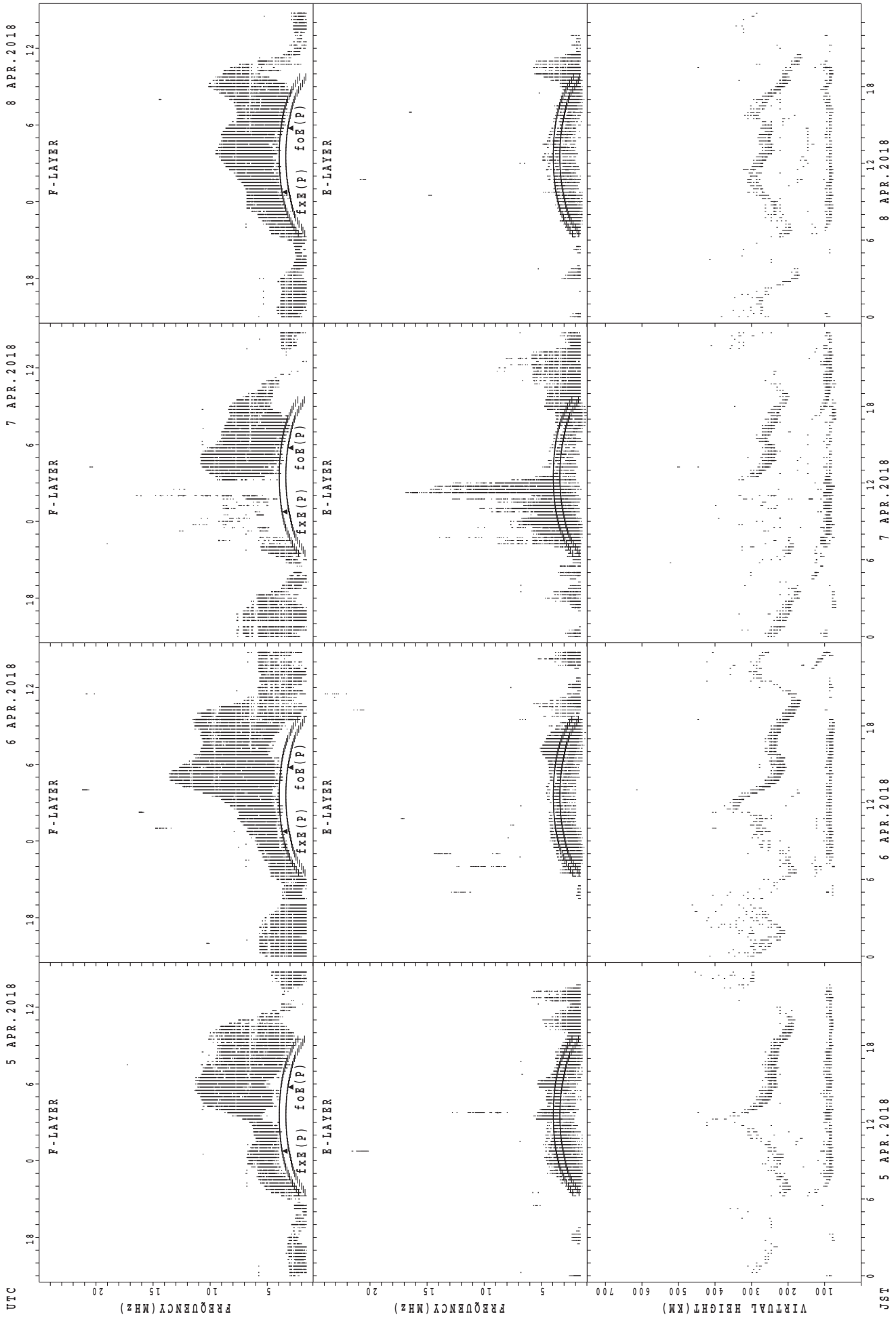
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



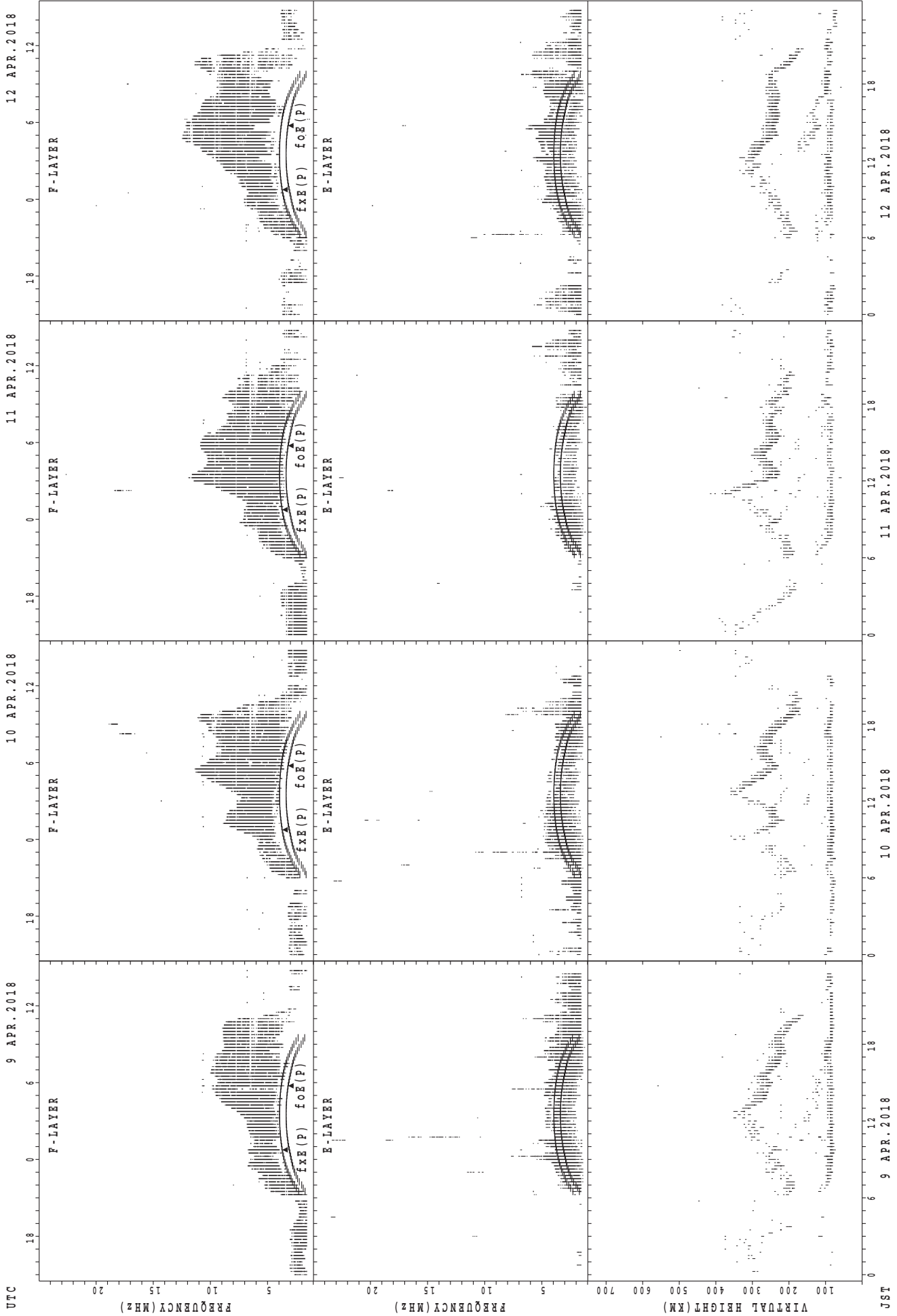
fXE(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



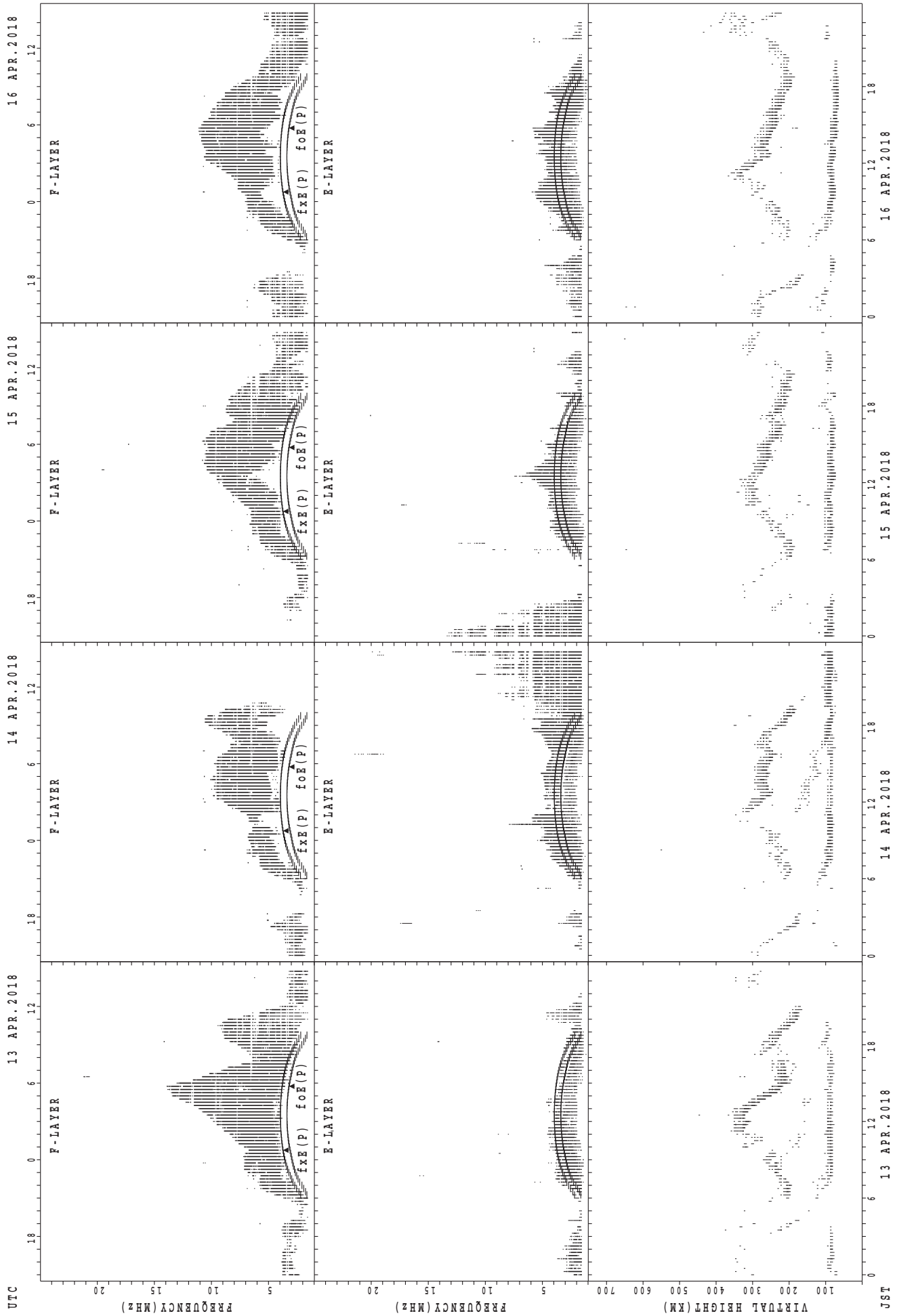
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



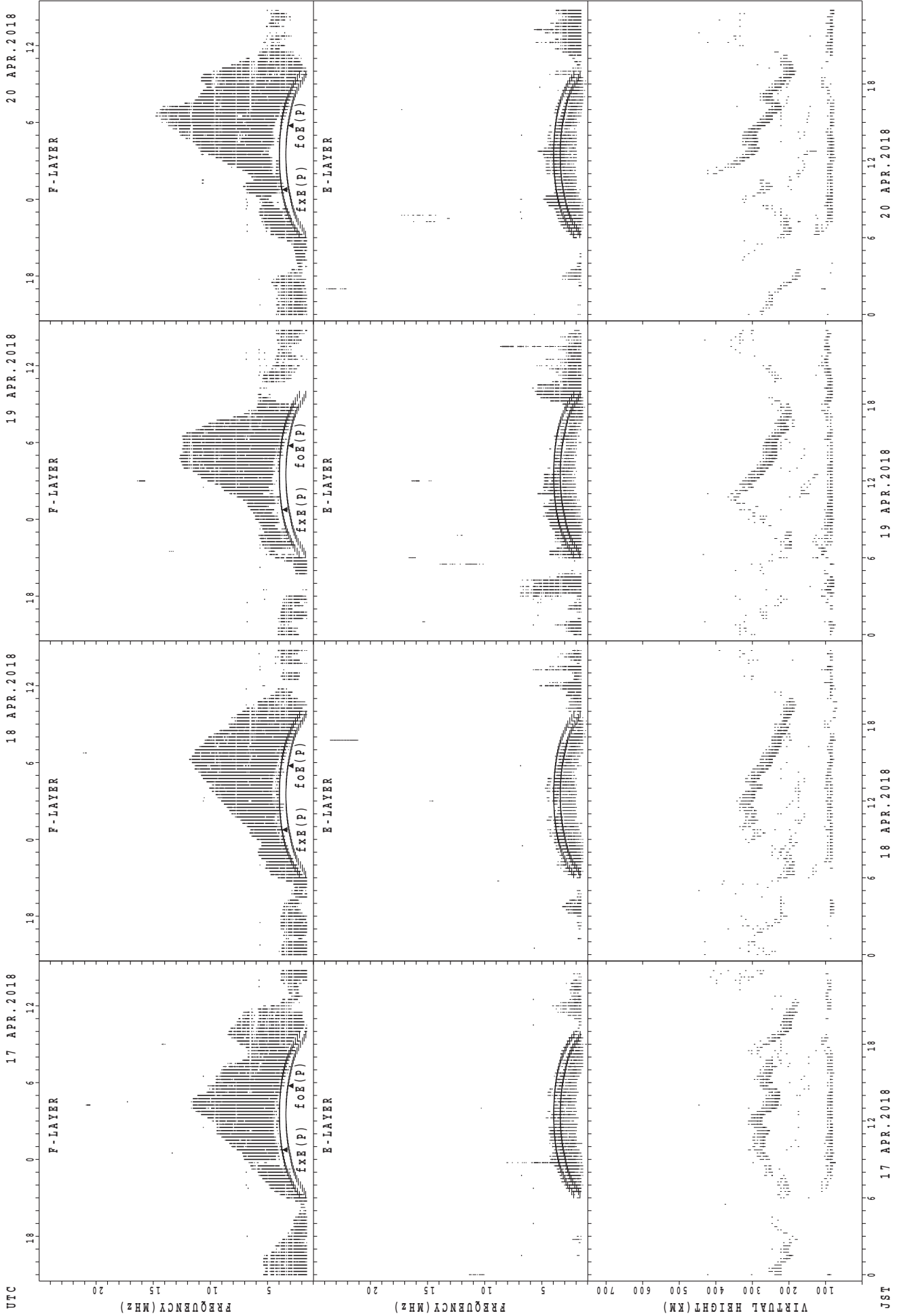
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



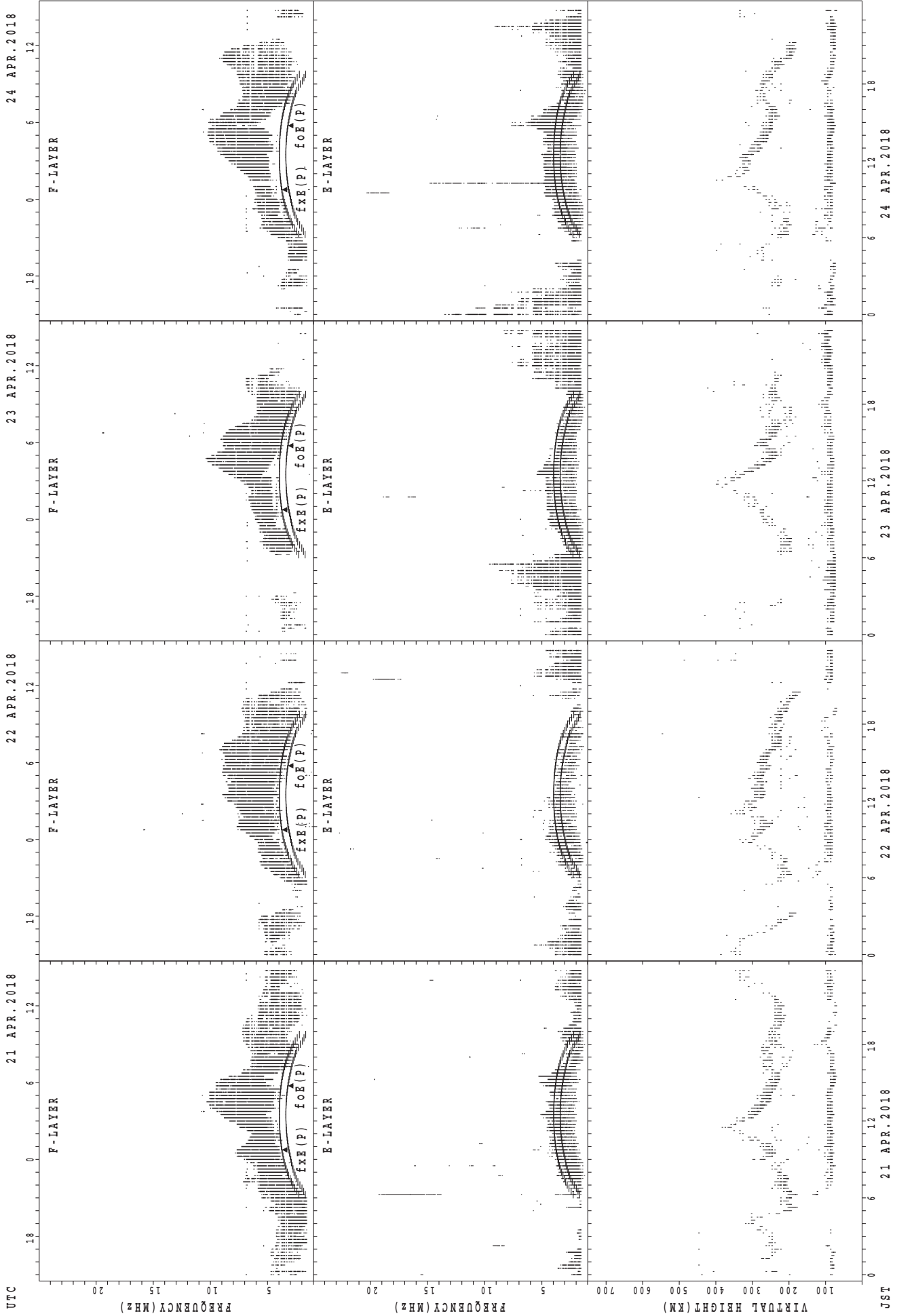
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



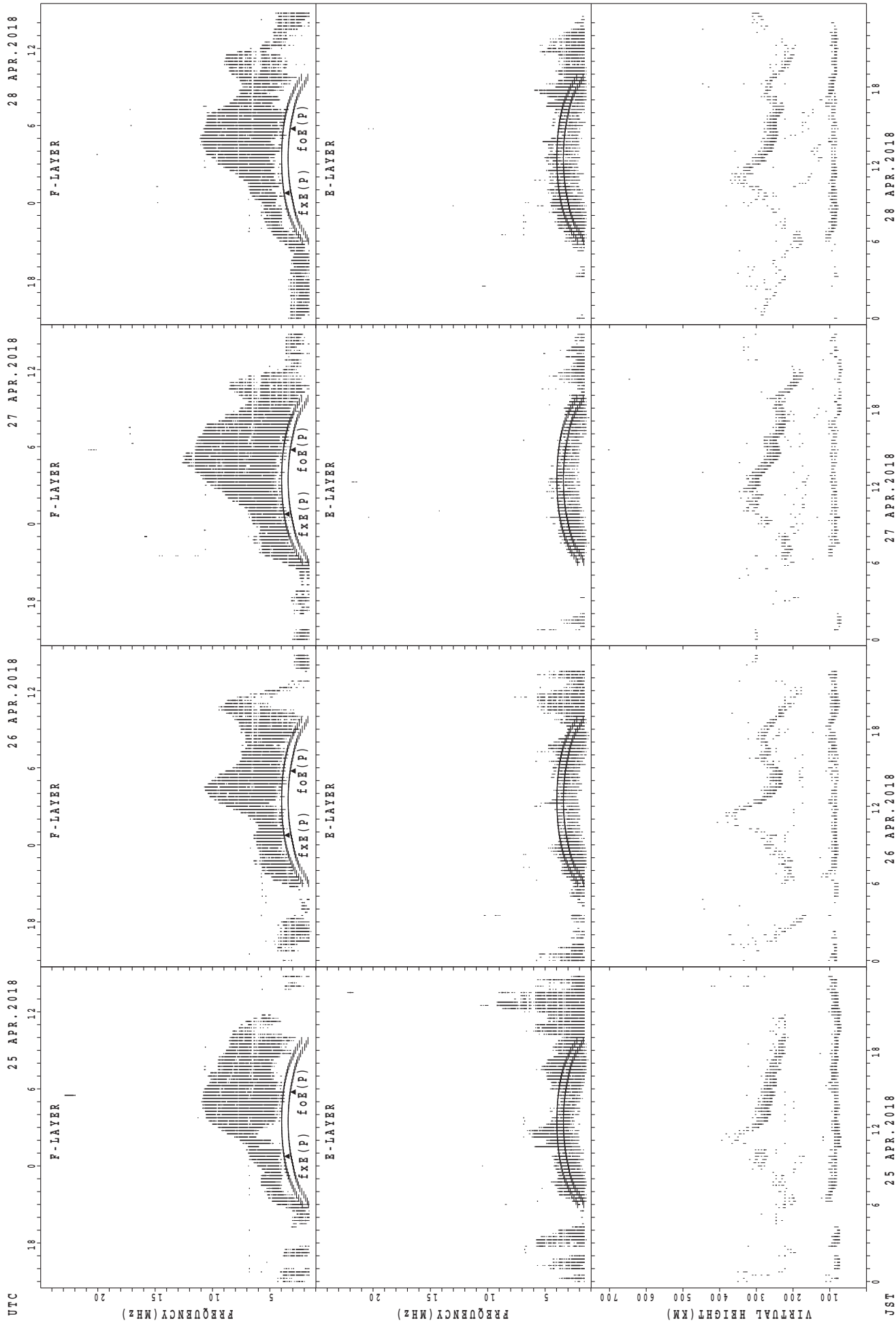
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



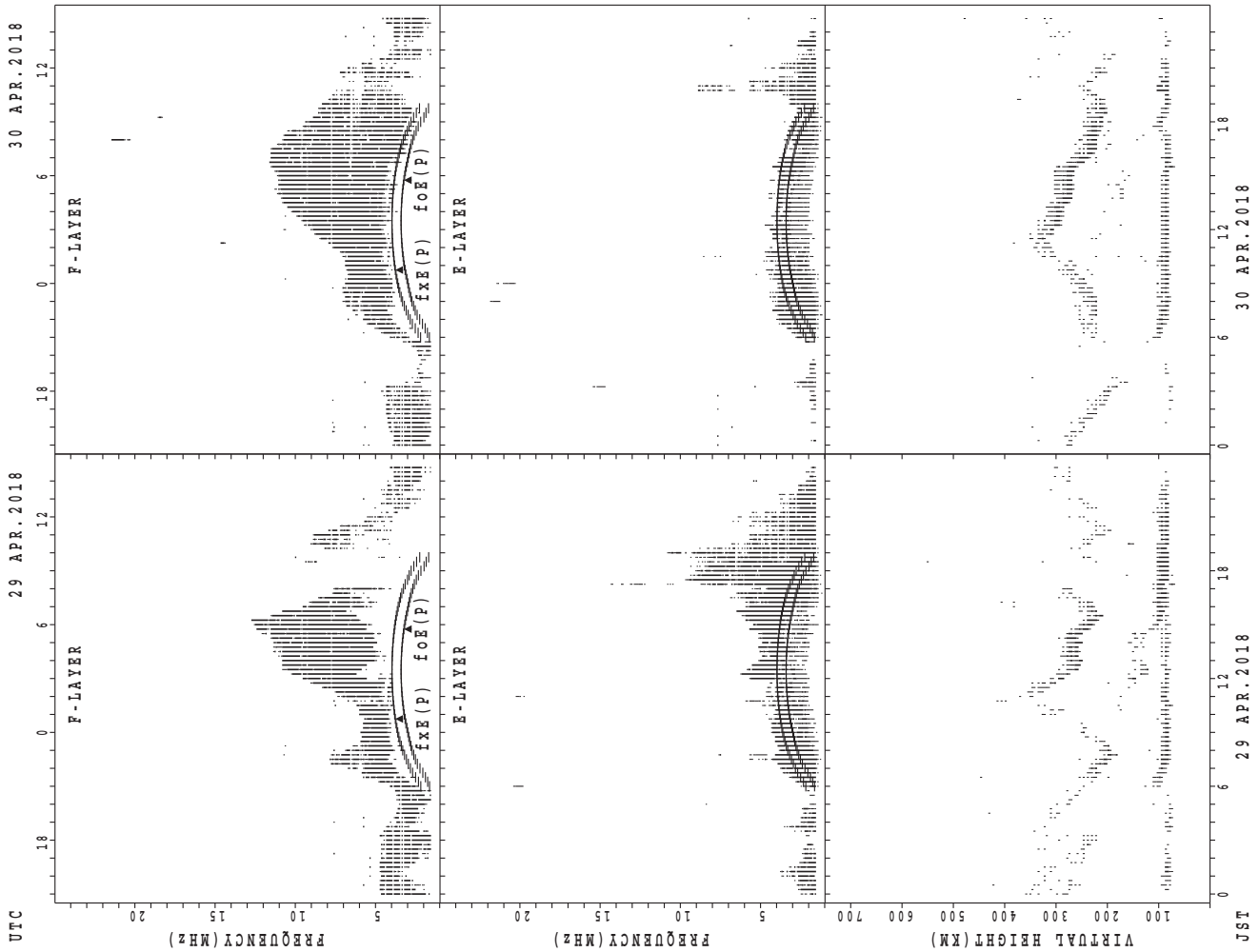
f_oF(P); PREDICTED VALUE FOR f_oF
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es
 APR. 2018 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				8	11	11	14	15	11	9	5		1	1	2			
MED						192				290	280	286	290	298	306	272	246		240	276	239			
U Q						96				293	284	298	314	312	310	289	271		120	138	250			
L Q						96				280	256	278	280	280	282	267	240		120	138	228			

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	6	6	7	7	9	26	30	30	30	30	30	30	29	30	30	29	26	13	16	9	6	8	10
MED	81	87	81	91	149	117	116	110	101	95	93	91	95	91	93	91	95	110	95	97	101	86	89	91
U Q	99	89	87	111	179	134	125	125	107	103	97	167	167	109	143	107	107	125	108	103	105	91	93	95
L Q	77	81	79	81	87	103	107	101	89	89	89	87	89	87	87	89	89	95	76	89	89	83	82	87

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								5	5	8	17	14	22	21	18	20	13	5	8	3	4			
MED								250	252	280	280	292	283	280	263	264	266	260	241	234	228			
U Q								260	255	291	312	304	314	302	290	288	289	307	256	274	242			
L Q								239	247	266	255	268	264	260	252	246	253	248	216	226	203			

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	3	3	6	5	6	28	29	27	27	25	26	26	25	25	29	29	28	25	23	18	14	13	12
MED	86	85	83	83	83	95	121	113	95	95	97	95	91	91	95	97	101	99	97	97	94	91	89	89
U Q	89	97	89	89	133	113	134	131	103	101	101	97	97	99	103	102	109	106	102	99	97	99	97	96
L Q	83	81	79	81	81	89	114	103	93	91	91	87	89	89	89	90	95	97	89	91	89	89	88	85

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	7	12	14	21	27	30	28	23	18	9	7	7	5			
MED								232	238	265	280	304	286	278	263	250	256	256	240	234	224			
U Q								234	252	273	296	321	296	288	271	264	262	269	262	274	228			
L Q								230	224	255	258	284	272	260	241	240	244	237	236	224	220			

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	6	5	6	4	2	17	30	30	30	30	30	29	29	30	29	30	30	25	25	25	21	17	14
MED	88	89	89	87	88	86	123	116	107	95	91	95	91	91	95	95	101	101	99	91	91	91	95	89
U Q	92	89	90	177	132	87	130	125	119	101	97	167	95	98	167	126	125	113	107	97	96	96	96	93
L Q	87	87	86	85	86	85	114	107	97	89	89	89	88	89	85	89	91	91	91	83	87	88	86	87

MONTHLY MEDIANS OF h'F AND h'Es
 APR. 2018 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	3	14	20	17	27	30	30	30	28	24	22	23	11			
MED								234	250	253	272	296	294	271	254	246	238	240	232	230	210			
U Q								240	274	268	309	323	310	284	264	254	246	258	260	248	232			
L Q								228	204	244	254	271	280	260	240	236	232	224	224	210	200			

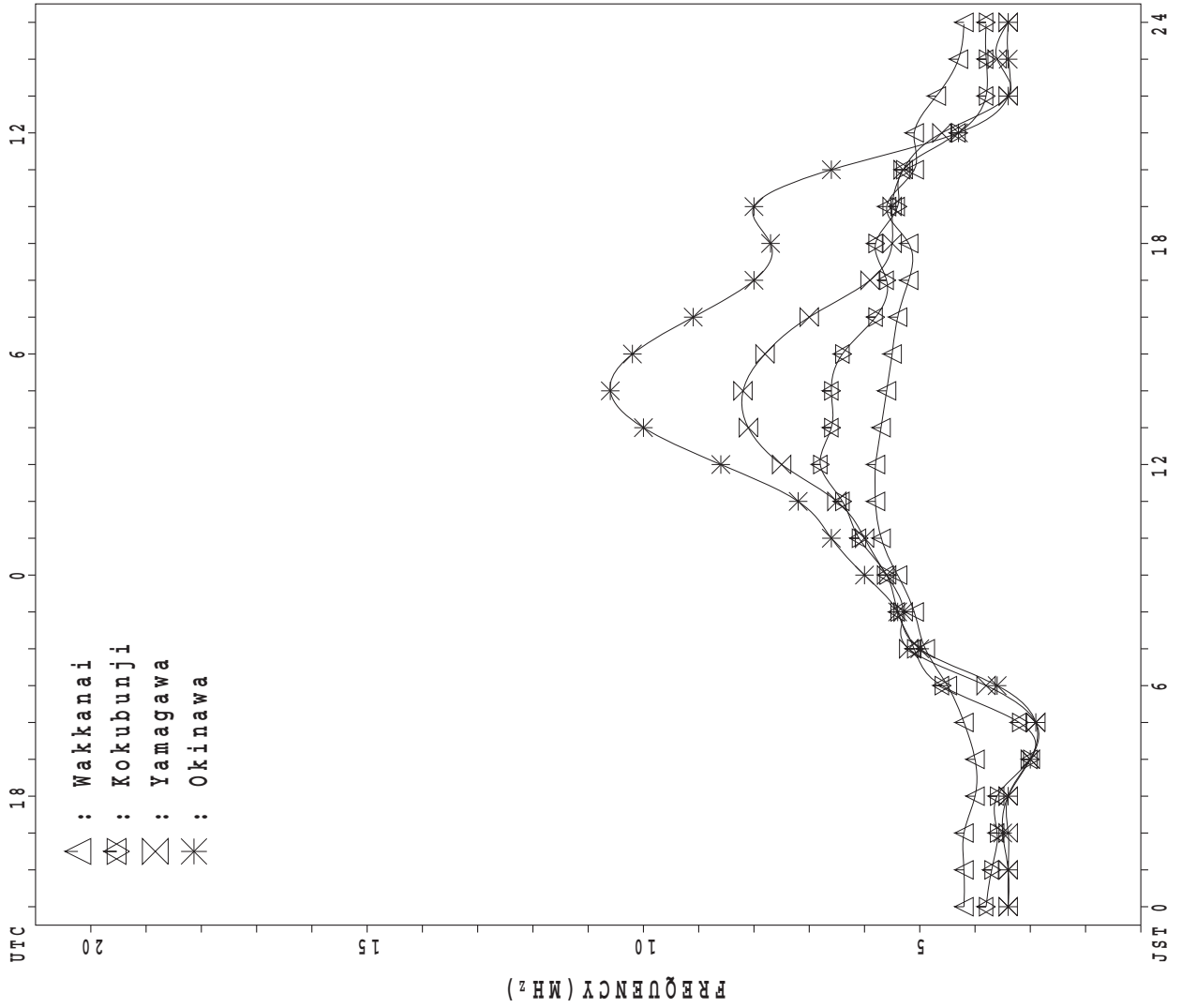
h'Es

	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	12	10	11	12	8	17	30	30	29	30	29	30	30	30	30	30	30	29	29	26	23	22	16
MED	89	87	88	115	87	92	119	119	101	95	95	95	100	138	113	92	95	101	97	87	89	89	90	89
U Q	97	90	101	175	90	100	128	131	125	98	95	155	153	157	155	131	119	113	110	91	99	97	95	96
L Q	89	86	85	87	84	85	100	107	91	90	89	87	89	91	89	87	87	89	89	84	85	87	89	87

MONTHLY MEDIANS PLOT OF fOF2

APR. 2018

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Wakkanai

APR. 2018 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 47	X 49	X 49	X 45	X 45																X 59	X 59	X 49	X 49	
2	X 49	X 50	X 52	X 49	X 45																	X 61	X 57	X 50	X 50
3	X 48	X 48	X 45	X 47	X 48																	X 55	X 55	X 54	X 51
4	X 51	X 49	X 48	X 50	X 46																	X 54	X 51	X 51	X 48
5	X 45	X 47	X 44	X 44	X 43																	X 53	X 52	X 49	X 51
6	X 57	X 58	X 48	X 47	X 55																	X 53	X 51	X 48	X 47
7	X 48	X 57	X 60	X 58	X 58																	X 63	X 62	X 58	X 60
8	X 58	X 59	X 59	X 59	X 59	X 59																X 59	X 58	X 47	X 43
9	X 48	X 52	X 58	X 51	X 57	X 57																X 65	X 65	X 52	X 47
10	X 48	X 48	X 47	X 41																		X 62	X 55	X 47	X 47
11	X 51	X 45	X 46	X 46																		X 56	X 54	X 51	X 48
12	X 45	X 44	X 43	X 43																		X 61	X 61	X 54	X 45
13	X 43	X 41	X 43	X 41																		X 55	X 54	X 53	X 45
14	X 44	X 45	X 43	X 45																		X 73	X 66	X 55	X 51
15	X 58	X 58	X 57	X 57																		X 62	X 59	X 58	X 58
16	X 56	X 55	X 51	X 52																		X 65	X 60	X 54	X 50
17	X 50	X 48	X 48	X 48																		X 64	X 64	X 62	X 59
18	X 54	X 58	X 55	X 57	X 57																	X 62	X 59	X 55	X 49
19	X 55	X 55	X 49	X 51																		X 55	X 55	X 55	X 54
20	X 52	X 52	X 49	X 52																		X 86	X 66	X 52	X 52
21	X 48	X 47	X 44	X 38																		X 52	X 50	X 48	X 45
22	X 42	X 40	X 40	X 35																		X 55	X 56	X 48	X 41
23	X 39	X 39	X 37	X 37																		X 54	X 54	X 51	X 45
24	X 43	X 43	X 41	X 41																		X 57	X 58	X 56	X 50
25	X 45	X 45	X 45	X 51																		X 63	X 59	X 49	X 48
26	X 48	X 45	X 45	X 44																		X 63	X 64	X 59	X 51
27	X 45	X 48	X 47	X 45																		X 65	X 56	X 51	X 48
28	X 46	X 43	X 43	X 43																		X 63	X 63	X 60	X 51
29	X 48	X 45	X 45	X 48	X 45																	X 67	X 64	X 61	X 53
30	X 45	X 45	X 45	X 42																		X 62	X 60	X 54	X 48
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	11	2																30	30	30	30
MED	X 48	X 48	X 46	X 46	X 48	X 58																X 62	X 58	X 52	X 49
U Q	X 51	X 52	X 49	X 51	X 57																	X 63	X 62	X 55	X 51
L Q	X 45	X 45	X 44	X 43	X 45																	X 55	X 55	X 49	X 47

APR. 2018 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 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	40	42	42	38	38	37	42	45	48	53	64	68	74	65	59	60	52	48	51	53	52	52	42	42
2	42	43	45	42	38	41	44	44	54	53	56	56	56	61	61	55	52	46	49	56	54	50	42	43
3	41	41	38	F 35	F 36	36	46	43	48	52	52	58	59	61	54	55	52	48	44	47	48	48	47	44
4	44	42	41	43	39	39	41	44	48	51	56	52	54	56	58	53	54	49	49	51	47	44	44	41
5	38	40	37	37	36	36	46	44	50	50	57	61	58	56	61	57	50	49	44	48	46	45	42	44
6	F 41	F 39	34	F 34	F 37	33	42	44	51	50	60	57	58	R 61	56	57	58	56	51	49	46	44	41	40
7	41	F 44	F 35	F 43	F 30	34	44	44	47	57	57	56	56	56	58	52	53	50	52	56	56	F 55	51	53
8	51	F 46	F 48	F 48	F 43	F 36	50	47	52	52	56	57	58	58	56	52	51	50	50	55	52	F 44	40	36
9	F 36	45	47	44	F 44	F 48	51	51	50	55	62	57	58	60	55	52	56	50	55	65	58	58	45	40
10	41	41	40	34	34	33	38	43	43	49	48	51	60	57	53	58	60	60	62	60	55	48	40	40
11	F 38	39	39	39	34	38	43	52	47	50	53	64	61	71	X R 55	54	54	50	52	58	49	47	44	41
12	38	37	36	36	33	36	44	47	48	52	53	56	56	56	50	52	49	47	48	56	54	54	47	38
13	36	34	36	34	33	38	40	42	46	50	52	52	52	56	54	49	48	52	50	50	48	47	46	38
14	37	38	36	38	38	40	48	50	59	56	64	54	50	55	58	51	52	52	55	64	66	59	48	44
15	F 44	F 48	F 44	F 45	51	41	43	42	49	55	57	55	53	54	54	52	53	53	52	58	55	53	51	51
16	49	48	44	45	41	42	44	45	51	57	64	62	55	54	55	58	53	49	50	60	58	53	47	43
17	43	41	41	41	44	40	44	45	49	55	59	58	60	60	57	56	54	57	48	55	57	57	55	F 44
18	47	F 44	F 44	F 44	F 41	41	39	46	50	52	54	52	53	56	53	53	52	50	49	58	55	52	48	42
19	F 41	F 43	42	44	37	37	39	42	47	47	49	50	52	56	56	57	57	49	46	48	48	48	48	47
20	45	45	42	45	38	41	41	44	46	A 53	59	65	58	54	56	53	56	68	80	78	79	59	45	45
21	41	40	37	31	30	29	35	33		A 39		42	40	47	45	47	42	38	44	45	43	41	38	
22	35	33	33	28	30	34	37	40	45	41	45	45	45	47	50	49	49	48	46	48	48	49	41	34
23	32	32	30	30	32	38	44	48	49	48	49	48	52	56	58	58	58	58	47	47	48	47	44	38
24	36	36	34	F 34	33	45	43	50	49	56	53	56	56	57	57	62	61	54	49	49	50	52	49	43
25	38	38	38	F 36	39	40		A 46	51	53	58	60	59	56	58	56	55	56	52	56	56	52	42	41
26	41	38	38	37	38	43	45	46	52	54	56	53	53	55	58	58	59	52	46	52	56	57	52	44
27	38	41	40	38	42	44	45	48	53	56	59	56	54	53	53	51	49	50	51	57	58	49	44	42
28	39	36	36	36	38	44	41	46	46	50	54	58	55	52	52	52	49	48	47	56	56	56	53	44
29	41	38	38	F 36	F 33	42	44	48	54	62	60	52	51	52	51	52	48	51	54	60	60	57	54	46
30	38	38	38	35	34	42	49	44	48	55	57	55	54	50	50	54	52	52	51	55	55	53	47	41
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	30	29	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	41	40	38	38	38	40	44	45	49	53	56	56	56	56	56	54	52	50	50	56	54	52	46	42
U Q	42	F 43	42	43	39	42	45	47	51	55	59	58	58	58	58	57	56	53	52	58	56	55	48	44
L Q	38	38	36	35	33	36	41	44	47	50	53	52	53	54	53	52	50	49	47	49	48	47	42	40

APR. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 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							
2							L		L	408	408	432	416	420	420	396	L	L						
3									L		L						L	L		L				
4								348	384	400	412	428		424		L	L		244					
5									400	420		424		424	412	384								
6					L				384		416	416		L	424		L	L						
7									396	408		L	424	428		L	L	L	L					
8								L	L		408	416		L	416		L	L	L	L				
9								344	404	412		L	448	440	424		L	L						
10							L	L		L	L	L	416		416	400	376	324						
11				L					416		L	432	408		416	404	384	348	348	292				
12							L		348	L	L	L	L		440	L	392	364						
13								356	384		A	L	L		416	408	L	L	L					
14								L	L		400		L	L		436		L	L	L	L			
15									396		L	L	L	L	L	L	L							
16								L		404	408	432	428	428	428	428	404	L	L					
17							L		392	420	428	440		424		L	L	L	L					
18								L	L	L		L	424	436	420	440		L	L	L	L			
19					L			368	L	L	L		L	L	L	L	L	L	L					
20								L	396	L	L	L	L	L	L	L	L	L	L	L	L			
21									A	A		A			L	L	L	L						
22									A	L		L	L	L	L	L	L	L	L					
23							L	L	L		L	L	L	L	L	L		L						
24				L				384	408		L	432	A	L	L	L	412		288	220				
25					L	A		L		U R				L		420	408	L	L	L	L			
26									416	L	L	L	L	L		412		L	L	L	L			
27							L	L	L		L	L	L	L		412		L	L	L	L			
28								L	L		L	416		436	432		424	396		L	L			
29					L	L	L	L	L		L	420	428		L	440	424	L	L	L	L			
30								L	L	L	L	L	L	L	L		428	L	L	L				
31							360																	
	00	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	6	13	16	12	13	11	14	14	11	3	5	2					
MED					212	360	352	396	414	428	428	424	424	418	400	364	324	256						
U Q							368	406	420	432	436	436	428	424	408	376	342							
L Q							348	388	408	416	416	416	420	412	392	348	266							

APR. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 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						B	192	260	268	308	324	324	316	312	304	268	240	196		B	B			
2						B	216	252	276	280	272	A	A	312	300	268	244	220		A	A			
3						A	208	232	268	276	316	320	316	304	276	144	248	196		A	A			
4						B	188	236	280	308	U R	260	312	328	300	280	280	244	204		B	B		
5						B	220	236	280	292	316	300	328	316	312	292	244	224		A	B			
6					B	B	A	256	268	308	320	332	328	316	296	280	260	196		B	B			
7					B	B	212	260	276	296	300	A	A	324	316	292	248	192		B	B			
8					B	B	216	272	288	308	312	312	320	U A	A	264	240	212		B	B			
9					B	A	188	236	272	304	300	304	A	A	A	268		212		B	A			
10					B	B	192	240	276	304	320	320	320	316	316	288	244	216		B	B			
11					188	204	192	240	284	284	296	296	A	304	300	264	260	208		A	A			
12					A	A	196	248	268	288	160	312	324	296	296	272	248	208	192	204				
13					B	B	216	252	276	288	284	304	308	A	316	284	248	208		A	A			
14					B	A	200	240	272	284	A	A	308	324	296	284	256	212		B	B			
15					B	B	204	252	280	288	312	328	312	312	292	280	260	216		A	188			
16					B	B	212	244	312	304	304	304	A	316	288	280	252	212		A	A			
17					B	B	208	252	276	300	316	316	288	A	A	304	292	260	224	256	A			
18					B	156	220	240	272	300	316	336	A	308	288	268	180		A	A				
19					B	A	204	276	272	308	308	A	264	316	300	300	236	216		A	188			
20					B	224	212	256	288	312	328	320	U R	304	324	328	A	264	216		A	B		
21					A	A	212	248	276	280	304	312	316	316	292	280	248	212		B	A			
22					B	R	188	216	272	284	308	320	320	304	308	280	268	212	208	180				
23					B	A	216	272	284	304	328	344	344	316	316	316	260	212		A	A			
24					B	192	224	260	288	304	312	312	316	256	A	296	252	220	884		B	B		
25					B	184	224	268	288	304	304	316	364	A	316	276	252		180		A			
26					B	180	244	260	276	304	328	336	336	316	316	300	260	224	180		B			
27					A	196	248	260	284	312	312	A	A	A	300	288	268	232	184		A	A		
28					B	252	224	268	296	328	328	328	328	324	300	276	260	228	204		B			
29					B	U A	232	248	276	280	300	328	328	336	320	300	292	272	232	208		B		
30					B	176	228	268	296	308	324	324	324	304	304	284	264	232		B	B			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	11	29	30	30	30	29	25	23	25	27	29	29	29	9	4				
MED					188	192	212	254	278	304	312	320	320	316	300	280	252	212	204	188				
U Q					224	222	268	284	308	322	328	328	318	316	292	260	222	232	196					
L Q					180	202	240	272	288	302	312	312	304	296	274	246	208	182	184					

APR. 2018 f_oE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23												
1	23	25	19	20	J A	E B		28	34	40	40	38	38	33	34	J A	34	33	24	E B	E B	20	22	28	29											
2	E B	E B	16	19	E B	E B	E B	16	23	29	31	35	34	J A	J A	G	33	31	33	28	J A	J A	J A	J A	26	20	E B	E B	E B	25						
3	E B	16	20	21	22	22	22	28	30	34	32	34	28	34	J A	33	32	J A	J A	J A	J A	J A	J A	J A	J A	26	20	E B	E B	E B	E B					
4	E B	E B	E B	E B	E B	E B	E B	16	23	28	31	37	28	34	40	32	31	32	34	21	23	22	26	E B	E B	E B	E B	16	16	16	16					
5	E B	E B	E B	E B	E B	E B	E B	16	26	28	31	34	34	35	36	J A	J A	J A	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	23	20	24		
6	E B	16	25	E B	16	27	23	16	23	33	33	34	36	38	J A	38	34	33	46	J A	34	24	E B	E B	E B	E B	E B	E B	E B	E B	16	16	23	20		
7	20	20	16	16	16	16	16	26	29	30	37	41	39	37	42	32	40	27	23	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16		
8	E B	E B	E B	E B	E B	E B	E B	16	24	27	33	33	35	35	36	35	39	31	J A	32	25	E B	E B	E B	E B	16	31	39	16	E B	16	16	16	16		
9	E B	E B	E B	E B	E B	E B	E B	16	20	20	22	30	31	32	36	39	55	63	59	46	42	24	16	18	31	41	48	51	J A	J A	J A	J A	J A	J A		
10	28	27	E B	16	19	E B	E B	E B	16	22	28	34	32	34	35	35	36	40	J A	28	27	23	16	17	23	27	21	23	27	21	23	27	21	23		
11	20	24	E B	16	27	G	J A	57	24	44	32	32	38	72	49	33	33	27	28	30	36	30	41	22	27	40	41	22	27	40	41	22	27	40		
12	39	J A	J A	29	20	20	21	29	31	32	J A	34	46	39	34	34	35	28	J A	34	27	27	37	29	26	23	37	29	26	23	37	29	26	23		
13	27	70	32	20	19	E B	16	28	30	35	54	J A	43	44	56	33	41	32	J A	47	J A	J A	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	22	E B	16	21	E B	16	19	26	22	28	35	32	33	35	36	58	35	30	J A	30	25	17	16	16	16	16	16	16	16	16	16	16	16	16		
15	E B	E B	E B	E B	E B	E B	E B	16	27	28	85	33	34	38	34	37	34	31	29	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	
16	E B	E B	E B	E B	E B	E B	E B	16	23	25	28	33	36	36	34	32	78	48	G	29	26	24	22	25	22	16	16	E B	E B	E B	E B	E B	E B	E B		
17	E B	E B	E B	E B	E B	E B	E B	16	21	20	E B	16	26	30	32	G	40	G	34	39	36	33	G	G	G	24	28	22	22	22	21	22	21	22	21	
18	E B	E B	E B	E B	E B	E B	E B	16	19	16	16	27	30	57	34	34	89	35	40	39	G	30	26	21	26	18	16	16	16	16	16	16	16	16	16	
19	E B	E B	E B	E B	E B	E B	E B	16	17	16	19	16	16	25	28	32	35	50	36	J A	55	34	35	38	G	30	G	18	26	E B	E B	E B	E B	E B	E B	
20	E B	E B	E B	E B	E B	E B	E B	16	16	16	16	16	30	26	32	34	36	34	59	43	39	39	41	34	28	16	16	16	16	16	16	16	16	16	16	31
21	28	38	34	32	28	36	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	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	20	32	20	26	16	G	30	43	36	49	39	41	42	34	40	36	35	28	J A	26	28	21	22	29	29	21	22	29	29	29	29	29	29	29	29	
23	E B	E B	E B	E B	E B	J A	16	52	26	28	39	39	61	48	48	35	37	J A	53	33	36	24	23	24	21	16	16	16	16	16	16	16	16	16	16	
24	E B	16	30	34	23	E B	16	G	28	32	37	35	121	53	35	45	45	49	62	J A	J A	J A	J A	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	28	27	32	32	28	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	J A	J A	J A	J A	J A
26	E B	E B	E B	E B	E B	J A	16	124	G	G	31	33	33	38	41	36	34	G	18	35	J A	51	G	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	
27	E B	16	20	28	25	25	G	J A	28	51	34	38	38	45	44	34	35	G	30	26	26	22	19	19	16	16	E B	E B	E B	E B	E B	E B	E B	E B		
28	E B	E B	E B	E B	E B	J A	E B	16	32	28	32	32	J A	79	42	36	41	40	35	38	J A	56	26	29	24	20	16	16	16	16	16	16	16	16	16	
29	E B	E B	E B	E B	E B	E B	E B	16	28	25	29	33	35	40	39	50	63	37	34	31	27	21	16	22	16	16	16	16	16	16	16	16	16	16	16	16
30	E B	E B	E B	E B	E B	E B	E B	16	31	31	33	35	35	40	40	42	54	35	34	31	29	J A	27	35	35	25	25	39	35	25	25	39	35	25	39	
31																																				
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23												
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E B	E B	E B	E B	E B	G	26	30	34	35	37	39	36	36	36	36	33	32	26	21	22	20	20	18	20	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	
U Q	22	25	21	26	20	27	28	33	36	39	40	46	43	45	40	38	35	30	26	26	28	22	27	29	28	22	27	29	28	22	27	29	28	22	27	29
L Q	E B	E B	E B	E B	E B	E B	E B	16	23	28	32	33	34	35	34	34	33	28	G	30	24	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16

APR. 2018 foEs (0.1MHz)
 NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

APR. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 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

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

APR. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		312	311	325	312	344	321	381	354	356	328	339	323	341	353	353	357	355	332	331	333	329	352	320	324
2		318	331	318	333	386	350	262	348	354	327	328	356	343	343	359	353	361	357	330	334	332	344	324	307
3		322	342	315	308 ^F	304 ^F	341	386	380	366	354	343	332	343	345	328	355	366	362	332	313	313	321	332	317
4		326	334	320	331	362	336	390	359	354	347	356	359	350	345	344	342	357	351	351	331	313	305	315	324
5		339	328	316	312	323	285	393	402	354	342	336	353	338	331	337	352	350	361	348	313	325	323	331	334
6		326 ^F	297 ^F	313	322 ^F	278 ^F	319	363	350	366	306	363	336	346	318 ^R	323	338	363	357	341	337	311	305	329	311
7		310	292 ^F	292 ^F	314 ^F	311 ^F	333	371	369	329	352	349	346	354	323	352	338	350	353	342	329	320	314	319	324
8		288 ^F	307 ^F	283 ^F	274 ^F	264 ^F	325 ^F	355	354	358	358	362	323	344	346	359	343	349	342	321	305	308	345 ^F	345	298
9		294 ^F	317 ^F	309 ^F	319 ^F	320 ^F	315 ^F	346	346	352	351	355	314	352	346	334	315	346	334	317	337	336	328	317	295
10		293 ^F	305	311	306	340	352	372	328	354	305	335	332	334	340	338 ^X	309 ^R	332	316	321	337	323	344	323	317
11		285 ^F	289	307	332	334	320	376	363	307	338	277	305	307	329	343 ^X	336 ^R	350	321	317	315	319	306	313	332
12		304	307	303	320	318	343	367	339	341	325	345	333	343	308	323	349	339	338	326	312	300	327	360	319
13		303	308	298	296	336	370	405	321	295	293	337	322	314	332	339	338	322	346	338	322	315	309	314	309
14		323	316	314	328	370	357	369	339	333	351	335	377	333	322	348	327	337	326	320	328	337	338	334	309
15		315 ^F	324 ^F	322 ^F	327 ^F	353	330	363	362	324	324	349	349	336	316	335	329	327	351	329	310	310	322	318	318
16		308	314	325	357	381	365	352	348	328	358	352	348	340	314	323	341	352	352	320	326	320	307	319	312 ^F
17		312	326	326	326	354	383	384	374	362	320	349	332	346	336	322	336	348	355	339	297	292	319	334	332 ^F
18		308	299 ^F	303 ^F	320 ^F	353 ^F	360	373	344	334	345	353	322	296	317	320	340	342	341	328	305	320	334	317	272
19		291 ^F	312 ^F	300	313	329	315	326	356	317	312	309	329	320	340	332	339	366	359	342	323	309	303	322	307
20		318	315	337	333	369	345	386	345	352	334	356	347	332	324	329	313	295	296	329	304	332	342	292	309
21		311	330	307	289	312	302	342	319	A	A	420	A	396	408	309	297	323	333	329	316	302	317	304	302
22		305	307	331	320	323	345	360	309	370	381	272	288	274	274	314	309	335	328	344	317	315	333	320	311
23		276	294	301	301	326	343	342	340	356	357	325	310	287	324	329	333	342	363	340	331	310	317	332	320
24		299	316	304	318	314	372	369	350	324	345	325	348	319	344	336	329	356	356	338	310	308	320	340	333
25		337	302	302	269 ^F	330	376	A	332	349	353	328	348	337	330	321	327	344	337	344	315	329	351	323	299
26		317	331	317	327	352	385	381	335	329	356	336	335	308	313	345	341	355	372	325	322	303	324	333	344
27		309	293	325	339	331	373	334	304	357	339	336	318	306	343	335	309	324	341	336	324	333	344	331	343
28		322	323	309	316	326	362	355	348	323	336	313	326	345	337	328	352	331	344	337	320	314	314	333	347
29		326	311	311	281 ^F	305 ^F	347	350	336	331	354	364	329	299	341	322	342	320	338	323	335	321	326	341	349
30		327	327	319	307	316	349	394	370	332	350	338	348	344	340	314	322	338	338	315	327	335	321	318	304
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		30	30	30	30	30	30	29	30	29	29	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED		312	313	312	318	330	345	369	348	349	345	338	332	338	334	333	338	345	343	330	322	317	322	323	317
U Q		322	326	320	327	353 ^F	362	382	359	356	354	353	348	344	343	343	342	355	356	340	331	329	338	333	332
L Q		303	305	303	307	316	325	351	336	328	326	328	322	314	322	323	327	332	334	323	313	310	314	318	307

APR. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 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							
2							L		L	373	371	370	399	387	387	387	L	L						
3									L		L						L	L		L				
4								413	372	398	394	388		L	388		L	L			L			
5									376	368		400		L	388	357	370							
6					L				367		374	394		L	L		L	L						
7									384	371		L		L	L	L	L	L						
8								L	L			L	L		L	L	L	L						
9									391	401		L			398		L	L						
10							L	L			L	L			L		364	L						
11					L				374		L	384	388		L	378	383	382	376	398	388			
12						L			385		L	L	L		L	354	L	386	377					
13								389	380		A	L	L		L		L	L	L					
14								L	L			L	L		L		L	L	L	L	L			
15									386		L	L	L		L	L	L	L						
16									374		L	L	L		L	L	L	381						
17						L			365	395	360	410	370	388	371	365	L	L	L	L				
18								L	L	L		L	L		L	L	L	L	L	L				
19					L				389	375	385	397		395		L	L	L	L	L				
20								392	L	L	L		L	L	L	L	L	L	L	L	L			
21								L	404		L	L	L	L	L	L	L	L	L	L	L			
22									A	A		A			L	L	L	L	L	L				
23							L	L	L		L	L	L	L	L	L	L	L	L	L				
24					396				378		L		A	L	L	L	L	L	L	L				
25					L	A		380	370		391	A	L	L	L	387	L	397	417					
26						L	A	L	U R		386	335		392	L	384	380	L	L	L	L			
27								370	L	L	L	L	L	L	L	397	L	L	L	L	L			
28						L	L	L	L	390		L	L	L	L	383	L	L	L	L	L			
29							L	L	L	L	388		L	380	389	L	375	358	L	L	L	L		
30							L	L	L	L	380	394		402	L	394	L	L	L	L	L			
31							378				L	L	L	L	L	366								
	00	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	6	13	16	12	13	11	14	14	11	3	5	2					
MED						396	378	390	374	384	384	388	392	388	382	370	376	397	402					
U Q								411	382	390	394	404	402	390	384	386	377	398						
L Q								385	370	374	372	380	377	378	372	365	370	372						

APR. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 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								254	266	296	266	276	256	252	270	246	230							
2							404		242	304	290	276	294	270	252	260	240							
3									264	288	284	290	282	270	282	258	244	224		268				
4								230	262	268	272	260	276	288	272	272	248	232						
5									266	302	270	270	288	296	292	256	256							
6					264				264	276	252	282	282	306	302	276	246							
7									310	270	280	288	278	306	266	280	264	258						
8								230	250	262	262	300	274	276	276	276	262	248						
9								228	244	288	268	312	268	280	288	302	266							
10							252	326		358	260	326	288	288	288	312	270	276						
11				240					350	298	342	318	338	268	276	288	254	270	256					
12							238	268	248	308	276	300	280	330	288	268	270							
13								328	374	E A 356	284	312	334	312	298	280	280	256						
14								280	272	280	280	244	272	330	260	280	264	272	248					
15									324	298	274	274	306	320	292	292	278	256						
16								228	314	276	260	278	284	310	310	270	256	256						
17							212		270	292	282	312	272	290	314	280	266	244						
18								266	286	294	278	320	358	326	304	298	282	242	256					
19					270			284	330	352	334	334	322	290	300	264	230							
20								290	266	306	280	280	310	318	306	348	350	304	246					
21									A	A		A			374	384	308	286						
22								E A 280	308		390	390	400	400	330	340	298	290						
23					234	270	276	276	276	310	360	360	312	302		260								
24				268				268	308	280	314	284	326	300	300	290	240	240	240					
25						222	A	288		280	294		292	298	298	292	268	258	240					
26									296	282	306	306	354	332	294	286	256	228	242					
27								242	284	274	274	280	304	350	298	290	290	304	262	262				
28									286	324	286	340	302	296	296	320	276	310	260					
29					270	232	302	302	266	246	312	362	288	320	280	300	270	278						
30								242	246	310	288	268	288	304	308	342	316	282	270					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					2	5	8	20	27	28	29	28	29	29	30	29	30	22	9	1				
MED					254	264	242	275	276	288	280	300	294	298	296	280	265	258	248	268				
U Q					270	261	287	310	300	300	312	336	315	306	295	282	270	259						
L Q					228	235	250	264	276	268	279	279	288	282	271	254	244	241						

APR. 2018 h'F2 (KM)

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IONOSPHERIC DATA STATION Wakkanai

APR. 2018 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	260	244	232	216 ^Q	224	240	226	226	226	204	204	194	192	196	190	206	198	230	234	234	234	214	222	254	
2	256	238	236	230	188	212	198	200	200	202	198	188	194	194	192	200	186	226	248	228	224	208	214	244	
3	242	242	272	256 ^Q	226	236	216	224	202	190	190	180	180	198	184	196	210	198	222	228	246	246	228	248	
4	232	234	246	236	214	234	214	200	210	196	200	200	188	176	204	204	222	196	230	226	248	256	252	224	
5	232	244	260	246	234	276	212	206	206	198	192	198	198	198	198	198	204	240	226	240	240	228	248	232 ^Q	
6	240 ^Q	252	268	264	232	216	224	222	200	204	198	198	198	194	206	196	196	228	218	230	232	246	230	256	
7	256 ^Q	242 ^Q	242 ^Q	196 ^Q	218	232	216	220	206	208	196	196	188	200	200	200	206	218	240	220	220	234	234	244	
8	250 ^Q	228 ^Q	230 ^Q	230 ^Q	230	222	230	198	202	202	198	180	214	196	196	198	198	206	236	246	240 ^Q	228	204	226 ^Q	
9	226 ^Q	232	236	244	238	220	216	200	218	198	200	192	200	202	202	224	198	244	258	238	218	224	238	256	
10	286	260	260	262	234	228	202	212	226	206	190	196	196	216	204	204	204	204	244	220	234	234	234	266	
11	266 ^Q	280	276	226	208	230	240	230	206	194	208	208	200	190	190	192	206	224	224	248	218	248	246	246	
12	262	264	270	254	242	242	210	200	216	202	194	186	198	198	192	200	200	266	254	246	262	238	220	220	
13	270	286	276	278	236	224	220	214	214	A	200	200	200	200	200	204	206	216	242	244	244	254	260	254	
14	234	242	250	240	200	218	222	198	198	192	208	186	192	192	198	198	204	214	214	238	214	218	208	228	
15	246	248	252 ^Q	242 ^Q	204	218	228	226	214	196	198	198	190	204	204	204	226	208	238	250	246	238	250	248	
16	246	242	250	224	226	204	218	184	204	202	196	196	190	190	194	194	218	200	262	242	230	230	230	262 ^Q	
17	236	246	246	228	206	212	172	220	200	192	192	192	186	190	190	196	208	200	234	266	248	236	226	222 ^Q	
18	244 ^Q	246 ^Q	246 ^Q	226 ^Q	200 ^Q	238	222	204	204	194	198	190	182	202	204	204	198	198	218	252	228	224	210	270 ^Q	
19	254 ^Q	234 ^Q	250 ^Q	230	196	202	256	202	220	204	204	194	196	204	198	194	200	220	238	244	244	258	236	248	
20	248	248	242	214	200	234	228	196	206	190	200	196	A	182	196	E S	228	218	218	230	260	214	222	294	268
21	284	226	256	260	290	242	212	A	A	A	198	A	198	200	184	210	198	224	270	274	270	254	272	272	
22	264	274	242	270	252	250	218	A	202	212	190	198	194	198	198	200	200	204	236	246	246	232	226	238	
23	290	276	268	268	236	194	218	196	196	196	196	196	196	196	206	288	202	236	222	256	244	260	238	234	
24	264	276	276	254	226	218	222	210	198	198	198	A	198	198	198	198	198	198	198	248	248	242	226	226	
25	240	278	266	260	224	190	A	224	254	216	296	278	190	188	202	202	202	202	202	244	226	216	226	238	
26	250	244	244	236	214	192	218	202	202	196	196	196	192	186	196	196	214	194	202	248	238	238	222	208	
27	252 ^Q	242 ^Q	220	246	228	218	198	200	196	196	206	198	198	198	200	198	198	212	224	224	222	216	220	220	
28	228	228	272	264	238	248	212	196	196	196	188	198	198	198	198	198	204	204	240	250	238	238	212	212	
29	226 ^Q	240 ^Q	240 ^Q	258 ^Q	258	198	198	198	194	194	194	194	194	186	198	202	200	212	212	228	246	236	212	212 ^Q	
30	230	240 ^Q	248 ^Q	234 ^Q	244	236	206	198	196	196	196	196	176	184	196	190	216	216	248	252	258	230	226	248 ^Q	
31																									
CNT	30	30	30	30	30	30	29	28	29	28	30	28	29	30	30	30	30	30	30	30	30	30	30	30	
MED	249	244	250	243	226	223	218	202	204	197	198	196	194	197	198	200	203	213	234	244	239	235	227	244	
U Q	262	260	268	260	236	236	223	220	214	203	200	198	198	200	202	204	208	224	242	250	246	246	238	254	
L Q	236	240	242	230	208	212	211	198	199	195	194	192	190	190	194	196	198	202	222	230	226	224	220	226	

APR. 2018 h'F (KM)

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APR. 2018 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	114	100	104	114	114	114	108	108	108	110	110	110		B	B			
2						B	144	112	112	108	104	A	A	104	104	96	96	96		A	A			
3						A	108	110	110	110	110	104	104	104	104	96	96	96		A	A			
4						B	104	104	104	110	108	98	98	98	98	108	108	108		B	B			
5						B	124	124	100	106	106	110	104	110	110	114	112	124		A	B			
6					B	B	A	104	112	112	106	106	106	106	106	110	112	112		B	B			
7					B	B	116	116	116	104	104	A	A	104	112	112	112	106		B	B			
8					B	B	124	114	114	106	106	106	108	102	A	102	112	124		B	B			
9					B	A	122	114	108	108	108	108	A	A	A	100	A	114		B	A			
10					B	B	96	110	110	110	110	110	110	110	110	110	110	110		B	B			
11					108	110	94	104	104	106	106	106	A	106	106	106	106	114		A	A			
12					A	A	120	116	102	102	A	108	108	98	98	106	106	98	98	118				
13					B	B	118	112	112	102	102	102	102	A	106	116	108	100		A	A			
14					B	A	114	114	114	102	A	A	102	102	102	108	108	116		B	B			
15					B	B	102	108	108	108	108	108	106	106	106	112	100	114		A	114			
16					B	B	128	112	112	98	98	98	A	102	102	106	106	106		A	A			
17					B	B	114	114	108	108	108	108	108	108	108	108	110	110	144		A			
18					B	B	124	112	112	112	112	110	A	A	108	108	108	98		A	A			
19					B	A	104	104	110	110	110	A	92	106	106	106	106	106		A	98			
20					B	150	112	112	112	112	112	112	106	104	104	A	104	104		A	B			
21					A	A	112	112	112	112	112	100	102	102	102	108	108	108		B	A			
22					B	136	118	118	108	108	106	106	106	112	110	110	100	102	102	94				
23					B	A	84	108	108	108	108	108	108	108	108	108	108	108		A	A			
24					B	142	98	108	108	102	102	102	102	102	A	102	102	102		B	B			
25					B	E A	120	106	108	108	108	108	94	A	94	96	96	A	110		A			
26					B	118	114	102	102	102	104	104	104	104	110	110	110	102	158		E B	B		
27					A	112	112	112	112	112	106	A	A	A	106	106	110	110		A	A			
28					B	116	106	96	114	114	106	106	106	106	106	106	106	110	110		B			
29					B	118	118	114	114	104	104	104	104	104	104	104	104	116	118		B			
30					B	B	106	106	106	106	106	106	106	106	106	106	106	106		B	B			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	9	29	30	30	30	28	25	23	25	27	29	29	29	7	4				
MED					108	118	114	112	110	108	106	106	106	104	106	108	108	108	110	106				
U Q					139	119	114	112	110	109	108	108	107	108	110	110	113	144	116					
L Q					114	105	106	108	104	105	104	102	102	104	105	104	102	102	96					

APR. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	96	96	96	96	96	B	116	122	118	108	112	108	110	152	98	100	100	172	B	B	94	86	86	92
2	92	B	90	B	B	B	170	136	136	102	90	94	94	120	150	124	88	88	88	86	86	B	B	98
3	B	92	92	82	84	84	142	138	174	100	156	96	96	154	86	94	90	90	90	88	94	B	B	B
4	B	B	B	94	B	B	146	140	128	198	200	106	182	94	102	100	106	172	144	90	88	B	B	B
5	B	B	100	B	B	B	120	138	124	108	104	162	162	98	126	110	116	110	118	B	114	106	106	98
6	B	100	B	92	100	B	126	120	106	100	106	100	100	104	140	126	104	176	B	B	B	B	96	96
7	98	98	B	B	B	B	132	126	134	104	102	102	102	102	112	108	134	132	B	B	B	B	B	B
8	B	B	90	B	B	B	110	122	116	102	102	102	98	96	100	160	98	136	B	B	B	102	102	B
9	B	B	B	B	96	94	168	142	130	124	96	96	98	98	98	94	98	156	B	112	108	108	108	102
10	96	96	B	96	B	B	118	128	104	122	102	96	104	174	98	100	144	114	B	B	114	92	92	92
11	96	92	B	96	G	106	122	108	108	108	98	98	98	108	164	106	142	112	112	106	100	100	88	88
12	88	86	86	86	86	86	142	122	124	144	98	100	116	92	104	112	132	106	94	106	106	94	94	86
13	86	84	84	84	84	B	114	114	112	98	98	98	102	102	108	110	84	94	82	86	86	96	96	96
14	96	B	86	112	112	118	118	94	94	100	100	100	102	110	114	142	116	B	B	B	B	B	B	B
15	B	B	B	B	B	B	122	148	98	98	190	168	164	150	146	146	126	116	114	100	B	106	94	94
16	B	B	B	B	B	122	152	134	158	104	104	90	94	102	102	G	168	138	118	106	106	106	B	B
17	B	B	B	88	96	B	152	136	136	G	182	G	94	96	G	172	G	G	G	118	118	106	108	96
18	B	B	B	118	B	B	158	176	100	118	120	88	96	102	102	G	102	82	82	82	86	B	B	B
19	B	B	108	B	B	144	120	112	102	114	96	96	96	162	96	G	108	G	128	104	B	B	B	B
20	B	B	B	B	B	152	150	140	124	124	134	92	102	96	96	84	104	128	G	B	B	B	B	116
21	124	114	114	102	102	100	104	104	104	104	104	104	G	G	146	144	122	108	112	112	94	86	110	B
22	102	90	136	98	B	G	118	118	118	114	110	110	98	140	100	102	110	122	92	112	90	112	106	106
23	B	B	B	118	B	84	124	98	108	104	98	98	98	98	130	116	128	118	118	118	112	112	B	B
24	B	92	92	94	B	G	128	126	116	116	96	96	96	96	96	106	96	G	B	B	B	B	B	B
25	88	88	88	88	90	86	112	112	108	108	104	98	108	98	88	100	100	88	92	100	106	104	94	94
26	B	B	B	B	92	G	G	96	106	106	106	94	94	102	G	86	106	88	G	B	B	B	B	B
27	B	94	94	94	94	G	106	106	106	106	90	98	98	88	96	G	134	108	108	86	86	86	B	B
28	B	B	B	96	B	118	100	106	122	114	180	148	100	100	100	108	96	112	124	104	90	B	B	90
29	B	B	B	B	B	116	116	116	102	102	90	90	90	90	98	132	132	126	110	B	82	B	B	B
30	B	B	B	112	B	118	118	110	102	122	106	106	104	104	144	100	120	120	112	110	112	112	102	102
31																								
CNT	11	13	14	18	12	14	29	30	30	29	30	29	29	29	28	26	29	27	19	19	21	17	15	16
MED	96	92	92	95	95	109	122	122	114	108	104	98	98	102	102	108	108	116	112	104	94	104	96	96
U Q	98	97	100	98	98	118	144	136	124	117	112	105	104	114	128	124	132	132	118	112	110	107	106	100
L Q	88	89	88	88	88	86	116	112	104	102	98	96	96	96	98	100	99	106	92	88	87	93	94	92

APR. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F1	F2	F1	F1			C2	C2	C2	CL21	C1	C1	CL11	CL11	C1	LC21	L2	CL21			F1	F2	F2	FF11		
2	F1		F1				H1	C2	C2	C2	L2	L2	L2	C2	HL21	CL21	L3	L3	L3	L3	F1			F1		
3		F1	F1	F1	F1	L1	C1	CL21	CL21	CL21	HL11	C2	LC21	HL2	L2	CL12	LC21	LC11	L2	L1	F1					
4				F1			C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	L1	F1				
5			F1				C2	CL21	CL21	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	F1	F1	F1	F1		
6		F1		F2	L1		L2	C2	C2	C2	C2	LC11	LC11	C1	CL11	C2	C2	H2					F1	F1		
7	F1	F2					L2	CL21	CL21	CL21	C2	C2	L2	L2	LC11	CL11	LC11	C2	C2							
8			F1				LC11	CL21	C2	C2	C2	C2	C2	C2	L3	CL21	L2	C2					F2	F4		
9				L1	L1	H1	H1	H1	C2	C2	C2	C2	L2	L2	L2	L2	L5	L4	H1		L1	F1	F8	F3	F5	
10	F3	F3		F1			C2	C2	C2	C2	C2	C2	C1	C1	C1	L1	H2	C2			F1	F2	F1	F2		
11	F1	F2		FF11		L1	L2	L4	C2	C2	C2	C3	L2	L2	C2	C2	H2	C2	L8	L4	F5	F2	F3	F3		
12	F3	F3	F2	F2	L2	L2	H2	C2	C2	C2	L1	L1	C2	C2	C2	LC11	C2	C2	L1	L1	F3	F2	F2	F3		
13	F3	F2	F2	F2	L1		C3	C3	C2	C3	C2	C2	C2	C2	C2	C2	C1	C2	L2	L1	F1	F1	F2	F1		
14	F1		F1		L1	L1	C2	C2	C2	C2	L2	L2	C2	C2	C2	C2	C2	C2								
15							C2	C2	LC12	C2	C1	C1	HL11	HL11	HL11	HL11	C1	C2	C3	C2		F1	F1	F2		
16					L1		C1	C1	H1	C2	C2	C2	L2	C1	C1		H1	C2	C3	C3	F1	F1				
17			F1	L1			C2	C1	C1		C1		C1	C1	LC11	H1				L1	F1	F1	F1	F1		
18			F1				H1	H1	L2	C2	C1	L1	L2	L2	LC11		LC11	LC21	LC31	L2	F1					
19			F1			H1	C2	C3	C2	C2	C2	L1	C2	H1	C1		C1		C2	C1						
20					C2	H2	C2	CL21	C1	C1	LC12	CL11	C1	C2	C2	LC22	CC22	C2							L1	
21	F3	F6	F6	F4	L3	LQ41	CQ51	CQ31	CQ31	CQ21	C1	CQ31			H2	H1	C2	C2	C5	L3	F1	F1	F1			
22	F1	F1	F1	F3			C3	C3	C3	C2	C1	C2	C1	C1	C1	C1	C1	C1	L2	L2	L1	F1	F1	F3	F3	
23				F2		L1	C2	C1	C2	C2	C1	C1	C2	C2	C2	C3	C2	C3	C2	C3	C2	F1				
24		F1	F5	F1			C2	C2	C2	C1	C1	C3	C2	C2	C2	L3	C2									
25	F3	F4	F5	F5	L3	L1	C7	C2	C2	C3	C3	C2	C3	L2	L2	C2	C2	L2	LC11	LQ31	FQ31	FQ51	FQ31	F2		
26					L1		C1	C1	C2	C1	C1	LC21	L1	L1		L2	C1	LC21								
27		F1	F2	F2	L1		C1	LC11	CC21	C1	C2	L2	L2	L2	LC21		CL11	C2	L1	L1	F1	F1				
28				F1			C4	C2	C2	C2	C1	C1	L1	L2	C2	C1	C1	C2	C4	C1	F2				F1	
29						C2	C2	C2	C1	C1	C1	C2	C1	L1	LC11	LC11	CL11	CL11	C1	C1	F1					
30			F1			C2	C2	C3	C2	C2	C1	C1	C1	C2	C1	C2	C2	C5	C6	L4	F8	F1	F3	F3		
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																										
MED																										
U Q																										
L Q																										

IONOSPHERIC DATA STATION Kokubunji

APR. 2018 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	X 45	X 44	X 42	X 40	X 38	X 36														X 63	X 59	X 45	X 41	X 40	
2	X 42	X 41	X 45	X 43	X 32	X 32														X 66	X 55	X 42	X 41	X 40	
3	X 40	X 39	X 38	X 37	X 37	X 36														X 55	X 49	X 46	X 45	X 44	
4	X 45	X 43	X 42	X 41	X 35	X 33														X 63	X 55	X 48	X 44	X 45	
5	X 44	X 43	X 42	X 38	X 41	X 42														X 64	X 58	X 45	X 44	X 46	
6	X 46	X 42	X 36	X 34	X 33	X 35														X 67	X 58	X 44	X 42	X 44	
7	X 44	X 42	X 44	X 35	X 26	X 29														X 59	X 51	X 46	X 45	X 44	
8	X 44	X 44	X 43	X 40	X 37	X 38														X 71	X 67	X 49	X 38	X 43	
9	X 42	X 40	X 38	X 37	X 33	X 37														X 81	X 78	X 36	X 42	X 47	
10	X 47	X 54	X 57	X 58	X 47	X 47														X 91	X 46	X 42	X 40	X 40	
11	X 41	X 40	X 38	X 42	X 32	X 37														X 75	X 68	X 57	X 55	X 53	
12	X 47	X 44	X 43	X 42	X 40	X 39														X 74	X 75	X 63	X 53	X 52	
13	X 49	X 47	X 44	X 42	X 40	X 45		C	C	C	C									X 65	X 63	X 53	X 49	X 48	
14	X 47	X 45	X 45	X 39	X 32	X 37														X 86	X 74	X 42	X 39	X 42	
15	X 44	X 46	X 46	X 54	X 38	X 38														X 72	X 65	X 56	X 53	X 53	
16	X 52	X 50	X 51	X 52	X 28	X 35														X 73	X 61	X 47	X 45	X 45	
17	X 44	X 45	X 46	X 47	X 28	X 36			C											X 64	X 66	X 60	X 57	X 48	
18	X 44	X 42	X 42	X 43	X 43	X 40														X 64	X 62	X 50	X 48	X 44	
19	X 44	X 46	X 43	X 40	X 38	X 40														X 54	X 54	X 50	X 49	X 49	
20	X 49	X 48	X 48	X 44	X 34	X 38														X 85	X 70	X 56	X 56	X 56	
21	X 55	X 54	X 48	X 47	X 44	X 44														X 58	X 58	X 54	X 51	X 48	
22	X 48	X 44	X 43	X 42	X 26	X 38														X 70	X 62	X 44	X 44	X 44	
23	X 42	X 40	X 39	X 39	X 35	X 39														A	X 55	A	X 46	X 45	
24	X 47	X 43	X 44	X 42	X 38	X 43														X 62	X 62	X 61	X 51	X 44	
25	X 41	X 41	X 40	X 38	X 37	X 42														A	X 65	X 50	X 48	X 45	
26	X 44	X 44	X 42	X 42	X 34	X 41														X 69	X 76	X 65	X 50	X 45	
27	X 45	X 40	X 45	X 45	X 38	X 40														X 75	X 68	X 46	X 42	X 40	
28	X 40	X 39	X 35	X 33	X 35	X 42														X 64	X 66	X 59	X 55	X 52	
29	X 48	X 45	X 40	X 41	X 37	X 40														X 74	X 75	X 65	X 53	X 46	
30	X 44	X 42	X 40	X 38	X 36	X 44														X 71	A	X 66	X 51	X 47	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30														28	29	29	30	30	
MED	X 44	X 44	X 43	X 42	X 36	X 38														X 68	X 62	X 50	X 47	X 45	
U Q	X 47	X 45	X 45	X 43	X 38	X 42														X 74	X 68	X 58	X 51	X 48	
L Q	X 44	X 41	X 40	X 38	X 33	X 36														X 64	X 56	X 45	X 42	X 44	

APR. 2018 f_{XI} (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 2018 f_oF₂ (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	39	38	36	34	32	30	48	49	56	56	62	75	92	90	73	58	51	52	54	57	53	39	35	34
2	36	35	F	37	26	26	43	45	48	58	65	65	70	68	62	53	50	55	62	60	49	35	35	33
3	34	33	32	31	31	30	48	49	52	56	64	65	61	58	66	63	52	52	48	49	45	40	39	38
4	39	37	36	35	29	27	42	48	51	54	56	54	57	61	62	65	55	53	62	57	49	42		F
5	38	37	F	32	34	F	43	48	53	56	59	63	79	74	66	63	52	56	58	58	52	39	38	F
6	F	F	30	28	27	29	42	48	53	62	60	59	70	69	66	62	66	64	62	61	52	38	36	38
7	38	36	38	29	20	23	40	47	53	60	58	56	60	65	72	61	58	58	60	53	45	40	39	38
8	38	38	37	34	31	32	45	51	54	53	55	68	66	64	62	62	58	57	58	63	61	42	32	F
9	F	34	32	31	27	31	48	48	53	51	59	61	67	64	57	60	64	62	66	75	72	30		F
10	F	F	F	F	F	F	50	54	52	50	76	63	64	76	71	66	73	77	82	85	40	36	34	34
11	35	34	32	36	26	31	46	52	60	A	68	86	96	89	83	62	60	56	65	69	62	51	49	47
12	41	38	37	36	34	33	46	51	52	54	66	66	71	74	69	64	60	56	59	68	69	57	47	46
13	43	41	38	36	34	39	C	C	C	C	56	A	70	63	79	68	56	53	54	59	57	47	43	42
14	41	40	39	33	26	30	46	55	72	68	58	59	60	56	59	62	59	55	66	80	68	36	33	36
15	38	40	40	48	31	32	50	53	60	60	59	60	64	63	61	58	58	60	68	66	59	50	47	47
16	46	44	45	46	22	29	47	48	54	57	78	70	70	64	64	64	64	60	63	67	55	41	39	39
17	38	39	40	41	21	30	44	46	C	53	63	70	71	70	73	74	57	47	52	58	60	54	50	42
18	38	36	36	37	F	34	46	49	50	56	58	62	59	61	70	70	64	54	60	58	56	44	F	38
19	38	40	36	34	31	F	50	58	53	55	59	61	72	73	70	72	64	51	47	48	47	44	43	43
20	43	42	42	38	28	32	41	47	49	51	63	68	72	64	66	68	68	78	96	79	64	50	50	50
21	49	48	42	41	38	37	49	A	A	A	A	A	50	54	53	56	54	52	48	52	52	48	44	42
22	42	38	37	36	20	32	42	A	A	50	50	56	55	55	54	55	60	61	62	64	56	38	38	38
23	36	34	33	33	28	33	45	47	54	56	50	54	54	60	A	82	66	51	54	A	49	A	40	39
24	41	37	F	F	32	37	44	52	53	55	58	61	63	72	76	74	66	56	46	56	56	54	44	38
25	35	35	34	32	31	36	47	50	51	55	64	A	70	66	72	76	68	53	58	A	59	44	42	39
26	38	38	36	36	28	35	48	51	52	60	63	66	66	73	81	79	56	52	51	63	70	59	44	39
27	39	34	F	39	F	34	48	60	54	59	62	56	68	70	61	56	54	56	60	69	62	41	36	34
28	34	33	29	27	28	36	47	52	52	48	53	63	73	71	58	58	58	54	52	58	60	53	49	46
29	42	39	33	35	31	34	48	59	62	63	53	57	58	54	54	55	53	54	57	68	69	59	47	40
30	38	36	34	32	30	38	47	56	63	56	62	72	64	61	56	62	69	68	62	65	A	60	45	41
31																								
CNT	27	28	25	28	27	27	29	27	26	27	29	27	30	30	29	30	30	30	30	28	29	29	27	26
MED	38	38	36	35	29	32	46	50	53	56	59	63	66	64	66	62	58	56	60	62	56	44	42	39
U Q	41	40	38	37	31	35	48	53	54	59	64	68	71	72	72	68	64	60	62	68	62	52	47	42
L Q	38	35	33	32	26	30	44	48	52	53	57	59	60	61	60	58	55	53	54	58	50	39	36	38

APR. 2018 f_oF₂ (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2018 f_oF₁ (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	U L						L	L							
2									U L	432	440	436	432	432	428		U L	L						
3									420	428	444	408	436	416		U L	408	L						
4									400	408	432	440	440	468	428		L	L						
5									L	L			U L	U L			L	L						
6									A	L	L	A				U L	L	L						
7								L	L				424	432	424	408		L	L					
8									L	A			U L			U L	L	L						
9									L	L	U L		432	436	444	440	428	L	L					
10									L	U L	U L	U L	428	432	428	396		L	L					
11									A	A	A	A	A			L	L	A						
12								L	A	A	A		424	444	440	428	412	A	A	A				
13								C	C	C	C	U L	A	U L		L	A							
14									L	U L	U L		U L			U L	A	A	A					
15									L	L	U L	U L	A			U L	L	L						
16									L	U L	U L	U L	448	436	428		L	L						
17									C	U L	U L	U L	448	436	432		U L	L						
18									U L	444	440	444	436	440	428	404		A						
19								A	A	U L			U L	428	412	U L	L							
20									U L	436	452	444	448	436	408		A	A						
21								A	A	A	A	A		U L	416	U L	A	A	A					
22									A	A		U L	U L	U L	U L	A	L							
23									U L	A	U L	A	U L		A		A	A						
24									A	U L			A				A	A						
25									L	U L	A	A	U L	U L		U L	U L							
26									L	L			460	444	432	424	396							
27								L	L	U L	U L	U L	U L	U L	U L	U L	L							
28									L	U L	U L	U L	U L	U L	U L	A	A	L						
29								L	L		U L	U L	U L	U L			L	L	L					
30									L	U L			U L			U L		A	A					
31									L	U L			404	432	444	440	444	444	428	396				
	00	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	20	25	23	23	28	29	20	8							
MED									U L	408	430	436	440	440	436	428	412	396						
U Q									U L	430	432	442	444	448	442	430	420	402						
L Q									L	406	418	430	436	432	432	422	406	390						

APR. 2018 f_oF₁ (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2018 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							196	UR 268	UA 296	A	A	A	A	A	A	UR 308	UR 192	UA	B					
2							B	UR 252	UR 288	R	A	A	A	UR 320	R	UR 280	UA	B						
3							B	UR 260	UR 296	A	A	A	A	R	R	UR 260	UR	R	B					
4							B	UR 240	UR 296	A	UR 348	A	A	A	R	UR 260	UR 236	UA	B					
5							UA 180	A	A	A	A	A	A	R	A	UR 280	UR	A	B					
6							B	UA 260	A	A	A	A	A	UR 320	A	A	A	B						
7							UR 216	UR 268	A	A	A	A	A	R	R	A	UA	UR 220	B					
8							UA 188	UR 252	UR 324	R	R	R	UR 324	UR 316	R	UR 260	UR 236	UA	B					
9							UR 200	UR 260	A	A	R	R	UR 324	R	UR	UR 276	UR	A	B					
10							A	A	A	A	A	A	A	A	UA 300	UA 264	A	B						
11							UA 176	A	A	A	A	A	A	A	A	R	R	A	B					
12							UR 200	UA 256	A	A	A	A	R	A	A	A	A	A	B					
13							C	C	C	C	A	A	UR 328	A	R	A	A	B						
14							UR 204	A	A	A	A	A	R	A	R	A	A	A	B					
15							UA 200	A	A	A	A	A	A	A	UR 312	UR 264	UA	B						
16							UA 220	A	A	A	A	R	R	A	A	A	A	B						
17							UR 248	UA	C	A	UR 344	A	A	A	R	UR	UR 276	UR 224	B					
18							UR 204	UR 268	UR 280	A	UR 328	R	R	UR 316	A	A	A	B						
19							UR 224	UA	A	A	A	R	A	A	A	UR	UR 276	UR 224	B					
20							UR 204	UR 260	UR 296	A	UR 344	UR 344	UR	UR 320	R	UR	UR	A	B					
21							B	A	A	A	A	A	A	A	A	A	A	A	B					
22							A	A	A	A	R	A	UR 348	UR 324	UR	UR 300	UR	A	B					
23							UR 252	UA	A	A	A	A	A	A	A	A	A	A	B					
24							UR 204	UA	A	A	A	A	A	A	A	A	A	A	B					
25							UR 212	UA	A	A	A	A	A	A	R	A	UR 252	UR	B					
26							A	A	A	R	R	A	R	R	R	A	A	A	B					
27							UR 220	UR 272	UR	A	A	A	UR 376	UR 344	UR 308	UR 268	UR	A	B					
28							A	A	A	A	R	A	A	A	UR 324	UR	A	B						
29							A	A	A	A	A	R	A	UR 324	UR 300	UR	A	B						
30							A	A	A	R	A	A	A	UR 340	A	A	A	B						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							16	14	6	1		4	3	5	7	7	11	7						
MED							UR 204	UR 260	UR 296	UR 324		UR 344	UR 348	UR 324	UR 320	UR 308	UR 268	UR 224						
UQ							UR 214	UR 268	UR 296			UR 346	UR 376	UR 334	UR 324	UR 312	UR 276	UR 236						
LQ							UR 198	UR 252	UR 288			UR 336	UR 344	UR 324	UR 316	UR 300	UR 260	UR 220						

