

# IONOSPHERIC DATA IN JAPAN

FOR April 2022

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NATIONAL INSTITUTE OF INFORMATION  
AND COMMUNICATIONS TECHNOLOGY  
TOKYO, JAPAN

# INTRODUCTION

This Series contains data on ionosphere obtained at the following stations under the National Institute of Information

and Communications Technology, Japan.

Stations	Geographic (WGS84)		Geomagnetic (IGRF-13 (2022))		Technical Method
	Latitude	Longitude	Latitude	Longitude	
*Wakkanai/Sarobetsu	45°10'N	141°45'E	37.1°N	149.9°W	Vertical Sounding
Kokubunji	35°43'N	139°29'E	27.5°N	150.8°W	Vertical Sounding
Yamagawa	31°12'N	130°37'E	22.4°N	158.5°W	Vertical Sounding
Okinawa	26°41'N	128°09'E	17.8°N	160.5°W	Vertical Sounding

\*We moved the observation facilities at Wakkanai to Sarobetsu in 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.

### 1. Automatic Scaling

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

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

#### a. Characteristics of Ionosphere

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

#### b. Descriptive Letters

The following descriptive letters are used in the tables.

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

#### d. Reliability of Automatic Scaling

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

#### e. Summary Plot

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

### 2. Manual Scaling

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

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

#### a. Characteristics of Ionosphere

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

#### b. Symbols

## (i) Descriptive Letters

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

- A** Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.
- B** Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.
- C** Measurement influenced by, or impossible because of, any non-ionospheric reason.
- D** Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.
- E** Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.
- F** Measurement influenced by, or impossible because of, the presence of spread echoes.
- G** Measurement influenced by, or impossible because the ionization density of the layer is too small to enable it to be made accurately.
- H** Measurement influenced by, or impossible because of, the presence of a stratification.
- K** Presence of particle *E* layer.
- L** Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.
- M** Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.
- N** Conditions are such that the measurement cannot be interpreted.
- O** Measurement refers to the ordinary component.
- P** Man-made perturbations of the observed parameter; or spur type spread *F* present.
- Q** Range spread present.
- R** Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
- S** Measurement influenced by, or impossible because of, interference or atmospheric.
- T** Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
- V** Forked trace which may influence the measurement.
- W** Measurement influenced or impossible because the echo lies outside the height range recorded.
- X** Measurement refers to the extraordinary component.
- Y** Lacuna phenomena, severe layer tilt.
- Z** Third magneto-electronic component present.

## (ii) Qualifying Letters

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

- A** Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.
- D** Greater than.
- E** Less than.
- I** Missing value has been replaced by an interpolated value.
- J** Ordinary component characteristic deduced from the extraordinary component.

**M** Mode interpretation uncertain.

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

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

**U** Uncertain or doubtful numerical value.

**Z** Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

- f** An *Es* trace which shows no appreciable increase of height with frequency.
- l** A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the part *E* layer minimum virtual height.
- c** An *Es* trace showing a relatively symmetrical cusp at or below *foE*. ( Usually a daytime type. )
- h** An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. ( Usually a daytime type. )
- q** An *Es* trace which is diffuse and non-blanketing over a wide frequency range.
- r** An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.
- a** An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.
- s** A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.
- d** A weak diffuse trace at heights below 95 km as-associated with high absorption and large *fmin*.
- n** The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.
- k** The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* ( particle *E* ) the *Es* type precedes k.

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

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

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

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



HOURLY VALUES OF fof2                      AT Wakkanai

APR. 2022

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	62	69	64	70	57	64	69	64	71	68	78	77	79	83	79	76	78	82	79	80	69	63	61	57	
2	62	63	50	51	46	52	69	81	82		97	97	89	101	99	99	89	85	85	71	65	65	62	61	
3	61	57	57	54	50	52	57	72	78	91	86	93	91	101	95	83	79	79	76	78	76	74	68	69	
4	64	69	63	55	52	54	49	55	66	79	91	99	99	104	104	97	89	84	85	82	70	66	63	56	
5	55	51	53	49	52	57	60	72	80	89	89	93	101	92	90	96	87	85	80	73	74	68	68	67	
6	65	64	63	53	51	53	67	83	86	93	100	96	95	98	102	98	95	81	87	79	69	67	66	66	
7	64	66	65	61	54	57	70	75	89	93	102	101	103	101	94	87	90	91	85	82	77	71	67	63	
8	66	65	63	55	52	56	73	73	92	93	101	91	102	97	95	86	87	83	79	81	79	69	64	62	
9	61	61	58	58	51	53	55	60	68	79	83	88	98	95	99	100	88	85	87	93	84	83	67	62	
10	61	57	54	51	54	48	54	47	51	48	67	73	78	83	85	85	99	81	85	71	70	53	49	50	
11	50	50	51	51	49	53	70	78	78	77	84	88	101	91	97	87	84	80	86	88	78	67	62	59	
12	61	60	59	55	51	57	67	60	67	72	84	93	94	100	99	89	85	73	74	83	79	68	60	51	
13	50	51	45	44	40	46	45	52	61	75	78	75	72	75	68	73	75	79	77	71	63	61	55	57	
14	56	56	55	50	50	57	69	73	78	85	88	84	91	81	83	90	94	85	87	89	90	79	64	60	
15	52	41	A	33	32	37	A	37	A	A	A	A	A	45	A	47	43	43	42	43	A	38	A	30	
16	26	A	25	26	31	39	43	55	A	A		61	69	66	73	72	73	74	73	67	66	61	60	55	
17	46	47	44	40	37	42	52	53	54	55	57	58	65	67	75	71	74	76	76	74	61	60	59	56	
18	56	55	50	45	47	55	63	72	78	73	81	76	81	77	83	78	80	78	86	95	86	66	53	54	
19	53	55	54	51	48	41	56	65	59	65	68	65	69	73	79	79	73	73	70	75	75	73	63	56	
20	53	57	53	53	54	54	57	67	67	63	69	68	67		75	81	76	78	83	83	72	64	57	54	
21	52	51	50	49	51	56	71	70	72	71	69	68	71	76	79	82	82	76	82	89	83	71	60	56	
22	44	53	56	52	43	36	54	47	58	57	57	65	65	73	78	74	72	75	74	74	73	65	64	62	
23	58	57	55	52	53	56	68	66	70	74	76	75	75	77	81	84	77	76	79	85	74	70	69	69	
24	67	66	63	53	51	60	64	65	67	63	62	64	69	75	78	77	72	77	89	89	73	70	63	62	
25	60	58	56	54	52	58	68	79	87	83	84	83	80	89	85	87	86	87	89	93	86	81	73	66	
26	65	62	61	57	57	64	79	79	75	71	81	79	80	81	84	89	91	84	82	82	82	77	73	68	
27	65	66	66	61	64	71	71	80	86	85	91	90	92	86	87	92	86	89	91	100	89	73	71	69	
28	59	59	59	58	59	57	71	67	68	66	62	64	72	73	84	80	76	75	71	82	85	83	74	67	
29	66	65	61	55	55		63	64	69	67	73	67	77	79	85	83	76	79	81	81	73	73	66	65	
30	67	65	70	65	57	64	79	77	78	84	A	81	80	85	92	91	87	91	N	85	74	73	70	72	64
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	29	30	30	29	29	30	28	27	28	29	29	29	29	30	30	30	30	30	29	30	29	29	
MED	60	58	56	53	51	55	67	67	72	74	81	79	80	83	85	84	83	80	82	82	74	68	64	62	
U Q	64	65	63	55	54	57	70	75	79	85	88	92	94	96	95	90	88	85	86	88	82	73	68	66	
L Q	53	54	52	50	48	50	55	60	67	66	68	68	71	75	79	78	76	76	76	74	70	65	60	56	

HOURLY VALUES OF fEs                      AT Wakkanai

APR. 2022

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	25	G	G	G	G	G	33	37	39	35	34	35	34	34	32	35	28	23	G	G	G	G	23	24
2	26	G	G	G	G	G	23	34	30		40	39	G	56	34	32	28	G	G	26	34	G	G	G
3	G	G	G	26	G	G	G	31	45	47	69	39	54	93	38	31	27	G	G	31	G	G	G	G
4	G	G	G	32	G	G	28	38	38	34	37	147	39	34	34	30	64	31	G	31	31	G	G	G
5	G	G	G	G	G	G	32	35	38	43	32	52	39	36	35	40	30	29	G	26	G	G	G	G
6	G	G	G	G	31	G	44	43	38	38	46	40	48	38	38	37	32	G	G	32	27	26	24	G
7	G	G	G	G	G	G	32	34	37	40	38	36	38	52	41	32	38	31	G	G	G	24	26	G
8	G	G	G	G	G	G	33	35	39	46	38	54	36	40	37	50	28	G	G	27	29	G	G	G
9	G	G	G	G	24	26	33	33	37	40	108	N	50	34	41	42	36	G	G	G	G	G	G	G
10	G	G	G	G	G	G	24	34	38	38	40	42	48	54	51	34	G	31	28	24	24	G	G	G
11	G	G	G	G	G	31	40	44	35	50	56	60	51	49	35	39	40	34	33	58	32	38	35	33
12	G	G	G	G	G	G	34	35	38	66	45	50	70	45	49	60	58	49	30	58	34	41	39	41
13	24	32	28	G	G	32	25	109	38	46	47	48	51	40	38	38	34	26	26	G	G	50	G	
14	G	G	30	G	G	G	32	36	37	38	48	46	40	44	91	42	34	24	G	G	G	G	G	28
15	149	23	39	26	28	166	33	33	38	58	104	38	38	36	32	41	34	35	36	35	39	32	38	26
16	G	32	G	25	G	G	38	41	64	59	54	44	38	41	48	40	38	34	G	G	27	53	48	44
17	39	28	G	G	G	G	33	34	44	38	38	36	50	G	35	46	50	31	34	34	G	29	26	29
18	33	25	29	G	31	G	30	33	46	36	40	48	47	45	35	32	38	44	27	28	G	40	28	34
19	32	G	G	G	G	G	36	47	52	38	47	44	37	48	34	40	32	G	28	26	G	G	G	G
20	26	G	27	28	G	G	28	30	36	46	40	41	49		35	39	37	32	G	30	35	23	G	G
21	G	G	G	G		G	33	37	40	35	34		42	38	35	34	35	33	33	34	28	26	37	G
22	28	39	27	25	25	32	24	36	50	49	48	38	44	40	36	49	71	69	52	34	25	G	32	G
23	G	G	G	G	G	G	33	90	38	49	50	54	56	57	36	45	57	38	43	64	38	27	G	G
24	G	G	33	28	27	32	145	39	151	58	64	56	50	59	64	66	44	39	40	30	38	G	G	G
25	32	G	34	40	29	G	25	37	46	48	53	41	45	53	46	37	36	36	G	G	G	G	G	G
26	G	G	G	G	G	29	34	38	44	45	37	43	36	44	50	34	37	32	58	G	G	G	G	G
27	G	G	G	G	G	G	32	35	38	41	38	45	43	49	38	40	36	37	33	26	G	G	G	G
28	G	G	G	G	G	G	55	38	40	50	38	60	40	46	36	39	44	37	28	39	40	29	G	G
29	26	G	G	G	25		40	56	94	94	46	52	55	42	55	58	74	86	62	58	G	34	53	55
30	G	G	G	48	38	38	39	37	54	53	114	36	44	36	35	38	50	72	65	49	26	35	43	33
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	29	29	30	30	30	29	30	28	30	29	30	30	30	30	30	30	30	30	30	30
MED	G	G	G	G	G	G	33	36	38	46	42	44	44	42	38	39	37	32	26	29	26	G	12	G
U Q	26	G	27	25	25	27	34	38	46	51	53	52	50	50	48	42	44	37	34	34	32	29	35	28
L Q	G	G	G	G	G	G	28	34	38	38	38	39	39	36	35	34	34	26	G	G	G	G	G	G

HOURLY VALUES OF fmin                      AT Wakkanai

APR. 2022

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	17	15	17	15	14	15	17	16	15	16	15	17	17	17	17	17	17	13	16	14	14	15	16	16
2	16	16	16	16	14	14	23	17	17		17	19	44	15	15	17	15	15	17	15	15	14	14	15
3	16	16	15	15	16	15	15	16	16	16	20	19	18	17	16	15	13	23	15	16	17	16	15	16
4	14	15	15	15	15	14	16	17	15	15	15	22	16	17	17	15	16	15	17	17	15	15	14	14
5	14	15	14	14	14	15	15	15	15	17	16	20	19	18	16	15	16	15	18	14	14	14	15	16
6	14	15	15	15	16	15	15	16	15	5	18	16	16	21	18	14	14	15	17	16	15	15	16	16
7	15	14	14	14	16	15	17	17	14	15	15	15	15	17	15	15	15	15	18	14	15	15	16	16
8	14	16	14	15	14	17	16	17	14	15	16	16	17	18	15	15	14	13	15	15	15	14	16	14
9	15	15	14	16	16	15	16	15	14	17	15	15	17	17	13	13	13	13	17	14	14	14	15	14
10	14	15	14	14	14	15	16	16	14	15	15	18	19	16	15	15	15	13	14	16	16	16	16	15
11	15	14	37	15	14	15	15	15	14	15	13	15	15	14	13	15	13	14	16	17	16	15	16	16
12	14	15	14	14	14	16	16	15	15	15	15	14	17	17	18	17	13	15	16	17	16	15	15	15
13	15	16	16	15	15	14	16	14	15	14	16	20	16	17	15	14	14	13	16	16	17	15	15	15
14	15	14	15	15	14	15	16	14	15	15	16	19	17	15	14	16	14	14	15	16	14	14	17	15
15	16	16	16	17	15	16	15	15	14	14	17	21	20	19	17	15	16	17	16	14	15	17	15	15
16	14	16	16	16	14	16	16	15	15	15	15	20	20	19	17	15	15	16	15	14	15	17	15	15
17	15	15	14	16	16	18	16	15	15	16	17	20	19	48	21	17	15	15	15	14	14	16	16	16
18	16	16	15	16	16	15	16	16	16	22	22	21	23	23	20	17	15	14	15	15	15	15	15	16
19	16	14	14	15	15	18	15	15	17	15	19	21	18	19	22	19	14	16	15	15	16	14	17	16
20	15	16	16	16	16	17	16	16	14	20	18	20	20		15	17	15	17	15	14	17	16	16	15
21	15	14	14	14	15	18	16	16	16	18	17		20	19	19	16	17	16	16	16	15	15	16	14
22	16	15	16	17	15	16	16	15	15	16	19	17	21	18	19	16	14	14	14	16	16	14	16	15
23	15	14	14	15	15	15	16	13	16	17	15	17	14	21	15	14	15	15	14	15	15	15	17	14
24	14	16	17	15	15	16	16	14	15	15	14	15	21	18	19	15	15	17	15	14	14	15	14	17
25	16	17	16	15	16	15	16	16	16	15	14	21	21	17	15	15	14	16	15	14	14	14	14	14
26	14	14	14	15	16	16	16	15	16	17	16	19	19	19	15	16	15	15	15	14	14	14	14	14
27	14	14	15	14	16	20	15	15	15	15	15	16	17	19	15	14	14	13	15	17	16	14	14	17
28	14	14	14	14	14	15	16	15	15	15	15	19	21	21	17	15	15	13	14	15	15	16	16	18
29	16	14	14	16	15		14	15	15	15	16	16	15	16	14	13	13	14	15	17	16	16	14	16
30	16	14	17	14	14	14	15	16	19	15	17	19	17	17	27	17	16	15	15	14	16	17	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	30	30	30	29	30	29	30	29	30	30	30	30	30	30	30	30	30	30
MED	15	15	15	15	15	15	16	15	15	15	16	19	18	18	16	15	15	15	15	15	15	15	15	15
U Q	16	16	16	16	16	16	16	16	16	16	17	20	20	19	18	17	15	16	16	16	16	16	16	16
L Q	14	14	14	14	14	15	15	15	15	15	15	16	17	17	15	15	14	14	15	14	14	14	15	15

HOURLY VALUES OF foF2                      AT Kokubunji

APR. 2022

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	62	60	62	55	57	54	72	89	98	107	119	130	113	113	113	103	93	100	97	85	69	65	67	64
2	67	69	71	45	46	44	71	84	92	101	107	112	105	109	114	115	103	96	93	86	64	64	69	66
3	65	64	63	59	57	55	71	82	89	100	105	110	115	117	125	111	90	90	97	95	78	65	62	61
4	63	60	65	58	45	50	63	76	91	109	105	111	135	134	127	122	113	115	106	95	61	61	64	63
5	62	55	57	55	52	54	83	87	93	95	101	107	107	120	120	104	97	93	91	83	71	63	61	65
6	65	60	59	55	51	53	72	88	100	101	105	107	108	110	113	113	105	101	97	83	67	63	63	66
7	63	66	69	58	49	49	69	83	93	99	103	103	110	113	105	99	99	100	101	89	73	76	71	69
8	67	72	73	63	N 61	62	79	93	95	97	105	103	106	108	109	98	95	97	97	90	73	67	67	68
9	66	64	64	61	51	55	68	69	79	93	104	107	114	121	121	112	108	99	100	99	89	74	68	66
10	64	63	55	58	56	62	85	95	79	81	96	101	108	116	117	87	114	111	106	95	61	54	43	50
11	48	51	50	44	43	53	78	84	76	89	99	101	103	111	114	110	99	96	107	97	78	63	62	63
12	57	60	61	59	54	59	69	79	79	84	90	104	115	119	122	114	106	103	106	104	87	66	59	56
13	55	56	54	51	47	53	67	76	80	97	101	87	101	106	99	92	99	113	109	76	55	54	54	56
14	55	55	54	50	46	50	67	78	83	89	96	101	110	107	107	108	101	109	117	107	98	88	64	68
15	62	51	50	40	41	40	A	A	42	A	A	A	A	65	A	61	61	58	66	72	63	45	45	48
16	46	48	44	43	50	59	55	69	65	69	75	84	95	87	89	91	83	82	82	77	A	59	57	57
17	55	50	50	40	37	48	67	82	89	89	91	82	87	89	91	95	97	94	94	93	70	A	57	59
18	57	56	52	51	40	59	77	73	78	85	85	94	103	109	112	115	113	108	108	108	87	A	49	50
19	51	50	49	42	47	55	71	75	86	81	79	86	94	97	97	98	95	92	93	92	91	65	54	53
20	54	52	51	45	51	49	79	69	76	77	78	82	88	90	105	111	107	112	96	75	A	55	55	
21	54	47	54	48	49	51	82	97	79	69	71	90	98	99	103	113	100	103	104	95	68	53	A	
22	53	53	56	54	41	51	64	74	67	61	71	83	102	106	102	102	100	95	99	91	76	A	64	62
23	63	60	57	55	53	59	73	70	74	75	92	83	92	97	100	101	102	101	102	95	80	74	76	66
24	76	70	67	60	55	67	95	84	74	86	87	87	91	91	96	101	109	105	108	97	68	69	79	67
25	65	69	68	60	57	60	81	91	87	93	86	92	97	111	114	118	108	97	103	101	92	69	75	69
26	65	69	67	65	64	68	89	86	81	87	86	99	103	111	101	108	104	100	91	94	91	81	71	72
27	71	70	76	72	57	63	79	84	88	103	101	99	112	118	114	121	121	120	120	100	79	77	83	85
28	78	70	70	72	70	74	69	77	86	97	83	95	105	111	89	83	91	95	89	81	71	69	A	69
29	71	68	67	64	63	66	74	75	76	71	68	75	80	95	101	101	103	95	97	88	68	A	73	69
30	71	70	65	67	72	73	68	70	79	83	88	88	92	100	105	116	107	94	93	89	A	75	77	75
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	29	29	29	29	28	29	29	29	29	30	30	30	30	28	26	30	29
MED	63	60	60	55	51	55	72	82	80	89	96	99	103	109	109	104	102	100	100	94	76	66	64	65
U Q	66	69	67	60	57	62	79	86	90	98	103	105	110	114	114	113	108	105	106	97	88	74	71	68
L Q	55	53	54	48	46	51	68	74	76	81	85	85	93	97	99	98	97	94	93	88	68	63	57	56



## HOURLY VALUES OF fEs AT Kokubunji

APR. 2022

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	34	G	G	G	G	G	50	33	37	34	34	40	38	32	33	G	29	31	G	G	G	G	G	G	
2	G	G	G	G	G	G	32	38	35	39	41	41	G	39	36	48	41	36	29	26	53	G	33	40	
3	33	G	G	G	G	G	47	49	31	38	36	G	38	46	35	40	34	G	G	23	29	28	24	27	
4	G	G	G	G	G	G	45	34	36	61	45	42	48	48	36	33	41	33	38	34	29	25	G	G	
5	G	G		G	G	G	G	27	39	34	36	48	38	41	41	38	33	32	G	G	26	41	28	G	
6	31	34	32	G	G	G	32	33	39	46	40	48	40	40	37	33	29	29	G	G	G	G	G	G	
7	G	G	G	G	G	G	31	56	38	39	36	36	38	G	42	33	29	25	24	G	26	33	33	34	
8	28	40	29	29	G	G	G	34	37	57	53	60	41	55	53	37	33	40	31	31	29	28	G	33	
9	G	G	G	G	24	G	48	33	33	38	48	53	38	41	36	33	34	36	29	27	G	G	G	G	
10	G	G	G	G	G	G	28	33	36	40	50	48	38	53	37	34	48	36	90	29	40	G	G	G	
11	G	G	G	G	G	G	24	32	35	32	32	49	40	38	41	50	54	63	52	56	38	31	G	40	
12	G	G	G	G	G	G	25	34	51	42	52	50	49	52	47	35	41	41	40	26	30	46	24	G	
13	28	32	G	G	29	G	39	40	36	57	59	59	52	56	45	57	50	42	G	26	33	29	29	G	
14	G	G	31	G	G	88	24	33	91	38	45	54	34	G	40	34	34	45	40	35	34	34	G	41	
15	G	G	38	G	27	G	32	32	116	47	52	60	61	62	68	34	38	38	39	38	38	34	G	46	
16	29	41	G	G	G	34	32	38	34	47	41	41	42	39	64	62	62	66	50	G	72	48	23	50	
17	G	26	29	25	G	G	34	32	45	32	50	45	57	G	G	G	34	36	32	G	G	60	32	G	
18	G	G	24	G	G	G	35	34	32	47	148	50	49	40	52	45	48	56	43	41	26	50	G	28	
19	G	30	G	G	G	G	37	41	50	48	41	50	52	59	56	35	46	41	40	42	34	29	G	G	
20	G	G	G	G	G	G	G	29	33	54	52	55	58		46	51	48	45	180	40		87	48	33	
21	G	33	25	G	G	G	31	37	38	37	37		G	37	35	34	48	45	43	33	24	41	40	54	
22	29	G	G	G	G	G	34	31	41	41	53	50	49	39	G	33	71	64	63	72	69	106	G	25	
23	27	27	28	G	G	G	G	34	40	54	67	48	60	68	33	32	35	59	54	27	38	59	34	27	
24	39	32	G	G	G	G	40	47	63	71	70	57	57	104	65	88	51	65	57	60	57	70	71	41	
25	G	G	G	G	G	G	38	71	49	57	68	54	60	54	43	35	37	40	42	49	77	56	G		
26	G	G	G	G	G	G	G	31	47	64	36	35	45	36	36	39	49	45	52	G	40	G	G	G	
27	G	G	G	G	G	G	36	42	39	47	47	48	46	45	53	57	41	33	39	G	G	G	G	G	
28	G	G	G	G	G	47	31	36		55	55	52	G	57	G		48	44	46	33	60	G	G	G	
29	41	G	G	G	G	G	34	50	64	37	84	37	35	G	49	53	58	57	65	45	43	92	52	56	
30	41	26	G	45	32	G	42	37	39	116	68	77	59	40	G	51	31	47	62	65	85	81	48	G	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	29	30	30	30	30	30	29	30	30	29	30	29	30	29	30	30	30	30	29	30	30	29	
MED	G	G	G	G	G	G	32	34	39	46	49	49	44	41	40	35	41	41	40	30	34	34	G	25	
U Q	29	27	25	G	G	G	38	40	48	55	55	54	52	54	49	50	48	47	52	41	48	56	33	40	
L Q	G	G	G	G	G	G	25	33	35	38	40	41	38	37	35	33	34	36	29	G	26	G	G	G	

HOURLY VALUES OF fmin                      AT Kokubunji

APR. 2022

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	16	15	15	13	13	13	15	16	15	17	14	15	14	15	15	15	15	15	17	13	13	13	13	14	
2	13	13	13	13	13	15	16	15	14	17	26	29	49	14	16	15	15	15	15	16	16	17	16	16	
3	15	15	17	15	15	15	22	15	14	14	13	43	39	29	14	13	16	15	15	15	16	16	16	16	
4	13	13	21	14	13	13	15	16	14	17	14	22	17	19	35	16	15	16	15	15	15	15	16	14	
5	13	13		14	17	13	15	15	15	17	16	17	17	29	17	14	13	15	15	15	15	15	16	13	
6	16	15	16	13	14	14	15	16	15	18	15	16	21	22	16	16	17	14	17	13	13	13	13	13	
7	14	13	15	13	14	13	15	16	14	15	17	15	23	40	20	17	16	14	15	15	15	16	16	15	
8	16	15	15	15	15	14	22	16	14	15	19	17	16	16	20	15	15	14	15	16	15	15	14	16	
9	14	13	13	13	15	13	23	15	14	17	17	18	19	16	19	15	15	17	15	15	15	16	13	15	
10	15	13	16	13	14	13	15	17	15	14	16	18	15	20	16	20	14	14	16	16	14	16	14	13	
11	14	13	15	15	16	14	17	15	17	16	16	16	21	19	19	15	13	15	15	15	16	15	15	15	
12	15	21	13	13	16	13	20	17	17	19	19	19	19	23	23	22	14	15	15	15	16	16	15	14	
13	15	16	13	15	15	15	14	15	15	14	19	21	21	14	17	15	15	14	18	15	16	15	15	16	
14	15	15	16	16	15	11	15	16	15	16	23	23	21	23	20	15	17	17	15	14	14	15	16	14	
15	16	15	15	15	15	15	15	16	15	16	19	15	20	20	19	25	14	17	14	14	15	16	16	15	
16	15	14	14	13	14	15	22	15	16	16	21	19	34	17	20	20	18	17	15	15	15	15	16	14	
17	16	15	15	16	15	15	16	15	15	15	17	35	22	57	45	16	15	14	15	15	16	15	15	16	
18	15	15	15	16	14	17	15	17	16	20	10	23	21	33	21	19	15	15	15	15	15	15	16	15	
19	15	15	14	13	14	14	15	16	15	16	19	21	22	21	23	17	15	15	15	15	16	15	16	14	
20	16	15	13	13	13	13	15	17	17	21	19	38	37		25	16	20	15	13	14	15	15	15	15	
21	17	16	16	13	14	14	16	14	16	21	20		46	19	20	18	17	14	14	16	15	15	15	15	
22	15	15	13	16	13	14	16	17	16	18	17	17	21	45	43	16	16	13	14	13	15	15	15	15	
23	16	15	15	13	15	14	15	16	15	15	19	20	20	21	26	22	17	14	14	15	14	14	14	15	
24	15	16	15	15	16	14	17	15	19	17	20	23	25	19	19	18	14	15	14	15	14	15	14	15	
25	15	13	18	14	13	18	16	16	15	15	17	40	22	36	20	16	16	15	14	14	15	15	13		
26	13	13	15	13	13	15	14	14	20	21	21	21	22	17	17	19	17	14	15	15	15	13	15	15	
27	13	14	13	13	15	20	16	17	19	21	22	20	18	16	20	16	15	16	14	13	13	13	14	14	
28	13	14	18	13	13	18	15	17		19	21	19	49	40	41		14	14	14	16	15	15	13	15	
29	15	15	13	13	13	18	15	14	16	19	20	20	22	50	18	18	15	14	14	15	16	15	15	15	
30	15	15	15	14	15	20	15	15	17	11	21	23	21	18	55	24	17	16	14	15	14	15	15	14	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	29	30	30	30	30	30	29	30	30	29	30	29	30	29	30	30	30	30	30	30	30	29	
MED	15	15	15	13	14	14	15	16	15	17	19	20	21	20	20	16	15	15	15	15	15	15	15	15	
U Q	16	15	16	15	15	15	16	16	16	19	20	23	23	31	23	19	17	15	15	15	16	15	16	15	
L Q	14	13	13	13	13	13	15	15	15	15	16	17	19	17	17	15	15	14	14	14	14	14	15	14	14

HOURLY VALUES OF foF2                      AT Yamagawa

APR. 2022

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	67	65	64	57	58	53	61	76	94	101	113	115	120	118	121	114	109	109	115	107	71	74	72	80	
2	72	86	76	56	48	50	66	78	95	93	110	117	117	115	128	122	114	107	105	107	94	67	68	71	
3	66	65	63	56	53	52	57	83	92	100	103	111	122	127	129	119	105	100	111	103	91	58	61	62	
4	61	60	60	61	51	42	50	68	87	96	110	113	128	145	125	132	117	121	115	106	97	75	76	70	
5	62	60	60	60	54	52	67	77	87	93	110	105	117	135	127	118	107	101	99	98	77	67	67	73	
6	73	67	64	59	49	51	57	79	92	97	98	101	108	115	119	119	119	119	108	97	86	72	68	70	
7	71	72	79	67	45	45	50	75	87	99	104	101	104	112	109	105	106	102	98	101	96	79	81	59	
8	73	73	77	69	55	53	63	80	94	96	94	102	109	124	118	117	107	98	102	97	85	62	70	71	
9	72	72	63	60	54	50	57	73	87	92	105	100	103	112	117	113	113	109	107	104	96	63	64	62	
10	61	60	56	55	53	54	69	95	80	81	100	96	113	130	135	110	120	117	108	102	75	A	50	A	
11	54	55	51	49	50	49	67	74	77	90	96	98	113	122	114	117	115	114	117	99	92	61	67	66	
12	62	60	61	58	56	54	61	73	72	76	88	104	115	126	127	126	120	125	104	99	96	61	63	67	
13	61	58	56	54	57	49	61	78	97	105	94	91	113	125	126	125	124	125	116	99	67	58	63	61	
14	62	63	52	55	45	41	52	78	96	90	101	103	116	127	121	125	121	124	118	95	108	96	74	62	
15	64	57	49	49	44	45	49	44	47	A	A	A	62	A	63	65	69	64	76	75	70	A	48	55	
16	53	55	46	41	48	44	48	63	64	67	80	97	113	121	125	115	106	107	113	111	95	62	53	56	
17	56	51	53	43	39	41	60	84	92	89	91	89	101	113	114	119	115	113	108	97	94	59	57	57	
18	60	58	57	51	51	57	69	70	75	92	86	100	117	124	124	127	120	122	119	116	102	55	62	61	
19	67	64	61	54	55	55	63	87	84	87	87	94	115	114	111	111	116	113	116	110	97	69	55	55	
20	57	58	58	53	54	54	67	73	71	89	88	87	98	80	110	111	121	125	109	113	98	66	64	70	
21	67	66	63	57	57	58	77	93	78	77	80	B	99	110	110	116	129	123	120	113	102	77	58	A	
22	59	59	62	84	60	34	57	75	71	81	80	90	107	115	123	115	122	120	118	107	87	A	65	69	
23	74	68	63	61	57	62	73	87	79	91	95	90	107	115	112	120	125	106	114	110	97	88	86	89	
24	89	80	67	67	65	62	77	80	77	87	95	99	97	101	109	119	117	122	117	112	93	87	80	78	
25	80	83	91	79	58	58	76	93	91	97	93	104	105	119	129	131	119	115	A	121	124	81	94	100	
26	101	96	104	97	90	69	88	96	88	93	93	103	110	120	119	114	109	91	107	98	97	85	82	84	
27	80	75	78	B	B	B	B	B	B	B	B	A	115	123	127	138	140	105	131	113	N	95	95	93	99
28	97	78	68	83	70	73	76	91	91	97	102	97	112	125	119	109	103	105	113	102	94	93	70	78	
29	79	71	75	57	62	65	83	80	65	79	82	86	103	113	118	121	125	122	109	101	83	69	69	79	
30	75	82	79	84	68	57	58	80	71	88	93	95	108	121	120	131	118	114	115	99	96	82	79	72	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	29	29	29	29	29	28	28	27	30	29	30	30	30	30	29	30	30	27	30	28	
MED	67	65	63	57	54	53	63	78	87	92	94	100	111	120	120	118	117	114	113	102	94	69	68	70	
U Q	74	73	75	67	58	57	71	85	92	96	102	104	115	125	126	125	121	122	116	110	97	82	76	78	
L Q	61	59	57	54	49	47	57	73	73	87	88	94	104	113	114	114	109	105	107	99	86	62	62	61	

## HOURLY VALUES OF fEs AT Yamagawa

APR. 2022

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	40	G	G	G	G	G	33	38	40	42	41	43	43	40	35	34	35	32	G	G	G	G	G	
2	G	G	G	G	G	G	G	35	43	47	41	37	G	38	49	48	47	44	G	35	G	35	33	G	
3	23	G	G	G	G	G	G	32	38	43	46	36	46	44	37	40	38	G	31	G	G	G	G	G	
4	G	G	G	G	G	G	G	48	41	40	46	42	46	48	36	43	39	34	35	29	G	G	G	G	
5	G	G	G	G	G	G	G	29	37	44	43	61	46	44	51	43	33	35	G	G	34	55	G	G	
6	G	G	G	G	G	G	G	48	37	41	48	45	46	39	48	36	38	36	33	32	37	G	G	G	
7	G	G	G	G	G	G	G	G	35	42	45	44	55	34	45	34	33	34	28	G	25	G	G	G	
8	G	G	G	G	35	27	G	48	41	45	41	41	44	51	33	38	46	42	39	41	31	G	33	G	
9	G	G	G	G	G	G	G	29	32	39	51	50	50	45	47	43	38	35	33	G	31	34	G	G	
10	G	G	G	G	G	G	G	36	41	45	46	37	41	46	57	48	40	50	61	39	48	48	34	103	
11	G	G	G	G	24	G	G	G	34	36	47	46	46	48	46	41	44	43	39	34	29	38	G	G	
12	G	G	G	G	G	G	G	54	37	47	44	38	65	50	48	45	48	46	36	34	32	11	G	G	
13	G	G	G	G	G	G	G	36	42	47	54	46	50	46	49	34	35	35	32	24	G	G	G	G	
14	G	30	G	G	G	G	G	G	36	39	46	46	48	52	50	41	44	39	34	G	40	G	G	G	
15	G	G	G	G	G	G	30	38	45	52	54	50	52	84	58	40	48	48	62	83	59	73	38	G	
16	G	60	34	G	G	G	23	45	44	48	49	51	58	50	59	55	66	47	45	41	56	11	35	33	
17	58	24	40	G	G	G	G	35	42	45	45	51	46	G	43	38	48	44	36	35	G	G	G	33	
18	46	34	G	G	34	G	G	32	43	51	60	58	59	43	69	60	47	52	60	55	70	46	41	44	
19	59	G	G	G	35	36	G	30	38	40	48	44	43	43	44	32	41	36	G	30	32	33	G	38	
20	46	G	33	29	G	G	G	33	40	49	48	43	69	G	45	45	39	35	G	G	11	11	G	37	
21	48	G	G	45	G	G	G	55	43	49	45	B	56	47	44	41	47	47	60	57	41	G	32	54	
22	40	G	G	G	G	G	G	36	53	74	54	65	92	90	98	42	47	61	57	38	33	57	G	34	
23	40	G	G	28	G	G	G	32	40	49	49	51	90	44	45	46	33	41	47	44	45	40	52	57	
24	47	34	G	G	G	G	G	40	46	42	43	54	52	51	49	42	52	45	40	64	65	G	G	41	
25	55	57	60	53	44	G	G	59	39	44	46	56	66	75	63	71	66	109	153	84	44	58	56	48	
26	54	G	G	G	G	49	42	38	46	49	60	85	111	106	88	80	63	102	49	41	G	G	49	G	
27	G	G	G	B	B	B	B	B	B	B	B	C	55	44	40	49	57	70	52	45	70	G	54	55	40
28	G	G	G	G	G	G	28	40	50	59	59	43	60	57	67	40	40	38	34	57	53	49	G	G	
29	G	G	G	G	G	G	29	44	50	72	50	55	52	56	G	45	50	59	50	44	35	34	46	G	G
30	G	G	30	G	32	45	37	34	32	66	42	48	36	38	G	51	47	50	83	46	G	G	G	32	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	
MED	G	G	G	G	G	G	G	36	41	45	46	46	50	46	48	42	45	44	38	35	32	11	G	G	
U Q	46	G	G	G	G	G	G	44	43	49	50	54	59	51	57	48	48	50	49	46	44	46	34	38	
L Q	G	G	G	G	G	G	G	32	37	41	44	42	46	43	44	40	38	35	32	24	G	G	G	G	

HOURLY VALUES OF fmin AT Yamagawa

APR. 2022

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	23	15	15	18	16	15	15	15	15	22	23	24	23	23	17	27	17	17	15	16	28	15	26	15	
2	15	15	15	15	17	14	15	26	17	19	20	24	50	20	21	15	18	19	15	16	16	15	16	14	
3	15	16	21	14	15	15	24	15	19	21	19	21	18	30	28	19	16	15	15	15	26	14	22	15	
4	23	16	15	15	15	15	18	17	16	21	23	23	21	29	19	20	18	17	17	15	17	15	15	15	
5	26	16	15	16	14	15	16	15	18	20	23	20	23	45	27	18	18	16	15	15	15	15	15	18	
6	15	15	15	15	16	16	20	16	18	22	20	24	19	20	21	27	20	15	15	15	15	15	24	26	
7	15	23	15	15	15	24	18	15	17	20	21	21	20	22	26	18	27	27	16	16	15	15	16	15	
8	26	15	14	16	15	15	15	15	17	21	21	23	23	23	21	18	23	19	15	15	17	15	16	16	
9	24	14	15	24	17	15	17	15	15	20	18	22	23	21	21	16	18	22	17	14	15	16	16	15	
10	15	15	24	15	16	15	20	15	19	21	22	23	22	24	19	20	17	17	13	15	14	15	15	15	
11	15	15	17	15	16	15	21	16	15	21	21	21	23	23	21	19	18	18	15	16	15	15	15	15	
12	16	14	15	14	15	15	16	15	16	19	24	19	21	19	22	21	19	15	15	16	16	16	15	26	
13	16	15	16	16	16	15	23	15	18	21	20	22	23	21	34	26	16	15	15	16	16	15	16	16	
14	16	16	15	28	15	21	23	26	16	19	21	22	21	23	22	21	21	16	15	14	15	15	15	26	
15	15	16	15	15	24	23	15	17	20	21	21	23	20	23	22	27	26	18	15	17	17	15	15	17	
16	15	16	15	16	15	17	15	15	20	22	21	23	19	22	19	19	18	17	15	15	15	17	15	15	
17	15	16	15	15	15	16	22	15	16	21	22	22	20	61	35	27	20	22	16	16	16	15	15	16	
18	15	15	15	16	15	16	14	15	20	21	19	19	21	23	21	22	22	22	15	14	18	15	15	15	
19	16	17	17	24	15	15	15	15	17	23	22	23	21	24	21	28	20	15	15	15	15	17	15	15	
20	15	23	16	15	15	23	14	17	19	21	22	34	21	78	22	23	21	19	15	16	15	15	26	15	
21	15	24	15	15	15	15	22	17	18	21	23	B	23	21	23	21	20	21	16	15	15	15	15	15	
22	17	15	15	21	16	15	16	17	19	21	22	21	20	22	23	23	21	20	15	15	15	15	15	16	
23	16	16	23	16	15	15	16	17	20	23	22	20	20	26	20	22	27	19	16	15	15	17	15	17	
24	15	15	15	17	22	15	15	17	21	18	22	19	21	23	22	22	23	17	14	16	15	16	15	15	
25	16	14	15	15	15	15	23	18	17	23	22	21	19	17	19	22	19	14	11	15	14	17	15	15	
26	16	16	15	15	15	15	16	14	20	20	22	23	25	22	22	23	21	13	13	14	18	16	15	23	
27	24	27	15	B	B	B	B	B	B	B	B	C	38	21	21	23	19	16	21	15	15	16	14	14	15
28	14	22	23	14	15	16	15	15	18	22	22	20	23	21	21	21	21	19	16	15	14	15	15	16	
29	15	15	15	23	15	16	15	15	17	19	24	22	23	21	23	21	20	19	16	15	15	15	15	23	
30	15	15	15	15	16	17	15	15	17	23	23	23	22	19	58	26	21	21	15	15	16	16	26	15	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	
MED	15	16	15	15	15	15	16	15	18	21	22	22	21	22	22	21	20	18	15	15	15	15	15	15	
U Q	16	16	16	16	16	16	20	17	19	22	22	23	23	24	23	23	21	20	16	16	16	16	16	17	
L Q	15	15	15	15	15	15	15	15	16	20	21	21	20	21	21	19	18	16	15	15	15	15	15	15	

## HOURLY VALUES OF foF2 AT Okinawa

APR. 2022

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	73	A	75	66	54	55	57	74	87	112	124	131	145	167	150	143	139	160	148	145	93	91	101	118	
2	113	127	119	74	58	69	67	83	93	94	120	129	131	147	151	143	141	141	138	135	120	97	77	84	
3	80	67	66	57	53	49	54	79	97	103	109	123	148	160	157	130	174	169	174	181	136	97	97	85	
4	84	70	72	82	61	51	51	71	86	105	117	128	155	176	181	164	120	179	171	155	142	130	124	117	
5	97	81	71	66	63	60	68	73	83	110	120	122	146	157	167	149	145	151	145	127	118	103	84	86	
6	89	82	79	77	49	43	49	75	99	108	100	105	115	141	159	139	151	150	148	134	125	120	98	93	
7	98	100	116	88	39	43	44	69	94	102	109	108	114	123	124	128	132	133	123	127	110	80	85	82	
8	77	77	84	71	45	41	50	76	92	107	99	111	119	143	161	147	143	135	129	132	110	88	95	100	
9	102	98	83	67	58	50	53	73	92	108	111	105	108	121	135	143	154	145	147	134	117	83	75	75	
10	70	63	60	55	57	57	60	82	90	90	102	111	125	145	158	144	153	153	129	126	91	58	58	57	
11	59	A	62	51	51	54	62	63	83	93	104	102	124	139	141	148	157	113	148	141	108	99	95	85	
12	81	74	69	69	65	41	47	69	72	81	101	122	139	148	174	172	169	175	176	162	135	95	98	98	
13	79	63	61	54	52	43	57	84	122	106	83	102	129	150	165	134	169	177	168	133	93	79	75	70	
14	81	79	75	61	53	45	49	69	93	109	107	119	139	170	127	129	135	107	173	182	177	133	98	85	
15	83	65	45	A	43	50	50	54	45	A	A	59	66	80	82	77	82	86	91	100	63	A	A	55	
16	57	56	51	43	44	43	47	55	73	81	99	117	138	167	174	160	165	161	172	161	126	94	83	77	
17	44	62	59	58	45	42	60	86	87	89	101	103	118	131	157	153	145	147	142	143	124	79	63	64	
18	59	62	67	65	A	60	67	66	81	91	88	113	127	145	154	163	174	178	187	181	145	104	101	102	
19	116	114	99	86	65	61	72	82	91	87	90	110	125	136	133	137	139	156	155	153	121	93	99	82	
20	74	80	79	73	66	65	68	70	75	91	95	106	118	129	137	133	154	157	166	153	135	120	112	117	
21	117	116	114	103	87	97	95	84	88	88	82	100	113	123	145	137	166	159	153	141	127	99	77	A	
22	77	79	92	129	83	A	A	67	83	93	91	103	121	133	145	150	154	170	168	160	131	126	127	125	
23	129	123	115	108	81	N	84	101	111	101	107	100	110	120	127	145	171	161	170	171	156	152	76	142	136
24	130	114	100	87	84	78	71	77	79	96	109	113	117	116	126	141	157	154	154	155	131	125	127	111	
25	102	95	94	75	A	60	75	92	97	93	103	113	125	142	149	155	145	154	157	162	153	147	149	48	
26	62	155	149	139	113	80	85	81	89	96	111	118	131	141	141	131	123	135	145	138	125	118	122	110	
27	98	91	93	86	56	55	61	85	94	102	102	113	131	149	157	186	185	187	172	125	151	153	151	72	
28	113	93	93	89	75	74	80	96	102	94	108	117	128	146	137	118	125	143	140	144	119	99	88	90	
29	91	95	91	74	69	70	89	67	69	85	87	106	127	147	157	155	157	152	155	145	134	125	114	140	
30	142	134	125	123	98	46	55	77	83	84	108	116	128	144	151	160	149	137	138	137	126	116	96	92	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	28	30	29	28	29	29	30	30	29	29	30	30	30	30	30	30	30	30	30	30	29	29	29	
MED	84	82	81	74	58	55	60	76	88	94	102	112	126	144	150	144	152	154	154	144	126	99	98	86	
U Q	102	107	99	87	72	67	71	83	94	106	109	118	131	149	158	155	161	169	171	156	135	122	118	110	
L Q	74	68	67	63	51	44	50	69	83	89	97	105	118	131	137	134	139	141	142	134	117	89	83	76	

## HOURLY VALUES OF fEs AT Okinawa

APR. 2022

LAT. 26°41.0'N LON. 128°09.0'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	59	50	G	G	24	G	G	49	43	47	47	46	46	45	40	43	34	36	28	G	11	G	G	G	
2	G	G	11	11	G	G	G	34	41	44	48	33	G	48	G	50	46	44	46	29	33	32	41	26	
3	28	24	G	G	G	G	G	31	36	37	46	56	48	G	33	51	31	40	40	28	11	G	G	G	
4	G	G	G	G	G	G	G	49	36	38	40	37	48	48	36	G	G	32	G	G	11	26	28	G	
5	24	23	23	G	G	G	G	49	36	38	36	45	53	54	G	50	32	29	31	G	G	G	G	35	
6	G	G	G	G	28	G	G	27	36	43	44	44	44	47	34	34	38	29	G	32	G	G	G	G	
7	G	G	G	48	G	G	G	33	36	40	44	45	46	43	35	49	G	32	28	28	G	25	28	G	
8	G	G	G	11	G	G	G	33	40	39	41	53	40	35	49	34	33	41	82	90	25	31	G	G	
9	G	G	G	G	G	G	G	26	34	38	44	49	50	48	51	51	44	38	25	28	26	28	G	G	
10	26	26	G	25	G	G	G	38	33	44	45	48	36	46	88	46	58	62	51	31	26	30	24	25	
11	G	57	31	35	G	G	G	32	37	46	40	45	52	51	49	47	32	36	38	35	29	30	34	G	
12	G	G	G	G	G	G	G	G	49	34	42	49	60	51	50	43	36	54	78	41	34	45	G	G	
13	G	G	G	G	G	G	G	26	34	35	40	46	59	51	49	35	34	41	28	34	34	29	G	G	
14	G	26	28	40	30	24	G	39	57	32	36	43	54	48	49	38	38	32	28	39	32	48	G	G	
15	G	G	27	26	G	G	G	26	35	42	51	72	47	56	52	57	G	40	36	36	48	34	58	48	41
16	G	28	G	G	28	G	G	25	35	46	46	51	52	39	46	37	34	44	34	42	34	32	59	27	33
17	34	33	30	34	32	26	40	34	34	49	41	G	47	G	54	70	69	41	40	29	57	32	40	31	
18	31	39	48	54	59	45	35	32	37	51	52	46	56	60	41	46	52	51	32	24	48	G	24	G	
19	33	36	30	26	G	G	G	40	42	41	52	51	47	48	48	51	60	53	35	71	38	27	26	G	
20	G	G	29	G	G	G	G	31	39	43	40	G	G	G	36	34	46	34	32	39	11	48	G	26	
21	G	G	57	G	32	33	25	31	42	41	42	G	54	49	53	51	47	30	34	26	G	59	70	90	
22	48	46	53	35	36	46	107	59	46	51	82	59	111	78	54	36	40	36	34	69	11	31	31	50	
23	84	41	26	G	30	G	28	47	45	53	56	47	48	57	53	35	34	36	35	33	32	41	69	56	
24	32	34	30	G	G	G	G	54	56	48	64	60	57	61	58	54	49	44	41	41	50	G	29	43	
25	30	26	43	151	94	48	29	42	44	46	51	56	47	48	64	80	90	115	52	36	59	50	32	59	
26	28	26	G	11	11	G	G	36	36	46	47	52	53	59	56	65	62	59	59	72	103	28	G	31	
27	G	26	G	G	G	24	28	32	44	48	49	56	48	48	39	48	36	39	31	G	G	G	G	G	
28	G	G	G	G	G	G	21	38	36	48	52	46	58	61	62	57	40	38	49	34	59	56	60	40	
29	G	26	25	27	G	G	27	40	48	56	45	46	53	54	52	53	66	76	74	77	46	35	54	28	
30	24	26	G	26	11	G	28	38	45	49	110	46	57	59	50	60	56	35	38	G	29	G	33	48	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	G	26	6	6	G	G	G	35	40	45	46	46	49	48	49	48	40	37	36	34	29	30	26	26	
U Q	30	33	30	27	28	G	27	40	45	48	52	52	54	54	54	51	52	44	46	41	38	45	34	40	
L Q	G	G	G	G	G	G	G	32	36	40	42	45	46	46	36	35	34	34	31	28	11	G	G	G	

HOURLY VALUES OF fmin AT Okinawa

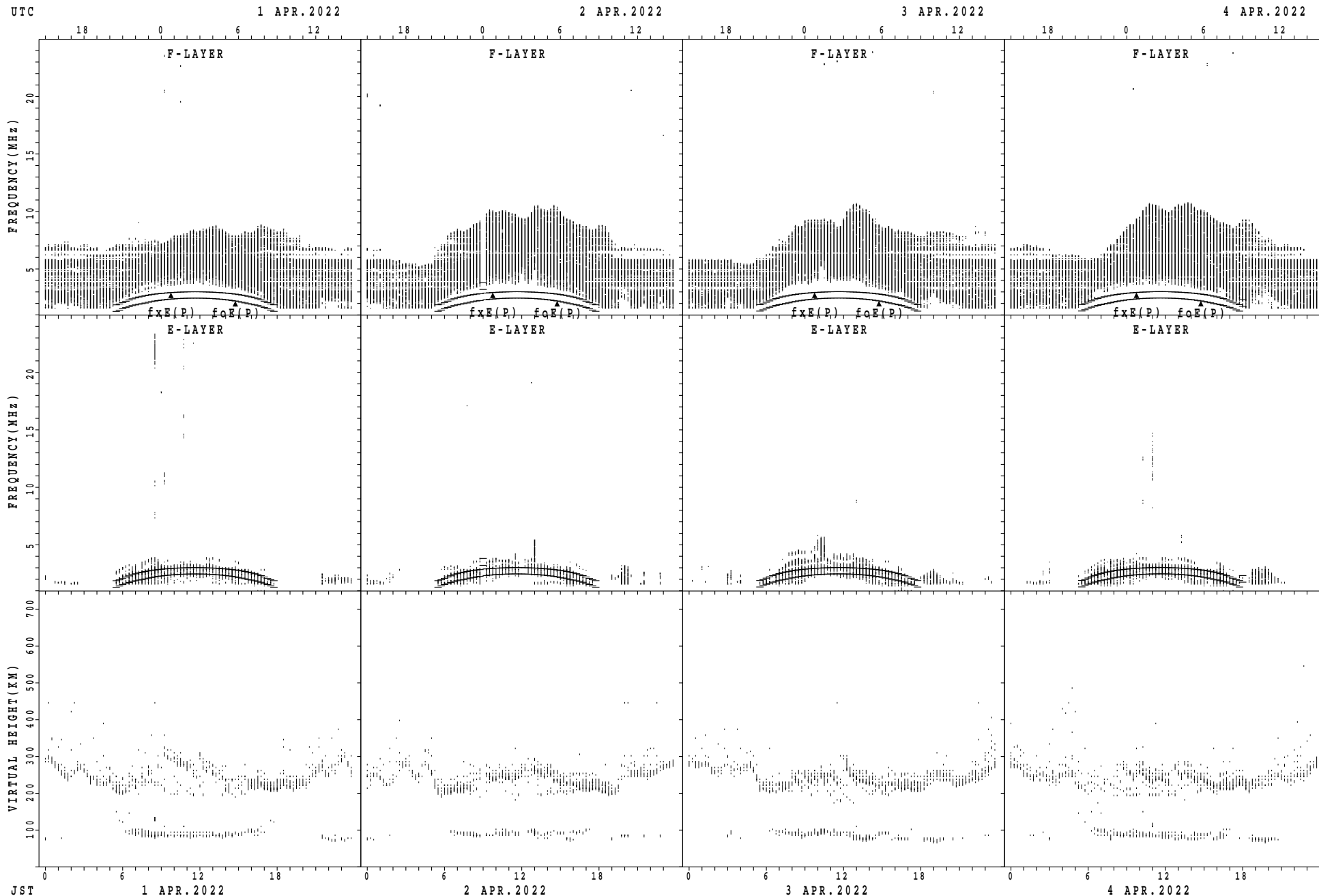
APR. 2022

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	17	15	15	16	15	14	15	15	14	17	17	23	23	23	21	18	17	14	14	17	15	14	15	15
2	14	14	15	14	15	15	14	15	15	19	21	21	53	44	38	22	17	17	15	15	16	15	15	16
3	15	16	16	16	15	16	15	15	17	18	21	20	25	45	20	17	16	15	15	16	18	15	15	15
4	14	14	14	14	17	14	14	16	15	17	21	22	39	44	38	37	22	17	14	15	14	15	15	15
5	15	15	15	14	16	14	14	15	17	18	19	22	22	21	43	19	17	16	15	14	14	14	14	15
6	14	14	14	14	16	15	14	16	15	17	17	24	23	41	20	22	20	15	15	15	15	15	15	15
7	15	14	14	14	14	14	14	16	17	15	17	20	23	23	21	17	15	15	14	16	15	16	15	14
8	14	14	14	15	16	15	15	16	15	18	21	21	23	21	26	18	17	15	15	14	15	15	15	15
9	15	15	14	14	14	14	14	15	15	16	19	20	21	21	17	19	17	17	15	15	16	15	16	15
10	16	15	16	15	15	15	14	15	16	15	17	26	20	20	18	15	17	14	15	15	17	16	15	15
11	15	15	16	15	14	15	14	15	15	15	19	19	21	21	21	17	16	14	13	16	15	16	15	15
12	15	15	15	15	14	16	15	15	17	22	22	20	20	18	21	21	17	13	14	16	16	16	15	15
13	14	14	14	15	15	18	15	17	17	16	17	20	23	16	17	15	16	13	13	16	15	16	16	15
14	15	15	16	14	16	16	16	16	13	17	20	21	22	24	19	19	16	16	15	15	16	14	14	14
15	14	17	15	16	15	15	15	17	15	17	21	32	36	25	22	15	17	15	15	15	16	16	16	15
16	15	16	15	16	15	15	16	15	18	19	21	21	19	19	28	20	22	17	14	16	16	15	16	16
17	14	16	15	16	16	15	15	15	17	19	17	39	39	54	42	20	17	17	15	15	15	16	15	16
18	16	15	15	15	15	16	16	16	17	18	22	23	21	20	22	21	16	16	15	15	16	15	15	15
19	16	15	15	15	14	15	16	15	17	21	21	21	25	23	26	22	17	15	17	13	15	16	16	15
20	21	15	15	15	14	14	17	16	17	20	19	42	42	90	20	38	16	17	15	15	16	14	16	15
21	14	15	15	14	15	16	15	15	15	16	20	75	42	40	24	37	19	17	16	13	15	15	15	9
22	15	16	15	15	15	14	14	15	15	18	16	20	18	27	39	19	18	15	16	17	14	14	15	15
23	14	16	15	15	15	16	16	15	16	16	21	14	30	20	19	20	17	14	13	16	15	15	16	16
24	16	15	16	15	17	16	18	15	12	14	16	26	21	20	25	18	22	15	15	15	14	14	15	15
25	16	16	15	5	15	15	16	14	16	21	21	24	48	33	21	19	19	17	15	16	15	15	15	15
26	16	15	15	14	14	16	14	16	17	17	21	23	22	22	20	23	19	15	13	14	13	16	15	16
27	16	15	17	18	18	16	15	16	15	14	20	23	22	23	21	17	23	17	15	16	14	15	14	24
28	15	15	15	14	14	14	14	16	17	19	39	25	42	30	23	22	19	15	14	14	15	14	15	14
29	15	15	16	16	16	15	14	15	15	16	21	20	32	40	23	21	17	16	13	15	15	16	15	15
30	16	15	15	15	14	15	15	15	16	20	22	23	23	22	54	28	20	17	15	15	15	14	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	15	15	15	15	15	15	15	16	17	20	22	23	23	22	20	17	15	15	15	15	15	15	15
U Q	16	15	15	15	16	16	16	16	17	19	21	24	36	40	26	22	19	17	15	16	16	16	15	15
L Q	14	15	15	14	14	14	14	15	15	16	17	20	21	21	20	18	17	15	14	15	15	14	15	15

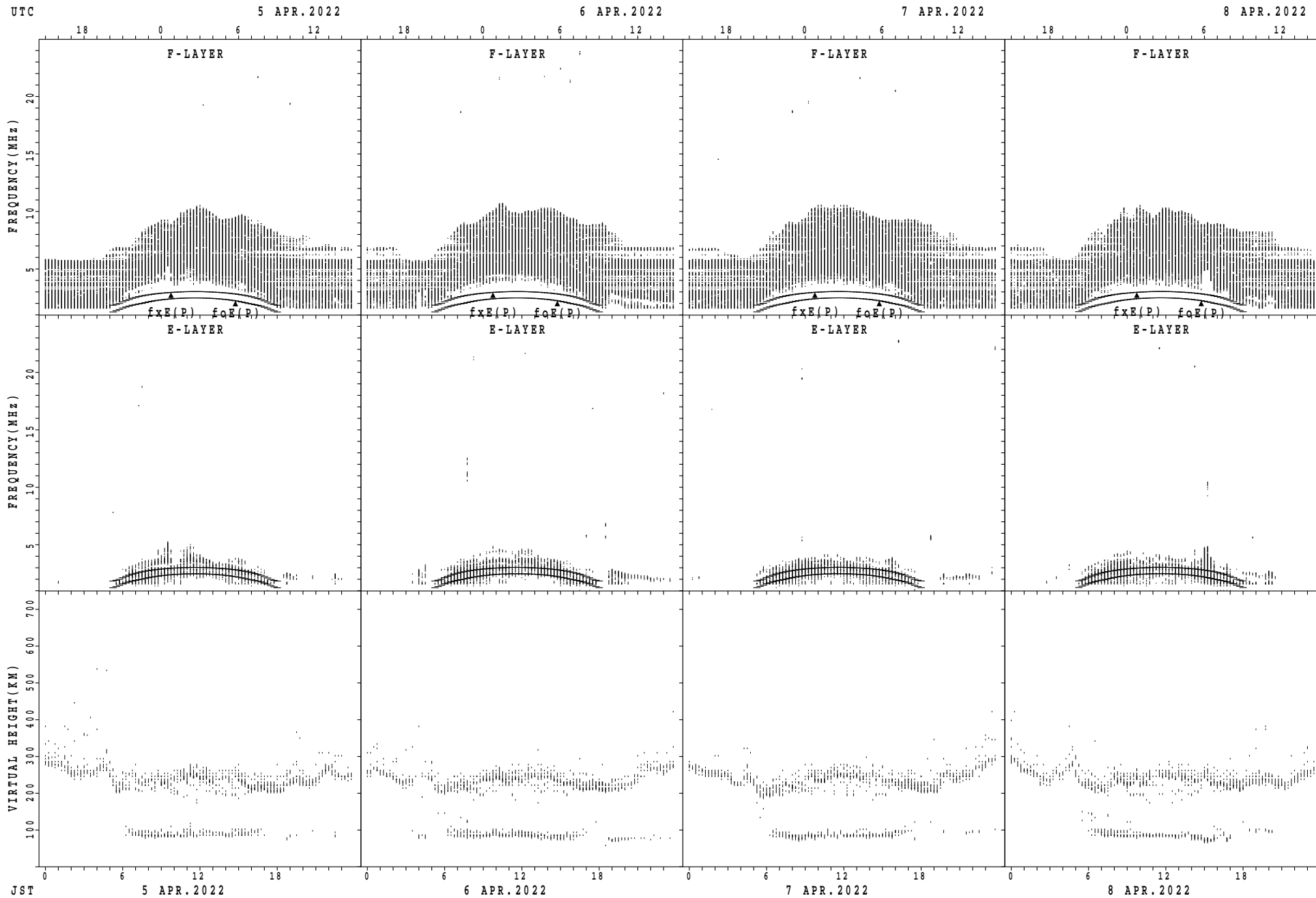


SUMMARY PLOTS AT Wakkanai



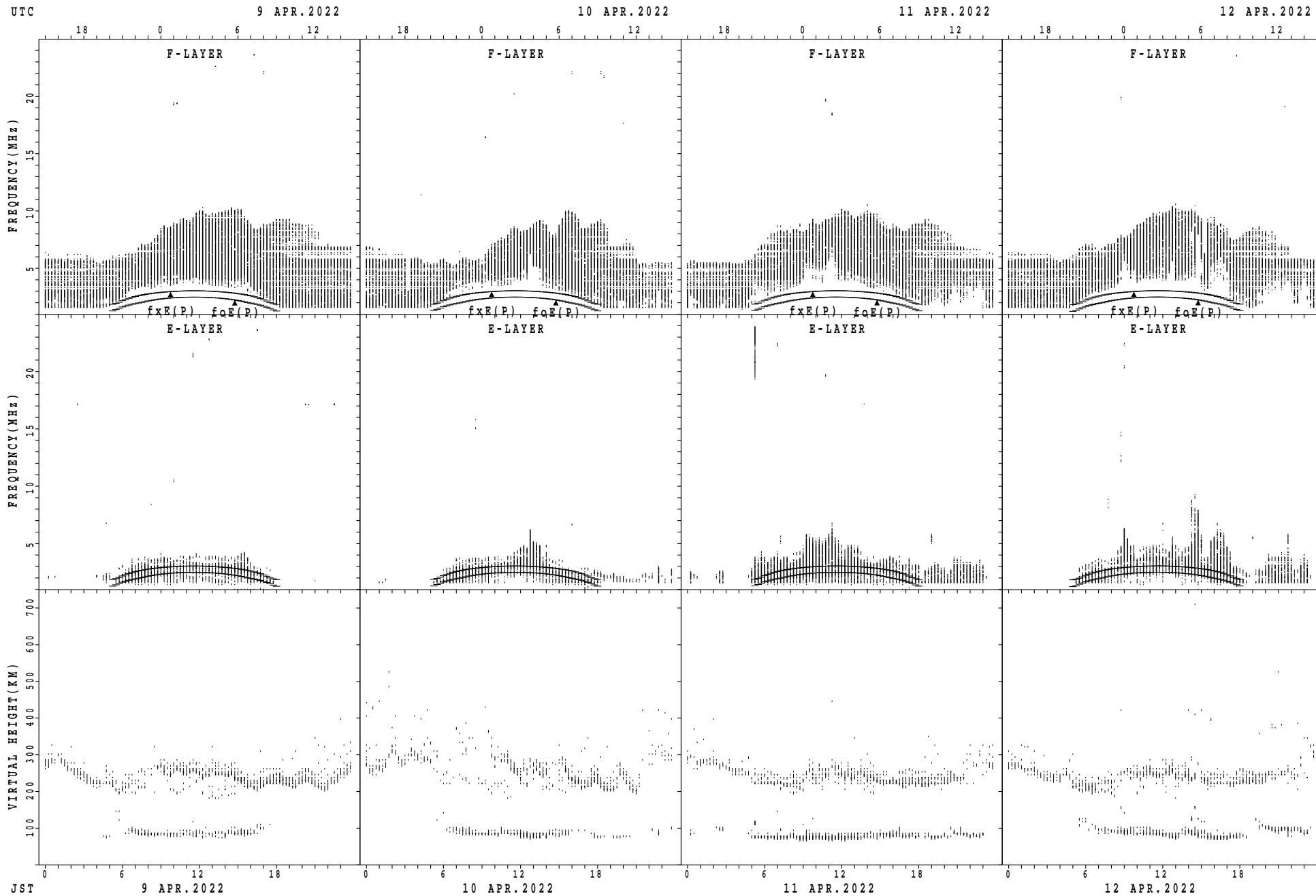
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Wakkanai



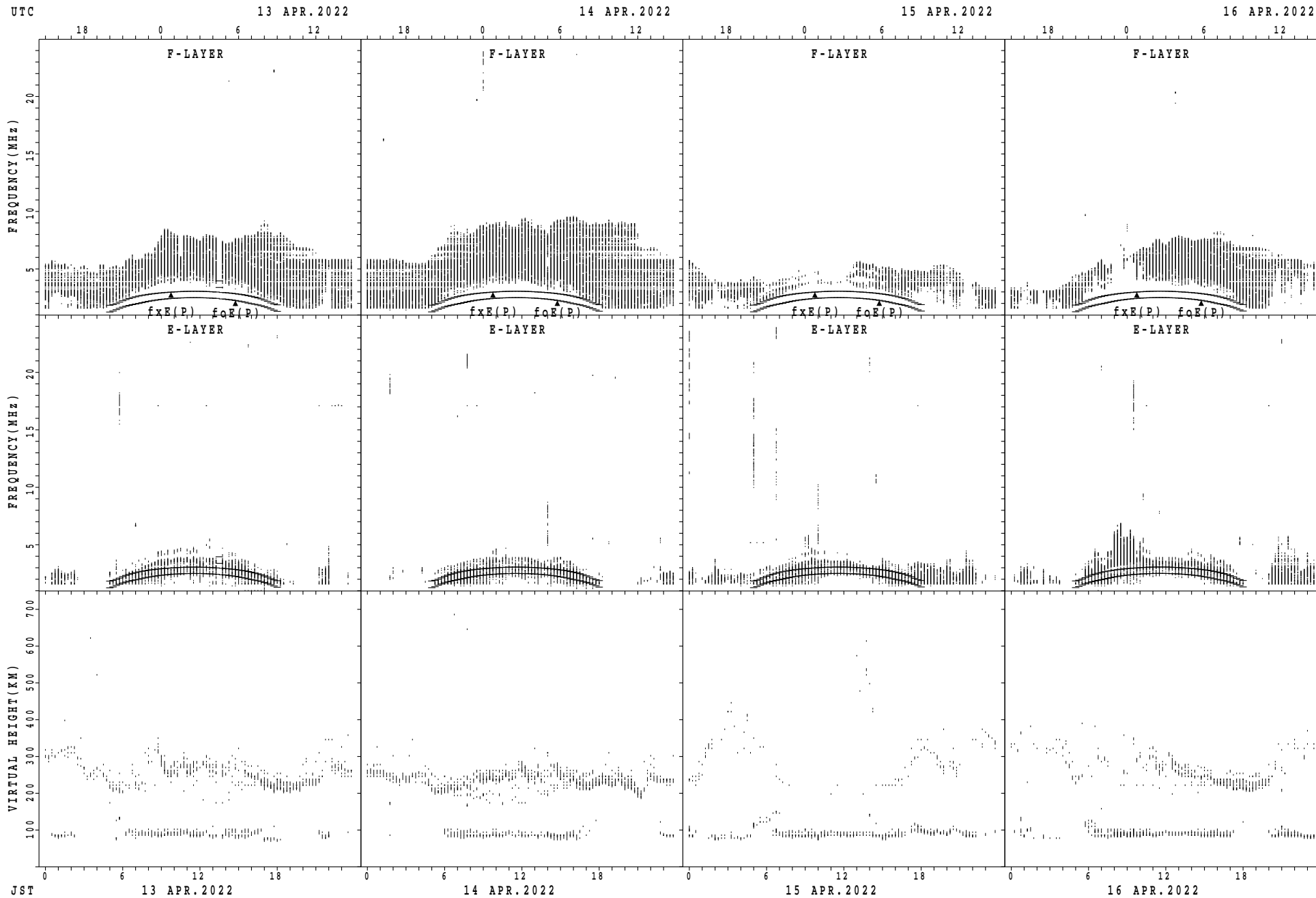
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



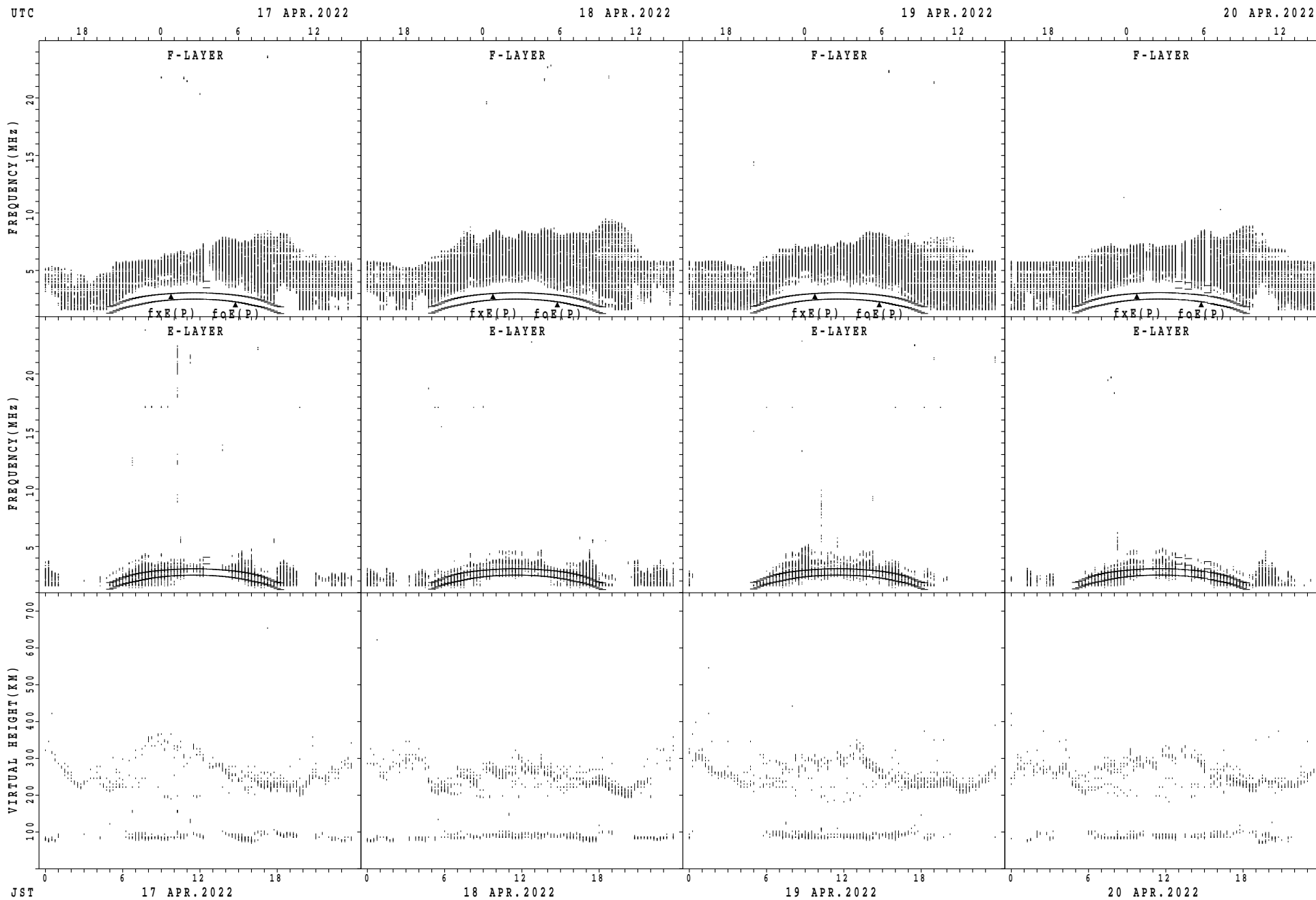
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



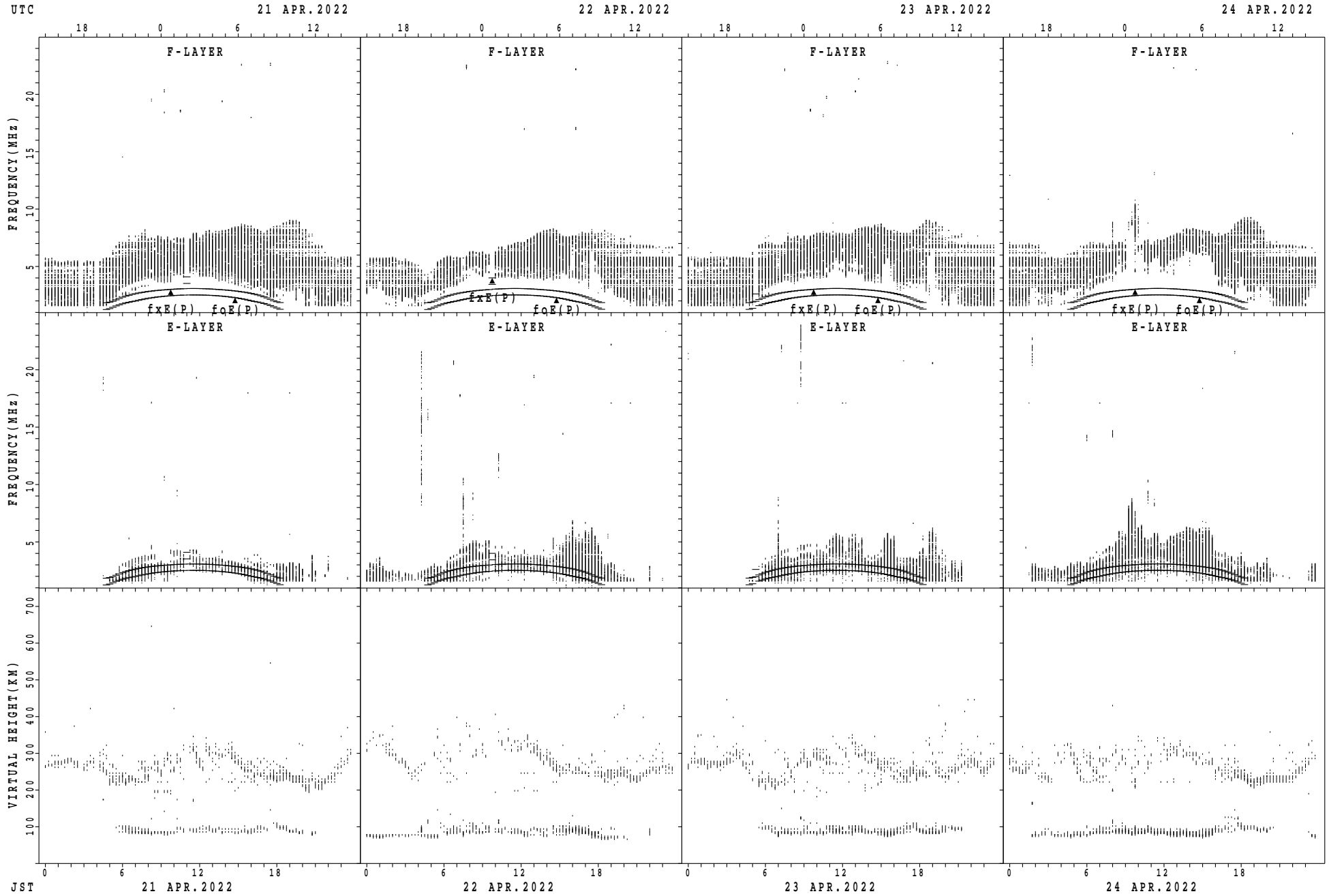
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Wakkanai



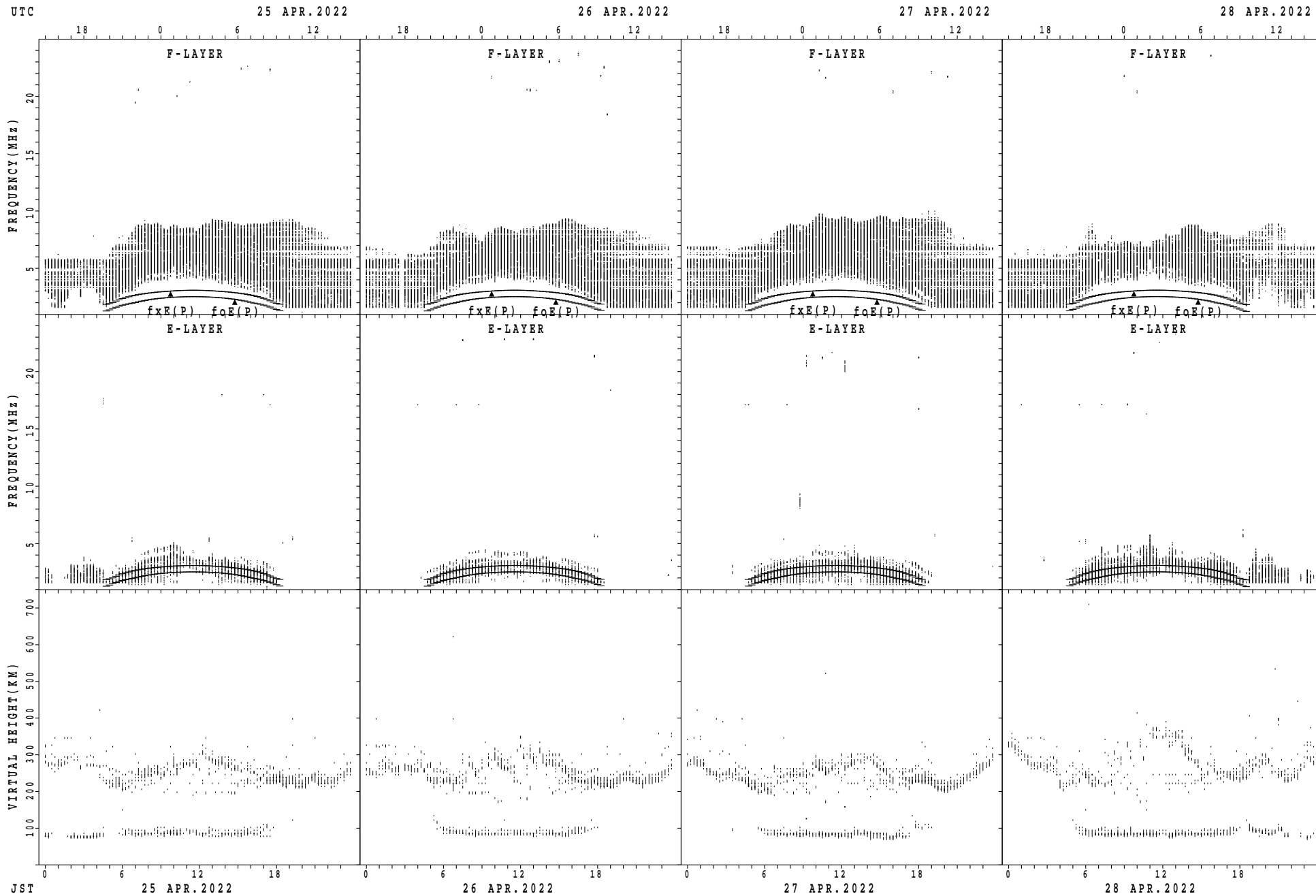
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Wakkanai



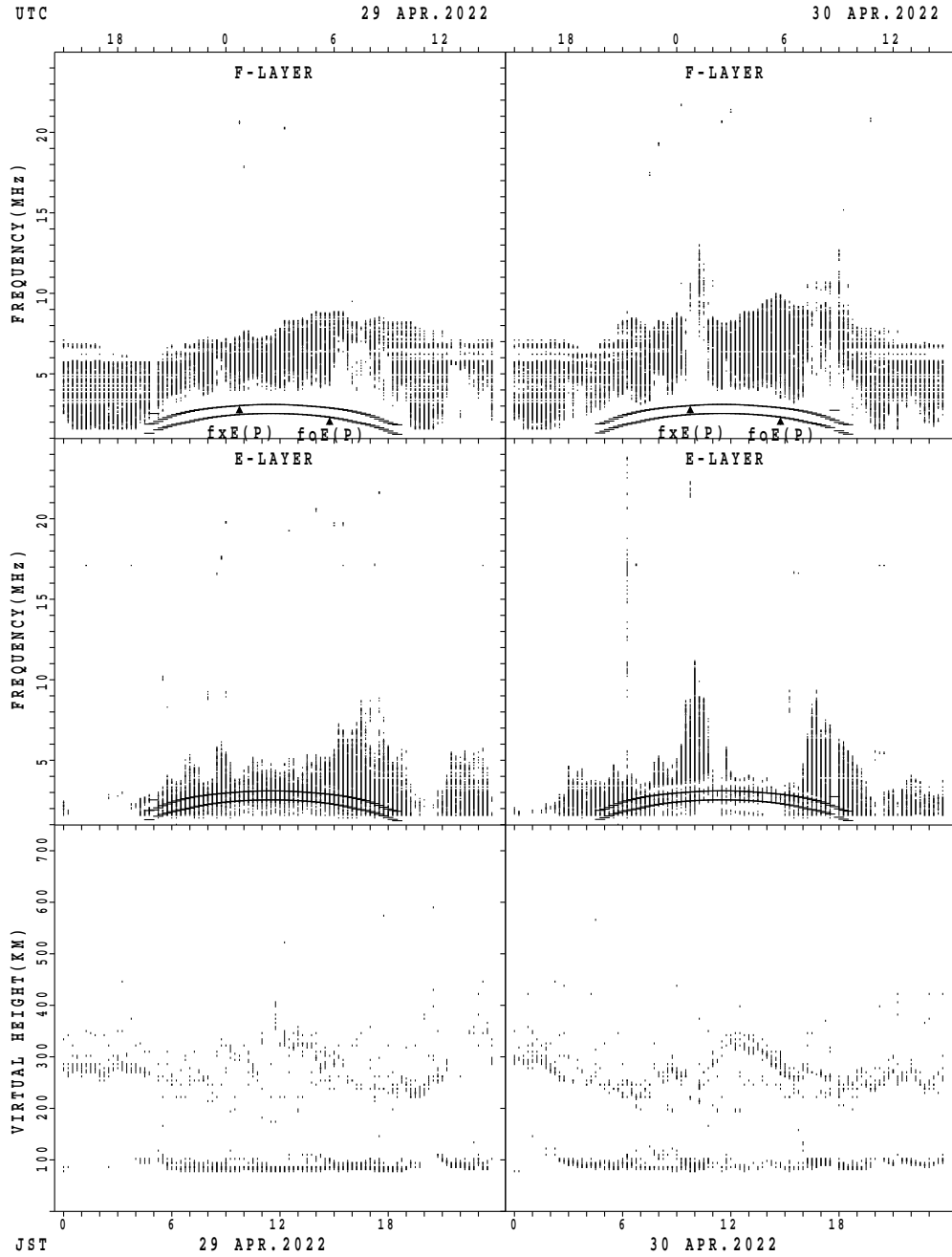
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Wakkanai



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

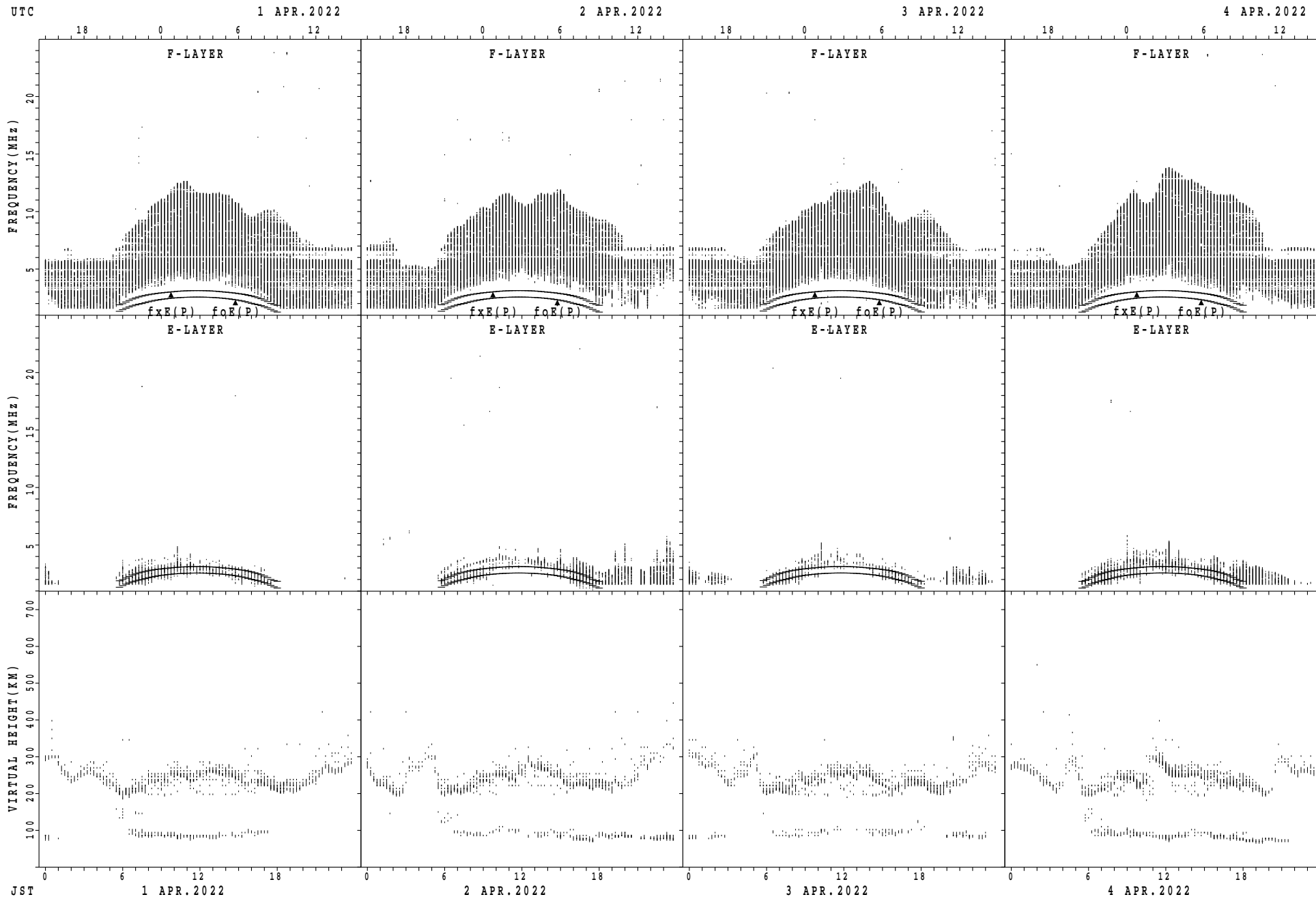
SUMMARY PLOTS AT Wakkanai



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

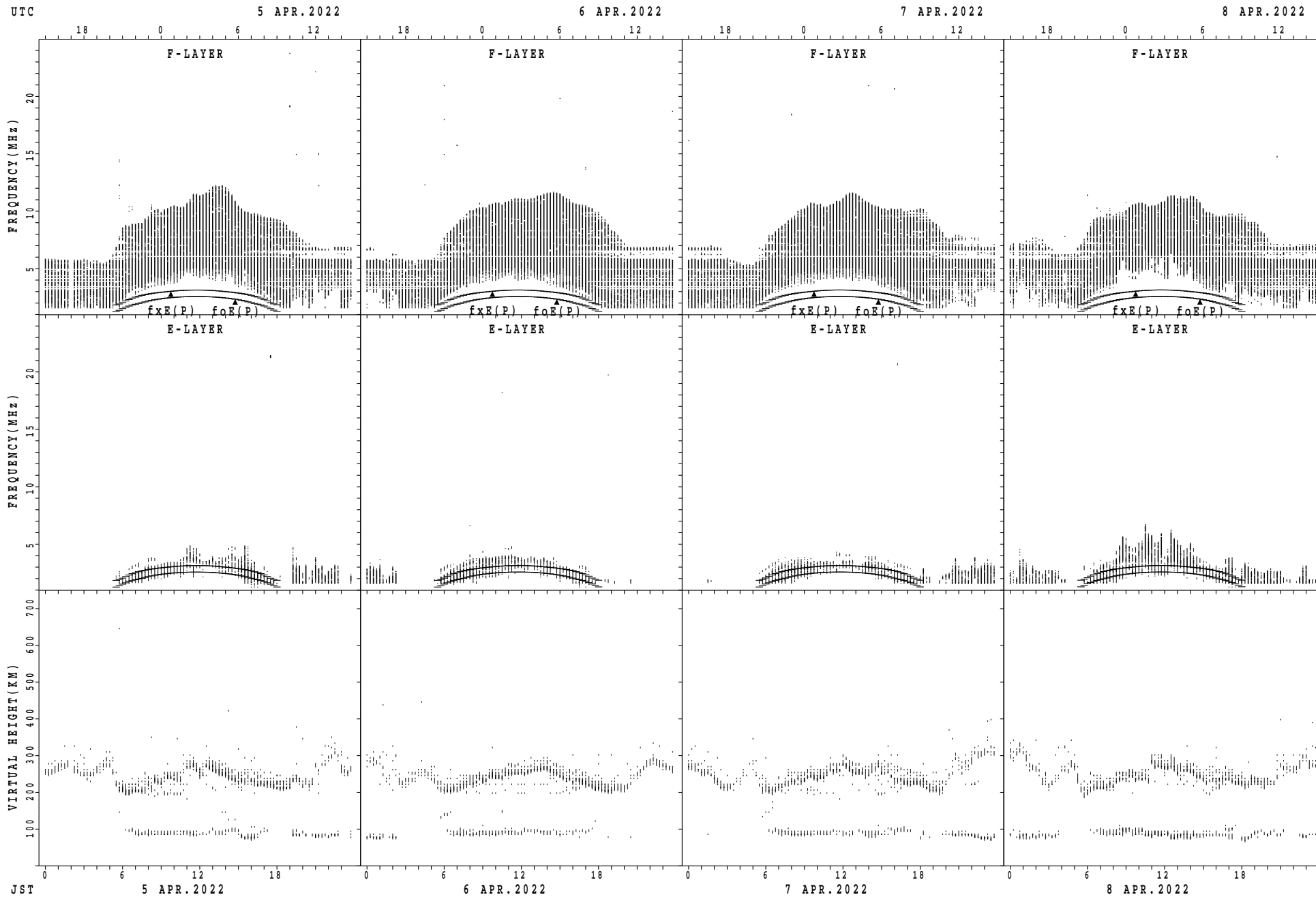


SUMMARY PLOTS AT Kokubunji



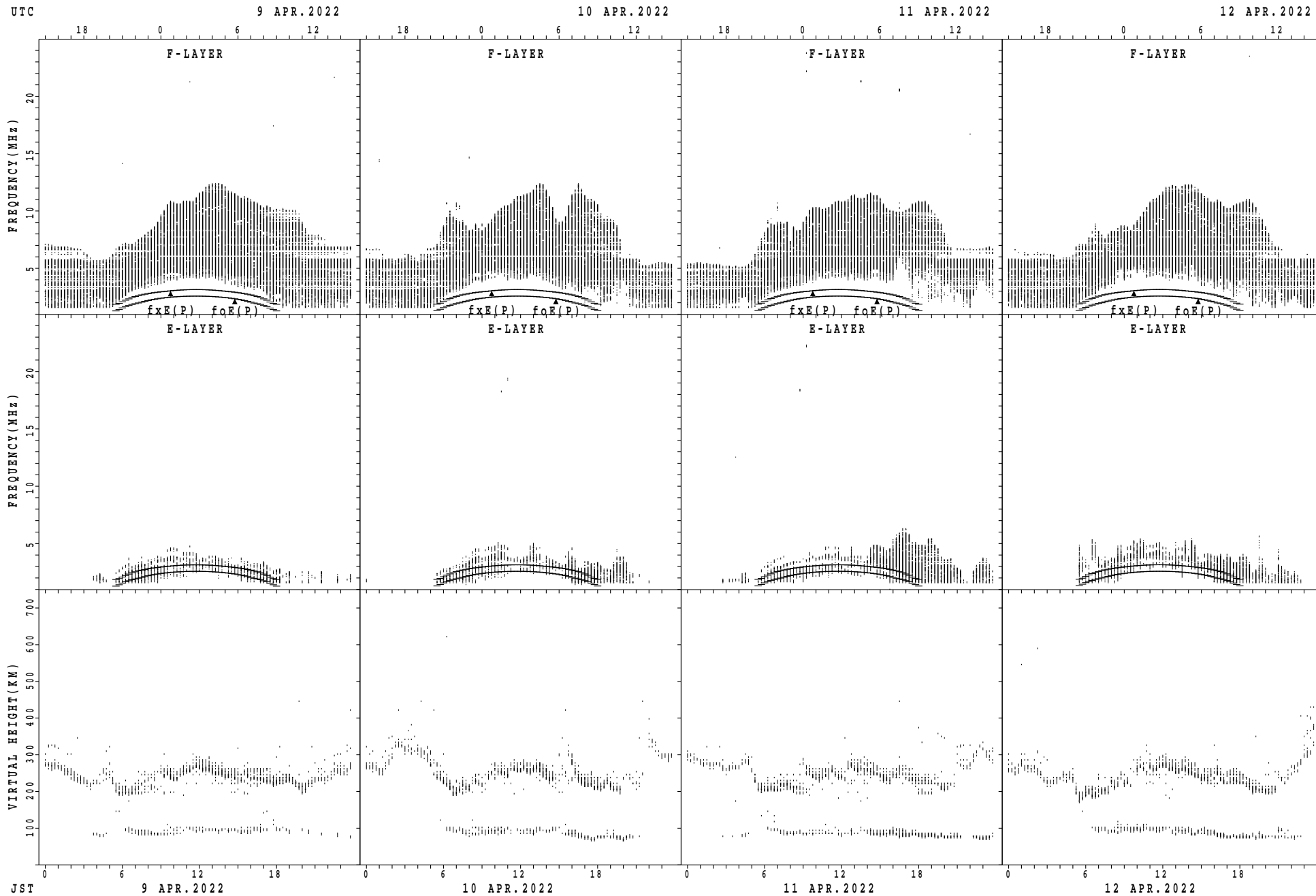
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji



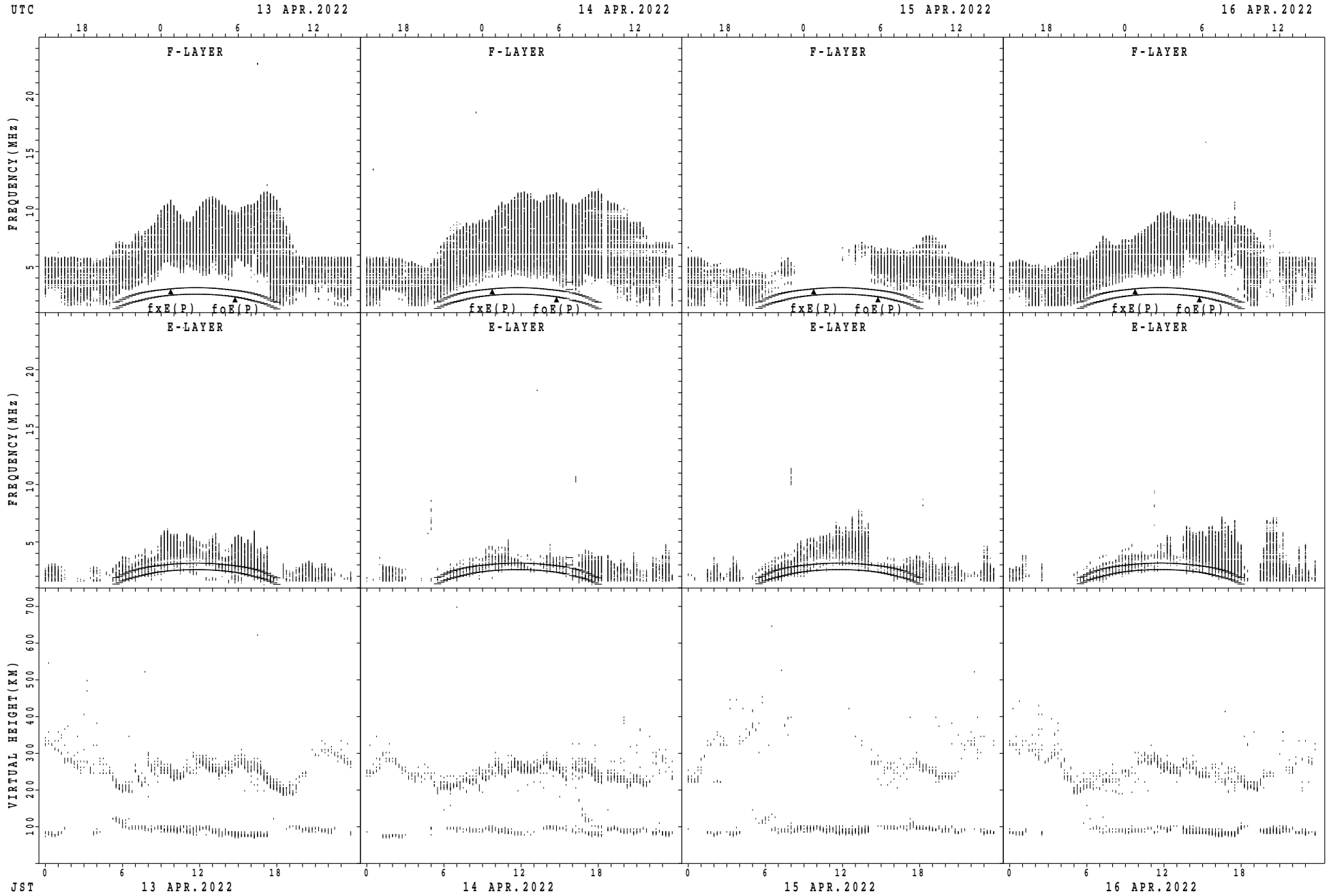
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji



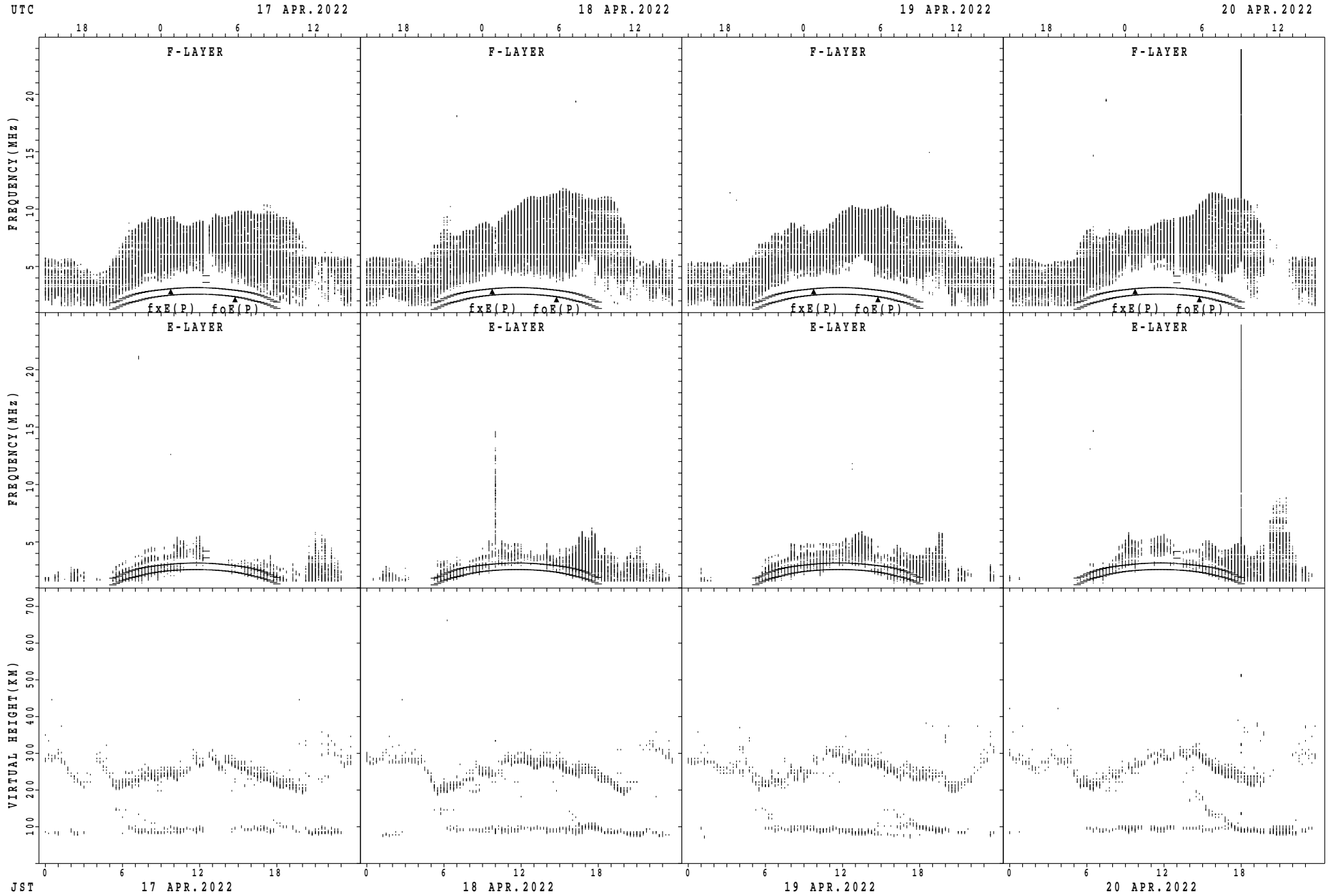
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji



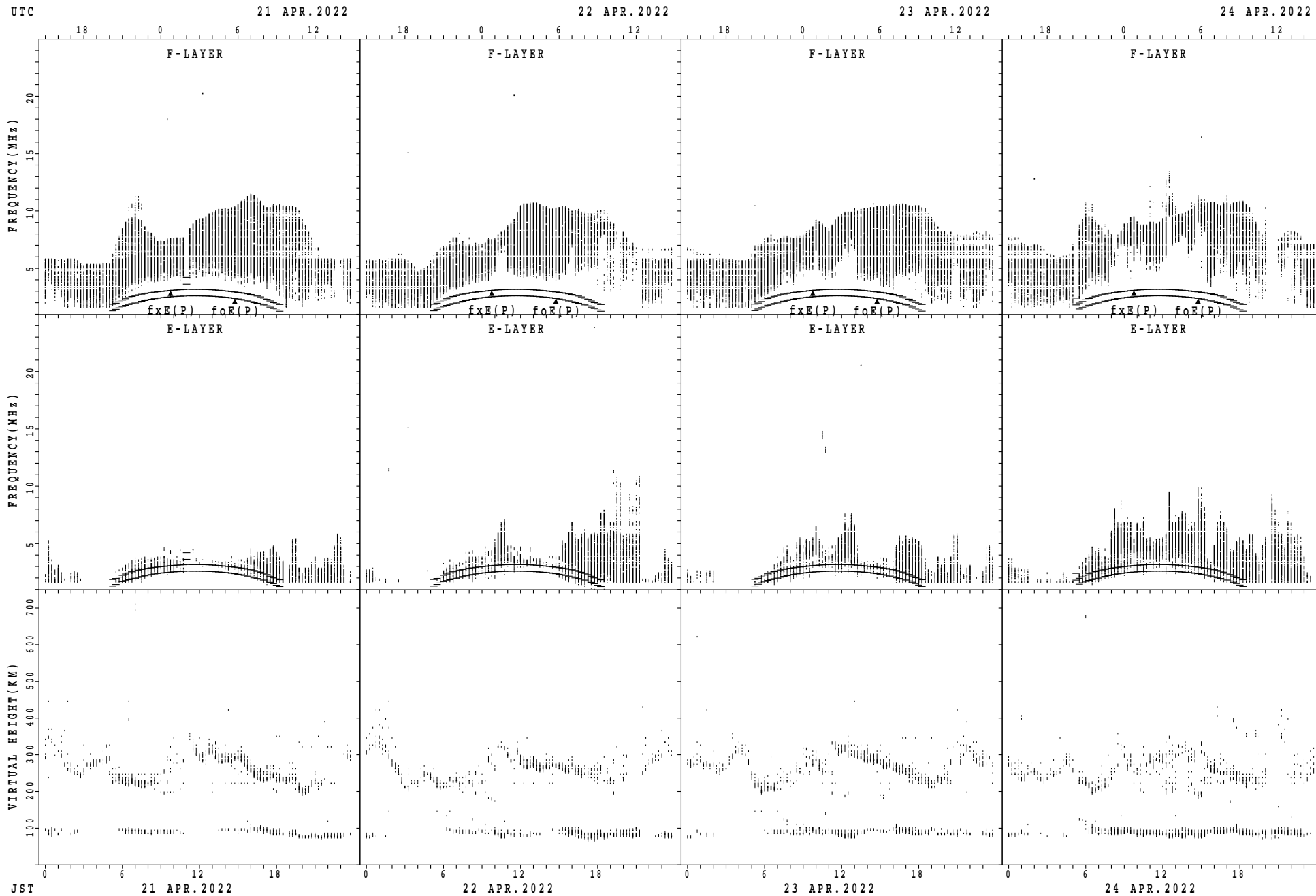
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji



