

IONOSPHERIC DATA IN JAPAN

FOR February 2023

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« 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 obtained at the following stations under the National Institute of Information

and Communications Technology, Japan.

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

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

IONOSPHERE

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

1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

- A Impossible measurement because of the presence of a lower thin layer, for example Es (for $foF2$).
- C Impossible measurement because of any failure in observation.
- G Impossible automatic scaling because of very small ionization density of the layer (for fEs).
- N Impossible automatic scaling because of complex echoes.
- Blank No digital record because of problems occurring in the automatic data processing system, but existence of film record.

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

(ii) Qualifying Letters

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

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

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

HOURLY VALUES OF fof2 AT Wakkanai

FEB. 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	49	49	39	33	41	45	44	61	89	92	98	112	104	112	101	89	67	63	60	49	41	44	45	40
2	44	43	44	47	41	42	42	67	95	109	115	103	104	112	103	84	71	66	59	53	49	50	50	56
3	53	49	49	48	46	50	42	66	90	99	101	100	111	109	103	96	79	64	48	43	A	40	39	38
4	46	41	40	41	42	42	46	68	89	102	115	120	121	118	122	104	85	81	63	43	43	40	39	41
5	42	43	43	45	41	38	34	65	87	99	100	123	111	100	97	103	90	68	61	52	43	43	44	43
6	43	44	43	40	N 39	39	37	61	84	97	109	111	103	104	107	95	79	82	77	61	49	50	51	49
7	51	45	47	47	49	49	40	63	98	92	101	116	119	113	107	101	98	92	70	57	57	57	53	58
8	61	50	43	45	41	47	36	74	119	118	114	118	113	112	115	107	101	87	65	43	45	49	42	42
9	48	44	49	41	42	37	42	66	97	108	127	130	124	115	109	105	99	96	69	53	57	56	53	49
10	43	44	48	48	42	35	25	69	99	127	124	121	119	116	119	109	99	93	65	60	60	53	50	44
11	44	49	51	54	44	33	31	63	92	96	114	111	114	114	113	100	91	93	66	50	39	41	48	49
12	51	44	46	50	50	44	44	67	97	104	126	123	110	106	103	96	89	78	65	54	48	43	42	42
13	43	41	43	43	42	41	39	72	91	103	111	110	115	114	108	94	98	94	89	67	58	51	51	51
14	53	54	54	53	52	44	43	66	99	106	112	113	115	112	108	99	95	84	73	65	49	49	52	51
15	53	55	54	52	54	51	51	71	93	117	106	114	118	120	113	109	104	103	87	79	59	61	57	52
16	53	51	51	45	44	45	53	86	81	121	123	136	137	125	117	110	101	101	97	73	65	55	49	53
17	45	38	37	38	32	32	32	63	91	109	129	152	118	118	103	101	87	84	67	55	50	47	50	43
18	42	40	41	42	42	39	43	67	87	99	101	111	113	113	106	101	96	87	64	54	49	39	39	41
19	41	41	44	43	45	34	41	75	93	105	111	112	110	119	114	103	98	87	60	54	50	45	40	42
20	41	41	43	45	46	41	44	74	100	111	107	103	113	116	106	105	102	84	69	53	49	44	38	41
21	39	39	40	37	37	37	41	71	95	93	111	98	108	120	116	106	91	88	81	56	41	44	43	49
22	52	49	30	32	32	31	37	85	106	108	112	116	113	118	109	96	93	84	71	A	A	37	38	39
23	39	38	36	38	37	38	45	69	93	113	113	129	115	119	107	109	101	89	66	47	42	42	43	50
24	45	45	42	42	43	44	51	75	80	121	107	127	123	119	109	99	93	80	79	62	53	57	57	60
25	61	62	64	61	63	65	72	105	105	97	114	116	109	114	113	98	99	94	76	53	51	49	43	A
26	43	43	39	35	33	33	42	75	92	119	103	109	111	112	110	109	95	97	81	59	50	43	41	44
27	47	45	43	44	43	41	41	69	91	82	119	117	99	110	123	111	107	101	97	93	78	65	76	63
28	64	85	33	37	31	34	34	41	41	41	44	46	59	59	68	66	66	60	55	53	47	47	51	47
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	26	28	28	27
MED	46	44	43	44	42	41	42	68	92	104	112	115	113	114	108	101	95	87	68	54	49	47	46	47
U Q	52	49	48	47	45	44	44	74	97	112	115	122	118	118	113	106	99	93	78	61	57	52	51	51
L Q	43	41	40	39	40	36	37	65	89	97	104	110	109	112	104	96	88	80	63	52	45	43	41	42

HOURLY VALUES OF fEs AT Wakkanai

FEB. 2023

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	29	G	G	G	G	G	G	28	30	30	34	45	50	35	32	26	G	G	G	G	G	G	G	G		
2	G	G	G	G	G	G	G	11	28	29	32	33	33	32	30	27	40	G	G	G		27	G	G	G	
3	G	G	G	G	G	G	G	160	28	50	53	60	34	48	35	44	30	40	30	35	36	33		G	G	
4	G	G	G	G	G	G	G	48	G	52	37	32	34	32	36	34	46	57	29	34	28	26	24		G	
5	G	G	G	26	32	28	31	39	60	31	31	34	34	55	30	34	33	11	33	48	32	35	33	38		
6	32	28	G	28	27	28	G	G	37	34	54	34	34	34	32	29	G	G	G	G	G		31	G	32	
7	35	32	G	G	G	G	G	33	24	34	33	34	34	32	35	40	32	11	11		G		G	G	28	
8	G	G	G	G	G	G	G	G	27	54	69	78	34	33	40	29	24	G	G	G	G	G	G		29	
9	32	32	G	G	G	G	G	31	31	36	106	35	35	35	40	29	25	G		G	G	G	G		G	
10	G	G	G	G	G	G	G	G	35	39	46	35	G	61	39	38	26	30	G	G		34	33	31	26	
11	G	G	G	24	G	G	24	31	58	61	36	35	35	35	33	30	24	G	41		24	G	G		40	
12	32	38	29	G	G	G	G	G	27	32	34	35	35	35	40	29	30	28	24	29		G	G	G	G	
13	G	G	G	26	G	G		47	27	31	33	34	36	34	34	29	24	32	43	33					32	
14	G	G	28	G	G	G	G	G	26	30	33	34	34	35	34	30	24	G	G	G	G		28	27	G	
15	G	G	G	G	G	G	G	48	32	31	45	35	35	35	34	30	24	G	61		G	G	G			
16	G	G	G	G	G	G	G	G	25	29	32	60	51	36	43	37	38	32	35	27		G	G	G	G	
17	G	G	G	G	G	G	24	30	27	32	32	44	34	45	39	36	32	24	G	G	G		27	G	33	
18	37	32	G	G	G	G	G	G	28	53	33	38	39	35	33	40	35	20	48	39	26		24		G	
19	G	27	G	G	G	G	G	48	34	39	39	39	59	40	39	30	53	60	46		G	G	G	G	G	
20	G	G	G	G	G	G	G	28	35	39	33	41	35	39	40	38	79	29	11		G	G	G	G	G	
21	G	G	G	G	G	G	G	48	34	38	38	38	36	35	39	35	32	112		G	G	G	G	G	G	
22	G	G	G	G	G	G	G	G	34	39	39	38	48	47	49	38	40	48	11	60	92		G	G	G	
23	25	G	G	G	G	G	G	49	34	37	39	39	41	37	45	46	35	N	26		G	G	G	G	G	
24	G	G	G	G	G	G	G	50	34	52	47	56	55	40	40	36	32	29	28	50	34	33		G		
25	G	G	24	25	G	G	G	G	36	38	39	46	45	38	34	38	40	59	27	22		G	G	G	60	
26	25	28	G	G	27	G	G	31	35	41	53	39	34	37	38	35	36	27	G	11		G	G	26	G	
27	23	G	G	G	G	G	G	23	34	38	38	34	34	39	32	37	33	G	G	G		G	G	G	G	
28	G	25	31	28	25	27	25	34	37	35	34	33	32	32	32	29	33	G	26	G	G	G	G	G	G	
29																										
30																										
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	28	28	28	28	28	28	27	28	28	28	28	28	28	28	28	28	28	27	28	28	28	28	28	28	26	
MED	G	G	G	G	G	G	G	30	33	38	38	36	35	35	36	34	32	24	18	G	G	G	G	G		
U Q	25	26	G	G	G	G	G	47	35	40	45	42	40	39	40	38	37	32	31	31	27	26	G	29		
L Q	G	G	G	G	G	G	G	G	27	31	33	34	34	34	34	33	29	24	G	G	G	G	G	G		

HOURLY VALUES OF fmin AT Wakkanai

FEB. 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	14	14	14	14	14	14	15	17	16	18	20	20	15	17	15	22	14	15	16	14	15	14	14
2	14	15	17	16	16	14	14	14	15	16	21	22	17	22	13	16	15	15	14	14	15	16	14	14
3	14	15	14	14	14	15	15	15	15	16	16	18	17	21	18	15	16	15	15	15	15	16	16	16
4	15	14	14	14	14	14	14	14	15	29	34	22	27	17	19	16	15	14	15	17	15	15	16	15
5	15	15	14	15	14	14	15	14	14	16	23	17	24	18	17	15	15	15	15	16	15	17	16	15
6	16	16	15	14	15	14	14	20	14	17	16	18	18	17	17	15	15	14	14	14	14	16	14	16
7	15	16	14	15	15	14	14	17	15	15	17	17	17	17	15	15	16	15	14	15	15	14	15	15
8	15	14	15	14	14	14	14	15	15	15	16	17	18	17	15	15	16	15	16	16	14	14	14	16
9	15	16	16	16	16	14	14	15	15	13	15	15	17	18	15	16	16	16	16	16	14	15	15	16
10	16	16	14	15	14	15	14	20	15	15	15	15	38	17	15	15	15	15	14	14	15	15	15	16
11	16	15	16	17	15	16	15	15	15	19	17	17	17	16	17	17	15	17	17	16	16	15	14	15
12	16	16	16	15	15	14	14	18	15	17	17	17	16	18	15	17	16	15	16	15	14	16	14	14
13	14	16	14	17	15	14		14	15	16	23	17	17	17	17	17	16	16	15	16	16	14	15	16
14	14	16	16	16	17	14	16	15	15	16	17	17	16	17	17	15	15	17	14	15	16	16	16	15
15	15	14	14	14	16	14	14	21	17	17	16	17	18	17	18	17	16	17	14	16	16	15	14	16
16	14	15	15	14	14	14	16	21	15	17	18	17	15	17	15	13	13	16	15	15	14	17	17	16
17	16	14	14	17	15	15	15	14	15	15	15	14	13	15	14	12	13	17	16	17	18	15	15	16
18	16	16	15	15	15	14	14	15	15	16	17	19	16	16	16	15	13	18	16	16	16	15	16	15
19	16	16	14	16	14	15	14	15	16	15	15	14	15	17	15	17	14	18	15	14	14	14	14	14
20	14	14	14	16	17	14	16	15	16	14	15	17	16	15	15	14	17	15	14	15	14	14	14	14
21	14	15	14	14	15	14	14	14	15	14	15	15	15	18	13	16	16	97	14	15	14	15	15	15
22	14	14	16	16	14	14	14	14	14	15	14	15	17	17	15	14	15	16	14	15	12	14	15	15
23	16	15	14	14	16	14	17	14	16	15	15	15	15	17	16	14	13	16	16	14	15	14	14	14
24	14	15	14	14	14	16	17	16	15	14	15	15	15	15	15	15	16	16	15	15	16	16	16	16
25	16	16	15	16	16	16	14	17	15	15	15	16	18	15	16	13	15	16	14	17	15	14	15	16
26	15	16	16	16	16	15	15	15	15	15	15	15	15	15	15	16	17	16	16	16	14	14	15	17
27	16	15	16	16	14	14	14	15	16	17	18	17	16	15	15	15	16	16	14	14	16	14	14	14
28	15	16	15	15	17	15	15	16	15	15	17	15	17	17	15	16	17	15	16	16	16	15	14	15
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	15	15	14	15	15	14	14	15	15	16	16	17	17	17	15	15	16	16	15	15	15	15	15	15
U Q	16	16	16	16	16	15	15	16	15	16	17	17	18	17	17	16	16	16	16	16	16	16	15	16
L Q	14	14	14	14	14	14	14	14	15	15	15	15	15	15	15	15	15	15	14	15	14	14	14	14

HOURLY VALUES OF fof2 AT Kokubunji

FEB. 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	40	45	39	38	37	36	36	60	88	117	129	107	112	109	113	107	85	75	57	65	56	43	39	45	
2	44	36	43	39	35	33	35	69	85	102	115	112	119	106	108	97	81	65	62	67	44	A	A	42	
3	40	39	40	41	41	41	41	73	94	89	103	123	112	102	99	99	91	80	55	54	40	40	41	36	
4	38	38	39	40	39	40	45	80	93	87	122	133	137	121	121	129	114	79	67	68	47	43	43	40	
5	41	41	42	44	37	32	32	65	92	103	114	111	103	112	99	101	93	73	60	57	56	50	49	48	
6	46	46	49	44	42	37	39	72	92	102	115	103	103	110	103	97	84	73	76	77	59	54	51	54	
7	43	41	41	42	40	39	41	72	86	108	101	110	123	111	106	101	88	90	75	63	59	63	66	57	
8	55	42	35	35	36	35	47	65	100	113	114	117	112	118	114	107	99	91	78	61	47	53	52	45	
9	44	49	44	37	34	35	38	80	91	107	115	121	124	122	122	109	100	95	83	71	59	63	60	53	
10	54	49	43	41	39	35	39	82	111	121	120	117	134	140	140	130	116	101	91	73	61	59	50	51	
11	49	46	50	49	39	27	33	80	126	125	126	132	131	129	125	128	114	111	92	81	57	52	51	53	
12	51	43	37	A	35	34	37	83	103	119	121	126	125	123	113	109	102	101	96	74	64	55	50	49	
13	49	41	37	38	36	34	39	77	98	115	106	107	109	107	107	113	101	92	89	85	59	58	54	50	
14	55	51	50	51	41	37	39	76	91	98	107	110	122	115	119	111	107	99	89	75	65	59	56	51	
15	50	50	47	45	43	44	46	83	95	104	115	115	116	120	124	111	113	109	108	92	66	61	60	56	
16	54	54	54	48	49	46	55	93	99	128	131	128	117	123	124	116	104	100	105	103	72	70	65	57	
17	55	39	39	49	A	31	33	82	113	139	150	153	150	135	124	113	107	90	78	67	61	55	52	52	
18	54	48	45	43	40	37	40	79	109	109	119	115	115	101	116	113	109	90	80	66	58	45	45	44	
19	48	45	49	50	40	31	31	76	95	106	101	131	126	115	121	119	100	93	69	57	62	55	43	39	
20	41	42	40	43	49	33	36	68	99	106	103	118	120	107	110	103	103	99	81	55	55	51	40	40	
21	41	41	39	42	40	40	43	77	89	105	125	124	129	111	117	120	111	98	74	67	62	56	52	55	
22	59	57	45	27	31	33	38	81	105	126	132	120	121	125	118	110	105	87	79	58	50	42	41	41	
23	39	40	40	39	39	34	42	76	97	113	123	125	129	136	124	101	110	95	72	41	38	40	43	45	
24	45	A	38	39	39	39	43	91	110	118	132	123	139	136	133	129	99	88	75	68	54	41	39	40	
25	41	39	41	43	42	37	41	74	109	118	115	119	118	116	125	117	104	97	83	67	50	43	45	41	
26	39	41	39	38	39	39	42	84	100	112	118	130	130	122	125	113	116	108	95	A	52	54	A	48	
27	46	45	45	48	44	36	40	66	100	131	116	102	101	111	139	119	99	95	114	103	92	63	73	65	
28	63	69	55	59	59	61	59	57	69	55	89	95	94	102	92	86	82	86	77	73	A	49	53	52	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	27	28	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	26	28
MED	46	43	42	42	39	36	40	76	98	110	116	118	120	116	118	111	102	92	78	67	58	54	50	48	
U Q	54	49	46	48	42	39	42	81	104	118	124	125	129	123	124	118	109	99	90	75	62	59	54	53	
L Q	41	41	39	39	37	33	36	70	91	103	110	110	112	109	109	102	96	86	73	61	50	43	43	41	

HOURLY VALUES OF fEs AT Kokubunji

FEB. 2023

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	23	27	G	G	G	G	G	26	45	35	46	37	44	35	28	G	G	G	G	G	G	G	G
2	G	32	G	G	G	G	G	G	24	29	39	37	37	35	33	40	26	G	40	25	30	33	32	32
3	G	G	G	G	G	G	G	G	26	60	57	41	49	49	50	50	115	G	59	G	31	27		G
4	G	G	G	G	G	G	G	G	26	55	42	53	54	63	89	53	38	62	41	40	31	24	G	G
5	32	G	G	G	G	G	G	G	G	55	G	41	40	G	47	47	47	41	G	G	G	G	G	G
6	G	29	33	G	G	G	G	G	27	108	38	38	39	46	35	40	35	34	56	29	G	G	G	G
7	G	G	G	G	G	G	G	G	26	31	33	G	34	37	35	39	49	34	33	37	48	31	G	G
8	G	G	G	G	G	G	G	47	G	36	38	48	G	40	36	38	28	G	40	33	24	G	G	G
9	G	G	G	G	G	G	G	47	33	31	40	38	G	54	G	33	34	G	G	G	G	G	G	G
10	G	G	G	G	G	G	G	48	31	52	40	39	G	G	42	31	31	G	G	G	G	24	G	G
11	G	G	G	G	G	G	G	G	31	41	36	34	39	G	40	38	G	G	32	31	29	24	G	G
12	G	29	28	33	29	30	G	G	27	30	37	39	31	35	55	38	29	G	24	36	G	G	G	G
13	G	G	G	G	G	G	G	G	26	31	G	G	37	38	38	35	26	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	47	26	G	G	G	36	64	63	46	37	G	31	G	G	G	G	G
15	G	G	G	G	G	G	G	G	28	29	47	37	G	41	40	41	35	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	32	28	G	41	54	47	37	39	34	G	G	G	G	G	G	G
17	G	G	G	G	24	G	G	G	28	G	G	G	52	47	32	34	G	G	G	G	G	G	G	G
18	G	G	G	G	G	23	G	47	G	G	G	G	G	G	40	51	41	G	G	G	G	G	G	G
19	26	G	G	G	G	G	G	G	G	G	59	36	G	G	G	53	57	G	33	24	G	G	G	G
20	G	G	G	G	G	G	G	G	G	G	55	G	G	G	G	33	36	78	11	G	G	G	G	G
21	G	G	G	G	G	G	G	G	26	G	47	G	37	G	58	60	61	52	G	31	G	G	G	G
22	G	G	G	G	G	G	G	G	G	29	32	G	G	G	32	35	G	21	G	G	G	G	G	G
23	G	59	23	26	G	G	G	G	32	31	G	G	G	50	49	52	42	G	11	G	G	G	G	G
24	G	33	33	G	G	G	G	25	33	37	32	40	G	38	35	32	28	G	25	36	49	24	24	29
25	32	33	G	G	G	G	36	36	54	33	55	G	42	33	34	47	41	45	38	32	29	G	G	G
26	G	G	G	G	G	23	G	G	G	G	45	52	70	50	61	42	57	71	51	81	77	37	56	26
27	G	24	26	G	G	G	G	27	G	G	G	40	40	39	47	43	34	G	25	27	33	G	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	38	35	41	41	39	49	70	44	G	26
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	28	27	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28
MED	G	G	G	G	G	G	G	G	26	30	36	37	36	38	38	40	35	G	25	12	G	G	G	G
U Q	G	24	G	G	G	G	G	26	29	39	43	40	40	47	48	47	41	37	38	32	30	24	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	34	28	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

FEB. 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	15	16	15	15	13	14	14	21	17	14	17	21	29	17	18	15	15	15	16	15	14	16	13	13
2	14	16	14	14	14	14	13	20	15	22	22	39	18	35	33	21	16	21	14	15	15	15	16	16
3	15	13	14	13	18	14	13	22	15	15	17	39	35	21	20	23	17	16	15	16	16	15	15	15
4	20	14	14	14	14	14	13	13	15	30	34	35	21	21	19	15	15	15	15	15	15	16	15	14
5	15	15	13	16	15	14	15	22	15	15	35	26	38	37	18	17	15	14	16	15	15	14	13	14
6	15	16	16	15	15	14	14	22	15	15	35	30	19	20	17	15	16	14	14	15	15	13	17	17
7	13	14	13	14	14	13	13	21	15	16	35	16	28	21	25	16	16	16	14	15	14	15	15	13
8	15	14	13	14	14	13	13	22	30	16	17	17	40	18	17	16	17	15	15	15	16	15	15	14
9	13	14	13	13	17	14	13	23	17	17	17	17	35	18	36	18	14	22	15	16	15	14	15	14
10	14	13	13	14	13	15	14	17	15	15	15	17	47	45	19	16	17	22	14	13	15	15	16	15
11	14	15	14	15	16	15	14	23	17	15	16	24	17	17	17	16	15	14	15	15	15	16	14	15
12	15	15	17	16	15	16	14	23	15	16	15	19	17	17	16	17	16	15	15	13	14	13	13	13
13	14	14	14	13	13	13	13	23	16	16	39	40	30	41	21	15	15	23	14	13	13	14	13	14
14	14	13	14	13	13	31	13	17	15	15	17	15	17	20	16	17	15	14	15	14	17	14	14	15
15	14	14	14	14	14	14	14	23	15	15	17	28	42	18	29	17	17	21	13	14	13	14	15	14
16	14	14	14	15	14	14	29	24	15	16	36	39	16	18	19	16	16	23	14	14	13	15	15	14
17	14		15	13	15	15	14	15	16	15	34	39	18	14	15	15	34	15	14	13	14	17	14	17
18	14	15	14	14	13	16	13	25	15	34	39	40	40	40	39	16	15	15	14	16	13	15	15	15
19	16	15	14	13	13	18	13	24	15	15	37	16	40	15	15	15	15	15	15	15	16	15	14	15
20	15	15	14	15	14	15	14	25	16	16	35	42	42	40	35	16	16	15	14	14	14	14	14	14
21	14	15	14	14	14	14	14	14	15	16	25	40	28	40	19	12	14	15	13	16	16	13	15	15
22	14	14	14		14	14	13	14	15	16	16	39	42	39	40	15	17	15	15	13	13	14	14	14
23	14	15	16	15	14	21	14	16	15	15	17	39	39	40	15	13	13	15	13	14	14	15	14	14
24	13	15	15	15	14	14	14	15	15	15	17	16	16	28	16	14	15	24	15	15	16	16	16	15
25	16	16	15	15	15	15	15	15	16	17	16	42	17	17	15	16	14	14	15	15	15	15	15	14
26	14	13	14	13	14	15	15	14	15	15	19	20	20	18	15	15	13	14	15	14	14	15	15	15
27	15	16	15	15	15	13	15	15	14	16	16	19	33	31	17	16	14	15	15	16	16	15	15	14
28	14	15	14	13	14	13	15	15	15	15	35	43	42	37	30	17	16	14	16	17	16	17	16	16
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	27	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	14	15	14	14	14	14	14	21	15	16	18	29	30	21	18	16	15	15	15	15	15	15	15	14
U Q	15	15	15	15	15	15	14	23	16	16	35	39	40	38	27	17	16	18	15	15	16	15	15	15
L Q	14	14	14	13	14	14	13	15	15	15	17	18	18	18	16	15	15	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Yamagawa

FEB. 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	42	42	38	43	41	38	41	53	81	99	130	117	121	128	117	118	112	103	102	92	98	82	60	51	
2	41	38	38	37	34	34	31	48	83	91	95	106	112	119	103	107	112	99	84	73	61	52	49	49	
3	49	45	42	46	55	46	38	56	91	95	104	129	127	118	119	117	116	113	99	86	85	69	53	50	
4	41	37	35	39	39	36	42	55	85	93	119	152	140	133	140	153	N	113	125	98	85	77	53	50	49
5	43	41	44	45	40	A	31	48	91	102	96	103	115	104	113	108	102	97	67	65	72	62	53	50	
6	45	44	43	45	45	33	34	51	87	92	113	114	109	123	120	114	99	89	88	92	79	61	57	54	
7	45	38	39	41	45	34	34	50	87	102	91	102	127	127	107	109	105	109	99	78	84	90	86	72	
8	57	43	34	36	34	35	40	53	89	110	109	121	122	134	127	130	130	127	123	100	67	67	64	44	
9	46	53	48	33	30	32	27	57	90	95	107	118	128	133	134	125	120	115	104	94	77	73	71	61	
10	56	57	44	35	40	31	32	63	101	117	109	117	137	145	146	144	133	105	103	112	95	91	77	65	
11	55	54	53	50	47	30	33	56	98	121	124	141	143	146	154	139	137	116	117	109	105	76	66	67	
12	51	47	43	41	41	37	37	61	97	120	130	126	116	134	136	140	153	112	98	109	127	103	72	62	
13	54	49	41	41	41	32	31	56	95	110	111	110	111	110	116	119	113	97	101	97	95	94	81	74	
14	64	57	49	49	50	37	34	57	89	104	106	115	123	133	134	145	128	110	165	106	104	N	111	93	70
15	57	53	50	51	44	39	39	61	94	94	110	115	114	120	123	121	125	125	137	120	121	100	92	94	
16	71	67	59	61	47	45	45	78	88	116	117	125	123	131	131	127	106	119	136	139	117	97	74	65	
17	59	35	40	51	31	30	31	50	94	123	149	142	142	138	140	126	116	116	103	101	97	89	87	71	
18	75	67	56	51	46	36	35	58	96	107	119	111	116	112	112	123	104	97	101	95	80	74	69	62	
19	62	54	53	55	47	31	34	52	89	95	108	120	138	126	129	125	123	112	108	92	83	88	81	60	
20	53	51	44	45	49	35	34	51	94	101	112	120	121	123	119	108	99	104	98	84	77	75	55	51	
21	57	54	51	51	46	44	50	67	98	118	133	127	115	129	127	127	122	111	98	90	92	69	70	56	
22	59	55	41	A	35	38	37	58	99	113	129	127	129	129	123	134	118	101	92	85	79	54	41	A	
23	41	42	41	41	A	39	39	63	95	119	129	124	131	149	128	117	120	115	96	65	49	52	51	51	
24	46	34	37	38	A	39	40	68	97	98	120	115	135	141	151	133	121	100	97	84	73	51	41	44	
25	41	41	43	45	41	39	39	60	91	110	119	119	118	119	138	133	118	122	109	107	89	63	53	50	
26	44	39	37	39	39	39	38	71	92	100	117	127	137	139	126	125	134	119	123	97	85	82	67	55	
27	44	42	44	44	47	31	33	58	96	139	102	77	102	122	139	119	105	98	117	127	99	72	86	85	
28	72	75	68	55	54	63	67	83	104	93	105	124	112	121	113	98	99	95	99	97	82	63	65	63	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	27	26	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	
MED	52	46	43	45	42	36	36	57	93	103	112	120	122	128	127	125	117	110	101	94	84	74	66	60	
U Q	58	54	49	51	47	39	39	62	96	116	122	126	133	134	137	133	124	116	113	106	97	89	79	67	
L Q	44	41	39	39	39	32	33	52	89	95	106	114	115	120	118	117	105	99	98	85	77	62	53	50	

HOURLY VALUES OF fmin AT Yamagawa

FEB. 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	16	15	16	15	15	15	14	16	16	14	15	16	17	15	16	17	15	15	15	16	17	15	15	15	
2	15	15	14	15	15	16	18	15	15	15	15	18	16	16	16	17	15	15	15	16	16	15	14	16	
3	15	15	17	15	14	17	14	16	15	17	17	17	21	20	20	17	17	15	16	14	16	16	16	16	
4	16	16	20	15	15	16	15	16	15	15	17	26	27	21	15	18	17	15	15	15	15	15	14	15	
5	15	17	16	15	16	15	16	16	15	17	17	19	36	20	18	16	17	15	15	15	16	15	15	15	
6	15	14	16	16	15	16	15	15	15	17	18	18	18	19	19	18	16	15	16	16	14	15	15	14	
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9	15	16	15	15	15	15	17	15	15	15	16	16	39	22	21	17	15	15	16	15	15	14	14	14	
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29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	15	15	16	15	15	15	15	16	15	15	16	17	19	19	18	17	16	15	15	15	15	15	15	15	
U Q	15	16	16	16	15	16	16	18	16	17	17	19	21	19	19	18	17	15	16	16	15	15	16	16	
L Q	14	15	15	14	14	14	14	15	15	15	15	16	17	17	17	17	15	15	15	14	14	14	14	14	

HOURLY VALUES OF fof2 AT Okinawa

FEB. 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
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2	77	71	61	46	40	31	^N 30	42	98	93	105	115	121	117	119	121	134	125	123	104	99	91	66	65
3	60	45	39	45	53	34	31	44	95	116	132	144	157	160	172	155	181	180	177	58	152	138	118	93
4	80	65	60	57	45	45	41	60	105	129	136	161	159	159	180	174	177	117	164	156	144	144	105	94
5	89	72	69	66	52	^N 31	^A	46	99	109	116	106	123	132	132	131	133	119	113	98	95	101	76	62
6	61	54	57	55	49	39	30	44	94	103	121	138	141	156	166	169	137	141	129	149	132	103	95	82
7	60	42	41	48	47	^N 23	24	52	88	101	111	108	129	140	130	129	131	145	155	156	176	179	169	68
8	110	61	43	43	39	37	44	53	90	114	127	131	143	150	167	184	188	183	114	163	133	122	100	71
9	57	60	47	36	^B 23	^B 24	^B 25	54	97	108	109	127	141	149	155	151	152	149	146	150	135	140	127	95
10	69	69	46	31	37	31	29	58	109	115	122	124	151	157	157	161	169	113	120	168	164	76	126	103
11	85	74	69	59	44	26	^N 30	52	93	121	135	152	148	173	183	187	185	179	121	175	163	143	120	112
12	70	57	45	45	41	35	36	57	104	126	145	145	144	163	185	192	187	176	123	179	173	157	131	121
13	90	78	66	55	46	33	31	51	85	109	131	110	116	125	127	131	126	123	124	130	119	116	153	125
14	101	95	95	66	61	36	31	53	89	115	128	134	140	162	180	162	176	171	170	179	190	111	144	138
15	112	105	103	101	73	47	49	52	91	110	125	122	124	129	132	138	151	160	181	197	205	111	180	180
16	133	119	105	65	63	57	61	111	123	125	151	125	139	137	151	147	147	157	169	185	197	171	130	130
17	89	54	44	50	40	^A	29	43	94	128	144	140	141	142	149	147	138	144	147	153	175	179	^N 160	131
18	112	104	83	67	51	33	35	56	92	117	121	117	121	126	132	136	148	128	128	133	125	128	119	94
19	89	80	64	65	47	32	32	50	93	93	107	145	151	168	152	158	162	168	176	169	160	158	168	138
20	103	87	70	70	53	39	34	51	88	115	122	151	136	138	137	133	113	112	123	105	100	107	96	79
21	75	76	61	61	55	49	57	64	95	121	138	156	157	161	160	177	145	147	149	145	149	134	115	73
22	76	70	44	37	37	39	37	55	95	125	136	163	151	148	153	155	149	123	133	145	108	94	63	52
23	49	49	43	43	40	36	35	56	93	130	130	154	151	158	150	140	140	136	117	99	88	85	79	72
24	63	44	38	38	40	35	37	58	95	113	127	131	145	162	120	161	154	140	136	123	123	95	71	61
25	56	55	57	53	47	49	35	59	91	112	135	134	140	141	162	168	142	139	183	171	159	141	122	102
26	84	60	45	38	39	41	40	71	100	99	127	141	147	150	155	155	164	167	168	165	124	150	124	101
27	57	47	45	51	51	32	30	56	93	149	113	72	101	133	148	135	116	105	126	139	132	94	60	117
28	101	64	77	57	55	67	77	108	121	123	116	140	121	159	124	114	104	116	118	126	105	97	87	81
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	78	64	57	52	46	35	35	54	94	115	127	136	141	150	152	155	148	142	134	150	140	125	118	94
U Q	95	77	69	63	52	41	40	58	98	124	135	145	150	159	164	168	166	167	167	168	163	143	130	119
L Q	60	54	44	44	40	32	30	51	91	109	118	123	126	137	132	135	135	123	123	128	121	99	91	72

HOURLY VALUES OF fEs AT Okinawa

FEB. 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	G	G	G	G	G	G	G	G		31	41	60	84	60	63	48	54	47	61	85	90	59	40	26	27									
2	25	28	G	G	G	G	G	G		48	56	39	48	52	58	56	66	52	35	39	33	30	38	G	27									
3	G	G	G	G	G		G		26	135	158	48	54	49	54	56	46	36	58	G		11	36	32	G	G								
4	G	G	G	G	G		28	24	G		31	34	38	52	51	46	42	35	46	36	G		31	25	57	24	28							
5	G	G	G		26	26	24	33	33	48	52	32	50	52	50	48	42	39	36	28	11		G		25	G	G							
6	G	G	G	G	G		30	25	G		29	36	39	51	56	53	55	62	59	40	28	39	26	34	25	19								
7	G		G	G		G	G		25	36	35	46	50	48	50	47	46	41	35		G	G					11	G						
8	11	G	24	G	G	G	G	G		29	39	42	56	53	62	56	47	42	36	46	11	33	33	25				G						
9	24	G	G	G	B	B	B		25	33	38	56	45	57	56	50	108	42	36		G	G				24		G						
10	G	G	G	G	G	G	G	G		32	59	42	55		G	48	108	54	42	47	39	43	25		G	G	G							
11	G	G	G	G	G	G	G	G		48	38	40	37	48	47	44	44	40	36	39	26		G	G	G	G								
12	G	G		26	24	27		G	G	G		26	38	41	52	44	50	41	44	41	35		G		26	32		G	G	G				
13	G	G	G	G	G	G	G	G		32	37	40	55	47	51	50	52	58	56	43	30	26	26			G	G							
14	G	G	G	G	G	G	G	G		32	38	42	45	52	54	52	48	44	48	42		G	G			28	55		G					
15	G	G	G	G	G	G	G	G		31	38	49	44	44	54	52	51	36	36		G	G			20		G	G						
16	G	G	G	G		11		G	G		30	45	37	49	64	57	64	55	48	106		G	G			G	G	G						
17	G	G	G	G		23	28		G	G		32	38	38	52	47	62	52	45	42	38		G		28	32		G	G	G				
18	G	G	G	G	G	G		G		24	26	37	39	57	55	43	60	46	40	35		G		29		G		G	G					
19	G	G	G	G		11		G	G	G		32	37	38	47	50	50	49	41	50	91		G		11	11		11	11	G				
20	G	G	G		G	G				31	35	38	52	52	58	70	59	53	50	43	32	39	34	24						G				
21	28	G	G	G	G	G	G	G		31	38	111	48	53	54	38	48	45	40		G	G			G	G				31	G			
22	25	G	G		28	26		G	G	G		149	36	40	58	41	38	52	38	38	45	43	42	59		G		24		G	G			
23	G	G	G	G	G		25		G		26	33	37	45	40	48	44	44	41	38	36		G		11		G		27		G	G		
24	G	G	G	G	G		24	28	27	32	40	42	42	44	100	41	40	39	35		G	G			11	31	31	32						
25	G	G	G	G	G	G		G		27	34	38	41	46	51	50	107	50	61	56	40	32	11	27	25	27								
26	G	G	G		31	23	31	29	30	31	35	41	N	49	36	40	36	40	35		G		24		G		40	39	28		G	G		
27	G	G	G	G	G	G		G		26	33	37	40	48	50	50	57	52	52	46	43	30		G	G		G		G	G	G			
28	30	35	33	G	G	G	G	G		29	38	38	38	50	54	59	67	79	39		G	G			20	11		G	G					
29																																		
30																																		
31																																		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
CNT	28	28	28	28	27	27	26	27	28	28	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28		
MED	G	G	G	G	G	G	G	G	32	38	40	50	50	52	52	48	42	38	G	25	11	26	G	G	G	G	G	G	G	G	G			
U Q	G	G	G	G	11	24	G	26	33	39	43	54	52	56	56	54	51	49	41	31	31	33	24	23										
L Q	G	G	G	G	G	G	G	G	31	37	38	45	47	49	45	43	40	36	G	G	G	G	G	G	G	G	G	G	G	G	G	G		

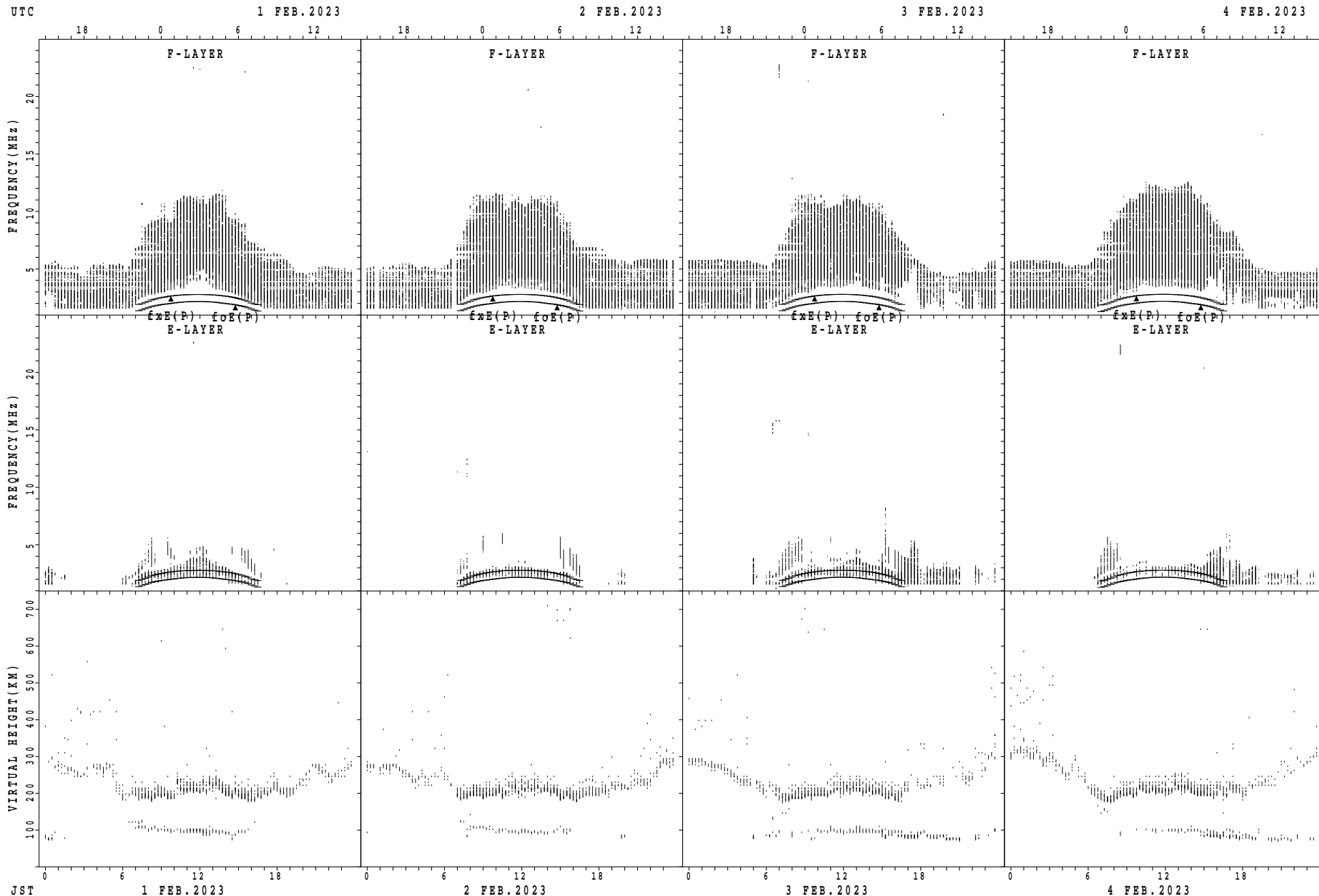
HOURLY VALUES OF fmin AT Okinawa

FEB. 2023

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

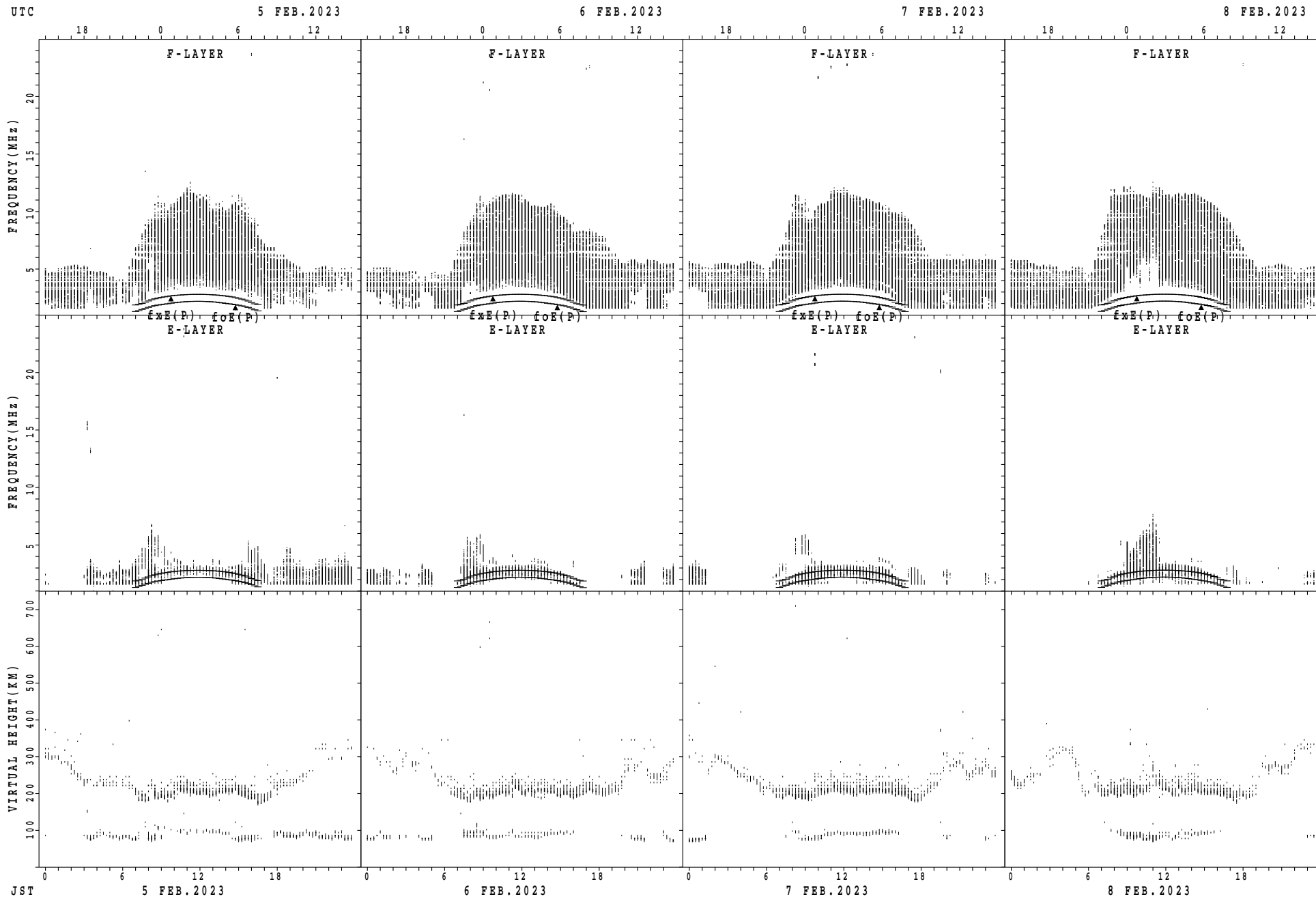
$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
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2	16	16	15	14	14	16	14	14	16	15	15	16	18	17	14	18	15	16	15	15	15	15	16	16
3	14	15	14	15	14	14	15	16	16	13	15	16	16	16	15	17	15	15	18	14	16	16	15	14
4	15	14	14	15	14	15	16	14	15	17	15	18	18	17	17	18	15	14	14	15	15	15	15	16
5	16	16	16	15	16	16	15	16	15	17	16	16	17	18	17	17	16	15	15	15	14	15	16	15
6	14	14	15	14	14	16	15	15	15	16	15	16	17	17	20	19	15	15	15	15	15	15	16	15
7	14	16	15	14	16	15	17	17	15	17	15	17	16	16	20	15	14	16	20	14	16	15	15	15
8	14	17	16	16	15	15	14	15	15	14	15	18	21	15	19	15	16	14	16	16	15	16	16	14
9	15	15	14	16	B	B	B	17	15	17	17	16	39	19	17	19	16	13	21	15	14	14	15	15
10	15	14	14	15	14	14	15	16	16	15	15	17	47	20	20	17	16	15	14	15	15	15	14	14
11	14	14	14	16	14	15	18	15	15	17	19	16	17	21	21	21	18	17	15	15	16	14	14	14
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14	15	15	14	14	14	14	15	17	15	15	17	23	20	19	19	15	17	14	15	16	14	15	15	15
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17	14	15	14	15	15	15	15	15	15	14	14	19	17	16	18	19	15	15	15	15	16	14	15	14
18	16	14	15	14	14	17	15	18	15	15	15	21	19	21	19	17	17	17	15	15	17	15	14	15
19	16	14	14	16	14	14	14	15	14	15	15	18	17	15	14	17	18	15	20	14	14	15	14	14
20	15	14	14	15	15	14	16		15	17	16	17	18	16	17	14	14	13	15	15	15	15	15	14
21	15	14	15	14	14	15	15	17	15	15	17	18	22	32	18	19	15	15	14	14	14	16	16	16
22	15	15	16	15	16	15	14	17	15	17	15	17	17	16	17	17	15	14	15	15	15	15	16	14
23	15	14	14	14	14	16	16	17	16	17	17	16	18	19	18	17	15	15	21	14	16	15	15	15
24	14	14	15	15	15	15	15	15	17	15	16	16	20	17	16	20	15	15	20	14	14	15	16	15
25	15	14	15	15	14	14	15	15	15	15	15	17	17	19	17	16	14	15	15	17	14	15	15	16
26	14	14	15	16	15	15	16	16	15	15	17	15	17	19	18	18	15	17	20	16	15	15	15	15
27	16	15	14	14	15	18	15	15	15	15	15	15	19	19	15	15	14	14	14	15	16	15	17	14
28	15	16	16	15	16	17	15	15	16	17	17	19	19	19	21	16	17	14	14	14	15	14	14	14
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	27	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	15	14	15	15	14	15	15	16	15	15	15	17	18	18	18	17	15	15	15	15	15	15	15	15
U Q	15	15	15	15	15	16	15	17	16	17	17	18	20	19	19	18	16	15	20	15	15	15	16	15
L Q	14	14	14	14	14	14	14	15	15	15	15	16	17	16	17	15	15	14	15	14	14	15	14	14

SUMMARY PLOTS AT Wakkanai



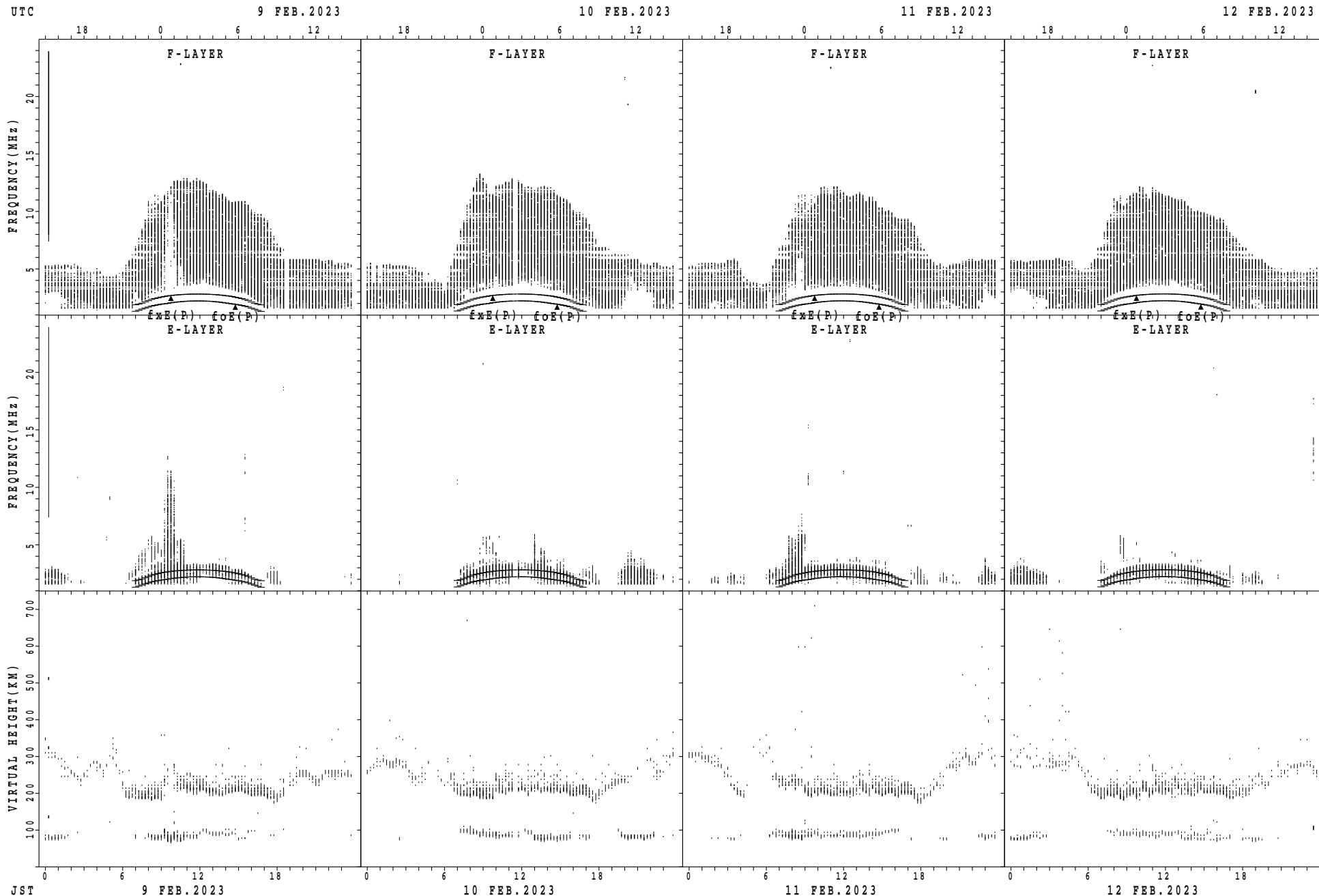
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 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



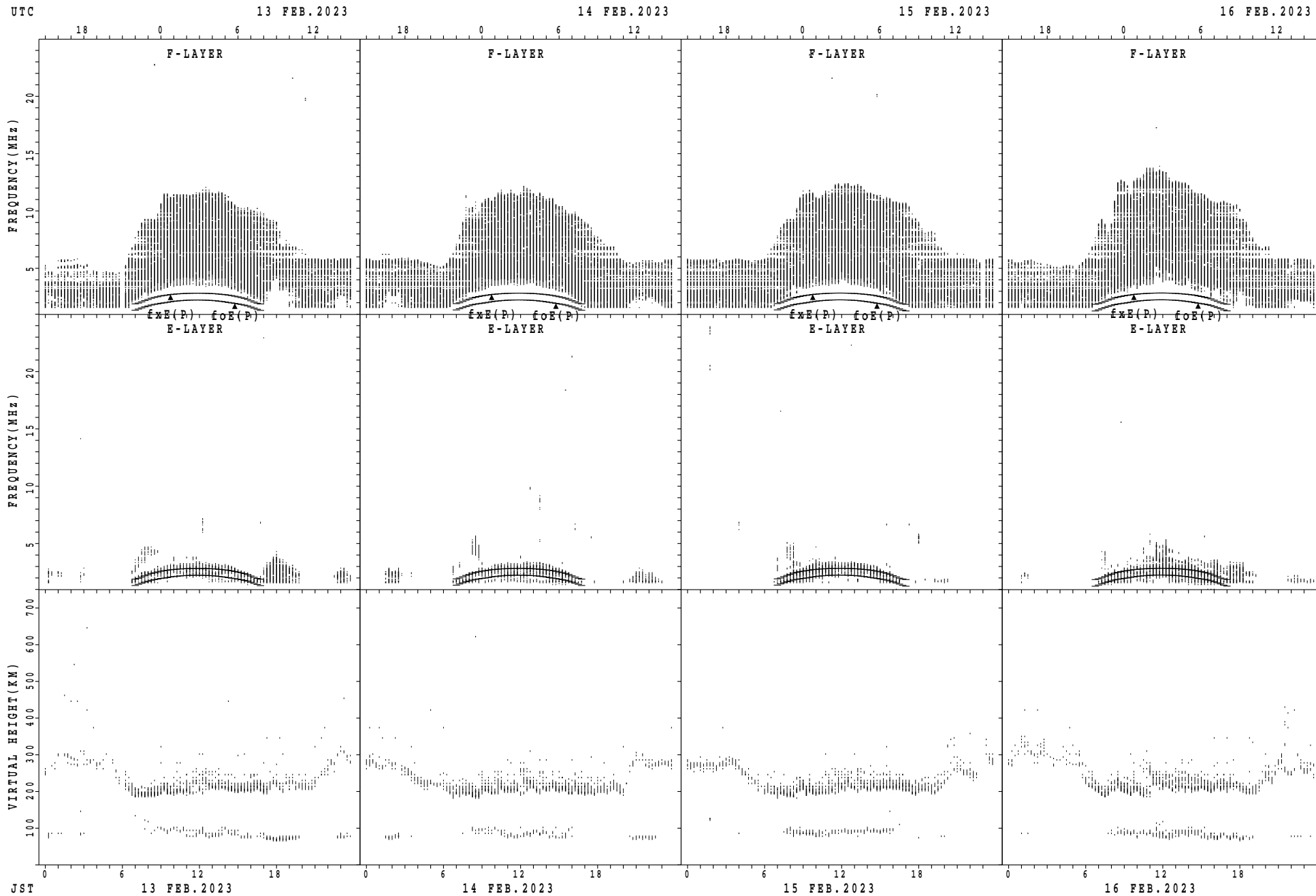
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 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



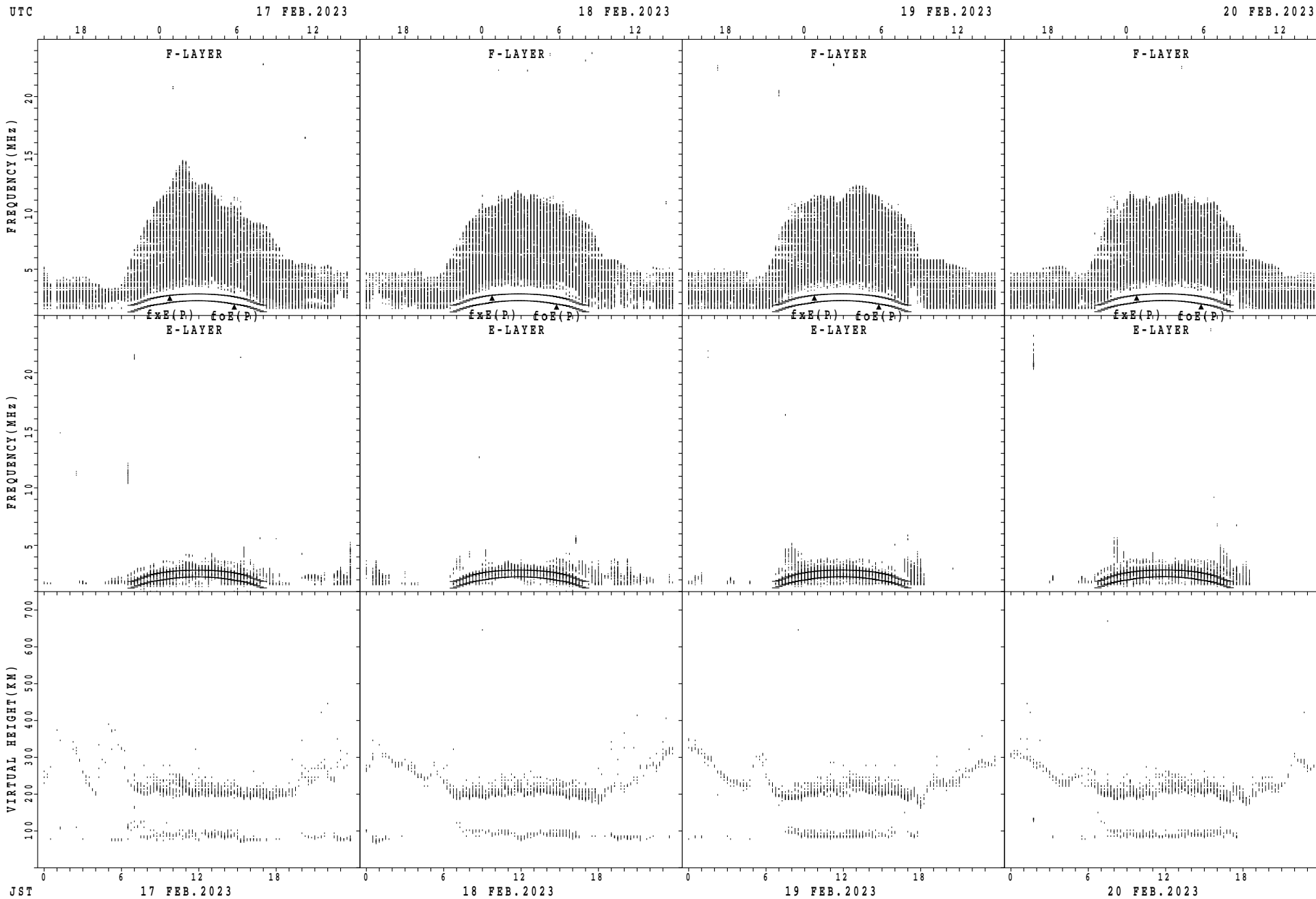
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



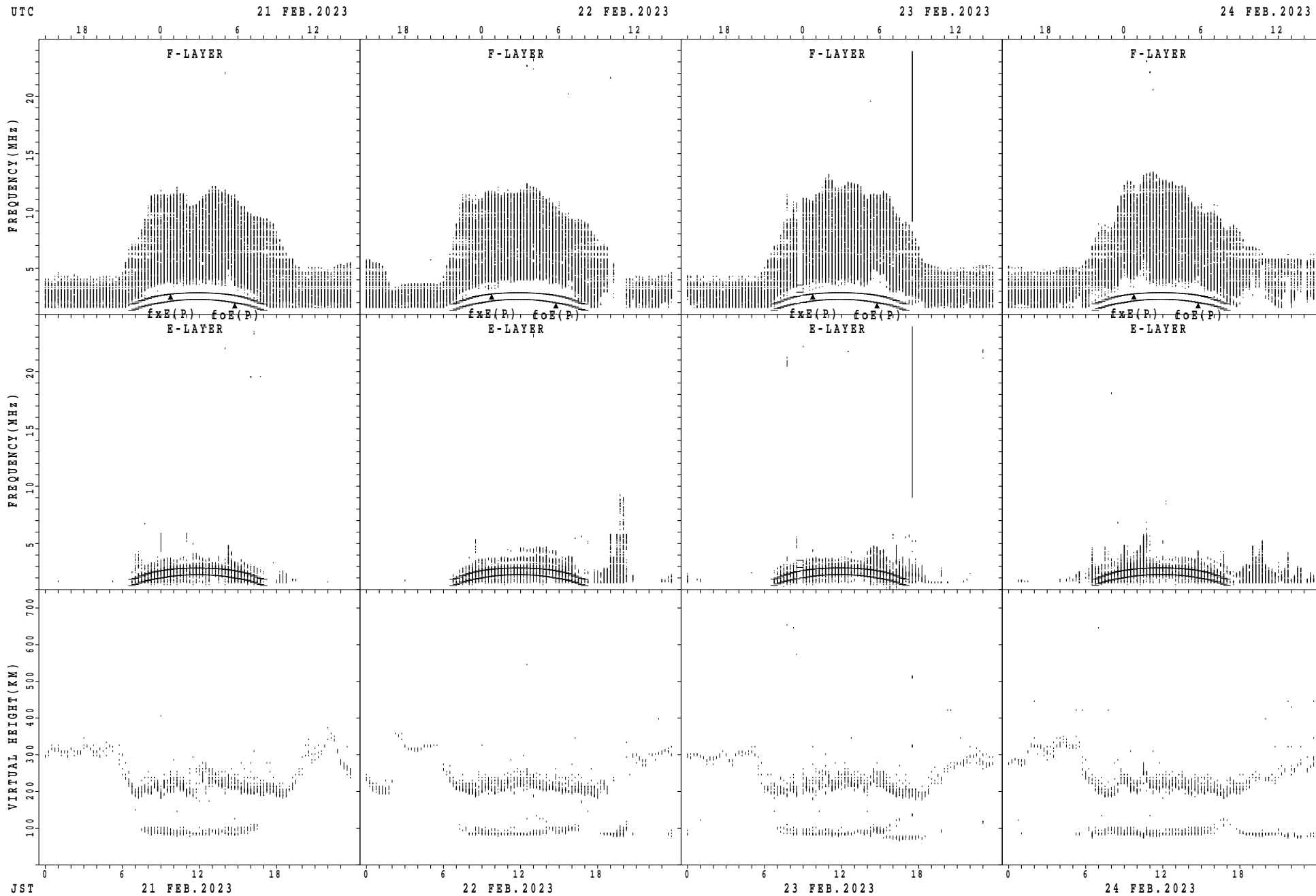
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



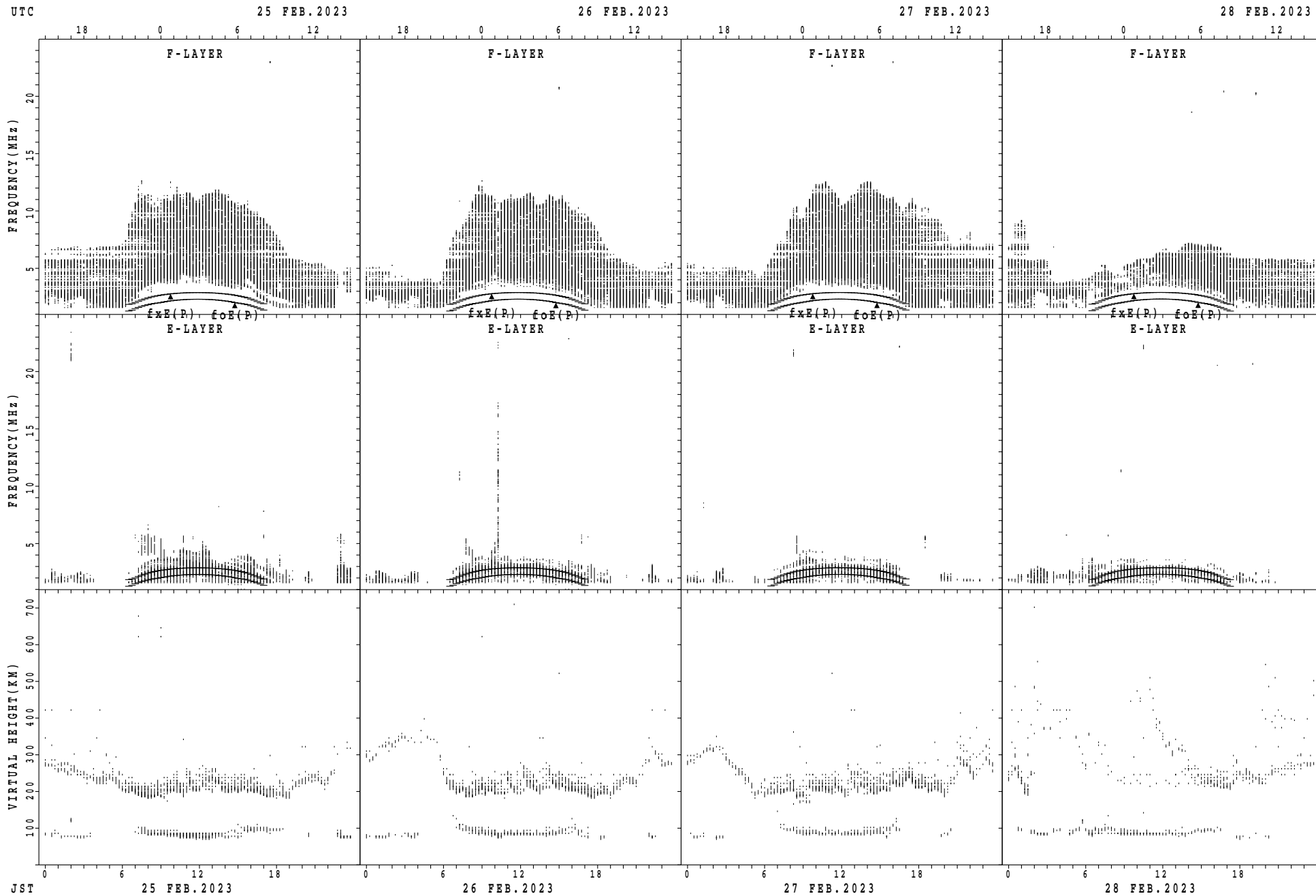
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



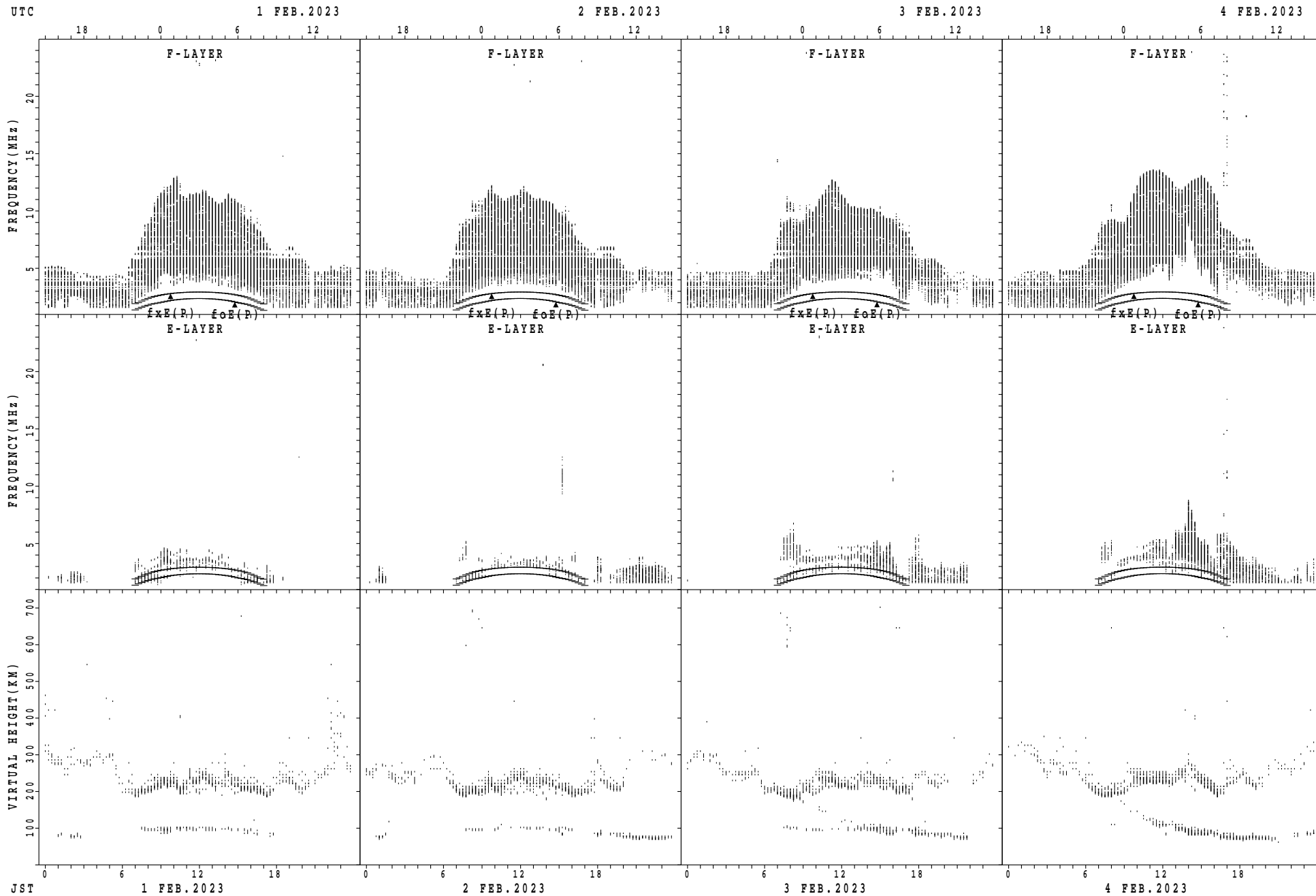
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



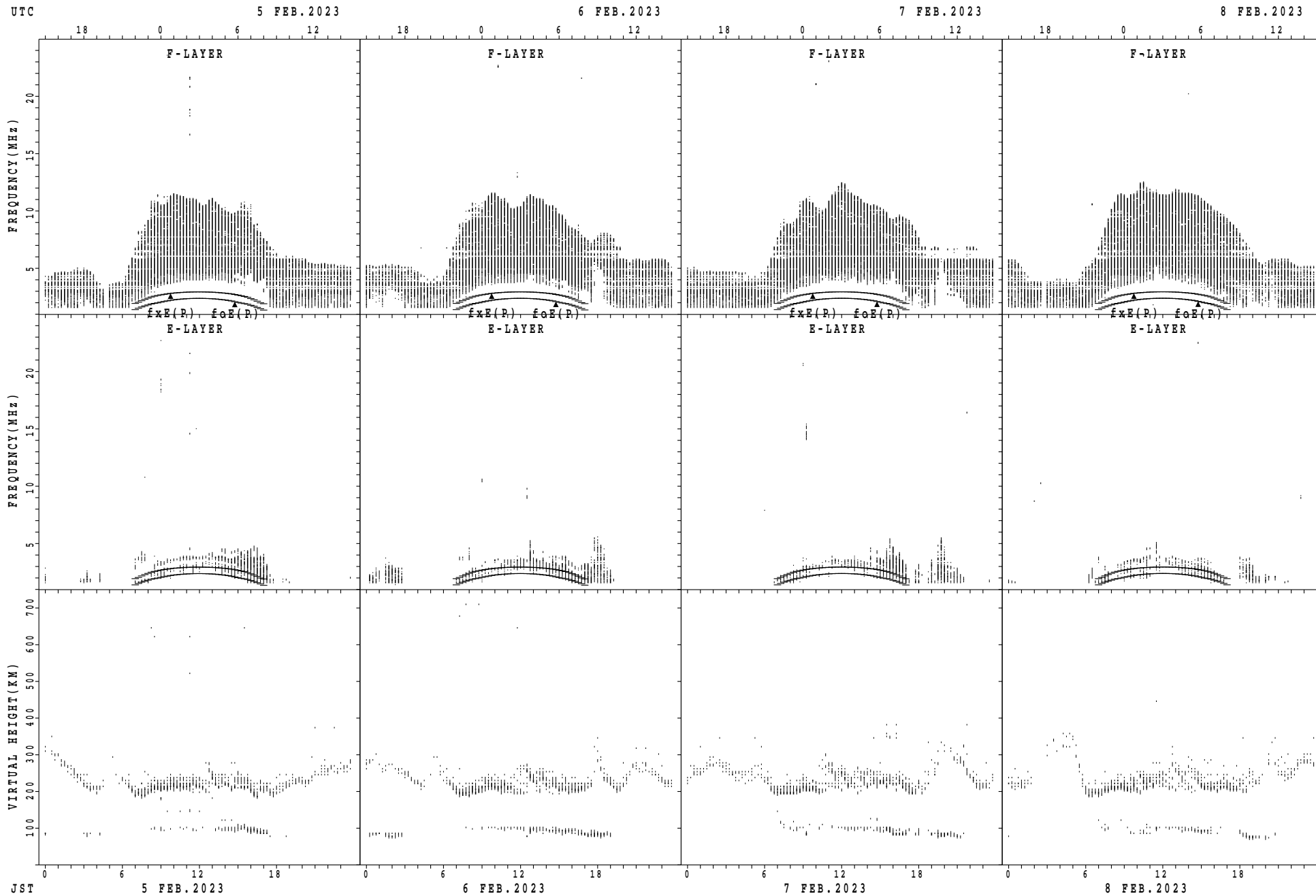
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



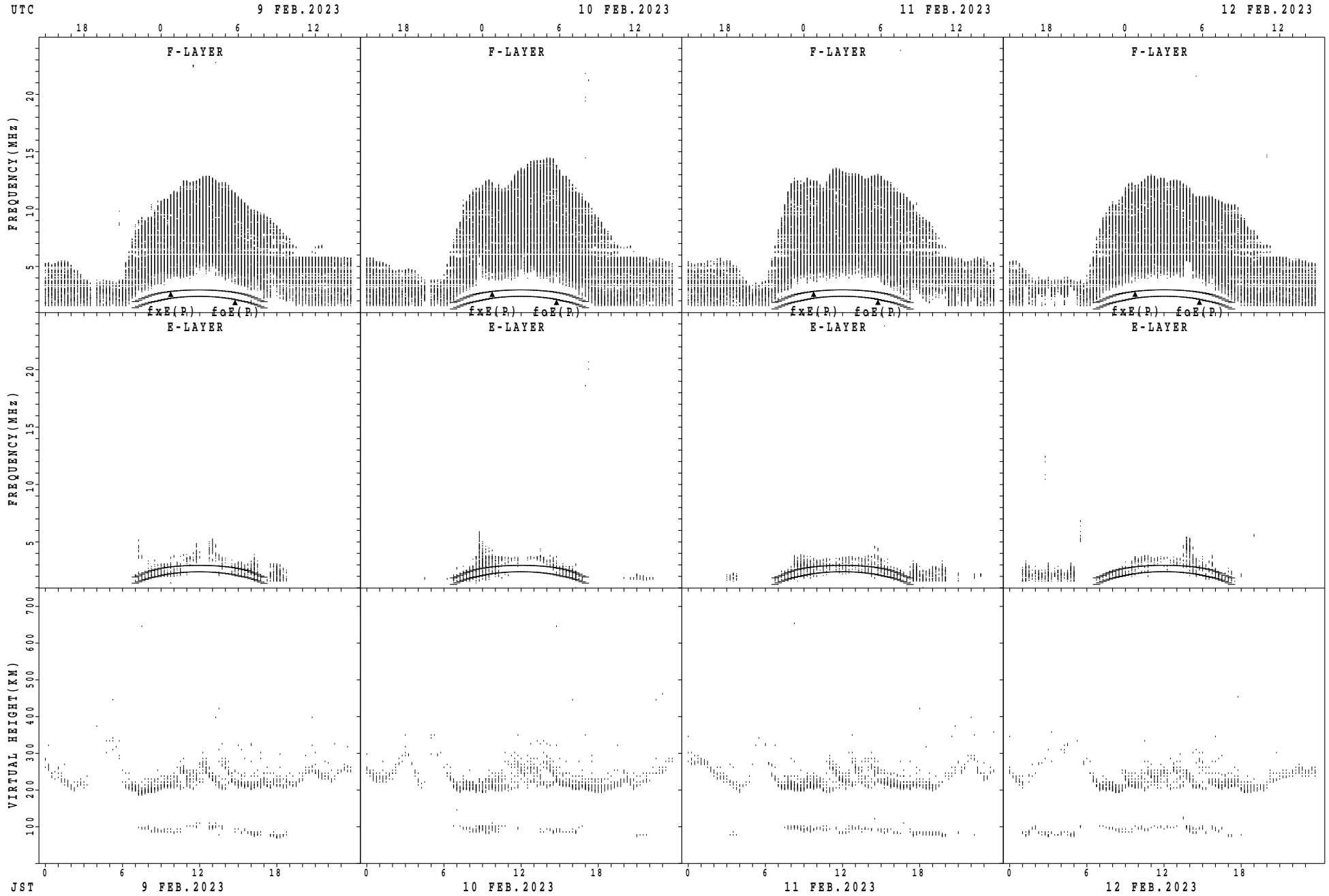
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



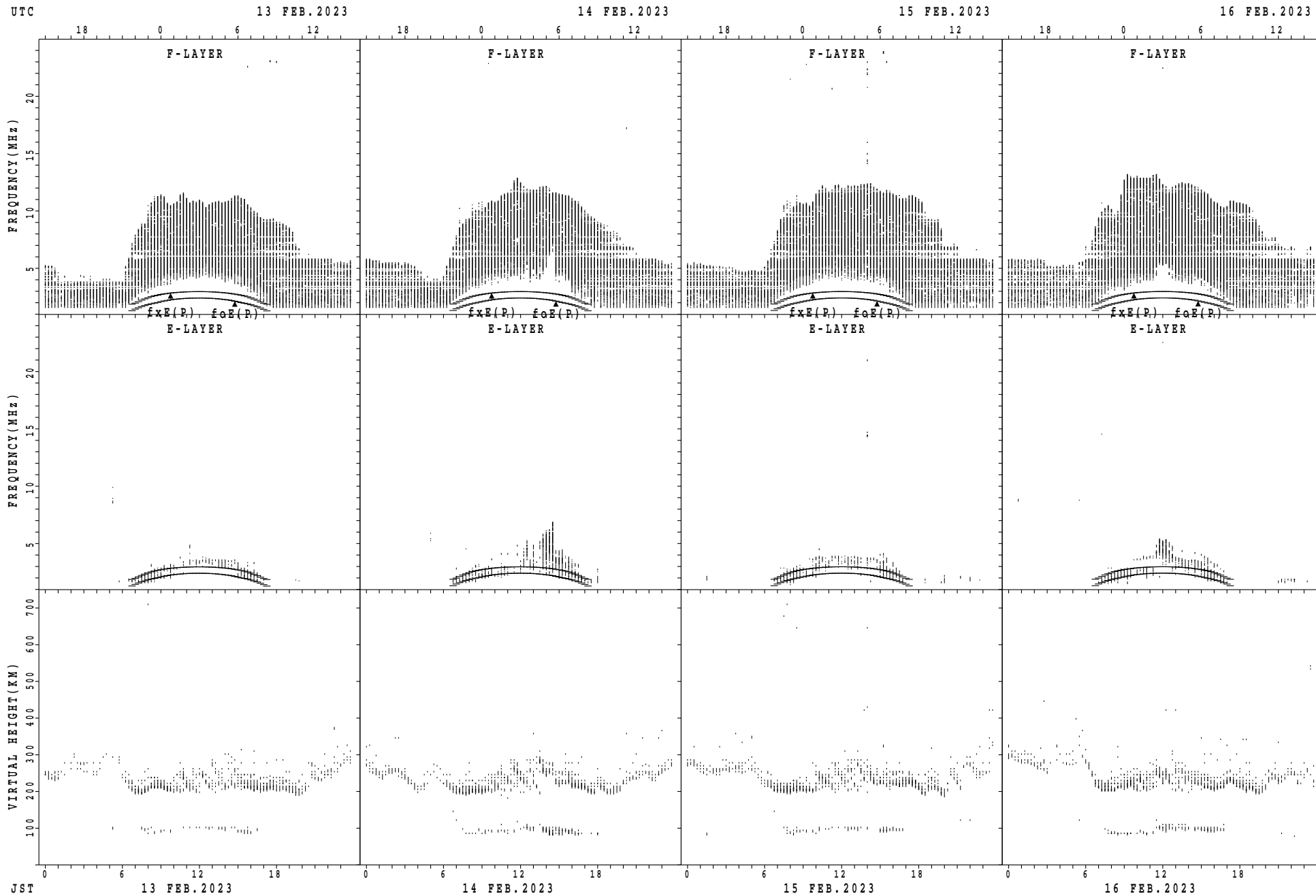
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



