

IONOSPHERIC DATA IN JAPAN

FOR April 2023

VOL. 75 NO. 4

CONTENTS

Introduction	1
Ionosphere	
1. Automatic Scaling	
Hourly Values at Wakkanai (f_oF2 , fEs and $fmin$)	4
Hourly Values at Kokubunji (f_oF2 , fEs and $fmin$)	7
Hourly Values at Yamagawa (f_oF2 , fEs and $fmin$)	10
Hourly Values at Okinawa (f_oF2 , fEs and $fmin$)	13
Summary Plots at Wakkanai	16
Summary Plots at Kokubunji	24
Summary Plots at Yamagawa	32
Summary Plots at Okinawa	40
Monthly Medians $h'F$ and $h'Es$	48
Monthly Medians Plot of f_oF2	50
2. Manual Scaling	
Hourly Values at Wakkanai	51
Hourly Values at Kokubunji	65
Hourly Values at Yamagawa	79
Hourly Values at Okinawa	93
f -plot at Wakkanai	108
f -plot at Kokubunji	138
f -plot at Yamagawa	168
f -plot at Okinawa	198

«WDC for Ionosphere and Space Weather ... <https://wdc.nict.go.jp/IONO/wdc/index.html> »



NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I) and solar radio emission (S) obtained at the following stations under the

National Institute of Information and Communications Technology, Japan.

Stations	Geographic(WGS84)		Geomagnetic (IGRF-10(2005))		Technical Method
	Latitude	Longitude	Latitude	Longitude	
*Wakkanai/Sarobetsu	45°10'N	141°45'E	36.4°N	208.9°	Vertical Sounding (I)
Kokubunji	35°43'N	139°29'E	26.8°N	208.2°	Vertical Sounding (I)
Yamagawa	31°12'N	130°37'E	21.7°N	200.5°	Vertical Sounding (I)
Okinawa	26°41'N	128°09'E	17.0°N	198.6°	Vertical Sounding (I)
Hiraiso	36°22'N	140°37'E	27.6°N	209.1°	Solar Radio Emission (S)

*We moved the observation facilities at Wakkanai to Sarobetsu on February 2009. The new observatory is located at approximately 26km south from the old observatory. The observation at Sarobetsu commenced on March 6, 2009.

IONOSPHERE

Ionospheric observations are carried out at the above four stations in Japan by means of vertical sounding using ionosondes. The ionosonde produces ionograms, which are recorded digitally on a computer storage medium. The digitally-recorded ionograms are collected from each station by the central computer and reduced to numerical values and Summary Plots by the automatic processing system. The ionograms obtained at Kokubunji are manually scaled by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

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

The published data consist of tabulations of hourly values of three factors (f_oF2 , fEs , $fmin$) and monthly medians of two factors ($h'Es$, $h'F$), daily Summary Plots and monthly medians plot of f_oF2 .

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

- A Impossible measurement because of the presence of a lower thin layer, for example **Es** (for f_oF2).
- C Impossible measurement because of any failure in observation.
- G Impossible automatic scaling because of very small ionization density of the layer (for fEs).
- N Impossible automatic scaling because of complex echoes.
- Blank No digital record because of problems occurring in the 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 f_oF2 , fEs and $fmin$ were scaled within a difference of 1 MHz from about 90, 90 and 99%, respectively of the test ionograms.

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

(ii) Qualifying Letters

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

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

extraordinary component.

- M** Mode interpretation uncertain.
- O** Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)
- T** Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
- U** Uncertain or doubtful numerical value.
- Z** Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

Median count (CND) 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. 2023

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	69	67	66	63	63	69	76	88	87	101	107	108	119	108	108	102	89	91	93	91	83	64	63	64
2	61	63	61	53	53	55	61	75	73	74	99	95	108	97	95	99	88	83	87	81	84	81	70	68
3	68	65	66	66	62	68	76	91	101	110	129	122	109	114	108	109	109	103	99	89	91	82	67	70
4	69	65	61	61	57	61	68	80	79	85	91	96	114	105	103	98	96	95	95	85	77	62	65	66
5	65	65	65	63	58	61	71	86	100	105	112	114	113	120	114	115	106	104	99	86	72	69	67	68
6	67	67	67	63	62	61	69	89	98	103	101	105	109	106	111	106	100	96	92	79	82	72	66	69
7	71	70	67	62	56	63	83	83	91	108	104	113	111	116	110	101	96	90	91	92	77	75	71	69
8	66	68	65	60	57	63	86	102	105	111	112	105	112	109	108	107	105	96	104	99	86	66	62	65
9	65	61	62	63	57	67	77	89	100	114	108	112	112	117	109	107	101	100	104	95	87	75	65	64
10	65	64	62	59	55	62	73	77	91	100	104	105	109	112	109	110	104	102	97	97	87	69	67	65
11	65	62	64	53	52	62	100	107	93	84	100	103	112	110	109	105	91	85	93	94	91	82	73	68
12	70	68	64	61	63	65	83	95	96	95	103	103	107	101	103	101	103	95	89	89	86	78	75	71
13	69	67	67	67	55	64	81	96	105	112	108	101	107	111	115	111	103	97	85	89	85	80	77	72
14	71	68	67	62	60	63	86	96	104	99	114	110	113	113	106	101	99	92	92	95	87	81	72	69
15	67	69	67	60	57	61	77	84	94	99	112	111	115	117	109	101	97	95	86	91	83	81	75	66
16	64	64	64	59	61	70	86	95	105	100	99	101	104	110	109	100	98	92	93	91	80	74	73	68
17	67	67	69	65	58	71	74	89	95	96	106	109	102	99	103	101	95	94	91	88	87	84	74	75
18	76	71	71	69	75	75	77	87	99	101	105	107	110	103	99	102	96	88	86	94	89	75	74	73
19	73	71	71	63	64	63	90	88	101	106	104	106	107	102	105	105	96	91	90	88	75	75	65	64
20	67	61	56	55	54	52	57	66	73	78	79	A	90	88	85	83	85	88	84	78	78	72	71	68
21	68	67	66	62	59	65	79	89	96	92	98	95	96	98	93	96	94	91	90	87	82	78	73	73
22	66	60	60	58	57	59	59	53	54	69	70	71	72	82	84	81	79	75	74	73	77	71	67	66
23	65	66	63	62	60	71	76	81	95	84	89	82	96	92	94	95	89	82	84	84	85	79	75	74
24	75	59	61	50	38	33	40	39	43	44	A	A	A	45	45	42	41	52	51	45	50	58	44	63
25	65	A	52	A	37	38	38	44	60	72	88	83	89	83	98	98	99	91	87	83	80	74	71	70
26	68	59	57	53	55	61	67	67	62	61	67	69	77	85	93	94	93	90	83	84	77	72	62	65
27	63	62	60	56	53	55	70	78	68	76	79	71	85	94	91	93	95	85	84	86	76	74	69	69
28	68	68	65	58	53	54	66	66	69	82	91	99	95	101	95	93	93	95	87	81	72	72	64	67
29	67	63	60	55	58	53	64	66	66	77	75	82	81	88	90	91	85	77	75	89	82	82	73	73
30	69	71	69	55	55	55	57	57	61	61	66	72	67	74		79	73	73	77	82	77	70	64	60
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	29	30	30	30	30	30	30	29	28	29	30	29	30	30	30	30	30	30	30	30	30
MED	67	66	64	61	57	62	75	85	94	96	101	103	107	102	103	101	96	91	90	88	82	74	70	68
U Q	69	68	67	63	60	65	81	89	100	103	107	108	112	111	109	105	100	95	93	91	86	80	73	70
L Q	65	62	61	55	55	55	66	67	69	77	88	89	92	92	93	94	89	85	84	83	77	71	65	65

HOURLY VALUES OF fEs AT Wakkanai

APR. 2023

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	32	33	28	G	G	G	52	37	35	45	51	50	35	36	35	34	34	33	28	G	G	32	G	29		
2	27	G	25	G	G	G	28	32	39	58	45	56	38	149	38	34	36	30	G	G	27	G	G	G		
3	G	G	G	33	24	25	29	36	37	38	58	44	92	59	55	38	34	38	32	34	30	G	G	G		
4	G	G	G	G	G	G	32	35	38	50	36	36	34	36	38	40	34	27	G	G	G	G	39	G		
5	G	G	G	G	G	G	46	38	39	45	50	38	94	37	38	38	37	24	G		28	25	G	G	26	
6	G	G	G	G	G	G	29	38	56	47	39	38	38	36	37	34	36	24	G	G	G	G	G	G	26	
7	G	G	29	G	G	11	48	35	38	46	38	55	37	35	34	33	38	32	G	G	G	G	G	G	G	
8	G	G	G	G	G	G	26	36	38	36	66	37	46	37	35	38	38	32	34	39	28	G	G	G	G	
9	G	26	28	G	G	G	36	42	46	46	49	38	38	38	36	33	35	34	30	32	G	G	G	G	G	
10	G	G	G	G	G	G	32	36	44	46	38	54	46	42	36	32	29	32	46	G	G	G	G	G	G	
11	G	G	G	G	28	165	35	36	38	57	64	40	50	57	52	34	38	31	31	G	G	G	G	G	G	
12	G	G	G	G	G	27	35	35	39	39	46	38	56	44	45	58	37	32	30	28	27	G	G	G	G	
13	G	G	29	G	G	G	32	37	38	39	38	45	38	52	35	35	29	33	G	G	G	G	G	G	G	
14	G	G	G	G	G	G	24	37	37	38	53	38	39	38	37	35	39	34	34	G	G	G	G	G	G	
15	G	G	G	G	G	G	32	38	40	36	45	38	38	37	36	39	33	32	20	G	G	G	G	G	G	
16	G	30	G	G	G	G	32	35	33	37	35	56	39	52	38	33	34	34	G	G		24	24	G	G	
17	G	G	G	27	G	G	32	36	32	34	36	40	38	57	45	35	35	32	G	G	G	G	G	G	G	
18	G	G	G	G	G	G	33	36	44	42	115	46	56	39	43	34	39	34	G	G	G	G	G	G	G	
19	G	G	G	G	G	G	33	38	39	38	39	38	51	46	44	39	38	32	G	24	G	G	G	G	G	
20	G	G	G	G	G	26	35	44	54	42	46	88	69	46	38	39	34	32	39	32	31	G	G	G	G	
21	41	30	G	G	G	G	33	51	38	44	51	59	55	55	39	50	38	33	38	28	30	G	32	G	G	
22	G	G	G	G	G	29	34	37	39	38	49	59	50	39	36	34	38	33	G	G	G	G	G	G	G	
23	G	G	G	G	G	G	116	37	55	38	48	49	48	42	36	35	31	36	G	G	G	G	G	G	G	
24	G	G	G	25	G	G	26	92	32	35	62	36	64	35	32	32	33	32	30	36	38	50	G	25	G	
25	35	58	34	57	31	G	25		37	49	74	36	37	36	33	33	30	34	G	37	29	G	G	G	G	
26	G	G	G	G	G	G	32	37	50	33	50	89	52	60	51	42	38	33	29	27	G	G	G	G	G	
27	G	G	G	G	G	G	34	38	90	50	53	59	56	45	55	33	30	33	30	G		G	G	G	G	
28	G	G	G	G	27	31	33	37	40	66	56	71	145	54	35	34	44	46	31	G	G	G	G	G	33	
29	G	G	G	G	G	G	27	35	32	49	116	38	39	62	84	38	32	40	54	53	50	55	G		G	
30	29	50	G	G	25	54	38	37	38	42	37	37	38	42		33	28	39	34	31	35		26	32	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	30	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	29		
MED	G	G	G	G	G	G	32	37	38	42	49	42	46	42	38	34	35	33	28	G	G	G	G	G	G	
U Q	G	G	G	G	G	11	35	38	44	47	56	56	56	54	44	38	38	34	32	31	29	G	G	G	G	
L Q	G	G	G	G	G	G	29	36	37	38	39	38	38	37	35	33	33	32	G	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Wakkanai

APR. 2023

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

HOURLY VALUES OF fof2 AT Kokubunji

APR. 2023

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	70	67	65	62	63	72	92	87	91	105	123	117	130	133	124	117	111	109	114	106	81	64	64	65	
2	A	64	64	59	54	56	71	81	83	101	115	128	129	139	125	112	110	105	100	89	83	83	71	65	
3	69	68	68	65	59	56	77	95	92	105	119	125	125	124	A	120	115	119	117	115	77	71	73	73	
4	72	73	71	65	69	70	94	99	101	97	109	A	127	134	122	115	111	117	113	87	63	70	69	71	
5	69	71	71	65	57	57	71	83	98	107	117	123	129	135	141	138	133	131	125	89	77	78	73	73	
6	77	76	75	68	64	69	89	101	105	114	117	120	124	126	131	129	121	113	111	103	80	79	77	73	
7	73	78	72	71	59	61	83	103	101	111	121	120	125	126	125	113	106	105	113	106	83	A	81	73	
8	73	73	71	60	61	65	90	103	105	102	111	117	117	117	115	111	111	113	115	232	84	64	59	59	
9	64	60	60	60	56	56	78	93	96	105	117	126	227	130	131	127	121	117	121	111	78	78	78	72	
10	71	71	71	69	64	69	94	93	94	100	110	117	121	130	137	133	128	124	117	105	88	61	66	67	
11	68	65	63	56	47	49	83	101	109	111	118	138	135	130	129	125	114	107	104	102	91	73	73	72	
12	72	70	69	60	61	61	91	96	103	117	121	123	128	129	126	122	115	111	114	104	84	73	73	72	
13	72	72	72	60	53	56	84	95	101	112	117	127	135	139	135	131	125	115	110	105	94	94	87	82	
14	76	73	70	64	63	67	96	100	102	109	118	121	130	129	129	121	113	110	112	104	91	85	82	79	
15	77	73	80	69	61	65	97	104	106	111	117	124	133	136	135	129	121	117	117	108	94	82	73	72	
16	71	68	71	65	60	67	94	106	113	114	121	125	126	127	130	128	117	117	114	105	86	85	85	85	
17	84	83	80	72	69	72	93	99	109	114	116	117	119	118	115	114	107	104	104	101	90	81	79	80	
18	80	78	73	71	71	77	89	88	96	109	117	127	129	130	123	115	113	111	110	107	87	77	77	78	
19	76	81	75	69	63	69	88	101	98	113	117	124	122	125	128	123	114	111	105	93	77	77	78	73	
20	79	73	77	68	71	72	73	85	95	101	99	103	110	109	110	104	103	109	103	92	77	72	73	72	
21	A	73	72	64	59	65	81	92	91	97	106	114	118	121	123	113	113	111	105	95	85	72	81	75	
22	73	73	69	65	123	69	82	73	84	84	87	104	113	112	111	105	95	95	95	90	78	72	73	72	
23	73	72	71	68	63	69	81	93	95	97	100	105	110	115	111	112	105	95	95	95	85	88	89	87	
24	84	85	73	76	59	31	42	56			A	62			75	69	62	61	56	56	54	57	A	59	
25	60	59	65	66	65	81	79	81	89	102	84	94	108	112	107	111	104	99	97	91	83	75	71	68	
26	69	67	69	61	61	67	86	103	102	104	105	117	125	129	131	122	111	109	111	95	82	71	69	59	
27	67	70	70	60	59	63	73	81	86	94	97	101	103	107	112	112	109	102	106	93	79	73	73	81	
28	73	73	76	68	65	69	88	98	91	107	116	114	118	113	119	112	105	101	105	90	73	67	71	70	
29	71	69	69	59	64	60	70	83	96	96	103	102	111	115	114	112	108	95	87	95	94	A	78	85	
30	83	79	81	73	71	81	77	70	A		73	81	92	99	101	105	107	99	91	107	107	87	66	66	66
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	30	30	30	30	30	30	30	28	29	29	29	29	29	29	30	30	30	30	30	30	28	29	30	
MED	72	72	71	65	62	67	84	94	97	105	116	117	125	126	124	115	111	110	110	102	83	73	73	72	
U Q	76	73	73	69	65	69	91	101	102	111	117	124	129	130	130	125	115	115	114	106	87	80	78	78	
L Q	69	68	69	60	59	60	77	83	91	98	104	104	115	115	113	112	106	102	104	92	78	70	71	68	

HOURLY VALUES OF fEs AT Kokubunji

APR. 2023

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	G	G	G	G	G	G	G	33	37	39	49	58	64	39	47	67	75	39	G	G	22	G	38	51	
2	59	31	47	58	30	32	G	31	37	40	40	36	35	48	48	37	28	24	28	G	G	28	G	28	
3	G	G	G	G	G	G	G	32	40	35	36	37	45	G	41	43	40	32	32	G	22	G	G	G	
4	G	G	G	G	G	G	G	33	44	48	94	175	73	70	36	40	36	G	G	33	39	27	G	G	
5	35	G	G	G	G	G	23	34	33	43	40	64	66	50	51	53	36	40	59	38	25	31	G	G	
6	G	G	G	G	G	G	G	39	36	55	G	47	42	G	G	G	G	G	G	G	G	G	G	G	
7	G	G	G	G	G	G	G	35	33	38	39	G	G	G	G	G	39	G	G	34	G	92	54	G	
8	G	G	G	G	G	G	G	35	36	48	48	G	G	G	G	G	52	35	G	29	23	G	G	G	
9	G	G	G	G	G	G	31	55	41	65	41	43	G	G	G	G	36	39	32	G	22	G	G	G	
10	G	G	G	G	G	G	G	G	37	41	56	50	50	38	G	G	G	36	31	30	25	G	G	G	
11	G	G	G	G	G	G	33	33	47	48	48	37	41	39	39	42	31	31	G	G	G	G	G	G	
12	G	G	G	G	G	G	33	34	39	38	40	63	41	55	57	36	31	G	30	27	G	G	G	G	
13	G	G	G	G	G	G	G	35	87	36	49	47	39	G	55	47	38	G	G	G	31	G	G	G	
14	G	G	G	G	G	G	32	36	196	47	49	50	51	51	48	35	32	27	G	G	G	G	G	G	
15	G	G	G	G	G	G	31	36	33	37	G	G	G	40	39	35	32	33	G	G	G	G	G	G	
16	G	G	G	G	G	G	27	29	G	G	37	G	G	G	40	36	44	28	G	27	G	37	28	43	
17	30	30	G	27	G	G	31	35	38	G	G	30	G	60	G	41	33	36	31	G	24	G	G	G	
18	G	G	G	G	G	G	26	34	103	47	40	41	37	37	36	33	G	26	32	G	G	G	G	G	
19	G	G	G	G	G	G	35	35	39	257	G	G	G	37	51	65	52	40	48	G	32	53	G	G	
20	G	G	G	G	G	G	27	44	47	G	89	G	62	G	G	35	34	45	33	G	G	G	G	37	
21	25	G	G	G	G	G	28	30	33	40	44	43	55	G	G	G	32	40	33	84	28	71	94	27	
22	31	G	G	G	G	G	G	35	39	G	41	57	55	60	G	49	G	34	23	55	49	G	G	G	
23	G	G	G	G	G	G	G	33	G	G	G	40	43	G	G	38	31	35	33	32	37	34	29	G	
24	G	G	G	G	G	G	96	25	31	37	52	57	G	55	G	55	27	25	G	G	26	42	70	29	
25	G	G	G	G	G	G	25	27	G	G	52	G	G	G	G	39	31	27	33	31	G	G	G	49	
26	G	27	G	G	G	G	37	29	38	41	55	51	G	G	80	77	128	35	42	71	30	39	G	G	
27	G	G	G	G	G	G	G	34	32	48	G	G	G	G	G	33	G	40	35	37	31	27	41	59	
28	37	27	G	G	G	G	29	35	47	48	57	66	G	G	G	40	39	45	55	G	G	G	39	52	
29	23	G	G	G	G	G	G	34	33	G	59	61	62	G	35	45	31	56	39	56	77	93	84	59	
30	41	47	35	39	G	32	45	71	63	55	53	45	64	55	G	37	41	38	64	133	75	25	25	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	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	
MED	G	G	G	G	G	G	26	34	38	40	42	43	41	G	36	37	32	34	31	14	22	G	G	G	
U Q	23	G	G	G	G	G	31	35	44	48	52	57	55	48	48	43	39	39	33	34	31	34	29	29	
L Q	G	G	G	G	G	G	G	32	33	35	37	G	G	G	G	33	31	26	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Kokubunji

APR. 2023

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	17	16	19	16	16	16	18	15	18	20	29	30	30	30	28	20	18	16	18	16	16	16	17	17
2	16	16	16	17	16	16	17	16	17	18	20	28	31	27	23	19	15	16	16	17	16	17	16	16
3	17	17	16	16	16	16	17	17	17	19	29	29	28	30	31	26	19	17	16	16	17	16	16	17
4	16	16	16	16	16	17	18	17	18	22	27	24	25	27	23	21	20	17	17	16	17	17	16	16
5	17	16	16	16	16	16	16	16	19	20	28	32	33	35	32	29	26	16	13	17	17	16	17	16
6	15	16	18	19	16	16	17	19	16	26	48	31	31	50	45	50	19	17	19	16	16	16	15	16
7	16	16	16	16	16	15	17	17	19	20	29	29	55	47	45	19	18	19	17	17	15	17	17	16
8	17	16	15	16	17	16	18	17	22	27	31	53	47	52	29	21	19	16	17	16	17	17	36	17
9	16	16	16	17	16	16	16	15	19	24	23	29	26	25	51	45	18	16	17	16	16	16	16	17
10	16	17	16	17	16	16	17	15	20	21	37	18	37	32	49	45	21	17	16	14	17	16	16	16
11	17	18	16	16	16	17	16	17	21	23	21	25	21	25	25	19	17	15	21	17	17	16	16	16
12	17	16	16	17	16	16	17	17	20	21	24	35	25	32	27	25	23	17	16	16	16	16	16	17
13	17	16	16	16	16	17	17	17	23	21	35	27	30	50	22	21	16	19	17	16	17	16	17	17
14	16	16	16	16	17	17	17	19	27	20	34	31	34	34	30	26	21	17	17	16	16	16	16	16
15	17	17	17	16	16	17	17	17	25	26	51	47	57	30	28	25	22	17	17	17	17	16	16	16
16	16	17	16	17	17	17	17	18	20	29	29	34	42	47	30	24	17	19	17	17	16	15	17	17
17	17	17	16	16	16	18	17	18	16	23	29	24	36	54	49	22	17	16	17	17	17	17	16	16
18	16	16	16	15	16	19	17	18	17	21	25	23	29	29	22	21	19	16	17	16	16	16	16	17
19	16	16	16	17	16	17	17	17	20	19	26	48	48	28	21	18	17	17	17	15	16	17	17	16
20	16	16	16	16	16	17	17	17	19	30	30	48	29	52	32	23	20	18	17	17	17	16	16	16
21	16	16	42	16	16	20	17	20	22	24	34	30	28	50	23	21	21	17	16	17	16	15	17	17
22	17	16	15	16	16	20	17	21	28	34	29	51	36	29	22	21	45	17	19	17	17	16	16	16
23	16	17	17	16	16	19	17	19	19	45	29	37	35	29	21	25	21	17	16	17	15	16	17	17
24	18	17	26	16	17	17	19	21	20	21	37	51		27	49	49	22	18	16	17	16	16	17	16
25	17	17	17	16	16	17	17	23	41	46	46	50	47	47	46	20	20	19	18	17	17	16	16	16
26	16	16	17	16	16	21	17	20	24	29	38	34	51	42	43	23	19	18	17	17	15	16	17	19
27	16	16	17	16	17	17	19	19	21	47	47	52	35	47	31	27	27	23	17	16	17	16	17	17
28	17	17	16	16	17	16	17	19	20	28	39	60	48	34	32	21	23	17	19	17	17	17	16	17
29	17	17	16	17	16	17	19	20	23	26	32	27	41	51	27	21	23	19	17	17	17	17	16	16
30	16	17	16	15	16	17	17	20	22	28	29	33	58	42	20	20	19	16	15	17	17	17	17	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	29	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	17	17	18	20	24	29	32	35	34	30	22	20	17	17	17	17	16	16	16
U Q	17	17	17	17	16	17	17	19	22	28	37	48	47	47	43	26	22	18	17	17	17	17	17	17
L Q	16	16	16	16	16	16	17	17	19	21	28	28	29	29	23	21	18	16	16	16	16	16	16	16

HOURLY VALUES OF fof2 AT Yamagawa

APR. 2023

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	71	72	71	69	71	61	62	75	91	99	111	112	139	151	147	139	136	134	124	129	119	98	86	83
2	77	76	A	76	58	60	66	77	93	102	119	123	141	142	135	127	118	100	111	108	92	84	76	73
3	73	74	75	69	58	47	55	85	97	100	113	115	130	140	139	131	124	125	120	138	75	73	83	90
4	94	81	73	67	65	61	75	91	95	92	103	119	133	137	134	125	124	136	119	92	73	75	77	77
5	79	85	79	72	54	50	57	86	95	110	112	119	136	144	157	143	137	136	126	120	97	89	85	82
6	84	86	86	76	63	62	77	92	97	108	107	118	137	151	161	146	144	136	122	134	105	85	83	79
7	88	83	83	85	53	53	63	93	94	98	115	122	140	147	142	137	128	132	117	113	99	66	85	91
8	86	77	68	68	64	N 59	72	91	102	98	106	111	129	137	138	123	119	120	120	120	93	71	75	74
9	73	78	77	79	75	53	63	81	94	101	106	121	127	132	134	137	128	127	127	119	101	81	87	85
10	75	66	69	76	67	67	81	87	92	95	102	110	131	147	149	150	145	141	140	137	103	73	76	78
11	82	85	79	65	43	46	65	87	98	111	112	128	147	144	146	147	137	130	120	131	122	101	79	84
12	84	80	75	68	62	61	73	95	99	109	115	125	143	147	143	143	130	122	132	117	96	80	81	89
13	93	87	81	81	56	53	67	89	96	107	103	121	138	146	143	142	131	141	136	123	121	99	96	93
14	87	80	75	69	58	58	70	98	109	103	103	119	132	151	147	145	139	137	134	129	105	93	97	96
15	97	91	92	79	65	61	86	103	108	105	102	118	128	143	156	141	143	136	134	113	110	91	76	86
16	83	69	75	63	64	69	86	94	95	116	113	131	134	141	144	143	127	113	116	118	97	95	95	96
17	98	93	85	75	65	64	81	97	96	110	105	117	107	120	126	118	113	113	118	122	98	78	84	87
18	93	89	85	81	78	66	78	91	95	101	121	128	130	131	129	115	108	118	120	115	94	79	83	87
19	91	92	85	74	60	69	78	97	95	97	114	121	123	139	135	132	128	119	117	101	96	83	90	92
20	93	93	89	73	70	65	67	93	108	115	118	122	131	131	133	126	131	131	118	109	98	91	84	90
21	82	83	83	77	67	63	77	93	86	97	113	119	128	133	141	140	125	121	118	101	95	88	79	83
22	81	80	75	70	70	65	81	96	93	89	97	110	127	132	119	119	118	116	106	98	83	69	71	79
23	75	75	68	65	62	59	70	91	89	94	101	107	121	132	127	121	120	118	112	99	87	90	95	96
24	86	87	74	78	59	42	58	57	51	A	51	76	B 51	50	86	87	75	71	72	71	A	57	59	63
25	63	69	65	69	68	59	63	73	92	91	94	102	111	118	116	109	106	109	108	106	92	83	76	74
26	74	70	63	62	58	59	73	99	104	101	94	116	131	142	144	137	131	128	126	114	93	70	N 73	73
27	77	77	79	70	60	63	71	85	98	103	88	97	113	119	123	121	121	119	106	104	89	76	83	80
28	82	79	79	72	70	70	80	91	94	115	109	112	125	121	129	128	121	116	115	98	89	A	77	81
29	78	77	78	69	59	56	70	88	108	105	94	101	114	119	119	123	123	112	101	105	114	95	83	93
30	91	83	81	78	74	75	72	82	78	82	95	100	117	122	128	130	118	116	119	111	91	A	75	78
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	30	29	30	30	30	30	30	30	30	30	30	30	29	28	30	30
MED	82	80	78	72	64	61	72	91	95	101	106	118	130	138	136	132	126	122	119	114	96	83	83	84
U Q	91	86	83	77	68	65	78	94	98	108	113	121	136	144	144	142	131	134	126	122	104	91	85	90
L Q	77	76	73	69	58	56	65	85	93	97	101	110	123	131	128	123	119	116	115	104	91	74	76	78

HOURLY VALUES OF fEs AT Yamagawa

APR. 2023

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	60	33	G	G	G	G	G	30	37	45	47	50	46	58	74	88	33	35	35	35	22	22	G	G	
2	G	G	72	41	31	G	G	30	36	39	39	45	55	41	54	38	48	36	28	29	G	33	G	G	
3	G	G	G	G	G	G	24	32	38	43	45	46	45	48	51	50	45	48	32	G	48	G	G	G	
4	G	G	G	G	G	G	G	29	36	42	56	56	48	48	59	51	87	50	50	40	25	G	G	G	
5	G	40	38	33	G	G	G	32	38	44	46	44	N	50	46	49	34	36	32	34	G	G	G	G	
6	26	G	G	G	G	G	25	32	38	40	53	59	54	46	43	46	39	36	46	35	40	31	G	G	
7	G	G	G	G	G	G	G	31	38	40	41	84	44	46	36	37	39	40	37	30	G	G	G	G	
8	G	G	G	G	G	G	27	37	40	41	44	38	47	36	38	49	46	58	50	47	30	G	G	G	
9	G	G	G	G	G	G	32	34	40	45	48	49	44	34	43	36	39	45	34	32	G	G	G	G	
10	G	G	G	G	G	G	G	32	37	46	48	41	44	48	34	34	33	35	42	44	11	11	G	27	
11	G	27	G	11	G	G	27	31	44	46	46	51	54	55	58	53	50	40	38	33	25	33	G	G	
12	G	G	G	G	G	G	G	54	38	42	43	47	52	50	57	51	51	39	46	37	11	G	G	G	
13	G	G	G	G	G	G	27	32	38	44	49	46	38	46	64	56	45	37	30	24	G	G	27	G	
14	G	G	G	G	G	G	G	33	40	47	50	44	47	40	38	53	37	36	35	44	G	G	G	G	
15	G	G	G	G	G	G	29	35	40	41	39	38	44	35	51	41	40	57	54	43	34	G	G	G	
16	G	G	G	G	G	G	29	33	40	46	50	54	50	46	45	48	48	40	36	27	32	28	29	G	
17	G	G	G	G	G	G	G	33	39	44	41	38	48	81	45	50	46	39	52	38	33	23	26	59	
18	G	G	G	G	G	G	G	34	39	44	44	50	44	52	53	45	42	35	35	70	G	G	G	G	
19	G	G	G	G	G	G	G	37	44	44	42	37	51	54	56	46	45	51	71	40	30	G	G	G	
20	28	G	G	G	G	G	G	32	40	46	47	48	41	45	38	40	42	29	35	38	G	G	G	G	
21	G	G	28	G	G	G	G	38	39	48	50	50	36	44	63	57	52	44	46	30	40	G	73	25	
22	G	39	50	33	40	G	31	41	39	48	50	52	54	53	55	59	36	36	36	33	49	28	G	28	
23	32	G	G	G	G	25	22	32	43	43	44	41	55	52	57	51	38	29	34	40	45	56	30	34	
24	40	26	G	G	G	G	32	43	35	49	72	41	B	G	36	33	33	28	27	62	52	32	27	40	
25	39	33	G	25	G	G	G	32	38	32	N	48	46	G	36	37	34	38	31	28	G	36	31	28	
26	G	G	G	G	G	G	24	35	38	46	47	47	47	44	35	35	35	31	29	29	24	56	34	G	
27	G	G	G	G	G	G	G	33	45	48	34	56	34	46	46	36	41	40	38	37	40	32	59	46	
28	40	G	40	38	G	G	30	38	46	50	51	49	50	G	36	48	42	46	42	30	30	60	37	G	
29	G	G	G	G	G	G	33	32	46	52	41	50	G	78	48	50	34	32	36	38	40	79	40	35	
30	26	G	G	G	G	G	36	51	59	55	57	48	40	38	40	42	34	48	47	32	56	105	39	G	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	30	30	30	30	30	30	30	30	29	30	28	30	30	30	30	30	30	30	30	30	30	30	
MED	G	G	G	G	G	G	12	33	39	44	47	48	46	46	46	48	40	38	36	35	28	16	G	G	
U Q	26	G	G	G	G	G	29	37	40	47	50	50	50	52	56	51	46	45	46	40	40	33	30	27	
L Q	G	G	G	G	G	G	G	32	38	42	42	44	44	40	38	38	35	35	34	30	G	G	G	G	

HOURLY VALUES OF fmin AT Yamagawa

APR. 2023

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	16	15	14	14	15	15	16	15	16	19	19	18	25	19	17	17	17	16	16	16	16	16	16
2	16	15	16	15	16	16	16	15	15	16	17	19	19	19	22	20	17	15	15	16	14	16	16	14
3	14	14	15	17	16	15	17	16	14	15	18	20	22	19	18	15	17	14	15	17	15	15	14	18
4	14	14	17	14	14	14	15	17	15	17	20	19	21	18	18	16	17	14	14	16	16	17	15	15
5	15	15	15	16	15	15	15	16	15	17	18	20	19	19	20	17	17	15	15	16	16	16	15	17
6	16	15	14	15	14	15	16	15	15	15	15	18	17	15	20	38	15	14	15	16	15	15	15	15
7	14	14	14	14	14	14	17	16	15	15	21	17	17	23	18	17	16	15	17	15	15	16	14	16
8	15	15	15	14	14	16	15	16	16	18	18	21	39	17	20	17	16	17	15	14	15	15	16	14
9	17	15	14	15	15	15	15	16	15	17	19	23	21	19	19	17	15	14	15	15	14	15	15	14
10	15	15	16	15	15	15	17	17	15	18	19	20	21	21	20	17	16	17	15	15	15	15	15	17
11	14	15	15	15	15	18	17	16	15	16	19	18	20	19	21	16	16	14	15	15	15	16	14	15
12	14	14	14	14	14	15	18	17	17	17	19	19	19	18	20	20	17	15	15	15	14	16	15	15
13	15	14	14	14	15	14	17	17	15	17	22	19	21	19	22	21	18	16	15	17	14	15	15	15
14	14	15	14	15	16	14	18	16	15	16	20	19	22	19	20	21	19	15	17	14	18	14	14	16
15	14	21	14	17	14	14	15	17	15	16	18	18	19	20	21	16	17	15	15	16	15	16	16	15
16	14	15	17	15	14	15	15	17	15	16	18	21	19	21	19	17	17	15	16	16	16	15	15	14
17	15	15	14	15	16	14	15	17	15	19	17	17	20	13	19	19	17	15	15	15	15	16	16	16
18	15	14	17	15	15	14	15	16	15	16	17	21	23	21	18	19	16	15	16	16	14	14	14	15
19	14	14	14	15	15	14	15	16	16	17	20	18	22	20	19	17	16	16	15	15	16	15	15	15
20	16	14	14	14	14	17	15	15	15	19	18	21	19	21	21	18	18	17	17	15	15	17	14	16
21	15	15	15	16	14	18	15	17	17	23	21	17	19	42	20	20	21	17	15	15	15	15	15	15
22	17	15	15	16	15	16	15	17	17	21	20	20	21	20	19	21	17	17	17	15	15	16	16	15
23	16	127	14	14	15	16	16	17	17	19	19	21	19	20	18	19	17	17	15	14	15	15	16	16
24	15	16	16	14	14	15	16	15	17	18	19	19	B	81	19	19	17	16	15	16	15	16	15	15
25	15	16	15	16	16	15	16	17	18	17	17	21	21	40	18	20	18	14	15	15	14	15	15	15
26	15	14	15	15	16	16	17	16	17	20	18	19	21	23	19	19	17	17	15	15	16	15	15	15
27	15	15	14	15	15	15	16	16	15	17	20	18	19	16	21	19	18	15	17	15	15	16	15	16
28	15	16	15	15	14	15	15	17	16	18	20	20	19	39	22	23	19	16	15	15	15	15	15	15
29	15	17	14	17	15	14	17	17	17	17	23	19	18	17	19	21	18	17	17	15	15	16	17	15
30	16	16	14	17	15	17	17	15	19	17	18	22	19	20	21	19	15	18	14	15	15	15	15	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30
MED	15	15	15	15	15	15	16	16	15	17	19	19	19	20	20	19	17	15	15	15	15	15	15	15
U Q	15	16	15	16	15	16	17	17	17	18	20	21	21	21	21	20	18	17	16	16	15	16	16	16
L Q	14	14	14	14	14	14	15	16	15	16	18	18	19	19	19	17	16	15	15	15	15	15	15	15

HOURLY VALUES OF foF2 AT Okinawa

APR. 2023

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	86	77	71	76	78	58	44	71	98	112	117	125	142	168	175	156	187	187	187	192	184	121	153	N 109
2	114	133	107	104	75	74	66	79	91	119	123	133	142	161	161	153	154	133	144	155	110	84	89	93
3	84	83	87	85	56	40	48	80	95	105	115	126	147	165	169	159	149	148	159	131	N 101	119	127	141
4	143	136	111	97	80	63	67	97	100	97	107	132	151	155	153	147	145	151	132	99	96	100	103	99
5	101	98	100	73	50	44	51	79	105	117	109	122	147	153	163	181	168	167	164	155	146	138	151	134
6	125	47	137	111	71	69	73	88	100	115	118	129	151	155	187	196	193	191	123	196	160	118	131	131
7	149	132	139	126	66	53	60	87	106	108	122	137	158	155	153	176	173	173	171	165	113	129	128	133
8	124	101	87	82	74	61	65	87	110	108	111	125	139	182	172	161	154	151	152	136	112	118	97	115
9	103	105	119	128	94	61	59	82	96	113	115	128	137	159	160	159	167	145	139	143	128	101	111	108
10	103	93	103	99	93	82	65	87	98	107	102	123	151	167	179	166	183	175	180	164	147	140	127	122
11	121	123	121	91	54	55	57	81	103	122	134	135	153	181	183	172	179	151	173	183	183	157	147	147
12	147	141	113	98	66	66	66	93	112	118	123	137	150	170	172	164	153	151	159	147	115	111	113	111
13	118	114	103	89	61	51	60	84	95	103	114	133	154	164	161	159	166	158	174	173	171	170	151	131
14	113	100	108	103	72	68	71	107	113	96	114	132	146	159	179	173	181	185	177	168	142	128	143	152
15	153	125	114	107	81	65	81	112	99	110	113	118	139	161	165	160	168	160	159	153	135	99	99	98
16	103	91	82	73	64	64	69	92	103	118	128	137	153	172	167	169	165	166	155	157	148	151	107	N 155
17	163	155	147	96	76	65	75	107	115	104	107	119	126	135	139	134	133	127	137	146	105	84	99	109
18	110	105	100	92	84	78	67	86	103	117	127	135	137	146	139	132	126	131	135	137	104	105	108	115
19	113	115	109	82	67	71	77	97	97	107	124	127	139	156	157	164	171	149	141	143	139	103	68	71
20	125	158	129	116	86	83	81	100	115	120	128	145	155	167	152	157	145	159	145	139	137	139	133	124
21	123	105	106	97	69	59	70	84	93	95	118	131	147	149	162	163	126	148	141	128	129	109	96	96
22	97	95	95	75	67	71	82	102	93	96	89	113	139	142	137	141	147	140	135	122	108	80	77	80
23	81	80	82	79	65	63	67	88	89	88	112	124	148	161	151	139	154	151	130	117	97	109	121	109
24	103	97	89	77	65	59	63	69	57	64	59	90	94	53	106	109	105	N 97	105	91	61	62	61	63
25	63	67	70	64	67	51	56	85	94	93	98	115	133	143	130	123	133	138	147	140	106	88	93	86
26	85	79	76	66	59	56	63	101	110	94	87	115	143	149	161	164	161	156	149	141	112	84	85	81
27	84	84	83	80	58	60	72	91	92	103	88	111	134	146	134	136	137	139	129	122	95	83	85	79
28	86	82	83	72	70	71	79	89	101	122	120	124	141	168	173	171	146	146	139	135	123	109	105	105
29	110	99	93	81	60	61	61	87	104	111	116	116	125	139	135	131	131	133	139	131	132	97	108	99
30	104	100	90	87	75	72	84	96	75	93	102	116	136	158	159	153	149	151	156	145	113	109	110	115
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	110	100	102	88	68	63	66	88	100	108	114	126	142	158	161	159	154	151	146	143	119	109	108	109
U Q	124	123	113	99	76	71	73	97	105	117	122	133	151	167	172	166	168	160	159	157	142	128	128	131
L Q	97	84	87	77	64	58	60	84	94	96	107	118	137	149	151	141	145	140	137	131	106	97	96	96

HOURLY VALUES OF fEs AT Okinawa

APR. 2023

LAT. 26°41.0'N LON. 128°09.0'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	33	36	33	G	24	11	G	24	60	41	46	43	49	G	G	36	38	36	41	36	G	40	G	28	
2	33	G	G	G	38	G	G	24	37	47	49	57	41	52	48	43	40	38	29	29	G	G	G	G	
3	G	G	G	G	G	G	G	30	36	41	46	46	54	48	48	46	40	47	39	33	28	G	G	G	
4	G	G	G	G	G	G	G	G	41	41	44	45	55	38	35	36	36	37	109	48	28	G	G	25	
5	30	G	G	22	G	25	32	33	37	41	46	46	45	52	38	41	39	38	31	G	G	G	G	G	
6	G	G	G	G	48	G	G	30	35	40	42	56	44	50	47	G	40	46	41	50	43	25	G	G	
7	G	G	G	G	11	G	G	52	41	40	44	52	51	37	36	36	46	43	38	32	G	32	G	G	
8	G	G	G	G	G	G	G	31	38	43	45	48	54	41	37	53	58	54	40	50	49	27	G	35	
9	G	G	G	25	39	36	39	50	38	43	N	46	44	47	39	44	48	95	55	72	28	G	G	G	
10	G	G	G	G	G	G	G	50	36	51	48	53	40	57	46	93	39	36	G	107	G	G	25	33	
11	39	G	G	11	G	G	G	34	45	49	48	50	96	57	40	48	48	44	35	105	27	11	G	40	
12	G	G	G	G	G	24	26	32	38	42	56	55	56	43	44	38	44	42	30	108	60	39	G	G	
13	G	G	G	11	G	G	G	31	38	42	74	48	48	46	59	51	40	39	24	G	G	G	G	G	
14	G	G	G	G	G	24	G	81	47	42	44	48	48	40	43	38	35	37	29	G	34	36	39	28	
15	G	G	G	G	G	G	G	32	40	40	42	44	43	56	46	39	36	36	38	39	28	G	G	G	
16	G	G	G	G	G	G	G	31	38	43	43	56	50	43	45	52	50	39	58	37	46	G	G	G	
17	G	G	G	19	G	G	11	33	145	46	49	44	44	49	72	63	48	77	37	G	G	G	G	G	
18	G	G	G	G	G	G	G	34	37	46	48	49	51	51	58	66	51	88	116	31	G	G	G	G	
19	G	G	G	G	G	G	G	30	38	47	47	49	52	60	57	49	112	51	48	61	71	31	G	G	
20	G	G	G	G	G	G	26	38	46	50	50	55	42	55	53	54	45	37	42	46	71	32	28	G	
21	G	G	G	G	36	33	G	31	37	40	41	54	58	60	51	40	35	35	26	G	G	G	G	G	
22	48	G	28	G	G	G	27	38	40	50	54	50	52	56	56	36	36	38	30	G	54	109	G	31	
23	36	38	G	41	40	40	G	35	47	56	56	55	48	44	42	37	33	41	50	59	60	45	44	36	
24	49	72	49	40	39	38	29	30	56	45	41	35	44	36	35	36	32	29	35	36	39	55	29	36	
25	28	39	33	34	30	G	G	32	44	67	45	54	49	52	54	55	41	38	35	31	79	53	39	28	
26	G	32	G	G	G	28	28	29	60	56	57	46	65	45	G	35	34	36	32	73	35	G	69	31	
27	43	28	G	G	G	G	G	31	38	35	45	47	48	53	N	50	45	45	53	40	28	47	39	45	
28	40	29	27	35	31	31	175	45	46	46	44	44	54	45	38	36	65	53	56	50	28	31	40	27	
29	G	G	G	G	G	G	G	41	45	48	40	57	56	G	54	51	45	46	33	G	G	37	35	38	
30	30	G	G	G	G	G	G	36	55	51	75	56	55	63	52	47	70	36	62	57	38	33	G	54	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	29	30	30	30	29	30	30	30	29	30	30	30	30	30	30	30	30	30	
MED	G	G	G	G	G	G	G	32	40	44	46	49	50	48	46	44	40	39	38	38	28	26	G	13	
U Q	33	G	G	11	30	24	26	38	46	49	49	55	54	55	53	51	48	46	50	57	46	37	29	33	
L Q	G	G	G	G	G	G	G	30	38	41	44	46	44	43	38	36	36	37	31	29	G	G	G	G	

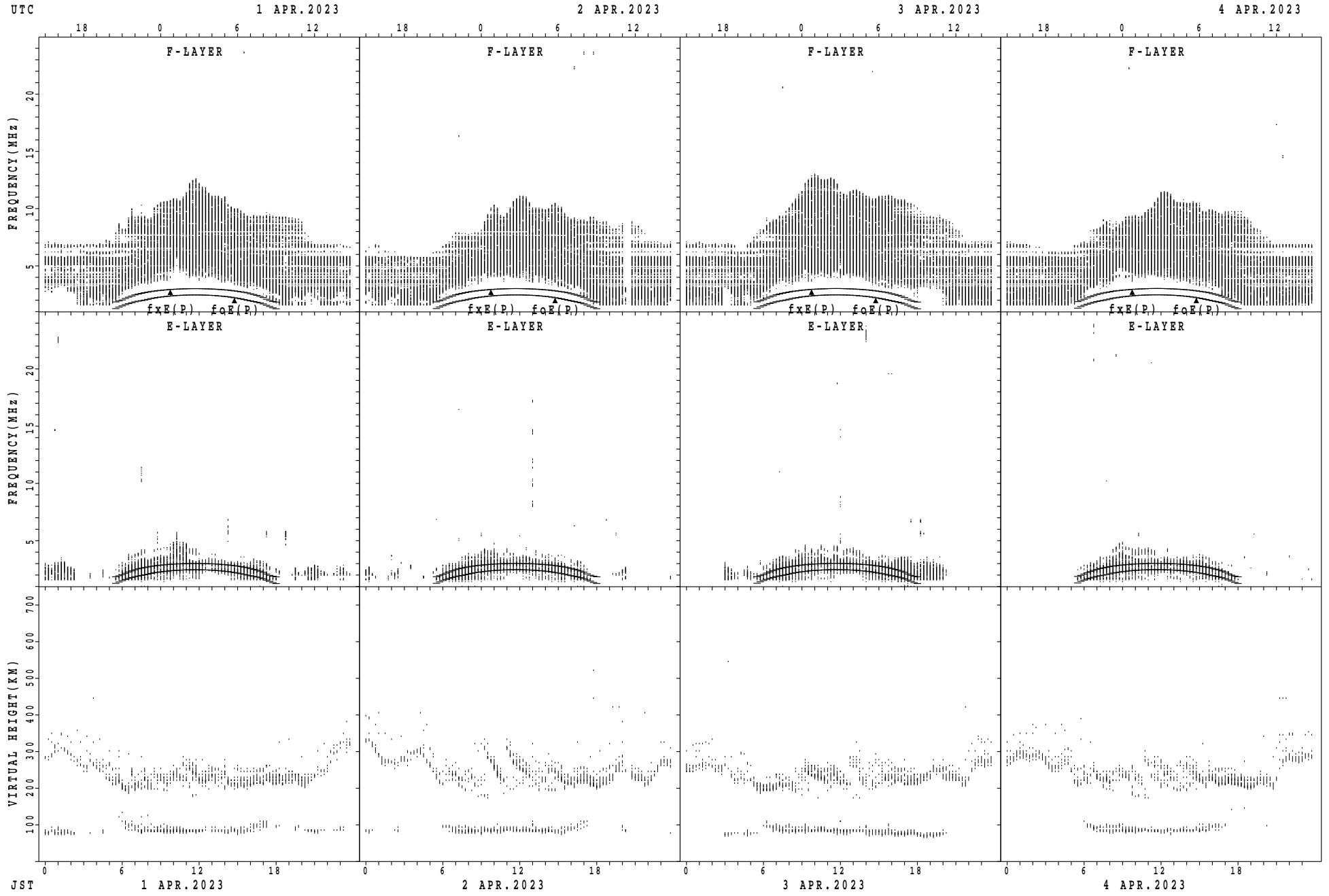
HOURLY VALUES OF fmin AT Okinawa

APR. 2023

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

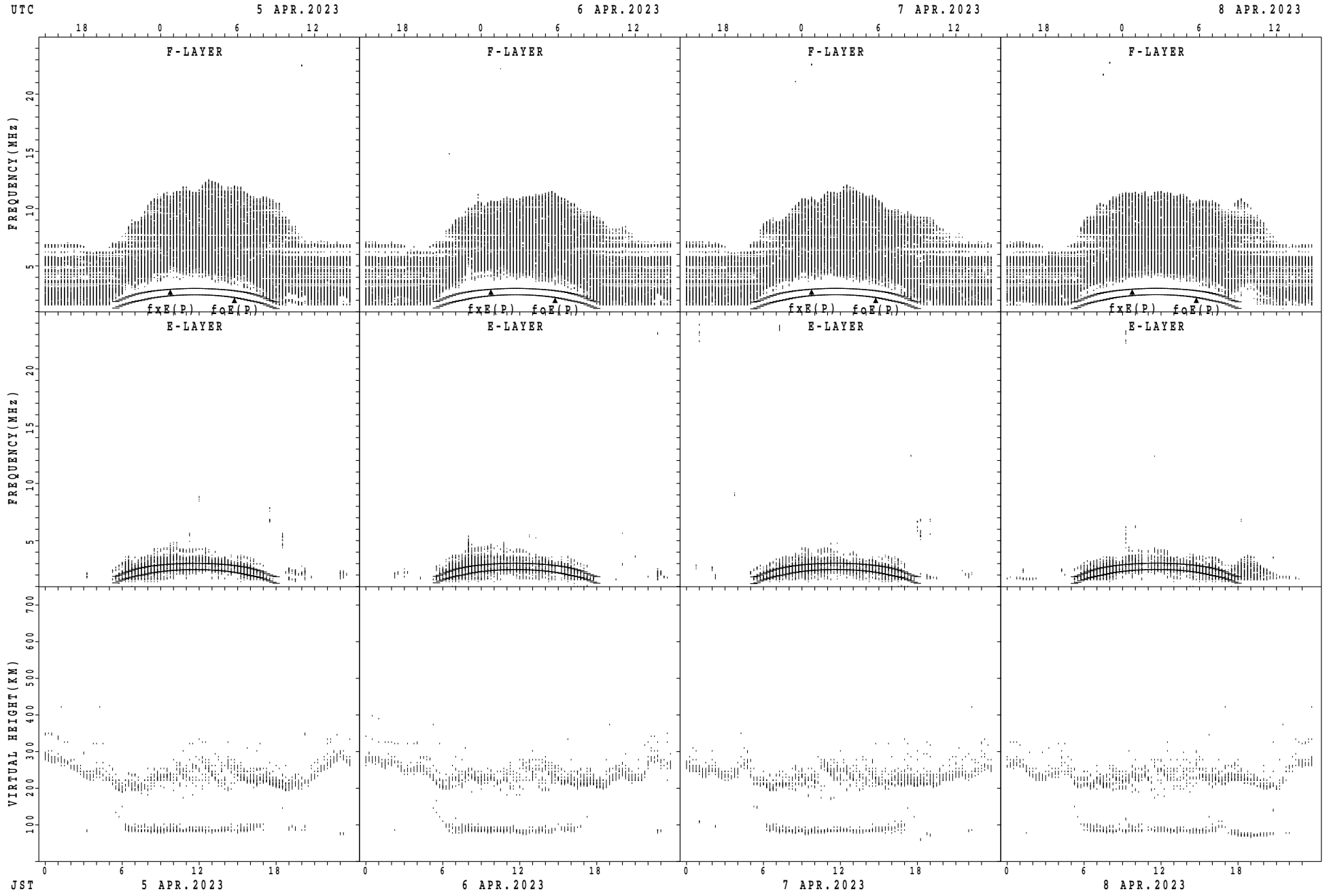
$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	17	16	16	15	14	15	15	17	17	18	18	42	39	16	17	16	14	16	15	14	16	16
2	16	16	14	14	15	15	15	15	15	14	16	19	18	20	21	19	18	15	15	15	15	15	14	15
3	15	15	15	14	15	16	20	15	16	15	22	20	21	17	16	17	14	13	14	16	15	14	14	15
4	15	15	15	15	15	14	15	15	15	15	18	18	21	20	15	15	17	14	11	16	16	16	14	15
5	16	16	15	15	16	16	16	16	15	15	18	19	21	19	20	17	17	15	15	15	15	15	15	15
6	15	14	14	15	14	15	14	15	14	16	17	19	17	20	18	39	16	15	14	15	16	15	15	14
7	14	14	14	14	15	15	14	16	16	16	17	19	17	16	18	17	17	14	16	16	15	16	15	15
8	15	14	14	15	14	15	15	15	15	17	16	19	21	16	16	15	17	15	15	14	15	16	15	16
9	16	14	14	16	15	15	15	16	15	16	19	21	34	16	17	18	17	15	14	14	16	15	14	15
10	15	15	14	14	15	15	14	16	15	18	20	21	20	19	22	22	16	14	15	17	17	14	16	16
11	15	16	15	14	14	15	14	16	14	17	16	17	18	22	22	18	19	14	16	15	15	15	15	15
12	18	15	14	14	15	15	15	15	17	18	21	20	21	19	16	36	16	15	17	13	15	15	14	15
13	15	14	14	14	14	17	15	15	15	19	21	21	20	21	15	18	17	14	15	15	15	15	14	14
14	15	15	14	15	14	16	15	16	14	17	18	21	21	21	20	19	17	15	14	15	16	16	15	16
15	15	15	14	17	18	16	16	17	15	19	19	20	21	42	16	17	17	15	13	15	15	16	15	20
16	15	15	15	16	15	15	15	16	15	15	19	20	23	22	19	19	16	17	15	16	15	16	14	15
17	15	15	16	15	14	15	17	16	17	17	18	15	20	19	15	14	19	15	14	18	15	15	16	16
18	15	14	15	14	15	15	16	16	16	17	19	19	19	20	17	16	16	16	15	16	16	15	14	16
19	16	15	17	15	17	15	22	15	17	29	19	19	18	17	19	20	17	17	14	15	15	16	15	29
20	15	17	15	15	14	14	15	17	17	17	17	12	34	18	17	19	18	16	17	15	15	15	16	17
21	15	15	17	14	15	16	18	15	16	16	19	20	40	20	17	21	18	17	14	15	15	15	15	15
22	16	15	15	16	17	15	16	15	15	21	22	21	17	21	19	24	23	15	14	14	15	15	15	16
23	16	15	15	15	14	15	16	15	15	16	20	20	20	19	18	19	21	22	15	13	15	15	15	15
24	15	17	15	15	15	15	16	15	15	17	17	18	16	17	23	19	22	21	14	16	15	16	16	15
25	16	16	16	16	14	15	18	16	15	19	19	19	17	22	20	19	19	15	17	15	15	15	15	16
26	16	17	17	16	16	13	15	17	19	18	21	23	23	21	39	17	16	15	14	15	16	16	16	16
27	16	16	14	14	15	14	15	16	15	19	20	20	21	21	25	22	18	17	15	14	16	17	15	16
28	17	16	15	16	15	15	17	15	17	19	19	42	20	17	15	20	20	15	16	14	15	17	15	16
29	16	15	15	15	16	16	15	15	16	19	19	20	40	40	16	18	18	16	16	18	15	15	16	15
30	16	16	20	17	15	15	15	15	18	19	17	22	23	18	22	21	17	17	18	14	15	15	15	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	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	15	17	19	20	20	20	18	19	17	15	15	15	15	15	15	16
U Q	16	16	15	16	15	15	16	16	16	19	20	21	21	21	21	20	18	16	16	16	16	16	15	16
L Q	15	15	14	14	14	15	15	15	15	16	17	19	18	18	16	17	17	15	14	14	15	15	14	15

SUMMARY PLOTS AT Wakkanai



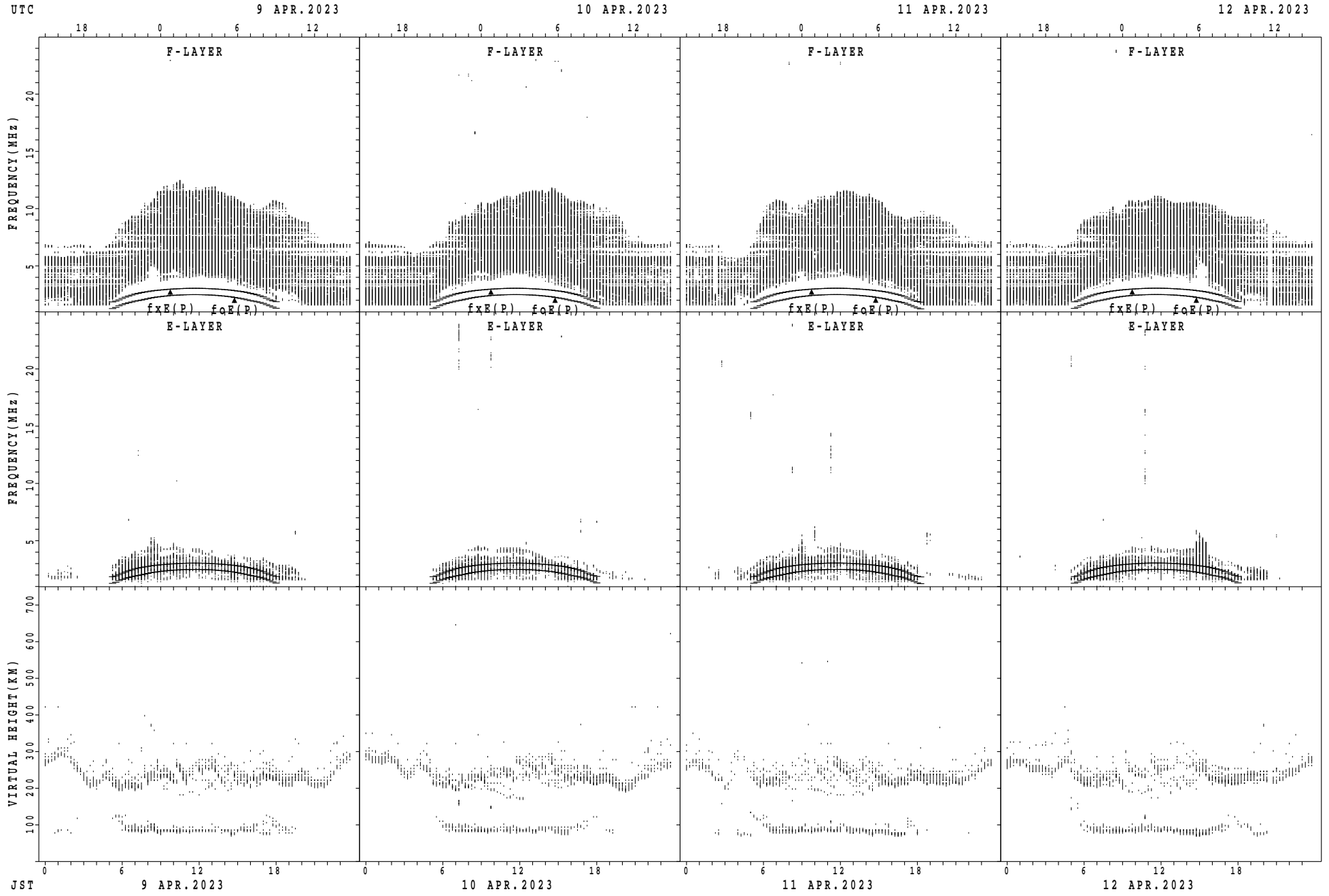
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



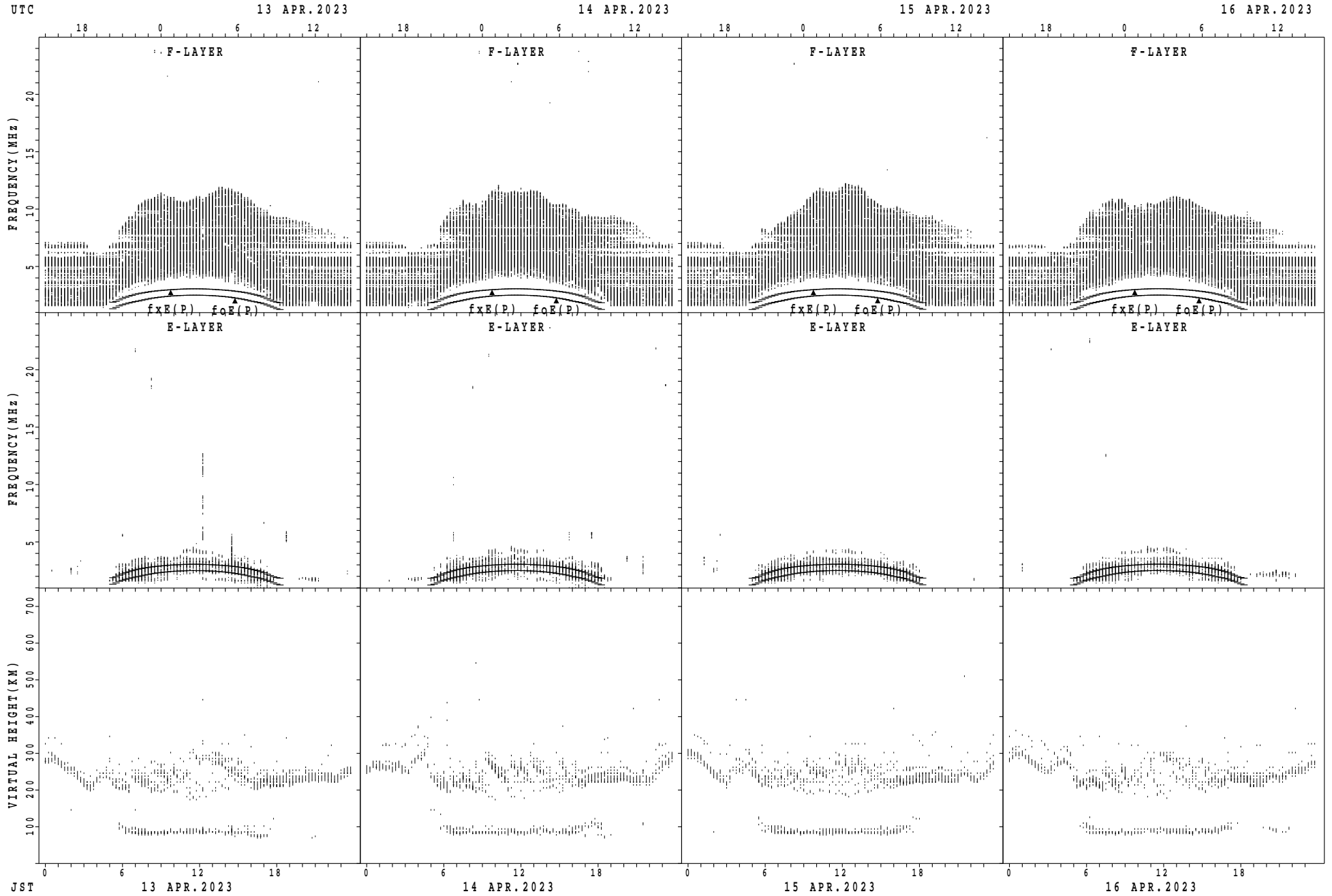
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



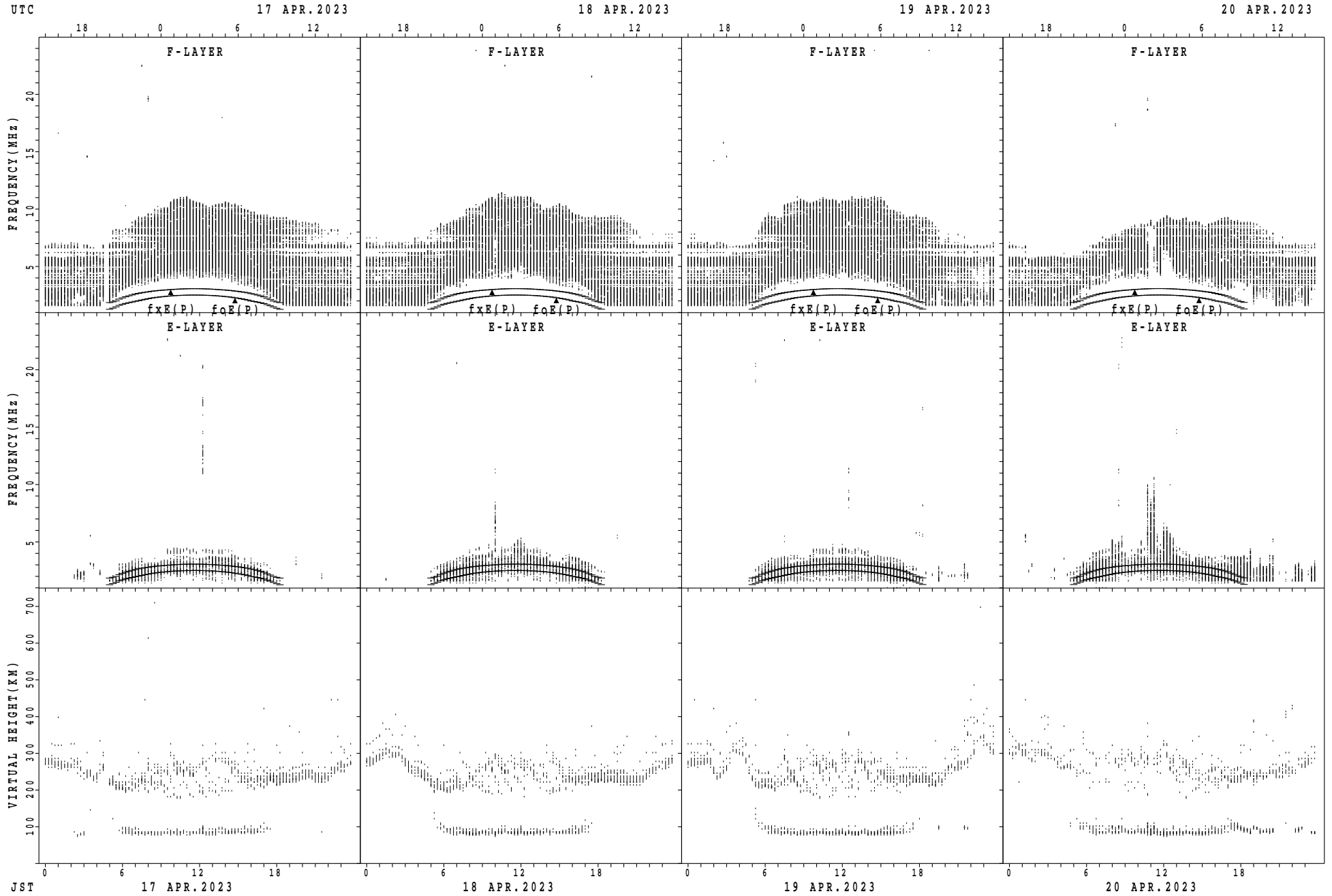
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



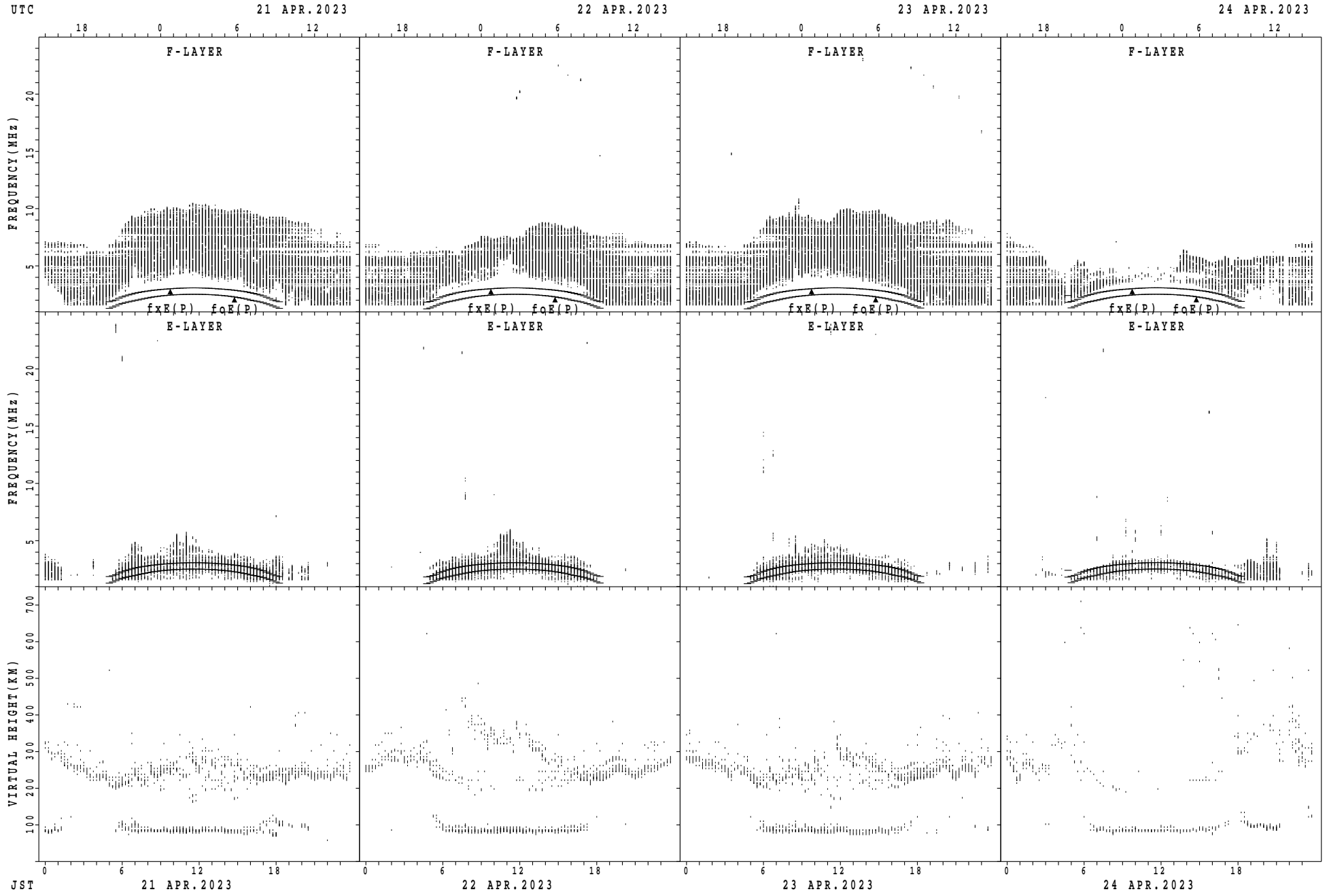
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



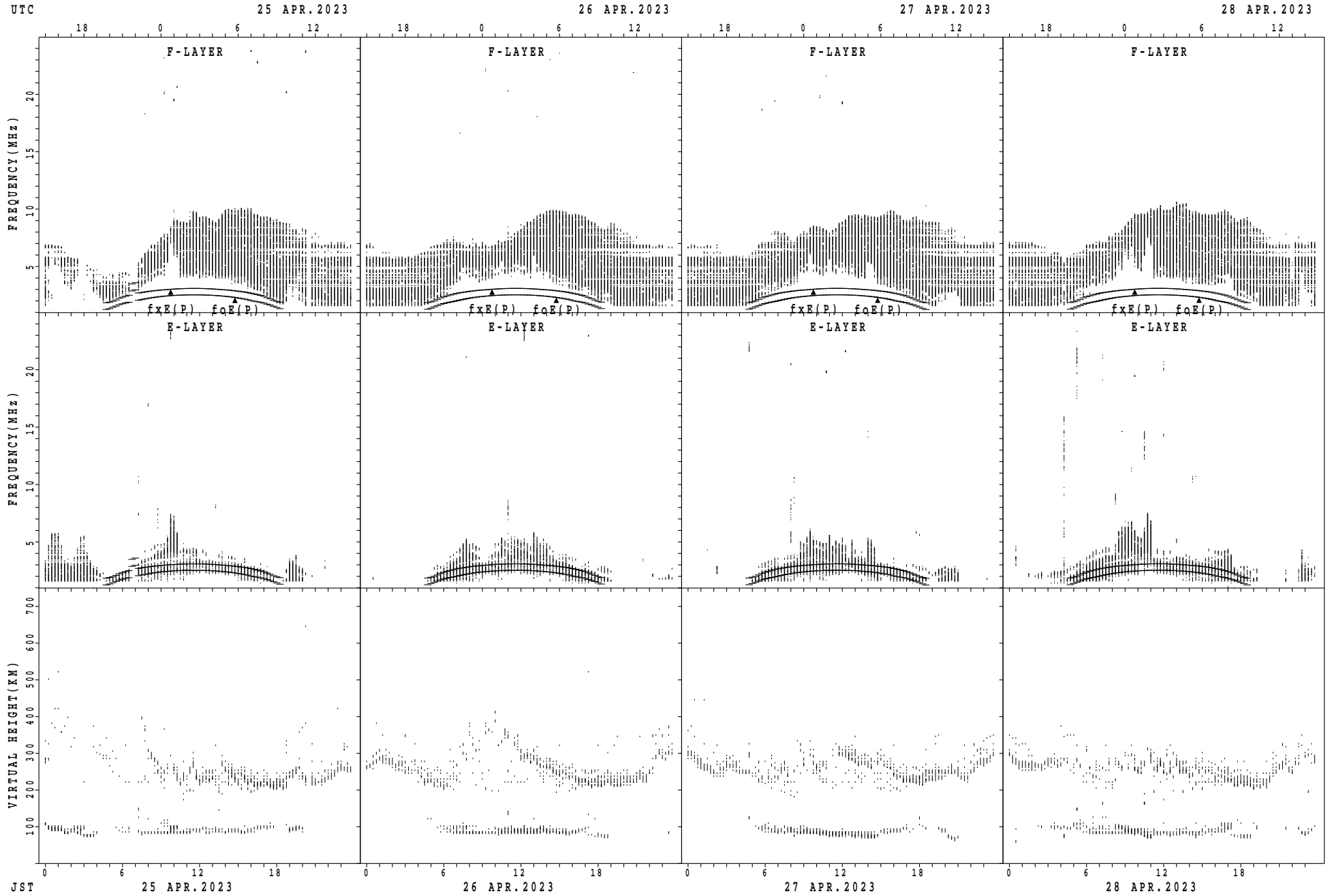
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



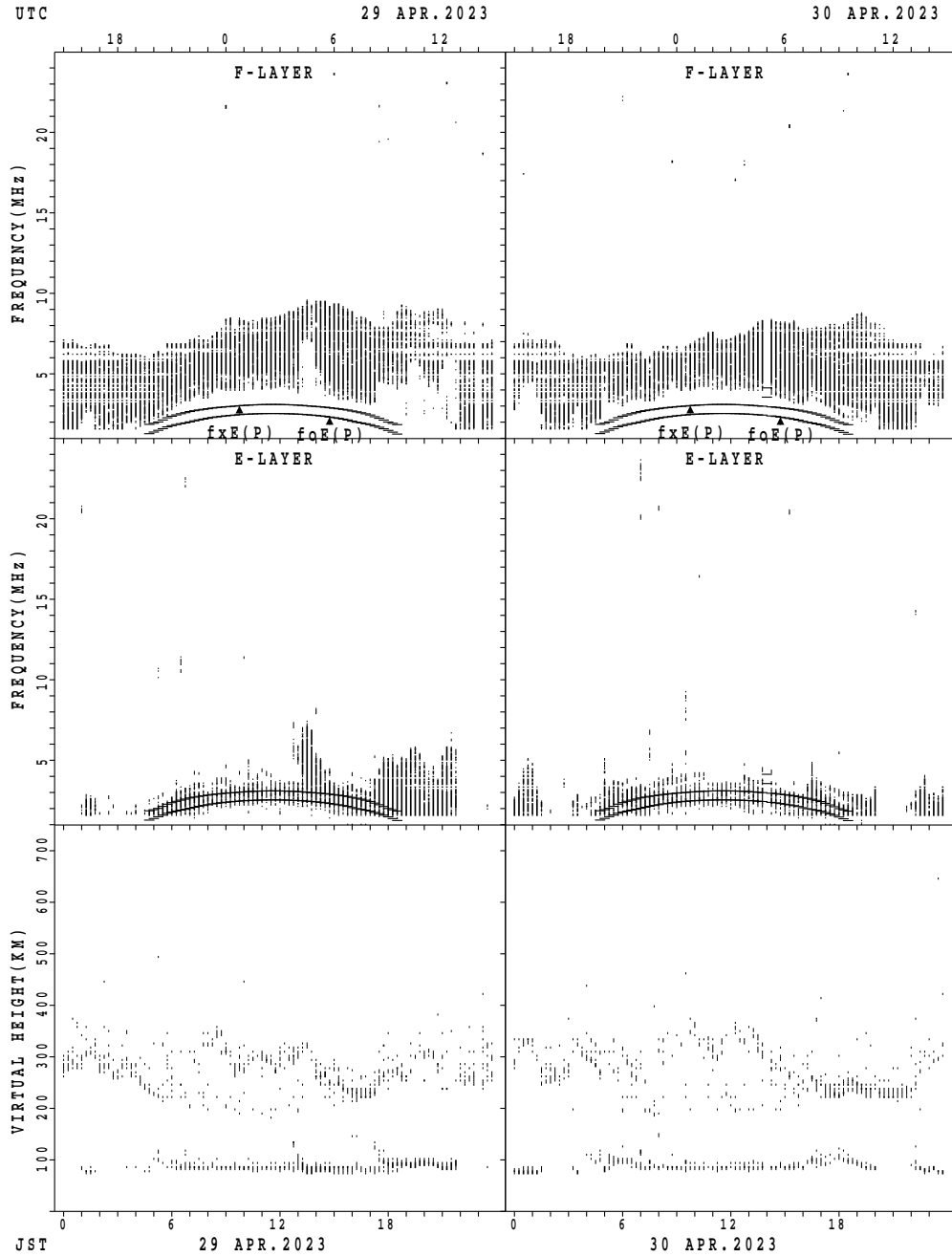
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



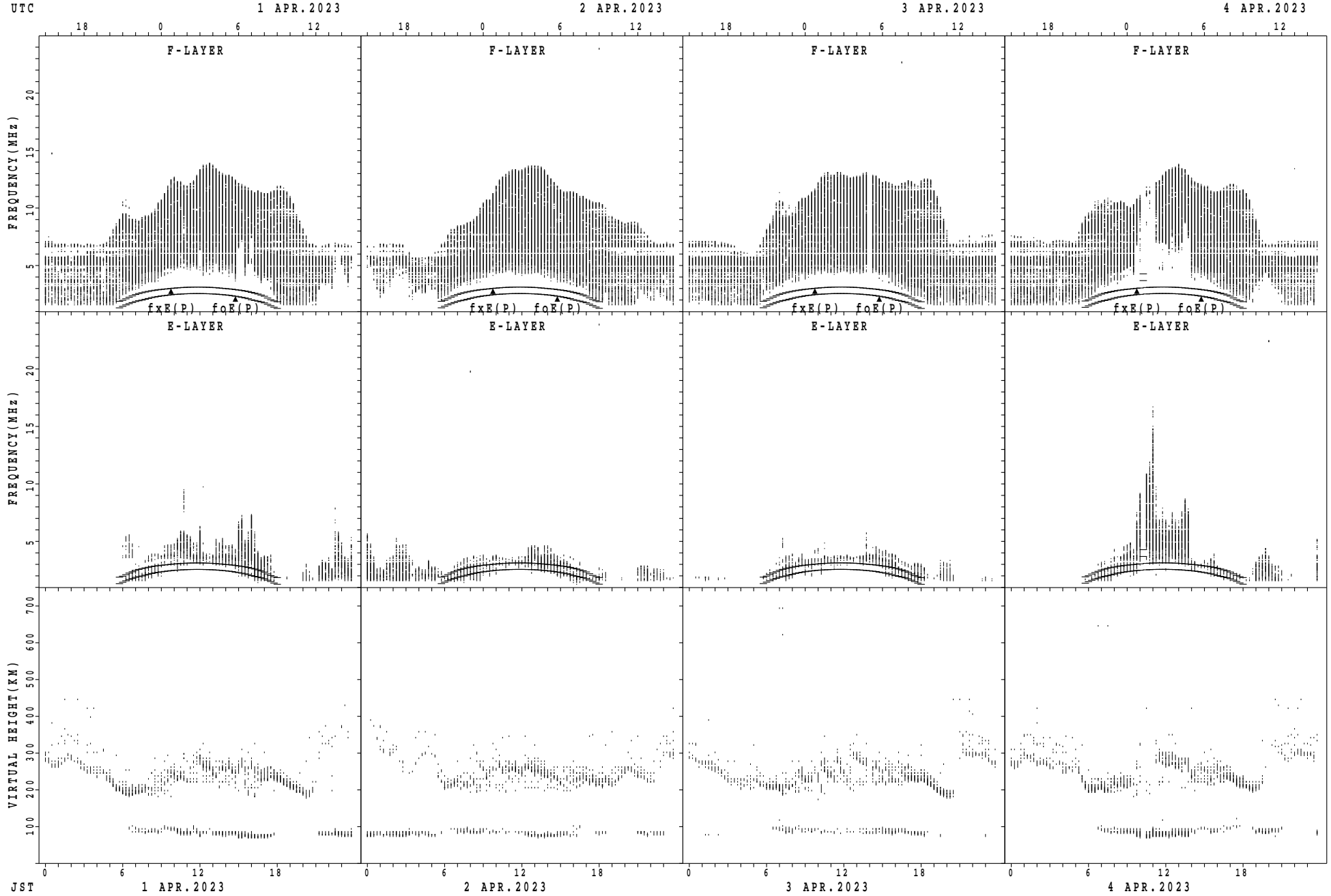
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



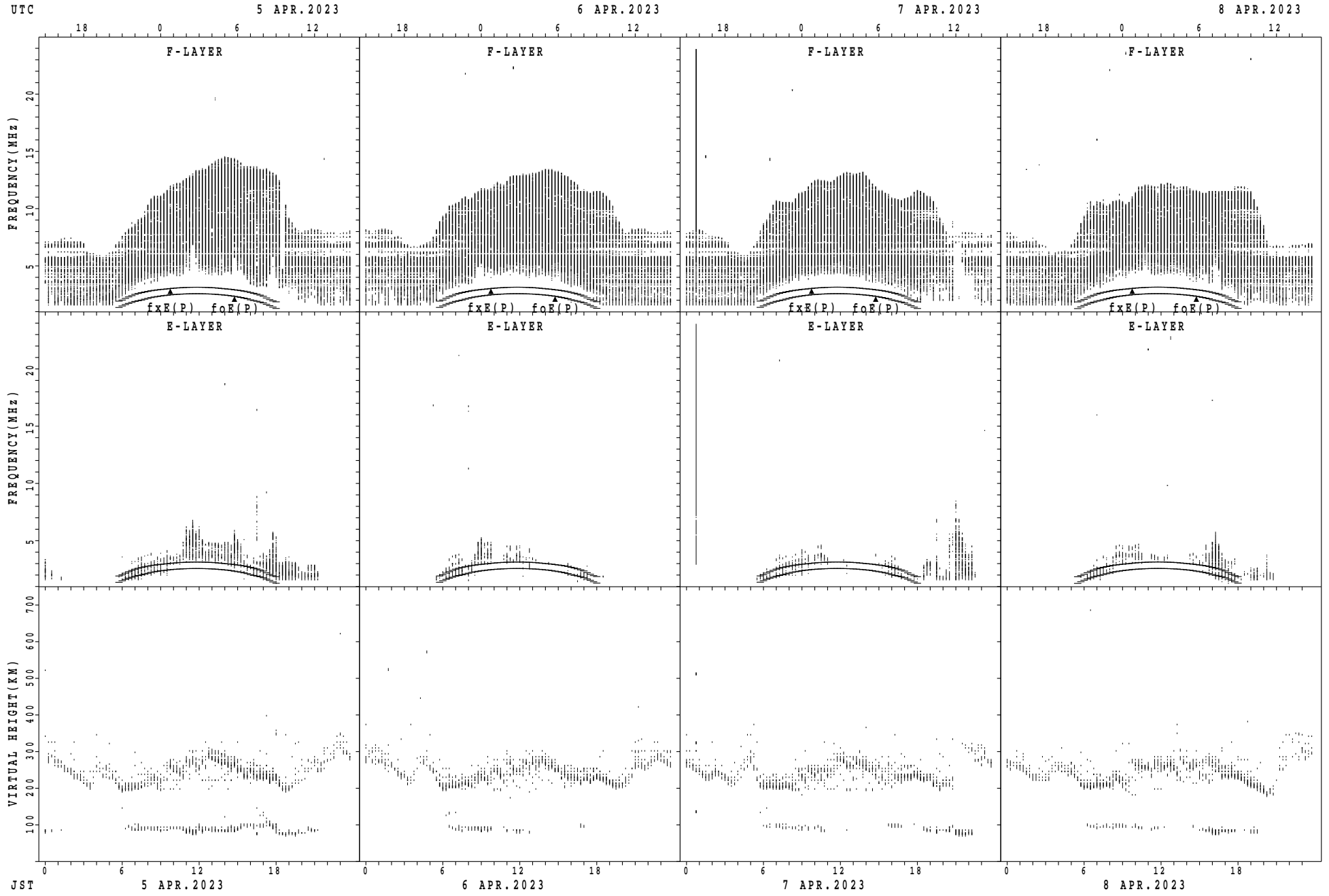
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



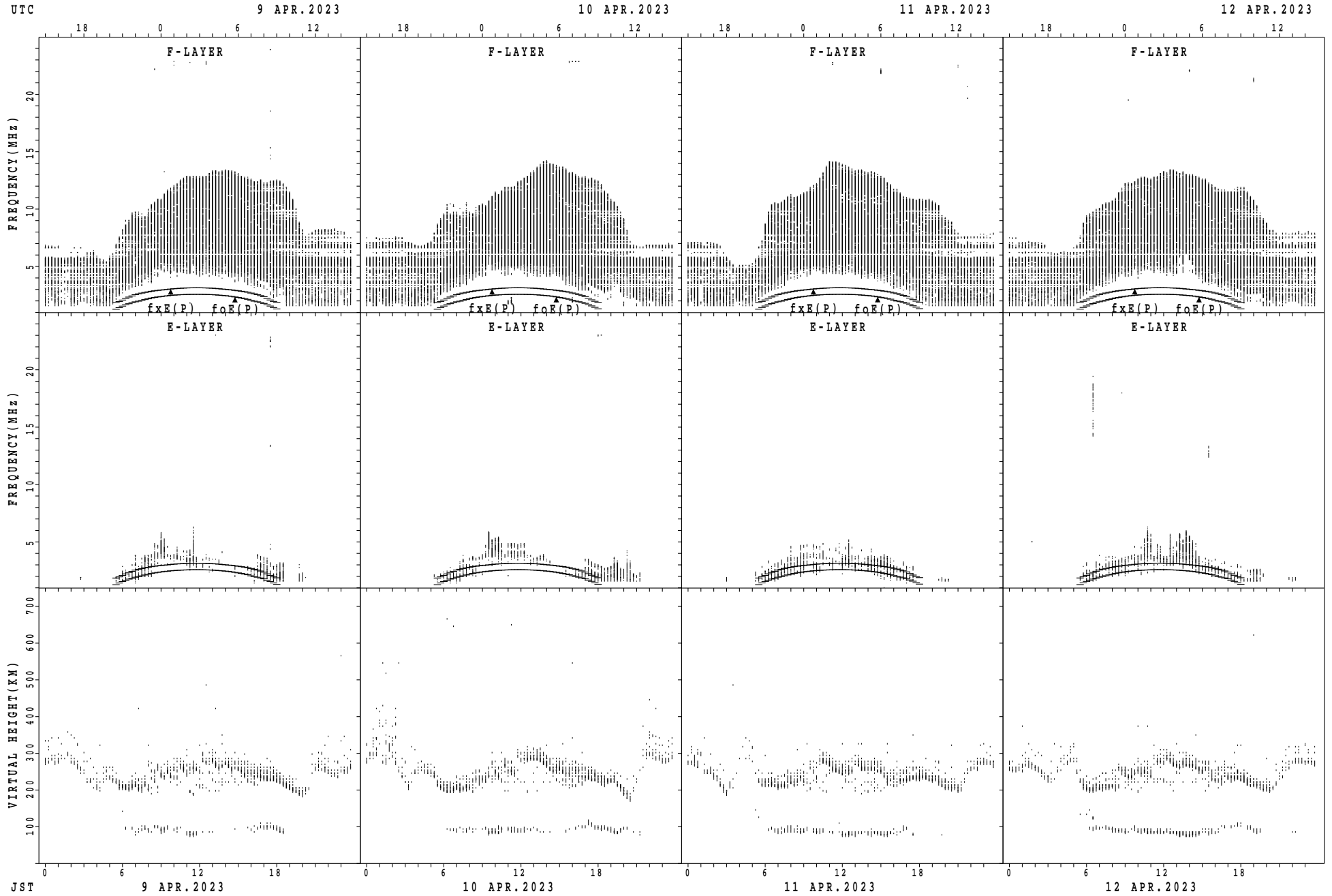
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



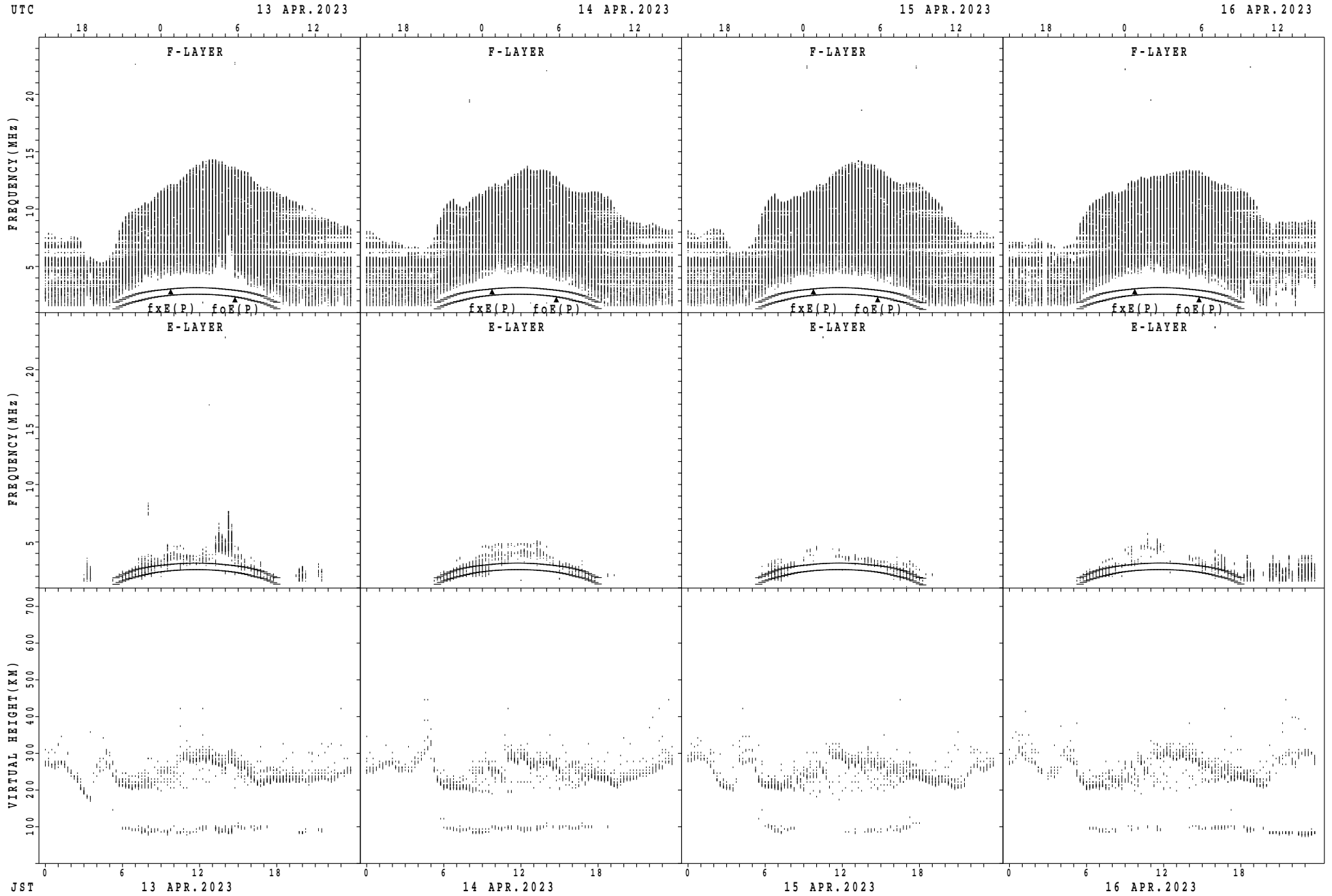
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



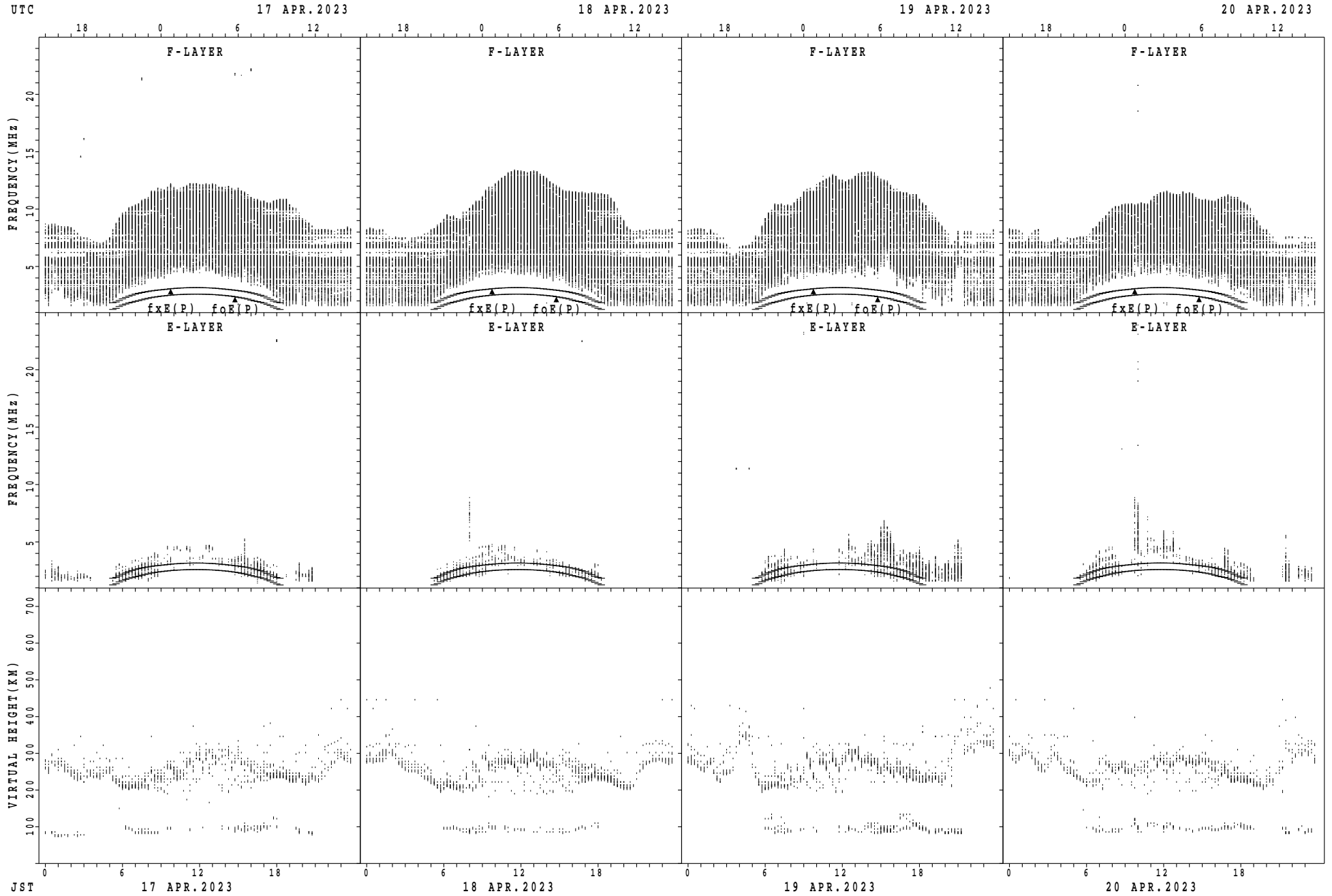
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



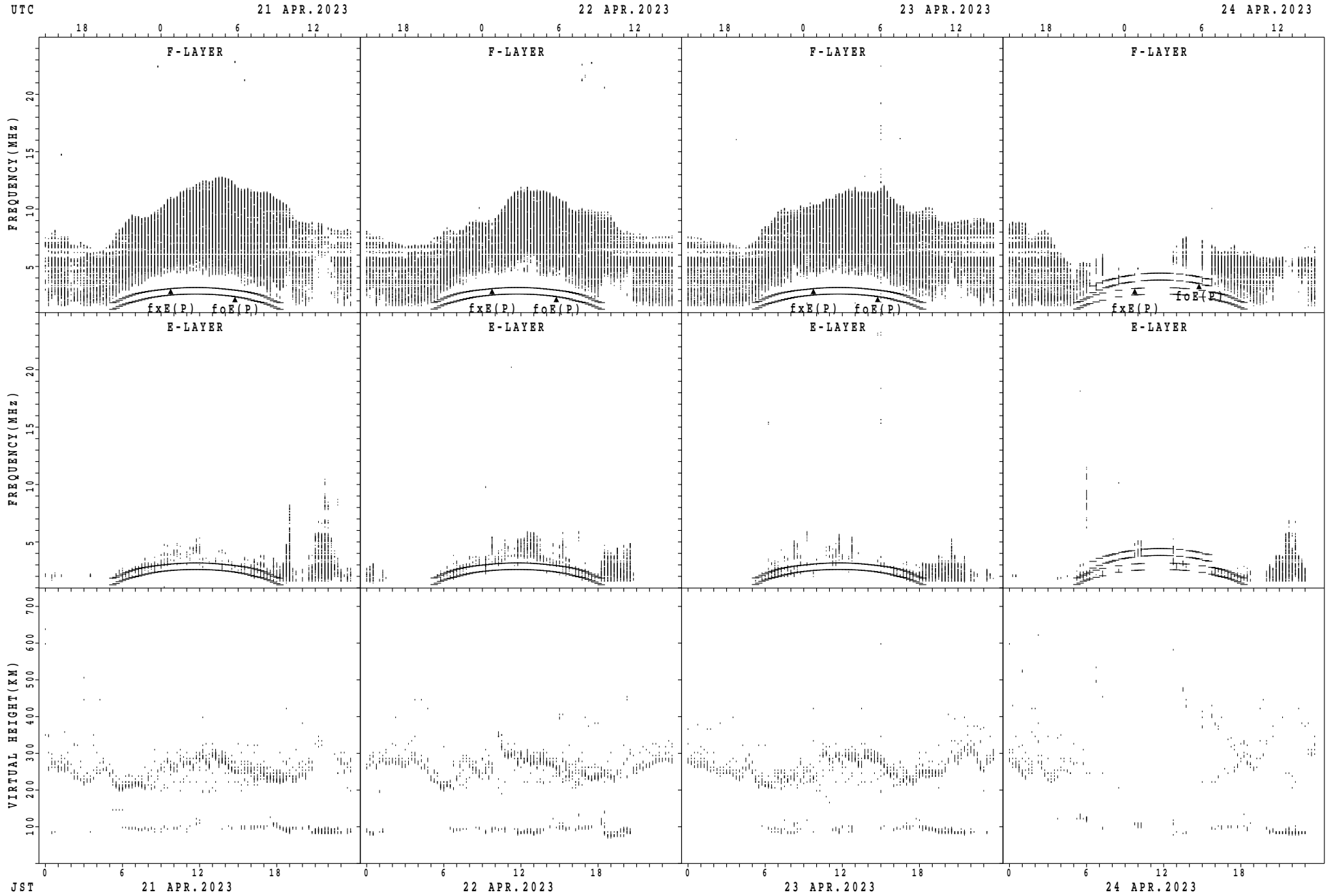
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