IONOSPHERIC DATA STATION Kokubunji

APR. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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 14	B 23	20	20	E 15	B 16	G	G	34	36	39	J 40	A 37	36	34	G	G	25	16	16	16	16	16	16	
2	E 16	B 15	B 16	B 16	E 15	B 15	21	32	34	G	35	J 37	G 39	G	G	G	G	26	23	E 16	B 16	B 16	B 16	B 16	
3	E 16	B 16	B 16	B 16	E 16	B 16	22	29	G	J 36	A 41	39	40	G	G 28	J 24	G	G 20	J 16	E 16	B 16	B 16	B 16	B 16	
4	20	E 16	B 16	B 16	E 16	B 16	22	30	33	35	36	G	J 38	A 40	G 28	J 28	G	27	20	20	E 16	B 16	B 16	B 16	
5	E 16	B 16	B 16	B 16	E 16	B 16	23	28	38	35	38	J 55	A 40	G 29	J 46	G	G	30	J 28	A 27	19	20	20	20	
6	E 16	B 16	B 16	B 16	E 16	B 16	22	30	32	35	38	36	36	38	36	36	J 31	A 28	J 32	A 22	E 16	B 16	B 16	J 21	
7	22	E 15	B 16	B 15	E 16	B 16	G	32	34	40	J 42	A 44	J 42	G	G	35	32	G	E 14	B 16	20	16	16	15	
8	E 16	B 16	B 15	15	14	15	26	30	31	G	G	G	G	38	G	G	G	G	J 35	A 29	J 24	A 15	E 15	B 15	
9	E 16	B 36	J 35	A 27	J 23	E 16	22	32	34	35	G	G	G	38	G	G	G	24	21	16	16	55	23	26	
10	J 27	A 22	E 21	B 15	E 14	B 18	23	34	G	33	38	J 50	A 76	J 44	A 36	35	32	27	J 36	A 31	24	22	15	25	
11	J 29	A 31	A 23	E 22	B 21	E 15	25	40	J 52	A 78	46	50	74	67	37	G	G	J 44	A 44	53	55	30	39	44	
12	19	22	21	22	E 16	B 16	26	31	J 41	A 57	46	44	G	J 37	A 41	39	42	J 54	A 54	47	49	53	33	27	
13	J 26	A 24	J 22	A 29	E 24	B 16	C	C	C	J 44	A 64	50	35	36	28	35	53	J 53	A 53	58	52	40	28	21	
14	26	21	16	16	15	16	26	31	J 36	A 44	44	38	32	41	G	37	J 45	A 43	J 52	A 44	25	16	16	14	
15	E 17	B 15	B 16	B 14	15	16	27	30	J 40	A 41	39	45	50	39	35	26	32	29	J 33	A 22	28	27	25	27	
16	22	20	20	16	13	21	30	44	J 36	A 37	38	G	G	37	36	36	J 34	A 39	J 33	A 27	E 23	16	15	23	
17	20	E 16	B 16	B 15	16	21	27	32	C	37	40	G	35	38	G	G	G	27	J 27	A 22	22	24	23	J 31	
18	19	E 16	B 16	B 16	16	16	28	30	35	37	40	40	G	38	38	J 43	A 37	J 24	A 28	22	35	32	23		
19	22	E 16	B 15	15	15	16	28	34	37	37	37	G	36	42	37	G	G 22	A 24	J 21	A 29	31	16	16	16	
20	E 14	B 16	B 16	B 16	16	16	29	34	34	43	54	39	41	G	39	G	J 46	A 50	J 44	A 28	16	25	62	24	
21	20	J 24	A 16	E 22	B 16	21	J 29	A 41	J 48	52	46	50	48	39	36	J 45	A 31	J 50	A 48	J 37	52	48	49	40	
22	J 38	A 28	J 30	A 51	J 32	A 31	J 32	A 80	J 76	A 49	G	37	41	43	G	G 42	A 30	J 32	A 27	23	24	32	24		
23	J 40	A 36	24	J 21	A 24	25	26	34	34	49	42	61	43	40	80	50	40	70	28	58	51	67	23	50	
24	E 16	B 16	20	J 38	A 37	23	29	43	45	44	45	47	48	42	42	43	44	40	25	24	16	28	37	16	
25	E 15	B 16	19	E 15	15	16	24	29	34	44	59	86	41	46	G	J 37	A 36	G	J 30	A 110	25	23	31	27	
26	J 24	A 25	J 28	A 25	J 26	A 23	29	33	36	G	G	41	G	G	G 34	A 32	J 24	A 21	J 64	A 30	25	22	15		
27	E 16	B 15	B 17	E 15	16	18	28	33	G	37	39	J 43	36	G	G	G	32	J 40	A 31	J 29	36	16	15	16	
28	E 16	B 16	19	E 15	15	16	J 32	A 37	J 40	A 39	G	39	39	J 41	A 40	40	33	J 30	A 28	J 26	33	27	15	16	
29	E 16	B 16	B 16	B 16	19	24	27	30	34	37	40	G	40	40	G	34	34	J 36	A 24	23	23	19	16	16	
30	E 16	B 16	B 16	B 15	15	16	J 31	A 33	J 37	G	41	40	39	37	38	J 37	A 58	J 52	A 56	90	51	40	26	40	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	29	29	28	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E 18	B 16	B 16	B 16	B 16	16	26	32	34	37	40	40	39	38	36	G	32	J 30	A 29	J 28	24	24	22	22	
UQ	J 22	A 23	A 21	A 22	A 19	A 21	J 29	A 34	A 39	A 44	A 44	A 47	A 42	A 41	A 38	A 37	J 40	A 43	A 36	A 44	A 33	A 30	A 31	A 27	
LQ	E 16	B 16	B 16	B 15	15	16	22	30	34	35	37	G	G	G	G	G	G	G	E 25	B 23	B 22	16	16	16	

APR. 2018 foEs (0.1MHz)
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APR. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

APR. 2018 fmin (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 2018 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	324	322	342	349	321	326	375	368	367	356	323	314	336	352	355	373	354	349	349	348	370	330	323	279
2	310	309	F	357	419	343	391	395	347	362	354	344	347	351	376	357	332	357	349	362	365	332	305	316
3	317	311	313	310	317	334	401	389	376	366	365	363	360	303	337	347	358	366	351	350	331	324	304	305
4	340	338	336	357	306	322	380	385	379	382	370	351	342	336	346	355	334	338	364	357	367	331	F	F
5	312	307	F	309	322	F	378	362	371	355	352	334	350	354	340	360	343	352	363	344	359	326	306	
6	F	F	299	313	320	338	360	377	347	355	369	324	337	334	342	344	344	360	351	353	354	324	298	311
7	314	325	363	427	462	334	387	379	363	365	353	347	338	336	353	326	341	362	366	342	346	307	313	308
8	308	336	346	357	330	331	395	375	358	358	319	347	347	321	350	358	364	349	345	358	383	391	290	F
9	F	314	330	316	318	327	358	360	371	349	349	344	340	353	345	337	336	348	332	348	401	344	F	F
10	F	F	F	F	F	F	388	391	379	265	341	330	324	347	341	318	325	326	354	355	363	311	302	314
11	301	299	278	356	371	376	376	328	372	A	283	311	341	339	352	359	355	321	335	330	307	303	314	322
12	318	280	296	324	330	360	362	383	347	331	369	336	328	337	342	350	359	344	322	319	355	324	306	307
13	306	301	292	322	334	386	C	C	C	C	337	A	341	307	328	345	373	356	345	342	324	320	286	315
14	326	316	338	356	319	341	363	355	346	381	371	336	339	324	333	353	325	344	317	359	394	323	293	299
15	301	319	320	407	351	325	371	361	367	369	355	329	332	343	345	343	342	348	343	336	344	325	300	310
16	315	304	333	395	364	345	393	381	346	329	343	319	339	324	336	338	344	337	352	353	359	298	307	301
17	315	323	347	402	352	345	392	381	C	334	337	332	321	326	340	371	378	323	319	325	337	332	330	335
18	323	317	313	320	F	328	367	386	344	345	343	332	316	311	336	354	352	339	357	344	359	315	F	305
19	312	313	310	383	332	F	379	372	388	337	332	320	319	340	346	350	369	376	361	327	331	306	300	306
20	315	323	344	357	328	321	387	362	356	335	337	324	331	325	311	312	288	297	344	321	369	287	286	296
21	293	320	306	300	298	319	387	A	A	A	A	A	296	317	319	352	349	344	345	303	294	317	303	306
22	309	313	309	361	334	356	368	A	A	346	316	329	329	339	313	324	345	350	345	337	360	333	302	307
23	312	290	334	356	345	362	386	364	371	372	321	315	319	321	A	354	373	336	348	A	318	A	307	317
24	323	298	F	F	333	368	374	379	367	331	338	341	336	320	341	328	350	357	325	318	331	347	328	320
25	310	304	323	325	331	358	378	387	331	368	336	A	335	329	318	338	357	325	327	A	357	332	297	315
26	321	321	330	364	383	356	391	342	342	345	335	321	295	316	346	368	361	330	296	322	353	367	330	322
27	295	291	F	370	F	340	333	385	353	359	356	290	327	341	343	331	335	339	344	355	372	320	317	322
28	314	318	290	312	310	389	377	386	385	291	301	314	334	335	343	344	362	351	334	315	324	327	323	329
29	322	312	333	346	335	311	349	367	368	363	324	337	343	314	343	343	344	340	320	319	344	355	338	330
30	318	332	336	337	329	356	373	365	371	328	351	348	331	354	319	320	335	340	338	308	A	353	328	302
31																								
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	25	28	27	27	29	27	26	27	29	27	30	30	29	30	30	30	30	28	29	29	27	26
MED	314	314	330	356	331	341	378	377	367	355	341	332	336	334	342	346	347	344	345	342	355	325	306	310
U Q	321	322	337	362	351	358	388	385	371	365	354	344	341	341	346	355	359	352	351	353	366	332	323	320
L Q	309	304	308	321	320	327	368	362	347	334	328	320	327	321	334	337	336	337	332	322	331	316	300	305

APR. 2018 M(3000)F2 (0.01)

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APR. 2018 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	L						L	L							
2									U L	L						U L	L	L						
3									410	426	402	395	U L	U L	U L	L								
4									L	L			U L	U L	U L	L	L							
5									A	L	L	A				U L	L	L						
6								L	L							U L	L	L						
7									L	A			U L			U L	L	L						
8									L	L	U L					U L	L							
9								L	L	U L	U L			U L	U L		L	L						
10									L	U L	L		A	A	U L	U L	L							
11									A	A	A	A	A	A		L	L	A						
12								L	A	A	A		435	416	390	390	U L	A	A	A				
13							C	C	C	C	U L		A	U L		L	A							
14								L	U L	U L	L		U L			U L	A	A	A					
15								L	L	L	U L	U L	A		401	401	363	L	L					
16									L	U L	L	U L				L	L							
17									C	U L	U L	U L	U L			U L	L							
18									U L	L							A							
19								A	A	U L			U L			U L	L	L						
20									U L	L			A		U L		A	A						
21							A	A	A	A	A	A			U L	U L	A	A						
22								A	A			U L	U L	U L	A	U L	L	A	L					
23									U L	A	U L	A	U L				A	A						
24									A	U L			A				A	A						
25								L	U L	A	A	A	U L	U L		U L	U L							
26								L	L									L						
27							L	L	U L	U L	U L	U L	U L	U L	U L	U L	U L	A	A					
28								L	L	U L	U L	U L	U L	U L	U L	U L								
29							L	L										L	L	L				
30								L	U L	L						U L		A	A					
31									405	408	401	426	410	391	395	404	357							
	00	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	20	25	23	23	28	29	20	8							
MED									U L	L						U L	U L							
U Q									397	400	412	415	408	398	396	394	374							
L Q									U L	L						U L	U L							
									404	411	418	426	422	410	402	400	385							
									U L	L			U L	U L	U L	U L								
									375	389	404	401	398	391	386	378	360							

APR. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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APR. 2018 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									254	268	290	288	248	238	238	236	268							
2										260	260	286	252	252	238	256	292	252						
3									244	260	258	242	256	344	264	248								
4									252	246	246	286	292	284	278	252	266							
5									250	256	252	280	252	236	264	250	250	258						
6								238	272	252	244	302	274	272	272	264	252	240						
7									268	250	262	290	286	278	250	284	262	258						
8									258	256	324	262	274	270	266	264	248							
9								246	246	286	266	268	272	288	292	288	272	252						
10									248	440	252	254	E A 296	266	258	296	280	258						
11									262	A 340	282	264	248	242	248	262	266							
12								240	C	C	276	246	272	282	266	250	252	242	254	254				
13									C	C	C	C	A 300	258	322	270	260	242						
14									258	256	234	242	294	282	302	282	272	264	E A 258	274				
15									256	240	264	254	298	266	276	274	272	266	266					
16									272	306	256	268	274	296	284	274	266							
17									C 288	288	278	270	274	260	238	250								
18									298	278	284	292	314	316	276	252	254							
19								236	228	278	298	312	290	264	270	250	236	226						
20									268	322	284	288	248	288	294	300	318	296						
21							238		A	A	A	A	A	370	320	326	270	272	E A 256	288				
22									A	A														
23										300	348	302	302	288	322	318	270	E A 258						
24									256	248	308	330	332	314			224	E A 306						
25									248	300	294	292	298	284	260	266	240	234						
26								234	288	268	286		282	292	286	268	238							
27								290	270	260	284	288	318	286	256	234	246	268						
28								286	246	266	252	262	366	300	268	280	292	286	272	250				
29								242	242	378	380	320	278	270	280	288	246	266						
30								292	248	236	244	300	302	292	314	288	286	274	282	282				
31									254	232	296	264	266	280	274	318	292	266	E A 246	278				
	00	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	12	25	27	29	27	30	30	29	29	29	21	6					
MED							286	246	256	268	284	288	280	281	272	266	262	258	U 264					
U Q							292	255	268	296	299	302	296	296	285	287	271	267	282					
L Q							238	239	245	252	255	272	266	268	259	251	246	252	254					

APR. 2018 h'F2 (KM)

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IONOSPHERIC DATA STATION Kokubunji

APR. 2018 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E B E B	232	236	224	218	242	262	206	202	202	210	208	200	190	190	192	190	200	214	218	208	194	196	212	280	
2	E B E B	260	256	238	210	180	234	200	198	198	198	198	198	192	188	190	190	206	218	218	196	194	198	248	248	
3	E B E B	252	256	258	266	232	232	202	202	188	190	208	192	204	202	208	210	208	216	212	210	210	232	252	248	
4	E B	240	230	230	214	218	250	196	204	206	202	192	188	194	196	202	186	204	214	214	202	200	220	282	254	
5	E B	244	242	246	242	226	224	206	210	A	196	190	A	192	180	202	168	192	210	212	216	200	204	262	262	
6	E B E B	242	232	250	238	256	238	196	192	194	204	190	188	170	196	198	192	194	202	220	204	192	206	258	260	
7	E B E B	252	248	212	184	176	250	204	210	210	A	200	206	204	208	198	192	198	210	210	206	202	226	264	262	
8	E B	244	226	222	214	228	228	200	204	198	190	186	198	222	210	190	188	194	220	220	216	198	188	268	250	
9	E B E B	250	240	244	232	246	230	204	190	202	194	206	196	182	182	198	196	222	212	230	208	174	222	270	276	
10	E B E B	258	258	270	220	228	238	210	208	202	198	192	A	A	216	214	204	216	214	210	208	190	238	274	266	
11	E A E A	314	300	288	214	198	212	212	228	A	A	A	A	A	190	200	206	A	A	E A	E A	E A	E A	E A	E A	
12	E B E B	222	264	260	238	214	204	210	202	A	A	A	192	192	200	206	220	A	A	E A	E A	246	220	216	244	240
13	E B E B	254	260	274	264	238	198	C	C	C	C	192	A	A	186	198	212	A	206	234	244	220	216	254	252	
14	E A E B	254	246	226	198	214	218	214	210	210	208	206	200	194	210	192	204	A	A	A	210	188	202	252	262	
15	E B E B	274	244	220	190	216	234	220	206	206	202	200	198	A	182	190	194	208	220	230	214	216	222	236	248	
16	E B E B	254	266	220	186	184	226	204	222	206	206	194	198	202	198	184	216	216	246	226	206	192	228	254	268	
17	E B E B	264	242	228	182	200	224	200	206	C	218	198	188	196	196	176	202	206	206	224	242	220	212	222	216	
18	E B E B	244	264	246	226	186	228	210	210	204	198	208	192	212	234	212	204	A	228	216	218	198	206	258	240	
19	E B E B	258	244	244	204	216	230	216	A	A	188	210	202	194	208	198	190	194	178	216	230	222	236	248	248	
20	E B E B	248	242	228	202	198	218	206	212	198	220	206	190	A	174	206	196	A	A	218	208	196	282	306	258	
21	E B	260	222	228	266	254	250	A	A	A	A	A	A	A	208	212	A	202	A	A	E A	E A	E A	E A	E A	
22	E A E A	270	260	268	232	362	206	218	A	A	212	192	174	234	A	208	208	A	214	234	218	204	202	262	256	
23	E A E B	310	294	242	208	206	222	206	206	202	A	200	A	E A	E A	A	218	A	A	224	A	E A	E A	E A	E A	
24	E B E B	242	260	254	248	226	210	202	230	A	220	218	216	A	220	210	204	A	A	220	240	226	216	214	210	
25	E B E B	246	248	246	242	224	188	212	198	208	A	A	A	218	218	188	204	202	202	236	A	200	196	266	258	
26	E A E B	248	246	246	210	210	204	208	210	206	186	198	228	214	202	204	184	190	188	212	244	220	200	200	226	
27	E B E B	264	262	238	206	182	224	208	216	200	192	204	200	194	204	194	200	200	A	A	214	194	188	224	248	
28	E B E B	250	258	276	268	216	208	202	194	202	200	190	222	184	206	212	A	A	218	216	E A	230	220	220	232	
29	E B E B	228	228	238	214	214	220	214	200	200	192	198	190	196	200	186	194	218	222	216	E B	214	198	202	224	
30	E B E B	228	244	240	216	222	196	212	204	202	200	204	190	196	190	200	190	212	A	A	E A	A	214	212	242	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		30	30	30	30	30	30	28	26	21	23	26	23	23	28	29	28	21	21	25	28	29	29	30	30	
MED		251	247	243	208	208	214	206	206	202	200	199	198	195	201	198	198	204	214	218	211	201	210	253	251	
UQ		260	260	254	238	228	234	212	210	206	208	206	200	212	208	207	204	210	219	228	239	220	224	264	262	
LQ		244	242	228	206	200	210	202	202	199	192	192	190	192	190	190	190	196	206	215	208	194	201	224	240	

APR. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2018 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							116	120	120	118	A	A	A	A	A	112	112	112	B					
2							B	112	112	112	A	A	A	110	108	108	108	110	B					
3							B	114	114	A	A	A	A	108	108	108	108	108	B					
4							B	110	110	A	108	108	A	A	A	108	114	108	108	B				
5							116	116	116	110	110	A	A	114	A	110	114	114	B					
6							B	112	112	112	110	A	A	A	110	A	A	A	B					
7							116	110	110	110	A	A	A	118	116	116	116	116	B					
8							120	112	108	108	108	108	108	108	106	106	106	116	B					
9							116	116	104	A	108	108	106	108	108	108	112	112	B					
10							112	112	108	A	A	A	A	A	112	112	112	112	B					
11							108	112	A	A	A	A	A	A	A	108	108	A	B					
12							116	110	108	A	A	A	108	A	A	A	106	A	B					
13							C	C	C	C	A	A	A	112	A	112	112	A	B					
14							112	112	A	A	A	A	114	A	110	110	110	A	B					
15							126	118	A	A	A	A	A	A	A	112	112	112	B					
16							124	116	110	110	A	108	110	110	108	A	108	A	B					
17							126	110	C	108	A	108	A	A	108	108	108	108	B					
18							116	108	108	108	108	108	108	108	108	108	110	A	B					
19							124	112	106	108	106	108	A	A	A	108	108	108	B					
20							116	116	106	110	A	110	114	114	112	110	110	A	B					
21							B	A	A	A	A	A	A	A	A	A	A	A	B					
22							118	A	A	A	106	A	106	104	110	108	A	108	B					
23							114	112	112	A	A	A	A	112	A	A	A	A	B					
24							110	108	108	108	A	A	A	A	A	A	A	A	B					
25							110	110	108	A	A	A	A	A	108	A	A	B						
26							114	114	108	108	108	108	108	108	108	A	A	A	B					
27							112	112	112	112	A	A	102	108	108	108	108	A	B					
28							A	110	A	A	110	A	A	A	A	110	112	A	B					
29							116	116	116	A	A	110	A	A	110	110	110	108	B					
30							118	112	112	112	A	A	A	112	112	A	A	A	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							23	27	22	15	10	10	10	15	19	21	22	15						
MED							116	112	110	110	108	108	108	110	108	110	110	110						
U Q							118	116	112	112	110	108	110	112	110	112	112	112						
L Q							112	110	108	108	108	108	106	108	108	108	108	108						

APR. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2018 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	92	92	90	B	B	G	G	126	114	98	96	98	96	92	G	G	140	B	B	B	B	B	B
2	B	B	B	B	B	B	132	124	130	G	96	96	102	G	G	G	G	118	116	B	B	B	B	B
3	B	B	B	B	B	B	154	140	G	100	98	96	94	G	94	92	G	G	124	B	B	B	B	B
4	96	B	B	B	B	B	130	138	142	100	110	G	104	100	G	100	G	142	122	88	B	B	B	B
5	B	B	B	B	B	B	132	120	118	110	110	98	96	94	92	G	G	114	114	112	112	86	86	84
6	B	B	B	B	B	B	116	142	132	120	108	96	96	96	148	88	92	88	88	84	B	B	92	92
7	98	B	B	B	B	B	G	134	124	110	100	98	98	G	G	110	116	G	B	B	112	B	B	B
8	B	B	B	B	B	B	136	134	134	G	G	G	G	140	G	G	G	G	82	82	82	B	B	B
9	B	96	90	90	88	B	152	126	114	102	G	G	G	148	G	G	G	132	118	B	B	94	100	104
10	100	100	100	B	B	98	116	116	G	98	104	100	88	98	110	128	140	132	104	94	94	96	B	122
11	108	96	106	112	100	B	138	118	98	98	100	108	94	92	102	G	G	106	102	104	102	102	94	90
12	84	84	84	84	B	B	132	120	110	100	92	92	G	94	94	94	118	106	100	96	96	86	86	86
13	90	90	92	92	92	B	C	C	C	C	98	90	92	90	92	92	128	90	88	94	94	92	92	88
14	88	88	B	B	B	B	134	118	96	96	96	96	94	88	G	122	122	104	100	98	98	B	B	B
15	B	B	B	B	B	B	126	114	106	102	98	94	90	102	102	102	126	116	110	106	98	96	92	98
16	94	94	98	B	B	136	120	120	112	110	102	G	G	108	108	96	122	102	100	100	98	B	B	96
17	96	B	B	B	B	148	128	120	C	114	102	G	94	94	G	G	G	146	110	100	100	100	100	98
18	84	B	B	B	B	B	132	142	124	122	116	122	G	126	110	114	102	140	102	98	98	96	96	B
19	96	B	B	B	B	B	120	120	114	112	108	G	96	94	100	G	82	82	120	100	100	B	B	B
20	B	B	B	B	B	B	124	122	120	114	102	146	150	G	136	G	118	102	100	112	B	152	96	96
21	108	98	B	110	B	130	120	102	102	100	102	100	94	100	94	98	96	94	102	100	98	98	96	94
22	92	94	94	90	90	76	126	102	102	102	G	102	148	116	G	G	102	120	108	106	96	96	100	96
23	94	94	92	90	90	86	110	120	114	100	98	102	100	124	102	100	104	106	104	104	100	100	98	96
24	B	B	102	96	88	90	132	120	114	116	100	100	100	100	98	96	96	98	104	102	B	98	106	B
25	B	B	96	B	B	B	124	122	116	104	98	88	98	100	G	100	100	G	114	90	90	98	98	90
26	86	86	82	82	82	96	122	116	108	G	G	130	G	G	G	100	94	92	128	86	86	86	86	B
27	B	B	B	B	B	140	122	126	G	110	100	100	100	G	G	G	128	106	106	100	100	B	B	B
28	B	B	118	B	B	B	106	112	100	108	G	100	100	98	98	182	134	102	114	104	102	96	B	B
29	B	B	B	B	112	118	118	118	124	100	100	G	98	98	G	152	124	108	108	102	102	100	B	B
30	B	B	B	B	B	B	120	120	118	G	106	96	98	168	108	104	100	104	100	100	94	94	98	96
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	12	13	10	8	10	27	28	25	25	25	23	24	23	18	19	21	26	28	25	22	19	17	17
MED	94	94	94	90	90	108	126	120	114	104	100	98	98	98	101	100	116	106	107	100	98	96	96	96
U Q	98	96	101	96	96	136	132	126	124	113	105	102	100	108	108	110	125	118	115	104	100	100	99	97
L Q	88	89	91	90	88	90	120	118	107	100	98	96	94	94	94	96	98	102	100	94	94	94	92	90

APR. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		F1	F2	F1					C2	C2	L1	L2	L1	L2	L1			H1							
2							C2	C2	C2		L1	L2	L1					C1	C1						
3							H2	H2		L2	L2	L2	L2		L2	L2			CL11						
4	F1						H3	H2	H1	L2	C1		L2	L1		L1		H1	C1	F1					
5							C2	C3	C2	C1	C1	L2	L2	L2	L2			C2	C4	F3	F1	F1	F1	F2	
6							C2	H2	C2	C1	C1	L1	L1	L1	HL11	L2	L2	L2	L4	F2			F1	F2	
7	F1							H2	C1	C1	L2	L2	L1			C1	C1				F1				
8							C1	C2	C2					H2					L3	F2	F1				
9		F2	F2	F3	F2		H1	C1	C2	L1				H2				C1	C2			F5	F2	F2	
10	F2	F1	F2			F1	C2	C4		L1	L1	L2	L2	L1	C1	C1	H1	C2	L6	F7	F2	F1		F5	
11	F5	F2	F2	F1	F1		H2	C2	L3	L4	L2	L2	L3	L3	L2			L3	L5	F7	F7	F3	F3	F4	
12	F1	F2	F2	F2			C2	C2	C2	L2	L2	L2	L2	L2	L2	L2	C2	L4	L5	F6	F4	F5	F6	F2	
13	F2	F2	F2	F2	F4						L2	L4	L2	L2	L2	L2	C1	L3	L4	F5	F5	F4	F3	F2	
14	F2	F1					H1	C2	L2	L2	L2	L2	L1	L2		C1	C3	L3	L4	FF23	FF22				
15							C2	C1	L1	L2	L2	L2	L3	L2	L2	L2	C1	C3	C4	F3	F5	F7	F4	F2	
16	F1	F1	F1			F2	C2	C2	C2	C1	L1			C1	C1	L2	C1	L4	L4	F7	F1			F2	
17	F1					F1	C2	C2		C2	L1		L1	L2				H1	C3	F8	F1	F2	F3	F3	
18	F2						H2	H2	C3	C1	C1	C1		C1	C1	C2	C2	L2	H2	F4	F5	F5	F2	F2	
19	F2						C4	C2	C2	C1	C1		L1	L2	L1		L2	L3	CL42	FF42	FF32				
20							C2	C2	C2	C2	L2	H1	H1		H2		C2	L3	L4	F4		F3	F5	F3	
21	F2	F3		F1		F1	C3	L3	L3	L2	L2	L2	L2	L1	L2	L2	L2	L2	L4	F6	F5	F6	F5	F5	
22	F4	F6	F3	F4	F3	F3	C3	L4	L4	L1		L1	L1	L1			L2	C4	CL42	FF22	FF32	F3	F3	F4	
23	F6	F7	F2	F2	F2	F2	C3	C2	C1	L2	L1	L2	L1	L1	L5	L3	L2	L5	L5	F5	F7	F7	F4	F6	
24			F1	F3	F3	F3	H2	C2	C2	C2	L1	L1	L2	L1	L2	L1	L2	L3	L2	F4		F3	F2		
25			F1				C2	C2	C1	L1	L2	L4	L1	L2		L2	L2		L3	F6	F3	F2	F3	F4	
26	F2	F2	F3	F5	F3	F3	CL22	C2	C2			C1				L2	L3	L2	CL22	F3	F3	F1			
27						F1	C3	C2		C1	L1	L2	L1				C2	L3	L5	F5	F5				
28			F1				L3	C3	L2	L2		L1	L2	L1	L3	H1	H1	L3	C3	FF32	F8	F3			
29					F1	F1	C2	C2	C1	L2	L1		L2	L2		H1	C2	C3	L3	F1	F2	F1			
30							C3	C2	C2		L1	L1	L1	H1	C1	L2	L2	L4	L8	F6	F5	F3	F1	F4	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 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	42	X	X	X	X	X															X	X	X	X	
2	X	X	X	X	X	X																X	X	X	X
3	X	X	X	X	X	X																X	X	X	X
4	X	41	X	X	X	X														X	X	X	X	X	
5	39	42	42	40	34	29														X	X	X	X	X	
6	43	X	X	X	X	36																X	X	X	X
7	40	42	54	59	32																	X	X	X	X
8	X	X	X	X	X	X																X	X	X	X
9	X	38	36	31	28	25																X	A	X	X
10	X	35	35	36	35	35																X	X	X	X
11	X	37	37	36	40	33	24															X	X	X	X
12	X	43	42	45	45	38	31															X	X	X	X
13	X	44	44	42	45	43	29															X	X	X	X
14	X	36	38	39	40	26	27															X	A	X	X
15	36	36	X	X	X	X																X	X	X	X
16	51	X	58	58	30	23																X	X	X	X
17	X	49	X	X	X	X																X	X	X	X
18	47	X	X	X	X	X																X	X	X	X
19	43	42	X	44	40	36	39															X	X	X	X
20	X	X	X	X	X	X																X	X	X	X
21	X	50	51	44	44	44	54															X	X	X	X
22	X	53	50	44	47	34	34															A	X	X	X
23	X	37	35	37	40	30																X	A	X	X
24	X	45	46	40	42	38	37															X	X	X	X
25	X	42	43	41	39	35	35															X	X	A	X
26	X	42	42	37	39	26	25															X	X	X	X
27	X	38	37	35	39	26	26															X	X	X	X
28	X	38	37	35	31	31	29															X	X	60	60
29	X	59	X	X	X	X	X															X	X	X	X
30	X	42	42	41	39	34	30															X	X	X	X
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	27															1	29	27	29	30
MED	X	X	X	X	X	X															X	X	X	X	X
U Q	45	44	44	44	36	35															76	71	50	41	42
L Q	X	X	X	X	X	X																X	X	X	X
	38	38	37	38	30	27																62	44	38	38

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	32	32	32	29	27	32	48	56	55	64	77	96	104	94	78	66	58	56	63	52	35	34	34
2	34	34	34	35	30	21	31	43	50	57	61	74	74	80	72	55	55	67	62	62	54	35	30	30
3	33	31	32	30	32	19	32	48	56	56	63	61	61	63	75	73	61	53	52	58	55	40	32	32
4	36	F	36	34	29	26	33	49	54	56	56	56	59	64	71	67	62	60	63	70	71	44	32	32
5	F	F	F	F	F	23	31	49	52	55	60	53	67	88	86	73	67	63	70	70	59	37	F	F
6	F	34	32	26	26	F	36	46	53	55	58	60	75	98	103	81	65	70	74	70	62	38	33	34
7	F	F	F	53	26	26	35	52	53	56	54	60	67	81	78	74	65	72	62	59	46	37	37	36
8	34	36	35	36	27	24	32	50	58	56	60	65	74	76	65	65	60	63	67	72	70	32	24	26
9	25	F	F	25	22	18	34	54	59	54	58	63	62	72	77	76	78	72	75	80	72	A	27	28
10	29	29	29	30	29	29	40	51	49	49	75	75	67	70	84	77	78	83	87	88	46	31	32	30
11	31	31	30	34	F	18	35	49	56	57	A	80	104	90	84	86	68	65	65	73	70	44	35	38
12	37	36	F	F	F	25	40	52	52	58	68	62	80	90	84	83	78	60	61	77	81	55	38	38
13	38	38	F	F	F	F	36	52	65	66	58	70	80	90	104	102	70	55	51	69	70	47	33	30
14	30	32	33	34	20	20	38	58	62	65	56	59	71	71	66	66	68	60	73	90	70	A	27	27
15	F	30	31	30	24	23	36	52	63	57	62	62	73	80	76	70	66	71	64	68	62	51	44	42
16	F	42	F	F	24	17	36	48	58	61	70	70	85	84	81	77	77	69	67	66	56	42	40	44
17	42	41	43	34	19	19	36	46	50	56	64	72	80	88	90	77	56	52	56	67	68	56	39	39
18	F	37	37	40	40	34	42	52	50	55	58	68	72	78	84	90	84	72	60	59	58	39	39	39
19	F	F	38	F	F	F	45	48	52	59	58	68	85	96	97	92	82	55	52	50	50	43	41	41
20	40	41	41	40	26	26	40	50	49	54	64	60	74	80	85	93	93	92	96	82	70	48	46	46
21	44	45	38	38	38	48	54	58	56	56	59	53	A	69	74	62	59	54	55	A	55	52	45	46
22	47	44	38	41	28	28	39	50	51	54	61	67	66	60	60	66	68	72	56	61	A	41	31	33
23	31	29	31	34	24	A	39	47	53	58	56	58	61	71	78	78	68	56	55	54	56	A	43	43
24	39	40	34	F	F	F	40	47	52	58	58	62	76	85	85	85	70	57	52	60	74	69	42	38
25	36	36	35	33	29	29	48	45	52	57	66	74	83	88	92	94	74	A	63	64	71	64	48	39
26	36	36	31	33	20	19	39	52	58	60	60	58	75	85	94	70	A	51	59	74	85	55	33	33
27	32	31	28	F	16	20	41	58	58	59	59	68	75	80	80	67	74	58	58	65	71	48	33	33
28	32	31	29	25	25	22	44	52	49	50	56	67	83	82	79	77	74	60	53	65	70	62	F	F
29	F	41	37	31	28	28	40	64	62	55	52	60	66	68	64	62	58	54	53	64	82	59	38	37
30	36	36	35	33	28	24	42	56	62	60	64	65	76	80	84	81	87	84	71	73	65	60	44	44
31																								
CNT	21	25	24	23	24	25	30	30	30	30	29	30	29	30	30	30	29	30	30	29	29	27	27	28
MED	36	36	34	34	26	24	38	50	54	56	60	64	74	80	82	77	68	62	62	68	65	44	35	36
U Q	38	40	37	36	29	28	40	52	58	58	64	70	80	88	86	83	78	71	67	73	70	55	41	40
L Q	32	31	31	30	24	20	35	48	52	55	58	60	67	71	75	67	64	56	55	62	56	38	32	32

APR. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 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	A		A		A	U	L	L						
2									L	L	U	L	U	L	U	L	U	L						
3									L	L	U	L	U	L	U	L	U	L						
4										L	L	U	L	U	L	U	L	U	L	L	L			
5									L	L				U	L	A		L	L					
6										L	U	L	U	L	U	L	U	L	L	L				
7									L	L	U	L	U	L	U	L	U	L	L	L				
8									L	L	U	L	U	L	U	L	U	L	L	L				
9									U	L	U	L	U	L	U	L	U	L	A					
10										U	L	U	L	U	L	U	L	U	L	L				
11									L	U	L	A		A	U	L	U	L	A	U	L	L		
12										U	L	U	L		A	A		A	A					
13									A	L	U	L	U	L	U	L	U	L	L	L				
14									L		L			A	A	U	L	A	A	A				
15										U	L	U	L	U	L	U	L	L	L	L				
16									A	U	L	U	L	U	L	U	L	L	L					
17										U	L	U	L	U	L	U	L	L	L	L				
18										U	L	U	L	U	L	U	L	L	L	L				
19									A	U	L	U	L	U	L	U	L	L	A					
20									L	A	U	L	U	L	U	L	U	L	U	L				
21								L		U	L	U	L	A	A	A	U	L	L	L	A			
22										L	U	L	U	L	U	L	U	L	L	L				
23										L	L	U	L		A	A	U	L	L	A				
24										L	U	L	A			U	L	L	L	L				
25										U	L	A		A	A	A	A	A	A	A				
26										L	U	L	U	L	A		A	A	A	A	A			
27										L	U	L	U	L	U	L	U	L	L	L				
28										L	U	L	U	L	U	L	U	L	L	L				
29								L	L	L	U	L	U	L	U	L	U	L	A	A	A	A		
30									A	U	L	U	L	U	L	U	L	U	L	A	A			
31										U	L	U	L	U	L	U	L	U	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	17	24	28	24	23	24	26	17	1						
MED									380	U	L	438	440	442	440	434	424	U	L	376				
U Q										U	L	452	446	448	442	432	418							
L Q										U	L	424	432	436	436	428	420							

APR. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 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	U A	A	A	A	A	A	A	A	A	A	A	U R	B					
2							B	U A	U A	A	R	U R	A	A	U R	A	U R	U A	B	B					
3						B	B	U A	A	R	A	A	A	A	A	A	A	U A	A	R	B				
4							B	U A	A		U R	A	A	U R	A	U R	U R	U A	A						
5							B	A	A	A	A	U R	A	A	A	A	U R	A	A	B	B				
6							B	A	U A	A	A	R	A	A	A	A	A	A	A	A	B				
7						B	B	U A	U A	A	A	A	A	A	A	A	A	A	U R	B	B				
8							B	U A	U A	U R	R	R	U A	R	U R	U A	U A	U A	A	B	B				
9							B	A	A	A	A	U R	U A	U A	A	U A	A	A	A	B	B				
10							B	U A	A	A	A	A	3 2 4	3 1 6	3 0 8		A	U R	U R	B					
11							B	U R	A	A	A	A	U R	A	R	U A	R	U A	U R	B					
12							B	A	A	A	A	A	A	A	A	A	U A	A	A	B					
13							B	U A	A	A	A	R	R	U R	R	R	U R	U A	B	B					
14							B	A	A	A	A	A	A	A	U A	A	U A	U A	B	B					
15							B	U A	A	A	A	A	A	A	A	A	U A	U A	U R	B					
16							U R	A	A	A	A	U R	A	A	A	A	A	2 8 8	2 5 2	A	B				
17							B	U A	A	A	A	A	A	A	A	A	U R	U A	A	B					
18							B	U A	U R	R	R	U R	U R	R	U R	U R	U R	U R	U R	B					
19							B	U A	A	A	A	A	A	U R	U R	U R	U A	U A	A	B					
20							B	U A	A	A	A	A	R	R	R	R	U A	U A	B						
21							B	U A	A	A	A	A	A	A	A	A	A	U R	U R	B					
22							B	U A	U A	A	A	A	A	A	U R	U R	R	U A	B						
23							B	U A	U A	A	A	A	R	A	A	A	2 8 8	2 4 8	A	B					
24							B	A	U A	A	A	A	A	A	A	A	A	U R	A	B					
25							B	A	A	A	A	A	A	A	A	A	A	A	A	B					
26							B	A	A	A	A	A	A	A	A	A	A	A	A	B	B				
27							B	U A	U R	U R	A	A	A	R	R		3 1 6	2 9 2	A	A	B				
28							B	A	A	A	A	A	A	A	U R	3 3 2	3 0 4	2 9 6	2 6 0	A	B				
29							B	A	A	A	A	A	A	A	A	U R	A	A	A	B					
30							B	A	A	U R	A	U R	A	A	A	R	U A	A	B	B					
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							1	18	13	5	1	5	4	7	7	10	18	21	9						
MED							U R	U A	U A	U R	U R	U R	U R	U R	U R	U R	U R	U R	U R						
U Q							2 0 0	2 2 4	2 7 2	3 1 2	3 3 6	3 4 8	3 5 4	3 4 4	3 3 2	3 1 8	2 8 8	2 4 8	1 9 6						
L Q							U A	U A	U R		U R	U R	U R	U R	U R	U R	U R	U R	U R						
							2 1 6	2 6 6	3 0 6		3 4 2	3 3 8	3 3 6	3 2 0	3 1 6	2 8 8	2 4 4	1 9 6							

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 17	B 16	B 26	J A 30	E 16	B 16	B 16	28	32	37	J A 52	J A 45	J A 61	37	J A 61	J A 41	J A 40	J A 37	J A 34	J A 31	26	20	E 16	B 16	
2	E 16	B 16	B 16	E 16	B 15	B 14	20	28	34	34	G	G	J A 38	42	G	J A 37	G	28	23	J A 24	23	E 16	20	E 15	
3	E 16	B 16	B 16	E 16	B 16	B 16	16	26	32	G	35	37	37	50	40	38	36	28	G	J A 24	15	20	E 16	B 16	
4	E 15	B 16	B 16	E 16	B 16	B 16	20	28	32	35	G	J A 36	42	G	J A 44	G	G	31	J A 27	16	21	15	23	23	
5	E 16	B 16	B 16	E 16	B 16	B 16	20	27	34	34	J A 51	G	J A 42	45	54	45	G	30	25	30	16	33	27	16	
6	E 16	B 16	B 16	E 15	B 15	B 15	23	J A 35	34	38	J A 42	G	J A 39	42	37	35	33	29	22	24	E 16	B 16	22	16	
7	E 16	B 16	B 16	E 16	B 19	J A 31	31	33	44	43	J A 44	J A 44	J A 49	60	49	38	G	24	37	J A 32	16	17	24		
8	E 16	B 16	B 16	E 16	B 16	B 16	21	25	31	G	G	G	41	G	G	38	37	32	J A 31	21	15	22	22	16	
9	E 16	B 16	B 16	E 16	B 16	B 16	16	27	31	34	39	38	G	40	40	38	J A 48	J A 37	J A 37	J A 72	69	77	31	24	
10	20	E 16	B 16	J A 21	J A 26	J A 26	21	28	32	34	J A 38	J A 36	40	40	36	40	35	G	G	E 15	15	15	15	15	
11	E 15	B 16	21	E 15	B 16	B 16	15	G	32	J A 47	J A 72	40	J A 57	G	G	38	G	30	G	J A 24	34	45	89	56	
12	J A 42	J A 41	J A 30	J A 28	22	21	22	30	34	J A 54	J A 51	41	J A 44	J A 44	J A 58	J A 42	J A 56	J A 54	J A 44	J A 52	J A 50	J A 38	J A 33	J A 28	
13	J A 25	J A 16	B 16	J A 24	22	E 16	24	29	36	J A 41	41	G	G	G	G	G	G	28	J A 28	J A 31	24	22	20	J A 29	
14	22	22	J A 34	E 16	B 15	B 16	J A 27	J A 33	J A 41	J A 39	J A 43	J A 43	J A 45	J A 47	39	38	J A 43	J A 58	J A 67	J A 46	J A 52	J A 85	J A 56	J A 40	
15	J A 32	J A 31	23	J A 26	22	22	18	30	J A 40	J A 45	J A 44	J A 43	J A 62	J A 60	J A 47	36	31	28	G	J A 33	J A 30	23	J A 46	B 16	
16	E 16	B 16	21	20	23	E 15	G	J A 37	J A 40	36	36	G	J A 47	J A 43	J A 52	J A 40	32	29	25	J A 26	J A 28	20	20	J A 23	
17	E 16	21	E 15	B 15	B 15	20	22	30	34	37	J A 42	J A 43	J A 41	38	36	J A 37	G	28	J A 28	J A 26	J A 45	J A 35	J A 34	J A 35	
18	J A 20	J A 22	E 16	B 16	B 15	B 15	19	28	31	G	G	G	G	G	G	G	G	G	G	E 16	J A 42	J A 40	J A 32	J A 28	
19	E 16	J A 20	J A 21	E 16	J A 20	20	J A 28	J A 35	J A 43	J A 41	38	44	40	J A 49	G	G	G	33	J A 45	J A 37	J A 37	J A 35	J A 40	E 15	
20	20	20	20	E 16	B 15	20	J A 25	30	32	J A 44	37	37	G	G	G	G	37	33	J A 32	J A 28	23	16	16	22	
21	J A 26	22	E 16	B 21	B 15	22	21	28	J A 43	J A 37	J A 42	J A 45	J A 55	J A 56	J A 42	J A 34	G	G	J A 27	J A 25	J A 31	J A 46	J A 42		
22	J A 34	J A 26	B 16	B 16	B 26	B 16	24	26	31	37	37	J A 44	J A 52	J A 40	G	G	G	29	24	30	66	51	60	J A 41	
23	J A 50	J A 43	J A 50	J A 24	J A 24	J A 32	19	G	34	37	40	37	G	J A 56	J A 52	J A 46	34	J A 37	J A 33	J A 31	J A 38	J A 50	J A 44	B 16	
24	J A 50	J A 16	B 16	B 16	B 16	B 15	23	29	34	38	J A 46	J A 48	40	J A 39	J A 43	J A 41	32	G	23	J A 26	41	J A 23	J A 48	J A 24	
25	E 16	B 16	B 16	B 16	B 16	B 16	21	29	31	37	J A 44	J A 44	53	58	57	48	45	39	J A 43	J A 46	J A 52	J A 76	J A 54	J A 42	
26	J A 35	J A 24	J A 27	J A 27	E 15	23	27	33	J A 36	J A 42	J A 42	J A 42	J A 52	J A 43	J A 47	76	J A 76	J A 50	J A 54	J A 66	J A 52	J A 24	J A 29	J A 26	
27	J A 27	J A 24	E 16	B 16	B 16	B 16	20	30	G	34	J A 39	J A 44	J A 39	G	G	36	32	33	J A 26	J A 16	J A 21	J A 51	J A 21	J A 23	
28	23	J A 22	J A 16	22	E 16	B 16	J A 27	J A 34	J A 35	J A 47	J A 48	J A 43	J A 42	37	G	37	G	33	J A 32	J A 29	J A 29	J A 29	J A 65	J A 27	
29	20	20	22	E 16	B 16	21	21	30	J A 37	J A 36	J A 40	J A 40	J A 40	J A 40	J A 47	G	J A 44	J A 42	J A 45	J A 50	J A 50	26	22	22	
30	E 16	B 16	B 16	B 16	B 16	20	J A 26	J A 32	J A 45	G	J A 42	G	J A 42	J A 42	J A 46	G	38	J A 58	J A 109	J A 57	21	21	J A 36	J A 50	
31																									
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E 18	B 16	B 16	B 16	B 16	B 16	21	29	34	37	J A 42	J A 40	J A 42	J A 41	40	38	34	30	J A 28	J A 30	J A 30	J A 25	J A 30	J A 24	
UQ	J A 26	J A 22	J A 21	J A 21	20	20	J A 24	J A 30	J A 36	J A 41	J A 44	J A 44	J A 45	J A 49	J A 52	J A 41	J A 38	J A 37	J A 37	J A 37	J A 45	J A 40	J A 46	J A 29	
LQ	E 16	B 16	B 16	B 16	B 16	B 16	19	27	32	34	37	G	G	G	G	G	G	G	G	G	E 21	B 20	B 20	B 16	

APR. 2018 foEs (0.1MHz)
 NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 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 17	E 16	E 17	E 17	E 16	E 16	E 16	26	30	34	46	39	53	35	50	37	30	29	17	19	E 17	E 16	E 16	E 16
2	E 16	E 16	E 16	E 16	E 15	E 14	E 16	25	32	33	G	G	33	36	G	31	G	26	21	18	E 16	E 16	E 16	E 15
3	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	29	G	32	36	36	40	34	32	31	26	G	20	E 15	E 15	E 16	E 16
4	E 15	E 16	E 16	E 16	E 16	E 16	E 16	24	29	32	G	34	36	G	34	G	G	28	23	E 16	E 15	E 15	E 18	E 16
5	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	30	32	35	G	36	38	41	37	G	28	22	25	E 16	E 30	E 15	E 16
6	E 16	E 16	E 16	E 15	E 15	E 15	E 16	28	31	36	36	G	36	36	34	32	31	27	21	15	E 16	E 16	E 16	E 16
7	E 16	E 16	E 16	E 16	E 16	E 16	17	24	32	37	40	40	38	38	38	32	29	G	20	24	E 22	E 16	E 17	E 16
8	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	29	G	G	G	39	G	G	36	34	28	25	16	E 15	E 16	E 16	E 16
9	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	30	32	35	36	G	39	39	35	42	28	31	61	57	A 77	E 16	E 16
10	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	29	32	33	33	40	40	36	38	32	G	G	E 15	E 15	E 15	E 15	E 15
11	E 15	E 16	E 16	E 15	E 16	E 16	15	G	31	36	A 72	36	50	G	G	36	G	27	G	E 15	20	28	20	24
12	30	19	E 16	E 16	E 16	E 16	20	26	32	34	34	34	40	40	53	36	49	44	39	50	35	21	21	21
13	E 16	E 16	E 16	E 16	E 16	E 16	21	28	33	36	33	G	G	G	G	G	G	26	23	22	E 16	E 16	E 16	E 16
14	E 16	E 16	E 16	E 16	E 15	E 16	18	26	32	34	36	36	40	42	37	36	37	46	62	29	37	A 85	20	19
15	E 16	18	E 16	E 16	E 16	E 16	17	28	34	35	38	36	56	46	37	34	30	27	G	24	23	E 18	E 16	E 16
16	E 16	E 16	E 16	E 15	E 19	E 15	G	31	34	35	35	G	37	36	34	34	31	27	24	20	20	16	E 15	E 15
17	E 16	E 16	E 15	E 15	E 15	E 15	20	28	30	34	37	37	36	36	34	32	G	27	23	16	37	31	20	17
18	E 16	E 16	E 16	E 16	E 15	E 15	17	25	29	G	G	G	G	G	G	G	G	G	G	E 16	28	E 16	E 16	E 16
19	E 16	E 16	E 16	E 16	E 16	E 16	23	31	31	34	35	37	38	44	G	G	G	32	38	30	E 16	E 16	E 16	E 15
20	E 16	E 16	E 16	E 16	E 15	E 16	21	28	30	39	35	35	G	G	G	G	35	31	25	22	E 16	E 16	E 16	E 16
21	E 21	E 16	E 16	E 16	E 15	E 16	18	26	32	32	36	36	A 75	42	50	35	28	G	G	A 27	19	27	28	E 16
22	E 16	E 16	E 16	E 16	E 16	E 16	21	25	30	34	35	36	37	37	G	G	G	28	22	23	A 66	23	23	27
23	18	21	18	18	A 32	A 18	18	G	31	36	38	36	G	46	44	38	32	34	29	26	A 32	50	29	E 16
24	E 16	E 16	E 16	E 16	E 16	E 15	20	26	32	36	42	42	38	36	37	35	31	G	21	20	36	22	21	18
25	E 16	E 16	E 16	E 16	E 16	E 16	20	27	30	35	41	38	42	53	52	41	36	32	35	35	34	36	54	20
26	E 16	15	20	20	E 17	E 15	21	26	31	32	34	38	38	44	35	40	A 76	44	42	50	39	18	19	19
27	E 16	E 16	E 16	E 16	E 16	E 16	19	26	G	33	33	35	36	G	G	35	31	29	25	16	E 16	E 16	E 16	E 16
28	E 15	E 16	E 16	E 16	E 16	E 16	22	29	32	34	37	40	37	35	G	36	G	31	28	24	18	20	20	E 16
29	E 16	E 16	E 16	E 16	E 16	E 16	18	26	34	34	36	36	34	34	38	G	38	35	40	35	35	25	E 16	E 16
30	E 16	E 16	E 16	E 16	E 16	E 16	22	28	36	G	36	G	36	38	38	G	35	38	36	22	E 15	E 16	19	34
31																								
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E 16	E 16	E 16	E 16	E 16	E 16	18	26	31	34	35	36	37	36	34	34	31	28	23	22	20	16	E 16	E 16
U Q	E 16	E 16	E 16	E 16	E 16	E 16	20	28	32	35	37	37	40	40	38	36	35	32	31	27	35	27	20	18
L Q	E 16	E 16	E 16	E 16	E 16	E 16	25	30	32	33	G	G	G	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16

APR. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

APR. 2018 fmin (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

APR. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F	336	323	323	315	309	366	381	362	336	319	309	339	348	340	344	338	357	357	372	368	348	314	289	
2	312	323	322	370	393	359	347	386	348	360	342	336	345	361	358	320	321	355	360	361	362	364	296	309	
3	297	316	310	335	361	403	355	391	373	354	364	359	328	325	331	352	359	363	369	358	377	384	299	299	
4	305	F	326	342	357	317	338	384	396	376	370	348	341	332	339	351	348	343	343	360	364	388	277	289	
5	F	F	F	F	F	343	360	384	363	353	362	324	319	325	343	343	323	344	351	355	371	339	F	F	
6	F	333	349	305	312	F	373	389	376	339	342	305	304	330	351	362	326	346	344	362	358	321	274	292	
7	F	F	F	352	406	311	327	379	392	373	346	341	327	334	333	344	328	356	375	345	341	322	284	297	
8	340	319	316	369	373	323	354	367	376	362	351	324	330	341	335	339	339	346	342	357	396	344	299	286	
9	291	F	F	299	338	336	373	387	372	359	356	348	326	323	331	335	337	340	335	351	392	A	294	305	
10	302	288	303	358	321	321	361	375	349	330	349	337	349	316	334	314	329	321	352	378	372	285	281	285	
11	286	291	302	374	F	309	368	365	387	342	A	292	330	336	309	338	350	337	335	332	352	343	275	300	
12	323	303	F	F	F	335	369	381	379	347	344	325	316	327	334	324	348	328	323	346	361	372	288	302	
13	311	302	F	F	F	F	370	366	373	351	355	292	289	304	328	361	371	344	337	336	372	362	281	291	
14	291	302	370	393	287	300	340	372	367	372	349	322	335	336	334	333	360	334	342	365	380	A	296	302	
15	F	330	329	344	338	317	361	365	394	353	343	317	320	329	306	342	333	361	350	347	351	347	290	277	
16	F	319	F	F	371	318	373	368	384	341	353	315	327	320	318	333	349	349	362	357	338	311	276	312	
17	320	329	378	399	325	332	377	357	358	341	335	319	318	332	341	360	319	341	324	339	350	370	309	309	
18	F	309	313	328	358	342	361	360	347	338	323	328	310	313	325	338	357	354	336	345	353	305	293	312	
19	F	F	347	F	F	F	385	382	376	355	319	306	322	321	343	345	359	354	361	344	341	306	290	292	
20	316	319	348	410	359	301	364	382	363	360	352	308	305	327	310	317	317	316	348	360	351	291	286	288	
21	297	333	303	303	303	369	350	355	348	305	366	267	A	324	340	343	351	322	343	A	328	309	310	285	
22	319	312	315	342	345	297	349	396	354	317	343	341	345	339	323	330	335	352	336	358	A	320	300	304	
23	300	321	332	376	362	A	384	381	355	373	332	328	305	315	336	337	341	359	341	325	336	A	308	330	
24	308	301	321	F	F	F	371	368	372	352	353	302	317	324	323	347	342	326	312	311	321	374	327	312	
25	312	328	331	330	311	329	373	400	354	348	338	309	308	314	321	332	327	A	312	330	343	351	353	A	278
26	310	299	320	400	314	318	362	359	363	365	332	301	300	329	363	341	A	312	309	325	375	384	299	296	
27	287	294	301	F	443	349	366	383	383	375	319	316	315	316	316	314	344	339	344	338	363	365	306	310	
28	325	289	292	294	340	364	380	404	353	312	303	308	318	323	321	341	356	352	328	329	337	343	F	F	
29	F	310	323	378	320	320	332	368	380	385	326	348	326	340	315	347	351	336	326	318	352	403	295	302	
30	320	327	321	344	367	327	361	374	365	338	362	304	314	310	312	308	331	343	336	341	341	371	314	310	
31																									
CNT	21	25	24	23	24	25	30	30	30	30	29	30	29	30	30	30	29	30	30	29	29	27	27	28	
MED	310	316	322	344	342	323	363	380	370	352	344	318	320	326	332	340	341	344	342	346	353	347	295	300	
U Q	320	328	332	376	364	342	373	384	379	362	354	336	330	334	340	345	351	354	351	359	372	371	306	309	
L Q	297	302	312	328	318	314	354	367	355	339	332	306	312	320	321	332	328	334	335	337	341	320	284	289	

APR. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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APR. 2018 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	A		A		A	U	L	L						
2									L	L	U	L	U	L	U	L	U	L						
3									L	L	U	L	U	L	U	L	U	L						
4										L	L	U	L	U	L	U	L	U	L	L	L			
5									L	L			U	L	A		L	L						
6										L	U	L	U	L	U	L	U	L						
7									L	L	U	L	U	L	U	L	U	L	L					
8									L	L							U	L	L					
9										U	L	U	L	U	L	U	L	A						
10										U	L	U	L	U	L	U	L	U	L					
11									L	U	L	A		A	U	L	U	L	A	U	L	L		
12										U	L	U	L		A	A		A	A					
13									A	L	U	L	U	L	U	L	U	L	L	L				
14									L		L		A	A		U	L	A	A	A				
15										U	L	U	L	U	L	U	L	L	L					
16									A	U	L	U	L	U	L	U	L	L	L					
17										398	388	411	436	423	416	402	378	L	L					
18										U	L							L	L					
19									A	U	L	U	L	A		L	A							
20									L	A	U	L	U	L	U	L	U	L						
21								L		369	379	365	407	A	A	A	U	L	L	L	A			
22										L	U	L		U	L	U	L	L						
23										L	L	U	L	A	A	U	L	L	A					
24										L	U	L	A			U	L	L	L					
25										U	L	A		A	A	A	A	A	A					
26										L	U	L	U	L	A	A	A	A	A	A				
27										L	U	L	U	L	U	L	U	L	L	L				
28										L	U	L	U	L	U	L	U	L	L					
29								L	L	L	U	L	U	L	U	L	A	A	A	A				
30									A		389	403	421	425	430	431	408	396	A	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	17	24	28	24	23	24	26	17	1						
MED									369	390	402	409	417	411	414	397	379	352						
U Q									400	410	422	429	421	420	408	395								
L Q									U	L	U	L	U	L	U	L	U	L						
									384	392	403	404	402	392	385	373								

APR. 2018 M(3000)F1 (0.01)

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APR. 2018 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									258	276	296	290	262	254	246	254	254	256						
2									260	260	270	260	258	258	234	314	308							
3									254	264	254	254	266	286	278	254	258							
4									244	244	274	284	284	262	242	256	260	260						
5									256	256	256	326	318	272	244	242	256	264						
6									280	274	298	298	268	234	232	272	272							
7									244	254	294	286	286	268	262	262	270	244						
8									244	250	258	296	270	254	278	276	282	262						
9									256	268	268	296	282	276	264	264								
10									262	258	268	306	270	276	276	270								
11									250	272	A	314	266	250	268	254	244	270						
12									272	258	258	300	250	264	262		E	A	E	A				
13									240	248	248	338	316	310	260	238	228	270						
14									244	236	278	308	268	268	268	278	254	290	E	A				
15									274	274	300	E	A	296	278	282	262	262	262	254				
16									234	276	254	292	278	278	270	266	248	248						
17									274	274	274	280	264	248	238	270	270	286						
18									286	300	284	292	292	274	260	242	236	244						
19									238	262	298	320	296	274	258	244	232	232						
20									262	276	276	302	304	294	302	290	266	268						
21								246	270	318	258	414	A	300	264	264	264	276	266			A		
22									264	296	284	284	276	290	296	276	276	252						
23									264	256	272	312	336	292	278	260	260	260						
24									260	260	272	316	298	278	278	250	256	264	280					
25									280	280	300	300	288	288	258	258	258	258						
26									250	250	292	372	302	284	246	246	A	E	A	E	A	E	A	
27									250	246	288	320	276	282	276	282	260	260	260					
28									262	332	334	312	284	264	264	260	250	268						
29								234	222	222	318	270	286	268	294	274	264	264	E	A	E	A		
30									238	286	258	306	288	288	276	290	260	248	244					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	21	29	29	30	29	30	30	30	28	27	13	2				
MED								240	250	264	274	299	286	278	269	261	260	263	262	E	A			
U Q									261	278	290	314	299	288	278	276	268	270	282					
L Q									242	252	258	274	273	268	260	250	254	256	256					

APR. 2018 h'F2 (KM)

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APR. 2018 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
1	E B	262	218	232	E B	E B	E B					A		A		A	202	192	214	216	206	190	196	E B	E B	E B					
2	E B	276	254	246	206	190	216	216	192	206	204	196	196	186	184	182	182	182	230	212	212	192	192	E B	E B	E B					
3	E B	264	270	264	252	198	190	202	198	198	198	198	180	180	E A	240	172	192	212	216	216	214	196	190	E B	E B	E B				
4	E B	244	244	226	212	212	E B	232	210	198	202	198	196	196	196	188	188	186	206	220	212	198	190	E A	E A	E B					
5	E B	272	244	244	240	240	240	210	206	200	190	190	190	178	188		A	188	180	218	218	216	196	E A	E A	E B					
6	E B	242	224	216	230	E B	E B	236	210	204	204	200	198	196	190	186	172	180	180	204	208	208	202	194	E B	E B	E B				
7	E B	272	256	232	194	190	242	E B	232	206	206	216	202	216	216	216	212	186	196	196	202	208	208	208	E B	E B	E B				
8	E B	244	244	230	202	198	240	E B	218	212	206	196	196	196	188	186	194	212	212	210	218	206	188	188	E B	E B	E B				
9	E B	286	276	264	236	226	E B	284	208	206	208	192	184	202	194	204	220	196		A	230	230	238	216	E B	E B	E B				
10	E B	270	290	256	224	238	E B	230	212	202	194	194	194	184	184	226	204		A	198	206	222	198	184	E B	E B	E B				
11	E B	284	284	284	206	206	E B	318	216	214	212	206		206		A	198	176		A	180	206	218	218	210	E A	E A	E A			
12	E A	310	280	286	246	226	E B	246	212	212	206	198	204	202	198		A	A			A	E A	E A	238	210	E A	E A	E A			
13	E B	256	250	282	246	218	E B	196	212	212		210	198	192	178	178	174	194	194	204	214	224	210	192	E B	E B	E B				
14	E B	304	274	210	198	346	E B	298	212	212	212	194	200	192		A	204	202		A	A	A	202	200	E A	E A	E A				
15	E B	292	266	234	204	228	E B	272	210	208	214	204	204	202		A	210	210	198	198	216	216	216	214	200	E B	E B	E B			
16	E B	276	262	230	202	202	E B	328	214	212		202	202	186	186	186	186	186	206	206	212	210	208	222	E B	E B	E B				
17	E B	246	234	212	184	296	E B	282	198	206	212	208	200	200	168	166	166	178	174	204	222	218	218	214	E A	E A	E A				
18	E B	270	254	254	220	192	E B	192	196	196	196	184	184	178	178	178	178	190	190	196	208	204	210	E B	E B	E B	E B				
19	E B	276	254	222	200	252	E B	260	198	198		A	198	196	202	202		A	202	194	194		220	226	E B	E B	E B				
20	E B	258	258	228	186	194	E B	256	210	210	208		A	202	202	182	190	190	190	218	E A	240	220	204	202	E B	E B	E B			
21	E A	270	222	248	248	280	E B	210	210	214	214	208	216	212		A	A	A			A			A	E A	E A	E A	E B			
22	E B	256	246	246	220	208	E B	236	224	216	202	196	196	196	196	196	196	192	192	206	206	218		A	218	E A	E A	E A			
23	E A	286	292	242	212	212		A	208	206	190	198	196	184	208		A	208	204		A	226	226	E A	E A	E A	E A	E A			
24	E B	236	242	246	246	206	E B	248	214	208	208	194		A	A	212	202	202	196	188	188	194	238	238	200	E A	E A	E A			
25	E B	242	242	242	238	238	E B	238	196	198	198	198		A		A	A	A	A	A	A	A	214	216	218	E A	E A	E A			
26	E B	272	268	252	198	190	E B	302	210	200	214	200	200	200	200		A	200		A	A	A	A		206	E A	E A	E A			
27	E B	298	292	292	202	230	E B	278	206	216	208	204	192	176	202	182	182	212	212	202	212	220	202	200	E B	E B	E B	E B			
28	E B	260	268	268	284	248	E B	218	206	198	188	188	188		A	188	188	182	192	186	212	222	234	214	E A	E A	E A	E A			
29	E B	242	238	242	222	228	E B	250	214	206	198	188	188	188	178	188	188	184		A	A	A		220	E B	E B	E B	E B			
30	E B	238	238	238	228	204	E B	242	204	210		A	198	198	196	190	188	190	198	206		A	A	206	206	E A	E A	E A	E A		
31																															
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT		30	30	30	30	30	29	30	30	26	29	26	28	24	23	24	26	25	22	24	27	29	27	29	30						
MED		E B	E B	E B	E B	U	E B	210	206	206	198	197	196	189	188	189	193	194	206	216	213	207	202	E B	E B	E B	E B	E B			
U Q		E B	E B	E B	E B	E B	E B	276	270	256	238	238	275	214	212	210	204	200	202	199	204	202	198	206	216	220	224	216	222	285	290
L Q		E B	E B	E B	E B	E B	E B	246	242	230	202	202	231	206	200	198	194	194	189	181	186	180	186	186	204	210	208	199	194	255	260

APR. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 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	108	108	108	A	A	A	A	A	A	A	A	108	B				
2							B	110	110	110	110	110	A	110	110	A	106	104	B	B				
3						B	B	108	108	108	A	A	A	A	A	A	A	108	112	B				
4							B	118	118	118	116	110	A	110	A	110	110	110	A					
5							B	108	108	108	108	108	A	A	A	A	108	112	B	B				
6							B	112	112	112	112	112	A	A	A	A	A	A	112	B				
7						B	B	112	112	A	A	A	A	A	A	A	A	112	B	B				
8							B	120	120	114	114	110	106	110	110	112	112	112	B	B				
9							B	112	112	112	112	150	114	106	106	106	A	A	B	B				
10							B	110	110	110	A	A	108	106	106	108	108	108	108	B				
11							B	108	108	108	A	108	A	108	108	108	110	110	110	B				
12							B	114	114	A	A	A	A	A	A	A	114	114	A	B				
13							B	114	114	A	A	112	112	110	110	110	110	110	B	B				
14							B	118	A	118	A	A	A	A	112	112	112	110	B	B				
15							B	110	110	A	A	A	A	A	A	A	110	110	108	108	B			
16							120	120	120	116	116	112	A	A	A	A	112	112	112	B				
17							B	112	112	112	112	112	A	A	A	A	112	112	A	B				
18							B	110	108	108	108	108	108	108	108	108	108	108	108	B				
19							B	112	A	112	A	A	A	112	110	110	112	112	A	B				
20							B	108	108	108	110	110	110	110	110	110	110	112	110	B				
21							B	108	A	A	A	A	A	A	A	A	A	108	108	B				
22							B	108	108	108	108	A	A	A	108	110	110	108	108	B				
23							B	110	110	110	110	110	108	108	108	108	108	108	A	B				
24							B	110	108	108	A	A	A	A	A	A	108	110	110	B				
25							B	110	112	112	A	A	A	A	A	A	A	A	A	B				
26							B	108	108	A	A	A	A	A	A	A	A	A	B	B				
27							B	108	108	108	A	A	A	108	110	110	110	110	110	B				
28							B	112	112	A	A	A	A	112	112	112	112	112	112	B				
29							B	A	A	A	A	A	A	A	A	112	A	A	A	B				
30							B	116	A	112	A	108	A	A	A	110	110	110	B	B				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	29	25	22	12	14	7	13	14	17	21	24	14					
MED							120	110	110	110	111	110	108	110	110	110	110	110	110					
U Q								113	112	112	113	112	112	110	110	111	112	112	112					
L Q								108	108	108	109	108	108	108	108	108	108	108	108					

APR. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	B	B			B	B	B	112	112	112	102	102	94	94	94	94	94	88	88	88	88	88		B	B
2	B	B	B	B	B	B	148	132	116	116	G	G	104	110	G	94	G	122	122	80	80	B	86	B	
3	B	B	B	B	B	B	B	146	146	G	96	96	96	92	92	92	84	156	G	82	B	82	B	B	
4	B	B	B	B	B	B	146	116	116	126	G	112	102	G	102	G	G	110	112	B	90	B	90	94	
5	B	B	B	B	B	B	136	128	124	118	90	G	92	96	96	96	G	158	138	106	B	106	112	B	
6	B	B	B	B	B	B	126	126	126	116	114	G	98	98	98	98	98	98	120	104	B	B	102	B	
7	B	B	B	B	B	102	126	120	120	106	100	100	100	100	96	96	96	G	120	98	98	B	B	86	
8	B	B	B	B	B	B	140	132	128	G	G	G	120	G	G	128	134	134	102	102	B	102	96	B	
9	B	B	B	B	B	B	B	116	132	130	112	144	G	138	124	140	106	106	106	96	96	96	98	98	
10	98	B	B	98	98	94	124	122	122	116	102	98	142	136	136	124	116	G	G	B	B	B	B	B	
11	B	B	114	B	B	B	B	G	116	120	100	106	100	G	G	164	G	140	G	108	108	106	106	102	
12	98	98	96	96	96	96	124	124	118	102	102	102	102	102	92	92	112	112	106	106	102	96	88	88	
13	88	B	B	98	98	B	126	126	122	100	98	G	G	G	G	G	G	142	120	104	104	96	96	96	
14	94	94	94	B	B	B	122	112	102	106	100	98	98	98	118	122	122	114	108	108	108	108	104	96	
15	96	96	96	96	96	96	130	120	112	104	104	98	98	96	96	116	136	140	G	74	78	78	98	B	
16	B	B	98	96	96	B	G	114	112	112	112	G	102	102	102	96	136	122	116	108	108	108	86	94	
17	B	94	B	B	B	132	126	126	124	116	116	116	100	100	100	98	G	140	108	108	100	100	96	96	
18	96	96	B	B	B	B	136	130	128	G	G	G	G	G	G	G	G	G	G	B	102	102	102	92	
19	B	94	94	B	94	94	112	112	112	114	98	98	98	122	G	G	G	162	106	106	106	102	102	B	
20	88	88	88	B	B	88	126	126	126	124	124	116	G	G	G	G	116	110	110	108	106	B	B	104	
21	88	88	B	110	110	116	116	104	100	100	100	100	96	96	92	92	92	G	G	92	90	90	90	90	
22	96	96	B	B	96	132	132	132	124	118	106	102	102	G	G	G	126	126	94	94	96	96	96	96	
23	96	96	F	96	96	96	92	G	114	114	112	122	G	118	118	118	118	118	108	96	96	96	100	B	
24	100	B	B	B	B	B	122	116	116	116	102	102	102	102	98	98	106	G	128	110	94	94	96	96	
25	B	B	B	B	B	B	108	114	118	114	100	98	98	98	98	98	98	98	98	94	94	94	94	94	
26	92	92	92	92	92	B	128	122	122	104	98	80	80	86	90	94	94	94	94	94	94	94	90	90	
27	88	88	B	B	B	B	134	134	G	146	90	94	100	G	G	148	148	130	116	B	104	104	98	98	
28	98	98	B	98	B	B	104	114	114	102	102	102	102	102	G	142	G	142	122	104	104	98	98	98	
29	96	94	94	B	102	102	106	102	102	102	98	98	98	98	G	G	98	98	98	98	98	98	98	98	
30	B	B	B	B	B	122	122	116	100	G	100	G	98	98	96	G	120	120	104	98	98	98	98	98	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	15	14	11	10	9	11	25	28	29	26	26	22	25	23	20	22	20	25	24	26	25	24	25	20	
MED	96	94	94	96	96	96	126	121	118	114	102	101	100	100	98	98	109	122	109	100	98	97	98	96	
U Q	98	96	96	98	97	110	133	127	125	118	112	106	102	102	102	124	121	140	120	106	104	102	101	98	
L Q	88	92	92	96	95	94	119	115	112	104	100	98	98	96	95	94	97	108	105	94	94	94	92	93	

APR. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1			F2	F3				C3	C2	C2	L3	L3	L4	L2	L2	L3	L2	L4	L4	L4	F2	F1			
2							H1	C3	C2	C2			L2	C2		L2		C2	C2	L2	F2		F1		
3								H5	H2		L2	L2	L2	L2	L2	L4	L3	H1		L4		F1			
4							H1	C2	C3	C2		C1	L2		L2			C2	L4		F4		F5	F2	
5							C1	C4	C2	C1	LC21		L2	L2	L2	L2		HL22	H2	L3		L7	F1		
6							C1	C3	C3	C2	C2		L1	L1	L1	L1	L1	L1	C1	L1			F2		
7					L2		C2	C4	C3	L2	L3	L3	L2	L2	L2	L2	L2		CL22	L3	F7			F1	
8							H1	H2	H2				C2				C2	C3	L3	L1		F1	F1		
9								C2	C2	C2	C2	H1		H1	C1	H1	L3	L3	L8	L8	F7	F4	F2	F2	
10	F2			F2	F3	F3	C1	C1	C2	C2	L1	L2	H1	H2	H2	C1	C2								
11			F1					C2	C2	L3	C2	L3				H1		H1		L2	F3	F7	F4	F4	
12	F6	F4	F4	F5	F2	F2	C3	C4	C2	L3	L2	L1	L2	L2	L5	L2	C3	C7	L4	L8	F4	F5	F4	F2	
13	F2			F2	F1		C2	C2	C3	L2	L2							H1	C2	L8	F1	F1	F2	F1	
14	F2	F1	F1				C5	C4	C3	C2	L2	L2	L2	L2	C2	C1	C2	C4	L8	L7	F5	F3	F3	F4	
15	F3	F3	F3	F4	F2	F2	H1	C3	C4	L3	L3	L2	L3	L3	L2	C2	C1	H2		L4	F5	F2	F1		
16			F1	F3	F2			C3	C3	C2	C1		L1	L1	L2	L2	H1	C1	C1	L5	L5	F1	F2	F2	
17		F1			F1	F2	C4	C3	C3	C3	C1	L2	L2	L2	L2	L2		H1	L4	L3	F6	F3	F4	F3	
18	F2	F4					H1	H2	H2												F7	F4	F3	F4	
19		F2	F4		F2	F1	C5	C4	C4	C2	L2	L2	L2	C2				H2	L4	L7	F2	F3	F2		
20	F1	F2	F1			F1	C3	C3	C2	C2	C1	C1					C2	C2	C2	C5	F1			F1	
21	F4	F2		F1		F4	C2	C1	L2	L1	L2	L2	L4	L2	L3	L3	L2			L5	L2	F7	F3	F3	
22	F2	F3			F3		C1	C2	C2	C1	L1	L1	L1	L2				C1	C2	L5	F8	F6	F4	F4	
23	F4	F4	F4	F3	F2	F8	L2		C2	C2	C2	C1		C2	C3	C2	C2	C3	C3	L8	F8	F8	F8		
24	F3						C2	C2	C2	C2	L2	L2	L1	L1	L1	L1	L1		C1	L4	F8	F3	F5	F3	
25							C2	C2	C2	C1	L2	L1	L2	L3	L3	L2	L2	L3	L8	L9	F8	F5	F6	F4	
26	F2	F2	F8	F5	F2		C2	C2	C1	L2	L2	L2	L2	L2	L2	L2	L5	L4	L5	L5	F5	F2	F3	F2	
27	F1	F2					C1	C2		H1	L2	L2	L2			H1	H1	H1	L3		F3	F3	F2	F2	
28	F2	F2		F2			L3	C2	C2	L4	L2	L2	L1	C2		H1		H2	C3	L6	F5	F5	F4	F3	
29	F1	F1	F1			F1	L1	L3	L3	L2	L1	L2	L2	L2	L2		L3	L3	F5	L8	F5	F6	F4	F2	
30					F2		C2	C3	L3		L1		L1	L2	L2		C2	C3	L4	L5	F1	F1	F4	F7	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

IONOSPHERIC DATA STATION Okinawa

APR. 2018 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	41	40	40	39	31	31	X														X	X	X	X	
2	X	X	X	X	X	X																X	X	X	X
3	X	X	X	X	X	X																X	X	X	X
4	X	X	X	X	X	X																X	X	X	X
5	X	X	X	X	X	X																X	X	X	X
6	58	58	58	56	43	39	47															X	X	X	X
7	72	79	76	66	X	X																X	X	X	X
8	45	45	39	43	30	27																X	X	X	X
9	X	X	X	X	X	X																X	X	A	X
10	X	X	X	X	X	X																X	X	X	X
11	35	36	36	40	27	22																X	X	X	X
12	40	40	37	39	32	28																X	X	X	X
13	X	X	X	X	X	X																X	X	X	X
14	X	X	X	X	C	X																X	X	X	X
15	X	X	X	X	X	X																X	X	X	X
16	X	X	X	X	A	X																X	X	X	X
17	56	58	46	36	30	24															X	X	X	X	
18	43	41	43	44	41	33	44															X	A	X	X
19	44	X	X	X	X	X																X	X	X	X
20	46	44	44	42	26	28																X	X	X	X
21	X	X	X	X	X	X																X	X	X	X
22	54	53	53	54	30	30																X	X	A	X
23	42	41	41	47	A	A																X	X	X	X
24	48	A	45	36	36	34																X	X	X	X
25	46	40	42	35	32	33																X	X	X	X
26	40	48	51	42	26	25																X	X	X	X
27	X	X	X	X	X	X																X	X	X	X
28	X	X	X	X	X	X																X	X	X	X
29	50	51	48	48	43	38																X	X	X	X
30	X	X	X	X	X	X																X	X	X	X
31	42	44	44	48	25	26																X	X	X	X
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	30	30	27	28	5														1	30	29	28	30
MED	42	40	41	39	31	28	44														86	72	46	38	40
U Q	48	48	46	44	36	32	46															86	57	47	45
L Q	X	X	X	X	X	X																X	X	X	X
	35	35	36	34	27	24	36															57	38	34	35

APR. 2018 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 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	F33	F32	F32	F31	F24	F23	28	46	52	60	68	87	101	110	JR120	123	121	95	R84	76	50	34	34	34	
2	34	32	34	34	27	18	25	44	52	63	68	81	85	88	88	90	84	82	62	63	48	36	27	27	
3	28	28	F27	F26	27	19	24	48	54	68	74	66	70	84	97	JR100	71	62	62	65	55	34	29	29	
4	28	30	30	30	23	20	28	48	53	58	62	57	71	80	84	85	76	70	72	86	90	26	23	24	
5	25	26	27	27	24	21	F26	48	53	60	59	57	64	91	105	108	102	96	90	97	70	36	32	34	
6	F38	F44	F47	F	F	F30	F34	45	50	56	63	71	82	110	132	120	108	103	109	108	66	55	V56	54	
7	F58	F68	F63	F57	32	26	30	51	50	A	60	68	83	99	107	91	86	80	79	62	48	28	34	F34	
8	F33	F32	F32	F37	F22	21	26	45	57	63	65	74	84	90	86	80	74	78	97	86	58	27	22	24	
9	27	25	23	F	21	18	28	48	54	59	58	61	63	78	91	90	95	92	83	85	71	26	A	26	
10	26	26	26	28	26	22	30	45	53	54	78	80	70	82	104	98	87	92	JR100	93	42	29	28	29	
11	F28	30	30	34	21	16	31	49	58	66	64	79	110	101	99	106	90	81	76	79	71	42	31	30	
12	F31	F31	31	33	26	22	33	49	57	66	68	78	90	106	120	117	105	98	90	100	104	R31	32	33	
13	33	33	32	32	31	18	32	54	64	67	69	80	95	108	130	126	88	61	75	87	82	39	30	30	
14	30	31	38	30	C	18	33	52	64	62	59	65	86	95	94	95	84	78	98	93	R39	28	27	26	
15	F28	25	F31	28	19	19	33	47	59	60	62	75	90	JR100	JR101	R101	97	76	82	76	62	46	41	41	
16	42	41	53	48	AJ	B15	31	49	62	65	72	78	96	100	105	105	96	88	76	58	50	45	41	F46	
17	F47	F48	40	30	24	18	29	45	56	66	77	90	94	112	107	92	88	62	70	80	71	50	28	F32	
18	F33	F33	F33	F33	F30	F20	F35	48	53	55	64	76	86	97	104	112	109	99	79	69	50	A	33	F34	
19	F36	35	33	28	24	F22	36	50	50	56	62	78	R99	119	122	120	108	78	54	A	51	39	37	F36	
20	F37	38	38	36	20	22	34	48	52	52	67	65	86	107	122	137	140	106	100	95	66	49	44	44	
21	45	42	41	38	36	45	52	58	58	67	68	62	77	94	95	F90	65	60	64	70	64	56	50	48	
22	47	47	47	48	24	24	35	52	53	58	72	69	80	81	H84	83	88	71	66	69	66	34	A	F28	
23	F33	F30	F33	F36	A	A	34	49	52	56	60	60	70	89	94	84	78	58	55	61	63	R40	F40	F41	
24	F38	A	F36	29	F27	F26	35	51	53	57	58	66	80	89	98	96	78	68	69	75	88	68	32	F	
25	F35	F32	36	29	26	27	39	50	53	56	64	72	91	101	105	103	JR101	92	83	80	70	52	28	F31	
26	F32	F37	F35	35	18	18	36	52	52	57	58	61	84	99	97	78	70	66	71	79	89	50	26	25	
27	26	24	25	27	19	F19	36	58	60	60	66	83	98	110	121	112	104	90	70	75	80	41	31	F31	
28	30	28	28	28	F28	25	37	46	49	53	63	73	90	101	107	103	98	80	72	79	86	62	42	F40	
29	F42	F42	F38	F37	F32	F30	36	63	64	55	55	68	92	104	110	122	92	71	A	A	83	F53	41	38	
30	36	V39	38	41	19	20	37	53	65	65	65	72	86	97	108	108	115	104	89	79	71	64	38	34	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	30	28	26	29	30	30	30	29	30	30	30	30	30	30	30	30	29	28	30	29	28	29	
MED	F33	32	33	32	24	21	33	49	53	60	64	72	86	99	104	102	91	80	76	79	66	40	32	33	
UQ	F38	40	38	36	27	24	36	52	58	65	68	78	92	106	110	112	104	92	90	86	80	51	40	39	
LQ	28	29	30	28	21	18	29	47	52	56	60	65	80	89	95	90	84	70	70	70	51	32	28	28	

APR. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 f_oF₁ (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	A	A				A	L	L						
2										L	L	L	L	L	L	L	L							
3										L	L	L	L	L	L	L	L	L						
4										L	L	L	L	L	L	L	L	L	L					
5										L	L	L	L	L	L	L	L	L	L					
6										L	L	L	L	L	L	L	L	L	L					
7										L	L	L	L	L	L	L	L	L	L					
8										L	L	L	L	L	L	L	L	L	L					
9										L	L	L	L	L	L	L	L	L	L					
10										L	L	L	L	L	L	L	L	L	L					
11										L	L	L	L	L	L	L	L	L	L					
12										L	L	L	L	L	L	L	L	L	L					
13										L	L	L	L	L	L	L	L	L	L					
14										L	L	L	L	L	L	L	L	L	L					
15										L	L	L	L	L	L	L	L	L	L					
16										L	L	L	L	L	L	L	L	L	L					
17										L	L	L	L	L	L	L	L	L	L					
18										L	L	L	L	L	L	L	L	L	L					
19										L	L	L	L	L	L	L	L	L	L					
20										L	L	L	L	L	L	L	L	L	L					
21										L	L	L	L	L	L	L	L	L	L					
22										L	L	L	L	L	L	L	L	L	L					
23										L	L	L	L	L	L	L	L	L	L					
24										L	L	L	L	L	L	L	L	L	L					
25										L	L	L	L	L	L	L	L	L	L					
26										L	L	L	L	L	L	L	L	L	L					
27										L	L	L	L	L	L	L	L	L	L					
28										L	L	L	L	L	L	L	L	L	L					
29										L	L	L	L	L	L	L	L	L	L					
30										L	L	L	L	L	L	L	L	L	L					
31										L	L	L	L	L	L	L	L	L	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									3	27	29	28	27	28	27	27	27	10						
MED									L	L	L	L	L	L	L	L	L	L	L					
U Q									392	424	440	448	444	440	440	432	416	380						
L Q									L	L	L	L	L	L	L	L	L	L	L					
									404	428	444	458	452	446	444	436	416	388						
									L	L	L	L	L	L	L	L	L	L	L					
									392	416	432	440	440	436	432	428	412	380						

APR. 2018 f_oF₁ (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 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							B	A			U A			U A	A	A	A	A	A	A				
2							B		280	304	332	336	332	332					A	A				
3							B		232	252	292	320	352	A	352	344	328	288	252		A	A		
4							B		184	264	304	328	328	A	A	A	A			A	A			
5							B		216	264	296	312		A			328	304	260		A	A		
6							B		212	A	292	A	340	336	336	328	312	288		A	A	A		
7							B		184	256	292	324	336	336	332	332	312	284			A	A	B	
8							B		204	264	300	328	336	344	A	332	320	296	268	188			A	
9							B		188	260	304	324	344	344	344	336	308	288	252	220			A	
10							B		232	264	304	A	340	A	348	332	320	296	268		A	A		
11							B		212	272	300	312	340	344	352	328	320	284	264		A	A		
12							B		192	264	A	A	328	A	A	340	316	308	284	192			A	
13					J K		B		212	A	A	A	A	A	344	340	320	284	248	196			A	
14							B		208	A	U A	A	A	328	348	340	344	316	288	260	196			A
15							B		240	U A	280	A	A	A	A	A	A	A	252	180			B	
16							B		228	U A	272	A	A	A	A	A	A	A	A	A	A			A
17							B		224	272	308	324	A	A	A	A	312	292	248		A			
18							B		248	256	296	320	340	340	A	A	A	296	256	192			B	
19							B		216	272	292	A	A	A	A	336	320	300	260	212			A	
20					J K		B		248	264	296	328	336	A	A	A	312	288	256	200			B	
21							B		208	260	A	A	A	348	A	A	A	A	256	204			A	
22							A		204	264	304	340	340	348	A	A	320	284	264		A		A	
23							B		224	256	A	A	328	340	344	A	332	280	268	212			A	
24							B		172	196	280	300	320	U A	A	A	A	A	272	200			A	
25							B		A	276	A	316	A	A	A	A	A	A	A	A	A			A
26							A		224	U A	280	A	A	U A	348	332	352	344	324	308			A	A
27							B		A	280	312	328	336	348	332	332	320	300	268		A	A		
28							B		A	280	A	356	A	U A	356	352	336	324	296	268	208			A
29							B		A	272	A	A	A	A	A	348	368	332	312	276			A	A
30							A		A	280	A	A	A	A	A	A	A	A	260	U A	A			A
31																	316							
	00	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	1	23	26	18	16	18	15	16	16	22	23	24	14					
MED					J K			172	212	268	300	324	336	344	344	336	320	296	260	200				
U Q								228	280	304	328	340	348	350	342	324	300	268	208					
L Q								204	264	296	320	336	336	332	332	316	288	254	192					