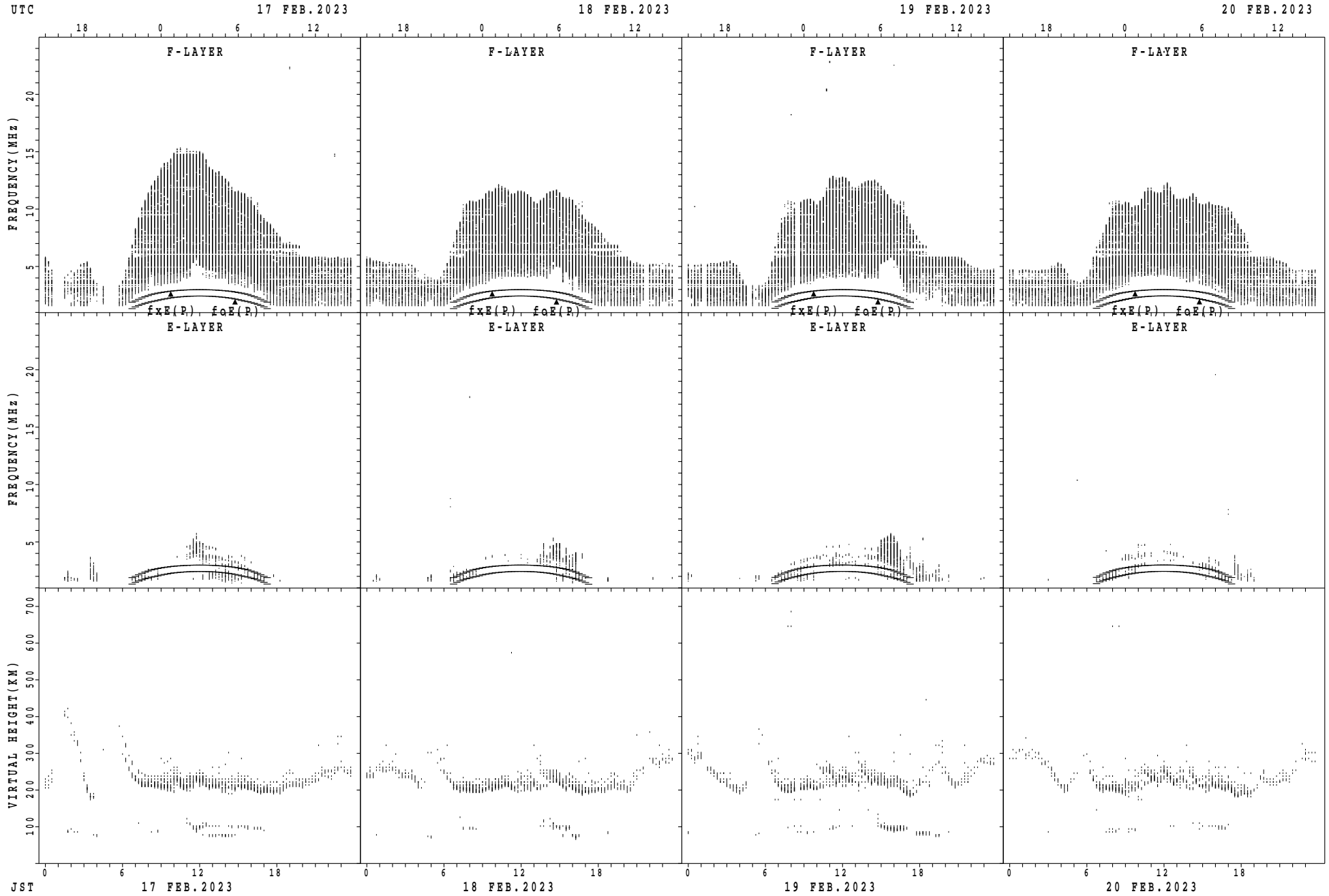
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



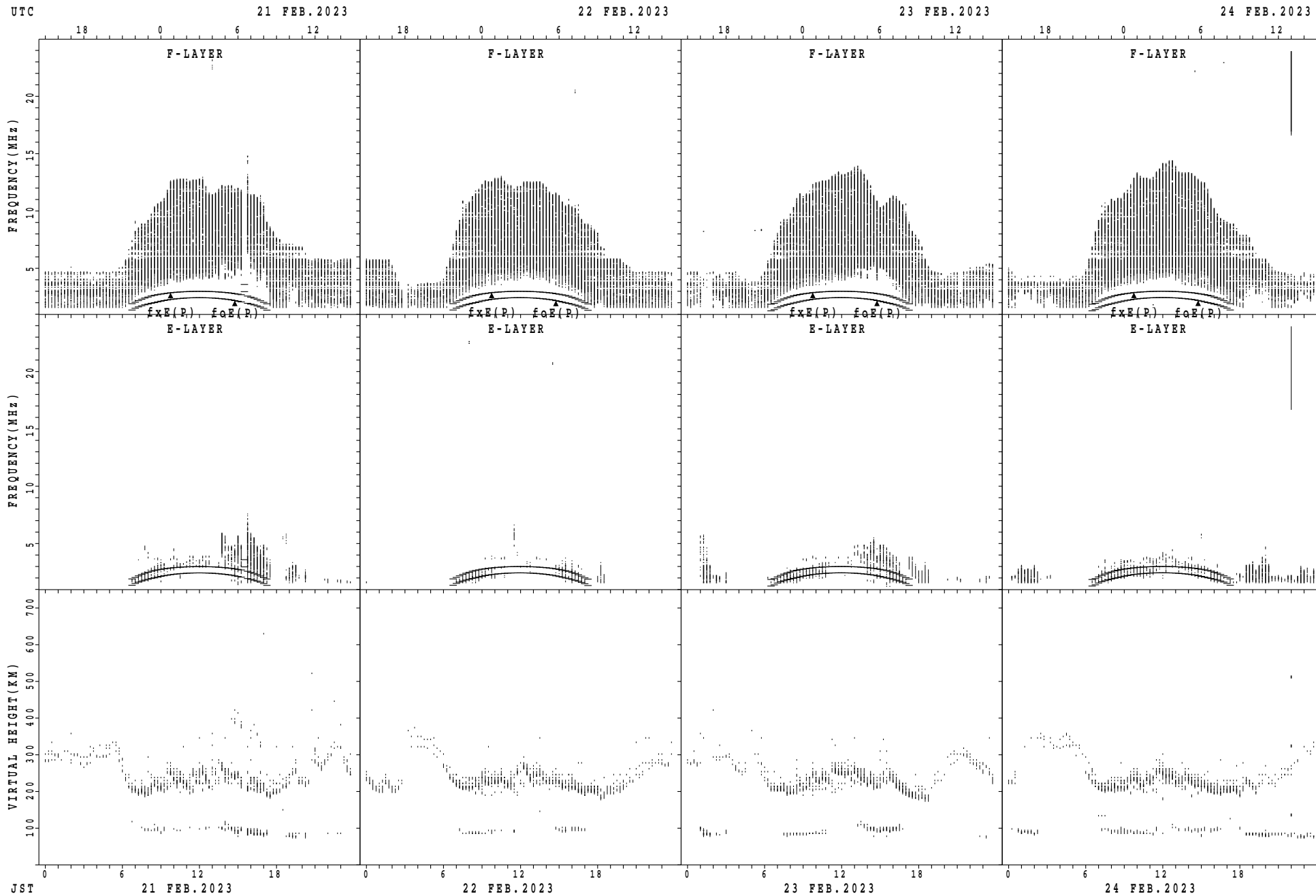
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



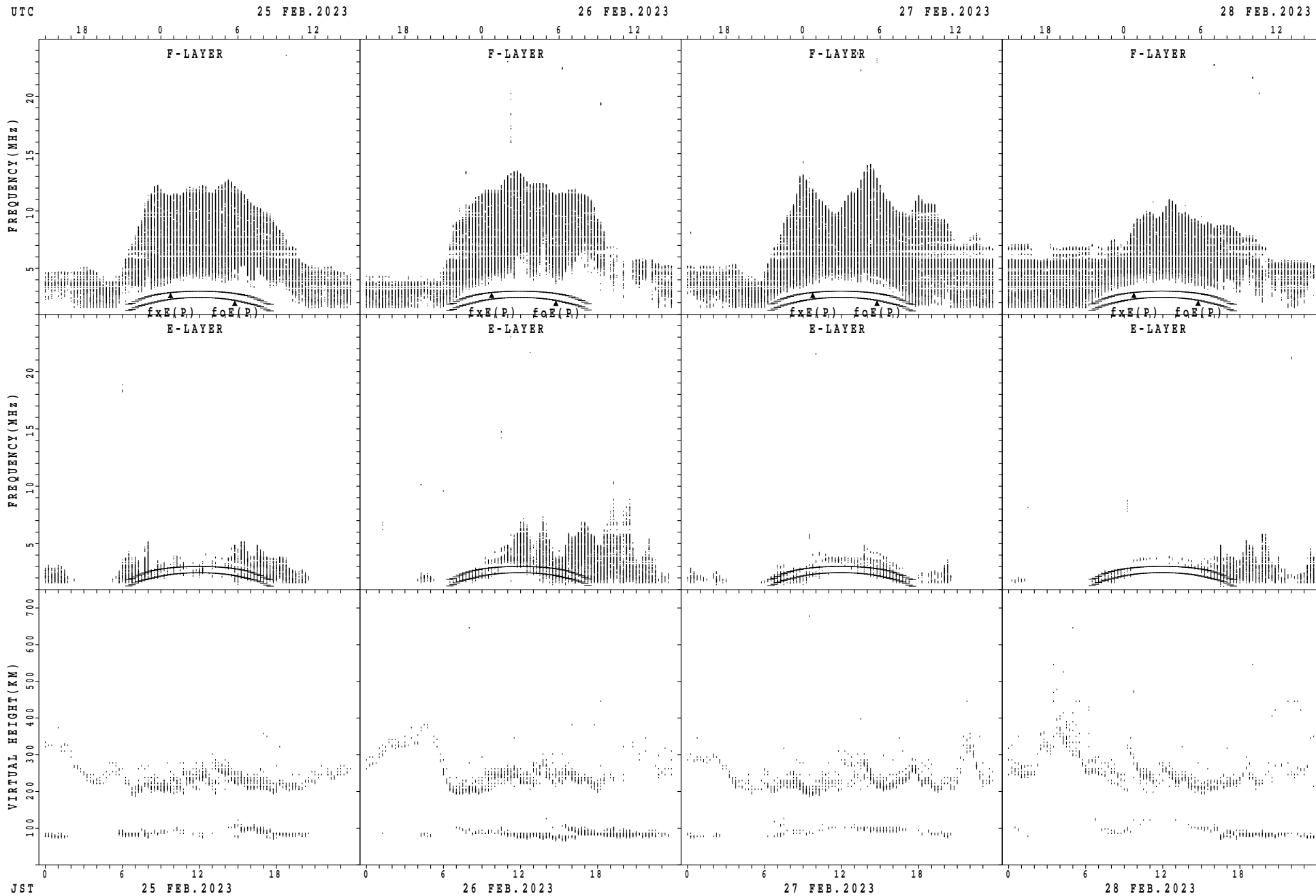
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



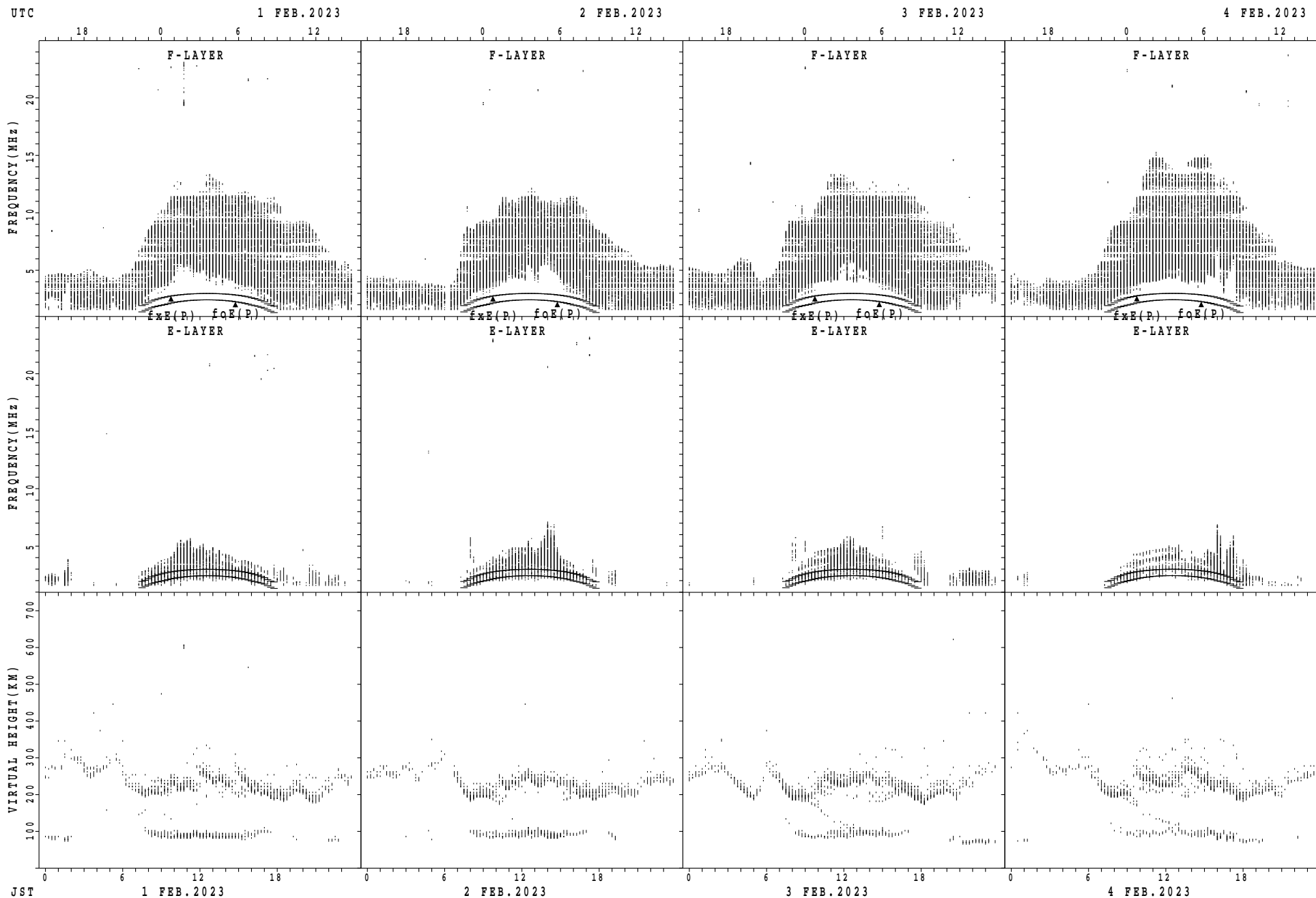
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



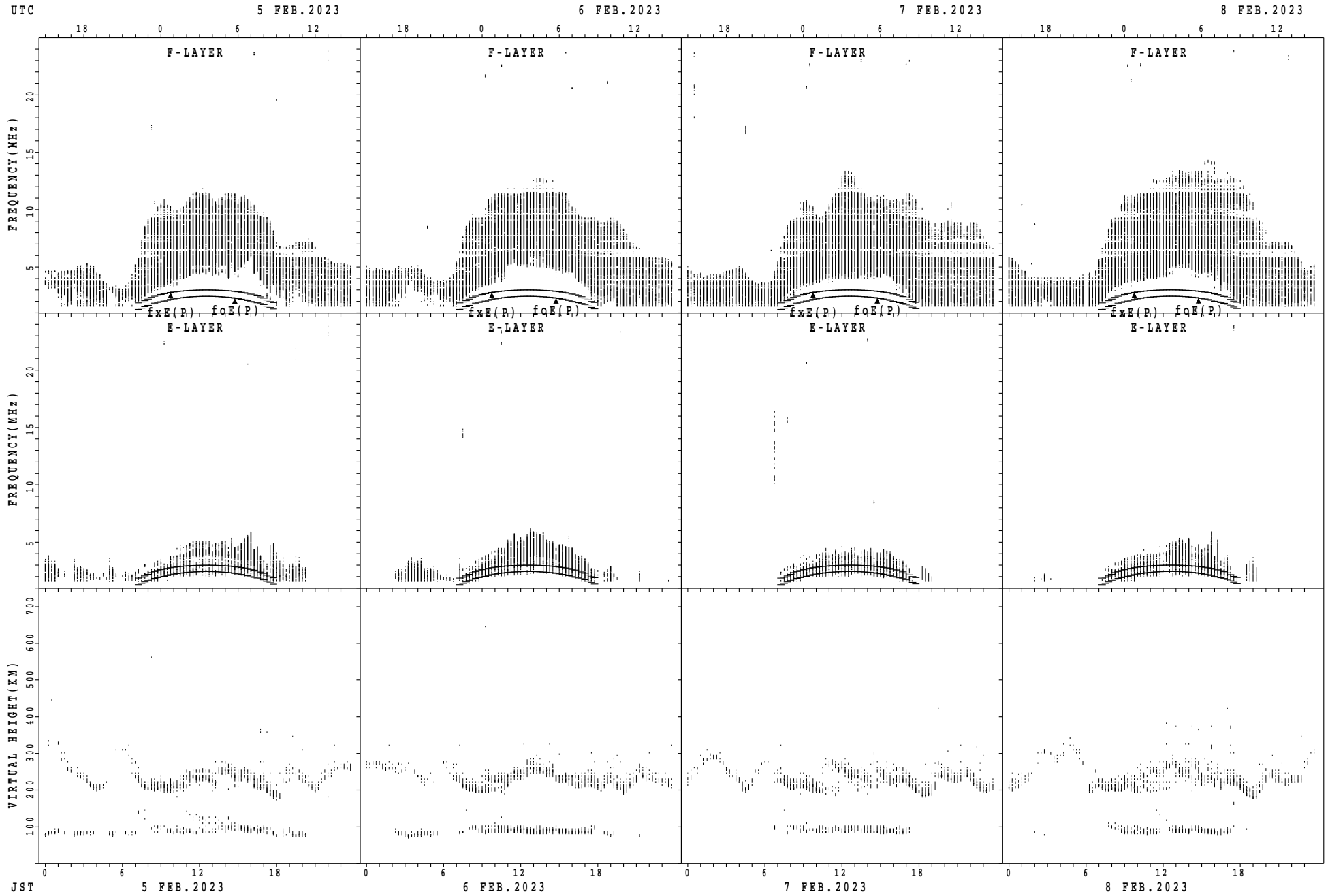
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



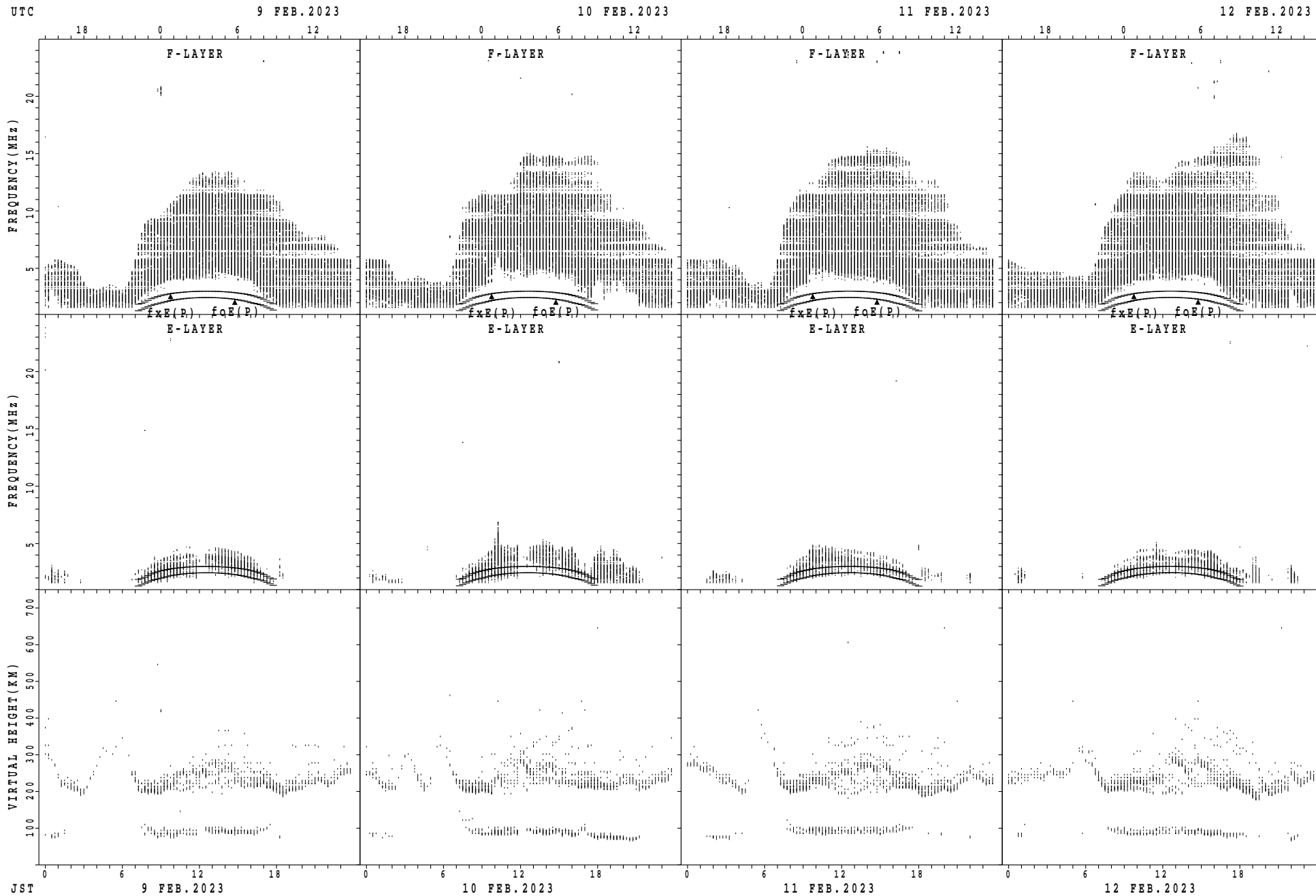
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



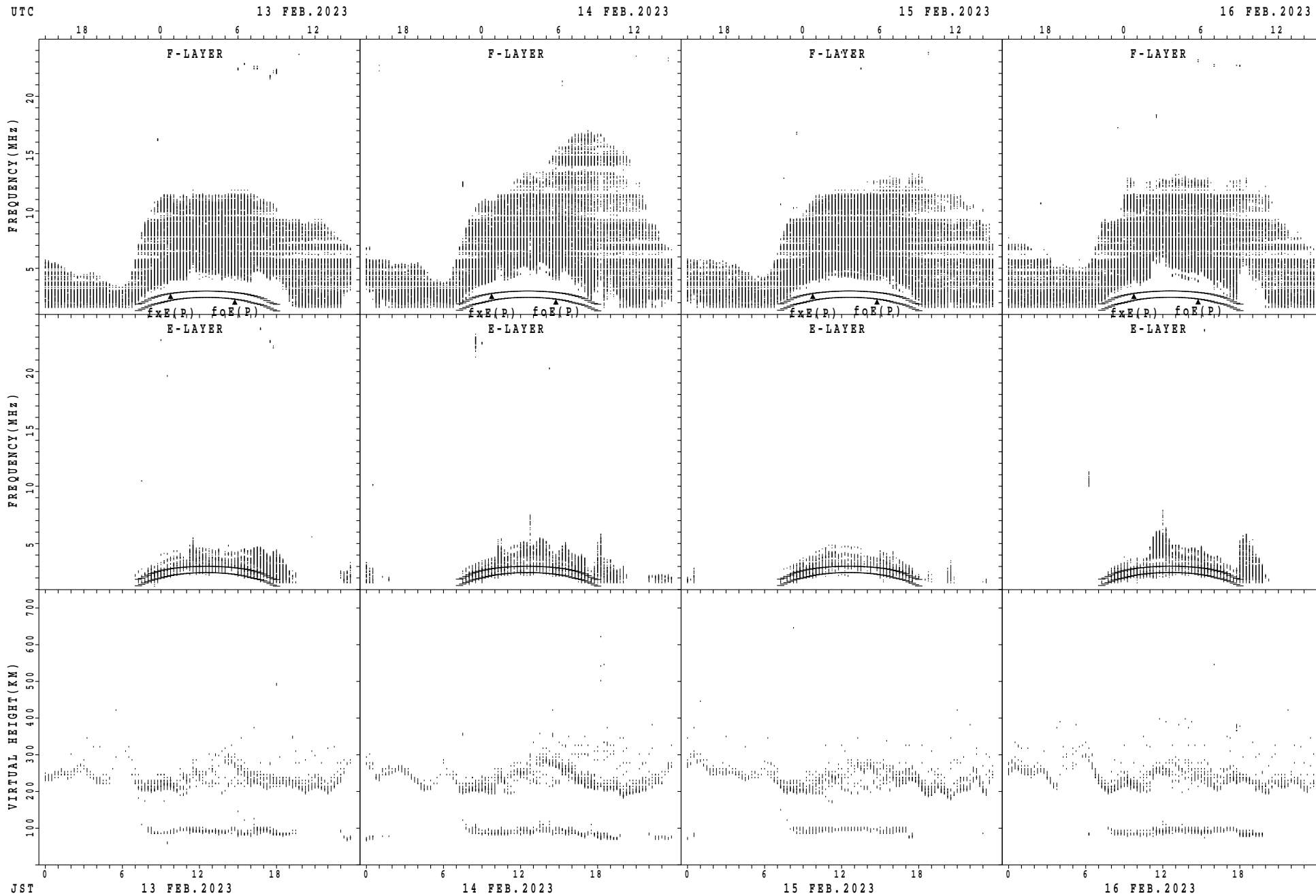
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



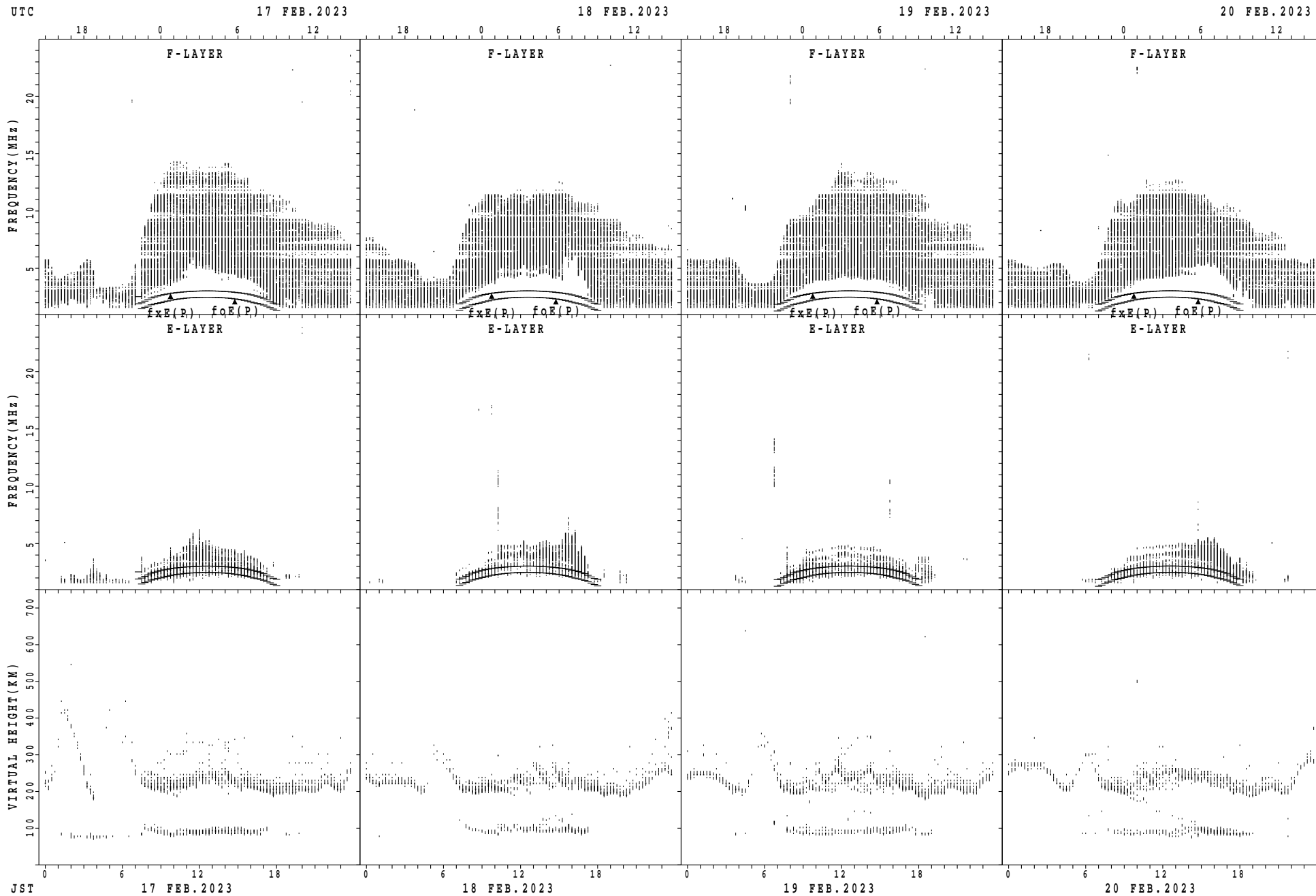
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



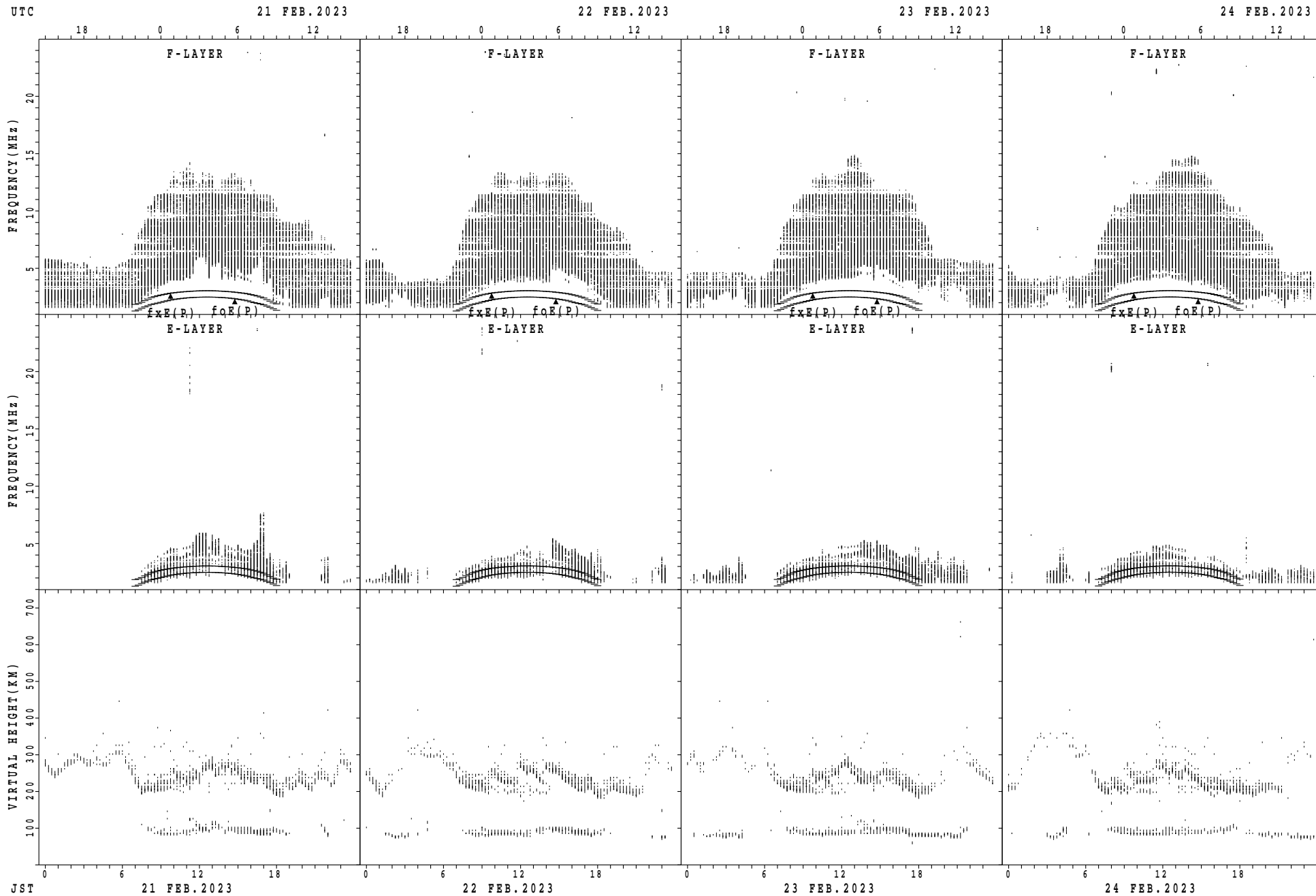
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



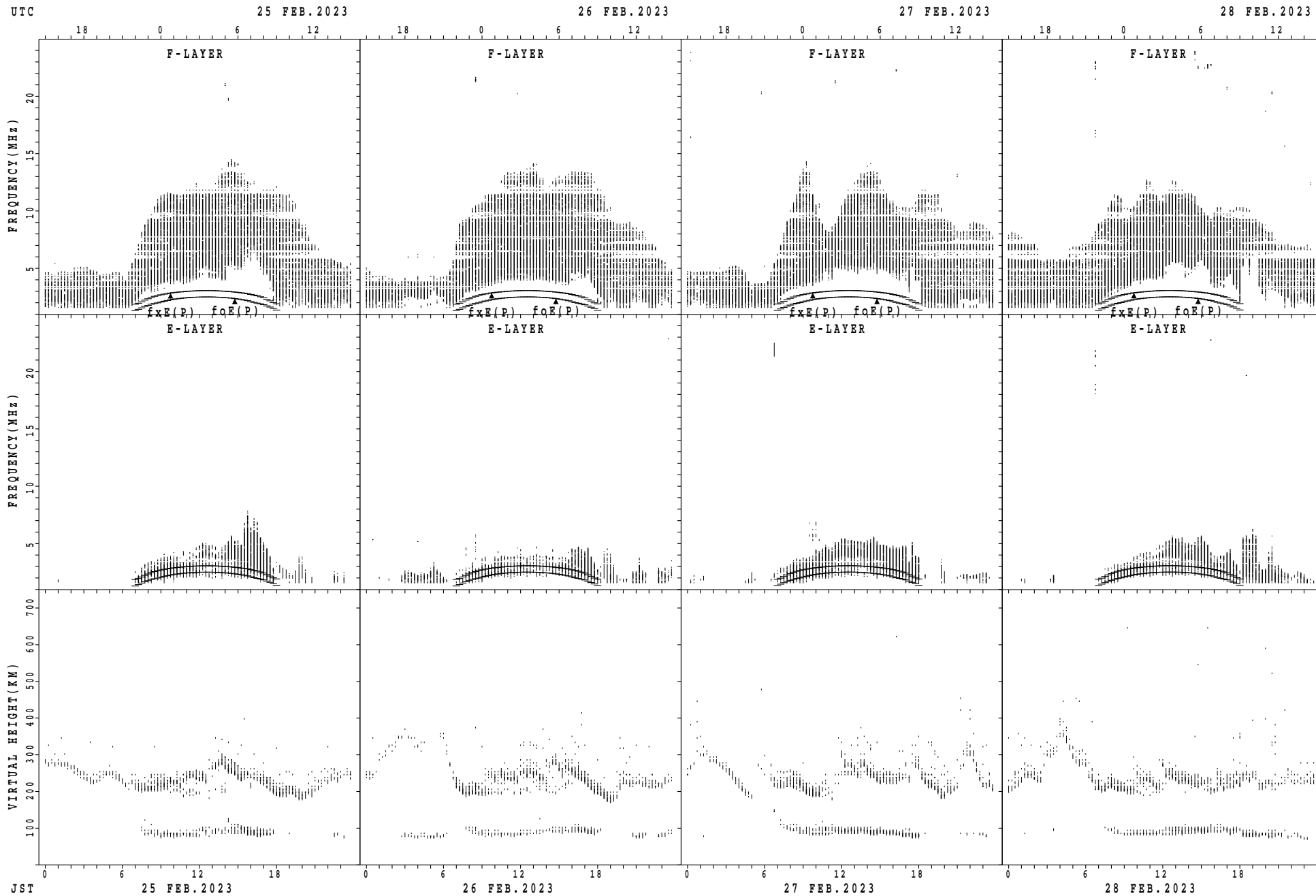
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



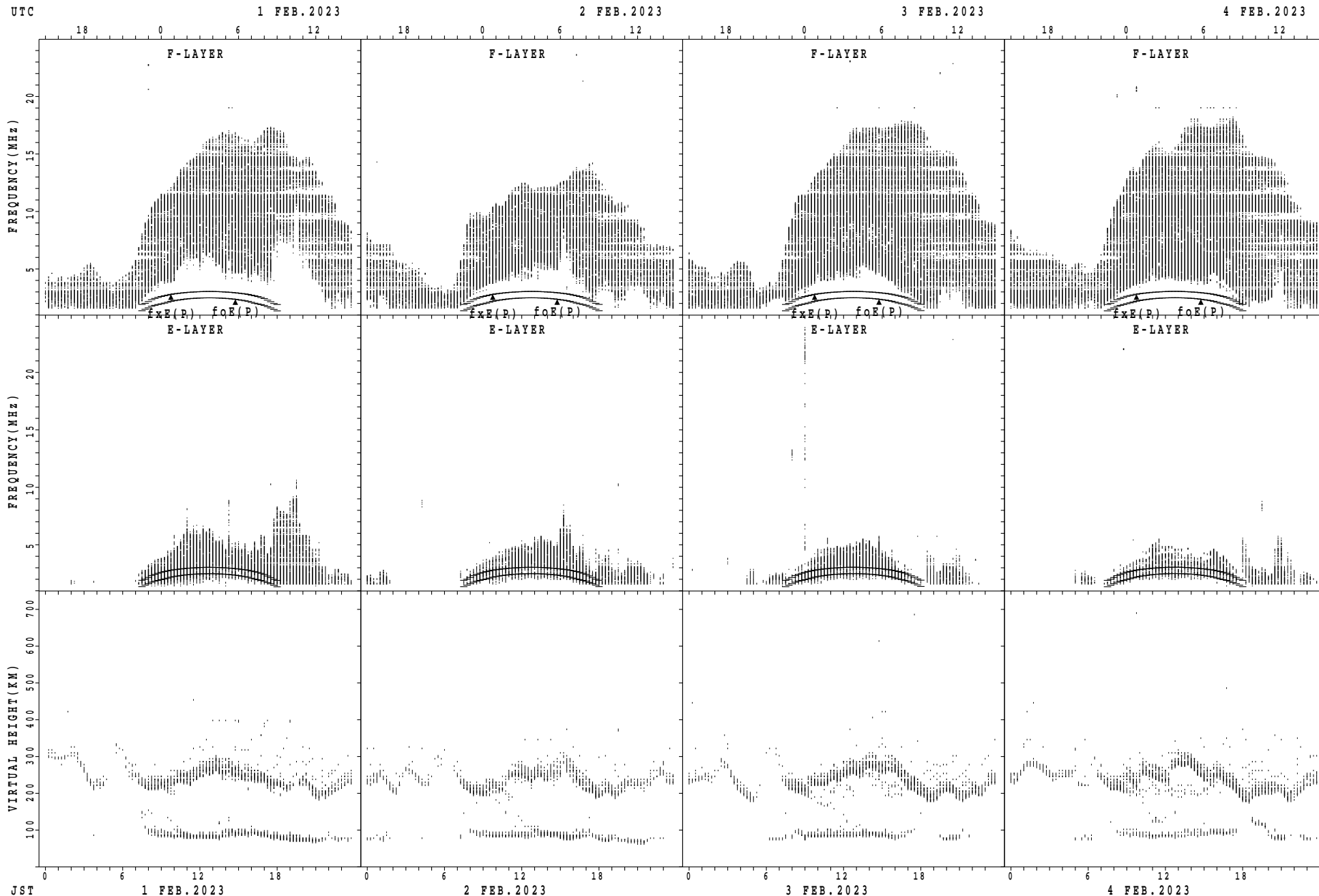
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



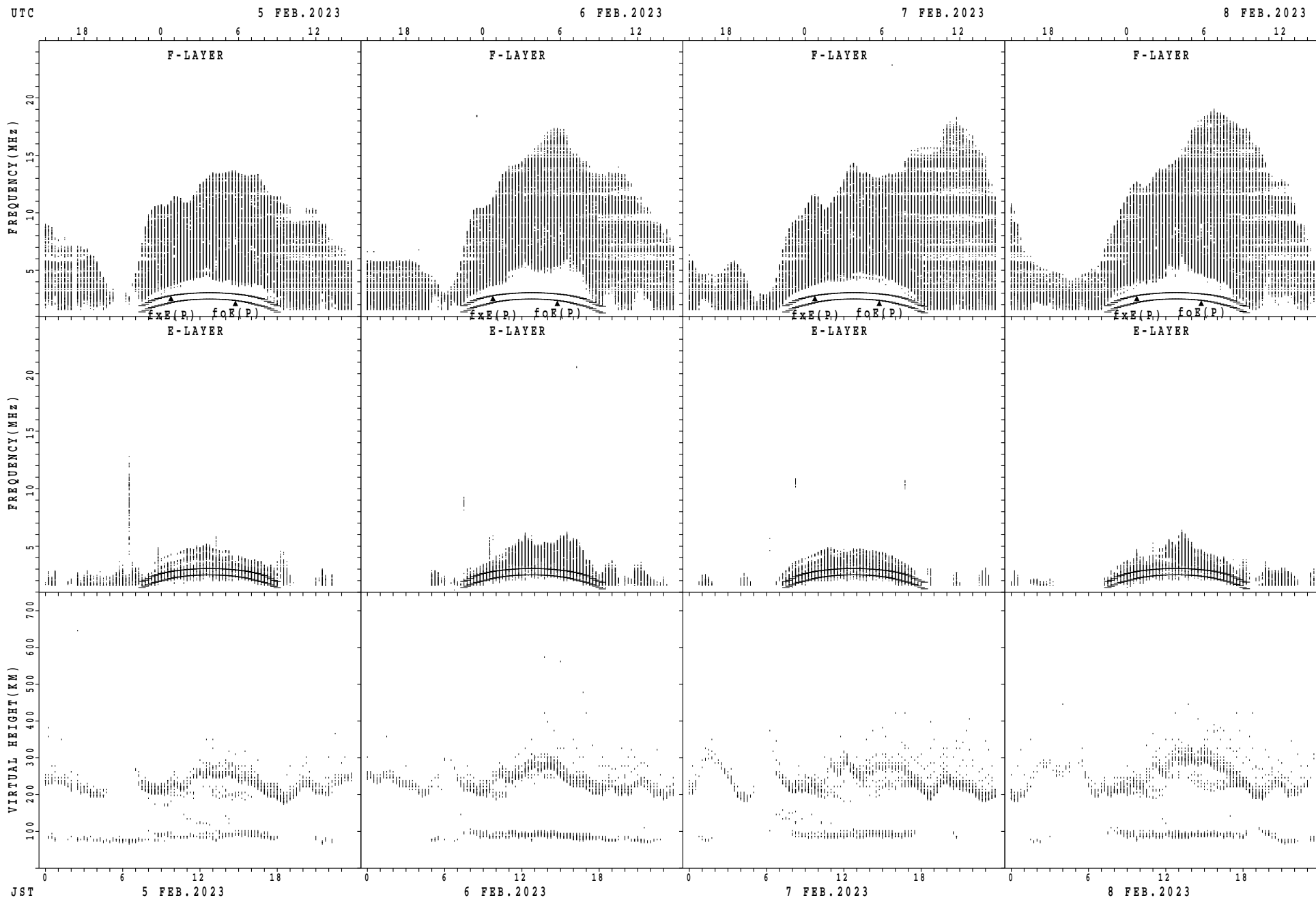
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



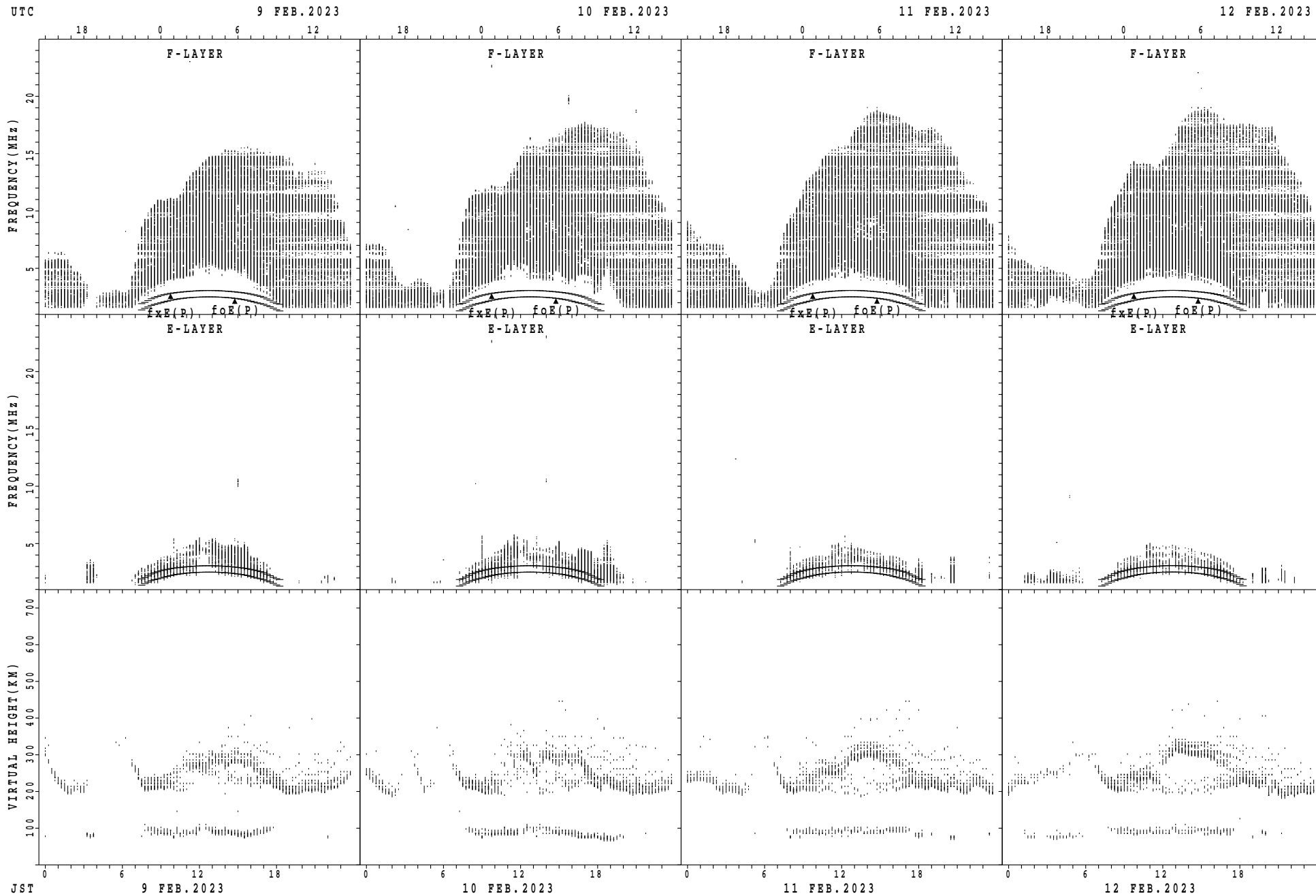
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



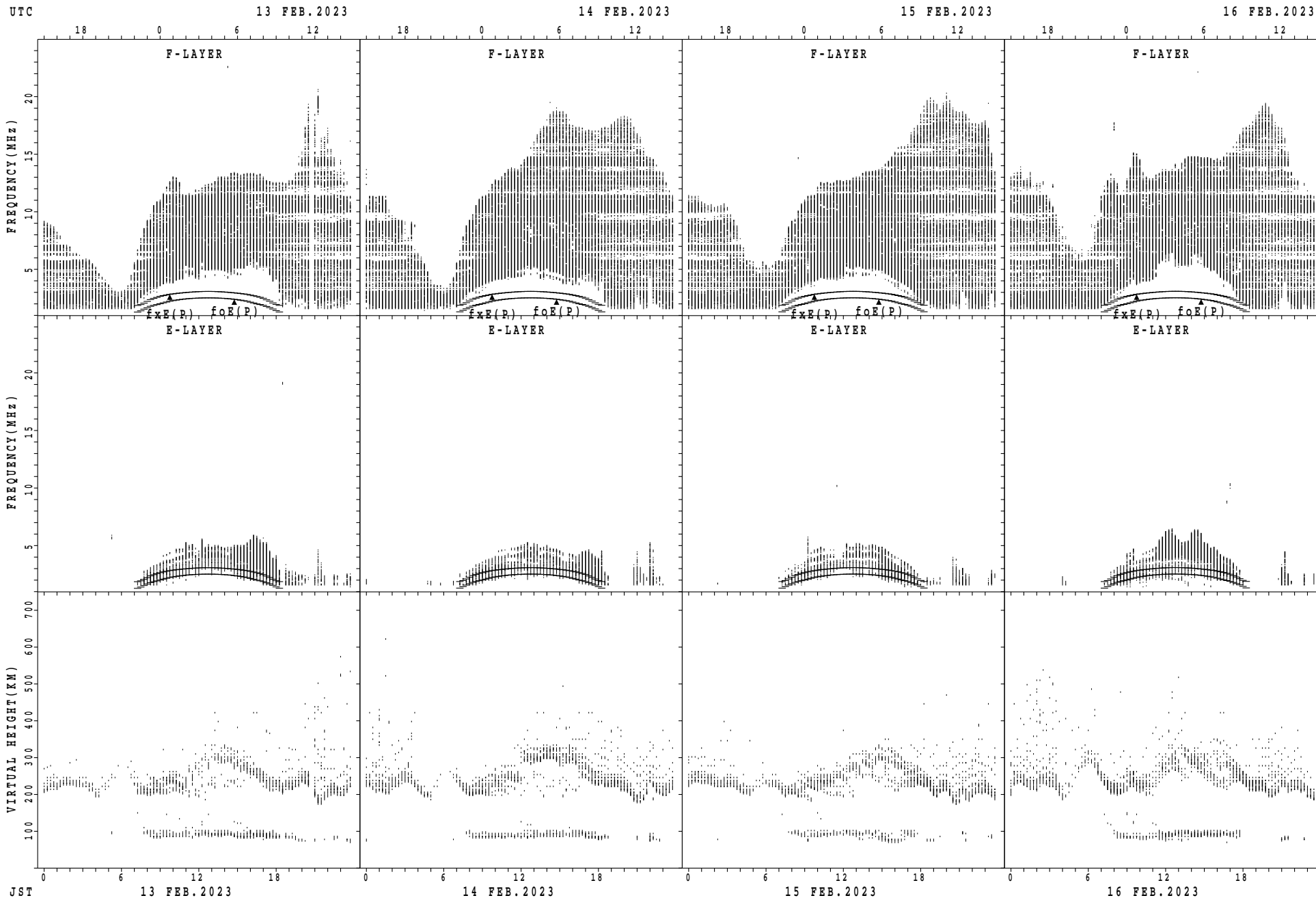
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



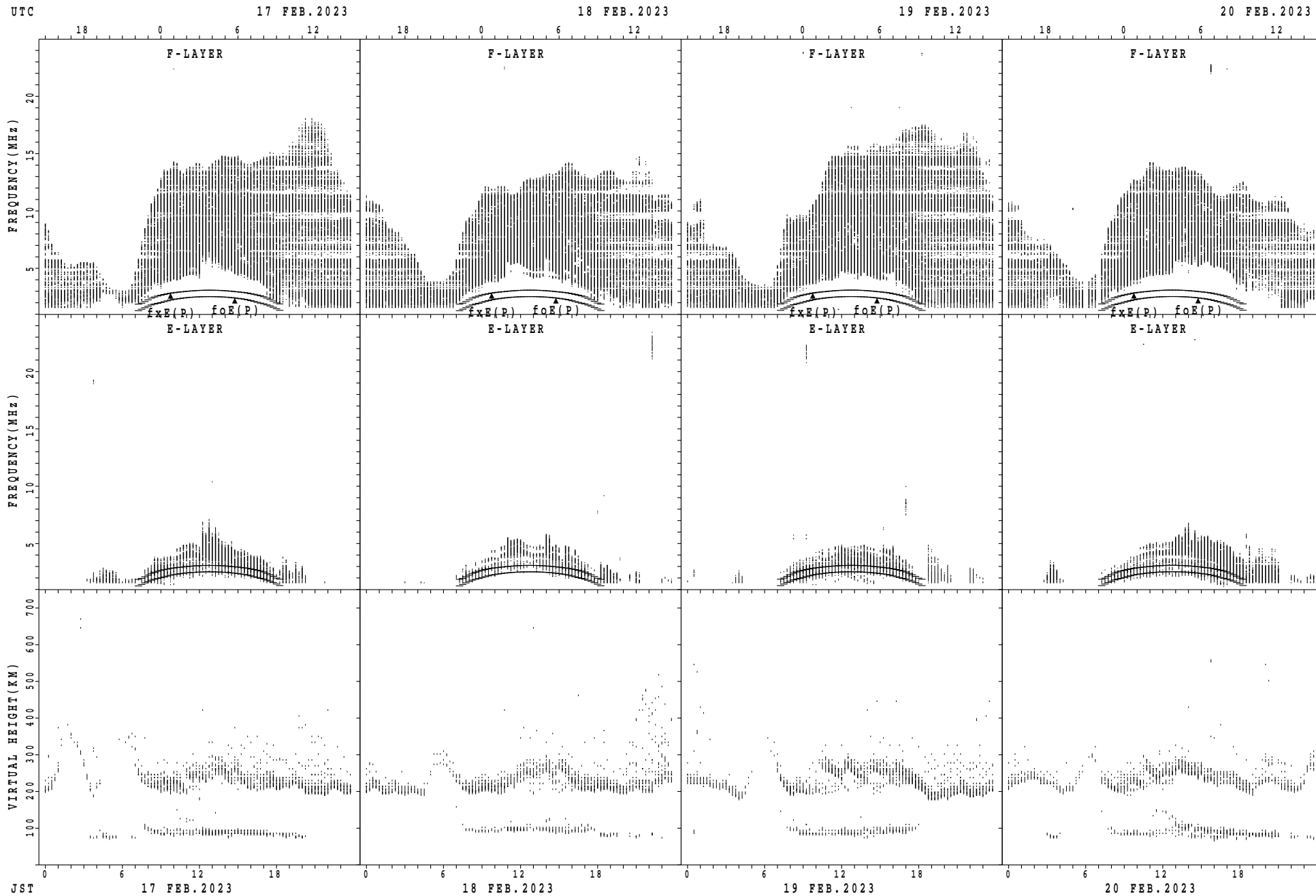
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



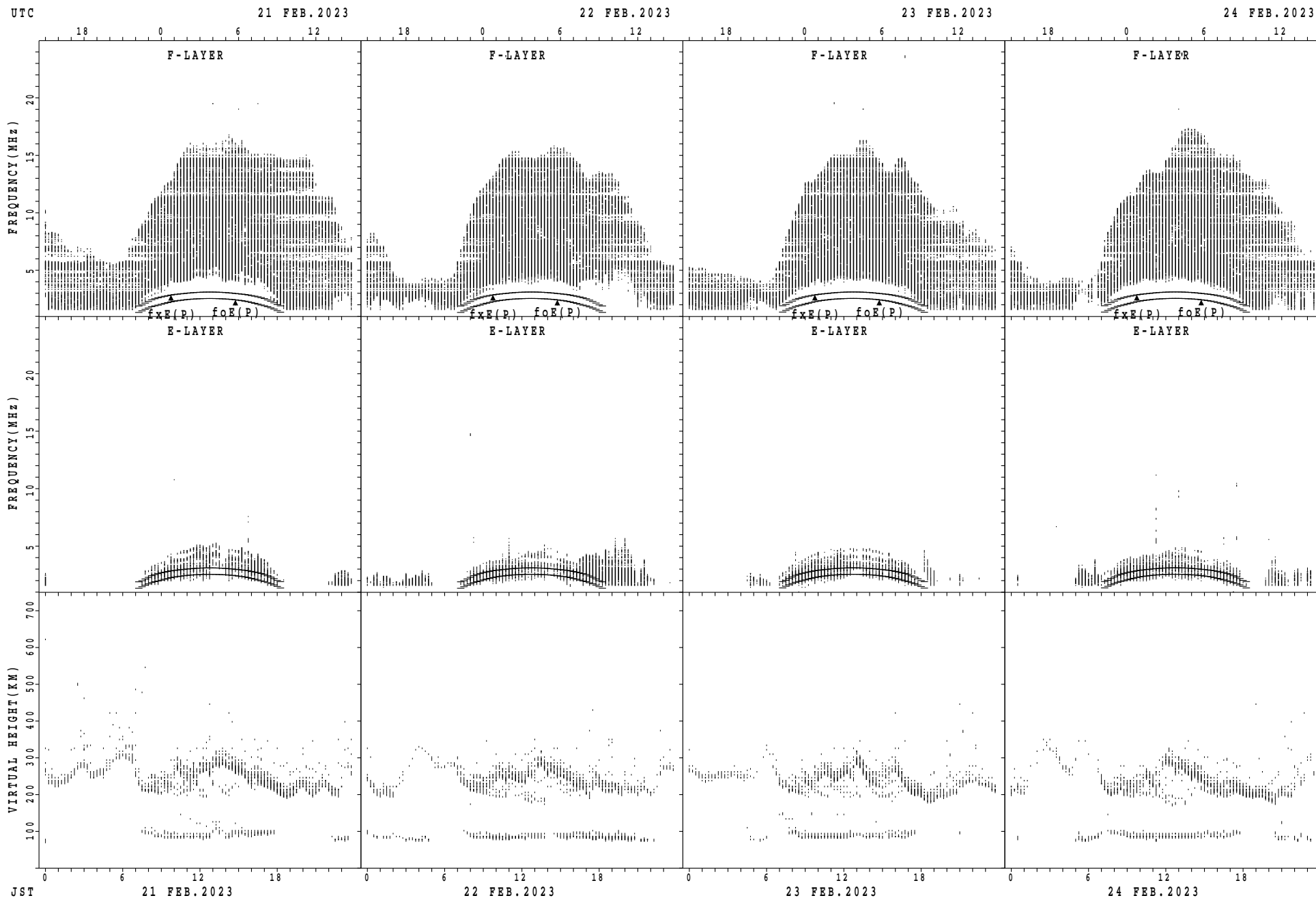
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



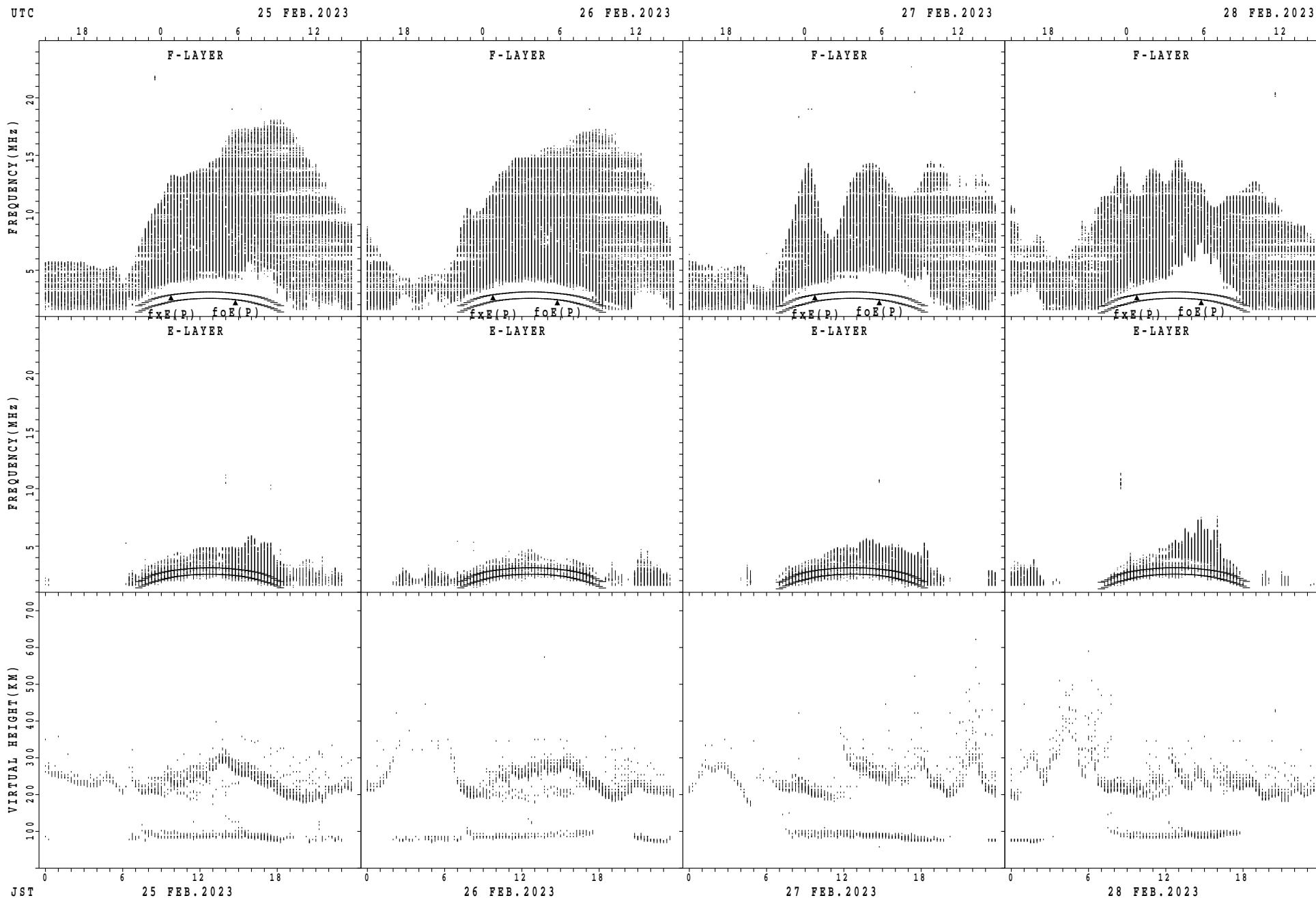
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



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

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
 FEB. 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		1					1	12	27	27	17	4	1	7	23	27	25	23	7	1				1
MED		288					256	216	214	216	214	214	206	218	216	218	216	224	240	240				302
U Q		144					128	226	222	224	223	218	103	222	222	240	224	234	256	120				151
L Q		144					128	212	200	198	207	213	103	214	214	206	213	218	224	120				151

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	21	13	17	18	10	10	24	28	28	28	28	27	28	28	28	27	17	19	21	18	17	15	21
MED	98	96	98	98	97	98	98	98	98	98	98	99	98	100	98	98	98	96	96	96	97	96	98	96
U Q	98	98	98	98	98	98	98	100	100	100	100	101	104	102	100	100	100	98	98	98	98	98	98	98
L Q	96	96	96	98	96	96	98	98	98	96	96	98	96	98	98	96	96	94	94	94	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								18	28	27	3				5	28	28	26	16	7		1	2	1
MED								224	216	216	222				228	225	229	232	248	244		336	288	242
U Q								236	222	230	238				239	232	233	248	256	252		168	326	121
L Q								216	211	208	204				214	221	215	216	233	232		168	250	121

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	10	14	9	11	7	8	4	13	27	27	22	19	18	21	25	28	27	21	19	18	17	17	16	12
MED	97	98	98	98	98	97	98	98	98	96	98	98	98	98	98	98	98	98	96	96	96	98	98	97
U Q	98	98	98	98	98	98	98	154	98	98	107	107	103	100	100	100	98	98	98	98	97	98	98	98
L Q	96	96	96	96	96	95	96	98	96	86	96	96	96	97	95	96	96	95	94	94	94	95	96	96

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	1							2	28	28	16					10	28	28	27	22	18	10	3	2
MED	282							247	223	218	224					240	238	231	230	235	242	258	280	241
U Q	141							250	231	224	232					248	248	244	232	256	254	266	288	250
L Q	141							244	214	208	215					232	224	223	216	224	240	240	266	232

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	13	14	15	14	12	12	9	15	28	28	28	28	26	28	28	28	28	28	21	22	14	15	18	14
MED	96	96	96	96	97	96	96	98	98	98	98	98	98	96	98	98	98	98	98	98	98	98	96	96
U Q	98	98	98	96	98	97	98	149	98	101	100	98	98	98	98	98	100	100	98	98	98	98	98	96
L Q	95	96	96	96	96	96	96	98	98	98	98	97	96	96	96	98	98	96	94	96	96	96	96	96

MONTHLY MEDIANS OF h'F AND h'Es
 FEB. 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	12	6	5	2			1	3	28	28	17						28	28	28	28	28	28	25	18
MED	269	264	274	302			410	266	224	223	230						249	238	224	225	232	232	236	240
U Q	280	264	278	330			205	392	234	231	235						271	257	239	239	253	247	252	258
L Q	249	256	258	274			205	256	216	213	222						231	224	215	216	224	224	229	224

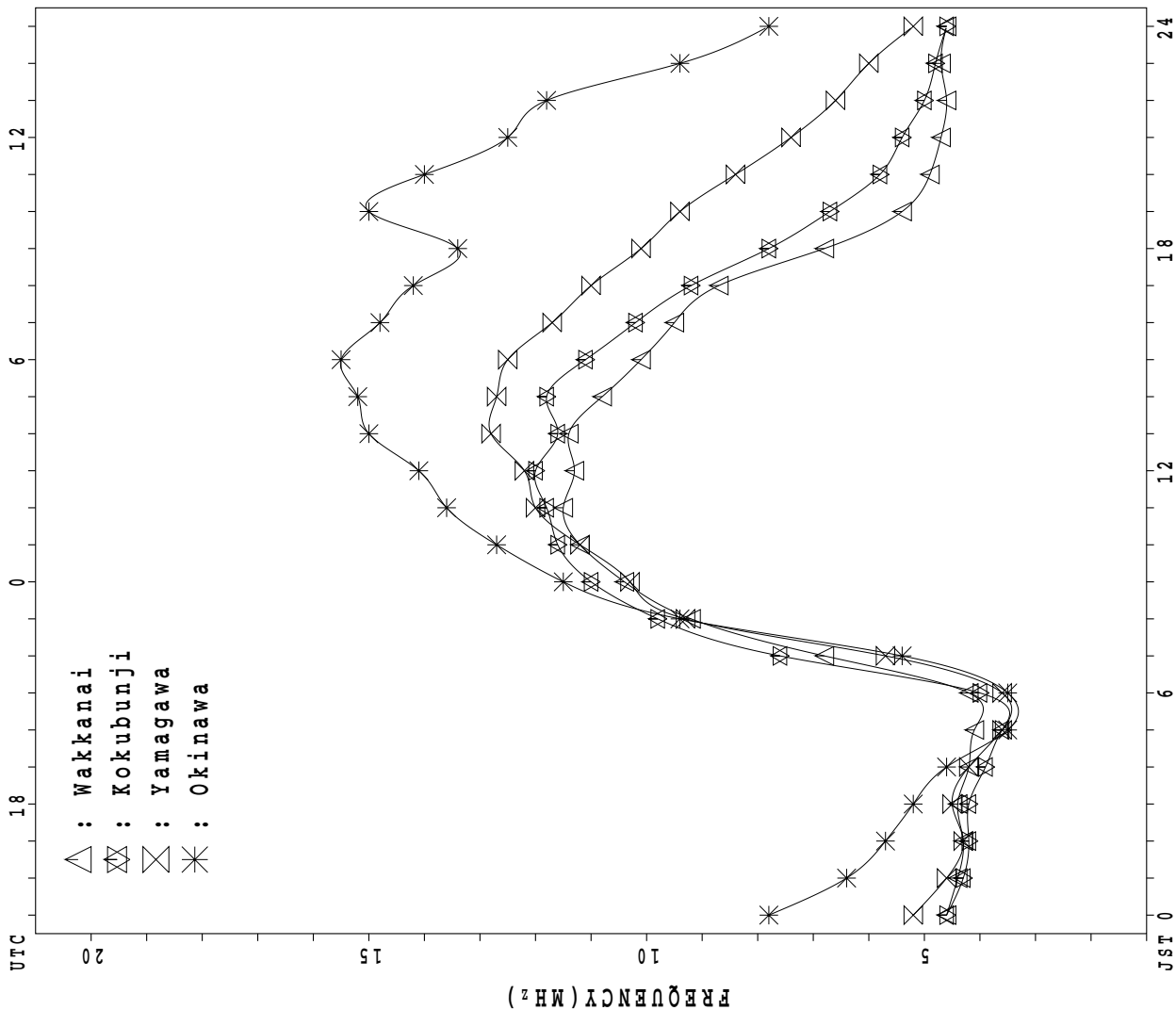
h'Es

	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	11	11	11	12	14	12	15	28	28	28	28	27	28	28	28	28	28	19	21	19	22	19	15
MED	96	96	96	96	97	96	96	98	98	98	98	97	96	96	96	98	98	98	98	98	98	97	96	96
U Q	98	98	98	98	98	98	98	147	98	101	100	98	98	97	98	98	100	100	98	98	98	98	98	98
L Q	96	96	96	96	96	94	96	96	96	94	95	96	96	95	96	96	96	97	94	93	96	96	96	96

MONTHLY MEDIANS PLOT OF fOF2

FEB. 2023

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Wakkanai

FEB. 2023 f_{XI} (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

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	58	57	57	48	57	57	54												X	X	X	X	X	X
2	X	X	X	X	X	X	X												67	57	48	53	52	51
3	53	56	54	56	51	50	53												67	61	57	57	58	60
4	60	59	55	59	58	58	54												X	X	X	X	X	58
5	58	58	58	58	58	51	53												X	X	X	X	X	X
6	X	X	X	X	X	X	X												X	X	X	X	X	X
7	51	52	53	53	49	46	42												68	59	52	54	53	52
8	X	X	X	X	X	X	X												X	X	X	X	X	X
9	52	53	51	49	48	49	46												X	X	58	59	60	58
10	X	X	X	X	X	X	X												X	X	X	X	X	X
11	58	55	55	57	57	57	50												77	66	64	66	64	66
12	X	X	X	X	X	X	X												X	X	X	X	X	X
13	67	60	54	54	53	55	47												73	56	55	57	52	54
14	X	X	X	X	X	X	X												X	X	X	X	X	X
15	56	56	56	52	51	48	50												X	X	X	X	X	X
16	X	X	X	X	X	X	X												X	X	X	X	X	X
17	55	56	57	60	52	41	40												76	59	52	54	59	59
18	59	55	58	59	60	55	54												X	X	X	X	X	X
19	X	X	X	X	X	X	X												73	62	56	52	52	52
20	52	52	53	52	52	50	50												91	75	67	60	59	59
21	X	X	X	X	X	X	X												X	X	X	X	X	X
22	60	63	61	61	60	55	52												80	72	61	58	59	59
23	X	X	X	X	X	X	X												X	X	X	X	X	X
24	61	62	61	60	61	59	60												94	86	69	68	66	60
25	X	X	X	X	X	X	X												X	X	X	X	X	X
26	61	59	59	56	55	55	61												104	81	72	62	60	61
27	X	X	X	X	X	X	X												X	X	X	X	X	X
28	54	47	47	49	36	37	41												X	X	58	55	55	52
29	X	X	X	X	X	X	X												X	X	X	X	X	X
30	51	50	50	51	51	48	52												72	62	57	49	52	52
31	X	X	X	X	X	X	X												X	X	X	X	X	X
00	58	51	53	52	52	45	50												69	62	59	55	52	52
01	X	X	X	X	X	X	X												X	X	X	X	X	X
02	51	50	52	54	54	50	53												X	X	59	55	52	52
03	X	X	X	X	X	X	X												X	X	X	X	X	X
04	49	48	49	47	47	46	51												87	65	53	54	52	57
05	X	X	X	X	X	X	X												X	X	A	X	X	X
06	60	58	37	39	39	39	46												78		46	46	46	46
07	X	X	X	X	X	X	X												X	X	X	X	X	X
08	48	46	46	47	46	47	54												72	55	52	52	52	56
09	X	X	X	X	X	X	X												X	X	X	X	X	X
10	54	54	52	51	52	53													84	72	63	64	65	66
11	X	X	X	X	X	X	X												X	X	X	X	X	X
12	66	68	70	69	69	70													81	64	59	57	54	53
13	X	X	X	X	X	X	X												X	X	X	X	X	X
14	54	52	50	45	42	42													87	69	59	53	51	55
15	X	X	X	X	X	X	X												X	X	X	X	X	X
16	56	55	53	54	52	51													105	99	87	77	84	74
17	X	96	58	47	41	44													X	X	X	X	X	X
18																			62	61	59	59	60	60
19																								
20																								
21																								
22																								
23																								
CNT	28	28	28	28	28	28	23												28	27	28	28	28	28
MED	X	X	X	X	X	X	X												X	X	X	X	X	X
U Q	56	55	54	54	52	50	51												76	63	58	56	54	56
L Q	X	X	X	X	X	X	X												X	X	X	X	X	X
	60	58	58	58	57	55	54												83	69	64	60	60	60
	X	X	X	X	X	X	X												X	X	X	X	X	X
	52	52	52	49	48	46	46												71	59	52	52	52	52

FEB. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F 48	F 46	F 43	F 38	F 44	F 47	F 46	61	87	90	96	109	104	109	98	86	68	63	60	50	41	46	45	44	
2	46	49	47	49	44	43	46	68	91	106	111	99	101	105	100	83	70	65	60	54	50	50	51	F 52	
3	F 50	48	F 48	F 47	48	51	47	65	88	96	100	98	105	106	99	93	78	64	50	42	39	40	43	F 42	
4	F 46	F 46	F 42	F 43	46	44	46	70	85	102	111	116	115	116	117	102	84	79	62	46	44	42	42	42	
5	44	44	46	46	42	39	35	63	84	96	99	115	107	97	96	100	86	69	61	52	45	47	46	45	
6	45	46	44	42	41	42	39	62	83	95	106	111	104	101	100	93	79	81	75	62	51	52	53	51	
7	51	48	48	50	50	50	43	63	95	91	99	113	115	109	106	100	95	89	70	59	58	59	57	59	
8	60	53	47	47	46	48	40	75	115	115	111	116	112	110	111	106	99	88	66	49	48	50	45	47	
9	49	48	49	45	44	40	43	65	97	105	122	125	123	115	108	104	97	91	70	56	57	58	53	51	
10	49	48	49	48	45	39	32	71	102	125	117	122	120	114	116	108	98	91	68	60	60	53	51	F 48	
11	48	49	50	53	46	34	32	64	88	95	109	113	112	110	108	98	90	90	69	52	45	47	F 50	F 49	
12	F 51	48	F 48	F 49	F 49	48	47	69	96	103	120	116	108	105	98	94	91	78	66	56	48	45	45	45	
13	46	45	46	45	45	43	43	72	90	102	108	108	113	112	108	98	96	94	84	68	60	53	52	52	
14	53	56	54	54	53	48	45	68	97	103	108	111	115	110	106	99	94	85	73	65	54	51	52	52	
15	54	55	54	53	54	52	53	74	91	112	108	112	116	118	112	109	105	102	87	79	62	61	59	53	
16	54	52	52	49	48	48	54	84	87	120	124	134	132	122	117	111	103	103	97	74	65	55	53	54	
17	47	40	40	42	29	30	34	63	88	108	127	140	120	116	100	98	88	85	69	56	51	48	48	45	
18	44	43	43	44	44	41	45	67	88	96	100	107	112	110	103	98	94	86	65	55	50	42	45	45	
19	F 45	44	46	45	45	38	43	75	93	103	108	108	108	118	112	102	96	86	62	55	52	48	45	45	
20	44	43	45	47	47	44	46	74	97	108	108	100	108	113	104	102	101	84	70	55	51	44	41	44	
21	42	41	42	40	40	39	44	72	95	108	113	H 105	105	117	113	104	94	89	80	58	A 39	39	39	39	
22	53	50	30	32	32	32	39	84	105	108	113	112	112	116	106	96	88	85	71						
23	41	39	39	40	39	40	47	72	90	107	110	127	116	119	106	111	98	86	65	48	45	46	45	49	
24	48	47	45	44	45	46	50	75	80	117	114	126	122	116	109	95	92	79	77	65	56	58	58	59	
25	59	61	63	62	62	63	70	103	102	98	112	112	106	112	109	98	95	90	74	57	52	50	47	46	
26	47	45	43	38	35	35	44	78	92	116	105	106	107	108	107	107	97	92	80	62	52	46	44	48	
27	48	48	46	47	45	44	43	70	87	88	116	116	99	108	122	111	106	100	98	92	80	70	77	67	
28	70	F 84	F 40		34	37	38	42	41	46	51	53	61	61	67	65	65	60	55	54	F 49	F 48	F 47	F 48	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	27	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	28	28
MED	48	48	46	46	45	43	44	70	90	103	110	112	112	111	106	100	94	86	70	56	51	48	47	48	
U Q	53	50	49	49	48	48	46	74	96	108	114	116	116	116	112	105	98	90	76	62	56	53	52	52	
L Q	45	44	43	42	42	39	40	64	87	96	106	108	106	108	100	96	87	79	64	52	45	46	45	45	

FEB. 2023 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 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										
2												L	U L 456	L										
3												L	L	L	L									
4											L	L	L	L	L									
5											L	L	U L 408	L	L									
6											U L 384	L	L	L	U L 372									
7											U L 384	L	L		L									
8											L	L	L	L	L	L								
9												L	L	L	L									
10											L	L		L	L									
11										L	L	L	U L 444	L	L									
12											L	L	L	U L 460										
13												L		U L 388										
14													L	U L 424										
15												L												
16												L	L	L			L							
17										L	L	L	L	U L 424										
18												L		L				288						
19											L	L	L	L	L									
20											U L 372	U L 396		L	L									
21											L		L	L	L	L								
22												L	L	L										
23											L	L	L	L	L									
24										L	L	L	U L 436	U L 452	U L 468									
25										L	L	L	L	L	L									
26										L	L	L		L	L	L								
27											L	L	L		L	U L 340	U L 296							
28											416	444	444	472	U L 496	U L 452	L							
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										5	4	4	5	6	2	1	2							
MED										376	390	458	452	442	412	340	292							
U Q										400	420	496	464	468										
L Q										370	384	440	426	424										

FEB. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 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								A	212	280	308	324	324	308	A	260	A	B							
2								B	236	288	308	332	324	308	300	264	A	B							
3								A	224	284	320	328	332	328	300	252	A	A							
4								216	228	280	324	332	340	324	308	264	A	A							
5								B	A	296	320	336	340	324	300	280	A	A							
6								A	A	296	324	336	344	336	308	276	208	B							
7								204	240	300	328	336	336	328	312	280	A	B							
8								A	280	A	324	A	352	340	324	280	240	B							
9								A	260	308	332	344	356	344	328	300	236	B							
10								A	A	A	A	348	360	356	324	292	220	A							
11								A	A	308	332	344	348	336	324	292	232	B							
12								176	272	316	336	348	344	352	324	296	208	A							
13								A	264	308	332	348	352	336	328	292	A	A							
14								A	264	304	336	344	344	336	320	296	236	B							
15								A	260	308	336	352	360	348	332	292	240	B							
16								A	256	280	328	340	340	328	316	284	A	B							
17								A	216	296	320	324	336	A	312	276	A	A							
18								A	276	312	336	348	348	340	328	284	A	A							
19								A	272	308	332	344	328	336	312	292	224	A							
20								204	272	304	332	344	340	328	332	300	248	A							
21								176	252	304	324	344	344	352	328	304	236	A							
22								196	A	312	324	336	348	340	328	304	240	B							
23								180	260	300	332	348	344	344	320	288	236	A							
24								B	A	U	A	A	336	340	332	316	284	260	A						
25								B	A	A	A	A	A	A	344	324	296	244	A						
26								B	228	A	U	A	A	332	336	336	316	292	248	A					
27								B	196	A	300	336	344	344	336	312	300	248	A						
28								B	A	U	A	A	316	324	324	332	312	288	256	172					
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								9	20	24	24	26	27	27	27	28	18	1							
MED								196	260	300	328	342	344	336	320	290	238	172							
U Q								210	272	308	332	344	348	344	328	296	248								
L Q								178	238	286	322	332	336	328	312	280	232								