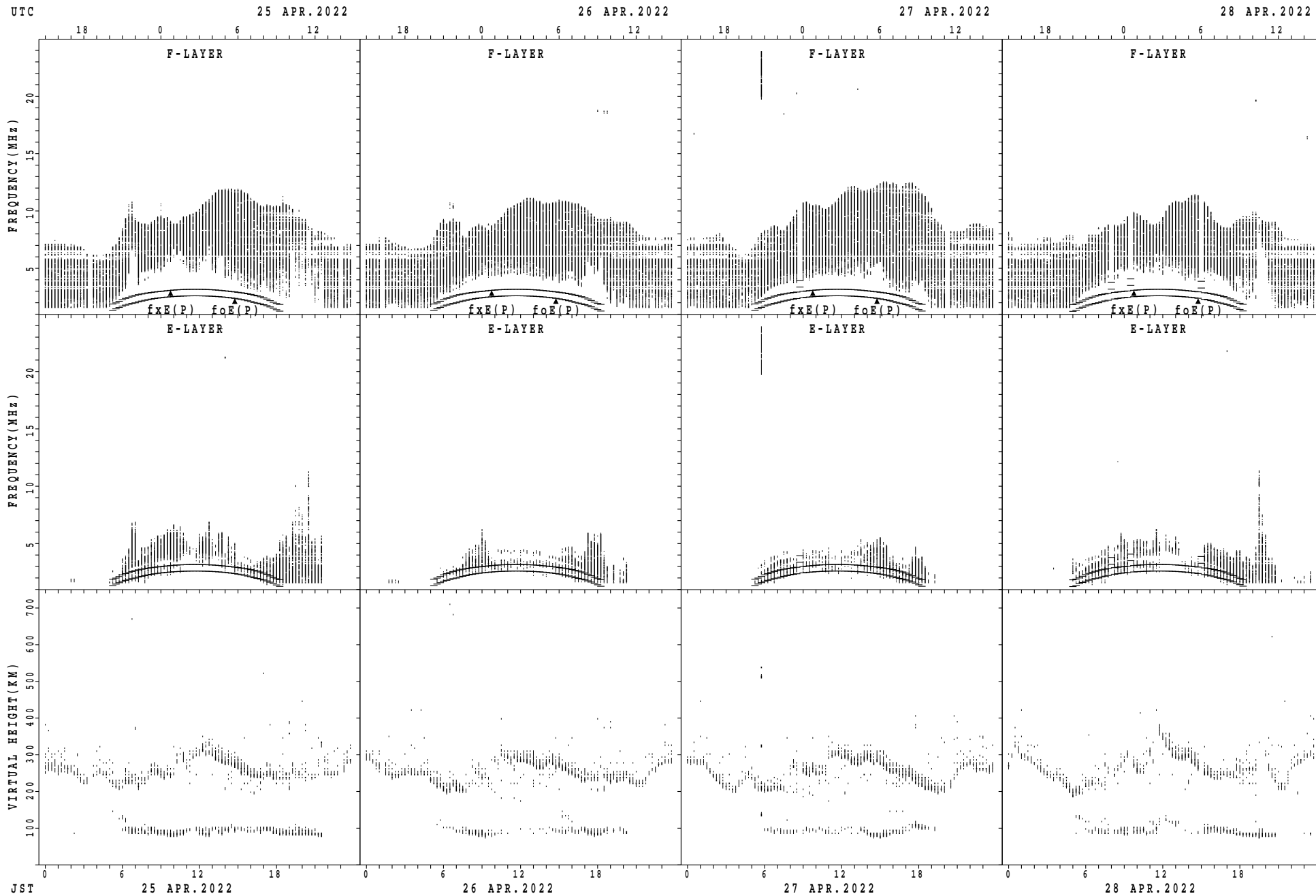
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji



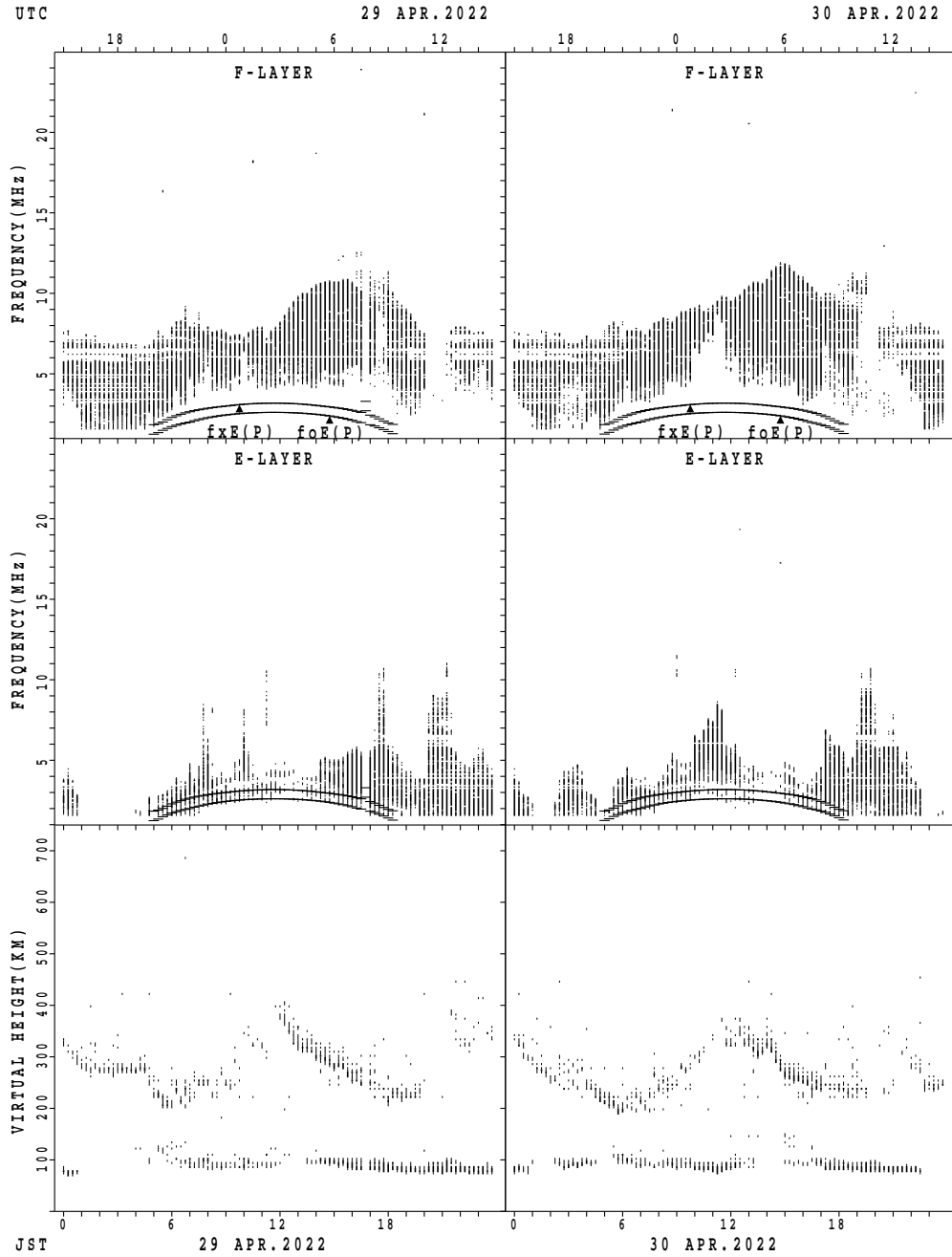
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji



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

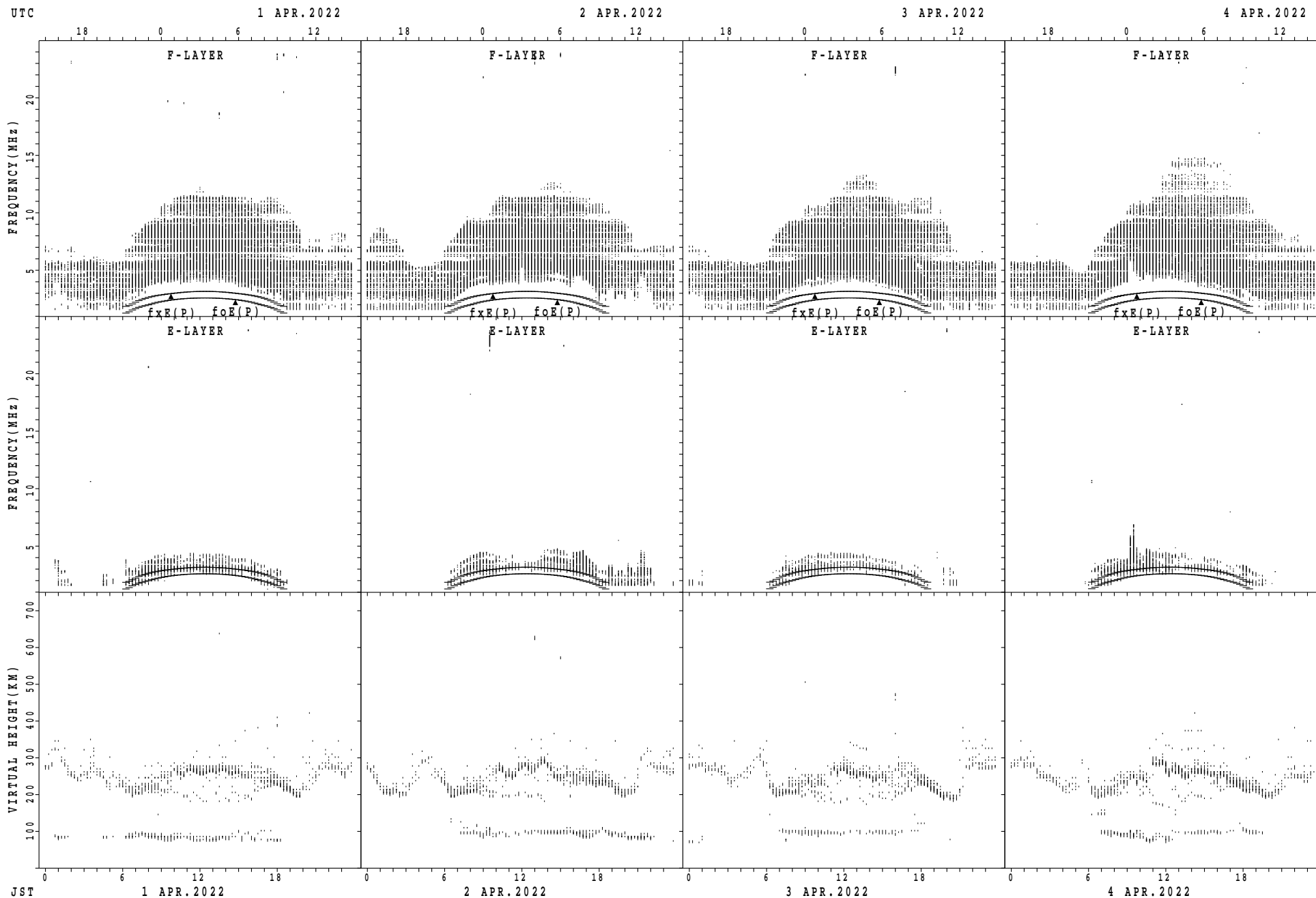
SUMMARY PLOTS AT Kokubunji



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

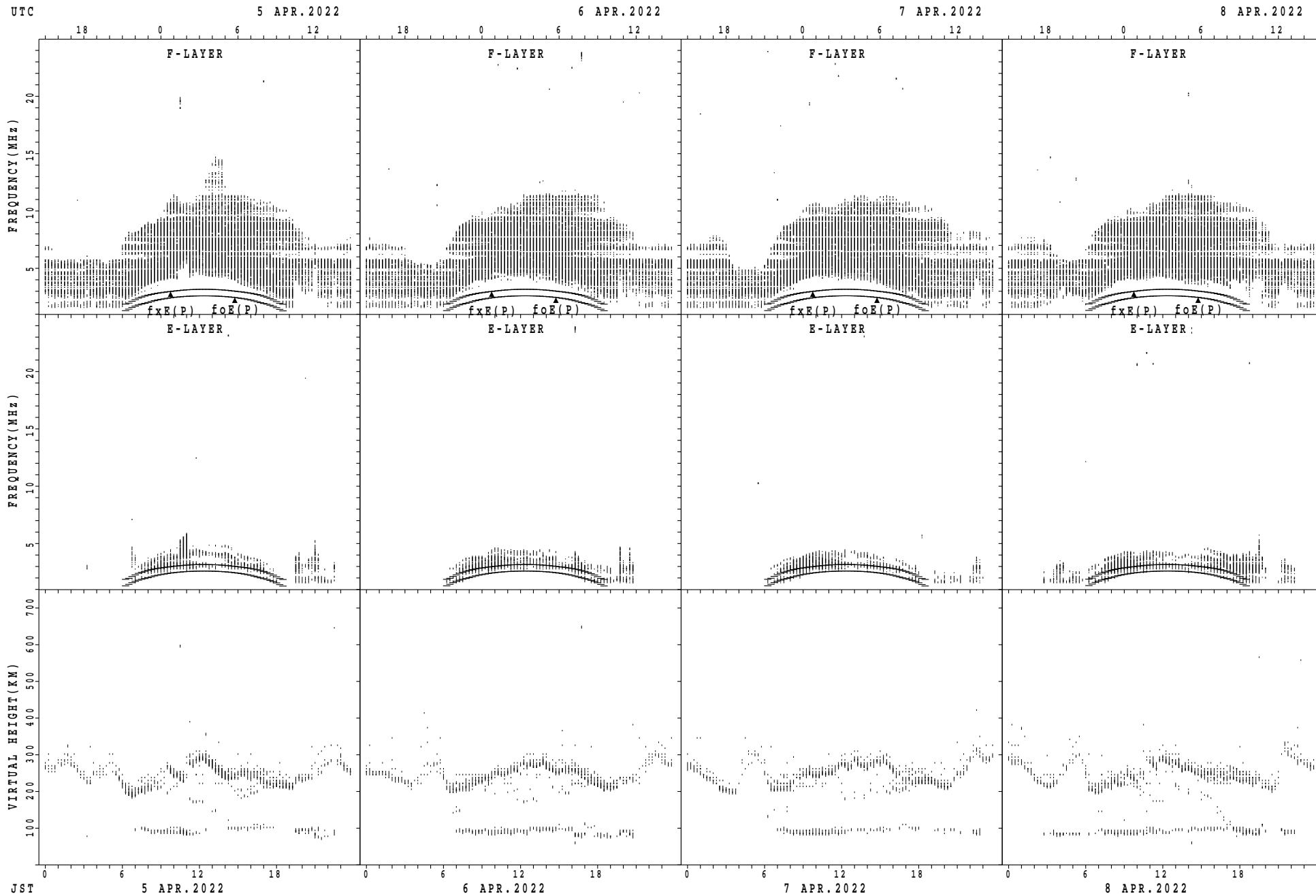


SUMMARY PLOTS AT Yamagawa



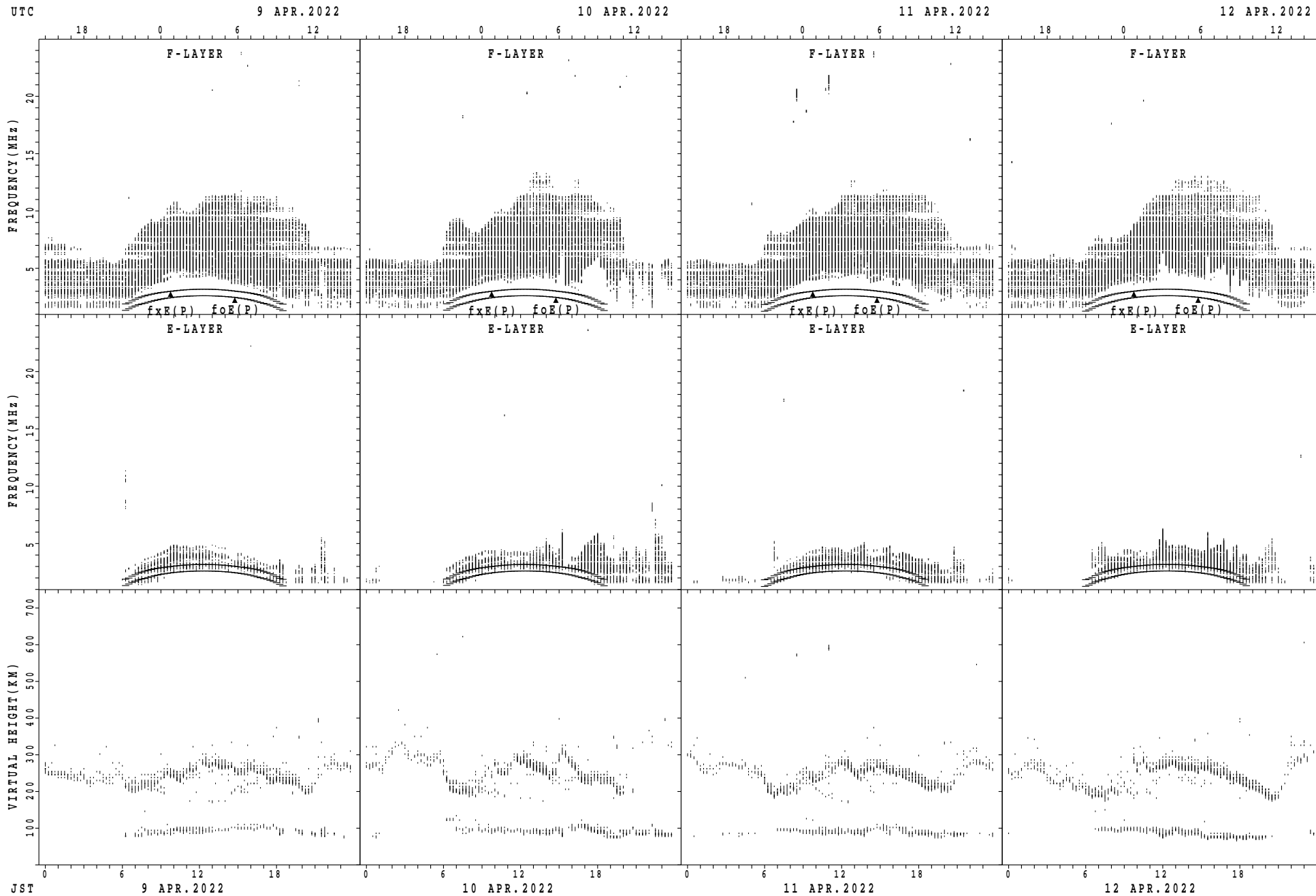
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Yamagawa



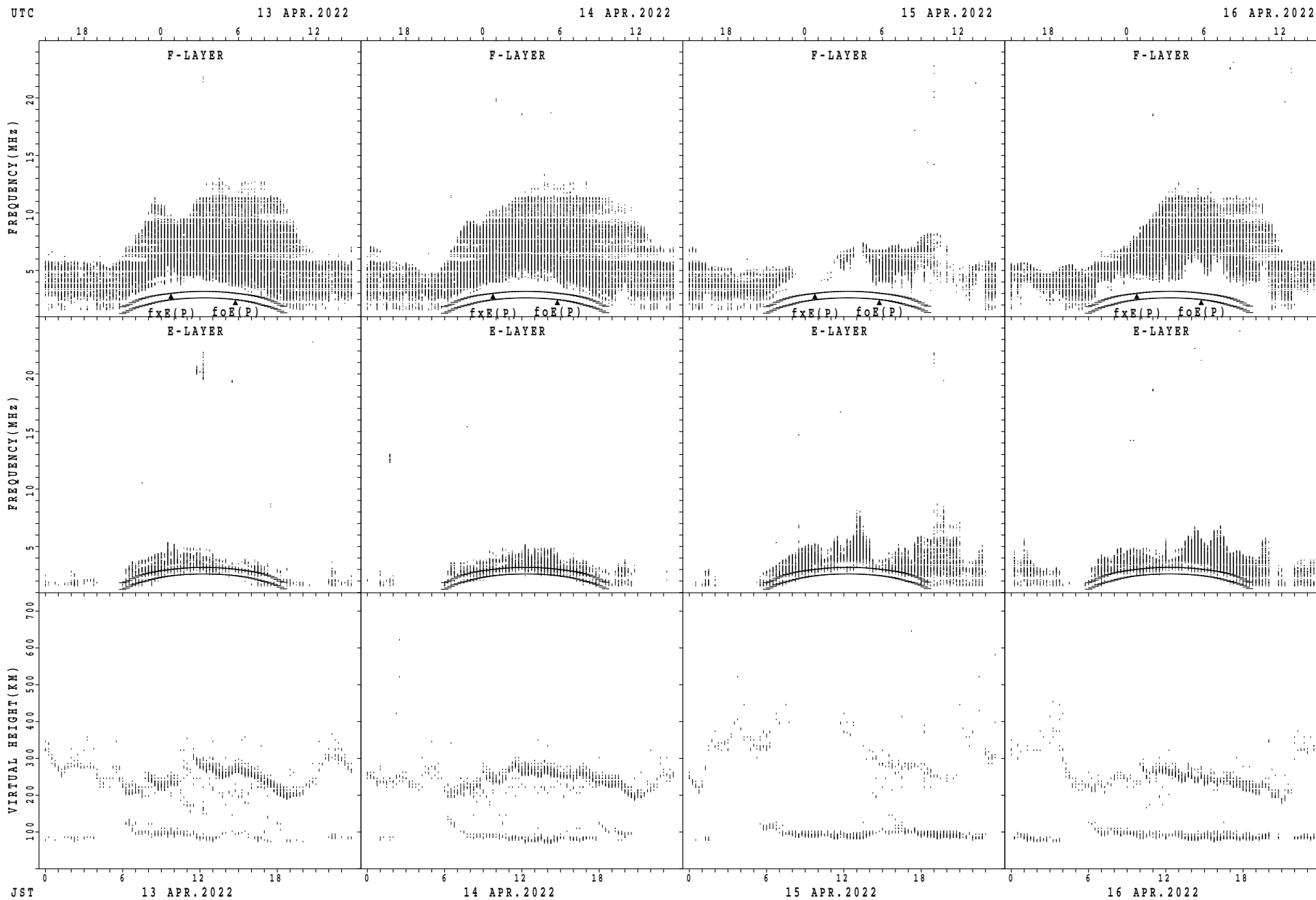
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Yamagawa



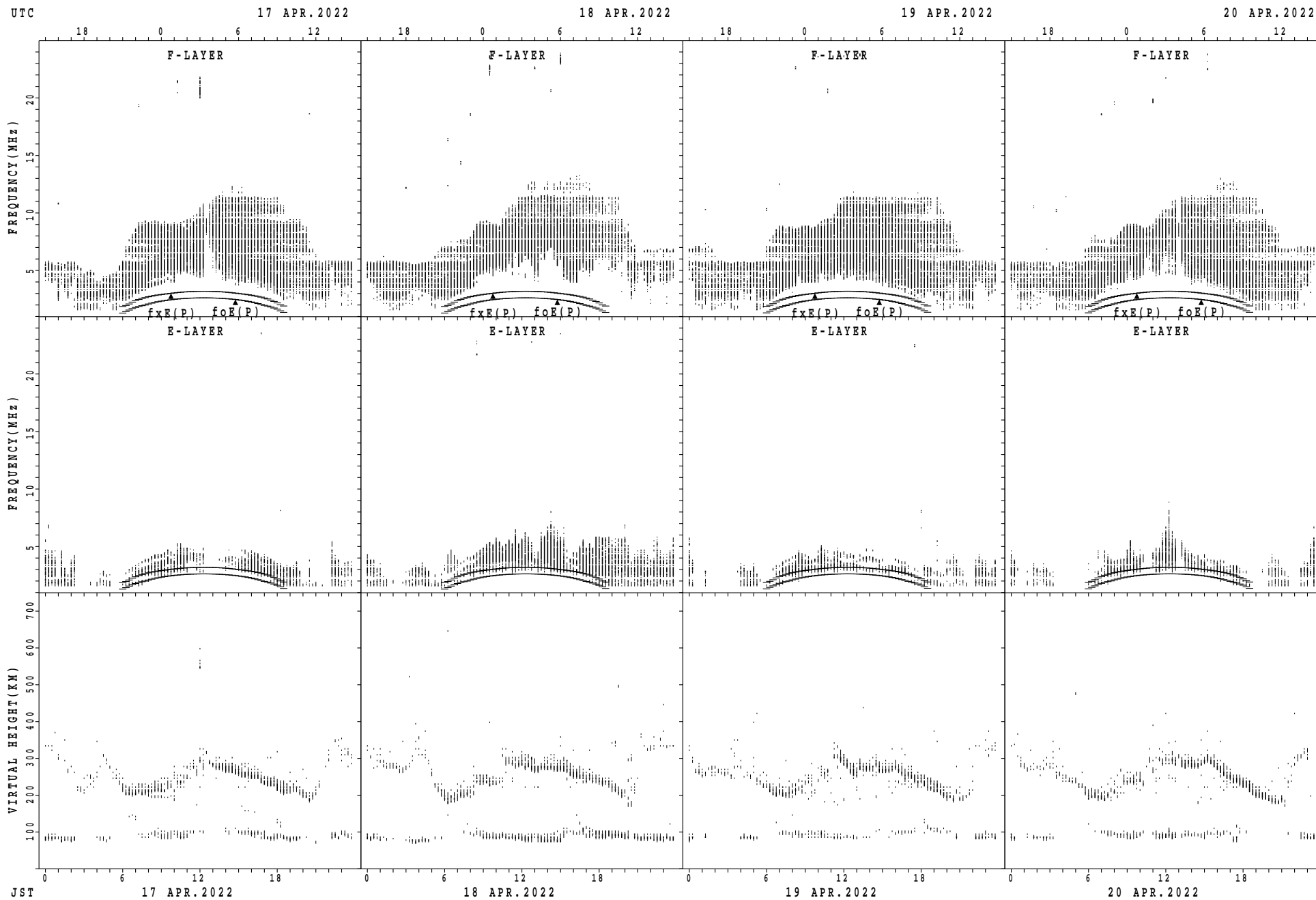
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Yamagawa



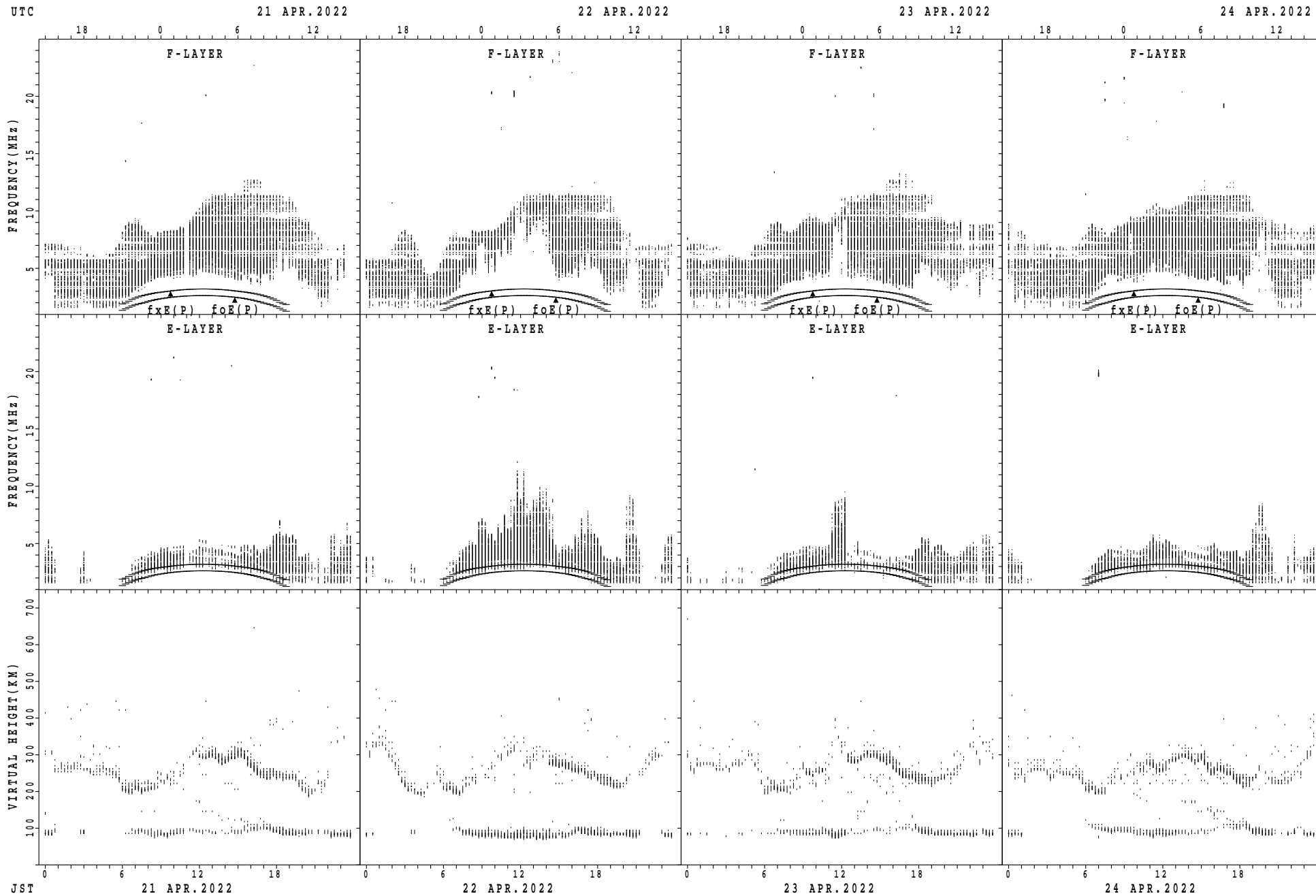
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Yamagawa



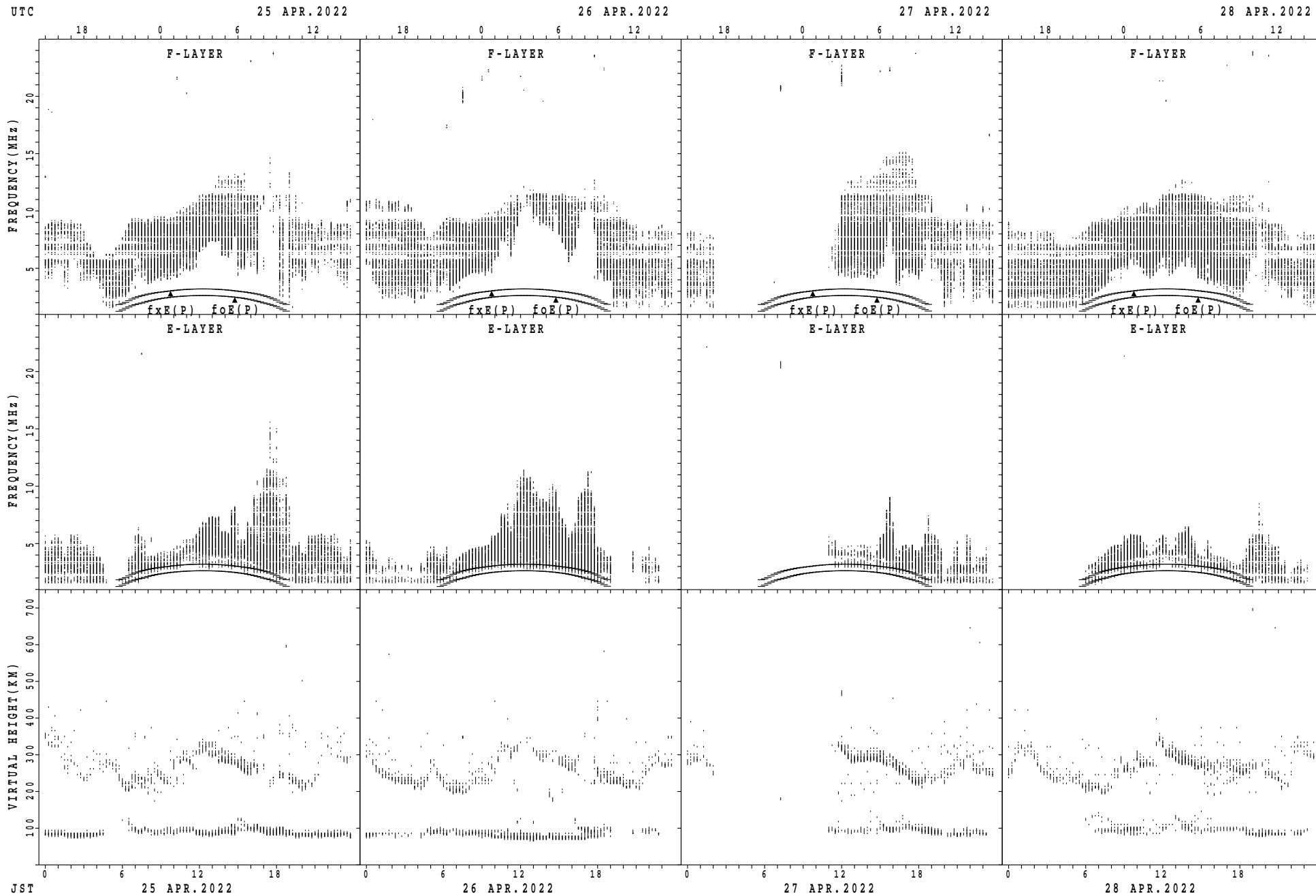
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Yamagawa



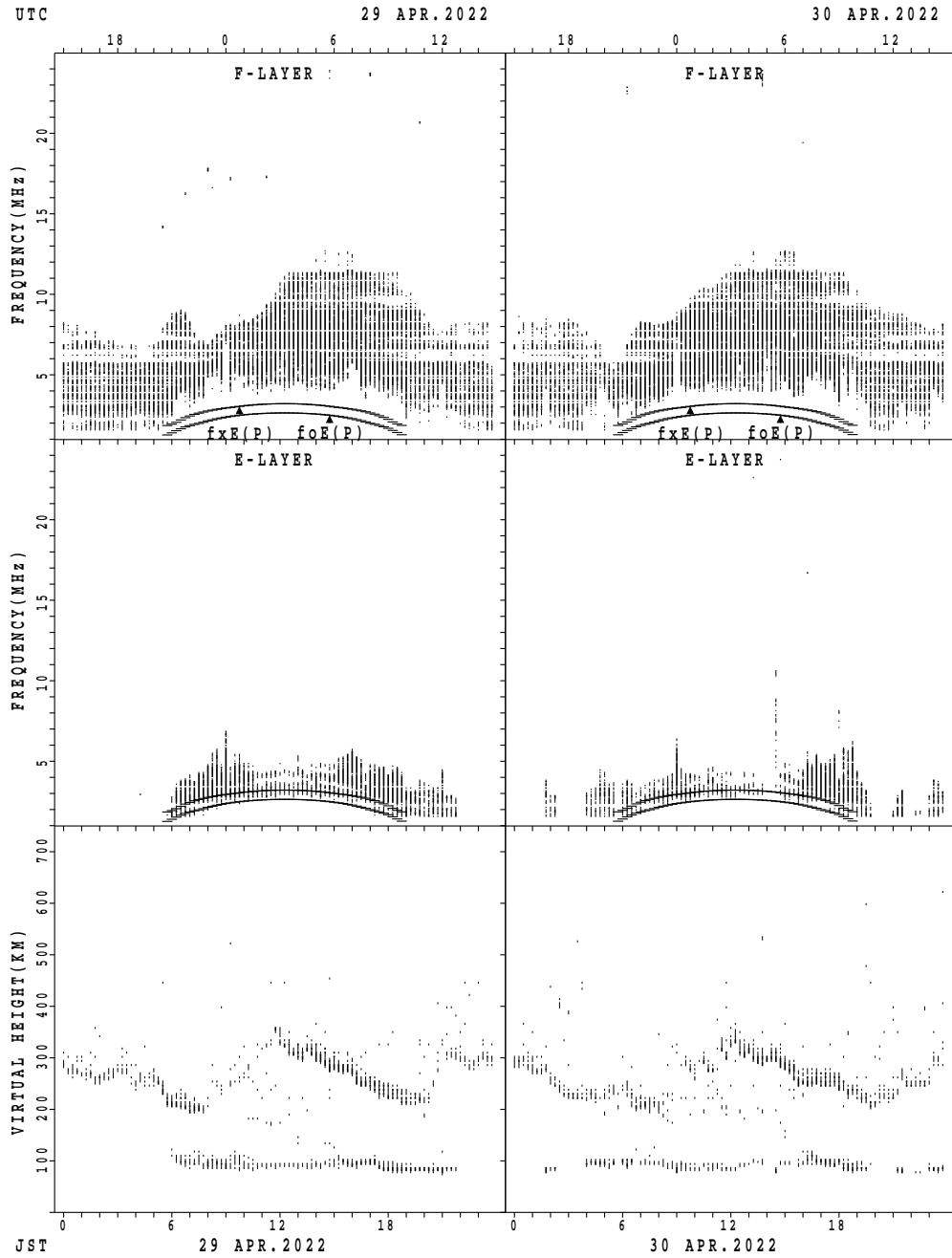
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Yamagawa



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

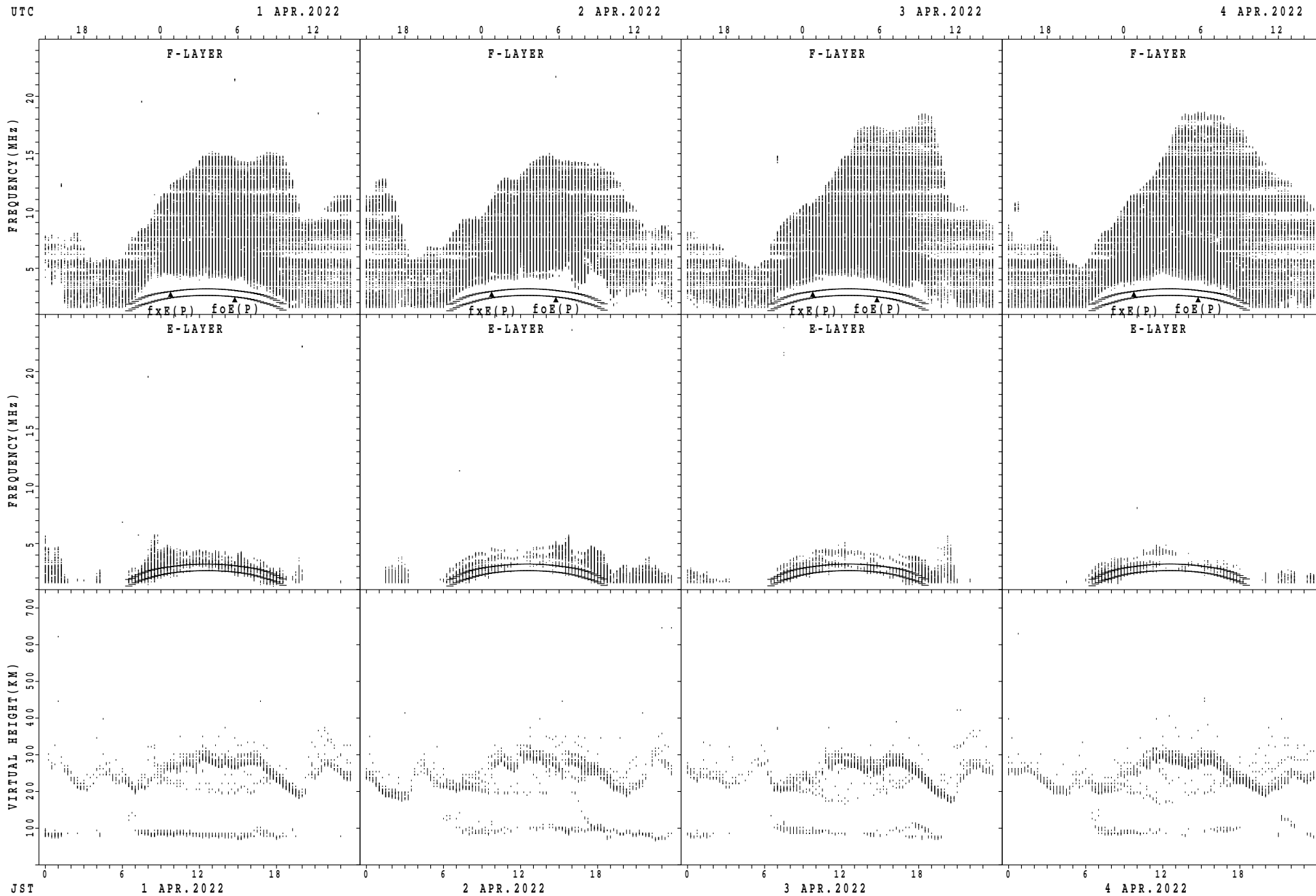
SUMMARY PLOTS AT Yamagawa



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

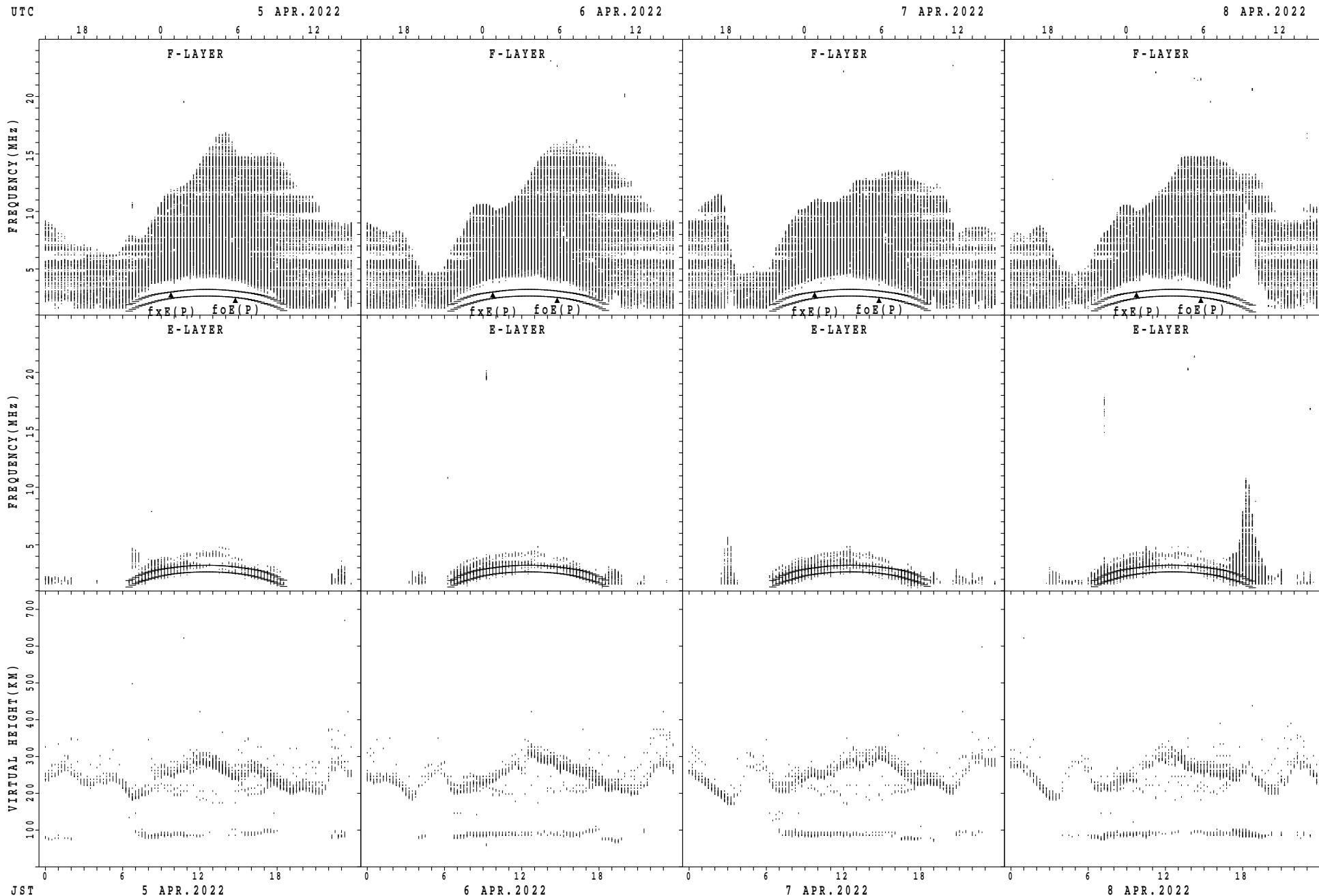


SUMMARY PLOTS AT Okinawa



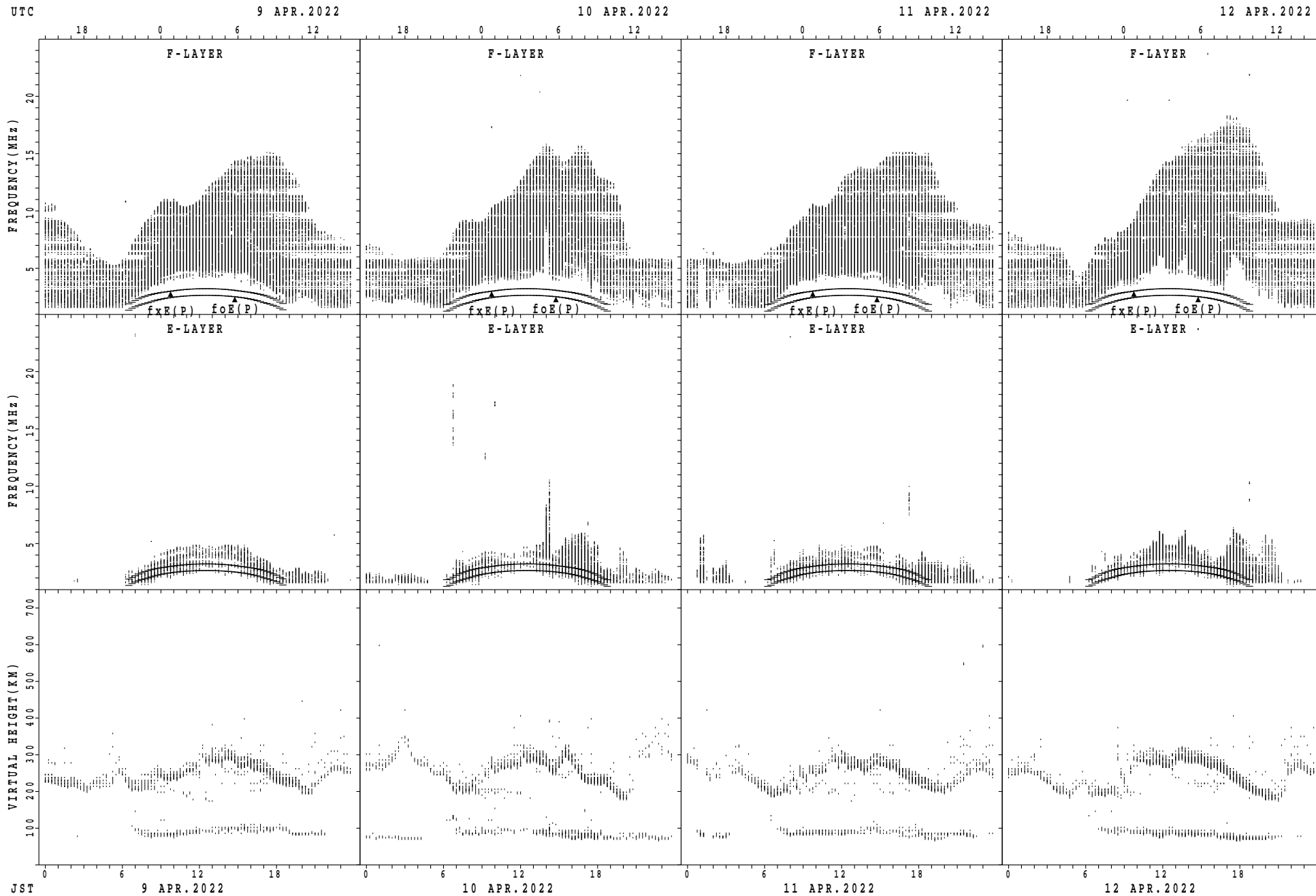
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Okinawa



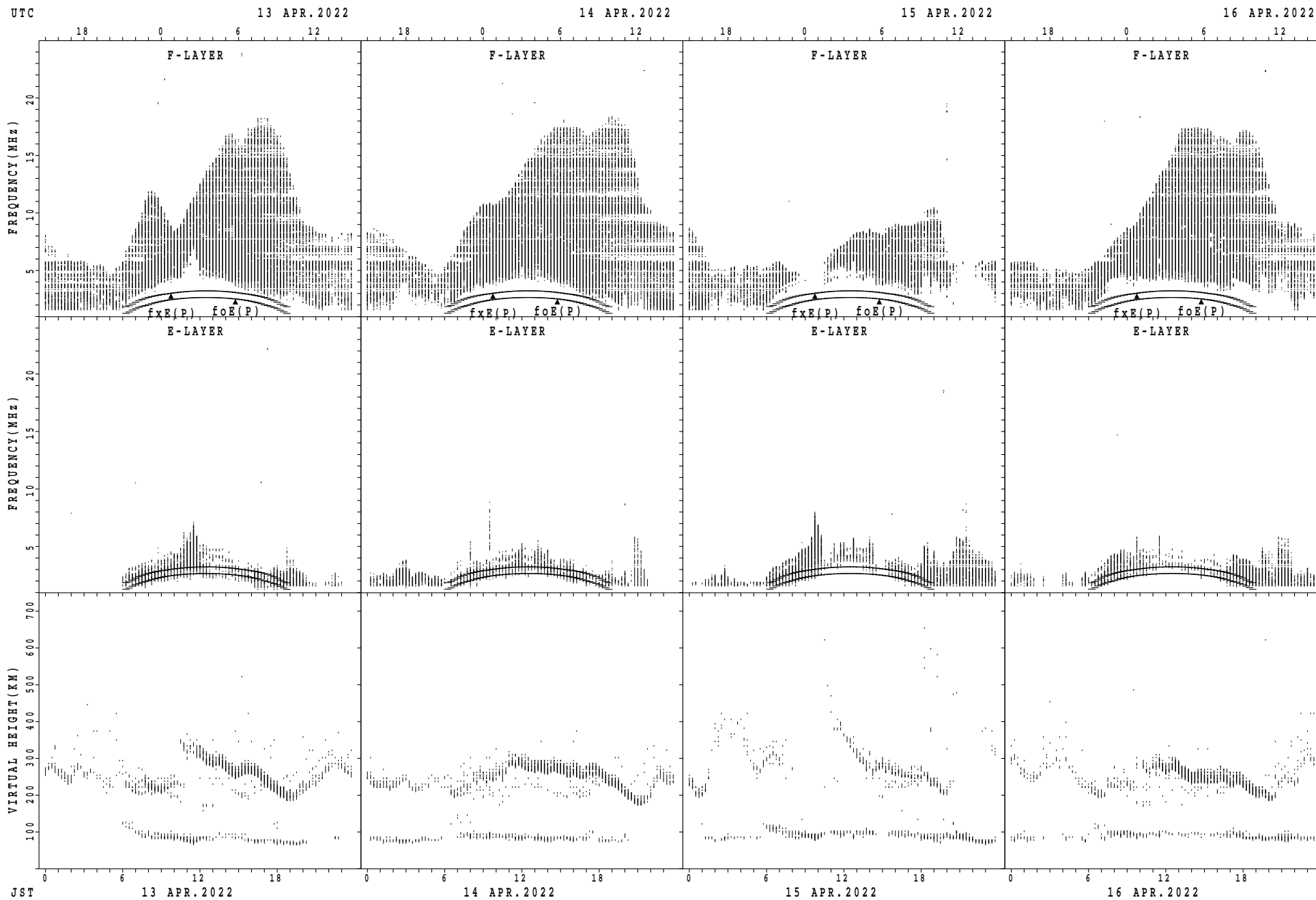
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Okinawa



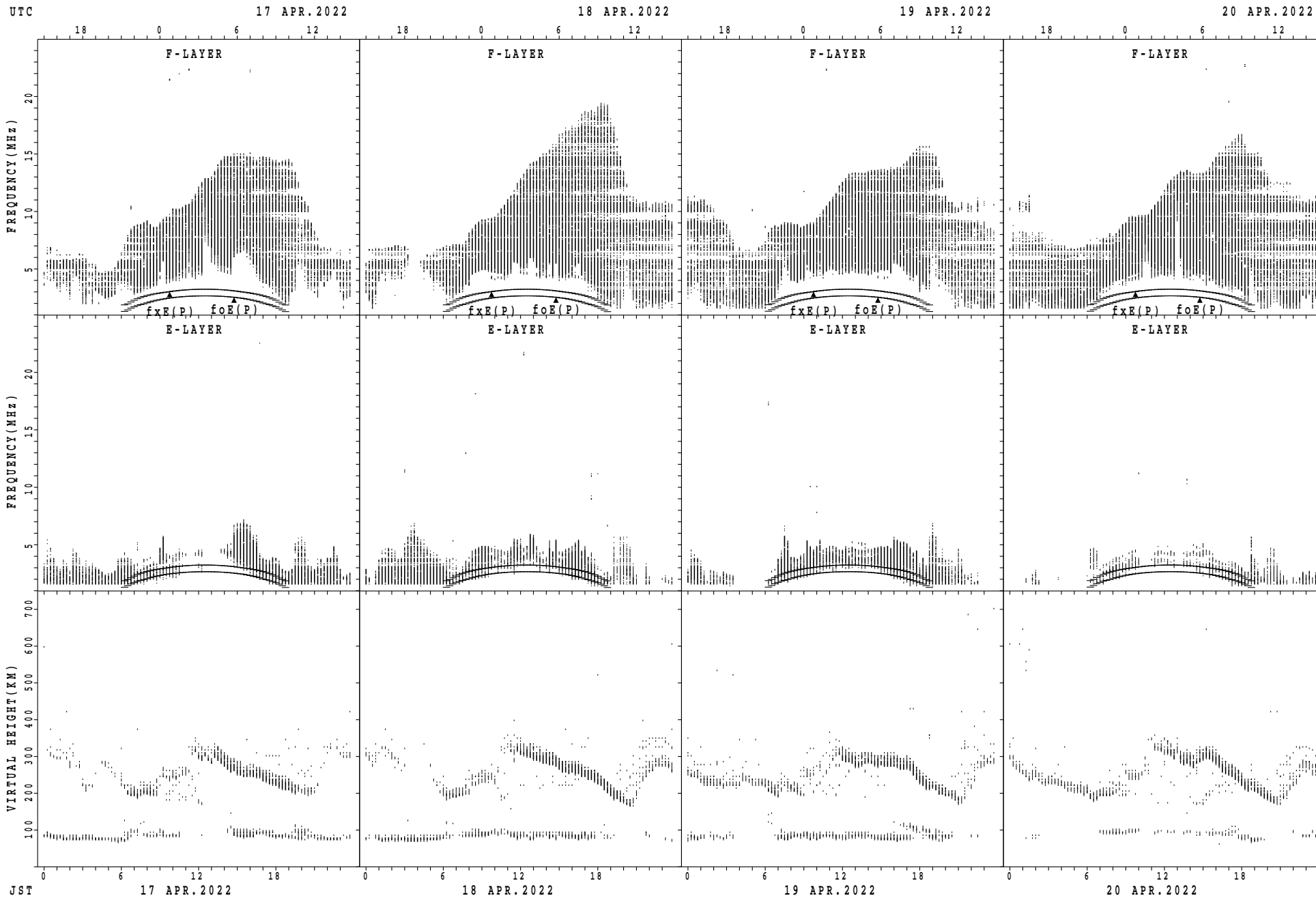
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Okinawa



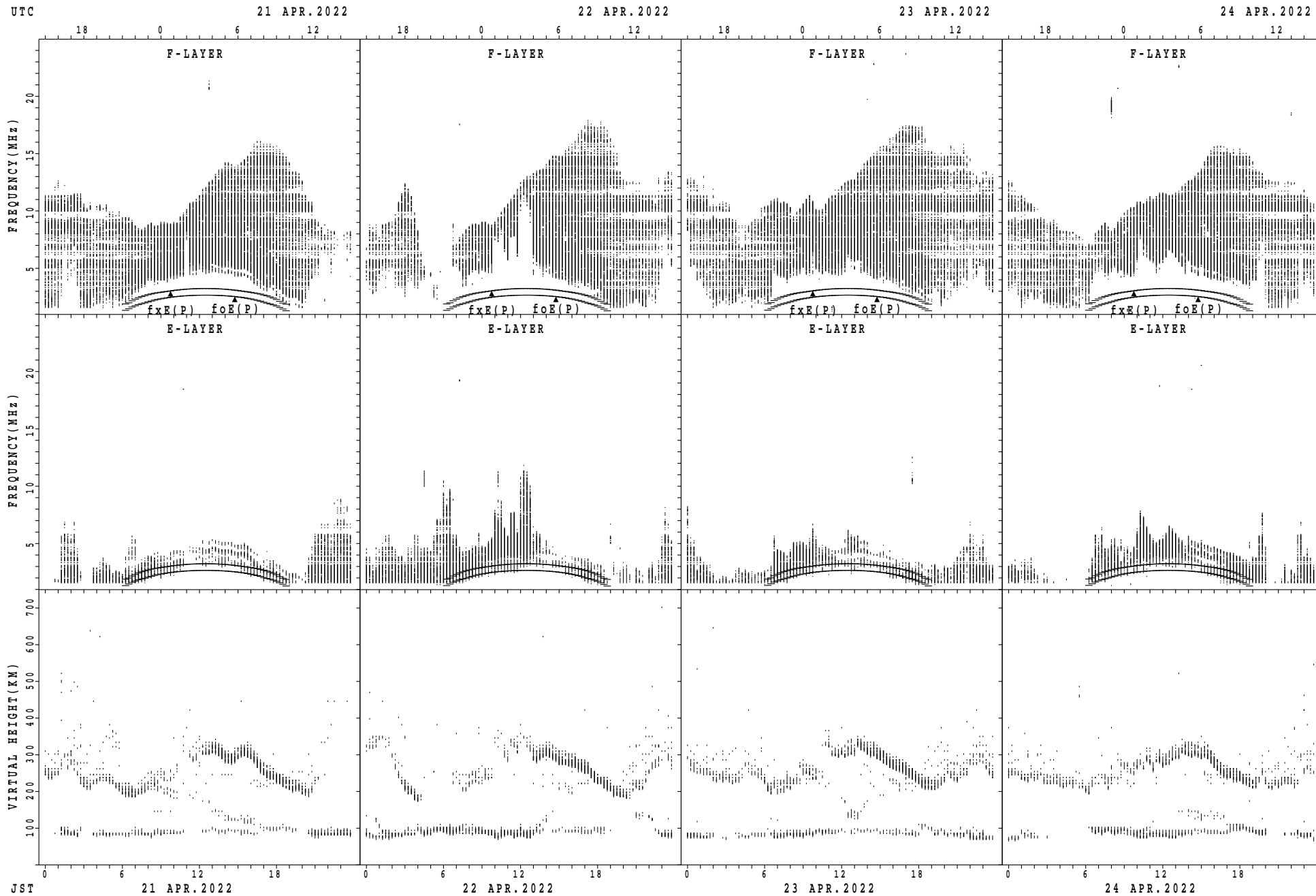
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Okinawa



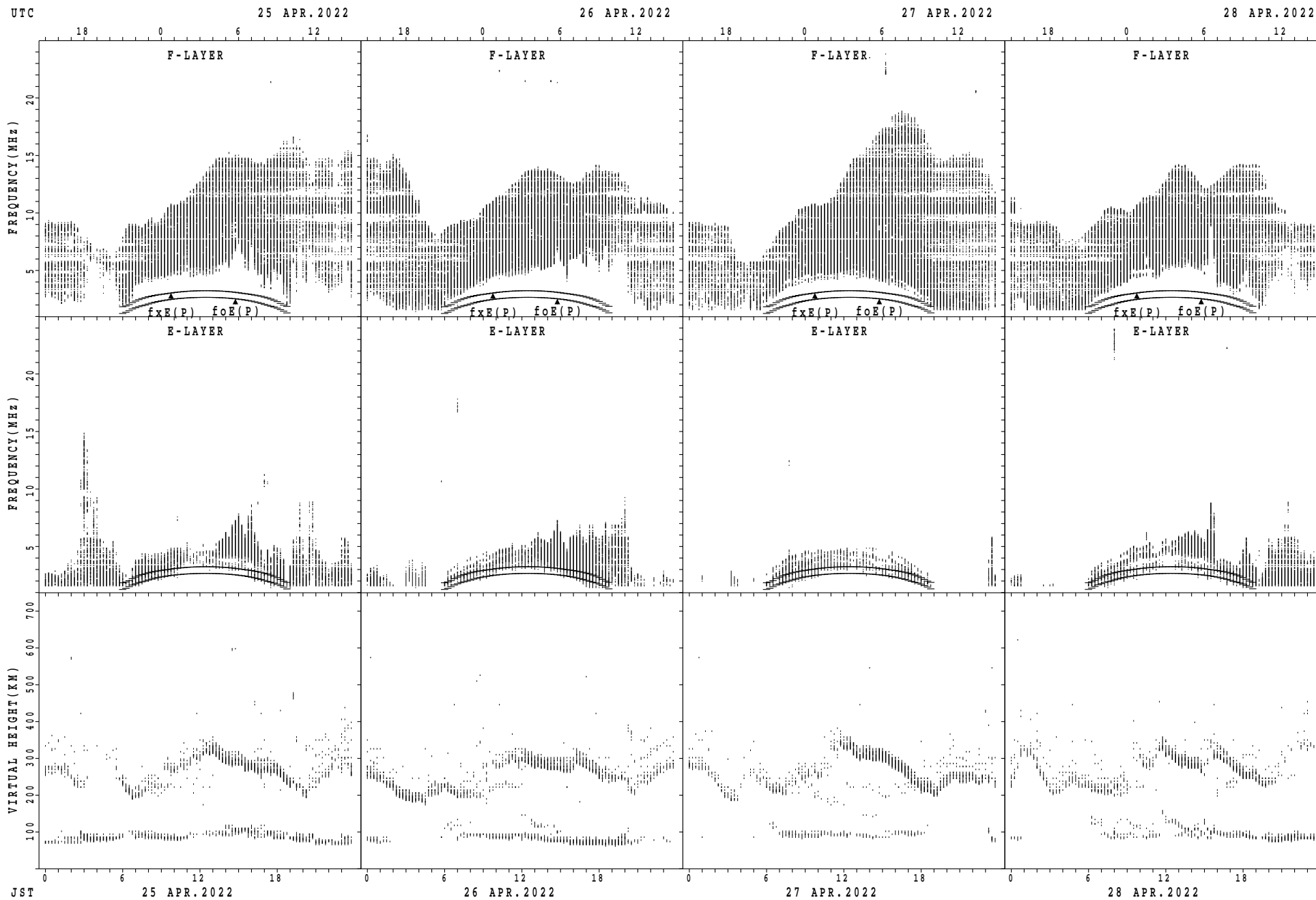
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Okinawa



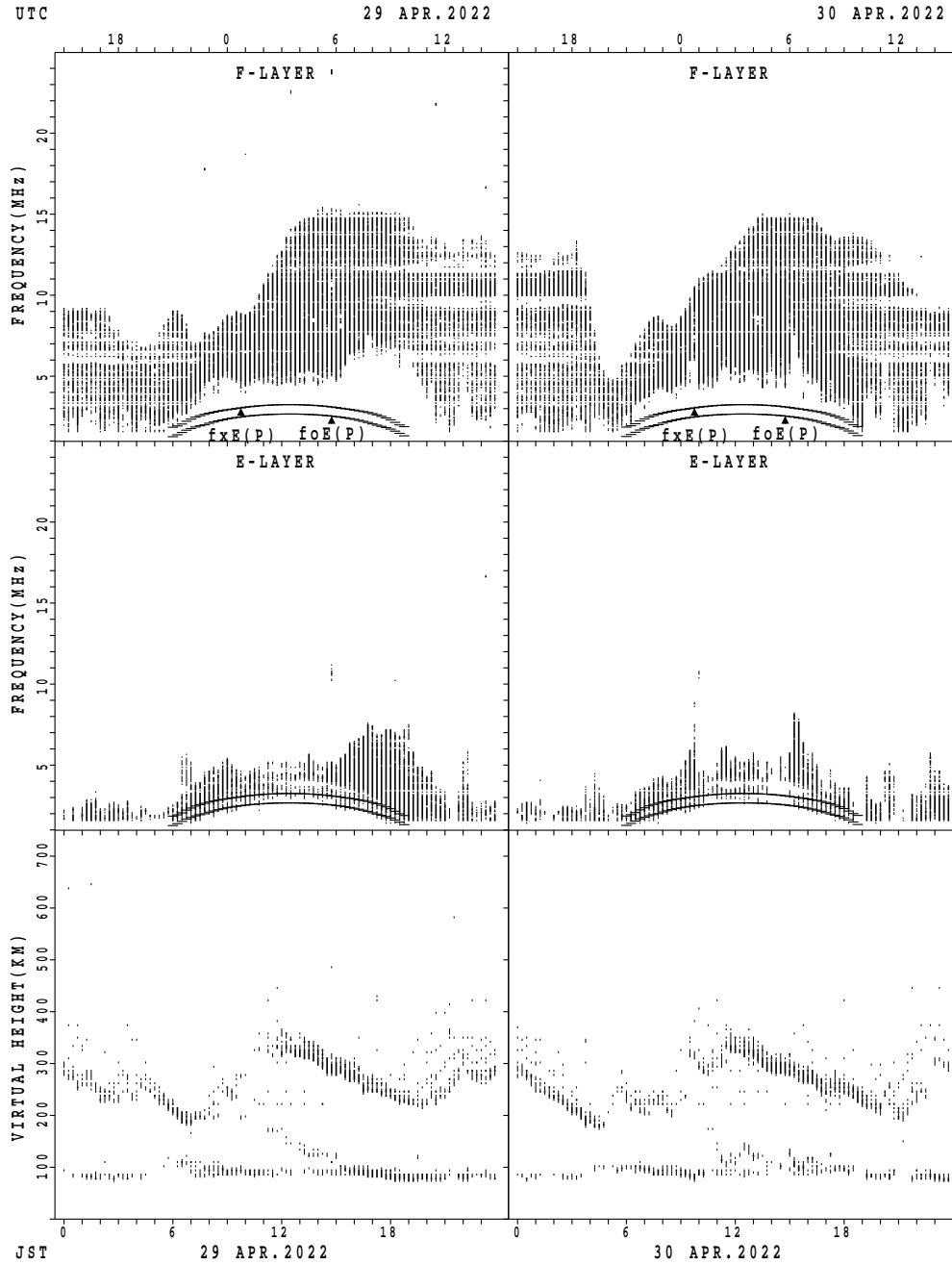
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; 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  
 APR. 2022 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	2						9	17									25	26	21	17	16	7	1	
MED	336						252	246									244	249	248	256	266	274	288	
U Q	340						274	256									263	278	256	274	280	290	144	
L Q	332						249	236									235	240	240	242	251	270	144	

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	18	15	16	19	19	14	30	30	30	29	30	29	29	28	30	30	30	29	24	23	22	20	24	23
MED	96	98	98	96	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
U Q	98	98	98	98	98	98	100	100	100	98	100	98	99	100	98	100	98	100	98	98	98	98	98	98
L Q	96	96	96	94	96	96	98	98	98	95	98	94	96	96	96	98	96	96	97	94	86	97	96	96

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		1	2	1	2		16	27	7								29	29	29	28	13	5	2	2
MED		356	287	258	314		233	232	228								248	240	238	244	254	282	276	326
U Q		178	288	129	316		264	244	240								256	254	251	259	264	291	344	330
L Q		178	286	129	312		222	226	224								239	230	231	234	229	258	208	322

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	21	17	19	11	11	7	29	30	29	30	30	28	27	25	26	29	30	30	27	27	27	26	24	20
MED	96	96	96	98	98	98	98	99	98	98	96	96	96	96	98	98	98	98	96	98	96	96	96	96
U Q	98	98	98	98	98	141	137	100	99	98	98	98	98	98	98	99	100	100	98	98	98	98	98	98
L Q	95	96	96	96	96	96	98	98	95	96	96	96	96	93	96	96	96	96	94	94	94	94	96	94

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	4	3	3	3	2		6	19	23								2	29	29	30	23	6	3	2
MED	298	328	264	258	291		242	226	238								255	246	238	235	232	254	316	305
U Q	341	378	288	266	314		242	242	248								256	255	248	246	248	272	330	312
L Q	295	282	256	240	268		234	218	224								254	238	224	230	216	240	300	298

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	19	16	17	13	17	11	15	28	29	29	29	29	29	28	29	30	30	30	30	27	26	26	22	21
MED	96	96	96	96	96	96	98	98	100	98	98	96	96	96	98	98	98	98	98	96	96	96	96	96
U Q	96	96	98	98	98	98	98	100	100	100	98	98	98	96	98	98	100	100	100	98	98	98	98	98
L Q	94	94	94	94	96	96	96	96	98	97	97	96	95	96	96	96	96	98	96	94	94	94	96	95

MONTHLY MEDIANS OF h'F AND h'Es  
 APR. 2022 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

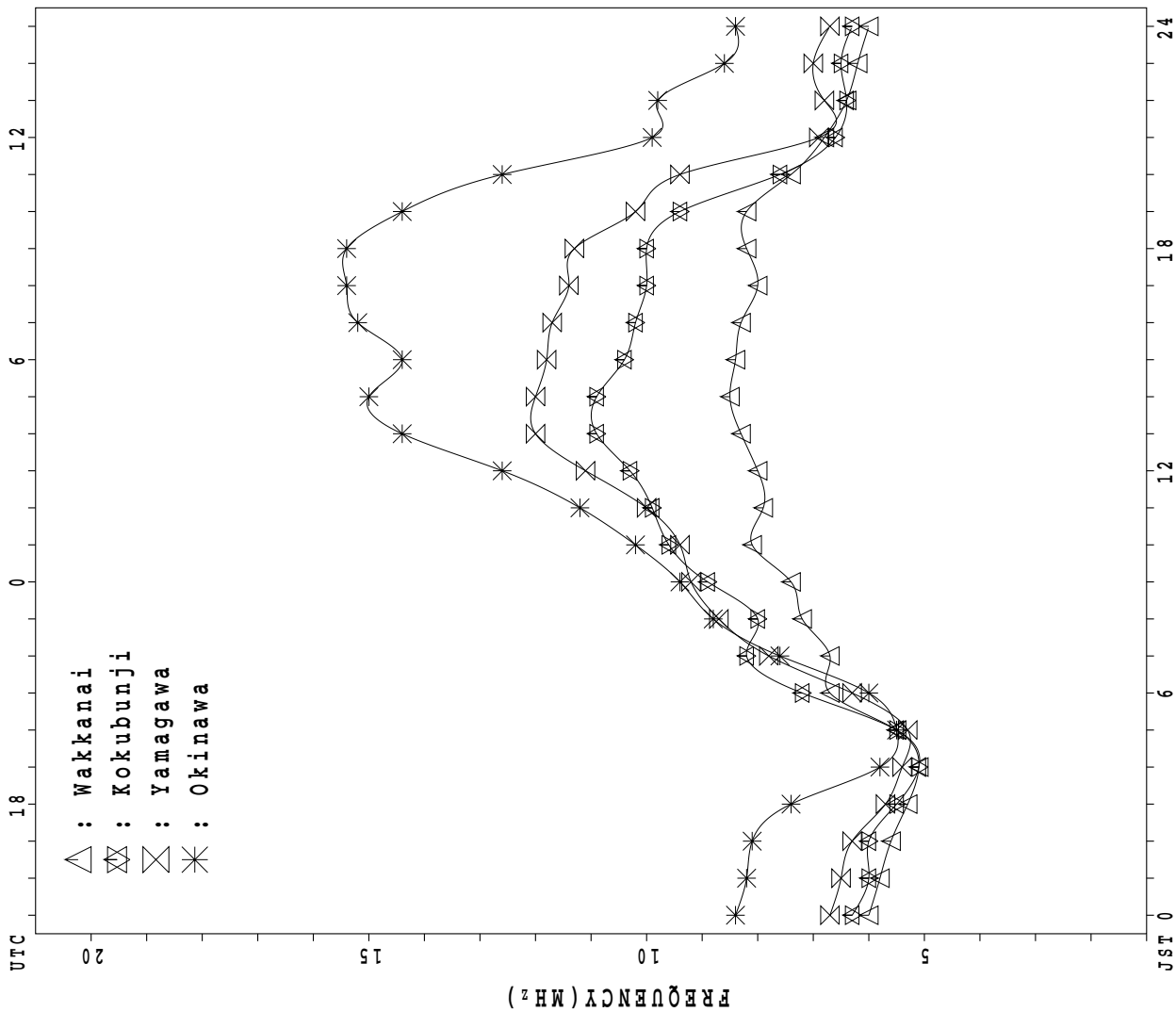
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	12	16	14	6	3	5	19	26	1								30	30	30	28	23	21	21
MED	288	269	270	241	237	266	224	226	239	248								247	228	228	218	258	314	304
U Q	309	298	285	264	266	288	248	236	248	124								258	248	238	244	274	330	313
L Q	265	255	252	220	216	252	217	210	224	124								244	224	212	208	236	284	288

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	21	20	17	17	16	17	29	30	30	30	27	28	27	28	29	29	30	30	26	25	24	24	24
MED	96	96	96	96	98	98	98	98	98	98	98	96	96	98	96	98	98	98	98	96	96	98	96	96
U Q	98	98	96	98	98	98	98	99	100	98	98	98	114	107	98	98	99	100	98	98	98	98	98	97
L Q	94	95	94	96	94	96	97	96	96	96	96	94	95	94	96	95	96	96	96	92	92	93	94	94

MONTHLY MEDIANS PLOT OF fOF2

APR. 2022



## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 f<sub>XI</sub> (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 71	X 74	X 71	X 75	69																X 76	X 70	X 66	X 65	
2	X 68	X 67	X 59	X 58	X 55																	X 75	X 75	X 70	X 68
3	X 66	X 65	X 65	X 62	X 56																	X 82	X 80	91	91
4	90	X 72	X 71	X 69	62																	X 77	X 72	72	X 64
5	X 62	X 59	X 59	X 58																		X 82	X 76	X 74	X 74
6	X 70	X 70	X 67	X 61																		X 77	X 74	X 74	X 74
7	X 72	X 71	X 70	X 67																		X 83	X 78	X 76	X 72
8	X 72	X 72	X 71	X 64																		X 85	X 77	X 73	X 69
9	X 68	X 67	X 66	X 65																		X 91	X 88	X 75	X 67
10	72	68	X 60	X 59																		X 77	X 62	X 57	X 50
11	X 59	X 58	X 57	X 59																		X 87	X 77	X 69	X 67
12	X 67	X 67	X 66	X 64																		X 85	X 77	X 67	X 61
13	X 58	X 58	X 54	X 54																		X 72	X 67	X 63	X 65
14	X 63	X 63	X 63	X 59																		X 93	X 85	X 72	X 66
15	X 61	X 51	X 45	X 39																		X 55	X 45	X 39	X 35
16	X 35	X 34	X 33	X 32																		X 68	X 66	X 60	X 58
17	X 55	X 54	X 53	X 46																		X 67	X 66	X 66	X 64
18	X 63	X 61	X 57	X 55																		X 91	X 72	X 63	X 61
19	X 60	X 59	X 61	X 58																		X 81	X 79	X 67	X 64
20	X 59	X 62	X 59	X 60																		X 79	X 70	X 66	X 61
21	X 59	X 58	X 57	X 56																		X 89	X 79	X 66	X 65
22	X 61	X 61	X 61	X 59																		X 79	X 75	X 71	X 67
23	X 66	X 65	X 63	X 60																		X 83	X 77	X 77	X 77
24	X 75	X 73	X 70	X 62																		X 80	X 77	X 70	X 67
25	X 67	X 65	X 64	X 61																		X 91	X 89	X 79	X 74
26	X 71	X 67	X 67	X 66																		X 86	X 86	X 79	X 75
27	X 72	X 72	X 70	X 67																		X 93	X 84	X 79	X 76
28	X 66	X 65	X 66	X 66																		X 91	X 91	X 79	X 77
29	X 74	X 71	X 68	X 65																		X 82	X 80	X 77	X 73
30	X 75	X 72	X 76	X 70																		X 81	X 79	X 78	X 72
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	4																30	30	30	30	
MED	X 66	X 65	X 64	X 60	59																X 82	X 77	X 72	X 67	
U Q	X 72	X 71	X 68	X 65	66																X 87	X 80	X 77	X 74	
L Q	X 61	X 59	X 59	X 58	56																X 77	X 72	X 66	X 64	

APR. 2022 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 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	64	67	64	68	F 59	62	66	65	69	67	76	76	79	84	77	75	77	82	78	78	69	63	59	58
2	61	60	52	51	48	53	69	80	80	C	94	94	90	100	97	96	86	82	83	72	68	68	63	J 61
3	F 59	58	F 58	F 55	F 49	52	58	71	77	86	88	88	90	101	93	81	78	78	74	74	75	73	F	F
4	F 65	F 58	F 58	F 47	54	50	56	65	77	90	97	97	101	102	96	87	82	87	79	70	65	60	58	
5	55	52	52	51	51	56	59	70	79	86	87	95	99	92	89	92	84	82	77	74	75	69	67	67
6	R 63	63	60	54	52	54	69	81	86	91	99	95	94	96	99	94	89	82	85	78	70	67	67	67
7	65	64	63	60	56	59	71	74	85	90	100	98	100	99	92	87	88	88	85	81	76	71	69	65
8	65	65	64	57	53	58	72	73	88	94	101	90	99	95	92	84	84	79	77	80	78	70	66	62
9	61	60	59	58	52	54	56	60	66	77	82	87	95	93	96	96	83	83	88	90	84	81	68	60
10	F 59	F 57	53	52	54	48	54	49	51	52	66	74	77	83	82	83	96	80	D 86	C 69	70	55	50	50
11	51	51	50	52	49	54	69	76	75	77	85	89	97	90	96	84	82	78	84	86	80	70	62	60
12	60	60	59	57	52	57	66	59	66	72	82	90	92	98	96	86	83	73	71	81	78	70	60	54
13	51	51	47	47	43	46	47	56	61	74	75	75	70	74	67	71	75	78	76	70	65	60	56	58
14	56	56	56	52	50	56	70	72	75	83	86	82	88	81	81	87	92	86	84	88	86	78	65	59
15	54	44	38	32	36	39	31	35	E 38	GE 40	GE 42	GE 42	GE 41	47	47	46	44	44	43	45	48	38	32	28
16	28	27	26	25	28	39	44	53	52	55	61	67	66	74	70	71	72	69	65	62	61	59	53	51
17	48	47	46	39	38	44	53	52	54	57	58	60	66	69	74	70	72	74	74	73	60	59	59	57
18	56	54	50	48	48	57	60	70	76	72	81	75	79	76	82	76	77	78	83	91	84	65	56	54
19	53	52	54	51	48	45	57	63	62	65	67	65	69	71	78	77	71	71	70	74	74	72	60	57
20	53	55	52	53	53	55	58	65	67	64	68	68	67	B	72	80	75	77	84	80	72	63	59	54
21	52	51	50	49	50	57	71	70	70	70	H 72	R 70	74	75	77	82	81	76	81	88	82	72	59	58
22	54	54	54	52	45	42	52	52	58	58	60	63	66	72	77	73	71	75	74	73	72	68	64	60
23	59	58	56	53	54	58	69	64	70	72	74	74	74	77	80	82	75	75	81	85	76	70	70	70
24	68	66	63	55	51	60	64	66	68	68	63	66	69	73	78	76	72	76	86	88	73	70	63	60
25	60	58	57	54	53	58	69	79	84	83	83	81	80	88	86	84	84	85	87	91	84	82	72	67
26	64	60	60	59	56	65	76	77	74	70	80	80	78	81	83	85	87	82	80	80	79	79	72	68
27	65	65	63	60	62	70	72	77	83	82	90	89	90	86	86	91	86	90	90	96	86	77	72	69
28	59	58	59	59	59	58	73	67	65	66	64	68	72	74	83	80	76	74	72	80	84	84	72	70
29	67	64	61	58	56	C	60	63	68	67	72	68	76	79	85	83	77	79	81	81	74	74	70	66
30	68	65	69	63	58	64	78	76	76	83	73	81	79	84	91	91	87	89	83	76	74	72	71	65
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	29	30	29	30	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30	29	29
MED	59	58	56	53	52	56	65	66	70	72	78	78	79	83	83	83	82	78	81	80	74	70	63	60
U Q	64	64	60	58	54	58	70	74	77	83	87	89	92	94	92	87	86	82	85	86	80	73	70	66
L Q	54	52	52	51	48	50	56	59	65	66	67	68	70	74	77	76	75	75	74	74	70	65	59	57

APR. 2022 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 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	440	484	508	500	556	484	476		L	L						
2									360		496		L	540	L	508	432	408		L				
3								332	480		496	520	532	420	480	476								
4							272	L	468	484	512	512	492	L	496									
5									L	L	500	484	444	440	512	440		L		280				
6								L	L	492	508	496	496	452	456	432		L						
7									L	500	476	508	508	508	464	436	368							
8								L	484	484	492	456	448	512	512	404	372							
9								U	372	404	488	492	492	504	504	472		L						
10							324	396	424		472	484		L	472	472	432							
11								300	428		L	488	480	464			L	L						
12								L	388	428		508	480	504	524	476	412							
13						L		U	344	448	440	476	476	476	476	440	440	424		L				
14								L	396	396	484	464	488	496	496	512	408	408			L			
15						260	248	L	384	404	420	420	412		L	420	404	416						
16								384		A	A	472		L	480	488	448	472	428	316				
17								420	460	460	480	480	496		B	480	448	364		L				
18					A			428	456	488	488	488		L	L	L	456	428		L				
19							396	432	496	468	492		L	476	528	500	472		L					
20								432	460	480	480	500		L	B	484		436	376					
21							404	404	460	448	464		B	492	500	500	444		L	L				
22						276	384		L	456	484	508	500		L	520	508							
23								L	460	504	472	508	532	508		472		L	L		L			
24					L	U	L	L	444		L	644	556	504	524	524		L	L	L	L			
25								L	344		500		L	508	528	508	476	436	400					
26								L	436	512	528	528	524	576	512	516	500	440						
27									404	492		532	528	564		548	488							
28						380		L	L	480		L	524	480	544	532	520	472	448	400				
29					C			L	L	456	488	524	524	524	540	508	508							
30								L	440		L	L	A	516	548	544	488	504	464					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						6	7	18	23	21	29	25	26	22	26	23	15	6						
MED						292	384	400	456	484	492	496	504	508	492	448	424	376						
U Q						320	400	432	480	500	510	510	532	524	508	476	436	400						
L Q						260	272	372	428	474	476	480	480	484	472	432	408	316						

APR. 2022 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	192	256	264	344	344	344	344	312	340	324	292	240	A	B				
2						B	196	260	160	C	348	352	B	352	336	316	288	232	B	B				
3						B	224	268	312	332	348	356	360	352	340	324	284	220	A	A				
4						B	200	288	312	324	356	356	360	348	340	316	292	240	A	A				
5					B	B	204	268	304	336	352	356	368	360	352	328	276	228	B	B				
6					B	B	236	256	308	320	348	348	348	360	352	316	280	220	B	B				
7					B	B	216	268	308	344	360	352	340	340	344	320	252	232	A	B				
8					B	B	252	288	316	328	336	308	352	360	340	A	216	232	196	A				
9					B	A	216	264	292	336	336	328	364	356	344	304	A	220	196	B				
10					B	B	212	268	292	320	368	336	336	284	336	312	276	232	A	B				
11					B	A	A	A	300	328	356	A	340	332	240	276	216	A	A	A				
12					B	B	216	276	312	348	348	348	392	A	316	328	A	A	A	A				
13					B		196	224	264	308	320	340	352	300	344	332	296	228	240	212	A			
14					B		244	224	272	304	320	336	340	332	348	292	244	268	236	200	B			
15					204	188	204	268	292	320	348	348	308	336	316	308	244	224	184	A				
16					B		188	236	284	312	320	344	364	332	364	332	304	288	A	B	B			
17					B		200	224	288	320	336	352	A	A	B	A	280	292	248	256	B			
18					B		200	240	276	320	340	352	352	340	336	352	312	304	A	204	A			
19					B		180	236	284	324	336	336	352	344	312	324	324	312	244	168	192			
20					B		180	256	300	324	336	356	364	364	B	A	328	292	248	A	A			
21					B		188	236	A	324	332	352	B	340	320	344	336	300	244	168	A			
22					228	A	236	288	328	352	356	364	380	356	316	340	300	240	224	A				
23					B		176	244	300	324	352	364	364	376	384	352	272	256	264	256	A			
24					A		248	248	296	356	356	356	356	356	320	332	260	272	252	204	212			
25					B		196	248	288	332	344	360	344	A	324	368	328	308	268	176	B			
26					188	216	268	304	332	348	348	332	376	376	356	336	300	260	B	B				
27					B		208	256	292	340	348	348	312	376	372	348	352	300	244	184	252			
28					B		192	264	296	336	352	360	340	364	364	348	336	300	264	172	A			
29					B	C	240	300	320	320	360	A	376	376	356	336	304	260	A	B				
30					B	B	240	288	324	356	368	368	368	368	368	332	300	256	200	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					3	15	29	28	30	29	30	26	27	27	28	29	28	27	16	3				
MED					204	196	236	284	314	336	352	352	356	352	340	320	290	240	198	212				
U Q					228	208	246	290	324	348	356	356	368	364	352	330	300	252	208	252				
L Q					188	188	216	268	304	322	348	340	340	332	332	304	270	232	180	192				

APR. 2022 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 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	24	19	19	E B	E B	E B	E B	J A		G	G	G	G	G	G	G	J A	J A	J A	J A	E B	22	22	22
2	22	J A	J A	J A	E B	E B	E B	26	29	33	C	40	39	E B	J A	G	G	J A	E B	J A	J A	E B	E B	E B
3	J A	19	J A	J A	E B	E B	J A	23	31	37	40	63	39	40	36	34	32	25	23	31	25	23	25	25
4	20	20	20	J A	32	22	E B	23	32	34	38	J A	J A	J A	J A	J A	J A	G	J A	J A	J A	E B	E B	E B
5	E B	16	21	E B	E B	E B	E B	J A	24	49	34	44	37	51	40	G	J A	J A	G	E B	J A	E B	E B	22
6	E B	E B	E B	E B	E B	E B	E B	J A	25	31	35	121	40	40	42	38	38	32	27	25	E B	J A	J A	J A
7	24	E B	16	18	E B	20	E B	J A	24	30	57	38	38	39	39	41	46	33	30	25	27	16	24	24
8	E B	E B	16	20	E B	J A	J A	J A	29	31	36	50	38	36	45	36	33	43	28	25	23	20	24	16
9	20	E B	16	18	J A	20	J A	24	29	33	52	38	37	41		G	J A	J A	J A	J A	J A	E B	E B	E B
10	E B	16	20	E B	E B	E B	E B	24	31	34	35	40	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	23	E B	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	J A	J A	J A	J A	J A	J A
12	E B	E B	E B	E B	E B	E B	E B	26	32	35	59	38	43	86	47	43	65	52	43	23	24	29	36	38
13	24	J A	J A	21	J A	21	28	J A	24	63	34	38	39	42	38	J A	49	38	36	29	26	25	26	31
14	J A	J A	J A	22	E B	J A	J A	25	30	33	38	J A	56	38	40	40	J A	J A	J A	J A	J A	E B	E B	E B
15	30	J A	J A	J A	J A	J A	J A	24	28	J A	33	52	106	38	J A	38	38	G	J A	J A	J A	J A	J A	J A
16	20	32	21	24	19	31	34	34	56	52	48	42	38		G	J A	J A	J A	J A	J A	J A	E B	J A	J A
17	J A	J A	E B	J A	22	20	26	32	38	38	38	36	36	E B	48	35	J A	J A	J A	J A	J A	J A	J A	J A
18	J A	J A	J A	22	31	21	27	32	38	38	41	41	41	J A	40	35	G	J A	J A	J A	J A	E B	J A	J A
19	J A	E B	E B	E B	E B	J A	J A	28	31	39	47	38	39	J A	38	37	41	34	37	25	20	J A	J A	E B
20	28	J A	J A	J A	J A	J A	J A	30	34	38	40	40	42	52	J A	B	34	46	36	29	22	23	31	20
21	20	E B	E B	E B	J A	J A	J A	20	23	25	31	35	48	G	E B	57	38	38	61	J A	J A	J A	J A	E B
22	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	J A
23	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	J A
24	E B	16	22	J A	J A	J A	J A	20	25	28	36	39	59	56	48	44	51	56	63	37	34	36	25	31
25	J A	J A	J A	J A	J A	J A	J A	28	33	37	40	45	41	39	43	48	42	38	30	21	16	13	16	16
26	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	E B	E B	E B
27	E B	E B	E B	E B	J A	J A	J A	29	32	37	38	38	37	G	39	G	J A	J A	J A	J A	J A	E B	E B	E B
28	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	J A	J A
29	27	E B	E B	E B	J A	C	J A	J A	J A	J A	J A	J A	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	23	23	24	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	30	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30	30	30
MED	22	20	20	20	20	J A	22	26	32	36	44	40	40	40	40	36	J A	J A	J A	J A	J A	J A	24	22
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	E B	E B	E B	E B	E B	E B	24	31	34	38	38	38	38	36	G	G	J A	J A	J A	J A	E B	E B	E B

APR. 2022 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 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	E 16	E 16	E 16	E 16	E 16		24	27	31	33	G	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
2	E 16	E 16	E 16	E 16	E 16	E 16		23	28	32	C	33	38	E 46	47	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
3	E 16	E 16	E 16	E 16	E 16	E 16		22	29	36	38	41	36	40	35	34	32	29	24	17	17	E 16	E 16	E 16	
4	E 16	E 16	E 16	E 16	E 16	E 16		22	28	33	35	36	36	32	36	32	28	30	28	23	16	16	E 16	E 16	
5	E 16	E 16	E 15	E 16	E 16	E 16		21	24	30	39	36	39	38		G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
6	E 16	E 16	E 16	E 16	E 16	E 16		22	28	32	35	39	35	40	36	34	32	27	23	18	21	E 16	E 16	E 16	
7	E 16	E 16	E 16	E 16	E 16	E 16		23	28	31	36	37	39	39	38	30	32	26	23	18	16	E 16	E 16	E 16	
8	E 16	E 16	E 16	E 16	E 16	E 16		24	28	34	37	37	35	39	34	33	37	26	24	18	18	E 16	E 16	E 16	
9	E 16	E 16	E 16	E 16	E 16	E 16		23	27	32	32	36	35	39		G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
10	E 16	E 16	E 16	E 16	E 16	E 16		22	29	31	34	34	35	37	37	31	30	27	23	18	16	E 16	E 16	E 16	
11	E 16	E 16	E 16	E 16	E 16	E 18		24	24	33	38	34	36	40	38	34	29	29	24	23	20	17	23	19	
12	E 16	E 16	E 16	E 16	E 16	E 16		24	30	32	45	36	40	41	39	39	32	30	24	20	E 16	23	19	24	
13	E 16	20	E 16	E 16	E 16	E 18		23	28	32	37	37	39	36	36	34	31	26	23	20	16	16	16	22	
14	E 16	E 16	E 16	E 16	E 16	E 16		24	27	31	36	40	36	36	38	38	29	27	24	17	16	16	16	16	
15	18	E 16	E 16	E 16	E 16	E 18		22	26	30	34	34	36	34	34		G	G	G	E 16	20	21	16	16	
16	E 16	E 16	E 16	E 16	E 16	E 18		23	32	A	A	44	37	33	G	G	G	G	E 16	E 16	17	17	18	24	
17	21	E 16	E 16	E 16	E 16	E 18		24	31	34	36	38	35	35	E 48	35	36	28	25	24	21	E 16	20	16	
18	20	E 16	E 18	E 16	E 16	E 19		26	31	36	35	38	38	39	39	34		G	G	E 16	E 16	22	21	24	
19	E 15	E 15	E 16	E 16	E 15	E 18		25	30	37	41	36	38	37	36	38	G	G	G	E 16	E 16	E 16	E 16	E 16	
20	E 16	E 16	E 16	E 16	E 16	E 17		25	29	35	36	37	40	40		B	G	G	E 16	E 16	23	16	16	16	
21	E 16	E 16	E 16	E 16	E 16	E 17		22	27	34	37	E 57	36	36	36		G	G	G	E 16	E 16	E 16	E 16	E 16	
22	16	27	E 16	E 16	E 16	E 20		24	33	36	40	40	38	38	40	35	37	29	32	29	23	16	16	21	
23	E 16	E 16	E 16	E 16	E 16	E 17		24	32	34	39	41	44	46	43		G	G	A	31	30	33	24	20	
24	E 16	E 16	17	E 17	E 17	E 21		21	34	36	48	49	43	40	42	52		G	G	E 16	E 16	28	17	15	
25	23	16	E 16	E 22	E 16	E 19		25	31	37	38	42	40	37	37	37	33	30	28	20	E 16	E 16	E 16	E 16	
26	E 16	E 16	E 16	E 16	E 16	E 20		26	32	35	36	36	37		G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
27	E 17	E 16	E 16	E 16	E 16	E 20		26	32	35	35	42	37		G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
28	E 16	E 16	E 16	E 16	E 16	E 20		26	32	34	37	38	38	38	37		G	G	G	E 16	E 16	E 16	E 16	E 16	
29	E 16	E 16	E 16	E 16	E 16	C		26	30	33	37	36	38	38	G	G	G	G	E 16	E 16	E 16	E 16	19	20	
30	E 16	E 17	E 16	E 26	E 16	E 19		22	30	39	44	50	39	42		G	G	G	E 16	E 16	E 16	E 16	26	18	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	29	30	30	29	28	30	30	30	29	30	29	30	30	30	30	30	30	30	30	
MED	E 16	E 16	E 16	E 16	E 16	E 17	24	29	34	37	37	38		G	36	36	32	28	24	19	16	E 16	E 16	E 16	
U Q	16	16	16	E 16	E 16	E 19	25	31	36	38	40	39	40	39		G	G	30	27	23	20	18	17	18	
L Q	E 16	E 16	E 16	E 16	E 16	E 16	22	28	32	35	36	36	37		G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	

APR. 2022 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	16	16	16	16	18	18	16	16	15	16	15	16	16	16	16	16	16
2	16	16	16	16	16	16	16	16	16	C	21	21	46	16	16	16	15	15	16	16	16	16	16	16
3	16	16	16	16	16	16	16	15	16	18	22	22	21	20	17	15	10	10	10	16	16	16	16	16
4	16	16	16	16	16	16	16	15	16	16	16	22	16	18	15	15	12	13	13	16	15	16	16	16
5	16	16	15	16	16	16	16	14	15	18	15	16	20	18	18	14	15	15	16	16	16	16	16	16
6	16	16	16	16	16	16	15	16	17	15	16	16	19	24	16	15	12	14	18	16	16	16	16	16
7	16	16	16	16	16	16	16	16	16	16	17	16	15	21	16	15	14	15	17	16	15	16	16	16
8	16	16	16	16	16	16	16	16	15	16	16	17	15	21	16	16	14	10	16	16	16	16	16	16
9	16	16	16	16	16	16	16	14	12	19	16	17	19	16	12	11	11	10	11	16	16	16	16	16
10	16	16	16	16	16	17	16	16	16	16	16	15	20	22	16	16	16	16	10	15	14	16	16	16
11	16	16	16	16	16	16	16	16	15	16	16	17	16	14	9	17	12	17	16	16	16	16	16	16
12	16	16	16	16	16	16	16	16	15	15	15	16	15	22	16	16	16	16	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	16	14	15	20	17	17	16	16	16	10	16	16	16	16	16	16
14	16	16	16	16	16	14	16	16	15	16	16	18	20	16	16	16	15	12	16	16	16	16	16	16
15	16	17	16	16	16	16	16	16	16	14	16	22	22	21	20	17	14	15	16	16	16	16	16	16
16	16	16	16	16	16	16	16	15	17	16	16	20	23	21	21	15	18	15	16	16	15	15	16	16
17	16	16	16	15	16	16	16	16	16	16	16	25	24	48	28	16	16	14	16	16	16	16	16	16
18	16	16	16	16	16	16	16	15	16	21	23	22	24	25	23	16	16	16	15	16	16	16	16	15
19	16	15	16	16	16	16	16	16	18	17	22	23	20	16	24	21	15	16	16	16	16	16	16	16
20	16	17	16	16	16	15	15	16	16	19	18	24	22	B	17	18	16	16	15	16	16	16	16	16
21	16	16	16	16	16	16	16	16	16	20	22	57	24	22	20	16	16	15	14	16	16	16	16	16
22	16	16	16	16	16	16	16	16	15	16	18	16	23	24	22	16	16	14	16	16	16	16	16	16
23	16	16	16	16	16	16	16	17	16	16	16	23	16	25	17	16	14	14	16	16	16	16	16	16
24	16	16	16	16	16	14	16	14	16	20	16	16	24	18	18	15	16	16	14	16	16	16	15	15
25	16	16	16	16	16	15	16	15	16	16	16	27	24	16	17	16	15	13	14	16	13	16	16	16
26	16	16	16	16	16	16	16	16	16	16	16	22	18	22	16	16	16	14	16	16	16	16	16	16
27	17	16	16	16	16	16	16	16	16	15	17	17	16	16	16	15	12	12	14	15	16	16	16	16
28	16	16	16	16	16	16	14	14	14	16	17	24	24	24	18	16	15	16	12	16	16	16	16	16
29	16	16	16	16	16	C	16	14	16	16	17	15	15	16	16	16	13	16	15	14	16	16	15	15
30	16	16	16	16	16	17	16	15	19	16	16	24	16	16	24	16	15	17	16	15	16	15	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	16	16	16	16	20	20	19	16	16	15	15	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	18	17	23	23	22	20	16	16	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	15	15	16	16	17	16	16	16	15	14	13	14	16	16	16	16	16

APR. 2022 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	262	277	276	277	274 <sup>F</sup>	302	324	324	331	307	302	310	303	313	330	311	311	331	312	308	308	275	285	256
2	300	300	276	273	279	283	338	341	323	317 <sup>C</sup>	321	302	301	301	320	320	320	312	299	281	281	281	281	281 <sup>J R</sup>
3	276	269	267	279	273	287	334	334	333	333	319	332	297	322	328	327	317	318	308	294	294	301		281 <sup>F</sup>
4	<sup>F</sup>	279	292 <sup>F</sup>	<sup>F</sup>	289 <sup>F</sup>	293	313	315	319	319	312	315	309	309	307	319	319	318	311	311	291	279	281	266
5	260	265	276	270	267	297	331	317	317	332	326	309	320	313	312	320	326	332	329	289	298	291	267	293
6	292 <sup>R</sup>	285	310	296	284	291	328	335	316	316	316	319	309	307	311	320	320	319	318	307	291	282	276	287
7	272	283	291	290	282	296	328	327	334	314	314	313	313	316	305	305	305	314	313	298	282	282	269	269
8	272	283	293	285	282	278	329	332	332	325	314	302	310	304	326	314	322	322	309	296	305	305	282	282
9	281	281	290	299	297	311	346	322	322	321	314	314	317	310	319	322	322	314	301	310	293	306	285	285
10	269	272 <sup>F</sup>	248	249	266	270	305	282	305	228	328	312	330	309	309	290	315	301	318	343 <sup>D C</sup>	295	310	273	317
11	273	270	276	293	290	295	329	337	337	334	328	305	318	309	312	329	320	320	319	317	316	299	282	282
12	281	280	292	291	288	315	346	346	345	328	326	321	308	319	318	322	336	335	312	312	312	312	312	272
13	268	273	272	291	283	336	318	340	315	315	321	323	306	321	312	312	312	317	317	311	296	305	278	286
14	283	285	298	295	292	324	348	340	332	342	321	334	322	322	305	318	317	317	313	313	313	334	290	311
15	299	277	258	248	248	255	325	366	<sup>G</sup>	<sup>G</sup>	<sup>G</sup>	<sup>G</sup>	<sup>G</sup>	249	252	314	301	300	292	280	295	295	295	263
16	263	262	261	311	266	324	281	301	217	323	312	301	311	328	327	330	329	341	330	324	306	294	283	281
17	277	288	296	315	289	323	312	317	295	299	318	318	297	318	327	327	322	324	320	325	303	297	286	286
18	284	282	280	276	284	325	352	331	341	311	324	324	323	316	315	315	323	314	307	325	328	320	289	281
19	273	270	286	283	283	289	307	313	286	326	326	307	317	291	309	323	309	320	312	299	299	315	314	283
20	293	280	277	291	288	315	315	314	321	306	321	321	299	<sup>B</sup>	291	319	311	311	316	322	315	306	284	281
21	279	278	275	287	289	292	335	326	337	330	278 <sup>H R</sup>	317	305	297	293	292	307	307	306	306	310	305	293	273
22	266	264	262	292	295	271	312	257	299	317	286	298	298	297	305	325	312	322	311	307	298	293	285	285
23	280	277	277	277	273	282	305	333	341	314	313	319	300	299	299	312	312	302	294	305	305	276	272	271
24	277	283	292	290	280	300	301	301	287	260	305	319	303	311	311	321	299	305	313	312	306	293	280	280
25	285	276	273	282	293	299	314	314	325	330	313	303	286	301	300	317	309	307	307	302	302	302	302	292
26	281	292	286	285	283	301	335	341	315	315	306	306	294	305	305	304	313	314	313	299	289	297	296	283
27	274	274	297	297	296	340	335	315	331	322	318	305	299	299	298	301	300	311	303	320	319	285	282	282
28	253	257	272	270	308	308	307	335	330	282	291	291	281	276	307	311	315	305	289	281	275	302	298	263
29	270	281	280	273	270	<sup>C</sup>	327	324	322	295	295	289	280	287	293	299	301	313	312	306	283	281	272	264
30	266	265	280	291	290	289	327	326	308	313	290	300	284	284	283	299	300	309	321	294	278	290	290	284
31																								
H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	29	30	29	30	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30	29	29
MED	276	278	278	287	284	297	327	326	322	316	314	312	304	309	308	318	314	316	312	307	298	297	284	282
U Q	282	283	292	292	290	315	335	335	332	327	321	319	313	316	315	322	320	320	317	313	308	305	292	286
L Q	268	270	273	276	274	288	312	315	308	306	305	303	297	298	300	311	309	309	307	299	291	285	279	272

APR. 2022 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 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	361	361	348	356	352	370	370		L	L							
2									385	C	373	L	365	L	361	394	390		L						
3								403	L	L	379	378	370	425	L	358	371								
4							411	L	U	L	L	365	369	369	359	374	L	U	L	L					
5									L	L	U	L	394	385	416	406	355	381		L	380				
6								L	L		380	369	368	381	412	L	L	L	L						
7									L	U	L	369	385	385	360	359	381	382	387						
8								L	365	385	384	385	384	374	370	391	383								
9								U	L	410	410	360	358	369	369	367	367		L	L					
10											361	353	350		348	375		L	L	L					
11											379	395	L	376	378	405									
12								L	L	L	396	395	L	365	401	399	360	371	391						
13						L			U	L	396	355	393	377	364	376	372	372	369	353					
14								L	412	412	369	393	374	373	366	349	388	376		L					
15							312	342	L	U	L	364	385	388	415	414	L	356	353	340					
16									391	A	A	372	L	371	344	389	367	346	390						
17									356	355	388	362	363	368	B	364	374	410		L	L				
18				A					366	365	365	377	377	L	L	L	366	369		L	L				
19									352	350	349	373	364	L	388	334	348	347		L	L				
20											358	358	367	374	373	L	B	362		L	U	L			
21									363	382	360	385	410	B	354	367	351	358		L	L				
22									359	340	L	L	360	348	366	379		350	349		L	L			
23									410	L	L	378	371	410	355	354	352		L		L	L			
24					L	U	L	L	344	353	349		311	341	381	387	362		L	L	L	L			
25										L	420	L	374	L	374	359	358	356	365	369					
26									L	366	356	356	356	356	338	362	347	347	366		L	L			
27									398	349	L	L	371	370	352	L	341	356		L	L				
28					L	L			348	L	L	376	L	376	407	336	350	334	368	363	370				
29					C	L	L	U	L	U	L	L	383	382	340	373	334	334	348	348					
30						L		L	400	387	L	L	351	368	A	386	330	341	U	L	364	341	369		
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						6	7	18	23	21	29	25	26	22	26	23	15	6							
MED						354	353	384	365	369	372	375	370	362	360	369	369	376							
U Q						400	363	398	383	384	382	385	384	372	370	382	383	380							
L Q						344	342	358	356	360	363	366	354	350	349	356	361	370							

APR. 2022 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 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								240	278	308	312	288	310	280	260	272	266							
2									262	C	270	272	302	298	298	252	252	260						
3								258	276	270	270	276	326	266	262	262								
4							262	248	294	290	288	262	268	288	288	264	258							
5									278	262	280	266	278	264	276	276	250	254						
6								262	276	276	282	264	280	280	278	272	270							
7									254	276	276	282	282	282	282	266	266							
8								246	266	248	262	272	280	290	284	276	260							
9								242	284	296	286	270	286	294	284	272	256							
10							294	392	332		290	300	258	274	280	314	264							
11								250	250	256	256	266	278	270	270	260	260							
12							260	254	248	270	270	274	272	260	268	264								
13					264		252	322	300	276	276	298	298	298	300	284	262							
14								242	260	260	282	272	292	270	308	280	280		276					
15					426	322	248		G	G	G	G	G		276	470	328	362						
16								306		A E A	298	308	330	296	280	280	272	272	262					
17								330	362	364	322	302	328	294	284	282	282	262						
18				A				276	262	304	278	280	294	282	284	272	282	264						
19								298	308	288	294	294	316	308	350	294	276	276	276					
20								294	284	306	306	298	336		B	340	298	294	282					
21								282	260	260	262	266	284	284	310	342	306	282	274					
22								284	304	316	372	330	404	358	328	328	306	274	278					
23								262	222	242	260	308	304	294	334	326	302	280	286	272				
24					300	300	300	302	328	452	324	286	336	310		298	262	284	274					
25								230	262	272	258	292	302	282	314	296	288	278	278					
26								258	256	300	284	314	288	348	322	306	306	268	268					
27								274	282	282	300	282	300	300	318	290	274	276						
28								276	276	262	306	290	290	264	364	364	312	268	280	286				
29								C	276	266	296	296	340	358	346	346	320	314						
30								244	254	252	284	282	402	308	350	326	348	286	300					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1	7	14	27	29	28	30	30	30	29	29	30	27	15	2					
MED					300	276	276	260	282	288	290	283	299	294	294	276	274	272	275					
U Q					300	298	294	303	305	312	302	334	318	310	298	282	278							
L Q					262	258	248	262	270	276	272	282	278	280	272	262	262							