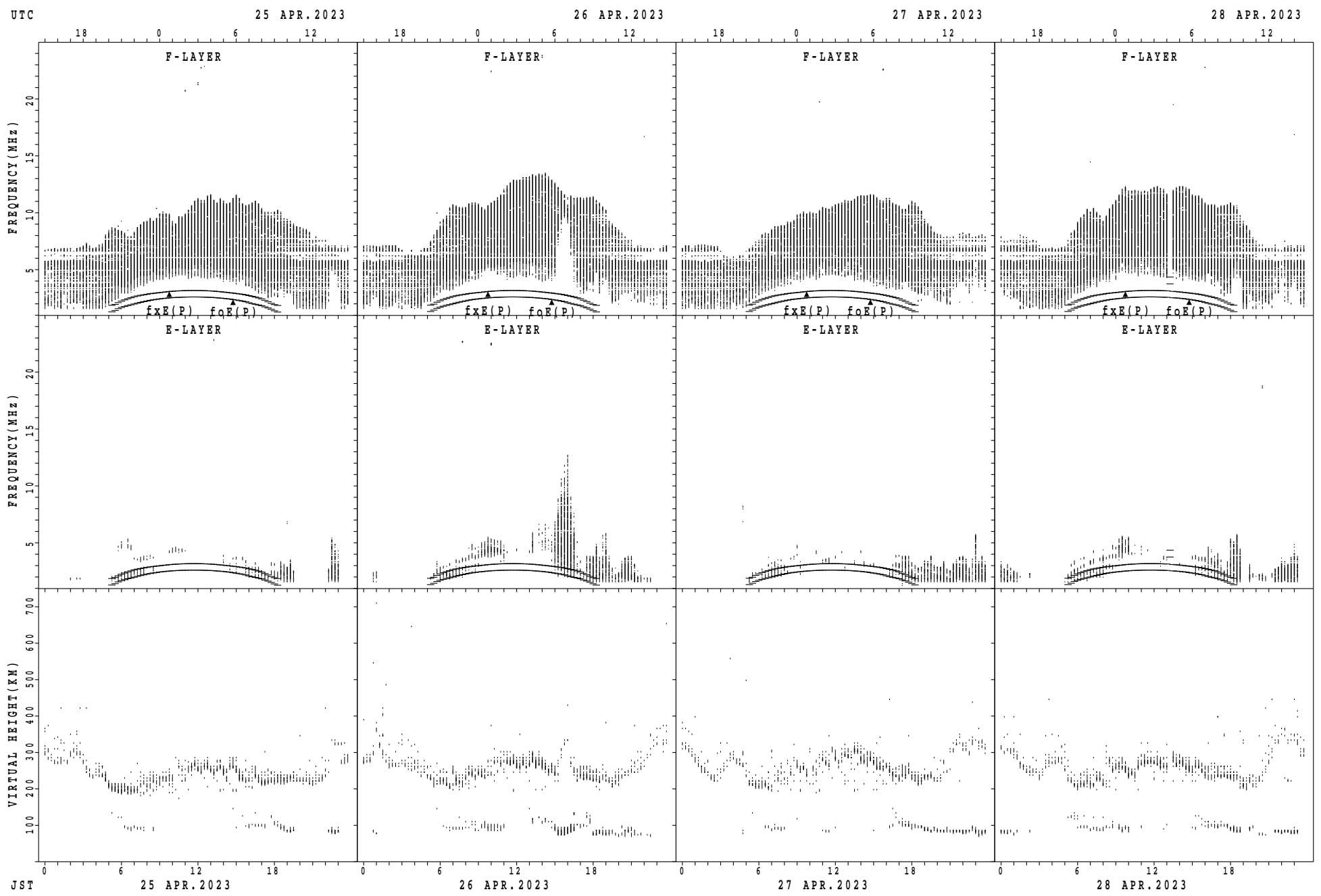
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



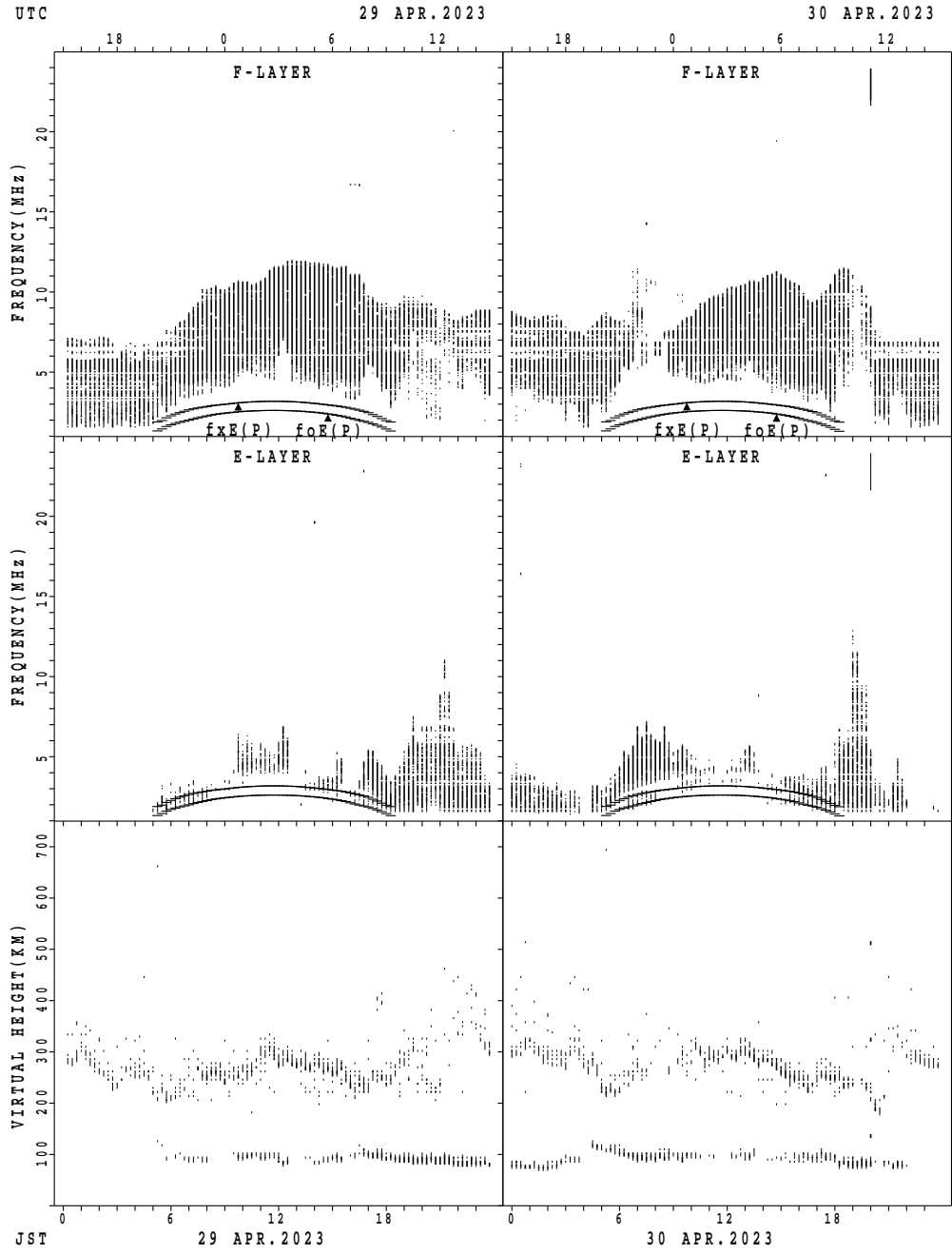
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



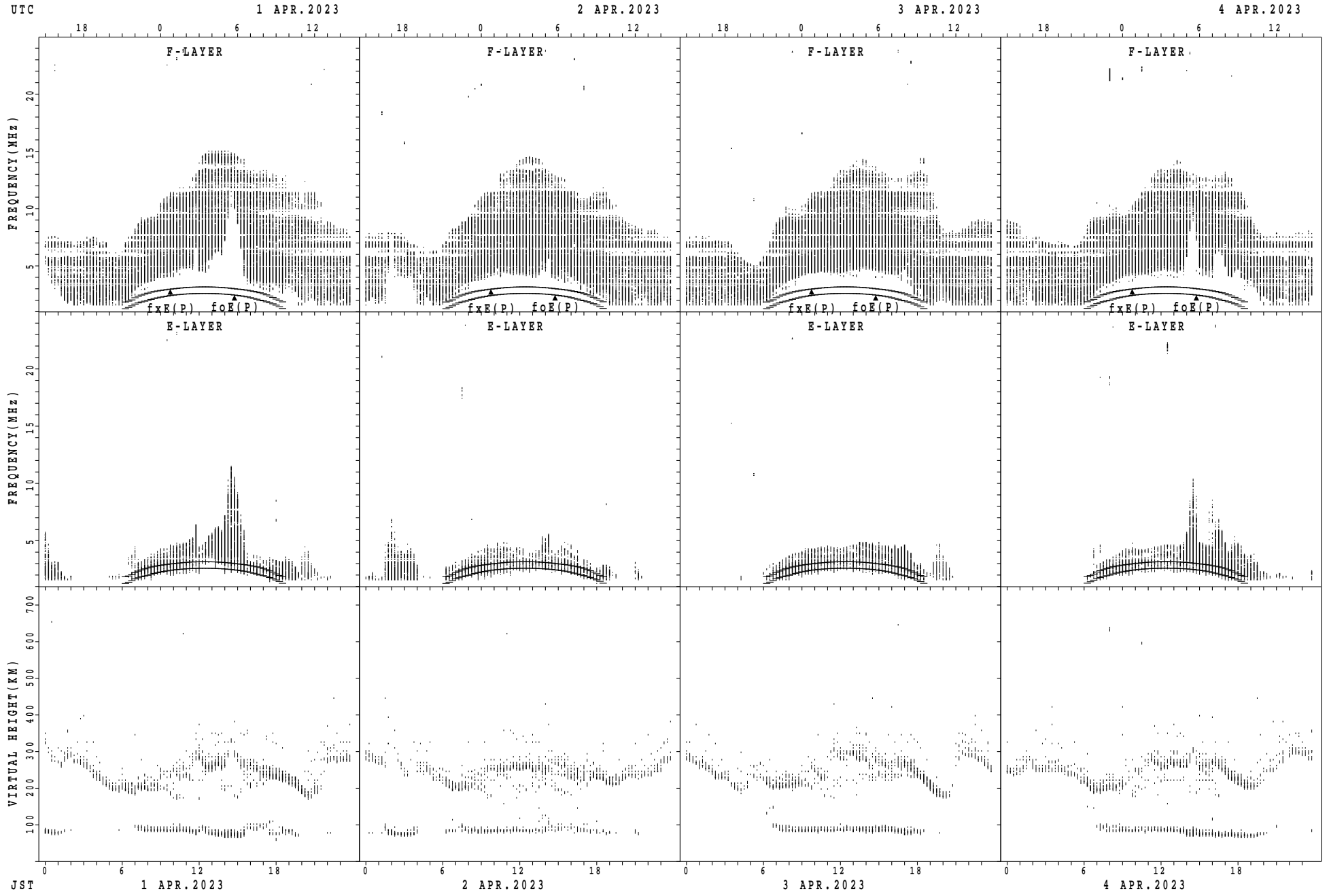
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



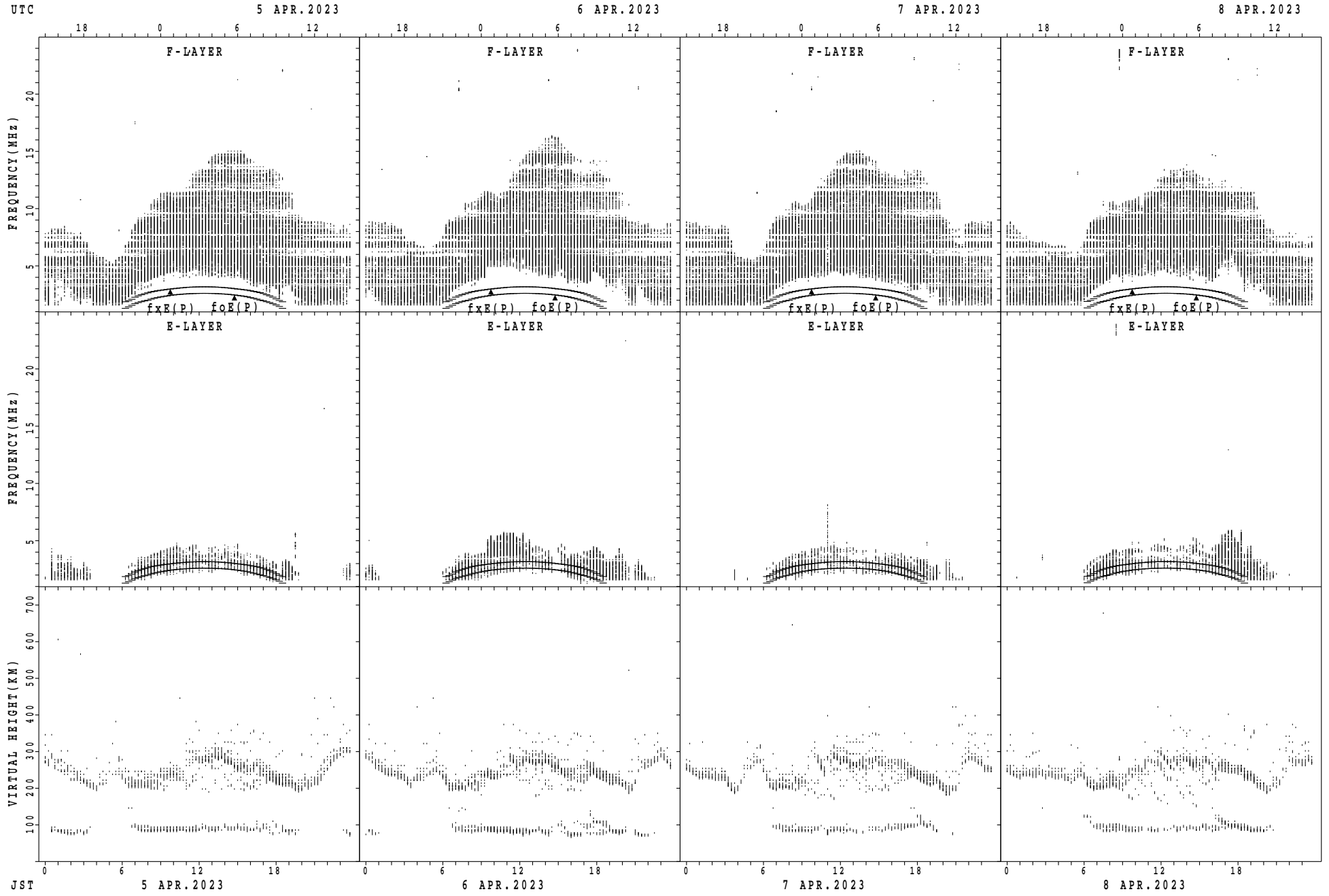
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



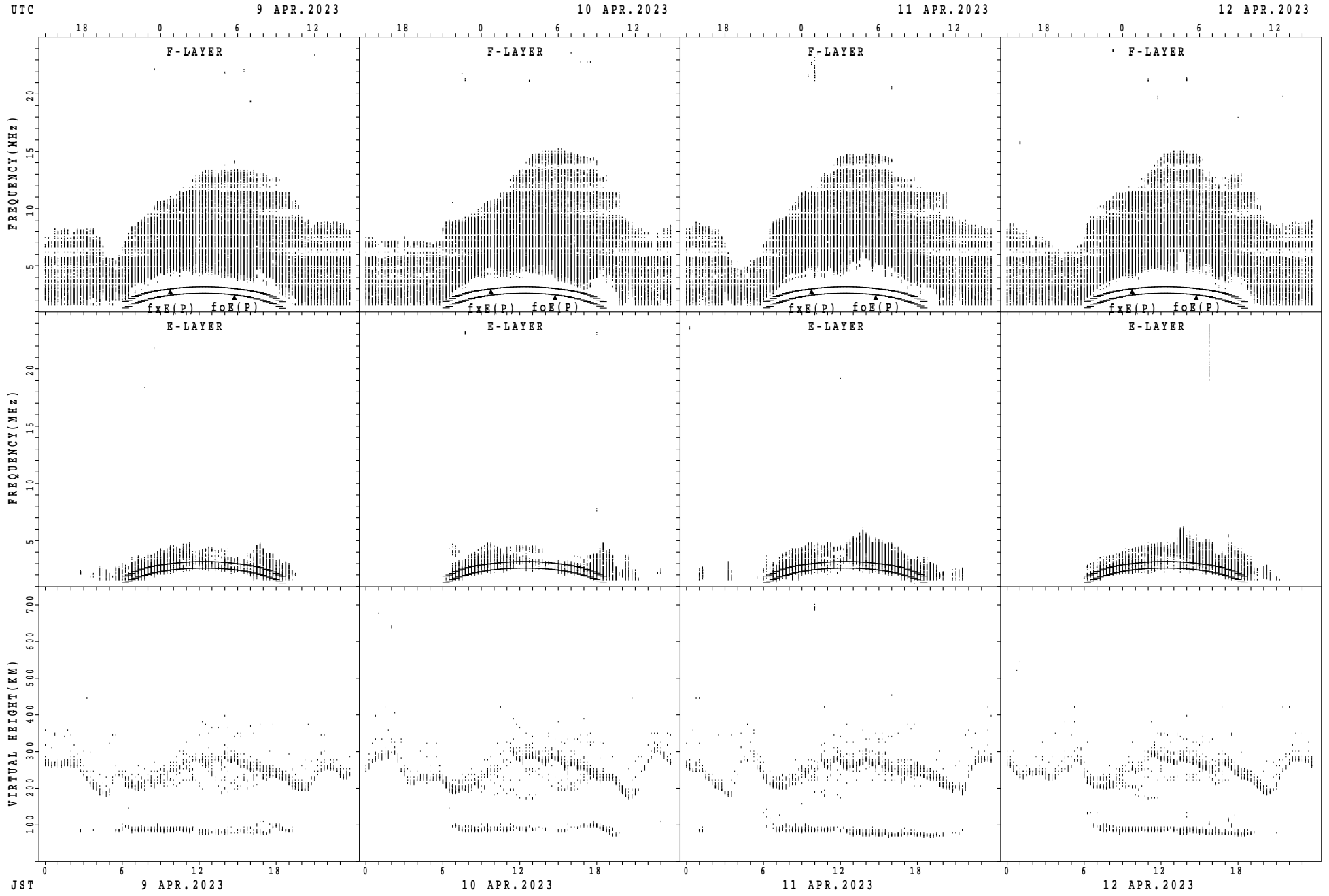
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



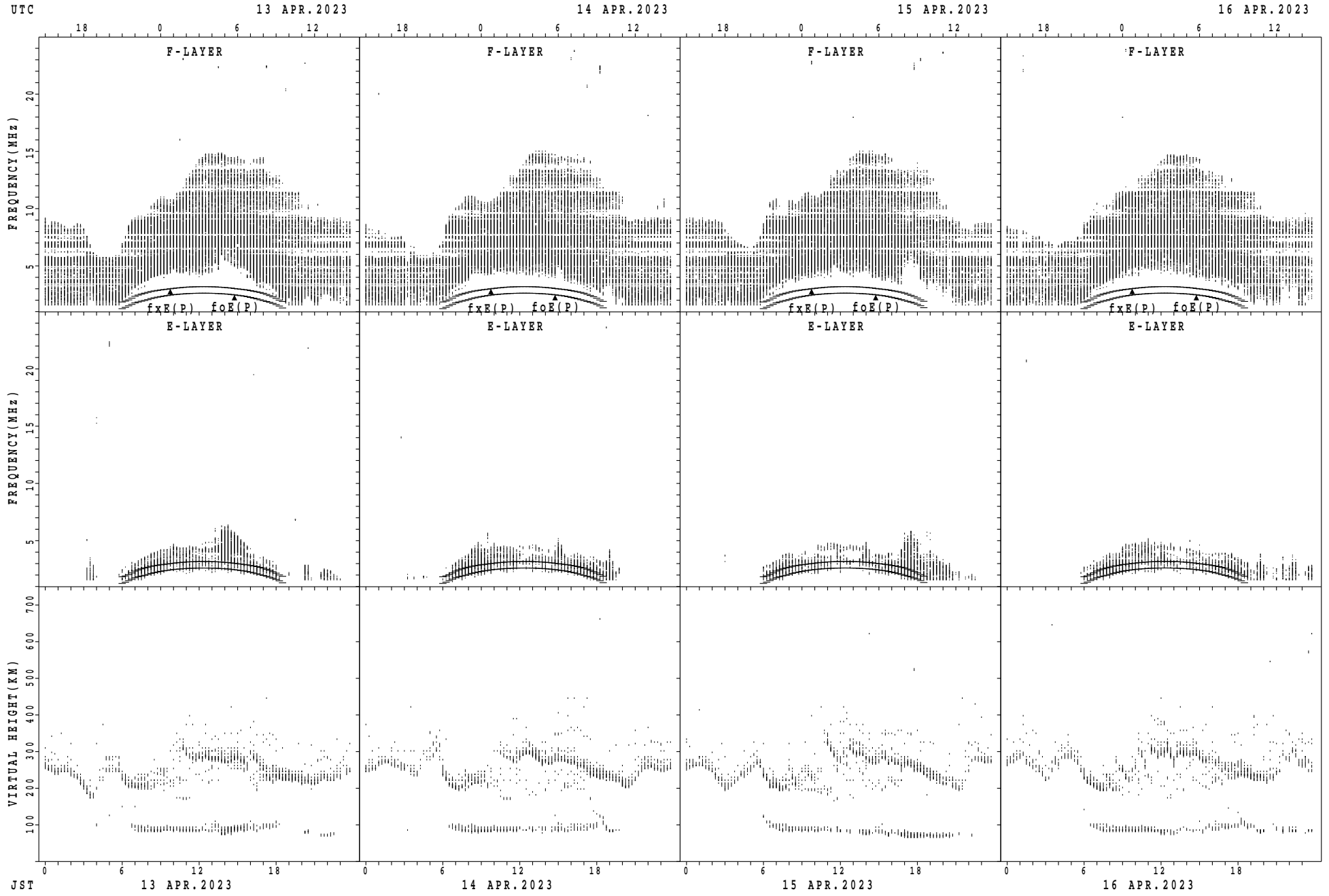
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



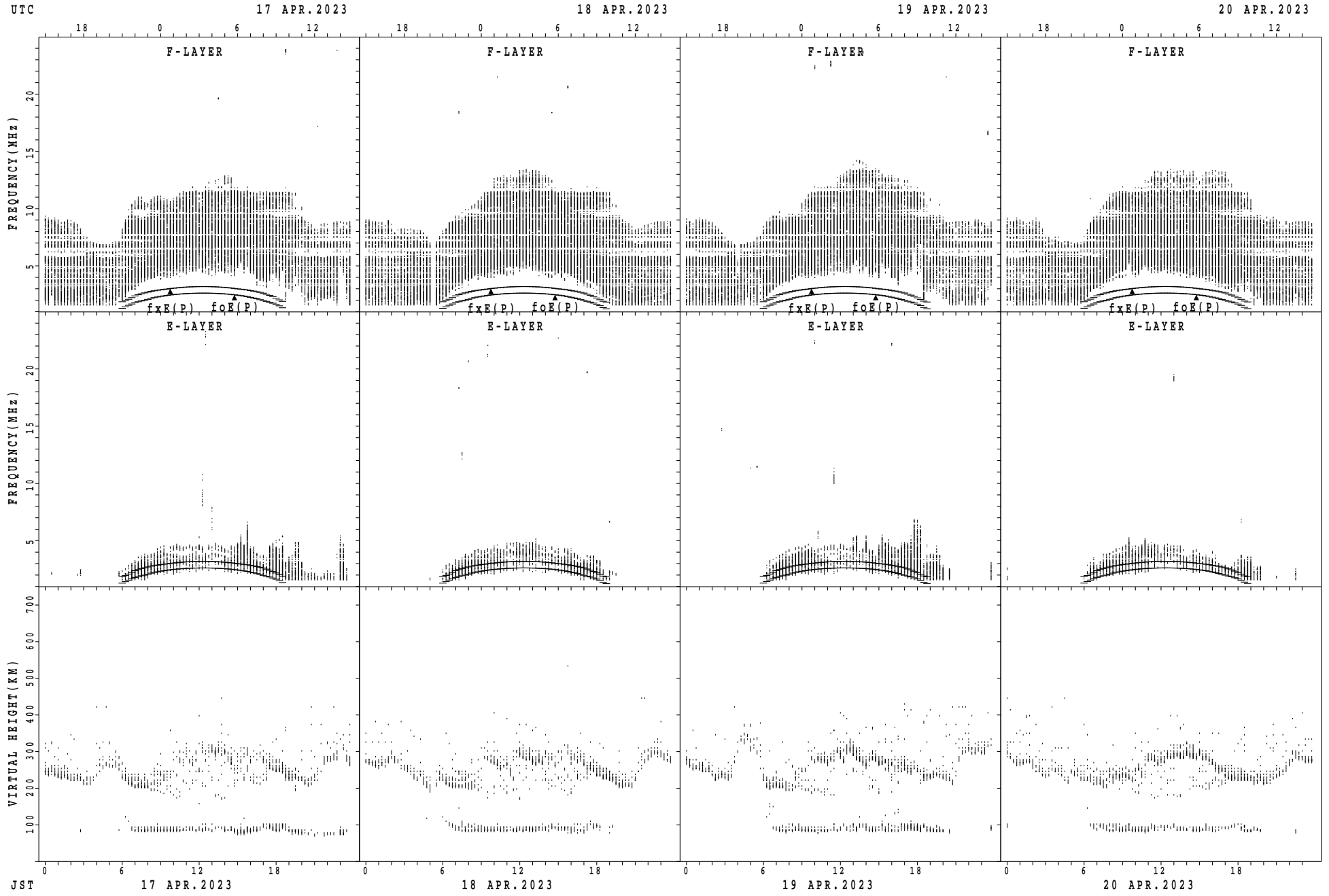
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



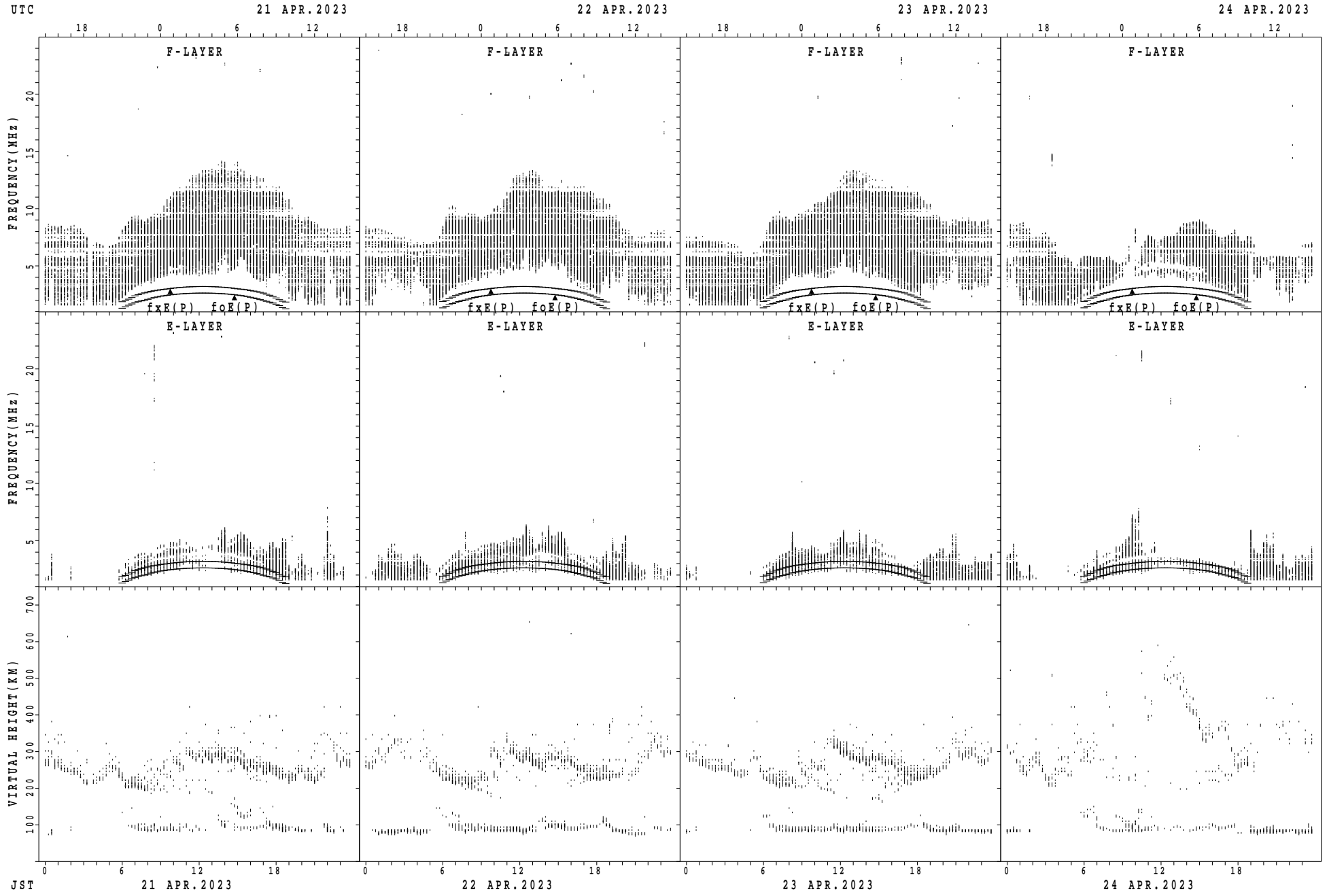
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



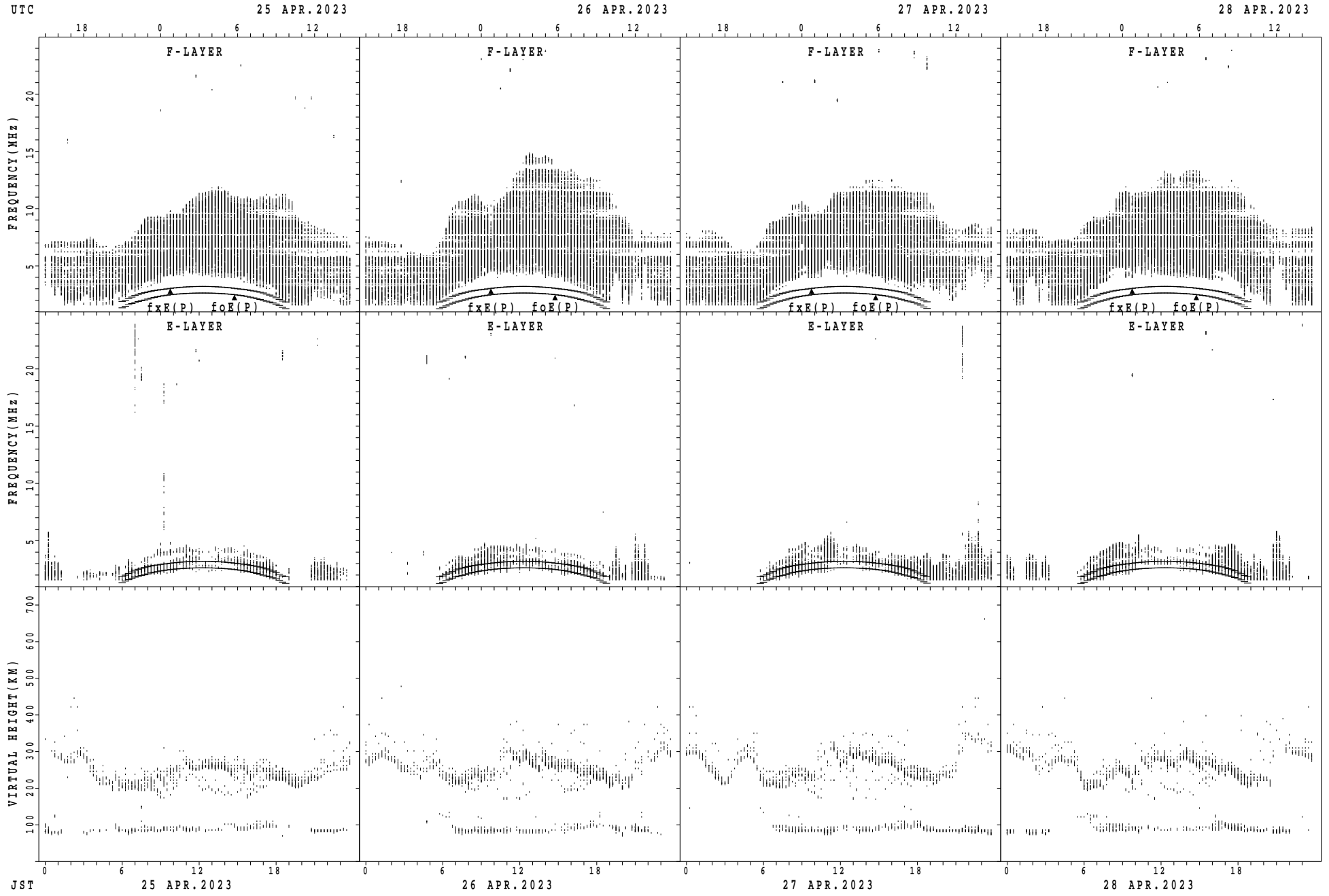
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



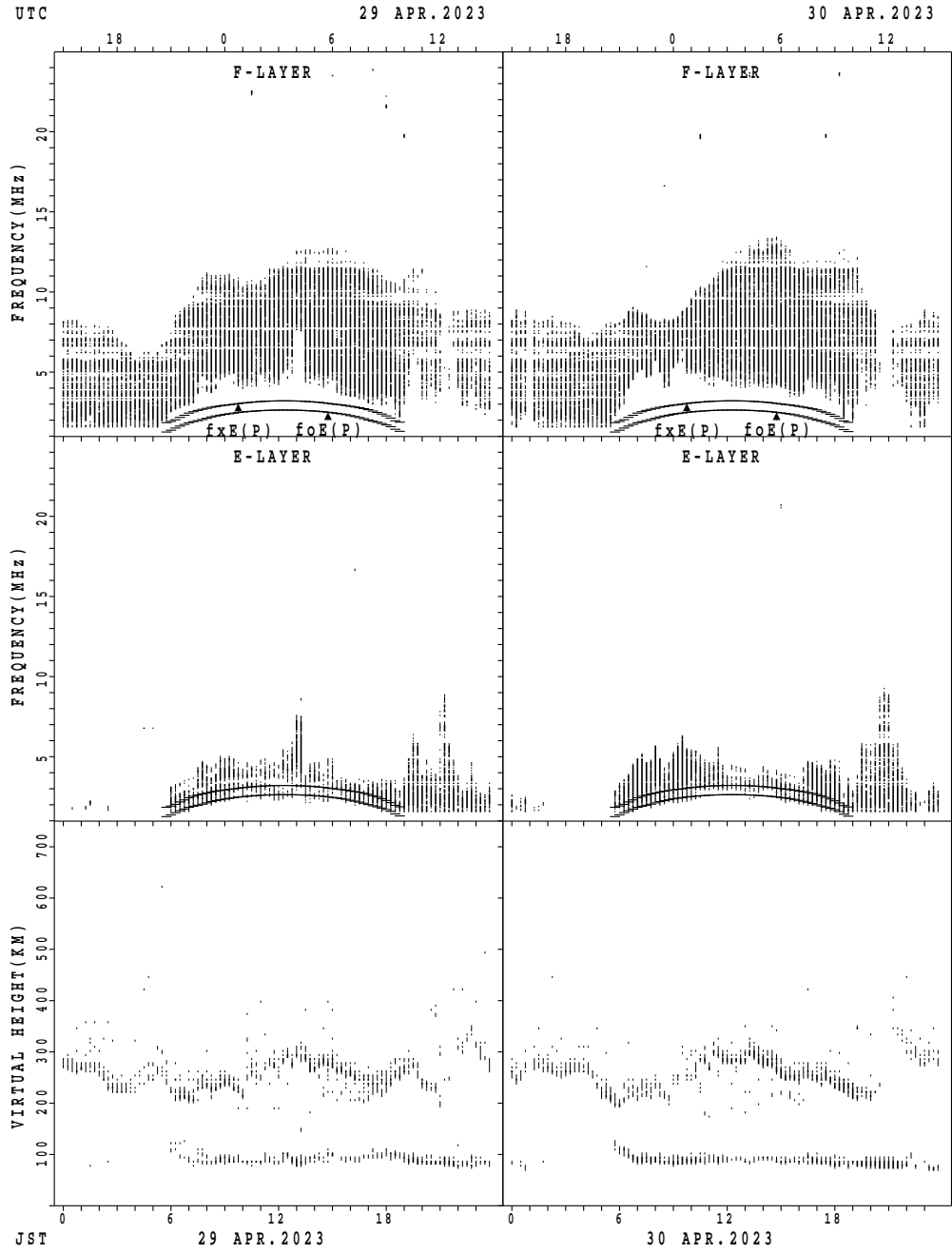
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



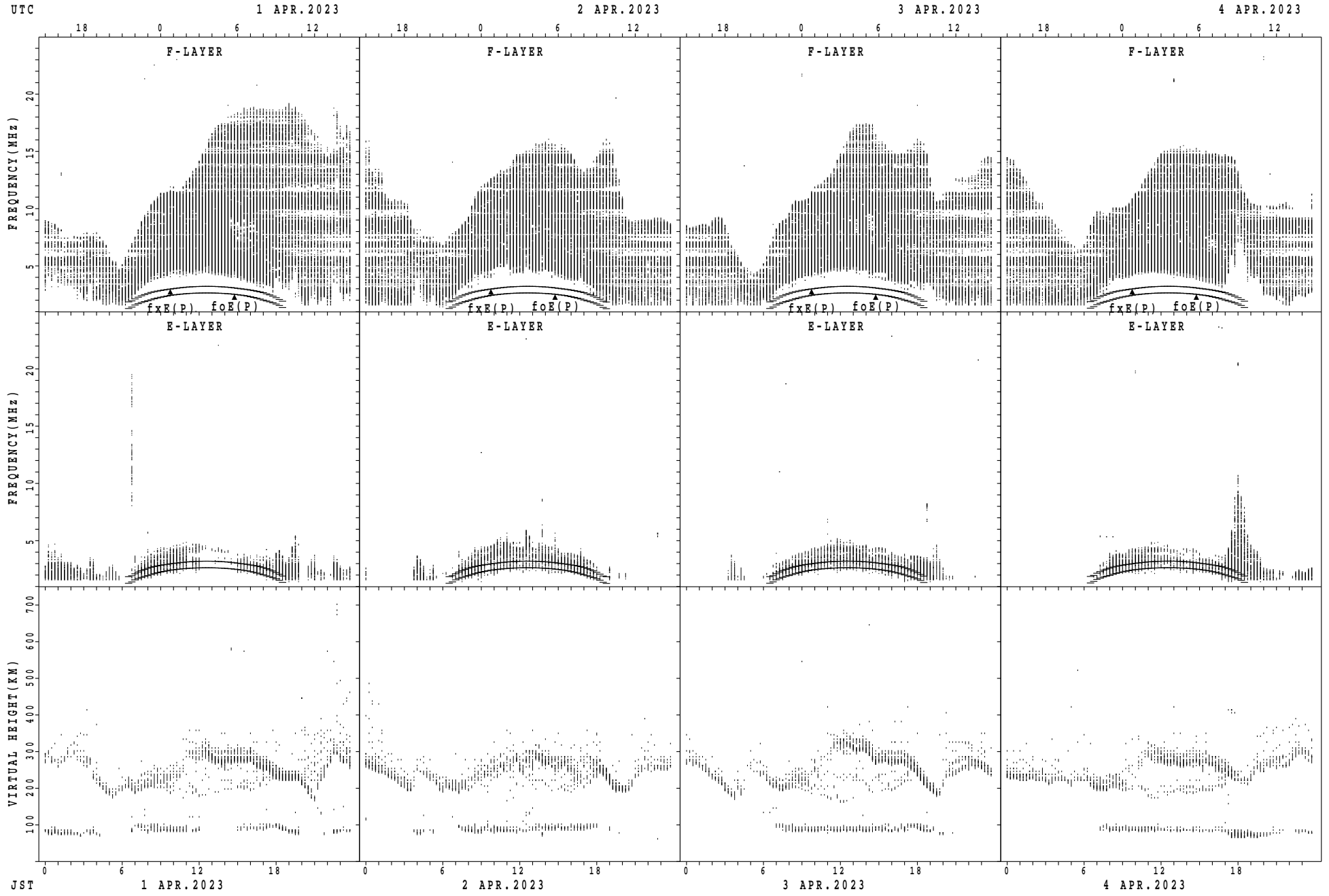
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



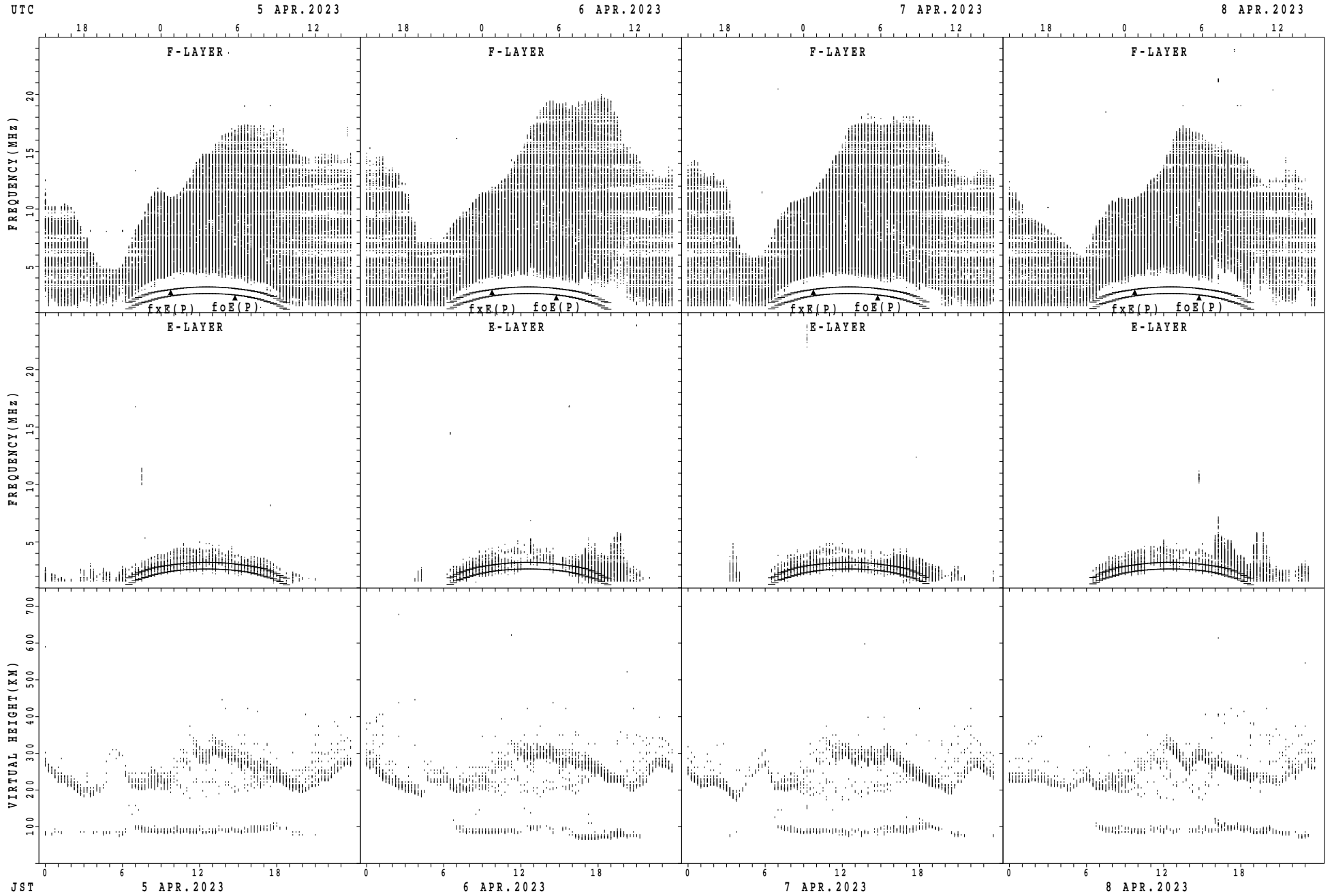
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



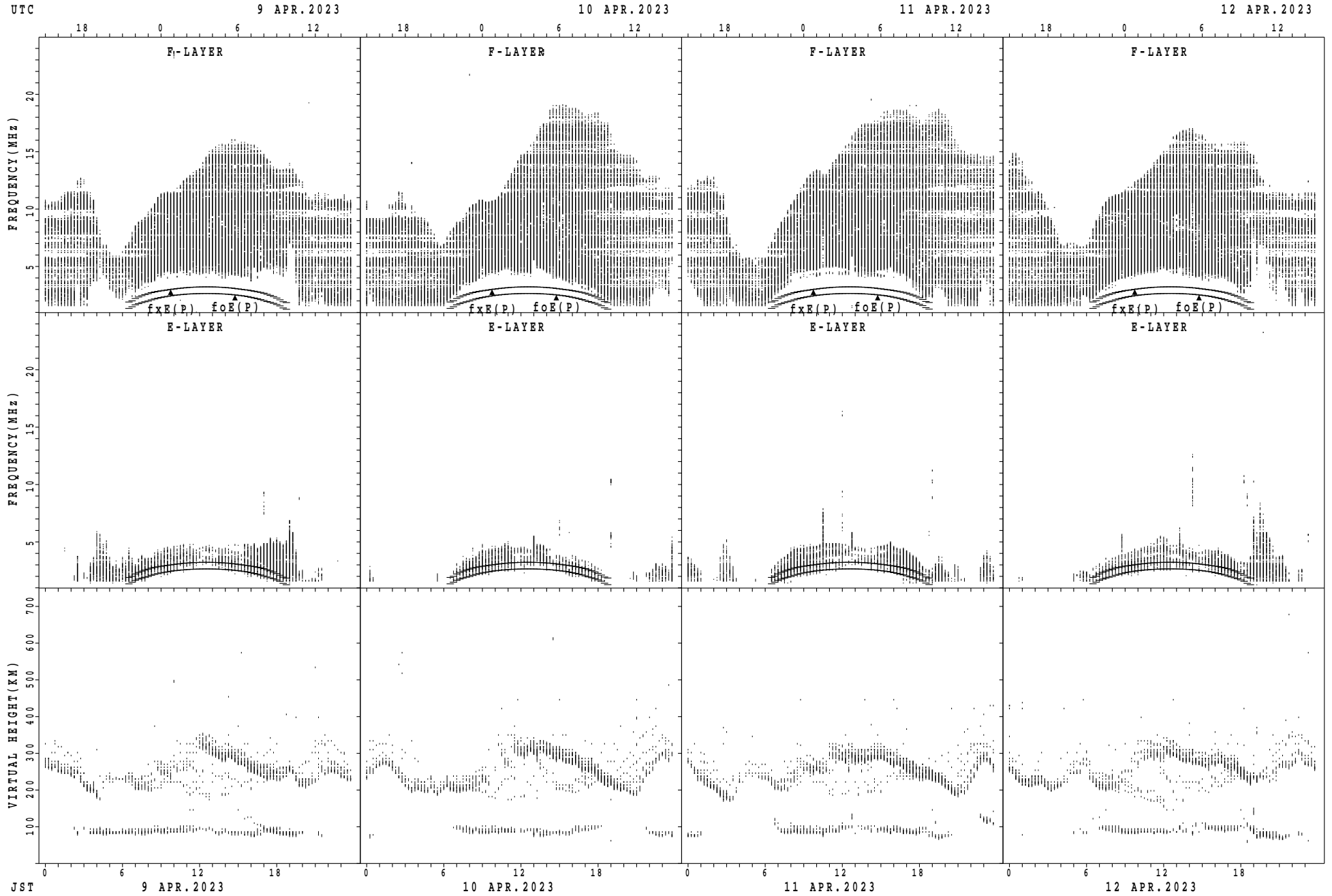
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



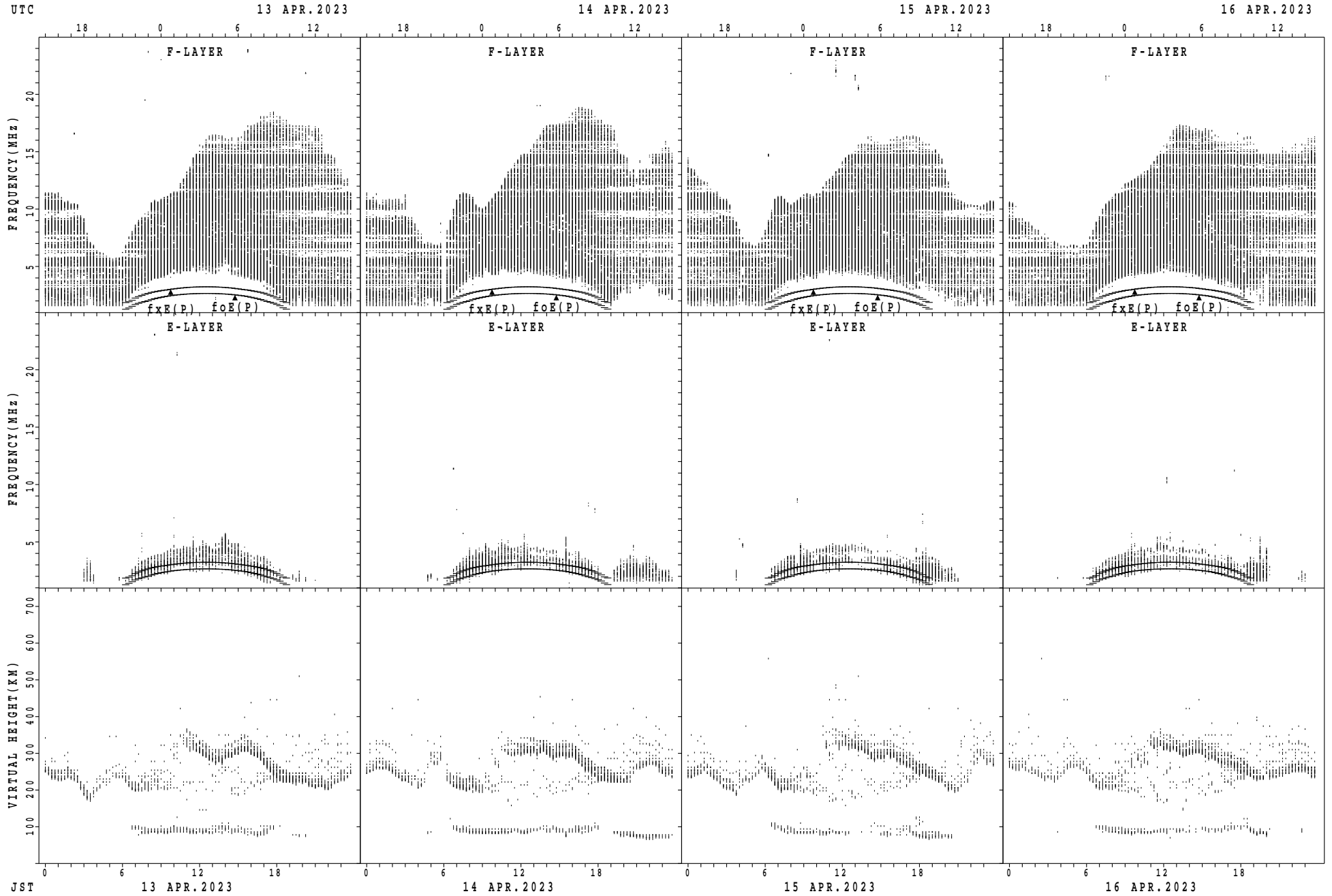
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



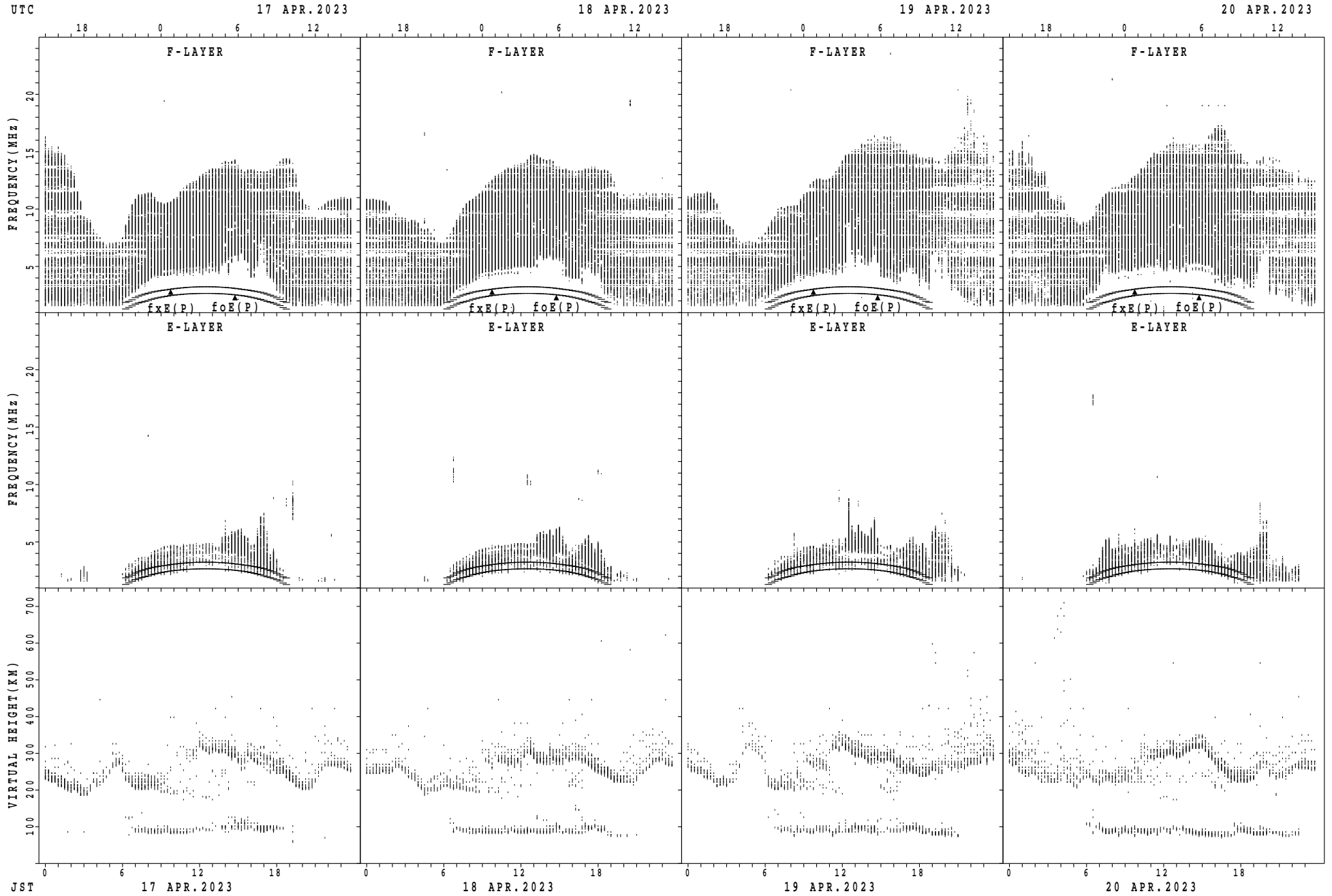
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



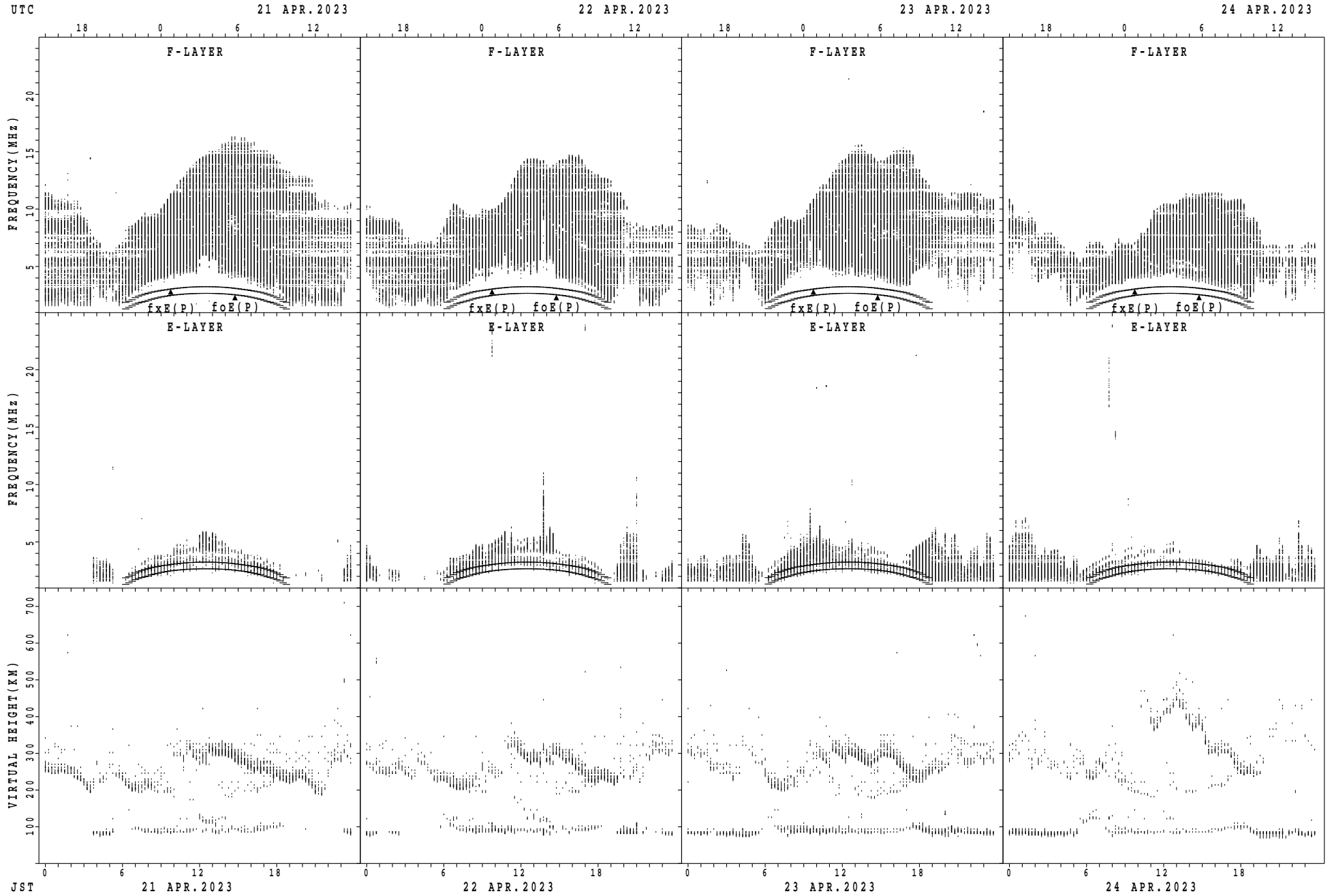
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



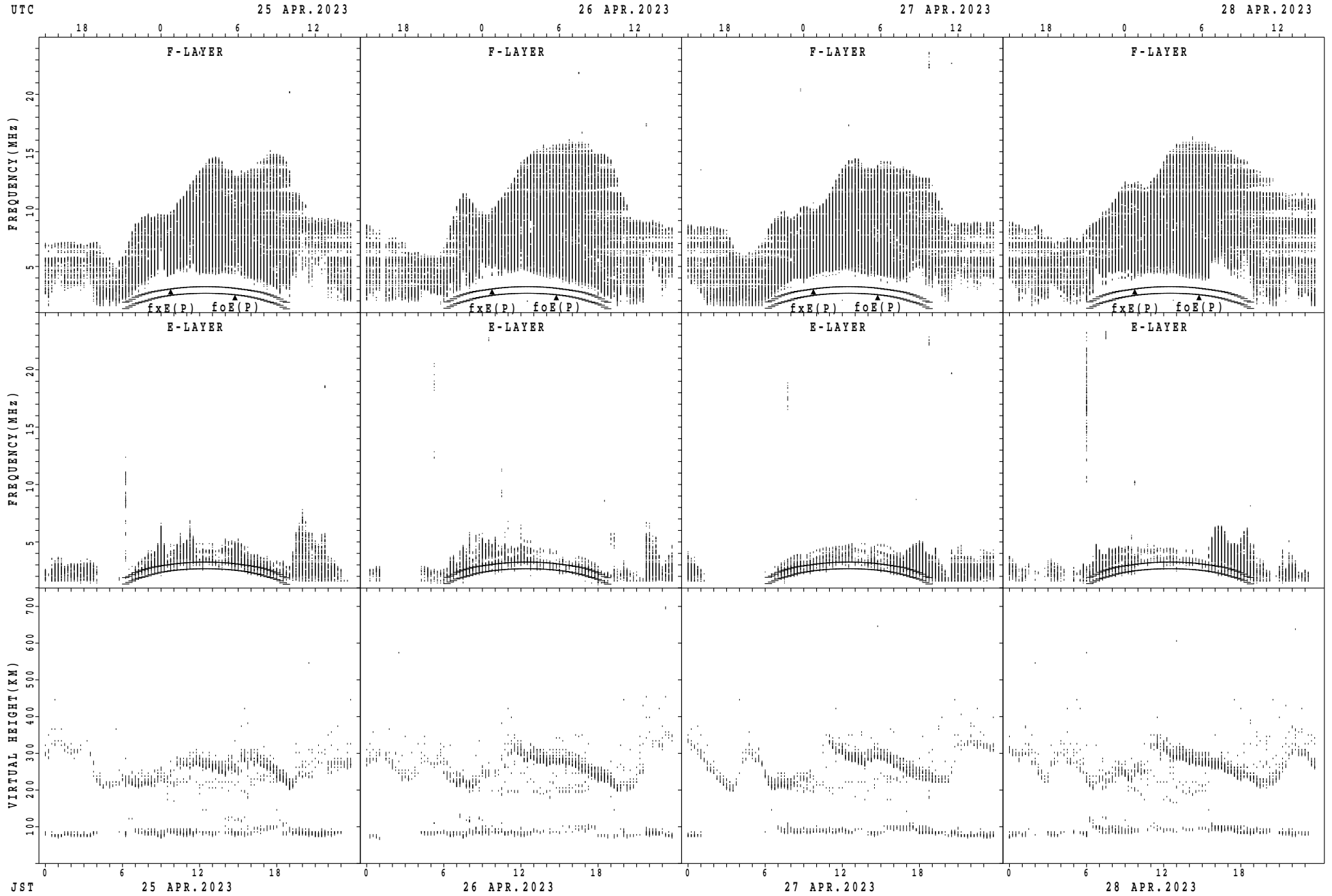
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



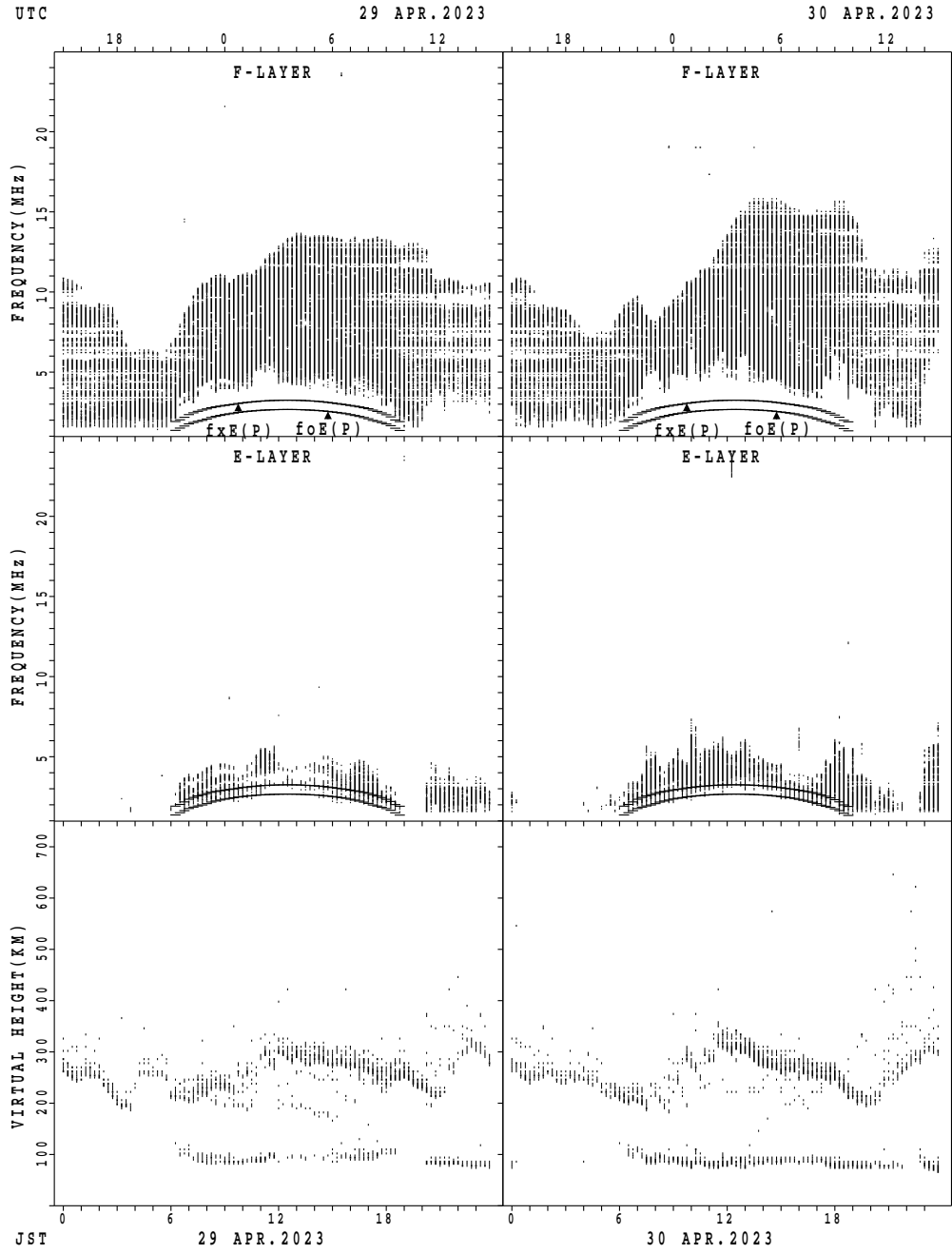
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es
 APR. 2023 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	1			2	20	23	3								27	28	28	24	15	10	4	2
MED		321	322			256	239	238	228								242	244	246	256	262	279	284	329
U Q		338	161			258	266	256	258								250	255	256	261	282	290	305	338
L Q		304	161			254	224	230	224								238	236	238	248	256	266	277	320

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	12	18	17	10	19	30	30	30	30	30	30	30	30	30	30	30	30	24	27	21	20	16	16
MED	96	96	96	98	97	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	98	98	98	97
U Q	98	98	98	98	98	98	100	100	98	98	98	98	98	100	98	100	98	100	98	98	98	98	98	98
L Q	96	94	94	96	96	96	98	98	98	98	94	94	94	96	98	98	98	98	96	86	96	96	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	28	30	30	30	30	30	30	30	28	29	29	29	29	29	29	30	30	30	30	30	30	28	29	30
MED	275	271	264	230	250	246	209	214	220	226	230	242	238	242	244	242	240	235	234	220	216	248	272	282
U Q	287	286	278	252	270	272	218	236	226	239	237	253	255	259	259	252	250	240	238	230	230	261	298	300
L Q	265	260	244	222	240	232	206	208	211	219	218	224	225	228	228	234	232	230	230	208	198	225	250	266

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	11	8	5	8	3	3	22	30	29	25	25	23	18	16	17	26	27	29	23	23	20	21	16	13
MED	98	96	98	98	98	96	98	98	98	98	96	96	96	96	96	98	96	98	98	98	98	98	96	96
U Q	98	96	98	98	98	98	98	98	98	98	98	98	97	97	98	98	98	98	98	98	98	98	98	98
L Q	96	94	95	93	96	94	98	96	96	96	96	94	92	93	94	96	88	97	96	96	96	96	95	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	16	9	9	8	3	1	7	28	29								2	29	30	29	25	9	12	9
MED	308	288	294	267	276	340	256	230	232								260	254	239	240	248	266	333	330
U Q	333	324	315	304	290	170	268	238	240								262	257	248	249	264	287	345	341
L Q	298	272	280	246	234	170	240	218	223								258	246	232	227	225	251	309	287

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	15	8	11	8	8	22	30	30	30	30	30	29	26	30	30	30	30	30	30	23	23	18	17
MED	96	96	95	96	98	98	98	102	98	98	98	96	96	96	96	98	98	100	98	98	98	96	96	96
U Q	96	98	98	98	98	98	100	102	100	98	98	98	98	98	98	98	98	100	100	98	98	98	98	98
L Q	96	96	93	94	96	98	96	100	98	98	96	96	96	96	94	96	96	98	96	94	96	94	94	96

MONTHLY MEDIANS OF h'F AND h'Es
 APR. 2023 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	27	25	25	21	8	2	3	27	29	2								30	30	30	28	25	27	27
MED	294	278	270	240	282	277	292	232	230	239								254	238	232	248	278	304	304
U Q	304	298	288	259	306	310	300	248	240	254								264	246	240	266	293	320	330
L Q	280	260	256	227	258	244	234	222	222	224								246	232	222	237	251	288	288

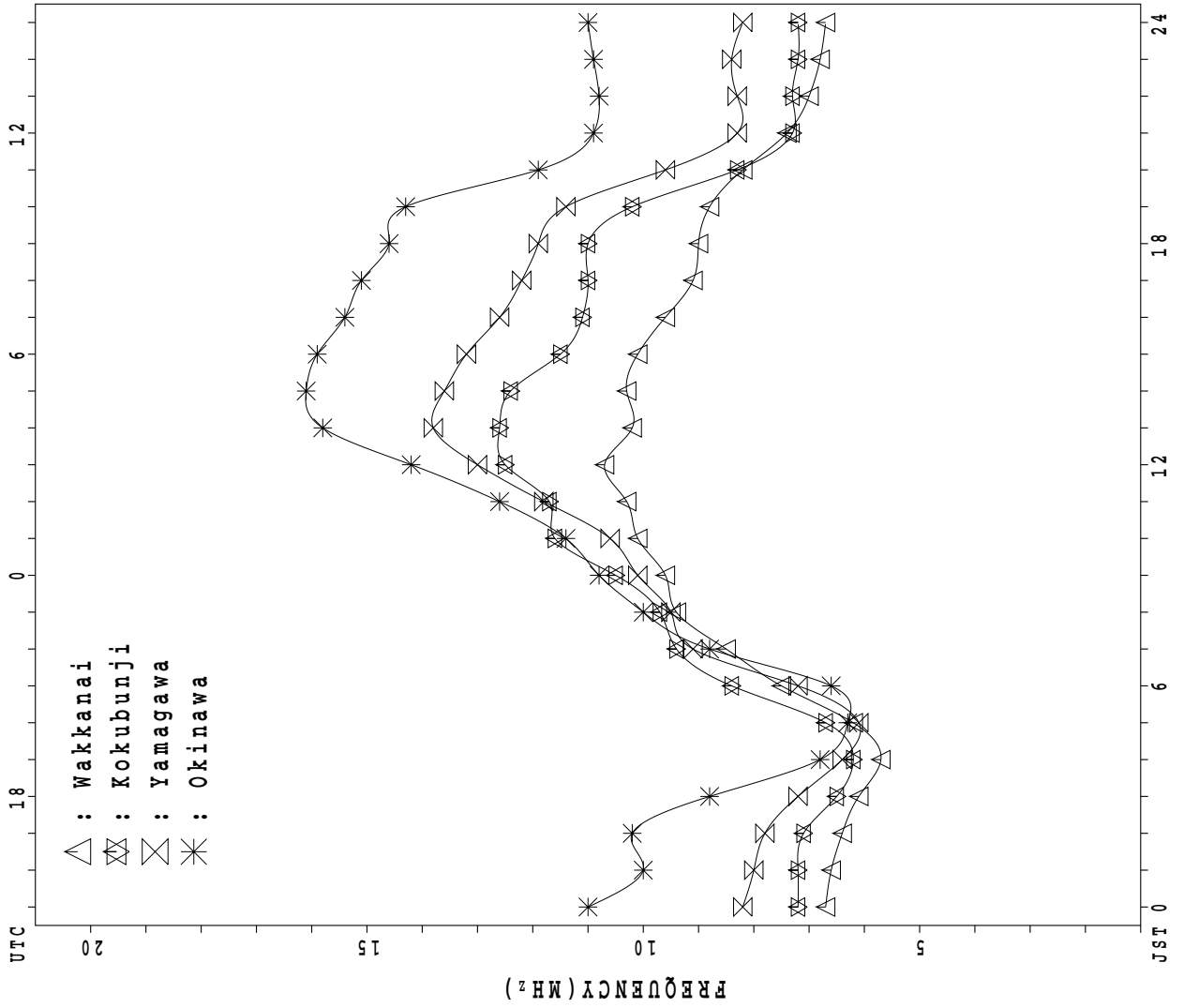
h'Es

	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	18	13	10	9	13	13	16	30	30	30	30	30	30	28	28	29	30	30	30	25	28	24	17	17
MED	96	96	96	96	96	98	97	98	98	98	96	94	96	96	96	98	98	98	98	96	96	96	96	96
U Q	98	96	98	98	97	98	98	100	98	98	98	96	98	97	98	98	98	100	98	98	98	98	96	97
L Q	94	93	94	96	93	97	96	96	96	96	96	82	80	92	96	96	94	98	96	92	94	93	93	94

MONTHLY MEDIANS PLOT OF fOF2

APR. 2023

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Wakkanai

APR. 2023 f_{XI} (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

APR. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 45°10.0'N LON. 141°45.0'E PSWEEP 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	68	66	66	64	64	70	81	91	87	101	104	110	117	107	105	95	89	90	91	89	84	69	65	65	
2	62	63	61	56	54	56	63	75	73	79	98	91	106	97	95	98	86	86	85	82	84	83	72	69	
3	70	66	65	67	62	67	78	87	96	113	126	121	112	112	106	106	107	103	96	90	89	82	71	72	
4	70	66	63	61	59	62	68	77	82	84	89	94	109	103	100	97	94	93	92	84	77	67	67	67	
5	66	66	65	63	59	62	72	84	98	106	109	114	113	120	112	114	108	105	101	88	76	72	70	69	
6	68	70	66	63	62	63	73	86	96	101	102	105	105	106	109	106	100	95	91	80	81	75	69	70	
7	70	70	68	62	58	64	82	84	92	104	103	111	111	113	108	102	94	92	90	90	80	76	73	69	
8	68	70	68	61	59	64	85	98	102	108	109	106	110	108	105	104	101	94	102	96	83	69	64	65	
9	65	62	63	65	59	67	80	89	98	113	116	113	114	114	108	103	98	96	103	94	86	77	68	65	
10	65	63	62	60	56	62	72	79	90	100	101	106	108	111	109	109	101	102	97	95	86	72	68	66	
11	65	63	63	54	52	63	93	104	97	97	104	107	113	110	110	102	91	85	91	93	88	81	75	70	
12	70	69	66	63	63	65	85	92	95	95	101	103	105	102	102	100	99	93	89	89	86	79	74	72	
13	70	69	69	68	58	63	81	94	105	110	106	102	106	110	116	111	104	96	89	89	85	81	79	73	
14	71	70	67	63	62	66	86	97	101	102 ^H	114	110	112	112	104	99	96	91	90	92	88	82	76	72	
15	69	70	70	63	58	64	78	82	91	100	112	110	114	115	108	99	97	94	90	90	84	81	78	70	
16	66	66	64	62	62	71	88	96	105	101	98	102	104	106	104	97	93	90	91	89	81	77	73	70	
17	69	69	68	65	59	73	78	86	92	100	104	107	100	99	101	98	93	91	91	88	85	84	79	79	
18	78	72	71	71	74	77	82	86	97	100	106	107	107	102	96	100	92	88	90	94	87	78	76	76	
19	74	72	72	64	65	70	92	92	101	103	105	104	102	106	106	103	95	90	91	86	77	74	68	68	
20	68	63	58	56	55	56	61	66	72	78	80	85	87	87	84	81	84	89	84	84	78	72	72	69	
21	68	66	65	62	58	66	78	90	94	94	97	96	96	98	94	96	92	89	89	86	84	80	75	74	
22	68	66	61	59	59	59	59	54	62	69	70	72	72	80	82	82	78	75	73	74	76	72	69	66	
23	64	66	63	63	61	71	80	84	93	89	85	84	94	94	92	94	88	81	83	86	84	82	79	76	
24	76	68	62	51	41	43	47	E	GE	GE	GE	GE	GE	G											
								40	42	43	44	46	45	51	58	52	48	52	51	51	57	59	54	65	
25	65	63	52	48	41	38	41	46	62	70	86	84	90	85	95	94	95	89	86	83	80	76	71	67	
26	68	61	58	55	56	62	72 ^H	68	66	66	68	70	81	91	93	94	91	88	81	82	77	72	66	65	
27	63	63	60	56	54	57	70	75	69	75	81	76	84	91	91	90	93	85	86	86	80	77	71	70	
28	70	69	65	59	55	56	64	67	70	80	93	96	95	100	94	90	91	93	87	82	72	72	70	69	
29	69	63	62	57	58	56	63	67	68	77	76	80	81	86	90	90	84	78	75	88	84	86	77	77	
30	71	72	70	57	58	56	60	58	61	62	67	71	69 ^H	72	C		77	73	74	76	82	77	72	65	61
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	29	30	30	30	30	30	30	30	30	30	
MED	68	66	65	62	58	63	78	84	92	98	101	102	105	102	102	98	93	90	90	88	84	76	71	69	
U Q	70	70	68	63	62	67	82	91	97	102	106	107	111	110	108	103	98	94	91	90	85	81	75	72	
L Q	66	63	62	57	56	57	64	68	70	78	85	84	90	91	94	94	89	86	85	83	77	72	68	66	

APR. 2023 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	U L	L	U L	L									
2								L	L	U L	L	L	U L	L	L	L	L							
3										L	L	L	L	L	L	L	L							
4								L	L	U L	U L	U L	L	L	L		U L							
5									L	L	L	U L	U L	L	L	U L	L							
6								L	L	L	L	U L	U L	L	L	L	L							
7								L	L	L	U L	L	L	U L	L									
8								L		L	U L	U L	L	L	L	L	L							
9									L	L	L	U L	U L	U L	L	L	L							
10									L	U L	U L	L	L	U L	L	L	L							
11								L	L	L	L	U L	L	U L	L	L	L							
12									L	L	U L	U L	U L	U L	L	A	L	L						
13								L	L	U L	U L	L	U L	U L	L	L	L							
14									L	L	L	L	U L	L	L	L	L							
15							L	L	L	U L	U L	U L	U L	L	U L	L								
16									L	L	L	U L	U L	L	L	U L	L							
17								L	L	L	U L	L	L	L	U L	L	L							
18									L	L	L	U L	U L	U L	L	L	U L	L						
19									U L	L	L	L	U L	L	U L	U L	L							
20								U L	U L	U L	U L	L	U L	U L	U L	U L	L	L						
21									L	L	L	U L	U L	U L	L	L	L							
22						L			L	U L	L	L	L	L	L	L	L							
23								L	L	U L	L	L	L	L	L	U L	L							
24						316	368	396	424	432	440	456	448	436	432	420	396	400						
25								U L	L	L	L	A	U L	L	U L	L	U L	L						
26								U L	L	L	L	L	U L	L	U L	L	L	L						
27								L	L	L	L	A	U L	L	U L	U L	L	L						
28						U L	U L	U L	L	L	L	A	U L	L	U L	L	L	L						
29						348	432	444		564	L	L	L	U L	L	U L	L	L						
30								L	L	U L	L	U L	U L	U L	U L	U L	L	L						
31								U L	L	U L	L	L	L	L	L	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	2	7	8	17	19	24	23	20	11	12	5	1						
MED						332	400	444	492	492	516	522	544	532	508	510	424	400						
U Q								472	496	532	532	538	576	558	528	528	440							
L Q								408	458	478	504	498	520	504	448	476	376							

APR. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 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							224	272	308	332	A	A	372	360	340	316	A	236	A					
2							200	276	296	308	356	376	372	356	344	320	280	228	B					
3						B	200	284	312	332	364	A	380	364	344	320	288	A	A					
4						B	200	264	304	336	A	368	372	364	A	320	284	228	A					
5						B	208	280	312	A	A	376	A	368	356	324	288	240	B					
6						B	220	284	U	A	U	A	U	A	A	A	376	368	348	340	292	232	176	
7						B	212	288	320	332	364	372	368	364	348	328	292	236	A					
8						B	224	276	332	348	360	380	A	A	352	A	304	240	A					
9						B	236	284	316	324	344	388	368	368	356	324	292	244	A					
10						B	236	280	320	328	372	372	368	A	356	328	288	244	192					
11						A	228	288	316	336	368	360	A	372	356	332	300	228	A					
12						A	236	284	332	348	A	372	376	A	A	A	304	236	A					
13						B	256	296	340	A	380	400	388	376	352	336	304	256	180					
14						196	244	296	336	368	384	388	392	388	364	336	A	260	A					
15						A	264	308	340	364	U	A	376	388	368	356	344	300	268	A				
16						A	248	300	340	368	372	400	388	384	A	A	304	268	A					
17						A	256	300	328	352	372	U	A	368	380	372	336	300	260	176				
18						180	240	300	340	356	376	392	A	380	360	332	308	264	A					
19						A	260	288	336	352	384	392	392	376	364	328	304	264	192					
20						176	236	304	344	372	384	U	A	A	A	360	336	304	260	A				
21						192	260	300	336	352	368	A	388	368	352	336	300	260	A					
22						A	264	300	332	352	360	372	A	A	360	332	304	256	196					
23						172	252	304	328	364	A	364	368	376	360	336	296	240	196					
24						A	232	288	316	332	A	A	368	348	332	312	284	248	A					
25						188	248	292	328	356	364	380	416	376	352	340	312	268	184					
26						196	256	296	328	360	364	A	A	A	U	A	A	300	268	A				
27						184	260	296	336	364	376	A	A	A	A	332	296	260	A	B				
28						A	252	300	328	352	A	A	368	380	356	336	296	260	A	A				
29						A	256	304	332	368	372	388	388	368	A	332	308	260	A	A				
30						A	256	304	332	348	380	384	372	360	A	332	304	256	188	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						8	30	30	30	28	23	22	22	23	24	26	28	29	9					
MED						186	242	294	328	352	368	378	376	368	356	332	300	256	188					
U Q						194	256	300	336	362	376	388	388	376	360	336	304	260	194					
L Q						178	224	284	316	334	364	372	368	364	350	324	292	238	178					

APR. 2023 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	J A	J A	J A	E B	E B	19	26	33	34	40	J A	J A	G	G	G	G	26	29	26	19	19	J A	J A	J A	
2	J A	22	19	J A	E B	E B	16	16	23	G	33	34	G	G	G	J A	31	G	G	E B	E B	J A	E B	E B	
3	J A	E B	E B	E B	J A	J A	J A	G	G	37	41	40	35	32	28	26	25	31	27	30	25	24	16	16	
4	E B	E B	E B	E B	E B	J A	23	28	34	42	36	G	40	G	37	G	G	26	18	E B	E B	E B	E B	18	
5	J A	E B	J A	E B	E B	E B	25	24	34	40	39	G	40	34	G	G	G	E B	J A	E B	E B	J A	E B	J A	
6	E B	E B	E B	J A	E B	E B	26	33	J A	51	38	39	39	G	G	G	G	G	J A	15	20	E B	18	20	
7	19	19	16	E B	E B	E B	24	G	G	37	G	G	G	G	38	G	G	G	J A	18	18	19	19	17	
8	J A	31	20	19	18	E B	26	30	G	37	40	G	40	37	G	32	G	G	J A	J A	J A	J A	J A	19	
9	J A	J A	J A	E B	E B	20	18	31	36	39	41	41	G	G	G	G	G	28	22	21	19	16	16	16	
10	E B	E B	E B	E B	E B	E B	G	G	36	38	G	G	G	G	36	G	G	G	G	J A	J A	E B	E B	E B	
11	E B	E B	E B	E B	J A	24	20	27	31	35	50	G	40	48	G	G	J A	29	27	26	15	15	15	21	
12	E B	E B	E B	E B	E B	19	16	18	28	30	G	37	38	G	G	J A	51	27	26	22	21	21	19	20	
13	E B	E B	E B	E B	E B	E B	G	32	G	39	33	G	G	G	G	G	32	19	J A	E B	20	20	16	16	
14	E B	E B	E B	E B	E B	20	G	26	32	36	G	G	G	G	G	J A	40	17	25	20	E B	E B	E B	E B	
15	E B	E B	E B	E B	E B	E B	19	G	G	G	40	G	G	G	G	G	G	G	20	E B	E B	E B	E B	J A	
16	E B	E B	J A	E B	E B	E B	19	27	G	G	G	G	G	G	38	36	G	G	20	E B	J A	J A	E B	E B	
17	E B	E B	E B	J A	E B	E B	G	33	G	G	40	41	G	G	G	G	38	G	G	20	E B	E B	19	18	
18	E B	E B	E B	E B	E B	E B	28	G	36	39	G	G	J A	50	G	G	G	G	20	E B	E B	E B	E B	E B	
19	E B	E B	E B	E B	E B	E B	G	32	G	G	G	G	G	G	G	G	G	G	E B	E B	E B	E B	J A	E B	
20	J A	E B	E B	E B	E B	E B	G	28	35	45	42	40	J A	J A	J A	G	G	G	30	30	29	27	20	23	
21	J A	J A	J A	J A	E B	E B	G	43	37	38	44	J A	55	G	E B	16	40	G	J A	J A	J A	E B	E B	E B	
22	E B	E B	J A	E B	E B	E B	G	G	G	37	41	53	42	39	G	G	G	G	E B	16	16	16	16	20	
23	E B	E B	E B	E B	E B	E B	20	30	G	G	40	41	40	40	39	G	G	28	E B	16	21	16	16	16	
24	E B	E B	J A	J A	E B	E B	19	26	G	G	J A	53	35	G	G	G	G	G	22	29	30	45	16	19	
25	J A	J A	J A	J A	J A	J A	21	26	31	37	44	68	J A	G	G	G	G	G	21	30	21	16	16	16	
26	19	E B	E B	E B	E B	E B	G	28	34	43	G	42	44	J A	J A	45	34	G	G	24	J A	20	18	E B	
27	E B	E B	E B	E B	E B	E B	20	G	G	G	43	46	J A	J A	J A	48	G	G	G	23	16	25	21	16	
28	20	J A	J A	J A	J A	J A	22	30	36	40	J A	63	49	J A	G	G	G	37	38	J A	J A	E B	E B	J A	
29	E B	J A	J A	J A	J A	J A	22	28	37	G	40	G	G	G	J A	52	G	35	32	47	46	46	48	15	
30	J A	J A	J A	J A	J A	J A	31	36	37	42	G	G	G	G	D C	41	26	G	G	31	26	23	28	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	E B	E B	16	16	E B	E B	18	26	30	34	38	40	G	G	G	G	G	G	20	J A	20	20	16	E B	
U Q	J A	J A	J A	J A	J A	20	20	28	33	37	41	41	J A	J A	38	37	G	G	28	J A	J A	J A	J A	J A	
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	G	E B	E B	E B	E B	E B	

APR. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 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	25	31	33	38	41	41	G	G	G	G	22	29	25	18	E 16	E 16	17	E 16	E 16	
2	E 16	E 16	E 16	E 16	E 16	E 16	23	G	32	34	G	G	G	G	G	29	G	G	E 16	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	23	G	G	36	41	40	34	31	27	22	18	24	18	21	E 16	E 16	E 16	E 16	E 16	
4	E 16	E 16	E 16	E 16	E 16	E 16	23	28	34	39	36	G	40	G	34	G	G	24	17	E 16	E 16	E 16	E 16	E 16	E 16	
5	E 16	E 16	E 16	E 16	E 16	E 16	24	22	33	35	38	G	37	26	G	G	G	G	E 16	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	26	30	35	36	39	38	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	E 16	
7	E 16	E 16	E 16	E 16	E 16	E 16	24	G	G	36	G	G	G	G	38	G	G	G	18	16	E 16	E 16	E 16	E 16	E 16	
8	E 16	E 16	E 16	E 16	E 16	E 16	24	30	G	37	39	G	40	35	G	32	G	G	22	22	E 16	E 16	E 16	E 16	E 16	
9	E 16	E 16	E 16	E 16	E 16	E 16	26	32	35	40	40	G	G	G	G	G	G	27	20	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	G	G	35	37	G	G	G	G	36	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
11	E 16	E 16	E 16	E 16	E 16	20	26	30	34	39	G	38	40	G	G	G	G	17	26	18	E 16	E 16	E 16	E 16	E 16	
12	E 16	E 16	E 16	E 16	E 16	18	28	30	G	36	38	G	G	G	37	36	41	25	26	22	E 16	E 16	E 16	E 16	E 16	
13	E 16	E 16	E 16	E 16	E 16	16	G	31	G	38	32	G	G	G	G	G	32	17	G	E 16	E 16	E 16	E 16	E 16	E 16	
14	E 16	E 16	E 16	E 16	E 16	G	26	32	36	G	G	G	G	G	G	G	31	15	22	E 16	E 16	E 16	E 16	E 16	E 16	
15	E 16	E 16	E 16	E 16	E 16	18	G	G	G	G	39	G	G	G	G	G	G	G	19	E 16	E 16	E 16	E 16	E 16	E 16	
16	E 16	E 16	E 16	E 16	E 16	18	27	G	G	G	G	G	G	G	37	35	G	G	20	E 16	E 16	E 16	E 16	E 16	E 16	
17	E 16	E 16	E 16	E 16	E 16	18	G	32	G	G	40	40	G	G	G	G	38	G	G	20	E 16	E 16	E 16	E 16	E 16	
18	E 16	E 16	E 16	E 16	E 16	G	26	G	35	38	G	G	40	G	G	G	G	G	20	E 16	E 16	E 16	E 16	E 16	E 16	
19	E 16	E 16	E 16	E 16	E 16	19	G	31	G	G	G	G	42	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
20	E 16	E 16	E 16	E 16	E 16	G	27	34	41	40	40	42	41	41	G	G	G	30	22	E 16	E 16	E 16	E 16	E 16	E 16	
21	E 23	E 16	E 16	E 16	E 16	G	G	40	36	37	42	47	G	E 16	E 16	38	G	28	24	E 16	E 16	E 16	E 16	E 16	E 16	
22	E 16	E 16	E 16	E 16	E 16	20	G	G	G	37	40	45	40	38	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
23	E 16	E 16	E 16	E 16	E 16	20	28	G	G	G	40	41	39	29	39	G	G	27	G	E 16	E 16	E 16	E 16	E 16	E 16	
24	E 16	E 16	E 16	E 16	E 16	18	25	G	G	G	36	35	G	G	G	G	G	G	22	26	19	42	E 16	E 16	E 16	
25	E 16	E 52	E 16	E 24	E 18	20	26	31	37	40	49	G	G	40	G	G	G	G	20	26	18	E 16	E 16	E 16	E 16	
26	E 16	E 16	E 16	E 16	E 16	G	28	34	40	G	41	40	40	49	42	33	G	G	22	17	E 16	E 16	E 16	E 16	E 16	
27	E 16	E 16	E 16	E 16	E 16	20	G	G	G	40	44	48	40	41	42	G	G	G	22	E 16	E 16	E 16	E 16	E 16	E 16	
28	E 16	E 16	E 16	E 16	E 18	21	28	32	37	49	48	60	G	G	38	G	34	34	23	19	E 16	E 16	E 16	E 16	17	
29	E 16	E 16	E 16	E 16	E 16	20	28	33	G	40	G	G	G	G	42	G	34	31	42	36	40	42	E 16	E 16	E 16	
30	E 16	E 22	E 16	E 16	E 16	28	30	35	36	42	G	G	G	40	C	G	G	30	21	20	22	E 16	E 16	E 16	20	
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	29	30	30	30	30	30	30	30	30	30	30	
MED	E 16	E 16	E 16	E 16	E 16	G	25	30	32	37	38	G	G	G	G	G	G	G	20	E 16	E 16	E 16	E 16	E 16	E 16	
U Q	E 16	E 16	E 16	E 16	E 16	20	27	32	35	39	40	40	40	36	36	G	G	26	22	17	E 16	E 16	E 16	E 16	E 16	
L Q	E 16	E 16	E 16	E 16	E 16	16	G	G	G	G	G	G	G	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	

APR. 2023 fbEs (0.1MHz)

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IONOSPHERIC DATA STATION Wakkanai

APR. 2023 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

APR. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 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

$\begin{matrix} H \\ D \end{matrix}$	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	277	266	273	279	269	298	353	340	325	317	321	296	316	314	325	316	310	312	318	308	324	273	266	263			
2	254	270	277	272	265	284	309	327	321	281	322	294	315	304	306	317	312	314	305	288	276	302	293	272			
3	282	276	284	290	297	315	337	335	318	299	313	310	298	301	301	301	310	310	312	295	303	298	272	271			
4	275	263	265	272	276	283	325	340	332	325	318	314	310	304	317	323	318	315	315	318	296	269	265	268			
5	270	271	285	290	285	299	341	337	321	314	298	308	294	303	297	309	307	309	321	321	294	280	273	265			
6	267	277	277	279	284	282	332	326	320	327	315	316	304	304	311	315	317	319	321	298	293	295	269	280			
7	281	292	293	286	279	290	337	335	317	337	321	315	299	307	307	309	301	312	310	314	299	287	283	275			
8	279	281	294	289	285	297	334	336	319	320	318	312	311	304	305	312	313	309	312	324	326	292	277	282			
9	279	272	271	294	298	320	339	329	325	318	297	297	295	298	302	310	308	307	323	317	304	308	290	283			
10	270	277	270	291	270	303	328	335	333	332	315	308	298	296	294	297	300	307	309	311	329	275	276	274			
11	282	278	297	299	280	284	323	311	279	267	281	278	304	307	297	320	315	313	305	308	310	302	285	278			
12	280	275	280	277	274	280	308	312	312	302	312	289	305	293	300	298	312	318	308	309	305	302	297	276			
13	276	271	289	307	286	296	315	320	306	315	315	293	292	289	293	300	309	310	308	298	290	294	301	294			
14	285	277	280	280	264	266	313	314	328	291 ^H	310	293	301	301	299	302	306	301	299	297	298	295	280	271			
15	258	269	284	279	274	285	320	320	320	292	302	296	290	297	307	305	299	308	306	299	291	284	296	273			
16	261	266	276	269	264	296	305	297	310	320	301	295	289	297	303	303	313	303	304	304	284	287	283	274			
17	272	277	275	283	286	309	330	322	319	306	304	309	302	291	300	309	305	303	299	295	281	289	281	275			
18	271	261	259	271	287	323	315	319	314	295	288	297	299	301	295	308	316	309	301	301	303	293	276	269			
19	276	275	276	275	256	268	301	296	313	305	297	297	293	284	296	306	312	304	311	306	276	273	256	251			
20	260	254	257	260	280	265	289	297	302	297	295	309	300	307	321	311	308	312	310	301	293	276	284	269			
21	277	273	279	286	288	309	319	326	309	308	308	293	296	301	300	304	316	316	301	303	289	286	290	295			
22	286	283	272	269	268	303	312	309	285	286	294	297	289	305	304	307	307	313	310	287	286	293	280	277			
23	269	278	275	289	286	325	312	327	319	304 ^H	323	294	300	300	298	314	316	306	301	293	275	288	274	267			
24	271	255	278	293	257	279	264		G	G	G	G	G				204	232	231	219	280	277	252	231	275	243	265
25	273	280	266	282	279	310	319	272	316	354	337	322	322	330	321	321	337	329	323	307	303	305	295	287			
26	274	269	281	283	296	310	297 ^H	315	291	287	256	289	290	283	308	310	313	325	313	310	300	290	278	273			
27	266	278	289	275	283	290	311	319	314	323	318	299	301	310	301	297	311	303	311	298	279	292	268	272			
28	266	268	273	277	270	277	304	318	312	314	313	318	317	308	323	314	311	323	309	304	291	273	281	276			
29	265	272	269	274	281	279	315	302	291	297	298	312	297	292	307	307	319	315	290	299	274	292	280	280			
30	267	272	275	264	258	288	305	314	311	301	288	317	279 ^H	285		C	306	311	318	310	305	295	292	282	286		
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	29	30	30	30	30	30	30	30	30	30			
MED	272	272	276	280	280	293	315	320	315	306	309	297	299	301	302	308	311	311	310	304	294	291	280	274			
U Q	279	277	284	289	286	309	330	329	320	320	318	312	304	305	308	314	315	315	312	309	303	295	285	280			
L Q	267	269	272	274	269	282	308	311	309	295	297	294	293	293	298	303	307	307	304	298	284	280	273	269			

APR. 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	U L	L	U L	L									
2								L	L	U L	L	L	L	L	L	L	L							
3										L	L	L	L	L	L	L	L							
4								L	L	U L	U L	U L	L	L	L		U L							
5									L	L	L	U L	U L	L	L	U L	L							
6								L	L	L	L	U L	U L	L	L	L	L							
7								L	L	L	U L	L	L	U L	L	L								
8								L		L	U L	U L	L	L	L	L	L							
9									L	L	L	U L	U L	U L	L	L	L							
10									L	L	U L	U L	L	U L	L	L	L							
11								L	L	L	L	U L	L	U L	L	L	L							
12									L	L	U L	U L	U L	U L	L	A	L	L						
13								L	L	U L	U L	L	L	U L	L	L	L							
14									L	L	L	L	U L	L	L	L	L							
15							L	L	L	U L	U L	U L	L	L	L	L	L							
16									L	L	L	U L	U L	L	L	U L	L							
17								L	L	L	U L	L	L	L	U L	L	L							
18									L	L	L	U L	U L	U L	L	L	U L	L						
19									U L	L	L	L	U L	L	U L	U L	L							
20								U L	U L	U L	U L	L	U L	U L	U L	U L	L	L						
21									L	L	L	U L	U L	U L	L	L	L	L						
22					L					L	U L	L	L	L	L	L	L							
23								L	L	U L	L	L	L	L	L	U L	L							
24					303	318	355	378	394	374	387	395	394	375	371	382	331							
25							U L			A	U L	L	L	U L	L	U L	L							
26							368	384	389		401		400	376		390								
27							U L	L	L	L	L	A	U L	U L	L	L	L							
28					U L	U L	U L	L	L	A	L	U L	U L	L	L	L	L							
29					339	342	389		366		L	U L	U L	U L	U L	L	L							
30							L	L	U L	L	U L	U L	U L	U L	L	L	L							
31							U L	L	U L	L	L	U L	U L	L	C	L	U L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	2	7	8	17	19	24	23	20	11	12	5	1						
MED					321	330	U L	U L	U L	U L	U L	U L	U L	U L	U L	U L	U L	U L						
U Q							382	382	394	392	404	389	394	382	371	394								
L Q							U L	L	L	L	L	U L	U L	U L	U L	L	L							

APR. 2023 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 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									226	230	238	246	230	242	250										
2								250	248	246	262	318	264	238	252	240	222								
3									240	244	238	226	264	232	266	240									
4								238	226	244	236	270	264	238	256		232								
5									234	234	224	242	246	246	234	248	230								
6								234	230	232	230	232	242	246	262	234	220								
7								216	222	242	226	256	240	234	262										
8								234		230	234	232	258	250	232	258	240								
9									226	238	224	226	260	272	260	240	266								
10									216	230	246	242	274	260	256	248	238								
11								242	240	276	274	250	262	250	244	242	222								
12									242	236	248	244	246	246	266	236	236	226							
13								240	234	254	258	250	284	282	270	250	232								
14									238	242	260	236	268	274	258	276	262								
15							234	262	254	230	256	248	260	258	256	252									
16									238	240	252	274	296	284	278	280		248							
17								258	272	250	270	258	264	288	288	262	238								
18									246	260	246	242	280	264	304	272	240								
19									252	272	276	256	290	264	242	252	244								
20								282	330	288	280	286	298	242	250	266	246	240							
21									270	246	264	258	258	278	268	272	250	234							
22					272				370	358	342	324	356	312	288	264	246								
23								226	252	232	280	260	290	270	284	260	254								
24					388	432		G	G	G	G	G	G	684	484	542	614	358							
25								432	292	246	246	236	236	238	262	248	232	230							
26								266	358	408	396	346	294	294	270	250	248	234							
27								266	246	276	264	256	296	282	274	296	250	234							
28					332	318	252		300	260	288	252	280	246	270	244	236								
29						272	328	336	316	286	312	296	308	270	282	252									
30						288	324	366	352	304	316	356		C	278	242	254								
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						3	4	18	27	30	30	30	30	30	29	27	26	10							
MED					332	295	255	246	246	259	256	264	264	262	260	241	235								
U Q					388	375	282	292	276	276	286	294	282	272	272	250	248								
L Q					272	253	238	234	236	244	242	252	246	250	248	232	234								