FEB. 2023 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 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 24	E B E B 19 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	21	28		G	34	38	43	35	32	G	22	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16
2	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A E B 17 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	19	27	G	G	G	G	G	G	G	22	E B E B 15 14	E B E B 16 16	J A E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A 19
3	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A J A 37 17	J A J A 17 23	26	31	G	G	36	40	34	36	J A J A 27 33	J A J A 30 29	J A J A 32 27	J A J A 27 25	J A J A 25 24			
4	J A E B 25 16	E B E B 16 14	E B E B 14 14	E B E B 14 14	E B E B 16 16	E B E B 16 16	E B E B 16 16	G	26	32	36	36	G	G	35	33	J A J A 43 37	J A J A 25 29	J A J A 20 20	J A J A 20 20	J A J A 20 23	J A J A 23 23		
5	J A J A 22 22	E B E B 16 16	J A J A 19 19	J A J A 28 24	J A J A 24 24	J A J A 32 27	J A J A 27 26	G	G	G	G	G	G	35	G	34	J A 29	J A 19	J A J A 31 45	J A J A 31 29	J A J A 28 32			
6	J A J A 25 25	J A J A 20 21	J A J A 19 24	J A J A 16 16	J A J A 16 16	E B E B 16 16	E B E B 16 16	18	J A J A 29 26	J A J A 26 26	36	G	G	G	G	G	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A E B 28 16	E B E B 16 30		
7	J A J A 31 27	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	G	G	J A J A 29 29	G	G	G	G	G	34	32	23	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A E B 25 16	E B E B 16 21	
8	J A E B 21 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	20	G	J A J A 47 52	J A J A 78	G	G	G	G	G	G	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A 26	
9	J A J A 25 25	J A J A 25 20	J A J A 14 16	J A J A 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A 25	23	34	61	G	G	G	G	J A 25	G	E B E B 17 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 20	
10	J A J A 20 21	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	20	28	33	38	J A G	G	J A 55	26	31	26	J A E B 25 16	E B E B 16 16	J A J A 32 33	J A J A 25 18			
11	J A J A 16 20	J A J A 20 18	J A J A 19 16	J A J A 19 16	J A J A 19 16	J A J A 19 16	J A J A 19 16	23	53	29	28	G	G	G	G	G	G	E B E B 17 16	E B E B 25 21	E B E B 19 16	E B E B 16 38			
12	J A J A 28 32	J A J A 25 17	J A J A 17 16	J A J A 16 16	J A J A 16 16	J A J A 16 16	J A J A 16 16	G	G	G	G	G	G	G	G	G	J A J A 24 29	J A J A 27 25	J A J A 25 16	J A E B 19 16	E B E B 16 16	E B E B 16 16		
13	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A E B 19 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	19	G	G	G	G	G	G	G	G	G	24	J A J A 32 40	J A J A 31 20	E B E B 16 20	J A 20 28		
14	E B E B 16 16	E B E B 16 22	J A E B 23 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	19	G	34	27	G	G	G	G	J A J A 25 21	J A E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	J A J A 16 24	J A J A 23 20		
15	J A E B 23 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	20	G	G	J A 39	G	G	G	G	G	G	E B E B 16 16	E B E B 16 19	J A J A 25 19	E B E B 16 16	E B E B 16 16		
16	E B J A 16 18	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	21	G	31	G	J A 37	44	37	35	G	J A J A 31 26	J A J A 31 20	E B E B 16 16	E B E B 16 16	E B E B 16 18	J A J A 16 16		
17	J A 15	E B J A 19 16	E B J A 14 18	J A J A 15 17	J A J A 22 27	G	G	G	G	G	G	37	G	38	31	G	J A J A 27 25	J A J A 27 19	E B J A 16 19	E B J A 20 20	J A 20 25			
18	J A J A 49 32	J A J A 19 26	J A E B 19 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	21	G	G	G	G	J A 32	G	G	G	32	27	18	J A J A 17 32	J A J A 25 18	J A J A 17 16		
19	J A E B 20 27	E B E B 16 16	J A E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	20	G	35	G	G	G	G	G	G	26	20	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	
20	E B E B 16 16	E B E B 16 16	E B E B 16 18	E B E B 16 16	E B E B 16 16	E B E B 16 21	E B E B 16 23	23	G	34	G	G	G	G	G	G	32	28	20	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	
21	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	23	28	33	G	G	G	G	G	G	35	28	18	E B E B 16 16	E B E B 16 16	E B E B 16 19	E B E B 18 20	
22	E B E B 16 16	E B E B 16 16	E B E B 16 20	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 23	J A 27	G	G	G	39	40	40	41	33	32	21	E B J A 16 53	J A E B 98 16	E B E B 16 20			
23	J A J A 19 16	E B E B 16 16	E B E B 16 16	E B E B 16 24	E B E B 16 16	E B E B 16 16	E B E B 16 25	31	33	37	38	G	36	37	37	27	J A J A 21 19	J A J A 18 18	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16		
24	E B 16	E B E B 20 16	E B E B 16 20	J A J A 20 20	J A J A 31 28	J A J A 45 38	G	G	G	G	G	G	G	G	G	34	29	22	J A J A 20 42	J A J A 27 21	J A J A 28 36			
25	J A J A 22 25	J A J A 18 19	J A E B 18 27	E B E B 16 22	E B E B 28 32	E B E B 37 39	E B E B 39 31	35	34	33	J A J A 24 19	J A J A 15 19	J A J A 16 16	J A J A 16 61				J A J A 24 19	J A J A 15 19	E B E B 16 16	E B E B 16 16	E B E B 16 16		
26	J A J A 20 21	J A J A 20 20	J A E B 20 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	30	33	47	G	G	G	G	G	G	28	J A 24	J A E B 20 23	E B E B 16 16	E B E B 16 32	J A 19		
27	J A J A 22 15	J A J A 15 20	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 23	E B E B 16 27	27	38	G	G	G	G	G	G	G	G	19	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	
28	J A J A 13 18	J A J A 25 21	J A J A 18 21	J A J A 18 21	J A J A 18 27	J A J A 28 32	G	G	G	G	G	G	G	G	G	G	G	20	J A J A 23 23	J A E B 23 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	J A J A 20 19	E B E B 16 16	J A E B 18 16	E B E B 16 16	E B E B 16 16	E B E B 16 21	E B E B 16 31	26	31	G	G	G	G	G	G	G	26	20	E B 16 18	J A E B 18 16	E B E B 16 16	E B E B 16 20		
U Q	J A J A 24 25	J A J A 20 20	J A J A 19 16	J A J A 16 16	J A J A 23 28	J A J A 33 38	J A 36	G	G	G	G	G	G	36	34	32	28	J A J A 24 24	J A J A 27 25	J A J A 20 22	J A J A 22 26			
L Q	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 19	G	G	G	G	G	G	G	G	G	G	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	E B E B 16 16	

FEB. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 2023 fbEs (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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 20	E 27	G	G 33	G 36	G 40	G 33	G 31	G	G 22	E 16	E 16	E 16	E 16	E 16	E 16	E 16	
2	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 18	E 27	G	G G	G G	G G	G G	G G	G	G 22	E 15	E 14	E 16	E 16	E 16	E 16	E 16	
3	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 14	E 26	E 30	G	G	G 35	G 40	G 33	G 35	E 24	E 25	E 16	E 16	E 16	E 16	E 16	E 16	
4	E 16	E 16	E 14	E 14	E 14	E 16	E 16	G	E 26	E 32	E 36	E 35	G	G	G 34	G 32	E 23	E 22	E 18	E 21	E 16	E 16	E 16	E 16	
5	E 16	E 16	E 16	E 16	E 16	E 18	E 16	E 16	E 25	E 25	G	G	G	G	G	G	E 24	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	E 16	E 18	E 27	E 23	E 25	E 36	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	
7	E 17	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	G	G	G	G	G	G	E 22	E 16	E 16	E 16	E 16	E 16	E 16	E 16	
8	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 20	G	E 41	E 23	E 41	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	
9	E 16	E 16	E 16	E 16	E 14	E 16	E 16	E 22	E 21	E 34	E 24	G	G	G	G	G	E 18	E 17	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	E 16	E 19	E 27	E 32	E 36	G	G	G	G	G	E 22	E 22	E 21	E 24	E 18	E 16	E 16	E 16	
11	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 21	E 28	E 26	E 25	G	G	G	G	G	E 17	E 16	E 16	E 16	E 16	E 16	E 16	E 16	
12	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	G	G	G	G	G	G	E 17	E 16	E 16	E 16	E 16	E 16	E 16	E 16	
13	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 18	G	G	G	G	G	G	G	G	E 24	E 19	E 20	E 16	E 16	E 16	E 16	E 16	
14	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 19	G	E 34	E 24	G	G	G	G	G	E 22	E 14	E 16	E 16	E 16	E 16	E 16	E 16	
15	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 20	G	G	E 25	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	
16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 21	G	E 30	E 36	E 30	E 36	E 34	G	G	E 26	E 16	E 23	E 17	E 16	E 16	E 16	E 16	
17	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 22	E 26	G	G	E 35	G	E 37	E 28	G	E 24	E 16	E 16	E 16	E 16	E 16	E 16	E 24	
18	E 16	E 20	E 16	E 16	E 16	E 16	E 16	E 21	G	G	G	G	E 25	G	G	G	E 28	E 25	E 18	E 16	E 16	E 16	E 16	E 16	
19	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 20	G	E 34	G	G	E 35	E 35	G	G	E 24	E 19	E 16	E 16	E 16	E 16	E 16	E 16	
20	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 22	G	E 33	G	G	G	G	G	G	E 32	E 28	E 18	E 16	E 16	E 16	E 16	E 16	
21	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 23	E 28	E 32	G	G	G	G	G	G	E 25	E 18	E 16	E 16	E 16	E 16	E 16	E 16	
22	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 22	E 27	G	G	E 38	E 39	E 39	E 40	E 32	E 32	E 21	E 16	E 53	E 16	E 16	E 16	E 16	
23	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 24	E 30	E 32	E 37	E 36	G	E 36	E 36	E 36	E 27	E 20	E 17	E 16	E 16	E 16	E 16	E 16	
24	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 23	G	E 42	E 35	G	G	G	G	G	E 34	E 28	E 20	E 19	E 23	E 16	E 16	E 22	
25	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 22	E 28	E 31	E 37	E 36	E 36	E 29	E 34	E 33	E 31	E 22	E 16	E 16	E 16	E 16	E 16	E 16	
26	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	E 28	E 33	E 36	G	G	G	G	G	E 28	E 20	E 16	E 16	E 16	E 16	E 16	E 16	
27	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 22	E 27	G	E 37	G	G	G	G	G	G	E 18	E 16	E 16	E 16	E 16	E 16	E 16	
28	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 24	E 27	E 30	G	G	G	G	G	G	G	E 20	E 16	E 16	E 16	E 16	E 16	E 16	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 20	E 26	E 30	G	G	G	G	G	G	E 24	E 18	E 16	E 16	E 16	E 16	E 16	E 16	
U Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 22	E 27	E 32	E 34	E 36	G	E 34	E 34	E 31	E 26	E 20	E 16	E 16	E 16	E 16	E 16	E 16	
L Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 18	G	G	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	

FEB. 2023 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 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

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

FEB. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 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

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	290	279	284	278	291	280	350	352	368	354	322	335	328	320	349	352	335	326	334	331	310	288	321	286
2	F	283	281	294	309	288	300	283	346	346	352	343	332	334	332	342	353	346	318	317	316	320	309	297	271
3	F	283	283	286	293	304	298	313	364	359	361	345	326	321	331	340	349	346	331	312	324	308	303	286	282
4	F	265	271	271	271	282	267	315	363	358	336	338	335	328	325	336	332	338	322	333	314	314	292	287	285
5		277	279	291	317	325	327	335	359	360	353	338	342	339	331	333	348	349	320	321	319	297	291	290	291
6		279	286	293	276	285	293	306	341	353	346	336	319	322	319	327	332	330	311	310	308	275	289	294	291
7		296	291	263	279	283	289	307	348	354	356	337	321	327	317	324	326	321	324	316	293	275	270	274	279
8		297	288	275	266	258	278	291	340	356	347	342	313	318	319	310	316	323	324	321	284	277	283	264	259
9		271	281	289	289	281	267	320	354	353	335	320	327	320	310	314	315	319	325	306	297	288	302	282	284
10		276	278	275	277	286	264	287	340	335	348	324	307	310	300	302	307	319	325	301	306	313	290	283	270
11	F	261	269	280	296	341	273	270	325	338	342	328	317	329	315	320	316	317	321	307	311	273	266	275	269
12	F	288	280	272	270	283	259	307	332	336	331	321	322	318	317	312	316	309	305	303	300	298	290	289	279
13		297	260	266	273	270	272	295	354	358	324	329	324	310	314	317	311	317	319	324	319	309	295	275	258
14		271	271	293	282	307	295	308	340	352	335	320	316	303	317	305	315	304	314	313	306	289	270	282	276
15		280	285	288	272	283	287	313	349	354	346	324	318	308	301	306	311	308	316	303	304	279	273	285	253
16		271	256	258	262	256	263	301	346	292	330	318	319	317	310	315	315	309	304	313	311	288	266	274	286
17		292	244	248	267	317	259	276	317	318	321	309	324	317	334	322	338	329	330	325	315	291	294	302	299
18		283	279	278	285	296	286	307	353	345	346	338	332	330	330	331	340	338	333	327	307	318	297	282	254
19	F	257	268	281	301	324	277	292	343	341	336	330	325	303	318	321	332	334	344	310	296	306	302	289	280
20		267	272	280	296	310	290	299	340	361	329	334	318	323	330	318	324	352	323	342	307	315	316	278	291
21		279	275	270	260	267	266	286	350	339	323	312	313	307	317	321	332	319	322	324	301	271	267	248	276
22		306	324	278	272	269	276	284	340	345	331	323	331	319	324	328	336	326	336	325	A	293	288	280	276
23		275	285	282	282	270	273	311	352	350	331	323	337	307	315	312	315	341	333	342	301	280	274	270	284
24		278	283	257	274	260	264	307	360	328	329	317	324	322	325	328	328	345	329	327	313	314	285	288	287
25		280	287	290	297	297	301	321	342	363	332	322	317	322	322	326	317	336	341	327	306	305	298	284	272
26		277	273	254	252	260	269	299	355	305	352	327	328	311	323	307	320	324	333	325	302	294	291	284	276
27		283	266	264	275	293	318	319	331	327	312	330	321	306	299	313	314	310	287	289	298	295	253	287	247
28	F	265	325	F	242	240	251	280	293	345	237	259	254	289	284	317	326	328	325	298	295	287	283	283	268
29																									
30																									
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		27	28	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	28	28
MED		279	279	278	276	284	276	306	346	348	336	326	323	318	318	320	325	327	324	319	306	294	290	284	278
U Q		288	285	288	291	300	292	313	354	357	348	336	330	325	325	328	334	338	330	326	314	310	296	288	286
L Q		271	270	266	270	270	266	289	340	337	330	320	318	309	314	312	315	318	318	308	300	284	274	276	270

FEB. 2023 M(3000)F2 (0.01)

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FEB. 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 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										
2												L	U L 402	L										
3												L	L	L	L									
4											L	L	L	L	L									
5											L	L	U L 416	L	L									
6											U L 431	L	L	L	U L 420									
7											U L 431	L	L		L									
8											L	L	L	L	L	L								
9												L	L	L	L									
10											L	L		L	L									
11										L	L	L	U L 419	L	L									
12											L	L	L	U L 406										
13												L		U L 422										
14													L	U L 413										
15												L												
16												L	L	L			L							
17										L	L	L	L	U L 420										
18										440		L		L				410						
19											L	L	L	L	L									
20										U L 447	U L 428			L	L									
21											L		L	L	L	L								
22												L	L	L										
23											L	L	L	L	L									
24										L	L	L	L	U L 404	U L 411	U L 387								
25										L	L	L	L	L	L									
26										L	L	L		L	L	L								
27											L	L	L		L	U L 433	U L 403							
28										345	359	369	337	U L 330	U L 368									
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										5	4	4	5	6	2	1	2							
MED										434	430	379	411	410	394	433	406							
U Q										U L 444	U L 431	U L 392	U L 418	U L 420										
L Q										389	394	373	370	387										

FEB. 2023 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 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												228	236												
2												234	228	236											
3												222	242	232	224										
4											236	226	232	236	222										
5											220	228	216	214	228										
6											212	222	216	224	220										
7											218	260	236	222											
8											226	264	228	240	230	222									
9												238	232	226	240										
10											250	234	224	234											
11										224	214	214	222	220	264										
12											264	282	232	236											
13												218	226												
14													272	228											
15												234													
16												272	236	232	228										
17										228	242	226	220	220											
18										208	214		232			212									
19											224	234	220	238	224										
20										206	212		246	232											
21											234	270	256	236	228										
22											214	246	246	238											
23										252	248	240	242	234	234										
24										240	220	230	228	232	218										
25										204	224	254	260	252	230										
26										224	216	250	232	268	238										
27										206	230	220	224	240	220	238									
28										566	490	490	352	352	278	248									
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT										11	19	24	21	25	18	6	2								
MED										224	224	234	232	232	231	228	225								
U Q										240	242	252	244	238	240	238									
L Q										206	216	226	223	226	224	222									

FEB. 2023 h'F2 (KM)

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FEB. 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	250	270	256	238	254	266	196	210	206	210	204	218	218	206	212	208	202	214	220	206	224	266	242	252
2	268	260	266	252	238	232	248	208	210	204	208	202	202	208	224	202	198	210	202	222	214	232	230	288
3	278	280	266	258	234	246	198	198	204	208	212	198	210	222	206	212	200	202	198	228	240	254	240	256
4	290	304	310	294	258	282	208	202	196	212	220	216	202	220	214	210	206	204	200	226	230	252	246	276
5	292	294	264	234	210	232	216	204	198	206	198	216	198	194	218	218	202	196	204	212	234	264	268	258
6	292	274	270	280	270	256	224	208	196	202	192	212	212	208	200	208	206	224	210	210	256	252	242	244
7	264	262	292	282	252	238	206	204	210	204	198	220	216	212	212	222	212	204	192	226	278	286	256	266
8	248	228	252	276	312	278	194	212	216	216	210	212	224	206	212	216	216	206	198	206	262	266	294	312
9	278	254	250	238	270	266	226	204	208	200	212	218	220	204	210	224	214	212	188	222	250	236	254	258
10	248	278	280	274	236	292	208	214	206	204	204	216	228	204	214	220	210	212	198	224	226	244	266	266
11	300	296	272	250	200	294	314	234	224	216	202	206	200	192	206	212	210	218	184	218	238	264	272	306
12	262	252	262	268	266	280	226	204	208	208	194	216	210	202	212	220	218	202	202	216	222	254	264	272
13	248	288	280	272	264	280	218	204	208	210	198	200	206	204	224	216	216	212	216	210	222	226	254	294
14	270	264	258	254	234	220	212	208	212	212	204	212	200	204	218	218	210	210	208	212	204	270	256	274
15	274	268	262	278	264	230	204	202	204	222	204	200	220	222	220	220	224	222	210	206	236	262	254	296
16	276	314	288	294	268	278	238	216	220	214	220	198	218	212	226	212	216	216	210	210	240	268	240	256
17	244	350	334	246	196	352	288	230	220	214	206	220	202	194	206	212	206	204	198	212	254	242	254	E A 268
18	262	E A 300	272	274	242	232	242	204	206	186	210	214	224	208	218	214	208	202	184	218	214	238	266	294
19	310	296	270	238	220	264	252	204	200	210	206	206	204	206	216	216	216	200	176	224	218	232	262	278
20	296	294	274	254	228	236	234	216	202	186	194	204	214	218	212	214	214	192	194	206	222	220	280	270
21	286	300	302	308	296	308	258	202	212	202	214	206	186	226	208	218	212	208	204	206	256	282	338	282
22	240	202	222	310	302	308	272	224	212	196	212	222	234	224	220	222	210	208	192	A	244	270	284	298
23	282	284	280	294	288	292	216	208	218	212	202	210	206	216	206	228	214	206	194	222	244	272	288	274
24	268	266	314	290	316	300	250	210	210	228	214	200	196	200	208	216	216	204	204	232	224	236	258	E A 262
25	270	256	260	238	234	240	218	212	200	200	208	204	202	208	212	214	216	210	198	196	228	244	228	268
26	284	288	316	328	334	316	262	214	206	206	206	194	210	218	212	222	220	214	202	196	228	220	268	278
27	274	292	306	282	252	208	202	216	222	186	218	214	210	232	210	206	226	248	226	212	198	260	266	260
28	236	Q 230	254	346	342	338	278	E A 286	248	230	224	220	242	218	228	236	232	228	234	230	230	244	262	268
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	28	28
MED	272	278	271	274	256	272	225	208	208	208	206	212	210	208	212	216	213	209	201	212	230	253	260	271
U Q	285	295	290	292	279	293	251	215	214	213	212	216	219	218	218	220	216	214	209	224	244	266	268	285
L Q	256	261	261	251	234	237	208	204	204	202	202	203	202	204	209	212	207	204	194	206	222	237	250	261

FEB. 2023 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 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								A	110	112	108	108	106	110	A	108	A	B							
2								B	112	116	110	108	108	108	108	108	A	B							
3								A	108	110	106	108	106	110	108	102	A	A							
4								156	112	106	110	110	108	108	108	108	A	A							
5								B	A	114	108	108	108	108	106	106	A	A							
6								A	A	114	114	110	108	100	102	102	102	B							
7								160	94	100	104	104	104	104	104	106	A	B							
8								A	106	A	104	A	102	108	106	106	112	B							
9								A	114	110	110	106	106	106	106	106	106	B							
10								A	A	A	A	108	102	106	106	106	110	A							
11								A	A	110	110	104	104	100	104	104	110	B							
12								104	100	102	102	100	100	100	104	104	102	A							
13								A	100	102	110	108	106	102	102	104	A	A							
14								A	104	104	104	104	104	104	104	104	112	B							
15								A	108	106	110	108	104	104	104	104	106	B							
16								A	98	98	98	104	104	104	104	102	A	B							
17								A	100	100	100	100	104	A	120	100	A	A							
18								A	100	100	104	104	108	106	106	106	A	A							
19								A	106	102	100	100	100	102	102	102	102	A							
20								114	104	102	102	102	102	100	104	104	104	A							
21								120	100	100	100	100	100	102	102	102	106	A							
22								114	A	102	102	102	102	102	102	102	108	B							
23								108	100	100	100	100	100	100	104	104	110	A							
24								B	A	102	102	A	102	102	102	102	102	A							
25								B	A	A	A	A	A	112	110	110	108	A							
26								B	116	A	104	A	100	100	100	106	106	A							
27								B	114	A	102	102	100	100	102	104	106	A							
28								B	A	102	A	102	102	104	102	102	104	104	108						
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								9	20	24	24	26	27	27	27	28	18	1							
MED								114	103	102	104	104	104	104	104	104	106	108							
U Q								138	108	110	110	108	106	108	106	106	110								
L Q								111	100	101	102	102	102	100	102	102	104								

FEB. 2023 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 2023 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	94	110	B	B	B	B	B	122	120	G	124	110	106	106	106	G	142	B	B	B	B	B	B	B
2	B	B	B	92	B	B	B	146	150	G	G	G	G	G	G	G	142	B	B	B	92	B	B	92
3	B	B	B	B	B	96	96	100	174	164	G	G	134	112	112	104	102	98	98	92	92	88	86	92
4	86	B	B	B	B	B	B	G	170	184	170	170	G	G	124	108	100	98	96	92	88	88	98	90
5	98	90	B	100	96	98	96	94	92	92	G	G	G	134	G	118	92	100	100	98	96	100	96	98
6	94	98	98	94	94	94	B	162	102	98	92	162	G	G	G	G	G	B	B	B	B	92	B	104
7	88	88	B	B	B	B	B	G	G	88	90	G	G	G	124	112	104	B	B	B	96	B	B	90
8	90	B	B	B	B	B	B	190	G	100	98	92	G	G	G	G	G	B	B	B	B	B	B	92
9	92	92	92	92	B	B	B	98	98	186	96	G	G	G	G	G	86	B	B	B	B	B	B	86
10	98	94	B	B	B	B	B	112	142	132	100	G	G	92	92	90	148	88	B	B	98	94	98	92
11	92	106	90	88	92	B	102	100	102	98	98	G	G	G	G	G	G	B	B	92	84	90	B	94
12	92	92	98	102	96	B	B	G	G	G	G	G	G	G	G	90	88	90	86	86	B	88	B	B
13	B	88	B	92	92	B	B	144	G	G	G	90	G	G	G	G	90	90	82	86	96	90	90	
14	B	B	86	90	B	B	B	134	G	196	G	90	G	G	G	86	90	B	B	B	B	86	84	86
15	86	B	B	B	B	B	B	140	G	G	96	G	G	G	G	G	G	B	B	82	88	88	B	B
16	B	96	B	B	B	B	B	154	G	158	G	128	94	132	116	G	90	88	88	88	B	90	90	
17	90	96	B	92	92	92	88	122	148	G	G	108	G	102	98	G	88	88	88	82	B	96	106	92
18	112	88	92	92	86	B	B	130	G	G	G	G	90	G	G	108	102	100	98	96	96	96	96	92
19	92	94	B	94	B	94	B	160	G	184	G	G	140	172	G	G	158	114	B	B	B	B	B	B
20	B	B	B	B	B	B	92	162	G	146	G	G	G	G	G	136	120	106	B	B	B	B	B	B
21	B	B	B	B	B	B	B	146	166	174	G	G	G	G	140	G	124	166	B	B	B	96	90	124
22	B	B	B	94	B	B	B	190	110	G	G	178	152	130	122	132	114	166	B	98	98	B	B	90
23	96	124	B	B	100	B	B	182	190	184	170	148	G	158	138	112	142	86	86	88	86	B	B	B
24	B	126	B	B	104	104	98	98	G	102	100	G	G	G	G	198	160	120	102	98	96	104	98	90
25	94	94	90	90	90	90	B	104	100	98	182	94	92	94	148	126	110	108	104	104	90	B	B	92
26	94	90	96	96	96	B	B	G	108	102	102	G	G	G	G	G	112	108	86	90	B	B	94	98
27	98	94	94	92	B	B	B	152	110	G	168	G	G	G	G	G	G	204	B	B	98	B	B	B
28	116	108	106	100	108	102	104	102	108	104	G	G	G	G	G	G	G	164	102	84	86	B	B	B
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	19	10	17	12	8	7	24	17	19	14	11	7	10	11	14	21	19	13	16	16	13	12	20
MED	94	94	93	92	95	95	96	137	110	132	100	110	106	121	122	110	110	100	96	91	94	92	95	92
U Q	98	106	98	97	98	100	102	157	158	184	168	162	140	134	138	126	142	120	101	97	96	96	98	93
L Q	90	90	90	92	92	93	92	103	102	98	96	92	92	102	106	90	91	90	86	86	88	88	90	90

FEB. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

FEB. 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	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F2	F1							C3	C2		C1	C1	C2	C1	C1		H1								
2				F1					H1	H1								HC11				F1			F1	
3						F3	F1	C1	HC11	H1				H1	C1	C1	C2	C1	L4	F2	F2	F3	F2	F1	F1	
4	F1								H1	H1	H1	H1				C1	C2	C2	L3	F3	F2	F1	F1	F1	F1	
5	F1	F1		F1	F2	F3	F3	L3	L1	L1					H1		CL11	L2	C1	F1	F2	F1	F2	F3	F2	
6	F2	F1	F1	F2	F2	F3		H1	C2	L1	L1	H1											F3		F1	
7	F3	F2								L1	L1					C1	C1	C1					F3		F2	
8	F1							HH11		C2	L2	L2	L2												F1	
9	F2	F2	F1	F1				L2	L2	HL12	L1						L1								F1	
10	F1	F1						C1	HC11	HC12	C2	C2			L1	L1	L1	H1	L1			F3	F3	F2	F1	
11	F1	F1	F1	F1	F1		F2	C2	C2	L2	L1										F1	F1	F1		F3	
12	F3	F3	F1	F1	F1												L1	LH11	L1	FF11	F2		F1			
13		F1		F1	F1			H1					L1					L1	L2	F4	F2	F1		F1	F2	
14			F2	F1				HL11		H1			L1				L1	L1					F1	F2	F1	
15	F1							H1				L2									F1	F1	F1			
16		F1						H1		H1		C1	LC31	C1	C1		L2	L2	F3	F2				F1	F2	
17	F1	F1		F2	F1	F1	F2	CL21	HCL11			C1			C2	L2		LC11	L1	F1	F1		F3	F1	F6	
18	F2	F3	F1	F1	F1			H1						L2			C1	C2	C1	F1	F1	F3	F2	F2	F1	
19	F1	F1		F1		F1		HC11		H1				H1	H1			H1	C2							
20				F2			F2	H1		H1							H1	C1	C1							
21								H1	H1	H1								C1	H1					F1	F1	F1
22				F1				H1	C1				H1	H1	H1	C2	H2	C3	H2		F4	F4			F2	
23	F2	F1			F1			H1	H1	H1	H1	H1	H1		H1	H2	C2	HL11	L2	F2	F1	F1				
24		FF11			F1	F1	L1	LH21		C3	C2						HC11	H2	C2	F4	F5	F7	F2	F3	F6	
25	F2	F2	F2	F3	F1	F1		C2	C2	C2	HC12	L2	L2	L2	HL12	CL22	C3	C3	F1	F1	F1				F3	
26	F2	F5	F2	F2	F2			C2	C2	C2							C2	C1	F1	F1				F2	F1	
27	F1	F1	F1	F1				H1	C1		H1								H1				F1			
28	F1	F1	F4	F3	F2	F2	C1	C3	C2	C2									H1	FF32	F1	F1				
29																										
30																										
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																										
MED																										
U Q																										
L Q																										

FEB. 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 53	X 53	X 49	X 46	X 45	X 45	X 44												X 64	X 70	X 62	X 52	X 52	X 54	
2	X 53	X 51	X 51	X 46	X 43	X 42	X 42													X 69	X 71	X 55	X 51	X 52	X 50
3	X 47	X 47	X 49	X 49	X 49	X 49	X 48													X 62	X 60	X 51	X 49	X 48	X 44
4	X 45	X 47	X 48	X 48	X 48	X 49	X 54													X 76	X 74	X 54	X 52	X 52	X 50
5	X 48	X 49	X 50	X 52	X 44	X 39	X 40													X 66	X 63	X 63	X 56	X 56	X 55
6	X 55	X 54	X 55	X 54	X 50	X 46	X 47													X 81	X 81	X 66	X 60	X 58	X 60
7	X 53	X 52	X 51	X 51	X 49	X 47	X 50													X 80	X 69	X 68	X 69	X 72	X 64
8	X 62	X 53	X 45	X 44	X 45	X 45	X 53													X 82	X 67	X 58	X 61	X 59	X 54
9	X 56	X 58	X 53	X 45	X 43	X 44	X 45													X 88	X 76	X 66	X 69	X 66	X 60
10	X 60	X 57	X 52	X 49	X 49	X 44	X 48													X 94	X 80	X 69	X 65	X 59	X 59
11	X 57	X 56	X 58	X 57	X 50	X 38	X 42													X 100	X 90	X 70	X 61	X 59	X 60
12	X 58	X 52	X 45	X 45	X 44	X 43	X 45													X 101	X 86	X 78	X 66	X 58	X 57
13	X 55	X 49	X 46	X 46	X 44	X 44	X 47													X 93	X 88	X 68	X 65	X 62	X 58
14	X 61	X 58	X 57	X 58	X 51	X 45	X 47													X 93	X 84	X 82	X 71	X 64	X 59
15	X 56	X 57	X 54	X 54	X 53	X 51	X 53													X 113	X 96	X 81	X 72	X 67	X 64
16	X 61	X 61	X 61	X 57	X 56	X 55	X 60													X 110	X 102	X 80	X 77	X 70	X 66
17	X 62	X 47	X 50	X 56	X 31	X 37	X 42													X 82	X 73	X 69	X 62	X 60	X 60
18	X 62	X 56	X 56	X 54	X 50	X 45	X 49													X 84	X 73	X 65	X 55	X 54	X 55
19	X 55	X 54	X 56	X 57	X 47	X 38	X 39													X 75	X 64	X 68	X 61	X 52	X 50
20	X 50	X 50	X 50	X 52	X 54	X 41	X 44													X 85	X 65	X 61	X 57	X 50	X 50
21	X 50	X 51	X 52	X 51	X 48	X 50	X 53													X 79	X 74	X 72	X 62	X 60	X 61
22	X 65	X 62	X 54	X 36	X 39	X 40	X 45													X 82	X 65	X 59	X 50	X 49	X 49
23	X 49	X 49	X 48	X 48	X 47	X 44	X 51													X 77	X 52	X 48	X 50	X 53	X 54
24	X 53	X 47	X 46	X 46	X 46	X 46	X 52													X 81	X 73	X 60	X 50	X 47	X 48
25	X 48	X 49	X 50	X 53	X 49	X 45														X 89	X 76	X 58	X 53	X 54	X 50
26	X 47	X 47	X 46	X 46	X 46	X 46														X 97	X 76	X 62	X 59	X 58	X 56
27	X 54	X 54	X 54	X 54	X 52	X 46														X 116	X 108	X 96	X 74	X 79	X 74
28	X 73	X 75	X 63	X 67	X 72	X 72	X 72													X 84	X 81	X 70	X 58	X 58	X 58
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	25												28	28	28	28	28	28	
MED	X 55	X 52	X 51	X 51	X 48	X 45	X 47												X 83	X 74	X 66	X 60	X 58	X 56	
U Q	X 60	X 56	X 54	X 54	X 50	X 46	X 52												X 94	X 82	X 70	X 66	X 61	X 60	
L Q	X 50	X 49	X 48	X 46	X 44	X 42	X 44												X 78	X 68	X 60	X 52	X 52	X 50	

FEB. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

LAT. 35°43.0'N LON. 139°29.0'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	47	47	43	40	39	39	38	61	84	112	124	107	111	108	106	102	85	73	58	64	56	46	46	48
2	47	45	45	40	37	36	36	70	84	98	111	108	114	106	104	94	80	65	63	65	49	45	46	44
3	41	41	43	43	43	43	42	72	92	88	99	118	110	99	98	94	89	78	56	54	44	43	42	38
4	39	41	42	42	42	43	48	77	88	87	118	131	130	118	119	127	110	80	70	68	48	46	45	44
5	42	43	44	46	38	33	34	64	88	102	111	108	102	107	96	97	91	72	60	57	57	50	50	49
6	49	48	49	47	44	40	41	71	88	97	111	102	100	108	103	93	82	73	75	75	59	54	52	54
7	47	46	45	45	43	41	44	72	85	105	99	104	120	109	102	99	90	89	74	63	62	63	66	58
8	56	47	39	38	39	39	47	66	97	110	113	114	111	115	112	108	97	90	76	61	52	55	52	48
9	50	52	47	39	37	38	39	77	88	103	111	120	122	122	119	108	97	92	82	70	60	63	60	54
10	54	51	46	43	43	38	42	79	108	116	118	117	131	139	141	130	120	105	88	74	63	59	53	52
11	51	50	52	51	44	32	36	79	118	120	120	126	128	127	124	125	116	108	94	84	64	55	53	54
12	52	45	39	39	38	37	39	80	100	114	117	126	122	122	115	108	106	104	95	80	72	60	52	51
13	48	43	40	40	38	38	41	75	94	110	102	108	106	103	104	109	99	89	87	81	62	59	56	52
14	55	52	51	52	45	39	41	74	89	96	103	112	120	114	118	112	108	96	87	78	76	65	58	53
15	50	51	48	48	47	45	47	79	94	102	112	113	116	118	119	114	110	108	107	90	75	66	61	58
16	55	55	55	51	50	49	54	91	97	123	126	126	119	118	120	114	104	101	104	96	74	71	64	60
17	56	41	44	49	25	31	36	80	111	131	146	149	148	130	122	112	104	88	76	67	63	56	54	54
18	56	50	50	48	44	39	43	78	102	105	113	113	113	103	110	110	104	88	78	67	59	49	48	49
19	49	48	50	51	41	32	33	75	94	104	100	122	124	114	121	116	100	90	69	58	62	55	46	44
20	44	44	44	46	48	35	38	70	96	102	100	114	116	106	107	100	99	97	79	59	55	51	43	44
21	44	45	46	45	42	44	47	78	88	103	123	122	124	111	117	116	110	98	73	68	66	56	54	55
22	59	56	48	30	33	34	39	80	103	118	124	120	118	121	116	109	99	85	76	59	53	44	43	43
23	43	43	42	41	42	38	45	76	94	108	121	123	129	134	122	100	108	94	71	46	42	44	47	48
24	47	41	40	40	40	40	46	88	107	112	129	124	137	135	130	121	98	87	75	67	54	44	41	42
25	42	43	44	47	43	39	47	74	104	114	112	115	116	112	122	115	102	95	83	70	52	47	48	44
26	41	41	40	40	40	40	49	86	97	114	114	127	129	120	119	112	115	110	91	70	56	53	52	50
27	48	48	48	48	46	40	43	68	97	128	112	98	100	113	136	118	100	94	110	102	90	68	73	68
28	67	69	57	61	$\begin{matrix} F \\ 62 \end{matrix}$	$\begin{matrix} F \\ 63 \end{matrix}$	$\begin{matrix} F \\ 62 \end{matrix}$	58	71	$\begin{matrix} H \\ 66 \end{matrix}$	90	96	94	102	93	84	82	82	78	75	64	52	52	52
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	48	46	45	45	42	39	42	76	94	106	112	116	118	114	118	110	100	90	77	68	60	54	52	50
U Q	54	50	48	48	44	40	47	79	101	114	120	124	126	122	122	116	108	98	88	76	64	60	55	54
L Q	44	43	42	40	38	36	38	70	88	102	107	108	111	108	105	100	94	84	72	62	54	46	46	44

FEB. 2023 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

FEB. 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									
2										L	L	L	L	LU	L										
3										L	L	L	L	L	L	L									
4											L	L	L		A	A	L								
5											L	L	LU	L	L										
6											L	L	L	L	L	L									
7												LU	L												
8												L	L	L			L								
9										U L			L	L	L	L									
10												L	L			L									
11												L	L	L	L										
12										L		LU	L	L			LU	L							
13											L	L	L	L											
14											LU	L	LU	LU	L	A									
15										L	L	L	L			L	L								
16										L	L	L	A	L	L	L									
17										L	L	L	L			L	L								
18													L												
19										336	360		L	L	L	L									
20										L	L		L	L	L	L	L								
21											L	L			L	L									
22											L	L	L	L	L	L									
23											L	L	LU	L	L	L					L				
24										LU	L	L	L	L	L	L	L								
25											L	LU	L	L	L	L									
26									U L		L	L			L	L	L								
27											LU	LU	LU	LU	L	L	L								
28									L	U	LU	LU	LU	L	L	L									
29											492	484	516												
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									1	4	2	3	7	3	1		1								
MED									336	406	480	484	524	508	460		336								
U Q										L		488	552	528											
L Q											374	452	516	496											

FEB. 2023 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	252	300	316	352	364	336	A	A	240	A						
2								188	264	320	A	344	360	352	340	A	A	A						
3								A	264	308	R	336	364	364	352	336	A	A	A					
4								A	252	304	A	368	364	356	336	280	A	A						
5								A	256	296	344	352	360	352	328	308	A	A						
6								A	276	328	348	364	348	A	344	A	A	A						
7								A	276	328	348	372	376	368	348	308	U	A	A					
8								204	B	324	340	352	368	368	A	A	272	A						
9								184	264	324	356	376	396	372	364	332	280	A						
10								184	288	A	A	A	B	A	A	336	276	A						
11								200	264	A	360	376	388	392	360	328	260	A						
12								196	280	308	348	380	392	380	356	340	A	A						
13								196	268	328	348	376	384	380	376	348	268	A						
14								196	284	324	344	368	380	376	352	A	A	A						
15								200	288	328	356	384	372	372	376	A	A	200						
16								184	268	304	U	R	364	364	360	336	A	276	184					
17								A	284	316	320	368	360	352	356	A	268	A						
18								224	288	B	A	388	380	380	360	324	288	208						
19								204	276	316	340	356	364	364	352	320	272	A						
20								188	268	R	R	A	R	388	372	360	332	284	216					
21								212	280	328	356	372	376	372	360	300	272	A						
22								212	268	320	336	368	368	368	356	328	280	A						
23								204	292	332	344	360	356	376	352	324	U	A	276	180				
24								192	284	324	348	360	352	368	352	324	284	184						
25								A	A	A	340	352	384	364	364	348	328	284	A					
26								B	228	284	R	A	A	A	364	A	336	272	A					
27								B	224	240	320	352	U	A	372	U	A	U	A	280				
28								B	216	260	304	R	352	368	364	344	316	272	A					
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								20	26	25	23	25	26	26	24	19	20	6						
MED								200	272	320	344	368	368	368	352	324	274	192						
U Q								212	284	328	352	376	380	372	360	332	280	208						
L Q								190	264	308	340	358	364	360	342	312	270	184						

FEB. 2023 foE (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

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

LAT. 35°43.0'N LON. 139°29.0'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	J 25	A 17	J 21	A 18	E 16	B 16	B 16	B 20		31	38	36	39	38	37	36	31	G		J 18	A 16	E 16	B 15	B 16		
2		J 18	A 26	B 16	B 16	B 16	B 16		G	G		40	38		38		G 34	28	19	J 35	A 19	J 26	A 32	A 29	A 32	
3	J 16	A 16	B 16	B 16	B 16	B 16	B 16		G	G		37	41	42	42	41	46	J 39	A 31	A 58	A 27	A 27	A 27	A 24	A 16	
4	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G		38	41	46	J 50	A 57	A 84	A 48	A 32	A 49	A 36	A 36	A 32	A 26	A 18	A 16	
5	J 32	A 16	A 16	B 24	J 18	A 16	B 16		G		36	38	41	40	38	40	40	J 42	A 37	A 16	B 20		J 16	A 16	B 16	
6	J 19	A 25	A 31	A 24	E 19	B 16	B 16		G	G		38		38	40		G	32	28	J 30	A 47	A 28	A 16	B 16	B 16	
7	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	G		37	40		40	38	38	J 45	A 28	A 32	A 31	A 49	A 26	A 16	A 16	
8		E 19	B 16	B 16	B 16	B 16	B 16		E B		32	36	38	42	41	39	36	38		G	J 26	A 36	A 30	A 22	A 18	A 16
9	E 16	B 16	B 16	B 15	B 16	B 16	B 16		G	G		40	41	43	49					J 19	A 26	A 19	A 16	B 16	B 16	
10	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	J A	J A		E B				G	G		E	B	B	B	J A		E B
11	E 16	B 18	A 19	J 20	A 20	A 16	B 16		G		31	34		G		40	38	30	21	J 28	A 25	A 25	A 20	A 20	A 15	
12	J 20	A 25	A 25	J 32	A 28	A 26	B 16		G		35		42		42	50		29	22	J 17	A 16	B 16	B 16	B 16	B 16	
13	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	G		41		G	G	G			30	22	E	B	B	B	B	B
14	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	G		G		G	J A	J A	J A		J A	E	B	B	B	B	B	B
15	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	G		39		40	42	41	37	30		G	E	B	B	B	J A	B
16	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	G		37	40	48	41	37	36		G	20	E	B	B	B	J A	B
17	E 16	B 16	B 18	B 16	B 18	20	B 16		G	G		G	42	45	41	32	35		G	22	E	B	B	B	B	B
18	E 16	B 18	A 16	B 16	20	J A	E B		G	E B		35	40	41	40	42	40	J 45	A 35		G	E	B	J A	A	
19	J A	20	E 16	B 16	B 16	B 16	B 16		G	G		39	41	41	40	40	J 48	A 50		J 22	A 27	A 21	A 17	E B	20	
20	J 19	A 17	A 16	E 20	B 16	E 19	B 16		G	G		42	43	43	42		G	G		G	E	B	B	B	B	B
21	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	G		35	41		G	41	57	55	58	46	16	24	17	16	15	19
22		E 18	B 16	B 16	B 16	B 16	B 16		G	G		40		G	42	38	36		G	20	J 22	A 16	B 16	B 16	B 16	
23	E 16	B 65	A 17	A 21	E 16	B 16	B 16		G	G		38		40	44	42	46	J 36	A 20	E	B	B	B	J A	E B	
24	18	J 27	A 26	A 17	20	E 16	B 16		G		32	39		G		G	G		G	22	J 19	A 31	A 46	A 18	A 22	
25	J 27	A 30	A 23	E 16	B 16	A 14	A 34		G	G		36	39		41	40	37	40	34	J 39	A 32	A 28	A 23	A 15	A 16	
26	E 16	B 18	E 16	B 16	B 17	A 16	B 16		G	G		41	J 46	A 69	A 44	A 55	38	J 54	A 64	A 44	A 86	A 84	A 36	A 53	A 20	
27	J 23	A 18	A 20	A 18	E 16	B 16	B 18		G	G		40		G	G	39	36		G	22	J 19	A 26	A 26	A 20	E B	
28	E 16	B 15	A 18	E 16	B 16	B 16	B 16		G	G		38	39		G	G	38	35	34	J 37	A 34	A 43	A 61	A 39	A 21	
29																										
30																										
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	G		38	40	40	40	38	36	30	22	J 20	A 20	A 16	B 16	B 16	E B	
U Q	J 19	A 20	A 18	A 18	A 18	A 16	A 16		23	30	36	40	41	42	42	41	40	36	30	33	28	26	20	18	18	
L Q	E 16	B 16	B 16	B 16	B 16	B 16	B 16		G	G	G	G	G	G	G	G	G	G		E	B	B	B	B	B	B

FEB. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

FEB. 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	E 16	E 16	E 16	E 16	E 16	E 16	20	28	35	35	38	38	36	36	30	G	19	E 16	E 16	E 16	E 16	E 16	E 16	
2	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	36	37	G	36	G	34	28	19	28	E 16	17	23	22	26	
3	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	G	G	37	40	42	41	40	36	28	20	E 16	E 16	E 16	19	E 16	E 16	
4	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	G	37	41	45	44	51	71	42	24	30	28	19	24	E 16	E 16	E 16	
5	18	E 16	E 16	E 16	E 16	E 16	E 16	20	G	36	37	40	39	37	39	38	34	20	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	E 16	20	G	G	37	G	37	38	G	32	28	25	30	E 16	E 16	E 16	E 16	E 16	
7	E 16	E 16	E 16	E 16	E 16	E 16	E 16	21	G	G	37	40	G	40	36	38	40	20	18	29	E 16	E 16	E 16	E 16	
8	E 16	E 16	E 16	E 16	E 16	E 16	E 16	22	E 32	35	38	39	41	38	36	34	G	20	E 16	E 16	E 16	E 16	E 16	E 16	
9	E 16	E 16	E 16	E 15	E 16	E 16	E 16	22	G	G	40	40	42	44	G	G	G	19	21	E 16	E 16	E 16	E 16	E 16	
10	E 16	E 16	E 16	E 16	E 16	E 16	E 16	22	G	36	36	40	E 45	38	38	28	20	20	E 16	E 16	E 16	E 16	E 16	E 16	
11	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	30	34	G	G	G	G	39	36	29	21	E 16	18	21	E 16	E 16	E 16	
12	E 16	E 16	E 16	E 16	E 16	E 16	E 16	22	G	34	G	40	G	41	46	G	28	21	E 16	E 16	E 16	E 16	E 16	E 16	
13	E 16	E 16	E 16	E 16	E 16	E 16	E 16	22	31	35	G	41	G	G	G	G	28	22	E 16	E 16	E 16	E 16	E 16	E 16	
14	E 16	E 16	E 16	E 16	E 16	E 16	E 16	23	G	G	G	G	G	42	46	37	28	21	19	E 16	E 16	E 16	E 16	E 16	
15	E 16	E 16	E 16	E 16	E 16	E 16	E 16	22	G	G	39	G	40	40	40	36	29	G	E 16	E 16	E 16	E 16	E 16	E 16	
16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	21	G	G	37	40	45	40	36	33	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	E 16	E 16	21	G	G	G	40	43	40	30	34	G	22	E 16	E 16	E 16	E 16	E 16	E 16	
18	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	G	E 35	40	41	40	42	40	42	19	G	E 16	E 16	E 16	E 16	E 16	E 16	
19	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	G	G	39	41	40	40	40	45	42	20	26	E 16	E 16	E 16	E 16	E 16	
20	E 16	E 16	E 16	E 16	E 16	E 16	E 16	22	G	G	42	43	43	41	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	
21	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	35	40	G	G	40	40	43	39	28	E 16	E 16	E 16	E 16	E 16	E 16	
22	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	G	40	G	41	38	34	G	20	E 16	E 16	E 16	E 16	E 16	E 16	
23	E 16	E 16	E 16	E 16	E 16	E 16	E 16	23	G	G	38	G	39	42	41	42	34	20	E 16	E 16	E 16	E 16	E 16	E 16	
24	E 16	26	23	E 15	E 16	E 16	E 16	24	32	36	G	39	38	G	G	G	G	22	E 16	20	18	E 16	E 16	20	
25	19	E 16	E 16	E 16	E 16	E 16	E 16	28	29	35	36	39	G	41	40	36	39	32	29	28	24	20	E 16	E 16	
26	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	41	45	46	30	43	38	41	43	35	29	18	19	26	18	
27	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	30	G	G	38	G	G	38	34	G	21	E 16	E 16	24	E 16	E 16	E 16	
28	E 16	E 16	E 16	E 16	E 16	E 16	E 16	24	29	G	37	39	G	G	36	34	33	34	28	28	28	30	E 16	E 16	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	22	G	G	37	40	38	40	38	34	28	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	E 16	E 16	23	28	35	39	40	42	41	40	38	32	22	24	18	18	16	E 16	E 16	
L Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	G	G	G	G	G	G	G	G	G	G	E 16	E 16	E 16	E 16	E 16	E 16	

FEB. 2023 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

LAT. 35°43.0'N LON. 139°29.0'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	16	16	16	16	16	16	16	16	16	16	15	21	23	18	28	18	16	16	16	16	16	16	16	16
2	16	16	16	16	16	16	16	16	17	21	26	28	26	26	22	26	18	16	16	16	16	16	16	16
3	16	16	16	16	16	16	16	16	17	18	20	27	26	25	21	24	17	15	16	16	16	16	16	16
4	16	16	16	16	16	16	16	16	17	19	34	29	25	23	24	18	16	16	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	16	18	25	27	23	28	22	18	16	16	16	16	16	16	16	16
6	16	16	16	16	16	16	16	16	17	16	25	26	28	24	24	18	16	16	16	16	16	16	16	16
7	16	16	16	16	16	16	16	16	16	16	24	21	28	24	23	18	18	16	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	32	17	20	21	31	29	20	19	16	14	17	16	16	16	16	16
9	16	16	16	15	16	16	16	16	16	20	17	20	30	28	21	21	18	16	16	16	16	16	16	16
10	16	16	16	16	16	16	16	16	16	17	17	19	45	29	25	21	18	18	16	16	16	16	16	16
11	16	16	16	16	16	16	16	16	16	17	18	24	22	23	20	18	16	16	16	16	16	16	16	16
12	16	16	16	16	16	16	16	16	20	20	18	25	20	21	18	20	18	15	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	16	18	24	30	24	30	24	21	17	19	16	16	16	16	16	16
14	16	16	16	16	16	16	16	16	16	18	21	18	25	25	24	17	16	16	16	16	16	16	16	16
15	16	16	16	16	16	16	16	16	13	17	20	27	27	24	28	20	20	16	16	16	16	16	16	16
16	16	16	16	16	16	16	16	16	16	17	24	26	20	22	21	18	17	16	16	16	16	16	16	16
17	16	16	16	16	16	16	16	16	17	20	20	30	28	18	14	17	17	16	16	16	16	16	16	16
18	16	16	16	16	16	16	16	16	17	35	35	34	35	32	26	25	15	16	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	15	16	18	18	28	26	25	17	17	15	16	16	16	16	16	16
20	16	16	16	16	16	16	16	16	16	18	19	37	28	33	26	18	18	16	16	16	16	16	16	16
21	16	16	16	16	16	16	16	16	16	16	22	27	26	31	27	14	16	17	16	16	16	16	16	16
22	16	16	16	16	16	16	16	16	16	20	18	24	22	22	31	17	16	16	16	16	16	16	16	16
23	16	16	16	16	16	16	16	16	16	17	19	22	22	29	16	16	16	16	16	16	16	16	16	16
24	16	16	15	15	16	16	16	16	16	17	20	18	20	22	21	18	16	16	16	16	16	16	16	16
25	16	16	16	16	16	16	16	16	18	21	21	26	20	20	18	14	16	16	16	16	16	16	16	16
26	16	16	16	16	16	16	16	16	18	18	22	26	19	23	16	15	16	16	16	16	16	16	16	16
27	16	16	16	16	16	16	16	16	16	14	19	20	25	28	18	18	14	16	16	16	16	16	16	16
28	16	16	16	16	16	16	16	16	16	19	27	21	30	20	28	21	17	16	16	16	16	16	16	16
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	16	16	16	16	16	16	16	16	16	18	20	26	26	24	22	18	16	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	17	20	24	27	28	28	26	20	18	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	16	17	18	21	22	22	20	17	16	16	16	16	16	16	16	16

FEB. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

FEB. 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	272	286	288	296	280	275	312	350	346	340	339	304	318	320	314	336	330	356	302	318	324	298	291	271
2	300	308	320	316	298	287	309	354	364	332	354	328	318	319	322	323	346	333	306	325	326	296	290	304
3	289	277	282	306	315	303	345	359	378	337	324	329	336	324	319	331	329	343	317	323	299	293	322	298
4	285	267	277	314	290	277	315	360	354	320	315	322	324	309	303	318	347	321	313	342	306	297	300	293
5	279	285	301	345	351	287	321	348	343	347	344	336	332	338	330	323	349	336	321	312	315	295	295	289
6	287	296	304	310	325	282	310	363	344	338	348	337	309	317	314	322	329	316	299	318	309	286	286	312
7	302	296	276	293	297	302	314	343	350	342	338	308	314	311	313	317	307	318	310	286	285	284	304	306
8	312	328	272	262	263	268	358	351	337	342	317	321	304	300	298	296	303	315	313	313	271	290	295	270
9	280	302	337	320	252	268	301	359	349	337	320	316	299	300	301	304	301	317	314	317	287	290	301	280
10	298	306	292	270	309	264	293	348	338	325	319	293	293	285	286	292	292	301	313	310	295	310	287	292
11	278	280	297	311	326	261	279	323	345	324	326	303	306	299	288	294	293	300	293	301	269	268	270	303
12	293	325	292	276	277	265	294	340	342	327	311	307	306	296	291	290	297	287	301	286	262	269	284	306
13	310	310	281	283	290	279	301	346	338	338	322	325	304	302	292	310	314	307	309	322	296	290	285	269
14	285	301	292	312	317	293	319	346	345	325	323	311	315	292	296	292	300	314	306	295	259	266	286	280
15	283	294	295	290	289	283	309	347	346	338	317	311	304	293	300	291	304	298	311	304	277	294	276	277
16	264	272	279	280	266	262	285	337	334	315	320	304	301	296	300	305	304	294	302	320	291	299	297	287
17	317	231	253	310	356	265	272	322	324	321	318	316	312	320	316	320	332	328	316	309	300	296	292	292
18	290	298	290	309	320	279	306	350	356	338	331	335	319	319	316	328	340	330	322	316	327	299	282	285
19	271	274	300	327	356	266	285	345	348	338	314	317	314	305	312	322	323	344	314	291	301	314	298	287
20	283	277	281	297	343	290	297	345	346	335	312	328	316	316	314	319	321	337	328	294	313	313	298	278
21	280	275	277	281	269	267	296	342	325	324	321	309	313	297	303	310	317	341	310	303	302	273	267	265
22	308	329	349	260	269	274	303	331	327	324	322	308	301	311	319	326	328	329	344	318	301	296	287	284
23	279	288	287	285	301	275	306	345	331	333	326	309	309	307	315	298	325	345	338	300	271	273	279	290
24	317	269	258	267	267	264	291	344	328	323	328	309	313	315	311	315	334	331	309	349	316	294	294	284
25	271	284	299	315	316	296	319	338	341	344	332	322	310	304	307	314	326	331	321	313	311	299	308	303
26	283	275	266	258	265	261	286	338	326	301	320	315	317	303	311	301	317	324	325	310	292	287	295	298
27	292	282	284	301	322	289	307	328	320	342	341	318	284	288	309	314	307	296	302	302	298	261	261	279
28	261	297	275	258	$\begin{matrix} F \\ 245 \end{matrix}$	$\begin{matrix} F \\ 256 \end{matrix}$	$\begin{matrix} F \\ 276 \end{matrix}$	304	312	$\begin{matrix} H \\ 284 \end{matrix}$	306	324	306	320	325	327	324	328	304	316	312	267	291	298
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	285	287	288	296	298	275	304	345	342	334	322	316	311	306	311	314	322	326	312	312	300	294	291	288
U Q	299	302	298	312	321	287	313	350	347	338	332	324	316	318	316	322	330	334	319	318	312	298	298	298
L Q	279	276	277	278	269	265	292	338	330	324	318	308	304	298	300	300	304	310	305	302	286	278	284	280

FEB. 2023 M(3000)F2 (0.01)

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IONOSPHERIC DATA STATION Kokubunji

FEB. 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 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									
2										L	L	L	L	U L	L										
3										L	L	L	L	L	L	L									
4											L	L	L		A	A	L								
5											L	L	U L	L	L										
6											L	L	L	L	L	L									
7												U L	L												
8												L	L	L			L								
9									U L			L	L	L	L										
10												L	L		L										
11												L	L	L	L										
12										L		U L	L	L			U L								
13											L	L	L	L											
14											U L	U L	U L	U L	A										
15										L	L	L	L		L	L									
16										L	L	L	A	L	L	L									
17										L	L	L	L		L	L									
18													L												
19									437	454		L	L	L	L										
20									L	L		L	L	L	L	L									
21											L	L		L	L										
22											L	L	L	L	L	L									
23											L	L	U L	L	L						L				
24										U L	L	L	L	L	L	L									
25											L	U L	L	L	L	L									
26									U L		L	L		L	L	L									
27											U L	U L	U L	U L	L	L	L								
28									L		U L	U L	U L	L	L	L									
29											369	384	378												
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT									1	4	2	3	7	3	1		1								
MED									437	424	386	410	378	382	395		U L								
U Q										440		419	388	402											
L Q										L		U L	U L	U L											
										420		384	370	375											

FEB. 2023 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

FEB. 2023 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											240	220	246	236	268	232								
2										216	220	236	254	238	238									
3										214	228	248	228	230	238	230								
4											252	244	240		268	242	212							
5											234	234	232	256	236									
6											228	224	268	246	238	222								
7												278	264											
8												244	246	270		230								
9										218		250	240	244	278									
10												272	266		278									
11												278	244	266	280									
12										250		254	252	258		276	226							
13											240	232	266	290										
14											228	240	252	242	242									
15										220	264	234	250		266	242								
16										246	248	250	234	272	250	246								
17										224	240	228	230		224	220								
18													238											
19									210	214		268	252	236	250									
20									216	212		250	270	238	254	228								
21											248	232		262	248									
22										244	240	232	234	260	246	240								
23										222	242	244	262	266	234		242							
24										220	246	244	264	240	242	230								
25											244	258	250	236	264	238								
26										220	258	260		272	270	248								
27											212	226	296	264	274	230	232							
28									270		276	252	266	242	238	224								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									3	13	19	27	26	22	23	16	4							
MED									216	220	240	244	251	251	250	231	229							
U Q									270	234	248	254	264	266	268	242	237							
L Q									210	215	228	232	240	238	238	229	219							

FEB. 2023 h'F2 (KM)

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IONOSPHERIC DATA STATION Kokubunji

FEB. 2023 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'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	302	270	254	258	284	286	204	202	214	218	214	198	202	208	228	210	214	204	212	230	206	232	252	286
2	250	260	240	236	230	264	256	214	210	200	208	196	198	202	194	220	206	210	250	220	218	280	E A 278	E A 278
3	268	292	288	242	240	244	206	208	200	186	202	222	218	214	218	220	218	212	206	228	222	262	230	238
4	280	306	298	246	256	266	228	206	202	208	220	236	230	236	A	A	204	222	230	220	E A 234	246	252	264
5	294	284	254	218	206	248	218	202	204	220	214	218	206	190	220	218	216	204	202	222	224	244	254	260
6	270	266	258	242	216	248	230	210	204	214	218	206	206	212	218	206	218	212	262	228	216	264	258	230
7	232	252	274	254	232	232	232	208	210	218	210	210	214	212	220	232	224	216	198	E A 276	244	278	242	218
8	226	218	240	294	318	322	206	202	224	222	208	206	222	214	214	222	222	224	210	226	268	254	240	280
9	264	242	212	214	304	306	228	214	210	210	220	226	218	230	212	222	218	232	216	220	234	252	234	256
10	250	230	240	294	220	298	252	216	218	208	212	206	226	210	216	228	220	218	210	216	228	218	236	252
11	282	278	248	224	204	250	280	228	218	212	222	208	214	222	218	234	228	216	208	204	234	254	284	236
12	252	216	244	266	280	314	258	212	216	210	218	224	208	216	236	214	210	224	210	206	218	236	246	248
13	248	238	268	258	246	280	244	210	218	226	210	218	198	220	218	224	222	218	216	210	204	242	252	276
14	278	244	260	244	208	234	220	210	212	214	212	212	200	208	A	232	232	220	218	206	220	242	248	256
15	278	264	254	262	260	262	220	216	212	210	216	210	200	230	228	218	230	232	220	216	198	228	276	252
16	298	282	272	254	280	274	290	224	218	218	216	212	A	212	208	220	220	236	218	208	212	234	244	244
17	214	370	356	238	186	308	300	240	226	212	206	208	210	214	200	202	218	208	200	222	218	230	238	266
18	242	254	260	244	218	270	256	218	216	208	216	224	208	230	222	230	218	208	208	212	212	236	270	274
19	290	288	246	220	200	294	292	228	190	178	216	228	220	210	236	232	218	206	222	226	246	216	234	272
20	276	292	280	262	210	228	266	214	212	198	222	236	238	220	210	214	224	218	198	190	228	228	240	288
21	282	290	280	270	294	298	264	214	202	218	226	218	234	218	234	240	226	210	202	224	226	284	280	302
22	236	204	210	260	322	314	276	228	220	206	202	218	208	224	232	224	222	206	204	208	214	240	262	282
23	278	262	264	284	256	272	238	214	210	198	212	208	208	226	226	222	236	206	188	204	238	284	282	256
24	E A 226	E A 296	E A 356	314	316	312	262	218	220	206	198	204	190	224	208	214	214	212	200	212	220	240	252	E A 298
25	E A 316	292	276	246	224	250	E A 252	206	224	220	208	230	216	216	218	230	222	214	202	204	208	224	252	254
26	262	292	320	328	334	338	258	206	214	198	218	232	242	198	236	228	246	234	216	248	230	264	288	246
27	258	276	282	260	216	200	230	218	228	214	202	194	206	212	222	224	222	244	244	220	218	234	318	224
28	250	246	252	320	352	308	264	258	234	216	220	204	212	218	218	204	222	222	230	234	E A 226	312	252	246
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	27	28	26	27	28	28	28	28	28	28	28	28
MED	264	266	260	256	243	273	252	214	214	211	214	212	210	215	218	222	221	216	210	219	220	242	252	256
U Q	281	291	280	268	289	307	264	218	219	218	218	224	220	223	228	230	224	223	219	226	232	263	273	277
L Q	249	245	247	242	216	249	228	208	210	206	208	206	206	211	214	214	218	209	202	208	215	233	241	246

FEB. 2023 h'F (KM)

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FEB. 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								A	104	104	104	104	104	102	A	A	102	A						
2								132	106	106	A	106	106	104	104	A	A	A						
3								A	106	104	104	104	104	106	104	A	A	A						
4								A	104	102	A	108	108	110	106	104	A	A						
5								A	102	102	104	108	102	104	104	104	A	A						
6								A	106	104	102	106	108	A	106	A	A	A						
7								A	106	100	108	106	108	108	106	104	106	A						
8								124	B	100	102	102	110	108	A	A	108	A						
9								108	104	102	100	100	108	104	104	104	102	A						
10								118	98	A	A	A	B	A	A	100	106	A						
11								126	104	A	104	104	104	104	104	104	104	A						
12								110	104	100	100	102	102	102	100	100	A	A						
13								134	104	102	102	108	108	108	108	104	104	A						
14								126	104	104	104	100	100	102	102	A	A	A						
15								114	102	100	100	106	106	106	106	A	A	108						
16								116	102	100	100	100	100	104	104	A	108	110						
17								A	104	100	102	102	104	104	102	A	104	A						
18								110	106	B	A	106	114	114	110	108	108	106						
19								112	100	96	96	96	106	106	106	106	106	A						
20								110	100	100	102	A	102	110	102	102	106	116						
21								114	104	100	104	108	106	108	106	102	102	A						
22								114	102	100	100	100	100	100	118	104	106	A						
23								110	116	104	102	100	100	108	104	104	106	110						
24								106	102	102	102	102	102	102	102	102	106	114						
25								A	A	A	104	102	102	102	102	102	104	A						
26								B	108	100	102	A	A	A	108	A	106	106						
27								B	122	102	100	100	100	102	102	102	104	A						
28								B	108	104	102	98	98	112	110	110	108	A						
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								20	26	25	23	25	26	26	24	19	20	6						
MED								114	104	102	102	102	104	105	104	104	106	110						
U Q								123	104	104	104	106	108	108	106	104	106	114						
L Q								110	102	100	100	100	102	102	102	102	104	108						

FEB. 2023 h'E (KM)

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IONOSPHERIC DATA STATION Kokubunji

FEB. 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	98	94	88	92	B	B	B	136	118	108	104	106	114	108	104	102	G	94	90	92	B	B	B	B	
2	88	86	B	B	B	B	B	G	G	G	102	114	G	110	G	106	100	172	94	96	92	88	84	84	
3	86	B	B	B	B	B	B	136	G	G	162	136	122	116	110	106	102	102	98	94	92	88	84	B	
4	B	B	B	B	B	B	B	150	G	G	180	142	128	118	116	106	100	96	90	86	86	82	76	80	82
5	96	96	B	98	98	B	B	94	188	G	164	154	142	146	140	120	114	106	102	B	82	82	B	B	B
6	104	96	92	92	88	B	B	160	G	G	138	G	110	104	G	102	102	98	94	92	92	B	B	B	
7	B	B	B	B	B	B	B	156	G	G	168	178	G	142	144	114	100	98	100	96	96	92	88	B	
8	84	B	B	B	B	B	B	166	B	114	116	110	126	116	108	102	G	98	98	88	86	84	88	B	
9	B	B	B	B	B	B	B	164	G	G	144	142	118	110	G	G	G	134	88	88	B	B	B	B	
10	B	B	B	B	B	B	B	148	G	110	106	110	B	102	100	96	96	194	B	B	B	88	88	B	
11	B	98	112	94	94	B	B	G	112	104	G	G	G	G	136	120	124	110	98	92	90	92	94	94	
12	94	92	102	90	90	88	B	192	G	116	G	142	G	132	108	G	106	88	84	B	B	B	B	B	
13	B	B	B	B	B	B	B	190	206	164	G	140	G	G	G	G	152	138	B	B	B	B	B	B	
14	B	B	B	B	B	B	B	168	G	G	G	G	G	110	108	104	102	160	94	B	B	B	B	B	
15	B	B	B	B	B	B	B	178	G	G	116	G	116	110	112	106	106	G	B	B	B	B	128	B	
16	B	B	B	B	B	B	B	194	G	G	160	134	110	116	110	104	G	210	B	B	B	92	92	B	
17	B	B	96	B	90	90	B	124	G	G	G	116	108	108	88	108	G	98	B	B	B	B	B	B	
18	B	88	B	B	90	86	B	176	G	B	176	150	138	126	130	112	88	G	B	B	B	B	96	96	
19	94	94	B	B	B	B	B	174	G	G	174	148	138	152	148	118	106	106	94	92	96	92	96	96	
20	96	96	B	B	B	96	B	158	G	G	182	160	140	132	G	G	G	G	B	B	B	B	B	B	
21	B	B	B	B	B	B	B	G	G	152	138	G	G	132	122	104	102	96	B	92	92	B	92	94	
22	110	B	B	B	B	B	B	G	G	G	G	194	G	142	136	130	G	102	100	B	B	B	B	B	
23	B	106	96	96	B	B	B	160	96	192	G	G	156	122	114	108	110	128	B	B	B	116	B	88	
24	102	102	100	100	100	B	B	142	138	122	G	112	112	G	G	G	G	150	110	96	94	94	92	90	
25	94	90	90	B	B	102	96	98	94	198	178	G	158	176	162	118	110	104	100	96	94	92	92	B	
26	B	118	B	B	94	92	B	G	G	G	102	100	94	92	100	128	112	100	98	98	94	94	94	92	
27	90	90	88	94	B	B	92	178	152	G	G	112	G	G	G	G	G	104	98	96	92	102	96	B	
28	B	104	108	B	B	B	B	128	142	G	126	126	G	G	118	118	116	102	98	96	96	94	94	90	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	13	15	10	9	8	6	3	23	8	11	20	21	17	23	22	23	19	25	18	18	15	16	16	10	
MED	94	96	96	94	92	91	94	160	128	122	143	134	118	116	111	106	106	102	98	93	92	92	92	91	
U Q	100	102	102	97	96	96	96	178	147	164	171	145	139	132	130	118	110	136	98	96	94	94	94	94	
L Q	89	90	90	92	90	88	92	142	104	110	116	112	111	110	108	104	100	98	94	92	90	88	88	88	

FEB. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

FEB. 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

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

FEB. 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

FEB. 2023 f_{XI} (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	X 47	X 50	X 47	X 50	X 48	X 46	X 48													X 110	X 104	X 91	X 72	X 58	
2	X 50	X 45	X 45	X 44	X 41	X 40	X 39													X 78	X 70	X 60	X 54	X 56	
3	X 55	X 52	X 50	X 52	X 61	X 52	X 46													X 105	X 94	X 86	X 72	X 59	
4	X 50	X 44	X 43	X 46	X 46	X 44	X 48													X 90	X 85	X 62	X 56	X 55	
5	X 51	X 50	X 52	X 53	X 47	X 38	X 36													X 72	X 77	X 72	X 59	X 56	
6	X 53	X 51	X 52	X 52	X 53	X 42	X 42													X 97	X 87	X 72	X 67	X 62	
7	X 53	X 47	X 46	X 49	X 52	X 42	X 41													X 94	X 96	X 98	X 92	X 83	
8	X 68	X 51	X 44	X 44	X 44	X 44	X 48													X 116	X 88	X 80	X 71	X 56	
9	X 55	X 60	X 55	X 40	X 37	X 39	X 35													X 100	X 84	X 82	X 78	X 67	
10	X 62	X 64	X 51	X 44	X 48	X 41	X 41													X 125	X 112	X 96	X 83	X 72	
11	X 62	X 60	X 60	X 57	X 54	X 40	X 40													X 138	X 126	X 94	X 72	X 72	
12	X 60	X 54	X 51	X 48	X 49	X 46	X 46													X 158	X 140	X 120	X 93	X 73	
13	X 60	X 56	X 50	X 47	X 48	X 39	X 38													X 101	X 98	X 109	X 94	X 84	
14	X 73	X 65	X 57	X 56	X 56	X 45	X 41													X 164	X 158	X 137	X 112	X 94	
15	X 66	X 60	X 58	X 58	X 54	X 48	X 46													X 134	X 131	X 118	X 110	X 110	
16	X 84	X 78	X 72	X 69	X 56	X 53	X 54													X 136	X 128	X 112	X 84	X 79	
17	X 65	X 44	X 48	X 57	X 34	X 36	X 37													X 114	X 107	X 96	X 92	X 88	
18	X 82	X 73	X 62	X 58	X 52	X 44	X 43													X 105	X 88	X 84	X 75	X 72	
19	X 70	X 61	X 60	X 61	X 53	X 40	X 40													X 100	X 102	X 94	X 95	X 82	
20	X 61	X 57	X 53	X 54	X 56	X 43	X 41													X 89	X 83	X 81	X 65	X 58	
21	X 64	X 61	X 58	X 57	X 54	X 53	X 56													X 94	X 96	X 82	X 81	X 64	
22	X 65	X 64	X 48	X 40	X 43	X 44	X 45													X 90	X 82	X 62	X 50	X 50	
23	X 48	X 49	X 48	X 48	X 50	X 47	X 47													X 72	X 61	X 60	X 59	X 58	
24	X 54	X 44	X 45	X 46	X 46	X 46	X 47													X 90	X 78	X 60	X 48	X 50	
25	X 49	X 50	X 52	X 53	X 48	X 49	X 47													X 116	X 108	X 83	X 60	X 58	
26	X 53	X 46	X 45	X 45	X 45	X 45	X 46													X 109	X 94	X 88	X 75	X 64	
27	X 51	X 49	X 51	X 52	X 53	X 43	X 40													X 128	X 110	X 89	X 90	X 92	
28	X 84	X 79	X 74	X 62	X 62	X 72	X 74													X 108	X 90	X 74	X 73	X 71	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28													28	28	28	28	28	
MED	X 60	X 53	X 51	X 52	X 50	X 44	X 44													X 105	X 95	X 85	X 74	X 66	
U Q	X 66	X 61	X 58	X 57	X 54	X 46	X 47													X 120	X 109	X 96	X 91	X 80	
L Q	X 52	X 49	X 48	X 46	X 46	X 40	X 40													X 92	X 84	X 73	X 62	X 58	

FEB. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

FEB. 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	41	44	41	44	42	40	43	54	81	100	121	120	121	128	120	118	114	108	109	104	98	85	66	52						
2	43	39	39	38	35	34	33	48	83	90	94	106	112	117	106	108	112	99	82	72	64	54	48	50						
3	49	46	44	47	55	46	40	56	90	94	104	130	129	120	120	116	122	RJ	RJ	R	88	80	66	53						
4	44	38	37	40	40	38	42	56	84	92	122	147	141	135	143	147	125	127	108	84	79	56	50	49						
5	45	44	46	47	41	32	30	48	88	102	96	104	114	107	110	108	104	95	72	66	71	66	53	49						
6	47	45	46	46	47	36	36	51	86	90	110	114	114	124	122	116	100	90	90	91	81	66	61	56						
7	47	41	40	43	46	36	35	53	86	102	94	102	127	126	108	109	105	110	J	R	R	U	R	77						
8	60	45	38	38	38	38	42	52	87	108	110	121	124	133	135	137	140	134	J	R	U	R	74	65	50					
9	49	54	49	34	31	33	29	58	88	95	106	117	128	131	134	127	123	117	110	94	78	76	72	61						
10	56	58	45	38	42	35	35	63	104	115	111	117	138	145	145	146	J	R	J	R	J	R	90	77	66					
11	56	54	54	51	48	34	34	56	100	118	123	138	143	145	151	151	148	J	R	J	R	U	R	66	66					
12	53	48	45	42	43	40	40	61	96	118	130	126	123	135	143	146	R	R	R	U	R	R	87	67						
13	54	50	44	41	41	33	32	58	94	108	110	109	114	110	115	118	114	108	102	95	92	103	88	78						
14	67	59	51	50	50	39	35	58	89	104	108	116	128	131	137	152	166	166	166	158	152	133	J	R	J	R	88			
15	60	54	52	52	48	42	40	61	92	96	110	116	116	119	122	124	126	126	137	128	125	112	J	R	J	R	104	104		
16	J	R	78	72	66	63	50	47	48	78	87	114	118	123	124	128	128	127	120	120	134	130	J	R	J	R	R	R		
17	59	38	42	51	28	30	31	52	94	123	139	139	134	138	139	128	122	118	109	108	J	R	101	90	86	J	R	82		
18	76	67	56	52	46	38	37	59	95	108	115	108	115	110	114	122	108	103	104	99	82	78	69	66						
19	64	55	54	55	47	34	34	54	89	94	107	119	137	134	130	127	125	120	116	94	96	88	89	76						
20	55	51	47	48	50	37	35	52	91	103	112	120	121	125	118	110	101	103	98	82	77	75	59	52						
21	58	55	52	51	48	47	50	67	98	115	132	135	131	131	128	131	124	112	104	R	88	90	77	75	58					
22	59	58	42	34	37	38	39	58	96	113	128	128	126	130	124	132	122	104	93	84	76	56	44	44						
23	42	43	42	42	44	41	41	62	96	113	127	126	132	146	130	117	120	116	94	66	55	54	52	52						
24	48	38	39	40	40	40	41	67	96	100	120	119	134	142	143	135	119	102	99	84	72	54	42	44						
25	43	44	46	47	42	43	41	59	90	109	119	117	121	120	135	138	128	122	122	110	J	R	J	R	54	51				
26	47	40	39	39	39	39	40	72	94	105	118	129	134	138	127	126	133	137	122	103	88	82	69	58						
27	45	43	45	46	47	37	34	60	96	137	102	80	102	122	136	124	106	99	117	122	104	82	84	86						
28	78	73	68	56	56	66	68	84	106	95	107	126	110	122	114	98	96	95	101	102	84	68	67	65						
29																														
30																														
31																														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23						
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28					
MED	54	47	45	46	44	38	38	58	92	104	112	120	125	129	128	126	122	116	108	99	89	79	68	60						
U Q	60	55	52	51	48	40	41	62	96	114	122	127	133	135	136	136	127	126	125	114	103	90	85	74						
L Q	46	43	42	40	40	34	34	54	88	96	107	115	116	121	119	116	110	103	100	86	78	67	56	52						

FEB. 2023 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

FEB. 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	LU	LU	L								
2											L	LU	LU	LU	L	L	L								
3										L	LU	LU	LU	LU	LU	L	L								
4										UL	L	L	L	LU	L	L									
5										368	L	L	L	LU	L	L									
6										L	L	L	L	L	L	L									
7											L	LU	L	L	L	L	L								
8										L	L	L	L	L	L	L									
9												L	L	L	L	L	L								
10												L	L	L	L	L	L								
11												L	L	L	L	L	L								
12											L	L	LU	L	L	L	L								
13											LU	L	LU	L	L	L	L								
14													L	L	L	LU	L								
15											L	L	L	L	L	L	L								
16											L	L	L	L	L	L	L								
17											L	L	LU	L	L	L	L								
18											L	L	L	L	L	L	L								
19												L	L	L	L	L	L								
20											L	L	L	L	L	L	L								
21											LU	L	AU	LU	L	L	L								
22											LU	L	LU	L	L	L	L								
23											L	LU	L	L	L	A	L								
24										L	LU	LU	LU	LU	L	L	L								
25											LU	LU	L	L	LU	L	L								
26										LU	L	L	L	L	L	LU	L								
27												UL	L	L	L	L	L								
28										L	L	LU	L	L	L	L	L								
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT										1	2	6	10	9	5	3	1								
MED										UL	LU	LU	LU	LU	LU	LU	LU								
U Q										368	536	510	594	528	552	516	496								
L Q												528	632	596	596	592									
												500	540	520	536	488									

FEB. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B	232	284	324	348	A	344	A	336	300	A	B					
2								B	224	284	320	356	360	360	U A	A	292	224	B					
3								B	232	284	328	348	364	364	A	332	300	248	B					
4								B	228	288	328	356	372	372	372	U A	A	A	A					
5								B	236	292	328	360	376	368	356	340	304	A	A					
6								B	244	304	U A	U A	U A	U A	A	A	A	A	B					
7								B	224	296	344	364	388	380	372	352	A	248	176					
8								B	260	308	332	364	384	388	372	A	324	A	B					
9								180	248	312	348	368	388	400	A	364	328	252	B					
10								B	256	320	340	352	B	A	A	A	A	A	A					
11								B	256	308	344	A	388	388	380	360	320	268	B					
12								B	260	316	348	368	A	400	A	A	A	A	A					
13								176	244	312	352	384	A	A	392	A	308	260	A					
14								B	256	312	332	344	384	372	376	356	A	A	A					
15								176	252	316	344	368	380	380	380	356	324	260	B					
16								B	232	300	332	352	368	368	352	U A	A	312	A	A				
17								B	256	304	336	356	368	A	A	A	A	A	B					
18								192	272	312	340	356	368	368	384	352	324	A	A					
19								B	212	280	352	364	376	372	360	352	312	252	B					
20								176	232	308	340	376	376	376	368	348	324	A	A					
21								180	260	312	348	372	384	392	380	352	320	240	A					
22								A	244	304	332	348	360	368	368	348	308	A	A					
23								192	244	308	340	356	376	376	364	352	316	A	A					
24								A	268	316	340	360	368	368	368	352	320	264	A					
25								A	272	324	348	356	376	368	360	364	320	A	B					
26								A	272	316	344	356	360	352	364	348	316	264	A	A				
27								A	260	312	A	A	364	380	376	344	316	A	A					
28								A	252	308	344	360	368	376	356	340	328	264	A					
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								7	28	28	27	26	24	25	21	21	22	13	1					
MED								180	250	308	340	358	374	372	368	352	316	260	176					
U Q								192	260	312	344	364	382	380	378	354	324	264						
L Q								176	232	298	332	356	368	368	360	340	308	248						