APR. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	J A	20	20	19	J A	J A	E B	J A	G		39	42	56	46	46	44	51	40	38	44	32	21	E B	E B	18
2	E B	E B	E B	E B	E B	E B	E B	E B	G	31	37	39	39	J A	45	39	38	G	32	35	J A	J A	J A	E B	E B
3	E B	E B	E B	E B	E B	E B	J A	E B						J A						J A	J A	E B	E B	E B	E B
4	E B	E B	E B	E B	E B	E B	E B	E B				J A	J A	J A	J A					J A	J A	J A	E B	E B	E B
5	J A	E B	E B	J A	E B	E B	E B	E B		J A	J A	J A	J A			J A			J A	J A	J A	J A	J A	J A	20
6	E B	E B	E B	E B	E B	E B	E B	E B	J A								J A	J A	J A			E B	J A	E B	J A
7	J A		E B	J A		J A	J A		J A	J A	J A	J A	J A	126	36	36	36	32	J A	J A	J A	J A	J A	J A	J A
8	J A		J A	E B	E B	J A													J A	J A	J A	J A	J A	E B	E B
9	E B			E B	E B	E B	E B		G	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	E B			J A	J A	J A			J A	J A	J A	J A							J A	J A		J A	E B	E B
11	E B	E B	E B	E B	E B	E B	E B												G	J A	J A	J A	J A	J A	J A
12	J A	J A	J A	E B	J A	E B	E B				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	E B	J A	K J			J A	J A	J A	J A							J A				E B	E B
14	E B		E B	E B	E B				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		E B		G			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	E B
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
17	E B	E B	E B	E B	E B	E B	E B			J A											J A		J A	J A	J A
18	J A	E B	J A	J A	J A	J A	E B		G					J A							G		J A	J A	J A
19	J A	J A	J A	J A	J A	J A	J A				J A										G	G		J A	J A
20			E B	J A		J A	K J			J A					J A							J A	J A	J A	J A
21	J A	J A			E B		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
22	J A	J A	J A	J A	J A	J A	J A			J A	J A										G		J A	E B	E B
23	J A	J A	J A	J A	J A	J A	J A			J A												G	G	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
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
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	E B
27	E B	J A	J A	E B	E B	E B	E B														J A	J A	J A	J A	J A
28	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	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
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
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	J A	20	20	20	18	16	16	18	27	33	38	40	39	40	40	38	37	35	31	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
L Q	E B	E B	E B	E B	E B	E B	E B										G	G	G		J A	J A		E B	E B

IONOSPHERIC DATA STATION Okinawa

APR. 2018 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

IONOSPHERIC DATA STATION Okinawa

APR. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

APR. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 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	F	F	F	F	F	F	F								J R				R					
2																								
3			F	F											J R									
4																								
5								F																
6	F	F	F	F	F	F	F	F															V	
7	F	F	F	F					A															F
8	F	F	F	F	F																		A	
9																								
10																			J R					
11	F	F	F	F																				
12	F	F	F	F																			R	
13																								
14					C																	R		
15	F	F	F	F									J R	J R	R									
16					A	B																		F
17	F	F	F	F	F	F	F	F																F
18	F	F	F	F	F	F	F	F															A	F
19	F	F	F	F	F	F	F	F					R							A				F
20	F	F	F	F	F	F	F	F																
21																								
22																								
23	F	F	F	F	A	A																	R	F
24	F	A	F	F	F	F	F	F																F
25	F	F	F	F	F	F	F	F																F
26	F	F	F	F	F	F	F	F																
27																								
28																								F
29	F	F	F	F	F	F	F	F												A	A			F
30		V																						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	28	26	28	30	30	30	29	30	30	30	30	30	30	30	30	29	28	30	29	28	29
MED	F																							F
U Q																								F
L Q																								

APR. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 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	A	A	A		A		L	L						
2										379	418				406		379							
3										L	L	L	L	L	L	L	L	L	L					
4										L	L	L	L	L	L	L	L	L	L					
5										L	L	L	L	L	L	L	L	L	L					
6										L	L	L	L	L	L	L	L	L	L					
7										L	L	L	L	L	L	L	L	L	L					
8										L	L	L	L	L	L	L	L	L	L					
9										L	L	L	L	L	L	L	L	L	L					
10										L	L	L	L	L	L	L	L	L	L					
11										L	L	L	L	L	L	L	L	L	L					
12										L	L	L	L	L	L	L	L	L	L					
13										L	L	L	L	L	L	L	L	L	L					
14										L	L	L	L	L	L	L	L	L	L					
15										L	L	L	L	L	L	L	L	L	L					
16										L	L	L	L	L	L	L	L	L	L					
17										L	L	L	L	L	L	L	L	L	L					
18										L	L	L	L	L	L	L	L	L	L					
19										L	L	L	L	L	L	L	L	L	L					
20										L	L	L	L	L	L	L	L	L	L					
21										L	L	L	L	L	L	L	L	L	L					
22										L	L	L	L	L	L	L	L	L	L					
23										L	L	L	L	L	L	L	L	L	L					
24										L	L	L	L	L	L	L	L	L	L					
25										L	L	L	L	L	L	L	L	L	L					
26										L	L	L	L	L	L	L	L	L	L					
27										L	L	L	L	L	L	L	L	L	L					
28										L	L	L	L	L	L	L	L	L	L					
29										L	L	L	L	L	L	L	L	L	L					
30										L	L	L	L	L	L	L	L	L	L					
31										L	L	L	L	L	L	L	L	L	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									3	26	28	28	25	22	25	23	26	9						
MED									L	L	L	L	L	L	L	L	L	L	L					
U Q									397	387	394	410	411	412	403	388	379	379						
L Q									L	L	L	L	L	L	L	L	L	L	L					
									408	401	405	421	427	421	413	401	388	384						
									L	L	L	L	L	L	L	L	L	L	L					
									387	384	386	399	397	404	398	382	372	360						

APR. 2018 M(3000)F1 (0.01)

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APR. 2018 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										274	294	298	270	240	248	250	236	226	230					
2										254	278	264	260	260	276	270	250							
3										242	234	248	306	294	270	240	244	248						
4									226	246	254	302	282	268	268	256	286	256						
5									226	236	246	292	352	298	260	244	242	242						
6										264	276	284	342	278	234	224	248	246						
7										A	304	312	308	276	250	252	252	240						
8									248	246	280	298	278	250	262	256	290	266						
9									250	238	246	292	298	316	274	258	250	228						
10										334	250	248	294	330	272	250	268	252	228					
11									248	234	310	370	276	248	278	246	244	256	252					
12										236	288	312	306	284	244	248	242	240						
13									246	258	328	320	320	318	268	218	224		254					
14									230	244	278	324	288	270	270	264	256	272						
15									226	252	298	304	304	284	264	266	236	256	230					
16									246	254	280	340	302	270	266	248	244	224						
17									258	264	278	270	290	250	238	260	258	274	270					
18									238	306	316	304	314	290	290	256	246	232	222					
19										282	296	348	308	270	246	244	216	214		A				
20									234	306	258	410	336	294	300	266	234	264	228					
21									238	278	258	322	334	282	264	242	254	268	254					
22									262	304	264	332	302	280	280	272	252	232	246					
23									236	254	302	322	360		242	276	240	254						
24									266	250	304	334	316	288	268	256	242	280	280					
25									240	288	292	360	304	276	270	270	266	246						
26										262	286	364	320	262	246	256	276	284	278					
27									230	276	316	308	304	290	254	252	242	226	244					
28										326	296	340	304	270	258	254	248							
29								234	208	244	314	356	300	262	262	240	238	274		A	A			
30									234	252	274	322	318	298	282	278	246	232	220					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	20	29	30	30	30	29	30	30	30	27	14					
MED								234	238	254	283	316	304	278	265	255	246	248	245					
U Q								248	280	302	340	318	292	272	264	254	266	254						
L Q								230	245	264	298	294	265	250	246	242	232	228						

APR. 2018 h'F2 (KM)

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APR. 2018 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	258 ^Q	246	222	214	236	260	222	196	206	228	202		A	A	A	202	A	210	210	220	196	186	222	280	286		
2	274	270	240	192	174	332	238	206	212	224	236	190	248	206	194	202	204	216	216	206	186	200	242	304			
3	300 ^Q	290	288 ^Q	252 ^Q	202	194	242	200	220	202	192	178	186	168	172	196	230	220	222	208	188	204	266	298			
4	280	256	222	228	202	292	216	200	206	206	200	190	190	196	228	246	226	230	264	226	188	188	326	322			
5	304	258	248	248	224	310	246	208	208	198	190	192	212	A	234	A	204	214	232	202	188	180	280	296			
6	290 ^Q	250 ^Q	216 ^Q	264 ^Q	276 ^Q	240 ^Q	212	194	200	202	188	174	176	166	208	202		A	A	230	194	178	210	286	272 ^Q		
7	246	216	196 ^Q	178	176	254	222	196	236 ^A	A	196	186	214 ^A	174	172	208	200	220	220	200	212 ^A	240	264	276 ^Q			
8	248 ^Q	278 ^Q	266 ^Q	184 ^Q	216	296	236	200	204	188	180	224	186	222	208	210	194	202	220	204	180	212	280	304			
9	282	274	302	264 ^Q	222	354	228	200	200	204	210	210	270	220	A	226	228	212	228	212	180	310	A	300			
10	300	280	270	236	196	228	200	196	222	212	202	184	226	198	198	216	206	206	A	186	174	222	298	296			
11	340 ^Q	284	262	208	188	368	208	210	212	216	198	198	178	192	186	182	210	242	232	212	210	214	302	384 ^{E A}			
12	282 ^Q	276	284	214	212	230	210	206	214	A	202	212	A	A	A	A	A	A	A	240	A	246	226	190	182	290	314 ^{A A}
13	268	274	284	258	194	300	214	208	214	204	180	168	164	162	258	206	198	200	236	228	188	176	264	290			
14	284	252	208	182	C	348	220	210	210	A	242	238	190	236	A	A	A	A	A	A	236	224	194	172	234	310	334
15	292	302	224	194	312	276	208	198	210	198	194	174	A	160	230	232	208	200	222	210	202	212	280	302			
16	278	276	228	178	A	B	222	214	206	236 ^A	A	176	202	256 ^{E A}	A	232	198	204	208	200	206	236	282	302 ^Q			
17	230 ^Q	220	210	198	234	332	224	212	218	220	182	178	164	186	172	184	202	216	228	212	198	180	274	284 ^Q			
18	258 ^Q	298 ^Q	260 ^Q	204 ^Q	194	232 ^Q	218	196	212	180	180	216	176	184	214	212	220	206	206	200	186	A	284	274			
19	276 ^Q	272	254	210	260	266 ^Q	216	202	202	228 ^{E A E A}	228	A	248 ^{A A}	196	192	204	196	194	212	A	224	232 ^Q	280	290 ^Q			
20	270 ^Q	250	224	178	320	278	224	214	210	A	188	178	170	A	164	200	222	212	214	194	206	286	312	296			
21	250	256	224	240	296	206	204	218	210	192	216	224	206	198	198	A	206	204	232	240	218	216	244	282			
22	292 ^Q	284	246	196	338	278	220	224	208	188	230	208	192	208	190	200	188	206	218	218	196	206	A	312			
23	312	278 ^Q	244 ^Q	210	A	A	216	210	200	214	200	218	232	292	208	190	194	190	224	240	232	234	268	296			
24	240	A	232	218 ^Q	266	256 ^Q	224	210	200	192	244	198	268	212	194	A	A	A	194	228	248	208	190	356	316		
25	260 ^Q	226	216	218	268	230	214	212	208	206	180	182	166	200	202	194	E A	A	A	238	222	214	192	304	294 ^Q		
26	272	262 ^Q	248 ^Q	188	332	328	218	216	202	218	198	174	178	174	194	172	180	208	224	238	200	176	250	308			
27	288	316	298	210	246	302	208	216	216	180	186	176	178	194	214	188	194	210	232	234	194	182	262	280			
28	272 ^Q	272	244	224	238	214 ^Q	186	202	196	190	190	168	168	262 ^{E A}	200	252	242	252	268	248	216	200	220	294 ^Q			
29	284 ^Q	260 ^Q	242	226	258	268 ^Q	224	214	192	192	192	170	A	A	A	A	A	A	A	A	A	204	206	226	260		
30	270	246	224	198	254	290	214	220	214	190	184	166	182	200	172	170	206	212	202	214	216	200	204	268			
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	29	30	30	27	28	30	30	30	26	29	28	26	25	25	23	27	25	28	28	30	29	28	30			
MED	277	272	243	210	236	277	218	208	209	202	194	184	187	196	198	202	206	210	224	212	197	206	278	296			
U Q	290	279	262	228	268	306	224	214	214	216	206	209	214	216	211	216	226	216	232	227	210	227	294	304			
L Q	260 ^Q	251	224	194	202	236	212	200	202	192	187	175	176	179	188	190	198	203	219	200	186	189	263	284			

APR. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 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							B	A							A	A	A	A	A	A				
2							B		104	102	102	100	100	100						A	A			
3							B		122	102	102	100	100		A	A	A				A	A		
4							B		100	102	102	102	100		A			100	104					
5							B		124	116	106	106			A		102	102	102		A	A		
6							B		104		102		100	102	100	98	98	98			A	A	B	
7							B		104	104	104	104	104	104	104	100	104	104						
8							B		122	104	104	104	100	100		100	100	100	112	106				
9							B		102	102	102	96	96	96	96	100	100	100	104	106				
10							B		110	104	104		102		100	100	102	102	104		A	A		
11							B		A	A	A	A	A		104		104	104	102					
12							B		108	108	104	100	100	100	100	100	104	100			A	A		
13						B	B		100	104		102			102	100	100	102	104					
14							B		104		A	A	A		100	100	100	100	108					
15							B		118		104		104	102	100	100	100	100	102	104				
16							B		116	104		A	A	A	A	A	A	A	104	104				
17							B		104	102											A			
18							B		118	102	102	100			A	A	A	100	100	100				
19							B		100	100	100	102	102	102			102	102	102					
20						B	B		106	100	100			A	A	A		102	102	106				
21							B		124	106	102	102	102				102	100	100	104				
22							B		110	102		A	A		A	A		A	120					
23							A		100	106	102	102	102	102			102	102	102		A			
24							B		120	114		A	A		102	102	102	102	102		A			
25							B		136	100	100	100	100	100		100		104	104					
26							A		A		A	A	A		A	A	A	A	A		A	A		
27							B		100	104		A	108	106	108	108	108	104			A	A		
28							B		A		A	A			100	100	100	100						
29							B		106	100		108	110	104	102	102	102	102	102					
30							A		A		A	A		A	106	106	102	102	104		A	A		
31									102							100		106	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							1	23	26	18	16	18	14	16	16	22	23	24	14					
MED							136	106	104	102	102	100	102	100	100	102	102	102	104					
U Q								118	106	104	103	102	104	103	104	102	102	104	106					
L Q								100	102	102	100	100	100	100	100	100	100	102	104					

APR. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	96	96	90	90	86	86	B	118		110	106	100	100	96	96	92	92	88	104	88	84	B	B	96
2	B	B	B	B	B	B	B	100	136	108	104	170	94	158	164	G	138	114	108	102	102	102	B	B
3	B	B		B	B		B	160	170	170		G	136	116	90	162	190	136	116	102	100		B	B
4	B	B	B	B	B	B	B	134	142	116	106	102	102	104	114	154	144	118	100	94	98	96	B	B
5	96		B	B		B	B	134	112	102	104	88	108	104	108	100	104	102	98	94	92	96	96	96
6	B	B	B	B	B		B	124	94	124	120	122	116	122	112	106	100	96	92	94	B		B	124
7	106	94		B	88	88	128	122	118	106	104	104	108	106	140	104	150	150	126	110	104	104	94	110
8	94	84	82		B	B		96	96	144	136		156	146	176	144	150	148	132	102	96	100	100	100
9	B	90	92		B	B			G	116	104	104	146	152	126	128	126	120	108	102	96	94	94	96
10	98		B	98	110	92	92	92	98	96	108	96	90	148	136	130	168	118	108	100	98	98	98	B
11	B	B	B	B	B	B	B	120	110	124	124		G	G	G	G		94		104	106	102	96	96
12	98	98	90		B	B	B	126	120	102	90	102	104	162	140	140	130	118	104	102	100	102	96	84
13	82	96	94	94		B	B	124	124	112	96	100	100	96		158	G	G	156	114	104	106	98	148
14	B	82		B	C	B	B	116	110	110	104	102	102	154	154	134	126	124	112	102	98	98	102	100
15	100	96	96	96	94		B	94	94	104	106	104	100	98	94	162	92	92	144	116	94	108	98	98
16	94	118	104	100	90	96		120	106	96	94	98	92	92	88	88	84	84	84	82	82	82	98	104
17	B	B	B	B	B	B	B	152	126	108	106	96	96	154	96	156	158	140	112	102	102	98	98	98
18	98		B	108	94	94	98		G	142	110	110		158	104	154	170	154	88	130	80	100	98	94
19	94	98	94	116	94	104	132	124	120	110	106	152	138	162	158	158		G	G	112	100	98	110	100
20	94	94		94	92		B	132	118	118	106		96	94	156	96	160	138	124	114	110	102	98	94
21	94	92	94	94		132		130	118	96	100	140	128	96	96	90	90	90	126	104	104	104	100	96
22	92	90	94	96	92	92	128	126	90	112	162	160	156	154	96	94		G	124	104	82	B	B	98
23	96	94	94	92	92	92	92	134	118	108	106	104	130	116	120	138		G	G	190	98	94	100	100
24	98	98	92	92	92	94	96	128	114	114	108	104	106	104	98	98	100		G	108	96	92	92	92
25	108	90	90	90	88	88	120	104	104	104	104	92	92	152	160	106	102	100	96	94	90	96	96	96
26	96	96	94	94	94	90	124	118	122	102	94	92	92	106	90	106	106	112	120	100	98	98	98	B
27	B	82	82		B	B		122	126	130		116		G	G	154	156		G	G	108	96	84	84
28	90		B	B			92	92	96	116	106	104	102	96	96	130	140	114	170	154	126	108	100	100
29	104	94	94	92	92	86	112	108	108	100	160	98	158	148	148	120	114	114	102	102	98	98	98	96
30	100	92	86	86	92		B	114	108	108	100	100	98	94	94	94	96	96	128	108	96	102	96	96
31																								
CNT	21	20	20	19	17	17	17	28	29	28	27	26	28	28	29	26	25	25	30	30	28	27	24	22
MED	96	94	94	94	92	94	116	122	114	106	104	101	107	131	114	126	118	114	108	98	99	98	98	96
U Q	99	96	94	96	94	97	124	129	124	110	108	122	142	154	151	156	146	127	114	102	102	100	100	98
L Q	94	90	90	90	91	90	96	109	106	102	100	96	96	104	96	98	98	101	102	94	94	94	96	94

APR. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D	00	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	F1	F2	F1	F1	F1		CQ31		C3	C2	C2	C2	C2	L2	L3	L2	L3	CL13	L2	F1			F2	
2								L1	H2	C1	C2	H1	LC11	H1	HL11		H1	C2	CL82	C2	FF31	F1			
3			F1			F1		HC21	H1	H1			HC11	C1	L2	H1	H1	HL21	CL24	LL21	FF21				
4								HL31	HL21	C1	C1	C1	C1	C2	C2	H1	H1	C4	C6	C9	FQ41	F2			
5	F4			F4				H1	CQ11	CQ11	CQ11	LH11	CH11	C3	C1	C4	C1	C1	L3	L5	F9	F3	FQ21	F1	
6					F1			CL21	LC11	CL11	CL11	CL11	CL11	CL11	C1	C1	C3	L3	L4	L1		F3		F4	
7	F2	F1		F1	F1	F5	C1	C4	C3	C3	CQ21	C2	CH21	H1	C1	H1	H1	CL23	CL51	C8	FF52	FQ31	FF15	FQ21	
8	FQ21	F1	F1			F1	L1	HC21	H1			H1	H1	H1	H1	HL11	H1	H1	CQ31	L6	F3	F1	F1		
9		F1	F1					C2	C2	C11	CQ11	HL11	HL11	C1	C1	C1	C2	C4	C8	C6	F4	F3	F2		
10	F2		F2	F1	F3	F2	L3	LQ21	LQ11	CQ11	LQ11	LQ11	H1	HL11	H1	H1	C1	C2	C5	L8	F1	F3			
11								C2	C2	C1	C1						L2		C3	C4	F3	F1	F3	F4	
12	FQ21	FQ31	FQ31		F1			C2	C1	C2	LC12	C2	C2	H1	H1	H1	H2	C1	C6	C2	F3	F3	F2	F3	
13	F2	F4	F4	F2		K1	C1	C1	CQ11	LQ11	LQ11	L1	L1					H1	C2	C1	F1	F1	F1		
14		F1					C1	C4	C2	C4	C3	C2	H1	H1	H2	C1	C2	C3	C7	L9	FQ31	FQ31	FF32	FQ31	
15	FQ31	FQ31	FQ31	FQ11	F1		F1	L2	CQ21	CQ11	CQ11	CQ11	LQ21	LQ21	HL11	L2	L1	HL11	CL21	LQ31	FF11	F5	F2		
16	FF11	F2	F1	F1	F5	F1	H1	C2	C2	L3	L4	L1	L2	L3	L4	L2	L2	L3	L2	L1	F1	F1	FF21	FQ21	
17								HC11	C1	C2	C1	L1	L1	HC11	H1	HL11	H1	H1	C1	C1	F1	F3	F2	F2	
18	F1		F1	F1	F7	F2		H1	C1	C1			H1	C1	HL11	HL11	H1	L1	HL21	L1	F4	F9	F2	F4	
19	F2	F4	F2	FF13	FQ51	F1	H2	CL41	C1	C1	C2	H1	H1	HL11	HL11	HL11		C3	C8	F5	FQ21	FQ21	F2		
20	F1	F1		F1	F2	K1	H1	C2	C2	C2		L1	L1	HL11	LL11	HL11	H1	C1	CL11	CL11	F31	FQ21	FQ21	FQ21	
21	FQ31	F5	F1	F4		F1		H1	C1	LQ11	LH11	HC11	HC11	L1	L1	L2	L2	L1	C1	L8	FF12	FF12	FQ21	FFQ21	
22	FFQ21	F3	F2	F1	F3	F1	C1	C2	LC11	CQ21	HC11	H1	HC11	H1	L1	L1		C1	C1	L2			F7	F3	
23	F5	F3	F4	F5	FQ61	FQ71	L5	HL21	CL11	CL21	C2	C1	HC11	CL11	CL11	HL11			H1	L3	FQ41	FQ51	FQ41	FQ61	
24	FQ21	F7	FQ51	FQ31	F4	F1	L1	C1	C2	C2	C2	C1	C1	L1	L3	C3		C2	L3	F4	F6	F4	FQ31		
25	FFQ11	F2	F1	F2	F3	F1	C1	C2	C2	C1	C1	L1	L2	HL11	HL11	C1	CQ31	CQ31	L5	L5	F5	FFQ24	FQ41	FQ21	
26	FQ31	F3	F2	F1	F1	F2	CL21	C2	CQ11	CH11	L1	L1	L1	CL11	L1	C1	C1	CQ11	C3	L4	FQ31	FQ31	FQ31		
27		F1	F1				CL21	CL11	H1		C1			H1	H1				CL22	CL43	F3	F4	FF52	F1	
28	F2			F1	F1	F1	C2	C3	C3	CQ21	LQ11	LQ11	HL11	H1	C1	H1	H1	C2	C4	L6	F7	F5	FQ31	FQ11	
29	FQ11	FQ21	F2	F1	F2	F1	C1	C3	C2	C1	HC11	L1	HL11	H2	H2	C2	C4	CQ21	CQ81	CQ61	FQ31	FQ31	FQ31	F2	
30	F1	F1	F2	F1	F2		C5	C4	CQ21	CQ11	CQ11	L1	L1	L1	L1	L1	LH11	CL11	C2	L3	FQ31	FQ31	F1	F2	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

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

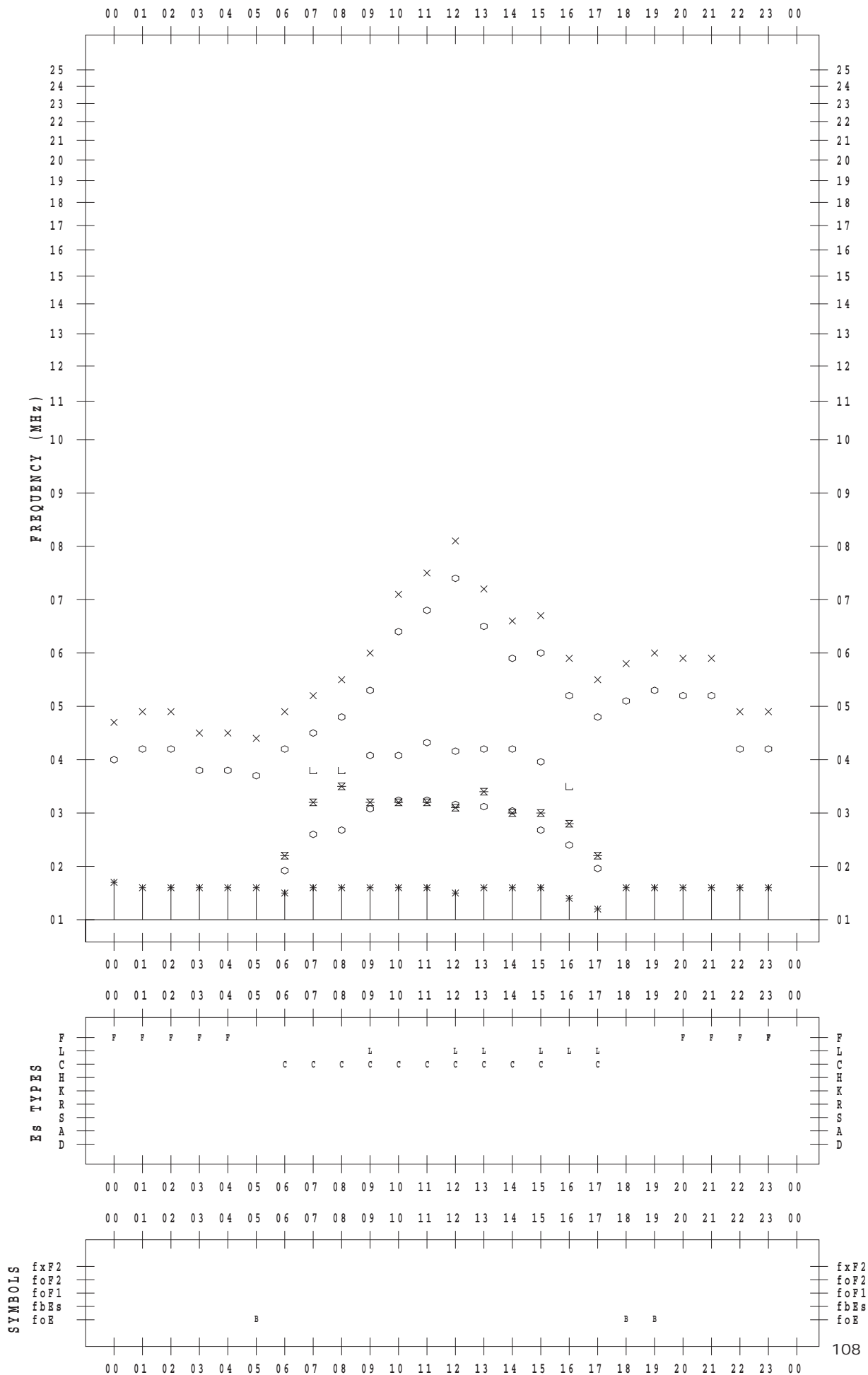
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 1

135 ° E MEAN TIME



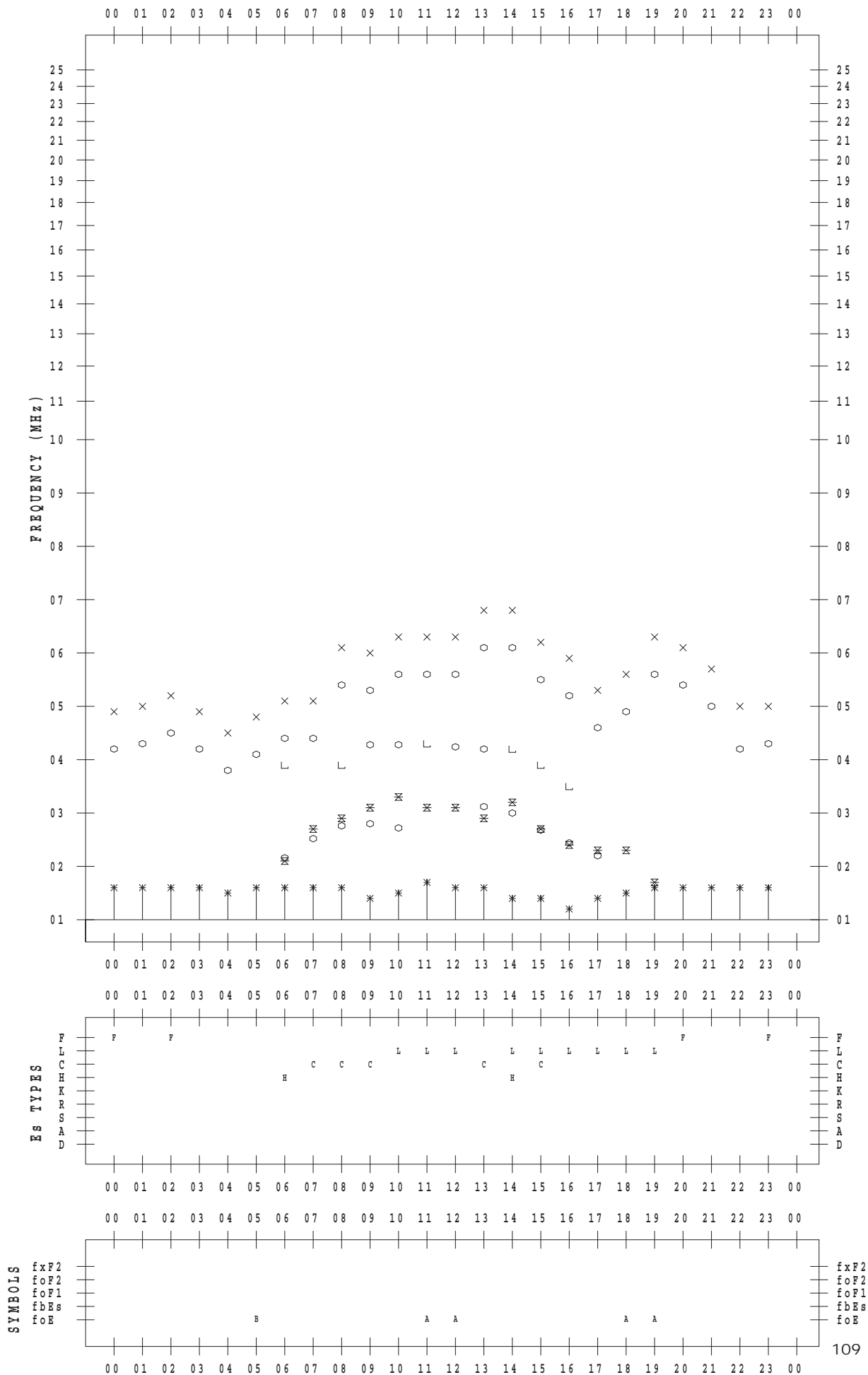
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 2

135 ° E MEAN TIME



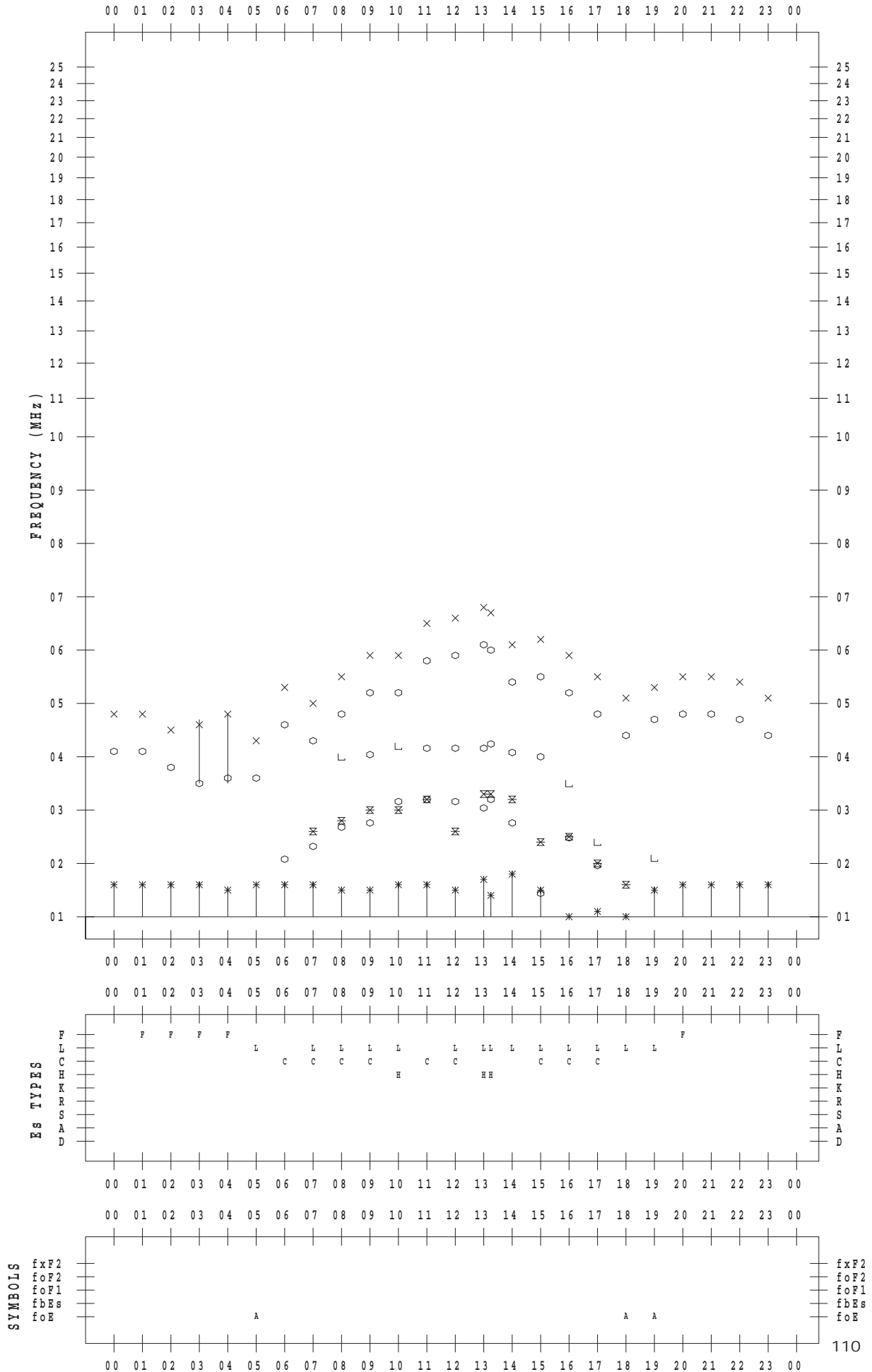
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 3

135 ° E MEAN TIME



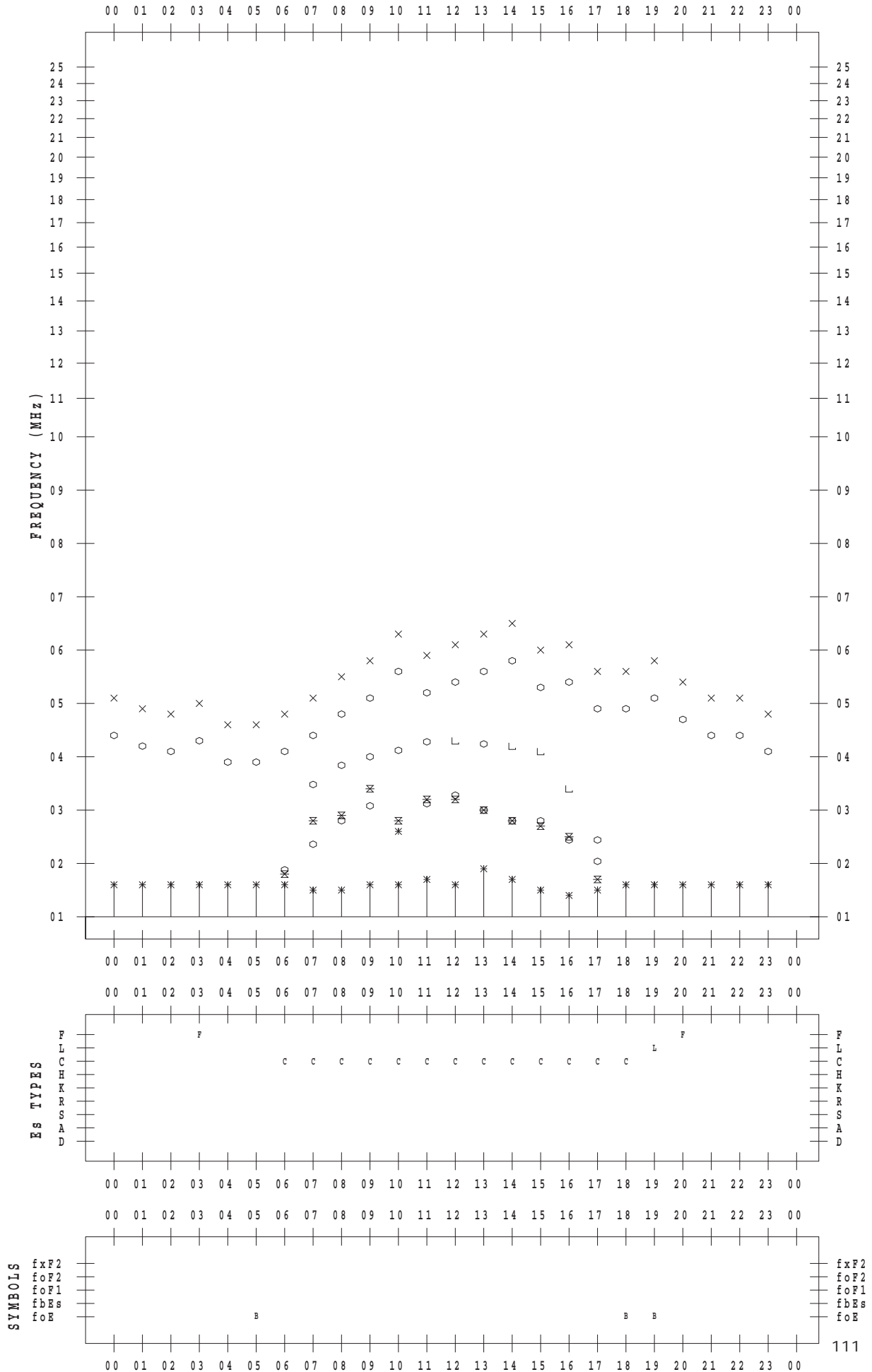
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 4

135 ° E MEAN TIME



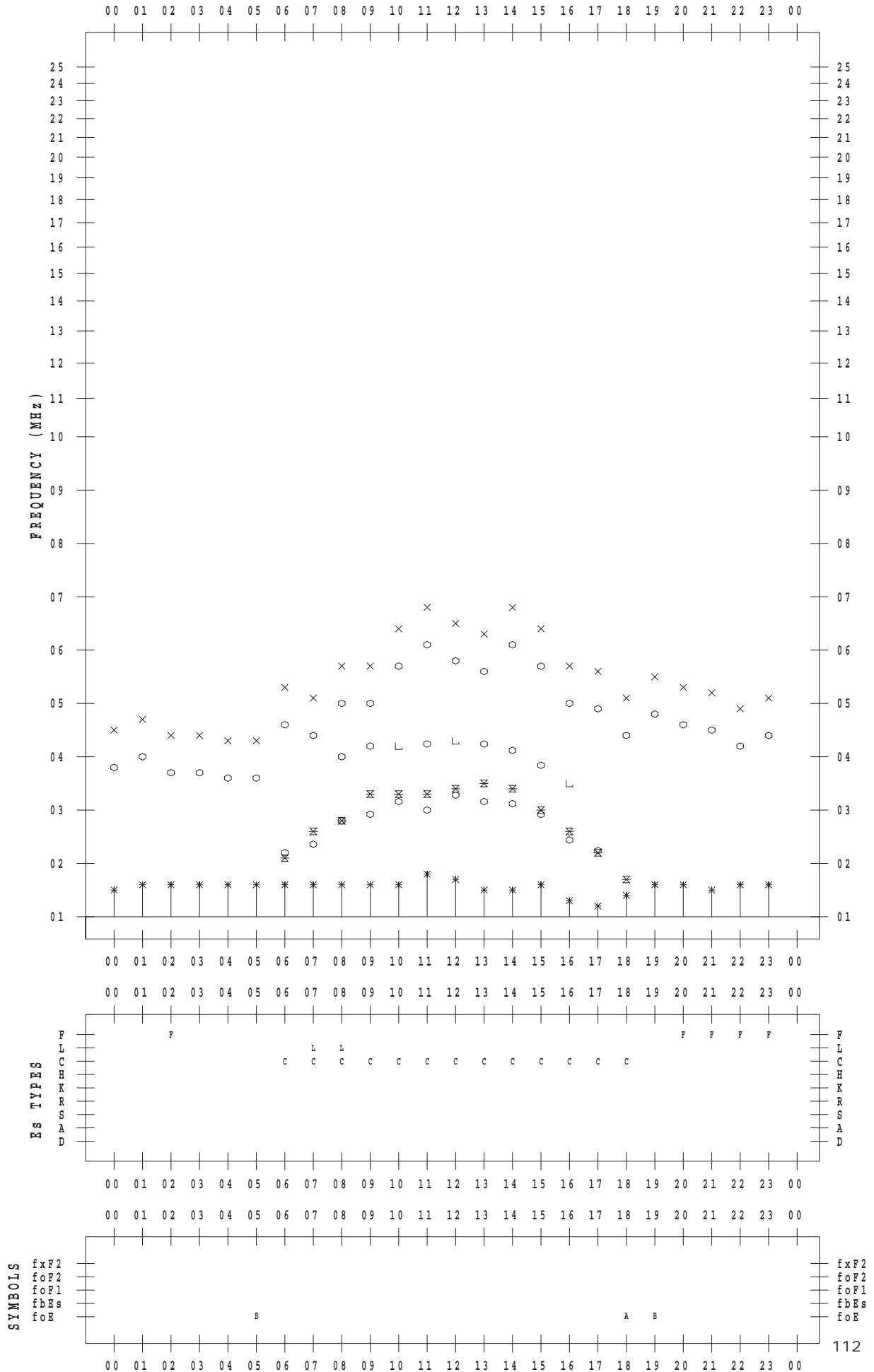
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 5

135 ° E MEAN TIME



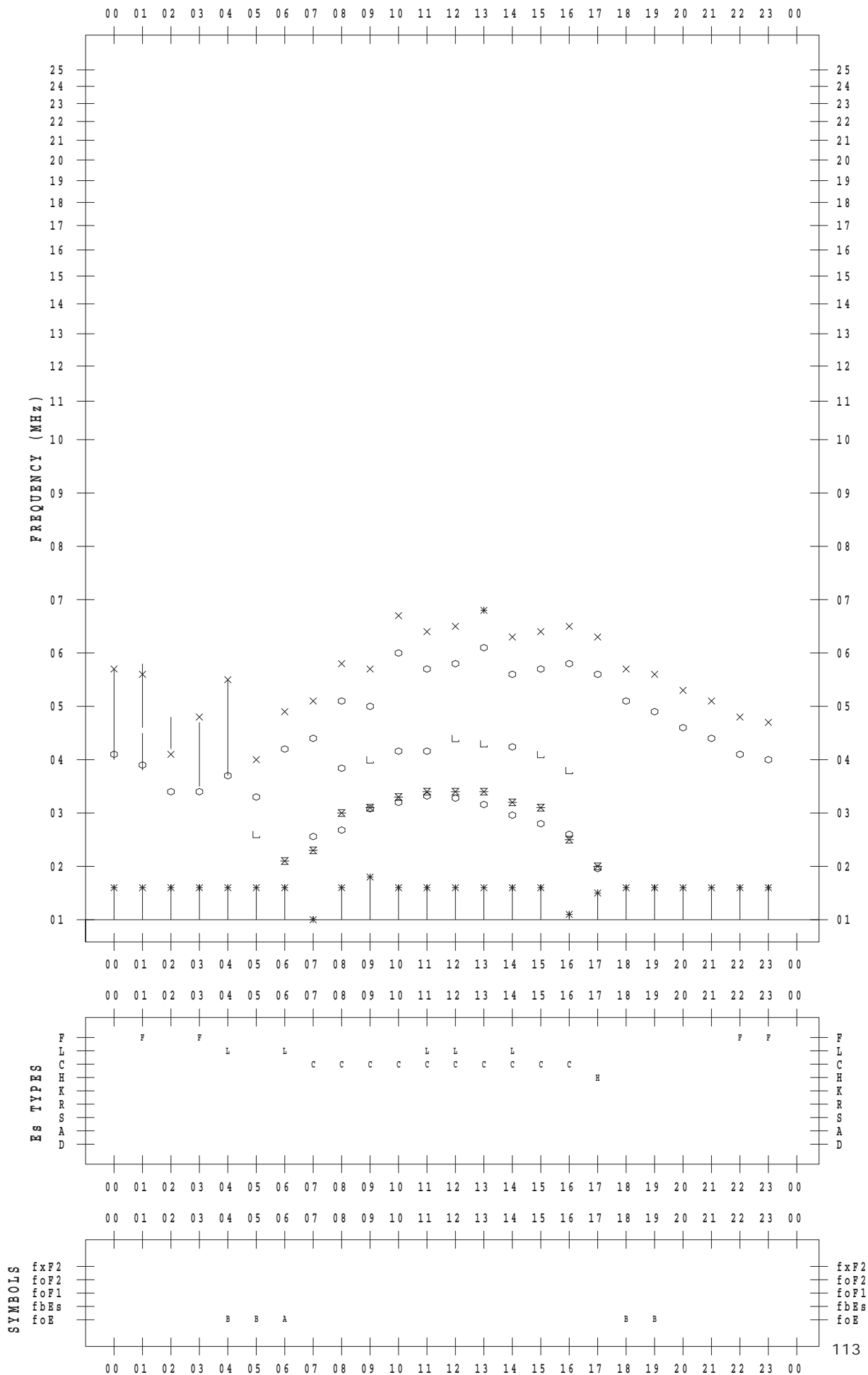
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 6

135 ° E MEAN TIME



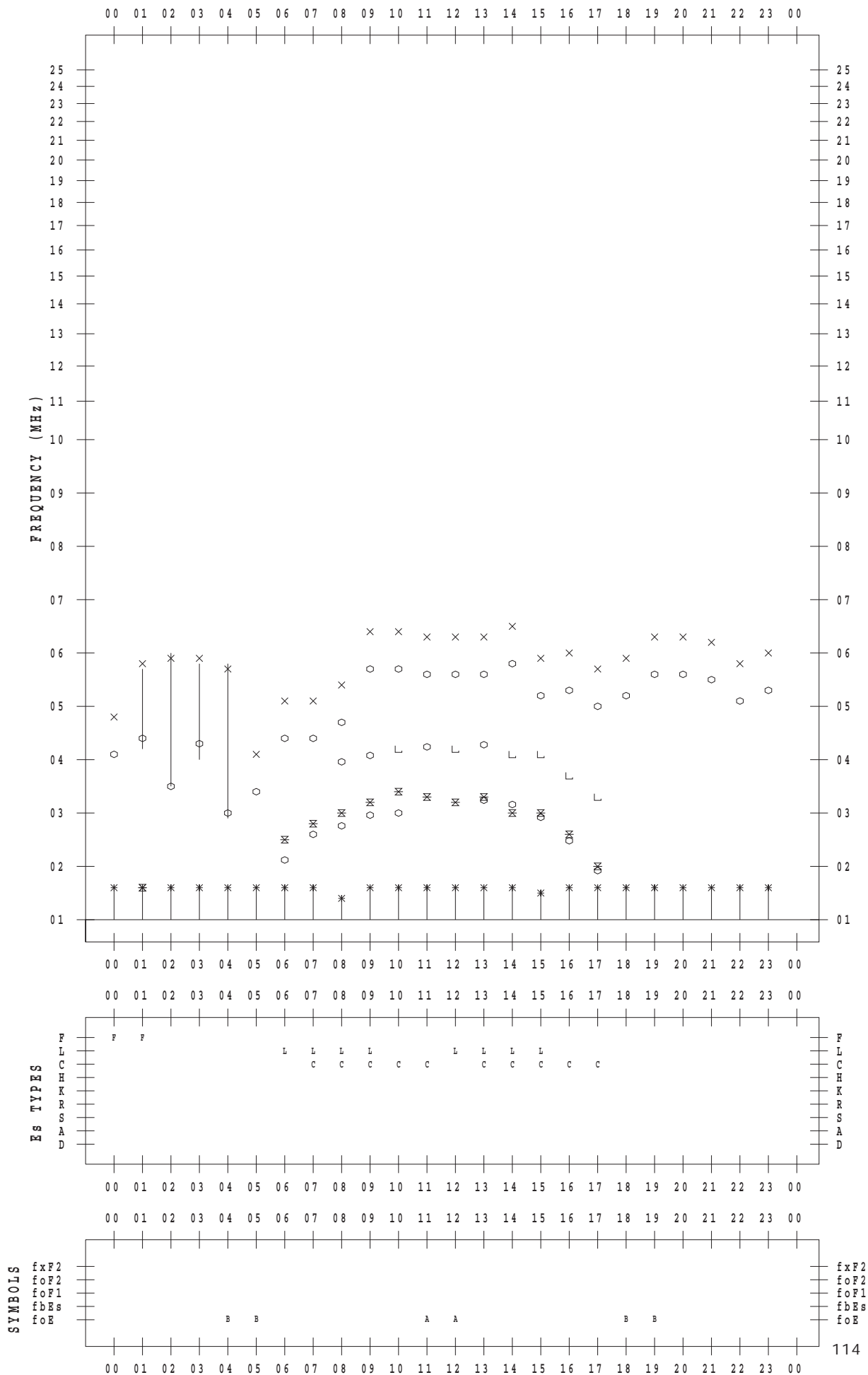
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 7

135 ° E MEAN TIME



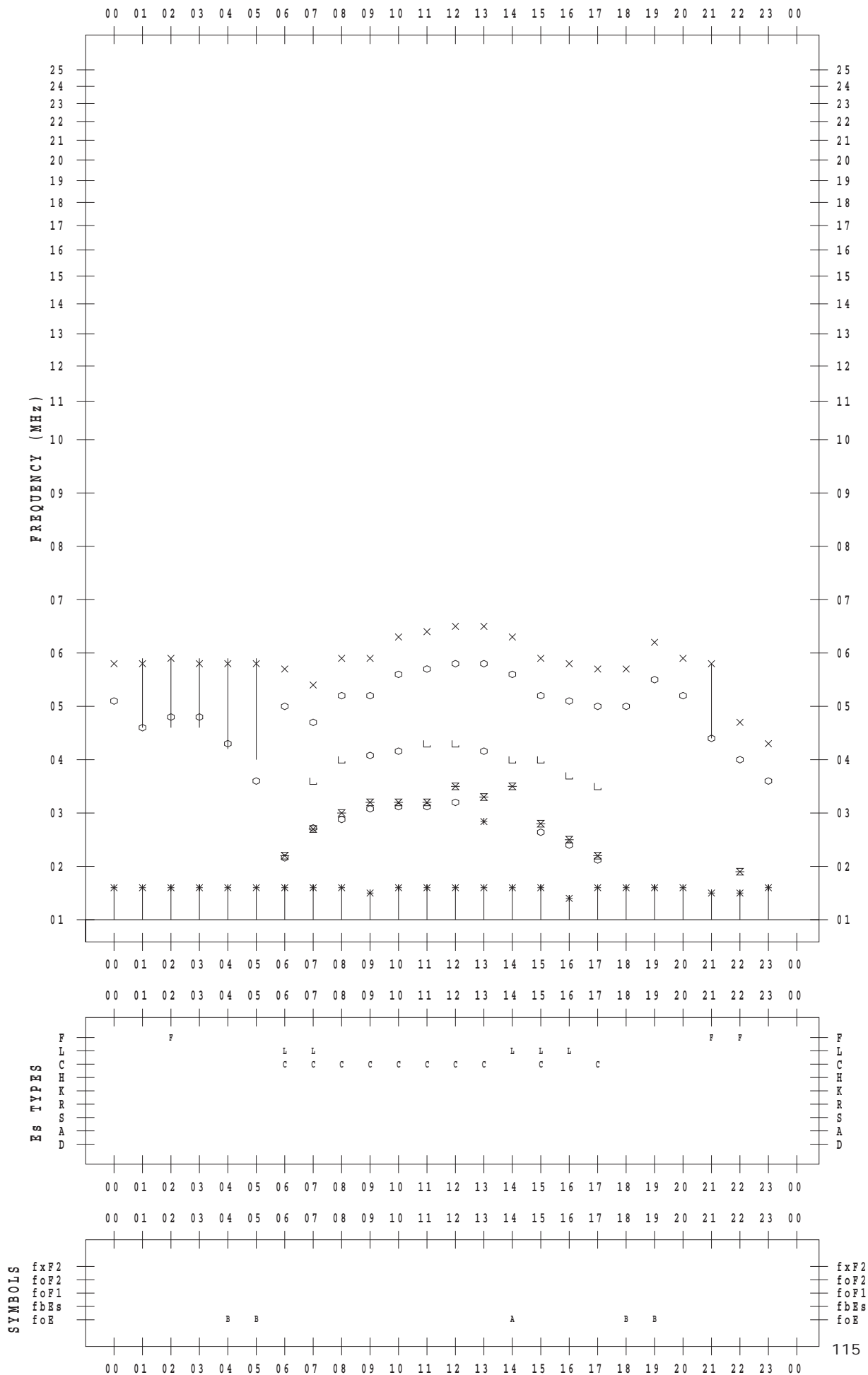
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 8

135 ° E MEAN TIME



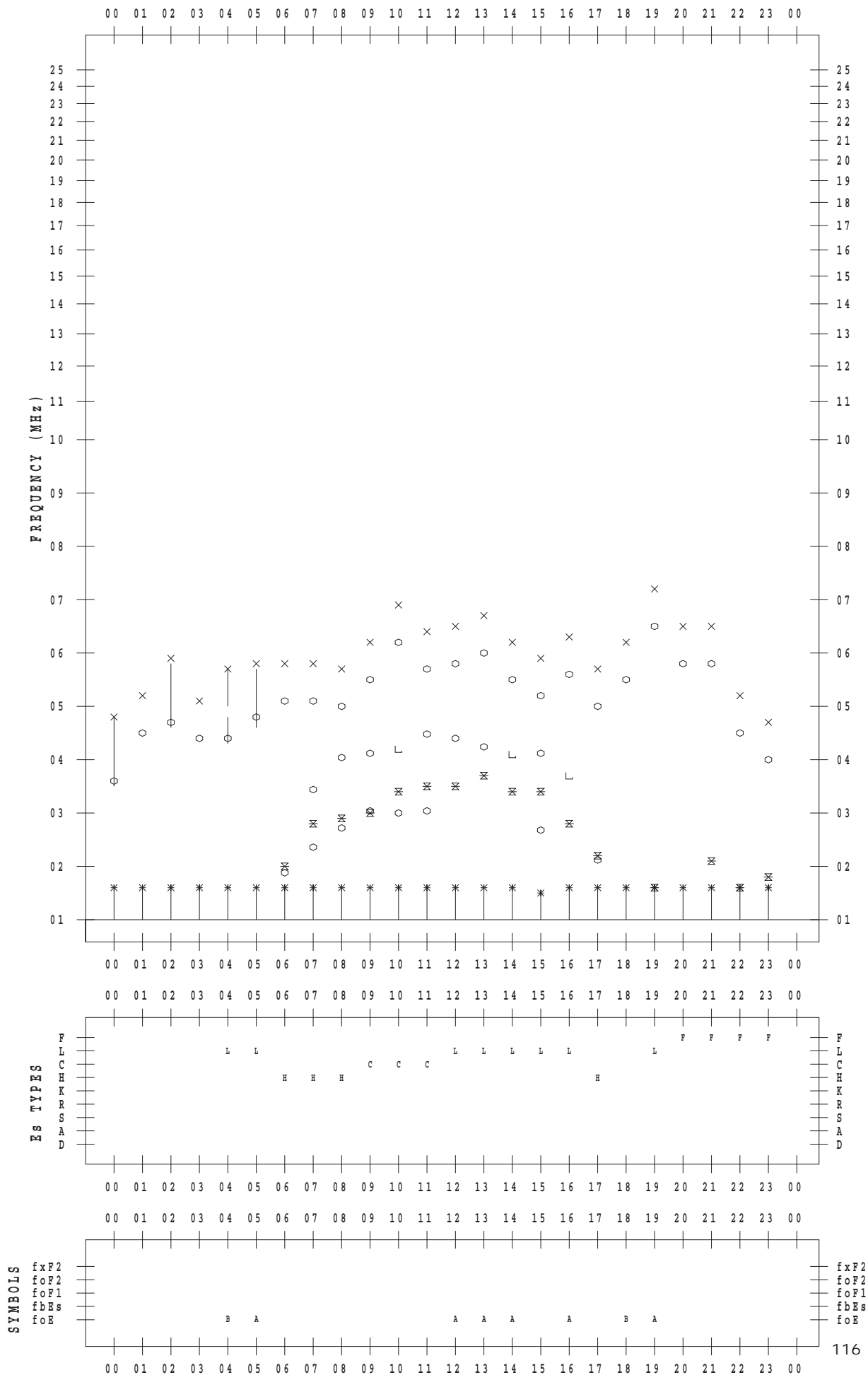
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 9

135 ° E MEAN TIME



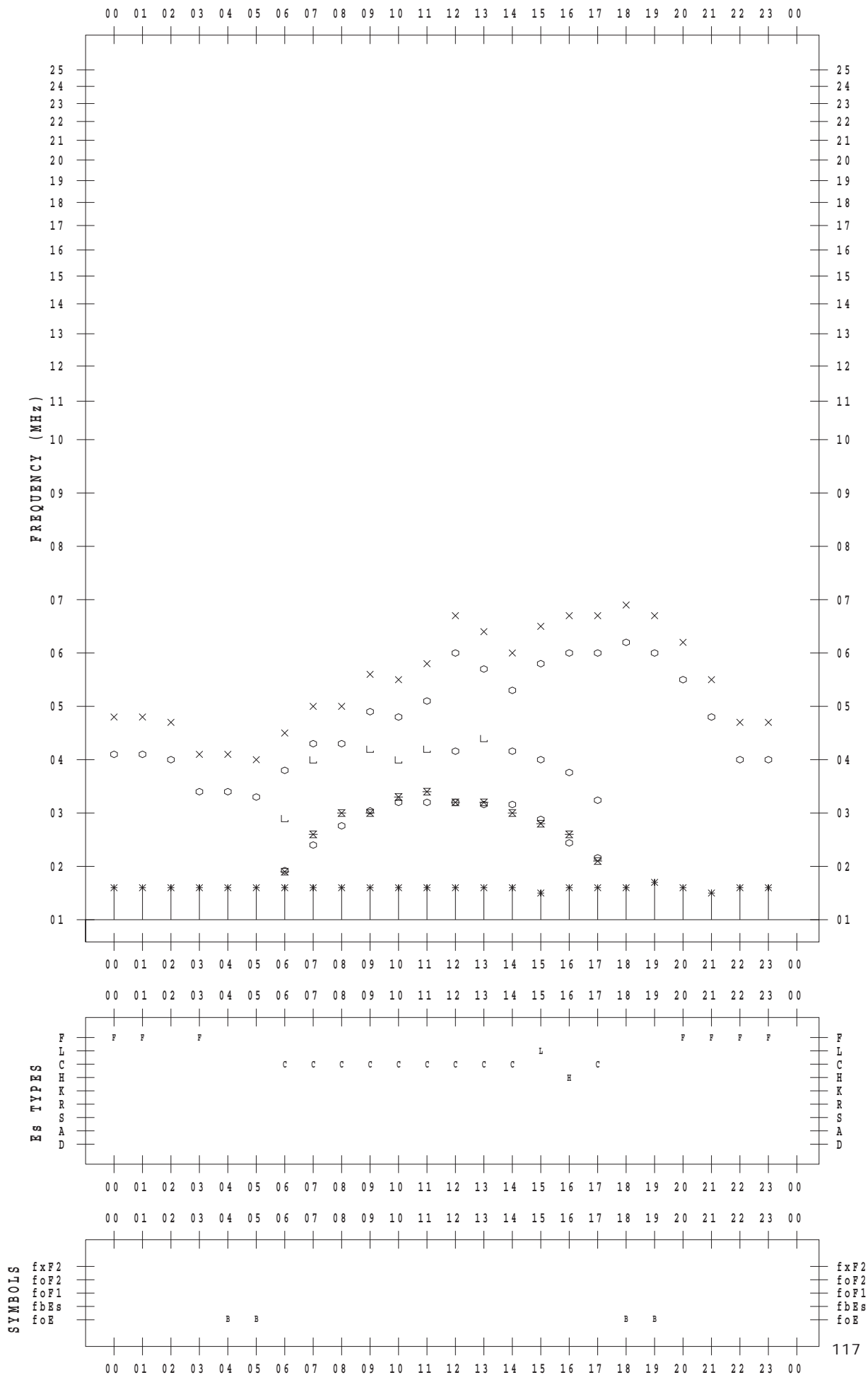
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 10

135 ° E MEAN TIME



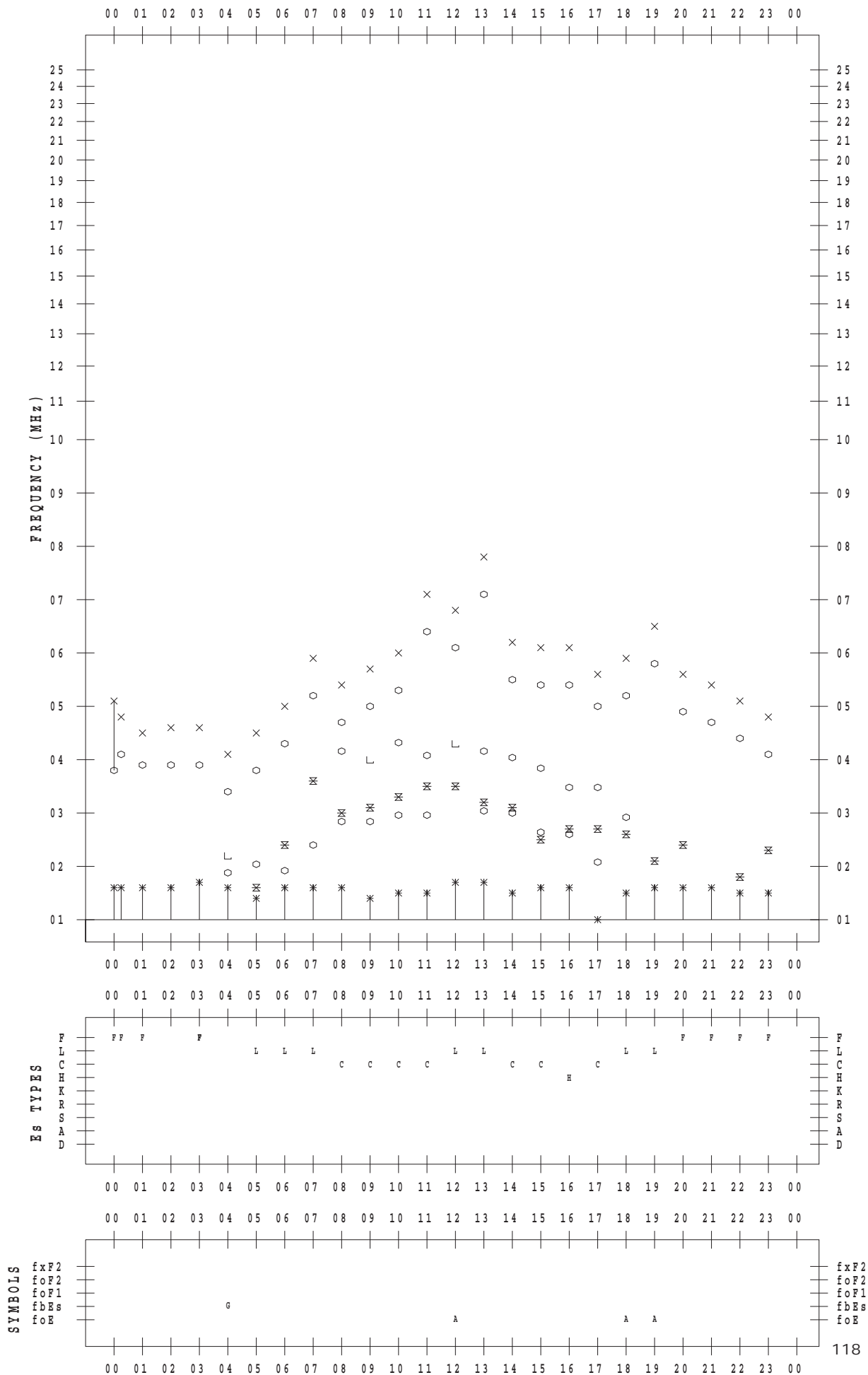
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 11

135 ° E MEAN TIME



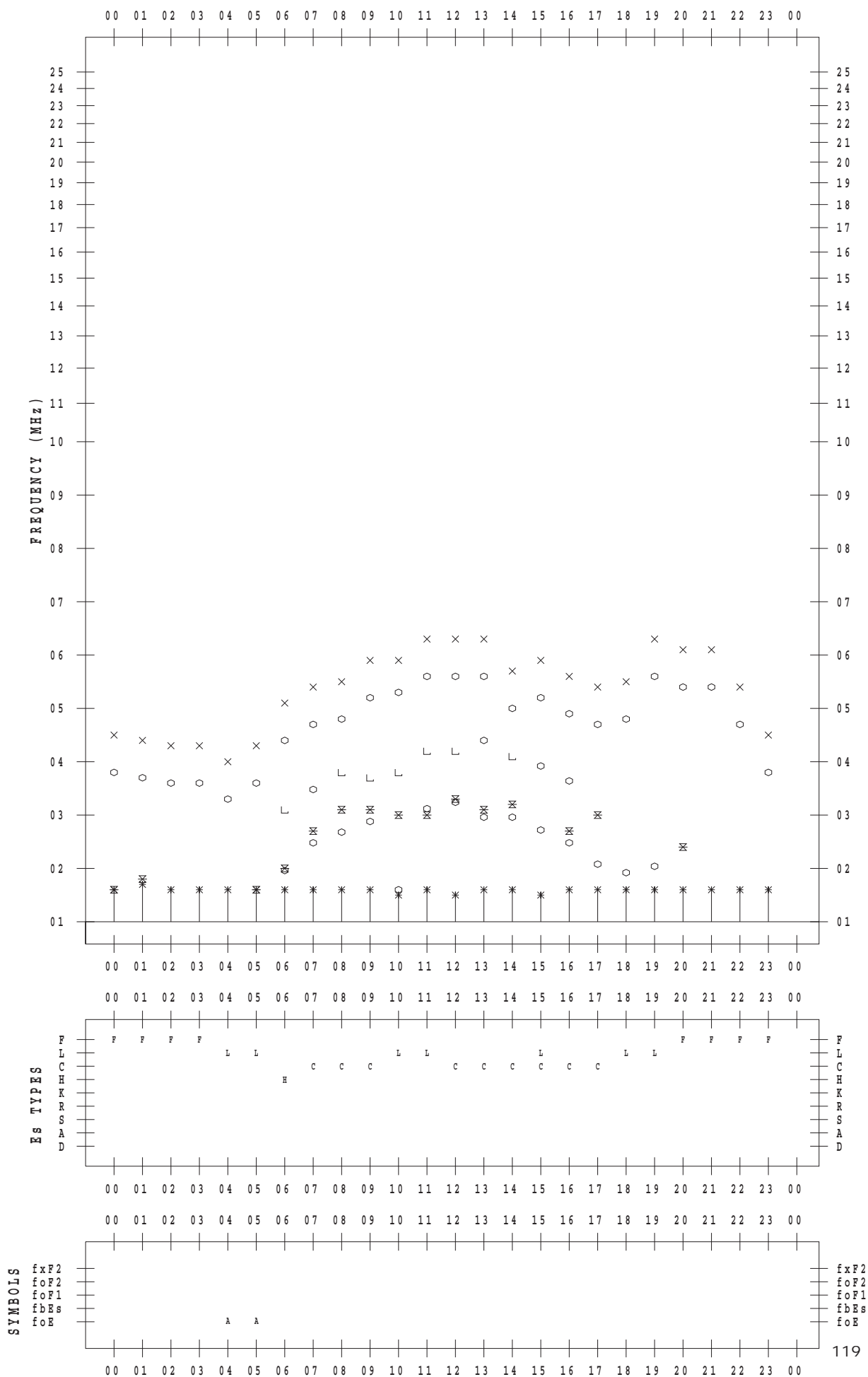
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 12

135 ° E MEAN TIME



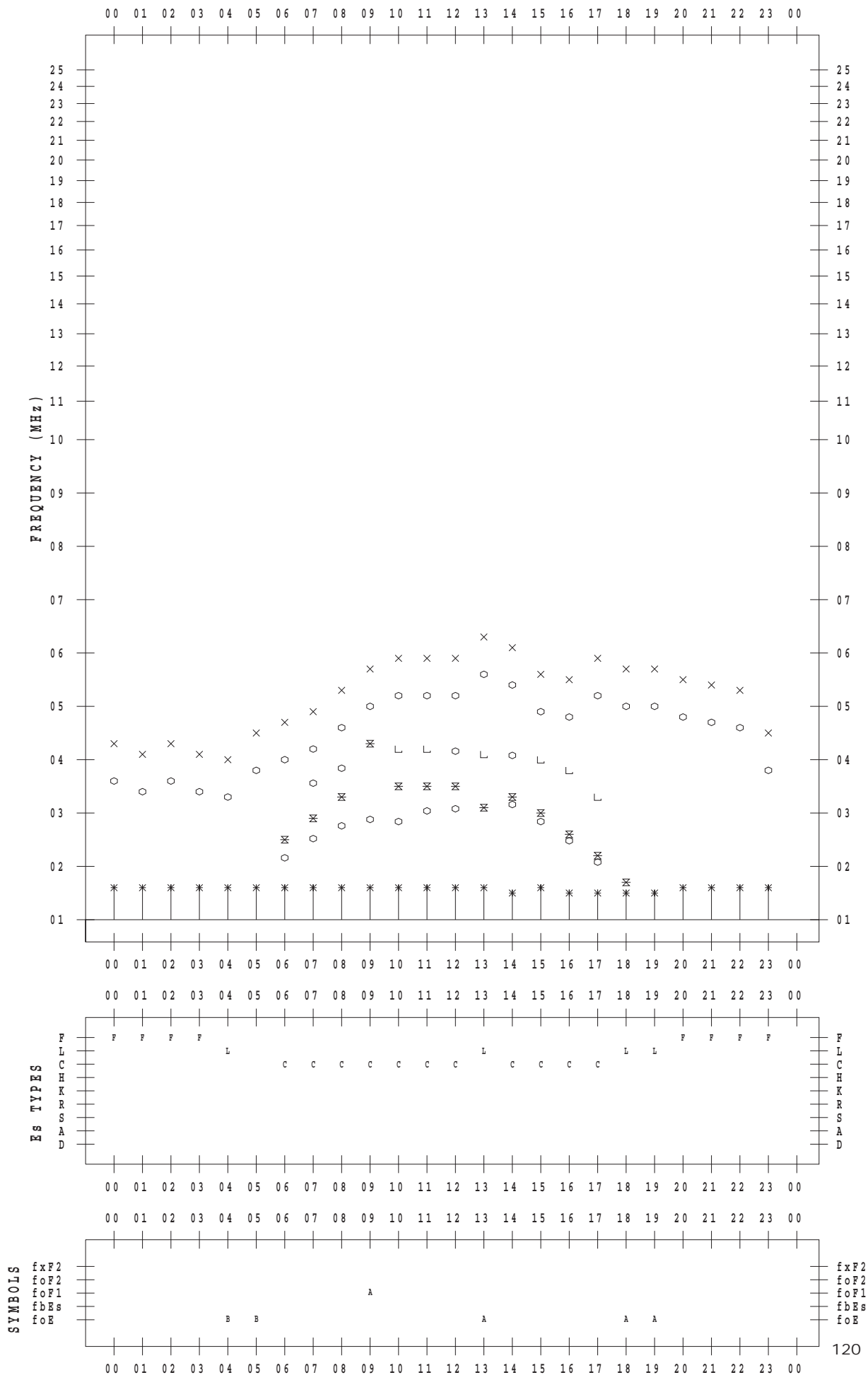
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 13

135 ° E MEAN TIME



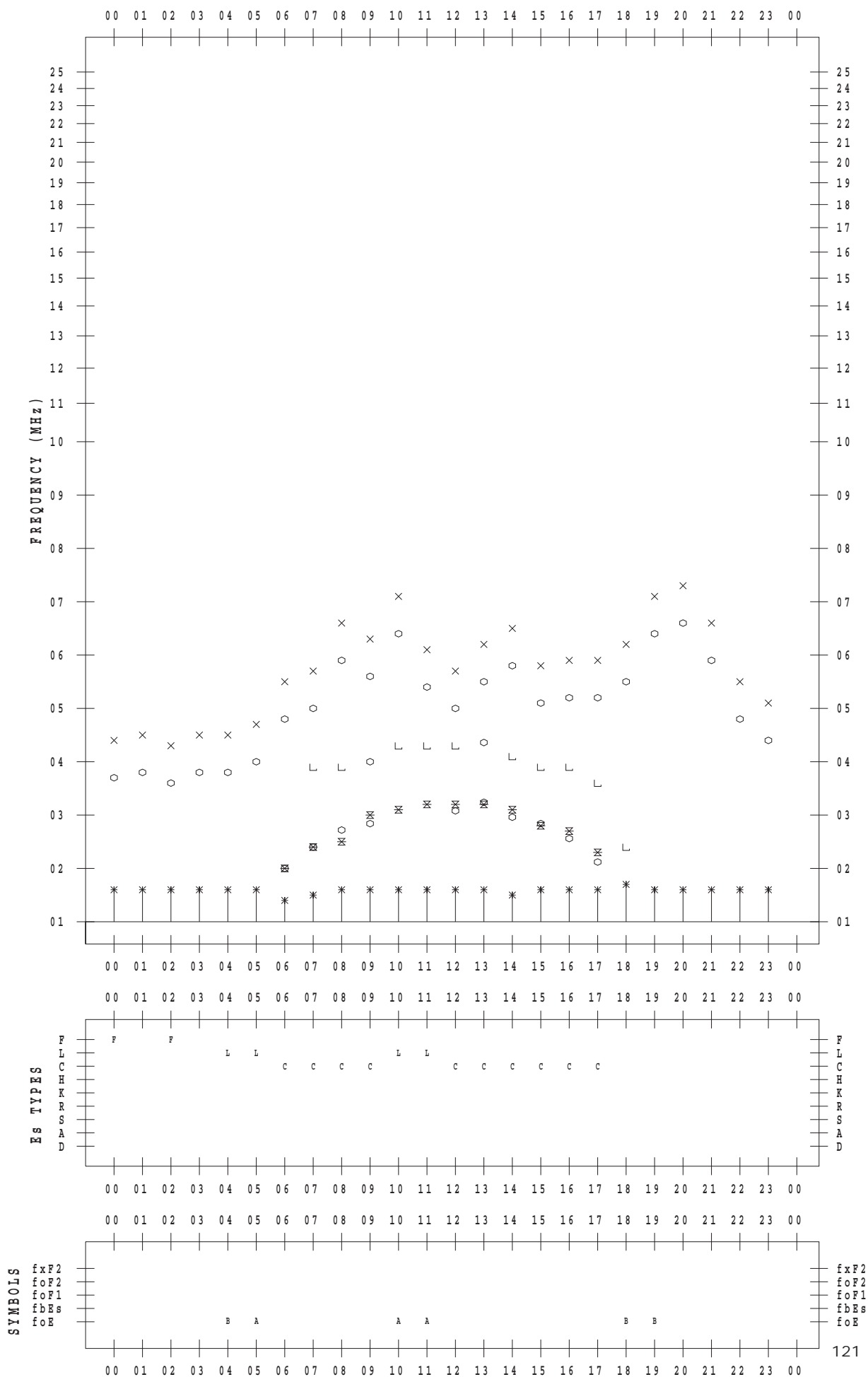
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 14

135 ° E MEAN TIME



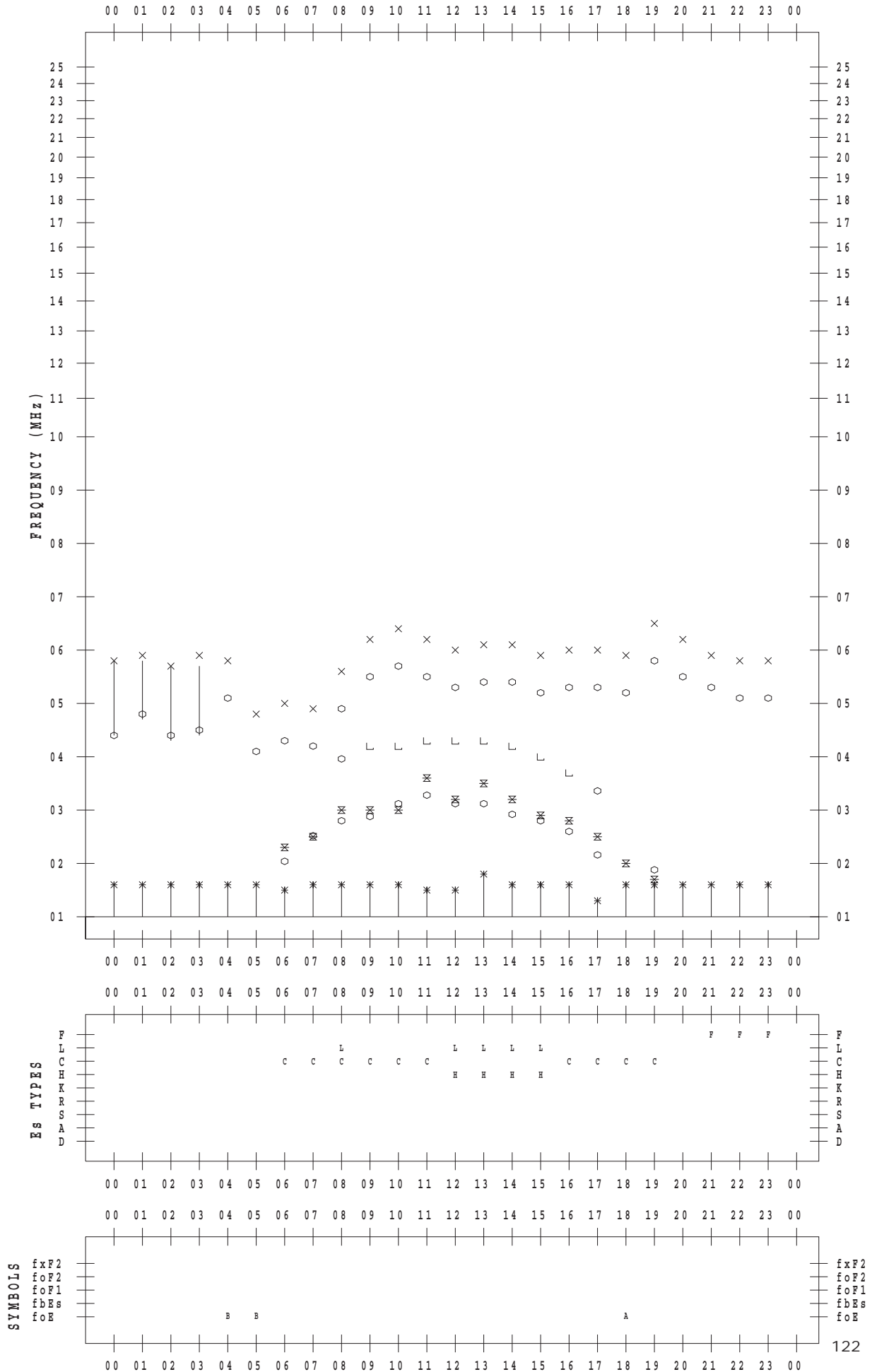
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 15

135 ° E MEAN TIME



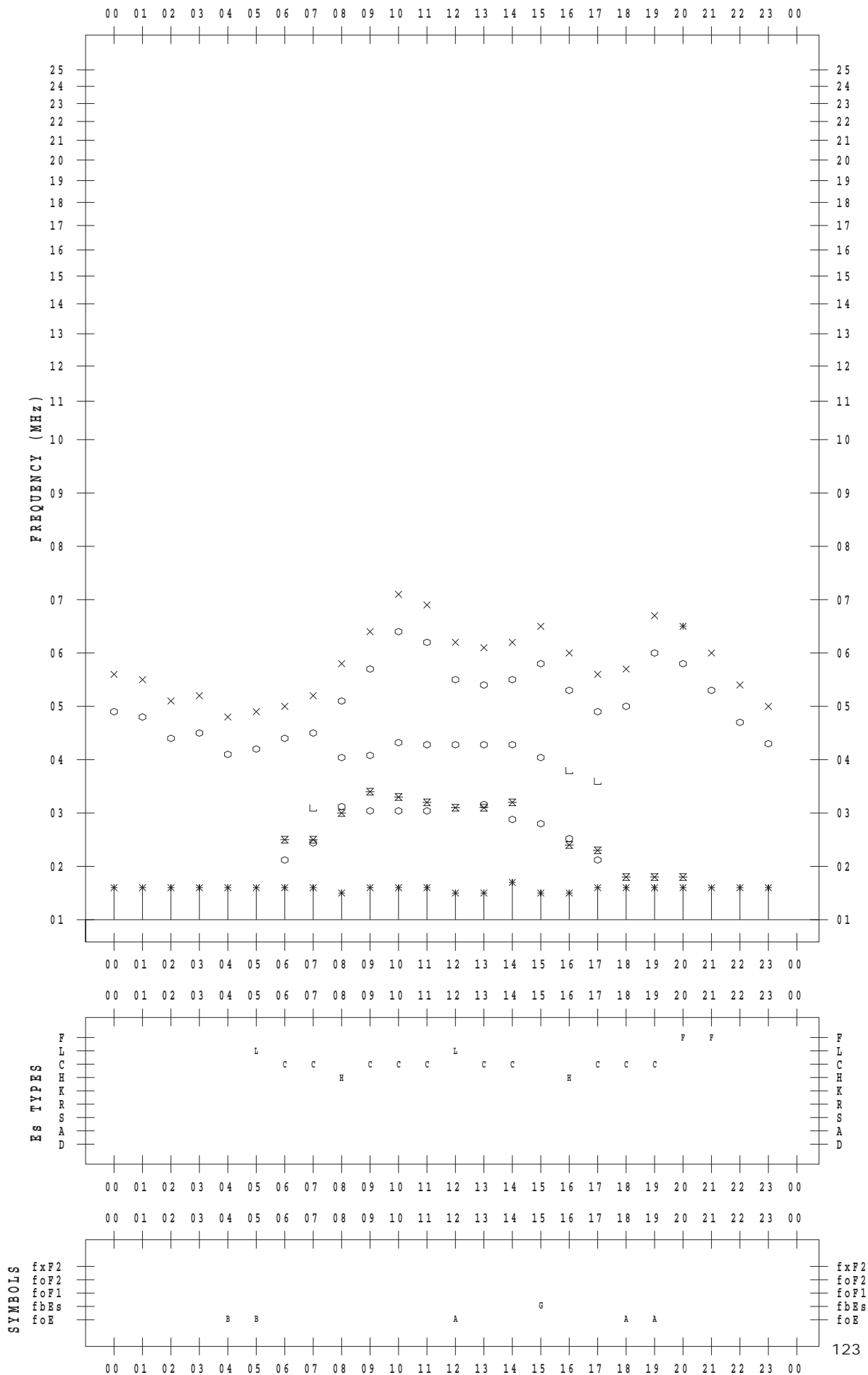
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 16

135 ° E MEAN TIME



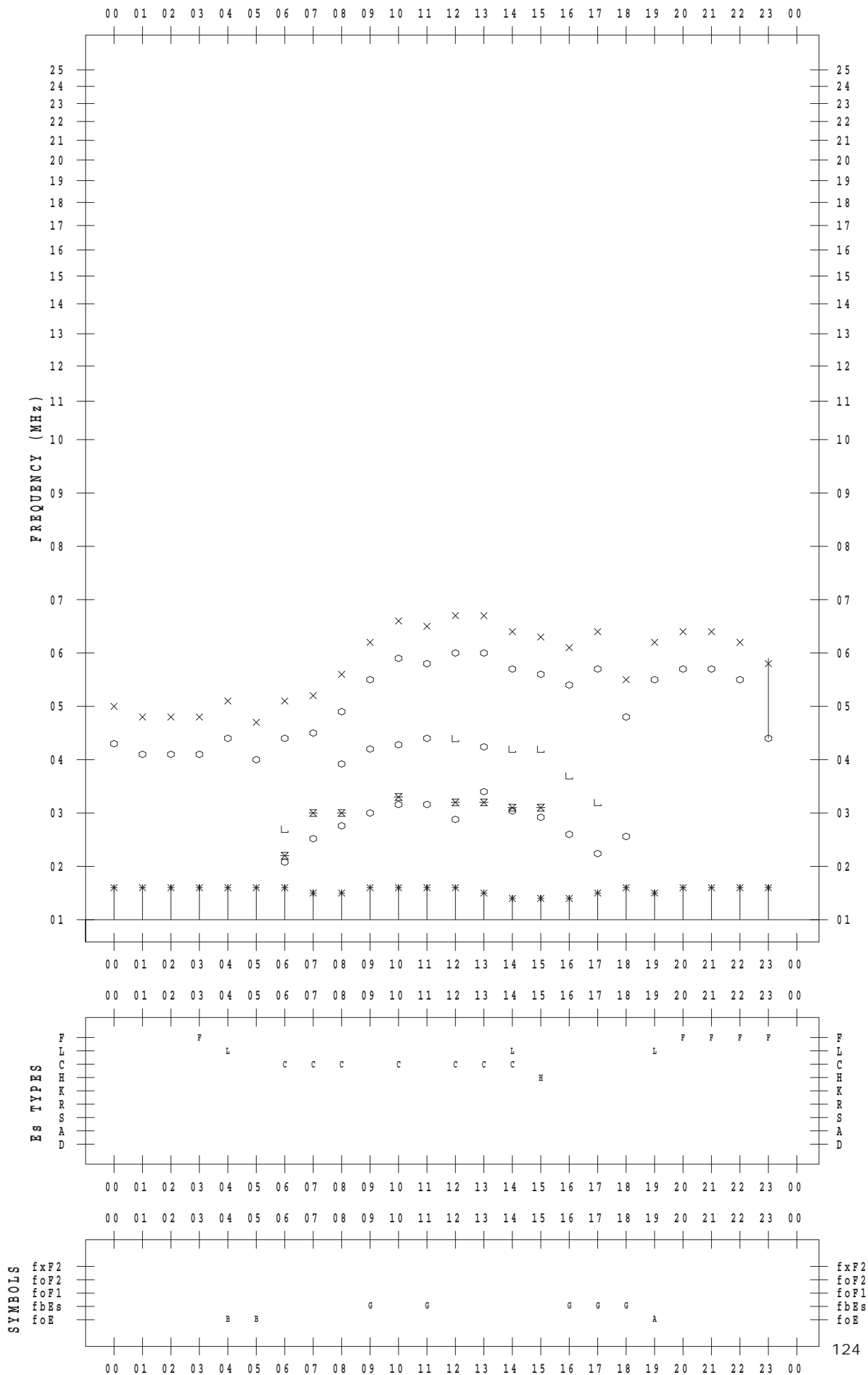
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 17

