

IONOSPHERIC DATA IN JAPAN

FOR OCTOBER 2018

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CONTENTS

Preface

Introduction 1

A. Ionosphere

A1. Automatic Scaling

Hourly Values at Wakkanai (f_oF2 , fEs and $fmin$) 4

Hourly Values at Kokubunji (f_oF2 , fEs and $fmin$) 7

Hourly Values at Yamagawa (f_oF2 , fEs and $fmin$) 10

Hourly Values at Okinawa (f_oF2 , fEs and $fmin$) 13

Summary Plots at Wakkanai 16

Summary Plots at Kokubunji 24

Summary Plots at Yamagawa 32

Summary Plots at Okinawa 40

Monthly Medians $h'F$ and hEs 48

Monthly Medians Plot of f_oF2 50

A2. Manual Scaling

Hourly Values at Wakkanai 51

Hourly Values at Kokubunji 65

Hourly Values at Yamagawa 79

Hourly Values at Okinawa 93

f -plot at Wakkanai 108

f -plot at Kokubunji 139

f -plot at Yamagawa 170

f -plot at Okinawa 201

« 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

OCT. 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	42	40	42	43	40	40	50	39	50	50	58	54	56	54	55	52	51	53	48	48	46	43	42	42
2	A	41	44	42	38	34	38	47	34	44	55	61	56	51	51	54	50	51	47	48	49	42	43	44
3	47	44	47	47	45	44	44	47	51	55	62	55	60	54	56	51	54	54	51	45	48	42	42	43
4	52	48	51	49	48	48	49	48	50	51	52	59	72	65	54	52	60	55	49	44	47	45	47	N
5	42	42	42	47	49	52	44	42	49	58	52	52	61	62	A	A	55	48	41	32	40	42	43	40
6	40	40	40	38	A	A	42	51	55	55	61	59	55	57	55	44	55	41	36	43	A	A	46	45
7	42	44	46	A	49	A		51	51	54	55	55	64	57	55	52	50	A	A	A	44	40	34	36
8	37	37	34	30	34	49	34	41	A	A		45	54	57	54	54	58	59	55	55	52	52	54	58
9	54		52	51	46	46	A	A	55	56	54	62	51	54	53	43	47	85	47	42	41	40	A	40
10	30	35	42	42	38	32	54	47	52	45	52	61	59	62	55	59	50	48	47	46	47	43	32	37
11	34	34	34	32	N	N	37	40	47	49	A	A	N	111	52	54	48	38	40	40	43	42	49	46
12	44	42	32	32	28	28		43	49	49	52	60	70	60	53	51	54	50	42	44	42	42	42	42
13	32	34	34	36	40	29	42	50	47	55	61	62	70	64	54	54	55	99	A	A	A	44	44	44
14	40	40	40	40	45	38	38	43	58	55	60	65	62	64	55	51	58	55	46	50	49	46	50	51
15	50	48	43	43	43	37	36	51	51	A	55	61	59	A	55	A	A	A	38	42	A	43	43	43
16	40	41	43	40	38	A	41	48	48	58	64	64	70	62	55	52	57	50	34	38	40	38	40	40
17	34	38	36	30	34	34	A	50	55	54	57	68	63	57	55	54	54	36	A	A		40	38	65
18	29	A	A	40	40	32	40	47	54	55	59	62	A	A	50	54	53	42	A	28	38	36	37	37
19	A	A	A	34	32	38	40	54	52	A	61	66	68	A	48	51	52	46	A	A	38	37	36	41
20	67	41	43	47	44	43	41	49	63	55	61	66	63	59	50	56	50	49	43	44	43	46	47	45
21	46	46	46	41	45	47	40	47	55	53	67	65	60	N	84	A	52	50	A	37	41	38	40	41
22	36	41	43	44	44	44	50	53	54	58	66	67	68	60	58	59	56	50	46	45	28	42	40	40
23	40	40	43	41	37	34	34	55	54	58	70	68	79	62	55	A	49	47	A	A	A	A	A	49
24	42	46	47	47	47	47	42	50	58	60	A	73	63	61	56	67	56	34	A	A	A	A	A	A
25	37	37	38	37	38	35	38	40	63	63	C	C	C	C	C	C	C	C	40	A	22	43	38	42
26	42	42	40	38	36	40	47	54	56	50	C	C	C	C	C	C	C	N	A	A	50	47	52	54
27	50	47	52	50	50	52	50	54	49	55	62	108		64	61	58	54	46	A	49	54	54	51	55
28	49	52	54	54	53	51	44	53	54	60	67	61	71	53	59	59	47	A	A	A	42	A	40	A
29	39	42		49	49	52	44	54	58	53	A	70	82	69	54	59	52	40	34	A	42	43	43	44
30	42	34	42	42	44	47	35	47	57	58	51	66	74	60	62	56	62	46	34	36	37	34	36	40
31	42	42	42	42	40	40	37	189	66	58	50	68	64	58	54	64	51	40	A	36	A	32	34	34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	28	30	29	27	27	30	30	28	25	28	26	25	28	25	28	26	19	21	24	27	29	28
MED	42	41	42	42	43	40	41	48	54	55	59	62	63	60	55	54	54	48	43	44	42	42	42	42
U Q	46	44	46	47	46	47	44	53	56	58	62	66	70	63	55	58	55	53	47	47	47	44	46	45
L Q	37	39	40	38	38	34	38	47	50	52	53	59	59	57	53	51	50	42	38	37	40	40	38	40

HOURLY VALUES OF fEs AT Wakkanai

OCT. 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	G	G	G	21	43	33	78	46	40	48	44	36	57	33	30	28	25	32	34	36	32		
2	39	28	34	30	G	G	30	46	40	54	44	43	43	40	38	41	36	40	34	43	28	27	G	26		
3	32	29	G	G	G	G	11	33	43	35	40	33	38	38	27	32	24	G	31	26	34	28	G	G		
4	G	25	G	G	G	G	156	46	92	42	48	34	86	48	39	37	31	53	27	G	G	G	G	G		
5	G	G	G	G	112	11	33	32	46	40	38	50	144	50	115	73	38	11	29	30	G	G	G	G		
6	59	G	29	53	70	89	40	88	82	27	35	31	40	43	39	34	29	38	30	36	40	55	40	G		
7	G	127	G	92	92	71		44	33	27	30	57	34	108	40	34	108	86	92	69	39	35	34	G		
8	G	G	G	G	G	G	130	33	179	57		29	52	36	57	32	53	40	34	52	32		G	G		
9	G		G	G	27	28	64	80	35	38	153	113	34	40	43	40	41	78	58	G	32	26	44	40		
10	29	33	27	33	95	G	G	34	41	43	42	48	36	44	46	24	G	G	G	G	G	154	28	38		
11	25	82	G	G	G	G	104	32	40	87	58	84	61	95	33	33	G	G	40		29	33	55	35		
12	32	G	G	G	G	G		40	44	116	49	52	42	43	41	38	43	34	G	G	G	G	59	33		
13	G	G	G	23	25	G	G	35	36	43	105	40	G	53	46	34	38	37	55	52	53	52	41	40		
14	30	27	G	G	G	G	G	32	43	40	55	54	38	52	G	G	G		11	G	G	G	G	27		
15	G	34	29	28	G	G	60	G	G	52	46	41	49	67	51	86	79	81	28	34	39	27	28	G		
16	G	32	G	G	G	G	40	38	34	41	40	39	53	71	39	41	45	G	11	34	G	G	28	28		
17	26	G	G	G	G	G	48	30	33	38	36	40	G	G		36	38	35	61	35	34		30	32	33	
18	32	58	39	29	28	G	33	G	46	51	60	65	77	72	36	94	G		31	38	G	G	35	27	58	
19	71	71	94	94	34	52	28	38	52	92	41	45	54	60	54	45	33	36	40	61	53	26	71	30		
20	55	G	113	56	31	128	92	55	32	48	155	38	41	54	G	31	G		27	31	26	G	G	49	G	
21	28	32	26	34	G	142	38	30	34	39	49	45	54	90	57	63	48	57	34	G	G	G	27	G		
22	33	34	G	G	G	G	26	135	39	39	44	44	54	54	43	46	40	G		38	40	32	33	G	G	
23	G	32	G	G	33	G	G	34	34	41	38	70	58	48	34	61	69	56	85	92	41	47	58	59		
24	40	26	G	G	G	11	43	38	40	41	79	46	39	40	77	37	32	31	60	58	56	155	47	39		
25	G	G	107	33	27	G	32	54	88	G	C	C	C	C	C	C	C	C		27	33	29	G	26		
26	37	G	G	G	G	27	48	28	92	40	C	C	C	C	C	C	C	C		24	44	39	39	37	34	35
27	56	32	156	24	39	36	29	G	39	43	115	60		63	148	G	G		27	71	29	G	25	25	39	
28	33	31	38	30	33	24	26	G	38	84	41	50	45	46	116	G	30	74	105	59	59	70	55	81	G	
29	39	G		28	G	G	38	55	32	39	84	103	65	G	35	54	40	40	29	46	41	34	33	G		
30	26	34	G	25	32	44	34	28	33	38	42	57	53	G	33	G	G		G	G	G	G	G	G	34	
31	27	G	G	G	33	32	21	169	161	34	42	57	52	75	39	35	34	38	39	32	29	23	G	G		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	30	30	31	31	31	29	31	31	31	28	29	28	29	29	29	29	30	31	31	30	31	31	31		
MED	28	28	G	G	G	G	33	34	40	41	45	48	48	48	40	37	33	35	34	32	30	28	28	28		
U Q	37	33	29	30	33	36	48	46	46	52	59	57	56	61	52	50	40	53	44	46	39	35	44	38		
L Q	G	G	G	G	G	G	23	30	34	38	40	40	38	40	35	32	G	24	28	G	G	G	G	G		

HOURLY VALUES OF fmin AT Wakkanai

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

HOURLY VALUES OF fof2 AT Kokubunji

OCT. 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	C	C	C	C	C	C	C	C	C	C	55		53	48	53	55	55	56	67	46	34	35	36	34	
2	36	34	34	44	34	26	23	42	51	58	56	55	61	59	54	58	58	65	51	34	A	A	25	35	
3	35	36	32	36	36	34	46	A	58	48	49	53	61	A	71	57	55	66	70	49	A	31	A	34	
4	34	34	34	34	31	34	39	34	48	52	59	65	61	59	59	57	58	62	57	55	A	38	40	42	
5	39	39	37	39	36	32	41	47	59	53	51	49	65	75	56	51	47	58	57	51	48	47	45	43	
6	43	42	32	36	35	36	26	51	52	54	56	63	64	59	52	54	51	54	38	36	A	39	41	36	
7	36	36	39	39	39	38	48	51	49	A	A	56	59	52	56		55	39	47	44	43	42	A	37	
8	37	34	34	37	31	36	43		62	51	61	68	71	61	64	63	58	52	51	48	48	44	37	24	
9	38	36	32	39	28	27	46	47	64	64	56	59	61	55	56	54	57	56	50	A	39	36	34	34	
10	A	37	27	A	30	30	48	51	52	65	65	69	65	58	58	58	62	49	42	39	34		32		
11	32	34	31	34	27	A	35	47	48	58	52	66	62	57	66	72	A	47	34	36	A	37	36	34	
12	32	36	A	36	27	N	41	50	51	59	58	72	70	A	59	60	54	55	53	36	A	A	A	A	
13	32	A		25	27	A	33	50	51	57	61	68	80	58	59	65	51	51	48	34	38	34	A	32	
14	32	N		A	21	27	36	48	60	58	72	77	74	56	62	59	55	58	39	38	37	34	34	34	
15	34	35	34	34	34	30	42	48	55	66	57	61	67	64	51	53	56	52	50	34	36			34	
16	34	31	32	32	32	N	40	53	57	75	65	68	80	58	60	68	54	55	57	31	A	36	34	32	
17	A	30	A	27	28	28	46	52	54	65	62	67	71	62	55	60	62	51	46	31	A	34	34	35	
18	34	A	34		A	A	38	50	56	70	59	65	66	60	55	58	58	56	52	42	34	32	32	A	
19	32	28		27	27	27		48	43	68	62	71	56	61	55	52	55	59	45	A	A	31	N	32	
20	32	34	34	34	35	28	39	53	55	71	69	57		47	58	51	58	52	50	A	34	48	34	34	
21	A	A	A	34	31	31	38	59	55	62	59	52	58	57	56	57	A	49	34	A	A	32	32	34	
22	34	34	32	32	34	26	49	48	51	55	49	64		67	56	56	55	58	54	A	A		36	36	
23	36	35	34	36		26	39	51	58	65	68	63	61	62	59	59	51	45	43	41	41	39		34	
24	A	34	A	34	A	A	34	55	64	61	59	66	71	58	58	69	66	56	A	A	26	A	32	34	
25	32	48	48	31	A	23	A	52	51	A	59	61	68	A	80	66	44	108	111	A	A	32	A	36	
26	34	34	32	34	A	27	34	54	53	56	64	55	68	57	59	59	65	34	A	A	35	36	37	A	
27	A	31	36	36	36	31	42	51	58	71	62	51	68	58	62	64	56	45	34	46	41	36	39	37	
28	A	A	36	A	32	32	37	44	54	66	59	61	69	64	55	56	52	38	30	A	A	35	A	A	
29	A	A	A	28	34	32	35	46	51	57	56	56	70	68	55	52	54	A	42	36	A	37	34	36	34
30	34	27	34	34	36	26	36	50	54	51	62	70	65	72	61	60	57	45	28	32	A	32	32	32	
31	32	32	32	27	32	28	36	53	53	53	64	58	54	64	57	59	55	51	26	N	32	26	27	21	
	00	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	24	22	26	25	24	28	28	30	28	30	30	29	28	31	30	29	30	29	21	18	25	22	26	
MED	34	34	34	34	32	29	39	50	54	58	59	63	65	59	58	58	55	53	48	38	36	35	34	34	
U Q	36	36	34	36	35	32	42	52	58	65	62	68	70	63	60	60	58	58	53	46	41	38	37	36	
L Q	32	33	32	32	28	27	35	47	51	54	56	56	61	57	55	55	54	49	38	34	34	32	32	34	

HOURLY VALUES OF fEs AT Kokubunji

OCT. 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	C	C	C	C	C	C	C	C	C	C	40		31	G	35	39	38	39	29	45	G	G	G	129
2	G	28	G	G	G	G	31	38	42	39	53	47	53	28	38	32	39	28	23	29	32	38	30	29
3	G	G	G	G	28	28	27	51	38	38	41	50	47	52	53	47	43	29	61	46	45	28	34	31
4	G	27	28	23	G	G	41	39	40	36	39	38	45	40	36	42	44	41	22	50	39	32	G	26
5	29	G	G	G	38	G	34	40	33	29	39	G	45	46	29	44	33	35	42	40	29	G	G	G
6	G	G	G	G	G	G	33	35	42	37	38	36	45	38	30	41	34	11	G	G	28	G	G	G
7	G	G	G	G	G	G	G	105	70	79	70	53	51	40	38		35	34	31	34	29	G	33	G
8	G	G	G	G	G	G	31		37	42	49	38	46	42	37	23	G	32	32	33	29	35	G	G
9	G	G	G	G	G	G	G	29	31	34	40	44	28	26	27	31	34	26	24	24	G	G	G	32
10	40	26	G	30	G	G	11	47	31	31	38	40	37	30	29	25	31	35	30	29	G	G	G	G
11	G	G	G	23	G	28	G	35	45	54	48	49	45	40	38	83	86	107	38	142	72	33	35	43
12	27	G	39	29	G	24	35	G	G	68	53	62	61	68	G	44	32	G	G	32	55	53	57	53
13	G	29	G	G	G	26	29	34	61	52	52	42	G	G	G	G	G	G	G	G	G	G	39	28
14	27	G	G	26	G	G	27	33	37	G	40	39	G	39	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G	G	G	G	G	G	G	38	G	G	G	G	G	29	G	G	28	G	G
16	G	G	G	G	G	G	32	34	39	G	G	G	G	G	G	G	35	33	G	33	34	30	G	31
17	34	25	26	G	24	G	G	32	36	46	38	G	39	G	G	G	37	33	42	39	31	31	30	34
18	27	54	29	G	53	49	32	40	44	48	43	52	56	47	G	G	35	46	50	60	35	G	29	40
19	G	26	26	G	G	G	G	29	40	G	46	41	40	40	57	53	41	32	60	38	71	26	G	G
20	G	29	26	G	G	G	34	43	34	G	G	57	G	G	42	37	31	G	34	29	G	84	38	53
21	90	60	45	28	G	G	G	34	G	40	54	56	40	G	39	47	66	41	70	38	G	29	38	G
22	28	38	G	G	G	G	33	35	83	40	44	39	G	53	G	G	34	33	31	40	47	37	32	25
23	37	G	G	G	G	G	24	31	40	41	42	39	G	41	G	50	70	67	53	59	G	88	70	31
24	40	25	37	27	42	38	24	33	37	41	G	38	52	G	G	G	42	29	37	40	G	54	G	G
25	G	G	G	29	32	30	53	53	40	57	146	44	43	82	85	54	63	167	132	60	61	41	29	26
26	G	G	G	G	31	G	31	29	37	55	58	51	41	G	39	G	44	39	29	78	34	39	33	60
27	33	29	22	29	23	G	29	G	42	47	46	49	60	44	49	38	32	38	29	37	30	28	G	30
28	58	49	39	49	G	28	G	31	35	45	51	G	93	G	G	G	G	31	28	24	31	41	111	55
29	43	42	42	G	27	31	33	28	G	40	43	53	50	53	38	52	43	52	30	26	33	28	33	31
30	29	G	G	G	21	G	11	G	G	G	G	G	52	G	G	G	50	29	G	26	45	27	26	31
31	28	G	G	G	G	26	22	G	34	G	G	G	39	G	G	G	33	28	26	G	G	G	G	G
	00	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	28	29	30	30	30	29	30	30	31	30	29	31	31	30	31	31	31	31	31	31	30	31
MED	14	G	G	G	G	G	28	34	37	40	42	40	45	38	29	32	35	33	30	34	30	28	29	29
U Q	33	29	27	26	24	26	33	39	42	47	51	50	51	44	38	44	43	39	42	45	39	38	34	34
L Q	G	G	G	G	G	G	G	29	33	29	38	36	37	G	G	G	32	28	23	26	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

OCT. 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	C	C	C	C	C	C	C	C	C	C	22		23	38	21	17	14	13	13	14	17	15	18	14
2	14	14	14	14	13	14	13	13	17	17	21	22	21	20	20	15	14	14	14	15	14	14	13	13
3	17	13	15	21	13	14	13	13	14	15	20	20	22	21	21	15	13	14	13	14	14	13	18	14
4	14	14	14	13	14	14	14	15	14	13	17	21	22	18	21	15	13	13	14	13	14	13	15	14
5	14	14	14	13	13	14	18	14	17	20	21	43	22	29	17	15	14	13	14	14	13	14	17	15
6	14	14	14	14	14	14	13	13	15	20	17	20	31	13	22	17	14	18	14	14	14	14	17	15
7	14	14	14	15	15	14	18	13	14	21	15	21	17	15	15		13	13	13	14	13	14	14	17
8	14	20	14	15	14	14	14		15	17	22	21	22	20	15	18	22	14	14	14	14	15	14	18
9	18	14	14	14	14	14	18	14	14	17	17	18	20	18	17	14	17	17	14	14	14	17	13	14
10	15	14	17	13	15	20	18	15	18	17	23	20	38	22	33	18	13	14	13	14	14	24	14	22
11	20	14	15	14	14	13	20	21	23	20	29	23	23	17	22	18	13	13	13	13	14	14	13	13
12	14	14	14	14	13	13	14	13	20	22	22	26	23	23	17	21	13	15	14	14	14	14	14	14
13	14	17		15	13	15	14	14	17	17	23	17	17	22	22	15	21	20	17	14	21	14	14	14
14	14	21		20	14	13	13	14	17	18	18	18	22	17	15	14	18	14	17	14	15	17	14	14
15	13	14	14	13	13	14	20	22	18	36	22	17	14	22	22	29	14	15	17	17	15	14		14
16	14	14	14	20	14	17	20	13	29	21	43	14	17	21	20	15	17	14	17	14	14	14	18	14
17	14	14	14	17	14	14	15	15	14	18	20	21	22	21	20	15	13	14	13	14	14	13	14	14
18	14	13	13		14	14	15	14	14	14	17	25	22	22	14	17	14	13	14	14	17	14	14	14
19	15	14	14	14	14	14	14	13	13	17	18	18	21	20	14	13	14	13	14	17	14	14	21	14
20	14	13	15	15	15	13	17	20	14	20	18	18		20	18	17	13	18	14	13	14	14	14	13
21	14	14	14	14	14	14	17	14	14	15	21	21	20	21	17	14	15	13	14	14	14	14	13	14
22	13	14	13	13	14	14	14	14	15	15	15	18		31	21	14	21	14	13	14	14	14	21	13
23	13	14	14	15	24	14	14	14	22	18	15	18	14	20	14	14	14	14	13	14	17	14	14	14
24	15	14	13	13	14	14	14	20	15	14	21	18	17	22	20	14	14	14	13	13	14	14	13	14
25	14	15	14	13	13	14	13	14	13	14	13	14	21	17	20	14	14	13	14	13	13	18	14	14
26	14	14	14	14	13	14	14	14	13	13	20	17	20	18	17	13	14	13	14	13	14	13	13	13
27	13	13	13	13	13	14	14	14	15	14	15	22	20	17	17	14	14	13	13	14	14	15	14	14
28	13	14	13	13	13	14	18	13	15	15	18	33	21	18	17	15	13	15	14	17	14	13	15	14
29	13	14	14	13	14	14	13	13	14	17	23	21	21	20	17	13	13	13	14	14	13	13	14	14
30	13	14	13	13	13	14	14	14	13	17	15	18	20	33	14	22	13	14	18	14	13	14	14	14
31	13	14	13	20	18	14	14	13	13	14	18	21	20	17	14	14	13	14	14	14	14	14	14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	28	29	30	30	30	29	30	30	31	30	29	31	31	30	31	31	31	31	31	31	30	31
MED	14	14	14	14	14	14	14	14	15	17	20	20	21	20	17	15	14	14	14	14	14	14	14	14
U Q	14	14	14	15	14	14	18	14	17	20	22	21	22	22	21	17	14	14	14	14	14	14	15	14
L Q	13	14	13	13	13	14	14	13	14	15	17	18	20	18	15	14	13	13	13	14	14	14	14	14

HOURLY VALUES OF foF2 AT Yamagawa

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

HOURLY VALUES OF fEs AT Yamagawa

OCT. 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	G	G		
2	G	G	G	G	G	G	G	32	40	46	42	30	41	32	32	40	42	50	36	11	11					
3	B	G	G	G	G	G	G							G									G			
4	28	G	G	G	G																					
5	G	G	G		B	B	G	40	27	39	45	53	78	57	57	68	72	50	46	44	40	50	59	25	40	27
6	G			11				32	38	44	48	52	50	36	56	42	122	24	25	G		40	38	34	28	
7	G	40	49	40	27	G	G	40	38	84	44	42	30	45	44	41	37	32	31	34	26	32	28	23		
8	G	G	G	G	G	G	G	31	49	44	45	46	45	44	33	41	46	36	34	29	28	31	28	29		
9	37	30	G	G	G	G	G	29	36	38	40	33	33	43	40	33	32	29	30	33	44	49	24	34		
10	34		26	G	28	28	G	27	30	40	56	50	51	42	39	44	41	31	G	G	G		B	B		
11	B	34	G	G	24	32	32	47	44	56	56	53	46	45	40	39	41	36	28	58	34	38	33	G		
12	G	G	B	G	20	B	G	28	33	87	89	57	90	47	104	28	G	28	G	31	G	G	G	29		
13	G	34	38	49	33	27	33	43	48	38	60	51	56	43	43	42	37	35	34	88	54	53	45	29		
14	32	28	32	28	B	B	G	29	38	37	41	48	39	48	G	G	G	G	G	G		G	G	G		
15	G	B		G	G	G	G	32	40	50	44	45	48	48	43	38	36	34	32	28	27			30		
16	G	G	25	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	B	G	G	G		
17	G	G	26	G	G	G	G	38					47						29							
18	G	G	G	G	G	G	G	33	42	42	41	G	39	46	G	G	G	G			G	G	G	B		
19	27	G	G	G	G	G	G	34	40	42	G	40	47	53	44	G	G		34	28	32	G	G	58		
20	39	33	G	G	B	G	G	37	38	40	37	47	48	40	41	36	42	27	32	32	32	G	B	G		
21	G	G	G	G	G	B	G	36	36	47	38	G	48	G	G	G		34	40	29	28	26	G	B		
22	B	G	G	G	G	B	G	26	32					41	44	44	42	40	44	38	39	33	G	G		
23	G	G	G				G	27	49	46	44	46	47	45	G		40	39	45	25	35	31	G	45		
24	53	34	41		27	G	G	48	42	38	41	51	60	G			41	52	57	72	43	11	55	27	34	
25	29	G	G	G	G	G	G	28	39	42	40	40	46		G		42	39	60	56	39	39	84	32	45	
26	G	G	34	G	11	G	G	35	G	G	G	G		46	47	51	48	42	38	52	52	30	G	G	G	
27	G	G	G	G	G	B		32	40	46	59	51	59	48	58	148	115	55	77	111	91	50	86	87		
28	G	39	G	G	G	24	B	41	G	40	48	49	54	41	G		77	51	41	43	49	56	49	59	46	
29	49	33	43	32	25	G	G	44	42	45	53	44	50	52	54	G		G							G	
30	25	G	32	32	53	39	G	43	G	58	42	42	51	88	50	57	59	31	G	35	43	32	29	29		
31	27	40	44	54	32	27	B	43	G	40	50	58	55	75	54	37	34	44	29	40	28	27	G	29		
00	49	48	27	G	G	B	B	48	32	G	38	49	49	G		42	38	34	27	29	G		G	G		
01	G																									
02	G	28	29	26	27	G	G	48	32	G	39	41	49	49	40	39	33	33	25	27	69	39	28	34		
03	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	28	30	30	31	28	25	27	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	29	27	
MED	G	G	G	G	G	G	G	35	38	42	44	46	48	45	42	39	39	36	31	34	30	30	27	28		
U Q	30	33	32	26	27	27	G	43	42	50	56	51	54	48	50	42	46	44	39	41	43	38	33	34		
L Q	G	G	G	G	G	G	G	31	32	38	39	40	46	36	32	33	34	29	26	28	25	G	G	G		

HOURLY VALUES OF fmin AT Yamagawa

OCT. 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	14	17	16	15	14	66	15	15	16	21	20	18	22	21	20	20	16	17	14	15	17	15	15	15
2	15	17	17	15	16	17	14	16	18	18	18	18	22	36	18	18	18	15	14	14	15	15	15	15
3	B	14	15	14	14	18	16	15	18	21	17	32	22	15	20	20	14	16	14	14	14	15	15	18
4	15	15	17	15	15	17	15	15	14	15	17	18	20	18	21	20	15	15	14	15	15	14	14	15
5	14	14	14	15	B	B	15	16	15	18	21	22	23	18	21	15	15	15	14	16	15	15	14	16
6	15	15	15	15	14	21	15	14	15	15	18	17	22	20	18	20	17	15	14	14	15	14	16	15
7	17	14	15	20	15	15	15	17	15	14	17	17	32	18	21	20	15	15	14	14	15	15	14	15
8	14	14	17	16	16	15	15	15	15	20	21	20	22	20	20	17	15	15	14	14	15	14	15	14
9	14	15	16	15	14	14	15	15	15	14	17	21	20	18	17	15	16	17	15	28	15	15	B	B
10	B	15	14	15	15	15	14	14	14	15	17	15	27	26	21	20	15	15	14	15	14	15	14	15
11	14	17	B	14	14	B	18	15	15	16	17	22	21	18	17	30	15	15	15	15	14	16	15	15
12	81	14	14	14	15	15	14	16	15	17	20	20	26	26	24	20	18	16	15	15	14	15	16	15
13	16	15	15	16	B	B	15	14	17	20	20	20	21	17	15	16	18	21	15	16	15	18	15	18
14	16	B	15	15	15	16	14	17	15	18	16	17	18	18	17	15	15	15	15	15	15	17	15	14
15	15	14	15	17	15	15	15	18	16	14	20	20	36	17	36	17	16	18	15	15	B	15	15	21
16	18	18	15	15	15	17	14	15	14	18	20	21	40	16	21	20	15	20	17	15	15	17	21	B
17	15	14	16	17	17	20	15	15	14	17	17	18	20	21	23	20	27	16	14	14	15	21	14	15
18	16	15	17	17	B	17	14	15	15	17	21	22	21	18	20	20	16	18	16	14	14	71	B	15
19	15	18	22	14	17	B	18	16	15	15	20	18	18	18	17	16	15	15	17	15	15	B	20	B
20	B	15	16	15	17	B	17	17	15	15	18	16	16	22	20	20	22	15	14	15	17	15	17	17
21	14	15	15	15	14	16	15	15	15	15	20	20	22	22	22	20	15	14	15	14	14	15	15	15
22	15	15	15	15	15	15	14	18	15	16	17	17	20	20	38	20	16	15	14	15	14	15	15	14
23	15	15	16	20	15	15	14	14	14	15	23	20	18	18	22	18	15	15	15	14	15	15	14	B
24	26	17	15	15	15	14	17	17	14	14	18	17	18	18	18	18	16	14	15	15	14	20	17	16
25	15	15	17	15	26	15	B	15	14	15	20	18	17	17	18	15	15	15	15	14	15	14	14	15
26	15	14	18	15	17	15	B	17	15	15	17	16	20	20	20	18	16	14	15	15	15	14	15	14
27	14	14	15	15	14	16	16	16	15	15	17	18	22	21	18	16	17	17	14	14	16	15	15	16
28	17	14	15	14	15	15	18	17	14	15	18	21	18	20	15	18	15	16	18	15	18	15	15	16
29	17	15	14	15	14	15	B	20	17	14	17	18	18	21	20	16	14	15	17	14	15	15	15	15
30	14	14	15	14	15	B	B	14	15	16	18	17	17	17	15	17	15	16	15	16	15	15	15	15
31	15	14	15	15	15	15	66	18	15	16	18	22	21	18	20	20	14	14	14	15	14	15	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	30	31	28	25	27	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	29	27
MED	15	15	15	15	15	15	15	15	15	15	18	18	21	18	20	18	15	15	15	15	15	15	15	15
U Q	16	15	16	15	15	17	16	17	15	18	20	21	22	21	21	20	16	16	15	15	15	15	15	16
L Q	14	14	15	15	14	15	14	15	14	15	17	17	18	18	18	16	15	15	14	14	14	15	14	15

HOURLY VALUES OF fof2 AT Okinawa

OCT. 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	42	42	42	40	29		N	50	58	64	62	63	72	82	74	59	57	74	67	44	32	31	32	31
2	31	31	31	32	B	B	N	54	54	58	66	A	61	84	91	66	60	42	69	54	34	30	A	59
3	30	29	A	32	N	B	26	50	36	55	55	A	A	A	69	68	75	82	55	A	A	A	28	A
4	49	A	A	31	N	B	A	48	54	69	67	66	77	A	68	65	A	74	81	50	A	A	A	A
5	31	A	39	N	B	N	N	47	55	51	50	57	76	57	60	58	60	60	72	60	A	44	40	40
6	40	37	33	B	N	26	N	46	53	46	A	A	66	57	66	65	50	60	56	A	44	42	42	40
7	34	34	34	34	28		B	48	61	51	63	63	60	62	62	67	52	60	67	53	44	28	A	34
8	59	30	29	32	28	29	26	54	53	55	61	83	81	84	75	67	64	75	65	54	42	A	A	A
9	34	31	34	34	49	N	N	51	54	68	75	68	75	76	60	63	60	71	58	43	36	29	30	A
10	32	28	28	28	28	30		46	49	A	82	94	90	81	82	65	64	63	54	A	25	A	34	34
11	34	34	34	39	N	B	B	51	60	62	75	84	87	100	91	78	78	63	51	54	38	A	32	34
12	34	32	A	A	A	A	A	49	54	65	71	74	68	75	85	76	75	74	60	60	A	A	A	A
13	31	32	34	N		N		47	54	66	84	91	87	69	69	70	71	56	54	54	40	29	31	31
14		31	30	29		26	B	40	51	66	90	107	100	78	98	103	92	92	60	A	32	A	32	49
15	30	31	30	23	31	29	A	46	52	64	76	91	75	66	66	68	65	57	63	44	36	32	34	32
16	32	31	29	29	32	N	N	47	54	57	79	96	84	84	93	90	91	91	72	40	40	32	40	43
17	42	41	47	48	51	N	49	49	54	56	67	91	94	81	78	87	91	79	53	37	A	A	29	30
18	31	31	29	31	26	B	B	50	51	57	73	98	107	81	86	78	71	70	55	41	34	29	26	26
19	29	30	32	32	28	B	B	42	56	51	58	76	87	87	98	86	76	66	56		A	N	26	28
20	28	26	28	31	25			44	47	63	65	76	67	64	67	68	77	70	63	A	A	A	26	26
21	28	30	30	A	26	B	B	46	59	56	65	81	86	84	97	90	84	79	A	A	A	A	32	32
22	34	A	34	A	A	A	A	46	58	56	57	75	80	75	90	101	90	54	52	54	38	37	A	A
23	32	34	A	28	28	29	26	44	54	58	72	90	100	111	121	121	86	53	A	23	A	A	31	30
24	34	29	30	34	34	A	B	42	55	55	62	90	84	93	101	91	91	96	47	32	A	A	28	28
25	31	30	28	28	26			46	54	55	54	61	77	82	80	78	85	65	52	A	A	A	A	A
26	A	A	29	29	28	N	N	41	73	51	56	78	84	48	63	77	72	61	51	A	A	A	A	A
27	A	A	A	28	29	N	A	40	52	56	67	A	A	A	78	86	80	64	66	26	A	32	31	30
28	31	30	31	31	28	26	B	64	52	64	60	90	85	90	96	100	72	67	79	A	A	A	26	A
29	A	30	59	A	A	A	A	44	73	51	55	79	71	66	81	82	83	76	60	54	49	32	32	28
30	30	29	31	29	25	N		43	50	51	55	66	95	91	98	101	76	60	60	50	40	36	37	34
31	29	28	A	A	A		B	43	53	52	54	62	68	55	72	81	67	60	51	54	32	28	32	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	26	25	23	19	8	4	31	31	30	30	27	29	28	31	31	30	31	29	21	17	15	23	22
MED	32	31	31	31	28	28	26	46	54	56	65	79	81	81	80	78	75	66	60	50	38	32	32	32
U Q	34	32	34	34	31	29	37	50	56	64	73	91	87	84	93	90	84	75	66	54	41	36	34	34
L Q	30	30	29	29	26	26	26	44	52	52	57	66	71	66	68	67	64	60	53	40	33	29	28	28

HOURLY VALUES OF fEs AT Okinawa

OCT. 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	G	G	G	36	11		39	54	43	51	40	47	46	47	90	37	40	37	30	40	G	G	G	G	
2	G	G	G	G	B	B	G		33	40	48	138	60	52	37	37	34	39	44	31	26	31	26	57	26
3	25	G	26	G	G	B	G		34	43	50	50	92	66	71	46	57	50	60	54	74	55	46	28	32
4	24	38	34	28	28	B	24	36	46	41	48	57	84	72	55	56	61	58	54	39	56	72	29	46	
5	31	29	G	28	B	G	G	46	40	36	34	48	35	47	35	43	36	37	43	34	50	G	30	25	
6	G	G	34	B	G	G	G	32	44	69	110	78	52	44	50	53	42	54	43	72	35	26	26	G	
7	33	26	27	24	G	G	B	29	54	40	42	45	38	46	48	89	36	34	53	27	31	27	34	G	
8	G	G	G	G	G	G	28	33	38	45	44	44	41	38	40	33	35	30	28	79	69	60	59	33	
9	G	24	25	G	G	G	111	28	37	45	51	57	53	55	136	45	49	46	32	29	G	G	G	45	
10	33	G	G	G	G	G	G	29	49	68	68	70	59	75	91	49	60	94	57	92	24	60	28	29	
11	29	G	G	G	G	B	B	28	36	45	43	39	39	41	41	30	34	34	28	27	26	49	G	G	
12	G	29	47	41	31	32	34	36	48	46	54	58	91	58	74	43	53	56	58	70	69	60	49	47	
13	28	28	27	G	G	G	G	30	36	38	40	45	45	G	45	54	43	46	39	G	21	G	G	G	
14	G	G	G	G	G	B	29	37	46	49	40	46	46	46	49	53	54	60	34	38	G	36	30	26	
15	G	G	G	G	G	G	56	G	G	G	G	G	44	44	G	G	38	33	28	26	G	G	G	G	
16	G	G	G	G	G	G	172	46	36	41	G	44	G	46	47	74	76	G	29	29	G	G	G	G	
17	G	26	G	G	11	G	G	28	38	46	40	G	G	93	46	42	40	41	35	28	31	28	G	G	
18	24	G	G	G	G	B	B	48	34	43	44	48	48	41	45	48	44	46	49	30	27	G	24	G	
19	G	G	G	24	25	B	B	G	35	37	39	47	G	41	44	61	42	36	48		32	G	G	G	
20	G	G	G	G	33	G	G	31	36	38	41	56	44	58	57	52	45	44	50	43	56	26	G	G	
21	27	23	G	29	26	B	B	29	40	47	64	53	43	47	49	54	56	52	56	35	34	45	29	G	
22	G	56	58	108	45	57	31	27	39	40	39	43	39	54	52	43	38	34	28	34	27	26	57	26	
23	27	27	32	G	G	G	144	178	43	43	54	46	48	44	G	41	41	68	72	35	67	59	29	G	
24	34	G	G	G	35	39	B	26	39	41	60	46	43	52	51	42	G	28	48	32	60	34	G	G	
25	G	G	G	93	G	G	G	32	38	45	52	52	54	G	104	59	55	40	40	33	90	35	70	72	
26	73	70	G	34	G	G	G	G	42	43	48	53	50	43	46	45	44	41	38	39	34	57	34	38	
27	56	38	38	29	G	G	26	38	41	80	108	78	57	72	92	53	51	55	38	29	40	30	28	G	
28	G	G	G	G	G	G	B	41	36	40	83	44	47	46	50	47	48	46	58	93	55	34	G	30	
29	30	26	G	43	44	34	54	28	31	42	60	69	56	47	45	45	44	45	23	41	G	G	G	G	
30	G	G	25	G	G	G	G	45	G	G	38	G	G	G	40	42	34	32	28	59	35	32	G	G	
31	G	G	29	32	27	G	B	35	36	41	40	48	43	46	41	43	35	38	44	23	26	G	G	39	
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	31	31	30	28	23	22	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	
MED	G	G	G	G	G	G	12	32	38	43	48	48	46	46	47	45	43	44	40	34	32	28	26	G	
U Q	29	27	27	29	26	G	39	38	43	46	60	57	53	55	55	54	51	54	53	43	55	46	30	32	
L Q	G	G	G	G	G	G	G	28	36	40	40	44	39	41	41	42	38	34	30	29	24	G	G	G	

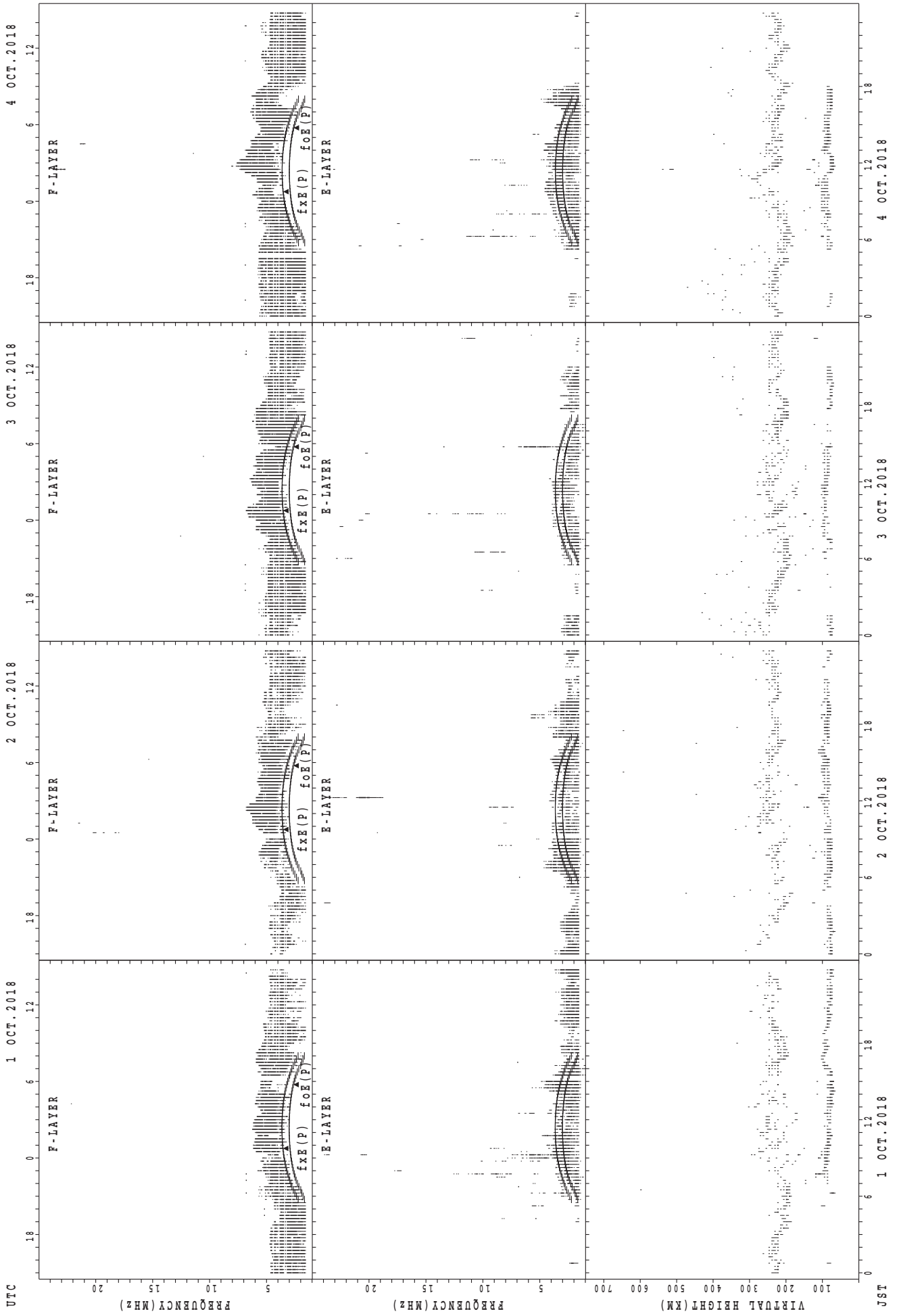
HOURLY VALUES OF fmin AT Okinawa

OCT. 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	18	14	14	14	14		15	14	14	15	20	21	20	21	20	18	14	14	14	14	14	16	14	14
2	15	14	14	14	B	B	14	14	14	15	14	16	20	20	17	15	14	14	14	14	14	14	14	15
3	14	20	15	15	14	B	14	15	14	14	17	18	22	21	15	14	16	14	14	14	15	14	14	14
4	15	14	14	15	14	B	16	15	15	28	18	18	26	24	18	20	14	14	15	15	15	14	14	14
5	15	14	15	14	B	15	15	14	14	14	20	20	26	21	22	17	14	14	14	14	14	15	14	15
6	17	14	14	B	15	15	15	15	14	14	14	15	14	15	14	15	14	14	14	14	15	15	14	15
7	14	14	15	14	14	14	B	14	14	14	15	32	21	15	18	17	14	14	14	15	14	14	14	14
8	14	14	14	15	14	14	14	14	14	14	17	20	17	15	17	17	14	14	14	14	14	14	14	15
9	15	14	14	15	20	14	14	14	14	14	14	16	17	16	15	14	14	14	14	14	14	14	14	14
10	15	15	14	14	15	26	15	14	14	14	14	17	18	16	20	20	15	14	14	14	14	14	14	14
11	14	14	14	14	14	B	B	14	14	14	14	17	15	15	14	15	14	14	14	14	14	15	14	14
12	14	14	14	14	14	14	14	14	14	14	15	18	22	18	20	18	16	16	14	15	14	14	15	15
13	14	14	15	14	106	14	16	14	14	15	17	16	18	17	14	14	14	14	14	14	14	14	15	14
14		14	14	14		14	B	15	14	14	14	15	14	14	15	14	14	14	14	14	14	14	14	14
15	14	14	15	18	14	14	49	17	14	15	14	14	14	14	14	16	14	14	15	14	14	14	14	14
16	14	14	14	14	14	14	15	17	14	15	18	17	18	18	18	17	14	14	14	14	14	14	14	14
17	15	14	14	15	14	14	14	14	14	15	15	17	16	15	16	18	14	14	14	14	14	15	14	14
18	14	17	14	14	14	B	B	15	14	14	16	18	23	17	16	15	14	14	14	14	14	15	15	14
19	14	14	14	14	14	B	B	14	14	14	15	16	17	16	15	14	14	14	14		14	14	14	14
20	14	15	16	15	14	17	66	15	14	14	14	14	14	14	14	14	14	14	15	15	14	15	14	15
21	14	14	15	14	14	B	B	14	14	14	15	14	15	16	16	15	14	14	14	14	14	14	14	14
22	14	14	14	14	14	14	14	15	14	14	15	15	17	16	14	14	14	15	14	14	14	14	14	14
23	14	14	14	14	14	14	14	14	14	14	15	17	17	15	17	14	14	14	14	14	15	14	14	14
24	14	14	14	14	16	14	B	14	14	14	14	15	15	14	14	14	14	14	15	14	14	14	14	14
25	14	15	14	14	14	15	16	14	14	14	14	16	15	15	14	14	14	14	14	14	14	14	14	14
26	14	14	15	14	15	14	15	15	14	14	14	17	14	15	14	14	14	14	14	14	14	14	14	14
27	14	14	14	14	14	14	14	15	14	15	15	17	16	18	17	15	14	14	14	15	14	15	14	15
28	15	14	15	15	15	14	B	14	14	14	14	17	15	18	17	16	15	15	15	15	14	14	14	15
29	14	14	15	14	14	14	14	14	14	15	14	14	14	14	18	14	14	14	14	14	15	14	15	14
30	15	14	14	14	15	15	17	17	14	14	14	15	14	17	15	15	14	14	14	14	14	14	14	14
31	14	14	14	14	14	18	B	15	14	14	16	16	18	18	14	14	14	14	14	16	14	14	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	30	28	23	22	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31
MED	14	14	14	14	14	14	15	14	14	14	15	17	17	16	16	15	14	14	14	14	14	14	14	14
U Q	15	14	15	15	15	15	16	15	14	15	16	18	20	18	18	17	14	14	14	14	14	15	14	15
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

SUMMARY PLOTS AT Wakkanai

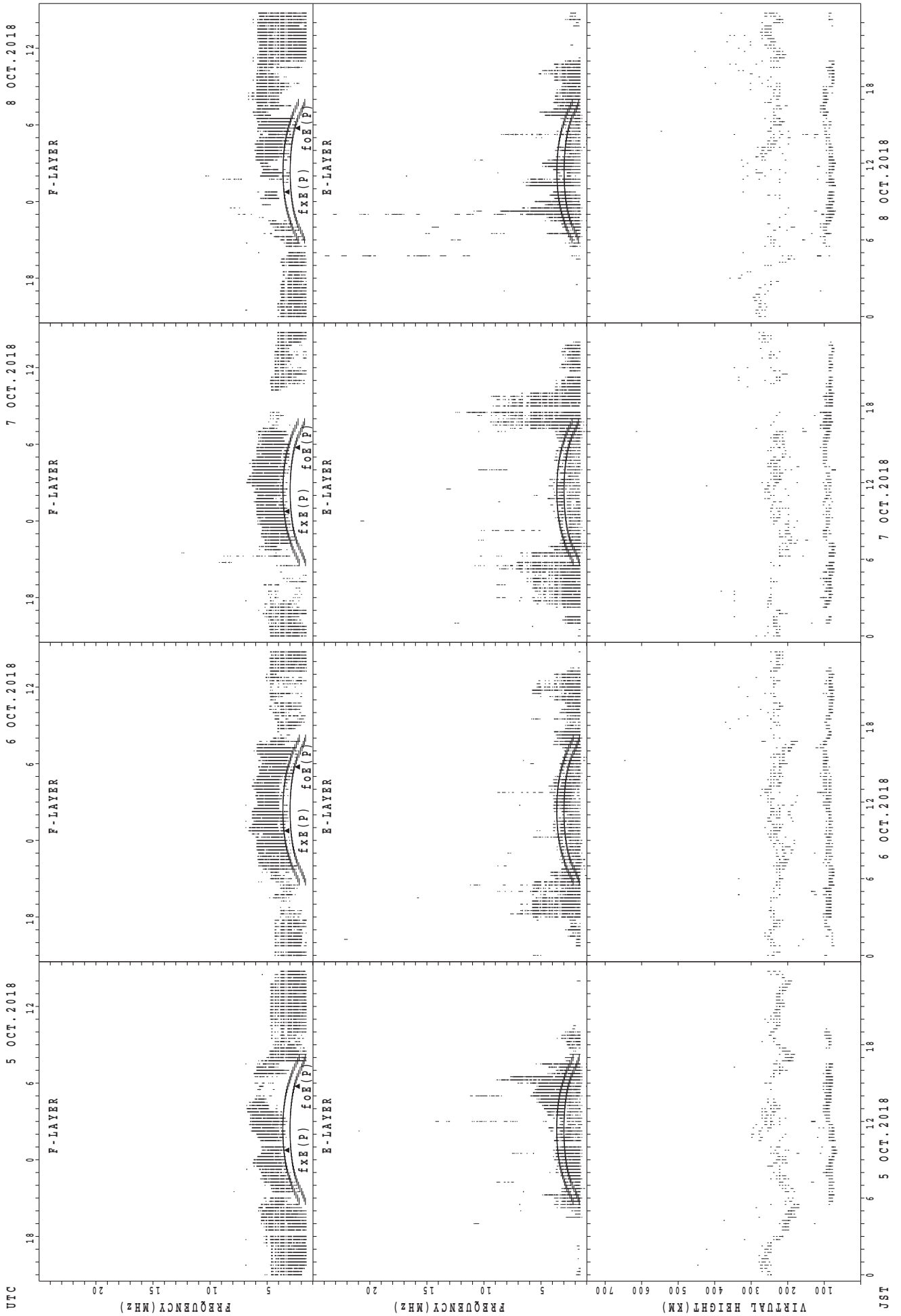


UTC
1 OCT. 2018
2 OCT. 2018
3 OCT. 2018
4 OCT. 2018

JST
1 OCT. 2018
2 OCT. 2018
3 OCT. 2018
4 OCT. 2018

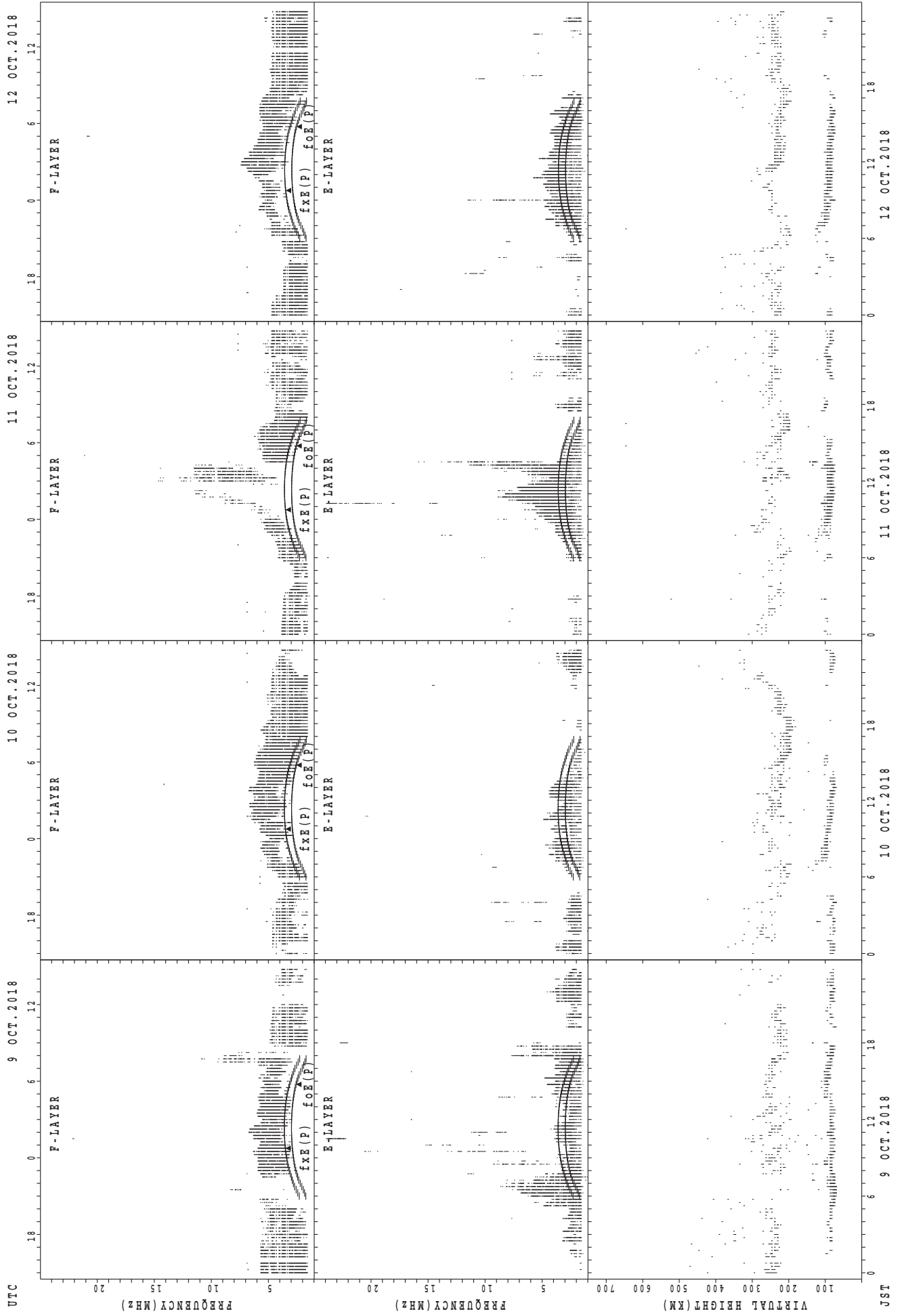
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



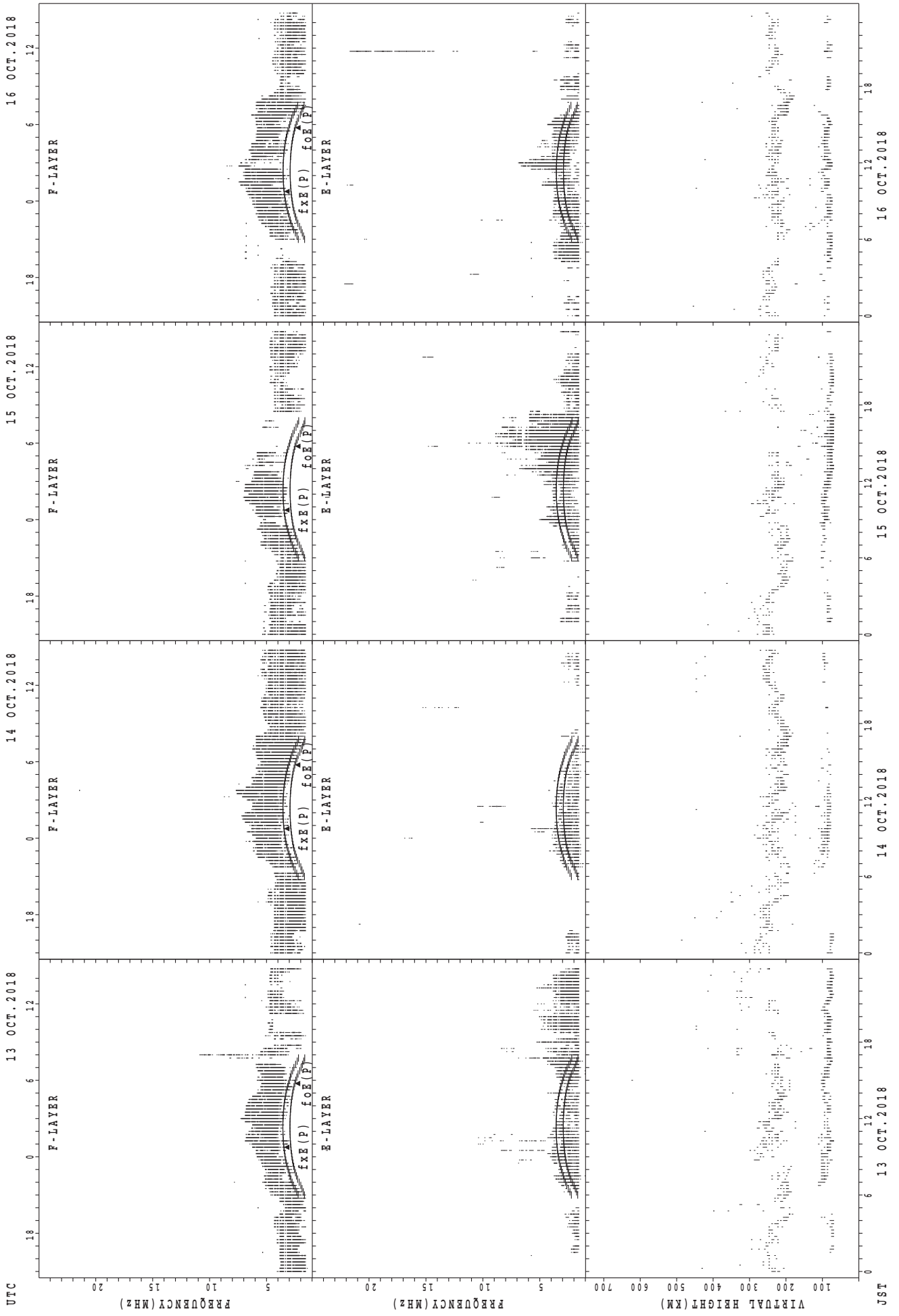
fxe(P); PREDICTED VALUE FOR fxe
foe(P); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Wakkanai



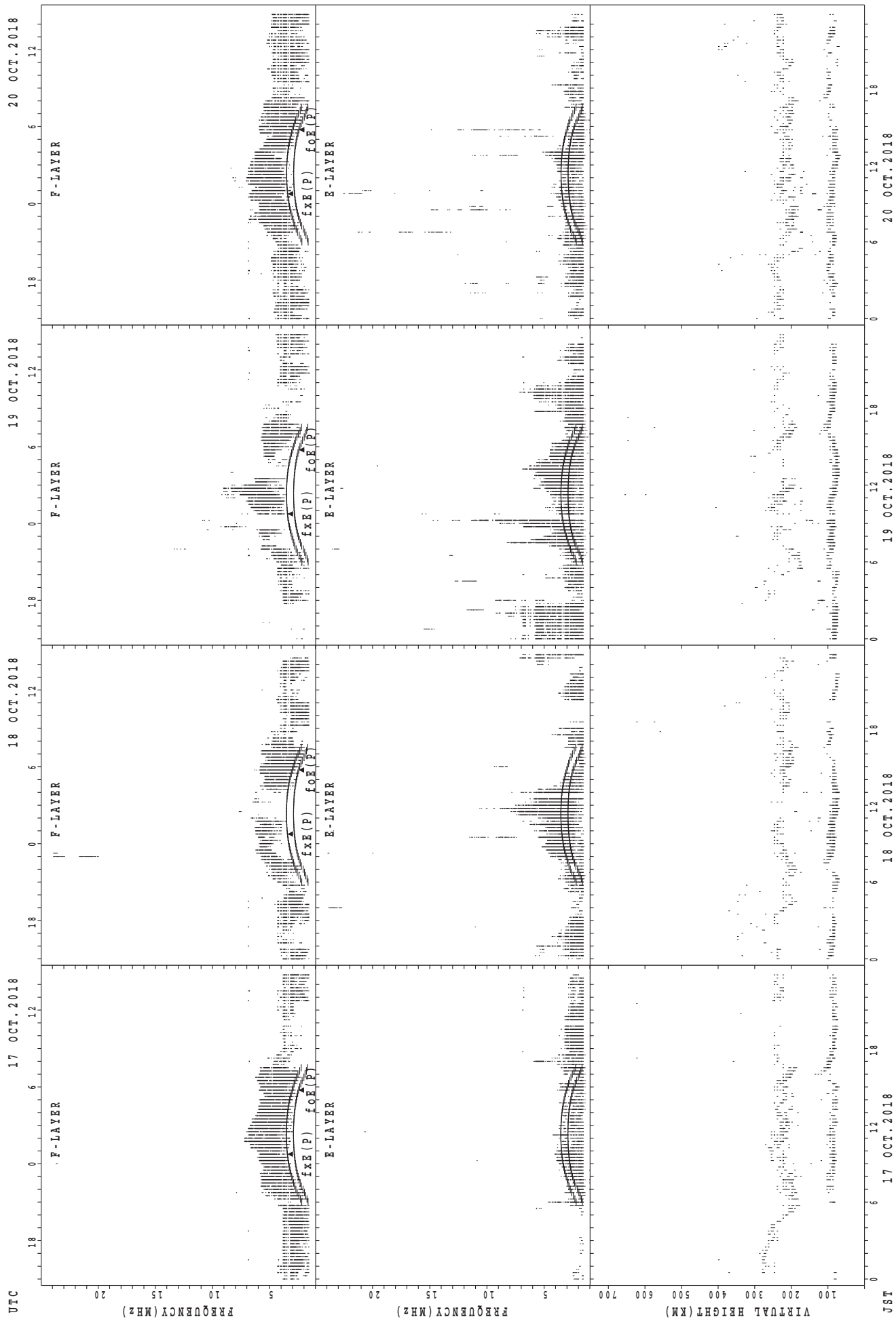
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



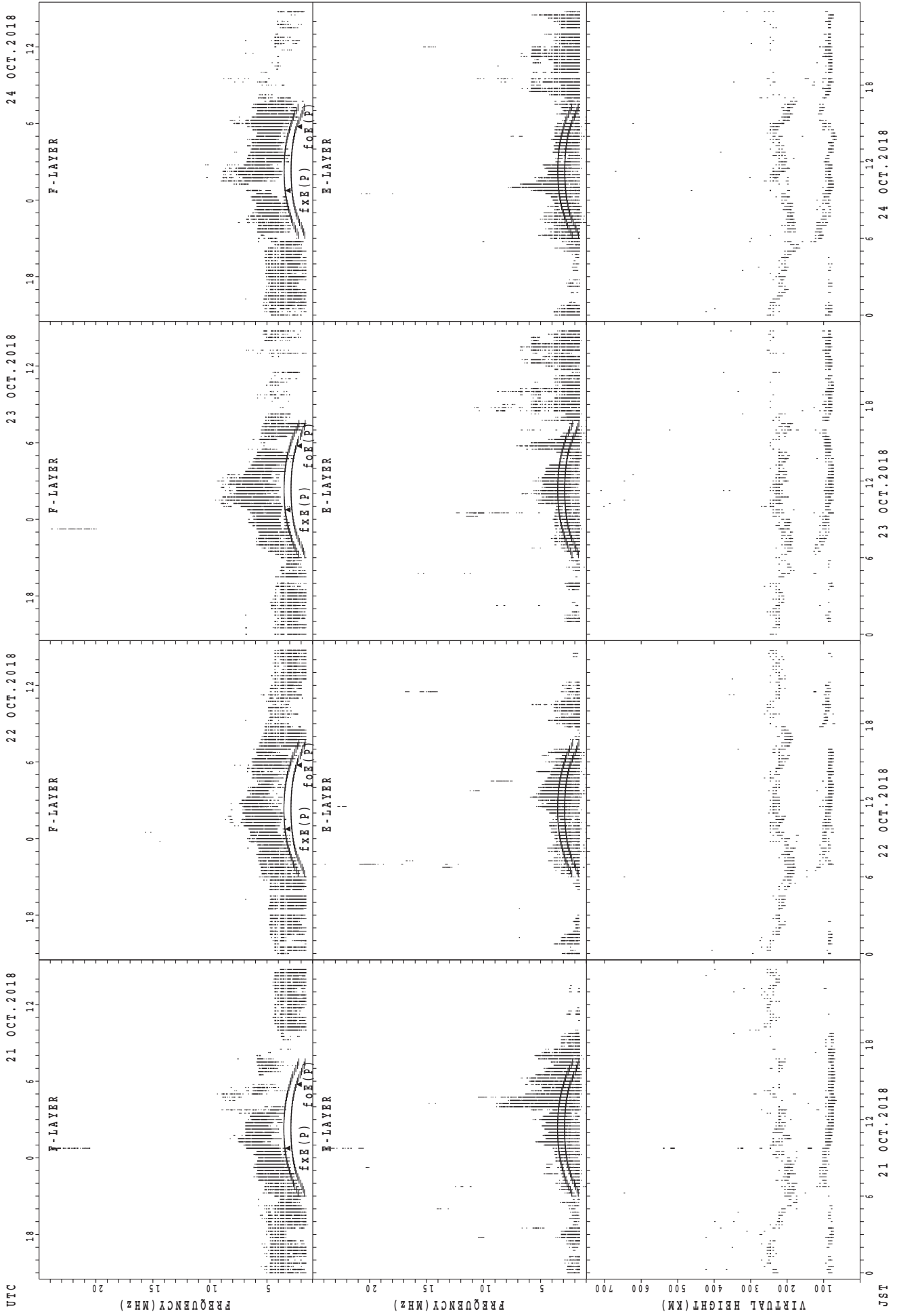
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



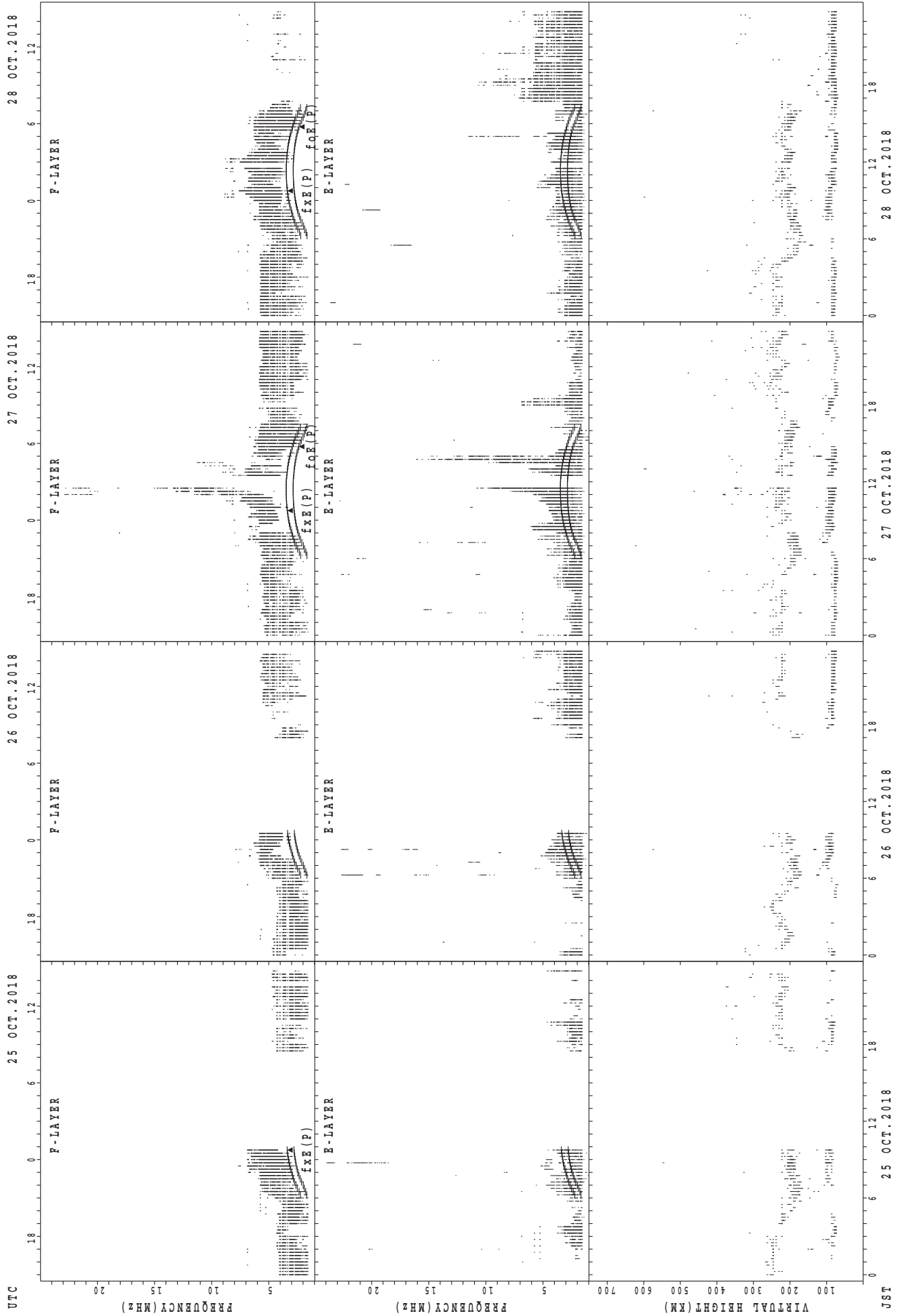
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



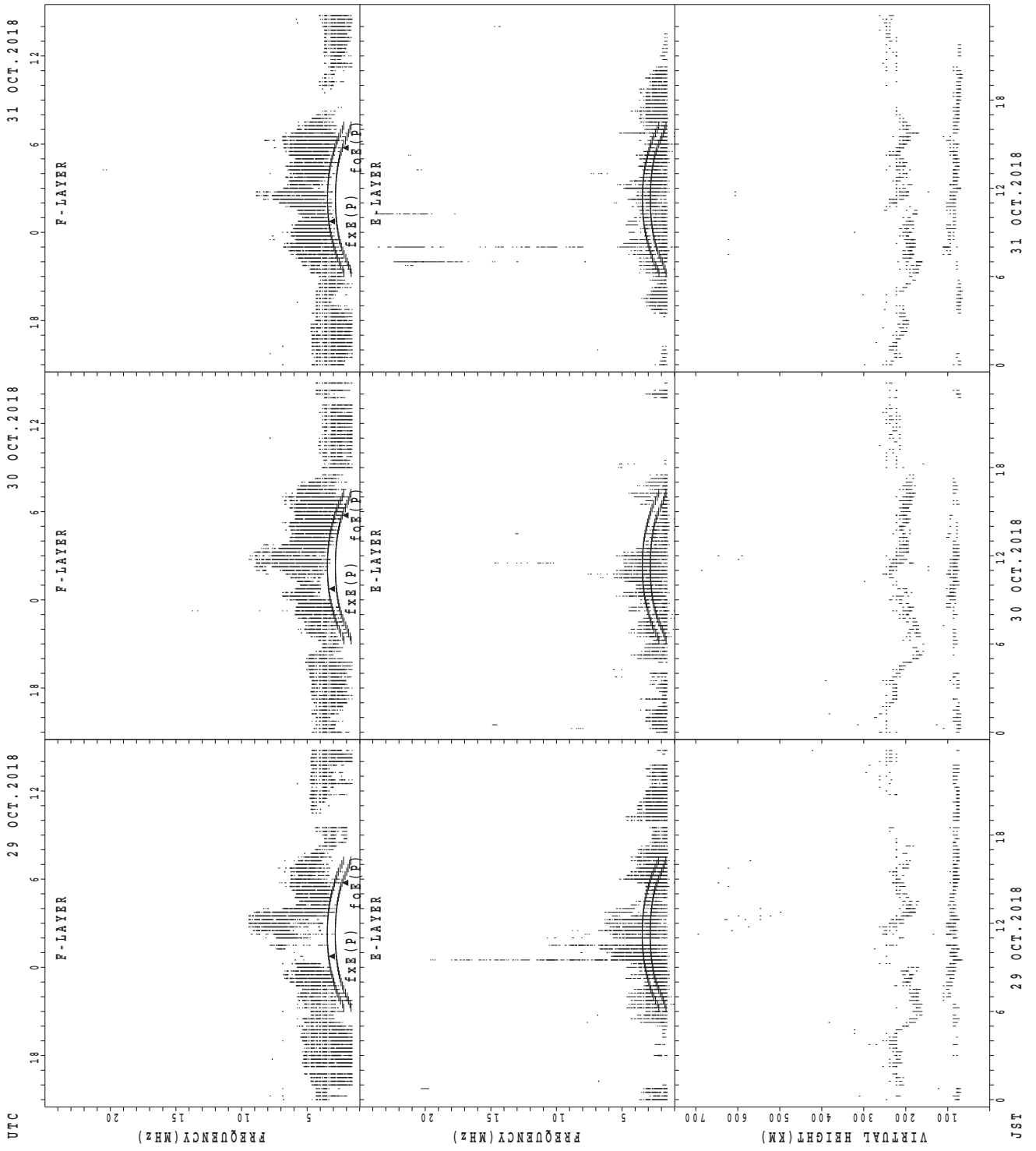
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



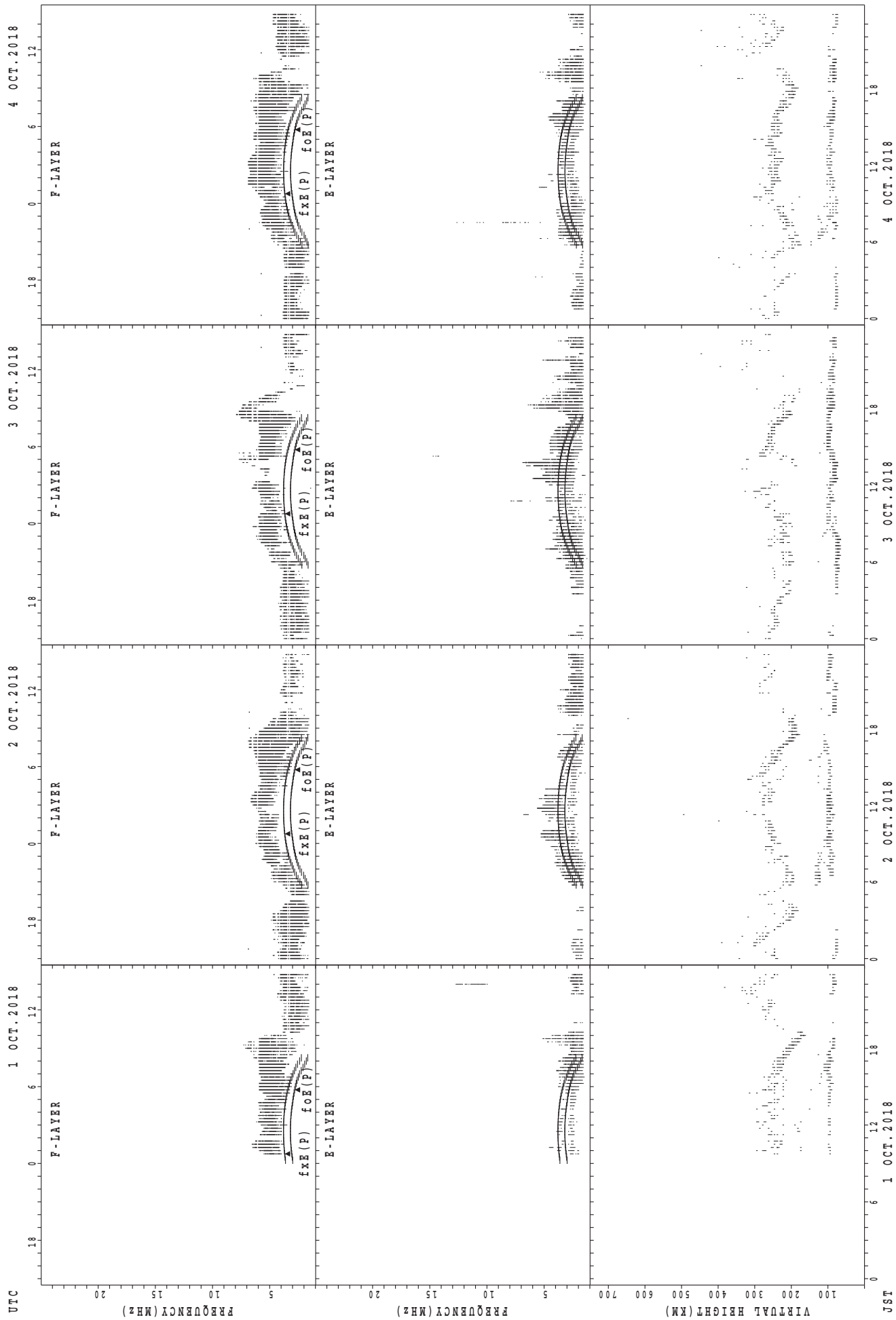
fx E(P); PREDICTED VALUE FOR Fx E
fo E(P); PREDICTED VALUE FOR FO E

SUMMARY PLOTS AT Wakkanai



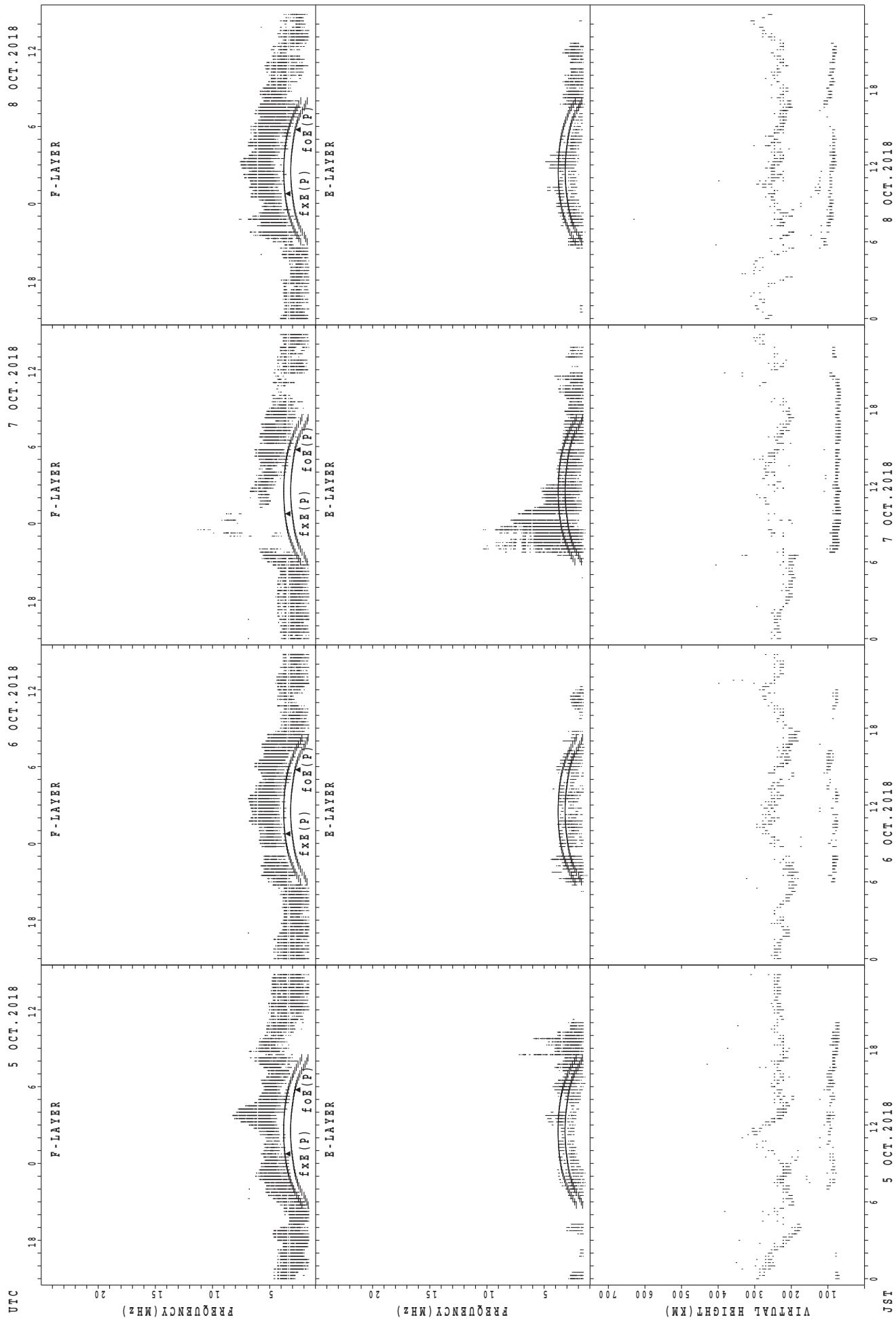
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



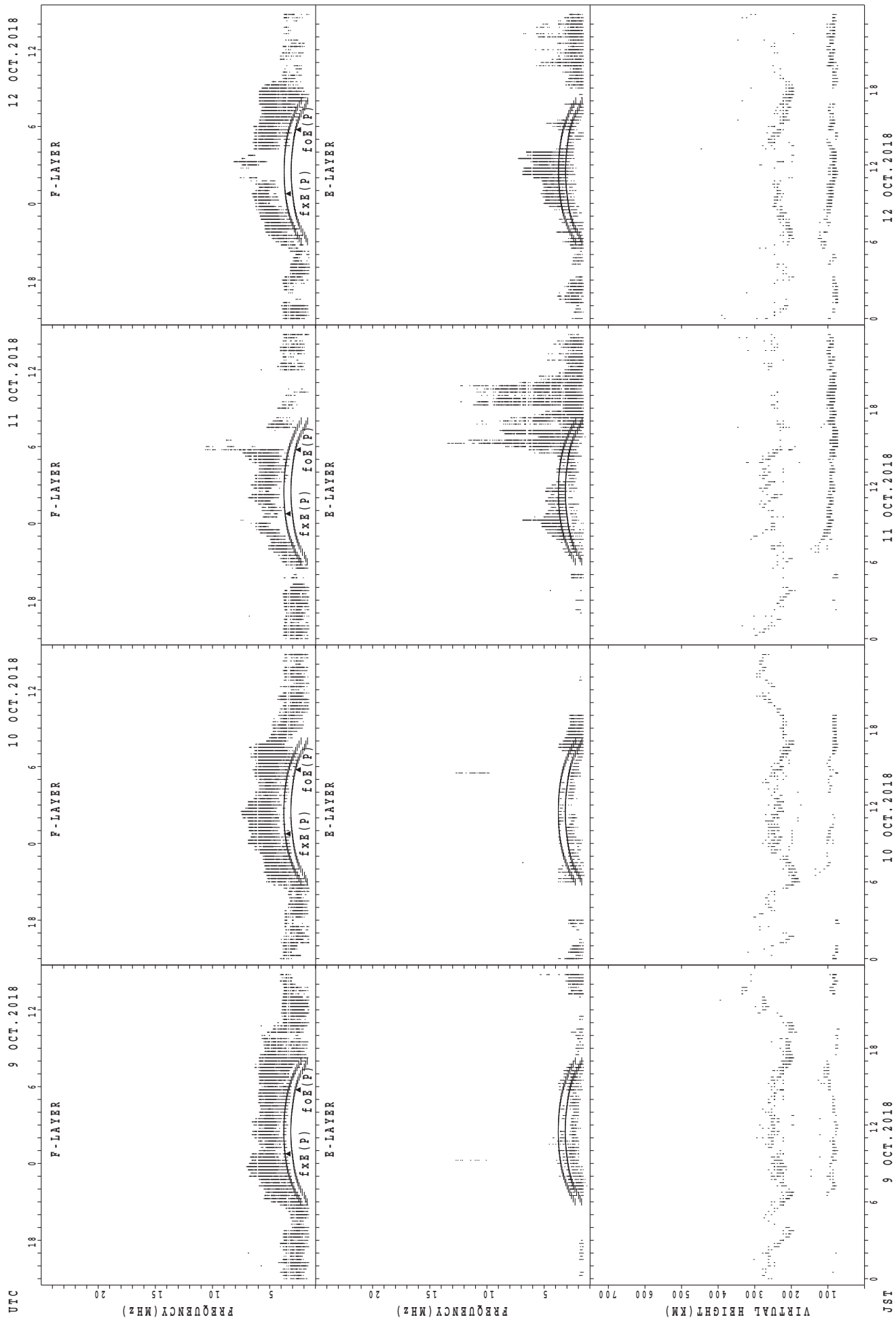
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



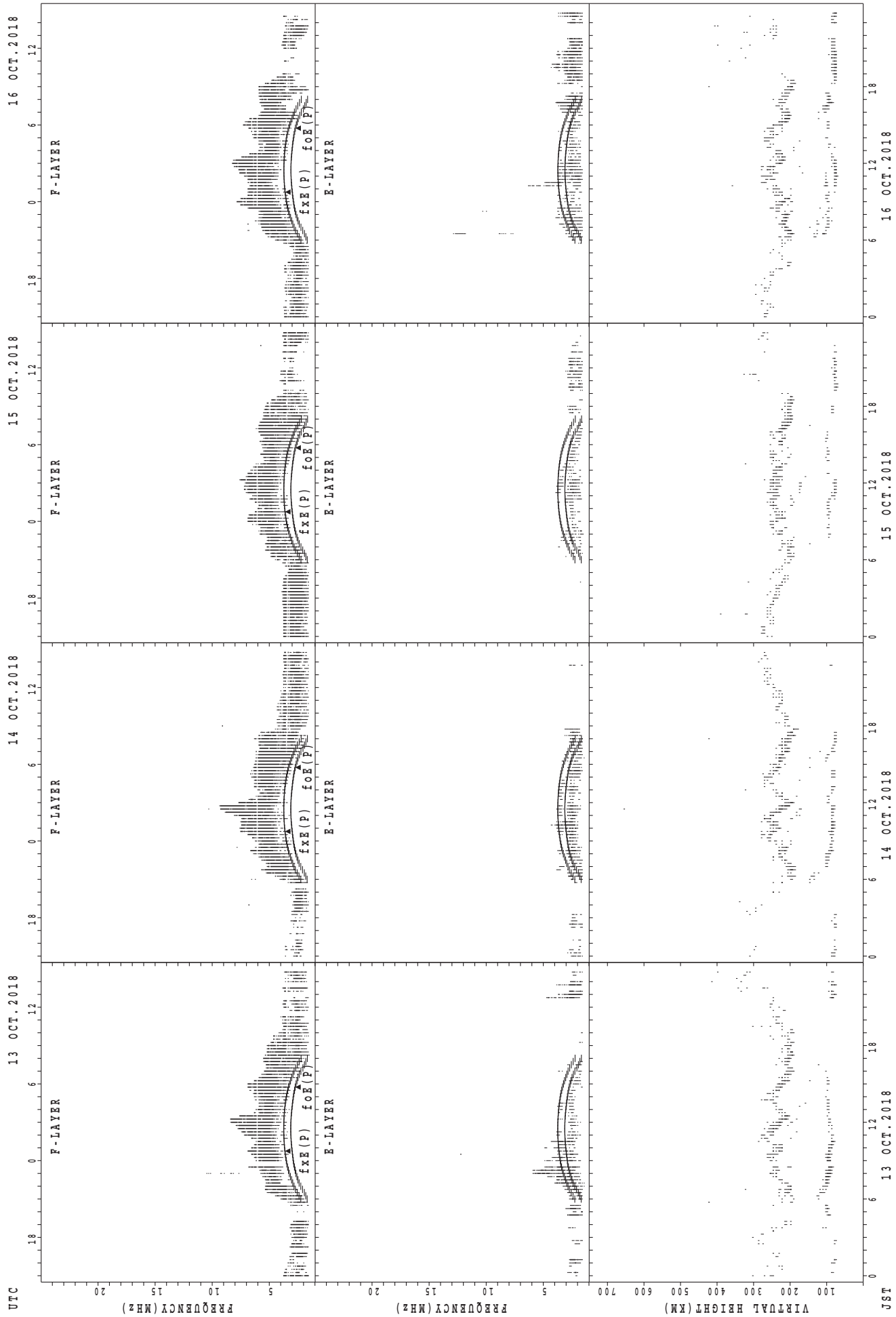
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



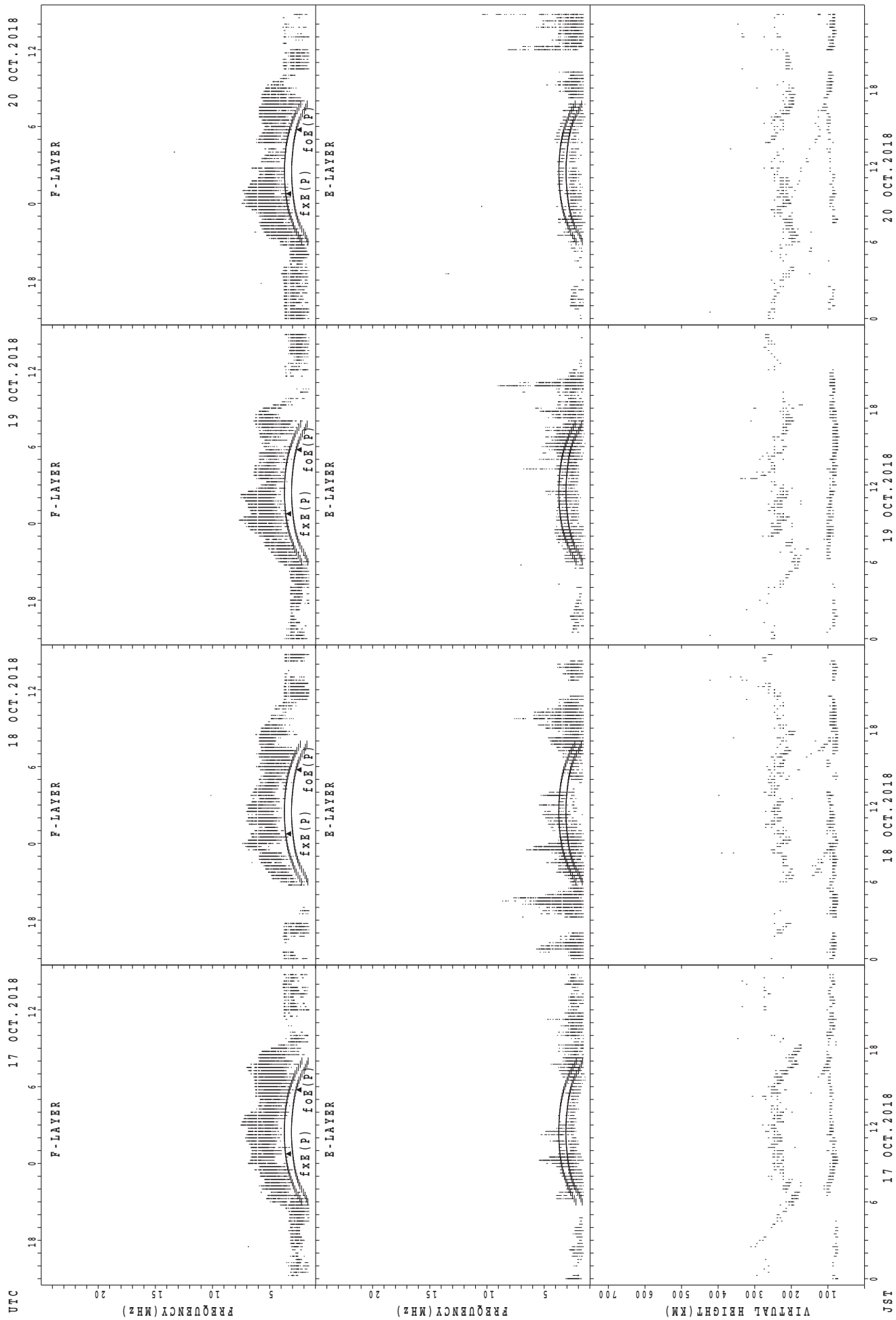
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



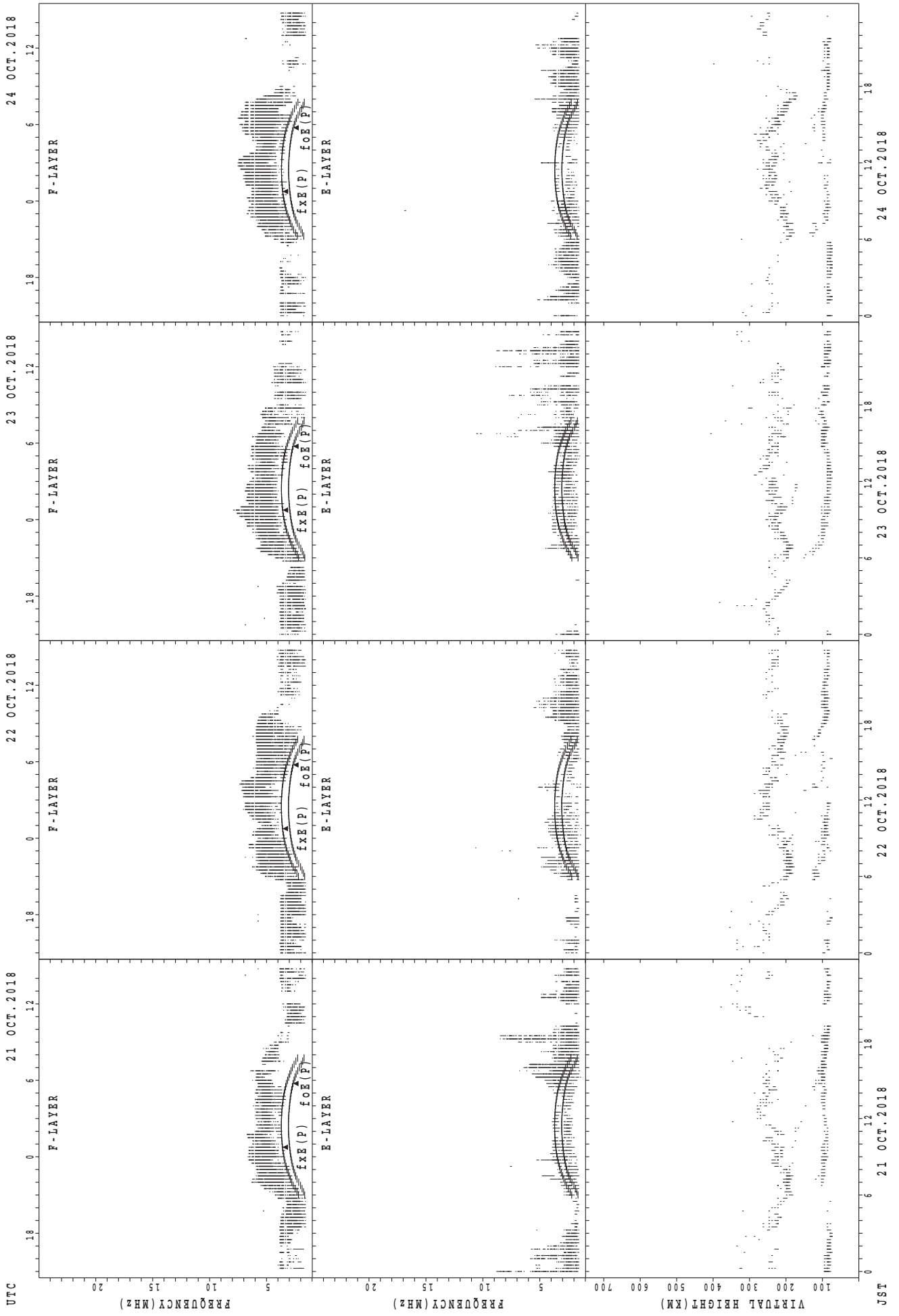
fxE(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



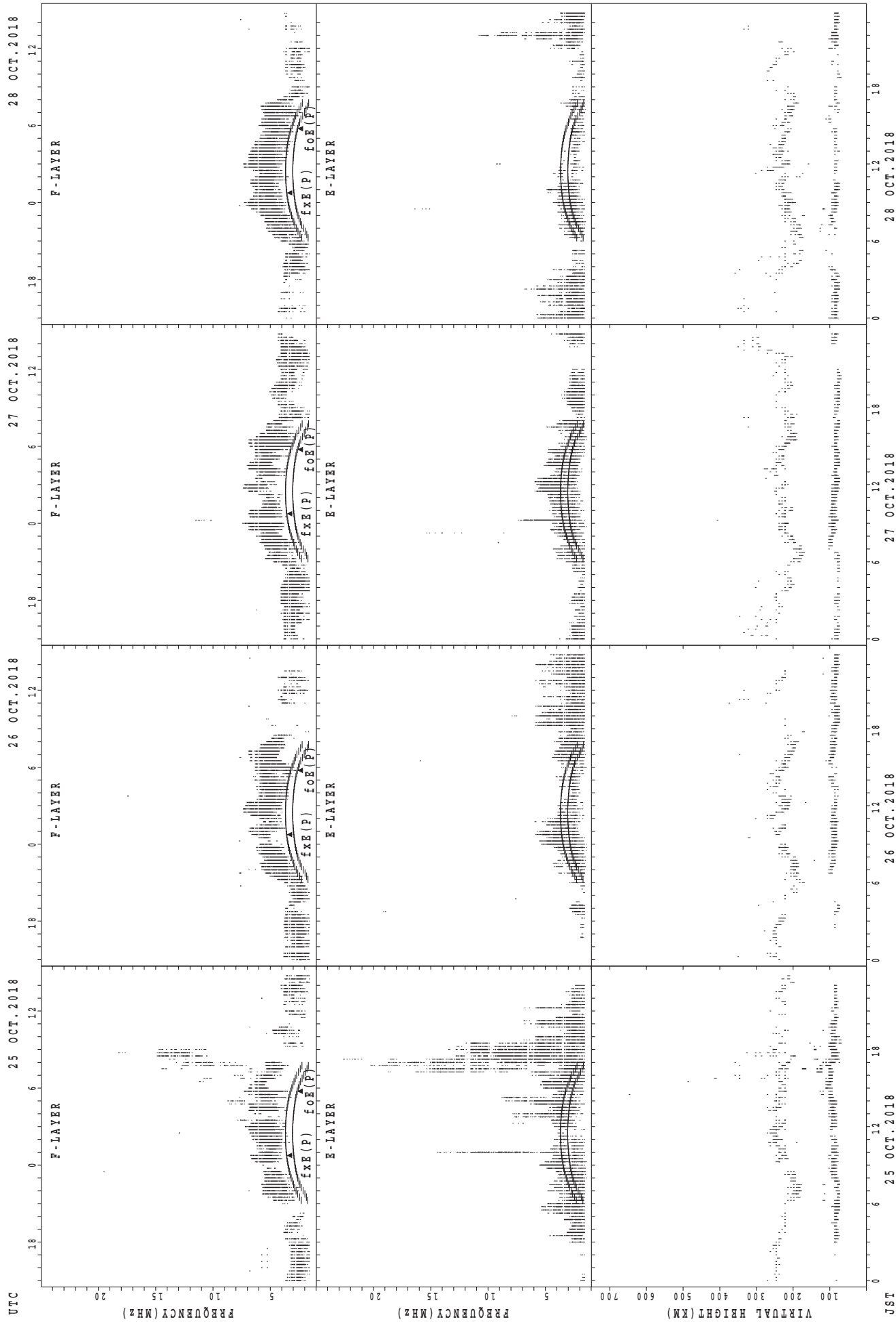
f_xe(P); PREDICTED VALUE FOR f_xe
f_o_e(P); PREDICTED VALUE FOR f_o_e

SUMMARY PLOTS AT Kokubunji



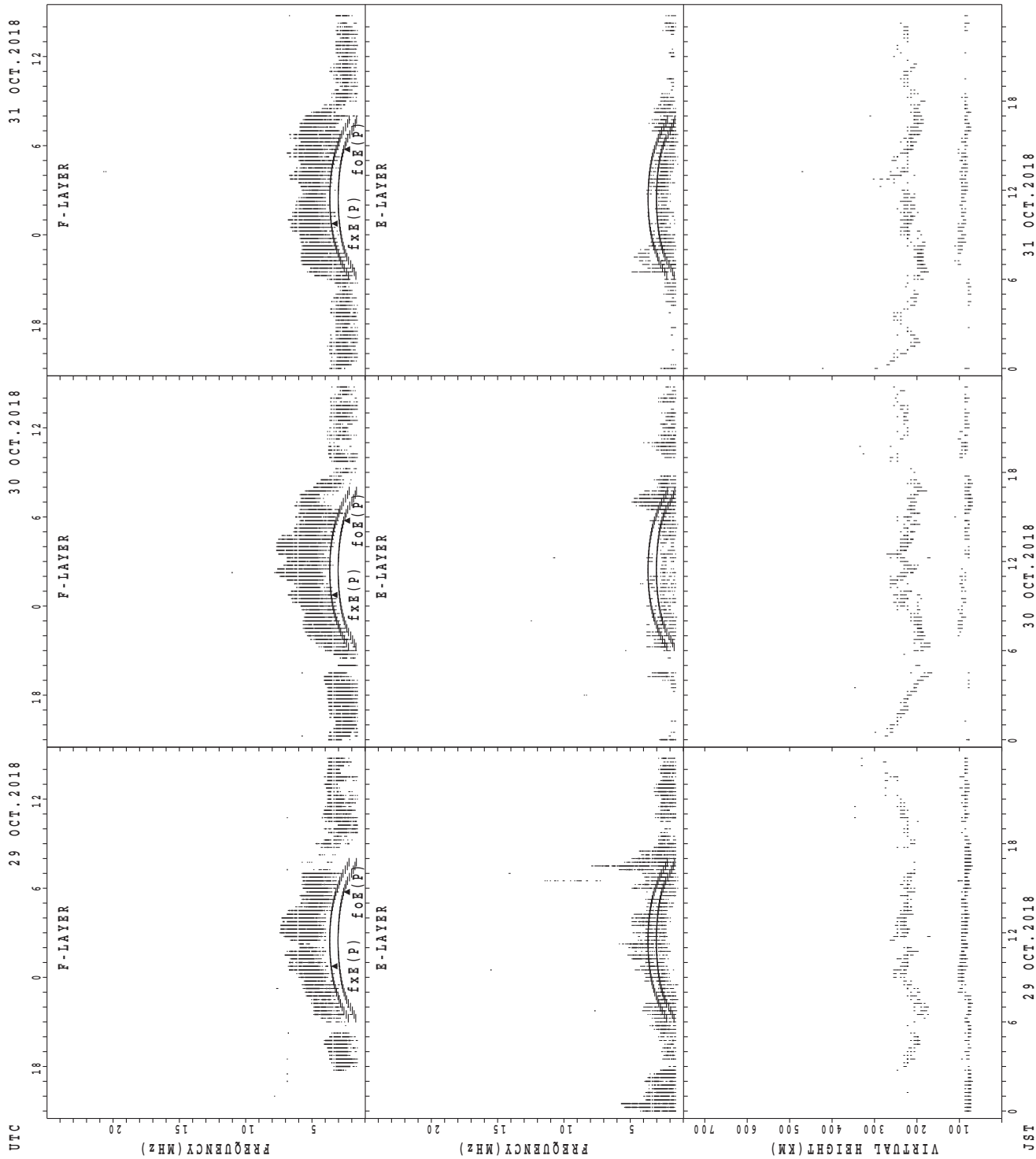
foF2(P); PREDICTED VALUE FOR foF2
 h'pF2(P); PREDICTED VALUE FOR h'pF2