FEB. 2023 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

FEB. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	31	38	44	41	40	36	27	G	G	E 24	E 16	E 16	E 16	E 16	E 16	E 16
2	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	G	G	41	43	40	41	34	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	E 16	E 16	G	G	40	40	44	40	38	G	G	E 16	E 16	E 16	E 16	E 16	20	20	
4	E 16	E 16	E 18	E 16	E 16	E 16	E 16	E 16	24	G	38	40	42	44	40	37	42	35	21	E 16	E 16	E 16	E 16	18	E 16
5	20	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	32	38	40	44	42	44	40	44	27	17	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	E 16	E 16	26	G	36	41	41	49	44	40	37	26	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	E 16	E 16	27	32	G	39	G	40	39	38	31	G	G	E 16	E 16	E 16	E 16	E 16	E 16
8	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	38	41	42	44	36	26	G	E 25	E 17	E 16	E 16	E 16	E 16	E 16
9	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	28	G	38	40	G	G	38	G	G	G	E 16	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	E 16	E 16	G	G	40	39	E 44	42	39	38	35	G	G	22	22	20	19	E 16	E 16
11	E 16	E 16	19	E 14	E 16	E 16	E 16	E 16	G	34	37	38	G	G	G	G	G	G	E 18	E 16	E 16	E 16	E 16	18	E 16
12	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	38	39	40	G	38	38	34	26	20	E 16	E 16	E 16	E 16	E 16	E 16
13	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	28	34	38	G	40	40	35	39	38	34	29	21	E 16	E 16	E 16	E 16	E 16
14	25	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	36	40	44	43	45	38	34	27	23	22	E 16	E 16	E 16	E 16	E 16
15	E 16	E 17	E 16	E 16	E 16	E 16	E 16	E 16	G	34	36	44	42	41	40	38	34	G	E 17	E 16	E 16	E 16	E 16	E 16	E 16
16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	32	G	41	50	44	39	40	26	26	39	24	E 16	E 16	E 16	E 16	E 16
17	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	41	43	39	38	36	29	23	18	E 16	E 16	E 16	E 16	E 16	E 16
18	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	34	36	42	43	41	46	40	48	31	E 19	E 16	E 16	E 16	E 16	E 16
19	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	34	38	39	43	41	40	38	G	G	E 27	E 19	E 16	E 16	E 16	E 16	E 16
20	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	40	41	41	42	44	45	42	32	28	E 16	E 16	E 16	E 16	E 16	E 16
21	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	34	40	42	52	51	45	41	37	29	20	E 16	E 16	E 16	E 16	E 16
22	E 16	E 16	20	E 16	E 16	E 16	E 16	E 16	G	G	G	G	G	G	G	G	44	36	30	20	E 16	E 16	E 16	E 16	E 16
23	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	28	G	G	41	42	42	43	42	36	32	25	20	20	17	E 16	E 16	
24	E 16	E 16	E 16	E 16	E 28	E 16	E 16	E 16	G	G	36	38	41	39	G	G	G	G	30	21	E 16	E 16	E 16	E 16	E 16
25	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	20	20	35	36	G	42	41	41	42	44	38	E 18	E 16	E 16	E 16	E 16	E 16
26	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	36	38	40	40	40	G	G	38	36	21	E 16	E 16	E 16	E 16	E 16
27	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	21	28	G	36	38	48	44	44	42	37	39	30	E 16	E 16	E 16	E 16	E 16
28	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	33	36	38	41	46	40	42	G	G	37	22	57	20	E 16	E 16
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	36	40	42	41	40	38	34	27	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	E 16	E 16	E 16	26	34	38	41	44	42	44	40	38	32	22	19	16	16	16	16	16
L Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	38	40	40	38	35	G	G	G	G	E 16	E 16	E 16	E 16	E 16

FEB. 2023 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

FEB. 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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	16	16	16	17	20	20	19	21	19	17	16	16	16	16	16	16	16
2	16	16	16	16	16	16	16	16	16	17	19	22	18	20	20	20	19	16	16	16	16	16	16	16
3	16	16	16	16	16	16	16	16	16	17	18	19	21	21	22	22	20	17	16	16	16	16	16	16
4	16	16	18	16	16	16	16	16	16	17	21	22	25	22	21	18	20	18	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	16	17	20	20	23	22	21	22	20	16	16	16	16	16	16	16
6	16	16	16	16	16	16	16	16	16	16	19	20	22	22	23	22	18	16	16	16	16	16	16	16
7	16	16	16	16	16	16	16	16	16	16	18	21	21	22	20	19	19	16	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	17	15	16	18	25	21	19	20	19	17	17	16	16	16	16	16
9	16	16	16	16	16	16	16	16	16	16	19	21	32	24	22	20	17	17	16	16	16	16	16	16
10	16	16	16	16	16	16	16	16	16	16	17	19	44	26	22	21	22	18	16	16	16	16	16	16
11	16	16	16	14	16	16	16	16	16	18	21	23	22	23	23	20	18	18	18	16	16	16	16	16
12	16	16	16	16	16	16	16	16	16	19	20	20	23	23	22	23	18	17	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	16	18	22	26	24	24	24	21	20	17	16	16	16	16	16	16
14	16	16	16	16	16	16	16	16	14	16	18	22	23	22	22	21	20	15	16	16	16	16	16	16
15	16	17	16	16	16	16	16	16	16	17	20	23	22	24	25	20	21	19	17	16	16	16	16	16
16	16	16	16	16	16	16	16	16	16	16	16	21	21	21	22	20	20	18	16	16	16	16	16	16
17	16	16	16	16	16	16	16	17	17	17	16	18	19	20	23	20	20	17	18	16	16	16	16	16
18	16	16	16	16	16	16	16	16	16	20	21	22	22	29	22	22	20	20	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	14	16	20	19	18	20	22	20	19	19	19	16	16	16	16	16
20	16	16	16	16	16	16	16	16	16	16	19	20	23	22	23	18	19	16	16	16	16	16	16	16
21	16	16	16	16	16	16	16	16	16	16	20	18	23	28	21	20	18	16	16	16	16	16	16	16
22	16	16	16	16	16	16	16	16	16	19	19	18	20	21	21	20	20	16	16	16	16	16	16	16
23	16	16	16	16	16	16	16	16	16	16	17	21	22	24	20	20	21	16	16	16	16	16	16	16
24	16	16	16	16	16	16	16	16	16	16	20	19	22	21	20	21	20	17	16	16	16	16	16	16
25	16	16	16	16	16	16	16	16	16	16	17	20	23	20	23	20	21	18	18	16	16	16	16	16
26	16	16	16	16	16	16	16	16	16	16	20	21	21	22	21	22	19	18	16	16	16	16	16	16
27	16	16	16	16	16	16	16	16	16	16	16	16	18	20	20	21	21	20	16	16	16	16	16	16
28	16	16	16	16	16	16	16	16	16	20	20	21	22	23	22	20	22	20	16	16	16	16	16	16
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	16	16	16	16	16	16	16	16	16	16	19	20	22	22	22	20	20	17	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	17	20	22	23	24	22	21	20	18	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	16	16	17	19	21	21	21	20	19	16	16	16	16	16	16	16

FEB. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

FEB. 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	313	290	268	303	289	268	295	325	347	347	341	329	305	320	316	308	321	310	298	270	319	301	279	289			
2	290	298	300	301	308	299	294	309	388	354	331	333	318	330	309	308	325	330	320	321	307	296	307	315			
3	309	302	290	302	343	370	294	318	364	353	331	331	326	314	306	301	303	312	RJ	RJ	R	296	267	258	275		
4	271	267	279	308	297	286	276	322	358	338	314	324	314	299	299	311	306	315	299	308	298	304	297	296			
5	283	278	292	327	354	300	282	318	359	355	350	325	327	318	309	314	326	340	317	291	320	304	297	288			
6	286	288	294	302	326	318	292	312	347	340	336	324	305	301	307	314	315	308	308	305	302	264	279	308			
7	308	285	283	297	334	307	283	300	345	344	343	303	302	317	301	298	298	312	J	R	R	279	277	301	294		
8	296	306	274	273	272	264	328	333	347	346	316	309	299	296	285	280	R	276	283	302	J	R	U	R	275		
9	266	319	339	361	256	274	264	319	351	336	320	305	300	292	294	290	290	305	307	312	291	291	306	288			
10	297	326	330	265	306	276	263	316	349	343	316	290	287	291	288	279	J	R	J	R	J	R	309	295			
11	272	288	300	317	339	258	244	302	342	331	319	305	300	290	285	280	285	J	R	J	R	U	R	309			
12	306	303	297	290	297	271	285	317	335	329	326	311	294	287	274	274	276	R	277	294	299	303	267	244	280		
13	311	295	285	293	315	303	267	310	352	334	333	316	300	297	287	294	307	298	303	307	317	266	278	269			
14	269	295	285	301	330	315	295	325	342	340	316	306	298	289	280	280	284	287	299	295	299	300	J	R	J	R	239
15	267	273	298	296	305	300	288	328	354	337	327	317	308	294	293	289	296	291	302	296	306	283	J	R	J	R	272
16	J	R	250	265	257	294	255	268	268	321	329	310	318	308	297	292	298	293	291	289	301	321	J	R	J	R	276
17	327	243	249	308	408	264	272	289	316	326	326	313	307	305	305	307	317	319	312	302	J	R	304	J	R	274	
18	294	317	321	318	349	267	283	324	346	340	350	317	327	304	309	322	322	320	329	309	313	293	284	268			
19	288	297	300	321	354	270	268	300	353	332	311	311	321	307	303	303	304	301	316	307	261	302	279	229			
20	287	277	277	295	341	331	280	308	332	335	315	328	308	312	311	312	311	332	321	320	306	330	291	270			
21	279	284	269	278	272	269	271	312	328	324	316	305	297	304	294	306	314	315	314	305	301	262	293	256			
22	296	349	324	279	267	273	286	308	339	339	322	324	304	313	299	312	317	314	322	304	324	317	281	289			
23	284	292	287	283	294	282	277	322	325	335	326	314	301	313	304	301	303	327	334	331	269	279	285	300			
24	337	269	262	264	278	268	280	331	340	319	332	311	304	309	308	316	319	321	331	321	326	327	280	281			
25	290	289	292	318	310	303	319	332	340	343	342	320	316	299	305	312	302	313	301	312	J	R	J	R	296		
26	294	280	271	264	271	265	266	332	341	319	317	315	308	309	287	298	302	318	326	292	291	299	307	321			
27	301	273	286	296	337	286	303	329	325	342	366	304	285	295	305	308	298	288	287	304	304	259	271	305			
28	281	299	307	257	240	262	272	326	334	334	314	325	308	318	322	330	307	319	315	315	317	290	294	304			
29																											
30																											
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28			
MED	290	290	288	296	307	275	281	318	344	338	326	314	304	304	302	304	304	312	308	305	300	290	287	288			
U Q	304	300	300	308	338	302	293	326	352	343	334	324	311	313	308	312	316	319	318	312	310	303	299	298			
L Q	280	278	276	281	275	268	270	310	334	332	316	307	300	294	290	292	294	290	299	294	R	284	267	278	273		

FEB. 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

FEB. 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	LU	LU	L								
2											L	LU	LU	LU	L	L	L								
3										L	LU	LU	LU	LU	L	L	L								
4										UL	L	L	L	LU	L	L									
5										L	L	L	L	LU	L	L									
6											L	L	L	L	L	L									
7											L	LU	L	L	L	L	L								
8										L		L	L	L	L	L									
9												L	L	L	L	L	L								
10												L	L	L	L		L								
11												L	L	L	L	L									
12											L	L	LU	L	L	L	L								
13											LU	L	LU	L	L	L	L								
14													L		L	LU	L								
15											L	L	L	L	L	L	L								
16											L	L		L	L	L									
17											L	L	LU	L	L	L	L								
18											L		L	L	L										
19												L	L	L	L										
20											L	L	L	L	L										
21											LU	L	AU	LU	L	L	L								
22											LU	L	LU	LU	L	L	L								
23											L	LU	L	L	L	A	L								
24										L	LU	LU	LU	LU	L	L	L								
25											LU	LU	L	L	LU	L	L								
26										LU	L	L	L	L		LU	L								
27												UL	L	L	L	L									
28										L	L	LU	L	L	L	L									
29												UL	L	L	L	L									
30												UL	L	L	L	L									
31												UL	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	6	10	9	5	3	1								
MED										UL	LU	LU	LU	LU	LU	LU	LU								
U Q										426	376	396	374	375	365	365	366								
L Q												401	380	380	373	377									
												379	350	361	352	352									

FEB. 2023 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

FEB. 2023 h'F2 (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										226	248	234	274	252	248	274	230								
2											228	236	260	248	250	252	240								
3										204	238	250	238	250	268	236	236								
4										218	268	252	242	260	280	254									
5										226	222	250	248	240	270	248									
6											240	232	256	272	262	240									
7											218	282	278	254	244	268	252								
8									236		266	268	284	270	260										
9											260	256	286	284	268	276									
10											276	302	260	282		264									
11											264	272	276	288	284										
12											244	248	250	298	266	288	266								
13											226	242	256	276	302	278	250								
14												268		298	284	266									
15											242	264	250	276	288	282	262								
16											232	266		292	282	278									
17											232	232	256	252	270	238	230								
18											224		244	282	246										
19												252	260	254	272										
20											250	244	266	270	258										
21											272	242	238	278	278	264	250								
22											232	258	240	286	270	280	262	234							
23											244	242	282	264	234	226	262								
24											222	240	244	282	260	268	234	226							
25											236	252	250	280	280	254									
26											214	248	252	268	266		278	274							
27													312	276	280	242									
28											222	246	246	288	250	240	228								
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT										9	21	25	27	27	27	24	16								
MED										222	240	250	260	270	270	261	251								
U Q										229	248	262	278	278	282	278	265								
L Q										216	230	242	250	254	258	241	235								

FEB. 2023 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

FEB. 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	250	264	292	266	266	284	258	230	214	216	220	216	188	222	214	198	220	218	206	206	218	186	222	252
2	252	252	250	268	240	268	286	252	200	214	194	218	222	206	226	196	194	216	212	212	210	210	238	242
3	240	262	258	254	224	200	268	250	206	194	206	218	220	198	198	196	204	216	198	206	222	212	226	250
4	266	330	312	266	260	270	266	230	210	200	218	226	220	224	222	226	216	214	200	212	220	200	244	254
5	296	290	262	234	208	236	276	250	218	212	210	206	224	210	228	222	234	222	190	236	232	206	242	266
6	268	270	266	248	232	218	256	244	214	210	212	208	218	250	232	216	224	222	218	230	204	236	236	220
7	224	264	290	254	226	212	266	238	220	224	206	202	202	214	204	206	212	230	210	198	244	228	242	208
8	212	224	264	286	278	312	236	226	218	214	210	212	214	214	220	214	222	230	222	194	228	234	230	256
9	304	242	220	204	262	284	312	246	216	218	222	220	224	212	212	218	226	238	214	212	220	232	220	252
10	256	232	214	276	240	222	306	240	214	216	212	204	216	216	216	220	220	230	220	218	230	222	222	236
11	270	266	252	230	214	228	332	260	214	222	224	218	202	204	224	212	226	230	214	202	222	212	250	234
12	232	228	244	248	248	258	286	246	220	220	220	212	206	212	216	210	222	220	226	200	214	210	242	228
13	236	246	240	262	230	226	306	240	222	222	214	202	204	214	214	224	228	226	220	226	212	218	204	238
14	^{E A} 268	238	256	254	226	212	246	236	216	218	210	210	214	230	236	220	220	228	220	220	198	212	224	228
15	270	288	256	258	246	240	258	234	220	218	208	224	218	202	222	222	214	230	234	204	212	206	216	210
16	258	262	248	242	242	266	302	236	218	230	218	218	248	220	212	220	218	234	238	226	202	224	232	212
17	228	318	366	252	178	312	318	266	228	216	206	212	210	202	210	210	208	216	214	210	214	208	232	212
18	244	224	224	220	208	282	282	234	220	216	212	210	210	210	236	248	222	218	216	206	200	220	230	260
19	242	252	244	222	210	244	326	244	214	216	222	218	224	216	216	228	210	224	204	200	208	220	210	230
20	258	274	268	260	216	222	278	244	224	208	220	218	210	230	220	236	224	228	208	202	216	214	214	270
21	278	258	278	282	282	282	304	240	220	218	222	216	^{E A} 264	^{E A} 234	242	226	232	208	218	236	230	238	280	
22	244	202	240	266	300	296	282	254	228	218	196	210	200	200	212	244	222	216	200	214	208	194	260	294
23	272	258	272	294	290	258	298	238	220	212	204	222	212	228	218	^A	226	226	198	208	^{E A} 234	258	274	246
24	214	246	306	330	^{E A} 348	306	294	226	214	216	208	202	196	196	206	222	204	212	218	200	204	208	266	302
25	268	278	268	246	232	248	230	224	216	222	220	202	202	202	216	^{E A} 234	242	232	206	206	188	212	234	244
26	250	268	314	336	304	334	332	228	210	202	200	198	210	208	222	216	234	242	210	184	228	220	218	216
27	252	294	284	266	224	188	246	228	234	222	206	198	240	224	236	226	228	248	268	226	200	220	308	220
28	204	234	244	306	354	302	270	224	230	216	202	202	198	234	208	216	220	226	232	^{E A} 238	220	204	238	226
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	27	28	28	28	28	28	28	28	28
MED	252	260	260	259	238	258	282	239	218	216	211	212	212	214	217	220	222	226	214	208	214	213	233	238
U Q	268	272	281	272	272	284	305	246	220	219	220	218	220	224	225	226	226	230	220	219	225	223	242	255
L Q	238	240	244	247	224	224	262	230	214	213	206	203	202	205	212	212	215	218	206	202	206	208	222	223

FEB. 2023 h'F (KM)

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FEB. 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	106	100	100	100	A	100	A	104	110	A	B						
2								B	110	104	102	100	98	100	100	A	108	108	B						
3								B	108	104	102	104	104	104	A	104	104	108	B						
4								B	112	106	104	104	102	104	106	106	104	A	A						
5								B	108	100	98	100	102	104	104	106	106	A	A						
6								B	104	104	102	104	104	102		A	A	A	A	B					
7								B	114	104	102	102	100	100	100	102	A	102	E B						
8								B	110	100	98	102	102	102	102	A	106	A	B						
9								E B	164	100	100	106	102	106	104	A	104	102	104	B					
10								B	106	100	100	100	B	A	A	A	A	A	A						
11								B	106	104	102	A	102	102	102	102	106	110	B						
12								B	104	100	100	100	A	100	A	A	A	A	A						
13								E B	166	104	102	102	106	A	A	A	106	104	104	A					
14								B	104	100	100	100	100	100	100	102	A	A	A						
15								E B	160	106	102	102	102	102	102	104	104	104	108	B					
16								B	102	100	100	100	100	104	104	102	106	A	A						
17								B	110	104	102	98	102	A	A	A	A	A	B						
18								142	104	104	102	102	102	102	102	102	106	A	A						
19								B	104	102	100	100	100	100	100	104	104	108	B						
20								E B	200	106	100	100	102	102	102	102	102	A	A						
21								E B	174	102	100	100	100	104	106	108	106	106	102	A					
22								A	102	102	102	100	98	98	100	104	104	A	A						
23								148	104	104	102	102	102	102	102	102	104	A	A						
24								A	104	104	102	102	102	102	102	102	102	108	A						
25								A	112	108	106	102	102	102	102	102	102	A	B						
26								A	102	100	100	106	106	104	104	104	104	110	A						
27								A	108	106	A	A	106	102	102	102	102	A	A						
28								A	102	102	100	100	100	100	104	104	104	104	A						
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								7	28	28	27	26	24	25	21	21	22	13	2						
MED								E B	164	105	102	102	102	102	102	102	104	104	108	141					
U Q								E B	174	108	104	102	102	103	104	104	104	106	108						
L Q								148	104	100	100	100	100	100	101	102	104	104							

FEB. 2023 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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FEB. 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	98	98	94	94	B	B	B	B	170	166	114	102	102	102	98	98	G	114	90	94	B	90	88	92
2	B	B	B	92	88	88	B	B	162	G	G	138	122	116	102	106	G	G	B	98	90	B	B	88
3	84	B	B	84	B	B	B	92	G	G	170	136	122	120	112	G	G	G	B	B	94	94	86	80
4	82	84	B	B	B	92	92	92	186	G	158	136	124	120	176	126	100	102	102	86	84	84	86	B
5	92	100	96	92	90	90	92	94	174	198	182	146	128	128	120	120	104	102	88	100	92	B	B	B
6	B	B	98	94	92	92	94	B	196	G	114	108	106	104	102	100	100	102	108	94	B	B	88	B
7	B	B	B	B	B	B	B	B	216	178	G	170	G	116	114	116	104	G	G	B	B	B	B	B
8	B	B	96	92	B	B	B	90	G	G	G	160	124	108	104	104	98	102	B	B	B	B	B	B
9	90	90	96	B	B	B	B	G	202	G	158	140	G	G	106	G	G	G	B	B	84	B	B	B
10	B	88	90	92	B	B	B	B	G	G	104	106	B	102	100	100	98	G	90	90	84	84	90	B
11	B	B	90	88	92	92	B	B	G	124	110	108	G	G	G	G	G	G	B	B	94	B	88	B
12	B	94	94	B	B	B	B	B	G	G	126	108	114	G	102	102	102	96	96	92	B	B	88	88
13	B	B	B	B	B	B	B	G	176	178	140	G	106	104	98	152	126	108	98	98	B	B	B	100
14	82	B	94	B	B	B	B	B	G	G	140	180	108	112	118	122	104	94	94	88	88	94	86	B
15	86	88	B	B	B	B	B	G	G	190	128	178	114	112	118	122	112	G	88	B	B	B	B	94
16	B	B	B	B	B	B	B	B	188	172	G	G	126	106	110	112	102	98	110	98	98	98	100	106
17	B	B	92	92	88	92	88	B	G	G	G	108	102	106	108	108	100	104	B	96	B	B	B	B
18	B	86	B	B	B	B	B	G	G	170	140	112	110	110	122	134	108	106	164	B	B	B	B	B
19	B	B	B	B	92	B	B	B	132	198	156	148	140	146	142	122	G	112	B	104	B	B	B	B
20	B	B	B	B	B	94	92	92	142	G	184	160	146	128	118	108	104	104	100	98	B	B	98	B
21	B	B	B	B	B	B	B	G	G	164	132	142	116	118	120	120	114	102	102	98	B	B	94	B
22	114	108	94	94	94	B	B	G	160	G	G	G	G	G	G	108	104	100	100	96	B	B	B	90
23	B	B	94	92	92	B	B	G	158	G	G	184	146	128	114	116	112	104	98	96	94	90	106	B
24	96	B	B	92	98	98	98	148	G	G	114	120	110	108	G	G	G	194	152	100	94	94	88	86
25	94	90	90	B	B	B	B	166	96	170	160	G	114	118	146	120	102	102	100	98	92	96	88	92
26	90	90	B	92	92	90	94	142	G	G	132	118	114	154	136	G	118	110	104	B	96	94	86	92
27	B	90	94	B	B	B	B	148	206	G	120	114	108	106	106	106	102	98	96	98	B	92	96	96
28	B	B	B	B	B	B	B	176	G	156	146	142	124	110	110	108	G	108	104	98	96	96	92	86
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	12	14	13	10	9	7	11	14	12	21	25	23	24	25	23	20	21	20	20	14	11	17	13
MED	90	90	94	92	92	92	92	142	175	171	140	136	114	112	112	108	104	104	99	98	93	94	88	90
U Q	96	96	96	93	92	93	94	160	196	184	158	154	124	120	120	122	110	109	103	98	94	96	95	93
L Q	84	88	92	92	90	90	92	92	158	165	117	110	108	107	103	104	100	102	95	94	88	90	88	86

FEB. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

IONOSPHERIC DATA STATION Okinawa

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

LAT. 26°41.0'N LON. 128°09.0'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	X 47	X 47	X 46	X 52	X 50	X 41	X 45													X 154	X 146	X 141	X 120	X 102	
2	X 85	X 79	X 72	X 56	X 51	X 39	X 37														X 116	X 118	X 97	X 74	X 74
3	X 68	X 54	X 46	X 51	X 59	X 42	X 39														X 160	X 157	X 144	X 122	X 100
4	X 90	X 80	X 74	X 70	X 63	X 62	X 52														X 154	X 154	X 149	X 120	X 105
5	X 98	X 92	X 78	X 82	X 59	X 38	X 35														X 111	X 107	X 108	X 88	X 73
6	X 71	X 64	X 64	X 63	X 56	X 47	X 38														X 141	X 136	X 116	X 109	X 91
7	X 70	X 52	X 49	X 55	X 53	X 34	X 34														X 166	X 182	X 187	X 174	X 154
8	X 117	X 74	X 57	X 54	X 49	X 47	X 53														X 168	X 138	X 138	X 116	X 90
9	X 68	X 70	X 56	X 43	X 31	X 34	X 33														X 152	X 150	X 150	X 146	X 122
10	X 81	X 74	X 53	X 38	X 44	X 37	X 36														X 173	X 171	X 168	X 142	X 118
11	X 98	X 82	X 77	X 66	X 50	X 36	X 36														X 175	X 169	X 152	X 141	X 128
12	X 94	X 64	X 54	X 53	X 48	X 44	X 44														X 179	X 176	X 163	X 140	X 126
13	X 97	X 90	X 76	X 67	X 54	X 40	X 36														X 131	X 174	X 199	X 183	X 161
14	X 122	X 136	X 104	X 96	X 66	X 44	X 38														X 180	X 189	X 175	X 150	X 137
15	X 118	X 116	X 114	X 111	X 86	X 58	X 59														X 206	X 209	X 193	X 183	X 184
16	X 135	X 132	X 133	X 116	X 94	X 69	X 70														X 192	X 199	X 178	X 146	X 142
17	X 92	X 65	X 54	X 56	X 51	X 35	X 34														X 167	X 188	X 194	X 178	X 137
18	X 123	X 108	X 90	X 75	X 58	X 42	X 42														X 139	X 136	X 134	X 138	X 146
19	X 93	X 114	X 73	X 70	X 53	X 40	X 40														X 175	X 167	X 168	X 174	X 147
20	X 118	X 107	X 93	X 78	X 60	X 47	X 42														X 114	X 112	X 115	X 100	X 87
21	X 86	X 84	X 70	X 65	X 64	X 58	X 61														X 152	X 154	X 134	X 124	X 95
22	X 82	X 76	X 52	X 45	X 45	X 45	X 45														X 139	X 126	X 101	X 79	X 60
23	X 57	X 56	X 51	X 49	X 47	X 44	X 44														X 112	X 107	X 104	X 87	X 79
24	X 72	X 56	X 46	X 45	X 47	X 45	X 46														X 131	X 133	X 110	X 96	X 72
25	X 65	X 63	X 64	X 59	X 54	X 56	X 45														X 176	X 162	X 146	X 129	X 115
26	X 94	X 73	X 58	X 47	X 46	X 48	X 52														X 177	X 164	X 162	X 144	X 109
27	X 68	X 58	X 54	X 54	X 57	X 41	X 36														X 146	X 138	X 137	X 148	X 142
28	X 112	X 80	X 83	X 64	X 70	X 82	X 99	X 115													X 131	X 114	X 106	X 94	X 91
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	28	28	28	28	28	1	1											28	28	28	28	28	
MED	X 91	X 75	X 64	X 58	X 54	X 44	X 42	X 115	X 103											X 154	X 154	X 145	X 134	X 112	
U Q	X 105	X 91	X 78	X 70	X 60	X 48	X 49													X 175	X 172	X 168	X 147	X 140	
L Q	X 70	X 64	X 54	X 52	X 48	X 40	X 36													X 135	X 134	X 116	X 104	X 90	

FEB. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

FEB. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	41	41	40	46	44	35	39	56	93	111	120	137	151	162	164	164	158	167	167	148	140	135	114	96
2	79	73	66	50	45	33	31	44	94	92	102	111	120	115	117	121	131	134	128	110	112 ^R	91	68	68
3	62	48	40	45	53	36	33	45	92	110	129	142	155	168	170	170	174	175	172	154	151	138	116	94
4	84 ^J	74 ^R	68	64	57	56	46	62	104	125	134	157	151	160	180	173	177	179	164	147	148	143 ^R	114	99
5	92	86	72	76 ^R	53	32	29	47	94	102	111	104	120	131	132	131	129	121	114	105 ^{J R}	100	102 ^R	82	67
6	65	58	58	57	50	41	32	47	92	100	116	136	141	153	167 ^R	171	154	143	133	135	130	110	103	85 ^R
7	64	46	43	49	47	28	28	52	87	99	111	105	126	136	129	128	131	150	160	160	176	181	168	148
8	111	68	51	48	43	41	47	53	84	110	121	127	135	148	169	183	186	179	173	161	132	132	110	84
9	62	64	50	37	25	29	27	53	95	106	108	122	136	145	152	151	153	152	149	146	144	144	140	116
10	75	68	47	33	38	31	30	58	108	114	119	122	145	157	157	166	168	175	169	167	165	162	136	112 ^R
11	92	76	71	60	44	30	30	53	92	115	131	150	152	168	182	184	180	175	168	169	163	146	135	122
12	88 ^R	58	48	47	42	38	38	59	100	122	136	137	141	164	184	185	184	175	175	173	170	157	134	120
13	91	84	70	61	48	34	30	53	88	106	126	113	115	121	127	129	130	127	122	125	168	184	177	155
14	116 ^R	^F	^F	86 ^F	60	38	32	54	88	109	123	134	138	159	178	184	176	169	170	174	183	169	144	131
15	112	110	108	105	80	52	53	59	89	106	118	121	122	127	132	136	148	162	183	200	203 ^{R J}	187 ^{R J}	177 ^{R J}	178 ^R
16	129	126	^F	^F	^F	63	64	95	119	125	139	126	131	135	146	143	142	150	169	186	193	172	140	136 ^R
17	86 ^V	59 ^V	48	49	45	29	28	48	93	125	139	133	137	138	145	144	137	144	147	161	182	188 ^{U R}	172 ^R	131 ^F
18	117	102	84	69	52	36	36	56	91	112	116	114	116	125	128	131	137	128	127	133	130	128	132	
19	87	84 ^F	67	64	47	34	34	50	90	92	107	138	144	157	152	154	159	167	174	169	161	162	168	141
20	112	101 ^{J R}	87	72	54	41	36	50	88	112	122	139	134	134	133	128	113	110	120	108	106	109	94	81
21	80	78	64	59	58	52	55	64	94	116	133	154	157	158	163	163	152	150	147	146	148	128	118	89
22	76	70	46	39	39	39	39	54	95	118	132	149	146	143	151	154	145	130	132	133	120	95	73	54
23	51	49	45	43	41	38	38	58	92	122	130	146	150	155	158	140	140	134	116	106	101	98	80	73
24	66	50	40	39	41	39	40	60	93	111	123	131	142	162	168	163	148	146	134	125	127	104	90	66
25	59	57	58	53	48	50	39	58	90	108	129	130	136	142	160	171	174	178	179	170	156	140	123	109
26	88	67	52	41	40	42	46	70	98	100	123	138	144	148	154	156	162	167	169	171	158	156 ^R	138 ^{R J}	103 ^R
27	62	51	48	48	51	34	30	58	92	135	106	74	103	131	139	132	114	110	124	139	132	131		
28	^F	^F	72	58	57 ^F	67 ^F	79 ^F	106 ^F	119	121	115	136	121	143	124	116	101	112	115	125	108	100	88	85
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	26	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	26
MED	84	68	55	50	47	38	36	55	92	111	122	134	138	146	153	154	150	150	154	148	148	139	123	101
U Q	92	84	70	64	53	42	43	59	95	120	130	138	146	158	168	170	171	172	170	169	166	162	140	131
L Q	64	57	47	45	42	34	30	51	90	106	116	122	124	134	132	132	134	132	128	129	128	110	94	84

FEB. 2023 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	U L	U L	U L	U L	U L	U L	L	L						
2										L	L	U L	U L	U L	U L	U L	L	L	L					
3											U L	U L	U L	U L	U L	U L	L	L						
4										L	L	L	U L	U L	U L	U L	L	L						
5										L	L	L	U L	U L	U L	U L	L	L						
6										L	U L	U L	U L	U L	U L	U L	L	L						
7											U L	U L	U L	U L	U L	U L	L	L						
8											L	L	L	L	U L	U L	L	L						
9												L	L	L	L	L	L	L						
10											L	L	L	L	L	L	L	L						
11											L	L	U L	U L	U L	L	L	L						
12										L	L	L	U L	U L	U L	L	L	L						
13									284		L	U L	U L	U L	U L	L	L							
14											L	L	U L	U L	U L	L	L	L						
15										L	L	U L	U L	U L	U L	U L	L	L						
16										L	L	L	L	L	L	L	L	L						
17											L	U L	U L	U L	U L	L	L							
18											L	U L	U L	U L	L	L	L	L						
19												L	U L	U L	L	L	L	L						
20										L	L	L	L	L	L	L	L	L						
21										L	L	U L	U L	U L	U L	U L	L	L						
22										L	L	U L	U L	U L	U L	U L	L	L						
23											U L	U L	U L	L	L	L	L	U L	L					
24										L	U L	U L	U L	U L	U L	L	L	L						
25											L	L	U L	U L	U L	U L	A							
26											L	U L	U L	U L	U L	L	L	L						
27									L		U L	U L	U L	L	L	L	L							
28											L	L	L	L		A								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1		2	5	13	15	16	8	1	1						
MED									284		U L	U L	U L	U L	U L	U L	U L	U L						
U Q											U L	U L	U L	U L	U L	U L								
L Q											U L	U L	U L	U L	U L	U L								

FEB. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

FEB. 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	224	A	328	U A	U A	U A	U A	308	A	A						
2								B	212	284	324	352	372	372	U A	A	A	256	A					
3								B	212	284	320	360	368	372	A	A	316	276	196					
4								B	236	292	328	360	368	380	364	348	324	A	A					
5								A	236	296	332	360	372	376	368	360	324	A	A					
6								B	232	308	348	360	372	372	372	360	328	A	A					
7								B	200	296	348	376	392	A	A	A	324	276	188					
8								B	272	316	356	376	388	388	A	A	A	A	A					
9								B	252	316	356	384	404	404	A	A	348	280	196					
10								B	256	312	340	U A	A	388	A	A	A	A	A					
11								B	248	316	356	372	380	A	396	376	340	292	A					
12								B	252	312	356	376	392	380	364	A	A	276	200					
13								B	240	316	352	376	396	A	388	A	336	288	A					
14								B	240	308	356	384	384	388	380	352	U A	U A	U A	A				
15								B	244	312	356	384	392	392	388	360	320	A	A					
16								B	244	304	340	360	372	380	372	356	324	A	A					
17								B	240	304	336	364	384	348	348	328	A	A	A					
18								B	252	320	356	372	384	376	376	352	332	292	A					
19								B	256	308	332	372	384	388	372	352	U A	A	A					
20								B	240	300	336	368	388	388	372	360	340	280	A					
21								B	252	308	348	372	376	396	380	364	332	280	A					
22								B	248	312	332	A	372	384	380	364	324	248	U A	A				
23								A	252	304	340	372	380	392	368	352	324	A	208					
24								A	252	320	356	368	376	372	356	356	328	276	A					
25								A	276	324	352	368	380	372	372	360	332	272	U A	A				
26								A	248	304	340	368	380	372	372	352	336	280	196	A				
27								A	256	308	344	364	368	376	372	360	320	A	A					
28								A	272	312	348	376	380	384	368	352	328	272	A					
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									28	27	28	27	27	25	23	20	23	16	6					
MED									248	308	346	368	380	380	372	356	328	278	196					
U Q									252	316	356	376	388	388	380	360	336	284	200					
L Q									238	304	334	360	372	372	364	352	324	274	196					

FEB. 2023 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

FEB. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

LAT. 26°41.0'N LON. 128°09.0'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	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	27	31	36	48	43	45	37	37	35	31	74	64	44	27	E 16	E 17
2	E 16	18	E 16	E 16	E 16	E 16	E 16	E 16	26	31	G	40	40	40	42	39	35	G	21	E 16	18	26	E 16	20
3	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	25	G	35	41	41	42	45	35	25	G	E 16	23	E 16	E 16	E 16	E 16
4	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	G	38	44	42	40	40	37	37	27	18	22	E 16	20	E 16	18
5	E 16	E 16	E 16	E 16	E 16	E 16	19	20	26	33	38	42	43	42	41	G	G	27	20	E 16	E 16	E 16	E 16	E 16
6	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	G	G	40	44	44	46	43	43	28	18	23	E 16	E 16	E 16	E 16
7	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	29	34	38	42	G	40	40	38	G	G	E 16	E 16	E 16	E 16	E 16	E 16
8	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	G	44	43	41	38	34	28	20	E 16	E 16	E 16	E 16	E 16
9	E 16	E 16	E 16	E 16	E 16	E 16	E 16	17	28	34	38	42	48	44	40	42	25	G	G	E 16	E 16	E 16	E 16	E 16
10	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	21	36	40	46	G	40	40	34	36	28	29	E 16	E 16
11	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	13	G	G	G	40	42	40	G	G	G	G	E 16	E 16	E 16	E 16	E 16
12	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	37	44	42	41	40	38	34	26	G	E 16	20	E 16	E 16
13	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	G	G	44	42	44	43	43	34	21	E 16	18	E 16	E 16
14	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	G	G	39	42	44	44	44	39	37	38	28	E 16	E 16	20	E 16
15	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	27	G	G	40	42	42	45	44	41	35	28	19	E 16	E 16	E 16	E 16
16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	34	37	41	56	49	53	46	39	32	21	E 16	E 16	E 16
17	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	37	43	41	44	39	36	33	28	20	E 16	E 16	E 16	E 16
18	E 16	E 16	E 16	E 16	E 16	E 16	E 16	18	28	G	G	38	49	47	41	52	41	34	G	20	20	E 16	E 16	E 16
19	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	37	40	42	42	41	38	40	28	20	E 16	E 16	E 16	E 16
20	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	G	G	40	44	44	48	46	42	43	40	26	18	18	19	E 16
21	20	E 16	E 16	E 16	E 16	E 16	E 16	E 16	27	G	G	37	41	45	44	40	41	37	32	20	E 16	E 16	E 16	E 16
22	E 16	E 16	E 16	18	E 16	E 16	E 16	E 16	G	G	G	36	38	G	42	39	G	35	35	29	35	E 16	E 16	E 16
23	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	28	34	39	41	40	42	42	39	G	28	G	E 16	E 16	E 16	E 16	E 16
24	E 16	E 16	E 16	E 16	E 16	E 16	E 16	18	G	34	G	G	G	G	G	G	38	G	29	20	E 16	E 16	18	E 16
25	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	34	38	39	43	42	42	40	49	44	28	16	E 16	E 16	E 16	E 16
26	E 16	E 16	E 16	19	E 16	E 16	E 16	20	27	G	G	40	40	40	G	G	G	30	G	E 16	E 16	16	25	28
27	E 16	E 16	E 16	E 16	E 16	E 16	E 16	19	28	G	G	40	42	42	46	42	40	36	33	18	E 16	E 16	E 16	E 16
28	20	26	23	E 16	E 16	E 16	E 16	E 16	G	G	G	G	42	46	51	58	40	31	20	E 16	E 16	E 16	E 16	E 16
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	26	G	G	37	41	42	42	42	39	34	28	20	E 16	E 16	E 16	E 16
U Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16	17	27	34	38	42	44	44	44	42	40	34	27	19	18	19	E 16	E 16
L Q	E 16	E 16	E 16	E 16	E 16	E 16	E 16	E 16	G	G	G	40	40	40	40	38	G	G	G	E 16	E 16	E 16	E 16	E 16

FEB. 2023 fbEs (0.1MHz)

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FEB. 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

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

FEB. 2023 fmin (0.1MHz)

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FEB. 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

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	296	278	276	310	341	278	282	302	343	343	326	319	308	299	296	298	303	308	319	320	311	318	303	280
2	289	287	313	274	291	301	286	302	370	361	346	320	319	304	298	293	302	307	302	311	266 ^R	301	294	297
3	306	311	298	301	354	378	276	294	347	347	333	316	309	301	292	288	291	304	315	306	313	319	311	284
4	278 ^J	241 ^R	233	259	247	243	257	292	315	321	307	316	304	291	292	298	291	303	306	309	300	290 ^R	274	276
5	288	240	288	281 ^R	353	310	284	308	363	358	344	320	308	309	300	308	312	318	321	273 ^J	281 ^R	289 ^R	287	282 ^R
6	281	285	294	314	347	331	293	304	346	351	314	317	295	298	287 ^R	298	290	288	293	306	306	288	274	288 ^R
7	316	272	283	301	361	289	258	306	342	329	330	301	290	310	298	284	285	282	295	293	287	301	305	303
8	301	284	263	270	282	261	305	316	340	325	328	297	290	281	280	277	276	279	291	309	296	302	291	247
9	247	303	329	362	272	266	260	304	348	343	316	295	296	288	288	282	281	287	293	292	266	281	273	235
10	265	331	353	273	313	339	248	303	354	331	318	278	282	298	282	273	277	288	287	298	295	290	276	273 ^R
11	271	281	303	330	357	284	260	301	339	313	308	306	292	282	275	274	269	276	280	299	294	296	258	266
12	254 ^R	311	286	304	302	279	275	293	340	322	324	310	283	277	274	270	262	270	276	292	292	307	308	311
13	290	274	280	265	337	318	271	308	333	324	332	297	293	279	279	284	288	300	295	292	261 ^R	296 ^F	251 ^R	256
14	257 ^R			280 ^F	336	342	306	304	347	331	321	307	282	280	280	270	267	278	281	289	292	294	293	309
15	287	277	272	269	288	271	278	322	341	330	321	312	298	291	289	283	282	283	280	295	298 ^R	281 ^R	286	310 ^R
16	280	283				249	247	302 ^V	335	297	328	296	290	275	288	286	280	288	301	296	292	294	272	269 ^R
17	310 ^V	256 ^V	236	285	294	263	290	271	320	321	325	309	310	293	310	305	293	298	305	288	290	289 ^U	269 ^R	313 ^F
18	289	330	307	332	346	274	290	318	356	341	329	329	302	303	304	298	316	309	313	322	288	287	280	
19	307	302 ^F	298	327	364	287	265	296	373	338	295	311	300	307	290	295	288	302	311	307	303	294	313	297
20	276	255 ^J	236 ^R	301	340	328	278	295	328	320	318	319	309	301	309	313	314	303	313	319	289	288	305	276
21	289	288	277	279	274	263	265	273	314 ^F	315	303	303	298	283	286	295	290	299	310	304	295	289	292	244
22	289	334	329	292	277	293	283	297	326	322	311	312	307	292	293	303	305	299	313	316	289	286	266	269
23	278	298	308	303	305	302	262	313	332	331	320	312	304	295	303	291	294	321	331	293	254	249	283	304
24	305	286	271	267	291	267	276	315	336	324	314	319	293	299	303	305	302	293	324	316	298	282	250	256
25	275	280	297	321	323	309	315	329	342	319	332	315	304	289	293	297	298	298	312	318	315	304	293	277
26	284	276	245	257	267	267	257	320	359	310	309	303	305	299	292	287	291	302	311	294	290	295 ^R	286 ^R	289 ^R
27	278	266 ^F	287	300	339	281	310	338	321	346	364	332	265	297	302	306	290	265	270	300	302	249		
28		282 ^F	300	274	244 ^F	259 ^F	255 ^F	311 ^F	330	341	317	315	289	317	302	321	308	318	308	328	299	296	293	291
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	26	27	27	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	26
MED	287	283	288	292	313	282	276	304	340	330	321	312	298	296	292	294	290	298	306	302	293	292	286	281
U Q	296	302	303	310	346	310	288	314	348	342	330	318	306	301	301	300	302	304	313	314	300	298	294	297
L Q	276	274	272	273	282	266	260	296	331	321	314	303	290	286	286	284	282	285	292	293	288	288	273	269

FEB. 2023 M(3000)F2 (0.01)

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FEB. 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	LU	LU	LU	LU	LU	LU	L	L						
2										L	L	LU	LU	LU	LU	LU	L	L	L					
3										LU	LU	LU	LU	LU	LU	L	L							
4										L	L	L	LU	LU	LU	LU	L	L						
5										L	L	L	LU	LU	LU	LU	L							
6										L	LU	LU	LU	LU	LU	L		L						
7											LU	LU	LU	LU	LU	LU	L	L						
8											L	L	L	L	LU	LU	L	L						
9												L	L	L	L	L	L							
10											L	L	L	L	L	L	L	L						
11											L	L	LU	LU	LU	L	L	L						
12											L	L	L	LU	LU	LU	L	L	L					
13									448		L	LU	LU	LU	LU	L	L							
14											L	L	LU	LU	LU	L	L	L						
15											L	L	LU	LU	LU	LU	L	L						
16											L	L	L	L	L	L	L	L						
17											L	LU	LU	LU	LU	L								
18											L		LU	LU	L	L	L							
19												L	LU	LU	L	L	L	L						
20											L	L	L	L	L	L								
21											L	L	LU	LU	LU	LU		L						
22											L	L	LU	LU	LU	LU	L	LU	L					
23											LU	LU	LU	L	L	L	LU	LU						
24											L	LU	LU	LU	LU	L	L	L						
25											L	L	LU	LU	LU	LU	A							
26											L	LU	LU	LU	LU	L	L	L						
27										L		LU	LU	LU	L	L	L							
28											L	L	L	L		A								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1		2	5	13	15	16	8	1	1						
MED									448		378	380	359	357	355	359	365	392						
U Q												400	382	366	364	372								
L Q												370	353	351	344	344								

FEB. 2023 M(3000)F1 (0.01)

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FEB. 2023 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 26°41.0'N LON. 128°09.0'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	246	246	262	272	274	268	256	248						
2										218	230	262	268	256	246	260	270	226						
3										228	240	250	266	270	294	278	280							
4										258	262	262	252	298	292	254	266	238						
5										224	246	234	274	270	274	256	256							
6										226	256	256	262	292	294	268		236						
7											234	292	302	266	276	286	286	268						
8											238	278	278	314	314	312	294	270						
9												290	294	300	292	304	294							
10											242	302	310	274	316	302	296	270						
11											262	270	256	308	312	310	298	272						
12											242	246	260	302	332	320	318	310	282					
13									218		256	236	274	322	304	298	276							
14											256	266	292	316	318	308	310	282						
15										236	258	250	248	292	298	314	298	274						
16										264	234	242	296	300	306	296	302	288						
17											242	264	246	282	272	264								
18											222		250	258	286	284	250							
19												274	252	266	246	268	270	252						
20										234	238	270	260	280	266	266								
21										256	274	256	280	296	300	280		246						
22										238	260	266	256	284	276	270	248							
23										254	258	264	274	300	252	250	284	226						
24										232	252	238	308	290	262	250	234	224						
25											248	262	270	286	304	272	258							
26											252	254	268	282	284	284	288	254						
27									232		218	336	288	276	266	274								
28											236	256	244	270		242								
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	15	25	27	28	28	27	28	23	17					
MED										218	236	246	262	269	287	292	275	280	254					
U Q										254	257	270	293	300	304	300	296	273						
L Q										228	238	250	256	271	274	265	258	237						

FEB. 2023 h'F2 (KM)

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FEB. 2023 h'F (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	264	290	300	266	228	254	294	252	226	218	214	214	212	226	208	200	206	230	E A 230	216	226	200	206	224
2	238	246	214	262	238	232	288	260	218	210	192	198	216	206	210	206	216	216	200	202	216	222	234	260
3	238	238	246	274	214	190	296	276	226	208	184	200	208	206	222	200	188	228	214	194	216	196	218	214
4	242	272	276	252	244	240	216	250	226	216	208	228	220	202	216	218	204	222	198	214	212	204	192	232
5	240	240	224	212	206	206	E A 320	250	224	216	212	208	204	210	210	202	212	220	206	198	230	214	212	246
6	252	242	248	226	214	218	258	252	228	214	206	204	222	204	228	236	238	220	218	224	216	230	218	198
7	216	260	294	252	198	210	324	258	226	226	214	202	194	192	210	212	214	232	226	210	248	228	220	192
8	204	206	256	270	254	286	232	224	222	220	212	206	220	214	208	214	218	234	232	202	204	230	208	234
9	290	228	204	206	278	276	308	272	226	226	224	216	246	222	212	214	224	240	228	204	208	212	216	230
10	252	218	194	266	250	220	352	260	232	218	208	206	232	210	212	220	216	236	226	222	218	212	206	218
11	238	242	230	210	206	232	346	262	220	226	218	222	206	206	204	208	222	232	226	228	218	214	214	226
12	200	226	234	248	244	250	288	266	226	218	212	216	214	210	210	216	222	220	240	232	220	208	204	212
13	218	228	238	226	206	222	306	242	172	222	230	218	206	232	216	236	242	250	228	228	240	210	206	208
14	240	226	228	244	224	196	248	250	216	220	216	212	212	214	208	216	214	248	238	234	228	192	242	212
15	234	244	234	234	216	208	240	234	216	210	230	214	204	216	220	218	222	230	242	214	224	194	206	218
16	206	236	222	230	198	250	296	256	224	226	220	210	E A 254	252	262	240	222	218	246	224	206	232	224	202
17	206	264	346	268	206	E A 322	300	282	230	216	214	204	192	206	192	210	216	218	226	224	222	206	208	214
18	208	218	206	202	202	246	278	242	214	218	216	228	216	208	256	212	218	218	226	216	210	224	208	226
19	238	226	222	216	190	236	336	270	208	216	206	206	214	218	214	208	228	228	224	192	200	204	198	198
20	222	234	244	220	200	212	274	264	224	212	218	234	222	246	232	228	236	232	220	198	220	218	212	228
21	256	234	250	282	252	268	304	268	226	220	212	210	214	242	214	214	230	230	222	210	230	214	220	220
22	248	194	198	260	298	282	272	272	230	220	204	200	206	200	218	228	212	220	236	214	208	206	206	272
23	270	248	250	254	250	236	302	246	228	214	208	220	206	214	226	204	194	220	210	194	202	220	242	232
24	210	214	280	330	276	268	290	246	222	216	204	192	196	192	192	224	210	208	216	208	194	210	224	266
25	260	256	240	234	224	244	210	234	224	216	218	206	196	188	210	224	A 240	220	202	188	202	216	220	
26	222	232	282	E A 340	308	318	332	244	210	210	198	212	204	192	208	210	218	234	224	198	206	228	214	212
27	214	260	270	266	226	204	234	230	230	222	210	204	200	208	E A 236	224	232	236	264	230	208	228	294	222
28	200	E A 258	268	290	350	336	272	232	228	222	208	204	212	230	230	A 230	230	234	236	228	200	194	218	210
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	28	28	28	28	28	28	28
MED	238	236	242	249	225	237	290	252	225	218	212	209	211	210	212	214	218	230	226	214	216	212	214	220
U Q	250	252	269	267	251	268	307	265	227	221	217	216	218	220	224	224	228	234	234	224	223	223	220	231
L Q	212	226	223	226	206	215	265	243	219	215	207	204	204	205	209	208	212	220	219	202	206	204	206	212

FEB. 2023 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

FEB. 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		A								A	A							
									104		104	100	100	100	100	100	100									
2								B								A	A		A							
									106	104	98	98	98	98	98				98							
3								B							A	A										
									102	102	102	102	102	102			100	104	146							
4								B										A	A							
									104	104	100	100	100	108	108	104	104									
5								A											A	A						
									104	100	100	100	102	102	102	102	102									
6								B											A	A						
									106	102	102	100	100	100	100	100	100									
7								B						A	A	A										
									106	102	102	102	102					102	102	154						
8								B							A	A		A	A							
									110	104	102	102	102	100												
9								B							A	A										
									104	102	100	100	100	100				102	102	144						
10								B					A		A	A	A	A	A							
									106	102	100	98		102												
11								B					A							A						
									102	102	102	102	100		100	100	106	106								
12								B								A	A									
									106	102	102	102	102	102	102			110	130							
13								B						A						A						
									104	102	100	100	102		100		102	106								
14								B																		
									102	102	102	102	100	100	100	100	100	106								
15								B											A	A						
									106	104	102	100	104	104	104	102	98									
16								B											A	A						
									96	96	94	100	100	100	100	96	100									
17								B										A	A							
									100	98	98	98	102	100	100	100										
18								B																		
									108	106	106	104	104	102	102	102	102	102		A						
19								B																		
									106	102	98	100	100	100	100	100	100									
20								B																		
									100	100	100	102	104	104	102	104	106	106								
21								B																		
									106	100	98	100	100	112	100	102	102	104								
22								B				A														
									104	102	100		100	98	106	102	104	102								
23								A																		
									106	106	102	104	100	106	104	102	102									
24								A																		
									104	102	102	102	102	102	102	102	102	102								
25								A																		
									104	102	100	100	100	100	104	104	102	102								
26								A																		
									102	102	100	100	100	100	102	102	102	102	116							
27								A																		
									108	106	100	100	100	102	102	102	100									
28								A																		
									102	100	102	102	100	100	100	100	100	102								
29																										
30																										
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT									28	27	28	27	27	25	23	20	23	16	6							
MED									104	102	100	100	100	100	102	102	102	102	140							
U Q									106	104	102	102	102	102	102	102	102	106	146							
L Q									102	102	100	100	100	100	100	100	100	102	130							

FEB. 2023 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

FEB. 2023 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	80	90	90	B	92	B	B	B	154	112	90	104	100	100	112	112	114	102	96	94	90	86	98	90
2	90	86	86	B	B	B	B	B	168	160	G	140	124	112	106	102	98	G	96	88	86	82	82	82
3	B	86	B	B	B	B		92	92	186	G	110	164	140	124	108	102	92	188	G	B	92	96	94
4	86	82	B	B	B	84	92	B	202	G	178	130	134	154	190	124	106	106	186	132	100	92	96	90
5	90	100	94	88	82	82	86	86	180	164	176	140	136	132	142	G	G	100	96	B	B	92	94	92
6	B	B	B	B	B	88	86	B	170	G	G	106	106	106	104	104	102	100	96	94	92	94	88	86
7	B	90	B	B	96	106	B	144	152	146	132	130	G	114	108	108	G	G	G	B	92	106	86	B
8	B	94	88	88	88	98	B	B	G	G	G	G	122	108	106	104	104	104	96	100	104	86	82	B
9	90	B	B	96	100	B	B	150	214	186	154	130	110	104	104	98	92	G	G	B	B	B	84	88
10	B	B	B	B	B	86	B	B	G	G	86	132	102	102	G	114	100	100	96	92	88	86	B	B
11	B	B	B	B	B	B	B	B	86	G	G	118	108	108	G	G	G	G	G	96	94	100	B	B
12	B	B	92	92	90	90	92	B	G	G	164	110	152	108	112	106	102	98	G	90	100	90	B	B
13	B	B	96	B	B	B	B	B	G	G	180	152	120	G	154	166	126	114	108	100	96	92	86	96
14	90	90	B	B	B	B	B	B	204	G	178	170	140	108	110	108	110	102	98	98	B	96	94	82
15	B	B	B	B	B	B	B	92	190	G	158	152	124	110	110	106	110	110	166	84	B	132	B	B
16	B	B	B	B	B	B	B	B	G	G	146	160	132	108	110	106	106	106	104	184	B	92	B	B
17	B	B	B	92	86	88	88	86	G	G	178	126	134	100	108	102	108	104	96	92	88	B	88	B
18	B	B	B	B	B	B	B	172	170	G	130	114	112	114	132	140	130	G	98	96	94	90	B	86
19	88	B	B	84	B	B	B	B	G	G	172	148	138	144	134	130	108	104	118	B	B	B	B	B
20	B	B	B	96	96	B	B	B	G	G	180	150	142	124	120	114	108	104	102	96	96	92	90	B
21	88	B	B	B	B	B	B	B	198	G	158	136	124	128	146	124	120	110	108	B	B	102	96	92
22	104	104	100	92	92	92	B	B	G	G	G	94	106	G	178	158	G	102	102	100	96	94	92	B
23	B	B	B	B	B	88	94	150	152	162	130	186	150	138	132	124	G	106	G	B	92	106	B	B
24	B	B	B	B	B	92	92	160	G	G	120	G	G	G	G	168	G	136	156	B	B	94	92	92
25	90	B	B	B	B	B	92	92	G	G	188	142	142	120	112	146	130	102	102	96	96	B	108	96
26	B	B	90	94	92	90	92	90	182	G	G	170	146	132	G	G	G	124	G	96	96	96	90	86
27	B	96	B	B	96	B	B	142	164	G	G	120	114	112	106	106	102	100	94	92	92	B	B	B
28	90	90	90	96	B	B	B	90	G	G	G	G	140	116	108	102	102	110	108	B	100	B	B	B
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	11	9	10	11	12	11	13	17	11	19	25	25	25	25	25	21	23	22	18	19	21	18	13
MED	90	90	90	92	92	89	92	92	180	160	158	130	124	112	112	108	106	104	98	95	92	94	92	90
U Q	90	96	95	96	96	92	92	150	194	180	176	149	140	130	138	125	110	110	108	96	100	99	96	91
L Q	88	86	89	88	88	87	88	90	159	120	132	116	109	108	107	103	102	102	96	92	92	90	88	86

FEB. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F1	F1	F1		F1				H2	CH11	LH11	C4	C3	C3	C1	C1	C2	C5	L9	F7	F4	F7	F1	F3	
2	F2	F3	F1						HC11	HC11		H1	C1	C1	C2	C2	L2		L2	F3	F3	F3	F1	F1	
3		F1					F1	L2	H1		C1	H1	H1	C2	C3	C1	L2	H1			F3	F3	F1		
4	F1	F1				F1	F2		H1		H1	H1	H1	HL11	H1	C1	C2	C1	H1	F3	F3	F5	F1	F2	
5	F1	F1	F1	F2	F1	F2	F3	L3	H1	H1	H1	H1	H1	H1	H1			C2	L2			F1	F1	F1	
6						F2	F2		H1			C2	C2	C1	C1	C3	C3	C2	L1	F4	F3	F3	F2	F1	
7		F2			F1	F1		H1	HC11	H1	H1	H1		C1	C1	C1					F1	F2	F1		
8		F1	F2	F1	F1	F1							C1	C1	C1	C1	C1	C2	L2	F1	F3	F3	F2		
9	F2			F1	F1			H1	H1	H1	H1	H1	C1	C1	C1	C2	L1						F1	F1	
10						F1				L1	H1	C1	C1		C1	C1	C2	L4	L3	F8	F1				
11									L1			C1	C1	C1					L2	F1	F1				
12			F2	F2	F1	F1	F1				H1	H1	H1	C1	C1	C1	C1	L1		F1	F4	F1			
13			F1							H1	H1	C2		HC11	HC11	CC11	C3	C6	C4	F2	F1	F1	F1	F1	
14	F1	F1							H1		H1	H1	H1	HCL11	C1	C1	C1	C1	C2	L3	F1	F2	F2	F1	
15							L2	H1			H1	H1	H1	C1	C1	C1	C1	CL11	C1	H1	F1	F1			
16									H1		H1	H1	C2	C2	C2	C2	C2	C2	HC11			F7			
17				F1	F2	F3	F1	F1			H1	C1	H1	C2	C1	C1	C1	C1	L2	F2	F4		F1		
18								H1	H1		H1	C1	C1	C1	HC11	HC11	H1		L1	F2	F1	F3		F1	
19	F1			F1							HC11	H1	H1	H1	H1	H1	C2	C1	C1						
20				F3	F3		F1		H1		H1	H1	H1	C1	C2	C2	CL11	CL31	C2	F3	F3	F3	F3		
21	F3								H1		H1	H1	C2	C1	H1	C1	C1	C1	C1			F1	F1	F4	
22	F2	F1	F1	F2	F5	F1					L1	C1		H1	H1			C3	C3	F6	F4	F1	F1		
23						F1	F1	H1	H1	H1	HL11	H1	H1	H1	H1	C1		C1			F1	F2			
24						F2	F2	HC11		C1						H1		H1	HC11			F2	F2	F2	
25	F1					F1	L1		H1	H1	H1	H1	C1	H1	H1	C4	C8	L5	F1		F3	F2	F4		
26			F1	F5	F2	F4	F3	L2	H1			H1	H1	H1				C1		F1	F1	F4	F7	F2	
27		F1			F1			H1	H1			C1	C1	C1	C2	C2	C2	C3	L4	F4	F1				
28	F5	F4	F2	F1				L1				H1	C1	C1	C2	C3	C2	C1	C1		F1				
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

FEB. 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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

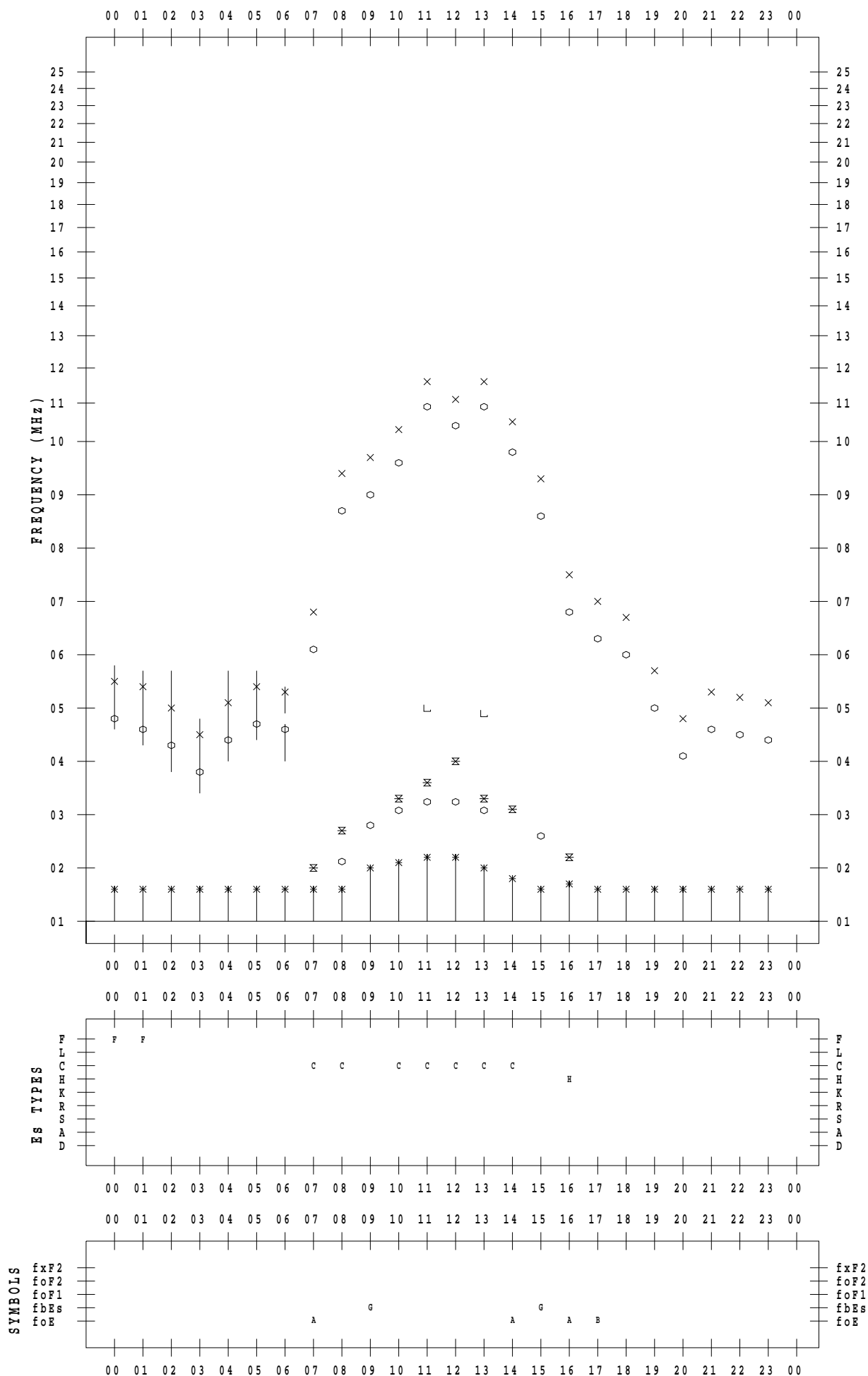
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 1

135 ° E MEAN TIME



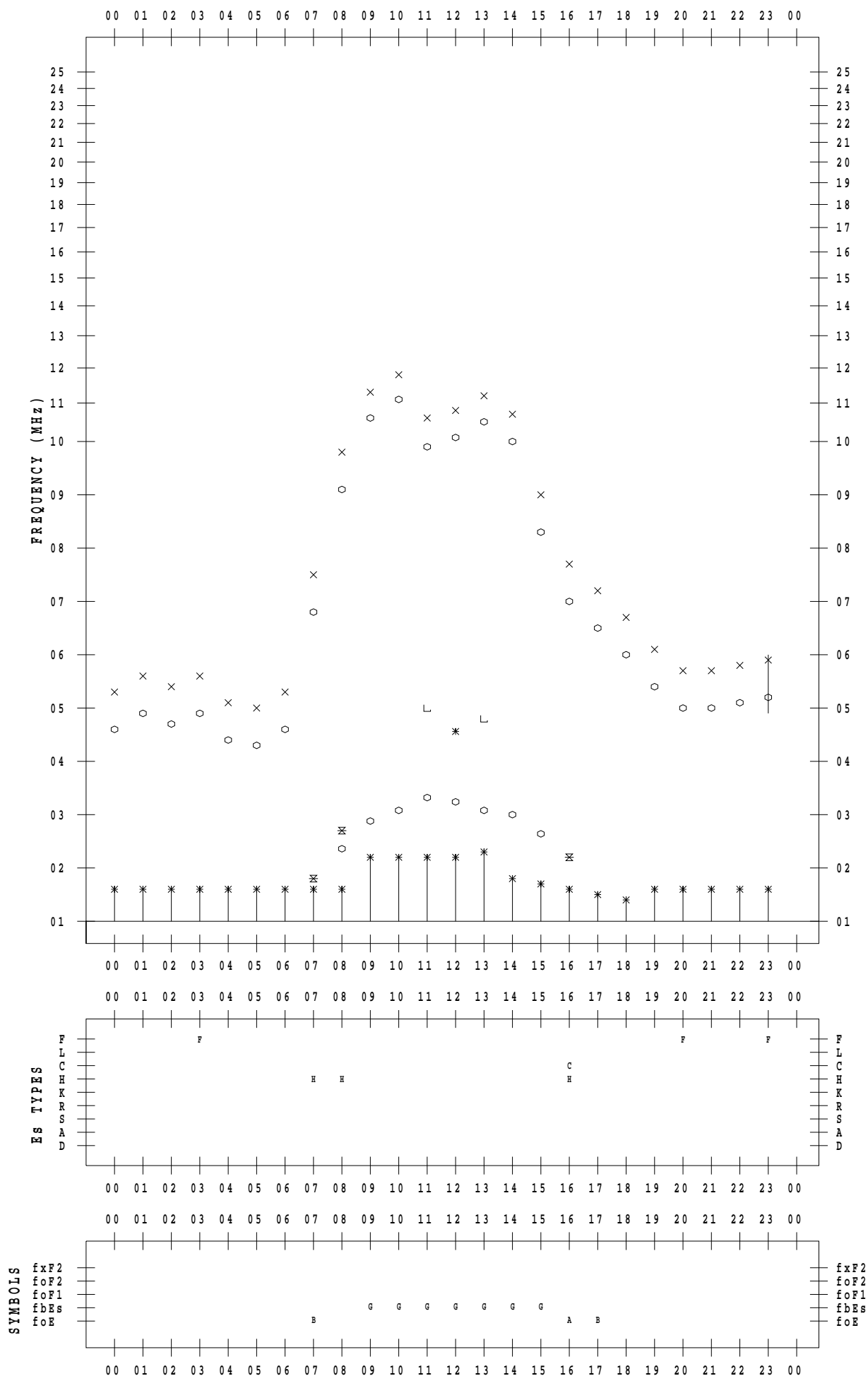
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 2

135 ° E MEAN TIME



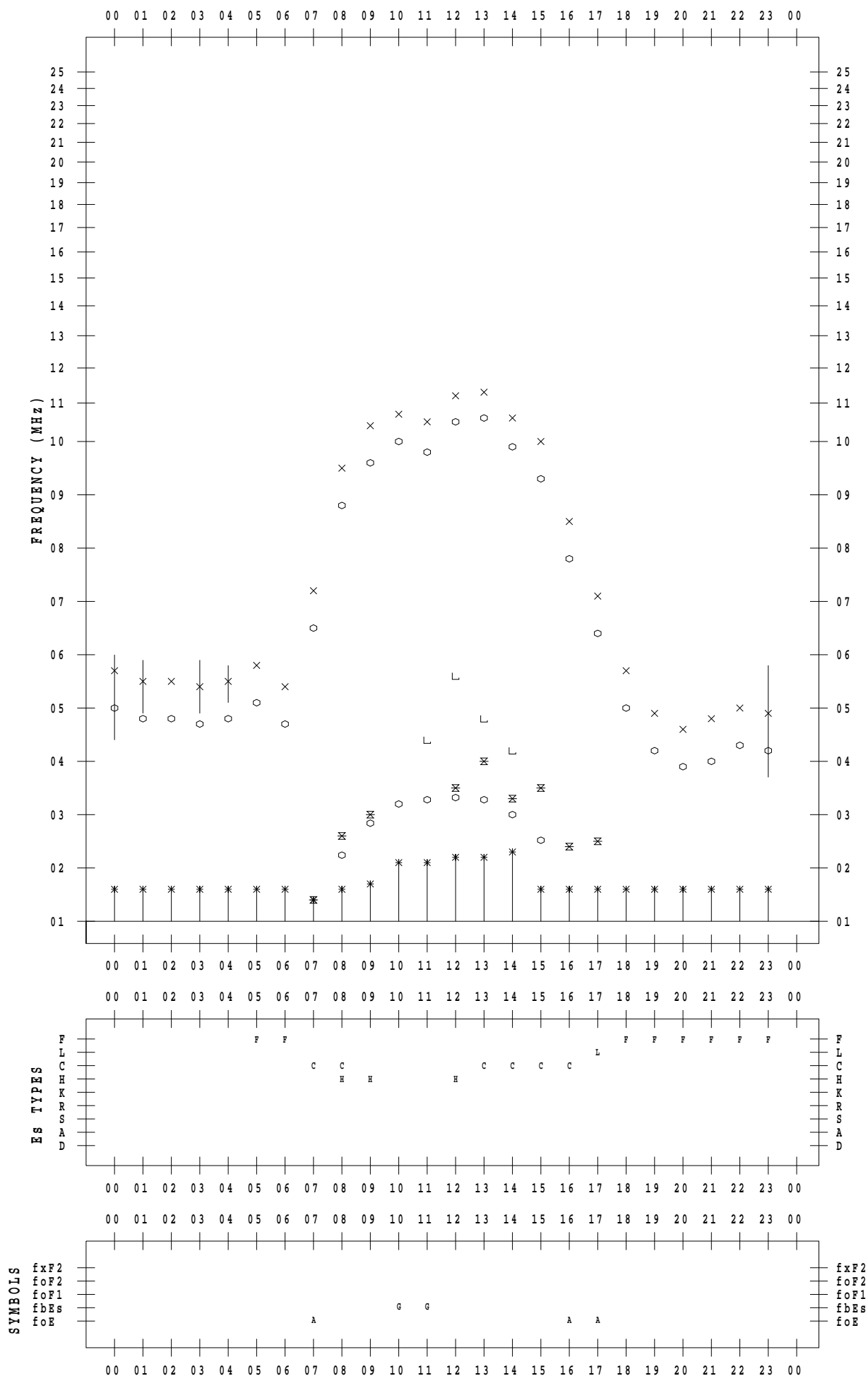
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 3

135 ° E MEAN TIME



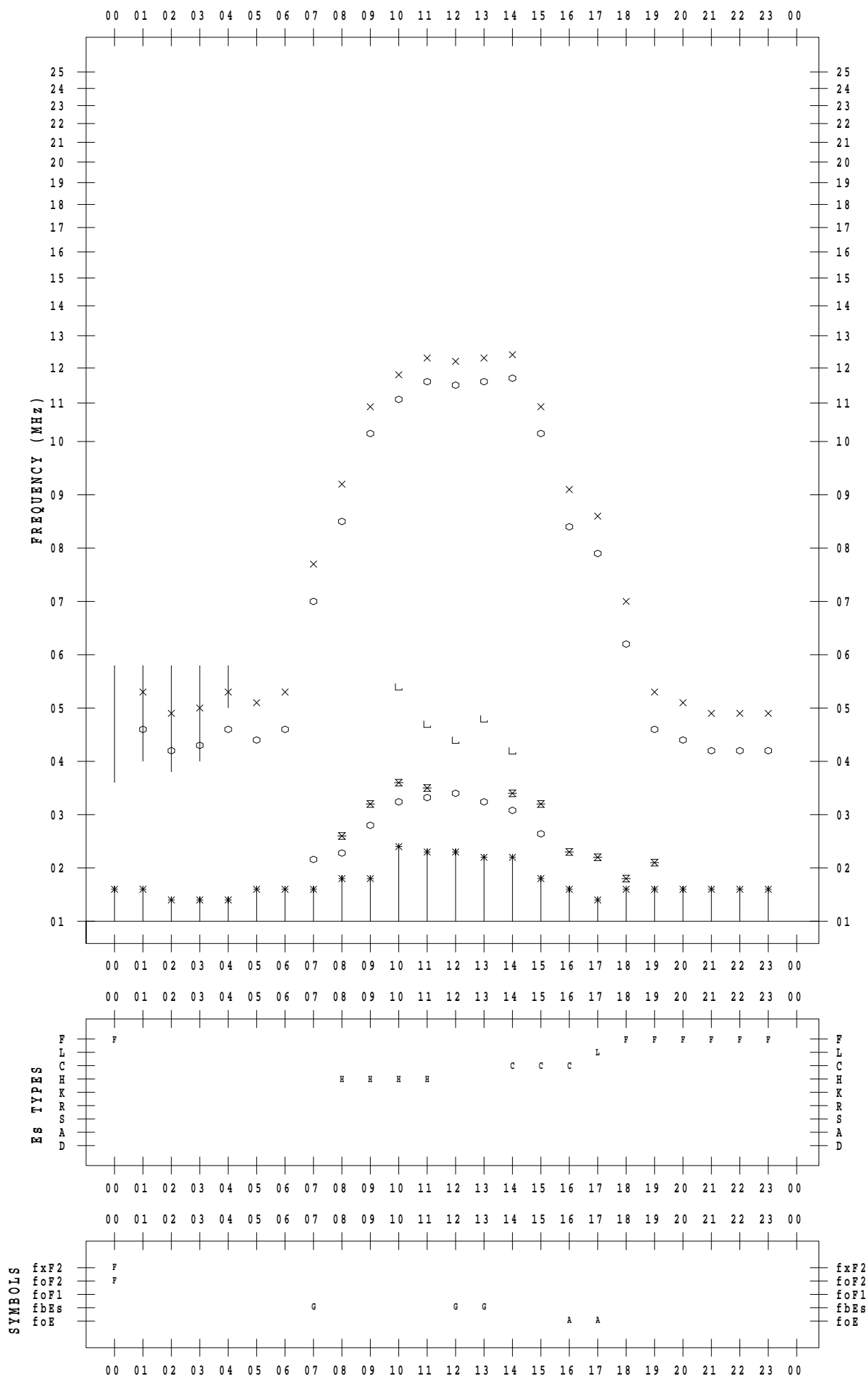
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 4

135 ° E MEAN TIME



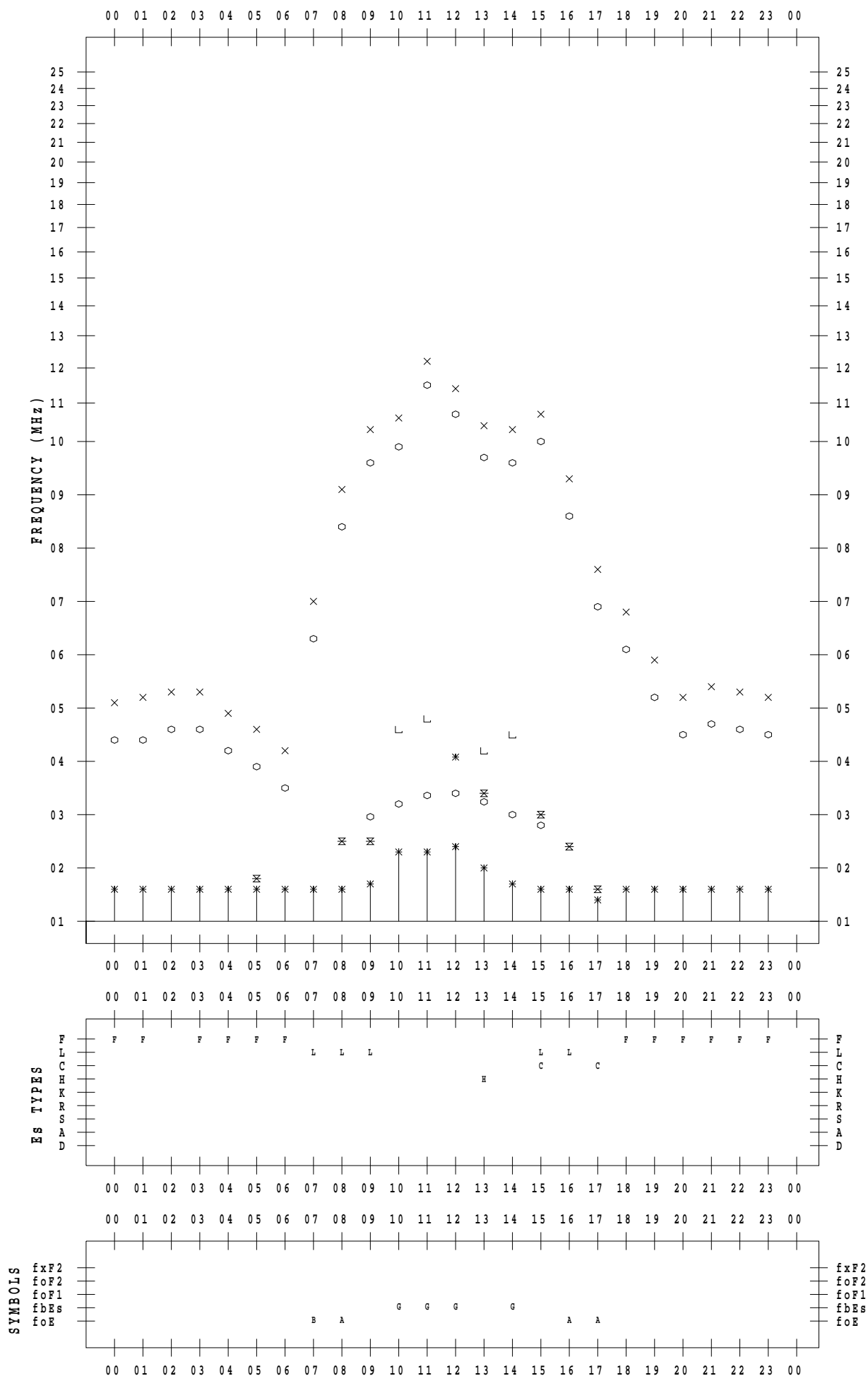
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 5