135 ° E MEAN TIME



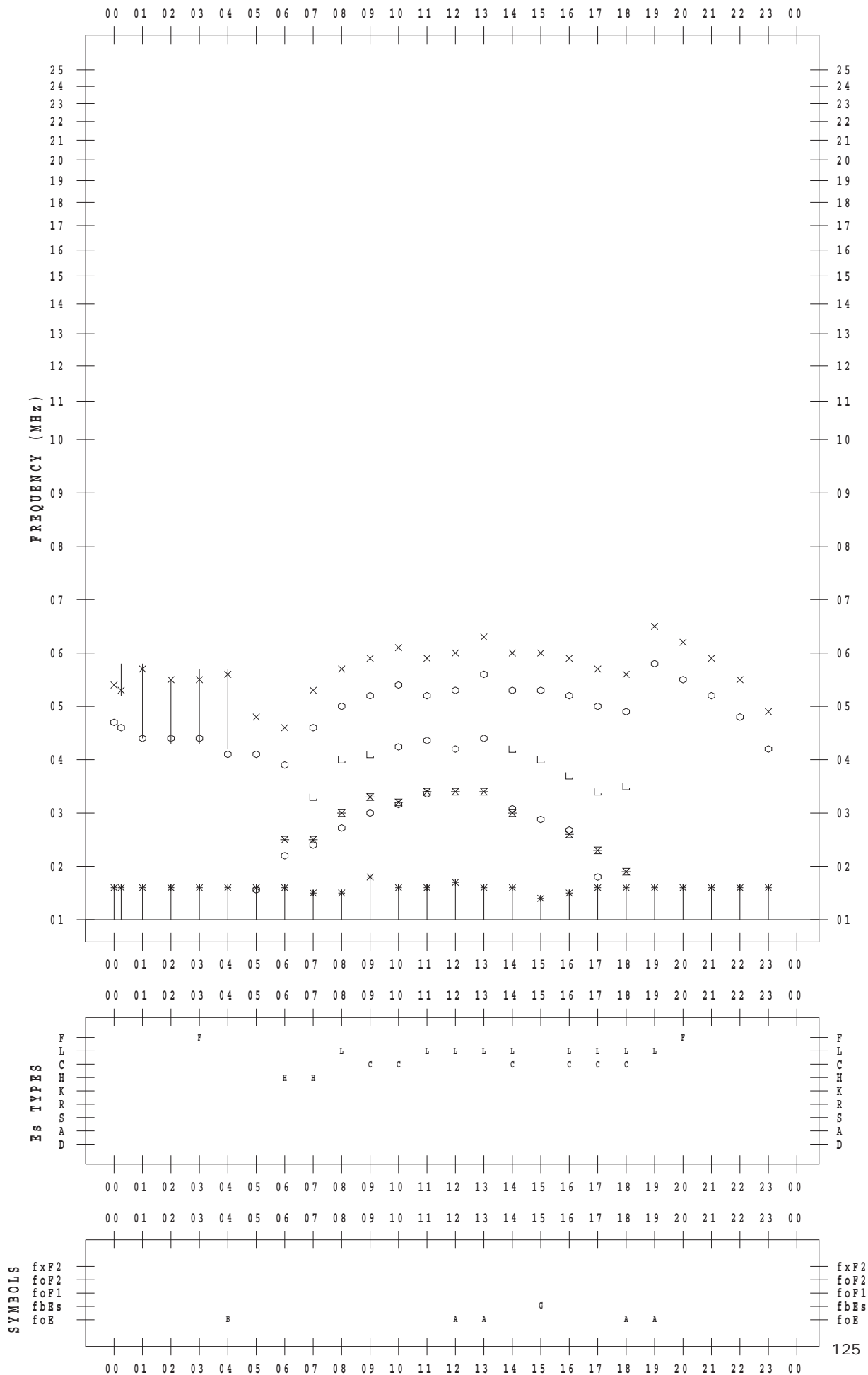
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 18

135 ° E MEAN TIME



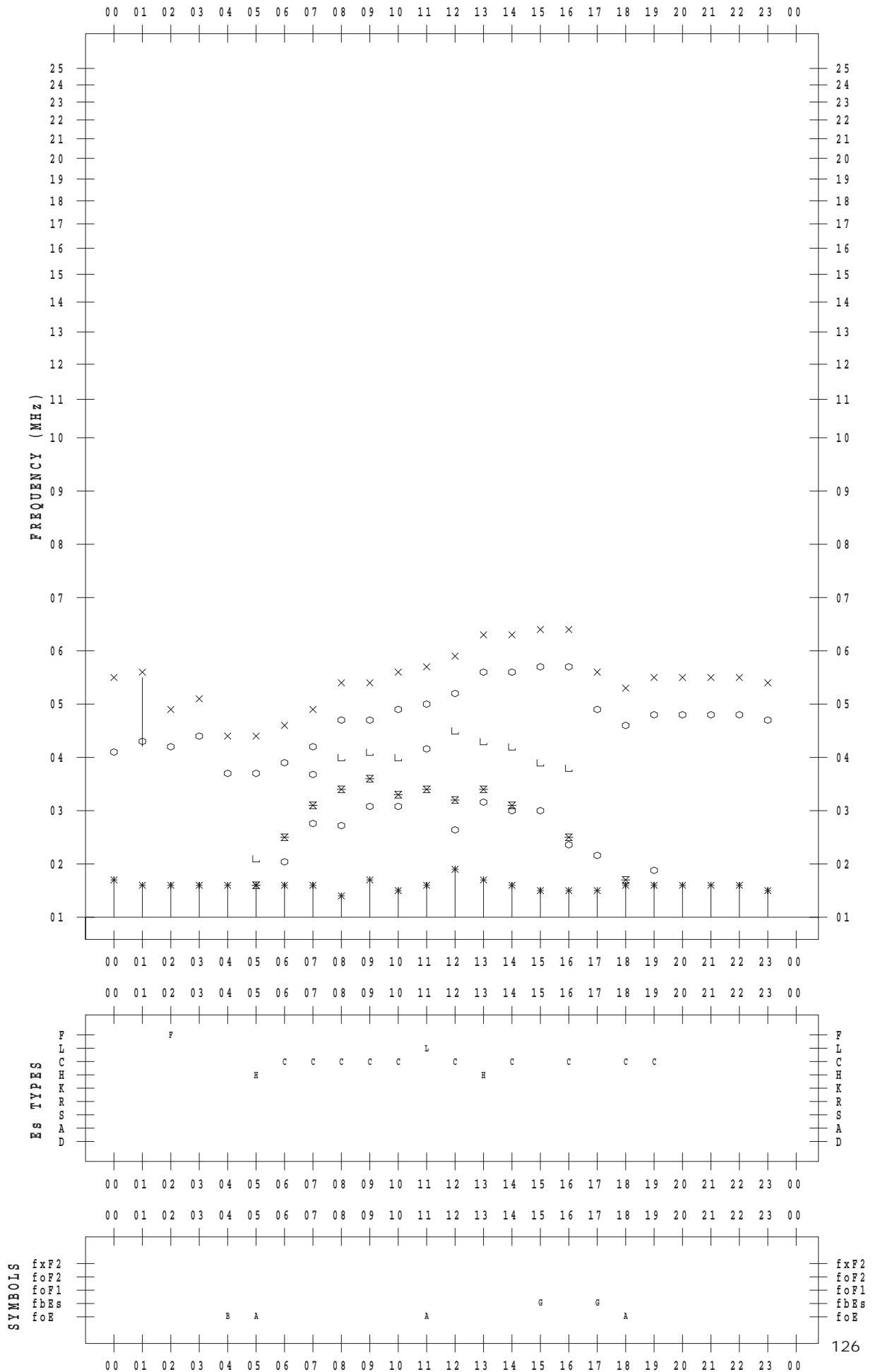
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 19

135 ° E MEAN TIME



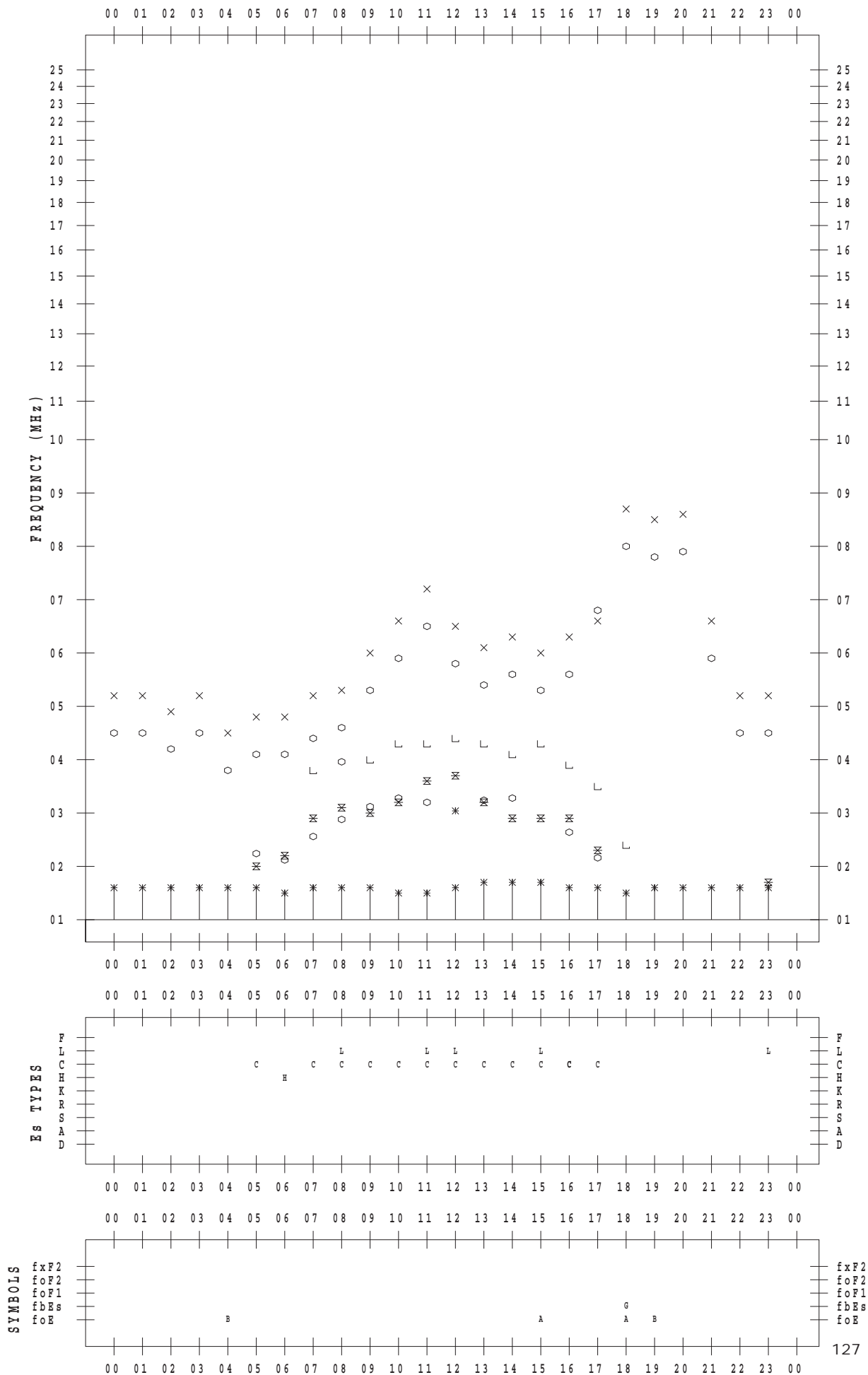
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 20

135 ° E MEAN TIME



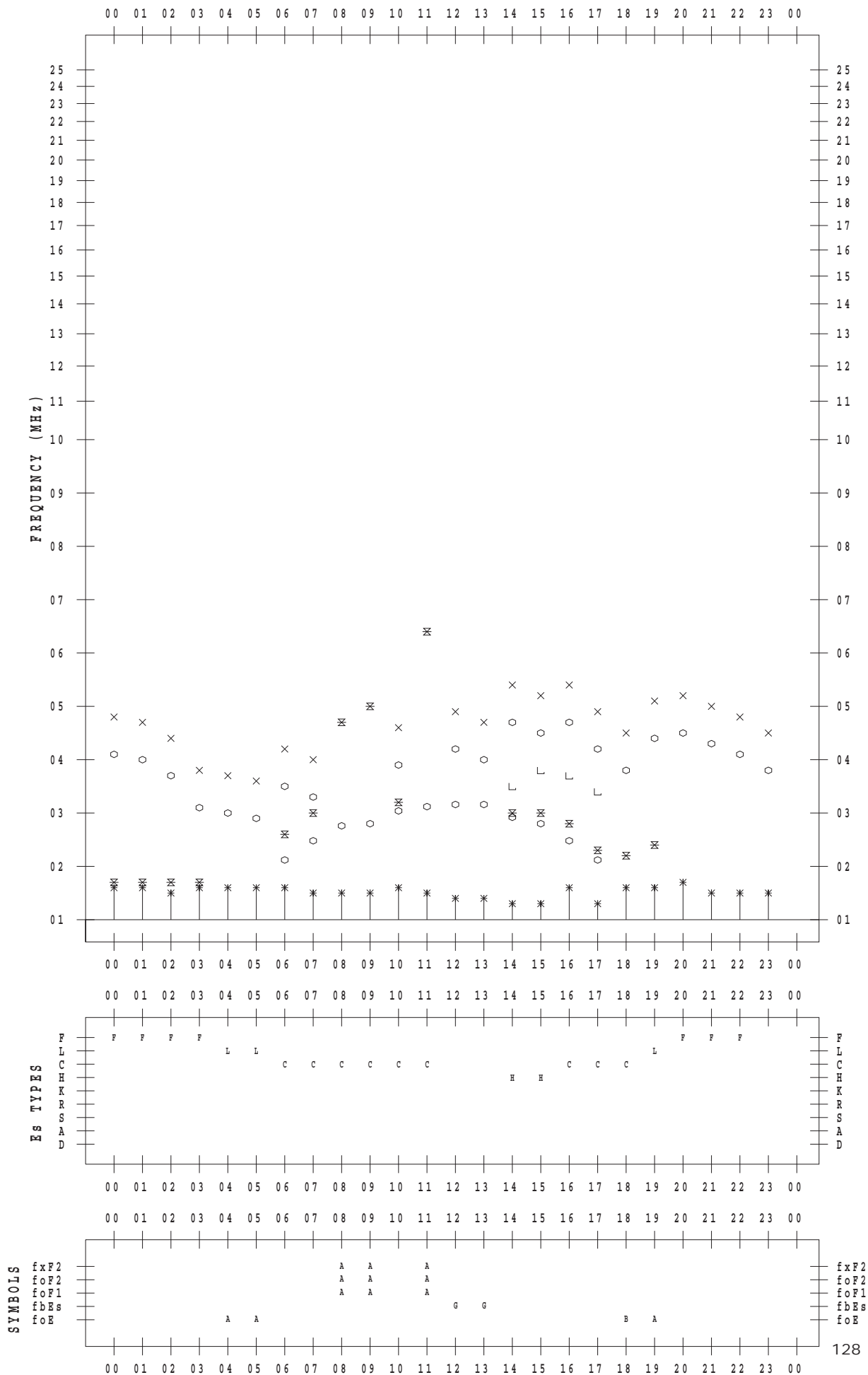
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 21

135 ° E MEAN TIME



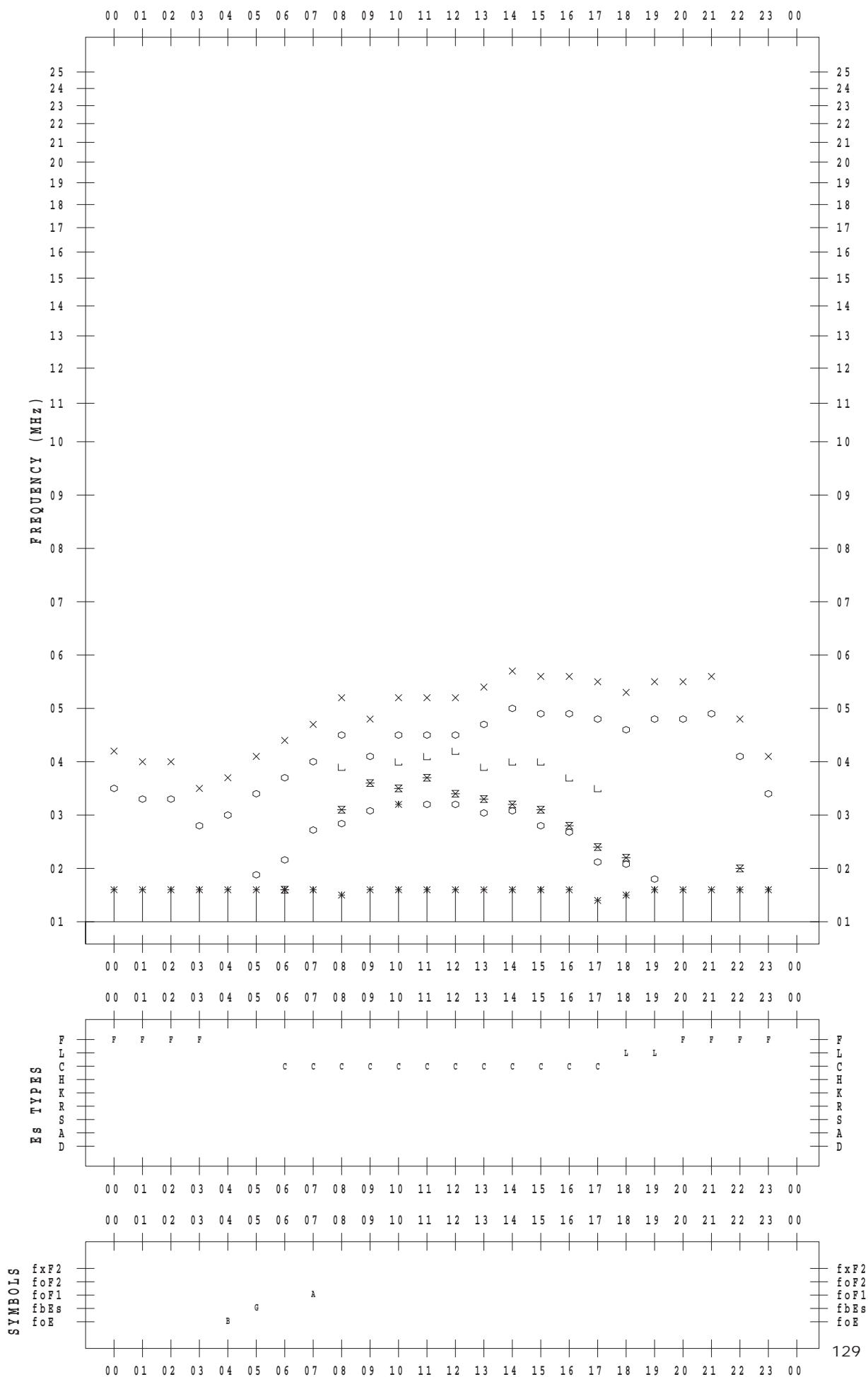
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 22

135 ° E MEAN TIME



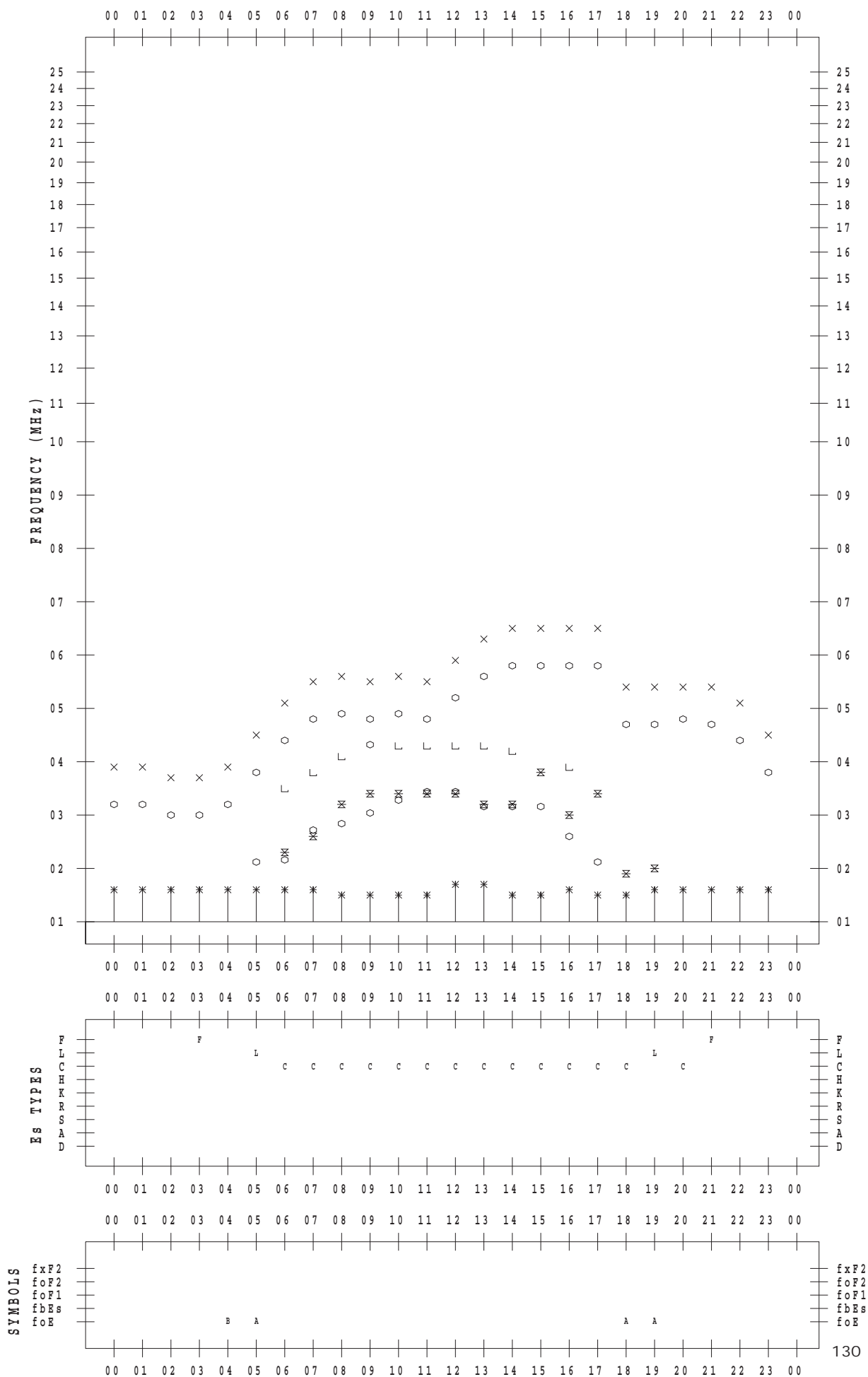
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 23

135 ° E MEAN TIME



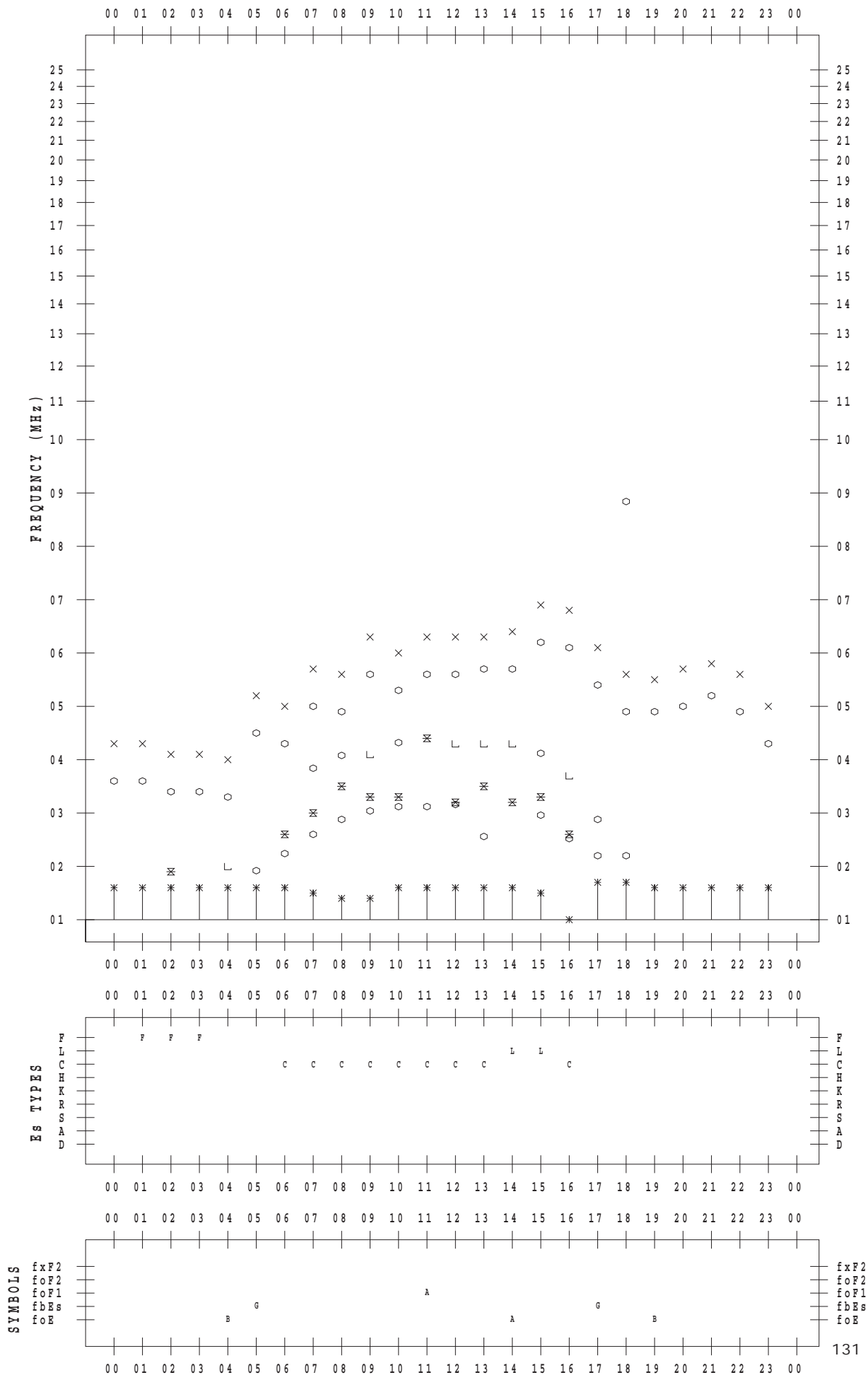
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 24

135 ° E MEAN TIME



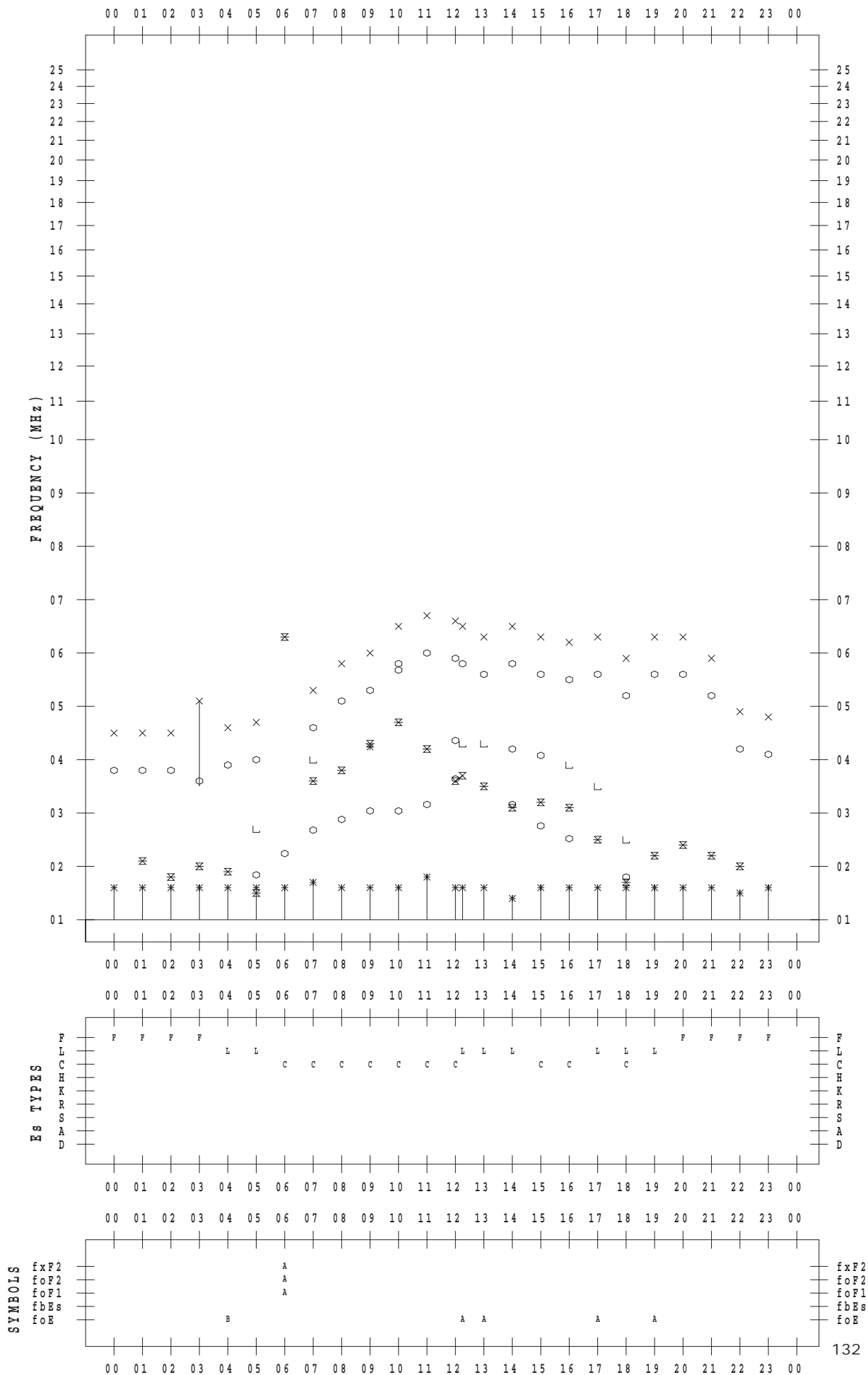
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 25

135 ° E MEAN TIME



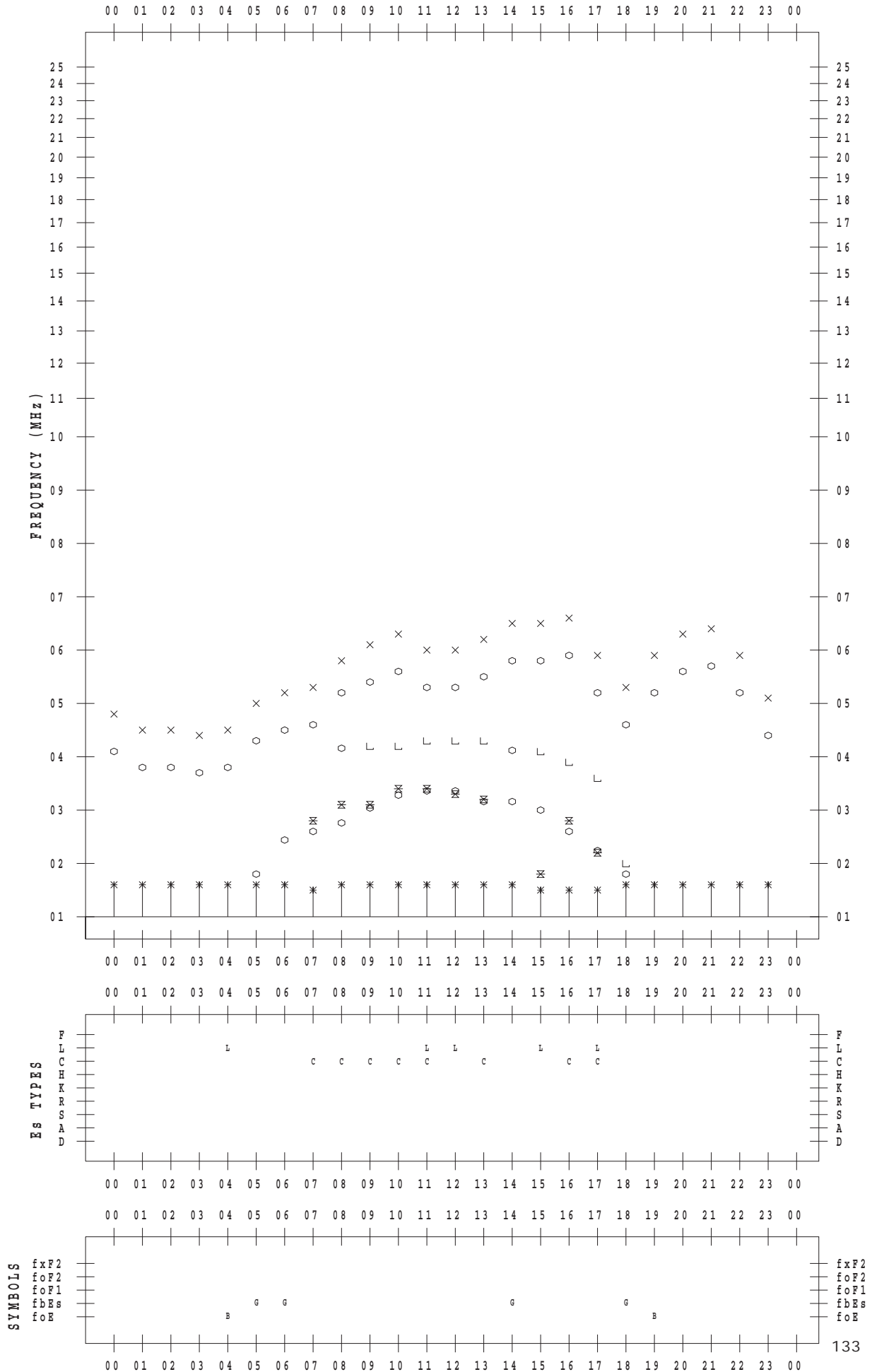
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 26

135 ° E MEAN TIME



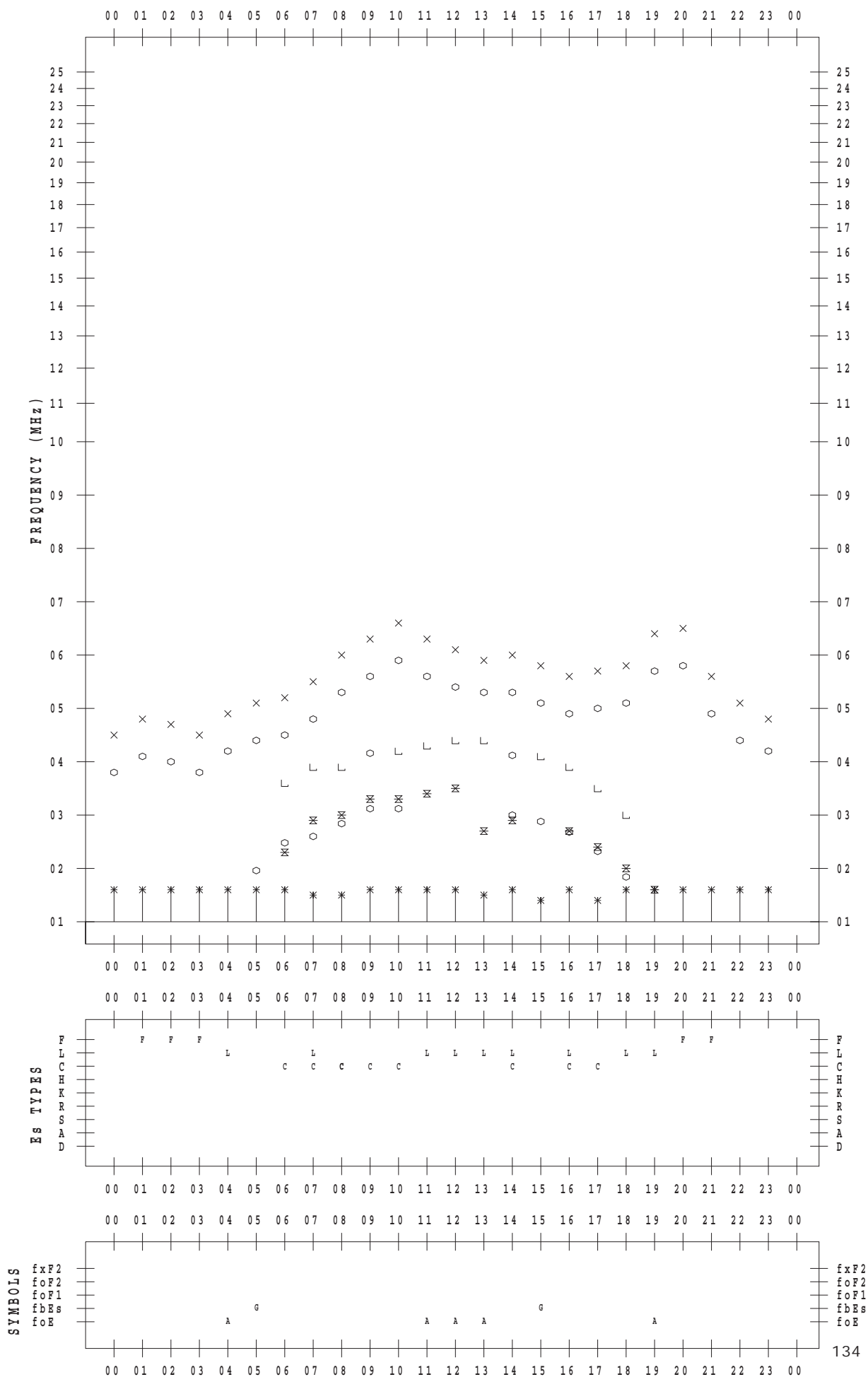
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 27

135 ° E MEAN TIME



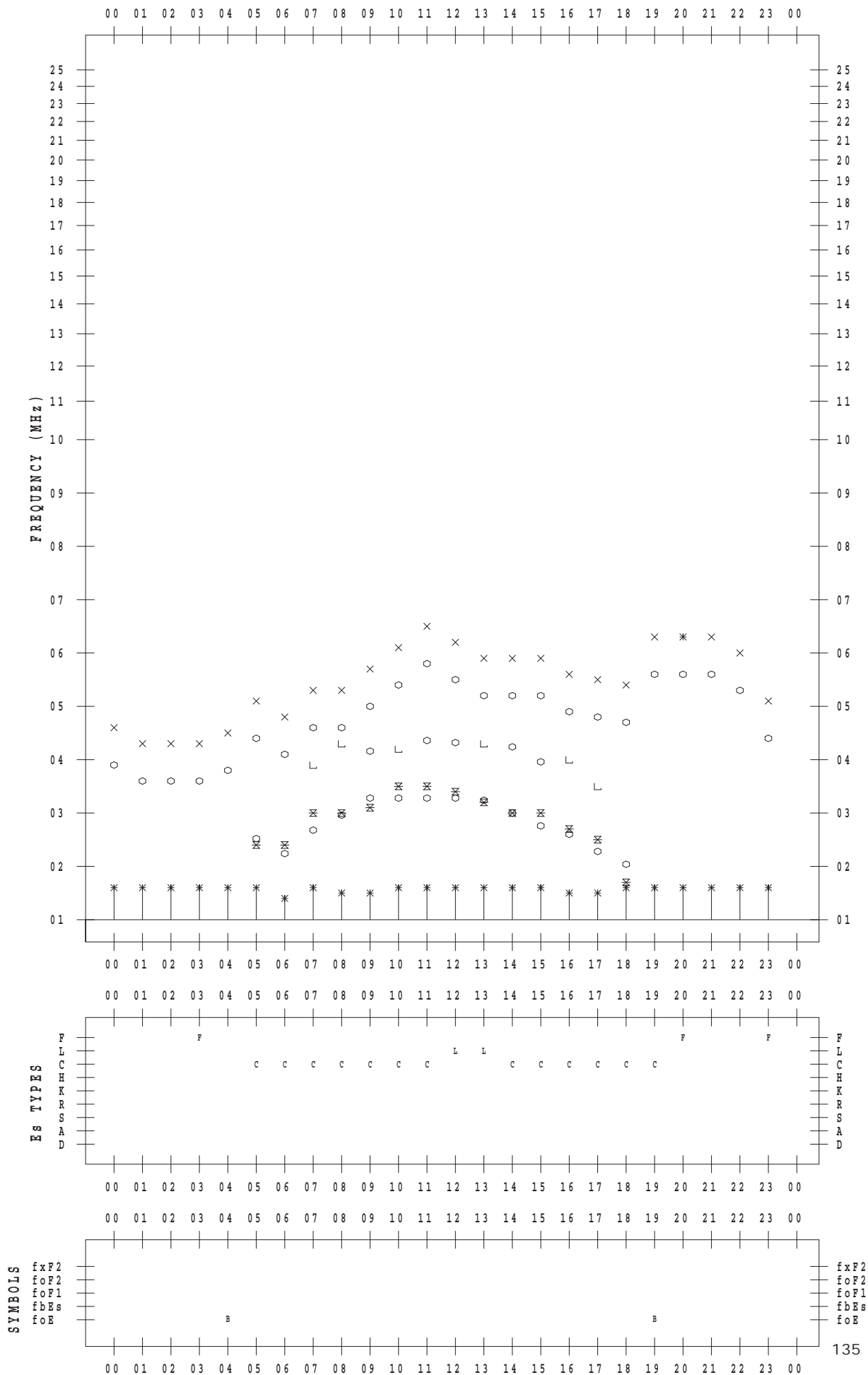
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 28

135 ° E MEAN TIME



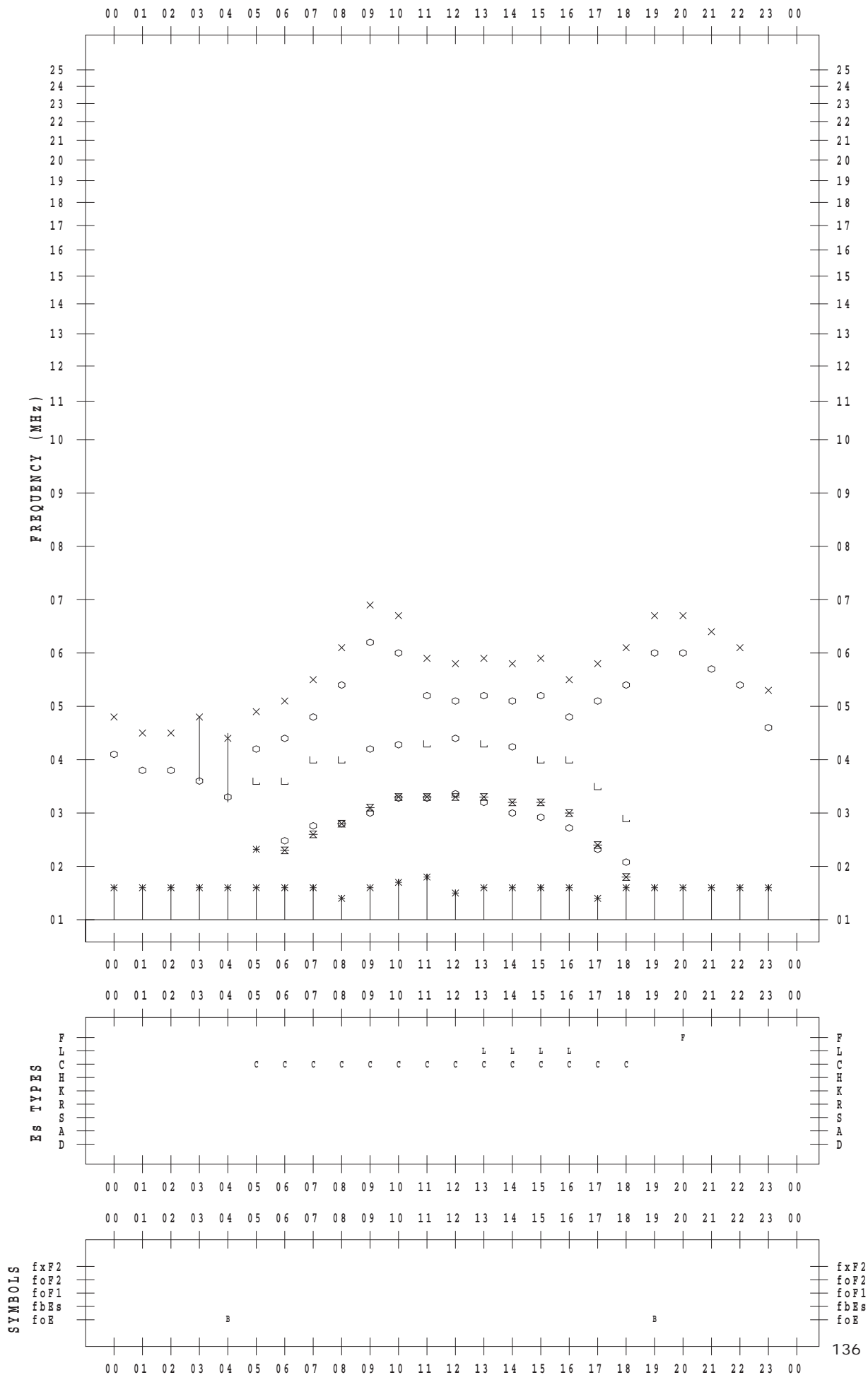
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 29

135 ° E MEAN TIME



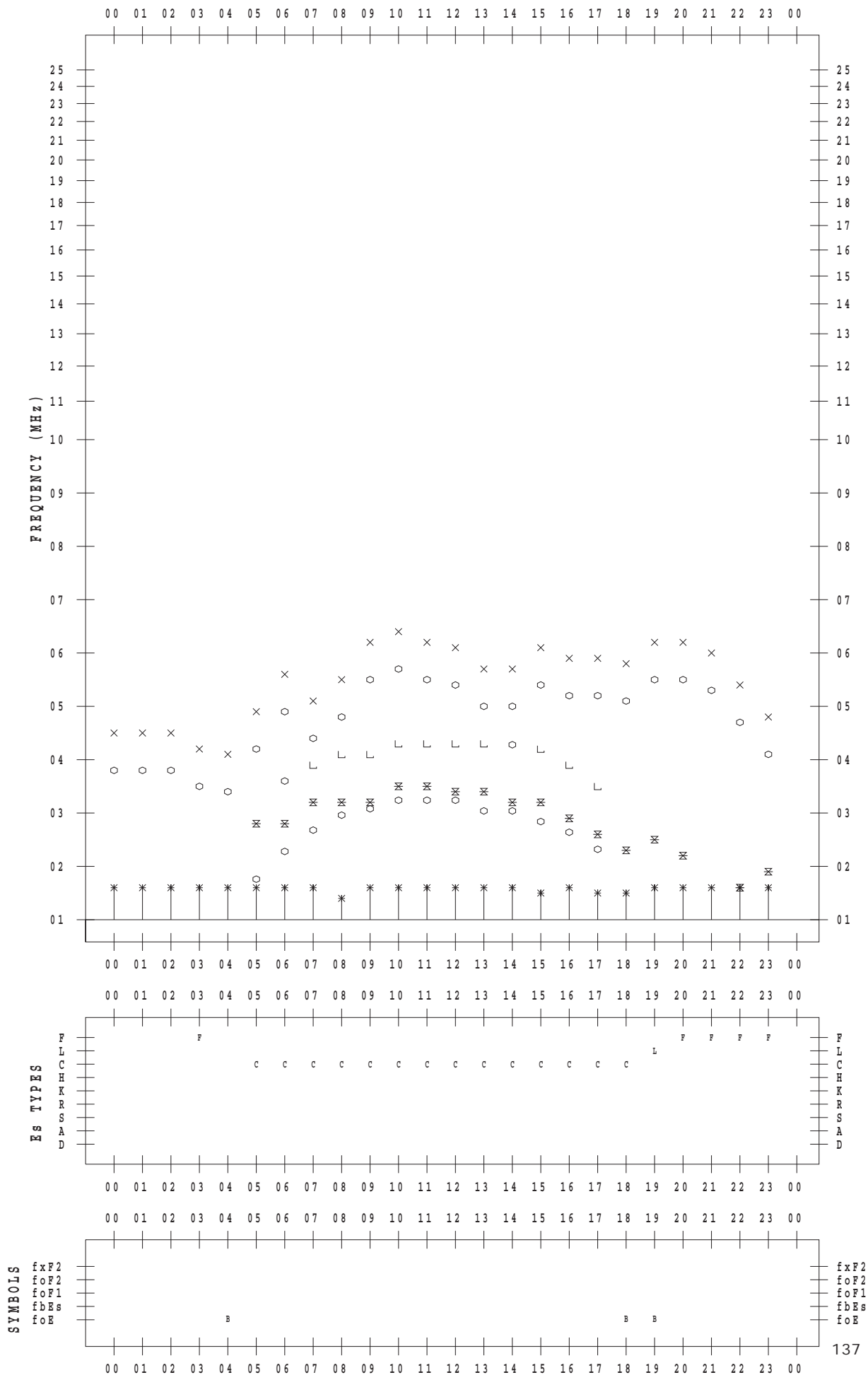
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018 / 4 / 30

135 ° E MEAN TIME



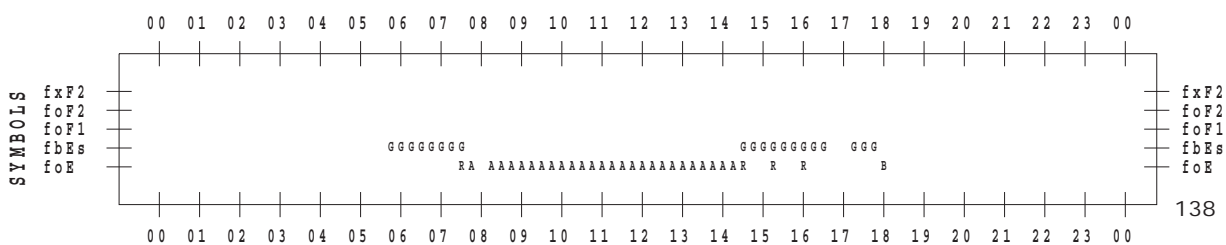
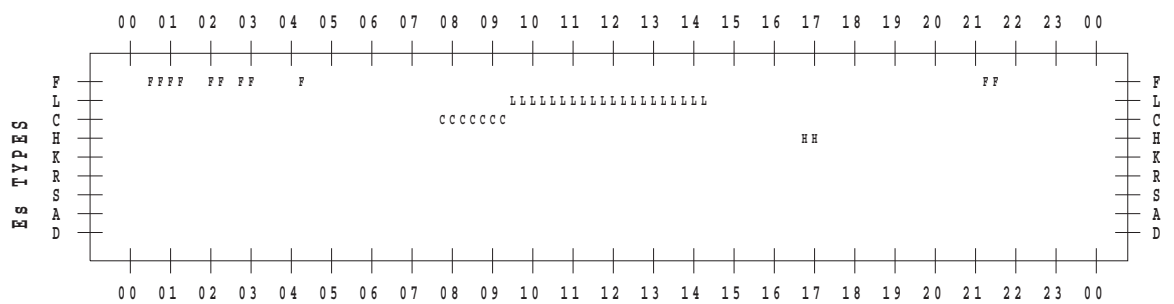
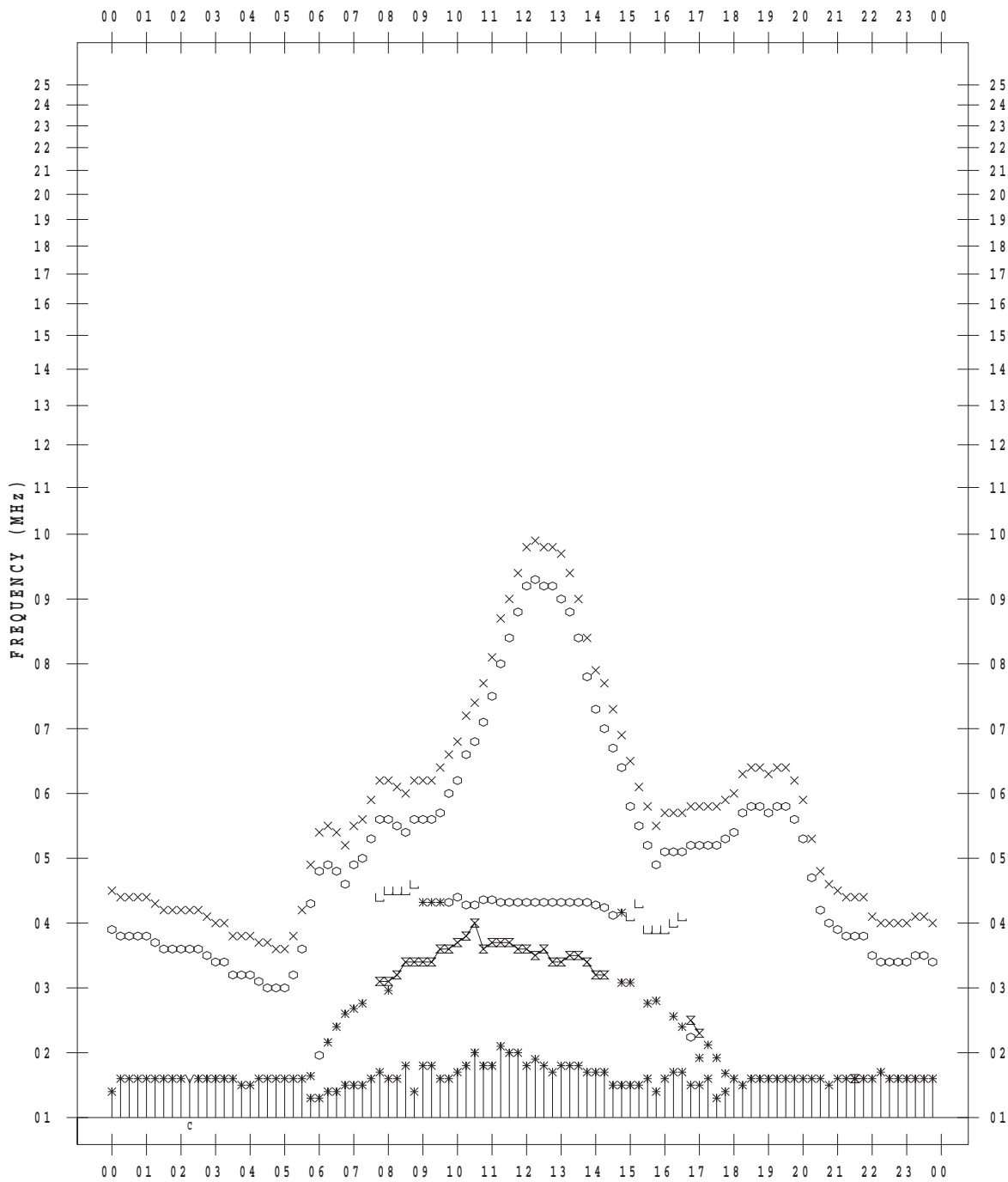
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 1

135 ° E MEAN TIME



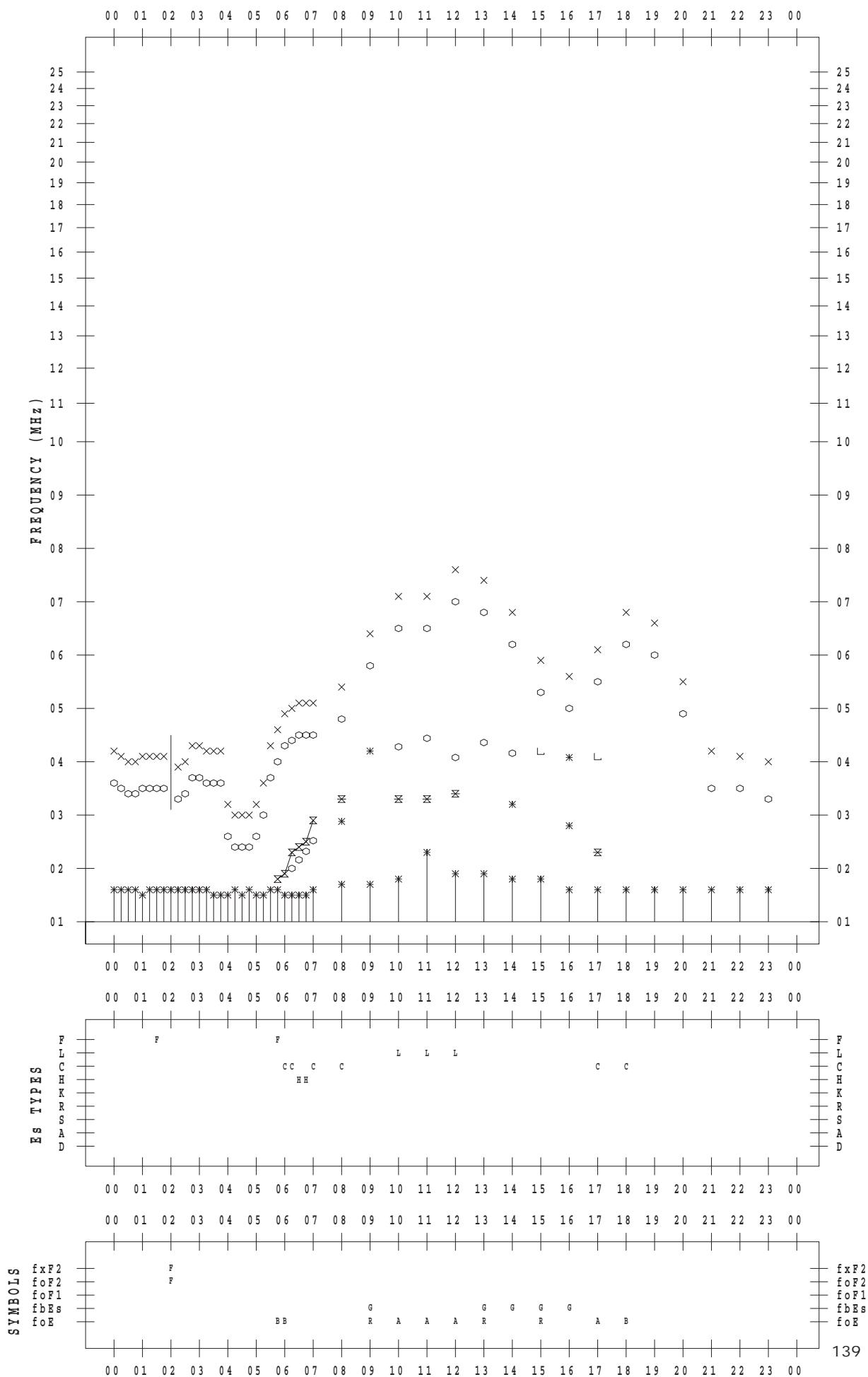
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 2

135 ° E MEAN TIME



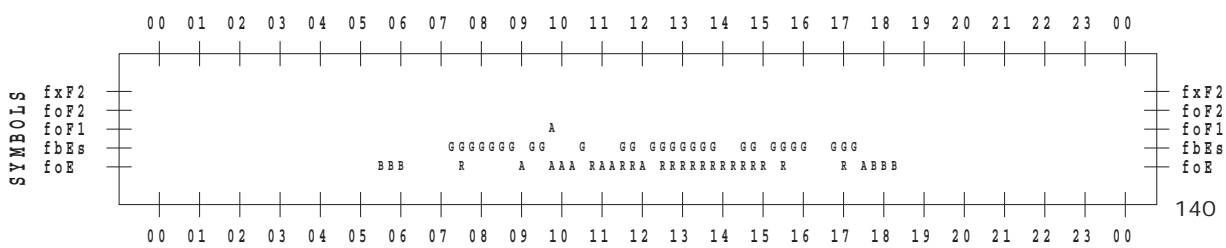
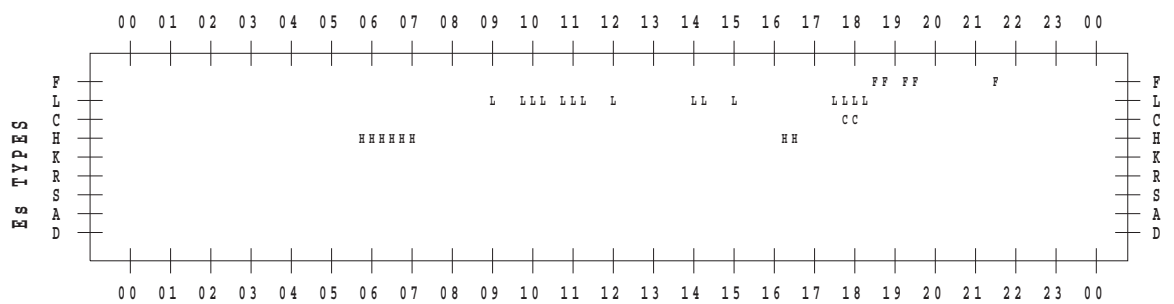
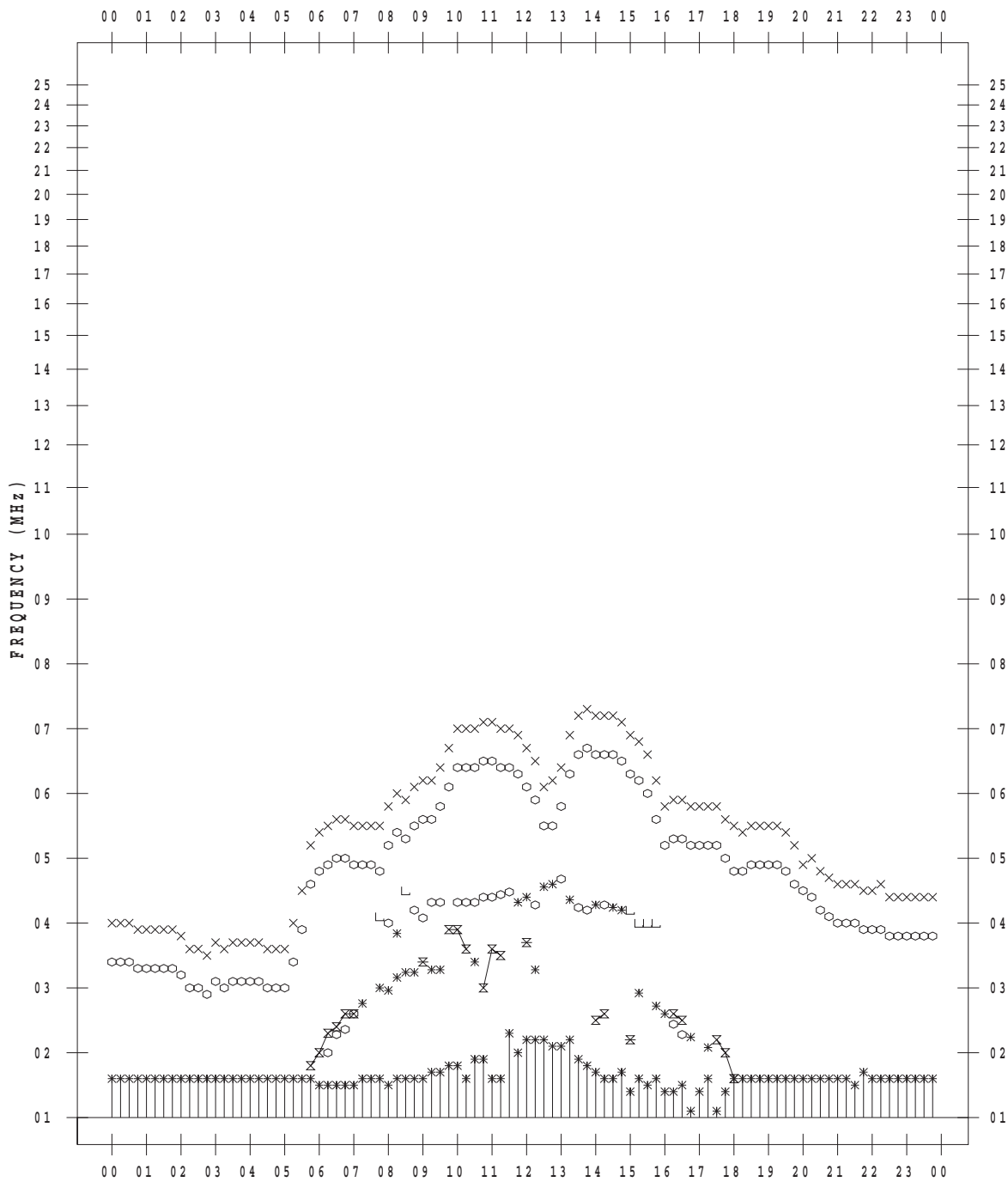
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 3

135 ° E MEAN TIME



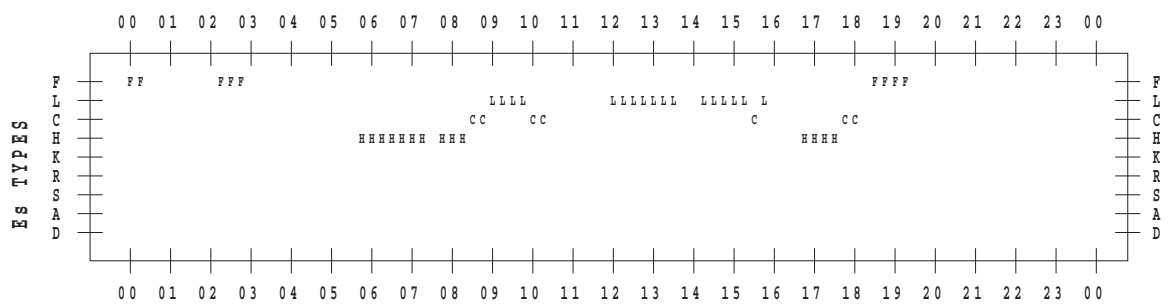
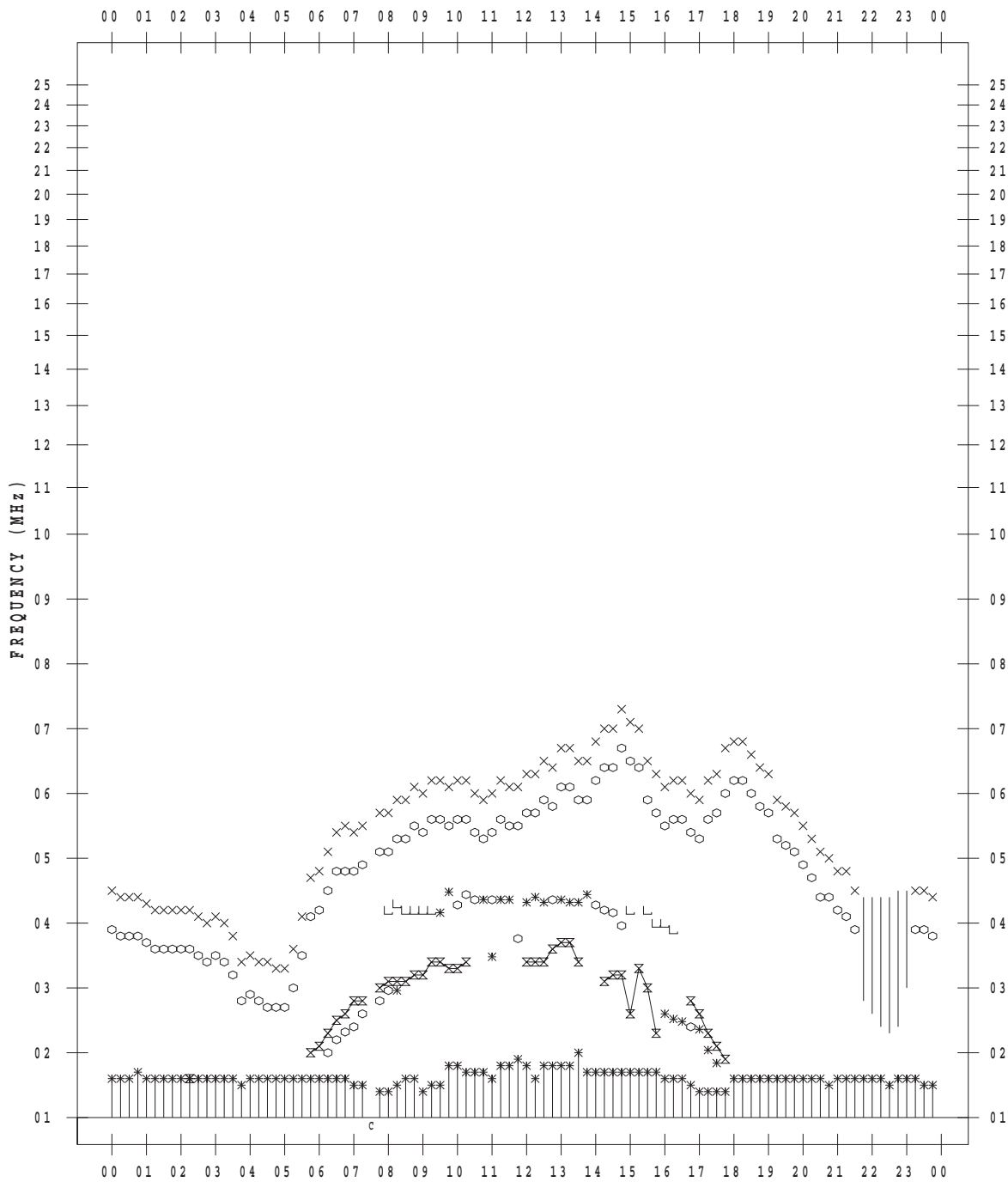
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 4

135 ° E MEAN TIME



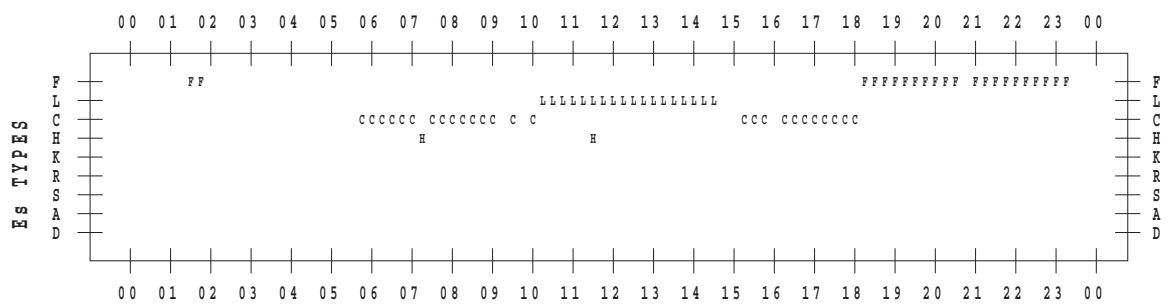
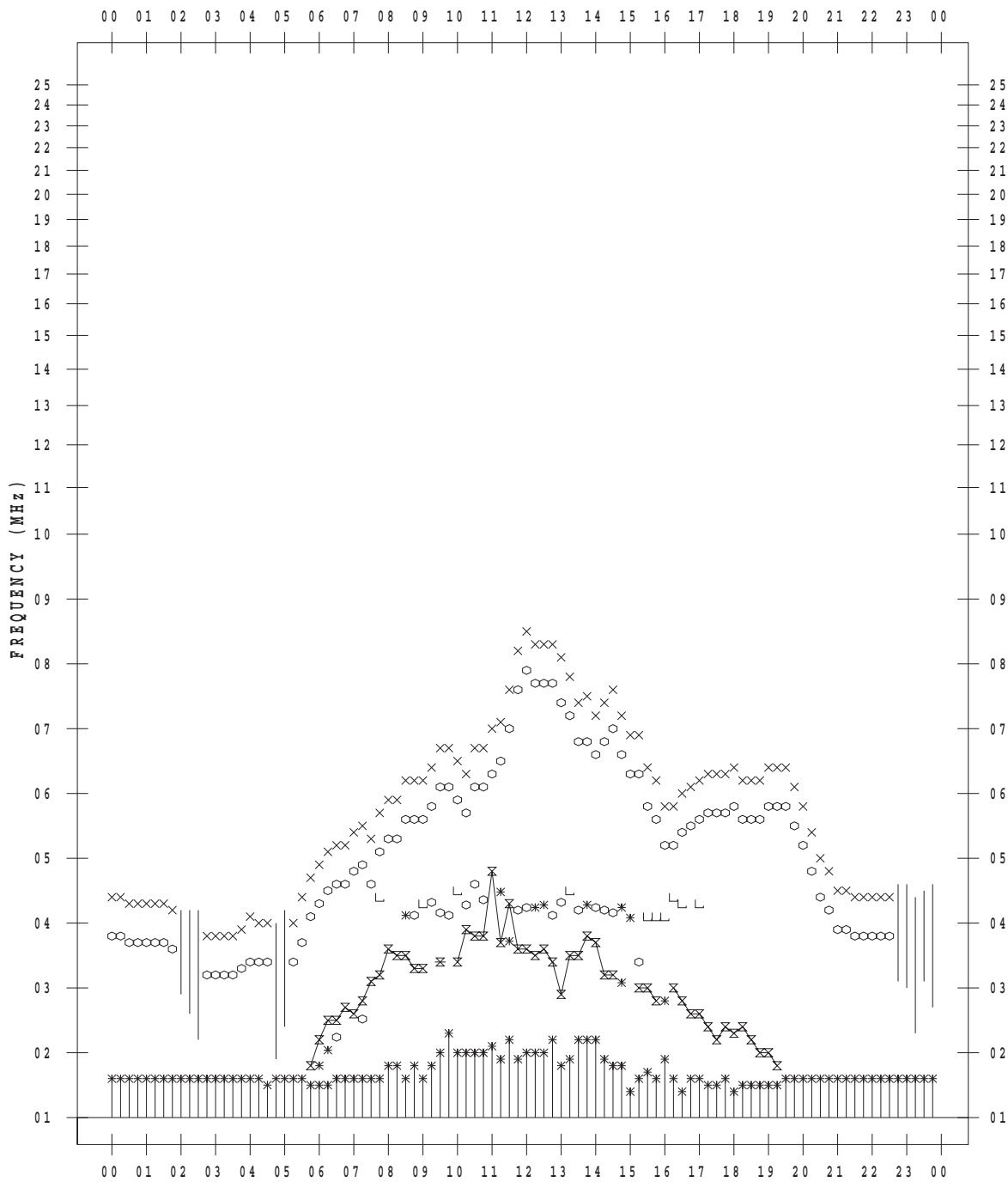
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 5

135 ° E MEAN TIME



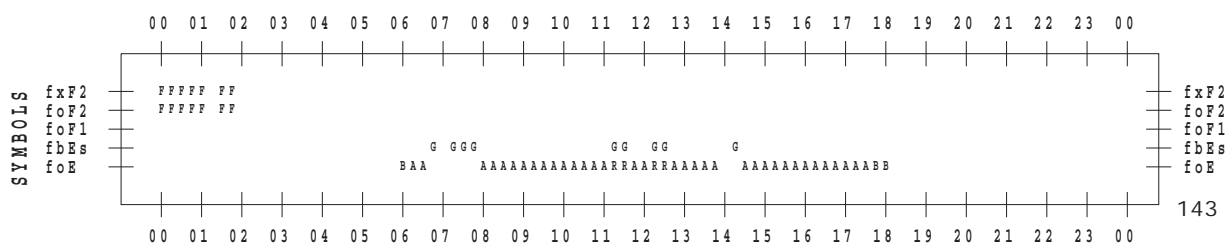
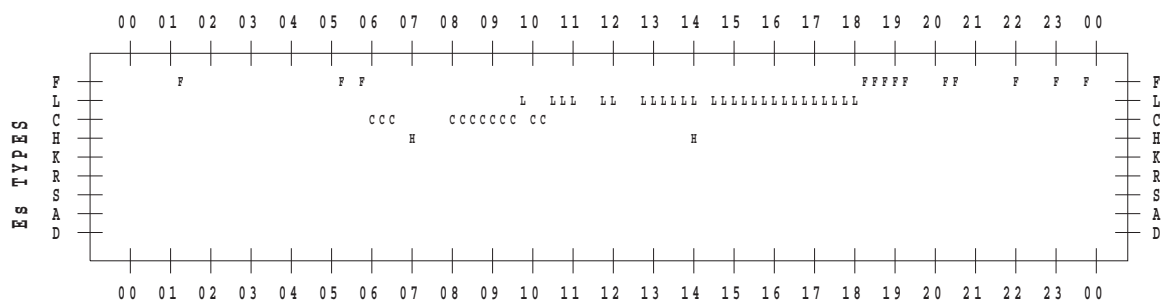
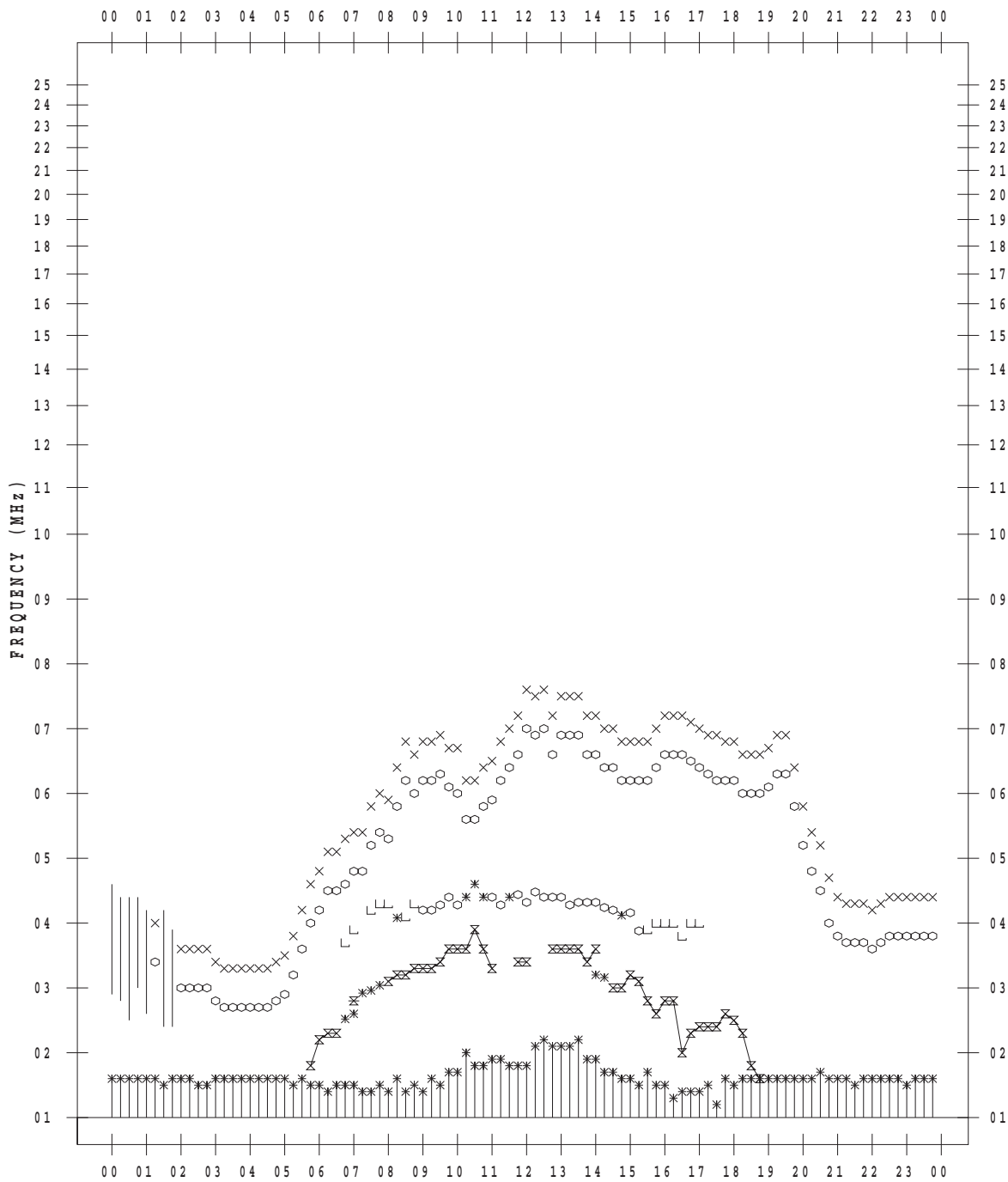
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 6

135 ° E MEAN TIME



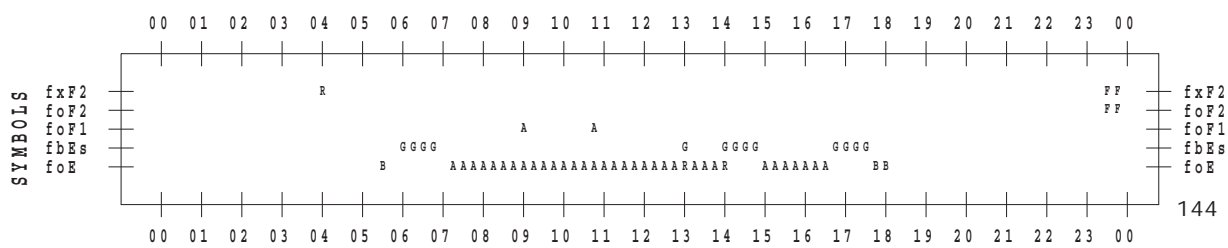
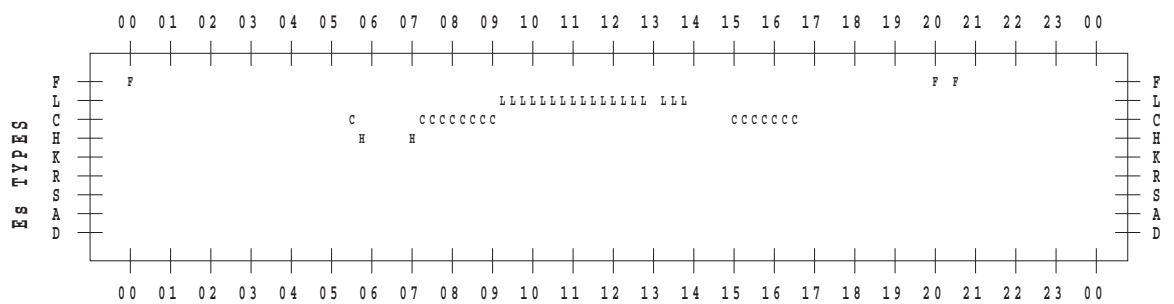
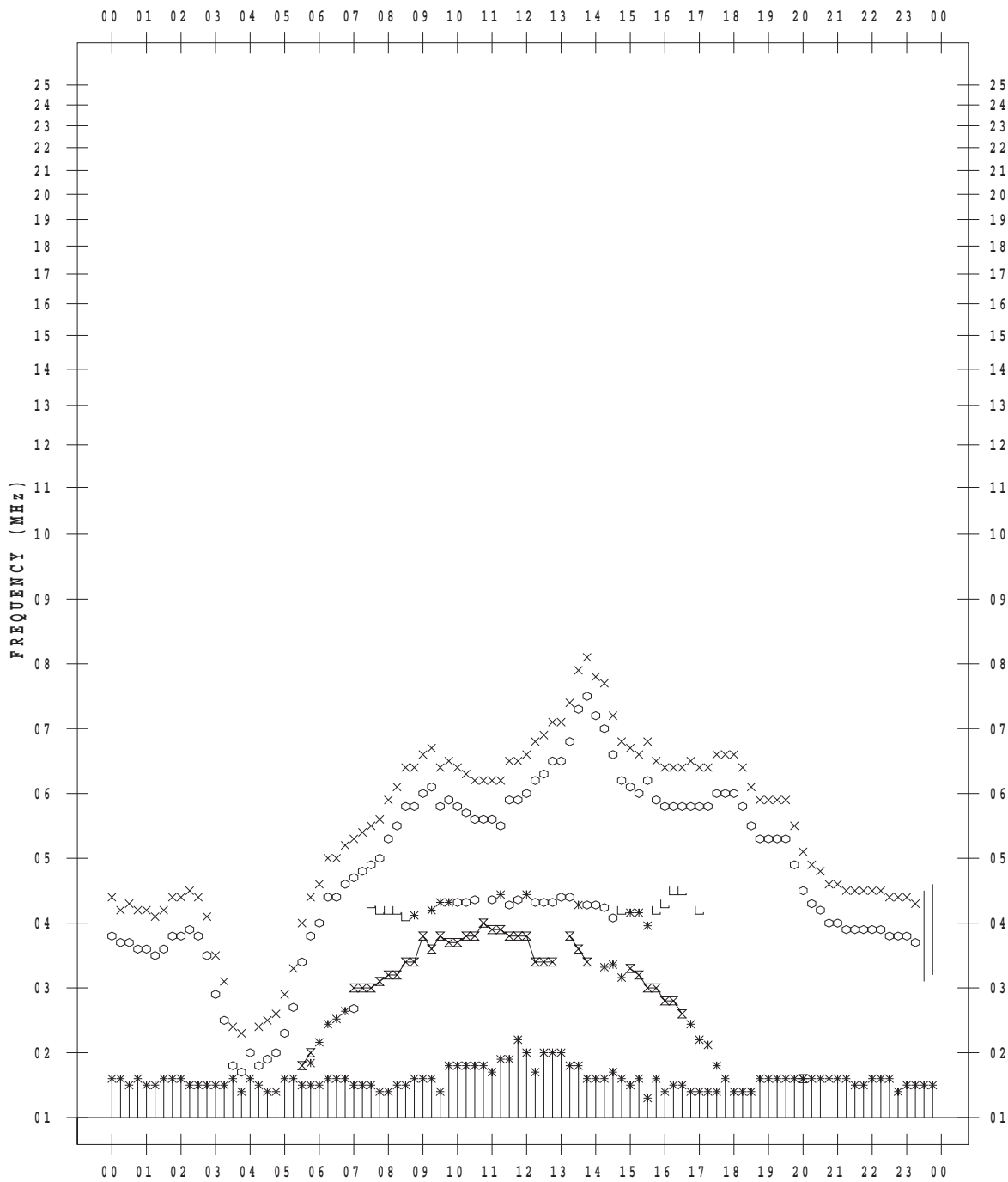
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 7