APR. 2023 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	262	292	272	250	260	230	208	206	208	200	198	194	186	190	202	210	214	220	222	224	212	226	248	294	
2	318	286	272	268	288	268	218	226	196	188	178	180	194	206	200	200	210	224	206	224	264	226	210	258	
3	250	258	256	246	224	230	206	208	202	184	214	198	216	180	172	194	216	220	216	226	236	232	220	270	
4	268	290	282	270	254	254	226	216	202	204	184	178	210	198	194	224	212	218	218	204	216	218	282	278	
5	284	268	260	238	234	230	202	204	188	194	202	182	192	194	204	194	214	222	216	206	208	234	260	282	
6	268	276	266	242	250	242	210	210	198	198	208	192	186	196	200	222	216	216	214	222	242	228	254	260	
7	262	244	248	228	236	242	218	200	204	190	186	176	220	188	218	222	214	218	216	220	228	238	232	252	
8	258	260	236	226	234	242	218	208	214	202	198	192	182	202	202	184	212	220	230	222	206	198	242	260	
9	266	282	272	226	210	228	204	210	202	226	212	196	186	192	212	210	210	232	228	210	228	212	218	264	
10	290	274	276	238	256	244	212	206	208	190	194	180	180	178	216	212	218	224	220	222	204	214	232	256	
11	254	260	234	202	250	238	222	214	202	206	206	190	190	186	182	216	210	222	234	224	218	224	224	246	
12	264	272	248	242	256	252	218	212	210	206	186	200	180	182	188	A	216	214	224	224	228	226	246	258	
13	270	274	252	220	226	238	212	206	204	200	198	186	188	184	212	212	212	220	216	222	232	230	230	236	
14	254	262	254	246	284	240	218	220	214	204	182	206	190	200	208	196	218	218	226	234	234	220	220	260	
15	290	282	242	210	246	250	218	220	200	202	192	200	194	188	198	210	214	224	230	226	224	230	234	234	
16	272	286	266	244	272	234	210	216	222	188	192	188	188	182	204	208	218	212	226	216	224	226	246	252	
17	268	264	260	240	230	224	210	214	198	210	196	184	200	182	194	230	218	214	222	230	236	232	232	258	
18	270	286	292	272	248	222	210	214	210	200	192	196	190	192	204	200	200	222	232	234	226	222	248	266	
19	276	270	248	254	304	236	218	204	194	194	194	192	196	188	184	190	218	220	226	224	236	260	284	324	
20	292	294	278	290	260	260	222	206	214	200	192	186	186	190	182	192	222	214	228	226	228	242	246	268	
21	286	274	254	246	224	214	216	240	204	200	190	206	174	170	196	214	208	214	232	222	240	230	236	234	
22	250	260	278	270	262	254	218	200	202	190	202	230	190	192	206	210	218	224	232	238	252	232	250	260	
23	270	272	260	248	256	230	212	210	182	188	194	208	176	200	220	204	216	224	234	240	260	232	246	272	
24	278	228	252	252	332	296	244	228	208	190	206	220	210	204	206	228	228	236	296	314	E A	E A	E A	266	
25	274	E A	296	E A	E A	276	268	228	198	212	212	A	180	218	208	188	216	198	220	214	232	238	218	232	260
26	260	282	270	248	252	230	208	204	204	208	202	182	196	E A	276	204	198	212	226	220	224	220	230	240	286
27	288	266	242	254	248	246	218	208	192	210	204	A	178	214	218	210	212	216	228	236	236	238	240	270	
28	292	262	258	270	270	252	228	210	210	E A	E A	E A	A	176	198	220	210	220	224	228	214	216	260	248	272
29	270	280	268	260	266	238	224	212	200	212	194	192	202	204	224	214	220	226	E A	260	E A	E A	262	248	
30	258	E A	290	260	272	304	266	228	212	190	206	190	208	204	192	C	194	206	214	234	238	240	220	236	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	30	30	30	30	30	30	30	30	30	30	29	28	30	30	29	29	30	30	30	30	30	30	30	30	
MED	270	273	260	246	254	241	218	210	203	200	194	192	190	192	204	210	214	220	226	224	229	228	241	260	
U Q	284	286	272	268	270	252	222	214	210	206	203	200	200	200	212	215	218	224	232	234	240	234	248	270	
L Q	262	262	252	238	236	230	210	206	198	190	191	183	186	186	194	197	212	216	218	222	220	222	232	256	

APR. 2023 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 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							104	98	98	98	A	A	96	96	98	100	A	102	A					
2							106	98	94	94	94	100	96	96	96	96	100	102	B					
3						B	102	98	96	96	96	A	A	102	98	98	98	A	A					
4						B	102	102	102	98	A	100	102	98	A	98	98	102	A					
5						B	102	98	98	A	A	98	A	100	100	98	100	100	B					
6						B	106	94	98	98	98	A	98	98	98	100	100	100	126					
7						B	96	94	96	98	96	96	96	96	96	96	100	100	A					
8						B	100	98	98	98	98	98	A	A	98	A	98	104	A					
9						B	98	98	98	98	98	96	96	96	96	96	96	100	A					
10						B	102	96	96	96	98	98	98	A	98	98	98	102	114					
11						A	104	98	100	98	98	98	A	98	98	98	98	108	A					
12						A	100	98	98	96	A	96	96	A	A	A	108	104	A					
13						B	98	98	96	A	112	102	98	98	98	98	98	108	E B					
14					E B	140	100	96	98	98	98	98	98	98	98	98	A	104	A					
15						A	100	100	98	96	96	96	98	98	98	A	A	100	100	A				
16						A	100	98	98	96	96	96	100	100	A	A	102	100	A					
17						A	100	96	96	96	96	96	96	96	98	98	100	100	122					
18					E B	134	96	98	96	96	96	96	A	96	96	96	98	100	A					
19						A	100	98	96	96	96	96	96	96	96	98	98	108	E B					
20						118	104	100	100	100	100	98	A	A	98	98	98	100	A					
21						112	96	96	98	98	98	A	98	96	96	94	98	108	A					
22						A	100	100	98	98	96	96	A	A	96	96	98	98	E B					
23						118	96	96	96	94	A	94	98	98	98	98	98	98	120					
24						A	104	100	96	96	A	A	96	96	96	100	100	104	A					
25						102	94	96	96	96	96	94	98	98	98	98	98	100	114					
26						116	98	98	98	96	96	A	A	A	A	98	A	98	98	96				
27						110	100	100	98	96	96	A	A	A	A	96	98	102	A			B		
28						A	102	100	96	96	A	A	96	96	96	96	96	102	A			A		
29						A	102	100	96	96	98	98	98	98	A	98	98	98	A			A		
30						A	106	100	98	98	98	98	98	98	A	98	98	100	112			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						8	30	30	30	28	23	22	21	23	24	26	28	29	10					
MED						114	100	98	98	96	96	97	98	98	98	98	98	100	115					
U Q						E B	126	102	100	98	98	98	98	98	98	98	100	104	120					
L Q						111	98	96	96	96	96	96	96	96	96	96	98	100	114					

APR. 2023 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 45°10.0'N LON. 141°45.0'E PSWEEP 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	88	88	88	B	88	138	120	110	102	96	92	G	G	G	86	152	124	98	88	104	92	92	98	
2	90	100	94	B	B	B	140	G	104	104	G	G	G	G	88	G	G	G	B	B	98	B	B	B	
3	98	B	B	84	84	82	178	G	G	98	178	90	90	90	86	86	88	86	84	80	82	86	B	B	
4	B	B	B	B	B	86	142	182	122	100	96	G	184	G	98	G	G	144	112	B	B	B	B	86	
5	84	B	84	94	B	B	136	98	136	100	100	G	100	94	G	G	G	G	B	96	96	B	B	84	
6	B	B	88	106	B	B	140	126	104	100	98	96	G	G	G	G	G	G	88	80	B	90	100	96	
7	96	90	B	B	B	B	154	G	G	102	G	G	G	G	192	G	G	G	170	82	82	82	84	B	
8	84	84	84	84	B	B	138	170	G	116	108	G	100	96	G	96	G	G	82	82	82	84	84	86	
9	86	90	86	B	92	136	114	108	108	192	102	G	G	G	G	G	G	122	106	102	82	B	B	B	
10	B	B	B	B	B	B	G	G	102	102	G	G	G	G	94	G	G	G	G	86	86	88	B	B	
11	B	B	88	B	86	136	128	134	114	100	G	100	108	G	G	G	86	122	88	86	86	88	90	90	
12	B	B	B	86	B	164	144	142	G	116	98	G	G	96	86	86	92	154	112	102	98	90	90	90	
13	B	B	B	B	B	B	G	168	G	106	96	G	G	G	G	G	154	86	G	B	86	80	B	B	
14	B	B	B	B	G	186	146	142	G	G	G	G	G	G	G	G	102	82	108	82	B	B	B	B	
15	B	B	B	B	B	154	G	G	G	G	102	G	G	G	G	G	G	G	108	B	B	B	B	84	
16	B	B	B	B	B	170	182	G	G	G	G	G	G	G	98	96	G	G	134	100	100	B	B	B	
17	B	B	B	94	94	126	176	G	G	112	104	G	G	G	180	G	G	190	B	B	92	92	B	B	
18	B	B	B	B	B	G	150	G	142	110	G	G	106	G	G	G	G	G	122	B	B	B	B	B	
19	B	B	B	B	B	166	G	144	G	G	G	G	106	G	G	G	G	G	G	B	B	B	104	B	
20	100	B	B	116	108	G	158	114	110	108	116	98	96	96	G	G	G	124	100	102	98	114	114	B	
21	92	94	124	112	B	G	G	108	118	114	100	92	G	G	B	178	G	132	118	108	102	B	B	B	
22	B	B	88	B	B	116	G	G	G	116	100	94	94	120	G	G	G	G	B	B	B	B	B	90	
23	B	B	B	B	B	150	124	G	G	G	100	100	100	88	186	G	G	132	G	B	84	B	B	B	
24	B	B	122	108	B	118	136	G	G	G	96	94	G	G	G	G	G	G	126	102	102	98	B	134	
25	116	102	98	106	92	126	162	148	122	116	106	G	162	G	G	G	G	168	102	98	B	B	B	B	
26	104	B	B	B	B	G	160	122	114	G	104	98	94	94	96	94	G	G	118	78	78	B	B	100	
27	B	B	B	B	B	194	G	G	G	98	94	88	88	88	86	G	G	G	118	116	98	98	B	96	
28	94	88	110	112	102	108	130	124	116	100	100	84	G	G	176	G	120	106	82	106	B	B	B	90	
29	B	90	90	90	90	116	154	112	G	106	G	G	G	G	94	G	132	128	102	100	102	96	96	B	
30	90	86	92	92	114	88	110	112	112	112	G	G	G	104	90	G	G	104	116	96	96	100	98	90	
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	10	15	14	10	18	22	19	16	22	20	13	12	12	12	8	8	14	23	20	21	16	11	14	
MED	92	90	88	94	92	126	141	126	114	105	100	94	100	95	95	95	111	123	112	96	96	91	92	90	
U Q	99	94	98	108	102	154	158	148	122	114	105	99	106	100	137	137	142	132	122	102	99	98	100	96	
L Q	87	88	86	88	86	108	136	112	109	100	97	91	94	92	87	86	90	104	98	82	83	87	90	86	

APR. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

APR. 2023 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F4	F4	F4	F1		F1	H1	C2	C2	C2	L2	L2				L2	HL11	CL11	L3	F1	F1	F4	F1	F2	
2	F2	F1	F2				H1		C1	C1					L1						F3				
3	F1			F2	F1	L2	HC11			C2	H1	L1	L1	L1	L2	L2	L2	LQ21	L3	F3	F1	F1			
4					L1	H2	H1	C1	C2	L1			HL11		L1			H1	C1					F1	
5	F1		F1	F1			H2	L2	H1	C1	C1		C1	L1						F1	F1			F2	
6			F1	F1			H2	C1	CQ21	C1	C1	L1						L1	F1			F1	F1	F2	
7	F1	F1					H1			C1					H1			H1	F1	F1	F1	F1	F2		
8	F1	F1	F1	F1			H1	H1		C1	C1		C1	L1		L2		L3	F5	F3	F1	F1	F1	F1	
9	F1	F1	F1		F1	H1	C2	C2	C2	HC11	C1							C2	C3	F3	F1				
10									C2	C2				L1						F1	F1	F1			
11			F1		F1	HL11	C2	H1	C1	C1		C1	C1				L1	CL11	L2	F1	F1	F1	F1	F1	
12				F1		H1	H2	H1		C1	C2			C2	L2	L3	L2	H1	C3	F3	FF32	F1	F1	F1	
13								H1		C1	L1						HL11	L1			F1	F1			
14					F1		H1	H1	H1								C1	L1	CL11	F1					
15						H2					C1								C2					F1	
16			F1			H1	H1								L1	L2			H1		F1	F1			
17				F1	F1	C1		H1			C1	C1				H1			H1			F1	F1		
18						H1		H1		C1				C1					C2						
19						H2		H1						C1										F2	
20	F1			F1	F1		H1	C2	C1	C2	C1	C2	L1	L1				C2	C2	F4	F3	F1	F1		
21	F4	F3	F1	F1				C2	C2	C1	C1	L2				H1		HL11	CL34	F1	F3				
22			F1			C2				C1	C1	L2	L1	CL11										F1	
23						H1	C2				C1	C1	C1	L1	HL11			HL11				F1			
24			F1	F1		C2	H1				L1	L1							C2	F7	F3	F6		F1	
25	F4	F4	F3	FF54	F2	C2	H1	H1	C1	C1	C2			H1				H1	F3	F5					
26	F1						H1	C2	C2		C1	L1	L1	L2	C1	L2			CL12	F2	F1			F1	
27						H1				C1	L1	L3	L3	L2	L2				C2	C1	F7	FF32		F1	
28	F1	FF11	F1	F1	F4	C2	H2	C2	C2	C2	C2	L3		H1			C2	C2	L2	C3				F4	
29		F2	F1	F1	F1	C1	H1	C1		C1				L2			H1	CL22	CL32	C7	F8	F9	F1		
30	F4	F6	F1	F1	F1	LC15	C2	C2	C1	C1				C1	L1			C2	C1	L5	F5	F1	F2	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. 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 f_{XI} (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'E OSWEEP 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 76	X 72	X 71	X 70	X 69	X 78														X 112	X 86	X 70	X 71	X 70	
2	X 69	X 69	X 70	X 64	X 60	X 62														X 96	X 89	X 89	X 78	X 73	
3	X 74	X 74	X 74	X 71	X 66	X 62														X 121	X 86	X 77	X 79	X 79	
4	X 79	X 77	X 77	X 74	X 75	X 76														X 93	X 72	X 76	X 75	X 76	
5	X 76	X 76	X 77	X 72	X 63	X 64														X 96	X 83	X 85	X 82	X 81	
6	X 83	X 83	X 82	X 75	X 69															X 110	X 86	X 85	X 83	X 82	
7	X 82	X 84	X 78	X 76	X 66															X 112	X 90	X 80	X 82	X 82	
8	X 81	X 80	X 77	X 69	X 67															X 117	X 90	X 70	X 69	X 71	
9	X 71	X 70	X 67	X 68	X 63															X 117	X 85	X 84	X 84	X 83	
10	X 76	X 76	X 76	X 72	X 69															X 111	X 94	X 71	X 72	X 73	
11	X 74	X 72	X 70	X 63	X 53															X 108	X 97	X 82	X 80	X 81	
12	X 80	X 76	X 75	X 69	X 67															X 110	X 91	X 82	X 82	X 82	
13	X 82	X 78	X 78	X 68	X 58															X 111	X 105	X 102	X 94	X 88	
14	X 83	X 80	X 76	X 70	X 69															X 110	X 97	X 90	X 89	X 87	
15	X 84	X 82	X 86	X 76	X 67															X 114	X 100	X 89	X 82	X 82	
16	X 77	X 76	X 77	X 72	X 67															X 111	X 92	X 92	X 91	X 92	
17	X 90	X 88	X 86	X 78	X 74															X 107	X 96	X 87	X 85	X 86	
18	X 85	X 85	X 80	X 77	X 78															X 112	X 93	X 84	X 84	X 86	
19	X 85	X 86	X 82	X 74	X 69															X 100	X 85	X 84	X 84	X 82	
20	X 86	X 82	X 85	X 74	X 77															X 98	X 84	X 80	X 80	X 80	
21	X 82	X 80	X 78	X 71	X 66															X 102	X 92	X 88	X 87	X 83	
22	X 82	X 79	X 74	X 71	X 70															X 96	X 83	X 81	X 79	X 80	
23	X 79	X 78	X 76	X 73	X 69															X 102	X 92	X 94	X 95	X 94	
24	X 90	X 91	X 80	X 82	X 66															X 64	X 61	X 64	X 60	X 68	
25	X 69	X 71	X 70	X 75	X 72															X 98	X 89	X 83	X 78	X 74	
26	X 74	X 74	X 75	X 69	X 68															X 103	X 88	X 78	X 76	X 72	
27	X 73	X 76	X 76	X 69	X 66															X 99	X 85	X 82	X 85	X 82	
28	X 82	X 80	X 81	X 74	X 73															X 96	X 80	X 74	X 76	X 77	
29	X 76	X 74	X 75	X 69	X 69															X 101	X 100	X 93	X 84	X 88	
30	X 88	X 84	X 89	X 79	X 76															X 113	X 93	X 72	X 73	X 74	
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	5														30	30	30	30	30	
MED	X	X	X	X	X	X														X	X	X	X	X	
U Q	83	82	80	75	70	77														112	93	88	84	83	
L Q	X	X	X	X	X	X														X	X	X	X	X	
	76	74	75	69	66	62														98	85	77	76	74	

APR. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 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	70	66	65	64	63	72	92	87	91	104	122	116	130	133	124	117	111	110	114	106	80	64	65	64			
2	63	63	64	58	54	56	71	80	84	101	116	128	129	133	124	112	110	104	101	90	83	83	72	67			
3	68	68	68	65	60	56	78	95	92	105	119	125	126	124	C	119	115	120	120	115	80	71	73	73			
4	73	71	71	68	69	70	94	100	100	97	109	116	127	134	122	115	110	116	112	87	66	70	69	70			
5	70	70	71	66	57	58	72	83	98	107	117	122	129	135	141	139	133	131	125	90	77	79	76	75			
6	77	77	76	69	63	70	89	100	104	114	116	120	124	126	131	128	121	112	112	104	80	79	77	76			
7	76	78	72	70	60	60	82	102	101	110	120	120	126	126	125	114	106	104	112	106	84	74	76	76			
8	75	74	70	63	61	65	90	97	100	102	111	116	117	116	115	111	111	112	116	111	84	64	63	65			
9	65	64	61	62	57	56	79	94	97	104	117	126	124	129	130	127	122	119	122	111	79	78	78	77			
10	70	70	70	67	63	68	94	93	94	100	110	116	121	130	138	134	129	125	121	105	88	65	66	67			
11	68	66	64	56	V	47	48	84	101	109	111	119	138	135	131	130	125	114	106	104	102	91	76	74	75		
12	74	70	69	63	61	62	91	97	103	118	122	122	128	129	127	122	115	111	114	104	85	76	76	76			
13	76	72	72	62	52	56	84	96	102	112	118	127	136	139	135	131	124	115	110	104	99	96	88	82			
14	77	74	70	64	63	67	96	100	102	109	118	121	129	130	129	120	113	110	111	104	91	84	83	81			
15	78	76	80	70	61	65	98	105	105	110	117	124	133	136	135	130	121	118	118	108	94	83	76	76			
16	70	70	71	66	61	69	94	106	112	114	121	124	126	128	130	128	120	117	113	105	86	86	85	86			
17	84	82	80	72	68	74	92	100	108	114	115	117	118	119	115	114	107	103	104	101	90	81	79	80			
18	79	79	74	71	72	78	88	89	97	108	118	128	130	130	123	115	112	111	109	106	87	78	78	80			
19	79	80	76	68	63	70	89	101	100	112	118	124	122	125	128	123	113	110	105	94	78	78	78	76			
20	80	76	79	68	71	72	74	85	96	102	100	103	111	109	110	104	103	108	103	92	78	74	74	74			
21	76	74	72	65	60	64	80	91	90	98	106	114	119	121	123	114	113	111	105	96	86	84	81	77			
22	76	73	68	65	64	68	76	74	H	85	85	88	105	H	115	112	112	106	96	96	94	90	77	75	73	74	
23	73	72	70	67	63	68	81	94	95	98	100	106	110	115	110	113	104	95	95	96	86	88	89	88			
24	84	85	74	76	59	42	48	58	E	G	46	54	54	H	64	59	65	76	72	65	62	57	58	55	58	54	62
25	63	65	64	69	66	81	80	81	89	96	89	94	108	113	108	111	103	99	97	92	83	77	72	68			
26	68	68	69	63	62	67	86	103	103	104	104	116	126	128	131	122	110	109	110	97	82	72	70	66			
27	67	70	70	63	60	63	74	81	86	94	96	100	103	107	111	112	108	102	106	93	79	76	79	76			
28	76	74	75	68	67	69	88	98	92	107	116	114	118	114	119	113	104	100	104	90	74	68	70	71			
29	70	68	F	63	63	63	72	83	97	98	103	104	112	115	114	111	108	94	88	94	94	87	78	82			
30	82	78		73	70	80	77	70	66	73	81	92	100	100	105	108	99	93	107	107	87	66	67	68			
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	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30			
MED	74	72	70	66	62	67	84	94	97	104	116	116	124	126	124	115	111	110	110	102	84	76	76	76			
U Q	77	76	74	69	64	70	91	100	102	110	118	124	129	130	130	125	115	115	114	106	87	83	78	77			
L Q	70	68	68	63	60	60	77	83	91	98	103	106	115	115	113	112	106	102	104	92	79	71	70	68			

APR. 2023 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 2023 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	A	A	A						
2								L	L	U L	L	L	U L	U L	L	L								
3									L	L	456	U L	U L	U L	C	U L			L					
4									L	L	A	U L	L	L	L	L	L	L	L					
5									L	L	L	L	L	U L	L	L		L						
6									L		L	L	L	L	L	U L	L	L						
7									L	U L	U L	L	L	L	L	L	L	L						
8										L	L	L	U L	U L	U L			L	L					
9										L	L	U L	U L	U L	U L	U L	L	L						
10										L	L	L	U L	U L	U L	U L			L					
11									L		L	U L	U L	U L	U L	L	L							
12										U L	L	L	L	U L	U L	U L	L	L						
13								L	L	L	L	U L	U L	U L	U L	U L	L	L						
14										U L	U L	L	L	L	L	U L	L	L	L					
15										L	L	U L	U L	U L	U L	U L	L	L	L					
16								L	L	L	L		L	U L	U L	L	L	L						
17										L	L	U L	L	L	L	L	U L	L						
18										L	U L	U L	L	U L	U L	U L	U L	L	L					
19								L	L	L	L	L	U L	L	L	L	L	L						
20								U L	U L	U L	U L	U L	U L	U L	U L	L	L	L						
21								L	U L	U L	U L	L	U L	U L	L	L	L	L						
22									U L	U L	U L	L	L	U L	U L	L	L	U L	L					
23								L	L	L	L	L	U L	L	L	U L	U L	L	L					
24								400	460	468	468	492	B	476	456	464	460	408	U L					
25									L	U L	L	L	U L	U L	U L	U L	L	L						
26								L	L	U L	U L	L	L	L	L	U L	U L	A	L					
27									L	U L	U L	U L	L	L	L	L	L	L						
28									L	U L	U L	L	L	U L	U L	L	L	L						
29							L	L	U L	L	U L	L	L	U L	L	U L	L	L						
30										U L	U L	U L	U L	U L	U L	U L	L	L						
31										U L	U L	U L	U L	U L	U L	U L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	5	14	16	16	17	22	17	17	4	2						
MED								458	492	532	532	542	592	574	544	520	472	396						
U Q									U L	U L	U L	U L	U L	U L	U L	U L	U L	U L						
L Q									508	552	548	602	616	604	568	528	486							
									472	512	518	514	538	528	526	490	466							

APR. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'E OSWEEP 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							200	276	316	344	348		A	A	A	A	A	A	A	B				
2							196	284	324	340	376	388	U G	A	A		348	300	240	A				
3							196	288		A	U G	392	392	A	A	A	A	A	A	A				
4							192	272	320	336		A	A	A	A	A	A		248	A				
5							A	272	336		A	392	A	A	A	A	A		316	252	A			
6						B	196	280		A U A	336	404	A	A	G	G	B		308	244	B			
7						B	196	288	336	368	368		A	A	A		360	336	316	248	A			
8						B	224	284	340	360	368		A	G	U G	U G	A	A	A	A				
9						B	200	304	328	360	360		A	A	A	A	U G		316	240	A			
10						B	212	292	340	340		A	A	A	A	A	B		316	256	A			
11						B	220	284	328	352		A	A	A	A		368	360	308	252	B			
12						B	220	288	344	376	384		A	A	A	A		352	316	260	A			
13						B	228	304	352	372		A	A	A	A		364	360	320	284	A			
14						B	228	304	344	364	368	368	372	372	364	356		324	268	192				
15						B	244	304	340	368	412	404	U G	A	A	A		324	276	A				
16						B	232	308	336		A	400	420		A	A	A		368	328	268	A		
17						B	240	308	344	384	396	408	U G	U G	412	412	392	372	324	272	A			
18						B	248	304	336	364	400		A	U G	396	376	376	352	308	268	A			
19						B	228	300	340	372	380	U G	408	G	396	400	372	348	316	268	A			
20						B	232	296	344	368	372	412	412	404		A	376		256	A				
21						B	236	308	360	368	376	360	392	B		320	356	332	272	184				
22						B	216	296	348	380	372	376		A	A		380	356	320	284	A			
23						B	228		A	U G	380	360	G	A		376	368	352	312	268	A			
24						B	224	260	312	328		A	380	B	A	U G	B		308	256	A			
25						A		A	280	312	312		B	A	A	G	328	376	352	328	276	A		
26						B	236	296	336	364	376		A	B	A	G	A	A	A	A				
27						A	240	292	328	364		A	A	A	B		408		324	276	A			
28						A	248	300	336	364		A	A	B	U G	400	384	344	320	264	A			
29						A	236	308	364	368	372	360		A	B	A	A		312	268	A			
30						A	248	300	332	356	380	380	364		A	U G	376	356	344	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							28	29	28	28	22	14	11	12	19	18	24	25	2					
MED							228	296	336	364	378	384	396	378	376	354	316	268	188					
U Q							236	304	344	368	392	408	404	400	380	360	324	272						
L Q							206	284	328	346	372	368	380	374	364	348	312	252						

APR. 2023 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G		J 53	A 58	J 39	A 42	J 61	A 68	J 34	A 17	E 16	B 16	E 16	B 16	J 31	A 45	
2	J 53	A 24	J 42	A 52	J 24	A 26		G	G	G	G	G	G 35	J 42	A 42	J 32	A 22	G	G	23	J 17	A 16	E 16	B 22	J 23	A 23
3	20	J 15	A 16	E 16	B 16	E 16	B 16		G	G	G	G	45	38	D 41	C 37			J 26	A 14	J 20	A 18	E 16	B 20		
4	E 19	B 16	E 16	B 16	E 16	B 16		G	G	38	42	J 88	A 184	J 65	A 64	J 37	A 40	J 32	A 21	J 27	A 33	J 21	A 21	E 16	B 16	
5	J 30	A 18	E 16	B 16	E 16	B 16		G	G	37		J 58	A 62	J 48	A 45	J 48	A 34	J 54	A 31	J 19	A 24	E 20	B 16			
6	E 16	B 16	E 16	B 16	E 16	B 16		G	G	J 25	A 32	J 36	A 50	J 47	A 43		G	E 18	B 16	E 16	B 16	E 16	B 16	E 16	B 16	
7	E 16	B 16	E 16	B 16	E 16	B 16		G	G		40	37	34	32		G	G	G	20	J 28	A 20	J 86	A 44	E 16	B 16	
8	E 16	B 16	E 16	B 16	E 16	B 16		G	G	26	32	42	42	37		G	J 39	A 46	J 30	A 22	J 16	A 16	E 16	B 16		
9	E 16	B 16	E 16	B 16	E 16	B 16		G	G	26	36	38	59	44	40		G	G	31	25	16	16	16	16	16	
10	E 16	B 18	E 16	B 16	E 16	B 16		G	G	25		J 38	A 40	J 50	A 44	J 44	A 41	J 39	E 30	A 24	J 18	A 19	E 16	B 16		
11	E 16	B 16	E 16	B 16	E 16	B 16		G	G	26	31	40	42	44	37	43	42	39	J 29	A 19	J 19	A 19	E 16	B 16		
12	E 16	B 16	E 16	B 16	E 16	B 16		G	G	27	33		J 57	A 41	J 48	A 50	J 31	G	28	24	J 21	A 16	J 18	A 20	E 16	B 16
13	E 16	B 16	E 16	B 16	E 16	B 16		G	G	26		J 44	A 42		44	48	41	G	G	18	16	25	25	16	17	
14	E 16	B 16	E 16	B 16	E 16	B 16		G	G	26		40	43	44	45	44	41	G	G	16	16	16	16	16	16	
15	E 16	B 16	E 16	B 16	E 16	B 16		G	G		39		G	G	39	40	44	35	G	G	21	18	16	16	16	
16	E 16	B 16	E 16	B 16	E 16	B 17		G	G	26		J 37	A 32	J 46	A 45	J 44	A 40	J 39	A 30	J 20	A 22	J 16	A 32	J 22	A 36	
17	J 23	A 25	J 17	A 20	E 16	B 16		G	G	26		38		G	46		G	G	24	17	18	16	16	16	16	
18	E 16	B 16	E 16	B 16	E 16	B 17		G	G	32	37	42	42		G	G	G	G	30	25	17	16	16	16	16	
19	E 16	B 16	E 16	B 16	E 16	B 16		G	G	28	35	39		G	44	J 45	A 64	J 46	A 34	J 42	A 24	J 26	A 47	E 16	B 16	
20	J 14	A 16	E 16	B 16	E 16	B 16		G	G	27	37	40	42	J 84	A 54	J 56	A 40	J 38	A 38	J 27	A 21	E 16	B 16	J 16	A 31	
21	J 19	A 18	A 18	E 16	B 16		G	G	27	34		41	44	43	J 51	A 42	G	G	33	26	J 79	A 22	J 73	A 88	A 22	
22	J 26	A 24	A 16	E 16	B 16		G	G	26	34	39		42	42	J 55	A 54	G	41	35	24	J 37	A 43	E 20	B 16	16	
23	E 16	B 16	E 16	B 16	E 16	B 18		G	G	34	37		48	44	42		G	G	34	30	J 25	A 31	J 29	A 23	18	
24	J 17	A 16	E 16	B 19	J 16	A 16		G	G	26		38	45		E 51	B 32	G	E 36	G	23	16	J 20	A 36	J 42	A 24	
25	E 16	B 16	E 16	B 20	E 20	B 18		G	G	25		39	40	45	42	41	41	38	G	G	28	25	16	16	16	47
26	J 16	A 24	A 16	E 16	B 16		G	G	30	34	38	42	48	46	E 42	B 44	G	J 71	A 126	J 29	A 39	J 39	A 20	J 33	A 16	18
27	E 16	B 16	E 16	B 16	E 17	B 19		G	G	28	34	36	42	35	37	41	46	G	33	34	J 28	A 30	J 25	A 21	J 35	A 52
28	J 31	A 21	A 20	E 16	B 16		G	G	30	36	40	41	J 52	A 54	E 42	B 42	G	40	40	J 38	A 50	J 16	A 19	J 19	A 35	A 49
29	E 16	B 16	E 16	B 16	E 16	B 19		G	G	30	35		48	56	57	45	35	38	G	J 51	A 34	J 48	A 71	J 88	A 50	A 52
30	J 36	A 42	A 28	A 33	E 16	B 26		G	G	38	64	58	48	46	44	43	49	G	G	34	J 57	A 137	J 51	A 18	J 18	A 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	30	
MED	E 16	B 16	E 16	B 16	E 16	B 16		G	G	26	32	36	39	42	44	43	42	36	35	G	30	24	J 19	A 19	E 16	B 16
UQ	J 19	A 18	A 16	E 16	B 16		G	G	27	34	38	42	45	48	51	45	41	40	35	34	J 28	A 28	J 25	A 29	J 23	A 24
LQ	E 16	B 16	E 16	B 16	E 16	B 16		G	G	24		G	G	G	G	G	G	G	G	G	E 21	B 16	E 16	B 16	E 16	B 16

APR. 2023 foEs (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 2023 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 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G				U 39	G 42				E 17	B 16	E 16	B 16	E 16	B 16													
2		E 26	B 16	E 20	B 18	E 20	B 21	E 21		G	G	G	G	34	37	26	G 20		20	E 16	B 16	E 16	B 19	E 16	B 16												
3	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G	G		U 44	Y 38		C 36		32	27	23	16	E 16	B 16	E 16	B 16											
4	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G			37	41	80	46	44	48	36	37	31		G	20	24	27	E 16	B 16	E 16	B 16						
5		E 28	B 16	E 16	B 16	E 16	B 16	E 16		G	G			36		G	47	44	42	43	45			G	32	28	25	18	20	E 16	B 16						
6	E 16	B 16	E 16	B 16	E 17	B 16	E 16	B 16		G	G			45	42		G	E 41	B 18	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16						
7	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G	G	U 40	G 37	U 34	U 32	G	G					G	G		G	19	20	E 16	B 36	25	E 16	B 16				
8	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G		U 40	Y 37		G	G						G	G		G	38	35	30	19	17	E 16	B 16	E 16	B 16		
9	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G			G	G	G	G							G	G		G	30	22	16	E 16	B 16	E 16	B 16			
10	E 16	B 18	E 16	B 16	E 16	B 16	E 16	B 16		G				25		35	40	46	42	44	40	38		E 37	B 37		G			E 16	B 16	E 16	B 16				
11	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G		U 44	G 37	43	42	38	30	23				G	G		G	19	16	E 16	B 16	E 16	B 16					
12	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G			45	40	42	46	30					G	G		G	28	21	E 16	B 16	E 16	B 16					
13	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G			42	42		44	46	40					G	G		G	18	16	19	E 16	B 16	E 16	B 16			
14	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G			40	43	44	44	43	41					G	G		G		E 16	B 16	E 16	B 16					
15	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G	U 39	G		G	U 39	U 40	42	35					G	G		G	20	17	E 16	B 16	E 16	B 16				
16	E 16	B 16	E 16	B 16	E 16	B 17	E 16	B 16		G	U 37	U 32	42	46	44	42	40		G					G			35	29	20	18	E 16	B 20	18	28			
17		E 19	B 21	E 16	B 16	E 16	B 16	E 16		G		G	G		G		G								G	G		G	22	E 16	B 16	E 16	B 16				
18	E 16	B 16	E 16	B 16	E 16	B 17	E 16	B 16		G		G		G	G	G	G							G	G		G	30	24	16	E 16	B 16	E 16	B 16			
19	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G			44		G	42	45	39	33	34	18				G	20	36	E 16	B 16	E 16	B 16					
20	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G					G		G									G	34	36	25	20	E 16	B 16	E 16	B 16			
21	E 16	B 16	E 18	B 16	E 16	B 16	E 16	B 16		G				E 44	B 42	G	G									G		G	32	25	22	E 16	B 20	E 16	B 16		
22		E 19	B 18	E 16	B 16	E 16	B 16	E 16		G					G														G		E 21	B 16	E 16	B 16			
23	E 16	B 16	E 16	B 16	E 16	B 18	E 16	B 16		G				48	40	41													33	29	23	18	20	19	E 16	B 16	
24	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G				G 48	B 51	U 32													G		E 23	B 16	18	34	35	19	
25	E 16	B 16	E 16	B 16	E 16	B 18	E 16	B 16		G	G	E 39	B 40	43	42	41	40	38									G	G	26	21	E 16	B 16	E 16	B 22			
26	E 16	B 19	E 16	B 16	E 16	B 19	E 16	B 16		G				E 46	B 42	44												G	42	52	28	27	36	18	27	E 16	B 18
27	E 16	B 16	E 16	B 16	E 16	B 18	E 16	B 16		G		U 41	U 35	U 37	E 41	B 46												G	32	26	25	22	18	20	41		
28		E 20	B 18	E 16	B 16	E 16	B 18	E 16		G	G			E 46	B 42	G												G	40	39	36	25	16	16	16	21	30
29	E 16	B 16	E 16	B 16	E 16	B 18	E 16	B 16		G				43	49	54	45	35	36									G	46	31	32	20	54	26	E 16	B 20	
30		E 22	B 28	E 18	B 16	E 16	B 22	E 16		G				43	43	48													G	31	21	35	28	E 16	B 18	E 16	B 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	29	30	30	30	30	30	30	30	30	30													
MED	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G				E 41	G 41													G	28	22	18	E 16	B 16	E 16	B 16		
U Q	16	16	16	16	16	18	26	33	36	41	44	45	44	44	40	39	34	31	25	22	19	20	16	16													
L Q	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16		G	G	G	G	G	G	G	G	G										G	20	16	E 16	B 16	E 16	B 16			

APR. 2023 fbEs (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 2023 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

$\frac{H}{D}$	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	18	20	19	22	27	29	28	25	18	16	17	16	16	16	16	16
2	16	16	16	16	16	16	16	16	16	19	20	23	30	27	22	18	14	16	16	16	16	16	16	16
3	16	16	16	16	16	16	16	17	16	18	25	28	28	31	30	26	19	16	16	16	16	16	16	16
4	16	16	16	16	16	16	16	16	18	21	23	23	24	25	23	20	20	17	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	18	19	22	30	29	34	32	29	25	16	12	16	16	16	16	16
6	16	16	16	17	16	16	16	15	15	19	34	31	31	25	22	41	19	16	18	16	16	16	16	16
7	16	16	16	16	16	16	16	18	19	19	26	28	28	30	21	18	17	20	16	16	16	16	16	16
8	16	16	16	16	16	16	16	17	19	25	24	34	29	28	23	19	18	15	16	16	16	16	16	16
9	16	16	16	16	16	16	16	14	18	20	21	28	25	23	22	21	18	14	16	16	16	16	16	16
10	16	18	16	16	16	16	16	14	16	20	36	30	36	31	28	37	21	16	16	14	16	16	16	16
11	16	16	16	16	16	16	16	17	20	22	22	25	20	24	24	18	16	14	19	16	16	16	16	16
12	16	16	16	16	16	16	16	15	19	20	24	30	25	28	27	24	21	16	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	22	20	25	26	30	30	21	19	15	17	16	16	16	16	16	16
14	16	16	16	16	16	16	16	17	27	20	34	30	34	29	28	24	20	16	16	16	16	16	16	16
15	16	16	16	16	16	16	16	17	22	26	29	28	25	26	28	24	22	17	16	17	16	16	16	16
16	16	16	16	16	16	17	16	18	20	28	24	33	34	33	29	24	20	18	16	16	16	16	16	16
17	16	16	16	16	16	16	16	17	16	23	24	24	32	24	28	21	17	15	16	16	16	16	16	16
18	16	16	16	16	16	17	16	14	16	18	25	22	28	28	22	20	19	15	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	20	18	21	26	23	24	20	17	16	16	16	16	16	16	16	16
20	16	16	16	16	16	16	16	16	18	19	23	25	22	33	26	23	20	17	16	16	16	16	16	16
21	16	16	18	16	16	16	17	18	22	24	24	22	25	42	22	19	20	16	16	16	16	16	16	16
22	16	16	16	16	16	16	16	19	28	24	28	28	29	26	20	21	20	17	18	16	16	16	16	16
23	16	16	16	16	16	18	17	18	18	22	25	29	36	26	28	24	21	16	15	16	16	16	16	16
24	16	16	16	16	16	16	19	20	20	19	37	29	51	26	23	36	21	18	14	16	16	16	16	16
25	16	16	16	16	16	16	16	20	21	25	40	42	41	26	30	19	20	18	17	16	16	16	16	16
26	16	16	16	16	16	19	16	20	23	26	32	34	42	41	24	22	18	16	16	16	16	16	16	18
27	16	16	16	16	16	16	18	18	18	30	30	26	33	46	26	26	26	22	17	16	16	16	16	16
28	16	16	16	16	16	16	16	18	19	24	36	39	42	29	26	21	21	16	17	16	16	16	16	16
29	16	16	16	16	16	16	18	20	22	23	31	25	40	45	23	20	19	19	16	16	16	16	16	16
30	16	16	16	16	16	16	16	20	22	24	28	32	33	41	18	18	18	16	15	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	17	19	20	25	28	30	28	24	21	20	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	18	22	24	31	30	34	33	28	24	21	17	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	18	19	23	25	25	26	22	19	18	16	16	16	16	16	16	16

APR. 2023 fmin (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

APR. 2023 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	274	280	273	277	287	315	354	357	330	308	317	297	293	306	296	300	314	308	320	335	320	269	267	266	
2	258	268	282	300	269	269	327	334	309	308	290	300	298	304	305	299	305	312	309	292	279	300	286	267	
3	278	283	289	301	305	289	340	357	327	318	296	299	288	290	C	294	292	303	304	344	317	253	263	267	
4	280	265	277	271	279	278	336	348	336	328	297	295	295	306	302	303	304	319	327	330	261	269	263	273	
5	275	286	298	311	279	288	340	332	318	310	304	293	293	291	296	299	301	312	328	315	276	282	272	268	
6	276	278	295	297	276	287	333	336	328	320	309	298	295	293	301	303	307	314	316	322	298	277	280	277	
7	285	306	302	318	296	277	330	339	327	317	309	298	295	292	302	301	305	306	315	326	318	268	278	279	
8	285	289	300	295	292	304	335	340	318	326	297	306	299	299	299	297	299	313	318	339	346	271	271	277	
9	282	279	273	300	315	300	339	348	308	315	301	297	288	290	293	299	306	314	320	331	298	276	292	289	
10	266	276	270	295	V	281	303	343	358	336	323	310	301	286	291	298	295	292	297	305	318	335	261	269	274
11	282	290	308	309	262	272	320	330	320	300	290	305	300	296	296	304	307	307	306	312	312	291	280	280	
12	295	284	291	286	273	264	332	322	304	311	303	292	289	294	288	294	299	306	319	323	315	277	272	281	
13	283	282	296	355	284	283	327	329	314	301	293	284	287	295	291	294	301	294	306	301	299	302	296	293	
14	288	283	280	276	273	258	322	337	304	306	301	287	288	291	293	298	291	298	313	314	298	282	273	273	
15	270	270	301	320	275	275	329	344	308	306	292	283	288	290	287	291	291	296	301	309	309	298	269	279	
16	275	269	282	283	265	270	320	317	314	296	293	282	283	281	288	291	292	302	303	310	286	275	276	276	
17	286	285	297	293	281	284	321	319	301	310	311	289	292	287	283	290	298	298	301	307	306	270	267	266	
18	271	270	260	273	276	303	313	320	298	285	290	295	288	291	291	292	296	303	310	318	311	266	268	272	
19	277	293	297	288	246	260	316	321	314	280	284	288	287	283	292	292	298	308	315	303	286	258	259	250	
20	262	262	275	253	274	282	287	301	313	309	312	293	301	299	304	301	302	315	317	316	290	271	268	271	
21	282	287	297	293	284	292	323	332	314	302	294	290	289	293	303	292	304	310	316	315	287	280	276	279	
22	285	283	280	276	278	284	320	317	H	298	307	264	284	293	299	303	300	301	306	306	319	281	276	271	271
23	274	282	282	286	288	292	323	325	G	320	316	288	292	287	296	294	299	312	311	297	303	282	274	263	275
24	274	287	264	288	271	239	294	222	H	217	213	228	218	220	252	255	255	263	258	269	239	238	230	258	
25	271	273	267	283	284	345	374	330	H	340	339	317	319	324	317	320	327	315	327	315	315	304	300	293	277
26	283	263	277	286	289	295	318	335	303	325	290	289	299	298	310	303	298	306	320	316	301	287	280	253	
27	255	276	297	294	276	288	317	311	316	313	306	305	297	293	295	305	303	304	315	311	281	263	273	269	
28	270	275	284	288	266	271	314	324	305	302	309	299	298	292	302	301	306	308	318	316	293	264	263	256	
29	276	265	F	279	286	282	287	312	293	316	302	297	288	296	296	297	302	315	314	290	290	299	275	256	262
30	280	265		283	270	324	316	336	310	294	303	302	289	289	294	301	313	296	305	319	348	266	271	278	
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	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	
MED	276	280	282	288	278	286	323	331	314	308	297	294	292	293	296	299	302	306	314	316	298	274	271	273	
U Q	283	285	297	300	284	295	335	339	320	317	309	299	297	298	302	301	306	312	318	322	312	282	278	278	
L Q	271	270	276	283	273	272	317	320	305	302	290	288	288	290	292	294	298	302	305	309	286	266	267	267	

APR. 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 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	A	A	A							
2								L	L	U	L	L	U	L	U	L	L	L							
3									L	L		U	L	U	L	C	U	L		L					
4									L	L	A	U	L	L	L	L	L	L	L						
5									L	L	L	L	L	U	L	L		L							
6									L		L	L	L	L	L	U	L	L							
7									L	U	L	U	L	L	L	L	L	L							
8									L	U	L	L	U	L	U	L		L	L						
9									L	L	L	U	L	U	L	U	L	L	L						
10									L	L	L	L	U	L	U	L	U	L		L					
11									L		L	U	L	U	L	U	L	L							
12									U	L	L	L	L	U	L	U	L	U	L						
13								L	L	L	L	U	L	U	L	L	U	L	L						
14									U	L	U	L	L	L	L	U	L	L	L	L					
15									L	L	L	U	L	U	L	U	L	L	L						
16								L	L	L	L		L	U	L	L	L	L	L						
17									L	L	L	U	L	L	L	L	U	L	L						
18									L	U	L	U	L	L	U	L	U	L	U	L					
19								L	L	L	L	L	U	L	L	L	L	L	L						
20								U	L	U	L	U	L	U	L	L	L	L	L						
21								L	U	L	U	L	L	U	L	L	L	L	L						
22								U	L	L	U	L	L	L	U	L	L	L	L	U	L				
23								L	L	L	L	L	U	L	L	L	U	L	U	L					
24								341	340	389	406	376	B	440	393	349	328	331	U	L					
25									L	U	L	L	U	L	U	L	U	L	L						
26								L	L	U	L	L	L	L	L	U	L	A	L						
27									L	U	L	U	L	L	L	L	L	L							
28								L	U	L	L	L	U	L	L	L	L	L							
29								L	L	U	L	L	L	U	L	L	L	L							
30									U	L	U	L	U	L	L	U	L	L	L						
31									362	370	382	349	338	373	361										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								2	5	14	16	16	17	22	17	17	4	2							
MED								353	U	L	U	L	U	L	U	L	U	L	U	L	U	L	U	L	
U Q									384	388	404	394	383	382	382	377	379								
L Q									U	L	U	L	U	L	U	L	U	L							

APR. 2023 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'E OSWEEP 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									210	238	252	230	288	252	262	246	262	236						
2								232	240	260	256	262	250	254	248	228								
3									222	234	230	248	248	294	C	244		244						
4									224	214	E A	292	242	274	270	246	258	262	238					
5									236	230	250	274	258	290	278		254							
6									218		250	274	254	274	276	254	240							
7									214	242	242	246	286	268	264	268	250							
8										224	266	262	262	260	262		266	246						
9										250	264	250	256	286	274	264	252	244						
10										236	254	262	284	292	276	264		246						
11									230		268	278	252	272	260	262	240							
12										252	264	246	276	270	276	258	236							
13								220	238	242	248	288	286	284	268	272	246							
14										254	260	294	296	276	284	258	268	252						
15										222	248	248	308	290	276	294	270	264	260					
16								220	232	262	288		304	292	296	276	266	250						
17										238	252	274	294	296	268	298	264	262						
18										292	266	290	260	294	270	238	260	242						
19								226	242	248	282	272	280	308	288	270	244							
20								286	262	262	260	262	282	292	284	286	268							
21								226	236	264	262	280	290	304	286	250	262	250						
22									278	288	324	300	294	280	280	248	250	248						
23								244	240	250	308	290	272	288	296	282	250	242						
24								500	G	628	632	518	604	560	404	378	388	350						
25									218	222	224	246	264	258	250	256	232							
26								250	238	250	252	282	268	276	266	248	256	248						
27									236	272	252	286	294	296	288	278	268							
28								224		266	244	278	278	270	282	254	248							
29								244	270	258	248	260	300	280	278	284	264	240						
30										306	296	296	312	304	290	268	254	266						
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	21	28	30	29	30	30	29	28	27	17						
MED							244	232	236	250	259	274	280	282	276	263	254	248						
U Q							270	241	263	268	290	290	294	287	271	264	256							
L Q							224	222	238	250	256	262	270	265	252	246	243							

APR. 2023 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1	284	266	280	258	238	226	198	200	192	190	184	214	214	200	214	A	A	A	234	214	194	206	300	298					
2	340	300	270	218	266	276	214	212	196	180	190	170	196	188	198	202	214	236	220	218	252	240	218	272					
3	292	264	252	228	208	212	214	206	198	206	176	186	218	206	C	198	218	234	236	210	190	280	294	290					
4	268	290	272	262	252	264	202	210	202	210	A	E	A	206	218	250	202	214	210	232	220	E	A	252	286	298	288		
5	E	A	298	262	246	218	230	230	202	208	202	200	188	220	212	206	222	250	214	234	224	196	214	256	266	298			
6	276	266	250	228	252	256	204	208	210	216	190	208	200	200	204	226	214	228	234	216	206	260	254	280					
7	266	242	232	230	228	278	208	212	200	182	194	192	188	202	198	214	208	228	236	228	204	E	A	292	282	268			
8	260	254	230	222	248	248	208	216	210	208	186	228	196	184	190	222	228	232	238	216	194	216	272	286					
9	272	278	274	232	208	238	210	216	214	242	234	194	214	194	220	216	224	234	230	210	192	258	246	242					
10	274	280	286	220	250	246	210	214	208	214	228	202	192	184	194	218	218	230	226	226	196	200	292	278					
11	274	258	236	190	272	280	220	216	210	210	200	184	206	208	198	192	220	230	238	230	210	202	258	276					
12	258	254	262	226	254	286	210	212	212	206	192	196	182	200	220	200	218	236	236	214	202	228	268	274					
13	270	268	240	196	236	264	222	210	204	204	200	188	204	206	E	A	240	210	218	222	234	230	232	234	228	236			
14	248	266	272	250	278	288	212	214	206	202	206	194	224	208	210	204	212	222	238	224	230	236	246	262					
15	278	288	250	206	282	280	216	214	212	208	186	214	196	208	214	204	212	238	236	226	226	206	242	254					
16	270	296	270	232	260	272	210	210	204	194	216	234	210	196	212	216	226	226	242	224	212	254	268	292					
17	260	256	244	224	238	252	214	216	212	210	178	180	188	240	196	204	204	230	242	232	226	226	252	290					
18	276	284	298	260	248	228	214	214	216	200	196	176	184	202	190	194	196	228	238	226	210	226	280	282					
19	280	260	248	244	332	268	208	214	210	206	194	182	196	184	218	236	232	232	230	232	E	A	330	308	324				
20	298	296	272	262	270	246	218	232	216	210	210	186	188	200	228	228	214	248	228	216	216	250	276	294					
21	276	260	252	220	242	242	210	214	200	192	200	200	212	196	178	214	212	234	234	234	242	252	258	254					
22	266	278	278	264	262	230	208	230	226	186	208	182	242	242	196	212	206	204	240	234	232	252	266	280					
23	272	264	258	242	226	254	218	198	204	194	194	250	180	192	196	196	214	216	240	240	256	262	296	254					
24	282	242	280	230	256	268	250	246	228	208	194	222	B	194	220	226	226	248	280	256	E	A	E	A	E	A	E	A	306
25	292	272	284	270	242	210	198	200	182	194	188	212	206	206	192	188	208	222	222	222	222	222	214	232	274				
26	274	300	262	260	250	240	222	200	208	190	210	242	186	224	196	222	A	220	232	224	220	246	256	316					
27	316	280	236	232	282	236	212	200	196	204	218	206	186	212	188	194	220	232	236	234	230	256	302	E	A	330			
28	296	286	246	234	272	256	206	210	220	190	E	A	222	212	216	202	192	222	230	242	234	212	212	264	316	E	A	324	
29	288	300	262	230	250	224	212	216	214	210	188	242	A	206	212	216	216	222	240	280	252	E	A	E	A	322			
30	282	300	268	268	276	234	224	E	A	E	A	280	294	232	212	196	216	258	180	210	220	220	248	230	210	228	288	278	
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	29	30	28	30	29	29	28	29	30	30	30	30	30	30	30				
MED	276	270	262	231	251	250	211	212	208	205	194	200	202	202	198	214	215	230	236	225	216	243	268	280					
U Q	288	288	272	258	270	268	216	216	214	210	210	214	214	208	216	222	220	234	238	232	232	262	294	298					
L Q	270	260	246	222	238	234	208	208	202	194	188	186	188	196	193	201	212	222	230	216	206	226	254	272					

APR. 2023 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 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							120	100	100	100	100	A	A	A	A	A	A	A	B					
2							108	98	98	96	96	96	100	A	A	106	102	100	A					
3							112	100	A	100	100	98	A	A	A	A	A	A	A					
4							114	100	98	98	A	A	A	A	A	A	A	100	A					
5							A	100	100	A	98	A	A	A	A	A	A	100	102	A				
6						B	104	96	A	98	106	A	A	102	100	B	100	100	B					
7						B	106	102	98	98	98	A	A	A	96	104	104	104	A					
8						B	106	100	100	100	98	A	98	98	98	A	A	A	A					
9						B	104	100	98	98	98	A	98	98	98	96	96	102	A					
10						B	102	98	98	98	A	A	A	A	A	B	98	102	A					
11						B	102	96	98	98	A	A	A	A	104	104	104	104	B					
12						B	104	104	100	100	100	A	A	A	A	100	100	100	A					
13						B	106	100	100	98	A	A	98	A	98	102	102	104	A					
14						B	106	102	100	98	96	100	100	100	100	100	102	106	128					
15						B	108	100	100	100	100	98	A	96	A	A	100	98	A					
16						B	100	98	98	A	98	100	A	A	A	102	102	106	A					
17						B	106	100	100	100	98	98	100	100	98	98	98	106	A					
18						B	104	100	100	100	100	A	100	100	100	100	100	100	A					
19						B	116	100	100	100	98	92	94	98	98	98	98	98	A					
20						B	104	102	100	100	100	100	100	100	A	100	100	A						
21						B	106	102	100	100	100	100	100	A	96	98	102	106	E B					
22						B	102	102	102	100	100	100	A	A	100	102	104	104	A					
23						B	104	A	100	96	96	96	A	96	100	100	100	104	A					
24						B	122	100	100	100	A	100	B	A	90	B	100	100	A					
25						A	A	100	100	98	B	A	A	98	104	104	104	104	A					
26						B	102	102	102	100	100	A	B	A	100	A	A	A	A					
27						A	100	100	100	100	A	A	A	B	102	A	106	106	A					
28						A	110	110	100	100	A	A	B	100	100	100	102	104	A					
29						A	102	102	102	102	102	98	A	B	A	A	98	98	A					
30						A	102	100	100	100	100	100	100	A	100	100	100	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							28	29	28	28	22	14	11	12	19	18	24	25	2					
MED							105	100	100	100	100	99	100	99	100	100	100	102	122					
U Q							108	102	100	100	100	100	100	100	100	102	102	104						
L Q							102	100	99	98	98	98	98	98	98	100	100	100						

APR. 2023 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	B	B	168	G	120	108	98	90	88	88	88	84	82	82	B	B	B	96	90	90
2	90	90	90	88	88	88	196	G	G	G	G	G	88	86	86	88	86	G	90	90	B	90	92	86
3	90	84	B	B	B	B	160	142	96	G	G	G	96	96	94	94	94	94	90	86	86	86	B	80
4	84	B	B	B	B	B	G	G	106	98	88	92	90	102	96	98	96	G	106	98	96	96	B	B
5	92	92	B	B	B	B	150	G	G	98	G	92	102	96	92	94	G	116	104	86	86	92	96	B
6	B	B	B	B	B	B	138	132	98	100	G	92	92	G	G	B	G	G	B	B	B	B	B	B
7	B	B	B	B	B	B	132	G	G	G	104	94	94	94	G	G	G	G	112	92	92	90	86	B
8	B	B	B	B	B	B	154	140	G	102	98	98	G	G	G	96	90	130	88	90	B	B	B	B
9	B	B	B	94	B	B	146	118	112	100	100	94	G	G	G	G	G	108	102	B	B	B	B	B
10	B	B	B	B	B	B	148	G	108	100	96	96	96	98	96	B	G	118	106	100	98	92	92	B
11	B	B	B	B	B	B	132	140	104	100	98	98	88	88	116	88	92	G	B	94	84	B	B	B
12	B	B	B	B	B	B	136	124	G	G	G	96	92	90	88	92	G	156	110	98	B	94	90	B
13	B	B	B	B	B	B	162	G	G	G	106	94	G	112	102	104	G	G	166	B	90	100	B	86
14	B	B	B	B	B	B	126	G	G	106	98	100	98	102	104	G	G	G	G	B	B	B	B	B
15	B	B	B	B	B	B	G	G	G	110	G	G	98	92	96	96	G	G	104	86	B	B	B	B
16	B	B	B	B	B	B	138	G	116	92	100	156	104	100	102	G	102	156	116	98	B	92	92	90
17	90	82	80	86	B	B	146	G	122	G	G	G	G	166	G	G	G	G	112	96	98	96	B	B
18	B	B	B	B	B	B	G	162	116	104	G	100	G	G	G	G	G	156	106	110	B	B	B	B
19	B	B	B	B	B	B	140	116	132	G	G	G	106	G	102	98	104	126	106	102	94	92	B	B
20	98	B	B	B	B	B	130	116	116	114	106	116	106	G	98	G	104	108	108	100	B	B	B	94
21	92	96	B	96	B	B	150	140	G	116	102	98	114	B	G	G	G	118	108	98	98	98	96	94
22	92	92	B	B	B	B	116	120	112	G	116	104	94	92	G	114	110	G	136	86	98	86	B	B
23	B	B	B	B	B	B	G	100	134	G	G	172	98	106	G	G	174	142	110	100	96	90	94	94
24	94	B	B	98	126	B	140	G	G	118	104	B	88	G	B	G	G	158	B	98	94	92	92	B
25	B	B	94	96	96	150	132	G	G	150	B	156	156	106	126	128	G	G	112	96	96	B	B	92
26	92	86	B	86	B	98	128	128	112	106	100	160	B	146	G	94	94	100	90	86	82	98	82	B
27	B	B	B	B	90	150	156	128	150	112	96	96	96	B	G	96	G	114	104	98	94	94	90	92
28	88	88	98	B	B	136	120	114	110	106	98	98	B	G	G	138	116	104	100	B	92	106	94	92
29	B	B	B	B	B	136	130	122	G	G	100	104	100	B	90	102	G	108	102	100	98	94	92	92
30	90	86	84	100	B	120	110	102	104	102	102	100	102	100	G	G	G	116	100	88	90	94	92	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	12	9	5	8	4	7	26	17	18	20	19	24	22	20	16	17	13	18	26	23	19	21	15	13
MED	91	88	90	95	93	136	139	124	112	105	100	98	97	97	96	96	96	116	106	96	94	94	92	92
U Q	92	92	96	97	111	150	150	140	120	111	104	104	102	104	102	103	107	130	112	100	98	96	94	93
L Q	90	85	82	87	89	98	130	116	106	100	98	94	92	91	91	93	91	108	102	88	90	91	90	88

APR. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 2023 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						H 1		C 1	C 1	C 1	L 2	L 2	L 1	L 2	L 3	L 3	L 2				F 1	F 2	F 5		
2	F 4	F 4	F 3	F 3	F 3	F 3	H 1						L 1	L 1	L 2	L 1	L 1		L 2	F 1		F 3	F 2	F 2	
3	F 1	F 1					H 1	H 1	L 1				L 1	L 1	L 2	L 2	L 1	L 1	L 2	F 1	F 1	F 1		F 2	
4	F 1								C 1	C 2	L 3	LQ 21	L 2	CL 21	L 1	L 1	L 1		C 2	F 3	F 4	F 2			
5	F 4	F 1					HC 11			C 1		L 2	C 1	L 1	L 2	L 1		C 2	CL 41	F 3	F 2	F 3	F 1		
6							H 1	H 1	L 1	C 2		L 1	L 1												
7							H 1				C 1	L 1	L 1	L 1					C 1	F 2	F 2	F 3	F 3		
8							H 1	H 1		C 1	C 1	C 1				L 1	L 2	HL 12	L 1	F 2					
9			F 1				H 1	C 1	C 1	C 2	L 1	L 1						C 1	C 2						
10							H 1		C 1	C 1	L 2	L 2	L 1	C 1	L 1			C 1	C 2	F 4	F 1	F 1	F 1		
11							H 1	H 1	C 1	C 1	C 1	C 1	L 1	L 1	CL 11	L 2	L 1			F 1	F 1				
12							H 1	C 1				L 1	L 1	L 1	L 2	L 1		H 1	C 2	F 2		F 1	F 1		
13							H 1				C 1	L 1		C 1	C 2	C 1			H 1		F 2	F 1		F 1	
14							C 1			C 1	C 1	C 1	C 1	C 1	C 1										
15										C 1			C 1	C 1	L 1	L 1				C 1	F 1				
16							H 1		C 1	L 1	C 1	H 1	C 1	C 1	C 1		C 1	H 1	C 1	F 3		F 4	F 2	F 4	
17	F 2	F 2	F 2	F 1			H 1		C 1					H 1					C 3	F 1	F 1	F 1			
18								H 1	C 1	C 1		C 1						H 1	C 2	F 1					
19							HL 11	C 1	H 1				C 1		C 1	C 2	C 2	C 3	C 3	C 3	F 2	F 3	F 4		
20	F 1						H 1	C 2	C 1	C 1	C 1	C 1	C 1		L 1		C 1	C 2	C 2	F 1				F 2	
21	F 1	F 1		F 1			H 1	H 1		C 1	C 1	C 1	C 1					C 2	C 2	F 4	F 2	F 2	F 3	F 2	
22	F 3	F 4					C 1	C 1	C 1		C 1	C 1	L 1	L 2		C 1	C 1		H 2	F 3	F 5	F 1			
23								C 1	H 2			HC 11	C 1	C 1			H 1	H 1	C 3	F 4	F 4	F 6	F 2	F 3	
24	F 2			F 1	F 1		H 1			C 1	C 1			L 1					HC 11		F 2	F 4	F 6	F 3	
25			F 1	F 1	F 2	H 1	HL 11			HC 11		H 1	H 1	C 1	C 1	C 1			C 1	F 3	F 1			F 2	
26	F 1	F 1		F 1			L 1	C 1	C 1	C 1	C 1	HC 11		H 1		L 2	L 2	C 1	L 2	F 3	F 2	FF 32	F 1		
27				F 1			H 1	H 1	C 1	H 1	C 1	L 1	L 1	L 1			L 1	C 1	C 2	F 4	F 2	F 5	F 2	F 3	
28	F 3	F 2	F 1				H 1	C 1	C 1	C 1	L 1	L 1				H 1	C 1	C 2	C 2		F 1	F 1	F 4	F 5	
29							H 1	H 2	H 1			C 1	C 2	C 2		L 1	C 1		C 3	C 3	F 4	F 4	F 5	F 4	
30	F 5	F 4	F 2	F 2			C 2	C 2	C 2	C 4	C 1	C 1	C 1	C 1				CL 11	C 2	F 4	F 4	F 2	F 2		
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

APR. 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 f_{XI} (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 81	X 78	X 75	X 75	X 76	X 68														X 136	X 131	X 120	X 92	X 88	
2	X 83	X 82	X 82	X 79	X 69	X 68														X 116	X 97	X 90	X 84	X 80	
3	X 78	X 79	X 79	X 75	X 65	X 55														X 136	X 89	X 83	X 88	X 94	
4	X 96	X 89	X 78	X 73	X 72	X 68														X 99	X 82	X 82	X 82	X 82	
5	X 83	X 86	X 84	X 77	X 64	X 58														X 124	X 106	X 96	X 91	X 90	
6	X 90	X 93	X 89	X 82	X 70	X 69														X 144	X 116	X 93	X 90	X 85	
7	X 91	X 88	X 86	X 87	X 62	X 60														X 128	X 108	X 88	X 90	X 95	
8	X 92	X 84	X 77	X 72	X 70	X 65														X 126	X 96	X 83	X 82	X 80	
9	X 80	X 83	X 82	X 83	X 80	X 61														X 126	X 104	X 90	X 92	X 90	
10	X 81	X 75	X 75	X 78	X 73	X 71														X 135	X 112	X 91	X 83	X 85	
11	X 87	X 90	X 88	X 71	X 56	X 55														X 132	X 127	X 110	X 92	X 89	
12	X 88	X 84	X 82	X 76	X 68	X 67														X 132	X 101	X 92	X 90	X 93	
13	X 96	X 92	X 87	X 86	X 64	X 60															X 131	X 114	X 103	X 98	
14	X 90	X 84	X 79	X 75	X 66	X 65															X 115	X 100	X 106	X 110	
15	X 106	X 98	X 95	X 84	X 73	X 68															X 116	X 96	X 87	X 91	
16	X 88	X 82	X 81	X 73	X 71	X 74															X 106	X 101	X 102	X 104	
17	X 103	X 96	X 90	X 81	X 73	X 72															X 106	X 90	X 91	X 93	
18	X 97	X 94	X 90	X 86	X 84	X 76															X 98	X 89	X 90	X 94	
19	X 94	X 96	X 90	X 79	X 72	X 75															X 101	X 92	X 99	X 96	
20	X 97	X 98	X 93	X 82	X 78	X 75															X 104	X 97	X 93	X 94	
21	X 90	X 86	X 87	X 81	X 72	X 68															X 102	X 93	X 86	X 88	
22	X 88	X 86	X 81	X 77	X 74	X 72															X 90	X 80	X 80	X 83	
23	X 80	X 80	X 76	X 72	X 69	X 64															X 97	X 98	X 99	X 99	
24	X 94	X 91	X 81	X 83	X 67	X 56															X 65	X 67	X 67	X 72	
25	X 73	X 75	X 73	X 74	X 73	X 67															X 96	X 91	X 83	X 80	
26	X 78	X 75	X 73	X 69	X 65	X 64															X 99	X 88	X 81	X 81	
27	X 82	X 82	X 84	X 76	X 67	X 68															X 93	X 86	X 88	X 88	
28	X 86	X 82	X 84	X 78	X 76	X 75															X 94	X 86	X 86	X 86	
29	X 84	X 83	X 82	X 76	X 68	X 63															X 120	X 100	X 92	X 95	
30	X 97	X 89	X 87	X 84	X 80	X 80															X 98	X 78	X 82	X 90	
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														12	30	30	30	30	
MED	X 88	X 85	X 82	X 78	X 70	X 68														X 130	X 102	X 91	X 90	X 90	
U Q	X 94	X 91	X 87	X 82	X 73	X 72														X 136	X 112	X 97	X 92	X 94	
L Q	X 82	X 82	X 79	X 75	X 67	X 63														X 125	X 96	X 86	X 83	X 85	

APR. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E 0SWEEP 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	75	72	69	69	70	62	62	76	90	102	113	116	137	148	148	142	137	133	134	130	J R	R	86	82	
2	77	76	76	73	63	62	65	78	92	106	122	132	139	141	133	126	118	106	112	110	91	84	78	74	
3	72	73	72	68	59	49	57	84	96	98	114	117	130	138	139	133	124	125	138	130	83	77	82	88	
4	90	83	72	67	66	62	73	90	94	91	105	120	132	135	133	125	124	128	120	93	76	76	76	76	
5	77	80	78	71	58	52	59	84	96	110	112	117	133	142	148	146	140	137	130	118	100	90	85	84	
6	84	87	83	76	64	63	75	91	102	110	110	118	137	148	157	158	145	J R	140	138	J R	87	84	79	
7	84	82	80	81	56	54	63	89	96	98	113	126	139	146	143	136	128	131	134	122	J R	82	84	89	
8	J R	85	78	71	66	64	59	71	90	102	101	106	112	128	133	136	127	121	121	120	120	90	77	76	74
9	74	77	76	77	74	55	61	80	94	103	108	122	129	133	135	137	132	127	125	120	98	84	86	84	
10	75	69	69	72	67	65	78	87	91	97	104	116	132	143	146	150	146	142	139	129	106	85	77	79	
11	81	84	82	65	50	49	65	88	97	111	116	128	142	143	144	144	140	128	126	126	121	105	R	83	
12	82	78	76	70	62	61	75	96	105	112	118	128	141	146	146	142	128	126	129	126	95	86	84	87	
13	90	86	81	80	58	54	66	90	96	107	108	125	140	144	144	142	138	142	134	127	125	108	97	92	
14	84	78	73	69	60	59	74	98	109	104	107	122	132	146	146	142	142	141	135	126	109	94	100	104	
15	100	92	89	78	66	62	86	105	104	107	108	122	131	144	150	143	141	137	137	134	110	90	81	85	
16	82	76	75	67	65	68	84	97	100	116	118	128	139	144	144	142	129	124	121	120	100	95	96	98	
17	97	90	84	75	67	66	81	103	102	109	107	118	116	121	127	120	113	114	119	121	100	84	85	87	
18	91	88	84	80	77	70	77	93	98	108	124	127	130	131	126	116	114	118	118	116	92	83	84	88	
19	88	90	84	73	66	69	82	97	96	102	116	121	127	139	137	134	128	124	117	110	95	86	93	90	
20	91	92	87	76	72	68	74	94	108	116	119	124	131	132	132	128	132	132	119	111	98	91	87	88	
21	84	80	81	75	66	62	77	91	88	98	112	120	129	134	138	137	126	124	119	107	96	87	80	82	
22	82	80	75	71	68	66	81	96	94	91	98	112	127	132	118	121	121	116	108	102	84	74	74	77	
23	74	74	69	66	63	58	70	91	86	94	102	107	123	131	128	123	121	118	112	104	91	92	93	93	
24	88	86	75	77	61	49	57	57	54	55	E G	51	74	70	76	86	88	78	74	79	72	59	61	61	66
25	67	69	67	68	67	61	65	73	90	90	92	100	109	115	115	107	106	108	109	108	90	85	77	74	
26	72	69	67	63	59	58	72	H	103	106	103	100	115	132	144	142	136	131	126	123	115	93	82	76	75
27	76	76	78	70	61	62	72	86	97	102	92	101	116	119	122	121	122	116	110	106	87	80	82	82	
28	80	76	78	72	70	69	82	90	95	115	109	113	126	125	131	129	121	118	117	103	88	80	80	80	
29	78	76	76	70	62	57	72	90	110	108	101	106	115	122	122	124	122	112	106	107	114	94	86	89	
30	91	83	81	78	74	74	78	84	78	80	93	103	119	123	131	130	118	116	120	126	92	72	76	84	
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
MED	82	79	76	72	64	62	72	90	96	103	108	118	130	136	136	134	127	124	120	119	96	85	84	84	
U Q	88	86	81	76	67	66	78	96	102	109	114	124	137	144	144	142	137	132	134	126	106	91	86	88	
L Q	76	76	72	68	61	57	65	84	92	98	102	112	126	131	128	124	121	116	117	107	90	80	77	79	

APR. 2023 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

APR. 2023 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	LU	LU	LU	L	A	A	L	L							
2										L	L	L	L	L	L	L		L							
3									L	L	L	L	L	L	L	L	L	L	L						
4										L	LU	LU	LU	LU	L	L	L	L							
5										L	L	L	L	L	L	L	L	L							
6										U	L	L		LU	L	L	L	L							
7										L	L	L	LU	L	LU	L	L	L	L						
8										U	LU	LU	L	L	LU	L	L	L	L						
9									L	LU	LU	LU	LU	L	L	L	L	L	L	L					
10									L	L	L	L	LU	LU	LU	L	LU	LU	L						
11										L	LU	LU	LU	L	LU	L	L	L	L						
12										L	L	L	LU	L	L	LU	L	L	L						
13										L	LU	LU	LU	L	L	L	L	L	L						
14									L	L	LU	LU	L	L	LU	L	L	L	L						
15									L	L	L	L	LU	LU	LU	L	L	L	L						
16										LU	LU	LU	LU	L	LU	L	L	L							
17										L	L	LU	LU	LU	LU	L	L	L							
18										U	LU	LU	L	L	L	L	LU	L	L	L					
19										L	L	L	L	L	L	LU	L	LU	L	L					
20									L	L	LU	LU	LU	LU	L	LU	L	LU	L	L					
21										L	L	L	LU	L	L	L	L	L	L						
22										U	L	LU	LU	L	L	LU	L	L	L	L					
23										L	L	L	L	L	L	L	LU	L	L	L					
24										U	L	LU	LU	LU	LU	LU	LU	LU	LU	L					
25										L	L	L	L	L	L	L	L	L	L	L					
26										L	L	LU	LU	L	L	LU	L	L	L	L					
27										LU	LU	L	L	L	LU	L	L	L	L						
28										L	LU	LU	L	L	L	L	LU	L	L	L					
29										LU	LU	LU	LU	L	A	LU	L	L	L	L					
30										L	LU	LU	LU	L	L	L	L	L	L	L					
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								1	1	9	9	15	20	17	15	12	7	2							
MED								U	L	U	LU	LU	LU	LU	LU	LU	LU	LU	LU	LU	LU	LU	LU	LU	LU
U Q								388	472	500	560	560	584	592	556	534	488	450							
L Q										U	L	LU	LU	L	L	L	L	L							
										472	516	520	558	562	536	512	488								

APR. 2023 foF1 (0.01MHz)

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APR. 2023 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E PSWEEP 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	228	304	340	A	348	A	A	A	A	332	292	A					
2							B	A	A	328	A	A	392	384	384	368	344	288	A					
3							B	240	312	344	372	A	A	A	A	A	316	A	A					
4							B	228	296	352	352	368	U A	A	A	A	A	A	A					
5							B	224	304	348	A	A	A	U A	A	A	352	328	284	A				
6							A	236	296	340	U A	U A	A	A	A	A	344	292	208					
7							B	232	296	344	360	384	392	396	376	364	340	288	204					
8							A	248	308	352	A	400	388	392	380	356	328	276	208					
9							A	A	A	368	A	A	A	A	A	364	328	288	212					
10							B	256	308	348	A	A	G	G	R	352	336	292	212					
11							A	A	A	A	A	A	A	A	A	A	A	A	A					
12							A	236	316	360	376	400	A	A	A	A	A	A	A					
13							A	252	320	360	U A	U A	364	384	388	A	364	340	292	236				B
14							A	260	328	A	A	396	A	404	396	A	340	308	232	A				
15							A	276	332	360	376	A	424	A	A	376	352	A	A					
16							172	264	328	352	380	A	A	G	A	A	368	352	224	A				
17							A	252	320	348	392	392	412	404	A	A	A	A	316	A				
18							188	268	324	368	384	388	A	A	A	A	A	288	U A	B				
19							A	256	320	352	368	392	404	A	372	368	340	288	224	A				
20							A	256	304	352	372	364	A	A	A	A	A	300	224	A				
21							A	256	316	352	372	388	G	G	388	376	344	304	232	A				
22							180	268	316	356	376	384	A	376	388	372	356	296	228	A				
23							A	A	316	352	376	U A	U A	372	376	380	356	336	296	232	A			
24							A	244	296	332	356	376	376	380	372	352	328	280	212	A				
25							A	A	A	312	A	A	A	380	376	372	340	300	240	A				
26							A	A	316	A	A	A	A	A	A	364	360	340	296	232	A			
27							A	260	316	A	352	A	R	392	A	372	336	312	224	A				
28							A	256	312	344	U A	U A	380	388	388	364	340	300	A					
29							A	276	320	348	356	372	364	368	A	352	344	300	244	A				
30							192	260	304	A	A	A	388	384	392	360	336	284	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							4	24	26	25	18	17	16	19	12	20	24	24	19					
MED							184	256	316	352	372	384	388	388	382	364	340	292	224					
U Q							190	260	320	354	376	392	398	392	388	370	344	300	232					
L Q							176	238	304	344	360	368	378	380	374	356	334	288	212					

APR. 2023 foE (0.01MHz)

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IONOSPHERIC DATA STATION Yamagawa

APR. 2023 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	J 62	AJ 30	J 15	A 16	E 16	B 16	E 19	B 16	J 25	A 37	E 40	B 43	E 40	J 52	A 68	J 84	A 84	G	G	28	J 29	A 16	J 16	A 18	J 17	
2	20	20	J 87	A 42	J 26	A 20	J 18	A 26	31	37	38	39	42	35	48	46	40	G	23	J 25	A 16	J 28	A 16	J 16	A 16	
3	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	26	G	G	G	39	43	41	44	43	37	J 42	A 26	J 20	A 18	E 16	J 19	A 16	
4	19	E 16	B 16	E 16	B 16	E 16	B 16	E 16	26	32	G	G	G	40	J 42	A 54	J 45	A 41	J 44	A 43	J 32	A 19	J 16	A 19	E 16	
5	20	J 35	AJ 33	J 27	A 16	E 16	B 16	E 16	26	G	G	41	40	41	40	46	42	G	G	24	J 29	A 16	J 16	A 16	E 16	
6	J 24	AJ 22	A 16	E 20	B 16	E 16	B 16	E 17	27	34	38	J 48	A 52	J 48	A 40	42	46	J 32	A 35	J 40	A 29	J 34	A 28	J 16	A 16	
7	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	27	33	G	G	40	G	44	45	G	G	38	32	30	25	16	20	16	
8	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	20	31	36	G	39	G	43	G	43	39	J 52	A 45	A 41	J 26	A 20	J 18	A 16	
9	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	20	27	34	G	40	42	43	45	42	29	25	38	28	26	16	16	16	
10	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	17	G	G	40	40	43	G	G	G	G	G	J 33	A 31	J 36	A 38	E 16	A 24	
11	E 16	B 21	A 16	E 16	B 16	E 16	B 16	E 19	28	37	41	41	44	40	J 50	A 52	J 46	A 44	34	J 32	A 29	J 18	A 30	E 16	A 16	
12	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	20	28	33	G	G	46	43	47	45	44	31	J 43	A 32	E 16	J 19	A 16	A 23	
13	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	20	28	G	42	44	43	45	58	52	39	G	J 18	A 16	E 16	J 16	A 21	20	
14	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	18	G	43	42	G	43	G	J 52	A 52	G	G	30	38	16	16	16	41	
15	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	22	G	G	G	G	40	J 38	A 40	46	30	J 28	A 53	A 48	J 39	A 36	J 19	A 26	
16	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	21	30	G	40	43	46	45	46	46	42	39	34	30	26	26	22	25	
17	J 22	AJ 18	A 16	E 16	B 16	E 16	B 16	E 20	28	34	41	G	G	G	44	43	40	J 40	G	J 46	A 47	J 29	A 22	E 26	61	
18	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	20	G	G	G	41	43	43	46	41	39	38	32	27	20	16	16	16	
19	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	21	31	37	40	40	G	J 49	A 51	46	40	J 46	A 69	J 35	A 26	E 16	A 16	16	
20	J 24	A 16	E 16	B 16	E 16	B 16	E 16	B 16	20	29	34	39	42	42	44	42	40	38	36	G	29	32	17	20	16	
21	J 22	A 16	E 16	B 16	E 16	B 16	E 16	B 16	22	31	35	42	44	44	G	44	57	51	45	38	40	24	34	16	84	
22	J 16	AJ 34	AJ 47	A 30	J 38	A 21	24	34	37	41	43	48	48	48	50	54	G	34	29	34	42	26	23	23		
23	J 26	A 16	E 16	B 16	E 16	B 16	E 16	B 16	22	30	36	38	G	41	48	46	48	43	G	27	34	39	53	24	28	
24	J 37	AJ 21	A 22	E 16	B 16	E 16	B 16	E 24	36	34	42	J 66	40	G	G	G	G	G	33	25	56	47	25	21	34	
25	J 42	A 26	19	J 19	A 20	A 18	23	27	32	35	42	41	42	41	G	G	G	G	G	G	21	E 16	J 31	A 25	22	
26	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	23	31	35	40	40	40	44	G	G	G	34	25	22	J 17	A 17	A 31	A 16	
27	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	21	29	38	42	40	J 49	47	46	43	G	37	G	30	30	35	27	64	
28	J 34	A 16	E 16	B 16	E 16	B 16	E 16	B 16	23	31	39	43	44	43	43	G	G	42	39	40	J 39	A 24	25	64	32	
29	E 16	B 20	E 16	B 18	E 19	B 16	E 26	30	38	45	41	43	43	43	78	41	46	G	G	29	33	43	87	34	32	
30	J 22	AJ 17	AJ 19	A 16	E 15	B 16	E 28	J 44	AJ 53	AJ 48	AJ 51	A 42	G	G	G	G	G	G	J 42	A 44	A 25	A 54	A 109	34	22	
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	
MED	E 16	B 16	E 16	B 16	E 16	B 16	E 16	B 16	20	28	34	38	40	42	42	43	44	43	36	32	30	J 29	A 18	A 20	A 19	A 16
UQ	J 22	AJ 20	AJ 19	A 16	E 16	B 16	E 22	31	36	41	42	43	44	44	46	48	46	39	38	40	34	34	28	26	23	
LQ	E 16	B 16	E 16	B 16	E 16	B 16	E 18	26	G	G	G	G	G	G	G	G	G	G	G	G	J 27	A 25	E 16	E 16	E 16	

APR. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 31°12.0'N LON. 130°37.0'E OSWEEP 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		37		E B	E B	E B	E B	E B		G							G	G			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						G					G		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		G	G										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									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		G	G							G	G			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				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							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			G			G								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			G							G	G			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		G	G							G	G			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			G											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												G		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		G	G											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			G											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		G												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			G	G								G		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			G	G										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												G		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						G								E B	E B	E B	E B
22	E B		30	28	E B	E B	E B	E B											G			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	20	17	E B	E B	E B	E B	E B	E B														E B	E B	E B	E B
25	20	23	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	27	E B	16	31	29	E B	E B	E B														E B	E B	E B	E B
29	E B	E B	E B	E B	E B	E B	E B	E B														E B	E B	E B	E B
30	E B	E B	E B	E B	E B	E B	E B	E B														E B	E B	E B	E B
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E B	E B	E B	E B	E B	E B	E B	E B														E B	E B	E B	E B
U Q	16	16	16	16	16	16	16	16														20	20	16	16
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

APR. 2023 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 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

$\frac{H}{D}$	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	17	18	19	22	22	34	21	20	18	19	16	16	16	16	16	16
2	16	16	16	16	16	16	16	16	16	17	21	21	21	22	22	22	21	17	13	16	16	16	16	16
3	16	16	16	16	16	16	16	16	16	16	21	22	23	22	22	20	20	16	15	16	16	16	16	16
4	16	16	16	16	16	16	16	16	18	20	21	21	22	22	22	20	18	16	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	17	20	21	23	24	22	22	22	20	16	16	16	16	16	16	16
6	16	16	16	16	16	16	14	16	16	16	18	22	22	21	24	39	18	16	16	16	16	16	16	16
7	16	16	16	16	16	16	16	16	16	18	22	20	22	24	21	22	18	16	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	18	20	21	23	24	24	24	22	20	17	16	16	16	16	16	16
9	16	16	16	16	16	16	16	16	18	21	22	24	23	28	22	23	18	15	16	16	16	16	16	16
10	16	16	16	16	16	16	17	16	18	20	22	23	28	23	24	22	22	18	16	16	16	16	16	16
11	16	16	16	16	16	16	16	16	16	20	22	20	23	22	23	21	19	16	16	16	16	16	16	16
12	16	16	16	16	16	16	16	16	19	22	22	22	24	24	25	25	20	17	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	15	20	23	22	23	22	23	24	20	18	16	16	16	16	16	16
14	16	16	16	16	16	16	16	16	18	20	24	22	26	22	22	22	21	17	16	16	16	16	16	16
15	16	16	16	16	16	16	16	16	18	20	21	23	22	24	24	21	21	16	17	16	16	16	16	16
16	16	16	16	16	16	16	16	16	18	19	21	22	24	23	23	23	21	18	16	16	16	16	16	16
17	16	16	16	16	16	16	16	16	17	21	21	22	24	25	22	22	21	20	17	16	16	16	16	16
18	16	16	16	16	16	16	16	16	16	19	20	20	26	23	23	23	18	15	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	19	21	21	21	24	25	23	20	20	20	16	16	16	16	16	16
20	16	16	16	16	16	16	16	16	17	21	21	23	29	27	24	23	22	21	16	16	16	16	16	16
21	16	16	16	16	16	16	16	17	18	23	24	23	24	25	25	24	21	19	16	16	16	16	16	16
22	16	16	16	16	16	16	16	16	20	22	22	22	23	23	23	23	22	16	16	16	16	16	16	16
23	16	16	16	16	16	16	16	16	18	20	22	24	24	23	21	21	20	20	16	16	16	16	16	16
24	16	16	16	16	16	16	16	16	18	20	21	22	28	27	24	23	22	20	15	16	16	16	16	16
25	16	16	16	16	16	16	16	17	20	20	22	24	25	24	24	24	22	19	16	16	16	16	16	16
26	16	16	16	16	16	16	16	16	20	21	22	22	22	26	24	24	21	20	18	16	16	16	16	16
27	16	16	16	16	16	16	16	16	17	19	23	22	26	32	23	23	22	18	16	16	16	16	16	16
28	16	16	16	16	16	16	16	16	20	18	25	28	28	28	24	23	21	20	16	16	16	16	16	16
29	16	16	16	16	16	16	16	16	20	22	27	24	22	25	24	26	20	18	18	16	16	16	16	16
30	16	16	16	16	15	16	16	18	21	21	23	29	24	24	29	22	21	18	16	14	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	18	20	22	22	24	24	23	22	20	18	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	19	21	22	23	25	25	24	23	21	19	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	17	19	21	22	22	22	22	22	20	16	16	16	16	16	16	16

APR. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 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	282	287	266	283	310	324	327	337	323	314	312	293	297	299	295	295	291	304	313	325	J R	R	264	272	
2	266	271	267	322	285	291	302	340	317	306	302	300	297	297	301	296	302	293	305	318	310	292	280	278	
3	276	290	305	307	318	294	305	339	347	317	312	285	287	288	294	290	291	298	309	345	284	251	267	278	
4	298	283	285	272	278	283	314	351	342	330	299	294	300	297	300	295	297	321	331	314	271	270	263	271	
5	285	295	300	328	288	279	292	330	321	320	308	286	293	290	294	297	289	299	315	318	279	279	273	262	
6	279	281	302	298	288	284	312	347	332	315	313	291	290	295	292	299	292	J R	305	314	J R	277	273	273	
7	290	303	312	332	297	278	293	334	332	322	293	291	296	297	292	294	293	302	317	323	J R	255	273	284	
8	292	J R	288	298	295	307	317	337	340	315	312	301	295	298	300	295	306	307	307	331	326	272	260	280	
9	288	287	279	299	338	302	319	345	330	317	300	296	289	288	291	296	304	303	315	322	317	272	281	307	
10	281	274	276	316	317	308	336	340	330	315	302	282	295	292	290	292	287	301	315	322	333	251	259	268	
11	290	285	324	347	268	277	317	341	313	308	301	299	304	300	294	294	289	301	308	308	319	309	256	265	
12	287	304	297	302	279	278	289	329	314	308	306	287	292	294	291	297	295	297	313	330	329	264	270	274	
13	293	294	292	323	287	284	315	335	313	308	280	281	289	294	288	287	282	294	302	306	302	305	303	284	
14	287	283	283	296	286	271	288	340	328	315	284	285	286	291	294	285	280	290	300	306	319	273	275	277	
15	277	276	297	317	284	275	309	349	325	299	284	272	282	283	287	284	289	289	296	311	319	298	259	279	
16	275	276	277	278	263	270	309	333	301	311	289	281	278	282	281	287	289	293	296	307	302	274	270	287	
17	294	305	300	302	270	278	295	331	317	318	291	284	287	280	287	290	284	291	299	322	308	272	268	270	
18	282	282	271	275	279	288	305	315	302	283	295	290	289	295	291	287	284	301	311	316	305	267	263	268	
19	286	291	302	294	251	260	291	333	297	291	294	291	286	288	289	292	296	298	310	311	312	260	259	265	
20	269	280	281	276	271	274	268	310	323	318	301	294	293	294	295	287	299	311	313	312	295	281	267	272	
21	278	291	295	311	293	278	325	338	308	295	295	284	291	286	292	297	298	305	313	304	296	304	272	276	
22	286	287	284	274	280	283	307	334	324	318	289	276	295	303	293	293	301	308	319	310	305	276	259	265	
23	277	279	285	288	295	275	307	328	331	327	298	273	289	297	296	291	299	309	317	308	285	273	272	289	
24	274	284	268	297	280	262	304	286	285	234	G	275	222	218	233	259	259	252	269	296	242	240	241	254	
25	263	279	272	276	316	323	340	342	346	340	329	320	315	320	319	307	310	310	313	327	307	301	286	279	
26	282	276	282	291	287	284	307	322	H	318	322	288	278	292	304	300	296	299	303	320	319	310	287	273	261
27	271	274	297	301	270	280	305	322	324	332	296	278	298	297	296	294	297	313	311	319	288	271	263	269	
28	278	275	287	290	272	274	316	324	314	321	306	295	298	295	301	309	305	301	334	310	299	266	263	273	
29	277	277	284	305	279	280	300	308	328	316	293	284	288	294	297	302	310	308	294	293	317	302	263	269	
30	294	282	282	286	280	301	307	335	351	325	299	288	294	292	302	309	309	306	318	340	328	267	265	260	
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	282	283	285	298	284	280	307	334	324	316	298	286	292	294	294	294	296	301	312	315	308	272	267	272	
U Q	288	291	297	311	295	291	316	340	331	321	306	294	296	297	297	297	301	307	315	322	319	287	273	279	
L Q	277	277	279	286	278	275	300	328	314	308	291	281	288	288	291	290	289	294	305	308	296	267	263	268	

APR. 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 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	LU	LU	LU	L	A	A	L	L							
2										L	L	L	L	L	L	L		L							
3									L	L	L	L	L	L	L	L	L	L	L						
4										L	LU	LU	LU	LU	L	L	L								
5										L	L	L	L	L	L	L	L	L							
6										U	L	L		LU	L	L	L	L							
7										L	L	L	LU	L	LU	L	L	L	L						
8										U	LU	LU	L	L	LU	L	L	L	L						
9									L	LU	LU	LU	LU	L	L	L	L	L	L	L					
10									L	L	L	L	LU	LU	L	LU	LU	L							
11										L	LU	LU	L	LU	L	L	L	L	L						
12										L	L	L	LU	L	L	LU	L	L	L						
13										L	LU	LU	L	L	L	L	L	L	L						
14									L	L	L	LU	L	L	LU	L	L	L	L						
15									L	L	L	L	LU	LU	LU	L	L	L	L						
16										L	LU	L	LU	LU	L	LU	L	L	L						
17										L	L	L	LU	LU	LU	L	L	L	L						
18										U	LU	LU	L	L	L	L	LU	L	L	L					
19										L	L	L	L	L	L	LU	L	LU	L	L					
20									L	L	L	LU	LU	LU	L	LU	L	L	L						
21										L	L	L	LU	L	L	L	L	L	L						
22										U	L	LU	LU	L	L	LU	L	L	L	L					
23										L	L	L	L	L	L	L	LU	L	L	L					
24										U	L	347	341	379	353	373	366	384	379	359	341	329			
25										LU	L	L	L	L	L	LU	LU	LU	L	L					
26									L	L	LU	L	L	L	L	LU	L	L	L	L					
27										LU	L	L	L	L	LU	L	L	L	L						
28										L	LU	LU	L	L	L	L	LU	L	L	L					
29										LU	L	LU	LU	LU	A	LU	L	L	L	L					
30										L	LU	L	LU	L	L	L	L	L	L	L					
31										L	LU	L	LU	L	L	L	L	L	L	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								1	1	9	9	15	20	17	15	12	7	2							
MED								U	L	347	341	387	374	374	366	351	366	362	375	353					
U Q										U	LU	LU	LU	L	L	LU	LU	LU	L						
L Q										L	LU	LU	LU	L	LU	L	L	L							

APR. 2023 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 31°12.0'N LON. 130°37.0'E 0SWEEP 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										238	254	240	292	264	260	E A 274	268	254							
2										226	252	252	258	258	254	274		236							
3									216	222	254	236	292	302	292	286	268	276	244						
4										214	258	266	262	270	270	266	278								
5										246	250	270	280	294	278	262	254	248							
6										232	238		258	280	284	266	238	262							
7										230	290	268	276	274	254	276	262	270							
8										224	258	244	302	282	286	276	266	254							
9									224	232	256	264	284	288	292	276	262	240	242						
10									214	228	248	270	290	296	280	288	272	260							
11										250	250	266	280	268	284	280	250	256	248						
12										236	256	288	288	278	282	270	262	274							
13										252	258	304	294	284	282	292	280	262	240						
14									230	226	256	292	294	298	282	290	276	270							
15										254	250	234	332	280	308	294	282	288	272						
16										256	268	312	302	270	302	292	266	262							
17										246	284	294	252	310	308	254	274	286							
18										278	268	298	280	290	266	280	274	248							
19										250	278	276	292	298	274	276	274	260							
20									248	248	240	286	278	292	302	298	276	246							
21										248	282	308	298	278	292	290	270	254							
22										242	306	338	282	274	286	290	276	258	236						
23										252	268	312	302	292	276	292	278	252	238						
24								328	420	584	G	392	550	516	426	372	346	372	272						
25									218	232	238	280	262	266	260	240	230	258							
26								226	222	228	246	300	280	268	274	264	268	248	240						
27									234	244	230	274	270	298	286	272	272	250							
28									244	254	250	262	284	268	292	266	270	248							
29									244	246	220	252	270	292	276	278	268	250							
30										262	302	276	292	292	282	262	256	260							
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								2	12	29	30	29	30	30	30	30	29	29	9						
MED								277	232	244	256	276	284	283	283	276	270	258	242						
U Q									246	250	278	302	294	296	292	290	276	270	248						
L Q									220	229	248	265	276	270	276	266	262	250	239						

APR. 2023 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 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	292	264	290	266	232	206	206	194	200	192	182	186	180	238	A	A	208	220	236	222	196	192	272	278	
2	282	270	274	212	240	238	222	208	200	198	180	162	198	208	214	238	234	210	238	220	222	236	228	252	
3	284	260	246	230	200	224	230	212	208	204	186	174	212	200	206	206	206	E A	236	236	206	184	250	294	274
4	244	244	258	250	246	234	224	200	206	192	184	176	182	186	210	208	218	250	220	202	222	260	290	292	
5	272	254	236	222	204	236	234	212	212	200	190	200	182	192	216	202	204	204	224	218	200	214	256	294	
6	280	258	240	228	224	238	236	208	212	184	222	E A	226	212	186	218	236	204	222	242	224	208	218	262	288
7	256	234	232	226	196	256	252	206	210	196	198	198	210	232	196	202	218	218	234	216	200	198	286	266	
8	246	234	238	232	232	218	236	210	212	192	174	208	174	200	186	228	206	226	250	232	200	210	270	266	
9	270	264	264	240	202	188	228	204	196	192	194	180	206	240	202	202	206	230	236	218	198	224	262	238	
10	244	288	292	242	222	224	222	196	198	194	188	192	182	178	232	204	202	224	236	226	198	190	270	294	
11	264	256	216	192	240	270	236	212	210	196	196	216	178	222	226	226	224	210	226	232	214	204	232	276	
12	268	234	244	236	242	258	242	210	210	204	190	176	182	224	220	204	232	222	242	226	196	200	270	282	
13	262	244	244	204	194	250	234	212	206	198	190	202	178	224	E A	266	248	218	226	232	232	222	222	232	
14	250	266	270	258	234	278	246	212	210	198	192	172	200	194	198	206	204	208	242	230	214	224	262	254	
15	260	266	250	204	232	254	244	212	202	202	200	188	172	180	190	202	212	206	252	230	214	204	246	280	
16	272	284	258	226	256	284	236	210	210	190	190	238	198	226	226	220	222	218	236	238	232	244	270	268	
17	248	240	224	218	240	262	236	214	210	196	190	190	164	186	212	E A	212	202	220	252	238	216	222	268	294
18	272	262	284	250	222	194	228	214	206	206	192	194	180	226	178	202	190	210	234	234	212	220	286	290	
19	272	260	240	234	296	304	228	216	202	208	200	186	178	214	210	194	228	210	246	236	232	238	312	300	
20	292	268	260	240	240	238	230	220	208	206	198	196	188	188	194	194	206	222	230	224	216	234	266	282	
21	268	264	252	218	224	240	226	214	206	198	200	204	190	190	A	280	232	238	248	222	244	E A	270	268	
22	262	E A	292	272	234	264	230	220	214	196	180	240	194	218	218	220	208	228	228	226	238	230	286	294	
23	276	272	252	252	236	258	234	220	210	198	208	208	200	182	186	232	206	218	226	246	242	280	282	262	
24	290	252	260	228	242	240	270	282	230	212	222	214	212	204	198	218	226	240	254	E A	296	E A	334	314	306
25	292	278	274	278	226	216	212	212	192	184	206	166	206	198	190	188	192	204	226	222	212	228	250	258	
26	274	290	278	248	236	258	236	220	206	200	198	174	172	204	192	200	196	220	228	216	208	242	264	304	
27	294	288	250	214	270	288	220	214	214	210	196	196	246	244	224	218	218	226	230	228	238	E A	312	304	
28	292	288	270	262	278	272	208	212	212	212	182	188	224	196	186	222	208	230	238	218	222	E A	298	292	
29	276	268	262	224	226	244	228	214	204	210	186	184	192	A	182	212	212	214	232	268	240	240	274	294	
30	260	262	272	260	268	218	204	216	232	212	220	184	184	190	184	202	206	234	240	222	208	242	286	282	
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	29	28	29	30	30	30	30	30	30	30	30	
MED	272	264	258	233	234	242	230	212	209	198	192	190	189	200	202	207	208	220	236	226	214	226	270	282	
U Q	282	272	272	250	242	262	236	214	212	206	200	204	206	224	218	224	218	228	242	232	232	242	286	294	
L Q	260	254	244	222	224	224	224	210	204	194	186	180	180	189	190	202	204	210	230	220	200	214	262	266	

APR. 2023 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 31°12.0'N LON. 130°37.0'E PSWEEP 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								
								104	98	98		98					96	104									
2							B	A	A		A	A							A								
										98			110	110	106	102	102	102									
3							B					A	A	A	A	A		A	A								
								102	98	96	96						96										
4							B							A	A	A	A	A	A								
								102	100	100	98	98	98														
5							B				A	A				A				A							
								100	98	96				96			98	100	102								
6							A						A	A	A	A											
								102	100	98	98	98						106	104	104							
7							B																				
								102	102	96	96	94	94	94	98	98	102	102	104								
8							A				A																
								102	100	98		98	102	102	102	100	106	106	106								
9							A	A	A		A																
										98				104			104	104	98	98							
10							B				A	A															
								100	98	98			104	100			100	100	102	110							
11							A	A	A	A	A	A	A	A	A	A	A	A	A								
12							A						A	A	A	A	A	A	A								
								102	98	98	98	98															
13							A				A				A					B							
								100	100	96		96	96	98			96	102	102	102							
14							A			A	A									A							
								100	98			98		98	98			100	100	102							
15							A					A	A	A	A					A							
								102	98	98	98						102	102									
16												A	A		A				A								
							132	100	98	96	96		100			A	100	100		104							
17							A									A	A	A		A							
								96	96	96	96	96	100	100					102								
18													A	A	A	A				B							
							126	100	100	98	98	98							98	102							
19							A							A						A							
								102	98	98	96	96	98		98	98	98	98	100								
20							A							A	A	A	A			A							
								100	96	96	96	98							102	102							
21							A													A							
								102	96	98	98	98	98	98	98	98	102	102	106								
22													A							A							
							122	100	98	98	98	98		98	98	100	100	100	102								
23							A	A								A				A							
									98	98	98	98	98	98			98	98	98	106							
24							A													A							
								102	98	98	98	98	98	98	98	100	104	102	100								
25							A	A	A											A							
										96				96	100	100	100	104	104								
26							A	A	A	A	A	A			A					A							
															98	98	102	106	106								
27							A			A										A							
								102	102		98		98	98		100	102	104	104								
28							A													A							
								102	100	100	98		98	98	100	100	102	104									
29							A									A				A							
								102	98	98	98	98	98	98		102	102	102	108								
30										A	A								A								
							120	98	98					98	98	98	98	98									
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT							4	24	25	25	18	17	15	19	12	20	24	24	19								
MED							124	102	98	98	98	98	98	98	98	100	102	102	104								
U Q							129	102	100	98	98	98	100	100	100	100	102	104	106								
L Q							121	100	98	96	96	97	98	98	98	98	100	100	102								