135 ° E MEAN TIME



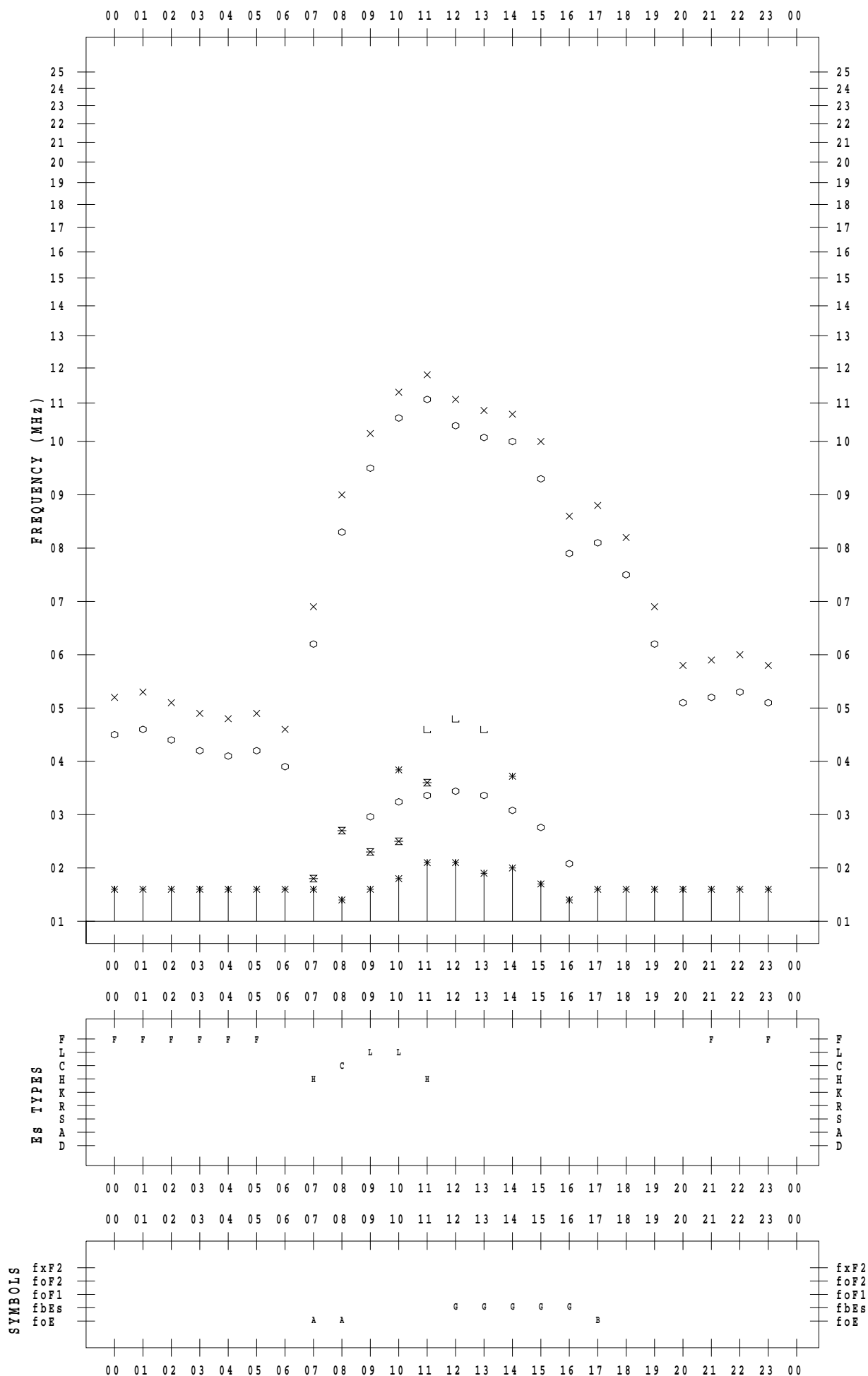
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 6

135 ° E MEAN TIME



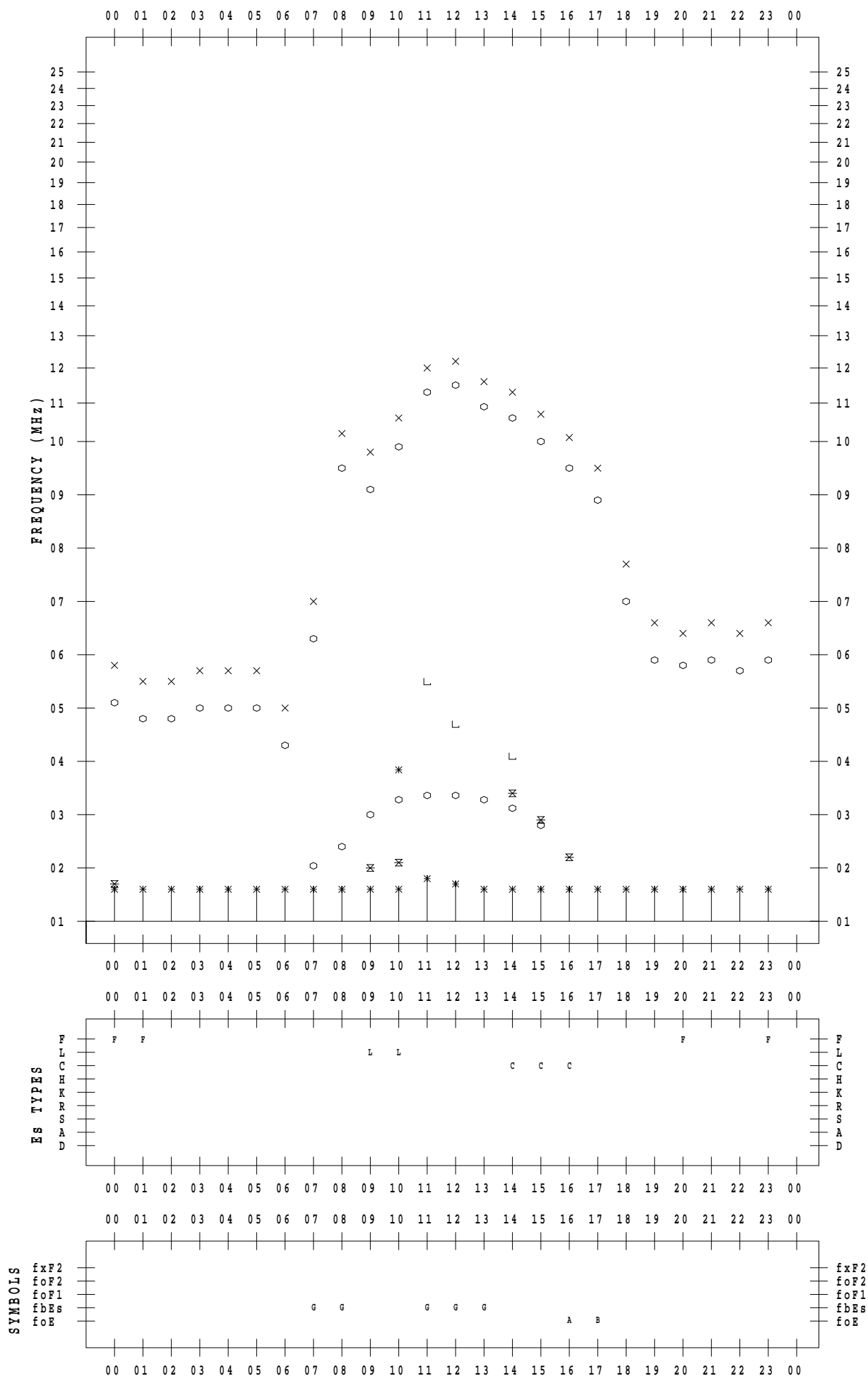
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 7

135 ° E MEAN TIME



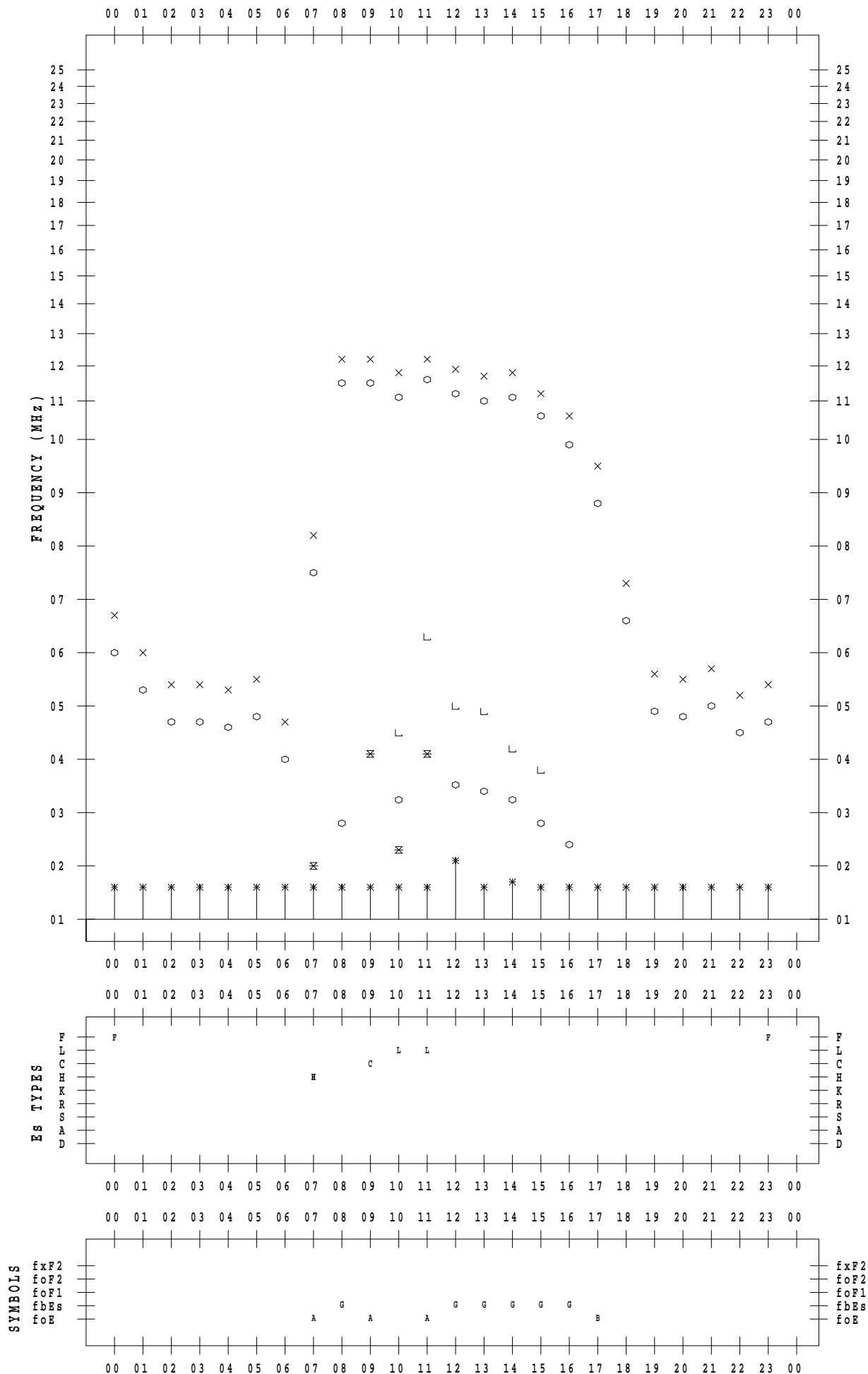
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 8

135 ° E MEAN TIME



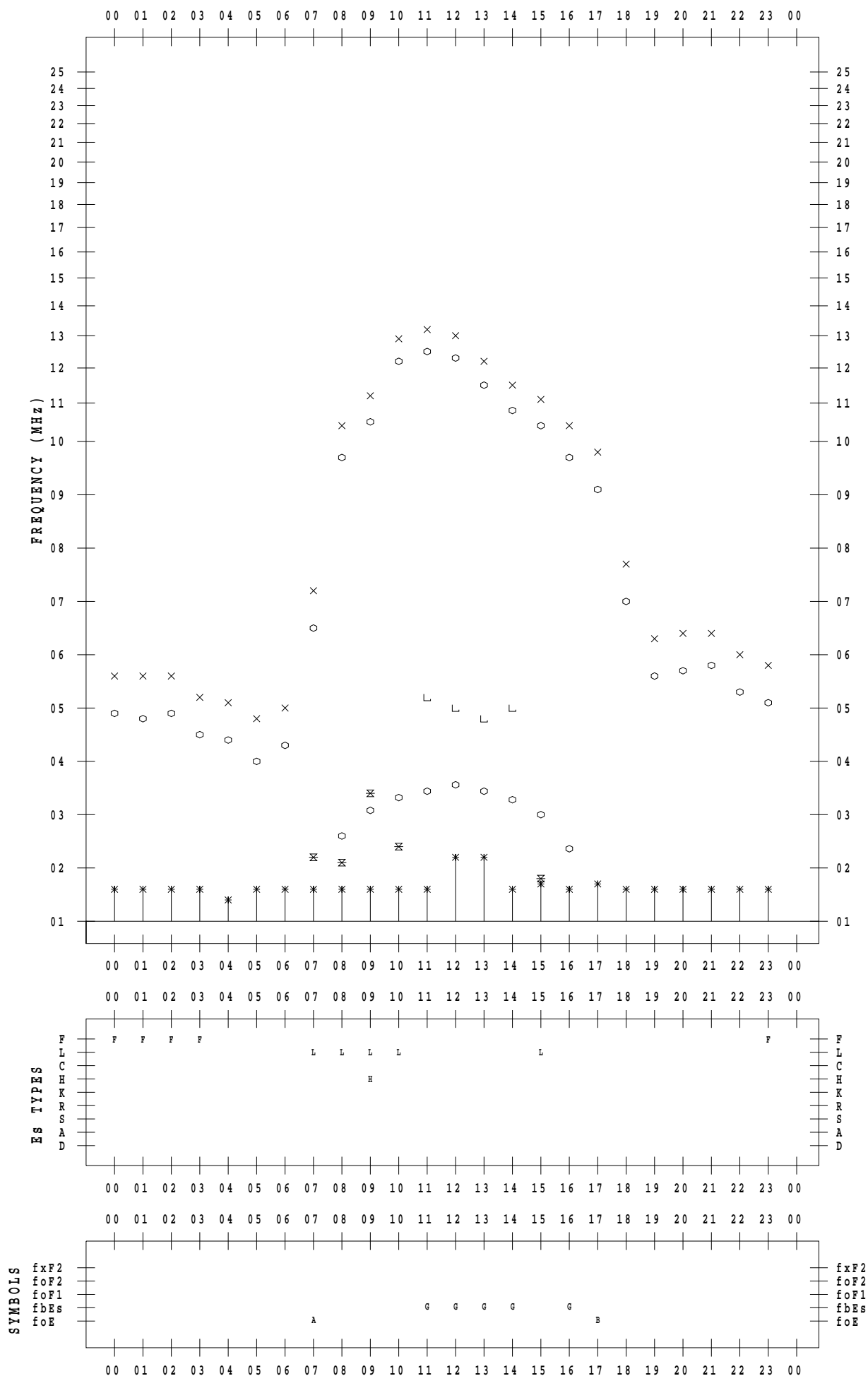
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 9

135 ° E MEAN TIME



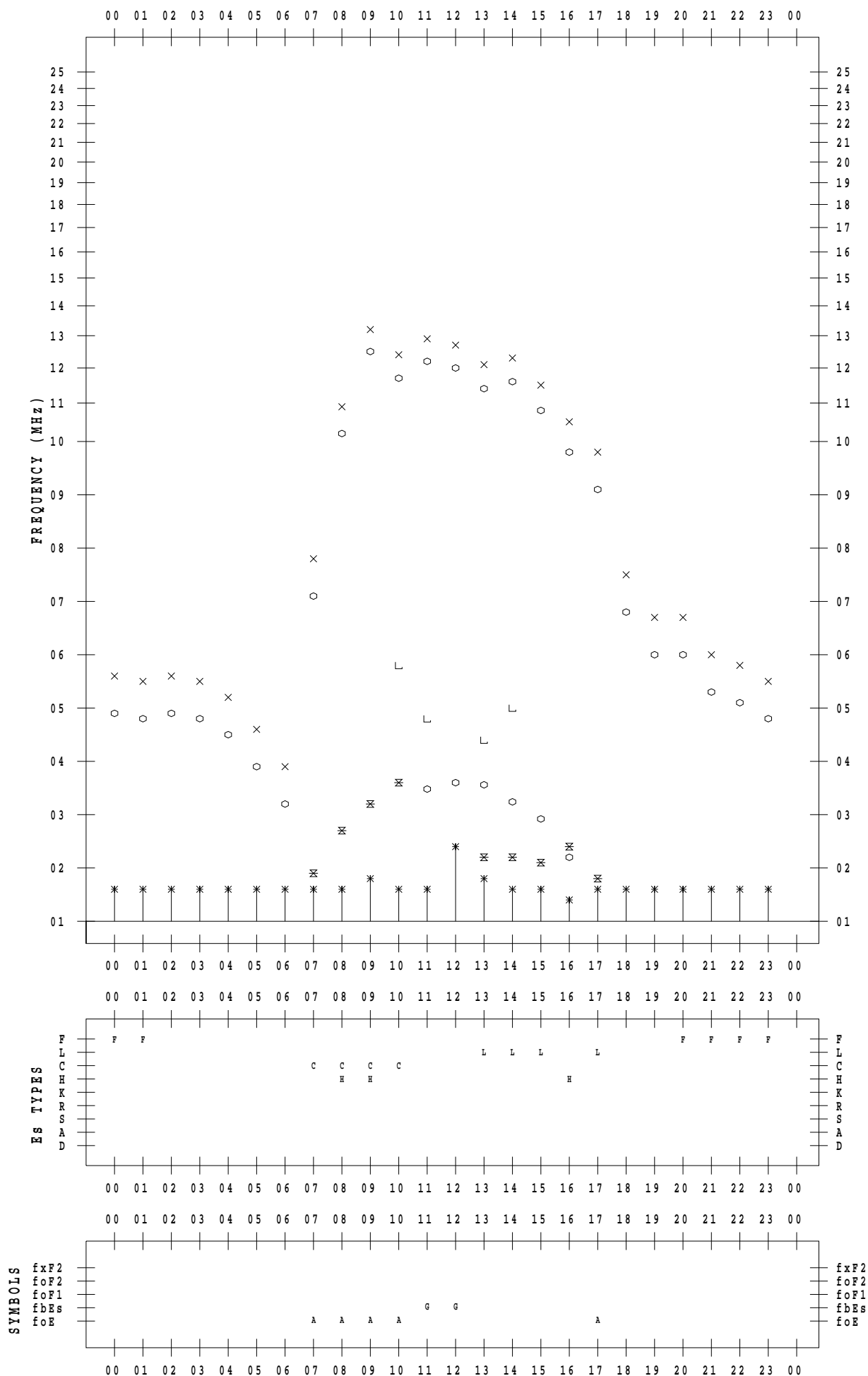
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 10

135 ° E MEAN TIME



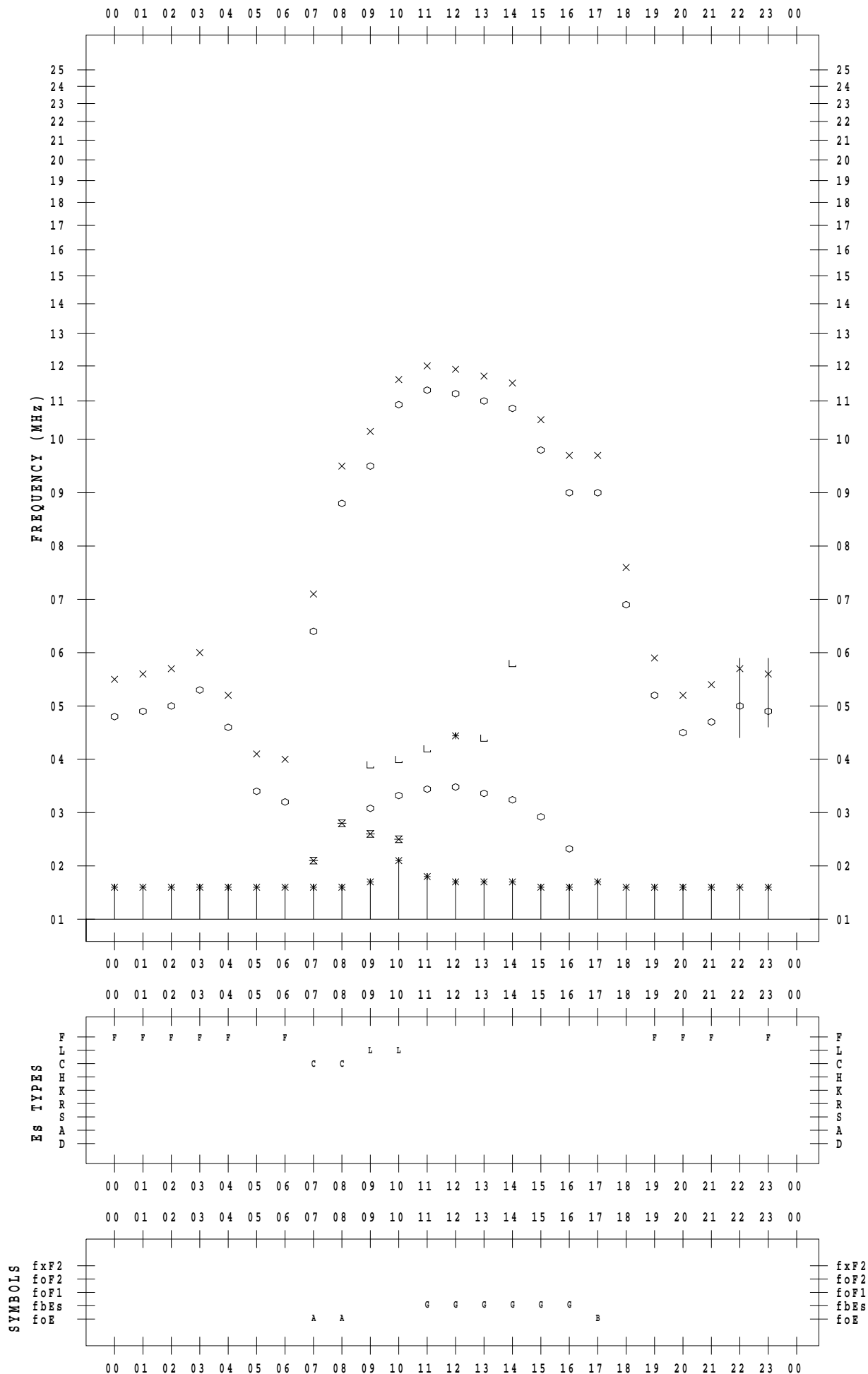
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 11

135 ° E MEAN TIME



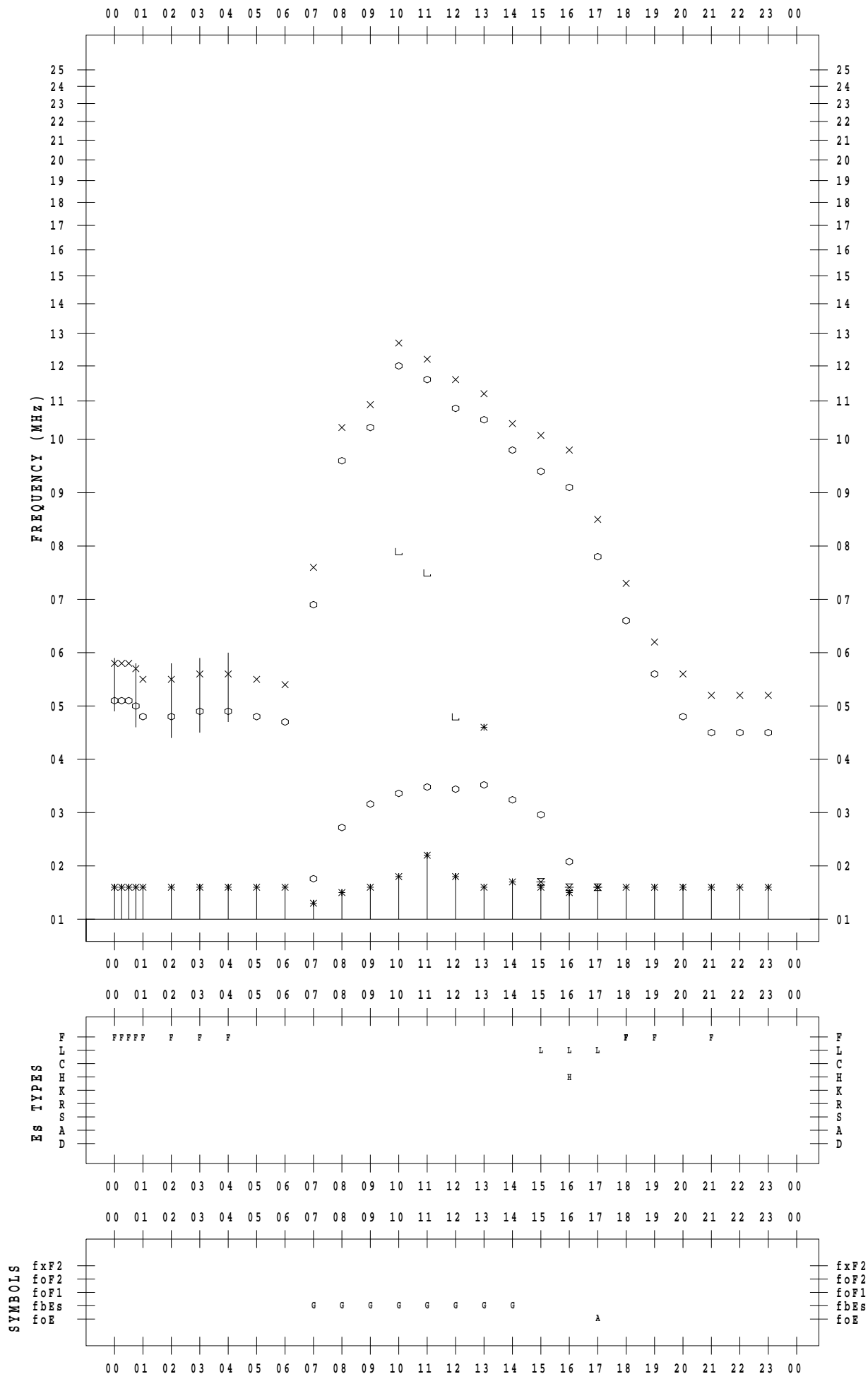
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 12

135 ° E MEAN TIME



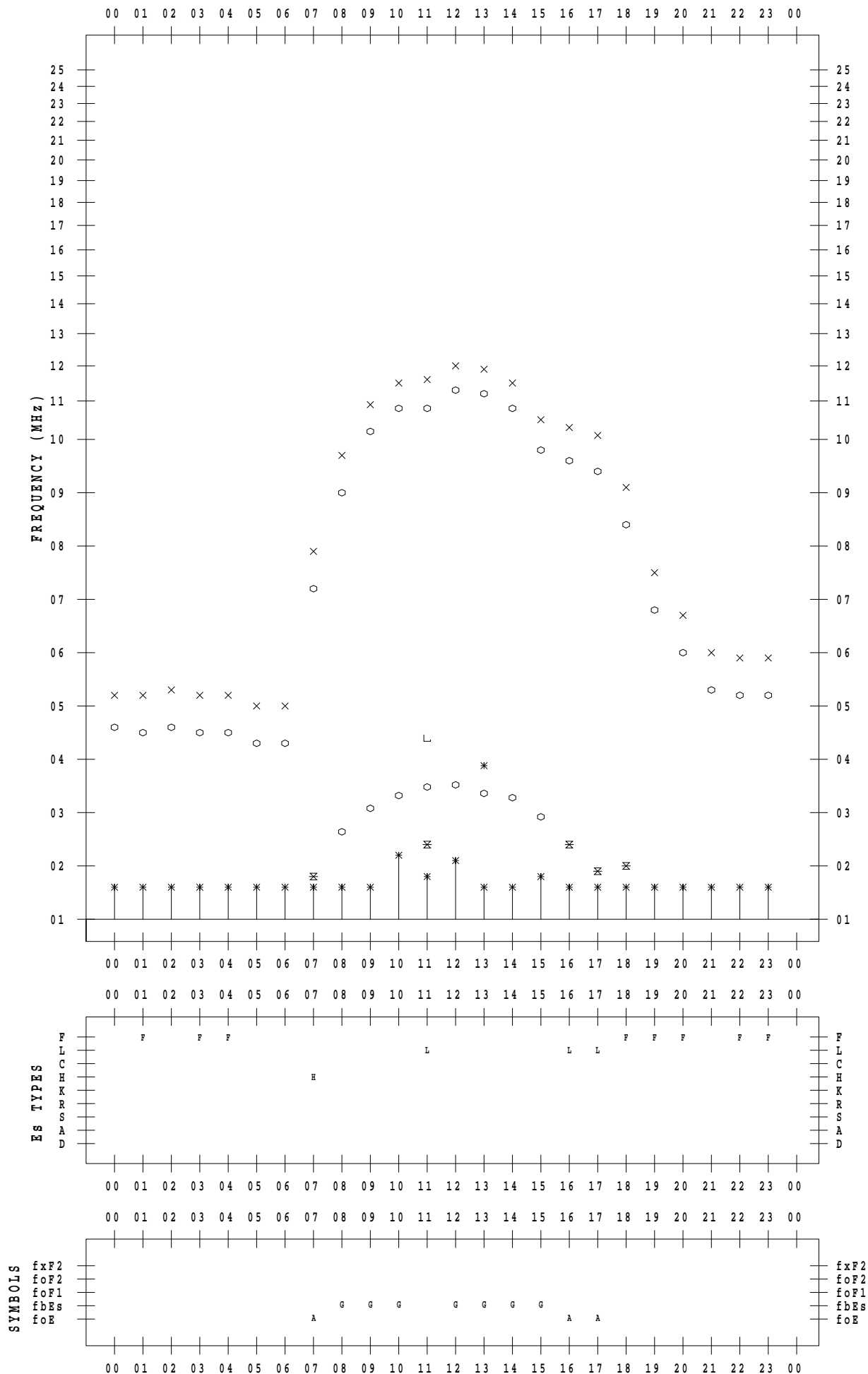
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 13

135 ° E MEAN TIME



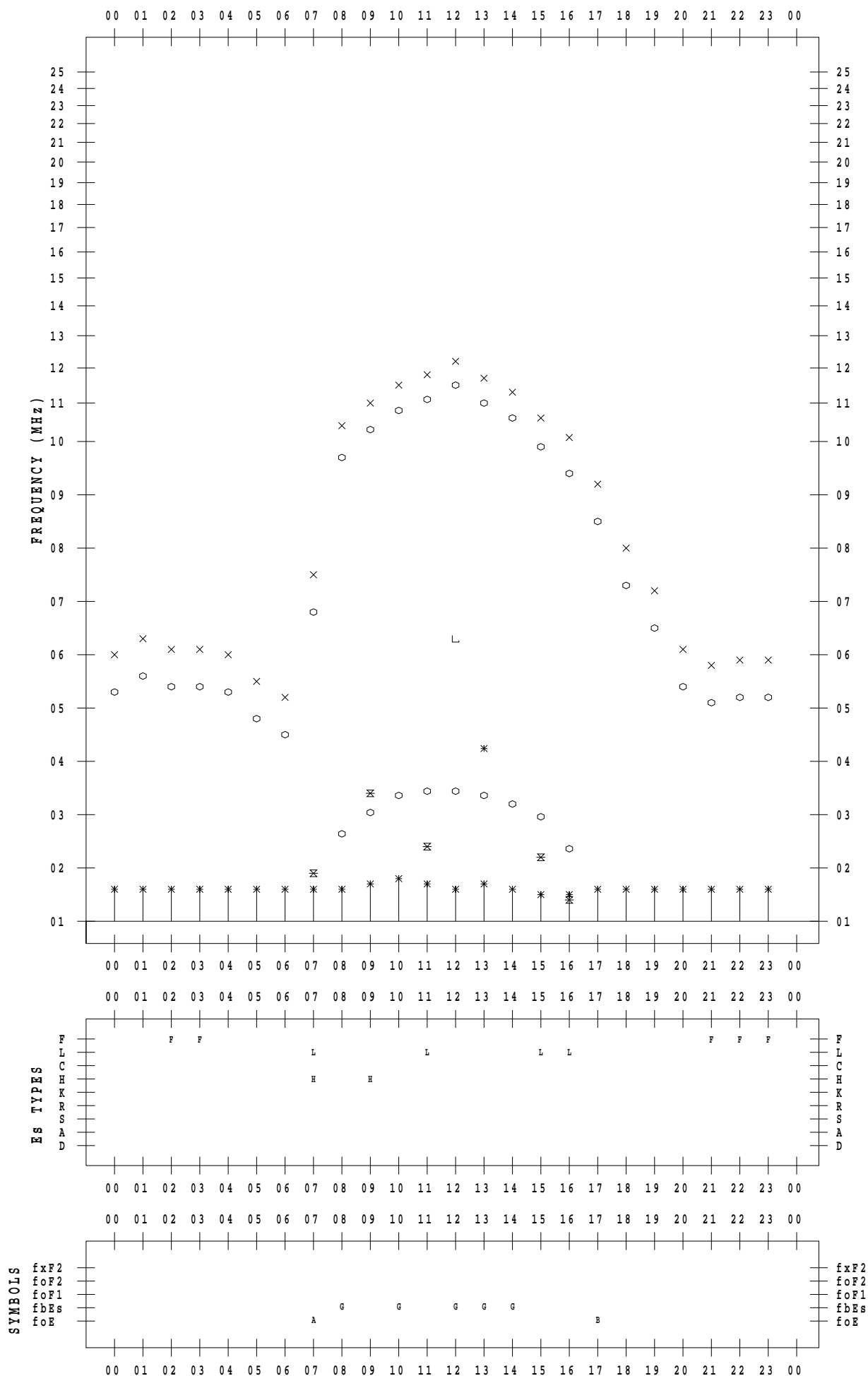
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 14

135 ° E MEAN TIME



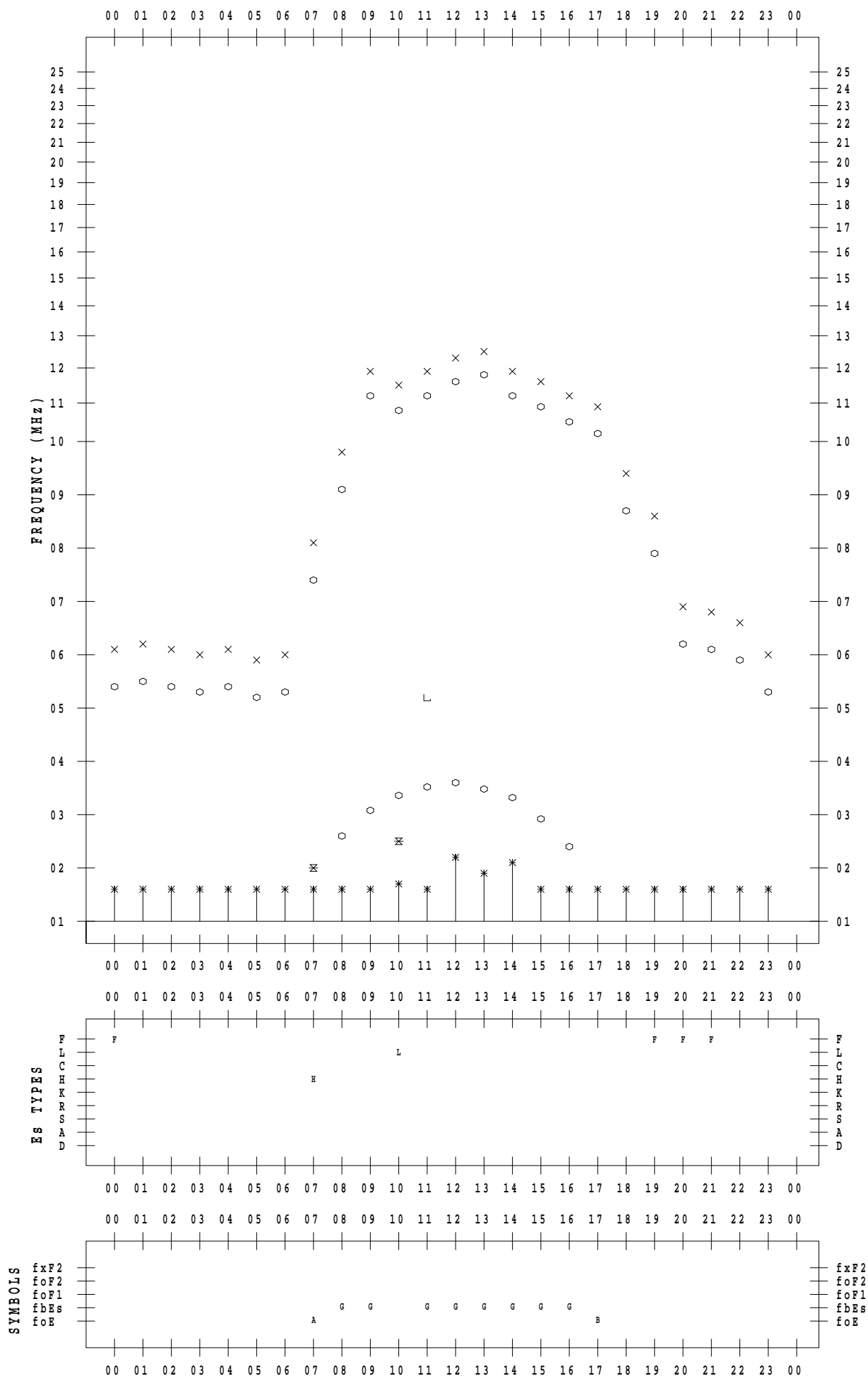
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 15

135 ° E MEAN TIME



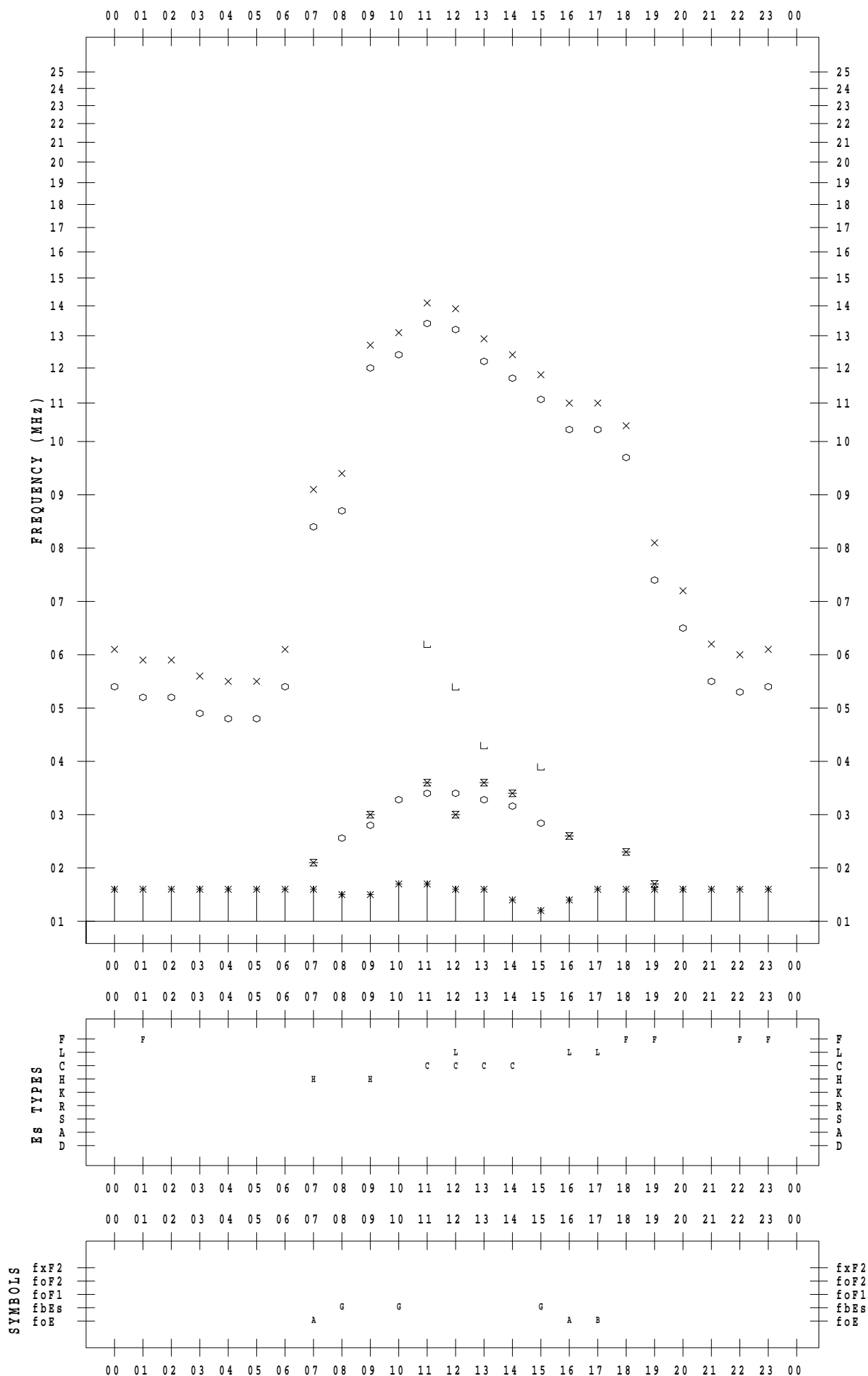
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 16

135 ° E MEAN TIME



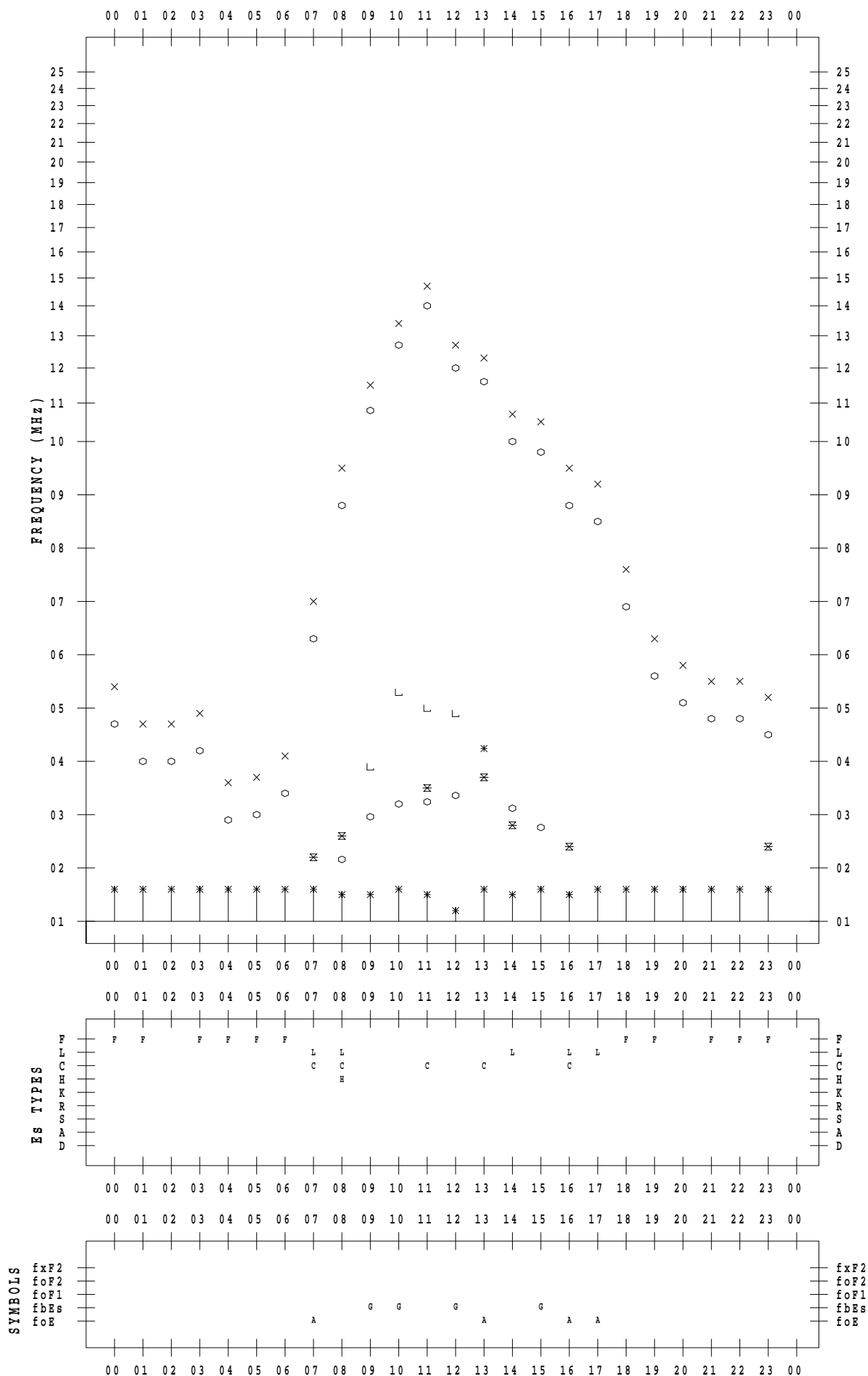
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 17

135 ° E MEAN TIME



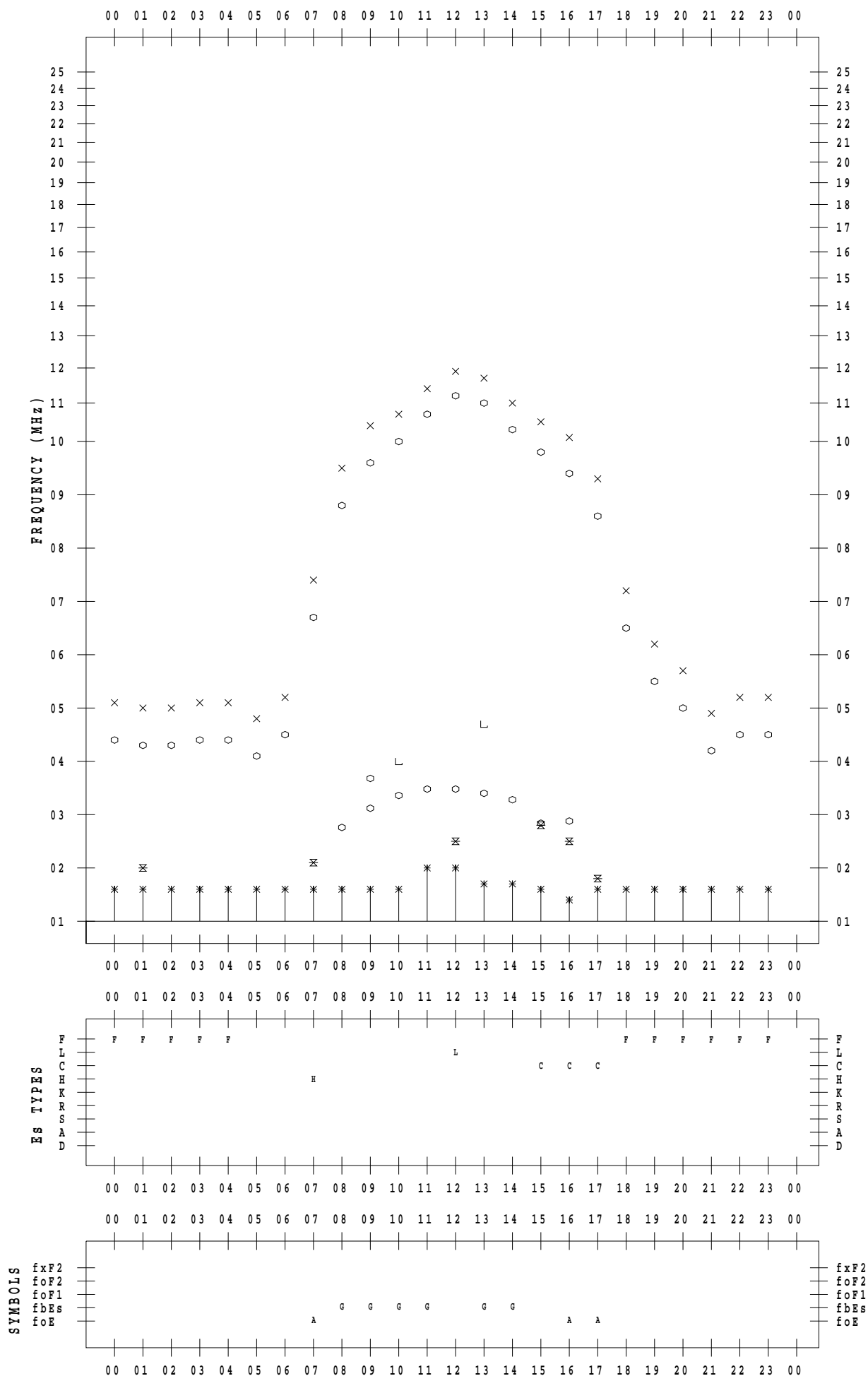
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 18

135 ° E MEAN TIME



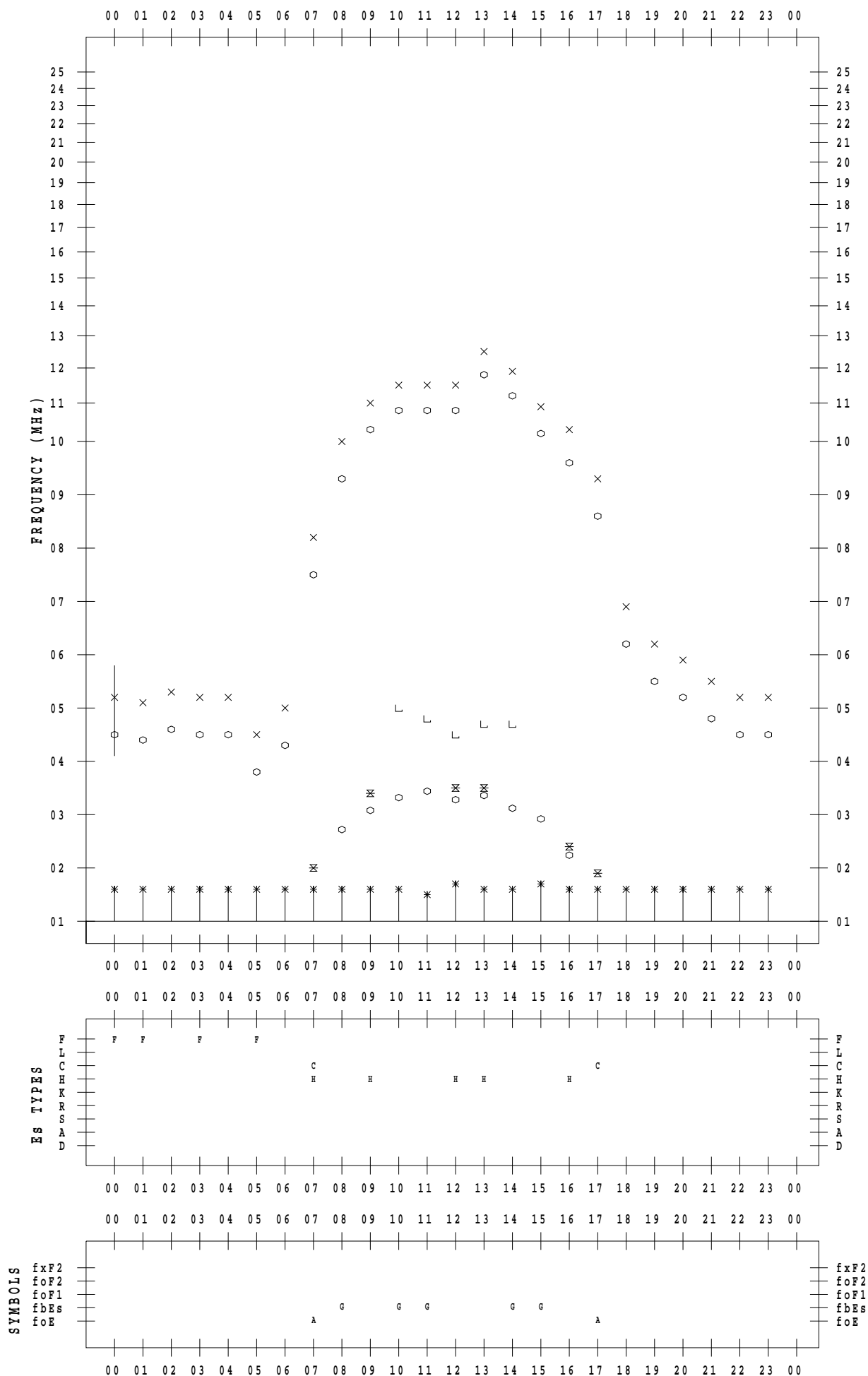
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 19

135 ° E MEAN TIME



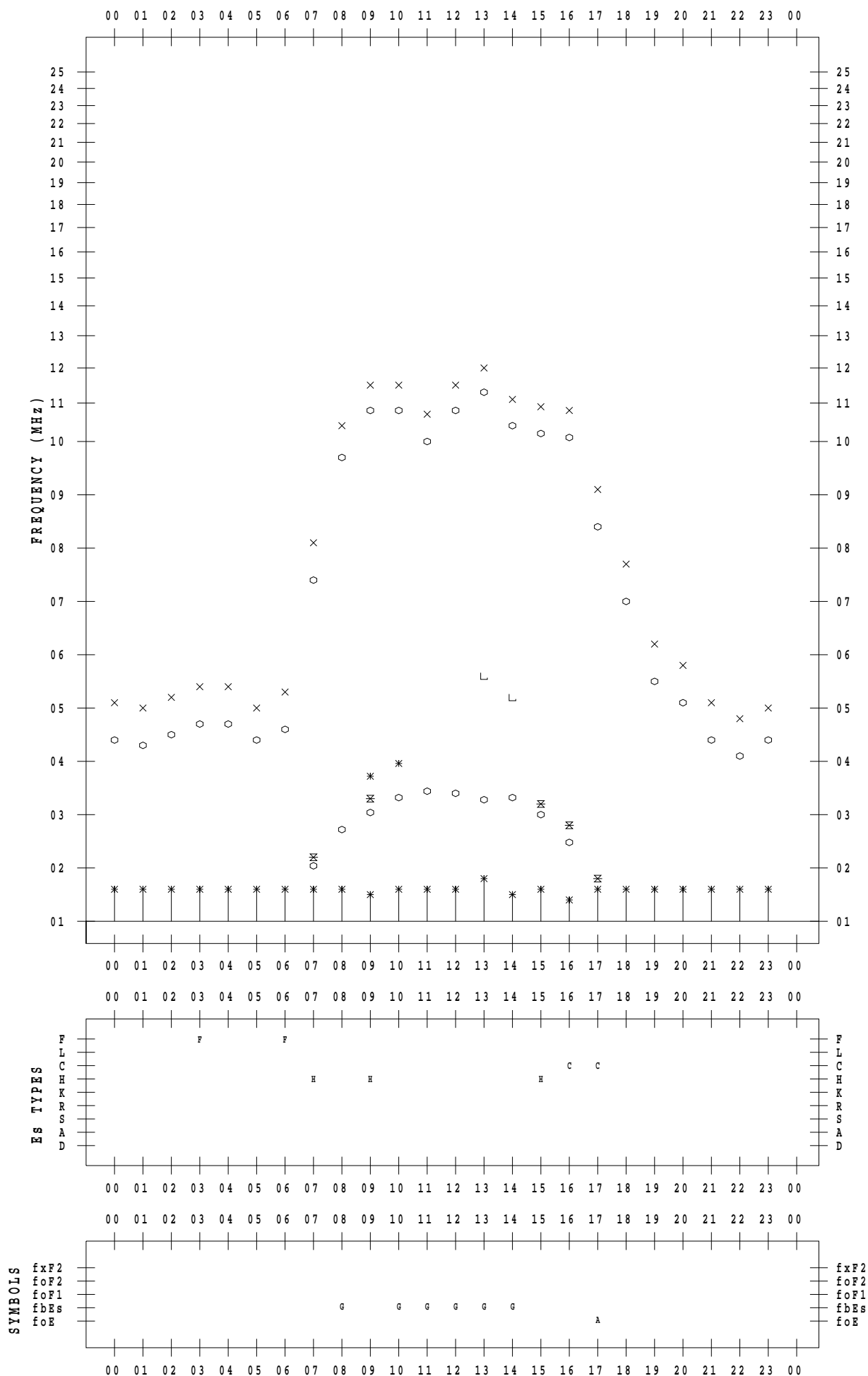
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 20

135 ° E MEAN TIME



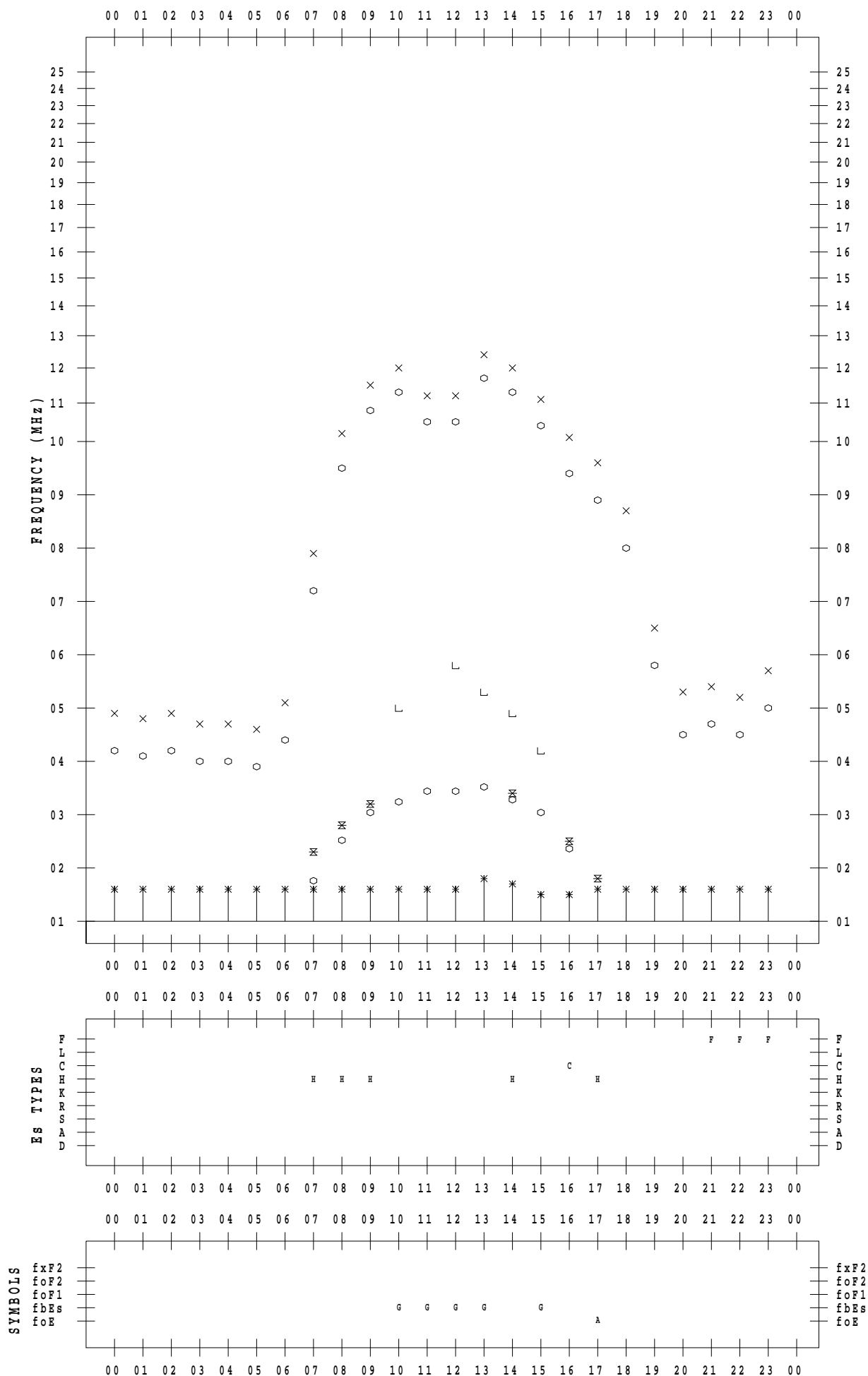
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 21

135 ° E MEAN TIME



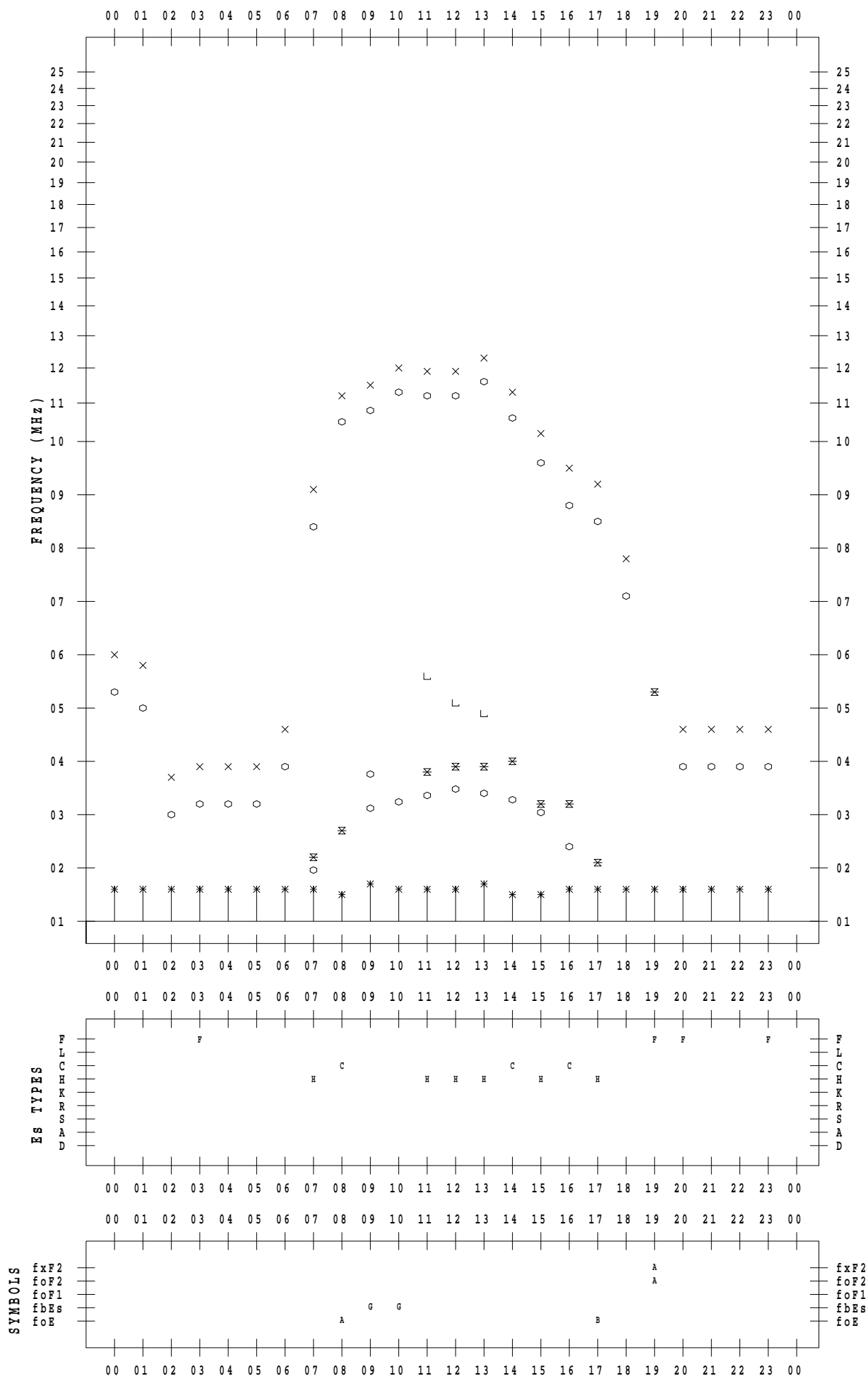
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 22

135 ° E MEAN TIME



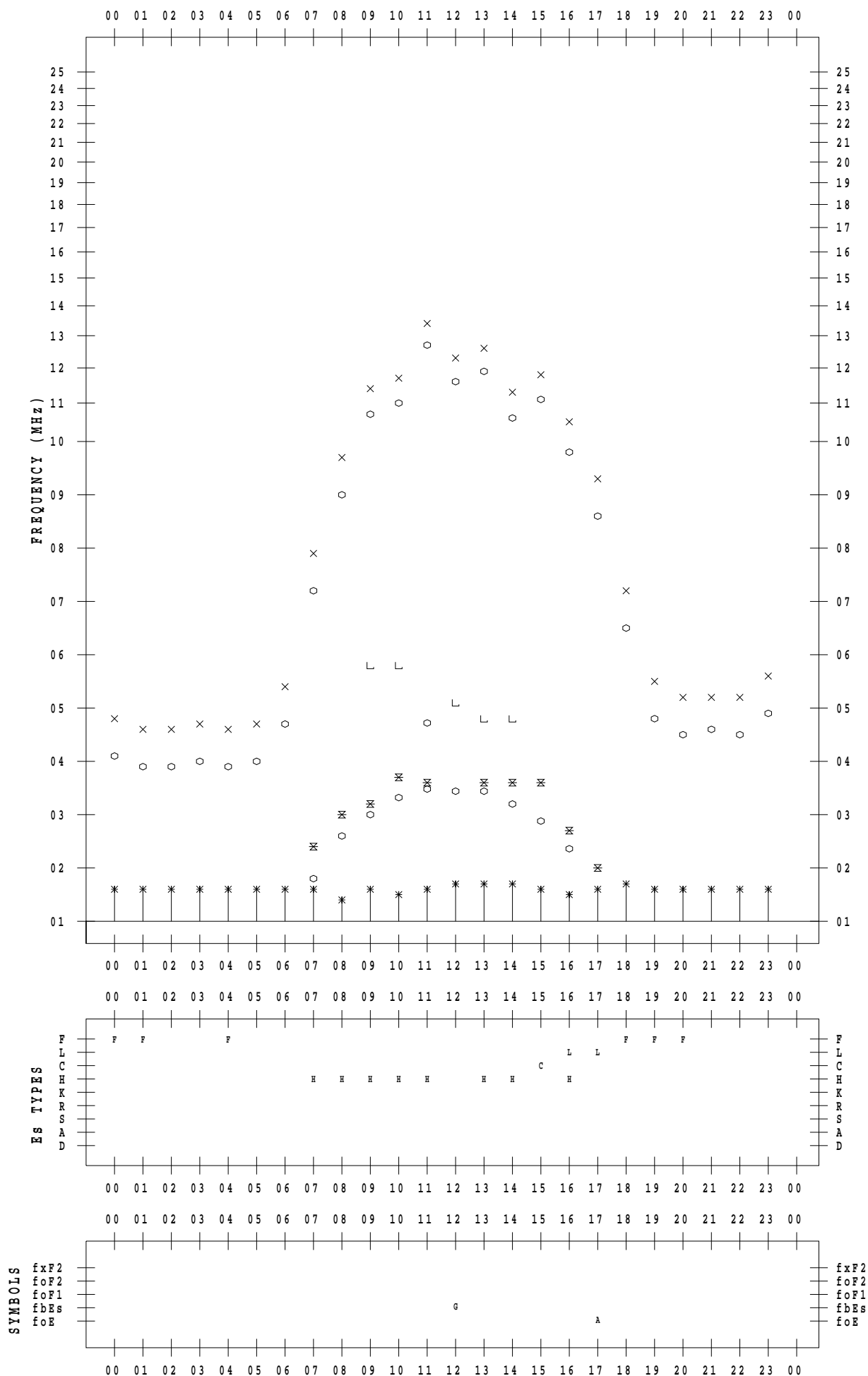
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 23

135 ° E MEAN TIME



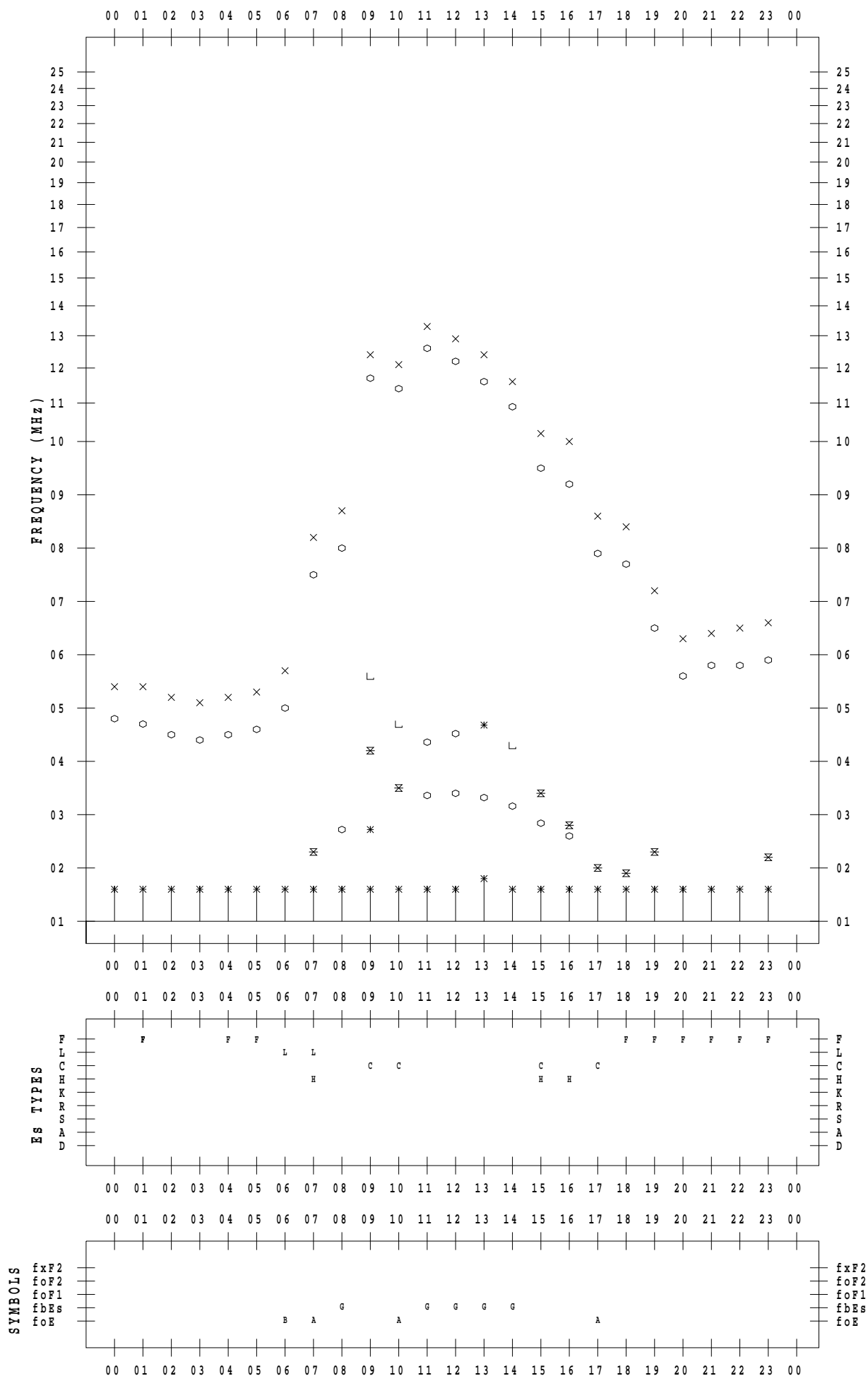
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 24

135 ° E MEAN TIME



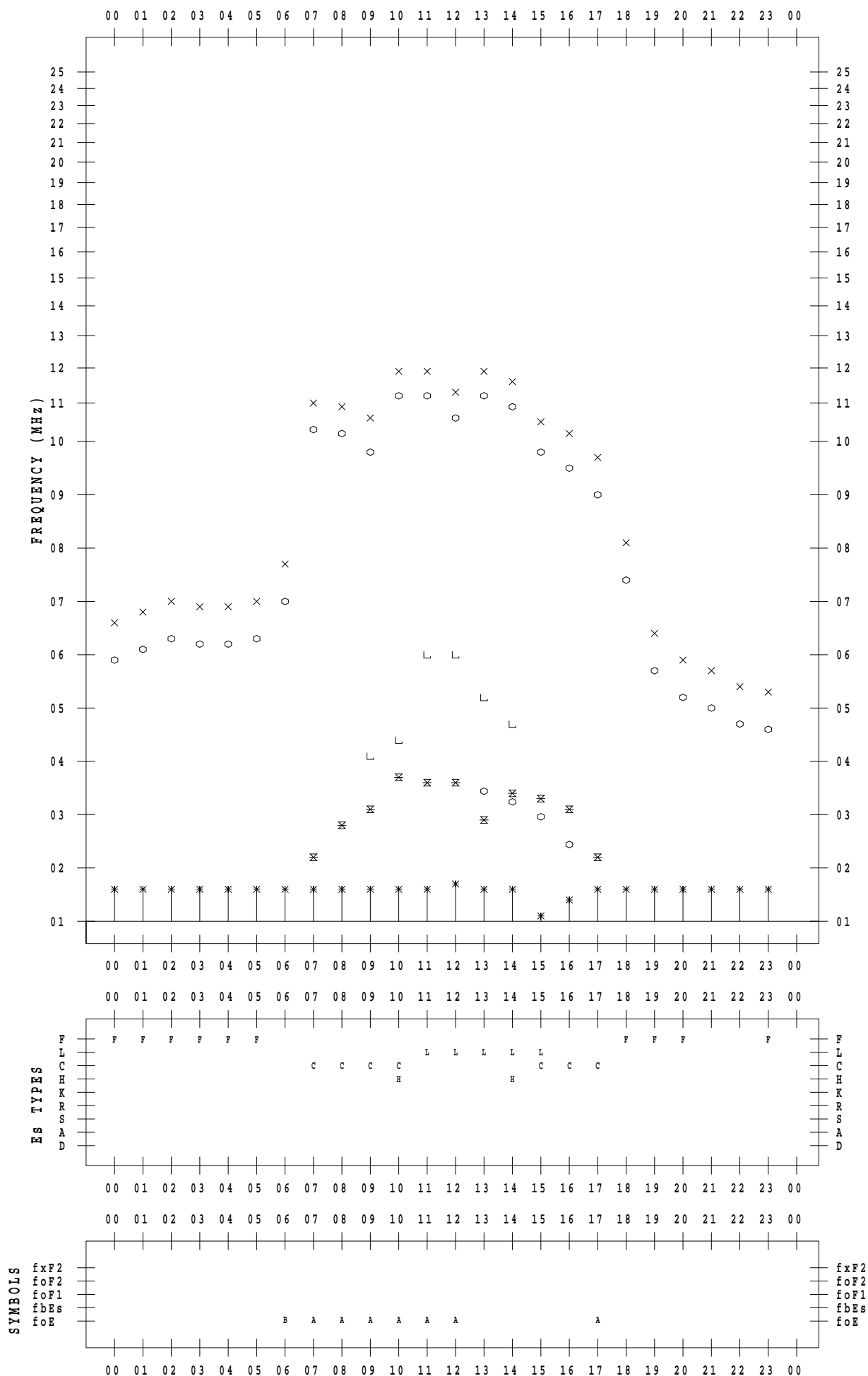
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 25

135 ° E MEAN TIME



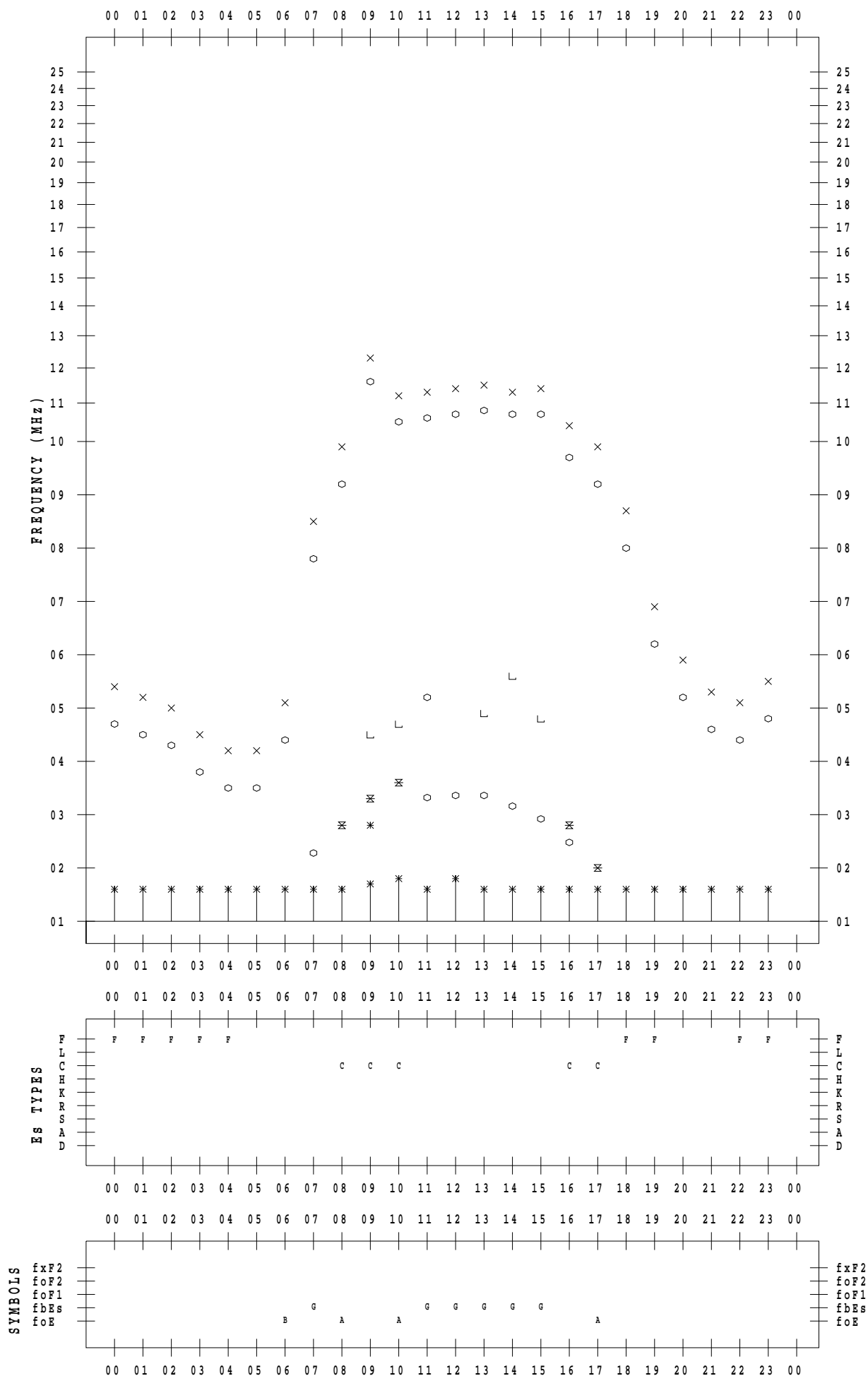
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 26