135 ° E MEAN TIME



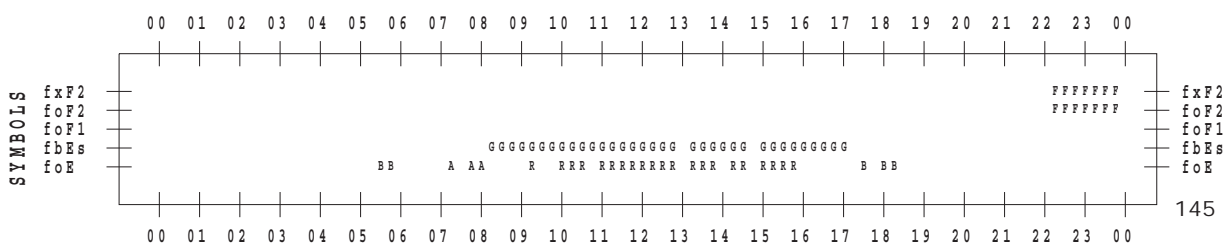
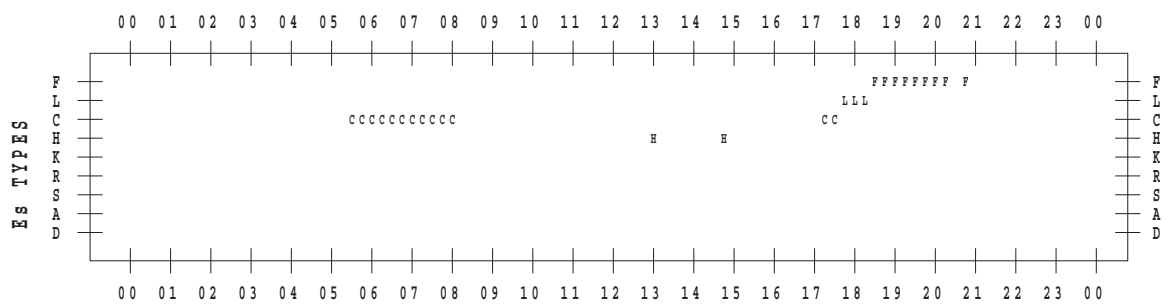
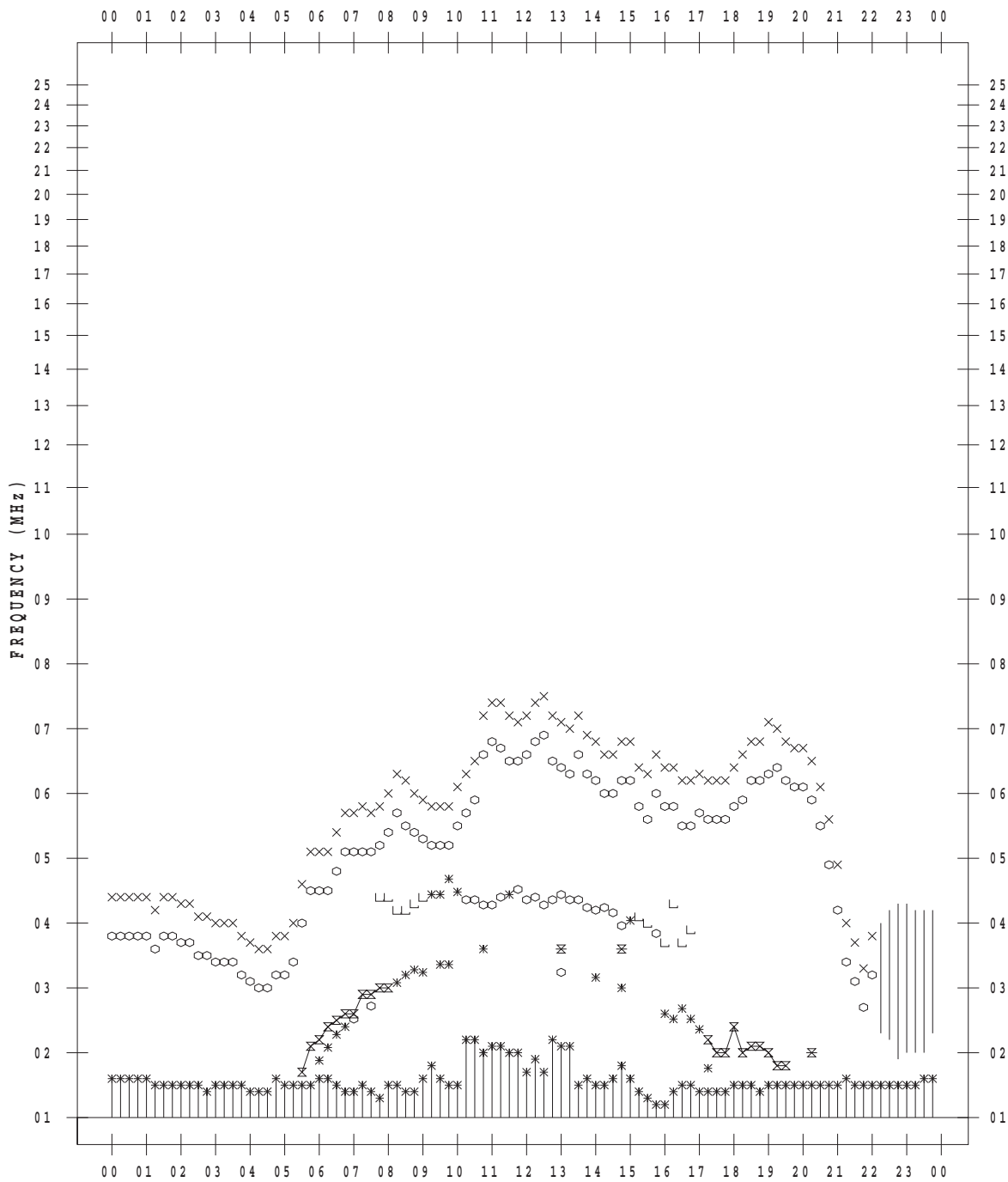
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 8

135 ° E MEAN TIME



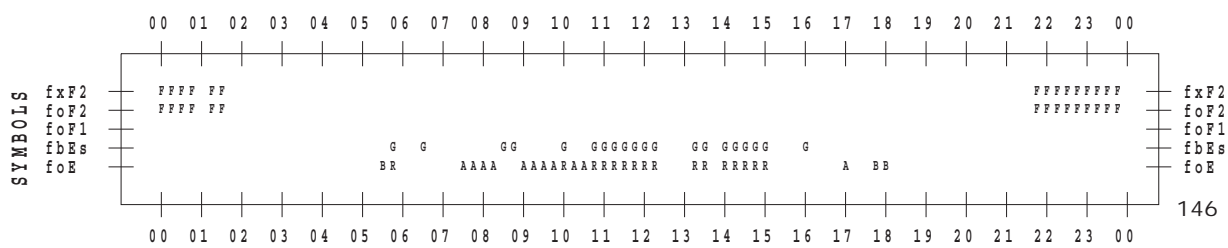
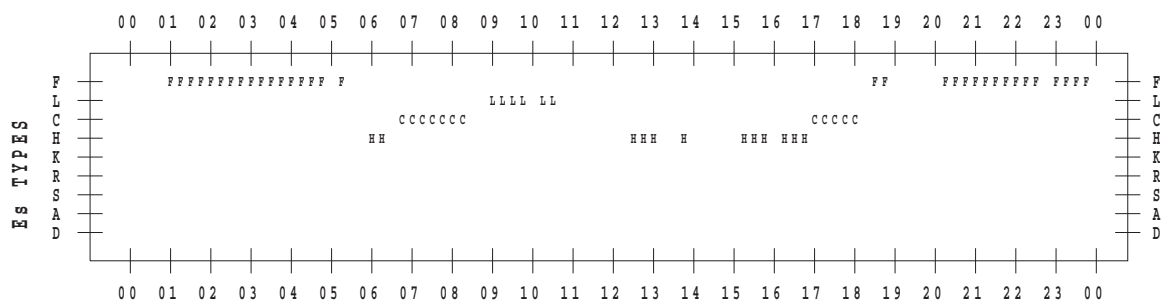
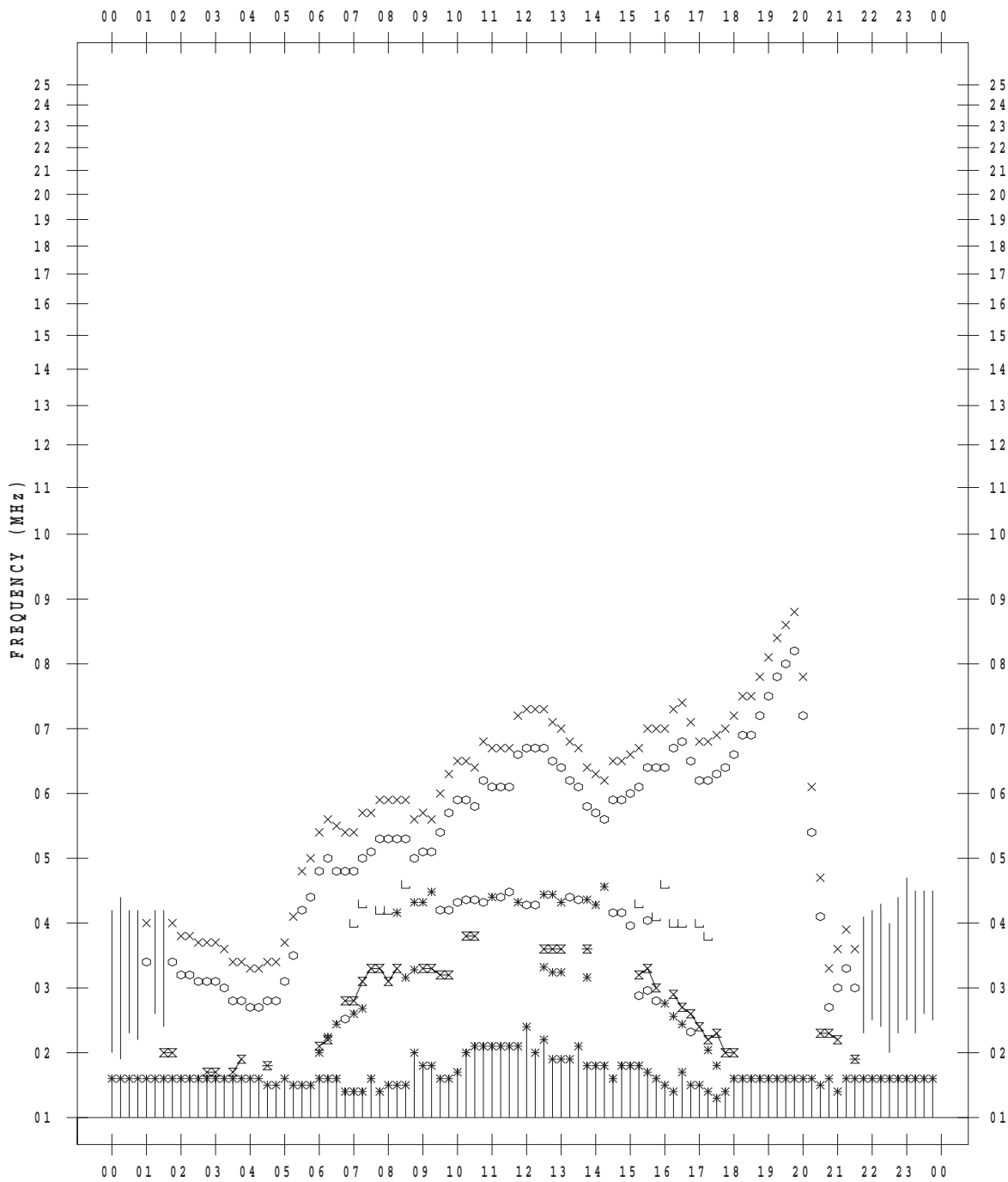
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 9

135 ° E MEAN TIME



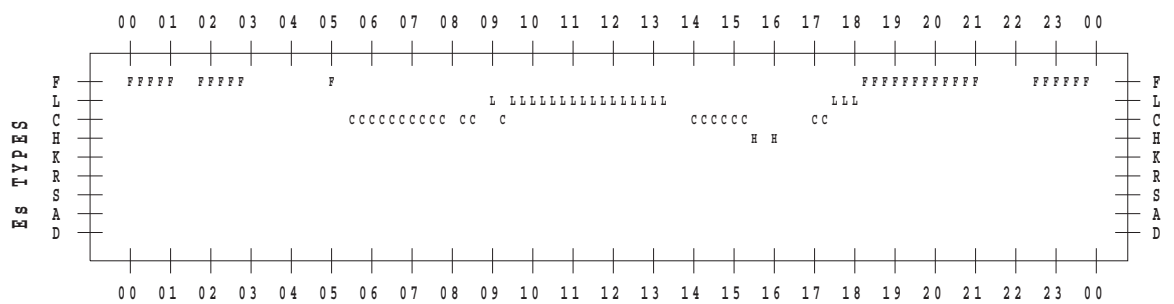
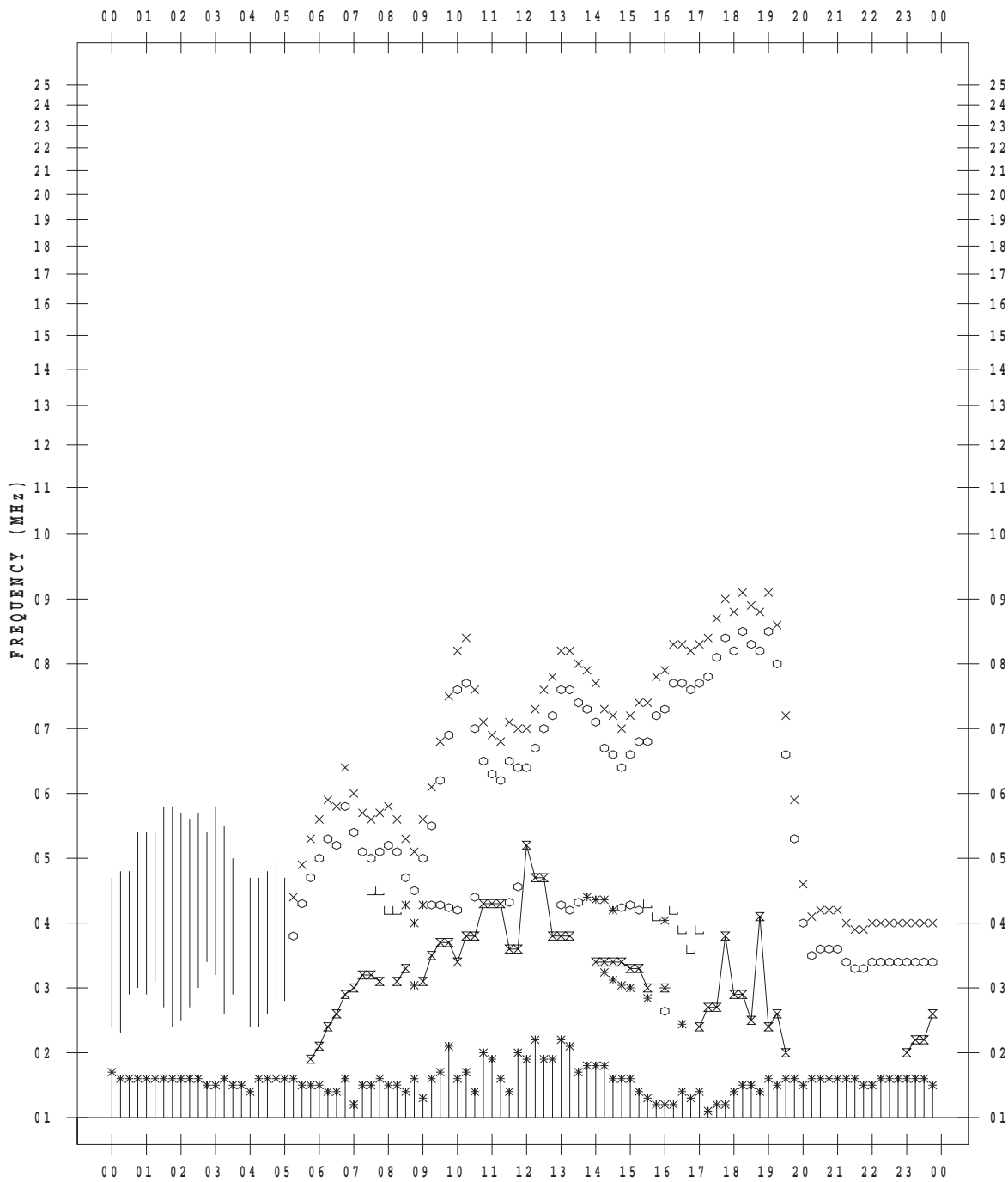
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 10

135 ° E MEAN TIME



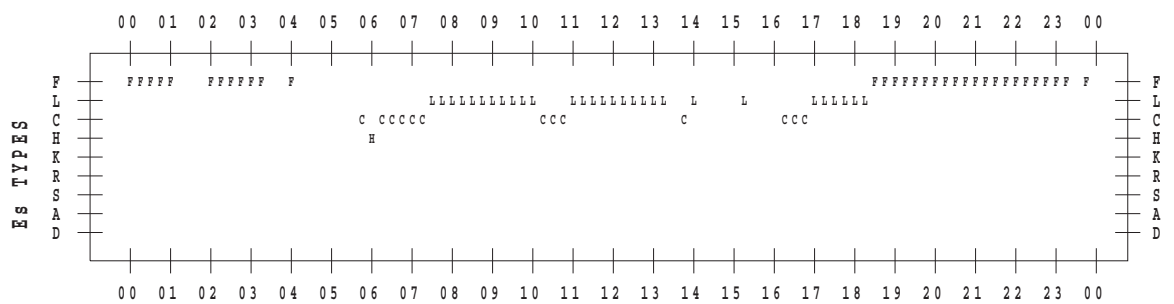
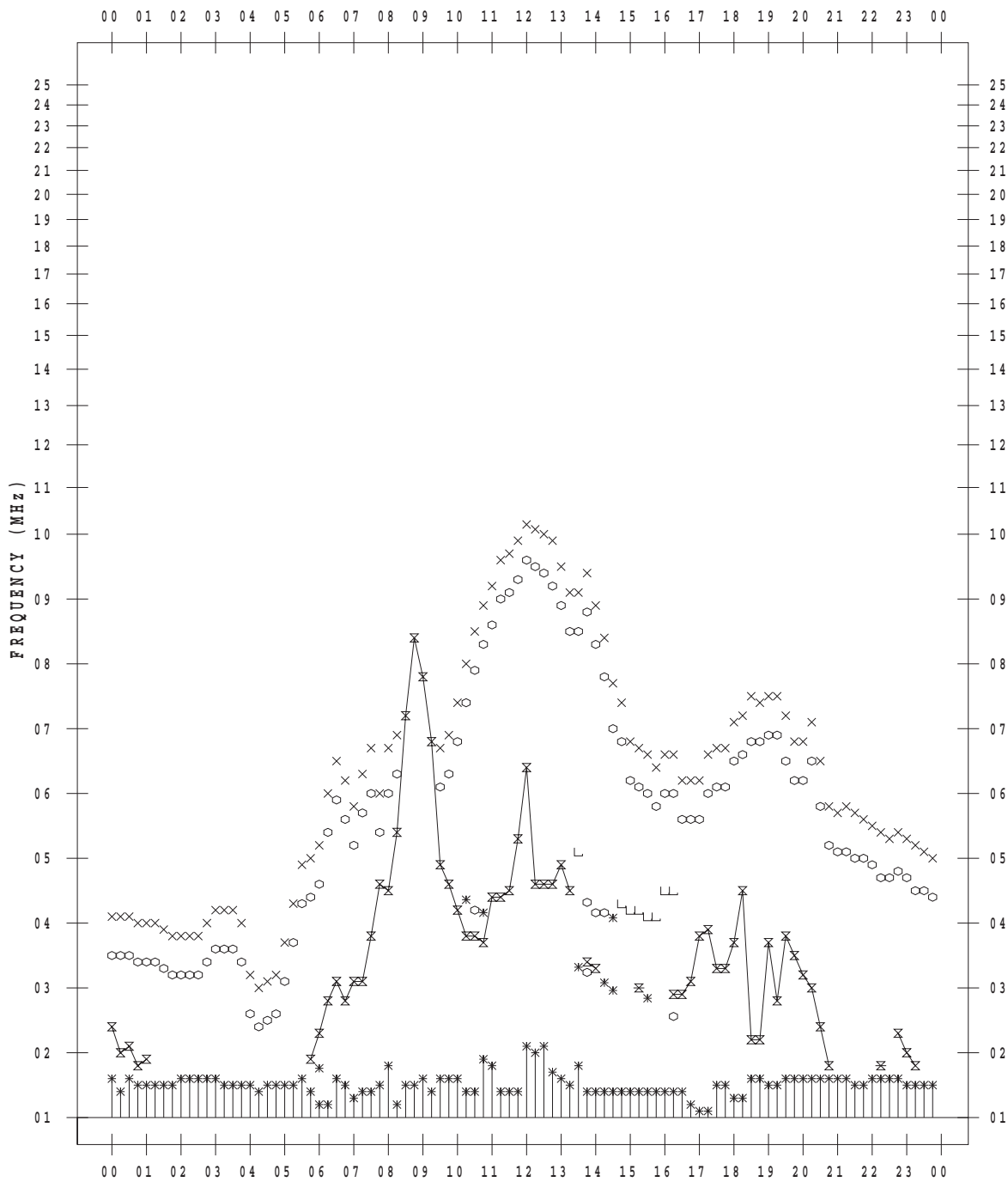
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 11

135 ° E MEAN TIME



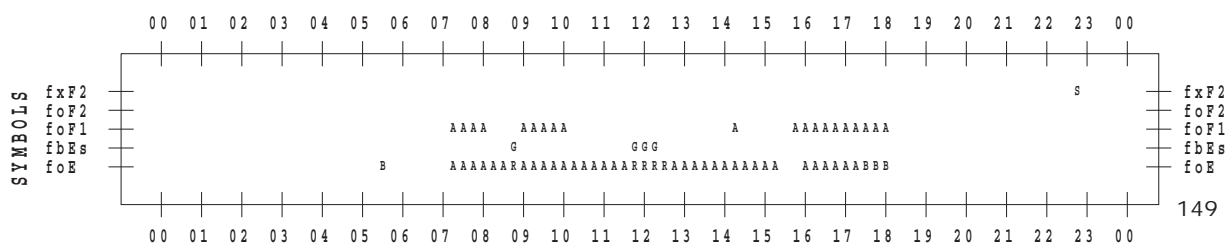
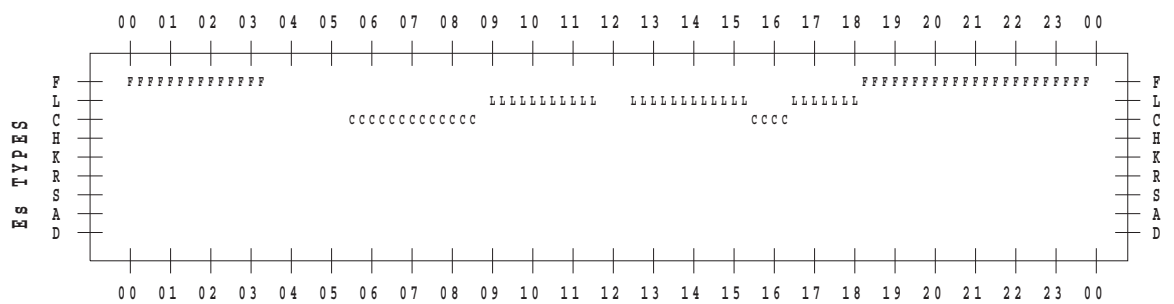
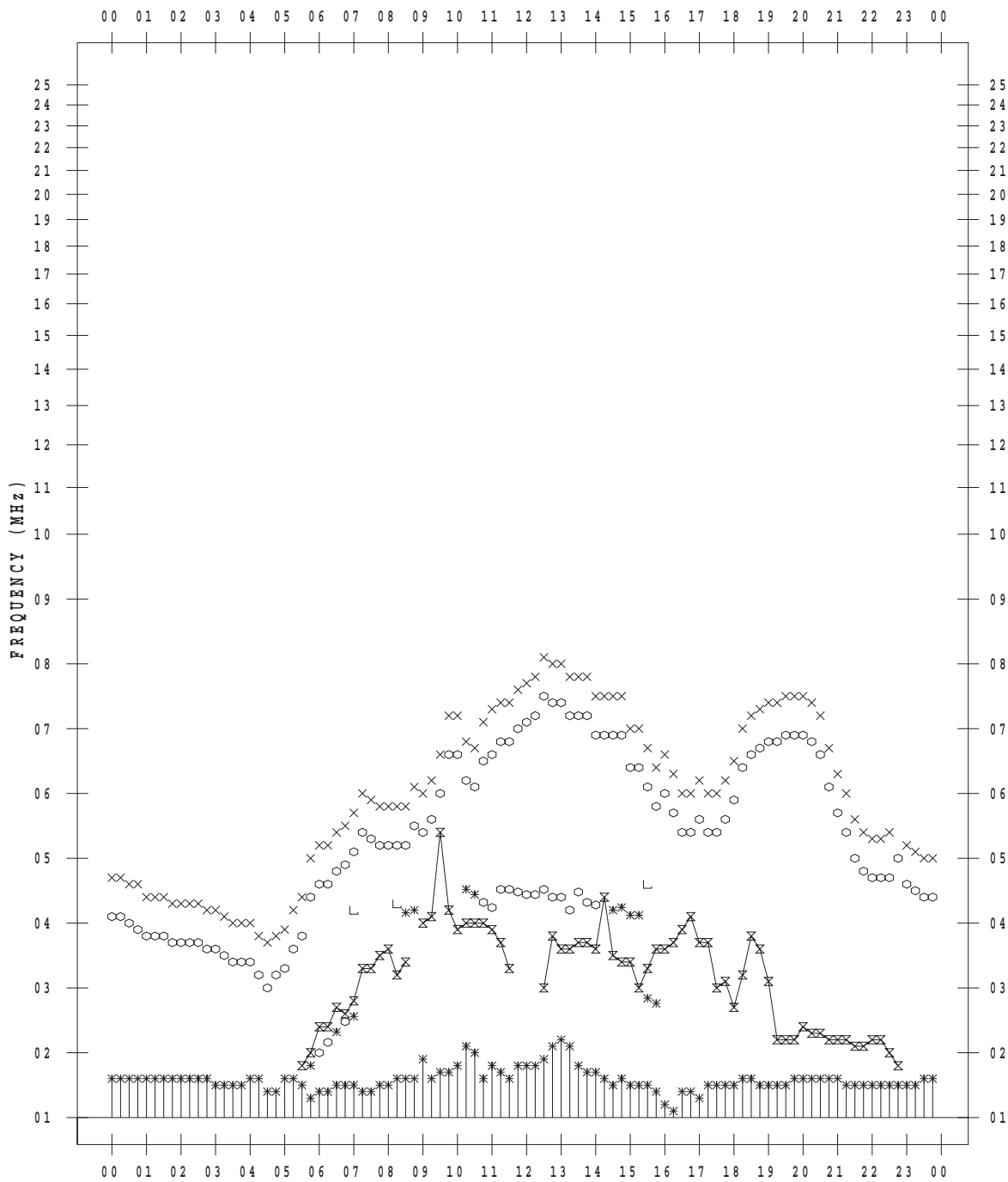
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 12

135 ° E MEAN TIME



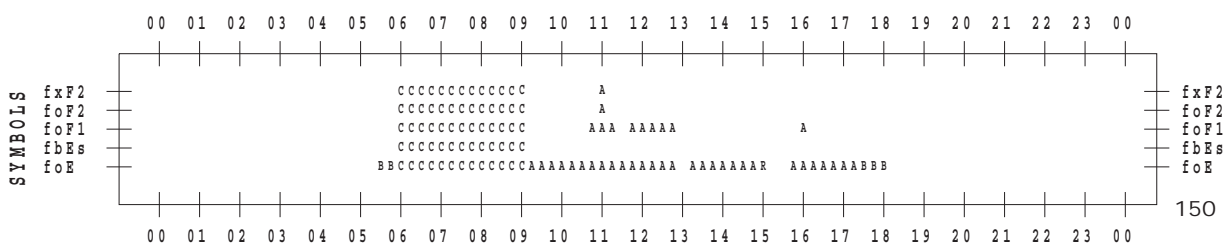
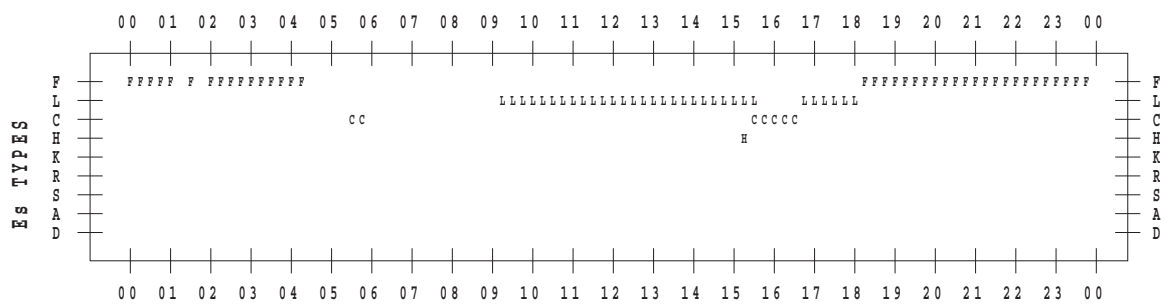
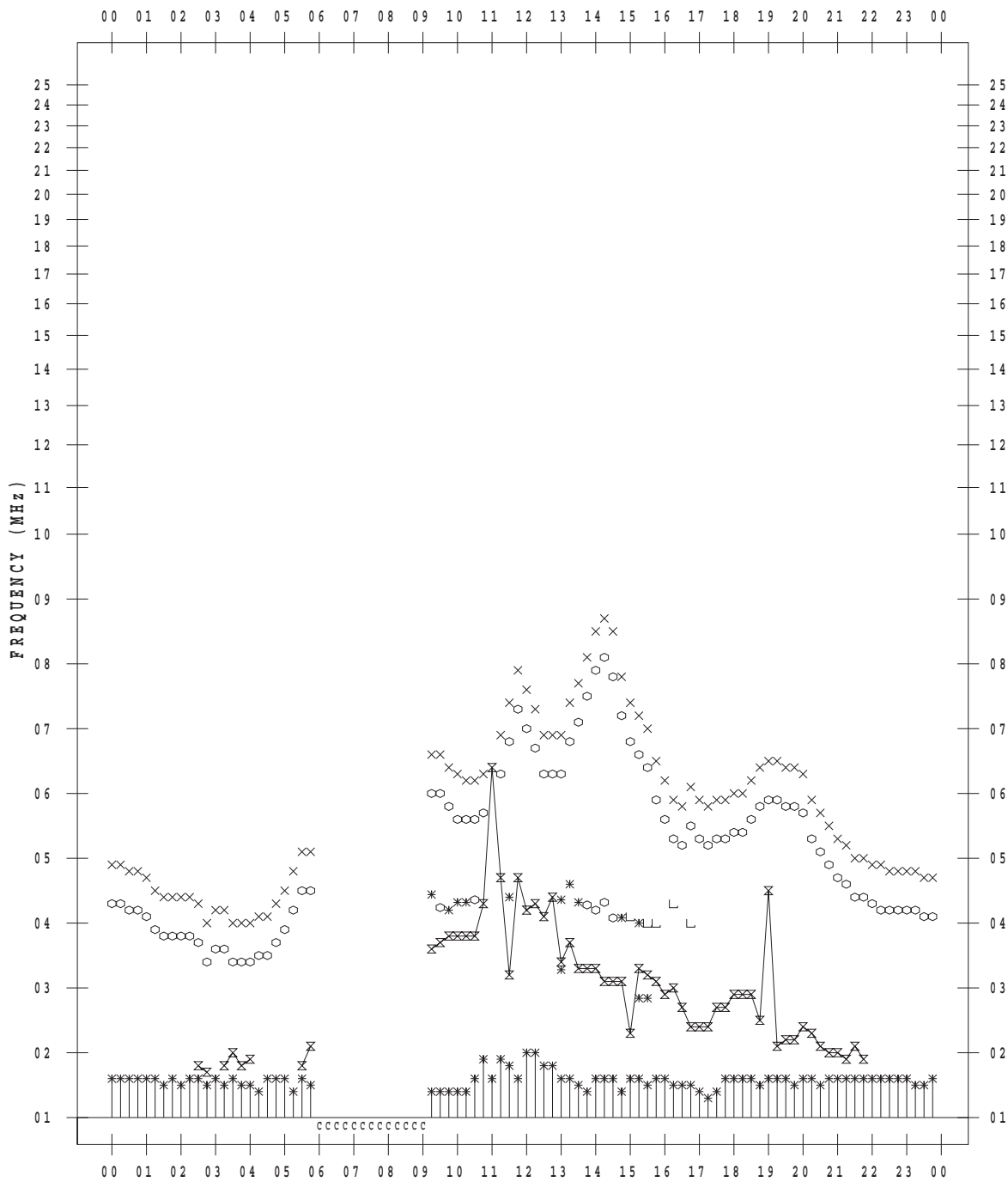
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 13

135 ° E MEAN TIME



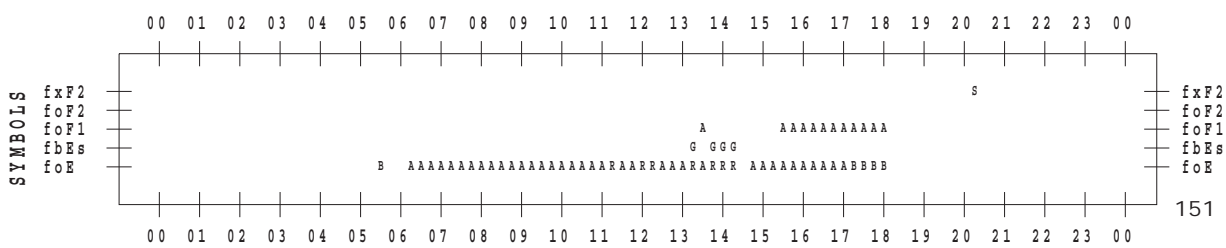
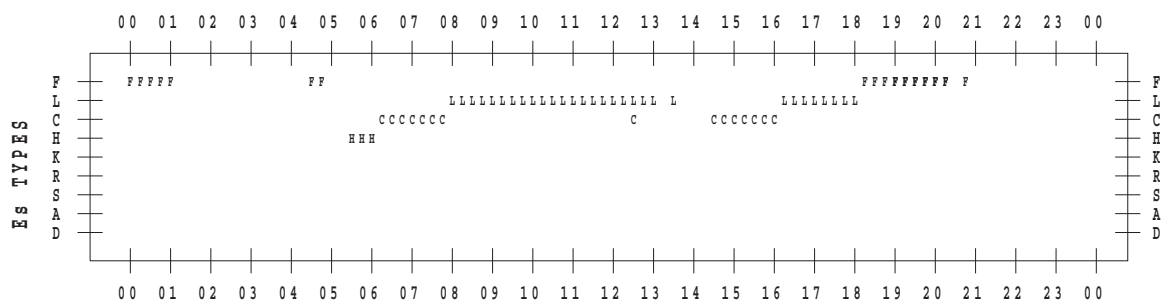
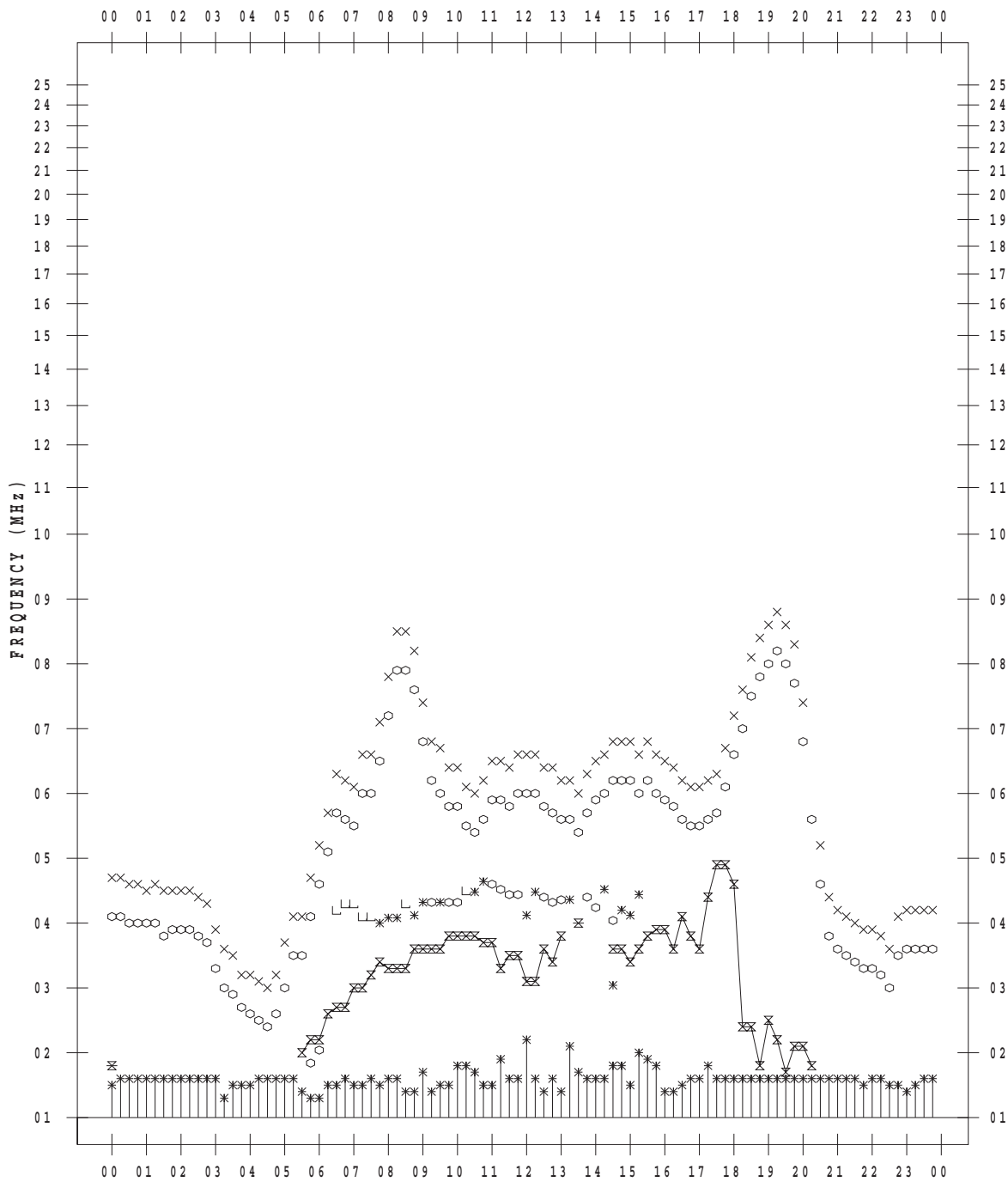
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 14

135 ° E MEAN TIME



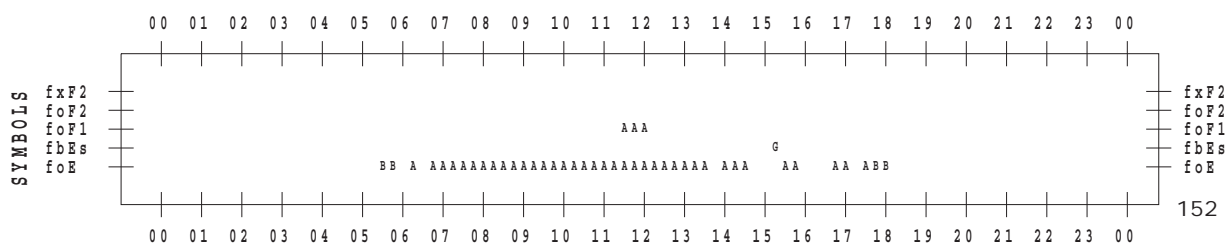
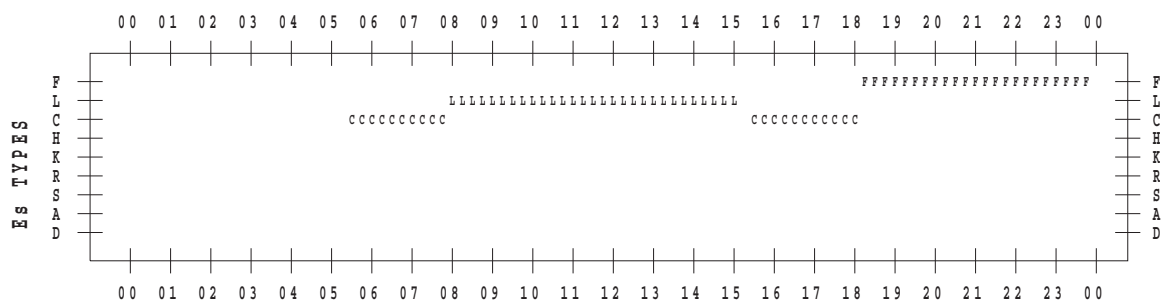
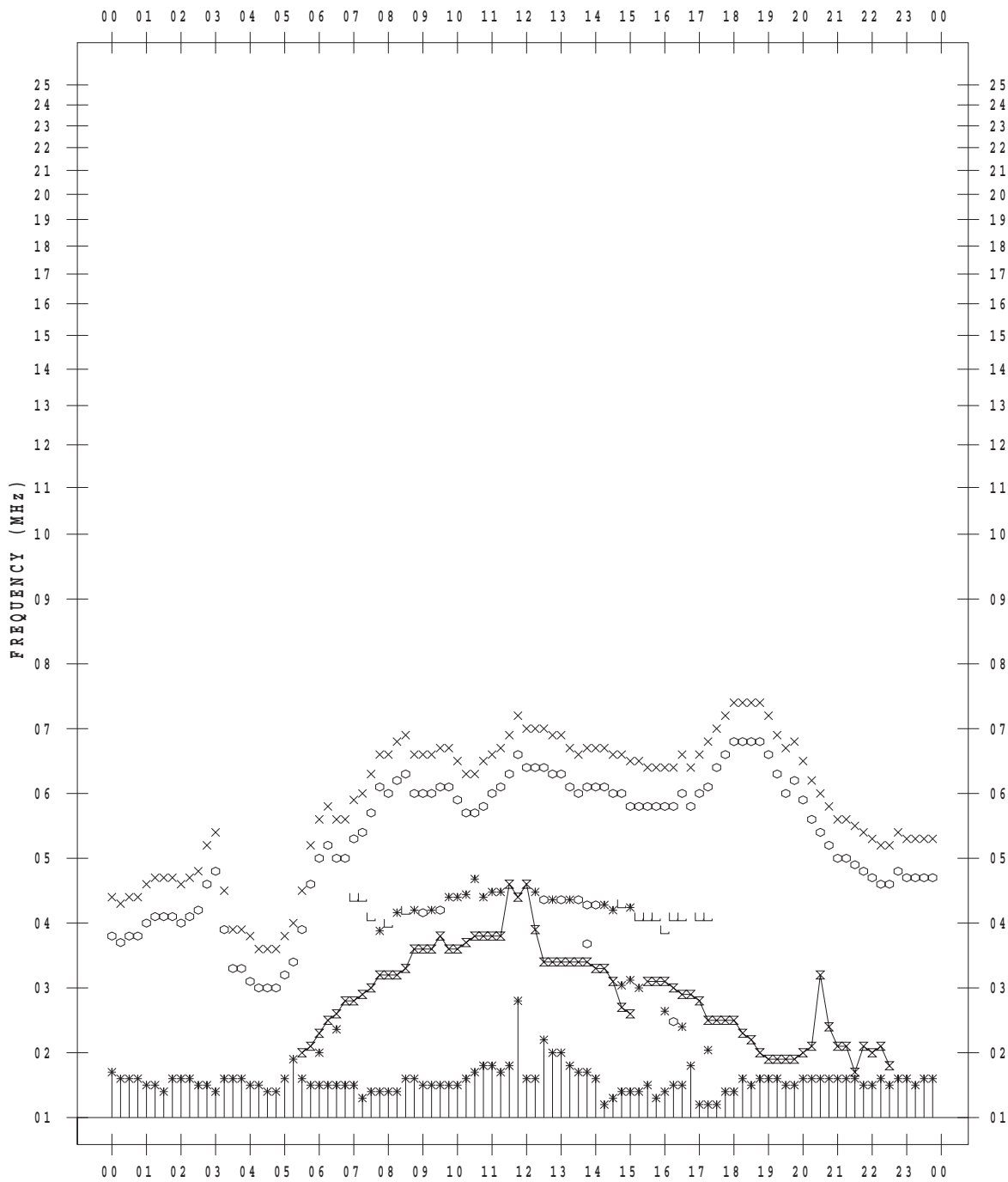
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 15

135 ° E MEAN TIME



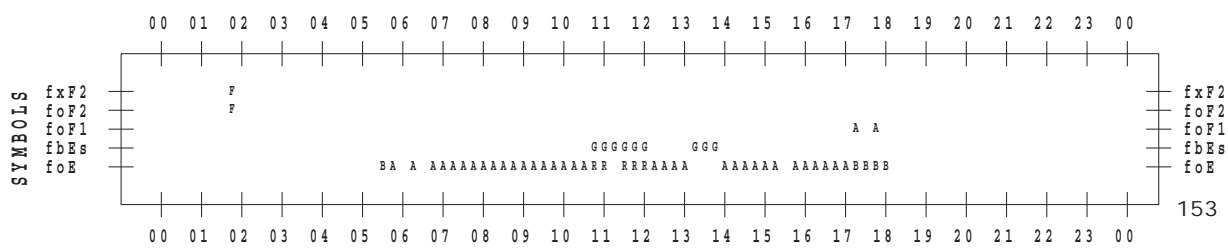
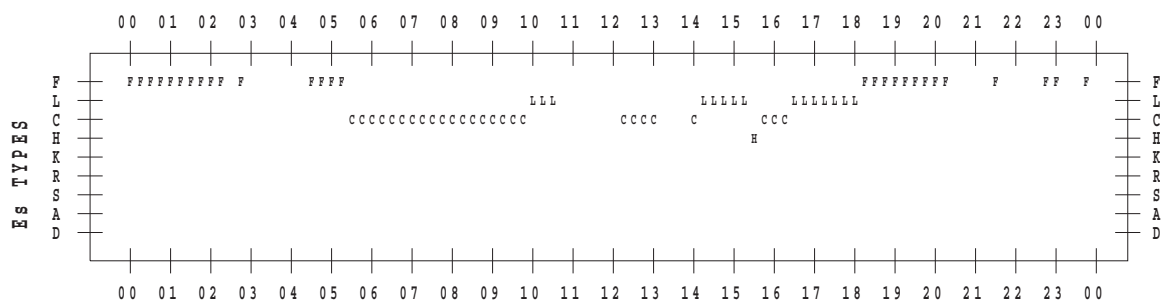
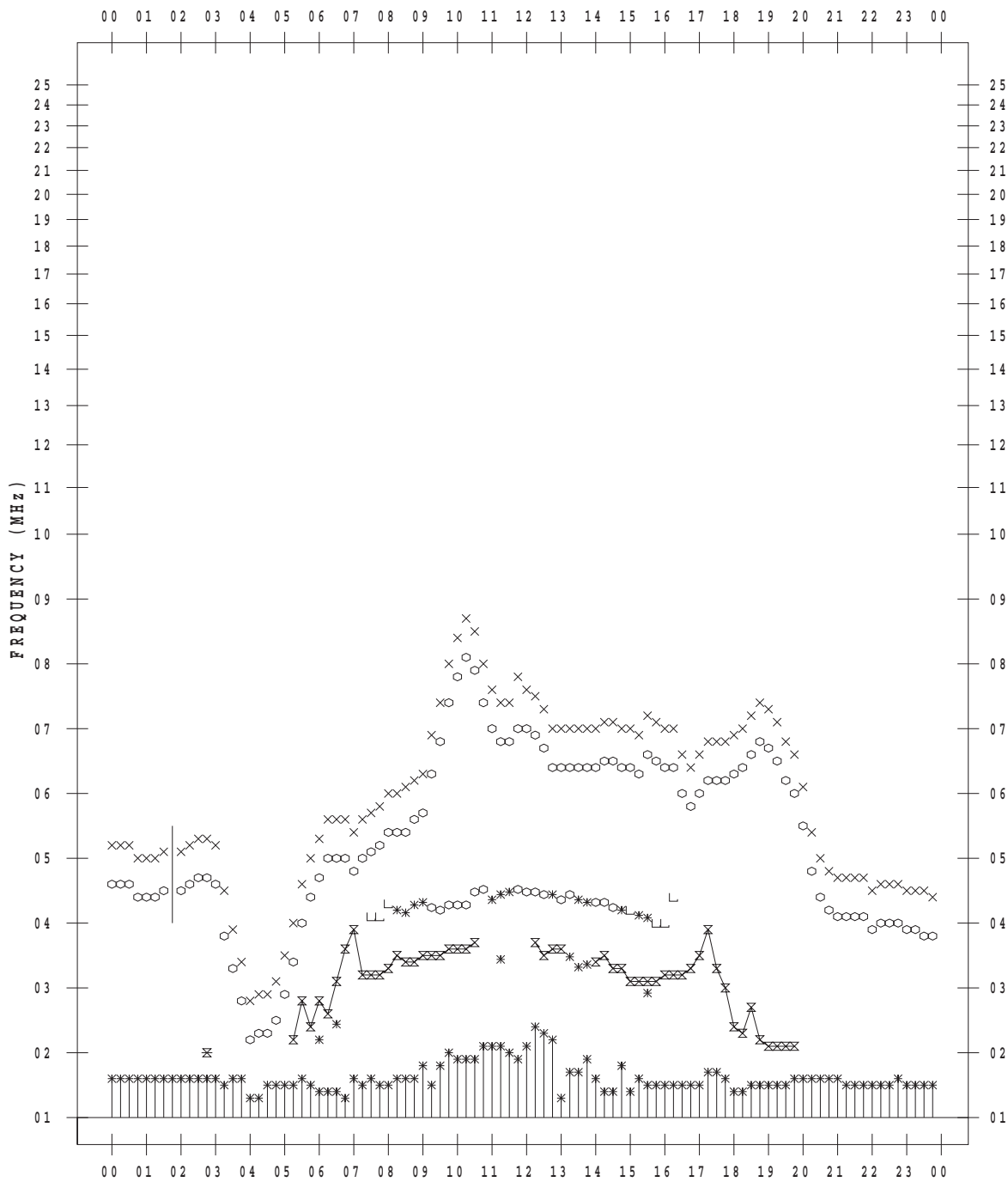
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 16

135 ° E MEAN TIME



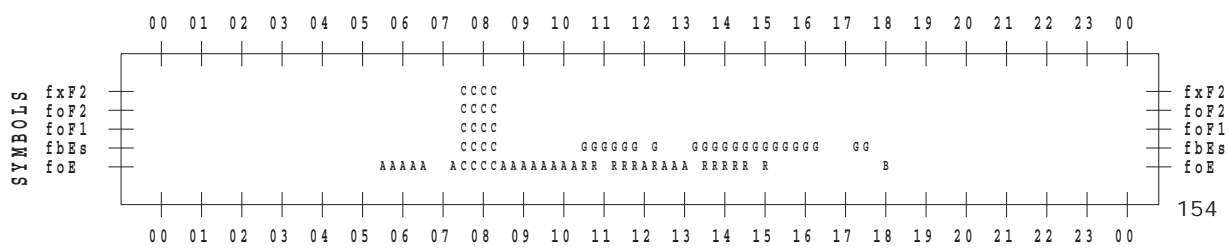
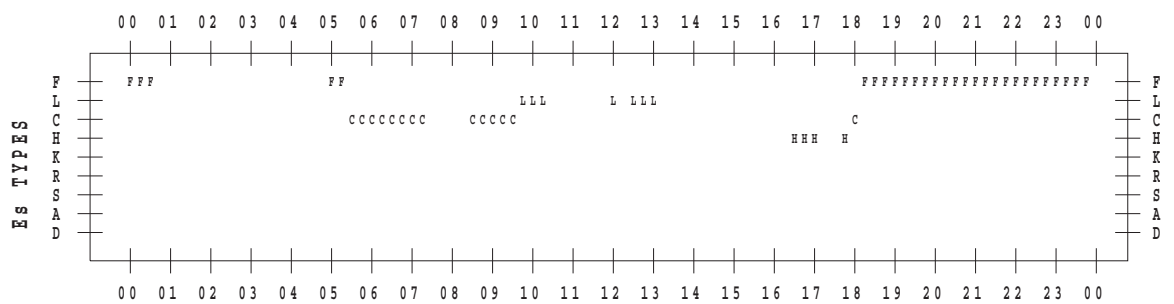
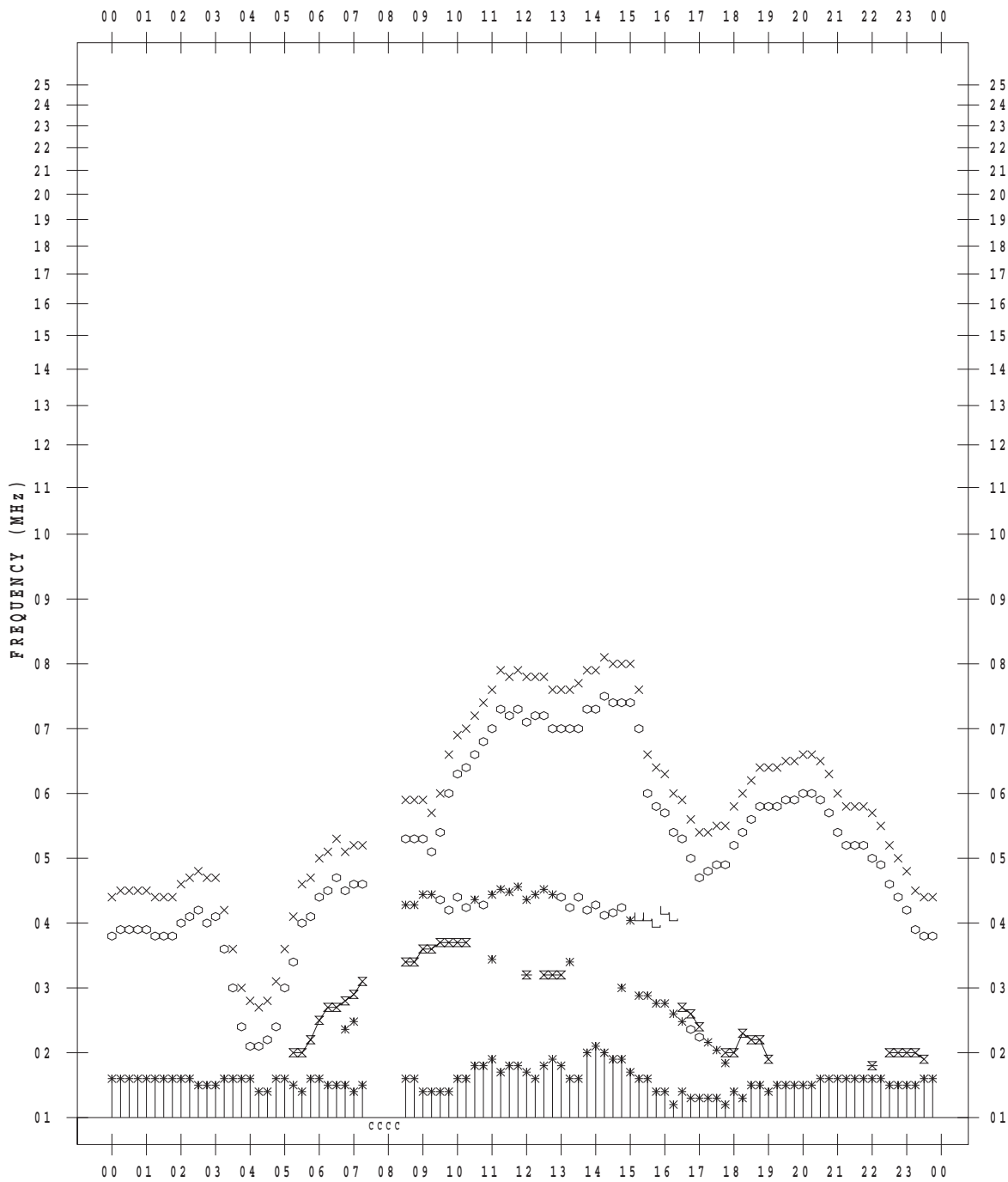
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 17

135 ° E MEAN TIME



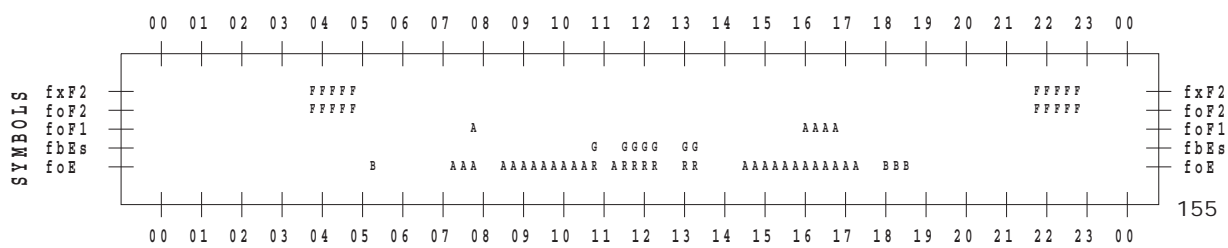
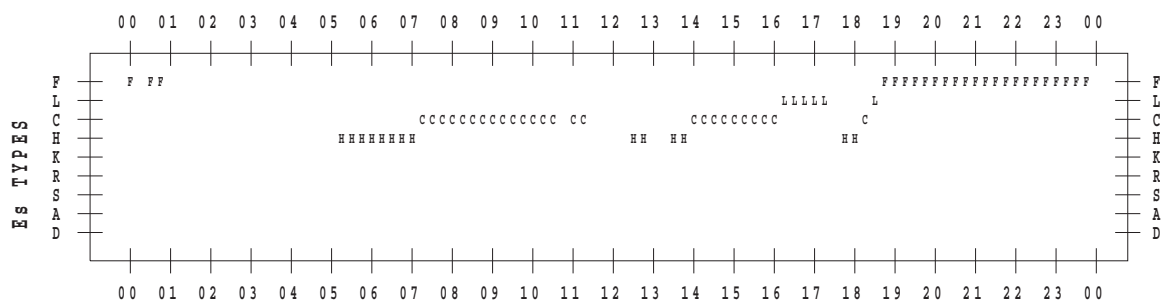
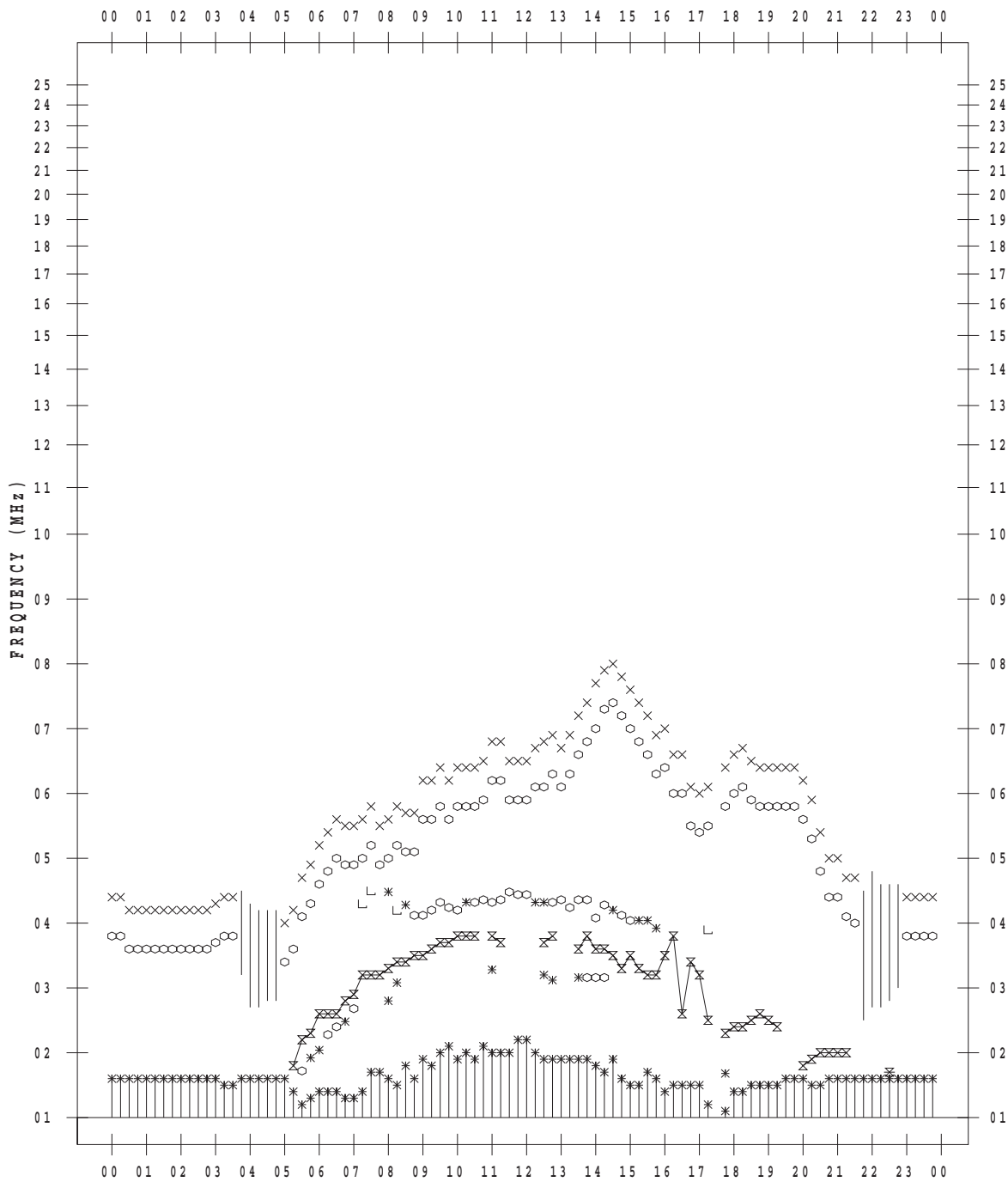
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 18

135 ° E MEAN TIME



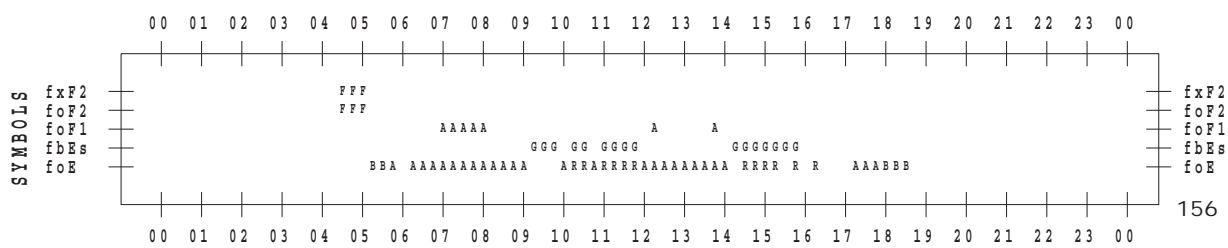
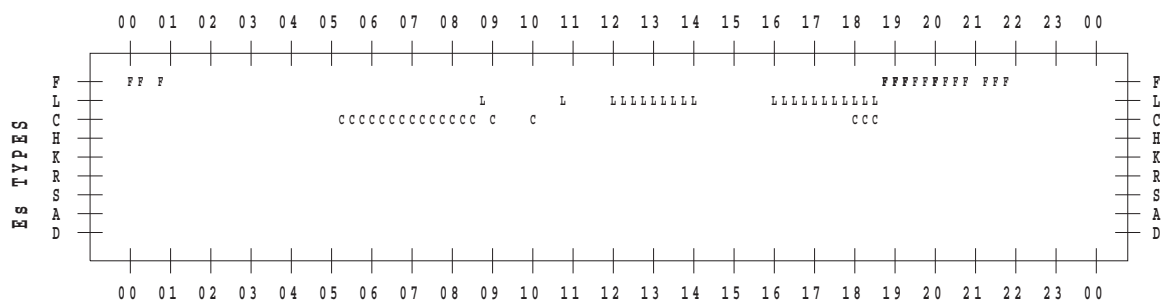
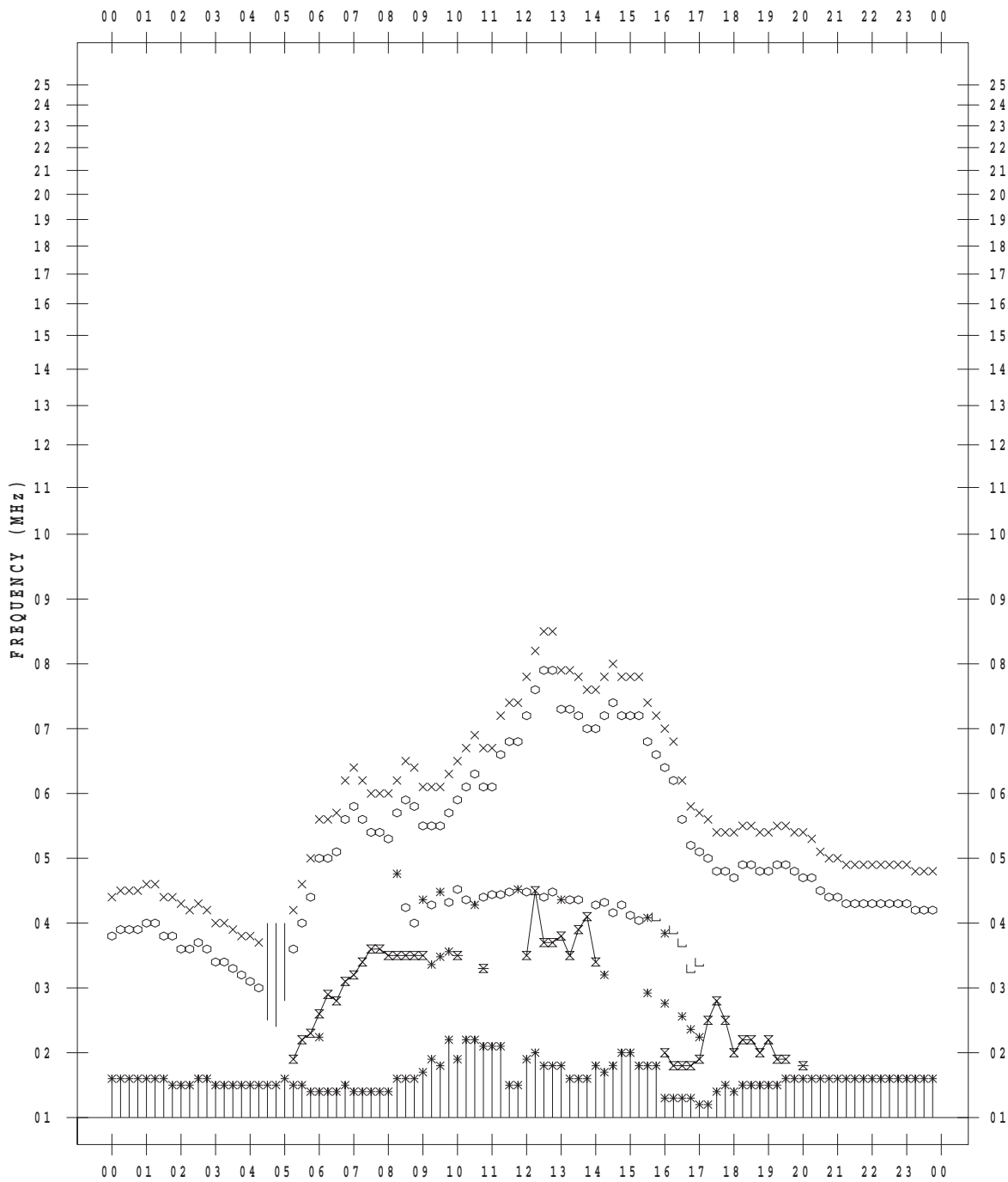
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 19

135 ° E MEAN TIME



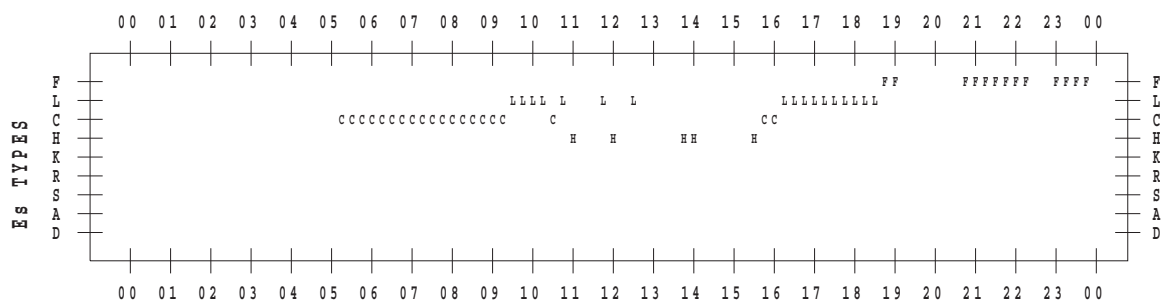
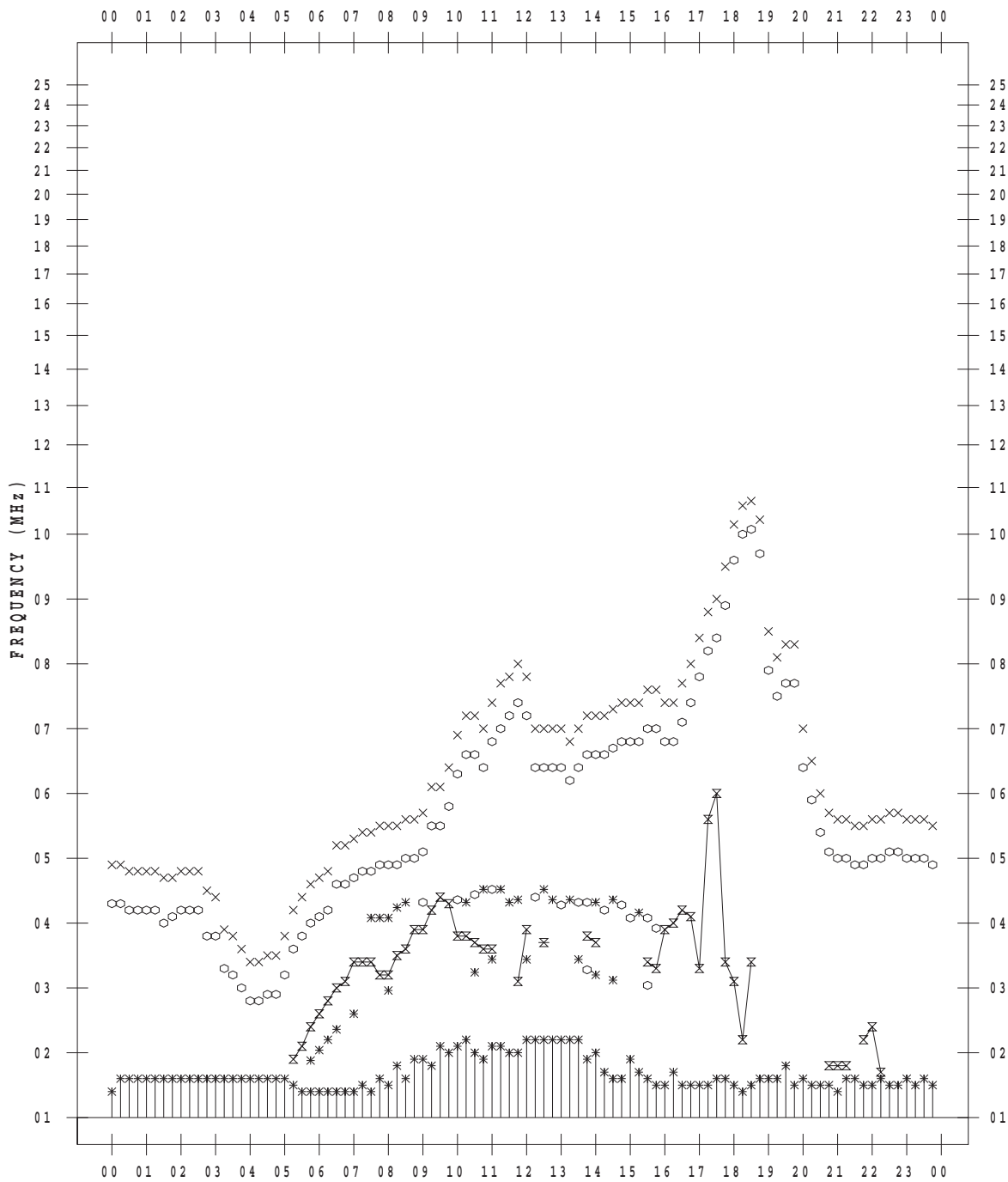
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 20

135 ° E MEAN TIME



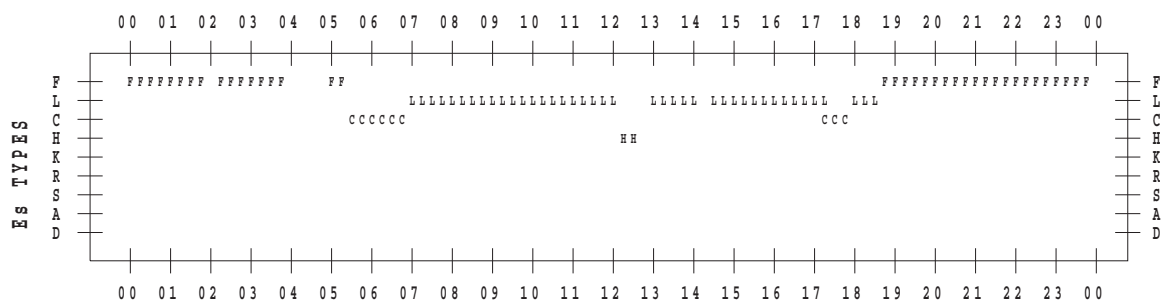
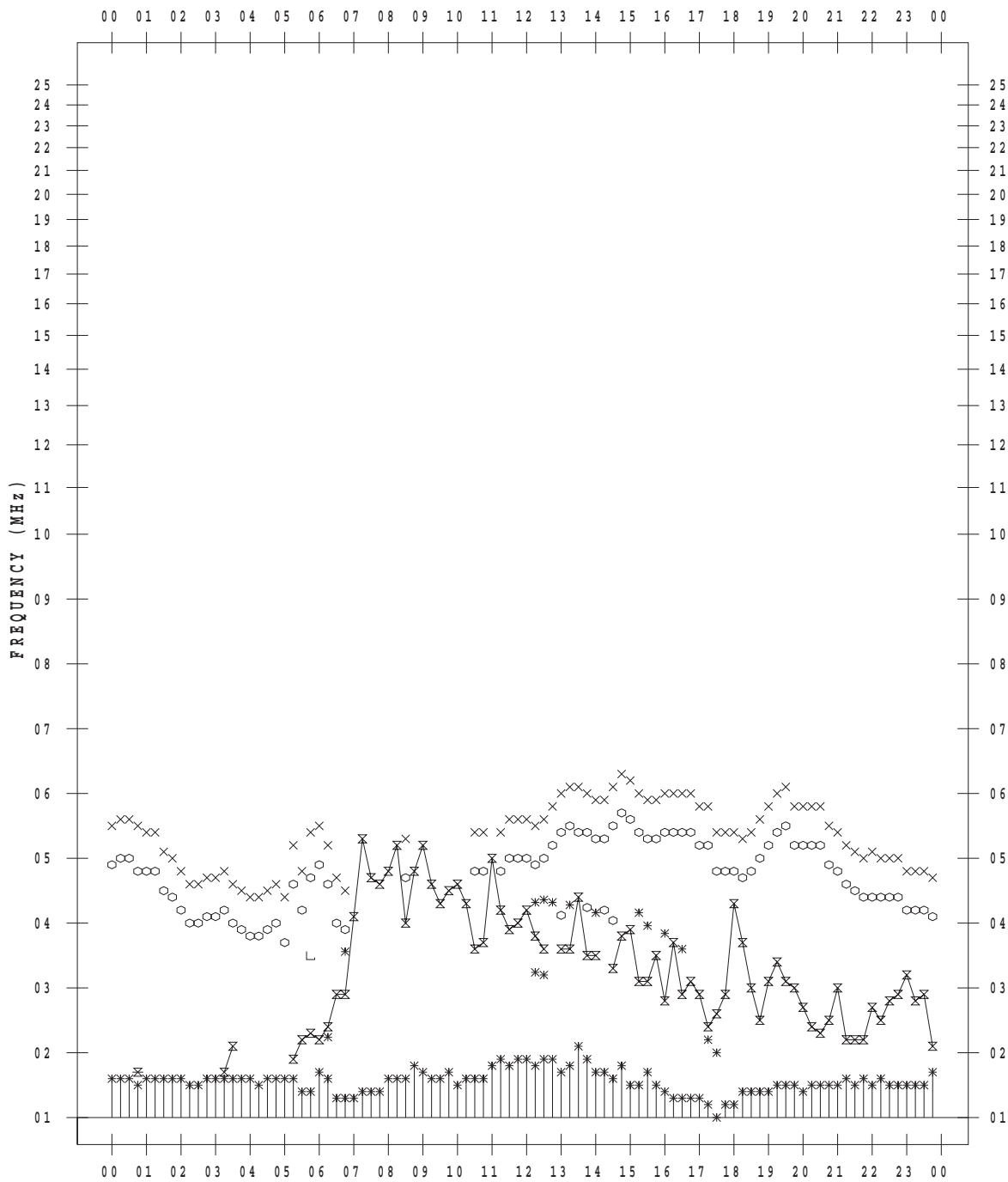
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 21

135 ° E MEAN TIME



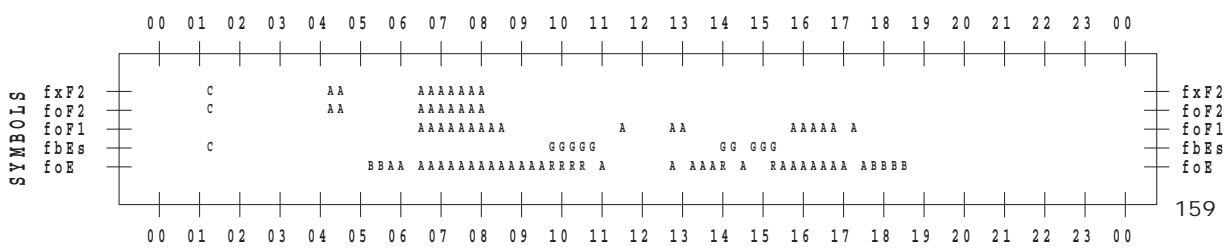
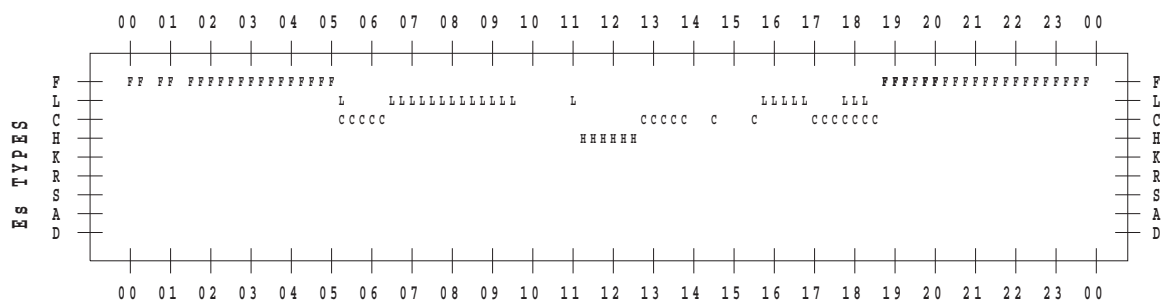
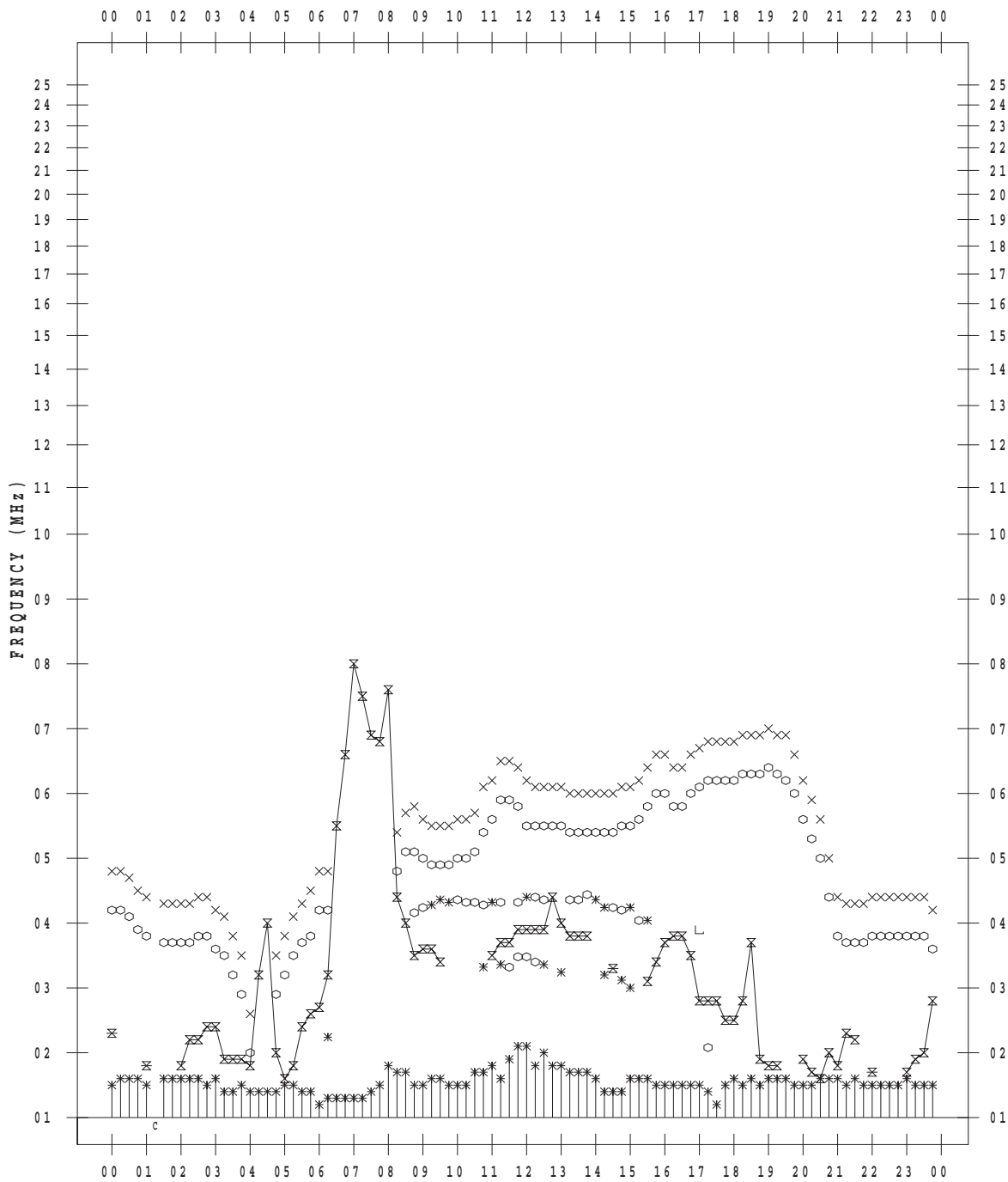
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 22

135 ° E MEAN TIME



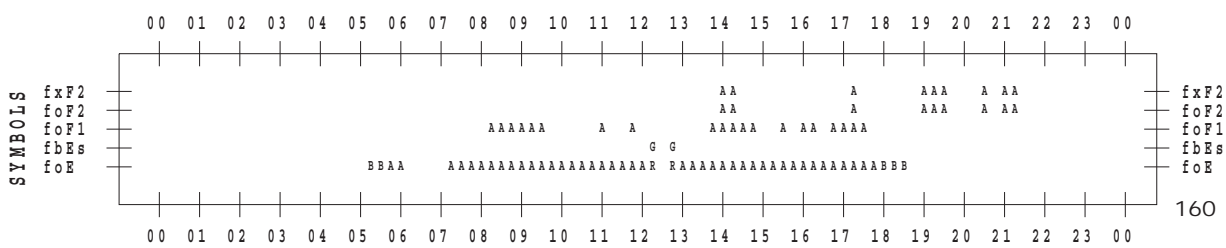
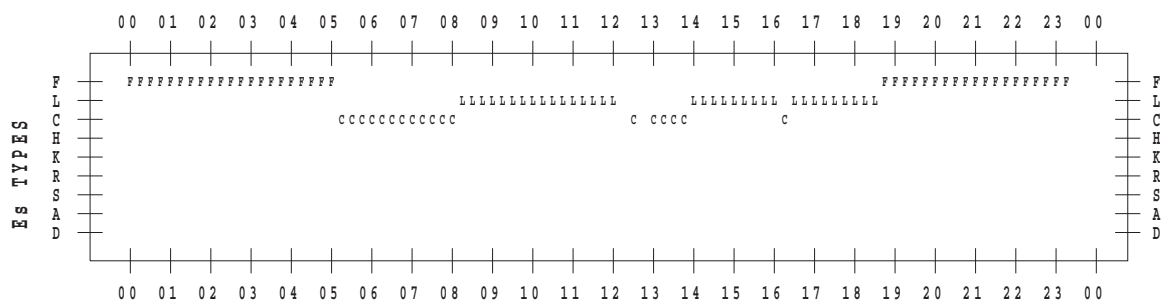
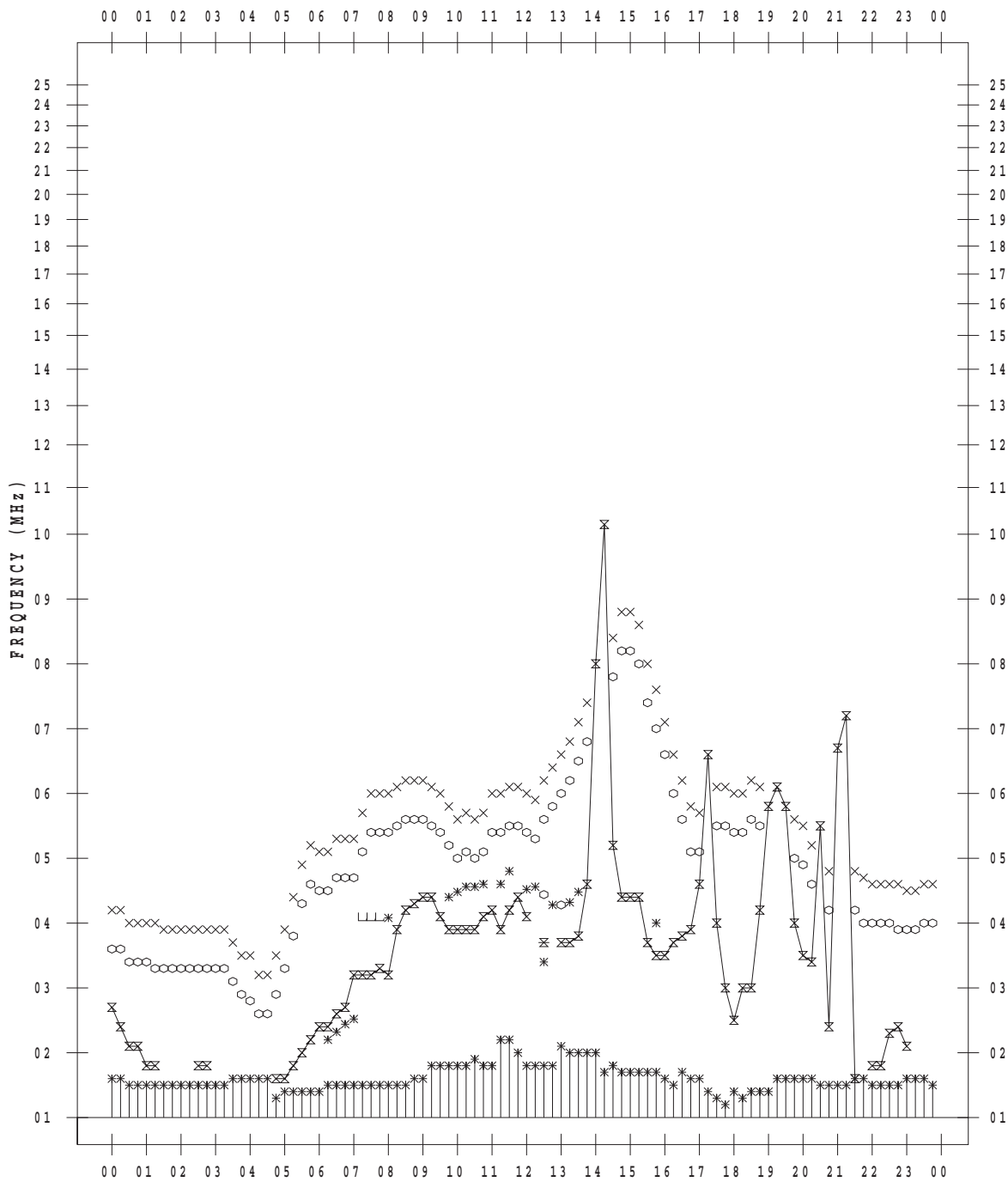
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 23