APR. 2022 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	306	288	260	288	242	266	242	208	218	220	218	226	236	202	208	194	222	236	238	238	238	282	272	300		
2	254	266	270	294	254	304	228	252	198	C	218	200	238	E A	254	200	210	212	232	232	270	270	270	278		
3	288	292	282	296	276	268	228	210	224	222	206	212	212	188	200	200	238	248	236	262	262	256	278	278		
4	292	272	258	244	256	272	200	200	204	208	208	202	202	196	202	204	202	240	246	258	258	276	260	276		
5	288	308	258	260	306	280	246	264	210	216	208	208	184	206	206	206	206	218	238	246	246	246	296	276		
6	280	292	274	246	274	274	236	212	202	200	222	204	204	204	204	210	220	244	248	240	240	264	284	284		
7	284	278	276	276	250	262	224	238	206	206	206	220	220	202	214	202	202	260	238	238	280	272	272	300		
8	306	294	274	256	280	302	254	218	218	216	204	198	202	212	224	204	220	242	250	258	252	248	264	284		
9	304	302	280	252	236	264	240	204	200	208	200	200	200	208	208	208	208	260	262	246	260	246	242	272		
10	286	294	332	326	336	296	232	226	A	222	218	192	202	222	208	208	216	218	244	258	234	266	212	294	306	
11	296	308	304	278	284	256	246	A	202	208	200	194	194	194	202	208	210	250	250	258	260	248	264	246		
12	294	276	272	256	260	254	210	198	198	226	212	202	214	214	220	194	250	226	258	270	256	246	252	306		
13	306	320	308	292	282	220	238	206	222	216	216	200	202	200	202	212	222	212	254	244	242	248	302	294		
14	284	280	266	264	278	248	242	202	202	210	222	206	198	214	214	204	212	262	232	252	240	222	274	258		
15	256	282	324	E B	374	364	278	270	208	214	214	220	204	204	198	234	242	242	276	268	310	282	264	272	E A	318
16	322	328	294	282	288	258	274	228	A	A	A	198	206	202	214	222	216	216	252	252	256	272	272	304		
17	316	300	270	258	290	248	258	242	230	214	206	212	198	B	210	230	210	228	236	236	232	278	284	290		
18	290	298	288	322	A	238	230	214	226	212	206	206	206	206	202	220	218	232	272	244	234	230	264	316		
19	308	324	274	276	250	244	244	240	226	218	202	218	200	208	216	214	214	234	260	260	264	234	248	264		
20	252	296	302	282	282	260	256	228	220	220	198	208	194	B	206	200	216	234	260	240	240	244	238	272		
21	272	290	290	272	288	260	220	204	214	204	192	B	196	H	204	212	222	220	220	258	258	248	222	254	272	
22	292	320	320	286	250	226	254	222	250	228	200	204	192	222	214	226	220	268	236	252	270	240	280	288		
23	290	290	290	302	310	208	200	200	200	200	200	234	244	220	212	228	214	216	260	254	262	286	320	268		
24	296	282	272	252	250	250	214	226	216	292	254	212	192	192	300	258	218	246	240	240	240	256	246	296		
25	286	300	300	292	276	254	206	200	216	204	204	202	198	196	204	212	206	230	262	256	230	254	252	262		
26	290	266	270	274	288	254	220	212	206	206	200	186	202	202	206	218	212	212	260	244	262	258	256	256		
27	300	308	264	278	266	238	228	200	210	212	202	198	208	202	206	216	216	242	266	244	226	244	260	280		
28	350	308	294	276	248	238	238	218	218	200	210	188	216	H	208	228	220	220	268	280	292	266	270	294		
29	286	296	280	296	302	C	216	216	212	204	216	190	196	206	H	224	224	284	284	258	264	256	276	290	336	
30	320	322	306	274	266	262	214	202	220	242	240	202	200	H	H	194	210	228	270	258	246	266	282	282	272	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	29	29	30	29	29	28	29	29	30	28	30	30	30	30	30	30	30	30	30	30		
MED	291	295	280	276	276	258	234	212	214	213	206	202	202	204	208	212	217	238	256	249	256	255	271	280		
U Q	306	308	300	292	288	270	246	227	221	219	217	210	212	208	214	222	220	250	260	258	264	272	282	300		
L Q	286	282	270	260	252	246	220	203	203	206	200	199	198	199	204	204	210	220	238	240	240	244	256	272		

APR. 2022 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	104	108	100	104	100	100	100	100	100	102	106	112	A	B				
2						B	112	104	112	C	104	98	B	98	98	98	98	118	B	B				
3						B	112	112	104	102	102	110	100	98	106	100	100	A	A					
4						B	108	108	108	108	100	120	104	100	100	100	104	104	A	A				
5					B	B	106	106	106	106	106	106	106	106	106	106	106	106	B	B				
6					B	B	120	110	110	110	110	104	104	104	104	102	98	110	B	B				
7					B	B	116	104	104	104	104	100	100	100	100	110	110	110	A	B				
8					B	B	116	116	112	108	102	102	106	106	106	A	96	102	122	A				
9					B	A	118	112	106	106	106	106	112	106	106	106	A	96	100	B				
10					B	B	106	110	110	104	104	104	104	104	98	106	106	106	A	B				
11					B	A	A	A	98	104	104	A	104	96	94	94	94	A	A	A				
12					B	B	110	110	108	108	108	102	102	A	108	108	A	A	A	A				
13					B	138	96	106	106	106	106	106	106	106	106	106	104	104	104	A				
14					B	130	110	108	94	94	98	100	102	102	102	102	102	102	102	B				
15					92	126	104	104	104	104	104	104	100	100	106	106	106	110	122	A				
16					B	128	100	100	100	100	100	100	100	100	100	100	100	A	B	B				
17					B	122	92	98	102	98	106	A	106	B	A	102	102	116	116	B				
18					B	106	122	106	106	98	104	104	102	102	106	106	106	A	114	A				
19					B	104	104	106	106	106	102	102	102	98	98	102	102	110	110	110				
20					B	110	98	102	102	102	102	102	102	B	A	106	106	106	A	A				
21					B	128	108	A	108	96	100	B	100	100	100	100	100	110	110	A				
22					92	110	102	102	96	96	96	100	100	84	98	98	98	80	94	A				
23					B	102	102	102	98	98	98	98	98	106	102	102	102	102	110	A				
24					A	96	96	98	98	98	98	98	98	98	98	98	98	100	118	104				
25					B	126	110	94	94	94	102	96	A	98	100	100	100	100	114	B				
26					92	112	106	106	98	98	98	98	98	98	98	98	100	106	B	B				
27					B	122	104	104	104	88	90	90	98	98	98	98	98	98	106	102				
28					B	108	108	108	108	102	90	90	100	100	100	100	100	100	100	A				
29					B	C	100	100	100	100	100	A	100	100	100	100	100	100	A	B				
30					B	B	100	100	100	102	98	98	98	98	98	98	98	98	108	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					3	15	29	28	30	29	30	26	28	27	28	29	28	26	16	4				
MED					92	122	106	106	104	102	102	101	102	100	100	102	100	104	110	103				
U Q					92	128	111	108	108	106	104	104	104	104	105	106	105	110	115	107				
L Q					92	106	101	102	100	98	98	98	100	98	98	99	98	100	103	98				

APR. 2022 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	92	90	90	B	B	B	136	142	104	104	G	100	G	G	G	128	120	96	94	94	B	100	92	92
2	92	92	96	100	B	B	164	154	128	C	114	116	B	108	G	G	102	108	B	90	102	B	B	B
3	96	96	96	98	98	B	148	156	128	124	98	106	166	94	112	112	178	136	92	88	88	88	94	94
4	100	100	90	90	92	B	154	140	128	110	110	122	98	100	86	116	124	120	94	90	90	90	B	B
5	B	100	B	B	B	B	140	108	130	110	120	118	118	G	88	112	122	116	B	98	B	B	102	102
6	B	B	B	102	B	B	152	144	130	92	108	104	104	100	120	116	108	138	B	90	90	90	90	90
7	90	B	90	B	98	B	156	118	98	116	116	116	110	170	102	114	104	114	94	B	116	108	108	B
8	B	B	94	94	96	112	150	130	106	106	106	104	114	108	88	116	92	126	114	112	B	B	B	B
9	106	B	94	96	96	94	148	166	134	98	102	102	176	G	110	104	104	148	92	B	B	B	94	B
10	B	90	B	B	B	B	152	124	124	116	92	106	100	96	90	110	110	148	90	98	88	88	92	106
11	106	B	100	100	94	94	94	128	122	92	92	96	96	104	100	100	94	94	90	98	100	100	100	100
12	B	B	B	B	B	B	124	158	126	114	114	100	94	94	106	128	94	94	94	96	118	114	114	110
13	98	98	98	102	94	174	146	92	106	106	106	108	106	118	114	104	104	140	88	90	90	108	106	102
14	92	90	98	98	B	158	146	150	138	120	100	104	112	156	98	96	106	118	98	B	B	B	98	96
15	104	108	96	96	90	122	134	142	122	112	92	100	100	100	G	100	106	124	116	108	108	116	104	104
16	104	100	94	94	100	96	120	120	118	106	106	106	108	G	100	100	104	104	130	B	108	114	110	100
17	100	96	B	96	96	130	132	124	112	110	102	102	102	B	G	102	98	112	112	112	108	104	104	96
18	96	98	98	98	98	134	140	128	116	116	102	102	102	102	102	G	102	98	110	110	B	104	98	98
19	104	B	B	B	104	100	174	146	110	110	104	108	108	108	104	104	110	112	156	104	104	B	94	94
20	94	100	100	100	100	100	118	118	118	118	106	106	106	B	102	104	104	146	124	106	106	94	88	96
21	96	B	B	122	104	106	110	104	130	96	G	102	102	102	G	138	156	118	108	104	98	B	B	B
22	90	90	92	92	92	92	162	132	116	98	102	106	106	106	106	114	104	106	106	106	88	98	98	90
23	B	B	90	B	94	98	104	94	120	120	114	102	102	110	G	96	104	118	104	104	106	110	134	B
24	B	98	98	98	94	94	94	132	112	112	108	106	106	100	100	100	116	126	118	116	102	106	B	92
25	92	92	92	92	100	150	150	144	114	108	100	98	96	116	98	104	104	112	112	B	B	B	B	B
26	B	B	B	B	86	98	98	108	104	104	104	100	G	110	G	96	112	112	112	B	B	B	B	B
27	B	B	B	100	96	158	168	146	118	118	104	98	G	100	100	100	90	90	120	92	B	B	B	92
28	B	B	B	B	106	146	108	130	130	104	124	102	102	96	G	G	116	116	102	112	106	106	106	100
29	100	B	B	B	108	C	108	114	118	116	216	92	120	114	114	104	104	104	104	104	104	118	110	110
30	88	144	124	110	108	108	108	124	120	120	106	114	118	G	174	168	136	112	104	104	108	102	114	114
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	17	19	20	21	20	30	30	30	29	28	29	26	23	23	26	30	30	27	24	22	20	22	21
MED	96	98	96	98	98	103	138	131	120	110	106	104	105	102	102	104	105	113	104	104	104	104	101	98
U Q	102	100	98	100	102	140	152	146	128	117	112	107	110	114	110	114	116	126	118	108	108	109	108	103
L Q	92	91	92	95	94	96	110	118	114	105	102	100	102	100	100	100	104	104	94	91	90	96	94	93

APR. 2022 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Wakkanai

APR. 2022 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F2	F2	F1				HL 21	HL 21	C 2	C 1		C 2				CL 11		LC 11	L 1	L 1		F 1	F 1	F 1
2	F2	F1	F1	F1			H 2	HL 21	CL 11		C 2	C 2		C 2			CL 21	C 2		L 2	F 4			
3	F1	F1	F1	F2	F1		H 2	HL 11	C 2	C 2	C 1	C 1	H 1	LC 21	CL 11	C 1	HL 11	HL 11	L 2	L 2	F 2	F 1	F 1	F 1
4	F1	F1	F1	F1	F2		C 2	H 2	C 2	C 1	C 1	LC 21	CL 11	LC 11	CL 11	CL 22	CL 21	L 1	L 1	L 1	F 2	F 1		
5		F2					H 2	C 2	HL 21	C 3	C 2	C 2	C 1		LC 11	C 1	C 2	C 2		L 2			F 1	F 1
6				F1			H 2	H 2	C 1	C 1	C 2	C 2	L 2	LC 21	CL 12	CL 22	CL 21	CL 21		L 4	F 3	F 2	F 2	F 1
7	F1		F1		L1		HL 11	CL 11	LC 22	CL 22	CL 21	C 2	C 2	H 1	L 2	C 2	L 2	C 2	L 1		F 1	F 2	F 2	
8			F1	F1		F1	LC 22	CL 22	CL 22	LC 22	C 2	L 1	CL 22	CL 22	L 4	C 2	L 2	LC 11	C 2	C 2	F 3			
9	F1		F1	F1	L1	L2	H 2	H 2	HL 21	LC 11	C 2	C 2	HL 11		CL 11	C 2	L 2	HL 11	L 1				F 1	
10		F1					C 2	C 2	CL 21	CL 21	CL 11	C 3	C 3	C 3	C 2	CL 21	CL 11	HL 21	L 3	L 2	F 2	F 1	F 1	F 4
11	F2		F1	FF 11		L4	L4	L4	CL 22	CL 33	C 2	L 2	C 2	C 2	C 2	C 2	C 2	L 2	L 2	L 4	F 3	F 6	F 6	F 4
12							C 2	H 1	C 2	C 3	C 1	C 2	C 2	L 3	C 2	C 2	L 3	L 3	L 3	L 1	F 2	F 5	F 3	F 5
13	F2	F4	F4	F1	L1	H1	HL 11	LC 11	C 2	C 2	C 2	C 2	C 1	C 1	C 2	C 2	C 2	CL 11	CL 11	LL 11	F 1	F 1	F 4	F 1
14	F1	F1	F1	F1		H1	HL 21	HL 21	HL 11	HL 11	C 2	C 2	C 2	H 1	C 2	C 4	C 2	C 2	LC 11				F 1	F 3
15	F4	FF 11	F6	F2	C2	CL 11	C 1	H 2	C 2	C 1	C 1	C 1	C 1		C 1	C 2	C 2	C 2	C 4	L 6	F 4	F 2	F 3	FF 21
16	F1	FF 32	F2	F3	L1	LC 11	C 2	C 2	C 2	C 3	C 2	C 1	C 2		C 2	C 2	C 2	L 3	C 2		F 3	F 5	F 6	F 4
17	F4	F3		F1	L1	C2	C2	C2	C2	C2	C2	L1		C1	C2	C2	C3	C3	L5		F1	F4	F4	F4
18	F5	F2	F3	F2	L4	CL 22	CL 21	CL 11	C 1	C 1	C 1	C 1	C 1	C 1	C 1	C 2	C 2	L 2	LC 22	L 1		F 7	F 3	F 4
19	F2				L1	LC 11	HC 11	HL 11	C 2	C 2	C 2	C 1	C 1	C 1	C 1	C 2	C 2	H 2	LC 11		F 1		F 1	F 1
20	F2	F3	F2	F2	L1	LC 11	LC 11	C 2	C 1	C 2	C 2	C 1	C 2		L 1	C 1	C 1	C 2	C 2	L 1	FF 52	F 3	FF 21	F 1
21	F1			F1	L2	LC 11	C2	C2	CL 21	LC 11			C1	C1	L1		H2	H2	C2	L3	F3	F3		
22	F4	F6	F3	F2	L2	L3	H1	H3	C2	LC 12	C1	C1	C1	C1	C2	C2	C2	C4	C4	LL 22	F2		F3	F1
23			F1		L1	L1	C2	C2	C2	C1	C1	C1	C2		C2	C2	C2	C2	L6	L8	F4	F4	F2	
24		F1	FQ 21	FQ 21	LQ 31	C3	L2	C2	C2	C2	C3	C2	C2	C2	C3	C3	C2	C2	C3	C1	F3	F1		F1
25	F2	F2	F4	F5	L2	C1	HL 21	HL 21	C2	C2	C2	C1	C1	C1	C1	C1	C1	C2	C1					
26					LC 11	LC 11	C2	C2	C2	C2	C1	C1		C2		C1	CL 11	CL 11	C2					
27				F1	L1	H2	H1	HL 11	CL 21	C1	C1	C1		C1	C1	C2	LC 21	LC 11	C2	LC 11				F1
28					L1	H2	LC 12	C2	CL 21	C2	C2	C2	C1	C2			C2	C2	C3	L5	F5	F2	F1	F1
29	F2				L2	C4	C2	C2	C2	C2	LL 11	C1	C1	C2	C2	C2	C2	C5	C4	L5	F2	F4	F5	F4
30	F3	F1	F2	F6	L6	C3	C2	C2	C2	C2	C4	C2	C2		H1	H1	H1	C6	C6	L5	F2	F3	F6	F4
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

APR. 2022 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 f<sub>XI</sub> (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H 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 66	X 66	X 66	X 62	X 62	X 61													X 100	X 89	X 78	X 74	X 74	X 73	
2	X 74	X 75	X 76	X 57	X 56	X 53													X 96	X 91	X 76	X 72	X 75	X 72	
3	X 71	X 70	X 70	X 66	X 64	X 62													X 100	X 97	X 83	X 72	X 68	X 69	
4	X 69	X 66	X 69	X 62	X 56	X 56													X 108	X 99	X 72	X 70	X 72	X 71	
5	X 67	X 62	X 62	X 61	X 59	X 60													X 95	X 86	X 78	X 72	X 69	X 72	
6	X 70	X 66	X 65	X 61	X 59	X 60													X 100	X 87	X 76	X 72	X 71	X 73	
7	X 71	X 71	X 73	X 64	X 58	X 56													X 102	X 94	X 80	X 83	X 79	X 78	
8	X 77	X 78	X 78	X 73	X 67	X 68													X 100	X 93	X 80	X 75	X 75	X 75	
9	X 74	X 72	X 70	X 67	X 60	X 62													X 103	X 102	X 92	X 82	X 76	X 74	
10	X 70	X 67	X 62	X 65	X 64	X 69													X 108	X 97	X 68	X 64	X 56	X 58	
11	X 57	X 58	X 56	X 54	X 54	X 59			C										X 110	X 102	X 84	X 70	X 67	X 70	
12	X 70	X 67	X 66	X 66	X 60	X 66													X 108	X 109	X 89	X 72	X 66	X 63	
13	X 64	X 66	X 59	X 58	X 56	X 61													X 111	X 81	X 63	X 62	X 62	X 62	
14	X 63	X 61	X 60	X 58	X 53	X 55													X 119	X 108	X 102	X 93	X 76	X 76	
15	X 70	X 60	X 55	X 52	X 51	X 48													X 74	X 78	X 70	X 57	X 57	X 56	
16	X 56	X 55	X 52	X 52	X 56	X 64													X 87	X 82	X 68	X 65	X 64	X 64	
17	X 60	X 58	X 58	X 50	X 46	X 52													X 99	X 95	X 76	X 63	X 63	X 65	
18	X 62	X 62	X 62	X 59	X 58	X 66													X 112	X 112	X 88	X 60	X 55	X 58	
19	X 57	X 56	X 56	X 54	X 54	X 61													X 96	X 97	X 92	X 72	X 63	X 61	
20	X 61	X 59	X 57	X 54	X 58	X 57								C					X 111	X 100	X 82	X 62	X 62	X 61	
21	X 61	X 61	X 61	X 56	X 56	X 58						C							X 106	X 106	X 98	X 76	X 63	X 63	
22	X 62	X 59	X 62	X 62	X 52	X 59													X 103	X 94	X 82	X 70	X 70	X 68	
23	X 70	X 67	X 65	X 62	X 58	X 66													X 107	X 98	X 85	X 81	X 82	X 83	
24	X 81	X 75	X 72	X 67	X 62															X 101	X 80	X 77	X 83	X 77	
25	X 72	X 74	X 73	X 67	X 64	X 66			X 90											X 106	X 100	X 80	X 82	X 78	
26	X 77	X 77	X 74	X 70	X 70	X 74														X 96	X 93	X 86	X 80	X 78	
27	X 80	X 77	X 82	X 78	X 66															X 103	X 88	X 85	X 90	X 89	
28	X 84	X 77	X 78	X 78	X 77				C											X 100	X 94	X 88	X 80	X 76	
29	X 78	X 75	X 75	X 71	X 68															X 92	X 77	X 78	X 80	X 77	
30	X 77	X 76	X 76	X 74	X 76															X 96	X 79	X 82	X 82	X 81	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	25				1										23	30	30	30	30	
MED	X 70	X 66	X 66	X 62	X 58	X 61				X 90										X 103	X 97	X 81	X 72	X 72	
U Q	X 74	X 75	X 73	X 67	X 64	X 66														X 108	X 102	X 89	X 81	X 80	
L Q	X 62	X 61	X 60	X 57	X 56	X 56														X 99	X 92	X 76	X 70	X 63	

APR. 2022 f<sub>XI</sub> (0.1MHz)

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## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 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

$\begin{matrix} H \\ D \end{matrix}$	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	60	60	60	56	56	55	72	85	96	107	117	122	112	112	110	104	92	96	94	83	72	68	68	67
2	68	70	70	51	50	47	70	83	91	99	106	111	103	106	111	115	100	94	90	85	70	66	69	66
3	65	64	64	60	58	56	72	82	86	97	103	110	114	115	122	110	88	88	94	91	77	66	62	63
4	63	60	63	60	50	F	63	75	91	108	107	108	133	129	125	118	110	110	102	93	66	64	66	65
5	61	56	56	55	53	54	82	84	90	94	100	103	109	116	117	101	94	91	89	80	72	66	63	66
6	64	60	59	55	53	54	72	85	96	99	103	105	106	108	111	111	103	100	94	81	70	66	65	67
7	65	65	67	58	52	50	69	80	91	97	102	102	108	112	103	98	97	96	96	88	74	77	73	72
8	71	72	72	67	61	62	78	91	93	97	103	100	105	108	109	98	93	94	94	87	74	69	69	69
9	68	66	64	61	54	56	67	69	77	92	104	104	112	119	116	109	106	98	97	96	86	76	70	68
10	64	61	56	59	58	63	84	93	79	81	93	100	108	114	115	87	110	110	102	91	62	58	50	52
11	51	52	50	48	48	53	77	82	C	86	99	99	104	110	110	107	96	96	104	96	78	64	61	64
12	64	61	60	60	54	60	70	78	80	84	88	103	112	116	119	110	104	98	102	103	83	66	60	57
13	F	F	53	52	50	55	69	74	78	95	99	86	99	107	99	94	99	111	105	75	57	56	56	56
14	57	55	54	52	47	49	68	77	82	87	94	100	110	104	107	107	100	106	113	102	96	87	70	70
15	64	54	49	46	45	42	40	44	51	48	51	A	59	64	63	61	60	60	68	72	64	51	51	50
16	50	49	46	46	50	58	55	68	66	69	75	83	92	88	88	90	84	82	81	76	62	59	58	58
17	54	52	52	44	40	46	66	79	86	87	90	82	85	89	90	93	94	93	93	89	70	57	57	59
18	56	56	56	53	52	60	76	73	78	84	83	94	102	108	108	112	111	106	106	106	82	54	49	52
19	51	50	50	48	48	55	70	75	84	81	78	83	94	98	97	97	94	90	90	91	86	66	57	55
20	55	53	51	48	52	51	78	71	75	77	78	81	87	C	92	103	111	105	105	94	76	56	56	55
21	55	55	55	50	50	52	80	93	77	70	72	C	90	95	98	101	111	102	100	100	92	70	57	57
22	56	53	56	56	46	53	63	73	68	62	72	83	100	103	99	99	97	95	97	88	76	64	64	62
23	64	61	59	56	54	60	72	71	73	76	89	82	93	99	99	101	101	101	100	92	80	75	76	77
24	75	69	66	61	56	66	94	84	76	83	87	86	89	91	96	102	104	101	105	95	74	71	77	71
25	66	68	67	61	58	60	80	91	84	91	87	91	99	110	115	115	106	100	100	100	94	74	76	72
26	71	71	68	64	64	68	87	86	78	82	85	98	102	107	103	106	102	99	90	90	87	80	74	72
27	74	71	76	72	60	63	80	82	87	103	102	100	111	116	114	120	120	120	116	97	82	79	84	83
28	78	71	72	72	71	72	70	77	C	86	94	86	92	104	107	C	88	82	90	94	88	82	74	70
29	72	69	69	65	62	65	74	75	76	71	70	74	78	94	101	103	103	95	97	86	70	72	73	71
30	71	70	70	68	70	72	70	72	79	82	88	88	93	101	105	114	105	94	93	90	73	76	76	75
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	30	30	29	30	30	28	30	30	28	30	29	30	29	30	30	30	30	30	30	30	30
MED	64	61	60	56	53	56	72	78	80	86	92	98	102	107	107	103	100	97	97	91	75	66	66	66
U Q	70	69	67	61	58	62	78	84	88	97	102	103	109	113	114	110	106	102	102	96	83	75	73	71
L Q	56	54	54	51	50	52	69	73	76	81	83	84	92	98	99	98	94	94	93	86	70	64	57	57

APR. 2022 foF2 (0.1MHz)

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## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L		L	L	L	L	L	L	L							
2									L	L	L	L		L	L	L								
3									L	L	L	L	L	L	L	L								
4									L	L	L	L	U	L	L	L	L							
5									L	L	L	L	L	532	L	L	L							
6									L	L	L	L	L	L	L	L								
7									L	L	L	L	L	L	L	L								
8									A	A	L	L	L	L	A	L	L							
9									L	L	L	L	L	536	504	L	L	L	A					
10									L	L	L	L	L	L	L	L	L	L						
11									C	L	L	L	L	L	L	L	L	L	A					
12									L	L	L	L	L	552	A	L	L	L						
13								L	L	A	A	A	L	A	L	A	A	A	A					
14									L	L	U	L	A	L	L	L	L	L	A					
15											U	L	A	A		A	L							
16											L	L	L	L	A	A	A	A						
17									L	L	L	L	L	516	A	L	L	L						
18									L	L	L	U	L	U	L	U	L	L	A	A				
19									L	L	L	L	U	L	A	A	L	A	L					
20											L	U	L	A	A	C	A	A	A	A				
21									L	L	L	U	L	C	L	U	L	L	L	L				
22									L	L	L	L	L	540	536	520	488	L	L					
23									L		L	A	U	L	A	A	524	504	L	A				
24									A	A	A	L	A	A	A	A	A	A	A					
25										A	A	L	U	L	556	556	L	508	L					
26										L	L	L	L	572	L	552	520	L	A	A				
27									L	L	L	L	U	L	U	L	U	L	L					
28									L	C	L	L	U	L	A	552	C			A				
29									L	L	U	L	U	L	L	564	544	528	A	A	A	A		
30									L	L	A	A	U	L	A	568	540	528	A	L	A	A		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	1	1	2	9	7	12	10	9	3								
MED							312	352	404	454	U	L	U	L	552	538	524	504						
U Q											U	L	U	L	536	572	566	552	540	508				
L Q											492	544	540	528	508	488								

APR. 2022 foF1 (0.01MHz)

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## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 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							192	U A U R U R U R				R R	R R	R R	R U R U R U R										
2							A	A U A	A A	A A	A A	A B	A A	A A	A A	A A	A A	A A							
3							U R U R U R	224 280 324		A A	A A	A A	A A	R U R U R U R	384 336 296 252										
4							U A U R	184 280 336	A U R	A U R	A U R	A A	A A	A U R U R	360 332	A U A	A U A	A U A							
5							U R U R U R U R	220 280 328 352 368				A U A	A U A	A U R U A U R U R	380 376 360 344 300 240										
6							U A U A	184 264	A A	A U R	A U R	A A	A A	A U R U R	336 300 248										
7							U A U A	196 268 312 360 376	A U R U R			R R	R R	R A	A U R U R	292 248									
8							U R U A U R	216 280 332	A A	A A	A A	A U R	A A	A A	A U R U R	332 300									
9							192 268		A A	A A	A A	A A	A A	U R U R U A	380 360 336 284										
10							U R U R U A	220 268 316	A A	A A	A A	A A	A A	A A	A A	A A	A A	A B							
11							U A	204 268	C U A	A A	A A	A A	A A	A A	A A	A A	A B								
12							U A U A U A	200 268 312	A A	A A	A A	A A	A A	A A	A A	A A	A B								
13							A U A A	276 316	A A	A A	A A	A A	A A	A A	A A	A B									
14							U A U R U R	196 288 312	A A	A A	A A	A R U R	A R U R	A U R U R U A	368 340 296 240										
15							U A U A U A	176 256 300	A A	A A	A A	A A	A A	A A	A U R U R U A	340 300 228									
16							U A U A	228 272	A A	A A	A A	A A	A U R	A A	A A	A A									
17							U A	220 280	A A	A A	A A	A A	A A	A A	R U R	A A	A A								
18							U A U A	228 288	A A	A A	A A	A A	A A	A A	A A	A U A A	312								
19							220 288	U A	A A	A A	A A	A A	A A	A A	A U R U A U A	388 312 256									
20							U R U R U A	244 288 328	A A	A A	A A	A A	A C	U R U A	396 372 308										
21							U R U A	228 304	A A	A U R	C	R U R U R U R	A A	A A	400 376 348										
22							U A U A	228 300	A A	A A	A A	A A	A A	A U R U R	388 368	A A	A A								
23							U R U A	228 296	A A	A A	A A	A A	A A	A U R U R U R	372 344 316										
24						U R	192 236 296	U A U A	A A	A A	A A	A A	A A	A A	A A	A A	A A	A B							
25							U A	252	A A	A A	A A	A A	A A	A A	A U R U R U A	364 320 268	B								
26							U R U R	260 324	A A	A U R U R U R	404 412 424 396	A A	A A	A R	A A	A A	A B								
27						B	252 300	U A	A A	A A	A A	A A	A R	A A	A U A U R U A	300 268 184									
28						B	248 296	U A	C A	A A	A A	A R	A U R	372	C U A A B	320									
29						B	260	U A	A A	A U R	A U R	A U R	A A	A A	A A	A B									
30						B	240	U A	A A	A A	A A	A A	A A	A A	A U A U R	356 324	A B								
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						1	28	27	13	5	7	2	4	8	9	17	17	11	1						
MED						U R U	192 222	U A U A U R U R	280 316 356 384	408 388	384 372 344 300 248 184														
U Q							U A U R U R	238 296 328 358 388					410 396 380 352 314 256												
L Q							U A U A U R	198 268 312 334 368					U U R U R U R U A	372 376 360 336 296 240											

APR. 2022 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A	E B	E B	E B	E B	E B			G	G	G	G	G	G	G	G	G	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	25	32					E B	39	38	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			G	G	G								E B	J A	J A	J A	J A	J A
4	E B	E B	E B	E B	E B	E B	24	33		G	40	41	J A	J A	G	G	J A		J A	J A	J A	J A	J A	J A
5	E B	E B	E B	E B	E B	E B			G	G	G	G	42	42	42	43	39		G	E B	J A	J A	J A	J A
6	J A	J A	J A	E B	E B	E B	26	30	36	38		G	42	42	41	38		G	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	24	32	36		G	G	G	G				G	G	E B	E B	J A	J A	J A
8	J A	J A	J A	J A	E B	E B			G	J A	J A	J A	G	J A	J A	G	G		J A	J A	J A	J A	J A	J A
9	E B	E B	E B	E B	E B	E B	24	31	35	39	42	42	39	39				G	J A	J A	J A	J A	J A	J A
10	E B	E B	E B	E B	E B	E B			G	G	J A		G	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	25	32		C	36	40	42	42	40	38	44	50	62	50	52	33	26	26
12	E B	E B	E B	E B	E B	E B	26	30	34	41	46	43	J A	45	47	40	36	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	J A	35	34	38	53	54	55	48	53	39	55	46	37	17	23	27	25	25
14	J A	J A	J A	J A	E B	E B			G	G	J A		G	G					J A	J A	J A	J A	J A	J A
15	J A	J A	J A	J A	E B	E B	25	32	35	40	43	55	57	57	66		G	G	J A	J A	J A	J A	J A	J A
16	J A	J A	E B	E B	E B	E B	25	31	35	41	42	43	44		66	60	58	64	45	19	70	43	24	46
17	J A	J A	E B	E B	E B	E B	27	32	38	38	44	45	J A	E B	G	G		J A	J A	J A	J A	J A	J A	J A
18	23	23	23	23	E B	E B	29	34	36	40	110	44	43	42	44	40	42	J A	J A	J A	J A	J A	J A	J A
19	J A	J A	E B	E B	E B	E B	30	35	J A	46	42	43	J A	J A	J A	J A	G		J A	J A	J A	J A	J A	J A
20	E B	E B	E B	E B	E B	E B			G	G	J A	J A	J A	J A	C				J A	J A	J A	J A	J A	J A
21	J A	J A	E B	E B	E B	E B			G		G	C	G	G	G			J A	J A	J A	J A	J A	J A	J A
22	J A	E B	J A	E B	E B	E B	28	34	39	41	52	47	43				42	66	60	63	66	85	105	21
23	J A	J A	J A	E B	E B	E B			G	J A	J A	J A	J A	J A	J A	G	G	G	J A	J A	J A	J A	J A	J A
24	J A	J A	J A	J A	E B	E B	32	40	J A	J A	J A	J A	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	30	70	42	58	64	54	56	56	49				J A	J A	J A	J A	J A	J A
26	E B	E B	E B	E B	E B	E B			G	G	J A	J A	J A	G	G			44	38	43	38	55	28	23
27	E B	E B	E B	E B	E B	E B	29	36	39	40	42	42	42		G	J A	J A		J A	E B	E B	E B	E B	E B
28	E B	E B	E B	E B	E B	E B	20	32	35		C	J A	J A	J A	J A	G	C		J A	J A	J A	J A	J A	J A
29	J A	J A	E B	E B	E B	E B	32	46	61	40	78		44		G	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	36	38	46	64	74	53	46	47	43		G	J A	J A	J A	J A	J A	J A
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	28	30	30	29	30	29	30	29	30	30	30	30	30	30	30	30
MED	23	21	21	E B	E B	E B	25	32	37	40	43	43	42	42	38	36	36	36	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	29	34	39	49	52	50	50	52	47	43	42	43	50	39	44	52	29	34
L Q	E B	E B	E B	E B	E B	E B	G	G	G	G	G	G	G	G	G	G	G	G	E B	E B	E B	E B	E B	E B

APR. 2022 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 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		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
2		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
3		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
4		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
5		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
6		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
7		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
8		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
9		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
10		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
11		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
12		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
13		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
14		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
15		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
16		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
17		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
18		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
19		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
20		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
21		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
22		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
23		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
24		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
25		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
26		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
27		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
28		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
29		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
30		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	
31		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	30	30	30	30	30	30	30	30	28	30	30	29	30	29	30	29	30	30	30	30	30	30	30	30		
MED	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B		
U Q	16	16	16	16	16	16	27	32	36	43	44	44	43	44	42	40	39	38	42	24	27	23	20	23		
L Q	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

APR. 2022 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 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	16	16	16	17	16	16	16	16	16	19	19	21	21	21	21	18	18	17	18	16	16	17	16	16	
2	15	16	16	16	15	16	15	15	16	18	20	25	50	24	21	20	17	16	15	15	15	16	16	16	
3	16	16	16	16	16	17	17	14	18	18	19	26	26	28	23	20	17	13	14	16	16	16	16	16	
4	16	16	16	16	16	16	14	16	18	20	17	19	20	23	25	20	17	15	16	16	16	16	16	16	
5	16	16	16	16	16	16	16	17	18	19	20	22	22	22	22	17	12	16	15	16	16	16	16	16	
6	16	16	16	16	16	16	15	15	15	18	18	18	21	24	17	16	16	16	16	16	16	16	16	16	
7	16	16	16	16	16	16	16	16	16	20	21	22	22	23	23	17	16	16	15	16	16	16	15	15	
8	16	16	16	16	16	16	16	17	16	18	25	25	21	21	18	16	16	16	16	16	16	16	16	16	
9	16	16	16	16	16	16	16	16	16	16	18	22	26	24	23	20	16	14	14	15	16	16	16	16	
10	16	16	16	16	16	15	15	15	15	15	17	17	17	20	17	17	15	14	14	14	14	14	16	15	15
11	16	15	15	15	15	15	14	14	C	14	18	19	19	19	19	18	16	15	14	15	15	15	15	15	
12	16	16	16	16	16	16	15	15	18	18	22	21	21	26	21	19	15	14	15	17	16	16	16	16	
13	16	16	16	15	15	16	16	16	16	17	22	22	22	17	17	16	16	15	17	16	15	16	16	16	
14	16	16	16	16	15	16	15	17	17	20	23	22	22	22	22	18	16	16	15	15	16	16	16	16	
15	16	16	16	16	16	16	14	14	14	18	20	21	21	22	22	22	16	14	14	15	15	15	16	15	
16	16	16	16	16	15	16	16	16	18	18	18	22	23	18	20	20	18	18	17	16	16	16	16	15	
17	16	16	16	16	16	16	16	15	15	18	20	20	22	45	29	16	16	16	17	17	17	17	16	16	
18	16	16	16	16	16	16	16	16	16	18	27	24	24	24	24	23	17	17	17	16	16	16	16	16	
19	16	16	16	16	15	15	15	16	16	16	17	20	26	25	25	20	14	14	15	17	16	16	15	15	
20	16	16	16	16	16	16	16	17	21	21	22	24	24	C	23	19	18	17	16	16	15	15	16	16	
21	16	16	16	16	16	16	15	15	16	18	21	C	23	23	23	23	20	15	16	16	16	16	16	16	
22	15	16	16	15	15	15	15	18	17	19	19	19	19	24	24	20	18	14	15	16	16	16	16	16	
23	15	15	16	15	16	15	15	15	16	16	19	20	20	22	28	23	21	17	15	15	16	16	15	15	
24	16	16	16	16	16	15	15	15	15	17	25	25	25	23	22	20	18	15	14	16	16	16	16	15	
25	16	16	16	16	16	16	16	16	16	18	18	32	26	26	19	17	16	16	16	16	16	16	16	16	
26	16	16	16	15	15	15	15	15	15	23	23	23	24	23	23	21	16	14	14	17	15	16	16	16	
27	16	16	16	16	16	16	16	18	19	20	24	24	24	23	21	16	16	16	13	14	15	15	15	16	
28	16	16	16	16	16	16	16	16	C	22	22	22	31	26	26	C	18	15	15	16	16	16	16	16	
29	16	16	16	16	16	16	16	16	16	20	23	23	24	23	23	23	18	16	16	17	17	17	16	16	
30	16	16	16	16	16	16	16	16	20	22	23	29	24	23	32	23	21	16	16	16	16	16	16	16	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	28	30	30	29	30	29	30	29	30	30	30	30	30	30	30	30	
MED	16	16	16	16	16	16	16	16	16	18	20	22	22	23	22	20	16	16	15	16	16	16	16	16	
U Q	16	16	16	16	16	16	16	16	18	20	23	24	24	24	24	20	18	16	16	16	16	16	16	16	
L Q	16	16	16	16	15	16	15	15	16	18	18	20	21	22	21	17	16	14	14	15	15	16	16	15	

APR. 2022 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 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

$\begin{matrix} H \\ D \end{matrix}$	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	298	280	320	279	288	297	335	332	320	314	309	322	302	304	307	314	314	326	334	318	295	282	281	275	
2	282	310	351	269	276	271	336	346	349	333	315	318	305	293	299	314	308	326	315	307	306	279	288	281	
3	272	280	293	299	281	267	336	356	347	332	317	304	307	297	318	320	312	310	323	334	319	300	284	291	
4	275	297	295	311	281	F	350	339	324	319	317	290	314	313	305	297	305	322	324	327	293	271	288	294	
5	296	274	284	292	285	282	348	352	338	329	321	307	306	313	321	318	324	327	319	307	307	295	281	292	
6	304	298	290	309	284	296	342	341	335	330	320	314	303	298	305	316	310	318	333	311	295	279	273	286	
7	291	293	319	318	294	278	347	336	331	326	323	307	304	305	307	298	306	307	317	313	297	291	285	277	
8	269	282	295	305	293	285	318	340	325	317	318	300	304	304	307	319	317	328	329	319	308	276	288	289	
9	286	295	304	312	290	297	357	348	337	327	322	322	306	309	316	308	313	313	309	313	326	288	290	296	
10	284	297	269	257	261	277	326	335	359	337	325	304	319	310	332	288	305	328	327	327	317	297	262	275	
11	275	281	286	291	289	303	353	346	C	316	328	303	313	303	312	324	324	312	323	334	339	276	289	285	
12	287	285	290	315	303	317	360	368	367	349	314	310	300	311	316	310	304	326	324	350	337	306	293	265	
13	F	F	284	289	273	299	341	334	326	323	340	313	307	315	309	296	302	328	346	339	302	277	277	281	
14	304	292	292	311	309	317	345	354	346	341	327	302	320	308	301	320	293	304	330	313	325	306	289	295	
15	314	282	274	252	260	260	247	240	284	245	225	R	A	272	300	331	319	332	303	305	297	316	283	262	275
16	273	275	253	268	291	348	336	336	347	347	329	318	330	335	323	328	331	333	340	334	315	281	285	287	
17	286	286	313	295	287	317	342	354	342	340	345	316	320	306	310	317	328	328	328	329	343	282	282	289	
18	275	286	282	284	287	333	359	341	334	335	312	305	300	311	303	308	306	303	321	339	345	286	270	278	
19	289	292	295	295	299	317	346	340	328	329	V	313	303	309	310	301	317	328	310	319	323	349	326	287	275
20	281	288	300	285	285	290	363	337	342	310	328	313	C	301	286	297	317	320	329	336	326	292	283	287	
21	281	278	293	291	287	291	342	362	352	318	313	C	290	293	298	294	301	307	311	319	339	314	266	276	
22	276	254	286	334	306	312	342	356	361	362	302	311	312	318	313	313	304	314	311	327	312	288	273	275	
23	290	288	299	282	268	306	325	353	334	310	317	297	293	287	301	295	305	319	322	329	287	280	267	277	
24	297	294	287	292	281	300	344	342	346	318	331	322	316	313	300	296	312	321	330	335	308	267	291	290	
25	281	271	289	301	285	292	317	346	322	340	302	300	276	288	290	312	312	297	311	319	313	277	287	283	
26	272	286	300	295	295	313	355	358	297	332	303	295	296	308	300	308	314	319	309	309	306	303	286	279	
27	284	278	301	318	291	300	342	335	311	321	300	284	285	297	285	297	307	305	325	328	298	275	273	284	
28	283	269	280	300	294	338	331	319	C	300	327	298	276	298	298	C	324	299	292	292	290	296	271	272	
29	274	270	276	274	279	296	315	342	340	335	293	296	272	283	290	291	308	311	315	323	275	265	276	265	
30	272	261	286	292	310	331	345	361	319	292	298	281	284	280	274	303	306	310	313	322	284	276	285	291	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	30	30	30	29	30	30	28	30	30	28	30	29	30	29	30	30	30	30	30	30	30	30	
MED	283	285	291	294	287	299	342	342	336	328	317	304	304	305	305	310	311	316	322	323	310	282	284	282	
U Q	290	292	300	309	294	317	348	354	346	335	327	314	312	311	313	318	317	326	329	334	326	296	288	289	
L Q	275	276	284	284	281	288	335	336	324	317	309	299	293	297	299	297	305	307	313	313	297	277	273	275	

APR. 2022 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L		L	L	L	L	L	L	L							
2									L	L	L	L		L	L	L								
3									L	L	L	L	L	L	L	L								
4									L	L	L	L	U	L	L	L	L							
5									L	L	L	L	L	373		L	L	L						
6									L	L	L	L	L	376		L	L	L						
7									L	L	L	L	L	L	L	L	L							
8										A	A	L	L	L	A	L	L							
9									L	L	L	L	L	373	379		L	L	L	A				
10									L	L	L	L	L	L	L	L	L	L						
11									C	L	L	L	L	L	L	381	L	L	A					
12									L	L	L	L	L	A	L	L	L							
13								L	L	A	A	A	L	A	L	A	A	A	A					
14									L	L	U	L	A	L	L	L	L	L	A					
15											U	L	A	A		A	L							
16						337	364	375	377	413	L	L	L	L	L	A	A	A	A					
17								L	L	L	L	L	L	393		A	L	L	L					
18									L	L	L	U	L	U	L	U	L	L	A	A				
19								L	L	L	L	U	L	381	368	364	A	A	L	A	L			
20									L	L	U	L	A	A	C	A	A	A	A	A				
21								L	L	L	U	L	C	L	U	L	359	383	L	L				
22								L	L	L	L	L	L	L	L	L	L	L	A	A				
23								L		L	A	U	L	A	A	362	377	L	A					
24									A	A	A	L	A	A	A	A	A	A	A					
25										A	A	L	U	L	L	L	L							
26										L	L	L	L	382	370	378	L	A	A					
27									L	L	L	L	U	L	U	L	U	L	L					
28								L	C	L	L	L	U	L	A	C			A					
29								L	L	U	L	U	L	L	L	L	A	A	A	A				
30								L	L	400	355	362	365	378	349	A	L	A	A					
31												A	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							1	1	1	2	9	7	12	10	9	3								
MED							337	364	375	388	392	380	370	373	362	378								
U Q											410	388	384	378	374	383								
L Q												U	L	U	L	L								
											378	362	354	360	356	377								

APR. 2022 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 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									266		266	254	264	278	262	262	262							
2									238	254	262	262		272	272	250								
3									250	248	248	268	260	260	260	248								
4									252	258	232	298	272	258	258	258	252							
5									242	242	248	286	250	268	256	244	256							
6									242	242	252	264	264	274	274	256								
7									256	244	244	278	278	270	270	270								
8										248	248	296	282	264	264	258	258							
9									258	260	246	262	272	262	248	260	260	238						
10									234	244	278	250	266	266	242	308	286							
11										C	296	248	260	260	266	264	264	264	258					
12									232	242	276	276	276	268	266	252	266							
13								266	280	256	238	258	288	258	264	268	262	240						
14									230	236	272	252	250	260	282	248	270	258						
15							482	522	400	534	492		A	406	336	266	296							
16								262	262	262	278	278	260	250	256	238	236	236						
17								238	256	256	244	264	268	282	282	270	256							
18									256	254	254	288	288	268	276	274	250	250						
19								250	258	246	284	320	282	278	278	278	258	258						
20									250	288	264	292	292		C	296	288	256	244					
21								242	242	250	294		C	294	306	286	296	274	264					
22								244	244	244	268	294	294	280	280	280	260	248						
23								234		300	286	292	320	298	290	280	266	250						
24									E A	238	266	256	286	286	286	290	260	252						
25									E A	252	252	276	306	306	280	268	254							
26									252	292	300	300	282	282	282	260	244							
27									270	270	260	296	296	284	296	286	258							
28								258		C	298	258	310	346	302	302						258		
29								238	246	256	326	328	382	328	304	284	266	260	234					
30								234	262		E A	E A	E A	270	318	328	328	268	268	248	242			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	11	24	28	30	28	29	29	30	29	24	15	3					
MED							482	244	251	254	260	280	282	274	275	268	260	250	242					
U Q								262	260	264	278	296	298	292	286	283	266	258	258					
L Q								238	242	245	248	263	265	265	264	257	256	244	234					

APR. 2022 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

APR. 2022 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E	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
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	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
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																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	27	26	24	24	26	22	24	23	21	16	27	30	30	30	30	30		
MED	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B
UQ	280	274	264	254	260	258	212	210	204	204	200	203	200	202	203	204	214	225	226	226	226	256	286	280		
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
	258	254	242	216	232	230	202	204	196	194	192	192	192	192	196	196	201	217	214	208	206	218	246	258		

APR. 2022 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 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							118	112	112	112	108	108	108	108	108	108	108	108						
2							116	112	108	108	108	108	B	A	A	A	108	A						
3							120	114	110	110	110	110	A	A	A	110	110	110						
4							110	110	108	108	108	A	A	A	108	108	A	108						
5							108	108	106	112	106	A	114	114	114	114	108	108						
6							118	108	108	108	108	A	A	A	A	108	108	108						
7							108	108	108	108	108	108	108	A	A	108	108	108						
8							118	110	110	110	A	A	110	A	A	110	110	110						
9							110	108	108	108	108	108	A	106	110	110	110	110						
10							108	110	110	A	A	A	94	A	A	A	A	B						
11							94	110	C	108	108	108	108	108	A	A	A	B						
12							112	112	112	112	A	A	A	A	A	A	A	B						
13							A	112	112	A	A	A	A	A	A	A	A	B						
14							112	112	110	110	A	A	110	110	A	110	108	108						
15							112	110	110	110	110	A	A	A	A	A	A	A						
16							110	108	108	108	A	A	A	108	A	A	A	A						
17							108	108	108	106	A	A	A	A	106	106	A	A						
18							106	106	106	106	A	A	A	A	A	A	110	A						
19							110	110	108	108	A	A	A	A	A	110	110	110						
20							110	108	110	A	A	A	A	C	110	110	110	110						
21							110	108	110	110	108	C	108	108	108	108	108	A						
22							108	108	108	108	A	A	A	108	108	108	A	A						
23							108	108	108	108	A	A	A	A	108	108	112	A						
24						120	118	108	A	A	A	A	A	A	A	A	108	A	B					
25							108	A	A	A	A	A	A	A	A	108	108	110	B					
26							110	110	A	A	110	110	110	108	108	108	108	A	B					
27						B	108	108	108	108	108	A	A	112	A	A	112	112	112					
28						B	112	112	C	A	A	112	112	112	112	C	112	A	B					
29						B	112	112	112	112	A	112	112	112	114	A	A	A	B					
30						B	114	114	110	A	A	A	A	110	110	112	110	A	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						1	29	29	25	22	13	9	12	15	14	19	21	14	1					
MED					120	110	110	108	108	108	108	110	108	109	108	110	110	112						
U Q						113	112	110	110	109	111	111	112	110	110	110	110							
L Q						108	108	108	108	108	108	108	108	108	108	108	108							

APR. 2022 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	88	80	B	B	B	B	136	134	G	G	G	G	G	G	G	G	G	G	B	130	B	B	B	B
2	B	B	B	B	B	98	120	120	112	110	110	110	B	100	100	98	110	92	92	92	92	92	92	92
3	92	92	92	92	92	B	G	G	G	108	108	108	112	G	G	G	G	G	112	B	94	94	94	94
4	B	B	B	B	B	B	136	164	G	112	G	92	92	92	G	G	92	136	104	72	80	80	78	78
5	B	B	B	B	B	86	G	G	G	G	G	98	148	132	122	122	G	G	B	B	86	86	84	B
6	84	84	84	B	B	B	144	146	122	116	G	102	102	102	98	G	G	G	B	B	B	B	B	B
7	B	B	92	B	B	B	150	146	130	G	G	G	G	G	94	122	G	G	B	B	92	92	92	84
8	96	92	88	88	88	B	G	140	G	112	98	92	G	92	90	G	G	110	80	94	94	94	94	94
9	94	B	B	B	94	94	146	140	128	120	112	112	100	100	G	G	116	124	114	94	94	94	B	94
10	84	B	B	B	B	B	G	G	108	96	96	94	94	94	92	96	96	86	92	84	82	82	82	B
11	B	84	84	84	84	90	146	126	C	132	120	108	108	108	104	94	94	94	90	88	88	84	90	80
12	80	B	B	B	B	B	136	136	132	110	106	100	100	100	100	100	100	84	84	B	84	84	84	B
13	82	82	82	82	88	120	102	116	116	98	96	94	94	94	92	88	86	86	B	90	90	90	90	90
14	90	90	86	84	B	84	130	G	G	116	96	96	G	G	96	G	G	122	118	102	100	100	100	96
15	90	90	86	86	84	B	120	118	118	110	108	92	90	88	94	G	G	108	106	104	104	88	88	88
16	88	88	88	B	B	B	146	130	116	112	100	100	100	B	98	94	92	88	100	100	96	96	96	92
17	92	90	88	88	88	B	128	126	114	114	100	100	100	G	G	G	100	100	106	106	100	96	94	94
18	94	94	92	92	B	B	130	128	122	110	88	96	96	96	96	96	124	102	102	92	92	92	92	92
19	92	92	86	B	B	B	128	128	110	110	96	96	96	94	94	G	140	124	110	102	102	98	98	B
20	94	B	B	B	B	B	G	G	112	100	100	98	98	C	162	162	146	118	98	98	98	90	90	90
21	90	90	90	B	B	B	140	124	114	G	C	G	G	G	G	130	124	100	100	100	86	86	86	84
22	84	84	B	84	B	B	124	124	124	118	92	90	90	G	G	114	96	96	94	94	94	92	92	92
23	86	86	86	B	B	B	G	136	120	114	96	96	96	90	G	G	G	94	94	94	94	92	92	92
24	92	92	90	90	90	G	116	114	102	102	88	88	88	88	88	88	108	98	98	98	96	94	94	94
25	94	B	92	B	B	B	128	102	100	94	94	94	94	94	98	G	G	114	104	96	96	96	B	B
26	B	B	84	B	B	B	G	G	92	92	G	G	G	G	142	140	118	100	94	104	102	B	B	B
27	B	B	B	B	B	B	114	114	110	110	110	106	104	G	94	88	128	G	120	B	B	B	B	B
28	B	B	B	B	B	134	122	122	C	102	102	116	G	116	G	C	114	94	90	90	90	90	B	90
29	90	90	B	112	112	112	124	112	112	112	94	G	116	G	112	98	98	98	92	92	88	88	88	86
30	86	86	116	96	96	108	108	108	108	98	98	88	88	130	122	128	G	96	96	94	94	86	86	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	18	18	12	12	8	22	24	22	27	23	25	22	19	20	17	19	24	27	25	27	26	23	20
MED	90	90	88	88	88	103	128	127	115	110	98	96	97	96	97	98	108	99	98	94	94	92	92	92
U Q	92	92	92	92	93	116	136	138	122	114	108	104	102	108	102	125	124	112	106	101	96	94	94	94
L Q	86	84	86	84	86	92	120	117	110	102	96	93	94	92	94	94	96	94	92	91	88	86	86	87

APR. 2022 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

APR. 2022 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	F3	F1					H2	H1												F1				
2						F1	C2	C1	C1	C2	C1	C1		L2	L1	L2	C1	L2	F3	F2	F3	F2	F6	F3
3	F2	F2	F1	F1	F1					C1	C1	C1	C1						F1		F3	F2	F1	F2
4							H2	H2		C2		L2	L2	L2			L2	H1	F4	F4	F2	F2	F1	F2
5					F1							L1	H1	H1	C1	C1			F1		F2	F4	F5	
6	F5	F5	F5				H2	H1	C2	C1		L1	L1	L1	L1									
7			F1				H2	H1	H1						L2	C1			F2		F1	F4	F5	F4
8	F3	F2	F3	F5	F2			H1		C2	L1	L2		L2	L2			L4	F4	F4	F5	F4	F1	F5
9	F1				F3	F1	H2	H1	C1	C1	C1	C1	L1	L1			C1	C1	F3	F3	F2	F1		F1
10	F1								C2	L1	L2	L2	L1	L2	L2	L2	L2	L2	F4	F3	F6	F2	F2	
11		F1	F2	F1	F2	F2	H1	C2		H1	C2	C1	C1	C1	L1	L2	L3	L4	F7	F9	F7	F5	F2	F6
12	F2						H2	H1	H1	C1	L2	L2	L2	L2	L2	L1	L2	L3	F5	F5	F3	F2	F2	
13	F3	F2	F2	F1	F2	F1	L3	C2	C2	L2	L2	L2	L2	L2	L2	L3	L3		F3	F3	F3	F4	F5	F1
14	F1	F2	F4	F2		F1	H1			C1	L1	L2			L2			C3	F3	F4	F4	F5	F2	F4
15	F2	F1	F5	F2	F2		C2	C2	C2	C1	C1	L2	L2	L2	L2			C3	F3	F4	F4	F5	F2	F4
16	F3	F2	F1				H1	H2	C1	C2	L1	L1	L2		L3	L3	L3	L4	F5	F1	F7	F3	F2	F5
17	F2	F2	F2	F2	F2		C2	C1	C2	C1	L1	L1	L1				L1	L2	F1	F1	F1	F5	F3	F2
18	F1	F2	F2	F2			H2	H1	C1	C1	L1	L2	L1	L1	L1	L1	C2	L4	F4	F3	F2	F6	F2	F2
19	F1	F1	F1				C2	C2	C2	C1	L1	L1	L2	L2	L2		HL11	CL31	F2	F7	F4	F2	F2	
20	F2								C1	L2	L1	L1	L2		H1	H1	H2	C3	F3	F3	F6	F5	F5	F2
21	F2	F5	F5				H1	C1	C1								H1	C2	L3	F6	F5	F3	F5	F6
22	F2	F2		F1			C2	C2	C2	C1	L1	L1	L2				C1	L3	L4	F4	F6	F5	F1	F2
23	F2	F2	F2		F1			H1	C1	C1	L1	L2	L3	L2				L4	F5	F2	F6	F4	F4	F2
24	F5	F1	F1	F2	F3		C2	C2	L2	L2	L3	L2	L2	L3	L3	L3	C2	L5	L7	F8	F8	F7	F8	F5
25	F2		F1				C4	L3	L2	L2	L3	L2	L2	L1	L2			C2	L4	F6	F5	F3		
26			F1						L1	L2				H1		H2	C2	L4	L4	F1	F3			
27							C2	C2	C1	C1	C1	L1	L1		L2	L3	HL11		C3					
28					F2		C2	C2		L2	L2	C2		C2				C2	L3	L4	F4	F4	F1	F2
29	F5	F2		F1	F3	L1	C2	C2	C2	C1	L2		C1		C1	L2	L3	L4	L4	F5	F6	F6	F3	F4
30	F3	F2	F1	F7	F5	L2	C3	C1	C1	L2	L3	L3	L2	C1	C1	C2		L2	L5	F6	F6	F7	F6	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

APR. 2022 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 f<sub>XI</sub> (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 74	X 69	X 74	X 65	X 64	X 60														X 116	X 82	X 81	X 82	X 85	
2	X 79	X 90	X 81	X 64	X 56		X 70														X 115	X 98	X 77	X 76	X 76
3	X 75	X 72	X 66	X 64	X 60																0 127	X 96	X 66	X 68	X 70
4	X 69	X 65	X 66	X 66	X 60																X 118	X 98	X 86	X 82	X 77
5	X 73	X 68	X 68	X 66	X 60	X 59															X 103	X 84	X 77	X 75	X 78
6	X 79	X 75	X 72	X 68	X 56	X 58															X 106	X 92	X 82	X 77	X 77
7	X 77	X 78	X 82	X 74	X 54	X 53															X 110	X 98	X 84	X 84	X 84
8	X 80	X 80	X 80	X 76	X 62	X 60															X 106	X 90	X 74	X 76	X 78
9	X 81	X 76	X 72	X 67	X 62	X 58															X 114	X 103	X 76	X 73	X 71
10	X 68	X 65	X 62	X 58	X 59	X 60															X 113	X 80	X 60	X 57	X 58
11	X 60	X 62	X 58	X 58	X 56	X 55															X 115	X 96	X 76	X 75	X 74
12	X 73	X 67	X 66	X 65	X 62	X 60															X 125	X 119	X 72	X 71	X 72
13	X 68	X 68	X 62	X 58	X 62	X 55															X 101	X 77	X 66	X 70	X 69
14	X 72	X 66	X 59	X 59	X 52	X 48															X 130	X 132	X 104	X 82	X 73
15	X 73	X 64	X 57	X 55	X 52	X 53															X 82	X 76	X 58	X 57	X 61
16	X 58	X 58	X 53	X 53	X 54	X 53															X 118	X 98	X 70	X 60	X 61
17	X 61	X 58	X 60	X 52	X 47	X 47															X 108	X 97	X 67	X 64	X 65
18	X 65	X 65	X 62	X 59	X 58	X 62															0 132	X 104	X 69	X 70	X 68
19	X 72	X 73	X 66	X 61	X 60	X 60																X 104	X 76	X 64	X 64
20	X 63	X 65	X 62	X 59	X 59	X 61									C						X 132	X 104	X 78	X 74	X 76
21	X 74	X 74	X 66	X 63	X 63	X 68						C									X 121	X 111		X 69	X 67
22	X 67	X 64	X 69	X 83	X 73	X 43															X 119	X 91	X 72	X 74	X 77
23	X 78	X 76	X 72	X 67	X 64	X 68															X 120	X 102	X 100	X 91	X 90
24	X 91	X 84	X 75	X 75	X 71	X 70															X 119	X 101	X 94	X 88	X 86
25	X 94	X 96	X 95	X 86	X 66	X 64															X 140	X 128	X 95	X 97	X 111
26	X 116	X 111	X 110	X 106	X 92	X 80															X 112	X 111	X 91	X 89	X 89
27	X 85	X 82	X 83	C	C	C	C	C	C	C	C	C									X 121	X 102		X 106	X 108
28	X 100	X 84	X 84	X 87	X 78	X 79															X 119	X 110	X 100	X 80	X 84
29	X 85	X 82	X 79	X 72	X 71	X 72															X 112	X 90	X 80	X 86	X 87
30	X 85	X 86	X 87	X 88	X 79	X 64															X 113	X 97	X 93	X 88	X 83
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	29	29	26	1													29	30	28	30	30	
MED	X 74	X 72	X 68	X 65	X 60	X 60	X 70														X 116	X 98	X 77	X 76	X 76
U Q	X 81	X 82	X 80	X 74	X 65	X 64															X 121	X 104	X 88	X 84	X 84
L Q	X 68	X 65	X 62	X 59	X 56	X 55															X 111	X 91	X 71	X 70	X 69

APR. 2022 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	69	63	68	59	58	54	60	76	93	104	114	119	126	123	123	120	109	109	118 <sup>R</sup>	110	76	75	76	79
2	73	84	75	58	50	52	64	79	93	93	109	118	117	118	132	127	116	111	109	111	92	71	70	70
3	69	66	60	58	54	52	58	82	90	100	104	110	128 <sup>R</sup>	135	138	123	108	106	116	121 <sup>R</sup>	90	60	62	64
4	63	59	60	60	54	46	51	70	84	98	109	115	134	146	145	143	137	137	117	112	92	80	76	71
5	67	62	62	60	54	53	68	78	86	93	114	104	117	139	136	117	108	108	101	97	78	71	69	72
6	73	69	66	62	50	52	58	79	91	96	98	100	110	118	129	122	120	118	111	100	86	76	71	71
7	71	72	76	68	48	47	50	76	84	96	103	102	106	111	111	109	111	106	104	104	92	78	78	78
8	74	74	74	70	56	54	64	81	92	94	95	104	110	123	128	118	109	104	104	100	84	68	70	72
9	75	70	66	61	56	52	58	73	85	90	105	99	104	113	117	115	112	112	110	108	96 <sup>R</sup>	70	67	65
10	62	59	56	54	53	54	70	94	81	81	95	96	118	134	134	112	123	128	111	107	74	54	51	52
11	54	56	52	52	50	49	68	77	77	90	96	96	114	125	114	116	118	117	119	108	90	70	69	68
12	67	61	60	59	56	54	60	73	74	76	89	106	120	129	132	131	132	132	125 <sup>R</sup>	122	113	66	65	66
13	62	62	56	52	56	49	60	78	98	106	96	94	115	128	128	125	127	127	124	95	71	60	64	63
14	66	60	53	53	46	42	53	76	91	91	100	105	120	128	131	136 <sup>R</sup>	128	126	116	126	126 <sup>R</sup>	98	76	67
15	67	58	51	49 <sup>F</sup>	46	47	50	48	48	A	A	46	64	70	63	63	68	65	75	76	70	52	51	55
16	52	52	47	48	48	47	47	62	62	66	82	96	114	124	126	118	112	112	116	112	92	64	54	55
17	55	52	54	46	41	41	60	82	91	90	89	90	101	113	118	120	115	114	111	102	91	61	58	59
18	59	59	56	53	52	56	71	70	76	91	88	101	116	127	126	130	136	133	R	126 <sup>R</sup>	98	62	64	62
19	66	67	60	55	54	54	66	86	84	85	87	93	114	115	114	115	114	113	117	117	98	70	58	58
20	57	59	56	53	53	55 <sup>F</sup>	70	72	72	86	85	90	100	C	114	112	126	130	128	123 <sup>R</sup>	98	72	68	70
21	68	68	60	57	57	75	91	78	77	80	C	100	113	114	115	132	131	125	115	105	77	63	61	
22	61	58	62	77	67	37	59	77	72	78	80	90	112	115	118	120	124	126	118	113	85	66	68	71
23	72	70	66	61	58	62	74	84	78	88	92	89	108	113	118	122	134	129	127	114	96	94	85	84
24	85	78	69	69	65	64	79	82	78	84	93	98	98	100	111	120	124	126	122	113	95	88	82	80
25	F	F	89	80	60	58	74	92	89	95	91	100	110	124	130	134	125	118	A	134	122	89	91	105
26	F	105	104	100	86	73	86	96	88	93	95	108	R	122	119	116	112	106	112	106	105	85	83	83
27	79	76	77	C	C	C	C	C	C	C	C	C	120	129	131	139	146	148	134	115	96	96	100	102
28	94	78	78	81	72	73	81	91	92	98	101	102	116	127	122	115	107	108	113	113	104	94	74	78
29	79	76	73	66	65	66	84	81	66	77	80	87	105	115	120	125	130	118	111	106	84	74	80	81
30	79	80	81	82	72	58	59	80	76	86	96	100	111	123	125	132	124	116	116	107	91	87	82	77
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	30	28	29	28	29	29	29	28	28	28	29	29	30	30	30	30	28	30	30	30	30	30
MED	68	66	62	60	54	54	64	79	84	90	95	100	114	123	124	120	122	118	116	112	92	72	70	70
U Q	74	75	74	68	59	57	72	83	91	96	102	104	118	128	131	127	128	128	120	115	98	85	78	78
L Q	62	59	56	54	50	48	58	74	76	84	88	94	106	114	117	115	112	109	111	106	85	66	64	63

APR. 2022 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	L	L	L	L	L						
2											L	L	L	L	L	L	L							
3										L	L	L	L	L	L	L								
4										L	L	L	512	L	L	L	L	L						
5										L	L	L	L	552	A	L	L							
6										L	L	L	L	528	U L	L	L	L						
7										L	L	L	L	540	U L	U L	L	L	L					
8									L	L	L	L	L	L	L	L	L							
9										L	L	L	L	512	512	508	L	L	L					
10											L	L	L	532	532	A	L	L	A	A				
11									L	L	L	L	U L	548	524	L	L	L	L	A				
12									L	L	L	L	A	U L	L	L	L	L	A	A				
13									L	L	L	L	U L	548	548	520	492	508	L	L				
14									L	L	L	L	L	L	L	L	L	L						
15							A	344	392	A	A	444	468	A	A	464	A	A	A					
16									L	L	L	L	A	L	A	A	A	A						
17									L	L	L	L	U L	616	516	L	A	A						
18										L	L	L	A	A	L	A	L	L						
19									L	L	L	L	U L	532	L	L	504	L	L	A				
20									L		512	512	528	C	528	548	488	L						
21									L	L	L	C	A	560	L	508	L	L						
22										A	A	A	A	L	A	L	L	A	A					
23										L	L	L	U L	556	544	596	536	492	L					
24										L	L	L	U L	536	556	556	552	A	L					
25									L	L	L	U L	A	A	A	L	A	A	A					
26										L	A	A	A	A	A	A	A	A						
27						C	C	C	C	C	C	C	U L	588	560	560	A	A	A					
28										A	584	L	A	540	A	L	L	L	L					
29										L	508	L	572	568	524	516	A	L						
30										A	L	L	L	L	L	A	L	A	L					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1		4	4	13	14	10	8	2							
MED								344	392		510	530	536	542	532	512	490							
U Q											548	560	564	556	556	542								
L Q											492	478	520	528	516	506								

APR. 2022 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR.2022 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	R	U	A	U	A	U	A	U	R	U	R	U	R	U	R	U	R		
2						B		U	A	U	A	U	A	U	A	U	R	U	R	U	R	U	R	U	R		
3						B	220	U	R	U	R	A	A	U	R	U	R	U	R	U	R	U	R	U	R		
4						B	176	U	R	U	R	A	A	U	R	U	R	U	R	U	R	U	R	U	R		
5							B	U	R	U	A	U	A	U	A	U	R	U	R	U	R	U	R	U	R		
6							B	U	R	U	A	U	A	U	R	U	R	U	R	U	R	U	R	U	R		
7							U	R	U	R	A	A	U	R	U	R	U	R	U	R	U	R	U	R	U	R	
8							B	U	R	U	A	U	A	U	R	U	R	U	R	U	R	U	R	U	R		
9							B	U	A	U	A	A	A	U	R	U	R	U	R	U	R	U	R	U	R		
10							B	U	A	U	A	U	A	U	R	U	R	U	R	U	R	U	R	U	R		
11							B	U	R	U	A	U	A	U	R	U	R	U	R	U	R	U	R	U	R		
12							B	U	A	U	A	U	R	U	R	U	R	U	R	U	R	U	R	U	R		
13							U	R	U	R	A	A	A	A	U	R	U	R	U	R	U	R	U	R	U	R	
14							B	U	R	U	R	U	R	U	R	U	R	U	R	U	R	U	R	U	R		
15							B	U	A	U	A	A	A	A	U	R	U	R	U	R	U	R	U	R	U	R	
16							B	A	U	A	U	A	U	R	A	A	A	A	A	A	A	A	A	A	B		
17							U	R	U	A	U	A	A	A	A	B	U	R	U	R	U	R	U	R	U	R	
18							U	R	U	A	U	A	A	A	U	R	A	U	R	U	R	U	R	U	R		
19							U	R	U	R	A	A	A	U	R	U	R	A	U	R	U	R	U	R	U	R	
20							U	R	U	R	A	A	A	A	C	A	U	R	U	R	U	R	U	R	U	R	
21							U	R	U	A	U	A	A	C	U	A	U	R	U	R	U	R	U	R	U	R	
22							U	R	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
23							B	U	R	R	A	A	A	A	U	R	U	R	U	R	U	R	U	R	U	R	
24							U	R	A	A	U	R	A	A	A	U	R	U	R	U	R	U	R	U	R	U	R
25							U	A	A	A	U	R	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
26							B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
27						C	C	C	C	C	C	C	A	A	A	U	R	U	R	U	R	U	R	U	R	U	R
28							B	U	A	U	A	A	U	A	A	U	R	U	R	U	R	U	R	U	R	U	R
29							U	R	U	R	A	A	A	U	A	U	A	A	A	A	A	A	A	A	A	A	
30							B	U	R	A	A	U	R	A	U	R	U	R	U	R	U	R	U	R	U	R	
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT							13	25	22	10	3	12	12	14	13	20	20	16	10	1							
MED							U	R	U	R	A	U	R	U	R	U	R	U	R	U	R	U	R	U	R	U	R
U Q							204	270	308	348	372	384	398	396	374	368	334	296	240								
L Q							U	R	A	U	A	U	A	U	R	U	R	U	R	U	R	U	R	U	R	U	R
							182	248	292	332	348	376	376	376	364	352	324	286	204								

## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 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	E B	J A	22	E B	22	21	22	G	34	38	39	39	G	G	G	G	G	G	GE	BE	BE	BE	BE	BE	B		
2	E B	BE	BE	BE	BE	BE	BE	J A	28	36	41	41	G	G	G	42	41	40	J A	G	J A	32	27	J A	J A	AE	B
3	24	J A	BE	BE	BE	BE	BE	G	G	G	38	40	G	G	G	G	G	G	24	15	15	15	15	15	16		
4	E B	BE	BE	BE	BE	BE	BE	G	G	34	39	41	G	G	42	G	G	32	27	28	20	E B	BE	BE	B		
5	E B	BE	BE	BE	BE	BE	BE	G	33	37	41	J A	58	45	45	45	39	G	G	GE	B	J A	J A	E B	B		
6	21	E B	BE	BE	BE	BE	BE	G	32	36	41	G	G	G	G	G	G	G	22	J A	34	20	E B	BE	B		
7	E B	BE	BE	BE	BE	BE	BE	G	33	38	44	G	G	G	G	G	G	G	22	J A	23	22	23	23	B		
8	E B	BE	BE	BE	J A	J A	G	G	34	38	38	41	G	G	G	G	39	36	J A	J A	J A	26	23	30	16		
9	E B	BE	BE	BE	BE	BE	BE	17	28	32	36	46	44	44	G	G	G	G	J A	31	19	25	28	21	24		
10	J A	BE	BE	BE	BE	BE	BE	19	30	34	36	40	G	G	J A	J A	G	J A	J A	J A	J A	J A	J A	J A	J A	A	
11	J A	28	21	21	22	23	20	17	G	32	36	41	42	G	J A	J A	G	41	37	35	34	30	25	38	21	21	
12	J A	BE	BE	BE	BE	BE	BE	16	31	34	40	40	G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	
13	24	J A	30	24	23	16	G	31	35	40	J A	48	40	J A	J A	J A	G	38	33	26	26	22	19	25	25		
14	23	J A	J A	E B	BE	BE	BE	21	G	32	G	40	40	J A	J A	J A	J A	G	G	G	26	21	J A	E B	BE	B	
15	20	20	25	E B	BE	BE	BE	23	30	J A	J A	J A	J A	J A	J A	J A	40	41	41	58	103	68	67	33	33		
16	E B	J A	J A	J A	J A	AE	B	J A	39	39	41	42	J A	55	44	58	51	64	42	40	38	55	22	33	36		
17	J A	53	22	J A	BE	BE	BE	30	29	36	40	40	J A	46	42	46	43	43	41	36	30	31	26	20	24	34	
18	J A	J A	22	J A	J A	J A	G	30	36	47	55	60	54	G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	A	
19	J A	J A	J A	AE	BE	J A	J A	G	32	35	38	41	41	G	G	44	G	G	31	26	G	J A	J A	BE	B	A	
20	J A	AE	BE	J A	AE	BE	BE	G	G	J A	J A	J A	J A	J A	C	46	40	G	34	16	16	16	16	16	33		
21	J A	J A	AE	BE	J A	E B	G	30	36	40	42	C	49	49	43	42	39	40	J A	J A	J A	J A	J A	J A	J A	A	
22	J A	41	22	22	16	29	16	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	A	
23	J A	J A	AE	BE	J A	J A	J A	25	31	37	G	J A	J A	J A	J A	G	47	40	G	J A	J A	J A	J A	J A	J A	A	
24	J A	J A	31	J A	BE	BE	BE	G	J A	G	J A	J A	J A	J A	J A	J A	G	43	45	38	32	60	63	24	26	41	
25	J A	J A	J A	J A	J A	J A	J A	J A	53	36	47	53	63	70	59	45	67	108	151	84	39	54	49	42	A		
26	J A	J A	J A	J A	J A	J A	J A	J A	53	34	42	43	57	80	109	106	83	77	58	95	47	42	15	31	44	16	
27	E B	BE	BE	BE	C	C	C	C	C	C	C	C	C	43	43	43	53	J A	J A	J A	J A	J A	J A	J A	J A	A	
28	E B	BE	BE	BE	BE	BE	BE	23	33	40	J A	J A	J A	J A	J A	J A	42	G	G	29	J A	J A	J A	J A	J A	A	
29	24	E B	BE	BE	BE	BE	BE	G	J A	J A	J A	42	46	49	44	44	J A	J A	J A	J A	J A	J A	J A	J A	E B		
30	E B	BE	BE	J A	J A	J A	J A	G	J A	J A	G	43	G	G	G	44	41	49	39	42	20	26	E B	J A	A		
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	30	29	29	29	29	29	29	29	29	28	30	29	30	30	30	30	30	30	30	30	30	30	30		
MED	24	21	20	E B	21	E B	G	30	35	39	42	42	44	42	44	40	38	36	J A	J A	J A	J A	J A	23	26		
U Q	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	A	
L Q	E B	BE	BE	BE	BE	BE	BE	G	G	33	36	40	G	G	G	G	G	G	G	G	26	22	23	20	16	16	

APR. 2022 foEs (0.1MHz)

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## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	E B 16		E B 24	E B 16	E B 16	E B 16	E B 16	E B 16		G			G	G	G	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16				
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		27	34	38	38	G	G	40	39	35	35	G	25	23	24	26	E B 16			
3		E B 21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		G	G		G	G	G	G	G	G		E B 23	E B 15	E B 15	E B 15	E B 15	E B 16			
4	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15		G	G		G	G		G	G	G		30	25	23	E B 16	E B 16	E B 16	E B 16			
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16		G		33	36	38	54	44	43	43	37		G	G	E B 15	26	39	E B 16	E B 16		
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		G		31	34	40		G	G	G	G		G	19	27	19	E B 16	E B 16		
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		G	G		32	34	35		G	G	G	G	G	G	E B 16	E B 16	E B 16	E B 16	E B 16			
8	E B 15	E B 16	E B 16	E B 16	E B 16	26	18		G	G		32	36	37	37		G	G	G		37	34	28	25	22	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17	26	32	35	42	41	41		G	G	G	G		E B 22	16	22	23	16	E B 16		
10	E B 16	E B 16	E B 15	E B 15	E B 16	E B 16	E B 15		26	32	36	38		G		38	42	39		G	39	48	23	36	36	18	25	
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17		G		30	34	38	38		G	38		38	34	32	28	23	17	23	E B 16	E B 16	
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		27	32	38	38		G	55	41	41	35	39	36	24	24	24	E B 16	E B 16	E B 16	
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		G		29	34	37	42	38	38	39		G		34	28	24	24	E B 16	E B 16	E B 16	22	
14	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		18		G	30		39	40	40	40	39		G	G		25	18	24	E B 18	E B 16	E B 17	
15	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16		21	29	35	A A A A 49 51	41	41	49	44	39	39	39	52	28	35	24	24	24	17			
16	E B 16	24	23	18	18	E B 15	21	27	34	38	40		G	51	42	50	46	54	36	36	30	26	E B 16	16	24			
17	E B 23	E B 16	24	E B 16	E B 16	E B 16		G	27	33	36	38	41	40	E B 46	40	40	39	33	28	24	24	E B 16	E B 16	E B 16			
18	28	24	E B 16	E B 16	23	19		G	28	34	41	49	52	48		G	58	43	39	38	E B 26	26	62	25	16	24		
19	28	E B 16	E B 16	E B 16	E B 16	22	16		G	29	33	36	39	40		G	41		G		G	31	26		E B 18	E B 16	21	
20	E B 16	E B 18	E B 16	E B 18	E B 16	E B 16		G	G		39	39	42	42		C	41	37		G		G	E B 16	E B 16	E B 16	E B 16	27	
21	27	E B 16	E B 16	E B 16	E B 16	E B 16		G	30	35	38	41		C	48	46	42	39	39	36	49	47	26	26	E B 17	25		
22	25	E B 16	E B 16	E B 16	E B 16	E B 16		G	29	31	62	44	50	75	42	56	39	35	46	46	27	25	26	16	23			
23	26	E B 16	E B 16	E B 18	E B 16	E B 19	21	28	34		G	39	41	45		G	43	38		G	34	27	26	26	28	33	26	
24	28	E B 16	E B 18	E B 16	E B 17	E B 16		G	28	36		37	40	43	43		G	41	42	36	31	50	55	18	E B 16	E B 16		
25	27	27	28	28	23	E B 16	21	27	34		G	39	46	54	65	54	42	45	48	A A 151	25	27	46	39	30			
26	42	23	23	22	20	28	28	28	30	34	49	60	78	67	77	71	51	89	39	25	E B 15	25	E B 16	E B 16				
27	E B 17	E B 17	E B 16	C	C	C	C	C	C	C	C	C	C	42	42	42	49	60	42	26	43	24	26	26	20			
28	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	20	30	39	45	47	42	51	48	56	40		G	G		27	53	23	E B 16	E B 16	E B 16		
29	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		G	29	36	38	41	41	44	46	41	40	47	31	30	22	24	34	E B 15	E B 15			
30	E B 16	E B 16	19	E B 16	19	23	27		G		32	57		40		G	G	G			43	36	38	26	24	E B 16	E B 18	16
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	30	30	30	29	29	29	29	29	29	29	29	28	30	29	30	30	30	30	30	30	30	30	30	30	30			
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		G	29	33	36	39	40	41	39	41	38	34	34	26	24	24	18	E B 16	E B 16			
U Q	25	16	16	16	18	16	19		34	38	42	42	48	44	43	40	39	38	31	26	26	26	16	23				
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16		G	28	32	34	38		G	G	G	G	G	G		G	E B 23	E B 18	E B 16	E B 16	E B 16		

APR. 2022 fbEs (0.1MHz)

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## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 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	15	16	23	24	25	26	25	24	24	25	20	14	16	16	16	16	16
2	16	16	16	16	16	16	16	16	16	17	20	27	32	28	28	28	24	22	17	15	15	16	16	16
3	16	16	16	16	16	16	16	16	22	22	24	26	26	26	26	26	24	20	15	15	15	15	15	16
4	16	15	15	15	15	15	14	16	17	20	22	25	25	26	25	25	24	23	17	16	16	16	16	16
5	16	16	16	16	16	15	16	16	16	24	25	25	25	26	26	26	26	17	15	15	16	16	16	16
6	16	16	16	16	16	16	16	16	16	22	24	28	27	27	27	27	25	15	15	15	16	16	16	16
7	16	16	16	16	16	16	15	15	16	18	22	23	24	24	23	23	23	21	15	16	16	16	16	16
8	15	16	16	16	16	15	16	16	16	20	23	25	26	27	26	26	24	21	15	15	15	16	16	16
9	16	16	16	16	16	16	17	16	16	23	24	24	24	26	25	25	25	20	15	16	16	16	16	16
10	16	16	15	15	16	16	15	15	16	16	22	27	27	27	26	24	23	18	16	16	16	16	16	16
11	16	16	16	16	16	16	17	14	16	18	22	22	27	26	24	24	18	12	14	16	16	16	16	16
12	16	16	16	16	16	16	16	16	16	21	22	24	24	24	25	24	24	16	16	16	16	16	16	16
13	16	16	16	16	16	16	14	14	15	18	23	24	24	23	23	23	23	17	14	16	16	16	16	16
14	16	16	16	16	16	16	16	19	21	20	23	25	25	27	25	25	23	18	14	15	15	18	16	17
15	16	16	16	16	15	16	16	16	16	23	26	24	27	28	27	26	26	18	16	16	16	15	15	15
16	16	16	16	16	16	15	16	14	16	23	23	26	26	26	26	25	20	18	16	16	16	16	16	16
17	16	16	16	16	16	16	14	15	17	20	24	25	25	46	24	24	24	22	14	14	16	16	16	16
18	16	16	16	16	16	16	16	16	21	24	24	25	25	29	29	24	24	23	23	16	17	16	16	16
19	16	16	16	16	16	16	15	15	19	24	24	26	26	26	26	26	26	25	17	16	16	16	16	16
20	16	18	16	16	16	16	16	16	17	21	25	24	26	C	27	27	26	20	16	16	16	16	16	16
21	17	16	16	16	16	16	16	16	16	22	24	C	27	27	27	27	24	21	15	15	15	15	15	16
22	16	16	16	16	16	16	14	15	16	23	23	24	27	28	28	27	24	20	16	16	16	16	16	16
23	16	16	16	16	16	16	15	15	19	21	23	25	25	25	25	24	24	22	16	16	16	16	16	16
24	16	16	18	16	17	16	16	16	19	22	24	25	26	26	27	27	24	18	15	16	16	16	16	16
25	16	15	15	15	16	16	14	16	16	22	22	26	26	26	26	26	26	17	16	16	16	17	17	17
26	16	16	16	16	16	16	16	16	18	24	25	26	27	27	27	27	25	16	15	15	15	15	16	16
27	17	17	16	C	C	C	C	C	C	C	C	C	28	28	27	27	27	24	15	15	15	15	16	16
28	16	15	16	16	16	16	16	16	16	23	25	25	26	26	26	25	24	24	14	14	14	16	16	16
29	16	16	16	16	16	16	16	16	17	18	24	27	27	26	26	26	24	20	14	14	15	16	15	15
30	16	16	16	16	16	16	16	16	22	24	24	24	26	26	29	27	26	24	16	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	29	29	29	29	29	29	29	29	28	30	29	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	16	16	22	24	25	26	26	26	26	24	20	15	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	18	23	24	26	27	27	27	27	25	22	16	16	16	16	16	16
L Q	16	16	16	16	16	16	15	15	16	20	22	24	25	26	25	24	24	18	15	15	15	16	16	16

APR. 2022 fmin (0.1MHz)

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### IONOSPHERIC DATA STATION Yamagawa

APR. 2022 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	292	281	299	287	289	294	326	343	335	316	311	310	309	306	307	297	302	308	324 <sup>R</sup>	334	302	280	283	299
2	286	333	324	311	275	278	322	348	346	326	310	321	308	299	295	300	303	306	309	324	328	281	285	288
3	284	294	302	294	291	277	291	345	341	324	327	302	300 <sup>R</sup>	302	312	308	292	298	311	331 <sup>R</sup>	353	295	284	284
4	288	291	305	308	319	296	313	348	343	320	323	295	314	309	301	306	299	303	356	322	318	279	291	296
5	287	282	282	305	295	286	332	353	350	319	319	302	302	318	322	314	309	310	322	327	307	298	281	291
6	308	303	311	319	296	285	305	340	345	341	319	313	296	300	304	302	307	320	323	323	301	308	281	283
7	296	309	324	341	279	277	297	336	335	336	331	314	300	298	306	289	308	312	304	316	337	289	278	273
8	278	279	313	331	297	277	304	336	334	328	324	303	295	307	304	312	315	313	323	337	327	279	285	295
9	306	305	299	325	286	307	305	330	336	323	341	310	298	305	310	311	305	314	318	323	346 <sup>R</sup>	288	279	286
10	299	301	274	270	285	289	303	351	353	316	316	300	306	317	327	290	302	328	331	322	376	281	254	278
11	280	298	290	292	296	303	332	354	345	330	340	305	311	328	313	312	324	321	333	335	341	283	288	289
12	305	293	301	316	322	340	332	380	362	323	311	305	304	313	311	305	314	324	335	319 <sup>R</sup>	354	305	282	285
13	265	302	281	286	290	291	335	339	331	353	313	286	311	313	314	323	317	317	325	336	314	289	274	279
14	313	323	306	319	307	288	328	331	346	322	329	310	324	319	323	309 <sup>R</sup>	311	317	322	316	328 <sup>R</sup>	336	299	287
15	310	311	266	257 <sup>F</sup>	246	275	285	279	287	A	A	243	285	301	304	333	333	311	321	325	346	269	256	280
16	272	280	269	F	266	318	339	361	350	331	268	317	316	338	325	332	326	317	323	342	348	331	294	285
17	285	274	309	299	304	301	345	364	367	357	328	313	298	310	308	319	321	326	344	332	347	316	282	288
18	290	292	291	284	269	302	369	357	330	327	306	293	308	306	308	304	318	317	R	340 <sup>R</sup>	370	306	271	274
19	285	283	290	309	302	304	325	356	360	338	310	290	314	310	302	303	306	315	320	330	349	334	273	276
20	276	293	308	294	314	323	351	360	360	333	332	289	289	C	304	291	309	330	335	343 <sup>R</sup>	346	310	269	276
21	287	287	291	293	278	F	340	368	360	340	323	C	297	295	301	300	306	315	311	331	348	311	278	288
22	277	259	268	337	337	312	335	367	329	346	308	299	304	311	304	304	309	317	332	335	338	286	275	280
23	292	279	285	291	286	279	298	339	331	334	324	294	290	297	284	296	312	320	324	328	310	295	277	278
24	293	314	290	300	295	301	338	344	323	316	323	311	311	305	300	302	298	322	334	332	325	292	288	275
25	F	F	312	325	297	281	335	352	331	338	312	299	282	291	304	309	309	304	A	323	331	329	290	267
26	F	293	304	307	314	300	325	345	316	309	286	288	R	301	308	300	305	297	316	310	314	310	282	283
27	284	275	303	C	C	C	C	C	C	C	C	C	288	299	295	294	300	310	325	315	292	295	282	303
28	300	264	283	298	288	295	303	323	308	322	306	292	286	299	303	295	293	296	308	303	313	313	274	270
29	278	283	295	278	283	298	337	372	371	325	316	270	278	290	294	300	308	320	316	319	309	259	272	269
30	276	283	296	304	333	331	323	342	321	298	293	281	281	289	288	298	307	306	325	318	301	288	287	277
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	30	28	29	28	29	29	29	28	28	28	29	29	30	30	30	30	28	30	30	30	30	30
MED	287	292	298	302	295	296	326	348	341	326	318	301	300	305	304	304	308	315	323	326	330	295	282	283
U Q	298	302	306	318	306	304	336	358	352	337	326	310	310	312	311	311	314	320	332	334	347	310	285	288
L Q	279	280	285	292	284	283	304	339	330	321	310	291	290	299	301	298	303	308	317	319	313	283	274	276

## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	L	L	L	L	L						
2											L	L	L	L	L	L	L							
3										L	L	L	L	L	L	L	L							
4										L	L	L	402	L	L	L	L	L						
5										L	L	L	L	370	A	L	L							
6										L	L	L	L	387	U L	L	L	L						
7										L	L	L	L	382	U L	U L	L	L	L					
8									L	L	L	L	L	L	L	L	L							
9										L	L	L	L	391	391	383		L	L	L				
10											L	L	L	376	374	A	L	L	A	A				
11									L	L	L	L	U L	379	379	L	L	L	L	A				
12									L	L	L	L	A	U L	L	L	L	L	A	A				
13									L	L	L	L	382	371	369	378	368		L	L				
14									L	L	L	L	L	L	L	L	L	L						
15							A	352	359	A	A	385	359	A	A	386		A	A	A				
16									L	L	L	L	A	L	A	A	A	A						
17									L	L	L	L	U L	345	368		L	A	A					
18										L		A	A	L	A	L	L							
19									L	L	L	L	U L	L	L	368		L	L	A				
20									L		411	411	384	C	379	353	360		L					
21									L	L	L	C	A	355	L	376		L	L					
22										A	A	A	A	L	A	L	L	A	A					
23										L	L	L	U L	365	371	333	356	362		L				
24										L	L	L	U L	400	378	363	350		A	L				
25									L	L	L	U L	A	A	A	L	A	A	A					
26										L	A	A	A	A	A	A	A	A						
27						C	C	C	C	C	C	C	U L	364	376	353		A	A	A				
28										A		L	A	368	A	L	L	L	L					
29										L	400	L	356	358	388	376		A	L					
30										A	L	L	L	L	L	A	L	A	L					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1		4	4	13	14	10	8	2							
MED								352	359		406	384	376	374	366	368	361							
U Q											414	398	396	379	379	376								
L Q											383	380	362	369	361	354								

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## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 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									244	260	278	278	264	276	276	278	278	278						
2											278	258	286	282	282	268	260							
3										260	258	274	274	260	260	260	280							
4										254	254	298	268	268	268	268	256	256						
5										264	252	302	300	268	242	262	262							
6										240	264	260	280	280	274	274	274	256						
7										256	256	256	288	300	276	286	278	266						
8									244	254	244	292	292	280	268	262	256							
9										256	250	262	288	288	280	260	280	274						
10											284	276	276	276	254	296	290	230	230					
11									248	248	248	280	280	240	264	276	262	254	232					
12									232	246	258	258	272	272	272	272	264	248	246					
13									252	236	254	278	278	278	260	276	260	244						
14									244	270	242	268	264	262	262	262	262	262						
15							328	388	382	A	A	540	374	340	284	296	266	260	264					
16									264	250	280	280	270	250	250	238	238	238						
17									236	228	280		308		272	270	252	238						
18										254		288	288	288	278	278	272							
19									218	250	272	272	298	264	274	274	274	256	246					
20									238		264	268	294	C	290	300	272	246						
21									230	246	260	C	302	302	290	306	278	258						
22									E A	E A		E A												
23									258	234	300	300	268	290	282	266	256	234						
24									272	272	276	312	284	308	292	264	254							
25									278	282	282	264	300	300	300	266	262			A				
26									262	262	274	300	E A		E A	E A	E A							
27						C	C	C	C	C	C	C												
28									264	252	298	306	290	290	276	264	340							
29									260	298	282	326	300	280	280	270	288	276						
30									290	290	290	340	306	300	288	274	260							
31									E A															
									302	268	278	328	320	304	286	262	262	262						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	1	13	25	27	27	30	28	30	30	30	25	8					
MED							328	388	244	255	264	278	289	281	276	277	266	257	246					
U Q									257	264	278	292	306	300	290	288	274	263	263					
L Q									234	249	252	268	276	268	268	268	262	251	233					

APR. 2022 h'F2 (KM)

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## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E	B	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
2	254	294	246	246	250	216	216	212	212	200	190	190	190	190	190	190	190	220	230	218	208	228	258	252	
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
4	266	218	208	206	228	242	232	204	204	204	196	196	202	196	196	198	198	218	228	214	208	208	274	258	
5	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
6	258	264	258	232	226	264	240	212	212	198	186	192	184	184	184	188	196	218	224	204	196	196	262	268	
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
8	268	270	246	232	210	210	230	198	204	204	204	186	186	186	194	192	210	216	216	216	200	212	234	234	
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
10	244	254	268	226	226	248	214	198	204	196	196	216	210	194	A	192	196	214	214	216	216	252	258	258	
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
12	246	242	228	216	216	240	230	206	206	194	194	202	188	188	190	190	202	212	220	206	220	220	266	272	
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
14	256	244	220	206	206	272	240	208	208	200	200	198	198	192	192	192	202	210	216	220	216	234	266	266	
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
16	274	270	234	214	236	262	236	202	212	198	186	186	186	186	196	196	212	212	228	212	212	212	278	264	
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
18	250	240	240	228	228	212	232	204	204	196	196	194	194	180	180	200	208	208	228	228	204	214	242	256	
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
20	256	250	280	292	268	268	248	200	196	196	196	190	190	190	A	200	204	A	A	204	204	308	324	324	
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
22	284	248	248	262	248	236	220	190	190	194	204	198	180	180	180	188	202	202	A	202	198	222	258	262	
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
24	240	240	258	218	212	212	194	194	194	194	194	196	A	192	200	196	214	A	A	212	192	188	256	266	
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
26	276	256	262	256	244	214	214	210	200	200	202	184	184	194	174	190	212	208	208	204	204	216	288	288	
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
28	244	230	230	230	212	230	206	206	198	188	190	190	190	208	204	182	190	204	216	222	204	204	204	228	
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
30	238	222	308	312	340	318	A	E	A	E	A	A	E	A	E	A	A	A	E	A	E	A	E	A	
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
00	286	286	296	326	286	216	220	216	216	198	186	176	A	196	A	A	A	A	A	218	214	214	186	230	
01	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
02	292	276	252	204	218	244	216	208	198	194	194	194	194	272	190	208	A	A	A	216	206	202	264	276	
03	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
04	286	278	274	260	300	250	196	196	202	202	224	A	A	216	A	224	224	234	220	212	208	208	286	298	
05	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
06	294	248	248	248	264	234	218	212	200	198	192	192	192	192	198	198	198	210	A	210	202	190	212	296	
07	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
08	296	278	252	266	234	230	202	202	202	214	188	188	188	C	188	206	202	202	220	212	194	194	250	288	
09	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
10	286	262	262	258	248	248	210	210	206	188	188	C	A	212	212	212	234	218	232	224	208	204	210	322	
11	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
12	296	324	272	218	200	200	208	200	200	A	A	A	A	200	A	200	204	A	A	208	208	216	268	296	
13	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
14	280	264	256	254	264	282	202	202	202	202	202	186	198	194	202	202	202	208	216	210	222	236	304	274	
15	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
16	260	230	250	238	238	234	206	206	194	194	194	198	190	204	204	204	A	220	220	212	238	218	218	246	
17	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
18	314	268	260	228	234	250	212	212	206	198	198	198	A	A	A	A	A	A	E	A	244	210	E	B	
19	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
20	282	252	236	228	212	248	208	208	204	204	A	A	A	A	A	A	A	A	244	210	212	212	246	264	
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
22	264	278	244	C	C	C	C	C	C	C	C	C	C	200	194	200	A	A	A	216	216	230	258	262	
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
24	242	306	280	246	222	226	204	204	204	A	218	198	A	E	A	A	202	202	202	222	256	224	224	206	292
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
26	272	258	252	258	238	238	212	202	202	202	192	190	196	220	194	200	A	210	220	216	206	290	288	274	
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
28	284	270	252	216	216	198	210	210	210	A	182	192	192	192	196	A	208	A	210	198	198	218	232	248	
29																									
30																									
31																									
CNT	30	30	30	29	29	29	28	29	29	25	26	25	22	26	21	26	22	20	23	30	30	30	30	30	
MED	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
UQ	270	260	252	232	234	238	212	205	204	198	194	192	190	193	194	199	202	211	220	211	206	216	260	270	
LQ	E	A	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
	286	276	262	258	249	250	230	210	207	202	200	198	198	204	200	204	210	218	228	218	216	228	278	292	
	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
	254	244	244	218	216	216	207	201	200	194	190	189	188	190	189	192	198	208	216	208	202	204	234	258	

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APR. 2022 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	110	110	110	110	108	108	108	108	108	108	108					
2							B	108	108	108	108	108	110	110	110	112	112	A	114					
3							B	122	122	122	A	A	116	114	114	114	114	114	114	114				
4							B	132	110	108	108	108	108	108	108	108	108	108	108	108				
5							B	108	108	108	108	A	108	108	108	112	112	112	112					
6							B	112	112	112	108	108	108	108	108	108	108	108	108	108				
7								128	112	112	A	A	112	112	112	112	112	112	112	112				
8							B	112	112	114	114	A	A	114	114	114	114	114	114	A				
9							B	114	112	112	112	A	A	112	112	112	112	112	112	A				
10							B	112	112	112	112	112	110	A	A	A	A	A	A	A				
11							B	108	108	108	108	A	A	108	A	108	108	108	A	B				
12							B	108	108	108	108	108	A	A	A	A	A	A	A	B				
13								108	108	108	108	A	A	A	A	108	108	108	108	108				
14							B	108	108	108	108	110	A	A	A	110	110	110	110	A				
15							B	110	110	A	A	A	A	A	A	110	110	110	A					
16							B	A	110	110	A	110	A	A	A	A	A	A	A	B				
17								120	120	108	108	108	A	A	A	110	114	114	114					
18								114	114	114	A	A	A	110	A	A	110	110	B					
19								124	116	116	116	116	112	112	112	112	112	112	112	112	112			
20								112	112	108	A	A	108	A	C	108	A	108	108	108				
21								120	116	116	116	116	C	108	108	108	108	108	112	A			A	
22								112	112	A	A	A	A	A	A	108	108	A	A					
23							B	108	108	108	A	A	A	108	108	108	108	108	A					
24								108	108	A	108	A	A	A	A	108	108	108	112	114				
25								114	A	114	114	A	A	A	A	A	A	A	A	A				
26							B	A	A	A	A	A	A	A	A	A	A	A	A					
27						C	C	C	C	C	C	C	114	114	114	114	A	114	A			A		
28							B	114	114	114	112	110	110	110	A	108	108	108	110					
29								124	114	114	A	114	114	112	112	112	114	A	A	A				
30							B	110	110	A	106	A	106	112	112	112	112	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							13	26	26	20	17	14	17	17	19	23	24	20	14	1				
MED							120	112	110	109	108	110	110	110	108	110	110	111	111	112				
U Q							124	114	114	113	113	112	112	112	112	112	112	112	114					
L Q							112	108	108	108	108	108	108	108	108	108	108	108	108					

APR. 2022 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	86	86	B	86	88	98	G	132	132	132	132	G	G	G	G	G	G	G	B	B	B	B	B
2	B	B	B	B	B	B	100	118	118	112	112	G	G	G	112	112	112	100	G	100	98	92	92	B
3	78	84	B	B	B	B	126	G	G	104	104	G	G	G	G	G	G	G	124	B	B	B	B	B
4	B	B	86	B	B	B	G	G	136	124	108	G	G	108	G	G	G	152	120	106	100	B	B	B
5	B	B	B	B	B	B	B	G	140	128	116	98	152	142	130	142	G	G	G	B	94	94	84	B
6	84	B	B	84	84	B	B	G	124	124	110	G	G	G	G	G	G	G	G	80	94	94	B	B
7	B	B	B	B	94	B	G	G	150	100	100	G	G	G	G	G	G	G	G	100	100	100	100	100
8	B	B	B	100	90	90	G	G	122	122	122	104	G	G	G	G	160	128	108	94	94	94	94	B
9	B	B	B	B	B	B	B	150	132	122	112	96	96	G	G	G	G	G	102	102	100	90	90	90
10	90	90	B	B	B	90	126	126	126	126	116	G	G	104	104	104	G	106	96	96	96	96	96	96
11	96	80	80	86	86	86	B	G	156	132	114	100	G	100	G	108	112	100	98	90	90	90	90	90
12	90	B	78	B	B	B	B	122	130	114	114	G	86	96	96	94	94	86	86	86	86	86	84	B
13	82	82	88	88	88	B	G	112	112	112	100	100	98	94	G	G	162	142	116	78	78	78	90	90
14	90	90	90	B	B	B	124	G	140	G	140	140	90	90	88	G	G	G	112	112	110	B	B	B
15	84	84	90	B	B	120	120	112	112	98	98	98	98	96	96	164	138	120	96	96	96	96	96	96
16	B	96	82	82	82	B	124	98	110	110	100	G	92	92	92	92	92	92	92	92	92	92	92	92
17	92	92	86	B	86	86	G	132	114	112	112	98	110	B	104	164	164	164	120	88	88	88	88	96
18	96	88	88	88	86	86	G	134	120	94	94	94	84	G	84	84	148	120	110	104	104	88	88	88
19	88	94	94	B	94	94	G	124	128	114	114	114	G	G	112	G	G	158	158	G	100	100	B	100
20	96	B	96	94	B	B	G	G	G	94	94	94	94	C	110	108	G	108	G	B	B	B	B	98
21	98	112	B	92	92	B	G	138	138	126	126	C	146	146	132	132	124	124	98	98	96	96	96	96
22	88	82	82	B	82	B	G	118	98	92	90	90	90	90	86	130	114	98	98	96	96	96	B	96
23	96	90	B	90	90	90	90	144	130	G	94	94	94	G	150	150	G	150	100	100	94	92	92	92
24	92	92	92	92	B	B	G	114	100	G	100	100	100	100	G	132	136	120	120	100	100	100	98	94
25	94	94	94	94	94	94	130	100	116	G	100	100	96	96	96	96	104	100	100	96	94	94	94	94
26	94	94	94	94	94	94	94	94	94	92	92	90	84	84	84	84	84	96	96	96	B	96	96	B
27	B	B	B	C	C	C	C	C	C	C	C	C	110	110	110	118	98	120	112	100	100	92	92	92
28	B	B	B	B	B	B	124	134	128	116	116	116	110	116	104	130	G	G	122	86	86	90	90	90
29	90	B	B	B	B	B	G	116	116	98	116	128	150	138	116	122	100	98	98	98	92	90	90	B
30	B	B	90	90	96	96	98	G	116	88	G	88	G	G	G	142	134	110	110	100	100	92	B	92
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	17	17	13	16	12	12	18	27	25	28	20	19	17	19	20	17	22	24	25	26	25	21	19
MED	90	90	88	90	89	90	122	120	124	112	111	99	96	100	104	120	114	115	105	96	96	92	92	94
U Q	96	94	93	94	94	94	125	134	132	124	116	109	110	113	112	137	143	128	118	100	100	96	96	96
L Q	88	84	84	87	86	87	98	112	114	98	100	94	90	93	92	100	99	100	98	91	92	90	90	90

APR. 2022 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Yamagawa

APR. 2022 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		F2	F2		F1	F2	L1		H1	H1	H1	H1														
2							L1	H2	C2	C2	C1				C1	C1	C2	L2		F5	F2	F5	F6			
3	F3	F2					C1			L1	L1								C1							
4			F1						H1	C1	C3				C1			H1	C1	F6	F1					
5									H2	C1	C2	L2	H2	H1	H1	H1					F3	F6	F2			
6	F1			F1	F1				C1	C1	C1									F3	F4	F2				
7				F1					H1	L2	L2									F1	F3	F2	F2	F1		
8			F1	F5	F2				C2	C2	C1	L1					H2	C3	L6	F3	F3	F2	F3			
9								H1	H1	C2	C2	L1	L2						L2	L2	F3	F5	F3	F2		
10	F2	F1			F1	C1	C1	C2	C2	C1				L1	L3	L2		L3	L8	F5	F9	F7	F3	F4		
11	F1	F1	F1	F2	F1			H1	H1	C1	L1			L2		C2	C1	L4	L8	F5	F8	F7	F2	F2		
12	F2		F1				C2	H2	C2	C1			L3	L2	L2	L2	L5	L4	L4	F6	F5	F1	F1			
13	F4	F2	F2	F1			C2	C2	C3	L3	L2	L2	L2	L3			H1	H1	C1	F2	F1	F1	F1	F2		
14	F2	F2	F4			C2		H1		H2	H1	L2	L2	L3	L2				C1	F1	F2					
15	F2	F1	F2		F1	C2	C3	C3	L4	L2	L2	L2	L1	L2	L2	H1	H2	C3	L6	F5	F6	F3	F4	F2		
16		F2	F6	F2	F3	C2	L2	C1	C3	L2		L2	L2	L1	L2	L4	L4	L4	L7	F8	F5	F1	F3	F3		
17	F5	F2	F4		F2	F1		H1	C2	C1	C1	L2	C1		L1	H1	H2	H2	C2	F3	F2	F2	F2	F2		
18	F3	F3	F2	F2	F6	F3		H2	C2	L3	L3	L2	L2		L3	L3	H2	C2	L7	F3	F8	F3	F2	F3		
19	F2	F2	F1		F4	F6		C1	C1	C2	C1	C1			C1			H1	H1		F2	F1		F4		
20	F4		F1	F2						L2	L1	L1	L1		C1	L1		C1							F8	
21	F2	F1		F3	F1			H2	H2	C1	C1		H1	H1	H1	H1	C2	C3	L8	F8	F3	F3	F3	F5		
22	F2	F1	F2		F1			C3	L1	L3	L2	L2	L5	L2	L4	H1	C2	L6	L7	F5	F6	F6		F2		
23	F5	F2		F2	F2	L1	H2	C2			L1	L1	L1		H1	H1		H3	L5	F9	F9	F3	F5	F2		
24	F4	F2	F1	F2			C2	L2			L1	L2	L1	L1		H1	H2	C2	L1	F8	F8	F2	F4	F5		
25	F3	F8	F5	F3	F4	F2	C1	L2	C1		L1	L1	L2	L2	L3	L2	L3	L5	L3	F4	F8	F4	F8	F4		
26	F3	F3	F2	F2	F4	L5	L2	L2	L1	L2	L4	L5	L3	L5	L4	L4	L8	L6	F3		F3	F2				
27												C1	C1	C1	C2	L4	C2	C1	F6	F3	F4	F3	F2			
28						C2	H2	C2	C2	C2	C1	C2	C1	C1	L3	H1			C1	F9	F4	F4	F3	F2		
29	F1						C1	C2	L3	C1	C1	H1	H1		C1	C2	L3	L2	L4	F7	F5	F9	F1			
30			F4	F1	F3	F4	L2		C1	L3		L1				H1	C2	L3	L3	F3	F1	F2		F5		
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																										
MED																										
U Q																										
L Q																										