SUMMARY PLOTS AT Kokubunji



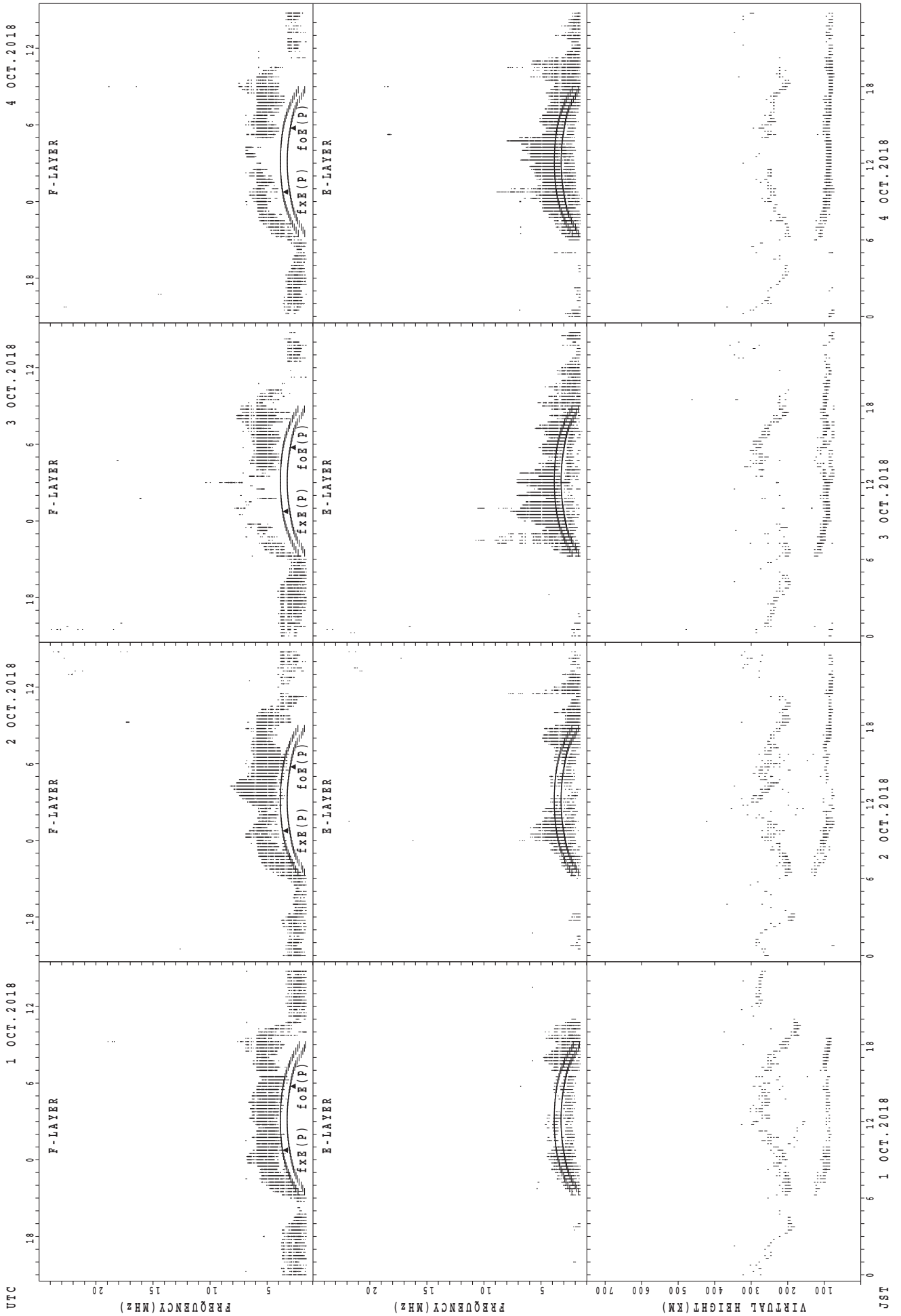
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



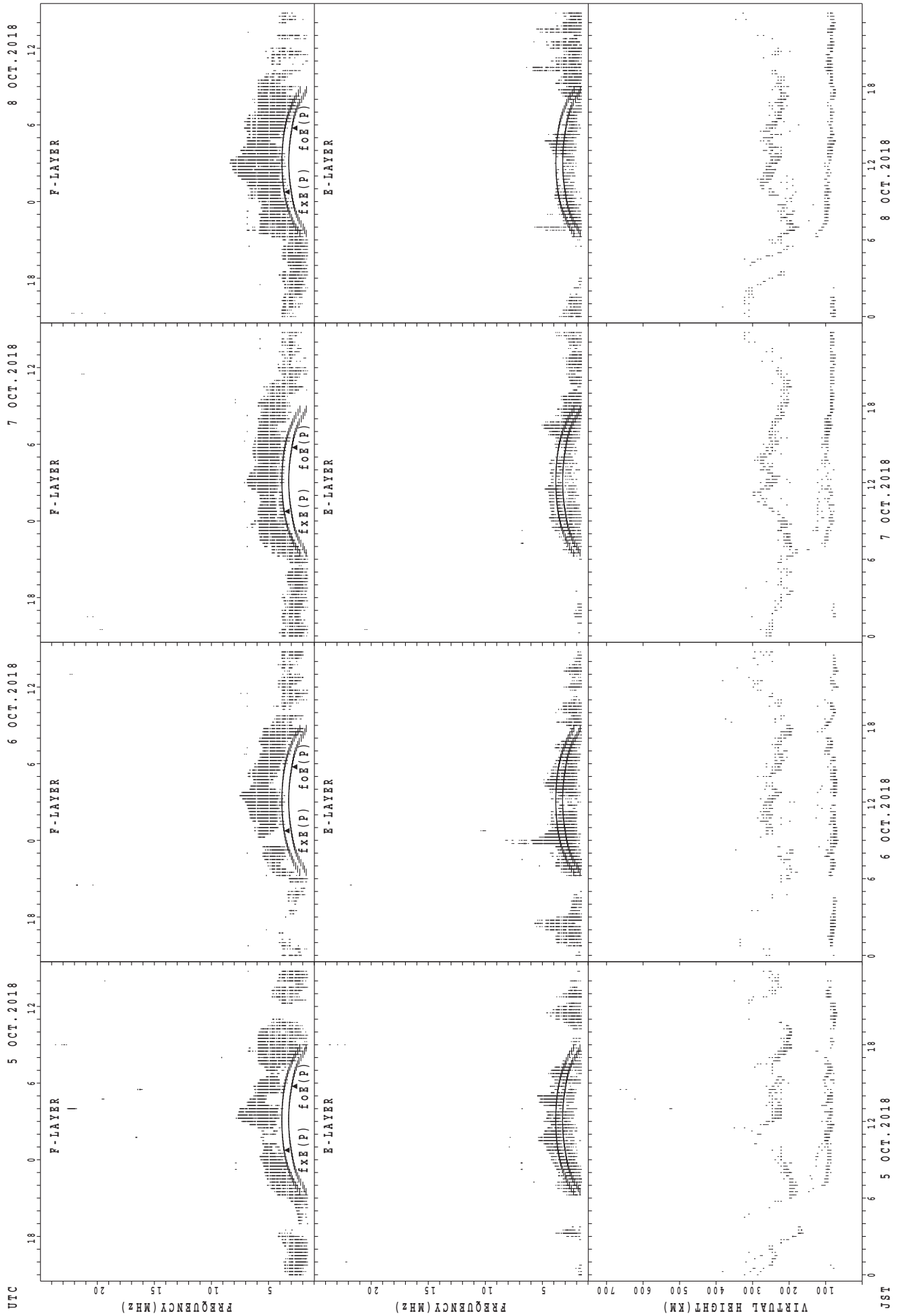
fxe(P); PREDICTED VALUE FOR fxe
foe(P); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Yamagawa



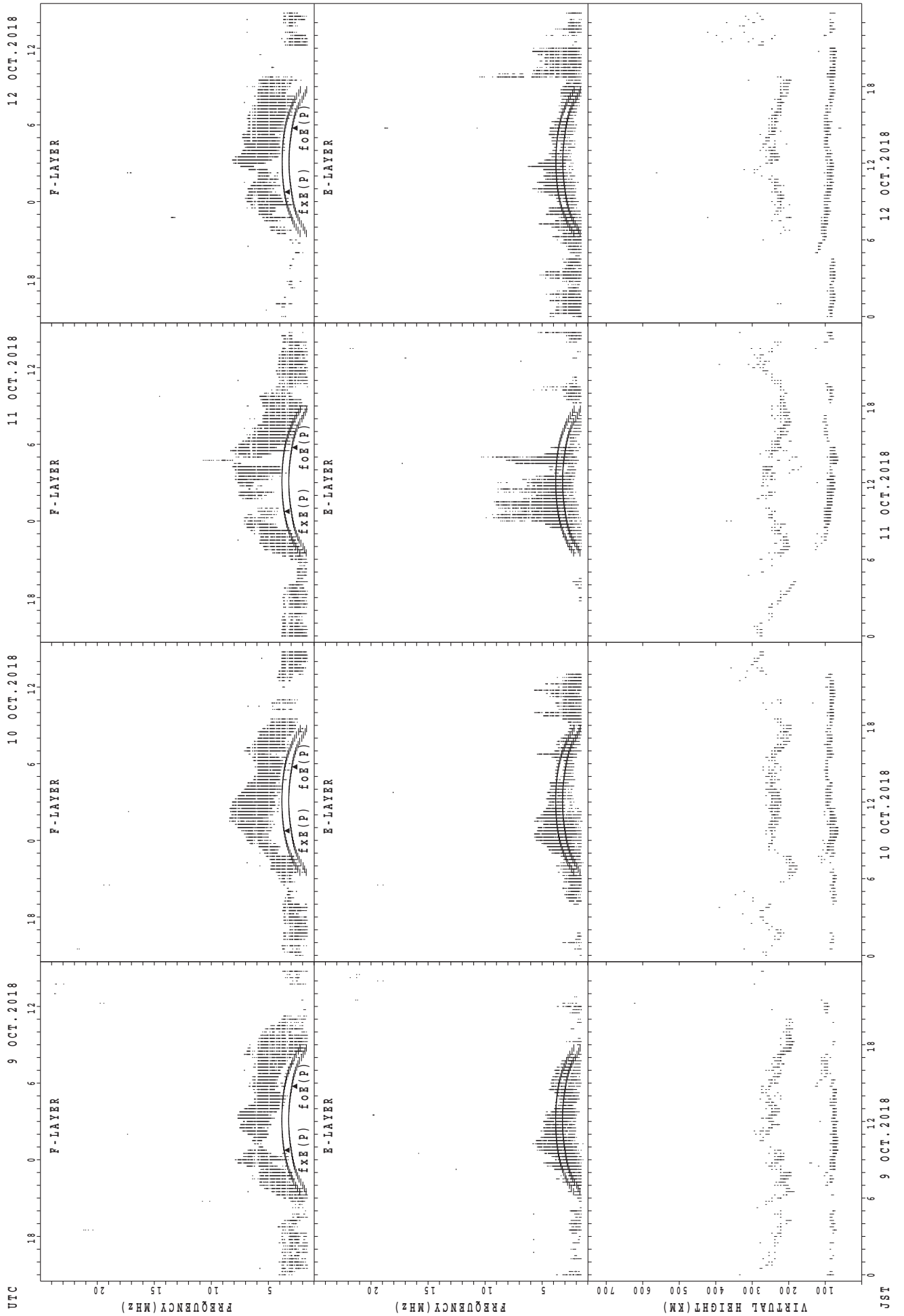
f_xE(P); PREDICTED VALUE FOR f_xE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



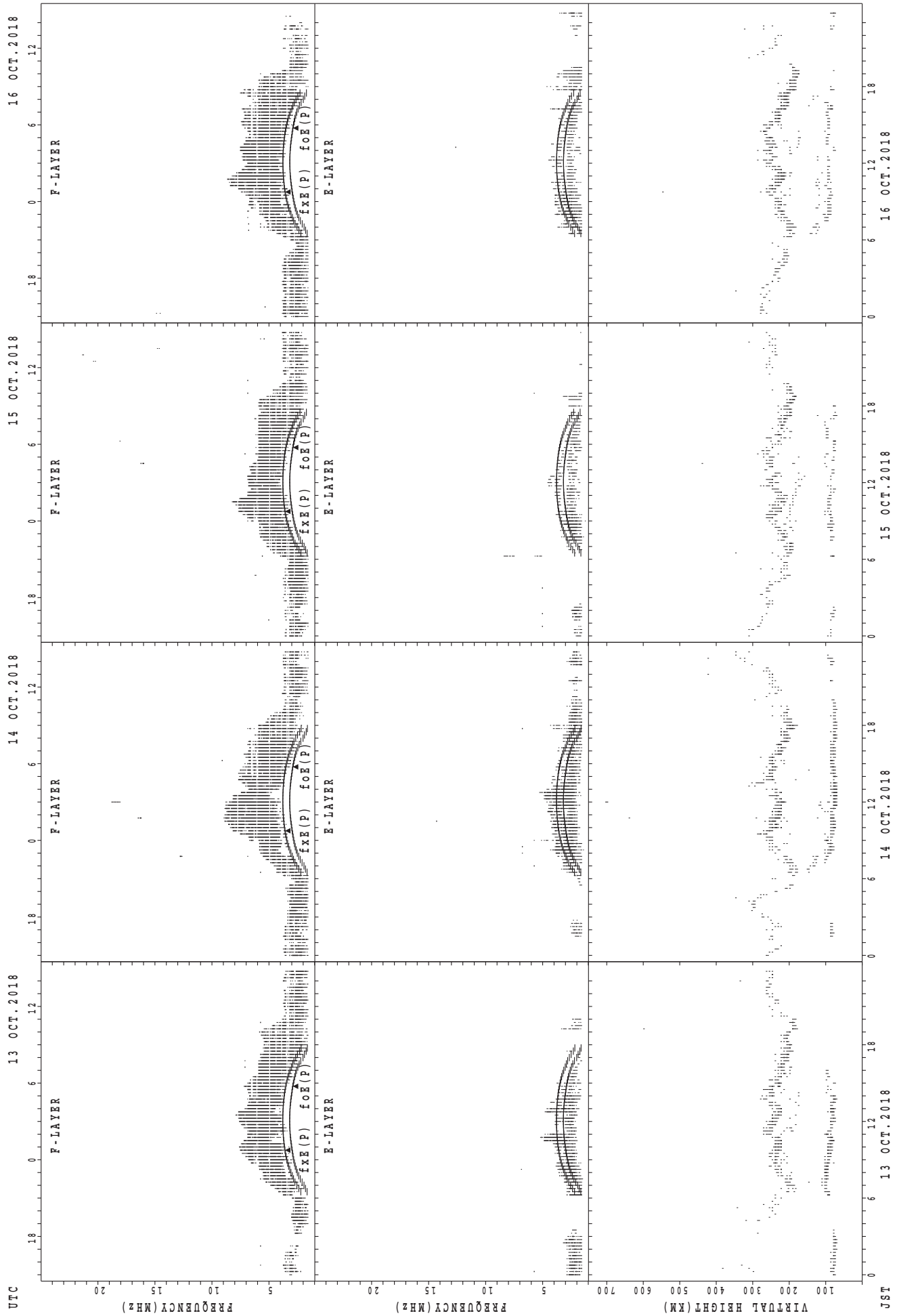
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



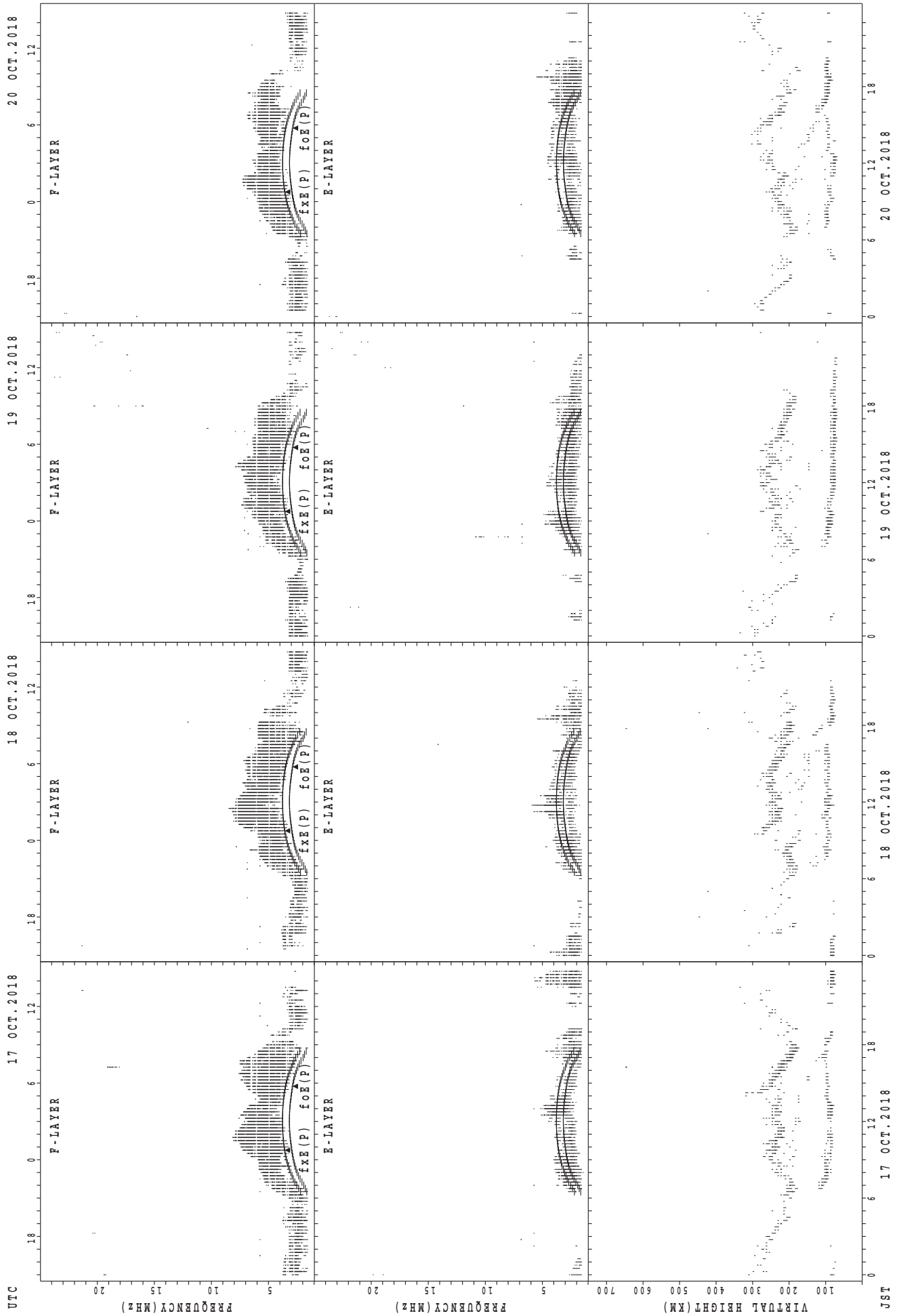
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



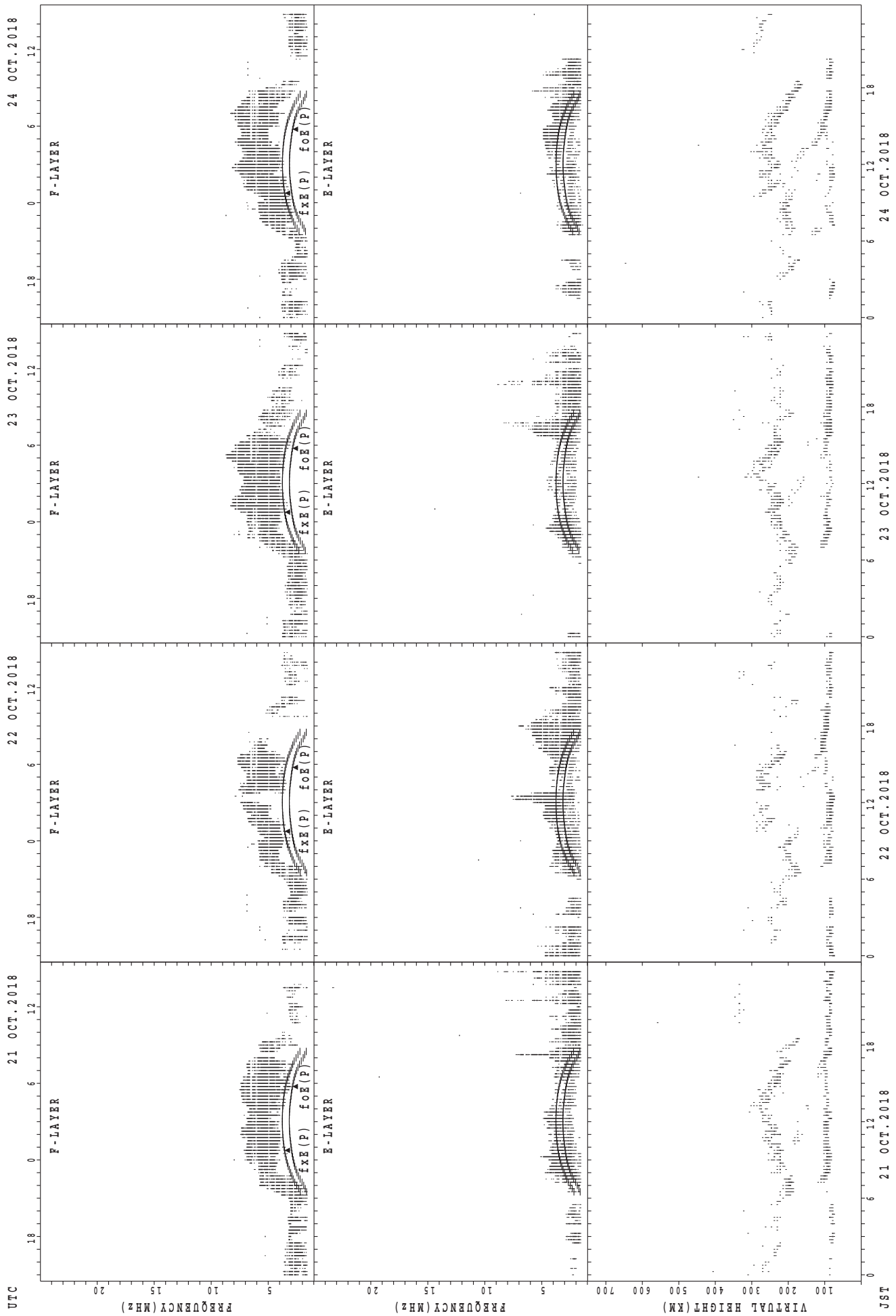
foF2(P); PREDICTED VALUE FOR foF2
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



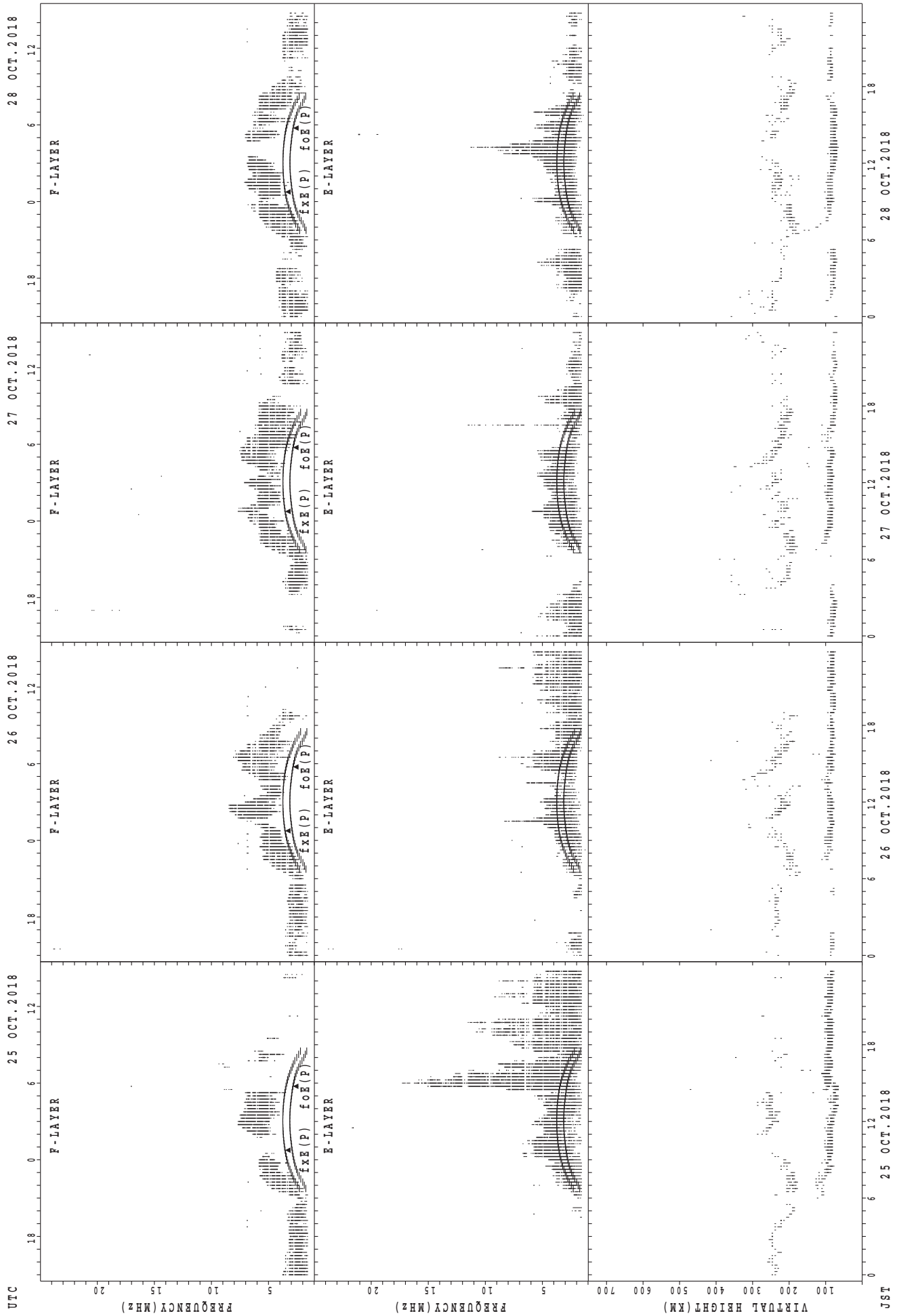
f_oF_2 ; PREDICTED VALUE FOR f_oF_2
 f_oE ; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



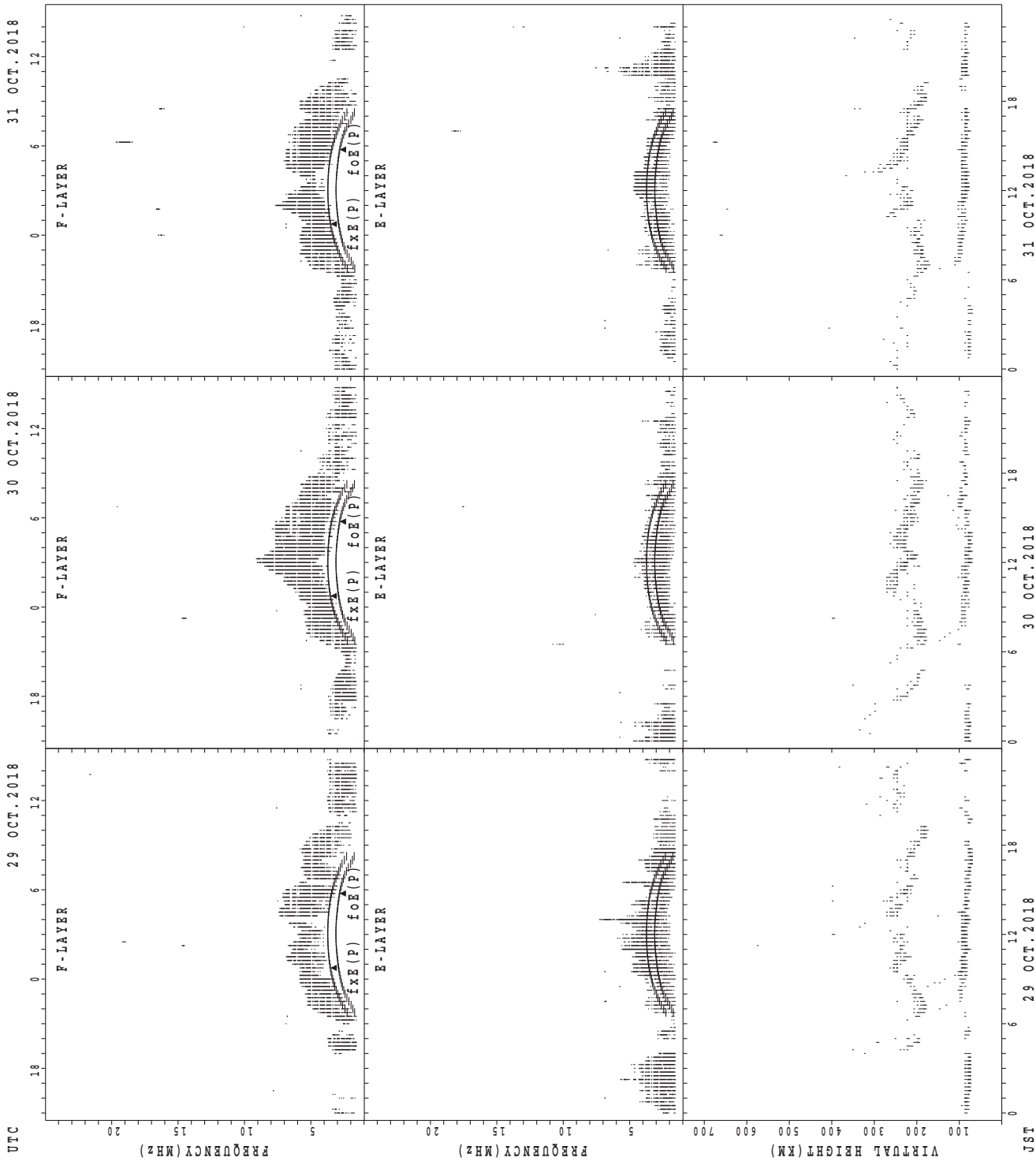
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

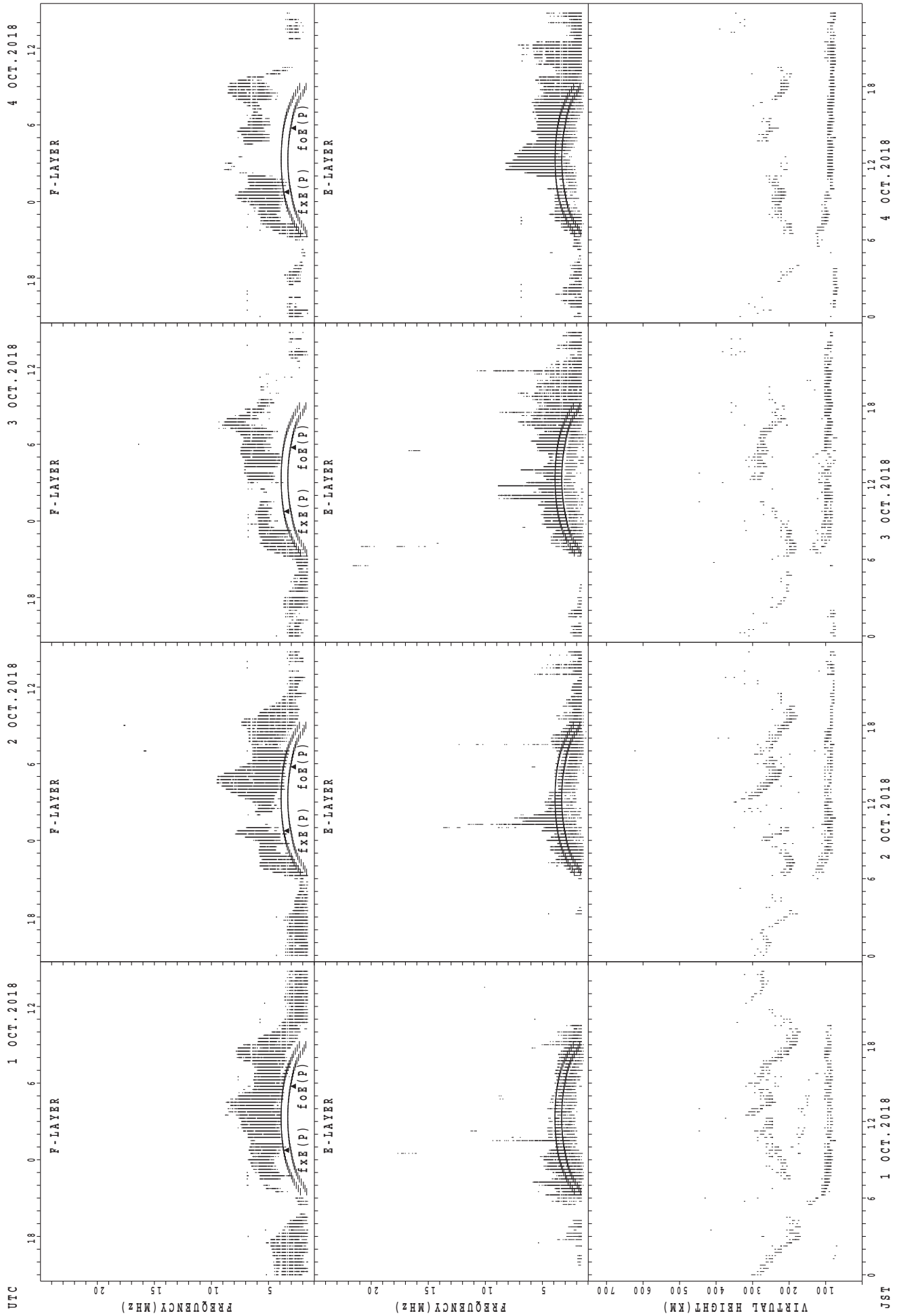


foF(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Yamagawa

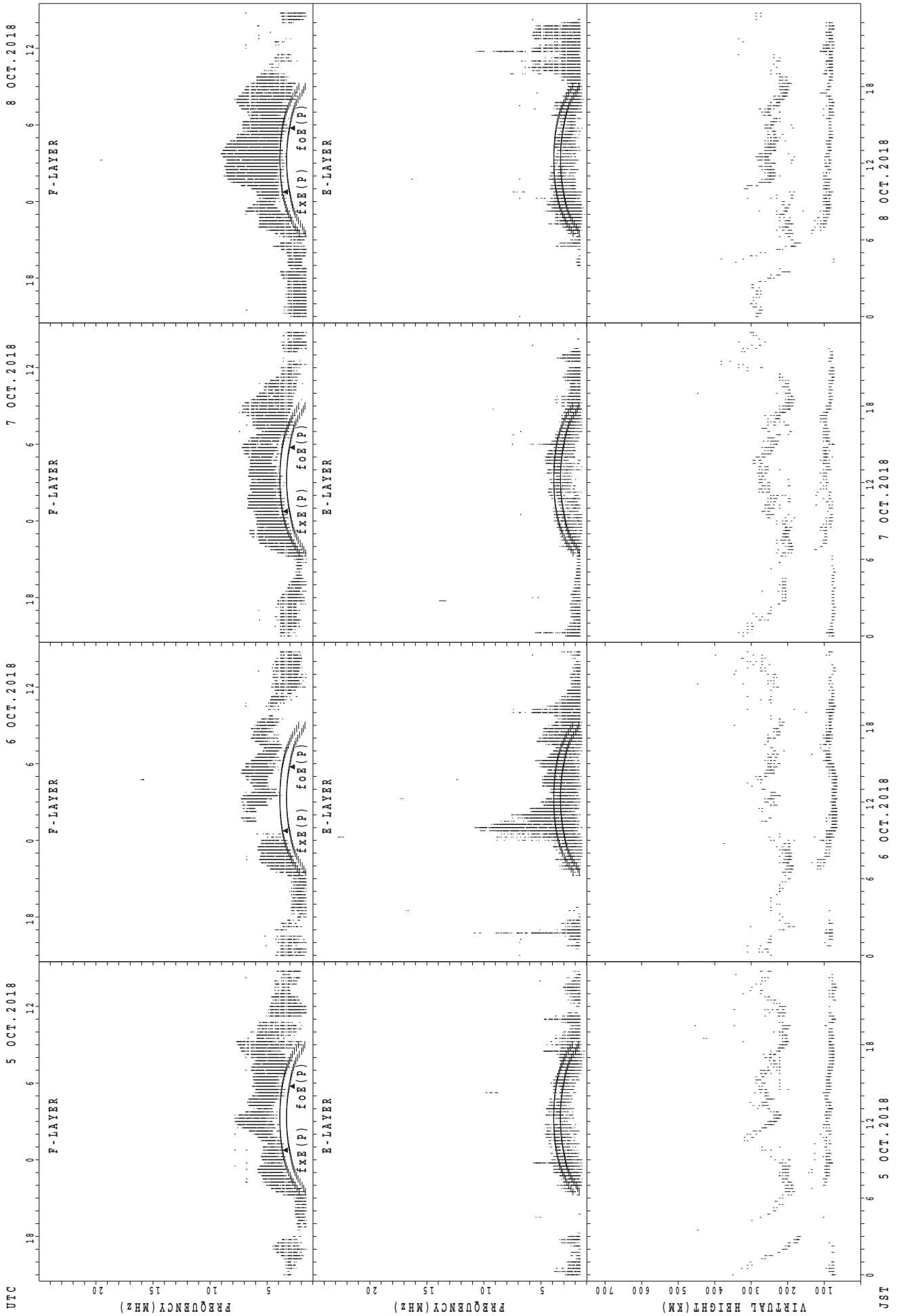


SUMMARY PLOTS AT Okinawa



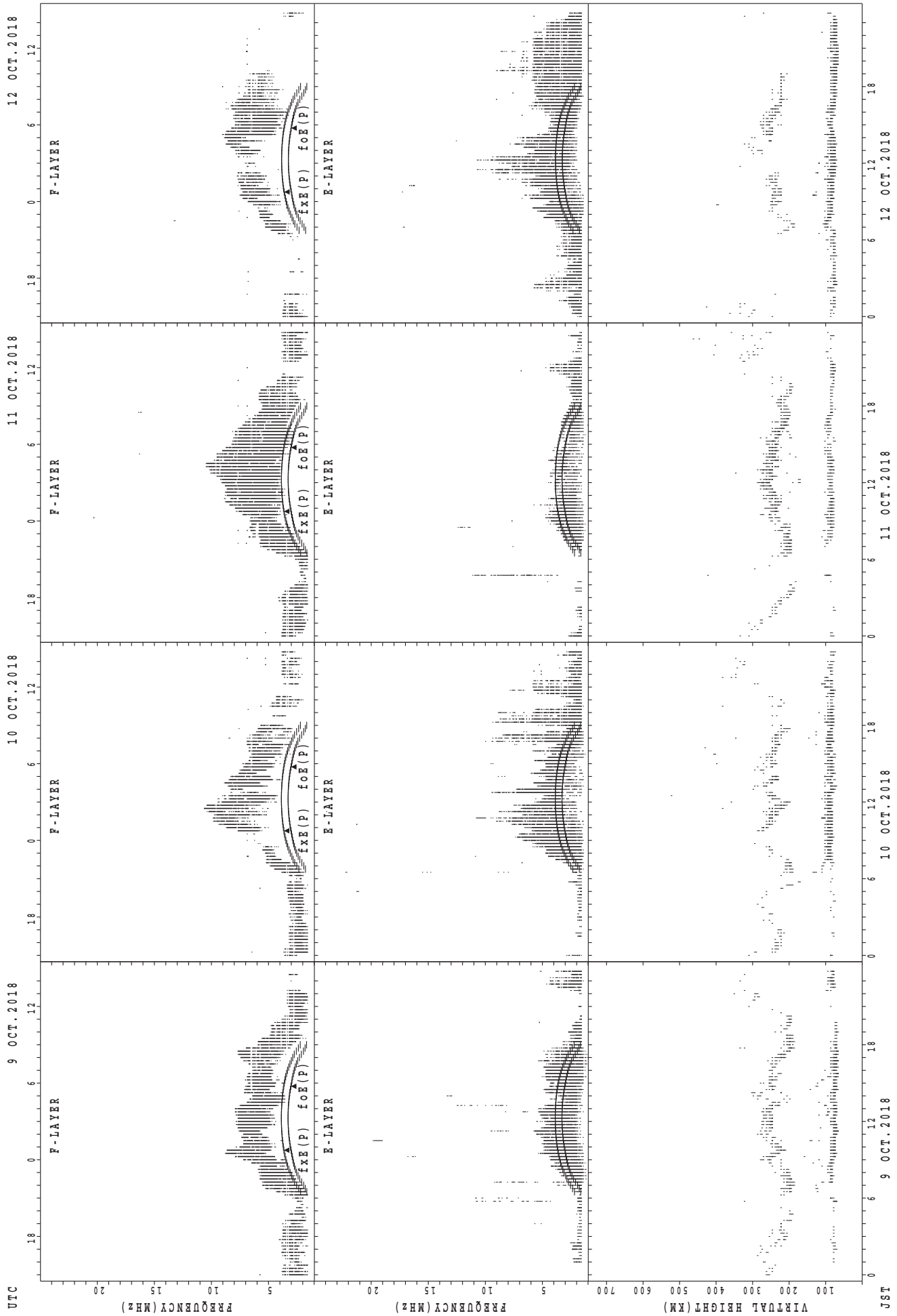
foF2(P); PREDICTED VALUE FOR foF2
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



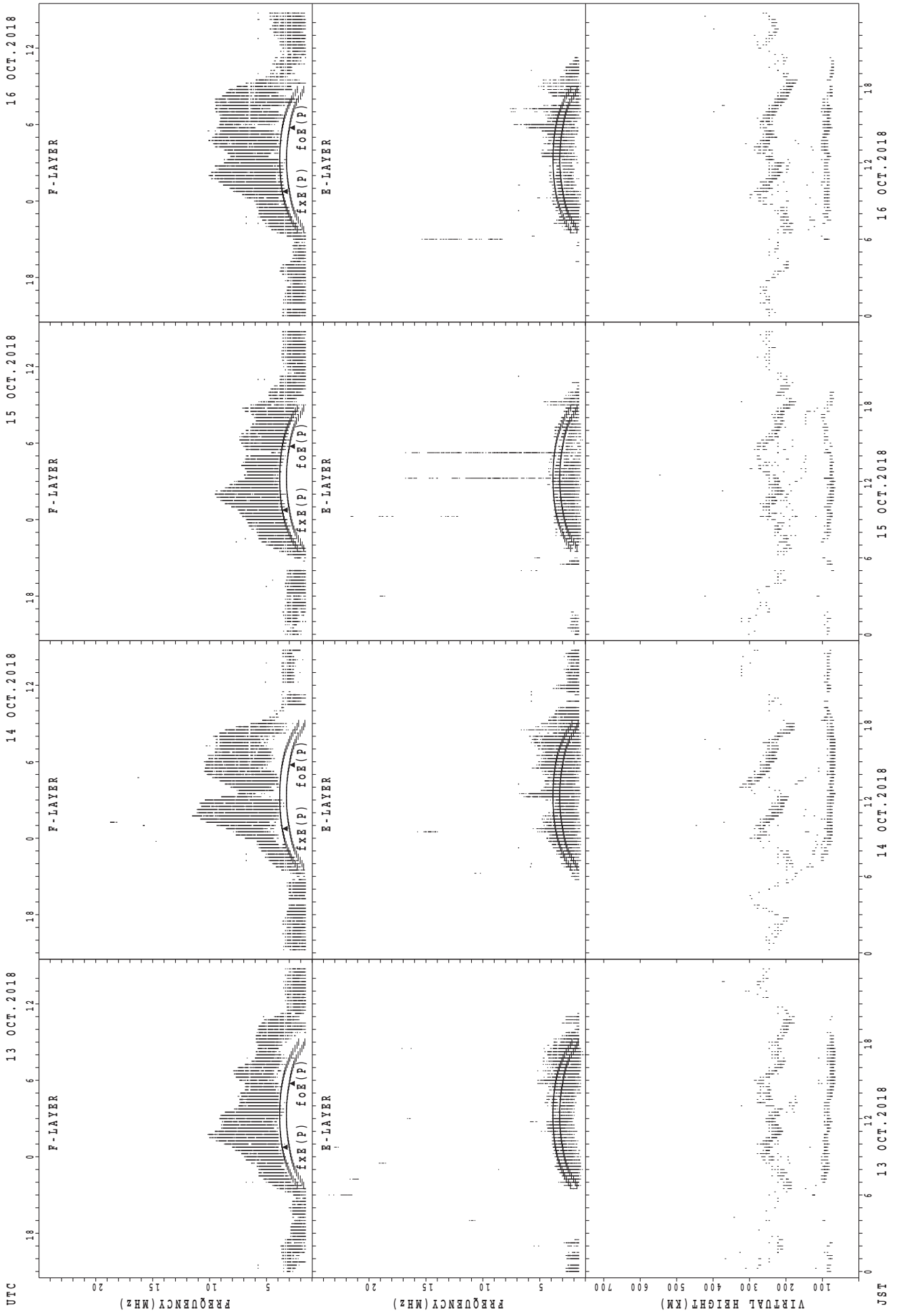
foF2(P); PREDICTED VALUE FOR foF2
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



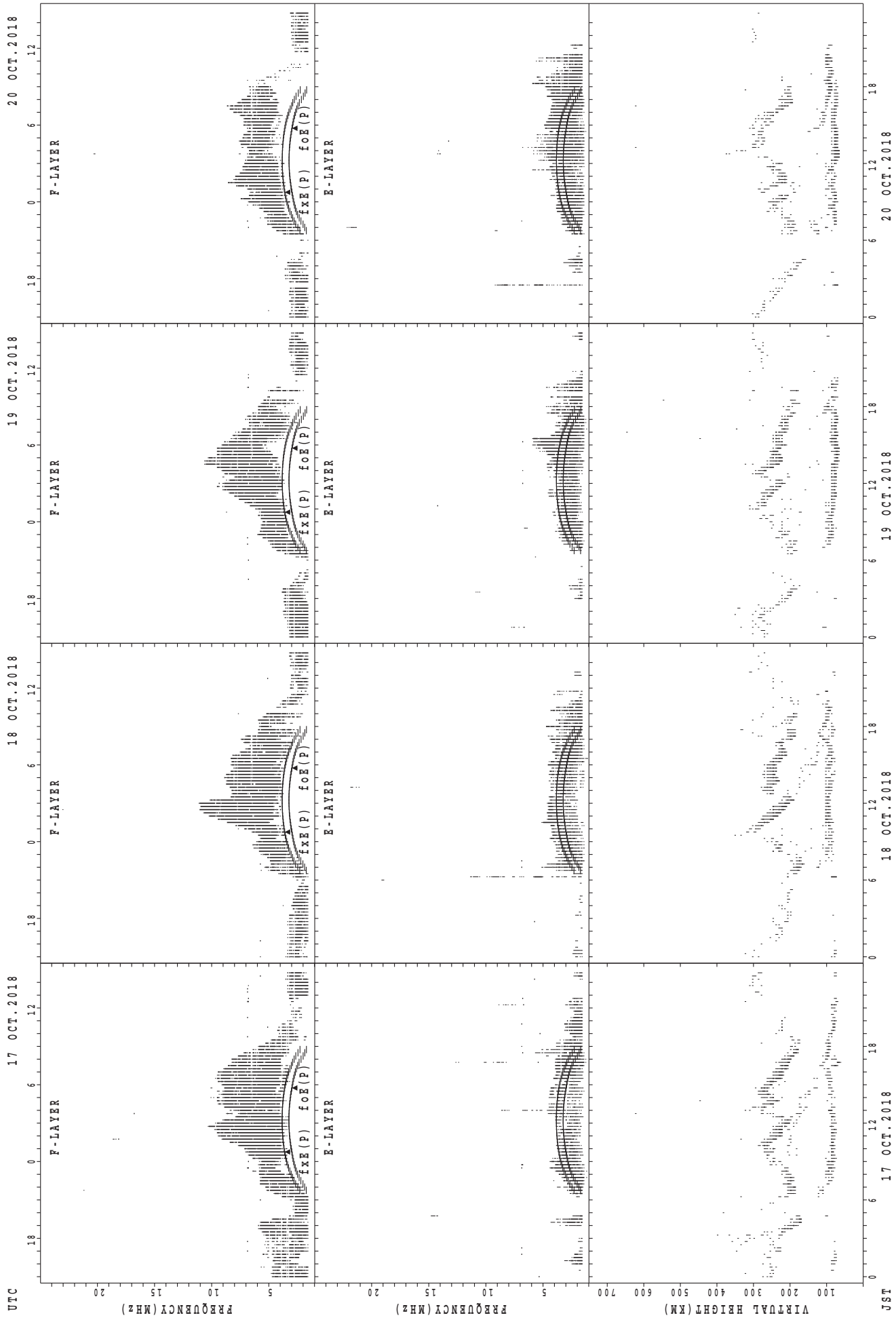
$f_{x E}(P)$; PREDICTED VALUE FOR $f_{x E}$
 $f_{o E}(P)$; PREDICTED VALUE FOR $f_{o E}$

SUMMARY PLOTS AT Okinawa



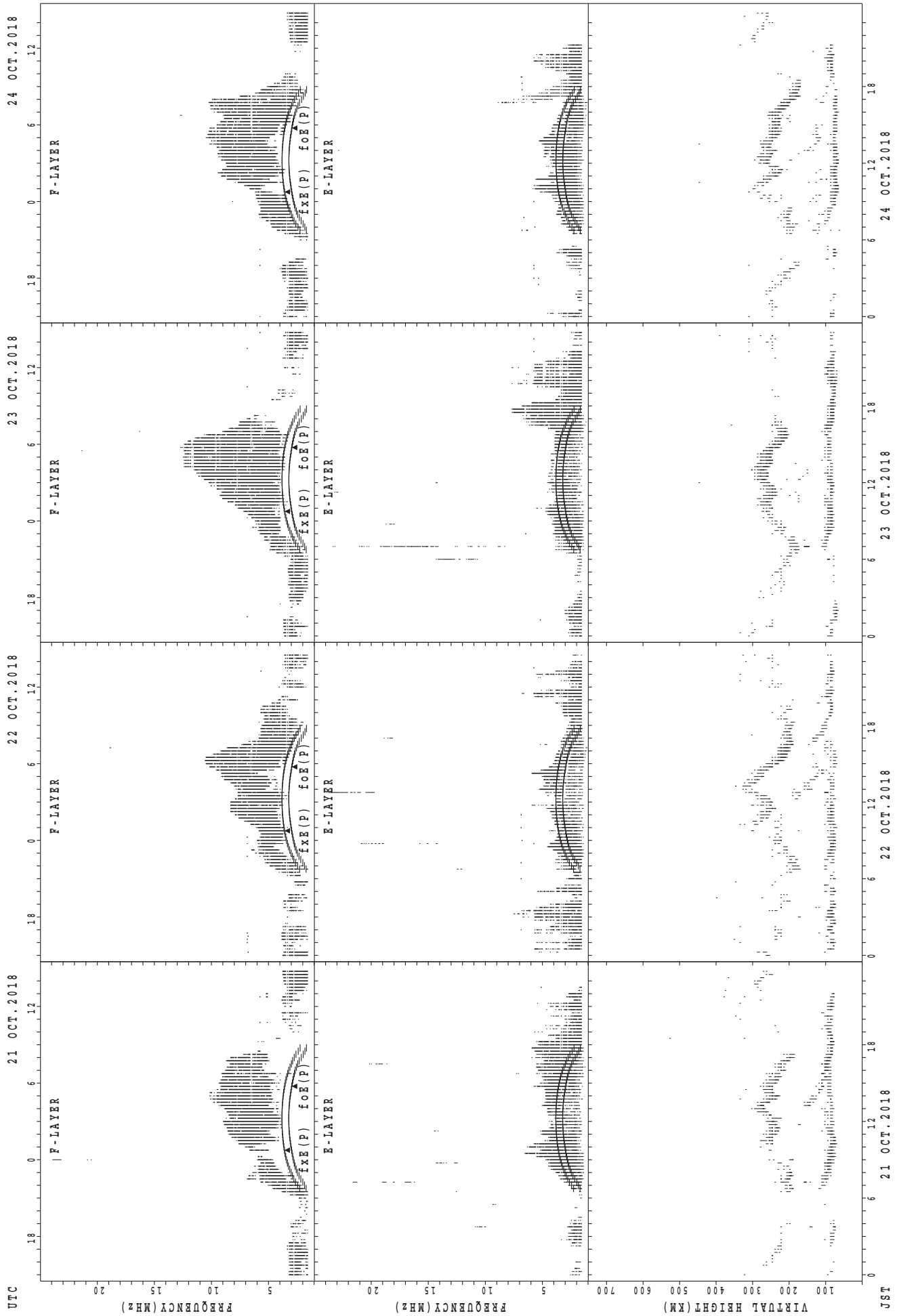
fxE(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



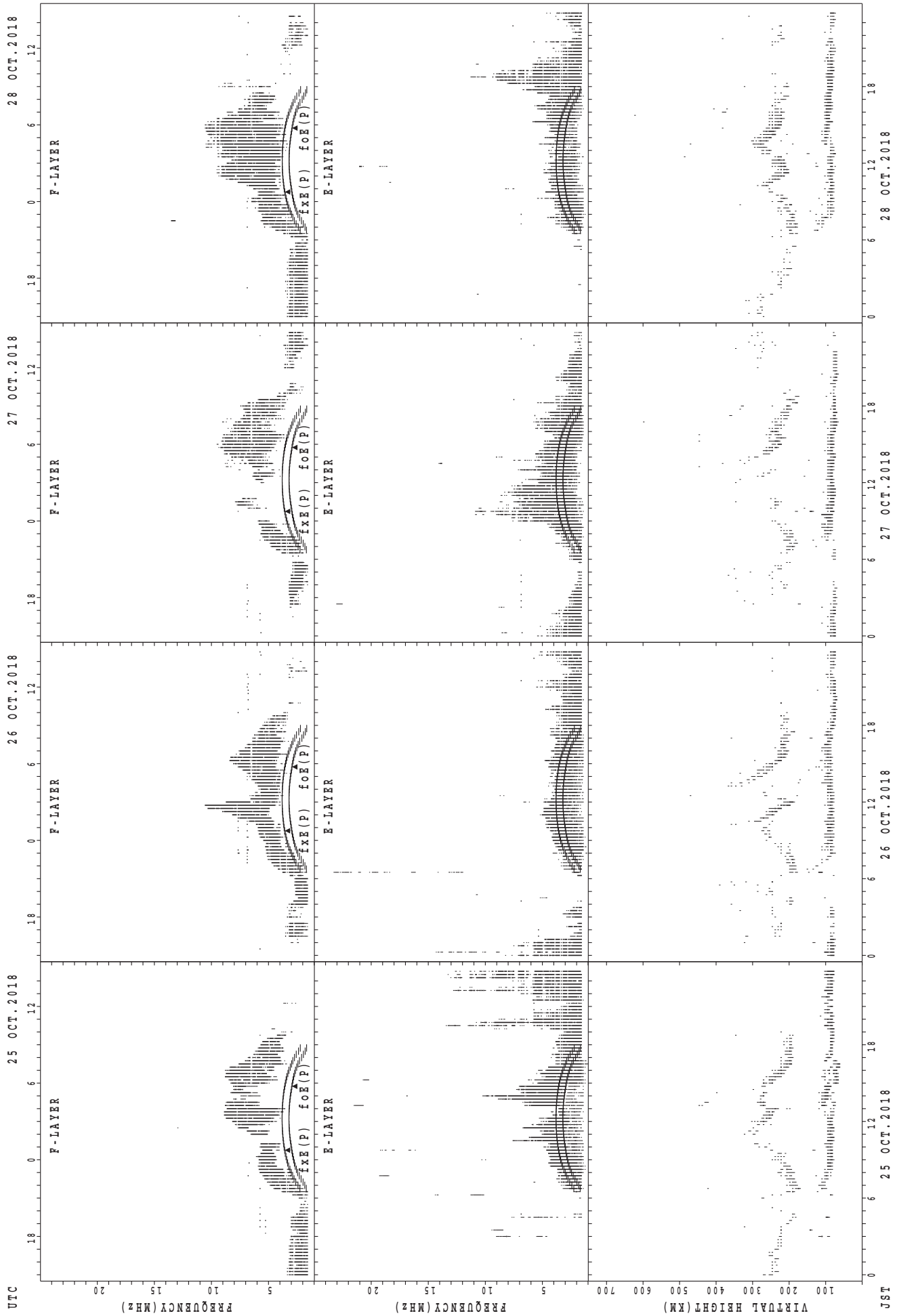
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



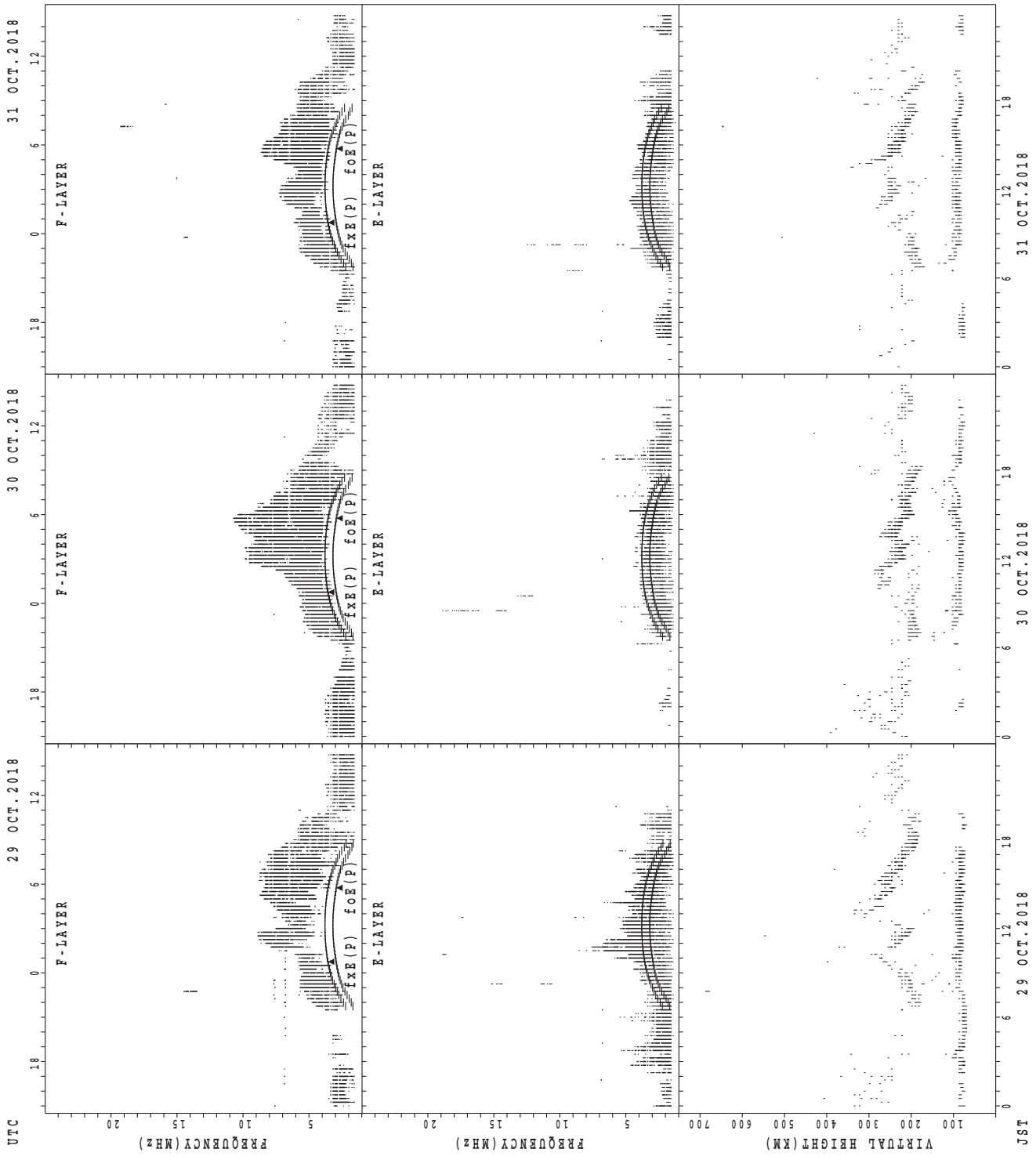
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es
 OCT. 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	4	5	4	5	6	9	3	4		4						1
MED								190	211	230	246	264	255	234	226	226		229						216
U Q								95	218	249	282	290	264	261	242	237		255						108
L Q								95	210	211	234	253	232	194	218	224		221						108

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	20	18	11	15	15	12	24	27	30	30	28	29	26	26	27	25	21	23	27	21	19	22	20	19
MED	83	86	89	85	85	92	102	107	101	96	98	89	89	86	89	89	91	91	89	87	85	87	88	83
U Q	90	89	99	89	89	140	149	125	107	105	113	103	99	107	101	95	114	97	95	95	89	89	93	93
L Q	81	83	83	81	79	81	84	91	93	89	88	85	81	79	83	81	83	81	87	81	81	81	81	81

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									4	9	2	6	5	5	6	10	4	2	3					
MED									258	242	261	256	264	260	258	242	223	223	224					
U Q									258	255	268	256	281	280	286	258	250	232	230					
L Q									241	220	254	248	249	238	208	232	218	214	198					

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	14	11	10	10	10	20	24	25	23	25	22	25	19	18	18	26	26	25	26	20	21	17	20
MED	83	87	87	81	81	82	115	122	97	95	95	96	95	87	94	97	96	90	89	88	88	91	87	87
U Q	89	89	89	87	85	87	155	131	110	95	175	177	101	101	101	111	107	103	97	93	91	95	91	90
L Q	81	81	81	81	79	81	86	102	90	89	89	89	87	83	87	91	87	81	84	83	82	85	86	84

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	8	5	5	9	8	7	19	13	6	3					
MED									224	234	240	254	252	255	264	252	240	230	216					
U Q									226	242	248	261	279	272	278	268	256	238	228					
L Q									220	229	226	244	232	248	248	240	234	208	216					

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	12	12	13	8	11	8	3	31	26	26	27	26	31	25	24	25	26	28	27	25	23	19	17	18
MED	84	82	83	81	81	83	107	125	97	95	91	90	95	91	97	101	94	91	89	87	87	85	87	87
U Q	87	87	87	82	83	87	123	149	107	101	107	95	167	146	109	130	107	100	97	93	91	89	89	89
L Q	81	81	80	79	81	81	75	111	95	91	87	85	83	84	89	92	85	87	85	85	81	83	82	83

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

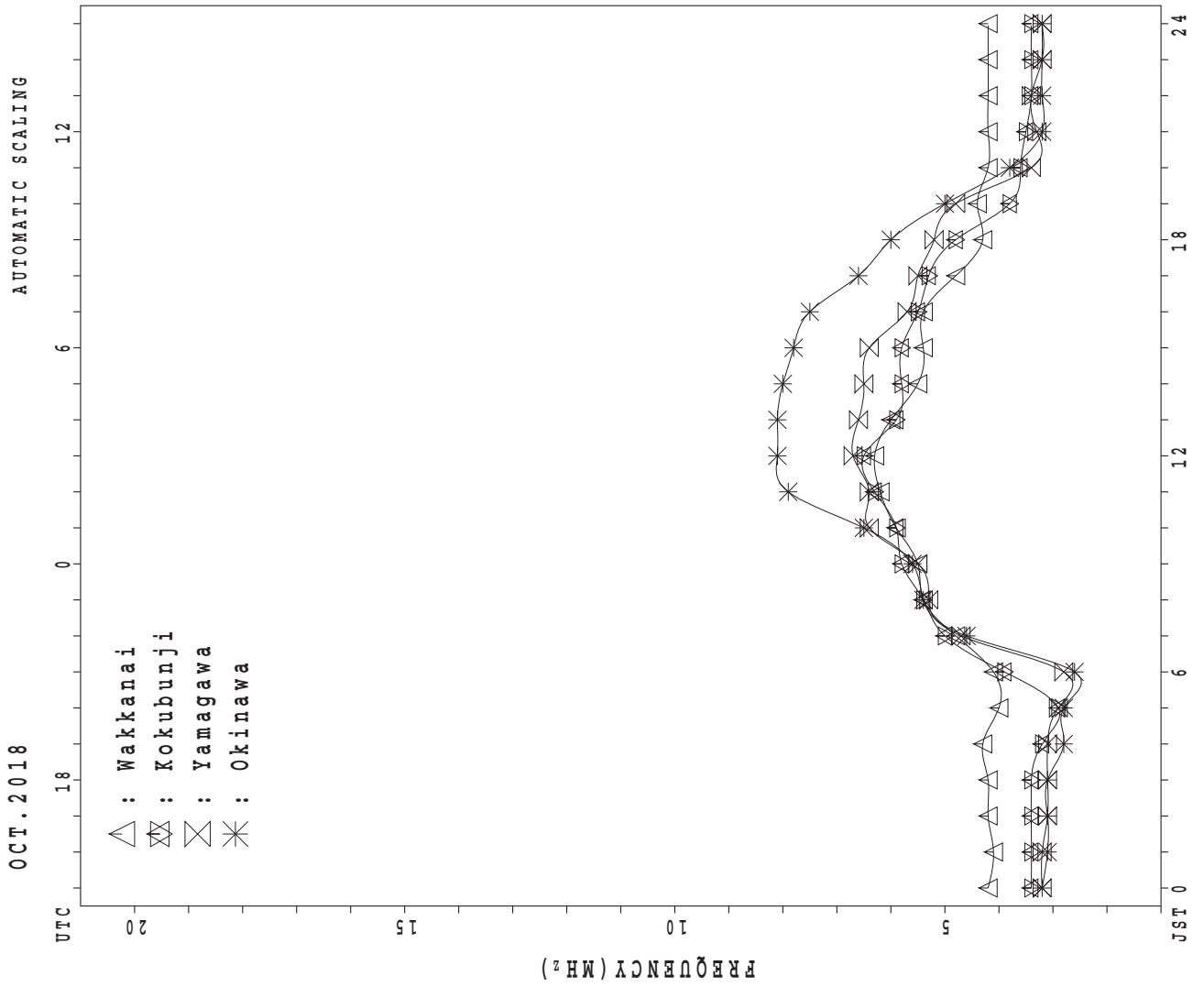
h'F STATION Okinawa LAT. 26°41.0'N LON. 128°09.0'E

	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	9	7	7	8	6	8	15	25	21	9	1				
MED									233	262	236	240	243	252	248	240	230	222	216	208				
U Q									238	285	256	264	254	264	266	248	242	233	230	104				
L Q									228	231	224	230	219	246	238	230	222	208	210	104				

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	14	13	12	13	9	4	11	28	29	29	29	28	27	28	29	30	30	30	30	29	25	21	17	14
MED	83	83	83	83	89	78	91	116	101	95	95	89	89	97	97	94	96	90	87	87	87	87	87	87
U Q	87	87	89	141	179	87	115	134	116	113	107	100	101	127	119	111	111	97	95	92	91	93	89	89
L Q	81	81	78	79	81	76	81	109	95	89	83	87	85	87	88	89	89	81	81	80	81	82	81	83

MONTHLY MEDIANS PLOT OF fOF2



IONOSPHERIC DATA STATION Wakkanai

OCT. 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

D ^H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 49	X 45	X 46	X 46	X 45															X 54	X 51	X 51	X 48	X 49
2	X 45	X 47	X 49	X 48	X 44															X 53	X 54	X 49	X 48	X 55
3	X 54	X 57	X 58	X 52	X 49	54														X 49	X 52	X 48	X 48	X 48
4	X 50	X 57	X 56	X 58	X 60	56														X 48	X 51	58	54	56
5	X 53	X 52	X 53	X 57	X 57															X 49	X 50	X 51	X 50	X 46
6	X 45	X 45	X 45	X 45	X 38															X 47	X 48	X 50	X 52	X 49
7	X 49	X 50	X 51	X 52	X 54															X 45	X 48	X 45	X 45	X 42
8	X 41	X 41	X 39	X 35	X 38														60	X 59	X 66	X 59	X 59	X 68
9	X 59	X 58	X 58	X 53	X 52	52														X 51	X 48	X 44	X 39	X 45
10	X 40	X 48	X 48	X 54	X 58															X 51	X 51	X 53	X 48	X 42
11	X 41	X 41	X 38	X 33	X 30															X 44	X 49	X 55	X 55	X 56
12	X 49	X 48	X 39	X 38	X 33	38													X 45	X 46	X 46	X 48	X 44	X 52
13	X 40	X 37	X 40	X 41	X 44															X 57	X 49	X 48	X 54	X 51
14	X 47	X 49	X 44	X 43	X 54															X 51	X 52	X 53	X 51	X 59
15	X 57	X 57	X 47	X 48	X 48															X 44	X 46	X 47	X 48	X 49
16	X 45	X 46	X 48	X 44	X 46															X 40	X 45	X 47	X 45	X 43
17	X 43	X 47	X 41	X 41	X 40															X 40	X 41	X 40	X 41	X 41
18	X 40	X 44	X 44	X 44	X 44															X 42	X 41	X 45	X 42	X 42
19	X 39	X 40	X 40	X 39	X 39															X 40	X 41	X 44	X 39	X 43
20	X 46	X 46	X 47	X 48	X 50	51														X 47	X 47	X 48	X 50	X 50
21	X 49	X 56	X 56	X 54	X 55	16														X 38	X 41	X 45	X 45	X 45
22	X 45	X 45	X 49	X 50	X 46															X 53	X 51	X 50	X 48	X 46
23	X 45	X 45	X 48	X 46	X 43															X 47	X 49	X 49	X 49	X 54
24	X 42	X 55	X 51	X 51	X 51															X 39	X 41	X 44	X 44	X 40
25	X 42	X 42	X 43	X 42	X 43						C	C	C	C	C	C	C	C		X 46	X 45	X 45	X 46	X 46
26	X 46	X 46	X 44	X 43	X 43						C	C	C	C	C	C	C			X 44	X 52	X 57	X 55	X 57
27	X 54	X 51	X 58	X 58	X 55															X 54	X 60	X 58	X 59	X 58
28	X 53	X 54	X 58	X 58	X 60	56														A	X 43	X 48	X 45	X 45
29	X 44	X 48	X 54	X 54	X 55	59														X 41	X 45	X 48	X 48	X 49
30	X 45	X 45	X 46	X 46	X 48	51														X 40	X 42	X 42	X 42	X 44
31	X 46	X 47	X 48	X 46	X 45	43														X 36	X 41	X 36	X 39	X 37
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	10														20	31	31	31	30
MED	X 45	X 47	X 48	X 46	X 46	52														X 44	X 47	X 48	X 48	X 48
U Q	X 49	X 52	X 53	X 53	X 54	56														X 49	X 51	X 51	X 51	X 54
L Q	X 42	X 45	X 44	X 43	X 43	43														X 40	X 43	X 45	X 45	X 44

OCT. 2018 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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

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

OCT. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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	L	420	L	L		L							
2					208				L		392	384	408	L	L	L	L							
3								L	L	432	L	L	L	L	L		L							
4						L		212	L	L	L	L	416	L	L	L	L							
5									L	392	392	L	L		A	A	L							
6								L	L	L	L	L	412	L	L	L	L							
7					R				L	396	L	416	L	408	L	L								
8					L	L	A	A	L	L	L	L	L	L	L	L	A				280			
9						A	A	L	L	392	L	L	L	L	L	L								
10									364	384	L	L	L	L	L	L	L							
11								L	L	L	A	A	L	A	L	L								
12						172				L	L	A	L	L	364	L								
13								L	A	A	L	L	396	L	L	L								
14					L	L	L	L	L	392	412	L	L	L	L									
15					L				L	L	L	L	L	A	A	A	L							
16									L	L	L	L	L	L										
17								L	L	L	L	L	L	384	L									
18								L		L	L	L	A	A	L	L								
19										L	L	L	L											
20									364	L	L	L	L	L	L	L								
21									L	L	L	408	L	L	L									
22									L	L	L	L	L	L										
23										L	L	L	L	L										
24						A			L	A	L	L	L	L	L	L	L							
25					L				L	C	C	C	C	C	C	C	C	C	C					
26								L	A		C	C	C	C	C	C	C							
27											436			360		L	L	L						
28										L	L	L	L											
29										L	L	L	L	L	L						392			
30									L	L	L	L	L	364	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						1	2	1	2	6	3	5	5	3	2				1	1				
MED					208	356	212	364	392	392	408	412	384	362			392	280						
U Q									396	436	414	418	408											
L Q									392	392	390	402	364											

OCT. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	196	220	256	A	A	300	292	292	288	A	200	A	A					
2						B	172	A	244	280	292	296	296	280	248	236	208	A	A					
3						212	192	204	256	280	296	296	296	280	288	240	180	B	A					
4						B	184	224	264	288	292	300	300	296	A	220	A	A	A					
5						B	A	244	268	284	264	304	304	296	280	236	236	B	A					
6						B	A	220	248	280	292	304	304	300	280	260	212	A	A					
7						A	A	A	248	288	296	296	308	300	268	244	A	A	B					
8						A	A	220	220	A	A	300	A	300	276	248	192	A	196					
9						A	A	A	240	280	280	300	280	280	276	256	200	A	B					
10						B	164	204	256	272	288	A	296	A	264	248	188	B	B					
11						B	A	232	232	280	288	288	288	256	252	244	184	B	A					
12						A	240	208	240	264	288	284	320	252	240	A	A	A						
13						B	B	212	216	264	268	296	280	268	240	U	A	A	A					
14						B	156	200	248	252	272	292	292	288	260	248	184	A						
15						220	A	208	248	268	268	280	A	A	A	A	A	A						
16						B	A	196	A	264	280	292	248	288	276	R	A	B						
17						A	A	A	248	272	272	288	288	292	280	A	184	204						
18						228	A	212	260	264	A	A	A	A	A	232	192	A						
19						B	B	A	256	256	272	256	A	A	A	A	200	A						
20						B	A	200	244	276	256	A	A	284	256	228	200	196						
21						220	224	236	264	272	284	272	A	A	A	A	A	A						
22						B	200	204	256	272	284	264	A	236	A	A	196	A						
23						B	A	200	260	284	A	A	A	A	252	232	204	A						
24						B	204	204	248	276	260	248	264	A	A	228	A	A						
25						B	228	220	256	276	C	C	C	C	C	C	C	C						
26						A	212	208	244	268	C	C	C	C	C	C	C	B						
27						B	A	196	244	264	272	272	272	252	A	232	176	188						
28						B	168	204	248	268	280	248	A	A	A	232	A	A						
29						B	188	248	280	280	A	A	284	A	A	A	A	A						
30						B	188	252	280	260	296	A	284	256	212	180	A							
31						B	192	248	272	280	284	284	288	248	A	256	A							160
	00	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	13	26	30	29	25	24	18	21	19	19	20	3	1					1
MED						220	196	206	248	272	280	292	292	284	264	236	196	196	196					160
U Q						224	218	220	256	280	288	298	300	294	280	248	202	204						
L Q						206	170	200	244	266	270	276	280	274	252	228	184	188						

OCT. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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

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 J A			E B E B	E B	E B	20	28		J A J A	J A	J A	G J A	J A	J A	J A	J A	J A	J A			J A	J A	
2	J A J A	J A	J A	J A	J A	J A	21	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
3	J A	24	28	26	26	21	J A			J A	J A	J A						E B	J A	J A	J A	J A	J A	J A
4	E B	16	26	22	E B	16	27	20	J A	J A	J A				J A	J A	J A	J A	J A	E B	E B	E B	J A	
5	J A	24	16	20	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	E B				E B	E B
6	J A	75	23	29	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
7	J A	21	34	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
8	22	E B	E B	E B	J A	E B	22	33	J A	J A	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	29
9	22	28	31	J A	J A	J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
10	32	J A	35	29	J A	J A	91	20											E B	E B	E B	E B	J A	J A
11	J A	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	E B	J A	E B		J A	J A
12	J A	25	22	22	J A		G		J A	J A	J A	J A	J A	J A	J A	J A	J A	J A				E B	E B	J A
13	E B	16	20	24	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	J A	J A	J A
14	J A	J A	J A	E B	E B	E B			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
15	J A	23	47	28	E B	16	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
16	32	J A	25	19	J A	28	38	35	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	J A	E B	J A	E B	J A
17	26	24	31	J A	19	20	22	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	J A	J A
18	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	J A	J A	J A	J A
19	J A	65	65	98	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
20	J A	27	19	32	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
21	J A	20	27	30	J A	28	24	22	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
22	J A	25	30	23	J A	19	16	20	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
23	E B	16	31	22	J A	E B	31	16																
24	J A	45	25	27	J A	32	24	20	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
25	32	J A	24	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
26	J A	E B	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	J A	J A	J A	J A	J A	J A	J A
27	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
28	J A	31	27	37	J A	31	30	23	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
29	J A	48	20	16	J A	22	22	19	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
30	28	34	26	26	J A	26	26	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
31	J A	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	J A	J A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	29	30	31	31	31	31	31
MED	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
U Q	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
L Q	22	22	20	19	20	19	20	25	29	33	34	34	33	32	31	27	22	23	27	25	24	25	21	24

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

IONOSPHERIC DATA STATION Wakkanai

OCT. 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 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	G 18					G 30		G 28	25	21	17	E 16	B 16		18	18	18	E 16	B 16			
2	A 21	16	16	17	E 16	B 16	E 16	B 15	23	24	30	29	32	30	32	30	30	22	24	E 16	B 16	19	E 16	B 16	16	16	E 16	B 16		
3	19	18	E 16	B 16	E 16	B 16	E 16	B 16	G 24	27	28	32	30	31	30	28	26	20	E 16	B 16	20	17	18	17	16	16	E 16	B 16		
4	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	G 16					G 29	33	38	33	33	38	29	25	18	7	25	E 16	B 16	E 16	B 16		
5	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	G 18	24	27	30	30	33	32	40	34	36	23	17	18	16	16	16	16	16	16	16		
6	E 16	B 16	E 16	B 19	16	21	18	20	22	25	29	32	32	32	31	28	26	22	21	16	16	24	20	17	16	E 16	B 16			
7	E 16	B 16	E 16	B 16	19	16	30	28	26	28	32	32	32		G 30	30	25	20	20	28		E 16	B 16	E 16	B 16	E 16	B 16			
8	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	E 16	A 25	32	32	30	30	31	30	28	25	38	28	17	30	17	E 16	B 16	E 16	B 16			
9	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	A 57	A 75	26	30	30	34	30	30	31	24	26	25	17	16	20	17	24	21	E 16	B 16		
10	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	G 25	31	30	33	32	32	33	28		G 18	17	17	16	16	16	16	16	16	16	16		
11	E 16	B 16	E 16	B 16	E 16	B 15	17	23	29	35	50	76	38	42	26	23	20	15	25	16	16	21	17	16	E 16	B 16	E 16	B 16		
12	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	G 30	33	34	38	41	29	34	30	27	26	24	15	15	16	16	15	16	E 16	B 16	E 16	B 16	
13	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 25	27	33	31	31	30	31	29	25	23	24	25	26	18	16	18	24	E 16	B 16		
14	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	17	23	27	32	35	29	34	31	29		G 20	16	16	16	16	16	16	16	16	16		
15	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	16	24	30	33	35	30	32	42	29	42	24	22	16	18	18	22	16	16	E 16	B 16		
16	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 17	20	24	29	31	31	30	35	31	29	23	19	16	19	16	16	16	16	16	16	16		
17	17	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	22	26	30	30	32	31		G 28	25	25	21	18	17	18	16	16	16	16	17		
18	E 16	B 17	17	17	E 16	B 16	E 16	B 16	E 16	B 22	36	36	33	36	42	37	24	25	19	21	28	16	16	17	17	17	E 16	B 16		
19	16	E 16	B 24	E 16	B 18	18	16	24	31	43	32	30	34	33	27	24	23	26	23	17	20	16	16	16	16		E 16	B 16		
20	16	16	E 16	B 17	16	16	16	23	23	30	29	30	30	31	31	29	20	22	16	16	22	16	16	16	16	16	16	17		
21	E 16	B 17	E 16	B 16	E 16	B 16	E 16	B 16	G 22	27	29	37	34	36	30	25	24	24	35	23	16	16	16	16	16	16	E 16	B 16		
22	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	G 23	30	30	31	33	34	32	27	24	17	16	19	23	18	16	16	16	16	E 16	B 16		
23	E 16	B 22	16	E 16	B 16	E 16	B 16	E 16	B 17	24		28	31	40	33	29	28	42	20	25	18	23	23	36	17	22	E 16	B 16		
24	16	16	E 16	B 15	E 16	B 15	E 16	B 15	34	29	32	32	77	35	30	30	25	26	22	22	E 16	B 24	26		20	21	17	E 16	B 16	
25	E 16	B 17	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 23	29		G C	C	C	C	C	C	C	C		16	19	16	16	16	16	16		
26	19	E 16	B 16	E 16	B 16	E 16	B 16	G 20	20	A		C	C	C	C	C	C	C	C		16	16	18	24	20	18	18	E 16	B 16	
27	16	E 16	B 18	E 16	B 18	E 16	B 21	17	G 28	34	32	51	36	36	30	23	G 16	G 17	G 17	23	16	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	
28	21	17	E 16	B 18	E 16	B 18	E 16	B 15	16	19	28	30	30	30	34	32	24	19	20	A 58	20	17	21	16	16	23	E 16	B 16		
29	24	16	E 16	B 16	E 16	B 16	E 16	B 16	19	G 23	G 28	38	33	30	28	24	24	26	20	17	19	21	21	18	16	E 16	B 16	E 16	B 16	
30	16	17	E 16	B 17	17	18	E 16	B 16	20	G 24	G 28	30	37	32	28	28	22	G 18	16	16	16	16	16	16	16	16	E 16	B 16	E 16	B 16
31	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 18	16	G 23	29	30	30	28	G 28	G 24	G 24	25	17	17	19	16	16	16	16	16	16	16	16	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	31	31	31	31	31	31	31	31	30	31	29	29	29	29	29	29	29	29	30	31	31	30	31	31	31					
MED	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	G 28	30	32	32	32	31	28	25	22	20	17	17	16	16	16	16	16	16	E 16	B 16	E 16	B 16
U Q	17	16	17	16	16	16		G 24	30	33	35	34	34	34	30	26	25	24	23	20	18	20	17	17	16	16	16	16	16	
L Q	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	G 22	26	29	30	30	30		G 27	24	G 20	17	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	

OCT. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
2	16	16	16	16	16	14	13	16	16	15	15	17	16	16	16	16	16	16	16	16	16	16	16	16
3	16	17	16	16	16	16	16	16	16	18	18	16	22	18	14	14	12	18	16	16	17	16	16	16
4	16	16	16	16	16	16	16	16	14	16	15	16	16	17	16	12	187	16	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	16	16	16	15	15	15	14	14	16	17	16	16	16	16	16	16
6	16	16	16	16	16	16	16	15	15	15	16	16	16	14	14	14	16	16	16	16	16	15	16	16
7	16	16	16	16	16	16	16	15	15	16	16	16	16	15	16	16	15	15	17	17	16	16	16	16
8	16	16	16	16	16	16	15	15	15	16	16	16	16	16	16	14	16	16	16	16	16	16	16	16
9	16	16	16	16	16	16	16	16	16	17	16	16	17	16	16	16	15	15	15	16	16	16	16	16
10	17	16	16	16	17	16	12	16	16	16	18	16	16	10	16	15	15	17	17	16	16	16	16	16
11	16	15	16	16	16	15	16	16	14	16	16	16	16	15	17	16	16	15	16	16	16	16	17	16
12	16	15	15	16	16	16	14	15	15	16	16	16	16	16	15	16	16	16	15	16	16	16	15	15
13	16	16	16	16	16	16	16	16	15	15	16	18	16	16	15	16	16	16	16	16	16	16	16	16
14	16	16	15	16	16	16	12	14	16	15	16	16	15	16	16	12	10	16	16	17	17	16	16	16
15	16	16	16	16	16	16	16	16	16	15	17	18	17	16	16	16	15	16	16	16	16	16	16	17
16	16	16	16	16	16	17	16	15	15	16	16	16	16	16	16	16	14	16	16	16	16	16	16	16
17	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	16	16	16	16	16	16	16
18	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	15	15	16	16	16	16	16	16	16
19	16	16	16	16	16	16	16	14	16	16	16	16	16	16	14	16	16	14	16	16	16	16	16	16
20	16	16	17	15	16	16	16	13	16	14	15	14	15	15	14	15	15	16	15	14	15	16	16	17
21	17	16	16	16	16	16	16	16	15	15	15	15	16	16	16	16	16	16	15	16	16	16	16	16
22	16	16	16	16	16	16	16	16	16	16	16	15	15	11	11	14	14	16	16	16	16	16	16	16
23	16	15	15	16	16	16	16	16	16	16	17	16	16	16	14	14	15	15	16	16	16	17	16	16
24	15	15	16	16	16	16	16	15	15	15	15	16	17	16	16	15	15	15	16	17	16	16	16	16
25	16	16	16	16	16	16	16	12	15	16	C	C	C	C	C	C	C	C		16	16	16	16	16
26	16	16	16	16	16	16	16	16	16	16	C	C	C	C	C	C	C		16	16	16	16	16	16
27	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	12	14	16	16	16	16	16	16
28	16	16	16	16	16	16	10	16	11	15	15	15	15	16	16	15	16	16	17	15	15	15	15	15
29	16	15	16	16	17	17	16	12	16	16	16	16	16	17	17	14	16	16	16	15	16	15	15	17
30	16	15	17	16	16	16	16	16	16	16	14	16	14	14	14	16	15	16	16	16	16	16	16	16
31	16	16	16	16	16	16	16	16	12	13	16	16	16	15	15	12	16	17	17	16	16	16	16	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	29	30	31	31	31	31	31	31
MED	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	16	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	15	14	14	15	16	16	16	16	16	16

OCT. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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	309	321	326	331	364	357	379	378	367	371	367	351	351	330	354	352	338	357	322	323	314	317	332	323
2	336	315	333	329	354	304	368	388	380	395	341	348	359	345	346	346	342	359	340	332	318	313	330	305
3	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
4	328	314	314	305	297	315	370	372	368	337	344	334	358	370	373	332	354	361	364	295	322	322	308	305
5	F	F	F	F	F	V	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
6	322	322	322	329	256	375	387	370	371	354	371	353	333	338	364	382	381	369	326	332	336	334	323	316
7	294	297	334	F	Z	321	243	396	368	368	374	357	359	346	359	358	377	365	317	333	337	324	323	321
8	311	287	296	282	316	312	334	352	R	252	313	327	355	H	321	350	381	346	353	344	F	280	F	F
9	F	F	F	F	F	F	A	A	348	357	339	369	316	356	359	352	355	349	345	332	326	328	310	337
10	301	318	314	312	309	307	366	375	G	239	327	357	359	372	351	352	365	346	344	324	325	310	F	F
11	298	298	338	347	340	350	378		328	350	A	A	300	228	329	347	385	349	343	329	310	302	329	306
12	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
13	323	299	289	300	350	358	379	396	359	364	359	300	370	367	376	365	371	365	215	322	326	300	284	301
14	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
15	292	292	323	302	291	300	370	358	375	345	327	369	343	384	357	351	360	370	319	333	330	306	306	279
16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
17	295	295	304	313	333	349	346	378	354	350	315	346	370	313	368	348	351	358	328	312	305	324	324	318
18	315	307	327	307	340	312	360	370	377	353	326	348	365	359	350	320	365	375	347	303	335	324	319	329
19	302	297	301	308	317	345	376	380	364	356	346	355	380	347	370	349	370	364	349	333	344	307	341	327
20	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
21	325	311	305	322	358	349	367	380	357	377	363	380	368	374	353	372	361	369	348	362	342	345	301	339
22	311	300	283	293	293	335	372	368	380	379	344	348	373	379	351	355	358	368	286	333	340	337	300	325
23	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
24	341	322	328	333	315	355	384	388	382	335	367	371	376	344	350	361	368	362	343	341	349	331	351	336
25	328	303	311	308	318	318	362	386	381	371	360	341	369	376	357	376	365	381	278	300	342	308	308	337
26	291	320	347	326	326	334	377	389	396	368	354	355	365	362	336	351	360	356	347	322	343	332	332	332
27	313	352	331	342	325	351	323	394	374	368	343	369	374	360	369	369	373	358	348	328	328	346	321	330
28	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
29	311	318	324	327	324	365	375	389	398	377	A	339	370	340	355	372	357	303	324	329	242	308	308	337
30	305	305	313	320	333	362	378	399	359	386	C	C	C	C	C	C	C	C	C	C	332	336	336	341
31	316	337	325	314	321	352	372	381	246	368	C	C	C	C	C	C	C	C	C	C	366	319	315	366
32	310	325	331	319	324	338	359	384	385	378	351	383	384	370	361	364	371	338	352	324	307	335	303	317
33	323	318	316	298	335	323	377	375	375	375	394	374	374	375	367	363	373	372	A	311	322	331	288	337
34	308	337	320	322	279	351	370	409	384	395	301	363	382	397	350	377	382	367	317	338	329	323	323	305
35	331	319	332	332	341	389	378	391	377	344	392	329	371	363	377	365	381	379	340	321	328	328	328	337
36	330	340	340	351	336	345	361	375	401	382	392	355	371	381	322	370	365	368	356	340	339	339	330	319
37	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	30	30	31	31	27	28	29	29	29	29	29	30	30	31	31	31	31	31
MED	311	314	322	314	324	345	371	380	368	368	351	355	365	362	357	352	365	363	336	325	328	324	321	323
U Q	325	322	331	329	340	355	378	389	380	377	367	366	372	373	368	367	372	368	347	333	337	334	330	337
L Q	302	299	305	305	309	316	361	372	357	350	338	344	356	344	350	348	356	355	319	315	319	310	306	309

OCT. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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	L	383	L	L		L							
2						374			L		413	419	392	L	L	L	L							
3								L	L				L	L	L		L							
4							L		L	L	L	L	387	L	L	L	L							
5									L				L	L		A	A	L						
6								L	L	L	L	L	391	L	L	L	L							
7							R		L		L		L		L	L								
8							239	L	L	A	A	L	402	L	L	L	L	A						
9							A	A	L		L	L	L	L	L	L	L			399				
10										381														
11								L	L	L	L	A	A	L	A	L	L							
12										L	L	A	L	L	405		L							
13								L	A	A	L	L		389	L	L	L							
14						L	L	L	L		L		L	L										
15						L			L		L	L	L	A	A	A	L							
16									L	L	L	L	L	L										
17								L	L	L	L	L	L		L									
18								L		L	L	L	A	A	L	L								
19											L	L	L											
20										L	L	L	L	L	L	L								
21									429	L	L	L	L	L		L								
22									L	L	L	L	L	L										
23										L	L		L	L										
24							A			L	A	L	L	L	L	L	L					L		
25						L				L	C	C	C	C	C	C	C	C	C					
26								L	A		C	C	C	C	C	C	C	C						
27															393		L	L	L					
28										L	L	L	L											
29										L	L	L	L	L	L						358			
30									L	L	L		L			L								
31							L	L	L	L	L	L	L	404	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						1	2	1	2	6	3	5	5	3	2				1	1				
MED						374	316	566	343	381	396	401	389	399	399			358	399					
U Q										390	413	410	392	404										
L Q										373	368	388	385	392										

OCT. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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									246	252	248	268	248	304	272		246							
2						278			246		294	270	254	284	264	272	248							
3								234	270	306	216	268	258	272	252		260							
4							214	212	236	270	268	302	236	236	242	244	234							
5									240	226	250	294	264		254	260	222							
6								230	230	242	242	246	262	268	242	228	222							
7						460			220	246	246	254	246	246	236	236								
8							256	236	A	292	310	288	308	268	240	240	452		238					
9							A	A		272	262	262	254	296	258	262	256							
10										G														
11								G	498		294	260	240	226	A	242	242	232						
12									302	268		A	A	298		288	256							
13									240		252	282	278	234	238	236	258							
14									224	214	254	258	258	238	238	236	244							
15						260	234	220	228	270	284	220	248	222										
16						236			240		288	254	230	318	230	E A	248	248						
17											236	226	262	256	232	248								
18								224	224	248	262	238	226	238	238									
19									208		236	250	244	240	230	230	230							
20											256	250	216											
21									208	232	246	228	220	230	230	230								
22											228	226	238	242	236		274							
23											214	228	250	250	230	240								
24											222	260		224	234									
25							A					A	246	226	262	238	230		322					
26						218					C	C	C	C	C	C	C	C	C					
27											E A		C	C	C	C	C	C						
28									214	438														
29													254			240	248	228	242					
30											226	216	226	226										
31											214	316	222	220	202	228			224					
											214	244	232		232	224		232						
											214	214	208	218	214	248	218	224	224					
CNT						4	6	11	21	26	27	25	28	23	22	17	10	3	1					
MED						248	237	224	233	243	256	254	236	238	240	243	240	242	238					
U Q						269	256	234	258	262	282	268	251	268	254	256	248	322						
L Q						227	214	214	217	226	246	243	226	230	236	231	228	224						

OCT. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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	232	232	232	232	200	214	214	216	198	198	202	202	194	190	202	254	204	218	218	234	258	252	226	238		
2	248	264	236	224	204	224	212	200	214	210	192	180	198	192	198	214	224	214	216	222	224	232	242	242		
3	^F 242	^Q 256	^Q 244	^Q 242	^Q 230	216	208	202	200	200	214	190	184	192	^A 202	240	224	226	200	232	248	242	242	242		
4	220	246	232	232	218	214	194	166	208	200	226	194	202		^A 182	^A 190	218	212	202	252	234	^Q 208	^Q 240	^Q 220		
5	^Q 244	264	264	222	196	198	184	206	200	186	186	196	204	244		^A	206	206	228	252	244	228	228	200		
6	234	250	250	232		^A 202	200	200	200	196	196	196	196	196	202	202	202	220	228	248	248	222	^Q 264	238		
7	238	238	230	256	256	234		190	190	192	204	194	196	196	200	200	218	204	204	^{E A} 276	218	252	238	258		
8	274	254	268	^{E A} 292	256	280	200	200		^A	^A 200	200	214	198	198	198		^A 234	218	^Q 262	^Q 238	^Q 238	^Q 258	^Q 226		
9	^Q 260	^Q 254	242	240	242	272			200	224	202	200	198	206	214	214	222	212	230	230	248	236	^{E A} 306	238		
10	274	248	260	260	268	252	202	220	^{E A} 424	206	198	196	196	206	194	212	200	218	212	226	234	^Q 250	^Q 274	272		
11	286	272	242	242	218	218	226	218	226	226			202		206	214	218	226	248	274	256	252	244	244		
12	^{E A} 242	230	^Q 230	^Q 258	238	270	202	214	232	222	232		^A 204	210	204	216	222	222	222	238	224	238	^Q 238	^Q 242		
13	224	242	^Q 254	236	214	220	218	196		^A	196	200	182	^H 194	192	200	228	214		^A 250	250	240	252	^A		
14	^Q 254	^Q 260	^Q 248	260	234	216	200	188	232	200	216	216	192	^H 178	222	208	232	204	230	242	226	246	254	248		
15	248	264	264	254	216	204	192	228	206	210	200	194	200		^A	^A	^A	200	200	232	252	220	252	236		
16	240	262	250	260	240	218	214	228	212	206	200	190	218	194	228	224	214	202	210	264	232	232	256	238		
17	230	262	274	254	254	216	194	198	198	198	198	204	194	196	204	240	216	220	216	102	228	282	234	242		
18	234	234	258	242	214	204	212	198	238	212	192	200		^A	^A	198	218	224	210	236	214	214	208	236	224	
19	242	268		268	268	196	198	212	220	208	194	180	192	210	196	220	220	204		^A 230	222	222	264	244		
20	228	236	236	236	236	196	216	210	198	^H 174	202	^H 176	176	186	190	206	222	214	222	232	212	230	226	236		
21	236	268	^Q 250	250	234	218	210	200	196	186	230	194	204	220	206	228	206	204		^A 276	242	242	256	236		
22	264	254	226	226	218	222	206	198	198	188	196	196	196	206	244	226	220	222	234	248	236	224	224	230		
23	244	226	234	216	234	204	200	216	216	194	200	224	212	190	220	236	210	226	226	276	246	258	232	242		
24	232	244	^Q 226	228	228	210		^A 210	202	194		^A 204	198	196	204	222	222	192	274	258		^A 252	254	222		
25	^Q 258	258	^Q 242	242	224	190	206	194	218	198		^C	^C	^C	^C	^C	^C	^C	^C		224	224	224	216		
26	256	216	216	240	246	216	196	196		210		^C	^C	^C	^C	^C	^C	^C		204	252	252	246	244	222	222
27	222	234	234	244	244	218	202	204	210	218	194	222	222	220	202	202	200	200	250	234	244	230	252	246		
28	202	236	246	246	246	192	204	196	210	192	200	180	206	216	226	218	196	216		^A 270	230	246	260	252		
29	240	224	232	240	^Q 232	208	188	188	218	206		^A 204	186	196	190	216	200	202	230	230	234	234	272	242		
30	248	252	254	234	234	190	182	188	192	192	190	254	194	186	220	204	214	212	232	232	240	240	240	240		
31	246	246	224	210	^Q 214	214	184	184	188	204	172	190	190	198	190	222	204	214	212	252	216	216	236	252		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	30	31	30	31	28	30	28	29	26	27	28	25	27	27	28	30	27	31	30	31	31	30		
MED	242	250	242	241	234	216	202	200	206	200	200	196	197	196	202	216	217	213	226	245	234	238	242	239		
U Q	254	262	254	254	244	220	211	212	218	210	202	204	204	208	214	224	222	220	232	258	246	250	256	244		
L Q	232	236	232	232	218	204	195	196	198	193	194	190	193	192	196	204	204	204	216	230	224	228	234	230		

OCT. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT.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

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	144	114	114	A	A	106	96	106	106	A	100	A	A					
2						B	96	A	108	100	100	100	100	98	98	102	106	A	A					
3						96	90	100	108	112	110	110	106	96	100	98	92	B	A					
4						B	90	114	110	110	104	104	106	106	A	104	A	A	A					
5						B	A	100	98	98	94	94	102	108	108	108	108	B	A					
6						B	A	100	102	96	108	108	102	110	108	108	118	A	A					
7						A	A	A	106	104	104	104	104	104	104	104	A	A	B					
8						122	A	114	98	A	A	102	A	102	106	106	110	A	106					
9						106	A	A	102	102	98	98	98	112	108	108	96	A	B					
10						B	128	104	104	104	102	A	102	A	106	114	104	B	B					
11						B	A	128	112	112	112	112	100	100	114	106	154	B	A					
12						A	130	118	106	110	110	110	110	110	110	A	A	A						
13						B	B	110	104	104	104	104	104	100	100	110	A	A						
14						B	130	100	104	110	100	104	104	100	100	100	100	A						
15						88	A	126	112	112	106	106	A	A	A	A	A	A						
16						B	A	106	A	98	98	98	92	104	104	A	124	B						
17						A	A	A	110	110	110	110	110	96	110	A	100	110						
18						94	A	124	108	108	A	A	A	A	A	108	106	A						
19						B	B	A	106	106	106	106	A	A	A	A	110	A						
20						B	A	112	110	110	104	A	A	104	104	104	128	128						
21						110	106	122	116	110	110	104	A	A	A	A	A	A						
22						B	126	106	104	104	104	102	A	102	A	A	122	A						
23						B	A	122	118	110	A	A	A	A	110	110	110	A						
24						B	132	132	116	110	110	110	102	A	A	108	A	A						
25						B	108	108	108	108	C	C	C	C	C	C	C	C						
26						A	108	126	106	106	C	C	C	C	C	C	C	B						
27						B	A	112	112	112	106	106	106	106	A	106	116	98						
28						B	98	130	110	110	110	100	A	A	A	104	A	A						
29						B	114	120	120	110	A	A	110	A	A	A	A	A						
30						B	110	110	98	98	98	A	100	100	116	102	A							
31						B	104	98	110	104	104	104	104	104	104	A	104	A						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						6	13	26	30	29	25	24	18	21	19	19	20	3	1					
MED						101	108	113	108	110	104	104	103	104	106	106	106	110	106					
U Q						110	130	122	112	110	110	107	106	107	108	108	117	128						
L Q						94	97	106	104	104	101	101	100	100	100	104	101	98						

OCT.2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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	B	96	96	B	B	B	126	150	138	110	100	92	G	94	90	90	104	104	104	104	98	94	94	94	
2	88	90	90	96	92	104	92	92	126	136	112	116	100	100	100	106	112	102	104	98	100	100	100	94	
3	94	94	106	96	92	110	G	132	136	104	144	106	106	140	138	128	130	B	94	84	98	94	90	86	
4	B	88	88	B	116	96	96	G	96	124	112	120	120	112	92	102	98	98	98	B	B	86	88	88	
5	90	B	102	B	B	B	100	100	106	94	112	92	136	112	104	104	104	B	94	102	102	B	B	B	
6	106	90	102	102	102	102	102	98	100	106	116	112	108	108	114	114	142	104	104	96	96	96	96	96	
7	96	102	106	106	94	94	98	94	146	140	114	112	112	G	112	112	98	98	102	102	92	96	96	96	
8	96	B	B	116	B	126	106	90	102	96	96	96	90	100	122	102	112	112	116	92	92	92	B	98	
9	96	90	110	102	100	100	94	102	124	186	128	100	126	116	110	110	110	100	106	94	98	98	98	98	
10	98	98	88	94	82	90	G	120	120	110	108	90	98	88	138	G	124	B	B	B	B	100	100	96	
11	112	100	B	116	B	B	104	150	112	112	106	106	96	96	164	104	164	B	110	B	94	100	114	100	
12	100	92	92	86	98	120	G	124	122	106	106	106	106	104	98	98	98	94	94	106	B	B	104	96	
13	B	86	86	86	86	B	B	116	110	114	114	108	108	108	96	110	G	96	96	96	96	96	102	94	94
14	94	86	90	B	B	B	154	112	112	108	108	96	144	84	130	G	118	96	96	88	98	98	106	100	
15	100	96	96	96	B	90	114	146	124	106	106	106	96	96	96	96	96	98	98	88	88	88	88	88	
16	98	102	98	B	98	98	98	144	96	118	118	106	98	98	102	98	124	B	94	94	B	94	B	94	
17	92	90	90	90	90	90	100	114	104	144	92	112	94	G	92	92	128	112	102	102	102	102	102	98	
18	104	104	104	100	100	94	94	144	108	108	108	102	102	94	94	136	122	112	108	B	108	92	86	136	
19	102	100	100	126	96	92	106	102	106	106	110	104	96	96	96	98	120	108	102	102	106	96	96	96	
20	102	102	102	98	116	106	100	130	130	94	108	102	94	186	96	94	100	130	106	108	88	112	106	114	
21	94	94	100	100	88	88	96	110	138	106	100	100	94	94	94	94	94	94	102	96	96	88	98	B	
22	98	98	98	98	B	98	134	120	108	120	108	102	102	102	102	96	96	96	112	104	104	104	B	90	
23	B	96	96	96	96	B	144	114	G	110	104	98	98	94	100	106	98	112	100	100	100	100	108	108	
24	108	92	100	92	92	102	124	124	114	114	98	98	100	94	90	104	120	110	106	106	94	100	100	102	
25	122	100	114	94	94	98	100	90	116	G	C	C	C	C	C	C	C	C	C	102	100	106	106	100	100
26	100	B	B	B	100	90	90	114	104	104	C	C	C	C	C	C	C	C	112	98	100	100	94	94	114
27	100	96	92	92	92	92	92	G	106	106	106	102	98	98	98	132	116	96	102	88	88	88	88	98	
28	98	98	98	98	98	98	96	120	110	110	102	102	94	90	90	106	96	96	96	96	96	106	110	98	
29	98	84	B	92	94	94	94	110	118	108	102	94	104	104	94	94	96	96	96	96	96	90	94	94	
30	84	86	90	90	90	96	96	90	100	100	100	98	86	164	158	90	90	94	102	84	B	B	B	88	
31	92	90	B	B	90	90	88	88	112	158	134	102	92	92	92	92	92	92	92	88	88	88	84	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	27	28	26	24	24	24	27	29	30	30	29	29	28	27	29	27	29	25	30	27	27	28	26	28	
MED	98	95	98	96	94	97	100	114	112	109	108	102	99	98	98	104	104	98	102	98	96	96	97	96	
U Q	102	99	102	101	99	102	106	127	124	118	113	106	107	108	113	110	121	111	104	102	100	100	102	100	
L Q	94	90	90	92	91	91	94	99	106	106	102	98	96	94	94	96	96	96	96	94	92	92	94	94	