135 ° E MEAN TIME



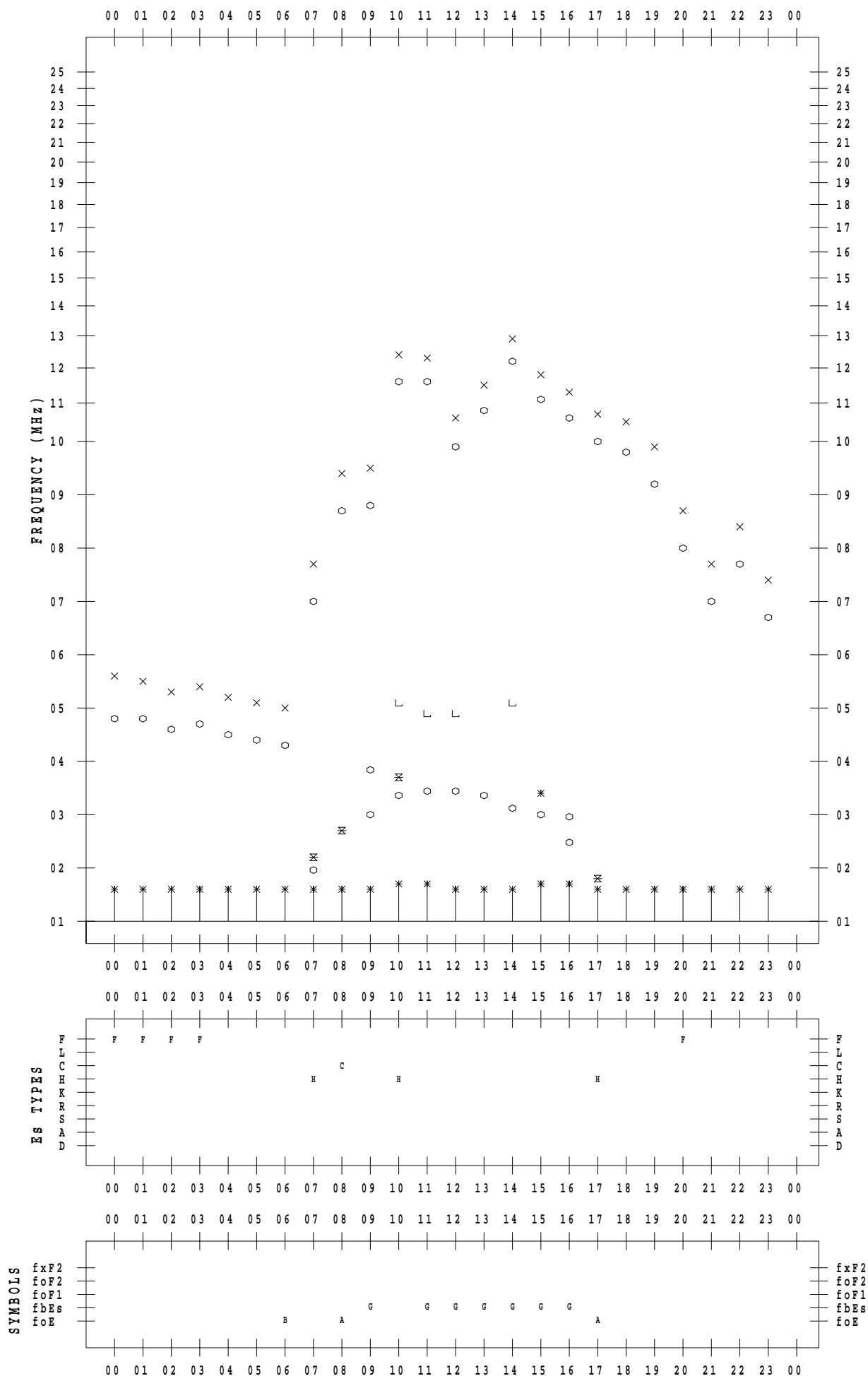
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 27

135 ° E MEAN TIME



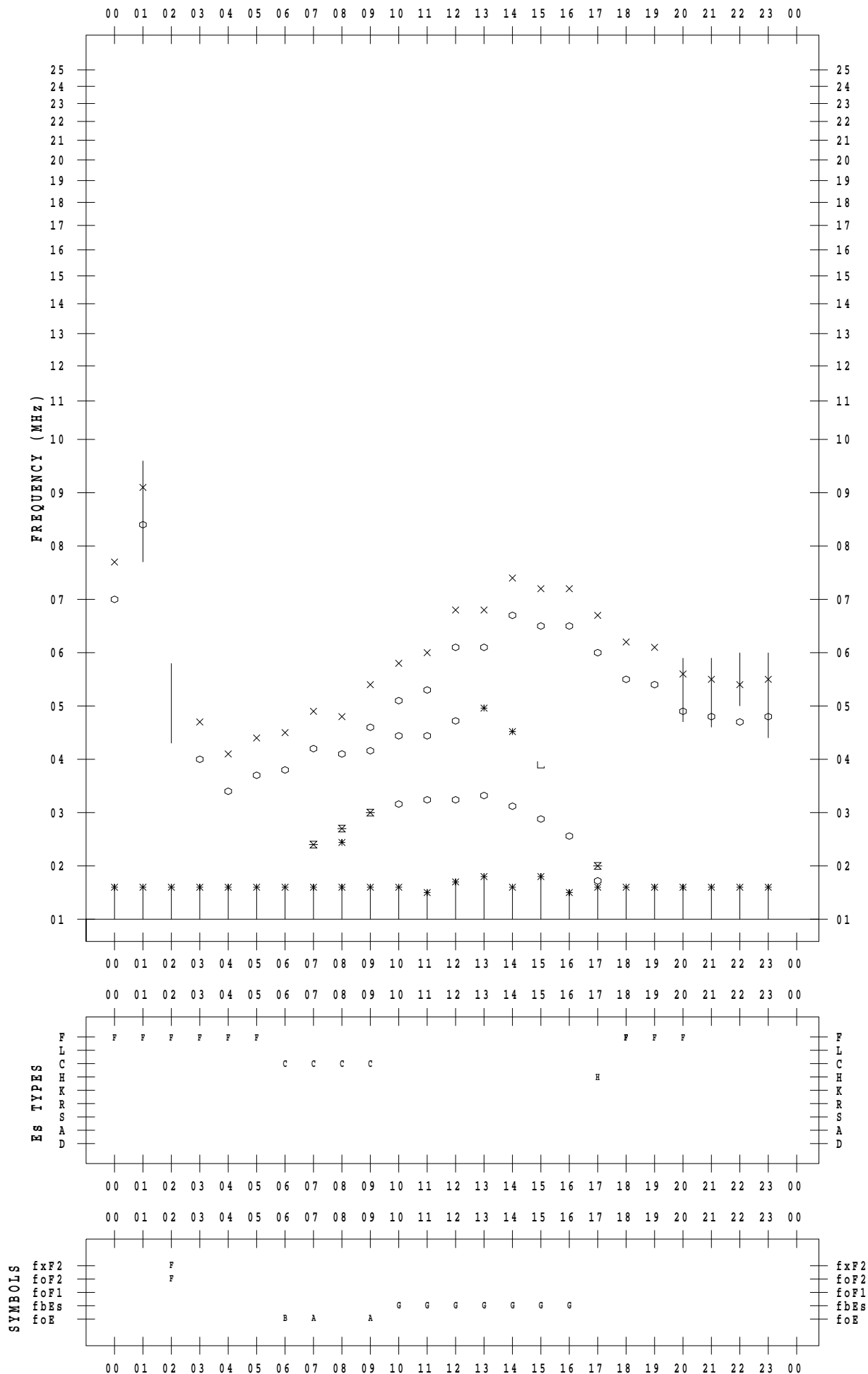
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 2 / 28

135 ° E MEAN TIME



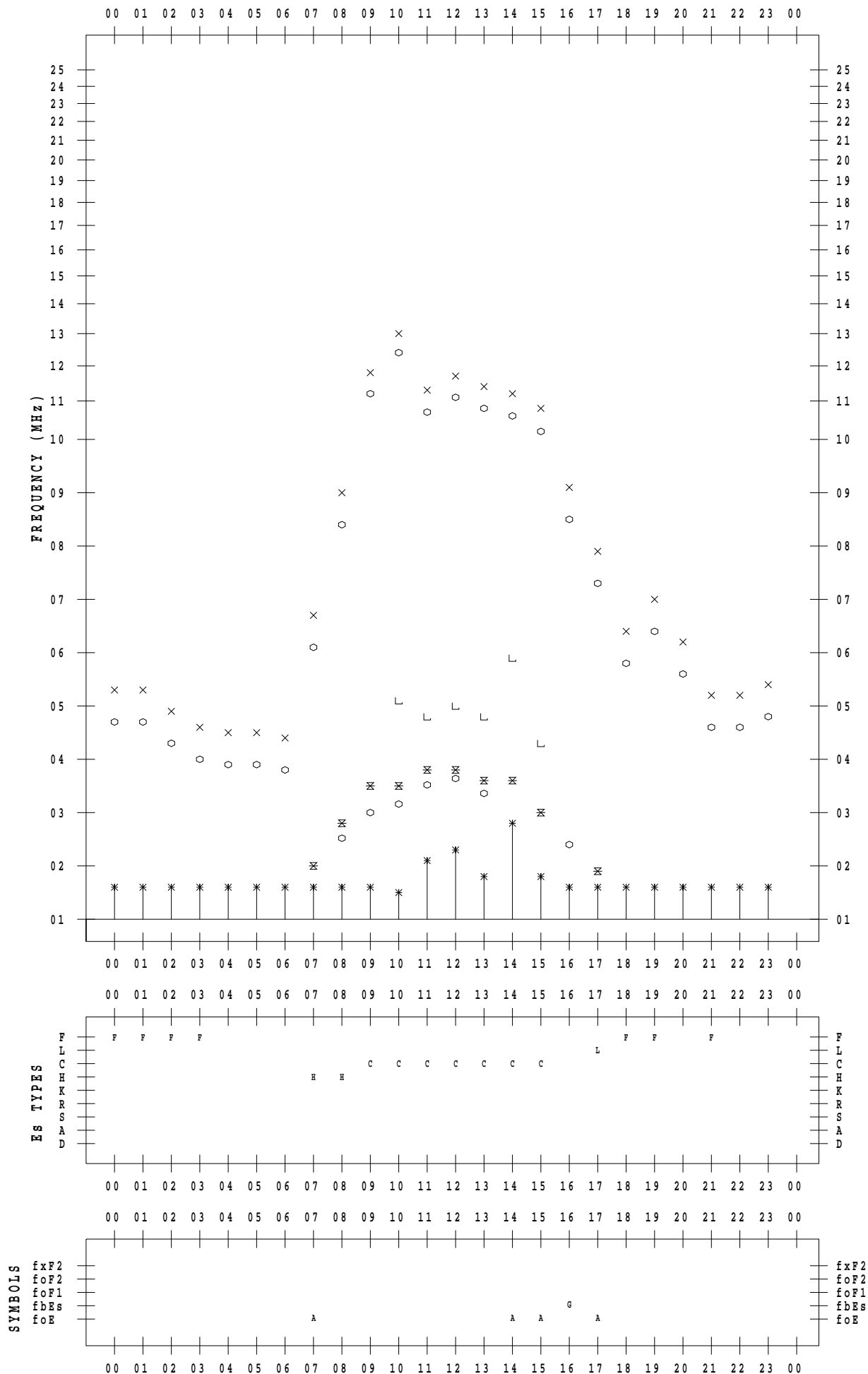
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 1

135 ° E MEAN TIME



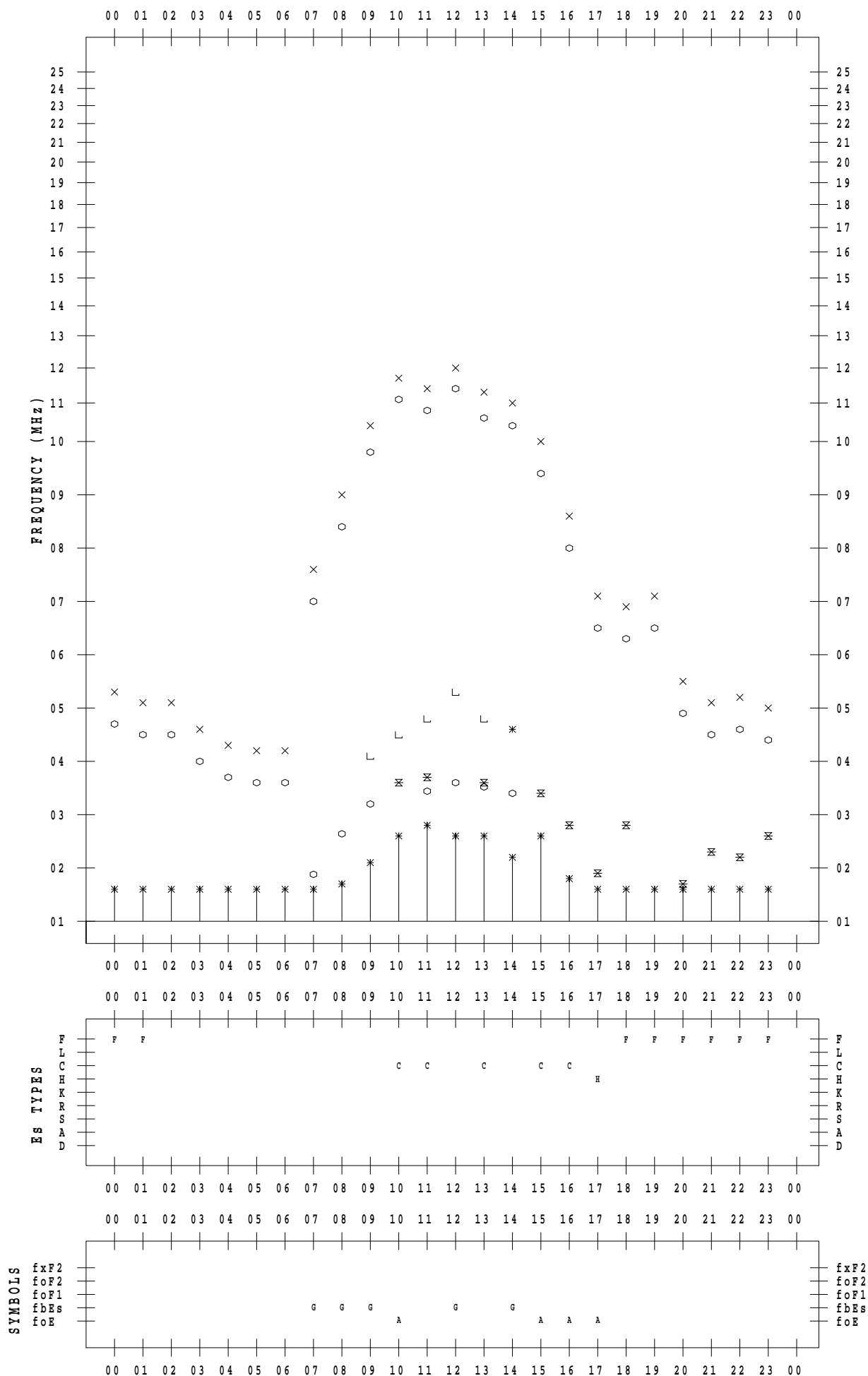
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 2

135 ° E MEAN TIME



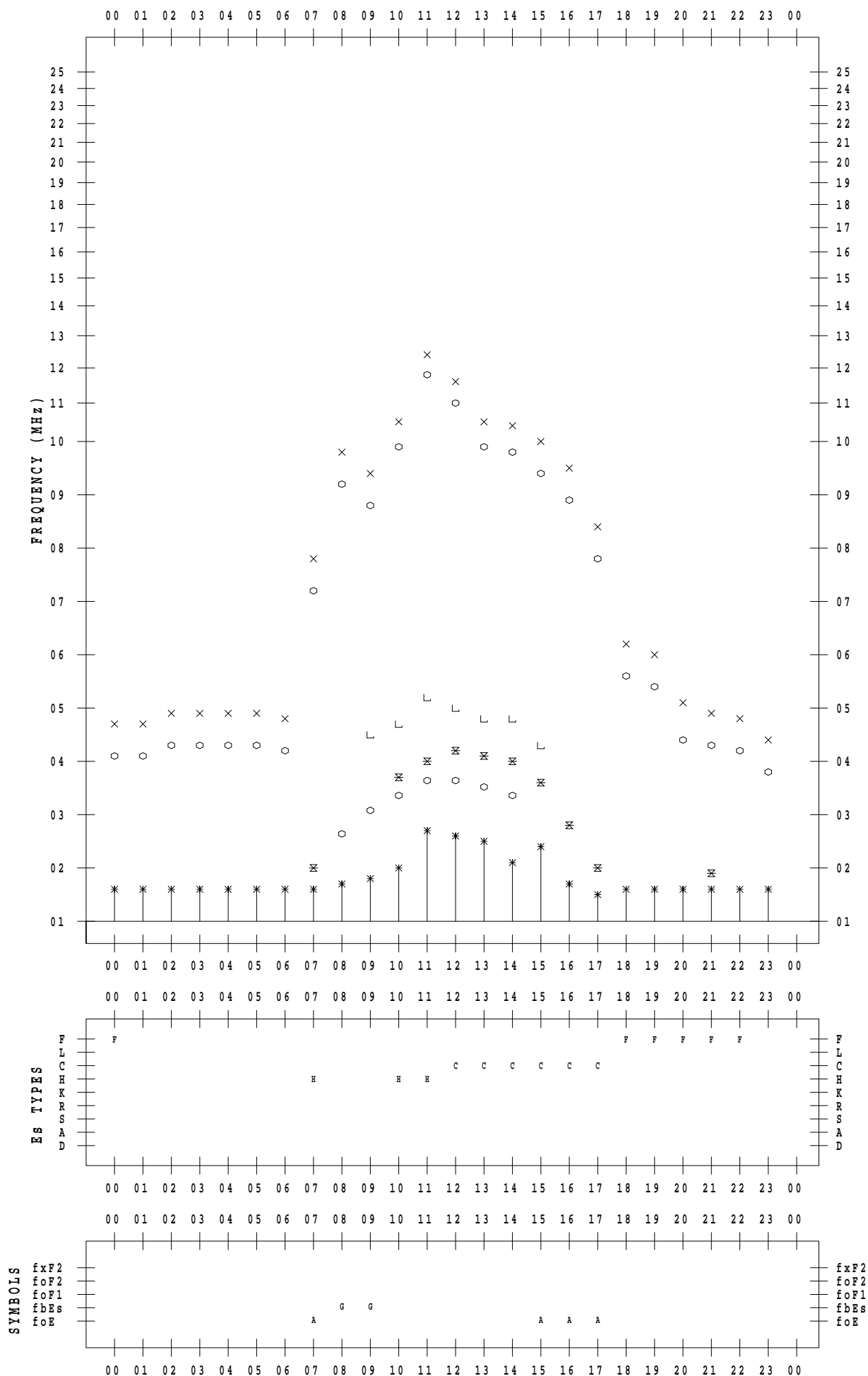
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 3

135 ° E MEAN TIME



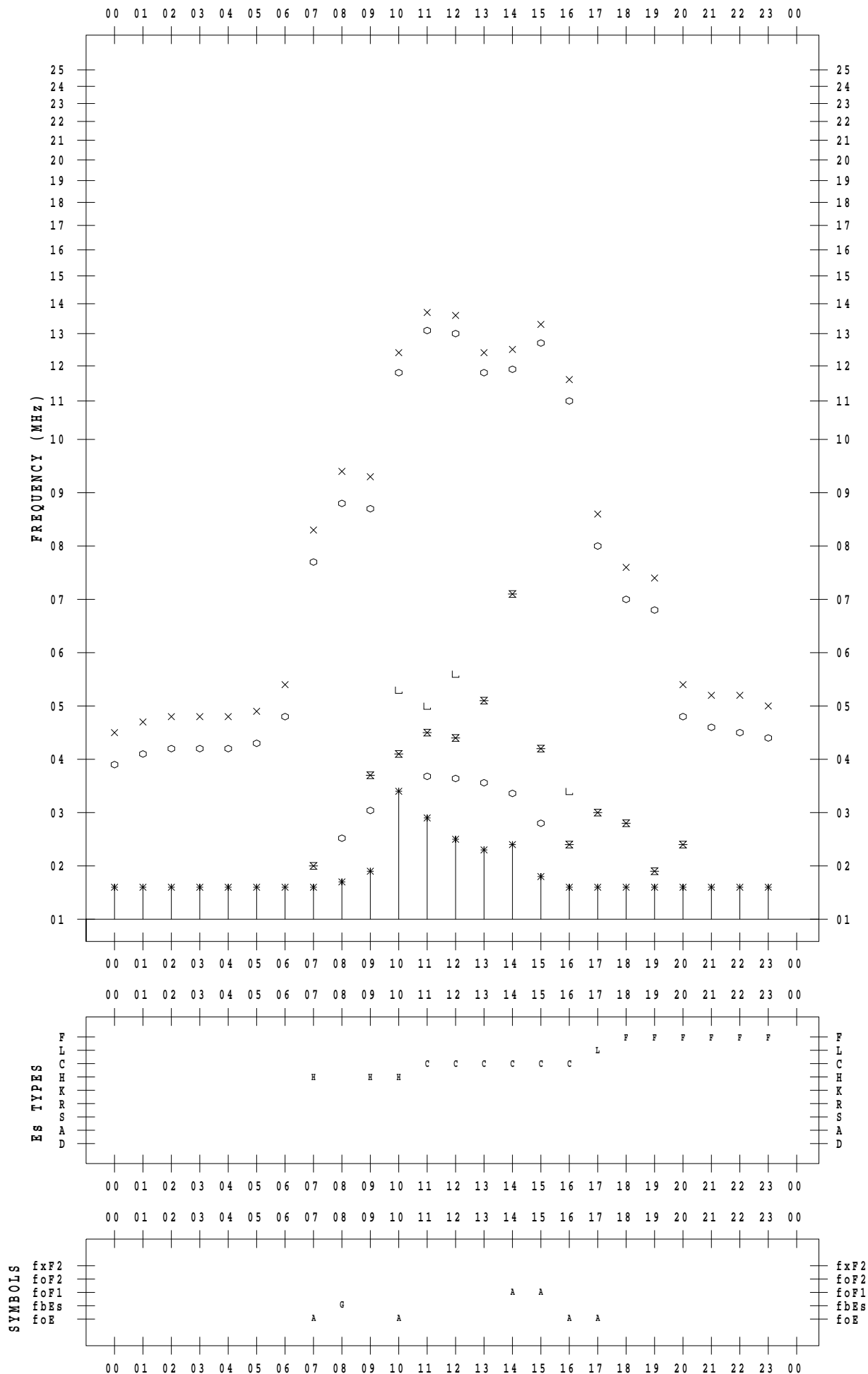
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 4

135 ° E MEAN TIME



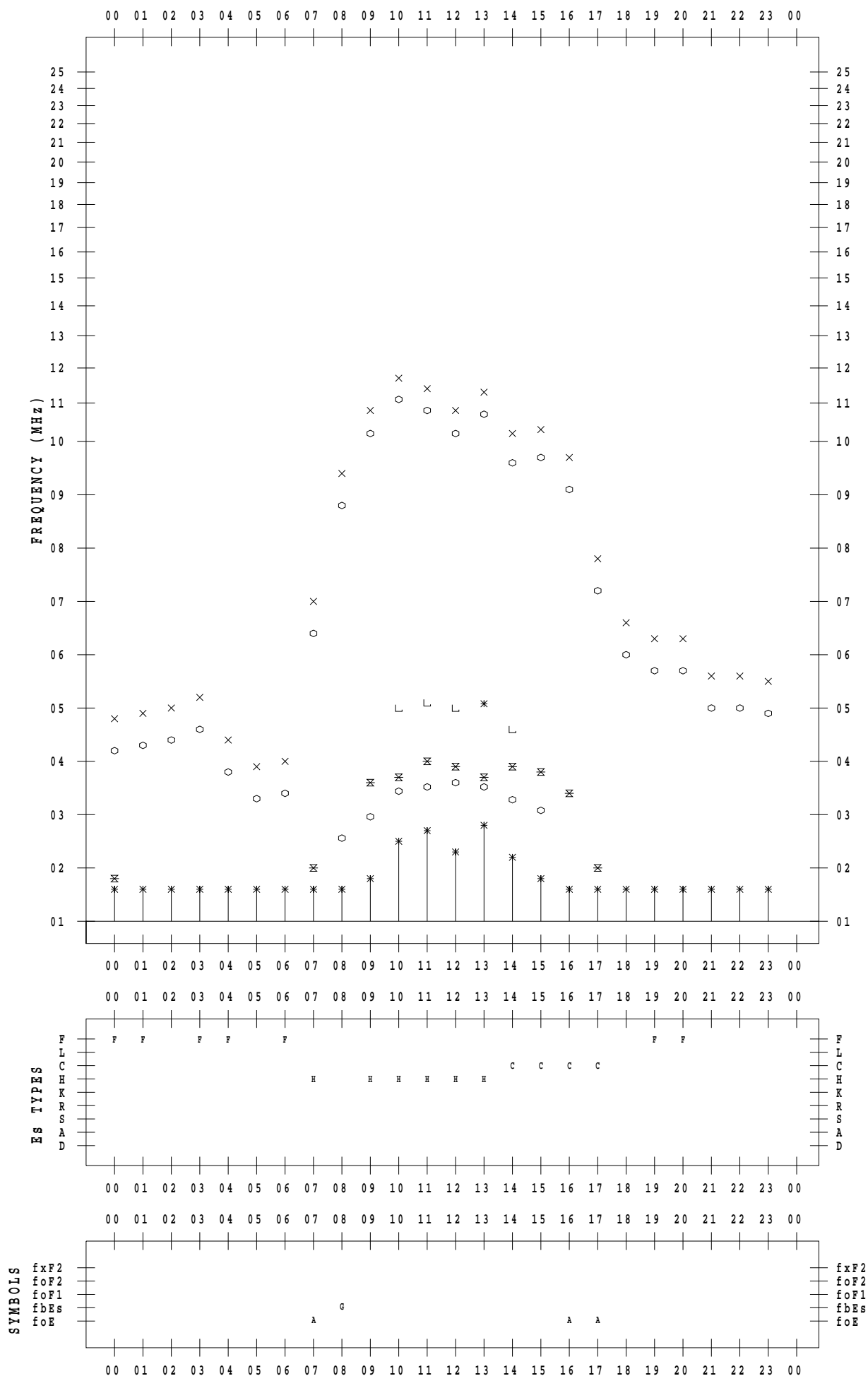
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 5

135 ° E MEAN TIME



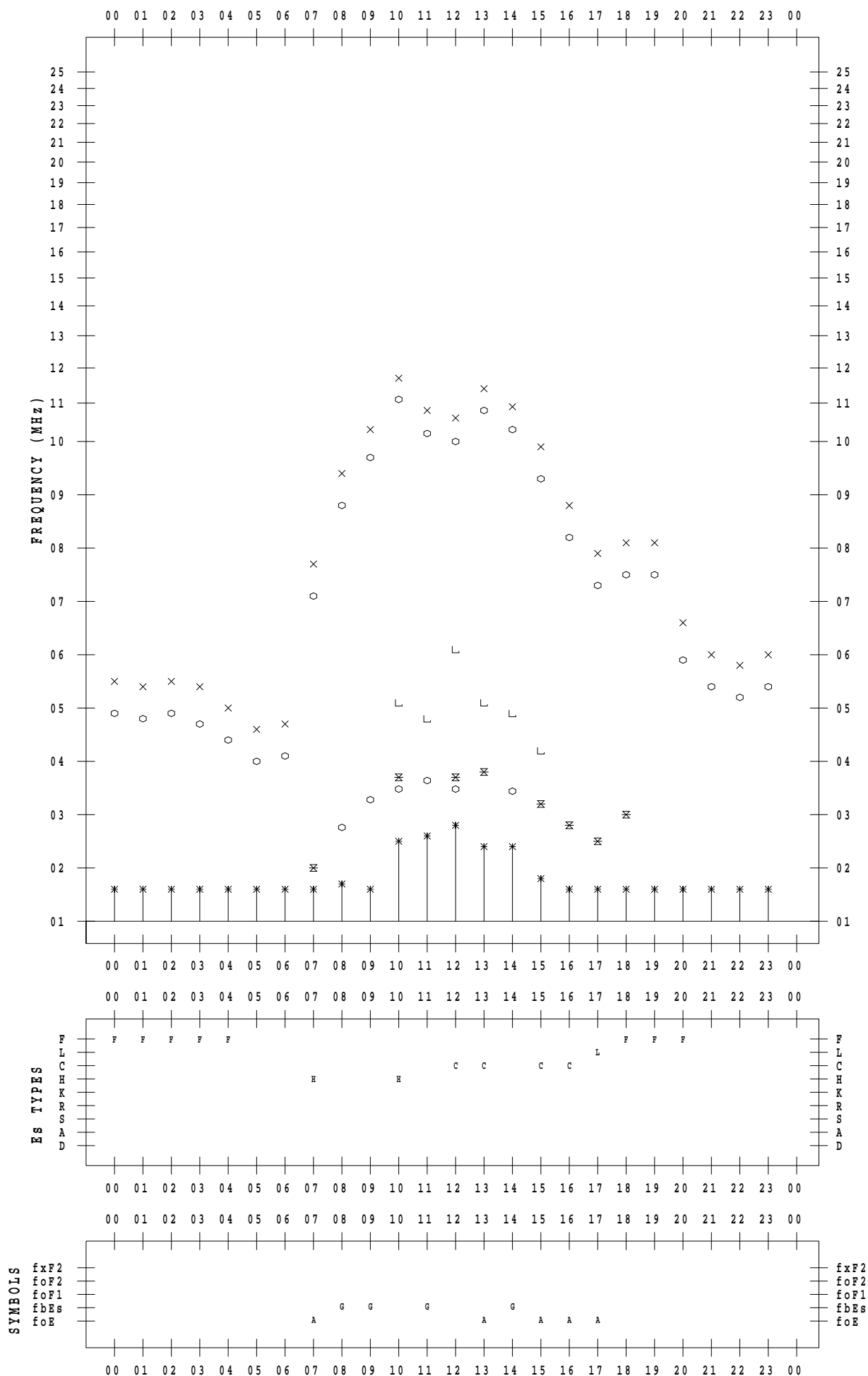
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 6

135 ° E MEAN TIME



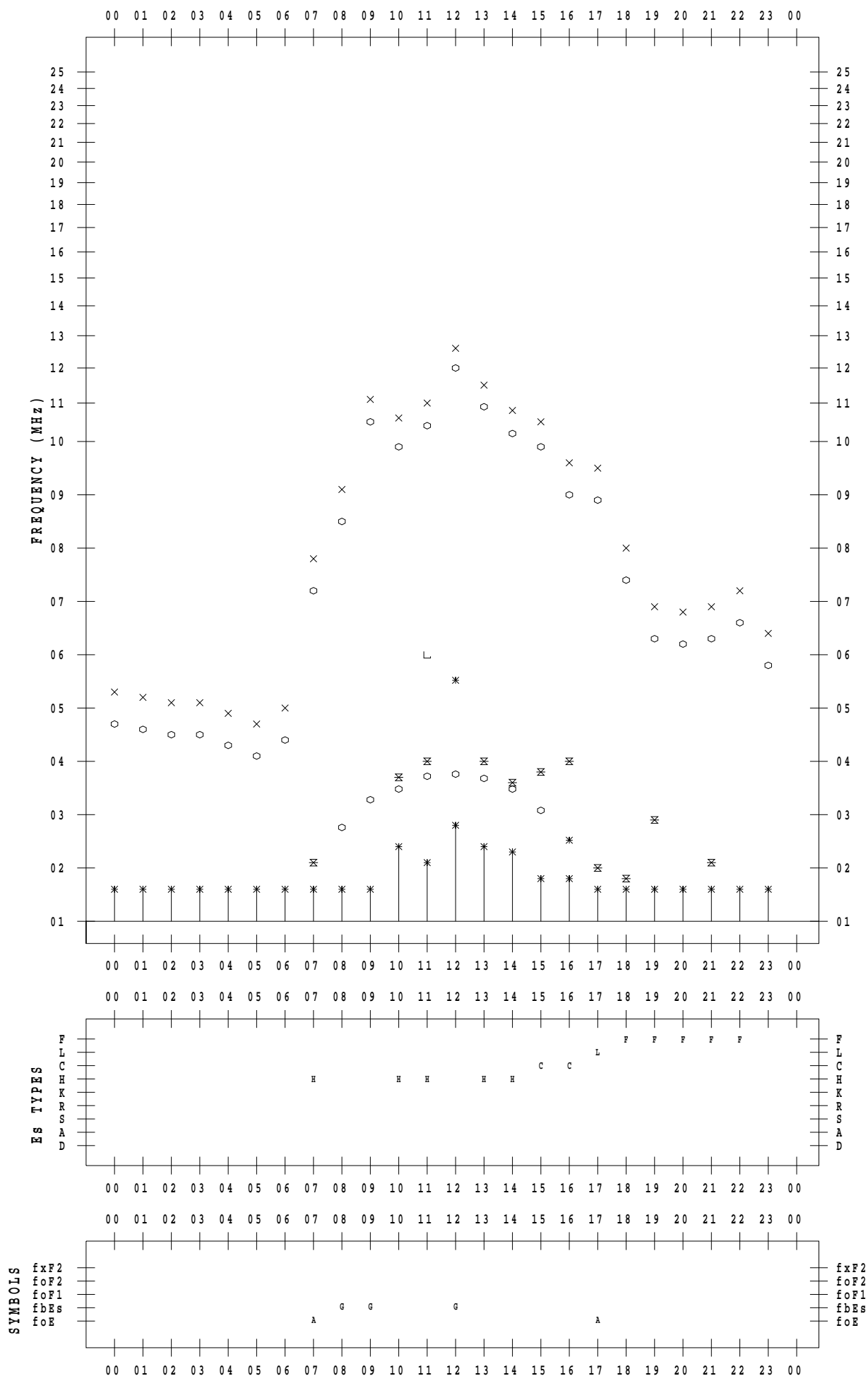
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 7

135 ° E MEAN TIME



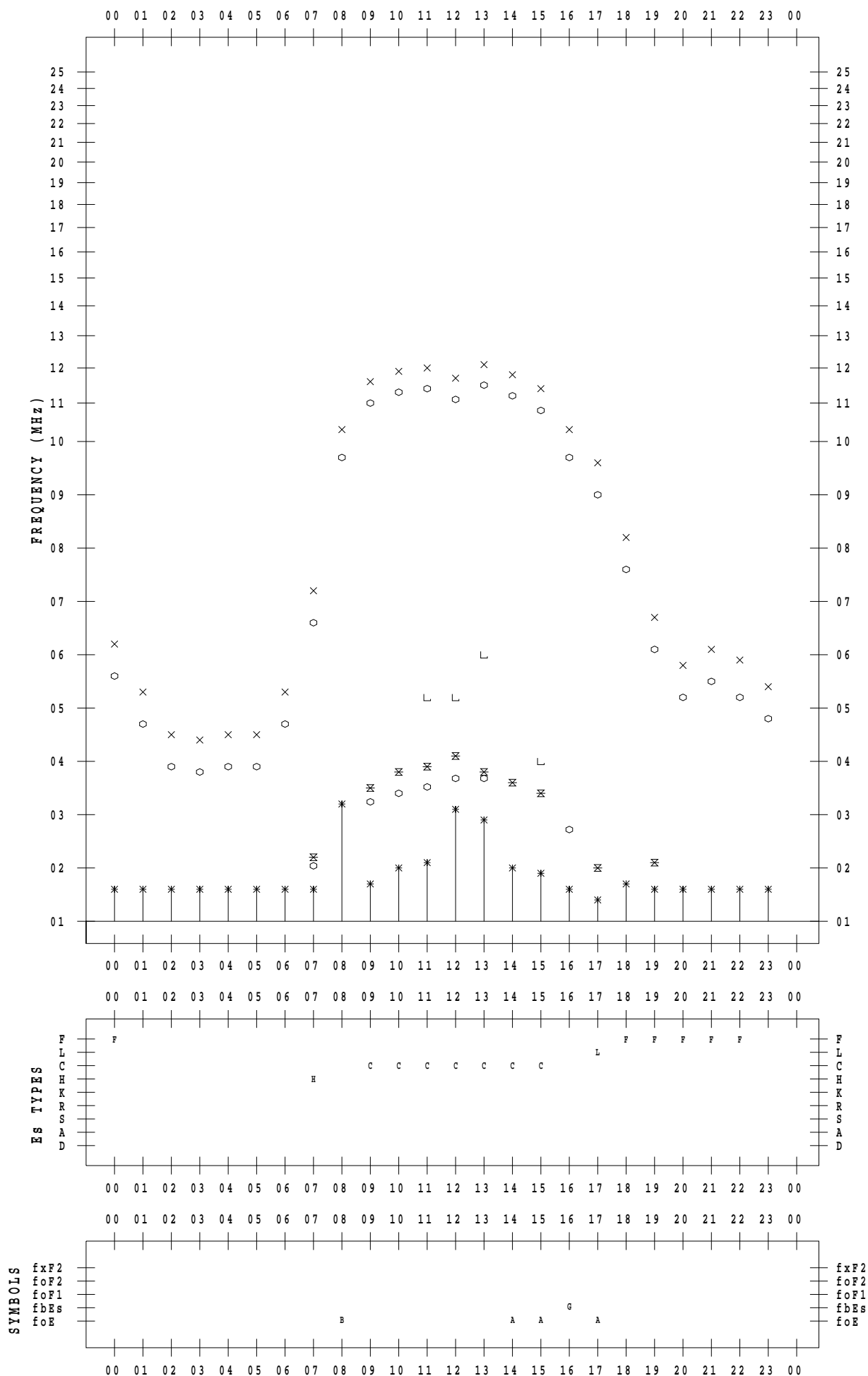
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 8

135 ° E MEAN TIME



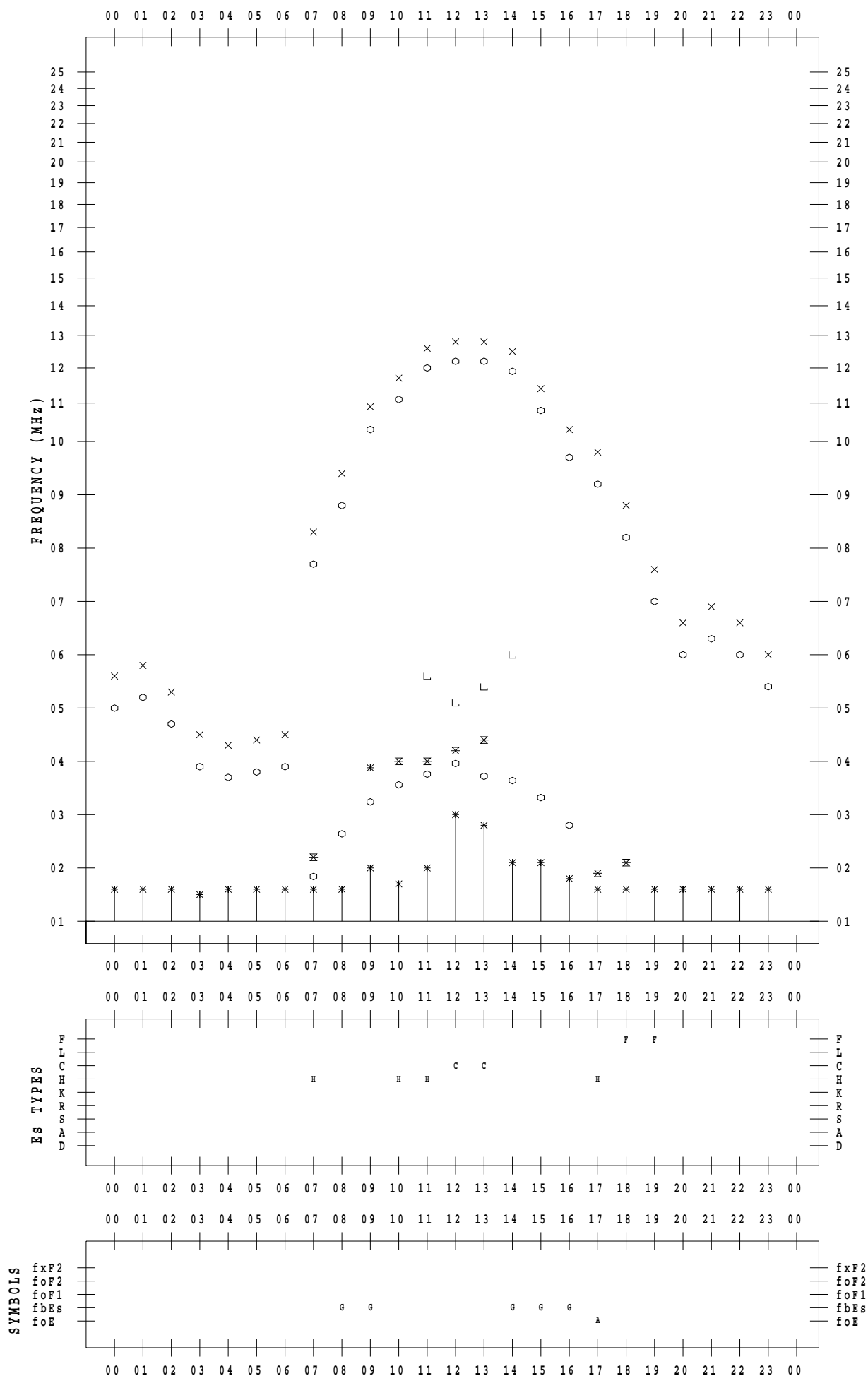
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 9

135 ° E MEAN TIME



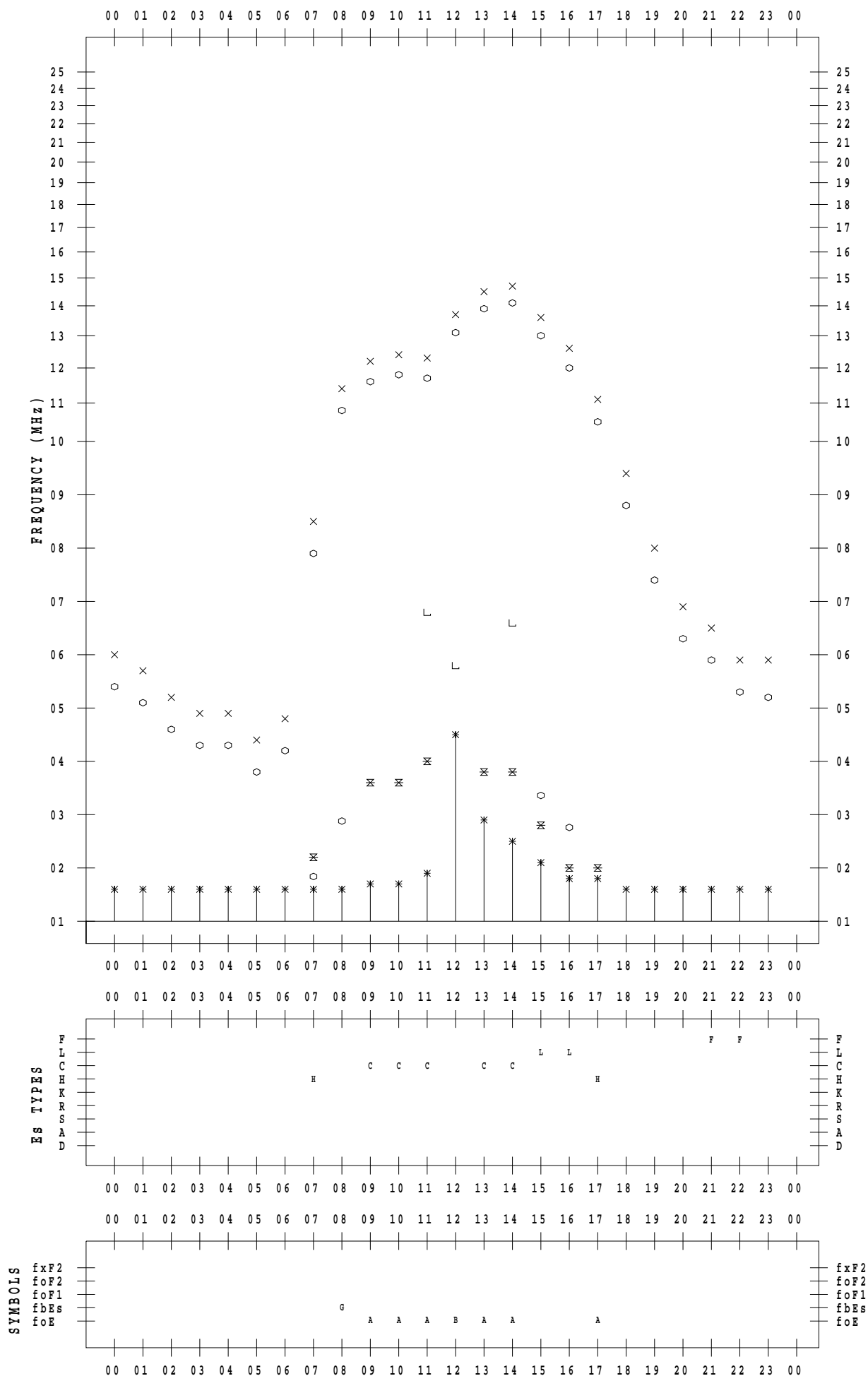
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 10

135 ° E MEAN TIME



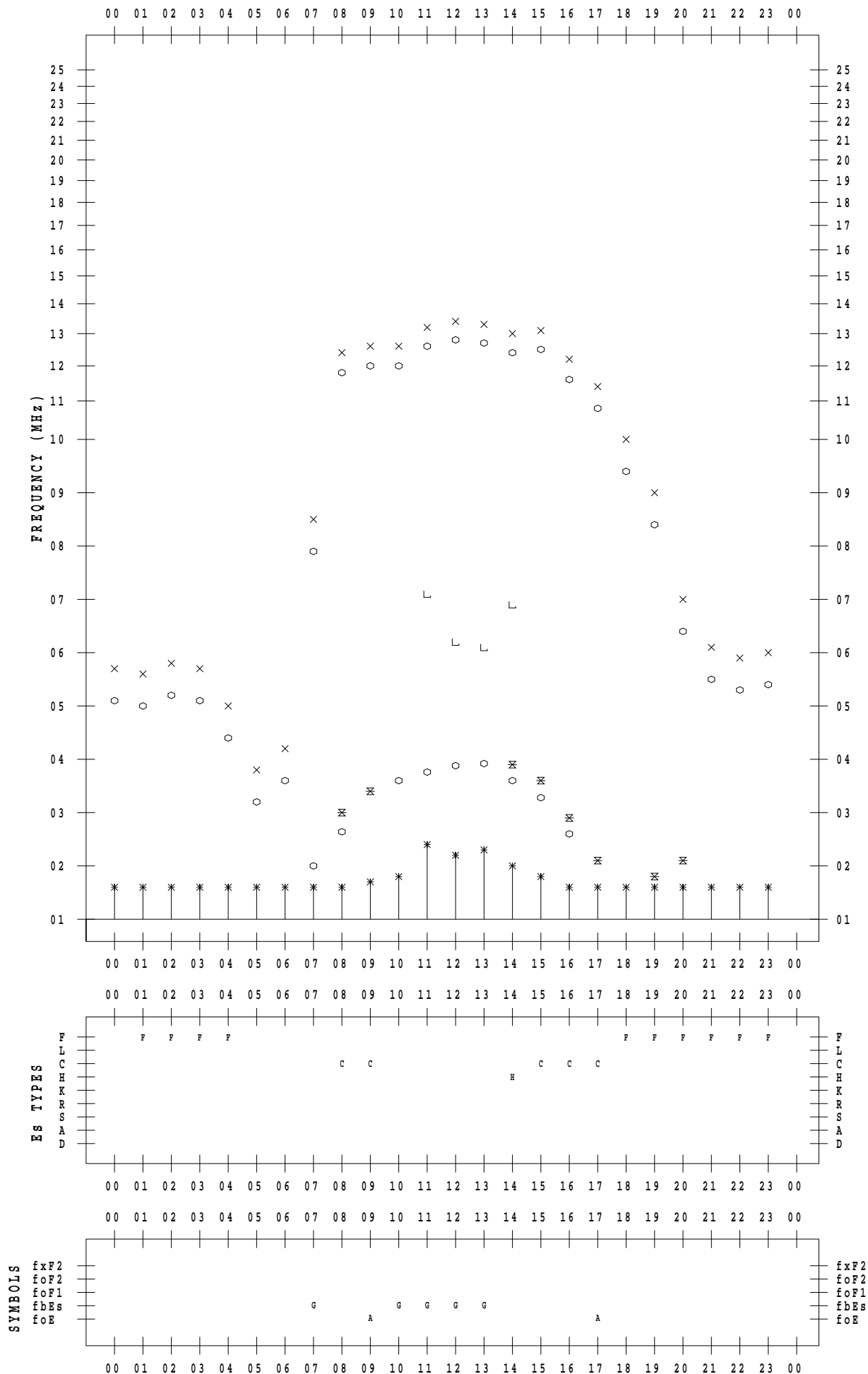
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 11

135 ° E MEAN TIME



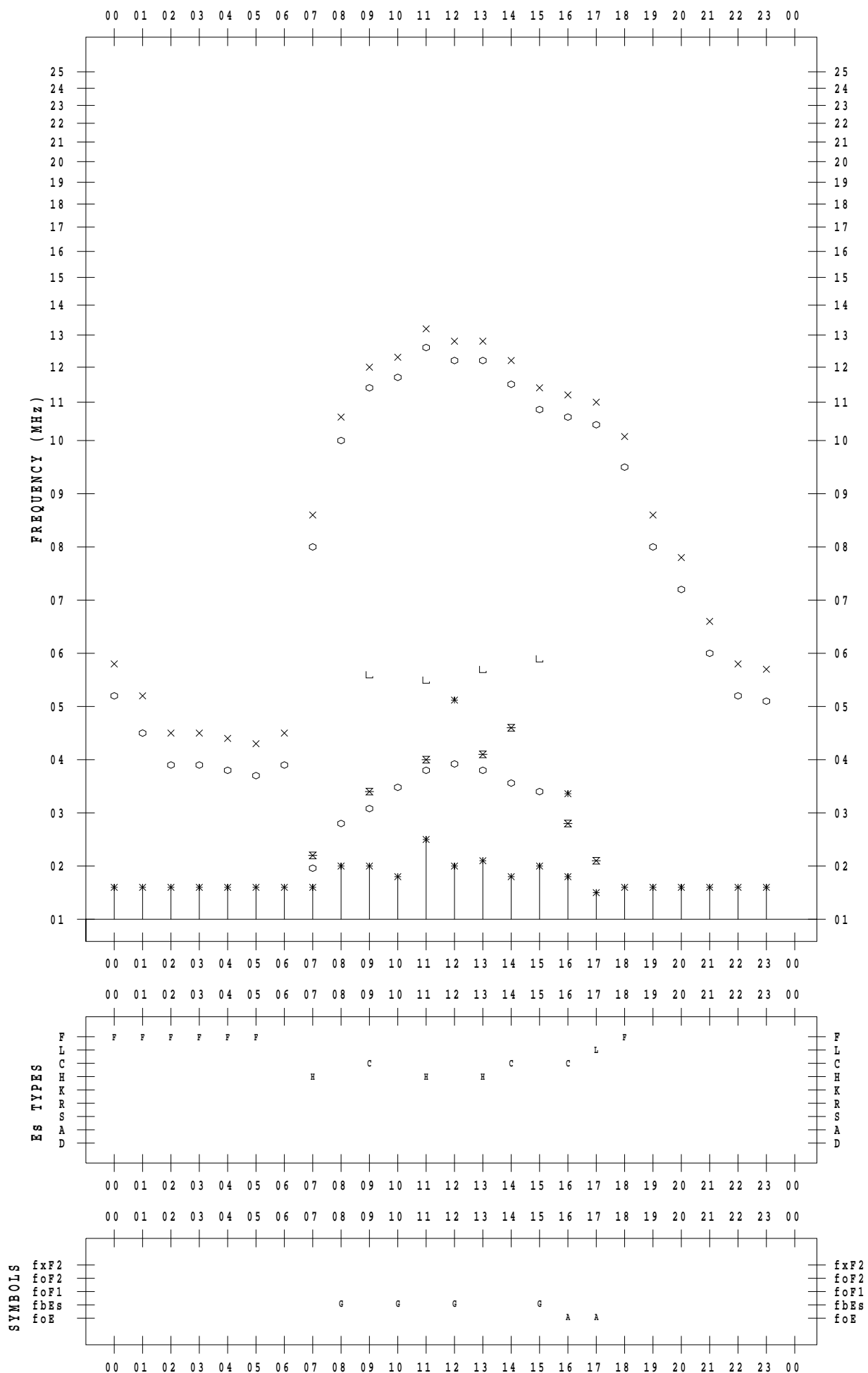
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 12

135 ° E MEAN TIME



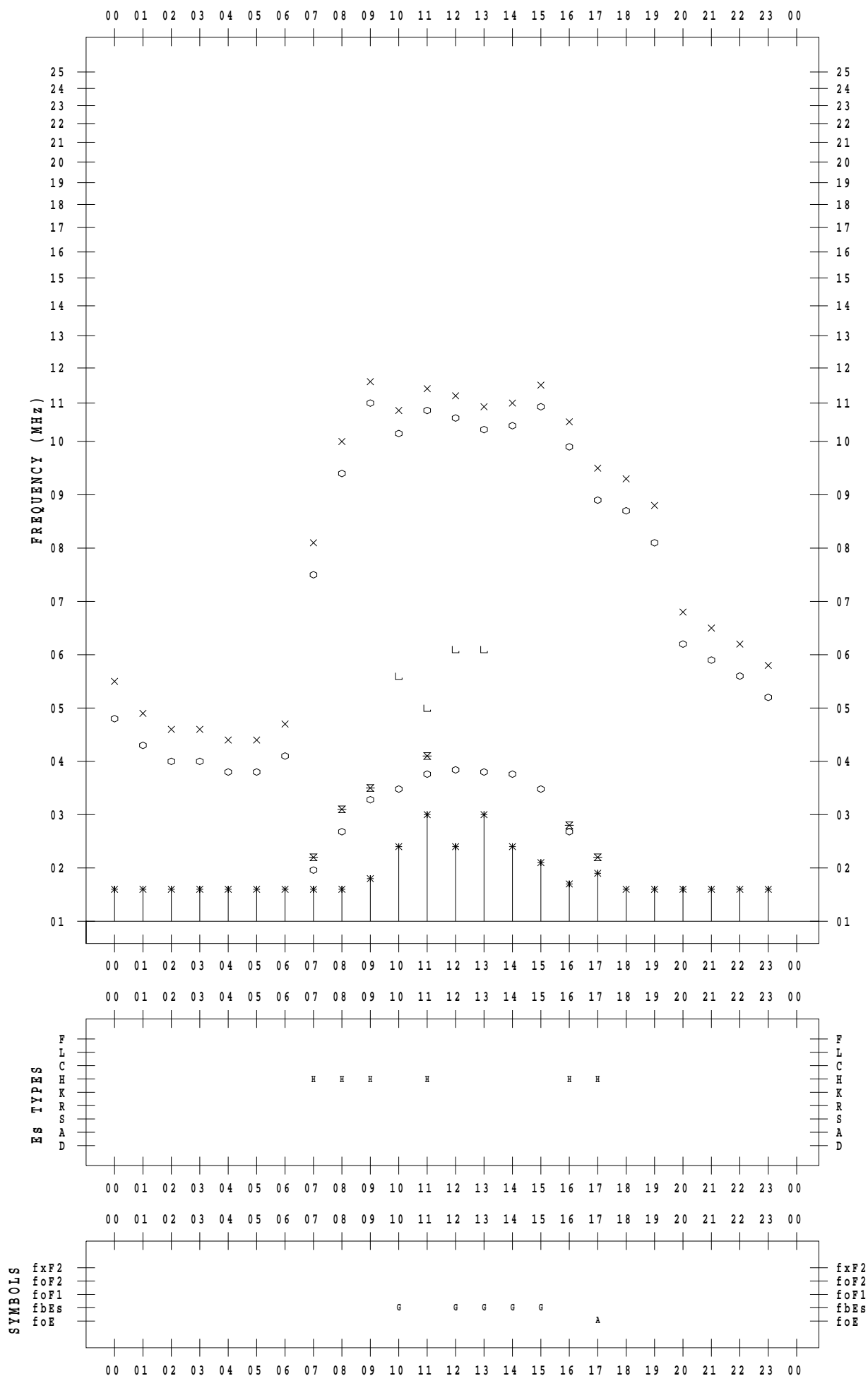
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 13

135 ° E MEAN TIME



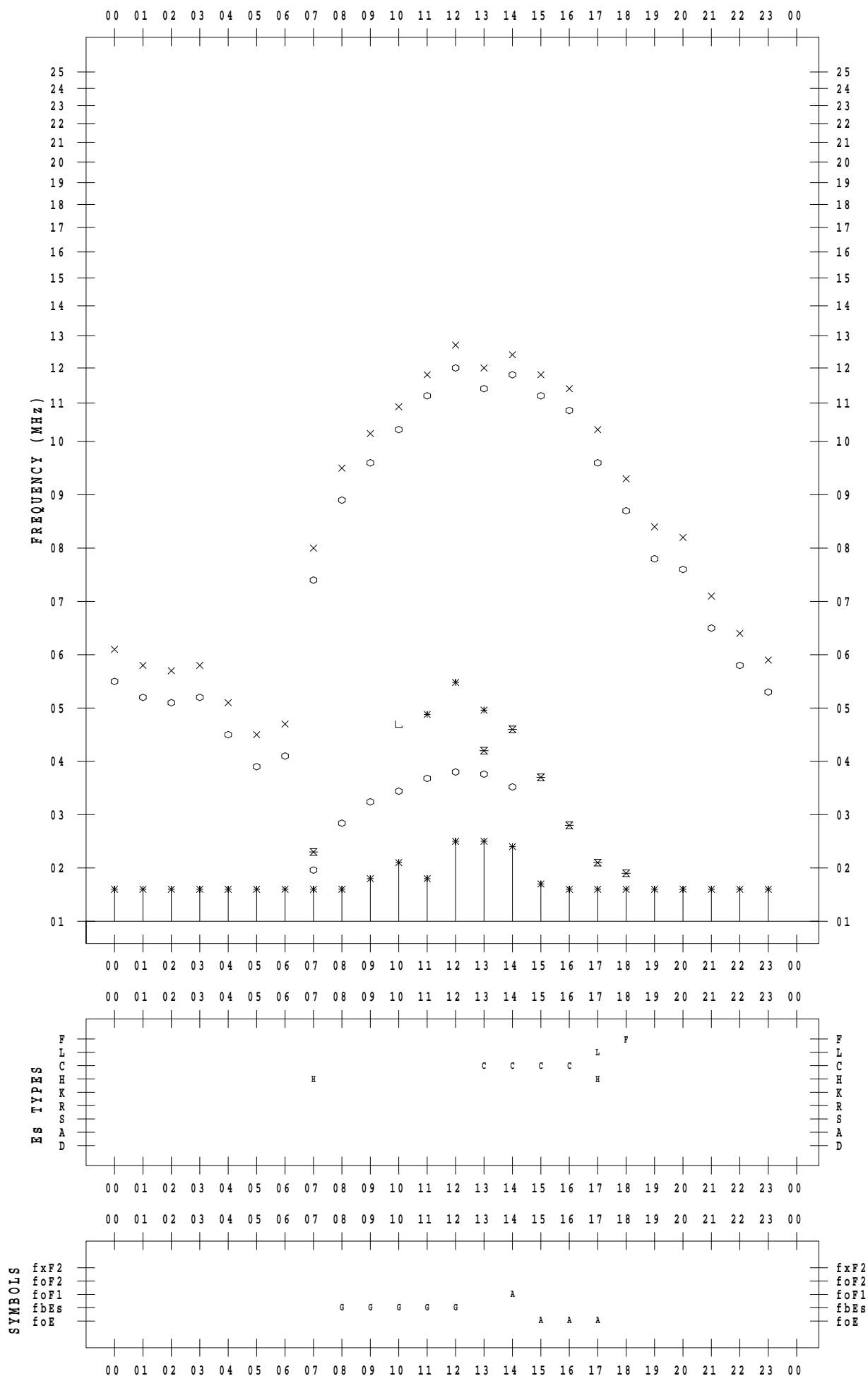
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 14

135 ° E MEAN TIME



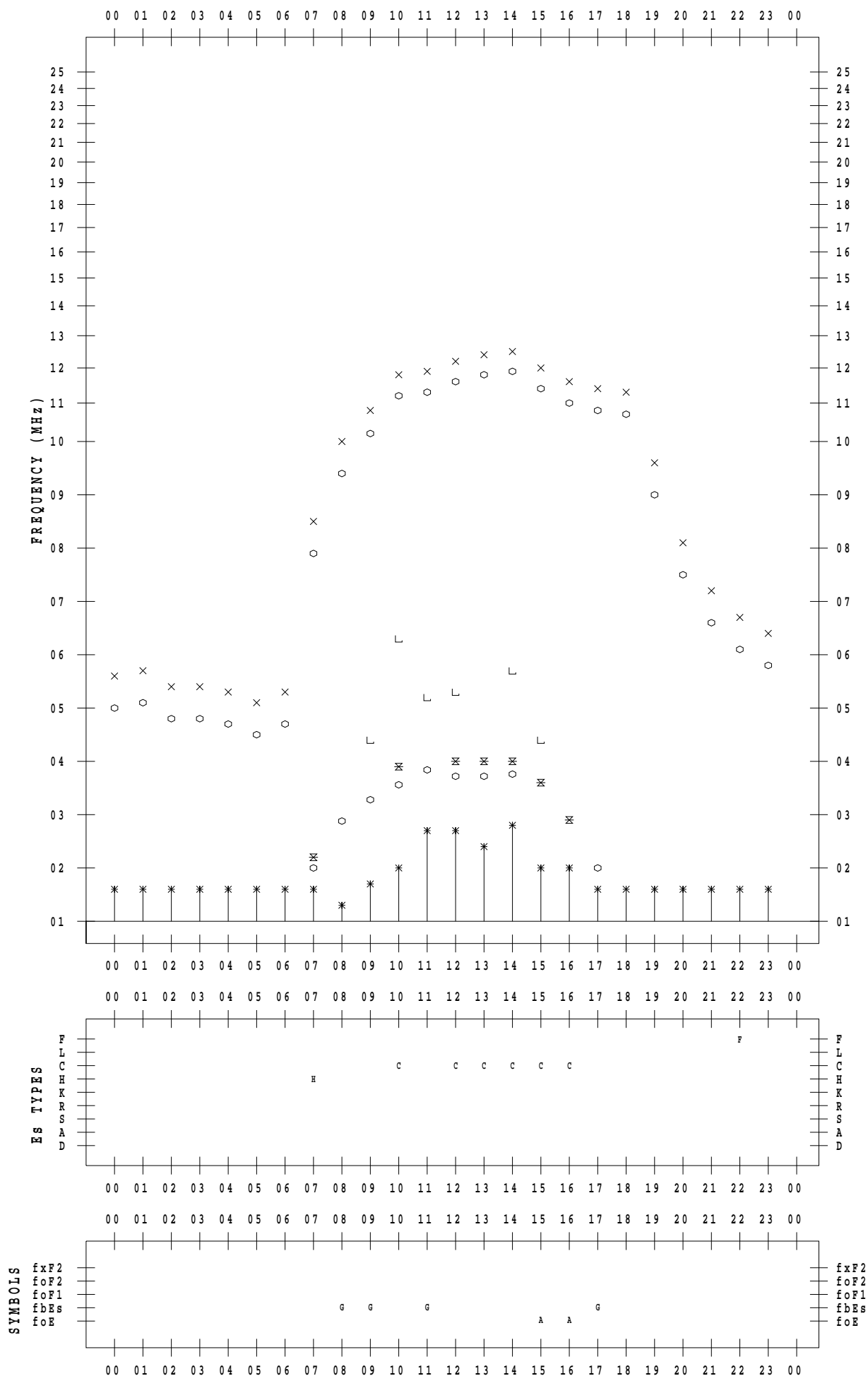
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 15

135 ° E MEAN TIME



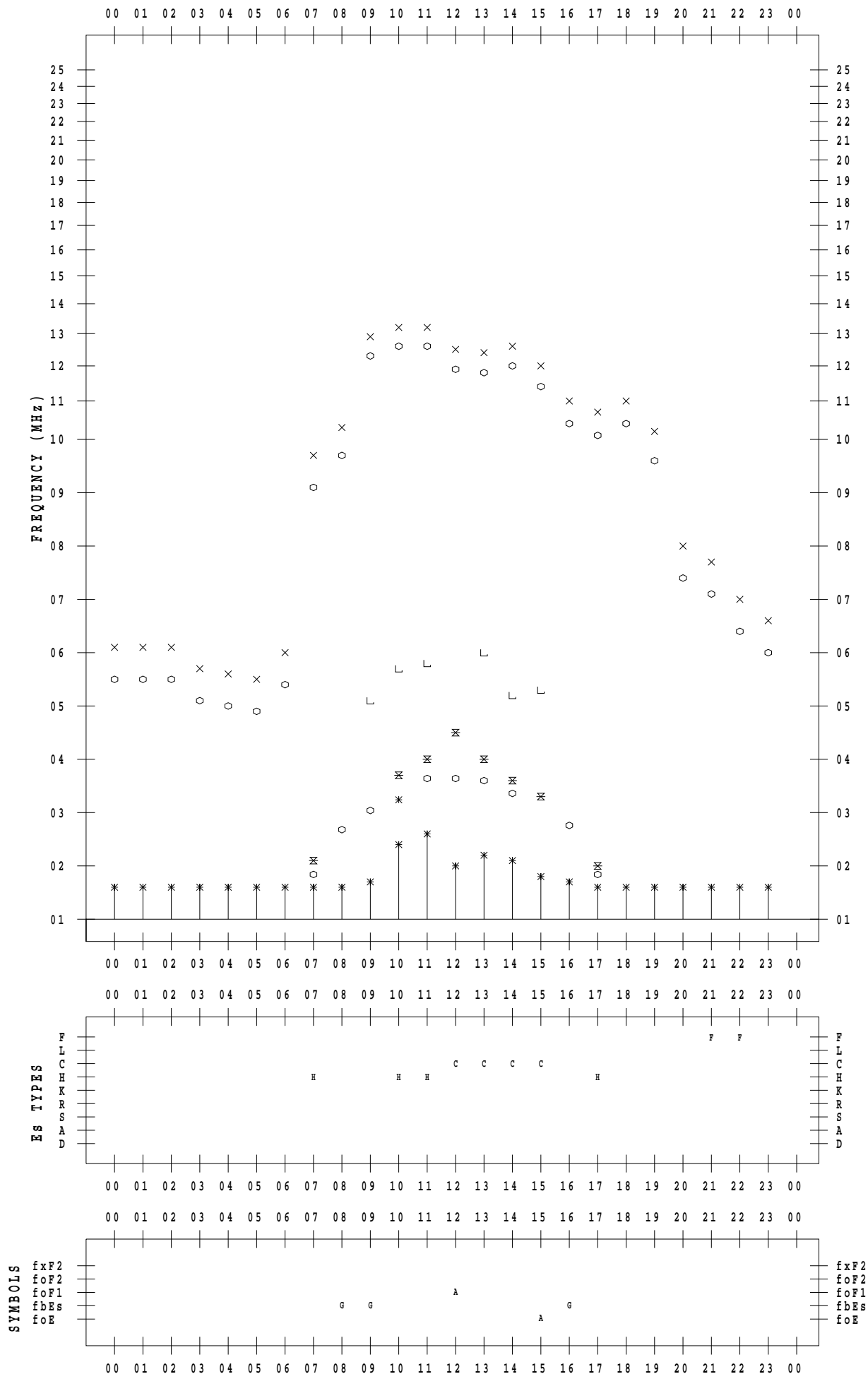
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 16

135 ° E MEAN TIME



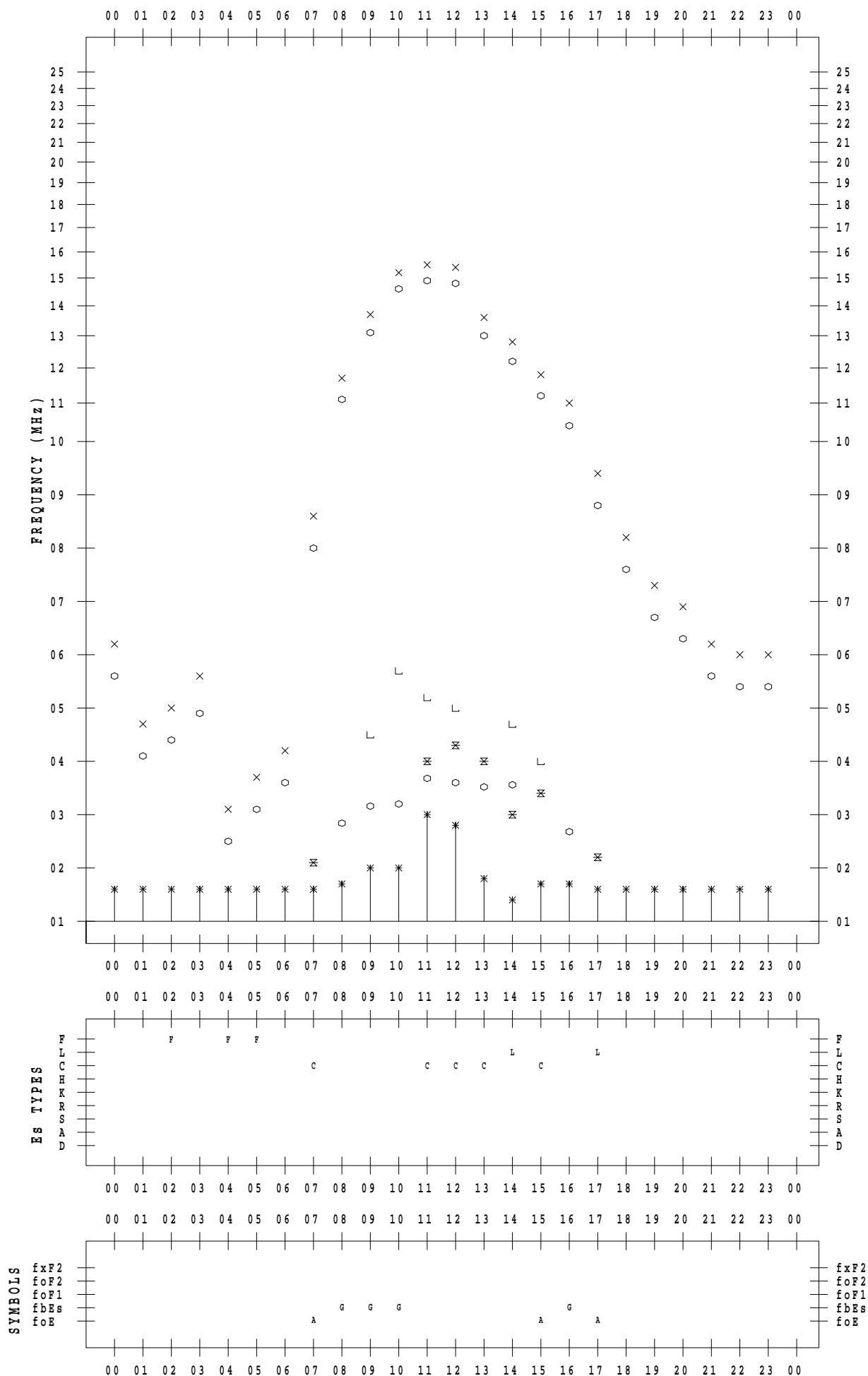
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 17

135 ° E MEAN TIME



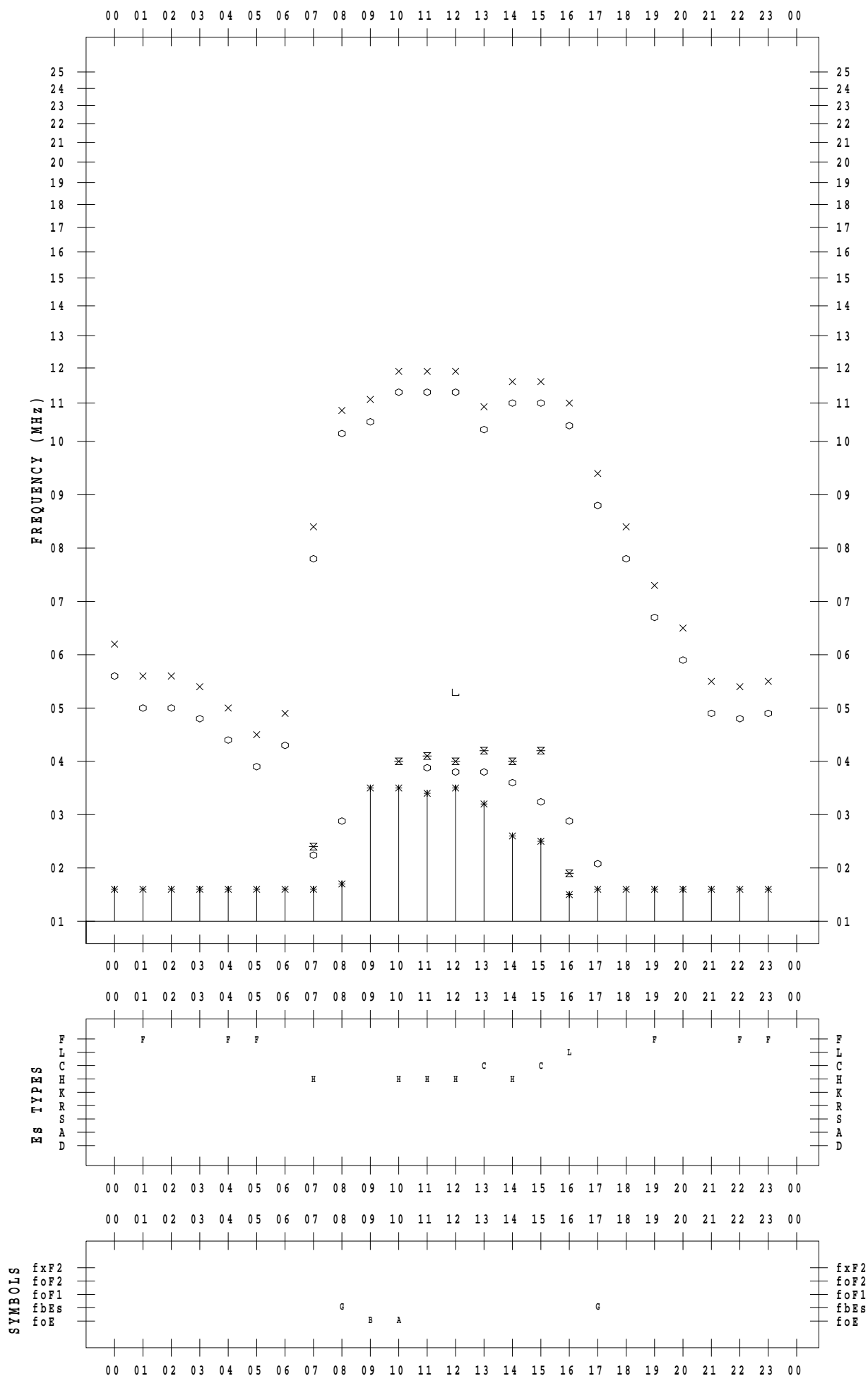
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 18

135 ° E MEAN TIME



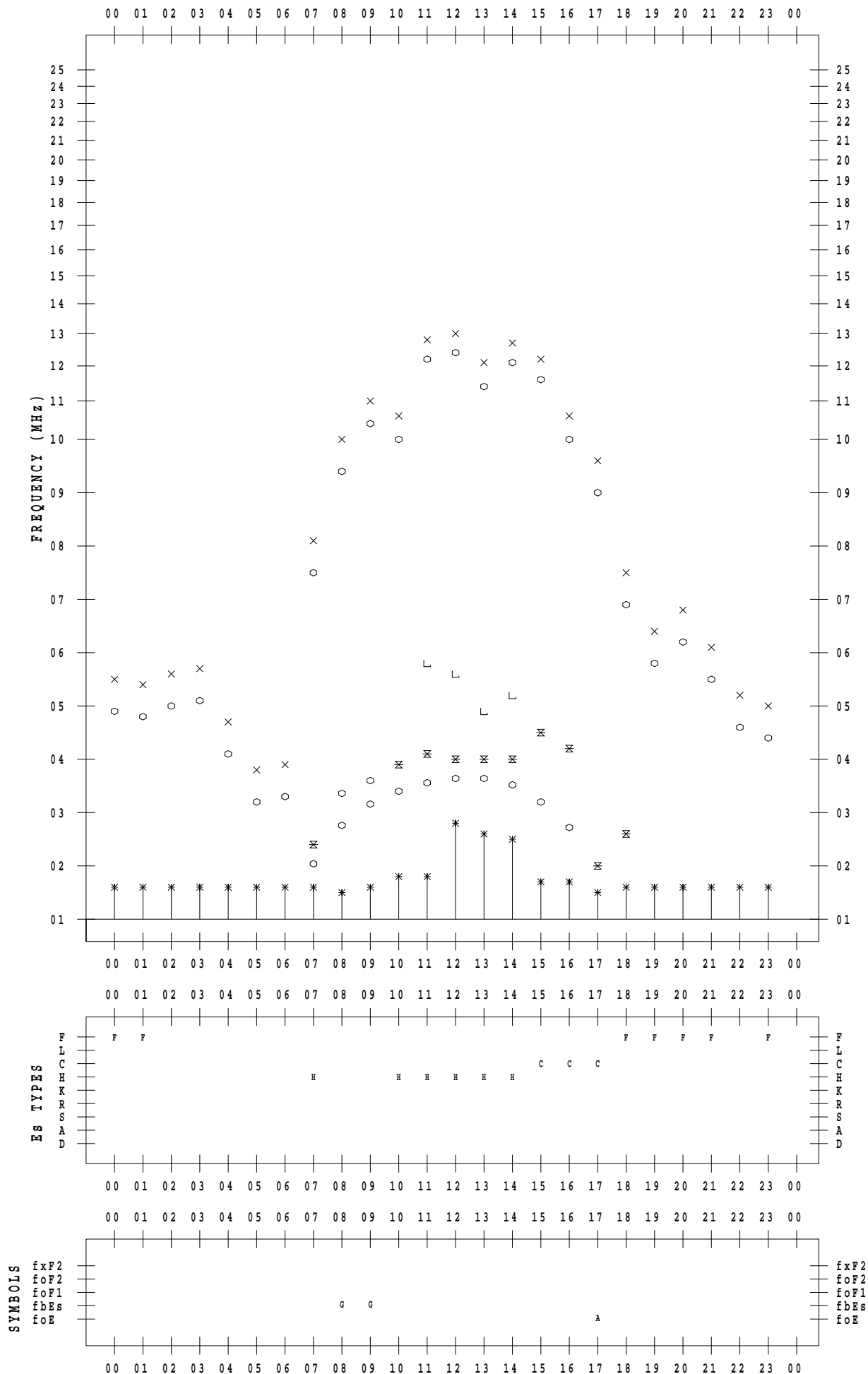
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 19

135 ° E MEAN TIME



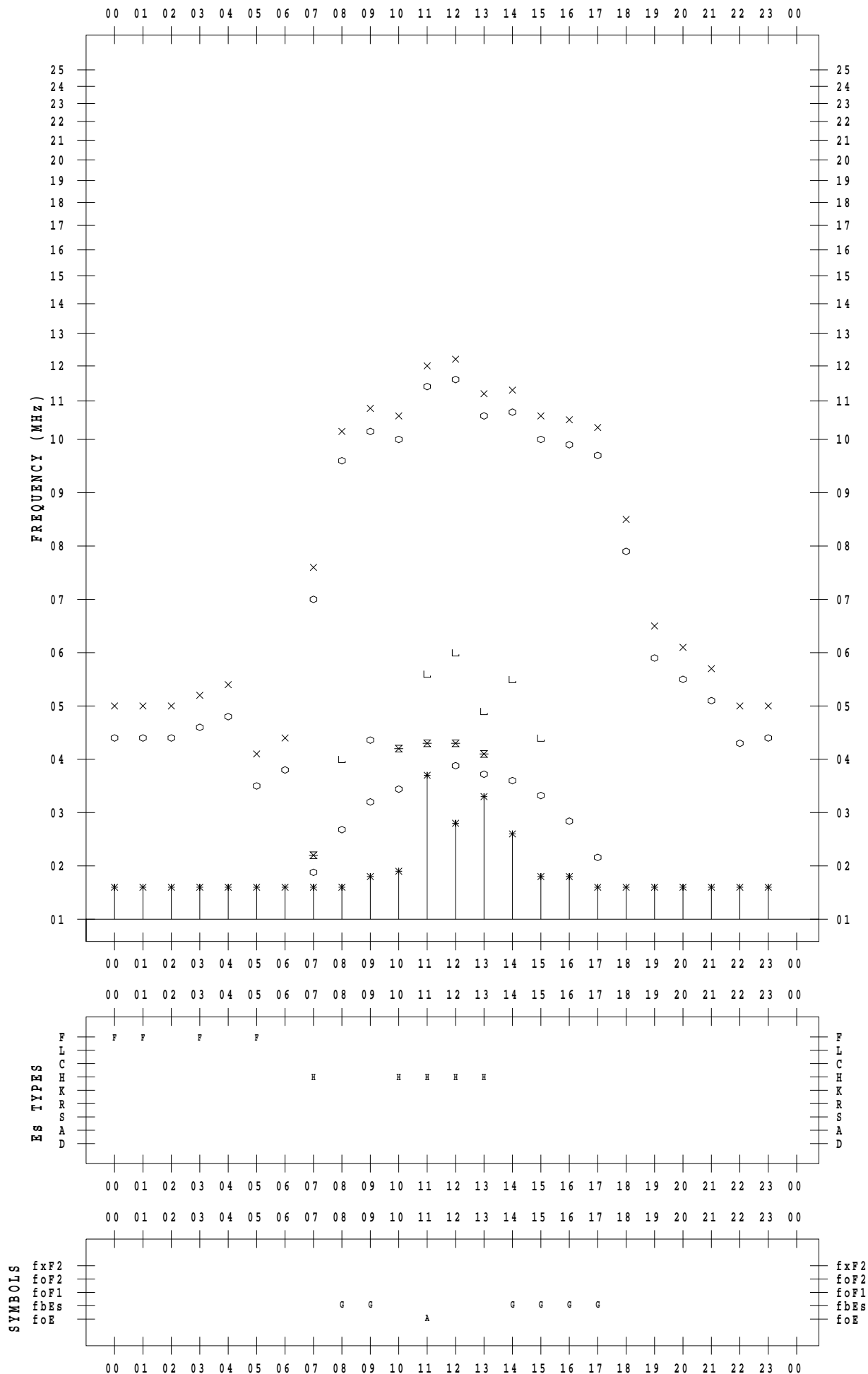
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 20