APR. 2022 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 f<sub>XI</sub> (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 82	X 79	X 81	X 72	X 62	X 62															X 110	X 101	X 109	X 125	
2	X 124	X 132	X 116	X 79	X 64	X 72															X 124	X 102	X 89	X 91	
3	X 89	X 78	X 78	X 65	X 61	X 55															X 137	X 110	X 114	X 102	
4	X 95	X 76	X 76	X 87	X 68	X 57															X 145	X 134	X 128	X 121	
5	X 104	X 86	X 78	X 74	X 71	X 66															X 127	X 119	X 108	X 93	
6	X 93	X 88	X 84	X 81	X 56	X 50															X 134	X 130	X 115	X 100	
7	X 110	X 110	X 122	X 89	X 49	X 51															X 113	X 87	X 89	X 88	
8	X 83	X 82	X 88	X 76	X 54	X 52															X 117	X 107	X 107	X 116	
9	X 110	X 104	X 87	X 74	X 64	X 56															X 121	X 95	X 84	X 81	
10	X 76	X 71	X 66	X 60	X 63	X 63															X 94	X 66	X 65	X 63	
11	X 64	X 67	X 67	X 57	X 58	X 60															X 117	X 107	X 97	X 91	
12	X 84	X 80	X 76	X 75	X 71	X 50															X 137	X 110	X 104	X 103	
13	X 92	X 69	X 69	X 60	X 58	X 54															X 98	X 90	X 82	X 84	
14	X 86	X 86	X 80	X 70	X 60	X 52															X 184	X 133	X 107	X 96	
15	X 90	X 73	X 54	X 54	X 52	X 56															X 69	X 60	X 60	X 62	
16	X 64	X 64	X 60	X 53	X 51	X 51															X 128	X 102	X 96	X 86	
17	X 78	X 71	X 64	X 64	X 54	X 49															X 122	X 89	X 72	X 71	
18	X 69	X 73	X 74	X 72	X 63	X 66															X 144	X 115	X 114	X 113	
19	X 116	X 115	X 108	X 94	X 72	X 69															X 121	X 112	X 123	X 112	
20	X 83	X 92	X 91	X 80	X 72	X 70															X 136	X 136	X 140	X 118	
21	X 122	X 121	X 117	X 115	X 98	X 98															X 130	X 106	X 88	X 84	
22	X 88	X 88	X 100	X 125	X 84	X 47															X 144	X 136	X 146	X 138	
23	X 142	X 136	X 127	X 119	X 94	X 92															X 163	X 169	X 154	X 142	
24	X 136	X 124	X 110	X 98	X 86	X 83															X 134	X 130	X 133	X 128	
25	X 109	X 98	X 97	X 84	X 72	X 67															X 162	X 155	X 154	X 164	
26	X 159	X 148	X 154	X 140	X 110	X 86		94	95	106											X 132	X 122	X 122	X 109	
27	X 101	X 96	X 96	X 90	X 61	X 60															X 151	X 156	X 157	X 145	
28	X 122	X 96	X 96	X 93	X 82	X 80															X 122	X 108	X 97	X 93	
29	X 95	X 96	X 96	X 82	X 75	X 76															X 144	X 140	X 140	X 140	
30	X 134	X 130	X 133	X 143	X 101	X 54															X 134	X 120	X 104	X 98	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30			1	1	1										30	30	30	30	
MED	X 94	X 88	X 88	X 80	X 64	X 60			94	95	106										X 131	X 111	X 108	X 101	
U Q	X 116	X 110	X 108	X 93	X 75	X 70															X 144	X 133	X 128	X 121	
L Q	X 83	X 76	X 76	X 70	X 58	X 52															X 121	X 102	X 89	X 88	

APR. 2022 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 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

$\begin{matrix} H \\ D \end{matrix}$	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	75	73	75	66	56	56	58	75	86	108	121	129	140	150	149	142	142	147	147	130	104 <sup>R</sup>	95	103	119
2	118	126	110	73	58	66	65	80	90	93	114	126	128	140	146	142	140	138	138	134	118	95	82	85
3	83	72	72	59	55	49	54	78	93	101	106	122	142	161	170 <sup>R</sup>	168	168	169	180	180	131	104	108	96
4	89	70	70	81	62	51	50	72	81	100	114	124	144	169 <sup>R</sup>	182 <sup>U</sup>	183 <sup>R</sup>	181	177	169	153	139	128	122	115
5	98	80	72	68	65	60	68	72	82	104	116	121	139	158	166	149	145	148	144	129	121	113	102 <sup>R</sup>	87
6	87	82	78	75	50	44	48	73	94	102	97	104	116	137	150	158	158	155	150	137	128	124 <sup>R</sup>	109	94
7	104	104	116	83	44	45	44	70	89	98	107	104	109	123	125	129	132	130	121	120	107	81	83	82
8	77	76	82	70	48	46	50	74	89	101	96	106	116	137	145	144	142	137	130	129	111	101 <sup>R</sup>	101 <sup>R</sup>	110
9	104	98	81	68	58	50	53	72	89	104	107	100	106	121	130	141	144	148 <sup>R</sup>	147	131	115	89	78	75
10	70	65	60	54	57	57	60	80	88	88	101	108	122	141	157	146	145	152	126	122	88	60	59	57
11	58	61	61	51	52	54	60	65	80	92	101	102	122	131	134	139	146	151 <sup>J</sup>	150	140	111	101 <sup>R</sup>	91	85
12	78	74	70	69	65	44	48	69	72	79	96	118	136	144	157	163	166	179 <sup>R</sup>	178	163	131	105 <sup>R</sup>	98	97
13	86	63	63	54	52	48	58	82	115	101	82	99	122	140	163	165	172	184	168	136	92	84	76	78
14	80	80	74	64	54	46	48	68	89	103	104	115	134	153	165	178	176	166	174	183	178	127	101	90
15	84	67	48	48	46	50	48	54	46 <sup>E</sup>	44 <sup>G</sup>		62	69	80	82	77	84	89	90	102	63	54	54	56
16	58	58	54	47	45	45	47	56	72	82	96	116	136	166	173 <sup>R</sup>	171	162	159	168	160	122	96	90	80
17	72	65	58	58	48	43	59	83	89	86	98	101	117	127	144	148	146	144	141	142	116	83	66	65
18	63	67	68	66	57	60	65	68	77	89	92	107	125	139	149	165	176 <sup>R</sup>	184	190	181	138	109	108	107
19	110	109	102	88	66 <sup>V</sup>	63	73	82	86	84	91	105	122	130	131	132	134	140	153	150	115	106 <sup>R</sup>	117 <sup>R</sup>	106 <sup>R</sup>
20	77	86	85 <sup>R</sup>	74	66	64	70	70	74	87	93	98	115	128	131	130	143	157	164	149	130	130	134	112
21	116	115	111	109	92	92	93	83	84	86	86	99	112	125	137	136	148	158	153	139	124	100	82	78
22	82	82	94	119	78	41		70	82	87	86	102	121	130	137	149	156	173	171	164	138	130 <sup>R</sup>	140 <sup>R</sup>	132 <sup>R</sup>
23	136	130	121	113	88	86	100	106	99	102	98	108	119	124	142	153	162	176	172	156	157 <sup>R</sup>	163	148	136
24	130	118	104	92	80	77	72	80	80	94	104	109	114	113	122	134	153	153	152	142	128	124	127	122 <sup>H</sup>
25	103	92	91	78	66	61	74	86	92	93	102	111	124	139	148	148	144	140	152	162	156	149	148	158 <sup>F</sup>
26	153	142	148	134	104	80	82	84 <sup>F</sup>	86 <sup>F</sup>	96	108	116	129	135	135	128	122	131	138	136	126	116	116	103
27	95	90	90	84	55	54	63	82	91	102	102	109	128	145	158	173	184	186	171	149	145	150	151	139
28	116	90	90	86	76	74	82	94	100	97	106	114	125	138	132	119	125	136	138	139	116	102	91	87
29	89	90	90	76 <sup>R</sup>	69	70	87	68	72	83	84	103	127	142	151	150	150	151	148	146	138	134	134	134
30	128	124	127	137 <sup>R</sup>	95	48	57	76	81	84	106	114	127	141	147	146	143	135	133	136	128	114	98	92
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	88	82	82	74	58	54	60	74	86	94	101	108	123	138	146	147	146	152	151	141	125	106	102	95
U Q	110	104	102	86	69	64	72	82	90	101	106	116	129	144	157	163	162	169	169	156	138	127	122	115
L Q	77	70	70	64	52	46	50	70	80	86	94	102	116	128	134	136	142	140	138	134	115	95	83	82

APR. 2022 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 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	U L	U L	U L	U L	U L	L	L	L							
2											L	U L	U L	U L	U L	U L	L	L							
3										L	L	U L	U L	U L	U L	L	L	L	L						
4										L	U L	U L	U L	U L	U L	L	L	L							
5										L	L	L	L	L	L	L	L	L							
6									L	L	U L	U L	U L	U L	U L	L	L	L							
7									L	L	L	U L	U L	U L	U L	L	L	L	L						
8									L	L	U L	U L	L	L	U L	U L	L	L							
9									L	L	U L	U L	L	L	L	L	L	L	L						
10									L	L	L	L	U L	U L	A	L	L	L							
11										U L	U L	U L	U L	L	L	L	L	L							
12										U L	U L	L	L	U L	U L	L	L	L							
13									L	U L	U L	L	L	L	L	L	L	L							
14										L	U L	L	L	L	L	L	L	L	L						
15								L	U L	U L	A	L	A	L	L	L	L	L	L						
16										U L	U L	L	L	L	L	L	L	L							
17										L	U L	U L	L	B	L	L	L	L	L						
18										L	U L	U L	L	L	L	L	L	L	L						
19									L	L	U L	U L	L	L	L	L	L	L	L						
20										L	U L	U L	U L	B	L	L	L	L	L						
21										L	U L	L	B	L	L	L	L	L	L						
22								A		L	A	L	U L	L	L	L	L	L	L						
23										U L	L	L	U L	L	L	L	L	L	L						
24										L	L	L	L	L	L	L	L	L	L						
25										L	L	U L	U L	L	A	A	A	L	L						
26										U L	U L	L	L	L	L	A	A	L	L						
27										L	L	U L	L	L	L	L	L	L	L						
28										L	L	L	L	A	L	L	L	L	L						
29										L	U L	U L	L	L	L	L	A	A							
30										L	U L	L	L	L	L	L	L	L	L						
31										396	480	564	L	560	588	576	536	548							
	00	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	6	21	28	27	27	26	25	16	5							
MED								348	398	478	528	554	556	568	552	540	524	464							
U Q										U L	U L	L	L	L	L	L	L	L							
L Q										476	506	538	528	544	528	522	514	440							

APR. 2022 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Okinawa

APR. 2022 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	A	A	A	A	A	A	A	336	300	212	B					
							200																		
2							B						B							A					
							208	280	328	356	364			364	356	364	328	292	208						
3							B						A	U	R	U	R	R		A					
							228	308	320	348	376			380	388	348	324	288	224						
4							B						U	R	U	R	R		B						
							212	292	332	364	380	392	380	368	356	332	292	212							
5							B					A	U	R	U	R			B						
							200	292	336	360		392	380	372	356	324	288	212							
6							B	A			A	A	A				R		A						
								284	332					376	376	344	332	292	220						
7							B				A	A	A						A						
							216	284	332						368	340	324	280	216						
8							B	A		A				R					A						
										A															
9							B												A						
							196	284	320	352	368	376	364	356	340	320	268	216							
10							B							A				A	A	A					
							208	280	320	348	364	376			340	332									
11							B		A	A		A	A						A						
							212								348	348	324	280	200						
12							B						A						A						
							220	284	324	336	352		360												
13							B				A	A	A						A						
							212	288	328					372	352	340	312	284							
14							B					A	A	A	A				A						
							212	280	324	360						348		284							
15							A						A						A						
							204	280	320	348	376			372		352									
16							A			A										A					
							228	292			376	380	384	368	336	320	284								
17							A			A			R	B	B	U	A		A	A	A				
							224	296	332		376	392				352									
18							A					A	A	A					A	A	A	A	B		
							224	296	328	360					384										
19							B	A	A	A	A	A	A	A	A	A	A	A				232			
20							B		A					B					A						
							240		352	388	400	416			380	360	336	300							
21							B					B	A							A					
							232	312	340	372				412	392	364	336	304	228						
22							A						A			R				B					
							244	300	344	360	380				384	364	348	292	224						
23							A	A	A	A	A	A								A					
													388	396	376	356	340	292	232						
24							B				A	A	A	A	A					A					
							244	300	336									340	292	240					
25							B	A	A	A	A	A	A							A					
														412	380	372	340	300	224						
26							A			A	A	A	A	A	A	A	A	A	A						
							228	308																	
27							A					A			A	A				A				B	
							252	304	348	368			384				364	340							
28							A			E	B		E	B						A					
							252	300	348	396	388	432	416	396	368	344	304	236							
29							A				A	A	A							A					
							252	300	340					412	380	364	336	300							
30							A			A	A	A			B					B					
							228	288				392	400		388	340	296	232							
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								25	23	21	16	13	12	17	20	24	22	22	18						
MED								224	292	332	359	376	388	380	374	354	334	292	222						
U Q								236	300	340	366	380	392	406	382	364	340	300	232						
L Q								210	284	324	350	364	378	370	358	342	324	284	212						

APR. 2022 foE (0.01MHz)

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# IONOSPHERIC DATA STATION Okinawa

APR. 2022 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 88	A 52	J 15	A 20	J 28	K 16	E 19	B 25		J 37	A 42	J 40	A 39	E 40	B 40		G 42		G 28		J 24	A 15		E 19	B 16	B 19		
2	E 16	B 16	B 16	B 16	E 16	B 16	B 16	B 16	J 16	A 16		28	35	38	41	40	E 44	B 41	41	44	39	38	J 40	A 23	J 26	A 26	J 38	A 20
3	J 23	A 25	J 23	A 22	J 20	A 16		20	25		35	40		G 40		G 32	G 32		38	33	34	J 23	A 16	E 16	B 16	B 16	B 16	
4	E 16	B 16	B 16	B 16	E 16	B 16	B 16		20	27	31		40		G 47		G 40		G 40		G 24	E 16	B 16	B 16	J 20	A 24	A 16	
5	J 18	A 19	J 18	A 16	E 20	J 16	A 16	B 16		24	32	35	38	44		G 42	40		G 40		G 24	E 16	B 16	B 16	B 16	B 16	J 32	
6	E 16	B 16	B 16	B 16	E 16	B 16	B 16		24	18	20	26	32	36	38	39	40		G 31		G 26	J 17	A 18	E 16	B 16		20	
7	E 16	B 16	B 16	B 16	E 16	B 16	B 16		26	32		38	40	40	42		G 40		G 25		G 20	J 22		J 20	A 18	A 24	B 16	
8		E 19	B 16	B 16	B 16	B 16	J 20	A 18		27	33	38		G 40	40	44	42	38		G 34	J 77	A 53	J 19	A 25	A 16	A 21		
9	E 16	B 16	B 16	B 16	E 16	B 16	B 16		25		37	41	42	44	40	44	43		J 40	A 32	24	22	20	22	17	16		
10	J 23	A 20	J 17	A 20	J 16	A 19	E 16	B 16		30	32	38	38		G 41	41	J 83	40		J 53	A 52	46	27	20	26	20	20	
11		J 20	A 61	J 25	A 32	E 18	B 16	B 16		25	31	40	37	39	J 62	40	42	40		G 31	30	29	24	29	35	20		
12	J 20	A 19	E 16	B 16	J 16	A 16	B 16	B 16		25	32	34	37	43	J 54	44	44	37	36		J 50	A 59	46	29	21	16	20	
13	E 16	B 16	B 19	E 16	B 16	B 18	B 18		28	32		G 39	55	46	44	41		G 25		G 22	24	29	29	20	20	22		
14	E 16	B 20	J 20	A 37	J 26	A 18	A 18		27	52		G 42	50	42	J 44	A 37	34	25	26		J 21	A 27	E 16	B 16	B 16	B 16		
15	E 16	B 19	J 21	A 25	J 21	20	20		28	35	42	J 64	42	49	44	J 56	42	38	30	31	J 41	A 31	55	43	38			
16	J 21	A 28	J 15	A 16	E 29	J 18	A 19		28	39	42	40		G 43		G 37	34	36	28		J 28	A 28	60	24	29			
17	J 33	A 32	J 32	A 28	J 28	A 33		27	32	42	38		G 56	B 47		J 68	A 68	39	33	22	64	33	33	26				
18	J 25	A 39	J 41	A 51	J 61	A 42	A 28		28	35	44	46	42	J 52	A 54	44	41	48	48		J 28	A 18	19	22	26	21		
19	J 30	A 33	J 25	A 20	E 16	B 16	B 16		34	37	37	J 46	45	48	47	45	J 46	50	30		J 72	A 49	E 16	B 23	A 19			
20	E 16	B 16	B 28	E 16	B 16	B 16	20		26	33		G 44	88	45	46	38		G 25		J 33	19	16	18	21				
21	E 16	B 16	A 53	E 16	J 29	A 28	20		G 36	38	40	E 72	48	48	46	44	40		G 28		20	20	53	66	86			
22	J 50	A 52	J 52	A 33	J 32	A 39	A 103		60	43	49	82	52	127	61	48	39		G 32		E 27	B 16	16	24	25	53		
23	J 79	A 38	J 22	A 20	J 28	A 18	22		40	39	46	53	42		50	46		G 30		G 27	26	38	88	52				
24	J 27	A 40	J 32	A 22	E 16	B 16	B 18		52	50	48	60	54	54	55	52	47	42	37	34	J 37	A 50	20	22	41			
25	J 24	A 22	J 40	A 150	J 98	A 52	22		38	40	44	49	53	47	48	58	J 74	A 85	35	48	32	64	51	38	53			
26	J 26	A 18	J 19	E 16	B 16	B 19	20		30	36	38	40	46	46	52	50	J 59	A 56	A 53	56	75	108	22	17	26			
27	E 16	B 21	A 16	B 16	E 16	B 16	J 18		21	30	38	41	43	42	43	44	44	40	39	33	26	16	16	16	16	B 16		
28	J 20	A 20	J 21	A 18	E 18	B 16	20		31	35	41	46	46	52	55	55	J 55	40	33	43	33	63	53	61	43			
29	J 21	A 24	J 24	A 21	J 20	A 20	20		32	43	50	40	41	46	47	46	47	J 60	A 70	68	70	40	30	49	23			
30	J 18	A 20	J 15	A 22	J 20	A 18	21		31	J 38	A 45	A 43	48	51	52	51	52	J 56	A 34	32	E 16	B 22	16	35	47			
31																												
H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30			
MED	J 20	A 20	J 20	A 19	J 20	A 18	J 20	A 28	J 35	A 38	J 40	A 42	J 46	A 44	J 44	A 40	J 38	A 33	J 30	A 26	J 23	A 22	J 24	A 21				
U Q	J 25	A 32	J 25	A 22	J 28	A 19	J 20	A 31	J 38	A 42	J 46	A 46	J 50	A 52	J 48	A 46	J 46	A 38	J 40	A 33	J 31	A 30	J 35	A 38				
L Q	E 16	B 16	B 16	B 16	E 16	B 16	B 16		26	32	35	38	39	40	41	41	37		G 25		E 19	B 20	B 16	B 16	B 19			

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 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		23		E B	E B	E B	E B	E B		24	30	36	37	39	40	39	40	39	G	G		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		27	33	36	40	39	E B	44	40	40	42	38	37	38	21	23	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		G				G	G	G							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			G			G	G	G							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						G	G								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						G	G	G							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			G				G	G							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	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	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	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	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	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	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	E B	
15	E B	E B	E B	E B	E B	E B	E B	E B			A A												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	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	E B	
18	20	24	30	40	30	33	20	27	34	42	40	40	42	50	43	36	35	38	28	16	16	16	16	16	16	16	16	16	
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	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	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	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	E B	E B
23	44	24	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
24	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	E B
25	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	E B
26	21	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
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	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	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	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	E B	E B
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E B	E B	E B	E B	E B	E B	E B	E B		26	32	36	39	40	42	43	42	40	36	31	28	20	16	16	16	16	16	16	
U Q	16	17	16	E B	E B	E B	18	28	35	38	40	42	45	49	45	44	39	35	34	26	21	20	20	18	18	18	18	18	
L Q	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	E B	E B

APR. 2022 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	15	14	18	21	26	29	25	25	22	19	15	14	16	16	16	16	16
2	16	16	16	16	16	16	16	16	16	20	23	24	44	28	28	23	19	16	16	16	16	16	16	16
3	16	16	16	16	16	16	16	16	16	22	24	24	30	28	24	23	19	14	16	16	16	16	16	16
4	16	16	16	16	16	16	16	16	16	19	22	27	28	27	23	24	23	18	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	19	21	23	24	26	29	26	25	22	16	16	16	16	16	16	16
6	16	16	16	16	16	16	16	16	15	21	20	26	26	27	29	25	22	17	16	16	16	16	16	16
7	16	16	16	16	16	16	16	16	16	18	22	23	25	28	24	21	18	14	14	16	16	16	16	16
8	16	16	16	16	16	16	16	16	16	20	22	23	26	27	23	22	19	14	16	16	16	16	16	16
9	16	16	16	16	16	16	16	16	14	18	22	24	26	27	22	20	18	16	17	16	16	16	16	16
10	16	16	16	16	16	16	16	16	18	16	20	26	26	23	22	20	18	15	14	16	16	16	16	16
11	16	16	16	16	16	16	16	16	16	18	21	21	23	25	24	22	19	14	14	16	16	16	16	16
12	16	16	16	16	16	16	16	16	19	23	23	26	25	25	25	22	21	14	14	16	16	16	16	16
13	16	16	16	16	16	18	16	16	17	20	21	23	26	21	22	19	19	13	12	16	16	16	16	16
14	16	16	16	16	16	16	16	16	15	20	22	24	27	29	24	22	19	16	14	16	16	16	16	16
15	16	16	16	16	16	16	16	16	16	20	25	30	38	30	24	22	20	17	16	16	16	16	16	16
16	16	16	16	16	16	16	16	16	22	21	23	28	31	28	29	25	22	16	16	16	16	16	16	16
17	16	16	16	16	16	16	16	16	17	22	21	32	28	56	42	27	23	20	16	16	16	16	16	16
18	16	16	16	16	16	16	16	16	20	21	27	28	29	31	25	26	19	20	14	16	16	16	16	16
19	16	16	16	16	16	16	16	16	20	22	23	28	31	30	32	26	20	17	15	16	16	16	16	16
20	16	16	16	16	16	16	16	16	20	21	27	35	34	88	25	23	20	18	14	16	16	16	16	16
21	16	16	16	16	16	16	16	16	18	19	22	72	36	34	28	27	21	16	16	14	16	16	16	16
22	16	16	16	16	16	16	16	16	16	20	22	25	28	35	32	26	20	18	14	16	16	16	16	16
23	16	16	16	16	16	16	16	16	19	24	24	29	29	26	27	23	19	16	14	16	16	16	16	16
24	16	16	16	16	16	16	18	16	18	23	25	28	28	29	30	24	22	15	14	16	16	16	16	16
25	16	16	16	16	16	16	16	16	20	20	23	35	35	34	30	26	21	18	18	16	16	16	16	16
26	16	16	16	16	16	16	16	16	20	22	25	31	31	28	30	24	23	16	14	16	16	16	16	16
27	16	16	16	16	16	16	16	17	15	21	23	29	30	30	27	24	24	18	17	16	16	16	16	16
28	16	16	16	16	16	16	16	16	17	22	40	30	43	31	28	26	22	17	15	16	16	16	16	16
29	16	16	16	16	16	16	16	16	17	21	25	24	32	31	27	24	22	19	14	16	16	16	16	16
30	16	16	16	16	16	16	16	16	19	22	24	29	27	32	44	29	21	21	16	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	16	17	21	23	26	28	28	26	24	20	16	15	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	19	22	24	29	31	31	29	26	22	18	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	16	20	22	24	26	27	24	22	19	15	14	16	16	16	16	16

APR. 2022 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	281	290	305	331	286	296	309	333	309	306	308	301	295	303	290	290	278	295	326	337	263 <sup>R</sup>	271	267	281	
2	273	321	343	340	274	305	310	336	344	314	304	307	291	288	289	290	288	302	305	317	322	309	265	273	
3	299	305	292	317	284	291	290	348	341	329	303	301	299	298	301 <sup>R</sup>	292	288	302	313	344	337	270	257	258	
4	259	285	295	319	321	297	315	342	337	309	307	296	294	293	297 <sup>U</sup>	286 <sup>R</sup>	288	297	309	305	295	288	285	291	
5	283	283	286	291	296	298	319	359	312	313	315	299	297	306	309	297	292	303	314	309	283	275	243 <sup>R</sup>	285	
6	304	299	306	347	305	297	305	343	338	340	319	296	283	289	292	294	296	292	304	314	302	283 <sup>R</sup>	253	266	
7	258	295	323	383	277	278	291	340	335	327	327	308	292	298	294	288	293	306	308	309	330	274	271	281	
8	280	291	325	346	290	271	297	338	324	332	305	290	290	296	307	299	307	306	310	317	305	261 <sup>R</sup>	246 <sup>R</sup>	259	
9	298	316	317	316	309	298	302	338	331	334	341	318	287	297	295	300	301	296 <sup>R</sup>	313	327	316	277	273	285	
10	291	287	279	262	284	293	299	326	339	319	309	300	296	302	309	290	295	323	326	323	342	261	262	269	
11	276	301	303	286	294	320	353	361	333	330	318	288	300	307	304	299	304	311	323	335	310	287	286	287	
12	295	293	288	314	325	335	316	361	346	333	292	300	305	293	297	298	300	309	332	353	325	276 <sup>R</sup>	260	279	
13	262	295	291	283	287	283	283	320	345	352	324	276	296	297	309	295	300	308	330	329	298	279	272	283	
14	302	317	319	322	327	311	314	329	324	328	309	299	308	306	301	301	300	296	305	324	335	333	269	275	
15	302	344	259	254	246	285	294	314	287				262	278	299	298	324	312	304	310	316	348	257	263	278
16	272	301	306	276	279	297	346	352	343	337	297	303	305	312	316	316	310	318	336	342	340	290	273	264	
17	285	265	290	322	302	299	343	374	355	321	318	294	292	295	310	308	316	319	320	332	330	292	269	274	
18	283	272	284	309	288	310	357	368	333	326	284	277	292	299	301	307	305 <sup>R</sup>	310	321	343	335	274	270	267	
19	295	309	296	286	292	307	310	350	350	320	290	282	296	304	298	301	302	310	332	345	354	272	246 <sup>U</sup>	236 <sup>R</sup>	
20	266	274	274 <sup>R</sup>	299	312	325	359	353	342	321	306	270	282	298	303	291	302	312	328	332	329	273	246 <sup>R</sup>	273	
21	278	288	293	300	293	311	343	361	337	321	297	270	279	289	303	285	297	316	324	327	327	297	264	259	
22	264	248	276	348	382	311		343	334	320	297	282	295	296	294	298	299	295	318	330	285	282	259	274	
23	268	271	278	279	271	265	309	329	326	309	310	278	286	282	290	297	305	301	328	303	280	289	270	271	
24	286	282	279	294	312	319	348	321	322	309	313	311	306	292	292	294	311	309	318	315	300	285	296	263 <sup>H</sup>	
25	276	283	307	301	294	307	322	354	323	295	297	282	280	287	297	296	300	295	304	328	329	274	281	287 <sup>F</sup>	
26	292	305	332	348	335	318	317	312 <sup>F</sup>	304 <sup>F</sup>	292	288	286	294	303	306	301	288	302	315	323	317	275	271	279	
27	285	280	302	328	296	294	322	331	322	309	298	272	279	289	285	289	297	305	305	298	281	287	300	306	
28	284	254	279	309	289	288	298	313	324	300	286	282	281	300	300	277	282	299	306	312	317	287	261	262	
29	277	291	305	277	283	308	354	381	339	320	297	261	273	279	292	297	297	303	312	311	277	270	268	284	
30	277	284	278	278 <sup>R</sup>	361	299	313	328	350	277	289	276	280	284	292	296	296	303	305	314	301	293	279	275	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	282	290	294	309	294	298	314	341	334	320	305	289	292	297	298	296	300	304	314	324	317	278	268	274	
U Q	292	301	306	328	312	311	343	354	342	329	314	300	296	302	304	300	304	310	326	332	330	288	273	283	
L Q	273	282	279	286	284	293	300	329	324	309	297	277	282	289	292	290	293	299	308	314	298	273	260	266	

APR. 2022 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 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	U L	U L	U L	U L	U L	L	L	L							
2											L	L	U L	U L	U L	U L	L	L							
3										L	L	U L	U L	U L	U L	L	L	L	L						
4										L	U L	U L	U L	U L	U L	L	L	L							
5										L	L	L	L	L	L	L	L	L							
6									L	L	U L	U L	U L	U L	U L	L	L	L							
7								L	L	L	U L	U L	U L	U L	U L	L	L	L	L						
8								L	L	L	U L	U L	L	L	U L	U L	L	L							
9								L	L	L	U L	U L	L	L	L	L	L	L	L						
10								L	L	L	L	L	U L	L	A	L	L	L							
11										U L	U L	U L	U L	L	L	L	L	L							
12										U L	U L	L	A	U L	U L	L	L	L							
13								L	L	U L	U L	L	L	L	L	L	L	L							
14										L	U L	L	L	L	L	L	L	L	L						
15							L	U L	U L	A	A	A	A	A	A	A	A	A	L	L	L				
16										L	U L	L	L	L	L	L	L	L	L						
17										L	U L	L	B	A	A	A	A	L	L	L					
18										L	U L	U L	L	A	L	L	L	L	L						
19								L	L	U L	U L	L	L	L	L	L	L	L	L	L					
20										L	U L	U L	U L	B	L	L	L	L	L	L					
21										L	U L	B	L	L	L	L	L	L	L	L					
22							A			A	A	A	U L	U L	U L	U L	U L	U L	U L						
23										U L	L	L	U L	L	L	L	L	L	L	L					
24								L	L	L	A	L	L	L	L	L	L	L	L						
25								L	L	L	U L	U L	U L	A	A	A	A	L	L						
26										U L	U L	L	L	A	A	A	A	L	L						
27								L	L	L	U L	U L	L	L	L	L	L	L	L	L					
28								L	L	L	L	A	A	A	A	L	L	L	L						
29								L	L	U L	U L	L	L	L	L	L	A	A							
30										U L	L	L	L	A	A	L	L	L	L						
31								412	399	351			369	331			359								
	00	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	6	21	26	25	24	24	23	16	5							
MED								339	388	381	381	366	360	356	352	362	354	370							
U Q										U L	U L	U L	U L	L	L	L	L	L							
L Q										367	369	356	352	344	343	350	346	356							

APR. 2022 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										264	282	290	296	290	290	290	296	276						
2											290	280	316	304	284	276	298	280						
3										246	252	284	298	286	272	266	290	278	258					
4										264	266	280	310	296	282	300	290	266						
5										270	266	286	298	286	272	256	280	266						
6									246	246	252	272	276	316	302	276	270	262						
7									256	254	256	268	290	296	298	306	288	258	246					
8										256	252	292	302	312	282	274	264	260						
9										258	248	270	266	300	310	286	280	274	246					
10									222	280	272	286	286	304	290	286	296	242						
11										256	260	288	290	282	278	290	282	254						
12										250	302	294	286	304	302	294	284	262						
13									236	224	248	312	320	298	284	270	276	252						
14										262	262	302	296	282	280	282	276	272	272					
15							312	310	380			G	A	440	380	324	290	290	274	266	266			
16										246	262	294	280	276	254	258	254	246						
17											262	268	314	294	294	272	268	252	240					
18										262	248	312	326	310	300	284	276	264						
19								230	264	280	304	308	292	302	300	294	288	250						
20										270	262	340	316	316	292	312	300	272	240					
21										256	252	E B	344	328	324	296	312	308	260	246				
22						A					E A	310	302	318	306	316	292	292	268					
23										272	248	342	320	320	316	304	280	266	236					
24									226	280	284	292	290	308	316	310	284	256						
25									256	238	282	290	306	334	306	302	286	284	282					
26										290	292	306	314	294	292	290	280	294	268					
27									262	262	268	336	344	320	320	310	290	264	236					
28									238	244	320	296	324	302	294	278	324	294	266					
29									222	256	274	340	332	334	316	296	286	264						
30									238	262	314	304	342	328	300	298	282	262	264					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	1	12	27	29	30	30	30	30	30	30	30	15					
MED							312	310	238	262	264	294	309	304	294	290	284	265	250					
U Q									256	270	283	312	320	316	302	300	292	274	266					
L Q									228	250	252	286	290	294	284	276	276	260	240					

APR. 2022 h'F2 (KM)

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## IONOSPHERIC DATA STATION Okinawa

APR. 2022 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	276	274	238	216	234	250	236	214	222	222	206	196	200	192	190	200	204	234	242	218	198	246	278	250		
2	240	210	198	190	246	238	222	218	222	212	200	206	222	196	204	212	202 <sup>H</sup>	240	258	230	206	204	226	276		
3	258	240	240	222	220	256	288	222	220	208	204	186	184	172	194	186	224	232	250	220	192	190	264	260		
4	256	256	250	220	204	216	232	212	216	212	208	200	254	174	200	200	206	226	238	222	194	218	244	234		
5	240	256	258	230	226	246	228	202	214	210	208	192	188	182	202	218	210	216	236	218	222	208	246	274		
6	246	244	238	208	198	248	260	218	222	218	204	196	188	186	190	208	212	216	238	224	214	208	252	284		
7	260	236	212	184	220	274	276	224	220	214	202	186	190	180	188	190	214	218	230	238	216	232	284	282		
8	278	264	234	194	208	260	266	224	226	216	206	184	186	242	232	216	210	228	264	242	210	228	272	272		
9	234	228	224	212	222	220	260	222	222	210	208	200	186	172	204	226	212	232	234	232	202	210	246	268		
10	256	266	290	328	276	256	258	212	212	202	200	188	196	186	<sup>A</sup>	196	238	228	238	224	190	276	300	310		
11	288	262	248	244	258	236	220	208	210	214	202	192	186	186	208	212	200	222	236	216	204	220	248	268		
12	254	262	252	232	204	200	232	206	210	206	188	182	230	182	204	172	212	238	236	212	190	184	258	268		
13	264	258	244	258	250	224	264	222	220	214	198	174	240	242	234	212	210	224	224	202	216	234	270	278		
14	248	224	230	222	212	218	226	216	212	200	188	208	204	230	198	196	220	204	238	240	214	190	204	246		
15	238	212	320	362	376	266	294	262	242	262	<sup>E A</sup>	<sup>A</sup>	206	<sup>A E A</sup>	248	218	224	226	216	236	224	212	316	360	320	
16	292	254	250	278	276	240	220	214	226	196	182	182	178	208	220	194	220	234	240	214	198	206	236	290		
17	268	286	262	226	230	258	234	212	216	214	196	194	186	<sup>H</sup>	<sup>B E A</sup>	<sup>A E A</sup>	282	244	206	232	228	200	200	292	286	
18	302	286	<sup>E A E A E A</sup>	284	264	296	256	204	208	214	222	194	188	204	<sup>A</sup>	218	214	210	242	244	210	188	198	264	280	
19	258	240	236	228	224	234	234	210	210	200	196	196	256	<sup>E A</sup>	258	<sup>E A E A</sup>	236	224	260	<sup>A</sup>	240	226	204	190	218	290
20	290	258	250	238	226	212	218	210	214	200	196	200	214	<sup>B</sup>	242	304	226	222	234	222	198	186	232	268		
21	254	254	262	222	232	230	212	204	210	208	200	<sup>E A</sup>	256	244	244	236	218	228	238	224	208	206	278	324		
22	286	308	278	214	190	278	<sup>E A</sup>	<sup>A</sup>	218	216	200	<sup>A E A</sup>	270	204	222	228	218	204	214	238	220	200	228	256	272	
23	264	252	242	238	234	252	240	208	216	222	210	186	186	<sup>E A</sup>	266	254	192	222	222	228	220	242	236	266	278	
24	248	242	246	230	226	226	212	222	212	202	214	264	204	276	<sup>E A</sup>	<sup>A E A</sup>	274	250	236	246	224	220	228	230	254	
25	258	264	252	220	234	240	244	212	204	186	192	228	224	236	<sup>E A</sup>	<sup>A</sup>	<sup>A</sup>	220	266	238	200	216	256	266		
26	256	248	226	198	200	214	234	208	204	194	184	222	218	<sup>E A E A</sup>	268	280	<sup>A</sup>	<sup>A E A</sup>	278	254	248	242	216	250	270	
27	282	274	248	200	206	260	238	226	210	210	202	182	184	200	214	206	190	228	220	218	242	248	250	246		
28	232	326	282	222	214	240	234	224	216	206	214	204	270	<sup>E A E A</sup>	278	<sup>A E A</sup>	250	216	234	250	258	228	240	226	312	
29	286	262	240	234	234	240	220	202	214	226	194	190	210	236	220	230	<sup>H</sup>	<sup>A</sup>	<sup>A</sup>	246	234	230	244	282	270	
30	280	260	244	212	196	190	240	218	194	190	184	244	206	280	<sup>A</sup>	<sup>A</sup>	226	224	240	236	216	202	238	290		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	29	30	30	30	28	29	29	27	25	26	27	28	30	30	30	30	30	30	30	
MED	258	257	246	222	226	240	234	214	215	210	200	194	202	<sup>U</sup>	204	211	210	213	226	238	224	207	214	252	272	
U Q	280	264	258	238	234	256	259	222	220	214	206	206	223	<sup>E A</sup>	248	235	224	226	234	246	234	216	234	272	286	
L Q	248	242	238	212	208	224	221	208	210	200	194	186	186	186	201	196	210	219	236	218	198	202	238	268		

APR. 2022 h'F (KM)

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## IONOSPHERIC DATA STATION Okinawa

APR. 2022 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

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

APR. 2022 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	98	92	98	98	98	B	106	144	100	100	98	96	92	90	94	90	90	G	146	90	88	B	B	86	
2	B	B	B	B	B	B	B	136	124	120	114	112	B	110	116	110	110	142	114	108	100	96	92	84	
3	88	88	92	92	94	98	96	166	G	110	108	G	96	96	94	G	186	154	120	104	B	B	96	B	
4	B	B	B	B	B	B	160	156	160	G	152	G	190	G	G	G	G	G	150	B	B	90	124	122	
5	92	90	88	B	90	B	B	162	154	162	150	98	G	G	164	186	G	G	B	B	B	B	B	98	
6	B	B	B	B	92	98	144	148	136	126	128	100	98	G	G	G	98	G	G	86	84	84	B	88	
7	B	B	B	B	B	B	B	150	150	G	100	98	100	100	G	G	G	90	88	86	102	98	100	B	
8	98	B	B	B	96	96	96	154	134	128	G	108	118	180	188	174	G	122	104	102	100	102	92	92	
9	B	B	B	B	B	B	B	184	G	120	118	112	106	114	108	110	118	118	140	102	98	98	102	B	
10	92	86	88	84	84	82	B	124	126	118	118	G	118	100	100	106	108	102	94	88	90	90	86	84	
11	84	96	92	92	96	B	B	136	98	98	128	100	92	112	112	118	G	120	102	102	100	96	94	98	
12	98	84	B	82	B	B	B	168	152	140	110	100	98	102	100	98	G	94	90	88	90	86	88	86	
13	B	B	96	B	B	B	128	130	136	G	102	94	190	190	164	G	92	88	86	84	84	80	90	92	
14	B	94	90	90	90	98	94	142	98	G	G	162	96	96	94	94	92	92	138	90	102	B	B	B	
15	B	128	94	94	94	124	122	122	114	108	104	108	108	108	110	202	170	152	118	100	100	104	92	88	
16	90	94	98	B	102	94	92	122	108	110	106	G	G	170	G	G	166	144	122	98	96	96	98	96	
17	96	96	92	92	90	88	90	134	126	116	128	G	G	B	166	104	104	108	98	98	110	98	94	92	
18	94	92	90	90	88	90	96	148	120	108	108	102	98	96	164	102	98	104	140	90	90	108	96	92	
19	90	96	90	92	B	B	B	96	96	130	96	112	208	178	186	92	138	122	116	94	98	B	88	106	
20	B	B	92	B	B	B	88	190	104	G	G	G	176	B	188	186	188	G	112	86	88	B	100	100	
21	B	102	100	B	96	96	98	G	96	142	142	B	182	158	136	132	128	G	116	108	104	100	100	98	
22	94	118	96	98	110	106	108	110	112	108	100	102	102	100	128	172	G	136	112	B	B	150	142	96	
23	94	90	90	86	92	94	94	94	96	96	102	102	G	144	172	G	G	G	122	108	98	98	94	92	
24	86	96	96	92	B	B	B	108	104	112	112	116	98	96	152	142	140	136	120	108	102	88	96	94	
25	86	82	96	98	90	96	100	114	108	102	96	96	162	156	130	118	116	122	104	100	94	88	86	102	
26	88	82	84	B	B	B	94	120	124	122	102	100	160	146	128	128	118	90	88	88	100	102	86	92	96
27	B	92	B	B	B	B	92	132	132	112	114	110	108	104	170	152	146	118	184	148	B	B	B	B	B
28	94	98	94	94	92	B	134	138	142	132	122	120	142	132	120	136	134	198	112	100	100	94	102	98	
29	102	98	94	94	96	114	122	116	114	104	106	102	170	144	132	124	108	104	98	94	B	96	94	94	94
30	94	94	98	96	114	110	116	108	106	104	102	148	122	132	116	140	126	156	110	B	96	B	98	96	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	19	22	22	17	19	17	21	29	28	25	27	23	25	25	26	23	23	23	29	25	25	22	24	25	
MED	94	94	93	92	94	96	106	136	114	112	108	102	108	114	129	118	116	122	114	98	98	96	95	94	
U Q	96	96	96	95	96	102	125	152	135	127	122	112	166	157	164	146	138	144	129	102	101	98	100	98	
L Q	88	90	90	90	90	93	95	119	104	104	102	100	98	100	110	104	98	102	100	90	90	88	92	90	

APR. 2022 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Okinawa

APR. 2022 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

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

APR. 2022 TYPES OF Es  
 NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
◊	f <sub>o</sub> F <sub>2</sub> , f <sub>o</sub> F <sub>1</sub> , f <sub>o</sub> E
×	f <sub>x</sub> F <sub>2</sub>
*	DOUBTFUL f <sub>o</sub> F <sub>2</sub> , f <sub>o</sub> F <sub>1</sub> , f <sub>o</sub> E
⊗	f <sub>b</sub> E <sub>s</sub>
└	ESTIMATED f <sub>o</sub> F <sub>1</sub>
†, ‡	f <sub>min</sub>
^	GREATER THAN
∨	LESS THAN

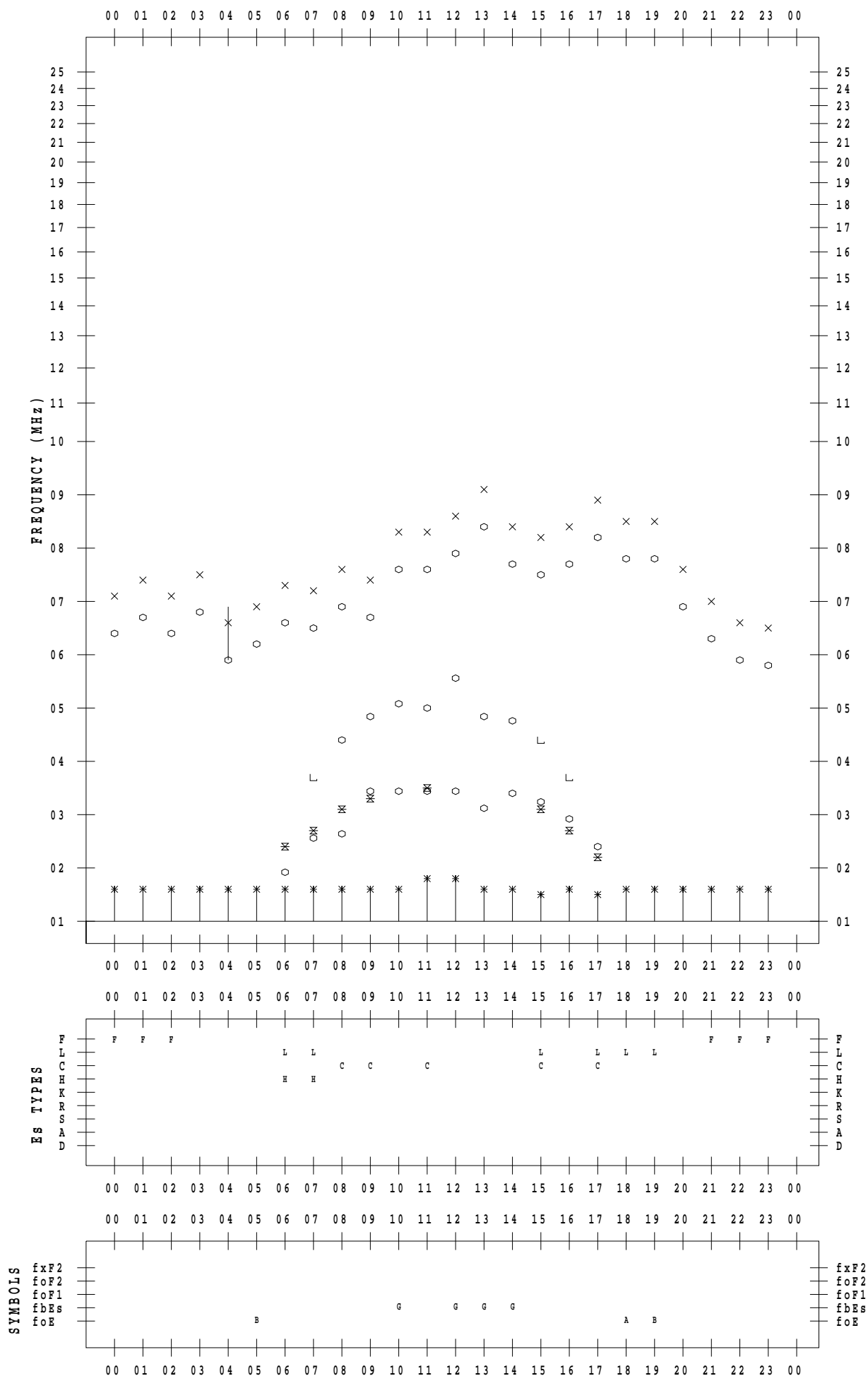
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 1

135 ° E MEAN TIME



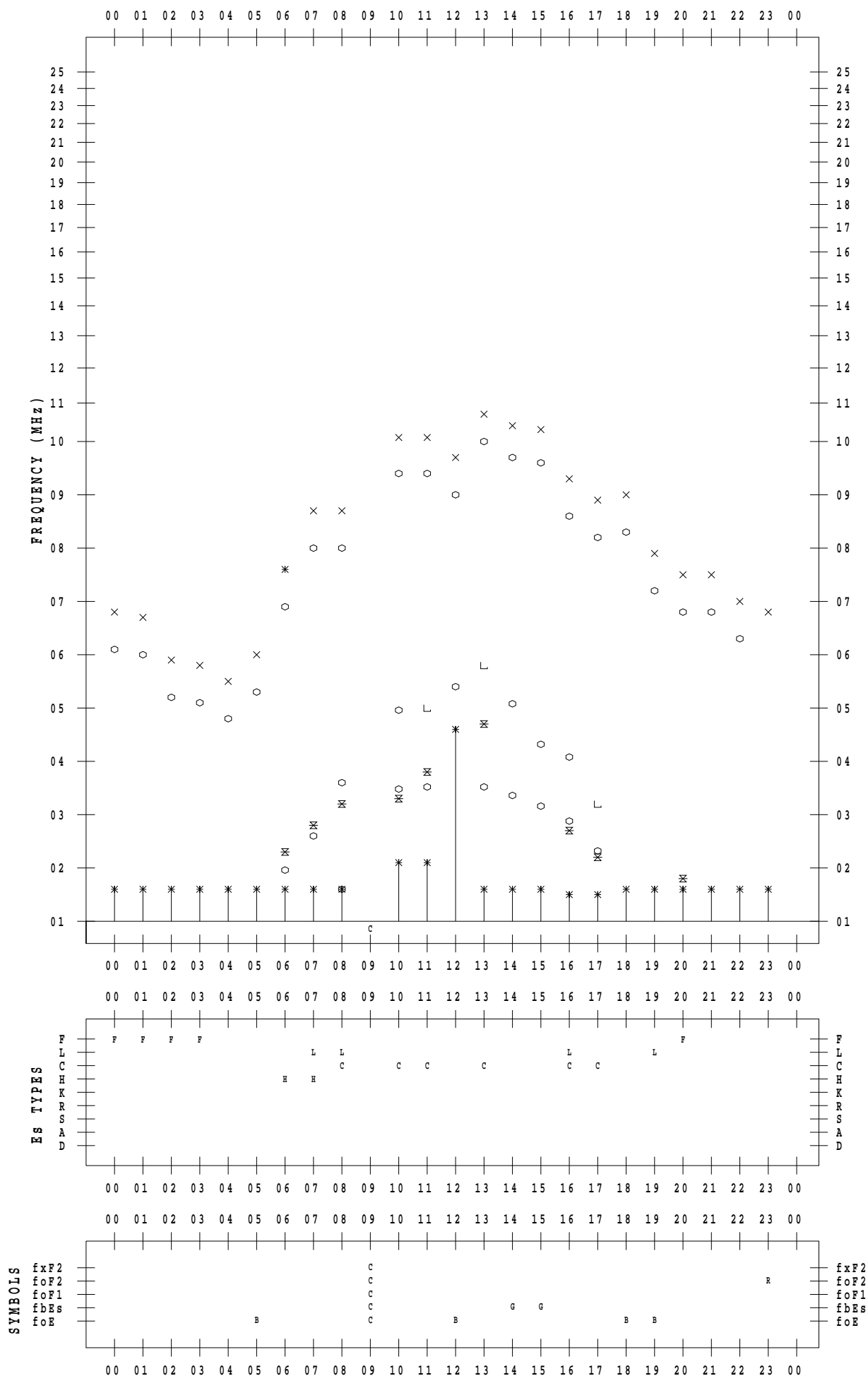
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 2

135 ° E MEAN TIME



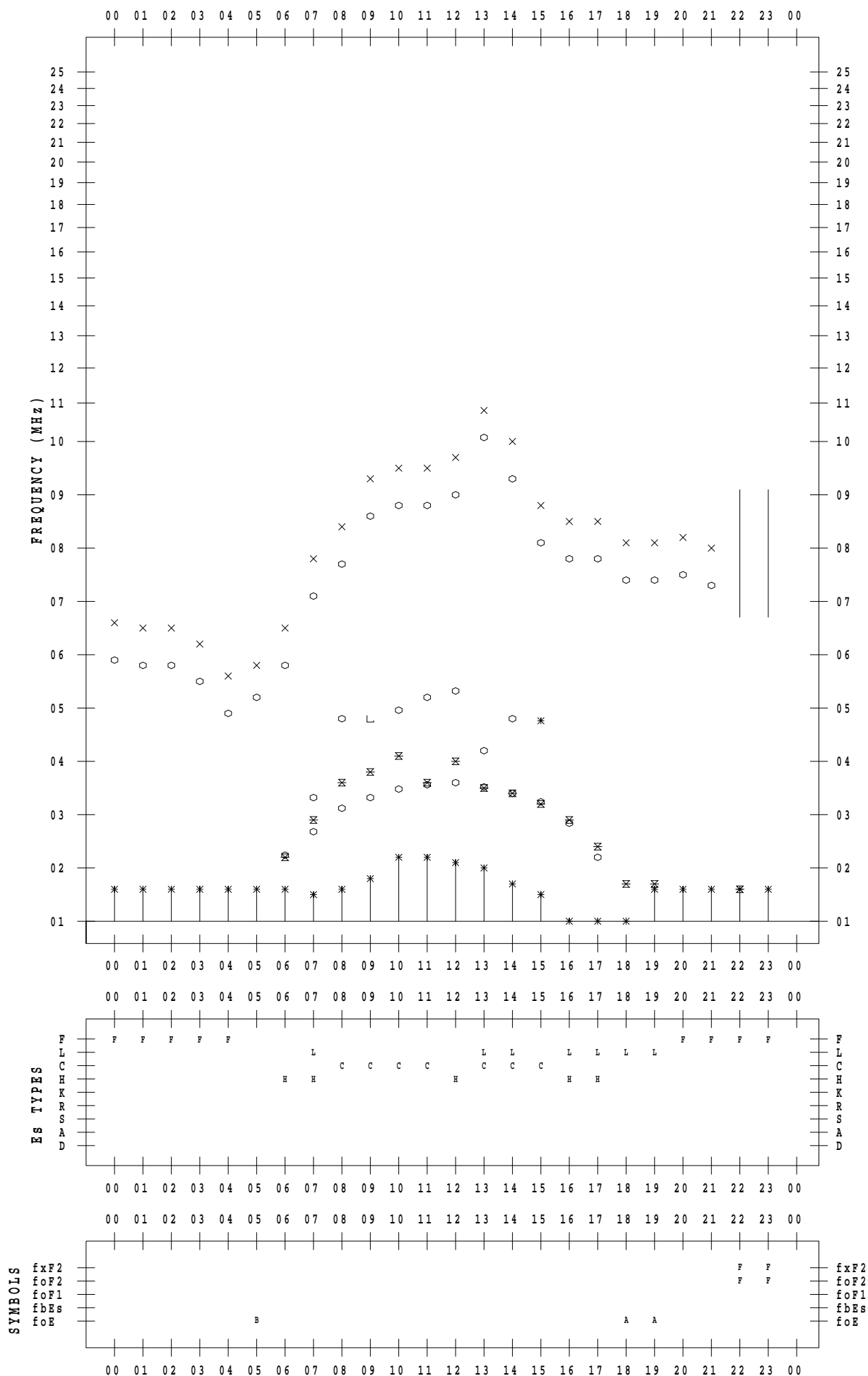
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 3

135 ° E MEAN TIME



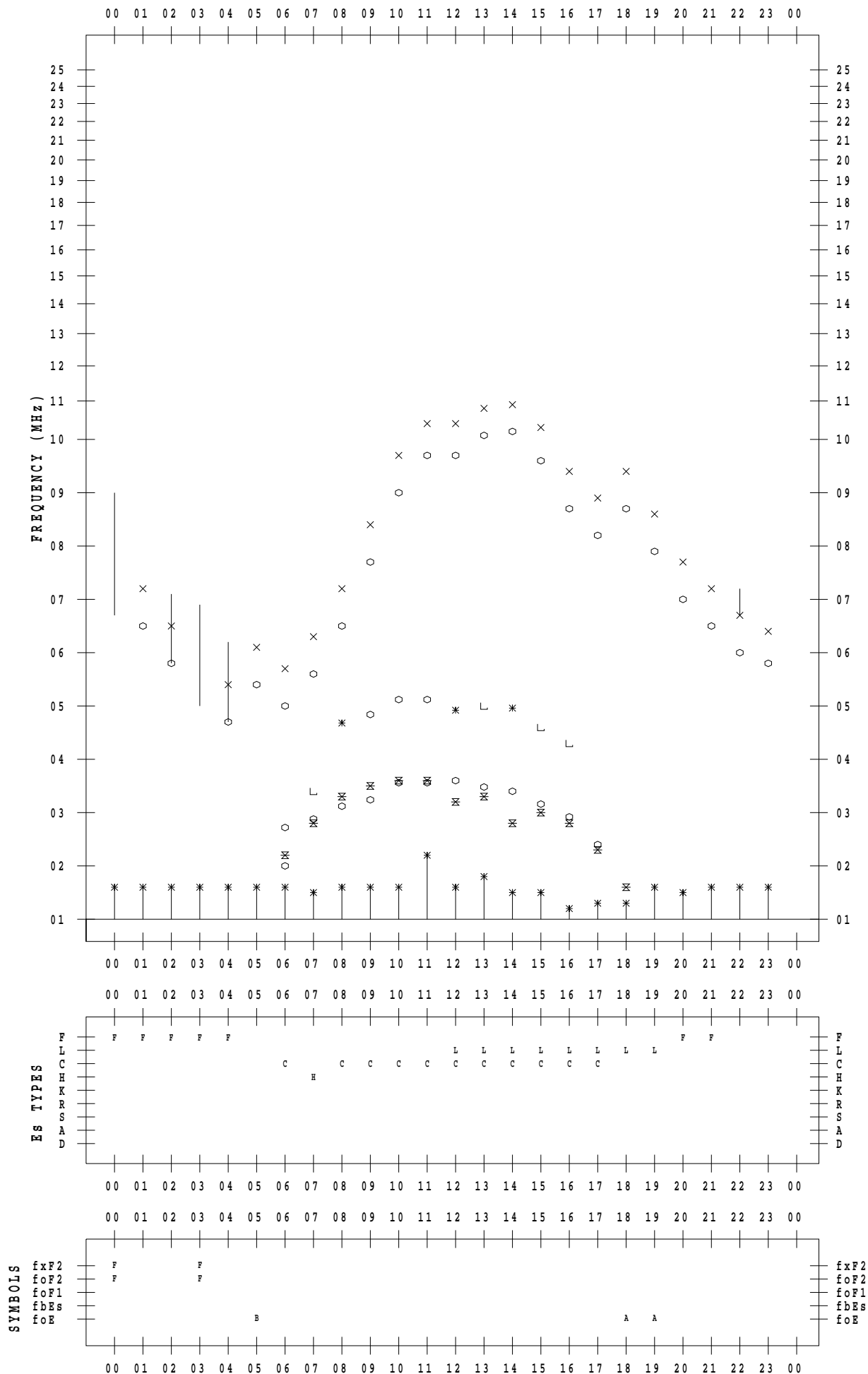
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 4

135 ° E MEAN TIME





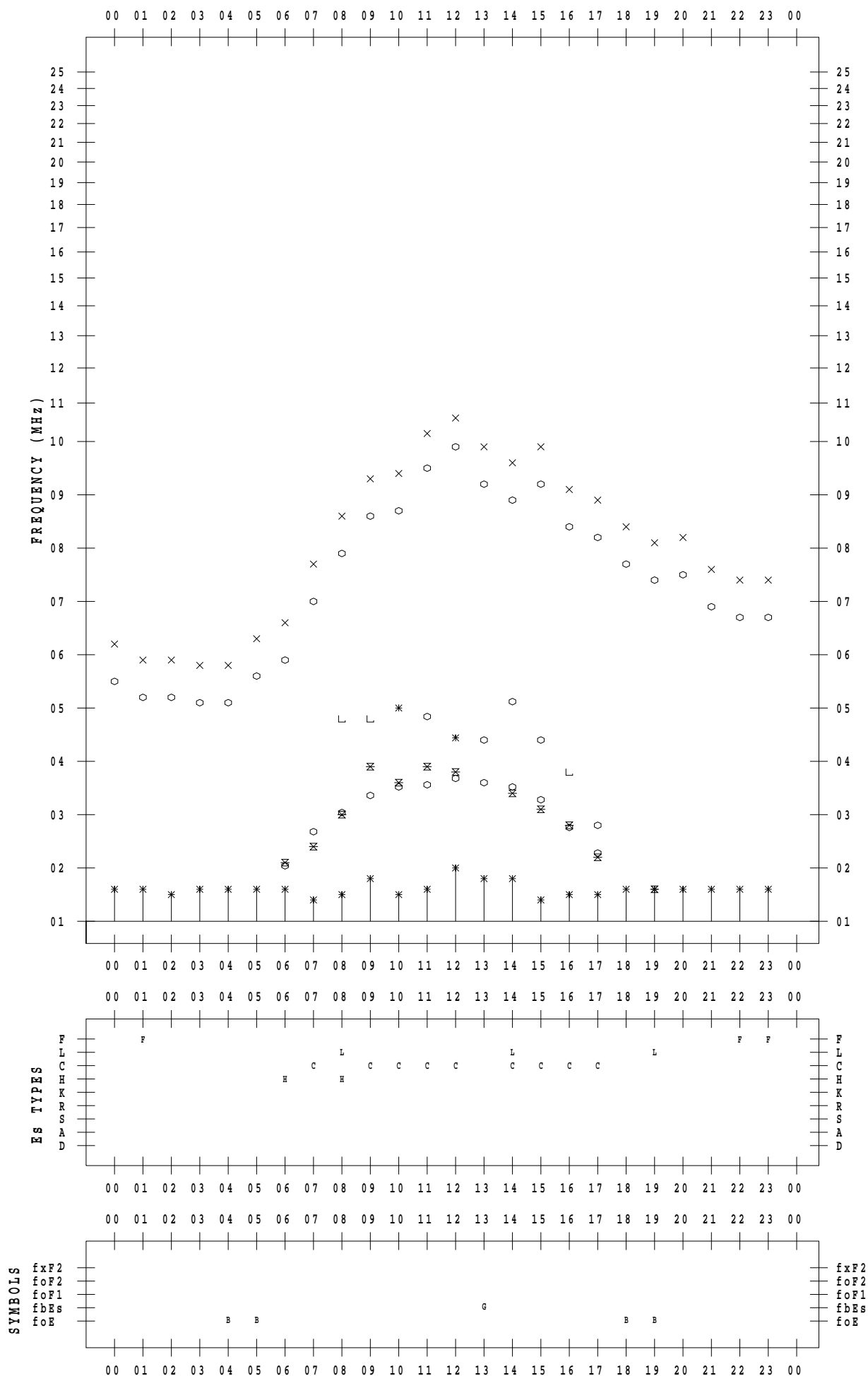
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 5

135 ° E MEAN TIME



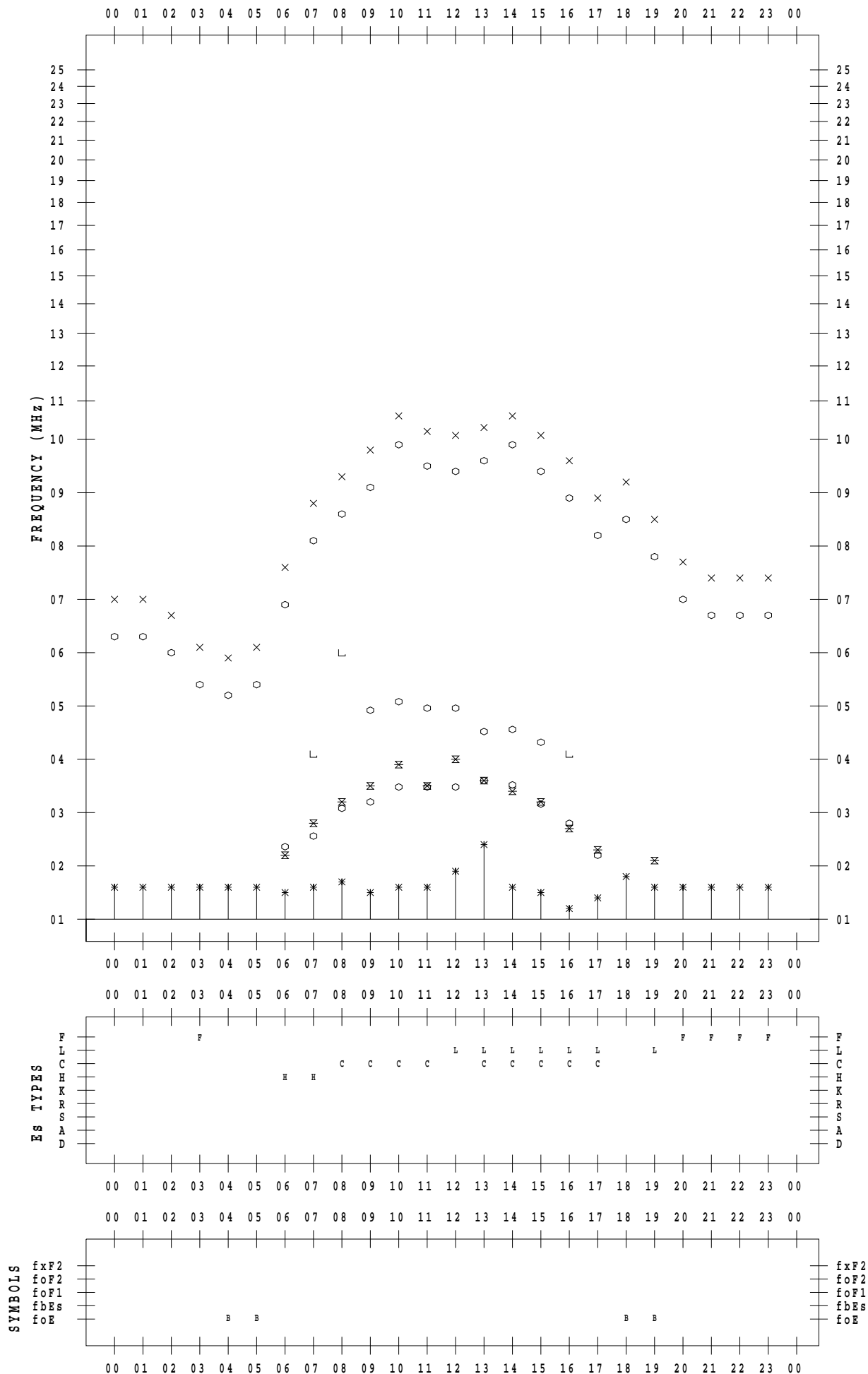
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 6

135 ° E MEAN TIME



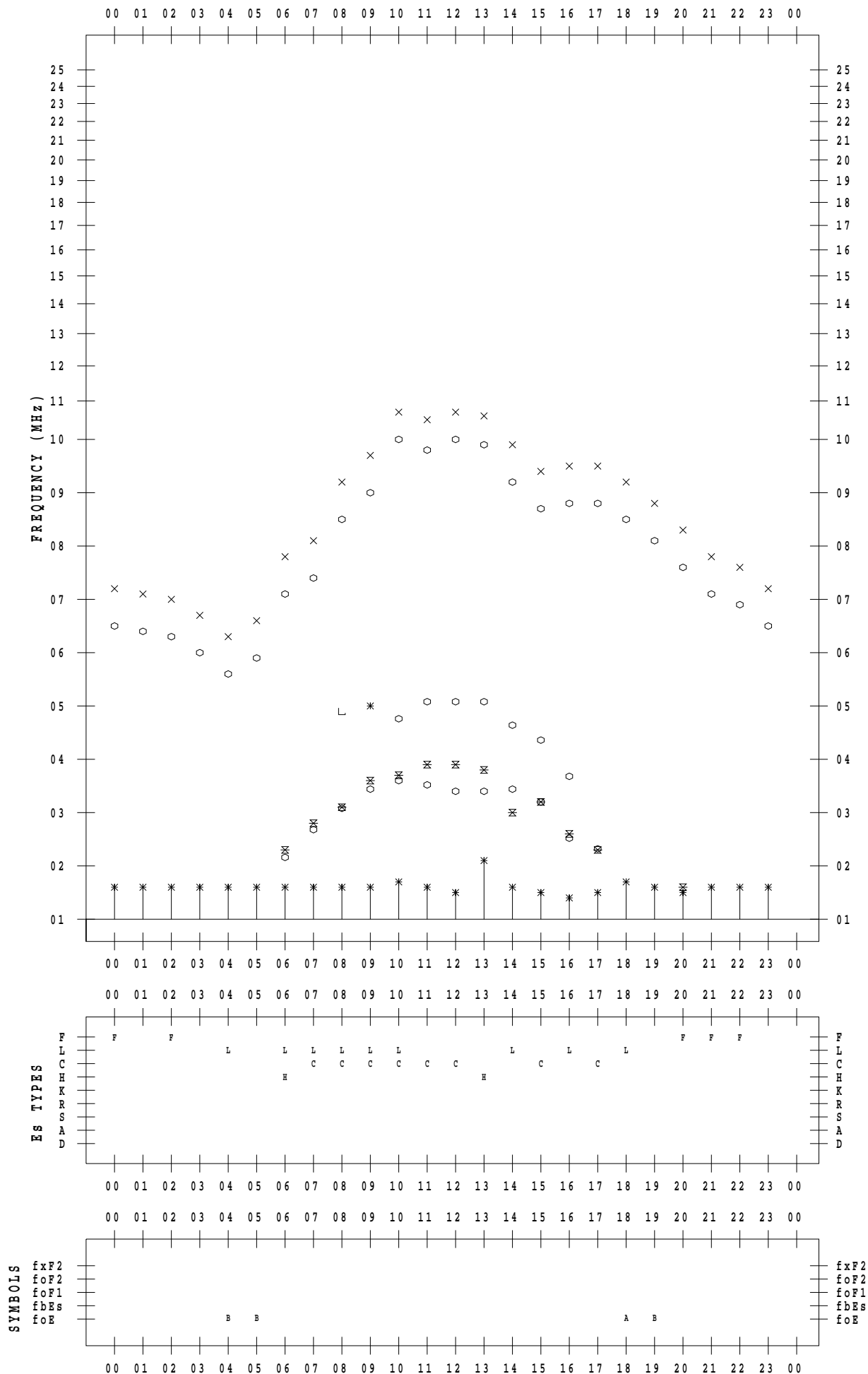
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 7

135 ° E MEAN TIME



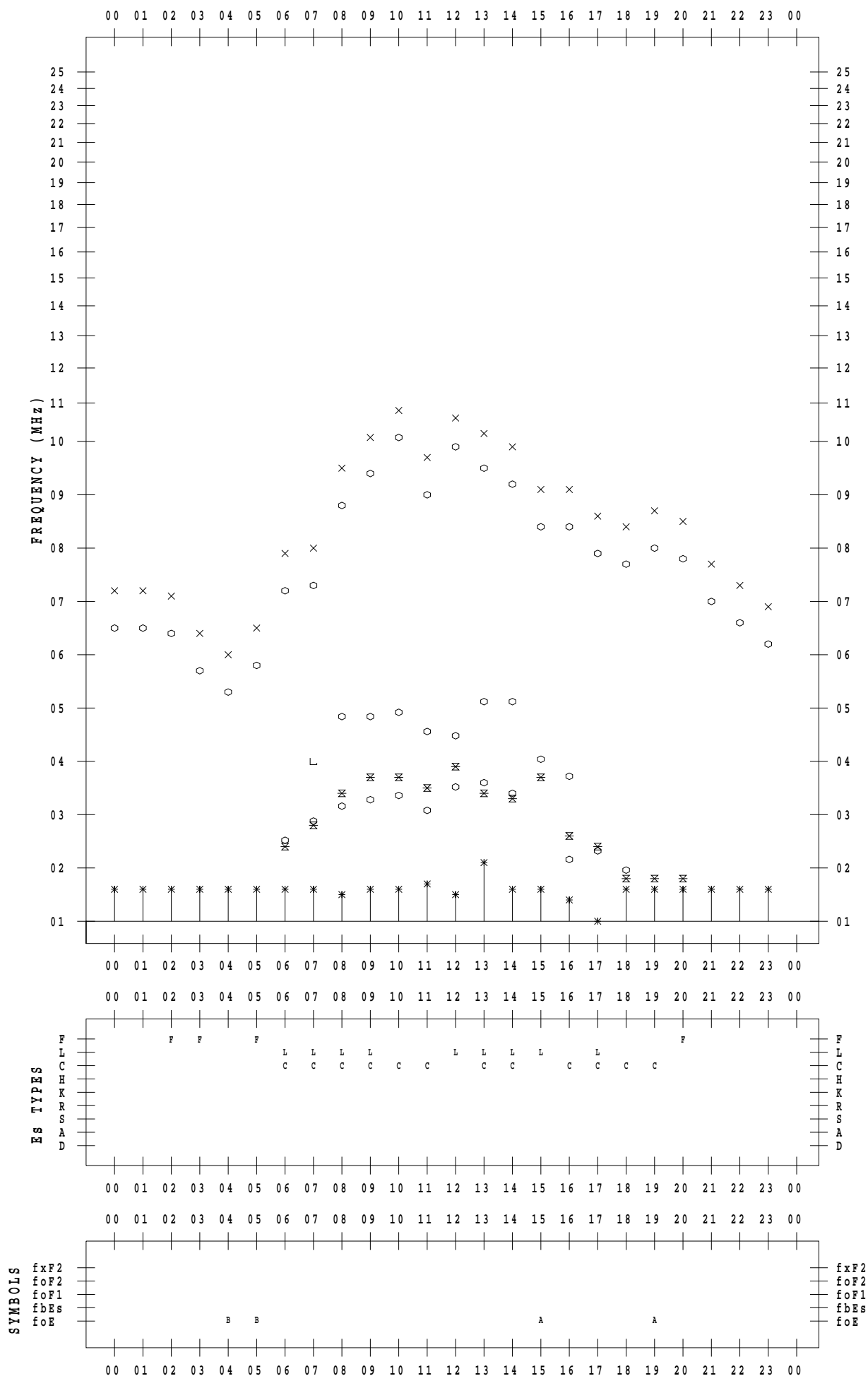
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 8

135 ° E MEAN TIME



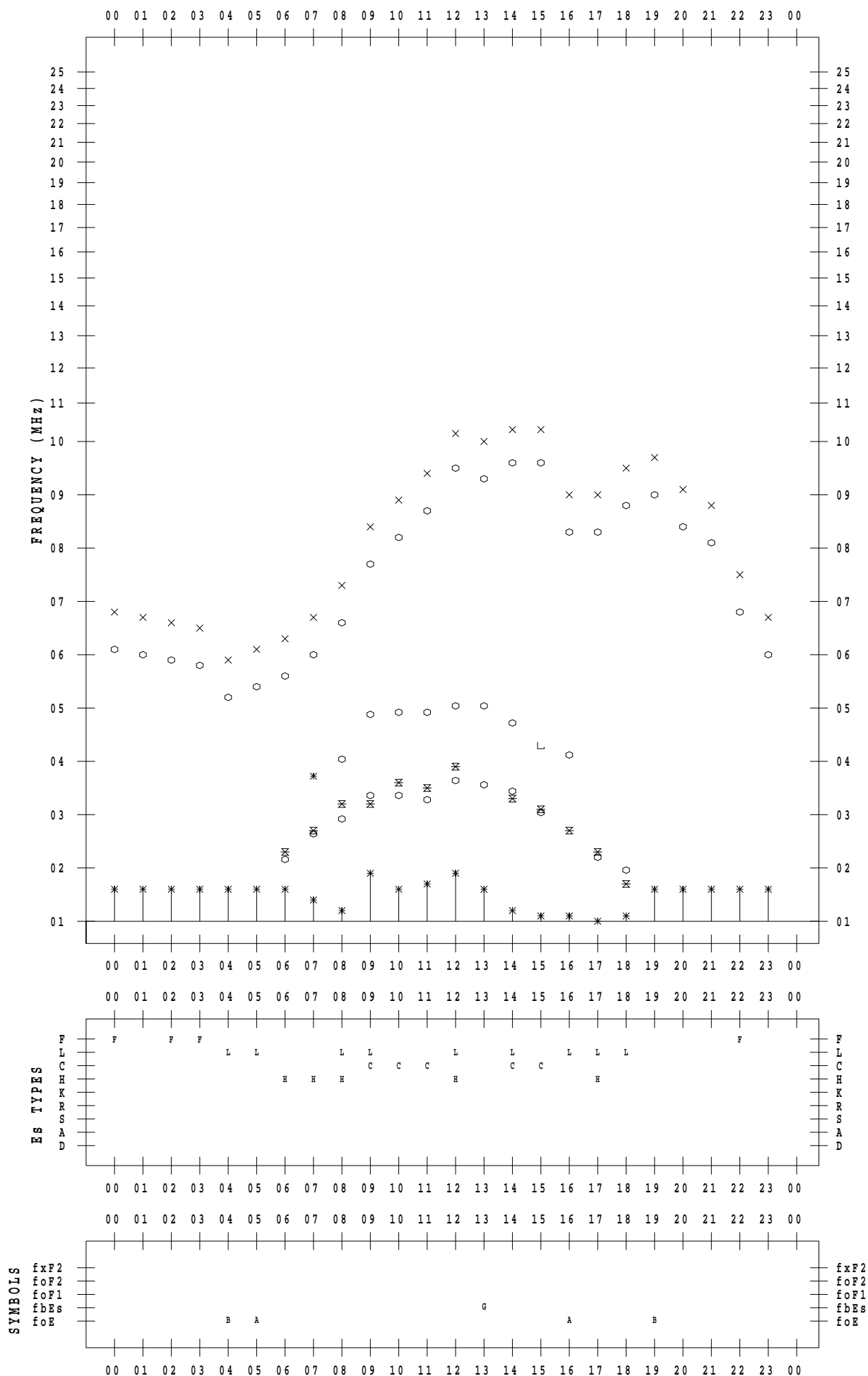
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 9

135 ° E MEAN TIME



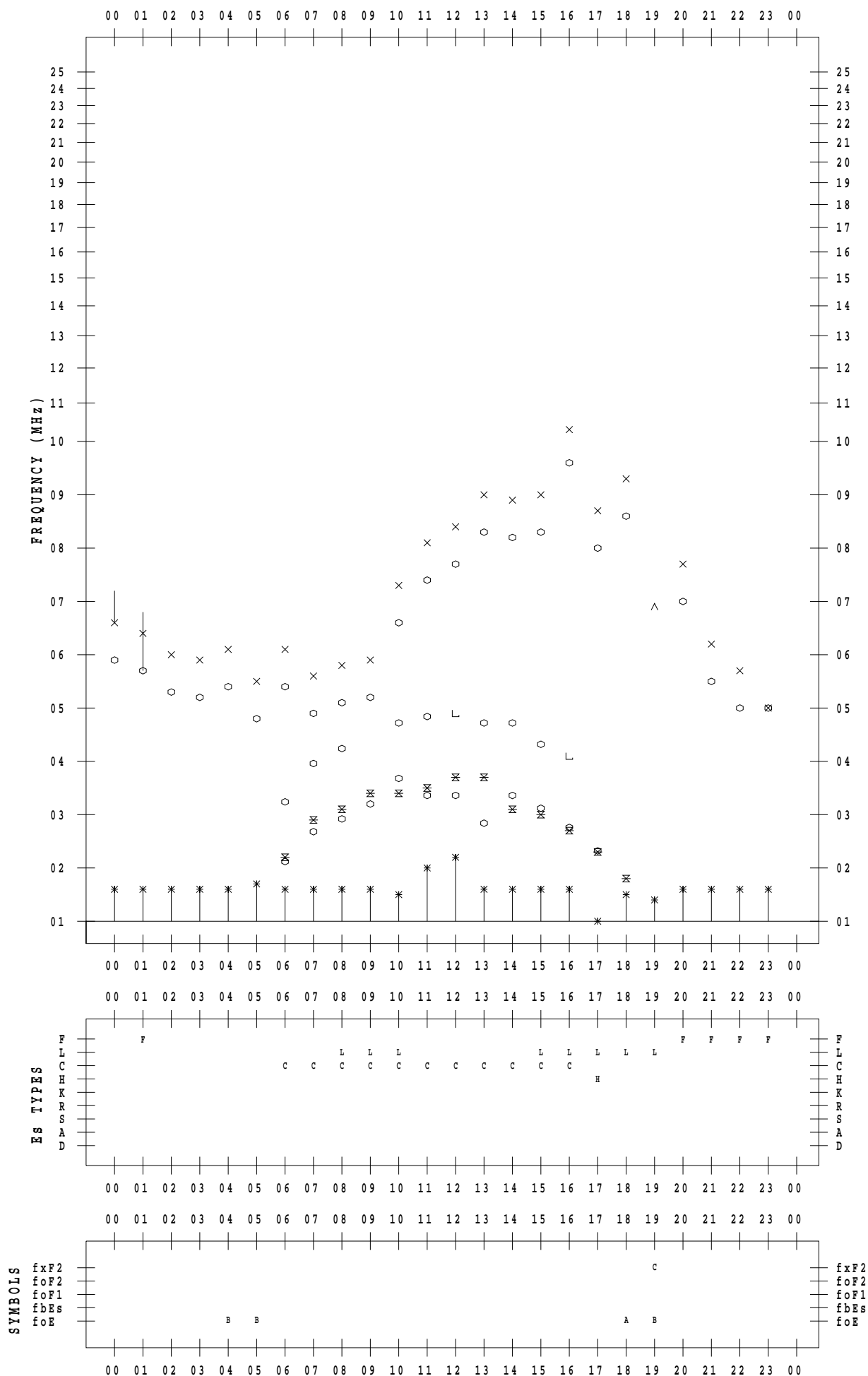
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 10

135 ° E MEAN TIME



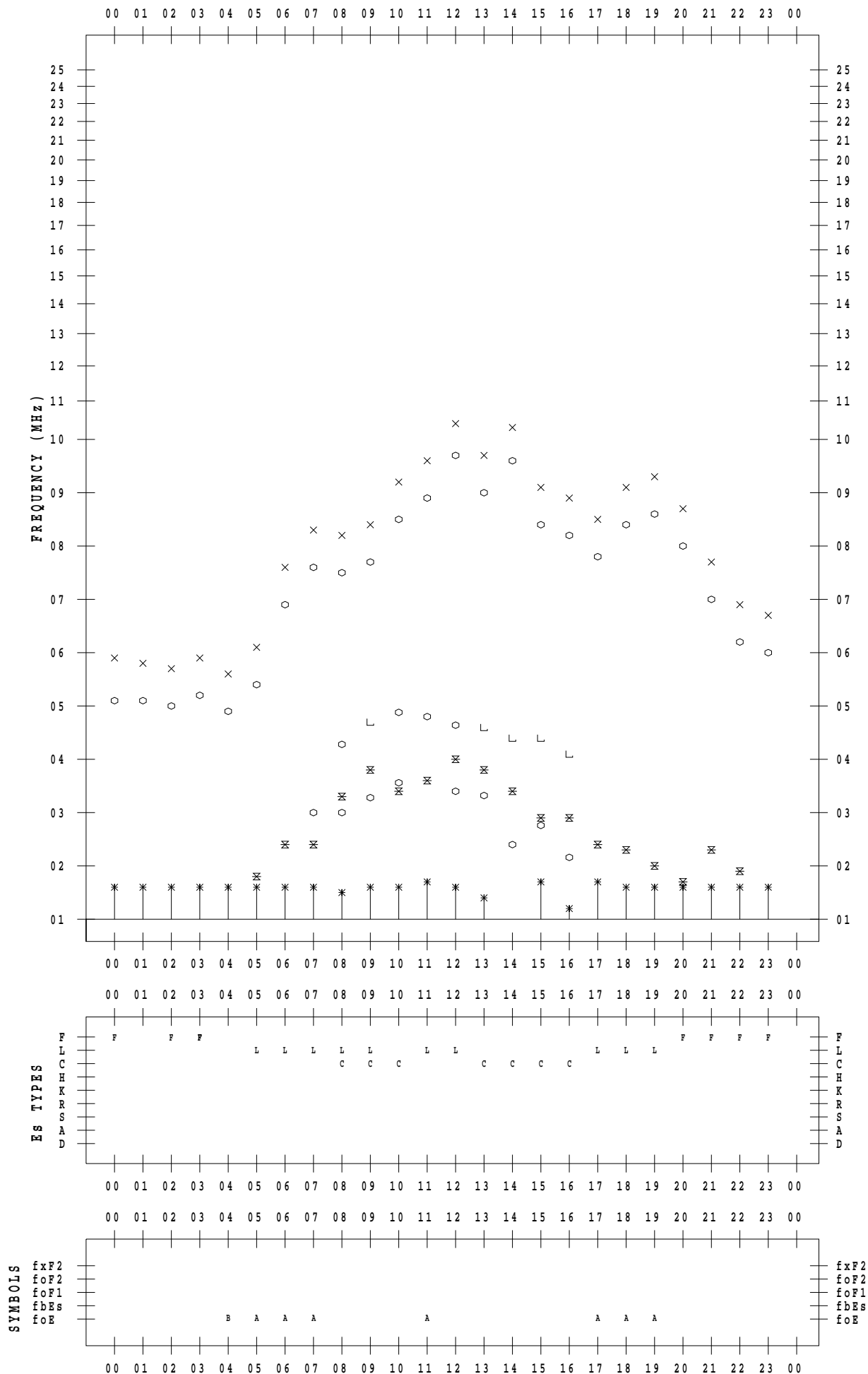
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 11

135 ° E MEAN TIME



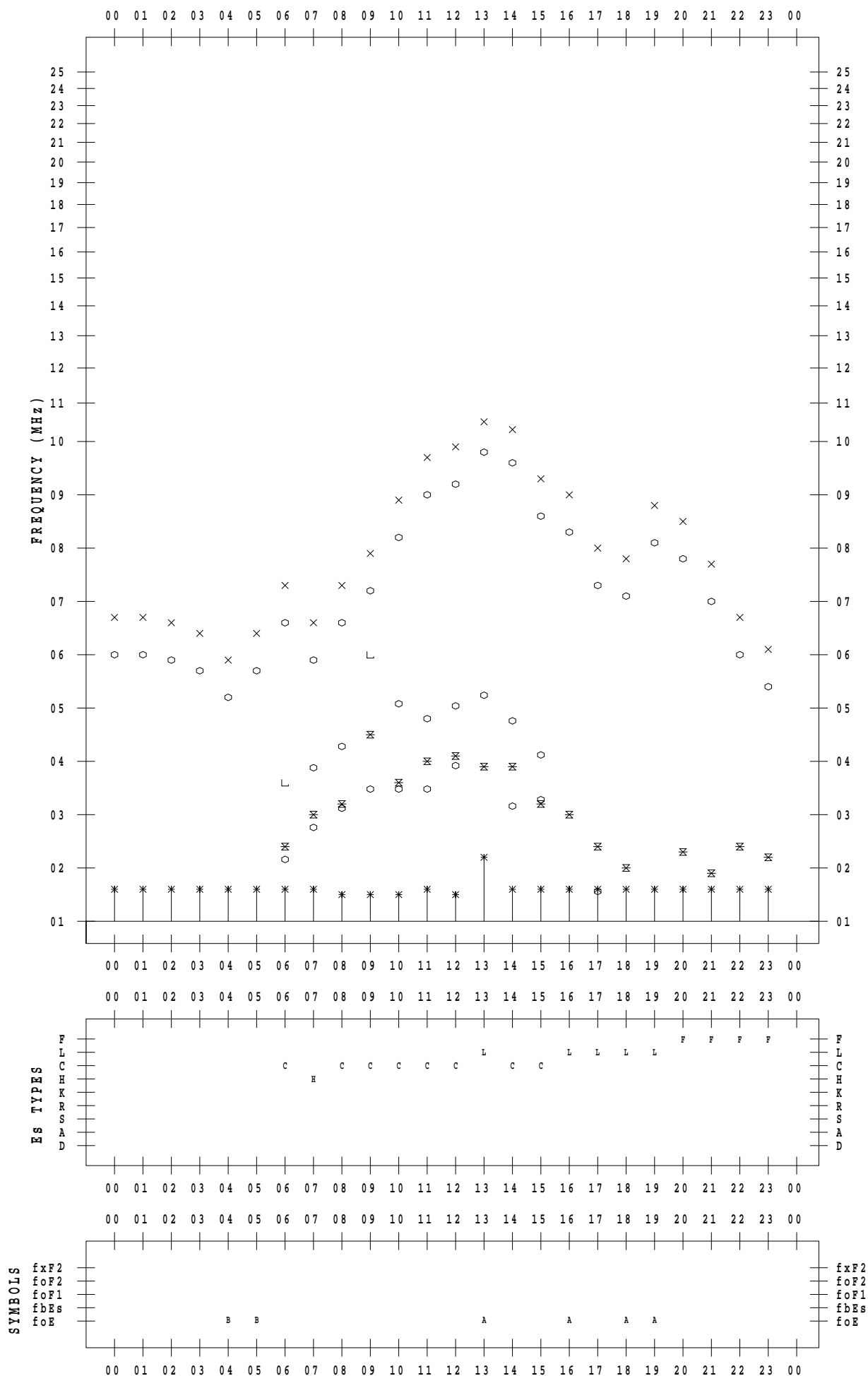
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 12

135 ° E MEAN TIME





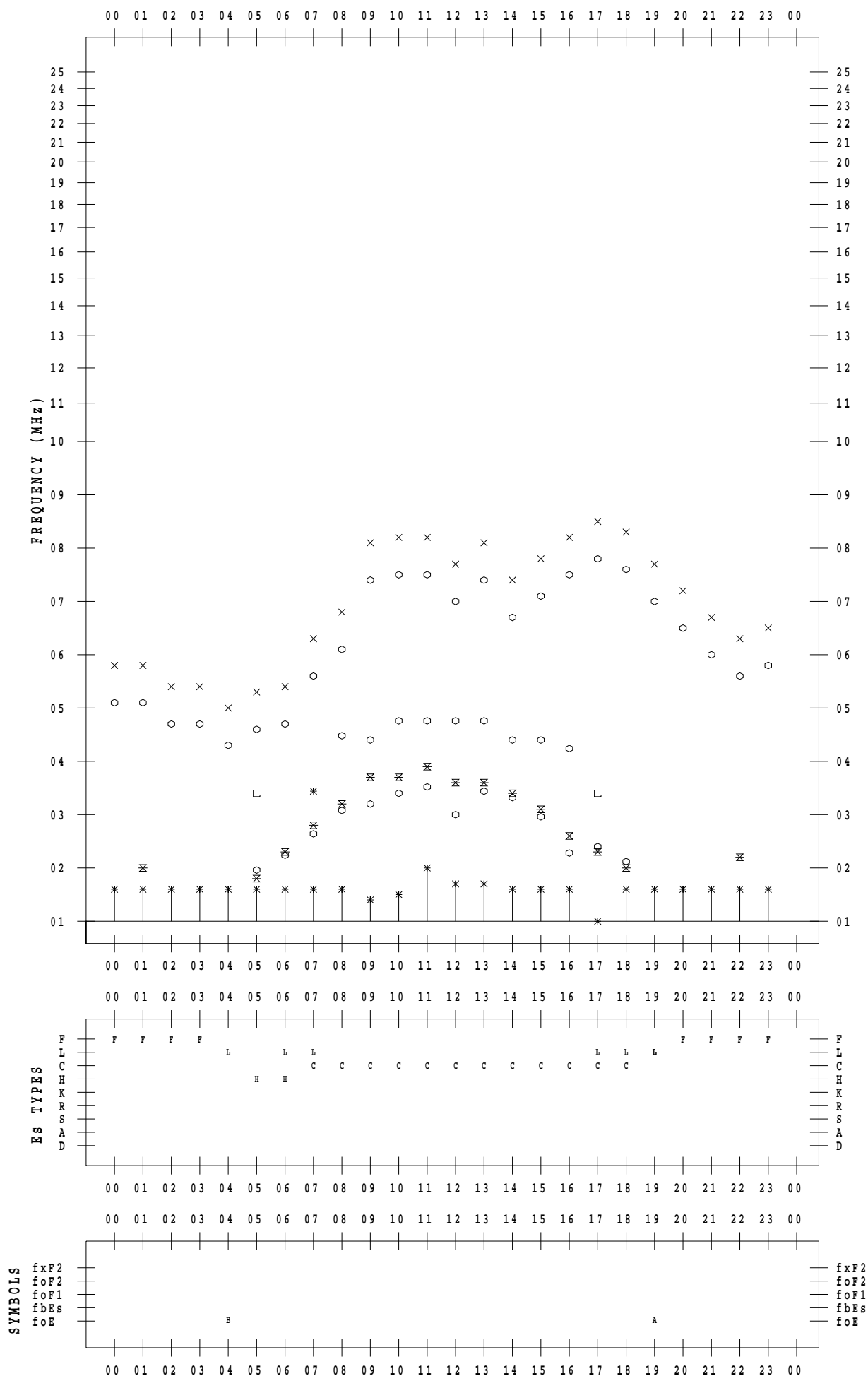
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 13

135 ° E MEAN TIME



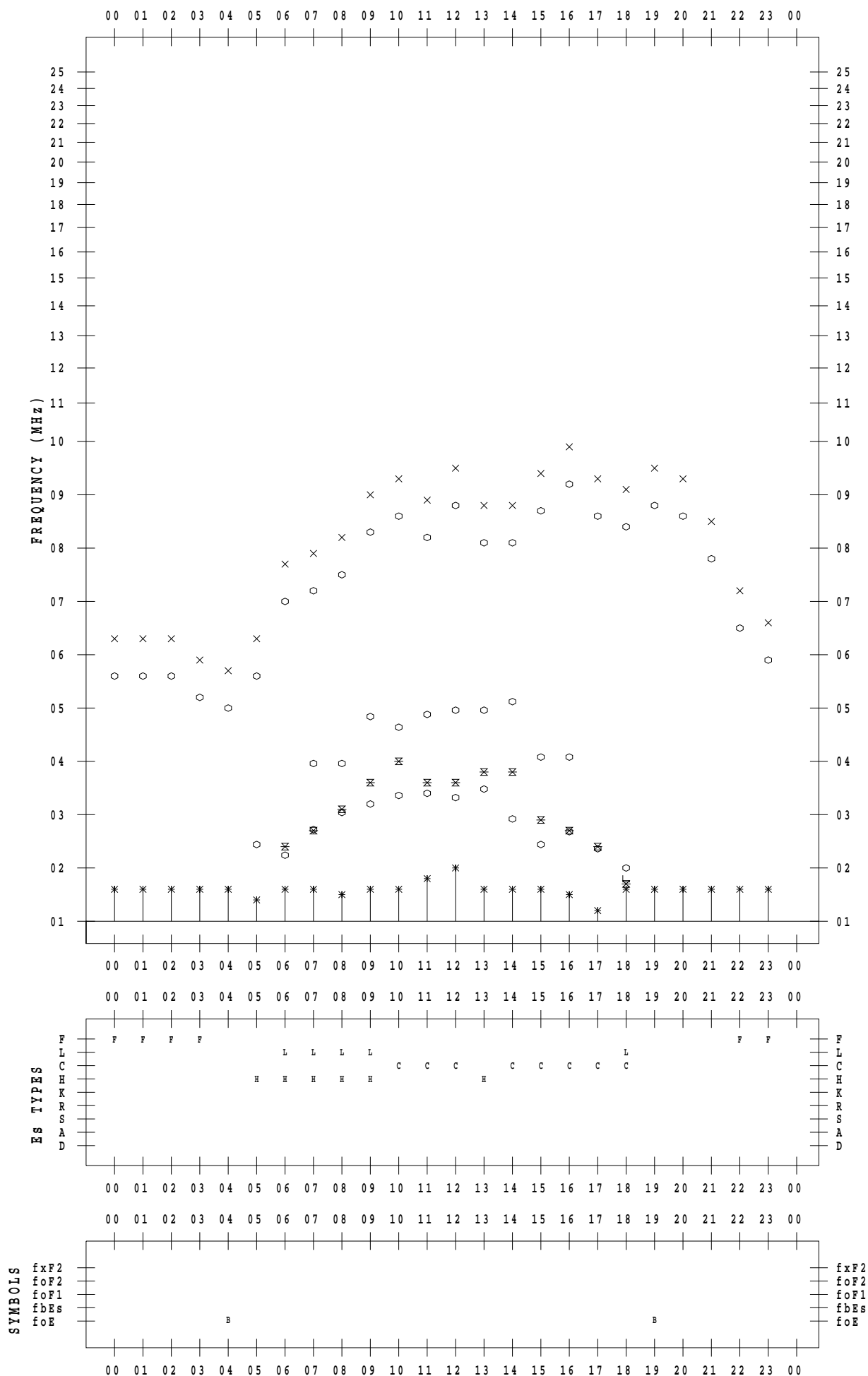
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 14

135 ° E MEAN TIME



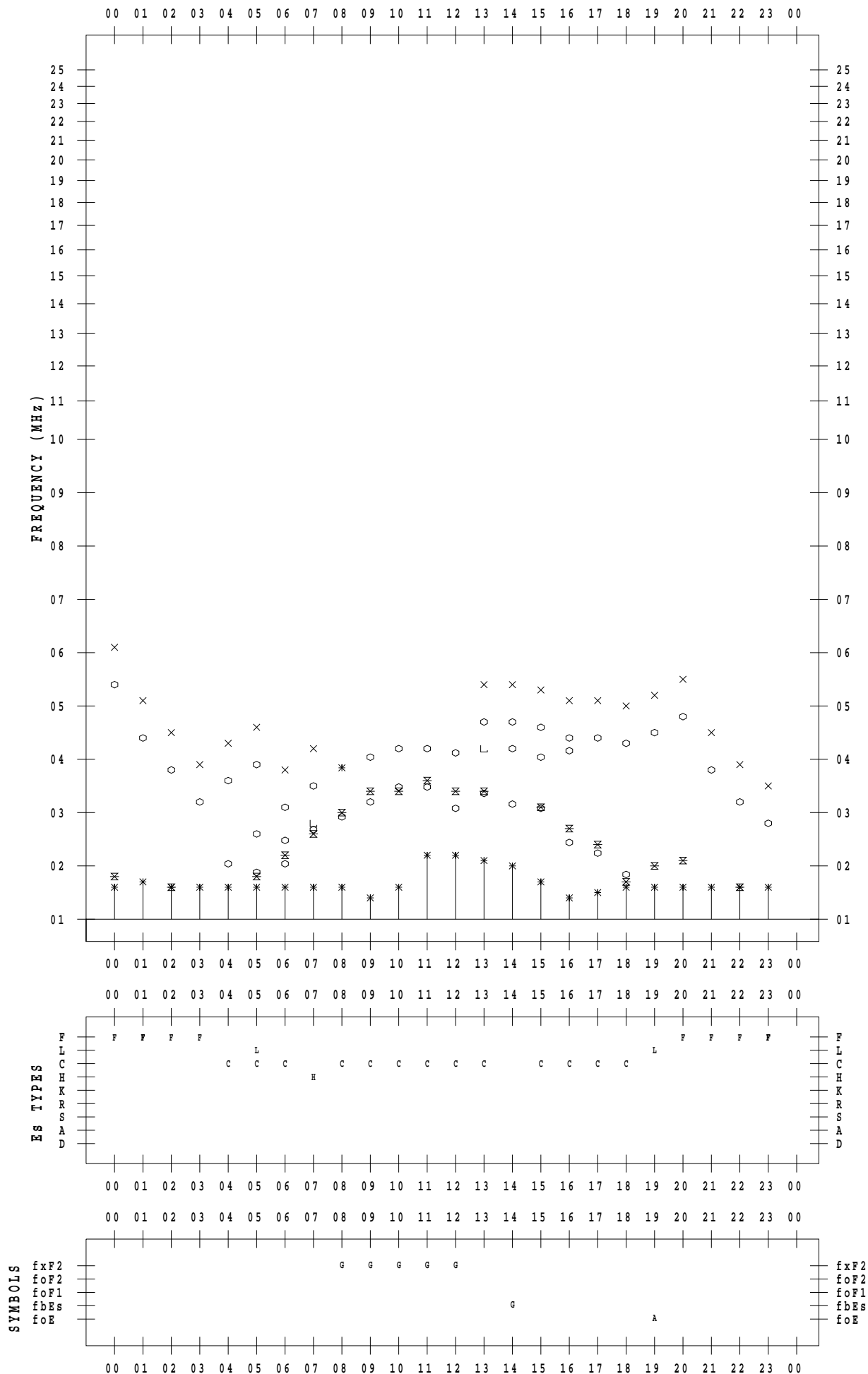
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 15

135 ° E MEAN TIME



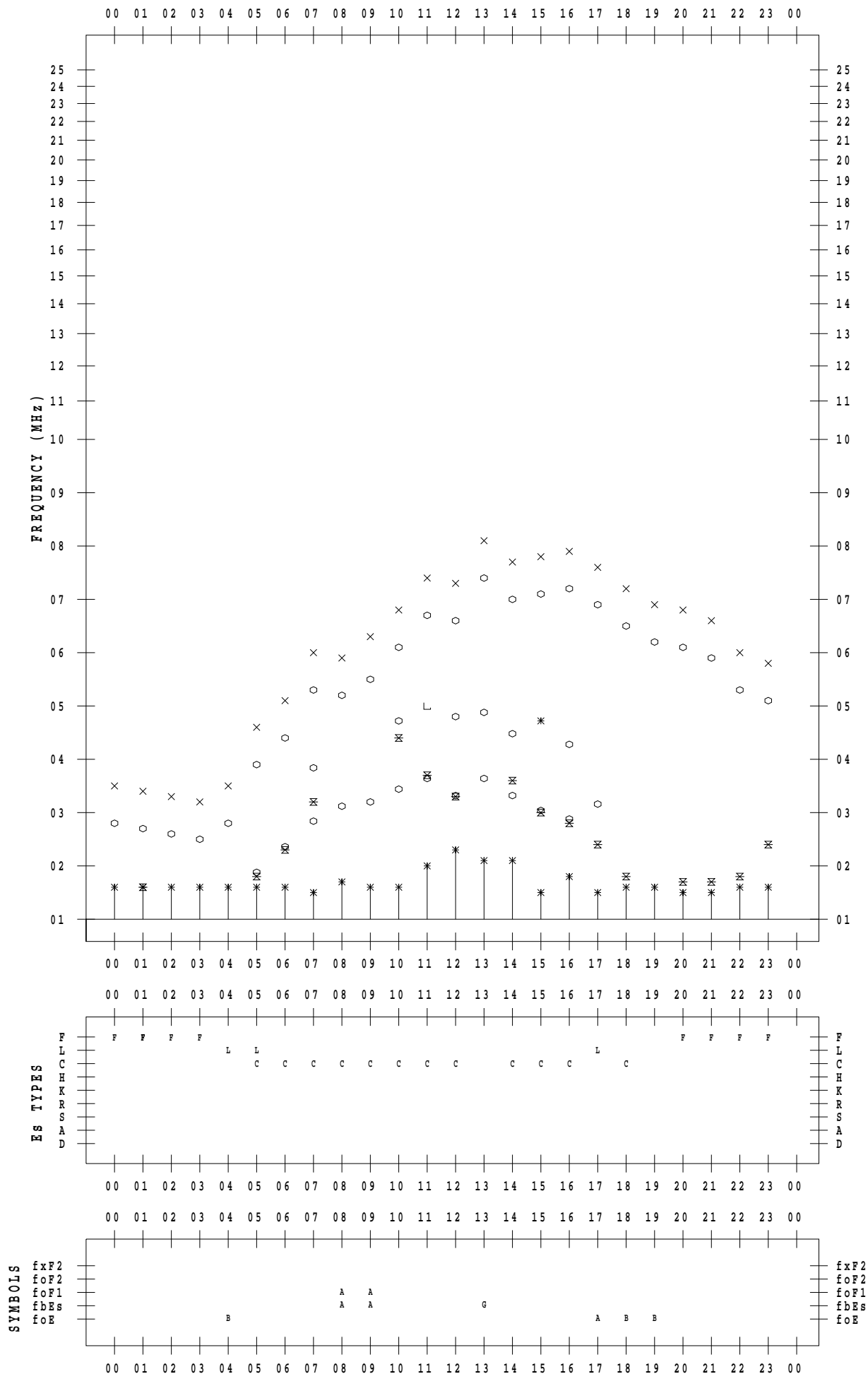
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 16