OCT. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

OCT. 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	F1				LC21	H2	HL11	L1	L2	LC11		LC11	L2	L4	C3	LQ11	L1	F1	F4	F2	F3	FQ21	
2	F2	FQ21	FQ21	FQ11	F1	L1	LC21	L3	CL22	CL21	C2	C1	C1	C2	C2	L3	C2	L4	L2	FQ31	F1	F2	F1	F2	
3	F3	F2	F1	F1	F2	C1		C2	C2	C1	C1	C1	C1	HL11	HL11	C1	HL11		L2	F2	F4	F4	F1	F1	
4		F1	F1		F1	L1	C2		C2	C2	C4	C2	C2	C2	L3	L3	L3	L3	L2			F1	F1	F1	
5	F2		F1			L1	L2	C2	LC21	CL12	LC21	C1	C2	C3	C6	L2	L2	L2	F2	F1					
6	F1	F3	F4	F2	F4	L3	L4	LC21	C2	C1	C2	C1	C1	C1	C2	CL21	L3	L2	F4	F4	F3	F3	F3	F1	
7	F1	F2	F1	F3	F5	L3	L4	L4	HL11	HL11	C1	C1	C1		C1	C2	L3	L4	L3	FQ41	F3	F2	FQ21	F2	
8	F1			F1		C1	L2	LC4	C4	L3	L3	L2	L3	CL12	C2	C2	C3	C3	C3	F5	F2	F1		F1	
9	F1	F1	F1	F2	F2	L2	L5	LQ51	CL22	HL12	CL22	L2	CL11	CL21	C2	C3	C6	L4	L1	F1	F4	F2	F5	F4	
10	F2	F1	F3	FQ11	FQ21	L1		C2	C3	C2	C2	L2	L2	L3	HL11		C1					F1	F2	F4	
11	F1	F1		F1		L1	C1	C3	C3	CQ41	CQ51	C3	CC53	HL11	C2	H1		L4		F1	F2	FQ21	F2	F2	
12	F2	F1	F2	F1	F1	LL11		C3	C4	C4	C4	C3	C2	C3	C3	L3	L4	L3	F1	F1			F2	F2	
13		F1	F1	F2	F1			F2	C1	C3	C1	C2	C2	C2	C3	C2	C2	L2	F2	F2	F3	F2	F3	F3	
14	F2	F2	F1			H2	C2	C3	C2	C2	C2	C1	H1	C1	C2		CL21	L1	F1	F1	F1	F1	F1	F1	
15	F1	F3	F3	F3		C1	L1	C1	C2	C3	C3	C2	L2	L4	L4	L4	L3	L4	F2	F2	F3	F2	F2	F1	
16	F2	F2	F1		F1	L4	L3	C2	L2	CL22	C1	C2	C2	LC21	C2	L3	C1		F2	F2		F2		F2	
17	F2	F1	F1	F1	F1	L1	L2	L2	C1	CL22	LC21	C4	L2		LC21	L3	CL21	C2	FQ31	FQ31	F3	F3	F1	F2	
18	F1	F5	F3	F3	F2	C1	C2	C2	C3	C3	C2	L2	L4	L2	L3	C1	CQ21	L2	F4		F1	F2	F2	F1	
19	F5	F5	F6	CL11	L2	LQ21	L3	L3	C6	C4	C1	C2	L2	L3	L3	L3	C2	L3	F7	F4	F2	F2	F2	F2	
20	F3	F2	F2	FQ21	FQ21	L3	L5	C2	CL12	C2	C2	L1	L2	L11	C2	LC21	LC11	L1	F1	F5	F1	F1	F4	F21	
21	F2	F2	F2	FQ41	F2	L2	L1	L3	C2	C2	C3	C3	L2	L4	L5	L4	L5	L6	F3	F1	F1	F1	F2		
22	F3	F3	F2	F1		L1	C2	C2	C2	C2	C2	C3	C3	L3	L3	L3	L3	C1	FF63	FF33	F3	F2		F1	
23		F2	F1	F1	F3		HL11	C2		C2	L2	L3	L3	L4	C2	C4	C2	L1	FQ31	F4	F2	F3	F3	F7	
24	F3	FF21	F1	F1	F2	L1	L6	C2	C3	C3	C6	C2	C2	L3	L3	C2	C2	L3	F3	F5	F8	F3	F5	F3	
25	FF11	F1	FF11	F3	FQ31	L1	L1	LC11	C2										FF11	F3	F1	F2	F1	F1	
26	F5				F1	L2	C2	C3	C4	C2								L3	F3	F5	F5	F3	F4	FF13	
27	F3	F2	F3	F3	F2	L3	L2		C2	C3	C2	C4	CQ41	CQ41	LQ31	C2	C2	C2	F4	F2	F1	F1	F2	F2	
28	F3	F2	F5	F3	F5	L1	C1	C2	C2	C1	C2	L3	L3	L2	L2	C1	L2	L3	F4	F3	F3	F4	F3	F4	
29	F3	F1		F2	F2	L1	C1	C2	C1	C4	L2	L2	L2	L3	L3	L4	L4	L4	F3	F4	F3	F4	F3	F1	
30	F2	F3	F1	F1	F3		L1	C2	C2	C2	C3	L3	L3	LC11	HL11	C1	C1	L1	F1	F1	F1			F2	
31	F2	F1		F4	F4	L1	C2	C2	H1	H1	LC11	L3	L2	L2	L3	C2	L3	L4	F3	F3	F2	F1	F2		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

IONOSPHERIC DATA STATION Kokubunji

OCT.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	C	C	C	C	C	C	C	C	C	C									X	X	X	X	X	X	44
2		X	X	X	X	X	X												72	52	40	43	43	44	X
3	X	X	X	X	X	X	X	X											X	X	X	X	X	X	X
4	X	X	X	X	X	X													X	X	X	X	X	X	X
5	55	48	45	45	44	33													X	X	X	X	X	X	X
6	X	X	X	X	X	X	X												X	X	X	X	X	X	X
7	X	X	X	X	X	X				X									C	X	X	X	X	X	X
8	X	X	X	X	X	X				61									X	X	X	X	X	X	X
9	X	X	X	X	X	X													X	X	X	X	X	X	X
10	X	X	X	X	X	X													X	X	X	X	X	X	X
11	X	X	X	X	X	X													X	X	X	X	X	X	X
12	X	X	X	X	X	X													X	X	X	X	X	X	X
13	X	X	X	X	X	X													X	X	X	X	X	X	X
14	X	X	X	X	X	X													X	X	X	X	X	X	X
15	X	X	X	X	X	X													X	X	X	X	X	X	X
16	X	X	X	X	X	X													X	X	X	X	X	X	X
17	X	X	X	X	X	X													X	X	X	X	X	X	X
18	X	X	X	C	X	A													X	X	X	X	X	X	X
19	X	X	X	X	X	X													X	X	A	X	X	X	X
20	X	X	X	X	X	X													X	X	X	X	X	X	X
21	X	X	X	X	X	X													X	X	X	X	X	X	X
22	X	X	X	X	X	X													X	X	X	X	X	X	X
23	X	X	X	X	X	X													X	X	X	X	X	X	X
24	X	X	X	X	X	X													X	X	A	X	X	X	X
25	X	X	X	X	X	X													X	X	X	X	X	X	X
26	X	X	X	X	X	X													X	X	A	X	X	X	X
27	X	X	X	X	X	X													X	X	X	X	X	X	X
28	X	X	X	X	X	X													X	X	X	X	X	X	X
29	X	X	A	X	X	X				X									X	X	X	X	X	X	X
30	X	X	X	X	X	X													X	X	X	X	X	X	X
31	X	X	X	X	X	X													X	X	X	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	30	29	29	30	28	3		1								2	7	28	29	30	31	30	31	
MED	X	X	X	X	X	X	X		X								X	X	X	X	X	X	X	X	
U Q	42	41	42	42	42	36	52											56	58	52	45	45	43	42	
L Q	X	X	X	X	X	X	X											X	X	X	X	X	X	X	
	38	38	36	36	34	32	40											49	44	40	39	39	37	37	

IONOSPHERIC DATA STATION Kokubunji

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

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

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

OCT. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT.2018 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							C	C	C	C	432	436	440		A		L	L						
2										460		A	A	A	LU	LU	LU							
3											LU	LU		A	A	A	A	A						
4								L	LU	LU	440	404	424	A	UL		L							
5								L			U	LU	LU			L	A		A					
6								L	LU	LU	424	416	432	436	U	L	L							
7									A	A	A	A	UL	UL	UL	L	L	L	C					
8									A	A	A	UL	UL	A	UL	L	L	L						
9									L	L	LU	LU	LU	LU	LU	L								
10										U	LU	LU	LU	U	L	L								
11									A	A	A	A	A	A	LU	L	A	A						
12									L	A	A	A	A	A	A	L	L							
13											A		U	L	L	L								
14									L	LU	LU	LU	LU	LU	L	L	L							
15										U	L	L	436	400	A			L						
16										LU	LU	LU	LU	L	L									
17										U	L	LU	LU	L	L	L	A							
18									L	A	LU	LU	LU	A	L	L								
19											U	L	LU	LU	L									
20								L	L	L	L	L	LU	LU	LU									
21										U	LU	LU	LU	L	L	A								
22									L		LU	LU	L	A	L	L								
23										L	L	L	L	L	L									
24										L	L	L	A	L	L									
25										A	LU	LU	LU	LU	L	A	A							
26											A	LU	LU	L	L									
27										A	L	A		L	A	A								
28										L	A	L	396	L	L	L								
29										L	L	L	400	A	L	A		A						
30										L	LU	LU	LU	L		L								
31										L	420	424	L	LU	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									1	9	10	19	17	9	3	1								
MED								380	U	LU	LU	LU	LU	LU	LU	LU	LU	LU						
U Q									432	432	436	436	436	434	464									
L Q									U	L	U	L	U	L										
									408	416	420	400	412	408										

OCT.2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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							C	C	C	C	312	R	RU	RU	UA	UA	UA	A						
2							B	UA	A	A	A	A	A	A	A	A	UA	UA	B					
3								A	A	A	A	A	A	A	A	UA	UA	A	B					
4							B	A	A	A	R	A	A	A	UR	UR	A	A	B					
5							B					A	A	A	A	A	A	A	B					
6								224	280	296	328													
7							B	A		A	A	A	A	A	A	A	A	A	C					
8							B	UA	UA	UA	A	A	A	A	A	UR	UR	A	B					
9							B	UR		A	UA	UA	A	R	R	UR	UA	A	B					
10							B	UA	UA	UA	UR	UR	UR	UR	UR	UR	UR	A	B	B				
11							B	232	A	A	A	A	A	A	A	A	A	A	B					
12							B	UA	A	A	A	A	A	A	R	A	A							
13							B	A	A	A	A	R	UR	UR	R	UR	UR	B						
14							B	A	A	A	A	R	UR	UR	UA	UA	UA	B						
15							B	UR		R	R	UR	UR	UR	UR	UR	UR	B						
16							B	UA	A	R	R	A	A	UR	UA	UA	A	B						
17							B	UR	A	A	A	R	A	A	UR	UR	A	B						
18							B	A	A	A	A	A	A	A	R	UA	UA	A						
19							B	UA	A	A	A	A	A	A	A	A	A	A						
20							B	224	A	R	A	R	R	R	UA	UA	A	B						
21							B	A	A	A	A	R	UA	UR	UA	UA	A	B						
22							B	UA	A	A	A	A	R	A	UA	UA	UA	B						
23							B	UA	A	A	A	R	A	A	UR	UR	A	B						
24							B	A	A	A	R	R	A	UR	UR	UA	UA	B						
25							B	UA	R	A	A	A	A	A	A	A	A	B						
26							B	224	A	A	A	A	A	R	UA	UA	A							
27							B	UR	A	A	A	A	A	A	A	A								
28							B	UA	A	A	A	R	R	R	UR	UR	UA							
29						B	UA	UR	A	A	A	A	A	A	A	A	A	B						
30							B	UR	A	A	A	R	UR	UR	UR	UR	UR							
31							B	UR	UR	UR	UR	R	A	UA	UA	UR	UA							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								21	7	4	4	3	1	7	13	16	8							
MED								U	U	U	306	318	320	320	316	284	256	210						
U Q								U	U	U	326	332	320	288	266	220								
L Q								U	U	U	306	320	U	U	U	U	U							

OCT. 2018 foE (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	C	C	C	C	C	C	C	C	C	C	34	G	G	37	34	30	28	26	20	E B	16	18	E B	16	18	18	
2	E B	17	18	E B	E B	E B	E B	22	31	33	38	44	40	47	35	37	30	30	20	E B	E B	16	16	20	23	20	21
3	E B	E B	E B	E B	E B	E B	E B	20	30	34	36	33	38	39	40	43	38	34	23	40	31	18	19	E B	16	18	
4	E B	16	18	18	E B	E B	E B	18	31	32	35	G	36	36	37	34	32	35	29	E B	16	23	22	E B	E B	E B	
5	18	E B	E B	E B	E B	E B	E B	18	25	31	33	34	36	36	38	32	36	23	26	26	22	20	E B	E B	15	15	
6	E B	E B	E B	E B	E B	E B	E B	22	24	31	G	26	34	37	36	32	31	25	17	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	31	37	73	A A A	65	42	35	36	33	30	24	C	22	22	23	E B	17	23	E B	
8	E B	E B	E B	E B	E B	E B	E B	21	24	28	39	41	36	38	34	31	G	25	24	23	21	E B	16	22	E B	E B	
9	E B	E B	E B	E B	E B	E B	E B	G	31	33	33	36	34	G	G	24	30	26	19	E B	16	23	16	16	16	18	
10	20	17	16	E B	E B	E B	E B	25	30	32	G	G	G	G	G	G	G	22	27	20	20	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	18	18	26	35	45	39	39	38	34	31	57	A A	80	16	20	21	20	18	19	19
12	E B	16	16	E B	E B	E B	E B	24	25	29	42	46	A A	55	50	62	G	30	23	E B	15	19	20	20	18	19	22
13	E B	16	18	E B	E B	E B	E B	20	26	31	33	40	G	G	G	G	G	G	E B	16	16	16	16	16	24	17	
14	18	21	E B	E B	E B	E B	E B	18	26	29	30	31	G	G	G	32	28	23	18	17	16	15	15	15	15	15	
15	E B	E B	E B	E B	E B	E B	E B	G	32	G	G	G	G	20	35	31	28	G	E B	16	15	15	19	19	20	E B	16
16	E B	E B	E B	E B	E B	E B	E B	25	30	G	G	G	33	33	G	32	28	26	25	E B	16	21	26	20	17	18	
17	26	E B	E B	E B	E B	E B	E B	28	26	35	34	G	41	32	G	G	G	28	21	E B	E B	18	E B	E B	E B	19	
18	E B	22	E B	C	16	A A	47	17	30	30	39	35	37	37	40	G	28	26	25	23	22	21	E B	15	18	20	
19	E B	E B	E B	E B	E B	E B	E B	26	31	33	32	34	36	34	31	30	27	19	22	18	A A	84	18	E B	E B	E B	
20	E B	16	17	E B	E B	E B	E B	25	29	G	33	G	G	G	34	29	24	18	25	21	E B	E B	E B	E B	E B	19	
21	19	E B	16	21	E B	E B	E B	17	26	28	32	32	G	32	G	33	36	35	22	E B	16	21	16	17	16	15	
22	E B	E B	16	E B	E B	E B	E B	25	27	28	31	34	33	G	43	32	28	26	24	22	32	20	17	22	E B	16	
23	21	16	E B	E B	E B	E B	E B	25	32	32	34	G	31	32	G	28	30	16	17	16	16	16	16	24	17	E B	
24	E B	E B	16	E B	15	23	23	16	28	29	33	G	41	G	33	30	21	20	26	41	A A E B	16	17	E B	E B	16	
25	E B	E B	E B	E B	E B	23	20	29	23	18	47	36	34	34	36	49	43	34	33	A A E B	140	15	20	18	18	16	
26	E B	E B	E B	E B	E B	E B	E B	24	28	32	43	37	33	G	32	28	33	28	28	A A	80	18	E B	16	18	19	
27	18	E B	E B	E B	E B	E B	E B	G	34	36	34	39	43	35	37	30	26	22	19	23	20	E B	E B	E B	E B	16	
28	18	E B	E B	E B	E B	E B	E B	24	28	32	37	G	G	G	G	G	G	22	15	16	16	16	16	16	117	19	
29	23	23	A A E B	15	17	16	25	21	G	33	36	34	34	39	28	28	24	31	21	16	15	16	18	18	E B	16	
30	E B	E B	E B	E B	E B	E B	E B	23	G	31	33	34	G	G	G	G	36	20	16	16	20	E B	E B	E B	E B	16	
31	E B	15	15	E B	E B	E B	E B	G	G	G	G	G	G	35	32	31	26	20	16	15	16	17	16	15	15	15	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	30	29	30	30	30	30	30	30	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	
MED	E B	E B	E B	E B	E B	E B	E B	18	25	30	33	34	34	34	34	32	29	26	20	19	20	18	E B	E B	E B	E B	
U Q	18	17	16	16	16	16	21	27	32	36	37	37	38	37	33	30	30	25	23	22	20	18	19	19	19		
L Q	E B	E B	E B	E B	E B	E B	E B	24	28	31	31	G	G	G	G	G	G	E B	E B	E B	E B	E B	E B	E B	E B	E B	

OCT. 2018 fbEs (0.1MHz)
 NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

OCT. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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	C	C	C	C	C	C	C	C	C	C	337	381	338	353	348	360	357	361	372	391	309	306	283	F	
2	F	303	F	F	F	320	383	379	379	378	373	345	344	356	322	338	353	384	356	358	320	319	325	318	
3	316	323	322	334	347	335	394	399	387	401	387	339	372	328	339	361	356	346	374	394	316	287	332	323	
4	301	336	332	356	323	F	388	394	383	345	358	364	357	364	362	358	362	382	363	392	321	F	F	F	
5	F	F	F	F	F	313	370	397	397	393	364	320	342	376	362	346	343	359	352	348	320	331	320	320	
6	327	329	344	343	327	380	396	390	372	353	341	364	361	370	371	378	378	382	343	331	316	299	333	336	
7	322	325	336	362	356	350	385	387	378	A	A	369	365	349	337	364	359	C	352	330	334	F	346	306	
8	306	316	306	345	296	F	343	357	390	363	358	351	360	361	334	376	349	362	349	318	335	343	306	295	
9	318	315	307	349	345	322	363	352	362	371	370	360	344	358	355	346	367	363	346	358	339	293	283	F	
10	325	332	324	312	319	325	391	400	374	370	363	366	357	366	343	361	369	A	381	334	354	318	324	305	309
11	303	327	319	344	377	373	385	370	342	379	377	373	340	350	344	367	A	369	341	327	308	313	315	F	
12	F	337	F	373	340	F	385	407	377	381	385	A	345	A	365	353	361	366	367	337	324	329	291	310	
13	306	325	331	311	388	330	386	399	364	332	375	353	370	369	359	379	377	380	368	370	331	316	306	298	
14	302	303	322	336	304	333	374	392	367	358	362	353	398	317	355	355	375	369	344	335	341	314	315	303	
15	312	322	323	343	F	316	383	391	373	365	374	343	356	379	357	365	371	383	357	346	320	321	323	315	
16	315	322	313	323	369	339	379	388	384	393	362	343	358	346	347	379	370	361	378	366	307	F	299	318	
17	302	323	322	319	320	342	390	388	351	380	379	382	354	374	353	356	361	378	387	348	316	315	311	317	
18	334	338	334	C	349	A	376	385	377	382	379	367	371	363	359	357	376	378	367	374	403	F	F	309	
19	316	324	314	326	349	375	409	382	363	368	365	362	358	343	358	367	378	381	385	365	A	305	336	324	
20	333	324	338	353	395	349	370	391	369	389	379	392	374	382	361	346	371	373	397	371	349	325	353	F	
21	339	335	330	F	360	340	388	405	394	399	375	389	333	357	349	363	384	377	392	365	304	283	300	319	
22	299	309	326	328	353	315	387	400	382	392	374	326	346	351	344	367	370	367	360	380	341	341	322	343	
23	349	332	318	331	379	327	366	398	376	377	392	358	370	348	341	385	367	367	356	313	350	369	334	F	
24	F	338	F	327	351	398	373	383	401	377	351	354	360	358	343	375	395	400	379	A	311	327	318	320	
25	319	325	338	344	361	403	381	403	405	366	369	362	374	334	351	373	386	372	A	341	353	334	341	351	
26	317	339	314	334	342	334	372	393	381	392	374	329	374	353	349	353	385	393	350	A	305	F	F	F	
27	F	315	305	322	F	337	393	391	391	392	386	375	383	328	348	366	391	373	355	362	368	323	351	F	
28	F	F	F	332	354	382	388	418	376	388	375	354	382	362	386	367	365	365	339	338	337	338	A	F	
29	335	289	A	F	335	375	395	416	384	353	400	390	358	367	357	379	383	355	387	345	330	F	329	F	
30	F	320	F	336	394	390	386	401	400	368	386	362	347	364	388	383	377	374	349	325	310	347	350	330	
31	330	327	366	338	342	368	390	396	402	363	390	383	356	363	347	368	365	393	371	343	341	334	351	365	
	00	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	28	23	25	26	26	30	30	30	29	30	30	31	30	31	31	30	30	30	29	30	25	27	21	
MED	317	324	323	336	349	340	385	392	378	377	374	362	358	358	351	365	370	373	358	348	322	323	322	318	
U Q	330	332	334	344	361	375	390	400	390	390	379	373	371	366	359	375	378	381	374	368	341	334	336	327	
L Q	306	318	314	326	335	327	374	387	372	364	363	351	346	349	344	356	361	365	349	336	316	310	306	309	

OCT. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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							C	C	C	C	427	409	408		A		L	L							
2										356		A	A	A	LU	LU	LU								
3											LU	LU		A	A	A	A	A							
4								L	LU	L	386	457	403	A	U	L		L							
5								L			U	LU	L			L	A		A						
6								L	LU	L	417	432	397	U	L	L									
7									A	A	A	A	U	L	U	L	L	L	L	C					
8									A	A	A	U	L	A	U	L	L	L	L						
9									L	L	LU	LU	LU	LU	LU	L									
10										U	LU	LU	LU	U	L	L									
11									A	A	A	A	A	A	LU	L	A	A							
12									L	A	A	A	A	A	A	L	L								
13											A		U	L	L	L									
14									L	LU	LU	LU	LU	LU	L	L									
15									U	L	391	417	450	A			L								
16									LU	L	405	432	463	L	L										
17									U	L	417	440	403	L	L	L	A								
18									L	A	LU	LU	LU	A	L	L									
19											U	L	420	LU	L	L									
20								L	L	L	L	L	LU	LU	L	L	A								
21									U	LU	LU	LU	LU	L	L	A									
22									L		LU	L	393	L	A	L	L								
23										L	L	L	L	L	L										
24										L	L	L	A	L	L										
25										A	U	LU	LU	LU	LU	A	A								
26											A	L	A		L	A	A								
27											L	A	L		L	L	L								
28											L	L	L	461											
29											L	L	L	432	A	L	A		A						
30											LU	LU	LU	L		L									
31											L	L	L	LU	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									1	9	10	19	17	9	3	1									
MED									425	404	422	409	418	402	380	379									
U Q										U	LU	LU	LU	LU	LU	LU									
L Q										412	434	420	430	424	390										
										U	LU	LU	LU	LU	LU	LU									
										388	405	397	400	384	366										

OCT. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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							C	C	C	C	276	234	282	260		260	260							
2										260	240	E A 258	276	252	318	266								
3											256	304	246	E A 272	284	254	244							
4								244	228	272	254	244	242	246	262	266								
5								228			258	336	270		246	244		234						
6								222	238	250	270	248	258	238	242									
7									A	A		250	246	264	278	242	246		C					
8									212	242	236	240	250	234	246	234	246							
9									246	242	238	264	250	258	266									
10										250	246	242	238	250	264									
11									294	238	254	248	268	270	272	E A 236	A							
12									238	240	226	A	252	A	254	256								
13										232	262	234	238	262										
14									250	248	238	254	210	312	258	258								
15										248	248	246	244	230			232							
16									224	228	234	264	236	232	256									
17										236	244	236	246	234	270	252	220							
18									238	230	236	244	240	250	254	244								
19									266	242	244	234	248	264	268									
20								218	242	220	234	220	234	246										
21										232	226	226	272	268	270	244								
22									216		240	272	262	252	258	254								
23										236	224	238	246	268	258									
24										246	252	240	242	246	262									
25										E A 266	230	244	234	290	250	236								
26										242	280	230	256	258										
27										230	222	222		260	234	234								
28										222	230	238	214	240	240	240								
29										268	228	216	234	236	244	232		E A 234						
30										250	228	238	234			226								
31										234		226	238	250	264									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								4	12	24	29	30	30	28	27	19	6	2						
MED								225	238	242	238	244	245	250	258	244	245	234						
U Q								236	248	250	250	258	252	264	268	256	246							
L Q								220	226	233	230	236	234	239	250	236	232							

OCT. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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	C	C	C	C	C	C	C	C	C	C	186	188	184	A	218	220	214	224	204	176	E A	E B	E A	E A	
2		E A	E B	E B	E B	E B					A	A	A	198	234	204	222	212	196	196	E A	E A	E A	E A	
3	E B	E B	E B	E B	E B	E B							A	A	A	A	A		226	206	194	E A	E A	E B	E A
4	E B	E B	E B	E B	E B	E B							A								E A	E B	E B	E B	
5	E A	E B	E B	E B	E B	E B										A		A			308	274	232	230	
6	E B	E B	E B	E B	E B	E B															220	224	222	224	
7	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															222	254	234	218	
9	E B	E B	E B	E B	E B	E B															E A	E B	E B	E B	
10	E B	E B	E B	E B	E B	E B															250	248	264	268	
11	E B	E B	E B	E B	E B	E B															E A	E A	E A	E A	
12	E B	E B	E B	E B	E B	E B															296	260	278	232	
13	E B	E B	E B	E B	E B	E B															E A	E A	E A	E A	
14	E A	E A	E A	E A	E A	E A															254	232	294	300	
15	E B	E B	E B	E B	E B	E B															222	218	322	300	
16	E A	E A	E A	E A	E A	E A															E B	E B	E B	E B	
17	E A	E A	E A	E A	E A	E A															222	222	244	254	
18	E B	E B	E B	E B	E B	E B															E A	E A	E A	E A	
19	E B	E B	E B	E B	E B	E B															254	232	294	300	
20	E B	E B	E B	E B	E B	E B															222	218	322	300	
21	E A	E A	E A	E A	E A	E A															E A	E A	E A	E A	
22	E B	E B	E B	E B	E B	E B															296	260	278	232	
23	E B	E B	E B	E B	E B	E B															222	218	322	300	
24	E A	E A	E A	E A	E A	E A															E B	E B	E B	E B	
25	E B	E B	E B	E B	E B	E B															222	218	322	300	
26	E A	E A	E A	E A	E A	E A															E A	E A	E A	E A	
27	E B	E B	E B	E B	E B	E B															254	232	294	300	
28	E A	E A	E A	E A	E A	E A															E A	E A	E A	E A	
29	E B	E B	E B	E B	E B	E B															222	218	322	300	
30	E B	E B	E B	E B	E B	E B															E A	E A	E A	E A	
31	E B	E B	E B	E B	E B	E B															254	232	294	300	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	29	29	30	29	30	30	28	23	23	26	24	24	28	24	28	28	30	29	30	31	30	31	
MED	E B	E B	E B	E B	E B	E B															E B	E B	E B	E B	
U Q	E B	E B	E B	E B	E B	E B															235	242	241	256	
L Q	E B	E B	E B	E B	E B	E B															E A	E A	E A	E A	

OCT. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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							C	C	C	C	108	108	108	158	112	108	108	A						
2							B				A	A	A					B						
3								122	116	110				110	110	110	108							
4								A				A	A	A	A		A	B						
5							B					A	A	A			A	B						
6								124	114	110	108				112	112								
7							B							A		A	A	B						
8								112	112	112	112	112	112		108		A	A	B					
9								A	A		108	108	108	106	108	110								
10							B	A		A	A	A	A	A	A	A	A	C						
11								B		A				A	A	A		B						
12								110		118	118	108					108	108						
13							B				A							B						
14								108	112	112		110	108	108	108	108	110		B		B			
15							B				A	A	A	A	A	A			B					
16								120	116															
17							B			A	A	A	A	A		A	A							
18								112	112						112									
19							B		A	A	A							B						
20								112																
21							B				A							B						
22								114																
23							B		A	A	A													
24								112																
25							B																	
26								114																
27							B		A	A	A	A	A	A	A	A								
28								118	106								112							
29						B		116		A	A	A	A	A	A	A	A							
30							B																	
31								120		A	A	114	108	108	114	112	112							
							B				A	A	A	A	A	A	A	B						
								112	112															
							B				A													
								110	110	110	110		112	106	112	108								
							B						A				A							
								108	108	110	108	108		110	108	108								
	00	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	19	14	12	17	14	17	22	22	13							
MED								114	112	111	111	110	109	110	110	108	108							
U Q								118	116	112	112	112	112	114	112	110	110							
L Q								110	112	110	108	108	108	108	110	108	108							

OCT. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	C	C	C	C	C	C	C	C	C	C	122	G	G	158	138	128	120	102	98	B	92	B	92	92	
2	92	86	86	B	B	148	126	132	122	118	102	100	98	114	128	122	114	114	114	106	96	94	102	102	
3	98	98	B	B	82	82	82	82	114	114	110	106	102	92	92	118	104	104	104	98	110	104	98	98	
4	94	92	88	88	86	86	132	122	120	108	G	100	104	100	114	114	102	98	98	96	94	100	B	96	
5	92	88	88	88	B	92	156	130	148	136	128	116	114	102	110	102	100	98	94	94	84	B	94	94	
6	B	B	B	92	92	92	92	92	92	G	92	118	110	108	118	102	102	B	96	96	96	92	B	B	
7	B	B	B	B	B	94	B	96	90	86	86	86	84	82	114	84	80	C	80	78	76	94	94	B	
8	B	86	90	B	B	B	110	132	102	158	132	122	94	88	90	G	118	118	102	102	98	90	B	90	
9	90	90	90	90	90	B	B	G	152	130	92	116	114	G	94	120	116	108	90	86	86	B	98	96	
10	96	88	B	84	B	B	B	142	134	114	G	G	G	G	G	G	98	94	94	90	88	B	84	92	
11	92	B	92	92	92	92	156	134	118	100	100	100	96	96	94	94	92	94	94	92	92	98	98	98	
12	96	92	86	86	92	90	110	136	120	108	100	96	94	94	G	98	98	B	88	86	90	90	98	94	
13	94	94	94	88	106	106	110	112	104	98	98	G	G	G	G	G	G	B	B	108	102	B	86	94	
14	90	90	90	88	B	B	138	114	98	94	92	G	G	G	144	134	130	86	86	B	B	B	B	92	
15	B	B	B	B	82	80	B	G	132	G	G	G	94	146	144	154	G	B	96	96	86	82	88	84	
16	B	B	B	B	B	B	142	126	114	G	G	110	88	G	142	140	122	104	96	90	88	88	88	88	
17	86	88	82	82	82	82	B	160	96	92	100	G	96	102	G	G	126	106	96	96	96	98	98	96	
18	96	94	92	C	92	90	142	132	122	104	98	96	96	104	G	164	144	106	94	94	94	B	94	88	
19	96	94	92	90	90	B	B	152	106	102	102	100	96	96	92	90	92	88	90	90	92	90	88	88	
20	86	92	92	92	92	100	138	134	110	G	96	G	G	G	126	116	126	114	98	98	B	102	98	96	
21	88	92	92	90	96	96	92	130	114	104	96	G	112	G	120	116	106	106	102	102	96	94	94	B	
22	94	94	98	B	88	86	124	118	112	106	102	100	G	116	126	174	136	124	106	98	98	98	98	98	
23	98	96	B	94	B	B	134	126	104	104	98	G	98	86	G	100	100	98	102	102	102	100	94	92	
24	88	98	92	90	90	90	110	122	124	110	G	G	110	G	136	114	106	102	100	96	96	94	B	92	
25	92	B	92	98	90	90	88	120	96	100	96	94	94	100	100	120	106	108	96	96	96	96	94	90	
26	B	92	92	92	90	92	B	156	100	94	94	94	92	G	96	108	100	98	96	86	96	96	96	92	
27	92	90	90	88	88	86	86	G	104	100	94	94	90	90	90	90	90	86	88	86	86	84	B	92	
28	90	90	88	86	98	92	B	118	104	98	92	G	92	96	96	G	110	92	90	86	86	92	96	96	
29	90	86	86	86	86	86	86	124	G	98	98	98	98	94	94	94	94	90	90	88	88	88	88	92	
30	90	B	96	94	90	94	B	156	G	112	110	100	G	G	G	G	86	86	86	96	96	92	92	94	
31	90	88	88	88	86	82	86	G	G	G	G	G	G	102	140	150	122	90	88	88	88	88	94	B	96
	00	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	23	23	22	22	22	21	26	27	25	25	19	24	21	24	25	29	26	30	29	29	24	24	28	
MED	92	92	90	89	90	90	110	128	112	104	98	100	96	100	114	116	104	100	96	96	94	94	94	93	
U Q	95	94	92	92	92	94	138	134	122	113	102	110	103	111	132	125	119	106	98	98	96	98	98	96	
L Q	90	88	88	88	86	86	90	118	102	98	94	96	94	93	94	99	96	92	90	88	88	90	90	92	

OCT. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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

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											C1			H1	H1	C1	C2	L3	F3		F1		F2	F2	
2	F2	F2	F2			F1	C2	C3	CL2	C2	L2	L2	L2	C1	C1	C1	C2	C2	C2	F2	F2	F5	F5	F7	
3	F3	F3			F4	F3	L3	L4	CL2	C2	C1	L2	L2	L2	L4	C2	L3	L3	F6	F5	F2	F5	F2	F2	
4	F1	F5	F4	F3	F2	F2	H1	CL3	C2	C2		L1	L1	L1	C2	C2	L3	L3	F1	F4	F4	F2		F2	
5	F3	F2	F2	F1		F1	H1	C1	H1	H1	H1	C1	C1	L2	C2	L3	L2	L6	F8	F4	F3		F2	F1	
6				F1	F1		L3	L3	L3		L2	CL1	C1	CL2	C1	L2	L3		F1	F1	F2	F2			
7					F1		L4	L2	L4	L4	L4	L3	L2	L3	CL1	L3	L4		F4	F6	F3	F1	F4		
8		F1	F1				C3	C2	L2	HL1	C1	C1	L3	L3	L2		C1	C2	F4	F5	F3	F4		F1	
9	F1	F1	F2	F1	F1				HL1	C1	L2	CL1	C1		L2	C1	C2	C2	F2	F2	F2		F2	F3	
10	F4	F3		F2				H1	H2	C1							L2	L3	L3	F5	F1		F1	F1	
11	F1		F1	F2	F1	F3	H1	H2	C2	L2	L2	L2	L2	L1	L2	L4	L4	L2	L3	F4	F4	F2	F4	F4	
12	F2	F3	F5	F3	F2	F1	L4	C2	C1	L3	L2	L3	L5	L4		L2	L2		F1	F2	F2	F2	F3	F3	
13	F1	F2	F1	F1	F1	F3	C2	C3	L2	L2	L1									F1	F1		F3	F1	
14	F2	F2	F2	F2			H2	C2	L3	L2	L2				HL1	H1	H2	L2	F1					F1	
15					F2	F2			HC1										F2	F1	F2	F3	F2	F1	
16						H2	C2	C2				CL1	L2	L2	H1	H1	C3	L2	F1	F4	F5	F2	F1	F4	
17	F4	F1	F2	F2	F2	F2	H1	L3	L3	L3			L1	L1			C2	L4	F2	F2	F2	F2	F2	F4	
18	F3	F4	F3		F4	F4	H2	CL3	CL2	L3	L1	L2	L2	L1		H1	H2	L3	F3	F3	F3		F3	F2	
19	F1	F3	F3	F2	F2			HL2	L2	L2	L2	L1	L2	L2	L1	L3	L3	L2	F3	F2	F3	F2	F1	F1	
20	F1	F3	F2	F2	F1	F2	H2	H2	CL2		L1				C1	C1	C2	C2	F5	F4		F4	F3	F6	
21	F3	F3	F4	F3	F1	F2	L1	C2	C2	L1	L2			C1	C1	C2	L5	F5	F5	F3	F2	F2	F2		
22	F2	F2	F2		F4	F2	C2	C3	C1	L1	L2	L2		C2	C1	H1	H3	C5	F6	F7	F4	F3	F2	F3	
23	F3	F1		F1			H2	C1	L2	L1	L1		L2	L2		L2	L5	L2	F3	F3	F1	F2	F3	F2	
24	F2	F2	F4	F3	F4	F6	C1	C2	CL2	CL2				CL1	H1	C2	L4	L2	F5	F6	F2	F5		F2	
25	F2		F2	F2	F4	F6	L3	CL2	L2	L3	L2	L1	L2	L2	L3	C4	L4	L4	F5	F2	F3	F3	F2	F3	
26		F2	F2	F1	F4	F1		H2	L1	L3	L3	L2	L2		L2	C1	L3	F4	F2	F6	F3	F5	F4	F6	
27	F4	F4	F2	F3	F3	F3	L2		L3	L2	L1	L3	L3	L2	L3	L2	L2	L5	F2	F2	F2	F2		F2	
28	F3	F2	F3	F4	F1	F1		C1	L2	L2	L2		L2	L2	L2		C1	L2	F1	F2	F2	F2	F4	F2	
29	F4	F7	F6	F2	F4	L2	L2	CL2		L2	L2	L2	L1	L2	L2	L2	L3	L4	F3	F2	F2	F2	F2	F2	
30	F2		F1	F2	F3	F1		H2		C1	C1	L1					L3	L3	F1	F2	F3	F4	F3	F2	
31	F2	F2	F1	F1	F2	F2	L1						L2	H1	HL1	C2	L2	L1	F2	F1	F1	F2		F3	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

IONOSPHERIC DATA STATION Yamagawa

OCT. 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	X 38	X 38	X 37	X 36	X 33	X 24														X 62	X 33	X 36	X 36	X 37
2	X 38	X 37	X 37	X 36	X 29	X 28														X 61	X 44	X 43	X 44	X 42
3	X 44	X 42	X 41	X 41	X 39	X 32														X 58	A	X 33	X 33	X 36
4	X 34	X 36	X 35	X 35	X 30	X 25														X 58	A	X 35	X 37	X 36
5	X 38	X 38	X 35	X 43	X 25	X 28														X 62	X 48	X 46	X 48	X 44
6	X 42	X 41	X 40	X 37	X 35	X 35														X 50	X 42	X 44	X 42	X 45
7	X 42	X 40	X 38	X 40	X 33	X 30														X 54	X 48	X 42	X 44	X 40
8	X 40	X 39	X 36	X 39	X 37	X 39														X 54	X 51	X 52	X 44	X 42
9	X 42	X 42	X 41	X 41	X 42	X 31														X 57	X 43	A	X 38	X 38
10	X 39	X 39	X 38	X 37	X 40	X 35													X 53	A	X 46	X 46	X 44	X 40
11	X 40	X 39	X 38	X 40	X 33	X 26														X 56	X 43	X 43	X 42	X 39
12	X 44	X 44	X 31	X 34	X 33	X 27														X 48	X 36	X 36	X 39	X 39
13	X 36	X 36	X 34	X 30	X 29	X 30														X 60	X 41	X 39	X 38	X 38
14	X 39	X 37	X 37	X 35	X 33	X 35													X 64	X 47	X 38	X 40	X 38	X 48
15	X 38	X 37	X 37	X 40	X 40	X 32														X 49	X 39	X 39	X 41	X 41
16	X 40	X 41	X 38	X 38	X 38	X 34														X 52	X 34	X 39	X 39	X 36
17	X 39	X 38	X 36	X 36	X 38	X 35	X 34													X 46	X 36	X 36	X 38	X 35
18	X 38	X 38	X 39	X 33	X 32	X 27														X 57	X 38	X 32	X 32	X 38
19	X 38	X 38	X 34	X 33	X 33	X 25														X 38	X 36	A	X 37	X 36
20	A	X 36	X 37	X 39	X 34	X 28														X 50	X 34	X 34	X 34	X 36
21	X 36	X 36	X 36	X 32	X 32	X 31														X 39	X 34	X 36	X 38	X 38
22	X 38	X 38	X 35	X 42	X 36	X 32														X 55	X 46	X 38	X 38	X 38
23	X 38	X 38	X 33	X 35	X 36	X 34														X 50	X 44	X 41	X 34	X 36
24	X 38	X 38	X 38	X 41	X 40	X 28													X 54	A	X 31	X 33	X 35	X 37
25	X 39	X 36	X 36	X 34	X 34	X 34														A	X 41	X 35	A	X 37
26	X 34	X 36	X 36	X 36	X 36	X 34														X 41	A	A	A	X 40
27	X 37	X 38	X 36	X 36	X 40	X 37														X 38	X 41	X 38	X 41	X 35
28	X 38	X 42	X 43	X 43	X 44	X 40														X 37	X 37	X 40	X 39	X 35
29	X 35	X 36	A	X 33	X 37	X 39	X 29												X 57	X 46	X 36	X 39	X 38	X 38
30	X 37	X 38	X 39	X 39	X 32	X 25													X 59	X 46	X 38	X 40	X 40	X 36
31	X 36	X 36	X 35	X 33	X 33	X 32														X 46	A	X 36	X 36	X 32
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	30	31	31	31	2											1	4	28	27	28	29	31
MED	X	X	X	X	X	X												X	X	X	X	X	X	X
U Q	40	39	38	40	38	35													60	57	44	42	42	40
L Q	X	X	X	X	X	X													X	X	X	X	X	X
	37	36	35	34	33	28													54	46	36	36	36	36

OCT. 2018 f_{XI} (0.1MHz)
 NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

OCT. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

OCT. 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	U	L	U	L	U	L	L	A					
2											L	U	L	U	L	U	L	L						
3											A	A	A	A	A	A	A							
4											A	L	A	A	A	A	A							
5											A	A	A			A	L	U	L					
6												U	L	U	L		L	U	L					
7									L	A	U	L	U	L	U	L	L	A						
8										U	L	U	L	U	L	U	L	L						
9										A	A	A	A	A	L	L	A	L						
10										A	A	A	A	U	L	U	L	U	L	A				
11											L	U	L	A	U	L	A	L						
12											L	A	A	A	L	L	L	L	L					
13											L	U	L	U	L	U	L	U	L	L				
14											L	U	L	U	L	U	L	L						
15											L	L		L	U	L	L	L						
16											L	U	L	U	L	U	L	U	L	L				
17											L	U	L	U	L	U	L	L						
18											L	U	L	U	L	U	L	A						
19											L	U	L	U	L	U	L	U	L					
20											L	U	L	U	L	L	L	A	A					
21											L	U	L	U	L	L	L	L	L					
22											U	L	A	A					A	A				
23											L	U	L	U	L	U	L	A						
24									L		L	U	L	U	L	U	L	A						
25											A	A	A	A	A	A	A	A	A					
26									L		U	L					A							
27									L	L	A		U	L	U	L	L	L						
28											L	U	L		A	U	L	A	A					
29											A	A	A		U	L	A	A						
30												U	L	U	L	L	L							
31											L	U	L	U	L	U	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										1	15	21	22	20	16	6	1							
MED										U	L	U	L	U	L	U	L	U	L					
U Q										484	428	432	432	432	426	400	440							
L Q											U	L	U	L	U	L	U	L						
											440	442	440	444	430	400								
											424	426	428	426	420	388								

OCT. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

IONOSPHERIC DATA STATION Yamagawa

OCT. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	J	A	J	A	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	J	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
3	J	A	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	J	A	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	E	B
6	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
7	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
8	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
9	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
10	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
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	E	B
12	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
13	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
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	E	B
15	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
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	E	B
17	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
18	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
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	E	B
20	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
21	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
22	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
23	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
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
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	E	B
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
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
28	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
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
30	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
31	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
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
UQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
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	E	B

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

IONOSPHERIC DATA STATION Yamagawa

OCT. 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 16	E 16	E 16	E 16	E 16	E 16	E 16	24	30	33	33	G	G	G	G	31	31	37	30	E 16	E 16	E 16	E 15	E 15
2	E 16	E 16	E 16	E 16	E 16	E 16	E 15	26	32	32	35	33	38	G	36	32	31	42	33	30	18	20	20	E 16
3	19	E 16	E 16	E 15	E 15	E 16	E 16	33	38	50	A 66	A 68	A 68	38	36	41	39	29	39	29	A 36	A 20	16	E 16
4	20	E 16	E 16	E 16	E 16	E 16	E 18	28	35	38	36	43	48	57	40	42	37	31	27	35	A 73	A 16	E 16	E 16
5	E 16	E 16	E 16	E 15	E 15	E 16	E 16	22	28	35	37	41	35	36	47	32	32	22	E 16	E 16	22	27	21	E 18
6	E 16	20	31	19	E 19	E 15	E 15	28	29	51	34	36	34	37	37	G	28	22	22	22	E 16	20	20	E 16
7	E 15	18	18	E 15	E 15	E 15	E 15	23	G	35	36	37	37	36	34	G	34	23	21	21	19	E 15	16	16
8	E 16	E 16	E 16	E 16	E 15	E 16	E 16	G	26	G	G	G	G	34	32	G	G	G	20	23	23	23	E 16	19
9	18	E 15	E 15	E 15	18	18	E 15	16	28	32	39	40	40	32	33	36	31	23	E 16	E 16	16	A 34	A 16	E 16
10	E 16	20	E 16	E 16	E 16	E 17	E 19	21	24	47	44	43	37	37	32	32	32	24	18	A 63	20	20	E 16	16
11	E 16	E 15	E 16	E 16	E 16	E 16	E 15	21	G	29	32	37	41	G	38	G	G	E 16	E 16	19	16	15	16	15
12	E 16	22	E 16	19	E 19	E 16	23	34	26	29	38	41	45	34	34	33	24	24	22	35	26	18	E 16	16
13	20	18	21	20	E 15	E 15	E 16	G	23	G	33	33	35	G	28	G	G	E 16	E 15	15	15	18	15	18
14	E 16	E 16	E 16	E 16	E 13	E 16	E 16	24	32	32	33	36	36	35	35	30	20	24	20	20	17	16	16	15
15	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	27	G	G	G	G	G	G	31	G	21	20	E 15	15	15	15	15
16	E 15	E 15	E 15	E 16	E 16	E 16	E 16	24	33	33	36	35	35	G	G	G	27	G	20	16	E 16	15	16	19
17	18	E 16	E 16	E 16	E 16	E 16	E 16	23	30	34	33	33	G	33	32	32	27	26	21	21	E 16	17	17	20
18	19	E 16	E 16	E 16	E 16	E 16	E 16	20	28	32	33	36	36	34	34	34	32	24	23	19	19	17	E 16	16
19	E 16	E 16	E 16	E 17	E 16	E 15	E 15	21	30	32	G	G	32	37	G	31	22	22	22	17	A 17	A 34	E 16	16
20	A 31	A 15	E 15	E 15	E 16	E 16	E 16	22	28	30	G	G	26	36	36	35	32	34	33	20	E 16	15	15	15
21	E 16	E 16	E 16	E 16	E 16	E 18	E 16	G	27	32	33	34	36	36	G	31	29	34	E 16	E 16	28	E 16	16	18
22	27	18	E 16	E 16	E 16	E 16	E 16	21	32	29	33	40	42	G	36	34	42	48	A 67	34	E 16	22	E 16	16
23	E 16	E 15	E 16	E 16	E 15	E 15	E 15	21	24	29	G	G	G	G	33	31	44	22	26	26	23	21	20	20
24	20	E 16	24	E 17	E 16	E 16	E 16	25	27	31	32	33	34	38	42	40	32	28	E 16	A 55	18	16	16	16
25	E 16	E 16	E 15	E 16	E 17	E 16	E 16	23	31	34	44	43	41	38	45	A 168	A 65	45	72	112	19	22	A 88	16
26	16	E 16	E 16	E 16	E 16	E 16	E 16	21	26	30	35	33	41	33	G	37	27	31	32	24	A 51	A 45	A 54	24
27	20	18	21	20	E 16	E 16	E 15	20	30	34	41	35	38	36	36	31	25	30	22	22	E 16	16	E 16	16
28	18	E 16	E 16	E 16	23	20	E 16	22	27	49	34	32	36	41	32	37	37	21	E 16	26	22	E 16	16	16
29	E 16	E 16	A 41	20	E 15	E 16	E 15	21	24	32	37	43	36	35	33	30	22	32	17	E 16	16	16	16	16
30	19	22	E 16	E 16	E 16	E 16	E 15	G	G	G	G	G	30	28	33	34	34	31	E 26	E 15	E 19	E 16	16	16
31	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	G	30	G	G	38	38	31	31	24	22	E 16	E 16	77	19	E 16	18
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	21	28	32	33	35	36	35	34	31	29	24	21	21	17	17	E 16	16
U Q	19	18	16	16	16	E 16	E 16	24	30	34	37	40	40	37	36	35	32	31	27	29	22	21	16	18
L Q	E 16	E 16	E 16	E 16	E 15	E 16	E 15	20	24	29	G	G	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	16

OCT. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

OCT. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

OCT. 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	310	311	318	355	383	349	359	387	395	393	377	367	347	344	358	360	349	359	361	413	305	307	315	320
2	322	315	317	394	326	331	331	388	392	360	390	346	329	347	351	358	354	364	380	366	352	292	309	307
3	288	319	313	341	357	320	353	375	397	398	A	A	A	350	356	338	354	368	379	401	A	293	323	F
4	342	352	323	349	378	363	375	372	369	363	387	375	340	351	362	356	362	332	375	378	A	297	F	304
5	F	319	314	403	326	315	360	409	403	391	384	358	363	373	371	378	316	361	364	371	319	332	336	333
6	323	315	352	340	362	375	368	401	401	381	349	360	365	373	368	383	378	383	386	339	340	309	305	312
7	310	313	354	344	347	396	346	383	402	396	380	331	358	347	350	366	358	364	370	363	371	327	317	313
8	317	303	306	342	296	353	354	423	404	312	335	352	362	349	354	365	364	364	362	340	315	332	301	293
9	305	324	318	354	378	343	354	355	383	376	364	349	299	364	337	356	343	362	373	376	355	A	304	287
10	330	332	330	308	F	292	397	396	370	368	358	351	361	354	380	360	366	383	356	A	357	300	306	279
11	290	296	319	356	408	354	318	389	365	379	359	363	342	334	338	368	369	360	355	376	317	315	270	311
12	F	358	315	365	360	344	371	396	376	373	356	347	350	340	350	349	370	379	367	386	308	308	F	F
13	323	333	350	355	322	301	381	375	359	361	371	351	363	366	354	367	374	376	368	362	350	330	315	326
14	329	328	335	325	304	355	354	402	346	347	366	355	361	325	346	349	359	360	376	378	323	339	321	F
15	301	313	328	F	F	358	359	402	391	373	368	366	371	335	344	356	366	378	372	347	317	336	322	322
16	316	303	326	358	366	361	342	409	367	355	367	374	340	346	345	348	357	363	387	378	307	334	351	335
17	313	320	319	326	370	363	334	400	367	349	364	362	352	363	313	350	364	382	391	383	336	307	313	311
18	288	305	351	338	382	353	384	395	406	357	350	364	353	336	344	366	359	365	403	380	336	348	324	F
19	F	F	315	329	385	384	365	377	364	302	355	341	342	334	350	349	349	374	380	382	301	A	328	306
20	A	320	335	375	375	403	350	397	377	365	373	395	360	346	329	351	341	352	374	404	331	340	319	305
21	324	333	353	342	346	362	353	393	376	377	371	363	334	331	343	358	348	377	378	413	299	310	F	279
22	335	330	318	F	370	333	386	407	399	403	348	335	341	338	335	335	362	367	A	365	370	310	283	328
23	329	334	351	329	363	332	368	386	371	376	358	354	314	325	347	370	348	369	358	359	332	328	336	314
24	300	333	330	F	377	376	356	374	377	399	362	310	364	345	353	361	376	396	426	A	289	310	325	327
25	332	342	333	330	354	393	330	397	397	399	350	340	363	330	352	A	A	393	A	A	F	A	A	F
26	329	327	330	339	339	350	366	389	386	371	337	374	396	314	331	337	385	371	375	395	A	A	A	F
27	F	F	F	F	F	F	F	400	383	375	392	381	378	292	357	366	366	379	348	369	340	313	342	330
28	318	F	330	339	383	F	360	391	376	399	374	353	362	341	366	349	380	383	378	351	311	325	341	F
29	315	323	A	289	F	F	F	403	394	381	354	370	369	340	350	366	339	362	376	395	321	335	315	311
30	323	F	F	F	369	394	343	411	402	391	354	353	367	342	352	373	396	362	350	372	320	333	355	352
31	319	332	318	348	345	370	376	425	404	392	338	391	384	318	356	350	374	369	381	370	A	324	391	355
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	28	26	27	28	29	31	31	31	30	30	30	31	31	30	30	31	29	28	26	28	26	25
MED	318	323	327	342	363	354	359	396	383	376	363	356	360	342	350	358	362	368	375	376	322	320	320	313
U Q	329	333	335	355	378	372	370	402	399	392	373	367	364	350	356	366	370	379	380	384	340	332	336	329
L Q	310	313	318	330	345	338	348	386	370	361	354	349	342	334	344	349	349	362	363	364	311	308	309	306

OCT. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

OCT. 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	U	L	U	L	U	L	L	A						
2											419	417	413	411	395										
3											L	U	L	U	L	U	L	L							
4											421	403	388	389	392										
5											A	A	A	A	A	A	A	A							
6											A	L	A	A	A	A	A	A							
7											A	A	A			A	L	U	L						
8											401	435					357								
9											U	L	U	L		L									
10									L	A	U	L	U	L	U	L	L	A							
11											404	383	407	408	386										
12										U	L	U	L	U	L	U	L	L							
13										366	392	396	393	410	409	404									
14										A	A	A	A	L	L	A	L								
15										A	A	A	428	398	384	410									
16											L	U	L	A	U	L	A	L							
17											409		430												
18										L	A	A	A	L	L	L	L	L							
19										L	L	U	L	U	L	U	L	L							
20											392	428	407	421	366										
21											L	L			A	L	L								
22											384	386	408	463											
23											L	L		U	L	U	L	L							
24											426	418			389										
25										L	L	U	L	U	L	U	L	L							
26											399	413	394	413	395										
27										L	L	U	L	U	L	U	L	L							
28											399	396	426	375											
29										L	U	L	U	L	U	L	A								
30											388	423	429	417	393										
31										L	398		457		443	403									
										L			U	L	L	A	A								
											414	411	436		L	L	L	L							
										L	U	L	U	L	U	L									
											393	430	430												
											U	L	A	A								A	A		
											402			367	360	387									
										L	U	L	U	L	U	L									
											389	418	424	405	364										
									L	L	U	L	U	L	U	L	A								
											390	401	427	381											
											A	A	A	A	A	A	A	A							
									L	U	L			436	385										
									L	L	A		U	L	U	L	L	L							
											423	423	399		A	U	L	A	A						
											L	U	L	443		384									
										A	A	A		U	L	A	A								
												442	415												
											L	U	L	U	L	L	L								
											389	390	393												
										L	U	L	U	L	A	U	L	L							
											396	393	379												
	00	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	15	21	22	20	15	6	1								
MED										U	L	U	L	U	L	U	L	U	L						
U Q										366	396	401	420	408	389	399	357								
L Q											U	L	U	L	U	L									
											407	420	429	422	409	404									
											U	L	U	L	U	L									
											389	394	407	394	384	387									

IONOSPHERIC DATA STATION Yamagawa

OCT. 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										220	240	250	288	278	276	268	266	248						
2										248	248	286	286	256	256	246	262							
3										214		A	A		268	268	274	250						
4										250	240	242	E A	E A	276	270	252	252	242					
5										230	224	274	256	238	236	236	364							
6											260	260	256	244	254	240								
7									232	222	240	290	242	256	264	244	244							
8										324	272	256	246	252	252	244	244							
9										226	238	260	246	244	256	240	258							
10										244	248	238	234	246	246	244	236							
11											254	252	262	260	250	238	244							
12										234	234	E A	246	254	268	268	268	238	238					
13										252	234	256	254	240	248	248	248							
14										262	242	238	218	250	250	250	234							
15										248	226	226	244	268	256	256	256							
16										256	252	230	254	254	254	254	238							
17										246	246	232	232	232	316	258								
18										258	258	238	240	258	258	248								
19										268	252	252	268	268	254	254								
20										244	236	222	252	270	308	262	224							
21										238	238	238	252	268	268	236	248							
22											278	260	264	272	272	256		E A	A					
23										240	240	232	260	270	256		E A							
24									238	238	246	266	234	262	244									
25											E A	260	264	238	252	252	A	A		A				
26									208		312	236		320	292	244								
27									224	238	222	226	234	356	264	246								
28											246	248	242	282	246	E A	238	222						
29										224	242	236	236	274	248	236								
30											270	254	230	248	248	228								
31										228	294	224	224	332	250	248								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									4	24	30	30	29	31	31	28	19	3						
MED									228	242	245	247	246	261	254	247	244	243						
U Q									235	251	258	260	258	270	268	255	256	E A						
L Q									216	229	238	236	235	250	250	240	236	238						

OCT. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

OCT. 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 E B E B	270 264 250	218 200	214 212	202 202	202 202	194 194	176 176	202 206	214								A	214 190	184	E B E B E B	274 268 268		
2	E B E B E B	254 264 256	190 228	E B 238	218 212	212 198	198 186	E A 240	218 210	210 228	226 218	214 206	280 258	262							A E A E A E	312 272 272		
3	E A E B E B	262 252 240	226 194	210 210	206 206		A	A	A	A	A	A	A	A					218 208	206	A E A E B E	312 272 272		
4	E A E B	288 252	244	214 200	220 214	200 210		A	210		A	A	A	A					A	230 216	214	A E B E B E	280 268 250	
5	E B E B E B	272 242 242	196 324	E B 254	198 190	206		A	A	A					A							230 230 230		
6	E B E A E A	238 268 284	210 264	E A 210	204 202	200 260	E A 188	196 194	194 194	194 194	208 212	196 214	210 268	276 236								E A E A E A	268 276 236	
7	E B E A	232 232	228	212 212	202 202	202 200		A	196 196	196 192	192 200								A	204 204	204	204 220	220 260	
8	E B E B E B	266 292 292	244 278	220 220	192 196	196 192	192 192	198 198	194 172	210 210	210 212	E A 270	214 240	284								E A E B E A	214 240 284	
9	E A E B E B	260 240 240	224 214	214 214	214 206		A	A	A											A	208 202	198 198	A 248	274
10	E B E A	246 244	220	E B 256	246 274	194 186	210		A	A	A									A	198 194		E A E B E B	254 254 268
11	E B E B E B	268 262 248	214 196	246 238	206 206	210 202	212		A	A	A											E A E B E B	254 260 226	
12	E B		E B	E B E A	252 250	198 214	208		A	A	A											E A E B E B	324 286 220 260	
13	E A E A E B	238 236 242	258 246	214 212	200 198	198 204	204 194	186 186	184 186	186 206	206 200	198 208	E A 324	286	220 260							E B E A	224 238 250	
14	E B		E B E B E B	250 220	232 250	276 226	212 192	208 208	194 194	178 178												E A E B E B	238 234 234 258	
15	282 258	246	246	208 208	196 206	194 194	188 184	184 182	208 194	212 212	196 196	224 224	224 228									E B E B	240 218 238	
16	E B E B E B	242 248 248	224 216	206 224	196 218	200 200	190 172	178 176	190 200	208 192	182 256	240 218	238									E B E B	240 218 238	
17	E A E B E B	270 242 252	248 218	214 196	196 196	196 196	196 196	186 186	184 214	214 200	200 202	216 252	252 298									E B E B	252 298	
18	E A E B	308 262	204 226	204 232	204 190	202 174	186 186	186 186	198 214	214 200	198 218	218 218	252 252									E B E B	252 252	
19	E B E B E B	282 236 254	238 206	206 216	216 216	192 200	200 174	202 198	188 202	208 208	192 254	E A 254	A E A E B	242 260								E A E B	242 260	
20	A E B E B	262 238	200 198	198 212	190 206	198 192	192 182	198 236														A	E B E B	258 268
21	E B E B E B	260 258 226	256 222	E A 236	208 198	208 208	184 184	184 208	208 208	208 208	208 208	216 272	260 270	300								E B E B	260 270 300	
22	E A E A	288 236	220 234	212 212	196 186	198 198	184		A	A												E A E B	278 262 240	
23	232 226	202 238	218 220	204 194	206 204	204 190	180 172	228 228														E A	E A	
24	E A E B E A	262 248 248	214 194	194 210	196 190	198 188	188 180	204 238	224 208	182 302	296 272	260										E B E B	272 260	
25	E B E B E B	238 238 230	240 226	198 244	196 192	204																E A E A	A E B	
26	226 226	230 220	228 220	206 192	178 206	208 208	206 198	188 208	208 206	198 188												A	A E A	
27	E A E A E A	254 242 282	282 224	210 220	186 192	204																E B	E B	
28	E A E B E B	268 236 246	214 208	208 208	192 192	220 196	184 186	186 184														E A E B	E B	
29	E B E B	240 230	A E A E B	330 222	192 242	198 198		A	A	A												E B E B	E B	
30	E B E A E B	270 266 244	226 196	190 220	194 194	188 196	192 188	182 206	194 200	200 192	192 250	242 210	220									E B E B	210 220	
31	E B E B E B	236 236 236	224 228	206 206	190 198	190 190	190 188	180 182	186 190	200 218	210 210	196 188										E A	E A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	30	31	31	31	31	31	31	24	23	22	23	27	23	22	22	29	29	28	27	28	29	31
MED	E B E B E B	261 242 243	213 212	211 210	196 202	198 196	192 186	192 186	192 198	203 208	208 208	204 200	206 247	254								E B E B	242 254	
U Q	E B E B E B	270 262 250	246 228	226 220	202 208	207 200	196 194	204 210	210 210	214 213	211 211	256 276	261 268									E A E B	E B	
L Q	E B	240 236	230 214	204 206	204 192	196 196	190 188	180 182	186 190	200 204	198 192	206 225	220 236									E A	E A	

OCT. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

OCT. 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	110	112	A	112	112	112	112	112	A	110	A	B						
2							B	120	120	112	A	A	114	108	108	110	110	A	B						
3							B	114	114	A	A	A	A	A	114	114	A	A	B						
4							B	116	120	A	A	A	A	A	A	A	A	A	B						
5							B	120	124	124	118	A	112	112	A	108	A	108	B						
6							B	A	A	A	A	110	110	108	A	108	A	A	B						
7							B	108	108	110	110	110	110	110	110	110	A	110	B						
8							B	112	A	112	108	108	108	A	A	108	108	108	B						
9							B	116	116	116	A	A	A	A	A	114	114	114	88						
10							B	108	108	A	A	A	A	A	A	A	A	A							
11							B	B	108	A	A	A	A	118	A	116	116	116	B						
12							B	116	108	108	A	A	A	A	A	A	A	A	B						
13							B	A	112	114	A	A	A	A	108	108	108	114	B						
14							B	114	114	A	A	112	A	A	108	108	114	A							
15							B	114	114	114	114	114	104	108	108	108	108	108	B						
16							B	126	110	110	110	110	110	110	110	110	110	108	B						
17							B	116	110	110	108	A	108	A	108	108	108	108	B						
18							B	B	108	108	108	108	A	108	108	108	108	106	B						
19							B	106	A	A	106	106	A	106	104	104	104	A	B						
20							B	104	110	110	110	110	110	110	110	110	110	A	B						
21							B	110	A	A	A	A	A	110	110	110	110	A	B						
22							B	110	A	A	A	A	A	110	110	110	110	A	B						
23							B	110	A	A	110	A	110	110	110	110	A	A	B						
24							B	112	110	110	110	110	110	110	112	114	A	A							
25							B	A	110	A	A	A	A	A	A	A	A	A	B						
26							B	116	114	A	A	A	A	A	114	A	A	A	B						
27							B	B	A	A	A	A	A	A	A	112	A	A	B						
28							B	110	108	A	106	A	A	A	A	A	A	A	B						
29							B	112	112	112	A	A	A	A	A	A	A	A							
30							B	134	118	112	86	110	A	A	108	108	108	B							
31							B	108	108	108	108	108	A	A	A	A	A	A	B						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								26	23	16	16	13	12	15	18	22	16	10	1						
MED								112	110	111	110	110	110	110	110	110	110	108	88						
U Q								116	114	112	111	111	111	110	110	110	110	114							
L Q								110	108	110	108	108	109	108	108	108	108	108							

OCT. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

OCT. 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	90	90	88	B	B	B	126	126	118	104	112	G	G	G	G	100	116	106	100	98	B	B	B	B	
2	B	92	B	B	B	B	126	126	120	112	104	100	148	G	112	140	122	98	98	96	96	92	92	92	
3	92	92	B	B	B	B	126	128	114	102	102	102	102	102	114	114	102	102	102	102	104	104	102	102	
4	90	90	90	B	90	90	124	126	126	100	98	98	98	98	98	98	98	98	98	90	90	90	90	90	
5	90	B	B	B	B	134	B	126	128	122	122	104	110	110	104	104	G	98	144	94	94	90	90	90	
6	90	90	88	86	84	84	B	84	92	88	122	120	116	106	106	G	102	102	102	92	92	86	82	82	
7	92	90	90	90	90	90	90	128	G	120	116	116	114	112	114	G	104	112	90	90	90	90	90	88	
8	84	84	90	90	B	B	140	G	104	G	G	G	G	G	104	104	G	G	G	98	98	98	98	98	
9	90	90	90	90	90	86	86	94	144	126	78	78	78	78	78	116	114	114	88	B	88	94	88	B	
10	88	88	B	B	90	90	84	136	114	98	92	90	90	94	96	96	96	92	92	90	90	90	90	B	
11	B	90	B	90	88	86	156	134	G	100	100	96	96	G	88	G	G	G	B	88	96	B	96	96	
12	94	92	92	90	90	126	110	118	108	110	96	94	94	96	96	96	96	96	94	90	90	90	100	90	
13	88	88	84	84	84	B	96	G	102	G	G	102	94	94	G	86	G	G	B	B	B	B	B	86	
14	B	B	86	B	B	B	146	146	118	100	88	108	92	86	152	152	G	86	86	86	86	86	86	84	
15	96	96	94	B	B	B	B	148	148	G	G	G	G	G	G	148	G	148	82	B	B	82	84	84	
16	84	B	B	B	B	B	B	122	122	116	116	116	114	G	G	G	146	G	86	86	B	B	86	86	
17	86	86	86	86	B	B	B	120	112	112	122	104	G	90	104	136	136	118	108	98	98	102	90	90	
18	90	90	B	90	B	B	B	124	118	112	132	104	98	114	136	136	130	116	110	96	90	90	B	B	
19	B	90	90	B	B	B	B	130	110	104	G	G	96	138	G	120	88	88	88	88	88	88	88	88	
20	92	B	B	B	92	92	92	132	132	140	G	G	90	144	144	132	122	106	94	94	100	B	B	B	
21	100	98	B	88	86	86	B	G	94	100	100	100	100	150	G	150	138	100	100	100	100	100	100	94	96
22	90	90	90	90	90	90	96	134	102	102	98	98	90	G	132	132	124	104	104	104	104	104	96	96	96
23	96	B	B	B	B	B	B	154	102	92	G	98	G	G	98	138	102	102	102	92	92	92	92	92	
24	92	B	92	90	B	B	B	116	130	118	118	118	124	156	126	118	104	96	96	96	92	B	B	B	
25	B	B	B	B	B	B	114	114	114	102	102	100	98	92	102	102	102	100	100	100	102	104	94	94	
26	94	94	94	B	94	94	92	152	130	96	96	94	94	94	G	94	94	94	94	94	90	90	90	90	
27	90	90	90	90	90	B	B	110	106	102	94	94	94	94	94	130	102	84	84	84	84	82	82	82	
28	82	82	82	82	82	82	82	130	142	102	138	94	94	90	90	88	86	94	94	94	94	90	90	90	
29	90	90	90	90	90	90	90	132	116	124	106	100	100	94	94	94	92	86	86	86	86	86	B	88	
30	88	88	88	88	88	B	B	G	G	G	92	92	88	88	108	114	114	108	94	102	96	96	96	96	
31	B	94	92	92	84	84	84	132	G	132	G	G	92	92	92	92	90	90	114	114	96	96	94	94	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	25	24	20	18	17	15	19	27	27	27	24	25	26	24	24	26	27	27	29	28	27	25	25	25	
MED	90	90	90	90	90	90	96	128	116	104	102	100	96	95	104	115	102	100	94	94	92	90	90	90	
U Q	92	92	91	90	90	92	126	134	128	118	117	104	102	111	114	136	122	108	101	98	98	96	95	95	
L Q	88	89	88	88	85	86	90	120	106	100	96	94	92	92	95	96	96	94	89	90	90	89	88	87	

OCT. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

OCT. 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	F1	F1	F1				C1	C2	C2	L2	C2					L2	C3	L5	L5	F2					
2		F2					C1	C2	C2	C1	L2	L1	H1		C1	H2	C1	L3	L8	F9	F3	F4	F3	F2	
3	F2	F2					CL11	C5	C2	L3	L5	L4	L4	L3	C2	C2	L5	L4	L6	F8	F6	F4	F2	F2	
4	F2	F2	F3		F1	F1	L2	C4	C3	L5	L2	L3	L3	L4	L3	L3	L3	L4	L4	F5	F5	F2	F2	F2	
5	F2			F2		F1		C2	C2	C2	C3	L2	C2	C1	L2	C1	L5	H1	L1	F1	F3	F3	F3	F3	
6	F2	F4	F5	F4	F4	F2		L5	L4	L5	CL22	CL22	C1	CL12	CL12		L2	L2	L4	F4	F1	F3	F2	F2	
7	F2	F3	F3	F2	F2	F1	L2	C2		C2	C2	C1	C1	C1	C1		L3	C2	L3	F1	F4	F4	F3	F4	
8	F2	F2	F1	F1			H1		L2					L2	L1				L3	F8	F4	F5	F4	F6	
9	F4	F2	F2	F2	F4	F5	L2	L2	H2	CL13	L4	L4	L4	L3	L3	C2	C3	C1	L1		F3	F6	F2		
10	F1	F4			F2	F2	F4	H2	HL32	L4	L3	L3	L2	L2	L2	L1	L2	L5	L1	F5	F6	F3	F2		
11		F1		F2	F1	F1	H1	H2		L3	L3	L3	L2		L4					F2	F2		F1	F2	
12	F5	F4	F3	F3	F4	F2	C7	C5	C3	C2	L3	L5	L2	L3	L3	L2	L2	L2	F3	F5	F6	F4	F2	F2	
13	F2	F3	F2	F2	F1		L1		L2			L2	L2	L2		L2								F2	
14			F2				H1	H3	C3	L2	L3	C2	L2	L2	H1	H1	L2	L2	L3	L3	F2	F2	F1	F2	
15	F2	F1	F2					H1	H2							HL12		H2	L2			F2	F2	F1	
16	F1						C2	C2	C2	C1	C2	C1					C1		L3	F1			F2	F2	
17	F2	F2	F2	F1			C2	C5	C2	C1	C1			L3	L2	H1	H1	C2	L3	F5	F3	F2	F2	F5	
18	F4	F2		F1			C2	C2	C2	H1	C2	L2	L2	C1	H1	H1	C1	C1	C3	F3	F2	F1			
19		F2	F2				H1	L2	L3				L3	CL11		CL11	L2	L3	L3	F1	F2	F3	F2	F1	
20	F2				F1	F2	L1	H2	H2	H1			L2	H1	H1	C1	C3	L4	L4	F4	F2				
21	F2	F2		F5	F4	F3			L3	L2	L2	L2	L2	C1		H1	H2	L7	L9	F2	F2	F2	F3	F5	
22	F7	F3	F3	F2	F3	F1	L1	H1	L6	L2	L2	L4	L5		H1	H2	C3	L6	L7	F8	F11	F8	F2	F2	
23	F2							H2	L3	L3		L2			C1	H1	L3	L4	L4	F4	F3	F4	F4	F1	
24	F1		F5	F3			C3	HL12	CL11	CL11	CL11	CL13	HL12	CL32	CL3	C4	L4	L4	L2	F6	F3				
25						L1	L3	C3	L6	L4	L4	L4	L4	L3	LL34	L6	L8	L8	L7	F5	F5	F8	F6	F5	
26	F6	F4	F4		F2	F4	L2	H2	H2	L3	L3	L2	L2	L2		L3	L2	L3	L7	F7	F9	F8	F9	F6	
27	F5	F5	F4	F4	F4			C5	L2	L3	L3	L2	L3	L2	L2	H1	L2	L3	L8	F7	F3	F3	F2	F1	
28	F2	F1	F2	F3	F5	F3	L2	C2	HL22	L5	HL12	L2	L3	L3	L3	L3	L3	L2	L1	F6	F3	F3	F3	F2	
29	F2	F2	F6	F6	F3	F2	F2	H2	C2	C2	L3	L5	L3	L2	L2	L3	L1	L6	L2	F1	F3	F3		F2	
30	F5	F5	F2	F1	F1						L2	L2	L2	L2	CL22	C1	C2	L3	L4	F3	F3	F3	F1	F2	
31		F3	F4	F3	F3	F1	L1	C2		C1			L2	L2	L2	L3	L3	L4	C1	F3	F6	F3	F3	F3	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

IONOSPHERIC DATA STATION Okinawa

OCT. 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	X 47	X 47	X 50	X 44	X 36	X 24														X 50	X 38	X 38	X 38	X 39
2	X 38	X 36	X 36	X 37	X 28	X 25														X 59	X 40	X 35	X 34	X 35
3	X 34	X 36	X 37	X 37	X 31	X 26														X 56	X 46	X 30	X 31	X 31
4	X 36	X 35	X 33	X 36	X 28															X 56	X 36	A	X 34	X 37
5	X 36	X 35	X 44	X 30	X 25	X 28														X 66	X 53	X 50	X 45	X 44
6	X 43	X 42	X 47	X 32	X 30	X 31														X 50	X 47	X 48	X 47	X 44
7	X 47	X 45	X 40	X 39	X 33	X 26														X 58	X 50	X 40	X 37	X 38
8	X 37	X 37	X 37	X 38	X 33	X 34														X 59	X 48	X 40	X 44	X 40
9	X 40	X 38	X 40	X 40	X 39	X 30														X 49	X 44	X 34	X 35	X 36
10	X 37	X 36	X 34	X 34	X 33	X 35														X 51	X 47	X 38	X 42	X 40
11	X 40	X 39	X 38	X 42	X 29	X 24														X 61	X 43	X 38	X 44	X 40
12	X 39	X 38	X 34	A	X 28	X 29														X 69	A	A	X 37	X 38
13	X 38	X 39	X 38	X 31	X 31	X 31														X 60	X 46	X 34	X 36	X 37
14	X 37	X 36	X 36	X 34	X 32	X 32														X 39	X 38	X 37	X 38	X 37
15	X 36	X 36	X 36	X 34	X 35	X 33														X 50	X 43	X 38	X 39	X 38
16	X 38	X 37	X 36	X 36	X 37	X 30														X 48	X 47	X 39	X 45	X 47
17	X 52	X 50	X 52	X 54	X 62	X 27														X 44	X 37	X 33	X 35	X 35
18	X 36	X 36	X 35	X 35	X 31	X 27														X 53	X 40	X 33	X 32	X 33
19	X 34	X 33	X 37	X 38	X 32	X 26														X 53	X 28	X 33	X 34	X 34
20	X 33	X 34	X 34	X 37	X 35	X 25														X 46	X 28	X 30	X 32	X 32
21	X 33	X 34	X 34	X 32	X 32	X 26														X 34	X 39	X 39	X 37	X 38
22	X 37	X 38	X 38	X 36	X 39	X 32														X 57	X 41	X 42	X 37	X 36
23	X 37	X 38	X 34	X 33	X 33	X 33														X 43	X 39	X 37	X 36	X 36
24	X 38	X 35	X 34	X 39	X 38	A														X 37	X 30	X 31	X 33	X 35
25	X 36	X 35	X 34	X 32	X 33	X 25														X 39	X 29	X 36	A	A
26	A	X 36	X 35	X 33	X 35	X 29	X 28													X 44	A	A	X 32	X 37
27	X 32	X 33	X 32	X 32	X 33	X 33														X 42	X 32	X 37	X 36	X 36
28	X 35	X 34	X 36	X 36	X 33	X 32														X 40	X 34	X 38	X 37	X 33
29	X 32	X 37	X 33	X 33	A 30	X 30														X 61	X 40	X 38	X 37	X 35
30	X 34	X 34	X 44	X 32	X 29	X 26														X 54	X 44	X 44	X 43	X 39
31	X 34	X 32	X 30	X 30	X 30	X 27													X 58	X 60	X 43	X 36	X 38	X 34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	30	30	29	1												1	31	29	28	30	30
MED	X	X	X	X	X	X													X	X	X	X	X	X
U Q	37	36	36	36	33	29	28												58	51	40	38	37	37
L Q	X	X	X	X	X	X														X	X	X	X	X
	38	38	38	38	35	32														59	46	39	39	39
	X	X	X	X	X	X														X	X	X	X	X
	34	35	34	32	30	26														44	36	34	34	35

OCT. 2018 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	41	41	44	38	30 ^V	18	24	49	57	63	62	62	70	81 ^H	73	58	57	72	69	44	32	32	32	33
2	32	30	30	31	22	19	23	54	53	59	64	55	60	83	90	64	59	63	69	53	34	29	28	29
3	28	30	31	31	25	21	24	50	55	55	54	50	61 ^V	67	68	68	74	82	62	50	40	24	25	25 ^F
4	28 ^F	29	27	30	22	16 ^{J B}	22	47	56	69	65	65		68	64	68	64	59	74	81	50	30	28	28 ^F
5	30	29	38	24	19	22	24	45	52	50	49	56	75	60	59	57 ^V	60	60	72	60	47	44	39	38
6	37	36	41	26	24	25	24	45	51	50		68	66	57	65	64	48	60	56	44	41	39 ^F	39 ^F	38
7	38 ^F	33 ^F	34	33	27	20	22	47	60	55	62	62	59	61	62	66	53	60	67	52	44	34	31	32
8	31	31	30	32	27	28	24	54	57	54	60	82	80	84	73	66	62	73	64	53	42	34	38	34
9	34	32	34	34	33	24	25	51	56	69	72	69	73	75	59	63	60	70	59	44	38	28	29	30
10	31	30	29	28	27	29	18	45	49	58	82	94	88	80	80 ^R	66	62	65	53	45	41	32	32 ^F	32 ^F
11	34	33	32	36	23	18	24	51	59	61	75	83	86	99 ^{J R}	93	78	76	61	51	55	37	32	33 ^F	32 ^F
12	32 ^F	31 ^F	28		22	23	24	47	53	64	70	72	68	75	84	76	74	72	66	63			29 ^F	29 ^F
13	28 ^F	31 ^F	32	24	23	25	22	45	52	66	82	92	86	71	68	69	70	55	54	54	40	29	31	31
14	31	30	30	28	26	26	18	40	50	64	89	107	99	78	97	100	90 ^H	92	60	33 ^R	32	31	32	31
15	30	30	30	28	29	27	22	45	56	63	76	90	74	64	63	68	63	56	60	44	37	32	33	32
16	32	31	30	30	31	24	23	45	53	57	78	96	83	84	92	91	90	91	72	42	40	33	39	41
17	46	44	46	48	52 ^F	21	30	48	54	58	68	90	92	76	90	88	91	78	54	38	31	27	29	29
18	30	30	29	29	25	21	21	48	51	56	66	98	106	79	83 ^H	78	70	69	54	47	34	27	26	27
19	28	27	31	32	26	20	18	42	56	50	58	76	86	88	98	88	72	65	56 ^{J R}	47	22	27	28	28
20	28	28	28	31	29	19	19	42	47	65	65	76	66	63	68	67	76	69	63	40	22	24	26	26
21	27	28	28	26	26	20	20	46	59	56	66	80	88	85	98	89	83	78		28	33	33	31	32
22	31	32	32	30	33	26	22	45	58	56	56	74	80	74	87	101	88	54	52	51	35	36	31	30
23	31	32	28	27	27	26	44	54	58	72	88	98	114	119	120	84	65		37	33	31	30	30	
24	32	29	28	33	32		18	42	54	55	62	88	83	88	100 ^{J R}	91	91	95	46	31	24	25	27	29
25	30	29	28	26	27	19	20	45	52	54	52	61	77	83	79	78	82	63	54	33	23	30		
26		27 ^F	28	27	26	21 ^F	22 ^F	40	47	51	54	78	83	51	62	76	71	61	50	38			26	28 ^F
27	26	27	26	26	27	23 ^F	20	44	53	55	68	58	54	57	73	85	78	69 ^V	71 ^V	37 ^V	26	31	30	30
28	29	28	30	30	27	26	18	46	52	59	57	88	84	88	96	101	72	64	54	34	28	32	31	27
29	26	27 ^F	27	27		24		44	52	51	53	78	70	64	80	82	78	76	60	54	34	32	31	29
30	28	28	30	26	23	20	18	43	49	51	54	66	94	90	97	100 ^R	75	60	59	48	38	38	37	33
31	28	26	24	24	24	21	18	42	52	51	55	64	67	53	73	81	66	59	52	54	37	30	32	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	30	30	30	30	31	31	31	30	31	30	30	31	31	31	31	29	31	29	28	30	29
MED	30	30	30	30	26	22	22	45	53	56	64	76	80	77	80	78	72	65	59	45	34	32	31	30
U Q	32	32	32	32	29	25	24	48	56	63	72	88	86	84	93	89	82	74	66	53	40	33	32	32
L Q	28	28	28	26	24	20	19	44	52	54	56	64	68	64	68	66	62	60	54	38	30	28	28	28

OCT. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 2018 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									L	L							L	L							
2									L	U	L	A	L				L	L							
3										A	L	U	L		A		A	A							
4											A	L	U	L			A	A							
5									L	L	U	L			L	U	L	L	L						
6										L	A	A		A	U	L	L	A	L	A					
7									L	L	L						L	L	L						
8									L	L	U	L		L	L	L	L	U	L						
9									U	L	L	L		L	L	L	L	A							
10										A	A	L		L	A	L	A								
11									L	L	L		L	L	L	L	L	L							
12									U	L	L		A		L	L	L	L							
13										L	L	L					U	L	L						
14										L	L	L					L	A							
15									L	U	L	L		U	L	L	L	L							
16										L	L	L					L	L							
17										L	L	L		U	L	L	L	L							
18									U	L	U	L	L	L	L	L	L	L							
19										L	L	L		L	L	L	L	L	L						
20										L	L	L					A								
21									L	L	A	L					A		A						
22									U	L	U	L		A	A	A	L	L							
23										L	L	L	U	L		L				A					
24										L	A				A	A	A	L							
25										L	U	L	U	L	L	A	A	A							
26									U	L	L	A		A	U	L	L	L	A	A					
27										L	L	A	U	L	L	L	L	L							
28									U	L	U	L		U	L	L	L	L							
29							A		L		U	L	A				L	L							
30										L	L	U	L				L	L							
31										L	L			U	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										2	15	25	26	28	26	26	25	8							
MED									U	L	L	L				L	L								
U Q										382	412	428	440	440	444	432	416	392							
L Q											L	L	L	L	L	L	L	L							
											420	432	444	444	448	436	428	398							
											L	L					L	L							
											404	426	436	436	436	424	408	386							

OCT. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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	A													
2							B	A																
3							B																	
4					J	K	B	A	U	A	A													
5							B																	
6							B																	
7							B	A																
8							B																	
9							B	A	U	A	A													
10							B	A	U	A	A													
11							B	A	U	A	A													
12							B	A	U	A	A													
13							B	A																
14							B	A	U	A	A													
15							B																	
16							B																	
17							B																	
18							B																	
19							B																	
20							B																	
21							B																	
22							A																	
23							B																	
24							B																	
25							B																	
26							B																	
27							B																	
28							B																	
29							A																	
30							B																	
31							B																	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1		18	25	22	18	22	17	19	16	20	18	15						
MED					J	K		182	248	284	306	320	324	324	312	294	264	208						
U Q								192	256	292	308	324	328	324	318	300	264	216						
L Q								176	242	280	304	312	320	320	308	292	260	196						

OCT. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A	J A	J A	E B	E B	J A	J A	J A	J A	J A	G	G							J A	J A	E B	E B	E B	E B
2	E B	16	18	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	J A	J A	J A	J A	J A	J A
3	J A	J A	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
4	J A	J A	J A	J A		J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
5	J A	J A	J A		E B	E B	E B							J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
6	J A	J A	J A		E B	E B	E B				J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
7	J A	J A	J A	J A	J A	J A	J A									J A	G		J A	J A	J A	J A	J A	E B
8	E B	16	16	16	18	20	16	16						G	J A	G		J A	J A	J A	J A	J A	J A	J A
9	E B	J A	J A	J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
10	J A	E B		17	20	20	18	24	42	61	63	64	54	68	50	48	56	90	53	103	27	70	21	25
11	J A	J A	J A	E B	E B	E B	E B			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
12	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
13	J A	J A	J A	J A	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	E B
14	E B	16	20	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	E B	J A	J A	J A
15	J A	J A	J A	J A	E B	J A	J A			J A								J A	J A	J A	E B	E B	E B	E B
16	E B	16	16	16	16	16	18	19	23	30	35	34	37	35	46	44	69	89	26	23	22	19	16	16
17	E B	J A	J A	J A	J A	E B	J A			G	J A							J A	J A	J A	J A	J A	J A	J A
18	J A	J A	E B	J A						J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	J A	E B
19	E B	16	16	18	J A	J A	J A	J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B
20	J A	J A	J A	J A	J A	J A	J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B
21	J A	J A	J A	J A	J A	J A	J A			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	J A	E B
22	E B	J A	J A	J A	J A	J A	J A			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	J A	J A
23	J A	J A	J A	J A	J A	J A	J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
24	J A	E B	J A	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	E B
25	J A	E B	E B	J A	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
26	J A	J A	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	J A
27	J A	J A	J A	J A	J A	J A	J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
28	J A	17	18	19	E B	J A	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
29	J A	J A	J A	J A	J A	J A	J A			J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
30	E B	16	16	26	19	19	16	18			G								J A	J A	J A	J A	E B	E B
31	E B	16	16	25	29	20	20	20				J A							J A	J A	J A	J A	E B	E B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	J A	J A	J A	J A	19	19	19	19	23	31	36	41	42	40	40	41	39	37	37	33	29	27	27	21
U Q	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
L Q	E B	16	16	16	17	16	16	16	20	29	34	35	37	36	36	36	35	32	27	23	22	20	19	16

IONOSPHERIC DATA STATION Okinawa

OCT. 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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	E	B
31	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
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	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	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	E	B

OCT. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

OCT. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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	307	326	337	367	370	V	317	336	391	383	390	367	342	341	292	H	322	329	338	368	385	369	334	287	307	310	
2	318	328	317	364	341	328	338	395	388	348	390	317	296	324	343	349	343	338	370	372	349	315	288	327			
3	309	322	324	351	366	357	339	400	400	383	380	323	316	V	336	331	335	338	379	371	352	391	312	296	320		
4	F	F	343	341	372	427	B	342	384	382	377	377	378	A	A	336	341	339	337	384	392	344	A	337	F		
5	331	309	364	412	324	363	355	404	401	384	362	338	371	344	347	352	V	346	341	365	355	338	335	326	328		
6	326	325	378	347	354	367	377	392	385	372	A	356	353	342	350	371	375	367	363	342	329	F	F	F	303		
7	F	F	319	342	361	359	361	344	381	389	368	364	366	359	345	340	369	336	360	369	373	368	324	290	317		
8	302	301	313	338	293	317	400	384	367	378	307	340	339	342	346	354	337	370	369	358	359	294	316	305			
9	316	320	331	367	370	385	327	384	367	343	368	327	344	352	323	343	353	368	374	345	350	297	284	305			
10	322	332	351	333	307	326	416	387	370	342	340	352	351	319	R	335	360	356	371	357	340	338	305	F	304		
11	302	308	331	375	392	336	317	381	380	354	355	355	328	J	R	319	319	344	352	376	357	373	353	323	F	F	
12	F	F	294	341	A	365	334	347	396	393	372	367	356	327	321	323	329	350	363	371	379	A	A	F	F		
13	F	F	331	365	F	349	363	351	389	372	355	344	368	347	325	345	334	374	371	356	360	352	303	318	323		
14	331	337	341	353	304	334	429	380	343	337	340	373	376	290	329	341	H	311	373	391	R	340	315	309	310		
15	315	299	334	321	361	372	325	371	369	354	344	375	359	338	332	331	355	362	388	356	342	311	318	322			
16	331	324	322	332	386	335	334	394	381	344	345	362	365	315	346	294	348	364	394	354	336	295	320	314			
17	269	289	307	295	F	369	369	319	392	378	365	351	363	371	294	278	323	352	386	389	338	373	311	288	296		
18	317	324	349	362	367	399	326	427	349	367	322	344	372	323	H	321	339	364	392	367	393	392	329	319	317		
19	313	348	308	369	419	362	296	395	393	370	332	342	363	310	332	353	349	371	383	J	R	377	394	312	317	313	
20	309	318	349	369	403	389	313	389	366	366	343	375	370	301	321	335	347	385	395	411	A	375	311	307	307		
21	316	344	367	333	392	355	349	367	404	350	350	347	319	304	319	334	373	406	407	295	313	299	309				
22	322	317	335	316	388	396	386	392	373	378	324	345	329	296	310	346	379	376	365	364	370	341	330	337			
23	326	331	340	332	355	348	370	406	358	356	342	340	294	304	311	340	360	387	A	358	347	326	328	315			
24	316	337	336	368	410	A	343	391	384	363	337	356	325	333	J	R	320	346	355	404	411	378	306	294	A	A	
25	333	341	352	355	374	380	338	380	390	381	354	324	327	336	331	347	355	386	376	390	363	304					
26	A	F	326	354	347	365	F	F	F	402	383	344	344	351	405	279	330	352	376	380	378	409	A	A	F	347	359
27	369	298	322	325	369	333	397	394	396	379	361	375	319	341	322	345	360	369	V	V	V	335	323	331	317		
28	320	328	350	361	348	373	396	392	387	373	331	365	353	292	311	323	348	380	385	381	326	327	357	366			
29	325	F	331	342	A	363	A	393	391	373	356	375	402	307	314	311	343	335	374	366	325	315	343	331			
30	375	332	F	360	366	361	393	346	396	399	382	346	322	366	360	328	R	354	362	366	378	348	335	325	348	366	
31	322	330	362	350	369	376	395	401	411	388	386	342	351	333	327	347	352	381	364	377	351	319	350	375			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	31	31	30	30	29	30	31	31	31	30	31	30	30	31	31	31	31	29	31	29	28	30	29			
MED	318	325	341	352	366	362	345	392	383	368	348	352	351	322	328	343	352	371	374	372	347	314	318	317			
U Q	326	332	352	367	386	374	377	396	393	378	364	366	366	338	336	352	360	381	385	380	366	324	330	328			
L Q	310	317	331	333	354	334	334	384	370	354	340	340	327	304	320	334	343	364	366	355	335	304	299	306			

OCT. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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	L							L	L						
2									L	U	L	A	A	412	371	375	397	383						
3										A	A	U	L		A		A	A	A					
4															A	U	L	L	L					
5									L	L	U	L			A	U	L	L	L	L				
6										L	A	A	A	U	L	L	A	L	A					
7									L	L	L						L	L	L					
8									L	L	U	L	L	L	L	L	L	U	L					
9									U	L	L	L	L	A	L	L	L	A						
10									A	A	A	A		A	A	A	A	A						
11									L	L	L		H	L	L	L	L	L						
12									U	L	A	409	A			L	L	L	L					
13										L	L					U	L	L	L					
14										L	L					L	L	A						
15									L	U	L	L	L	U	L	L	L	L						
16										L	L	L	L	U	L	L	L	L	L					
17										L	L	L	L	U	L	L	L	L	L					
18									U	L	U	L	L	L	A	L	A							
19										L	L	L	L	A	U	A	L	L						
20										L	L	L	L	A	A	A	A							
21									L	L	A	A	351	406	416		A	A	A			A		
22									U	L	U	L		A	A		L							
23										L	L	L	U	L		L					A			
24										L	A				A	A	L							
25										L	U	L	U	L	L	A	A	A						
26									U	L	L	A	A	U	L	L	L	A	A					
27										L	A	A	U	L	L	L	L	L						
28									U	L	U	L	U	L	L	L	L	L						
29							A		L		U	L	A				L	L						
30										L	U	L	L	403	411	394	402	L						
31										L	L		U	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									2	15	22	25	28	24	25	22	8							
MED									U	L	L	L				L	L							
U Q									417	388	392	395	404	400	393	374	376							
L Q										L	L	L	L	L	L	L	L							
										384	380	388	398	388	380	369	369							

OCT. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									232	220	246	264	258	286	268	300	268	234						
2									226	270	222	326	360	276	244	256	264							
3										220	236	314	330	286	294	274	268	224						
4										238	228	238		A	A	280	258	270	248					
5									216	230	234	L	298	244	260	264	276	264	254					
6										234	A	252	252	272	272	238	226	236						
7									220	234	250	242	266	266	278	244	268	242						
8									230	234	328	252	252	252	248	256	268							
9										274	234	262	262	258	290	266	248							
10										272	270	242	216	260	246	250	248							
11									218	244	248	252	272	262	252	248	238							
12										240	238	238	286		272	264	244							
13										250	260	228	244	250	260	278	226							
14										286	268	230	218	314	270	250	230							
15								208	224	250	258	226	232	286	290	266								
16									218	280	254	234	228	256	242	254	242							
17										240	256	240	216	302	260	266	234							
18									L	272	250	296	250	216	264	250	258							
19										252	298	264	228	282	238	228	228	224						
20										244	274	224	236	328	270	274								
21									208	240	272	252	252	284	244	252	226			A				
22										236	312	L	270	262	318	284	244	220						
23										248	262	254	266	280	262	240				A				
24										250	284	250	270	252	252	242	242							
25										234	276	296	276	246	264	258	228							
26										L	272	276	258	210	430	292	246	218	216					
27										226	254	260	286	264	282	240	248							
28										238	L	276	230	228	266	266	234	228						
29							A		218		270	236	212	314	284	268	236							
30										230	286	278	232	224	244	212	224							
31										222	226	280	246	274	276	244	232							
	00	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	30	30	31	30	29	31	31	27	8						
MED								208	220	240	261	252	249	272	266	254	238	235						
U Q									230	250	276	264	266	286	280	266	264	245						
L Q									218	234	246	238	228	259	250	244	228	224						

OCT. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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 \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	284	254	226	178	190	350	250	212	226	214	194	172	172	234	216	216	226	198	182	202	268	290	260		
2	260	256	272	208	258	302	254	204	210	226	A	E A 288	206	228	192	202	214	236	218	192	214	264	324	264	
3	298	256	254	218	200	214	230	196	210	A	A	E A 188	298	A	A	A	A	A	A	206	222	208	292	320	300
4	280	260	278	212	178	B	248	208	228	224	218	A	A	A	A	A	A	A	212	190	E A 250	A	254	288	
5	258	266	212	174	292	228	212	200	208	196	180	200	160	E A 242	210	210	188	214	210	206	224	212	248	262	
6	244	246	196	202	224	216	194	200	206	194	A	A	A	194	202	A	210	A	218	260	238	230	234	260	
7	Q 256	262	228	208	208	238	240	200	208	202	220	202	182	196	192	198	204	226	204	200	210	238	322	266	
8	288	288	272	242	302	260	176	212	212	200	184	184	200	202	174	180	208	228	214	212	E A 222	316	278	256	
9	256	248	244	212	214	198	240	202	212	224	212	200	188	E A 246	210	232	A	228	200	208	196	272	282	276	
10	266	226	224	258	260	240	184	206	220	A	A	A	202	A	A	A	A	226	222	E A 258	202	238	310	Q 298	
11	282	276	234	208	192	326	256	206	210	214	194	212	180	H 194	192	212	212	220	218	202	210	E A 316	Q 286	Q 282	
12	Q 246	280	218	A	222	256	230	204	206	E A 224	A	A	A	282	208	210	206	224	212	206	A	A	A	296	284
13	256	232	216	240	236	214	240	198	208	206	208	194	194	190	174	170	190	A	222	218	202	180	242	254	258
14	246	236	226	224	294	Q 240	182	194	208	210	222	222	204	168	168	234	A	224	190	232	A	224	246	272	252
15	266	286	246	258	220	204	242	194	188	202	196	192	178	212	190	204	234	218	194	208	208	256	248	244	
16	240	256	256	238	204	232	222	204	202	202	198	216	196	208	194	208	210	216	198	188	198	272	238	234	
17	254	248	236	230	Q 192	Q 198	232	198	208	200	198	190	194	H 172	220	244	228	214	196	210	192	274	286	288	
18	278	258	222	204	210	202	238	180	202	198	218	216	206	E A 172	222	A	224	212	228	190	186	238	250	262	
19	266	260	256	202	174	234	372	204	222	194	H 180	176	218	E A 258	210	A	214	218	196	208	188	266	256	274	
20	284	266	236	216	184	196	322	200	208	210	200	182	202	E A 166	248	A	250	210	200	210	A	186	274	282	282
21	278	246	228	232	190	248	260	206	198	204	A	A	174	194	A	A	A	204	A	202	302	276	282	Q 278	
22	258	252	226	250	208	208	E A 252	184	200	184	208	208	190	A	A	E A 240	212	208	204	202	184	226	246	234	Q
23	264	238	268	242	218	230	204	188	200	204	192	184	174	164	162	238	224	220	A	216	212	242	228	256	Q
24	242	236	242	204	182	A	294	198	212	214	E A 228	172	A	A	A	214	212	200	184	202	286	316	292	254	A
25	258	238	230	220	202	224	258	194	200	206	180	196	216	202	A	A	A	A	208	196	200	222	292	A	A
26	A	242	224	212	194	238	208	198	200	220	220	A	202	196	192	230	A	A	206	192	A	A	266	248	A
27	232	260	266	238	204	Q 236	190	200	206	202	A	A	182	178	162	226	226	A	214	200	E A 304	240	260	230	
28	264	256	236	212	200	198	220	196	204	188	196	186	182	180	204	224	A	222	220	192	246	254	208	206	
29	262	250	248	252	A	204	A	194	194	210	216	A	204	170	168	216	230	218	196	206	192	248	210	226	
30	212	242	Q 226	204	218	212	274	196	206	206	198	196	186	194	180	208	212	218	196	212	200	240	206	204	
31	228	254	214	252	222	214	206	194	196	198	200	206	194	170	204	230	216	206	204	190	192	246	222	212	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	31	31	30	30	29	30	31	31	29	23	24	28	26	25	22	22	27	29	31	29	28	30	30	
MED	259	254	234	217	208	228	237	200	208	204	198	196	193	190	193	213	213	218	204	202	205	251	263	260	
U Q	278	260	254	240	222	240	254	204	210	214	216	213	203	208	210	230	224	224	216	210	224	274	286	278	
L Q	246	242	224	208	192	206	208	194	200	199	194	187	181	172	177	208	210	212	196	192	192	240	246	244	

OCT. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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					
2							B	A	104		104	102	106	102	102	102	102	104	A					
3							B		108	106	106	106	104	102	102	102	102	104	A					
4							B	110	106	104	104	100	100	100	100	100	100	100	A	A				
5						B	B	A	110		A		104				100		A	A				
6							B		114	102	102	106	104					A	A	A				
7							B	106	106	104		A	A	A	A		102	102	100	A				
8							B	A		104	104	104	104	104	104	104	104	104	A	A				
9							B	108	108	106	102	100		100		104			A	A				
10							B	A		108	108	108		102	102	106	100	102		A	A			
11							B	A	102	102		A	A	A	A		102	100	100	A				
12							B	A	100	100		A	A	A	A	A	A	A	A	A				
13							B	A		A	102		A	A		A	A	A	A	A				
14							B	A		100	100		A			A	A	A	A	A				
15							B		100	100		116	108	102						B				
16							B	110	102	108	100	100	100		98	98	100	100	106					
17							B	118	106	106	104	104	102		A	A	A	A	102	A				
18							B	112	102	100	100	102	104	100	102	102	106	106		A	A			
19							B	114	102	106	104	104	104	104	104		A	A	104	A	A			
20							B	104		A	A	102	102		A	A		A	A	A				
21							B	116		A	A	100	100		A	A	100	104	102	A				
22							B	108	102		A	A	104	104	106	106	106	100		A				
23							B	108		A	A	106		A	104	104	104	102		A	A			
24							B	114	110	110		110		A	104	104	104		A	A				
25							B	A		110	102	102	102		A	102	102	102	106	104				
26							B	124	104	104	104	104		A	A	A	104		A	A				
27							B	122		A	A	A	A	A	A	A	A	A	A	A				
28							B	116	106		A		A		A				A	A				
29							A	A	108	108	108	102		A	A	A	A	A	A	B				
30							B		108	108	108	102								B				
31							B	114	106	106	104	104	104	102	102	106	104	106						
							B	A		106	106	106	102	102	102	102	102		A	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								18	25	22	18	22	17	19	16	20	17	15						
MED								113	106	104	104	103	104	102	103	102	102	104						
U Q								116	108	106	106	104	104	104	104	104	106	106						
L Q								108	102	102	102	102	102	100	102	102	101	100						