APR. 2023 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 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	90	88	92	B	B	88	B	160	G	110	102	96	98	90	84	84	G	G	108	94	94	90	84	92
2	92	90	88	86	90	90	96	176	148	106	102	114	162	90	120	194	162	G	108	88	B	90	B	B
3	B	B	B	B	B	B	B	162	G	G	G	100	194	94	90	96	96	90	88	90	90	B	146	B
4	124	B	B	B	B	B	B	170	186	G	G	G	96	94	88	86	86	84	82	82	84	98	98	B
5	98	94	88	88	B	B	B	160	G	G	100	100	100	100	104	100	G	G	102	96	96	B	B	B
6	108	80	B	90	B	B	156	162	134	132	98	96	94	94	88	104	84	162	120	100	92	90	80	B
7	B	B	B	B	B	B	B	158	146	G	114	G	174	174	G	G	188	156	124	110	B	80	B	B
8	B	104	B	B	B	B	124	116	112	G	102	G	G	164	G	178	128	114	102	94	94	100	86	B
9	B	B	B	B	98	B	94	94	172	G	94	90	90	170	86	88	86	106	102	92	B	B	B	B
10	B	B	B	B	B	B	B	G	G	106	104	104	G	G	98	94	G	G	104	96	B	B	B	116
11	B	92	B	B	B	B	134	126	106	104	102	96	124	88	88	86	84	100	84	82	84	86	B	B
12	B	B	B	B	B	B	154	146	152	G	G	G	94	168	132	92	90	114	86	86	B	84	B	84
13	B	B	B	B	B	B	140	148	G	G	98	168	102	108	108	102	108	G	G	86	B	B	80	86
14	B	B	B	B	B	B	146	G	G	110	98	G	178	G	G	110	G	G	140	94	B	B	B	86
15	B	B	B	B	B	B	124	G	G	G	G	98	92	96	90	90	88	86	82	82	82	86	86	B
16	B	B	B	B	B	B	132	134	G	102	98	96	88	184	192	158	174	106	114	104	94	94	94	B
17	112	90	B	B	90	B	172	130	142	106	G	G	G	G	172	110	94	G	98	98	88	80	82	92
18	B	B	B	90	B	B	168	G	G	G	110	102	96	170	100	100	98	184	100	100	B	B	B	B
19	B	B	B	B	B	B	150	138	122	118	118	G	G	104	102	120	146	102	96	96	92	B	B	B
20	102	B	B	B	B	B	144	122	108	102	100	100	98	98	96	108	102	G	110	94	94	94	B	B
21	84	B	92	B	B	B	152	134	132	112	108	108	G	132	104	142	134	126	104	100	92	B	96	96
22	96	90	90	94	88	92	146	128	118	108	98	174	90	106	116	104	G	176	140	106	94	102	86	98
23	94	B	B	B	B	94	130	140	138	118	G	100	96	98	110	172	G	G	136	100	98	96	94	94
24	94	92	104	B	B	B	130	120	130	114	112	136	G	G	G	G	G	216	108	94	92	92	94	94
25	92	88	94	90	90	94	140	124	142	126	172	94	154	154	G	G	G	G	G	102	B	92	92	94
26	B	B	B	B	B	B	138	122	124	116	96	96	96	152	G	G	G	194	164	108	82	98	96	82
27	B	B	B	B	B	B	142	158	122	112	106	92	182	174	178	G	180	G	108	98	94	94	94	92
28	90	B	88	88	B	B	124	124	112	102	98	96	172	G	G	136	128	106	102	100	94	92	92	96
29	B	96	B	92	92	B	120	126	108	100	98	102	112	92	98	104	G	G	112	104	98	96	90	90
30	94	84	96	B	B	B	110	100	100	106	106	98	G	G	G	G	G	100	92	94	92	92	90	90
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	14	12	9	8	6	5	24	26	21	20	24	23	23	24	22	24	19	18	28	30	21	21	19	16
MED	94	90	92	90	90	92	139	134	130	109	102	100	98	105	101	104	102	110	104	96	92	92	92	92
U Q	102	93	95	91	92	94	148	158	144	115	107	104	162	166	116	128	146	162	113	100	94	96	94	95
L Q	92	88	88	88	90	89	124	124	112	105	98	96	94	94	90	93	88	100	97	92	89	88	86	88

APR. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

APR. 2023 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	F4	F5	F2		F1		H1		C1	C1	C2	C1	L2	L4	L5			CL33	F7	F1	F1	F1	F1	F1	F1	
2	F1	F1	F2	FQ31	F1	F1	L1	HL11	HL11	C1	C1	CL11	HL11	L1	C1	H1	H1		CL11	F1		F2				
3								H1				C1	HC11	C2	L1	C1	C1	L3	L3	F1	F1		F1			
4	F1							H1	H1				C1	L1	L3	L2	L3	L3	L5	F8	F2	F1	F1			
5	F1	F3	F4	F3				H1			C1	C1	C1	C1	C1	C1			C2	FF42	F1					
6	FF12	F2		F1			H1	HL12	H1	H1	C3	C2	L2	L1	L2	C1	L2	H2	CL41	F5	F5	F2	F1			
7								H1	H1		C1		H1	H1			H1	H1	C4	F3		F1				
8		F1					C2	C2	C2		C1			H1		H1	CL11	C2	C5	F7	F7	F1	F1			
9				F1			L2	L4	HC11		L1	L1	L2	HL11	L1	L1	L1	CL22	C2	F3						
10										C1	C1	C1			L1	L1			C4	FF72					F1	
11		F3					H1	CL11	CL31	C1	C1	C1	CL11	L2	L3	L3	L3	CL13	L4	F6	F1	F2				
12							H1	H1	H1				L1	HL11	HL11	L2	L2	CL13	L4	F6		F1			F1	
13							H1	H1			C1	HC11	C1	C1	CL33	C2	C1			L1			F3	F1	F1	
14							H1			C1	L1		HC11			C1			H2	L8					F1	
15							C1					L1	L1	L1	L2	L1	L1	L3	L5	L5	F4	F3	F1			
16							H2	H1		C1	C1	C1	L2	HL11	HC11	HC11	H1	C1	C3	C3	F3	F1	F2			
17	F1	F1		F1			HC11	H1	H1	C1				HC11	CL12	L2			C4	C7	F3	F2	F1	F2		
18				F1			H1			C1	C1	L1	HL11	L1	C1	C1	H1	C3	C4	L4	F3					
19							H1	H1	C2	C1	C1			C1	C1	C2	H1	C3	C4	L4	F3					
20	F1						H1	C1	C1	C1	C1	C1	C1	L1	L1	CL11	C1		C3	L3	F1	F1				
21	F1		F3				H1	H1	H1	C1	C1	C1		H1	C2	H2	H1	C2	C2	C2	F3		F5	F2	F2	
22	F1	F9	F3	F3	F4	F1	H2	C3	C1	C1	C1	HC11	L2	C1	C1	C2		H1	H1	C2	F9	FF12	F1	F3	F3	
23	F4				F2		H1	H1	H1	C1		C1	C2	C1	C1	H1			H1	C8	F9	F4	F4	F5	F5	
24	F5	F3	F1				H1	C2	H1	C2	C2	H1						H1	CL11	L6	F5	F6	F2	F5	F5	
25	F4	F3	F1	F2	F1	F1	HL11	CL11	CL11	C1	H1	L1	L1	HL11	H1					C3		F6	F3	F2	F2	
26							H1	CL22	CL12	CL11	L1	L1	L1	HL11				H1	H1	C2	F1	F3	F4	F2	F2	
27							H1	H1	C1	C1	C1	L2	H1	H1	HL11		H1		C2	L4	F7	F5	F5	F6	F6	
28	F6		F5	F5			C1	C1	C2	C1	C1	L1	H1			H1	C1	C2	C4	C2	F4	F8	F5	F1	F1	
29		F1		F1	F1		C2	C1	C1	C2	C1	C1	C1	L3	C1	C1			C1	C4	F9	F8	F5	F2	F2	
30	F1	F2	F1				C2	C4	C3	CL21	CL21	C1						C2	L3	L3	F4	FQ41	F2	F2	F2	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																										
MED																										
U Q																										
L Q																										

IONOSPHERIC DATA STATION Okinawa

APR. 2023 f_{XI} (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X	X	X	X	X	X	X															X	X	X	X
	91	85	80	78	82	64																186	175	162	165
2	X	X	X	X	X	X	X															X	X	X	X
	191	154	124	110	83	80																113	92	93	94
3	X	X	X	X	X	X	X															X	X	X	X
	88	88	93	89	63	49																117	141	141	148
4	X	X	X	X	X	X	X															X	X	X	X
	147	140	118	107	89	74																105	108	110	105
5	X	X	X	X	X	X	X															X	X	X	X
	106	104	104	80	58	52																156	158	168	154
6	X	X	X	X	X	X	X															X	X	X	X
	171	163	143	131	78	78																169	150	138	140
7	X	X	X	X	X	X	X															X	X	X	X
	145	142	136	122	72	60																149	138	136	140
8	X	X	X	X	X	X	X															X	X	X	X
	130	109	95	86	79	66																130	148	161	147
9	X	X	X	X	X	X	X															X	X	X	X
	114	113	135	129	99	67																126	125	118	120
10	X	X	X	X	X	X	X															X	X	X	X
	114	105	114	113	102	91																154	150	146	142
11	X	X	X	X	X	X	X															X	X	X	X
	127	134	133	95	66	61																188	163	152	155
12	X	X	X	X	X	X	X															X	X	X	X
	153	153	131	106	76	73																127	126	121	116
13	X	X	X	X	X	X	X															X	X	X	X
	121	117	108	94	68	59																176	177	158	140
14	X	X	X	X	X	X	X															X	X	X	X
	124	124	124	118	92	89																156	151	152	164
15	X	X	X	X	X	X	X															X	X	X	X
	159	138	124	112	87	72																139	113	107	108
16	X	X	X	X	X	X	X															X	X	X	X
	110	99	88	79	72	72																157	160	171	171
17	X	X	X	X	X	X	X															X	X	X	X
	170	166	145	104	83	73																113	104	110	114
18	X	X	X	X	X	X	X															X	X	X	X
	114	110	102	96	91	85																114	124	124	117
19	X	X	X	X	X	X	X															X	X	X	X
	116	117	112	89	78	77																154	183	176	178
20	X	X	X	X	X	X	X															X	X	X	X
	169	168	135	125	96	94																148	150	146	142
21	X	X	X	X	X	X	X															X	X	X	X
	131	130	122	107	78	66																136	126	120	106
22	X	X	X	X	X	X	X															X	X	X	X
	108	99	98	81	75	77																112	93	86	88
23	X	X	X	X	X	X	X															X	X	X	X
	90	85	87	86	74	68																115	122	128	114
24	X	X	X	X	X	X	X															X	X	X	X
	115	100	94	84	72	66																74	72	72	72
25	X	X	X	X	X	X	X															X	X	X	X
	73	74	76	72	72	58																114	96	97	94
26	X	X	X	X	X	X	X															X	X	X	X
	89	84	80	73	65	62																115	94	92	90
27	X	X	X	X	X	X	X															X	X	X	X
	89	88	88	84	66	66																100	91	90	94
28	X	X	X	X	X	X	X															X	X	X	X
	92	87	88	80	76	76																142	135	121	116
29	X	X	X	X	X	X	X															X	X	X	X
	119	116	100	88	67	66																132	111	110	107
30	X	X	X	X	X	X	X															X	X	X	X
	108	108	94	91	81	78																118	118	119	118
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
MED		X	X	X	X	X	X															X	X	X	X
		116	112	106	92	77	70															131	126	122	118
U Q		X	X	X	X	X	X															X	X	X	X
		145	138	124	110	83	77															154	150	152	147
L Q		X	X	X	X	X	X															X	X	X	X
		106	99	93	84	72	64															114	108	110	106

APR. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2023 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		85	79	74	72	76	58	49	72	95	109	114	120	138	163	173	182	186	186	187	190	180	J R	169	156	159	
2		F	F	118	104	77	74	69	77	91	116	125	131	144	151	158	153	145	130	142	158	107	86	87	88		
3		82	82	86	82	H	43	48	78	93	103	114	124	145	J R	169	173	162	148	146	158	126	111	R	135	135	142
4		141	134	112	101	83	68	66	93	94	98	109	128	146	151	148	146	144	143	129	103	99	102	104	99		
5		100	98	98	74	52	46	51	78	101	112	108	120	140	151	163	168	170	168	167	157	J R	150	J R	162	148	
6		U R	F	J R		72	72	72	87	96	111	116	127	150	171	191	U R	193	191	190	194	192	163	144	132	134	
7		139	136	129	116	66	54	60	87	102	105	116	133	154	J R	175	181	172	178	177	175	166	143	132	130	134	
8		124	103	89	80	73	60	63	87	103	105	108	121	136	165	168	164	156	152	142	132	124	R	142	R	141	
9		108	107	U R	123	93	61	59	81	94	109	113	124	134	150	154	158	155	144	133	137	120	119	112	113		
10		R	R	U R	108	96	U R	85	67	84	97	104	104	121	144	158	180	186	186	181	164	R	R	U R	136		
11		121	128	U R	127	86	60	55	58	80	100	118	130	132	148	165	173	180	184	184	178	184	182	157	146	149	
12		147	147	U R	125	100	70	67	67	93	108	114	122	134	147	163	168	161	155	156	158	144	121	120	115	110	
13		115	111	102	88	62	54	60	83	96	105	112	130	152	163	163	160	171	182	184	176	170	171	152	134		
14		118	H	U R	R	H	U R	86	83	72	104	108	97	110	129	144	156	171	174	182	185	178	R	150	145	146	158
15		153	132	118	106	81	66	78	108	100	109	110	122	138	152	161	156	159	162	160	152	133	107	101	102		
16		104	93	82	73	66	66	70	92	107	118	126	135	152	169	168	166	168	164	167	158	R	151	154	165	165	
17		164	160	139	98	77	67	75	106	110	101	105	116	125	132	137	135	131	129	135	141	107	98	104	108		
18		107	104	96	90	85	79	70	88	104	114	126	132	136	145	140	134	130	132	132	126	108	R	118	118	111	
19		110	111	106	83	72	71	77	96	98	110	122	123	138	151	158	159	158	151	142	144	U R	148	177	170	172	
20		F	162	129	116	F	F	88	86	101	115	118	127	142	151	157	153	154	165	160	145	140	142	144	140	136	
21		J R	124	116	101	72	60	72	84	91	97	114	128	140	150	157	160	158	148	140	131	130	120	114	100		
22		102	93	92	75	69	71	81	100	92	95	96	113	135	140	136	139	143	136	128	122	105	87	80	82		
23		84	79	80	80	68	62	67	87	86	91	109	123	140	152	147	140	150	152	130	117	109	116	122	108		
24		109	94	88	78	66	60	64	69	60	66	72	88	105	104	110	110	111	106	107	91	68	66	66	66		
25		67	68	70	66	66	52	57	82	92	91	96	113	130	141	135	131	132	141	146	129	108	90	91	88		
26		83	78	74	67	59	56	63	99	106	95	99	115	137	150	152	156	163	160	146	140	108	88	86	84		
27		83	82	82	78	60	60	72	91	90	99	97	110	132	140	134	136	135	131	126	118	94	85	84	87		
28		86	81	82	74	70	70	79	90	101	120	120	120	138	152	158	159	152	149	140	135	136	J R	129	115	110	
29		R	110	94	82	61	60	65	88	102	106	108	114	125	134	132	130	129	129	128	128	126	105	104	101		
30		102	102	88	84	75	72	82	94	78	91	103	114	134	151	157	153	147	148	153	144	112	112	113	111		
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	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MED		108	104	100	85	70	64	67	88	98	105	111	123	139	152	158	158	156	152	146	140	125	120	116	111		
U Q		124	130	118	104	77	71	72	94	103	112	120	130	146	163	168	166	170	168	167	158	148	144	146	141		
L Q		93	88	86	78	64	58	60	82	92	97	105	116	135	150	147	140	144	141	133	128	108	102	104	100		

APR. 2023 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2023 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E PSWEEP 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	U L	L						
2											U L	U L	U L	U L	U L	L	L	L	L					
3											U L	U L	U L	U L	U L	L	L	L						
4											U L	U L	U L	L	L	L	L	L						
5											L	U L	U L	L	L	L	L	L						
6									352		L	L	L	L	L	L	L	L	L					
7										L	L	L	U L	U L	U L	L	U L	L						
8									L	L	U L	U L	L	U L	U L	U L	L	L						
9										L	L	L	U L	U L	U L	L	U L	L						
10											U L	U L	U L	U L	U L	L	L	L	L					
11											U L	U L	U L	L	L	U L	L	L	L					
12											U L	U L	U L	U L	U L	L	L	L	L					
13											U L	U L	U L	L	L	U L	L	L	L					
14									L		U L	U L	U L	U L	U L	U L	L	L						
15										L	L	U L	U L	U L	U L	L	U L	L	L					
16										L	L	L	U L	U L	L	U L	U L	L	L					
17										L	L	L	L	L	U L	L	L	L	L					
18										L	L	U L	U L	U L	U L	U L	L	U L	L					
19											U L	U L	U L	L	L	L	L	L						
20										L	U L	U L	U L	U L	U L	U L	U L	L	L					
21											L	L	L	U L	U L	L	L	L	L					
22											U L	U L	U L	U L	U L	L	L	L	L					
23											U L	U L	U L	L	L	L	L	L	L					
24									L	U L	U L	U L	U L	U L	U L	U L	U L	L	L					
25													U L	U L	U L	U L	L	L	L					
26										L	L	U L	U L	U L	U L	U L	L	L	L					
27										L	L	U L	U L	L	U L	U L	U L	L	L					
28										L	U L	U L	U L	L	L	L	A	L	L					
29										U L	L	U L	U L	U L	L	L	L	L	L					
30											U L	U L	U L	U L	U L	L	L	L	L					
31											U L	U L	U L	U L	U L	L	L	L	L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	2	4	13	16	22	22	20	15	10	2						
MED								L	U L	U L	U L	U L	U L	U L	U L	U L	U L	L	L					
U Q								376	424	514	576	586	604	600	610	580	590	496						
L Q										U L	U L	U L	U L	L	L	U L	U L							
										506	530	564	588	568	556	564	528							

APR. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2023 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	196	284	340	368	396	388	G	384	368	340	300	220	A				
2							B	228	288	332	380	404	A	392	A	368	340	304	224	A				
3							B	228	304	348	368	392	388	A	A	A	336	296	224	A				
4							B	212	308	344	368	A	388	384	372	364	336	296	A	A				
5							B	216	296	340	380	A	412	376	376	360	344	304	232	B				
6							B	228	288	336	396	392	400	380	400	B	348	A	A	A				
7							B	220	300	344	372	372	388	384	368	364	336	300	208	A				
8							B	224	296	332	A	380	388	412	388	368	340	288	U A	A				
9							A	A	A	A	A	396	396	396	388	388	348	292	220	A				
10							B	224	300	A	376	A	A	A	A	368	336	296	228	B				
11							B	248	292	A	356	372	376	G	416	388	364	340	U A	A				
12							B	216	308	344	376	A	408	392	400	372	A	304	228	A				
13							B	236	312	344	A	396	A	412	392	376	348	308	232	B				
14							B	252	A	348	368	400	400	400	388	376	348	312	240	B				
15							B	256	304	352	372	G	416	A	U G	388	396	400	356	312	252	A		
16							B	252	312	364	396	408	408	G	408	400	380	356	312	240	A			
17							B	256	308	360	372	A	396	408	396	380	360	308	A	B				
18							B	264	316	352	372	376	384	A	A	A	352	304	232	A				
19							B	244	324	A	372	392	412	404	388	372	348	296	A	A				
20							B	A	A	A	A	A	U G	A	A	A	A	A	A	A				
21							A	244	308	336	368	400	404	408	388	368	356	312	252	B				
22							A	248	304	356	384	A	396	408	388	368	344	308	232	B				
23							B	240	316	376	A	A	U A	376	388	388	368	336	300	240	A			
24							A	232	300	328	364	G	380	384	388	368	356	328	296	A				
25							B	256	A	A	A	A	A	A	A	A	A	A	A	A				
26							A	A	304	344	360	A	A	A	G	376	368	348	300	236	B			
27							B	252	312	A	A	A	A	G	400	392	372	352	316	236	A			
28							A	256	304	340	360	384	384	388	388	368	340	304	A	A				
29							A	264	304	352	356	372	396	G	404	388	376	344	304	260	B			
30							A	A	304	340	A	A	A	A	A	A	A	348	300	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								26	26	25	22	19	21	24	24	24	27	29	21					
MED								242	304	344	372	392	396	398	388	368	344	304	232					
U Q								252	308	352	376	400	402	408	392	376	348	308	240					
L Q								224	300	340	368	376	386	388	384	368	340	298	224					

APR. 2023 foE (0.01MHz)

IONOSPHERIC DATA STATION Okinawa

APR. 2023 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23							
1	J	A	J	A	J	A	J	A	E	B	E	B		G		G	G	G	J	A	J	A		E	B	J	A	J	A		
2	J	A	J	A	E	B	E	B	J	A	J	A		G		J	A	G	G	J	A	J	A	E	B	E	B	E	B	E	B
3	E	B	E	B	E	B	E	B	E	B	J	A		G		G	G	G	J	A	J	A	E	B	E	B	E	B	E	B	
4	E	B	E	B	E	B	E	B	E	B				G		G	G	G	J	A	J	A	J	A	E	B	J	A			
5	J	A			J	A	J	A	J	A				G		G			G	J	A	J	A		E	B	E	B	E	B	
6	E	B	E	B	E	B	E	B	E	B				G		E	B	G	J	A	J	A	J	A	J	A	J	A	J	A	
7	E	B	E	B	E	B	E	B	E	B				G		G			J	A	J	A	J	A	J	A	E	B	E	B	
8	J	A	E	B	E	B	E	B	E	B				G		G			J	A	J	A	J	A	J	A	J	A	J	A	
9	E	B	E	B	E	B	J	A	J	A	J	A				G			J	A	J	A	J	A	J	A	E	B	E	B	
10	J	A	E	B	E	B	E	B	E	B				J	A			G	G			E	B	E	B	E	B	J	A	J	A
11	J	A	J	A	E	B	E	B	E	B				J	A				J	A	J	A	J	A	J	A	J	A	J	A	
12	J	A	J	A	E	B	E	B	E	B	J	A	J	A					J	A	J	A	J	A	J	A	J	A	J	A	
13	E	B	E	B	E	B	E	B	E	B				G		J	A		G	G		E	B	E	B	E	B	E	B	E	B
14	E	B	E	B	E	B	E	B	J	A	E	B		G		J	A		G	G		G	G	J	A	J	A	J	A	J	A
15	18	E	B	E	B	E	B	E	B	E	B				G				J	A	J	A	J	A	J	A	E	B	E	B	
16	19	E	B	E	B	E	B	E	B	E	B				G				J	A	J	A	E	B	E	B	J	A			
17	19	E	B	J	A			E	B	E	B								J	A	J	A	E	B	E	B	E	B	E	B	
18	E	B	E	B	E	B	E	B	E	B				G					J	A	J	A	J	A	J	A	J	A	J	A	
19	E	B	E	B	E	B	E	B	E	B				J	A				J	A	J	A	J	A	J	A	J	A	J	A	
20	E	B	J	A	E	B	E	B	E	B				J	A				J	A	J	A	J	A	J	A	J	A	J	A	
21	E	B	E	B	E	B	E	B	J	A	J	A							J	A	J	A	J	A	J	A	J	A	J	A	
22	J	A	J	A	E	B	E	B	J	A	E	B							J	A	J	A	J	A	J	A	J	A	J	A	
23	J	A	J	A	J	A	J	A	J	A	J	A							J	A	J	A	J	A	J	A	J	A	J	A	
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	
25	J	A	J	A	J	A	J	A	E	B				J	A	J	A		J	A	J	A	J	A	J	A	J	A	J	A	
26	E	B	J	A	E	B	E	B	J	A	J	A							J	A	J	A	J	A	J	A	J	A	J	A	
27	J	A	J	A	E	B	E	B	E	B	E	B							J	A	J	A	J	A	J	A	J	A	J	A	
28	J	A	J	A	J	A	J	A	J	A	J	A							J	A	J	A	J	A	J	A	J	A	J	A	
29	20	E	B	E	B	E	B	E	B	E	B								J	A	J	A	J	A	J	A	J	A	J	A	
30	J	A	E	B	E	B	E	B	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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30							
MED	19	E	B	E	B	E	B	E	B	E	B	18	26	34	38	40	43	44	45	42	40	G		J	A	J	A	J	A		
UQ	J	A	J	A	J	A	J	A	J	A	J	A							J	A	J	A	J	A	J	A	J	A	J	A	
LQ	E	B	E	B	E	B	E	B	E	B	E	B							J	A	J	A	J	A	J	A	J	A	J	A	

APR. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2023 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 26°41.0'N LON. 128°09.0'E PSWEEP 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	19	22		E B	E B	E B	E B		23	32	36	40	G		G	G	G	G			E B	E B	E B	E B	18	
2	E B	E B	E B	E B	E B	E B	E B	E B		G			42				G	G	G	32	29	E B	E B	E B	E B	16
3	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	16
4	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	16
5	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	16
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	16
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	16
8	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	24
9	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	16
10	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	20
11	28	16	16	E B	E B	E B	E B	E B					G				G	G				E B	E B	E B	E B	32
12	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	16
13	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	16
14	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	16
15	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	16
16	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	16
17	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	16
18	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	16
19	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	16
20	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	16
21	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	16
22	34	16	16	E B	E B	E B	E B	E B					G				G	G				E B	E B	E B	E B	16
23	21	20	E B				E B						G				G	G				E B	E B	E B	E B	23
24	25	22	22	33	29	23	20	28	34	38	40		43				G	G				E B	E B	E B	E B	25
25	E B			E B	E B	E B	E B						G				G	G				E B	E B	E B	E B	20
26	E B	19	E B	E B	E B	E B	E B	E B					G				G	G				E B	E B	E B	E B	16
27	21	16	16	E B	E B	E B	E B	E B					G				G	G				E B	E B	E B	E B	26
28	25	19	E B	16	22	19	E B	20	37	37	39	41	42	41	44		G	G				E B	E B	E B	E B	20
29	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	22
30	19	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	20
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	
MED	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	16
U Q	19	16	16	E B	16	16	16	18	28	34	38	41	44	44	46	44	42	37	35	32	30	26	22	16	20	
L Q	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	16

APR. 2023 fbEs (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

APR. 2023 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	16	17	20	20	20	24	26	28	22	22	19	15	15	16	16	16	16
2	16	16	16	16	16	16	16	16	18	17	20	23	24	24	24	22	22	20	16	16	16	16	16	16
3	16	16	16	16	16	16	16	16	18	20	22	25	23	22	23	23	18	14	16	16	16	16	16	16
4	16	16	16	16	16	16	16	16	18	20	22	23	26	24	22	22	20	17	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	18	21	22	25	27	22	23	21	21	18	17	17	16	16	16	16
6	16	16	16	16	16	16	16	16	20	20	22	24	25	30	26	41	18	16	14	16	16	16	16	16
7	16	16	16	16	16	16	16	16	18	22	23	25	23	28	23	22	22	15	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	16	20	20	26	23	25	24	21	21	17	17	16	16	16	16	16
9	16	16	16	16	16	16	16	16	16	21	23	24	32	28	26	25	20	18	16	16	16	16	16	16
10	16	16	16	16	16	16	16	16	20	20	24	25	28	26	24	24	20	19	16	16	16	16	16	16
11	16	16	16	16	16	16	16	16	15	21	22	23	27	28	31	24	23	17	16	14	16	16	16	16
12	16	16	16	16	16	16	16	16	18	20	22	26	26	26	26	25	21	20	17	14	15	16	16	16
13	16	16	16	16	16	16	16	16	16	22	26	26	25	26	27	22	20	15	17	16	16	16	16	16
14	16	16	16	16	16	16	16	14	14	22	21	24	24	25	25	24	22	21	16	15	16	16	16	16
15	16	16	16	14	17	16	16	16	20	22	27	23	24	29	24	23	21	17	13	14	16	16	16	16
16	16	16	16	16	16	16	16	16	18	19	25	25	28	26	26	24	22	21	16	17	16	16	16	16
17	16	16	16	16	16	16	16	16	20	22	22	23	30	26	24	23	23	21	18	18	16	16	16	16
18	16	16	16	16	16	16	16	16	16	20	22	22	23	26	26	21	18	21	14	14	16	16	16	16
19	16	16	16	16	16	16	16	16	21	28	26	26	28	25	26	30	22	22	19	16	16	16	16	16
20	16	16	16	16	16	16	16	17	18	24	22	27	31	29	24	23	22	18	21	16	16	16	16	16
21	16	16	16	16	16	16	14	16	20	21	22	26	25	25	24	25	22	18	18	16	16	16	16	16
22	16	16	16	16	16	16	16	16	19	22	26	29	27	25	24	24	22	21	16	16	16	16	16	16
23	16	16	16	16	16	16	16	16	18	22	24	26	24	24	25	23	22	21	16	16	16	16	16	16
24	16	16	16	16	16	16	16	16	20	21	20	27	26	24	24	24	23	22	16	16	16	16	16	16
25	16	16	16	16	16	16	18	16	21	23	26	25	26	28	28	24	22	19	16	16	16	16	16	16
26	16	16	18	19	18	14	14	17	20	22	22	26	28	30	28	22	22	21	13	16	16	16	16	16
27	16	16	16	16	16	16	17	17	19	21	25	26	28	26	28	23	22	22	18	15	16	16	16	16
28	16	16	16	16	16	16	16	16	21	21	25	33	26	24	26	25	23	20	16	16	16	16	16	16
29	16	16	16	16	16	16	16	18	21	22	23	25	30	30	28	23	22	21	19	16	16	16	16	16
30	16	16	16	16	16	16	16	18	20	22	22	28	29	27	29	24	22	19	22	13	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	18	21	22	25	26	26	26	23	22	19	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	20	22	25	26	28	28	27	24	22	21	17	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	18	20	22	24	24	25	24	22	21	17	16	15	16	16	16	16

APR. 2023 fmin (0.1MHz)

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IONOSPHERIC DATA STATION Okinawa

APR. 2023 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1		289	298	274	284	326	357	288	331	323	320	311	285	284	293	285	284	287	291	299	315	295	J R	275	270	263				
2		F	F	260	313	286	295	298	327	297	306	301	295	296	291	295	292	297	286	295	327	334	271	280	289					
3		282	291	297	341	346	H	292	318	349	328	319	298	280	281	J R	278	285	281	287	295	321	344	242	R	238	256	284		
4		310	312	294	271	270	275	296	349	329	311	286	295	297	292	294	296	300	310	338	285	269	264	257	260					
5		282	303	328	330	325	268	289	336	320	334	296	283	290	288	289	291	289	288	300	311	J R	273	J R	262	J R	254	257		
6		U R	F	J R	J R	318	287	313	326	319	318	302	286	290	288	280	U R	286	283	290	302	319	307	287	277	267				
7		301	305	312	355	329	285	282	332	324	309	288	286	288	J R	283	281	283	284	294	311	317	298	277	267	287				
8		290	294	296	307	312	315	312	339	340	321	302	289	279	294	287	288	284	305	308	320	279	R	U R	U R	U R	225			
9		265	286	263	303	365	325	311	337	322	313	298	283	279	289	288	292	302	308	302	304	295	243	271	272					
10		R	R	263	275	298	U R	310	315	338	331	324	286	277	290	289	283	286	287	284	307	324	284	R	U R	259	234			
11		283	301	312	355	272	288	303	320	311	307	314	292	294	289	283	281	283	288	293	307	309	287	276	274					
12		291	290	268	307	291	283	277	316	314	294	287	287	286	292	293	291	283	286	313	324	282	R	261	253	275				
13		293	304	295	338	305	289	302	324	306	290	277	275	291	292	278	274	274	285	292	298	307	291	291	286					
14		272	H	U R	R	H	U R	257	273	258	226	269	332	332	303	279	286	287	283	284	277	280	292	292	297	R	276	259	268	281
15		276	270	279	306	290	287	295	343	322	301	275	271	274	278	287	283	286	286	299	309	316	268	250	267					
16		279	275	281	297	277	282	286	309	309	296	290	275	280	282	277	279	271	274	271	299	284	R	282	271	275				
17		295	290	308	303	291	268	293	328	334	316	283	280	273	278	284	291	284	283	295	315	308	255	261	276					
18		295	294	279	285	288	293	291	295	301	285	288	294	284	294	282	280	276	290	305	317	283	R	243	246	268				
19		288	304	320	297	257	259	272	309	297	285	295	279	283	293	288	286	292	286	298	297	U R	256	252	263	266				
20		F	283	298	299	F	F	277	262	300	315	304	292	289	289	289	283	285	291	307	298	280	279	276	265	266				
21		J R	239	258	293	295	291	301	326	324	288	278	284	284	287	289	295	296	302	302	287	296	287	222	264					
22		287	293	294	287	273	293	311	340	333	307	277	268	290	294	289	288	303	309	306	308	312	262	257	270					
23		270	278	285	300	287	290	296	334	329	292	283	281	289	294	293	278	289	308	313	291	271	260	264	283					
24		269	280	284	285	289	300	306	310	279	325	226	265	218	216	240	250	260	259	287	292	235	239	240	249					
25		263	265	276	264	300	312	314	347	352	341	307	307	310	310	293	277	293	296	315	334	306	290	282	275					
26		278	280	294	288	277	292	294	329	344	306	270	275	292	297	297	294	290	293	315	321	316	271	271	266					
27		268	276	302	321	275	277	309	338	334	316	285	274	295	302	293	290	299	305	307	318	286	262	264	274					
28		280	275	292	293	271	270	300	309	307	319	308	279	285	295	299	299	293	300	301	308	260	J R	247	248	263				
29		R	273	255	285	322	278	285	295	318	324	322	301	280	289	297	290	297	299	302	297	315	279	264	267					
30		280	285	287	298	292	300	335	354	325	311	297	280	286	293	297	298	294	300	321	332	293	272	263	278					
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	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30				
MED		280	286	290	298	290	288	297	330	324	310	289	282	288	292	288	286	288	292	302	310	290	266	264	269					
U Q		290	298	298	313	308	295	311	338	331	319	301	287	290	294	293	292	294	302	311	320	307	277	271	276					
L Q		272	275	276	285	276	277	289	318	311	301	283	277	283	287	283	281	283	286	298	297	276	255	256	264					

APR. 2023 M(3000)F2 (0.01)

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IONOSPHERIC DATA STATION Okinawa

APR. 2023 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	L	L	L	L	L	L	U L	L						
2											L U L	L U L	L U L	L U L	L U L	L U L	L	L	L	L				
3											L U L	L U L	L U L	L U L	L U L	L	L	L	L					
4											L U L	L U L	L	L	L	L	L	L	L					
5											L	L U L	L U L	L	L	L	L	L	L					
6									438		L	L	L	L	L	L	L	L	L	L				
7										L	L	L U L	L U L	L U L	L U L	L U L	L U L	L	L	L				
8										L	L	L U L	L	L U L	L U L	L U L	L	L	L					
9										L	L	L	L U L	L U L	L U L	L U L	L U L	L	L	L				
10											L U L	L U L	L U L	L U L	L U L	L U L	L	L	L	L				
11											L U L	L U L	L U L	L	L U L	L U L	L	L	L	L				
12											L U L	L U L	L U L	L U L	L U L	L U L	L	L	L	L				
13											L U L	L U L	L U L	L U L	L U L	L U L	L	L	L	L				
14									L		L U L	L U L	L U L	L U L	L U L	L U L	L	L	L					
15										L	L	L U L	L U L	L U L	L U L	L U L	L U L	L	L	L				
16										L	L	L	L U L	L U L	L U L	L U L	L U L	L	L	L				
17										L	L	L	L	L	L U L	L	L	L	L	L				
18									L	L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L				
19											L U L	L U L	L U L	L	L	L	L	L	L					
20										L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L					
21										L	L	L	L U L	L U L	L U L	L U L	L U L	L	L	L				
22										L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L	L	L				
23										L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L	L				
24									L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L				
25										L		L U L	L U L	L U L	L U L	L U L	L U L	L U L	L	L				
26									L	L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L	L	L			
27									L	L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L	L				
28									L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L	L				
29									L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L				
30										L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L				
31											L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	2	4	13	16	22	22	20	15	10	2						
MED								L	U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L
U Q											394	384	374	361	363	368	356	355						
L Q											U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L	L U L

APR. 2023 M(3000)F1 (0.01)

IONOSPHERIC DATA STATION Okinawa

APR. 2023 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									214	230	246	292	276	288	280	286	282	262							
2										256	266	284	258	288	276	268	258	268	266						
3										236	260	292	324	320	312	288	282	278							
4										224	236	298	290	284	282	280	274	254							
5										230	234	282	284	312	302	288	270	268							
6									208	230	260	276	308	294	300	290	284	272	256						
7										248	282	316	296	276	278	288	292	262							
8									226	222	276	260	288	300	254	294	268	258							
9										258	268	268	324	310	296	284	262	248							
10										240	262	274	310	312	310	296	282	266	244						
11										260	264	296	292	290	296	300	282	264	244						
12										248	270	304	304	300	290	280	284	274	250						
13											298	336	316	294	300	312	312	282	246						
14									214		278	310	308	316	312	304	302	268							
15										224	268		296	334	326	310	298	302	280	256					
16										228	254	292	336	324	320	312	310	296	284	260					
17										224	226	252	298	328	320	314	288	298	288	270					
18										254	300	308	278	268	296	282	292	290	286						
19											278	316	330	302	288	290	286	262							
20										234	240	250	302	300	300	320	326	284	246						
21											246	296	304	284	314	306	284	272	266	248					
22											272	252	322	306	290	288	302	280	250						
23											242	298	268	298	304	278	302	298	254						
24								282	374	236	562	392	414	456	388	374	314	310	258						
25									226			278	280	266	250	246	292	272	244						
26										222	250	252	306	304	292	278	284	278	256	236					
27										224	238	230	344	306	290	294	294	272	256						
28										250	252	260	328	318	294	284	274	268	254						
29											238	240	292	308	302	296	286	288	270	252					
30											274	294	314	306	282	272	262	258							
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	14	25	28	30	30	30	30	30	30	30	14						
MED								282	225	242	265	297	306	300	295	289	283	266	251						
U Q									234	255	280	316	318	312	310	300	292	274	258						
L Q									222	233	252	282	290	290	282	284	272	256	244						

APR. 2023 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2023 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	268	252	280	266	222	192	200	196	200	212	192	186	180	188	188	212	206	222	238	230	216	172	262	282
2	258	248	234	208	232	226	200	206	202	194	188	228	170	214	198	190	196	212	234	220	198	224	256	258
3	268	266	232	204	196	232	238	216	208	204	184	184	170	204	200	200	196	222	246	200	202	242	258	258
4	238	230	232	222	228	210	228	208	212	196	188	184	180	196	196	194	196	220	218	210	248	252	272	294
5	266	230	216	192	202	250	268	218	212	202	188	184	220	220	206	204	210	208	234	216	202	214	234	268
6	272	246 ^Q	224	208	194	226	232	200	194	202	198	180	200	196	192	216	206	230	240	228	216	212	250	274
7	248	216	222	208	182	236	274	214	212	196	184	214	178	198	200	194	206	222	236	220	206	222	262	258
8	232	228	232	222	212	206	236	214	212	196	196	186	196	216	214	220	244	238	240	236	210	210	250	260
9	268	256	246	218	190	210	226	212	210	204	210	200	192	228	194	230	210	234	236	258	214	230	254	242
10	238	272	264	220	206	216	212	202	210	200	188	178	178	220	176	210	206	222	234	222	212	194	252	290
11	274	232	210	184	222	240	240	212	218	204	206	196	184	260	200	200	194	224	224	236	218	192	228	290
12	258	224	224	212	212	246	270	216	208	198	192	178	246	208	210	192	208	216	238	236	220	250	268	274
13	258	234	240	194	200	222	244	206	204	202	186	206	206	192	230	196	206	206	226	228	226	212	212	234
14	250	266	256	232	214	272	268	214	204	190	182	206	204	192	196	204	210	216	234	230	230	252	266	252
15	246	250	238	210	206	232	264	216	206	200	194	186	182	180	224	208	212	218	238	242	222	204	250	288
16	266	262	246	236	242	268	254	212	210	200	200	214	224	202	224	228	202	216	232	242	248	246	258	258
17	238	220	202	190	216	248	258	214	208	206	194	186	188	180	230	268	216	242	246	238	210	228	270	270
18	254	256	256	252	212	200	218	216	204	192	194	198	196	196	E A	E A	220	228	258	240	224	228	266	286
19	268	250	220	214	254	308	248	210	214	218	204	206	194	256	E A	214	180	228	244	E A	252	260	248	274
20	280 ^Q	252	246	228	228	218	244	222	212	204	202	198	184	208	224	208	198	218	236	236	250	236	248	268
21	260	252	248	220	200	224	236	210	206	208	186	184	254	232	196	192	198	216	230	228	240	202	246	286
22	266	248	248	244	270	246	234	212	206	200	196	190	180	E A	254	226	190	198	220	232	228	238	224	288
23	292	274	254	246	224	260	248	210	206	196	212	180	190	210	188	192	200	220	234	252	266	278	272	272
24	274	270	252	E A	E A	246	242	242	248	240	220	202	190	208	210	202	206	216	232	246	246	E A	E A	E A
25	272	E A	298	E A	302	228	216	234	224	212	230	208	206	198	208	202	198	192	230	232	214	240	E A	250
26	268	292	270	232	242	260	246	220	204	192	204	182	188	196	196	196	198	204	230	220	210	228	E A	302
27	314	284	248	212	244	292	242	216	210	198	188	196	186	210	206	216	218	226	240	230	E A	E A	E A	314
28	296	284	268	E A	E A	278	270	224	218	212	198	190	216	178	214	196	206	A E A	244	236	226	214	238	282
29	270	252	256	206	226	252	220	214	220	204	192	214	192	194	260	230	200	208	228	260	236	212	254	304
30	264	246	254	244	252	224	216	214	208	216	184	194	192	E A	274	222	206	216	216	256	220	198	244	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	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30
MED	266	252	246	216	218	234	239	214	209	201	193	192	191	207	201	206	206	220	236	230	219	227	258	276
U Q	272	266	256	236	242	252	248	216	212	204	202	206	200	220	224	216	211	228	240	240	240	248	272	294
L Q	254	234	232	208	206	218	226	210	206	196	188	184	180	196	196	196	198	216	232	220	210	212	250	260

APR. 2023 h'F (KM)

IONOSPHERIC DATA STATION Okinawa

APR. 2023 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	98	98	98	98	96	96	96	96	96	96	98	102	A				
2							B	104	100	96	100	98	A	98	A	98	98	108	104	A				
3							B	104	98	96	96	96	96	A	A	A	96	98	106	A				
4							B	100	100	100	98	A	98	100	96	96	104	104	A	A				
5							B	104	100	100	98	A	98	94	98	98	98	102	106	B				
6							B	100	98	98	96	96	96	98	100	B	98	A	A	A				
7							B	98	98	96	96	96	96	96	100	100	98	100	102	A				
8							B	102	100	98	A	98	98	98	98	98	98	100	102	A				
9							A	A	A	98	A	98	98	98	98	102	102	104	98	A				
10							B	104	100	A	98	A	A	A	A	104	102	102	104	B				
11							B	102	100	A	98	98	100	104	102	102	102	100	A	A				
12							B	100	100	100	100	A	100	98	98	98	A	104	106	A				
13							B	100	98	98	A	98	A	98	98	98	98	100	102	B				
14							B	102	A	100	96	98	98	98	98	98	98	98	104	B				
15							B	104	100	98	98	96	A	96	96	104	104	102	A	A				
16							B	102	98	96	96	96	96	96	100	100	96	104	A	A				
17							B	104	98	98	98	A	98	98	98	98	102	102	B					
18							B	102	98	98	98	98	98	A	A	A	96	98	102	A				
19							B	102	100	A	100	100	98	98	100	100	100	100	A	A				
20							B	A	A	98	A	96	A	100	A	A	A	104	A	A				
21							A	104	98	98	98	98	98	100	100	100	100	100	104	B				
22							A	100	100	100	100	A	100	100	100	102	102	102	104	B				
23							B	104	100	100	A	A	96	96	96	96	96	100	104	A				
24							A	108	98	98	98	98	98	96	96	96	100	102	A	A				
25							B	106	A	A	A	A	A	A	104	A	A	102	106	A				
26							A	A	102	98	98	A	A	A	98	100	100	100	104	B				
27							B	104	100	A	A	A	A	100	100	100	100	104	104	A				
28							A	A	100	100	100	104	100	100	100	100	100	100	A	A				
29							A	104	98	98	96	96	96	96	96	98	100	100	108	B				
30							A	A	98	98	A	A	A	A	A	A	98	98	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								25	26	25	22	19	21	24	24	24	27	29	20					
MED								102	100	98	98	98	98	98	98	99	100	100	104					
U Q								104	100	100	98	98	98	100	100	100	102	102	105					
L Q								100	98	98	96	96	96	96	96	98	98	100	102					

APR. 2023 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

APR. 2023 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E PSWEEP 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	90	90	86	84	82	B	B	122	122	122	132	G	120	G	G	G	G	G	106	92	84	B	92	92	
2	120	122	B	B	92	96	92	G	142	124	104	160	100	146	104	G	G	98	170	96	86	B	B	B	
3	B	B	B	B	B	B	140	154	G	G	G	G	G	106	94	100	G	96	102	96	84	B	B	B	
4	B	B	B	B	B	B	98	190	G	G	G	100	G	G	G	G	94	132	82	84	82	88	B	90	
5	90	94	92	92	92	94	90	150	184	G	G	94	172	162	116	118	G	G	G	102	86	82	B	B	
6	B	B	B	B	B	B	168	154	150	G	G	G	148	112	G	B	G	82	80	96	88	82	84	B	
7	B	B	B	B	B	B	150	132	G	G	G	156	88	158	138	G	112	158	120	110	86	86	B	B	
8	84	B	B	B	B	B	116	122	106	102	102	96	180	164	182	122	106	100	94	96	92	82	82		
9	B	B	B	B	B	B	156	162	160	170	144	162	188	G	140	128	106	96	90	92	86	B	B		
10	92	B	B	B	B	B	164	152	108	G	G	100	100	90	90	90	G	G	130	B	B	B	92	88	
11	86	86	90	B	B	94	110	110	110	106	104	102	204	106	102	98	100	94	86	84	84	B	128		
12	128	88	B	B	B	90	92	158	G	G	G	96	156	178	170	112	G	136	98	88	80	84	88		
13	B	B	B	B	B	B	158	G	G	96	176	140	140	106	110	G	G	G	B	86	82	B	B		
14	B	B	B	B	B	94	B	G	104	G	G	174	164	G	G	G	G	G	B	90	84	82	82		
15	84	B	B	B	B	B	B	G	164	G	G	G	110	G	164	88	88	86	112	98	84	84	B	B	
16	82	B	B	B	B	B	B	G	G	G	G	180	162	172	168	178	G	G	128	94	88	B	94		
17	88	B	88	92	B	B	140	132	124	114	104	100	104	112	106	114	124	100	102	B	84	B	B		
18	B	B	B	B	B	B	B	G	G	102	102	102	98	142	124	114	164	114	100	102	84	82	B	B	
19	B	B	B	B	B	B	134	136	124	118	118	110	104	110	124	128	106	102	90	92	86	B	B		
20	B	104	B	B	B	B	110	120	96	102	98	94	102	180	96	90	90	138	98	94	94	90	92	B	
21	B	B	B	B	90	92	144	156	162	128	134	120	126	118	120	138	G	G	G	B	B	B	B	104	
22	92	94	94	B	110	B	132	118	126	106	100	102	G	126	118	G	G	G	112	98	114	B	94		
23	90	90	96	92	90	90	142	134	118	110	100	102	100	134	G	G	G	146	106	98	98	98	94	92	
24	92	94	92	90	92	90	122	130	138	132	130	G	130	G	G	G	G	G	102	98	92	92	94	90	
25	90	84	88	84	90	94	158	188	84	168	86	146	132	118	120	104	174	138	94	92	86	90	90		
26	B	90	B	84	102	90	126	130	124	104	104	88	88	142	G	G	G	180	78	96	84	92	92		
27	86	86	B	B	B	B	164	G	98	98	98	90	178	162	168	160	130	96	92	96	90	86	84		
28	84	84	84	88	90	96	98	106	102	110	118	112	124	170	G	G	108	102	100	94	94	92	92	92	
29	94	B	B	B	B	B	116	110	106	104	110	100	G	G	182	160	G	110	G	B	98	94	94	88	
30	88	B	B	B	86	86	126	108	100	100	90	88	92	90	92	94	G	110	92	90	88	86	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	18	13	9	9	12	13	16	26	23	21	20	25	26	24	21	18	14	19	24	24	28	23	15	18	
MED	90	90	90	90	91	92	119	142	124	110	104	102	110	142	118	116	112	106	102	94	88	86	92	91	
U Q	92	94	93	92	93	94	136	158	152	124	124	132	146	175	163	140	128	132	124	98	94	92	92	92	
L Q	86	86	87	84	90	90	95	120	106	103	100	97	100	115	105	100	98	100	97	91	85	84	84	88	

APR. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

APR. 2023 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
◊	f _o F ₂ , f _o F ₁ , f _o E
×	f _x F ₂
*	DOUBTFUL f _o F ₂ , f _o F ₁ , f _o E
⊗	f _b E _s
└	ESTIMATED f _o F ₁
†, ‡	f _{min}
^	GREATER THAN
∨	LESS THAN

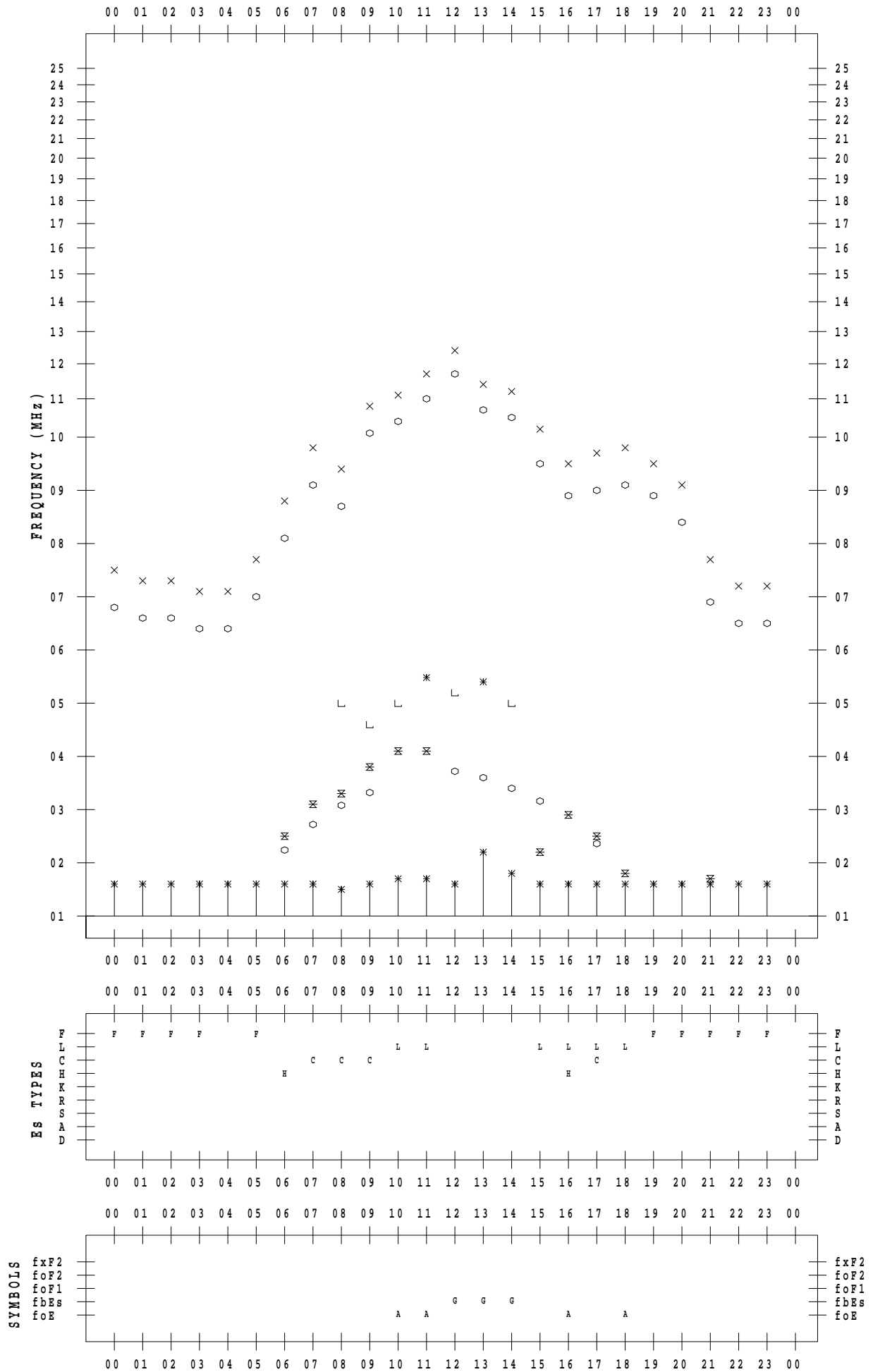
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 1

135 ° E MEAN TIME



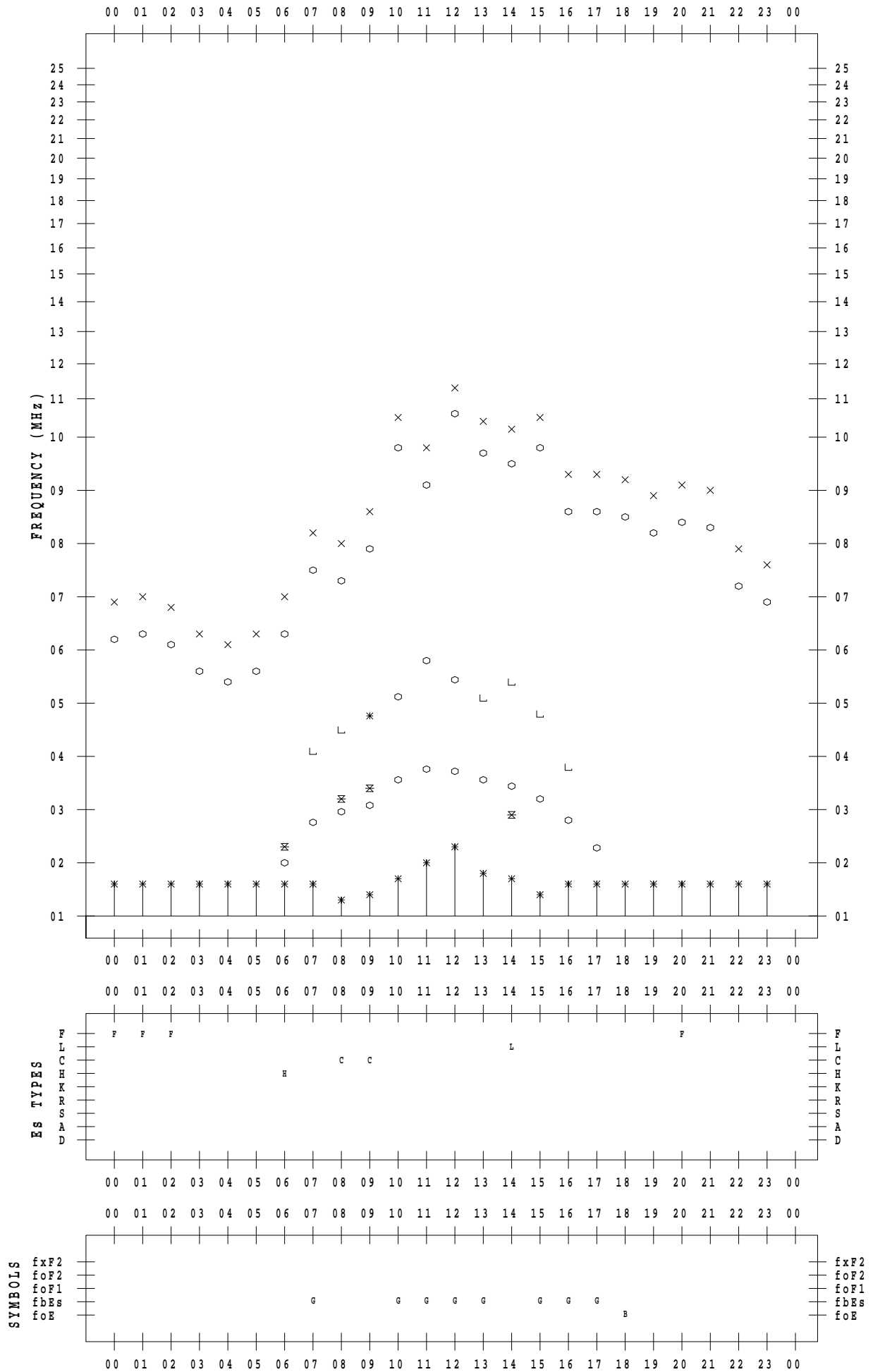
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 2

135 ° E MEAN TIME



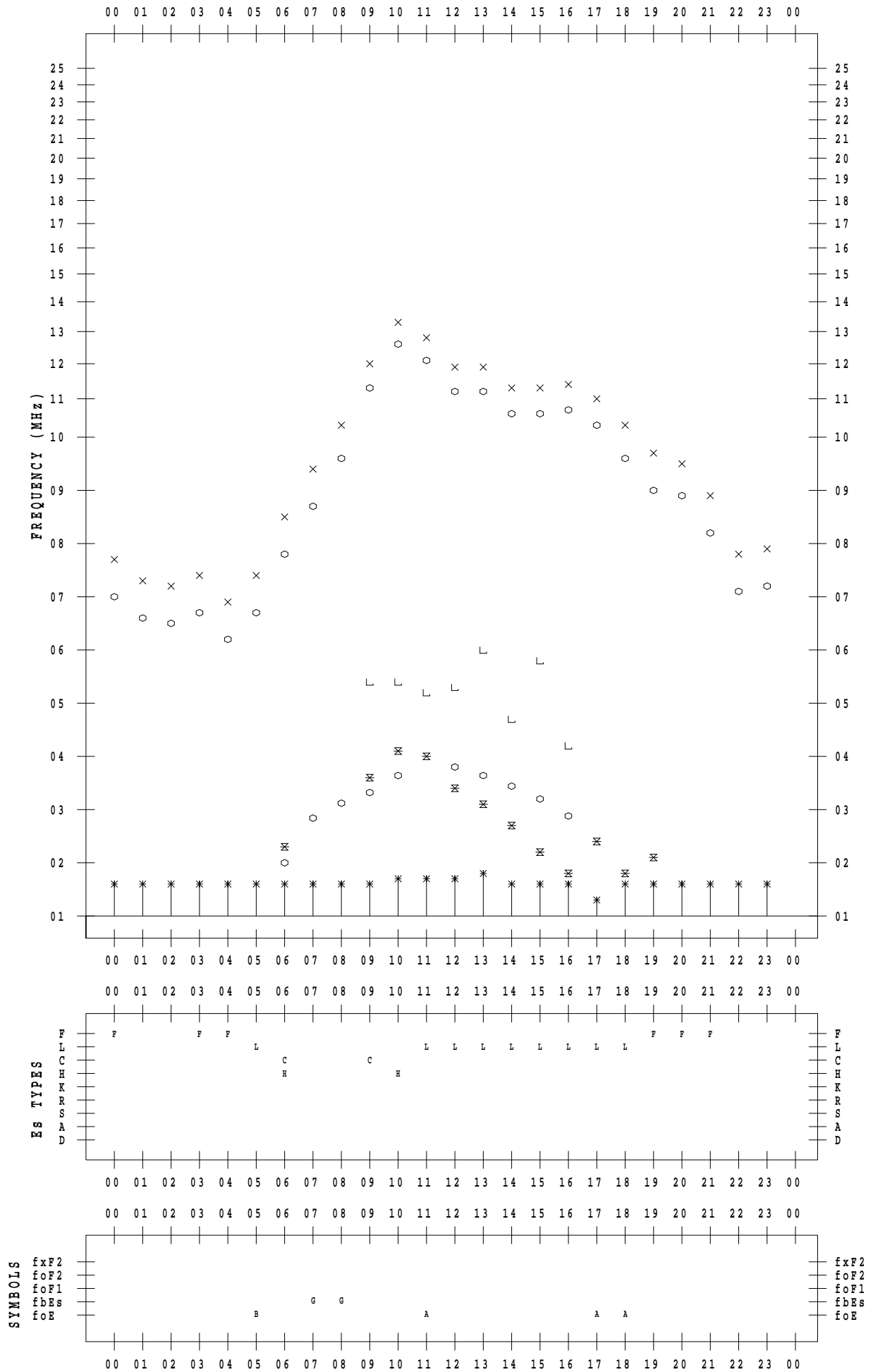
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 3

135 ° E MEAN TIME



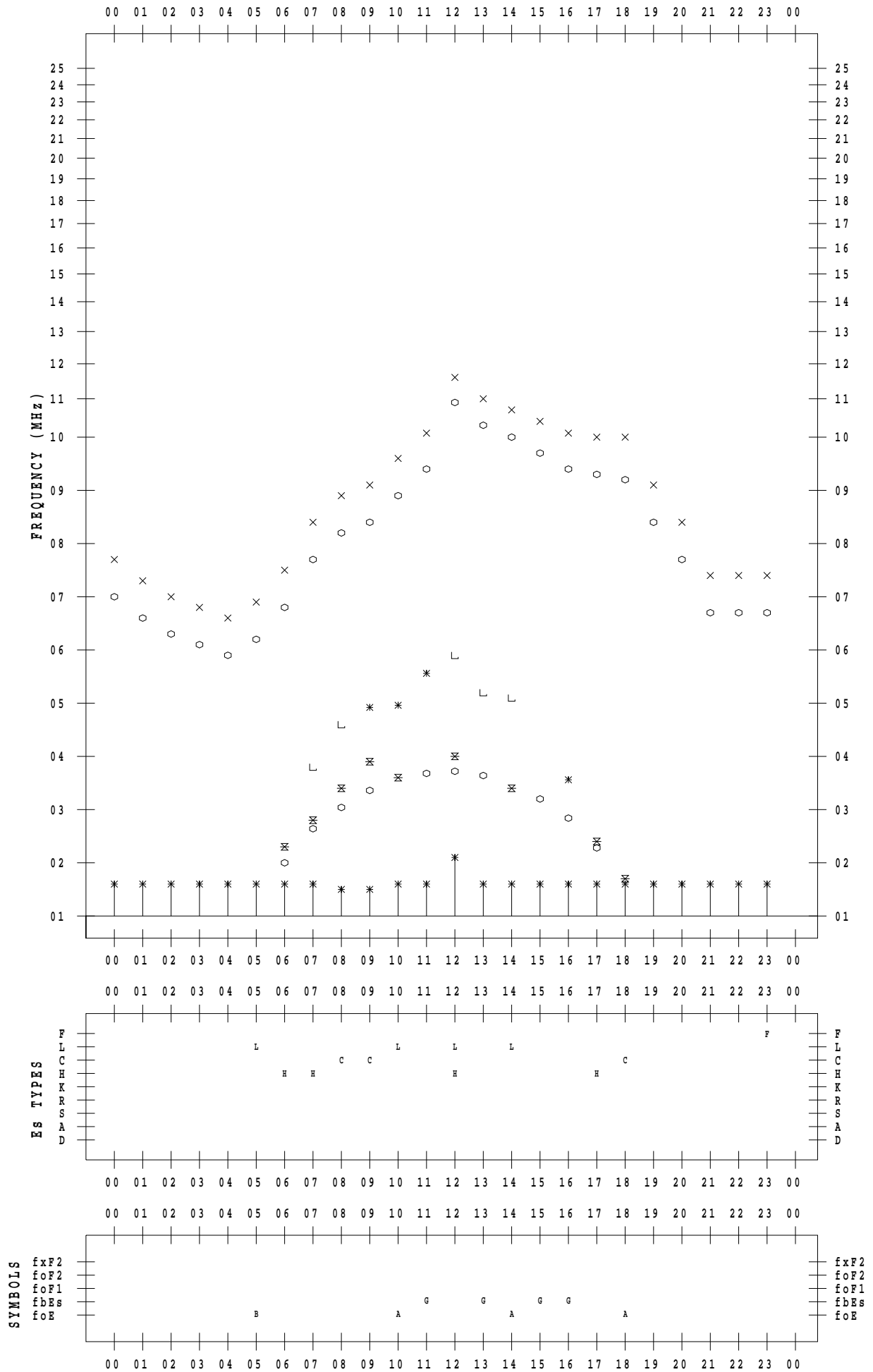
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 4

135 ° E MEAN TIME



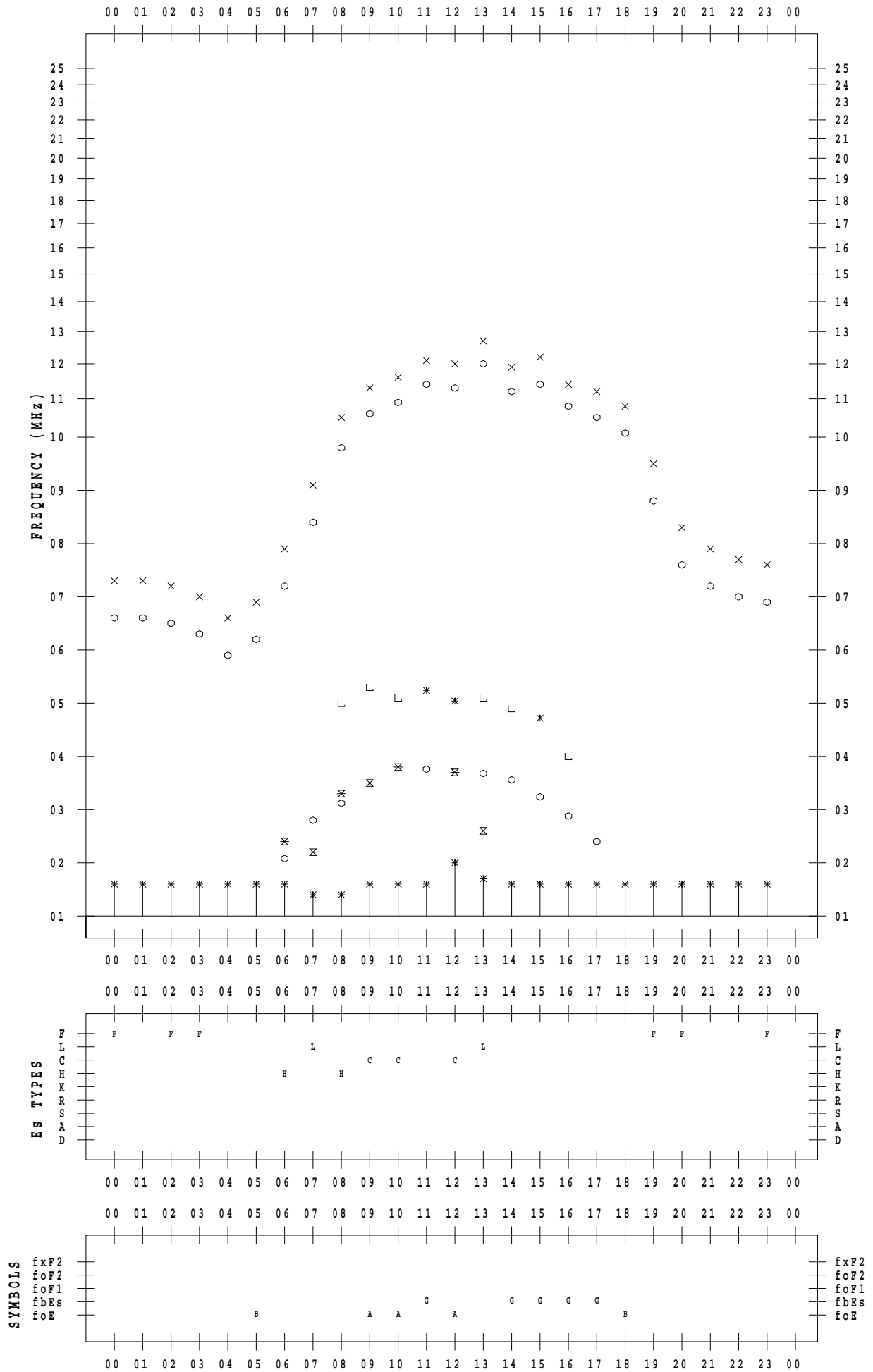
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 5

135 ° E MEAN TIME



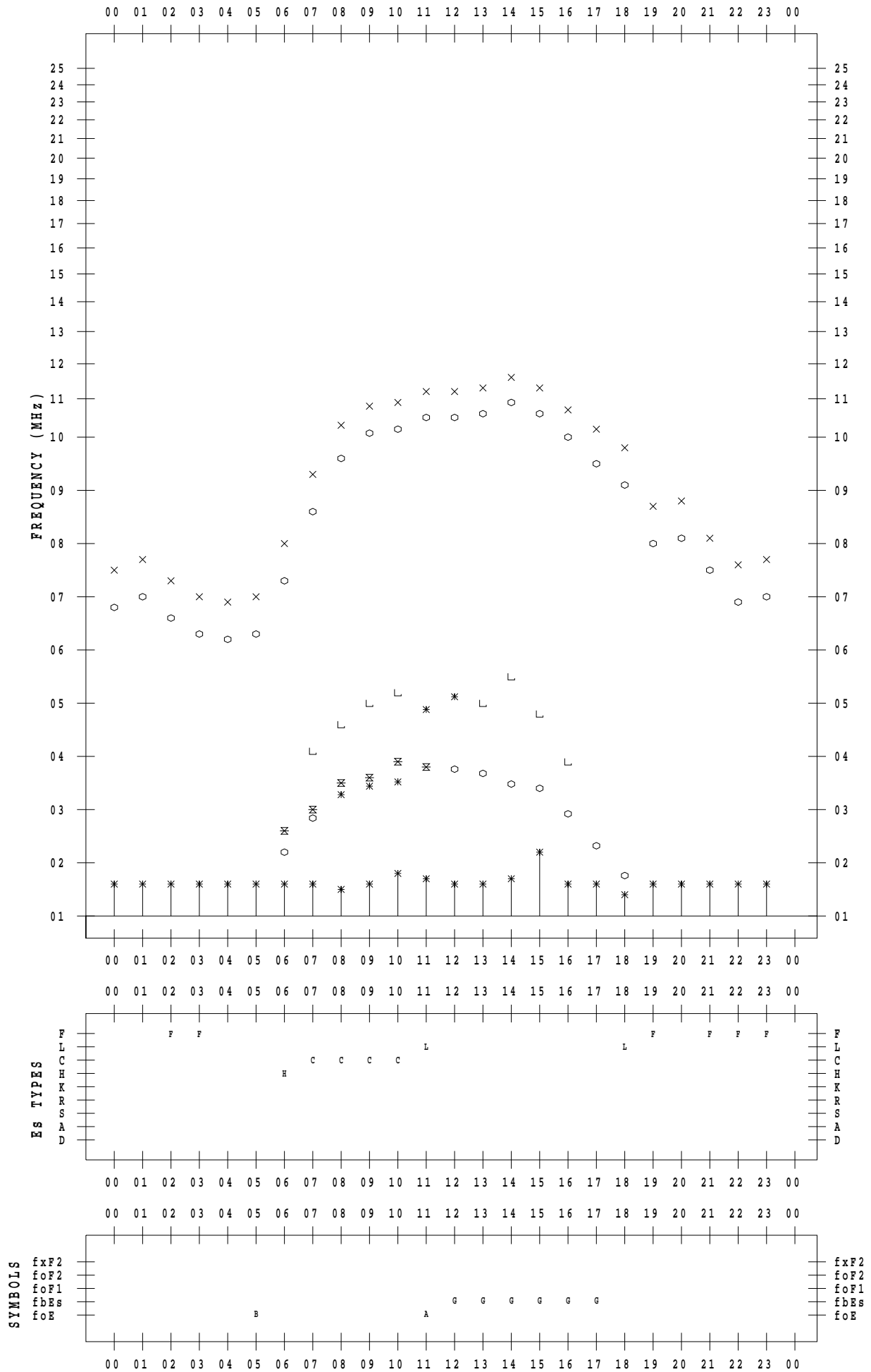
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 6

135 ° E MEAN TIME



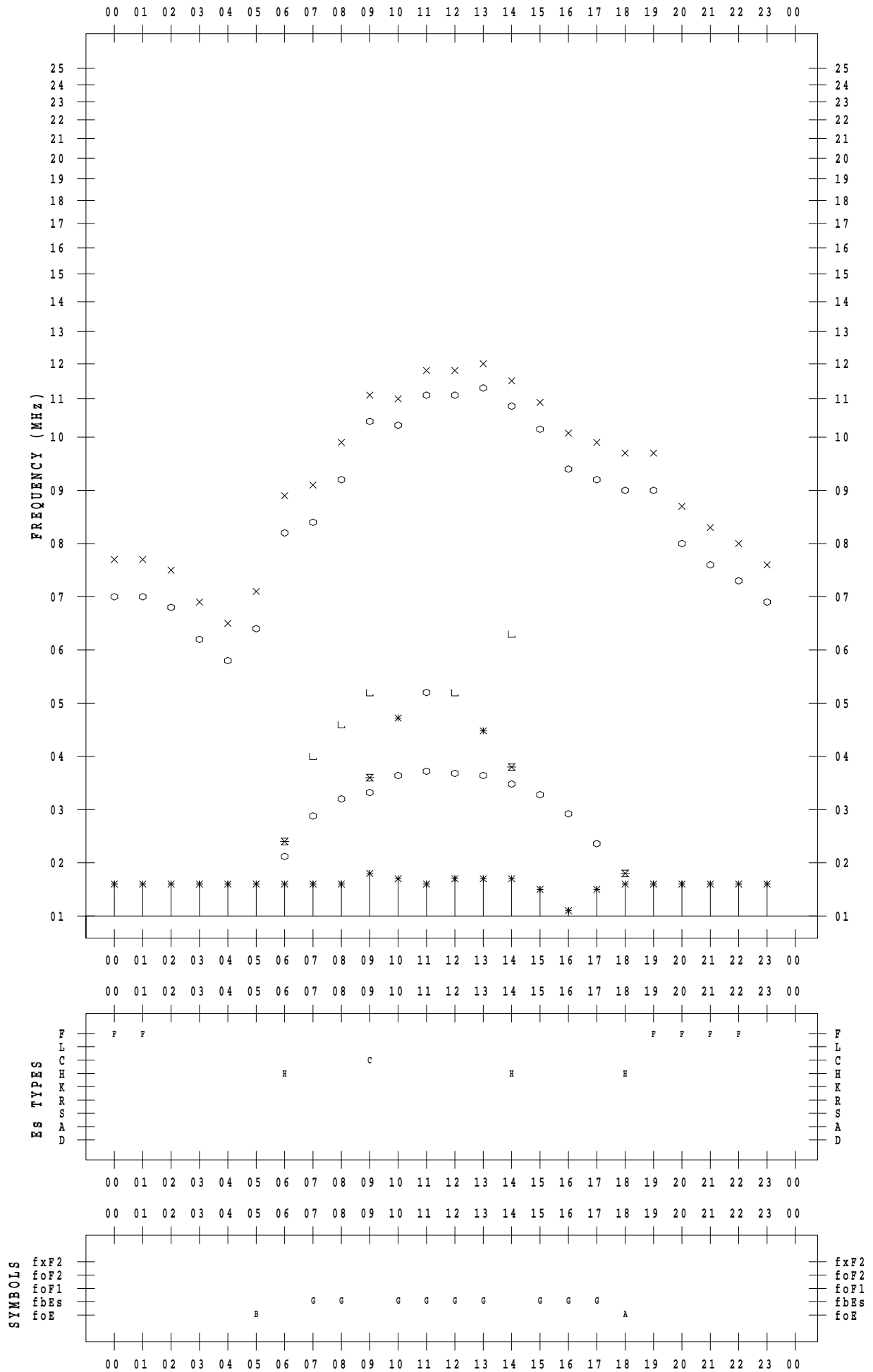
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 7

135 ° E MEAN TIME



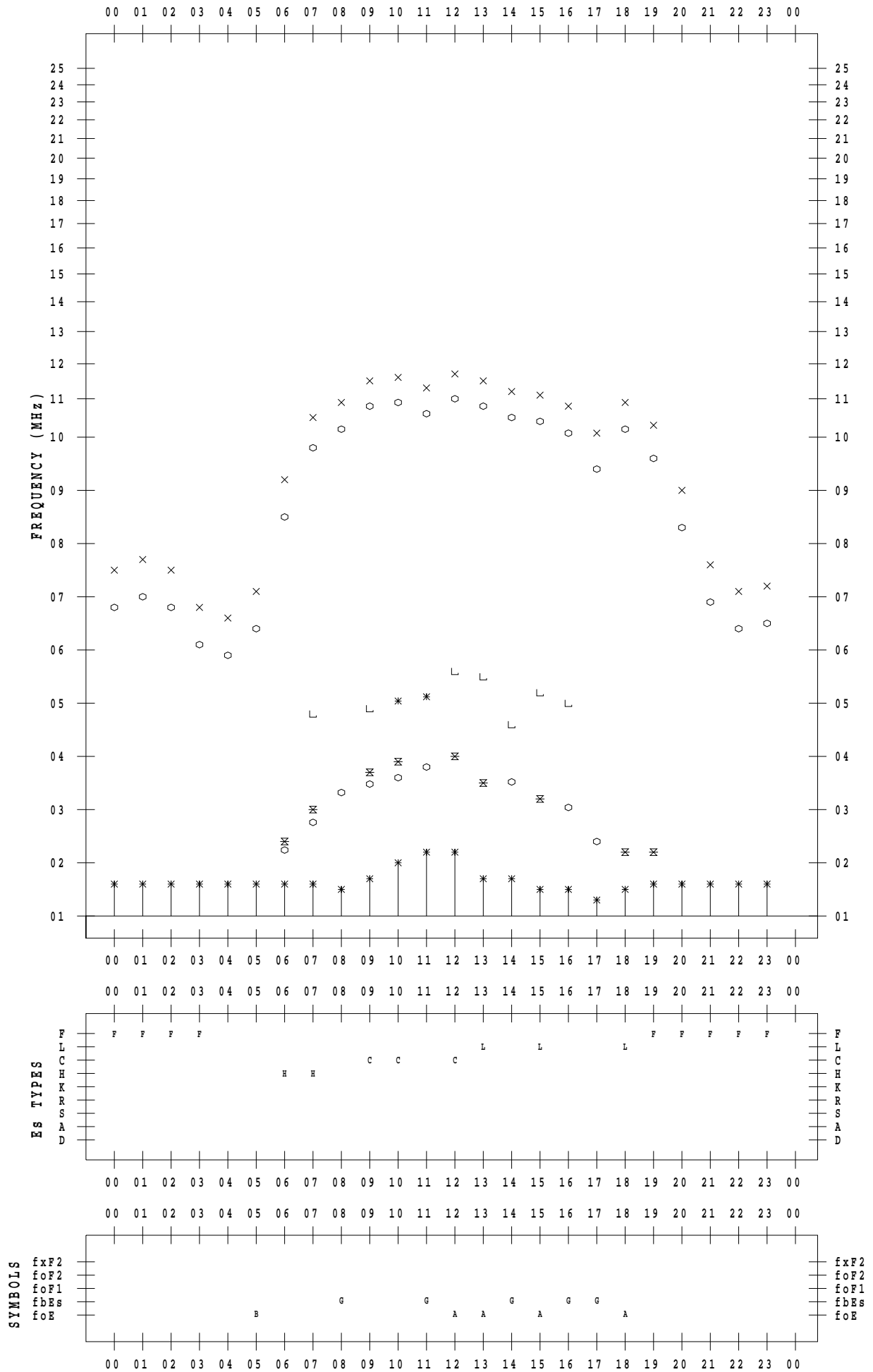
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 8

135 ° E MEAN TIME



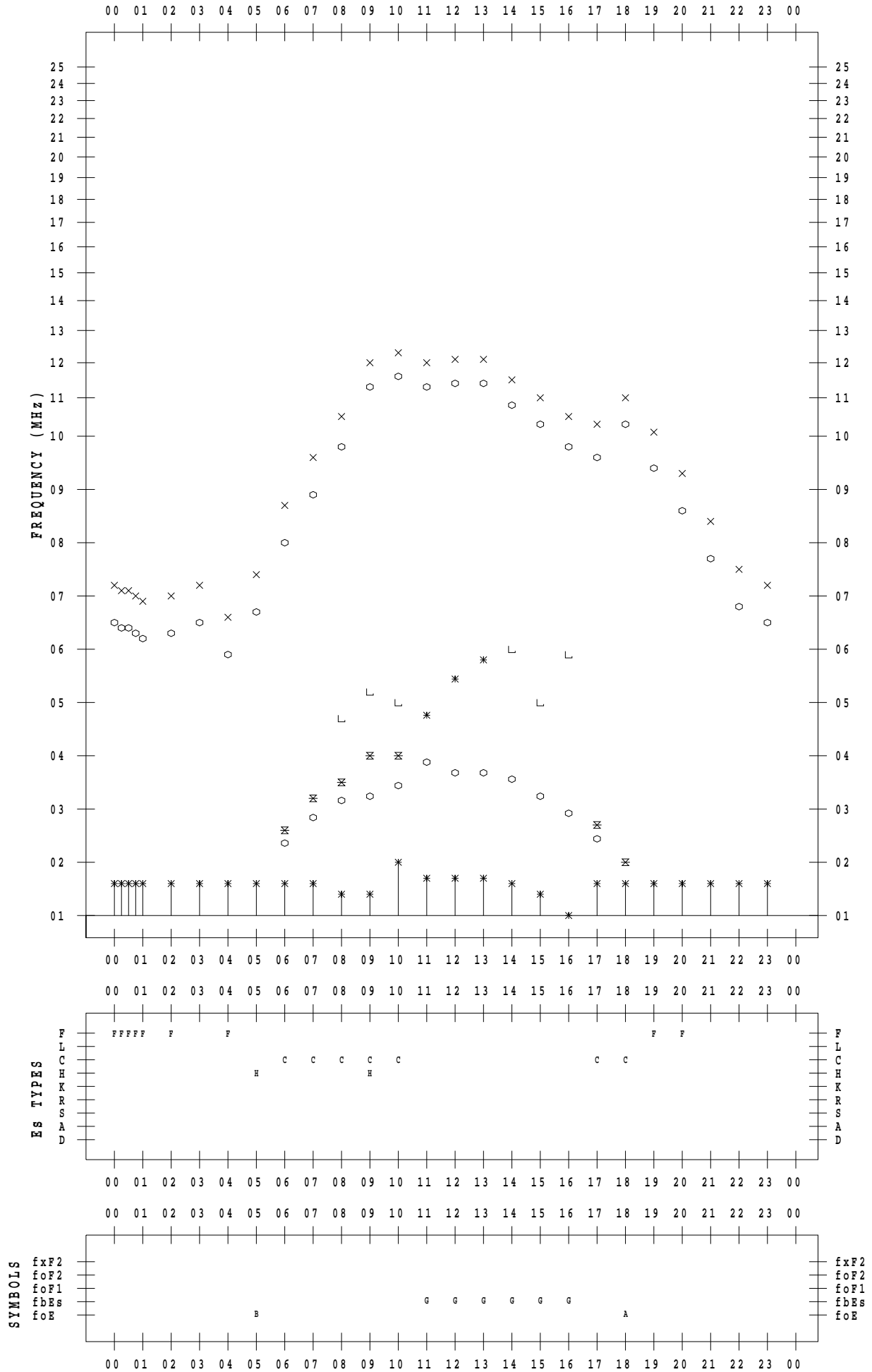
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 9

135 ° E MEAN TIME



Es TYPES

SYMBOLS

fxF2
foF2
foF1
fbEs
foE

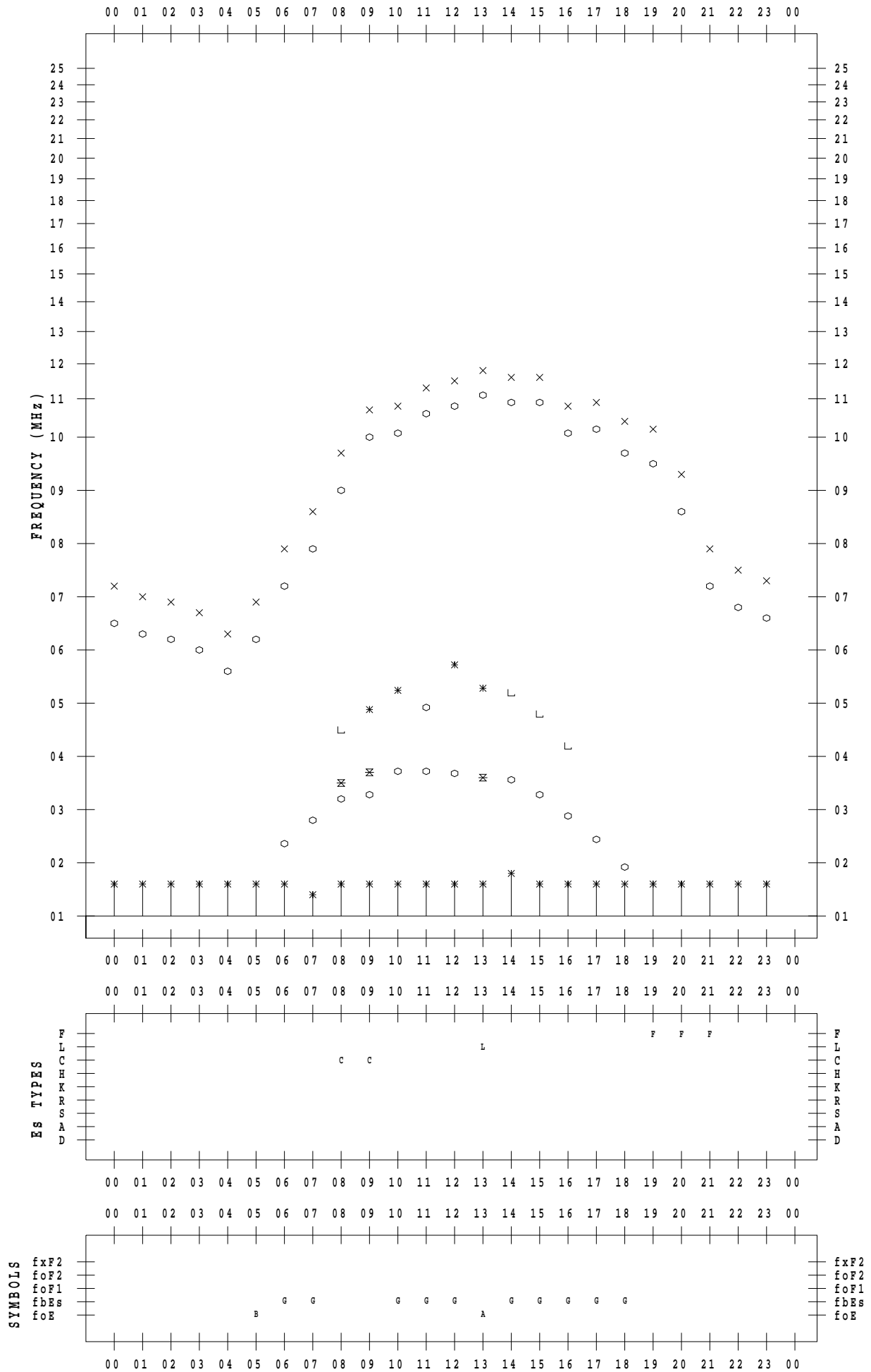
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 10

135 ° E MEAN TIME



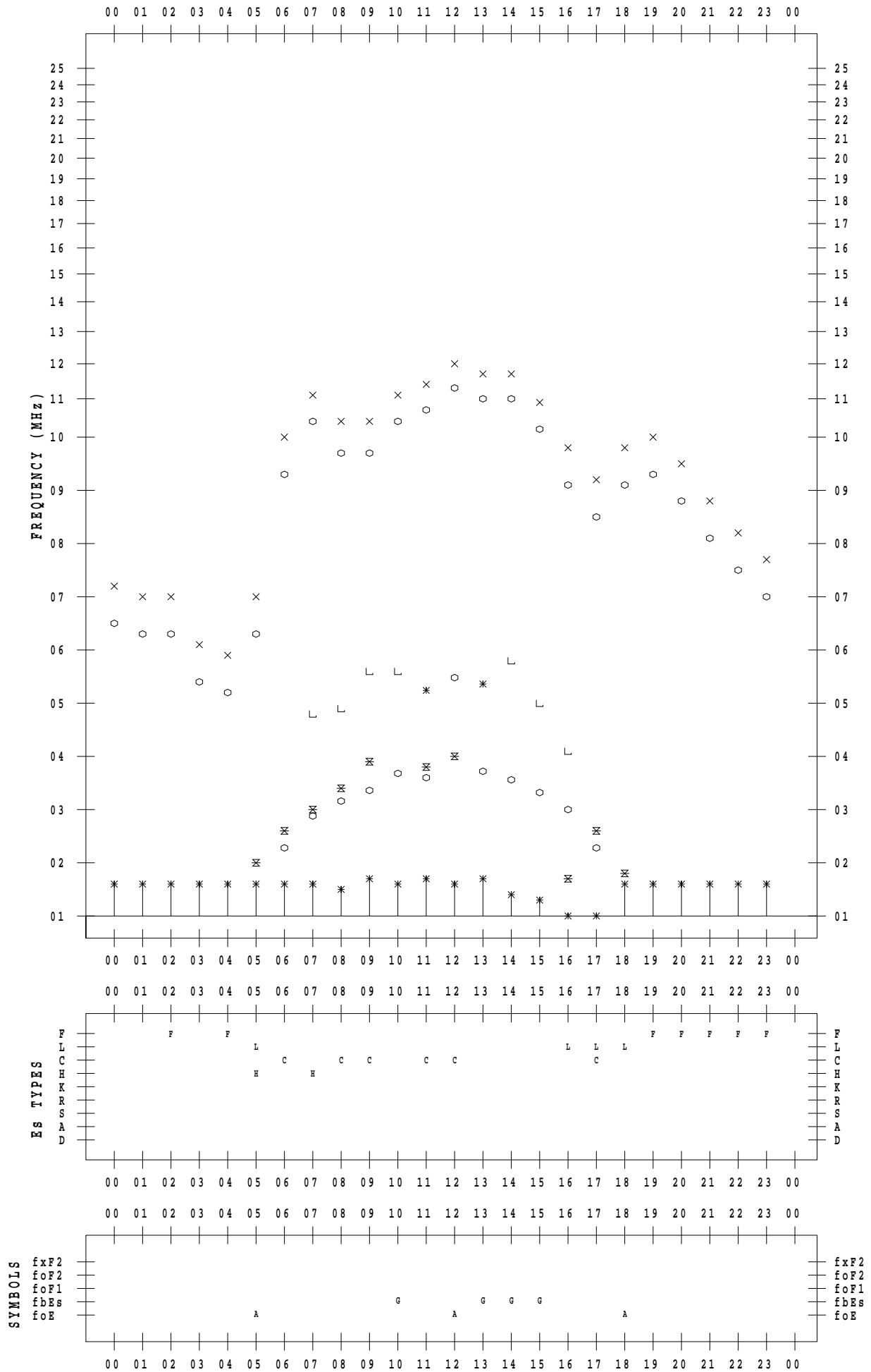
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 11

135 ° E MEAN TIME



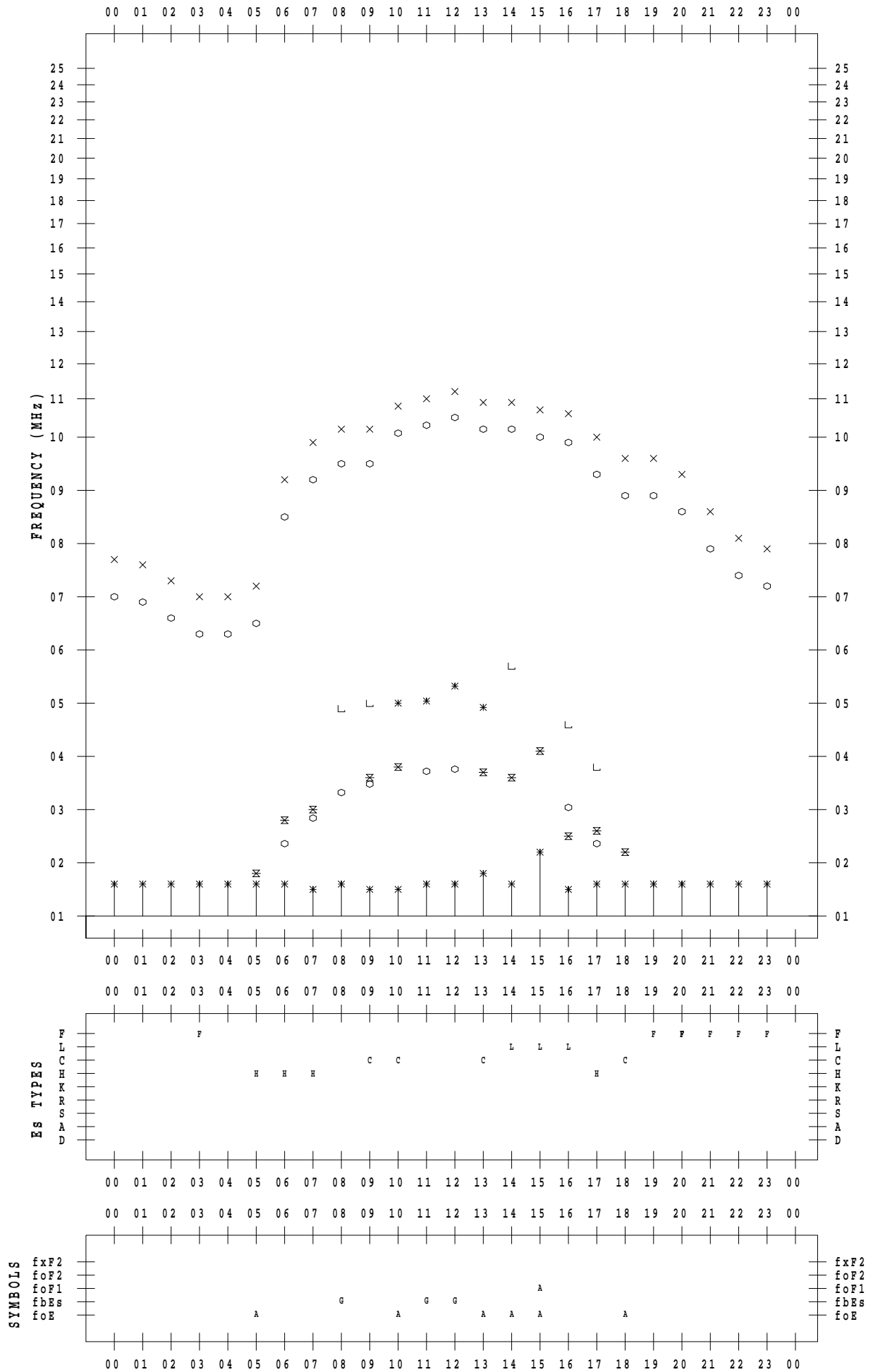
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 12

135 ° E MEAN TIME



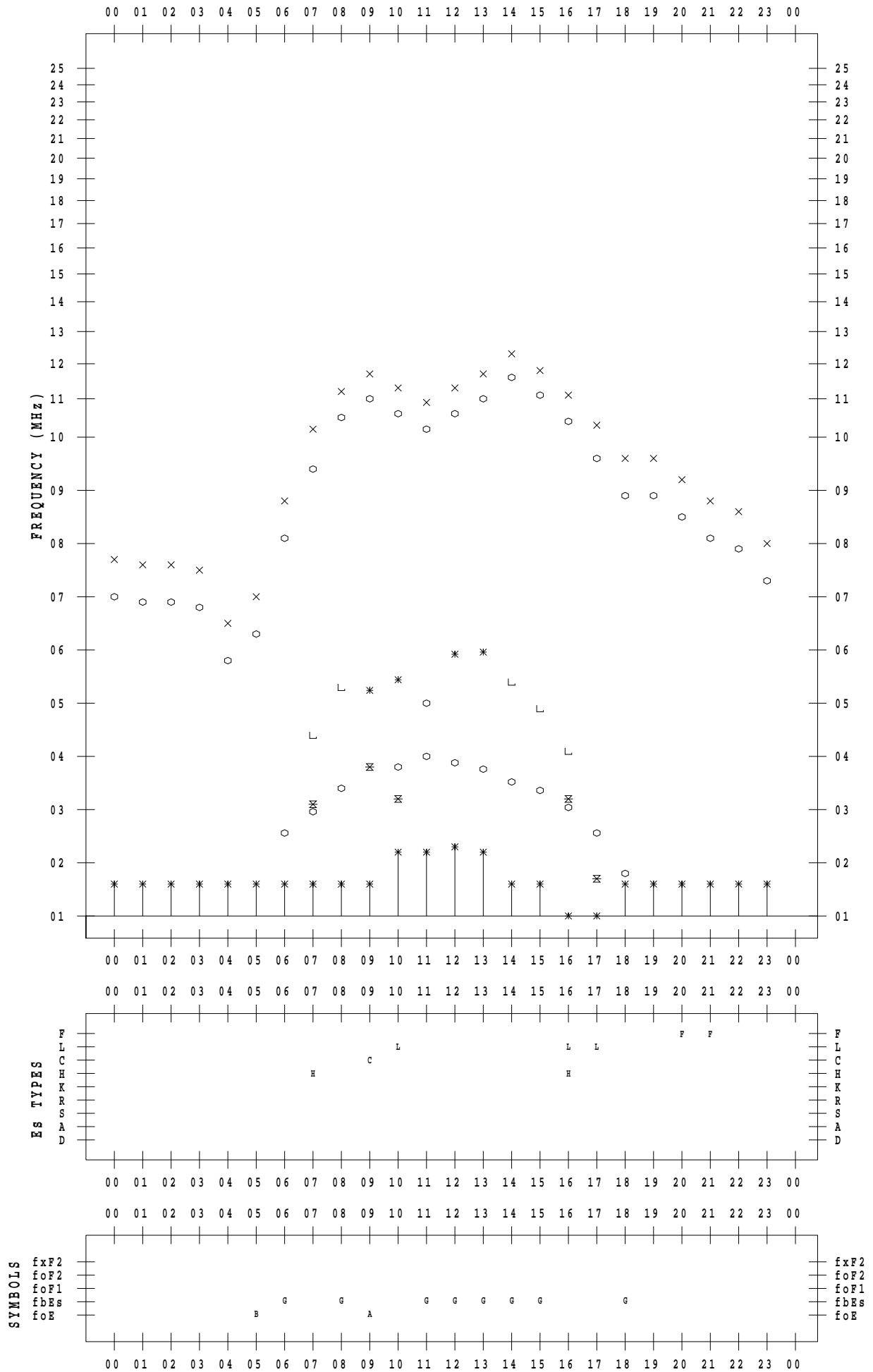
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023/ 4/13