135 ° E MEAN TIME



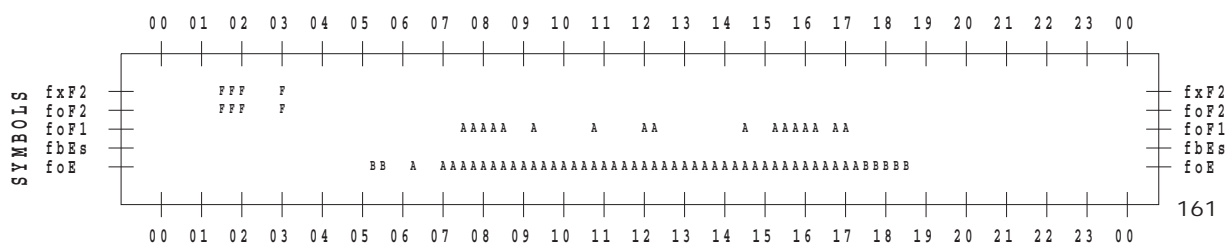
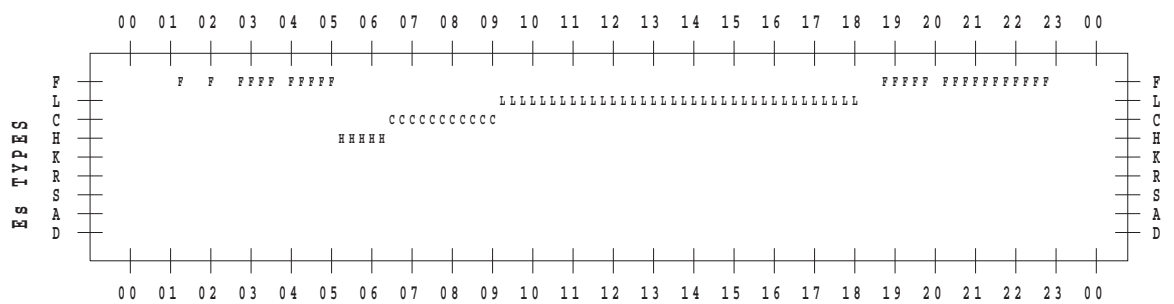
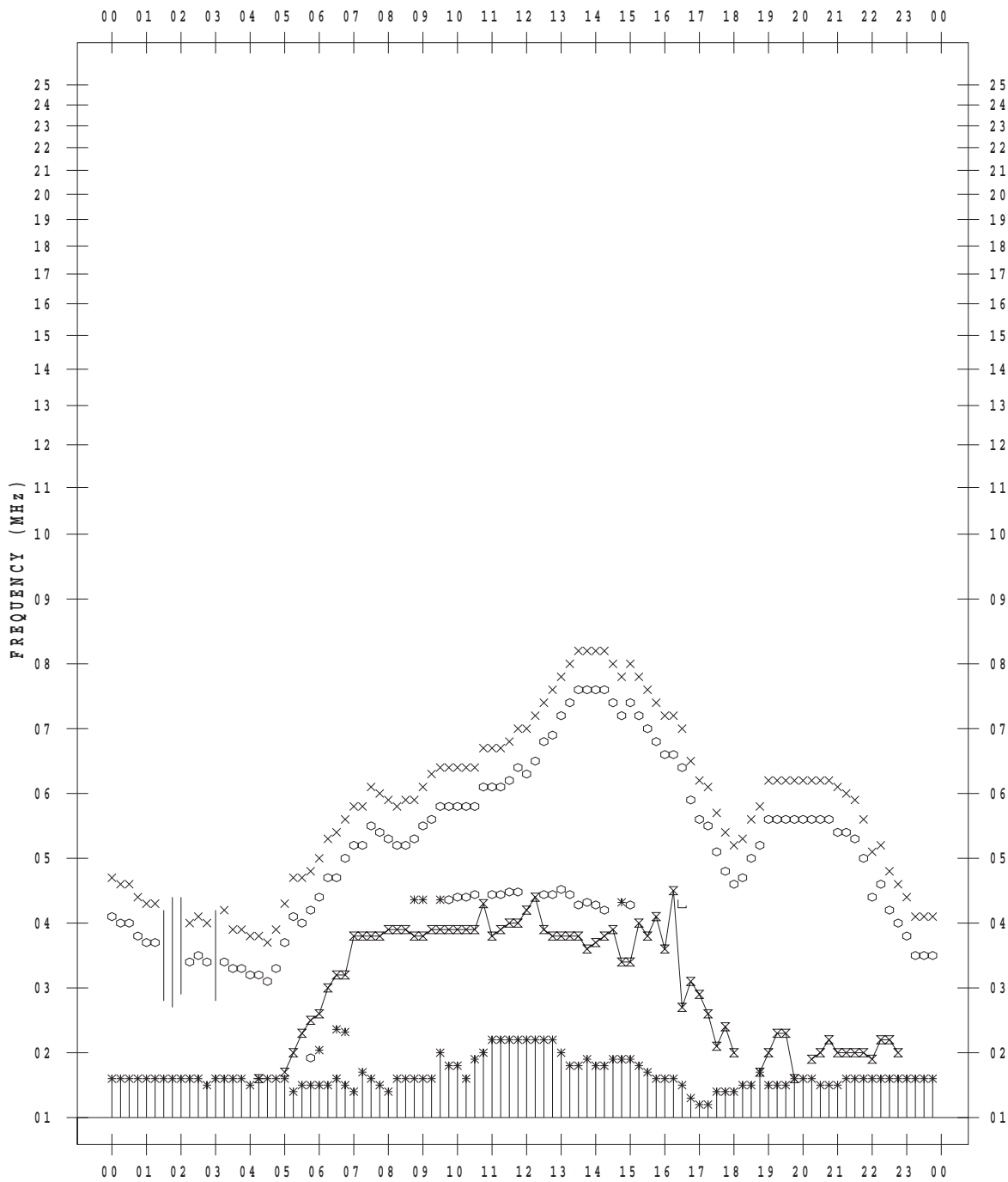
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 24

135 ° E MEAN TIME



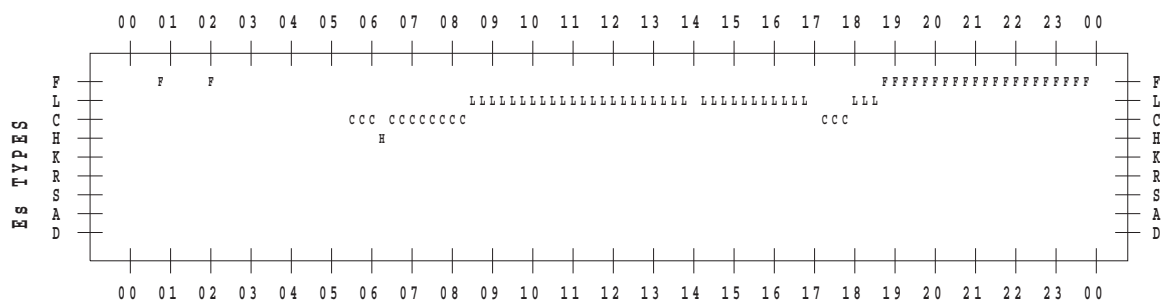
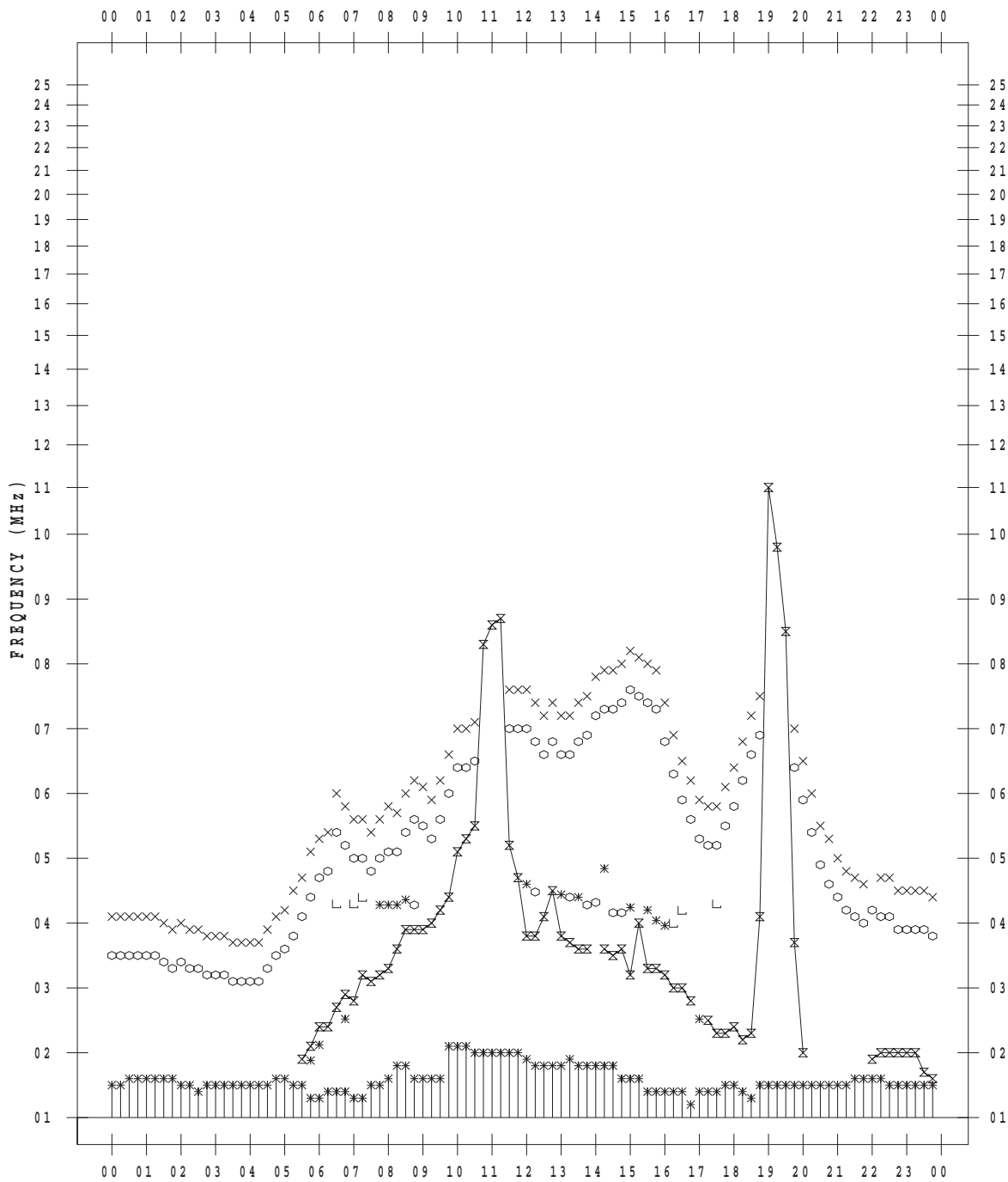
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 25

135 ° E MEAN TIME



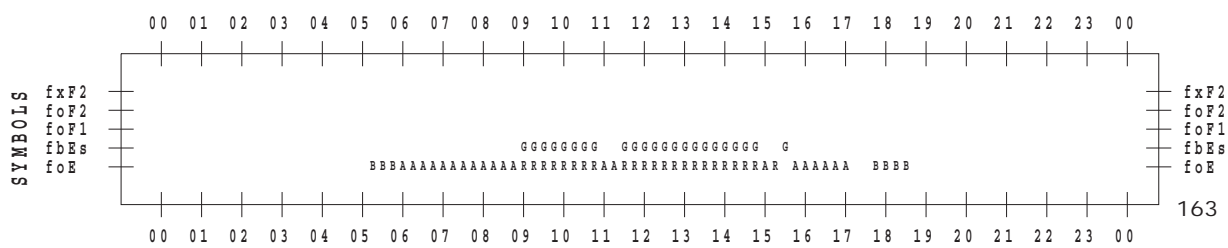
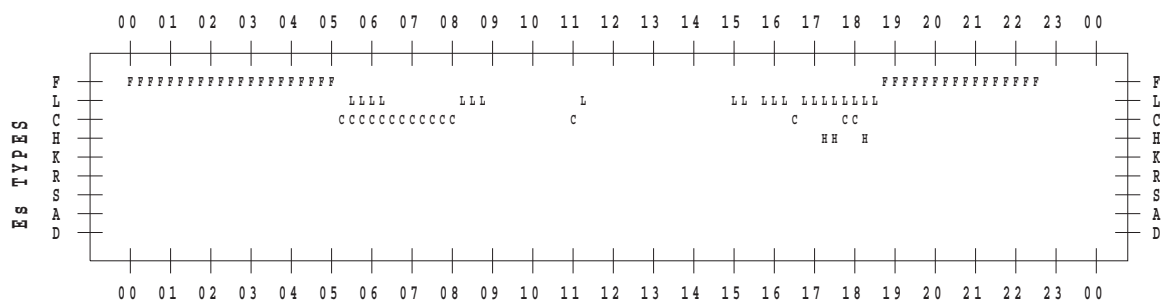
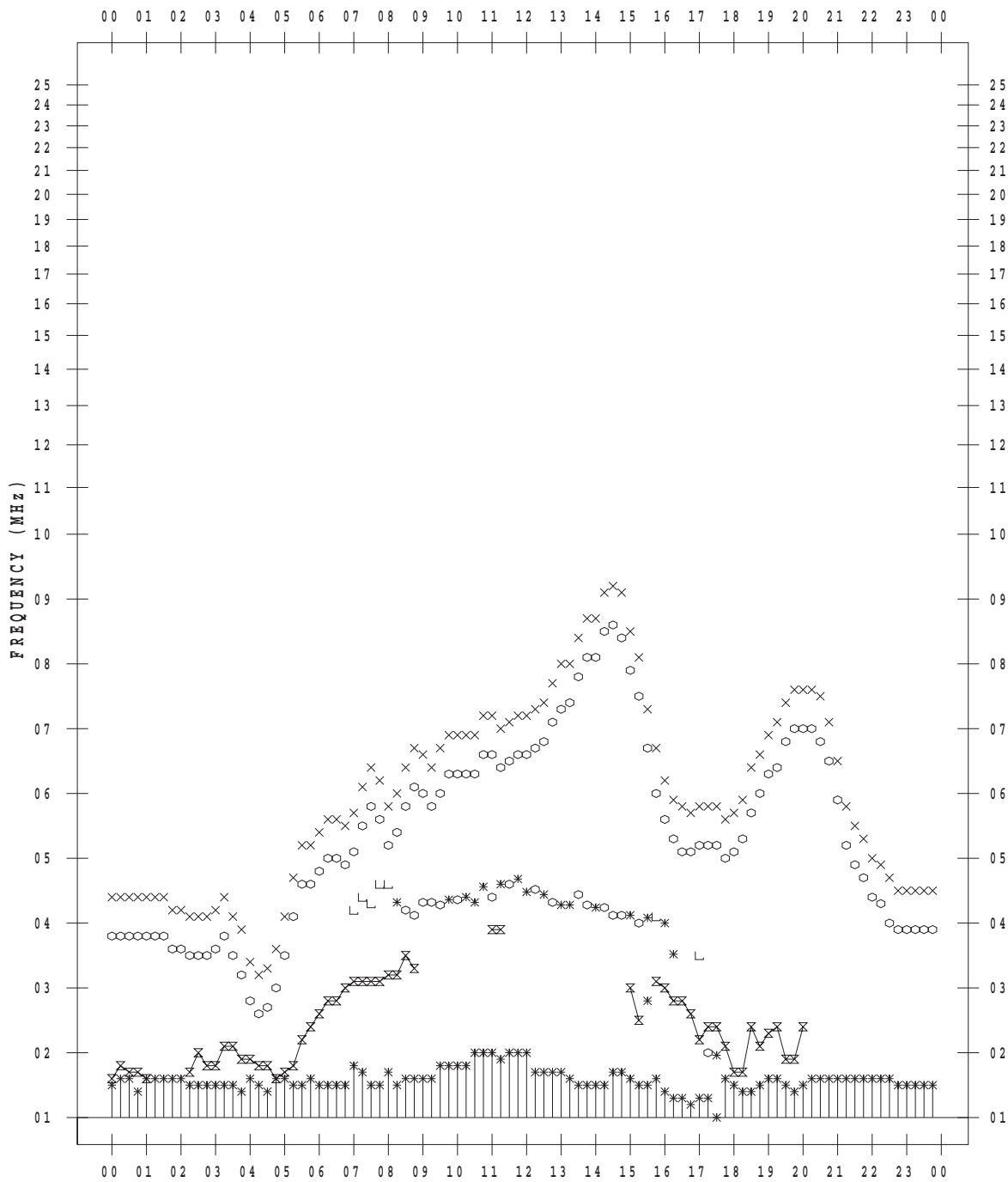
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 26

135 ° E MEAN TIME



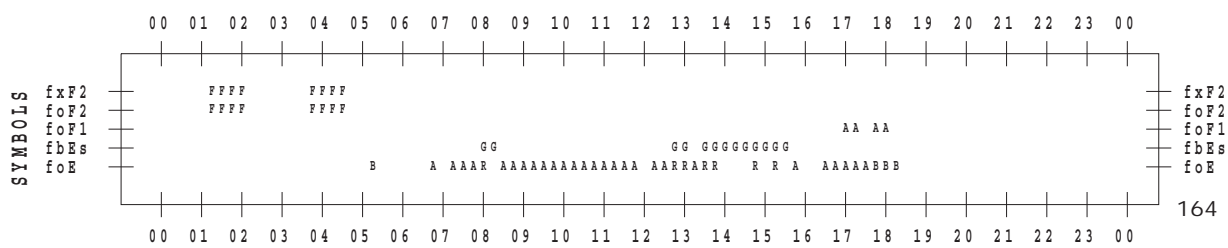
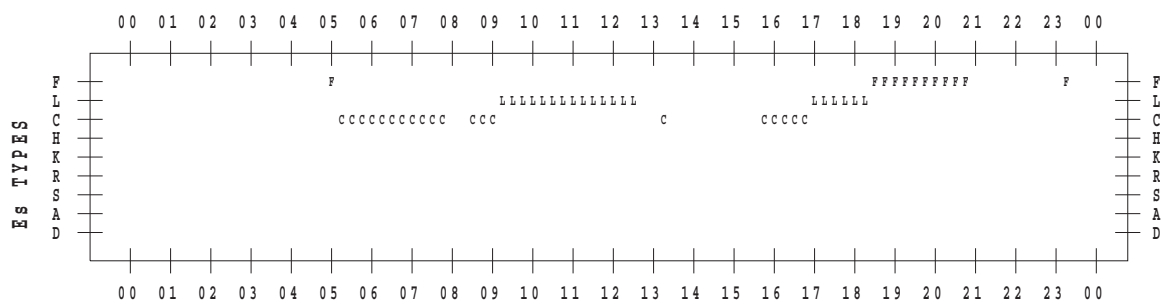
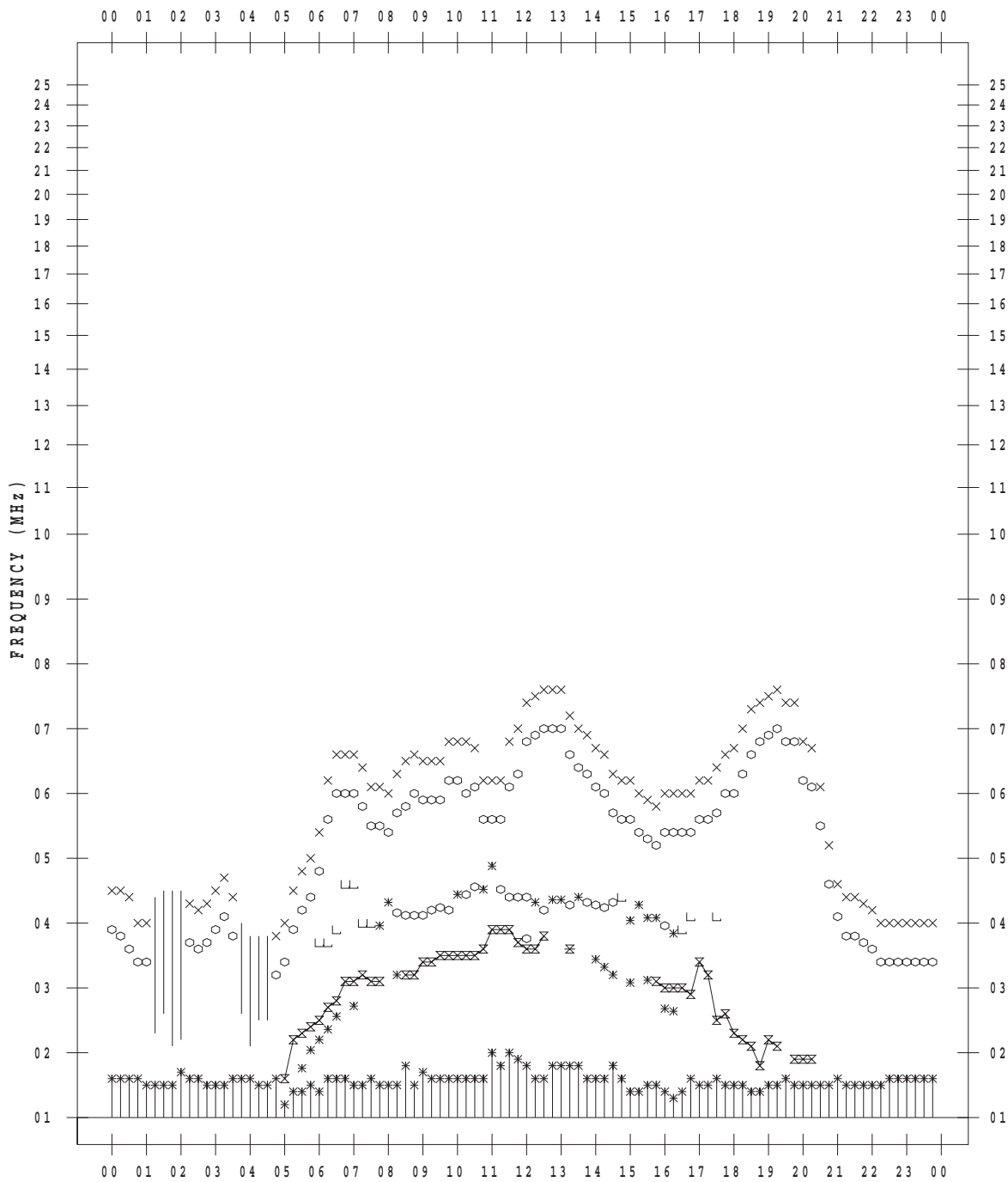
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 27

135 ° E MEAN TIME



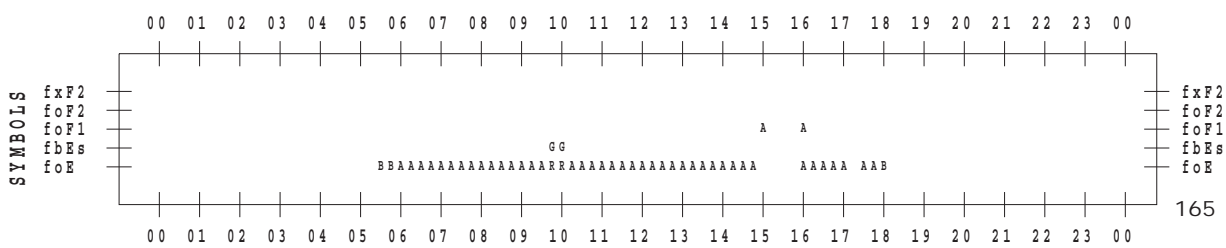
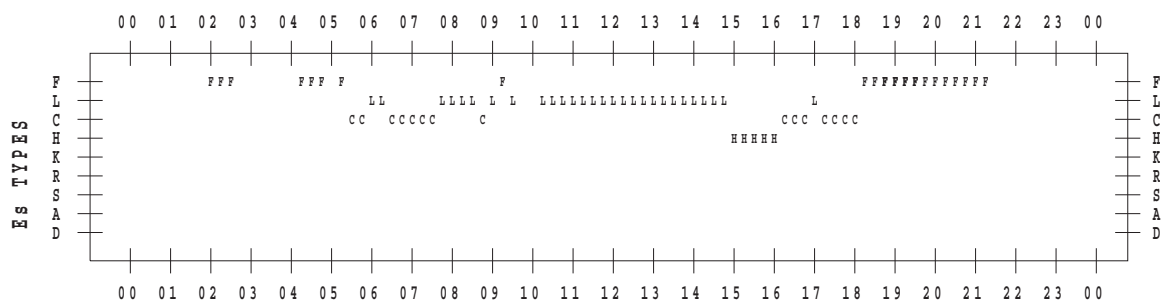
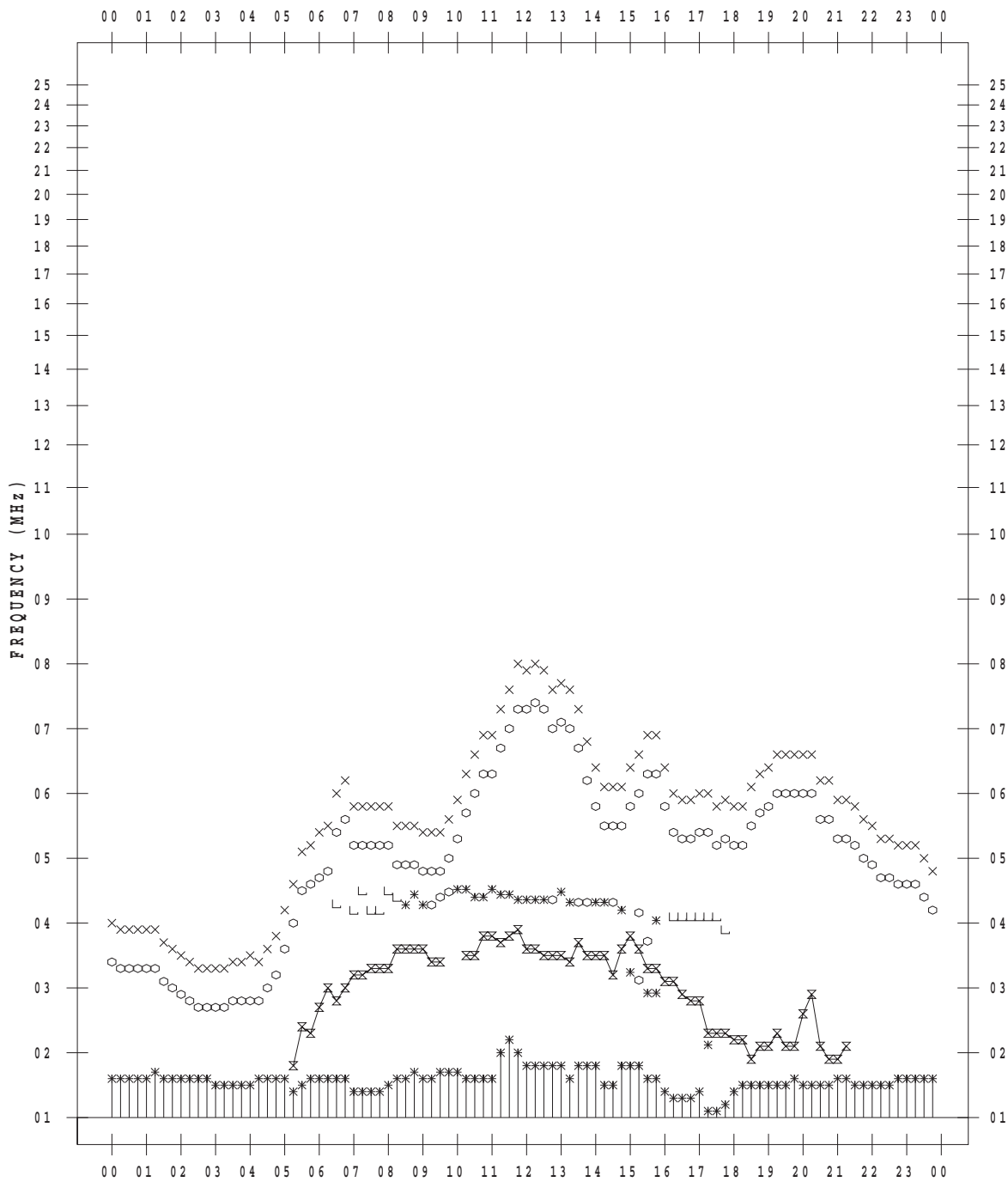
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 28

135 ° E MEAN TIME



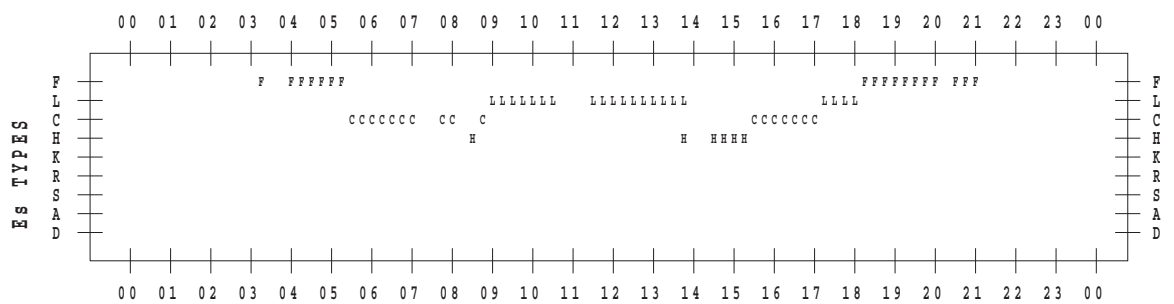
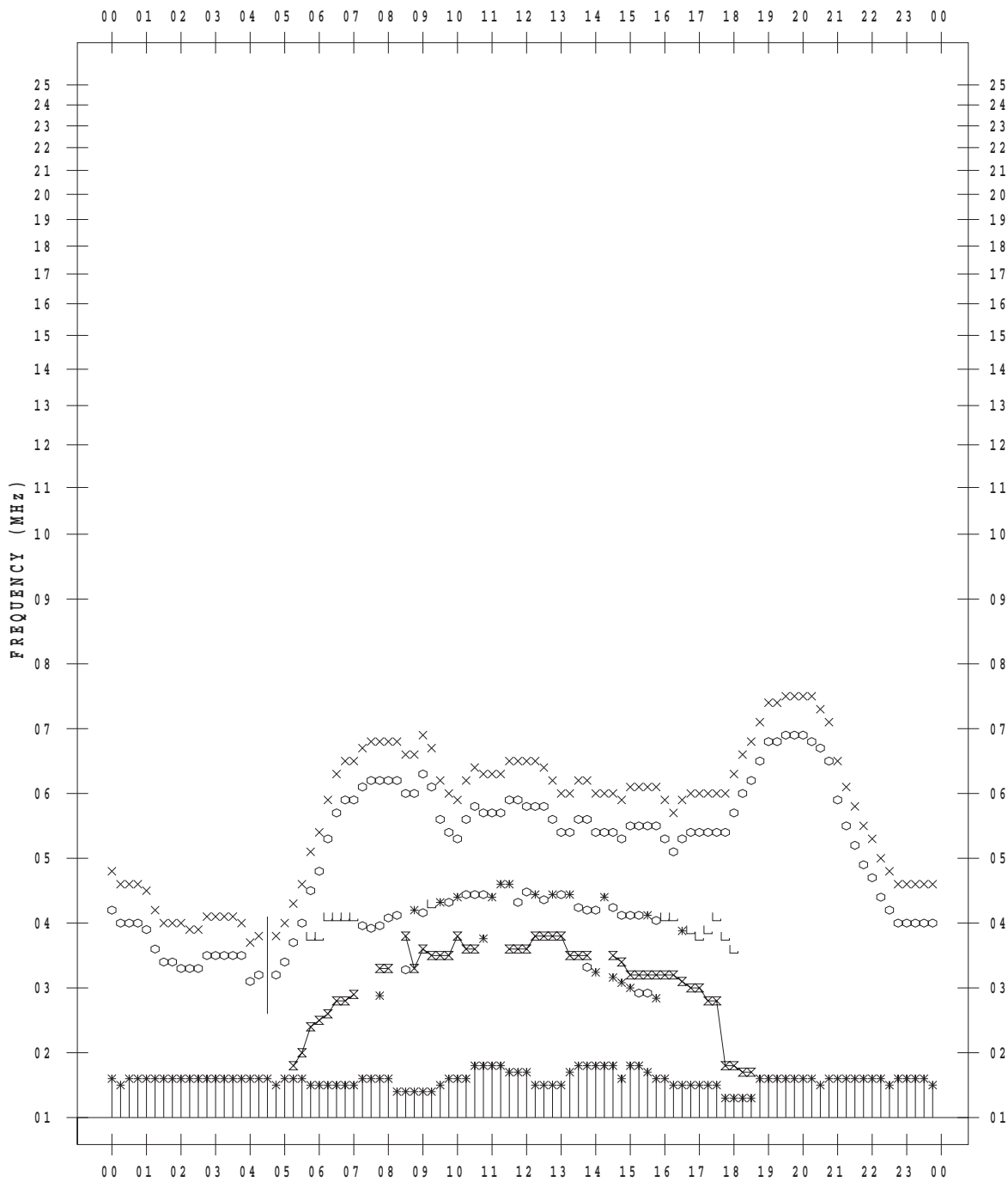
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 29

135 ° E MEAN TIME



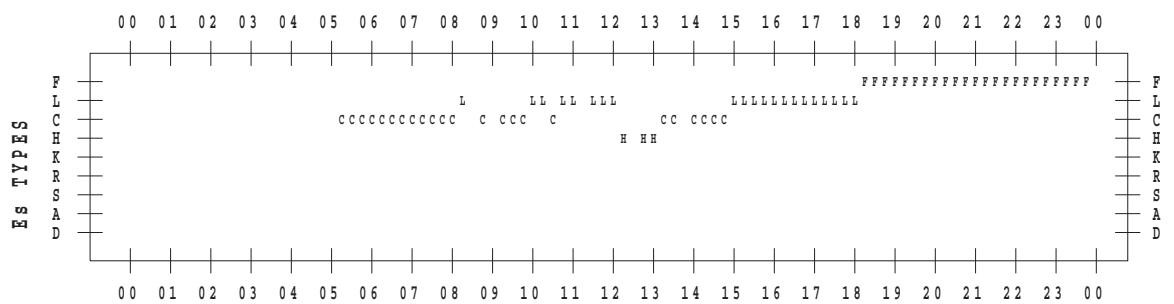
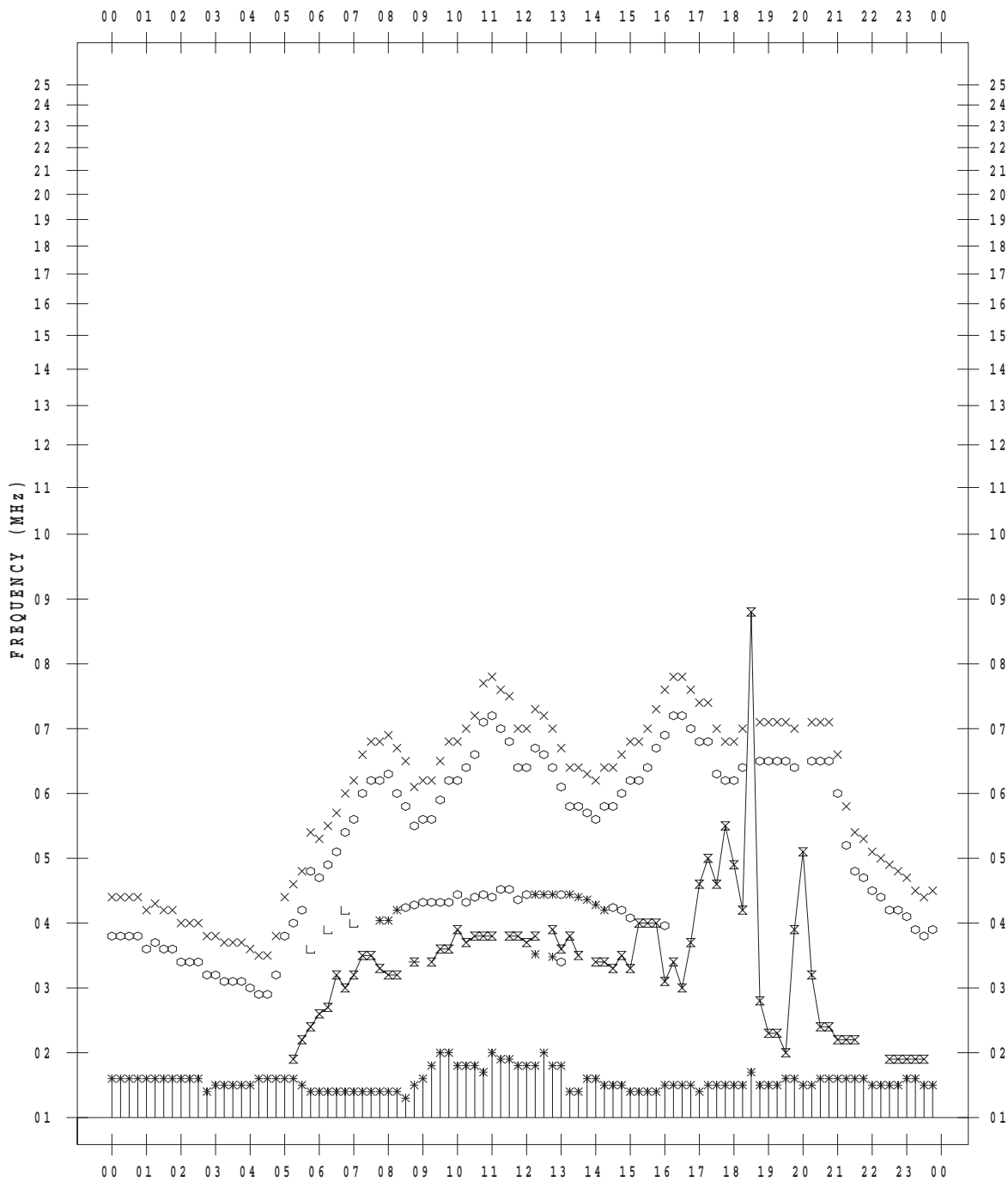
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018 / 4 / 30

135 ° E MEAN TIME



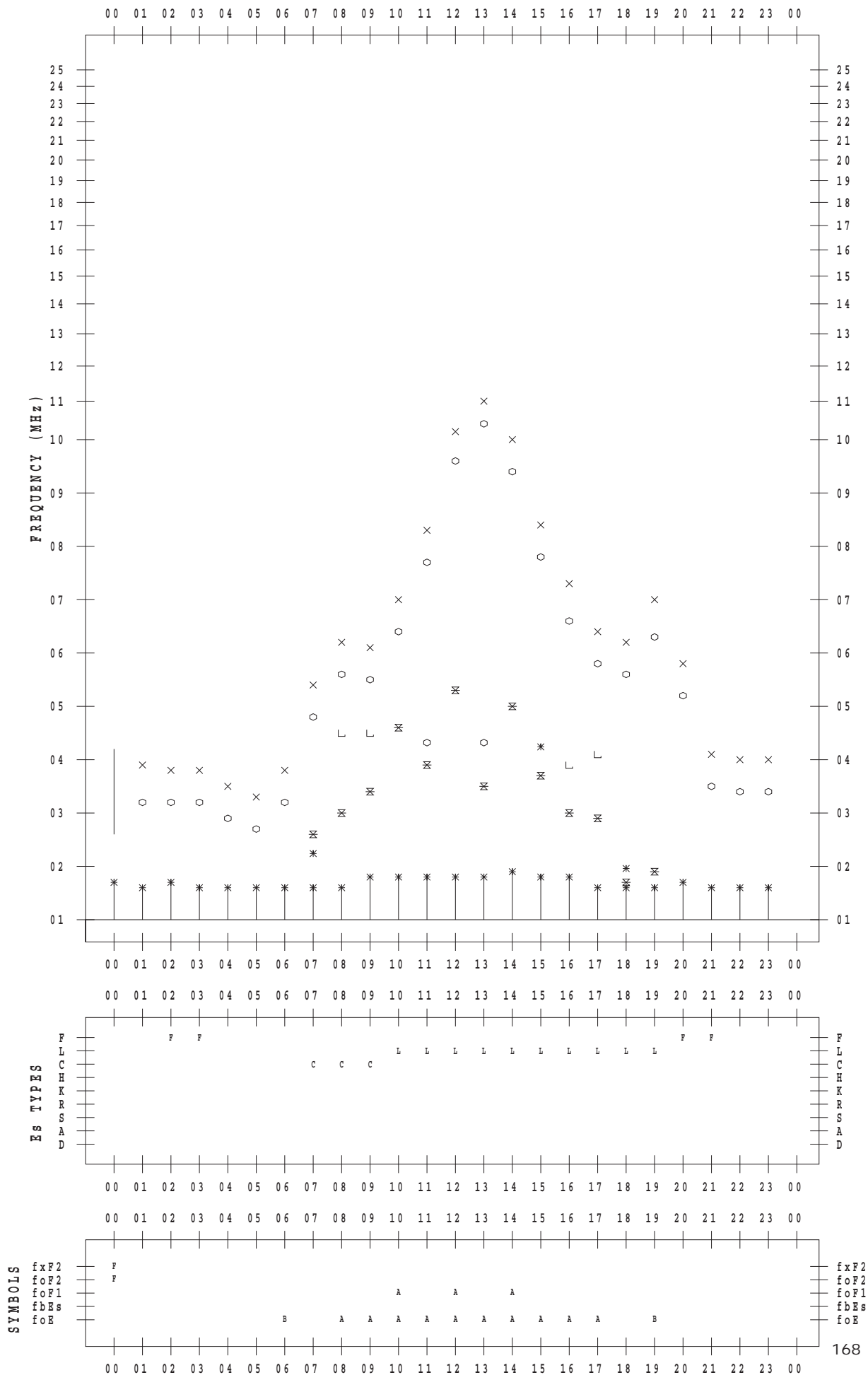
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 1

135 ° E MEAN TIME



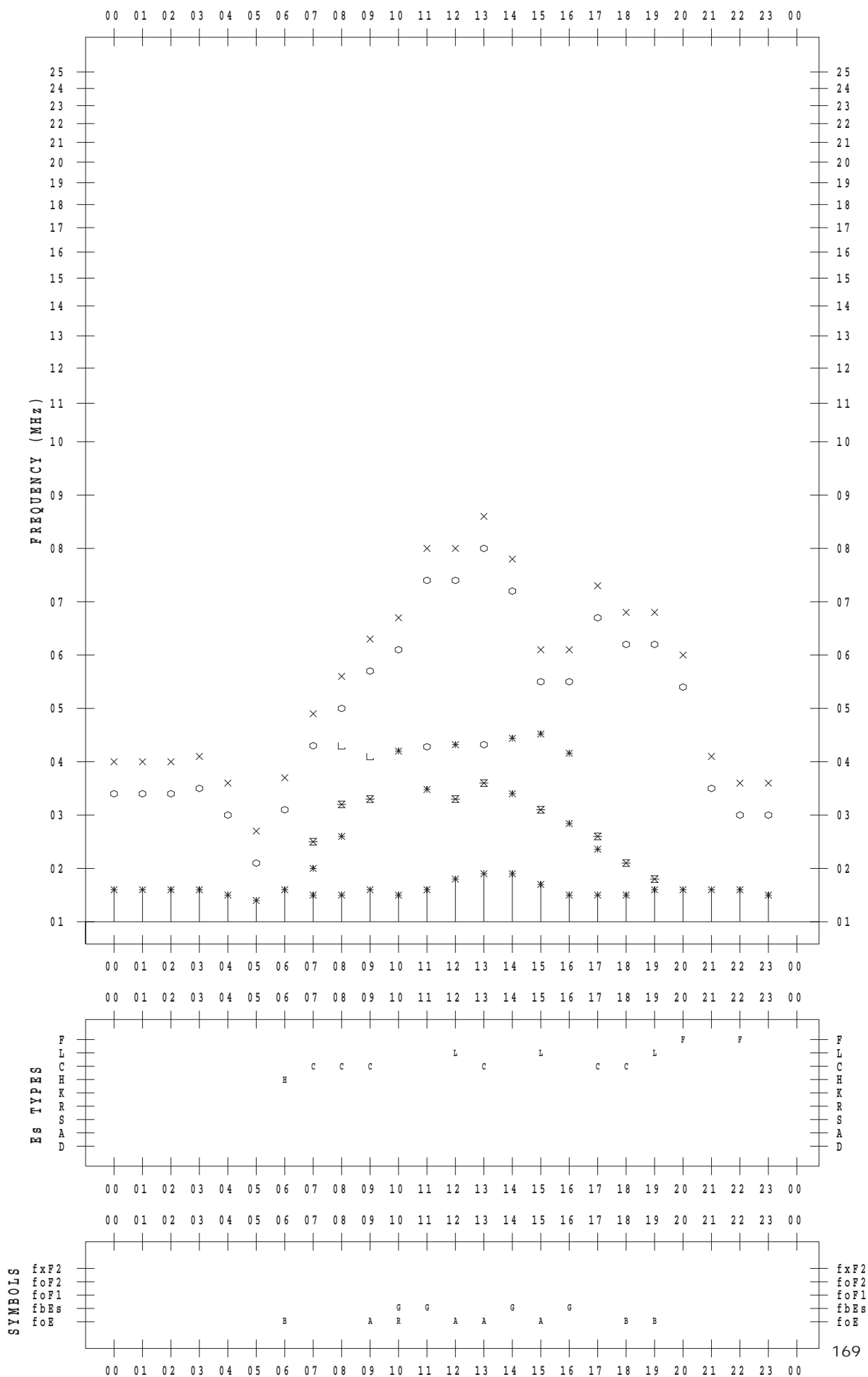
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 2

135 ° E MEAN TIME



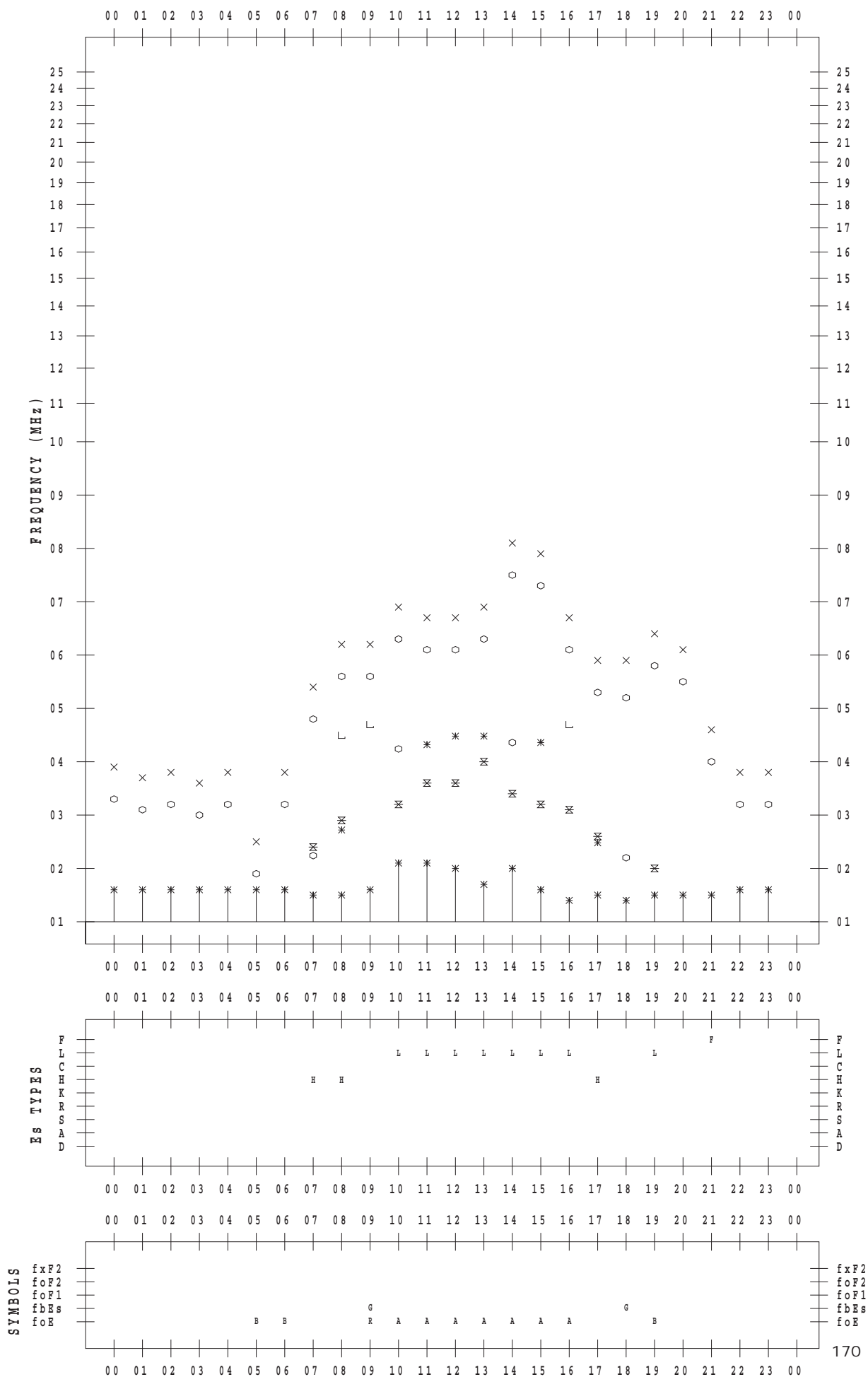
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 3

135 ° E MEAN TIME



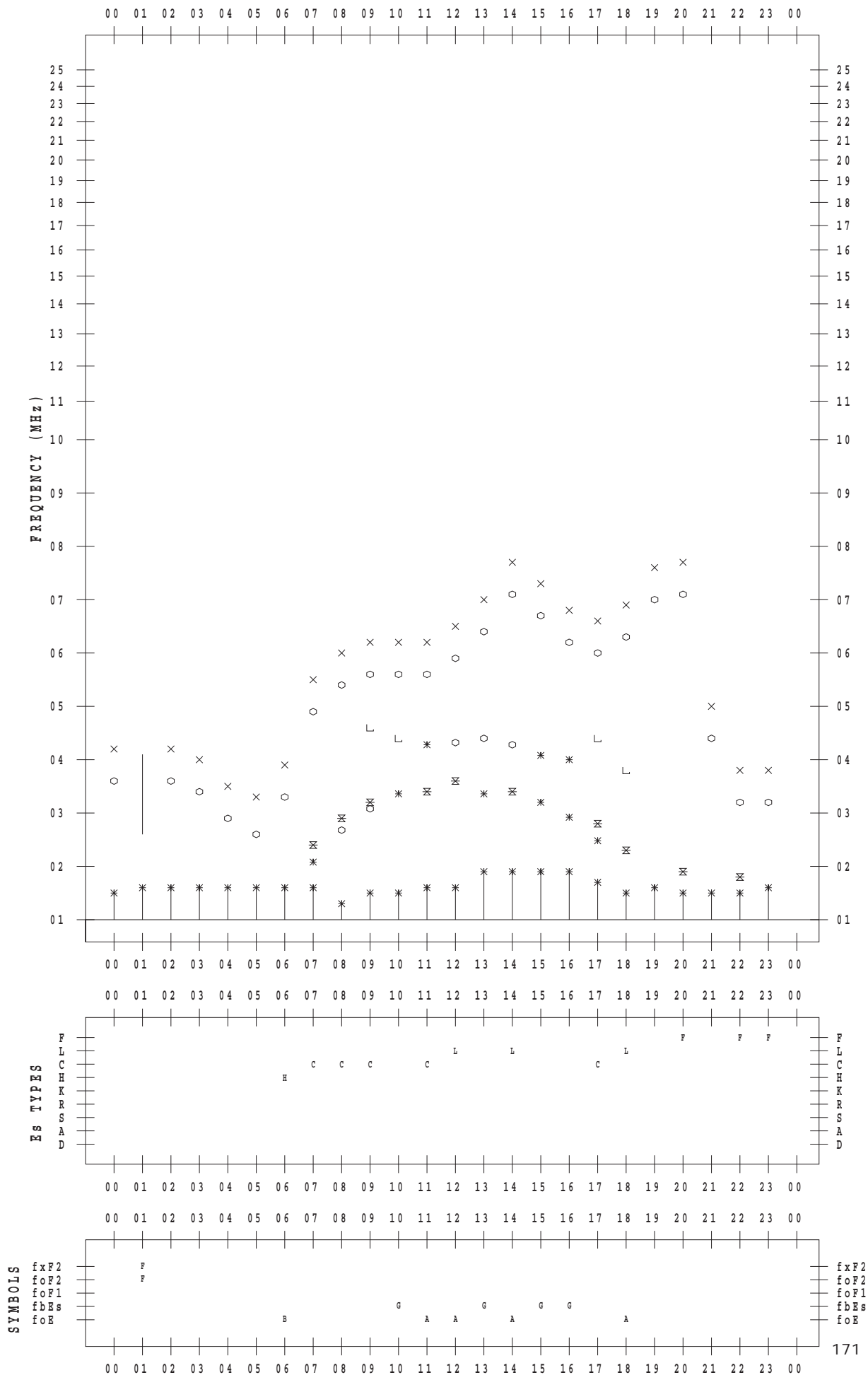
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 4

135 ° E MEAN TIME



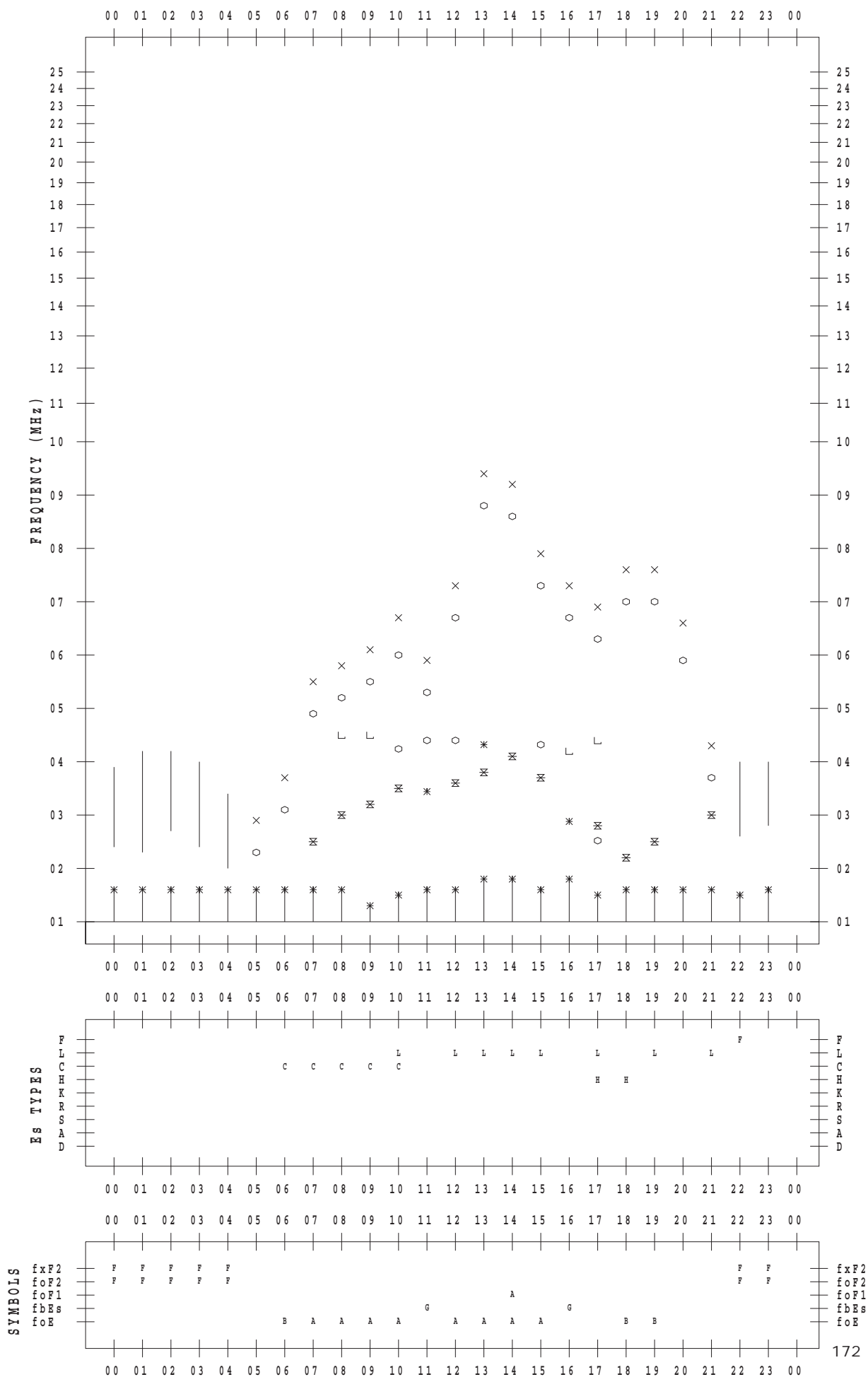
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 5

135 ° E MEAN TIME



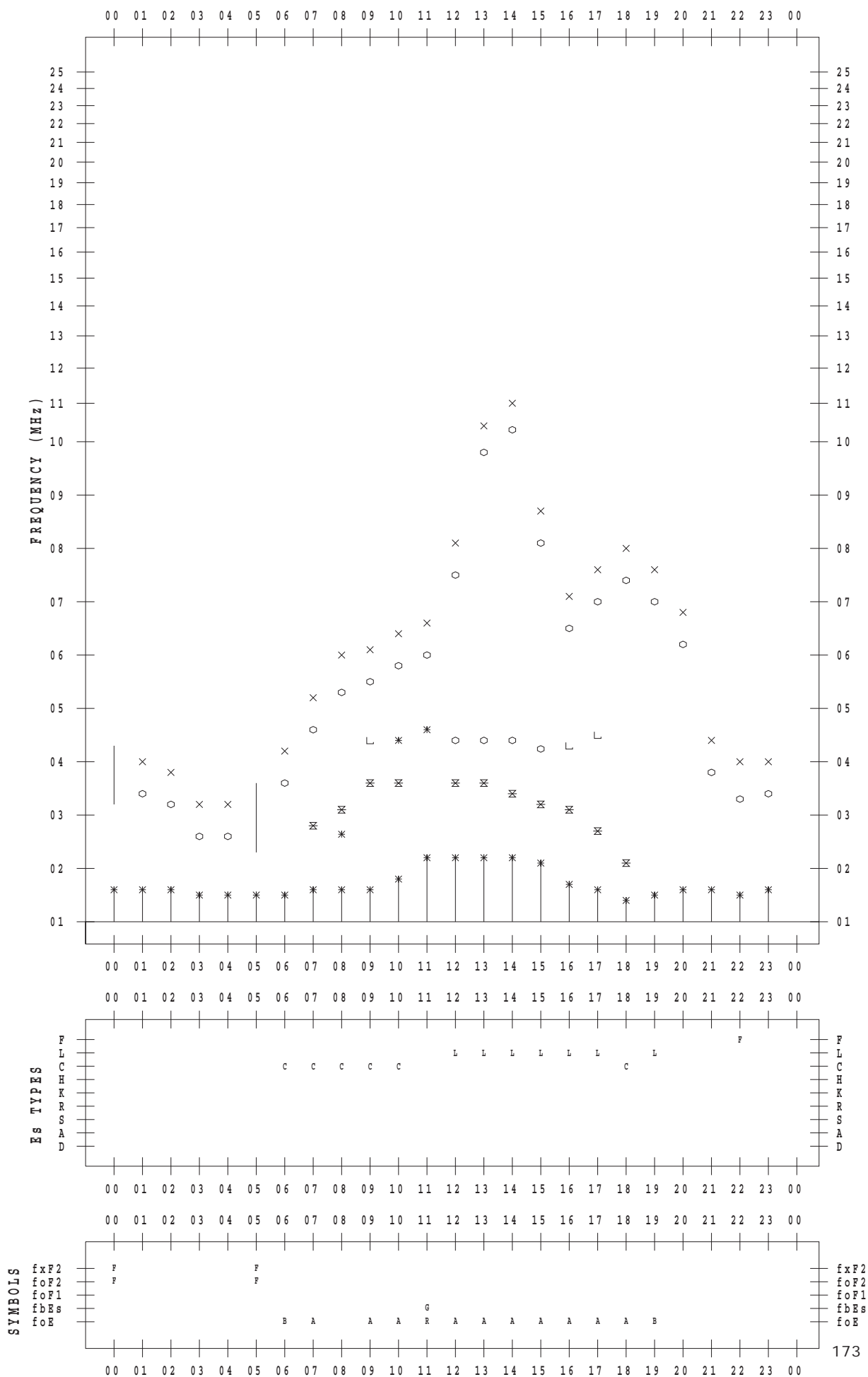
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 6

135 ° E MEAN TIME



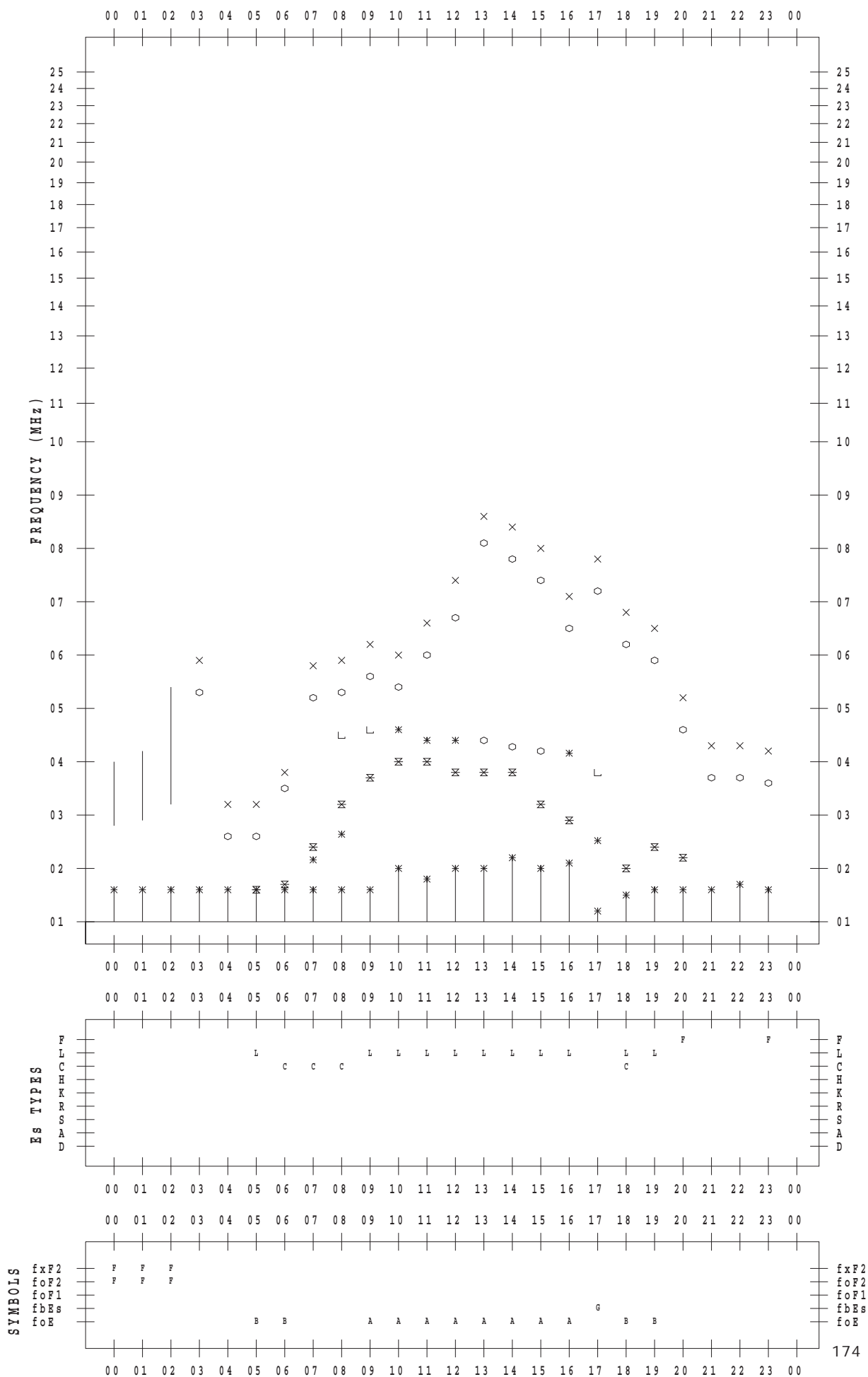
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 7

135 ° E MEAN TIME



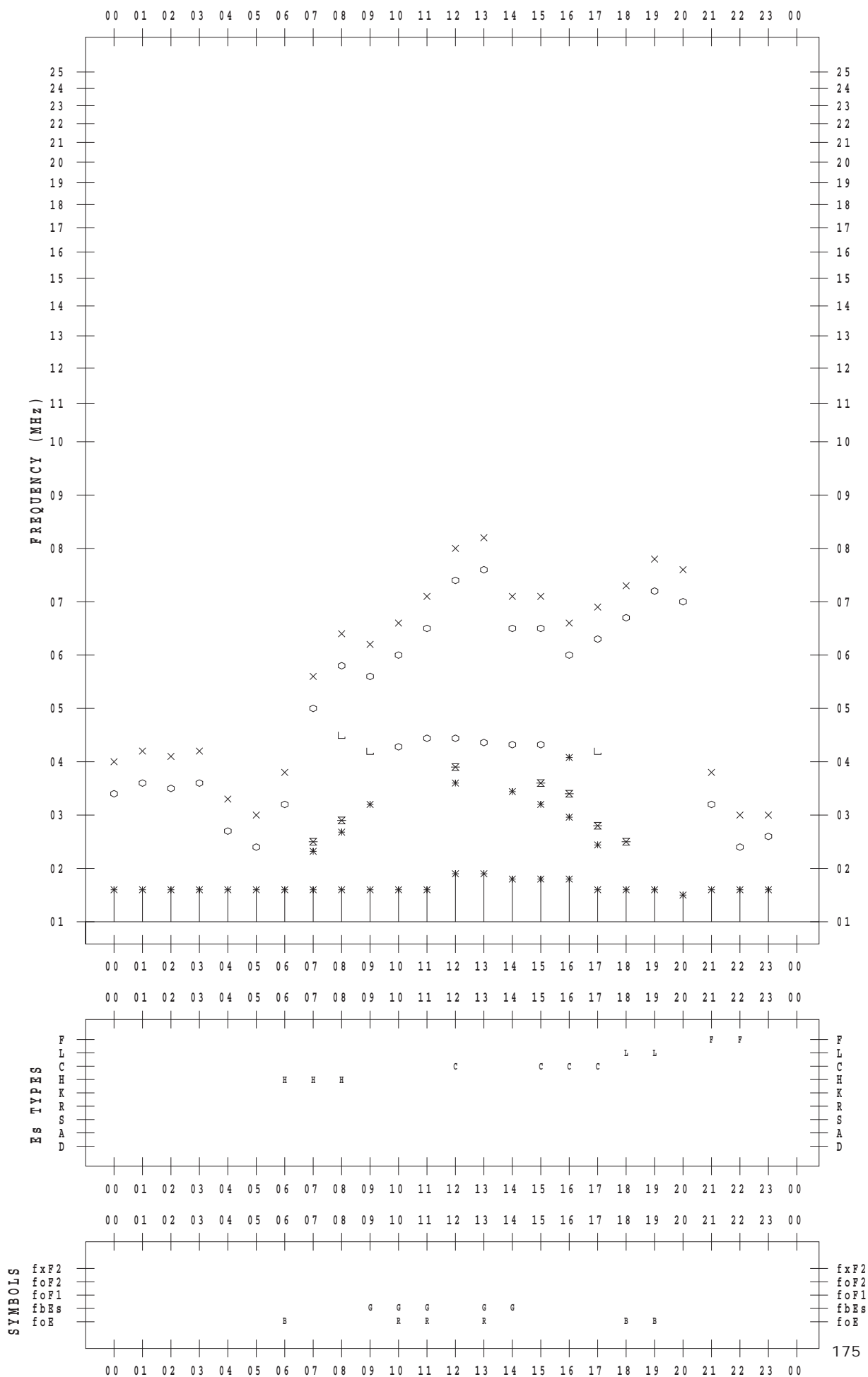
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 8

135 ° E MEAN TIME



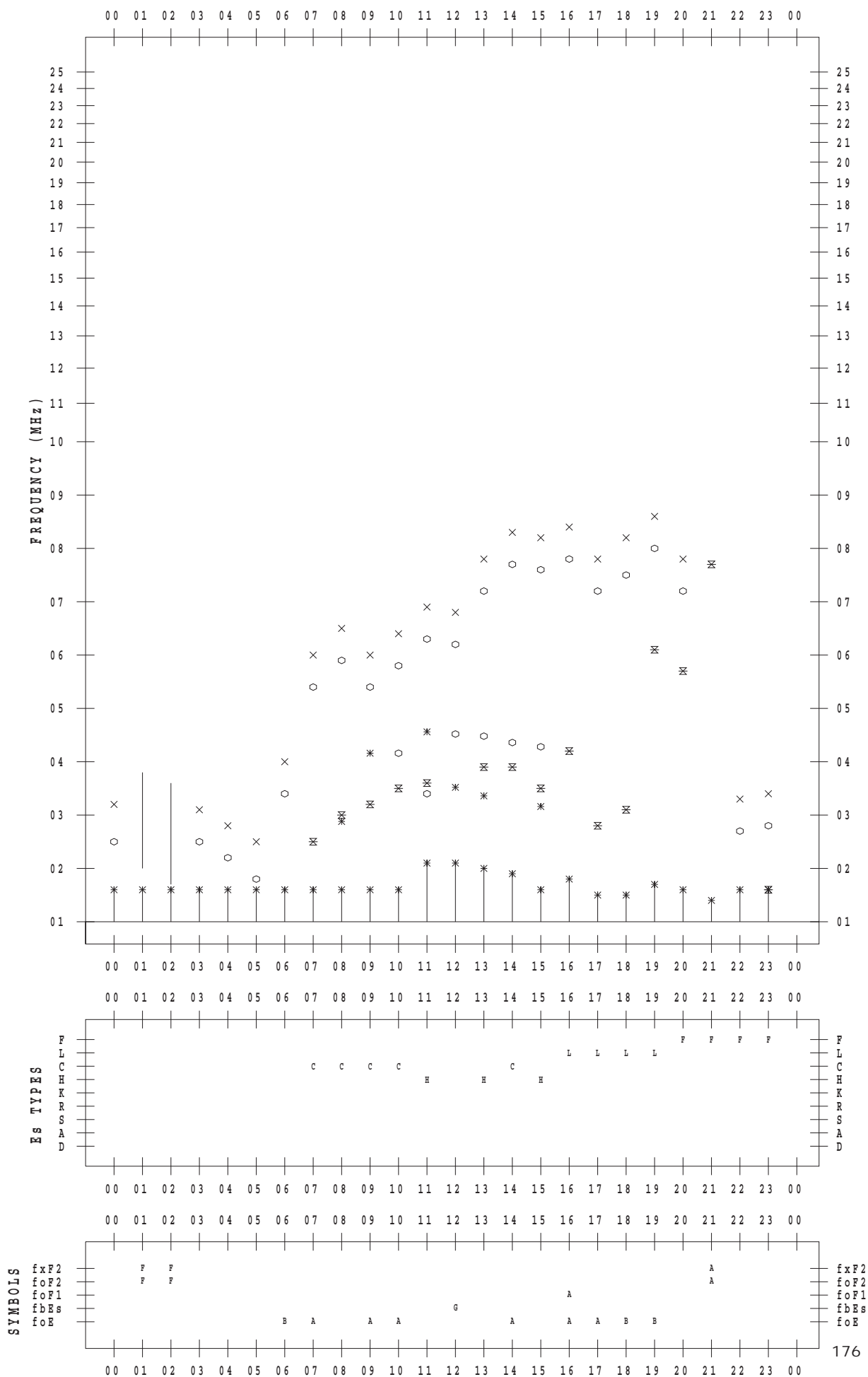
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 9

135 ° E MEAN TIME



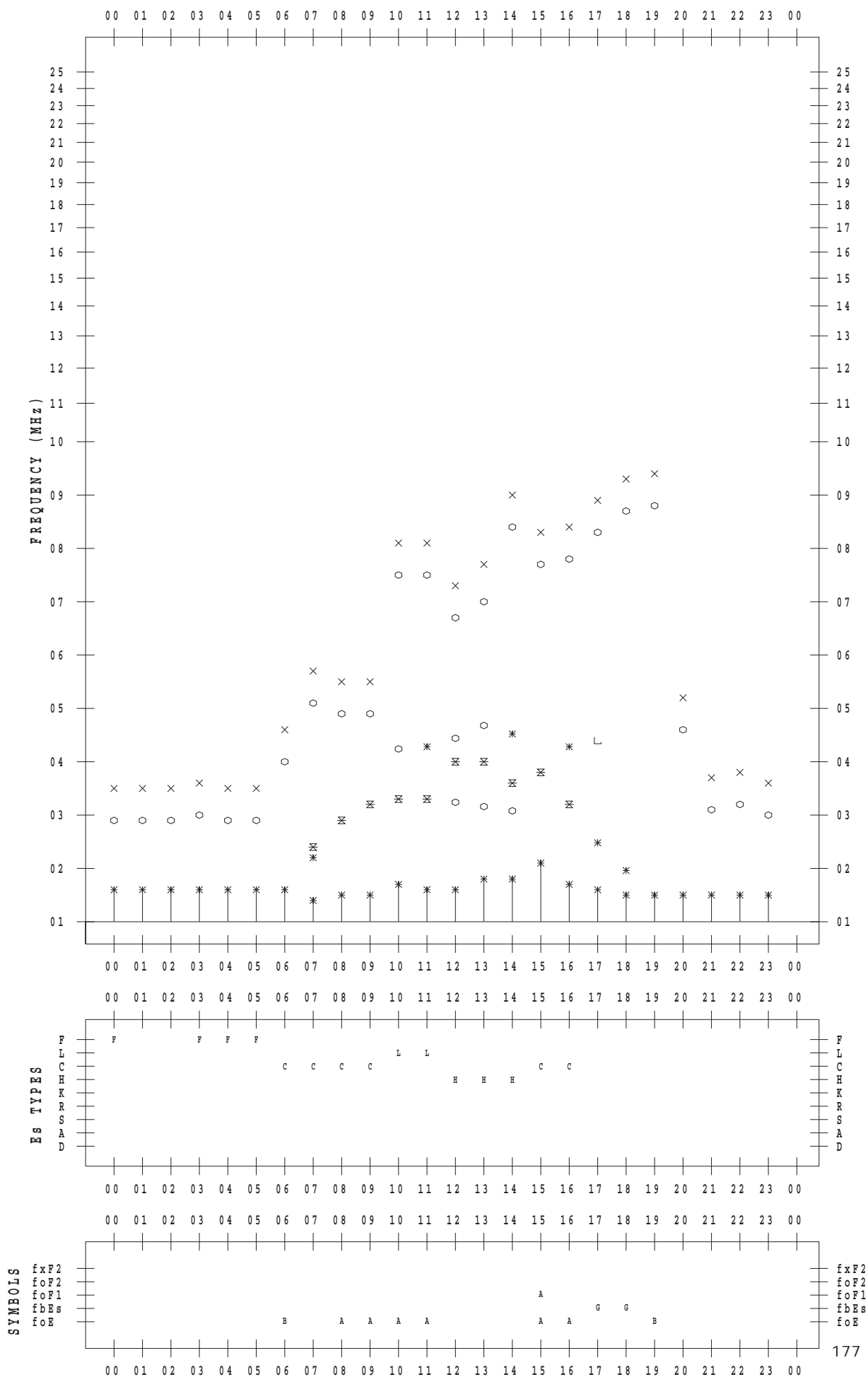
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 10

135 ° E MEAN TIME



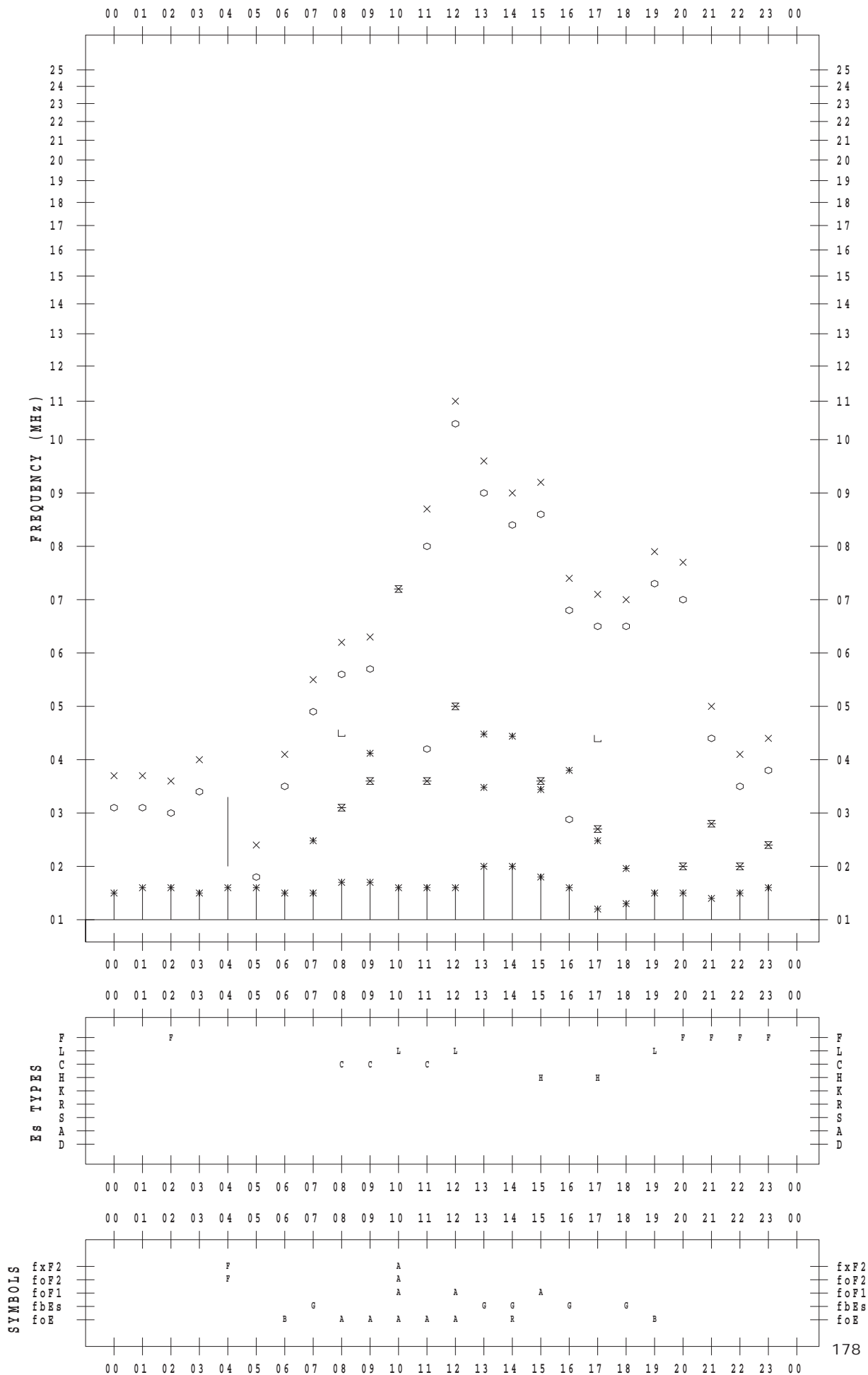
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 11

135 ° E MEAN TIME



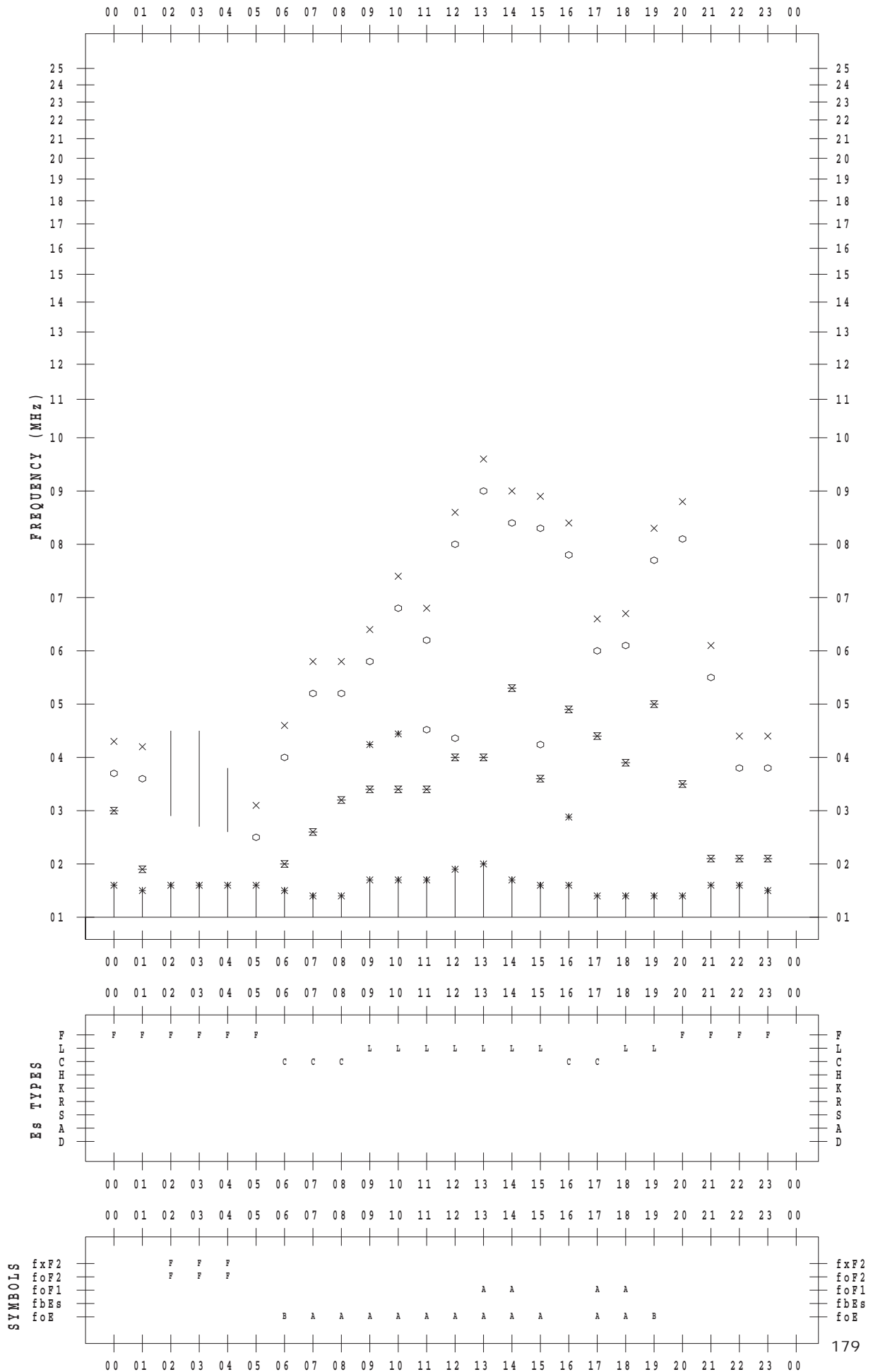
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 12

135 ° E MEAN TIME



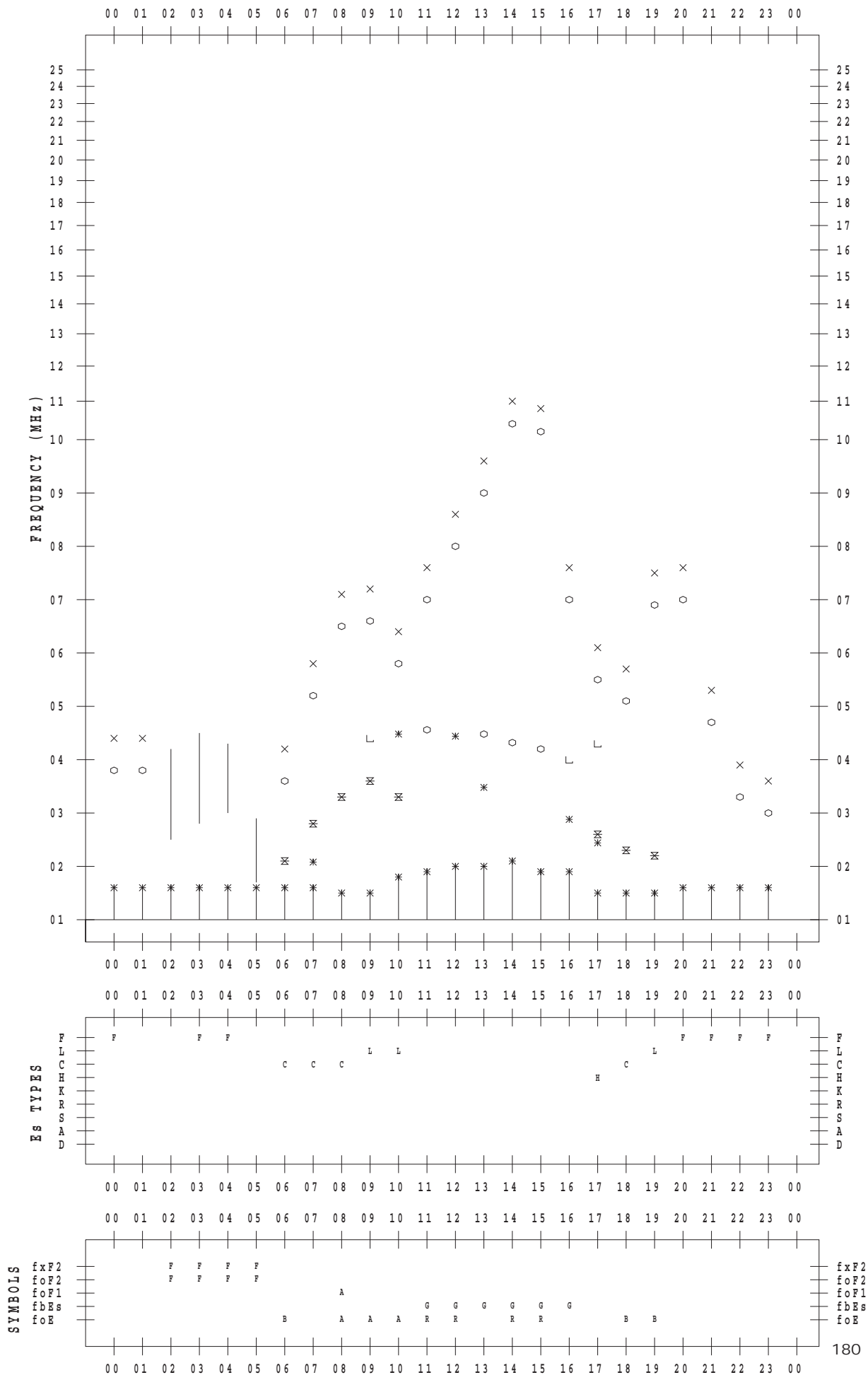
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 13