OCT. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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	88	82	82	B	B	164	130	112	110	104	G	G	158	G	148	156	122	110	100	100	B	B	B	B
2	B	100	B	B	B	B	126	126	118	106	106	104	104	104	130	126	132	106	98	98	92	92	92	96
3	84	88	92	90	88	B	B	132	122	112	114	108	116	112	136	112	110	100	100	106	98	100	104	98
4	98	88	84	84	86	90	124	128	108	108	94	104	100	100	106	104	102	96	96	96	92	92	90	92
5	88	84	86	96	B	B	B	140	142	126	126	114	128	92	102	106	94	92	92	92	88	94	84	98
6	92	92	92	86	96	B	B	114	148	128	86	86	84	84	84	102	108	104	96	96	92	92	92	90
7	90	90	88	88	86	86	86	120	160	134	136	118	116	112	106	88	G	116	100	98	92	92	92	B
8	B	B	B	86	84	B	B	126	G	108	106	102	100	98	96	96	144	94	98	102	96	106	92	92
9	B	90	86	86	88	90	90	122	144	126	94	90	112	110	90	124	114	86	88	84	84	94	94	94
10	94	B	94	90	90	92	92	114	106	104	106	102	102	100	100	100	98	98	98	120	98	106	94	94
11	94	94	90	B	B	B	B	128	120	108	108	102	96	94	98	166	118	100	98	96	92	92	122	86
12	92	90	90	90	90	90	94	110	104	102	96	94	96	94	94	98	98	92	88	88	86	100	88	88
13	94	90	88	88	B	B	B	104	106	104	124	86	94	G	90	108	84	84	86	86	84	84	B	B
14	B	80	80	86	B	B	B	134	128	108	90	152	86	118	88	86	84	86	90	100	B	B	94	94
15	94	94	90	76	B	92	106	144	94	170	G	88	84	154	144	162	152	136	90	84	B	B	B	B
16	B	B	B	B	B	94	94	140	126	134	134	128	124	128	102	98	108	98	90	84	84	B	B	B
17	B	90	90	90	90	B	G	130	112	106	100	132	90	94	166	136	132	118	106	102	90	90	90	110
18	86	86	B	90	88	90	90	130	172	118	152	108	108	110	176	142	124	118	116	108	128	B	86	B
19	B	B	86	86	86	86	86	116	162	156	92	90	164	182	132	88	102	86	104	112	92	86	B	144
20	96	96	B	B	B	B	B	142	140	104	90	106	174	84	84	126	120	110	104	98	102	100	B	94
21	94	90	110	92	88	92	88	G	106	134	102	104	108	118	124	124	110	104	96	98	96	96	92	B
22	B	92	96	90	90	108	92	G	102	98	106	98	122	152	128	134	134	124	112	98	98	94	94	94
23	94	94	82	82	118	88	88	130	108	100	100	102	96	108	110	140	122	96	94	92	92	98	90	92
24	92	B	88	B	96	86	86	124	122	130	86	120	84	146	124	124	132	128	96	94	98	98	B	B
25	86	B	B	98	B	88	126	120	110	100	104	102	108	146	112	108	106	102	96	94	104	98	98	98
26	96	94	94	94	B	B	92	150	88	106	106	102	102	102	110	124	118	124	94	90	90	90	96	94
27	92	92	92	84	84	92	90	136	106	100	100	96	96	96	94	96	94	92	90	94	88	88	82	88
28	88	84	84	B	84	B	90	128	136	106	106	102	98	142	112	106	106	104	100	98	98	94	92	92
29	92	88	92	92	88	88	86	86	120	138	114	98	98	104	98	96	94	94	94	88	88	B	B	B
30	B	B	88	90	90	B	G	90	144	132	120	122	106	114	108	162	126	136	110	96	96	94	B	B
31	B	B	90	90	88	88	94	142	124	114	116	110	112	108	152	102	108	98	94	94	96	B	B	94
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	23	25	24	20	18	23	27	30	31	29	30	31	29	31	31	30	31	31	31	28	25	21	21
MED	92	90	90	90	88	90	92	128	120	108	106	102	102	108	108	108	110	100	96	96	92	94	92	94
U Q	94	94	92	90	90	92	106	136	140	130	115	110	116	123	130	134	124	116	100	100	98	98	94	97
L Q	88	88	86	86	86	88	88	116	106	104	95	98	96	97	96	98	102	94	92	92	89	92	90	92

OCT. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

OCT. 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	F1	F1	F1			F1	H1	C7	C2	C2			HL11		H1	H1	C1	C2	C2	F1					
2		F1					C1	C3	C2	C2	C2	C2	C1	C1	C1	C1	C1	C3	L2	F2	F4	F3	F3	F1	
3	F2	F1	F2	F2	F1			H2	C4	C2	C2	C1	C2	C2	H1	C2	C3	C8	C8	F6	FF61	F2	F3	F2	
4	F2	F4	F7	F2	F1	L1	C1	C1	C1	L1	CL31	CL4	CL41	CL31	CL21	CL31	CL5	L5	L5	F3	F3	F4	F2	F2	
5	F3	F2	F1	F1				H2	H1	C1	CL11	C1	L1	C2	C1	CL11	L1	L3	L2	F3	F3	F1	F2	FF11	
6	F1	F1	F1	F1	F1			C2	HL11	C1	L4	L2	L2	L2	L2	C2	C1	C5	L6	F31	F3	F2	F2	F2	
7	F3	F2	F4	F3	F4	F2	L2	C1	HC11	HL11	HL11	C2	C1	C1	C2	LC11		C1	C3	F4	F5	F3	F5		
8			F1	F2				C3		C1	C1	C1	C1	L1	L1	L1	HL11	L2	L3	FF26	F4	F5	F4	F2	
9		F2	F3	F2	F1	F1	L2	CL11	H1	CL12	LC22	L3	CL11	CL32	LH11	CL12	CL32	LC42	LQ21	F6	F1	F1	F1	F3	
10	F2		F1	F2	F1	F1	L1	CL22	C2	C5	C2	CQ31	C1	C4	C2	C3	L2	L3	L3	FF15	F1	FQ21	FQ21	FQ21	
11	F2	F1	F2					C1	CQ11	CQ21	C1	L1	L1	LH11	H1	C1	C2	L3	L1	F3	F7	F1	F2		
12	F1	FQ31	FQ31	FQ51	F3	FQ51	L2	C5	CL31	C3	L3	LQ21	LQ31	LQ31	L2	L1	L2	L6	L4	FQ51	FQ41	FF24	F3	FQ21	
13	FF31	F2	F1	F1				C2	CQ11	C1	L1	L1	L1		L1	CL11	L2	L3	L2	F1	F1	F1			
14		F1	F1	F1				H1	C2	CL22	LC22	HL11	LC11	CL11	L3	L2	L4	L3	L3	F7		F3	F2	F2	
15	F1	F1	F1	F1		FF11	C1	H1	L1	HL11		L1	L2	HL11	HL11	H1	H1	L1	L1	F1					
16					F1	L1	H1	C1	H1	H1	C1	C1	CLH11	HC1	L2	CL13	LH21	L4	F3	F2					
17		F2	F2	F1	F1		H1	C2	C1	C1	HL11	L1	L1	H1	H1	H2	C2	C2	F3	F3	F4	F1	F1		
18	F1	F1		F1	F1	L1	H1	HCL11	C1	HC11	C2	C1	C1	HC11	HC31	CL22	C3	CL42	FF41	FF11		F2			
19			F1	F1	F1	L1	C1	HC11	HC11	L1	LH21	HL11	HCL11	HLL12	LC23	CL22	LQ31	C5	FF32	FF13	F1		F1		
20	F1	F1					H2	HC12	CL12	LC11	CL11	HC11	LH21	LH11	CL21	CL21	CL22	CL51	FF41	F1	F1		F1		
21	F1	F1	F1	F1	F1	L1		C2	HCL12	C5	C1	C1	C1	C1	C2	C5	C3	C8	F3	F3	F3	F5			
22		F3	F2	F3	F4	FF16	LF46		C2	L1	CL11	L1	L1	C3	H2	H1	H1	C2	C5	F4	F2	F1	F1		
23	F1	F1	F3	F1	F1	L1	H1	C3	C1	LQ11	C1	L2	C1	C1	HC11	C2	L5	L8	F9	FQ31	FQ21	F5	F1		
24	F2		F2		F1	F3	L1	C2	C1	H2	L5	CL12	L2	L2	CL21	L1	L2	L2	L1	F4	F2	F2			
25	F1			F1		F1	C1	C4	C2	C2	C4	CQ11	HC11	C4	CL22	CL22	C3	L7	FF61	F3	F2	F7	FQ51		
26	FQ41	FQ31	F1	F2			L1	H1	LC11	C1	C2	C3	C1	CQ11	CQ11	C2	CL11	CHL32	LQ41	F6	F9	F5	FQ31	F4	
27	F3	FQ21	F3	F2	F2	L1	H2	C2	CQ21	CQ41	LQ31	LQ21	L2	LQ21	LH21	L2	L3	L5	L1	F4	F2	F2	F2		
28	F1	F1	F1		F1	L1	C2	H1	C1	C1	C1	LH11	HL11	CH11	C2	C2	C5	L9	F3	F3	F4	F1	F2		
29	F2	F2	F1	F2	FQ21	FQ31	LQ31	LH11	C1	H2	C2	C3	L2	C1	L2	L2	L3	L3	L1	F5	F1				
30			F1	F1	F1	L1		H1	H1	C1	C1	C1	CL11	C1	H1	C1	H2	C4	F4	F4	F3				
31			F3	F2	F1	L1	H1	C2	C2	C1	C2	C1	C1	C1	HC11	C1	C3	L4	F3	F2				F4	
	00	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
v	LESS THAN

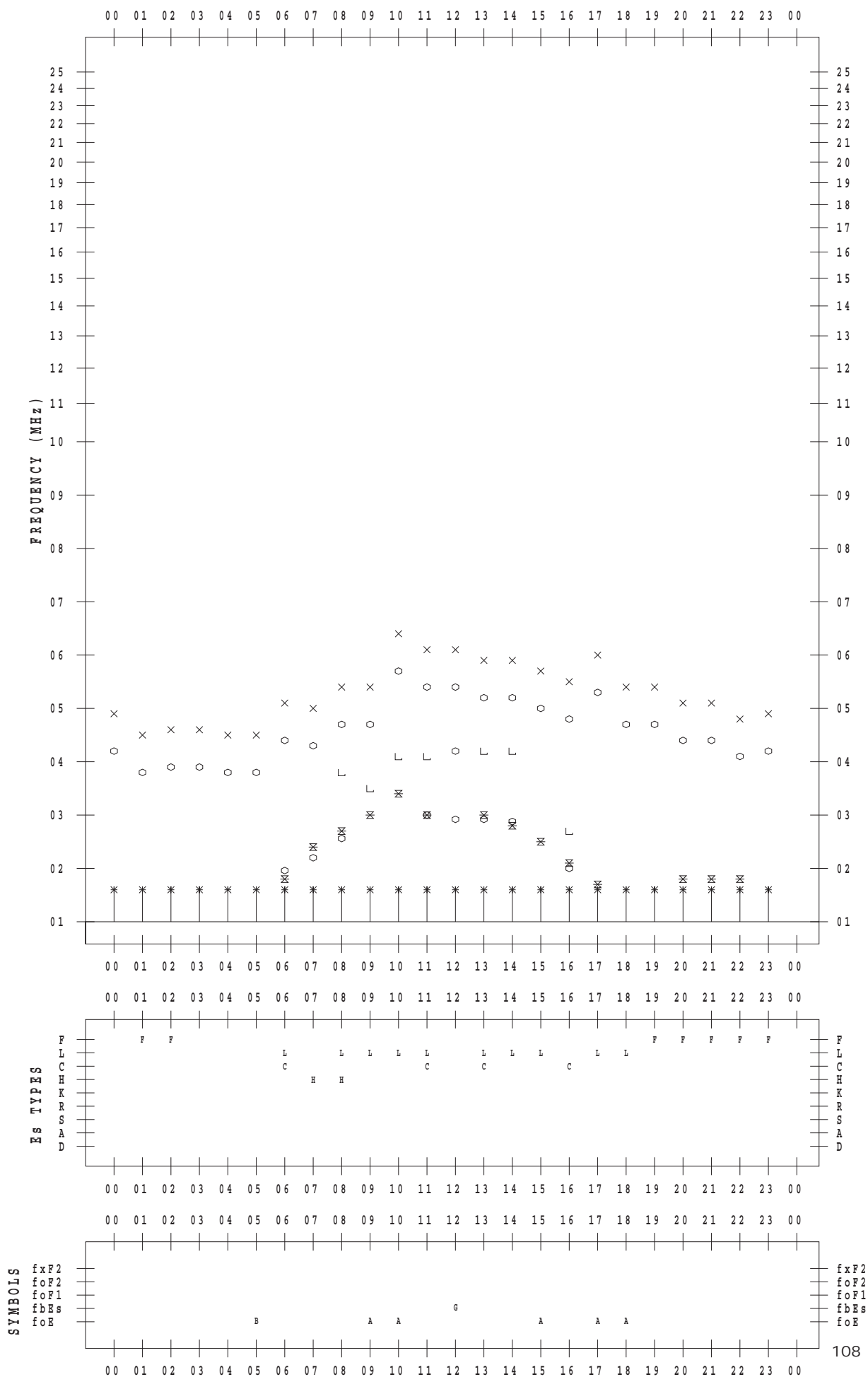
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/ 1

135 ° E MEAN TIME



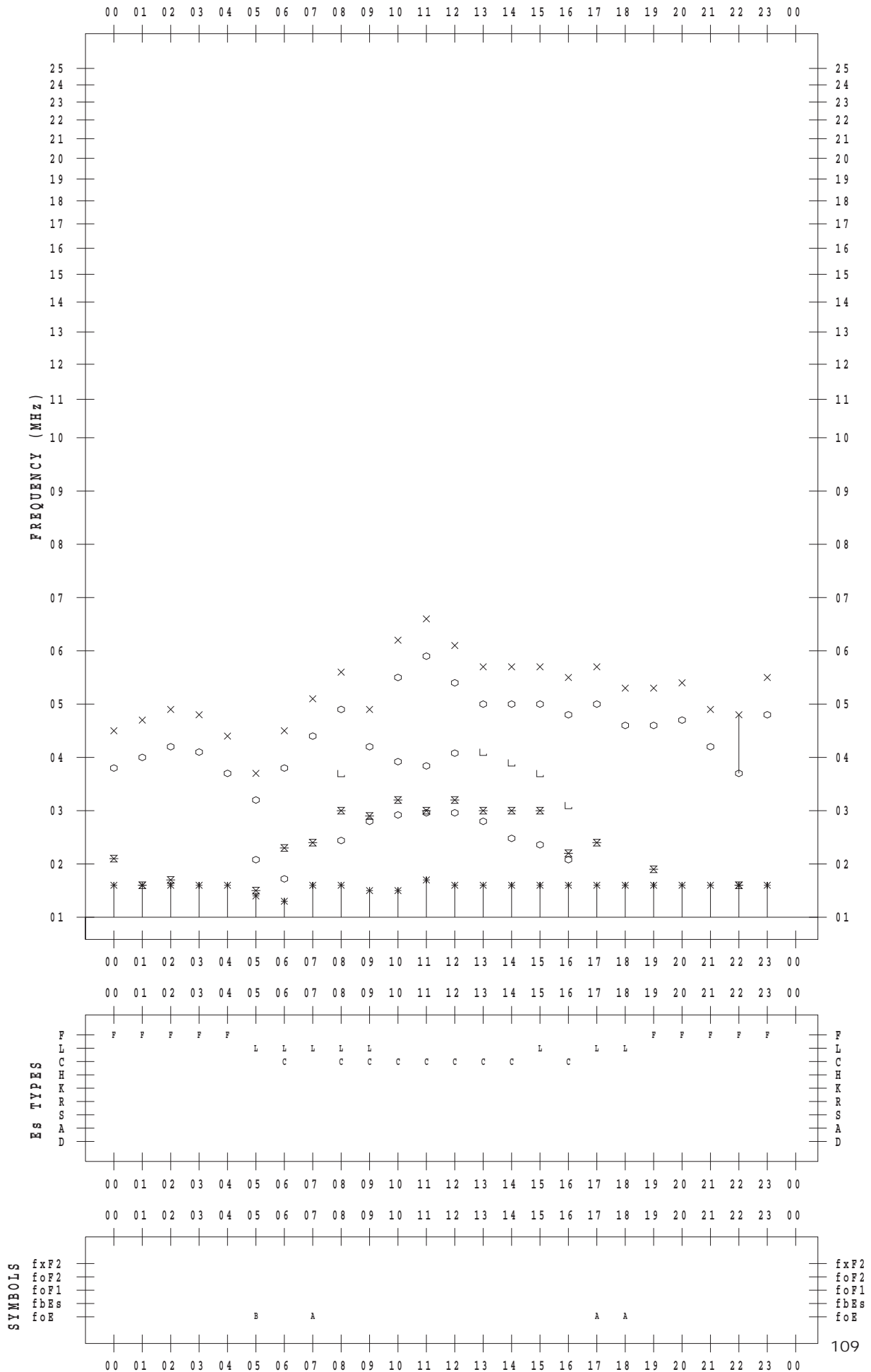
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/ 2

135 ° E MEAN TIME



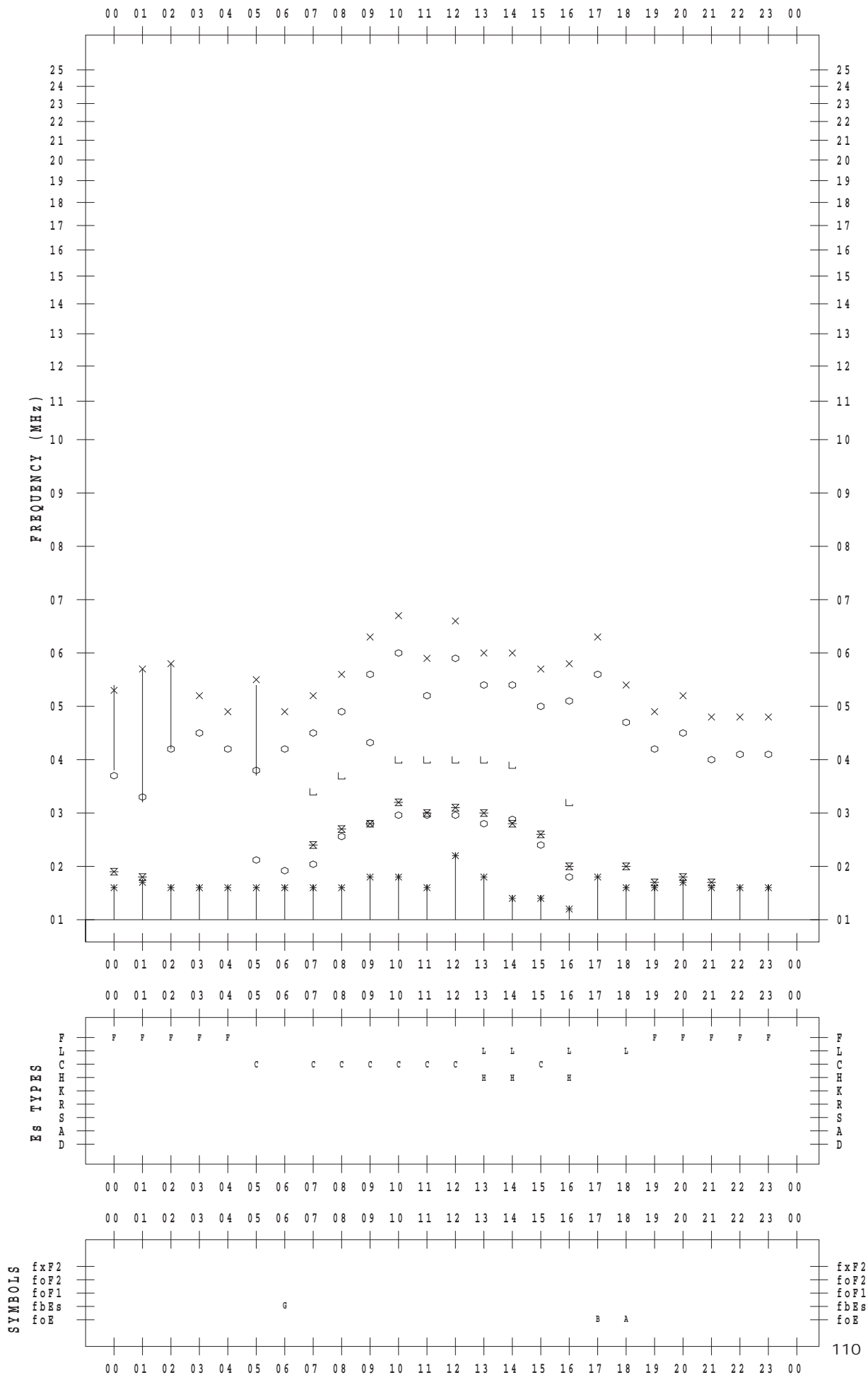
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/ 3

135 ° E MEAN TIME



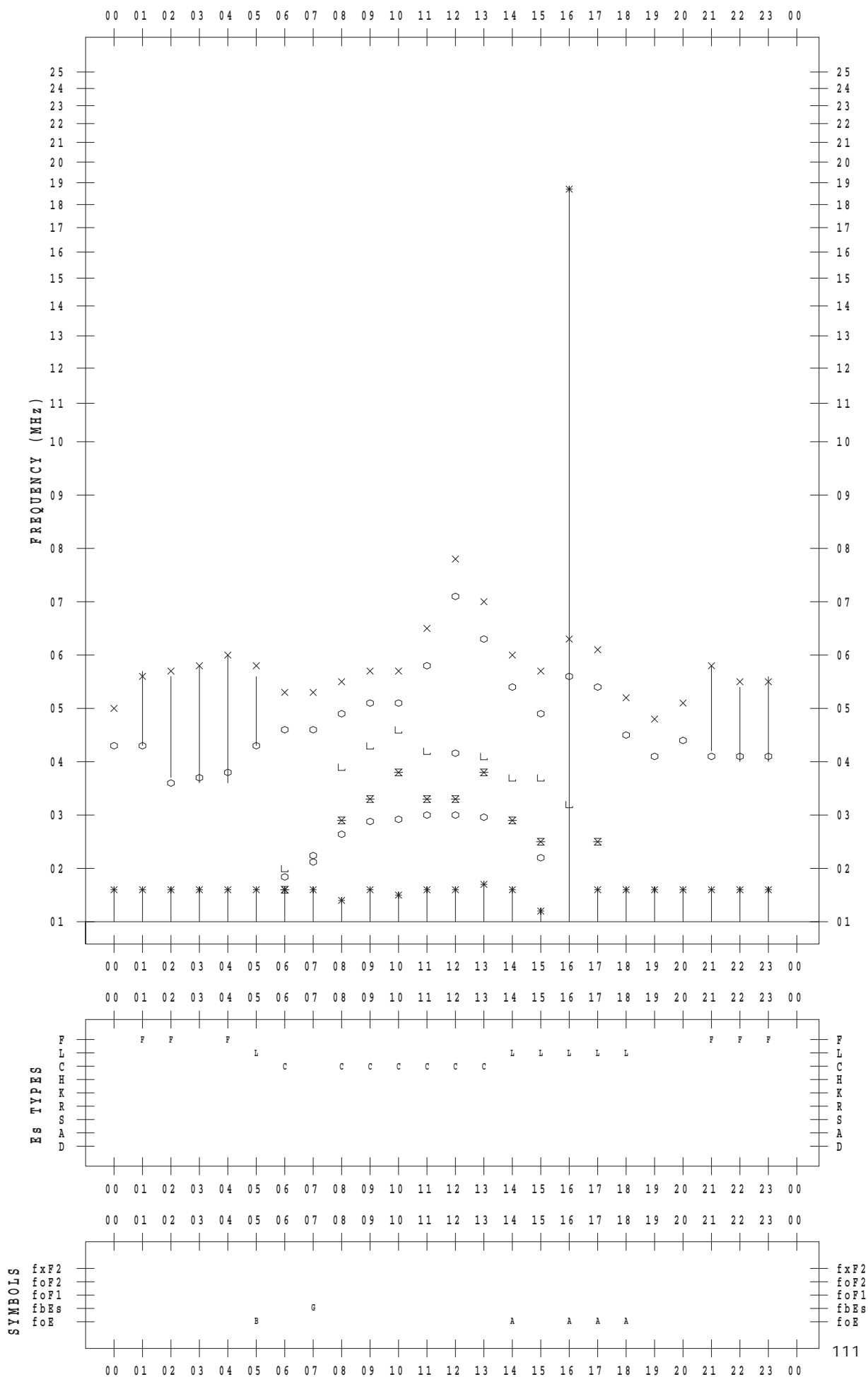
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/4

135 ° E MEAN TIME



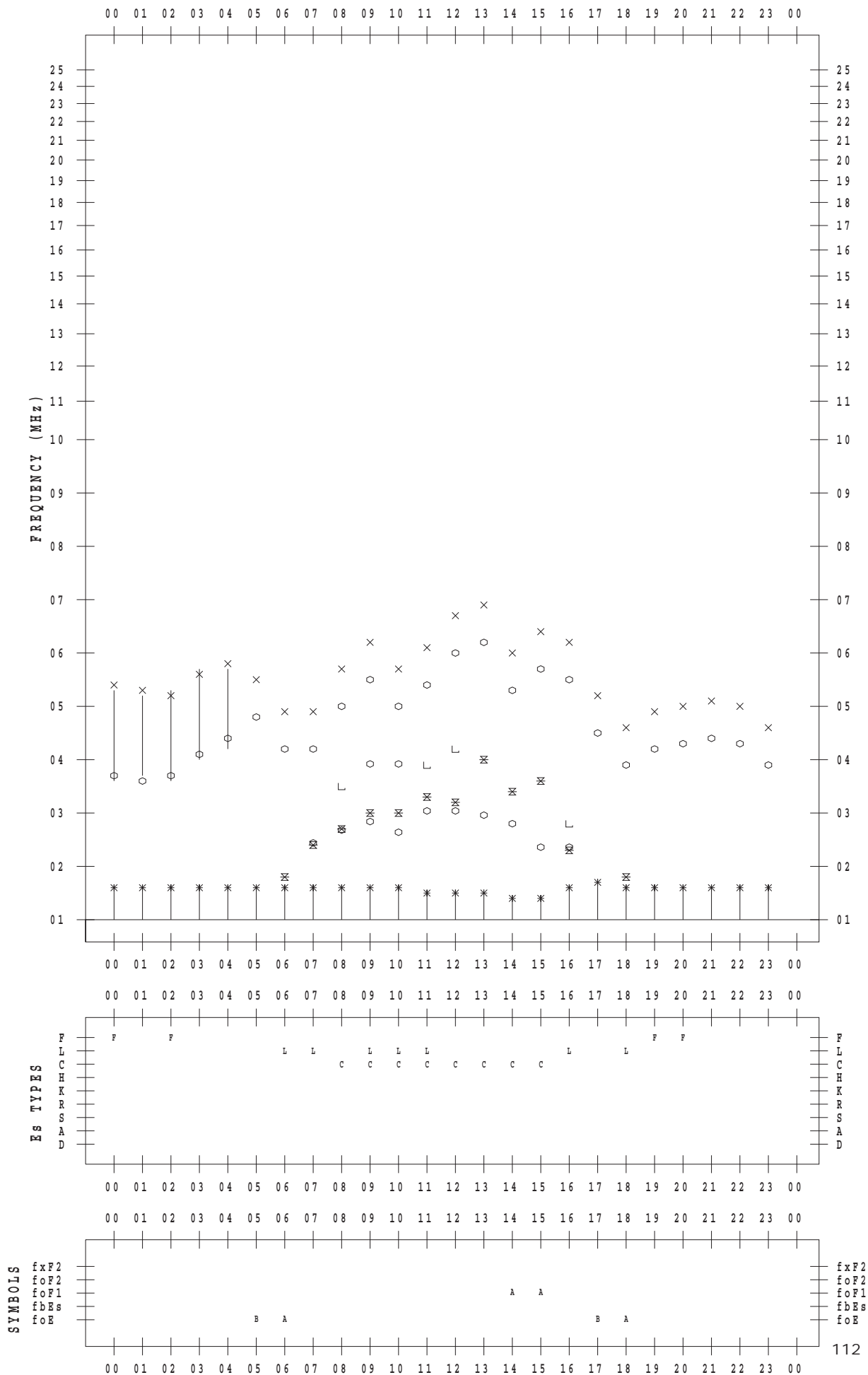
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/ 5

135 ° E MEAN TIME



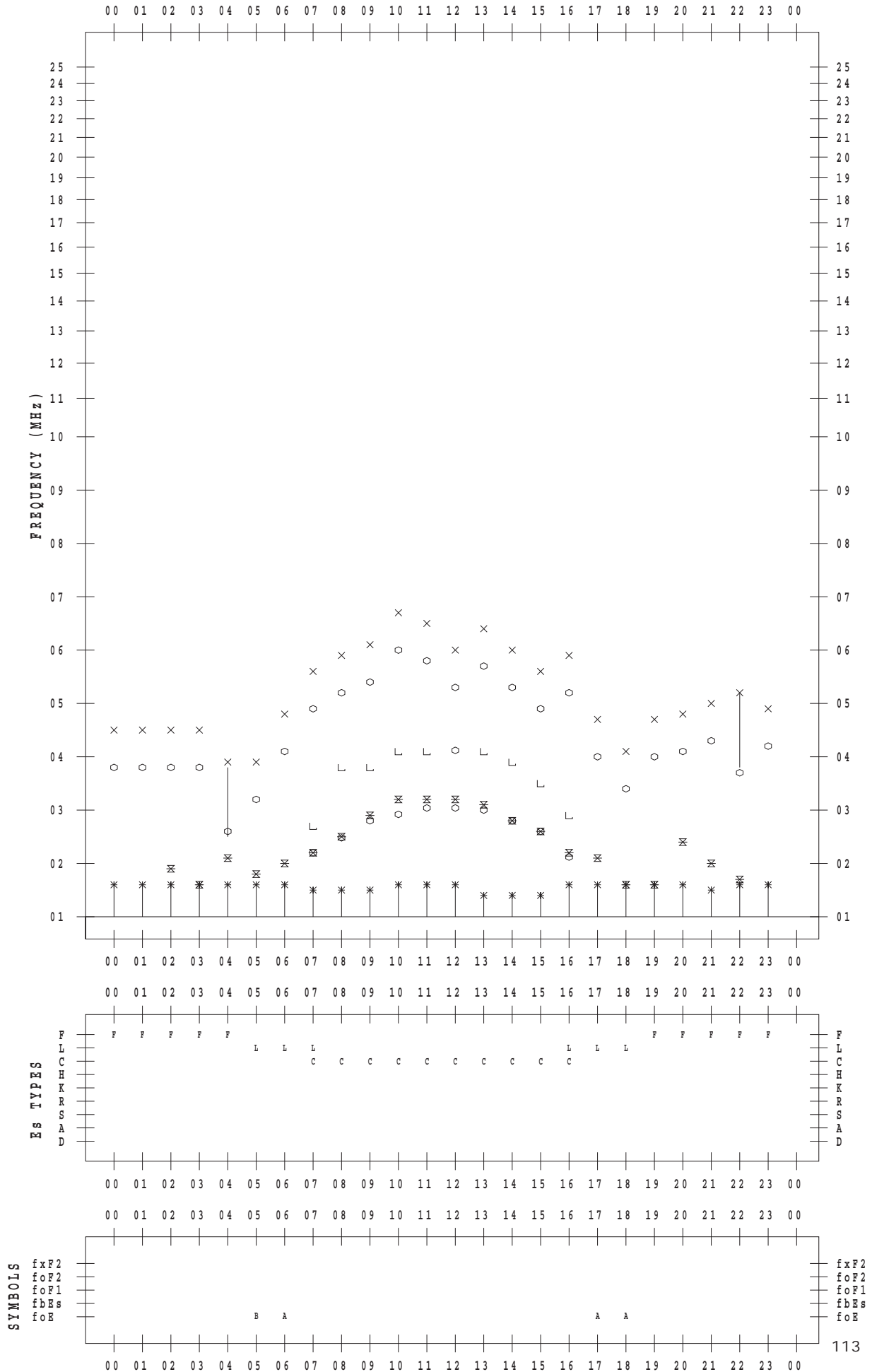
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/ 6

135 ° E MEAN TIME



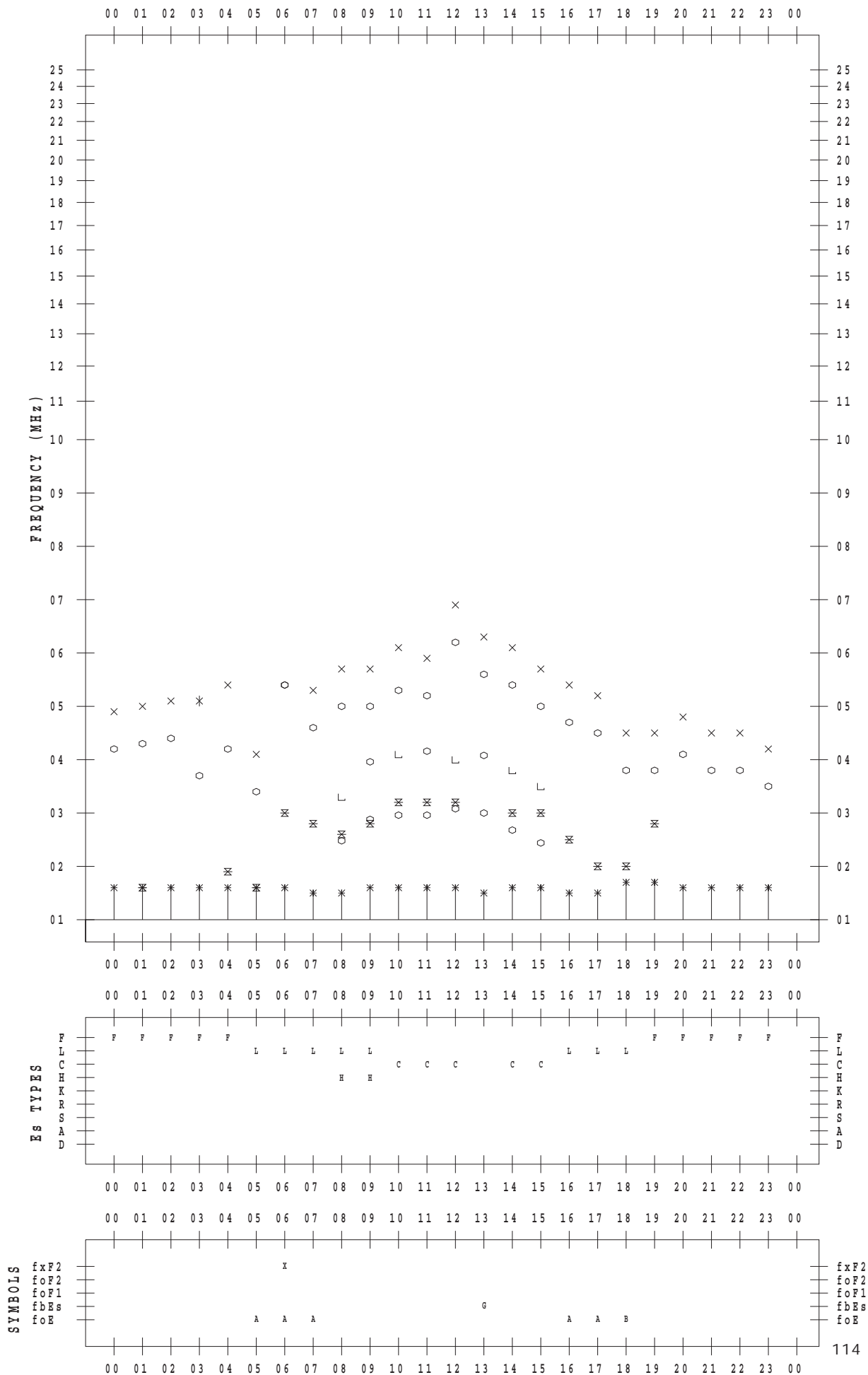
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/7

135 ° E MEAN TIME



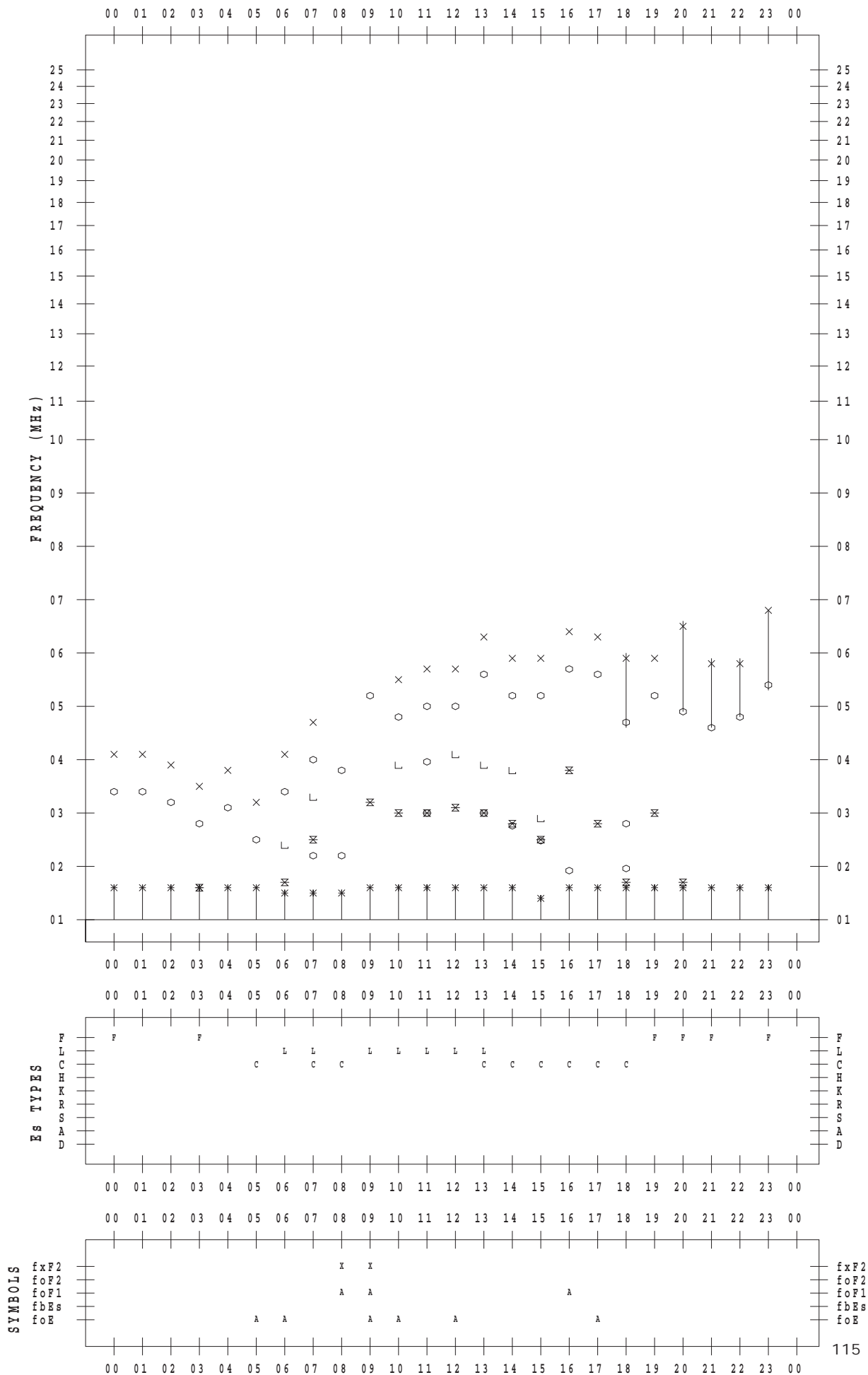
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/ 8

135 ° E MEAN TIME



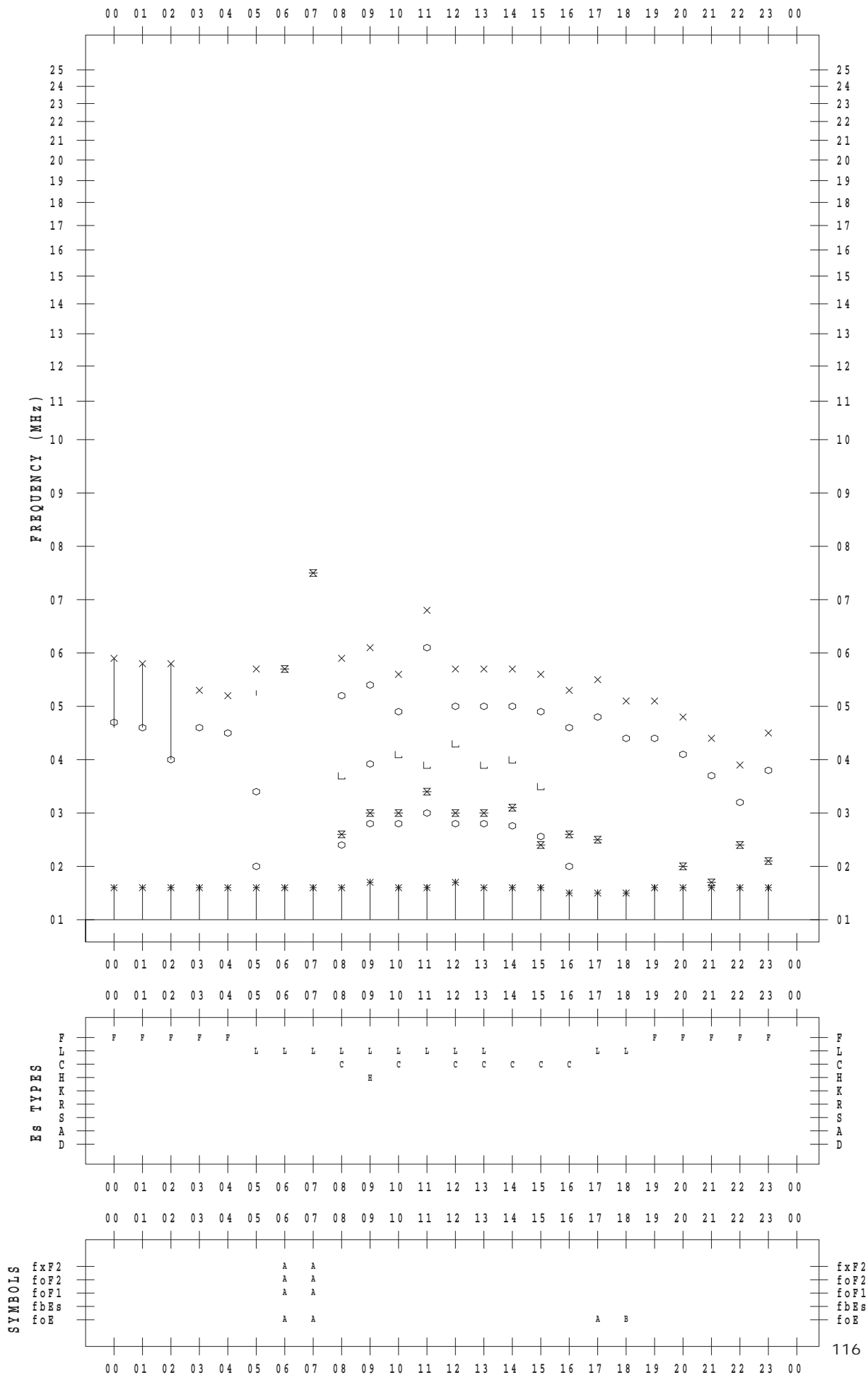
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/ 9

135 ° E MEAN TIME



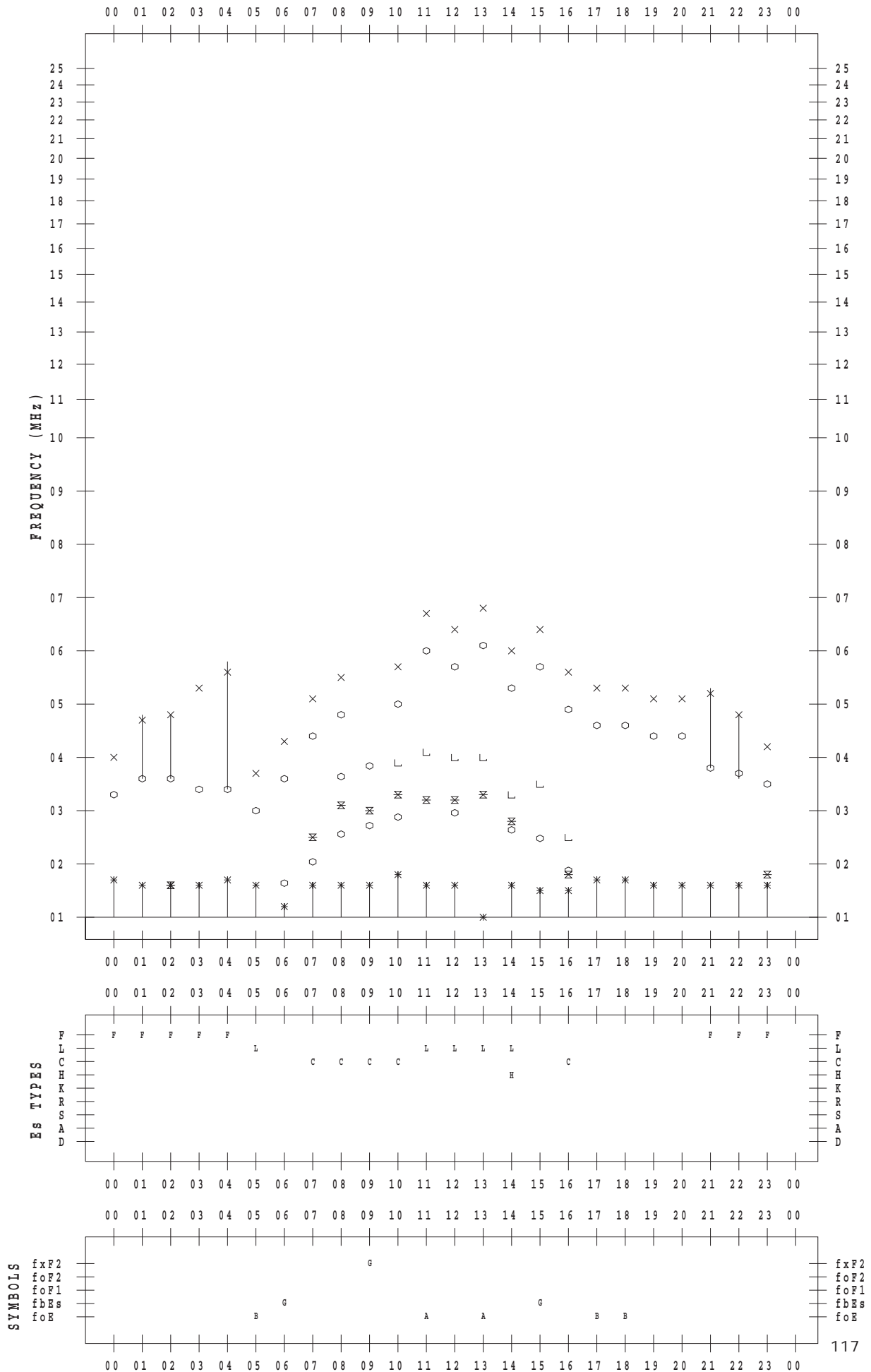
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/10

135 ° E MEAN TIME



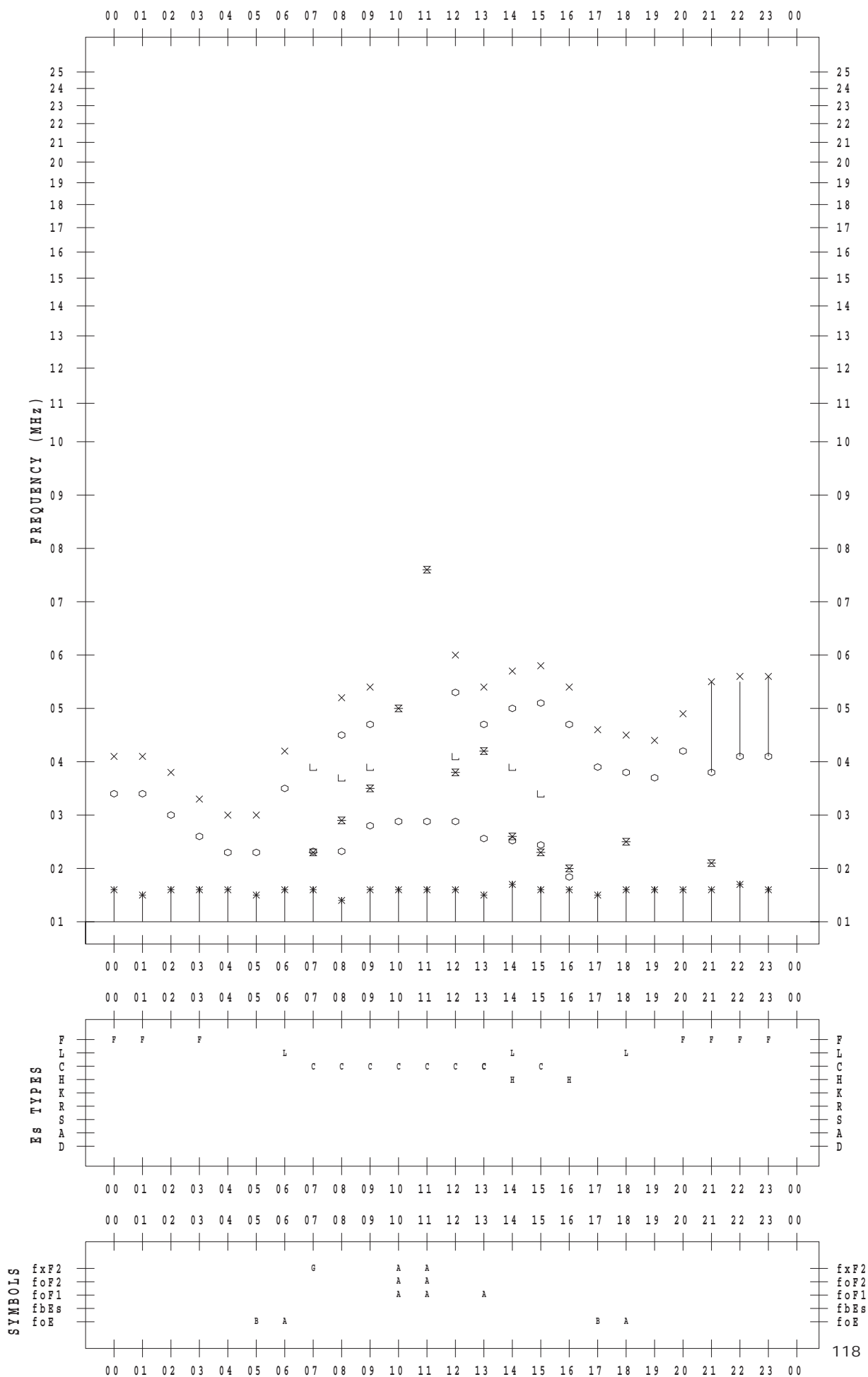
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/11

135 ° E MEAN TIME



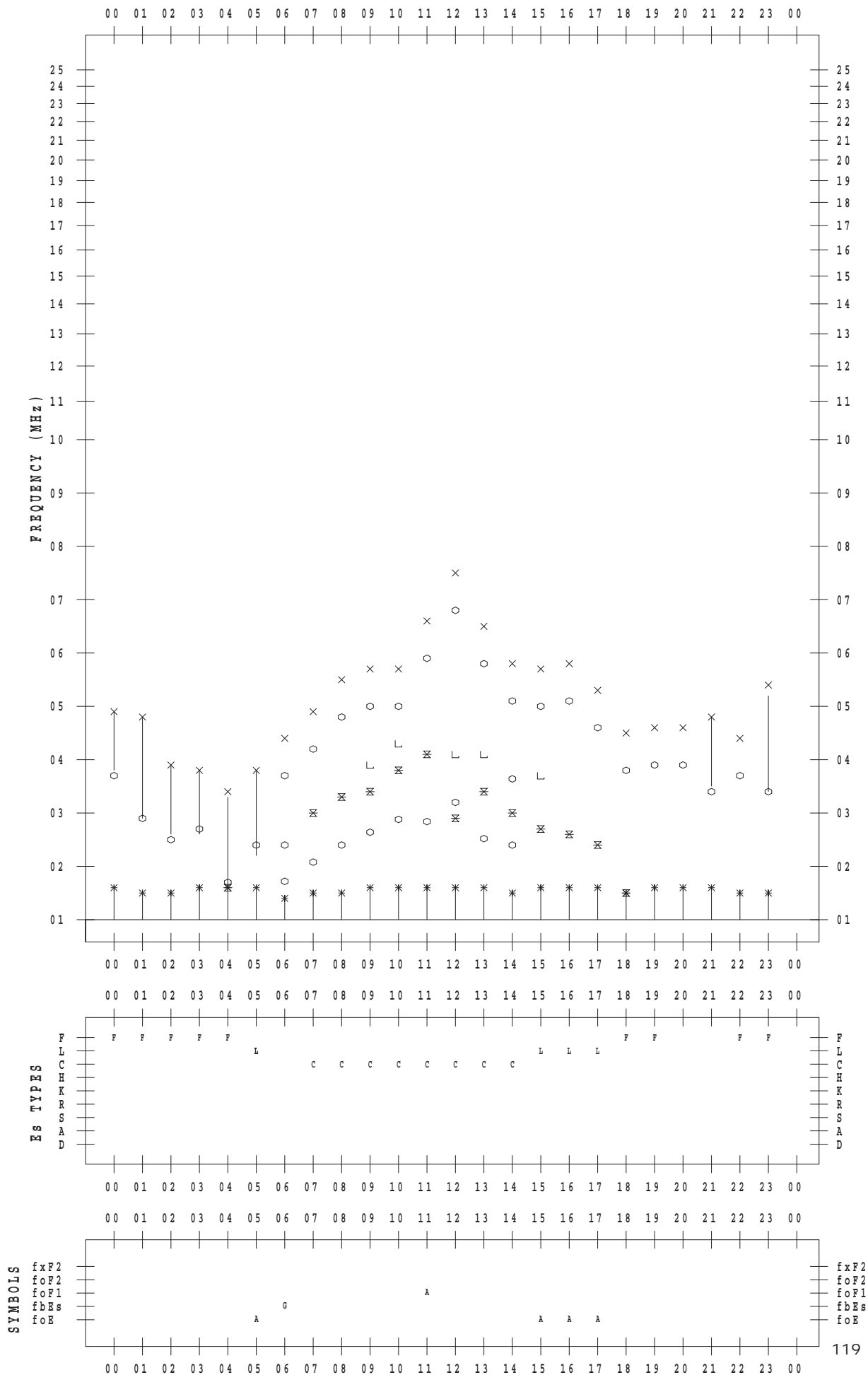
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/12

135 ° E MEAN TIME



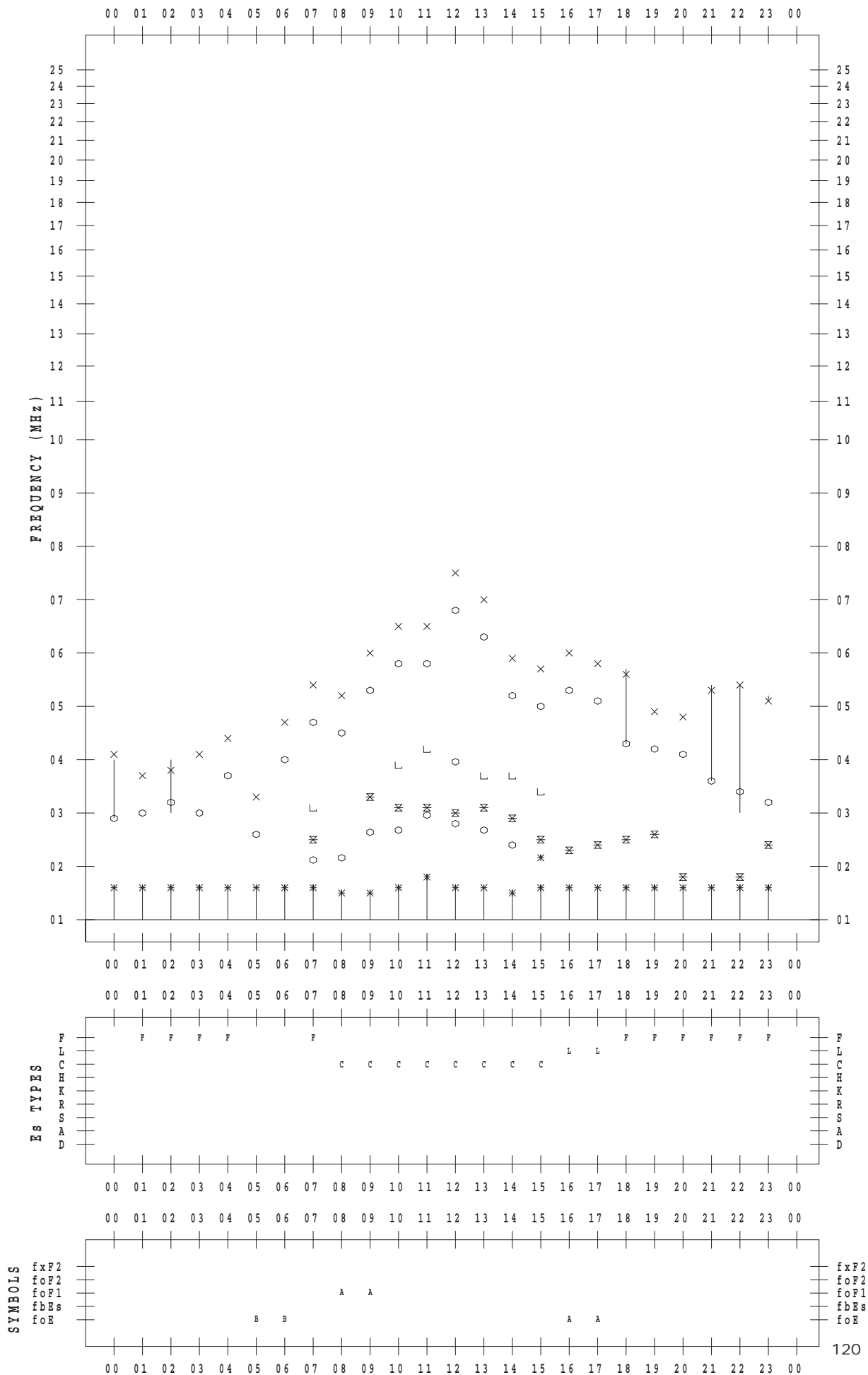
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/13

135 ° E MEAN TIME



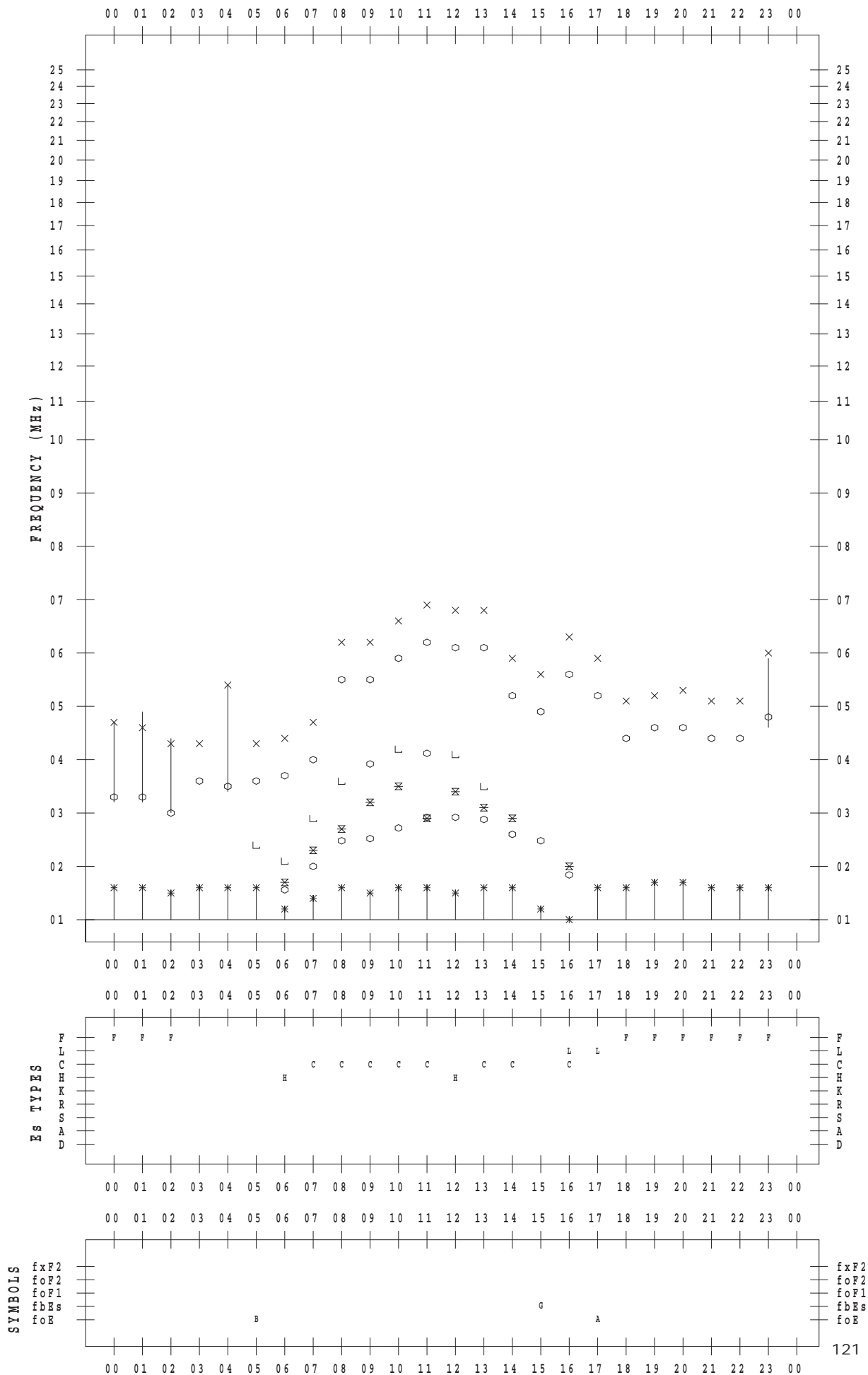
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/14

135 ° E MEAN TIME



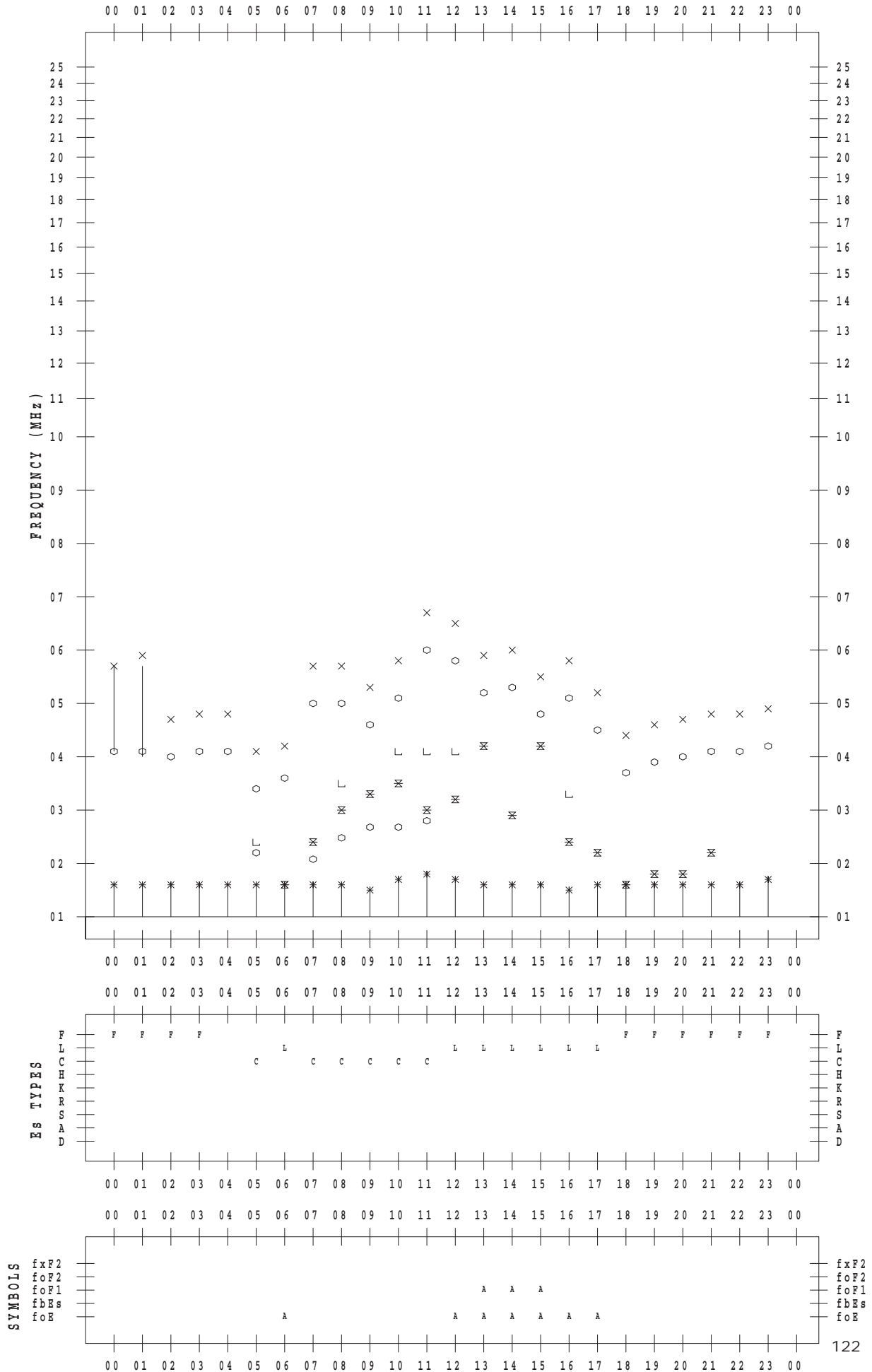
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/15

135 ° E MEAN TIME



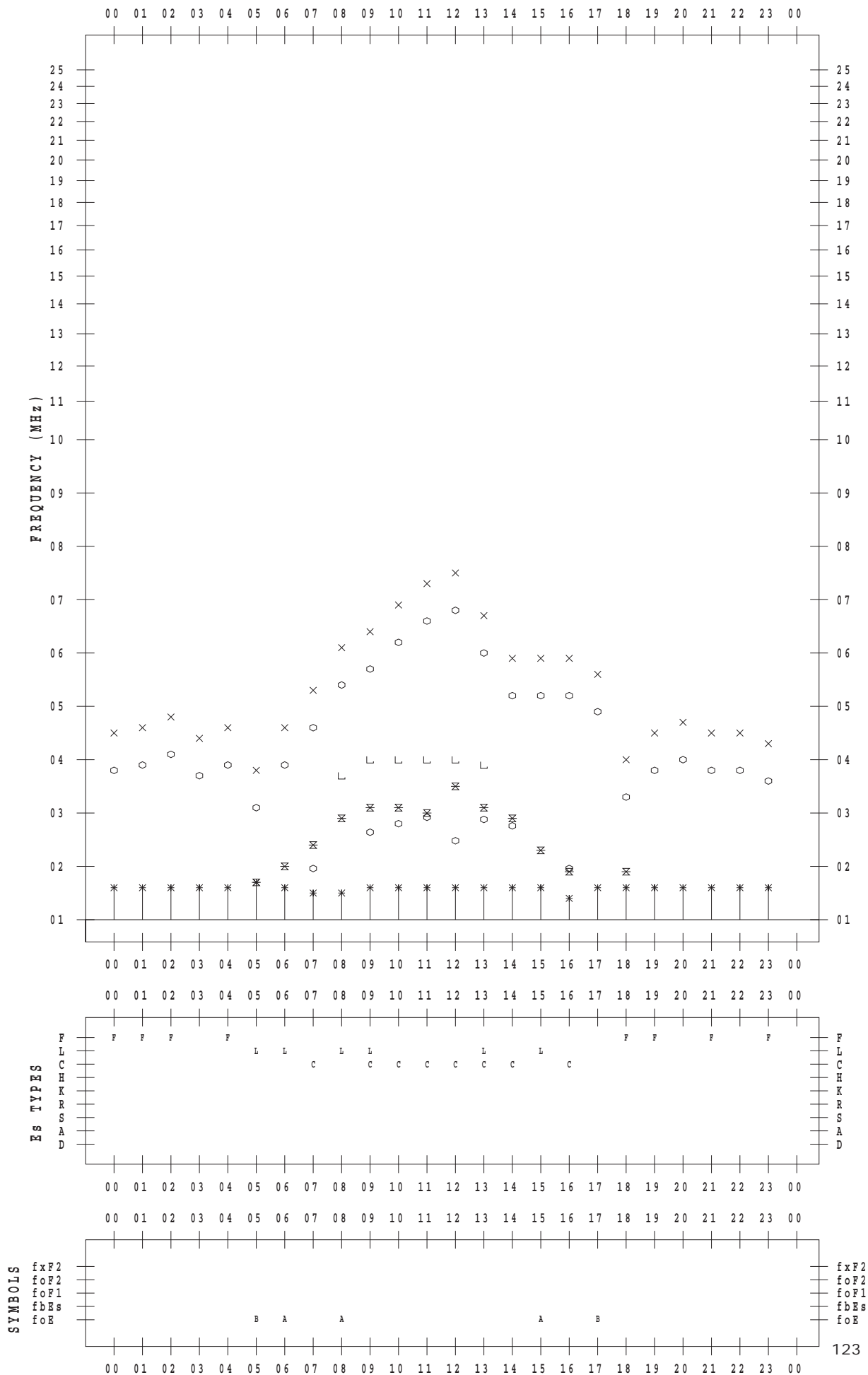
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/16

135 ° E MEAN TIME



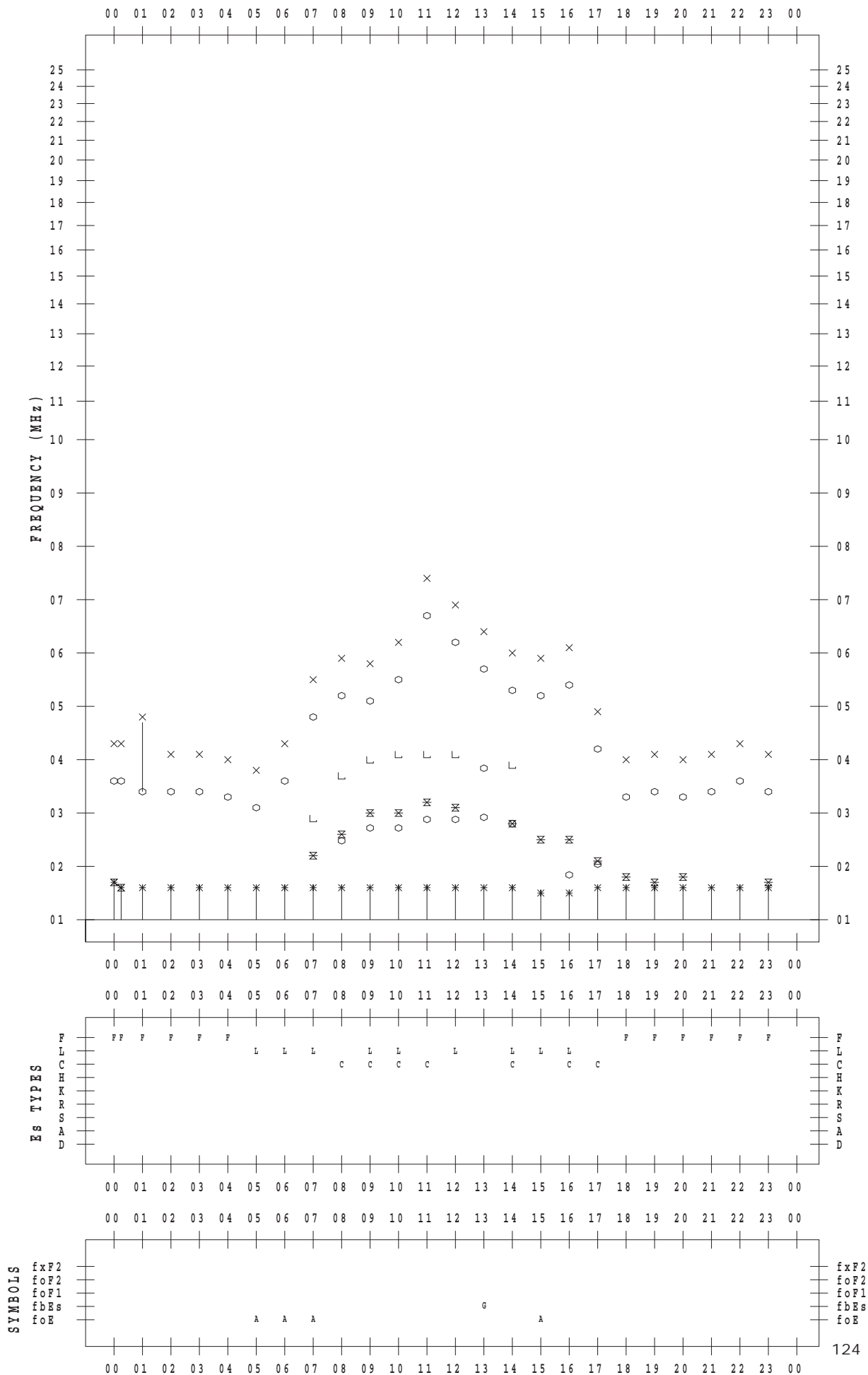
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/17

135 ° E MEAN TIME



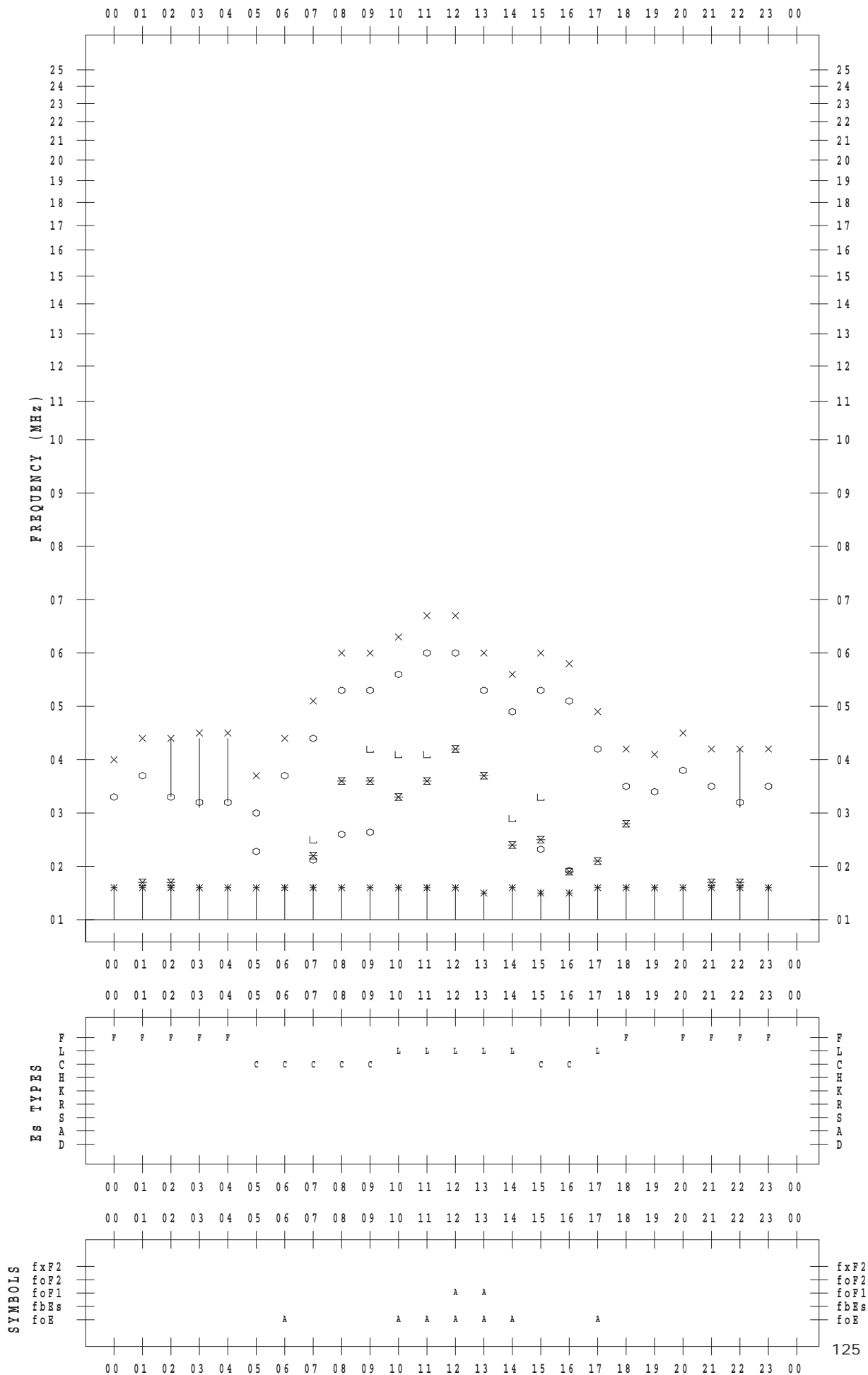
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/18

135 ° E MEAN TIME



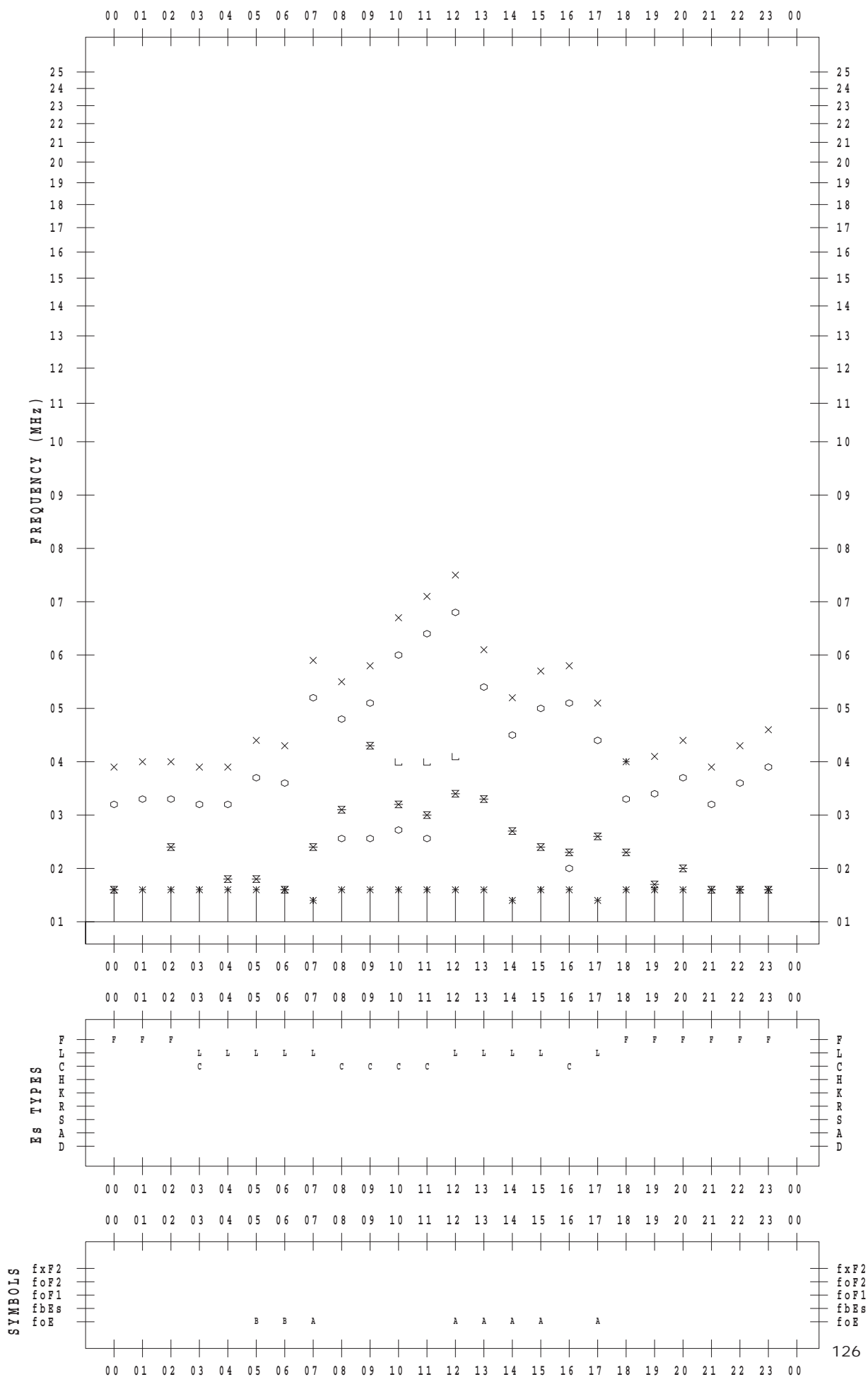
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/19

135 ° E MEAN TIME



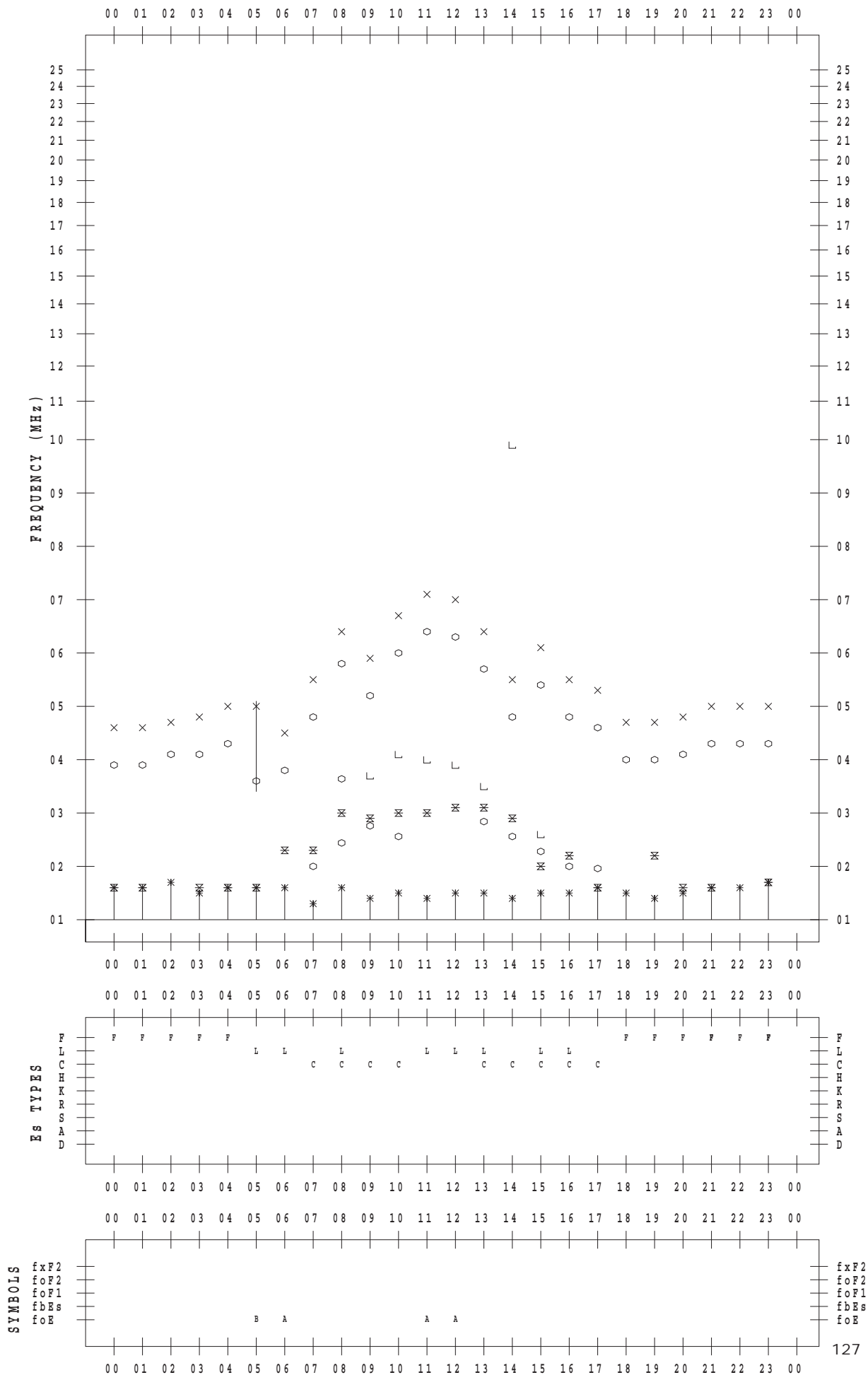
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/20

135 ° E MEAN TIME



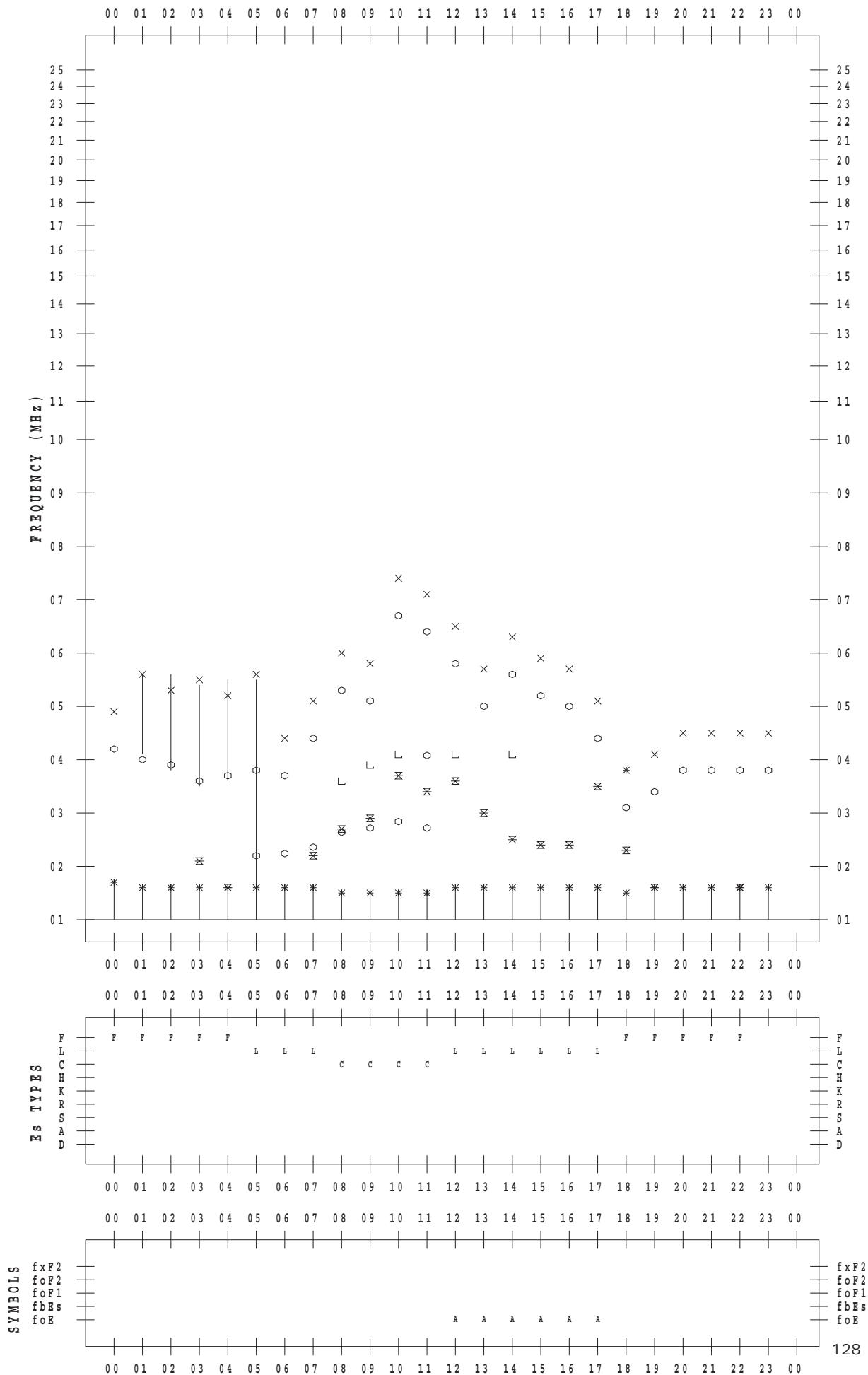
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/21

135 ° E MEAN TIME



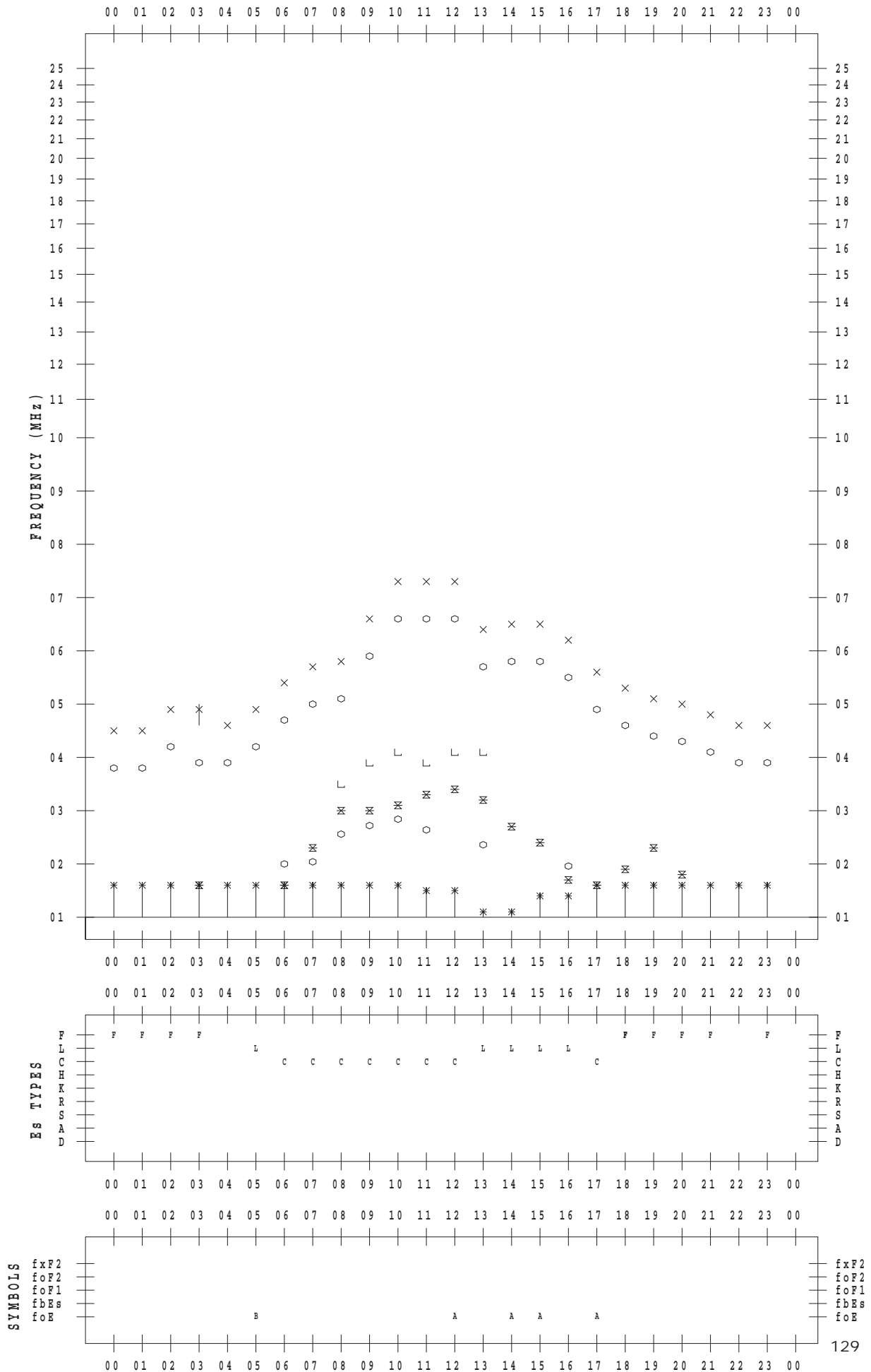
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/22

135 ° E MEAN TIME



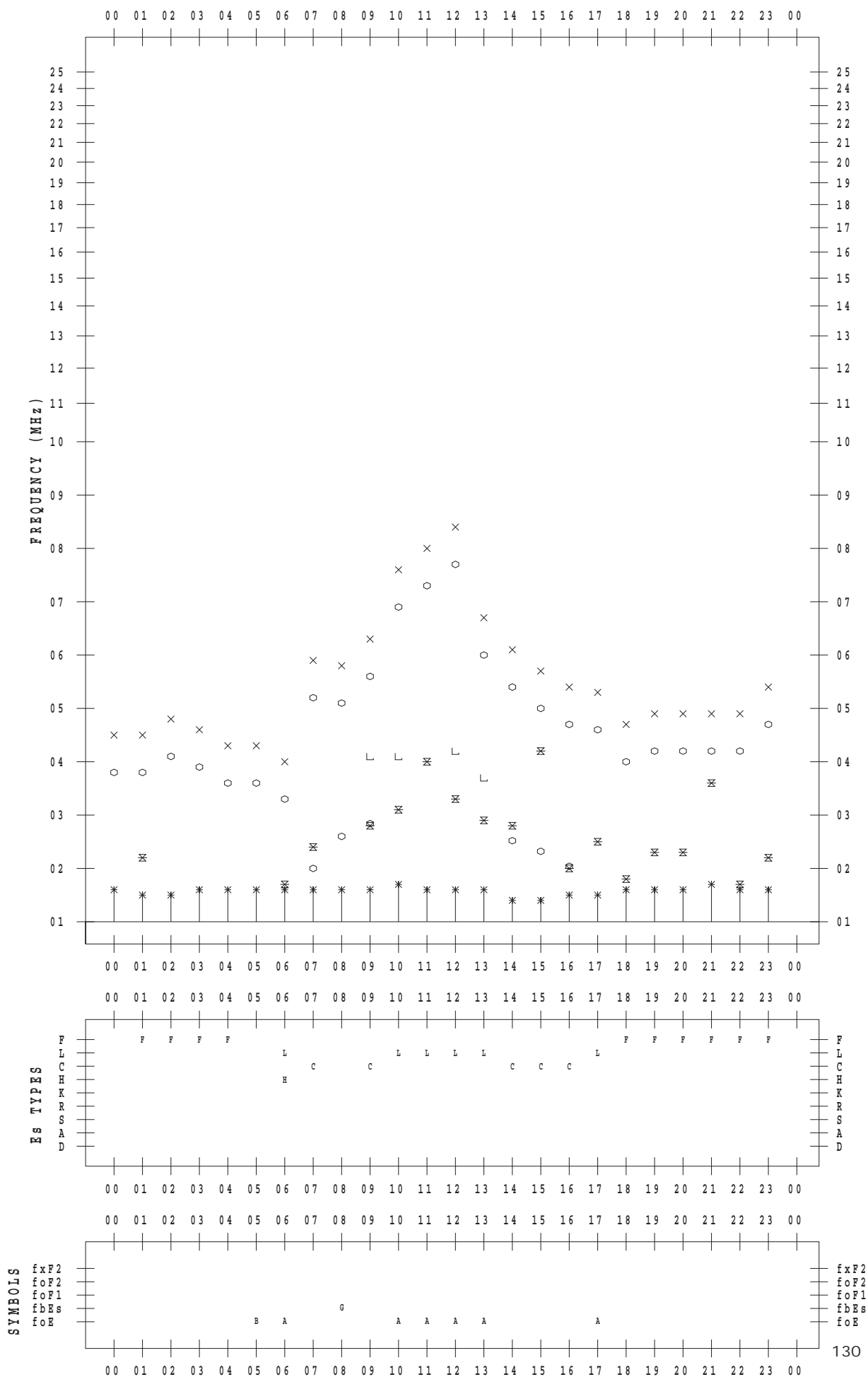
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/23

135 ° E MEAN TIME



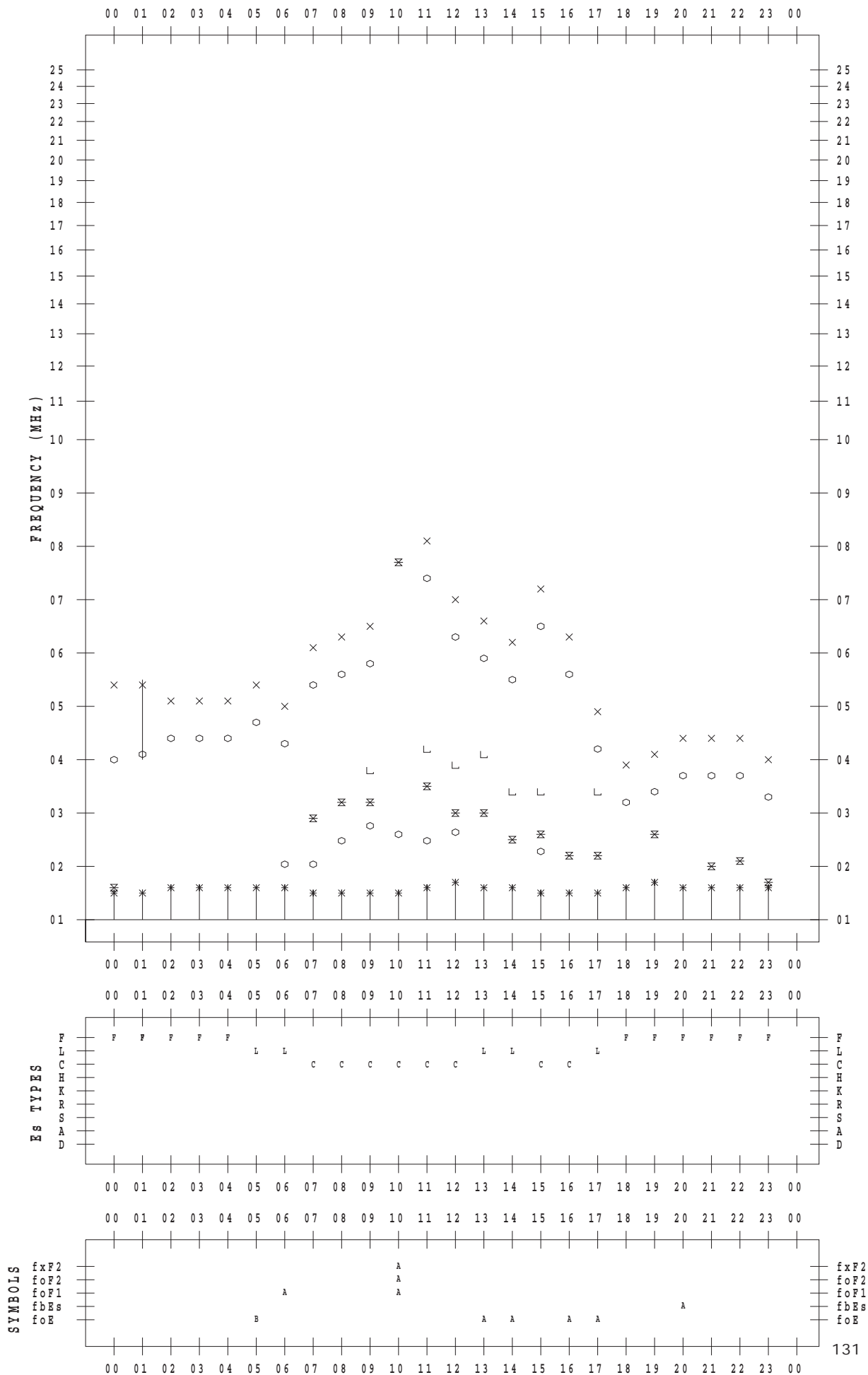
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/24

135 ° E MEAN TIME



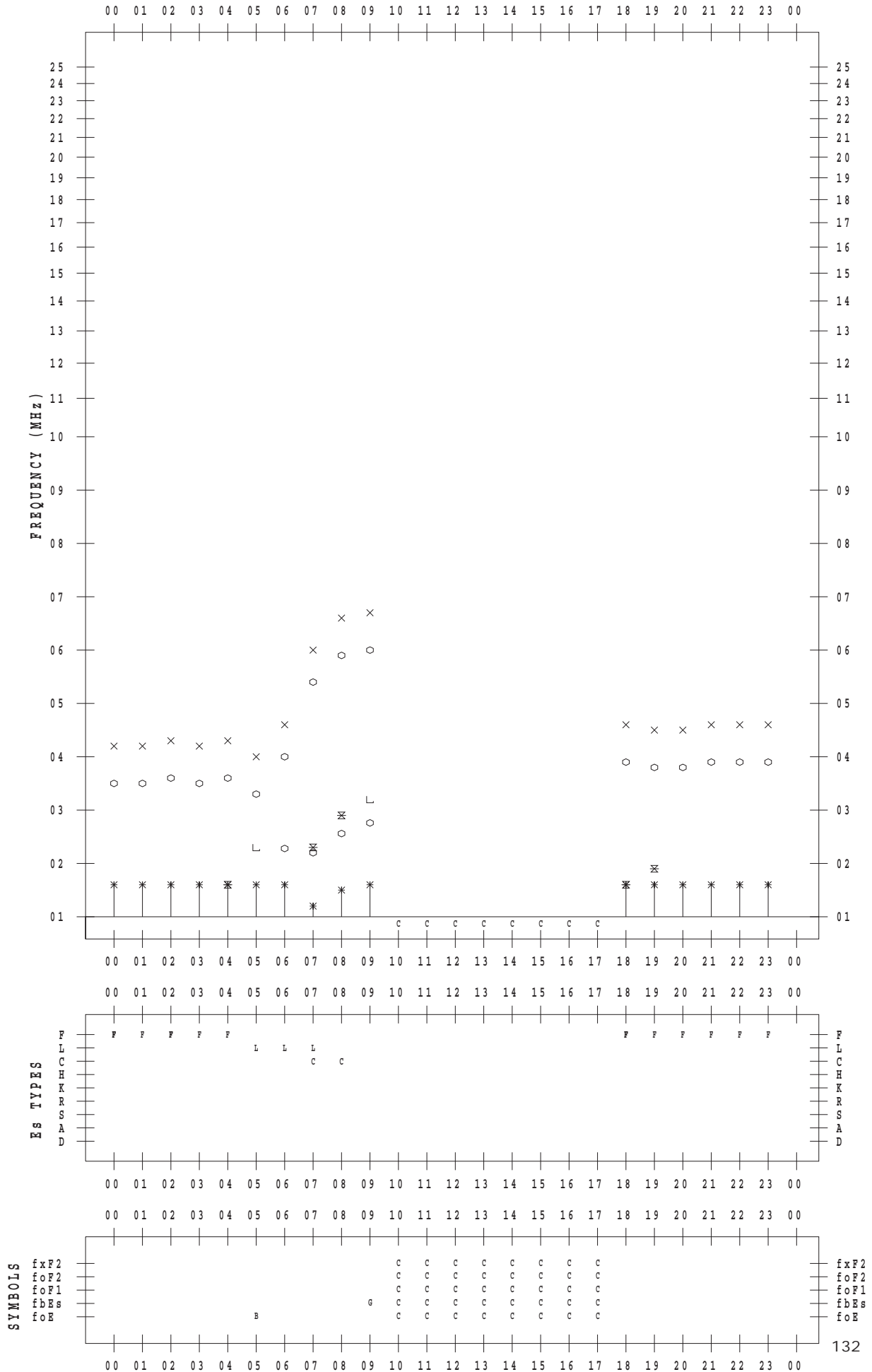
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/25