135 ° E MEAN TIME



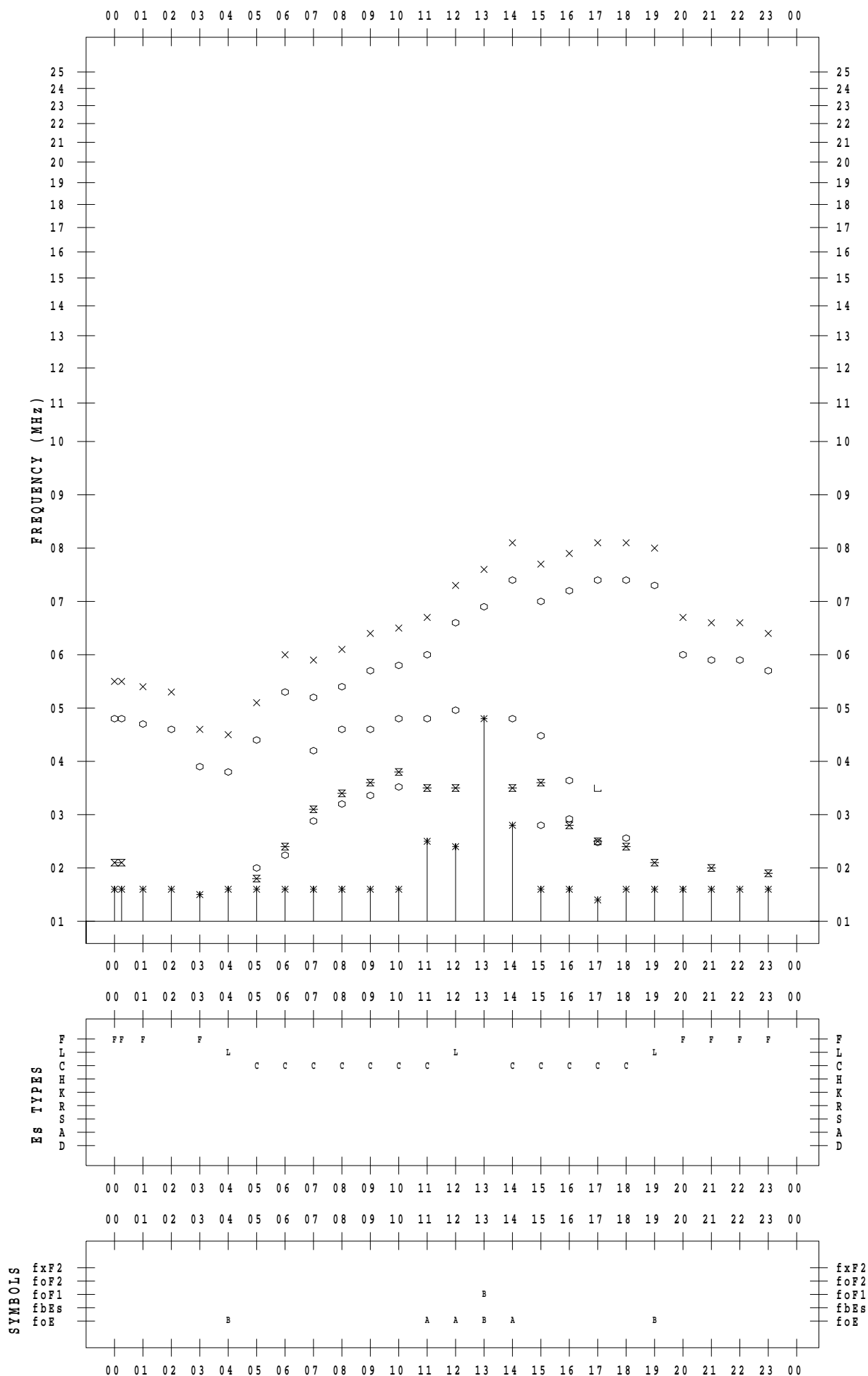
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 17

135 ° E MEAN TIME



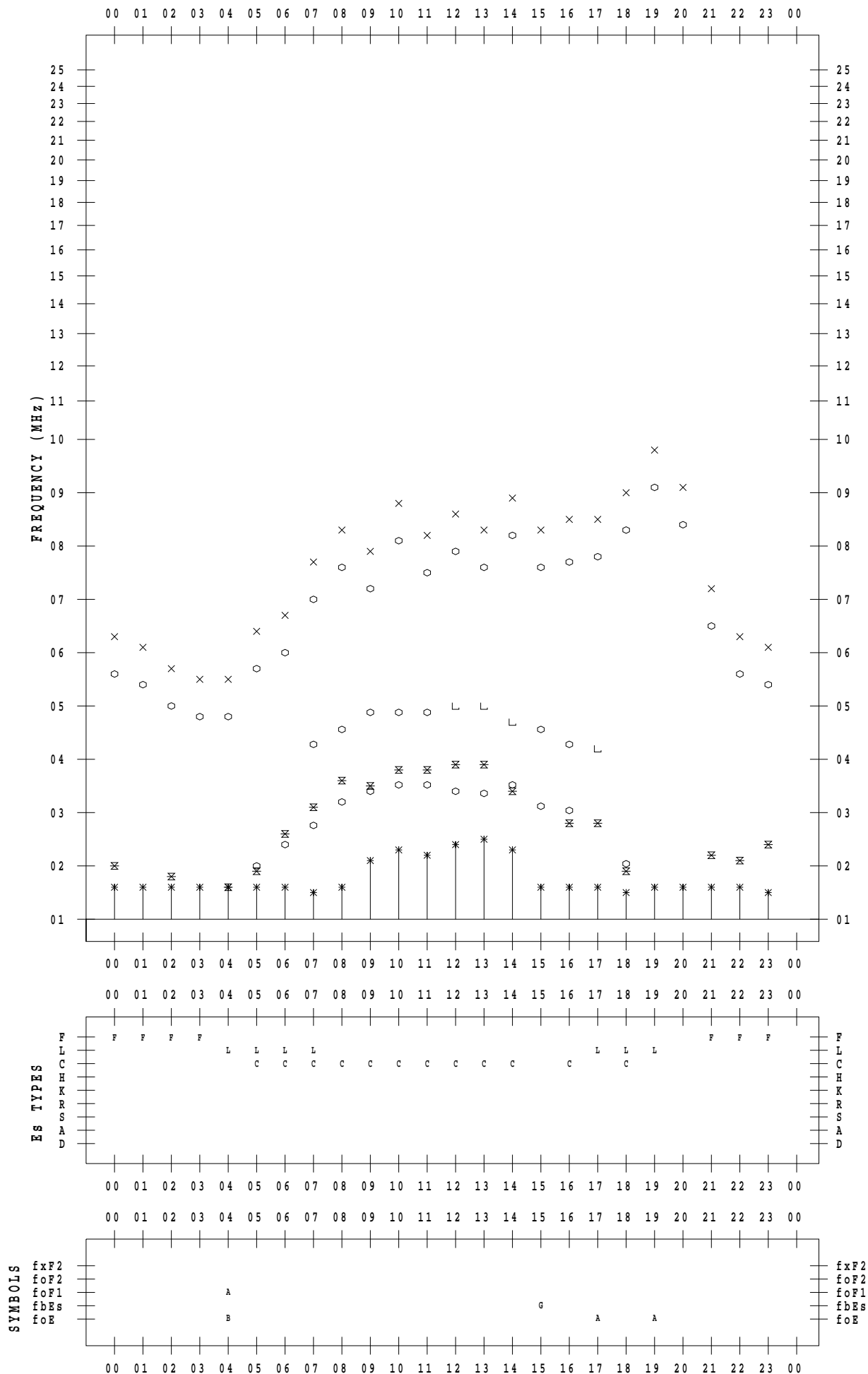
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 18

135 ° E MEAN TIME



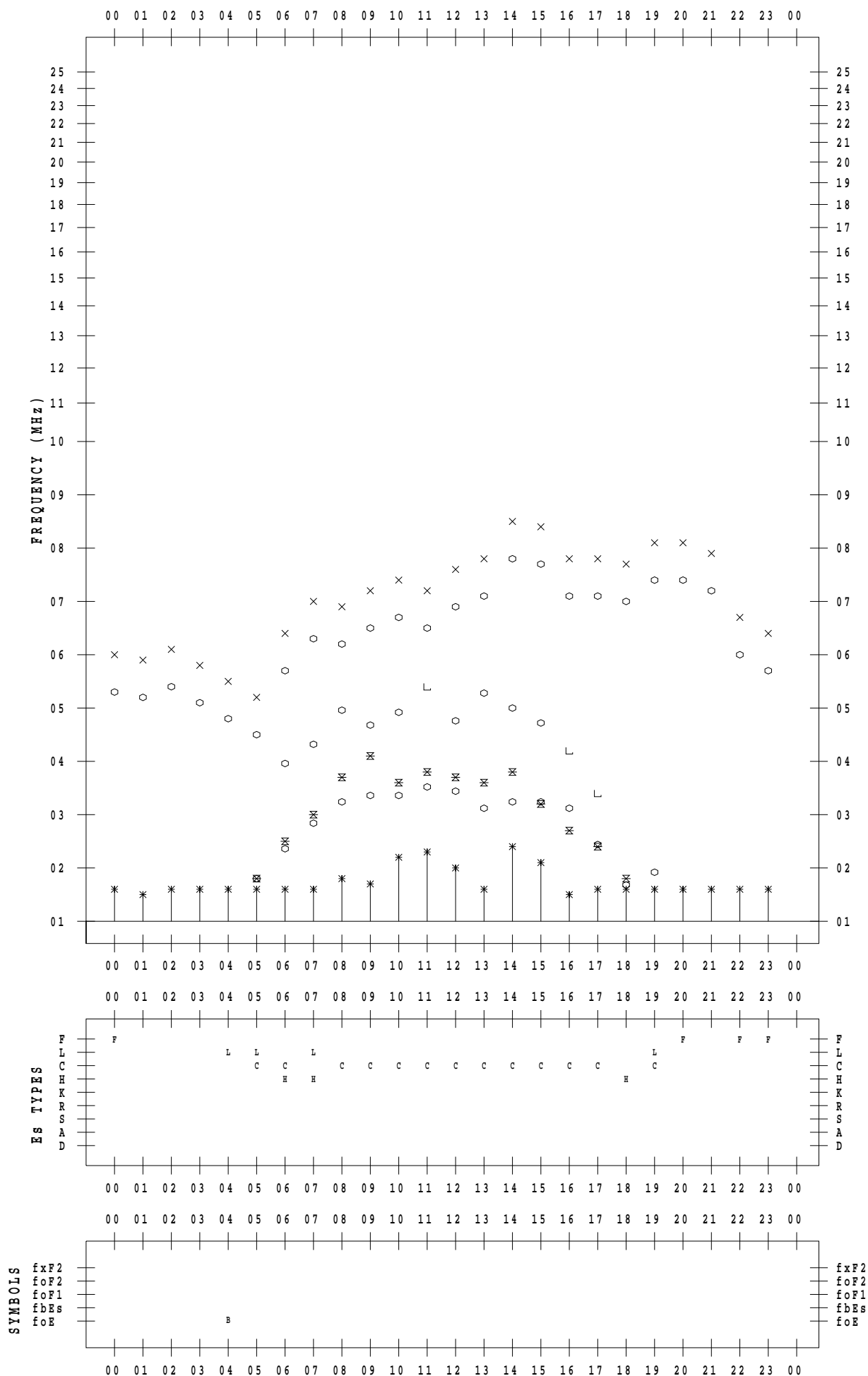
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 19

135 ° E MEAN TIME



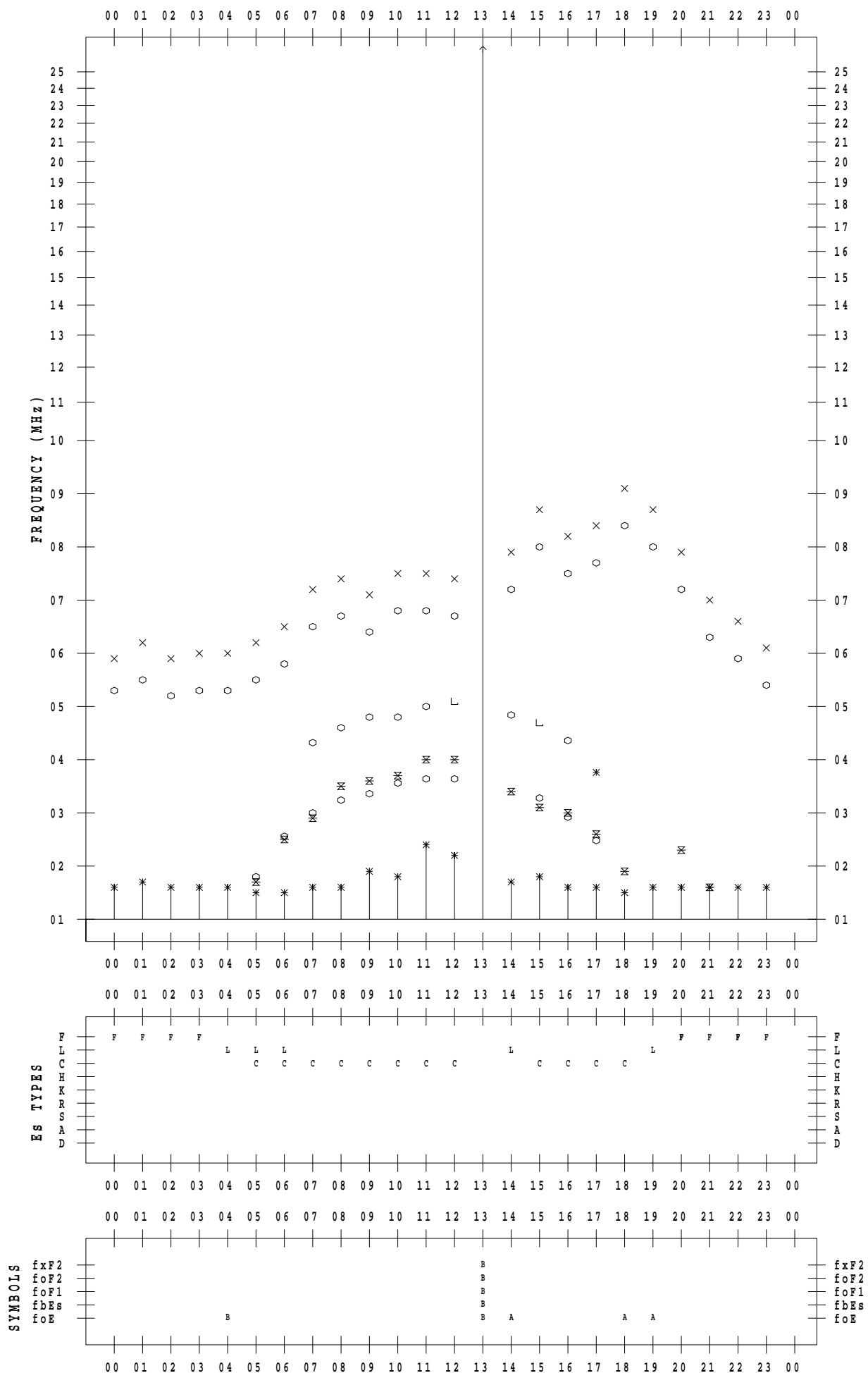
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 20

135 ° E MEAN TIME





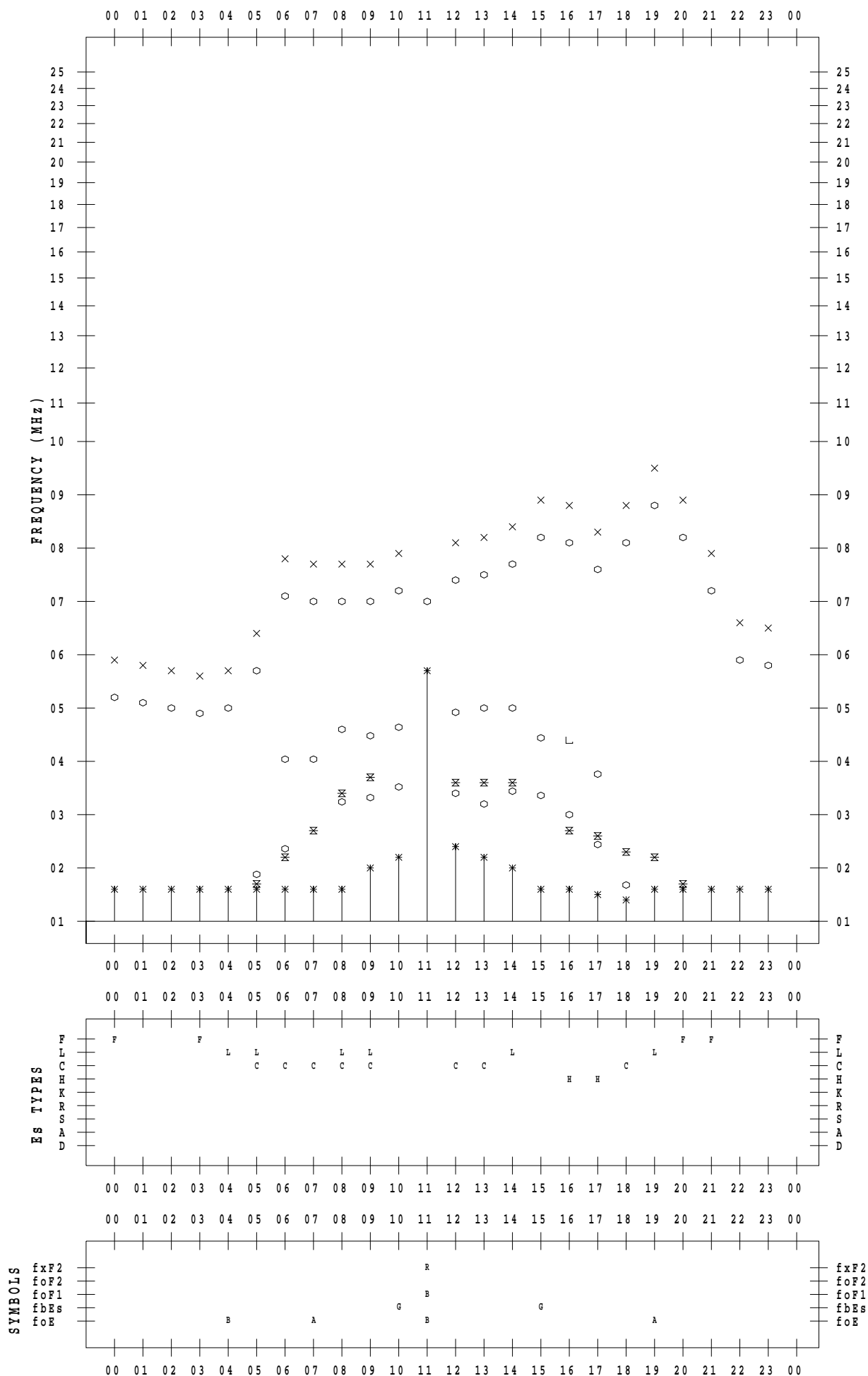
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 21

135 ° E MEAN TIME



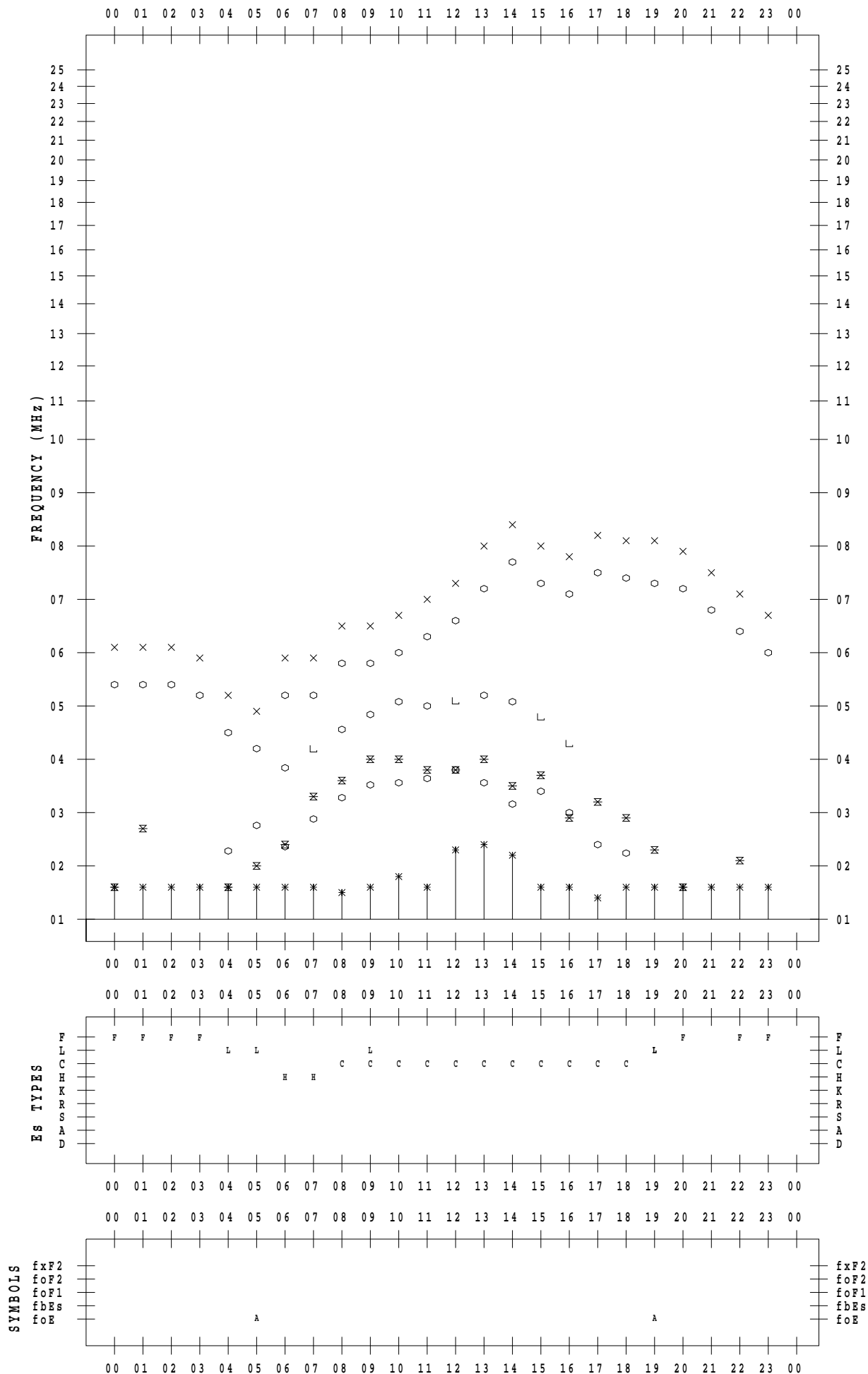
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 22

135 ° E MEAN TIME



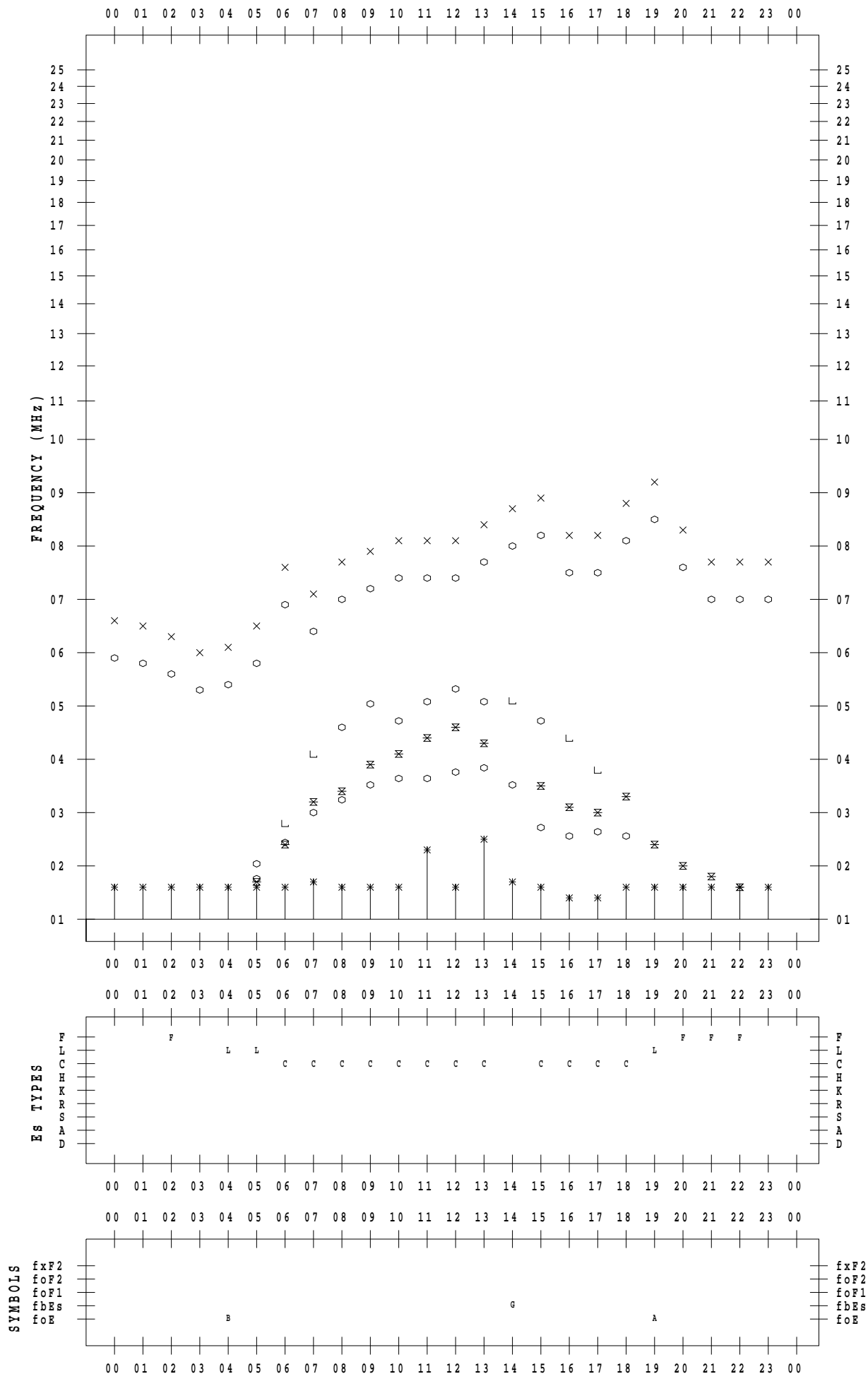
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SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 23

135 ° E MEAN TIME



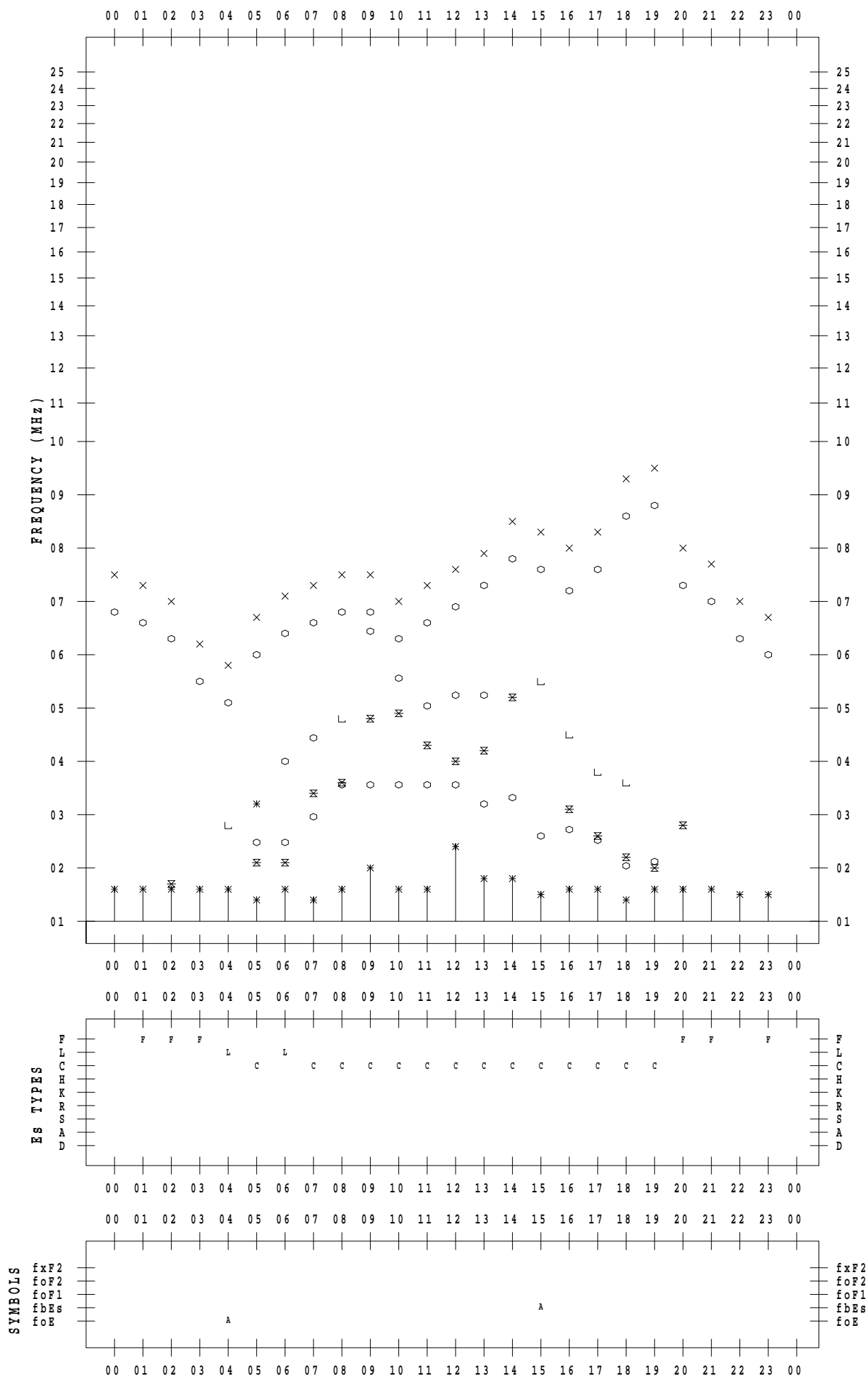
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 24

135 ° E MEAN TIME



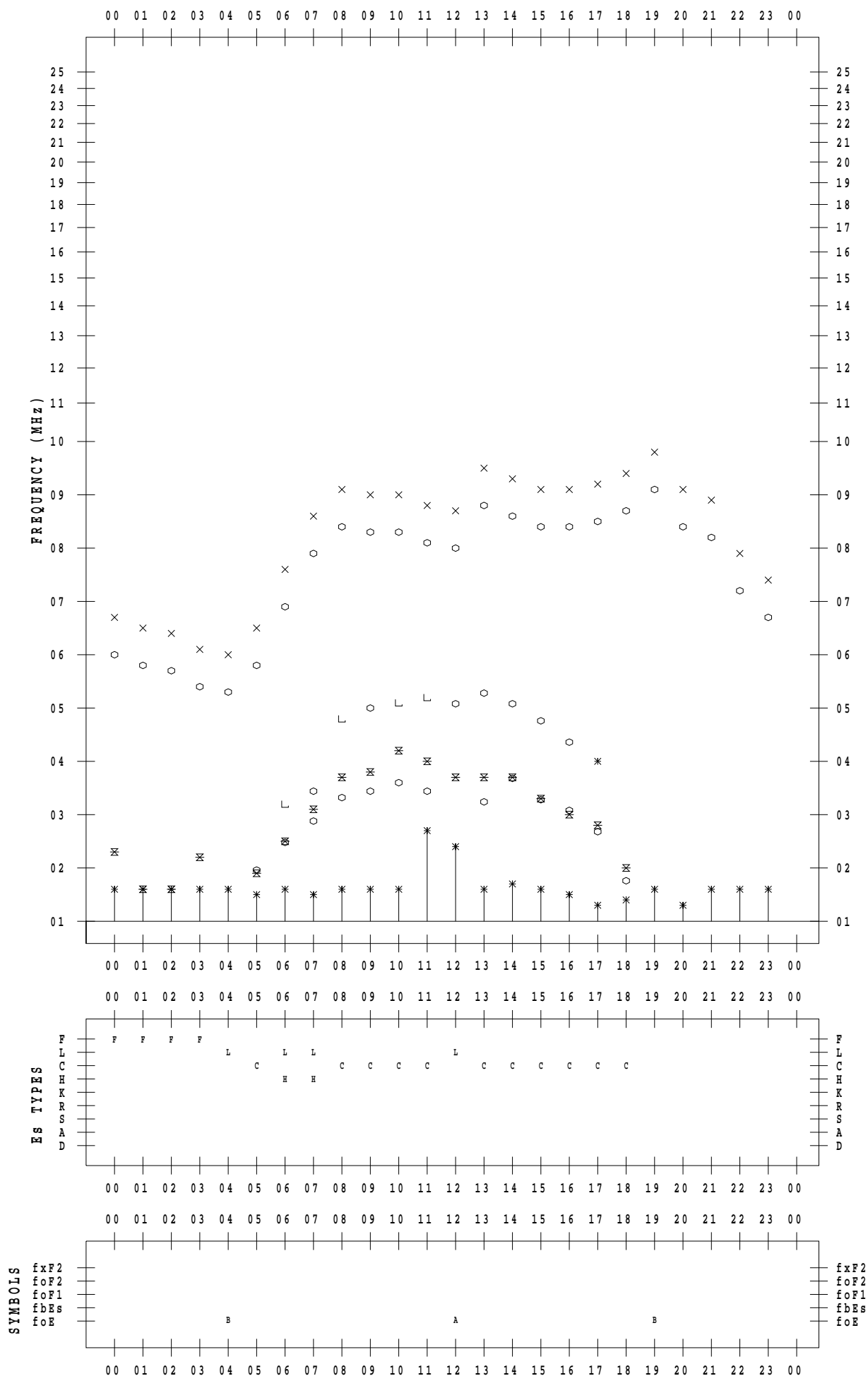
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 25

135 ° E MEAN TIME



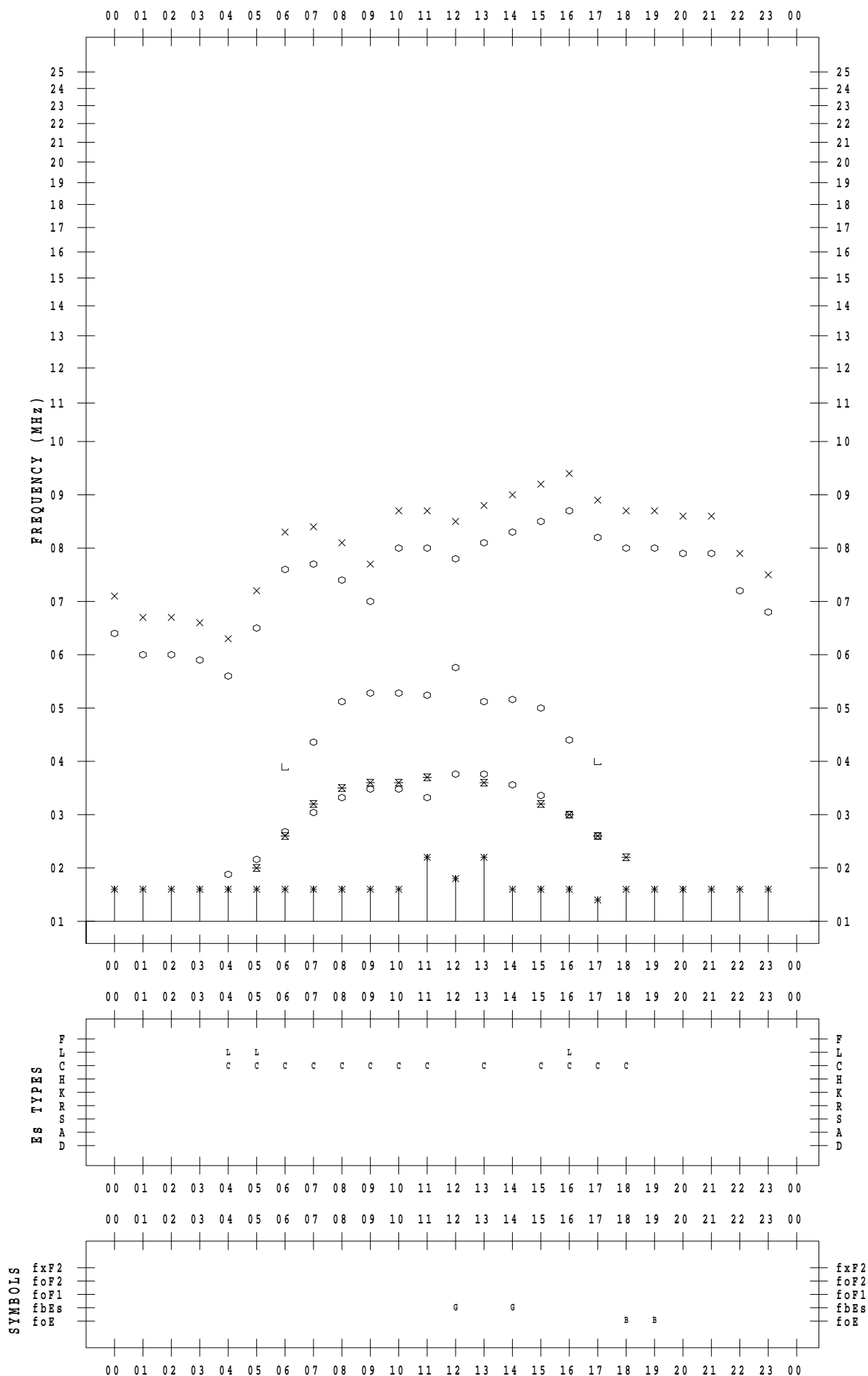
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 26

135 ° E MEAN TIME



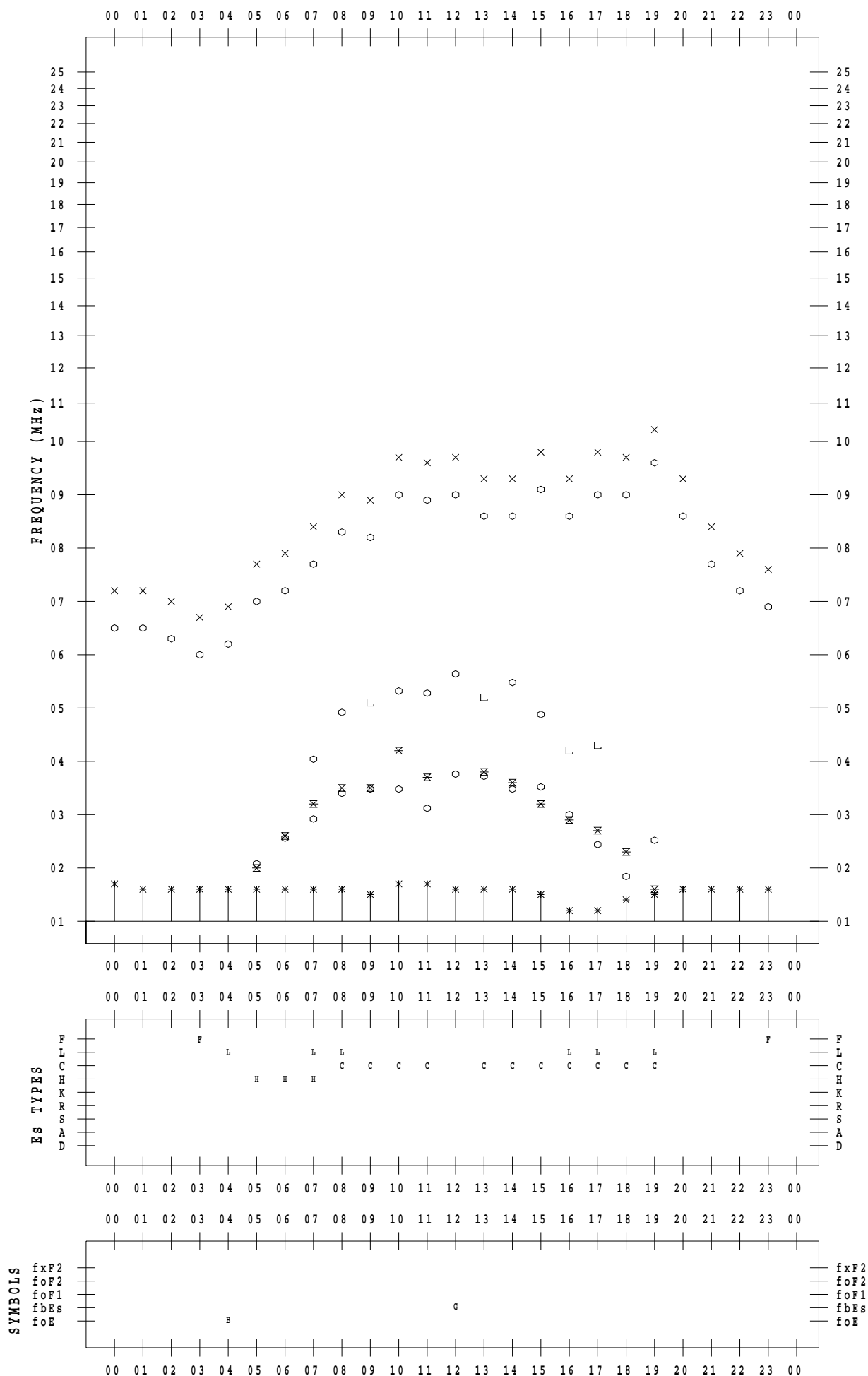
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 27

135 ° E MEAN TIME



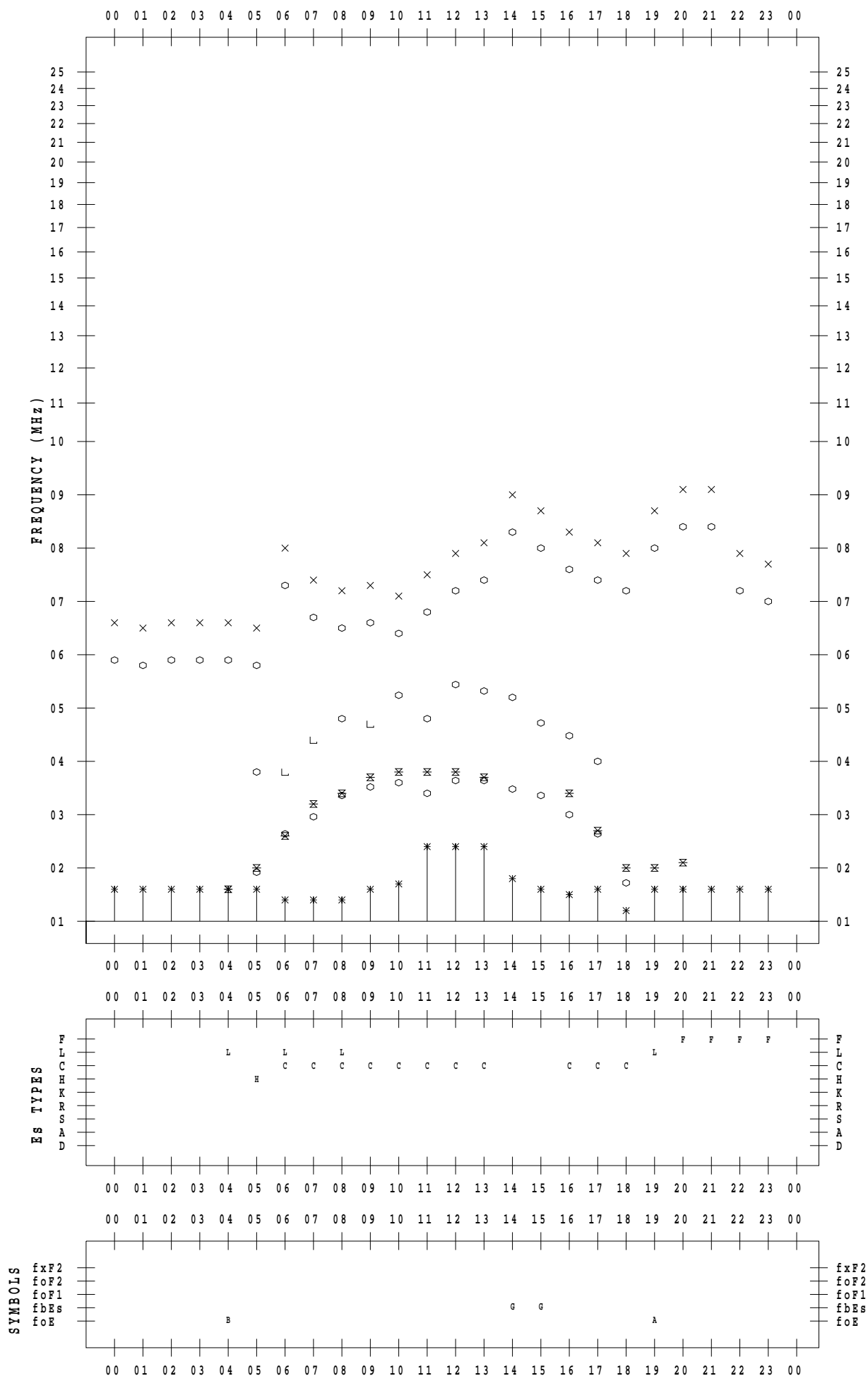
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 28

135 ° E MEAN TIME





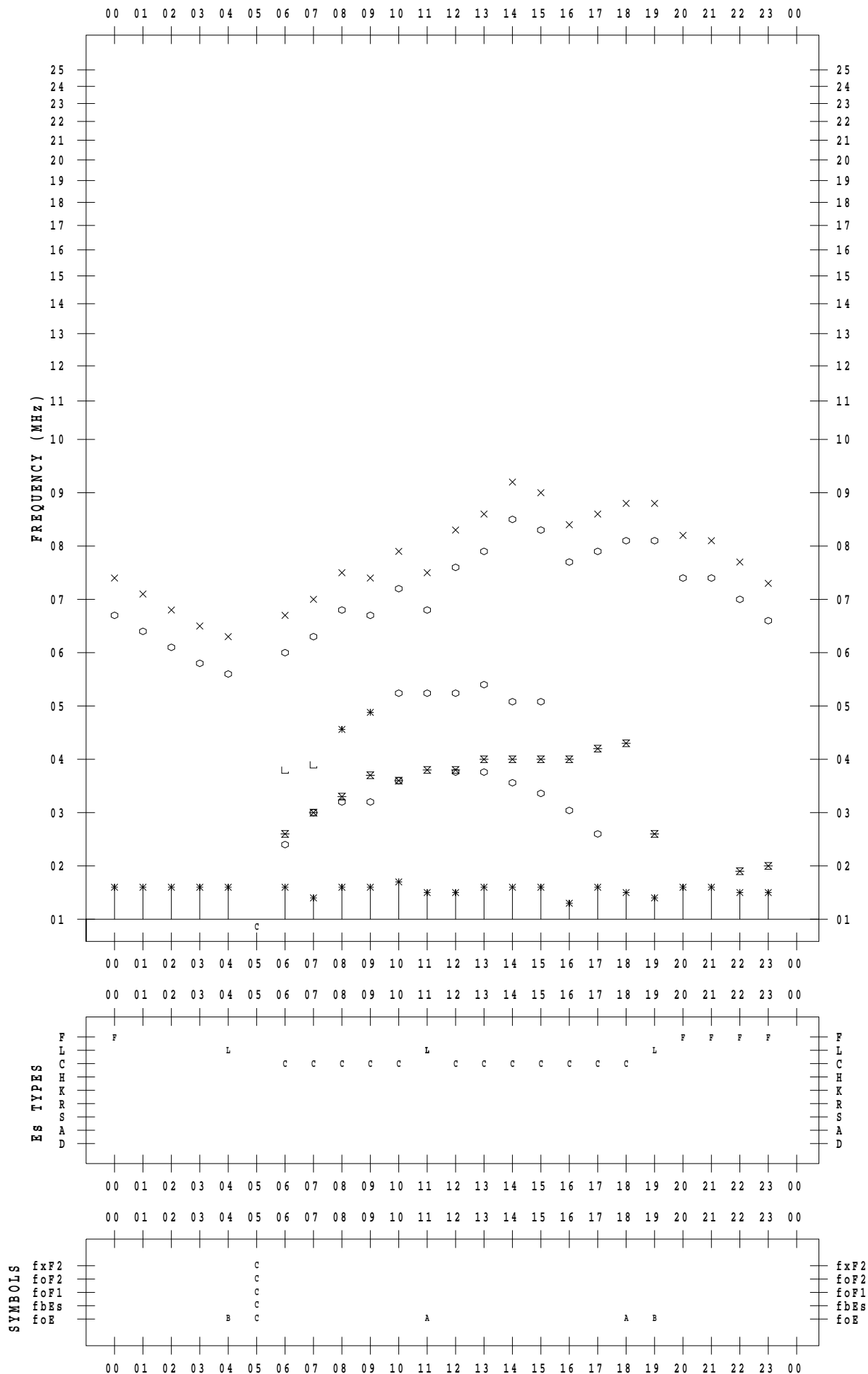
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 29

135 ° E MEAN TIME



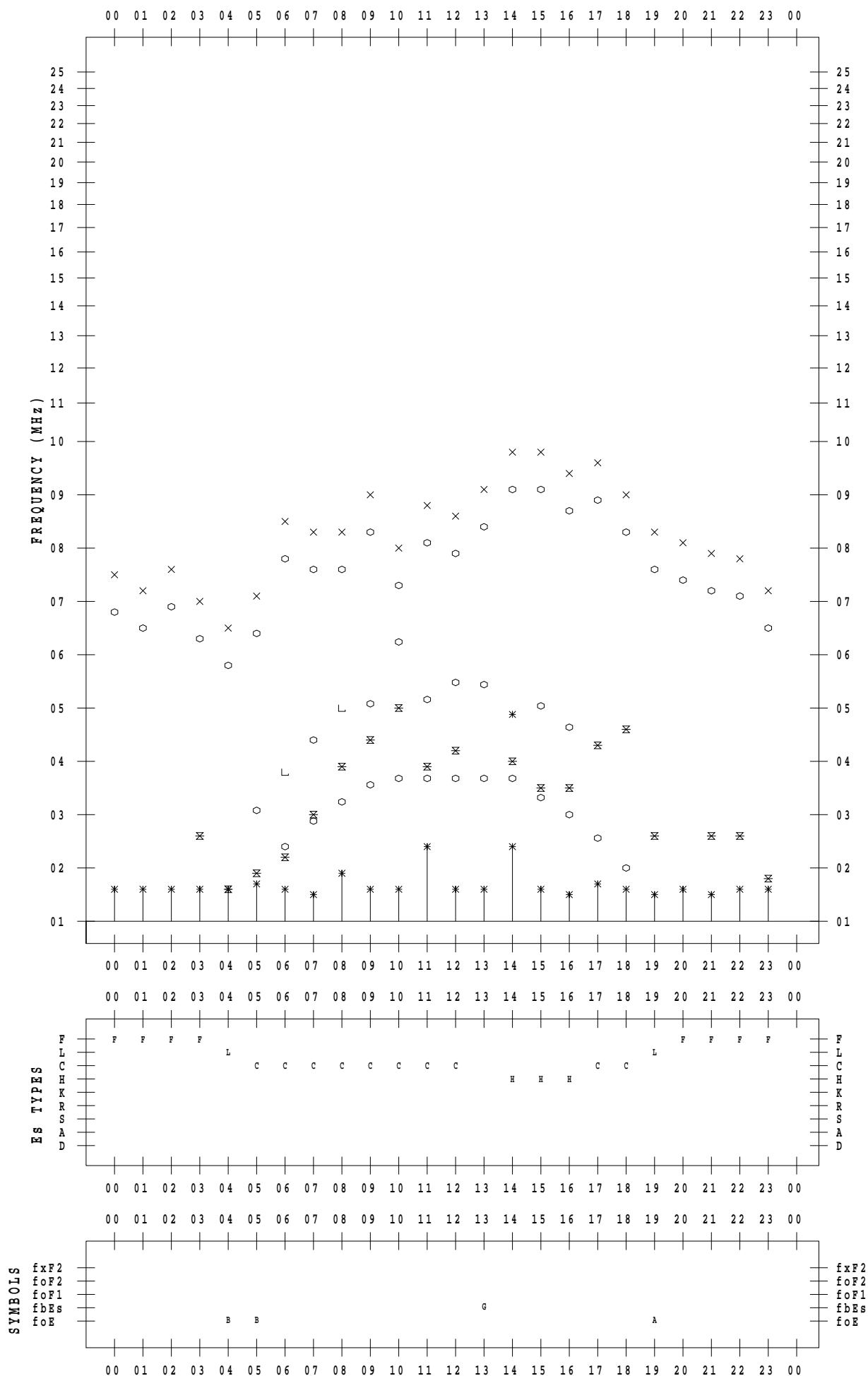
# f - PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2022 / 4 / 30

135 ° E MEAN TIME



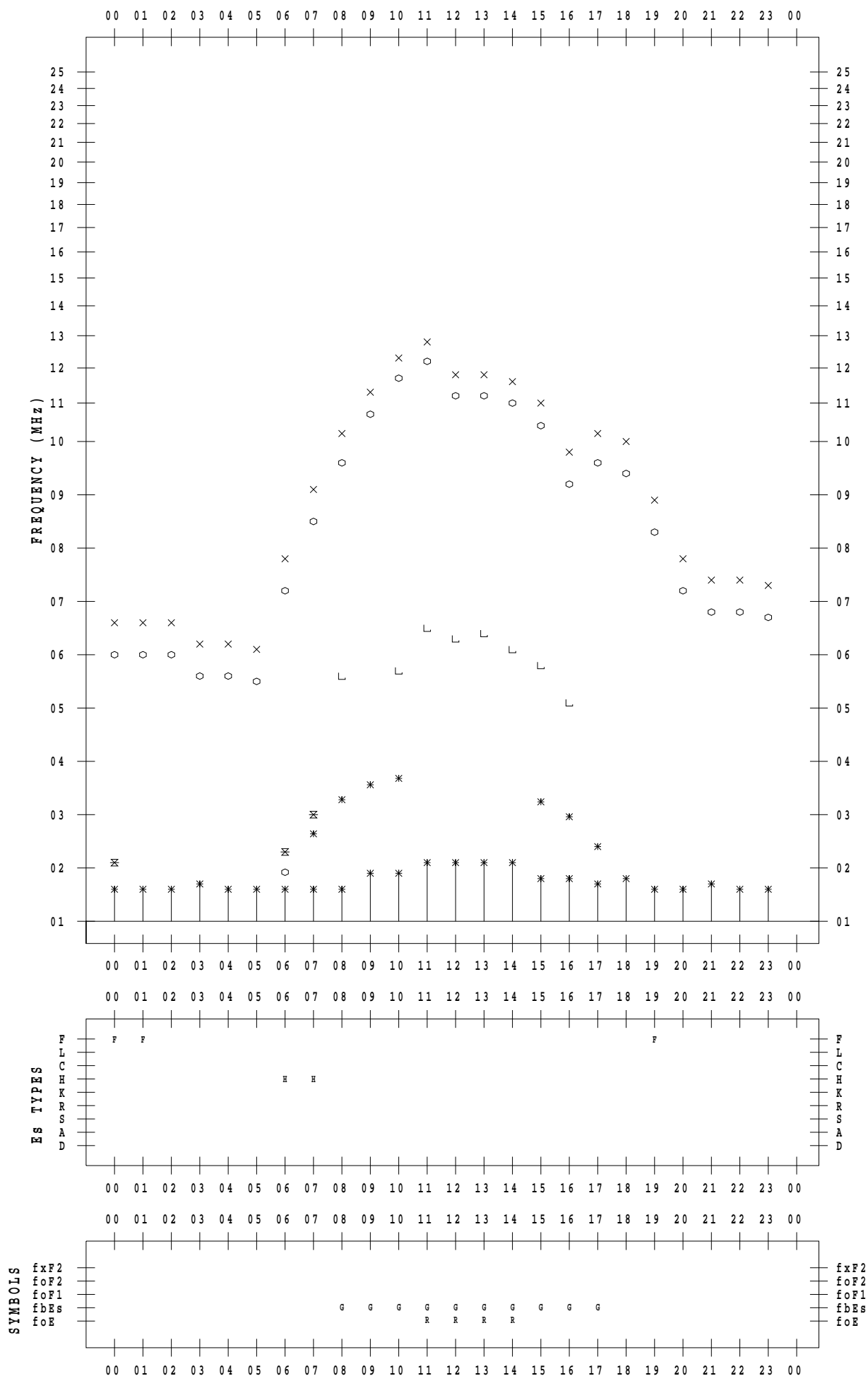
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 1

135 ° E MEAN TIME



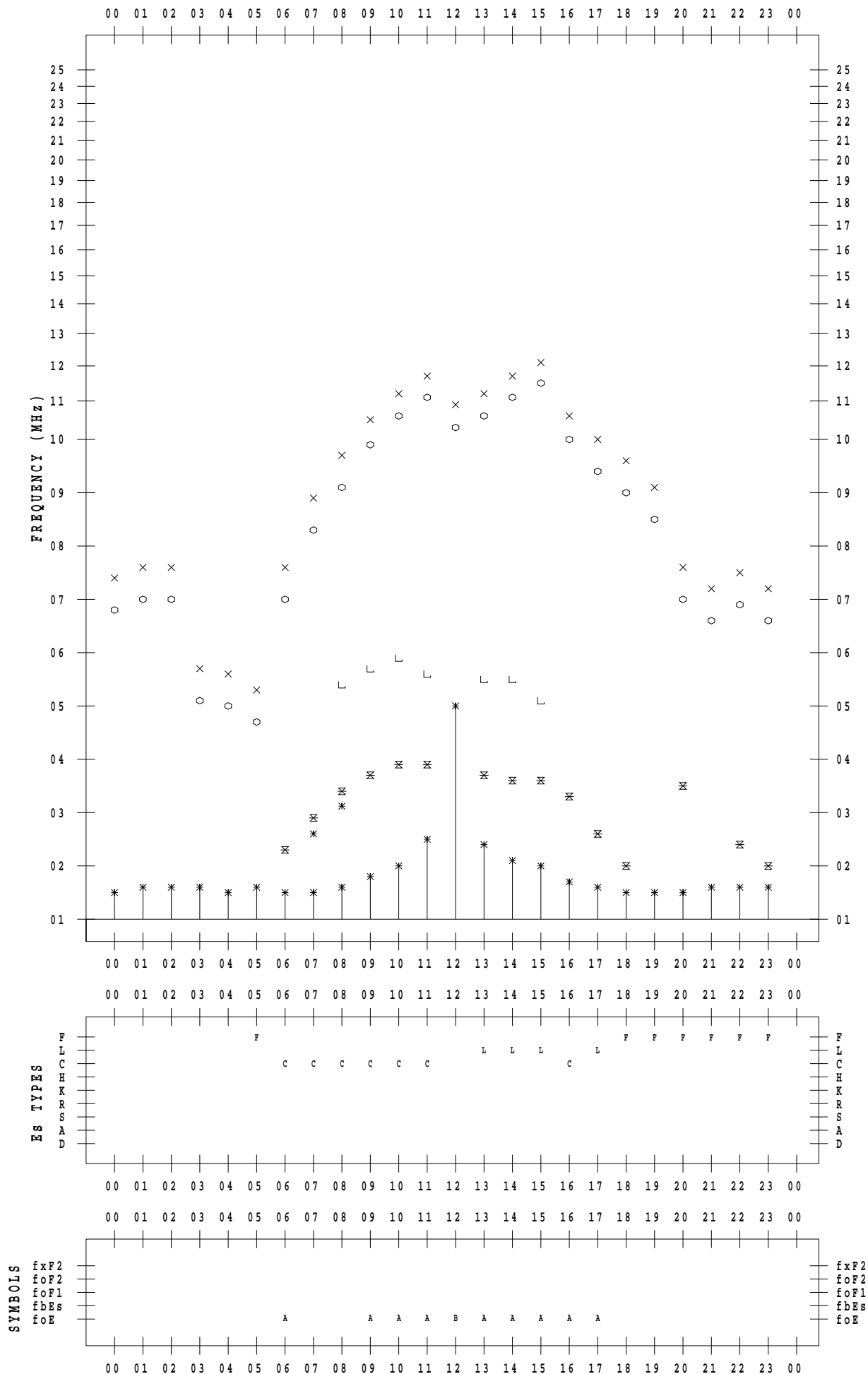
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 2

135 ° E MEAN TIME



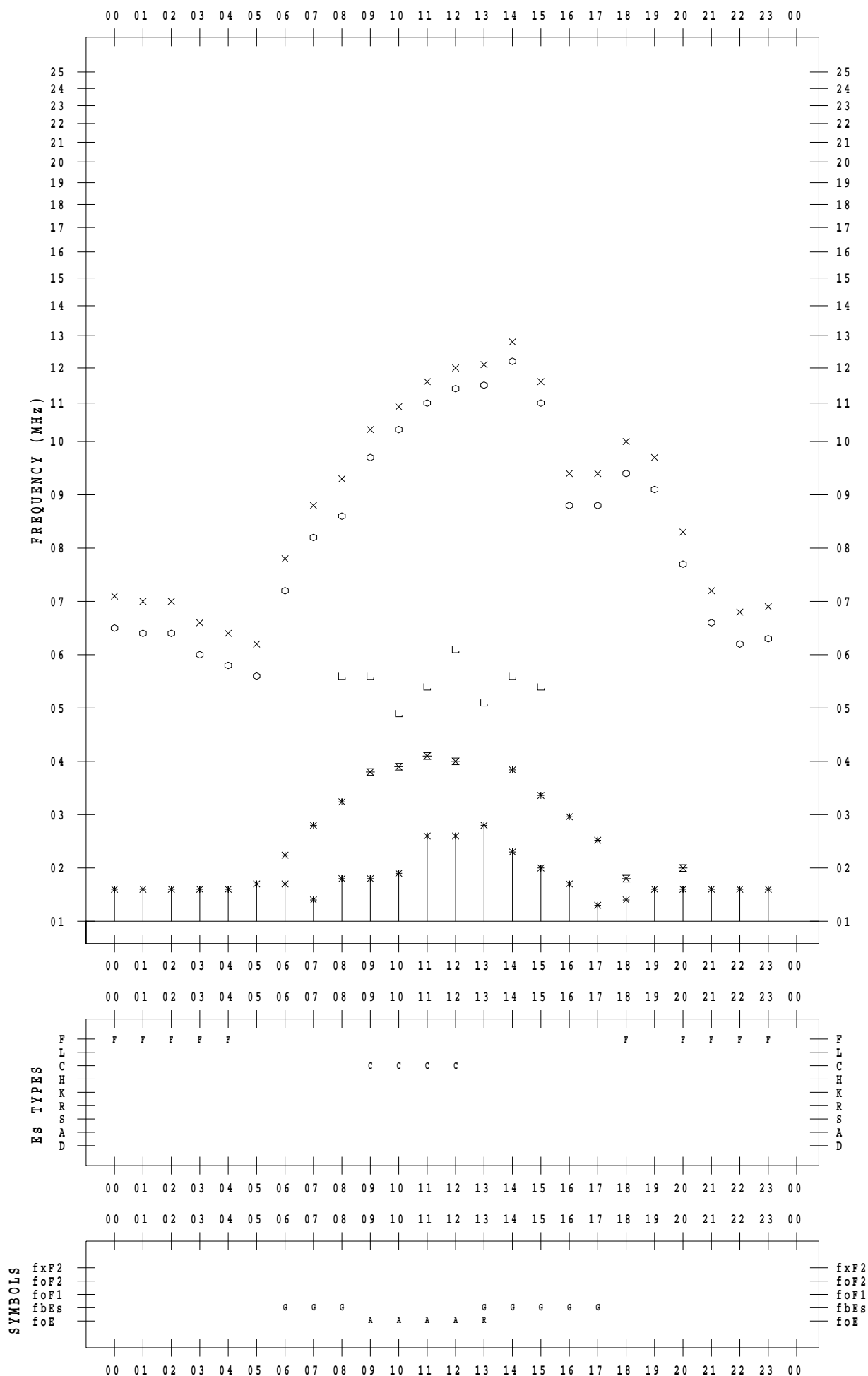
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 3

135 ° E MEAN TIME



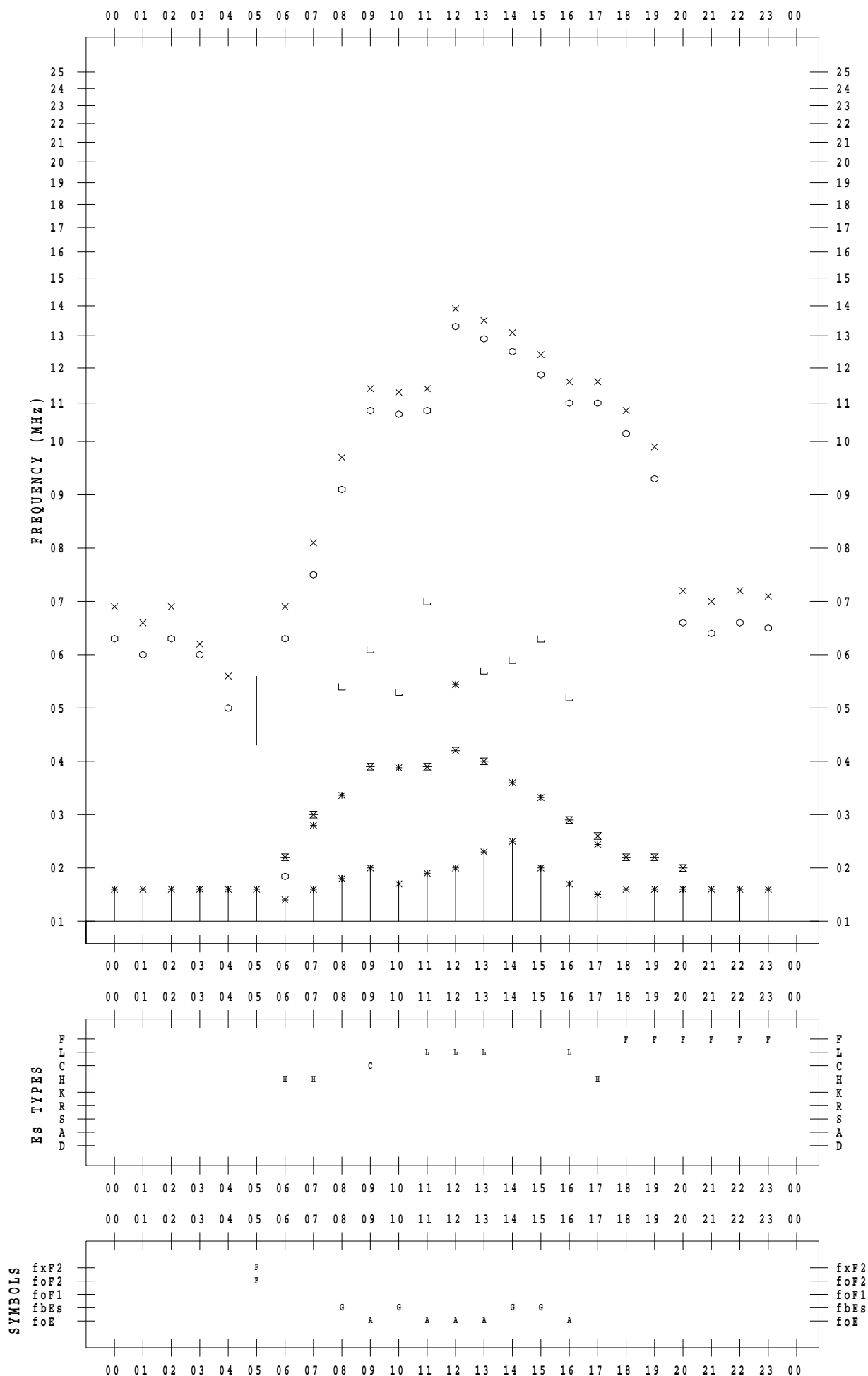
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 4

135 ° E MEAN TIME



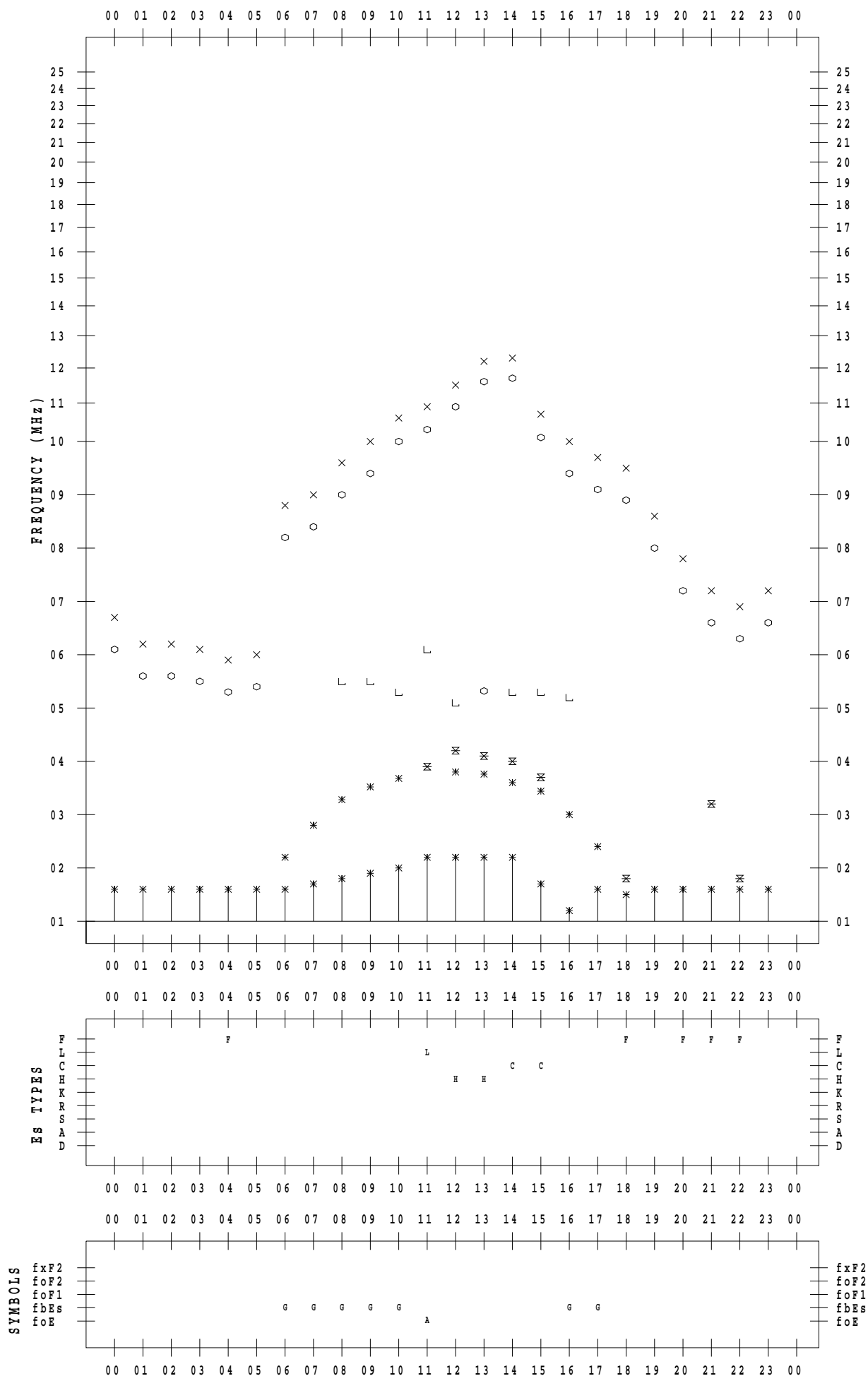
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 5

135 ° E MEAN TIME



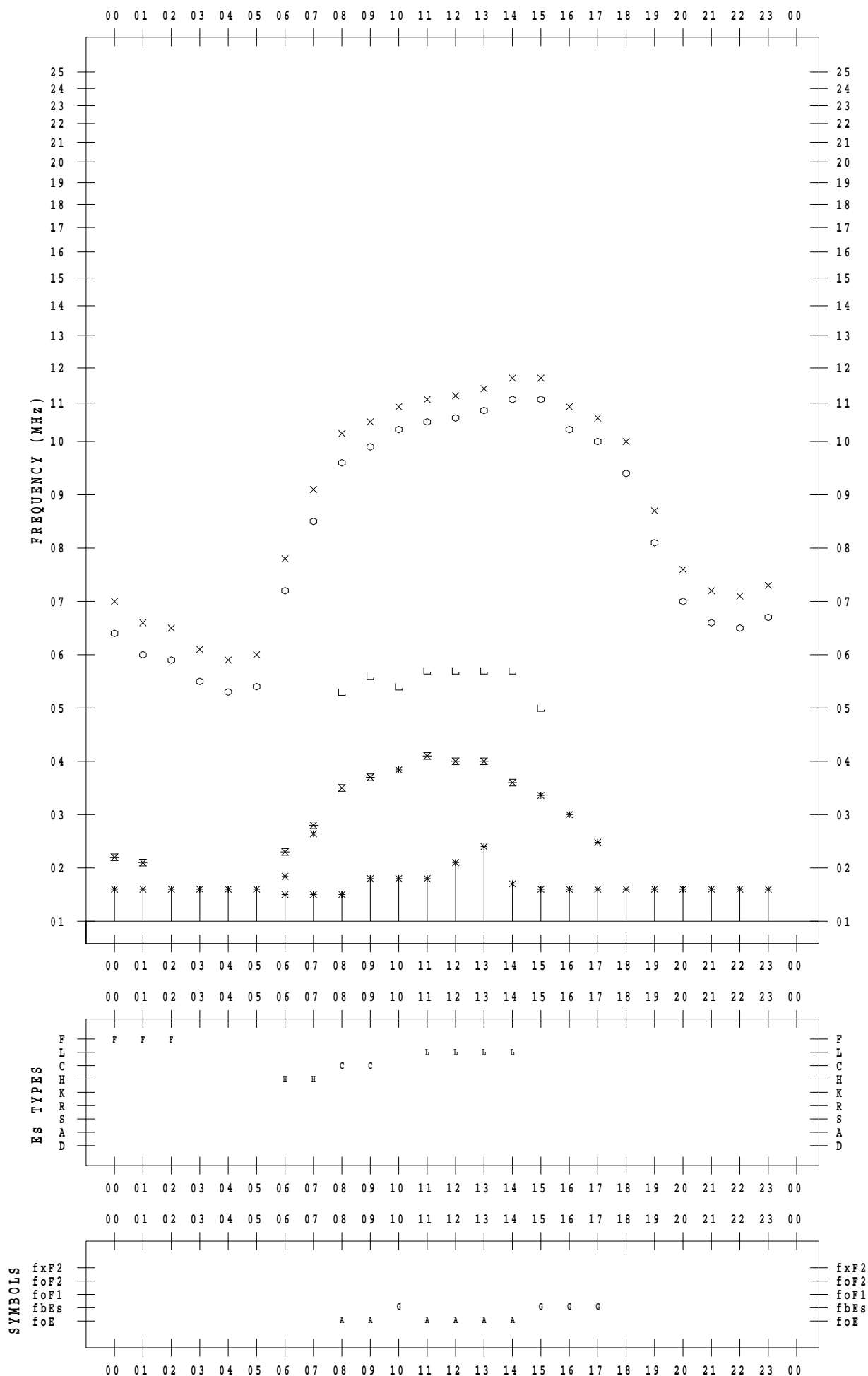
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SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 6

135 ° E MEAN TIME





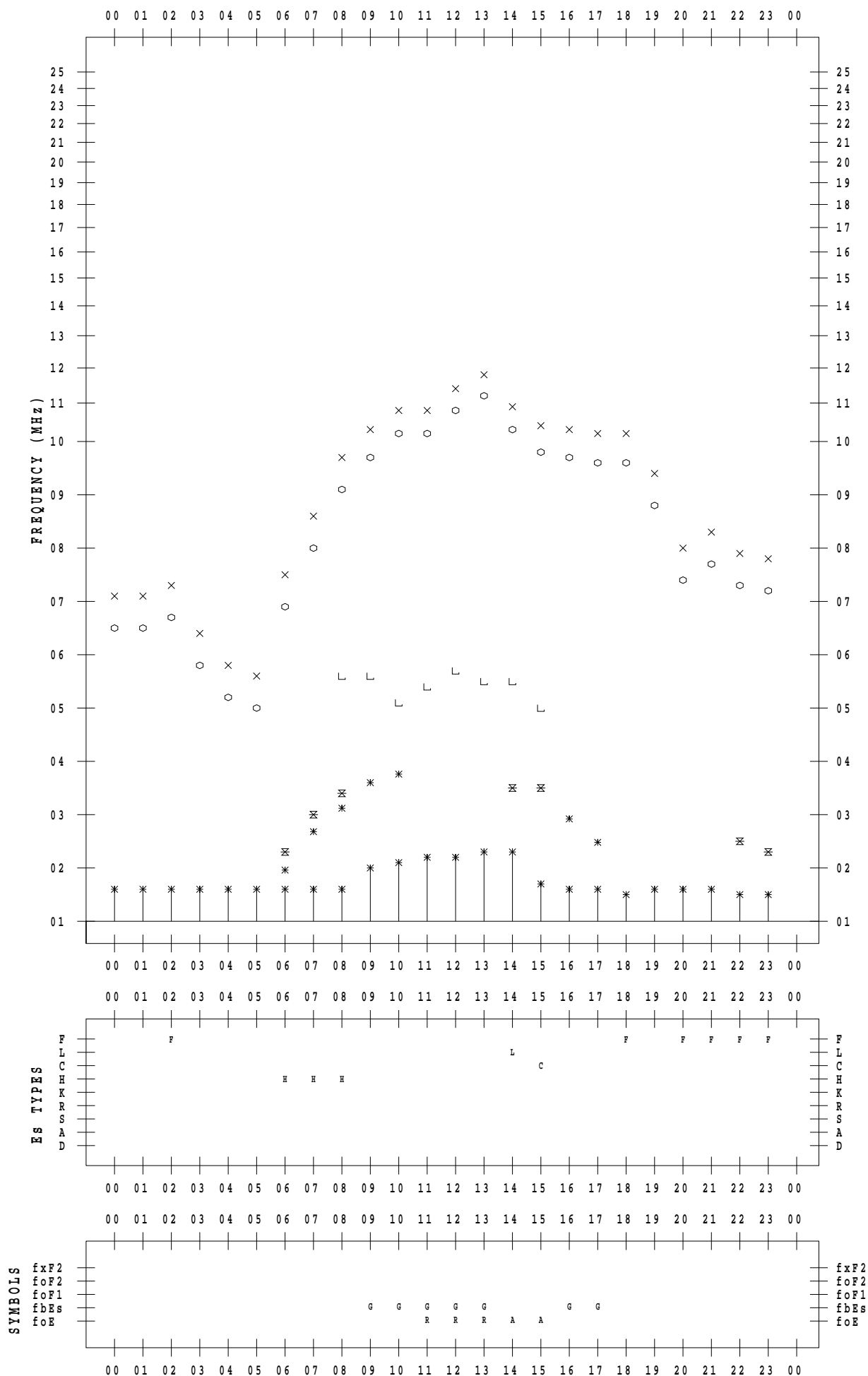
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 7

135 ° E MEAN TIME



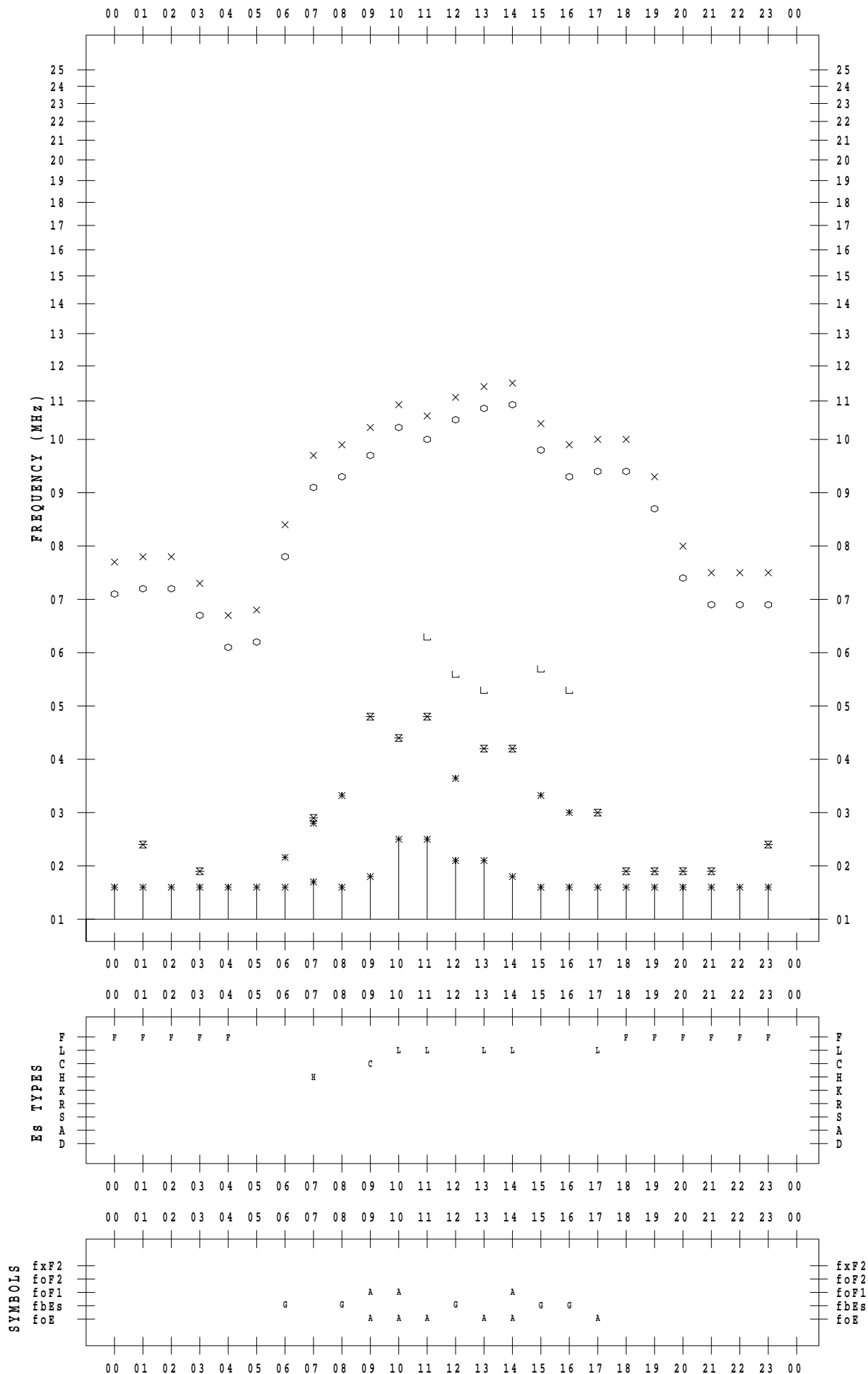
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 8

135 ° E MEAN TIME



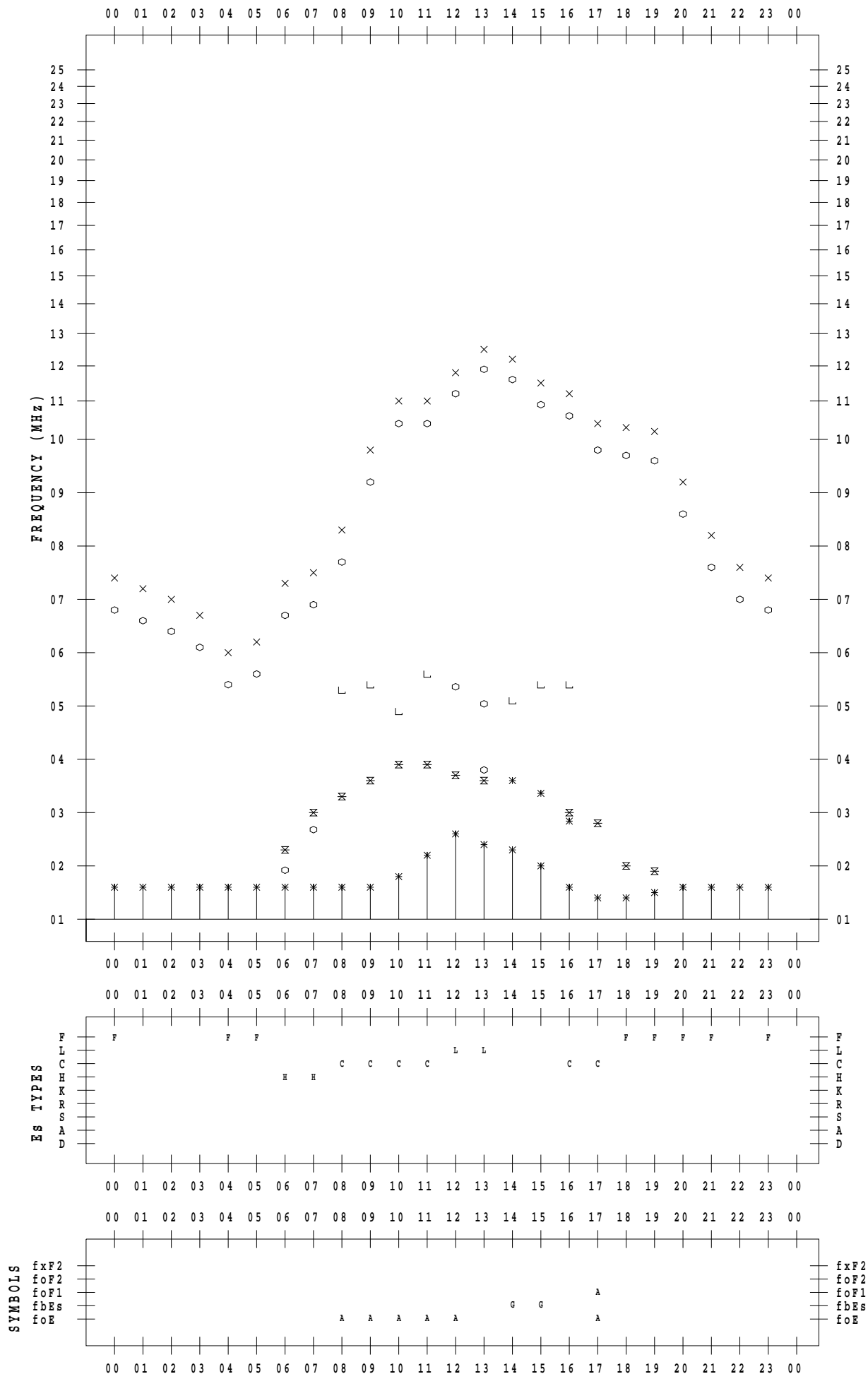
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 9

135 ° E MEAN TIME



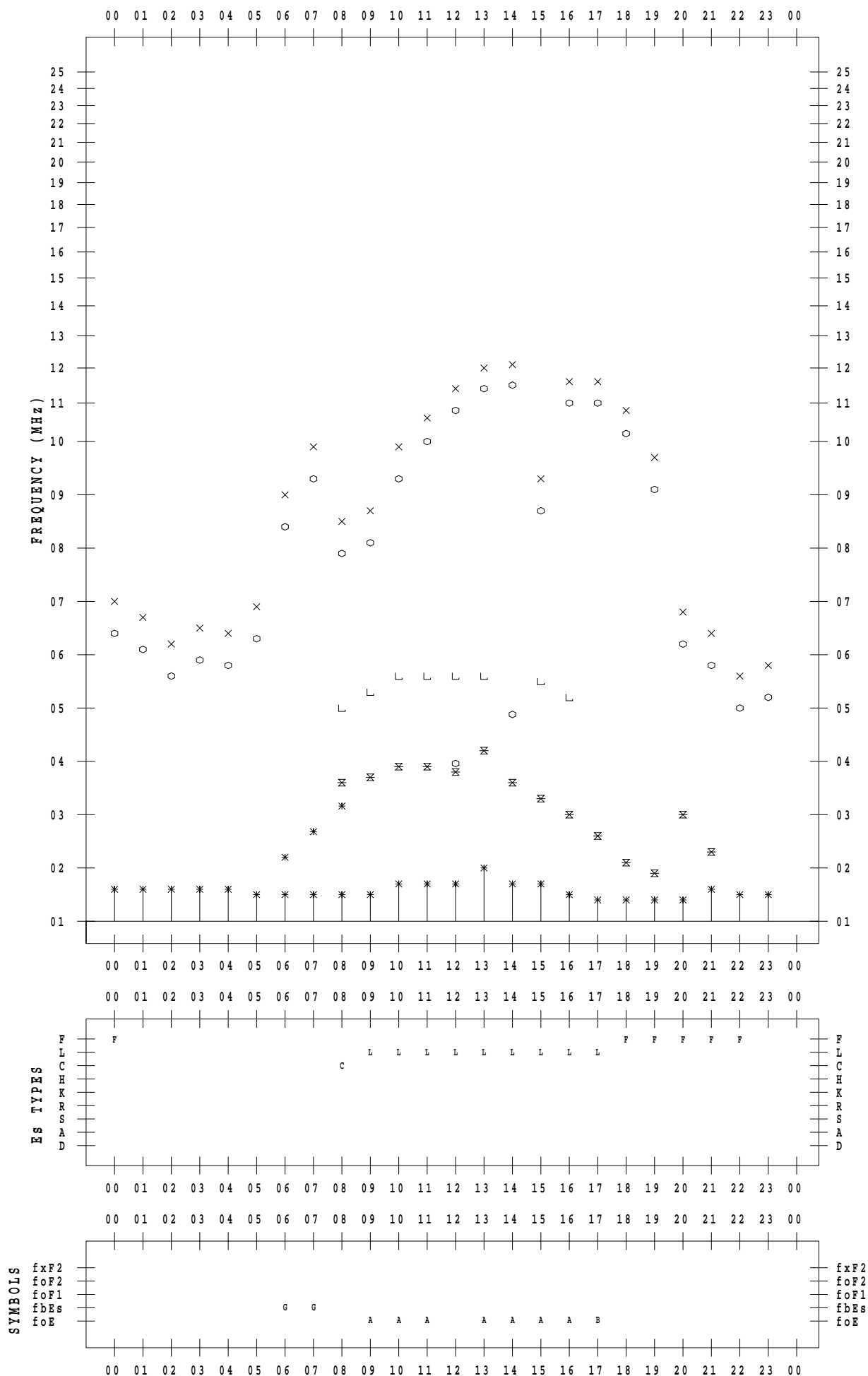
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 10

135 ° E MEAN TIME



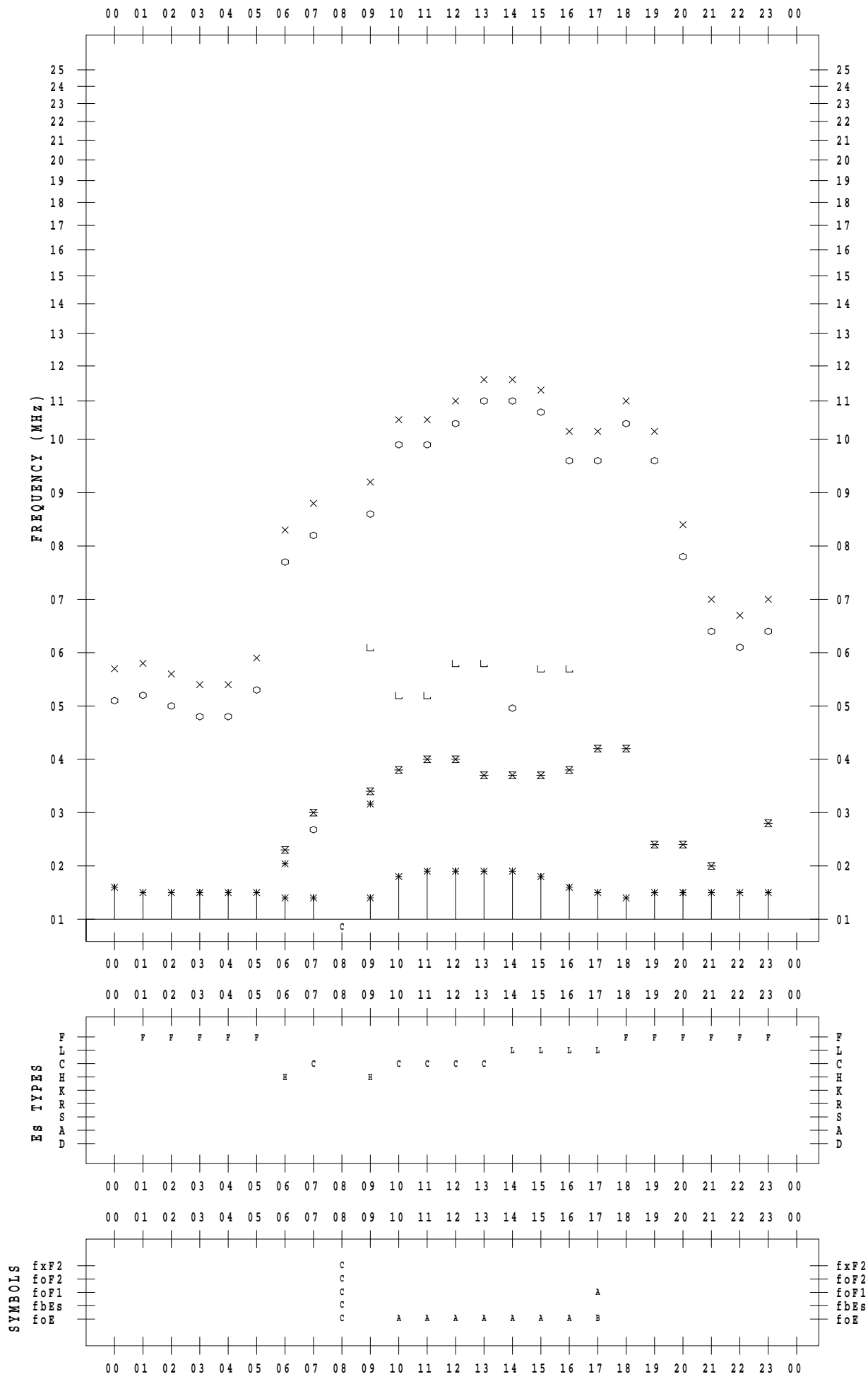
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 11

135 ° E MEAN TIME



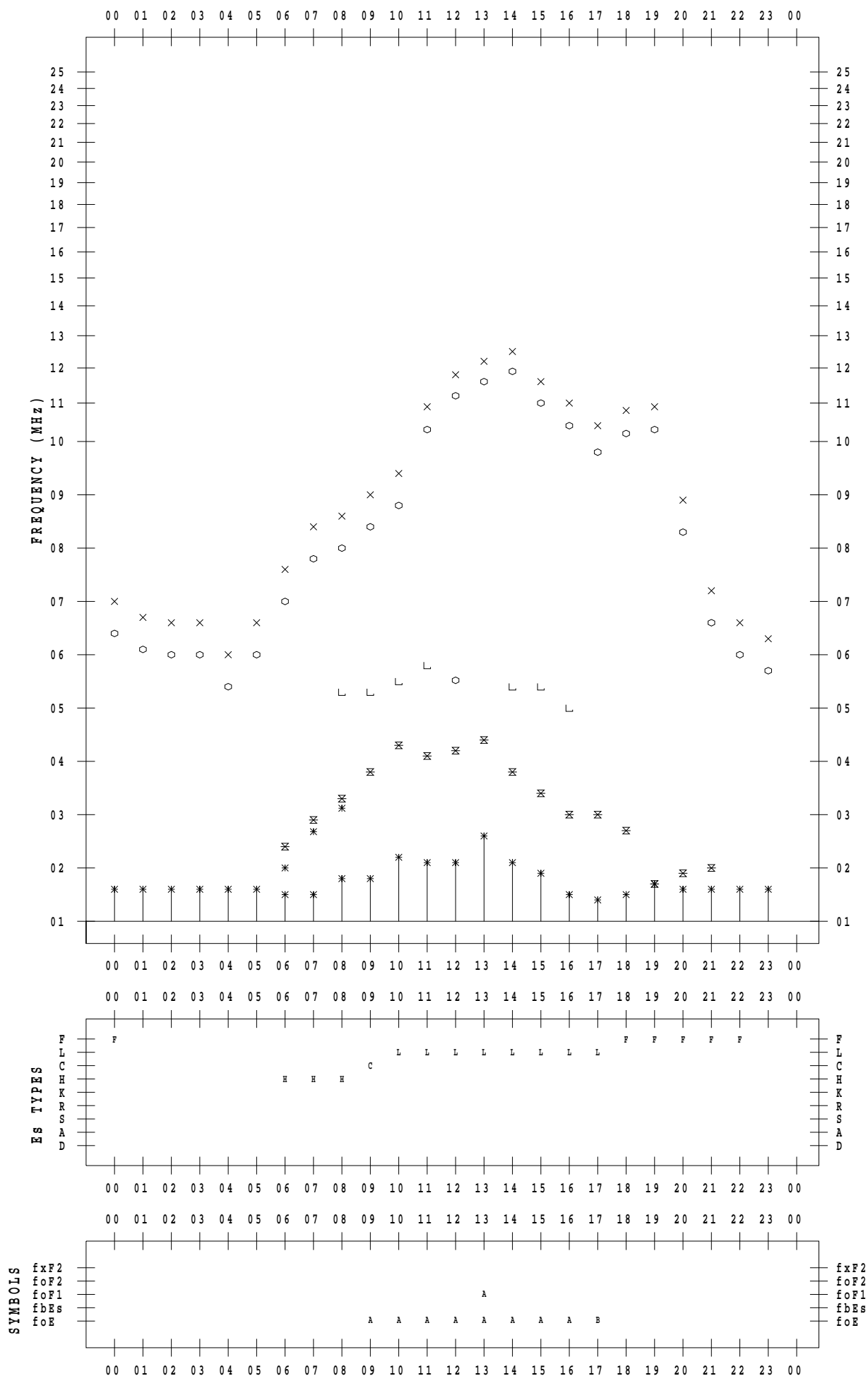
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 12

135 ° E MEAN TIME



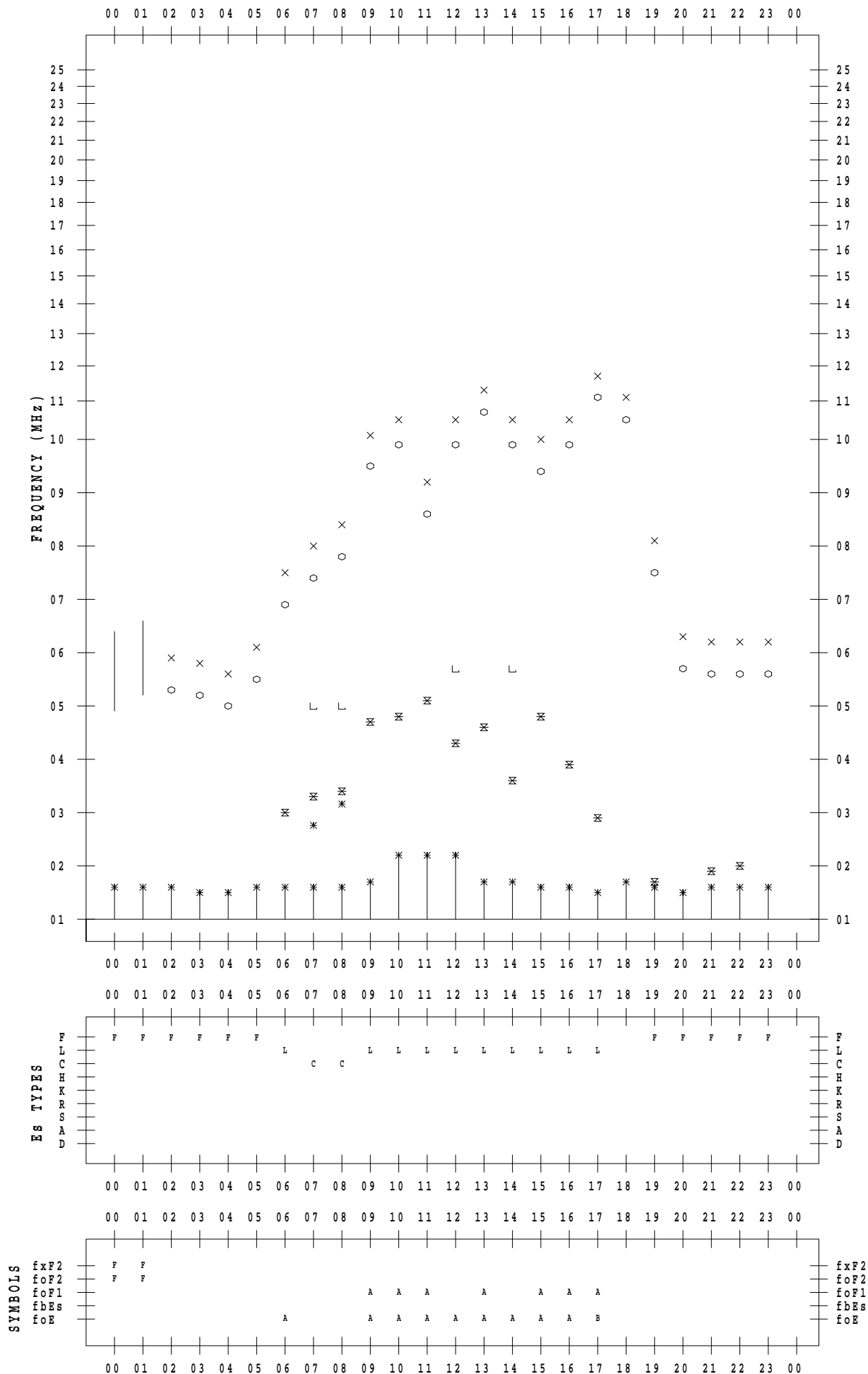
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 13

135 ° E MEAN TIME



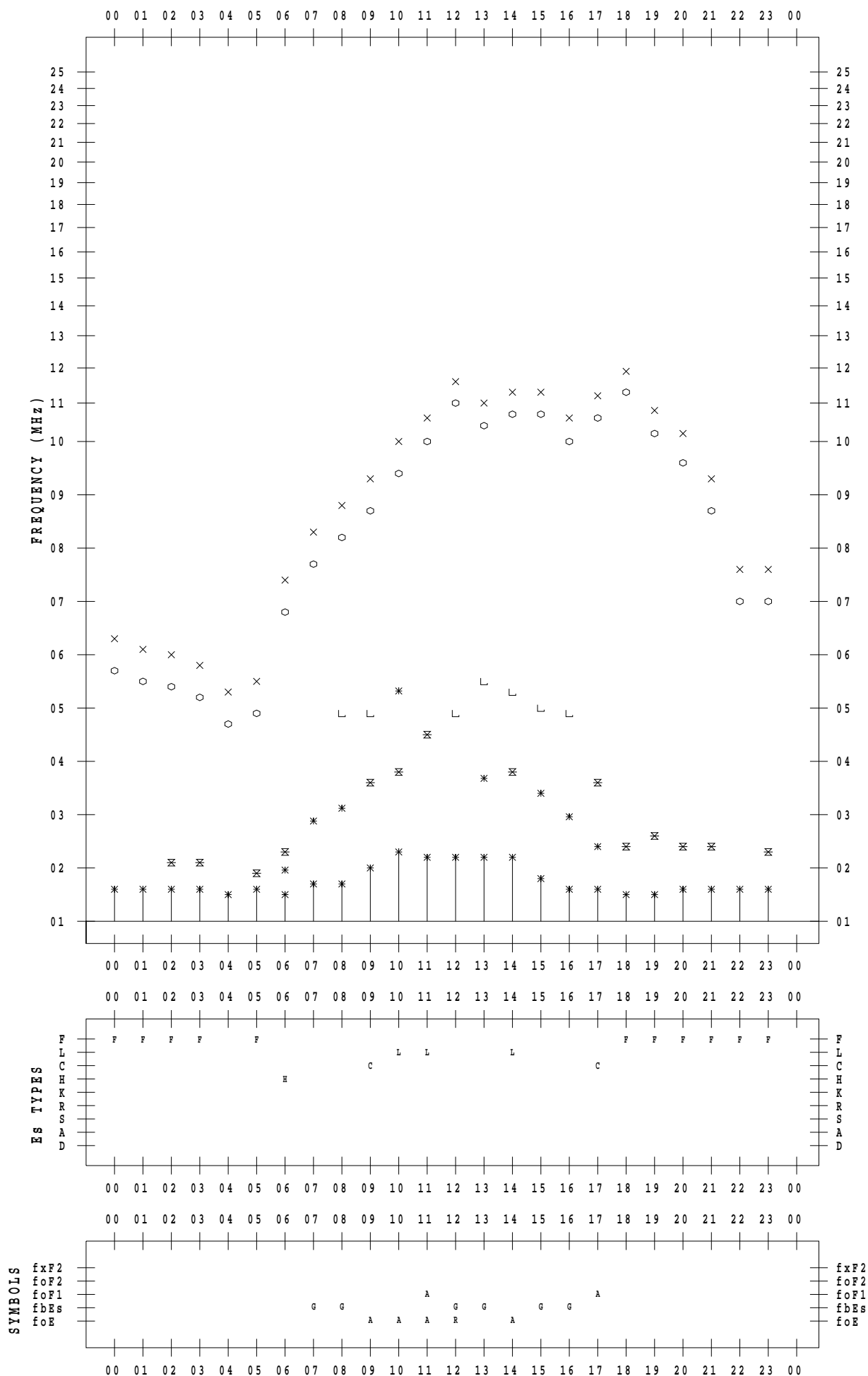
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 14

135 ° E MEAN TIME





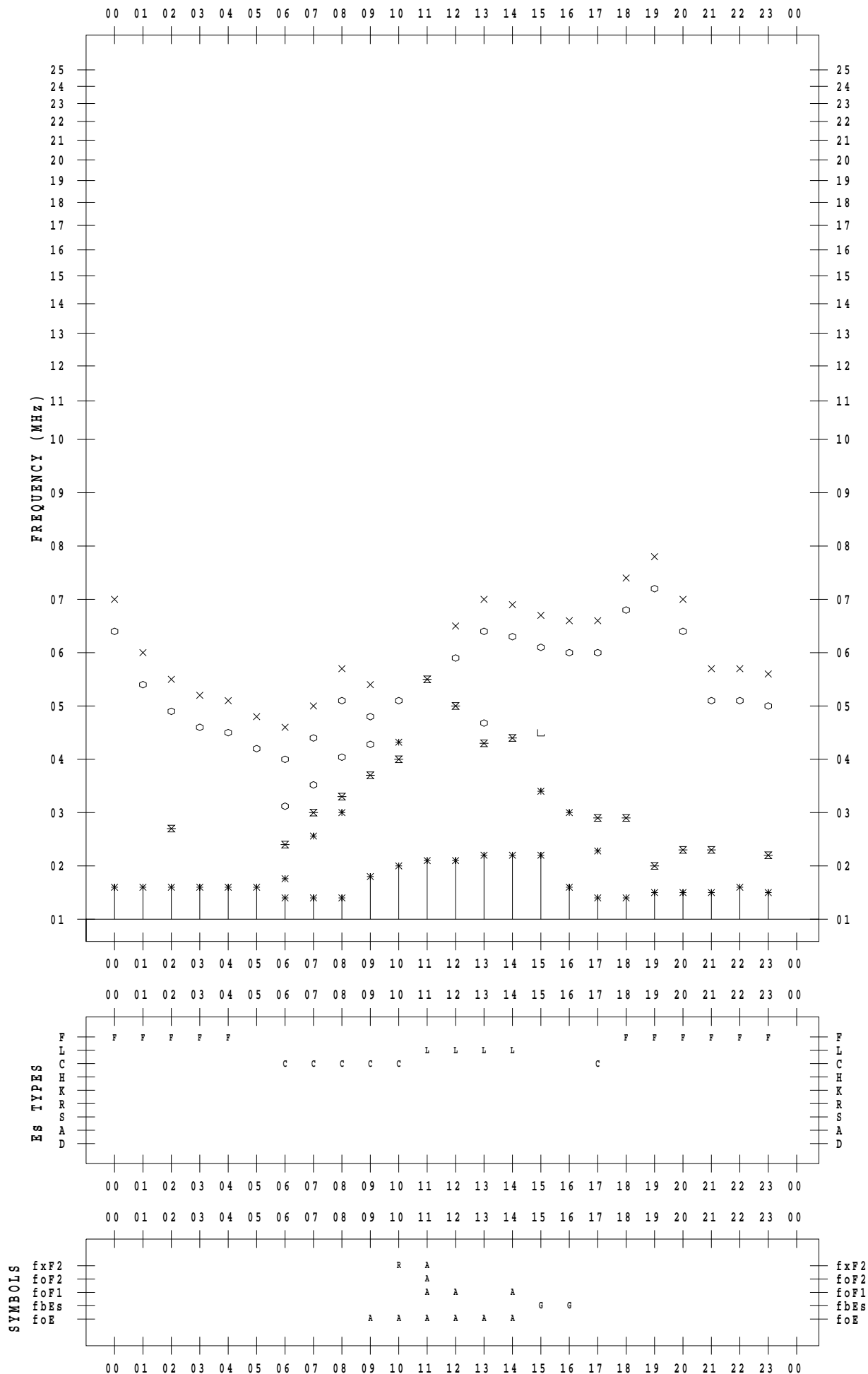
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 15