135 ° E MEAN TIME



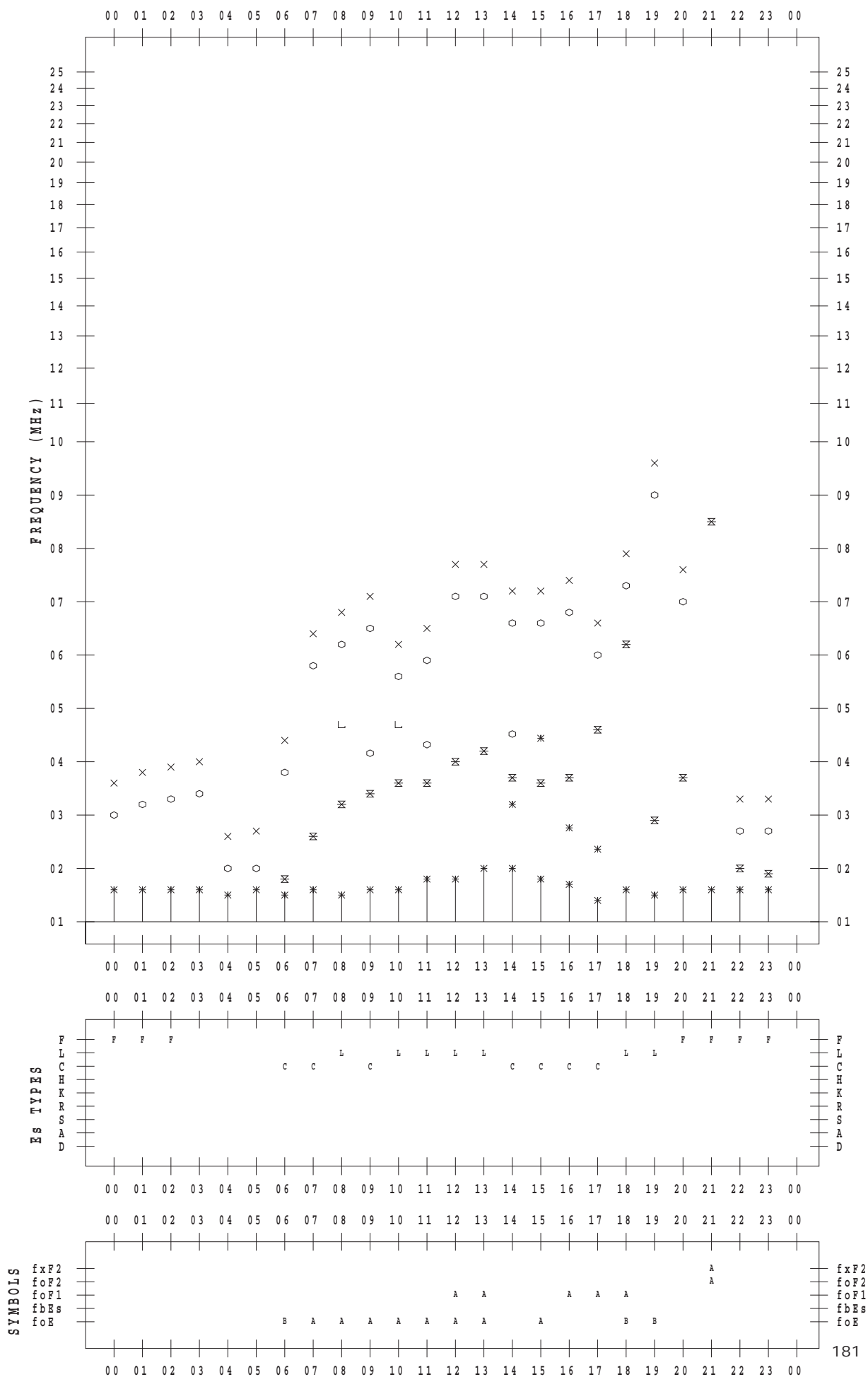
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 14

135 ° E MEAN TIME



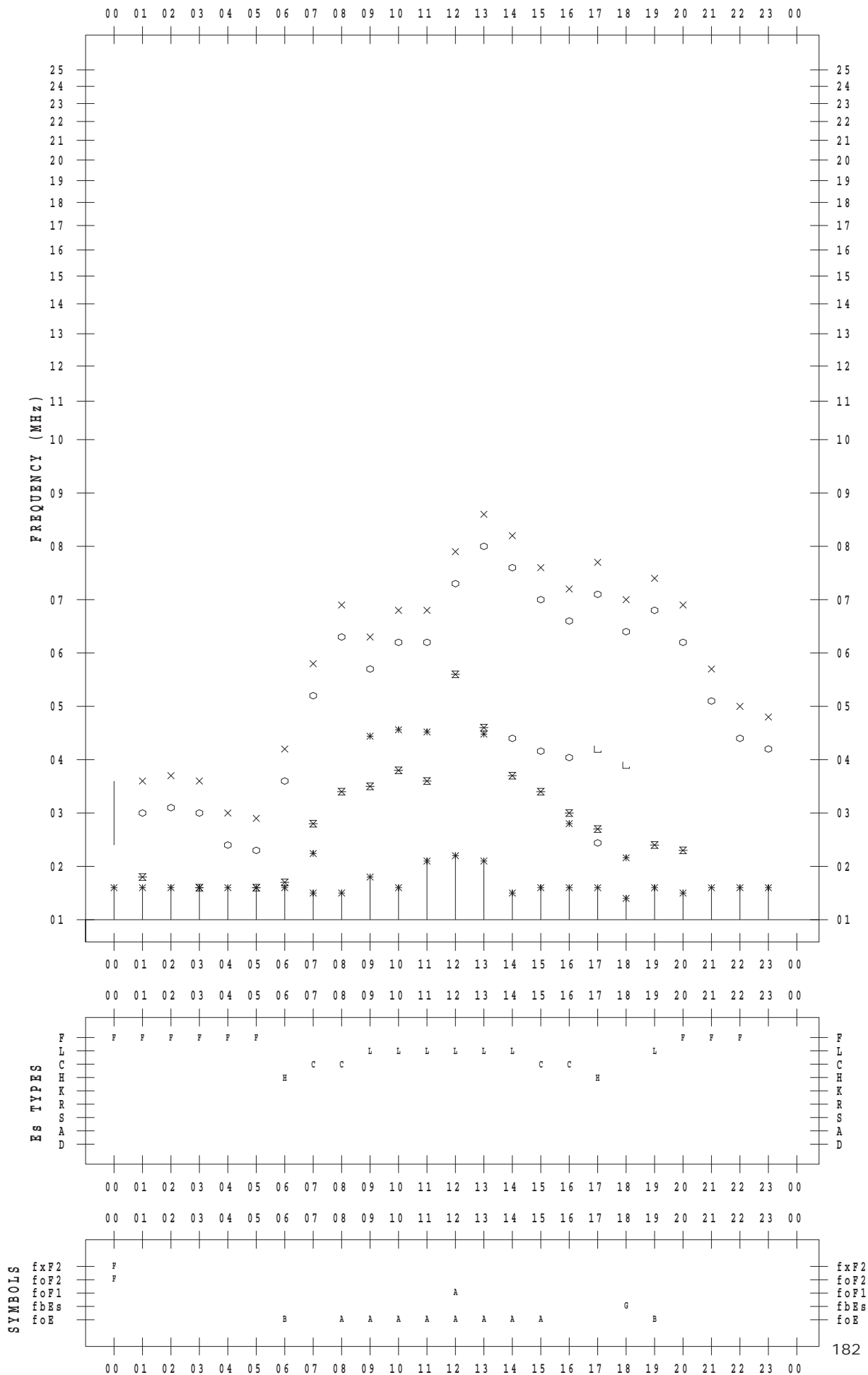
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 15

135 ° E MEAN TIME



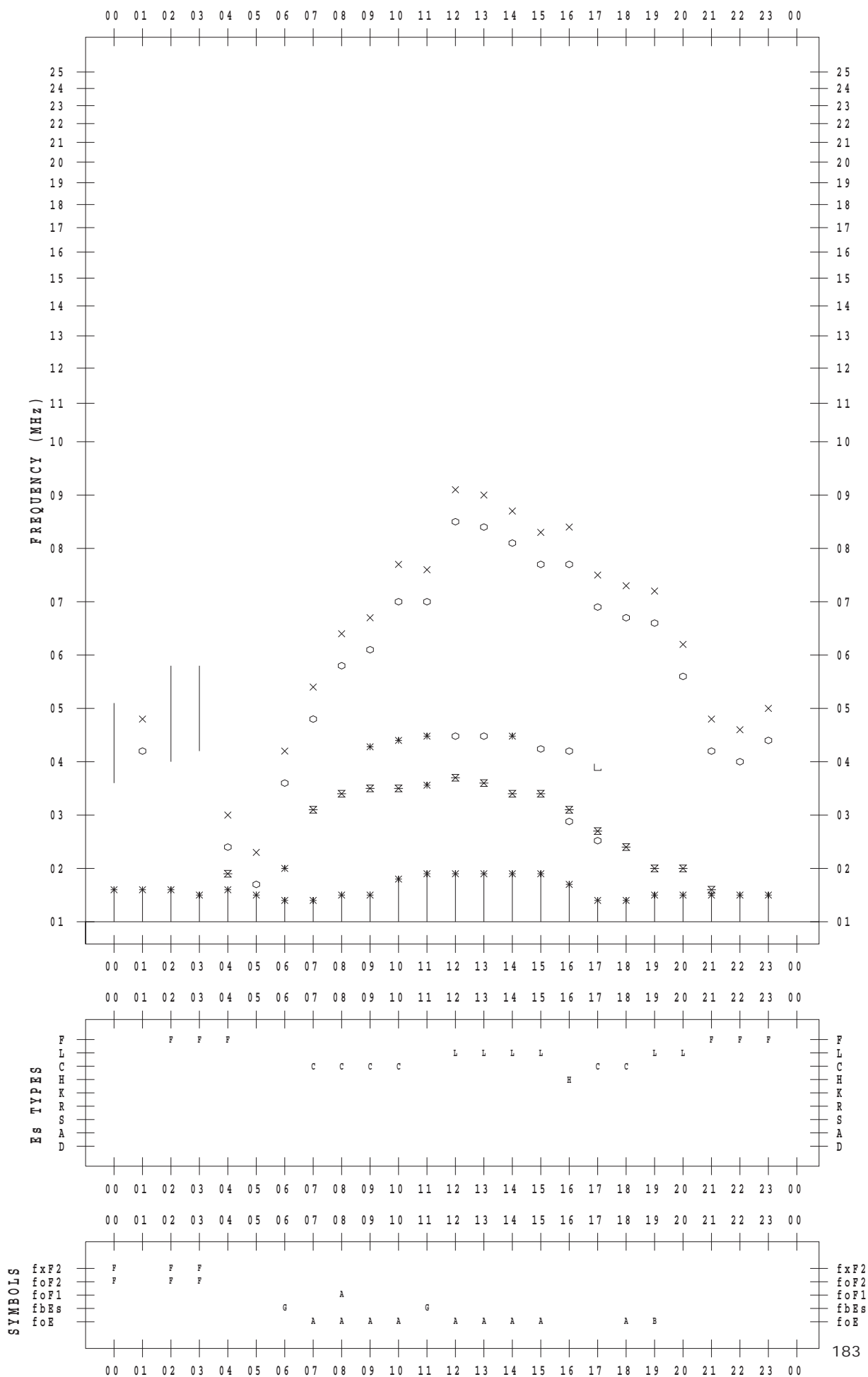
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 16

135 ° E MEAN TIME



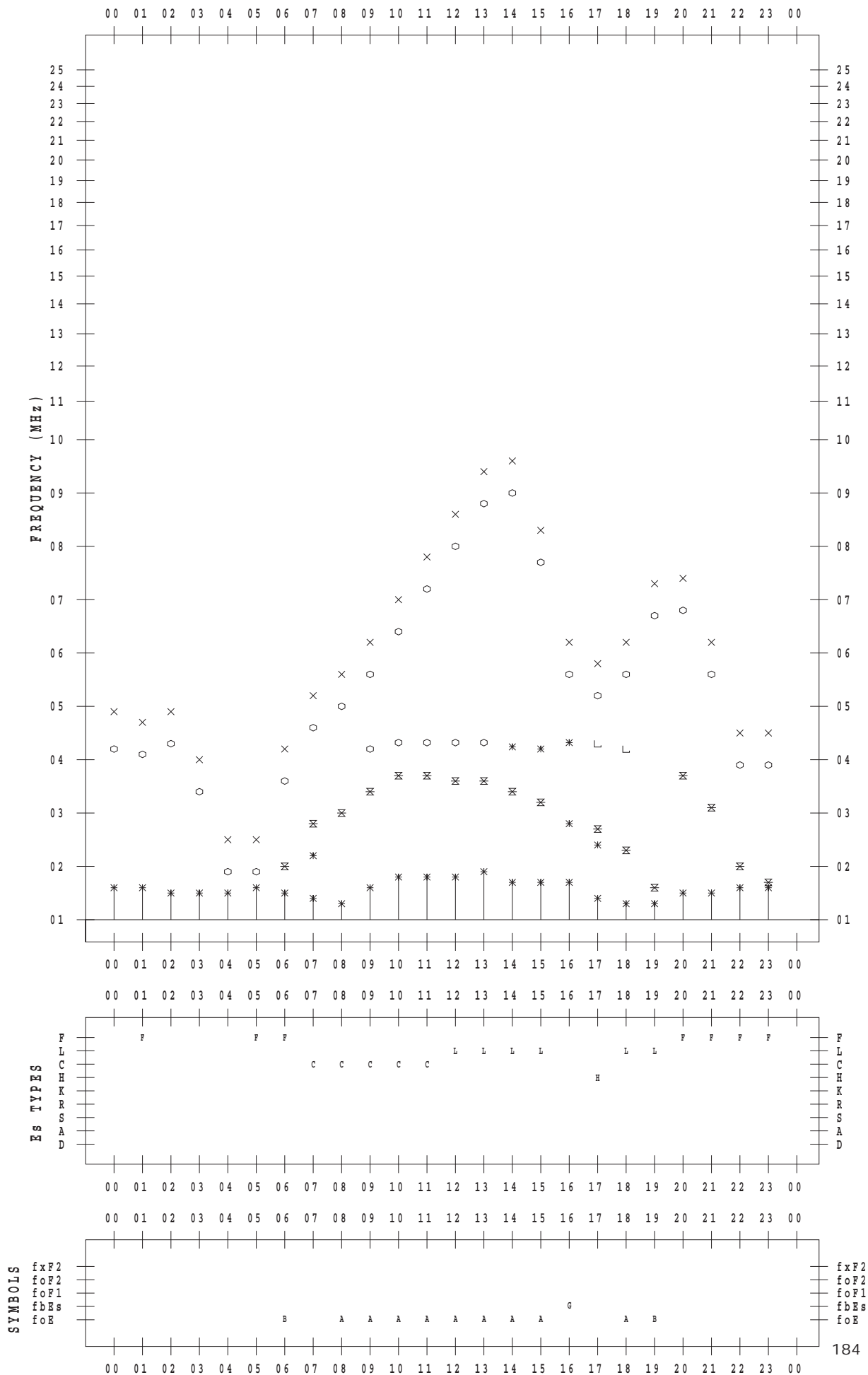
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 17

135 ° E MEAN TIME



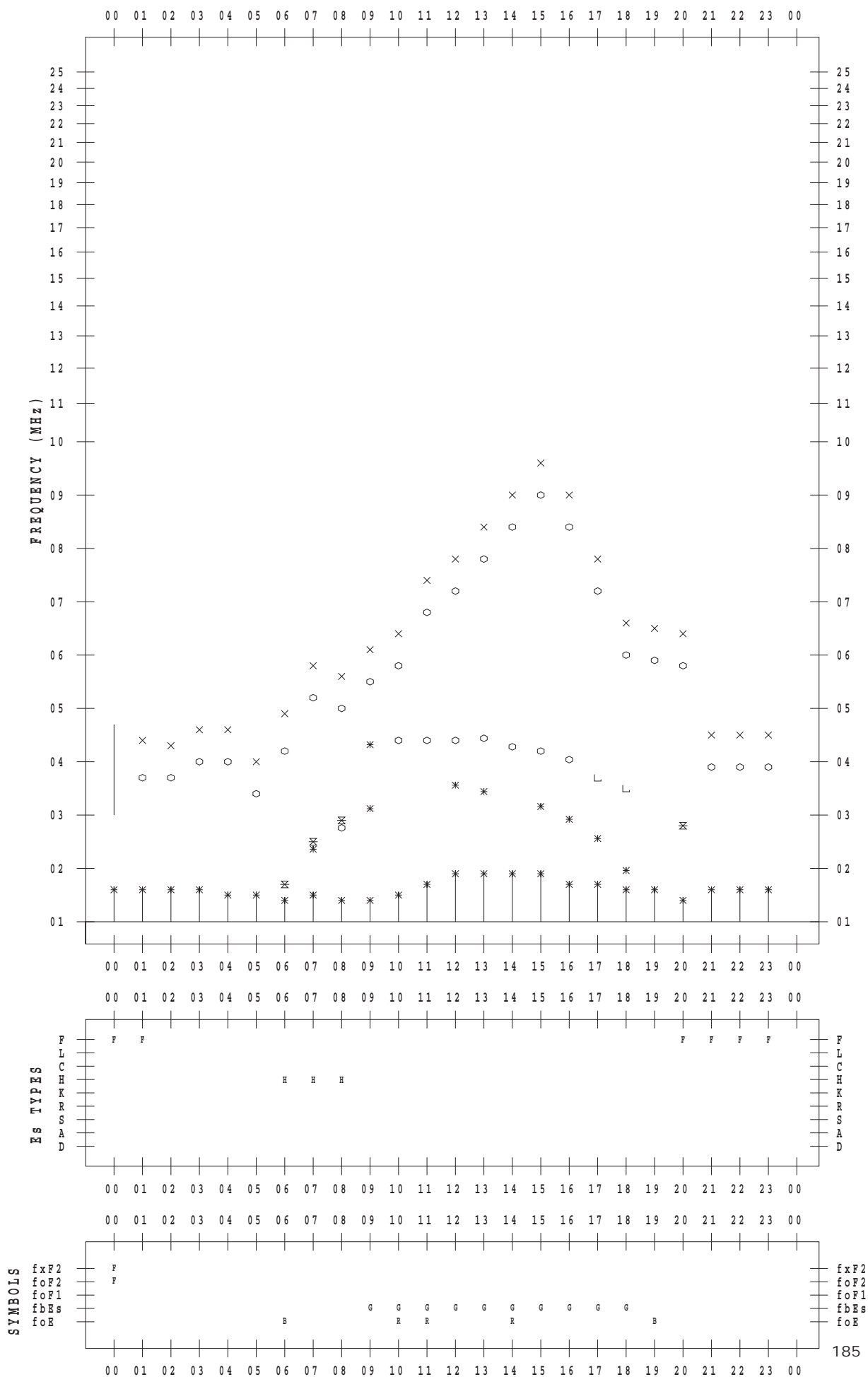
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 18

135 ° E MEAN TIME



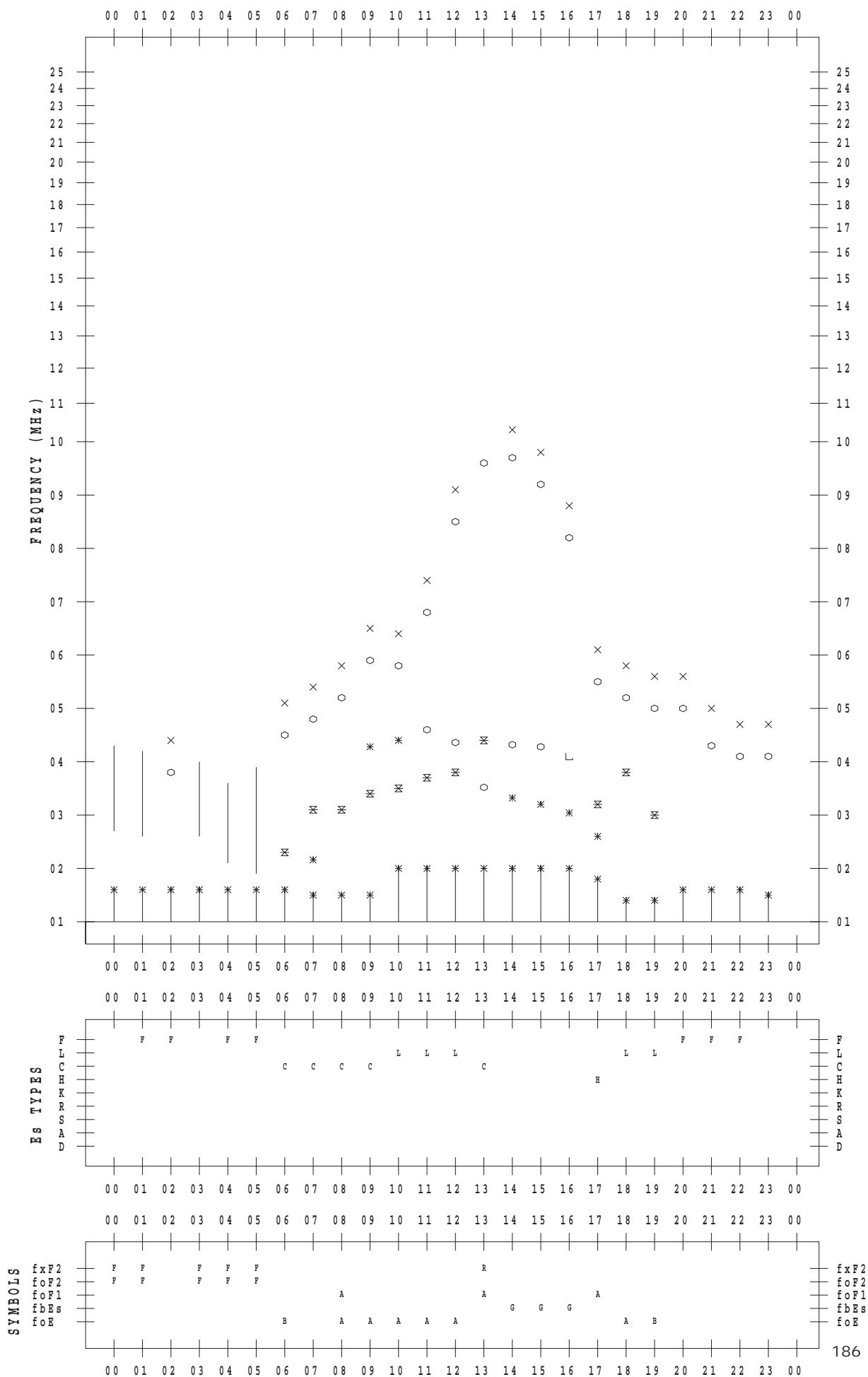
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 19

135 ° E MEAN TIME



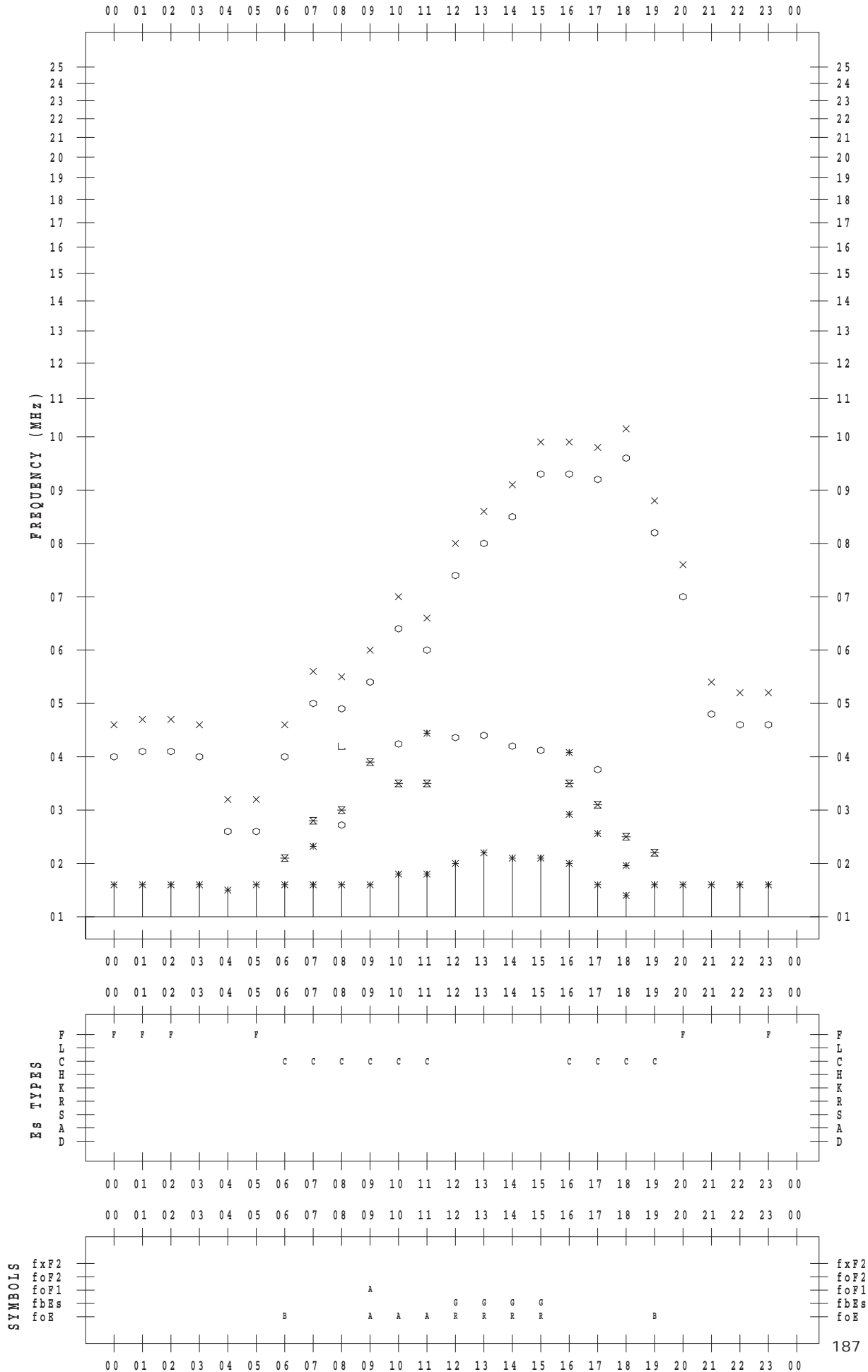
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 20

135 ° E MEAN TIME



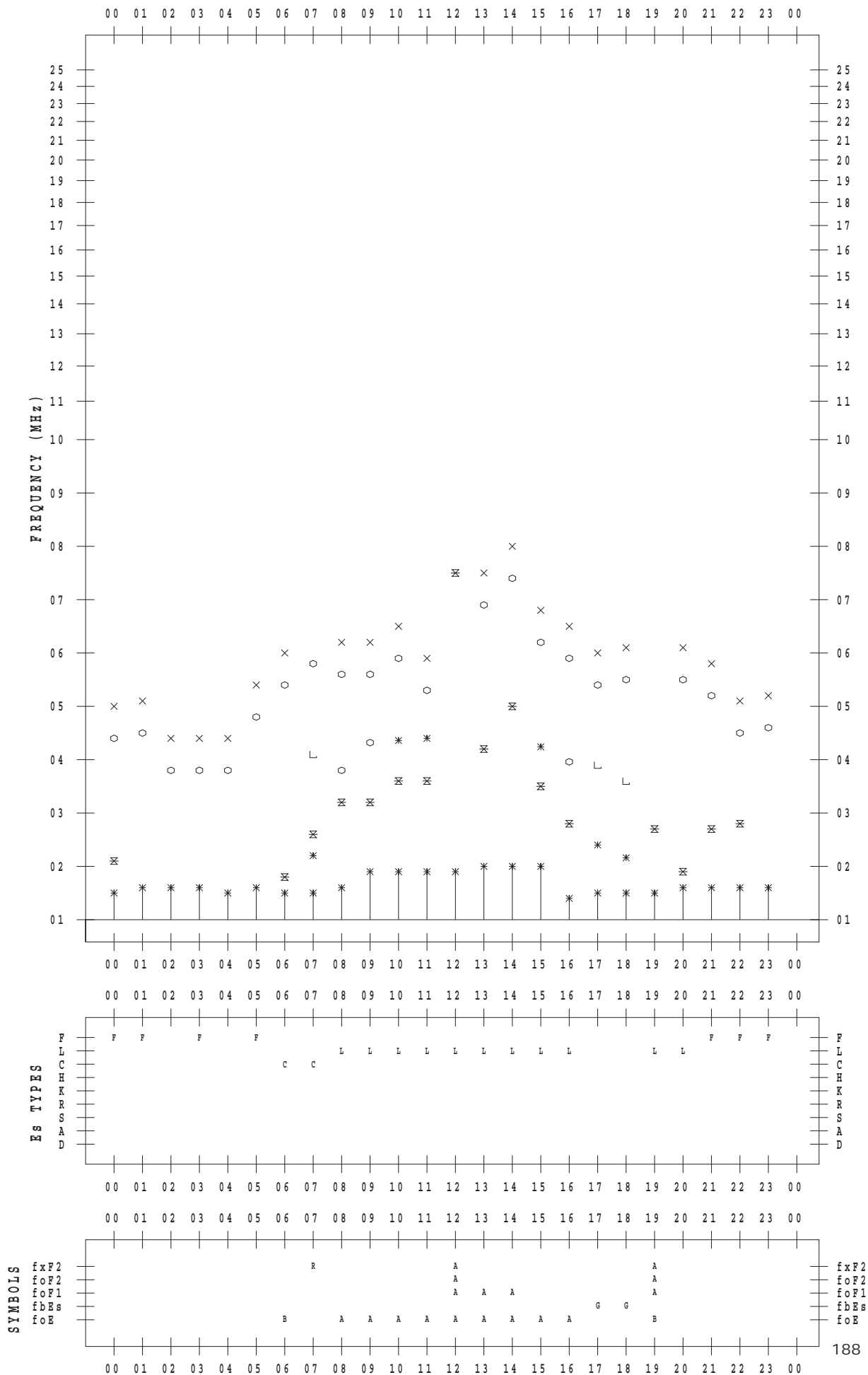
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 21

135 ° E MEAN TIME



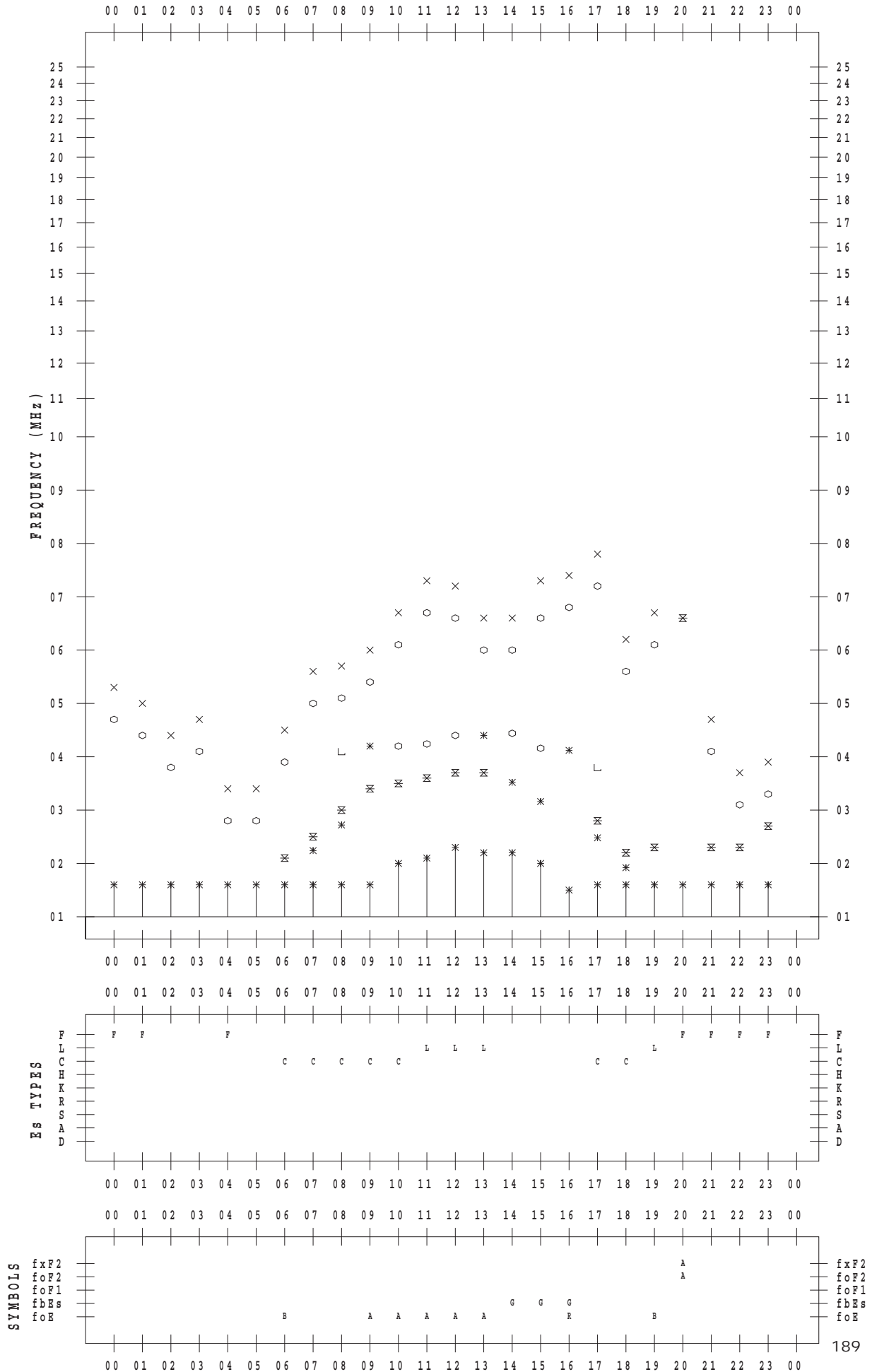
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 22

135 ° E MEAN TIME



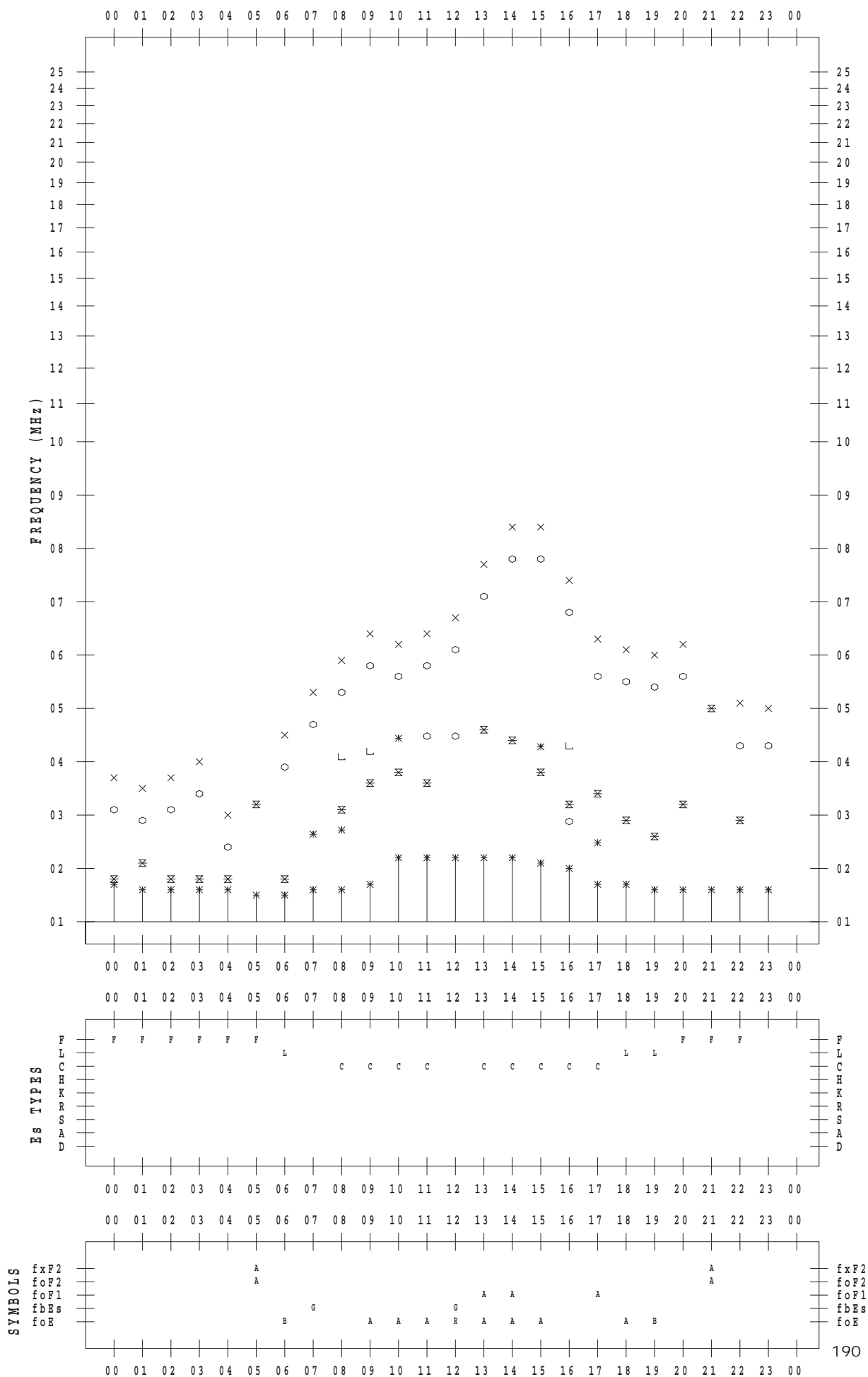
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 23

135 ° E MEAN TIME



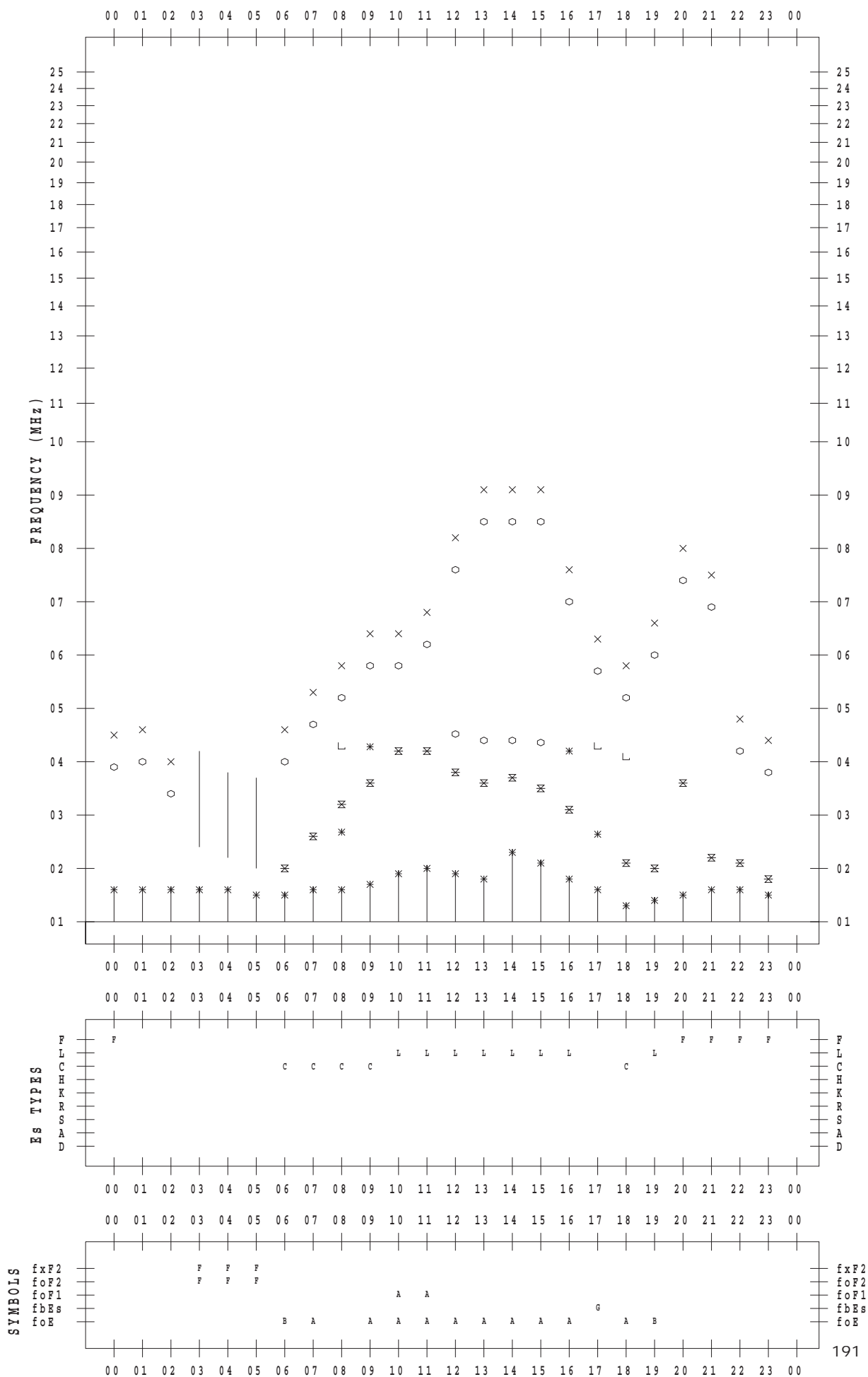
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 24

135 ° E MEAN TIME



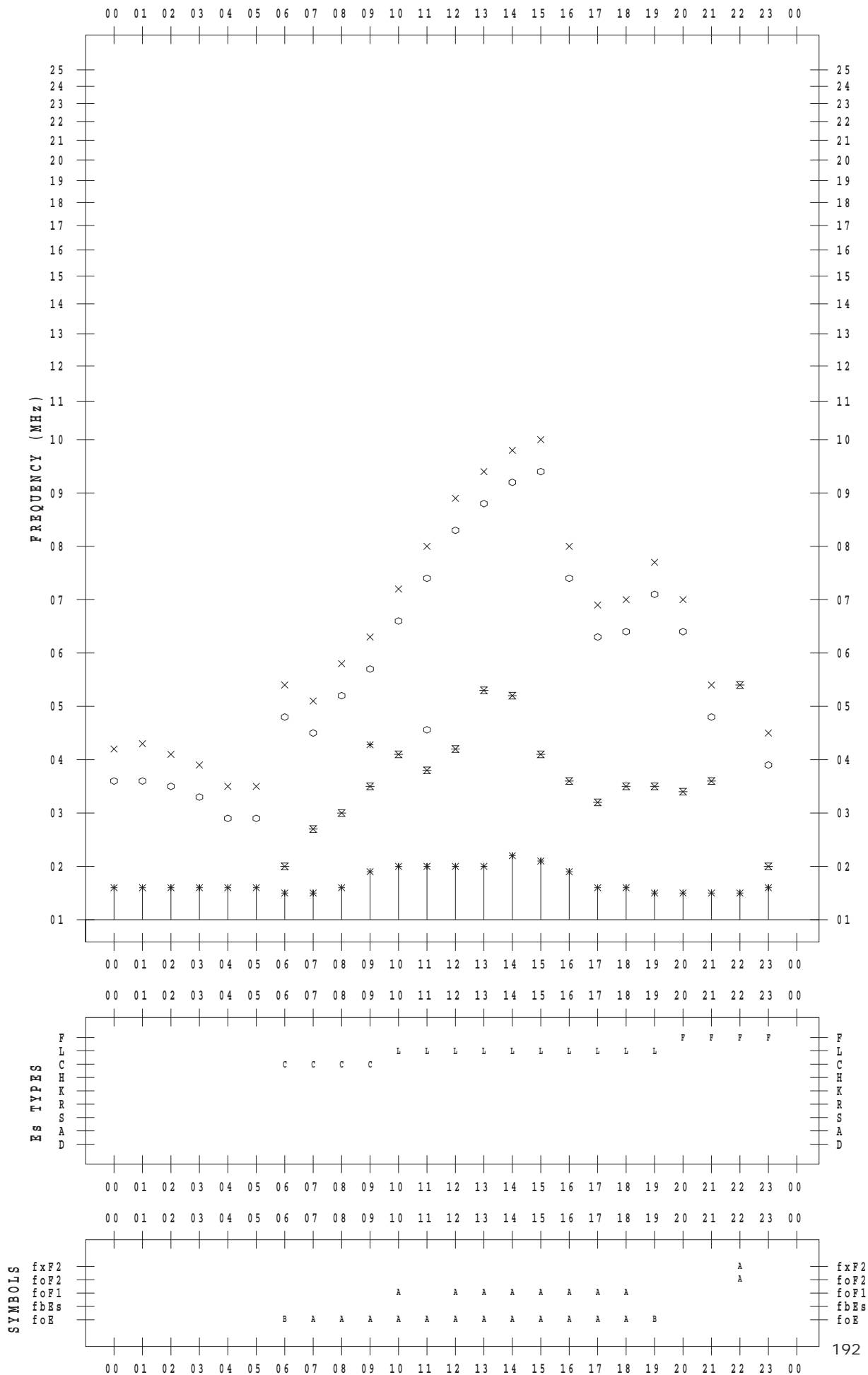
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 25

135 ° E MEAN TIME



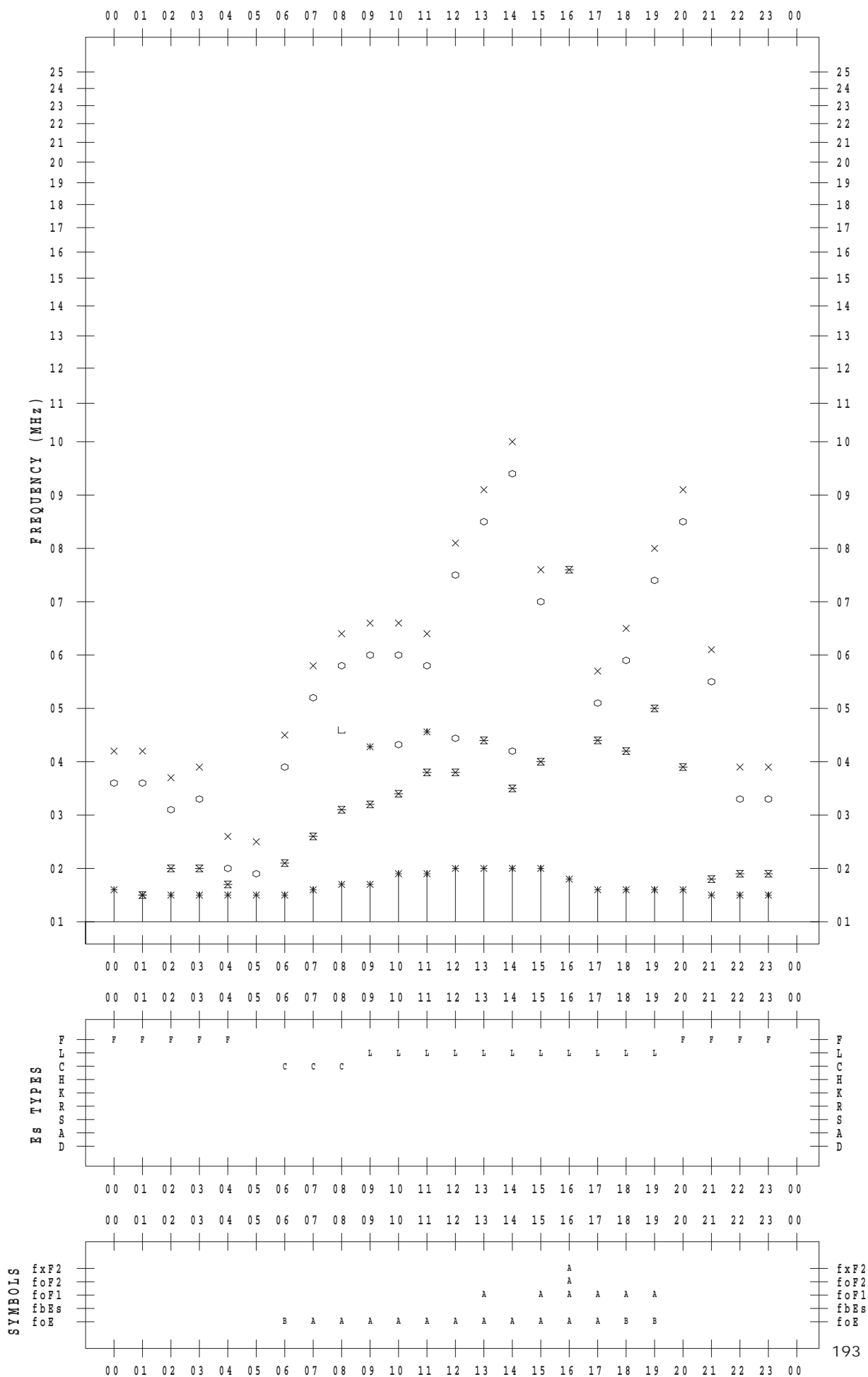
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 26

135 ° E MEAN TIME



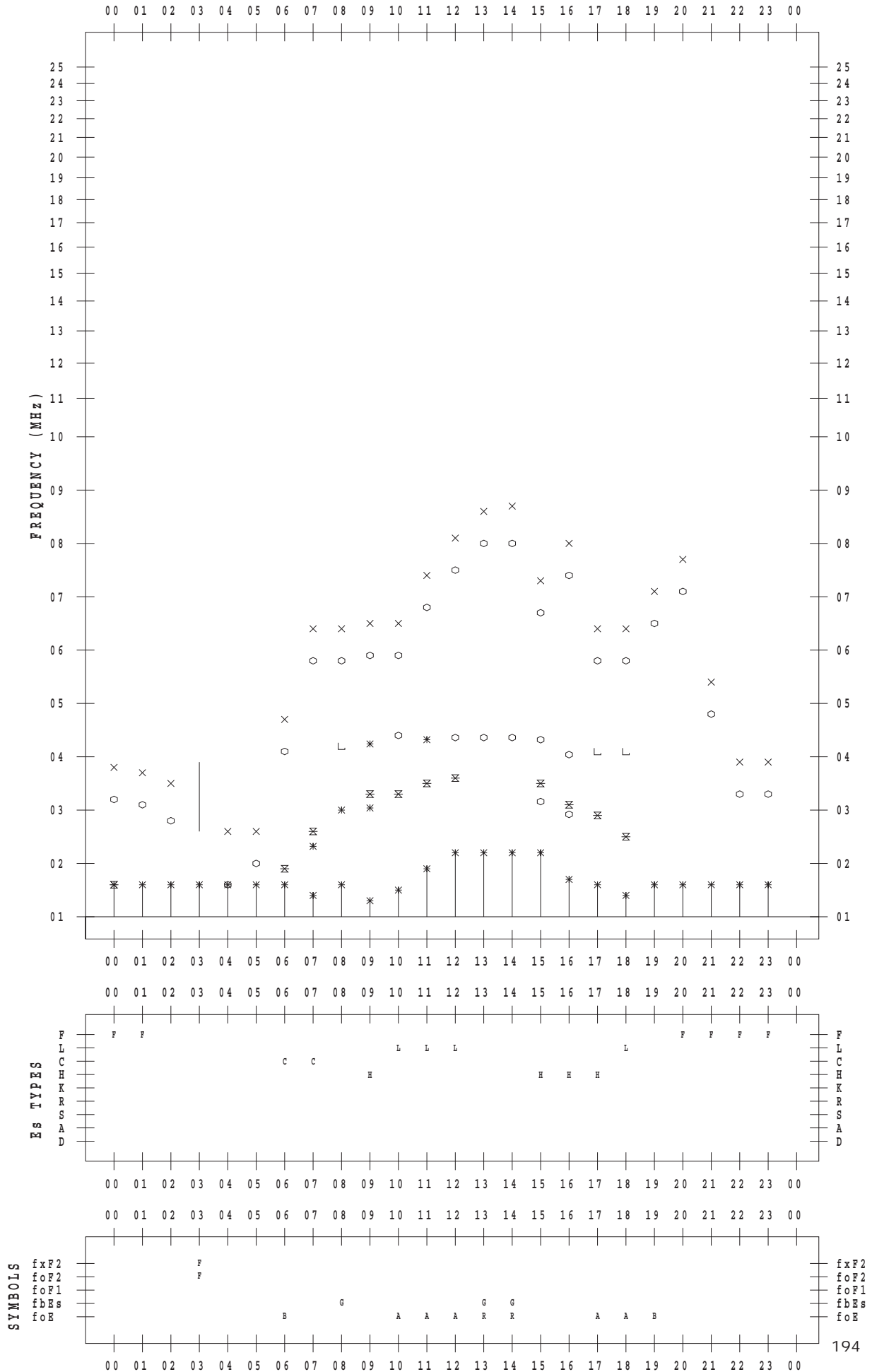
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 27

135 ° E MEAN TIME



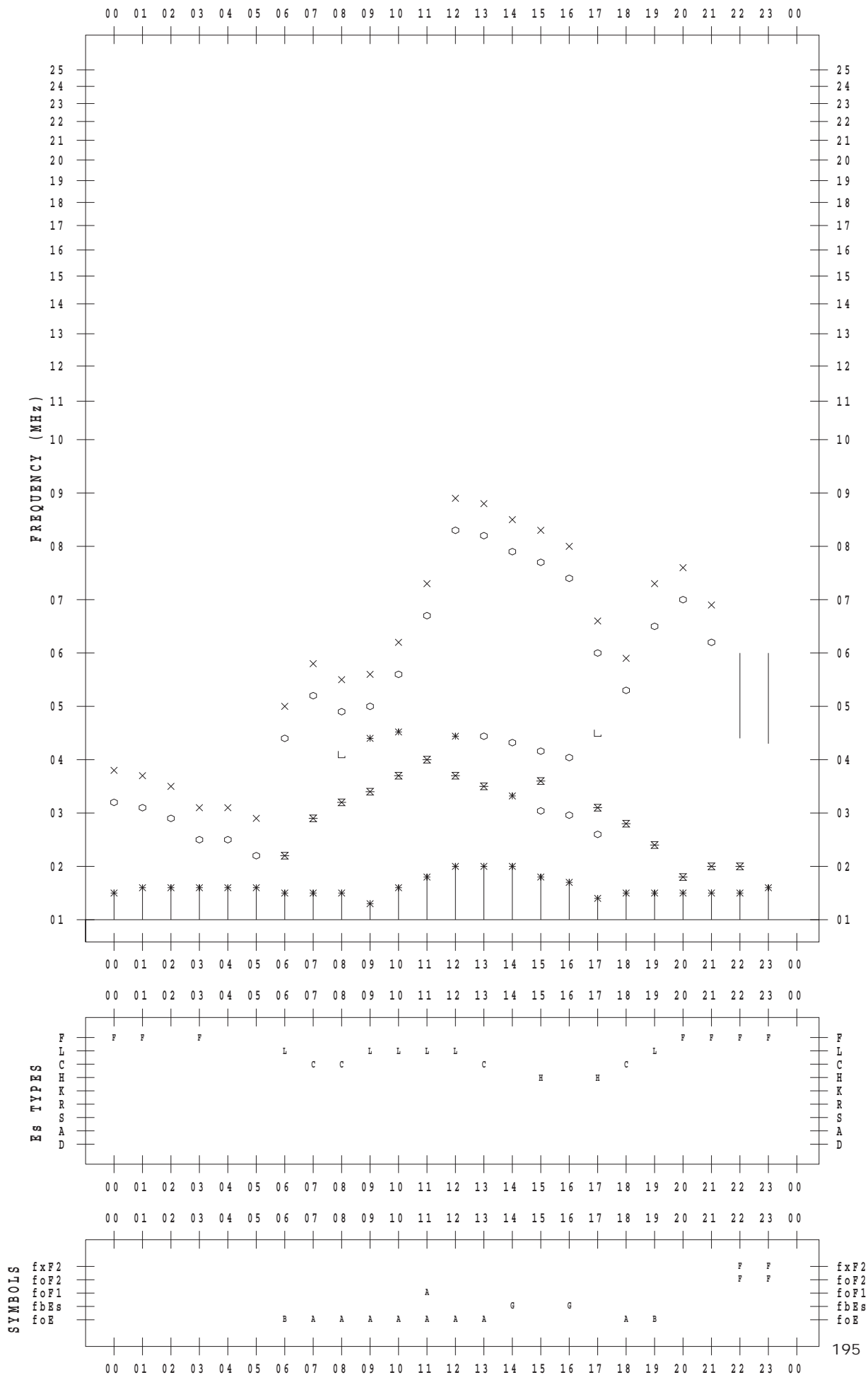
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 28

135 ° E MEAN TIME



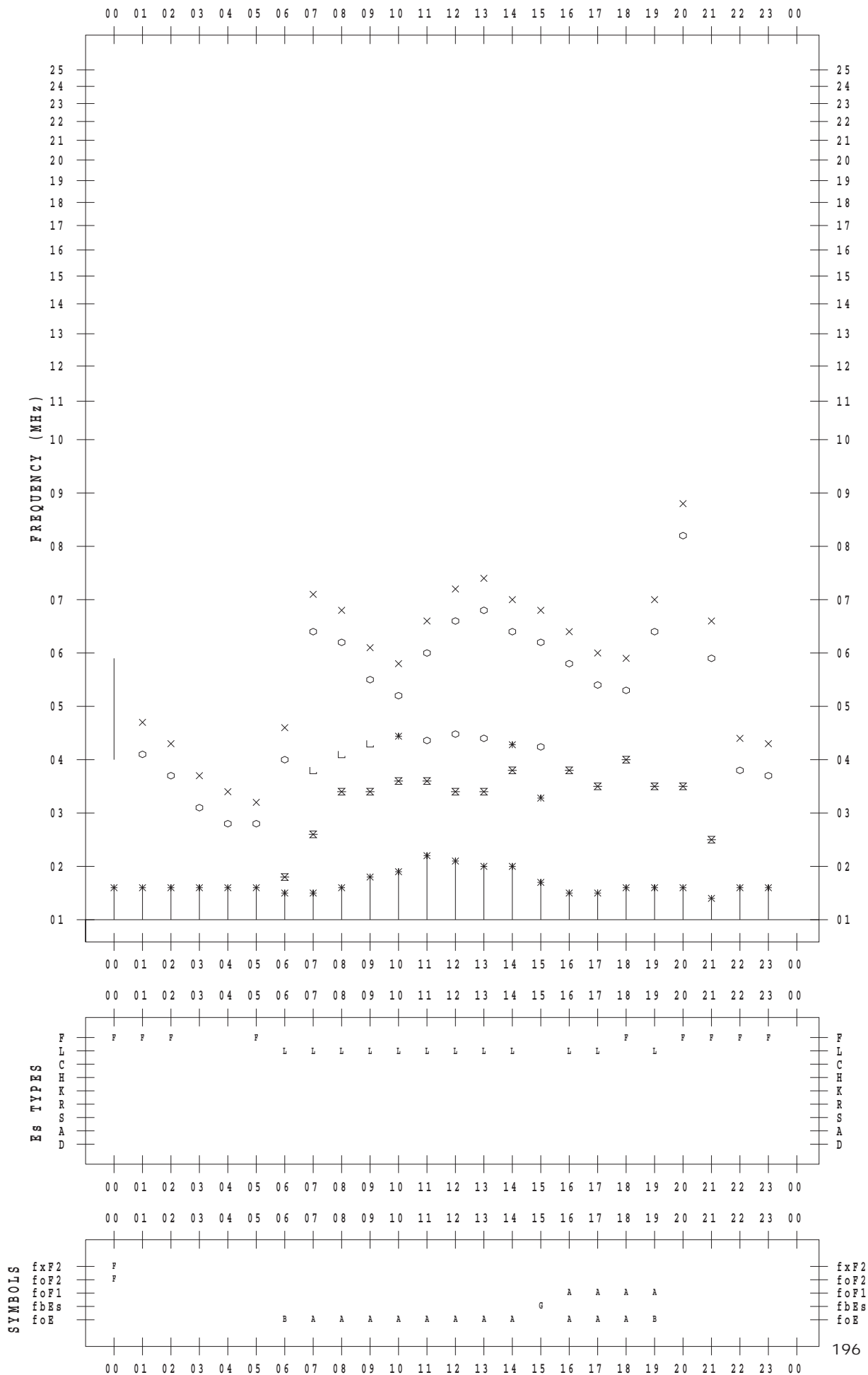
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 29

135 ° E MEAN TIME



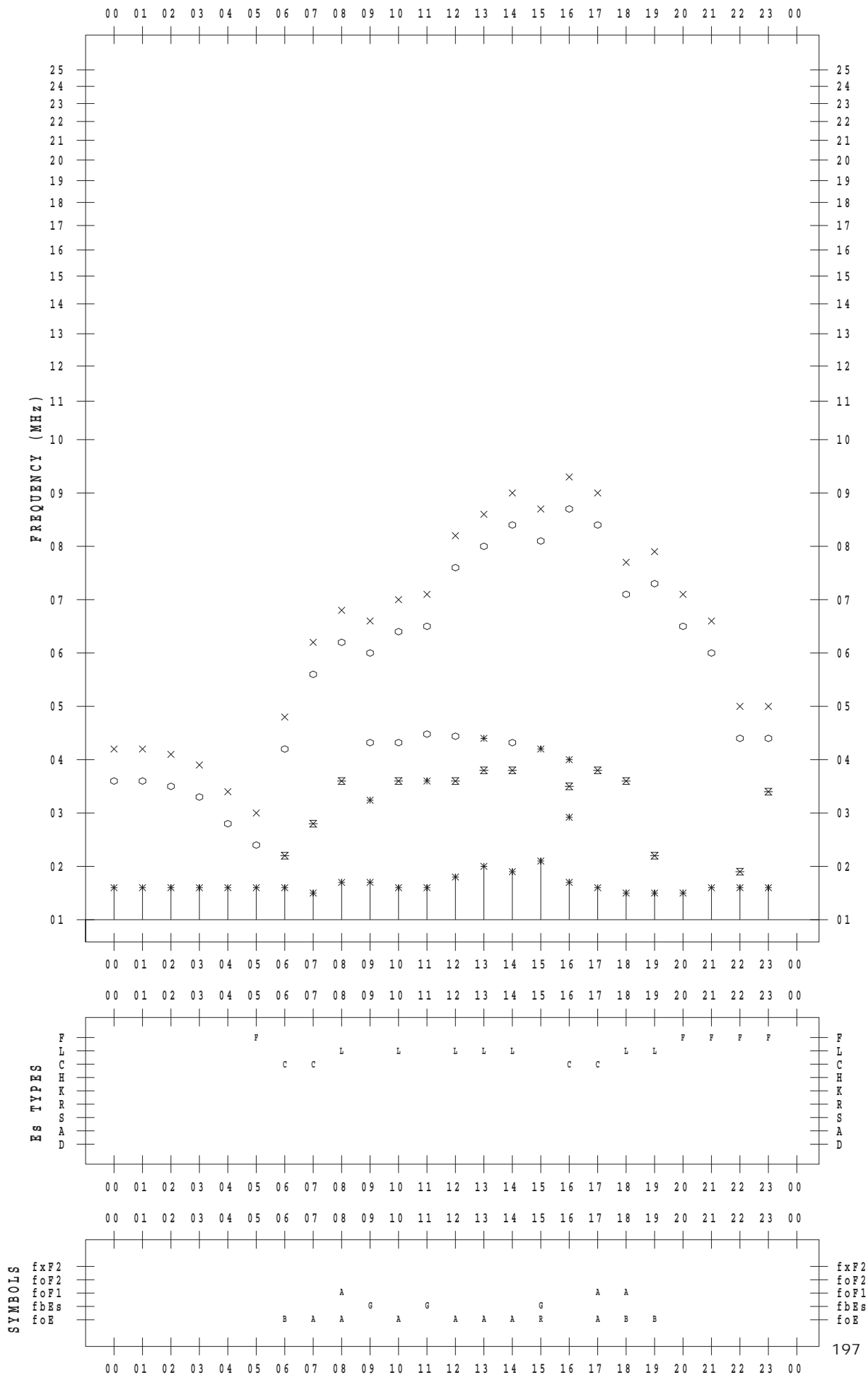
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018 / 4 / 30

135 ° E MEAN TIME



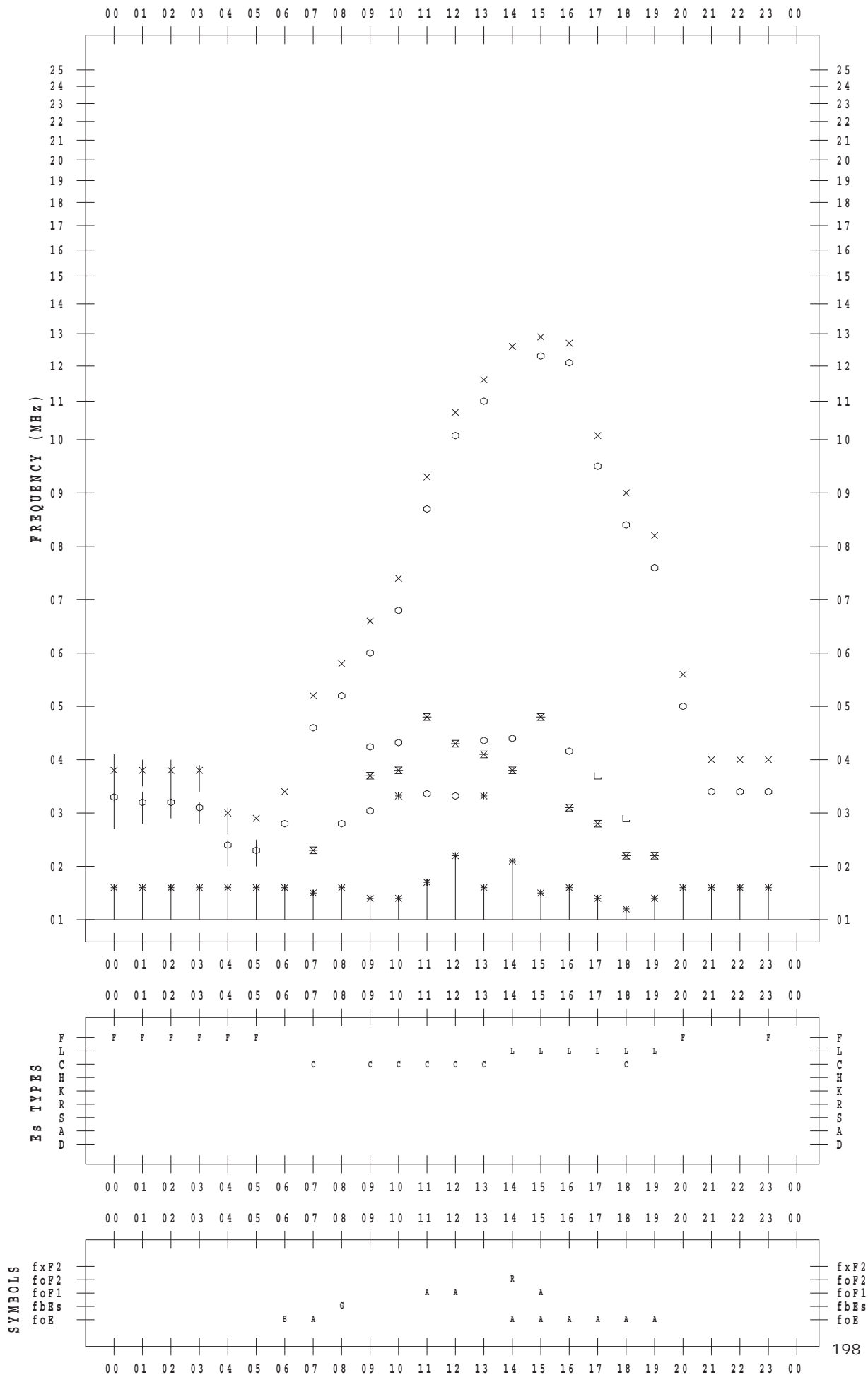
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 1

135 ° E MEAN TIME



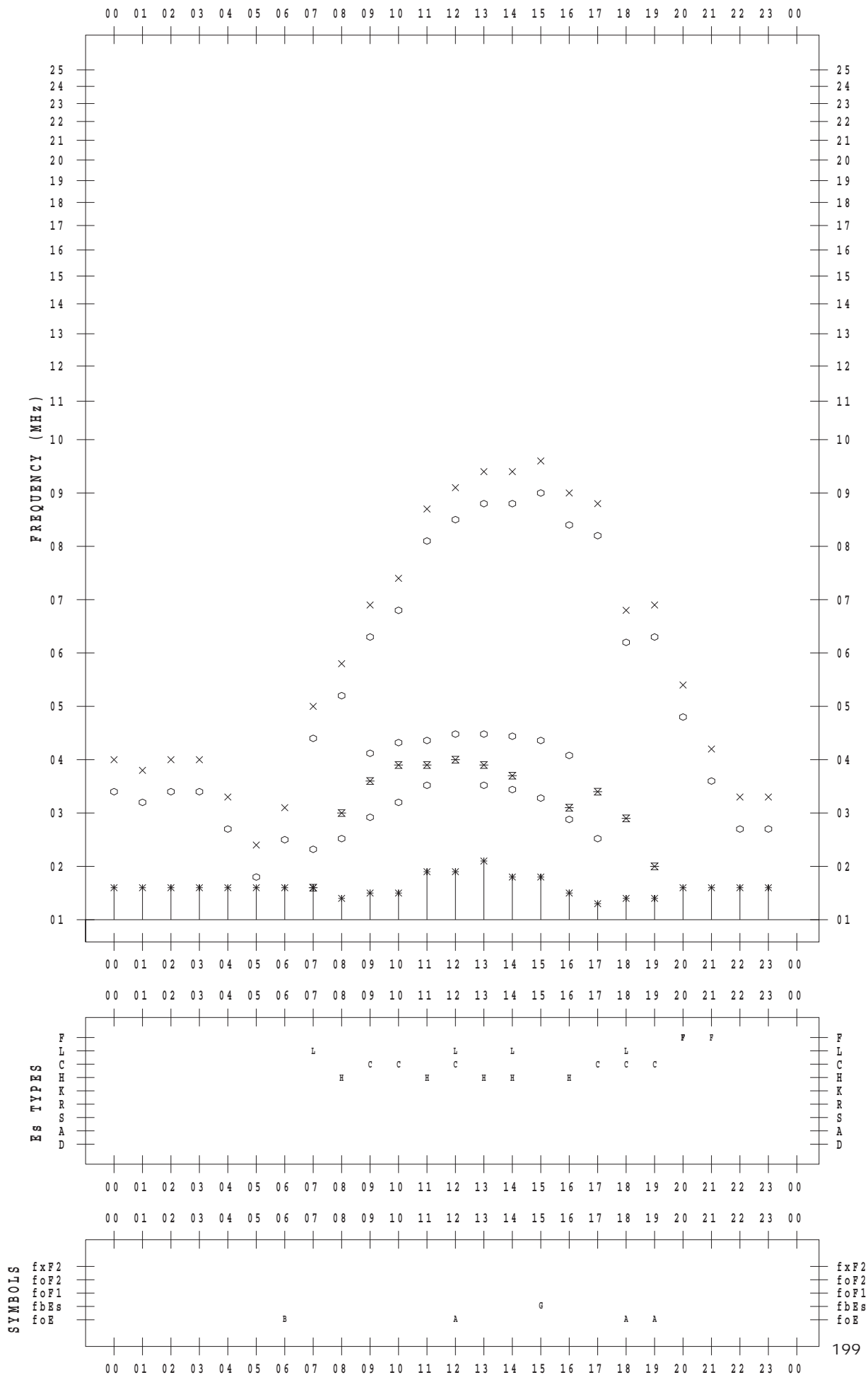
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 2

135 ° E MEAN TIME



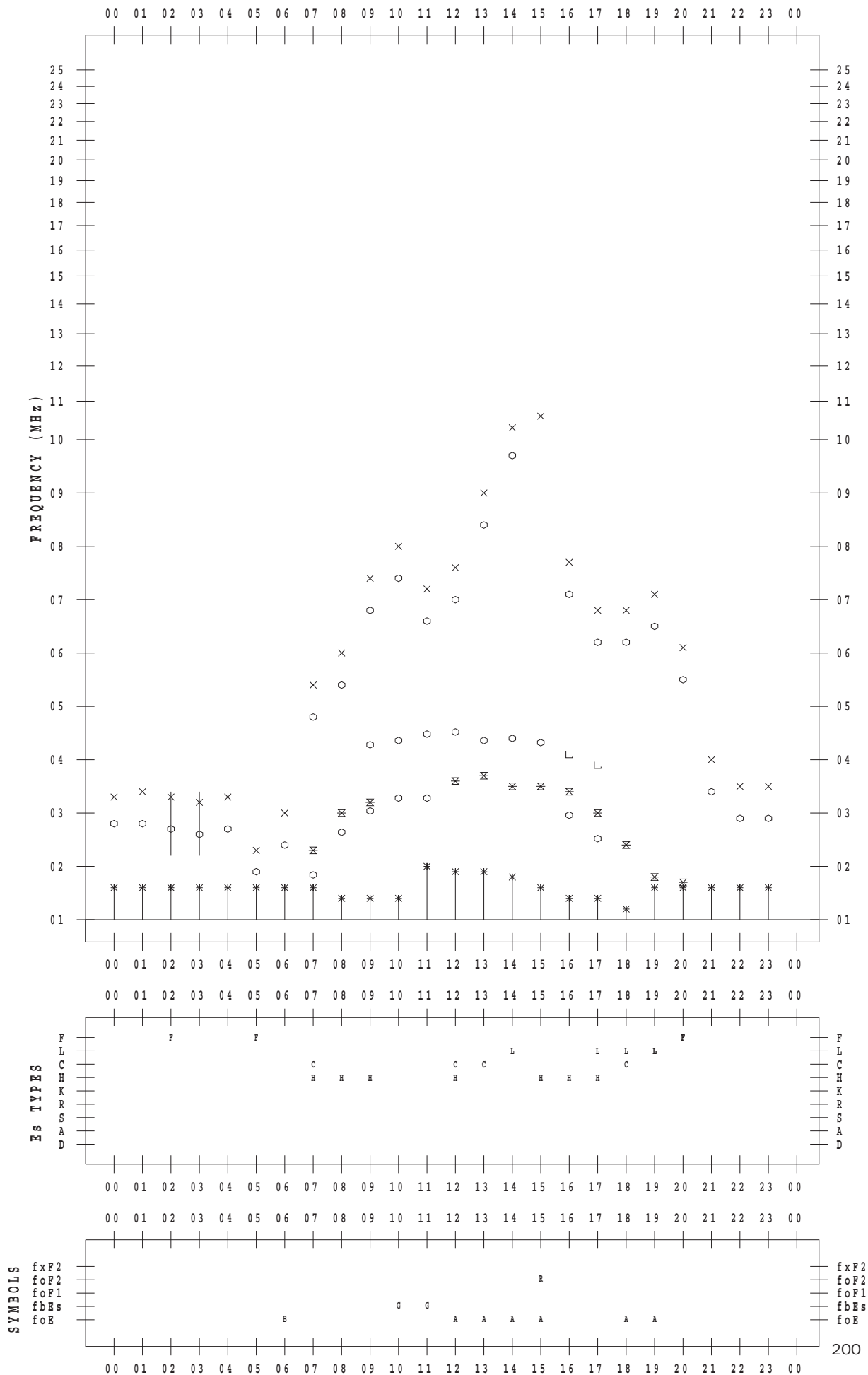
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 3

135 ° E MEAN TIME



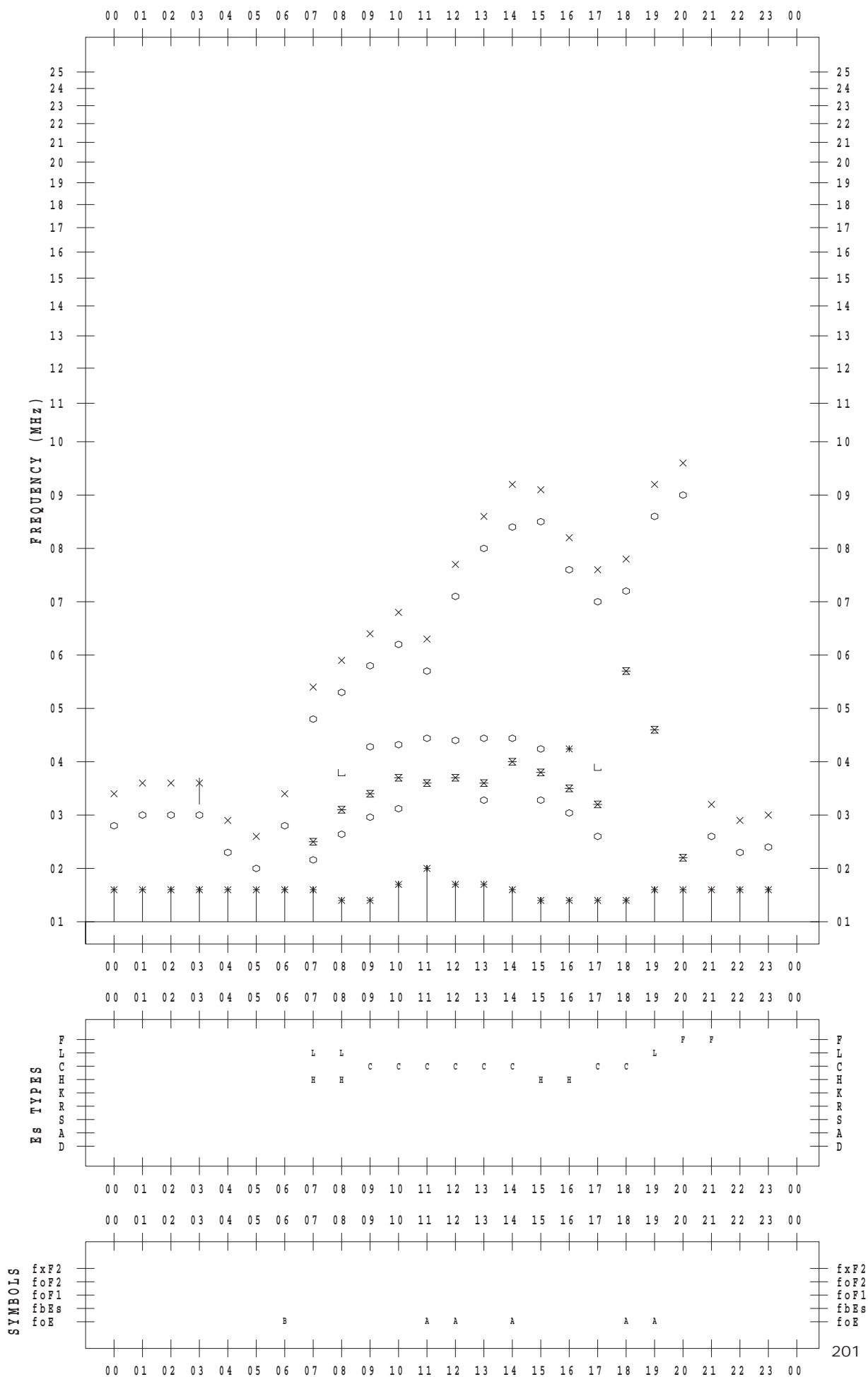
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 4

135 ° E MEAN TIME



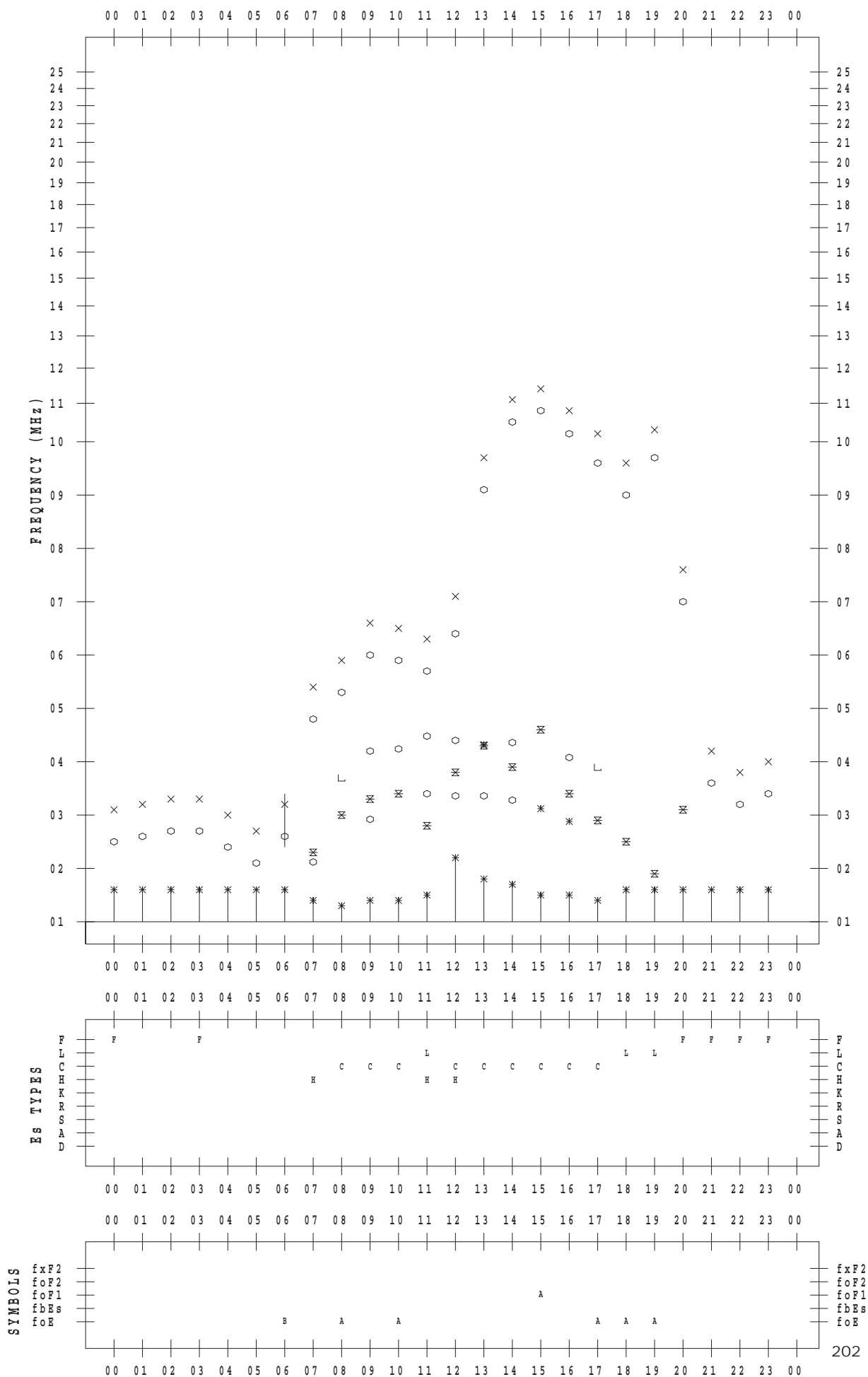
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 5

135 ° E MEAN TIME



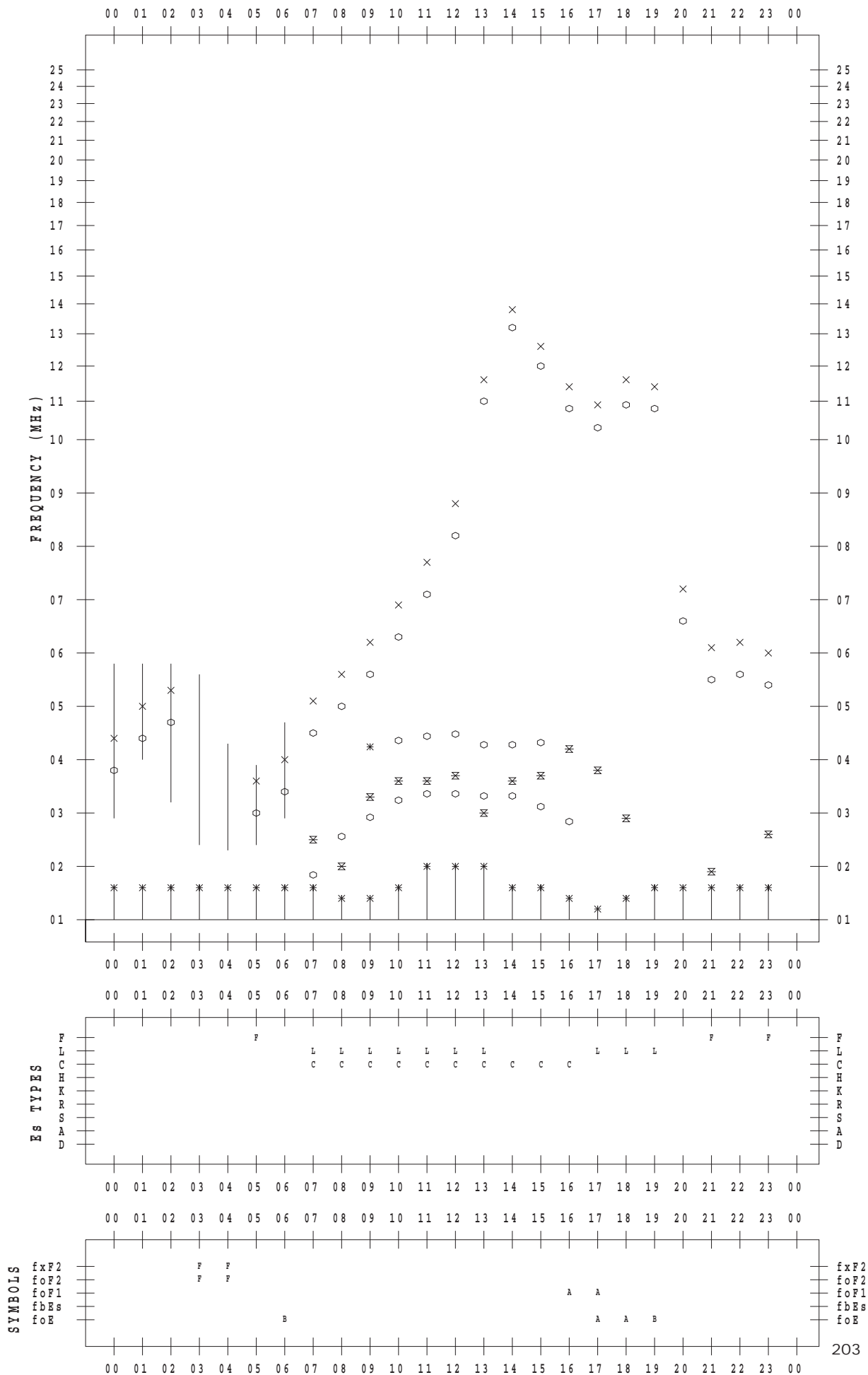
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 6