135 ° E MEAN TIME



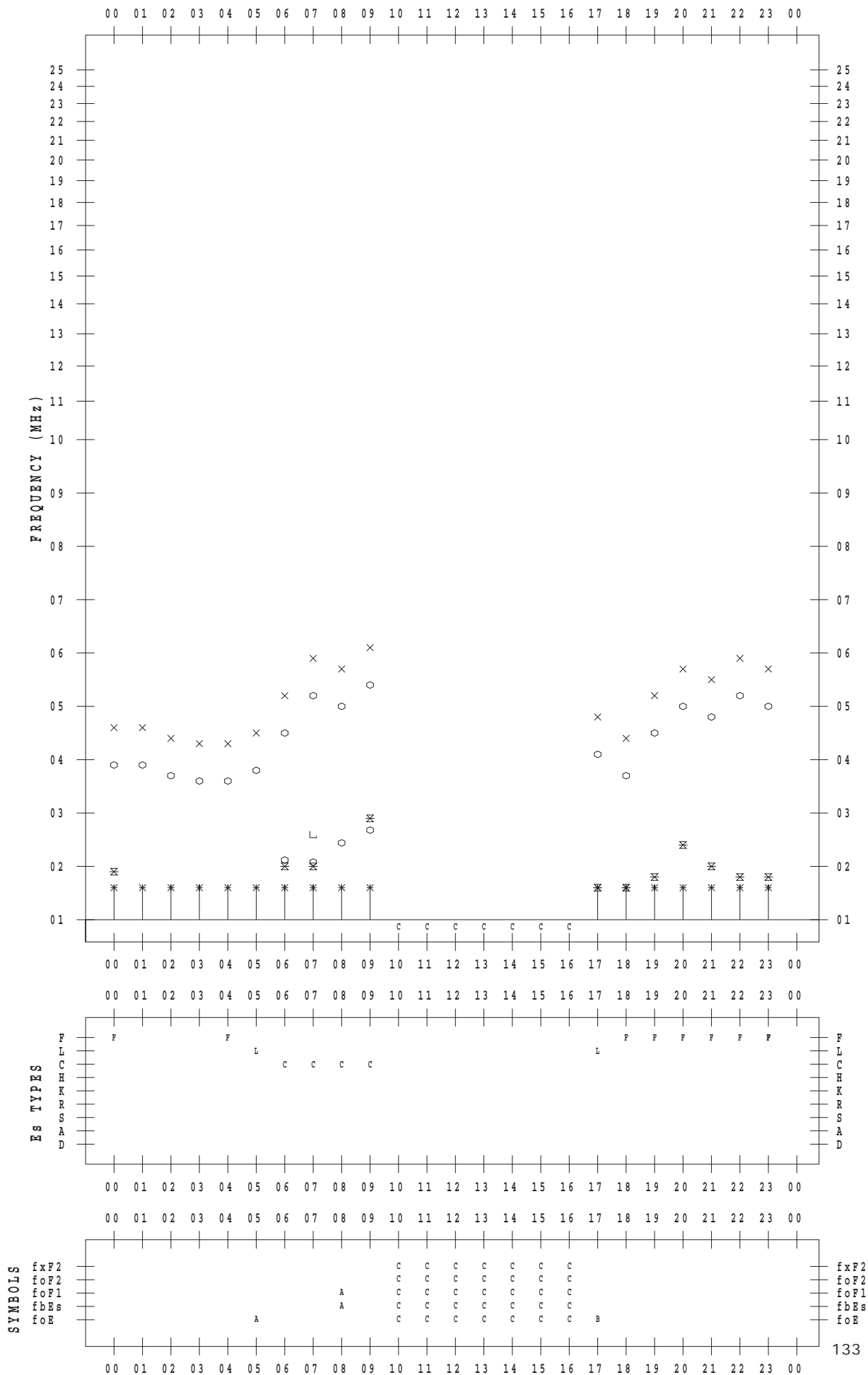
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/26

135 ° E MEAN TIME



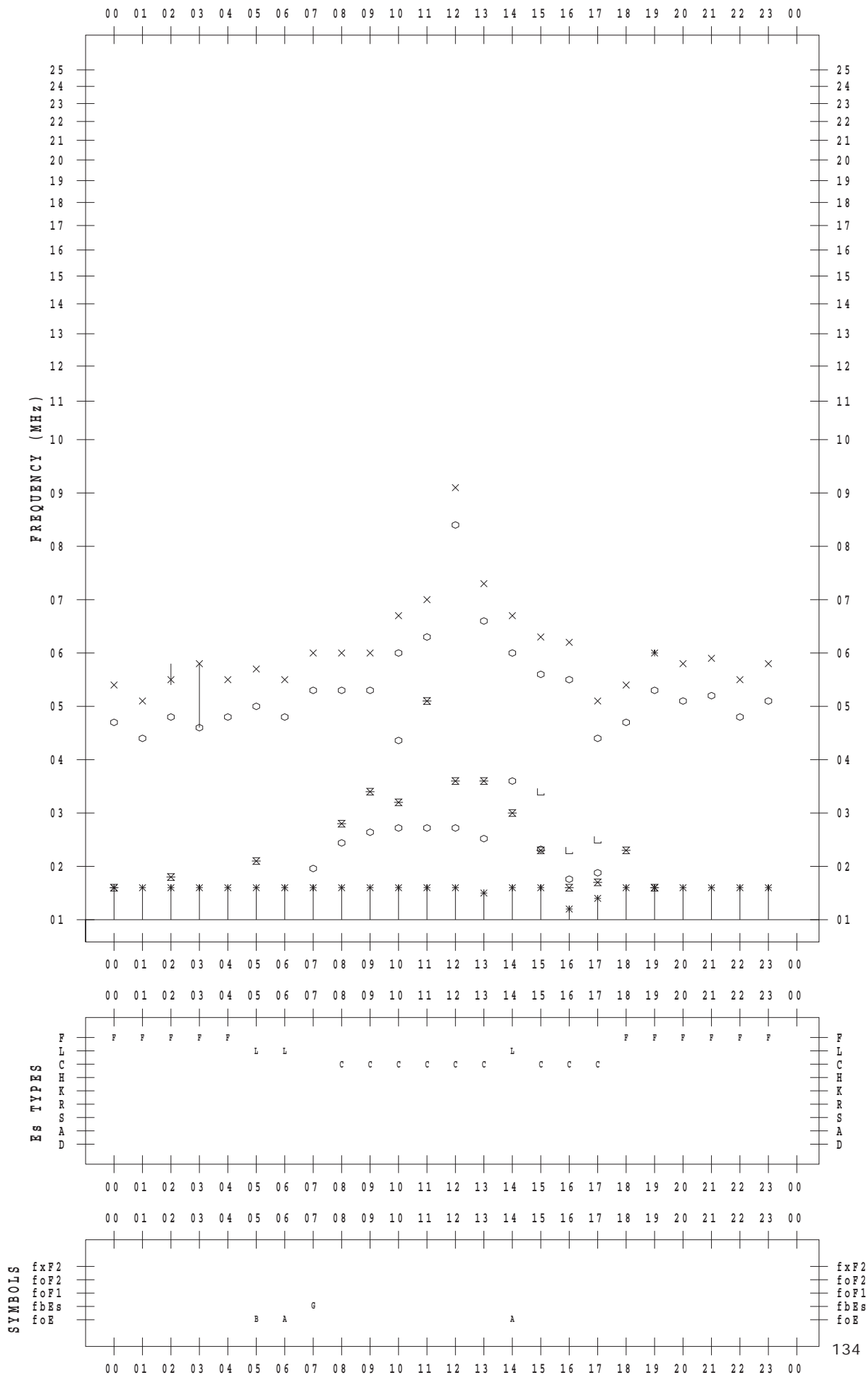
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/27

135 ° E MEAN TIME



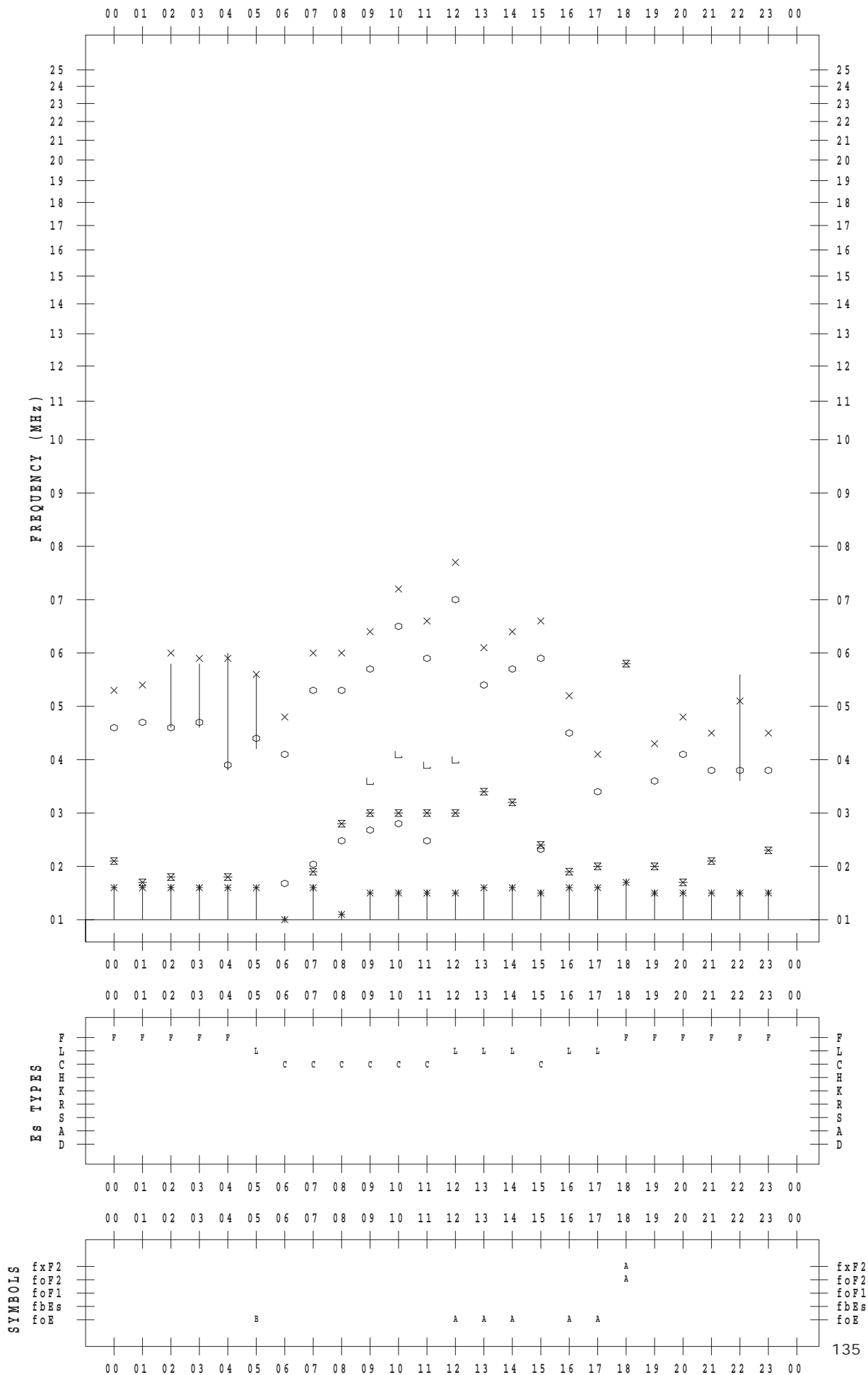
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/28

135 ° E MEAN TIME



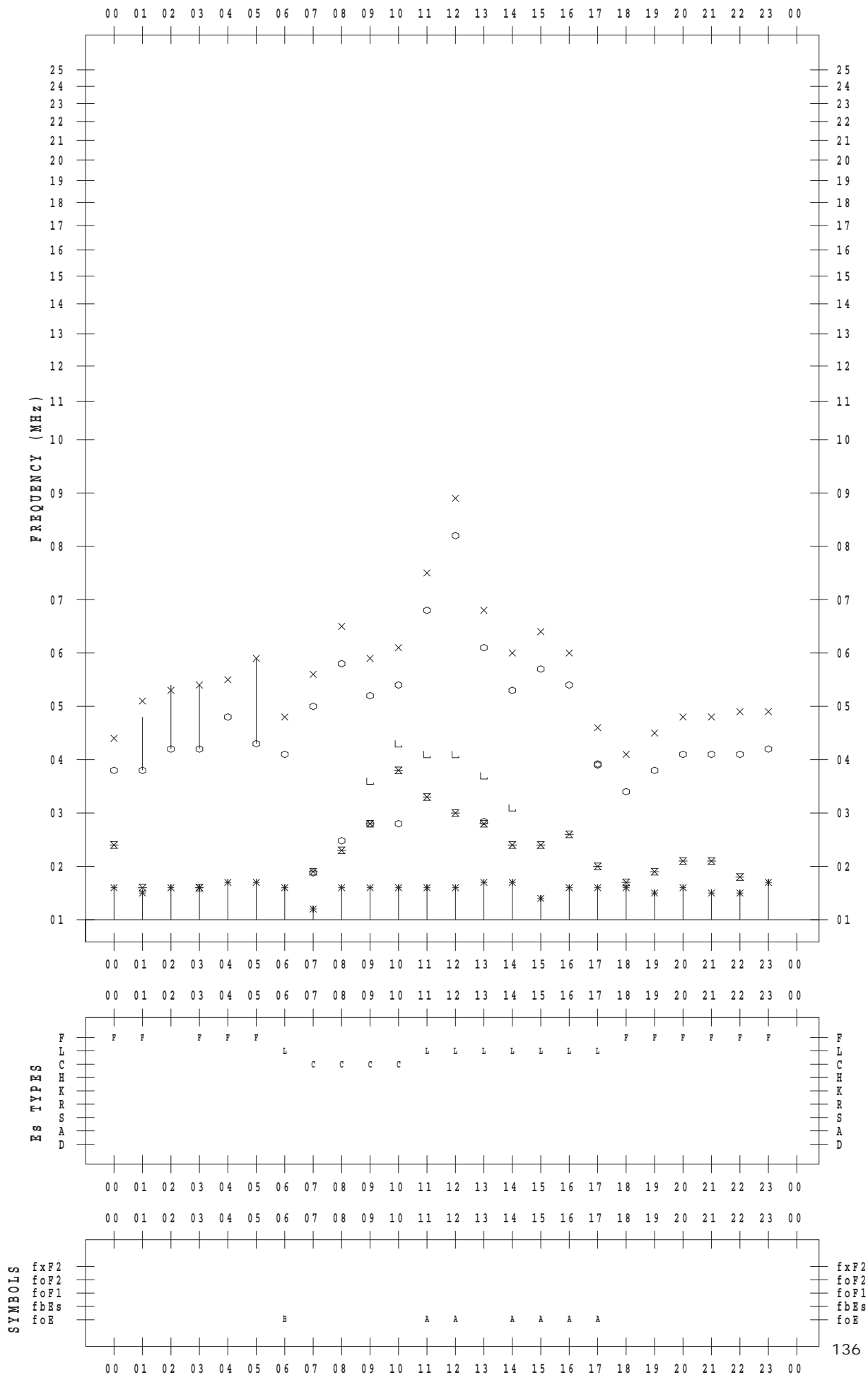
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/29

135 ° E MEAN TIME



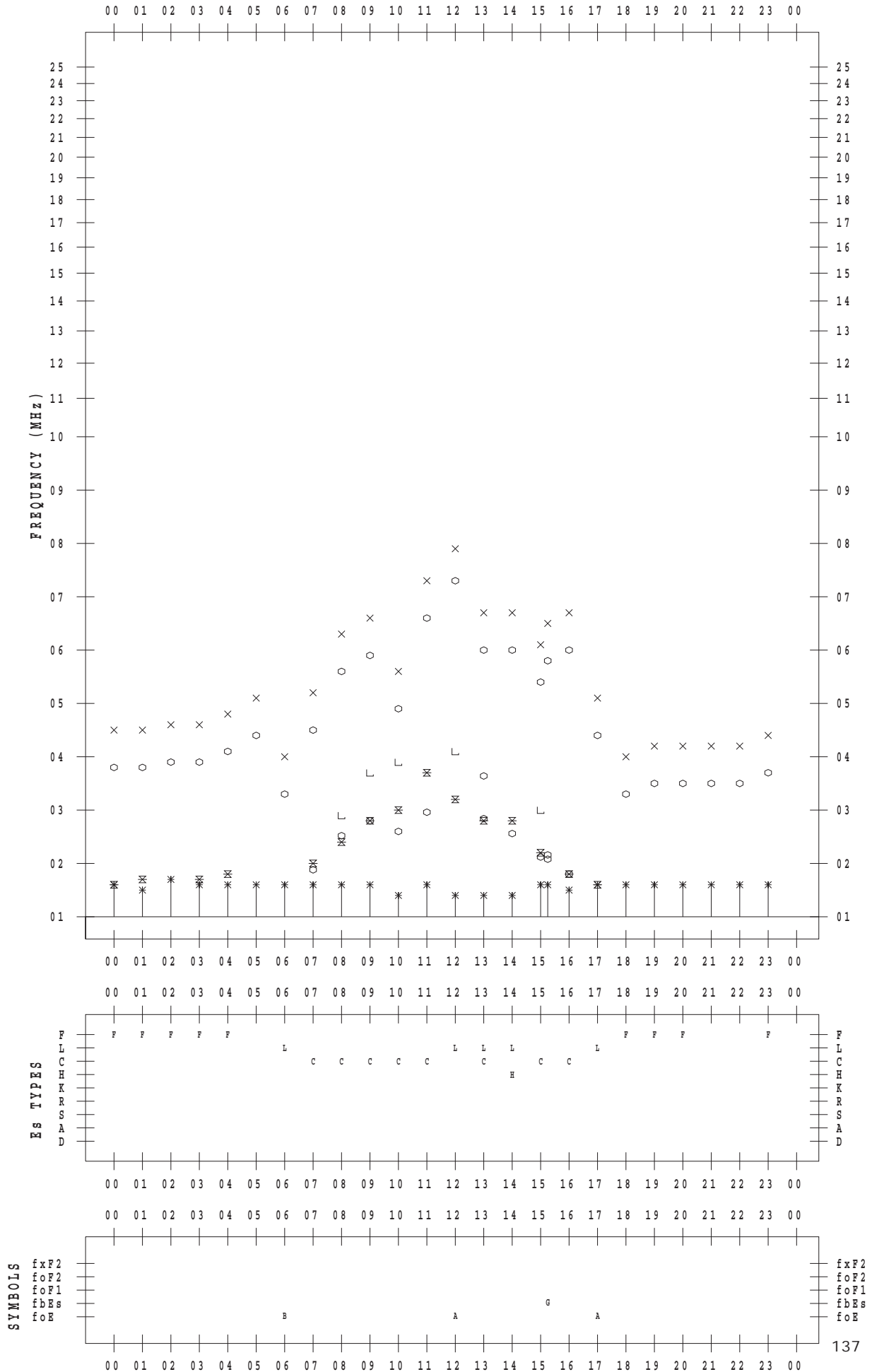
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/30

135 ° E MEAN TIME



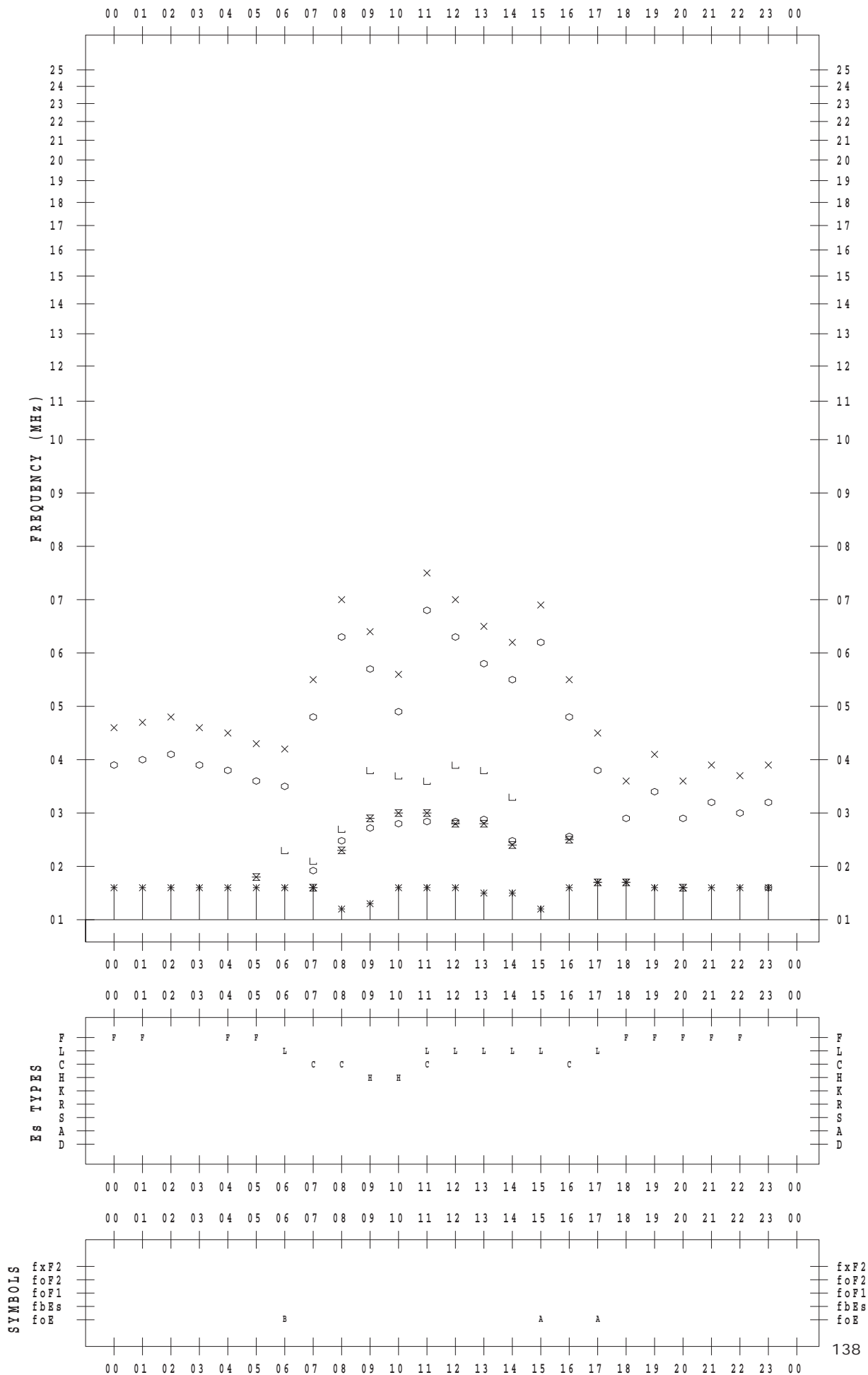
f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/10/31

135 ° E MEAN TIME



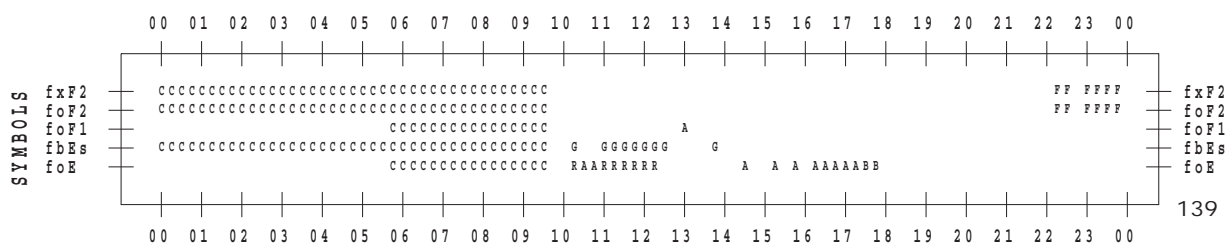
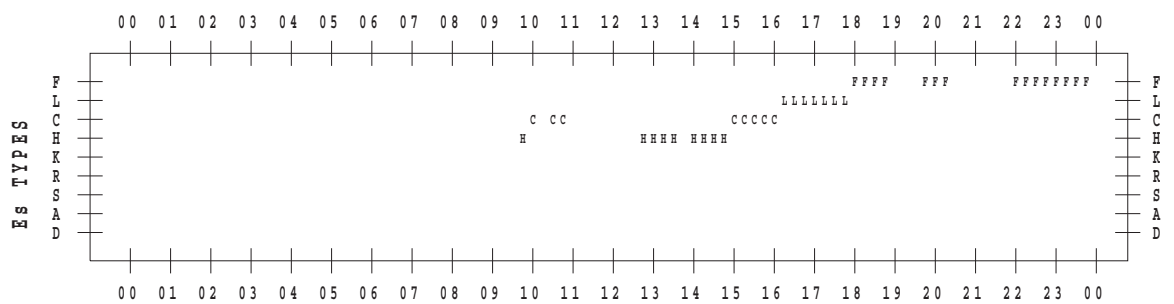
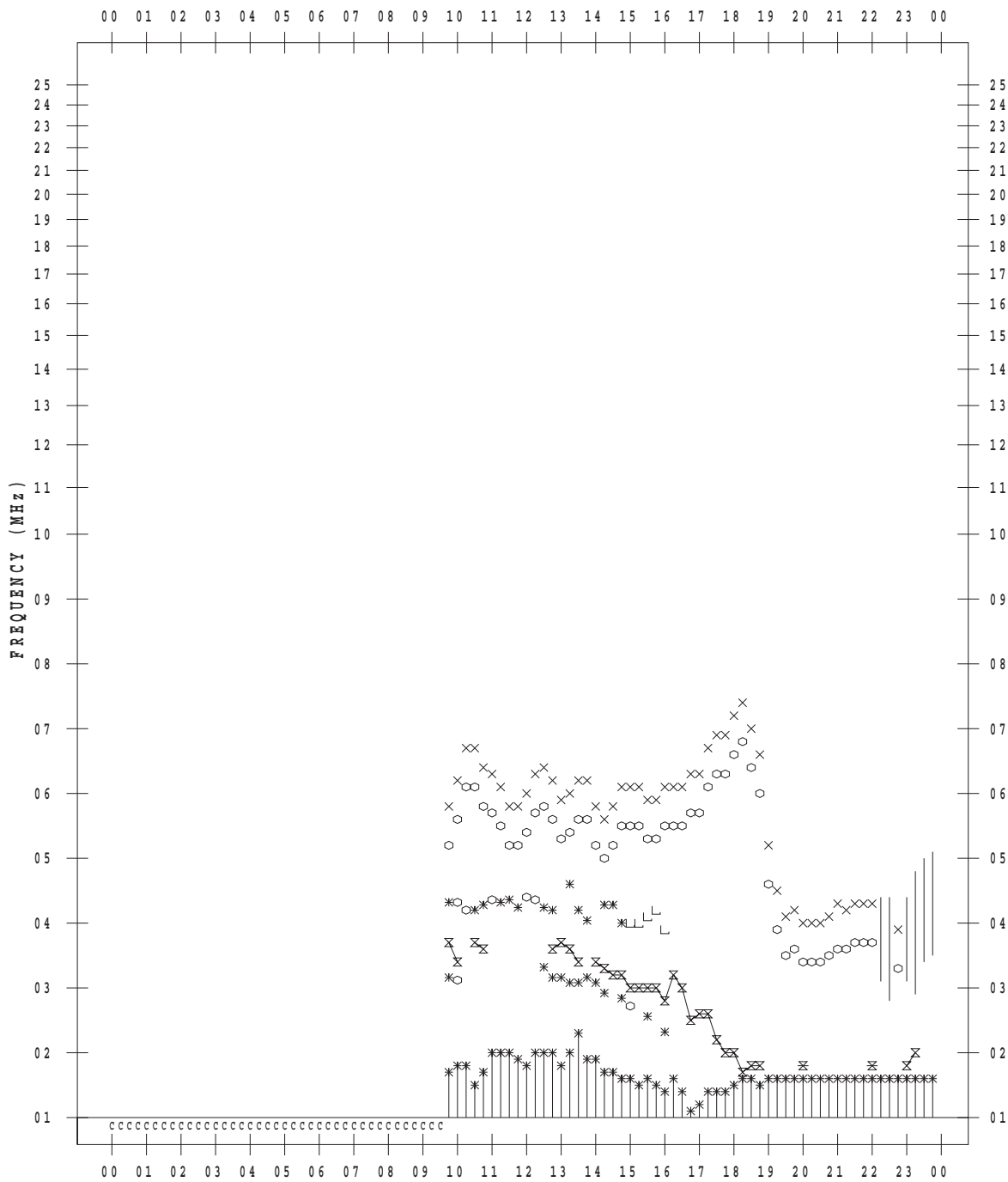
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 1

135 ° E MEAN TIME



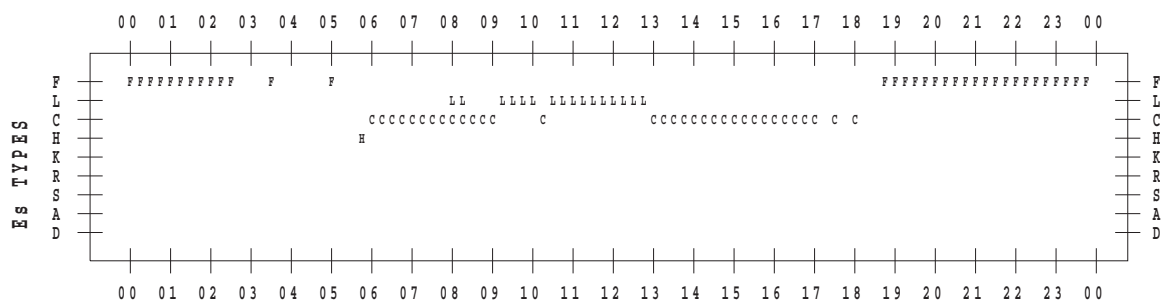
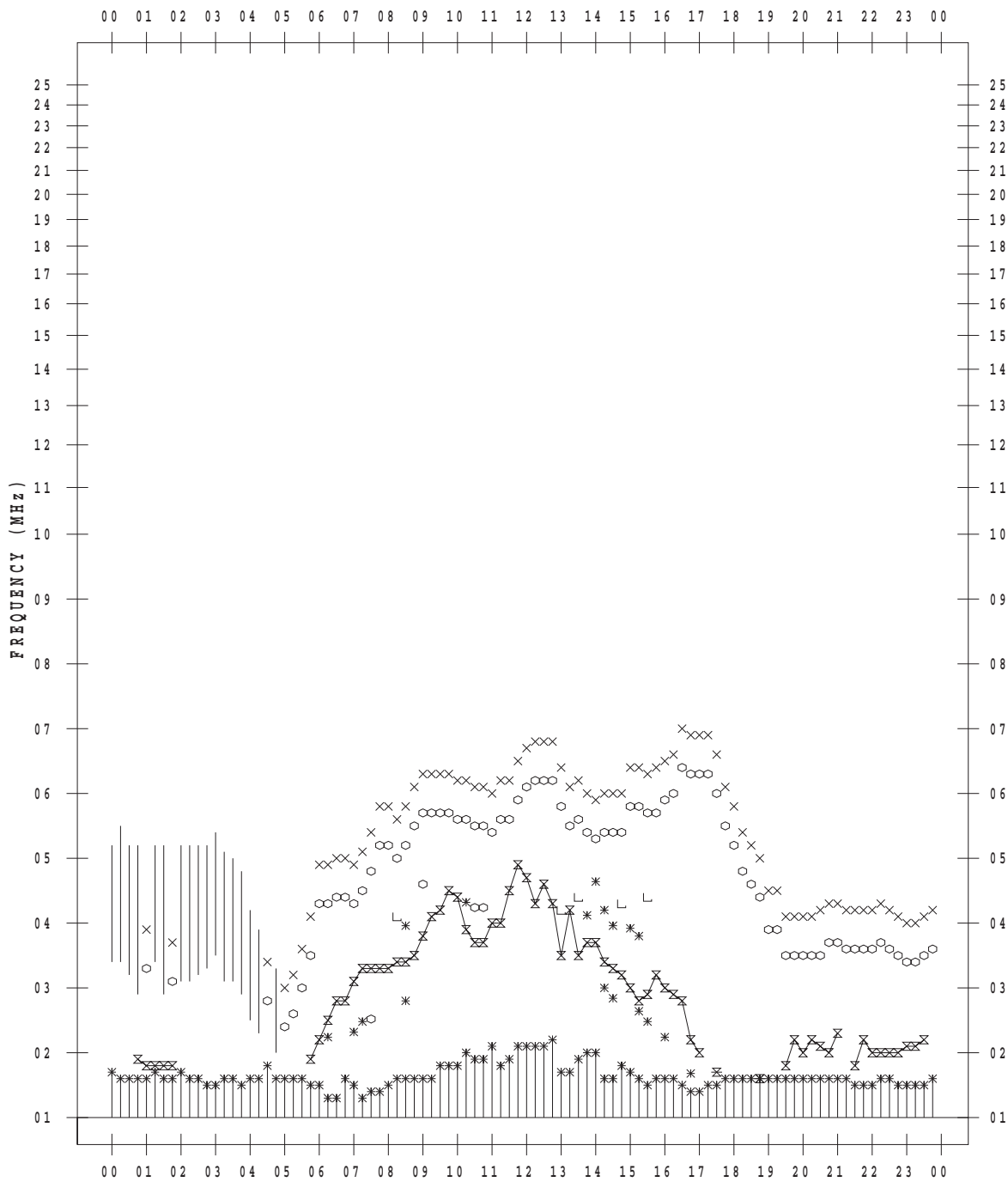
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 2

135 ° E MEAN TIME



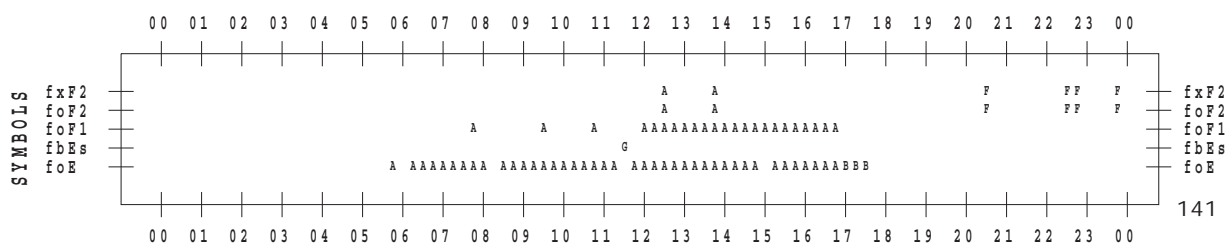
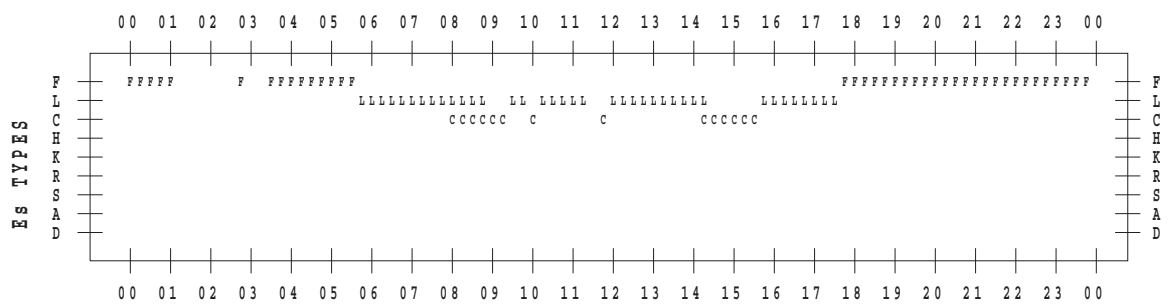
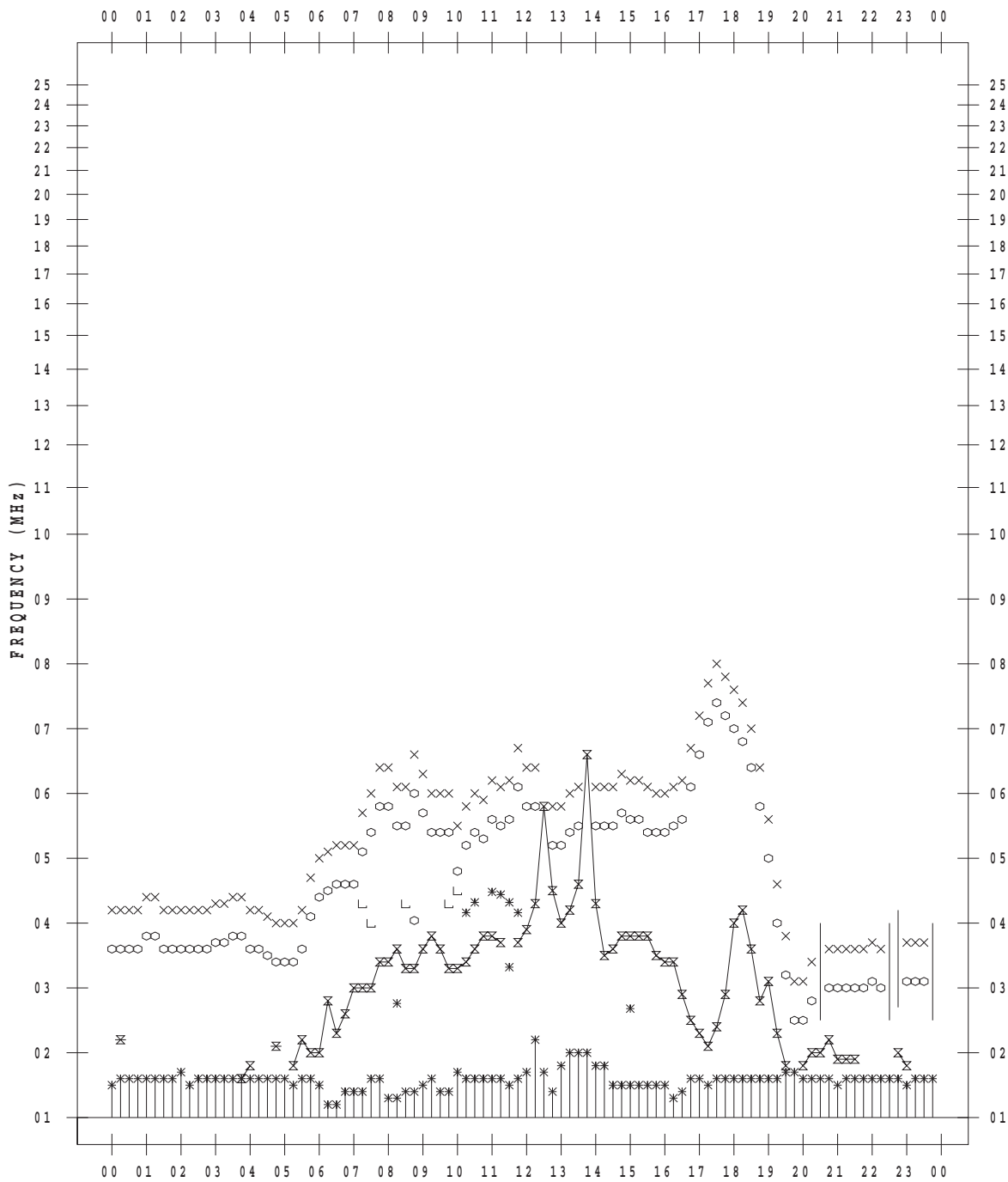
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 3

135 ° E MEAN TIME



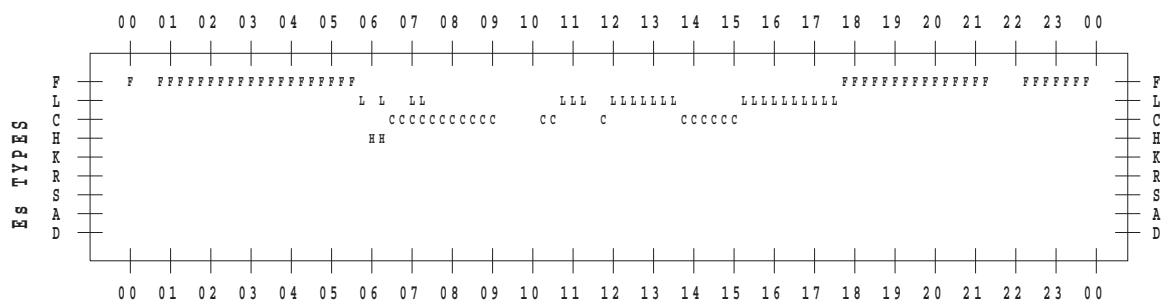
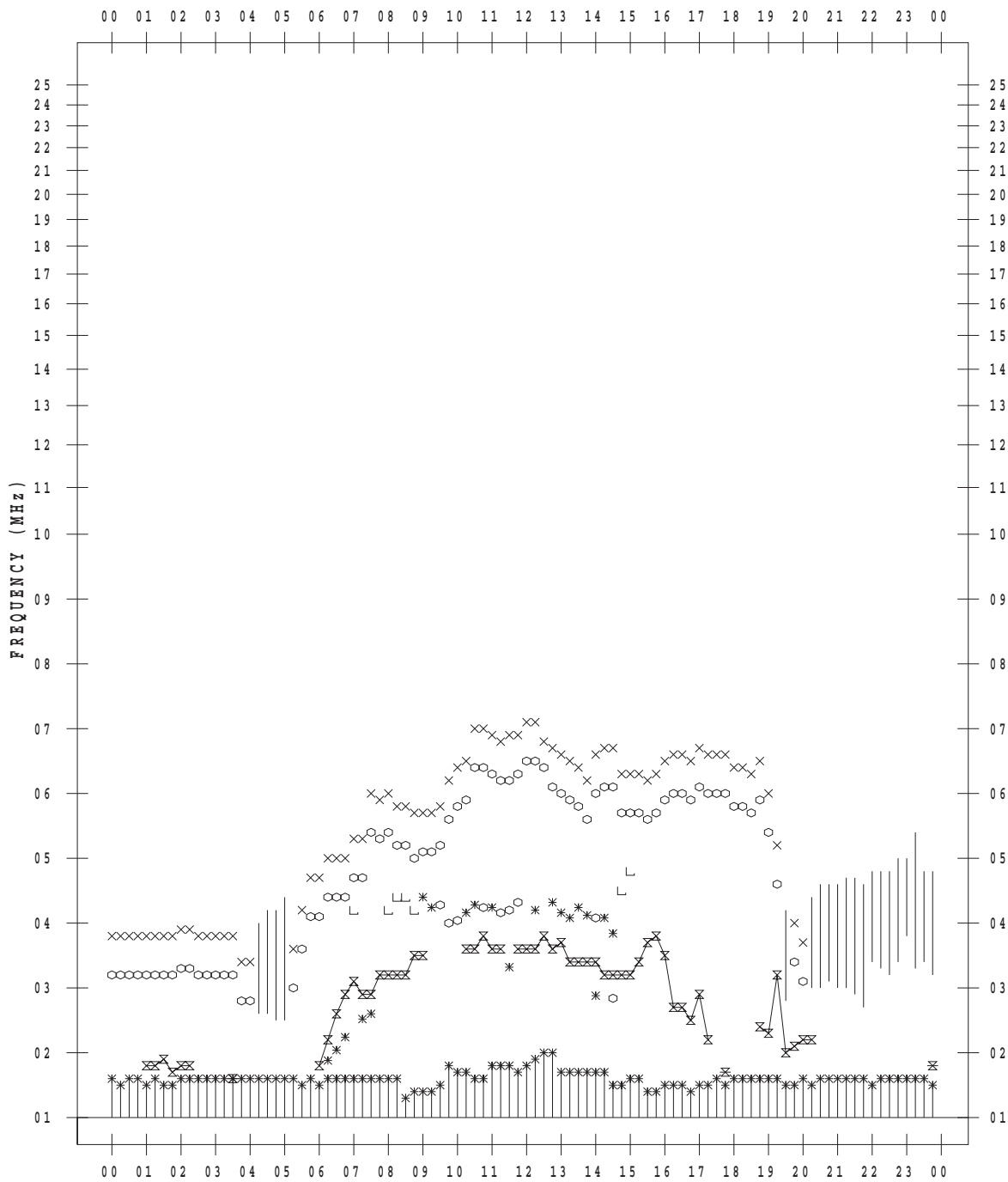
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 4

135 ° E MEAN TIME



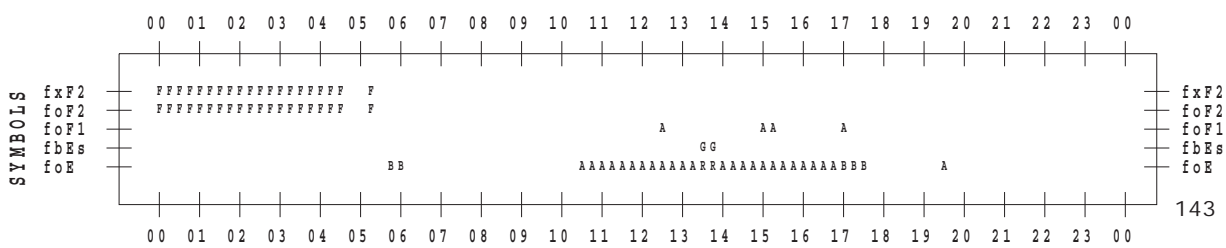
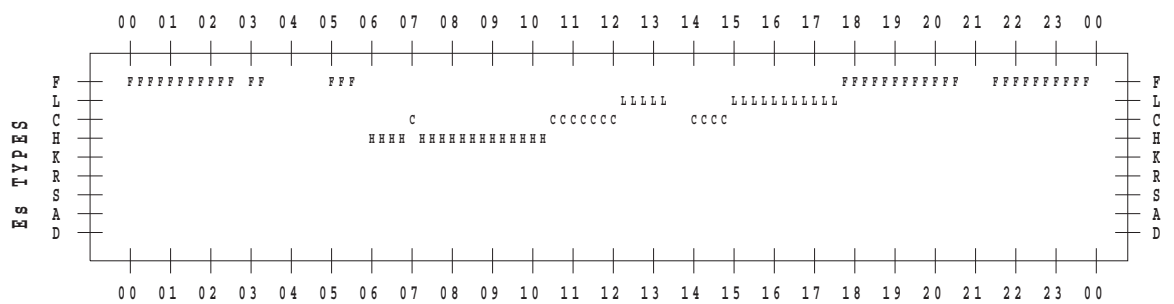
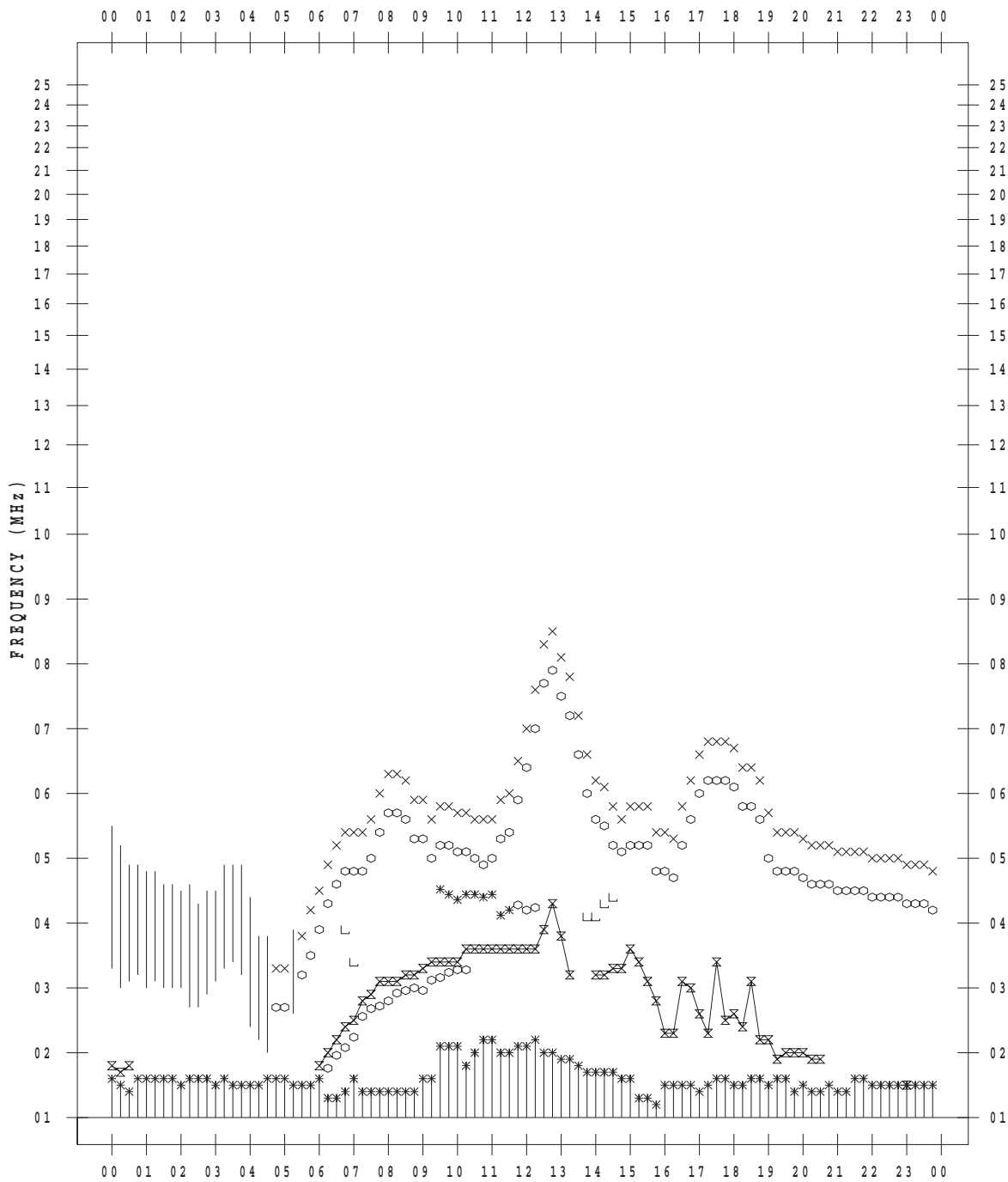
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 5

135 ° E MEAN TIME



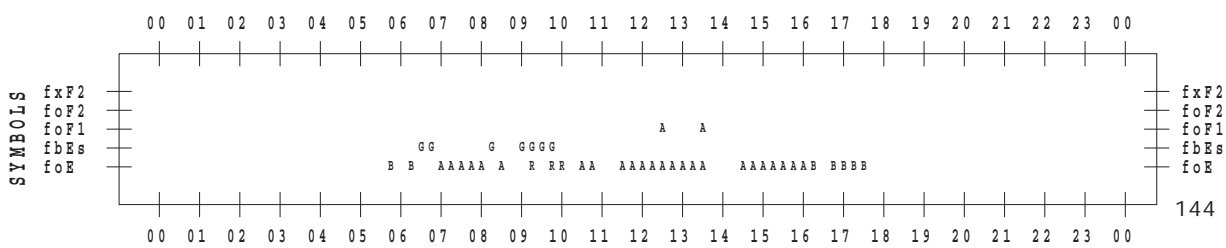
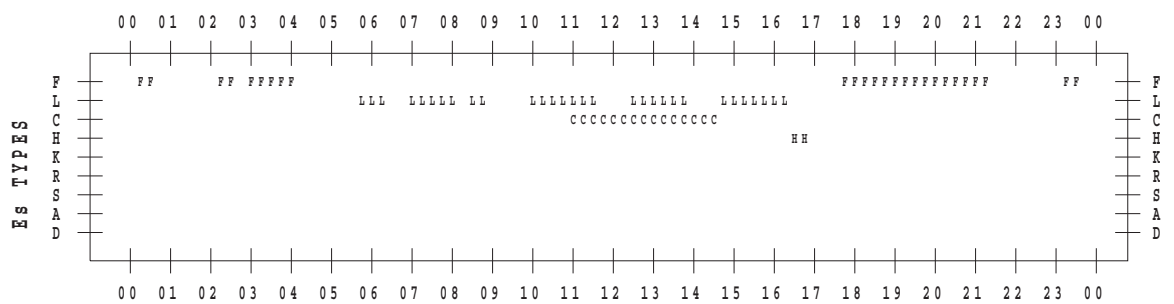
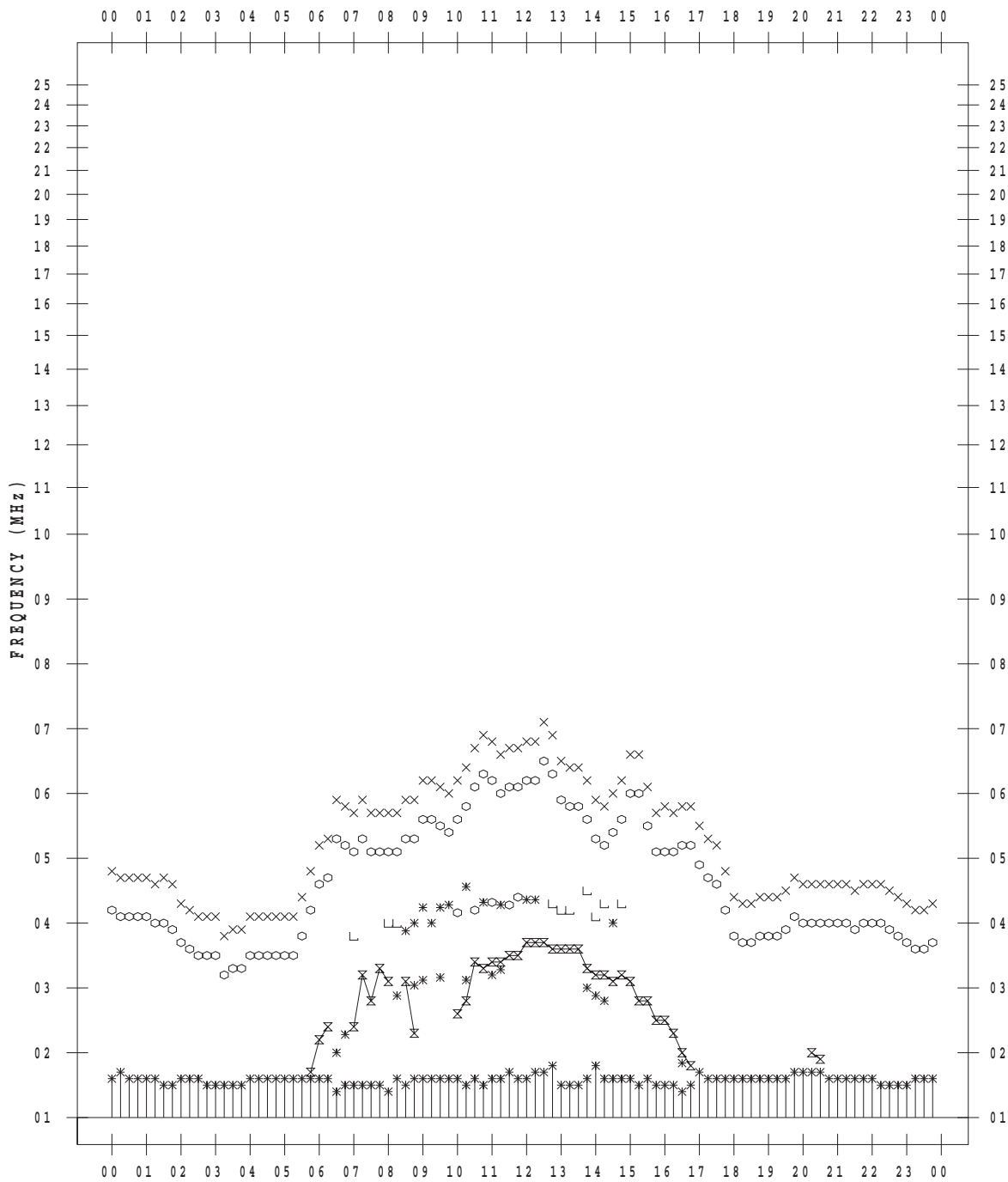
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 6

135 ° E MEAN TIME



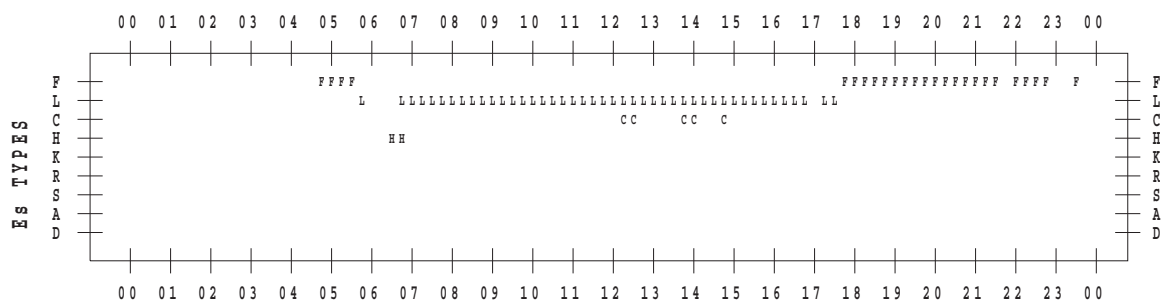
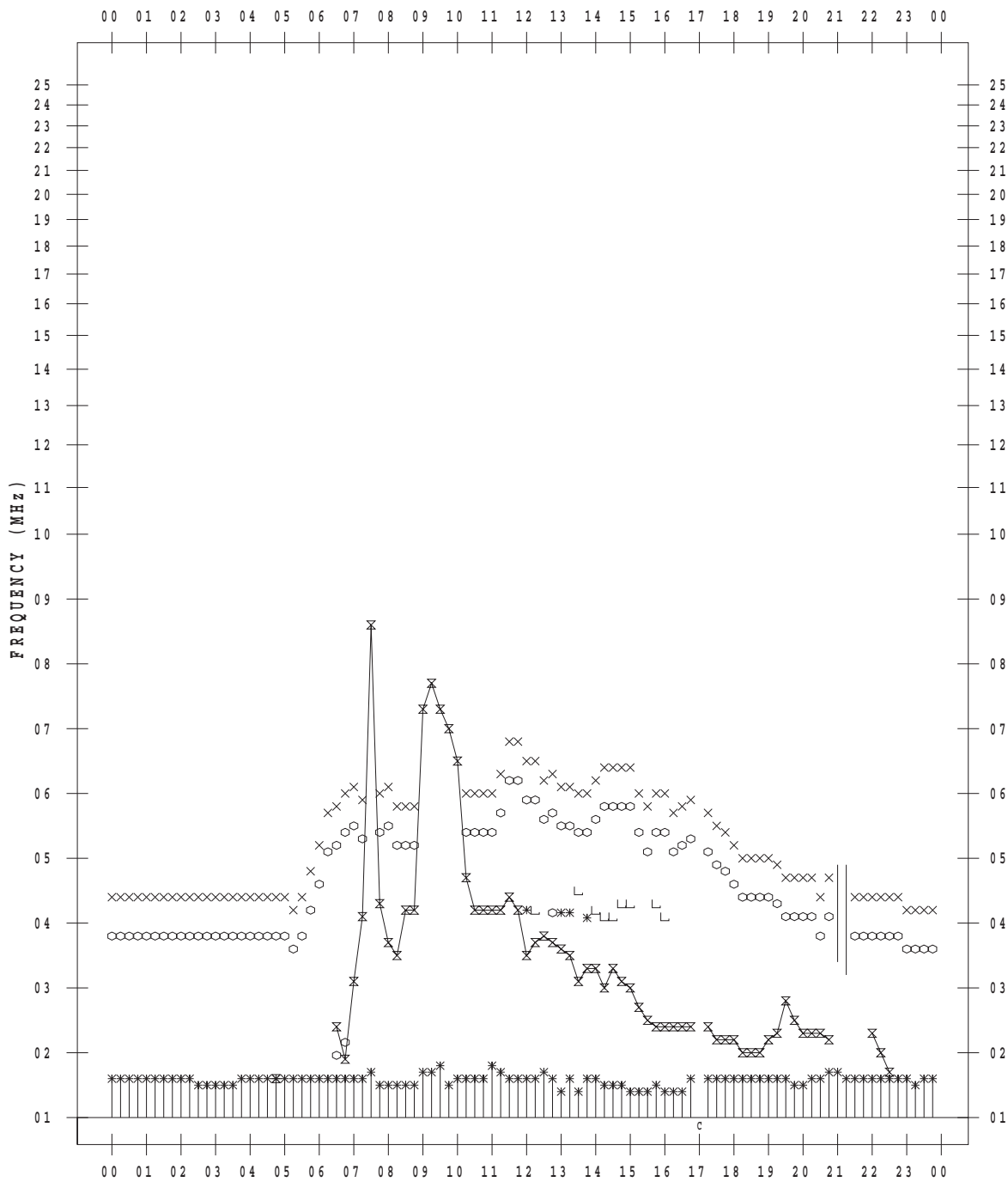
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 7

135 ° E MEAN TIME



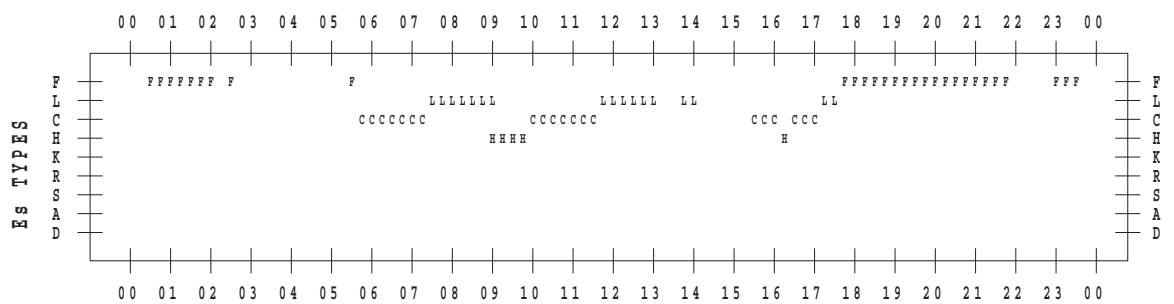
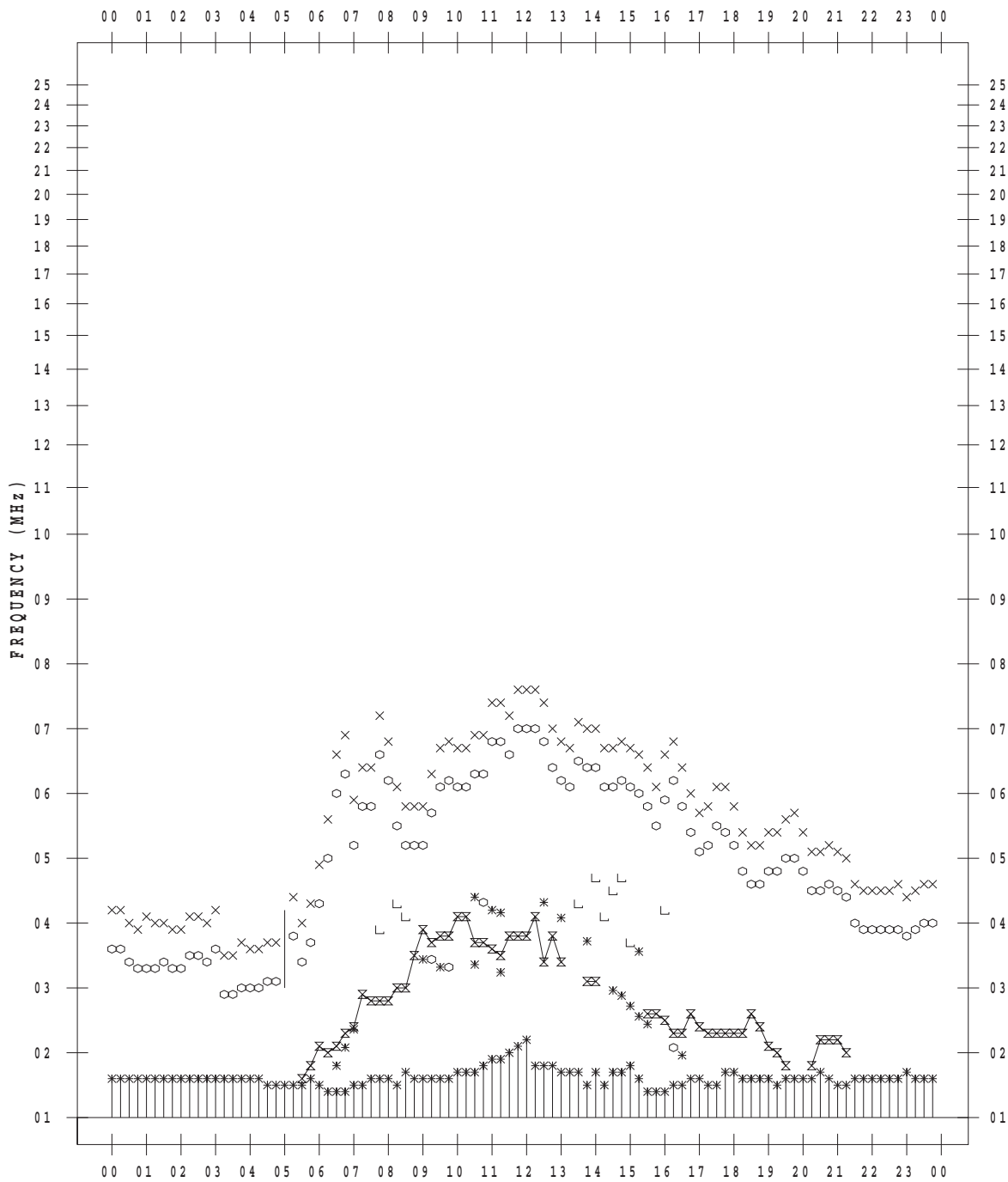
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 8

135 ° E MEAN TIME



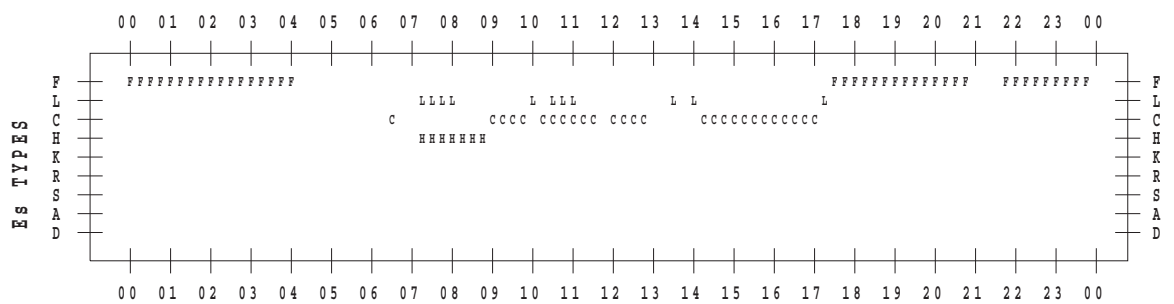
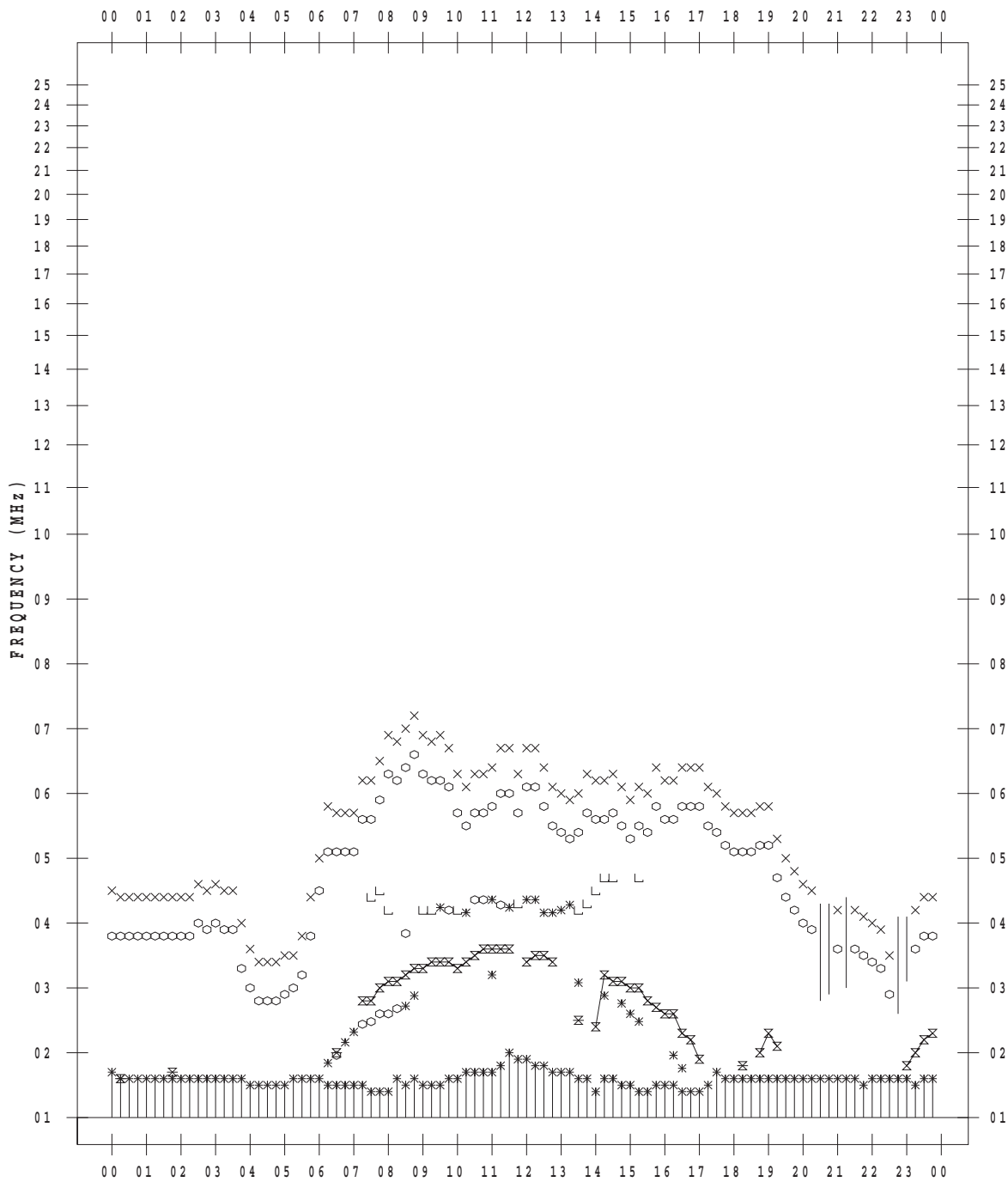
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/ 9

135 ° E MEAN TIME



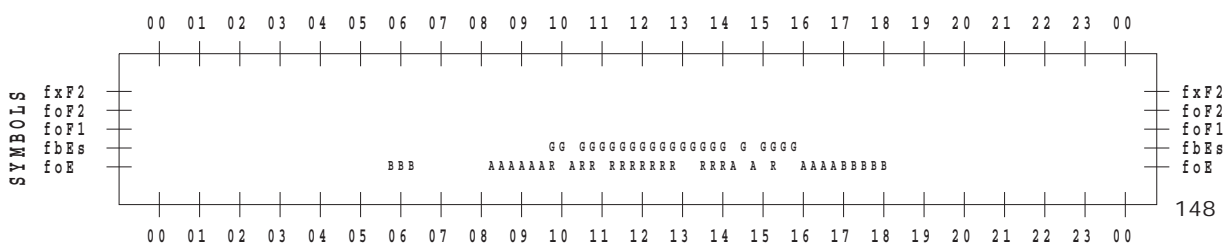
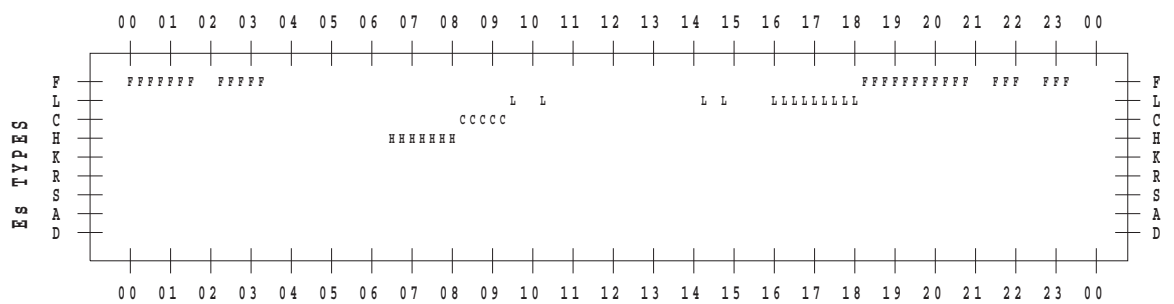
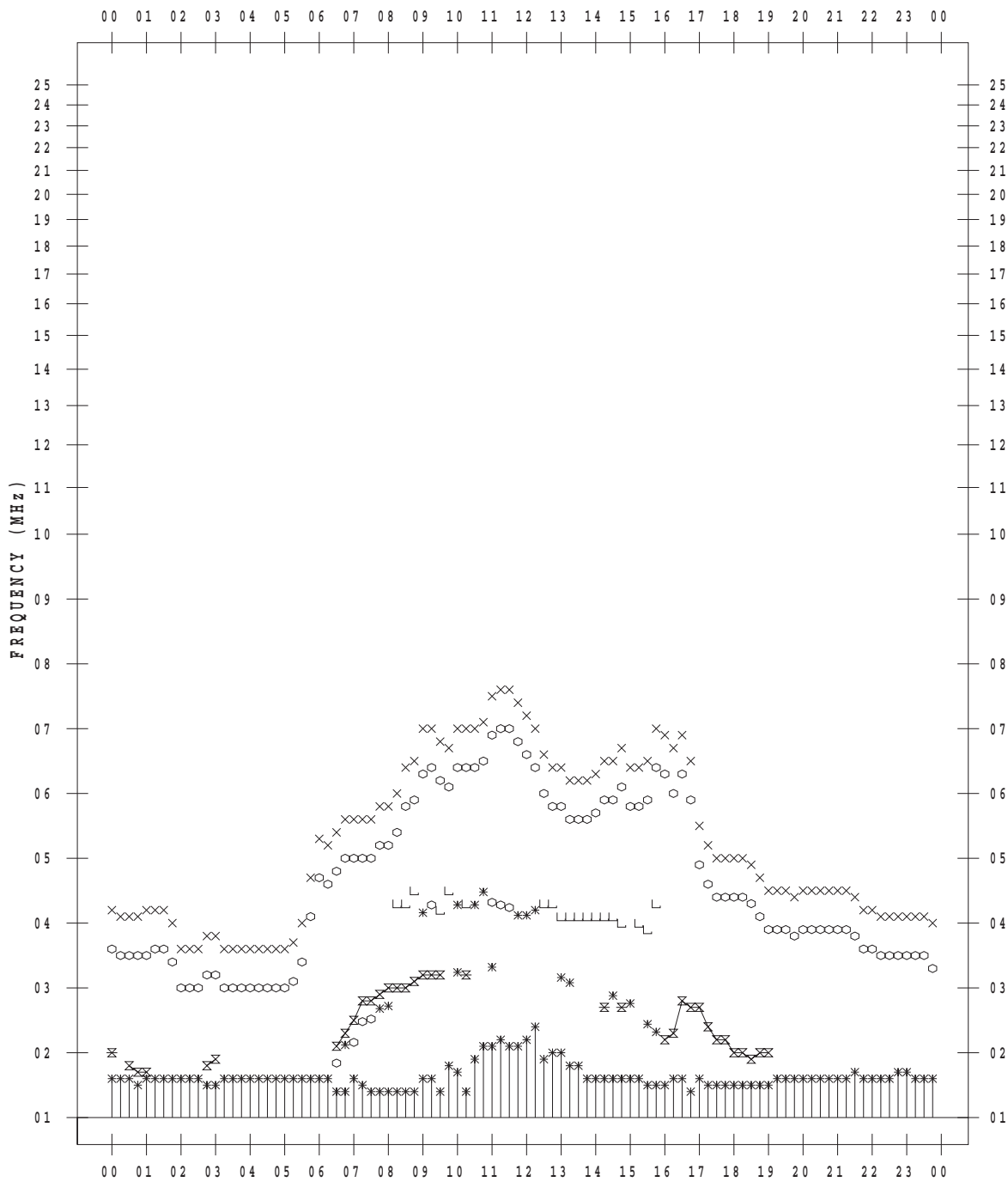
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/10

135 ° E MEAN TIME



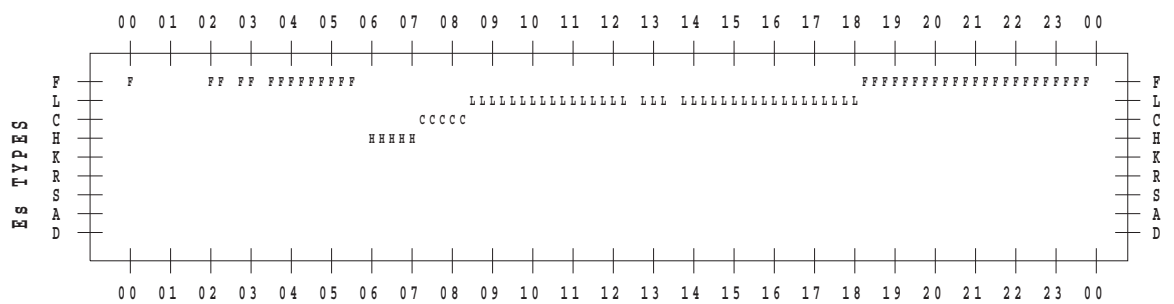
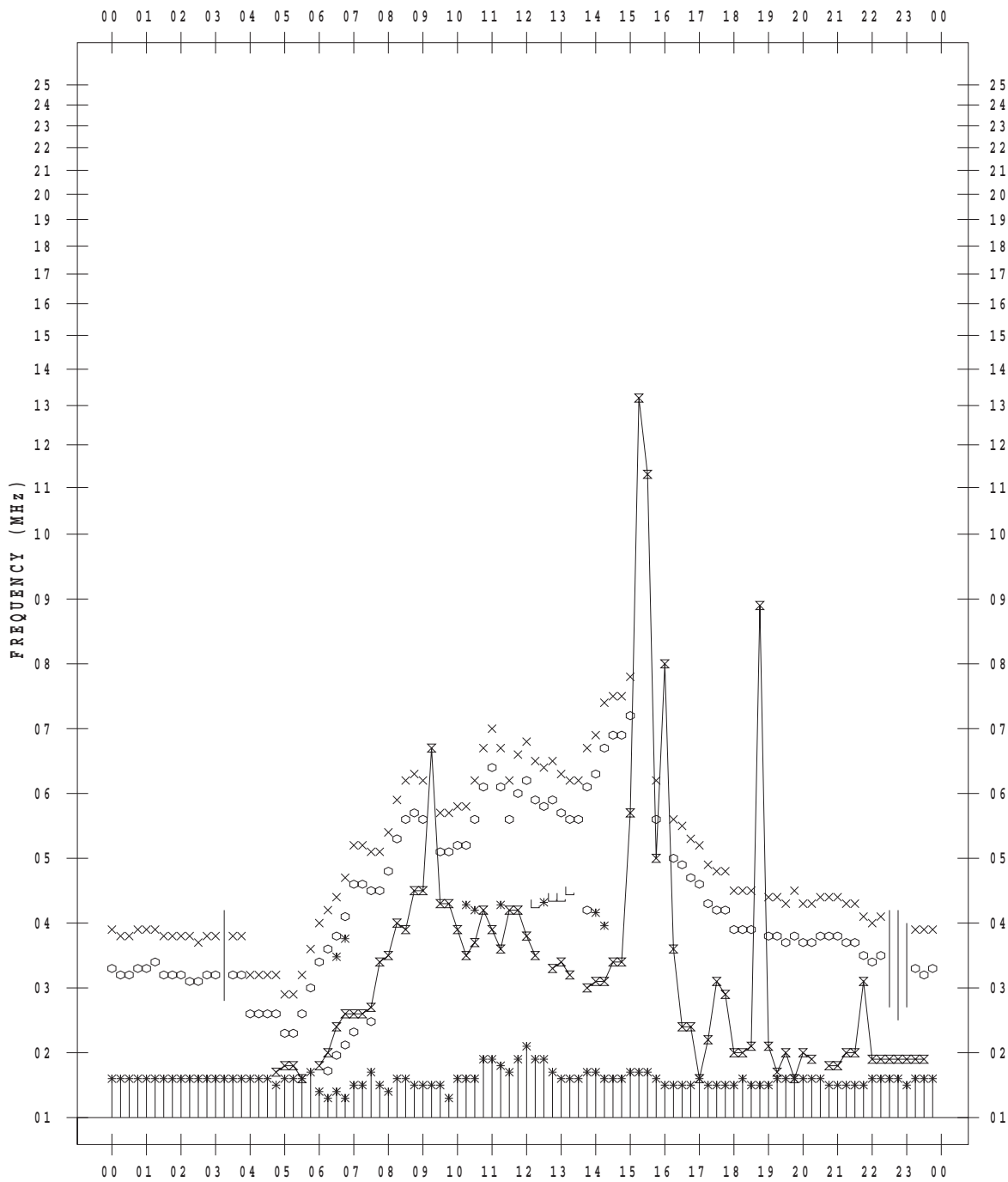
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/11

135 ° E MEAN TIME



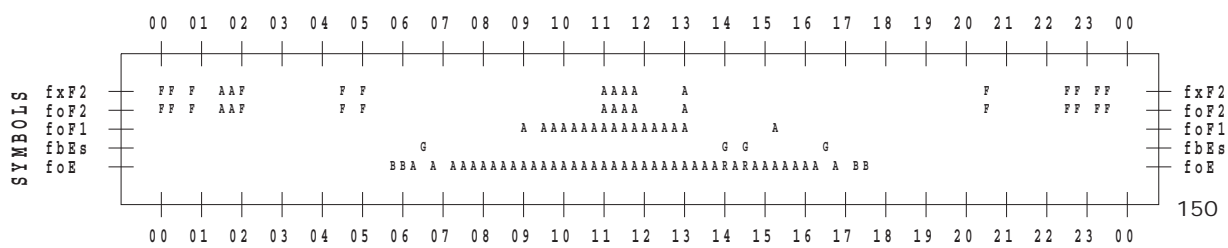
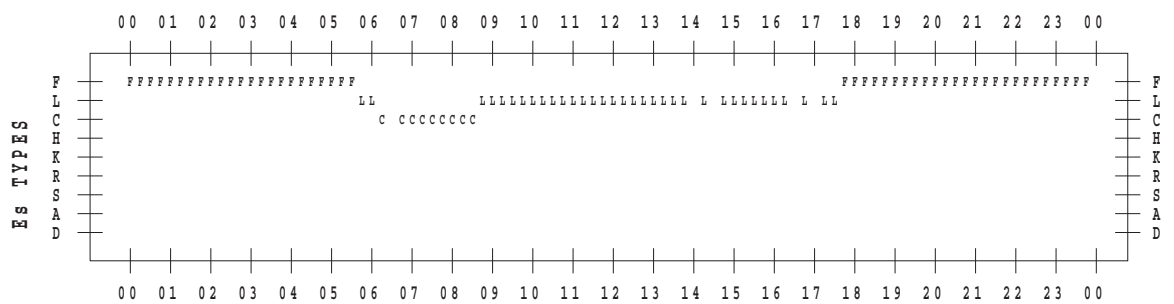
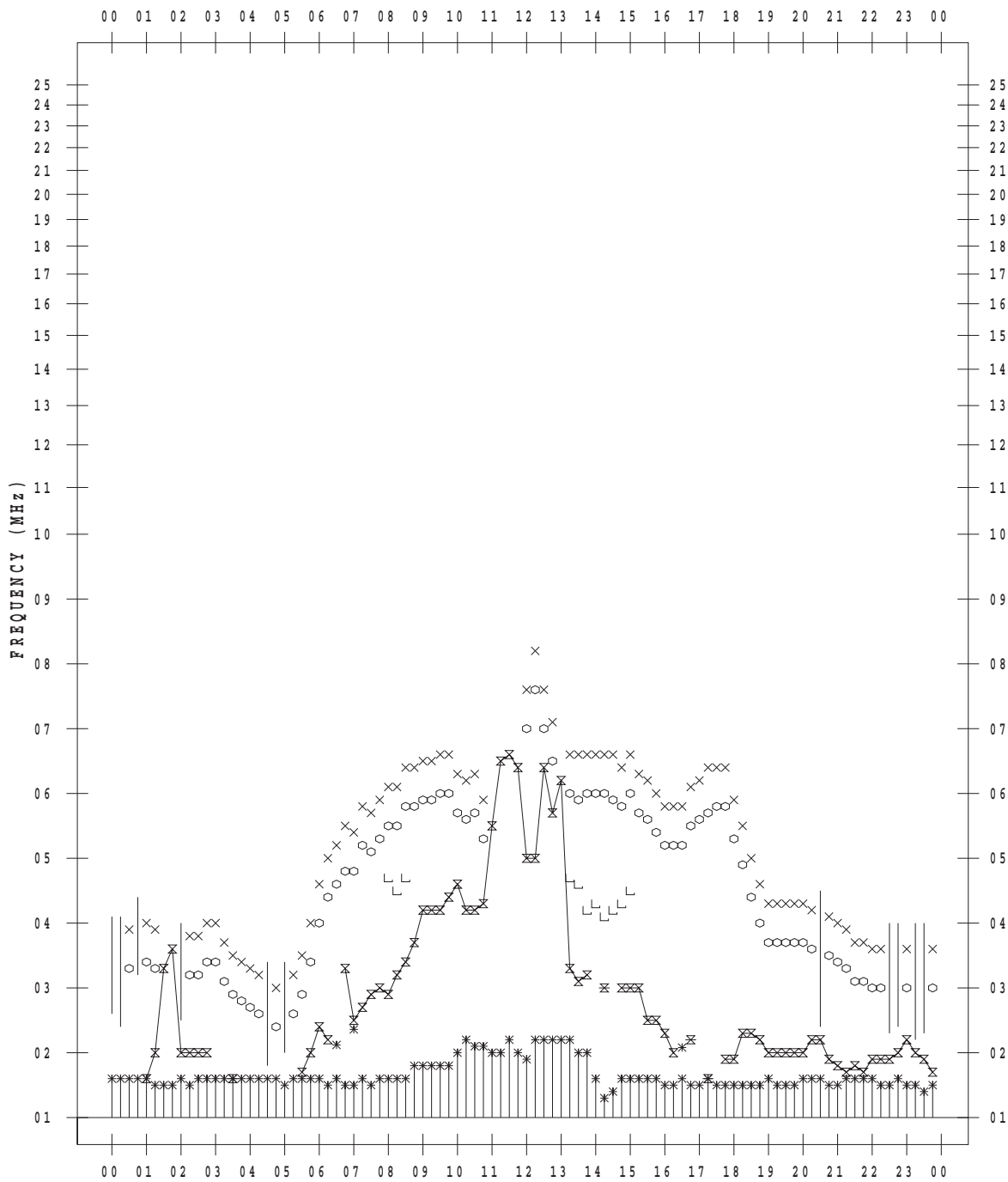
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/12

135 ° E MEAN TIME



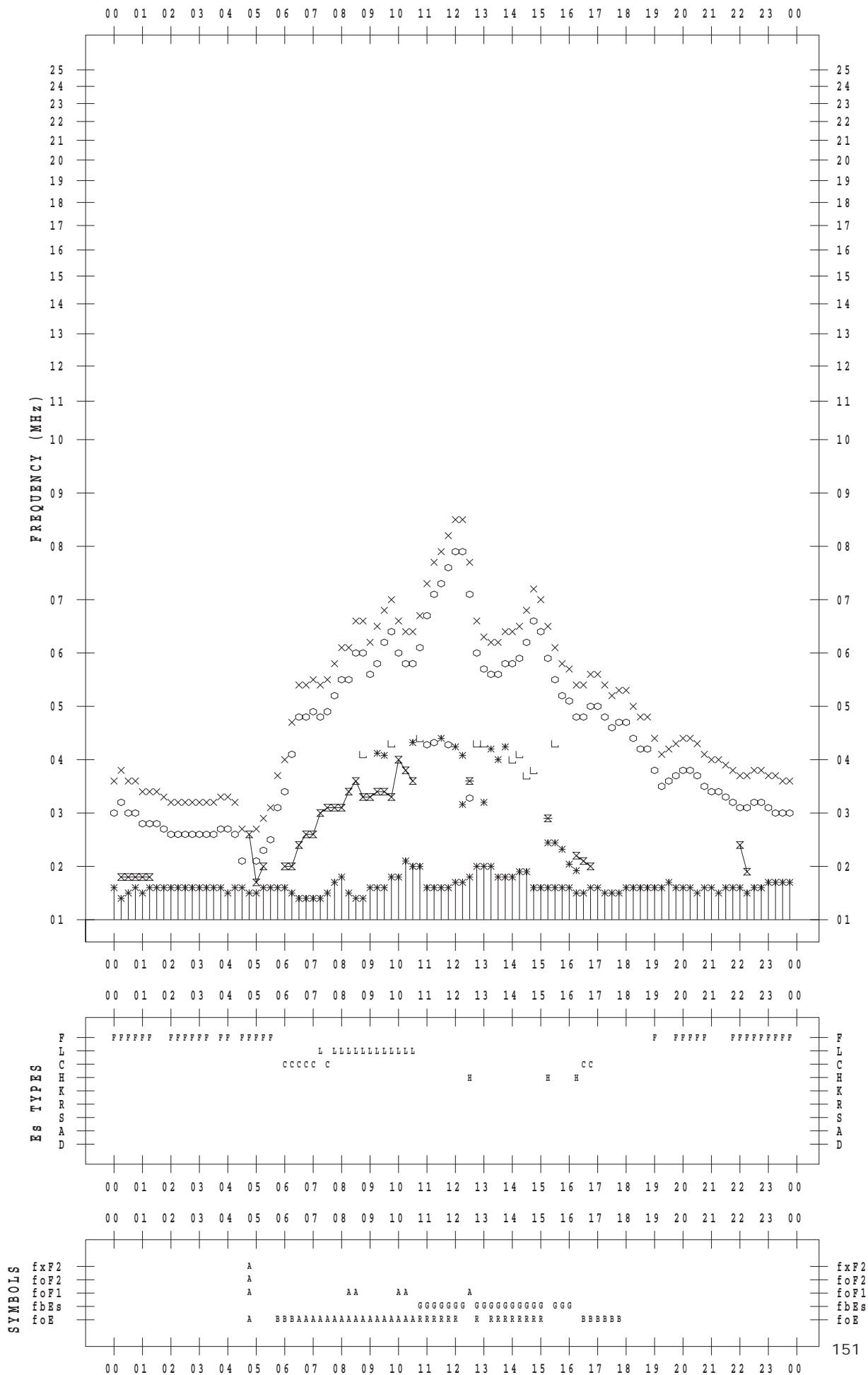
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/13

135 ° E MEAN TIME



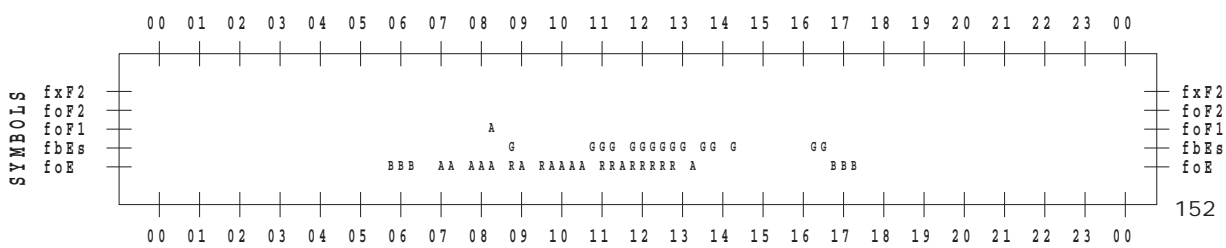
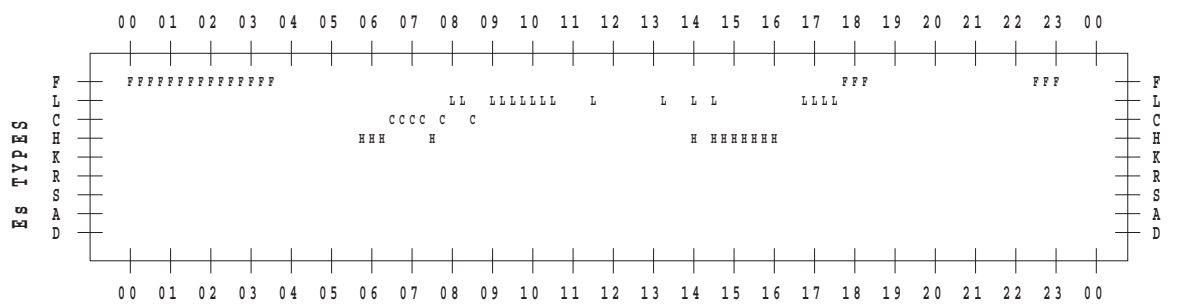
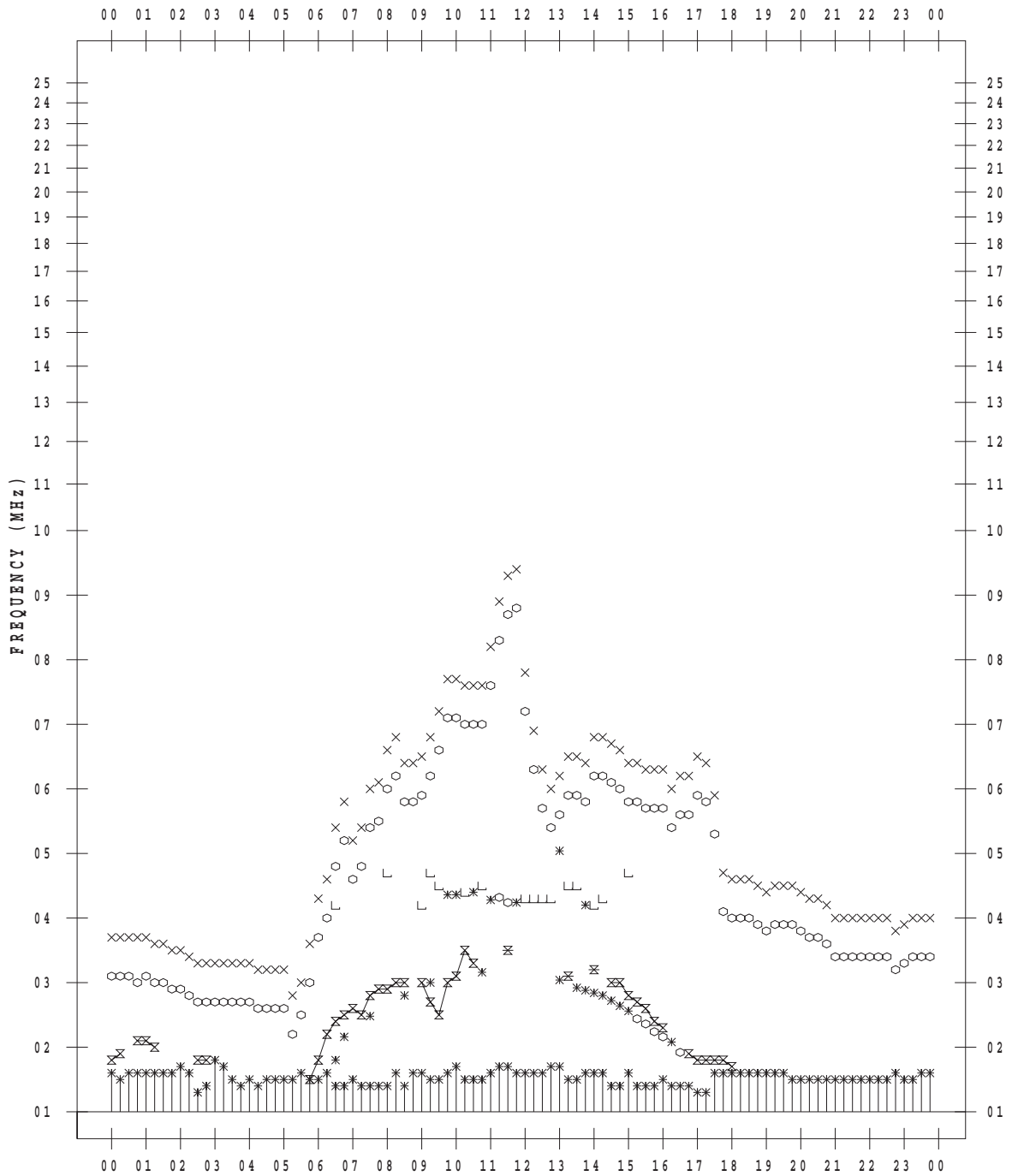
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/14

135 ° E MEAN TIME



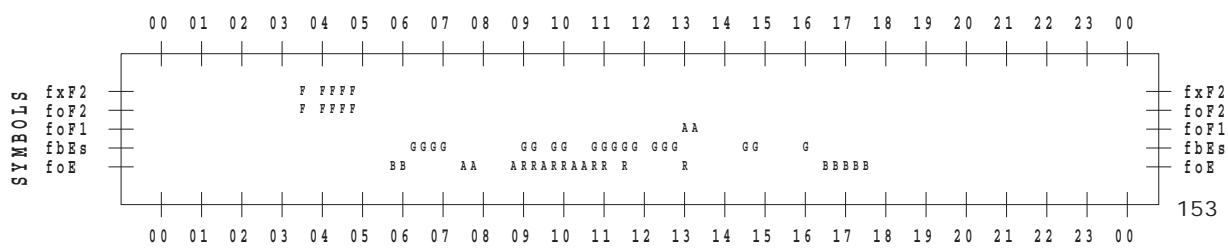
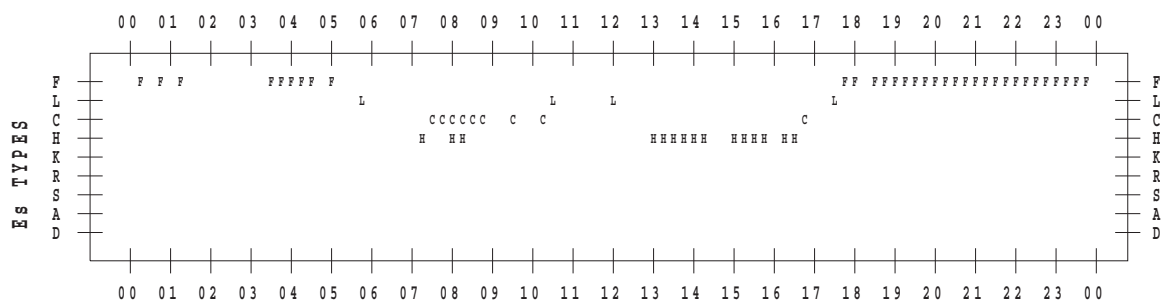
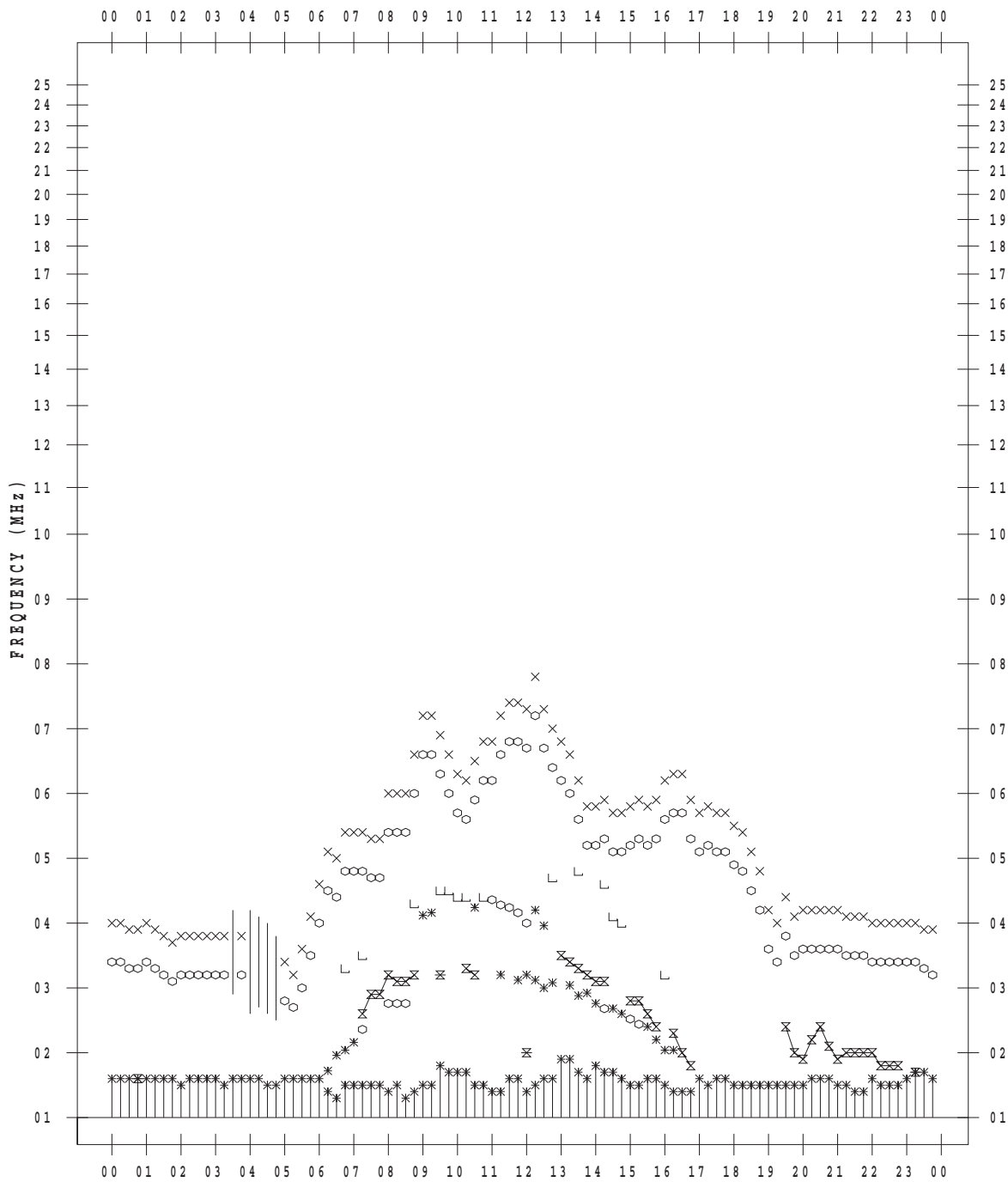
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/15