135 ° E MEAN TIME



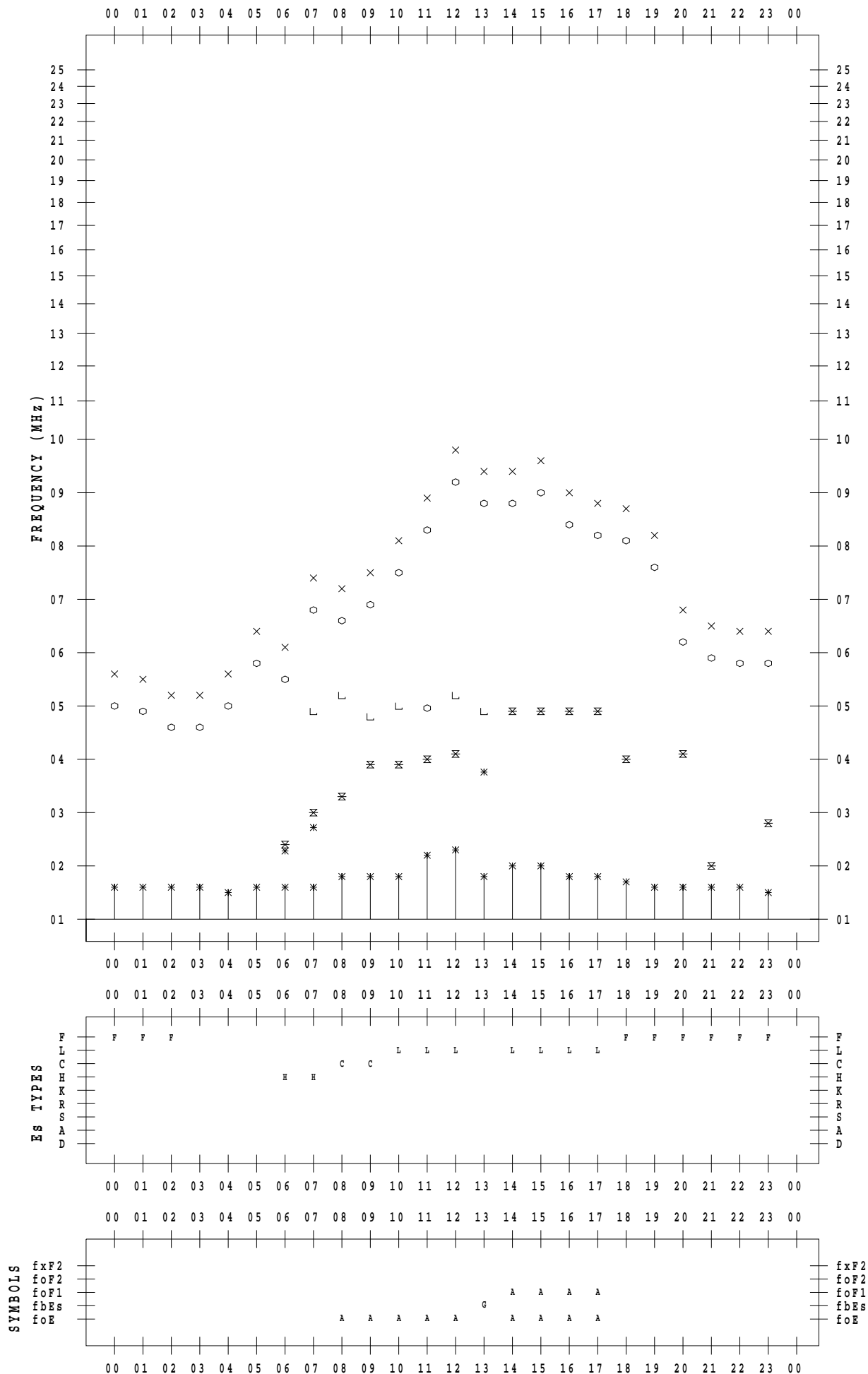
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 16

135 ° E MEAN TIME



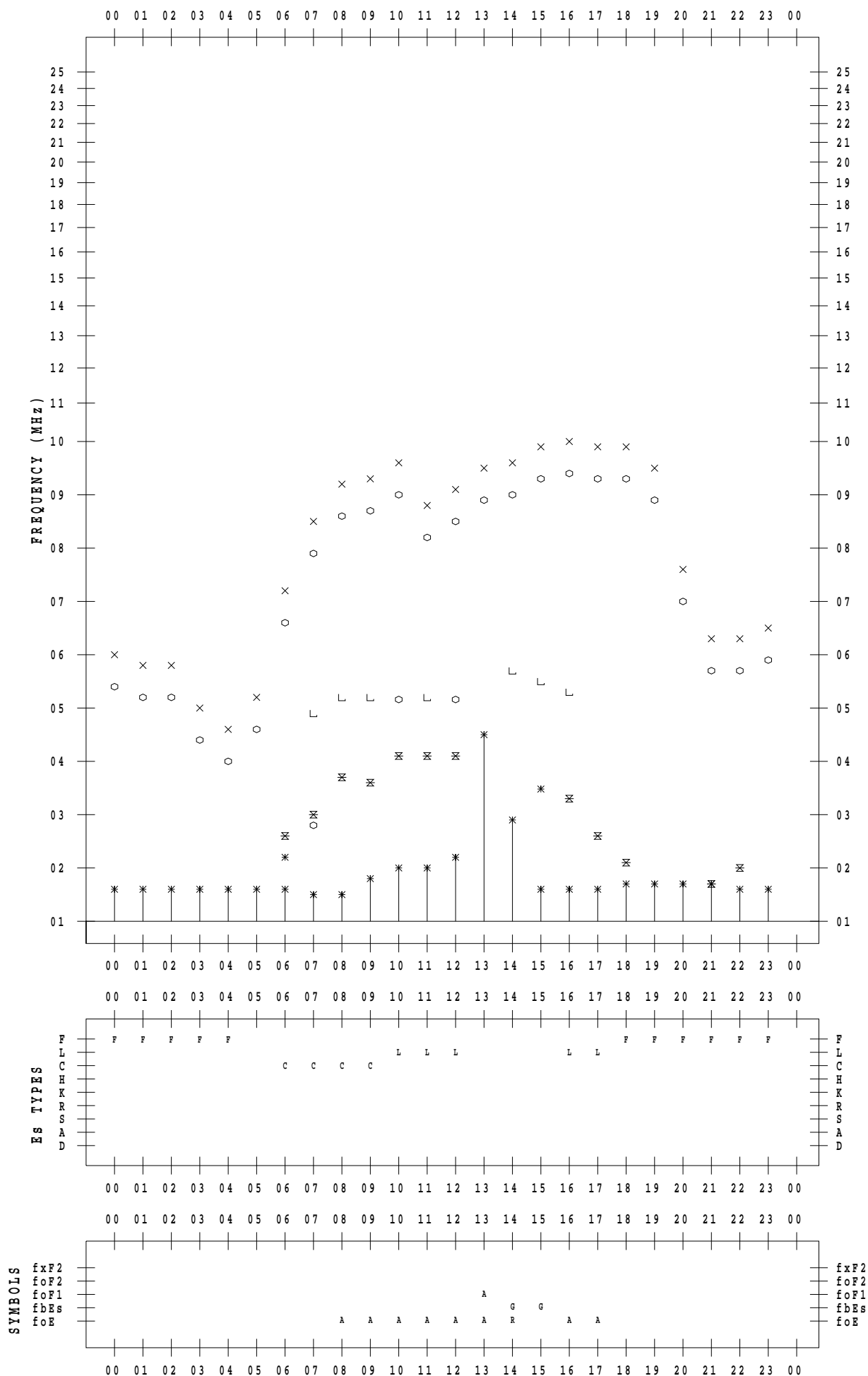
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 17

135 ° E MEAN TIME



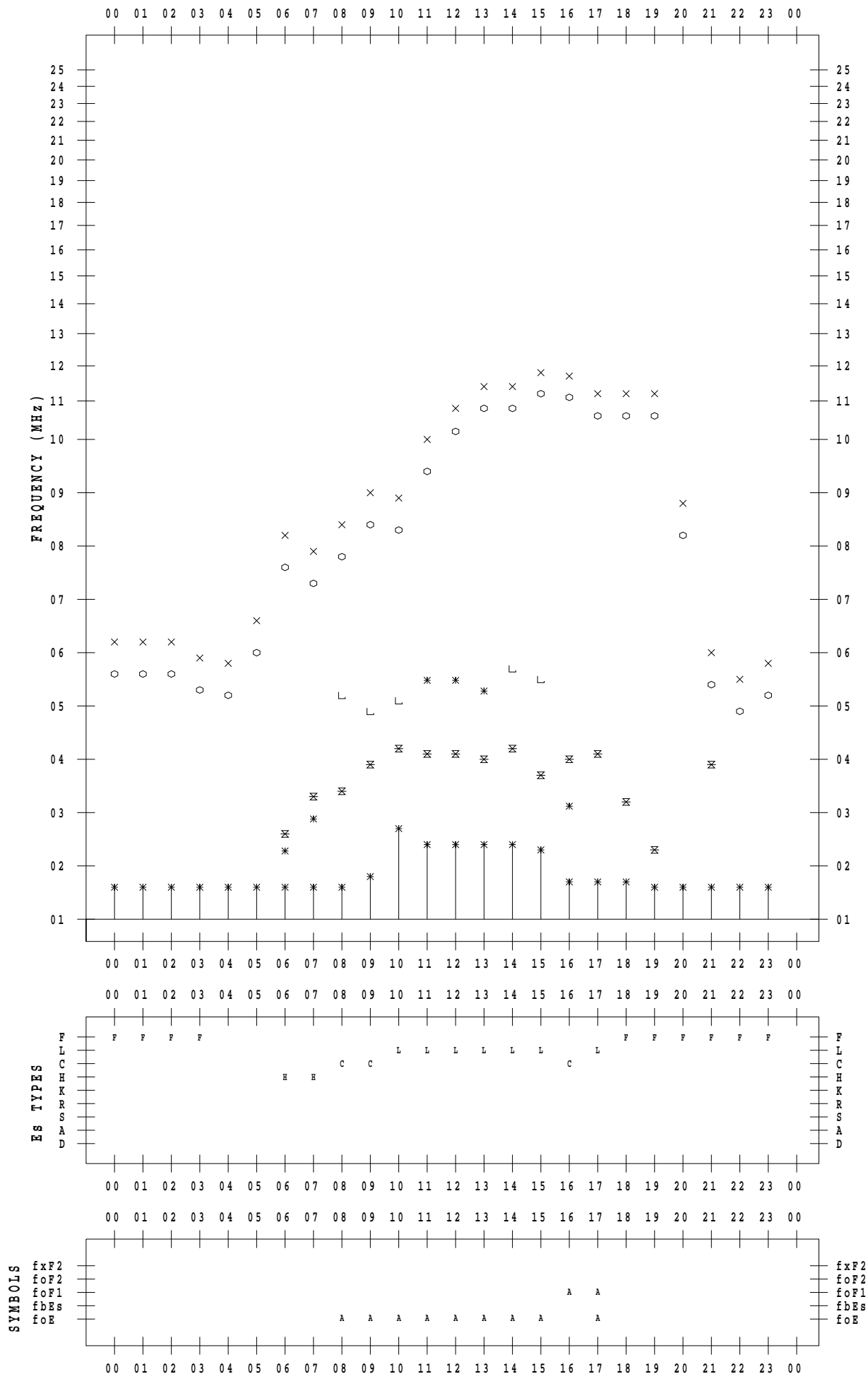
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 18

135 ° E MEAN TIME



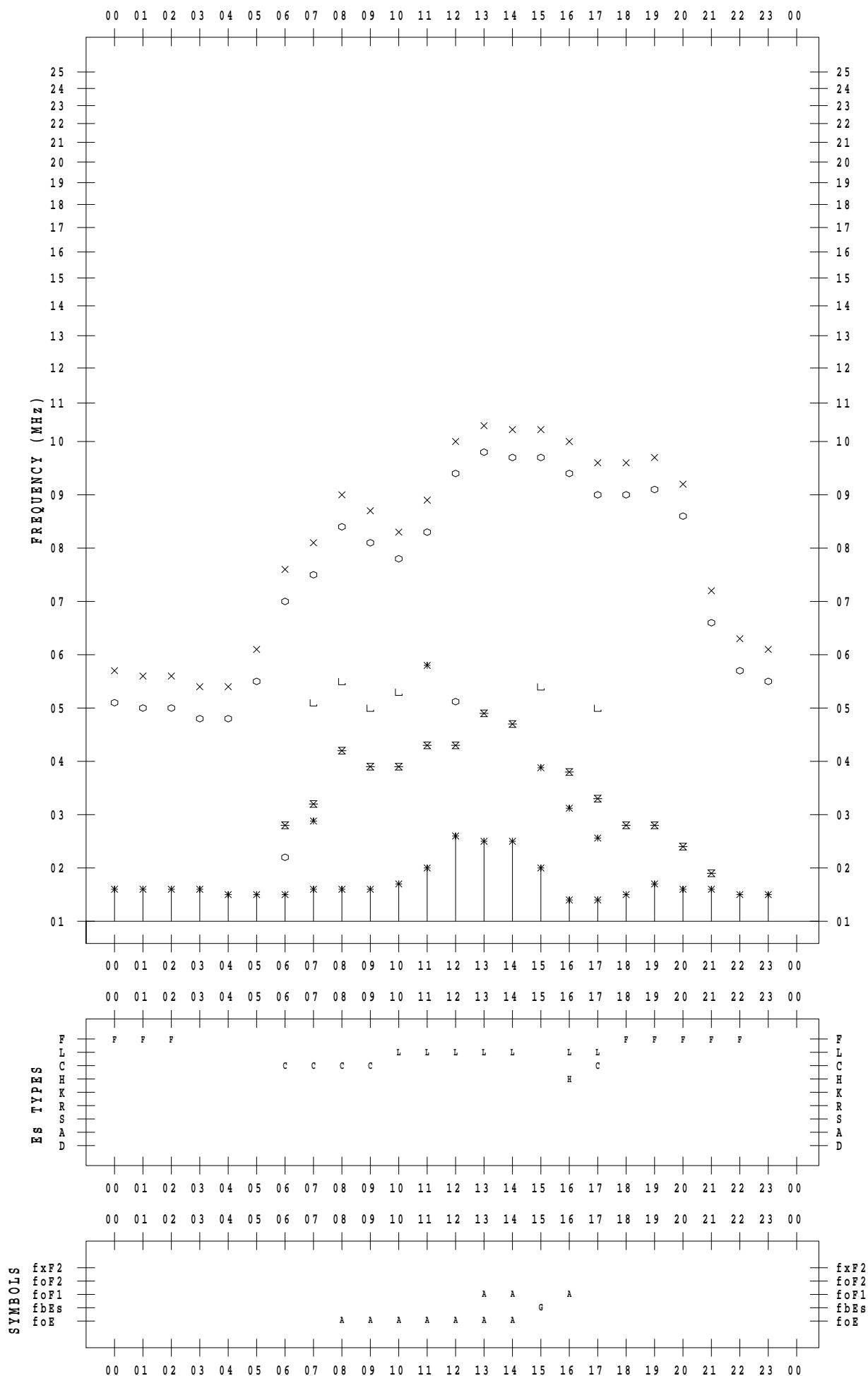
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 19

135 ° E MEAN TIME



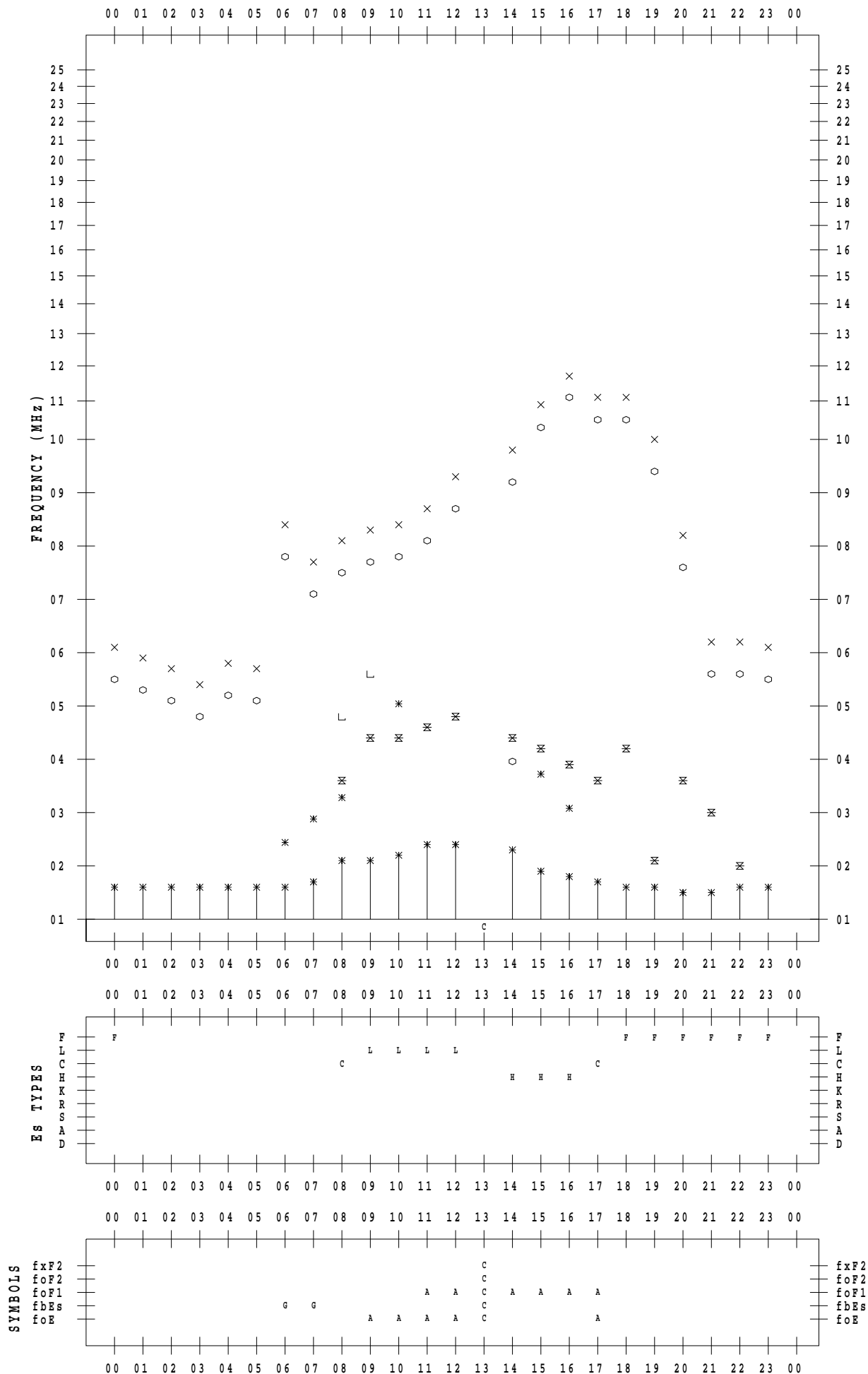
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 20

135 ° E MEAN TIME



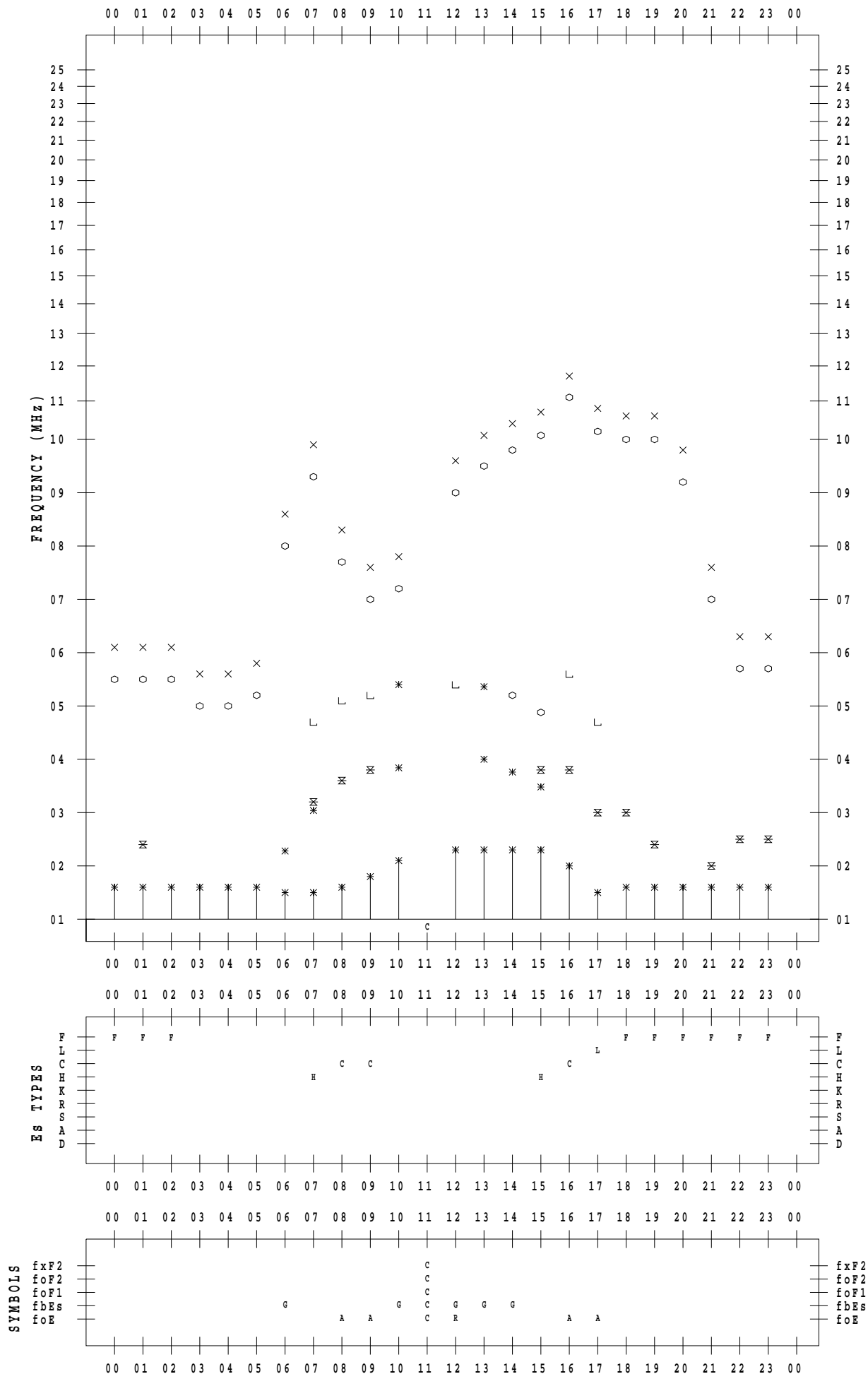
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 21

135 ° E MEAN TIME



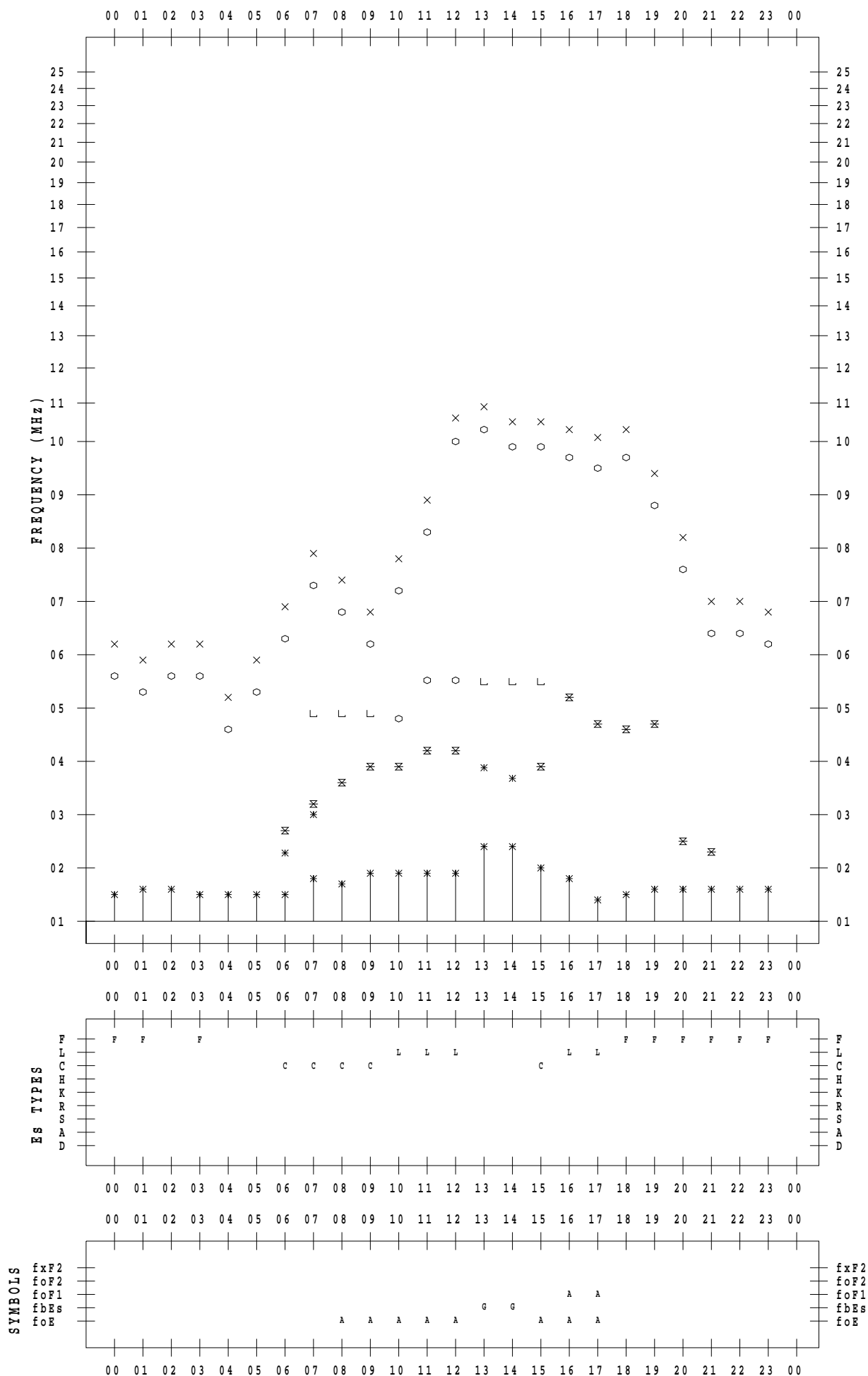
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 22

135 ° E MEAN TIME





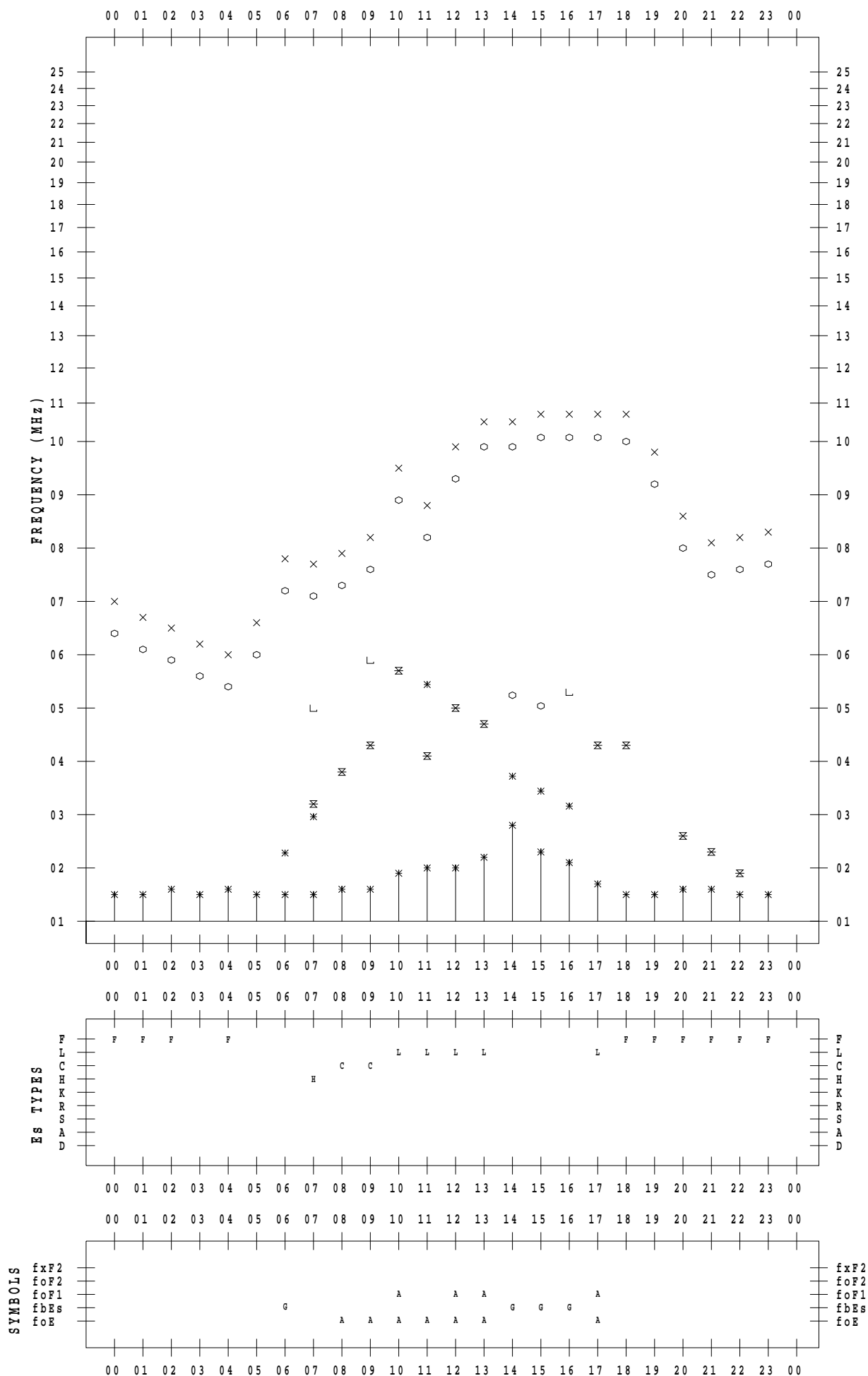
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 23

135 ° E MEAN TIME



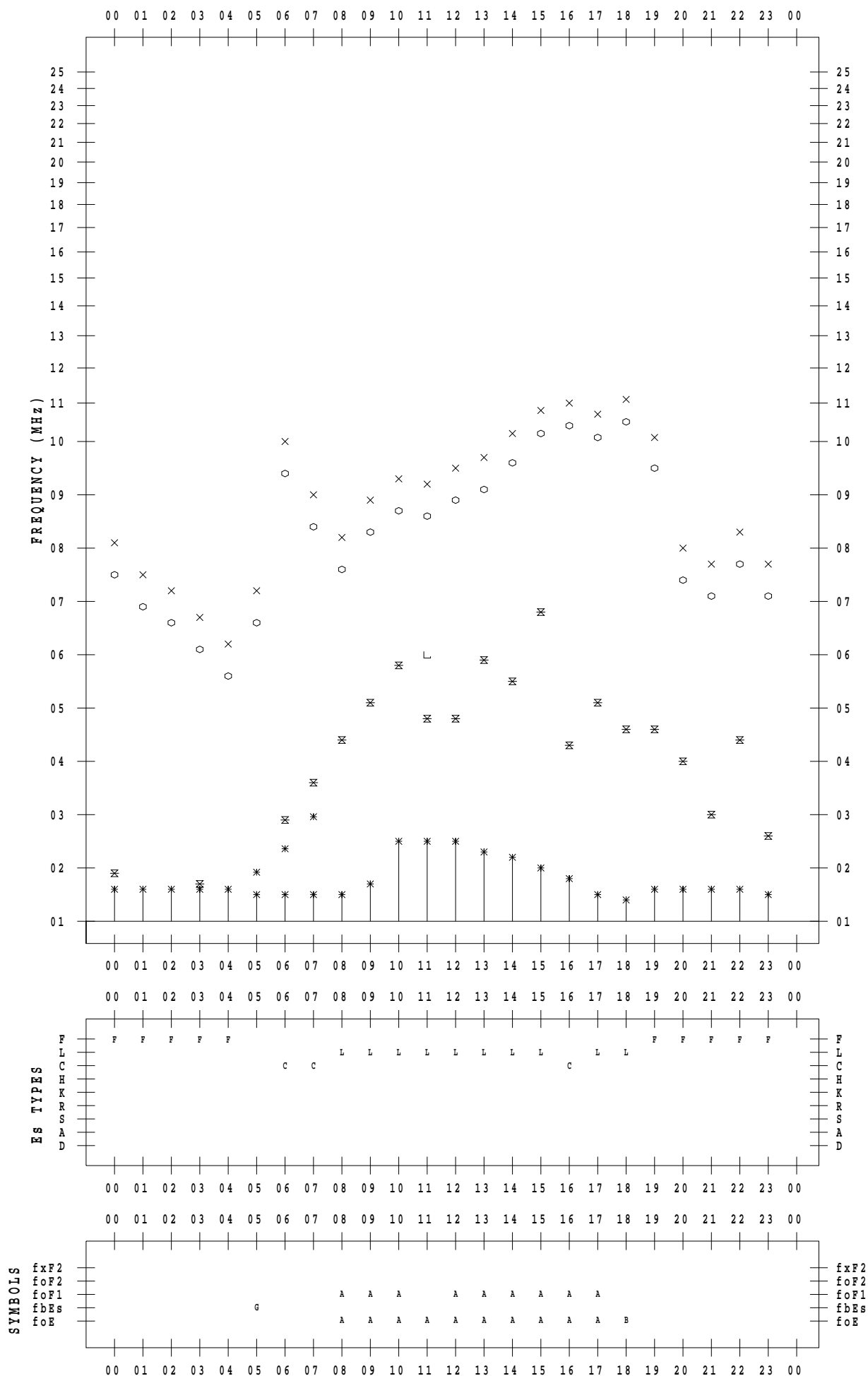
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 24

135 ° E MEAN TIME



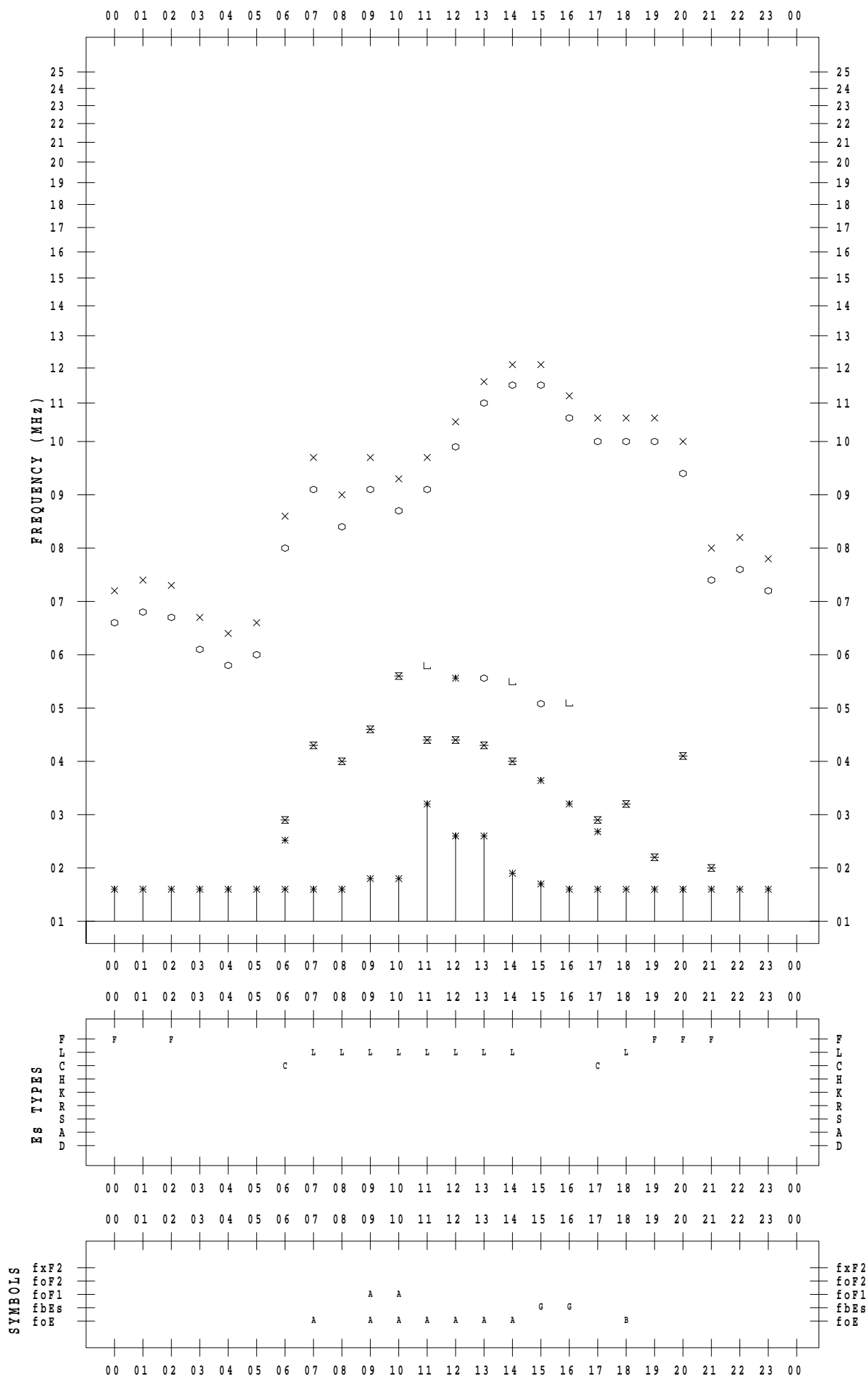
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 25

135 ° E MEAN TIME



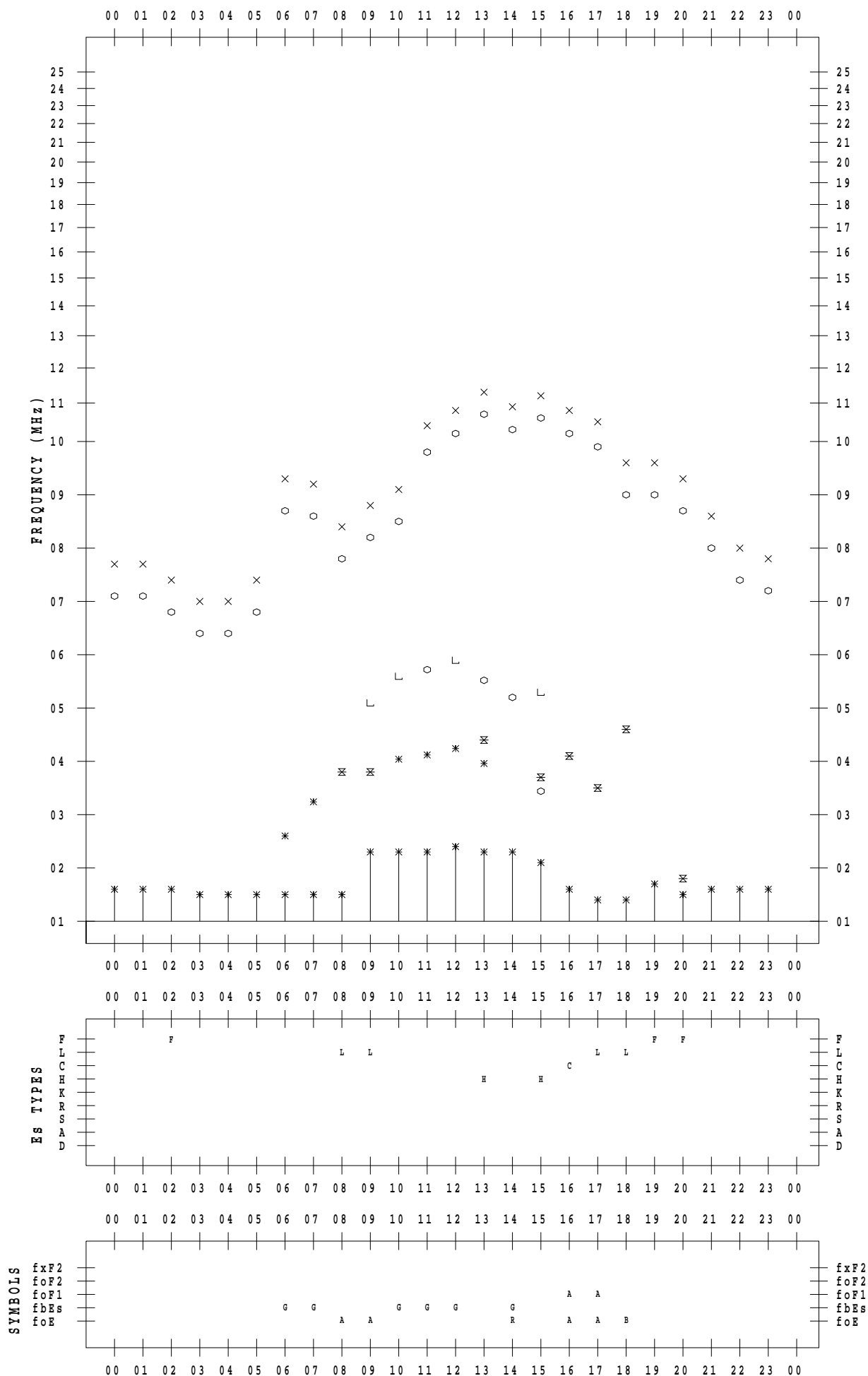
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 26

135 ° E MEAN TIME



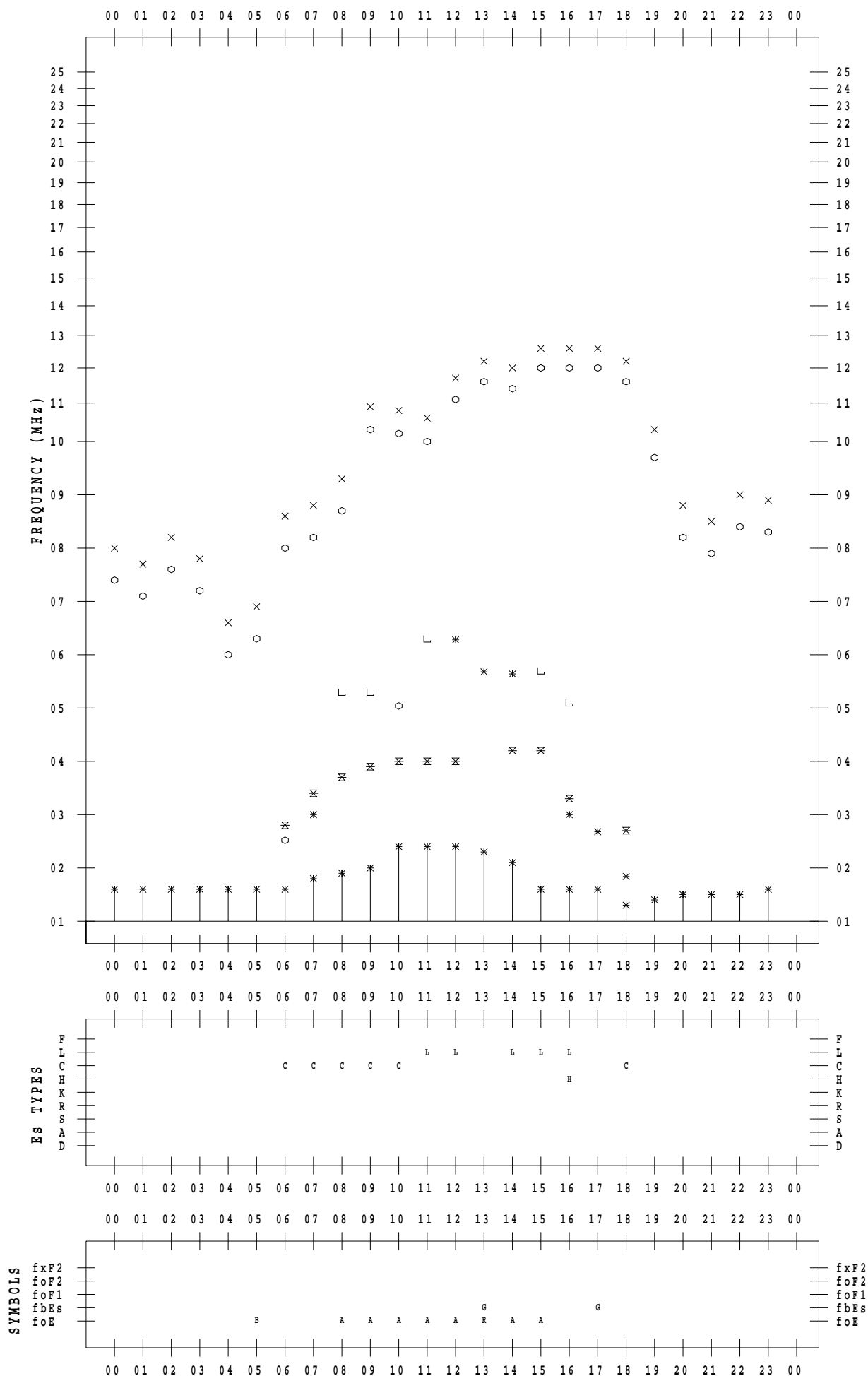
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 27

135 ° E MEAN TIME



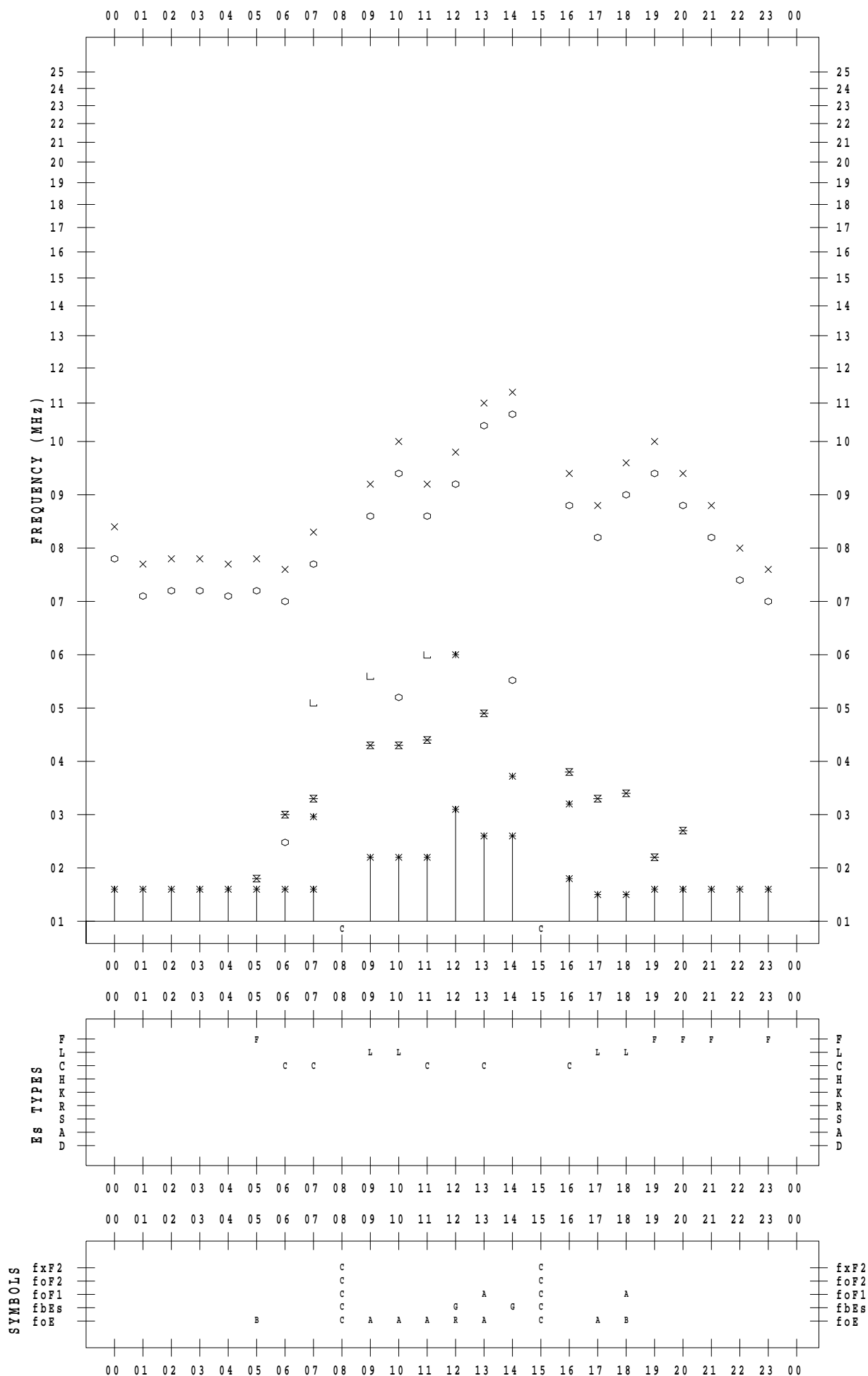
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 28

135 ° E MEAN TIME



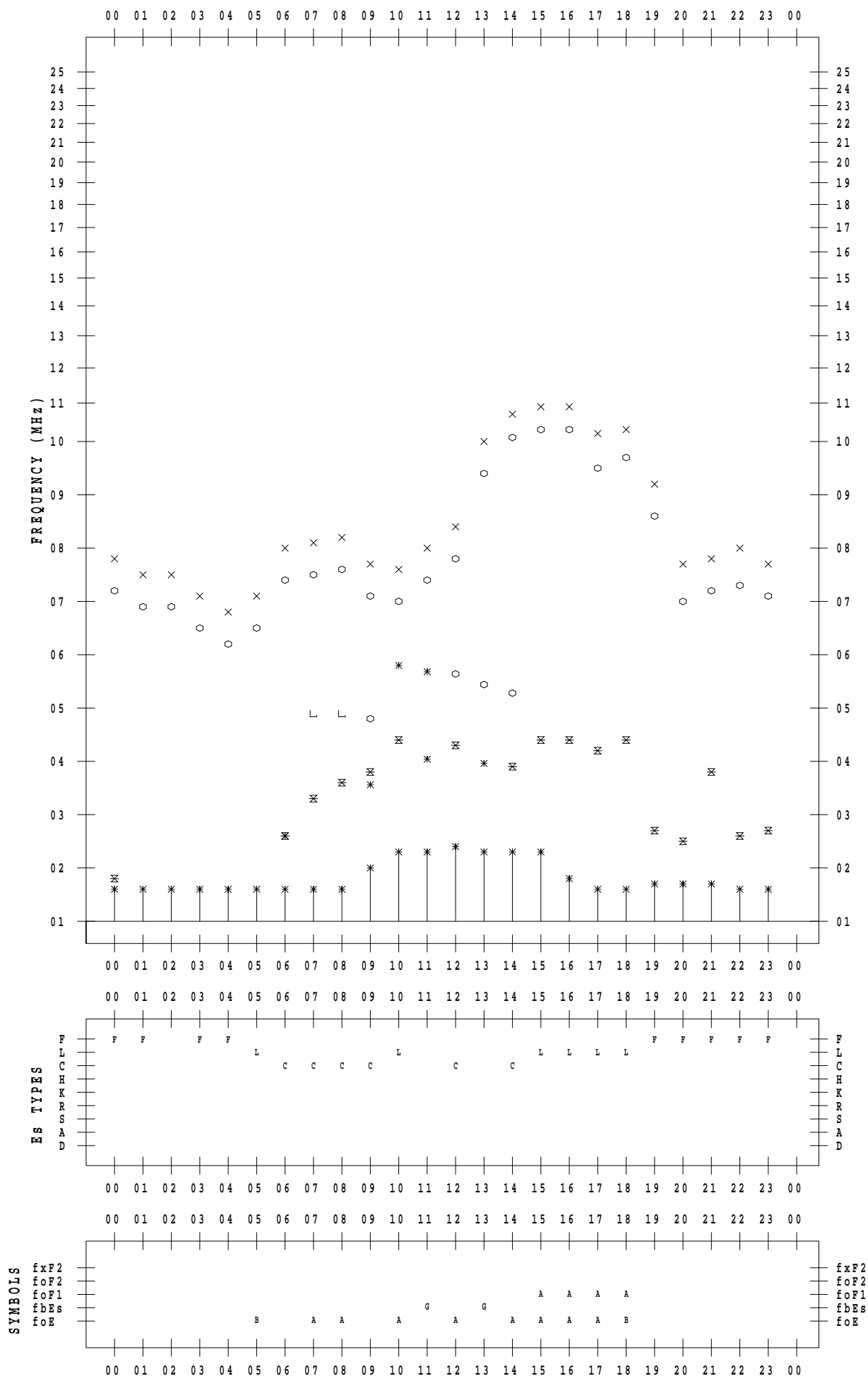
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 29

135 ° E MEAN TIME



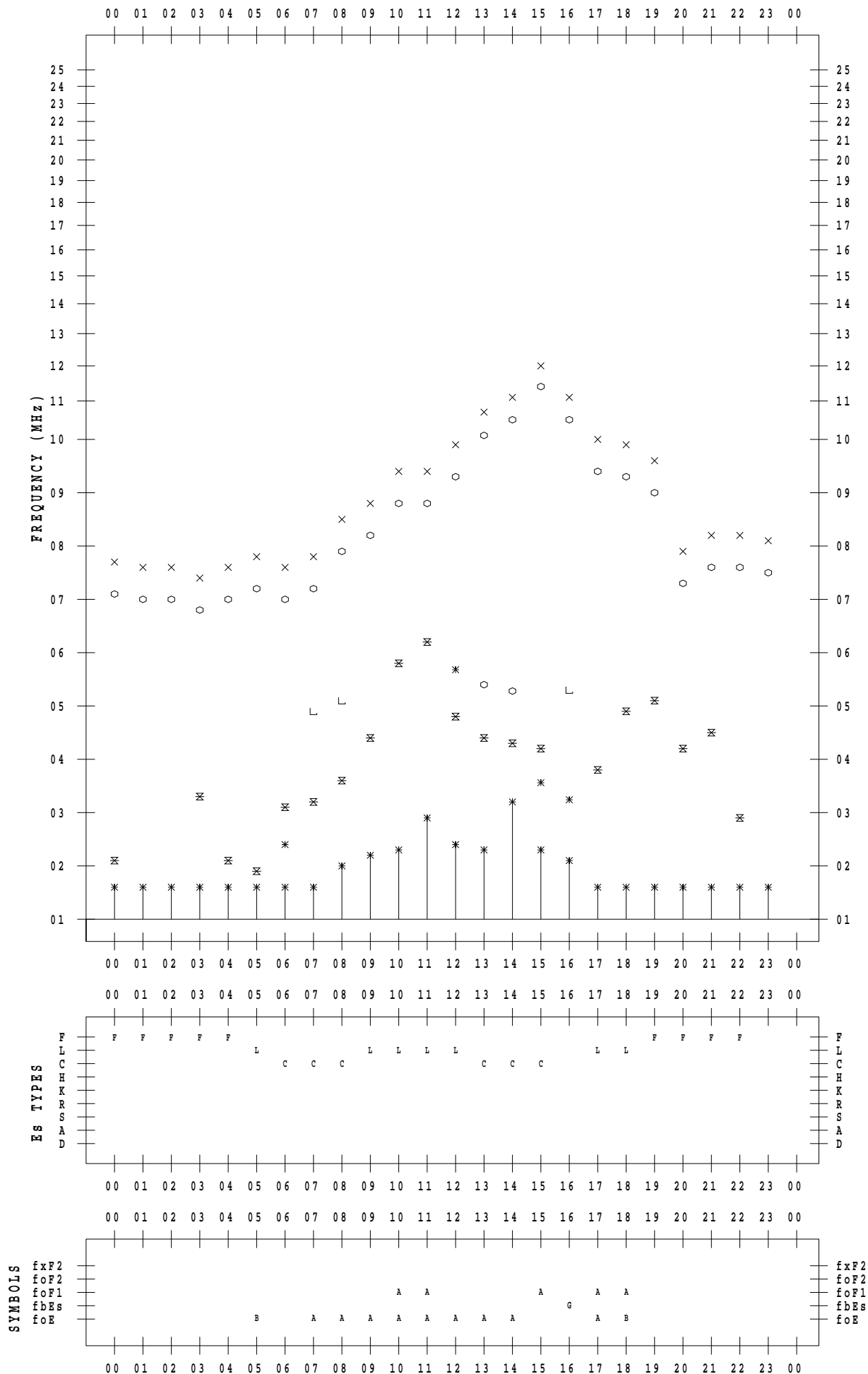
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2022 / 4 / 30

135 ° E MEAN TIME





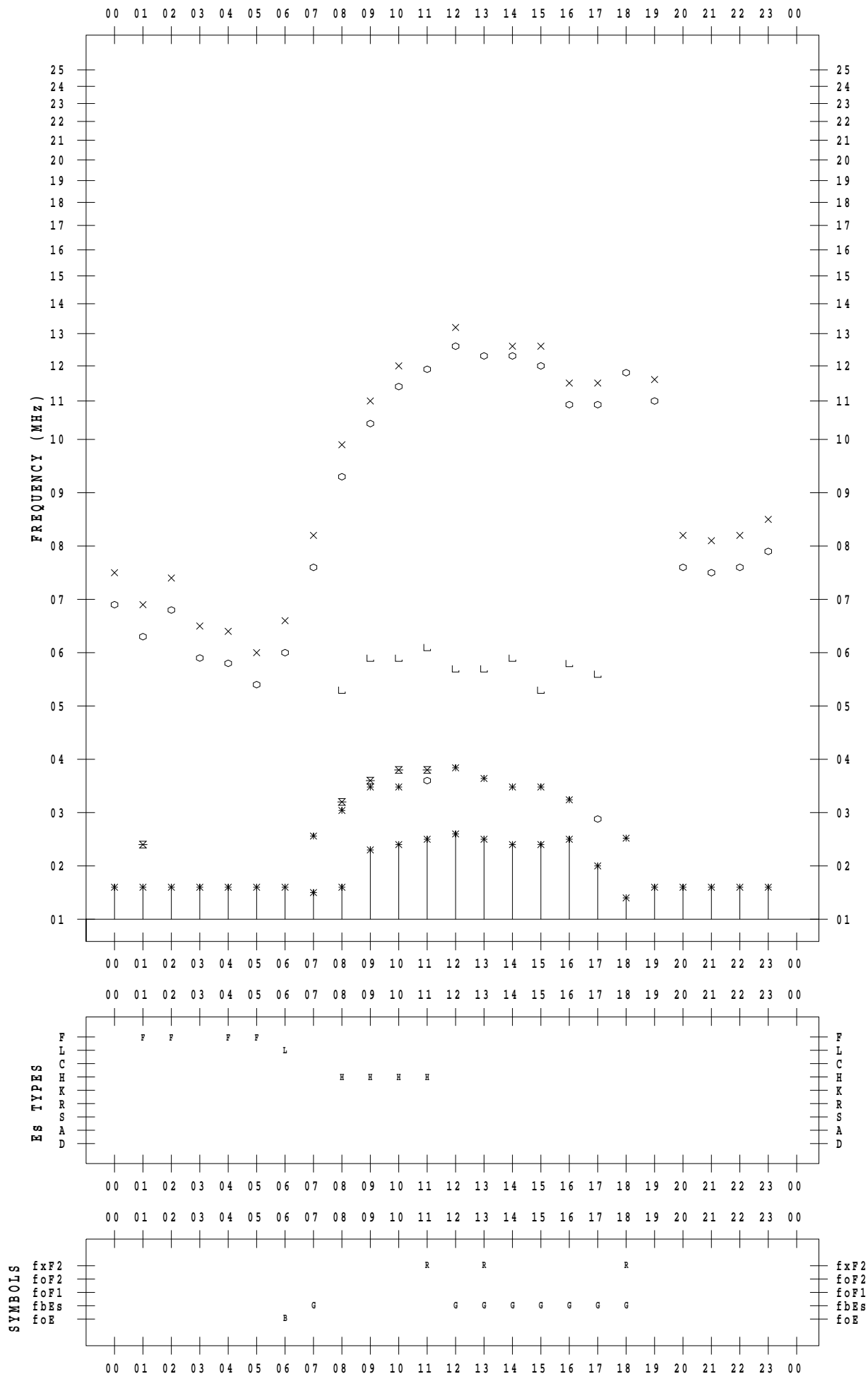
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 1

135 ° E MEAN TIME



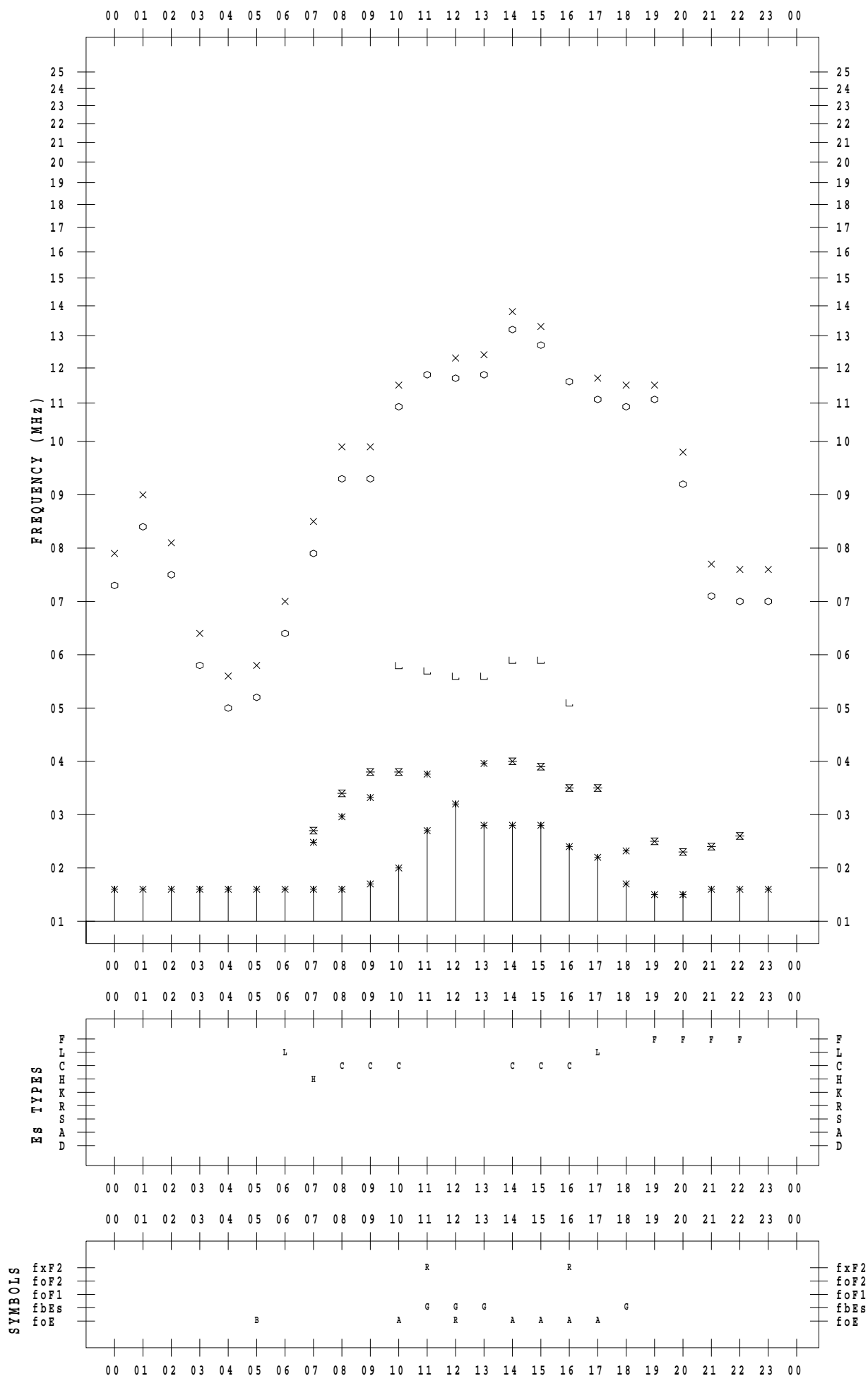
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 2

135 ° E MEAN TIME



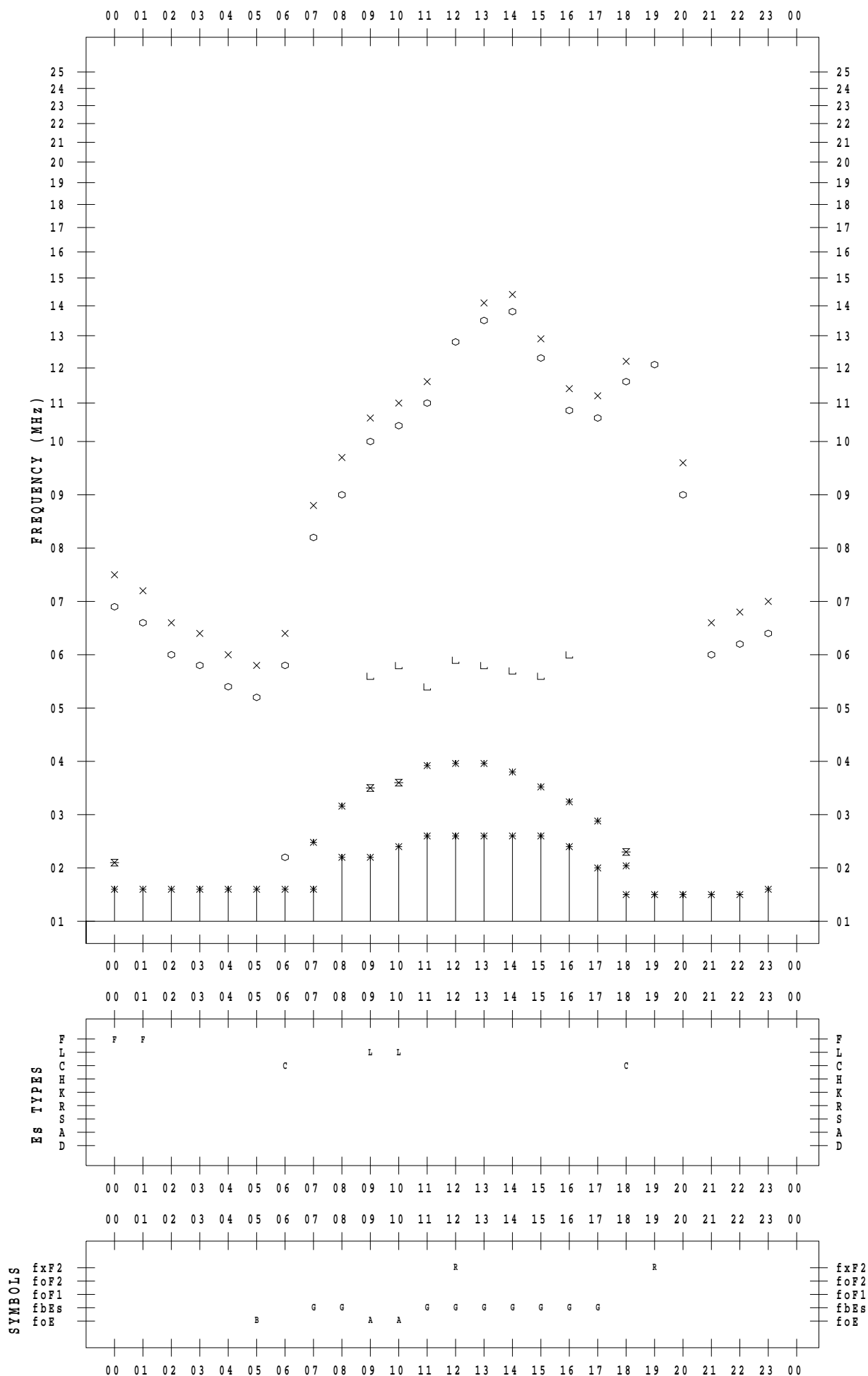
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 3

135 ° E MEAN TIME



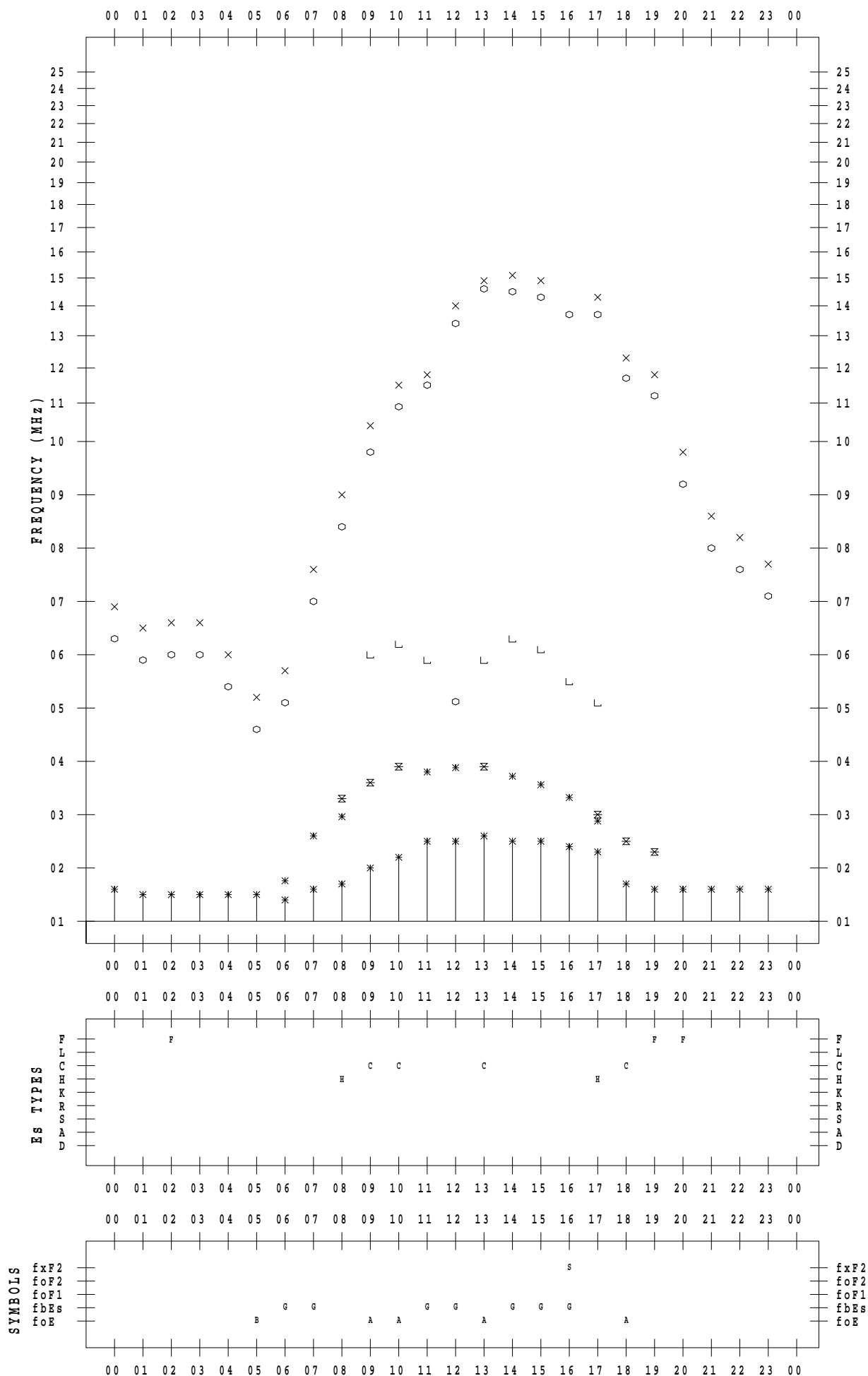
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 4

135 ° E MEAN TIME



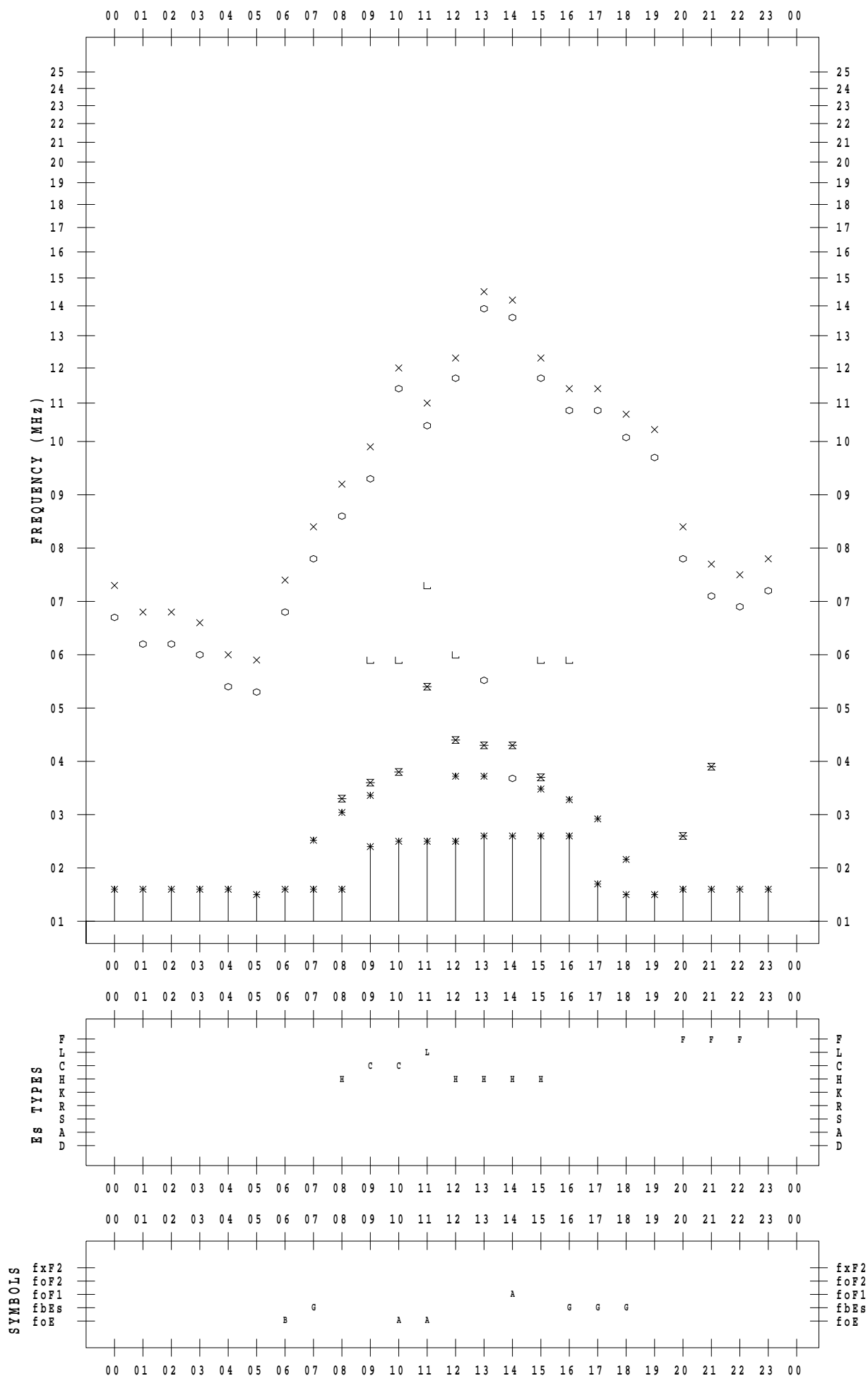
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 5

135 ° E MEAN TIME



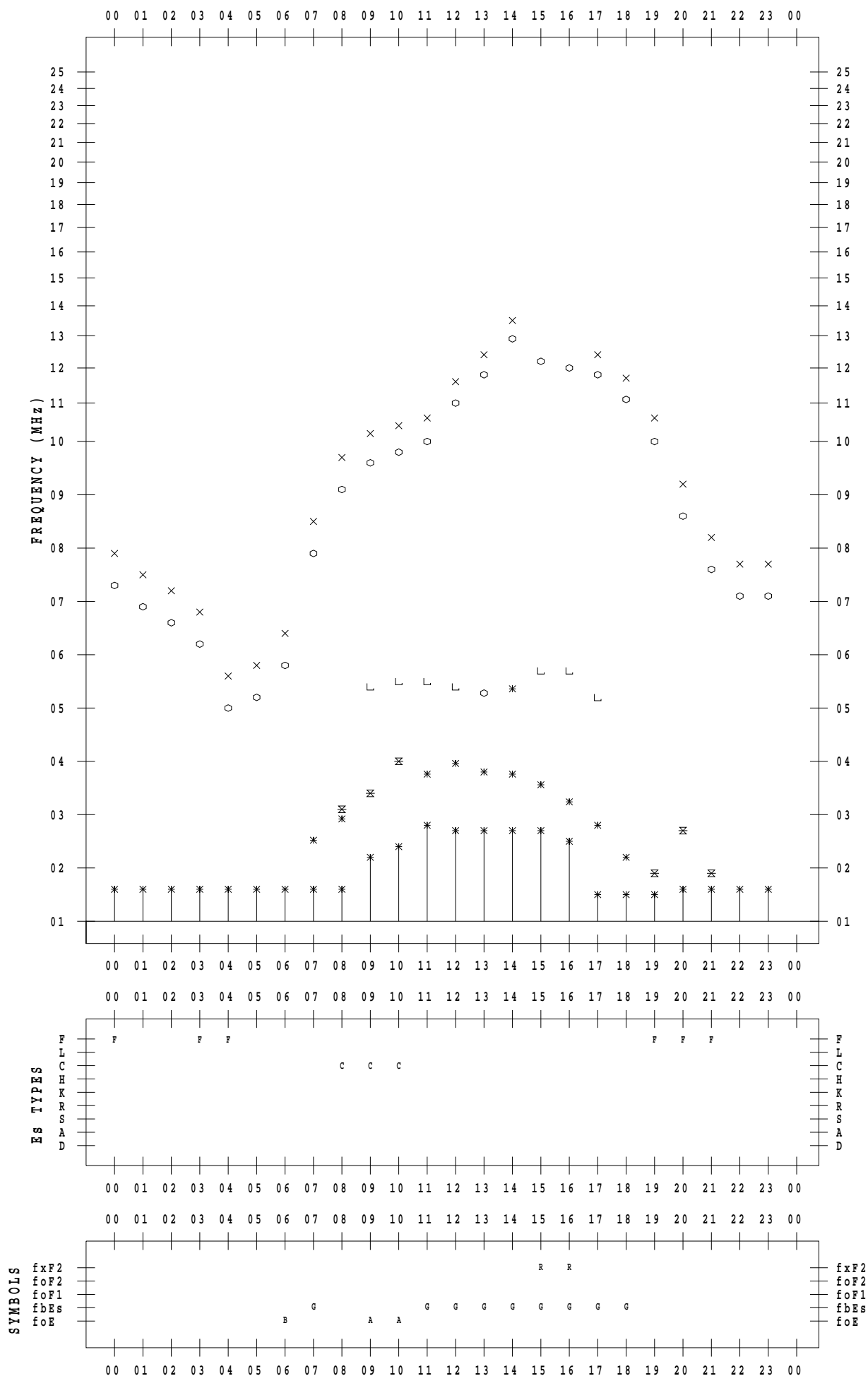
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 6

135 ° E MEAN TIME



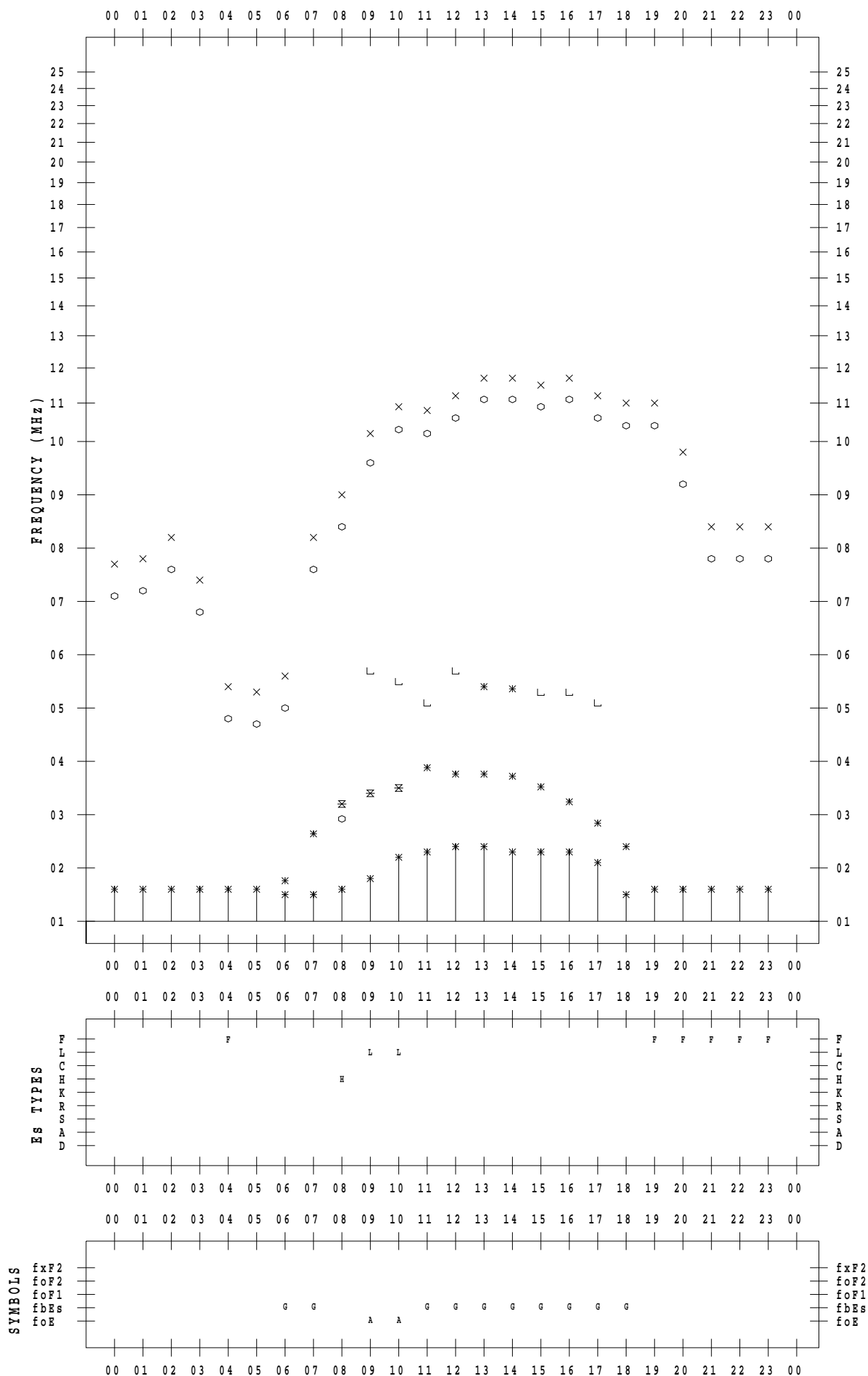
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 7

135 ° E MEAN TIME



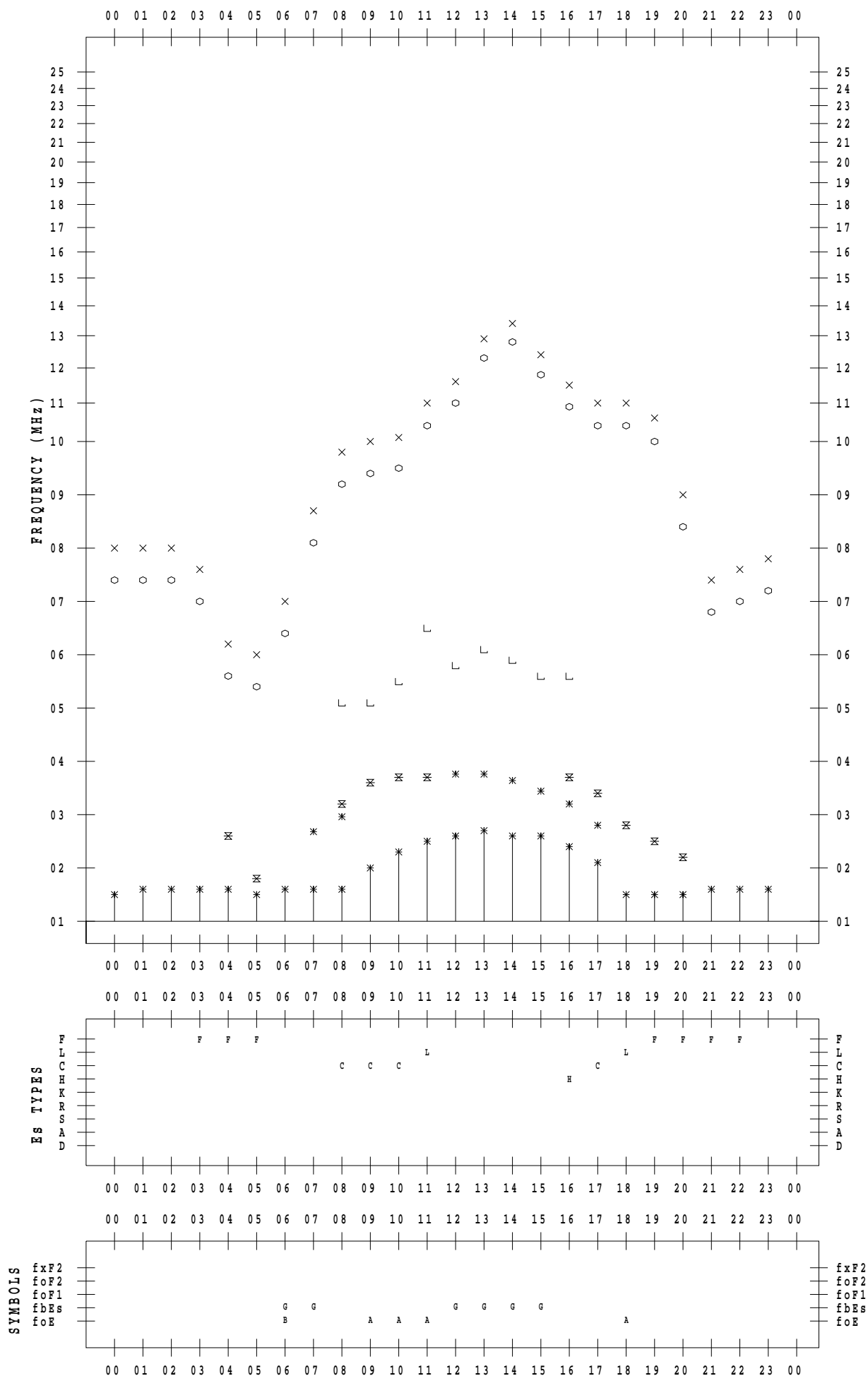
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 8

135 ° E MEAN TIME





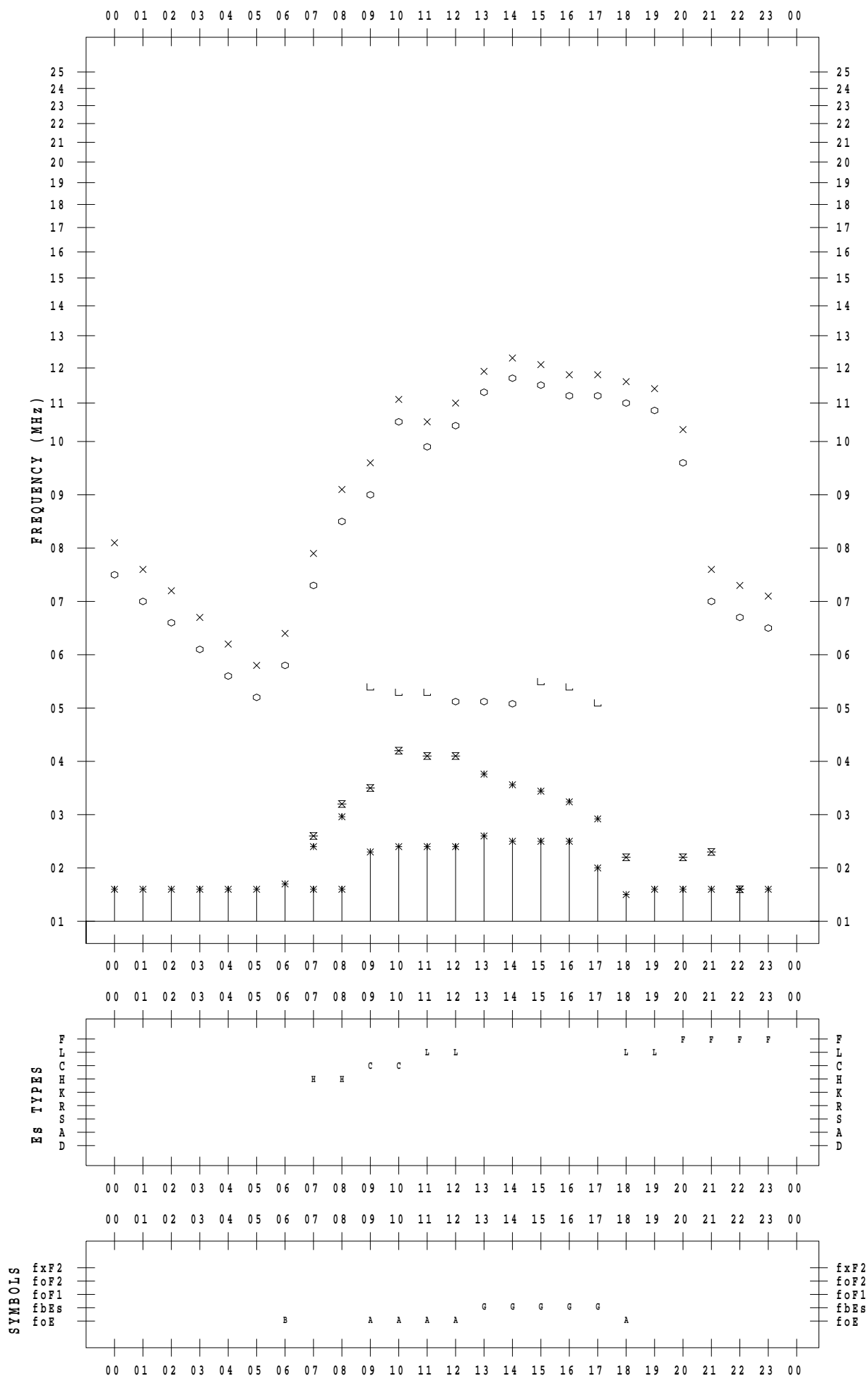
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 9

135 ° E MEAN TIME



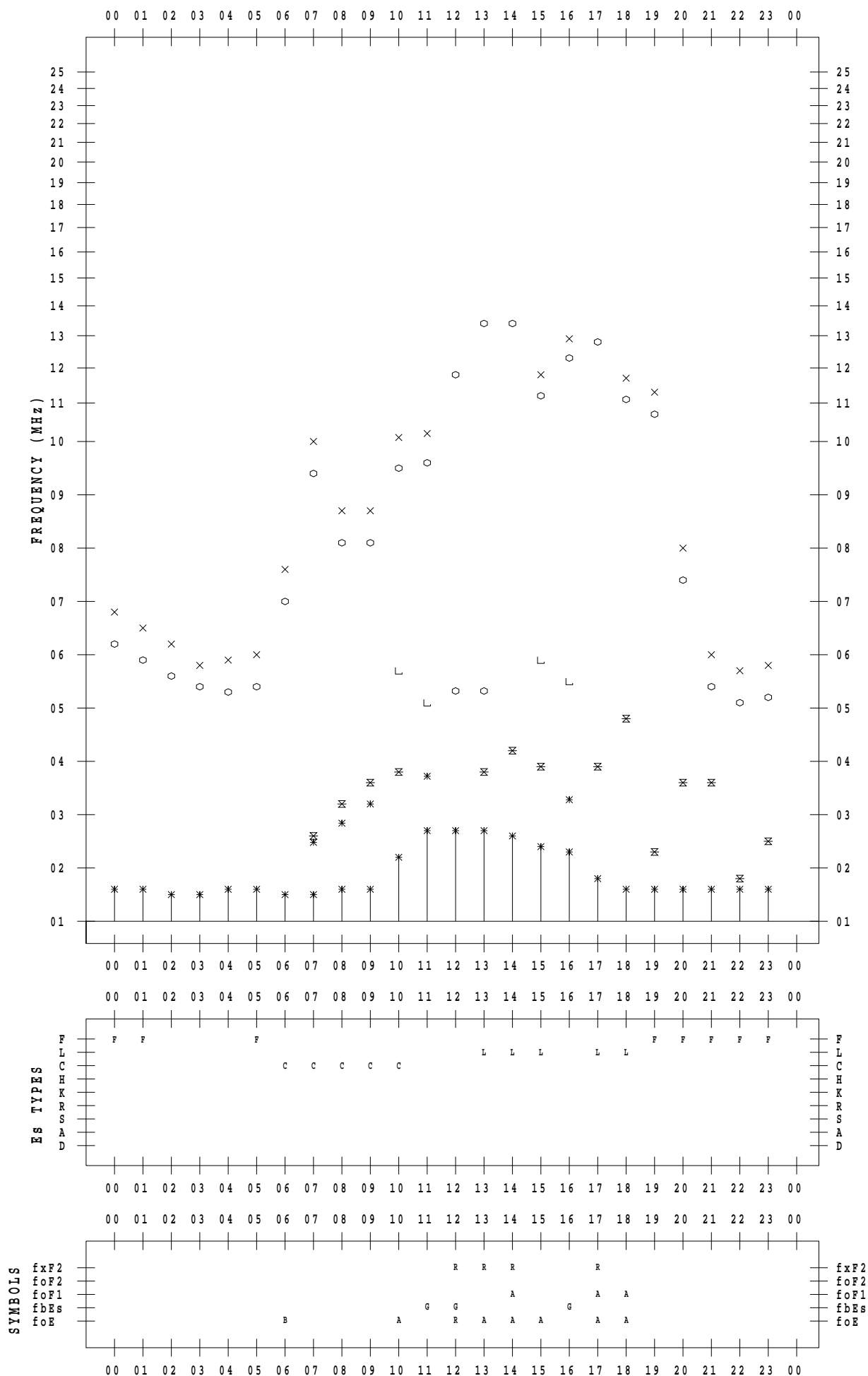
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 10

135 ° E MEAN TIME



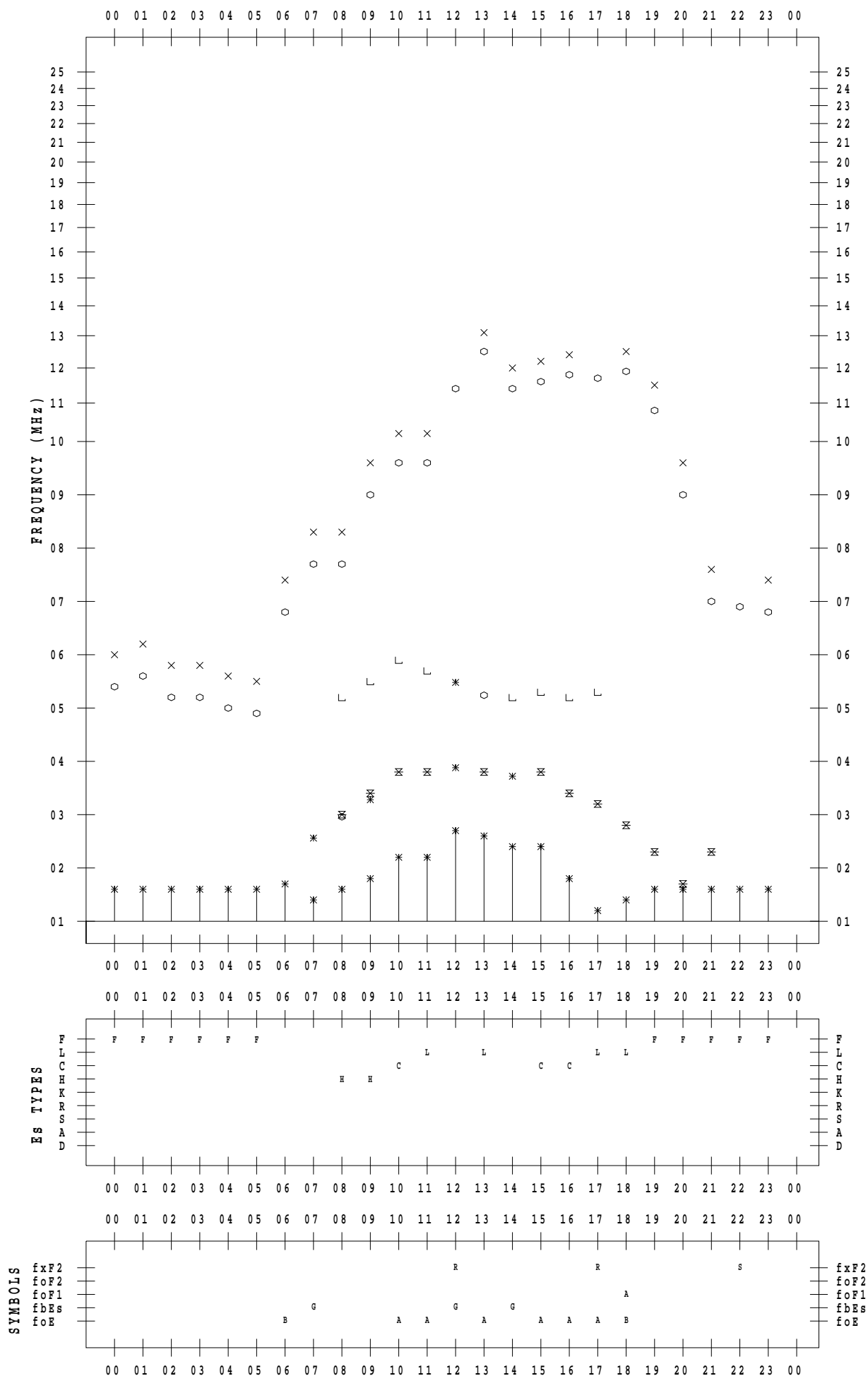
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 11

135 ° E MEAN TIME



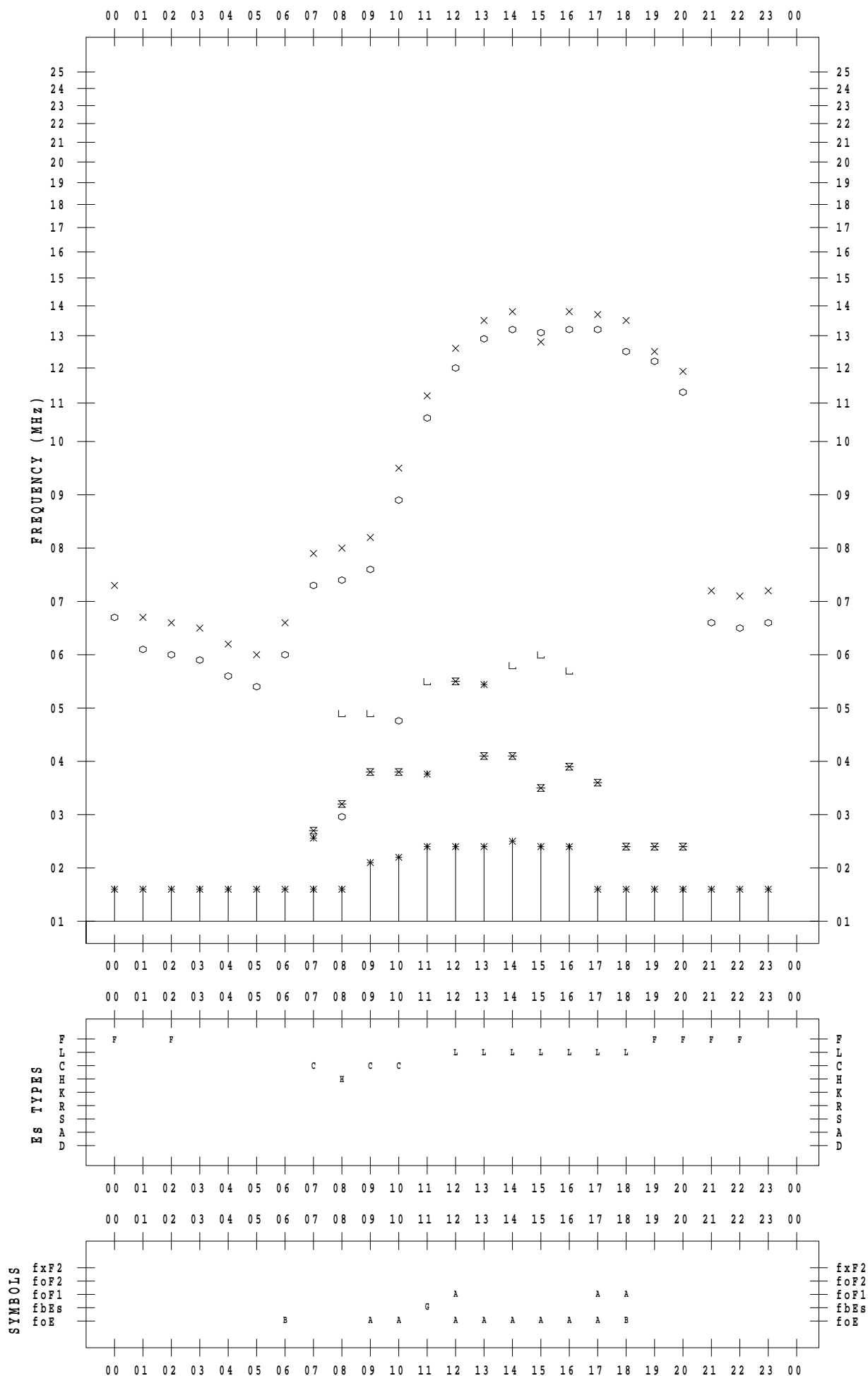
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 12

135 ° E MEAN TIME



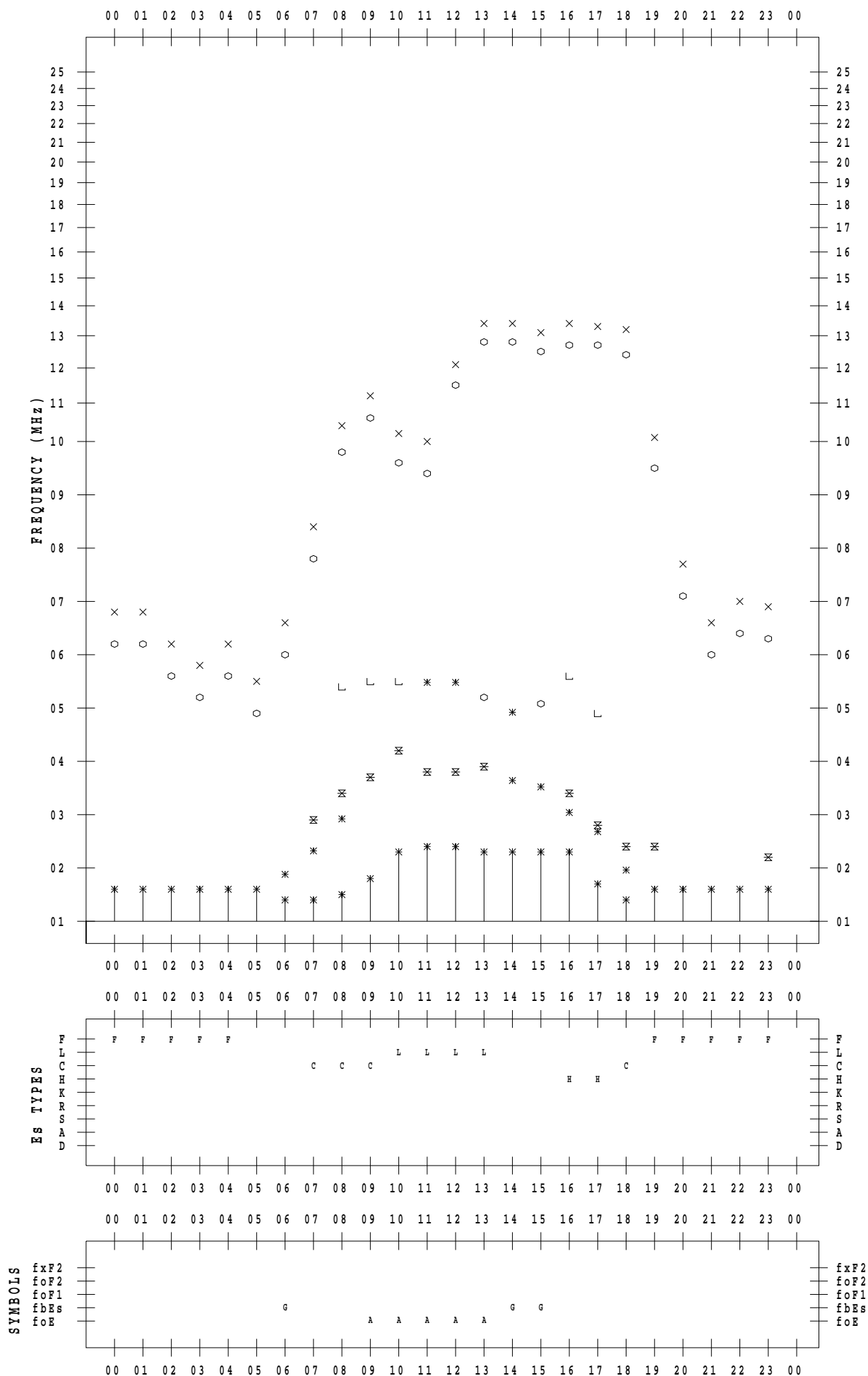
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 13