135 ° E MEAN TIME



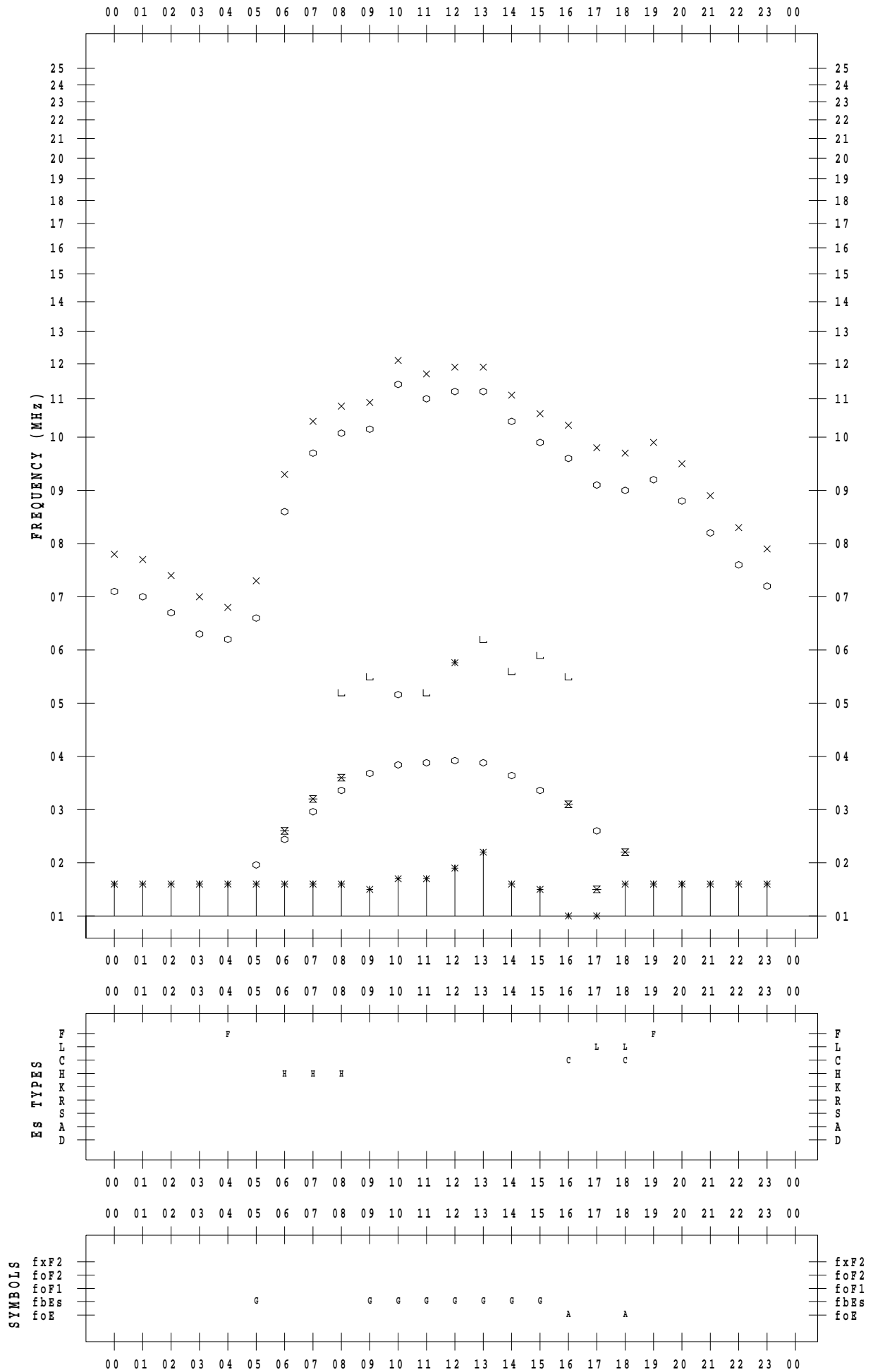
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 14

135 ° E MEAN TIME



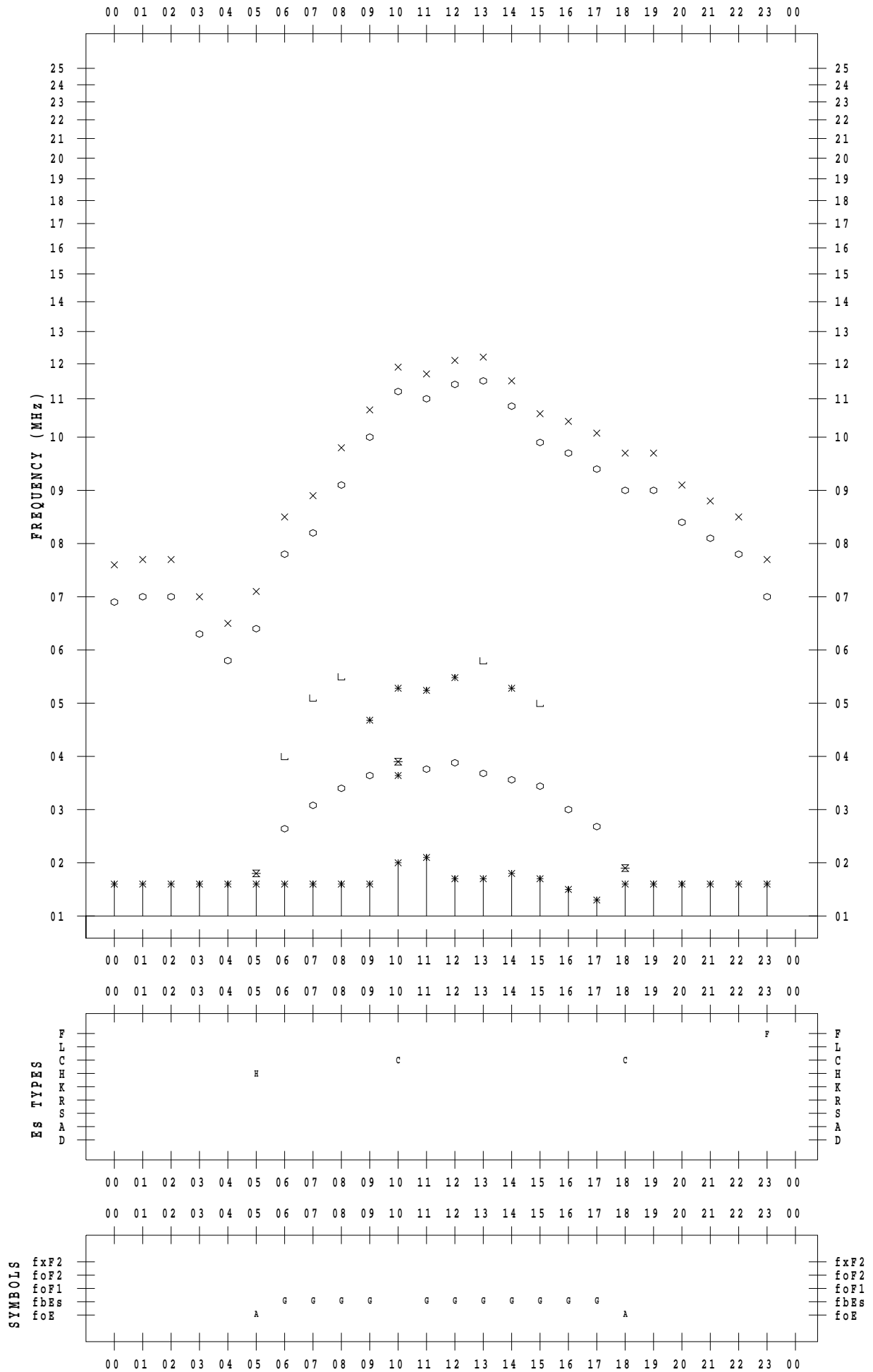
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 15

135 ° E MEAN TIME



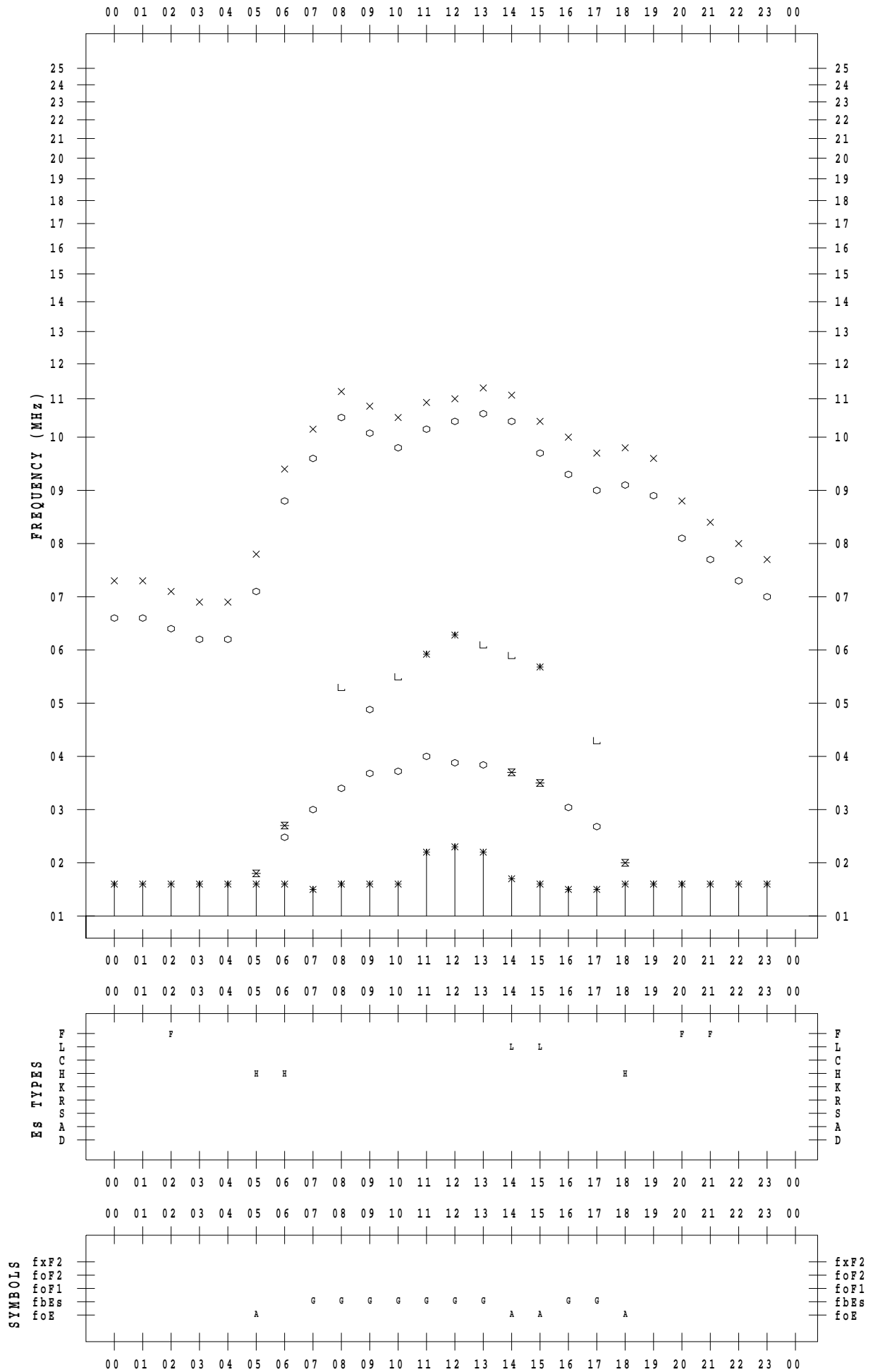
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 16

135 ° E MEAN TIME



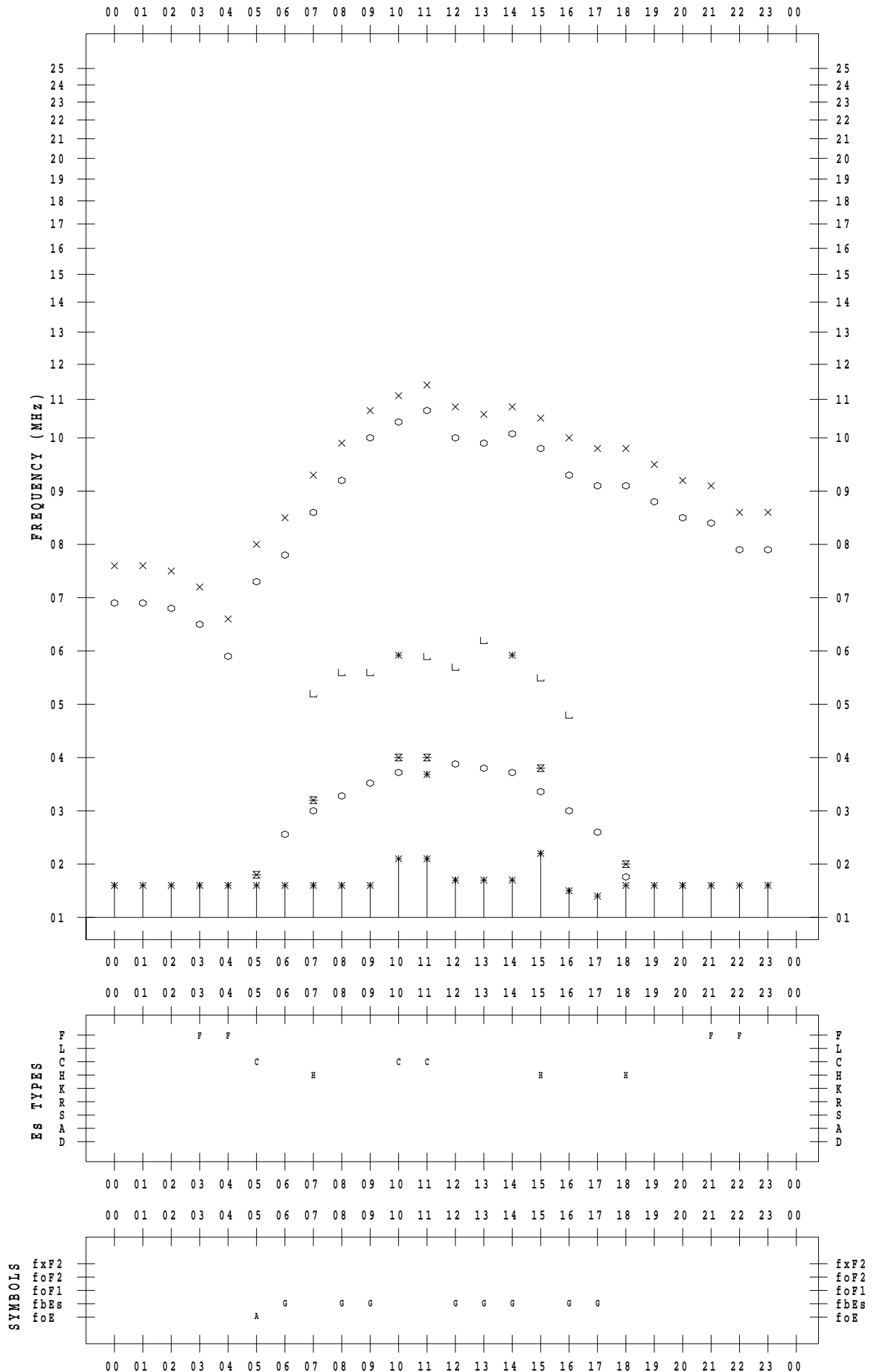
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 17

135 ° E MEAN TIME



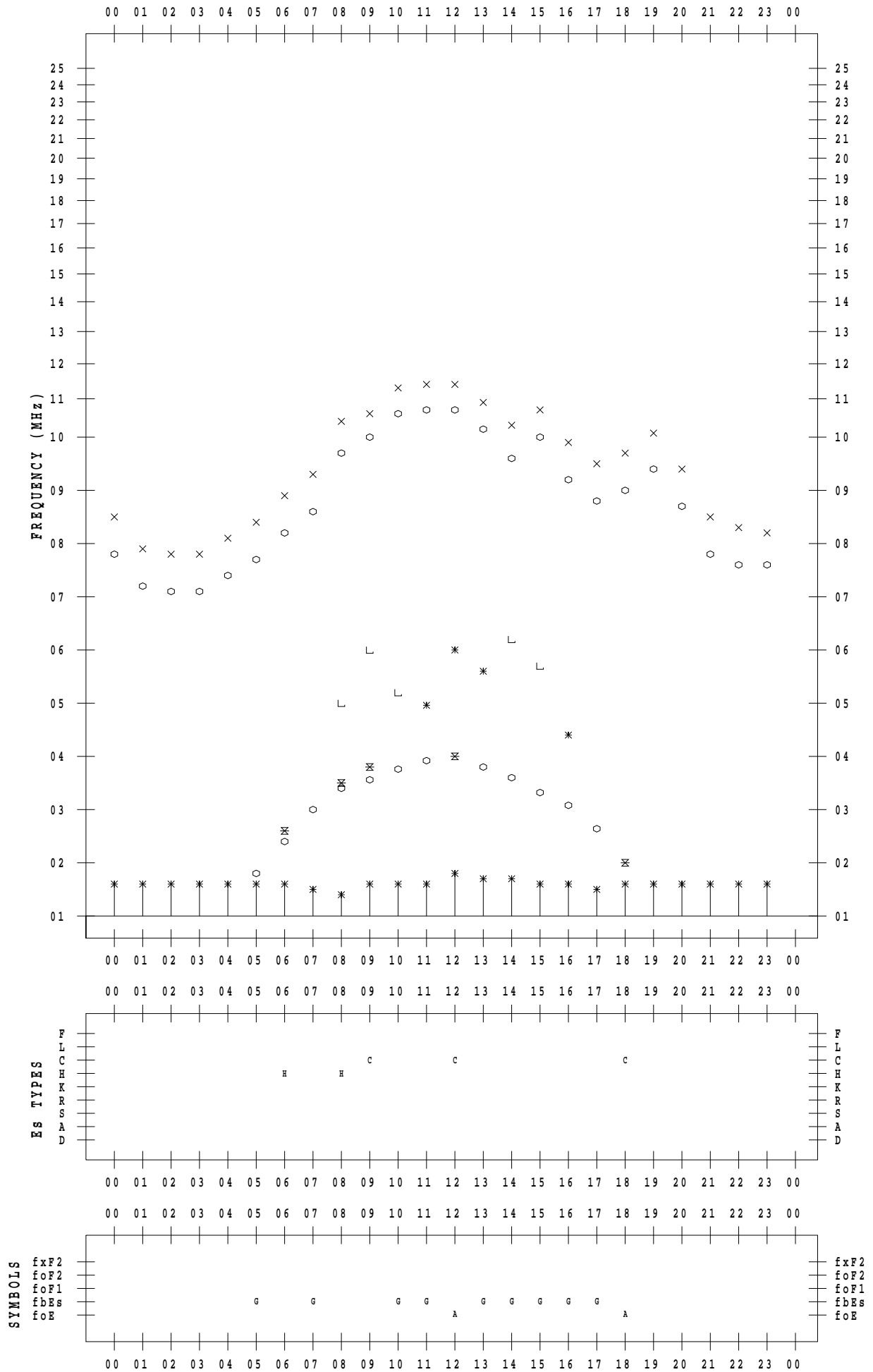
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 18

135 ° E MEAN TIME



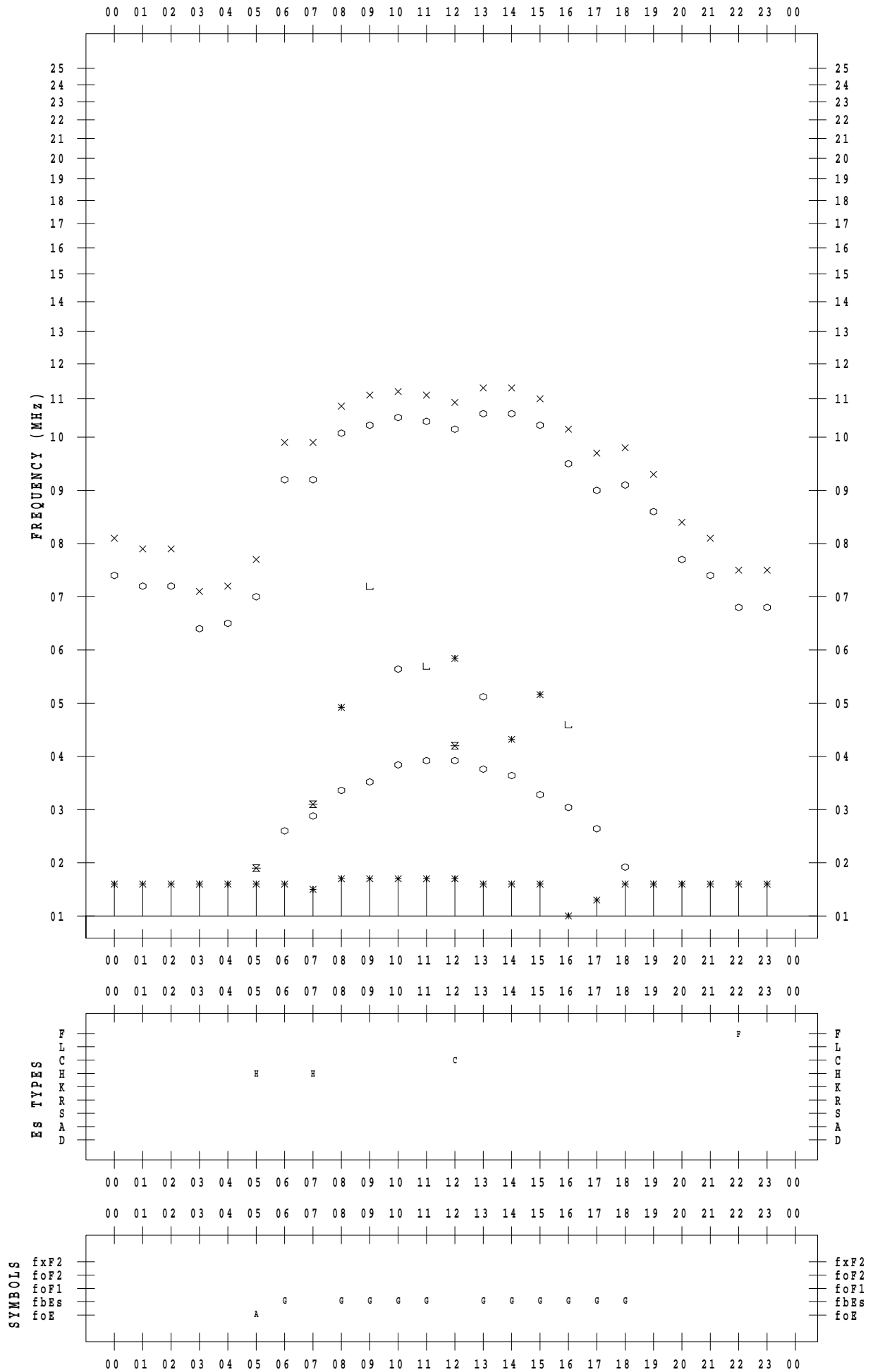
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 19

135 ° E MEAN TIME



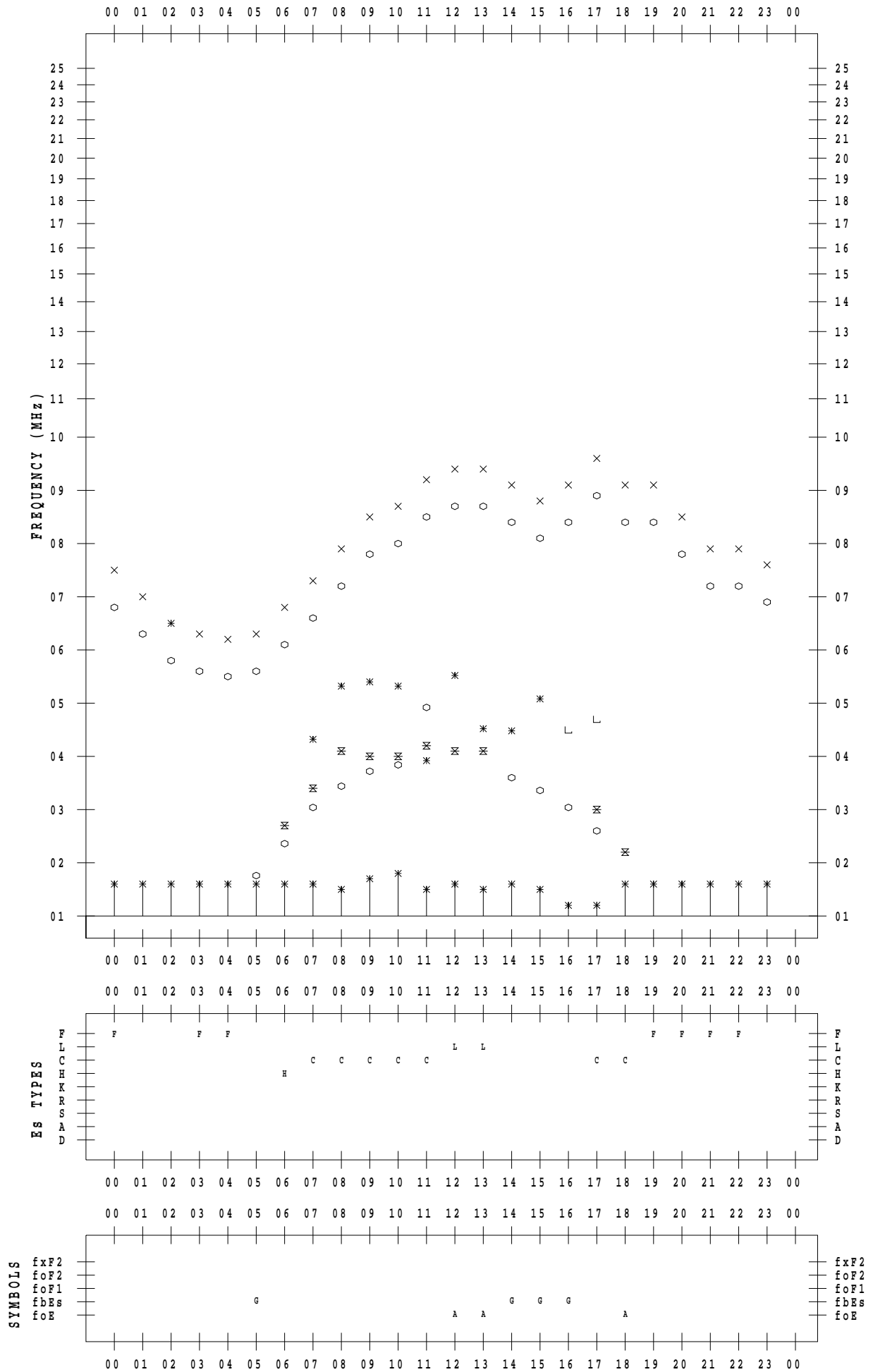
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 20

135 ° E MEAN TIME



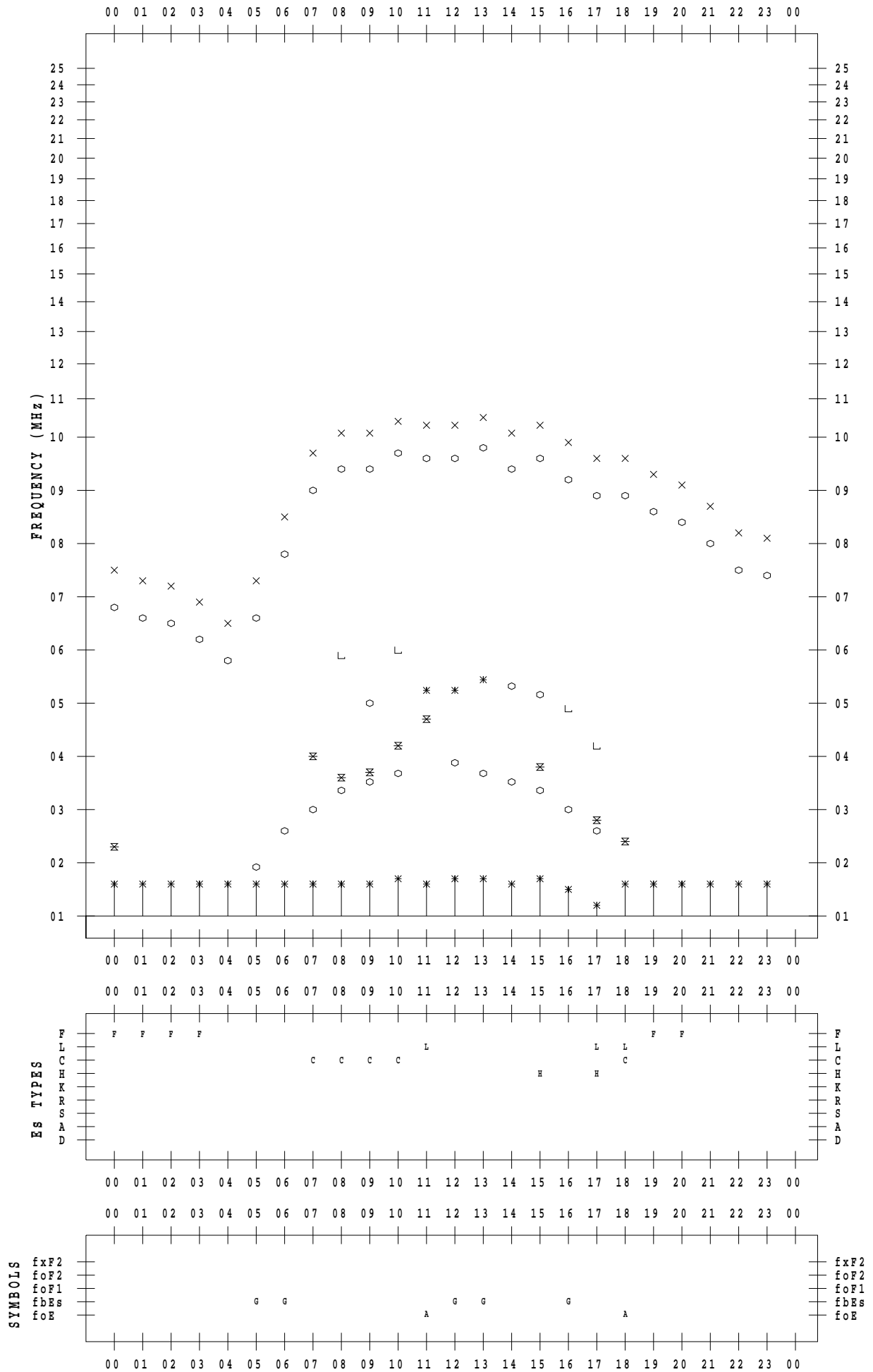
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 21

135 ° E MEAN TIME



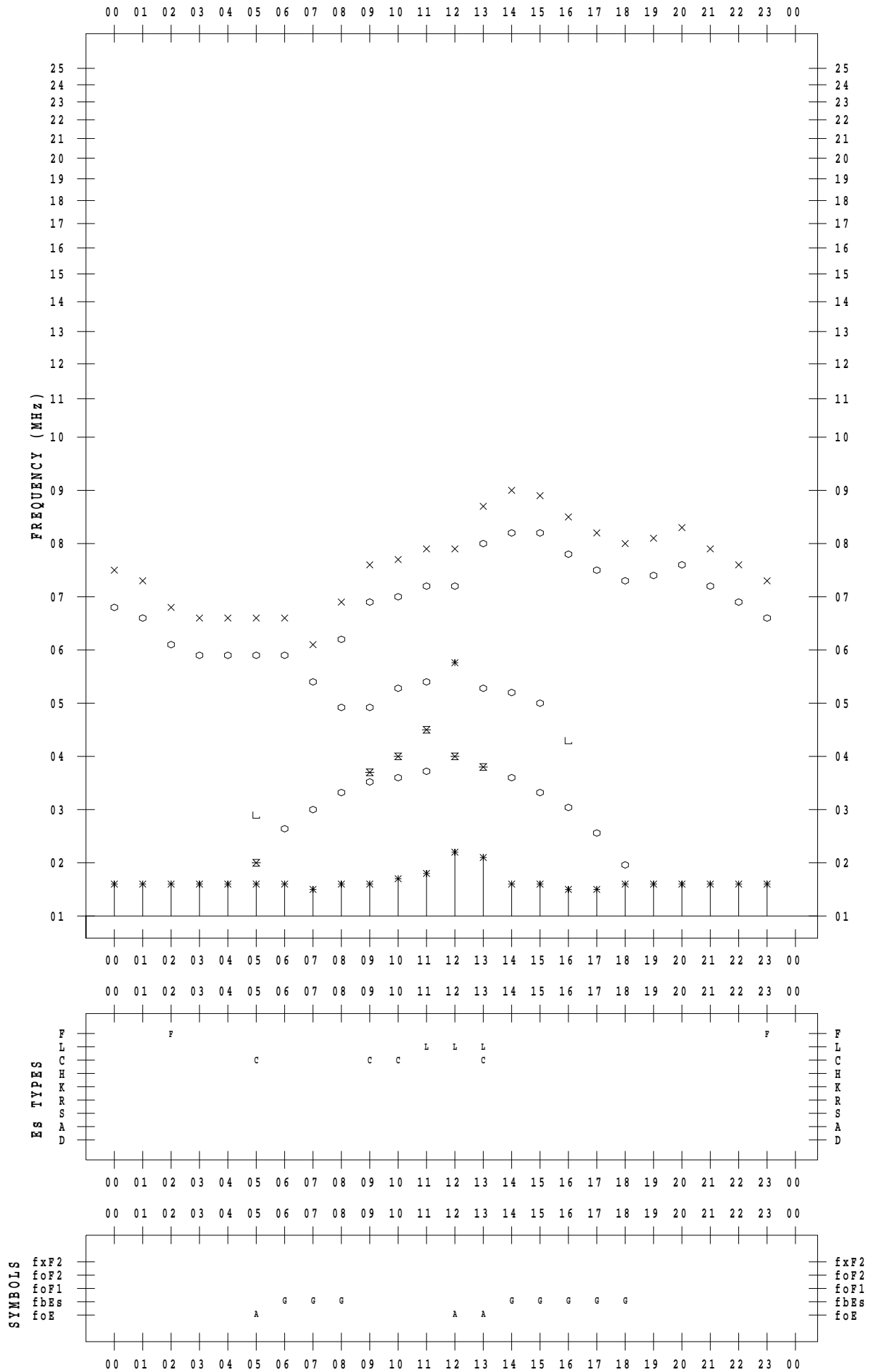
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 22

135 ° E MEAN TIME



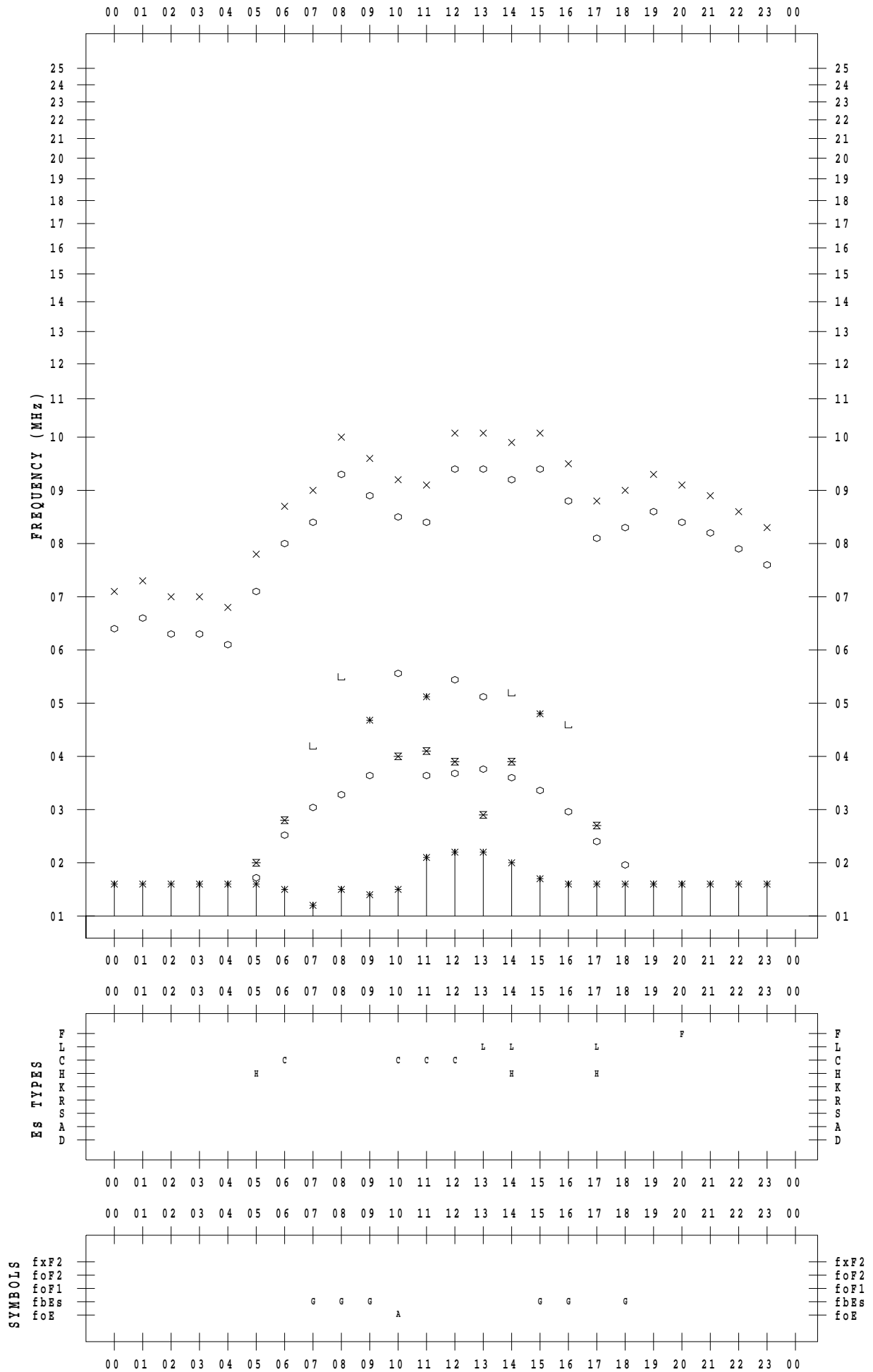
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 23

135 ° E MEAN TIME



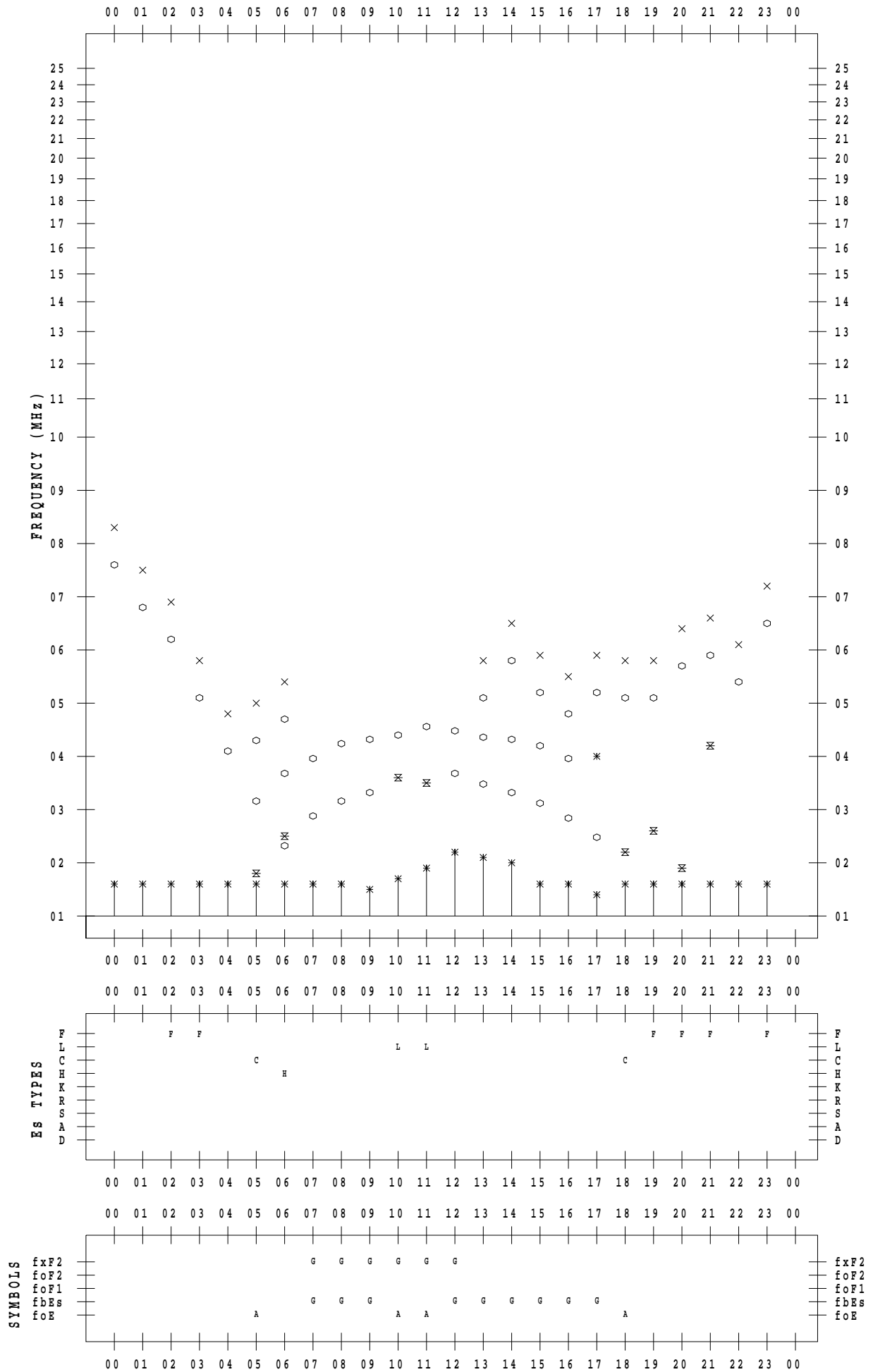
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 24

135 ° E MEAN TIME



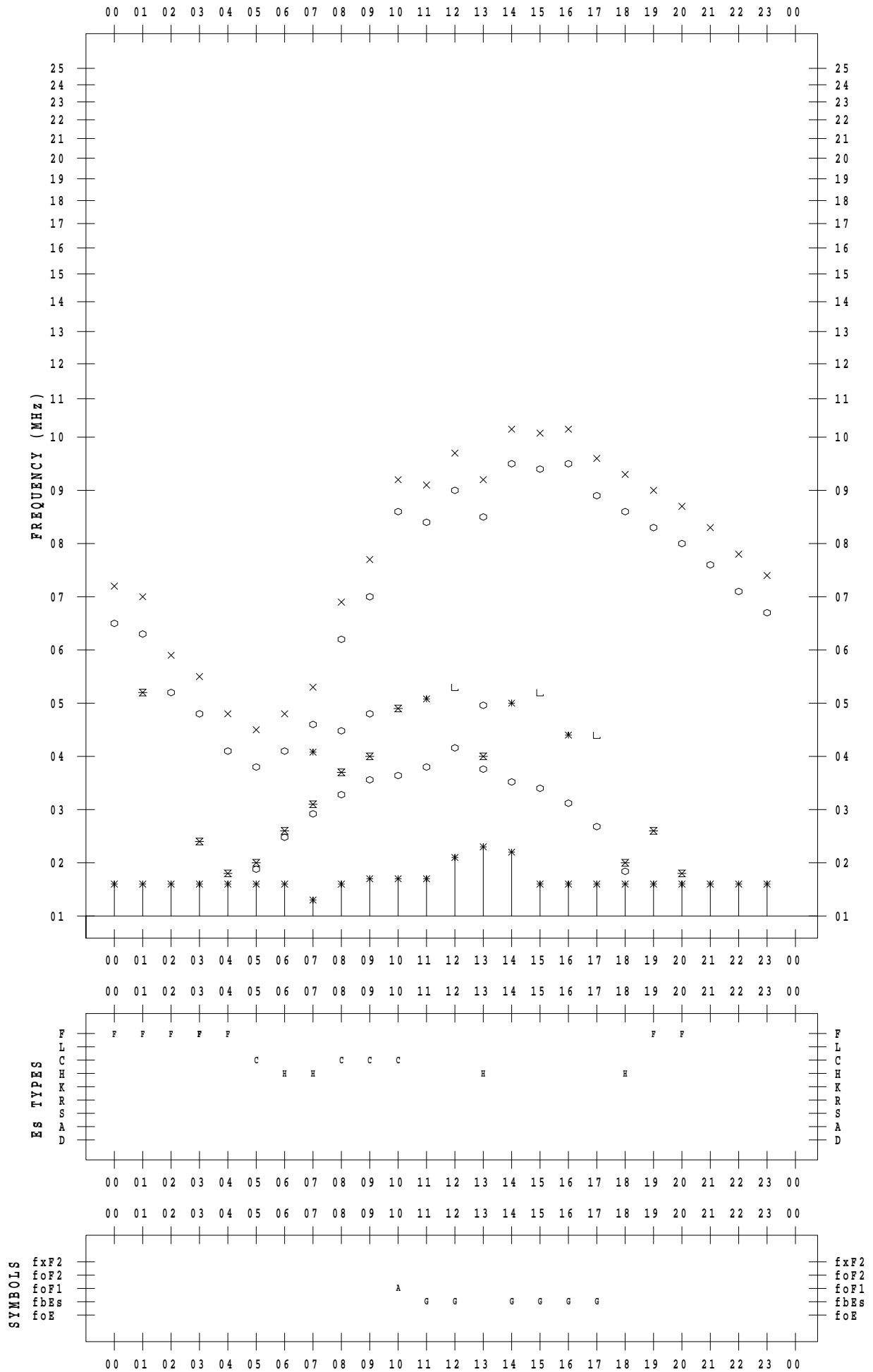
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 25

135 ° E MEAN TIME



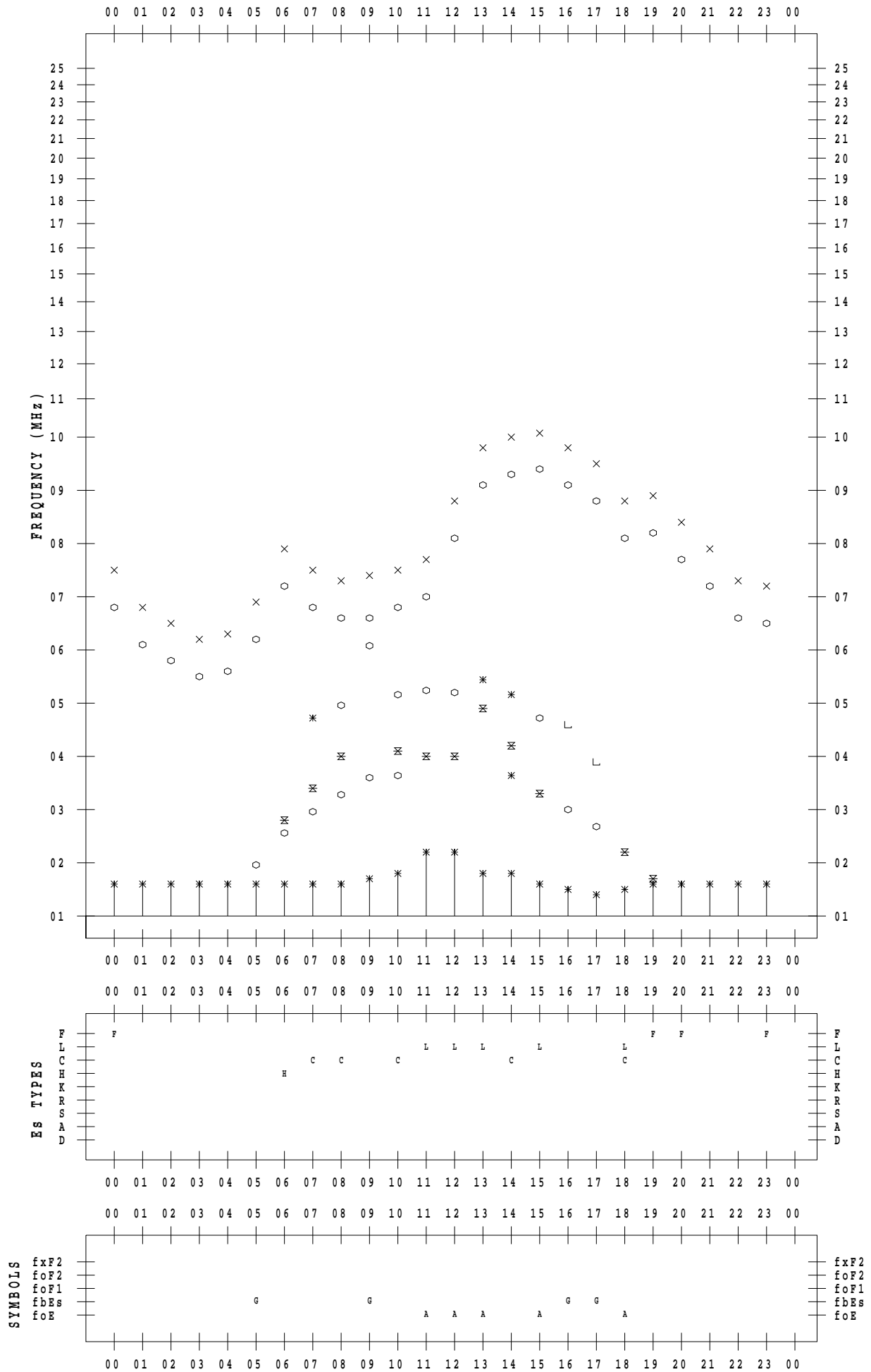
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 26

135 ° E MEAN TIME



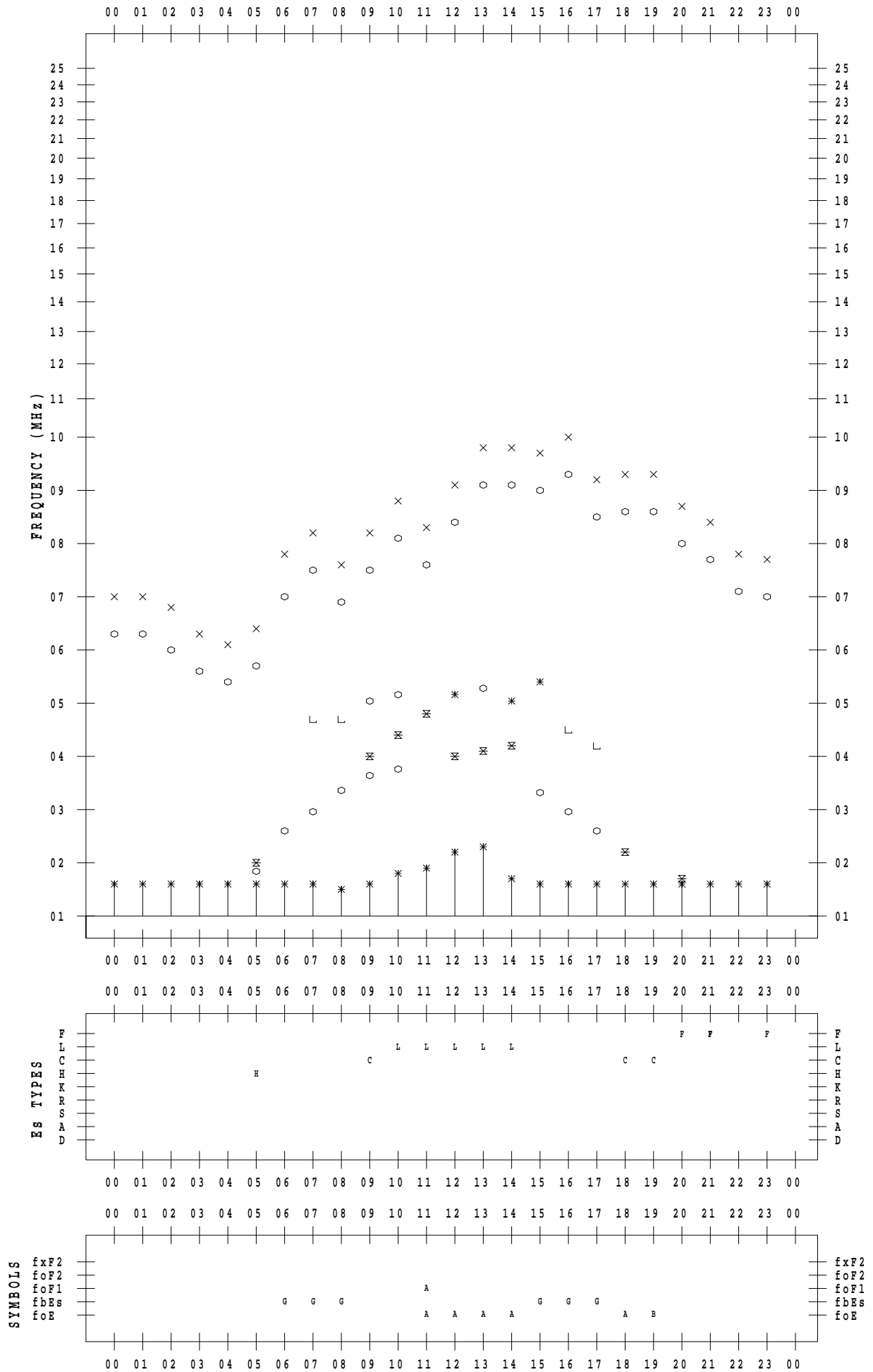
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 27

135 ° E MEAN TIME



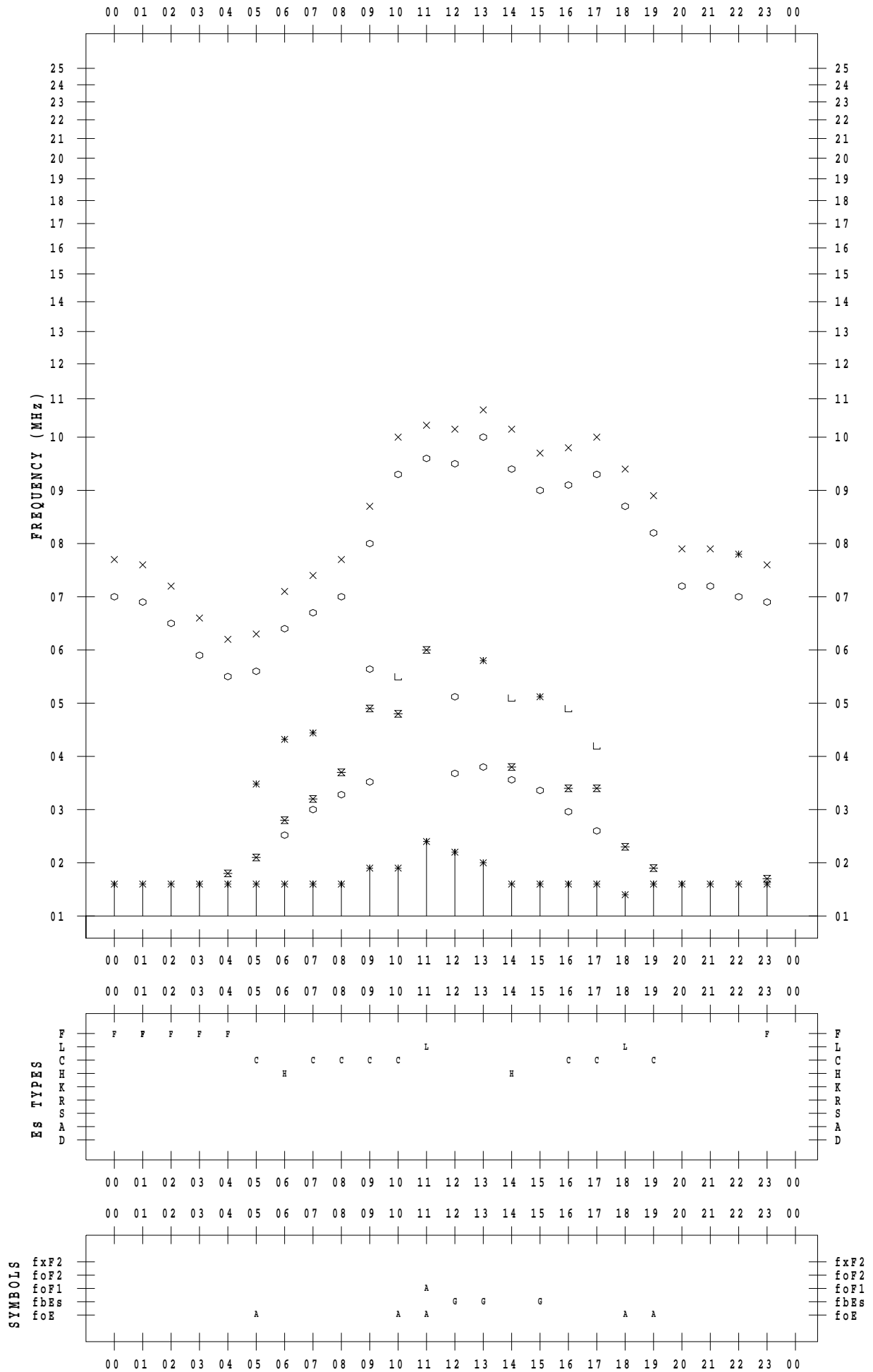
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 28

135 ° E MEAN TIME



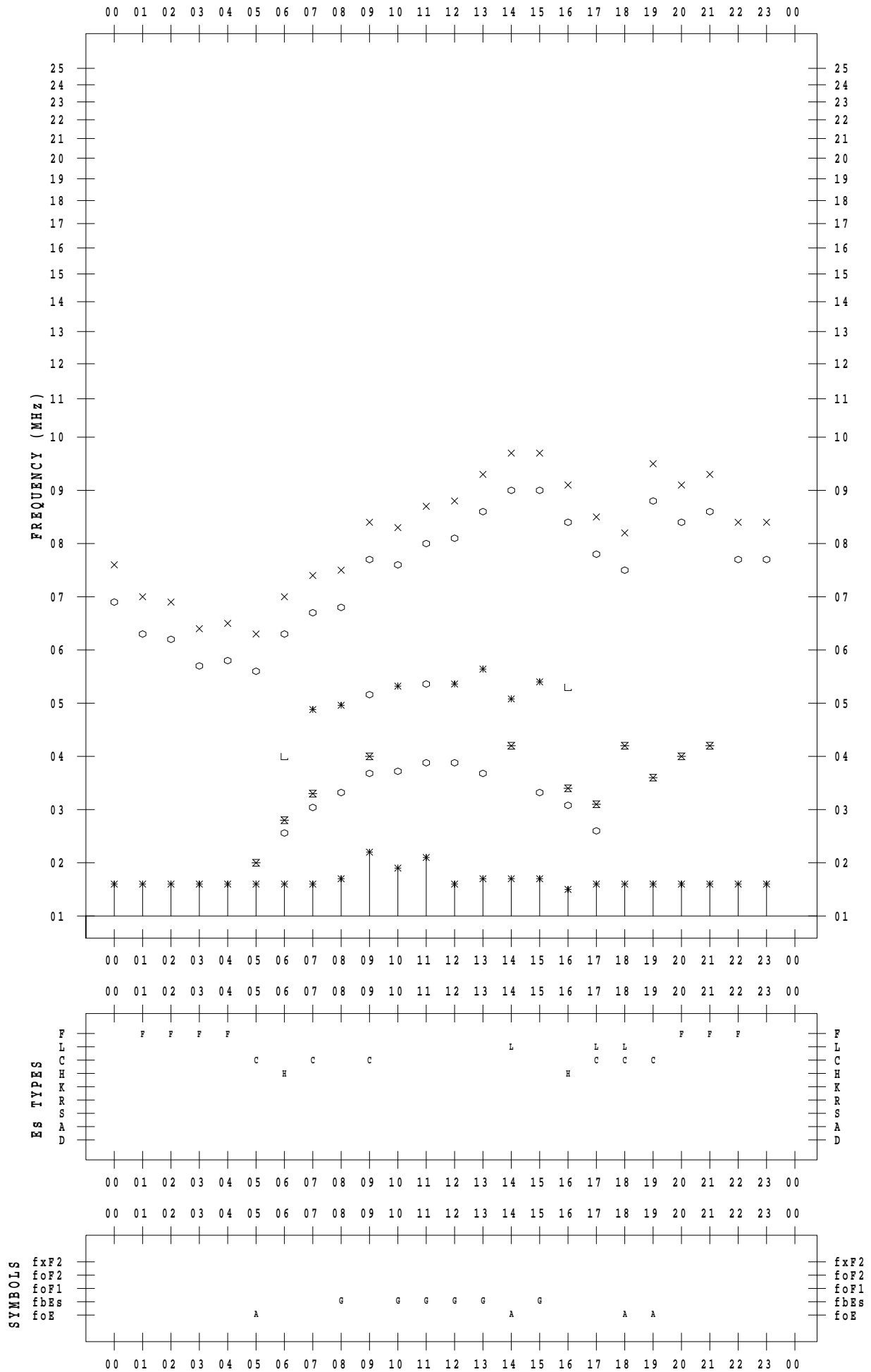
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 29

135 ° E MEAN TIME



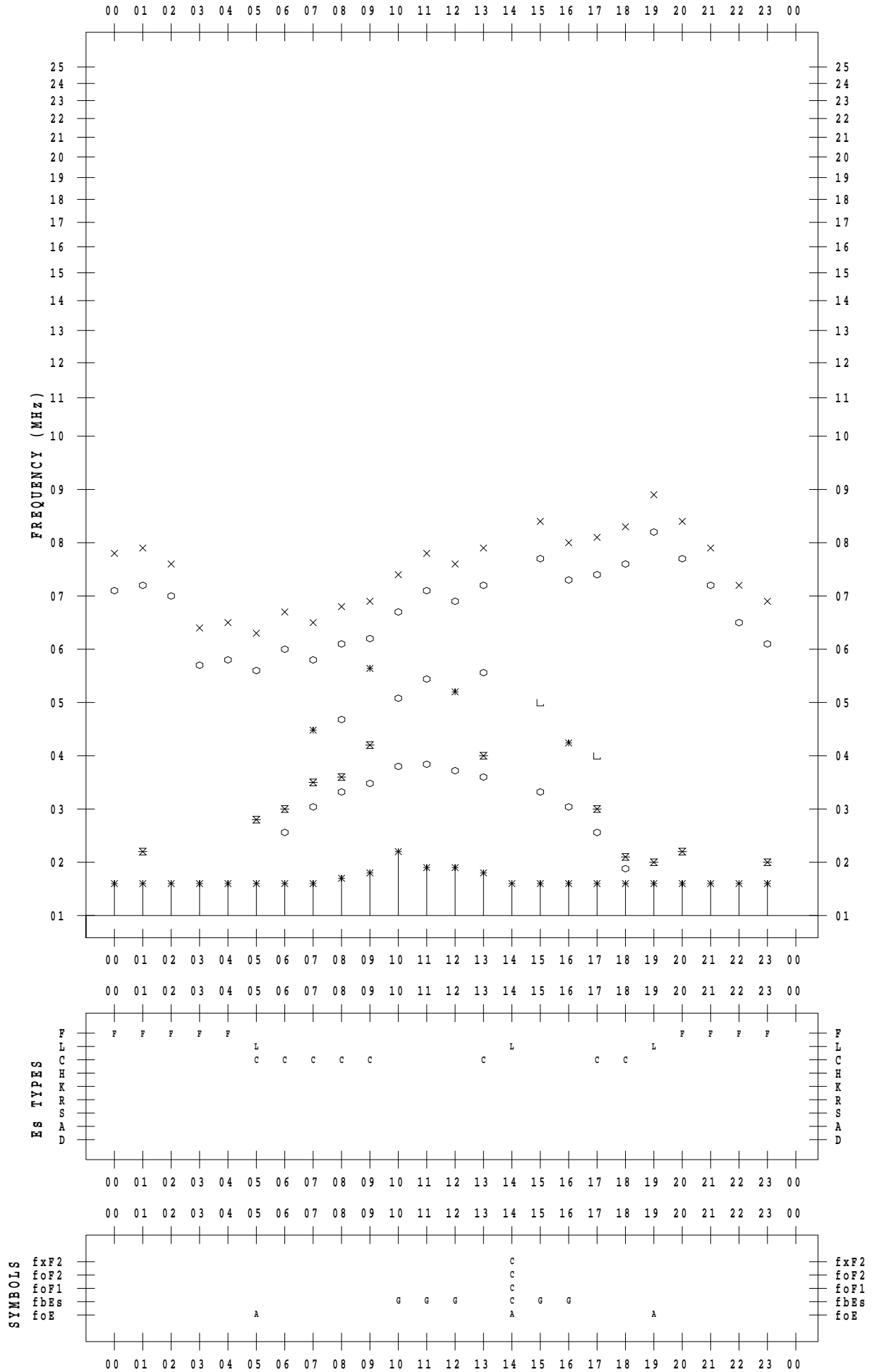
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 4 / 30

135 ° E MEAN TIME



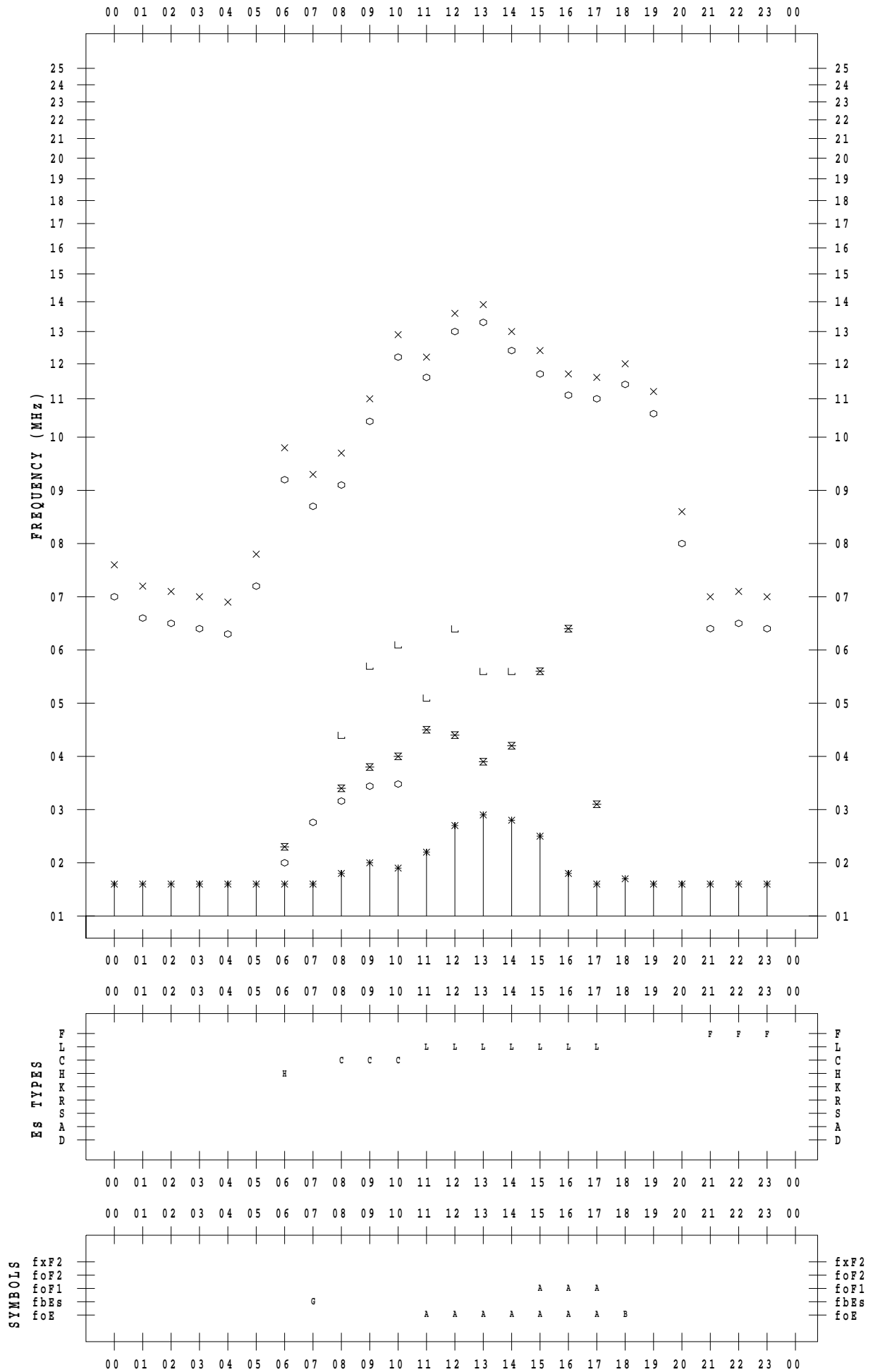
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 1

135 ° E MEAN TIME



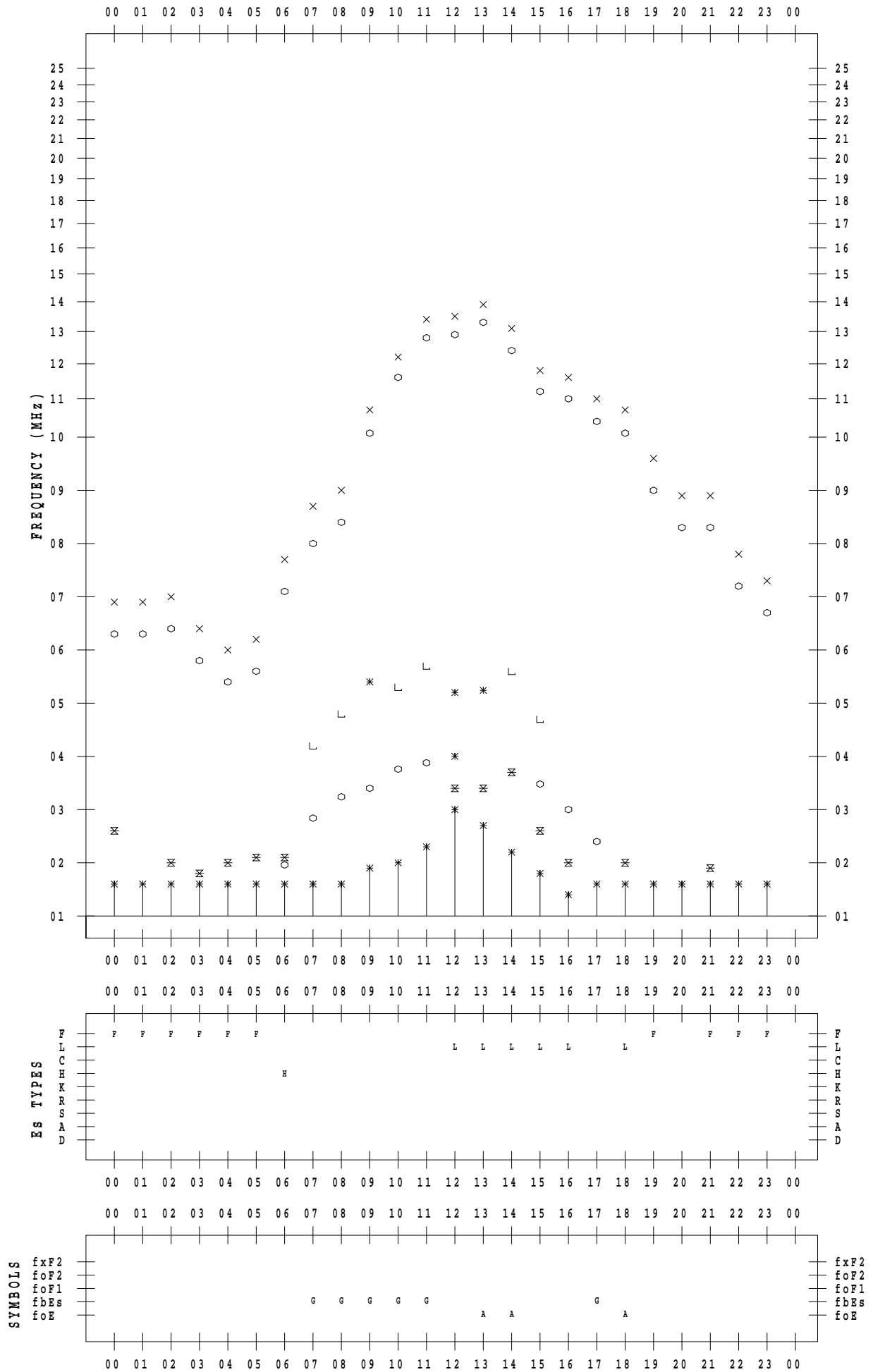
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 2

135 ° E MEAN TIME



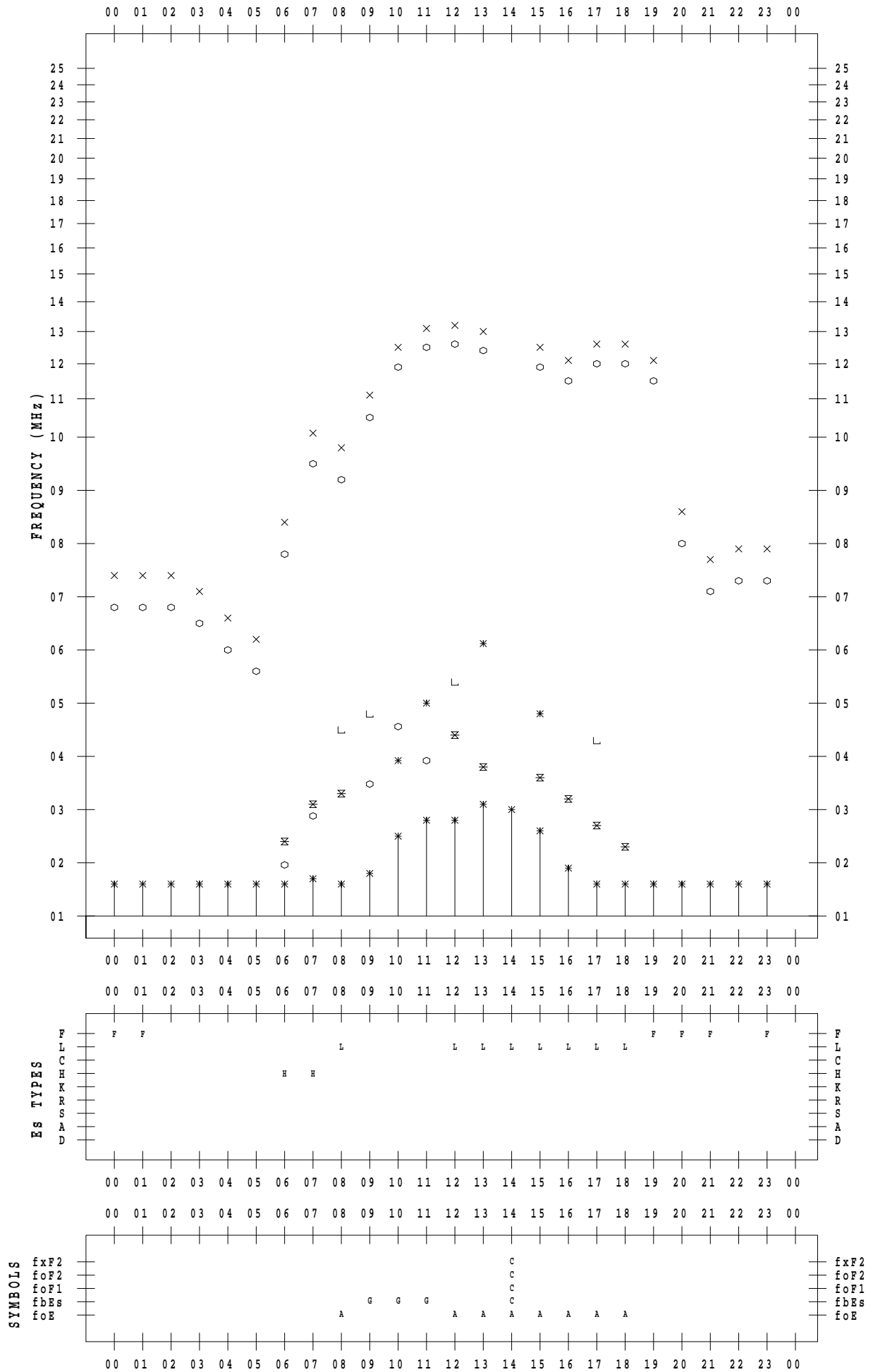
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 3

135 ° E MEAN TIME



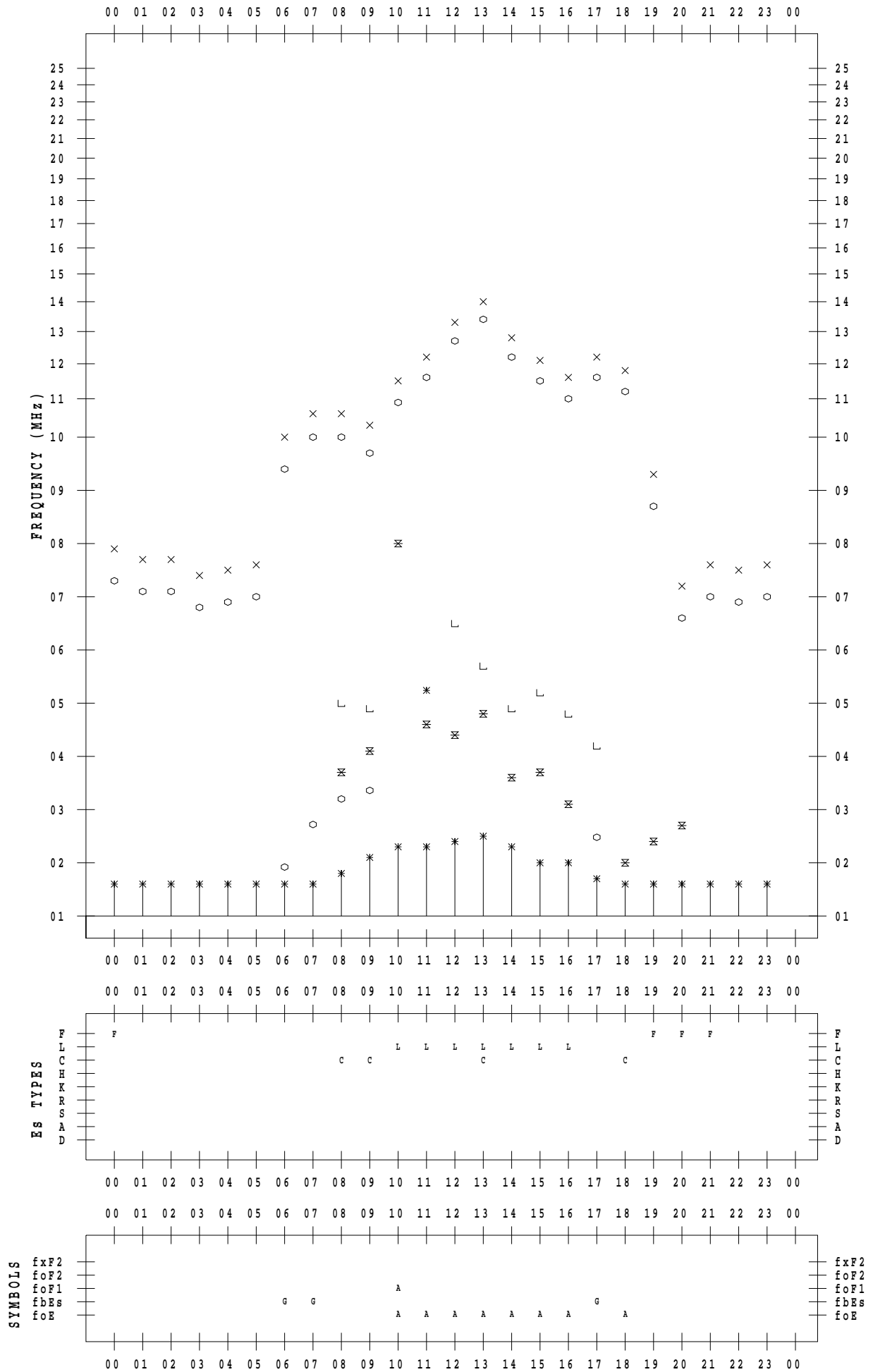
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 4

135 ° E MEAN TIME



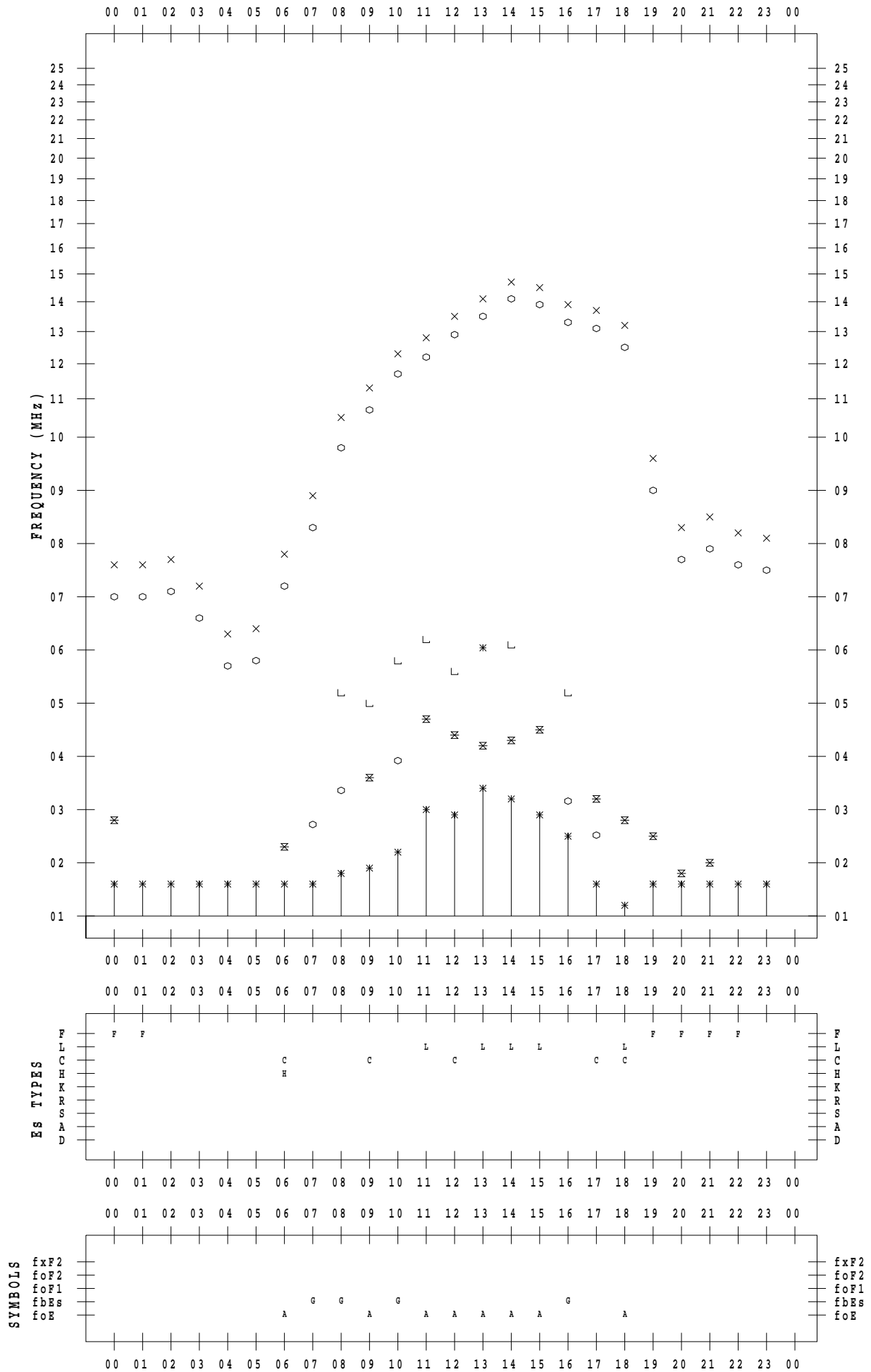
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 5

135 ° E MEAN TIME



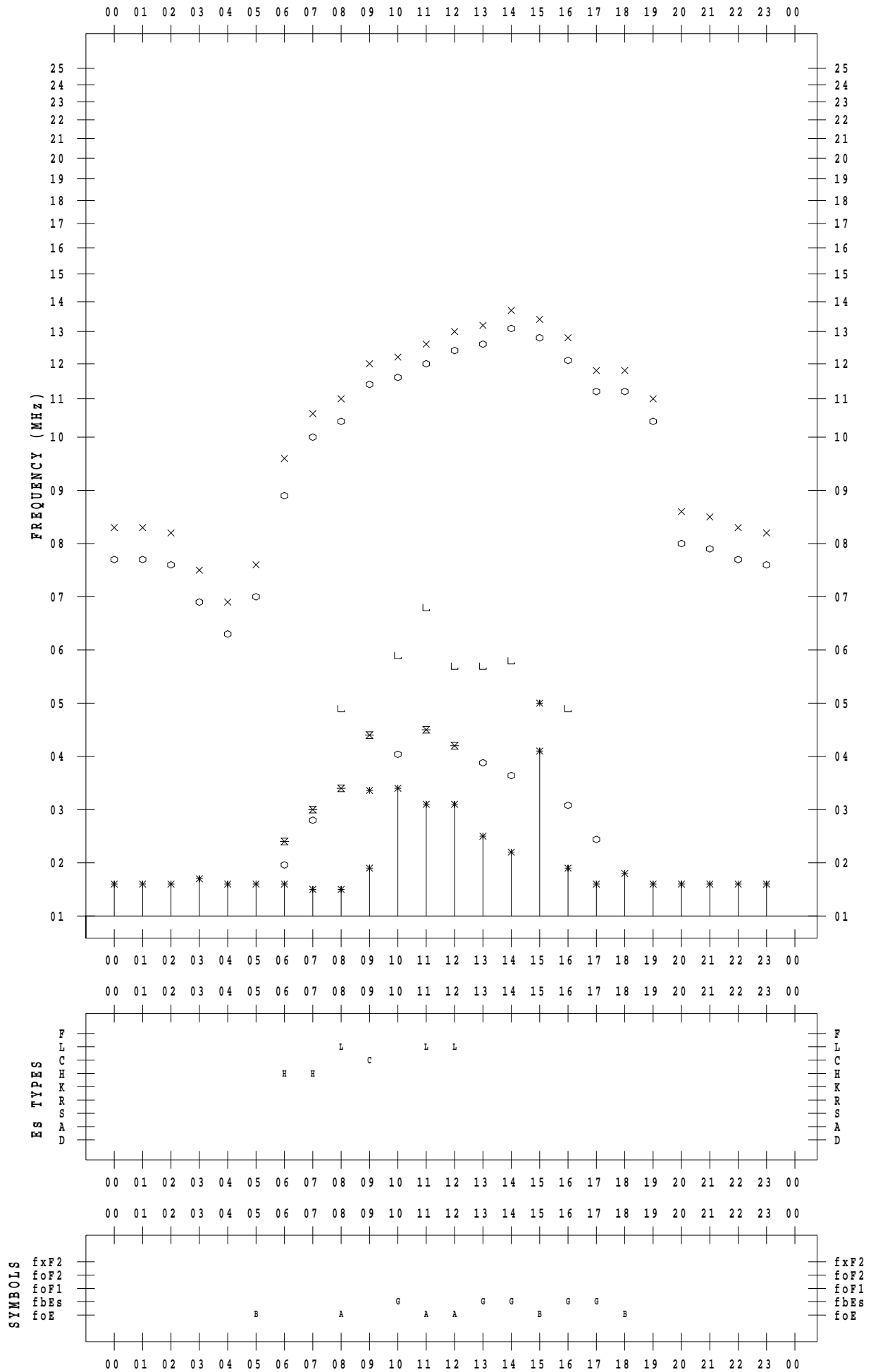
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 6

135 ° E MEAN TIME



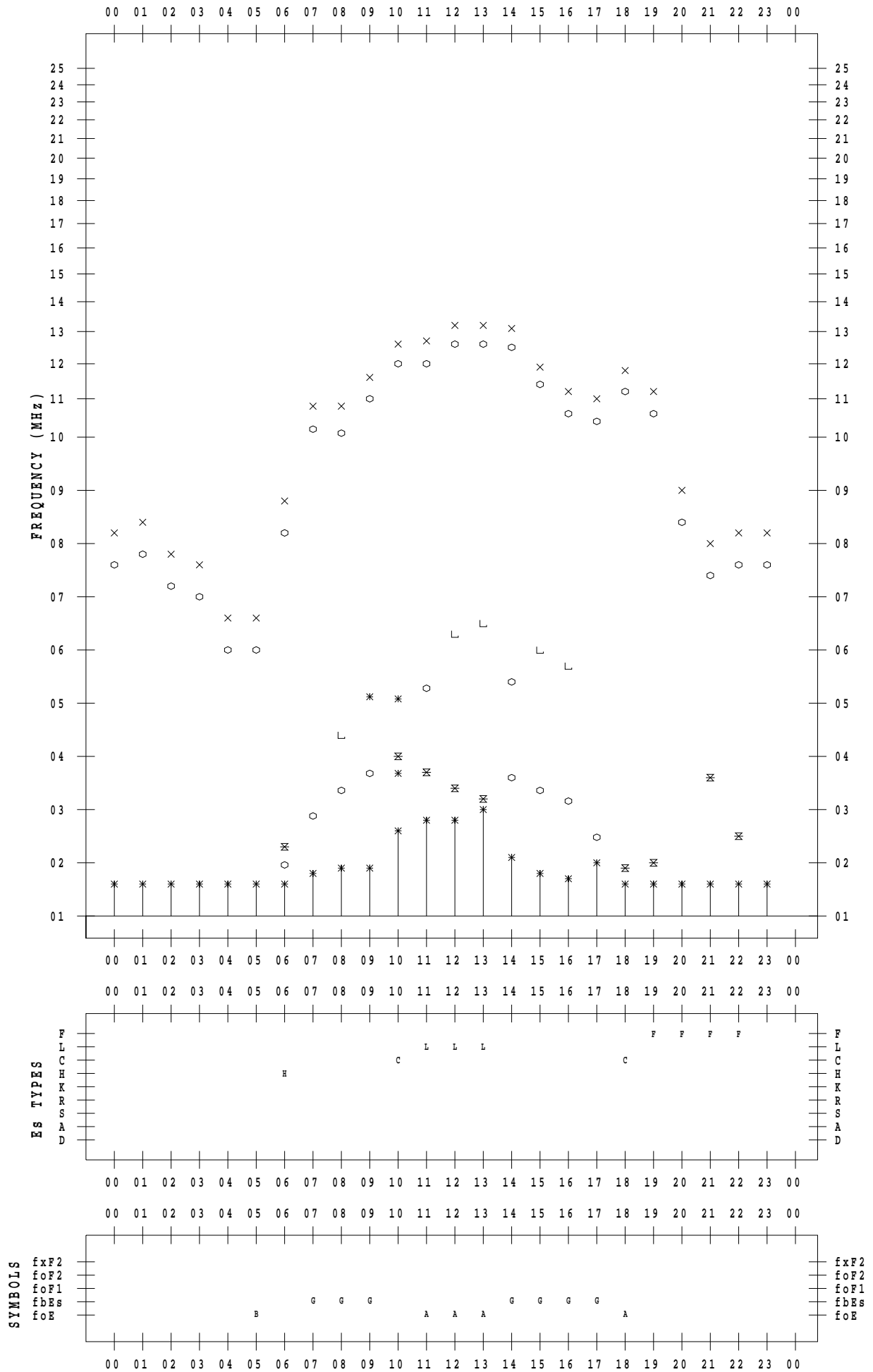
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 7

135 ° E MEAN TIME



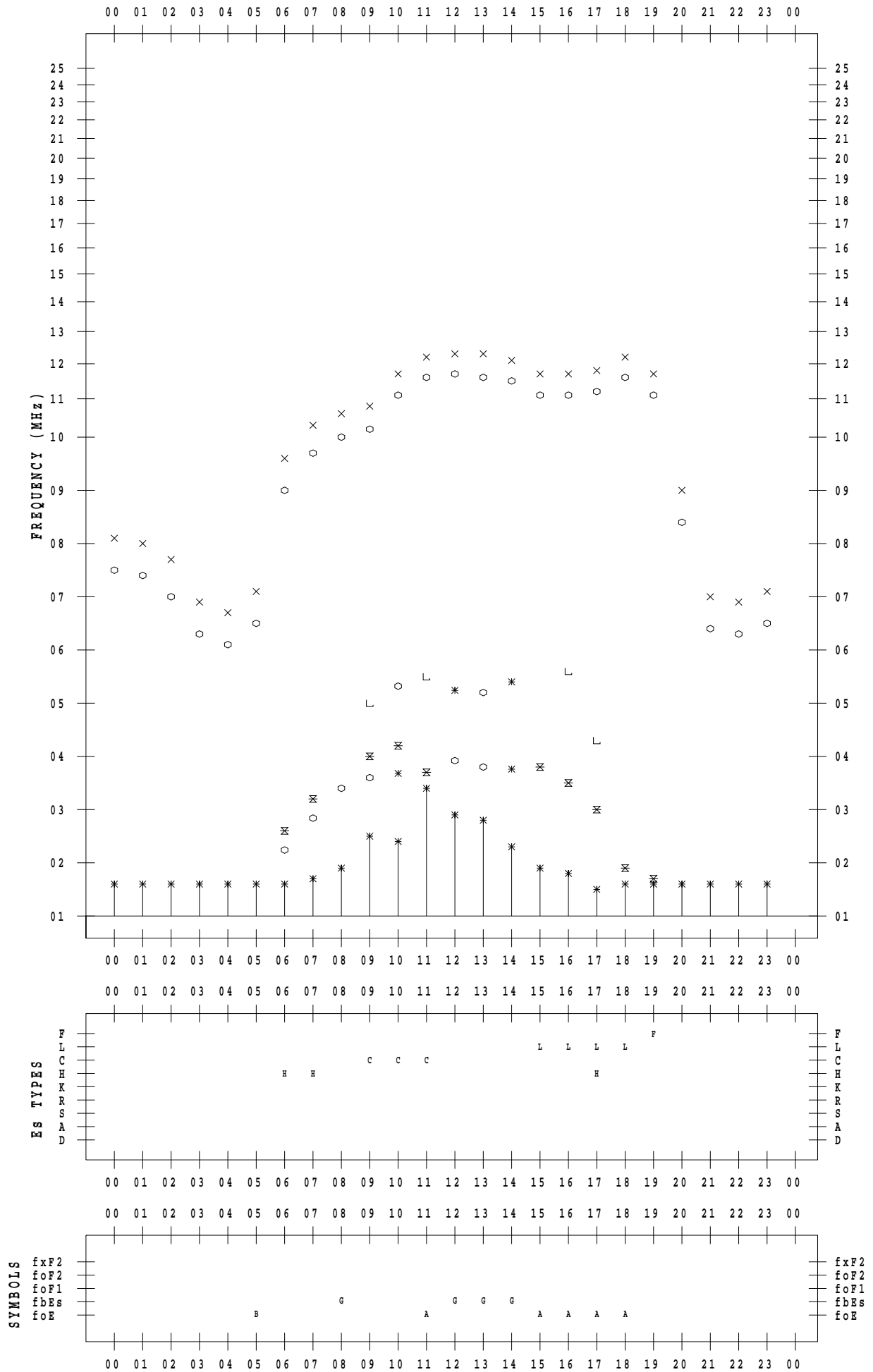
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 8

135 ° E MEAN TIME



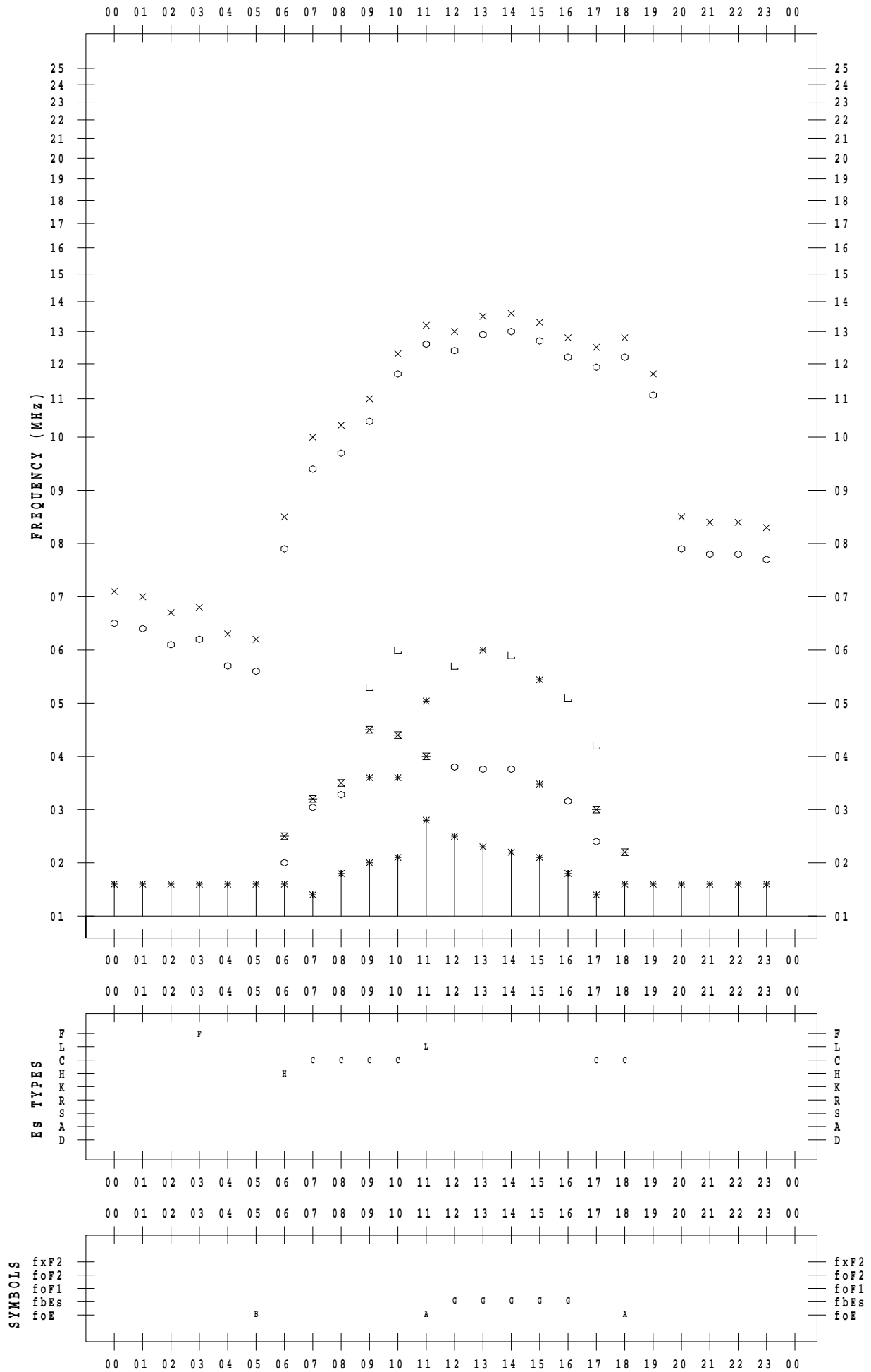
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 9

135 ° E MEAN TIME



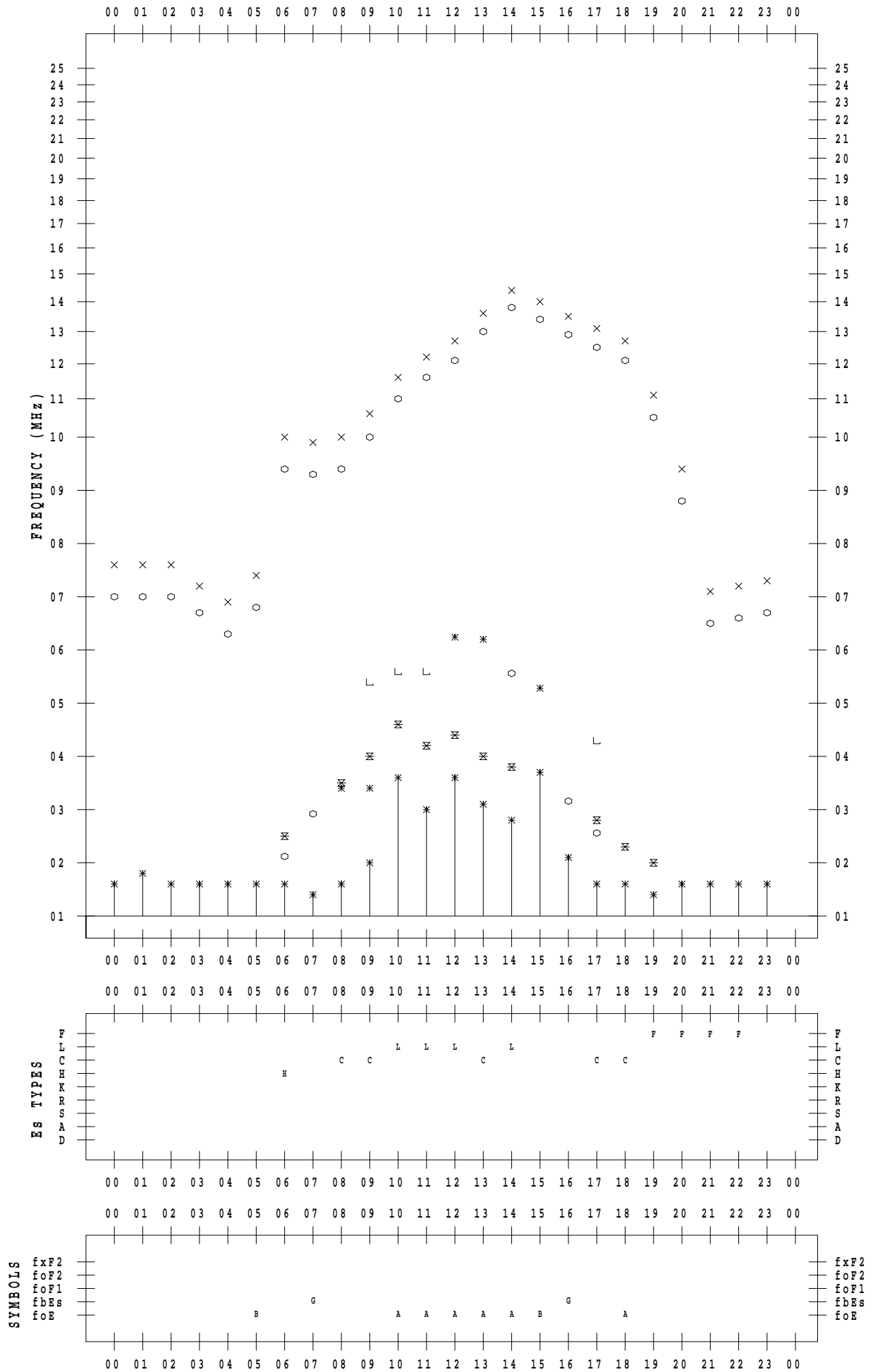
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 4/10