135 ° E MEAN TIME



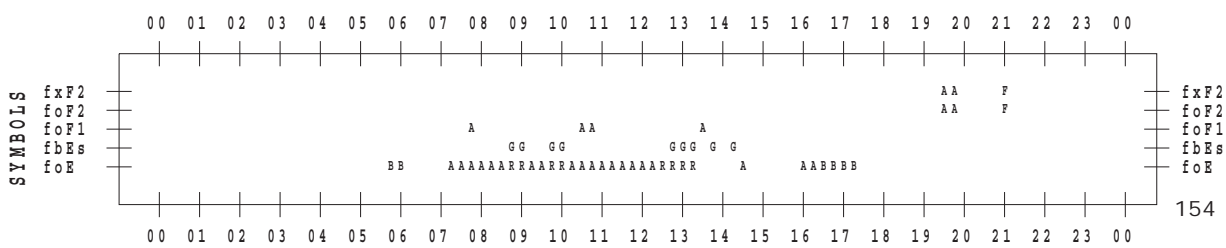
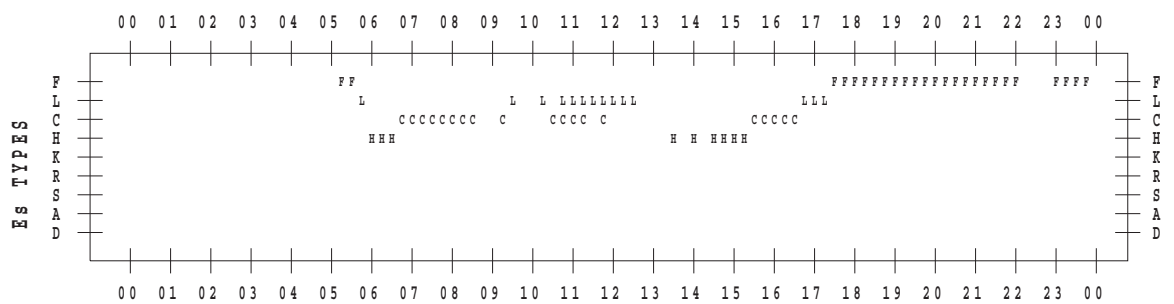
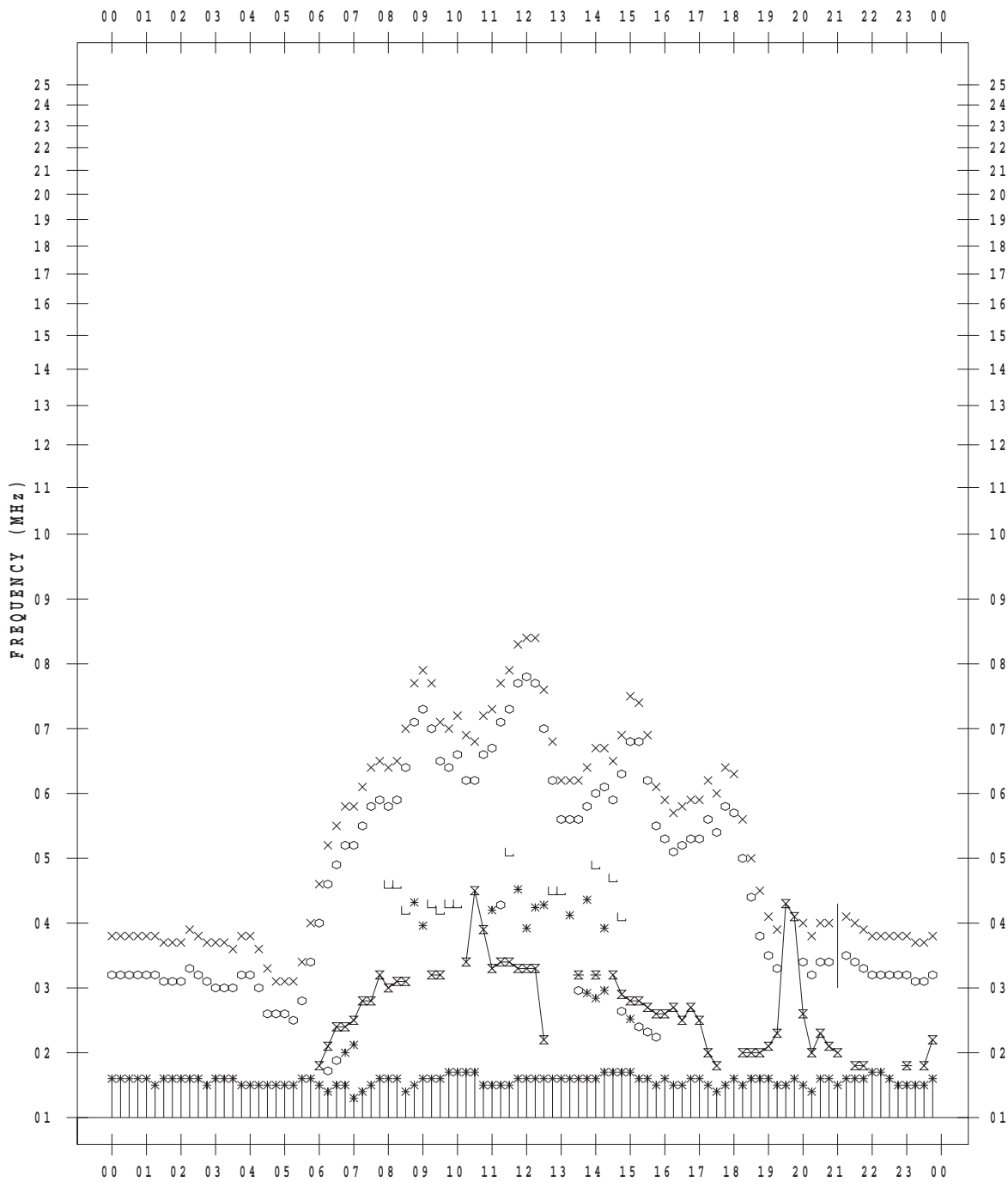
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/16

135 ° E MEAN TIME



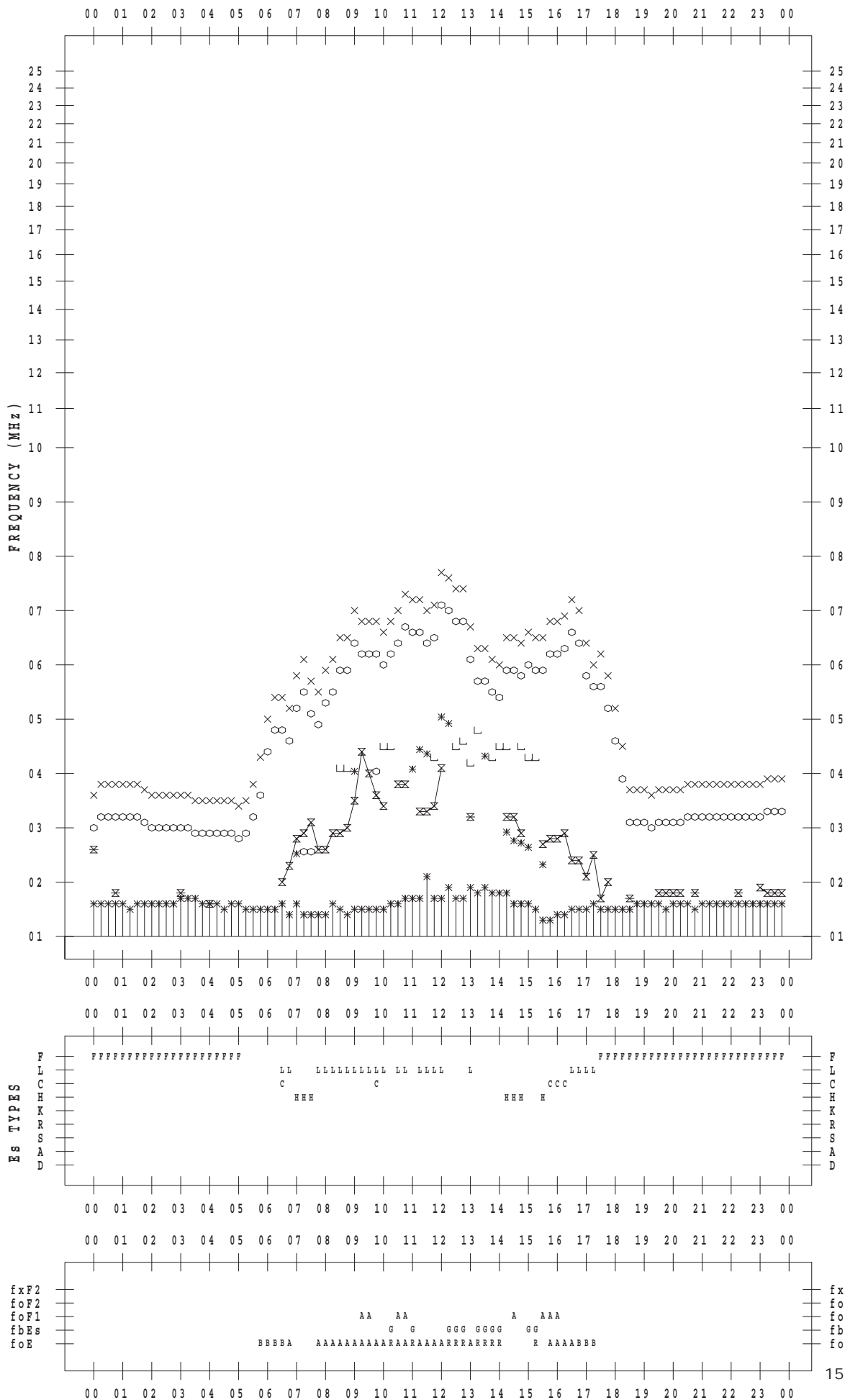
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/17

135 ° E MEAN TIME



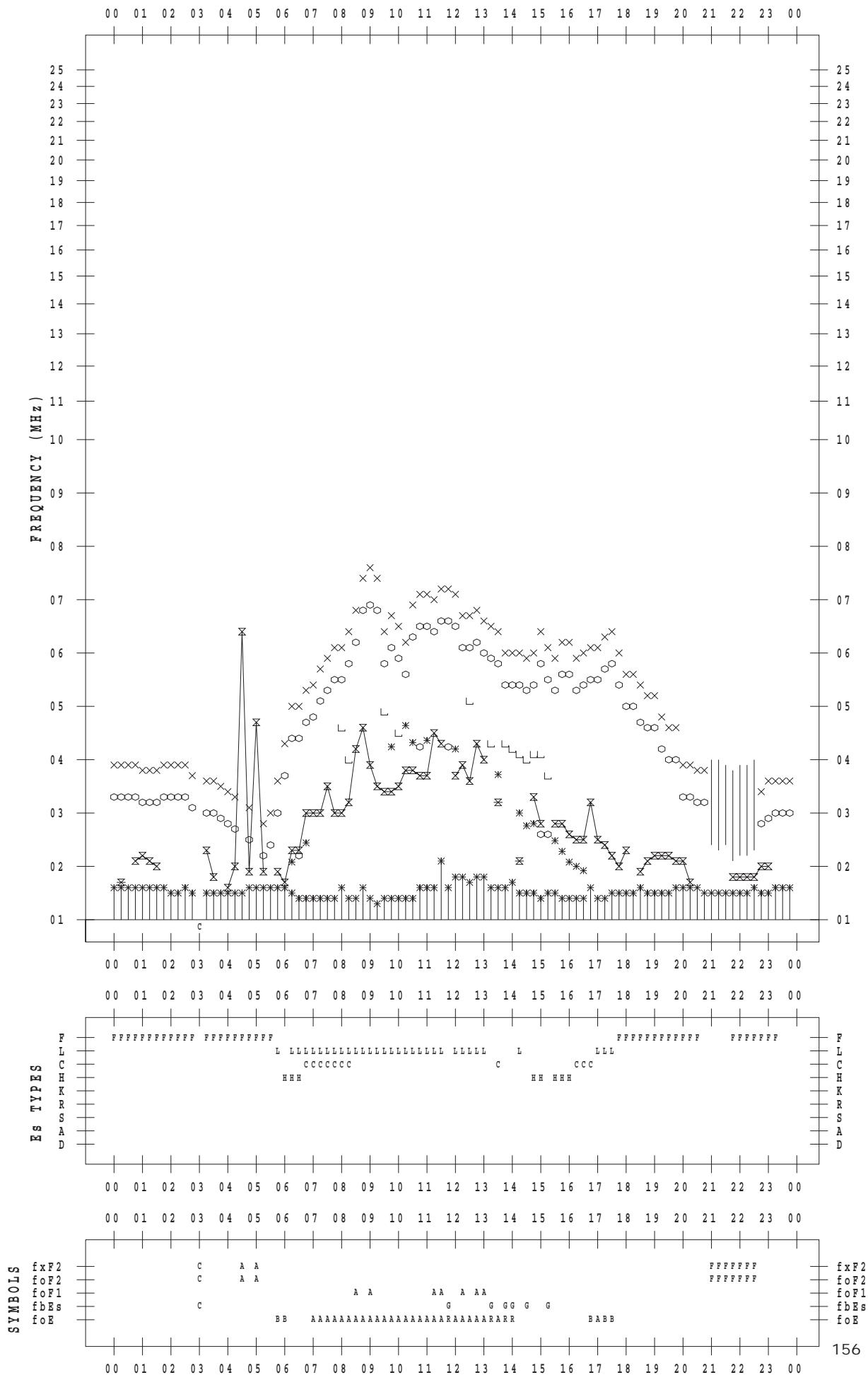
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/18

135 ° E MEAN TIME



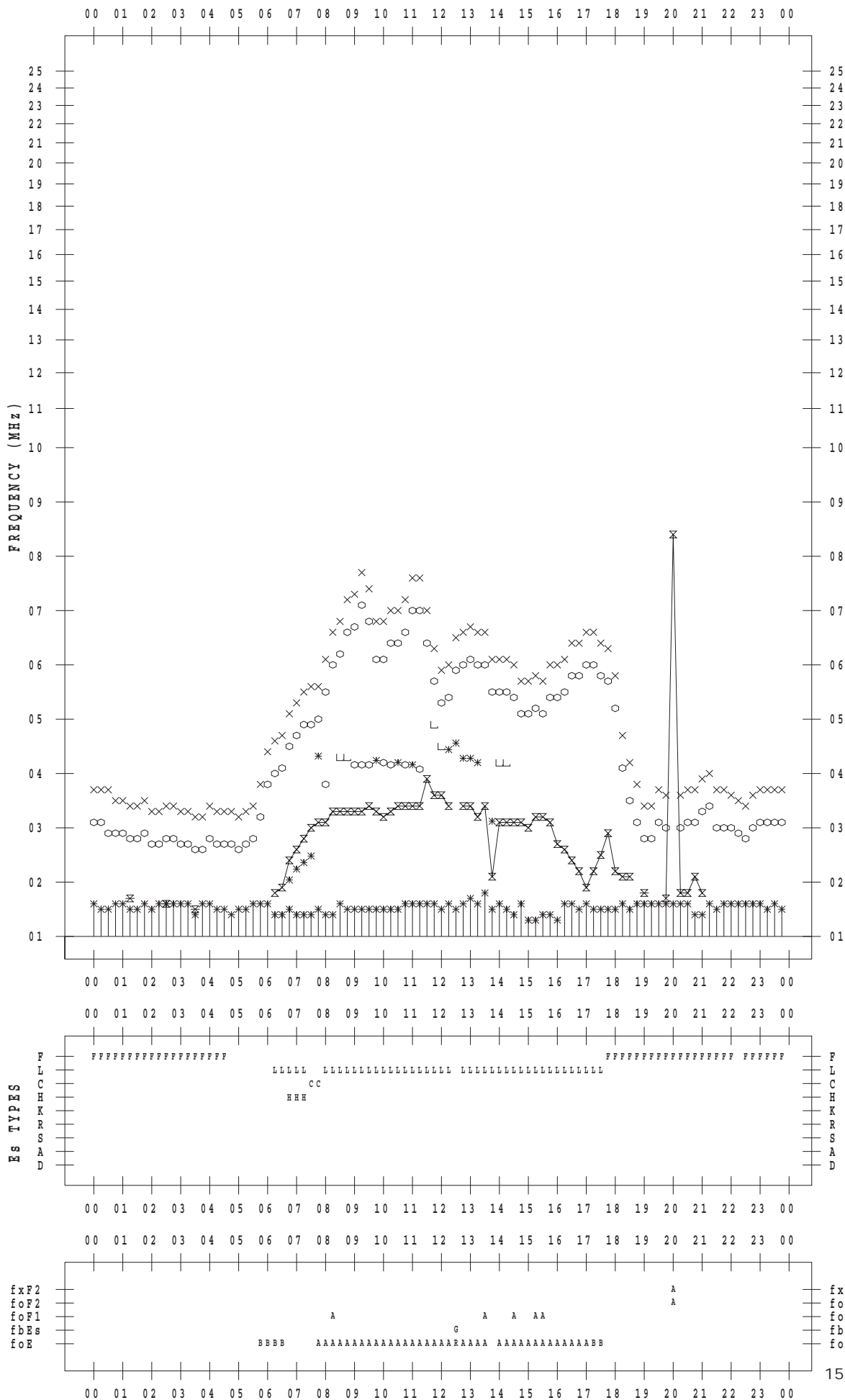
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/19

135 ° E MEAN TIME



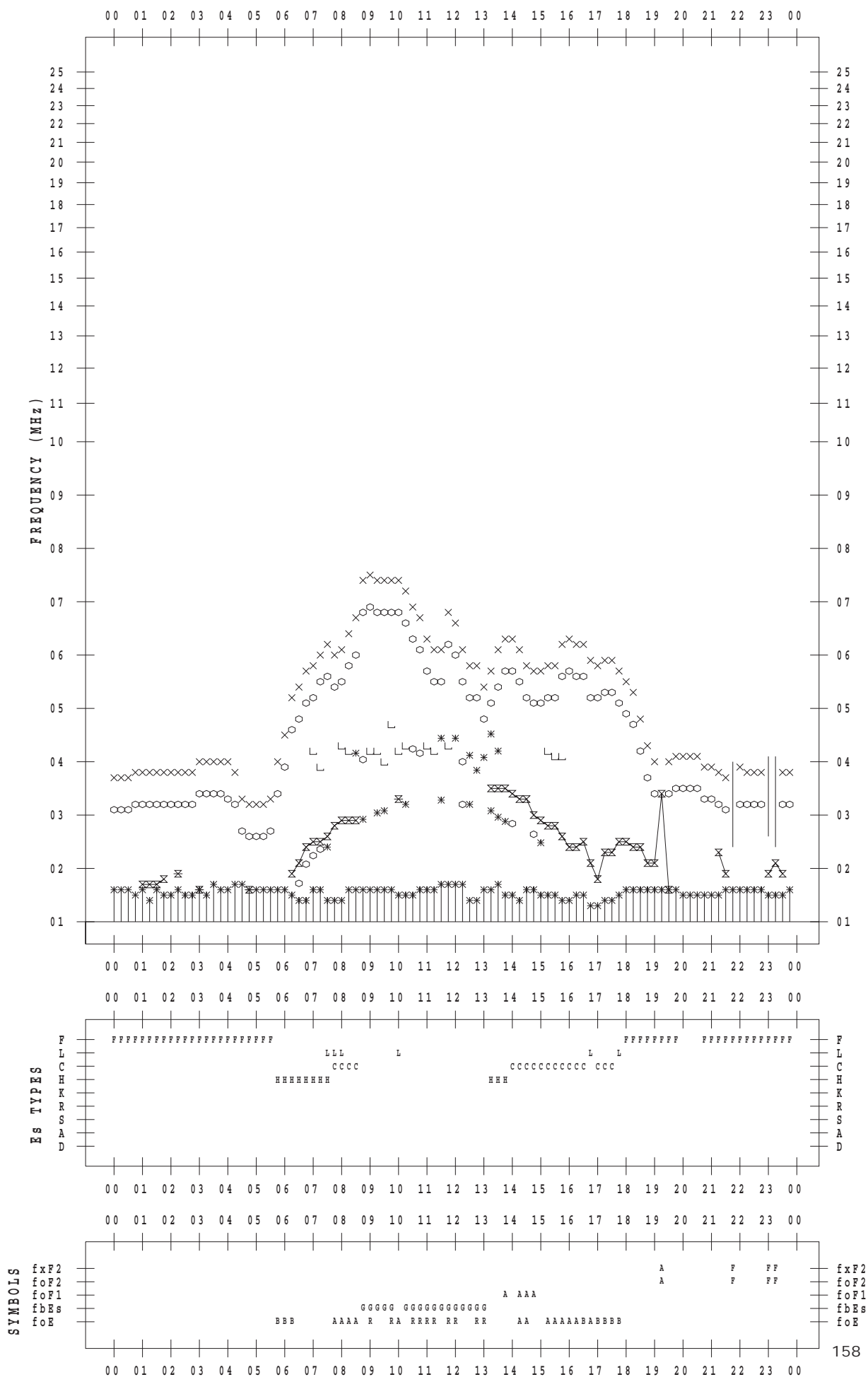
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/20

135 ° E MEAN TIME



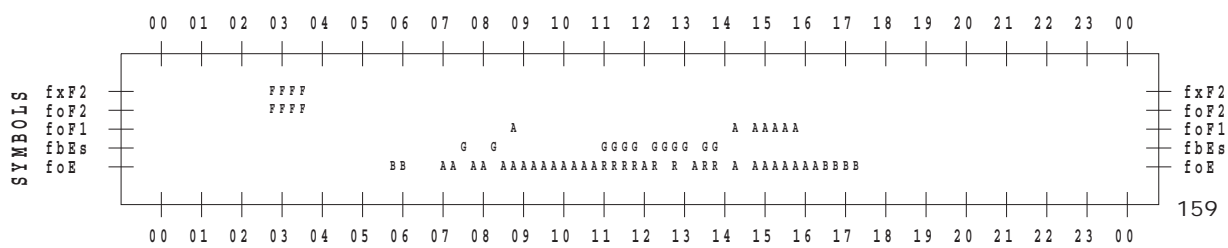
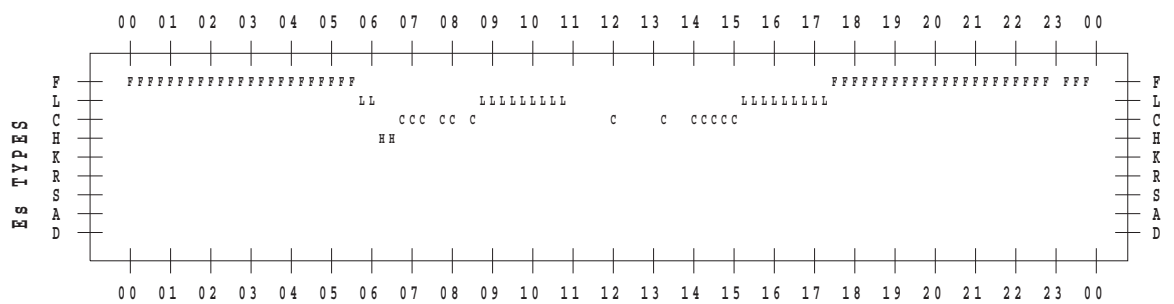
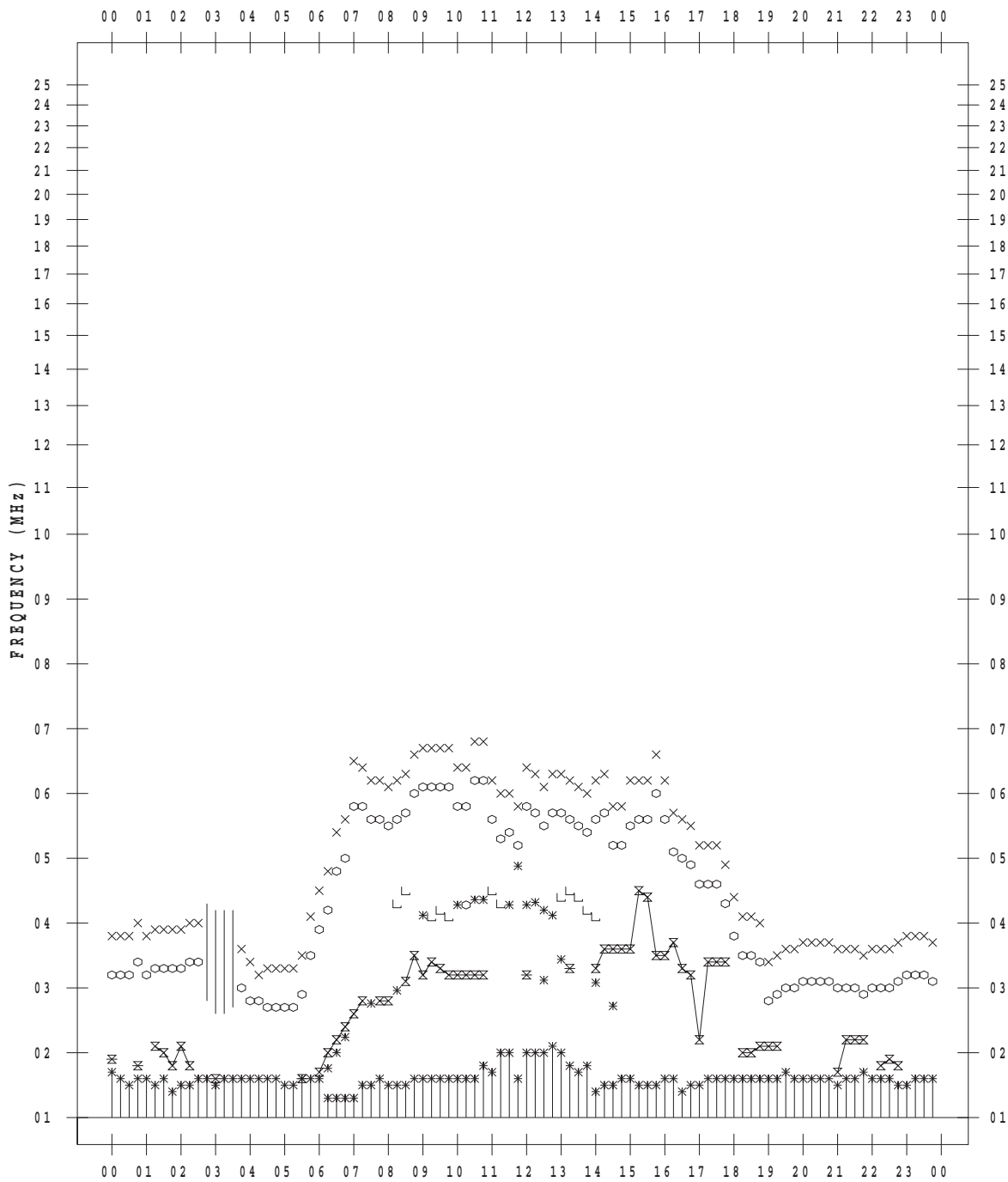
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/21

135 ° E MEAN TIME



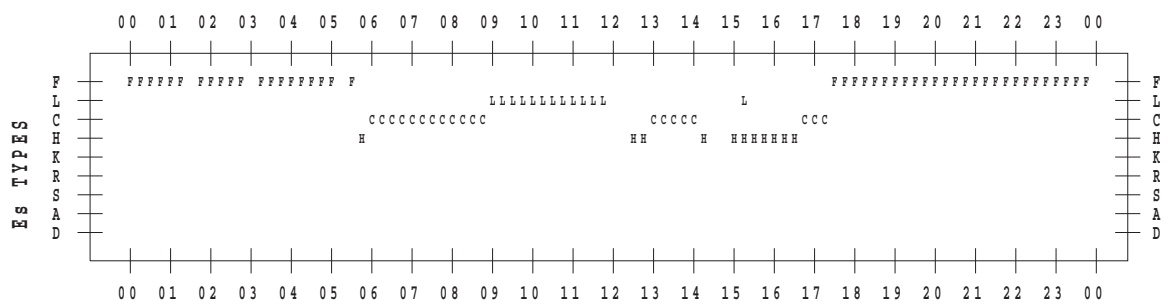
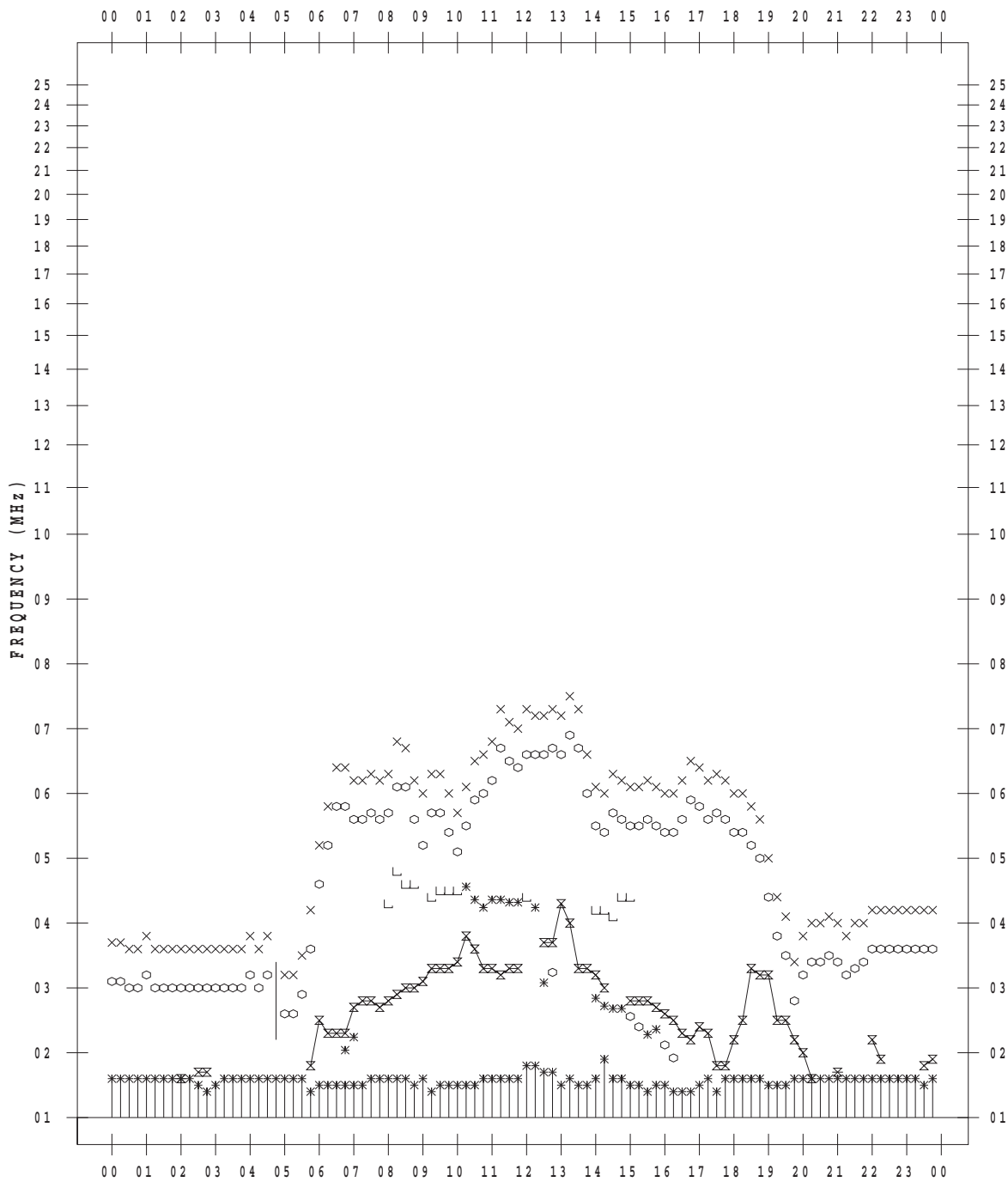
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/22

135 ° E MEAN TIME



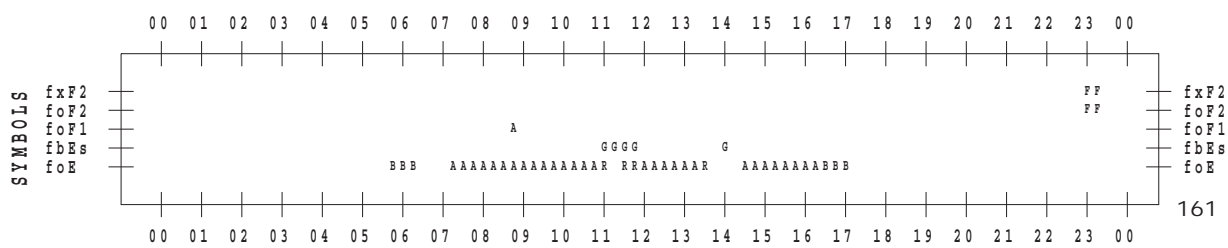
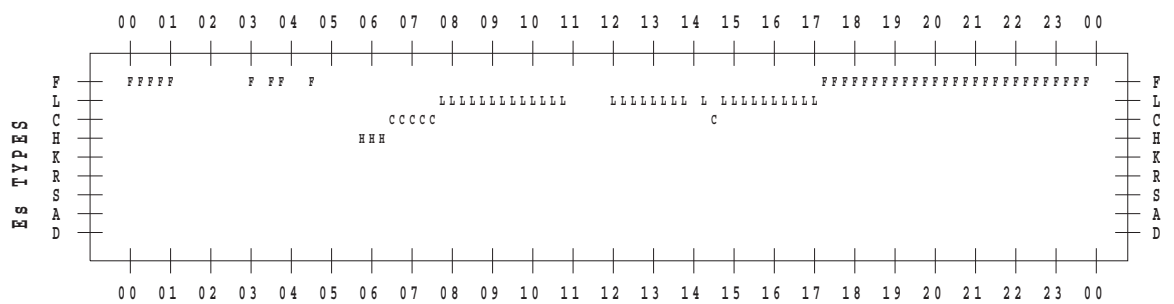
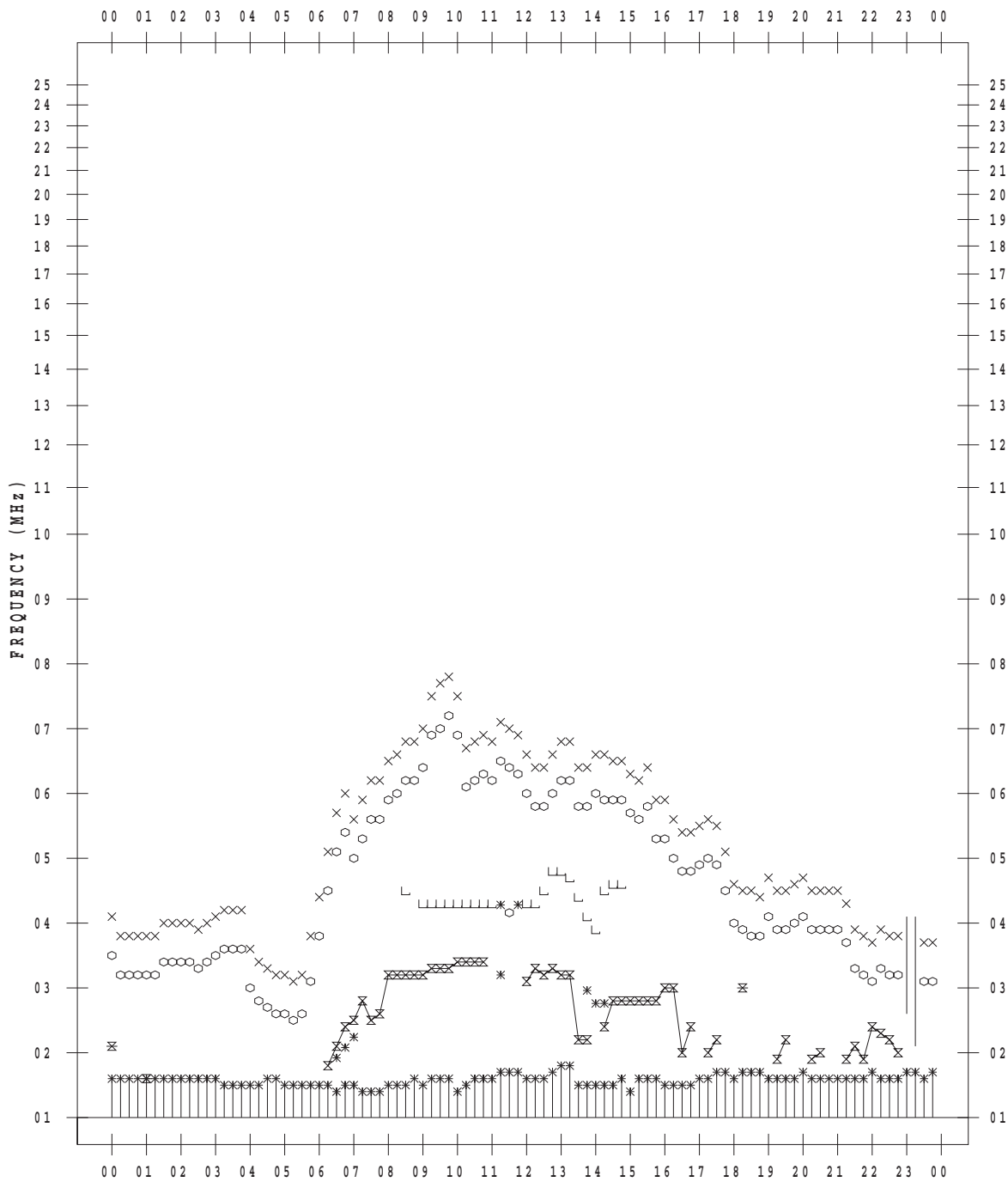
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/23

135 ° E MEAN TIME



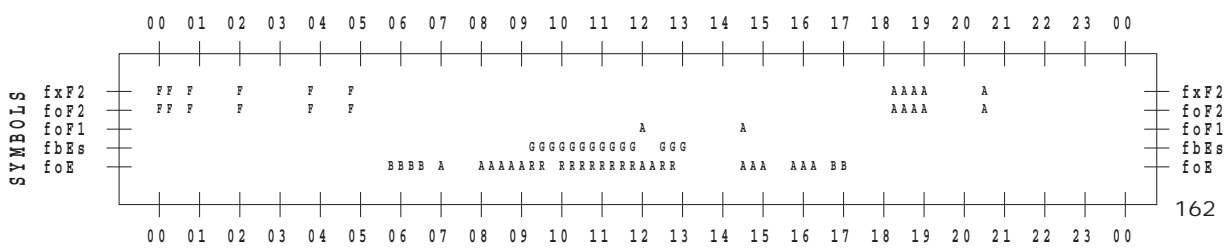
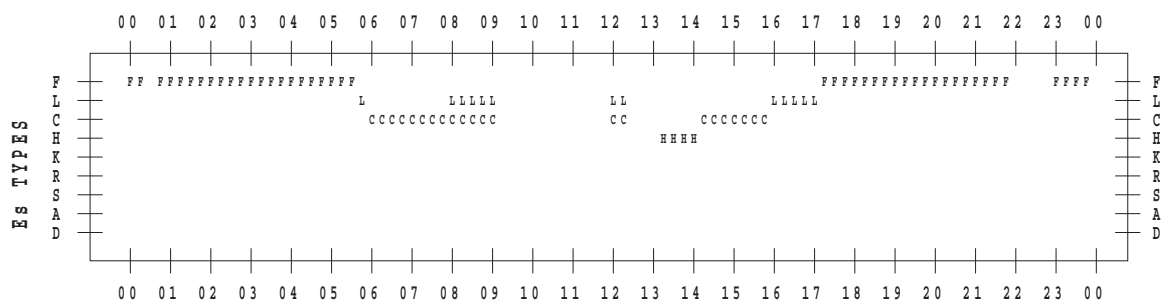
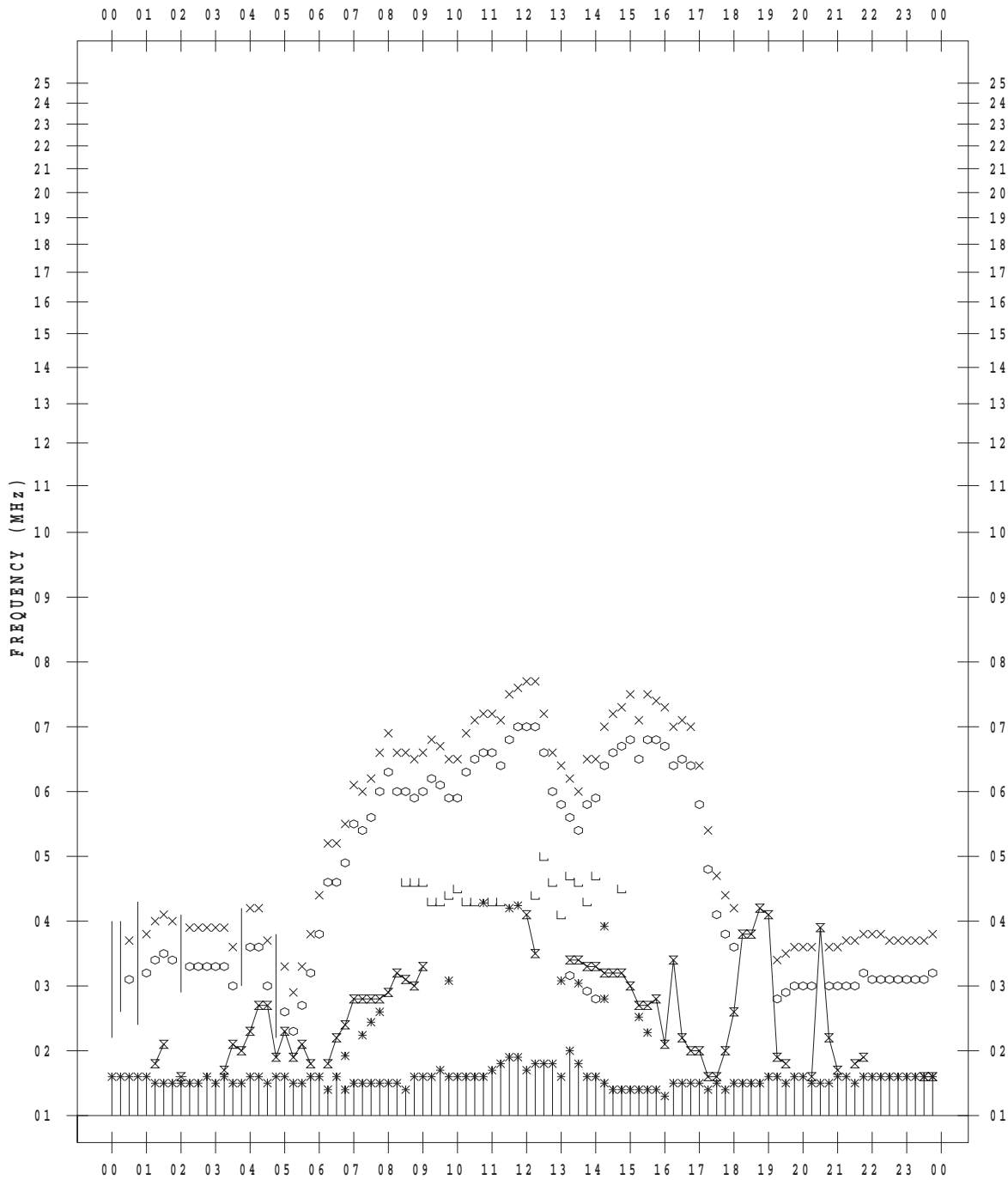
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/24

135 ° E MEAN TIME



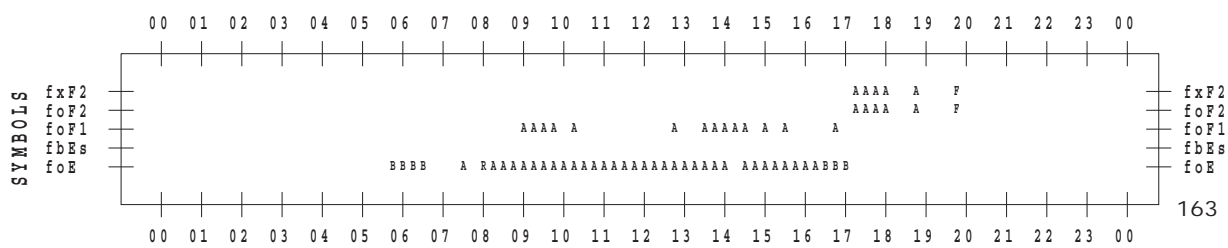
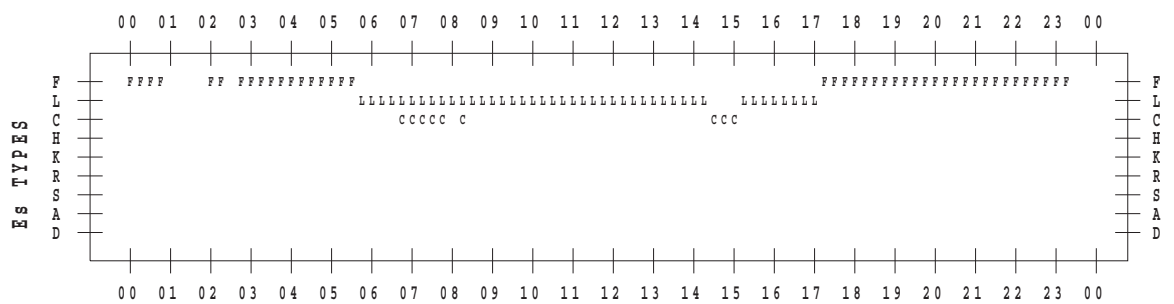
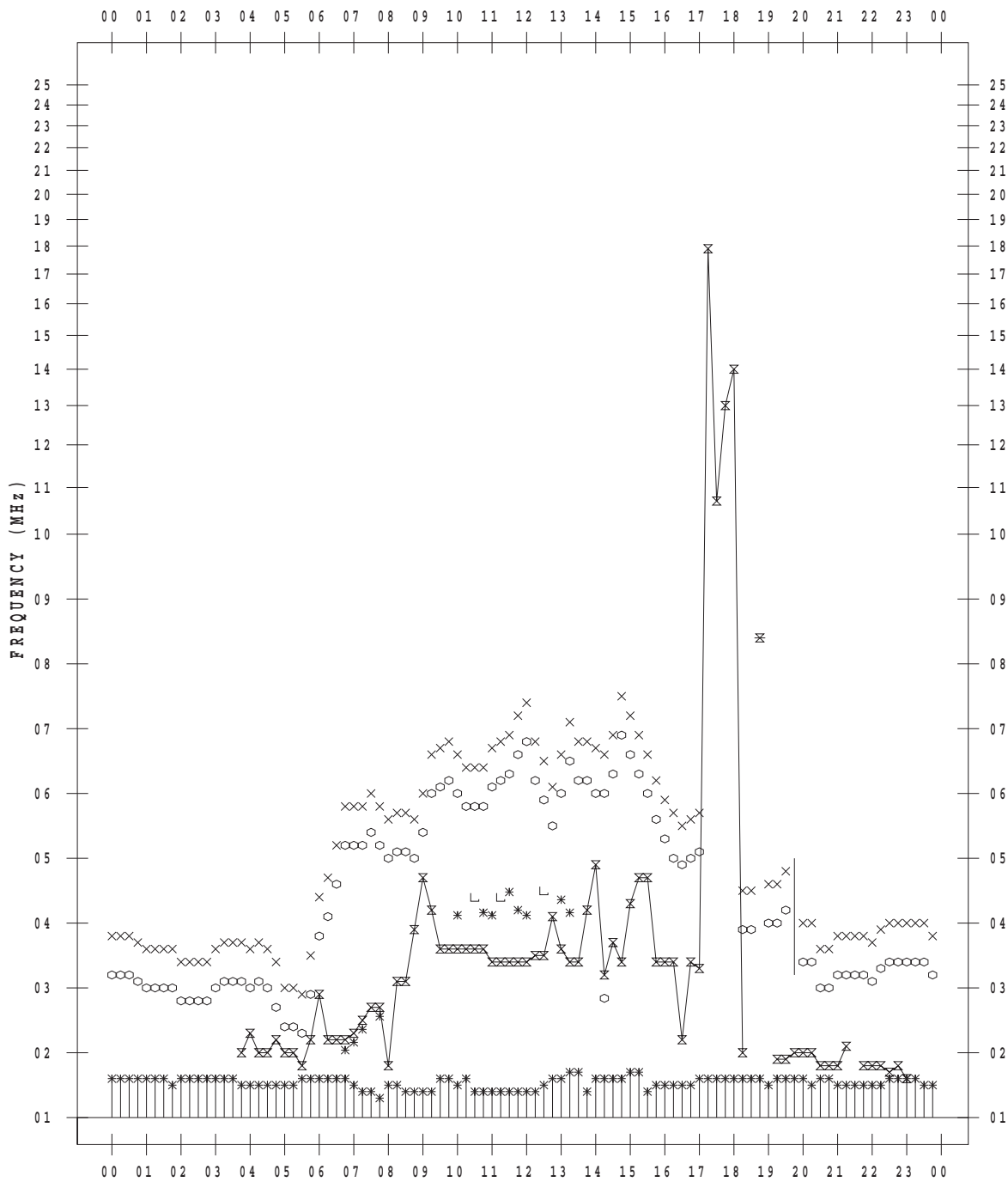
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/25

135 ° E MEAN TIME



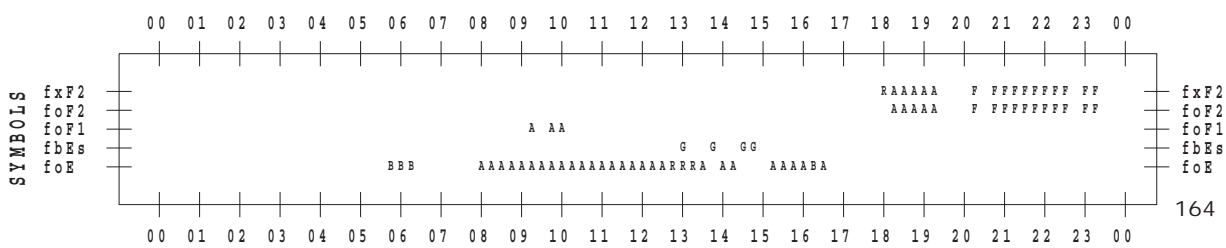
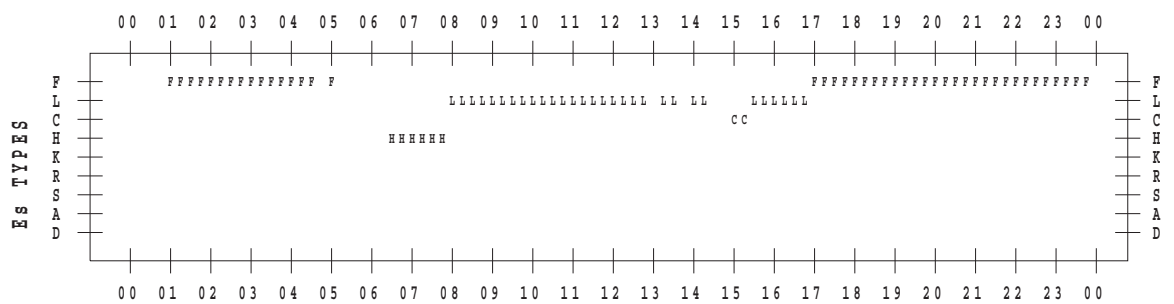
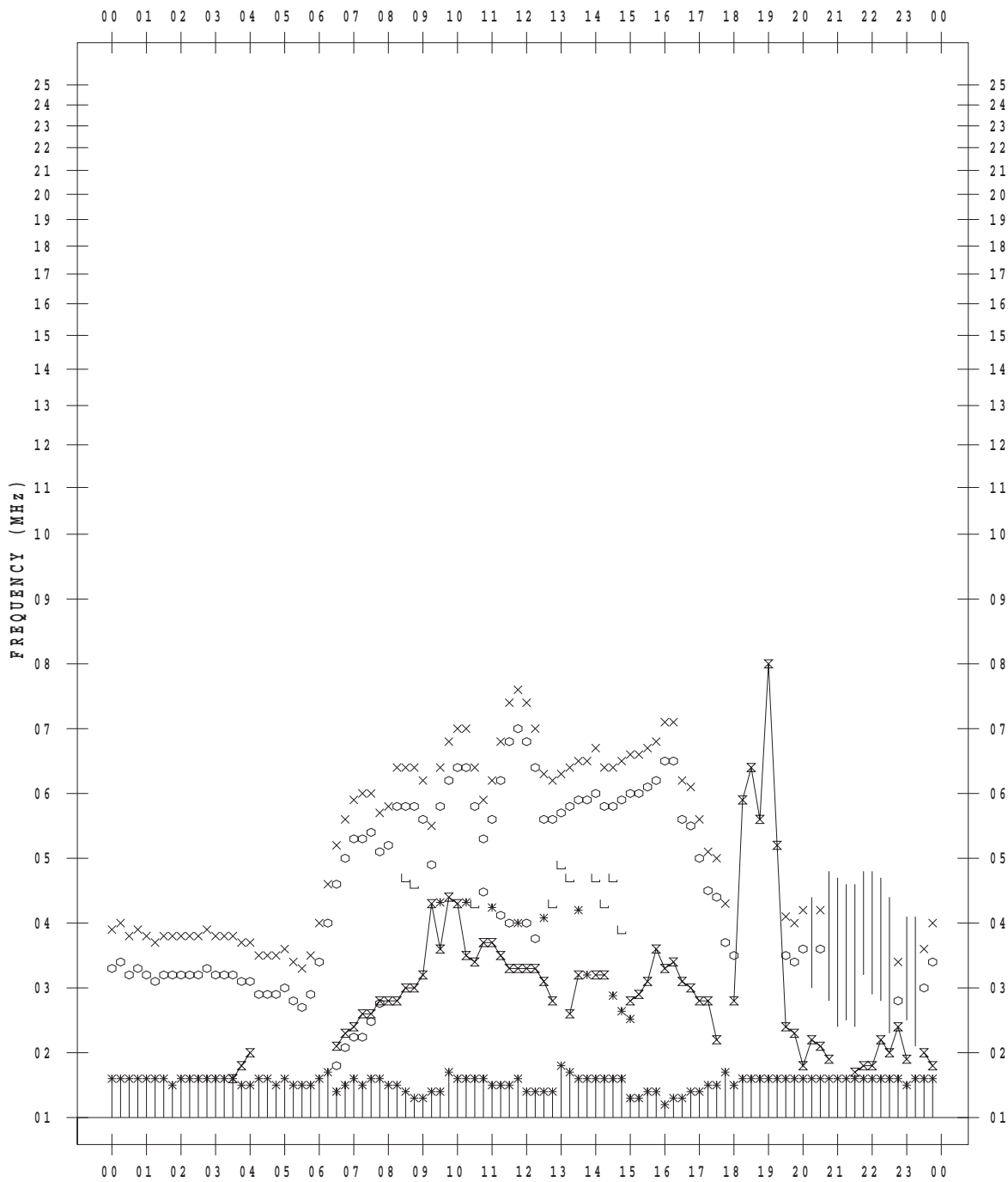
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/26

135 ° E MEAN TIME



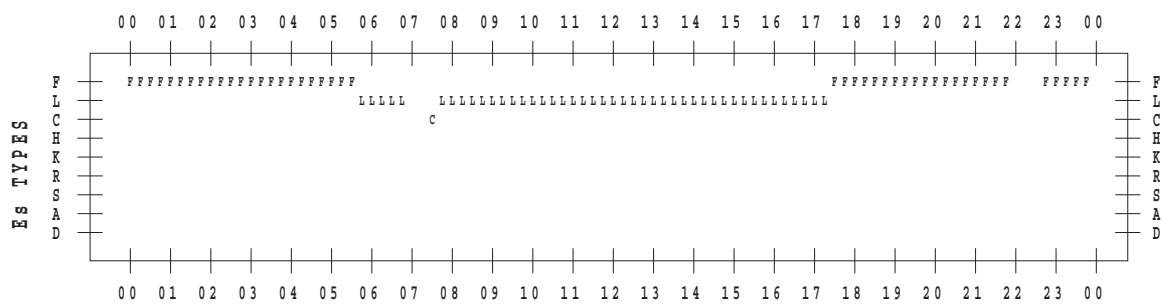
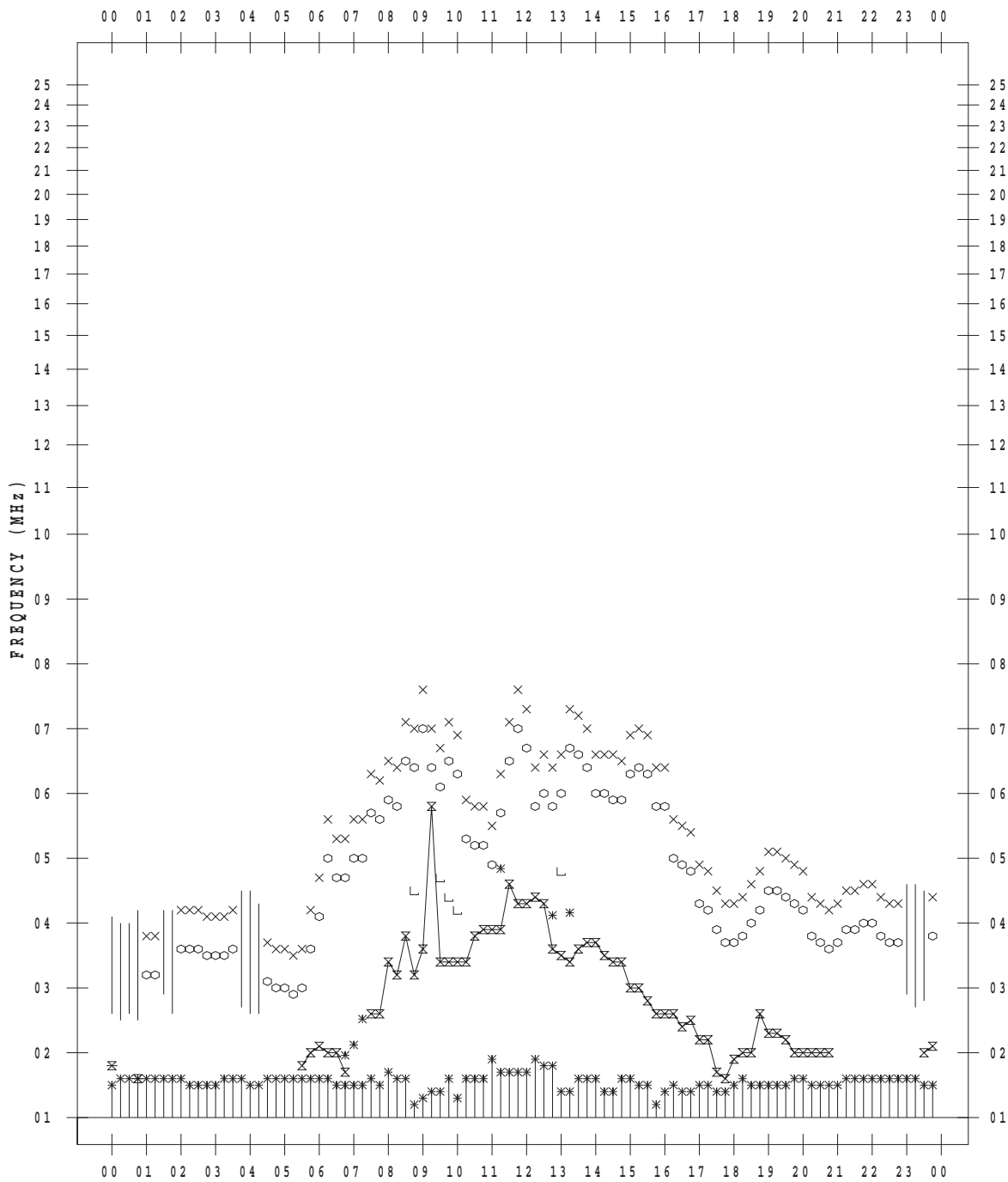
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/27

135 ° E MEAN TIME



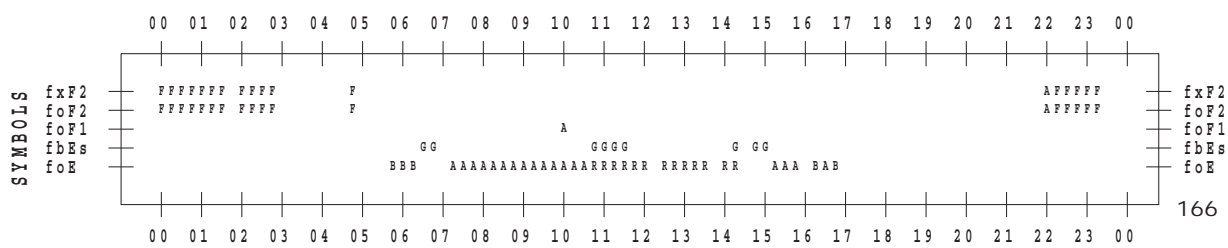
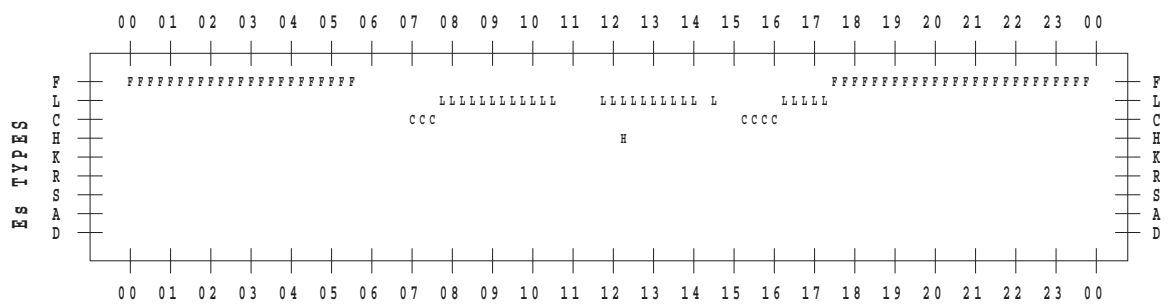
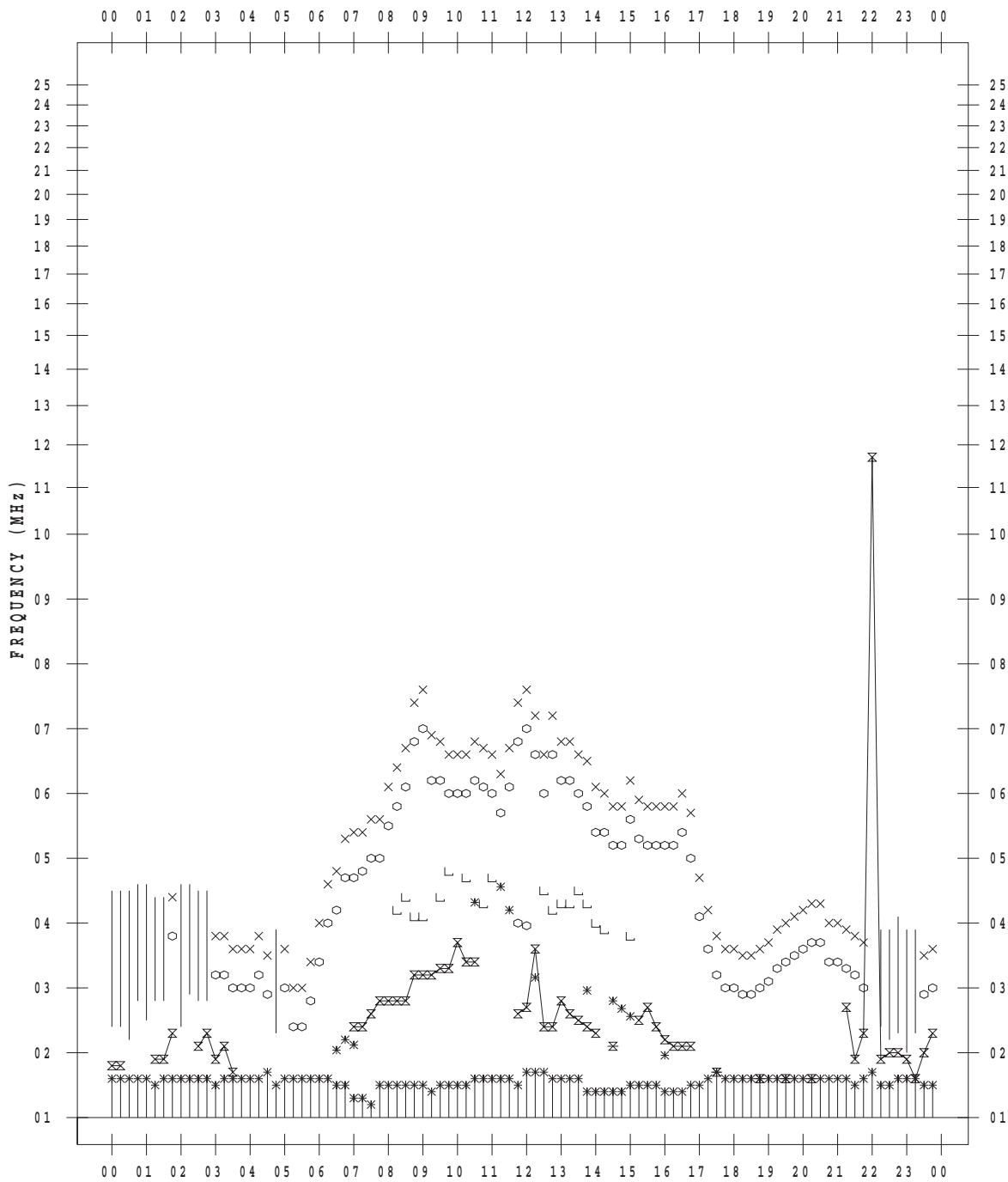
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/28

135 ° E MEAN TIME



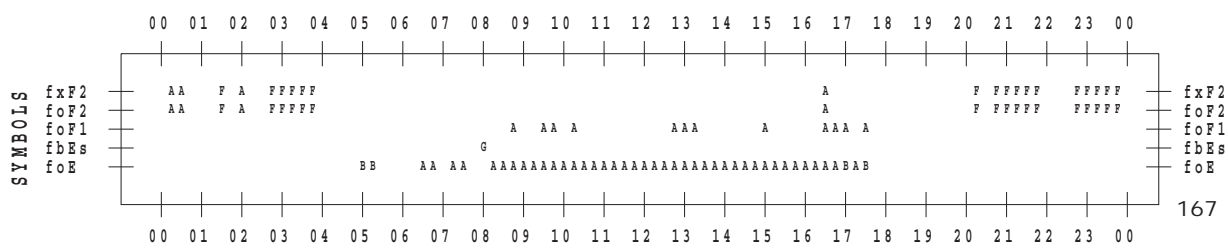
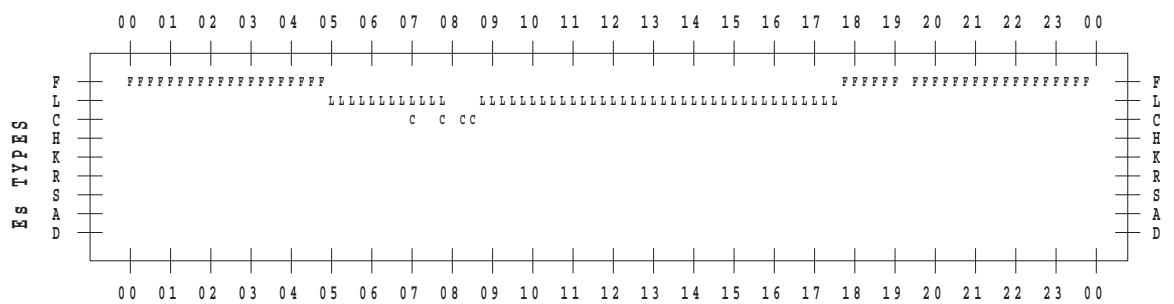
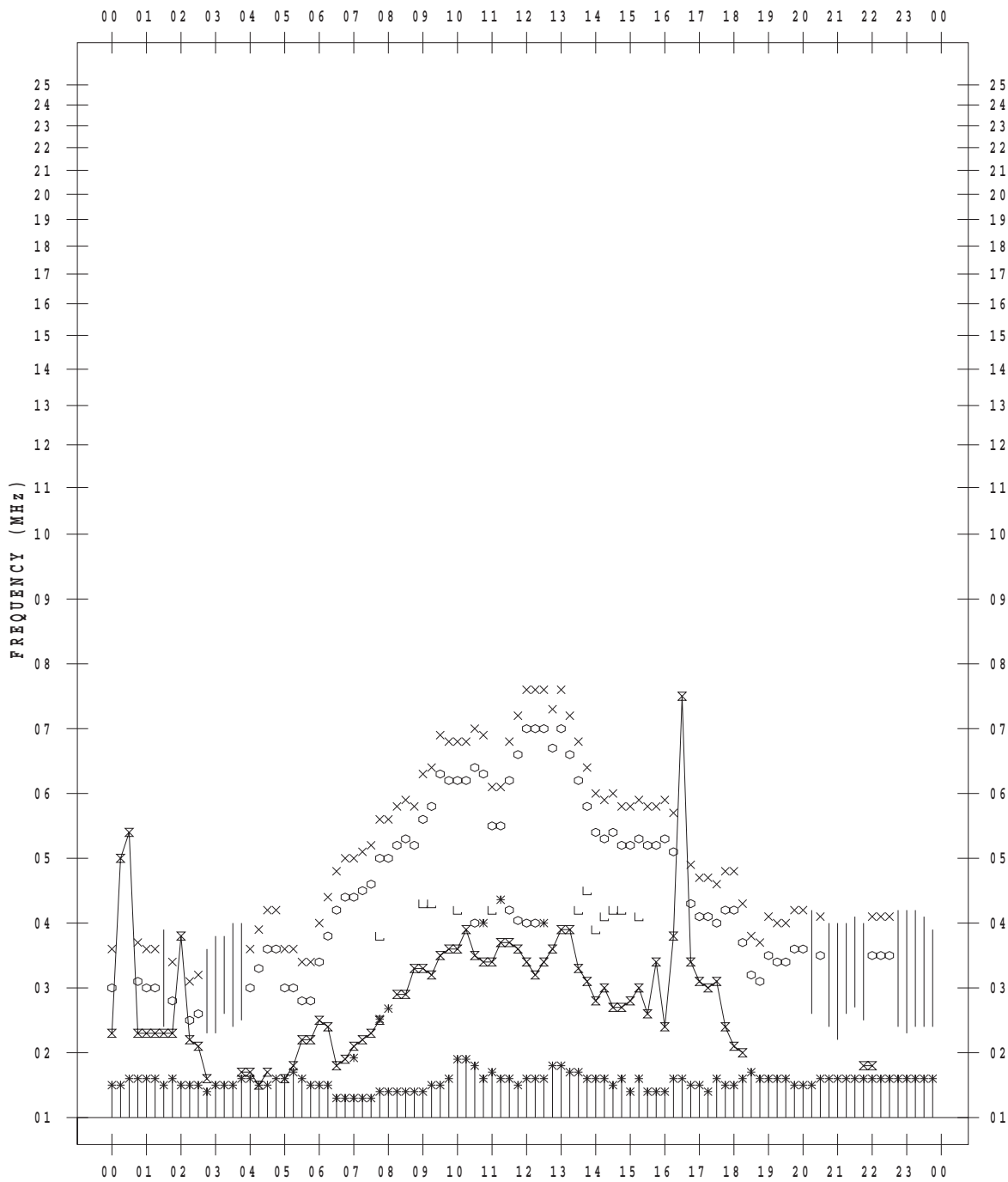
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/29

135 ° E MEAN TIME



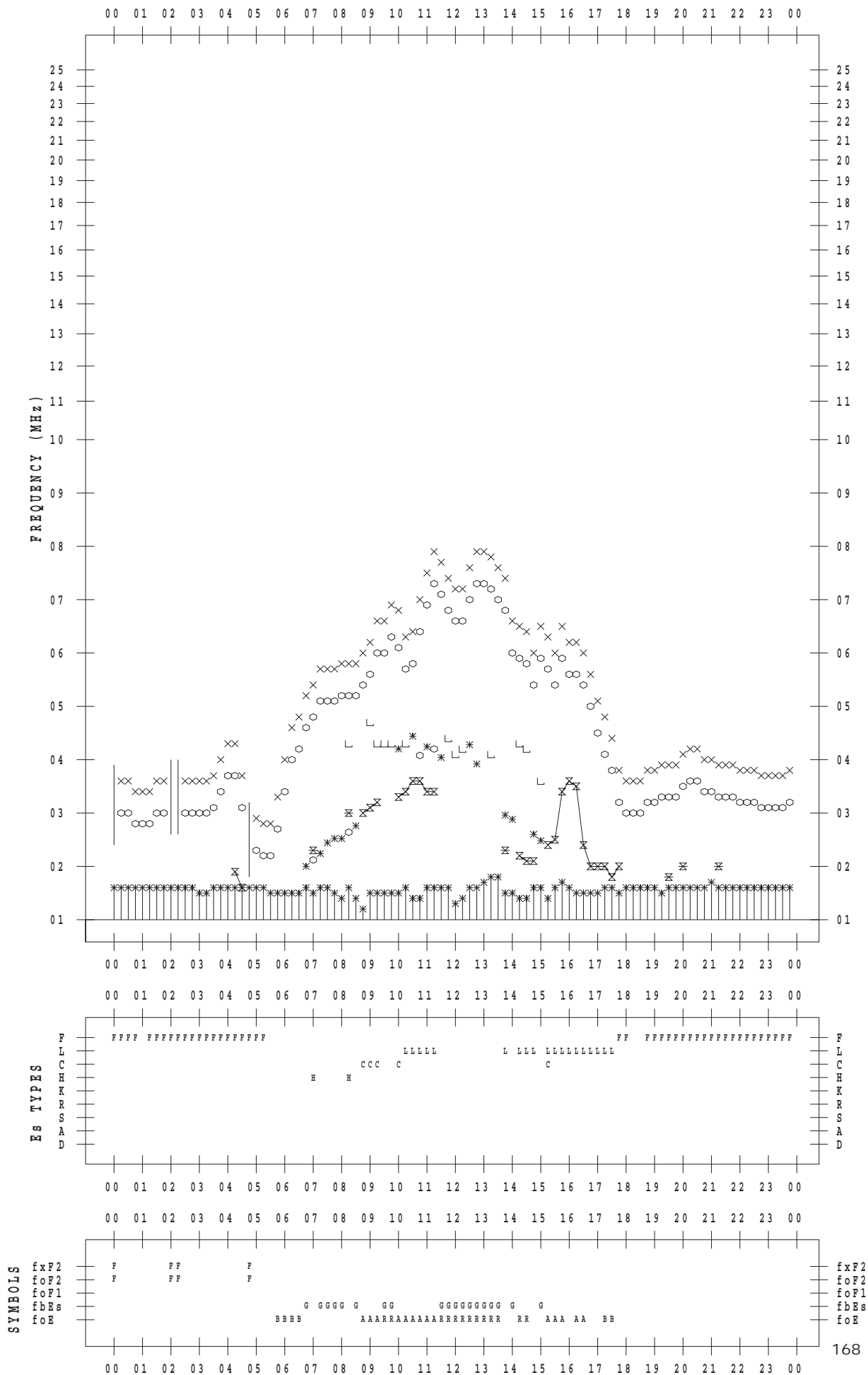
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/30

135 ° E MEAN TIME



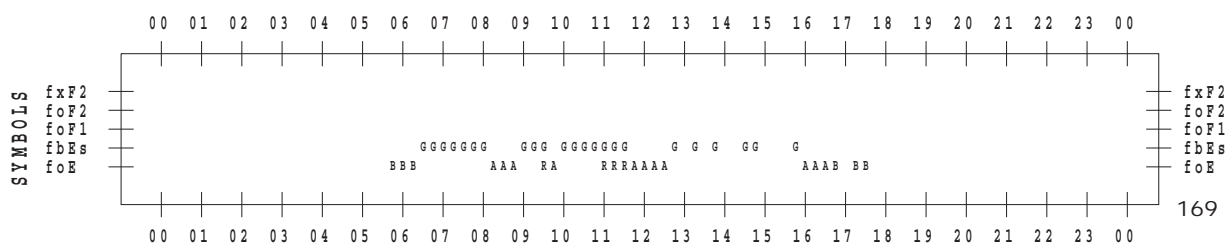
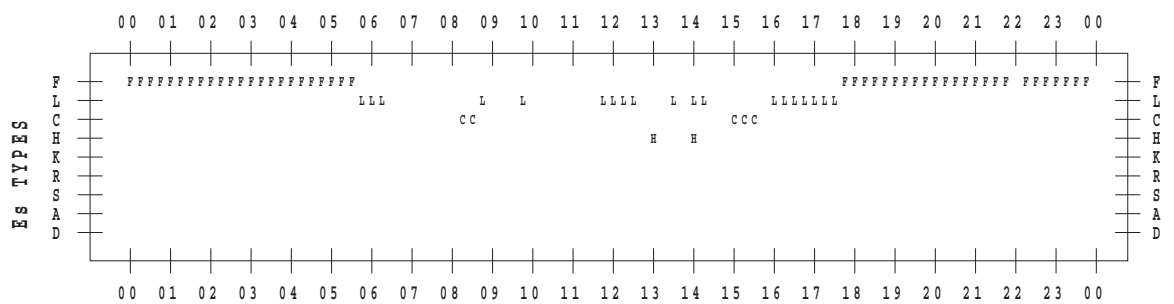
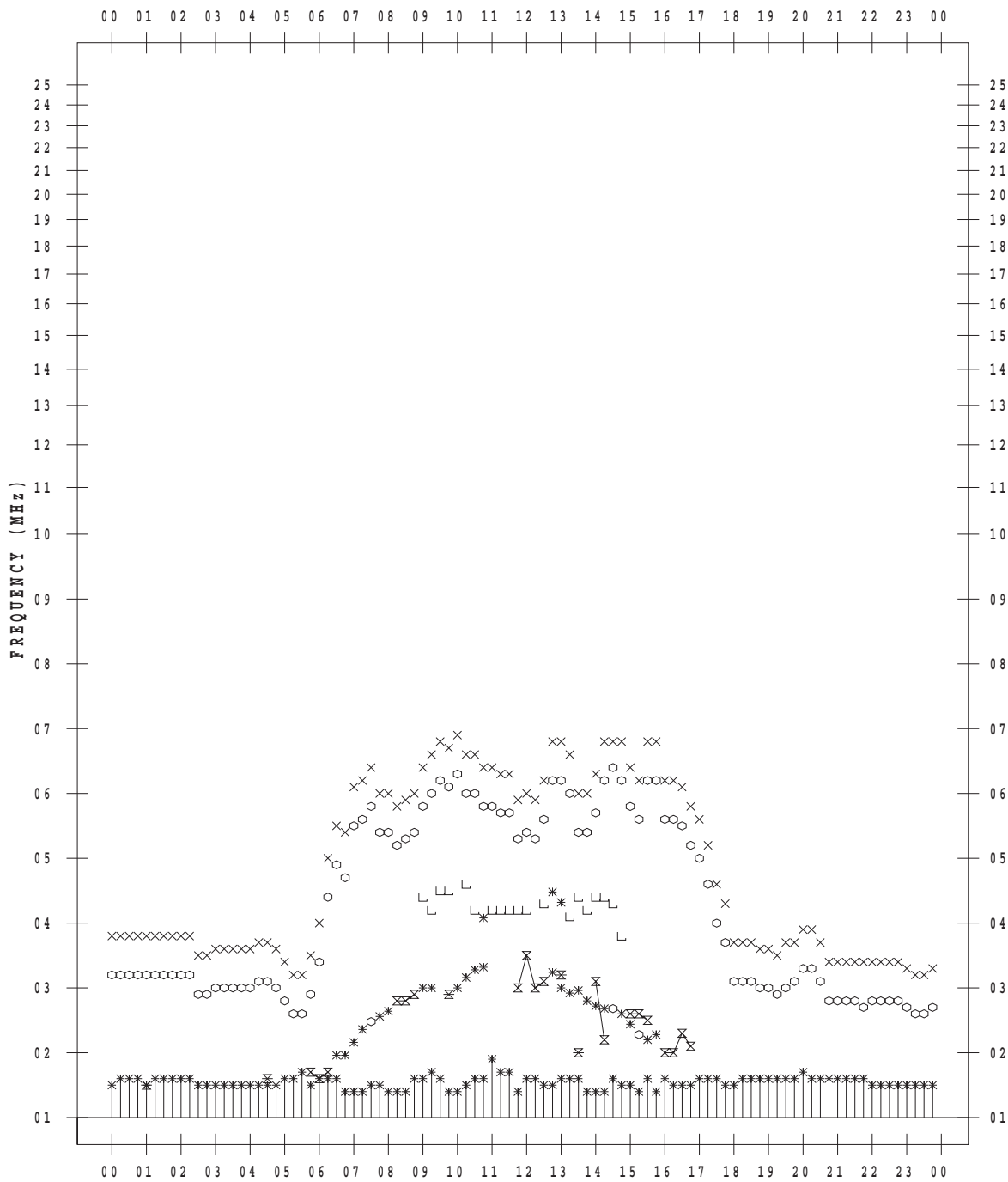
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/10/31

135 ° E MEAN TIME



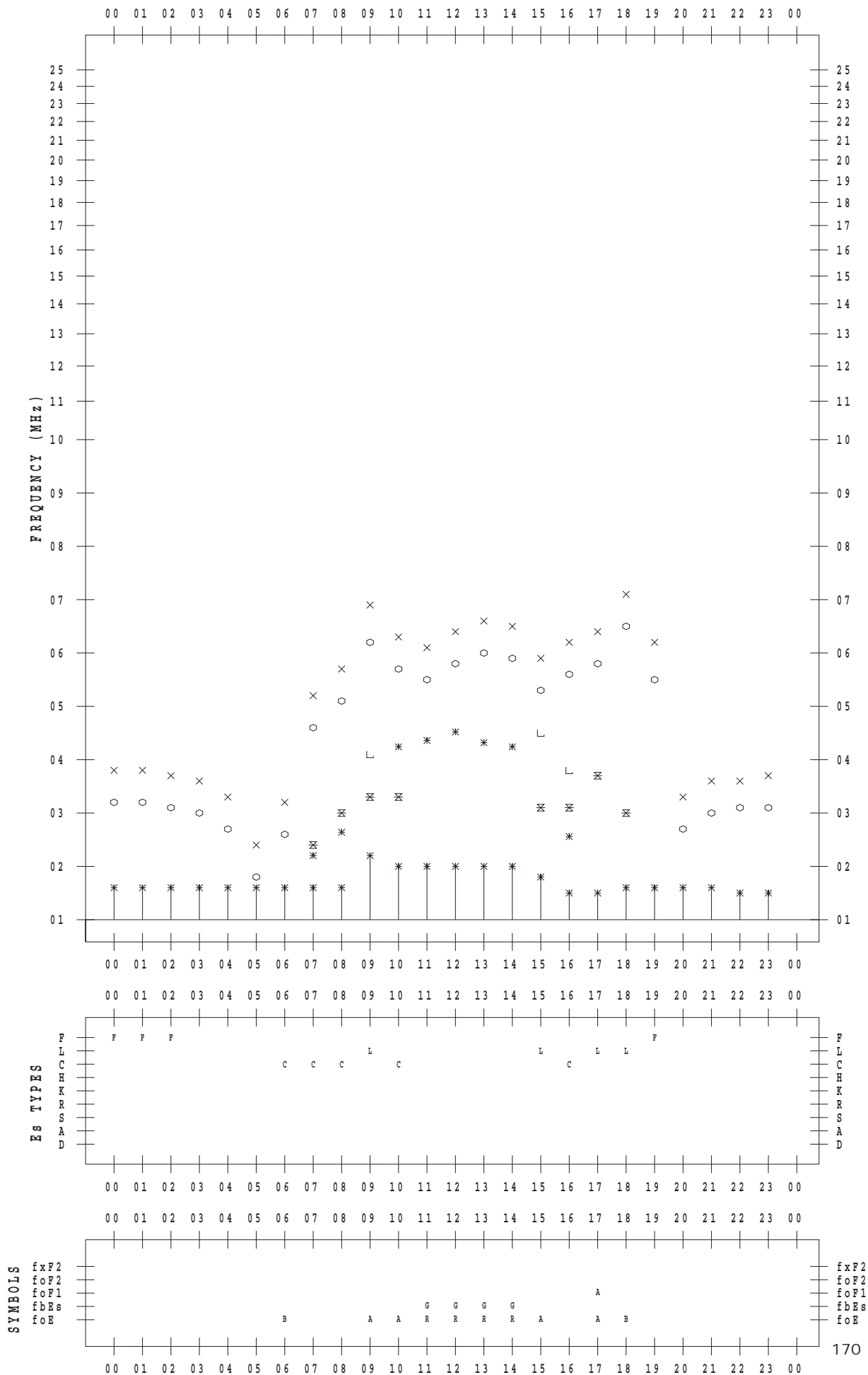
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/ 1

135 ° E MEAN TIME



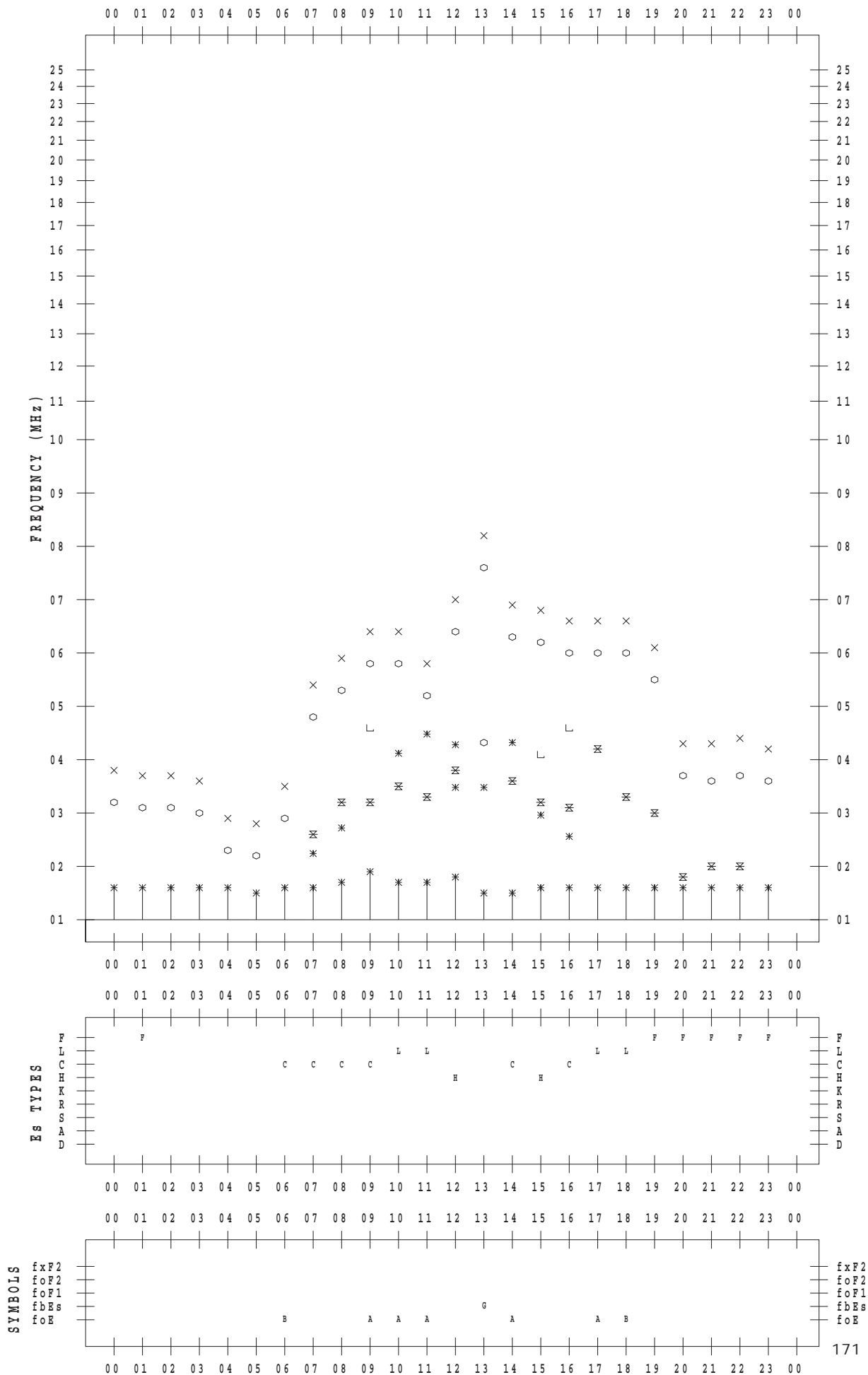
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/ 2

135 ° E MEAN TIME



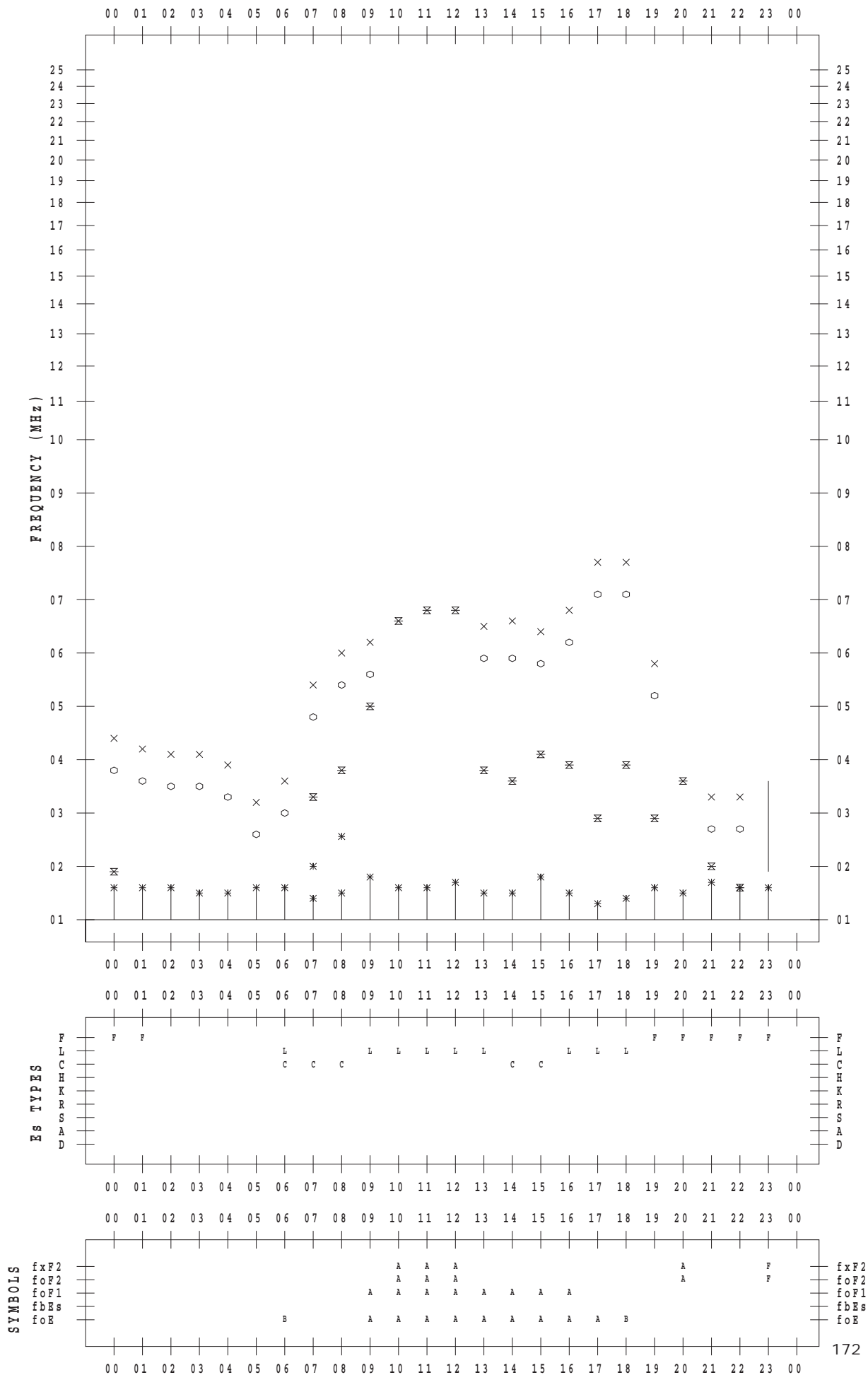
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/ 3

135 ° E MEAN TIME



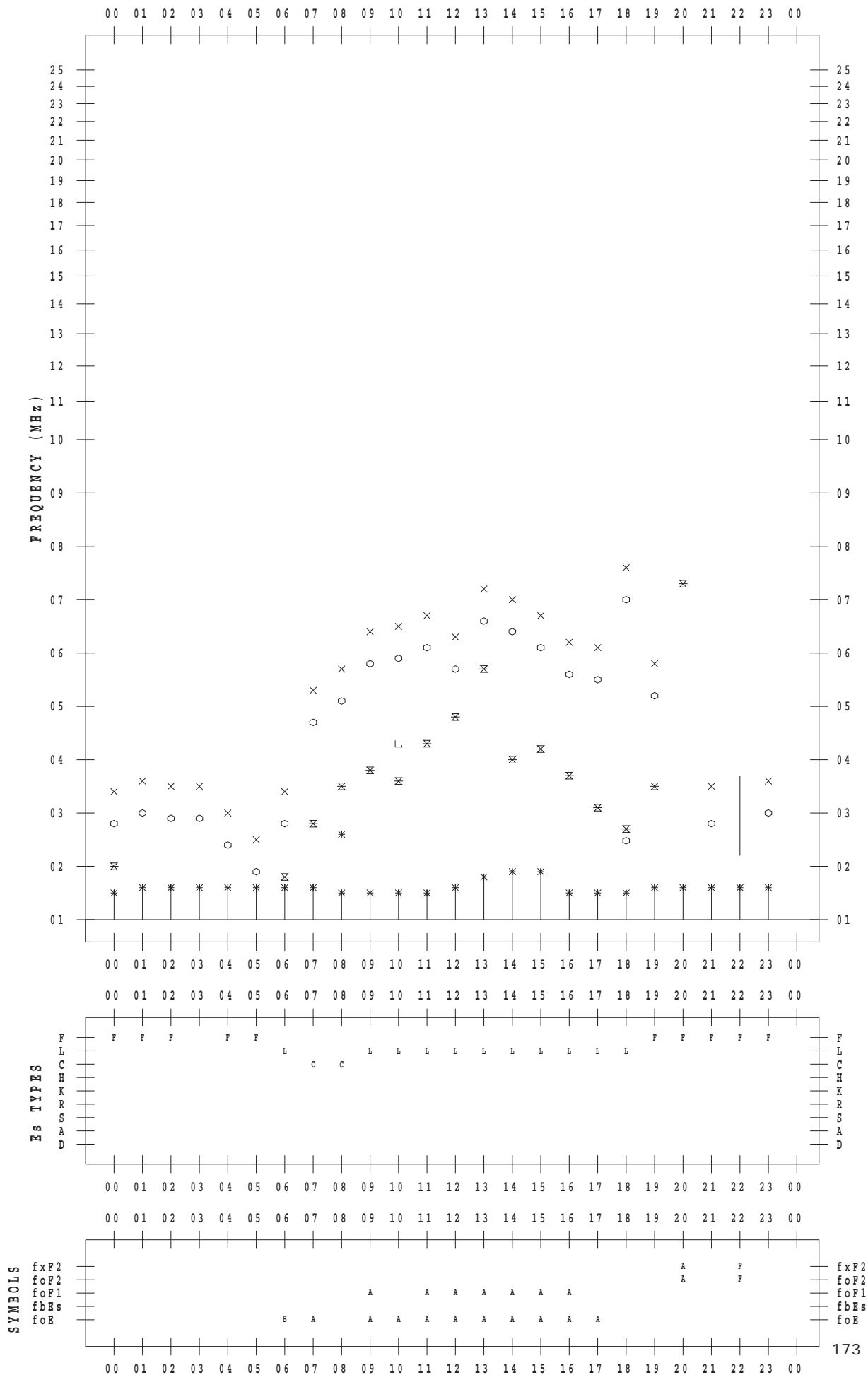
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/ 4

135 ° E MEAN TIME



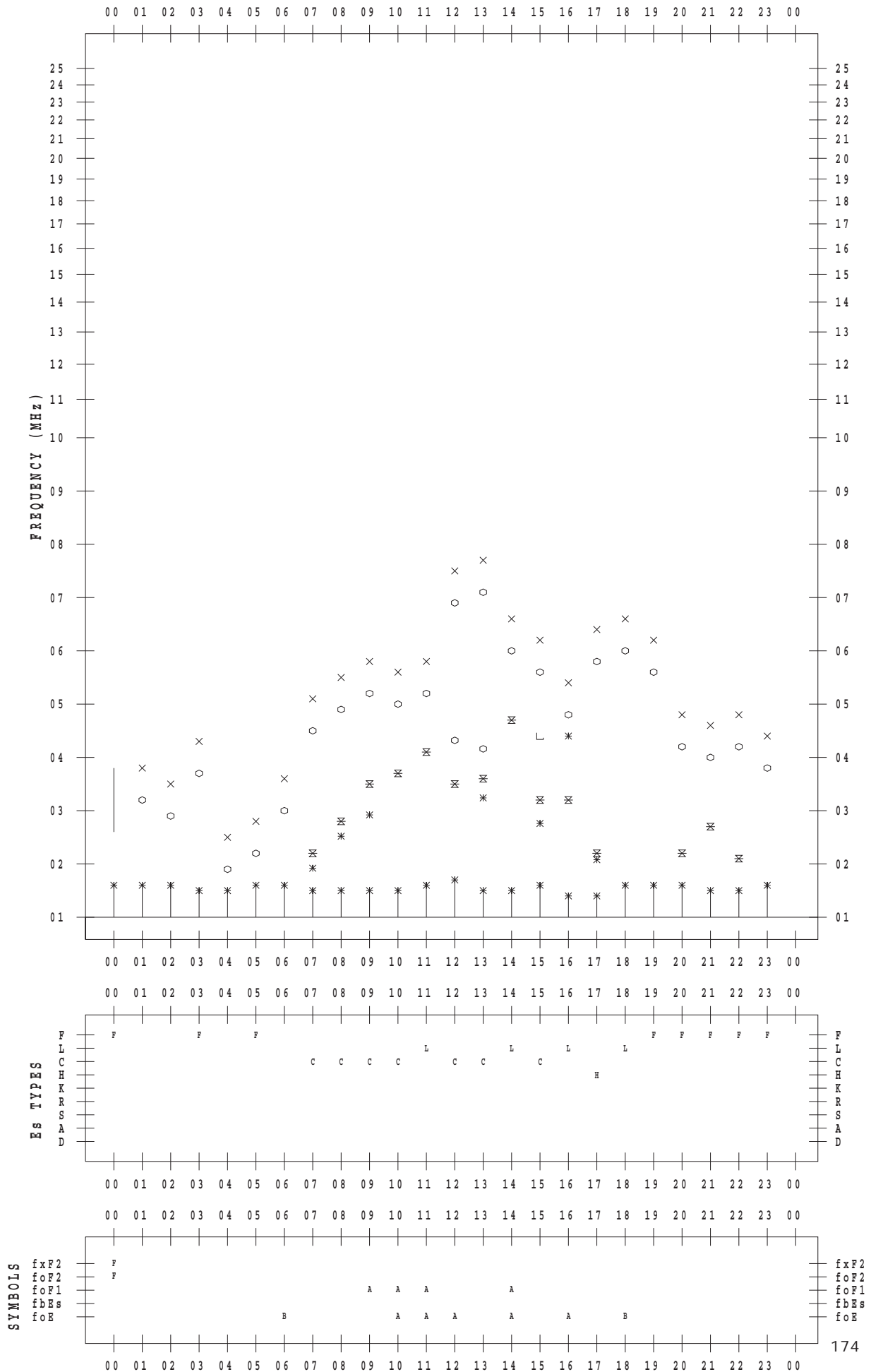
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/ 5

135 ° E MEAN TIME



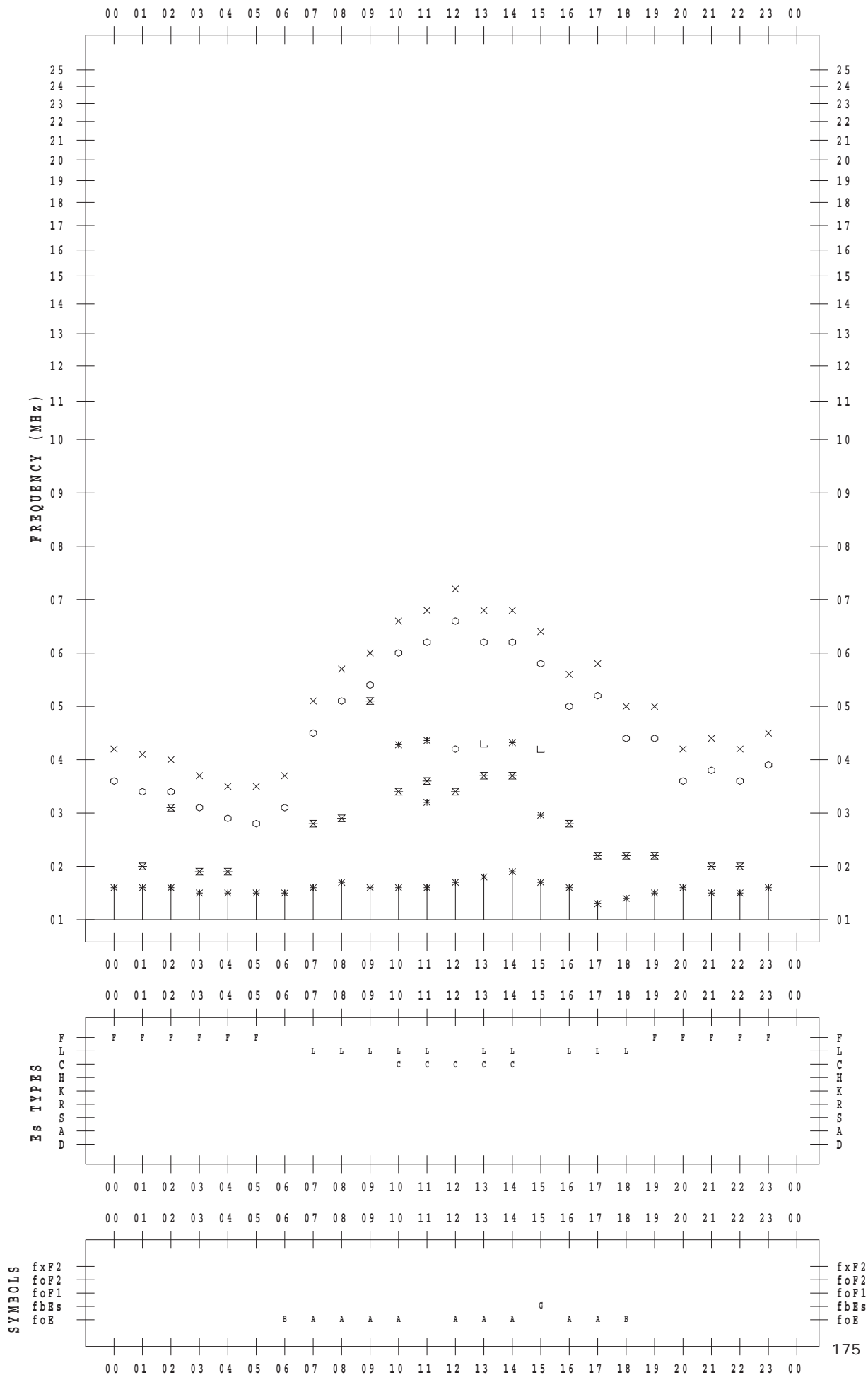
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/ 6