135 ° E MEAN TIME



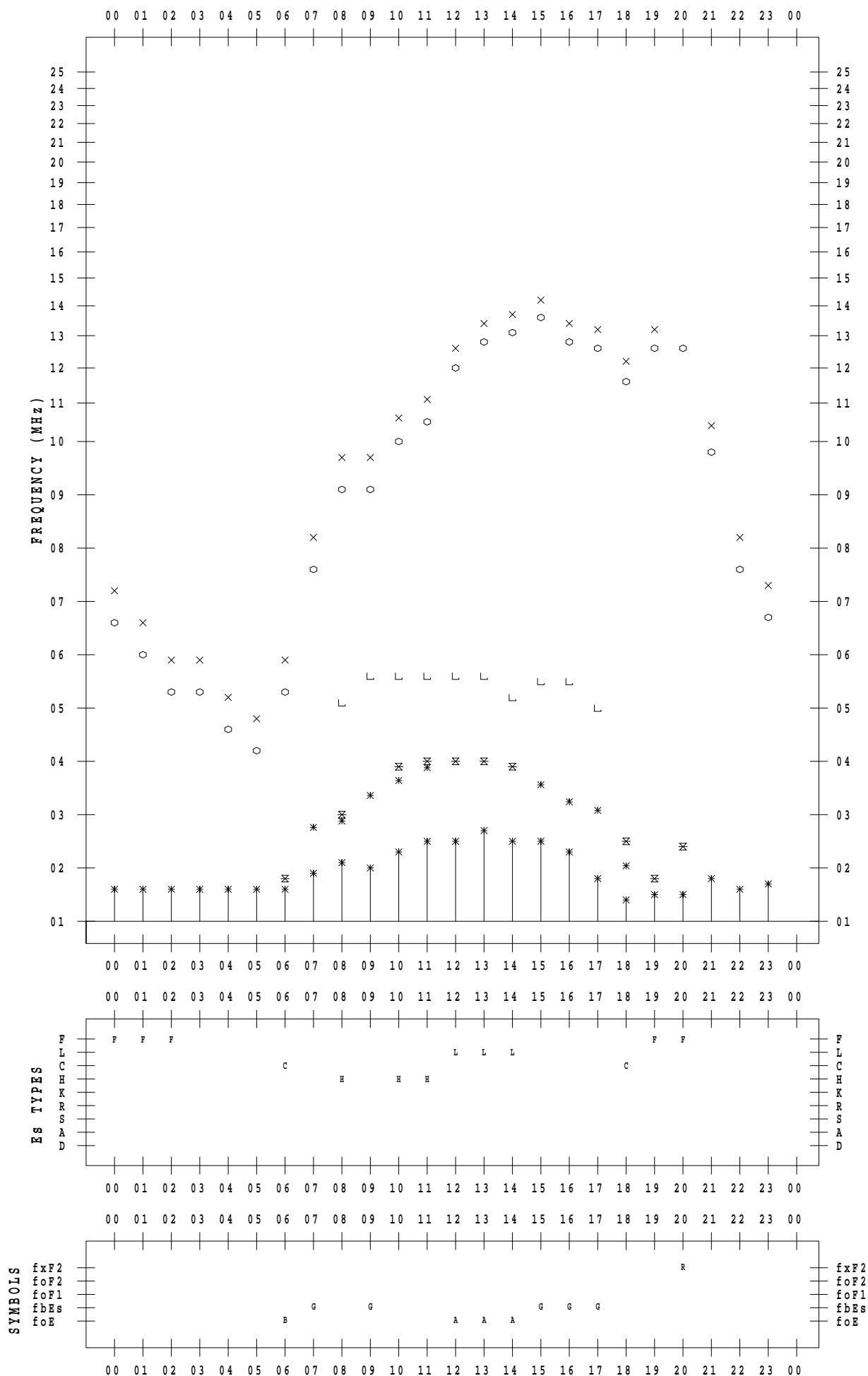
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 14

135 ° E MEAN TIME



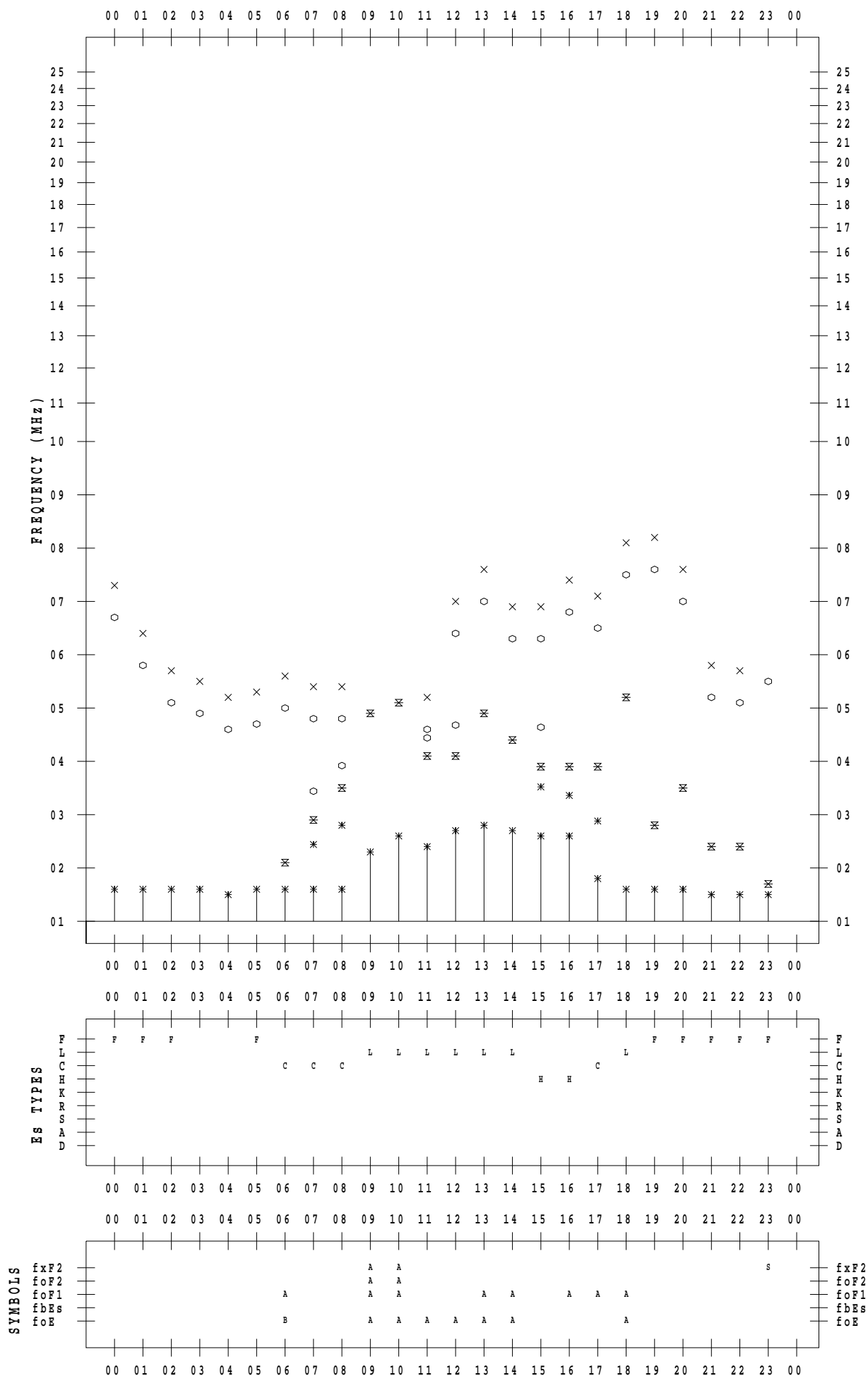
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 15

135 ° E MEAN TIME



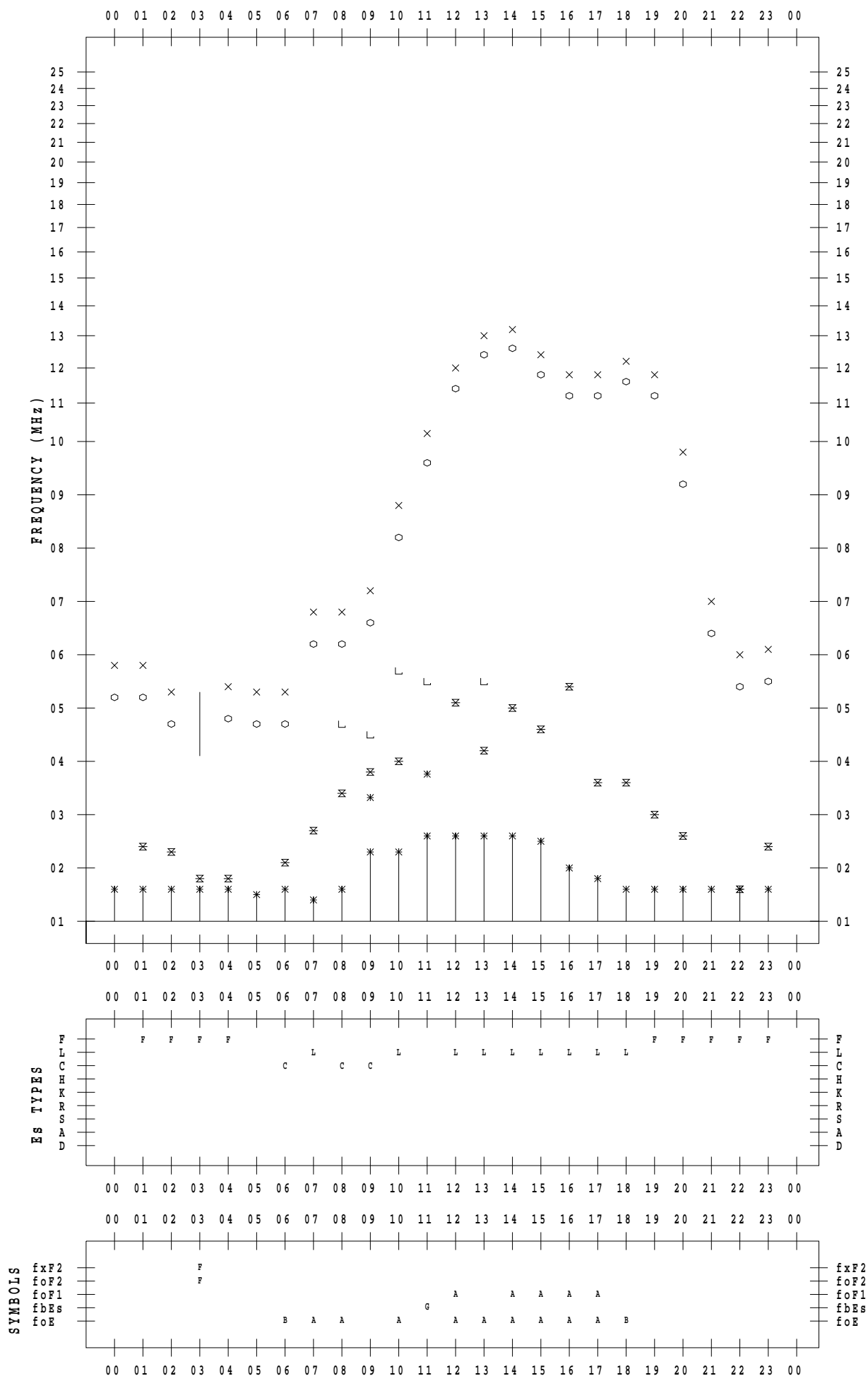
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SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 16

135 ° E MEAN TIME





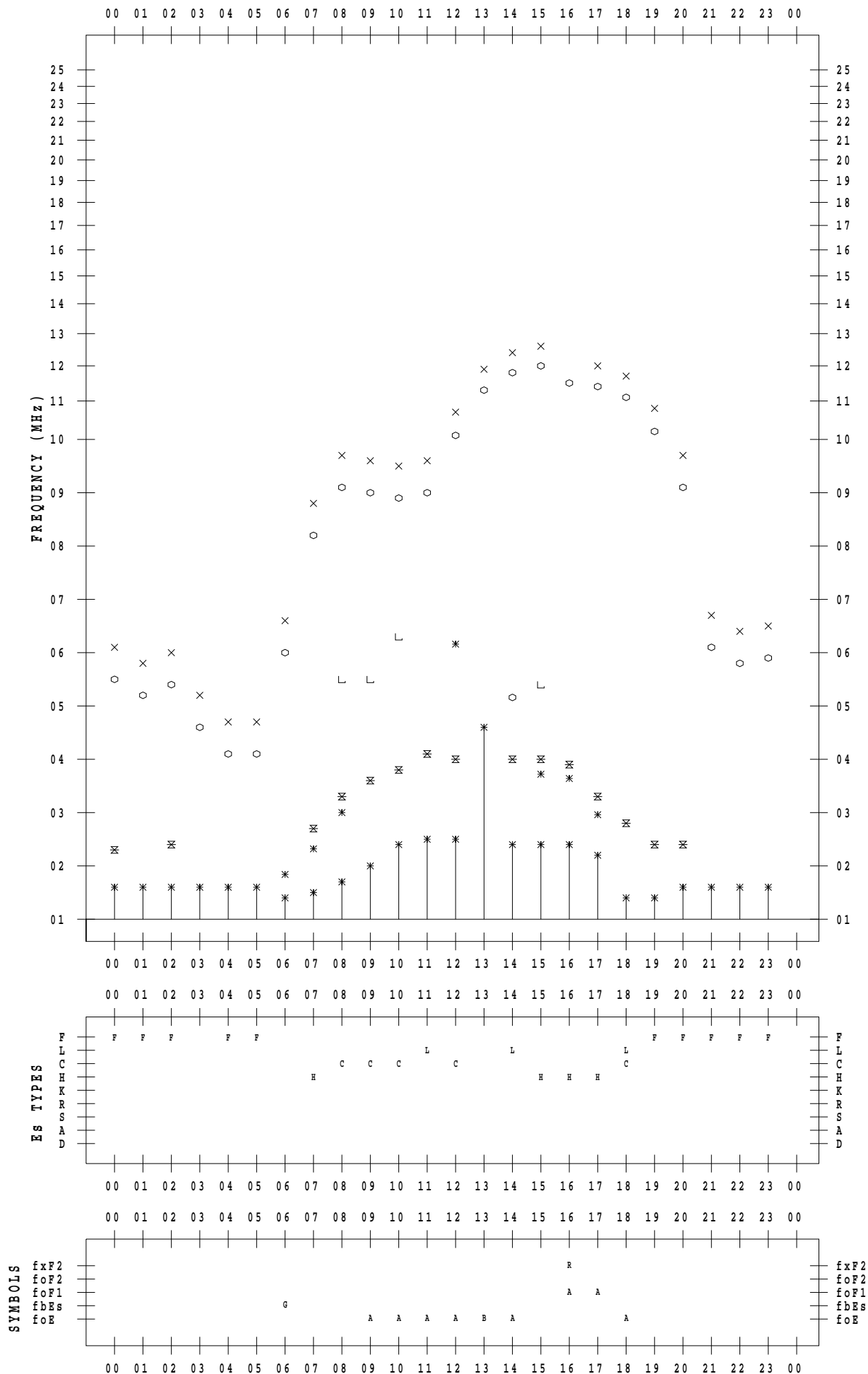
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 17

135 ° E MEAN TIME



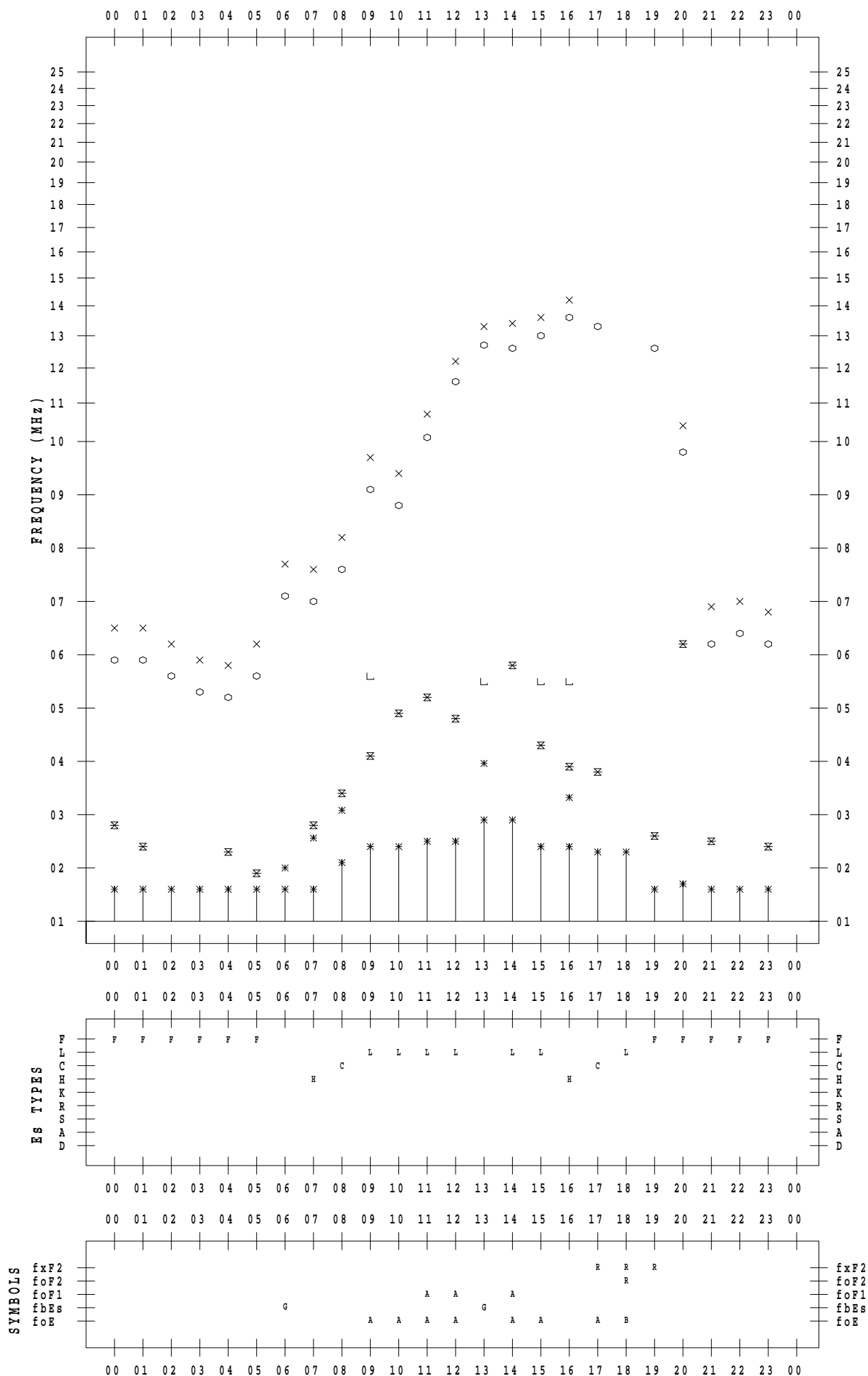
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 18

135 ° E MEAN TIME



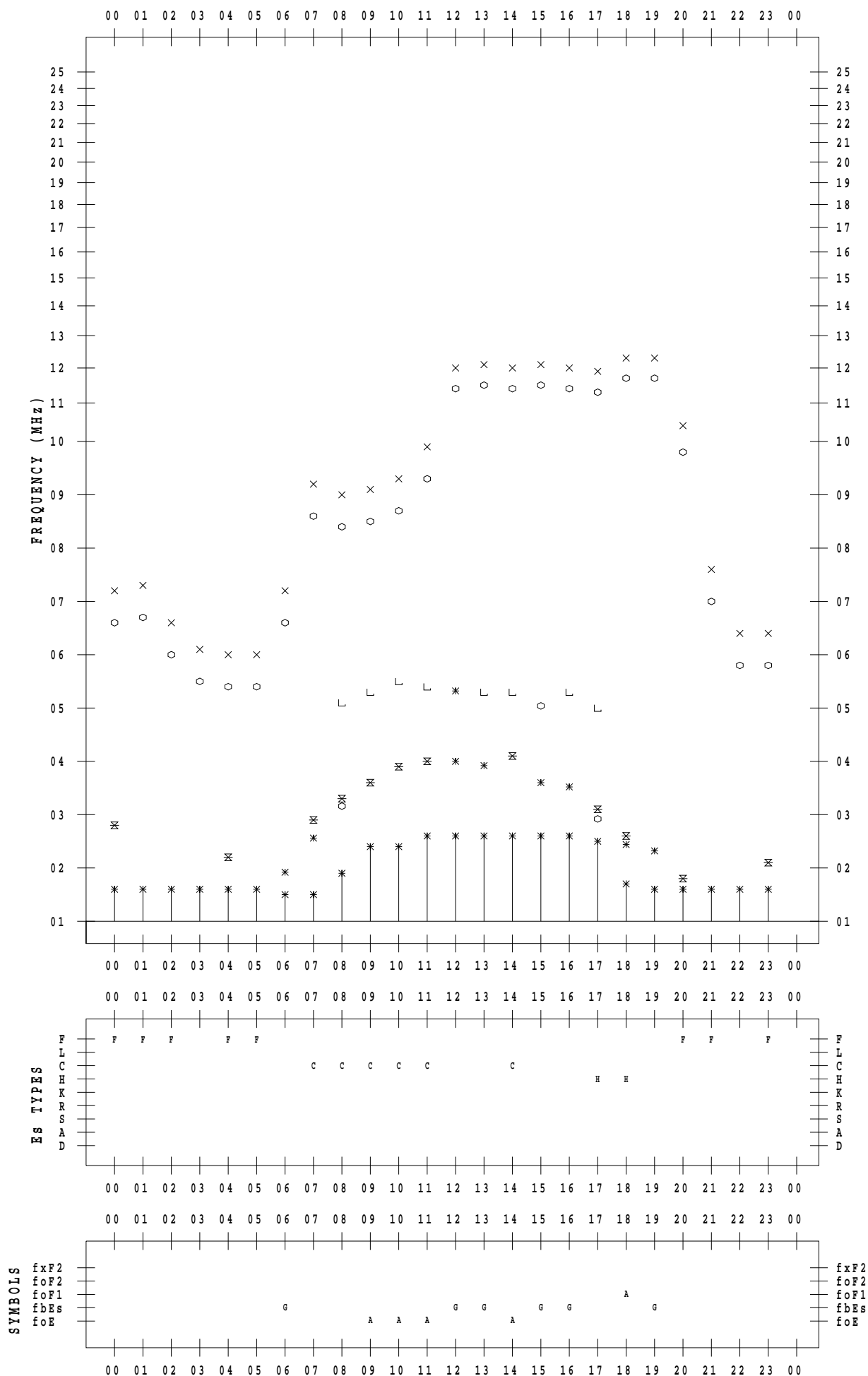
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 19

135 ° E MEAN TIME



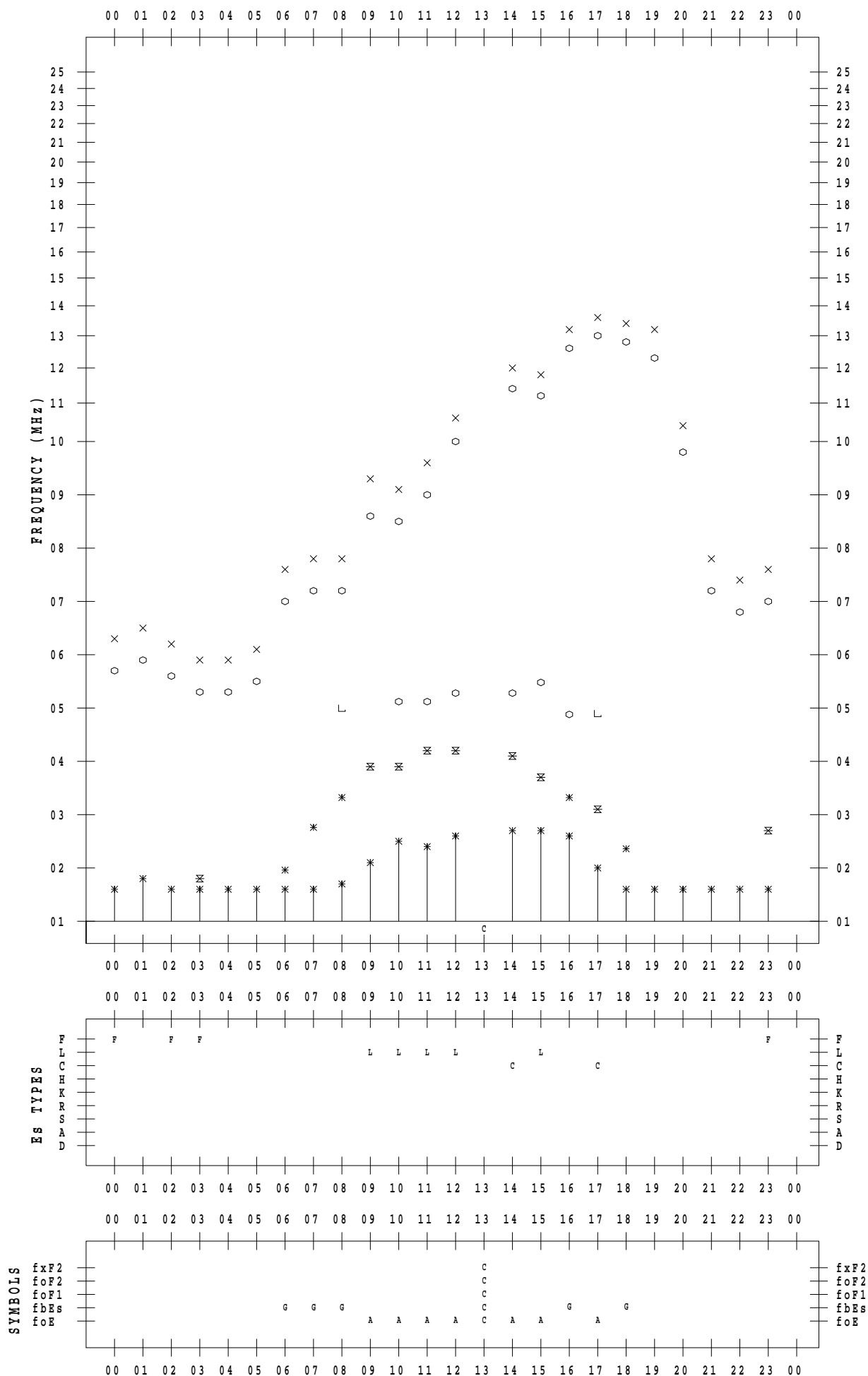
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 20

135 ° E MEAN TIME



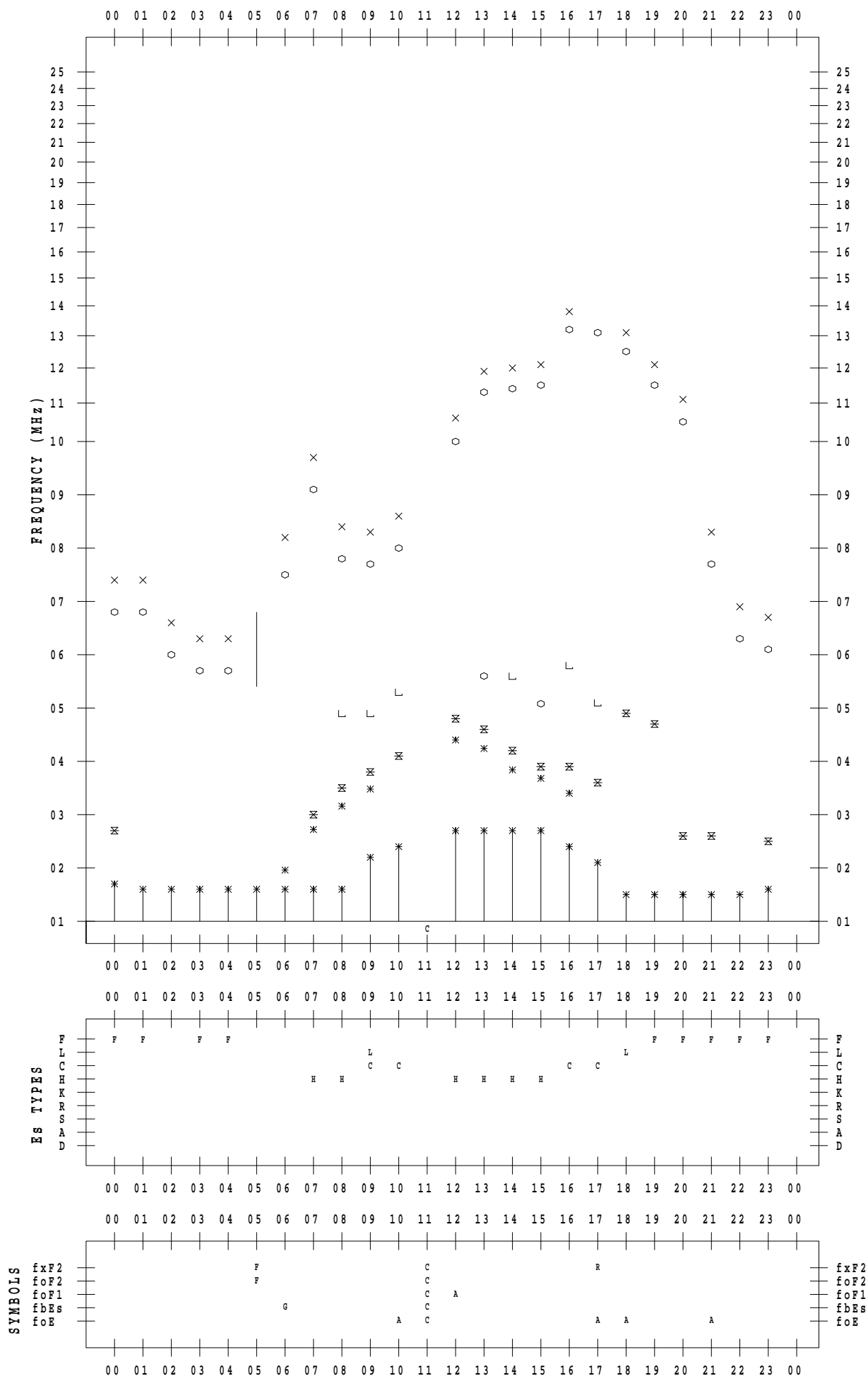
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 21

135 ° E MEAN TIME



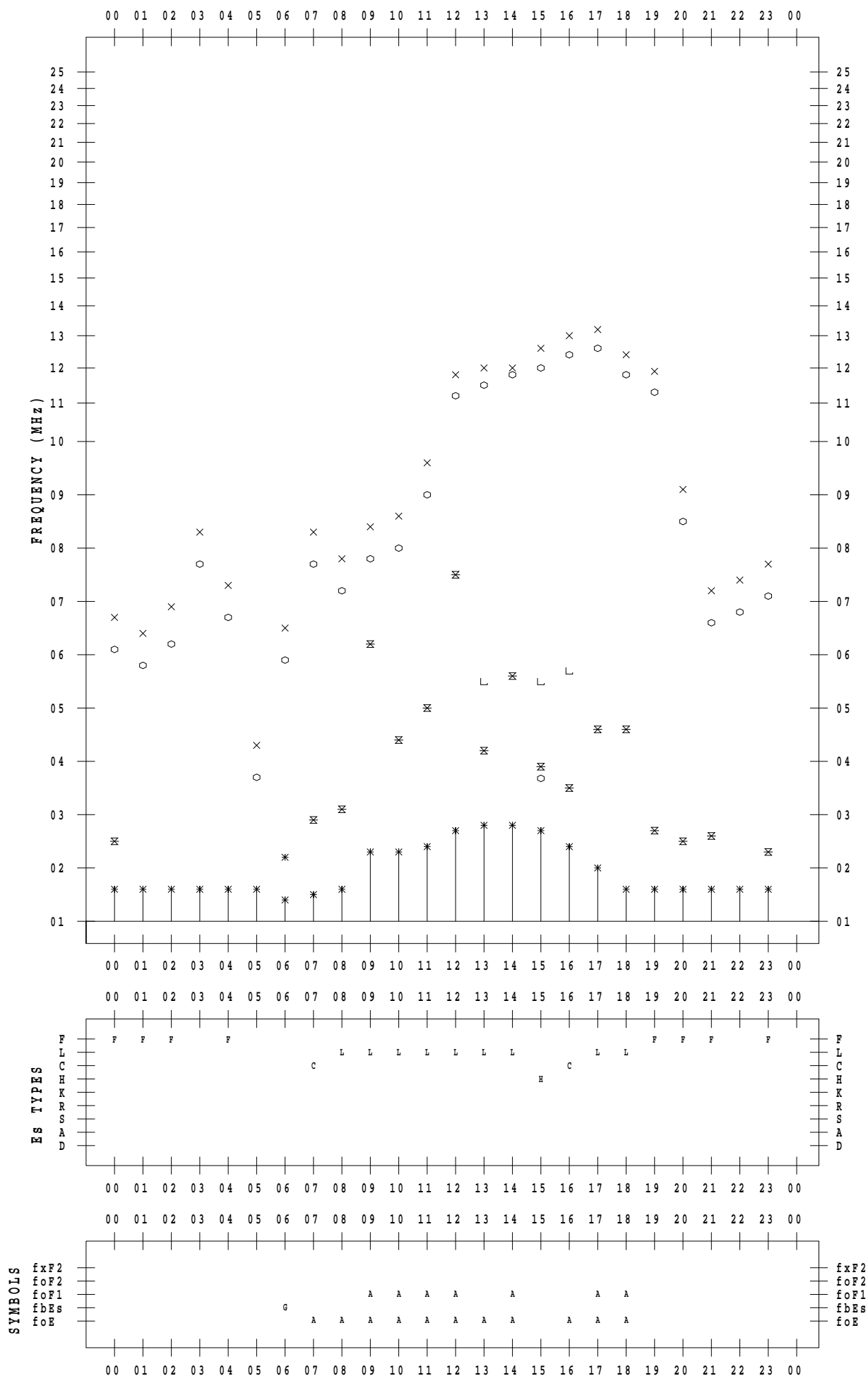
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 22

135 ° E MEAN TIME



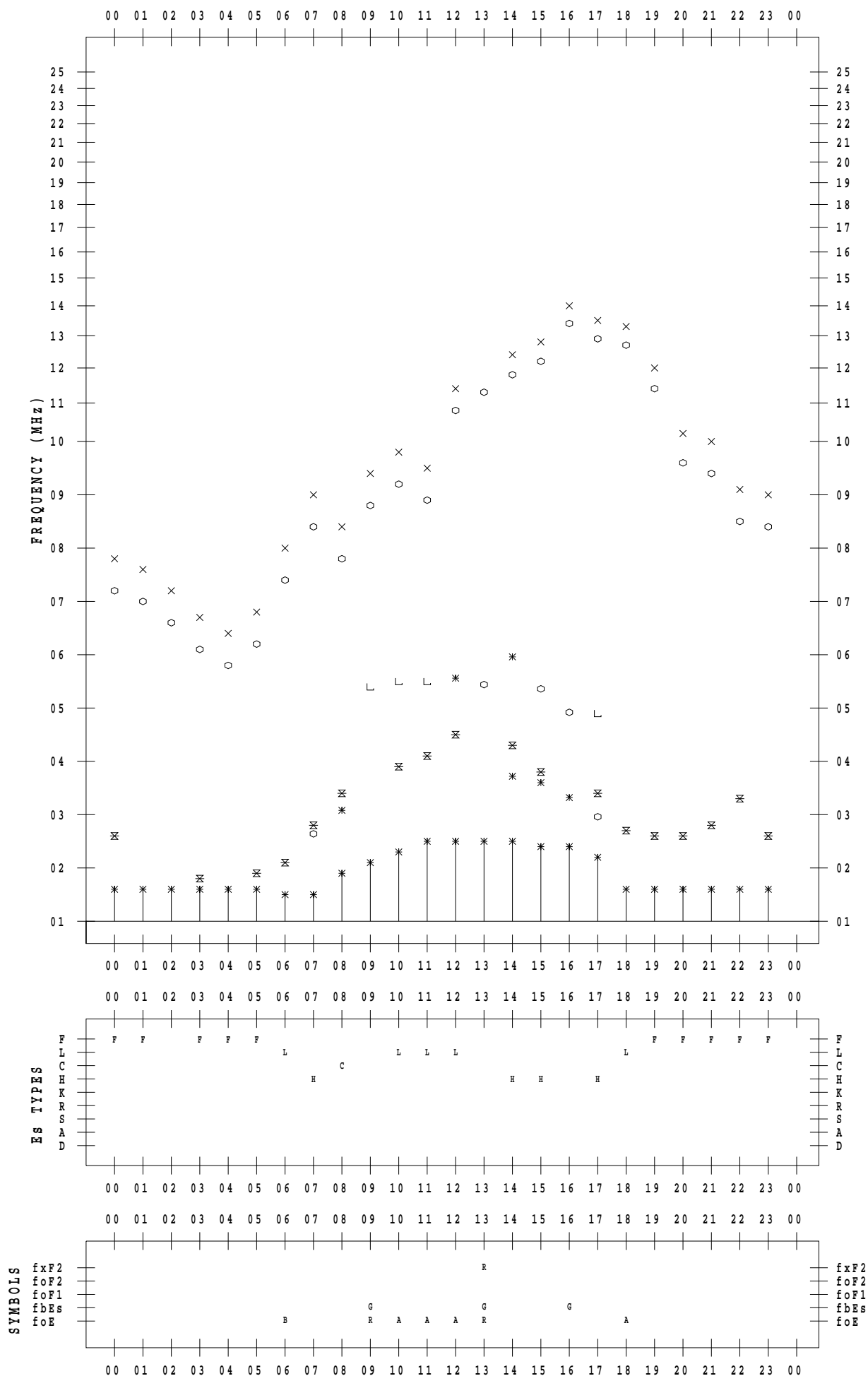
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 23

135 ° E MEAN TIME



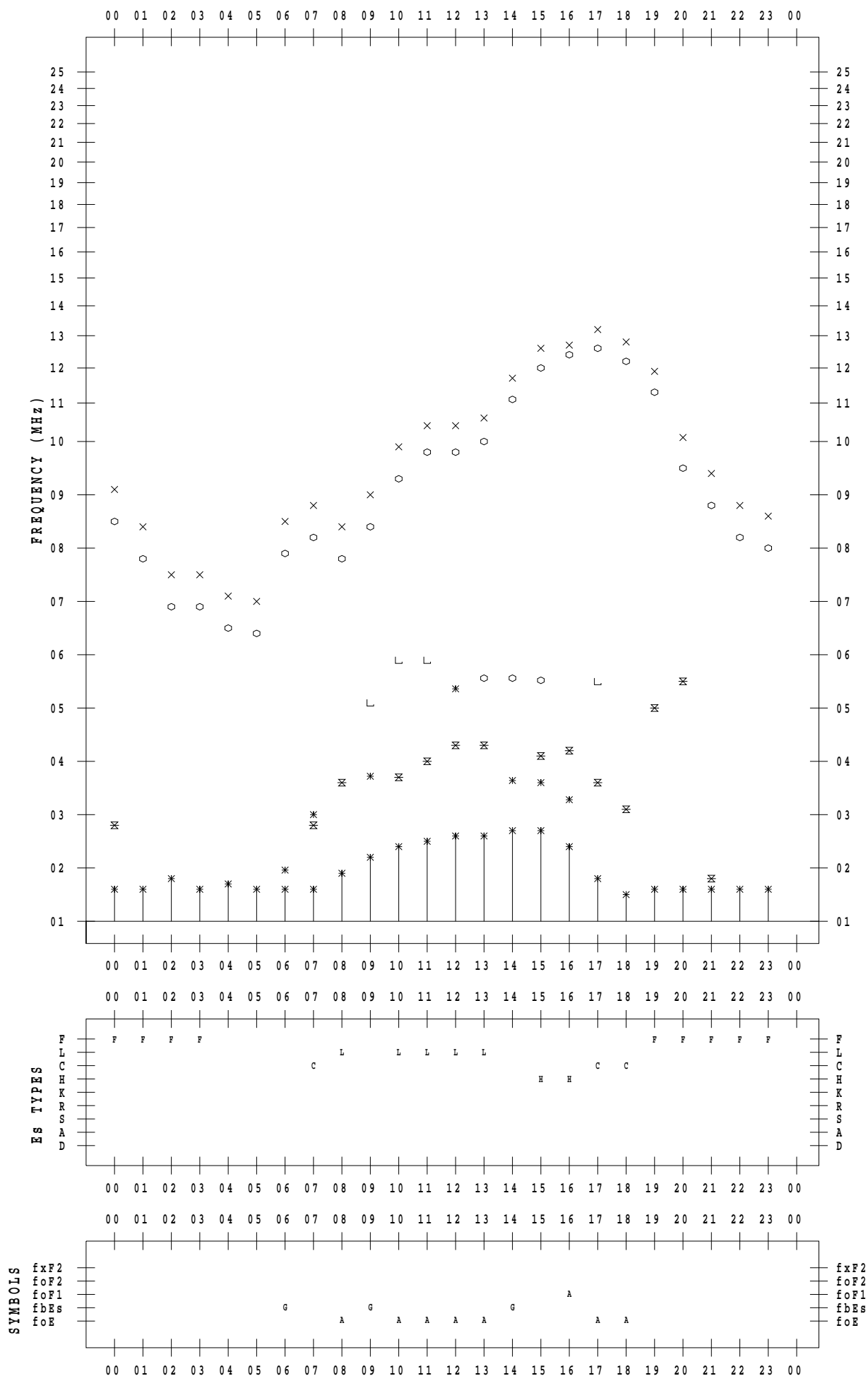
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 24

135 ° E MEAN TIME





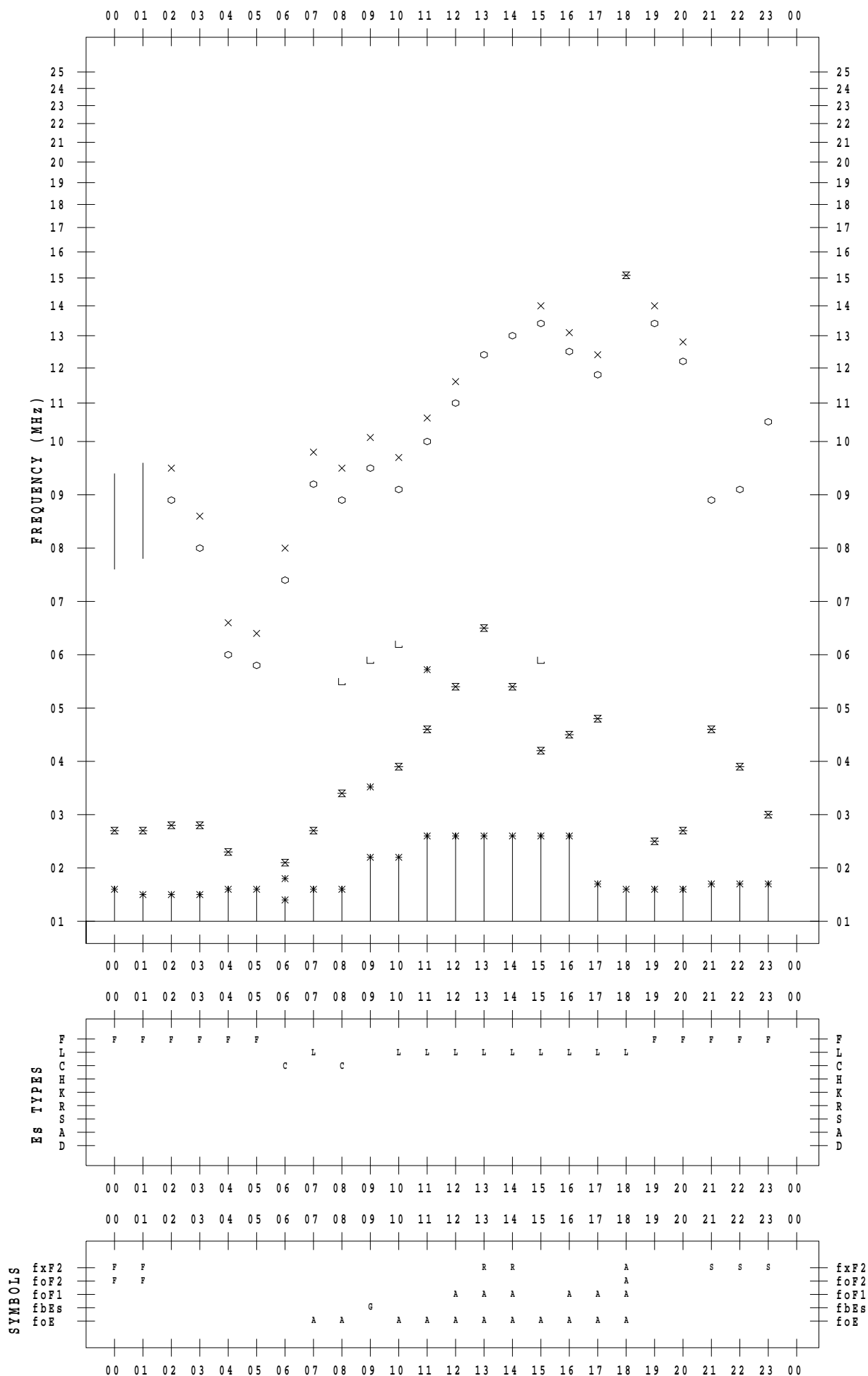
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 25

135 ° E MEAN TIME



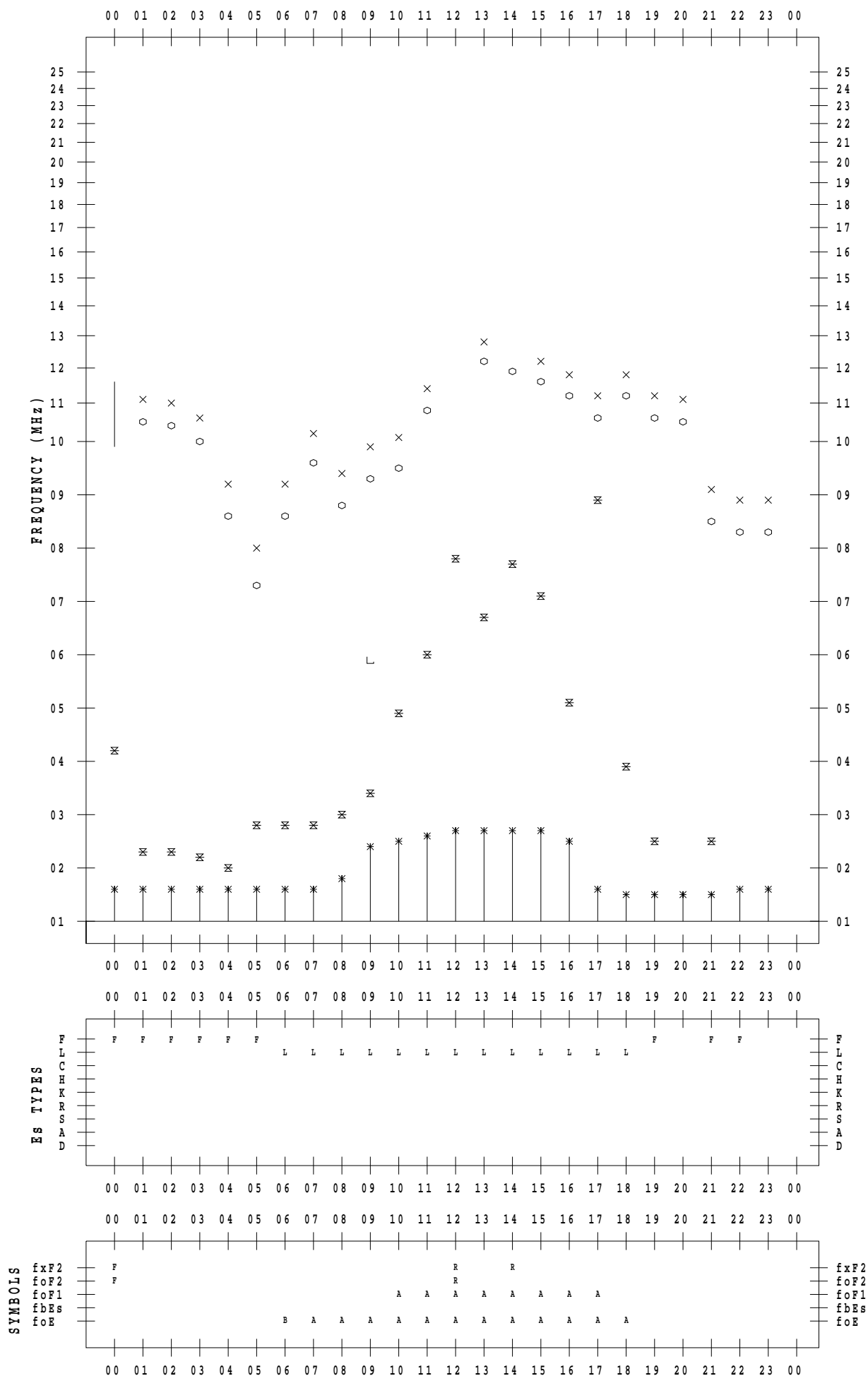
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 26

135 ° E MEAN TIME



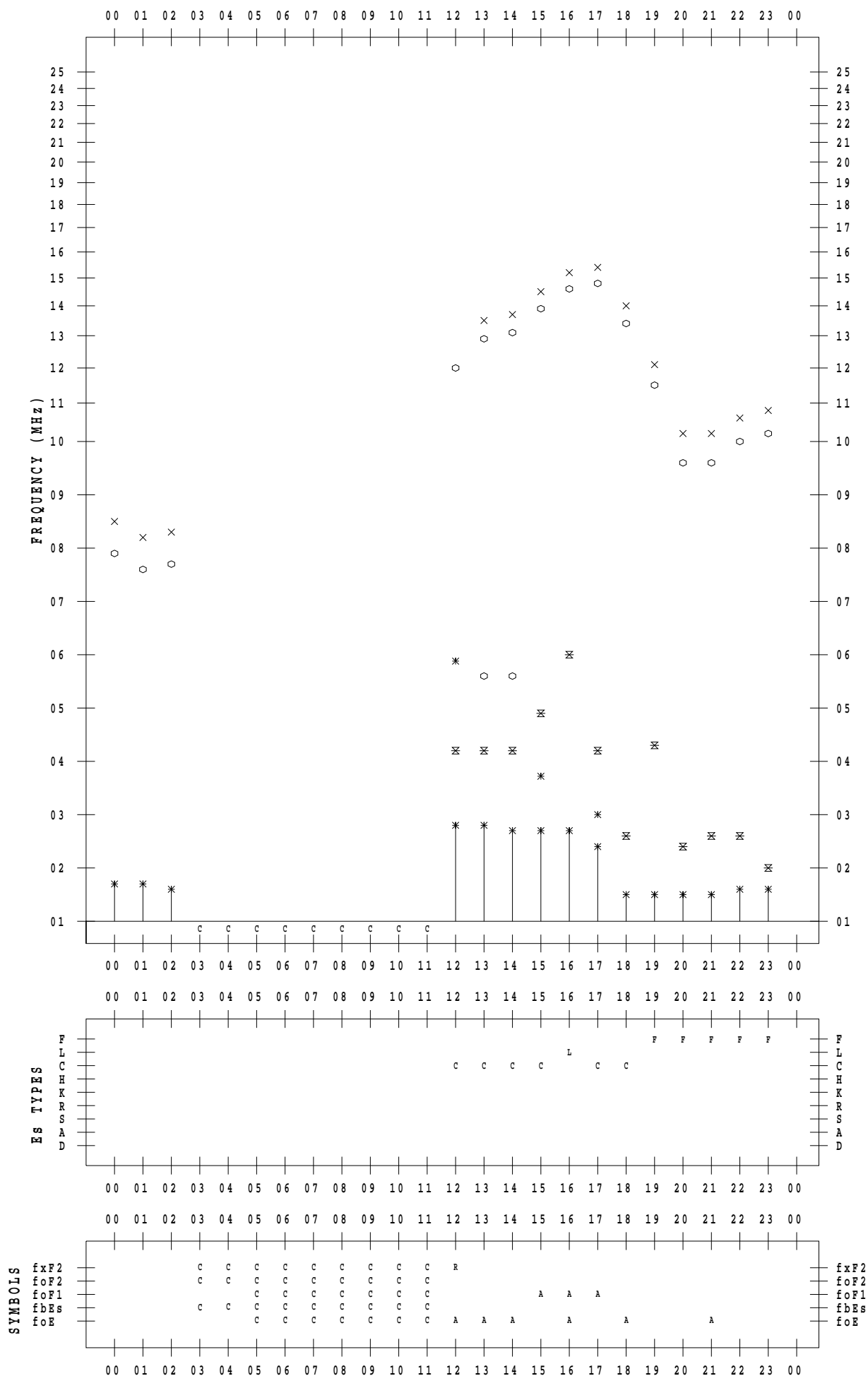
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 27

135 ° E MEAN TIME



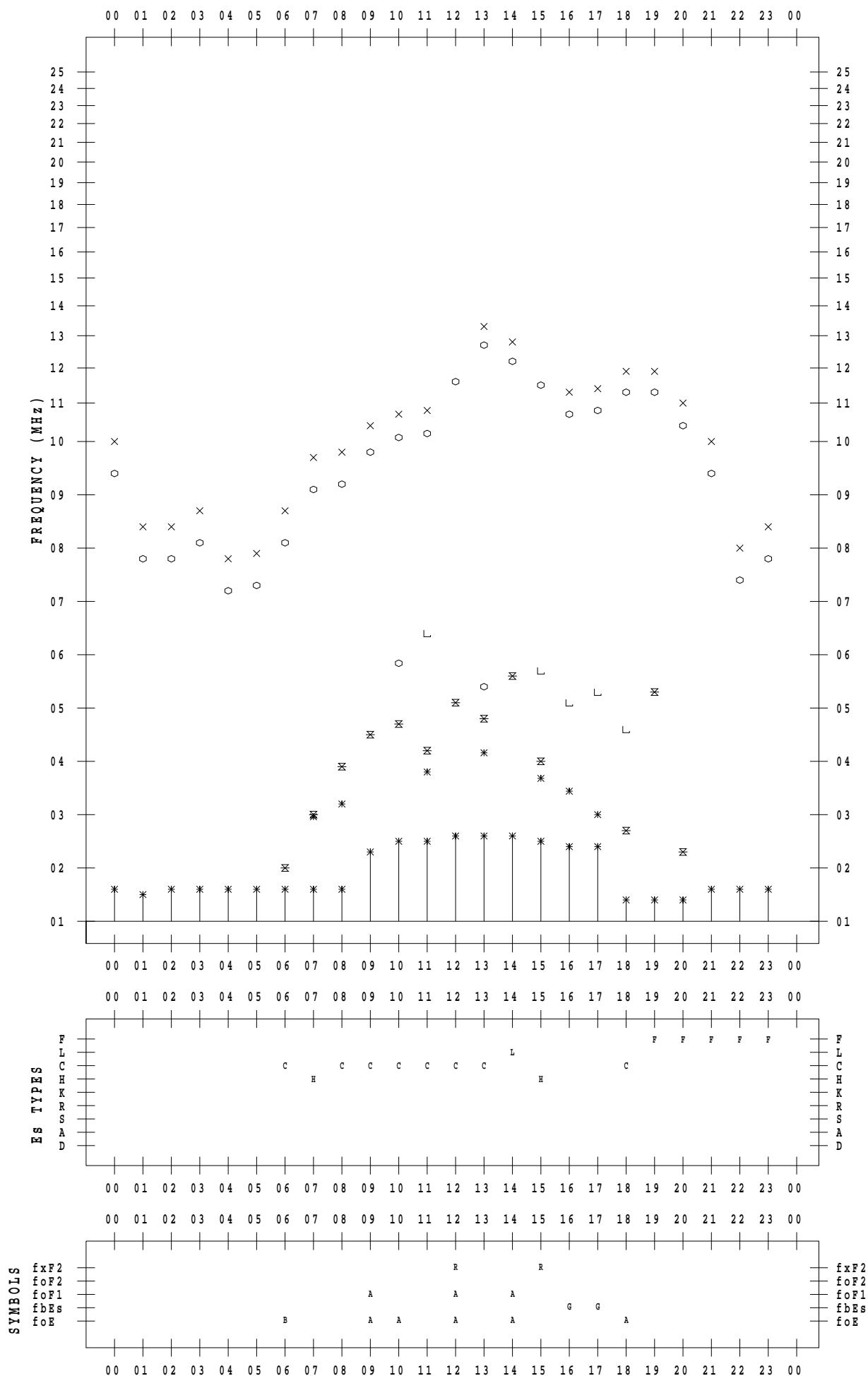
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 28

135 ° E MEAN TIME



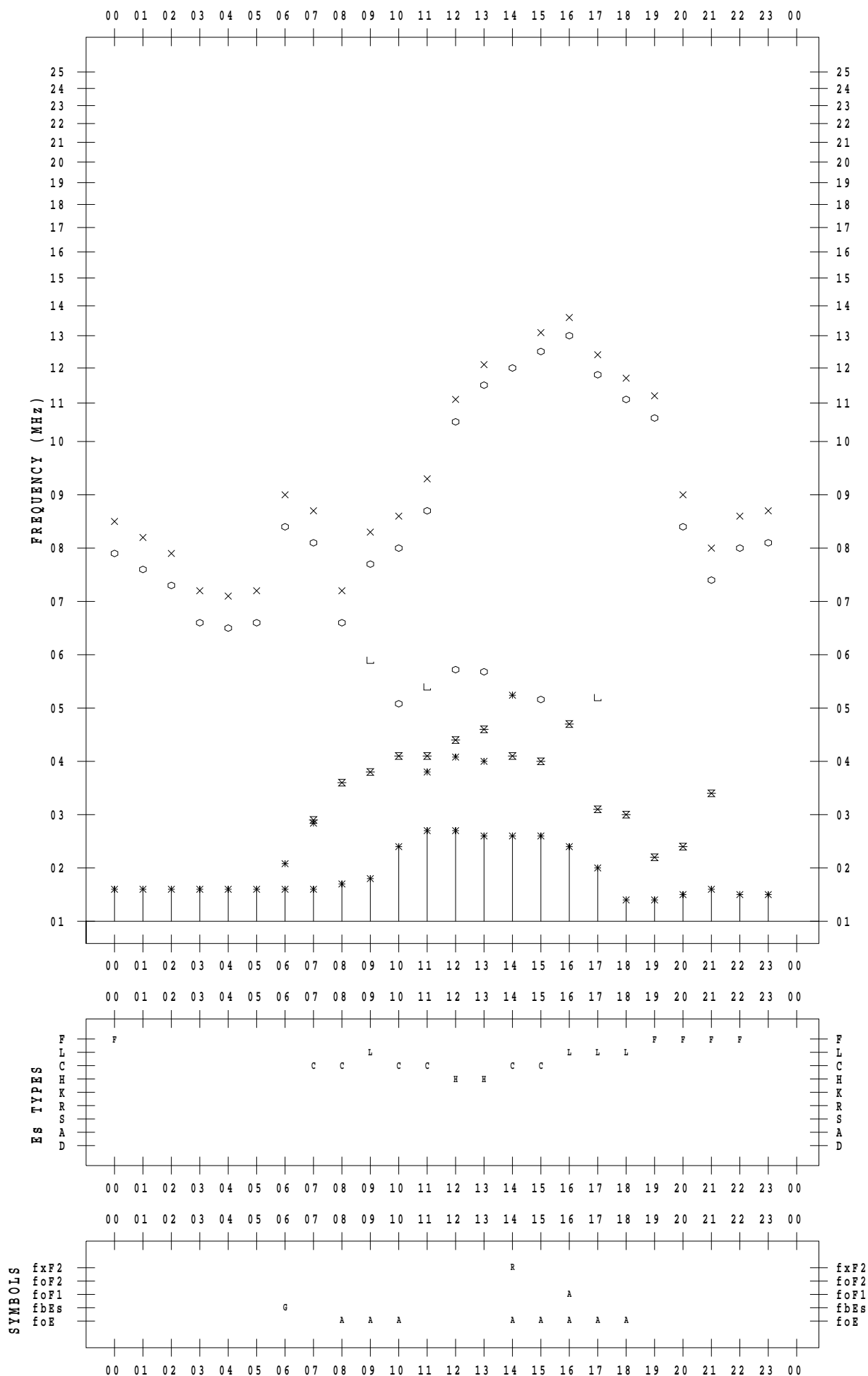
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 29

135 ° E MEAN TIME



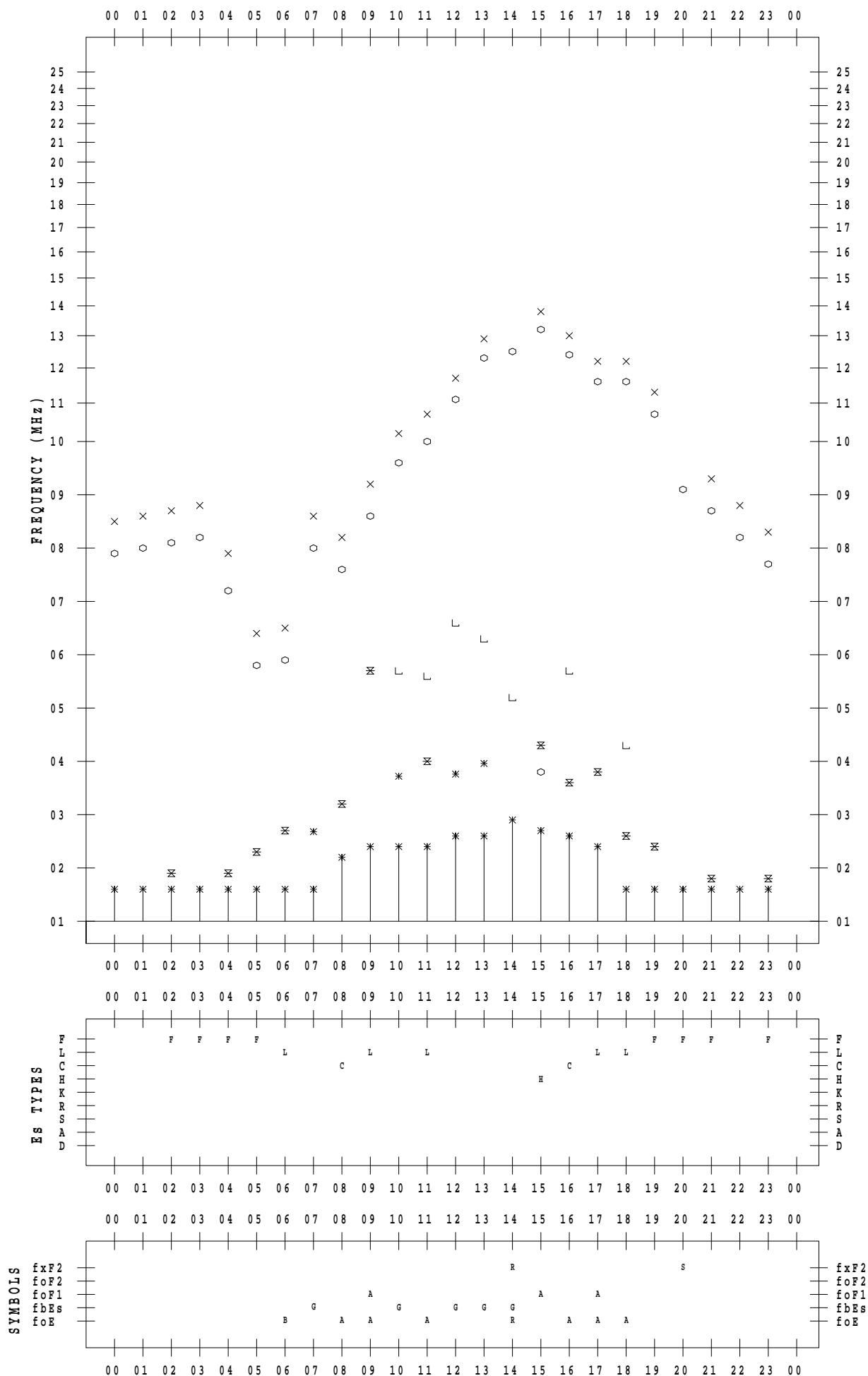
# f - PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2022 / 4 / 30

135 ° E MEAN TIME



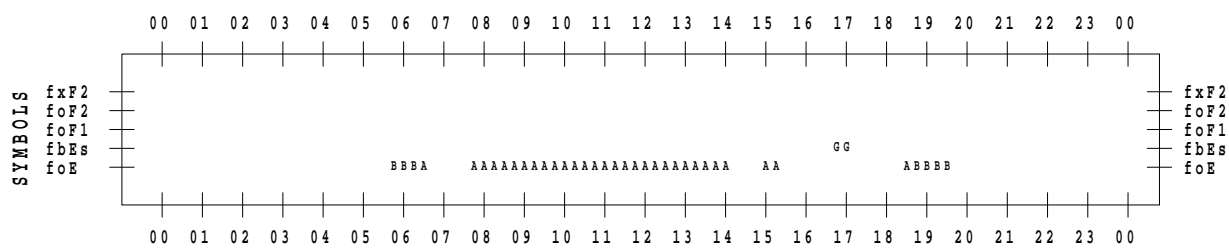
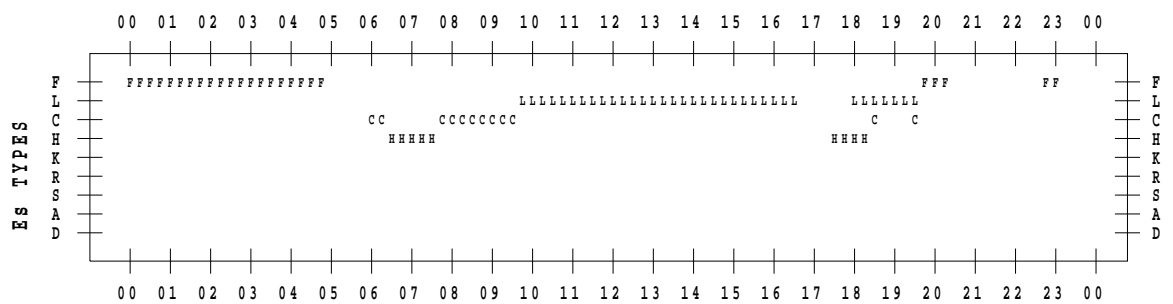
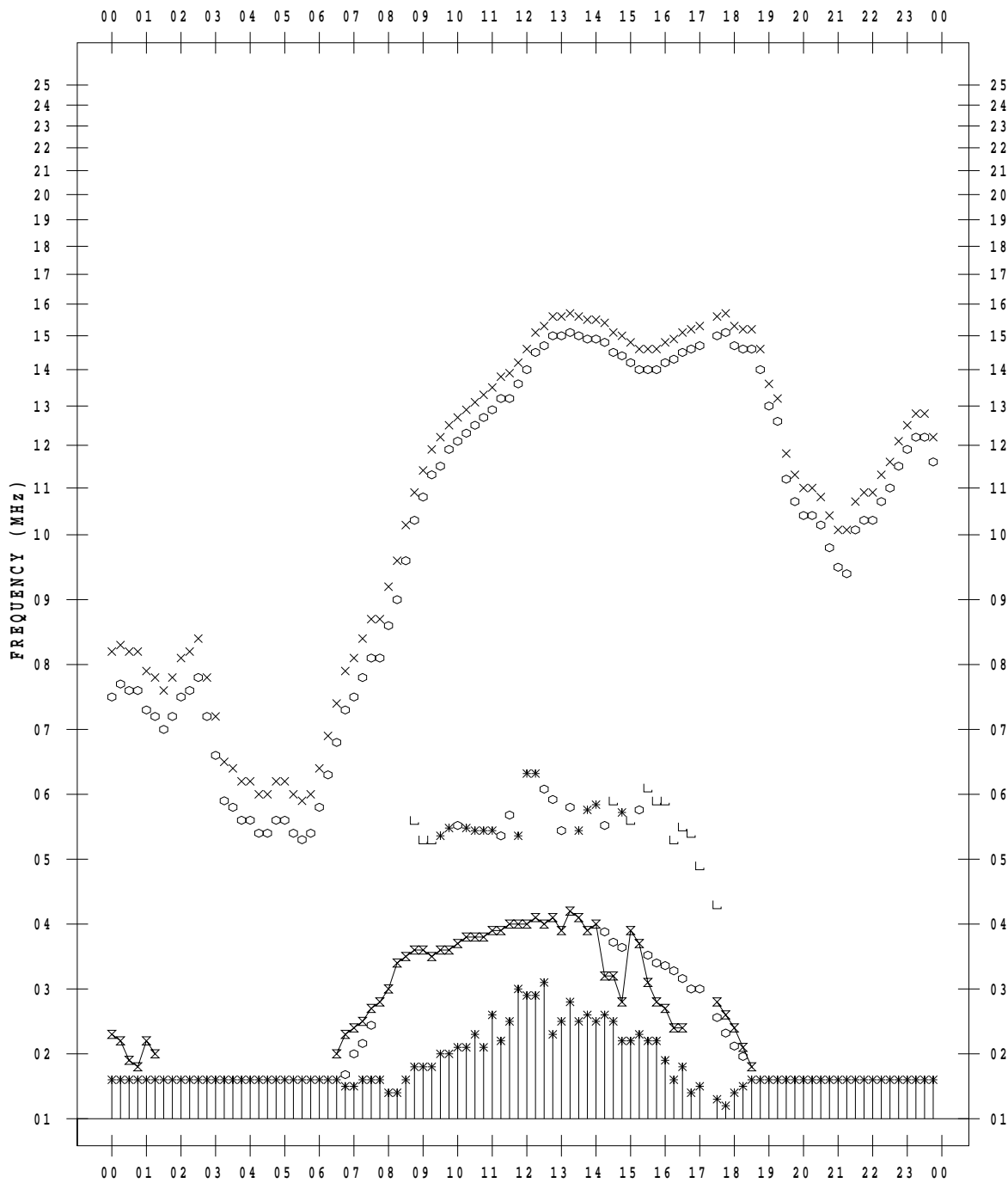
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 1

135 ° E MEAN TIME



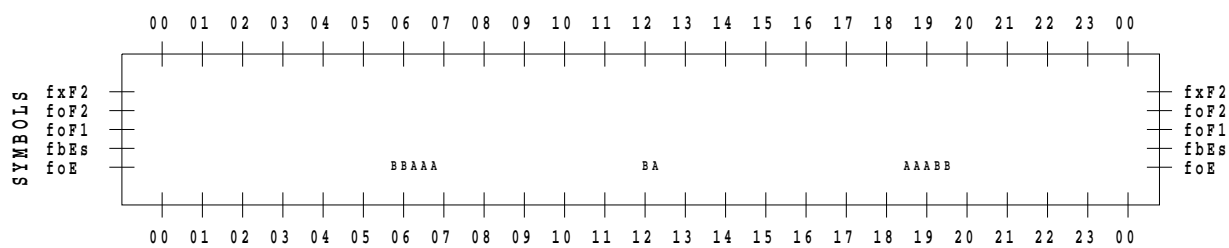
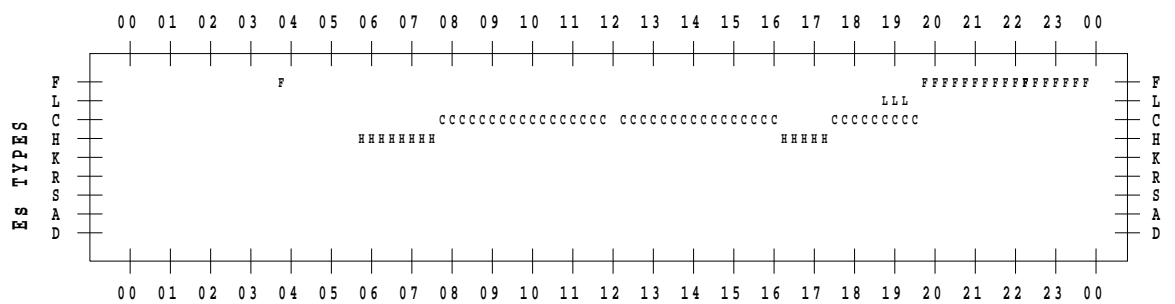
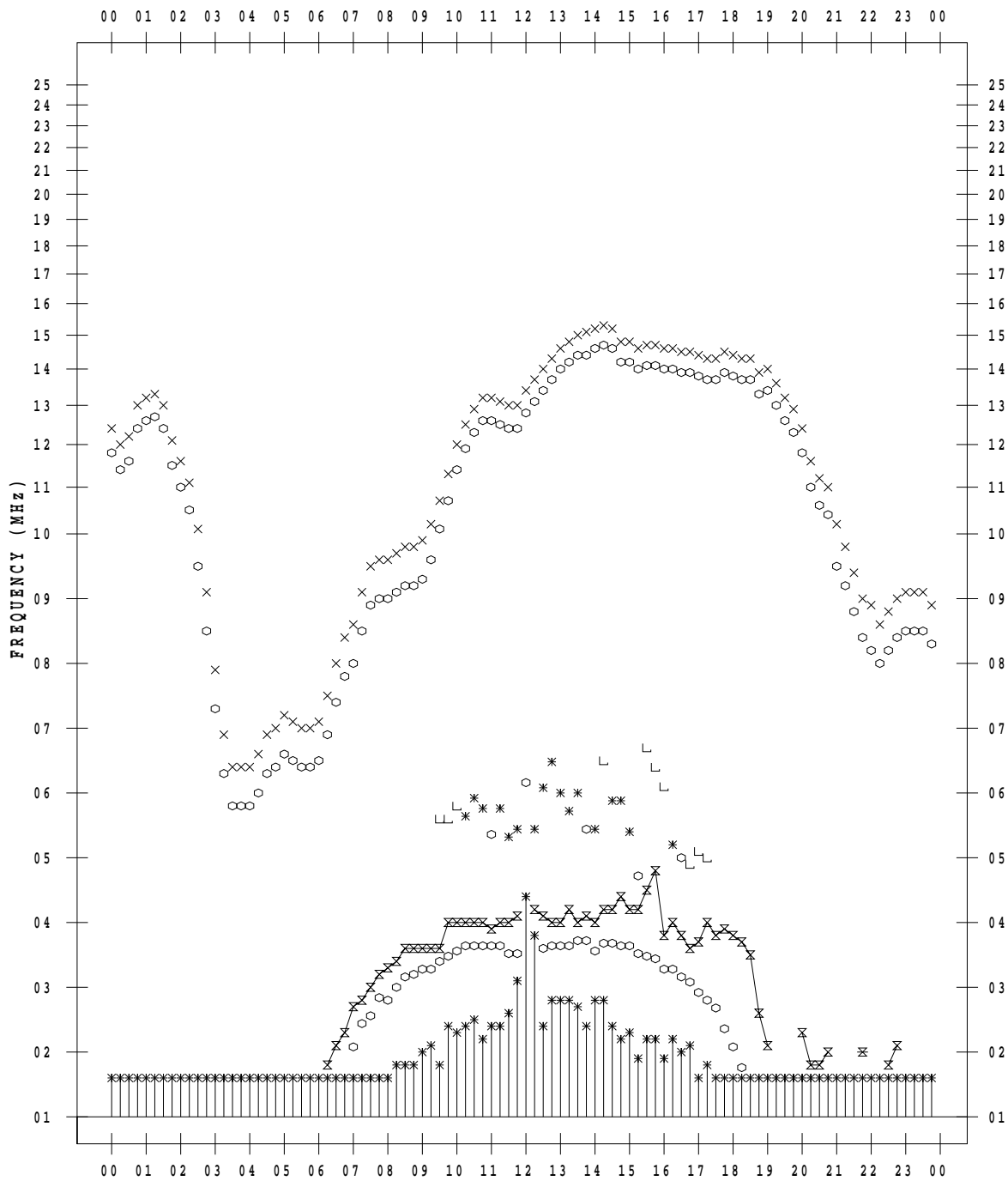
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 2

135 ° E MEAN TIME





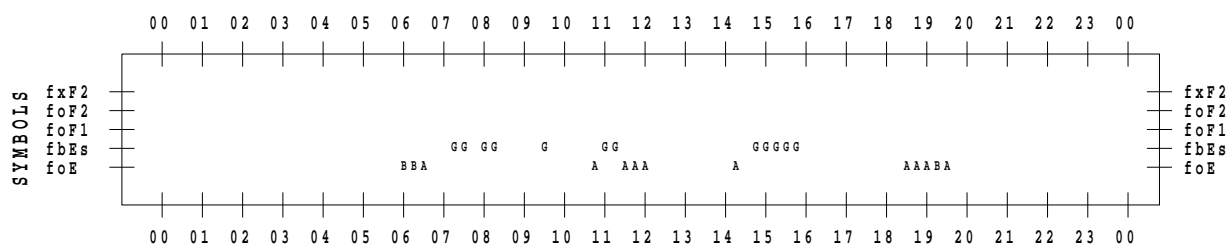
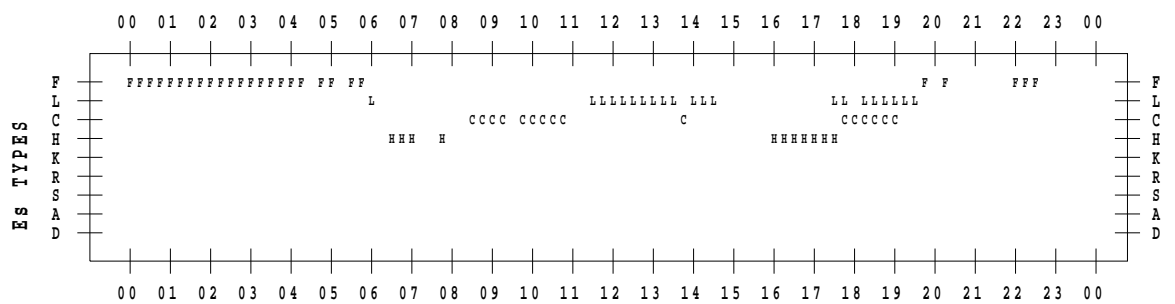
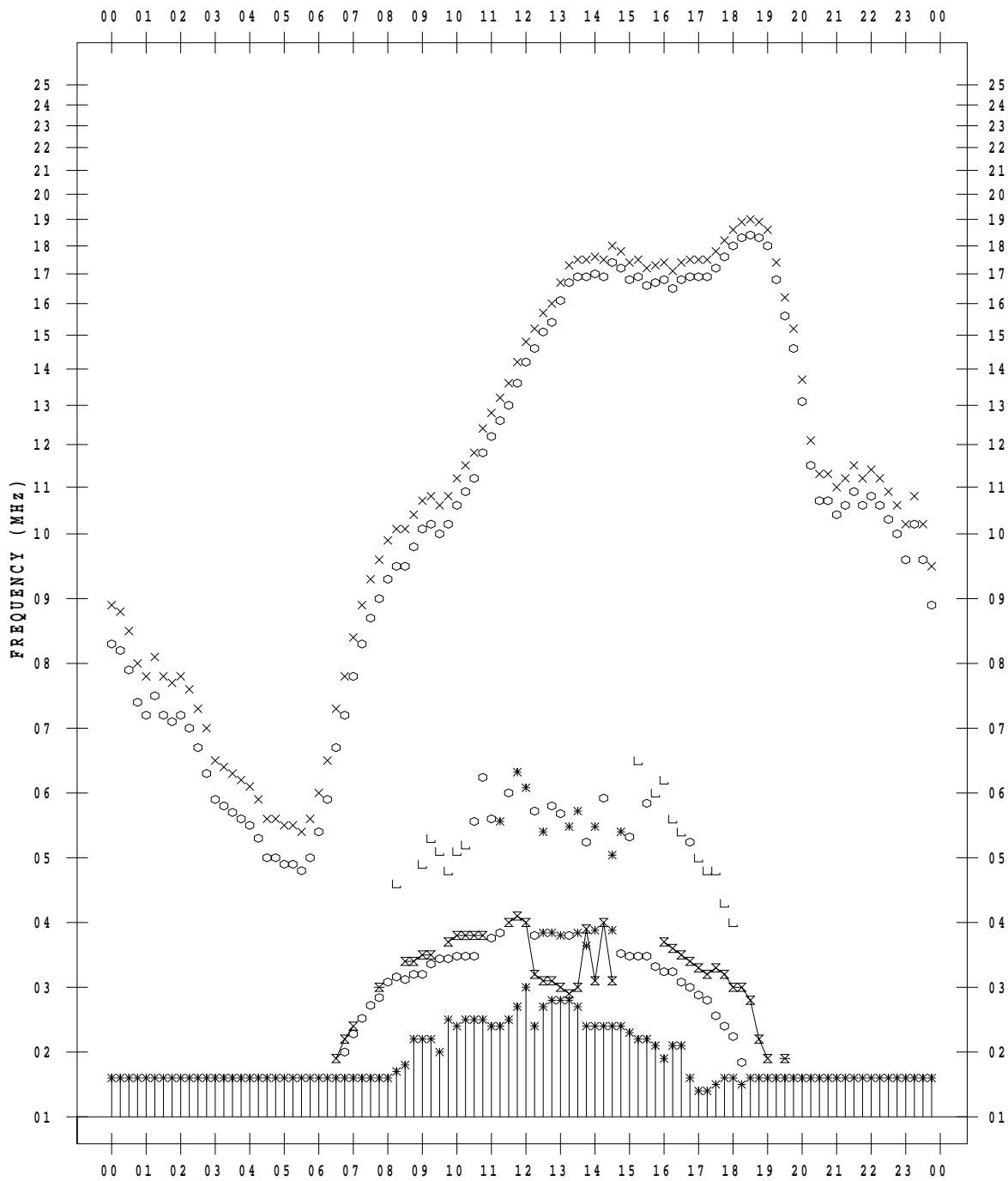
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 3

135 ° E MEAN TIME



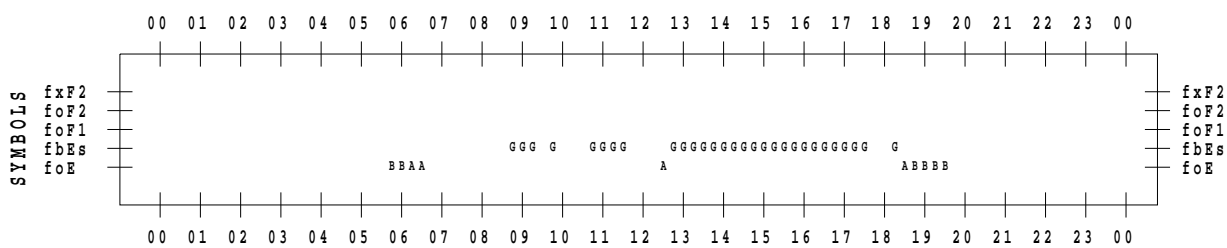
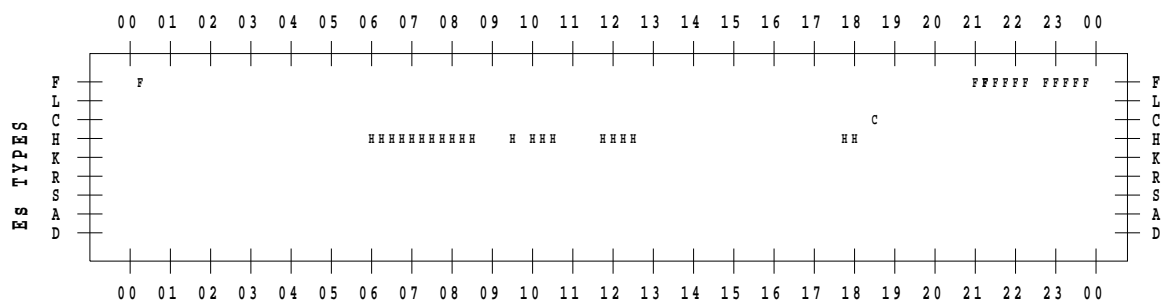
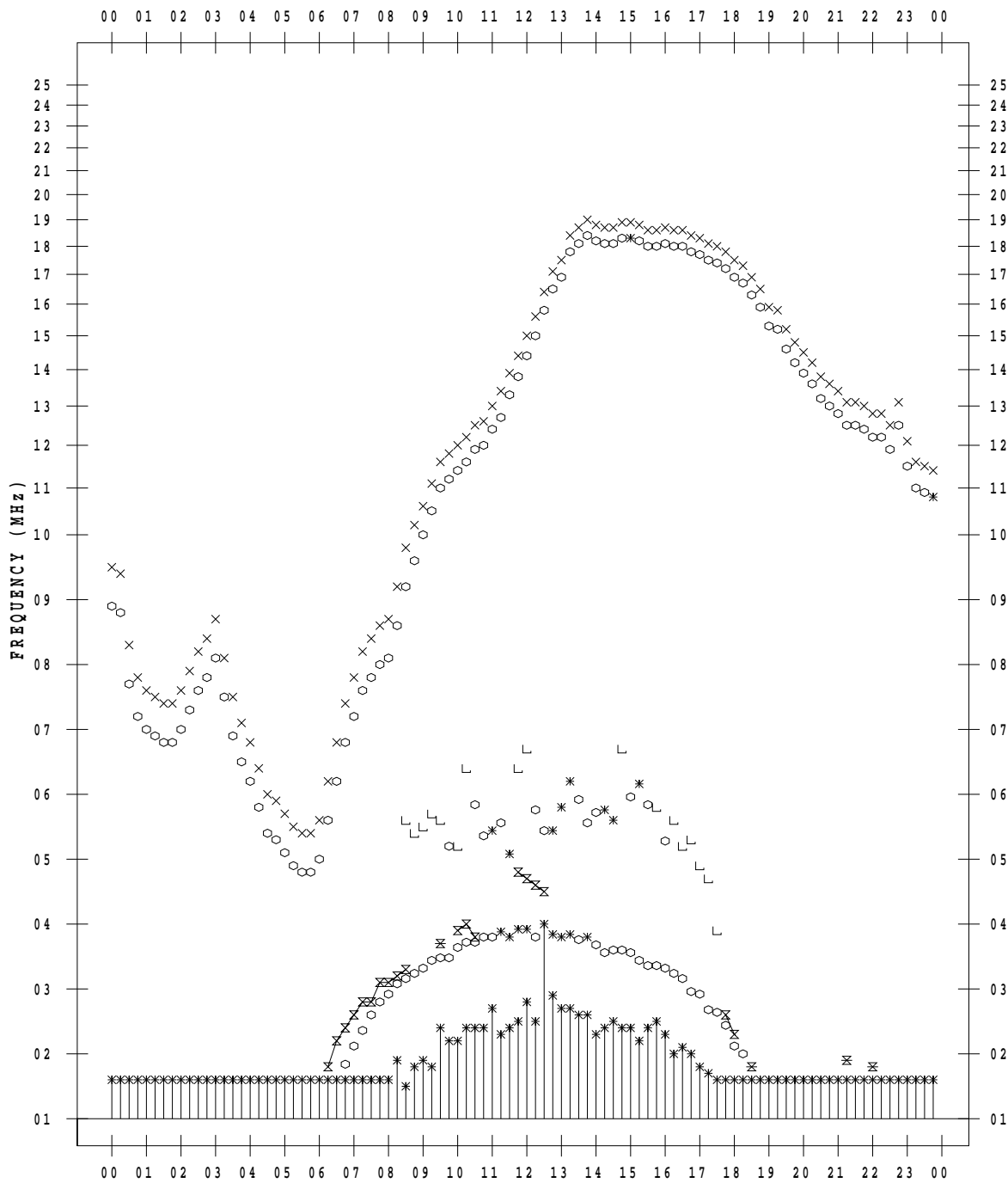
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 4

135 ° E MEAN TIME



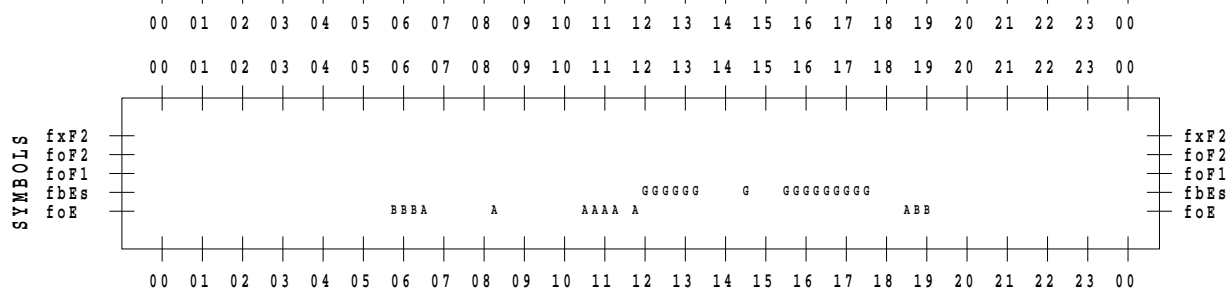
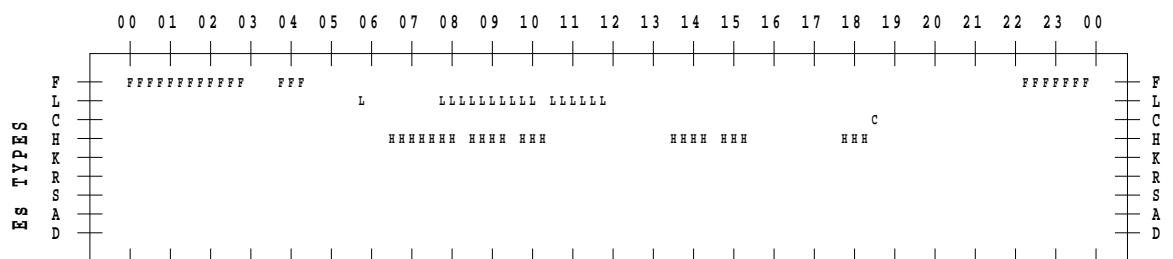
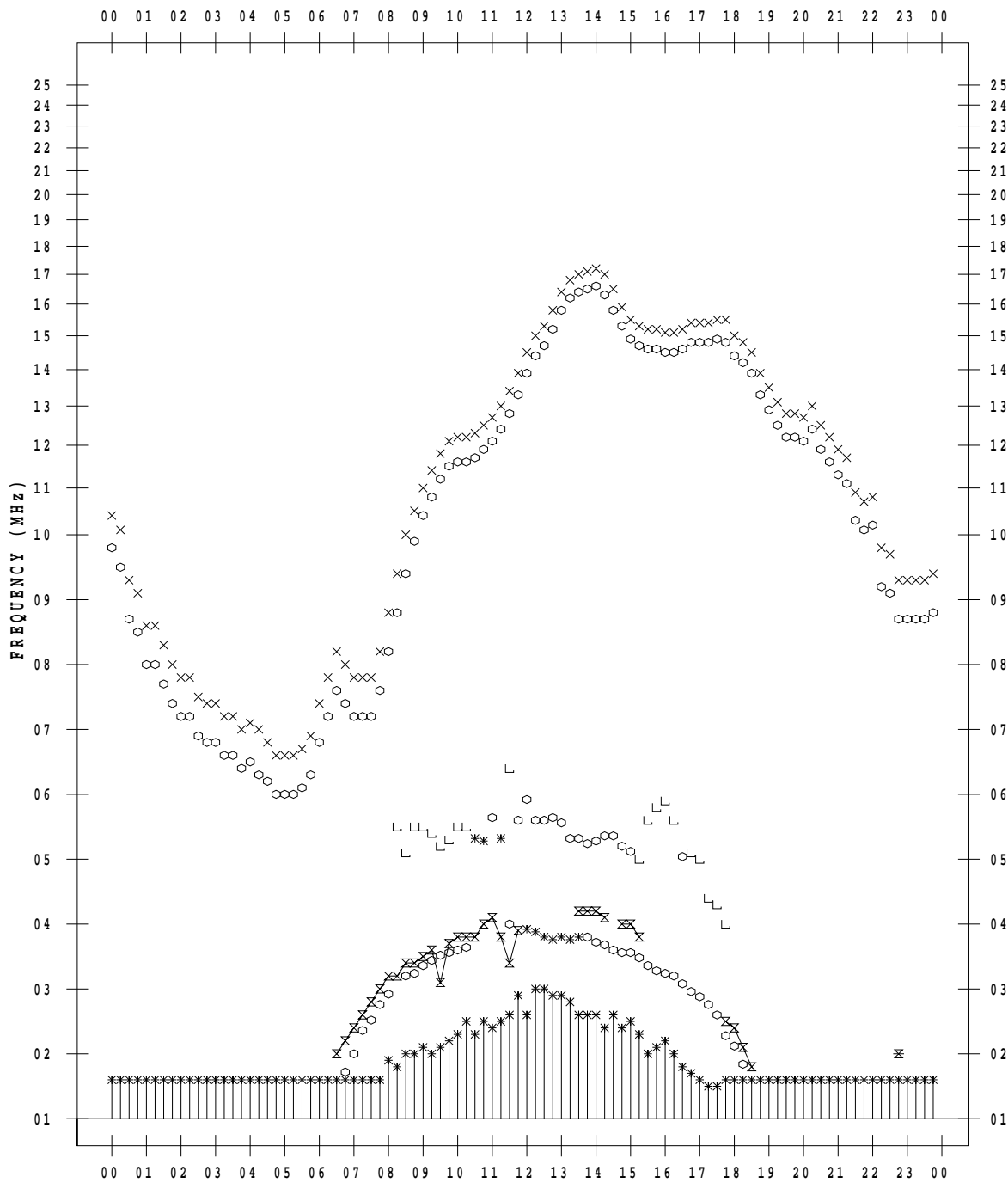
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 5

135 ° E MEAN TIME



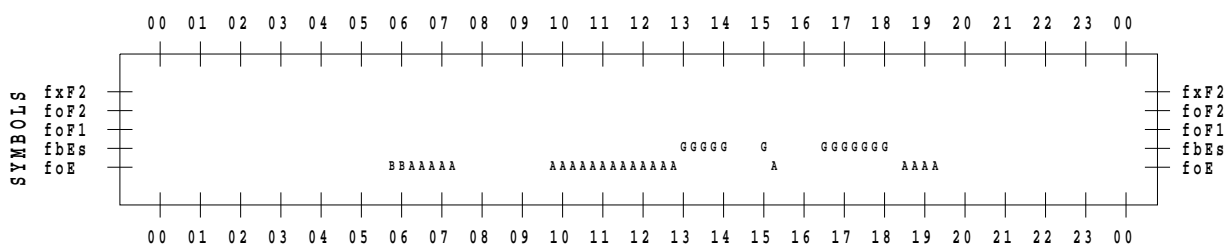
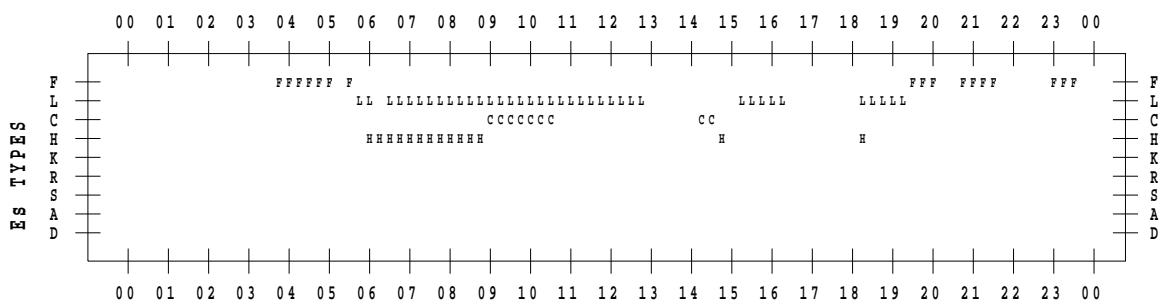
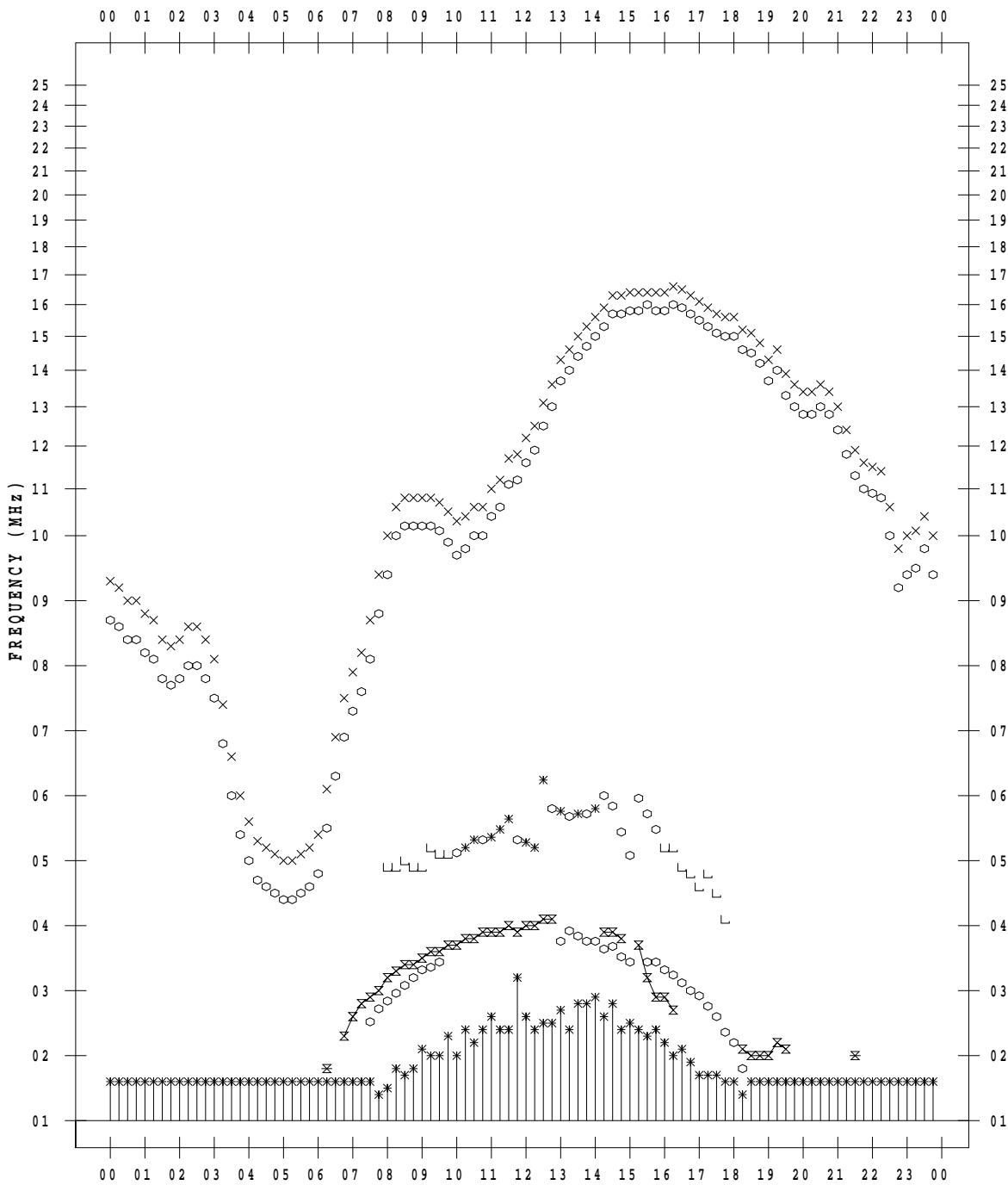
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 6

135 ° E MEAN TIME





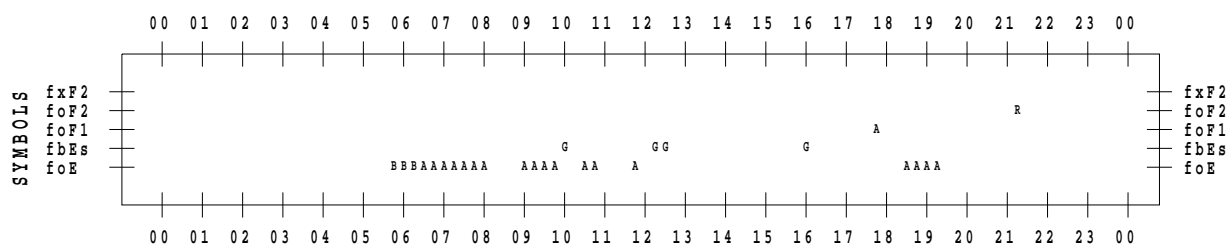
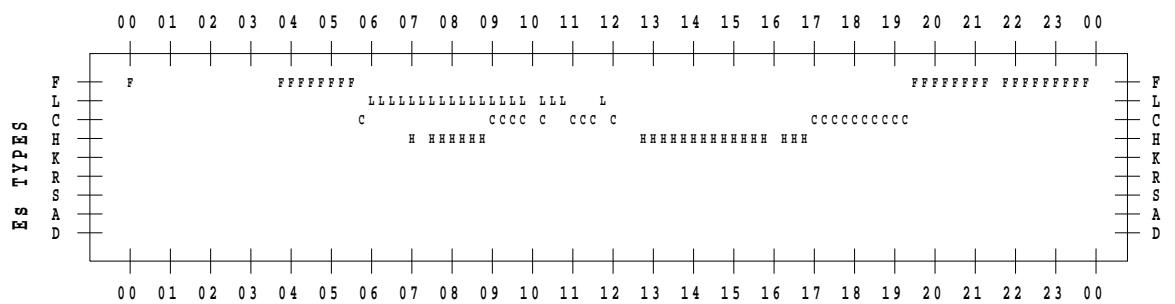
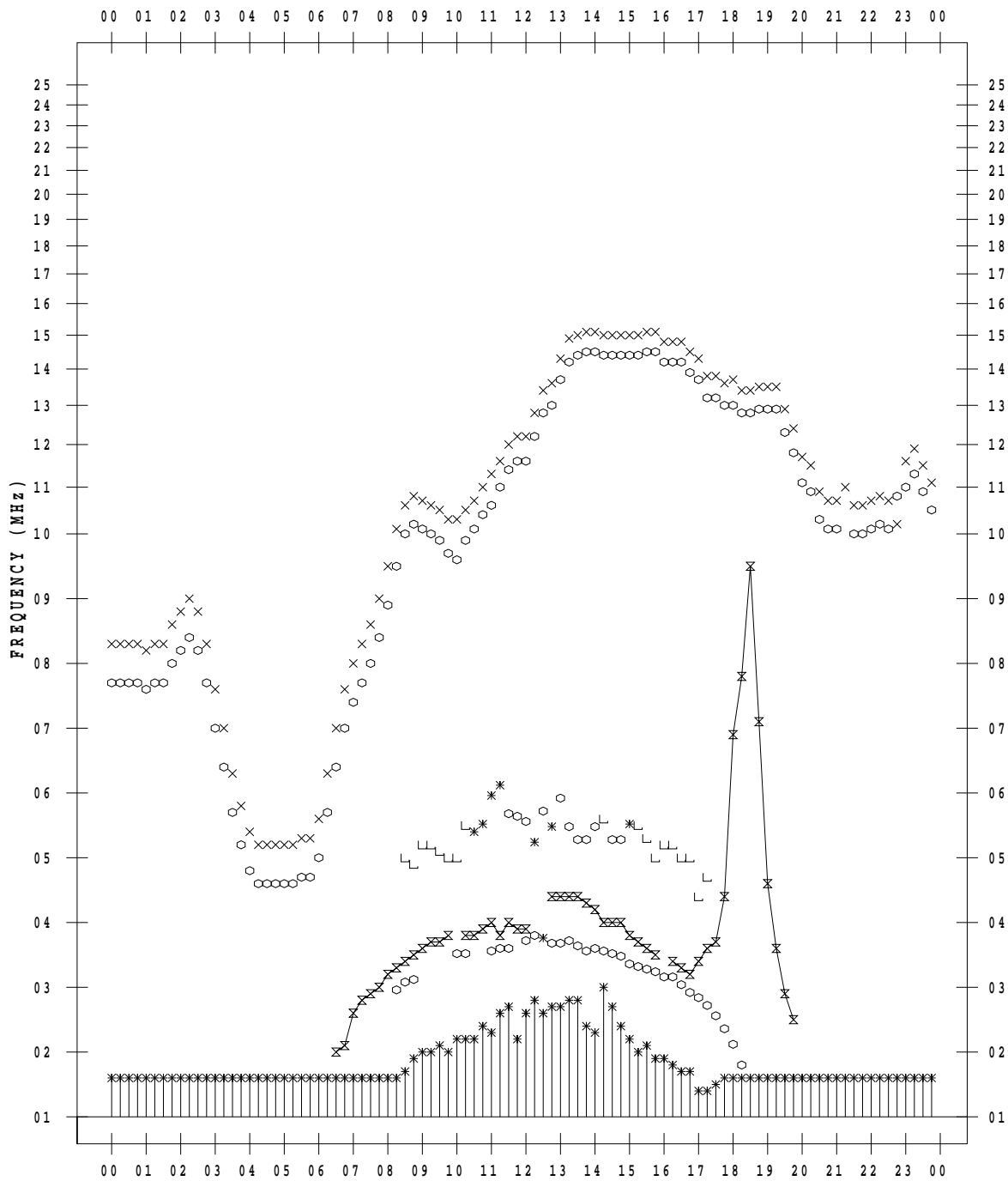
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 8