135 ° E MEAN TIME



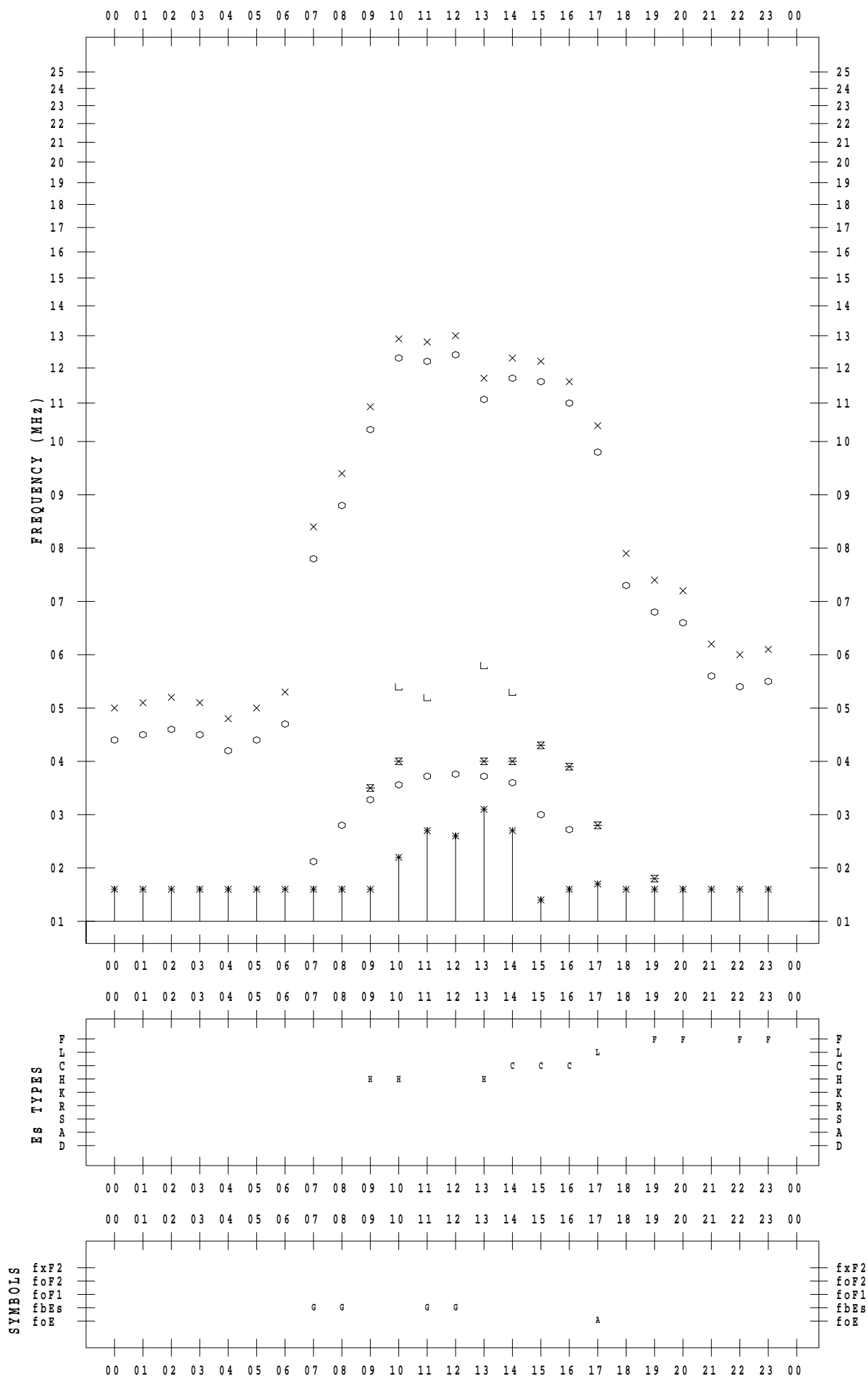
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 21

135 ° E MEAN TIME



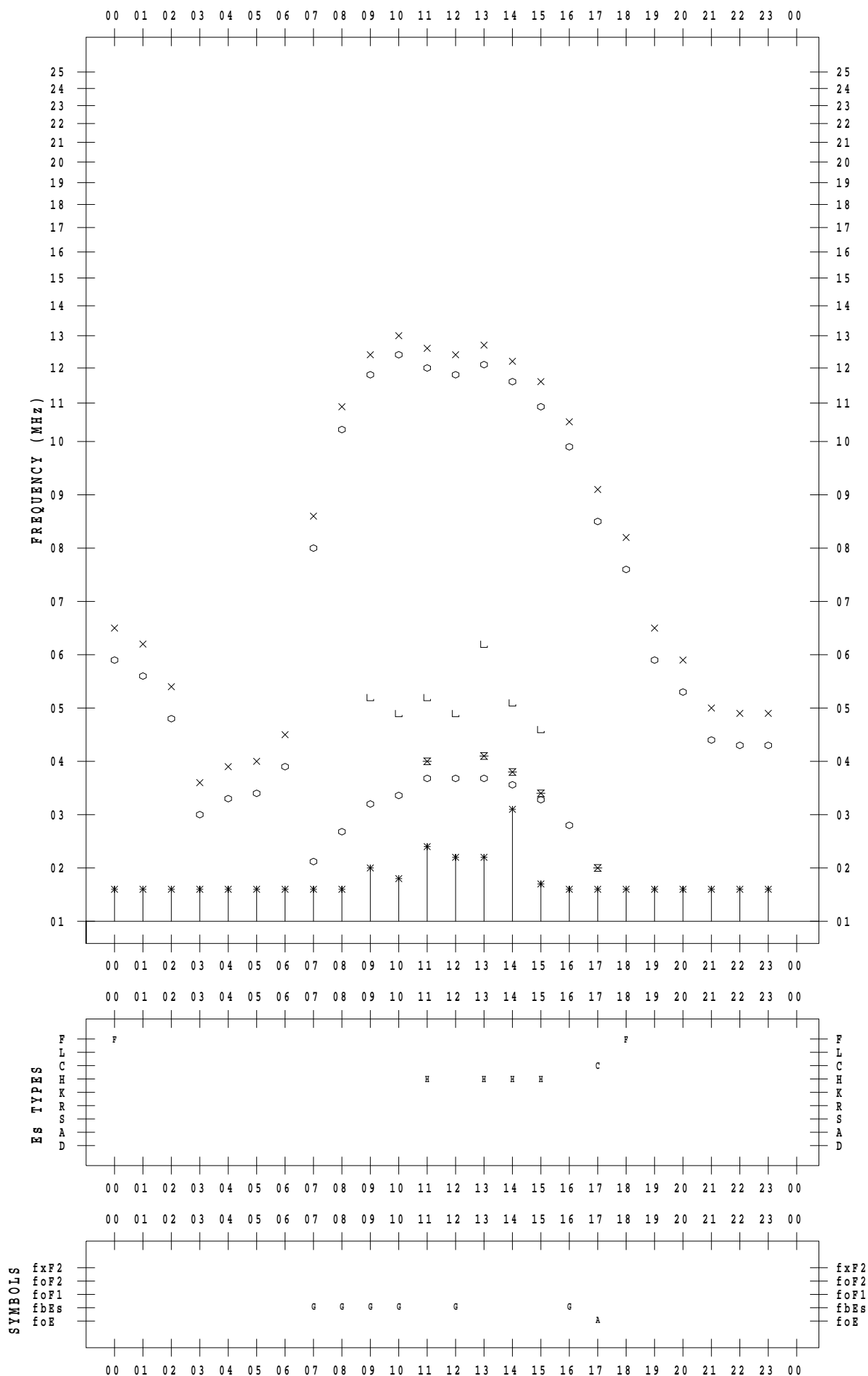
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 22

135 ° E MEAN TIME



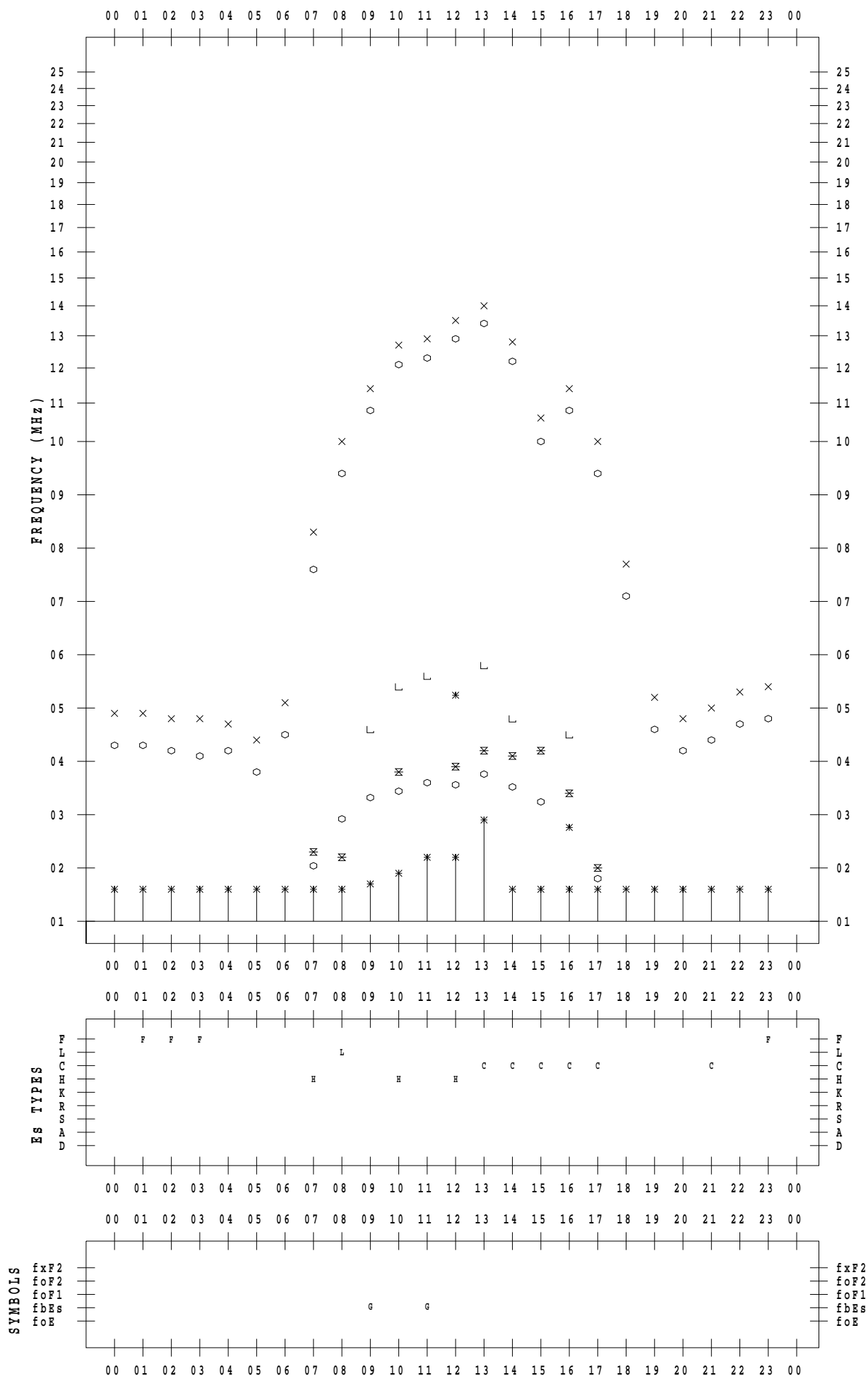
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 23

135 ° E MEAN TIME



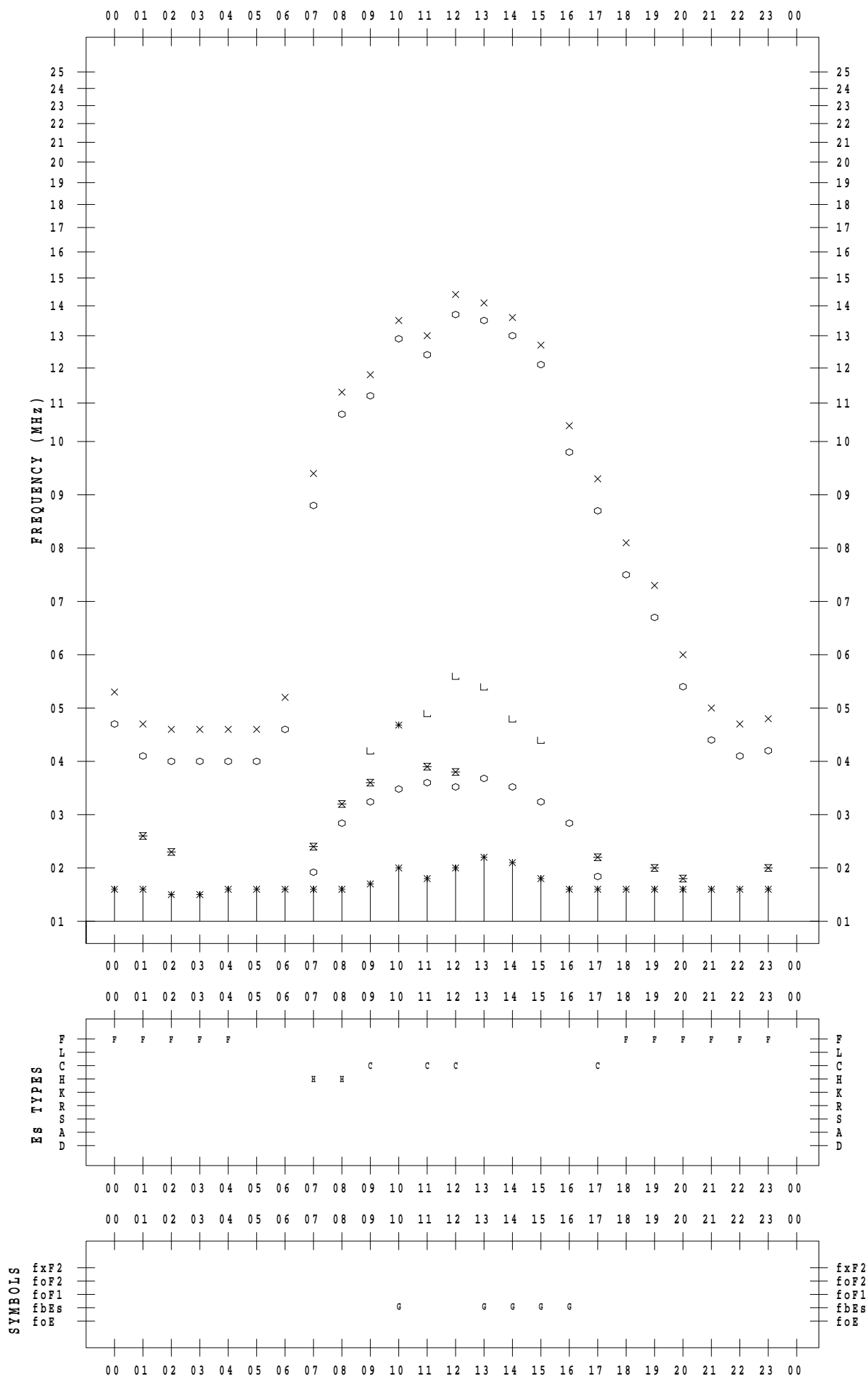
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 24

135 ° E MEAN TIME



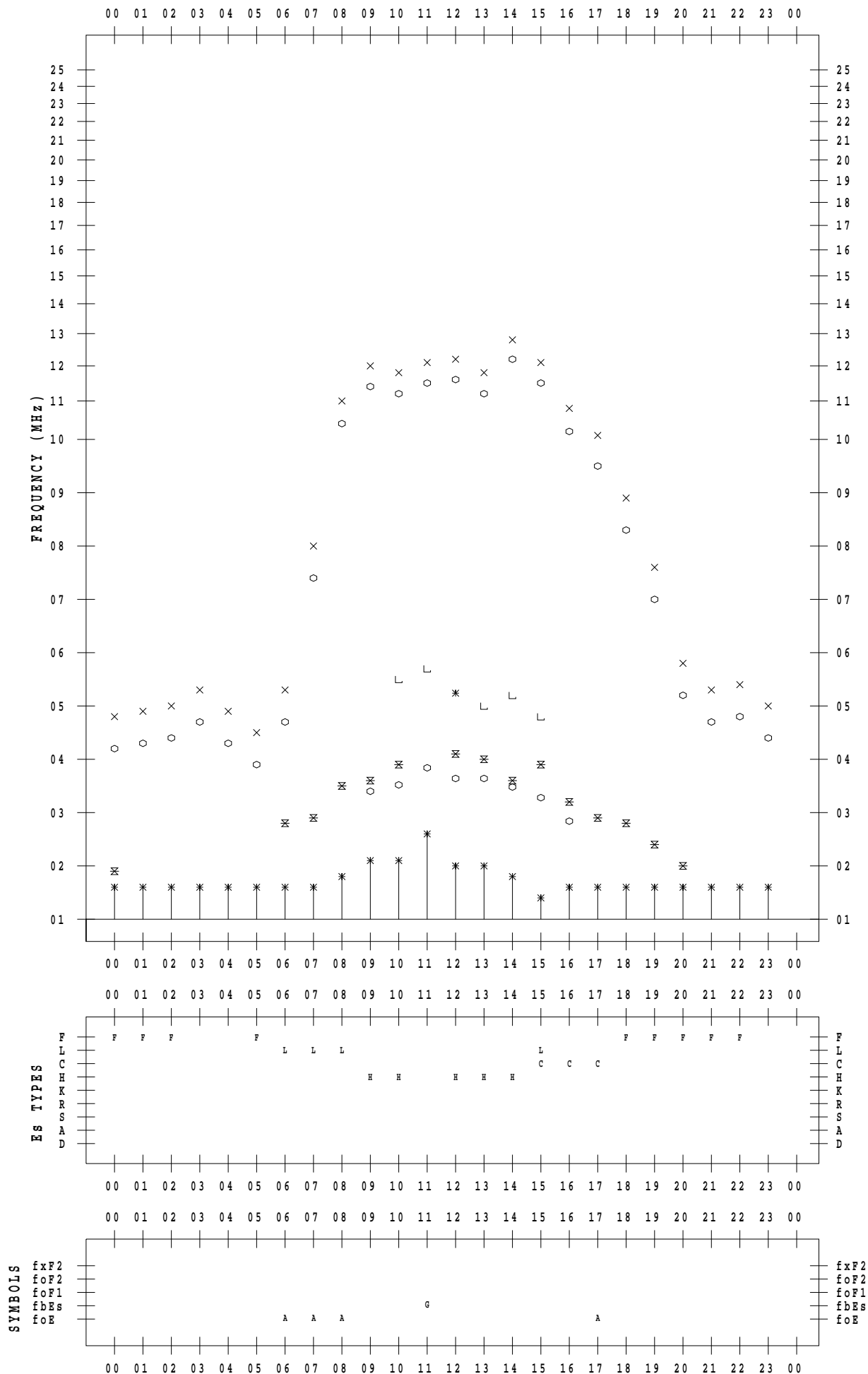
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 25

135 ° E MEAN TIME



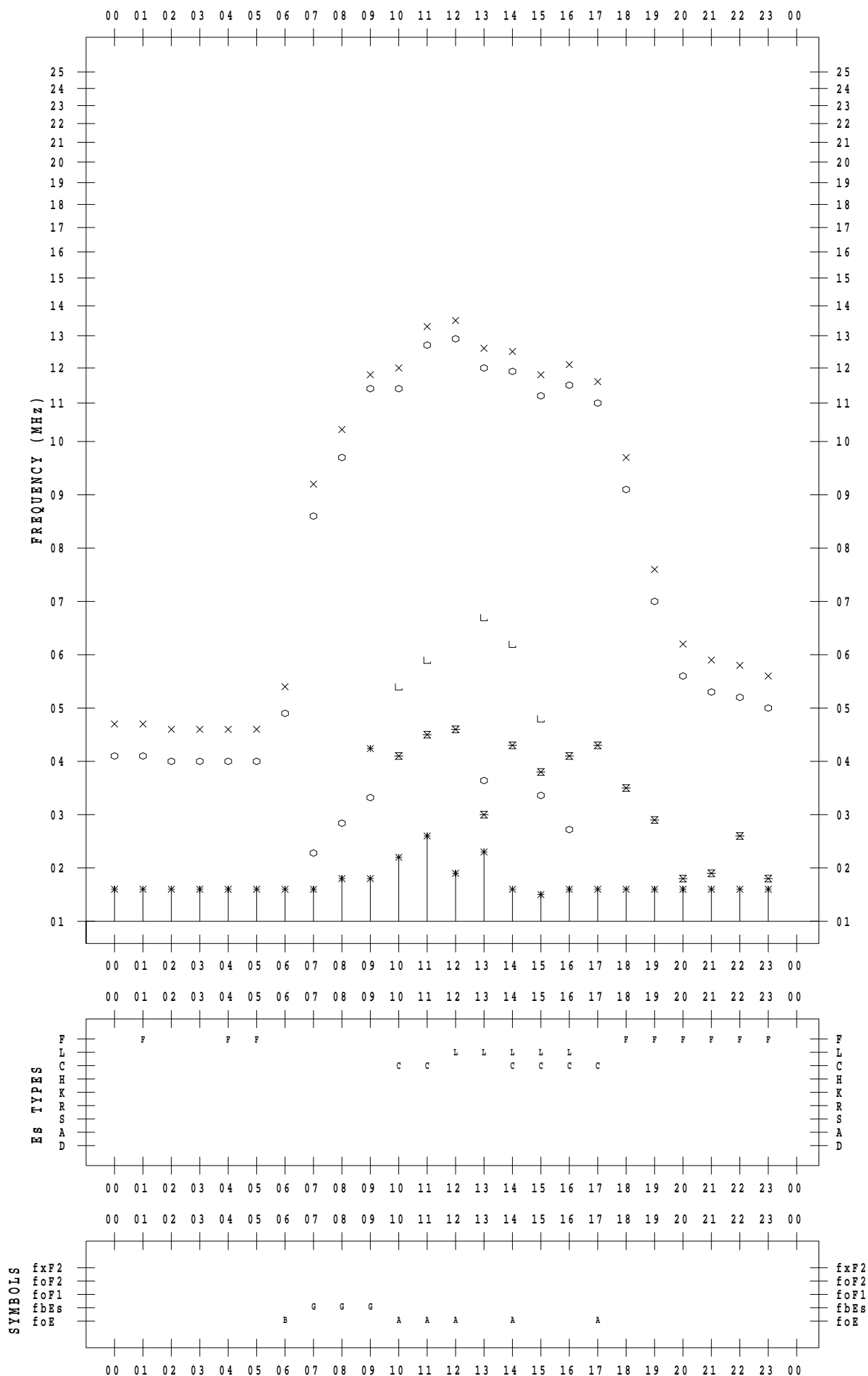
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 26

135 ° E MEAN TIME



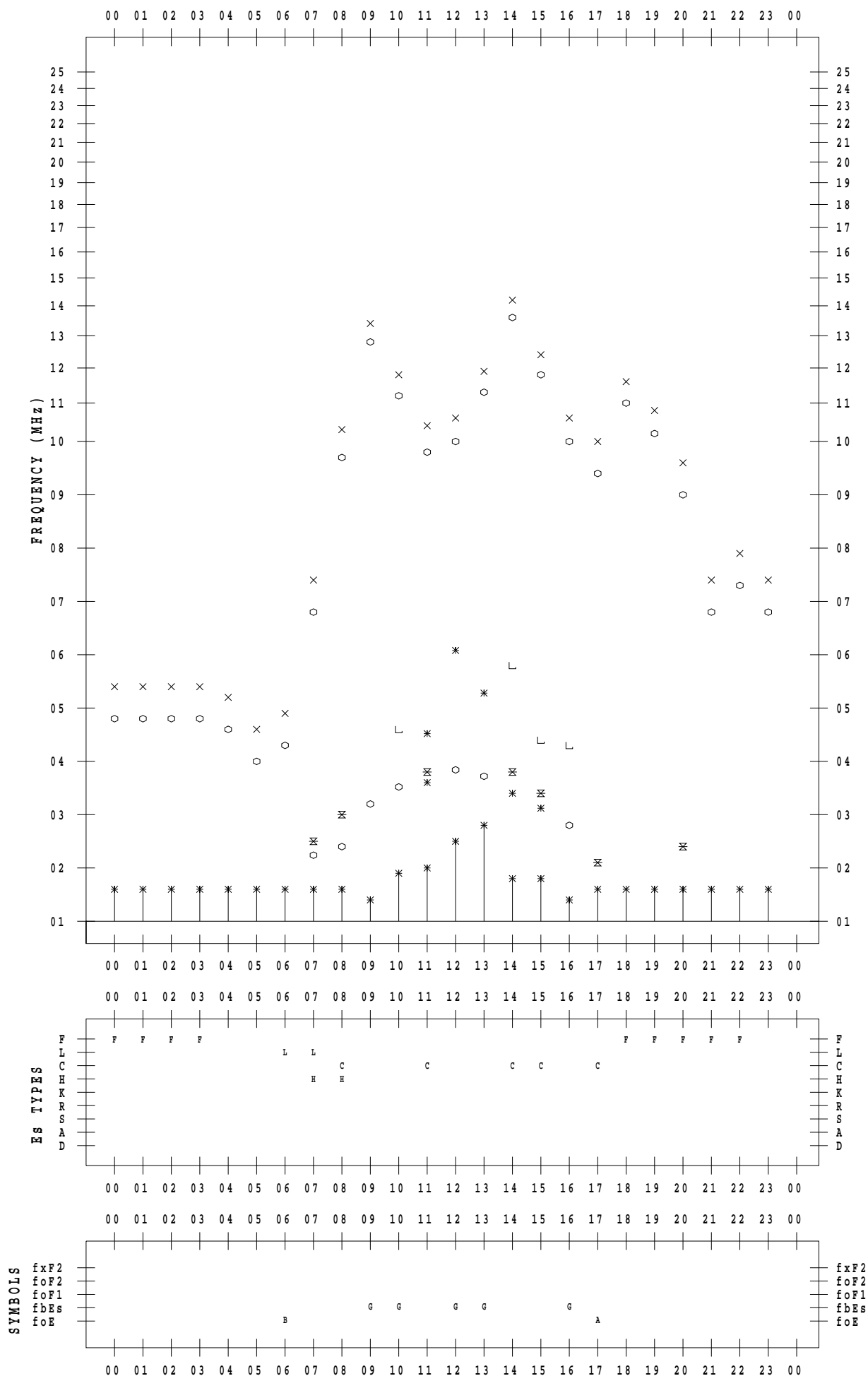
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 27

135 ° E MEAN TIME



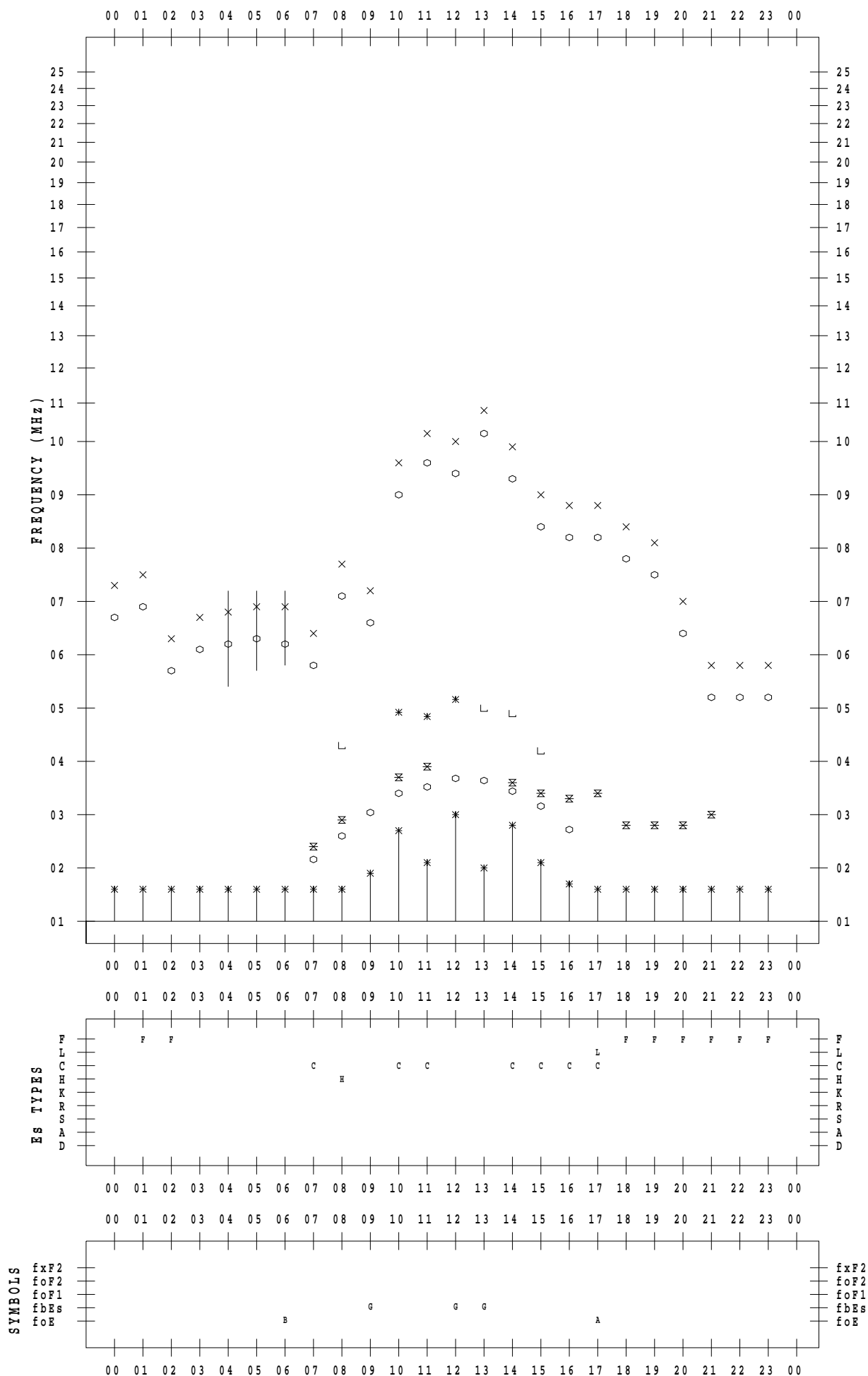
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 2 / 28

135 ° E MEAN TIME



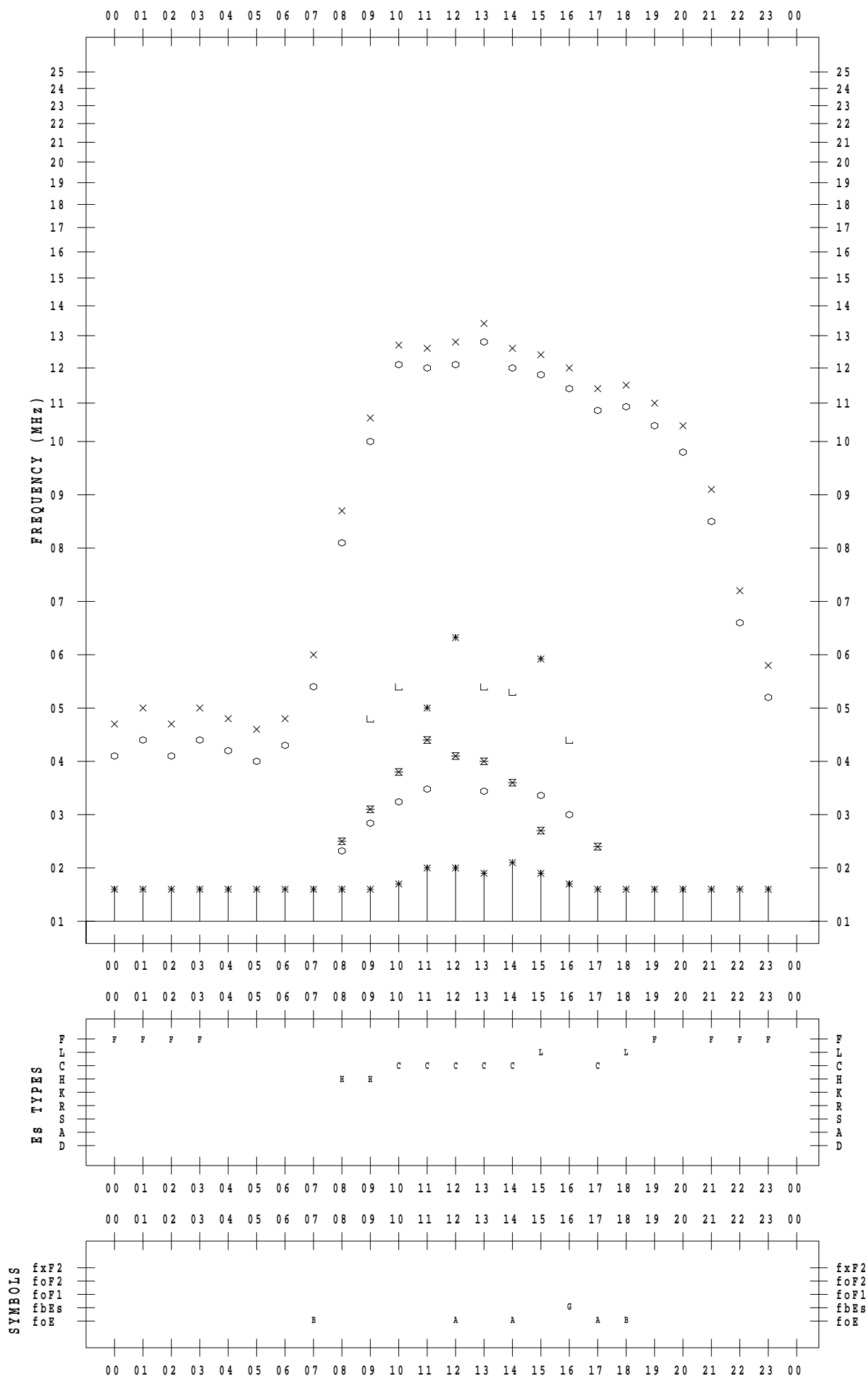
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 1

135 ° E MEAN TIME



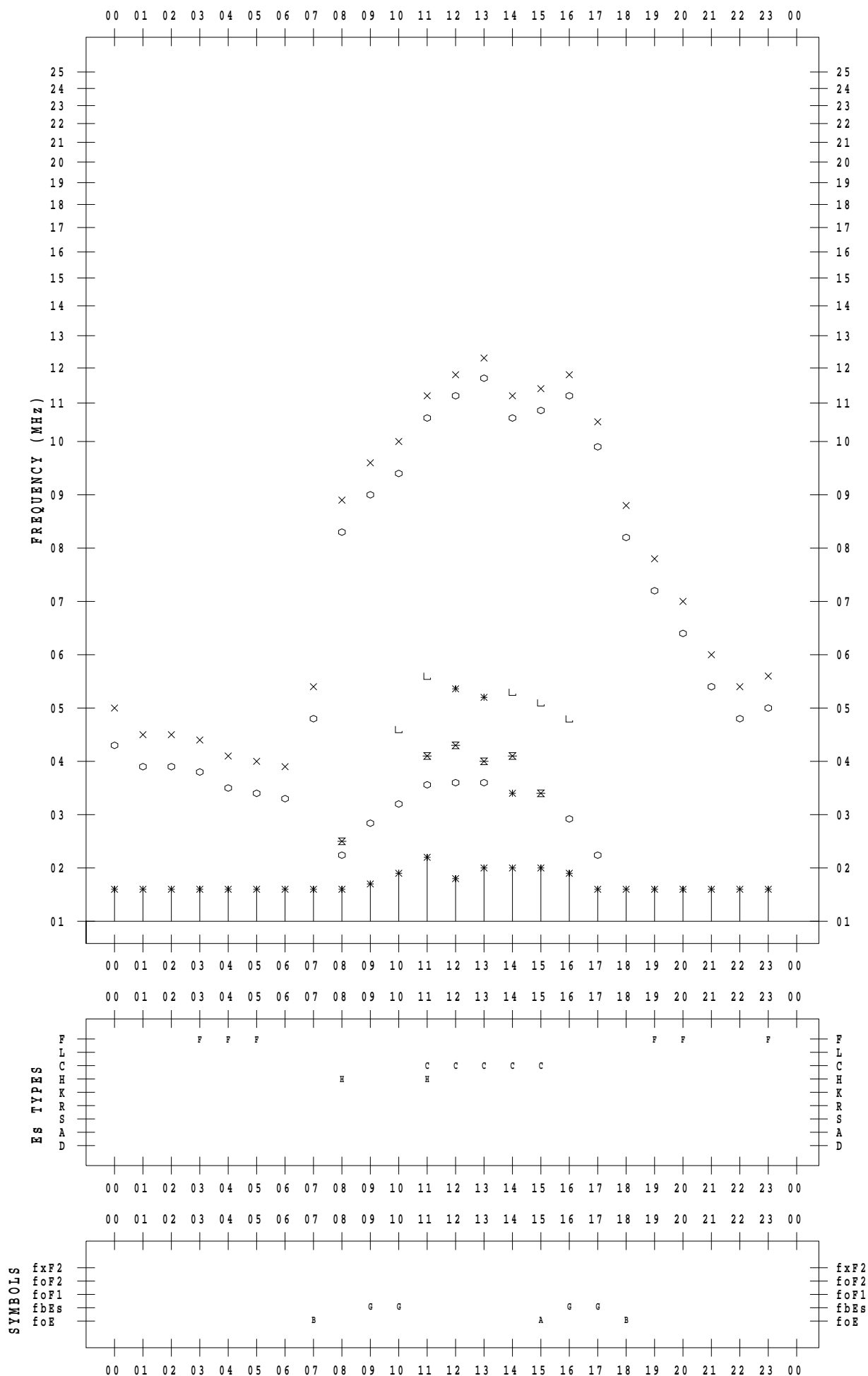
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 2

135 ° E MEAN TIME



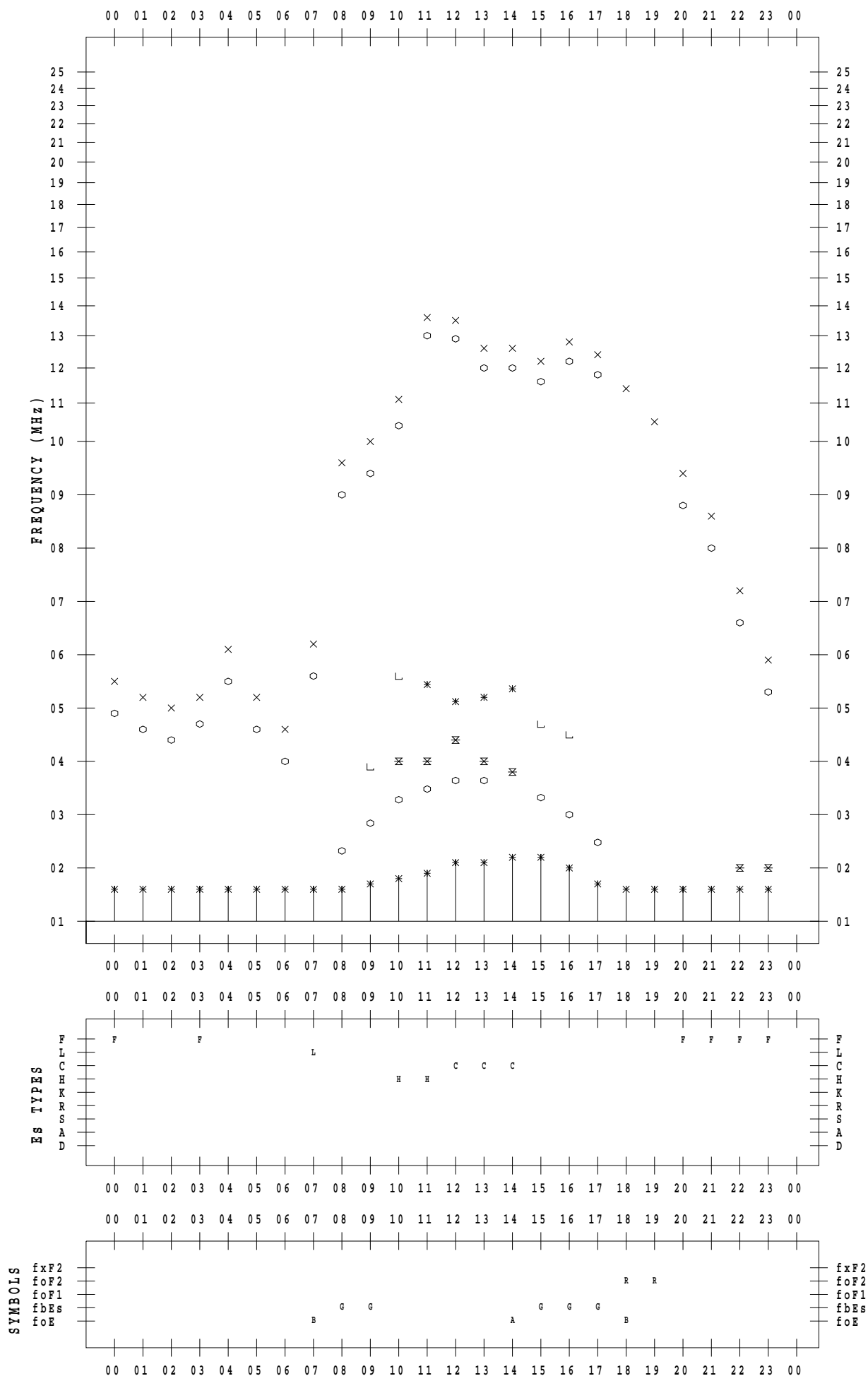
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 3

135 ° E MEAN TIME



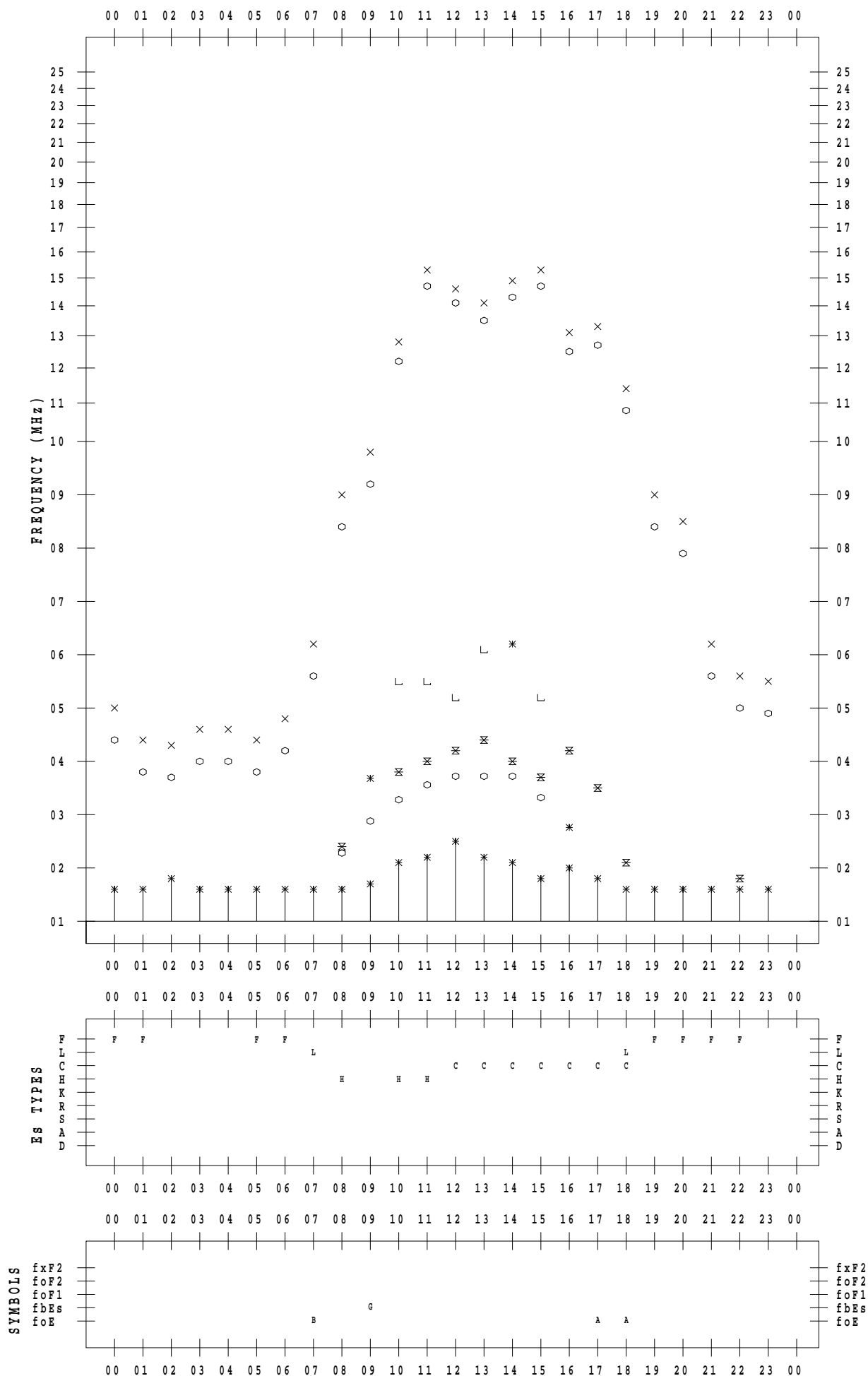
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 4

135 ° E MEAN TIME



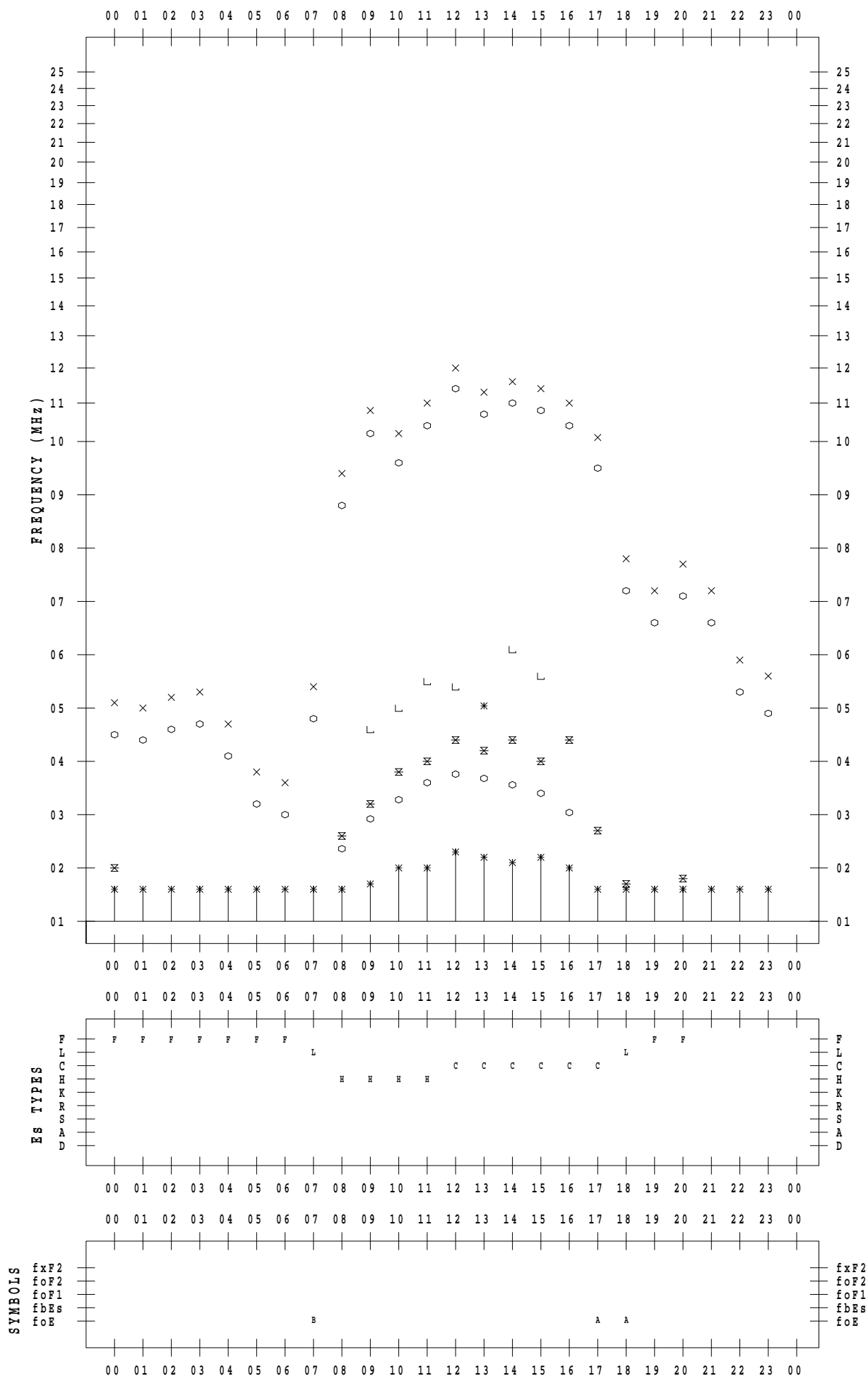
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 5

135 ° E MEAN TIME



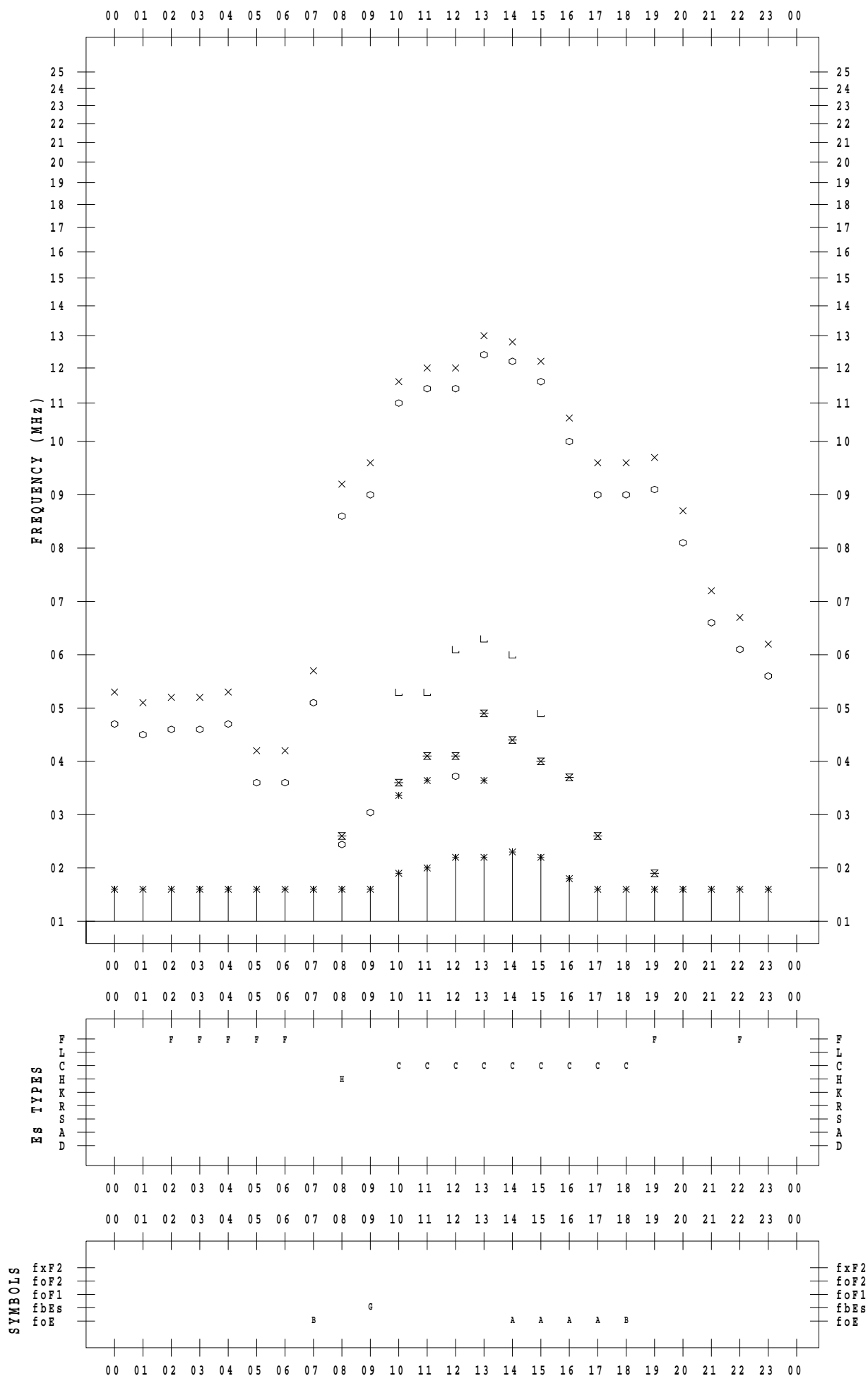
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 6

135 ° E MEAN TIME



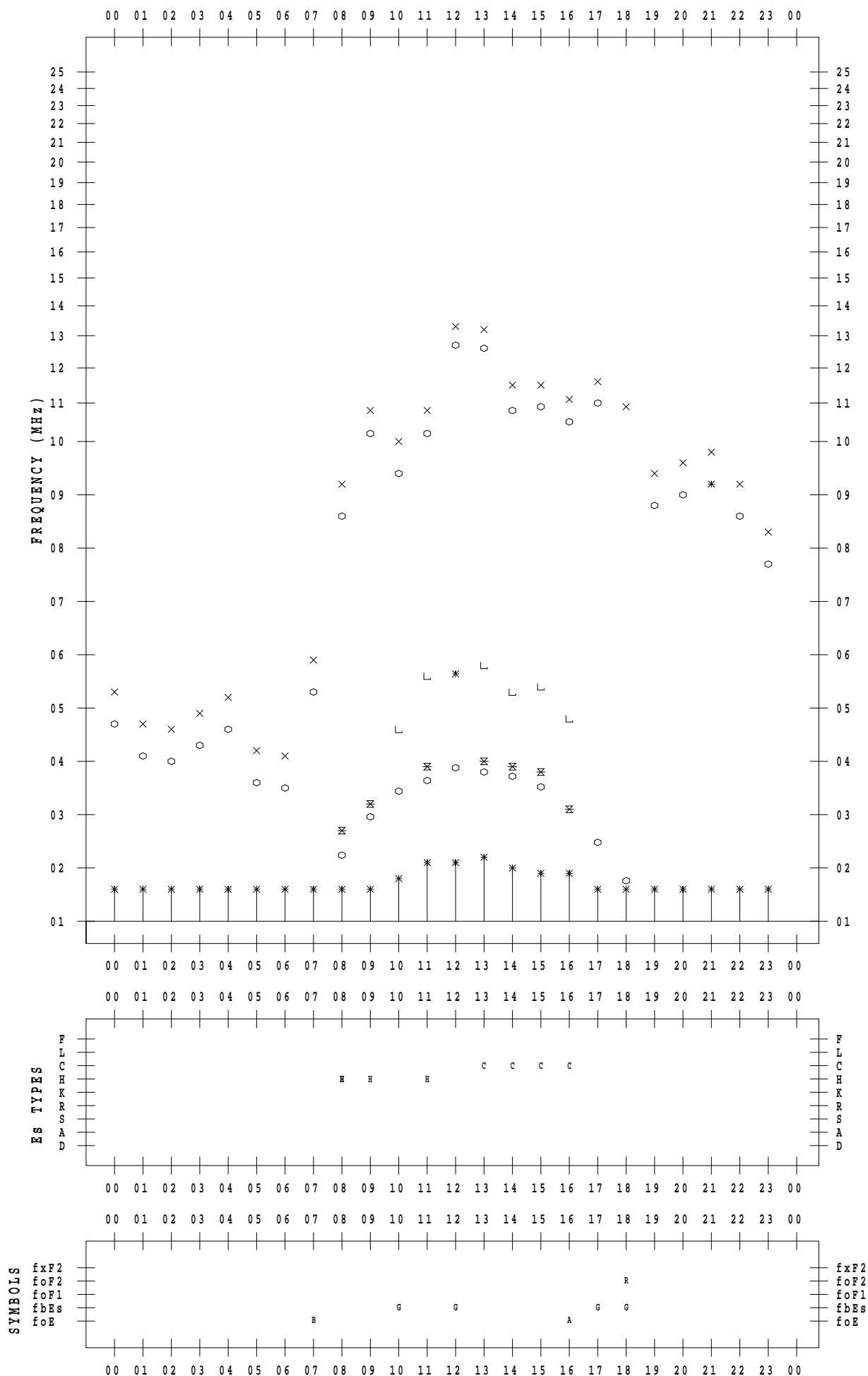
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 7

135 ° E MEAN TIME



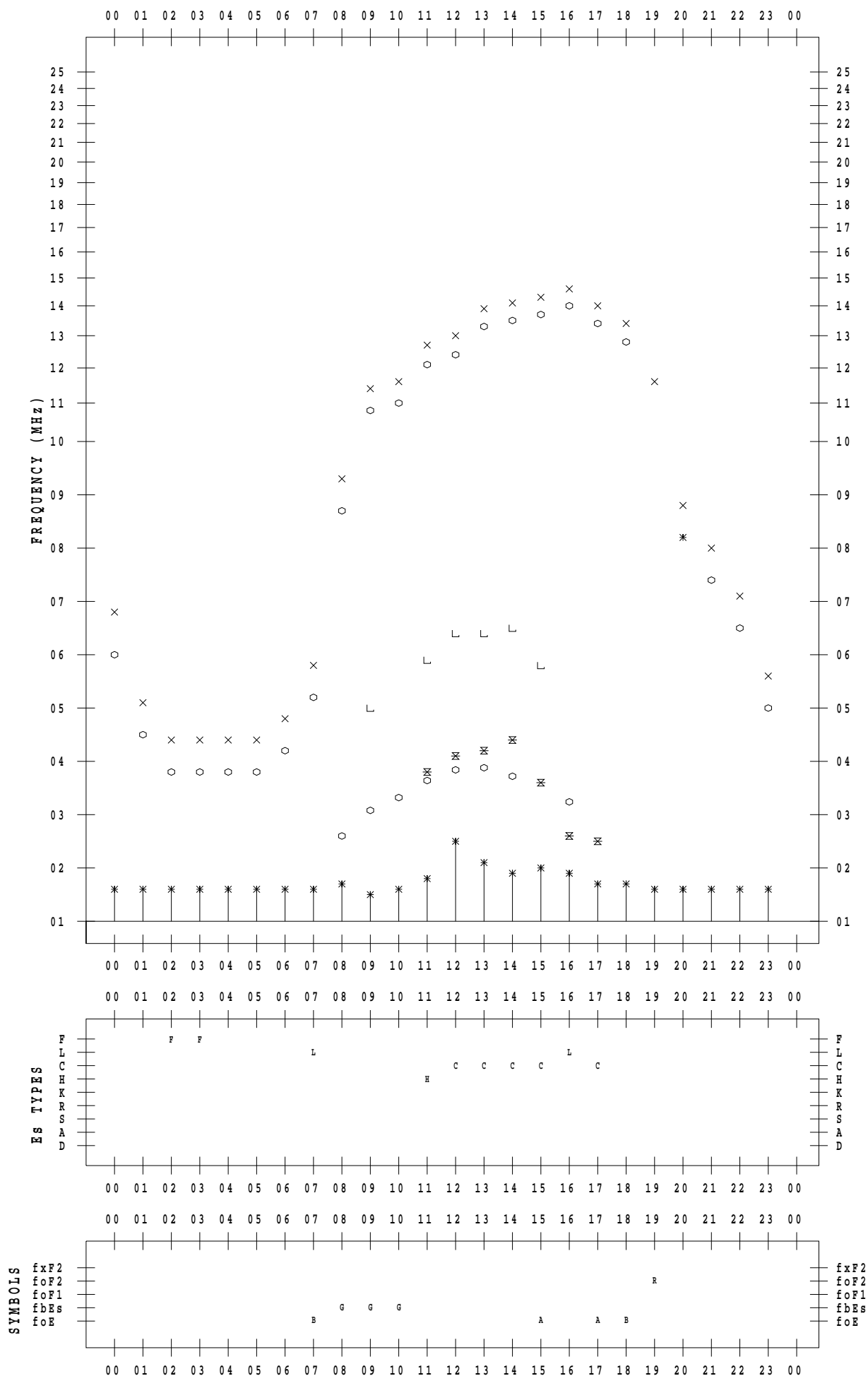
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 8

135 ° E MEAN TIME



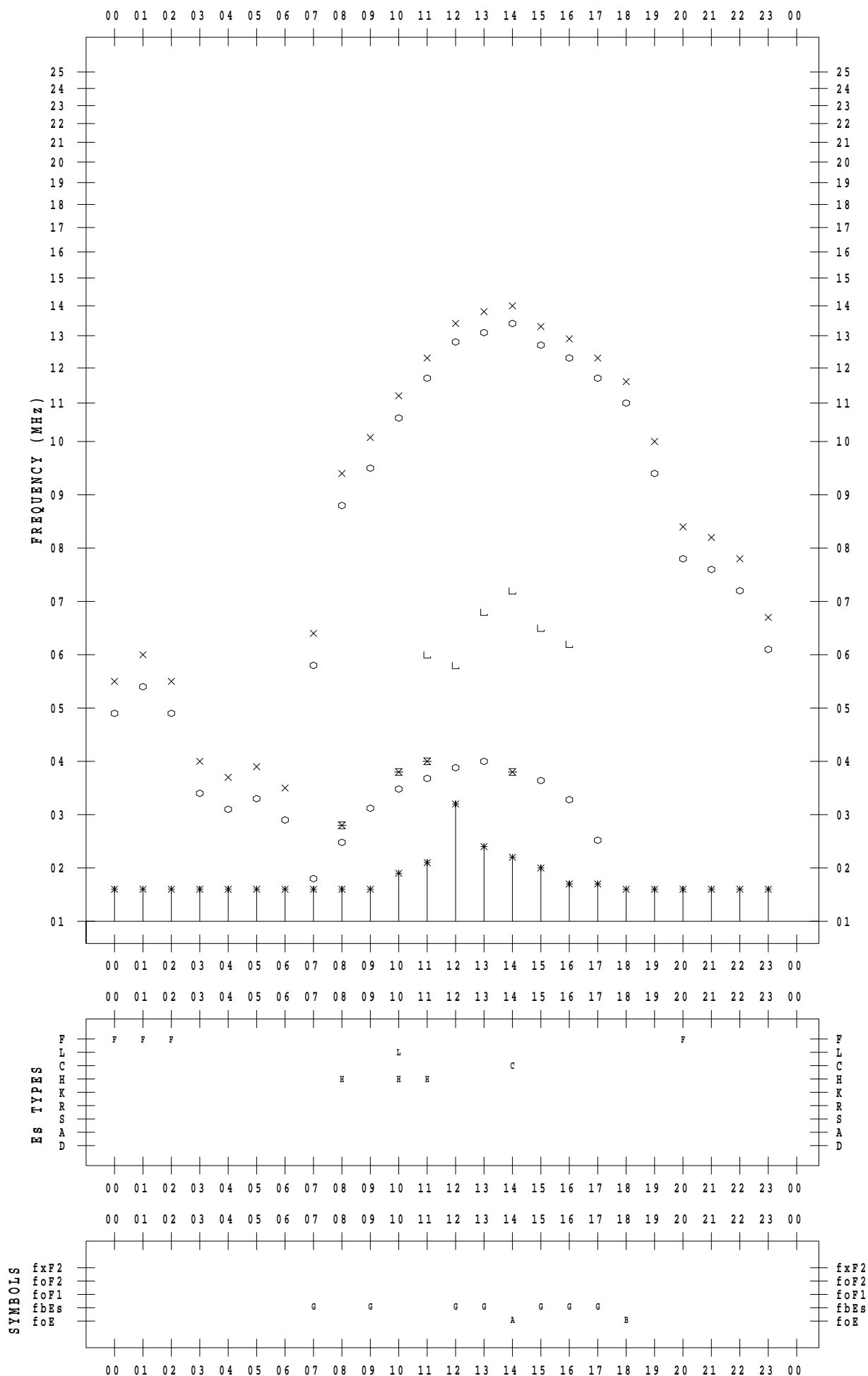
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 9

135 ° E MEAN TIME



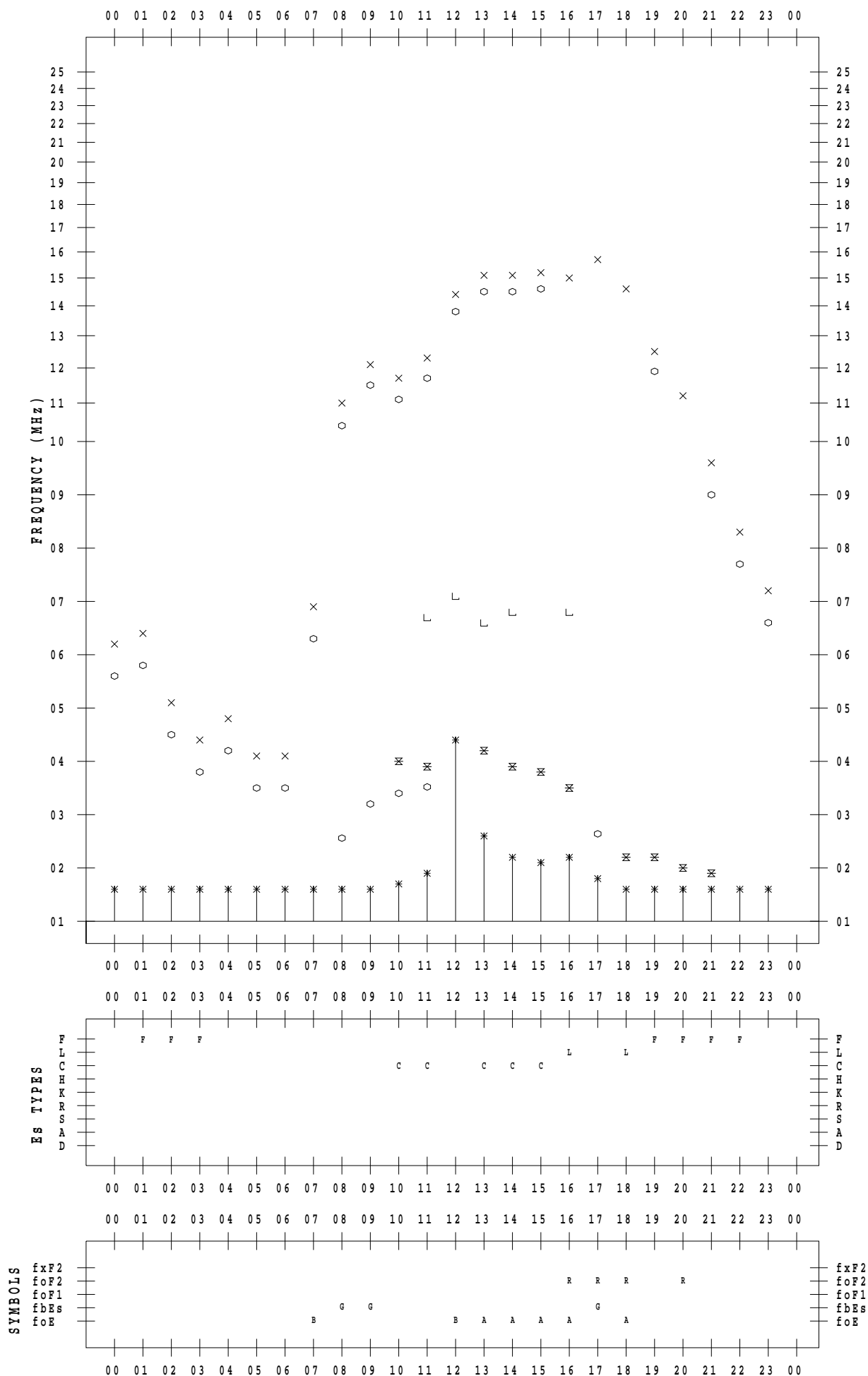
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 10

135 ° E MEAN TIME



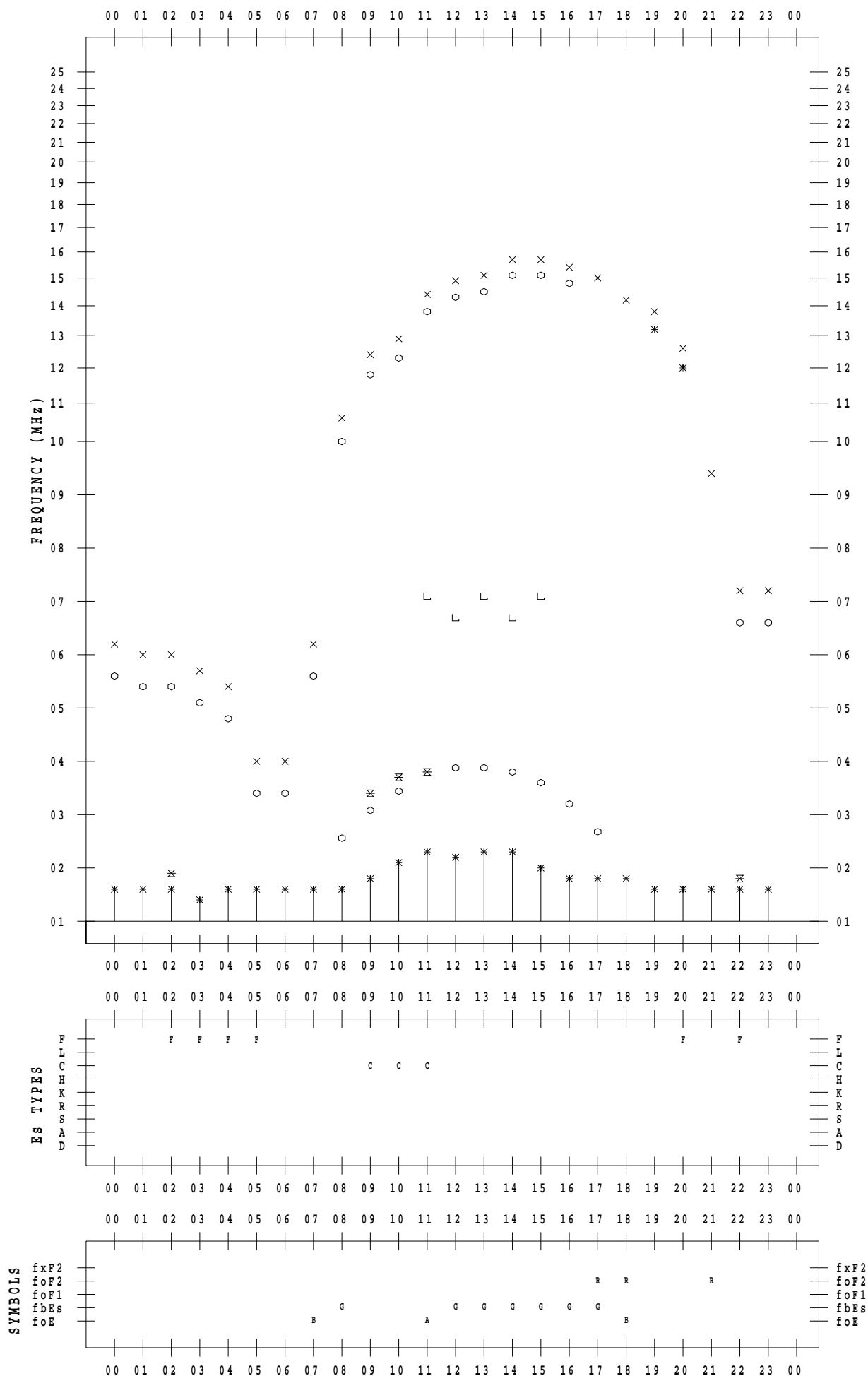
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 11

135 ° E MEAN TIME



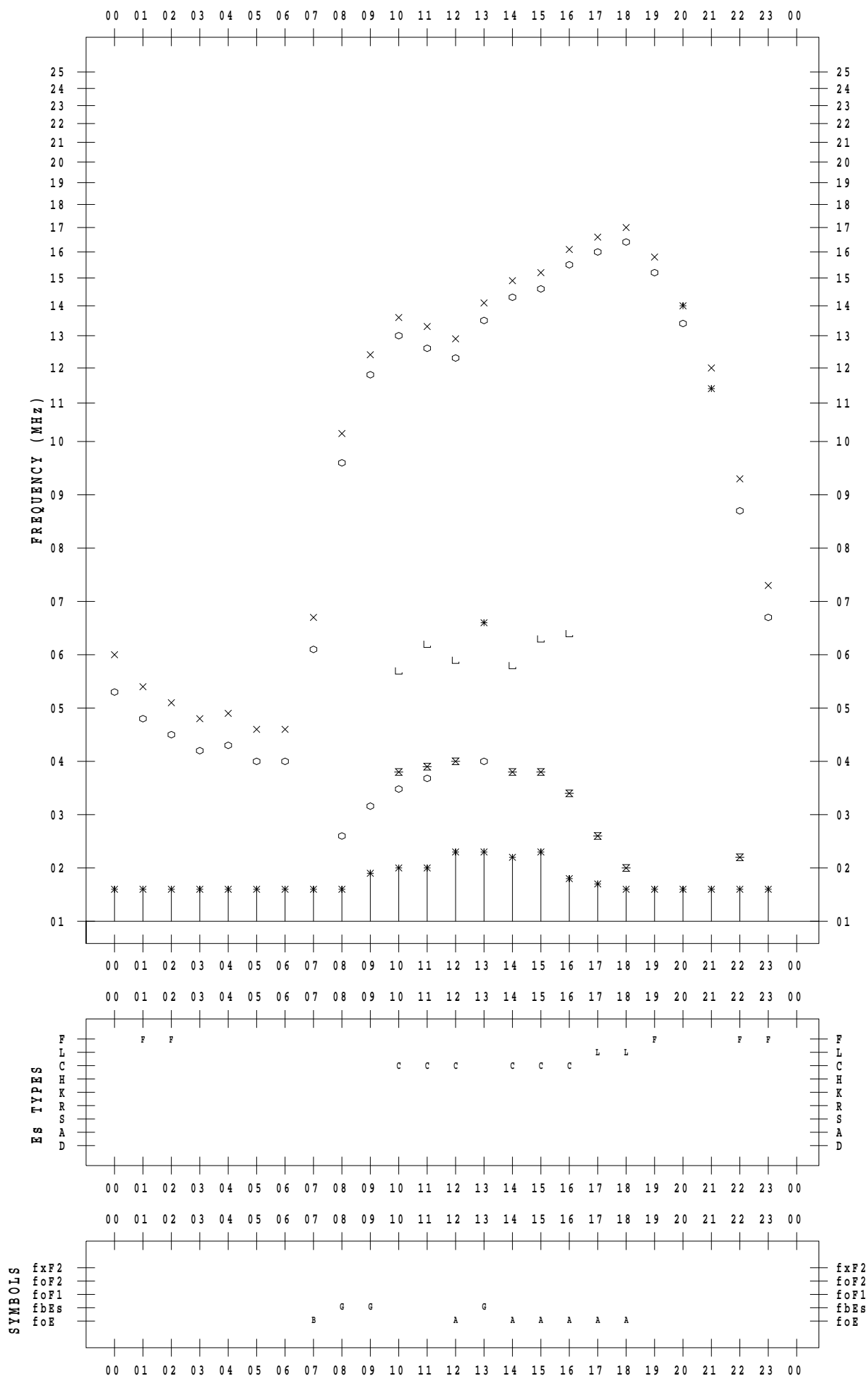
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 12

135 ° E MEAN TIME



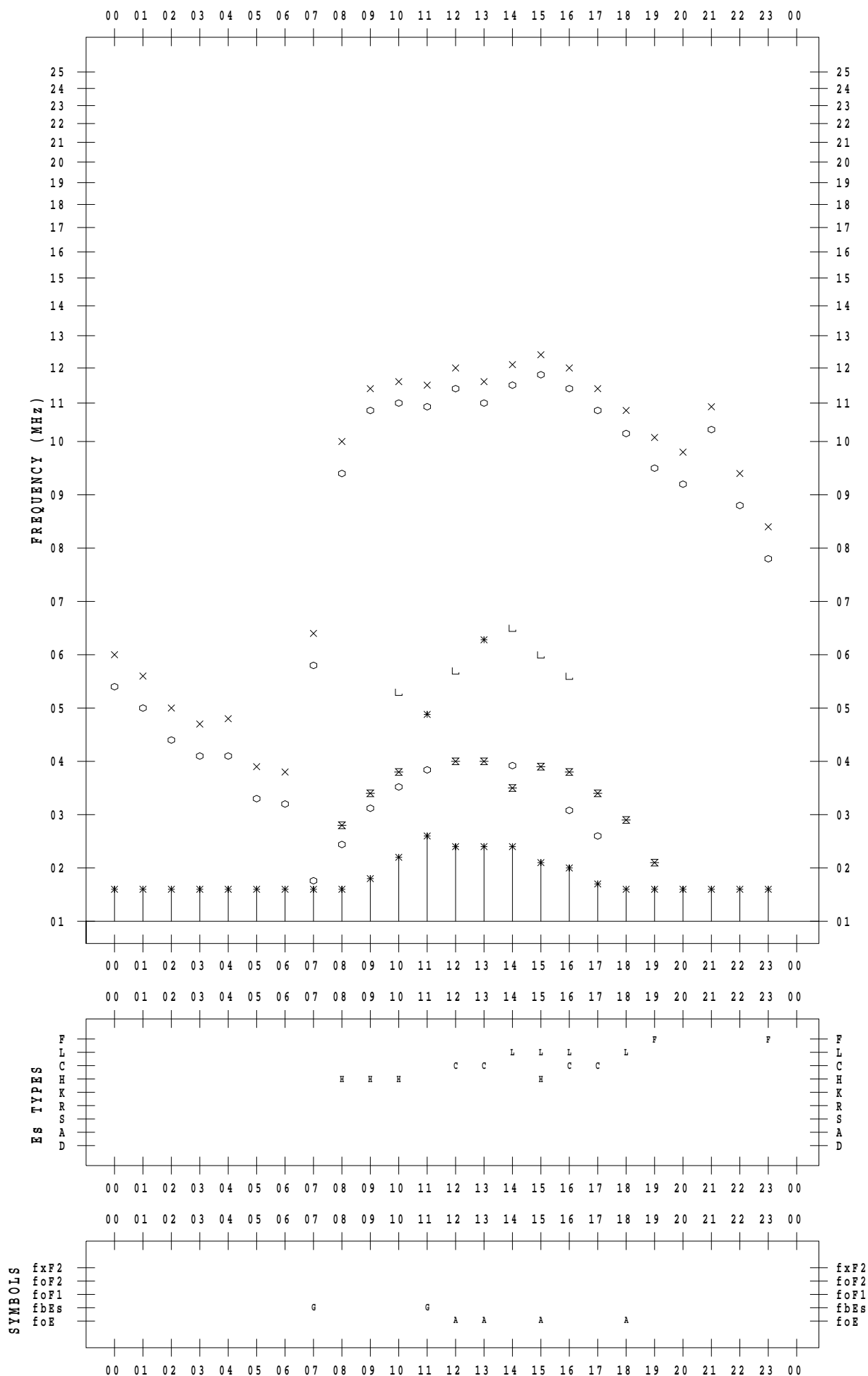
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 13