135 ° E MEAN TIME



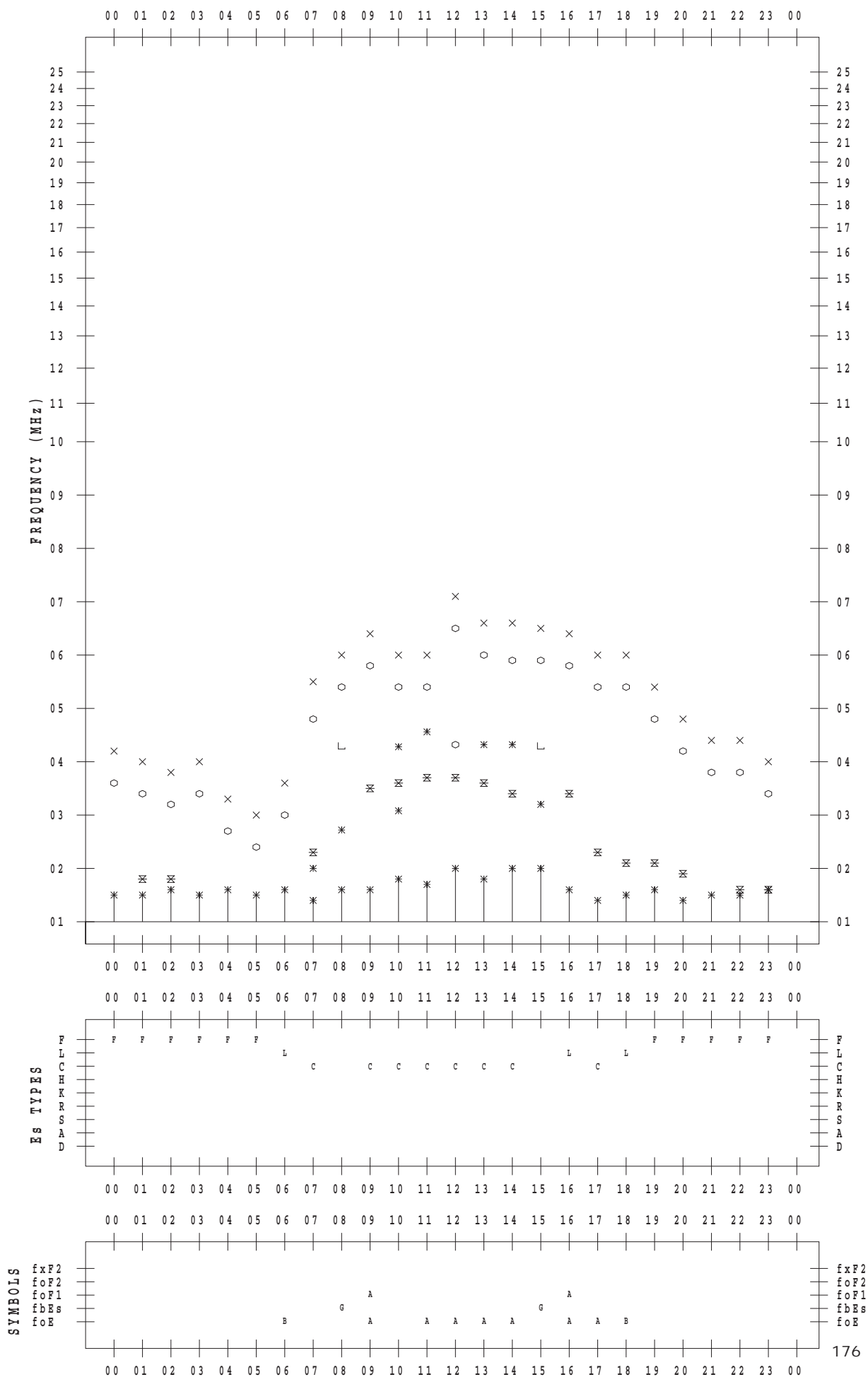
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/7

135 ° E MEAN TIME



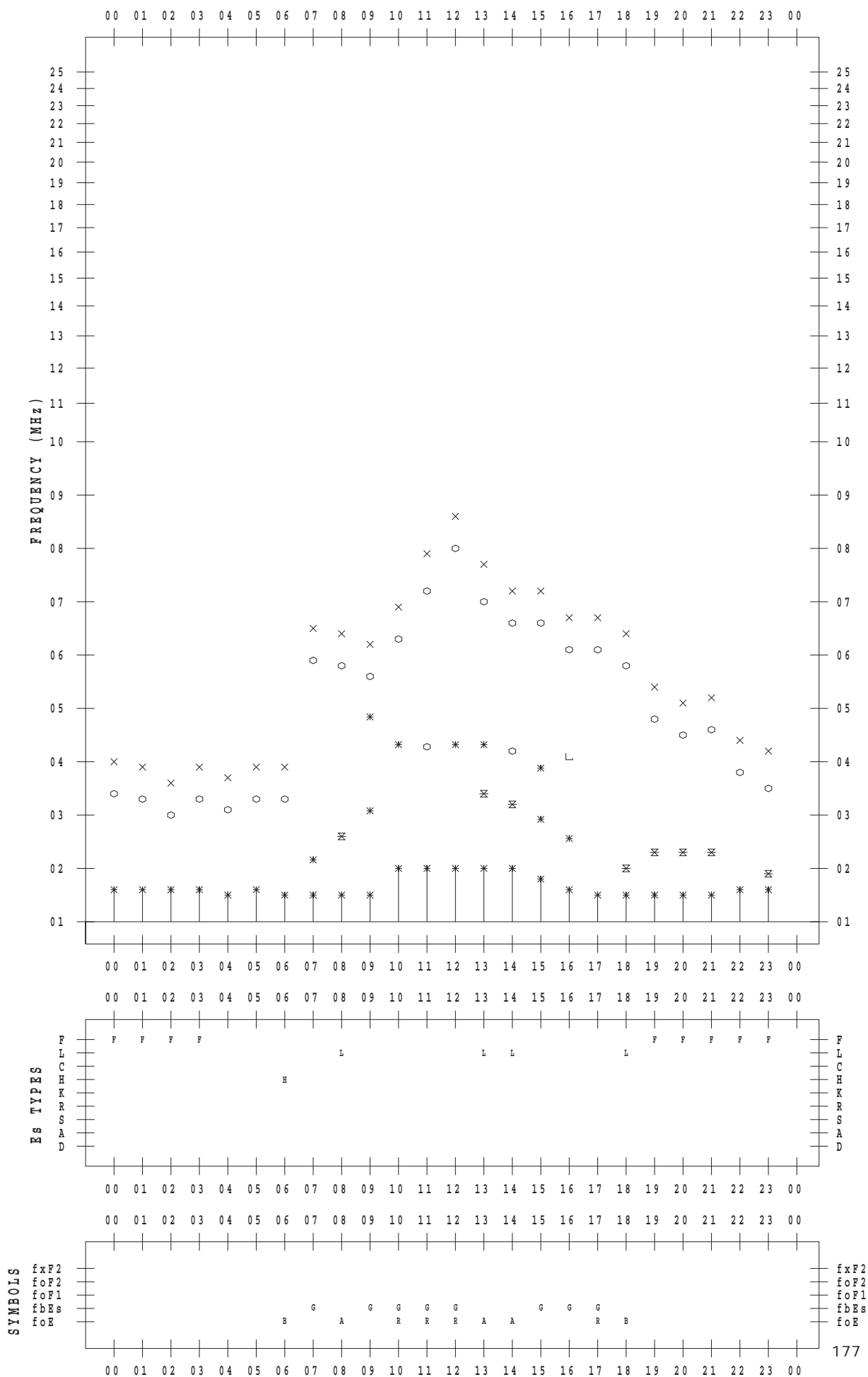
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/ 8

135 ° E MEAN TIME



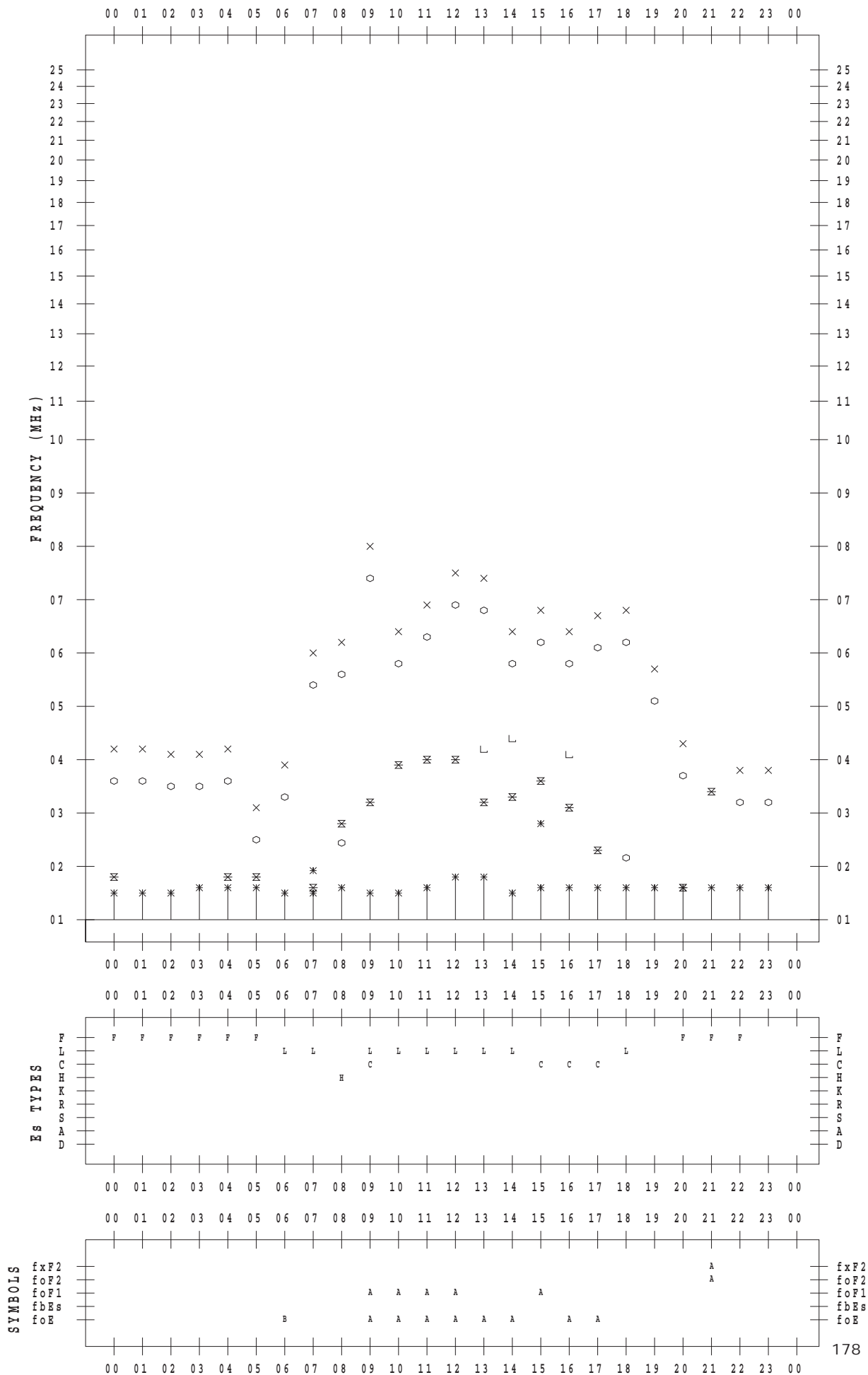
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/9

135 ° E MEAN TIME



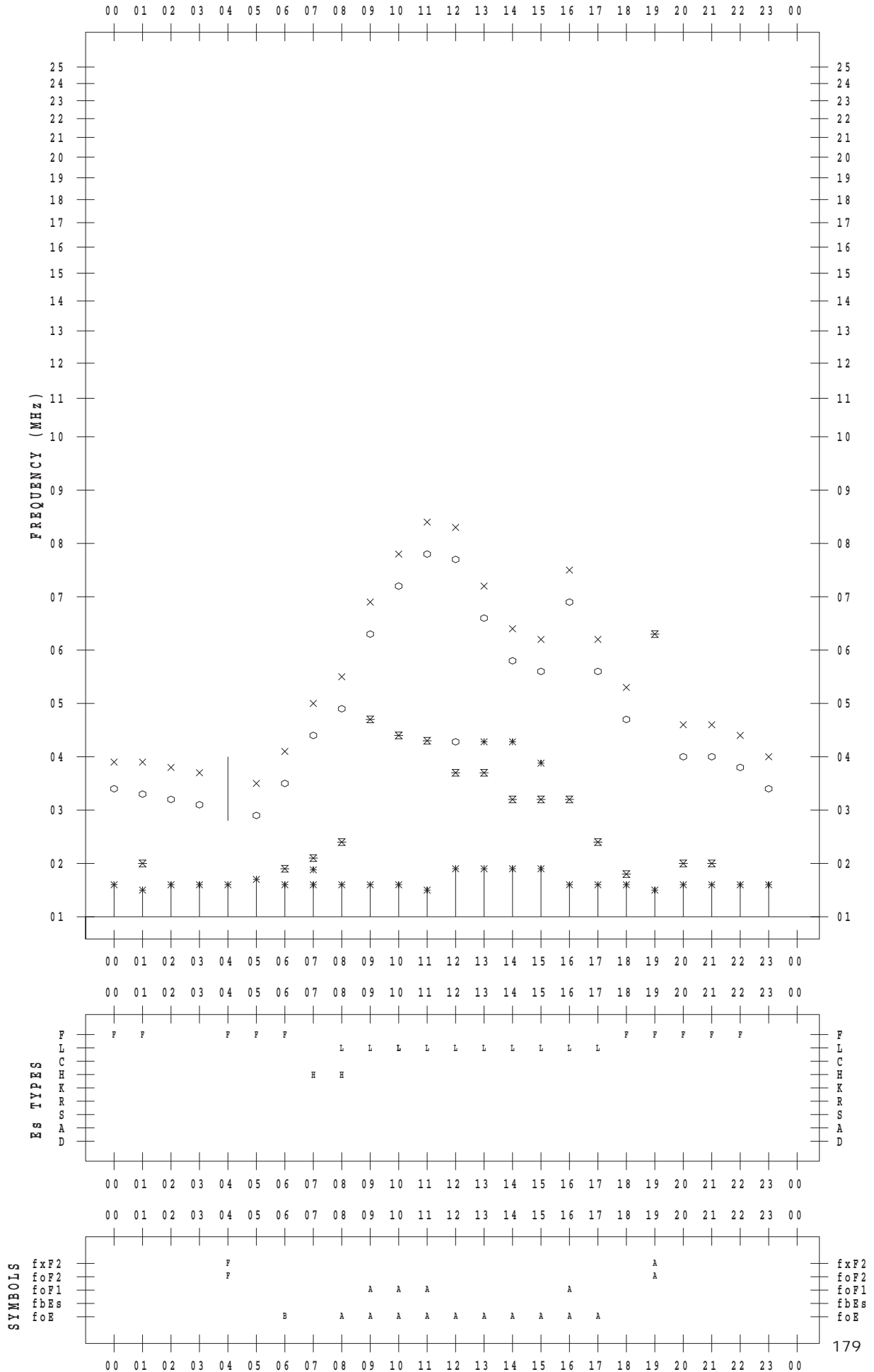
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/10

135 ° E MEAN TIME



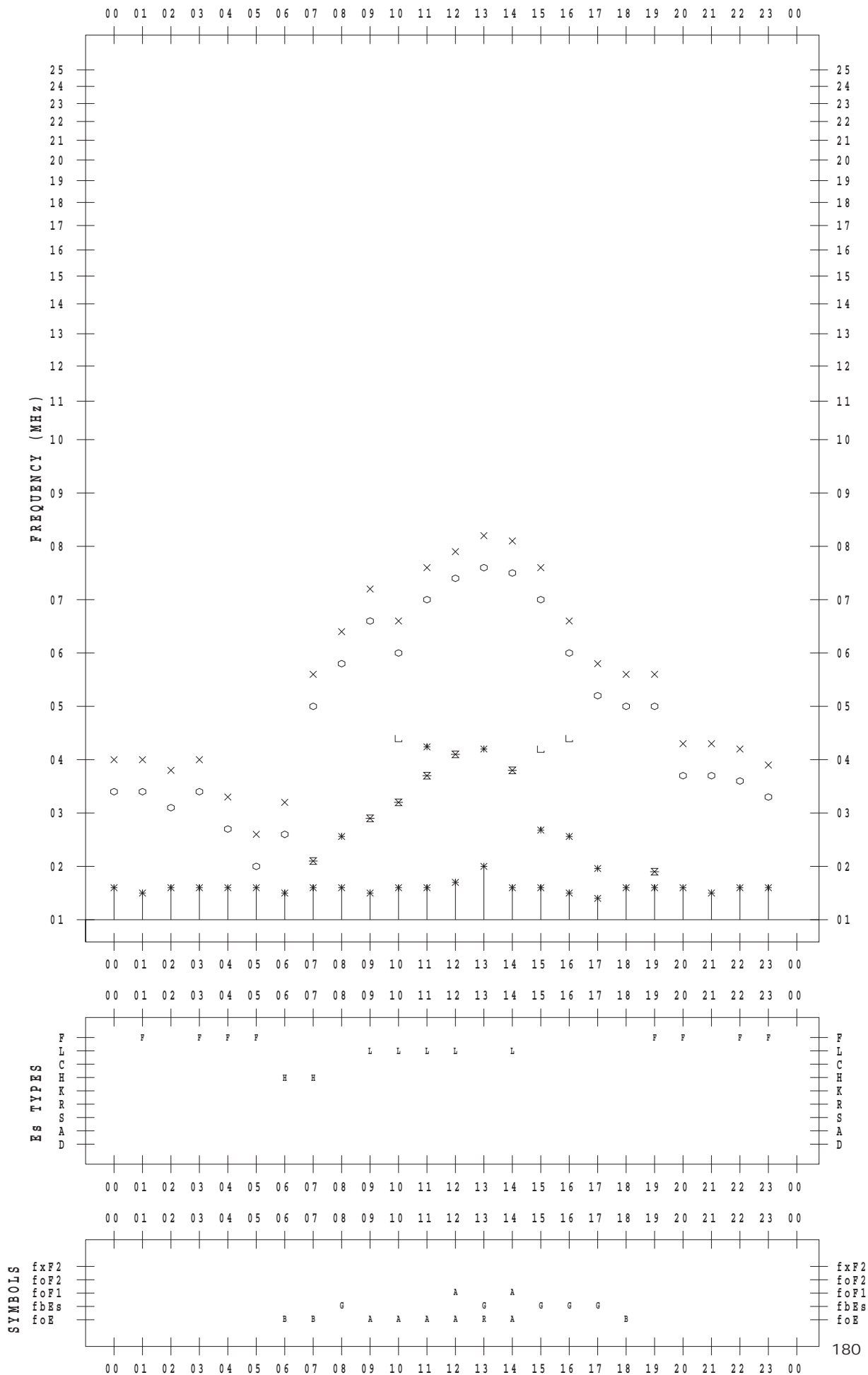
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/11

135 ° E MEAN TIME



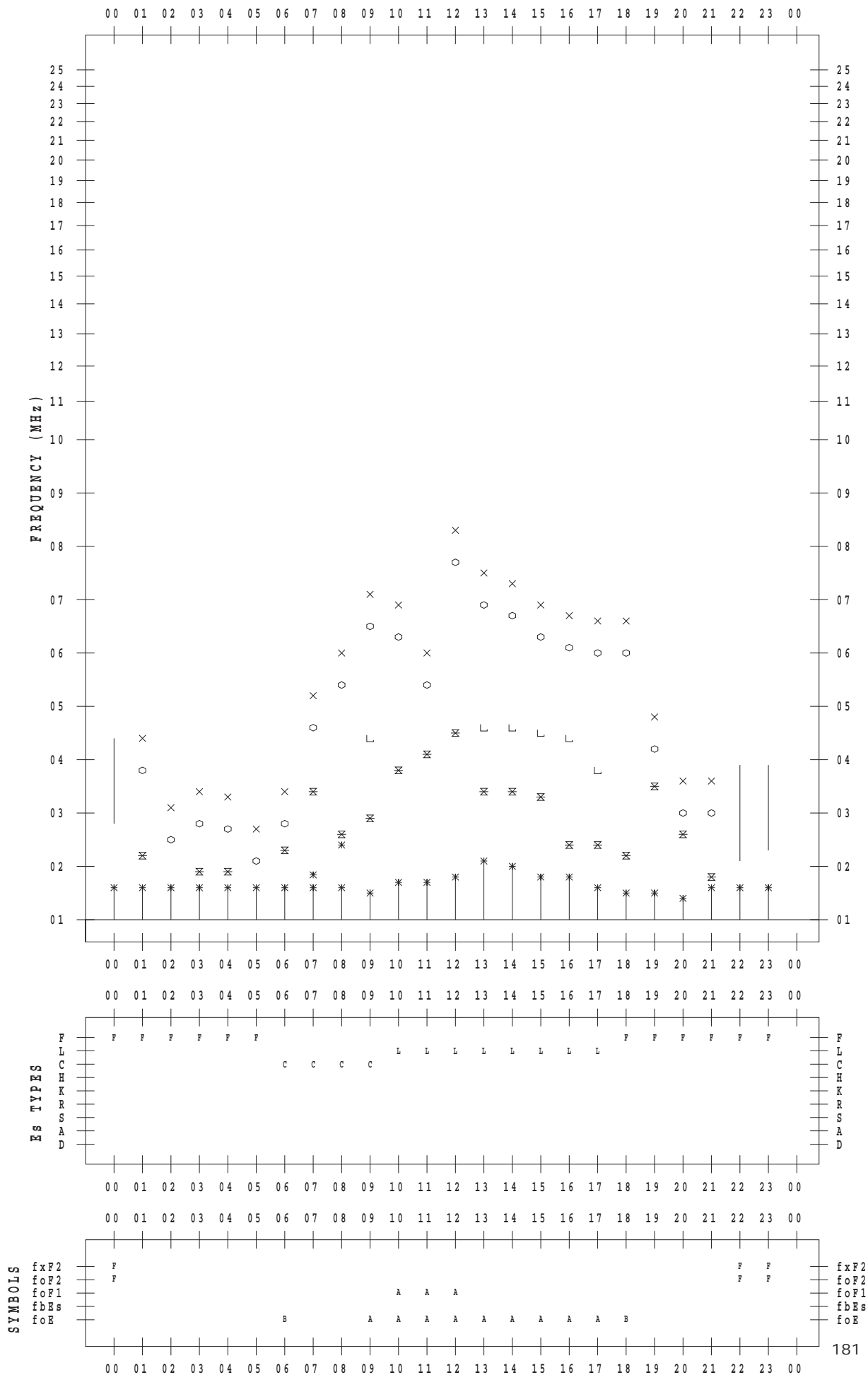
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/12

135 ° E MEAN TIME



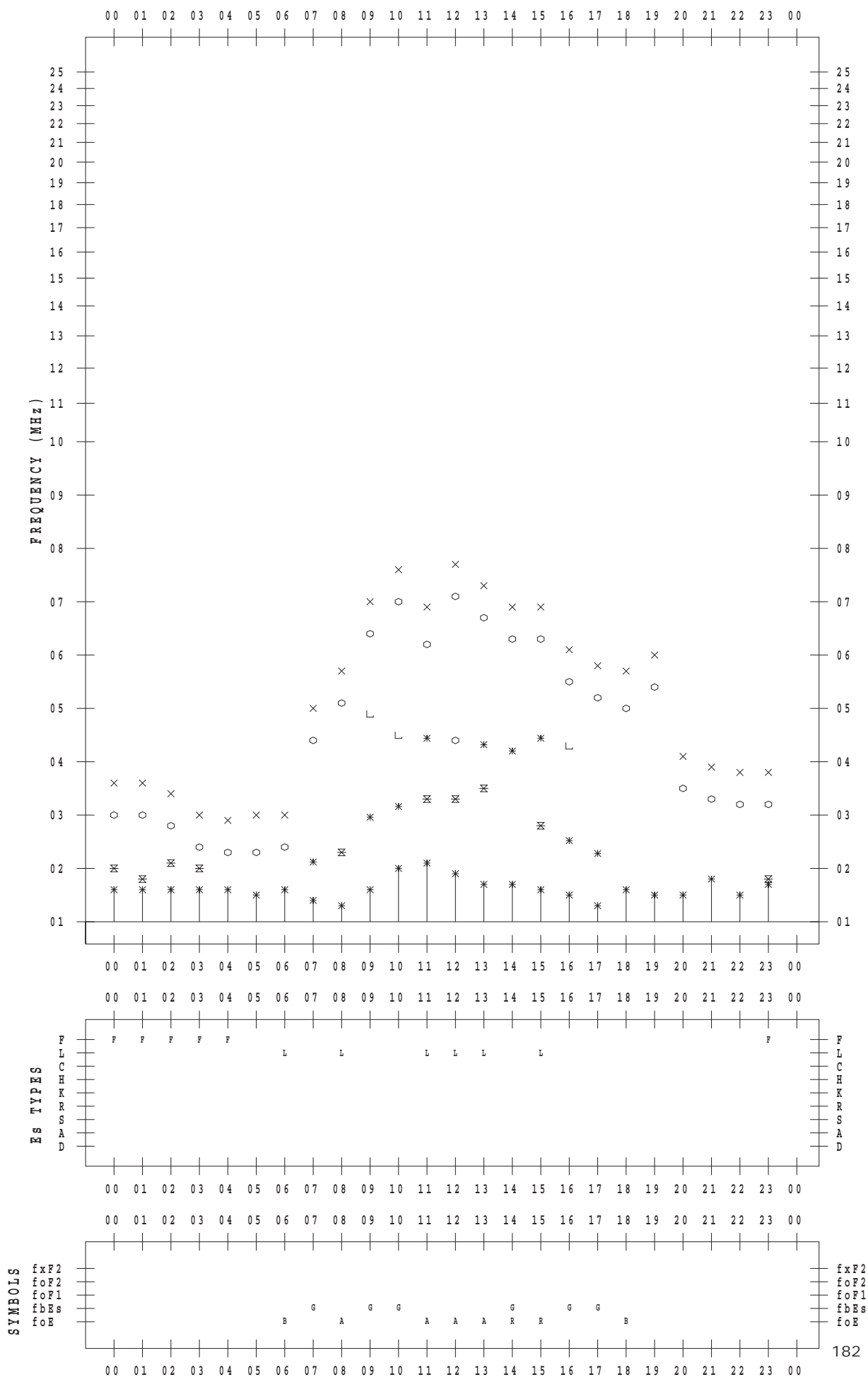
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/13

135 ° E MEAN TIME



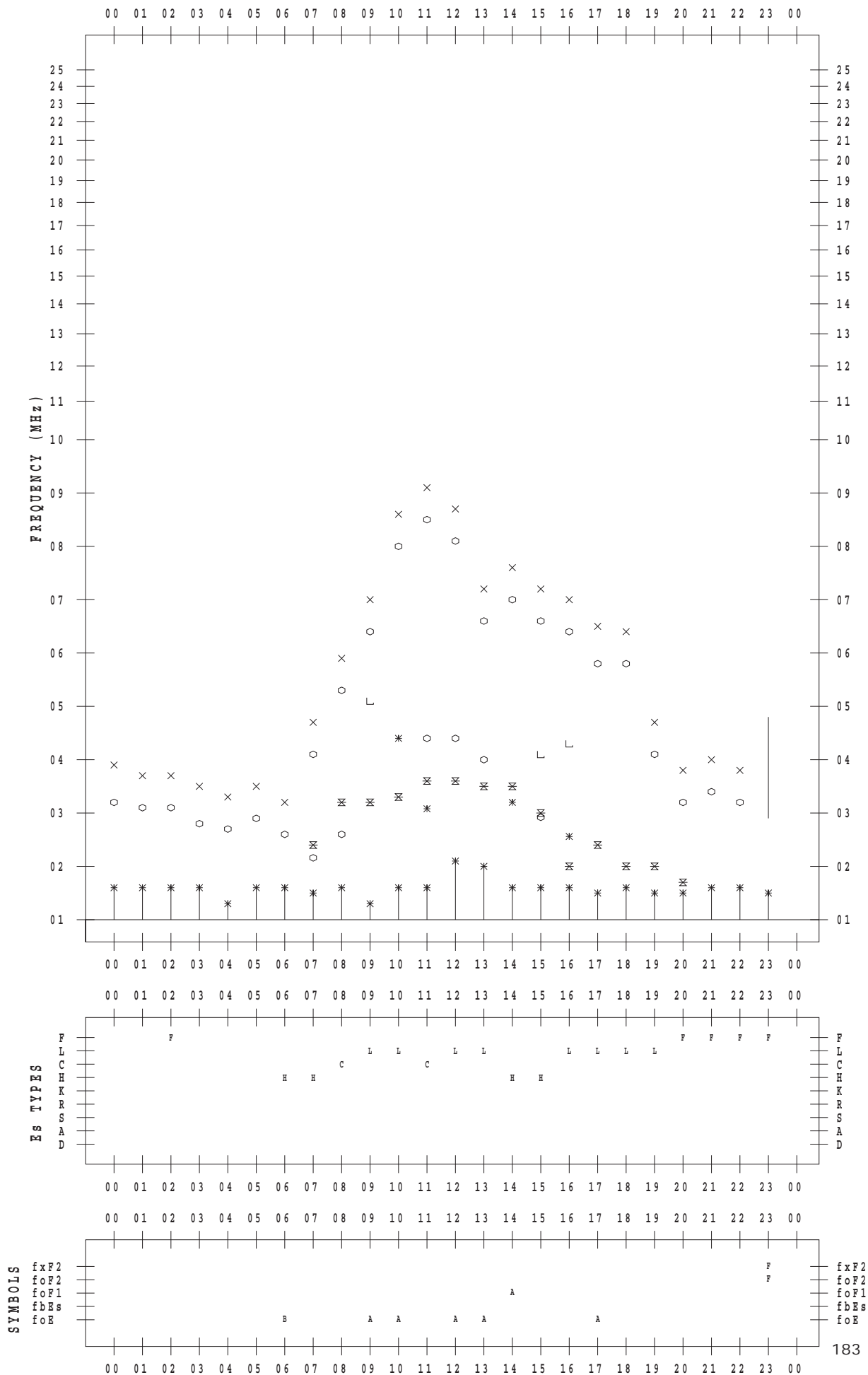
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/14

135 ° E MEAN TIME



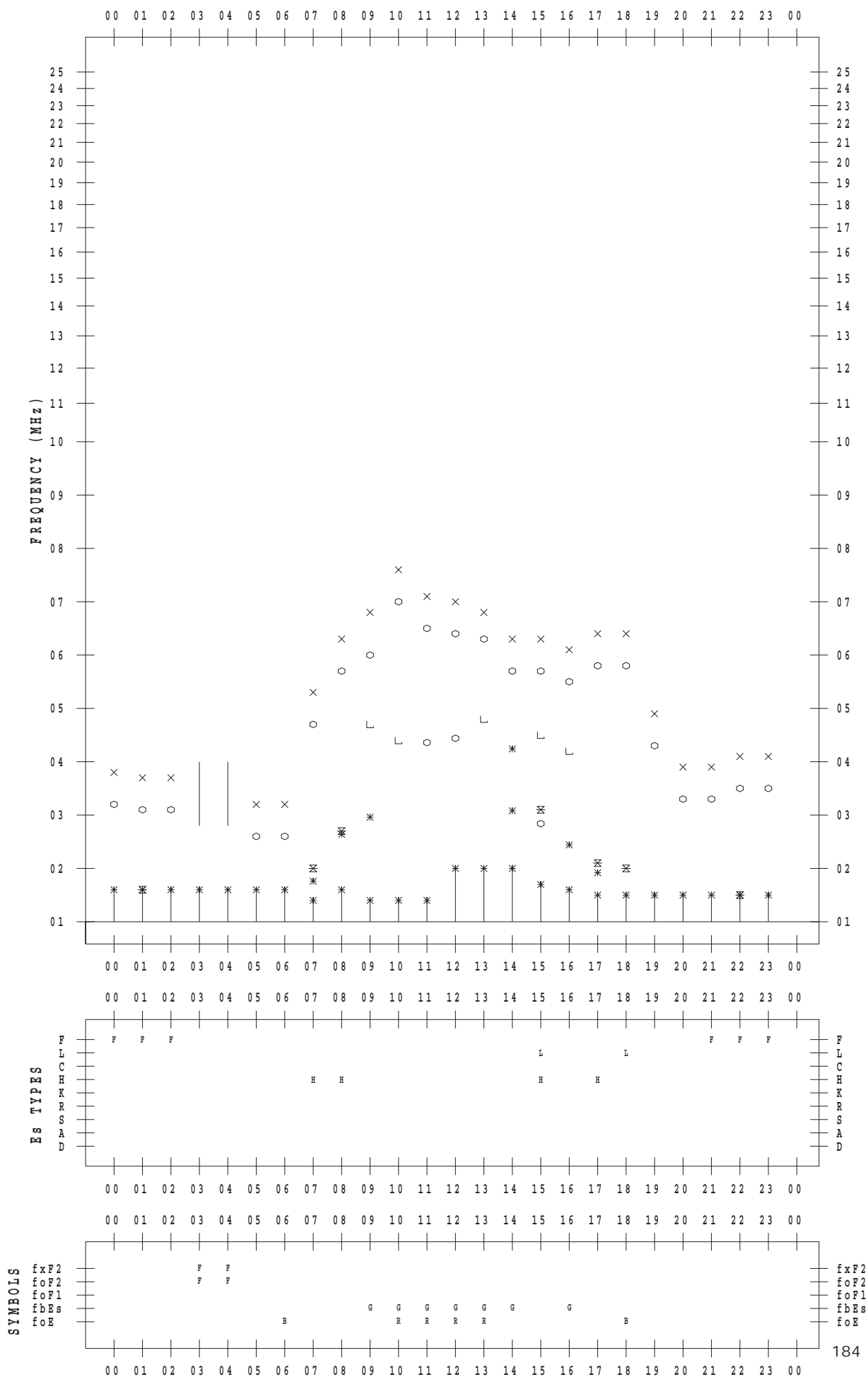
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/15

135 ° E MEAN TIME



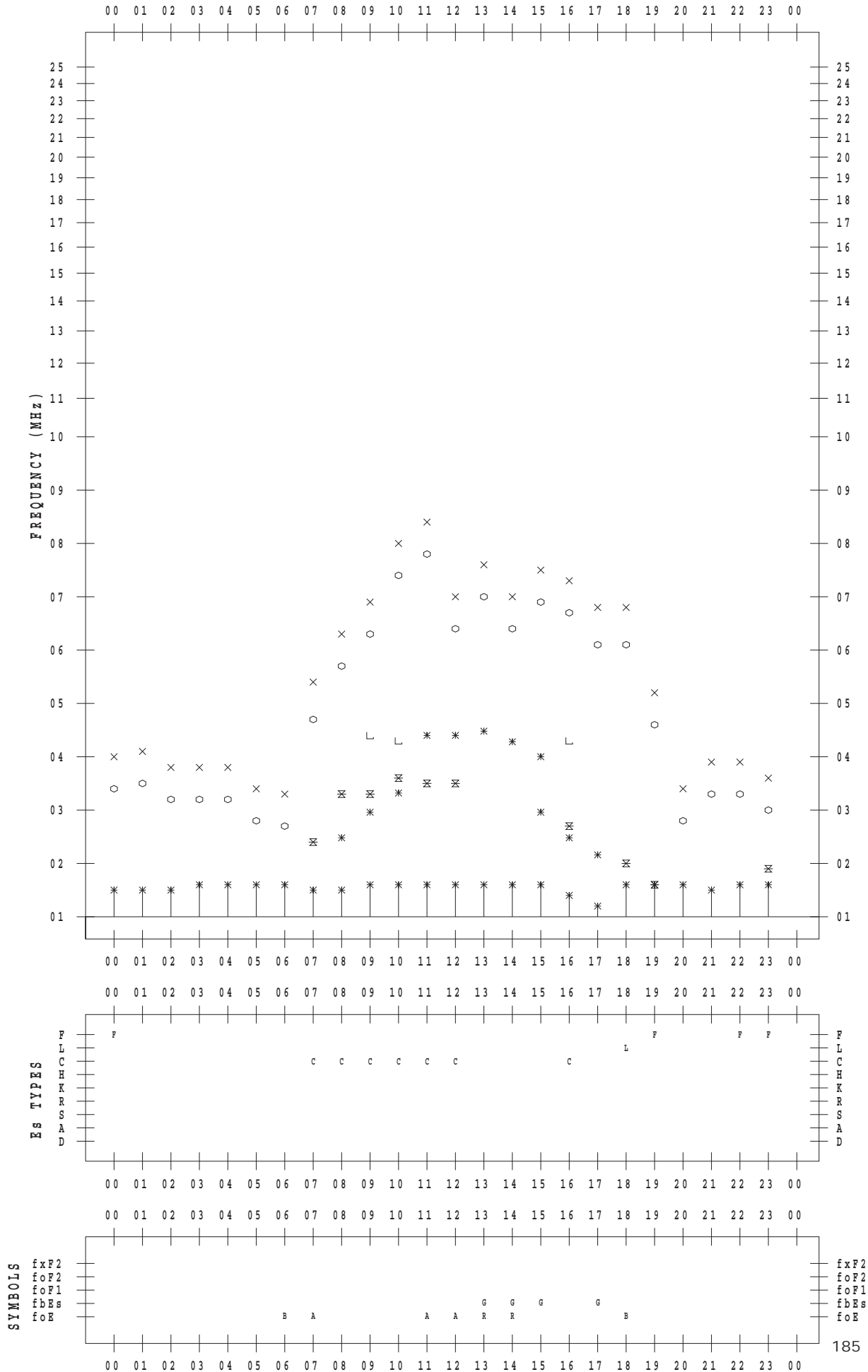
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/16

135 ° E MEAN TIME



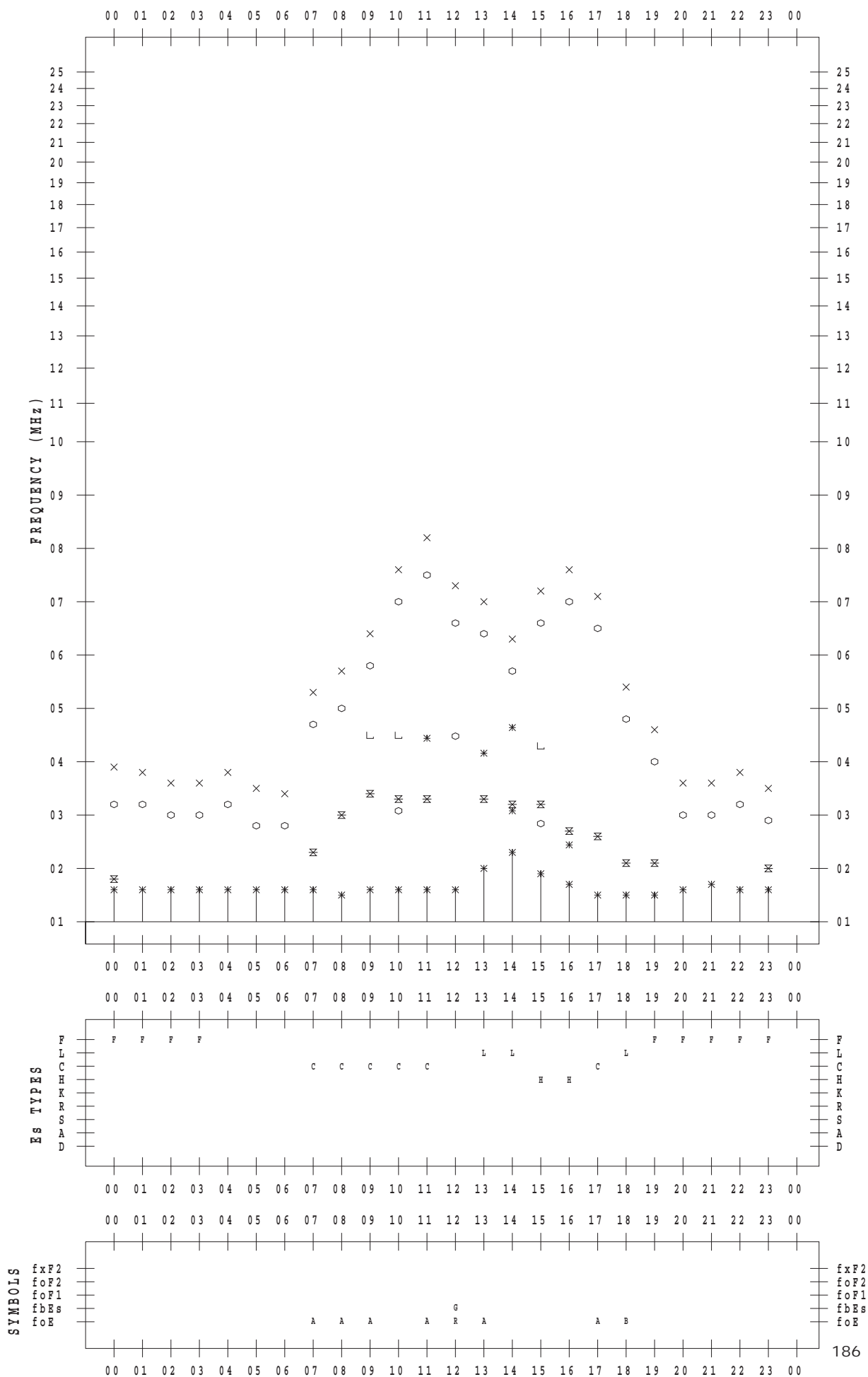
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/17

135 ° E MEAN TIME



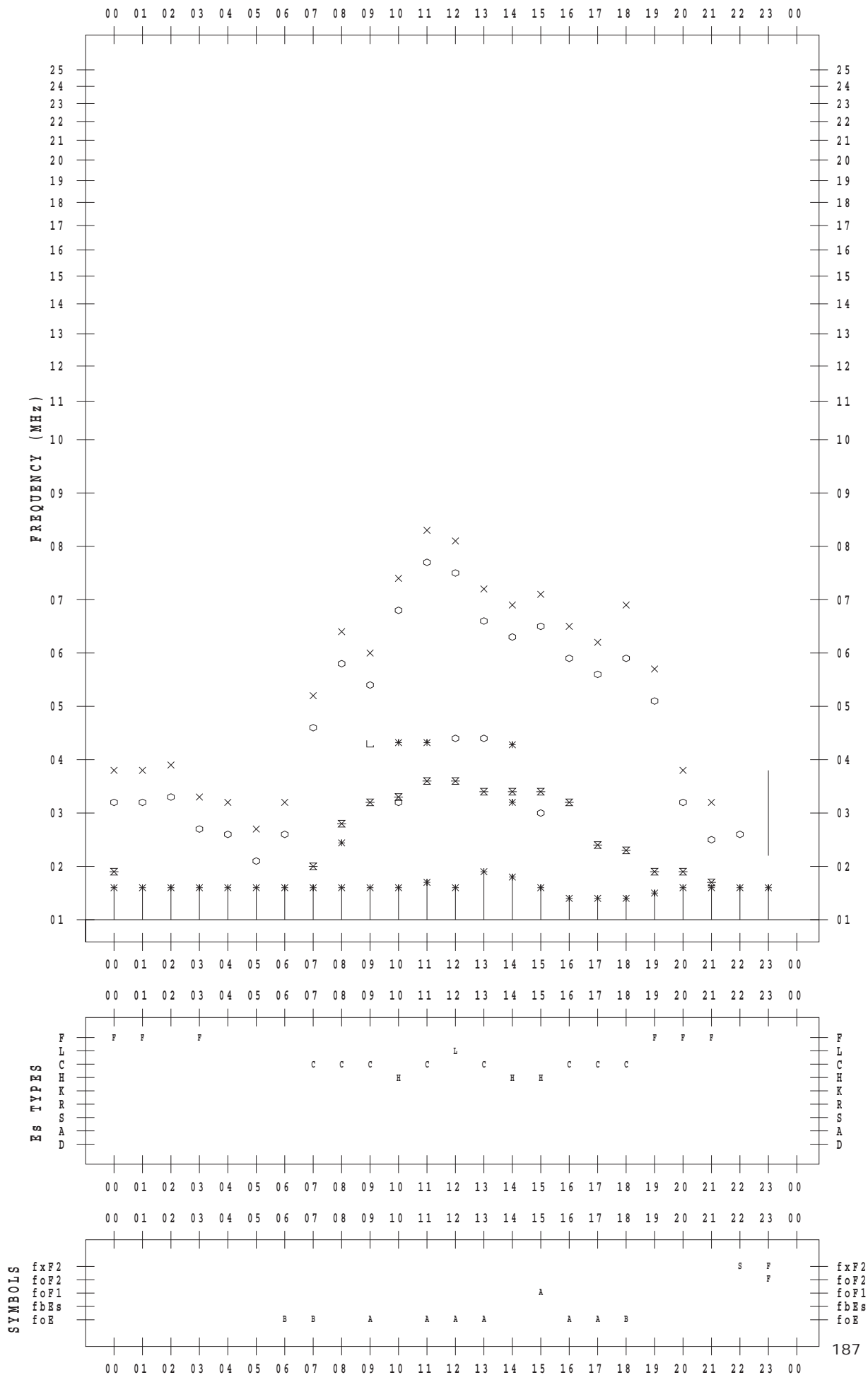
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/18

135 ° E MEAN TIME



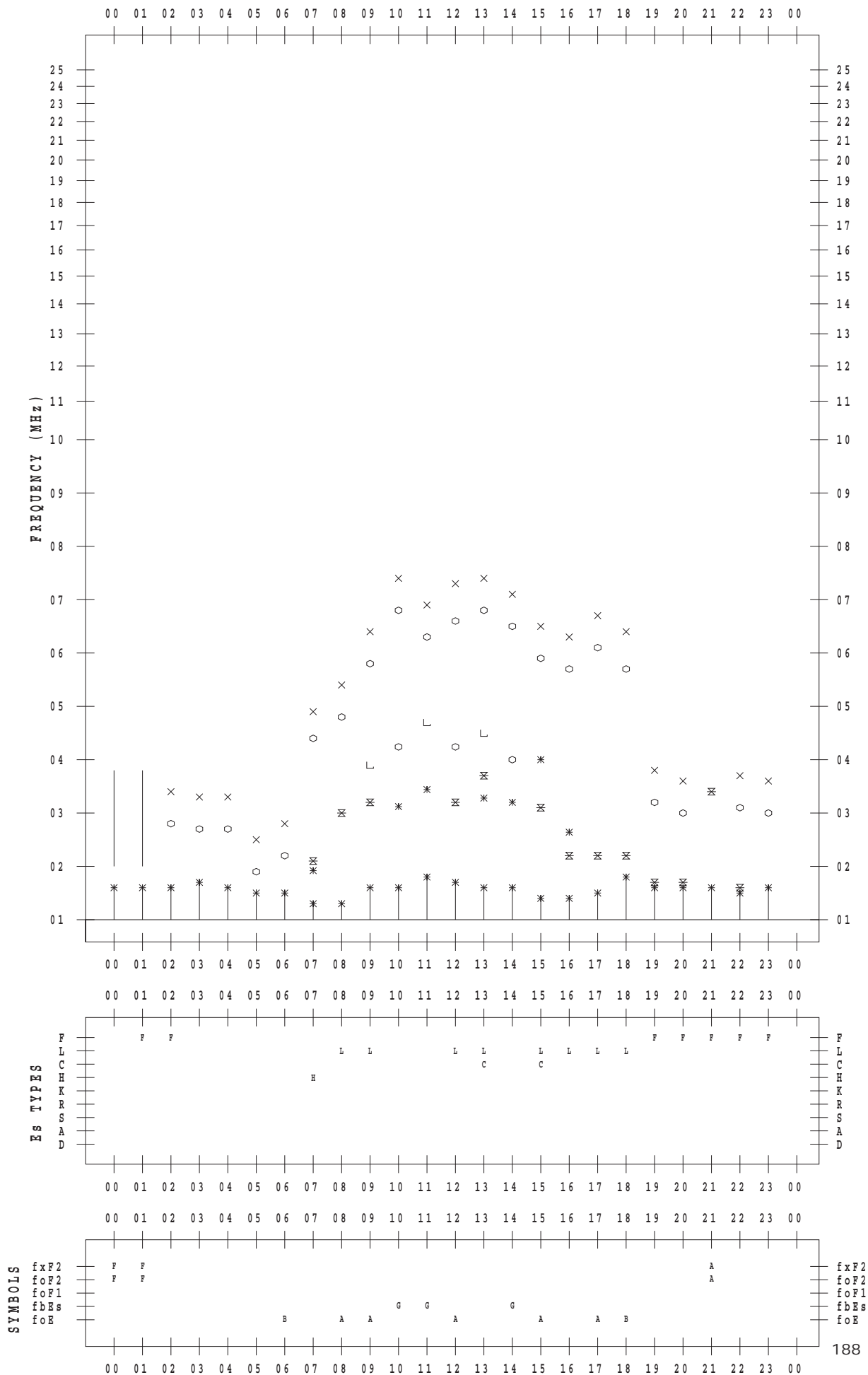
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/19

135 ° E MEAN TIME



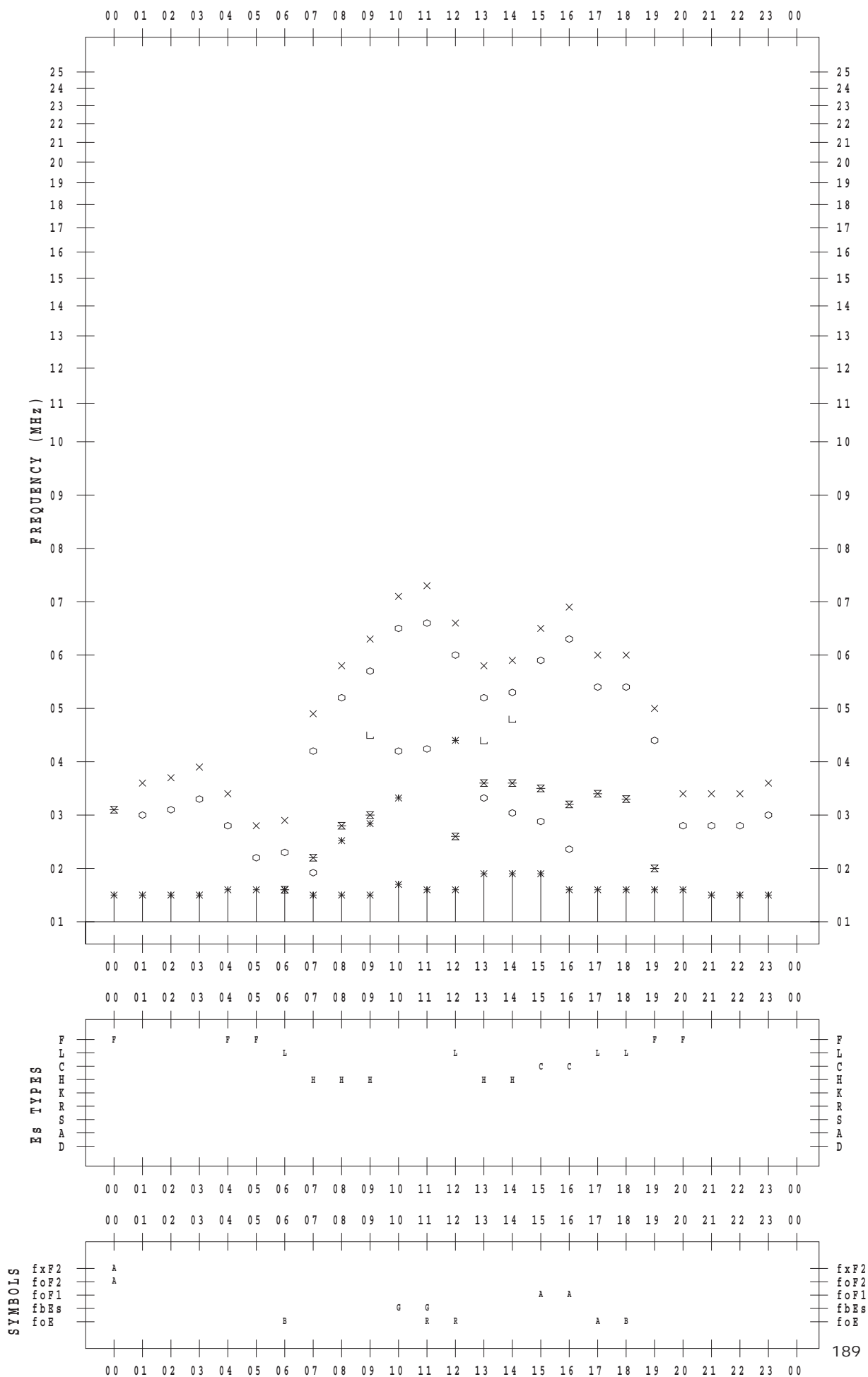
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/20

135 ° E MEAN TIME



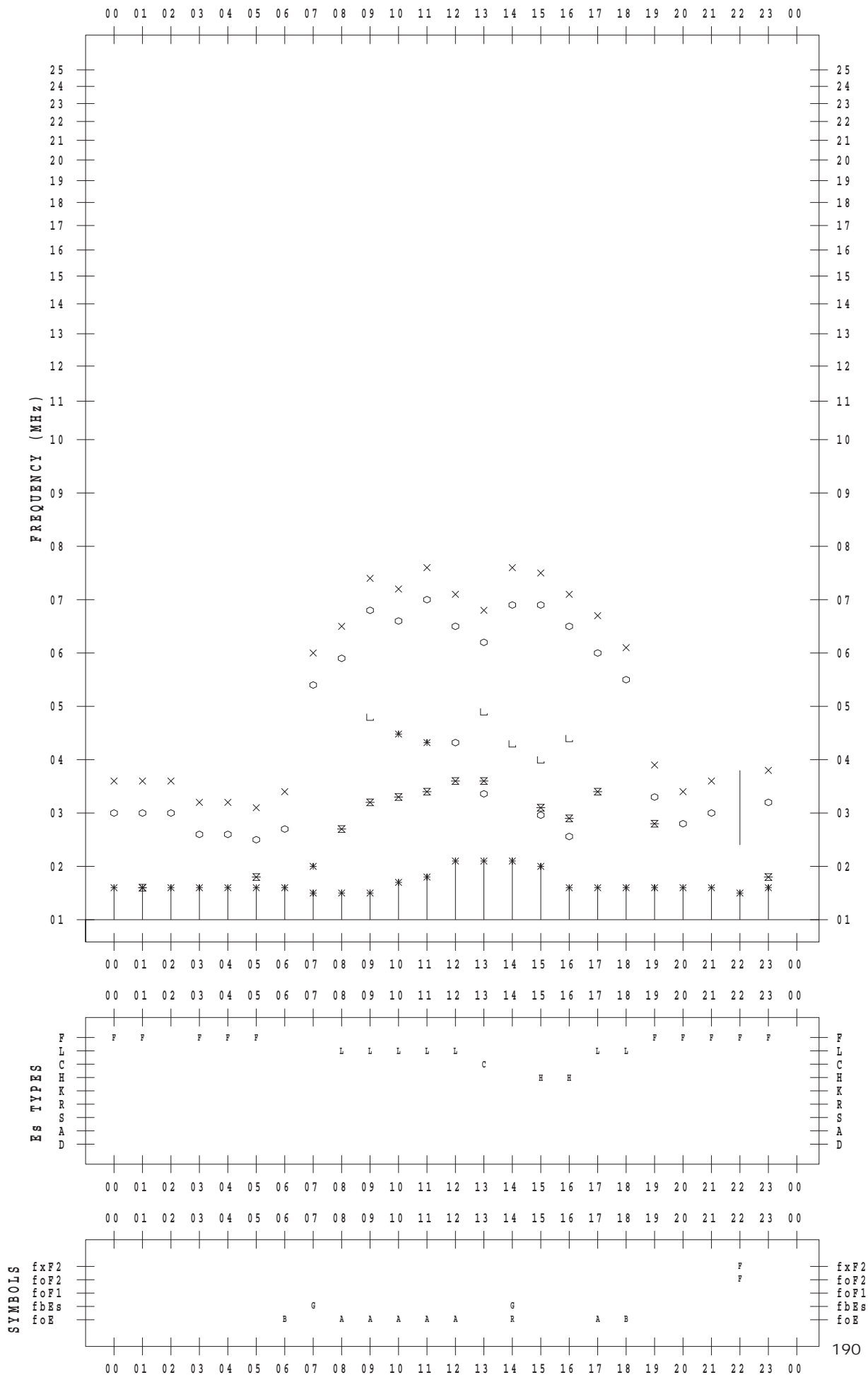
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/21

135 ° E MEAN TIME



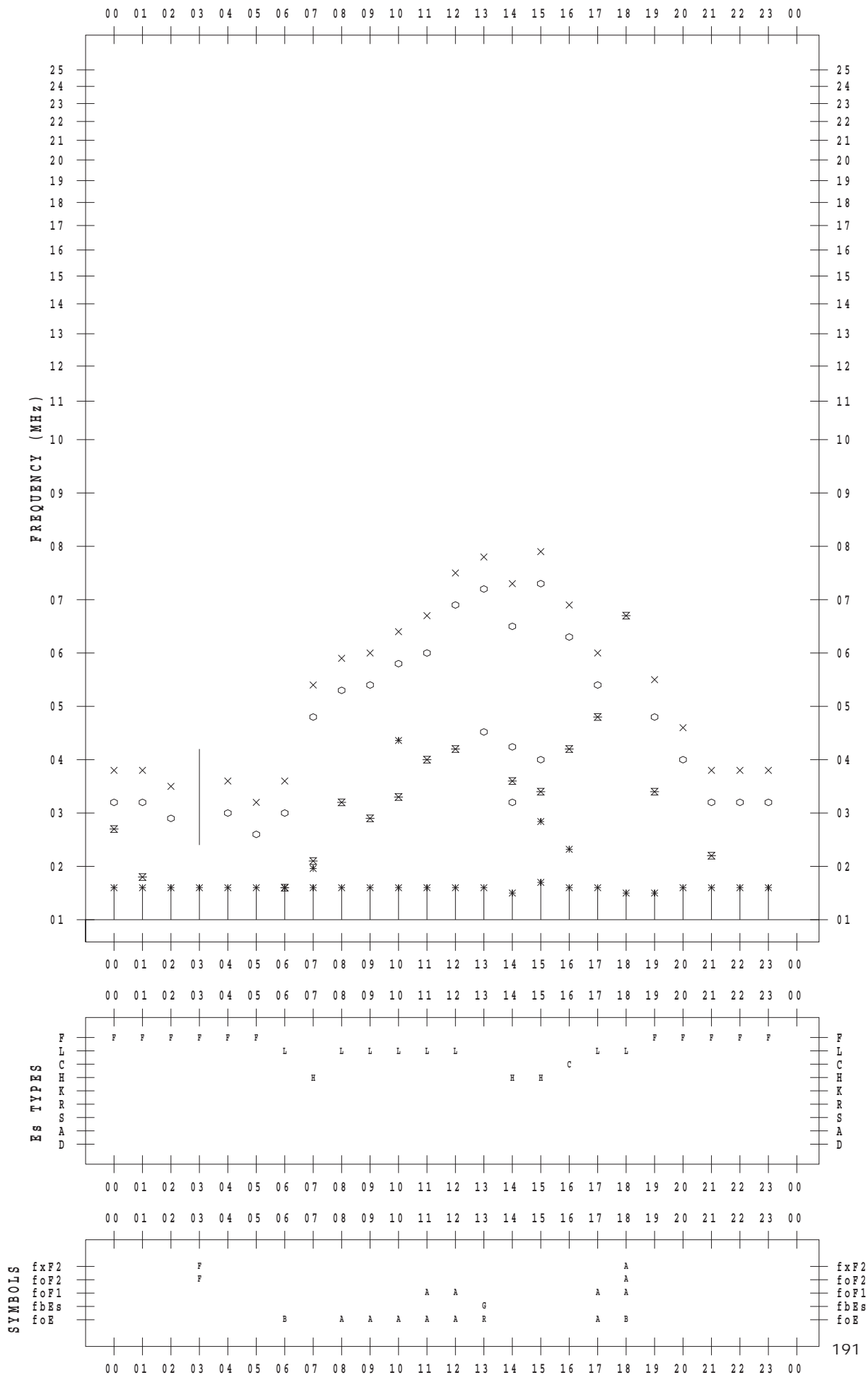
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/22

135 ° E MEAN TIME



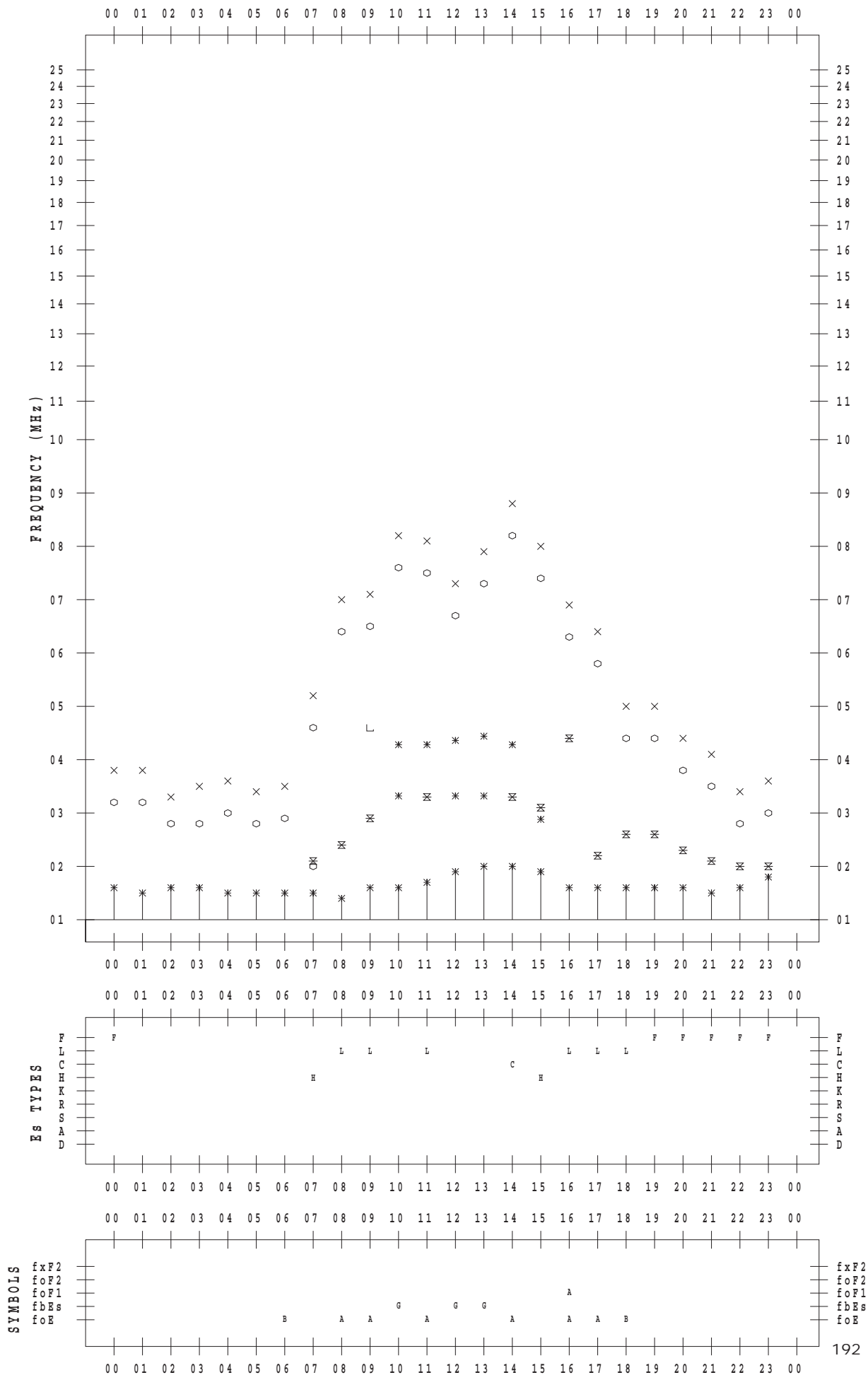
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/23

135 ° E MEAN TIME



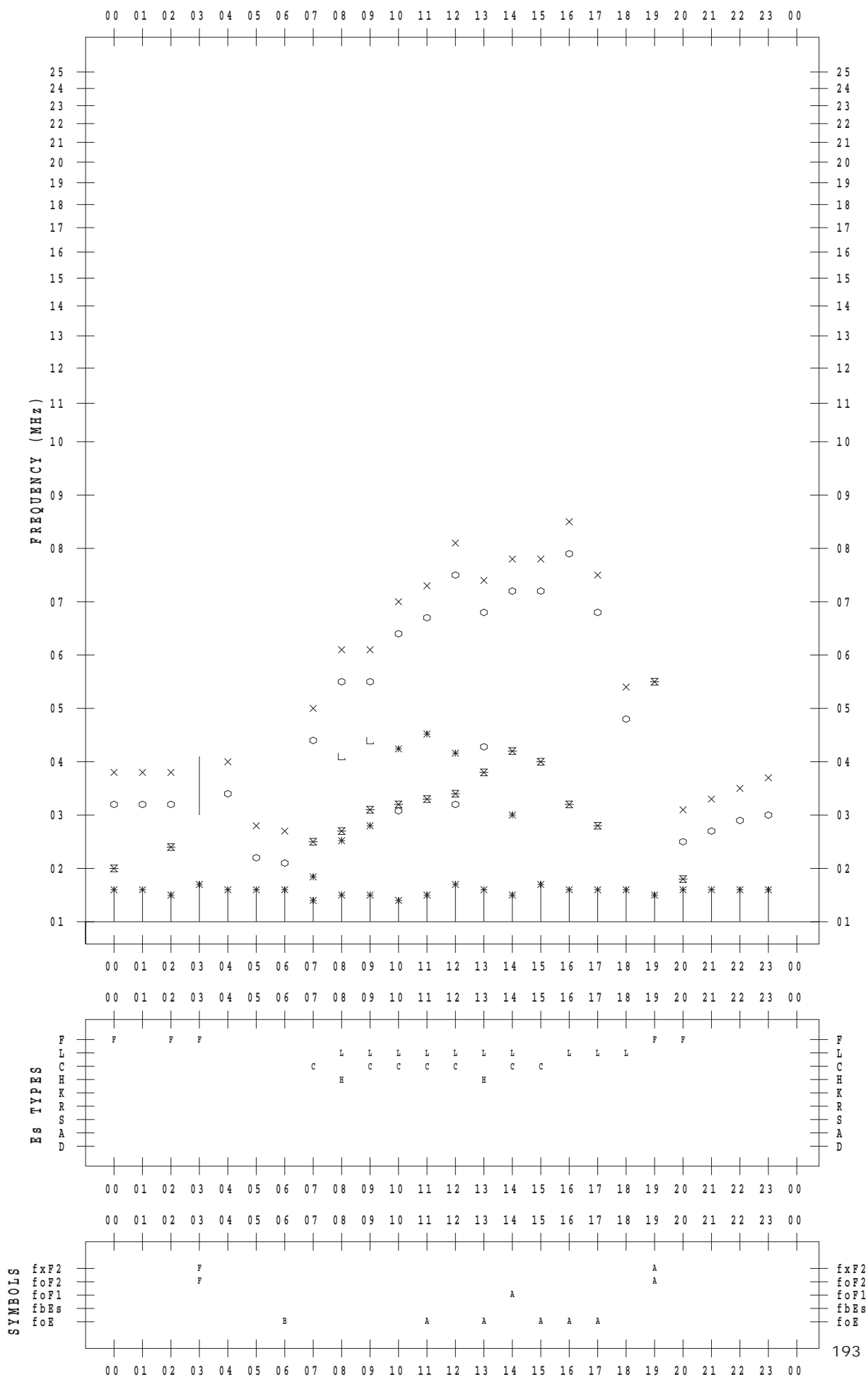
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/24

135 ° E MEAN TIME



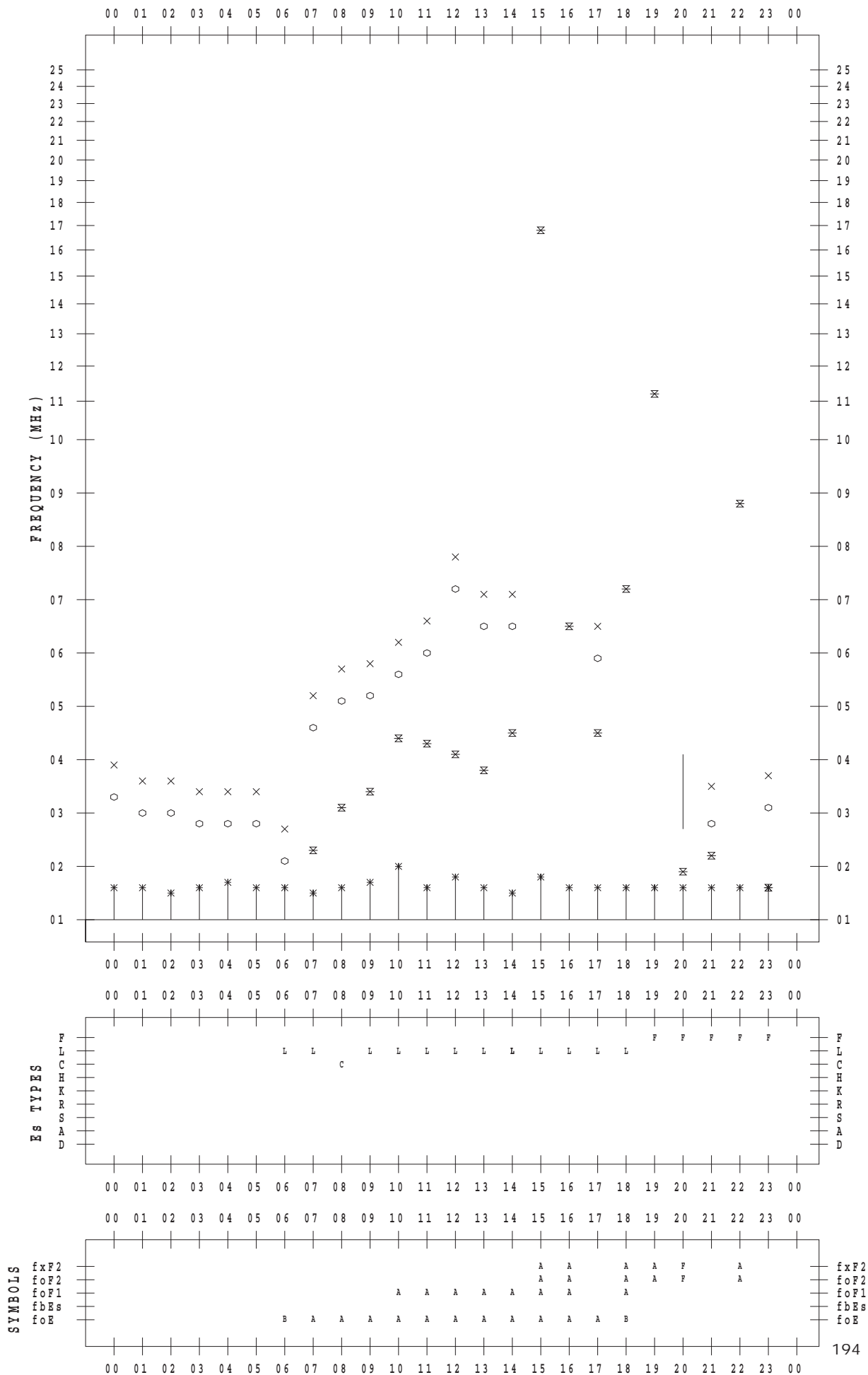
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/25

135 ° E MEAN TIME



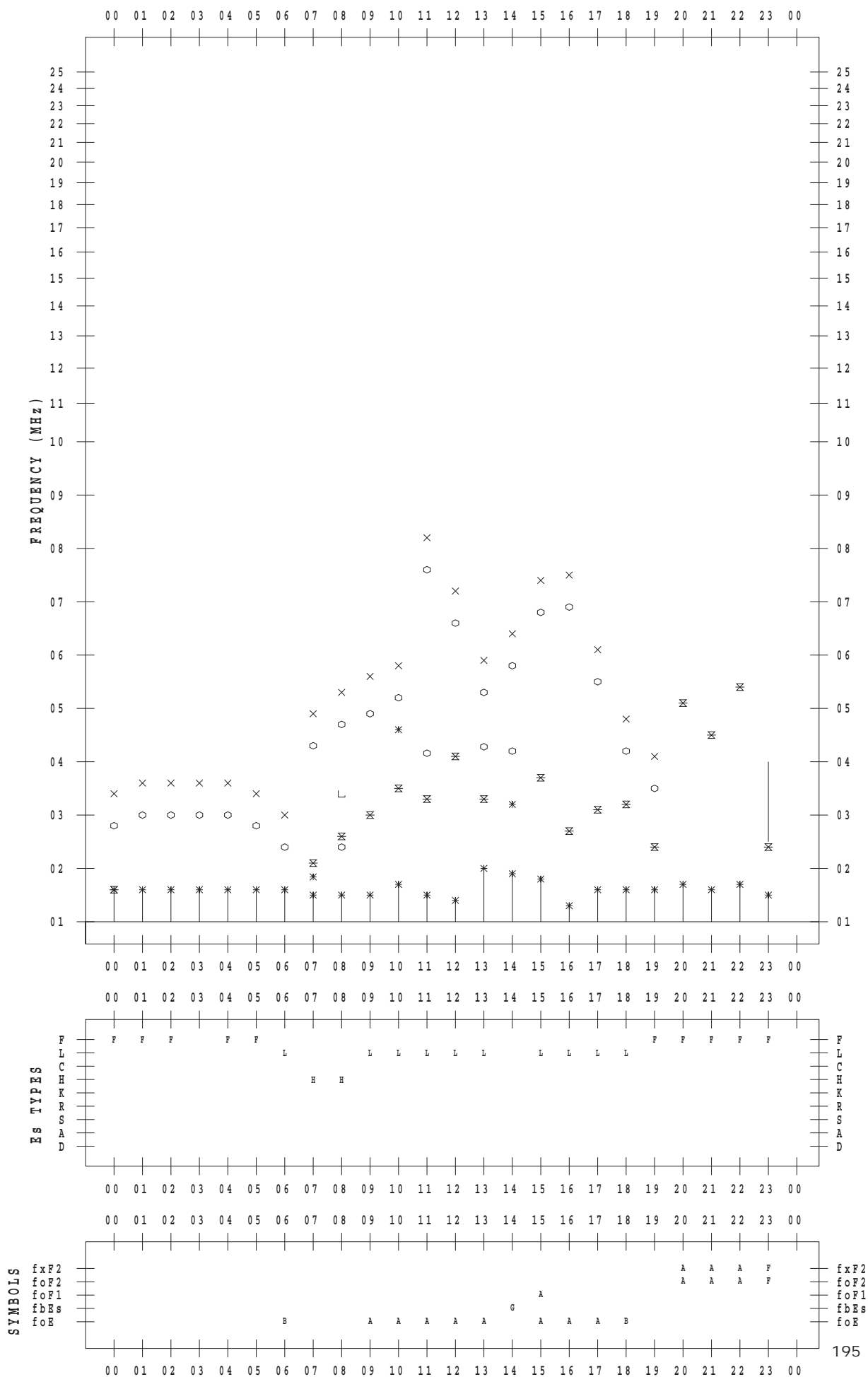
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/26

135 ° E MEAN TIME



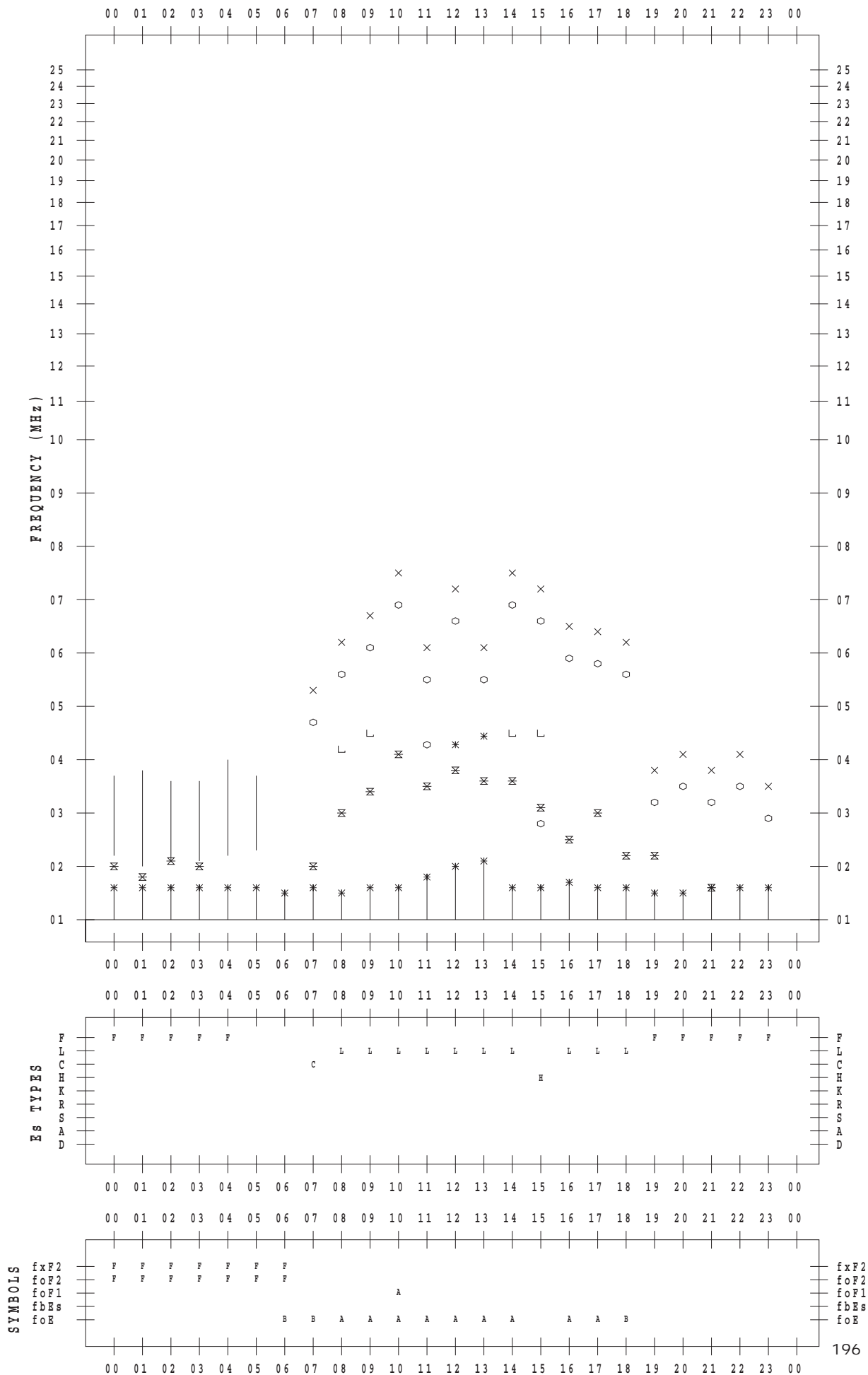
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/27

135 ° E MEAN TIME



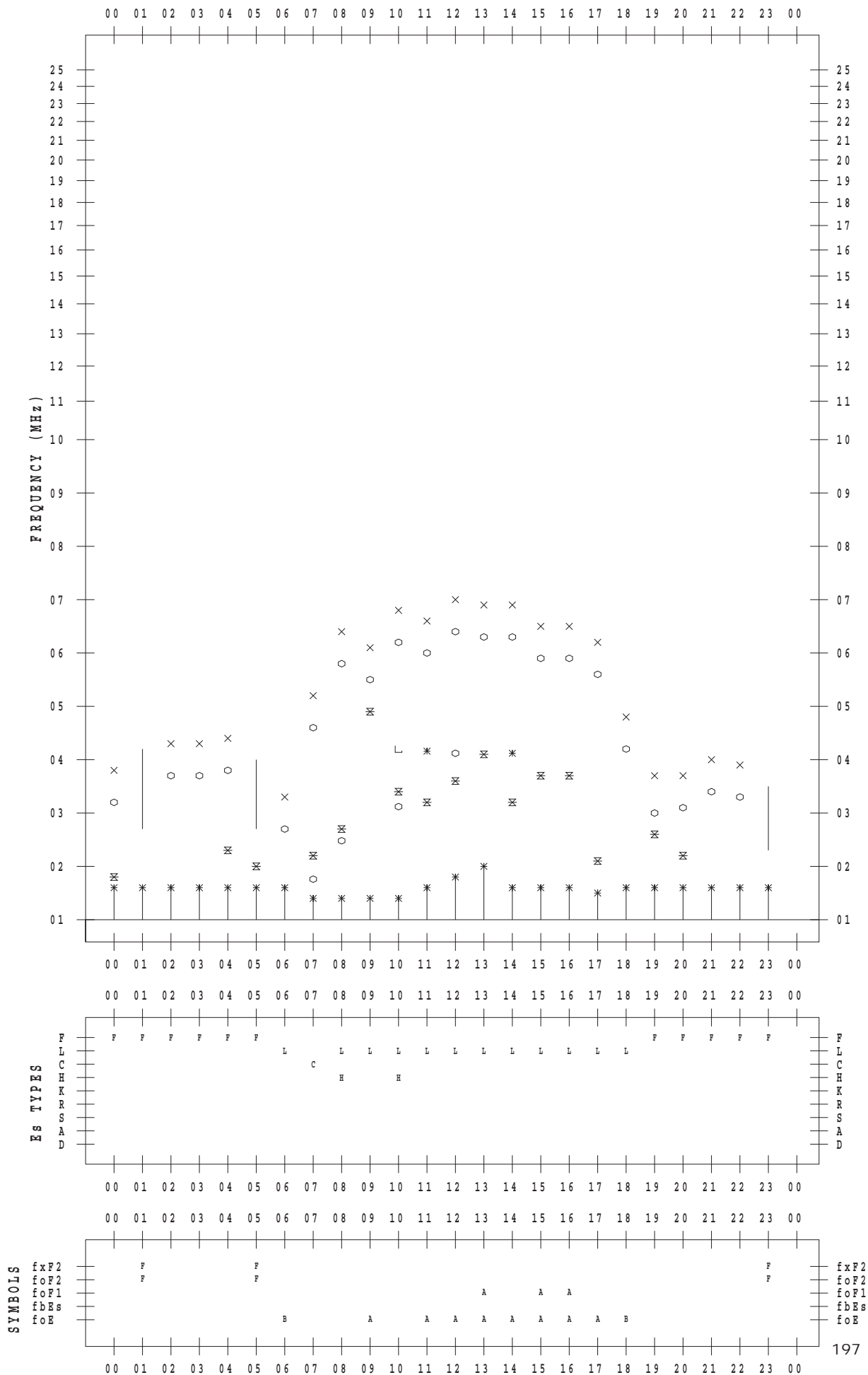
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/28

135 ° E MEAN TIME



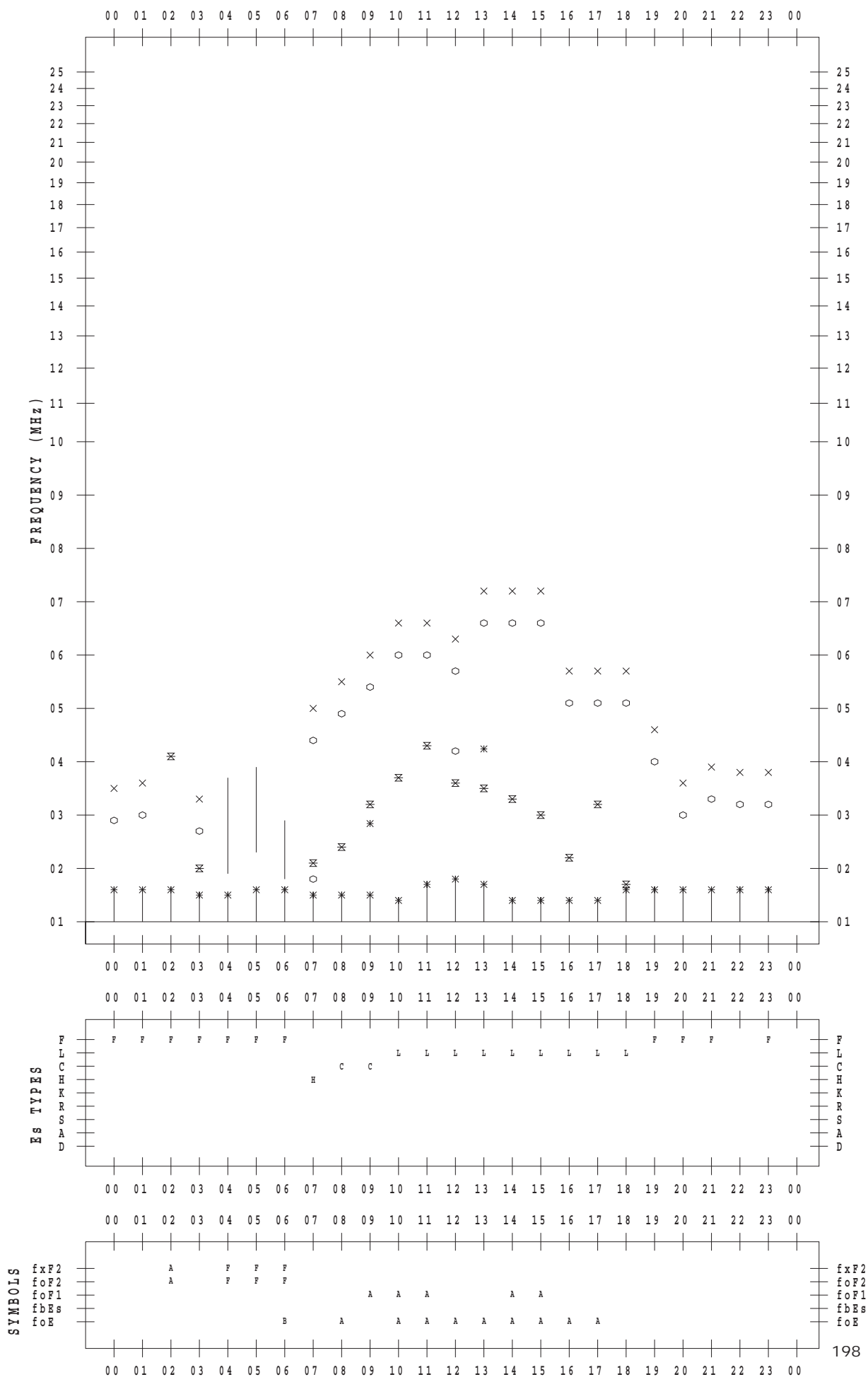
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/29

135 ° E MEAN TIME



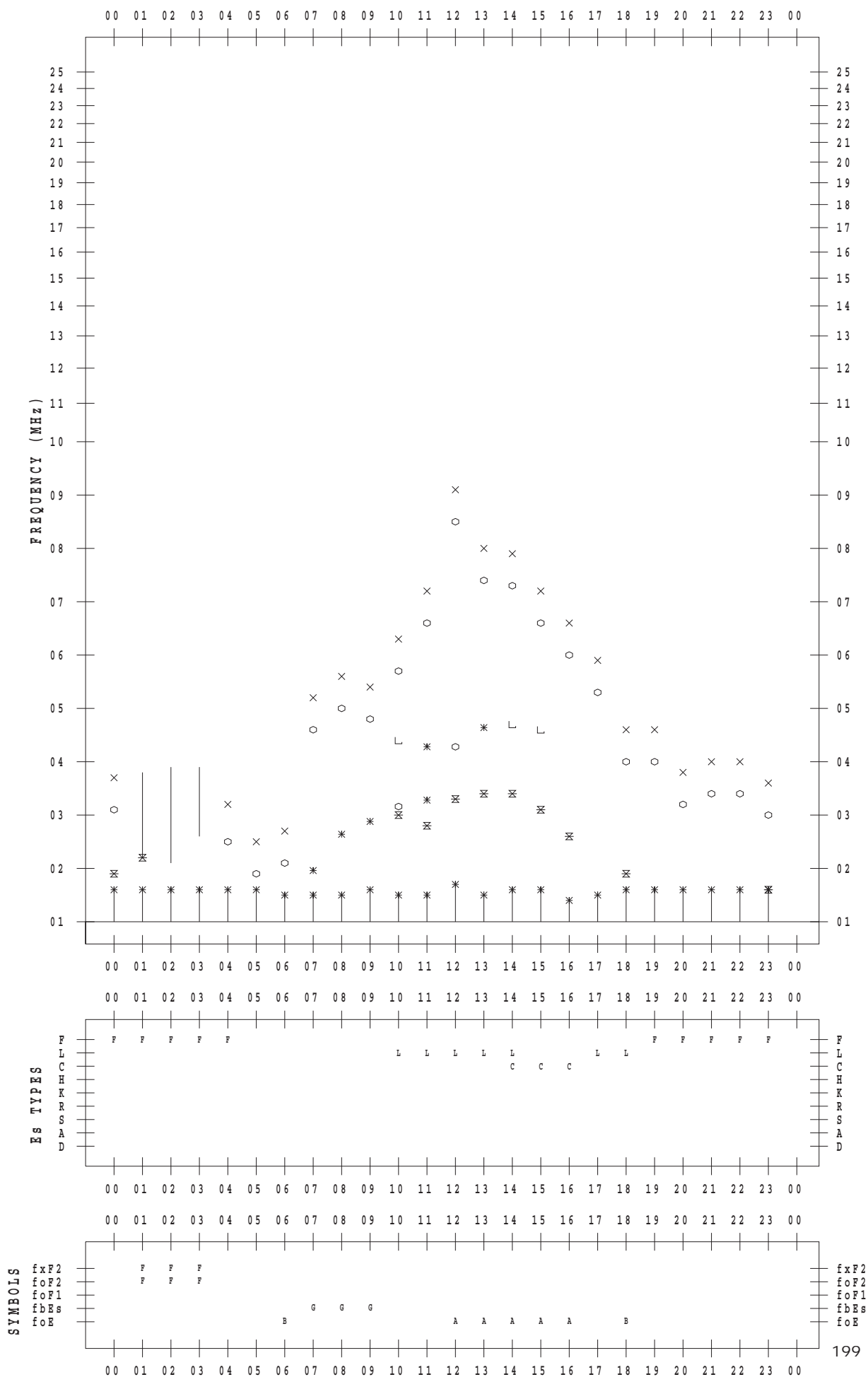
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/30

135 ° E MEAN TIME



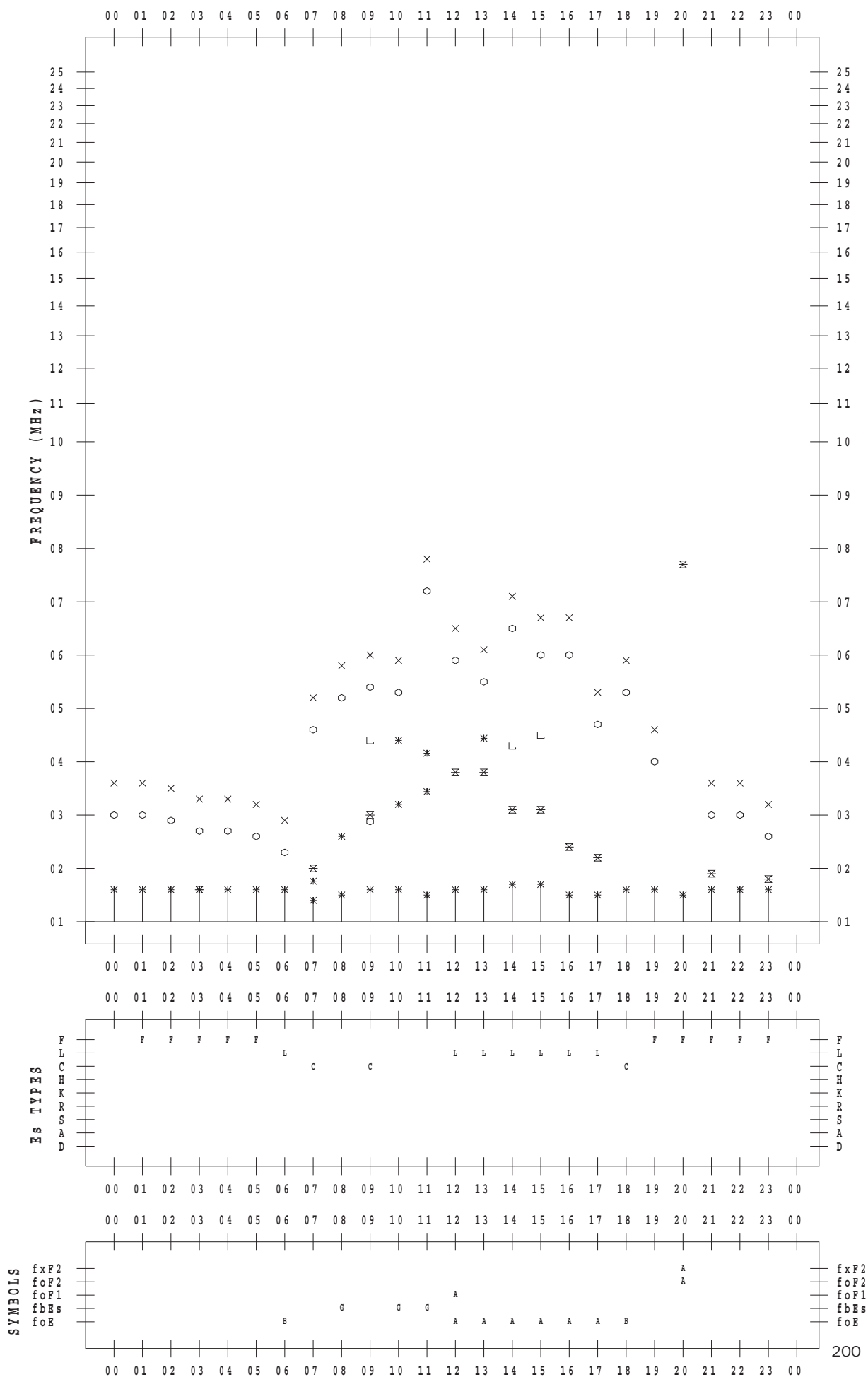
f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/10/31

135 ° E MEAN TIME



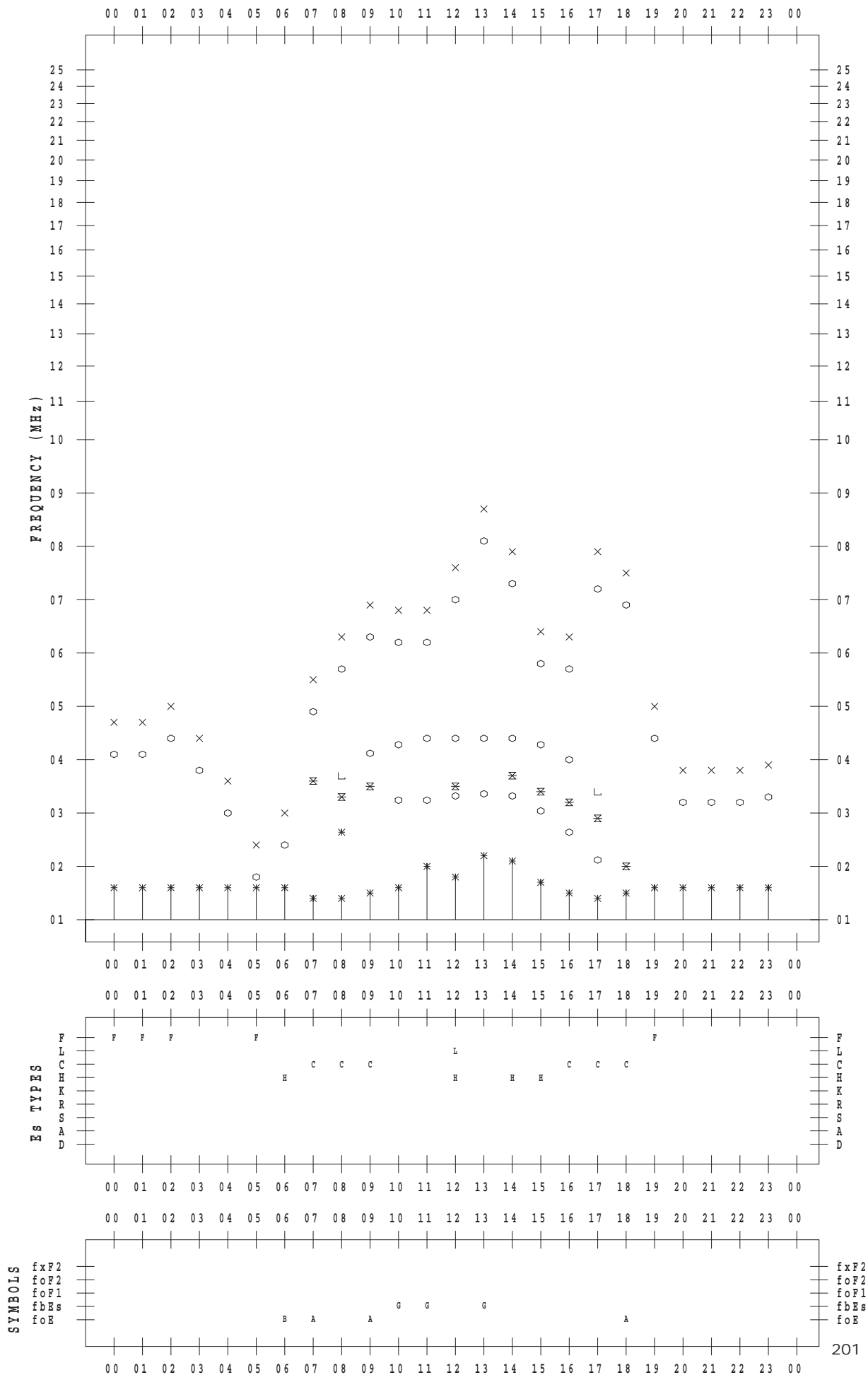
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/ 1

135 ° E MEAN TIME



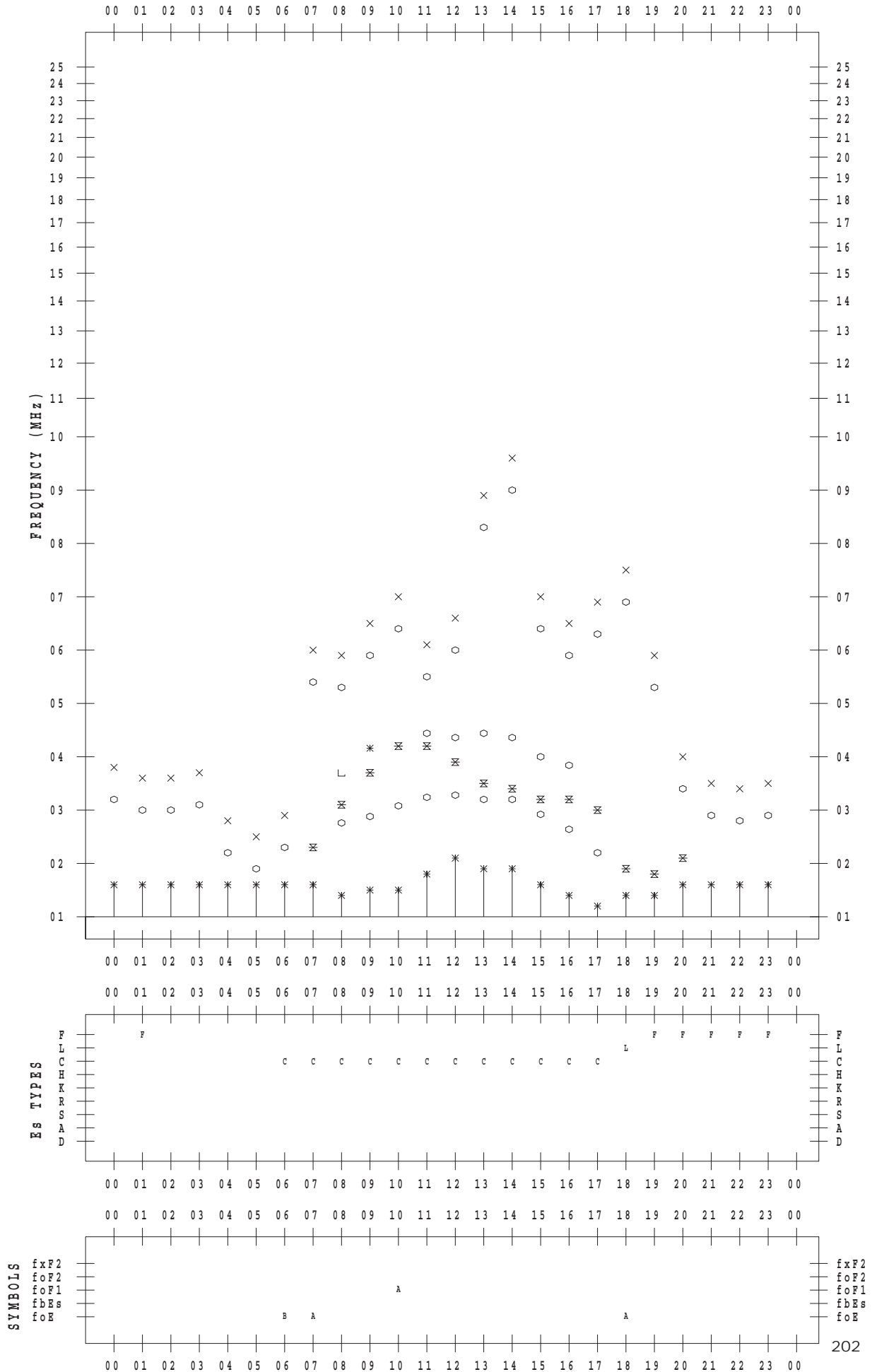
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/ 2

135 ° E MEAN TIME



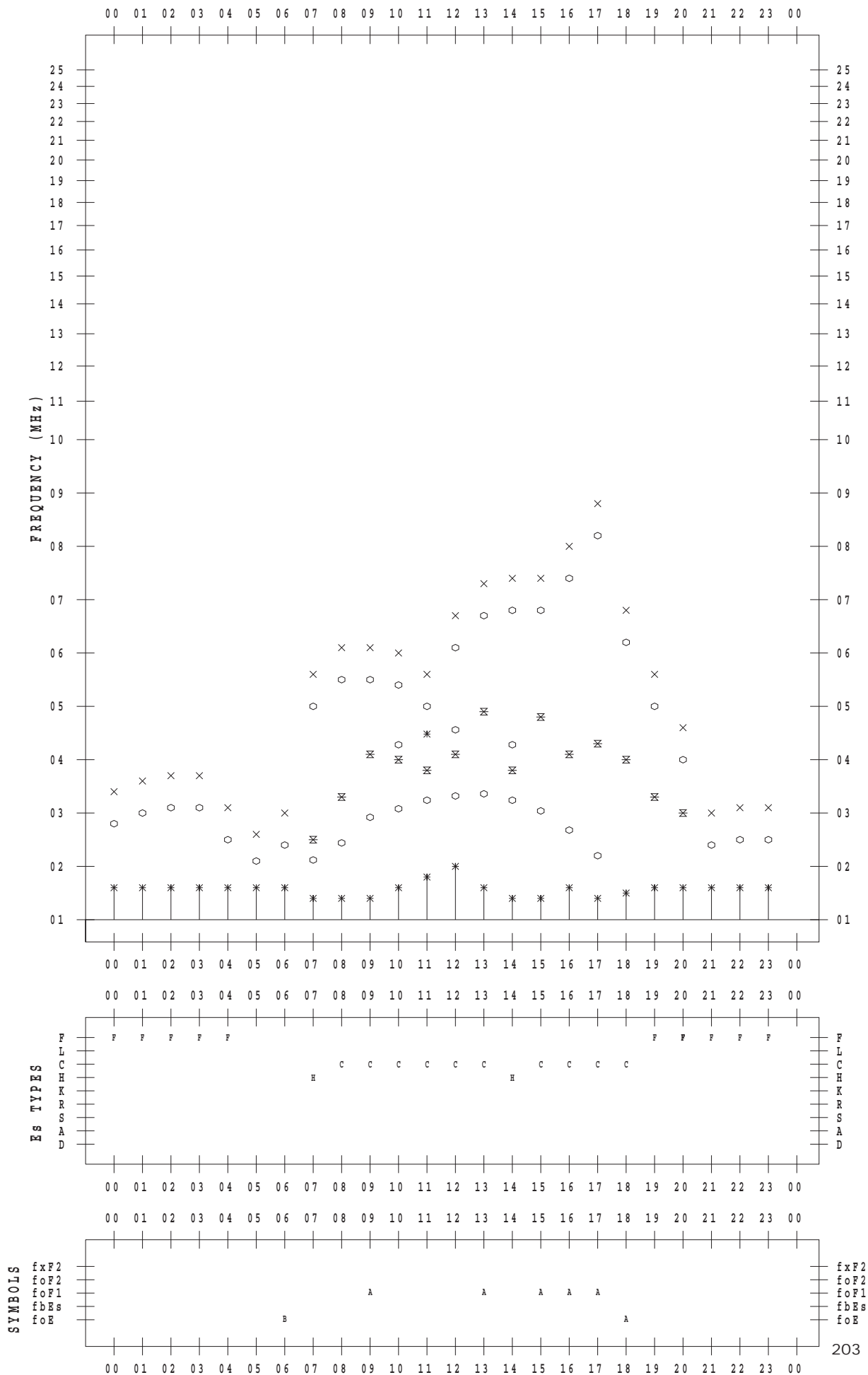
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/ 3