135 ° E MEAN TIME



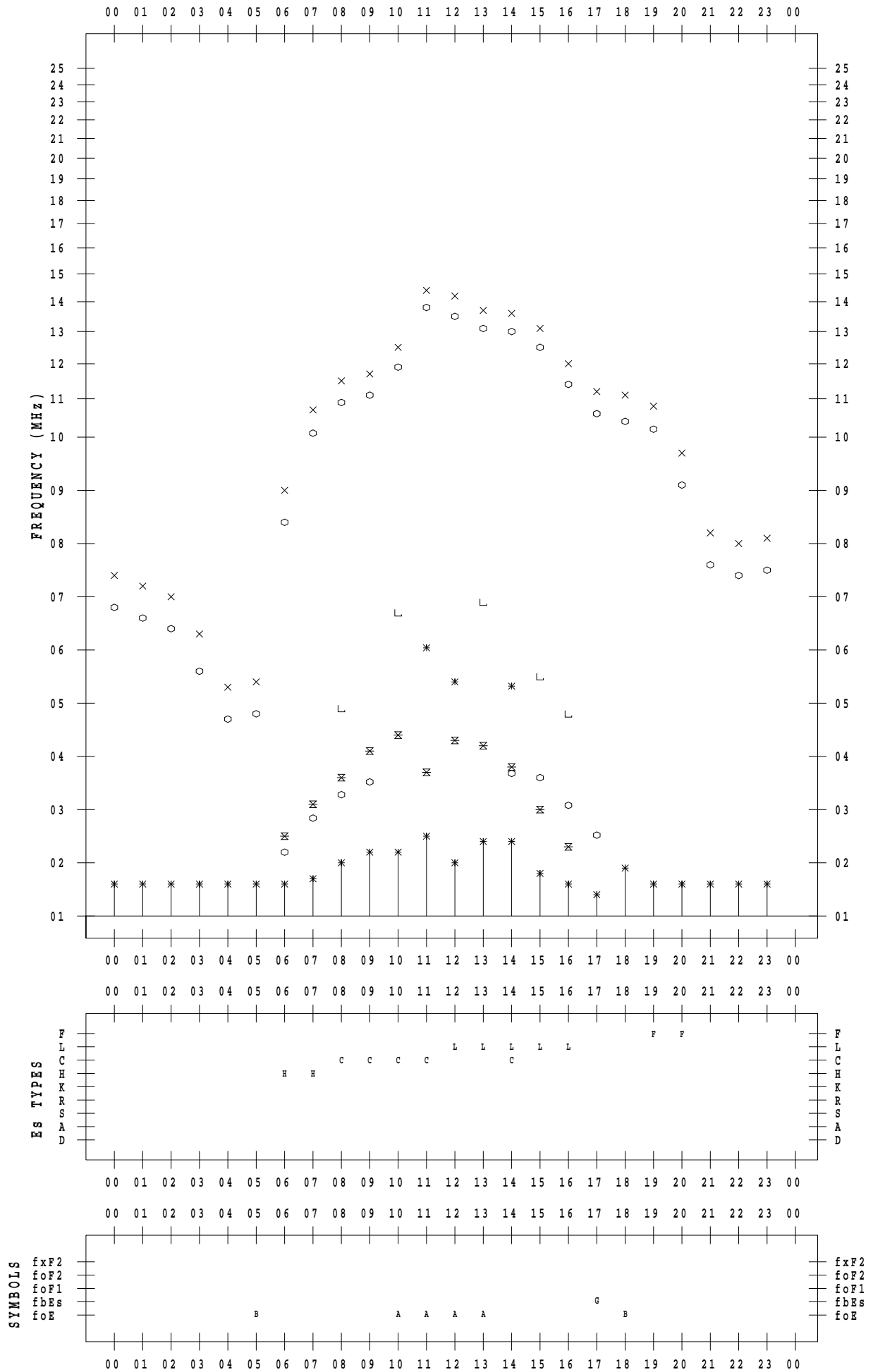
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 11

135 ° E MEAN TIME



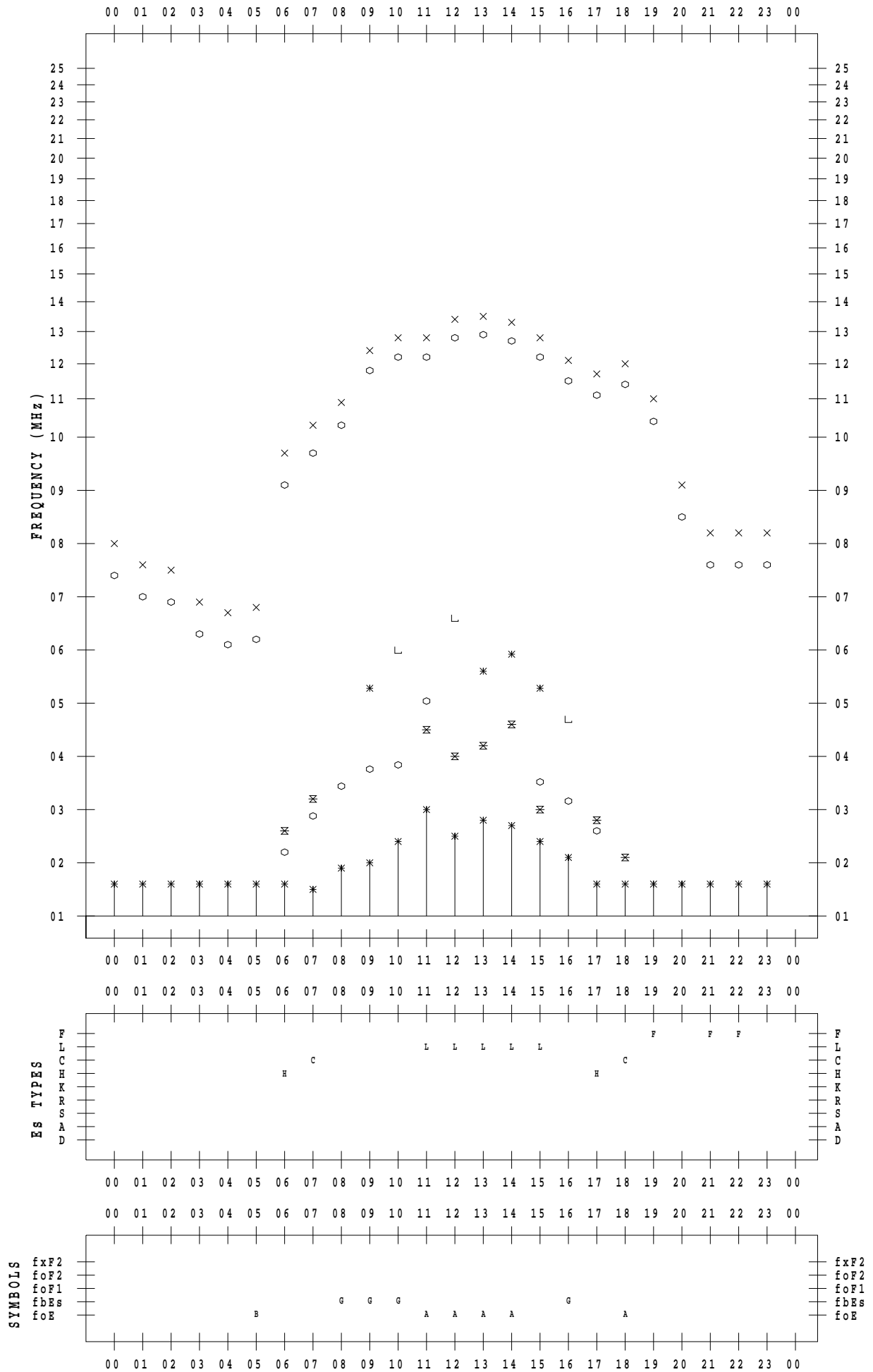
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 4/12

135 ° E MEAN TIME



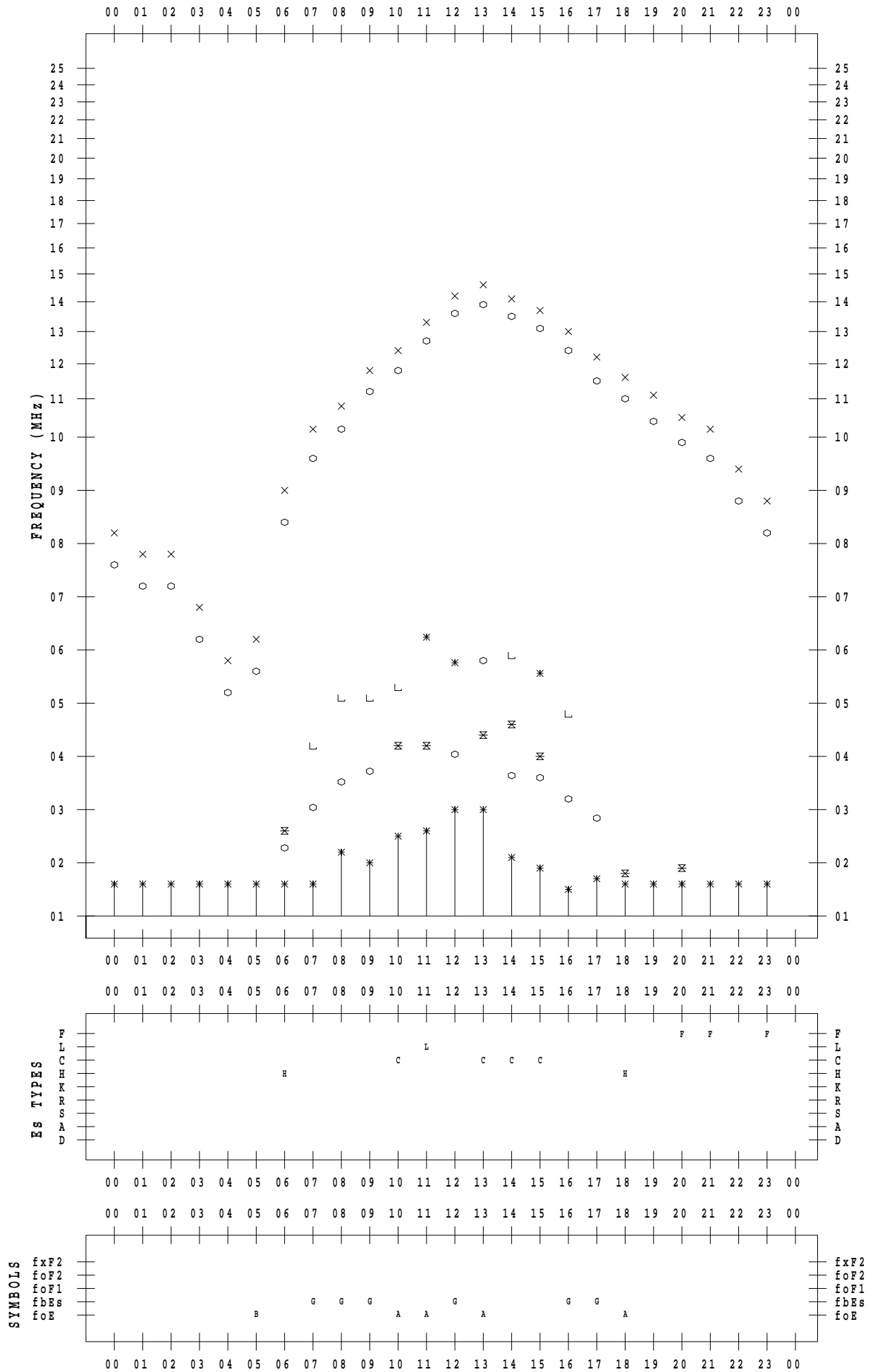
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 4/13

135 °E MEAN TIME



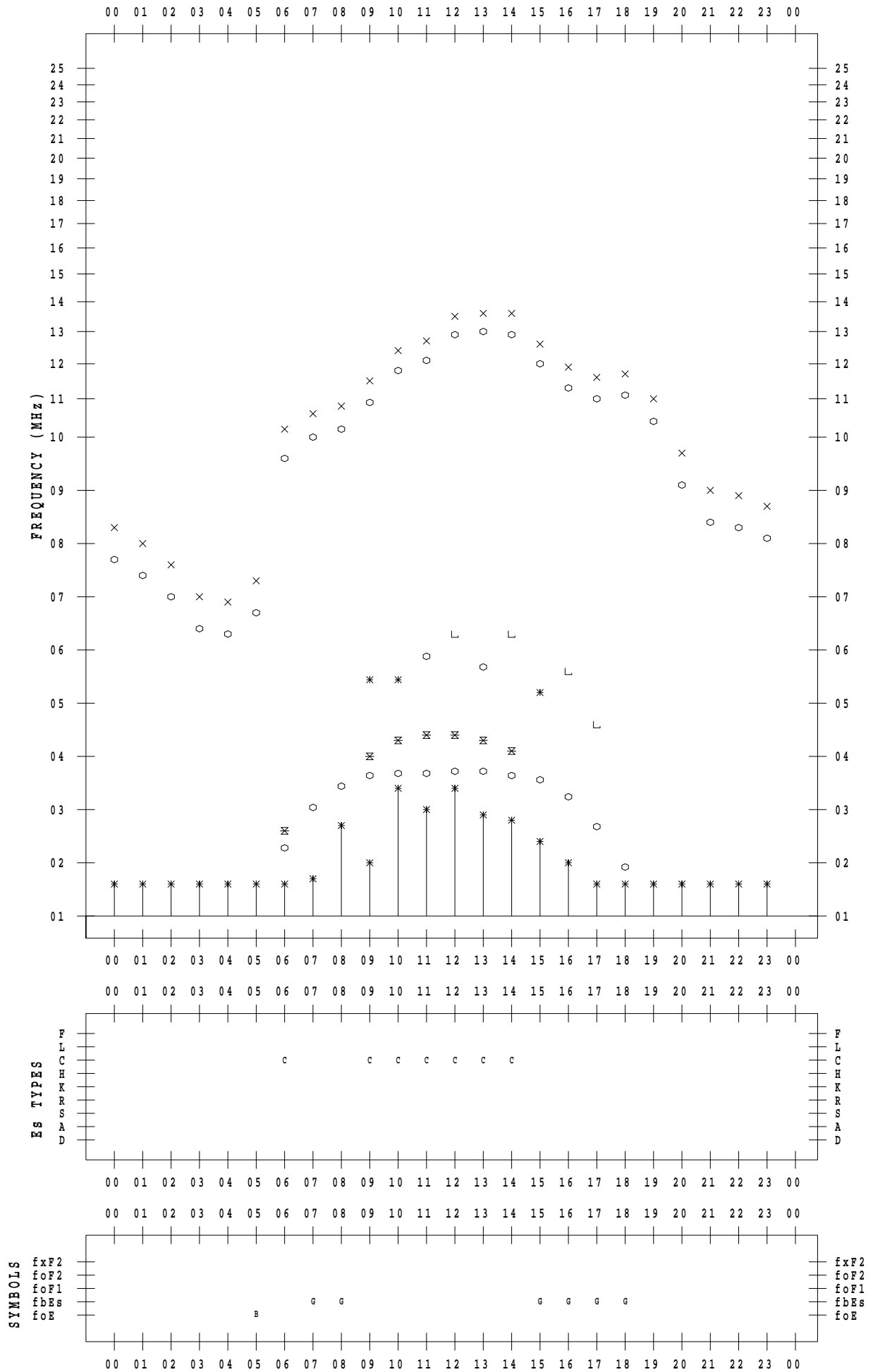
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 14

135 ° E MEAN TIME



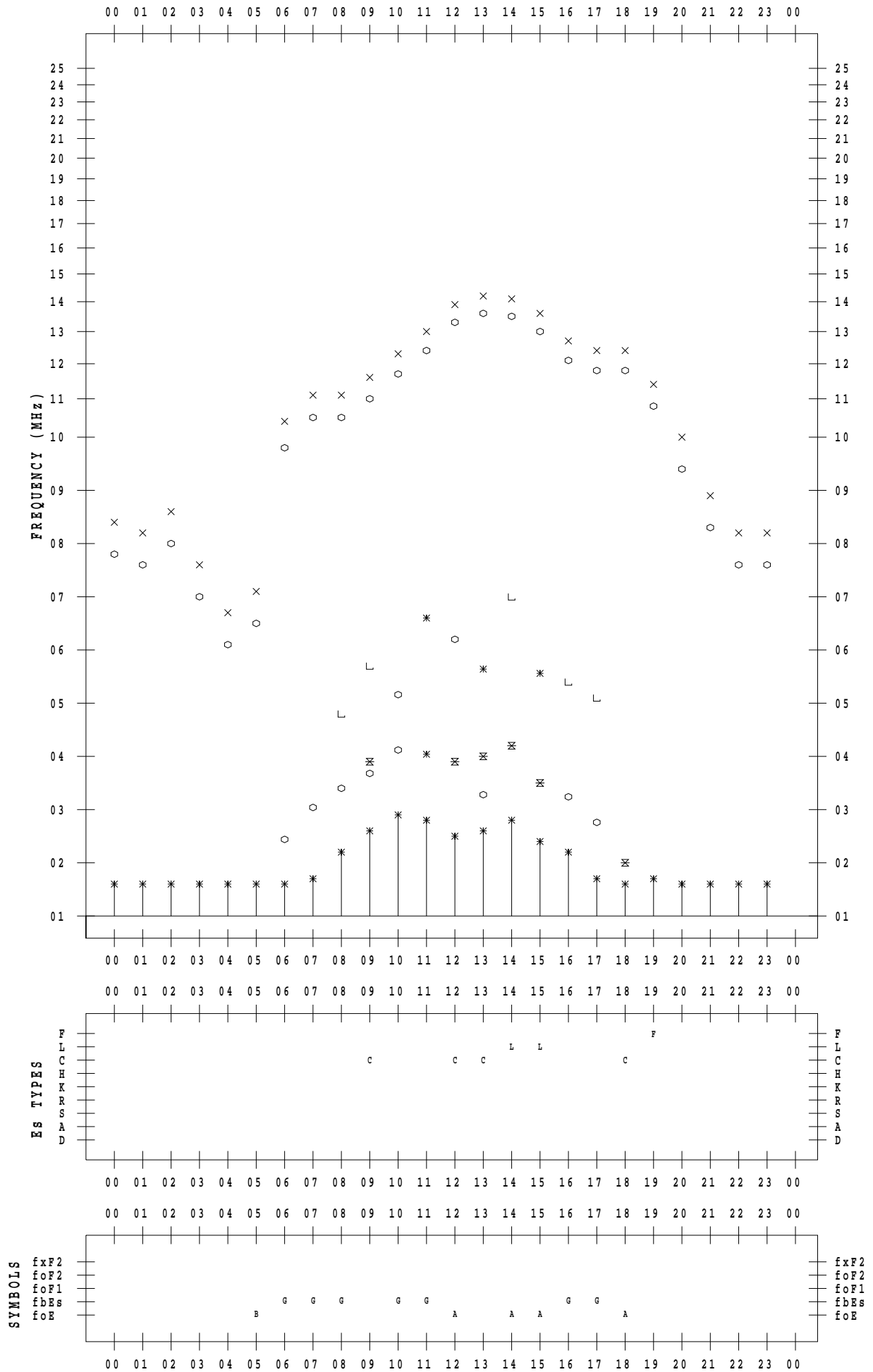
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 15

135 ° E MEAN TIME



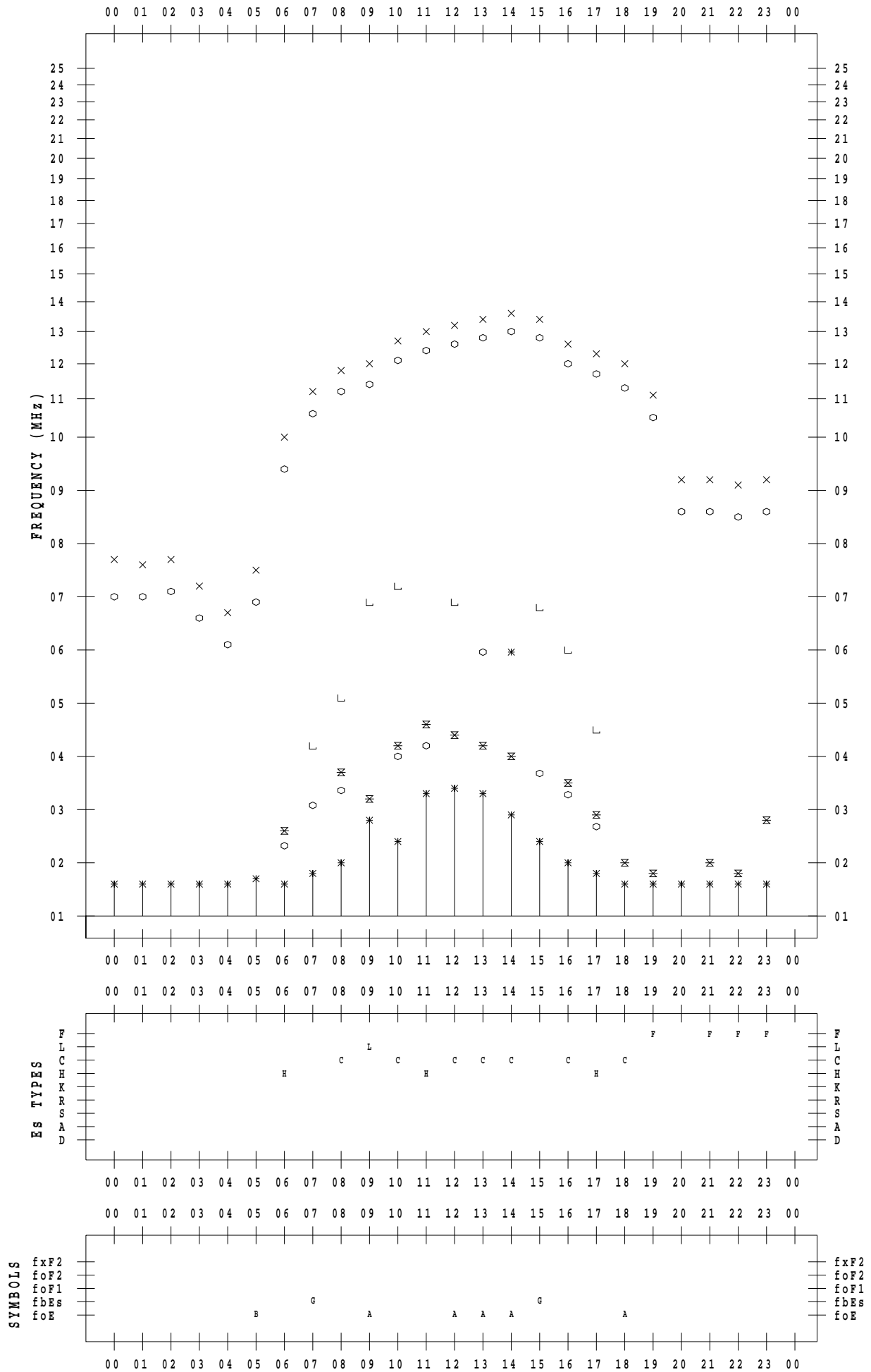
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 16

135 ° E MEAN TIME



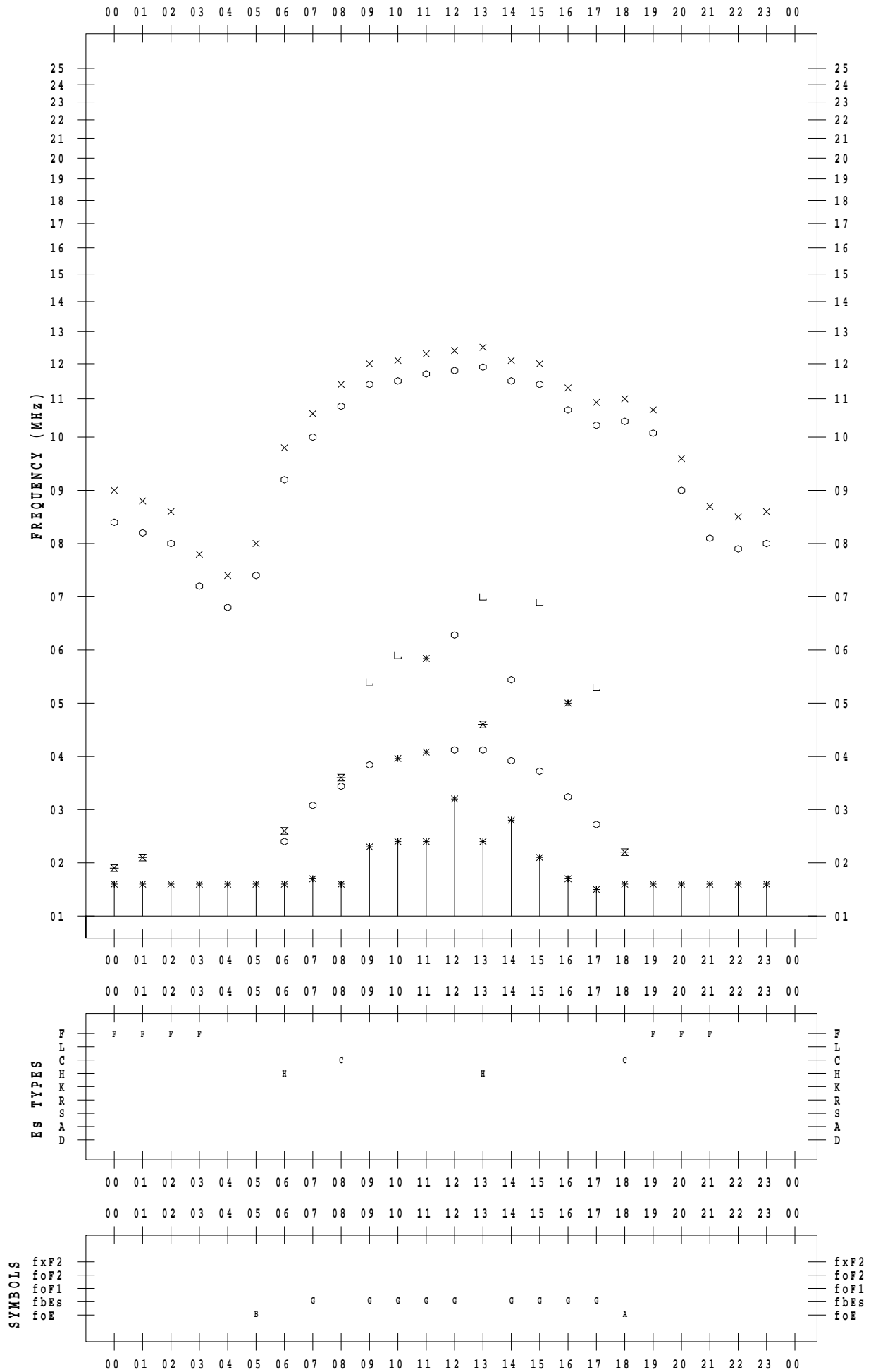
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 4/17

135 ° E MEAN TIME



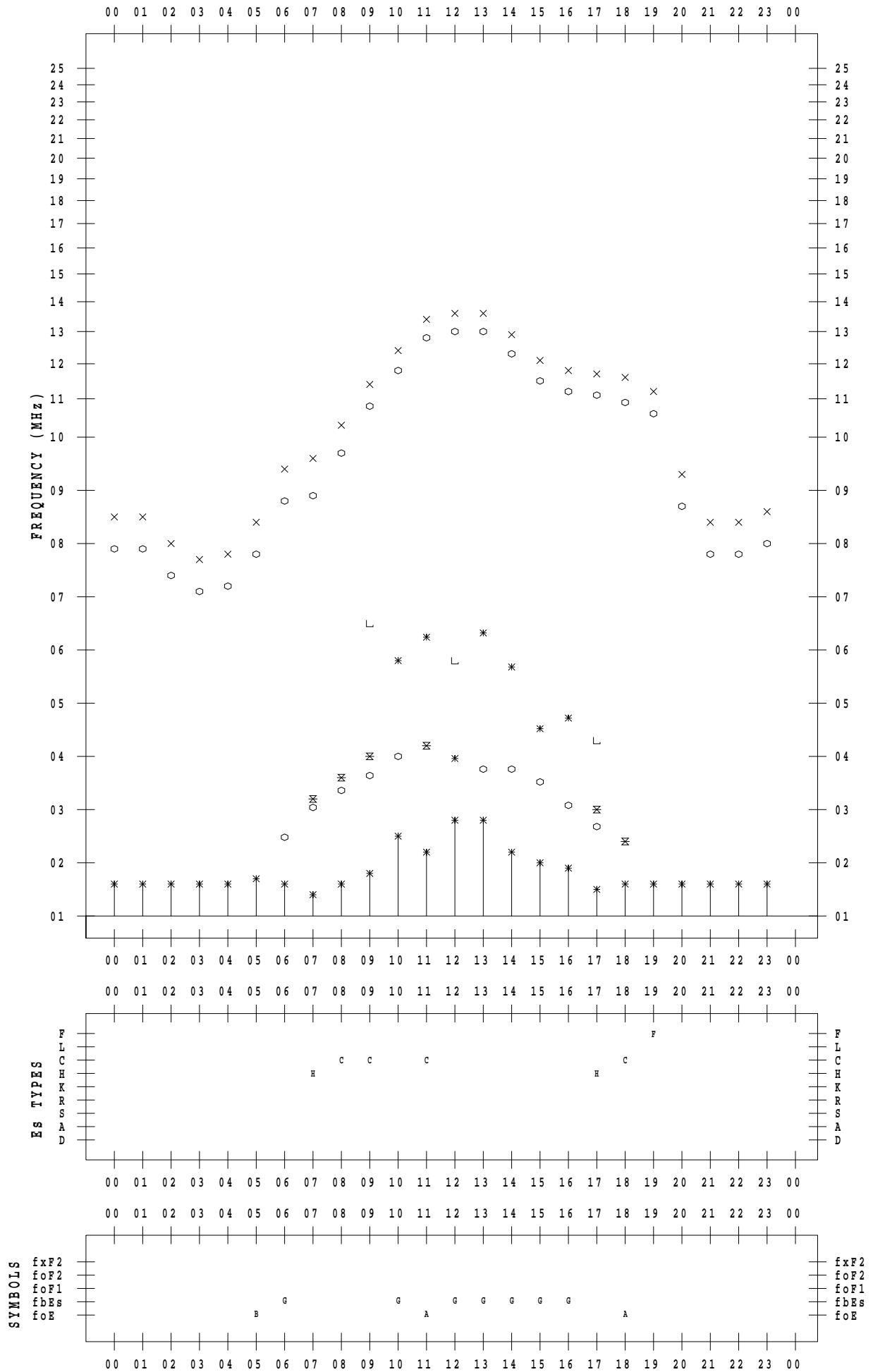
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 4/18

135 ° E MEAN TIME



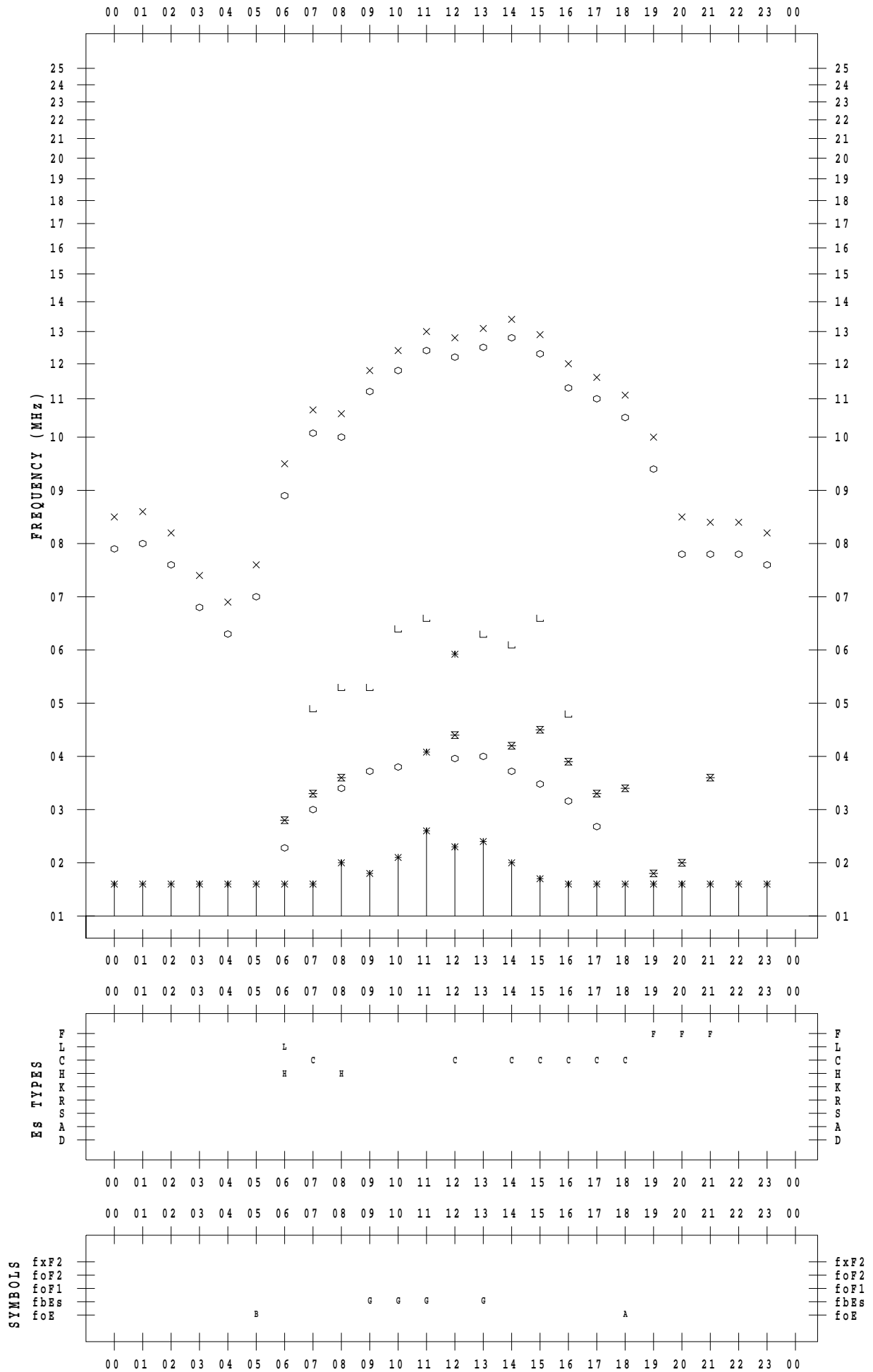
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 4/19

135 ° E MEAN TIME



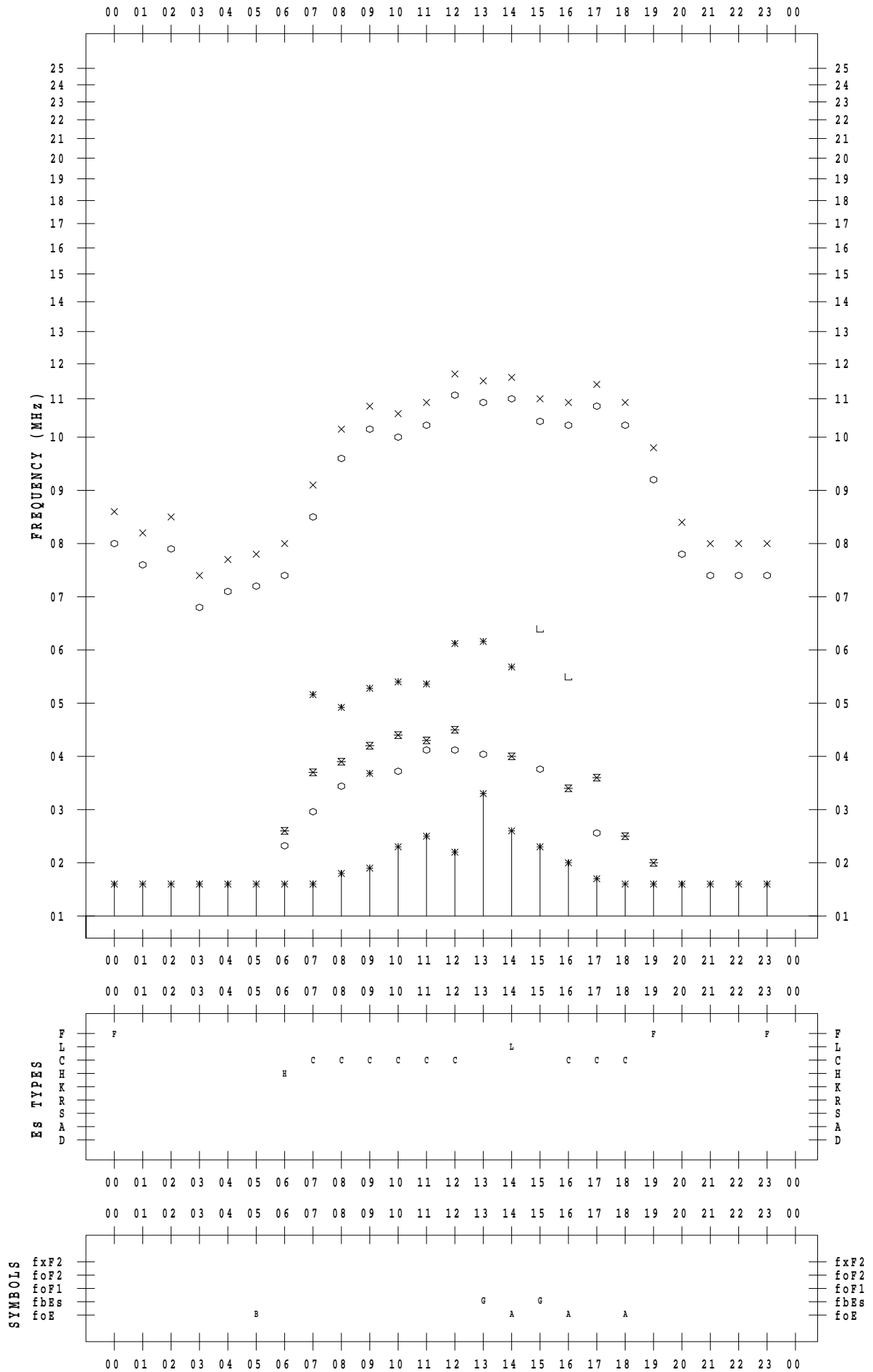
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 20

135 ° E MEAN TIME



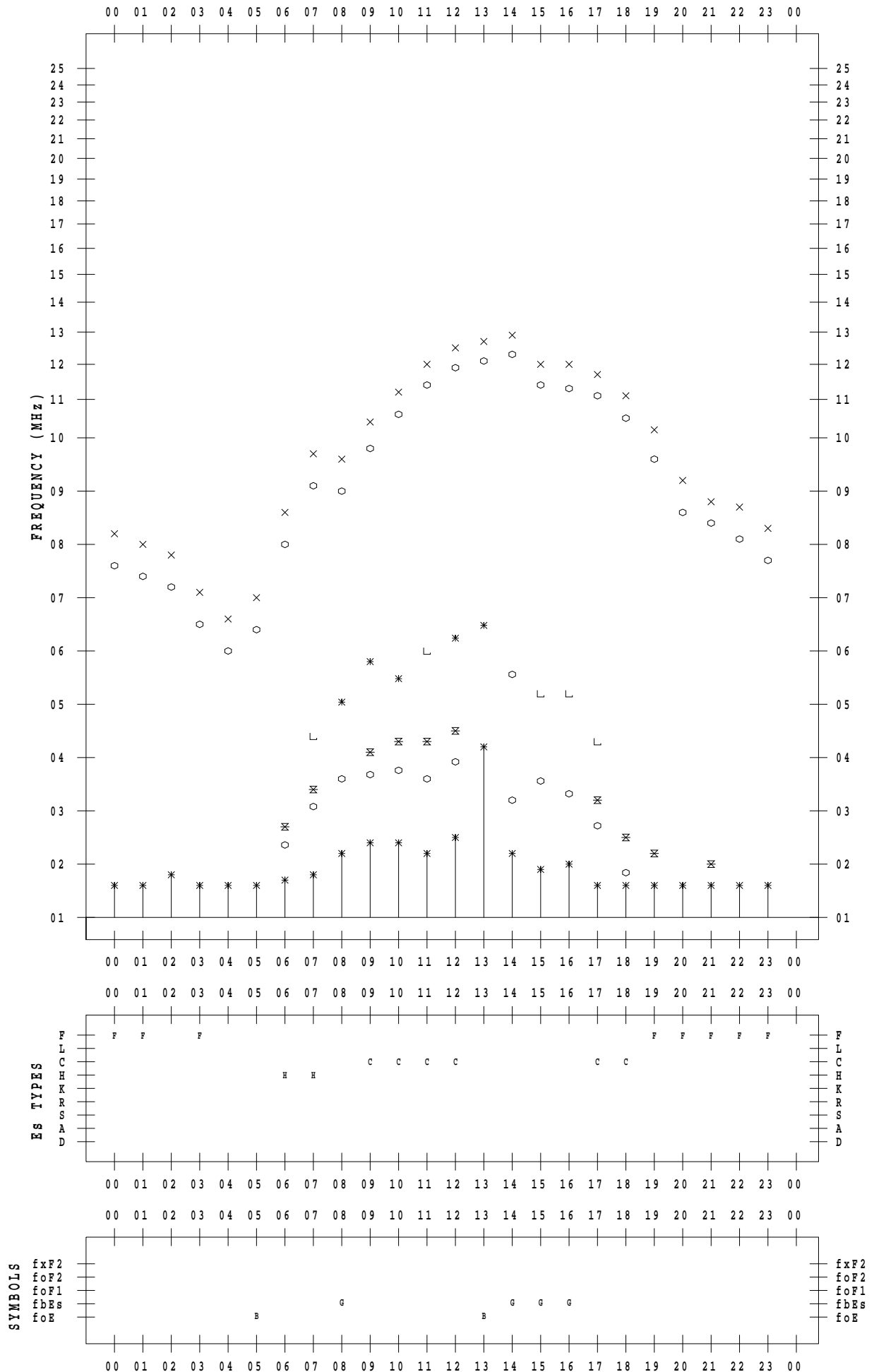
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 21

135 ° E MEAN TIME



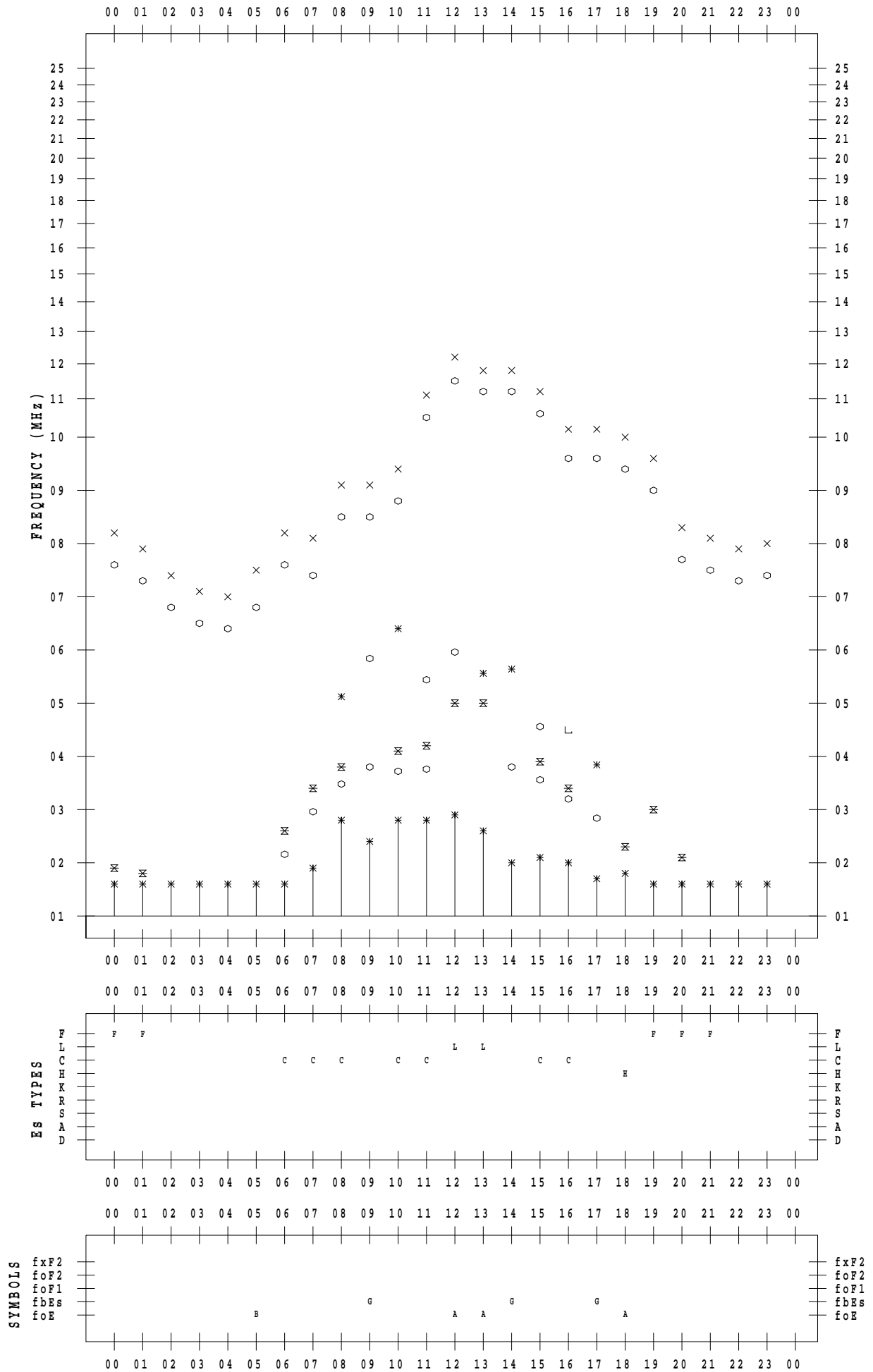
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 22

135 ° E MEAN TIME



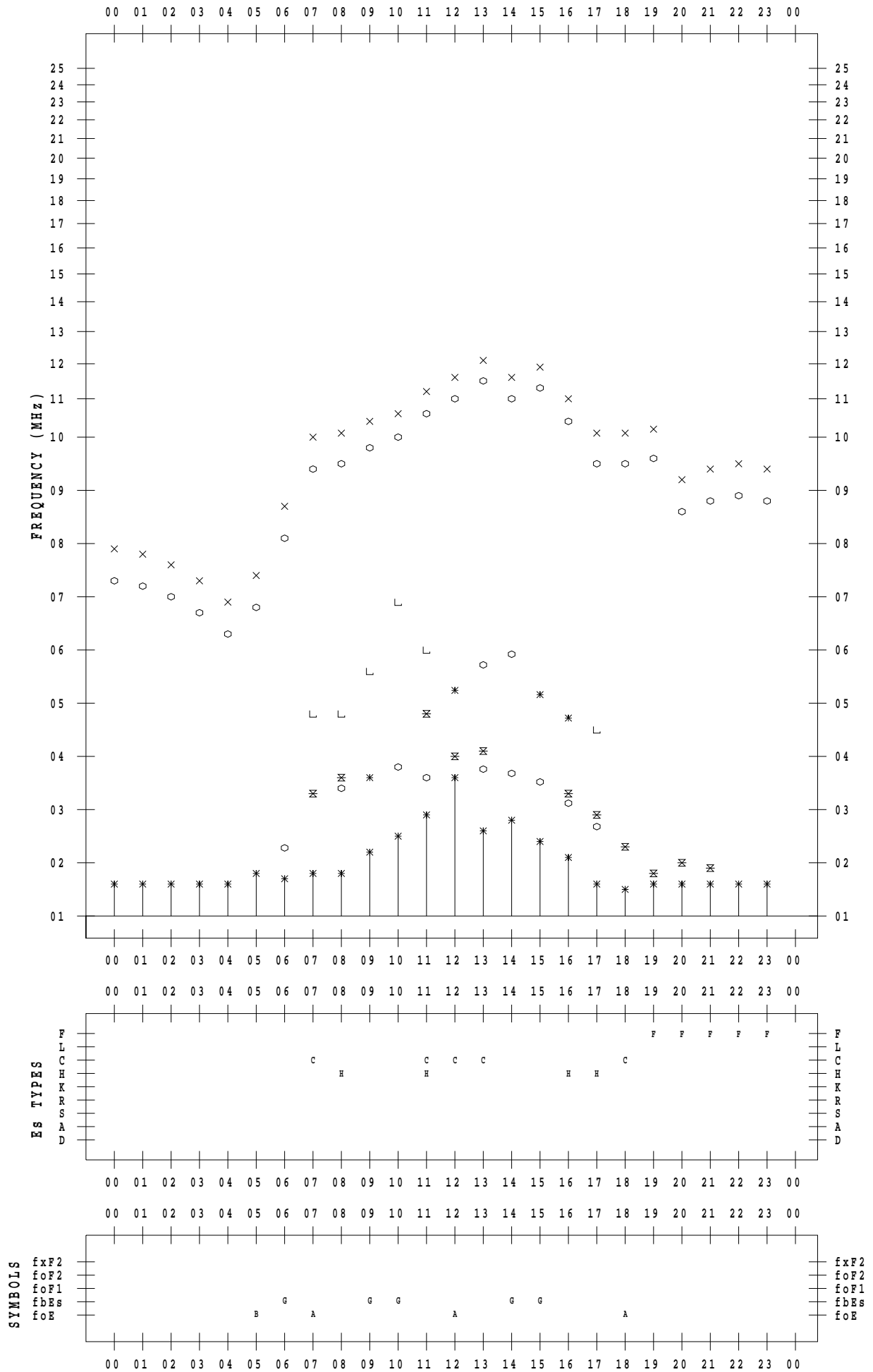
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 4/23

135 ° E MEAN TIME



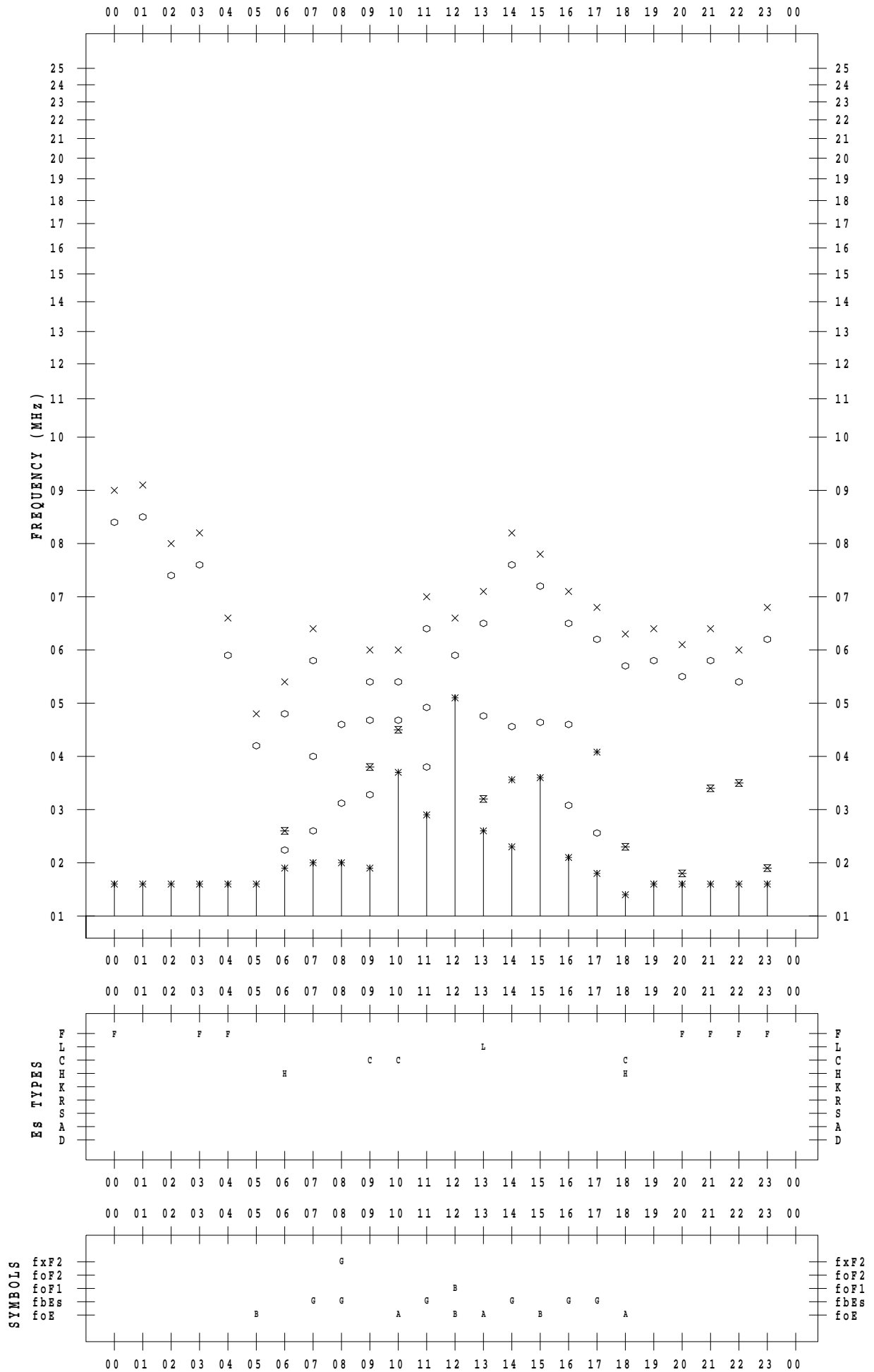
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 24

135 ° E MEAN TIME



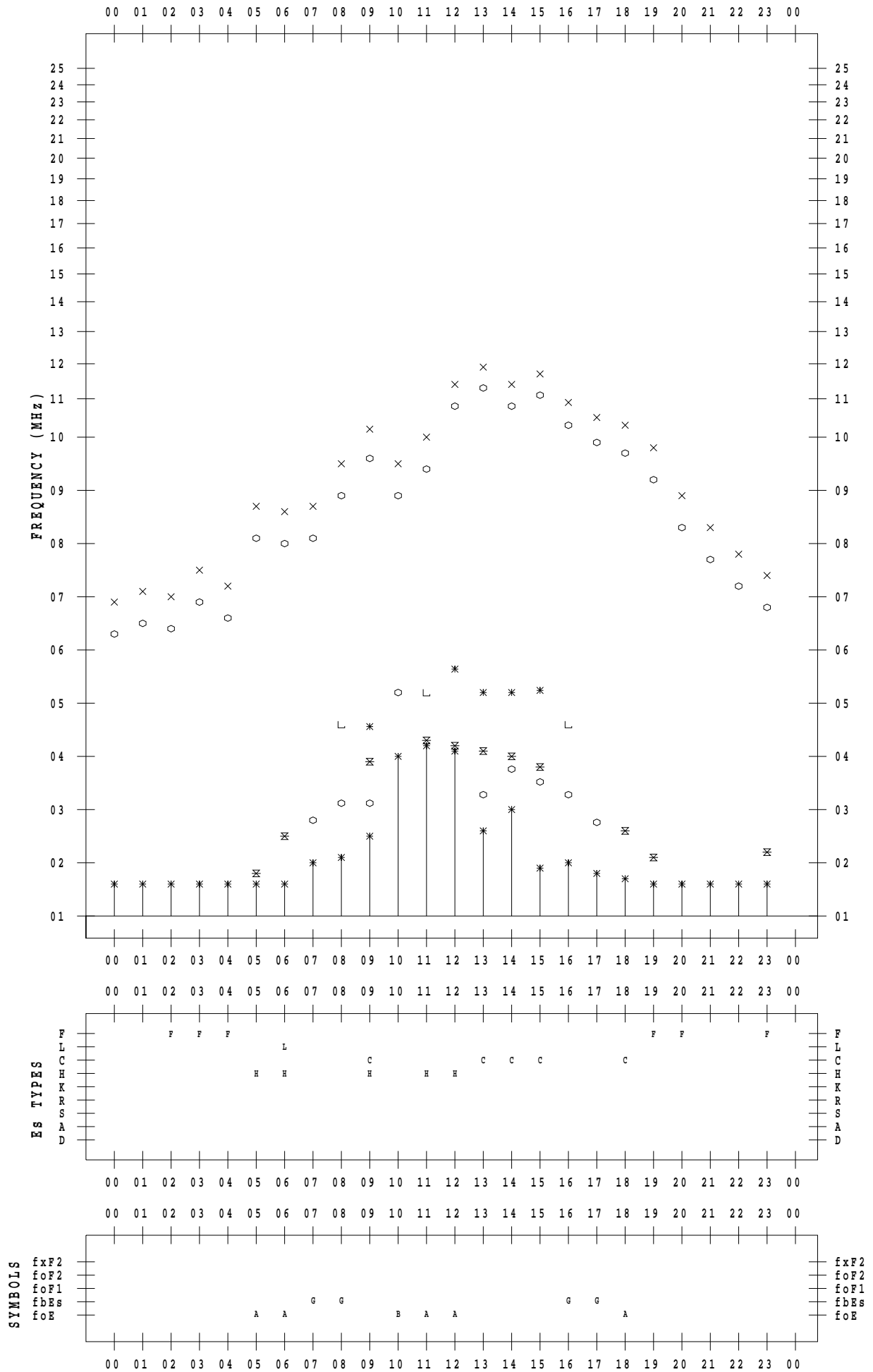
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 25

135 ° E MEAN TIME



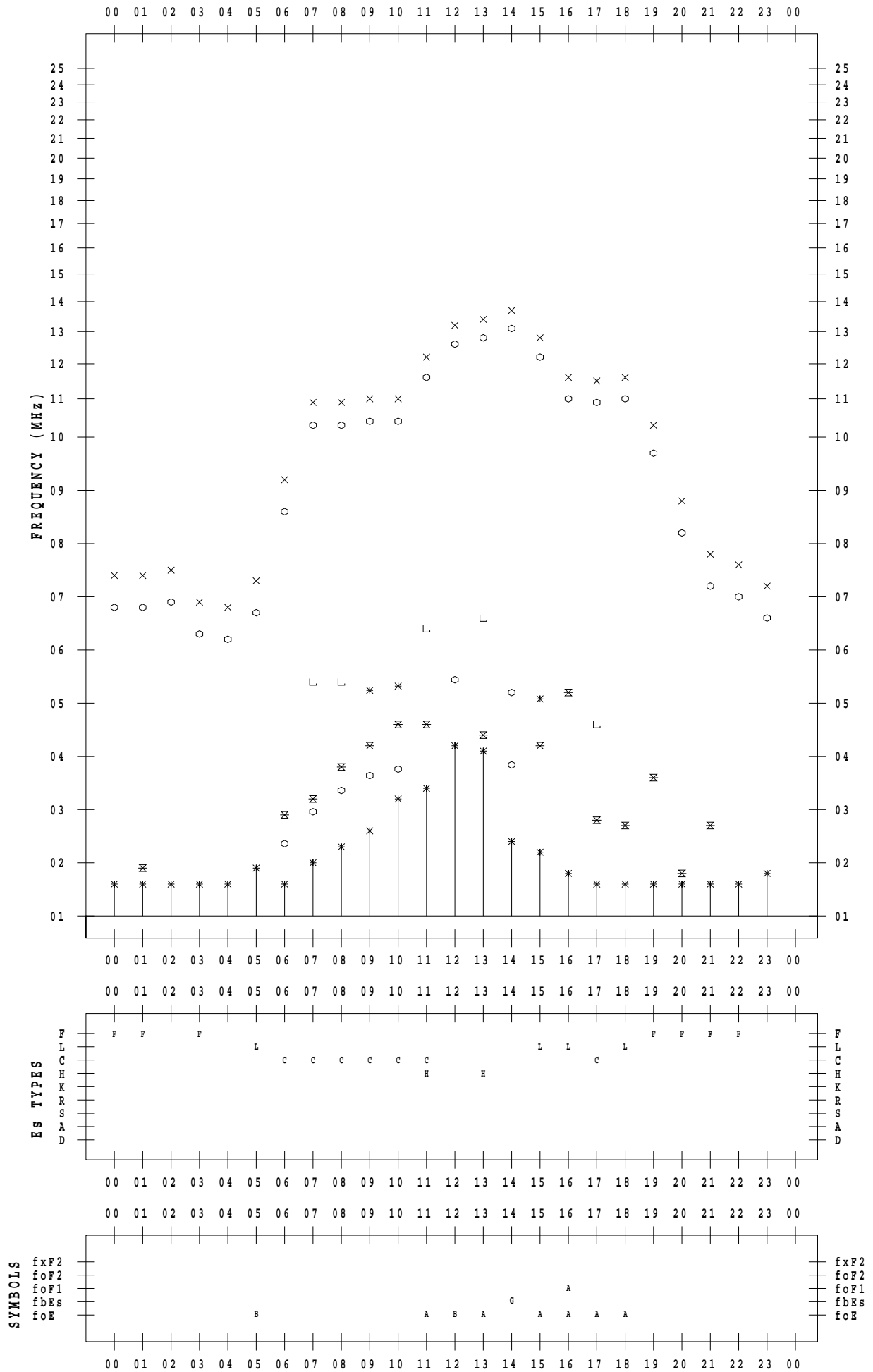
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 26

135 ° E MEAN TIME



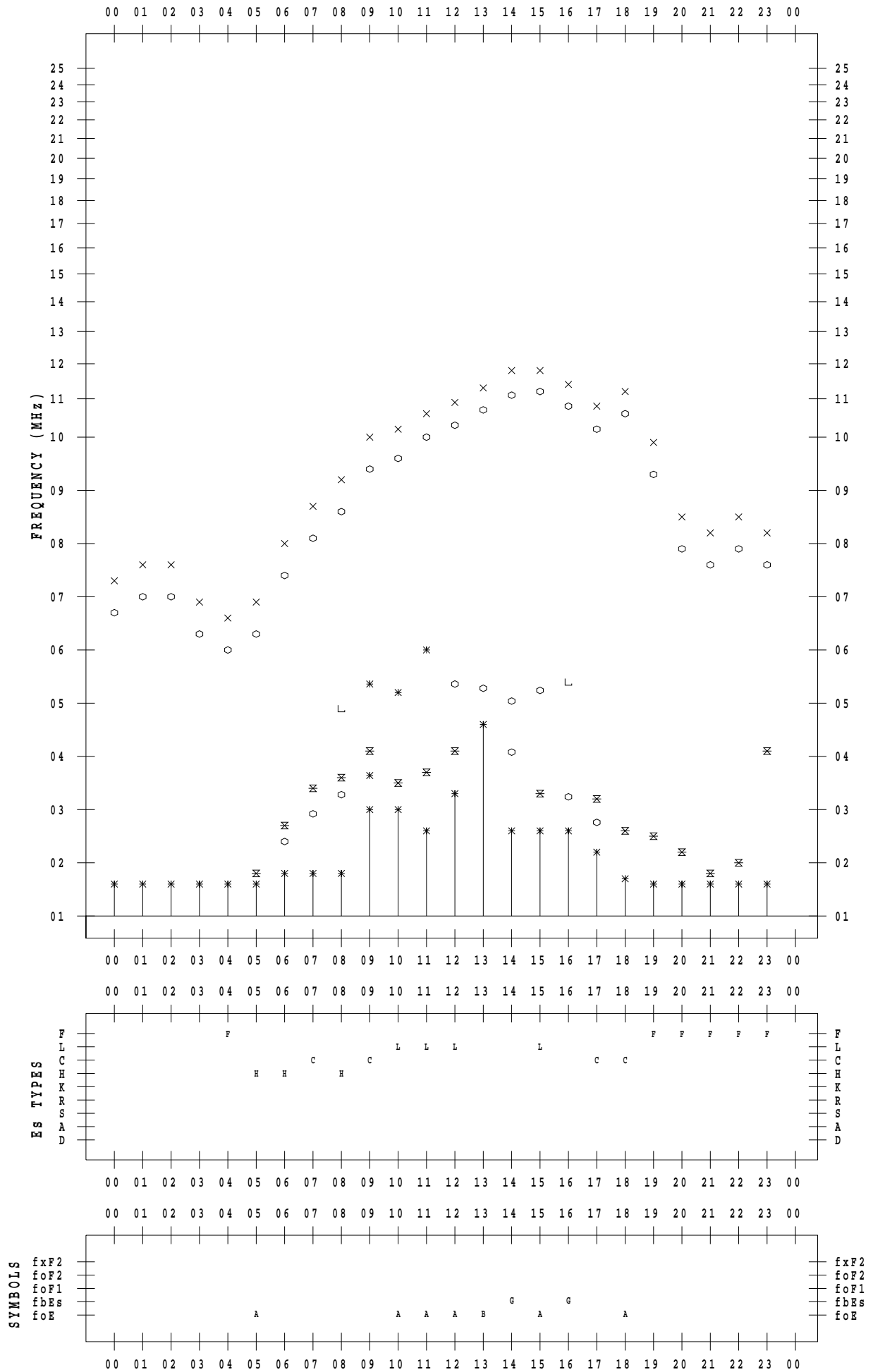
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 4/27

135 ° E MEAN TIME



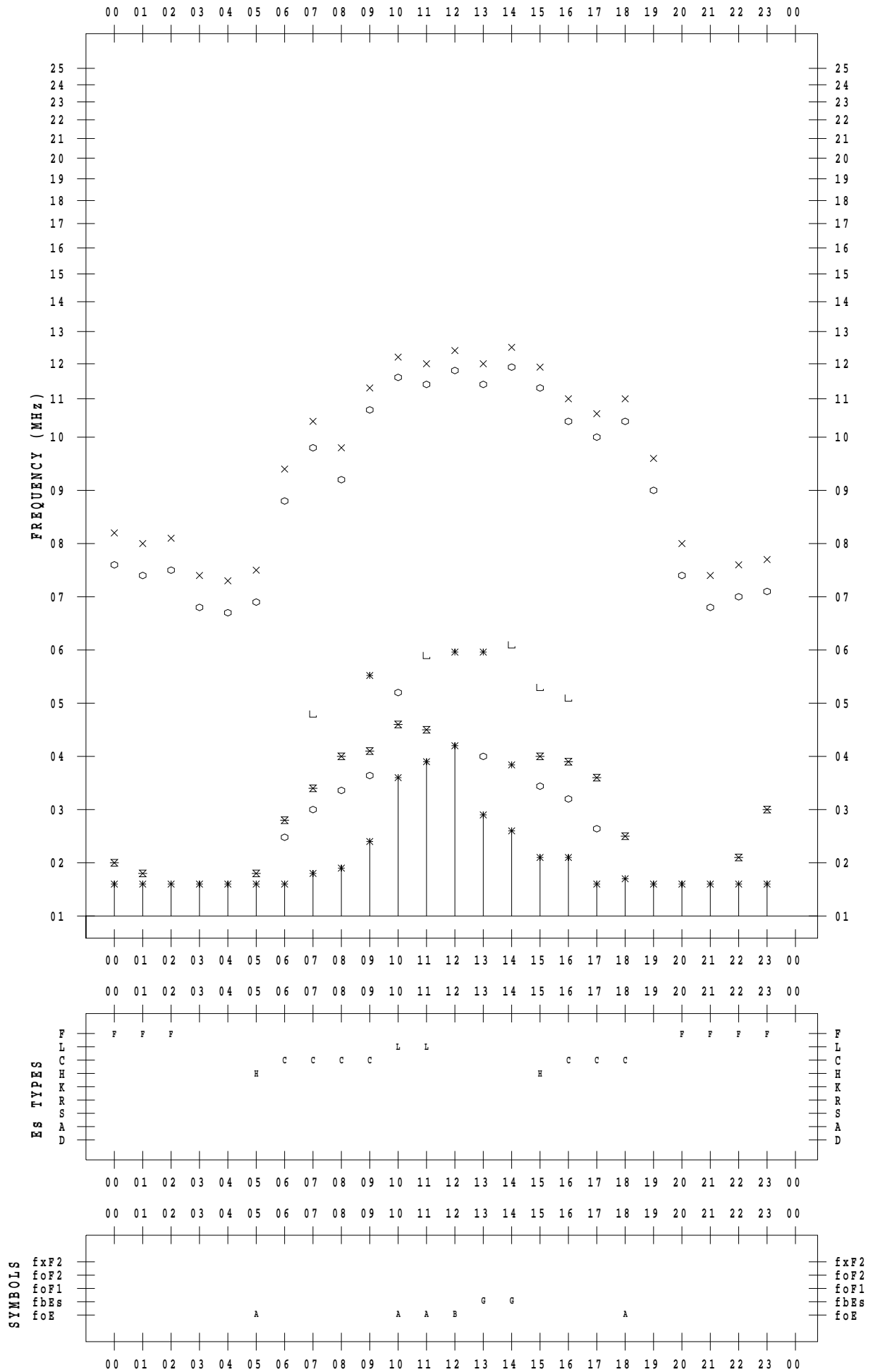
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 28

135 ° E MEAN TIME



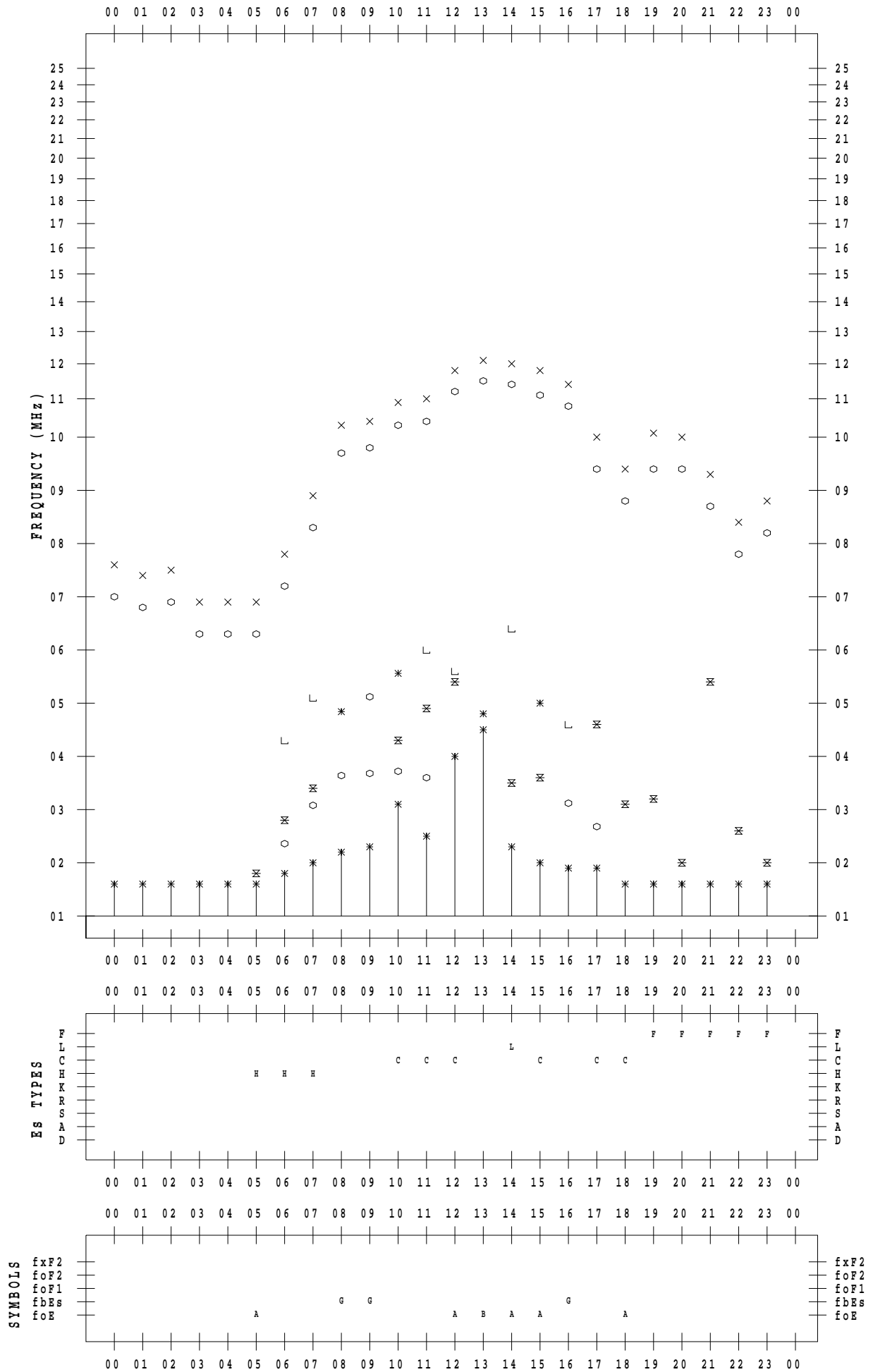
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 29

135 ° E MEAN TIME



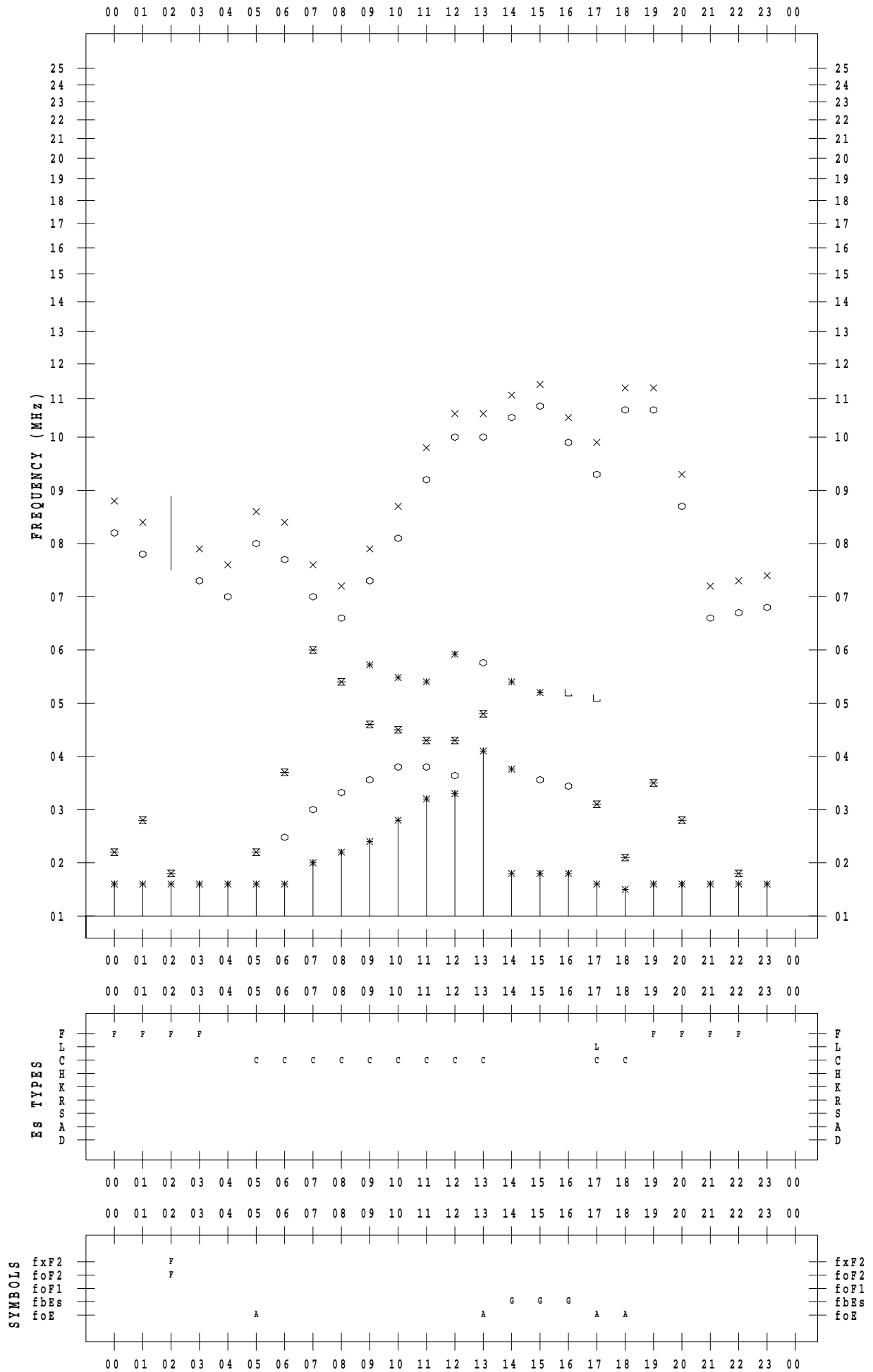
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 4 / 30

135 ° E MEAN TIME



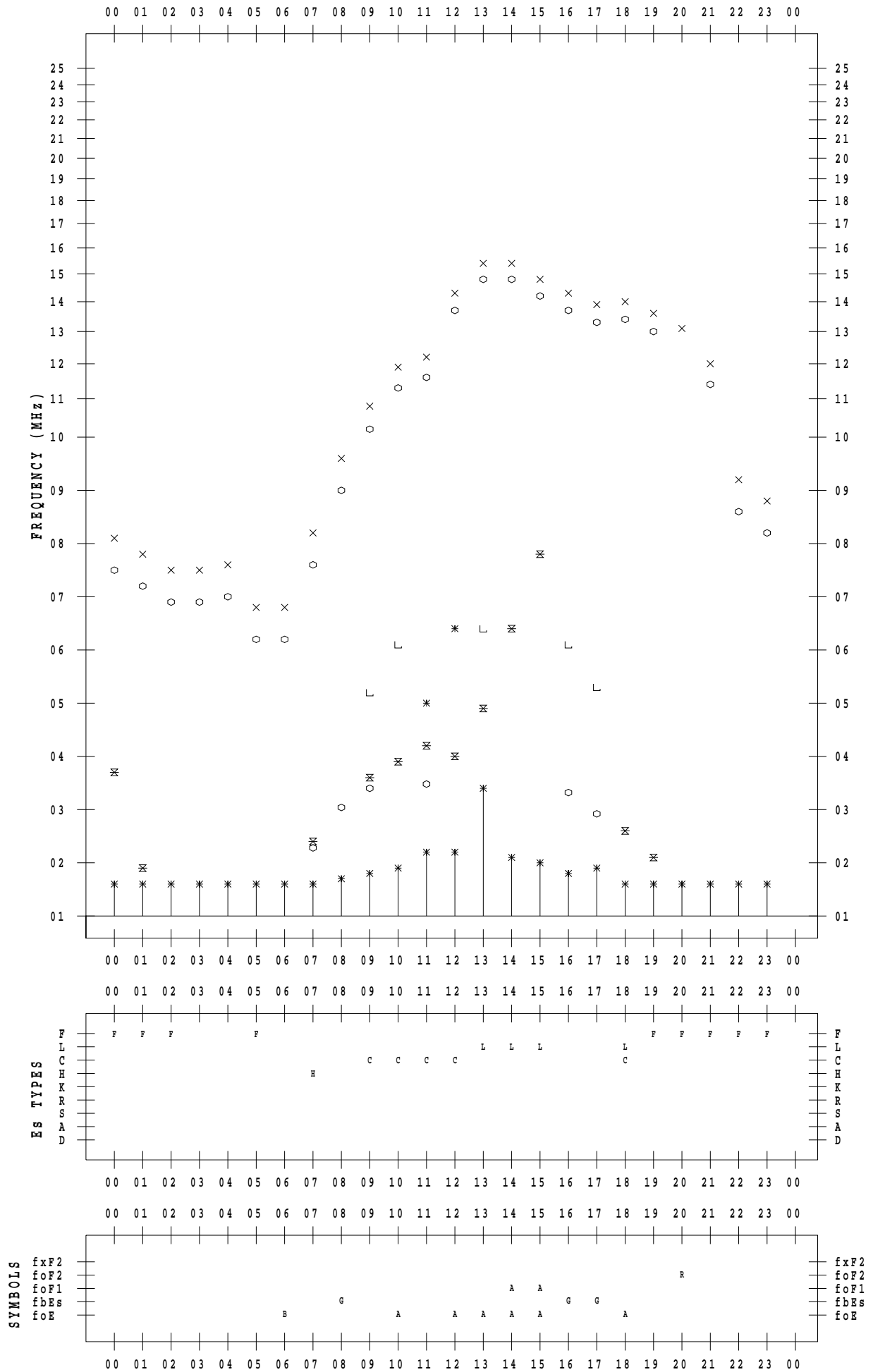
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 1

135 ° E MEAN TIME



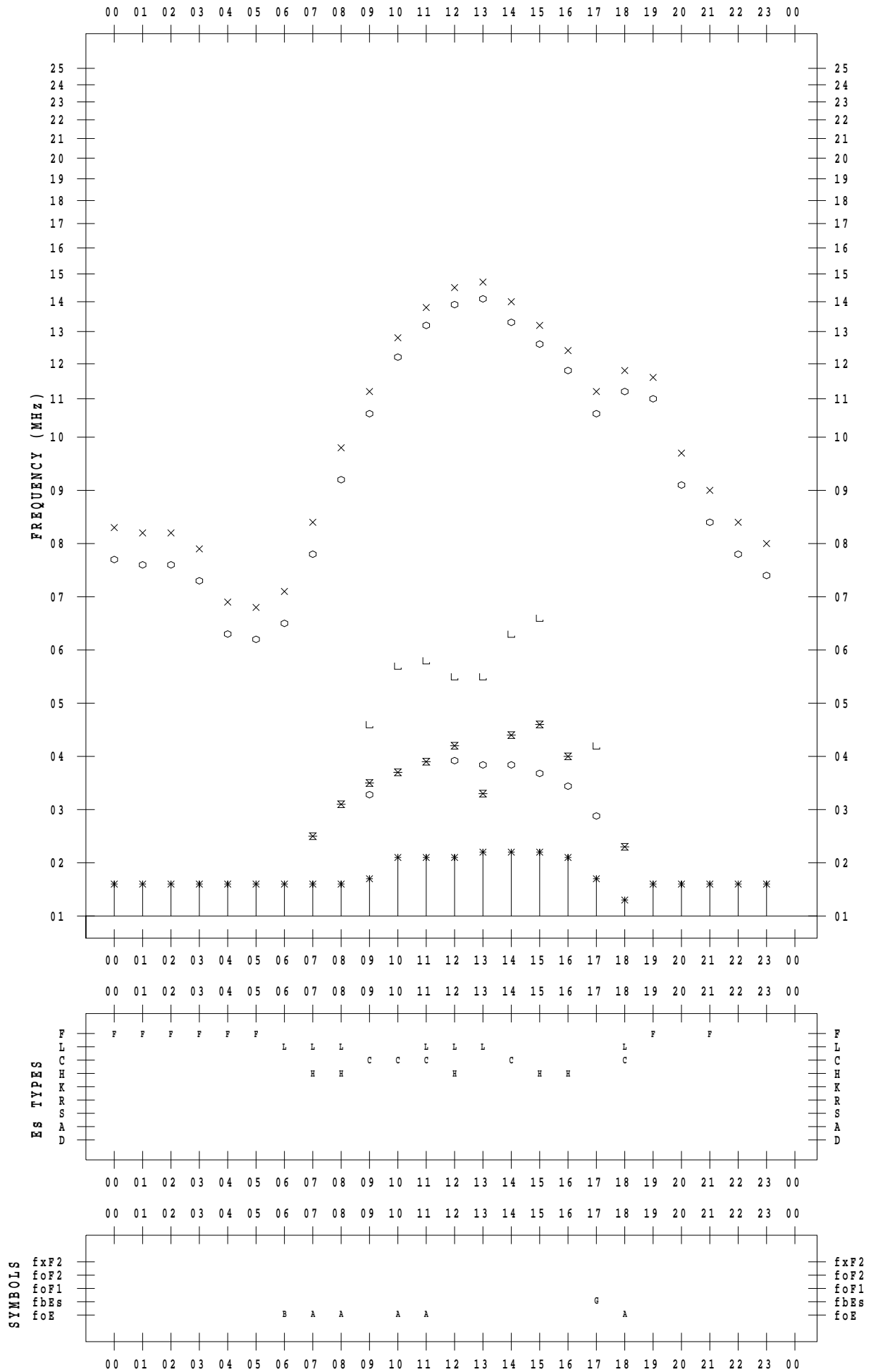
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 2

135 ° E MEAN TIME



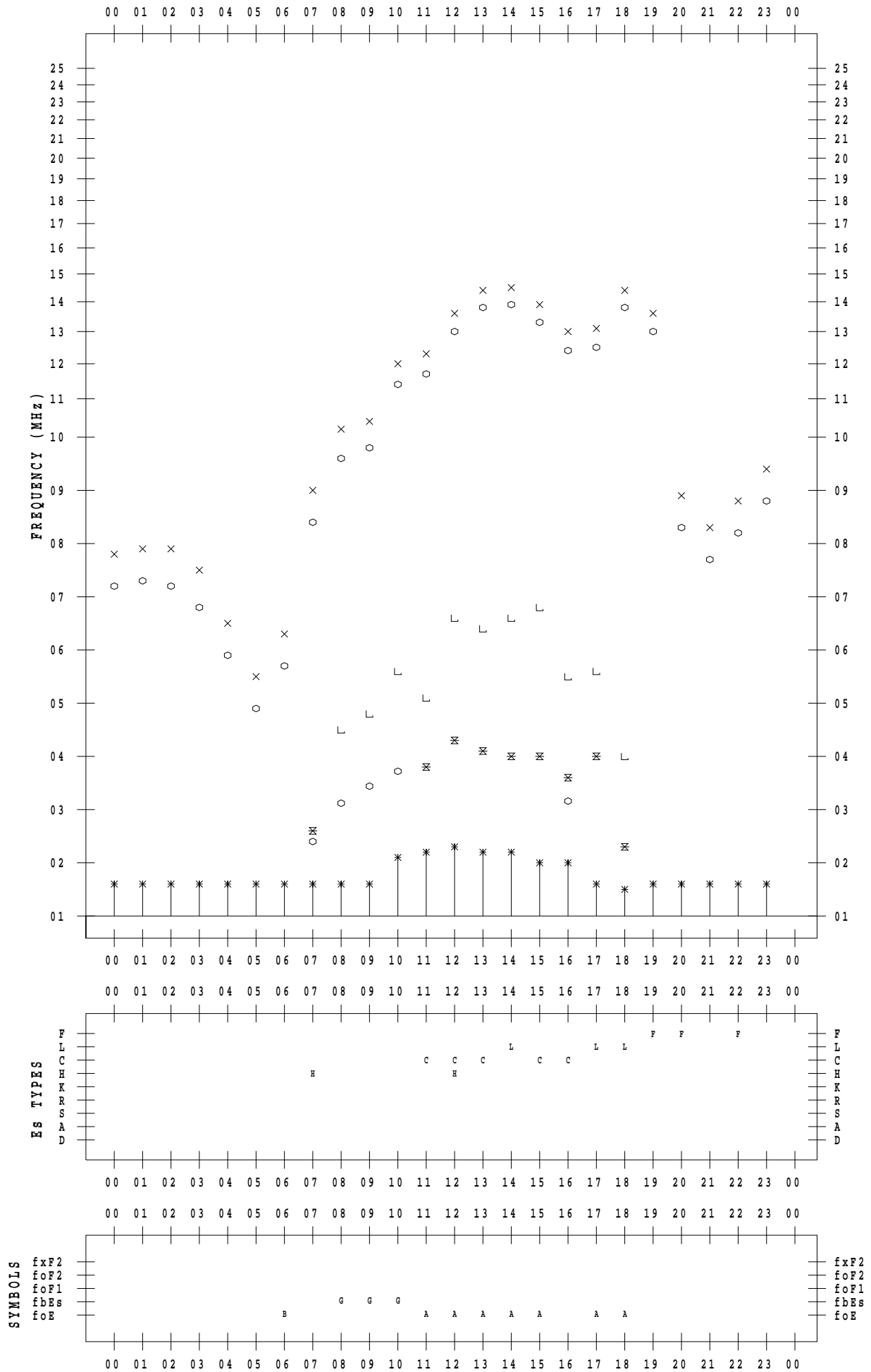
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 3

135 ° E MEAN TIME



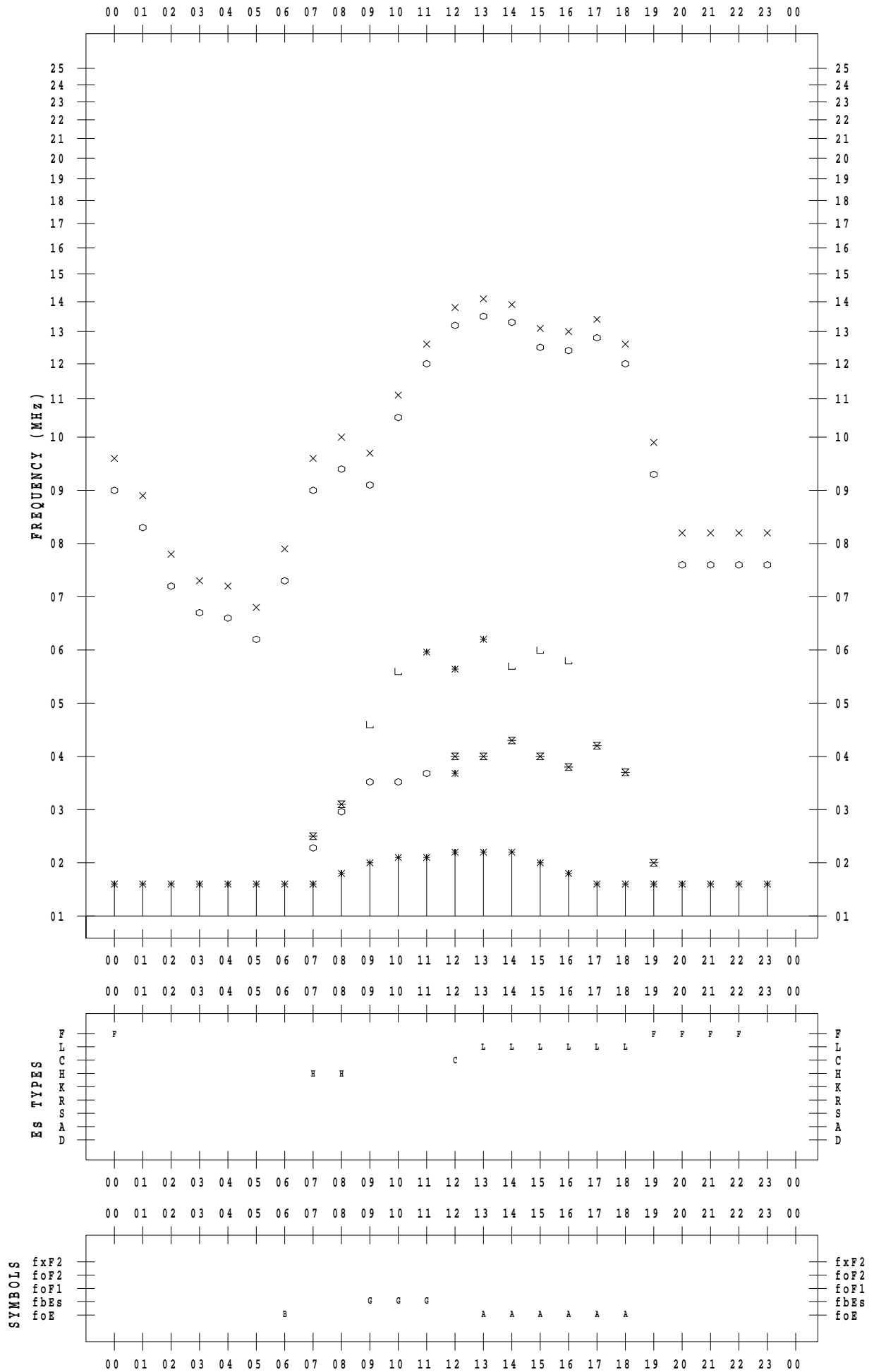
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 4

135 ° E MEAN TIME



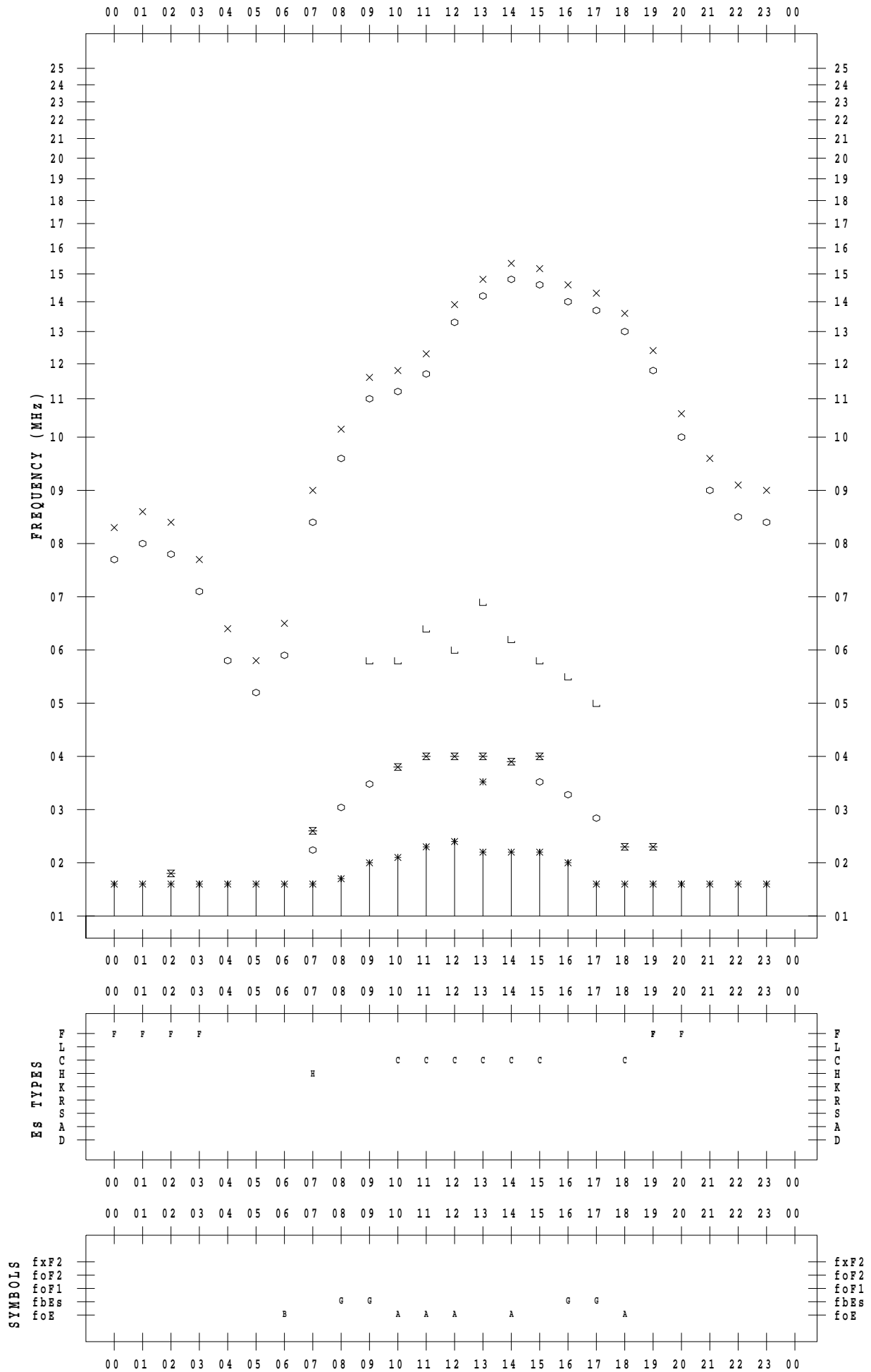
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 5

135 ° E MEAN TIME



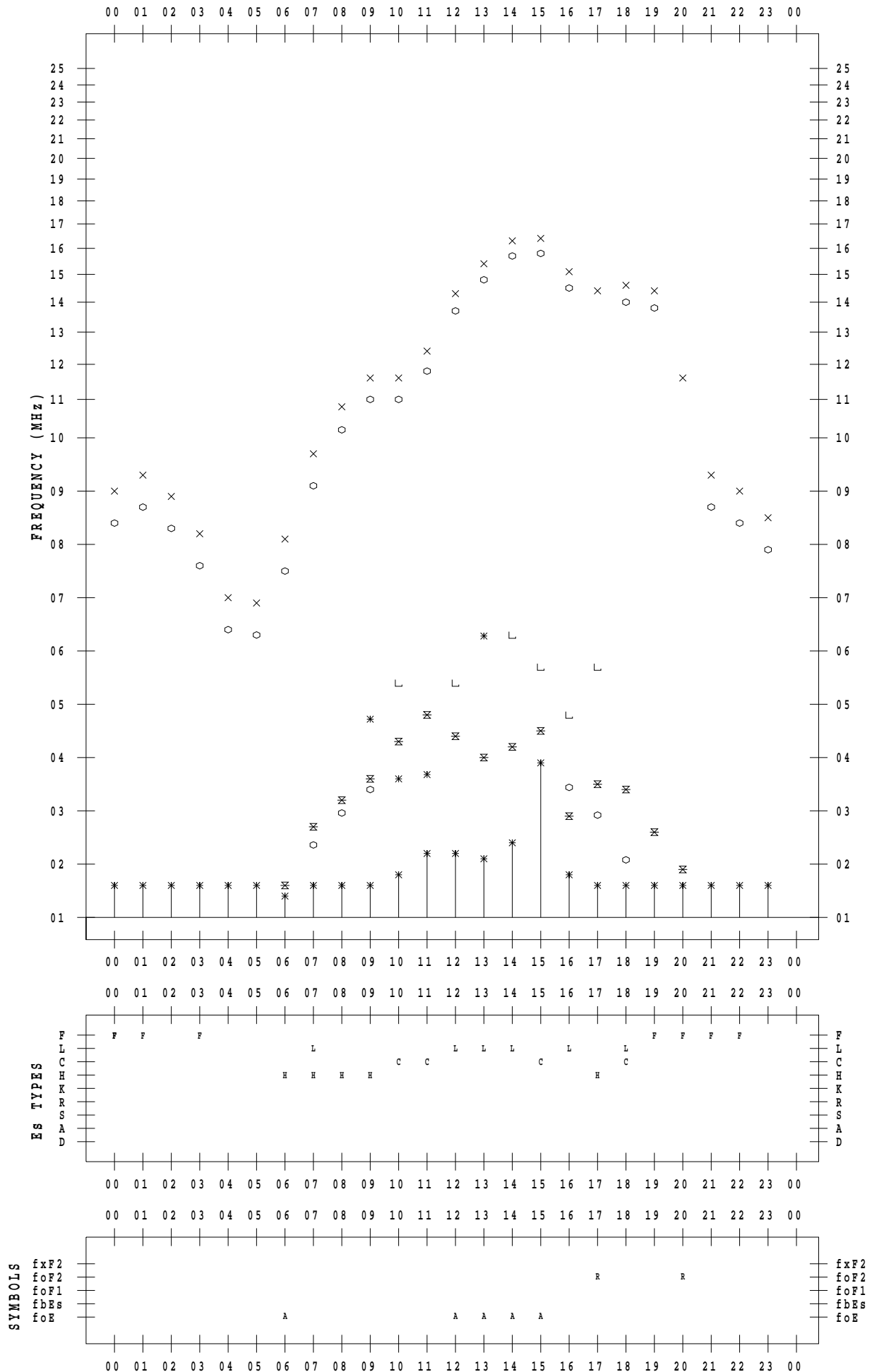
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 6