135 ° E MEAN TIME



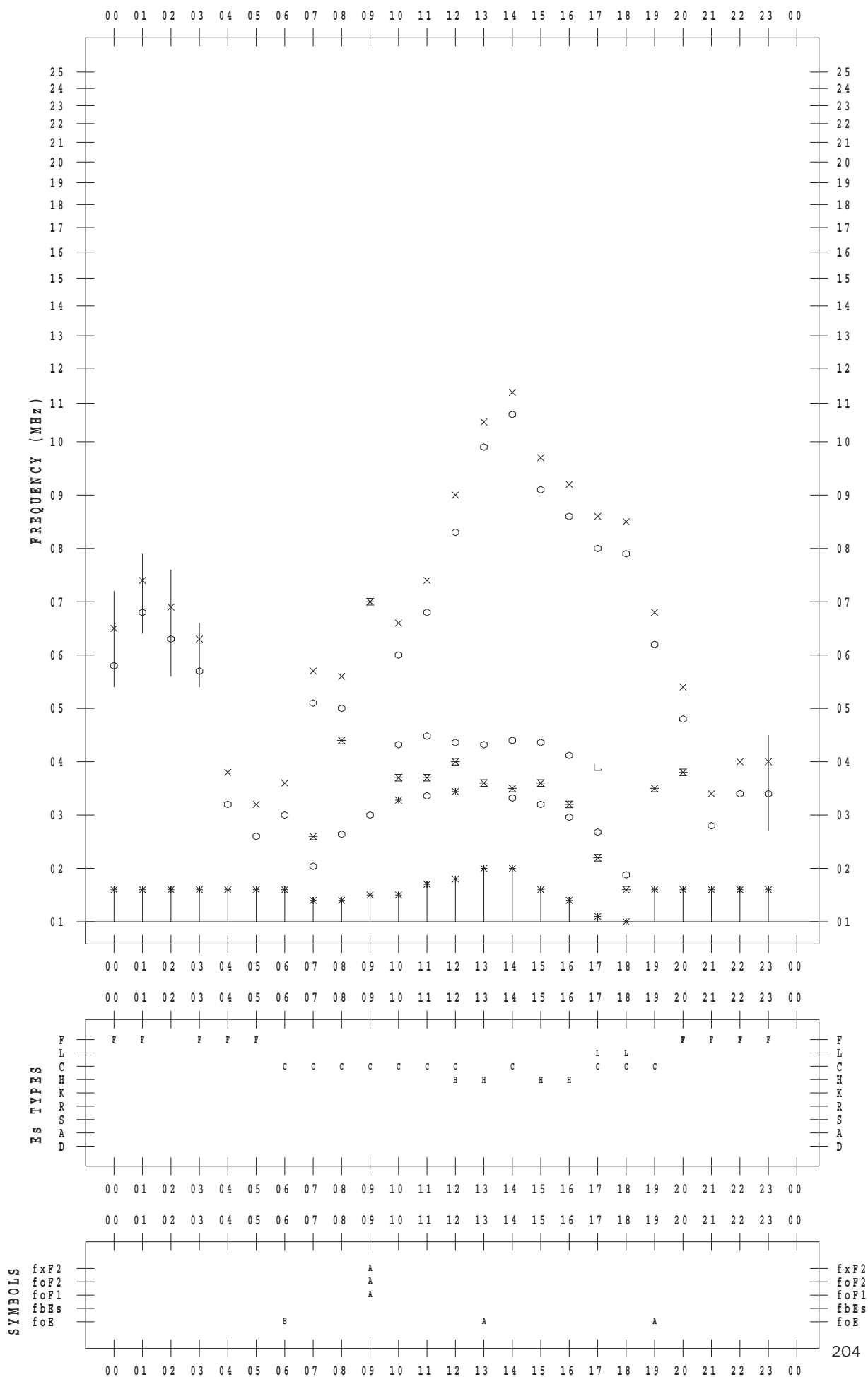
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 7

135 ° E MEAN TIME



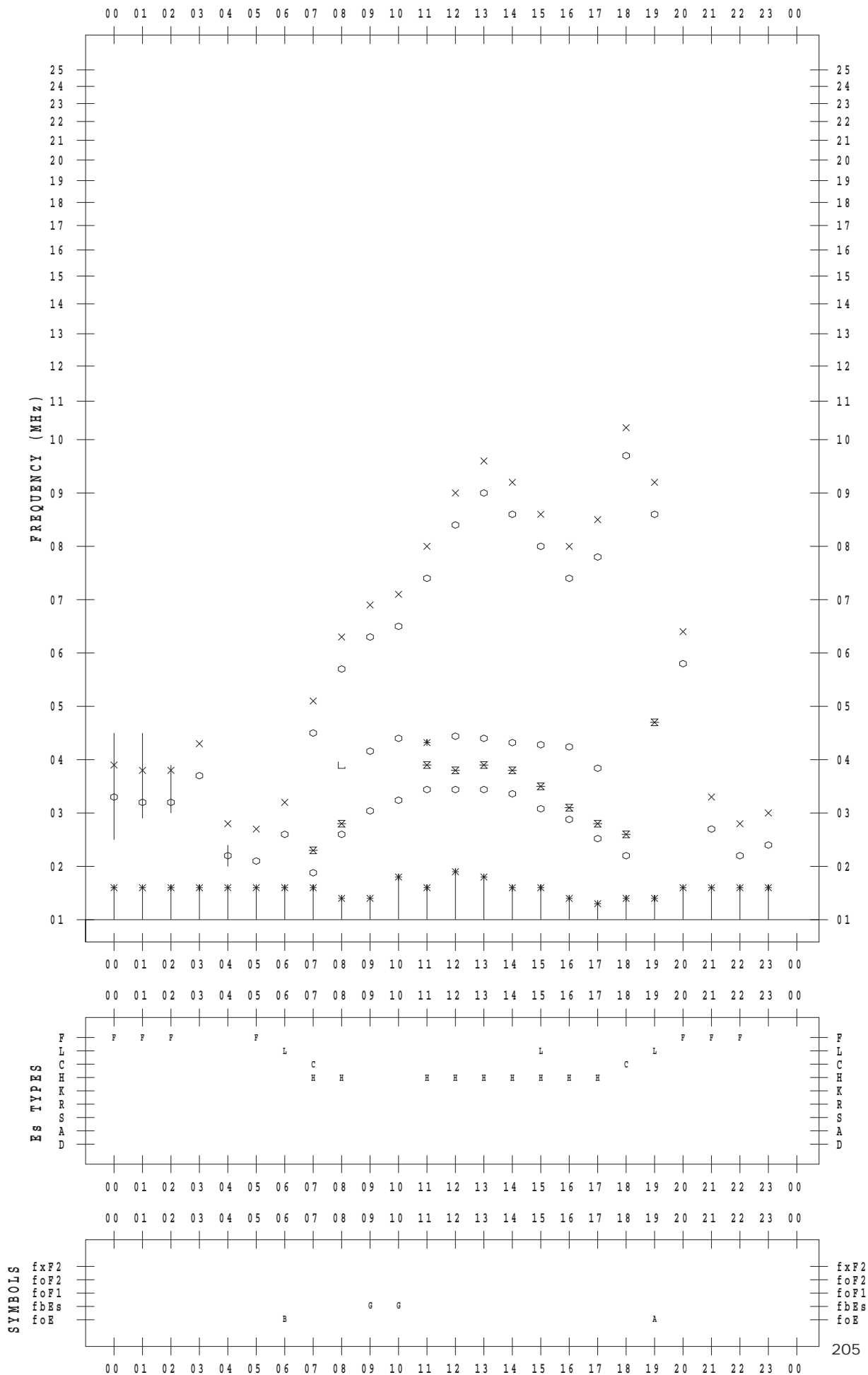
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 8

135 ° E MEAN TIME



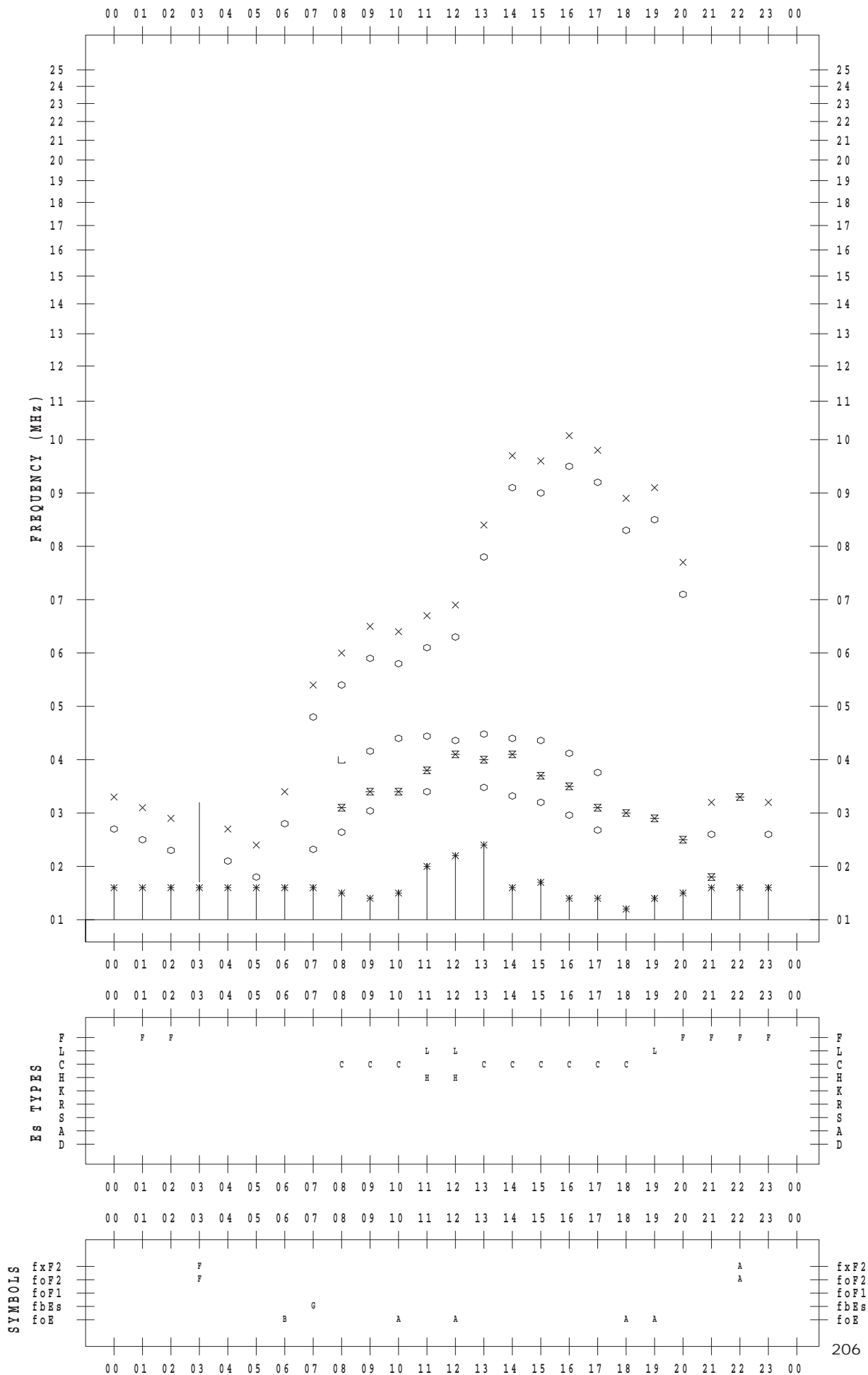
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 9

135 ° E MEAN TIME



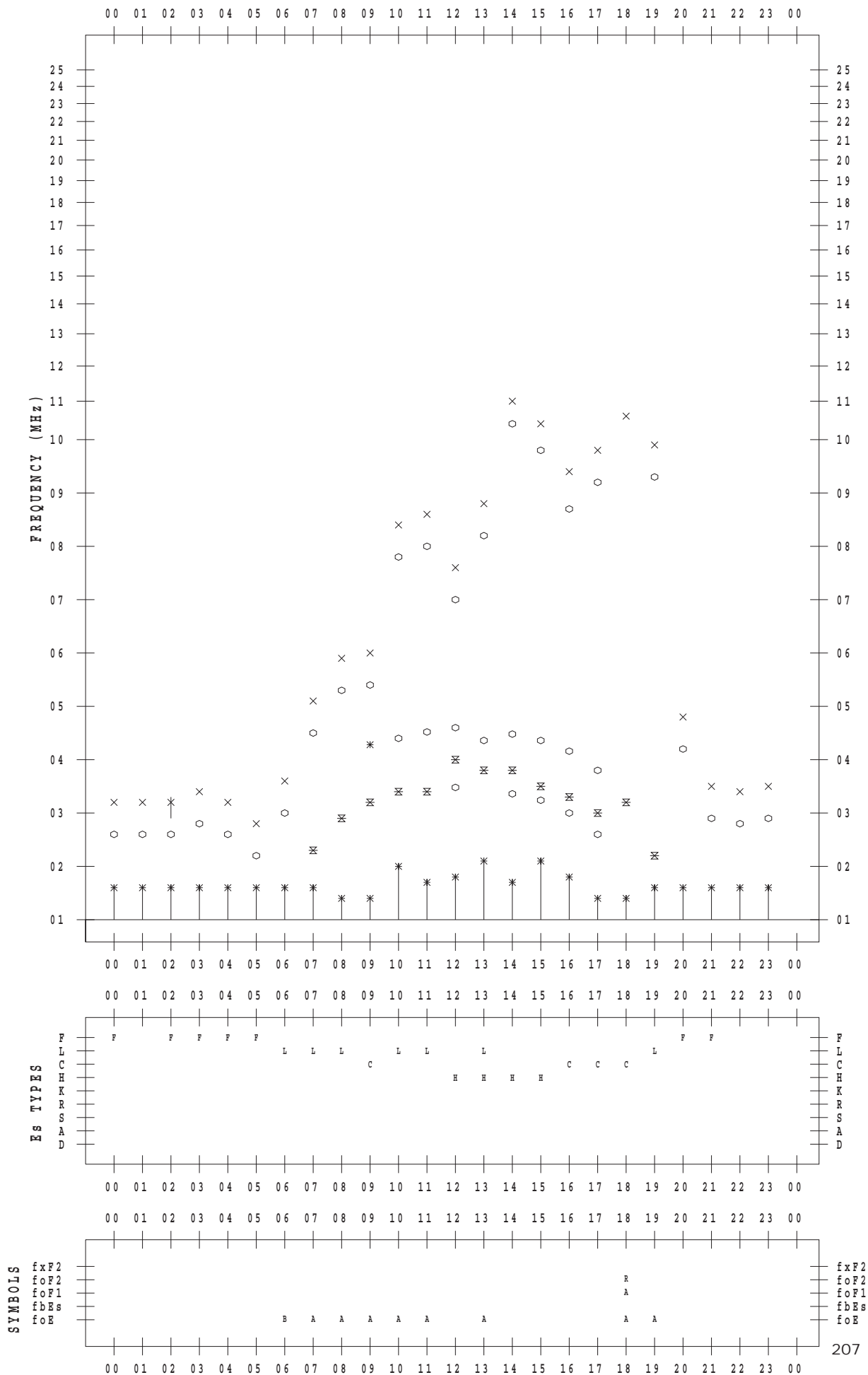
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 10

135 ° E MEAN TIME



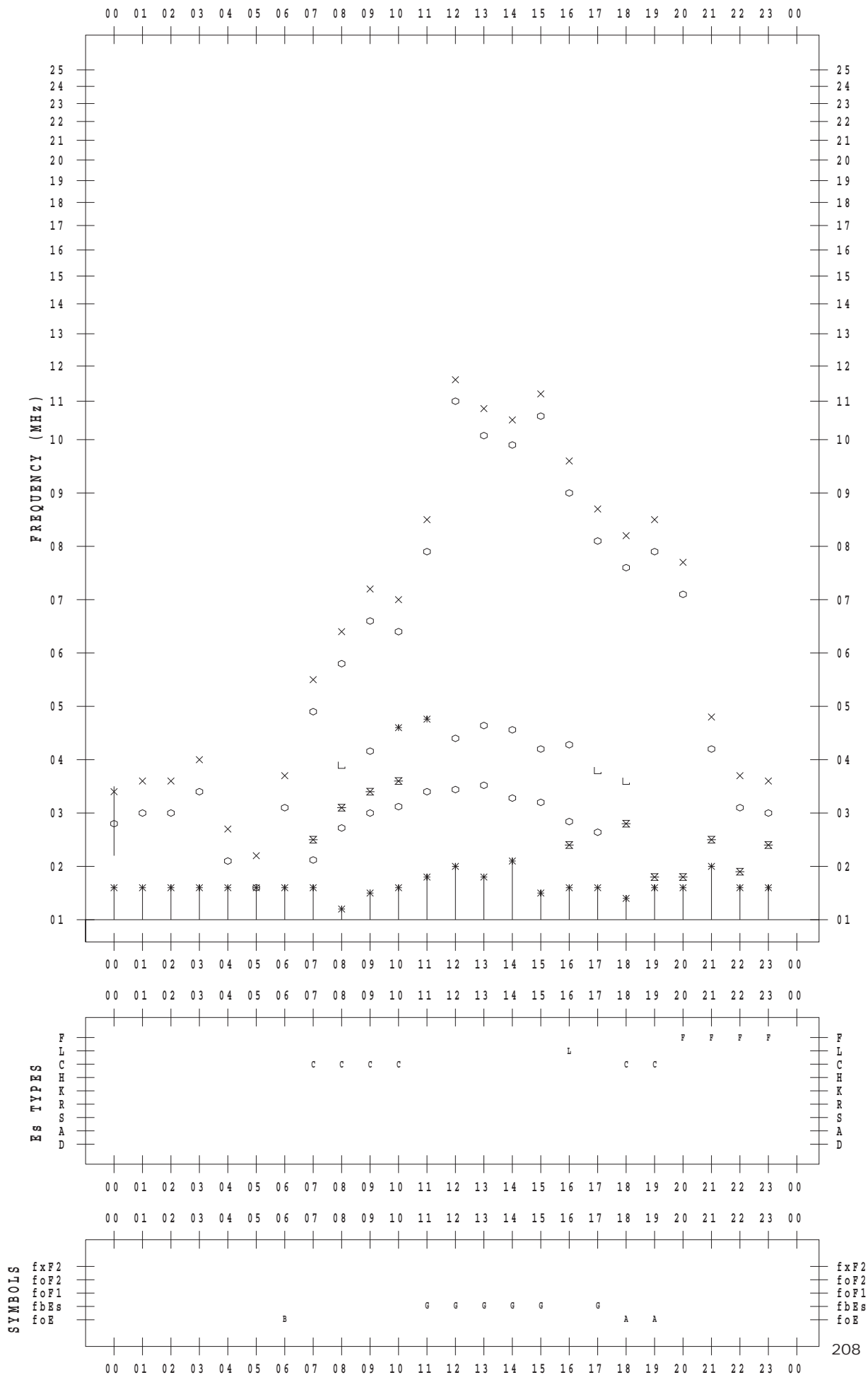
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 11

135 ° E MEAN TIME



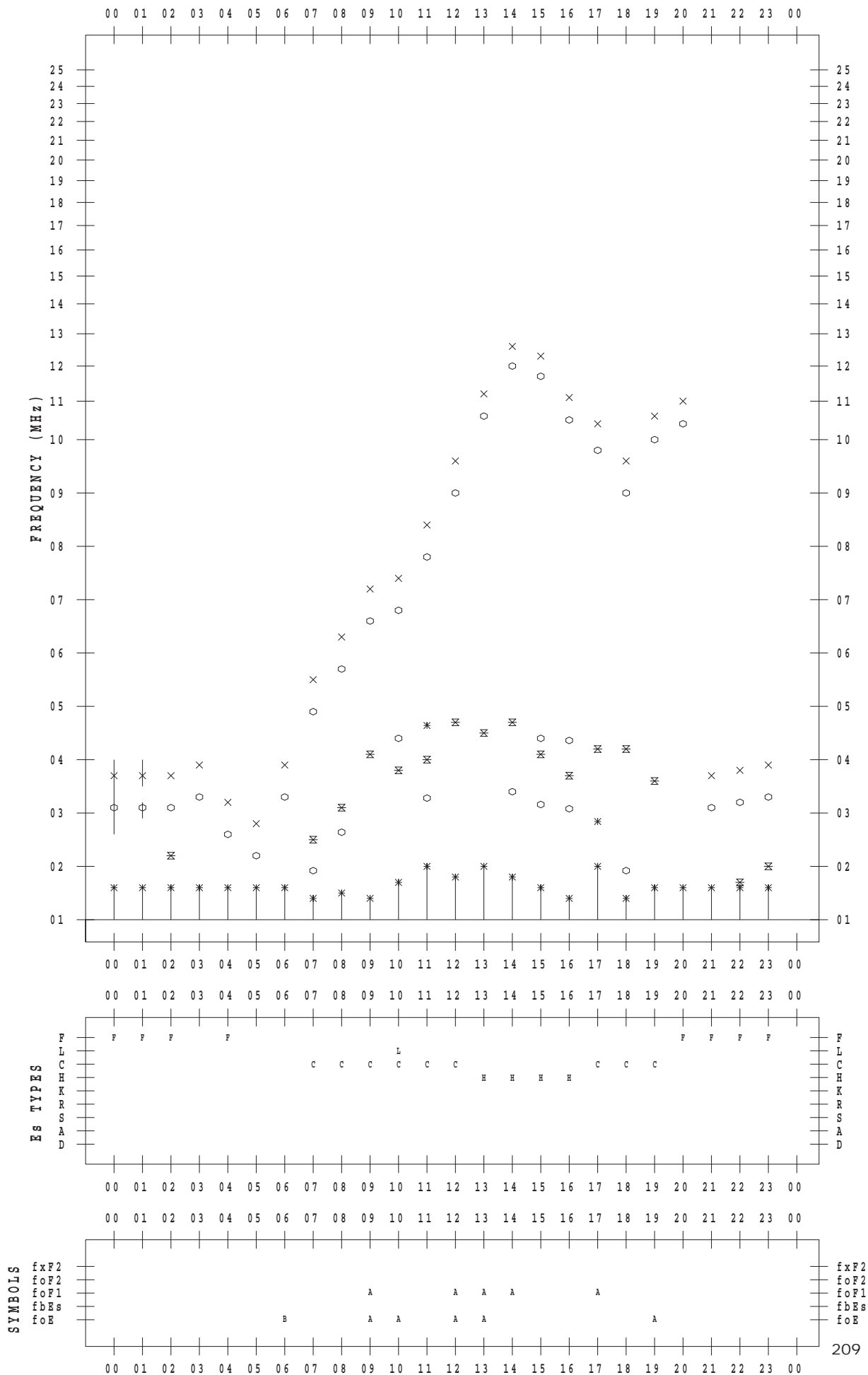
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 12

135 ° E MEAN TIME



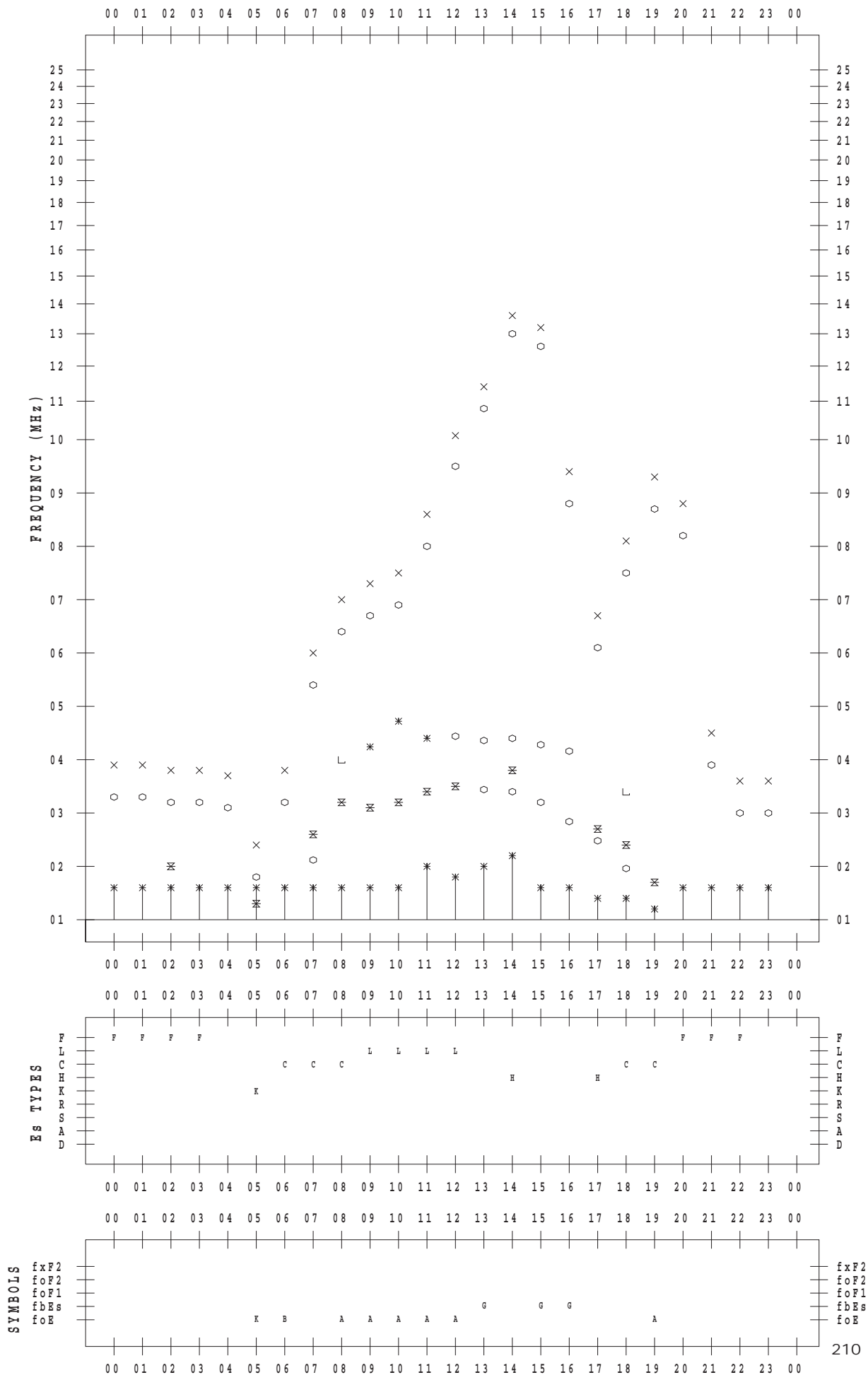
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 13

135 ° E MEAN TIME



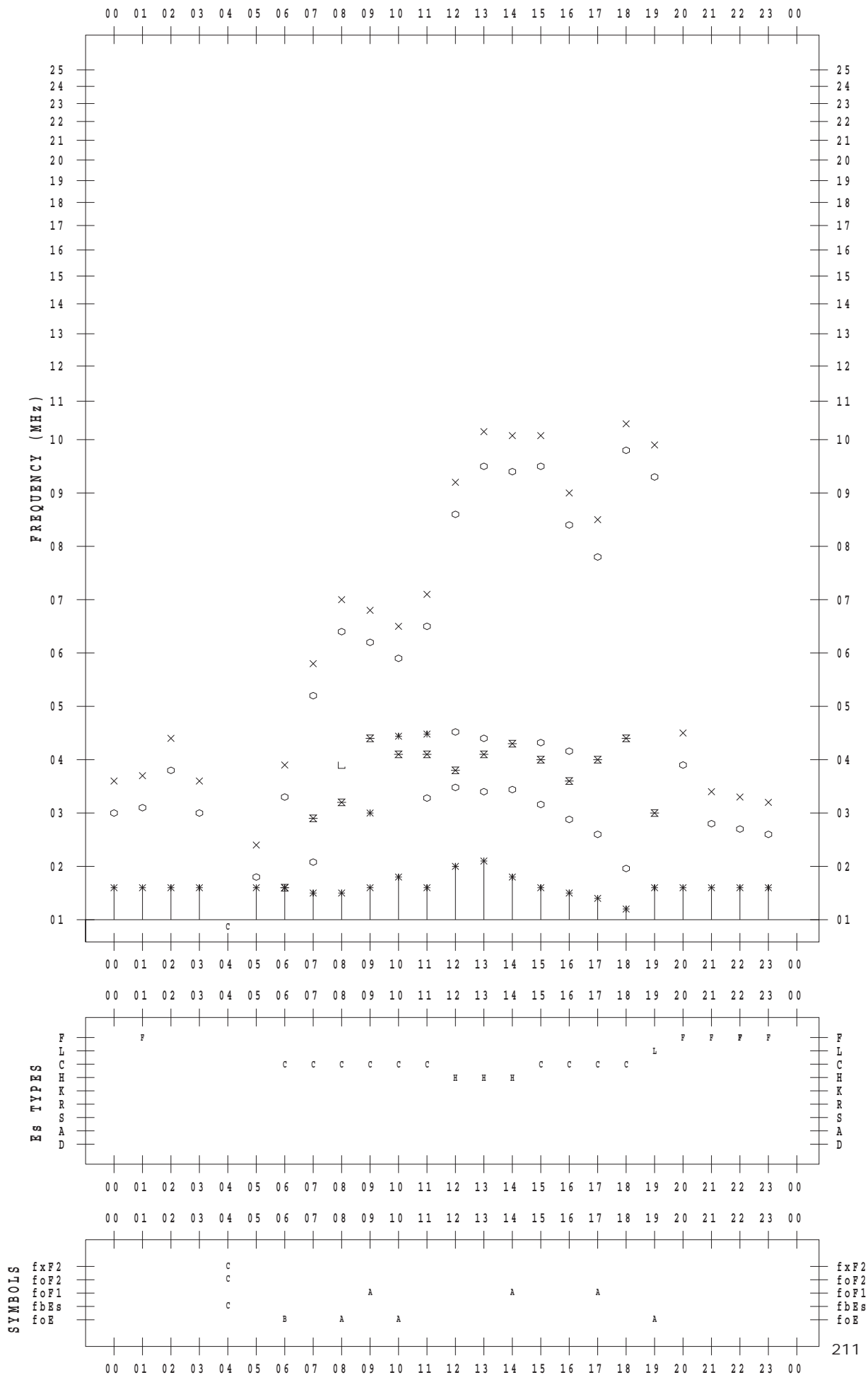
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 14

135 ° E MEAN TIME



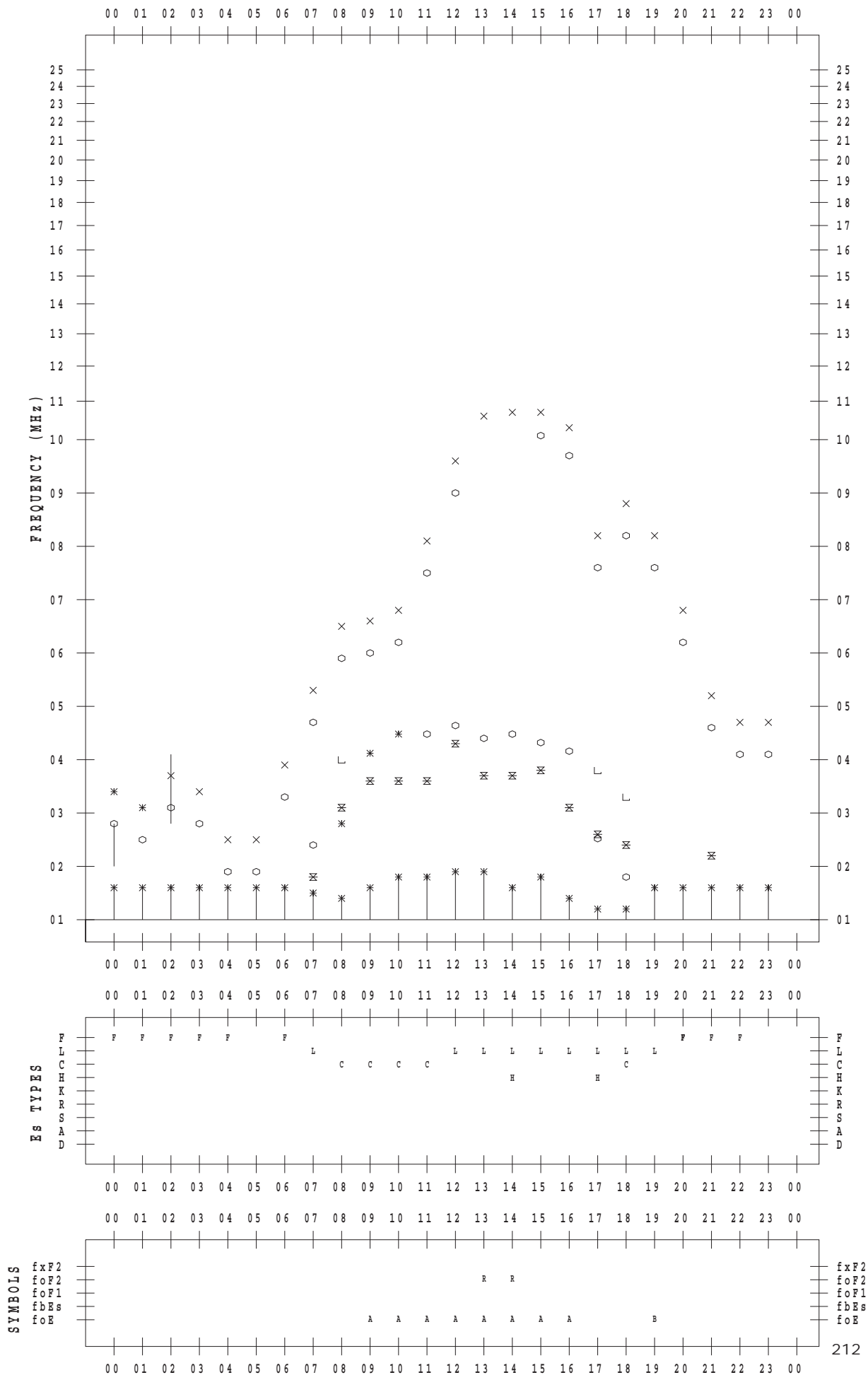
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 15

135 ° E MEAN TIME



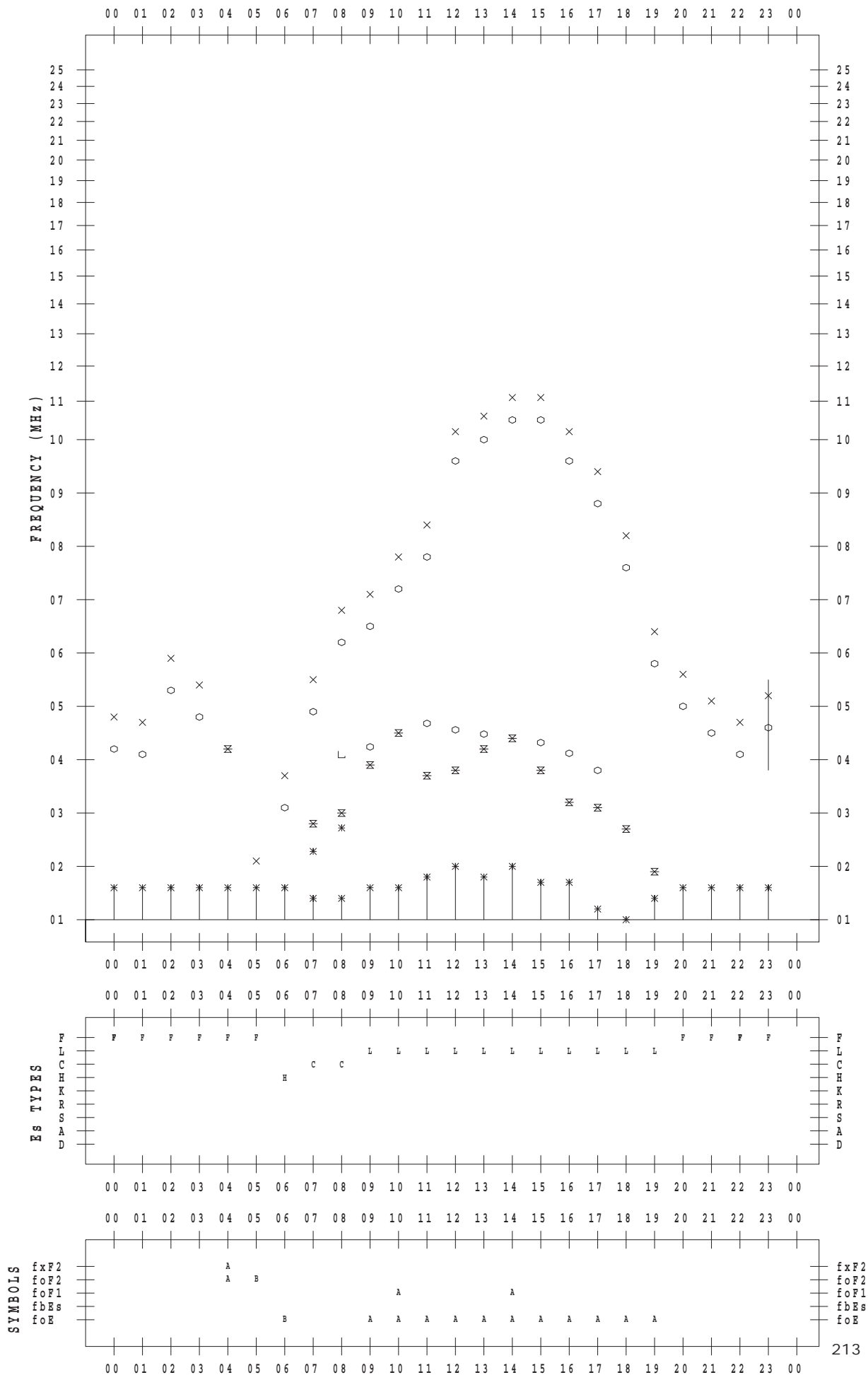
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 16

135 ° E MEAN TIME



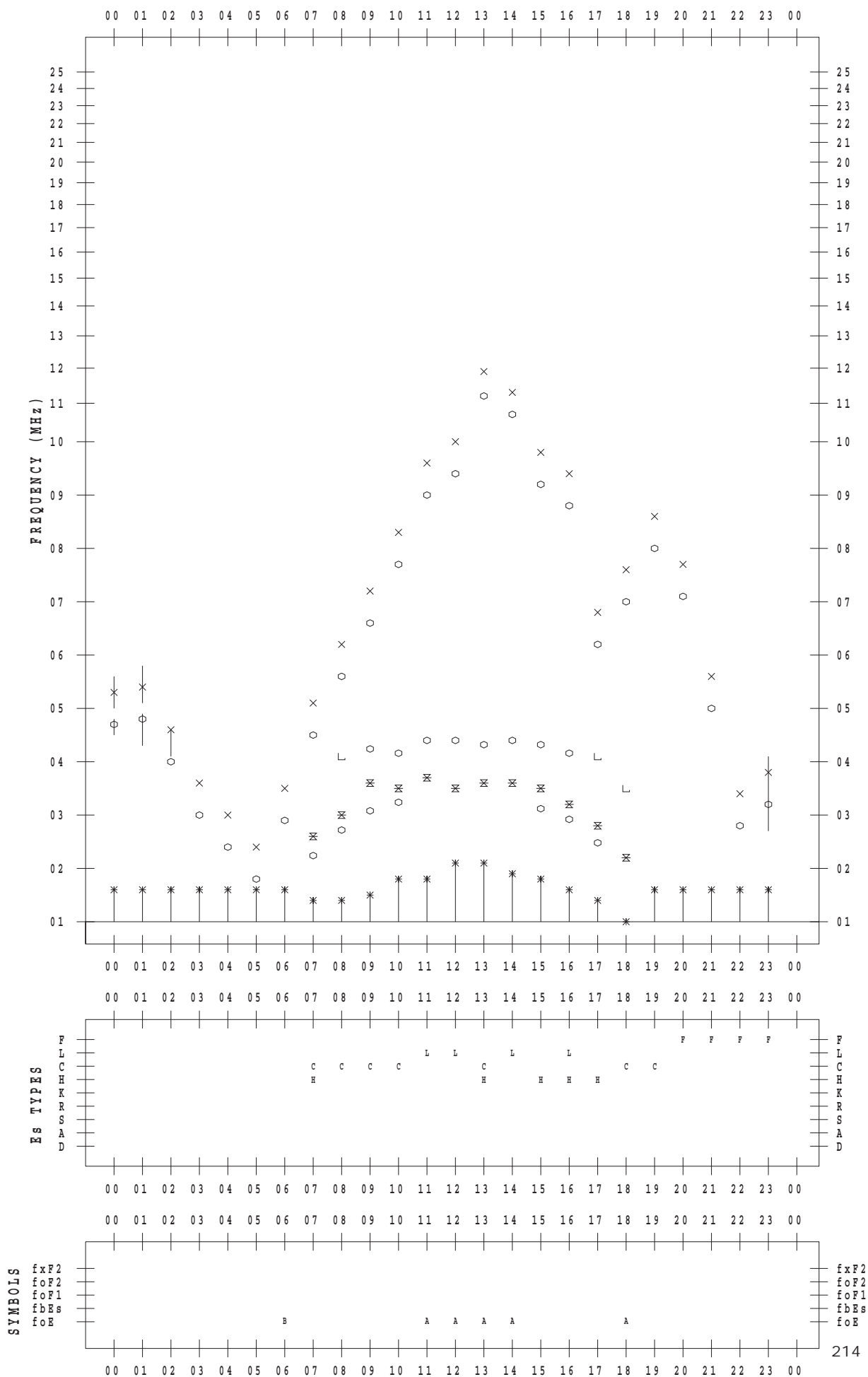
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 17

135 ° E MEAN TIME



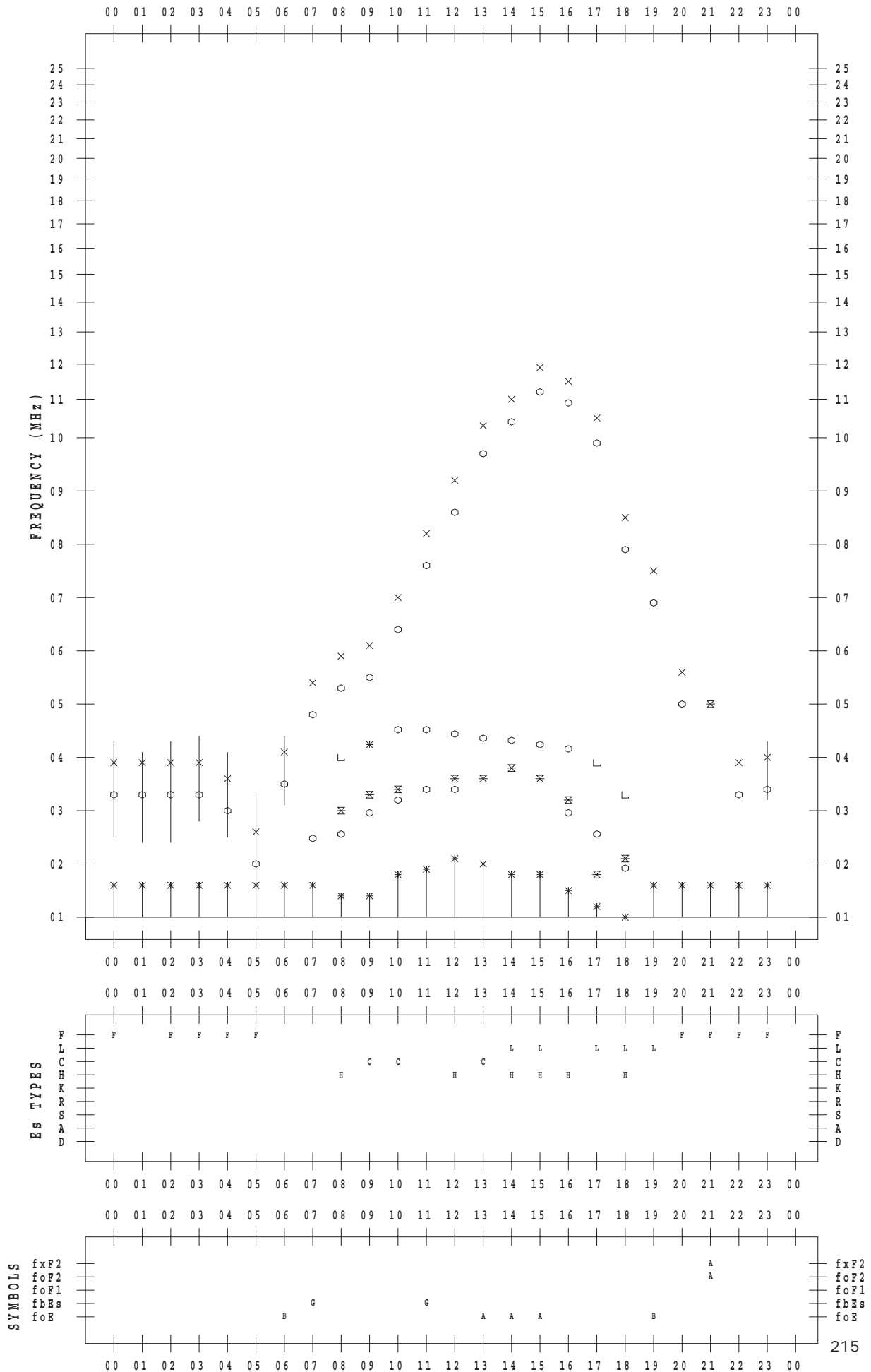
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 18

135 ° E MEAN TIME



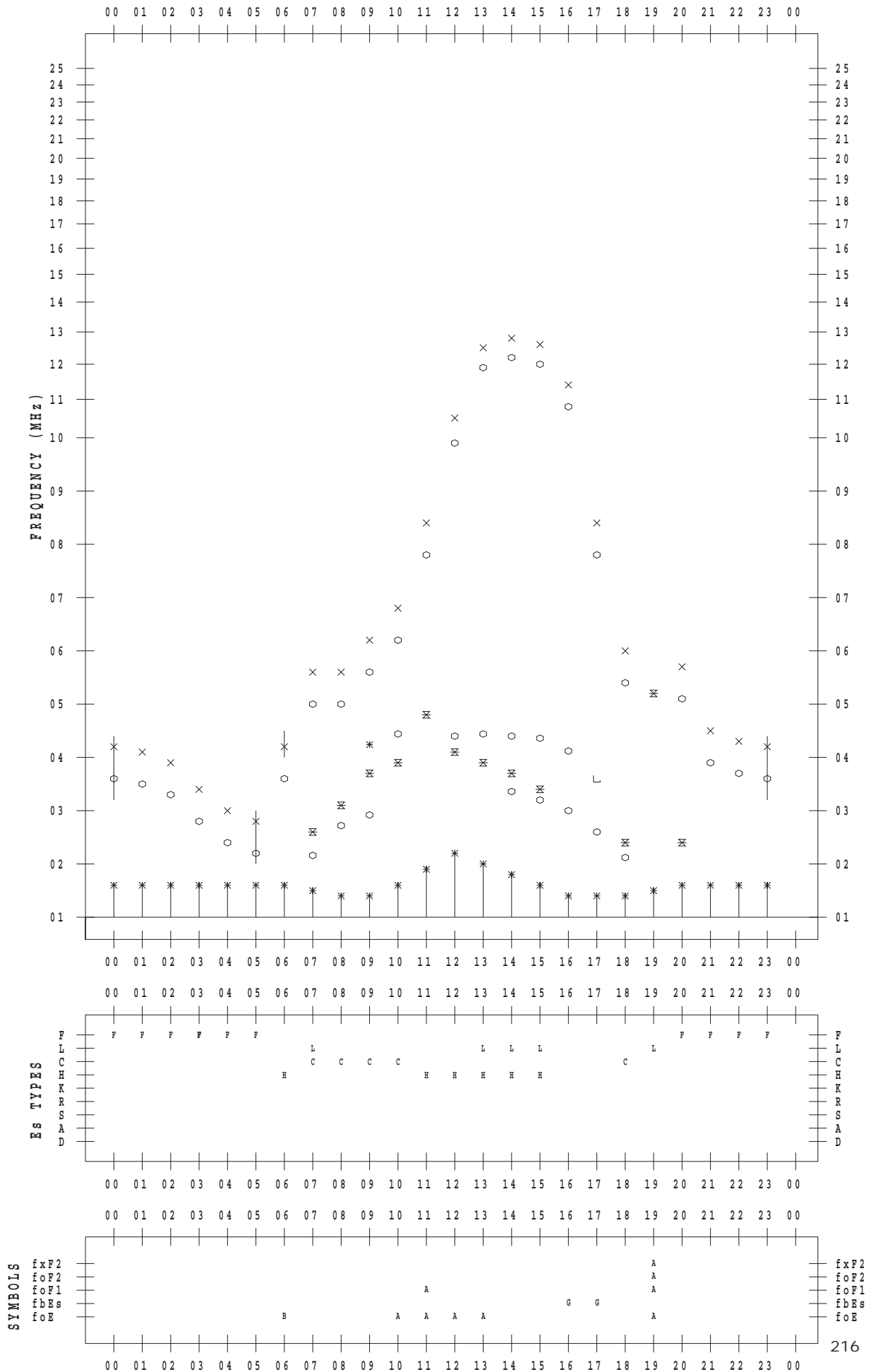
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 19

135 ° E MEAN TIME



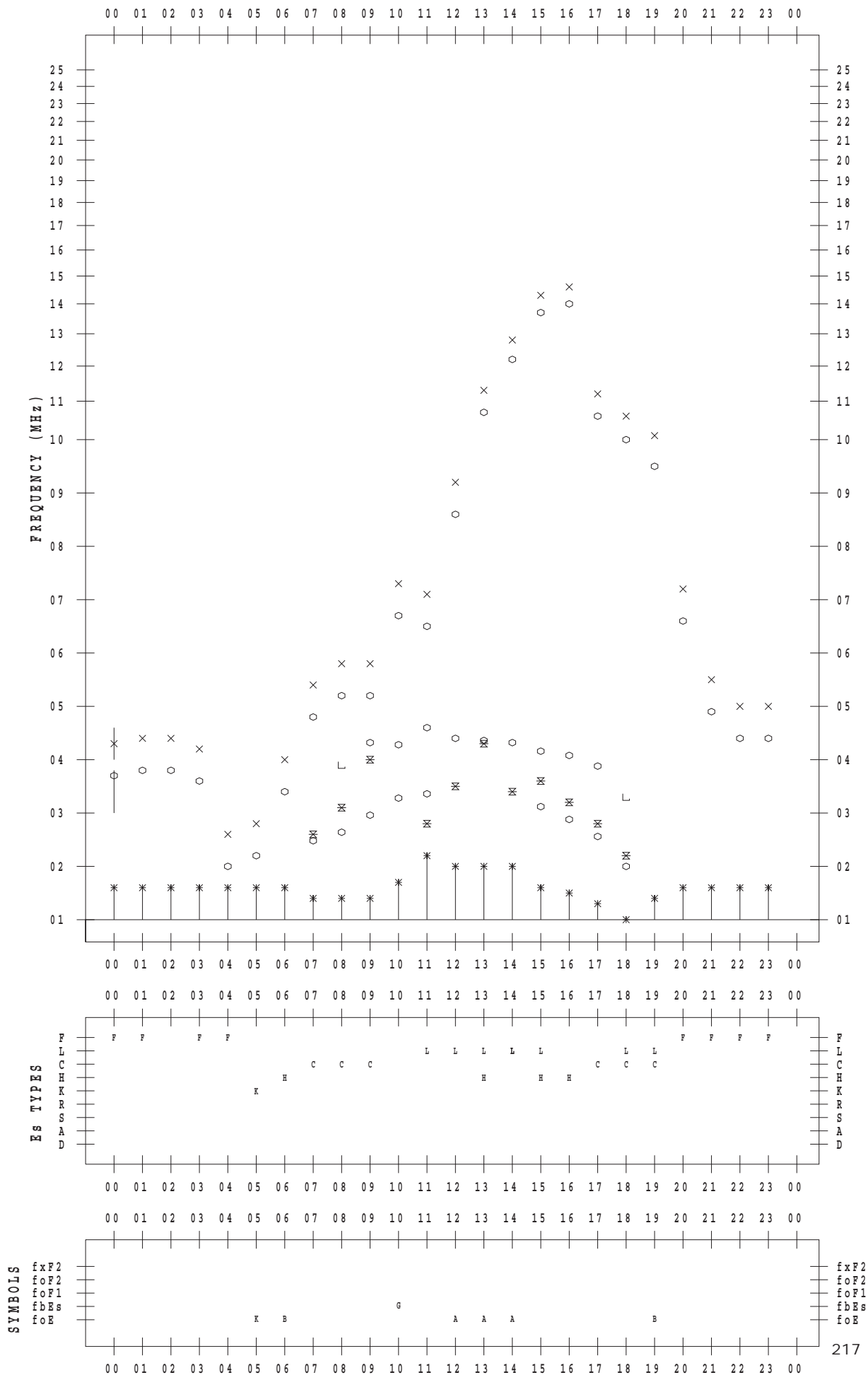
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 20

135 ° E MEAN TIME



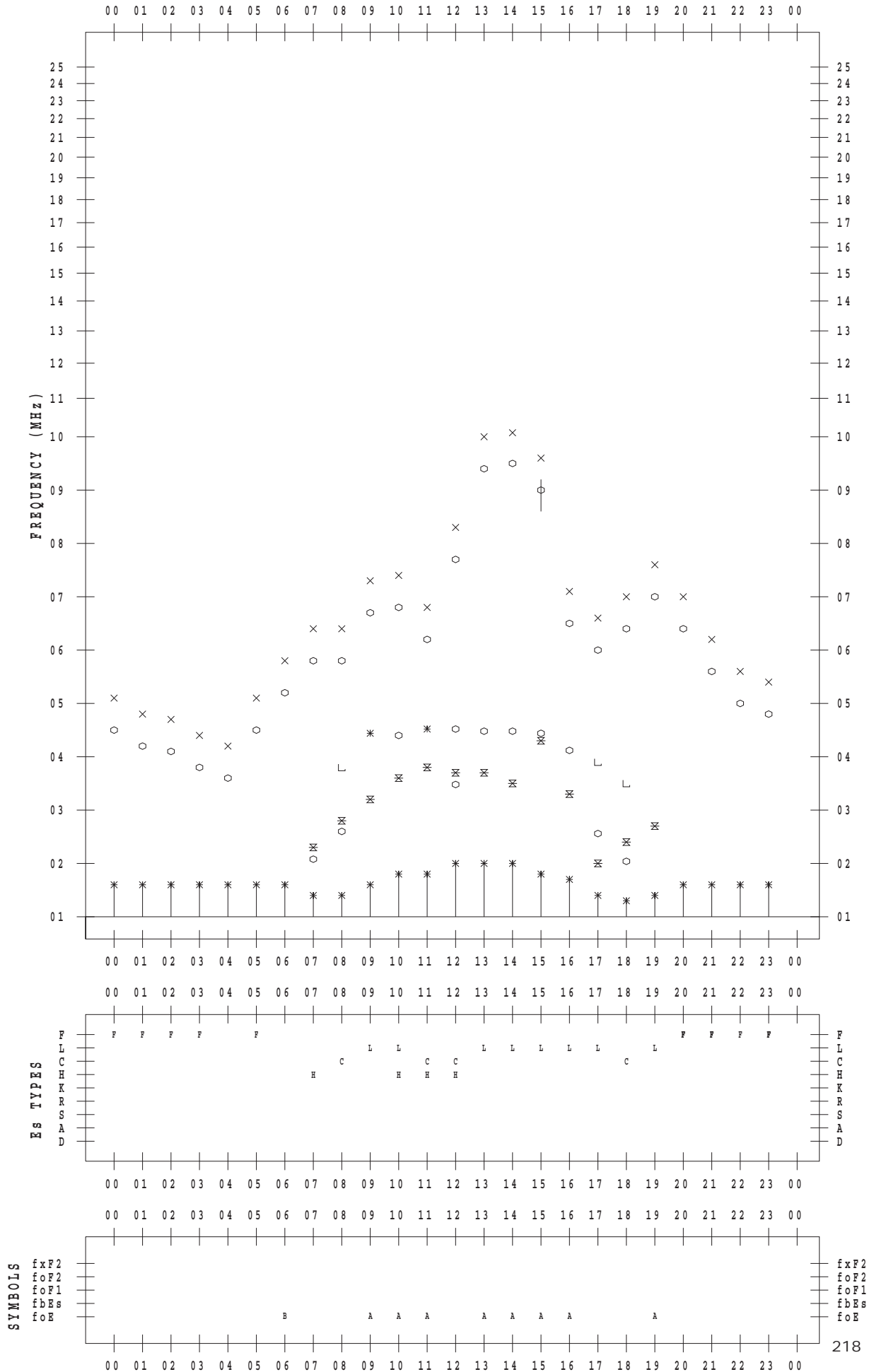
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 21

135 ° E MEAN TIME



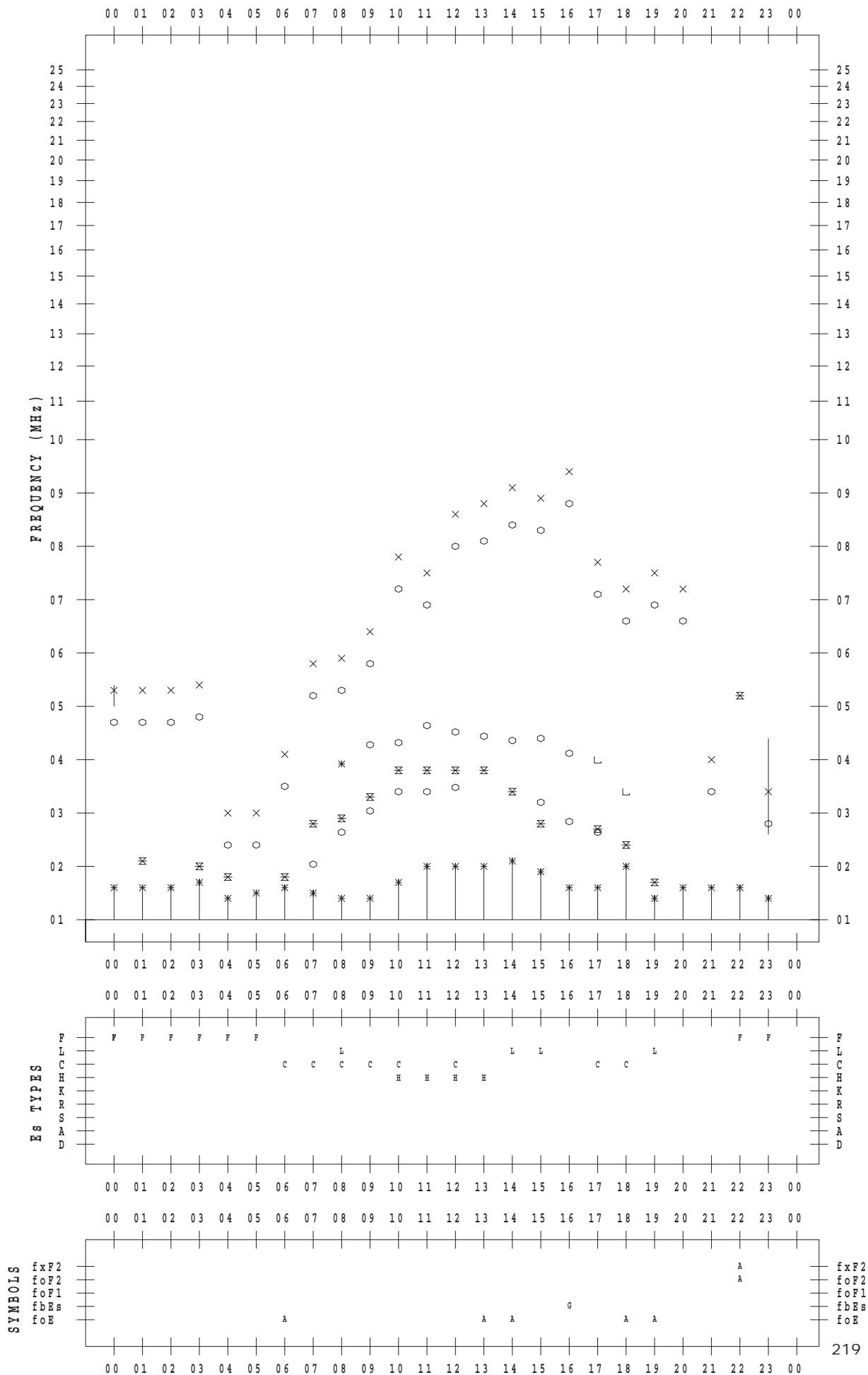
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 22

135 ° E MEAN TIME



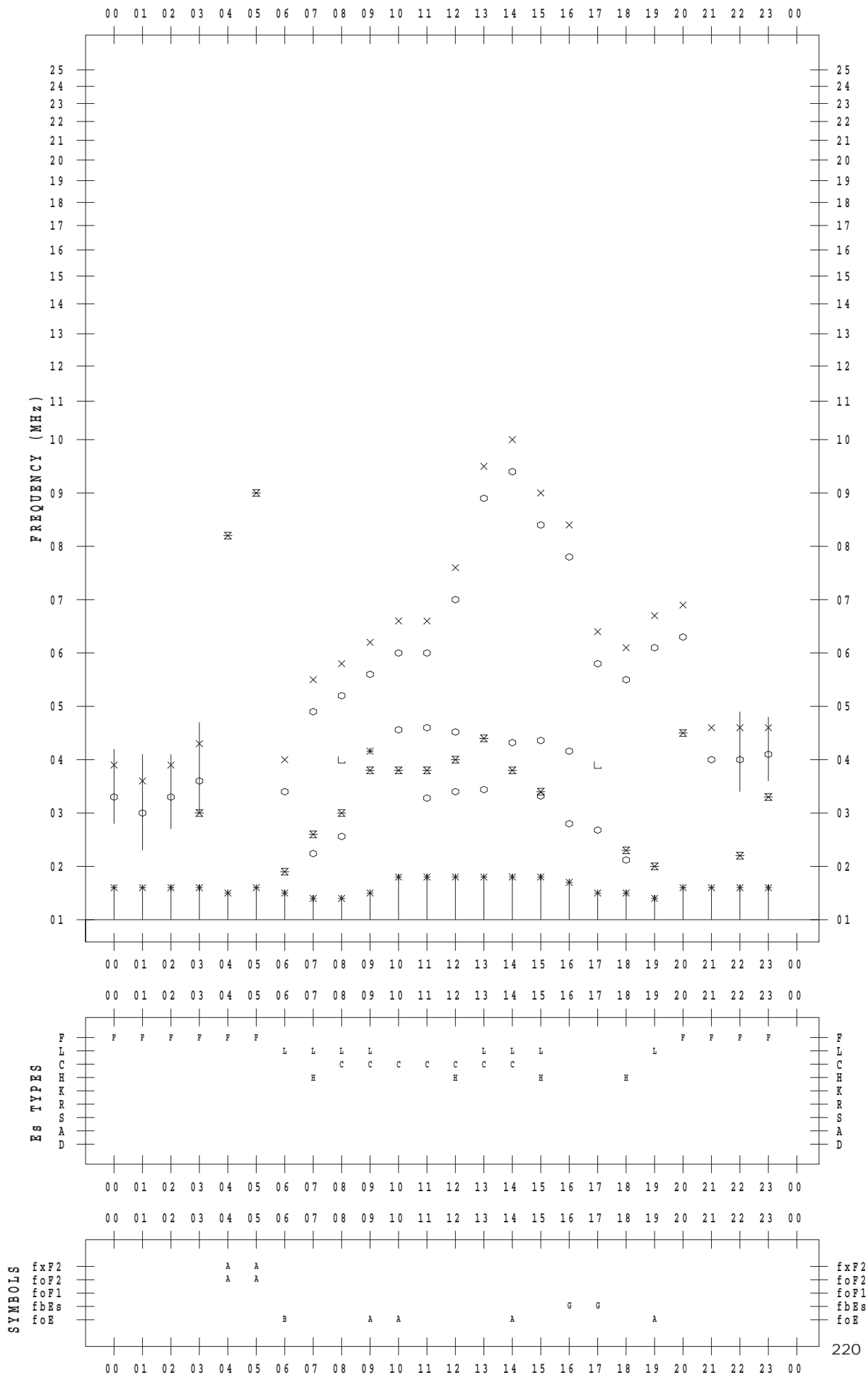
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 23

135 ° E MEAN TIME



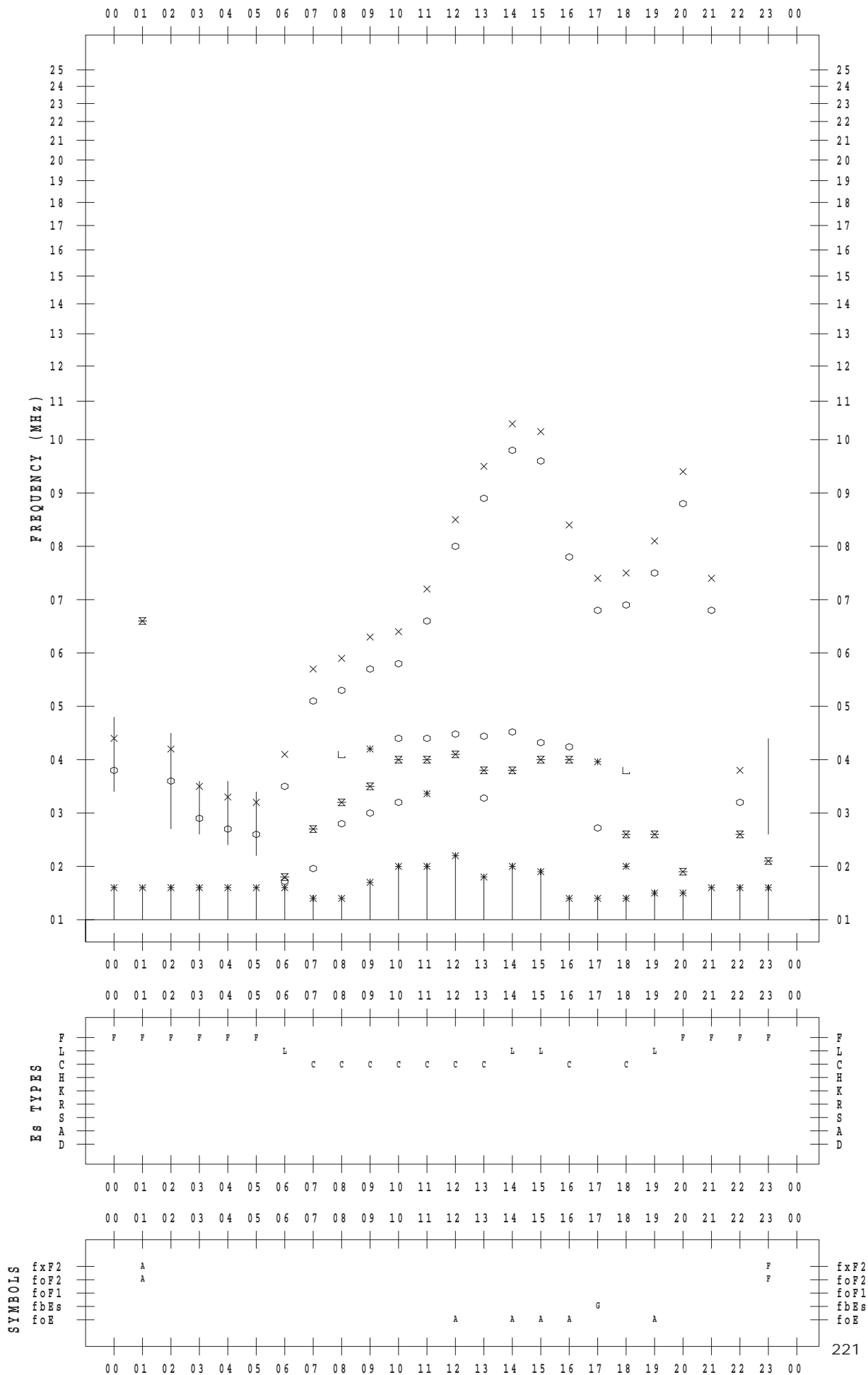
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 24

135 ° E MEAN TIME



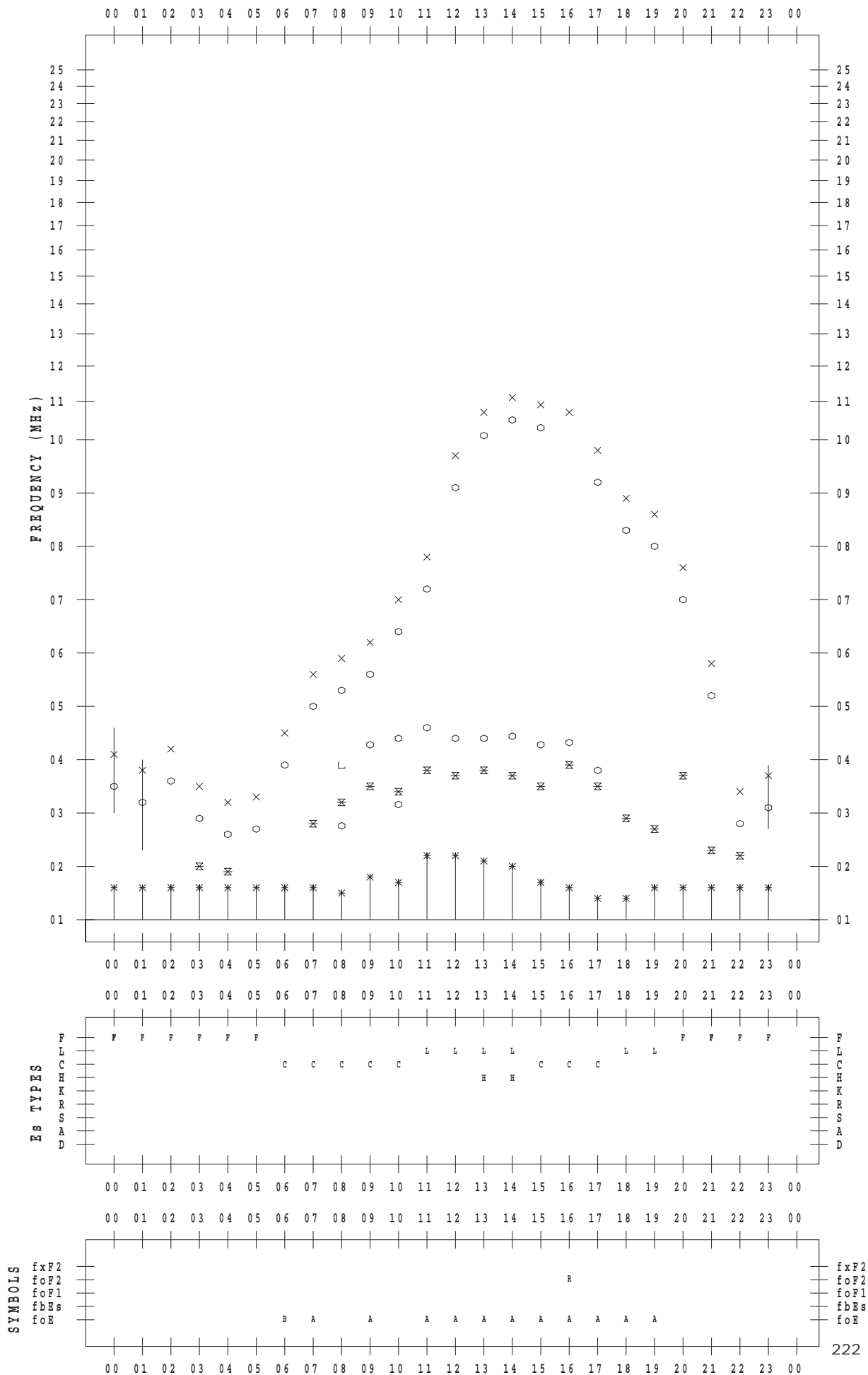
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 25

135 ° E MEAN TIME



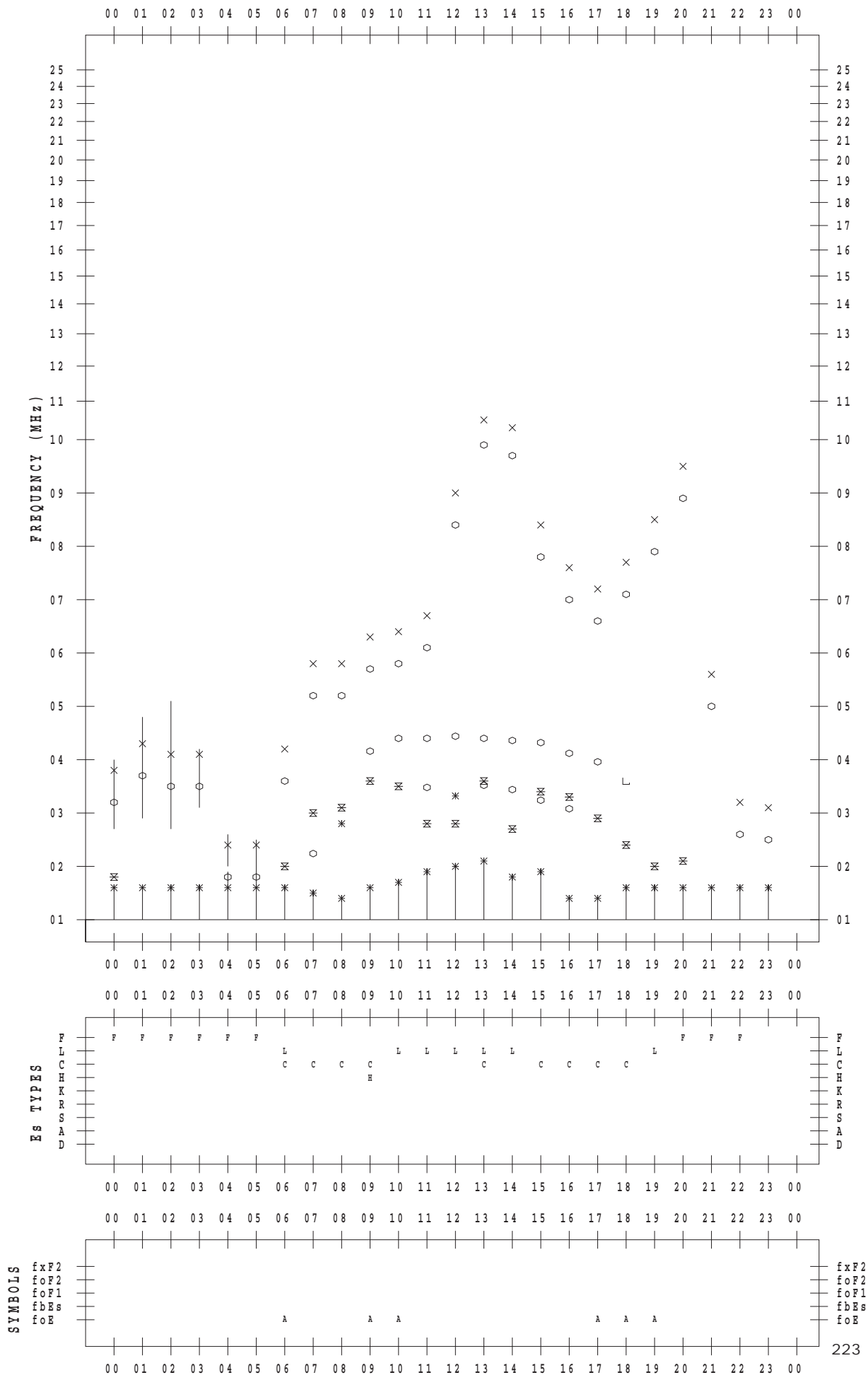
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 26

135 ° E MEAN TIME



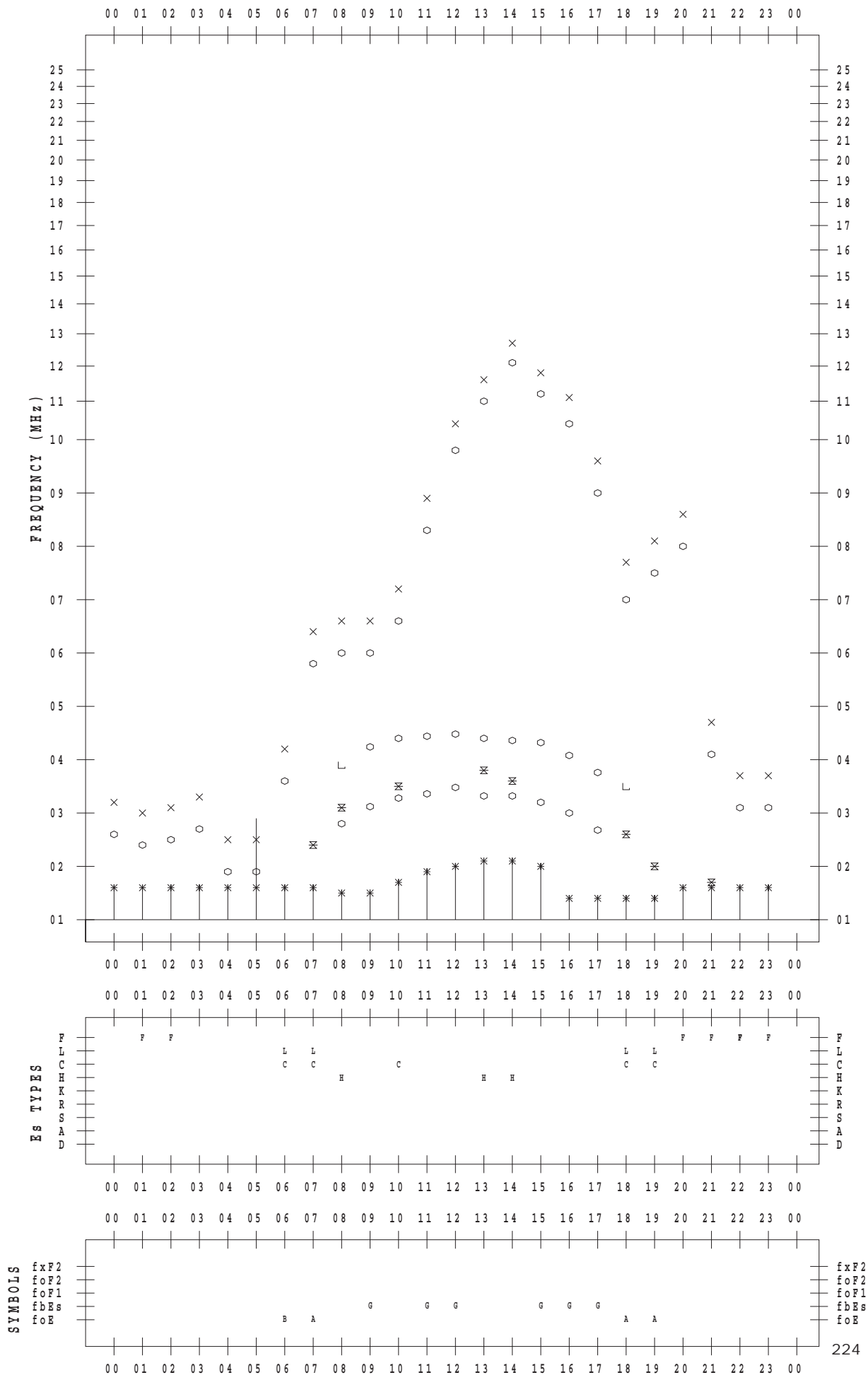
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 27

135 ° E MEAN TIME



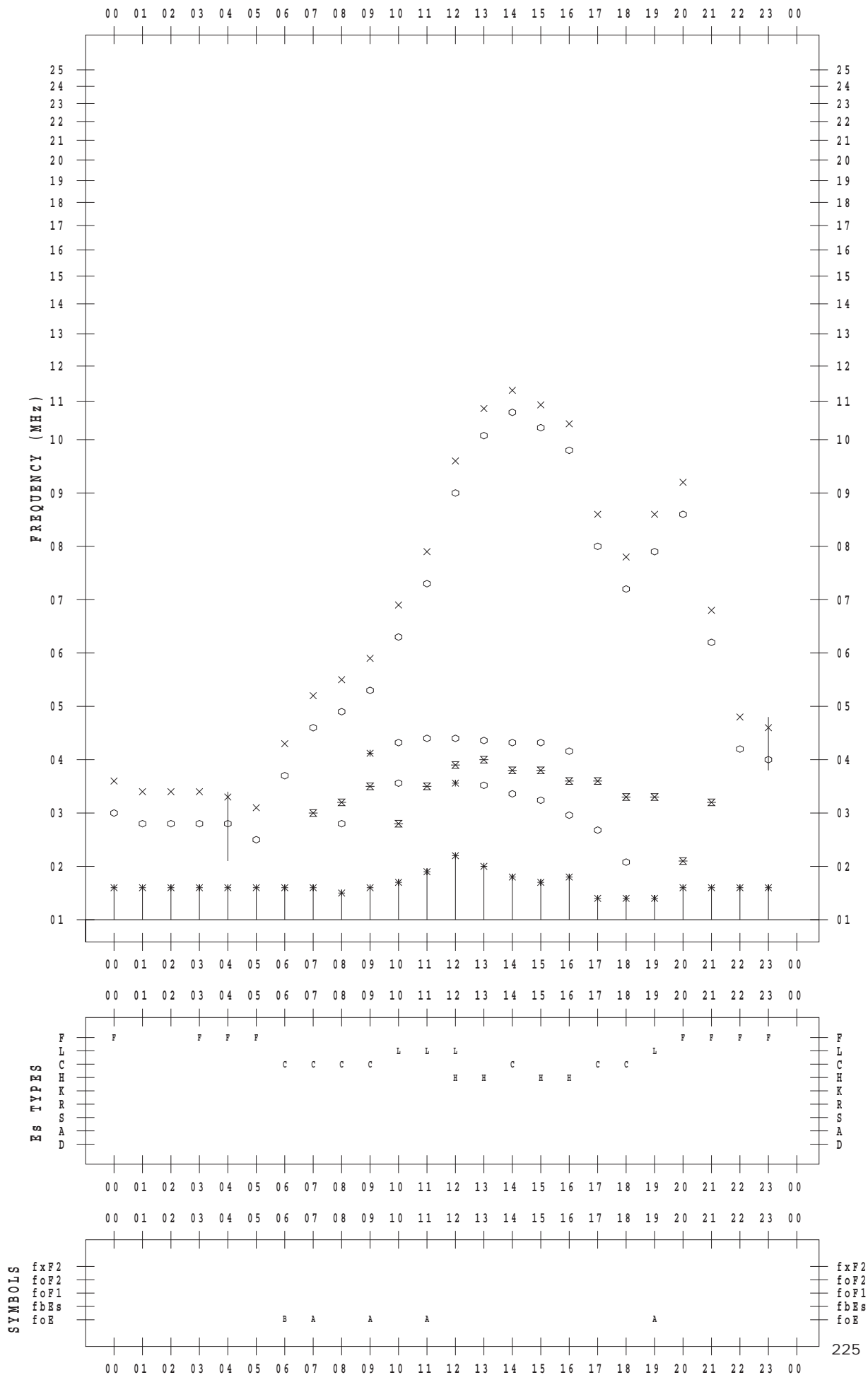
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 28

135 ° E MEAN TIME



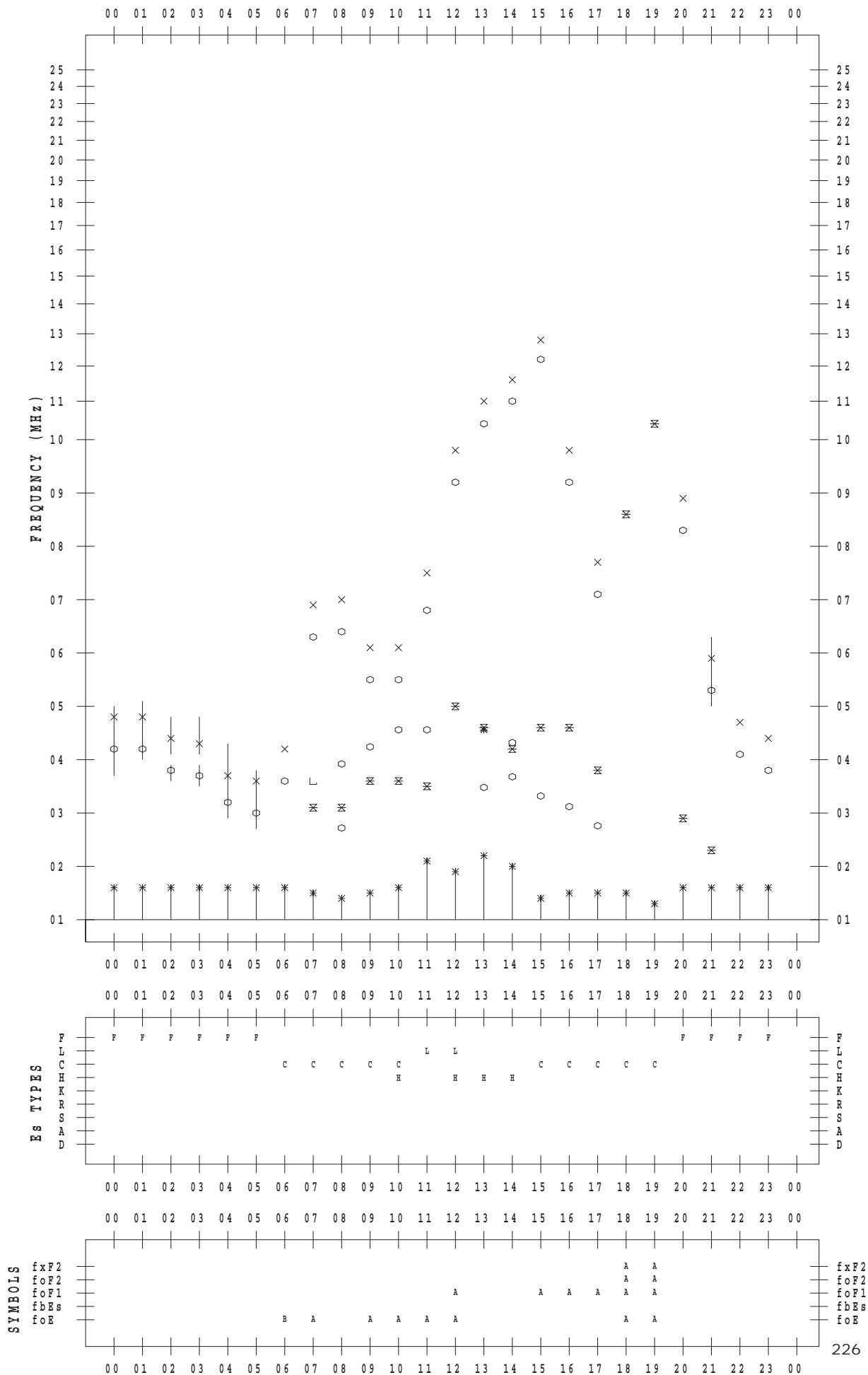
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 29

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018 / 4 / 30

135 ° E MEAN TIME