135 ° E MEAN TIME



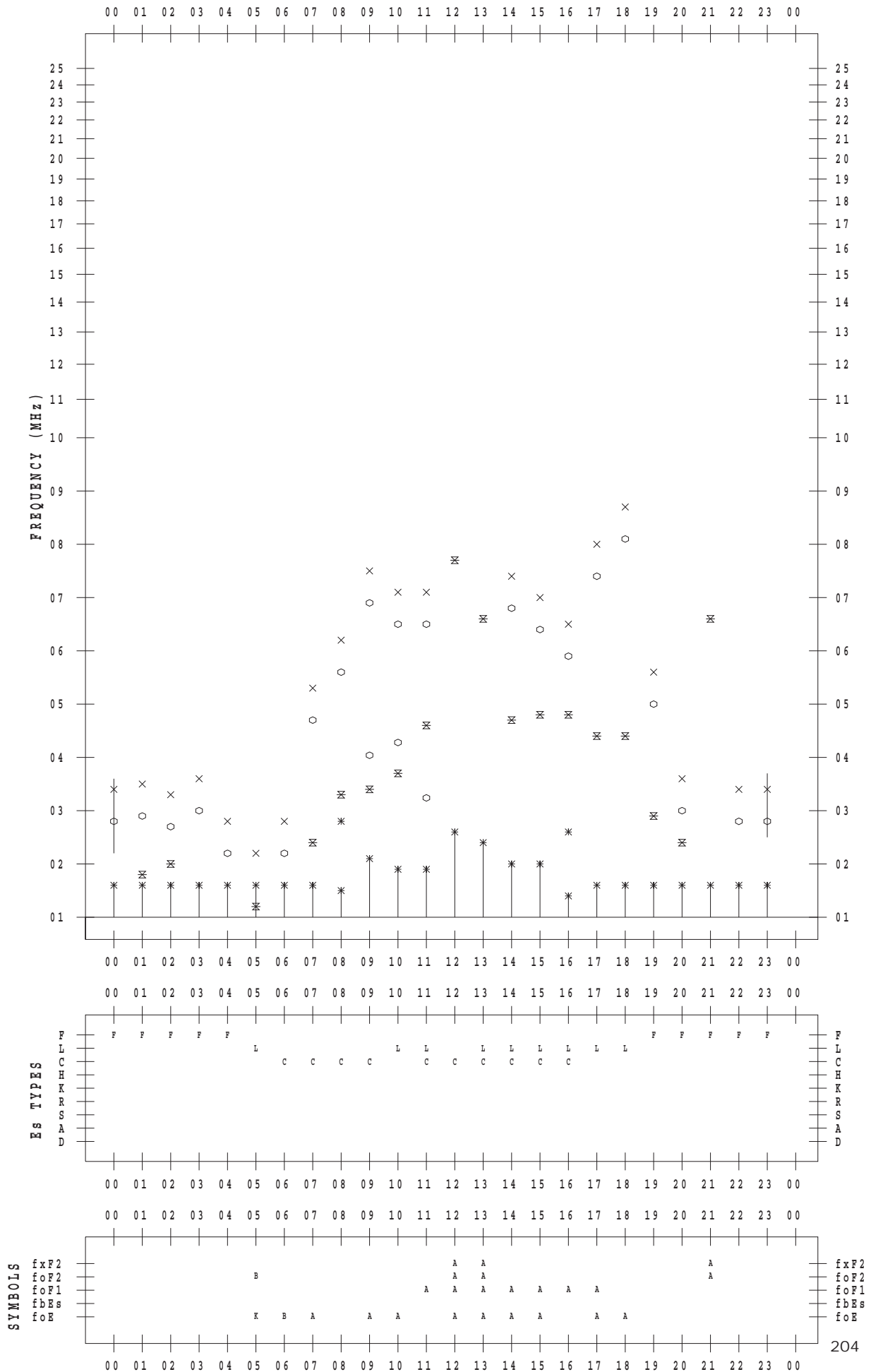
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/ 4

135 ° E MEAN TIME



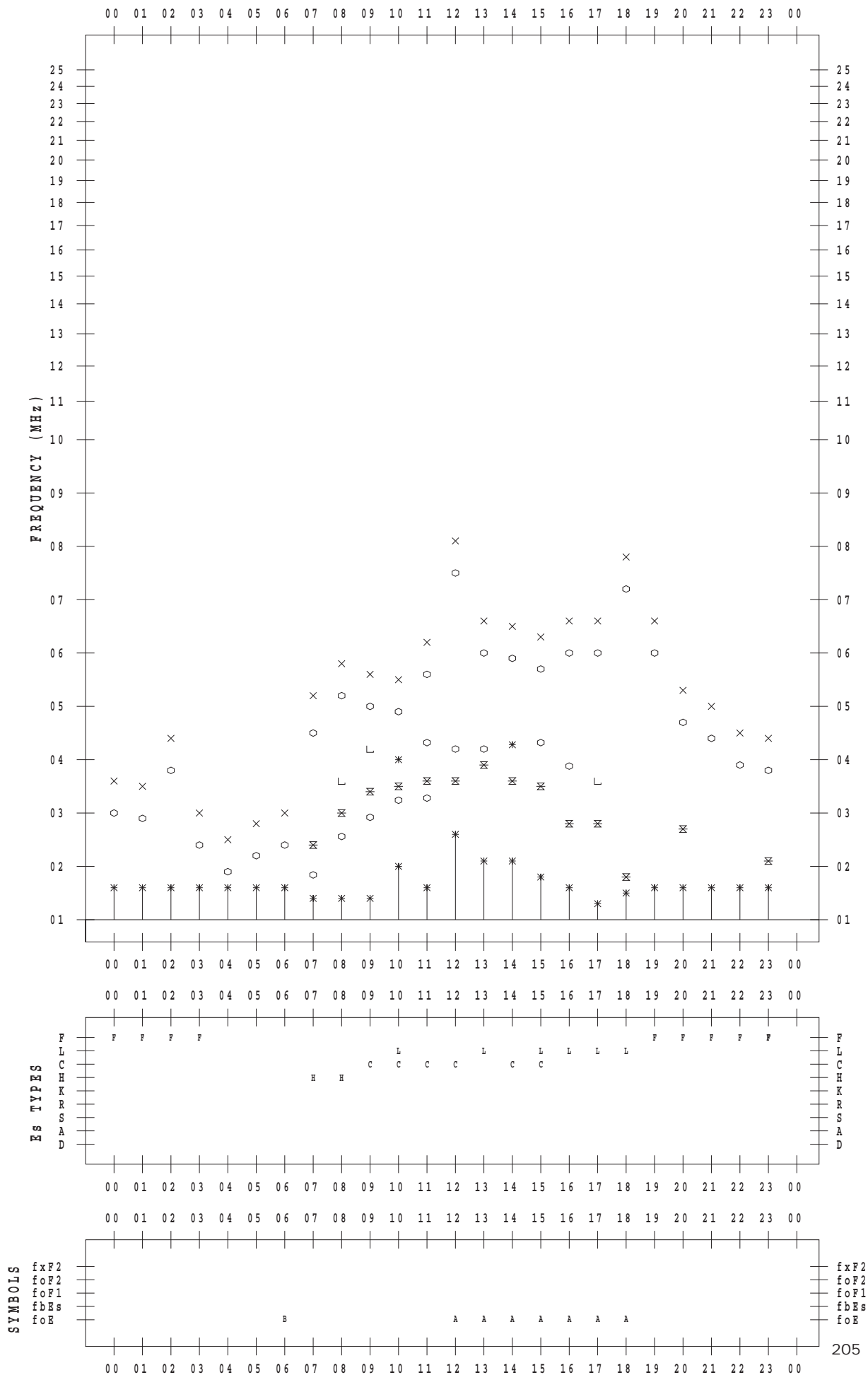
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/ 5

135 °E MEAN TIME



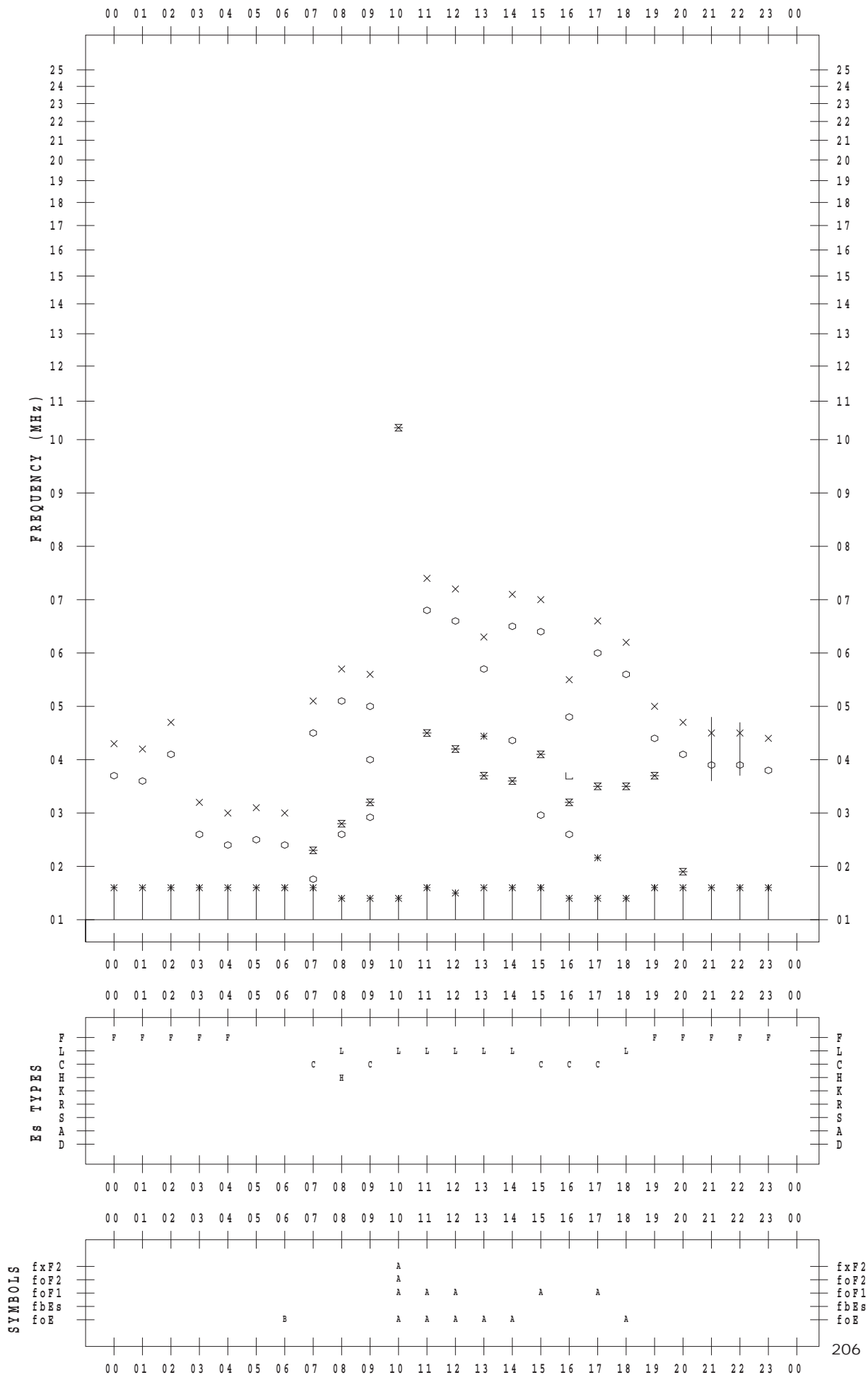
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/ 6

135 ° E MEAN TIME



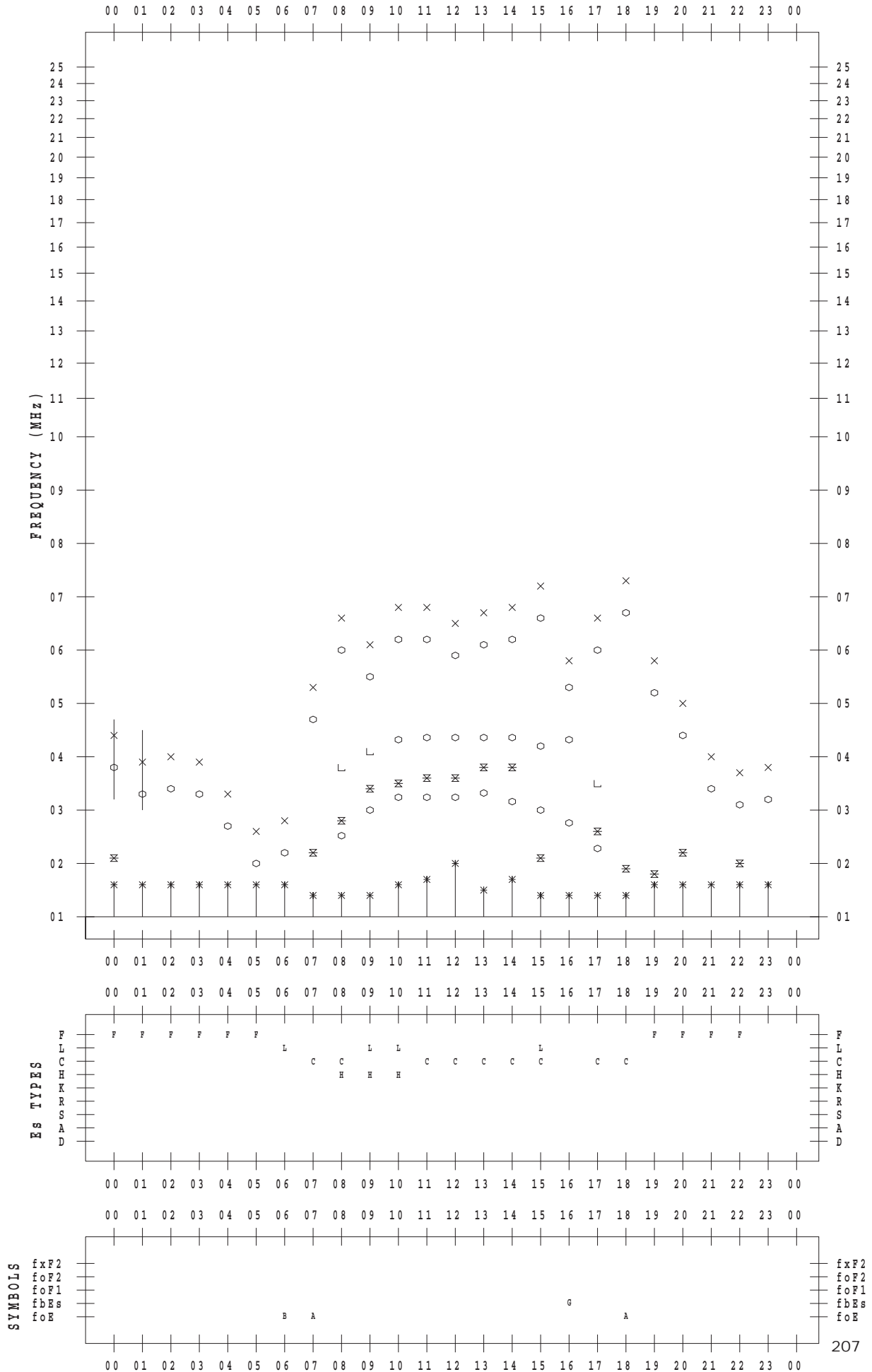
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/7

135 ° E MEAN TIME



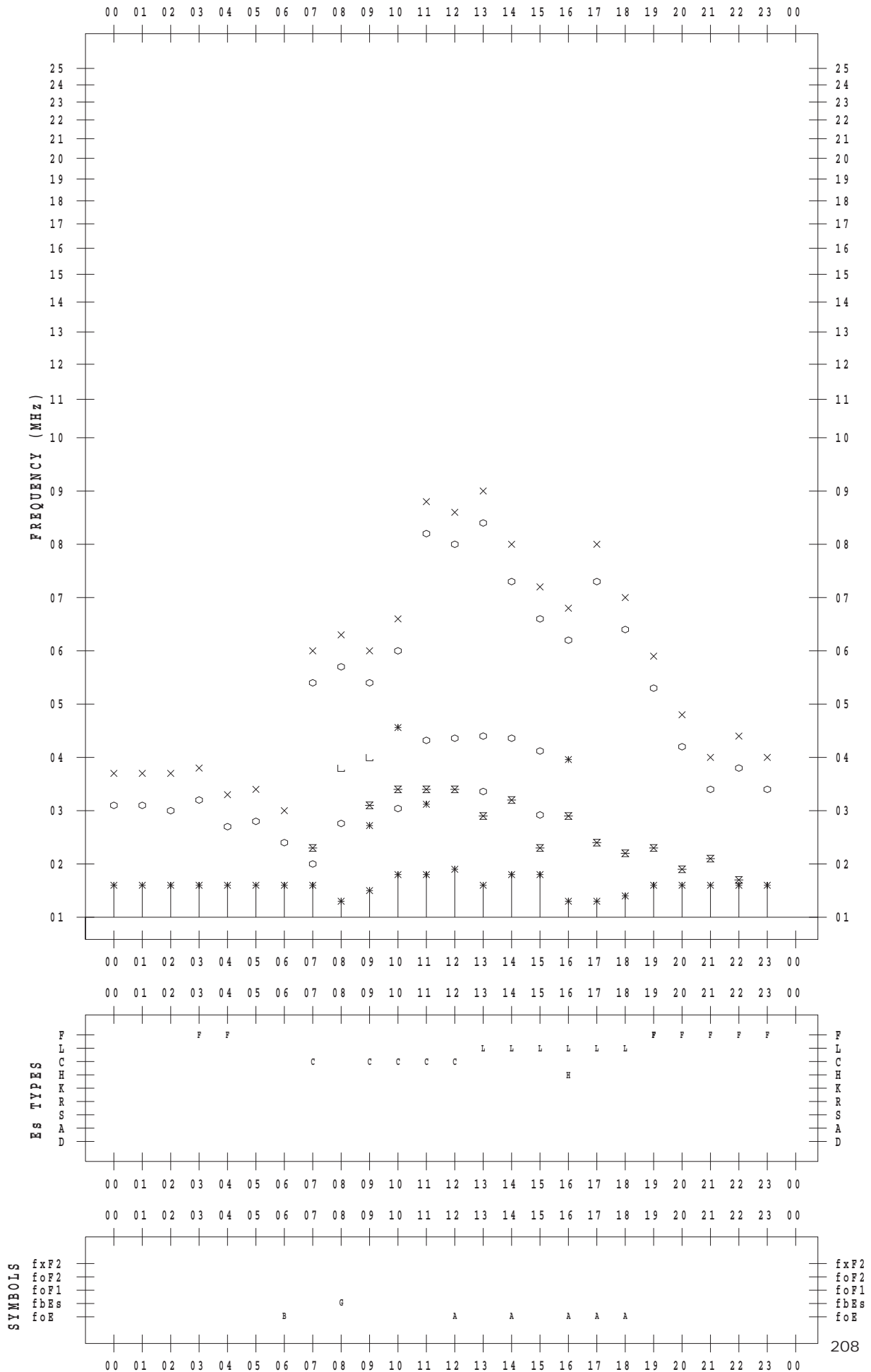
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/ 8

135 ° E MEAN TIME



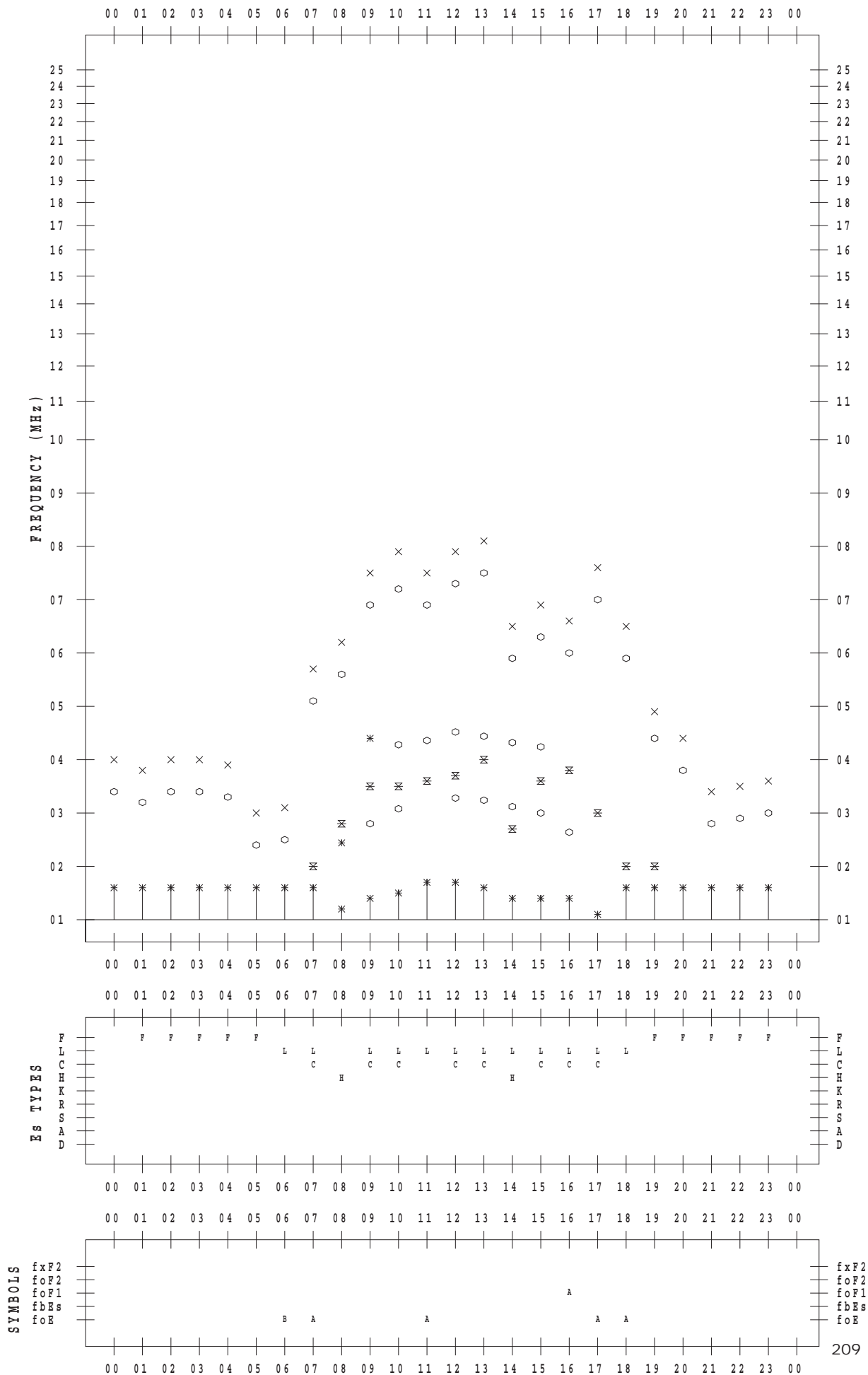
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/ 9

135 ° E MEAN TIME



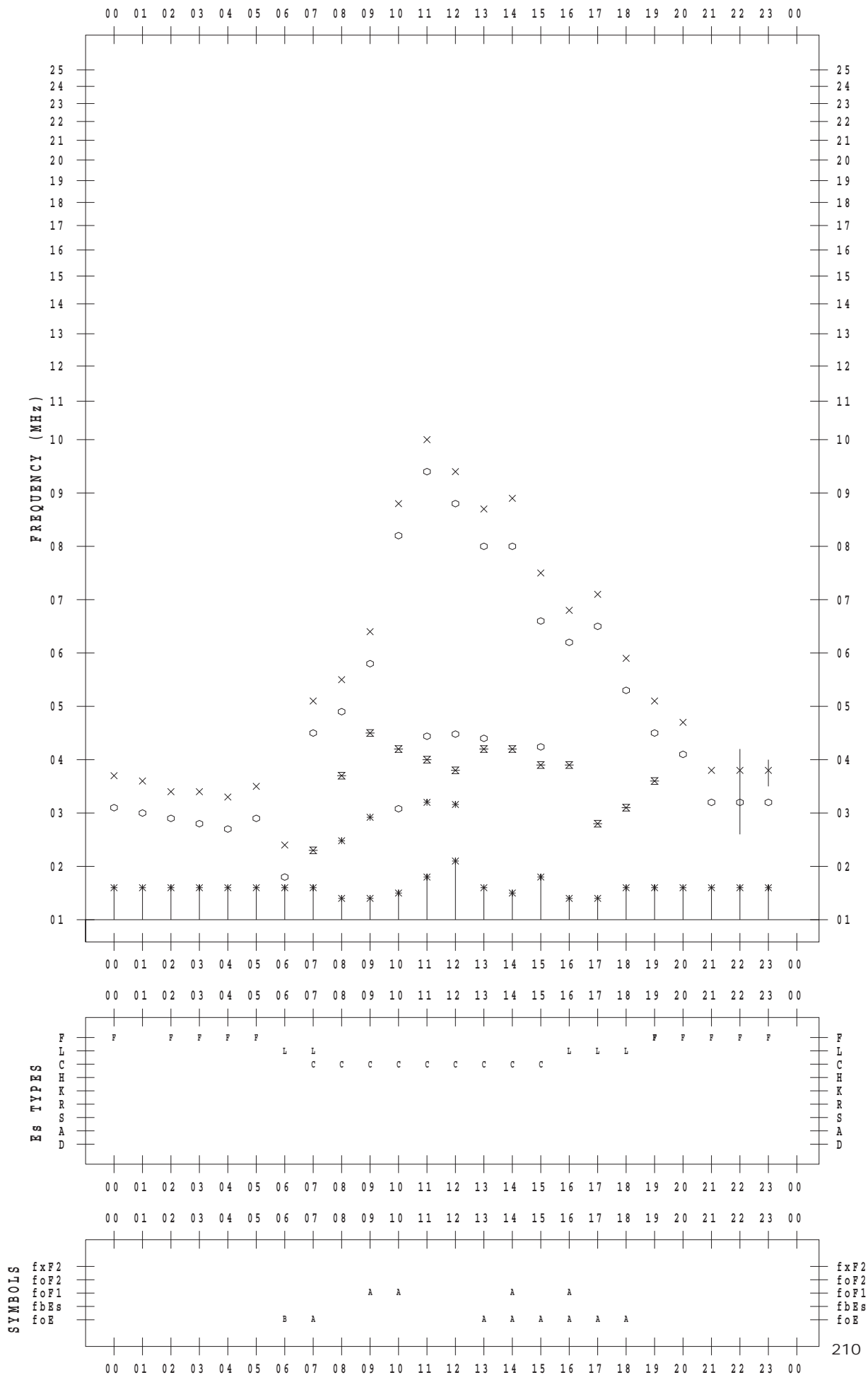
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/10

135 ° E MEAN TIME



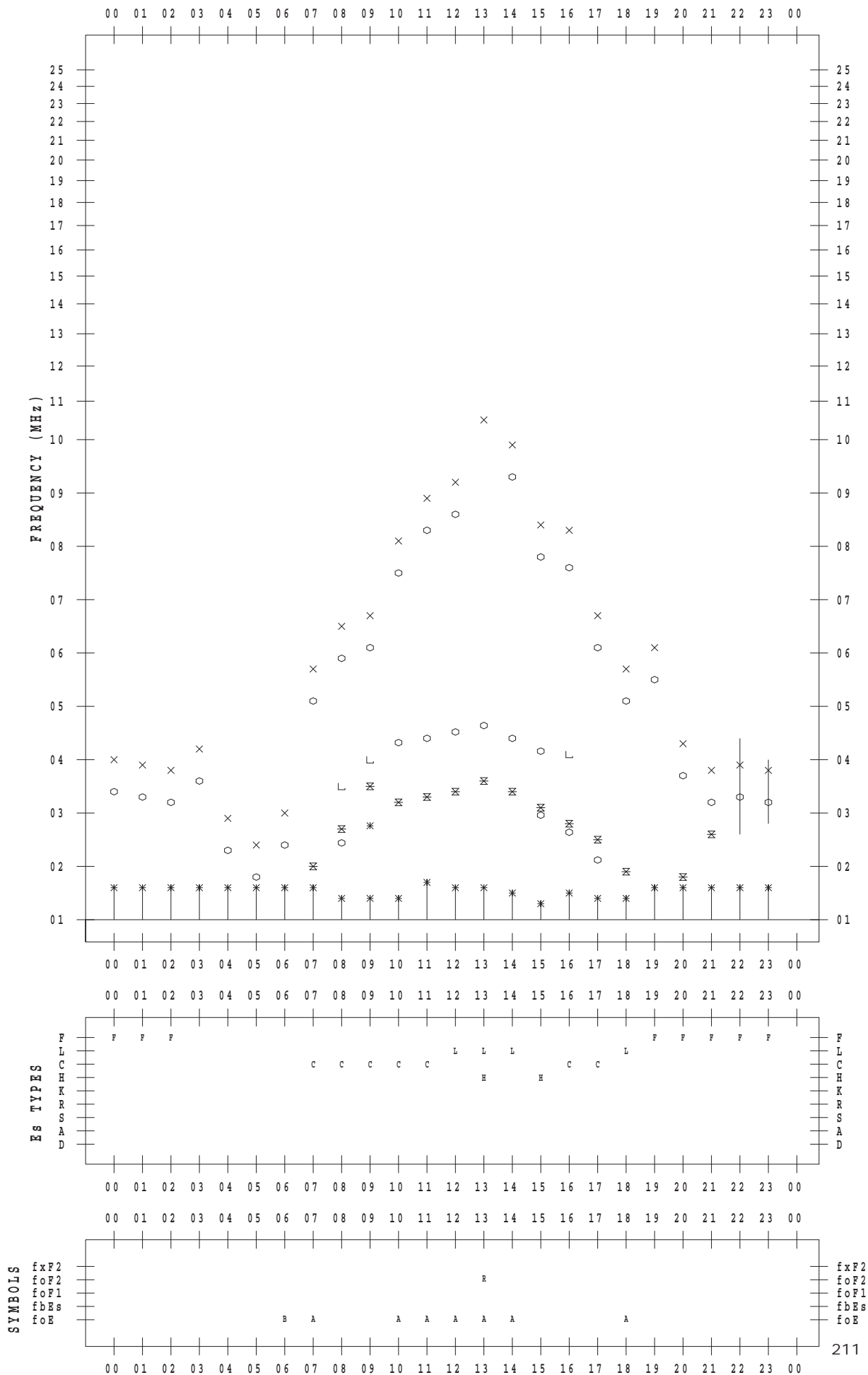
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/11

135 ° E MEAN TIME



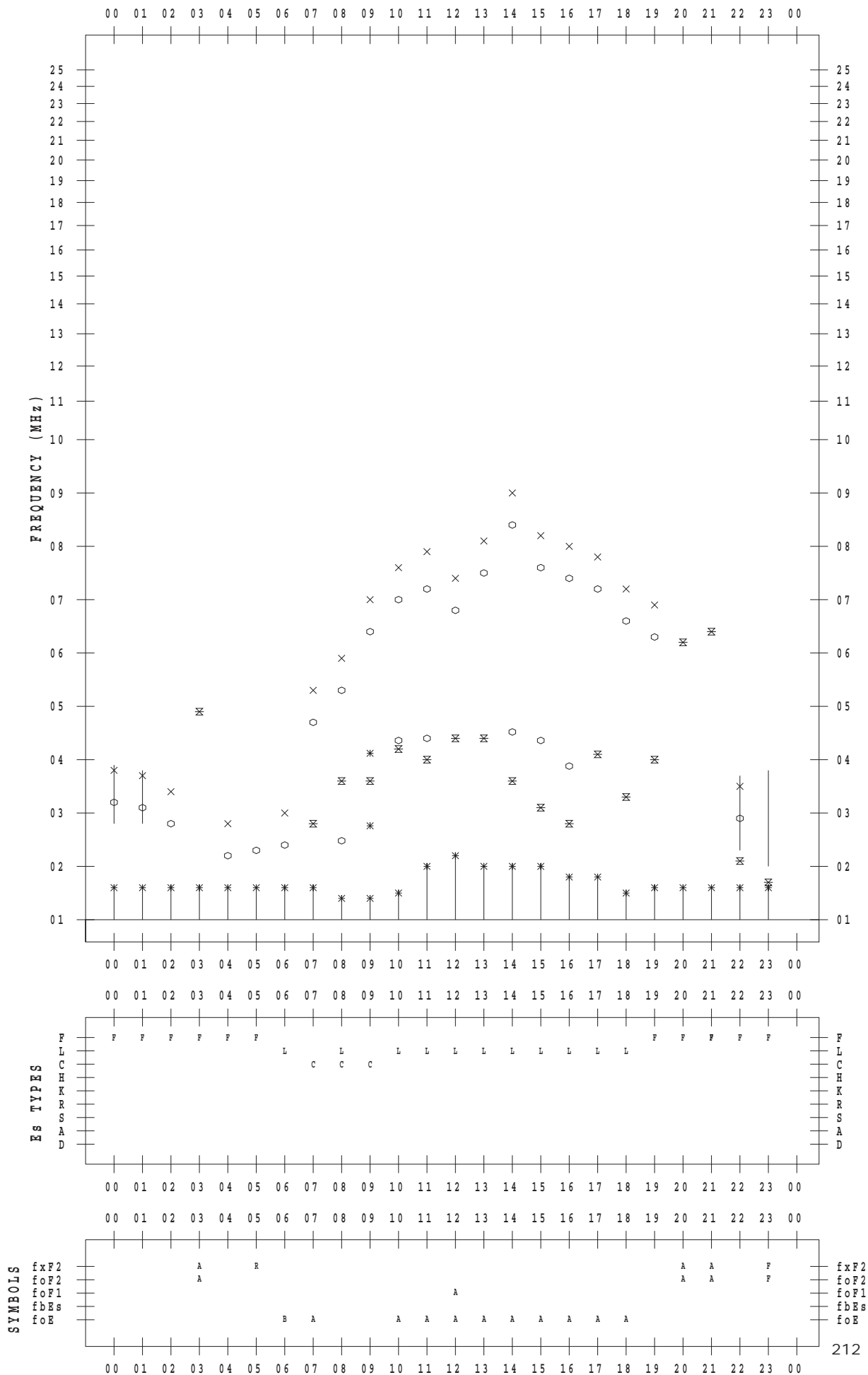
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/12

135 ° E MEAN TIME



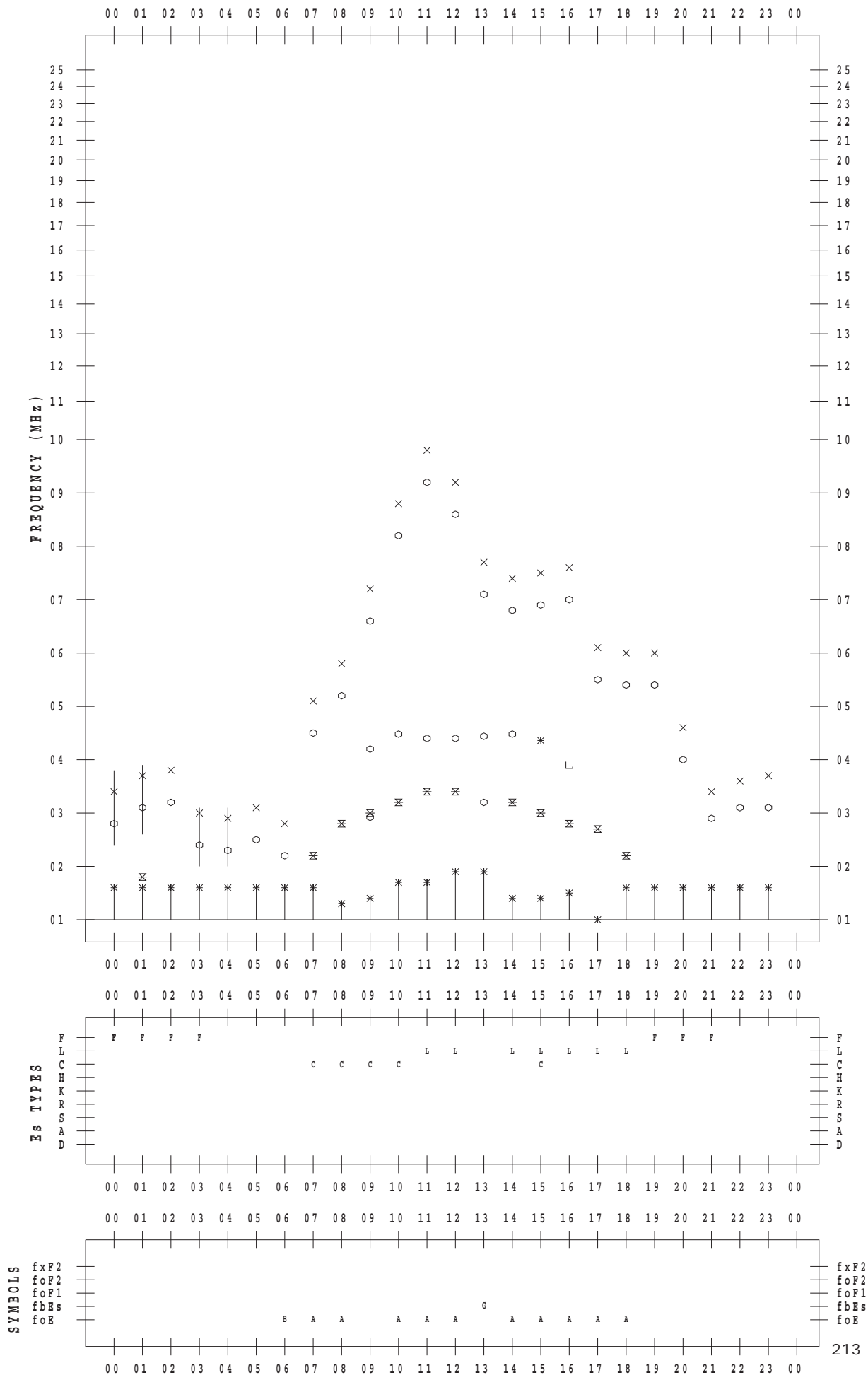
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/13

135 ° E MEAN TIME



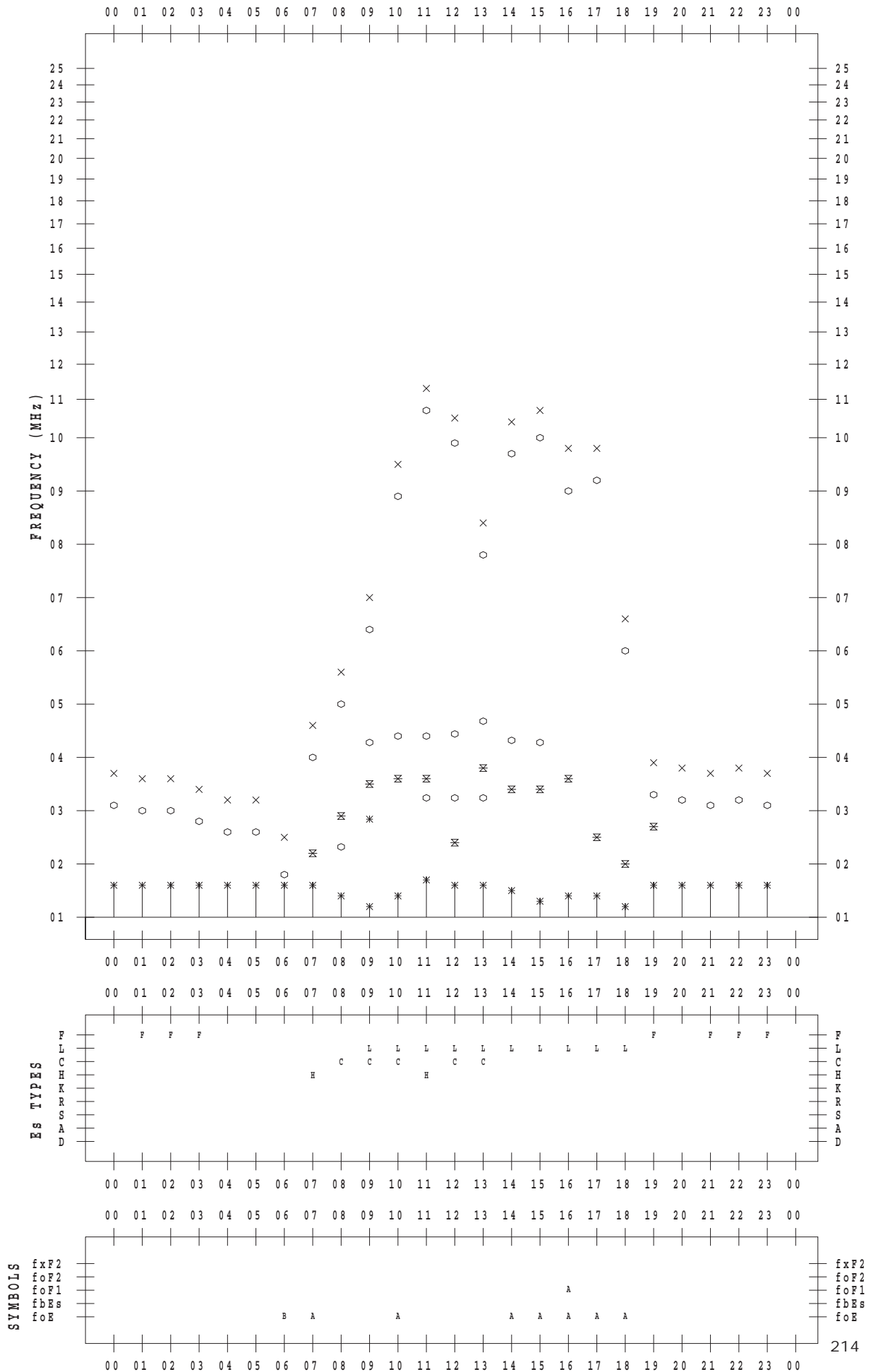
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/14

135 ° E MEAN TIME



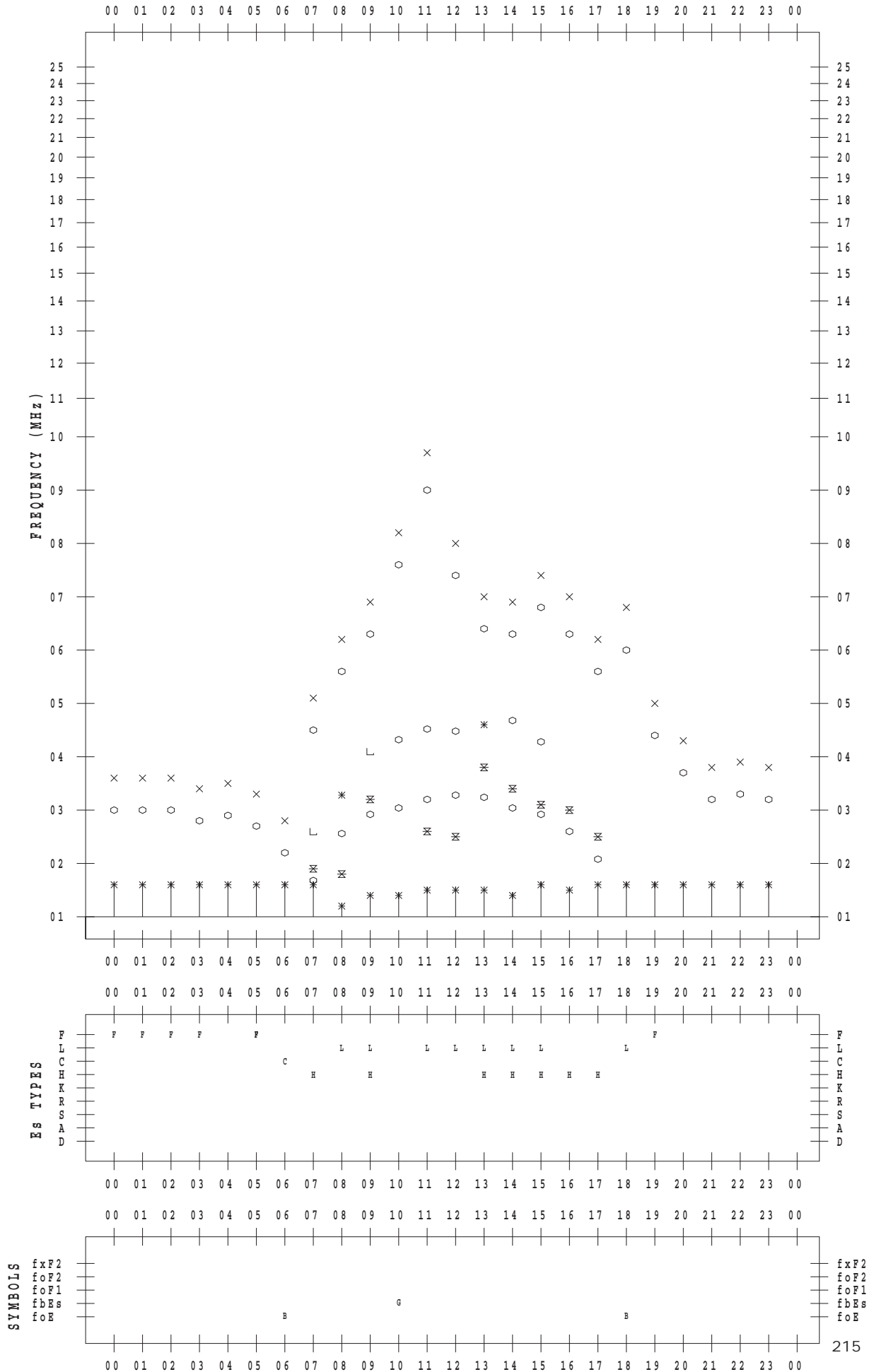
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/15

135 ° E MEAN TIME



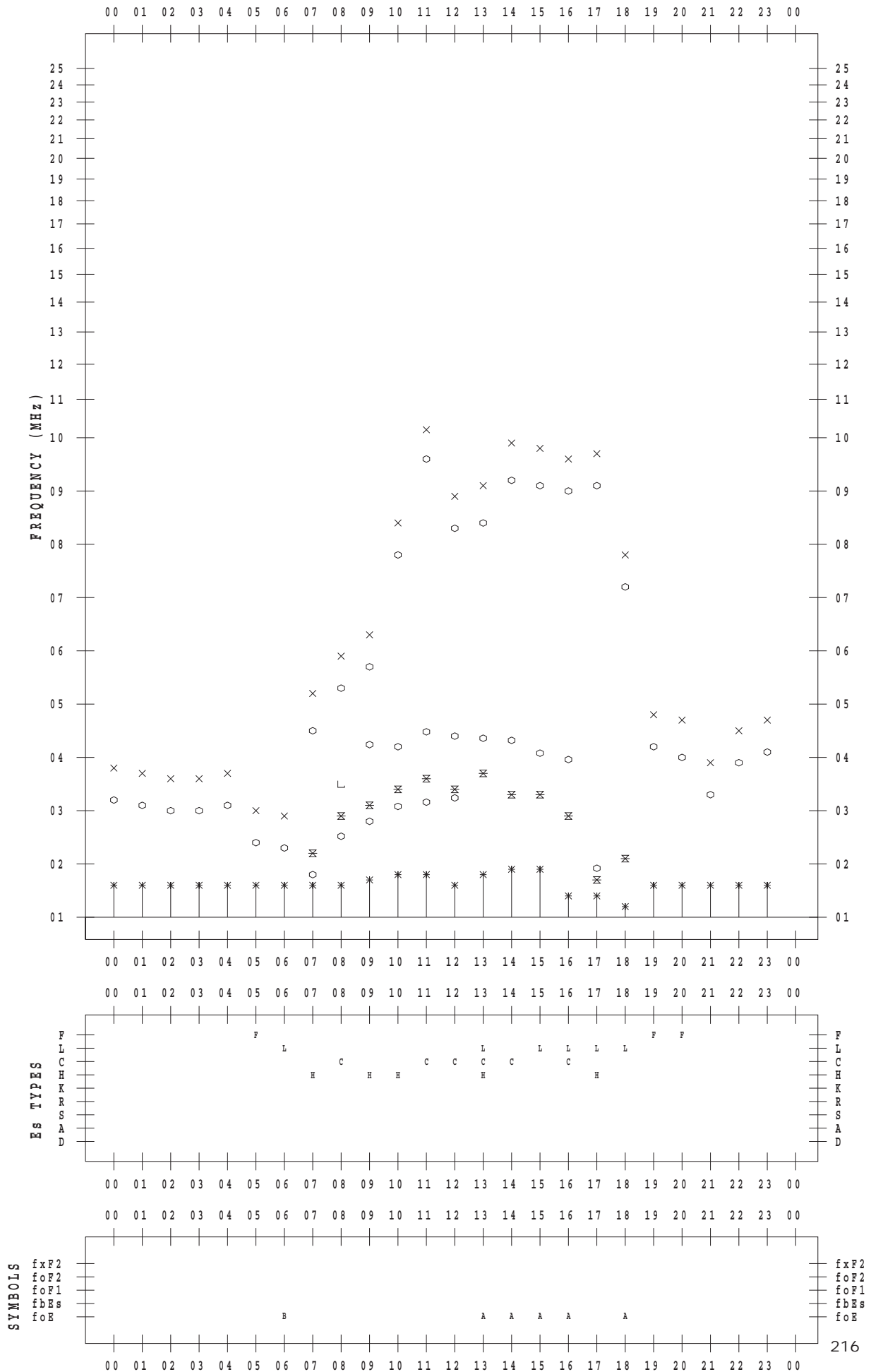
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/16

135 ° E MEAN TIME



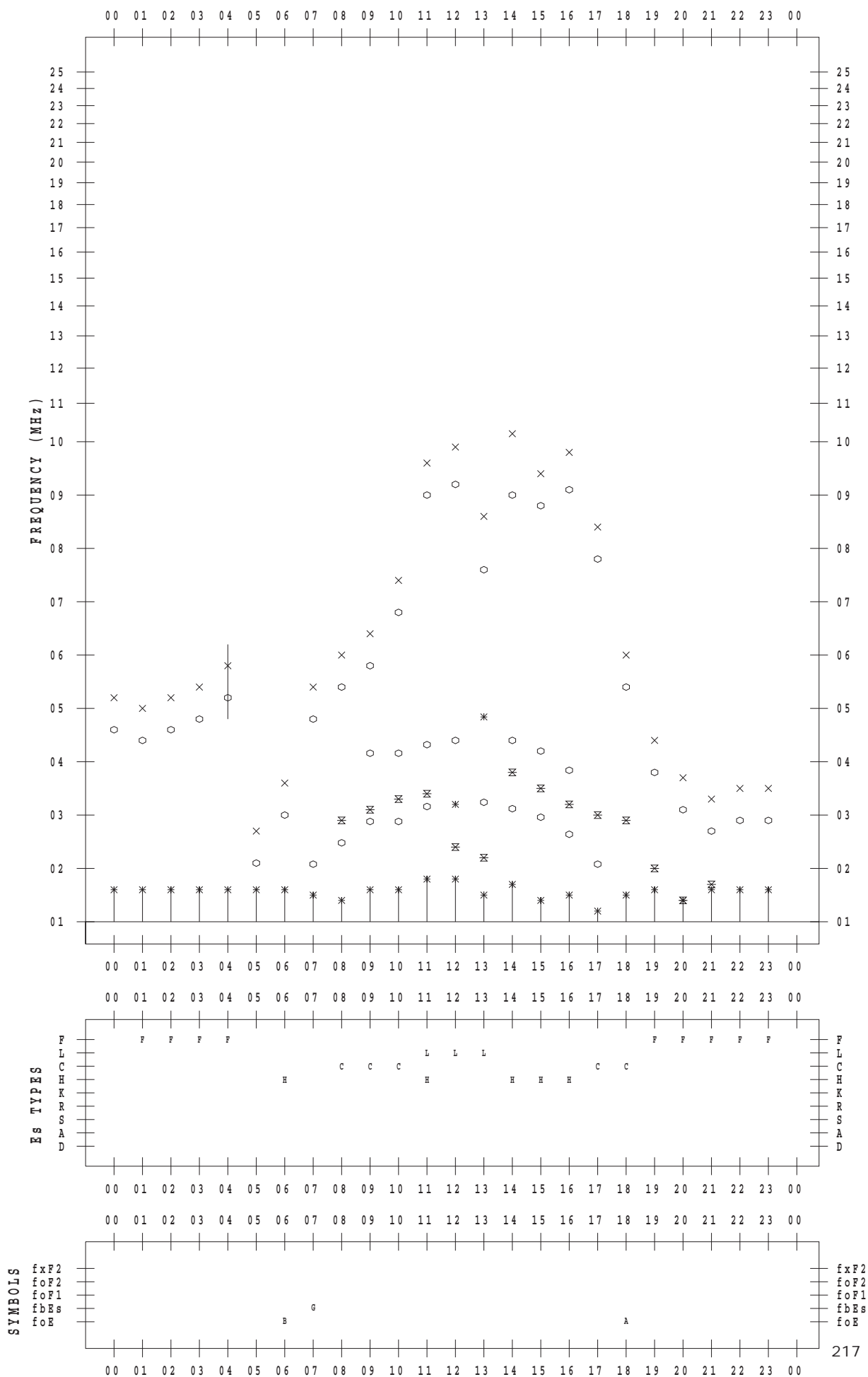
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/17

135 ° E MEAN TIME



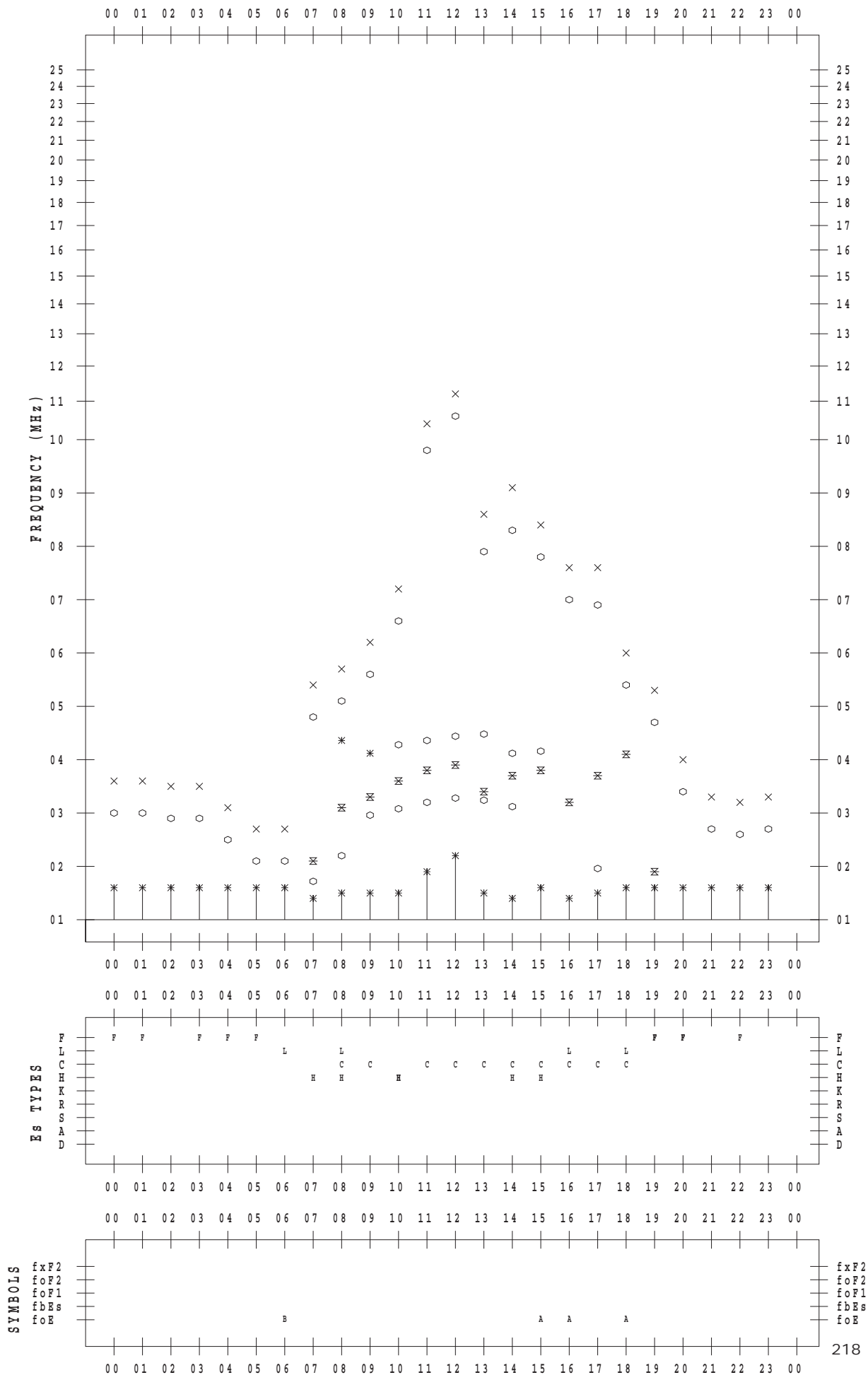
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/18

135 ° E MEAN TIME



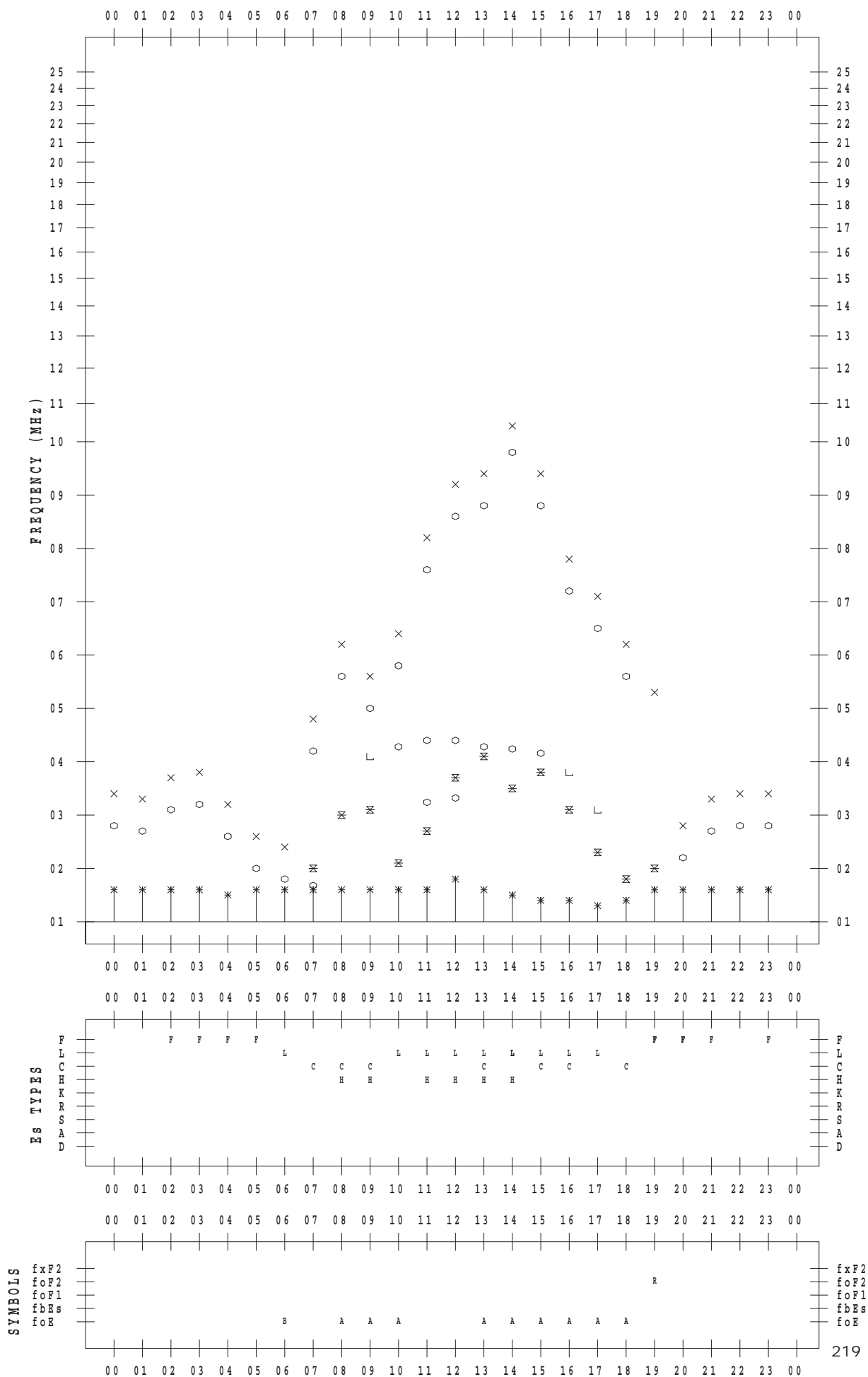
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/19

135 ° E MEAN TIME



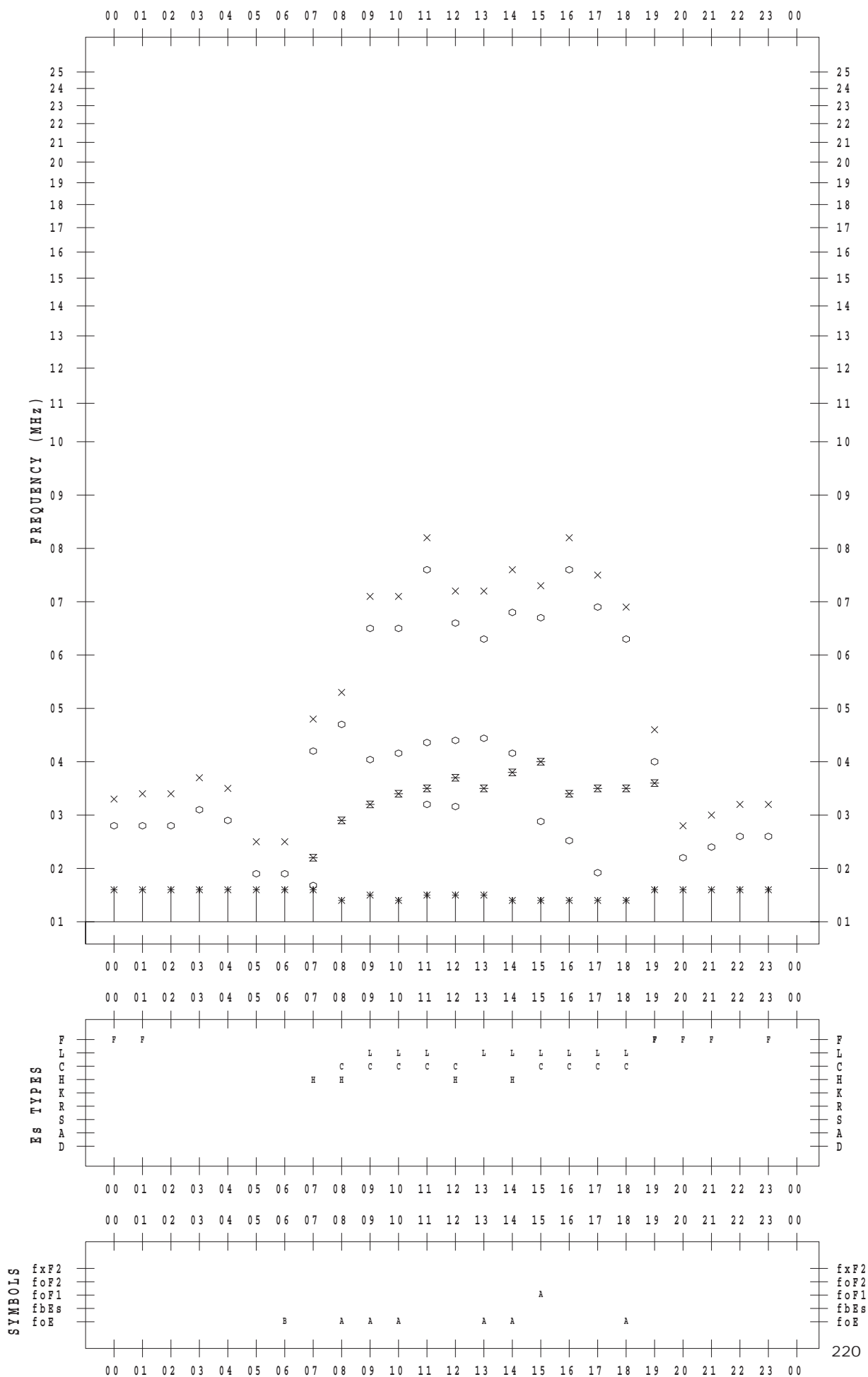
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/20

135 ° E MEAN TIME



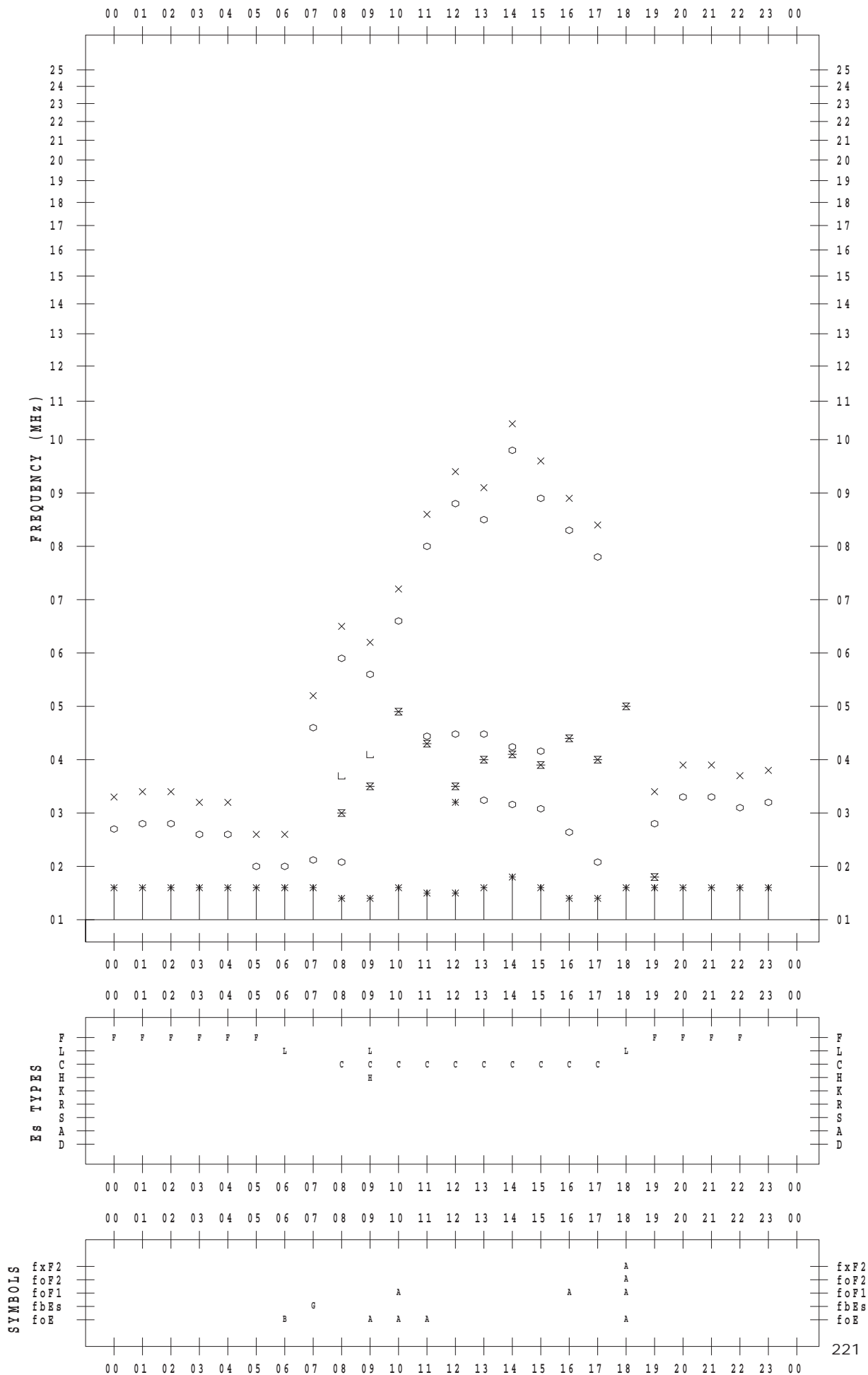
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/21

135 ° E MEAN TIME



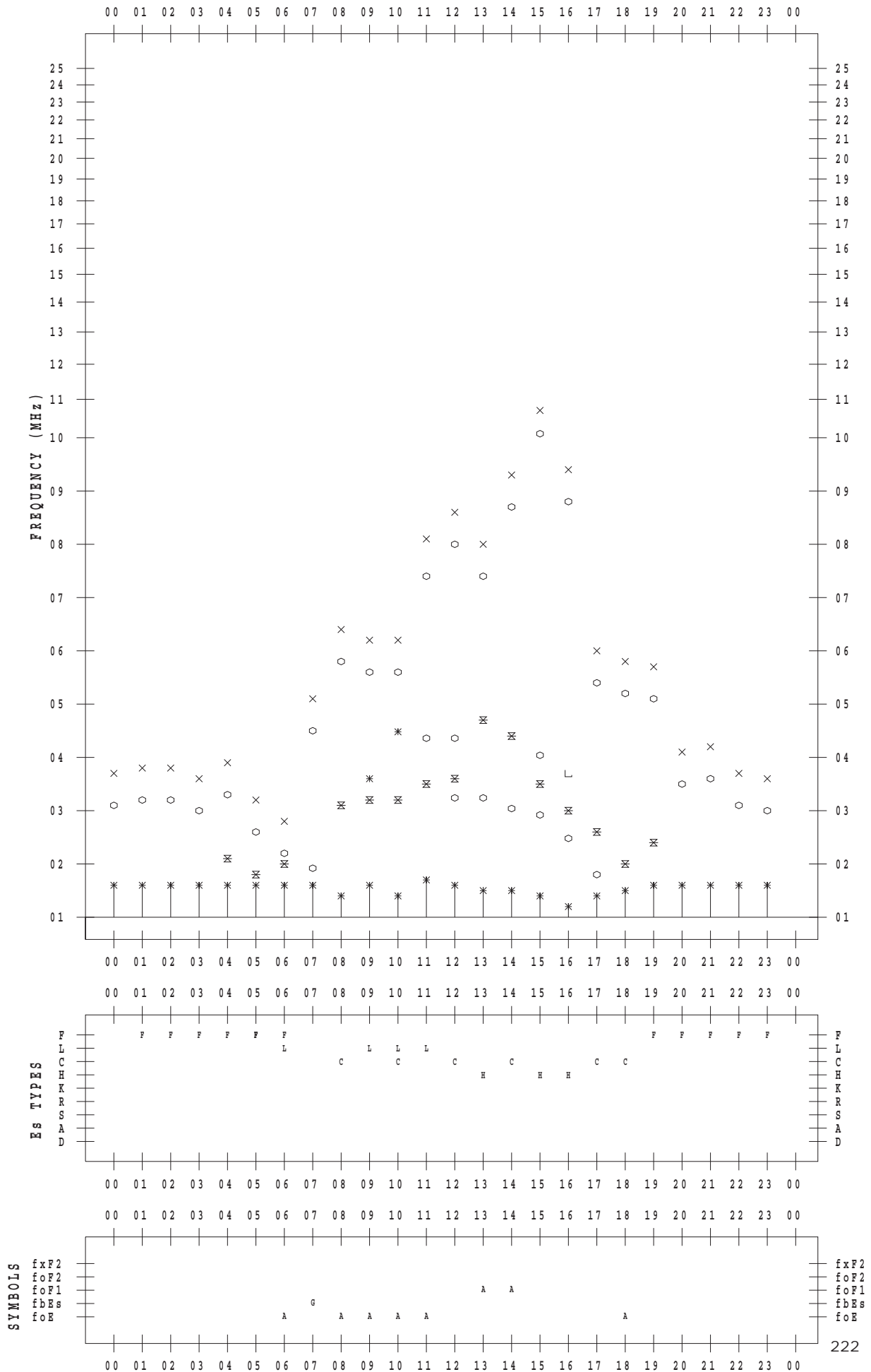
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/22

135 ° E MEAN TIME



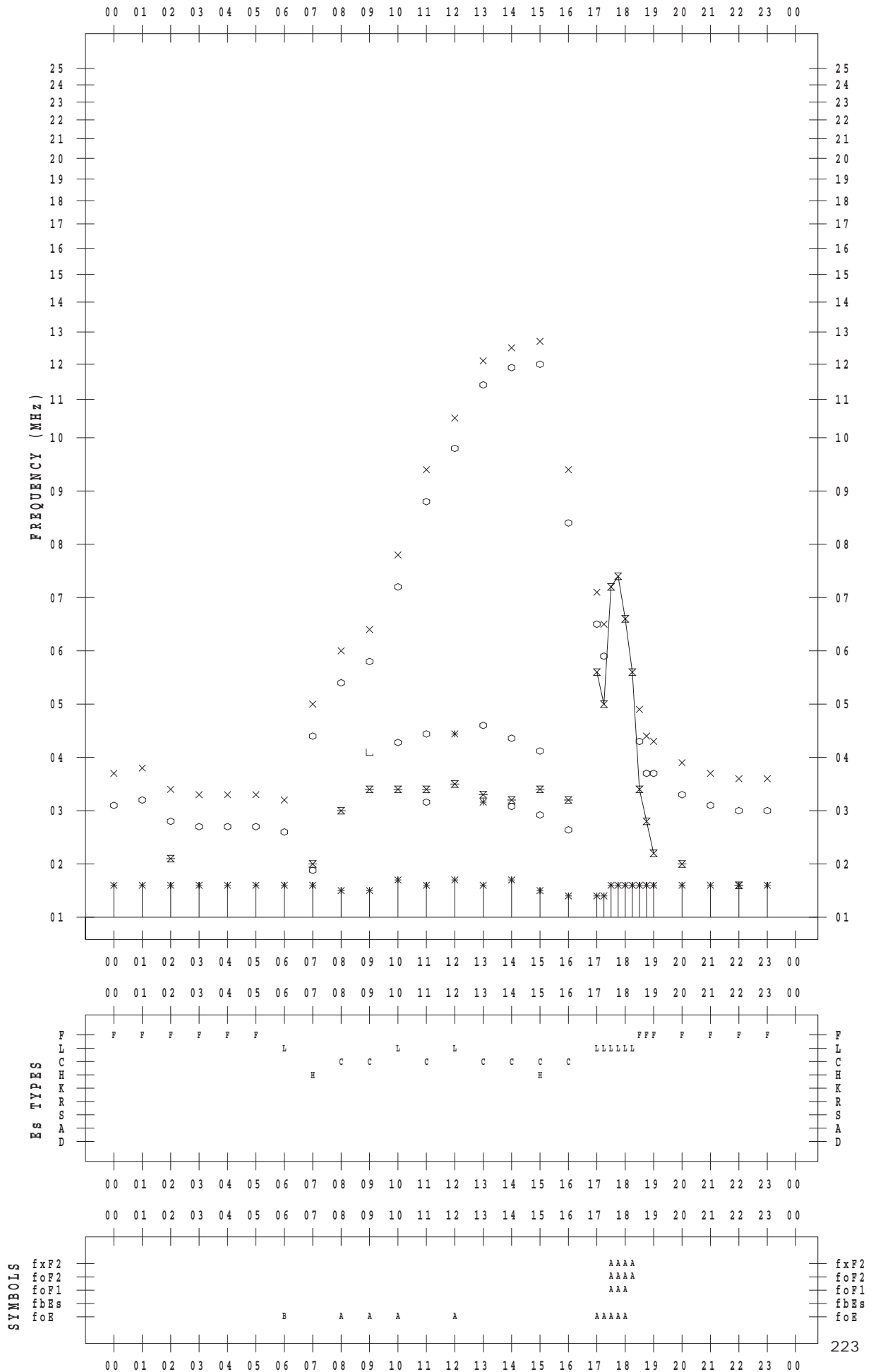
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/23

135 ° E MEAN TIME



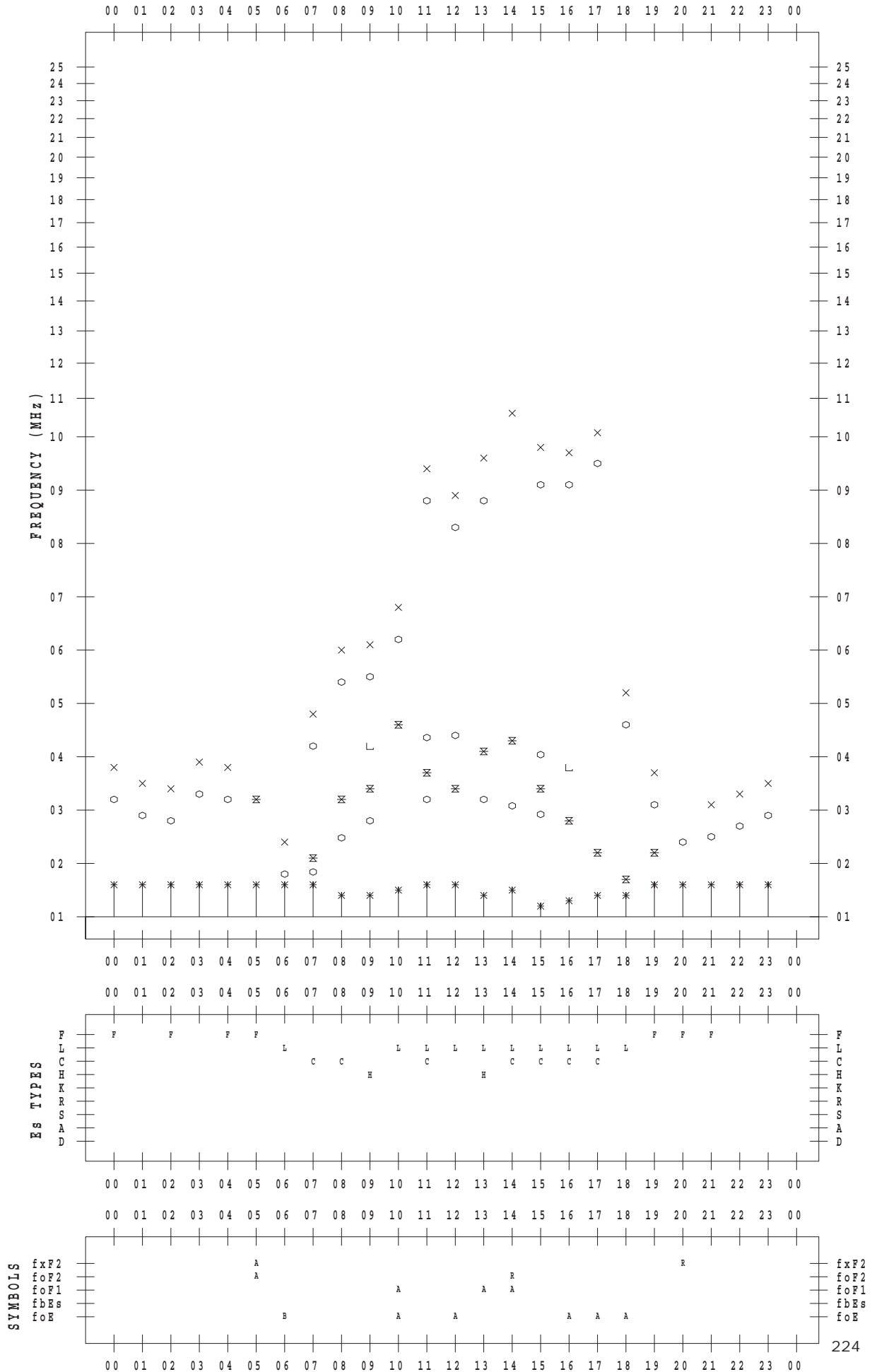
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/24

135 ° E MEAN TIME



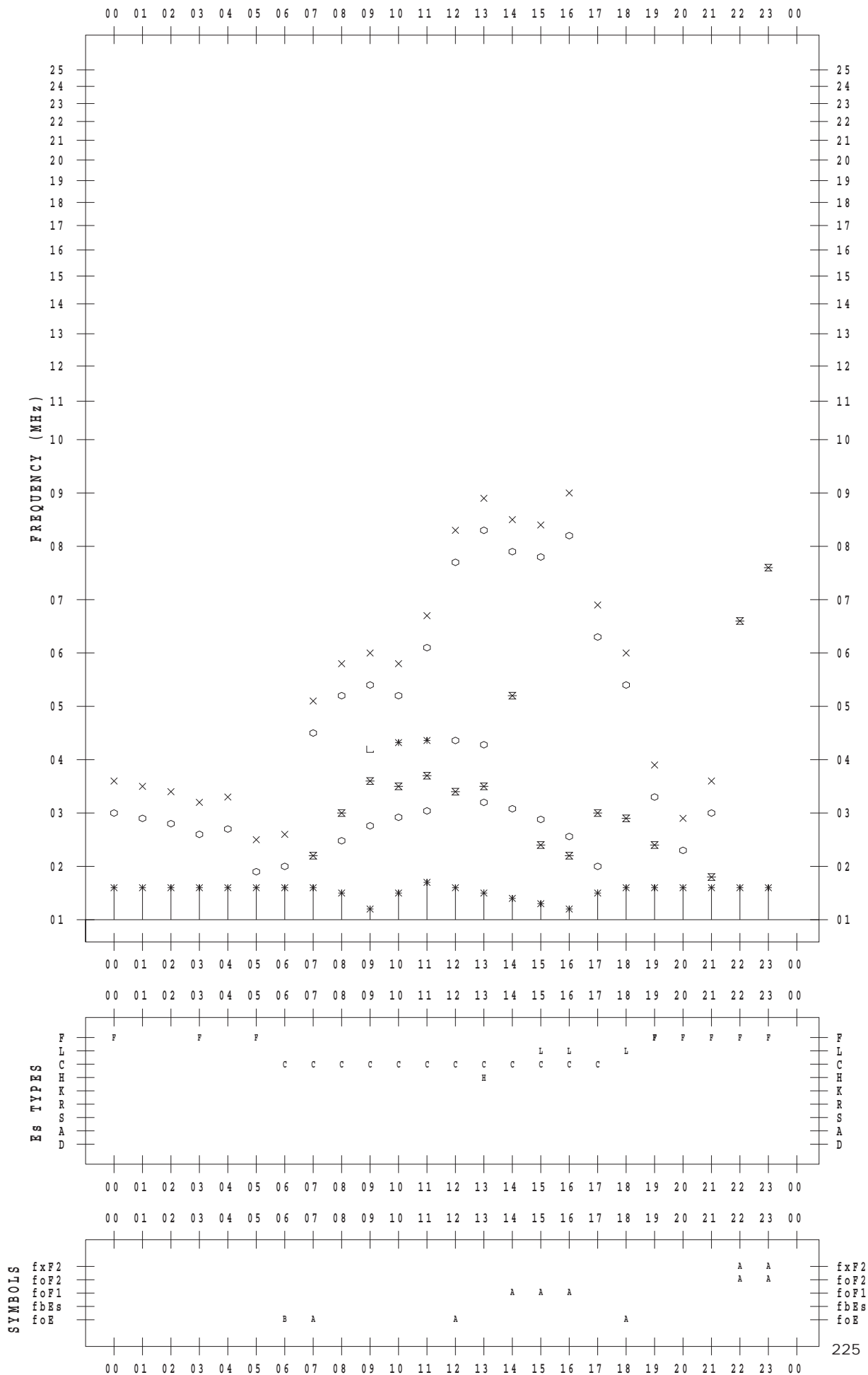
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/25

135 ° E MEAN TIME



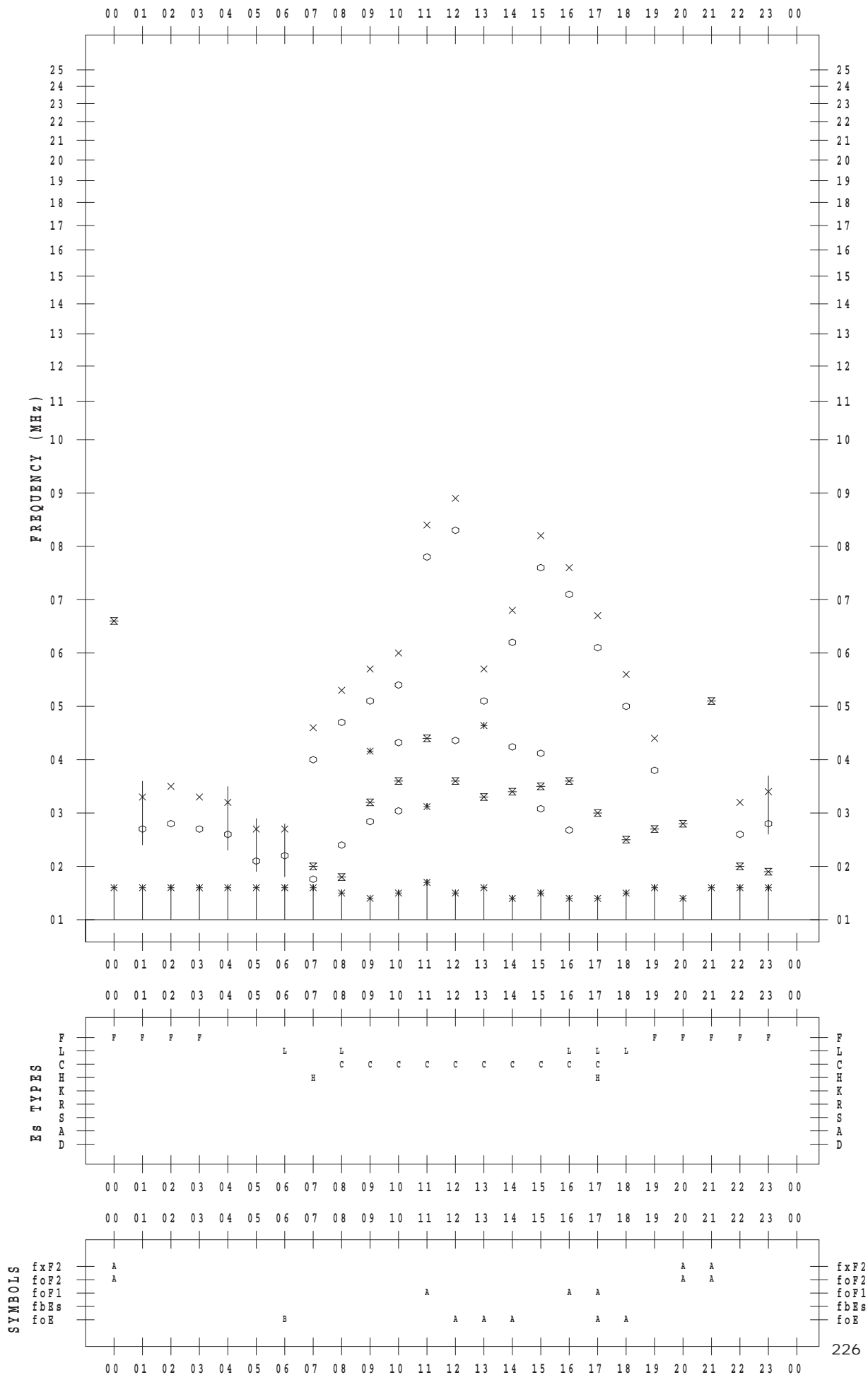
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/26

135 ° E MEAN TIME



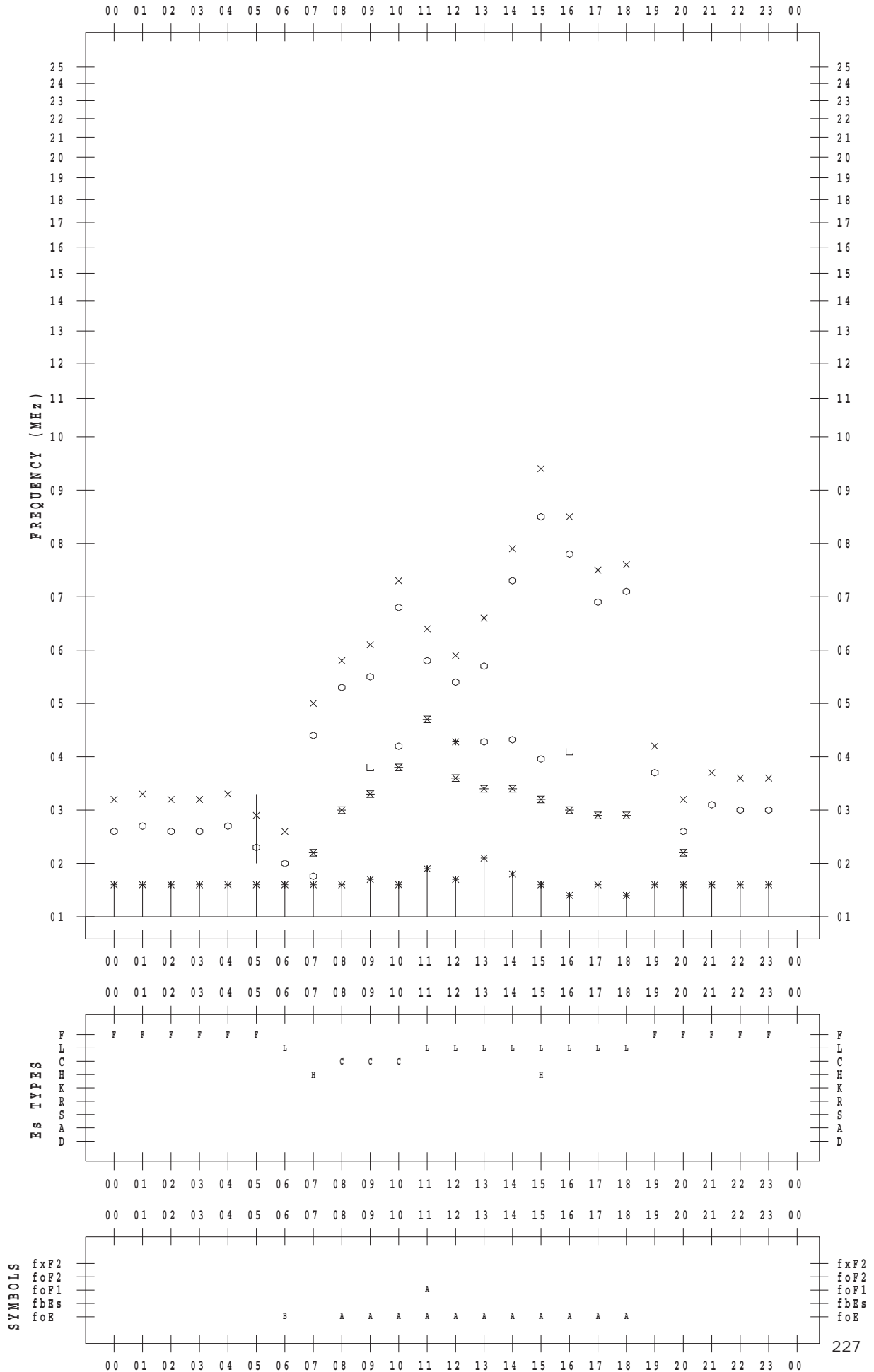
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/27

135 ° E MEAN TIME



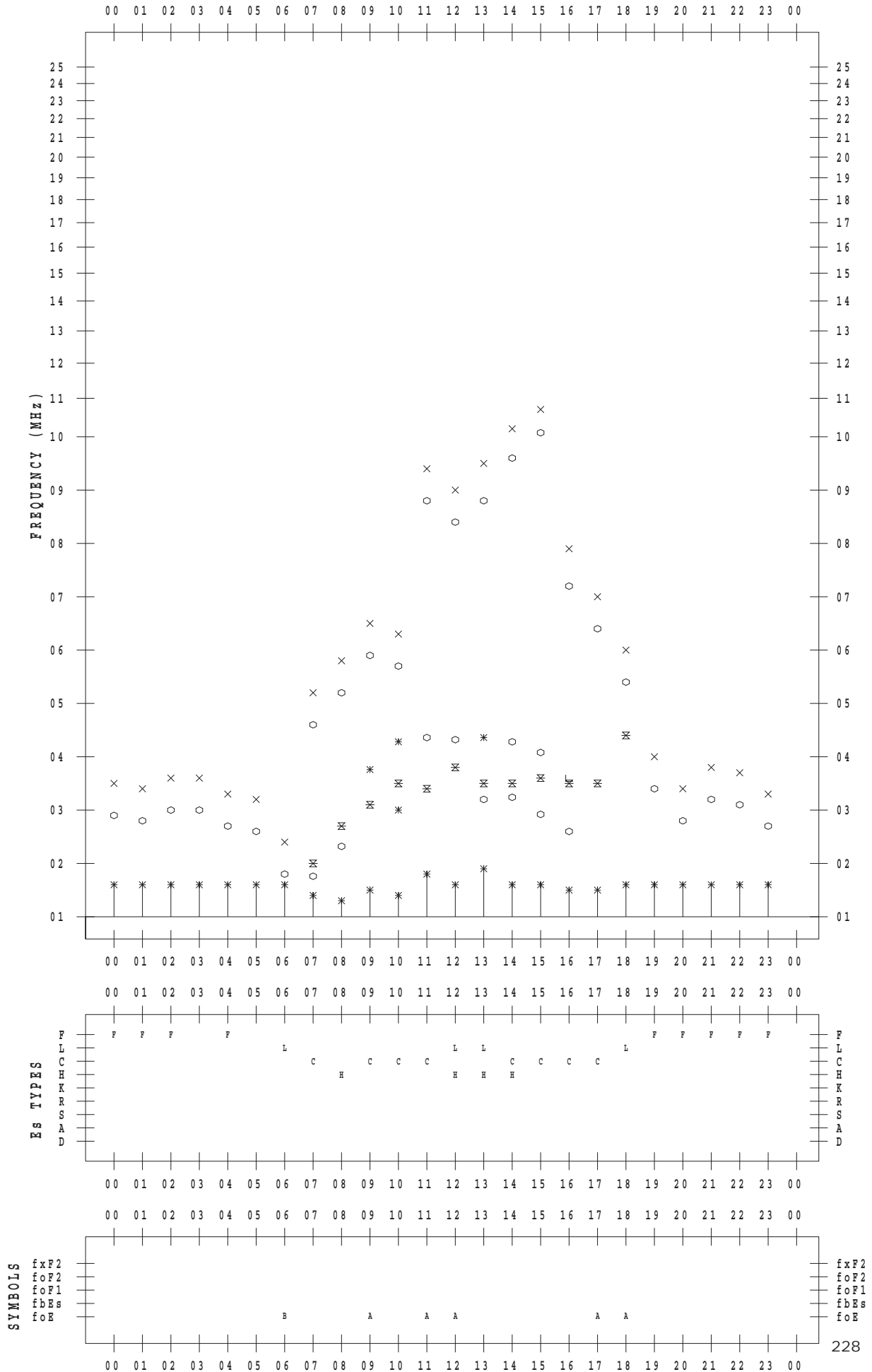
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/28

135 ° E MEAN TIME



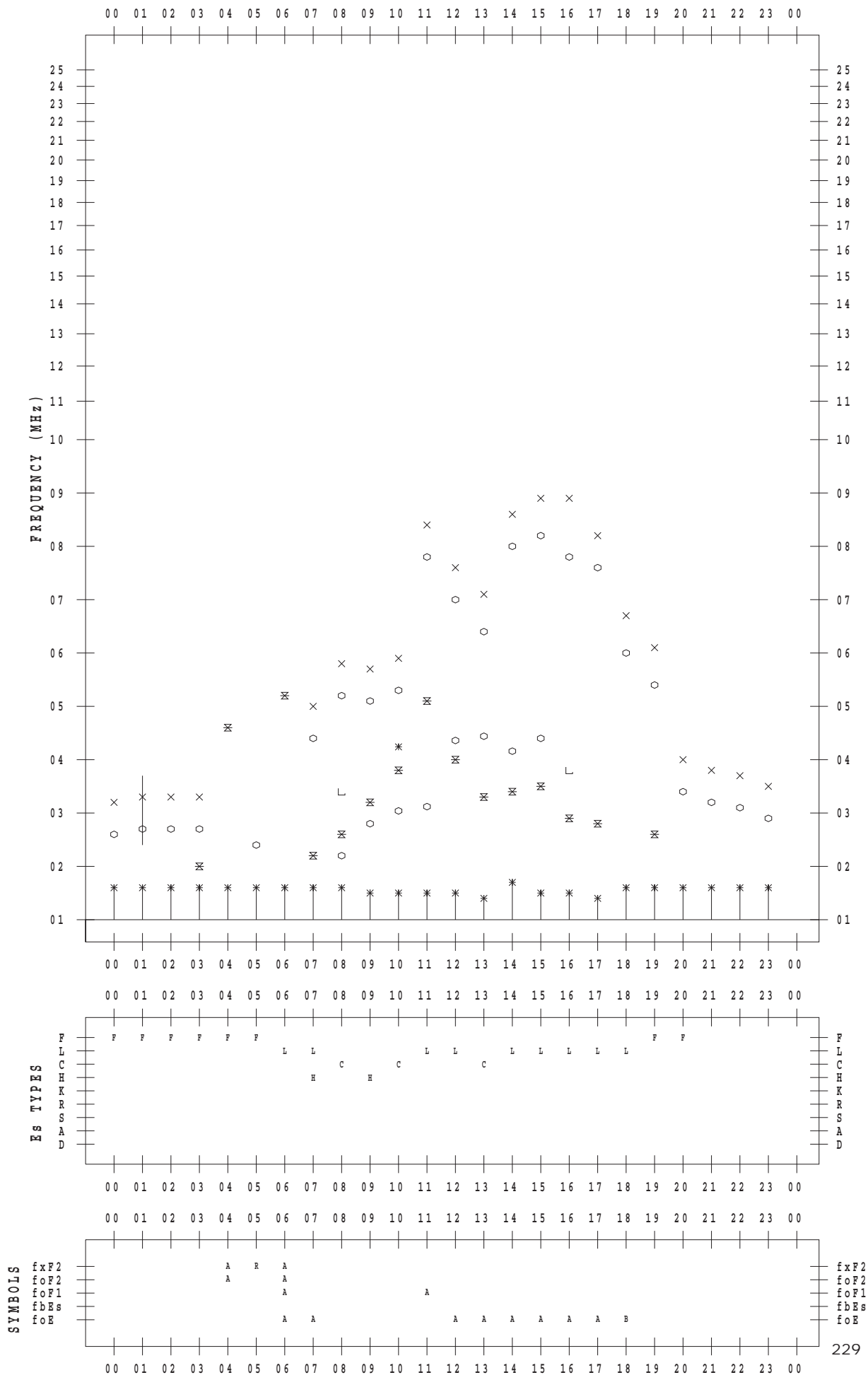
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/29

135 ° E MEAN TIME



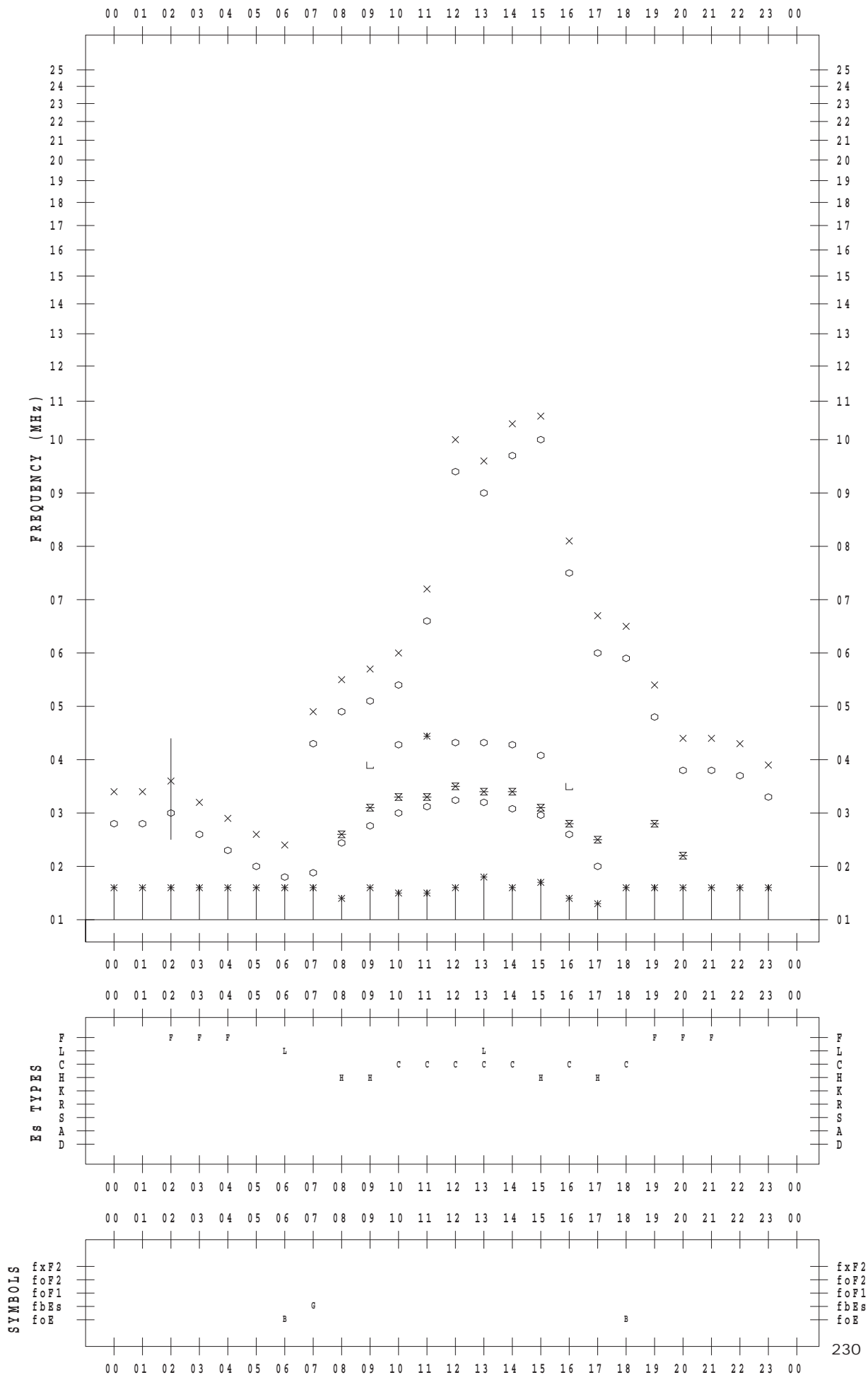
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/30

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/10/31

135 ° E MEAN TIME