135 ° E MEAN TIME



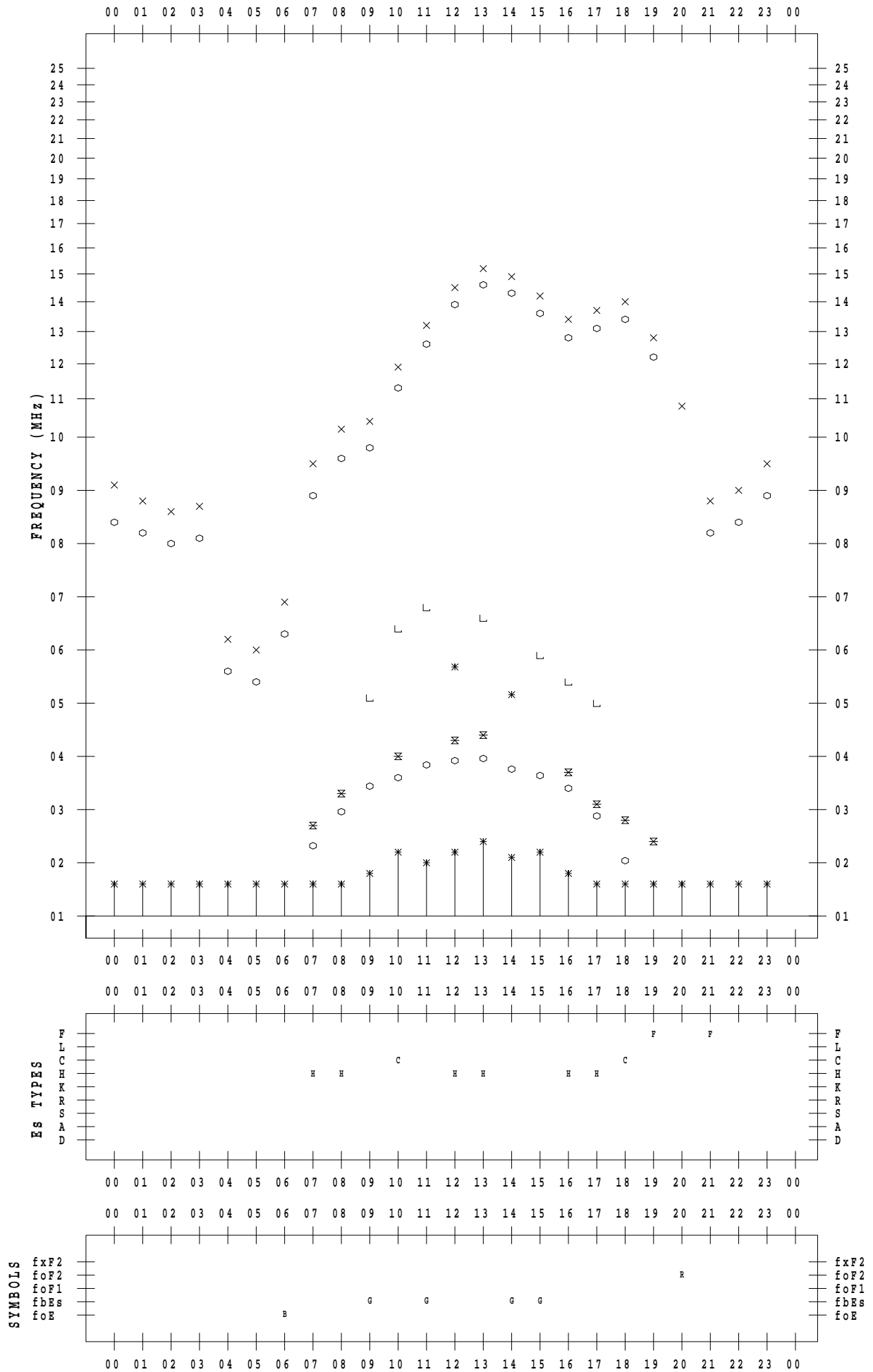
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 7

135 ° E MEAN TIME



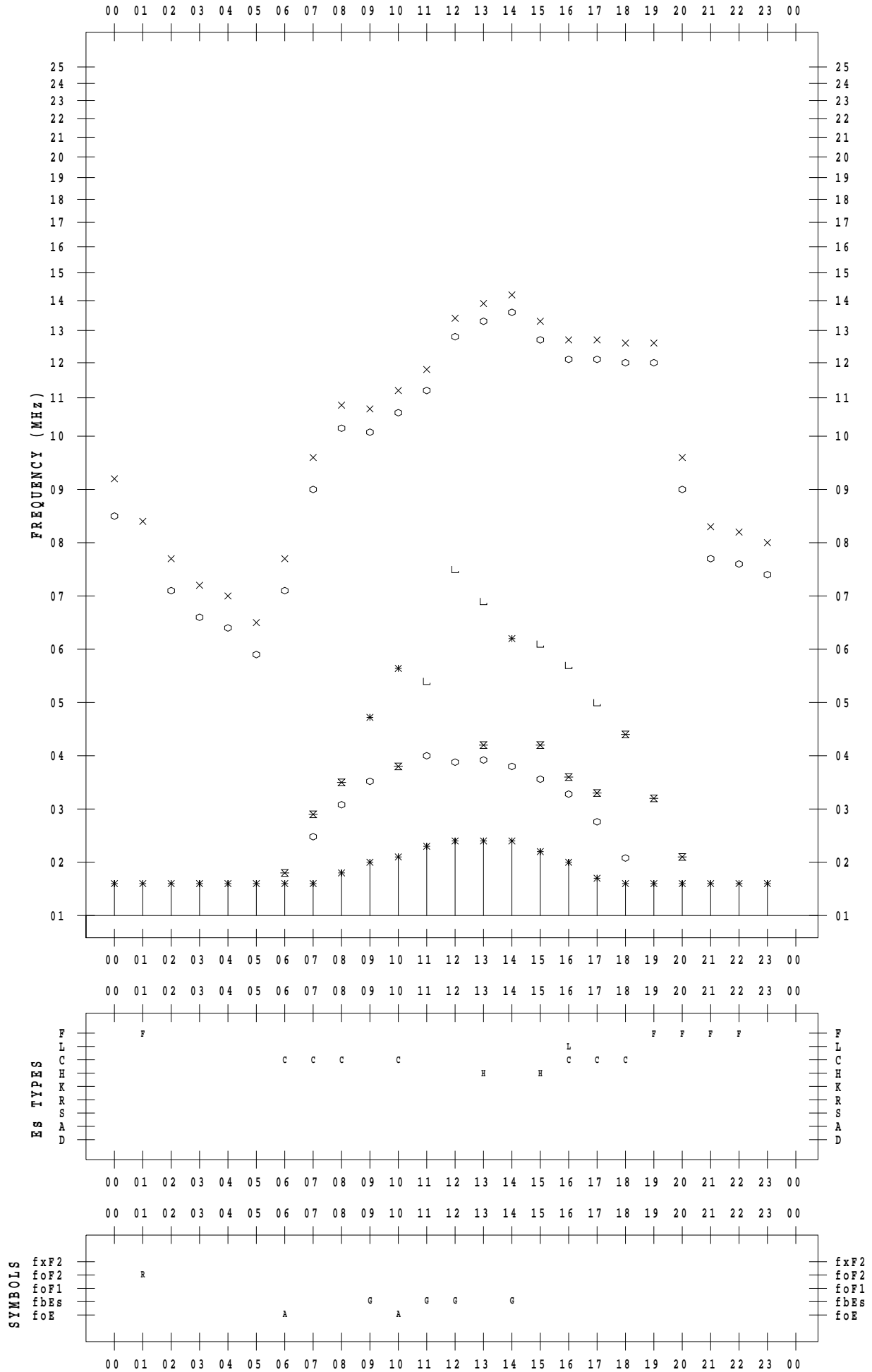
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 8

135 ° E MEAN TIME



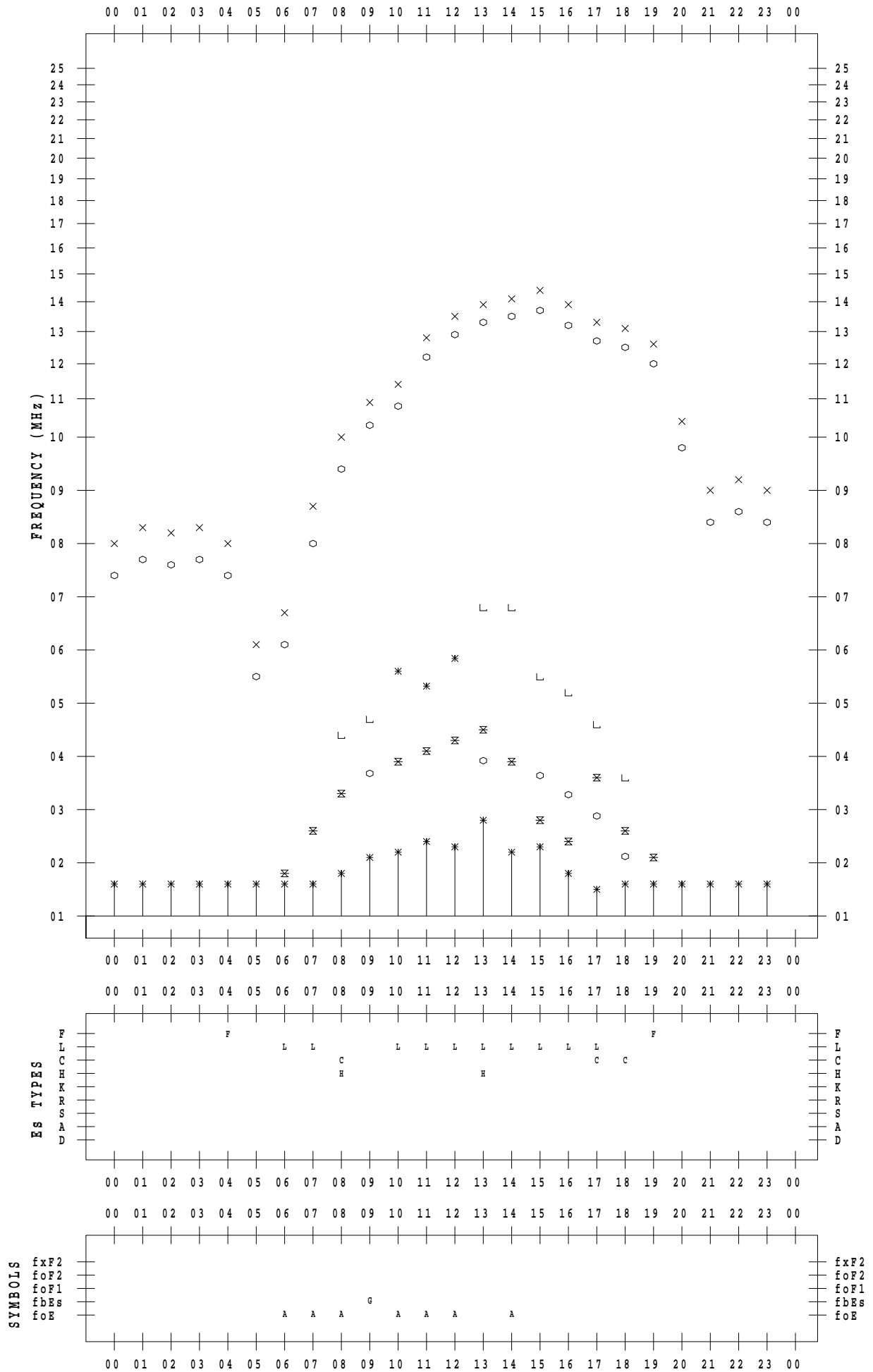
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 9

135 ° E MEAN TIME



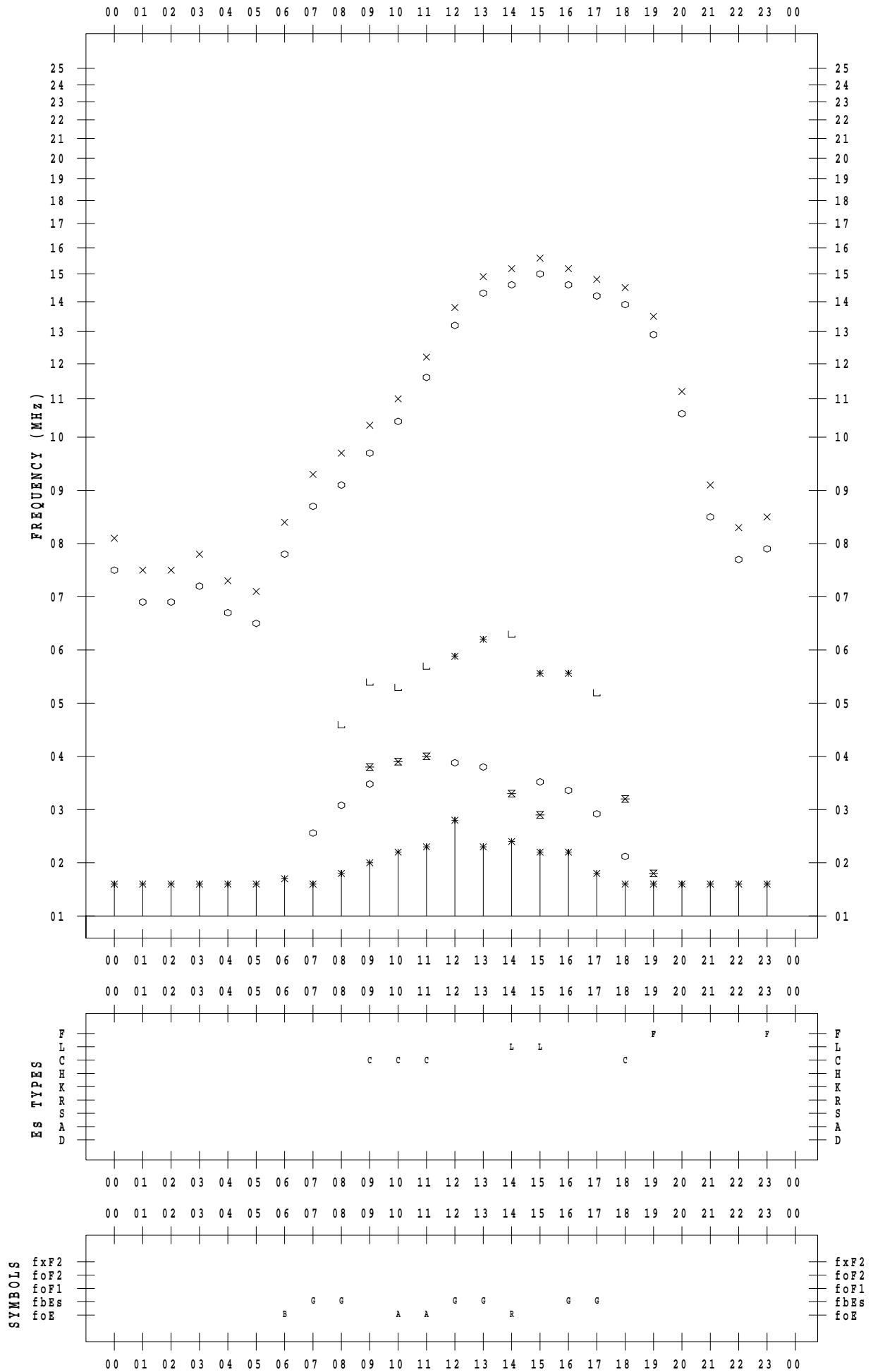
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 10

135 ° E MEAN TIME



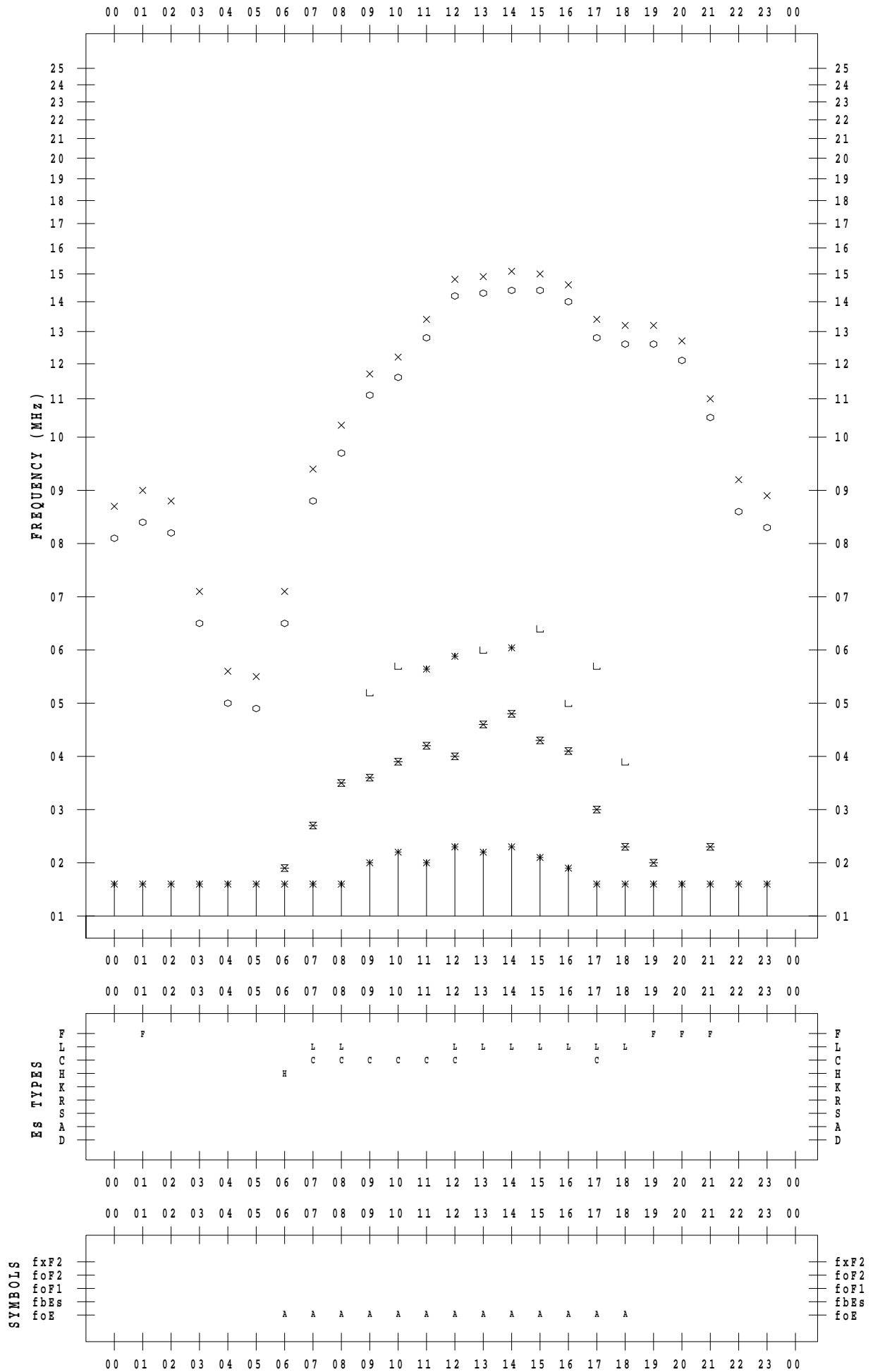
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 11

135 ° E MEAN TIME



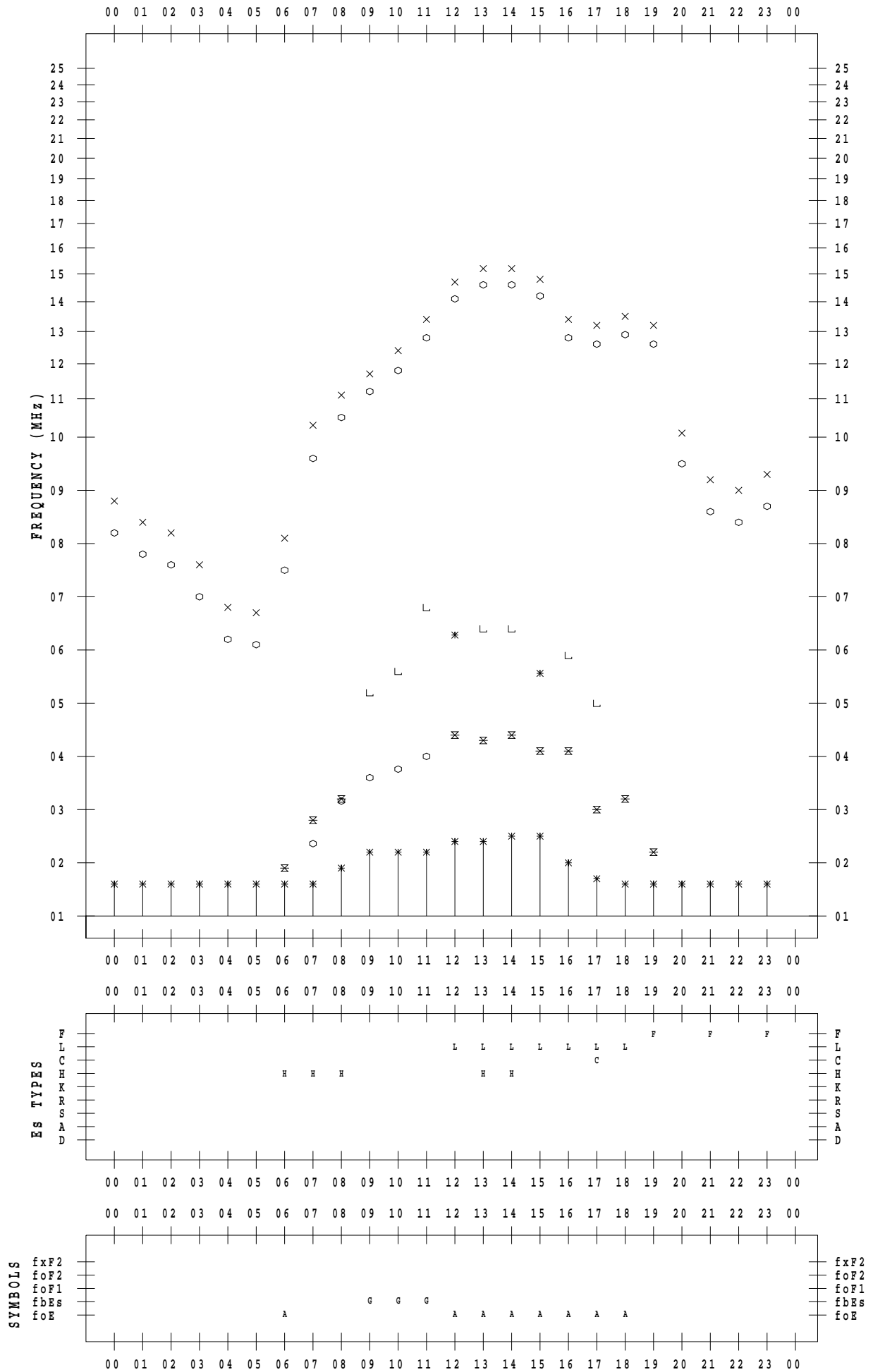
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 12

135 ° E MEAN TIME



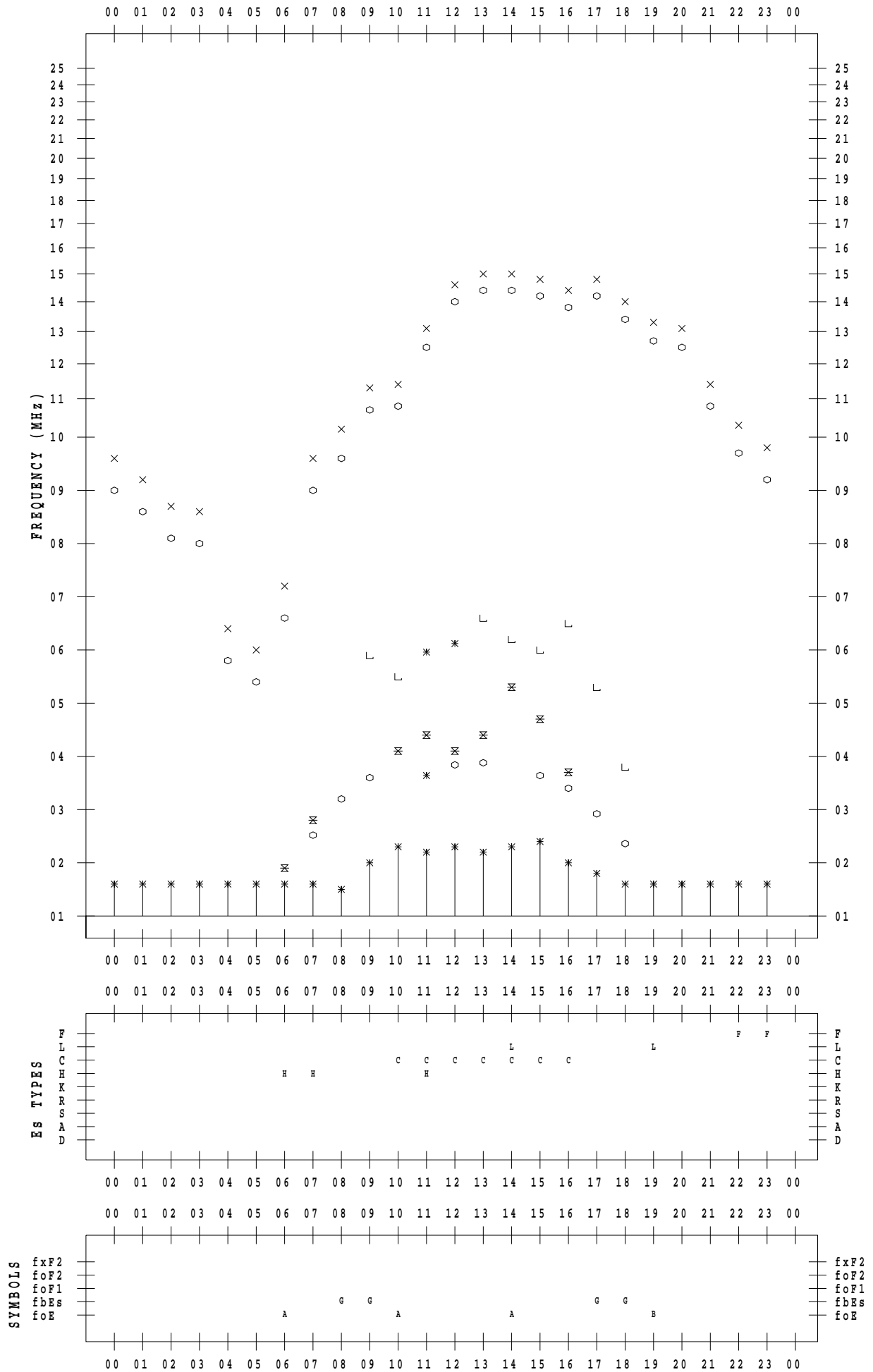
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 13

135 ° E MEAN TIME



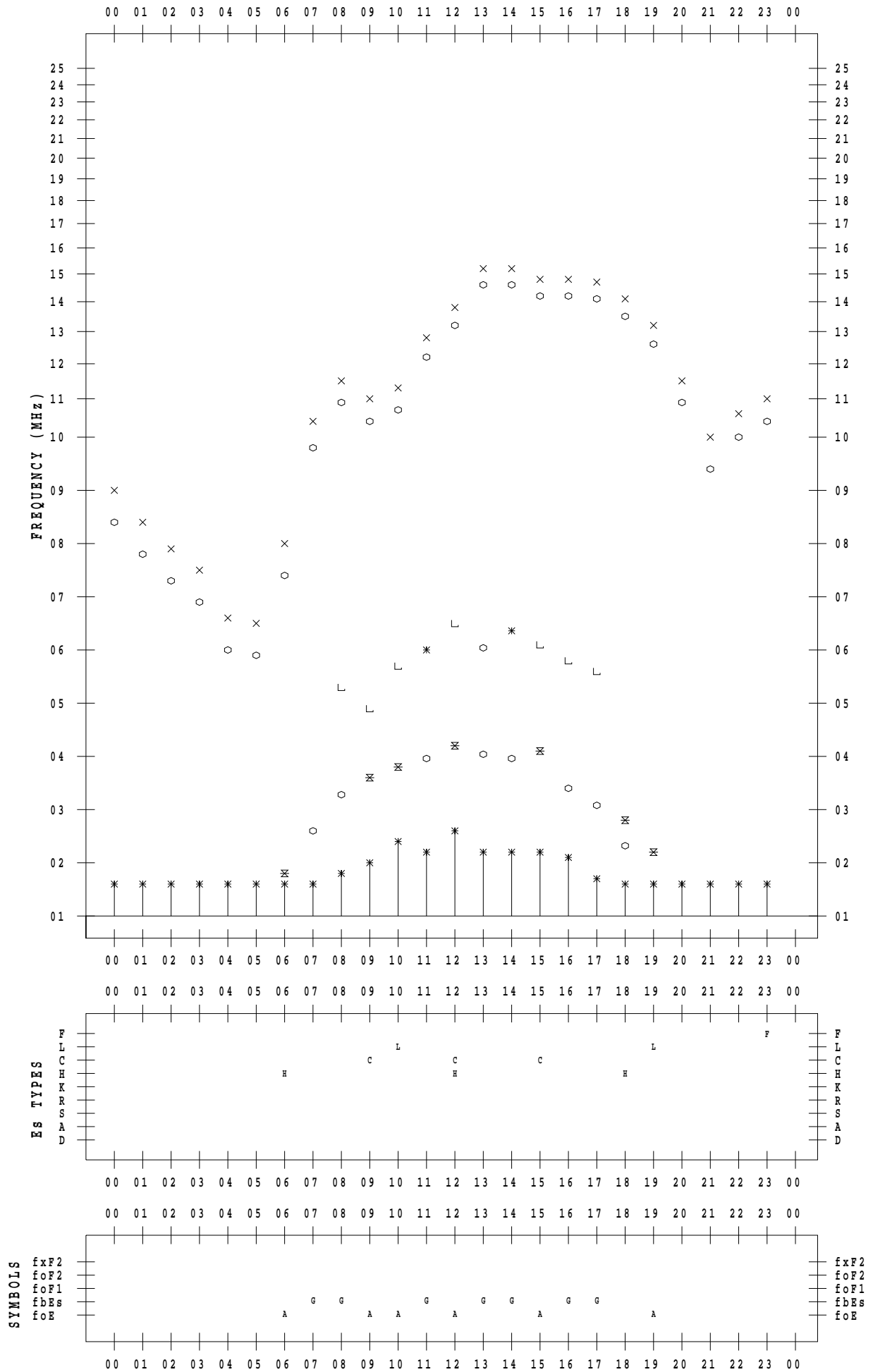
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 14

135 ° E MEAN TIME



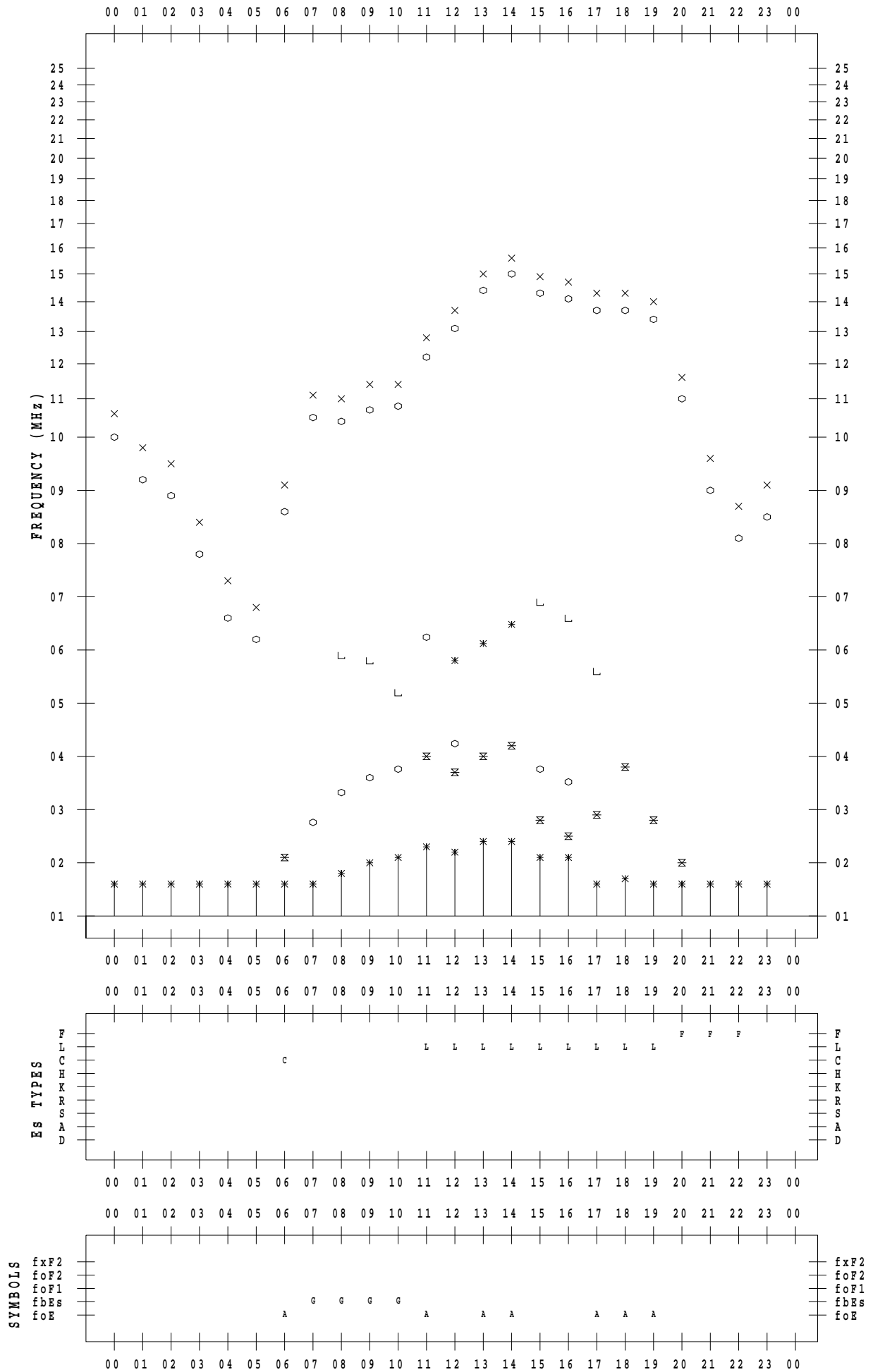
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 15

135 ° E MEAN TIME



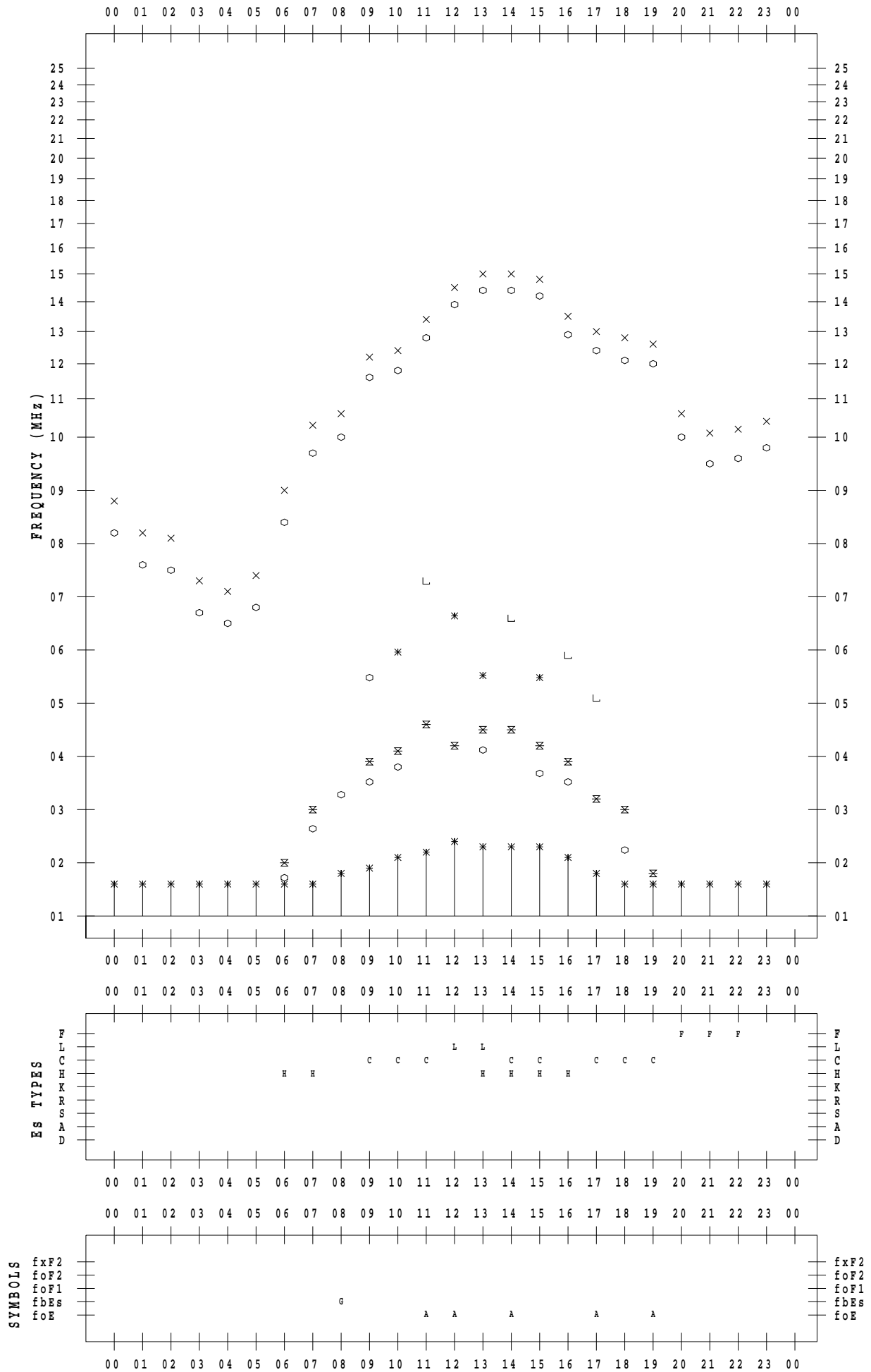
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 16

135 ° E MEAN TIME



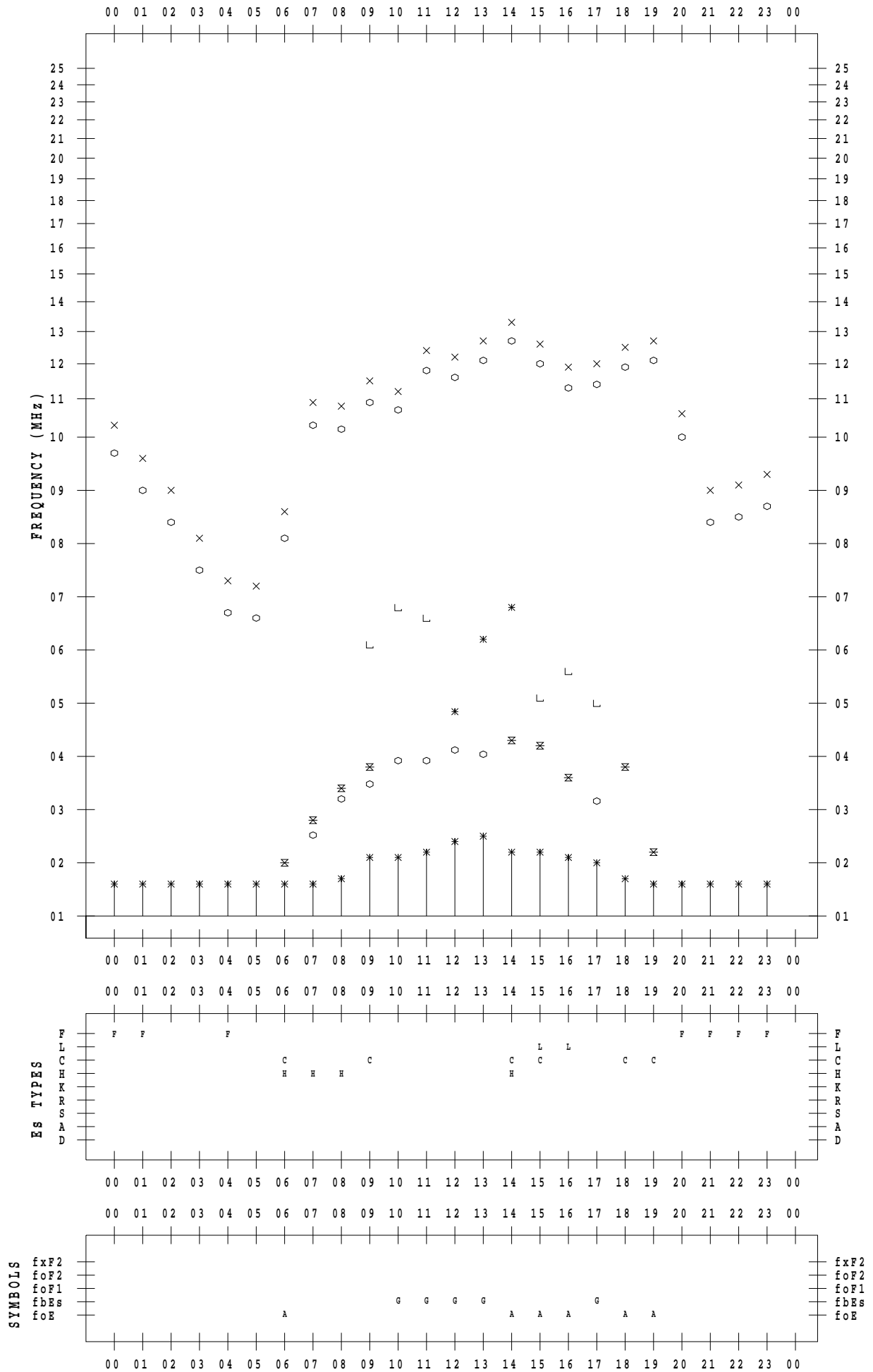
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 17

135 ° E MEAN TIME



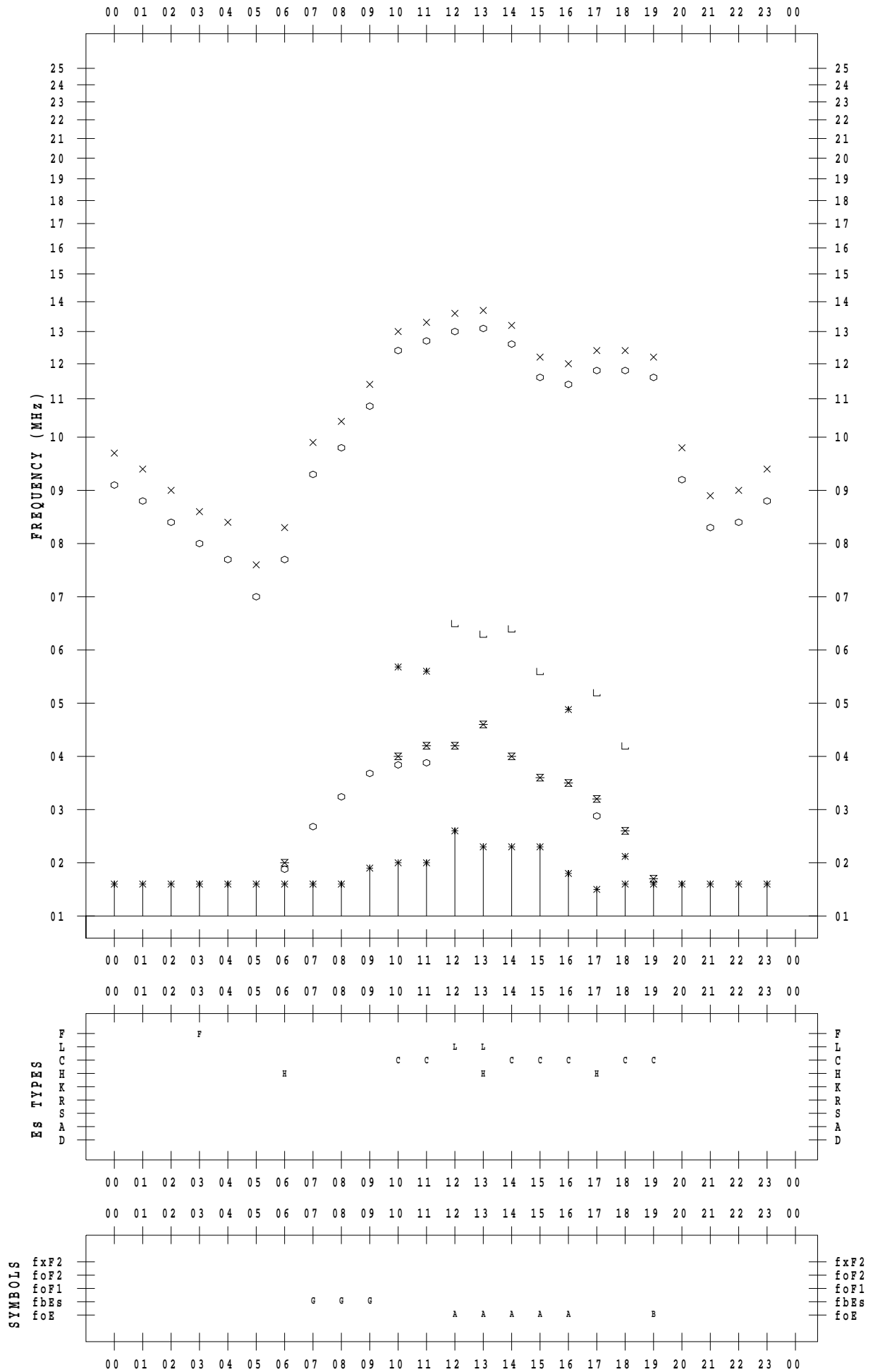
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 18

135 ° E MEAN TIME



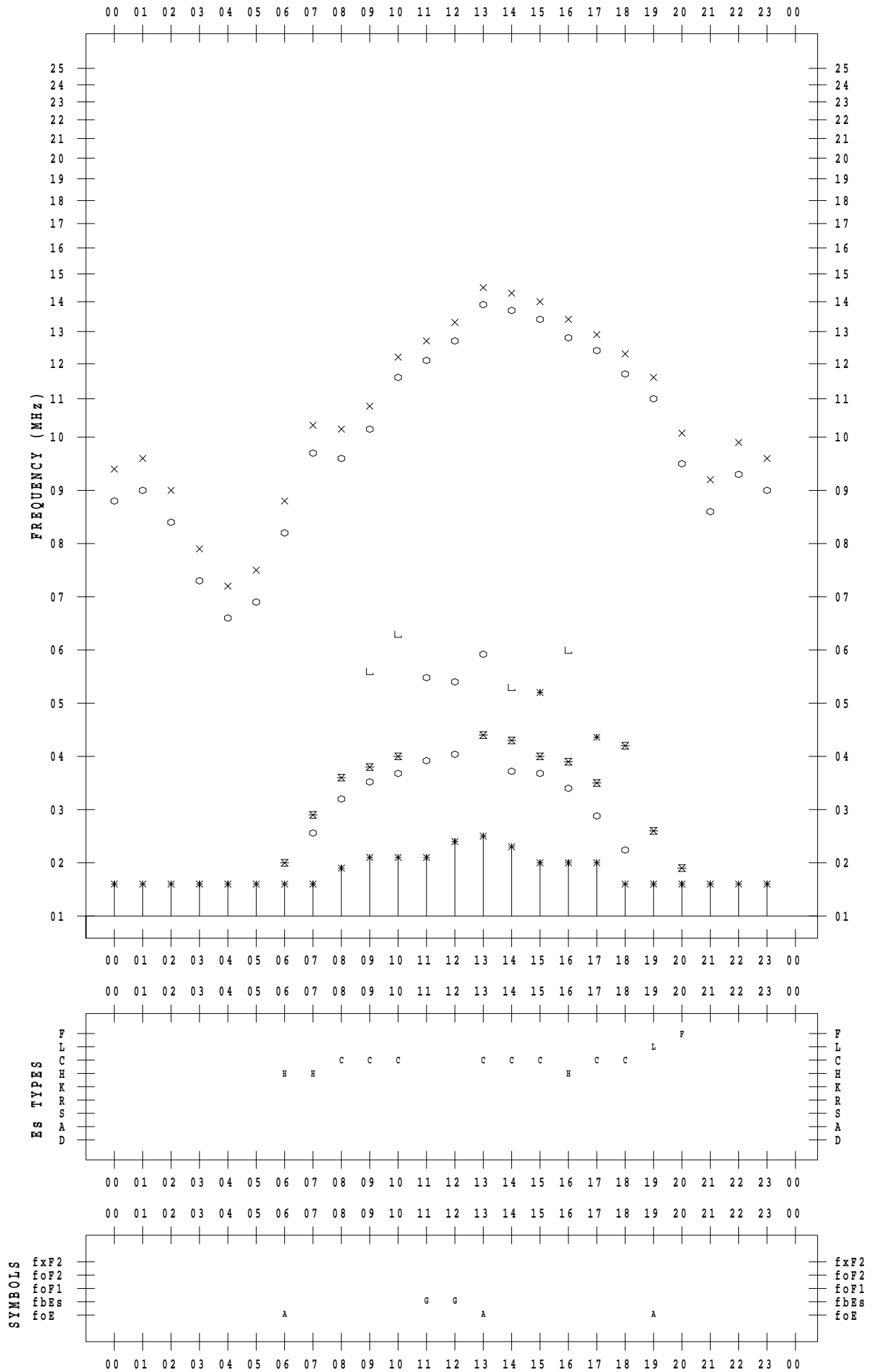
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 19

135 ° E MEAN TIME



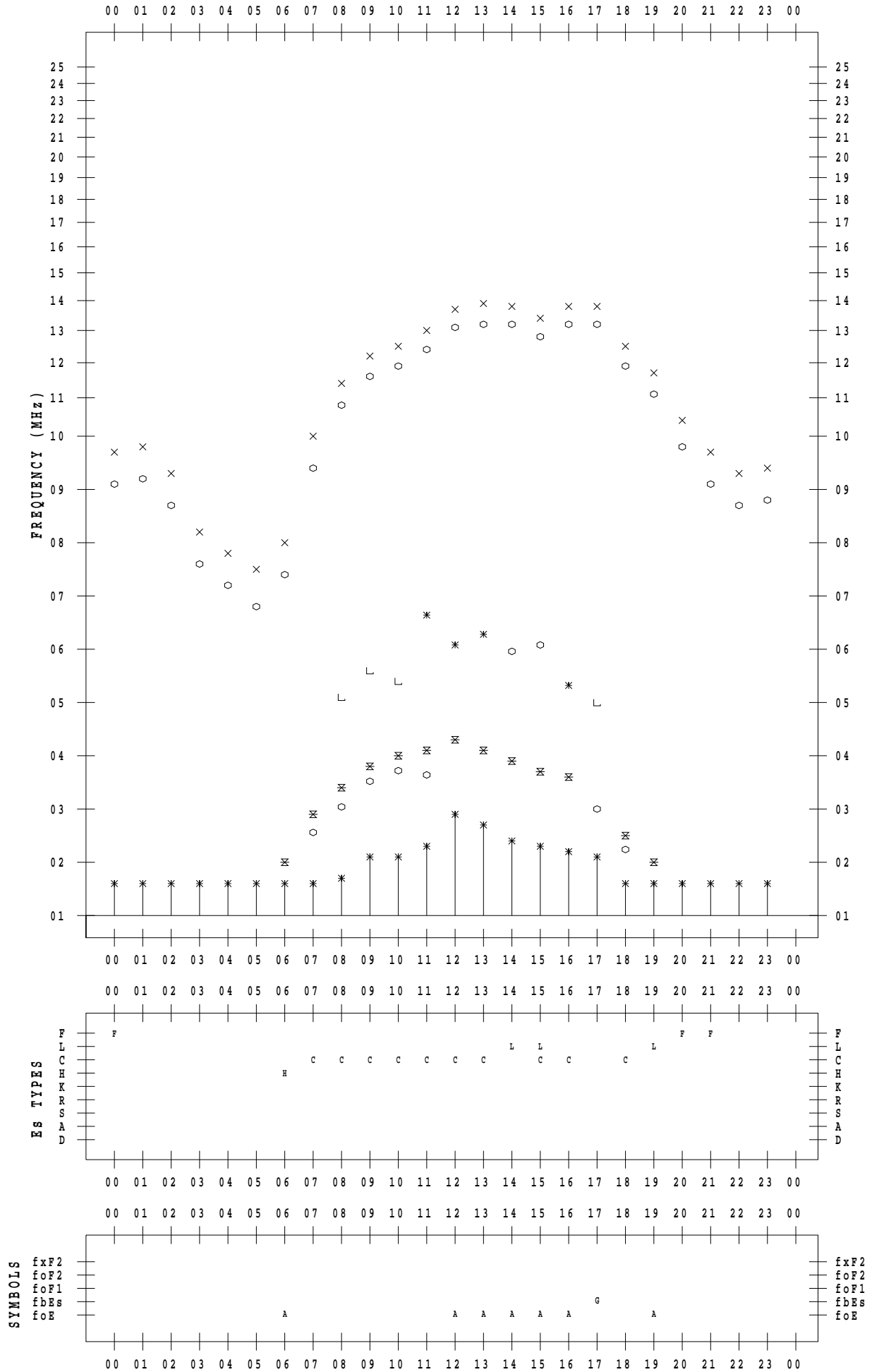
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 20

135 ° E MEAN TIME



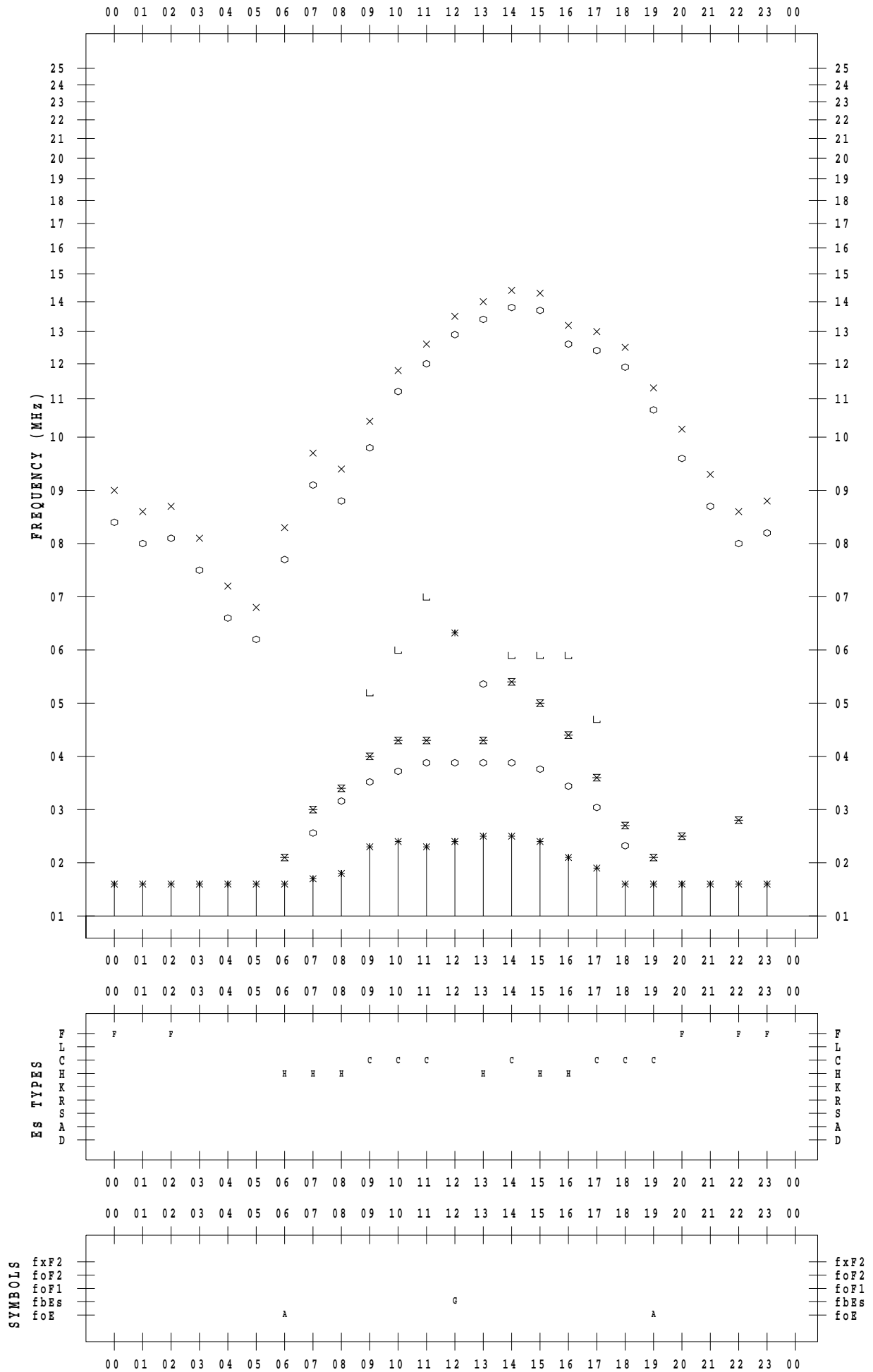
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 21

135 ° E MEAN TIME



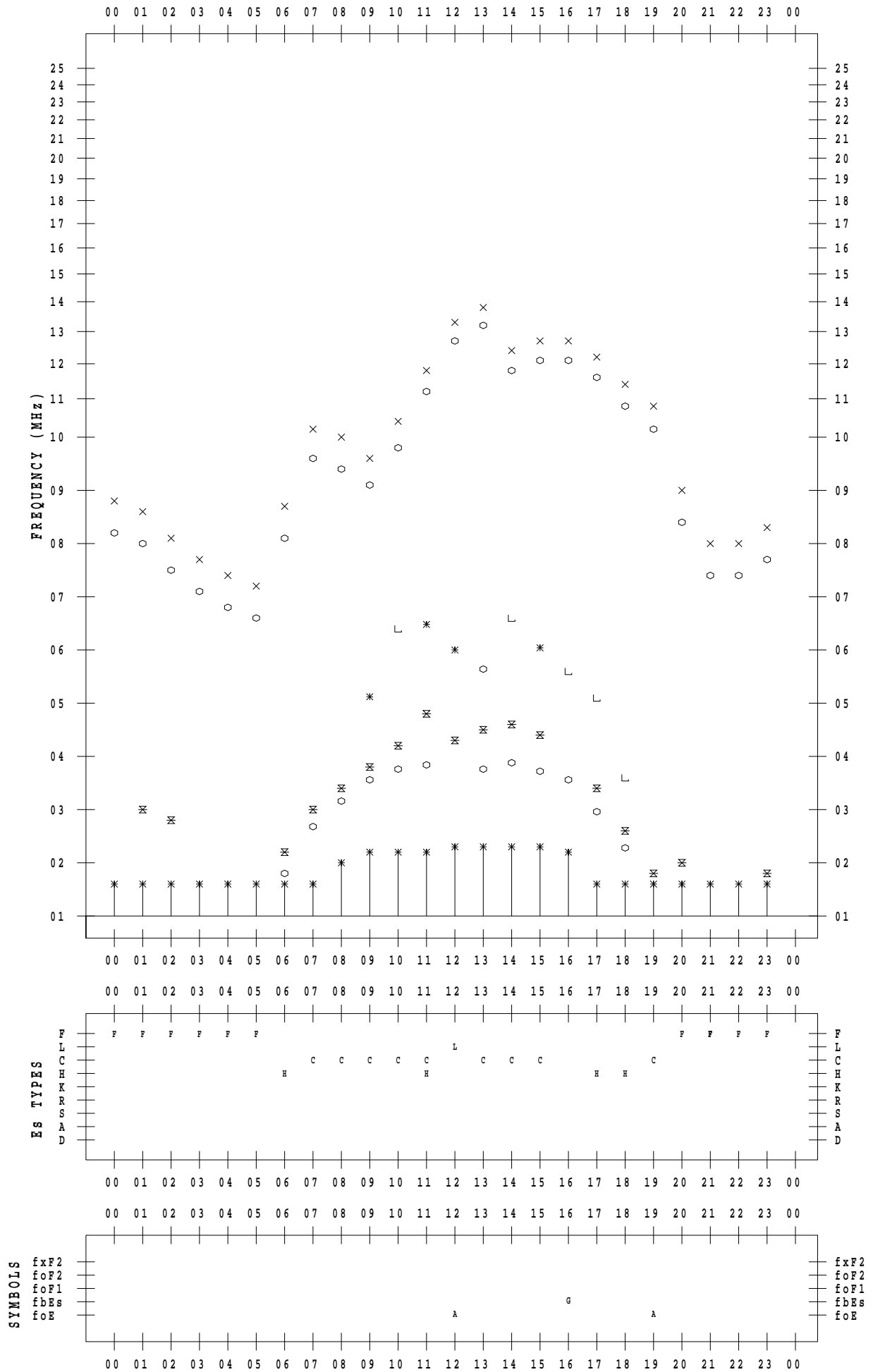
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 22

135 ° E MEAN TIME



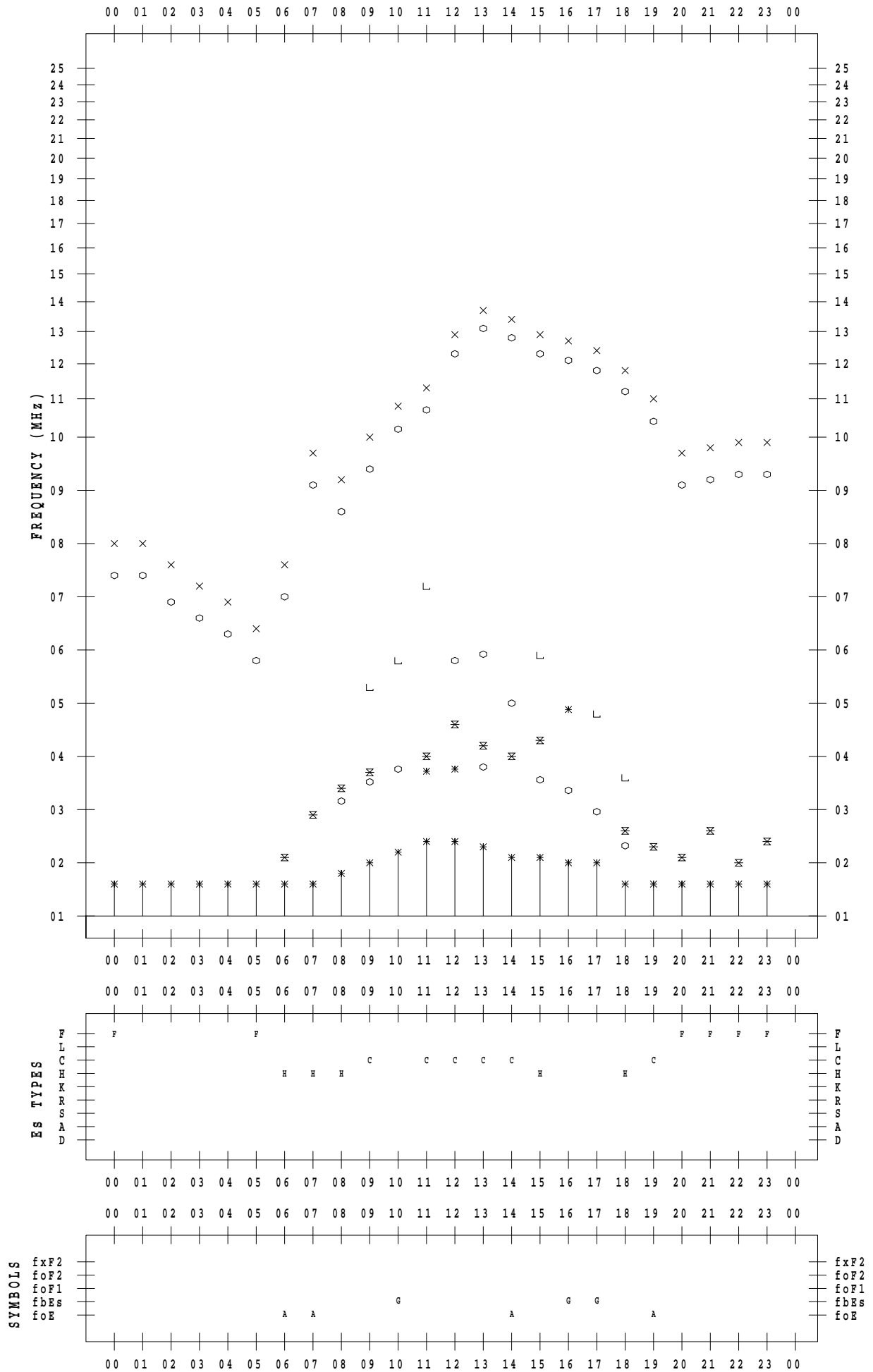
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 23

135 ° E MEAN TIME



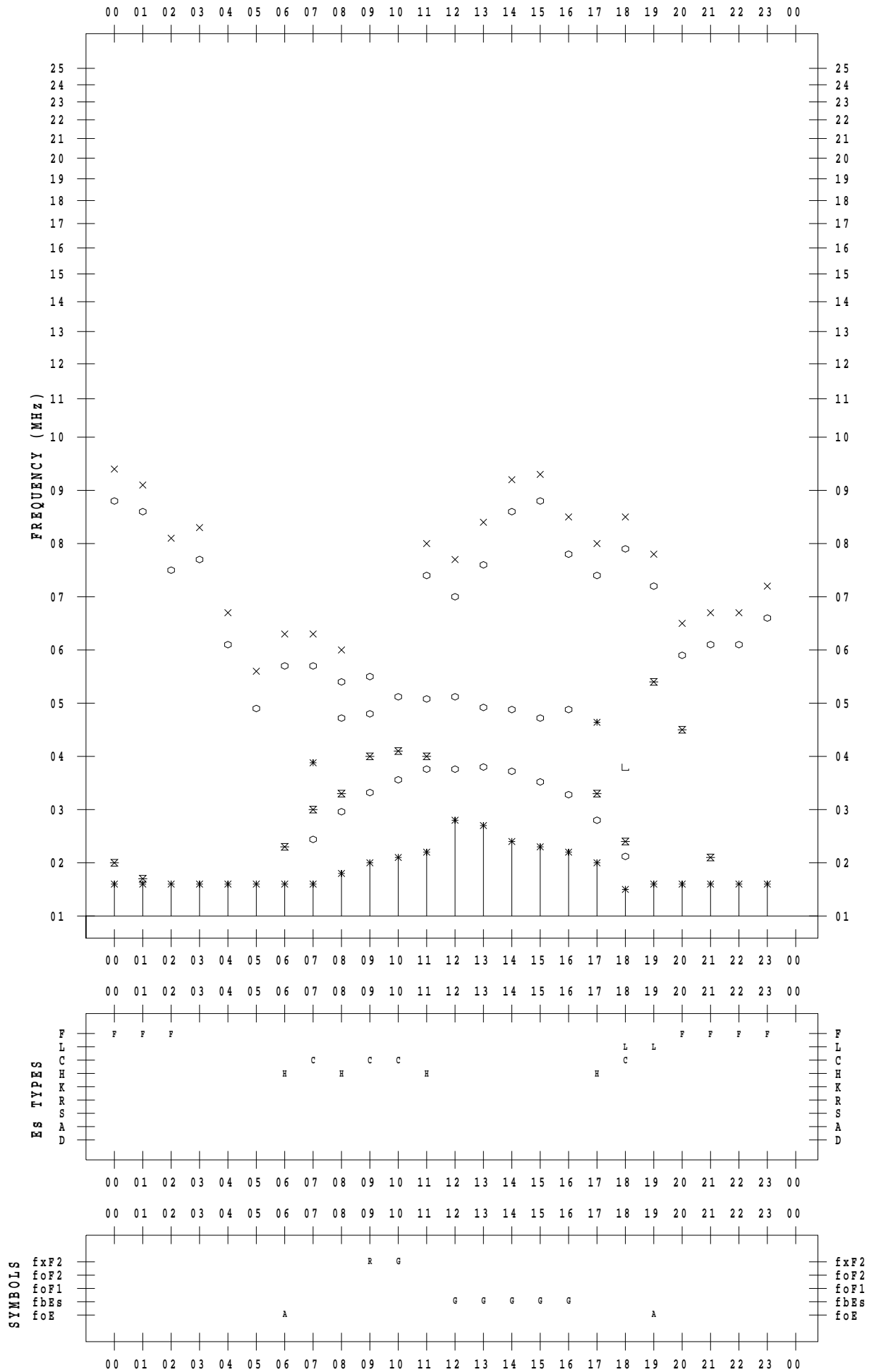
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 24

135 ° E MEAN TIME



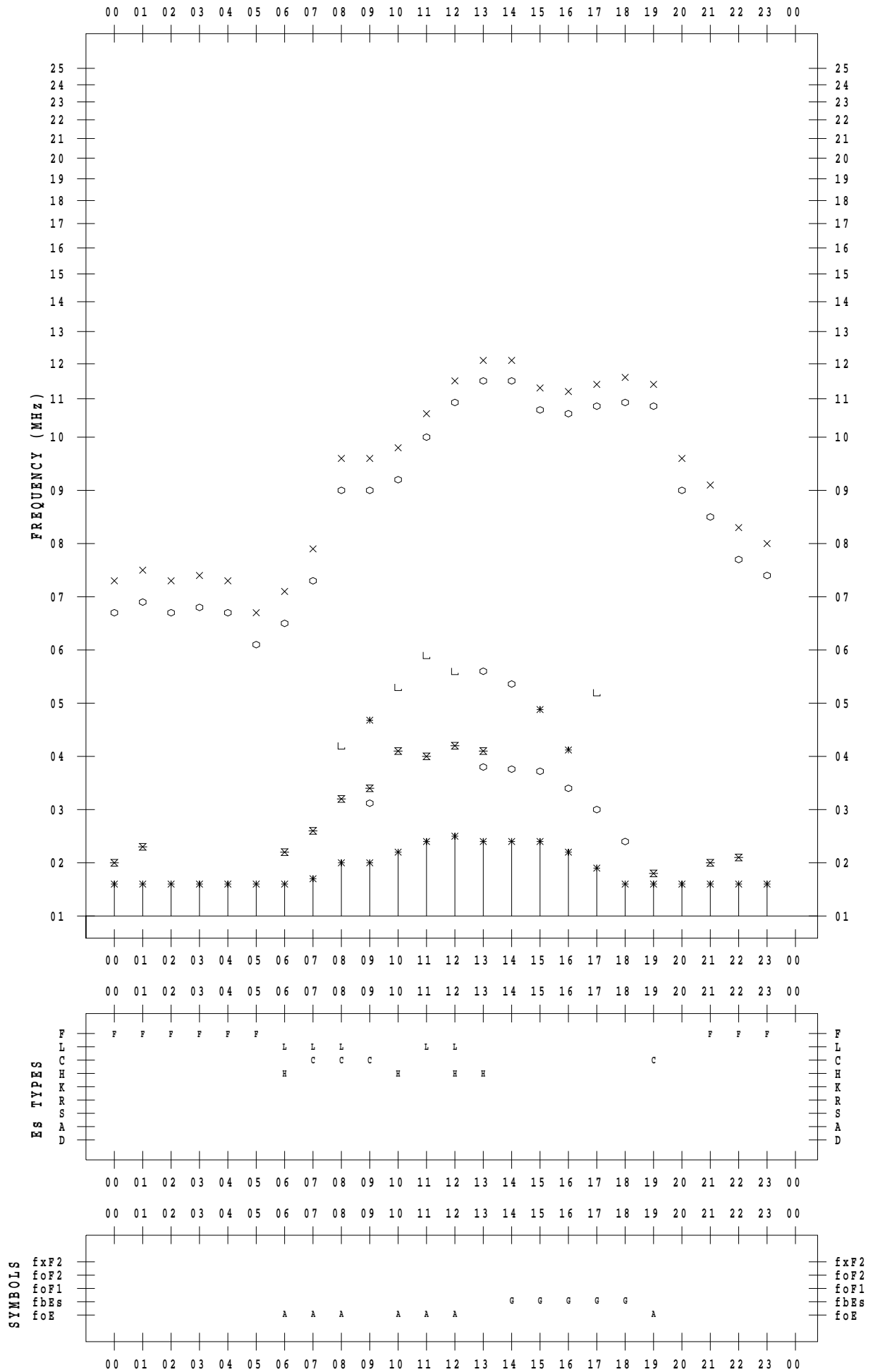
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 25

135 ° E MEAN TIME



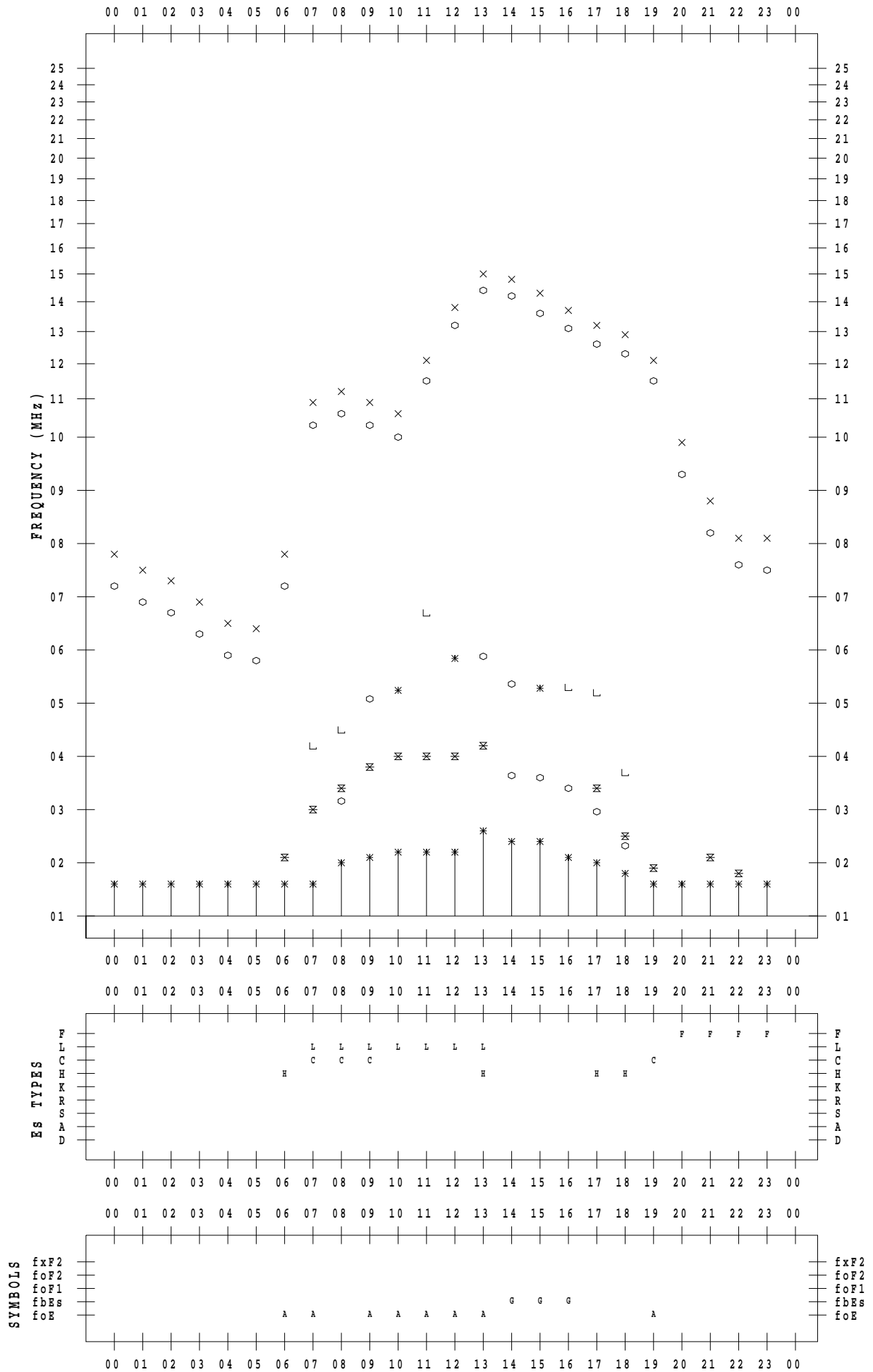
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 26

135 ° E MEAN TIME



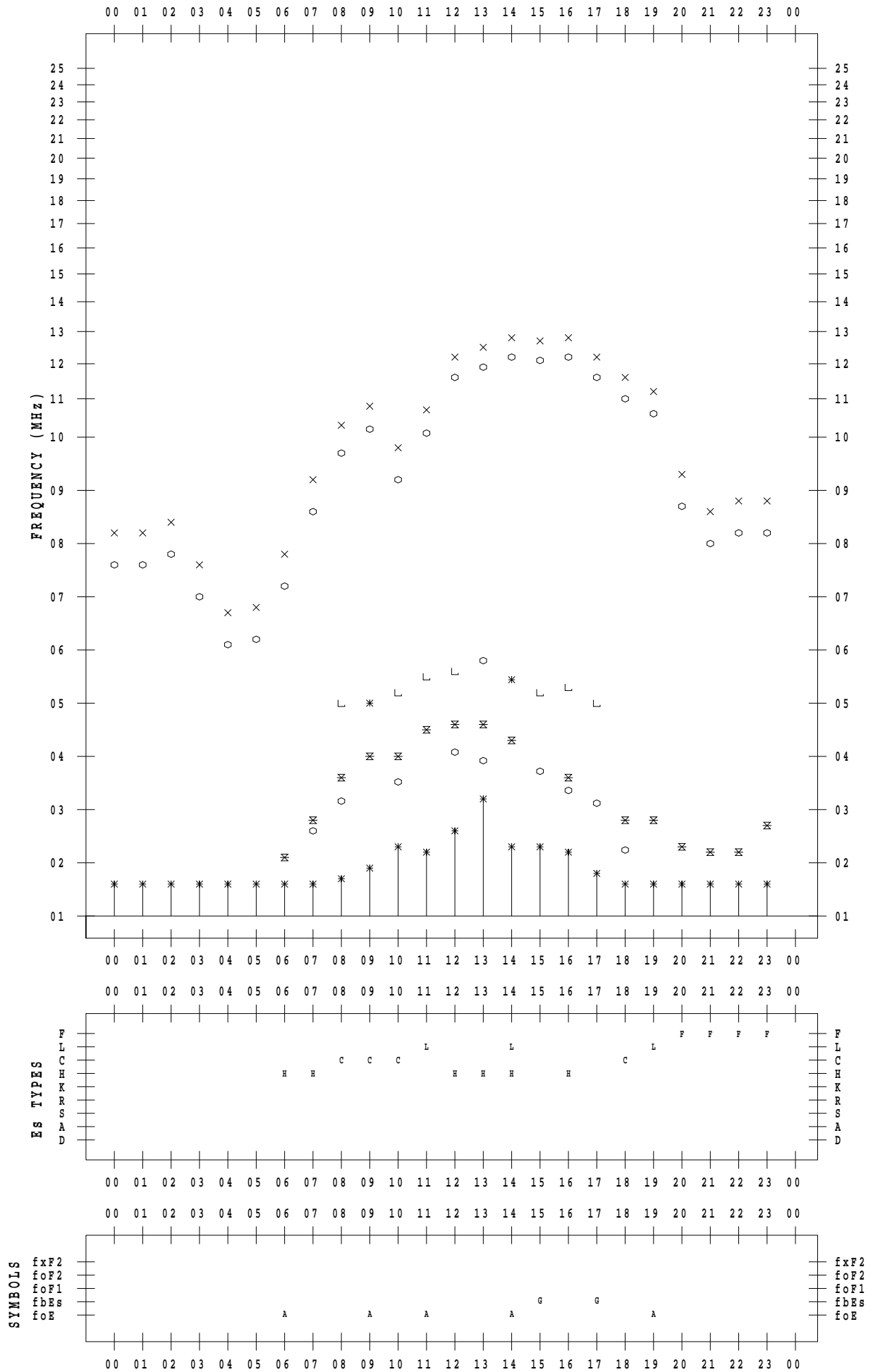
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 27

135 ° E MEAN TIME



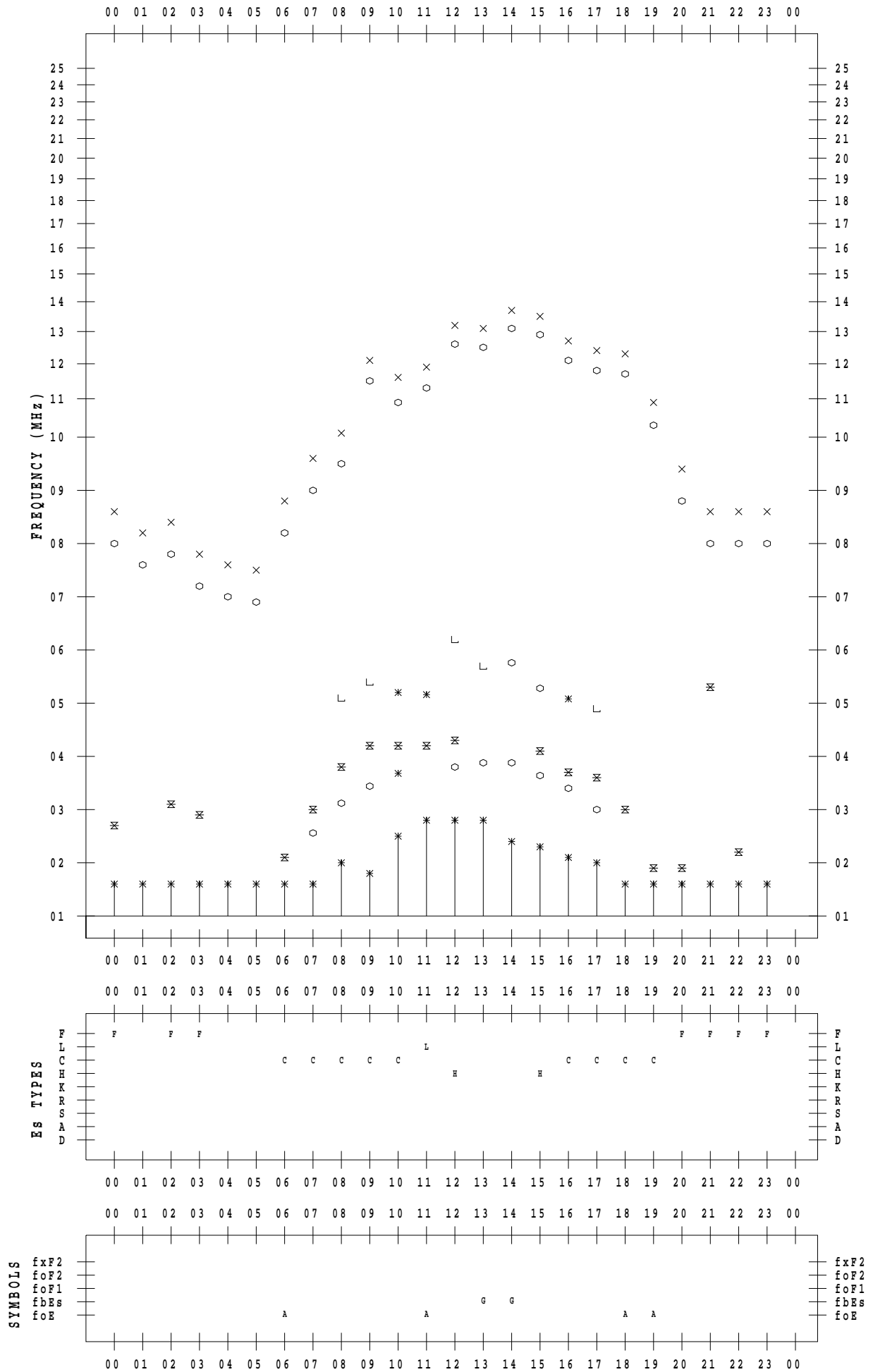
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 28

135 ° E MEAN TIME



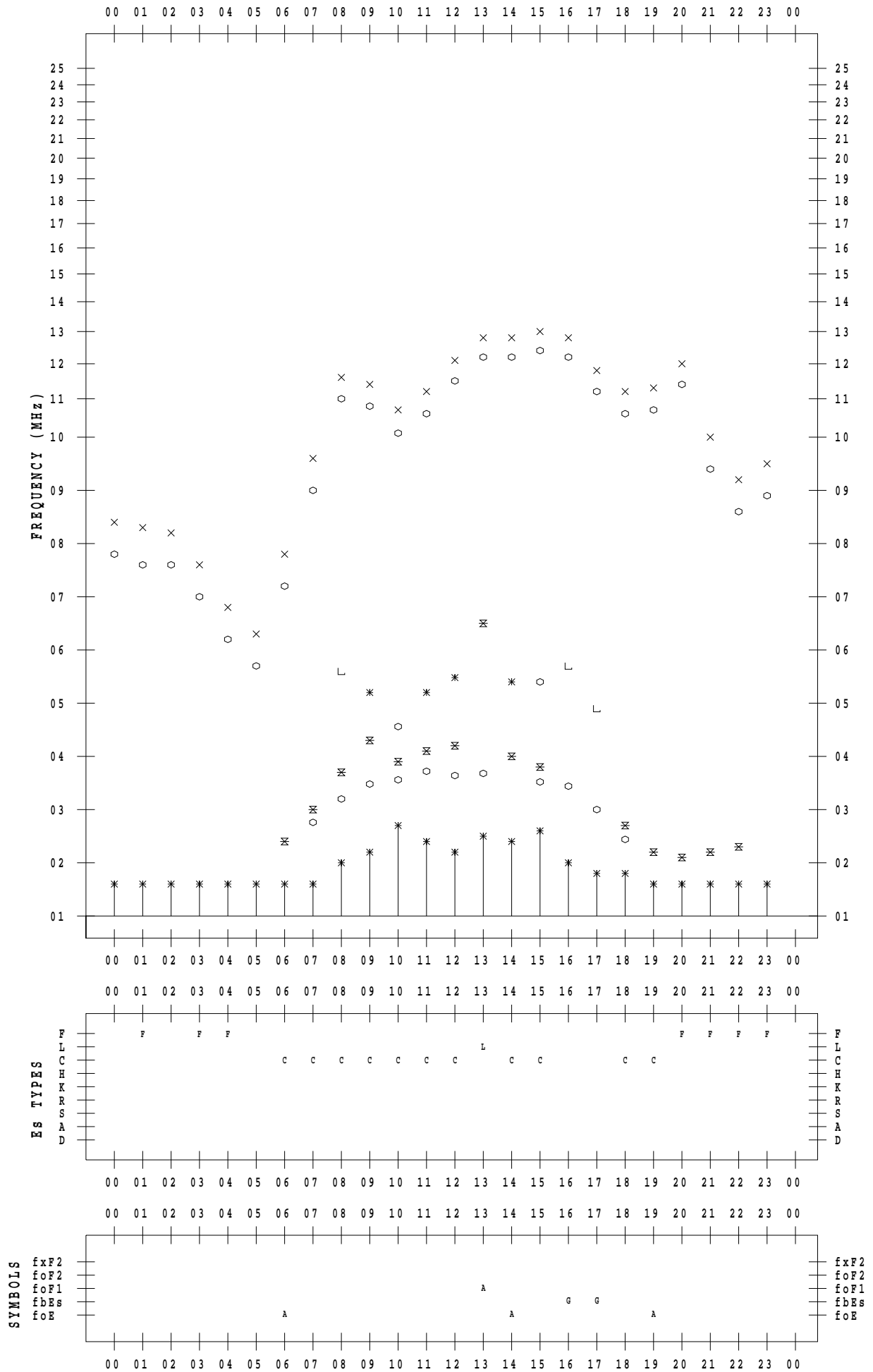
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 29

135 ° E MEAN TIME



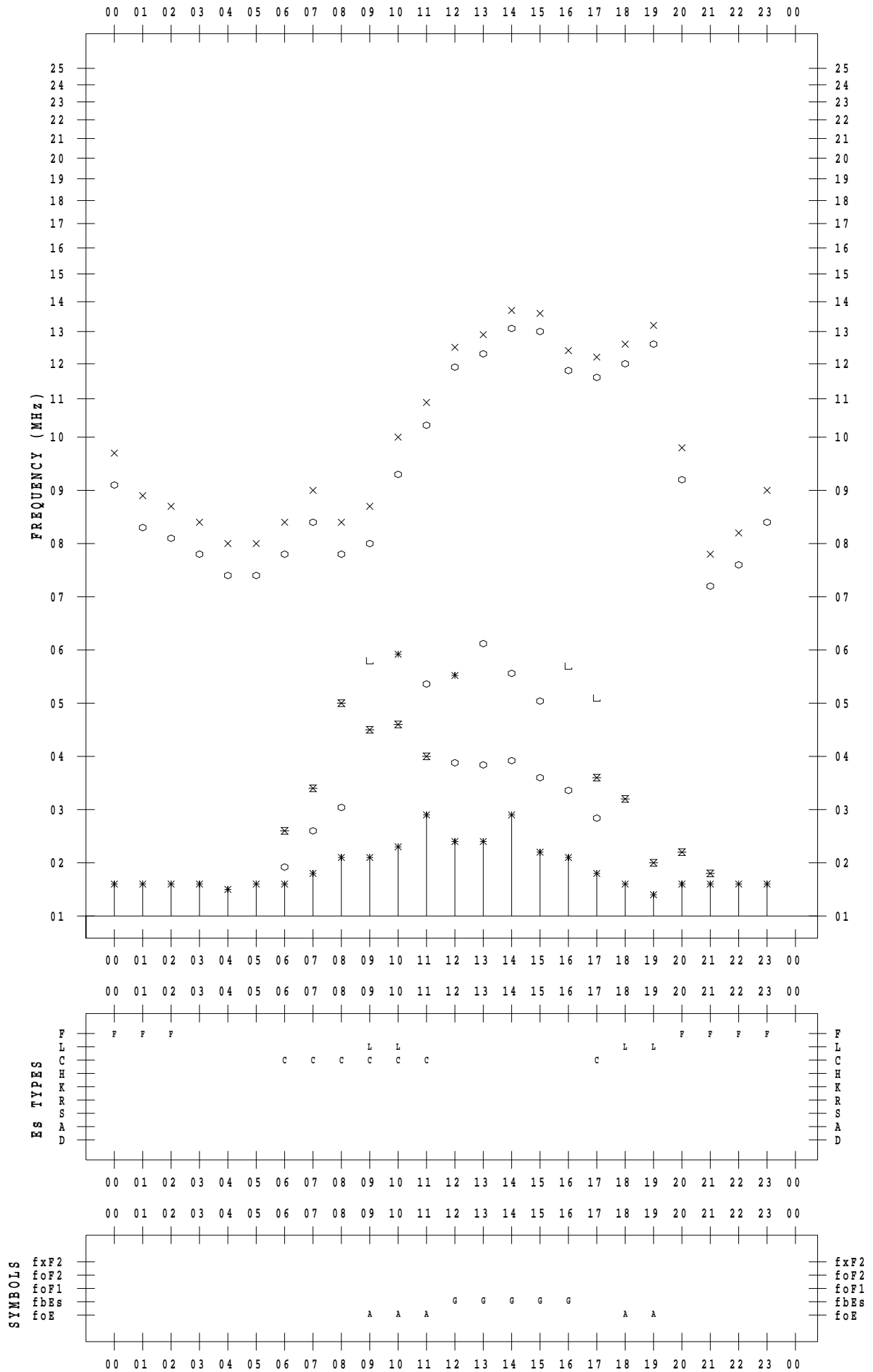
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 4 / 30

135 ° E MEAN TIME



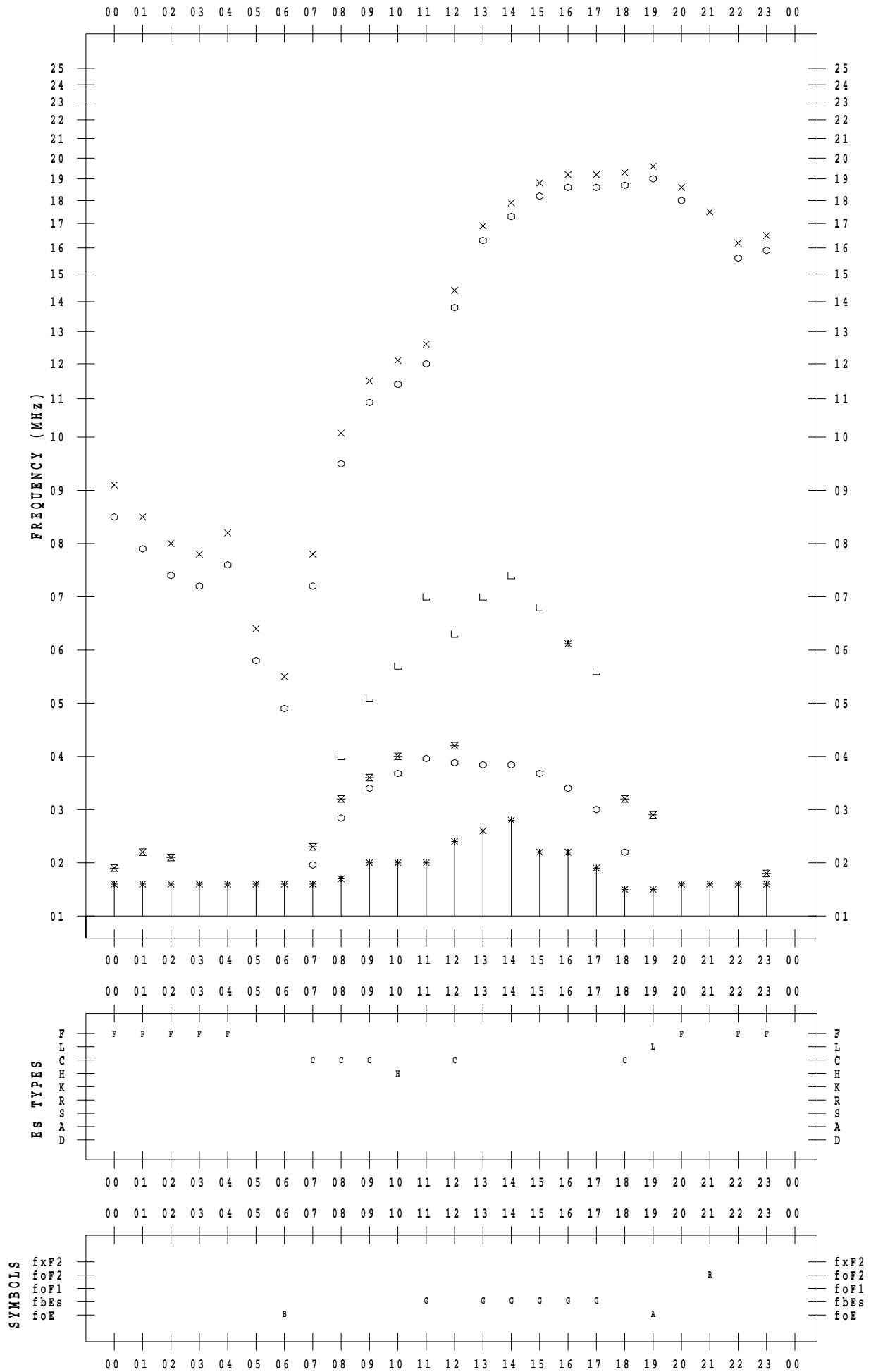
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 1

135 ° E MEAN TIME



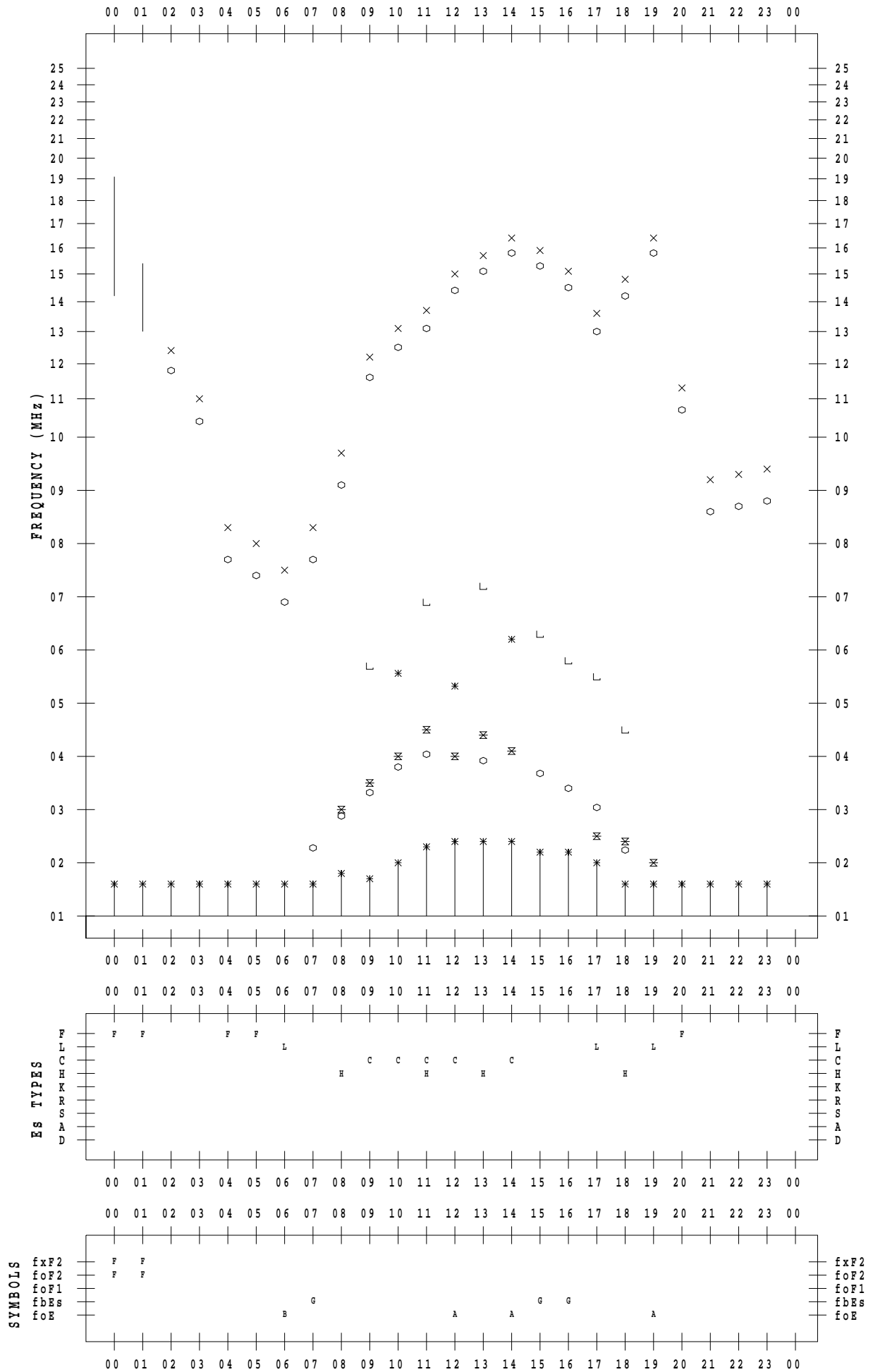
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 2

135 ° E MEAN TIME



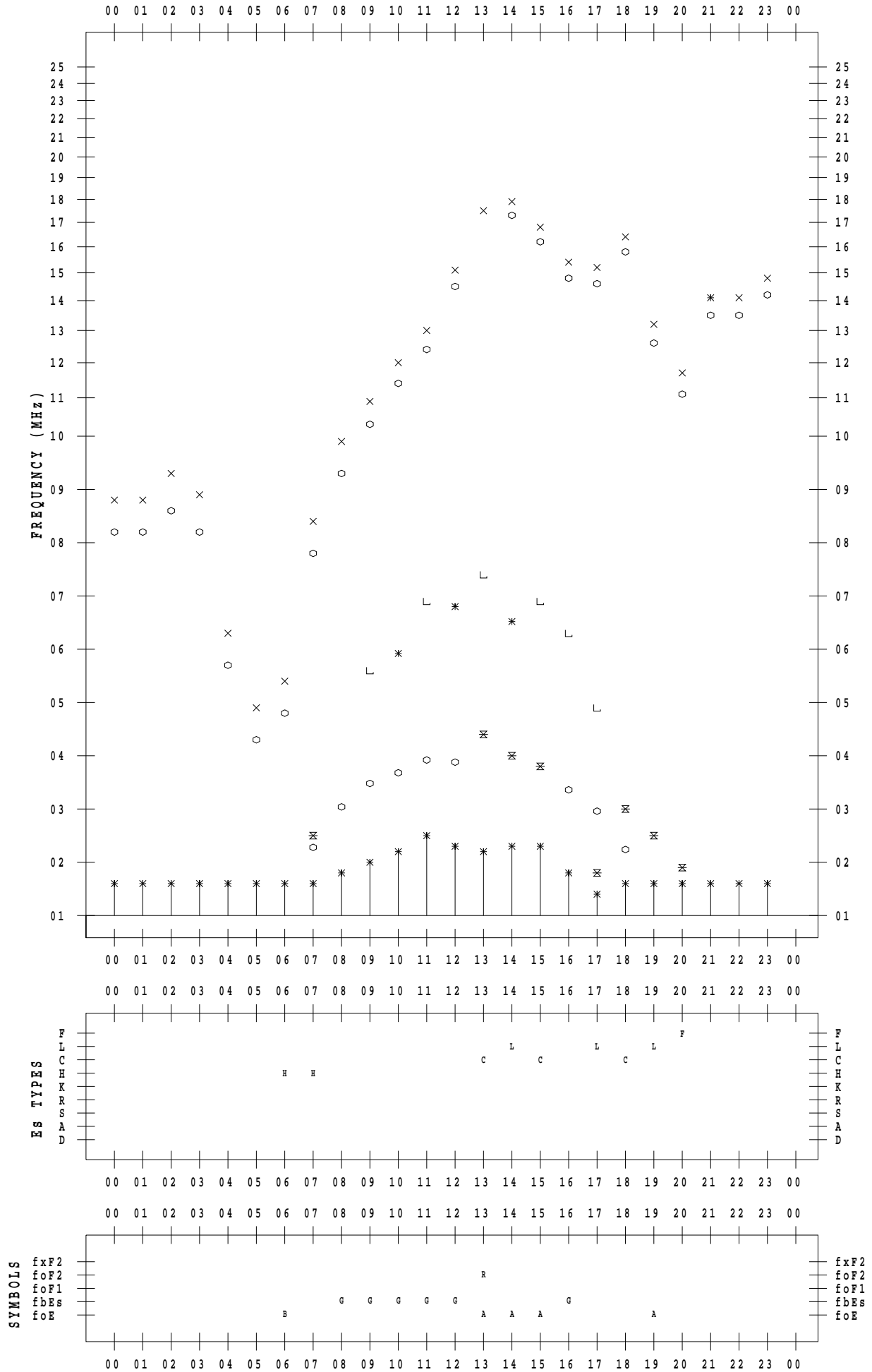
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 3