135 ° E MEAN TIME



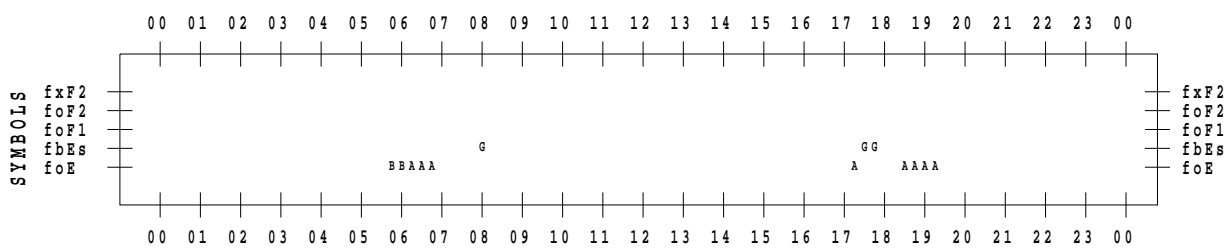
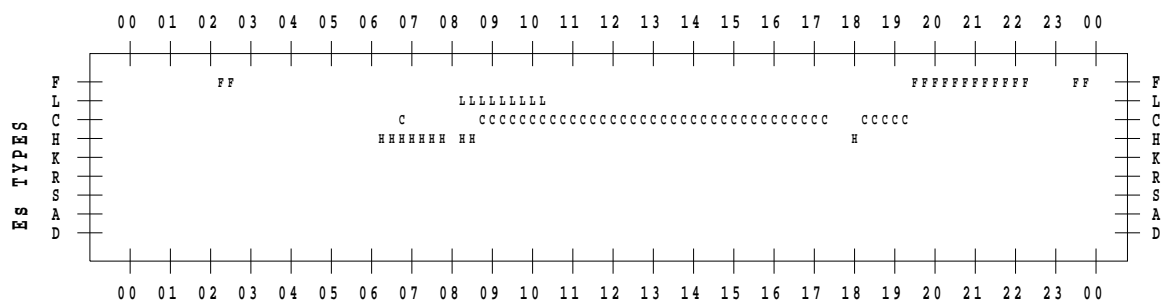
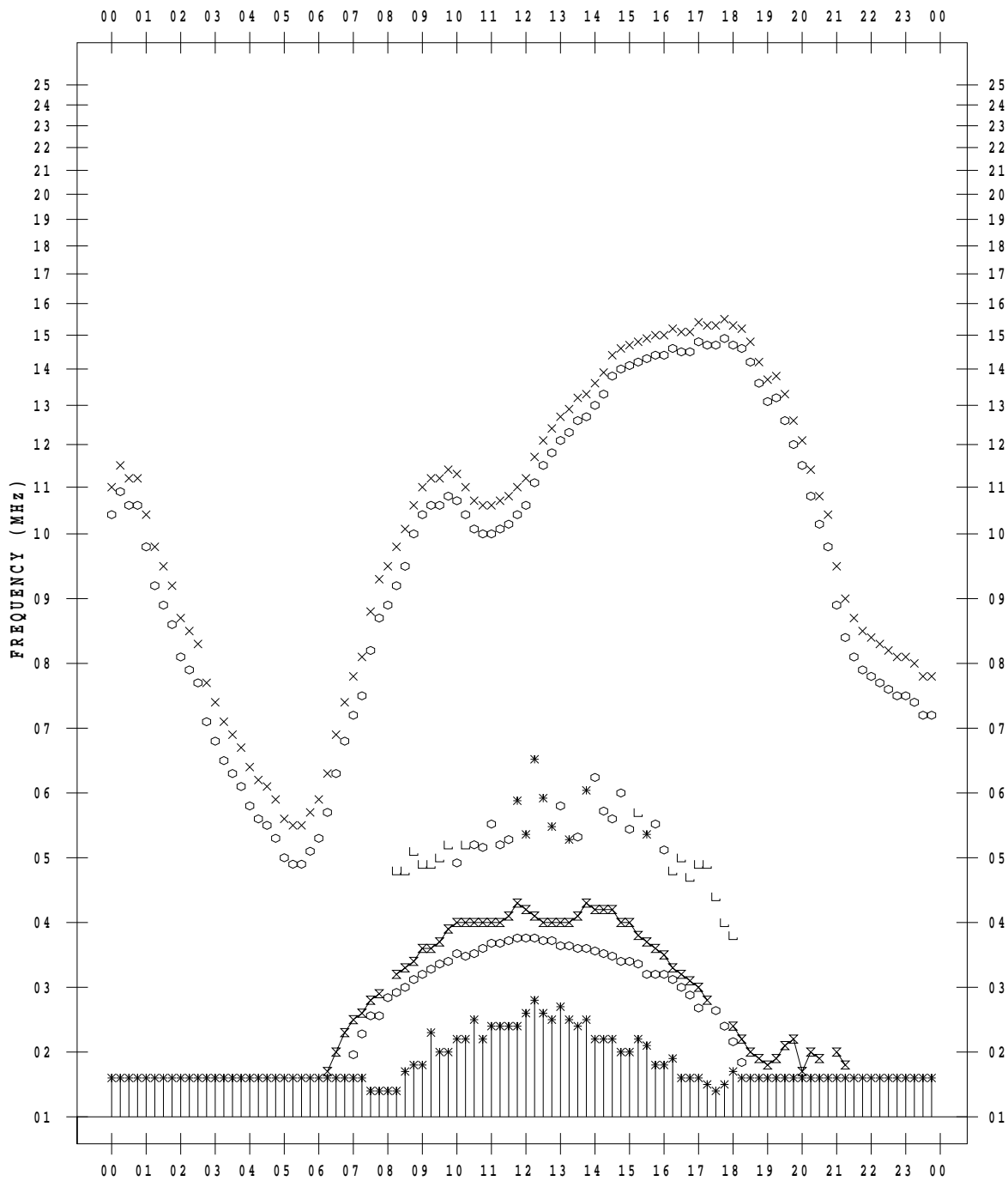
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 9

135 ° E MEAN TIME



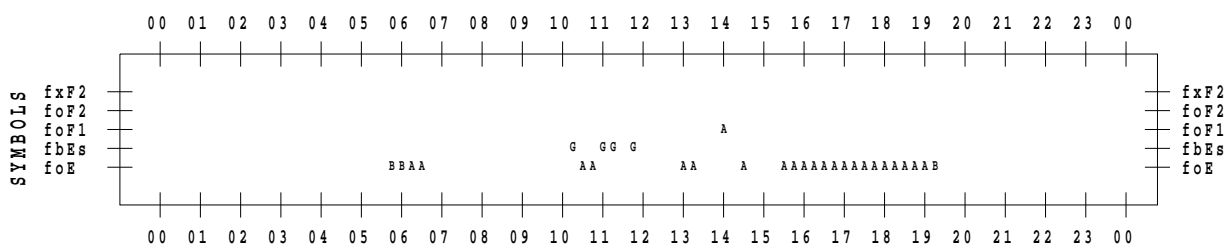
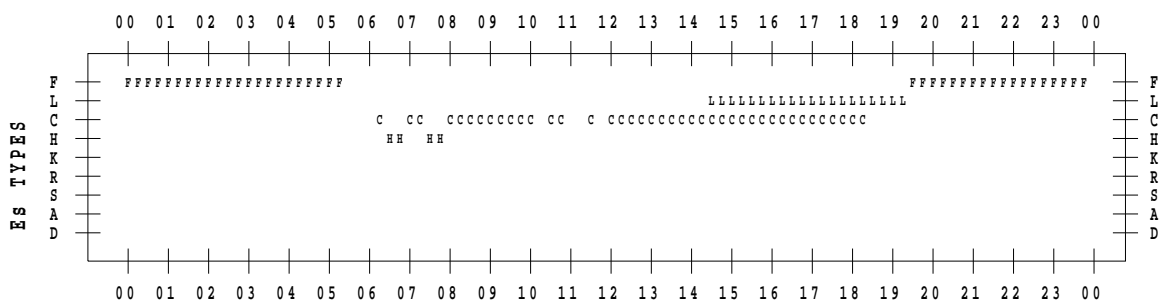
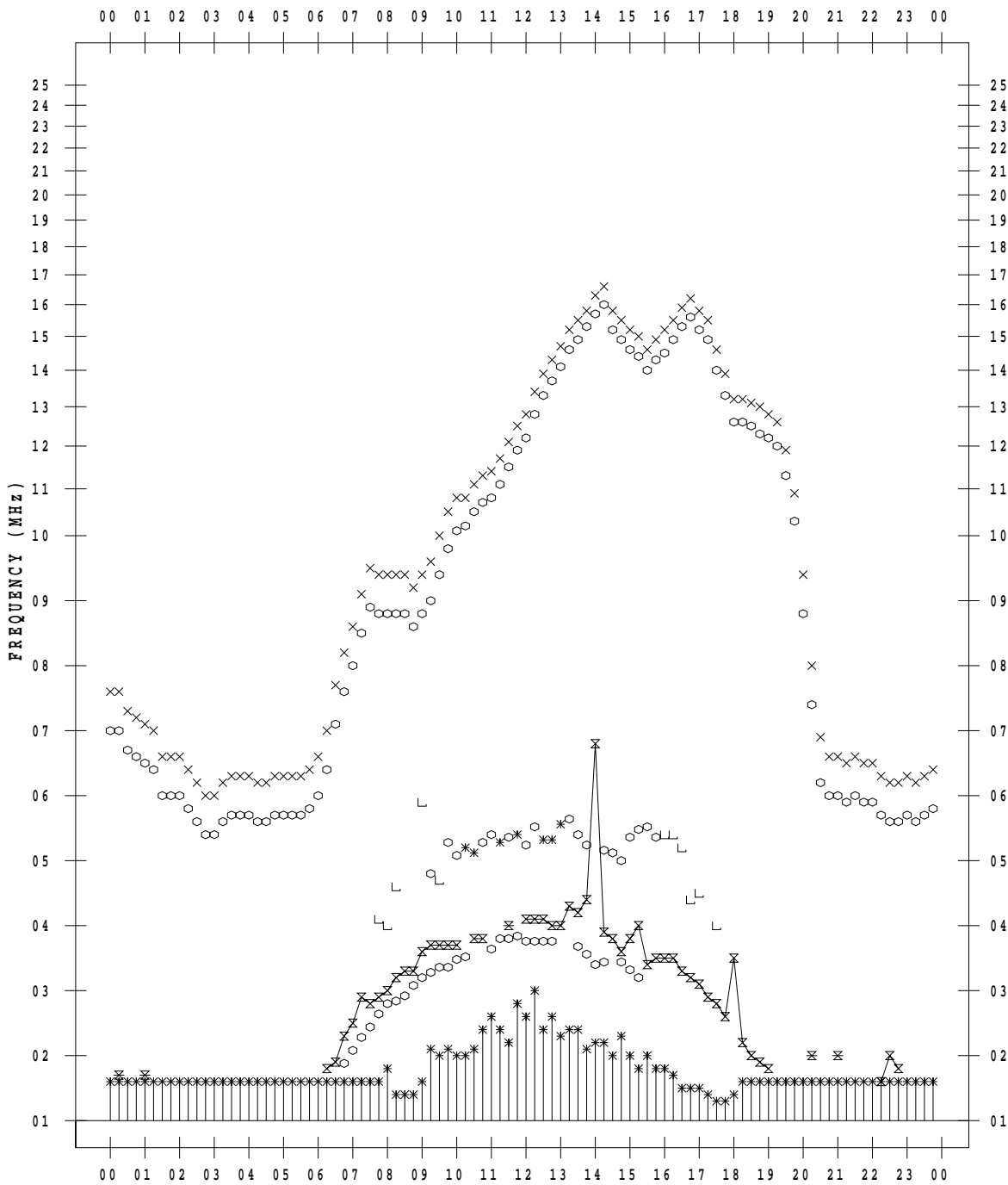
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 10

135 ° E MEAN TIME





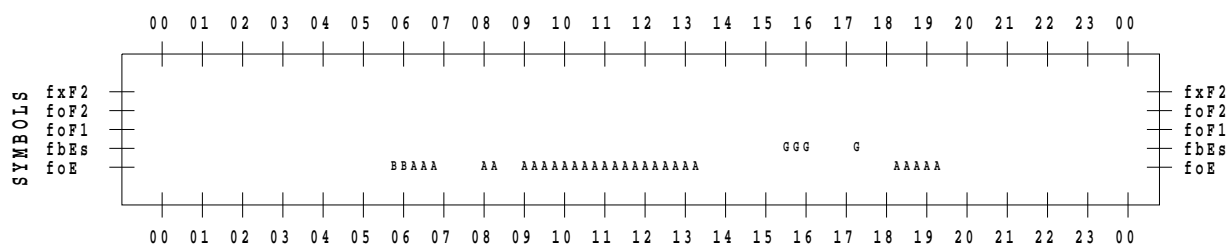
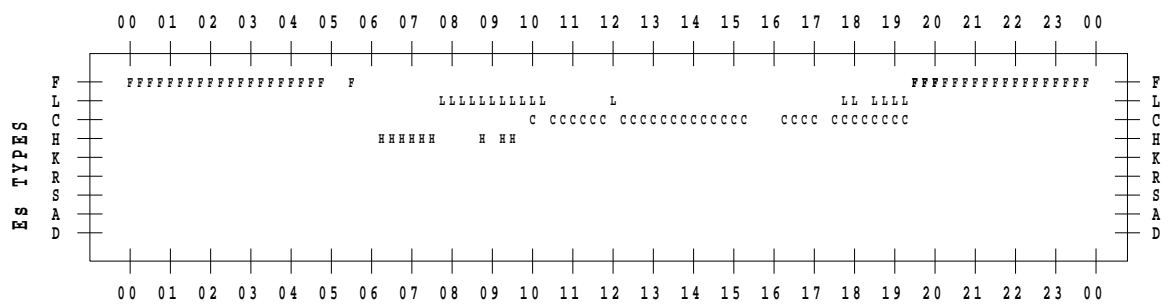
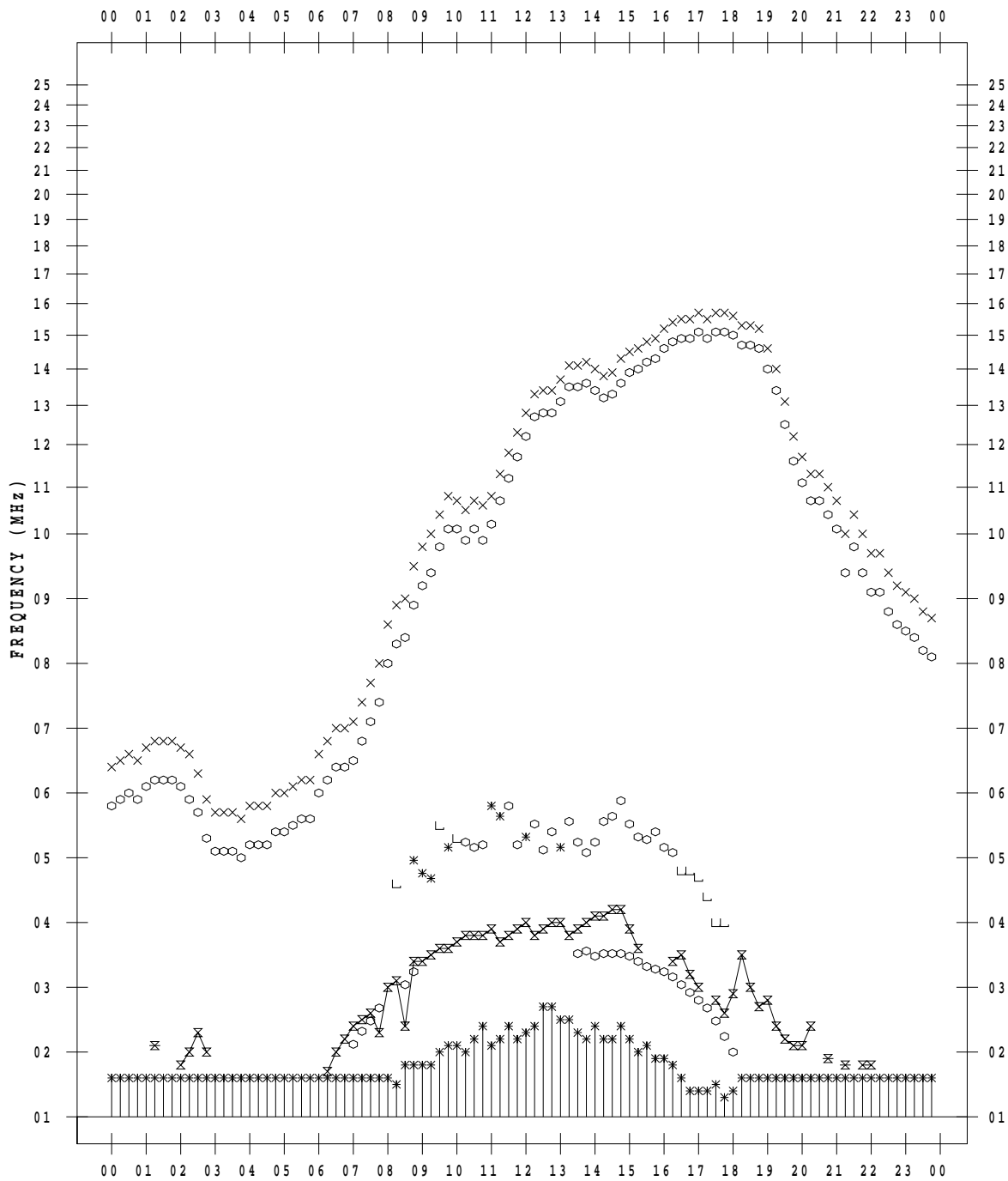
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 11

135 ° E MEAN TIME



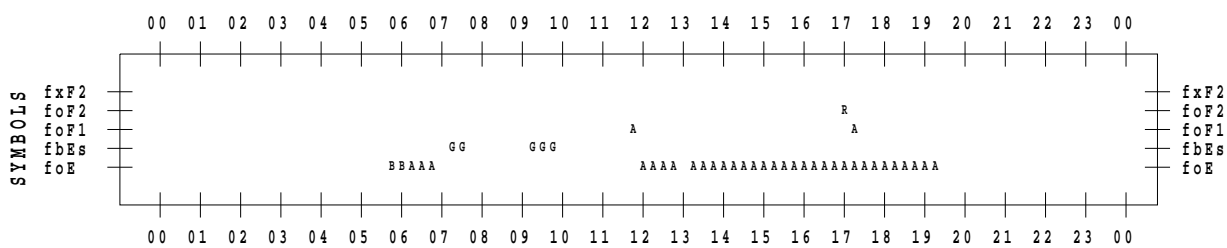
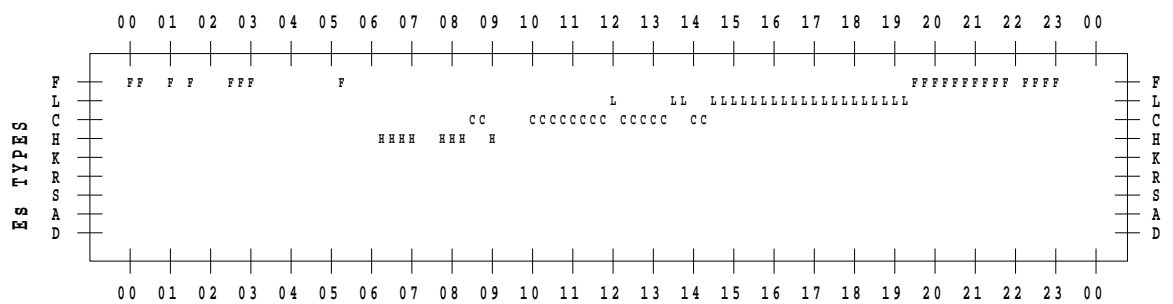
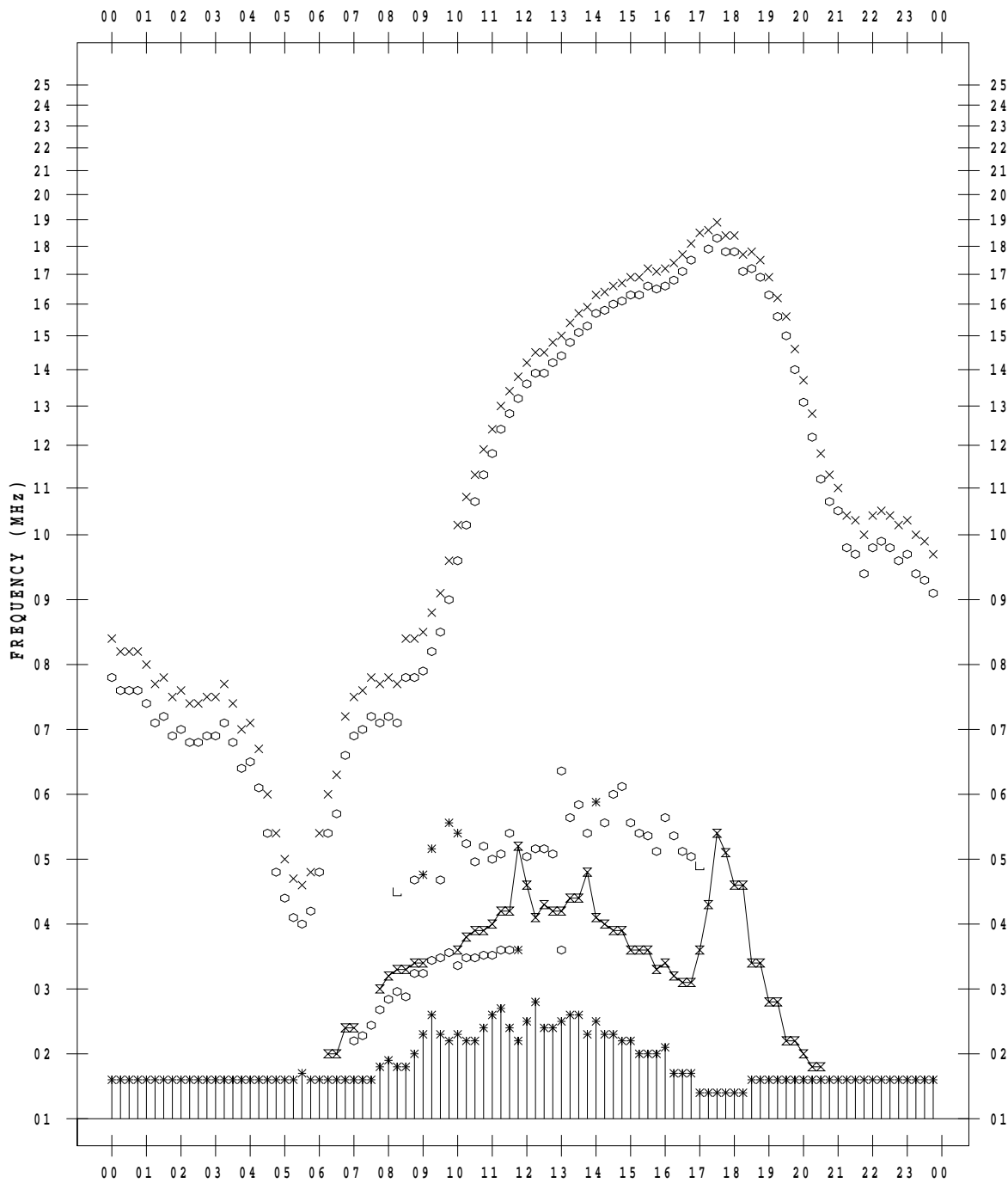
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 12

135 ° E MEAN TIME



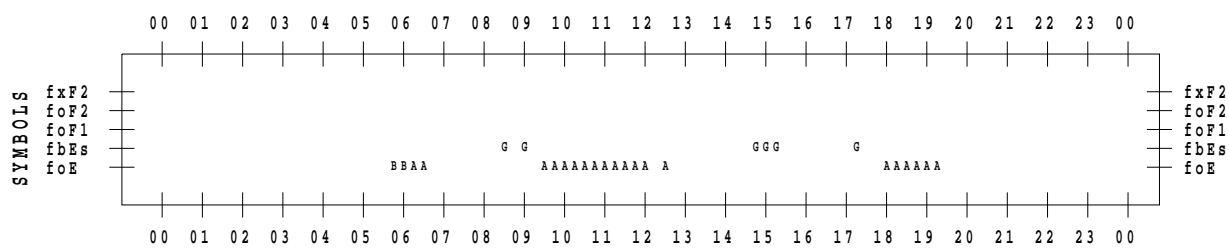
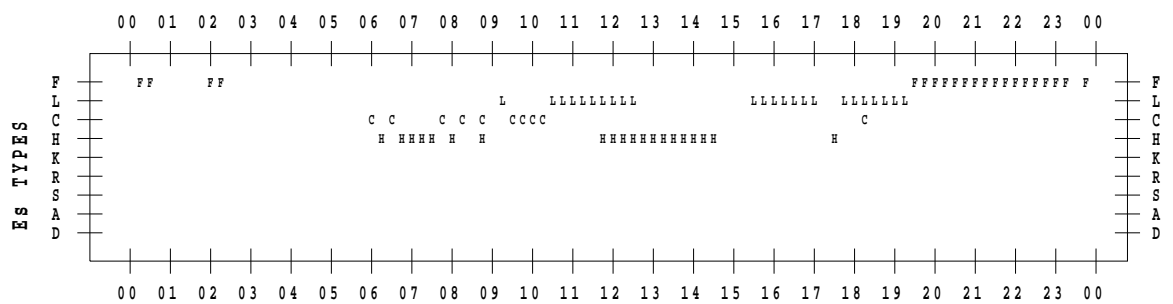
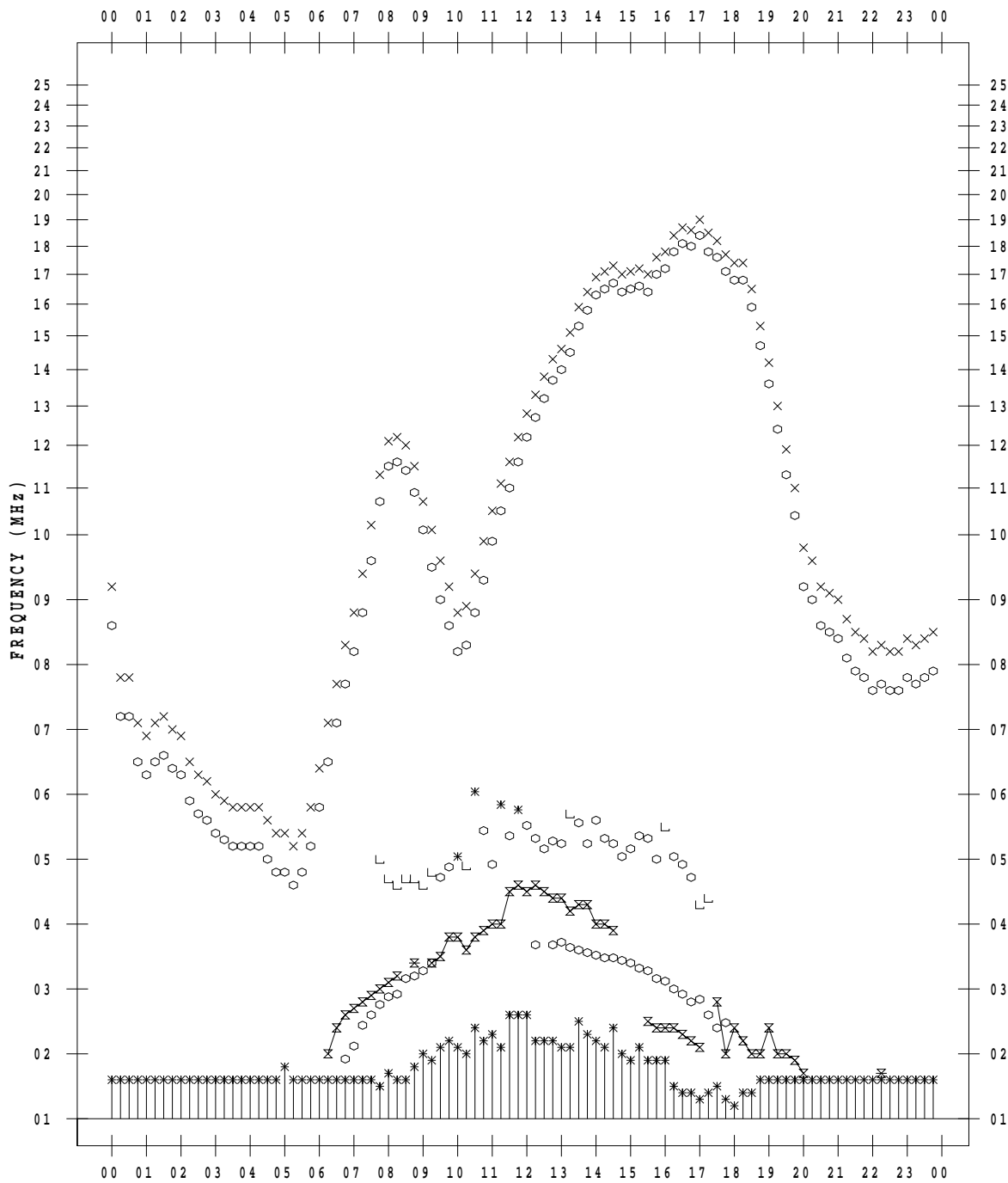
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 13

135 ° E MEAN TIME



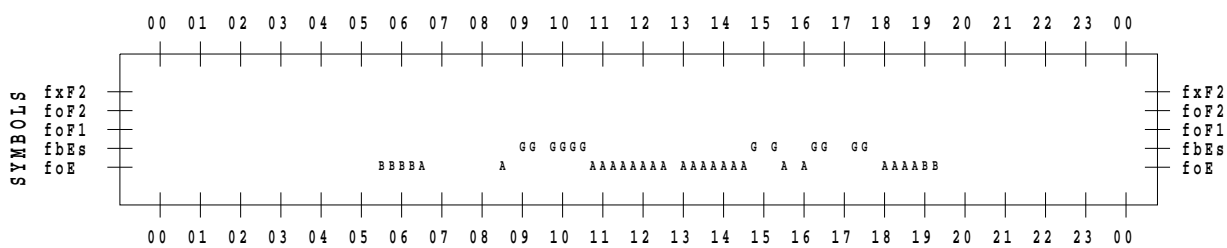
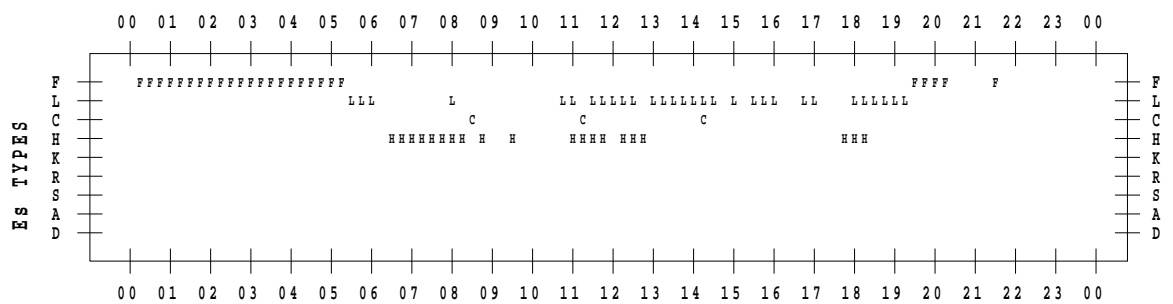
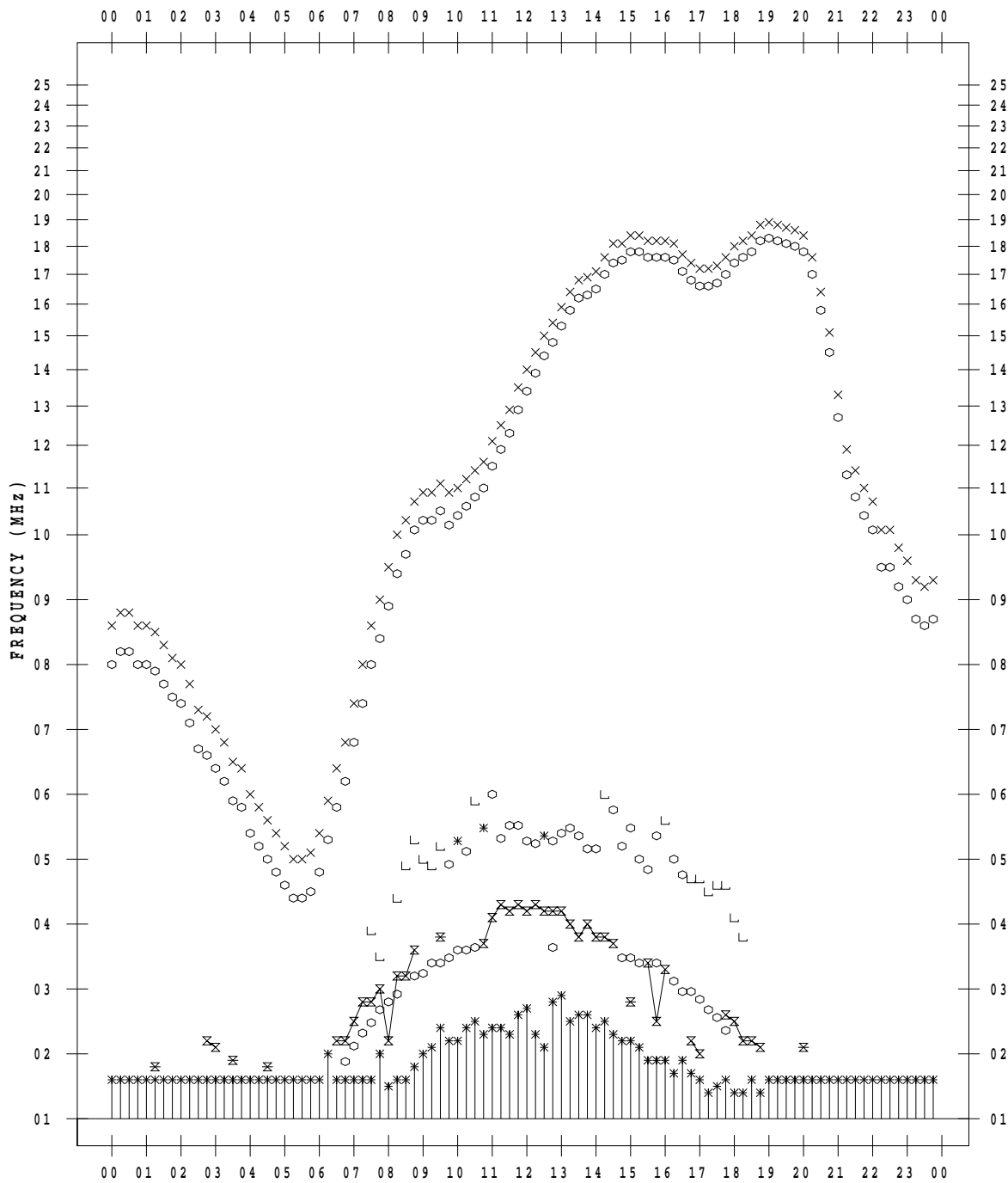
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 14

135 ° E MEAN TIME



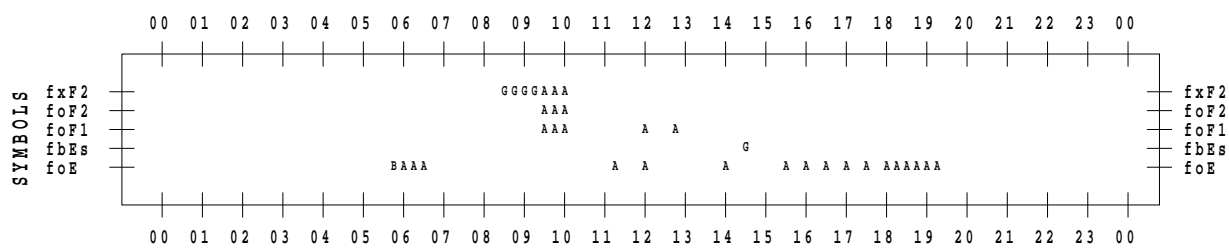
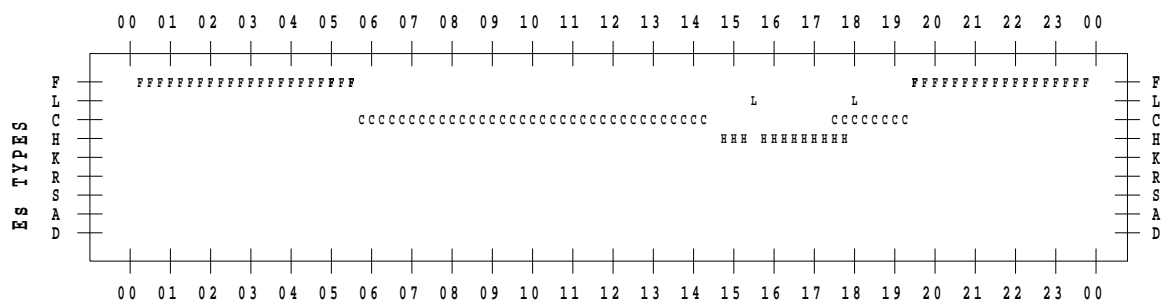
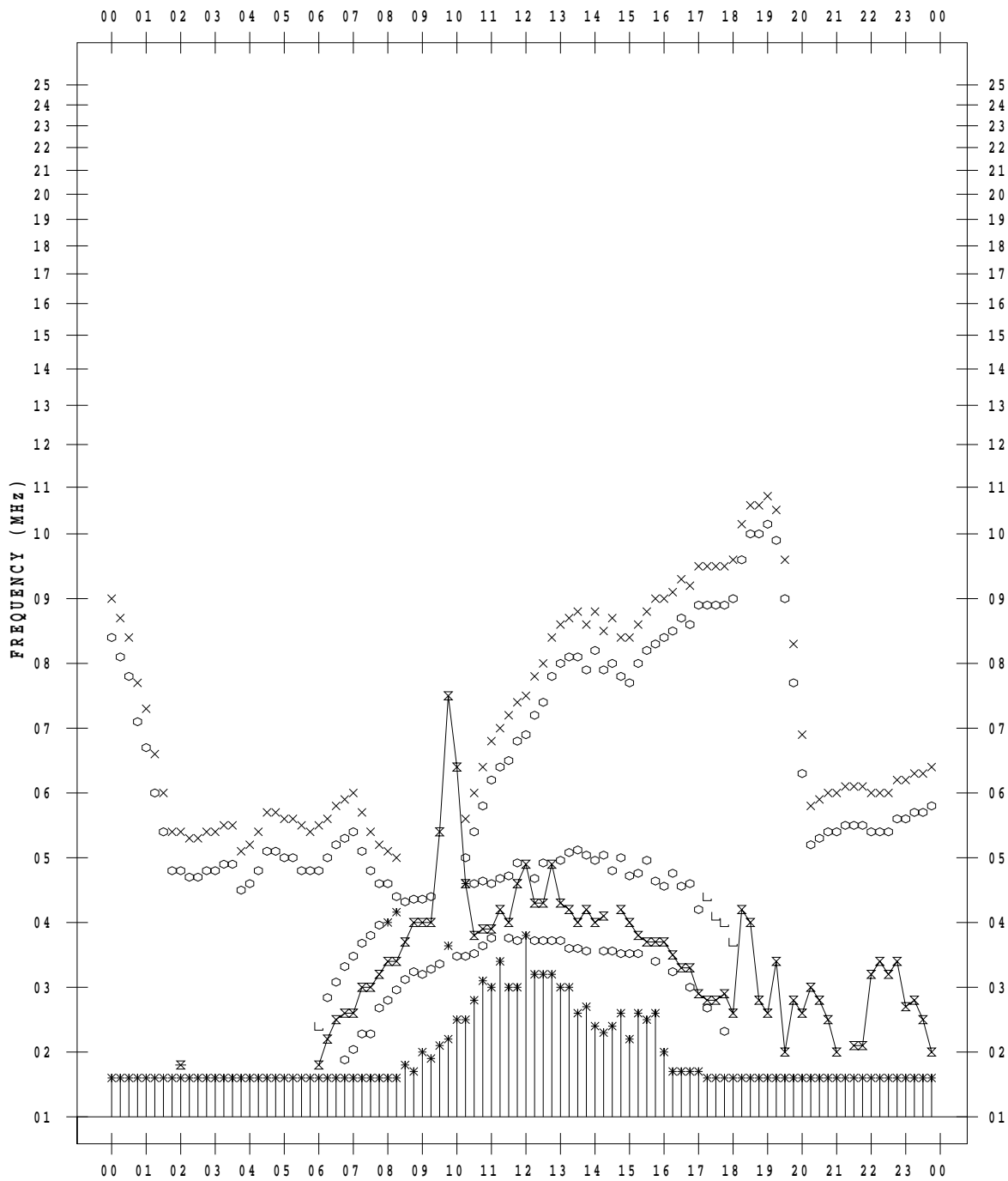
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 15

135 ° E MEAN TIME



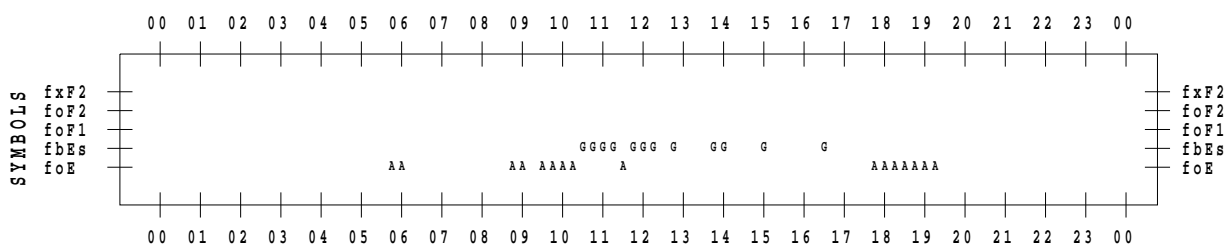
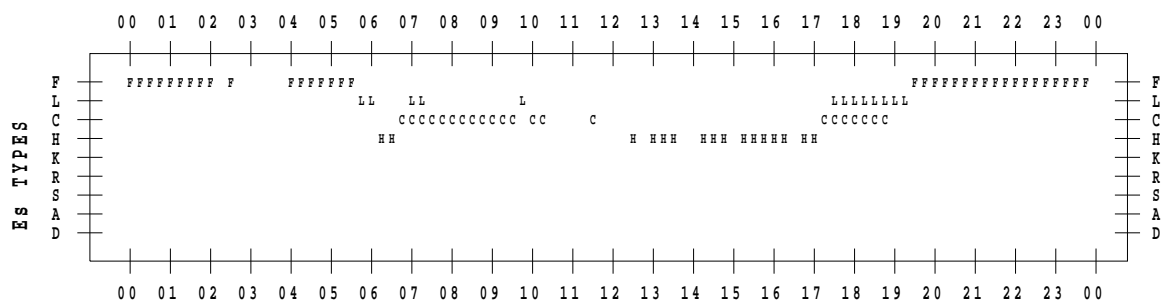
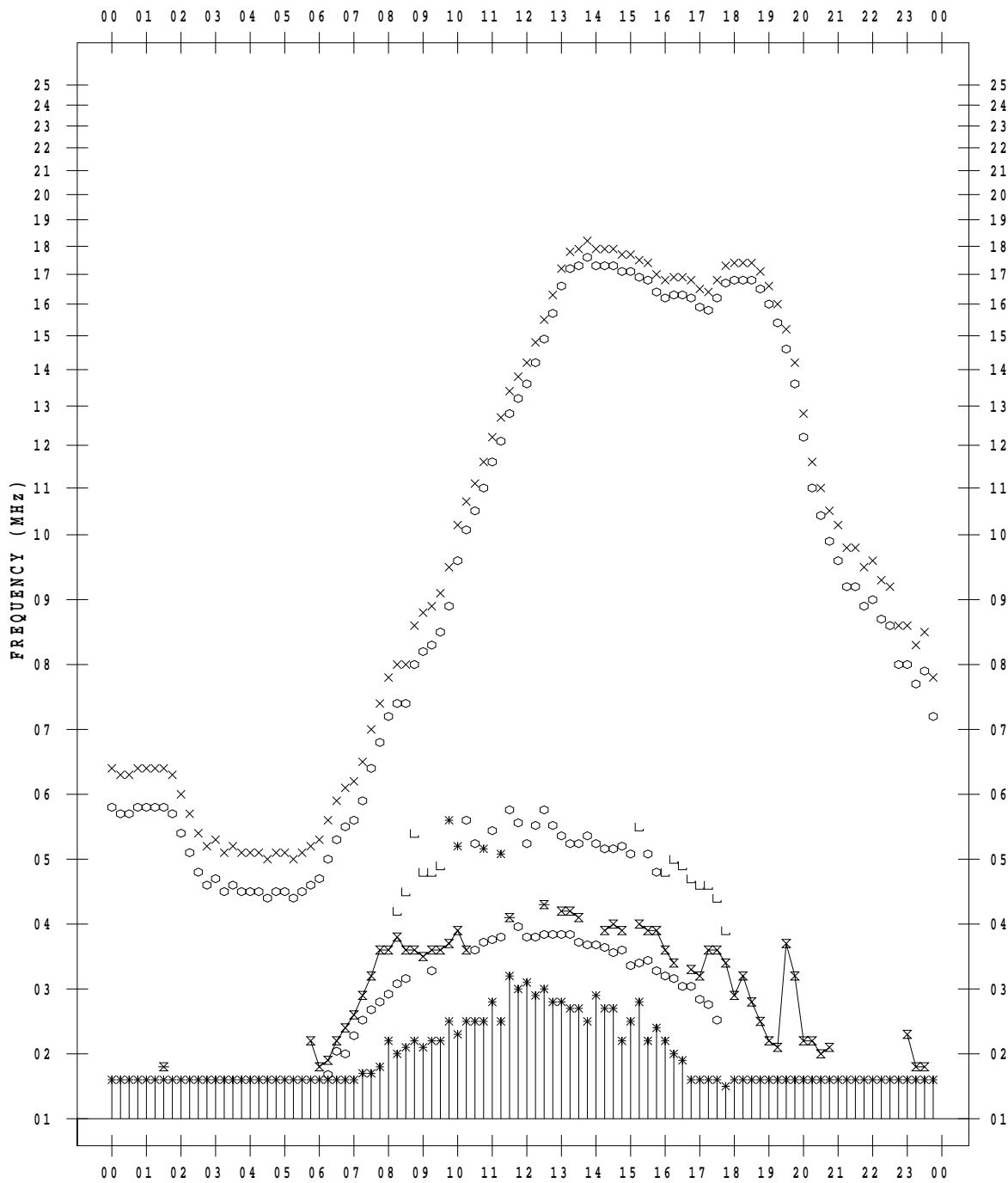
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 16

135 ° E MEAN TIME



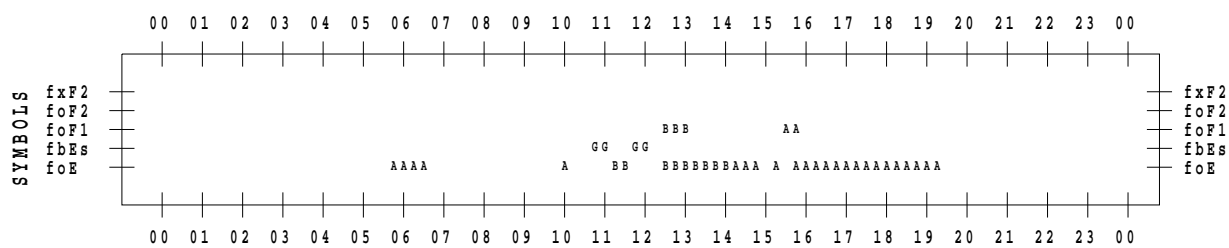
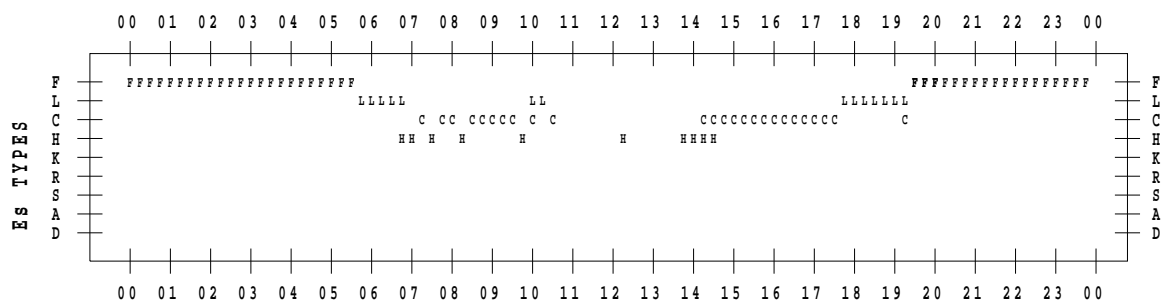
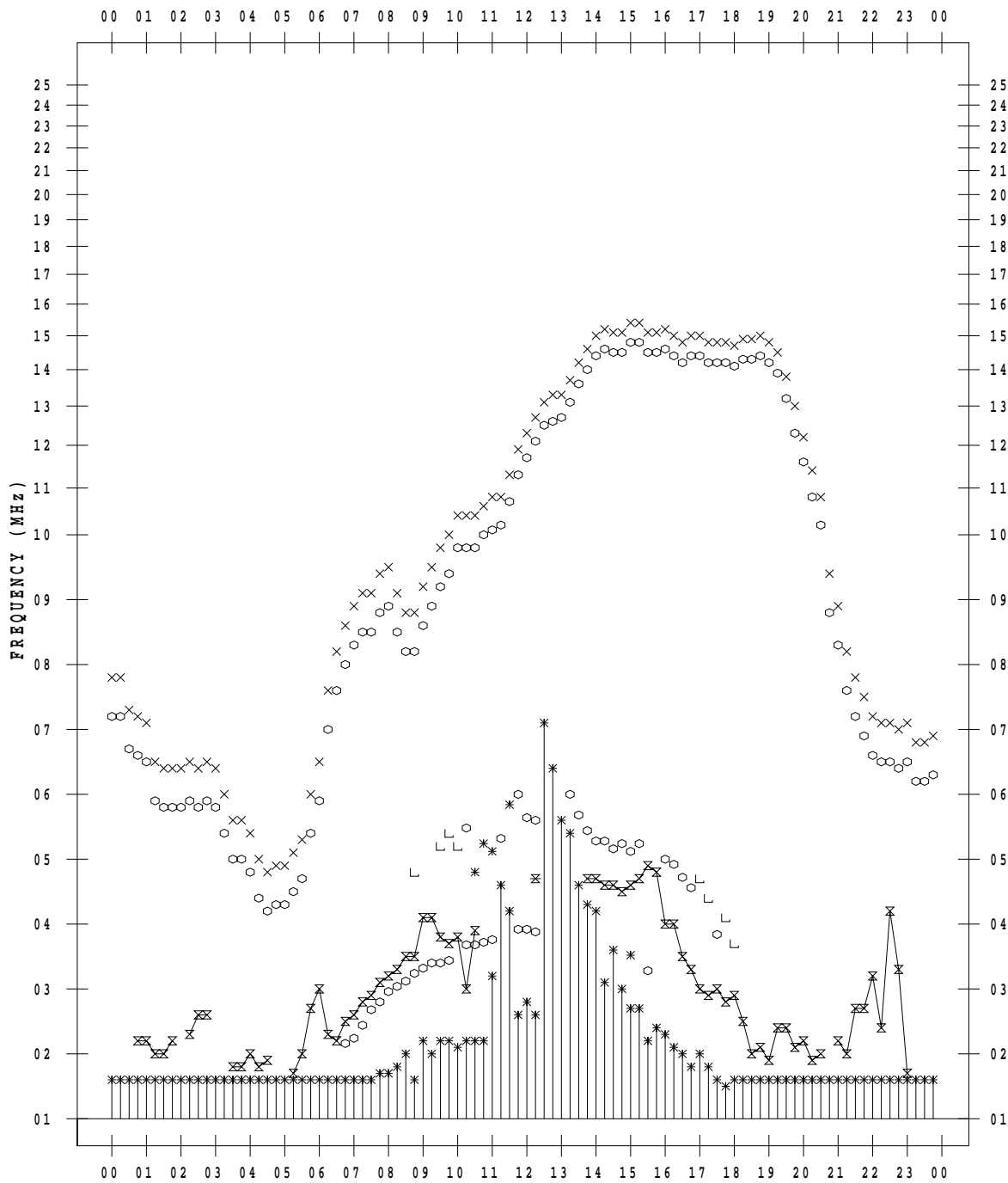
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 17

135 ° E MEAN TIME



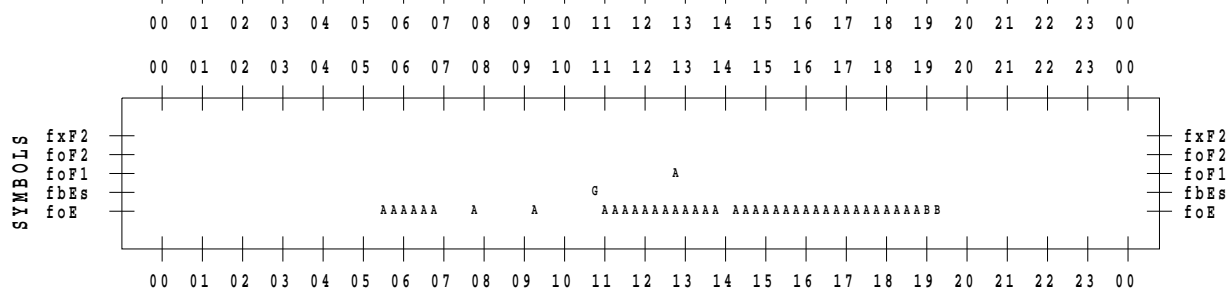
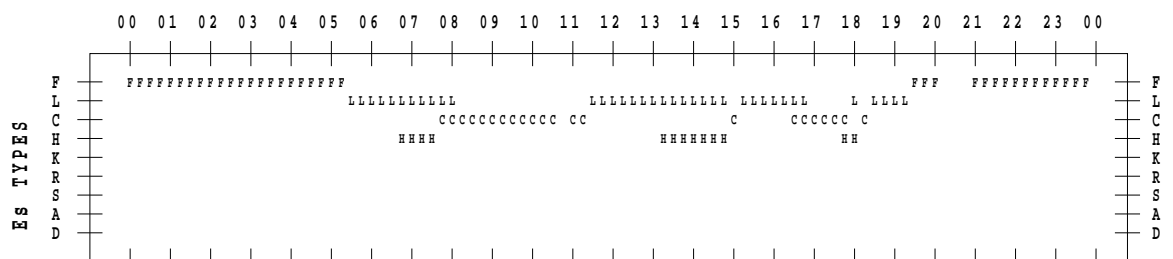
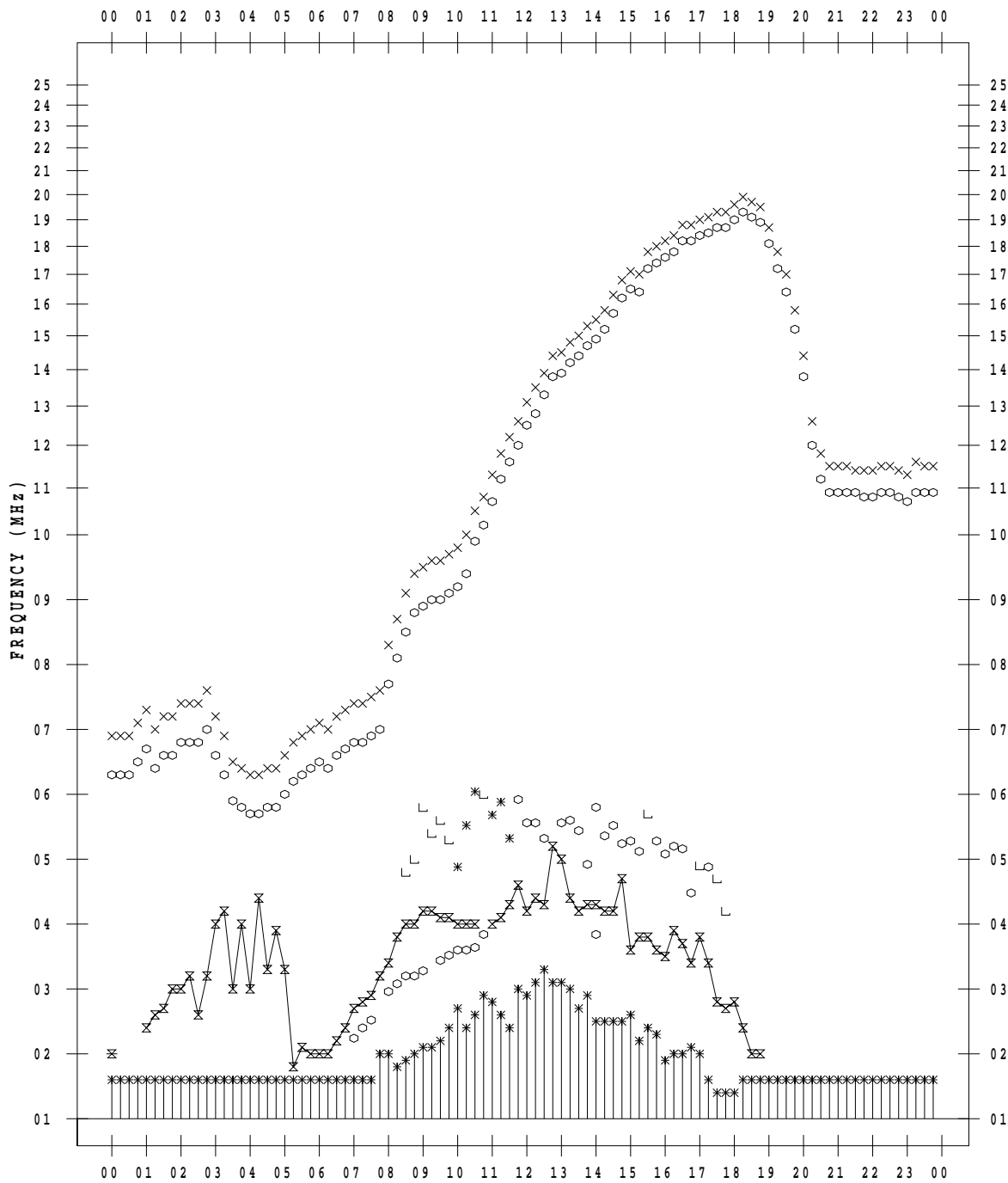
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 18

135 ° E MEAN TIME





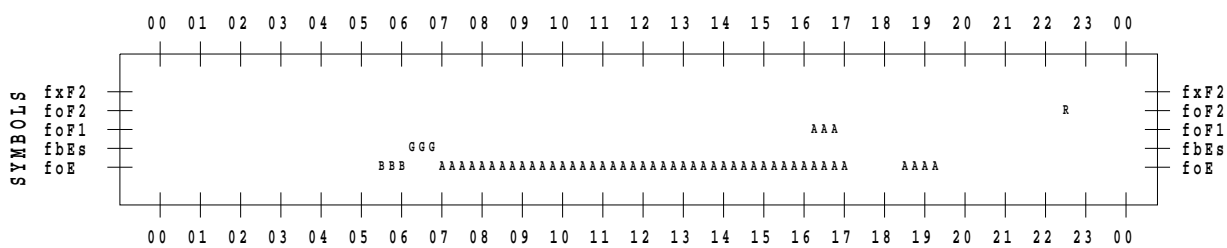
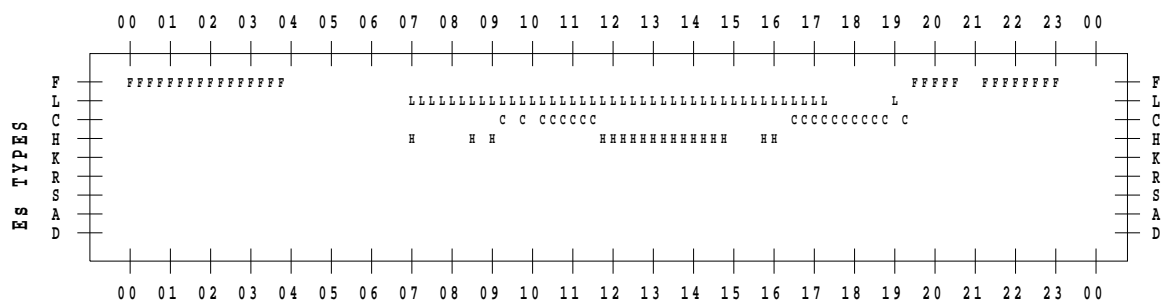
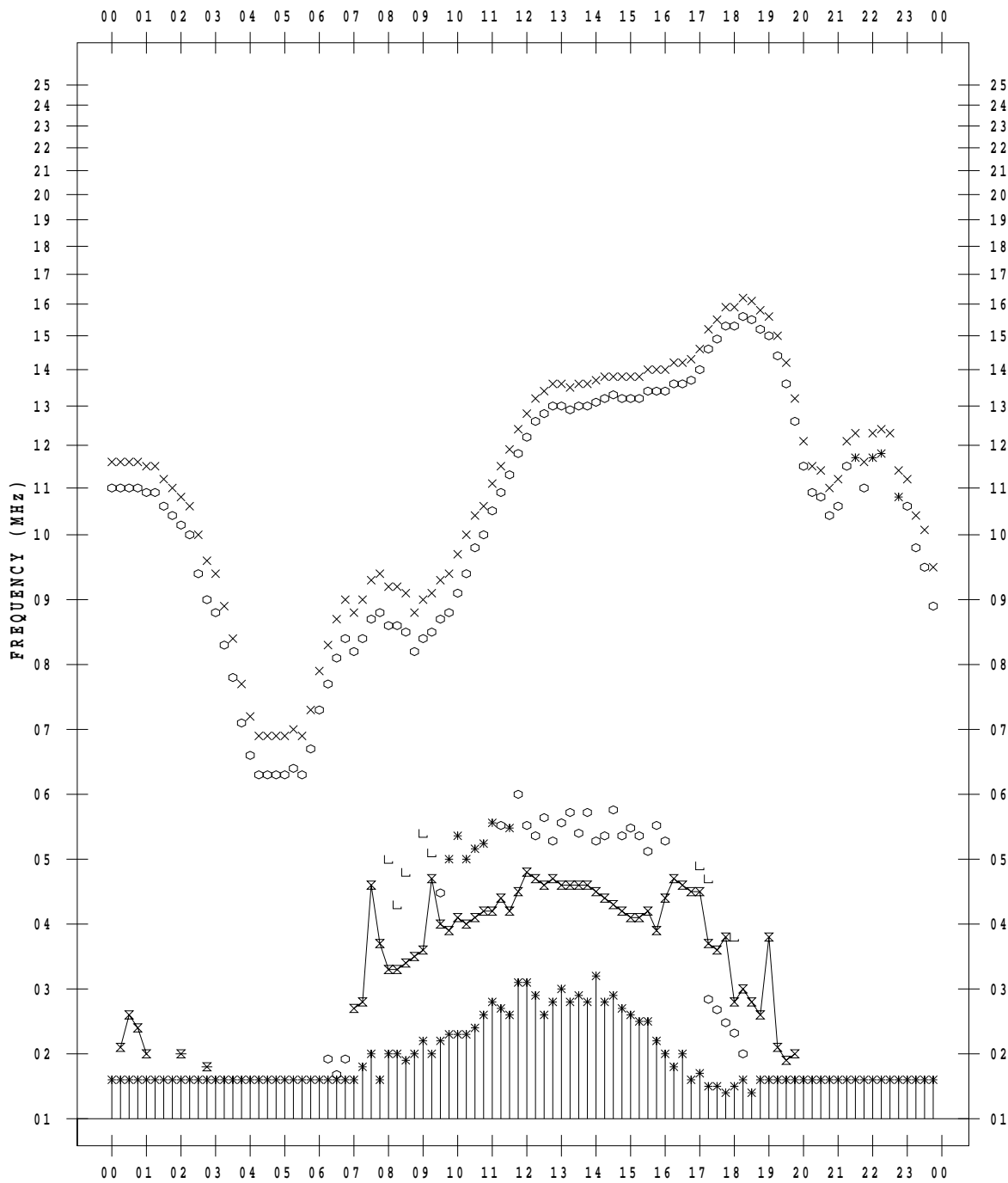
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 19

135 ° E MEAN TIME



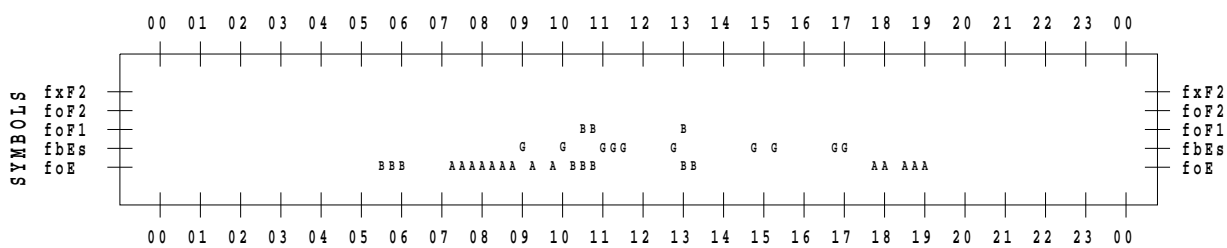
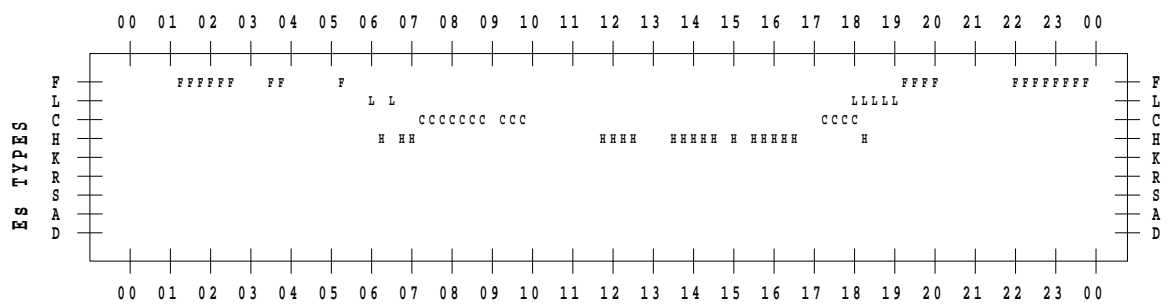
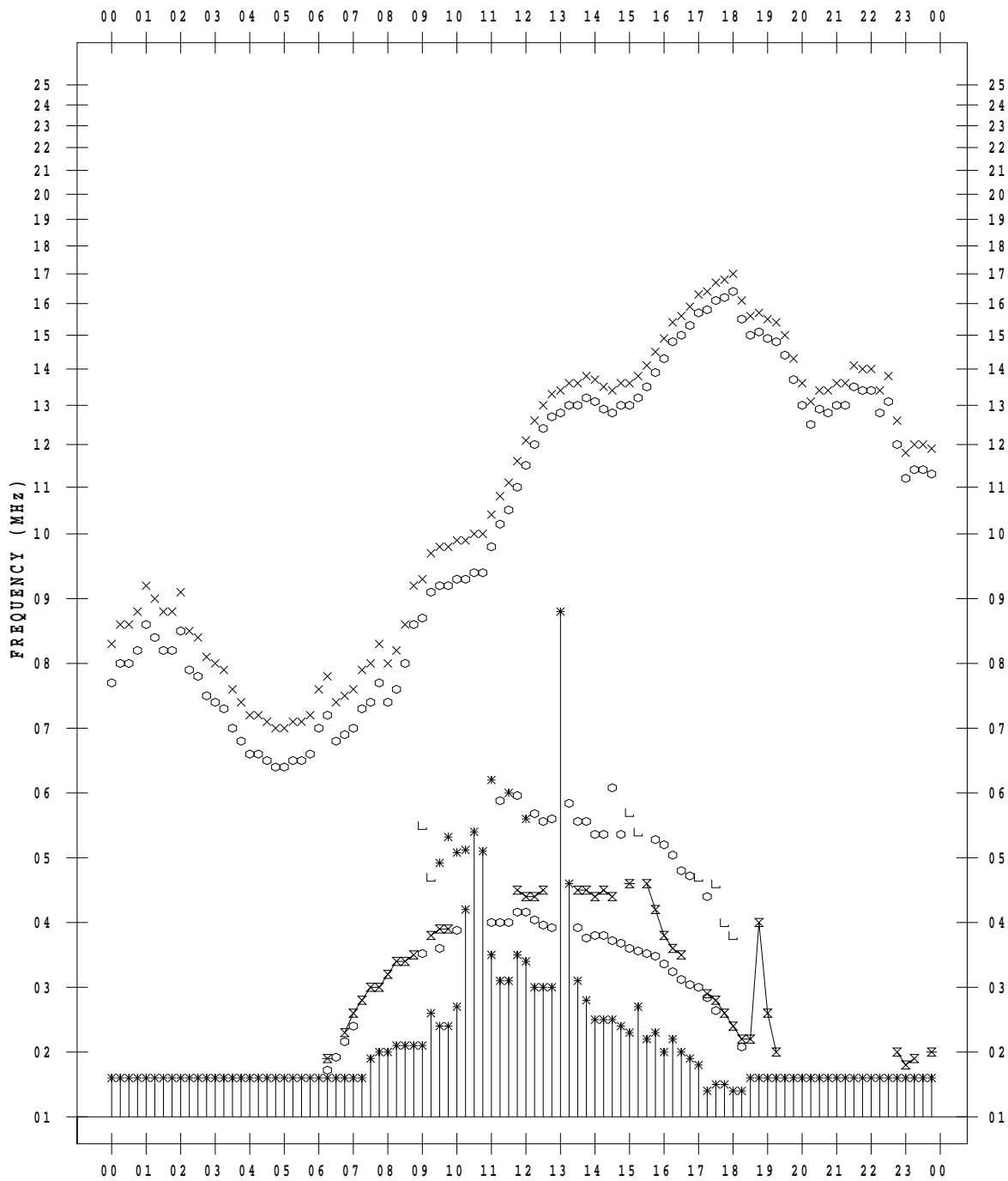
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 20

135 ° E MEAN TIME



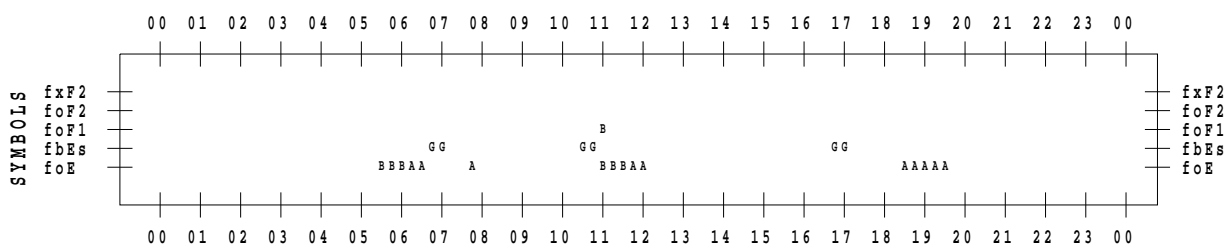
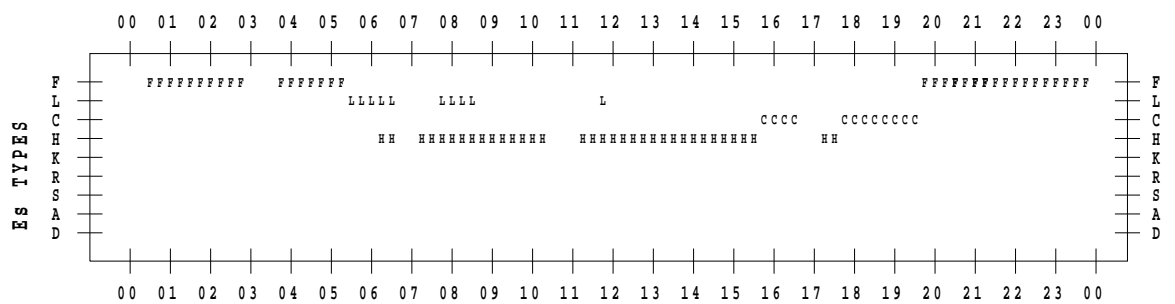
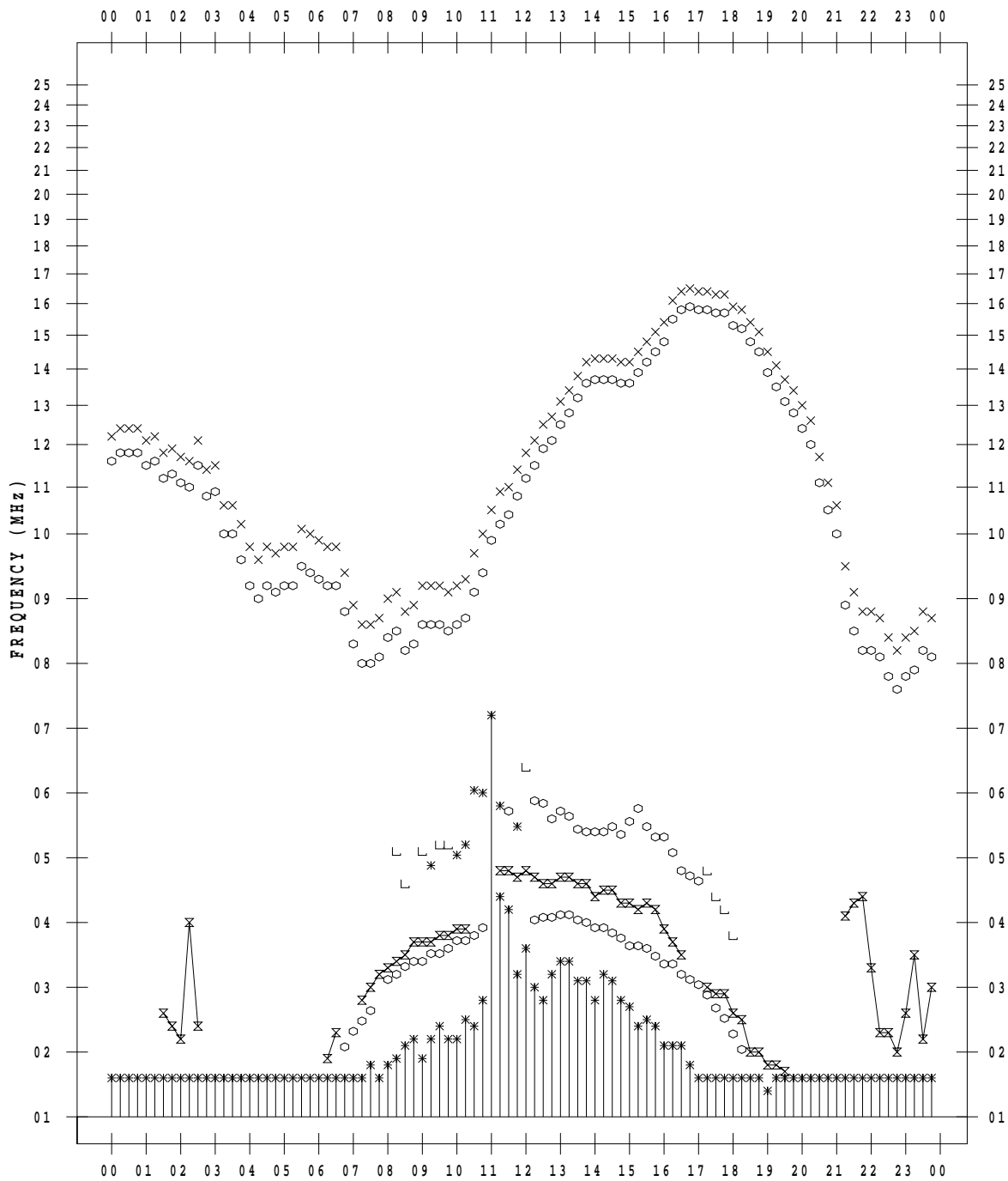
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 21

135 ° E MEAN TIME



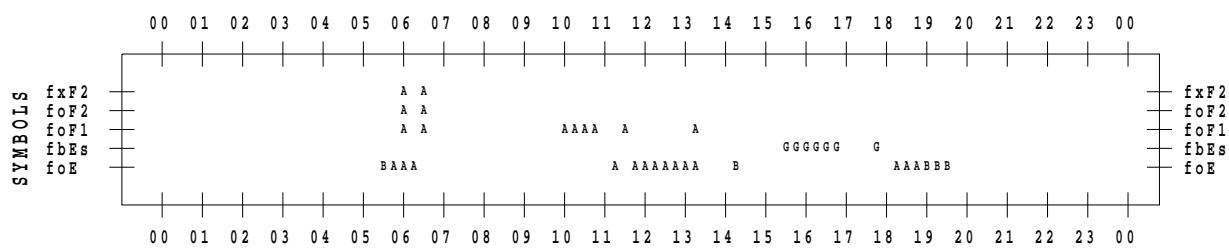
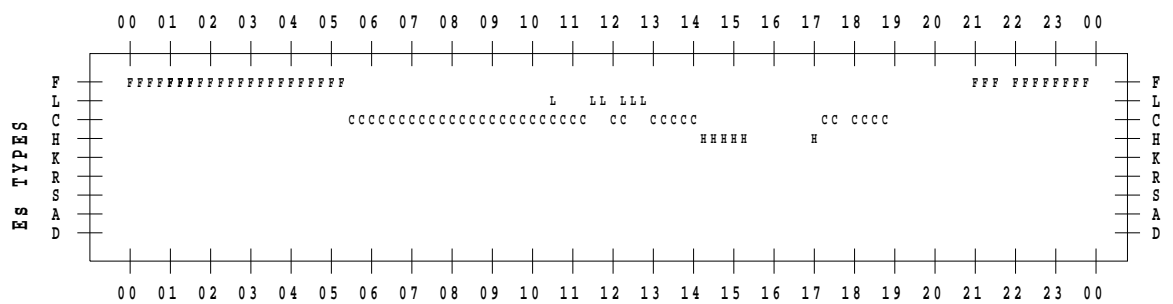
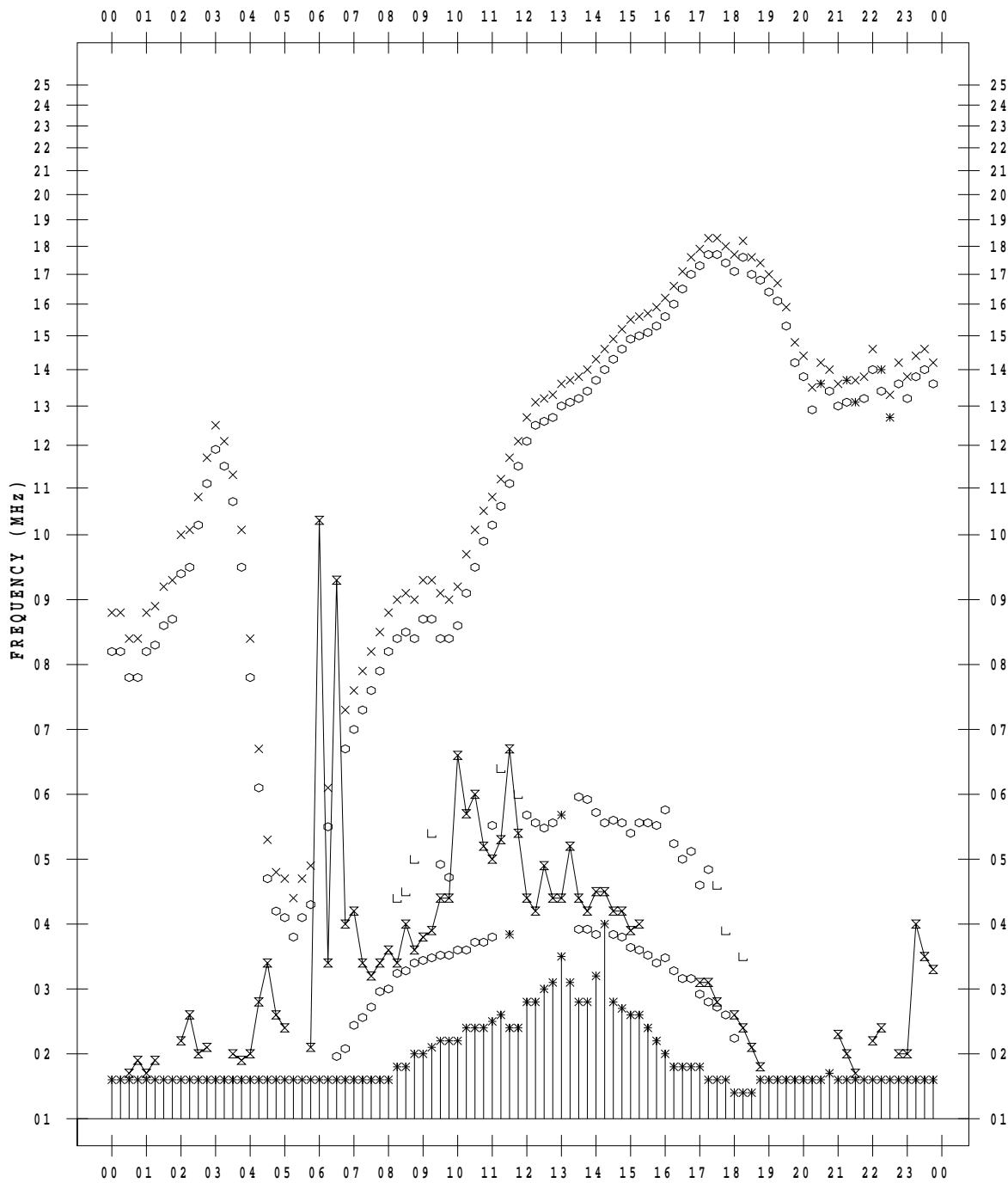
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 22

135 ° E MEAN TIME



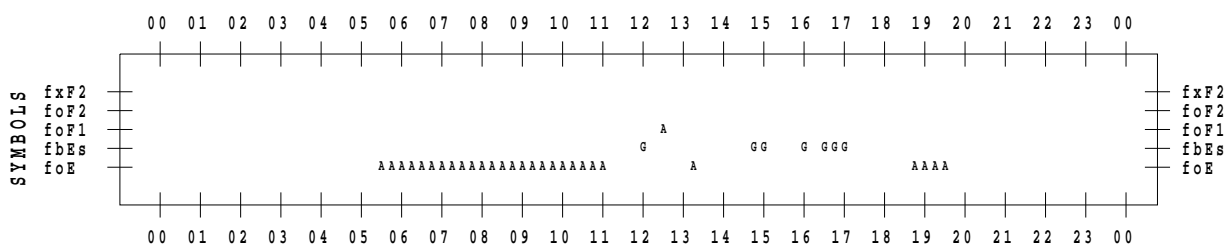
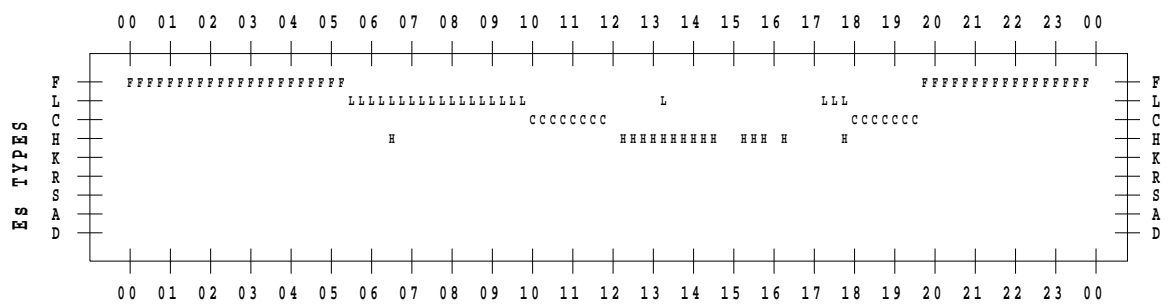
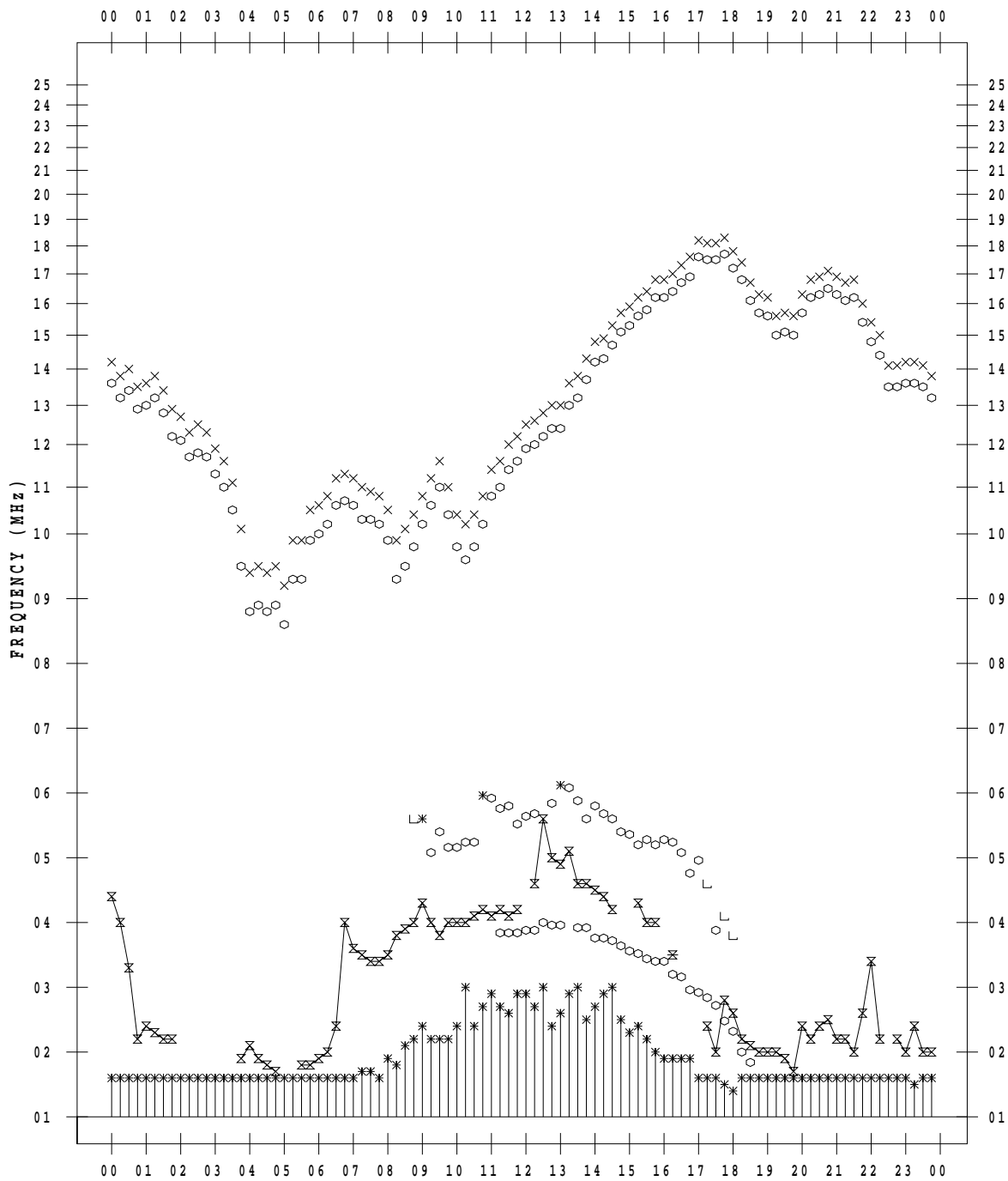
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 23

135 ° E MEAN TIME



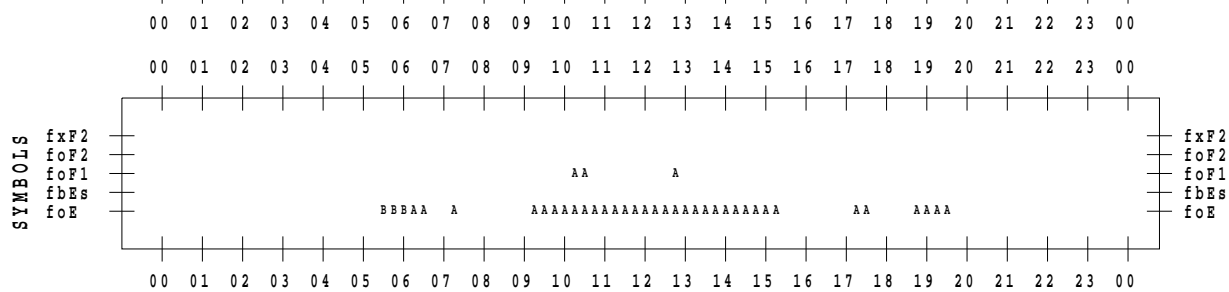
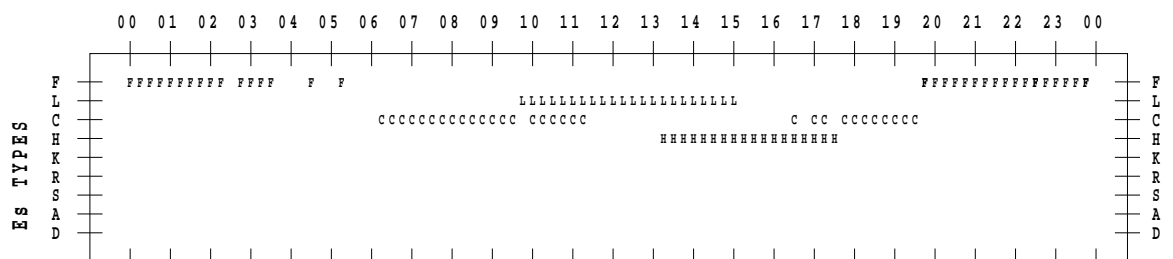
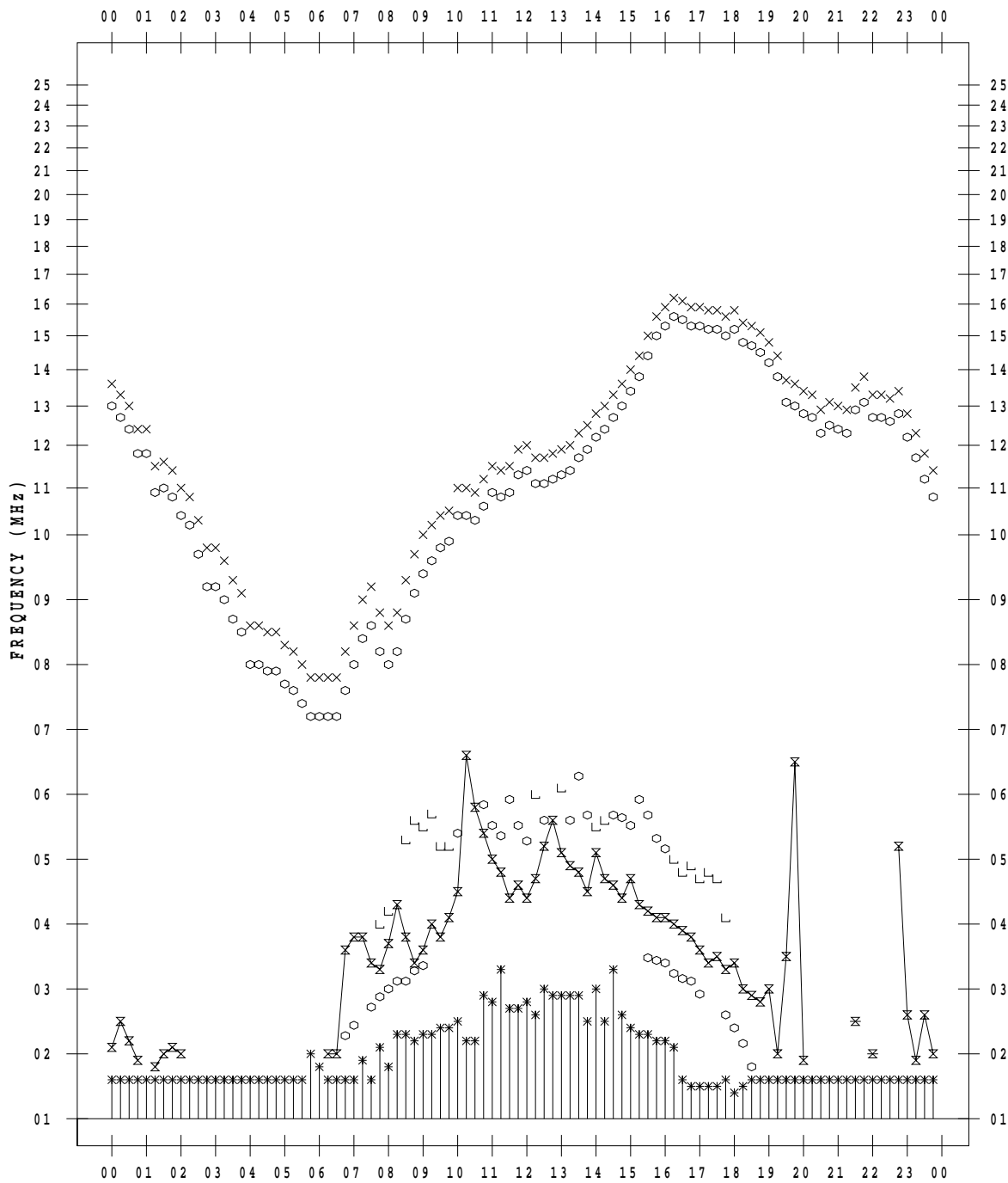
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 24

135 ° E MEAN TIME









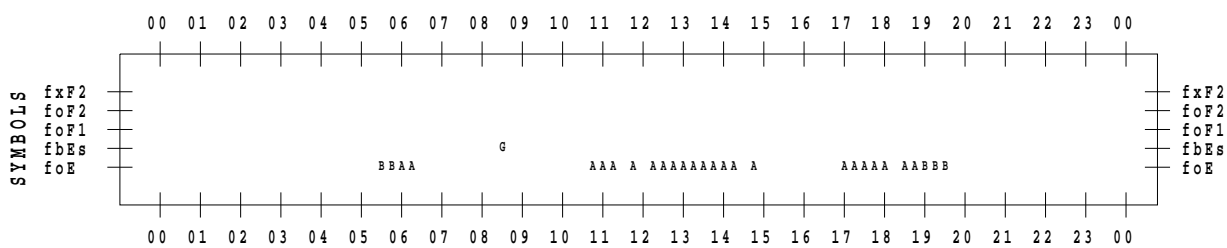
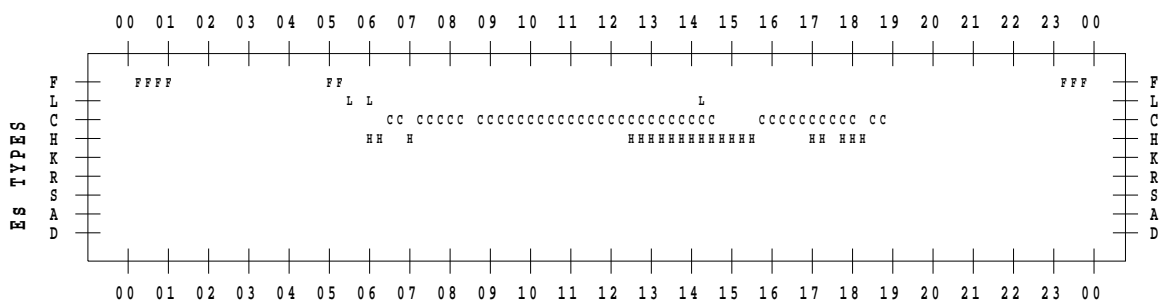
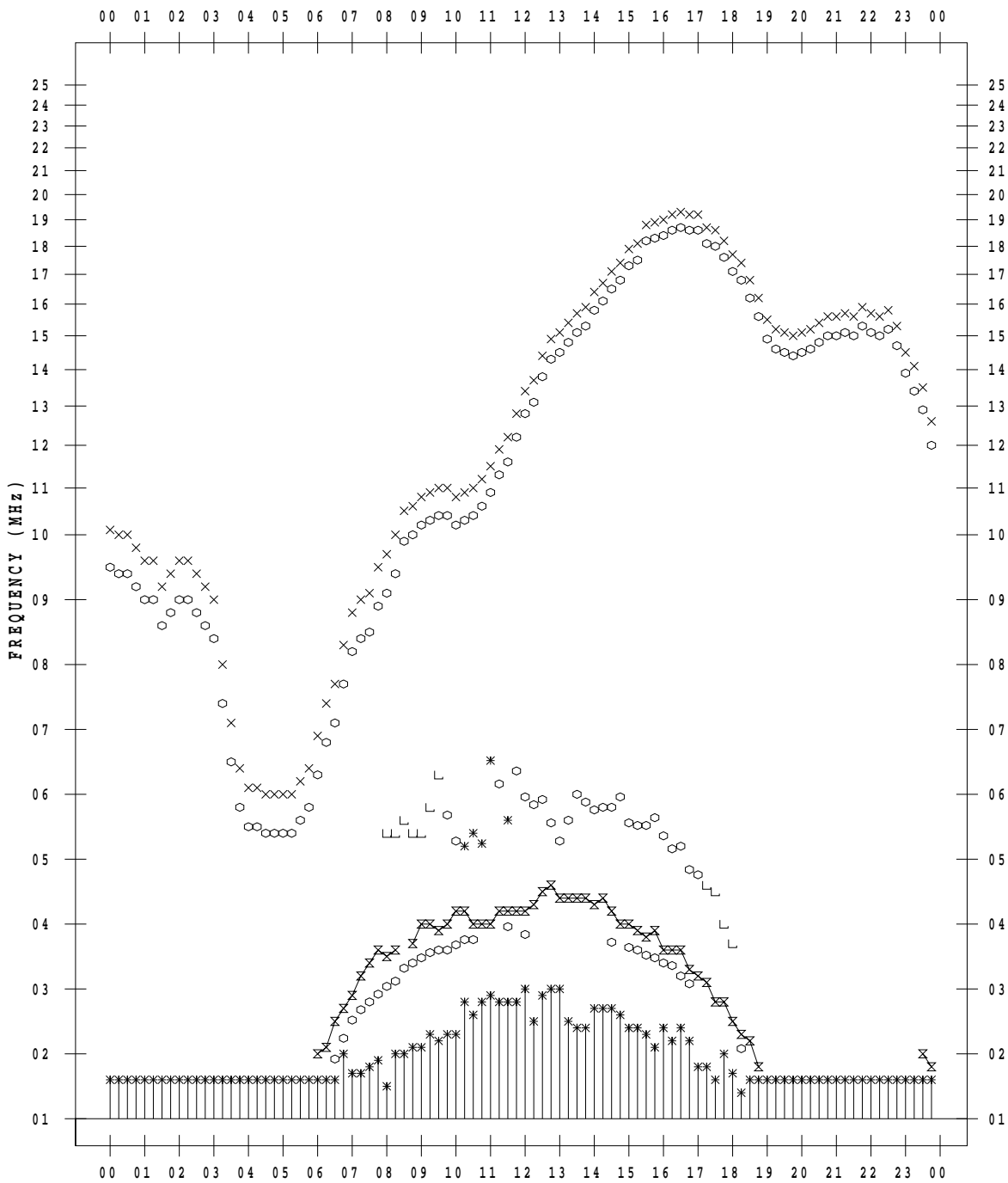
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 27

135 ° E MEAN TIME



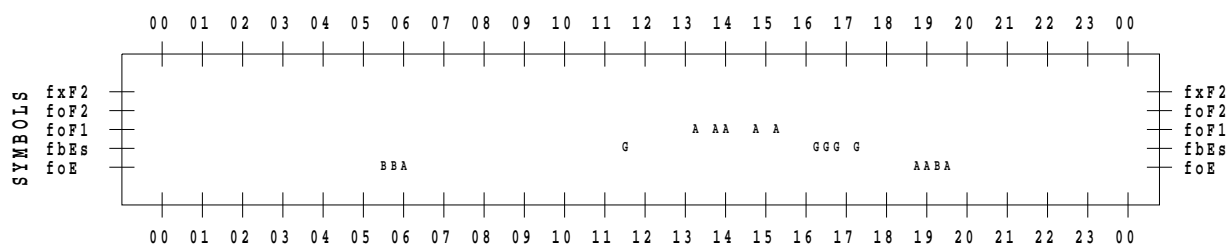
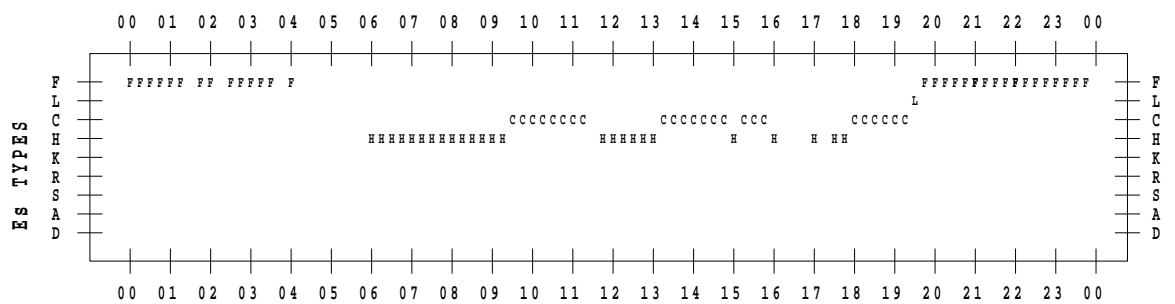
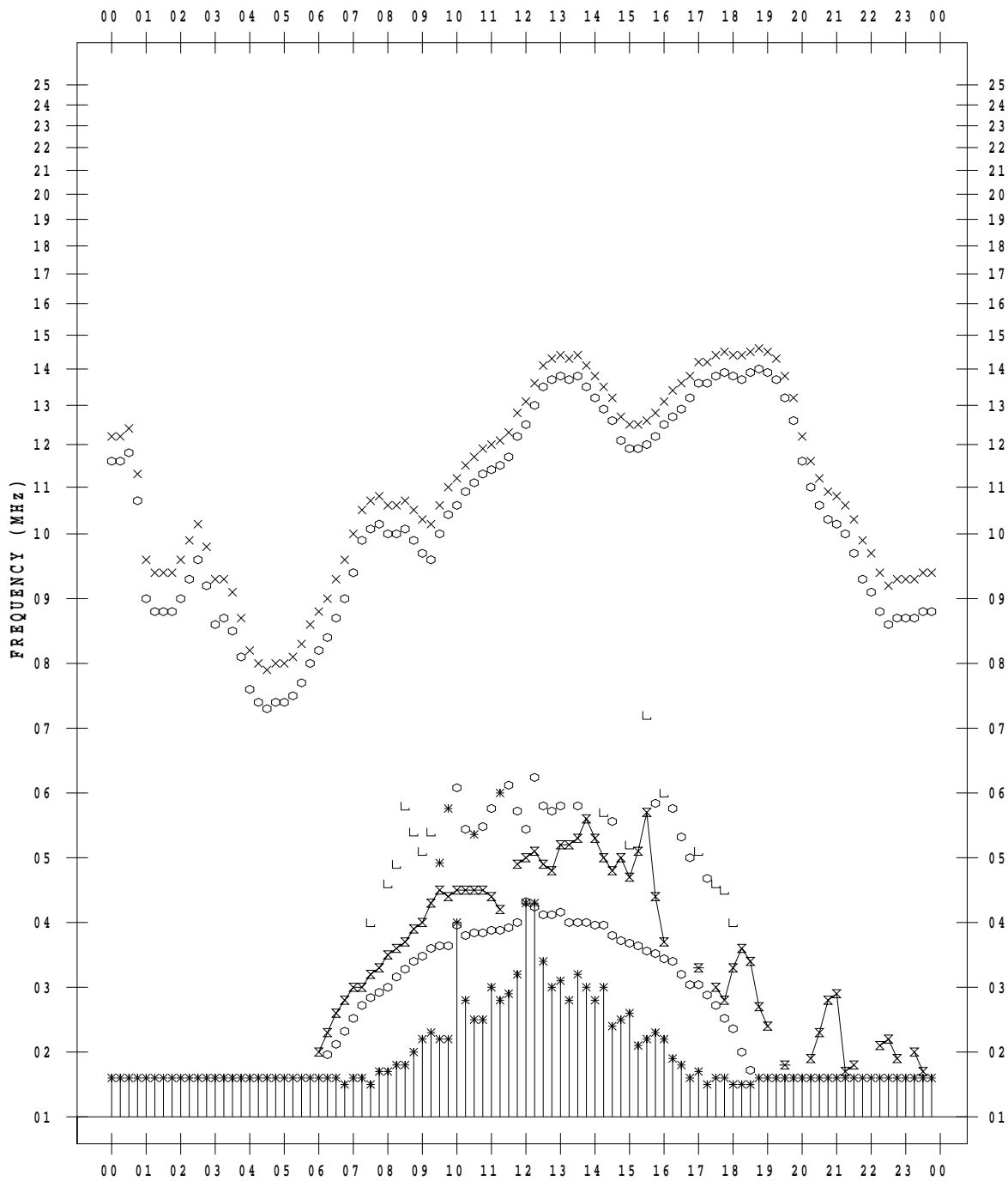
# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 28

135 ° E MEAN TIME



# f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2022 / 4 / 29

135 ° E MEAN TIME