135 ° E MEAN TIME



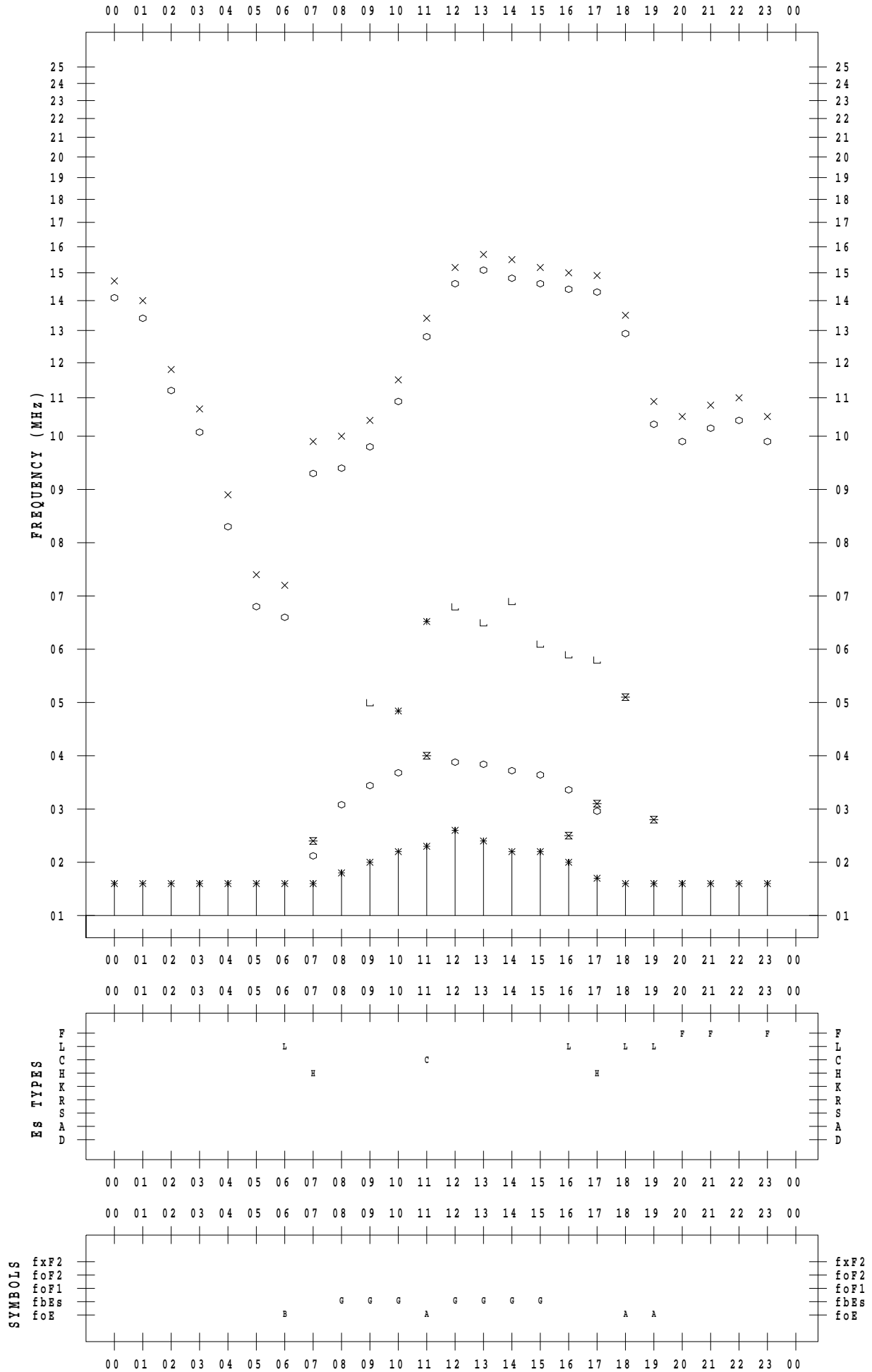
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 4

135 ° E MEAN TIME



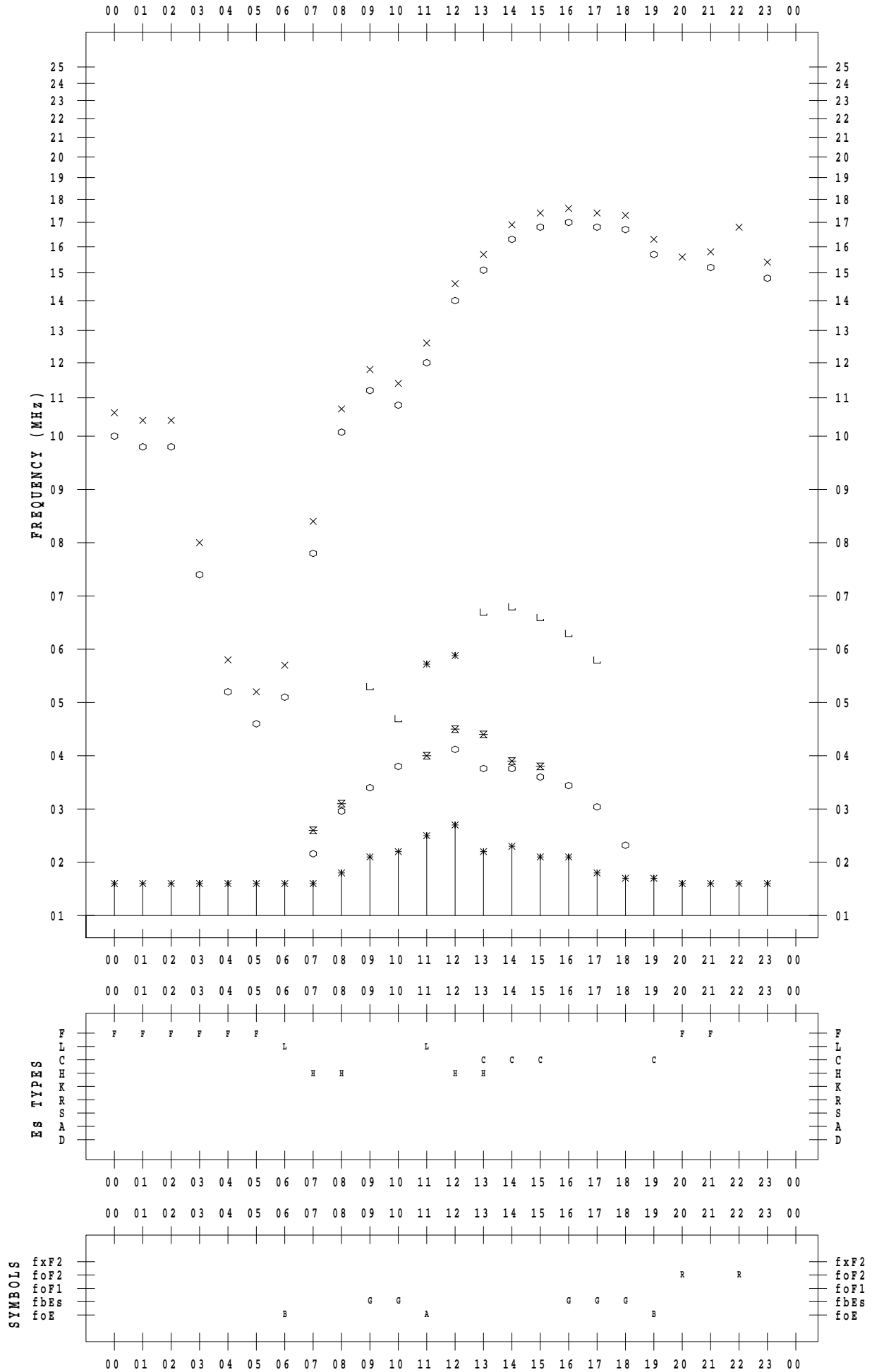
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 5

135 ° E MEAN TIME



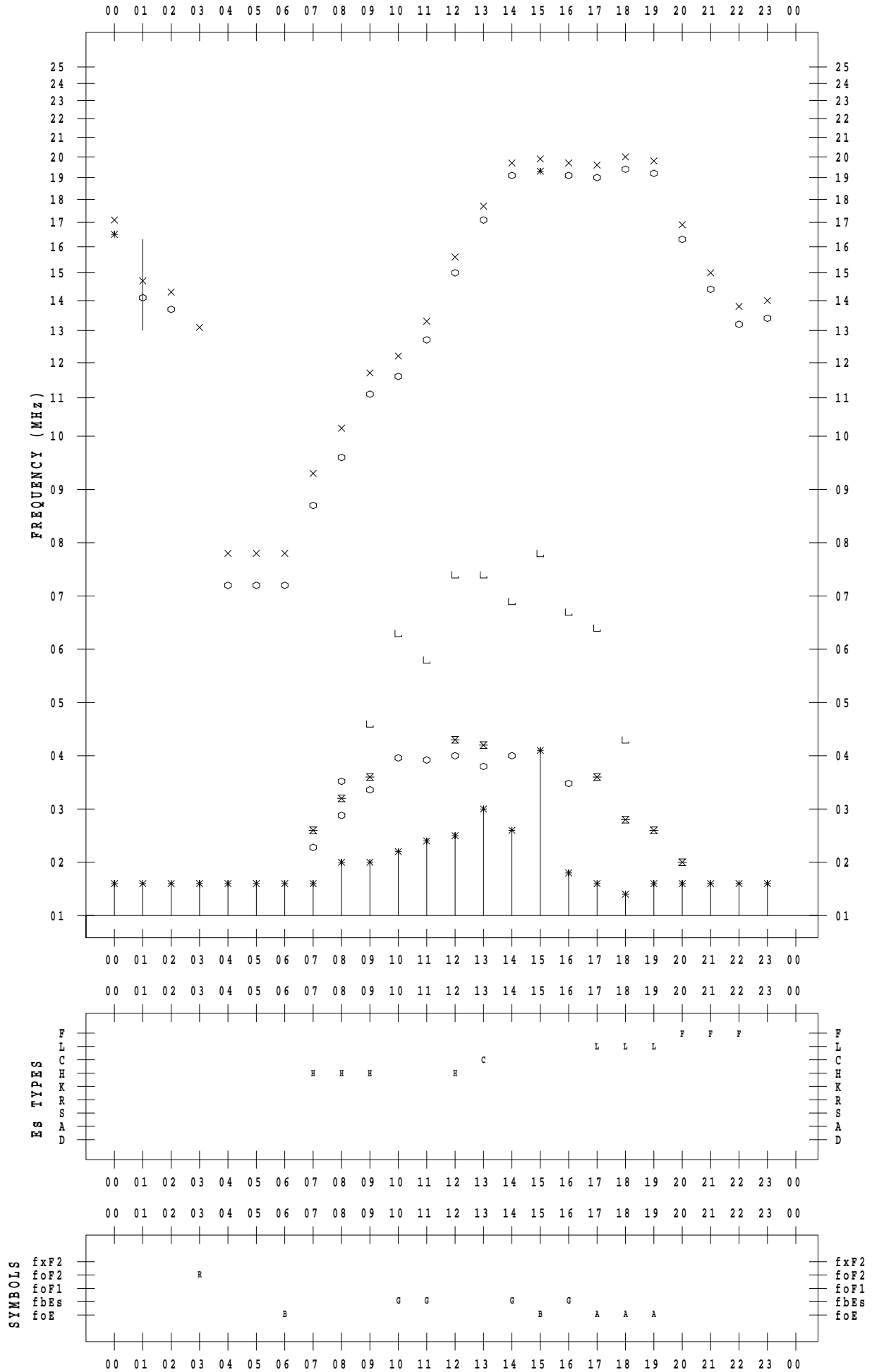
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 6

135 ° E MEAN TIME



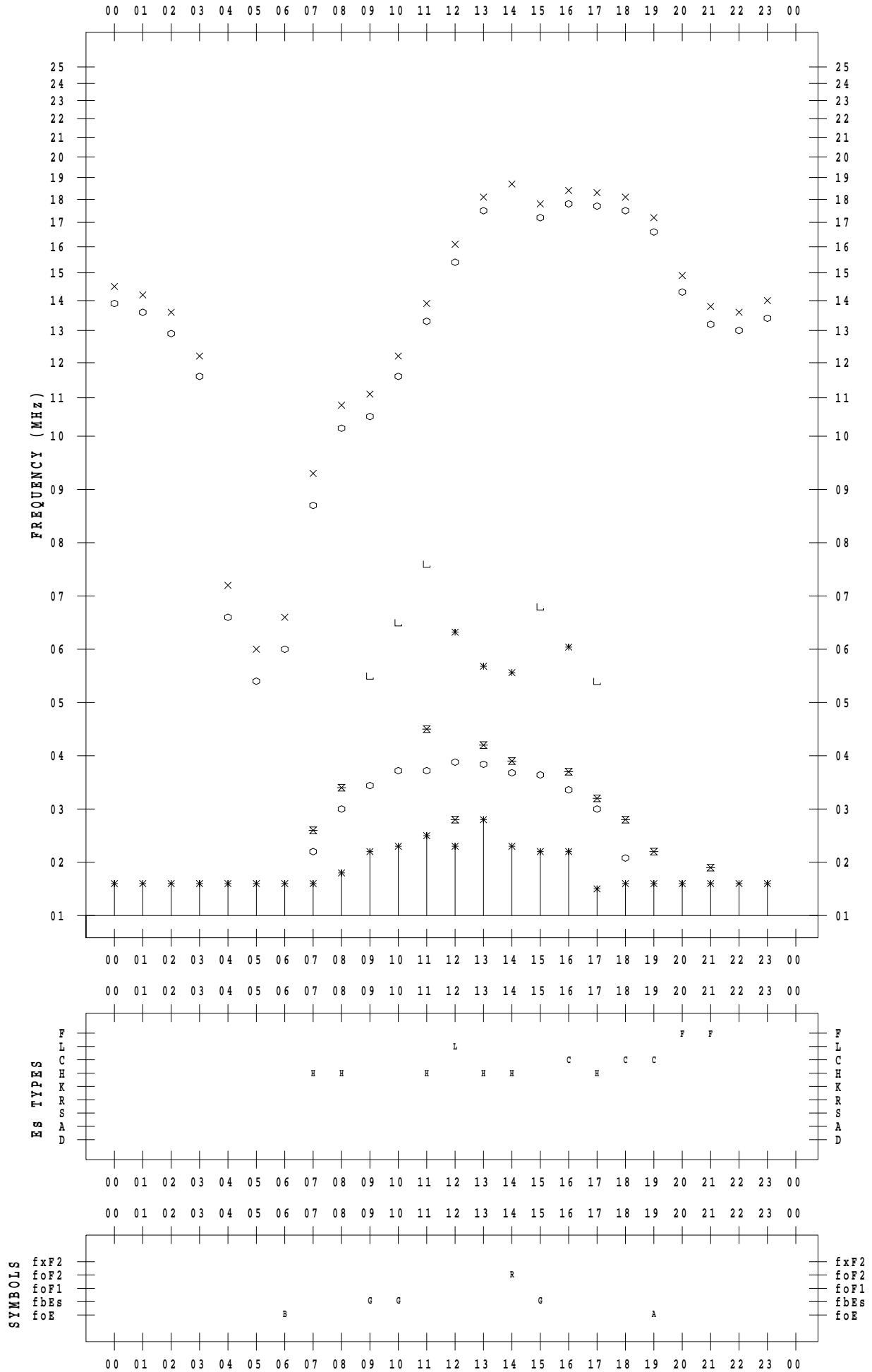
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 7

135 ° E MEAN TIME



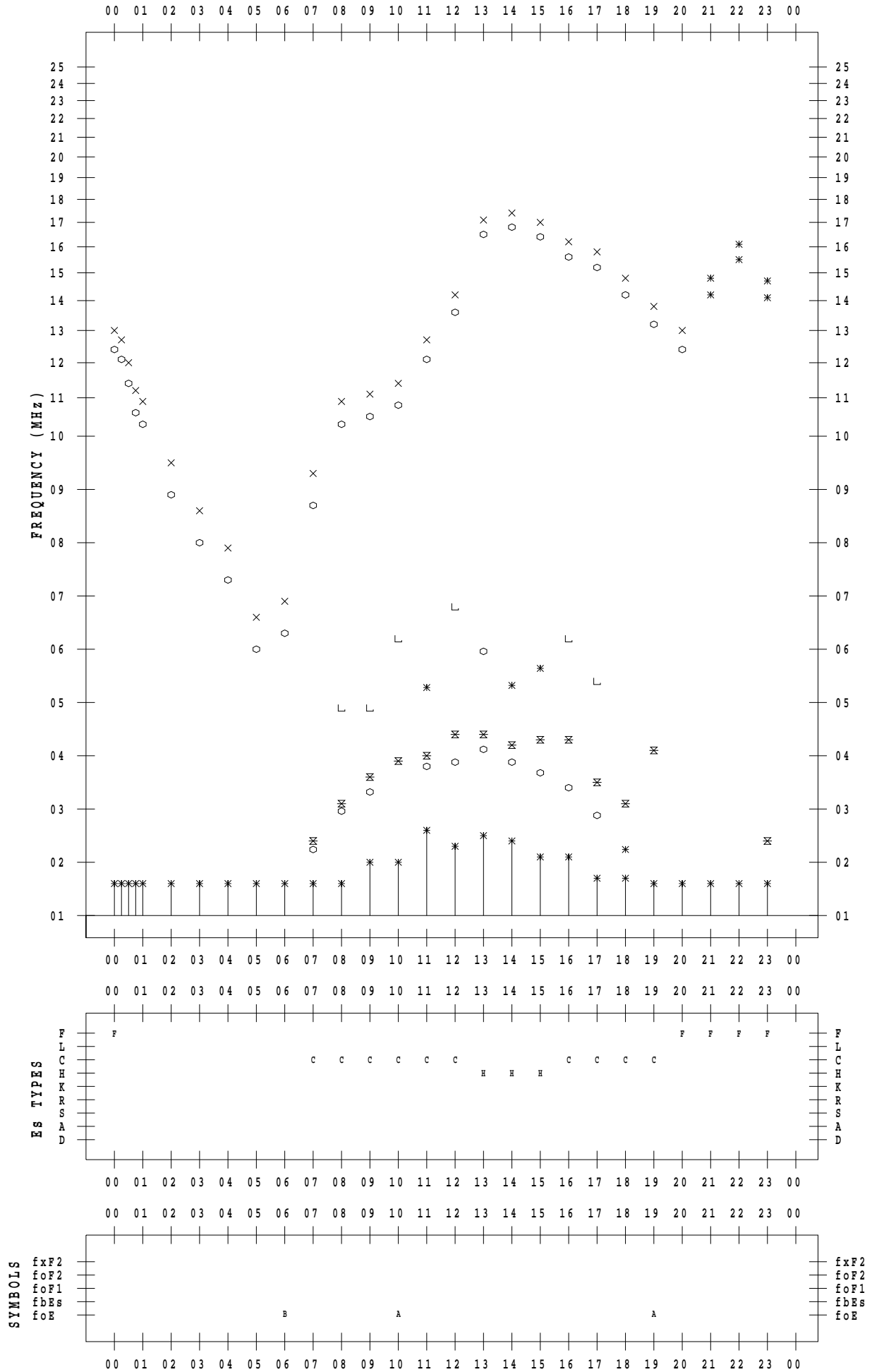
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 8

135 ° E MEAN TIME



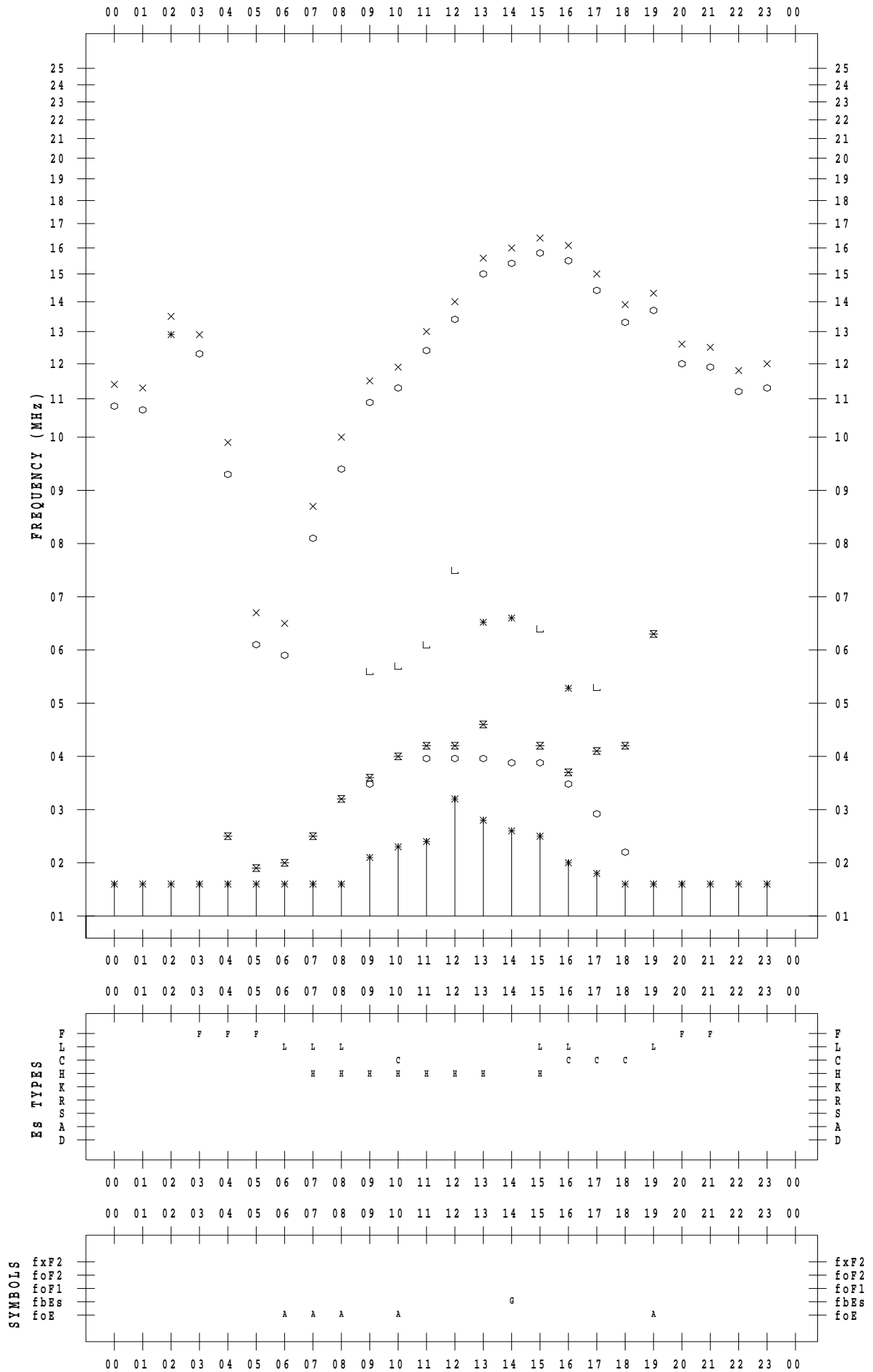
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 9

135 ° E MEAN TIME



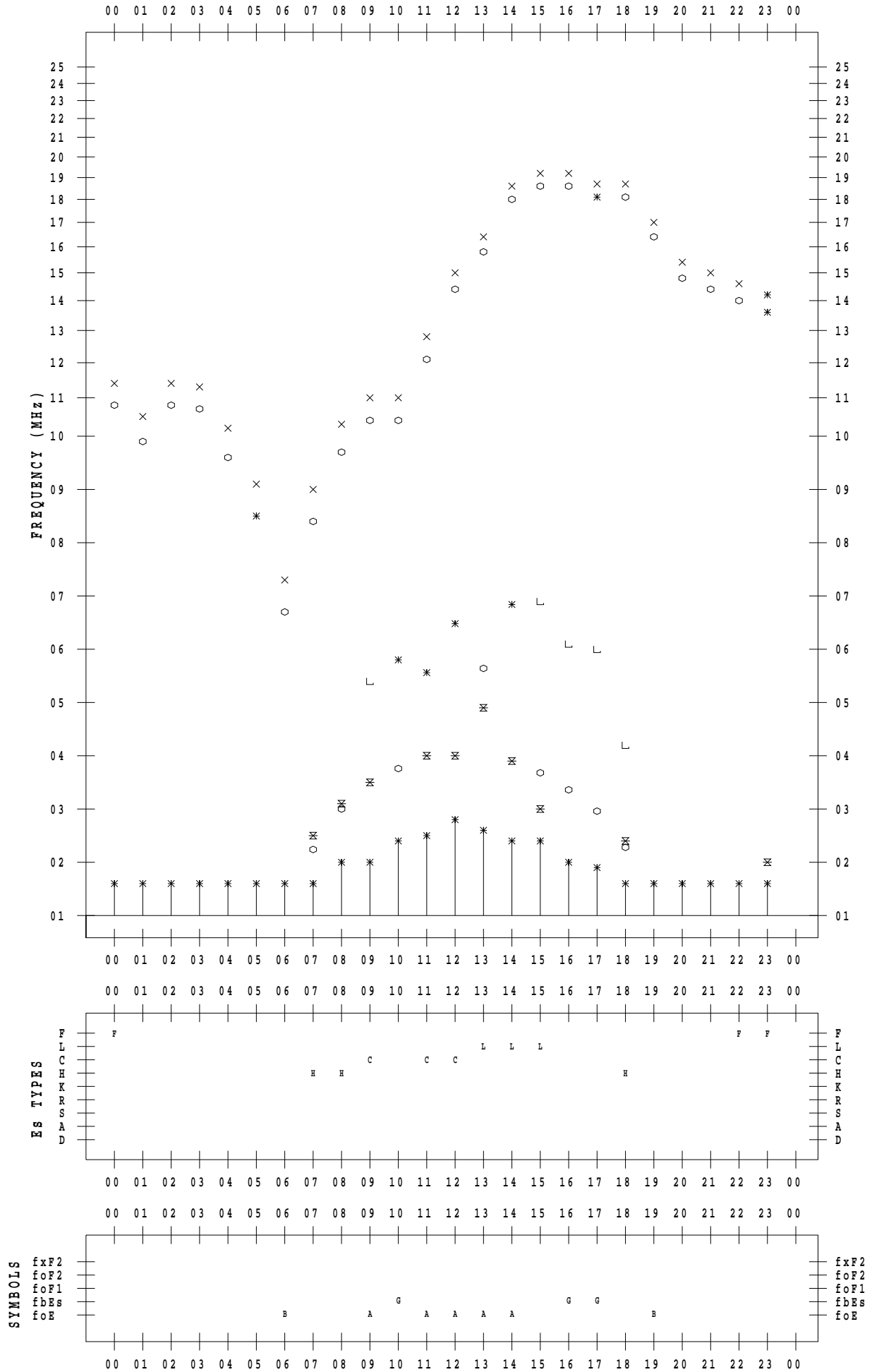
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 10

135 ° E MEAN TIME



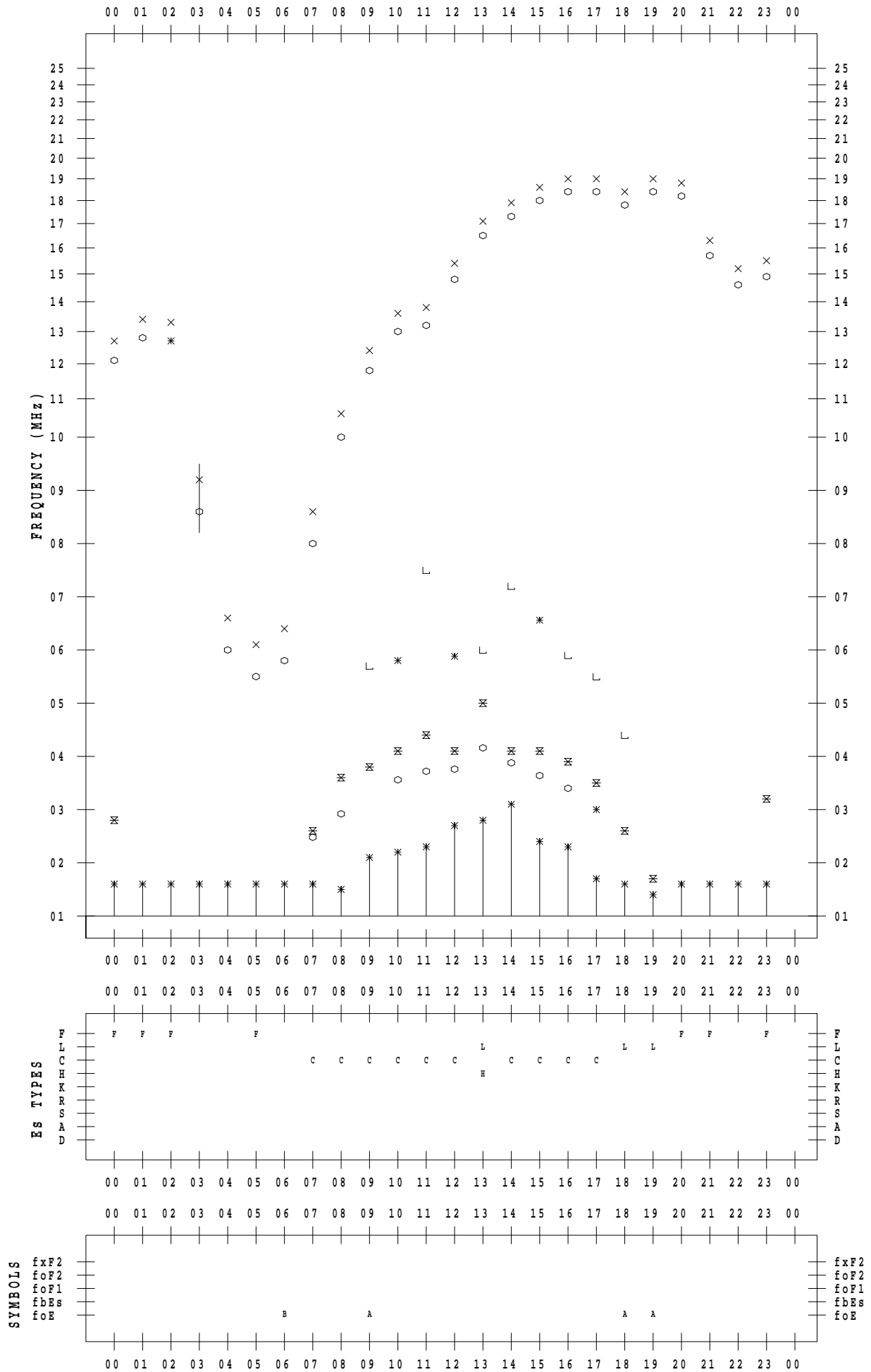
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 4/11

135 ° E MEAN TIME



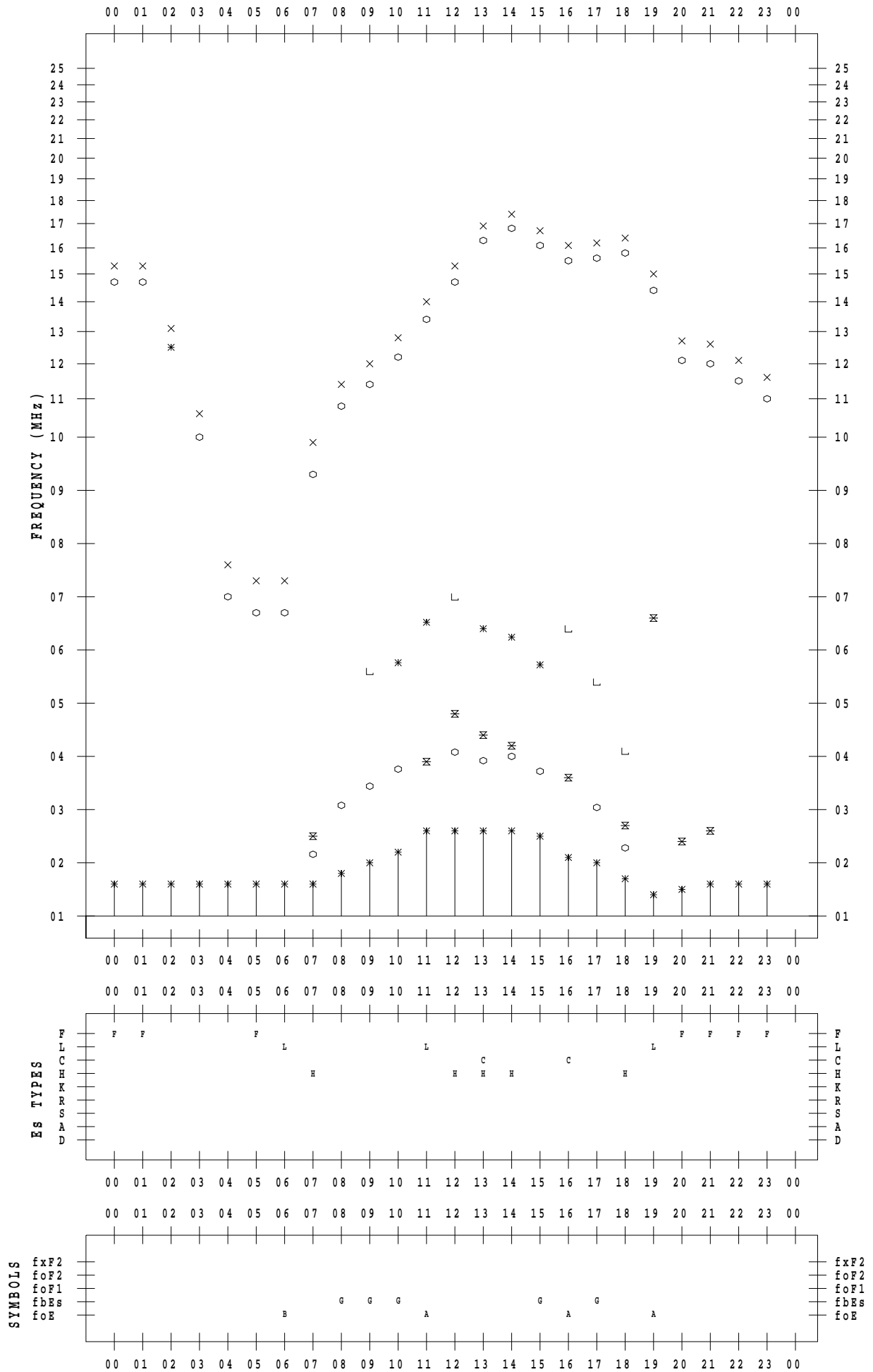
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 4/12

135 ° E MEAN TIME



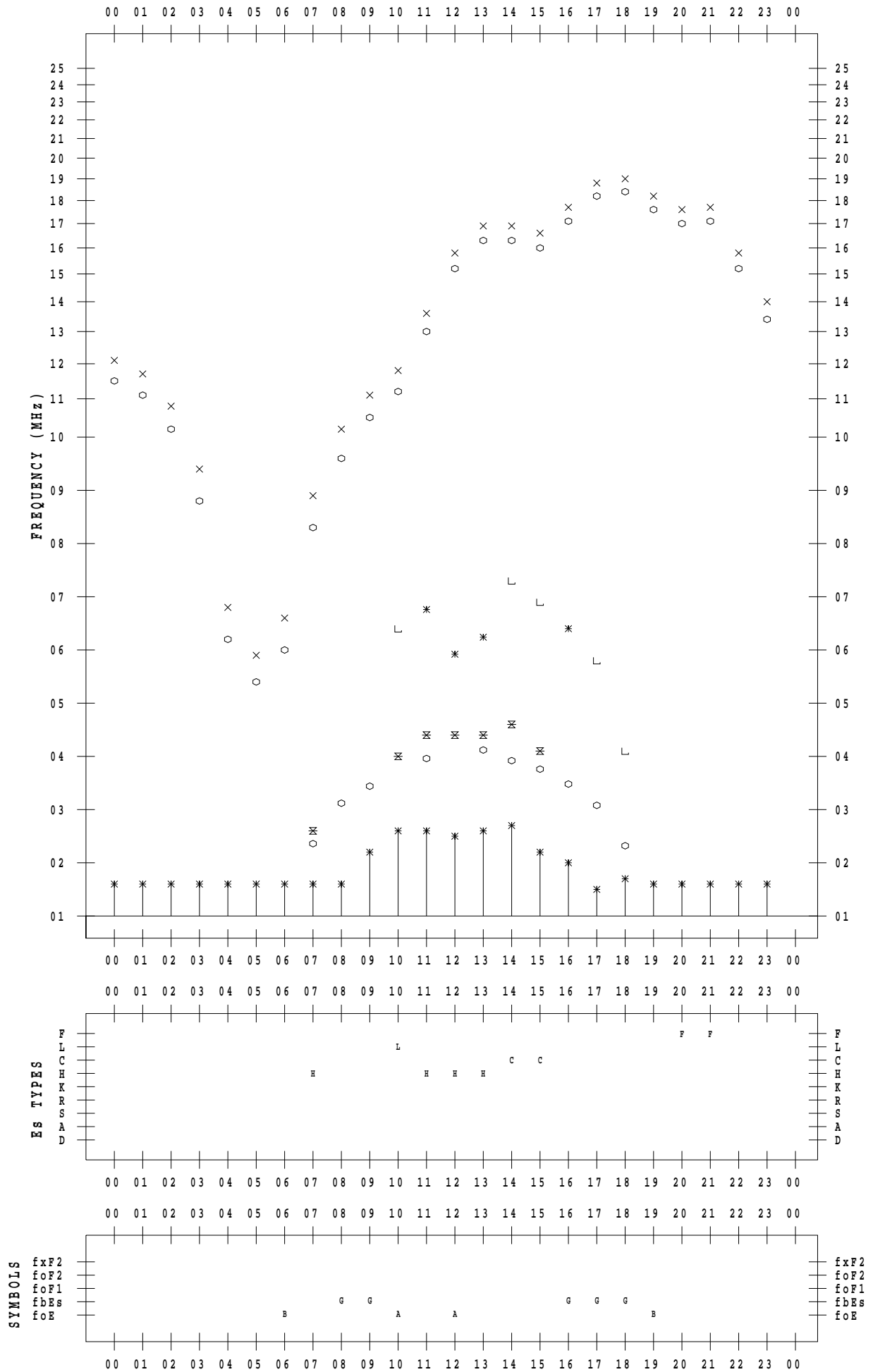
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 4/13

135 ° E MEAN TIME



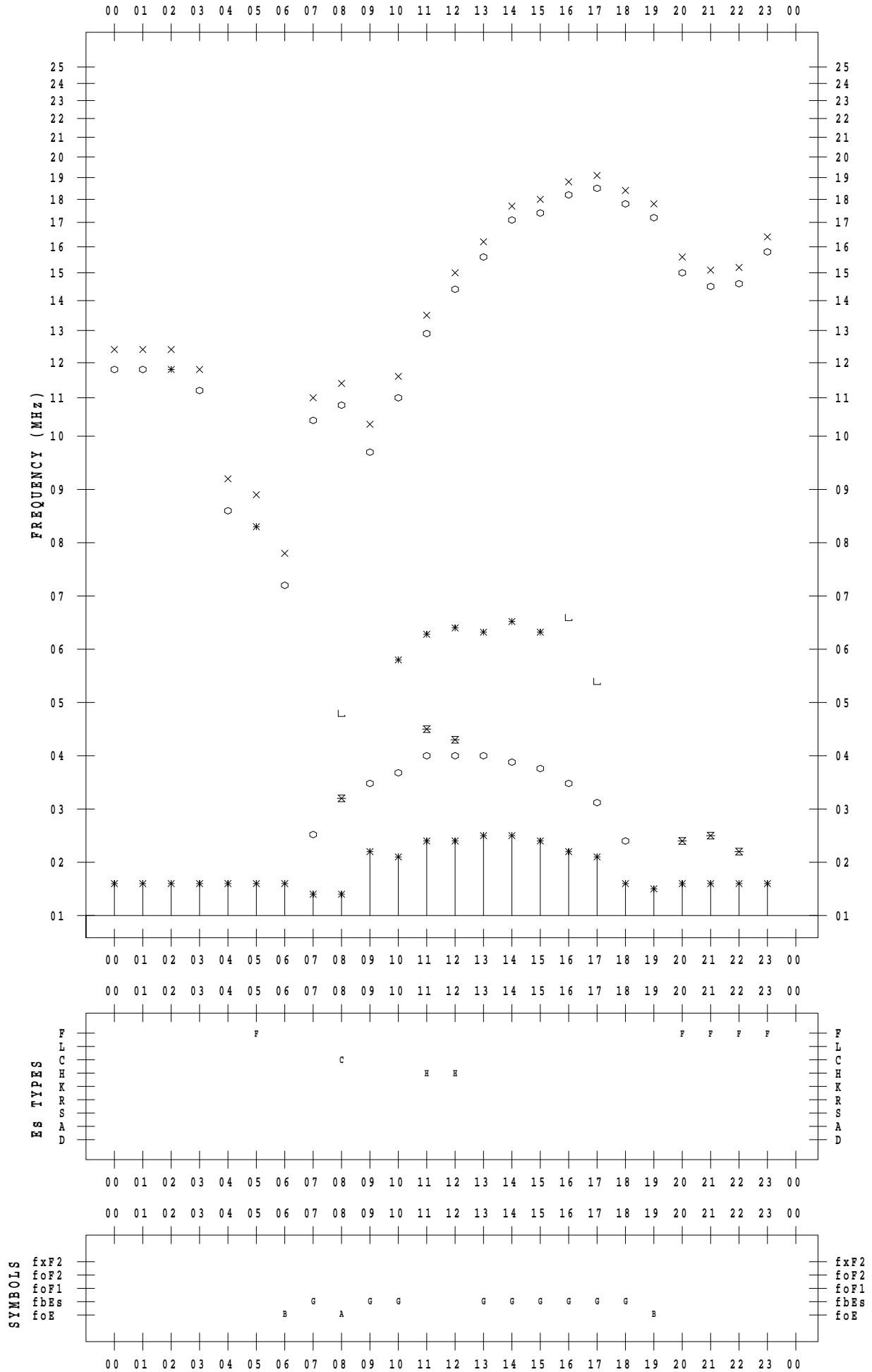
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 14

135 ° E MEAN TIME



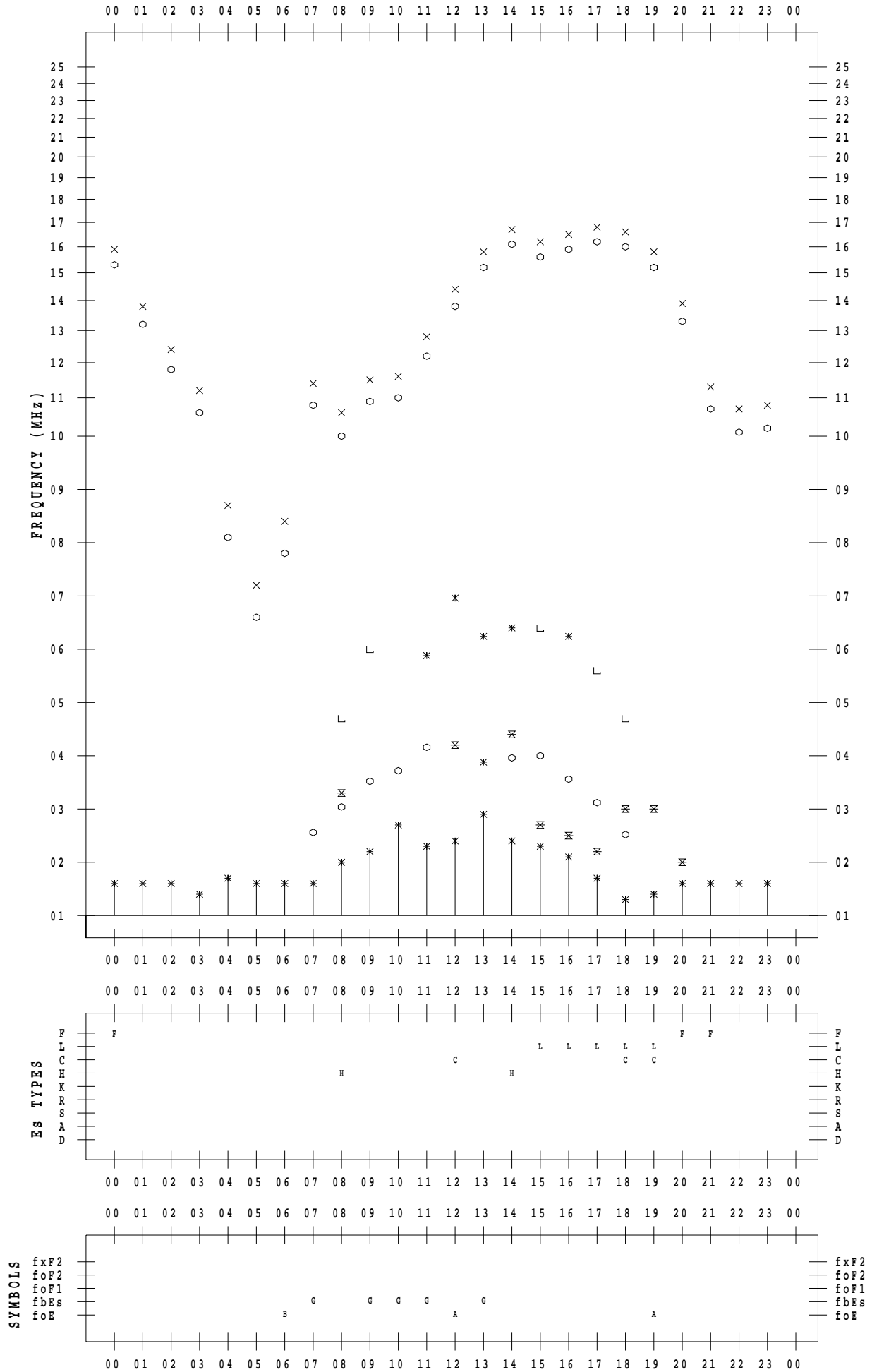
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 4/15

135 ° E MEAN TIME



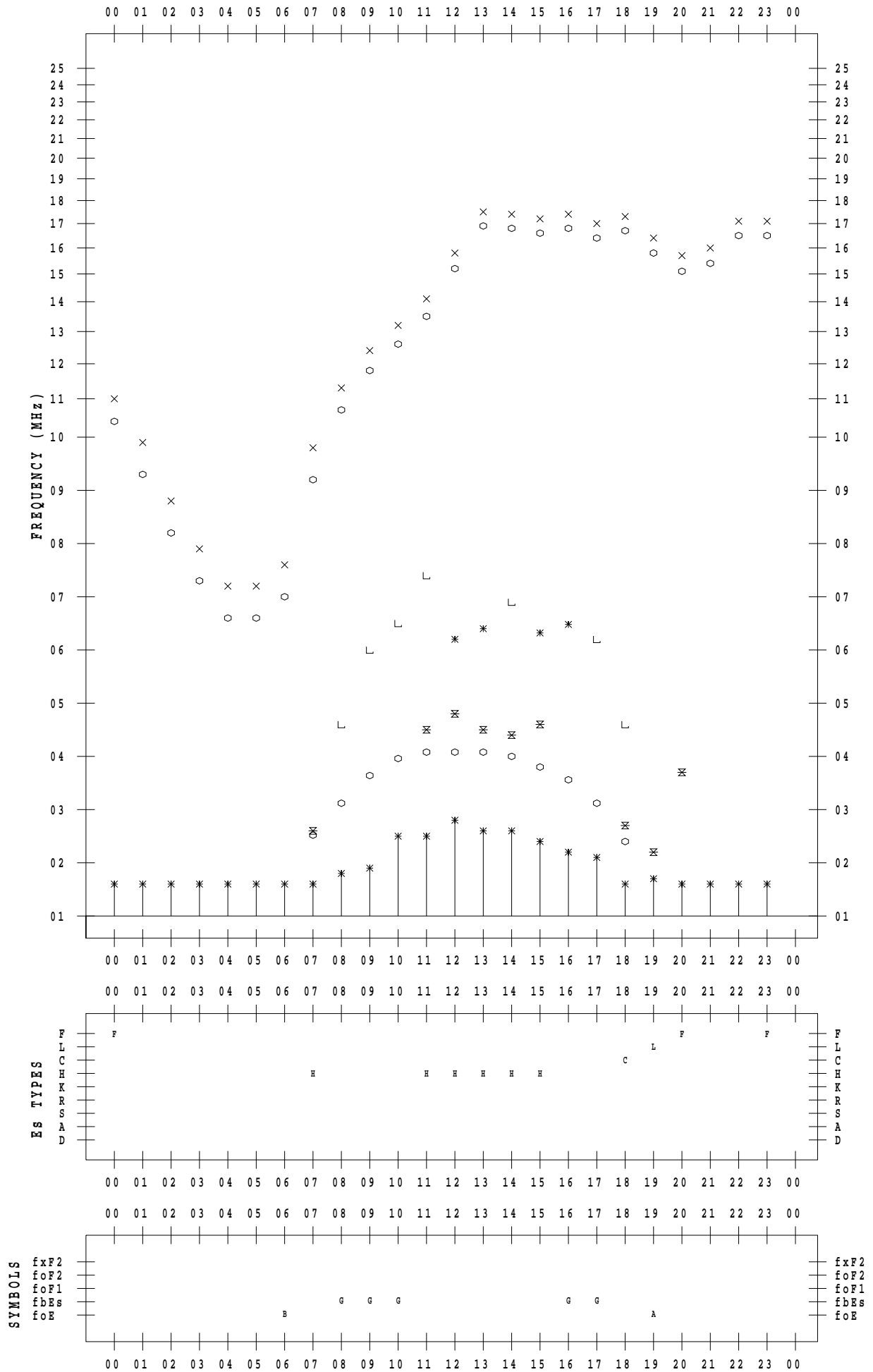
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 16

135 ° E MEAN TIME



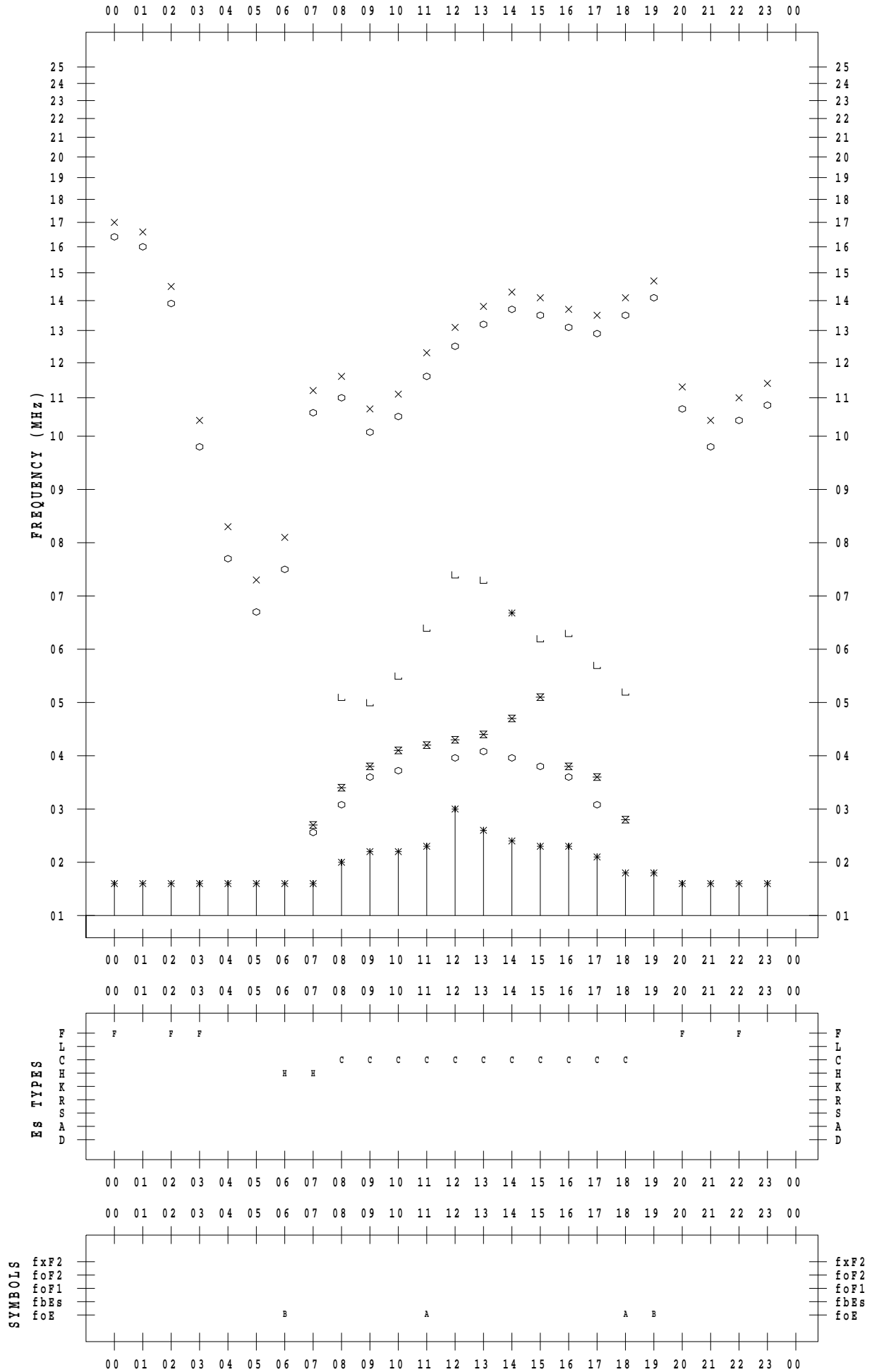
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 17

135 ° E MEAN TIME



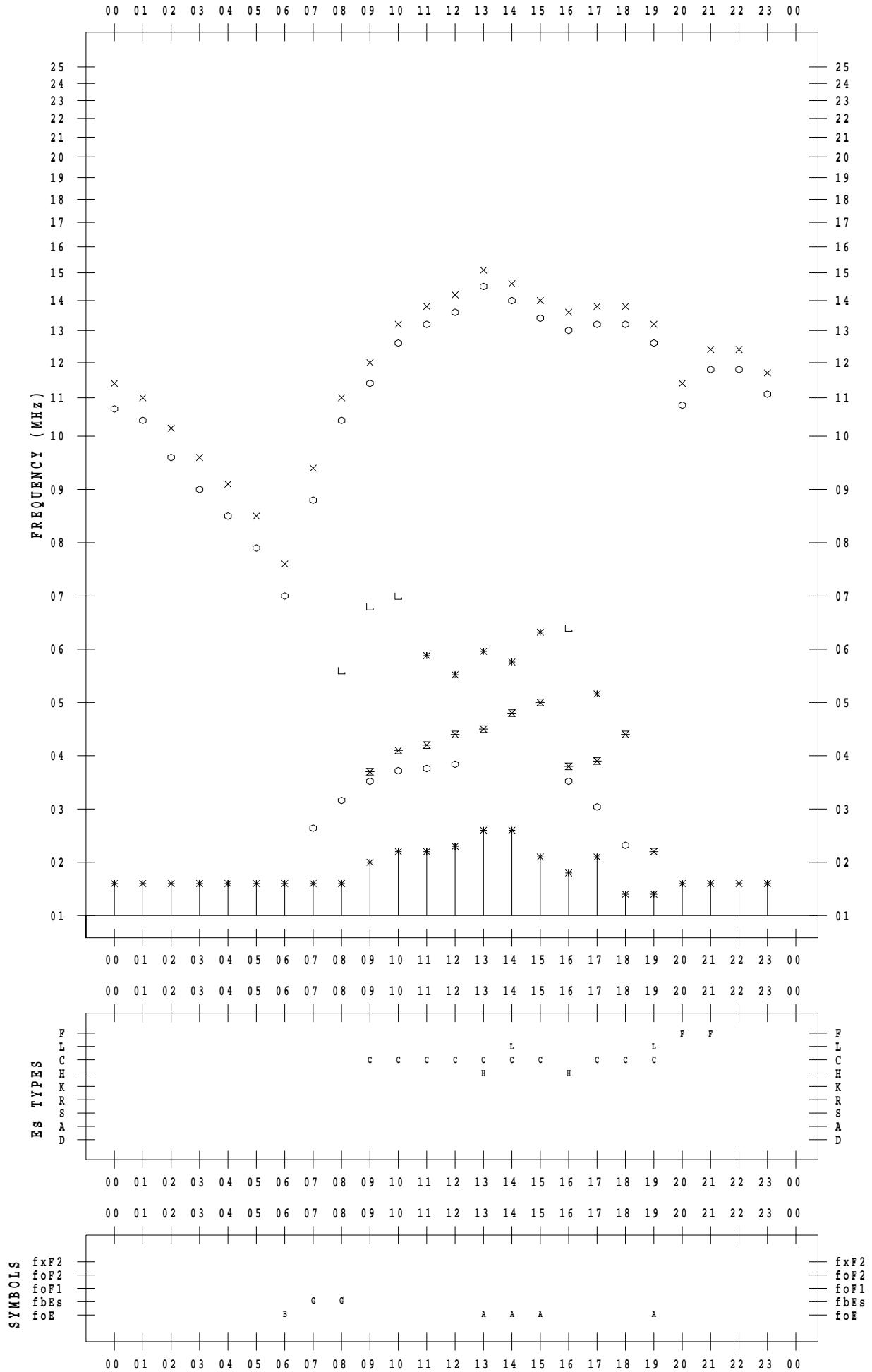
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 18

135 ° E MEAN TIME



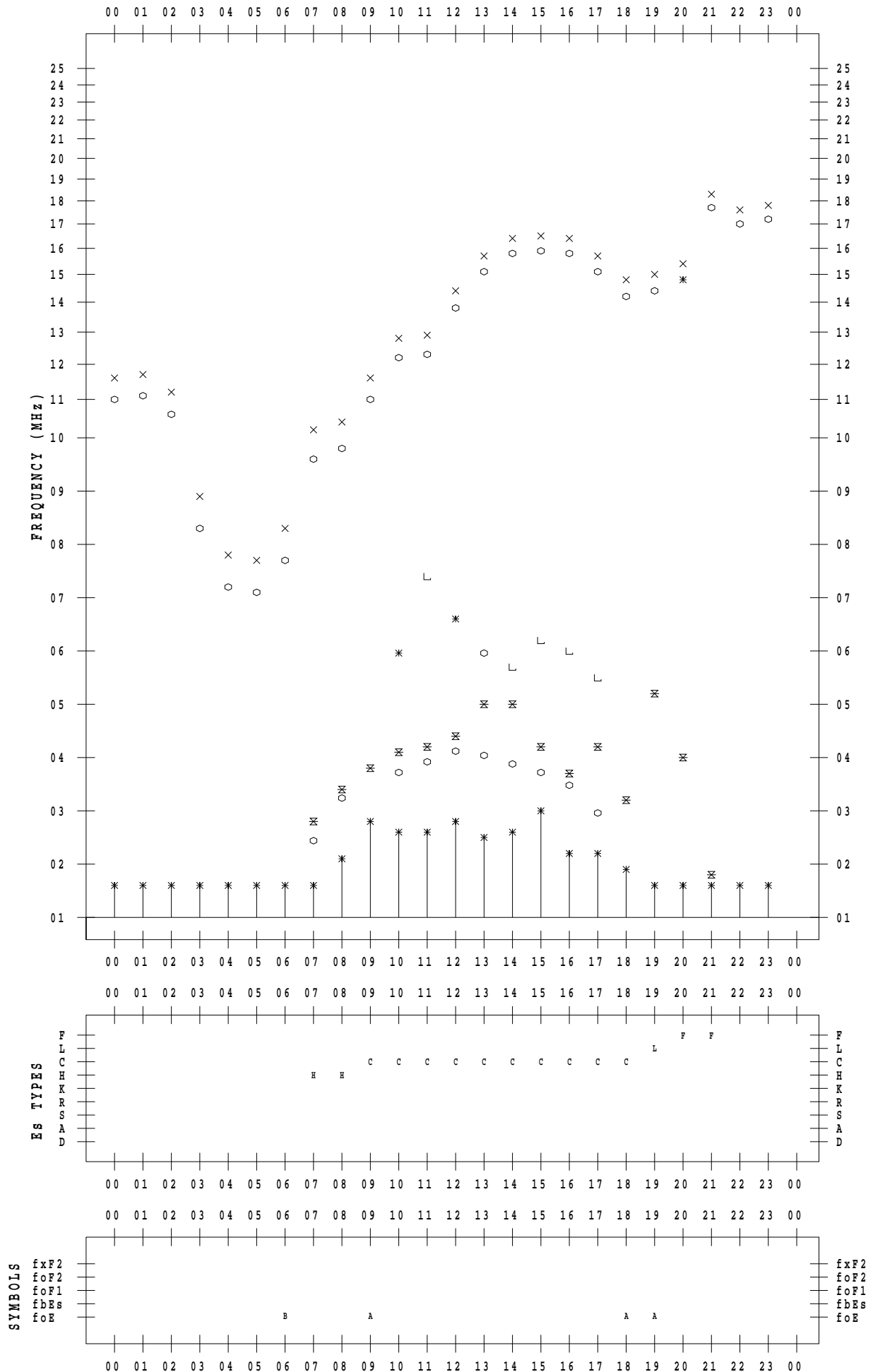
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 4/19

135 ° E MEAN TIME



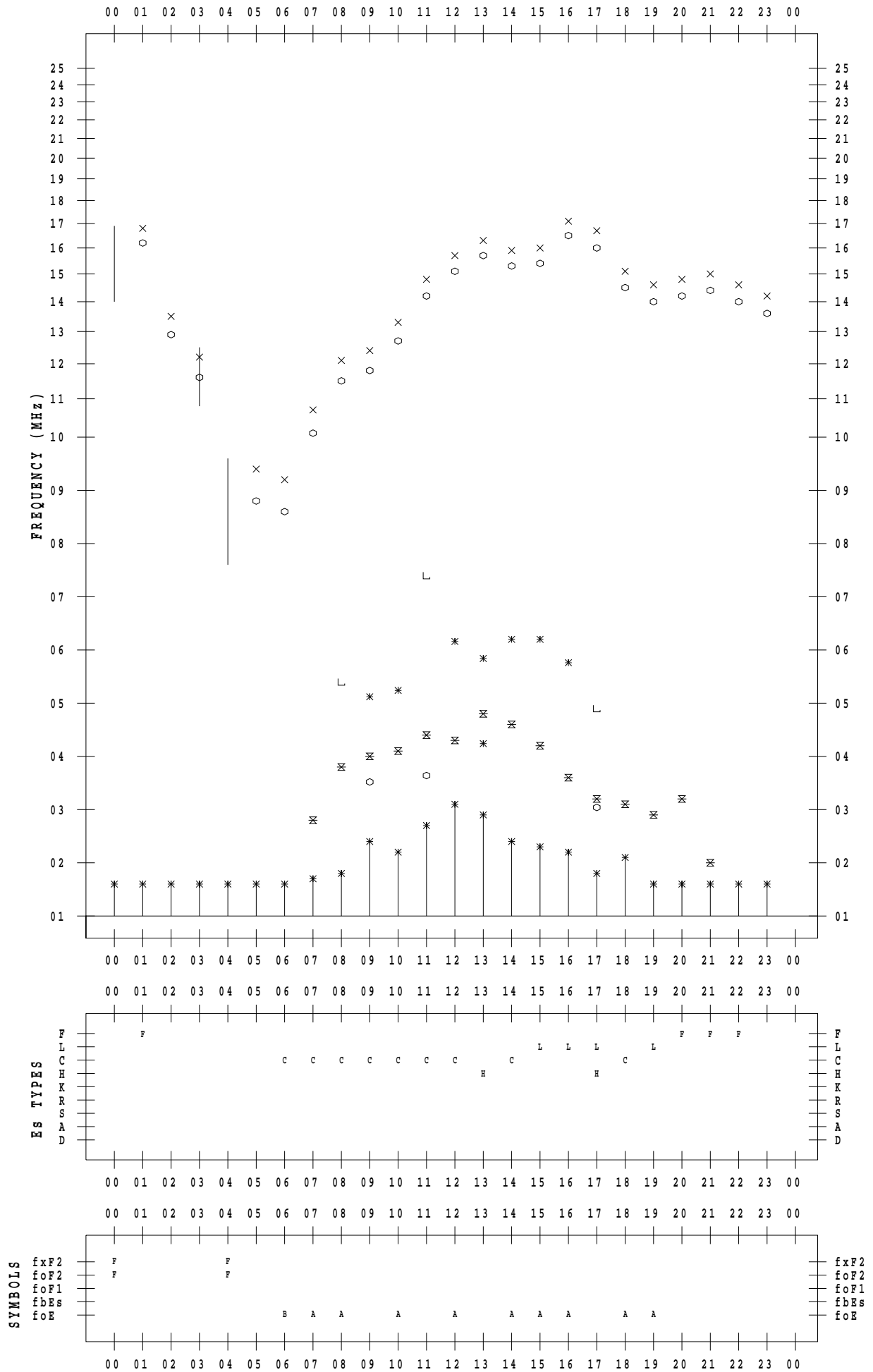
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 20

135 ° E MEAN TIME



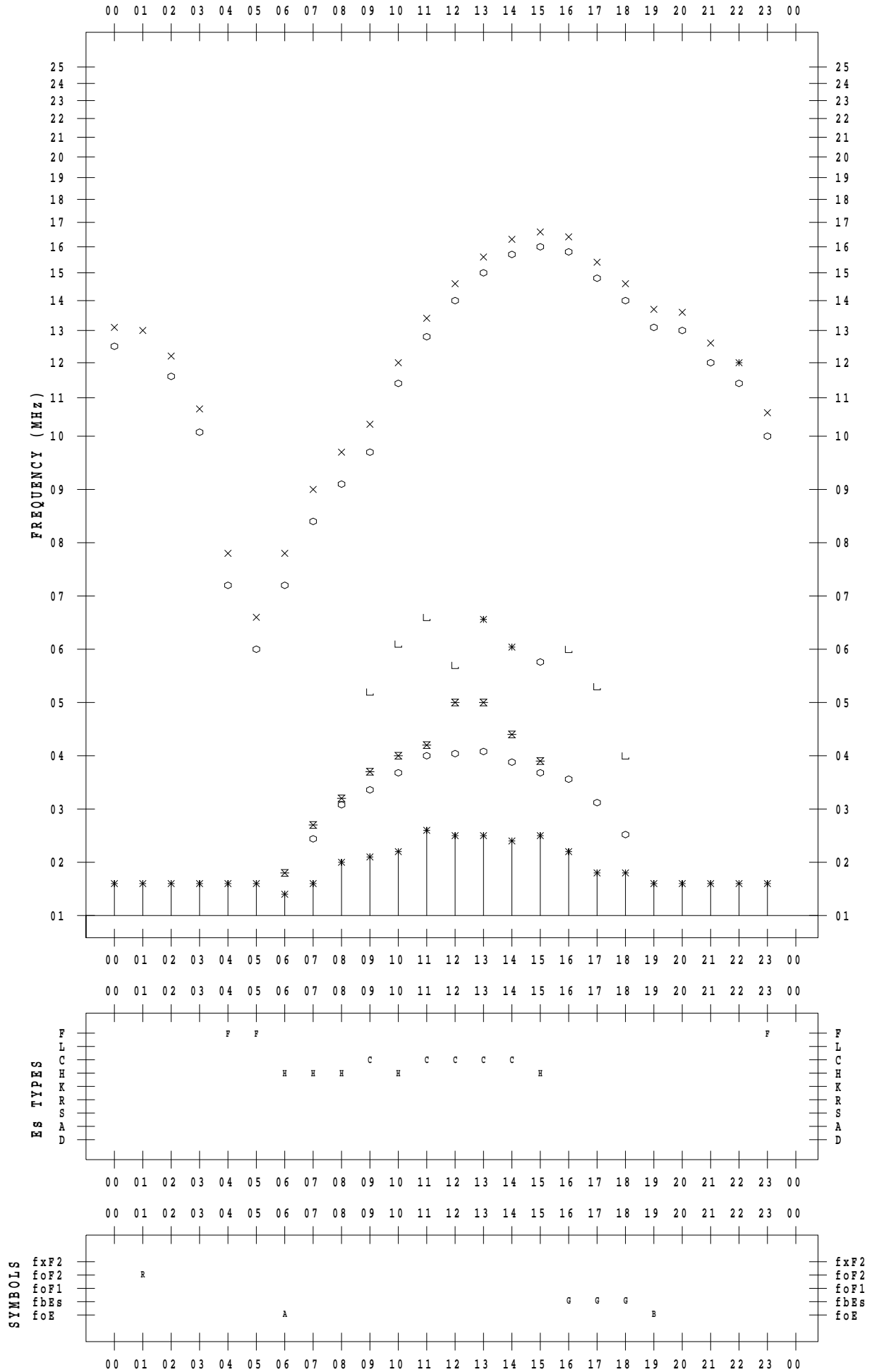
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 21

135 ° E MEAN TIME



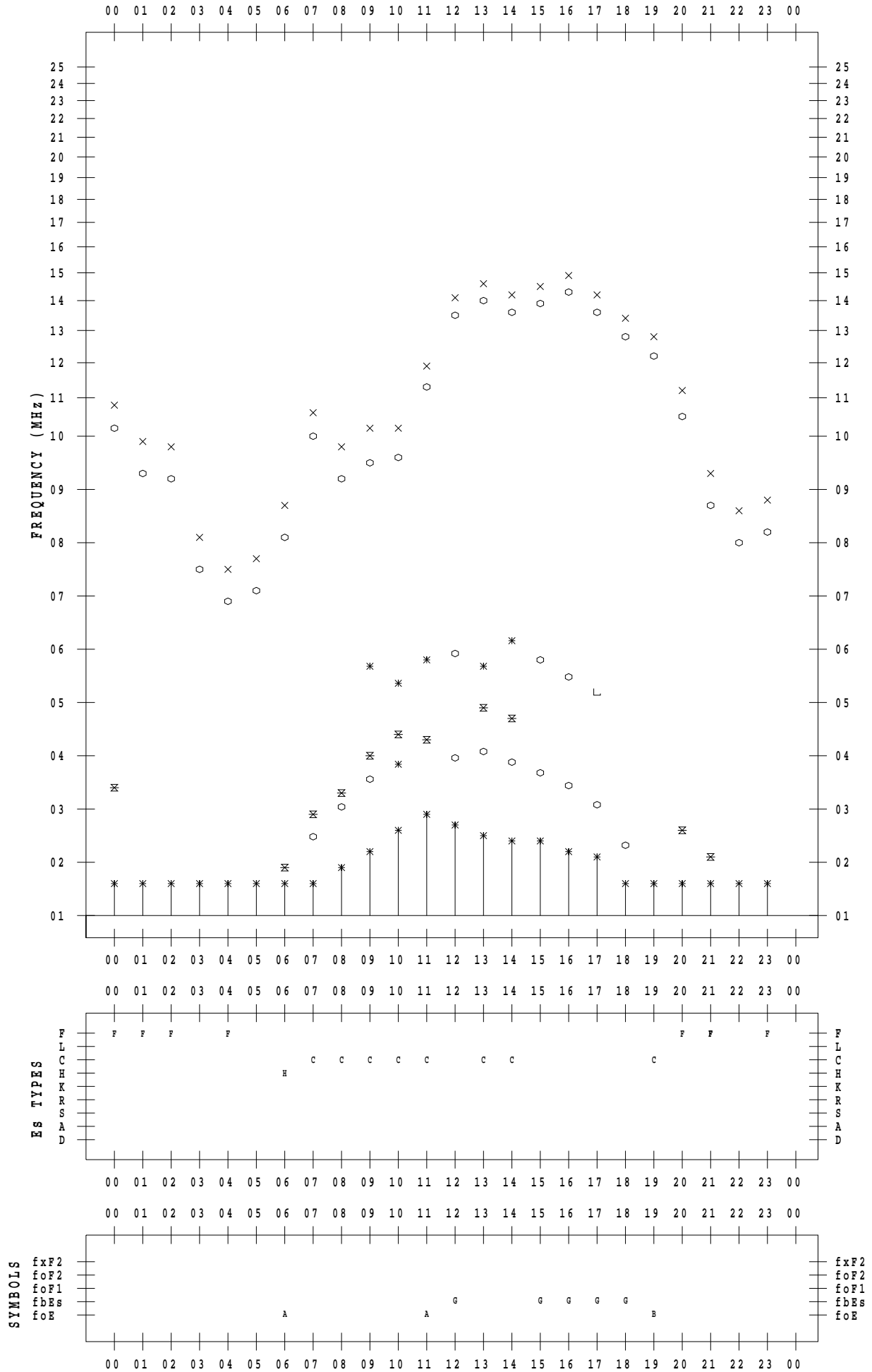
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 22

135 ° E MEAN TIME



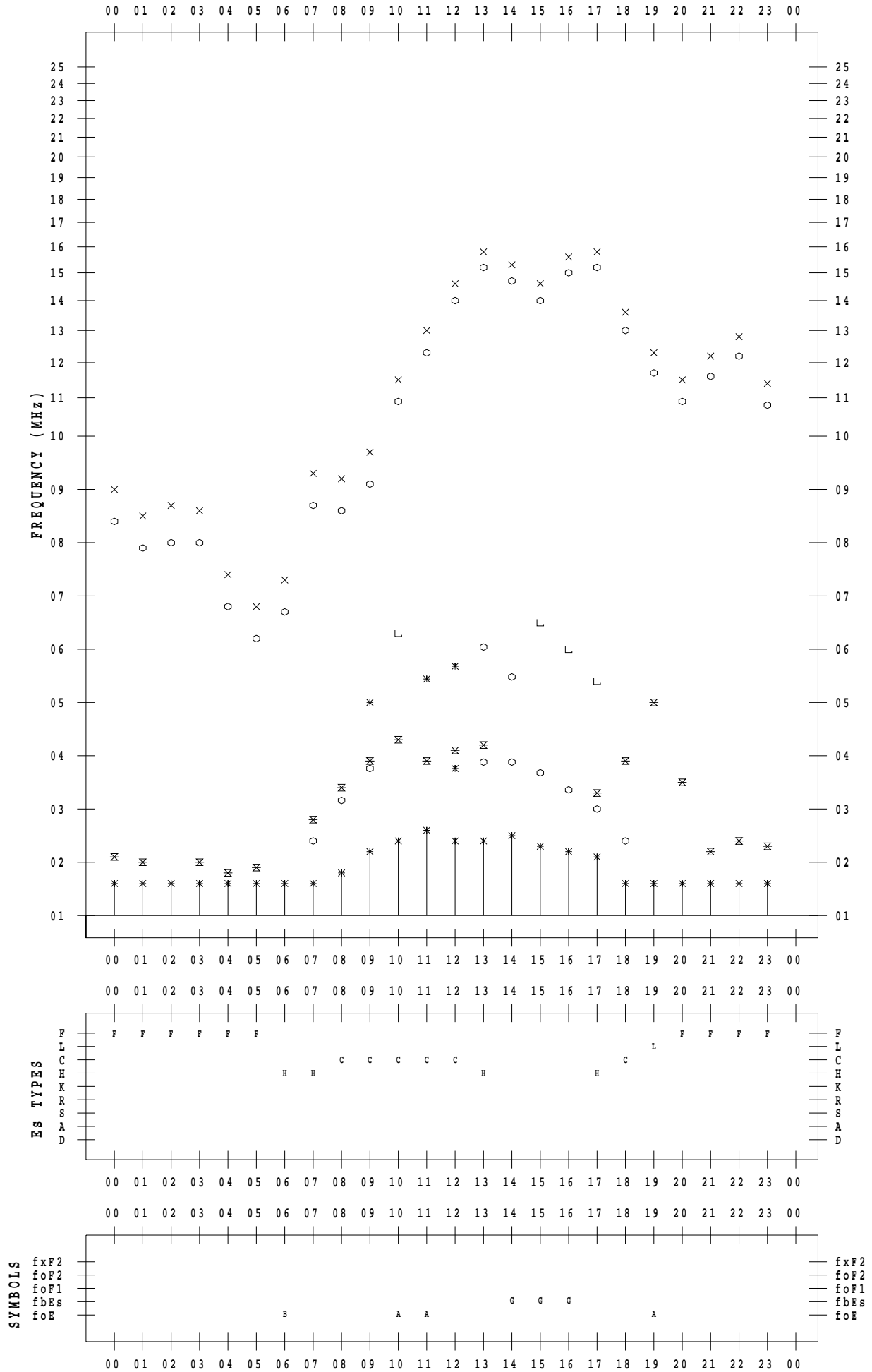
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 23

135 ° E MEAN TIME



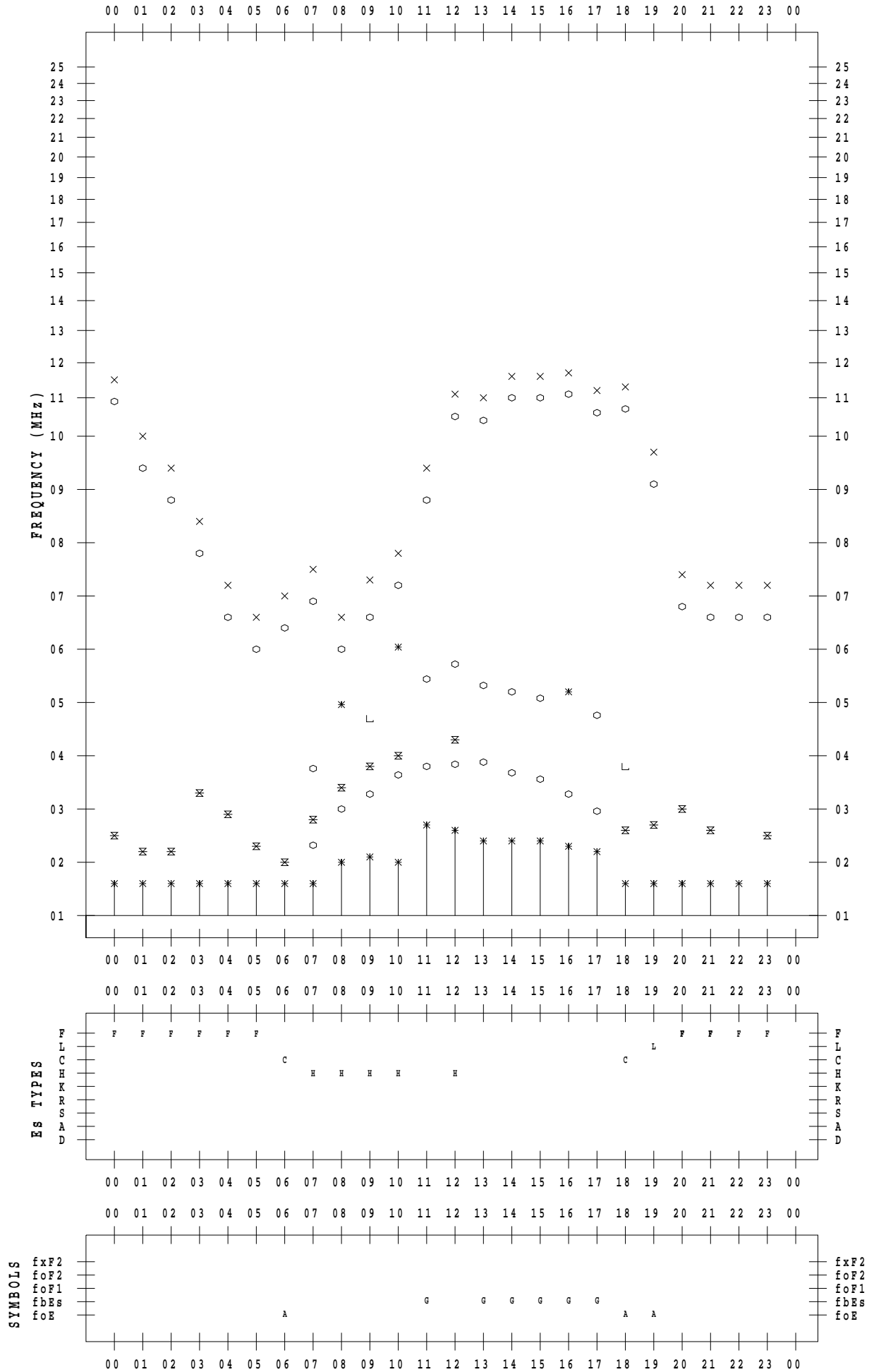
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 4/24

135 ° E MEAN TIME



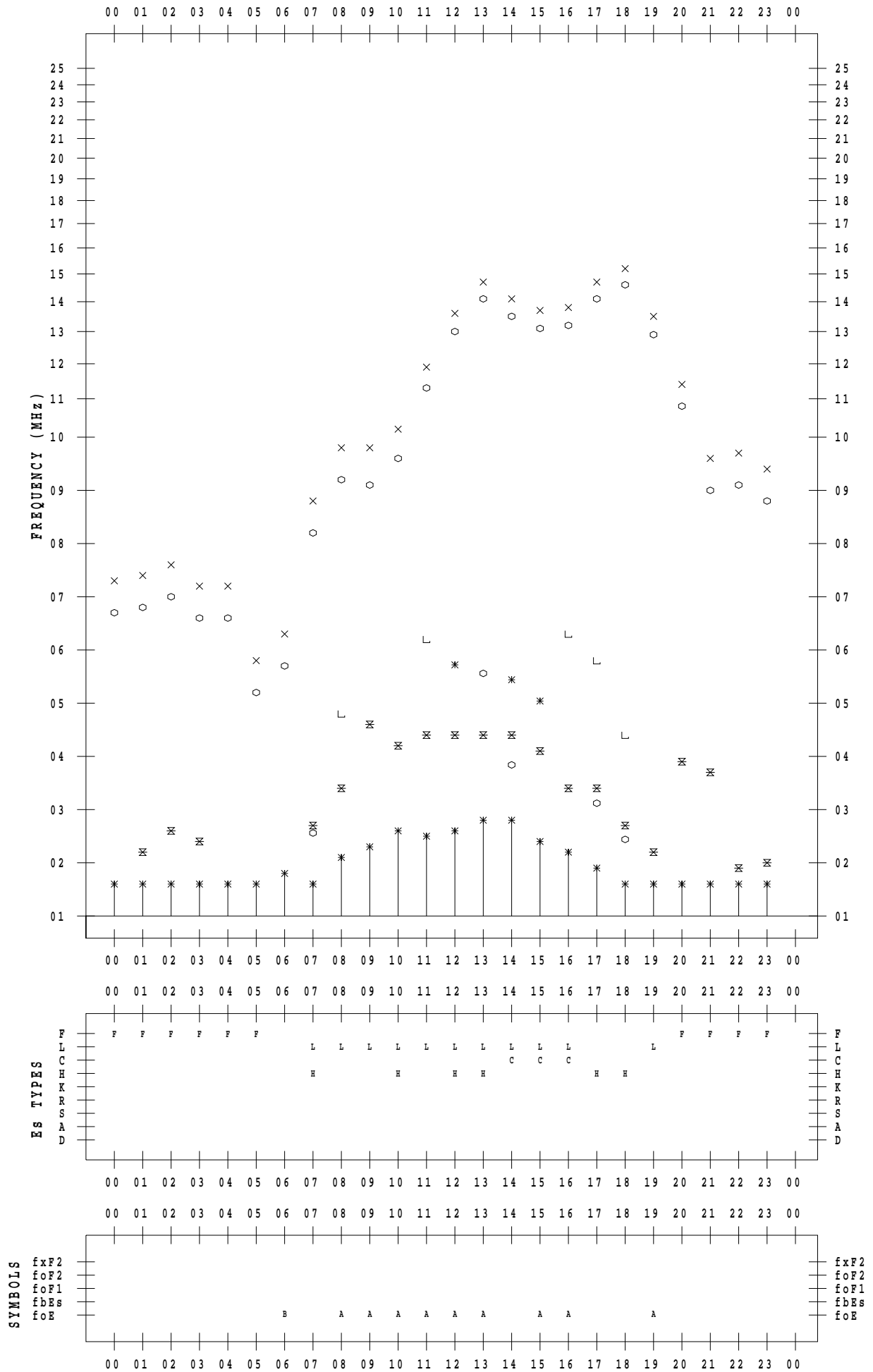
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 25

135 ° E MEAN TIME



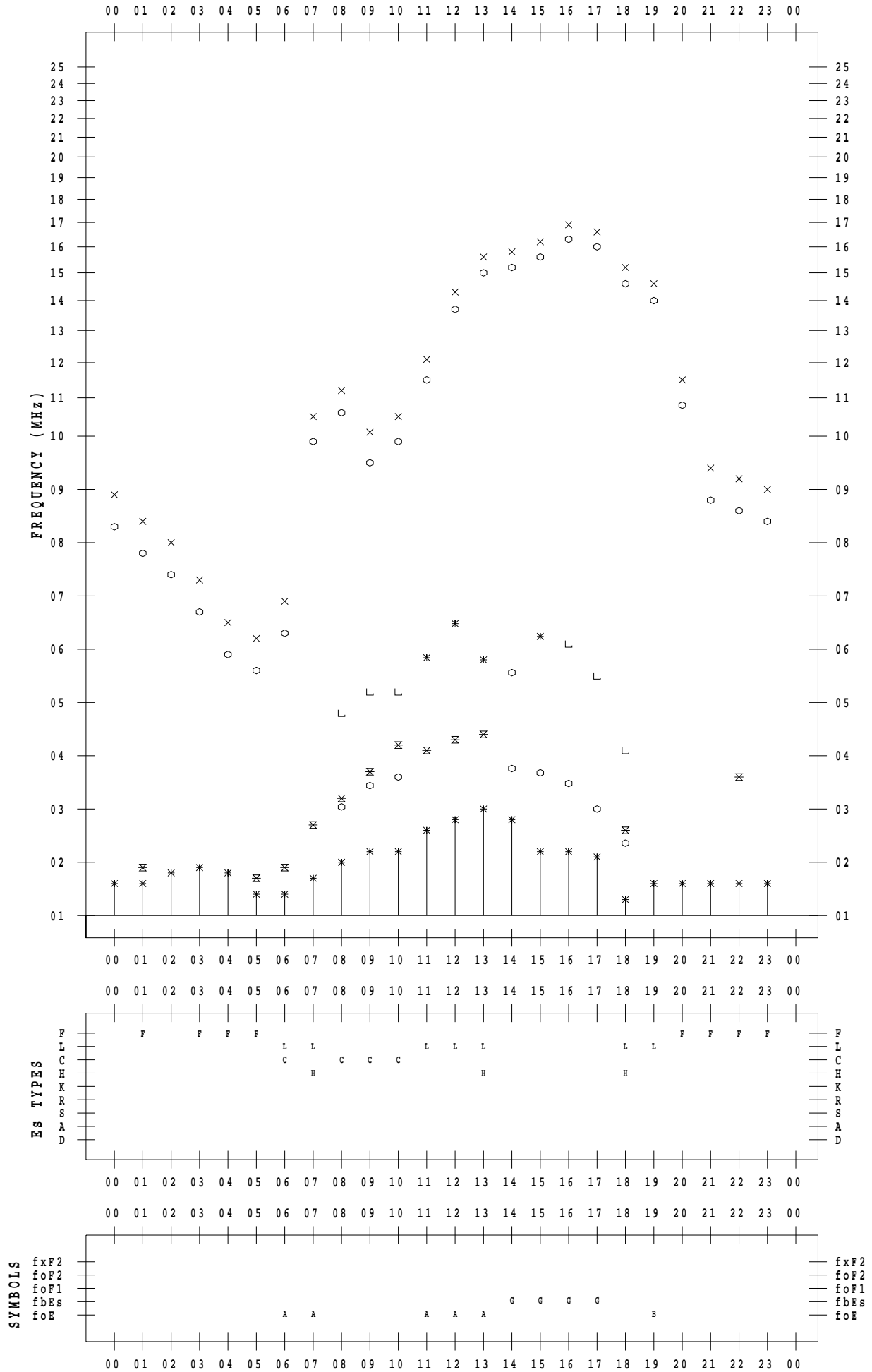
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 4/26

135 ° E MEAN TIME



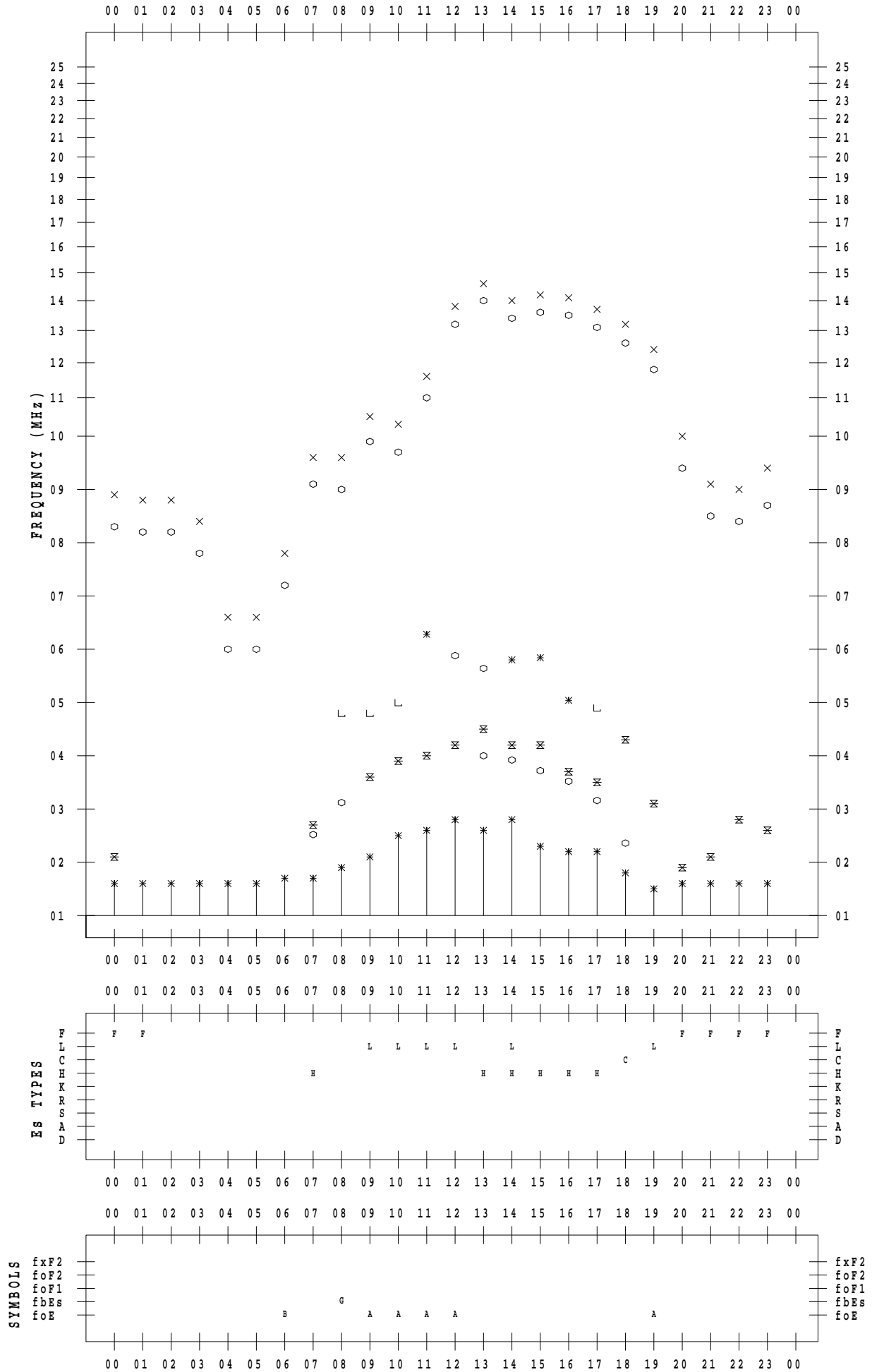
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 27

135 ° E MEAN TIME



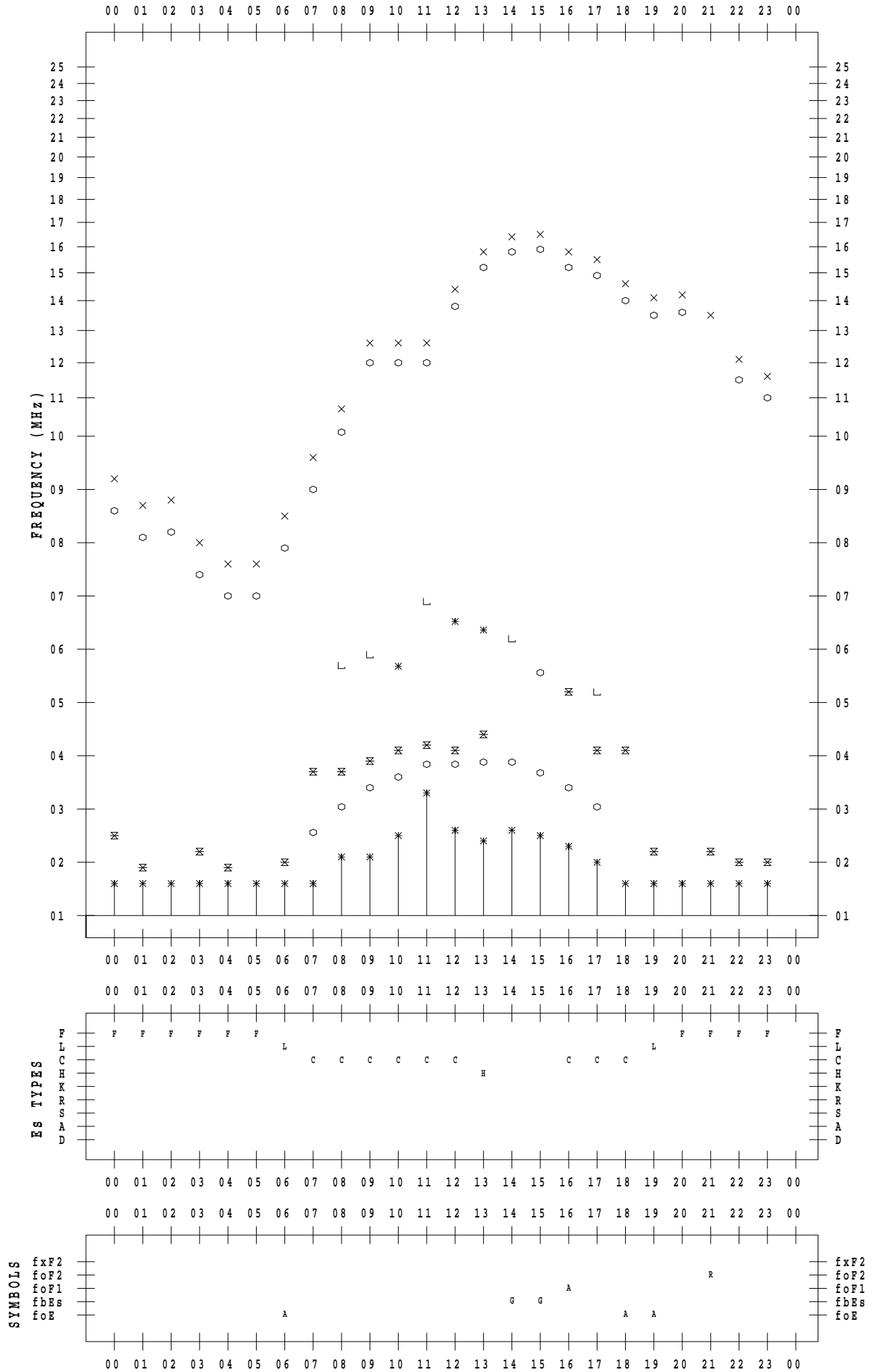
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 28

135 ° E MEAN TIME



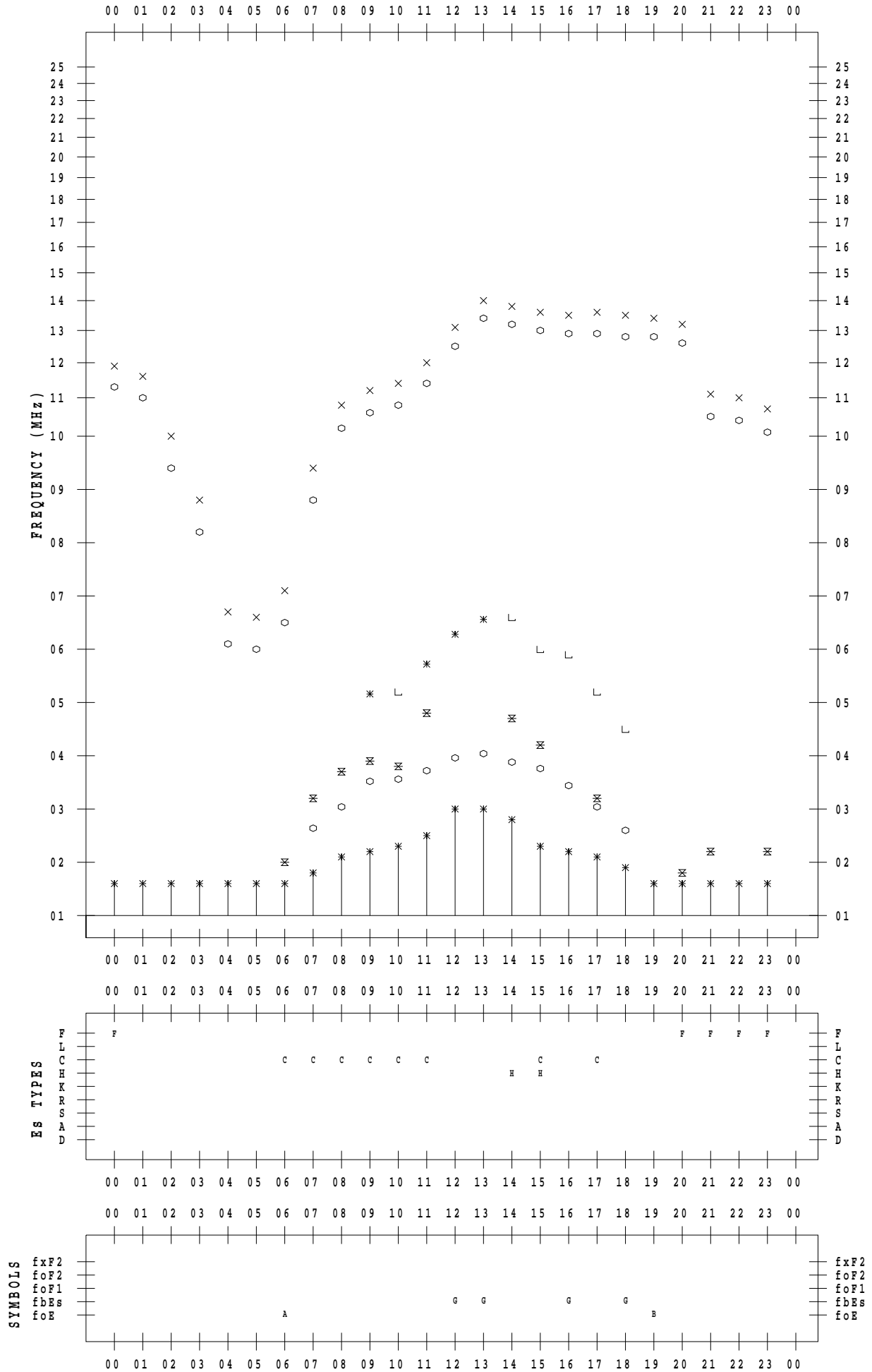
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 29

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 4 / 30

135 ° E MEAN TIME