135 ° E MEAN TIME



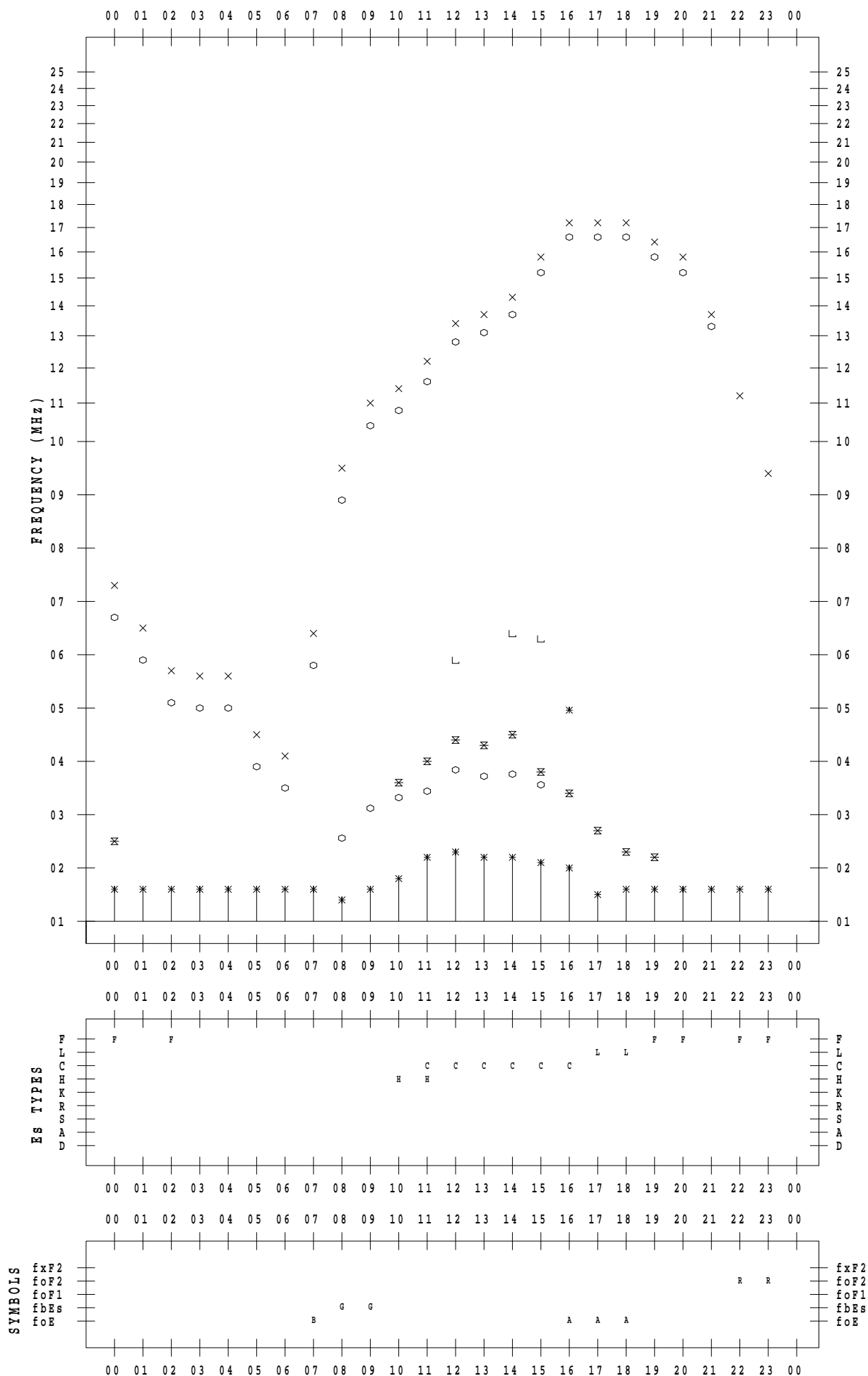
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 14

135 ° E MEAN TIME



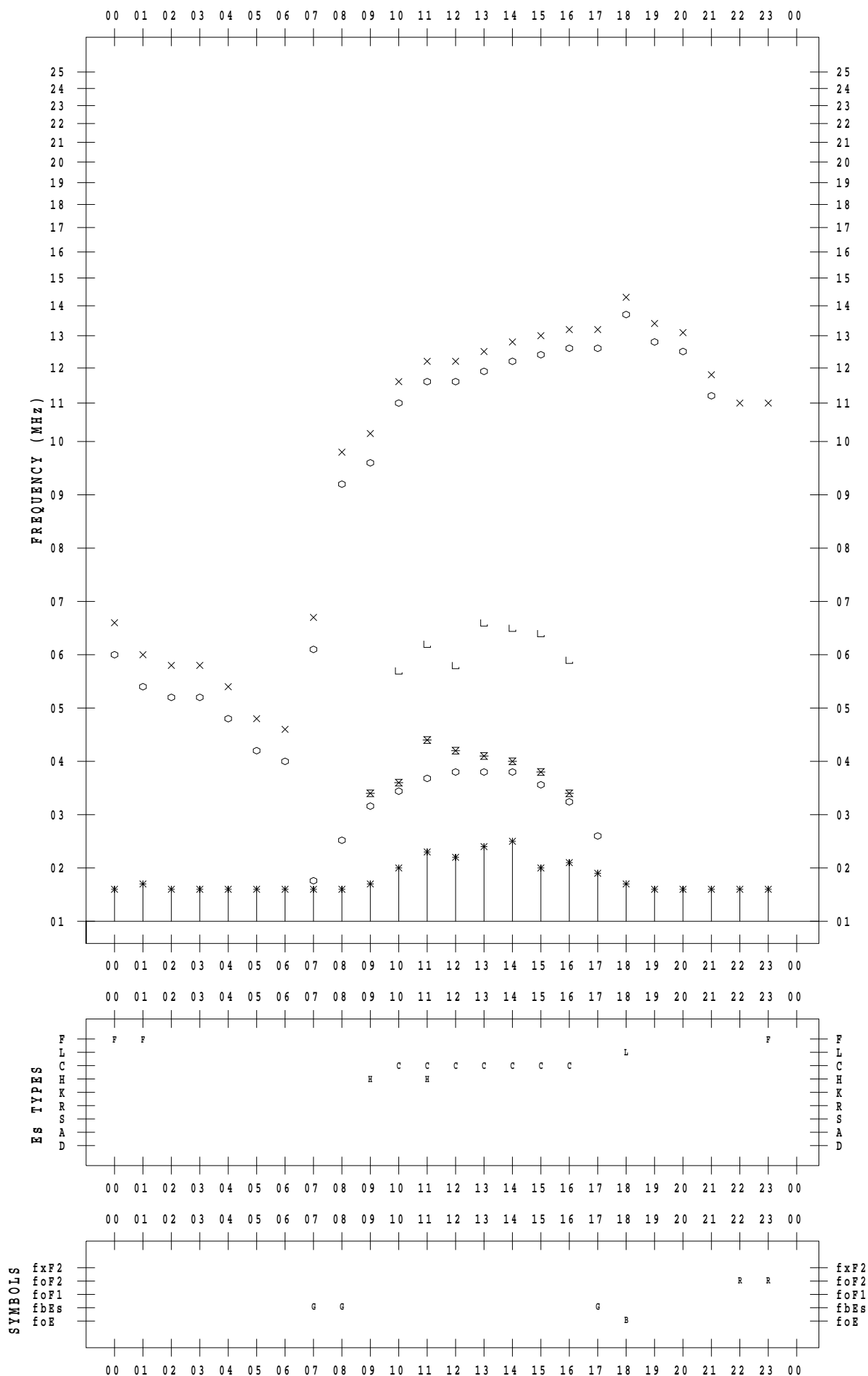
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 15

135 ° E MEAN TIME



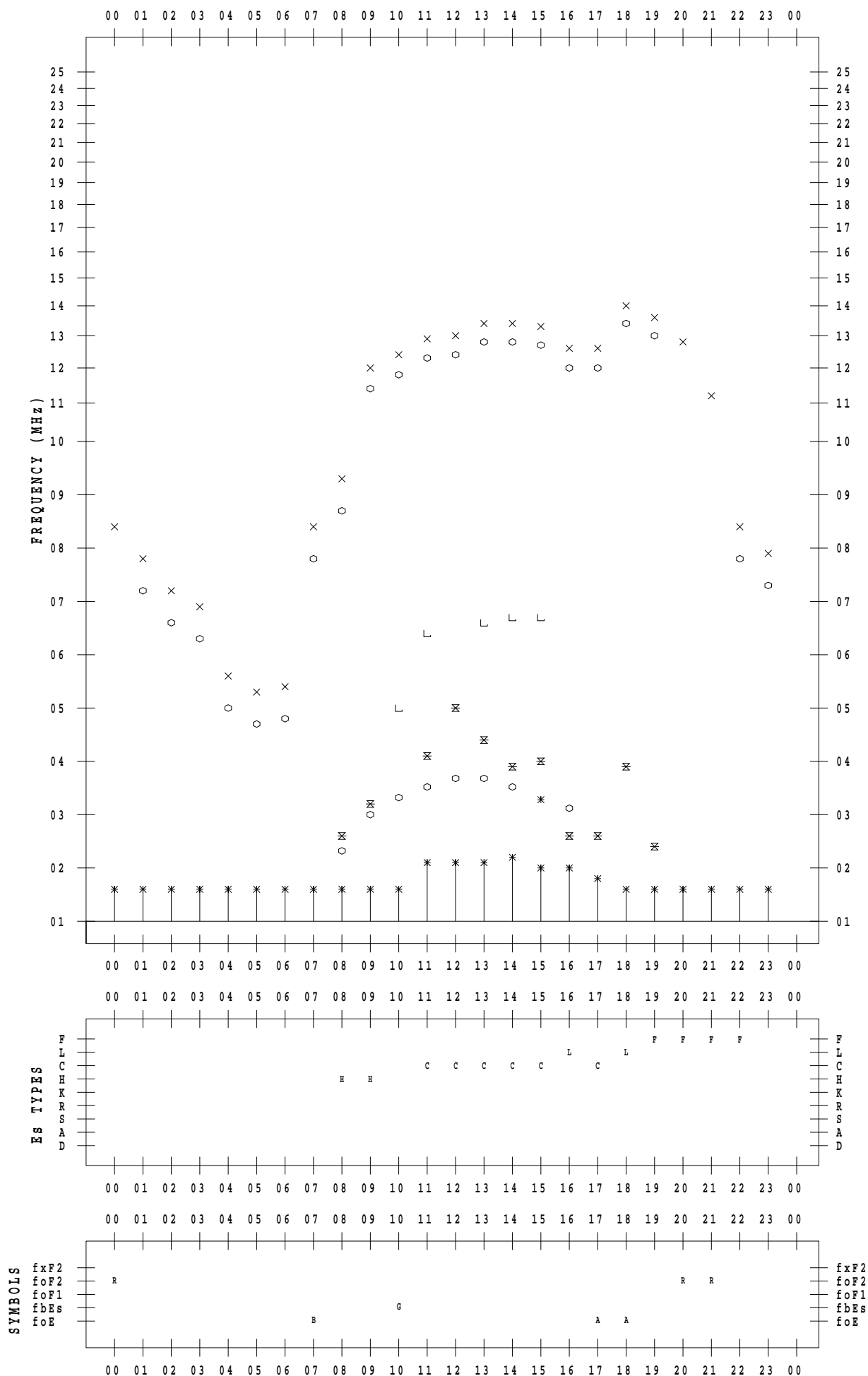
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 16

135 ° E MEAN TIME



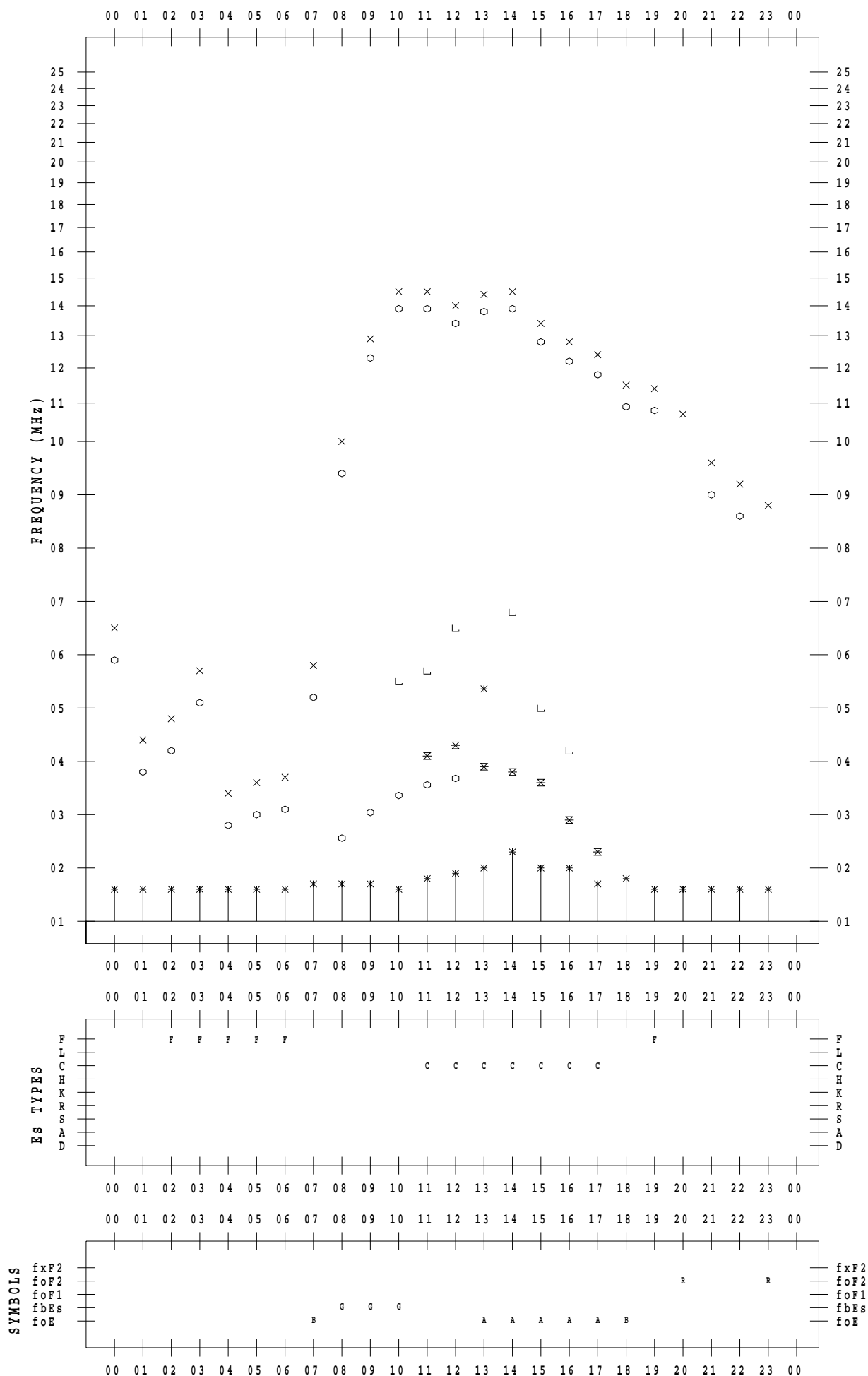
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 17

135 ° E MEAN TIME



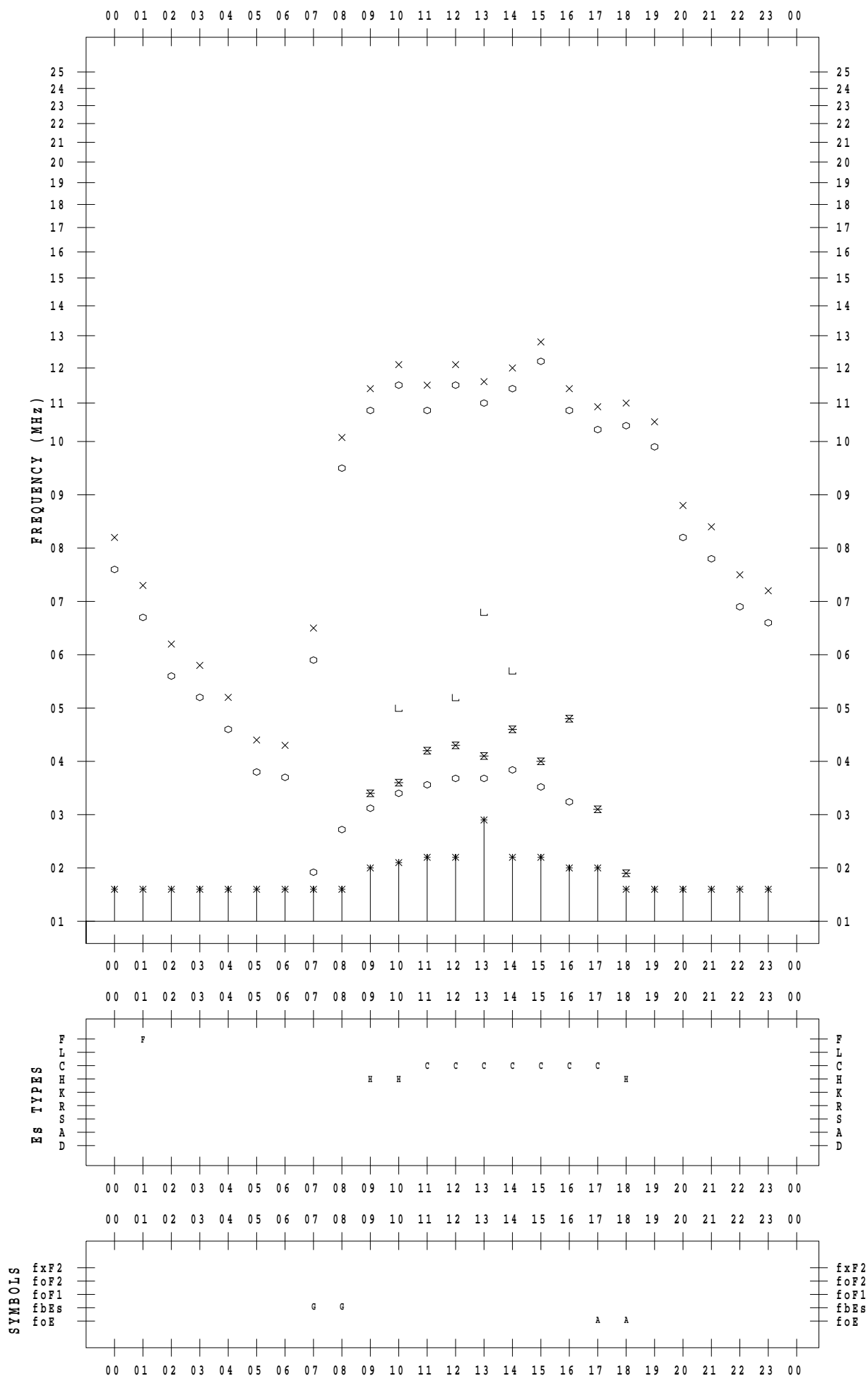
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 18

135 ° E MEAN TIME



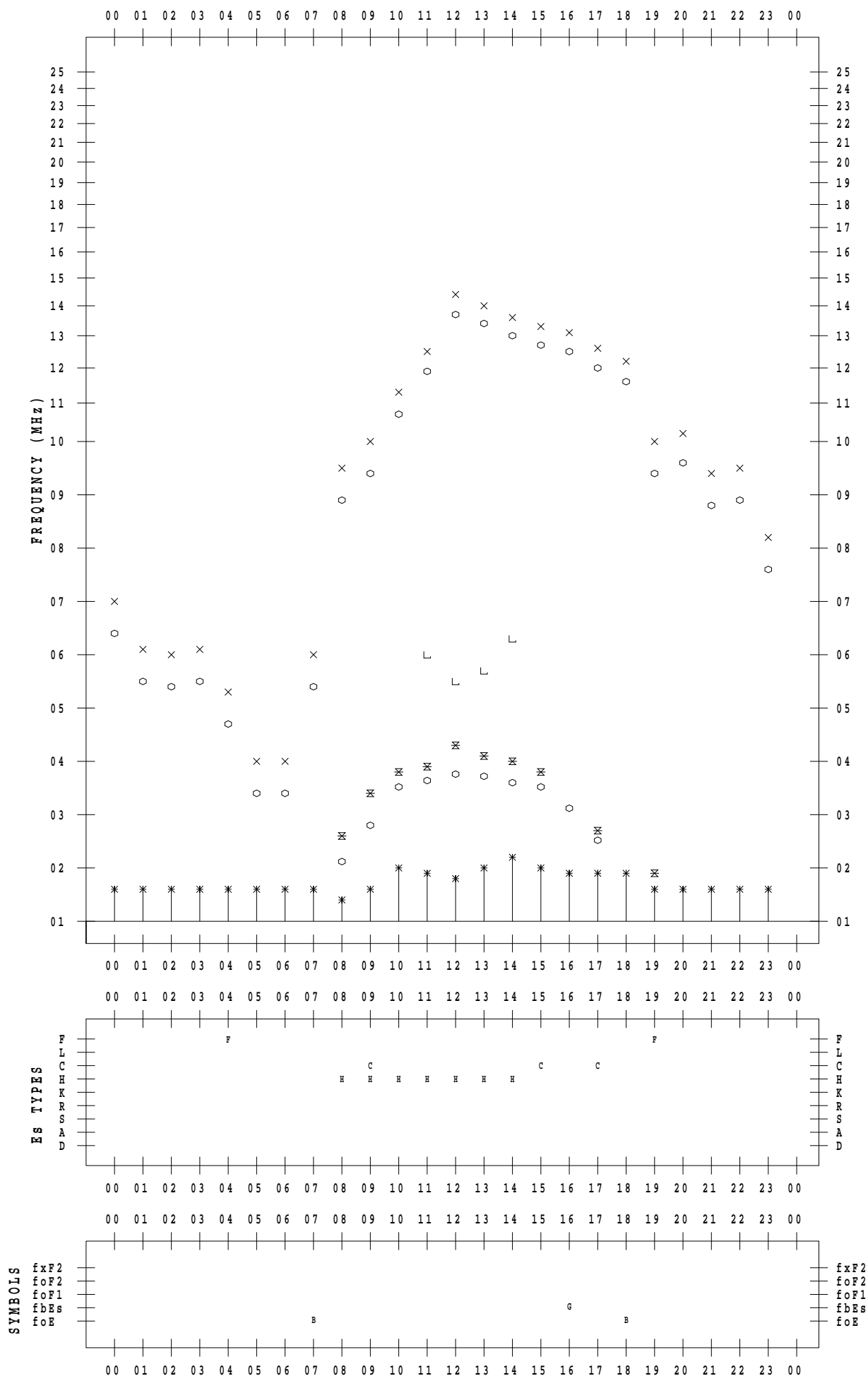
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 19

135 ° E MEAN TIME



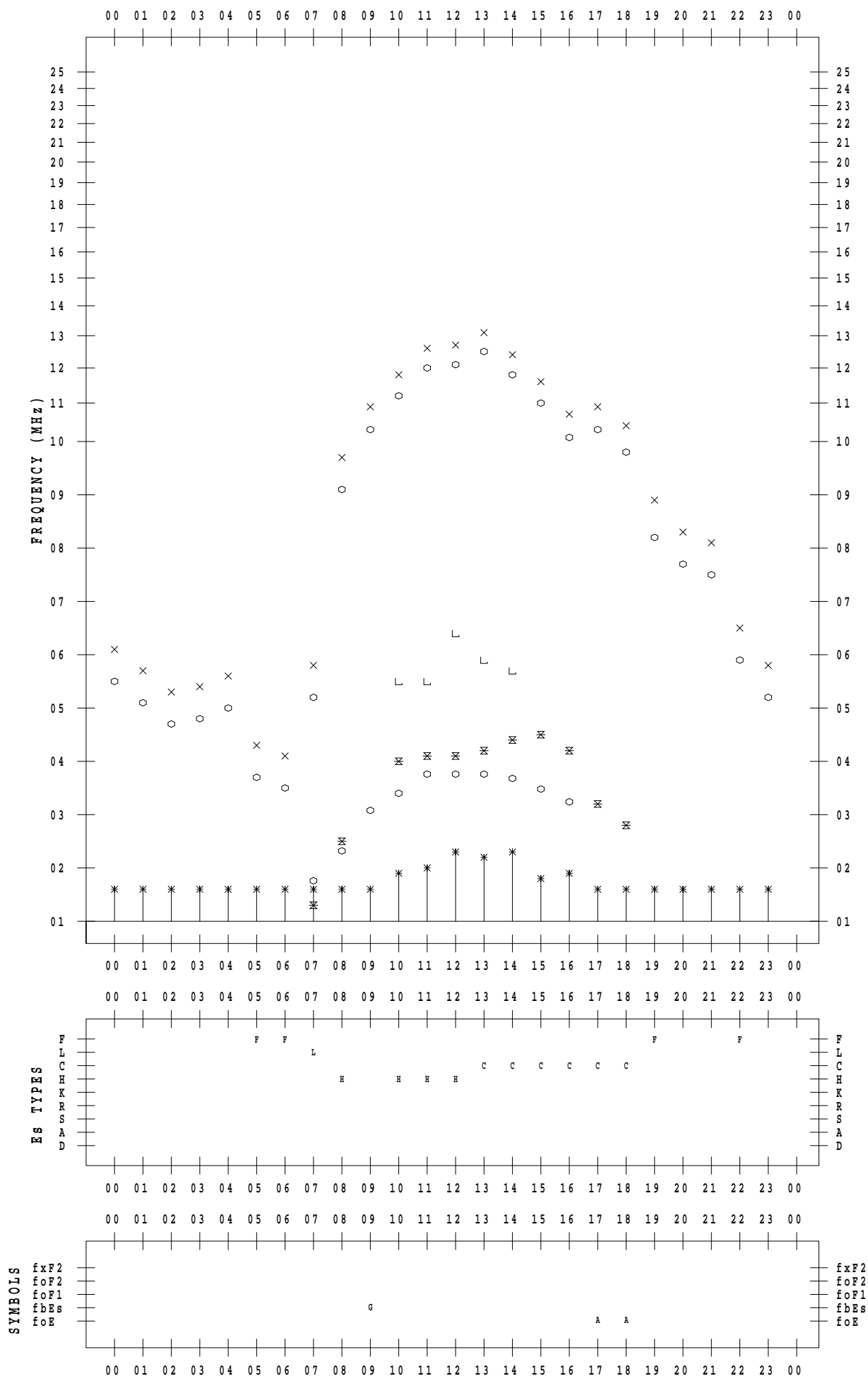
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 20

135 ° E MEAN TIME



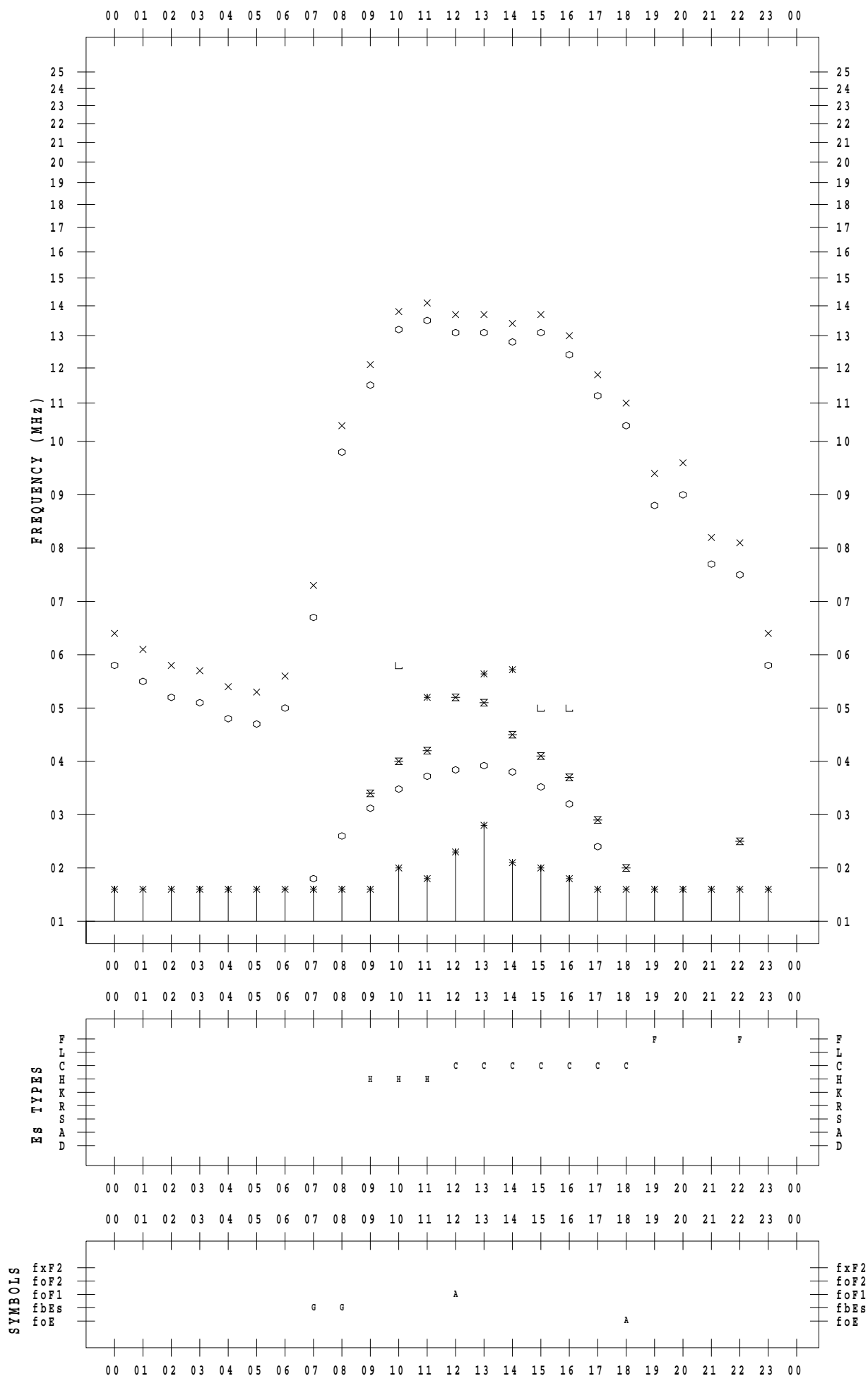
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 21

135 ° E MEAN TIME



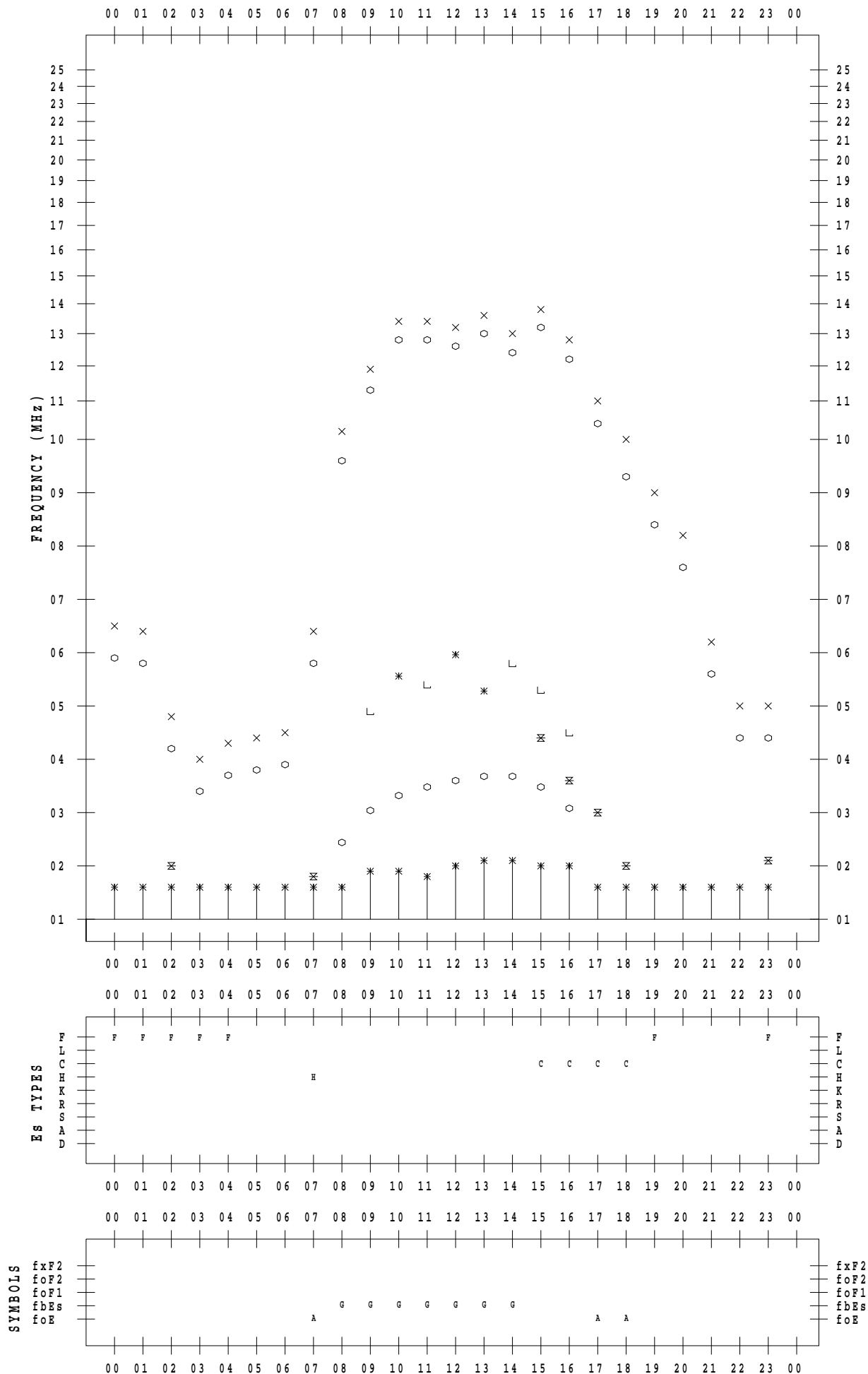
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 22

135 ° E MEAN TIME



Es TYPES

SYMBOLS

fxF2
foF2
foF1
fbEs
foE

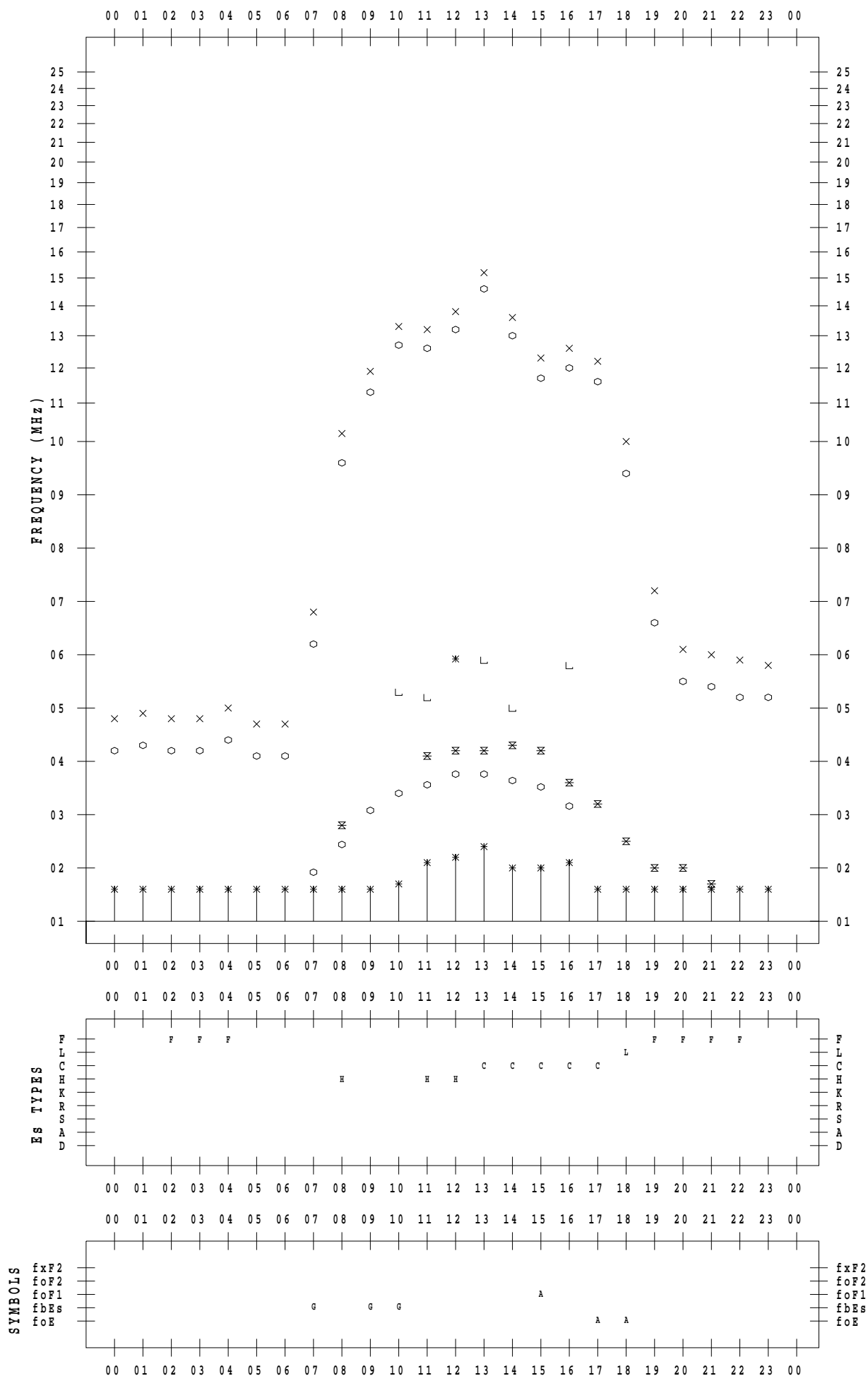
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 23

135 ° E MEAN TIME



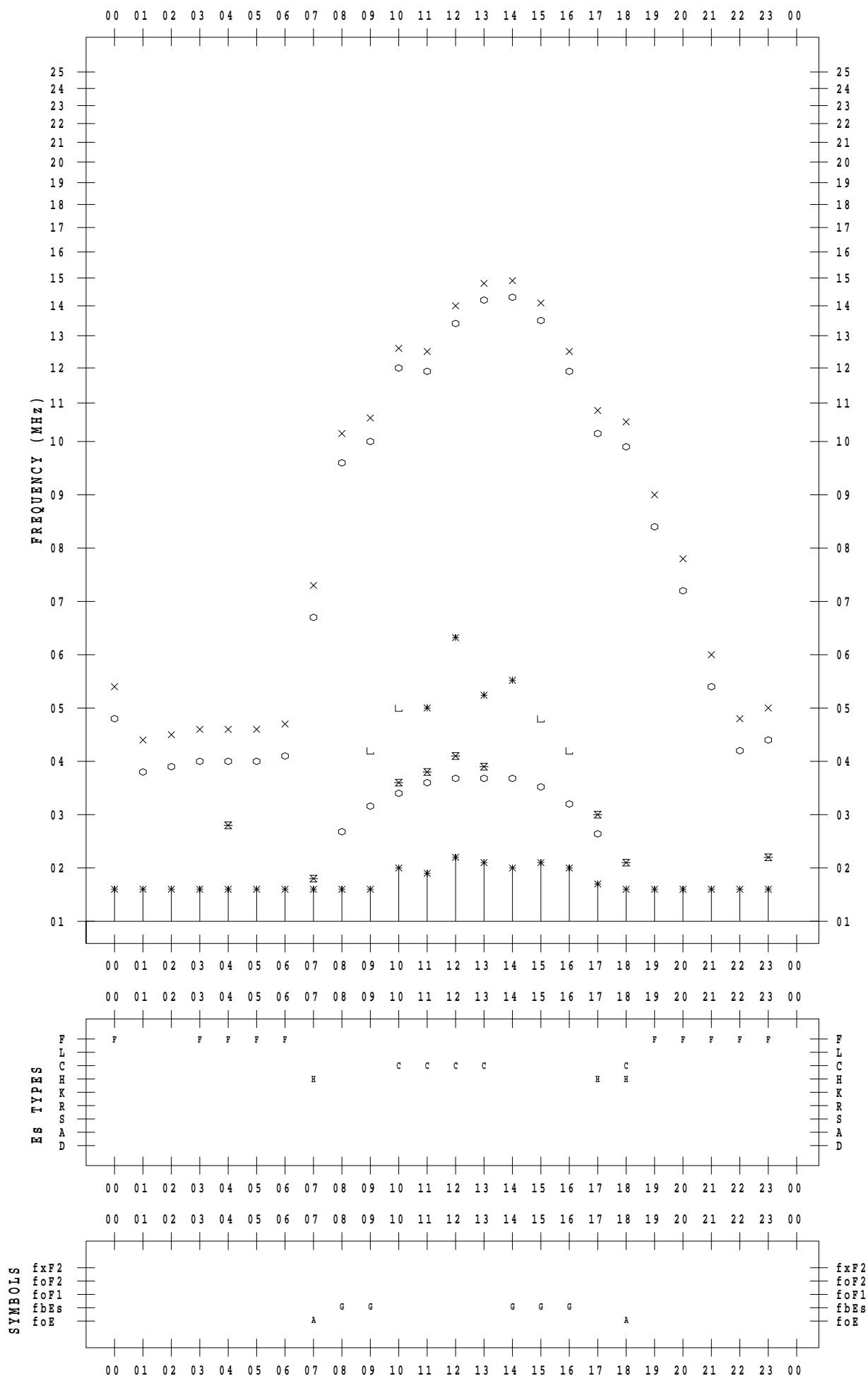
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 24

135 ° E MEAN TIME



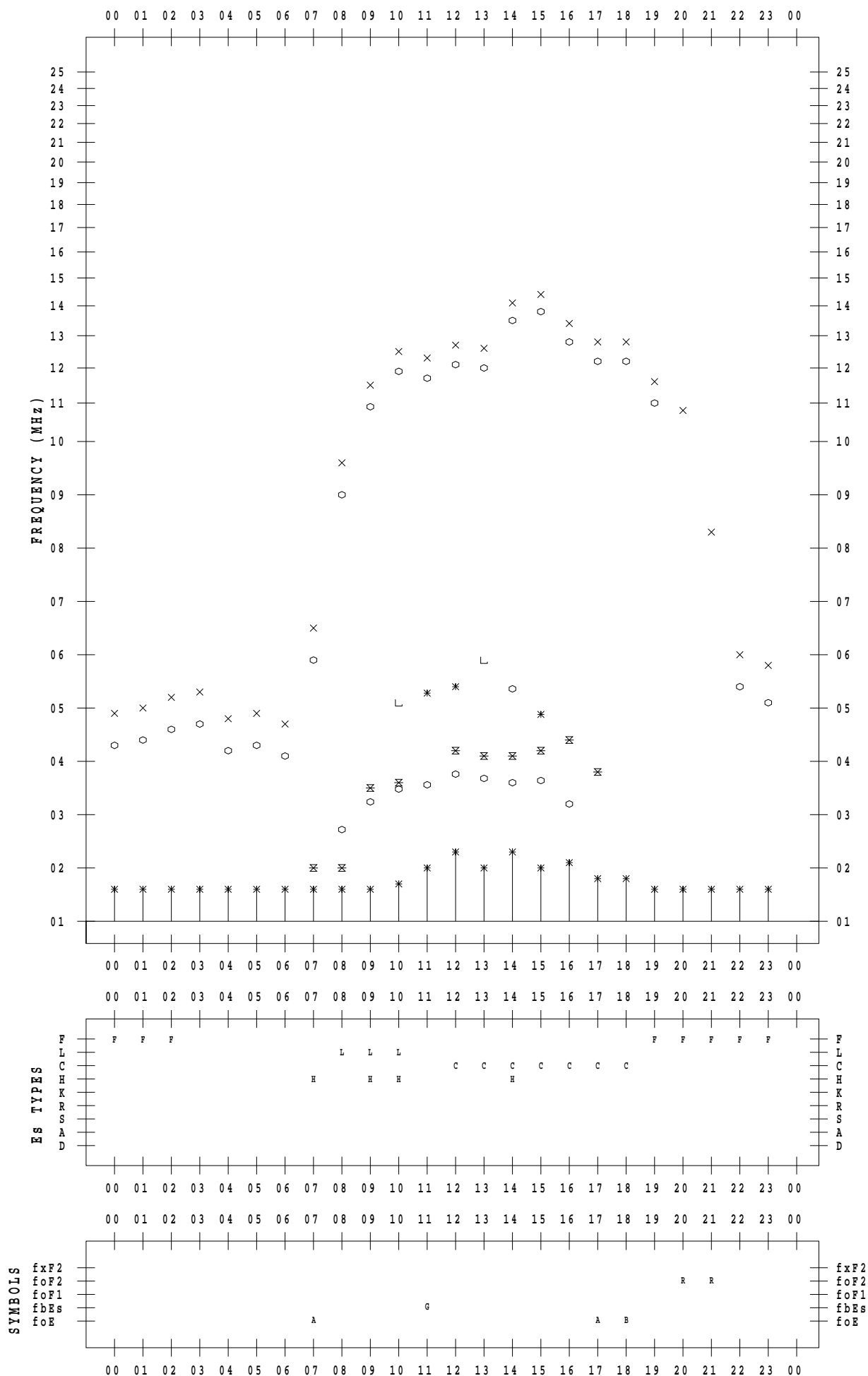
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 25

135 ° E MEAN TIME



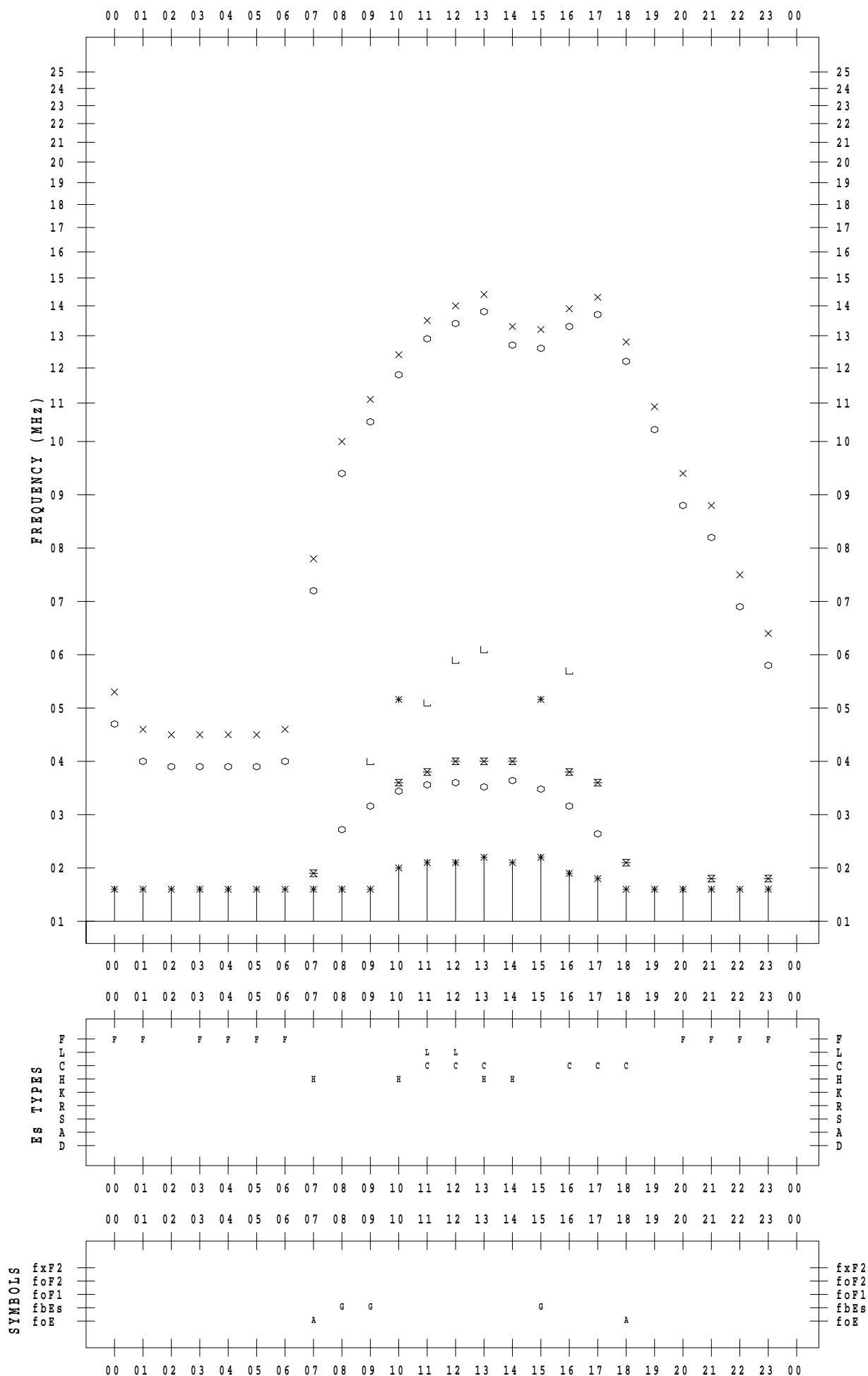
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 26

135 ° E MEAN TIME



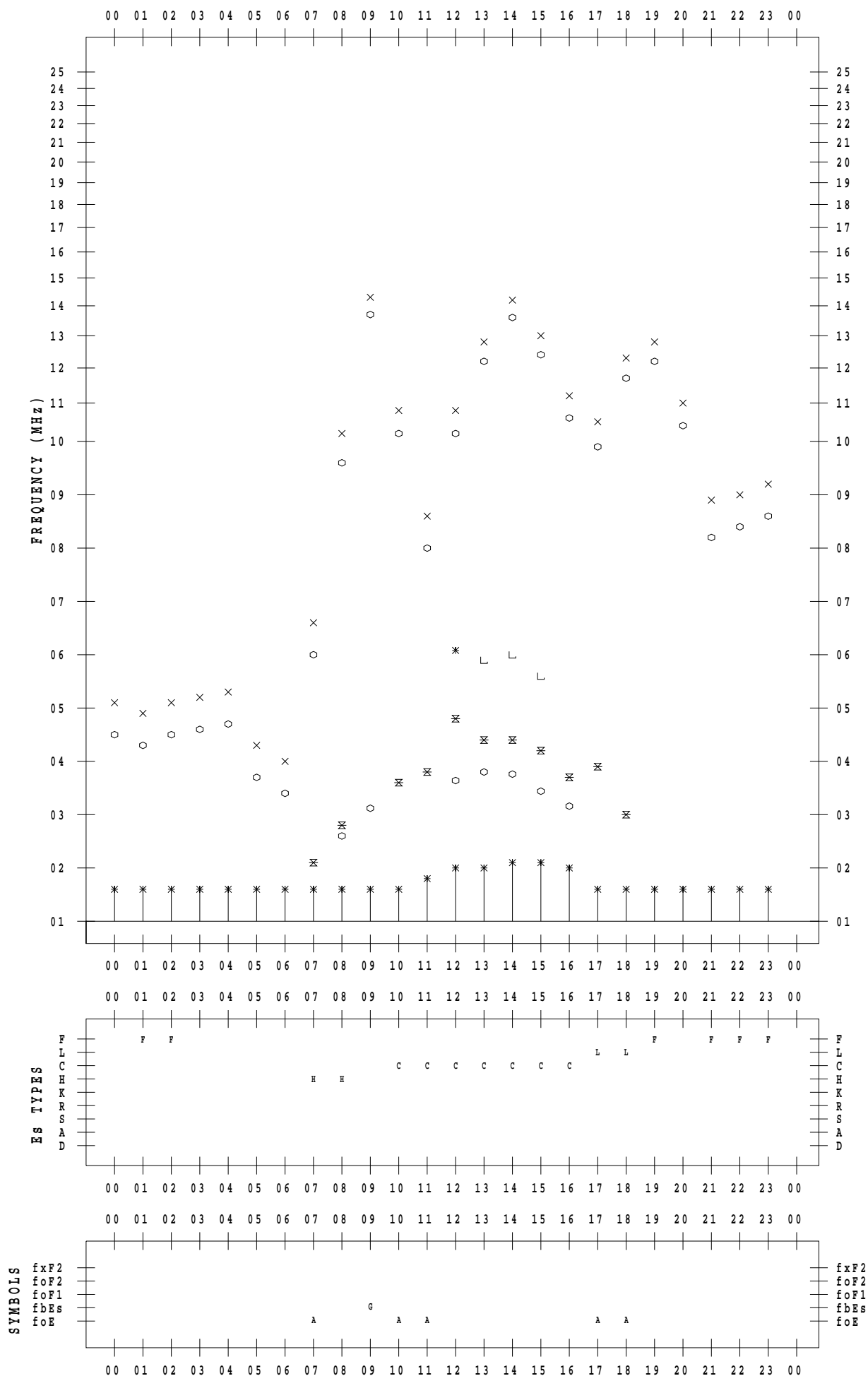
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 27

135 ° E MEAN TIME



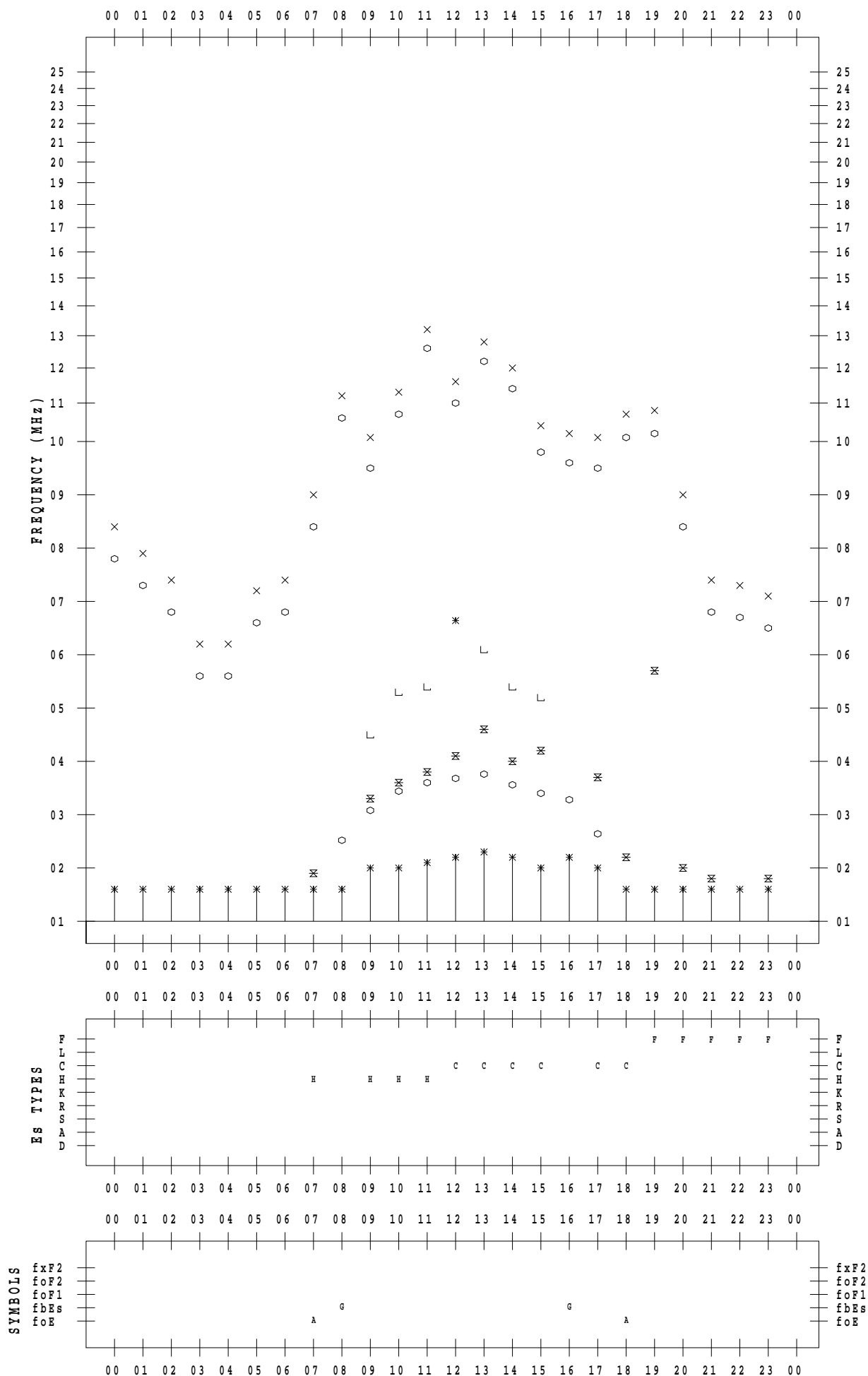
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 2 / 28

135 ° E MEAN TIME



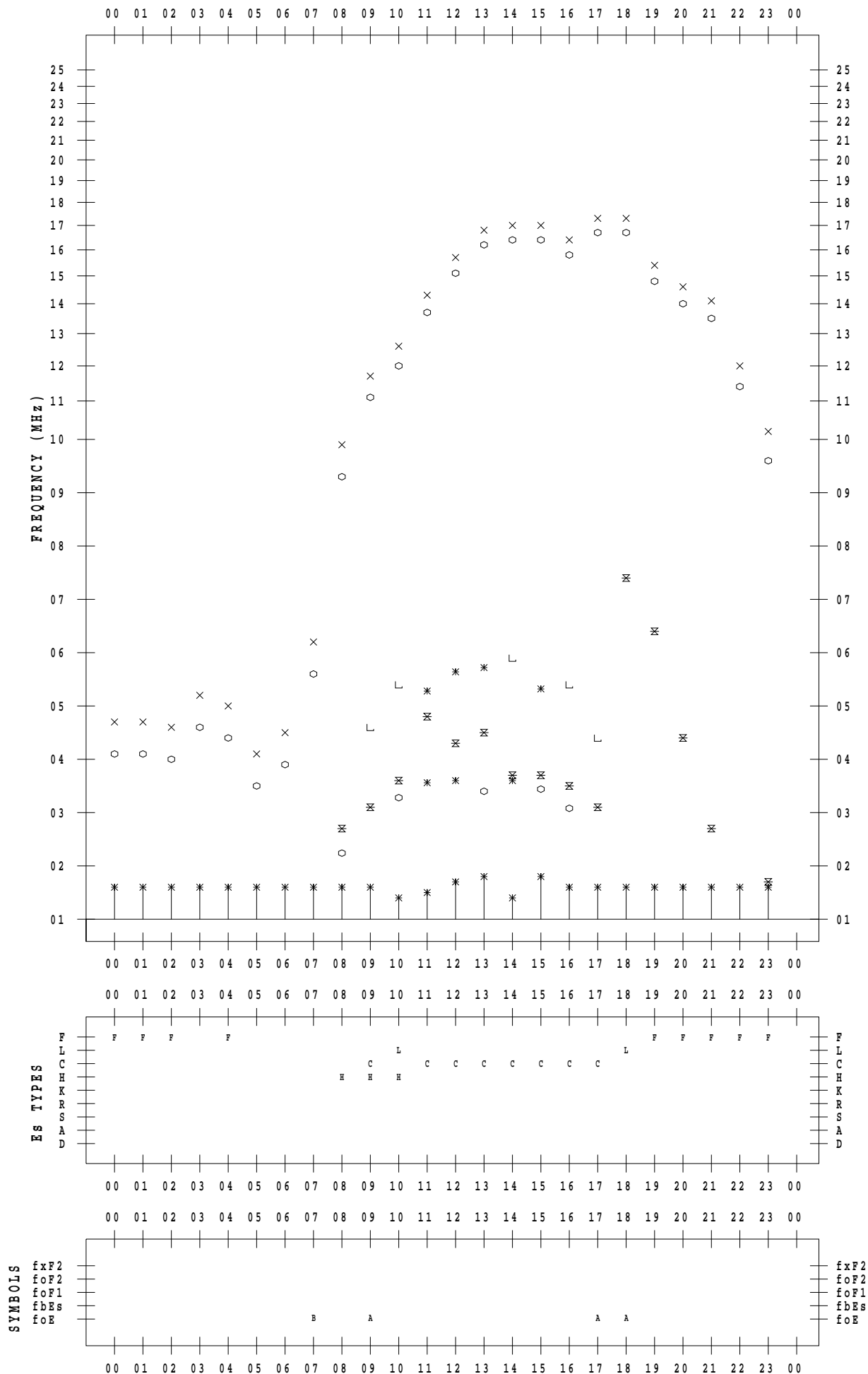
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 1

135 ° E MEAN TIME



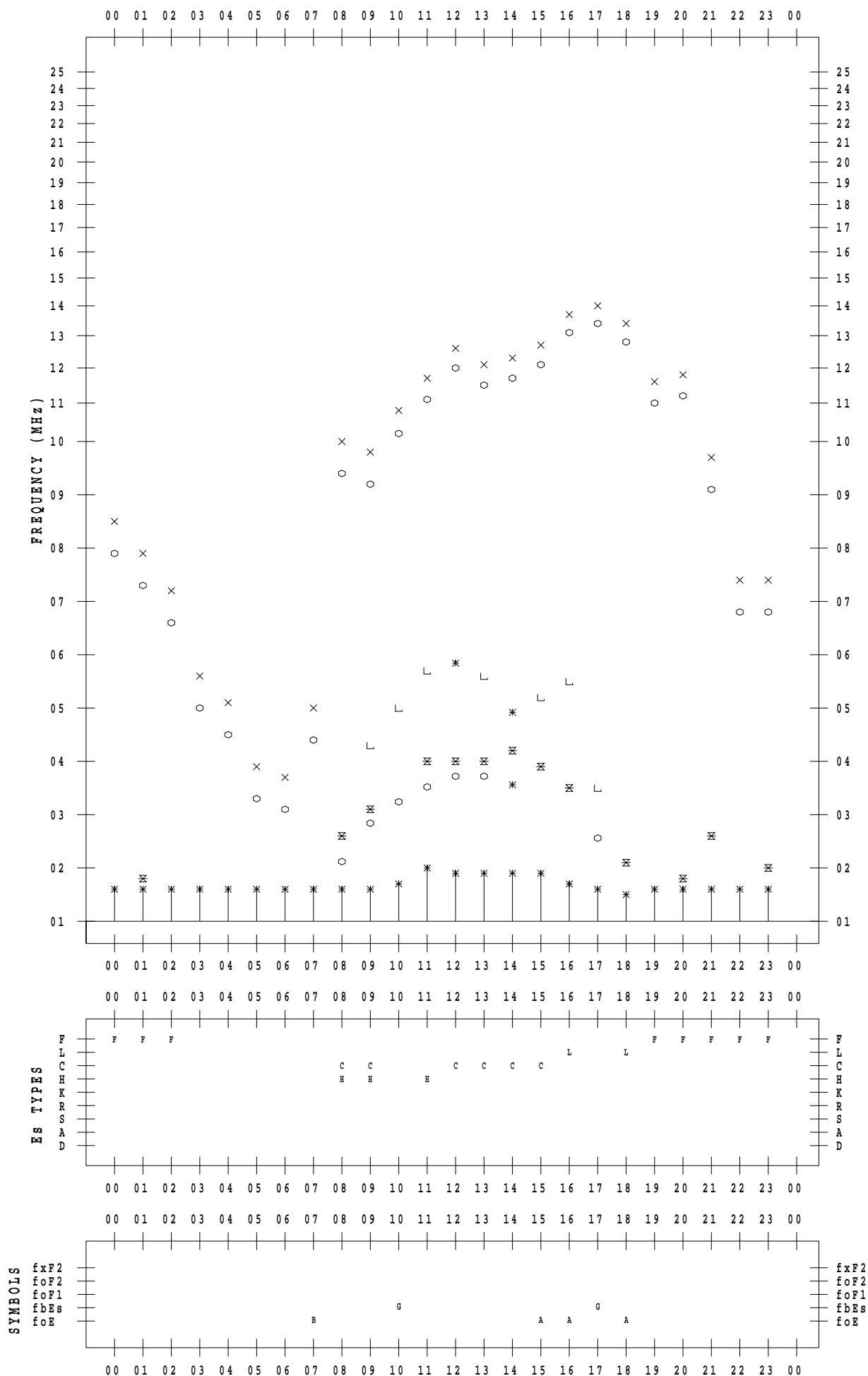
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 2

135 ° E MEAN TIME



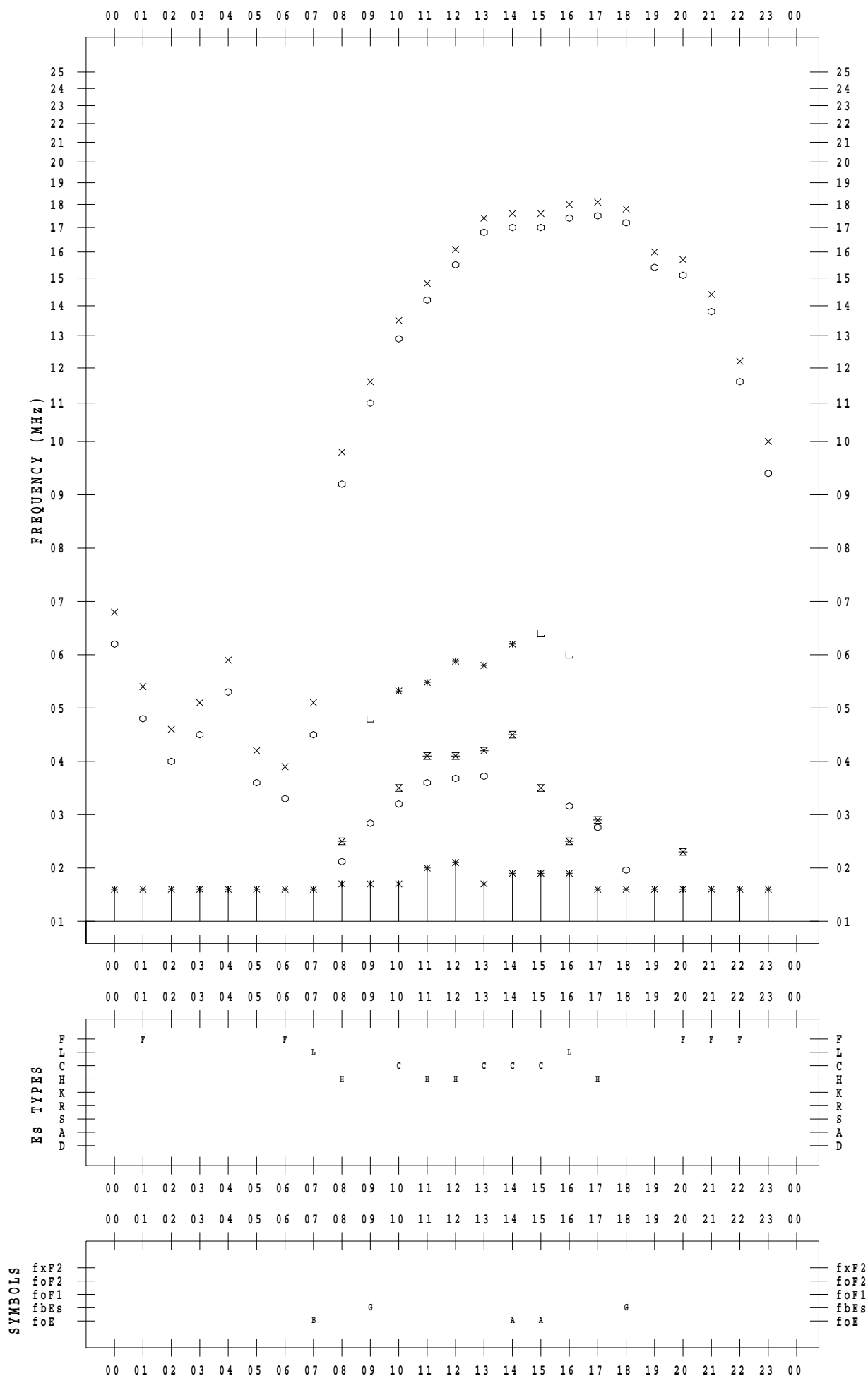
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 3

135 ° E MEAN TIME



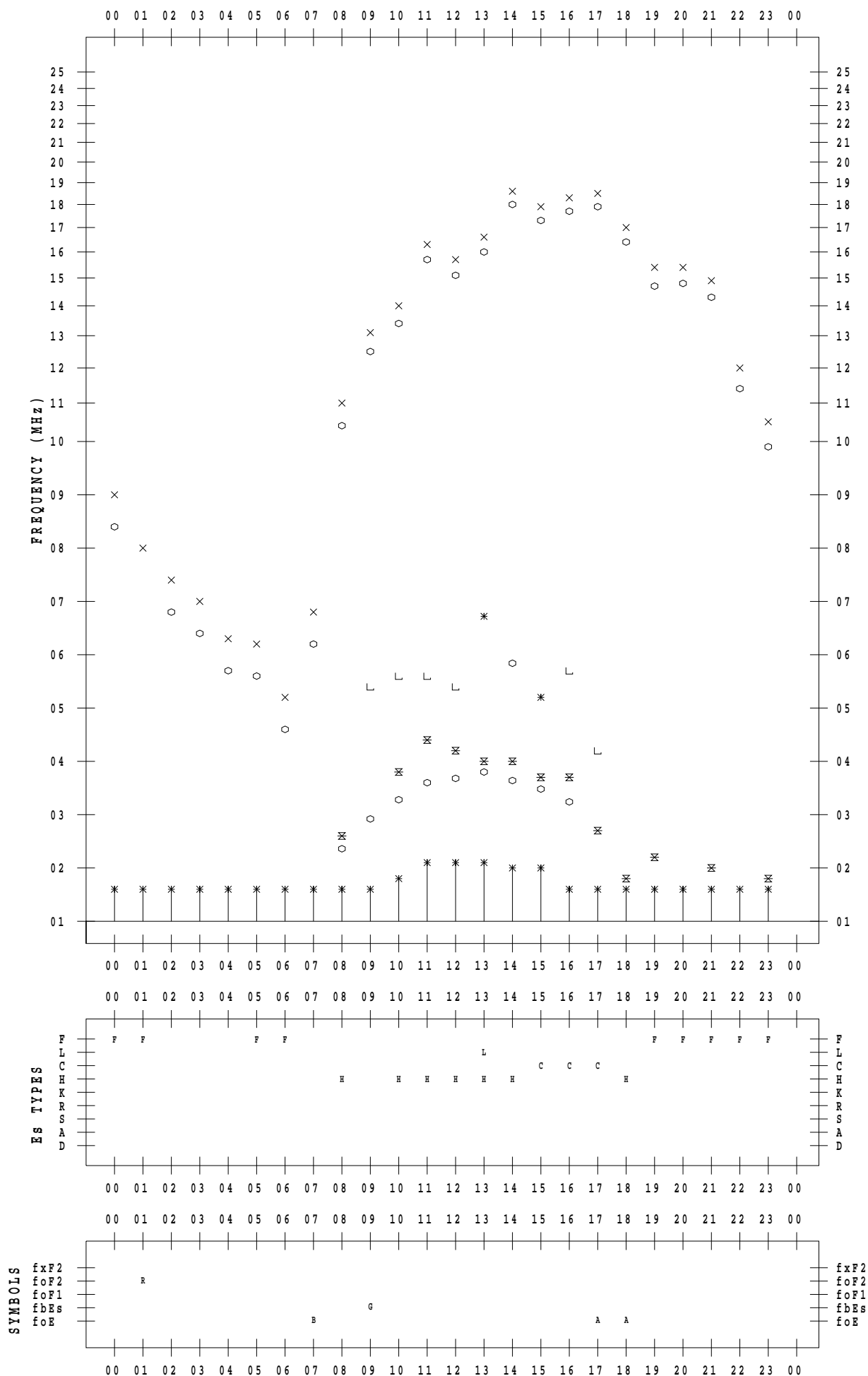
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 4

135 ° E MEAN TIME



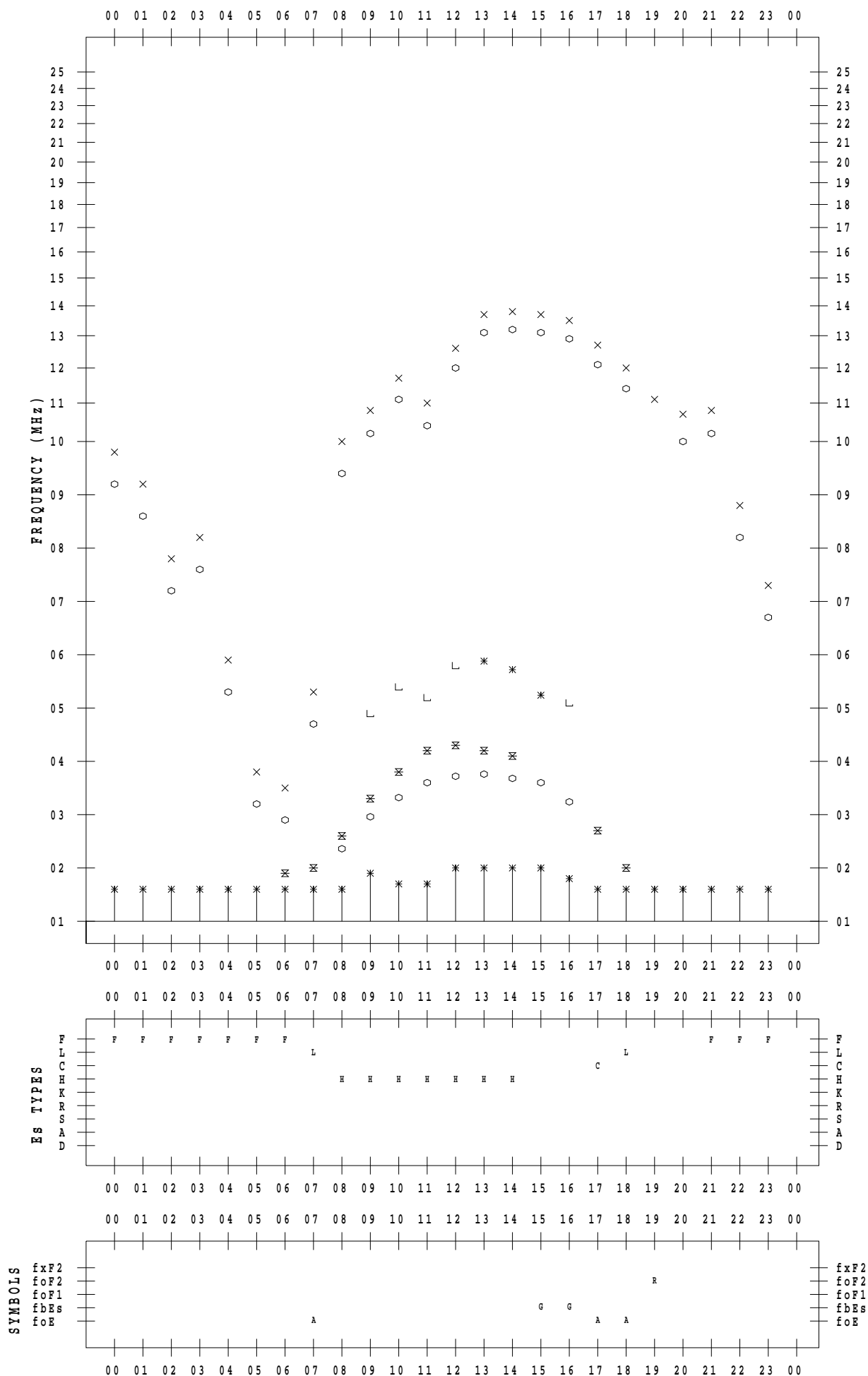
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 5

135 ° E MEAN TIME



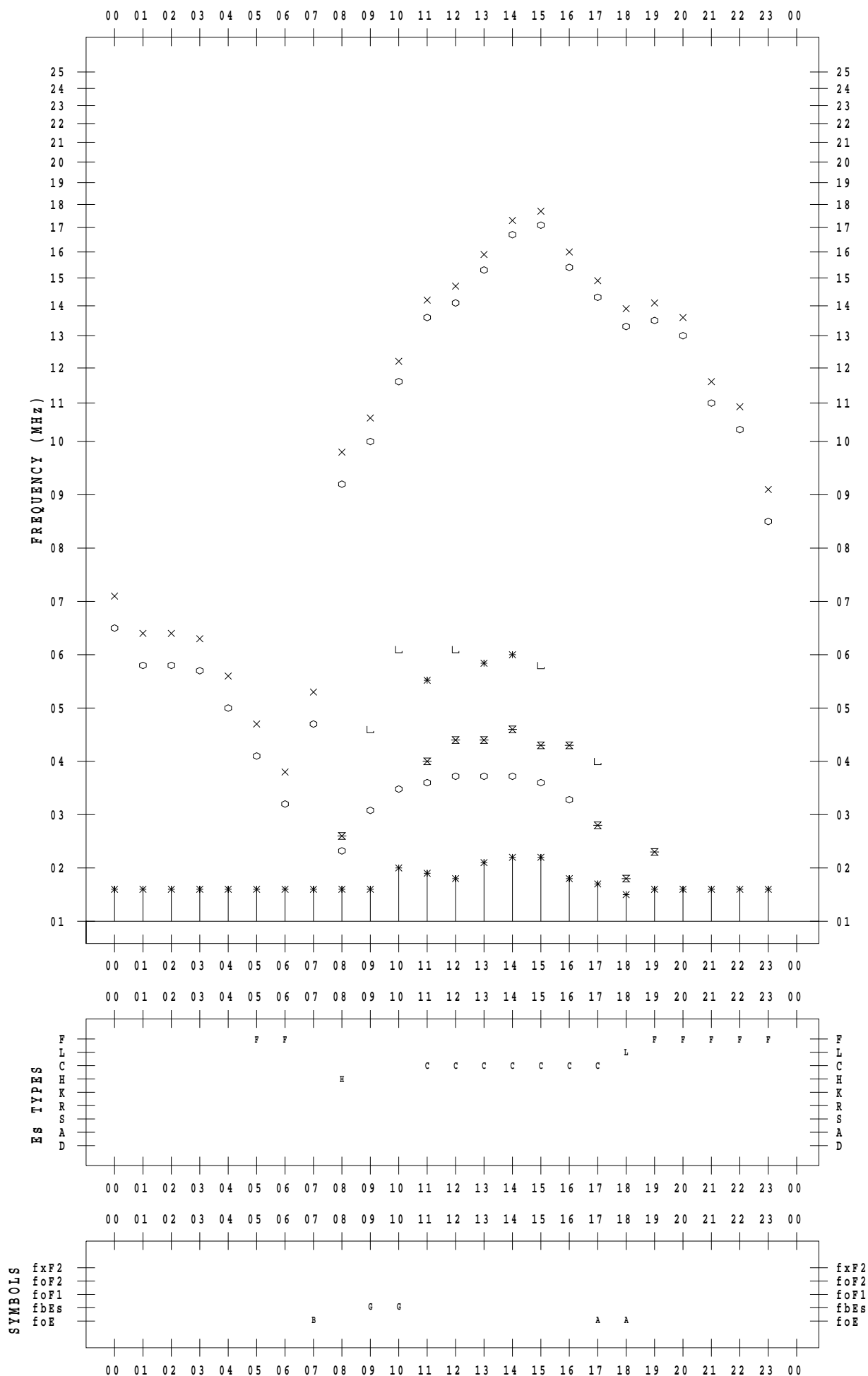
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 6

135 ° E MEAN TIME



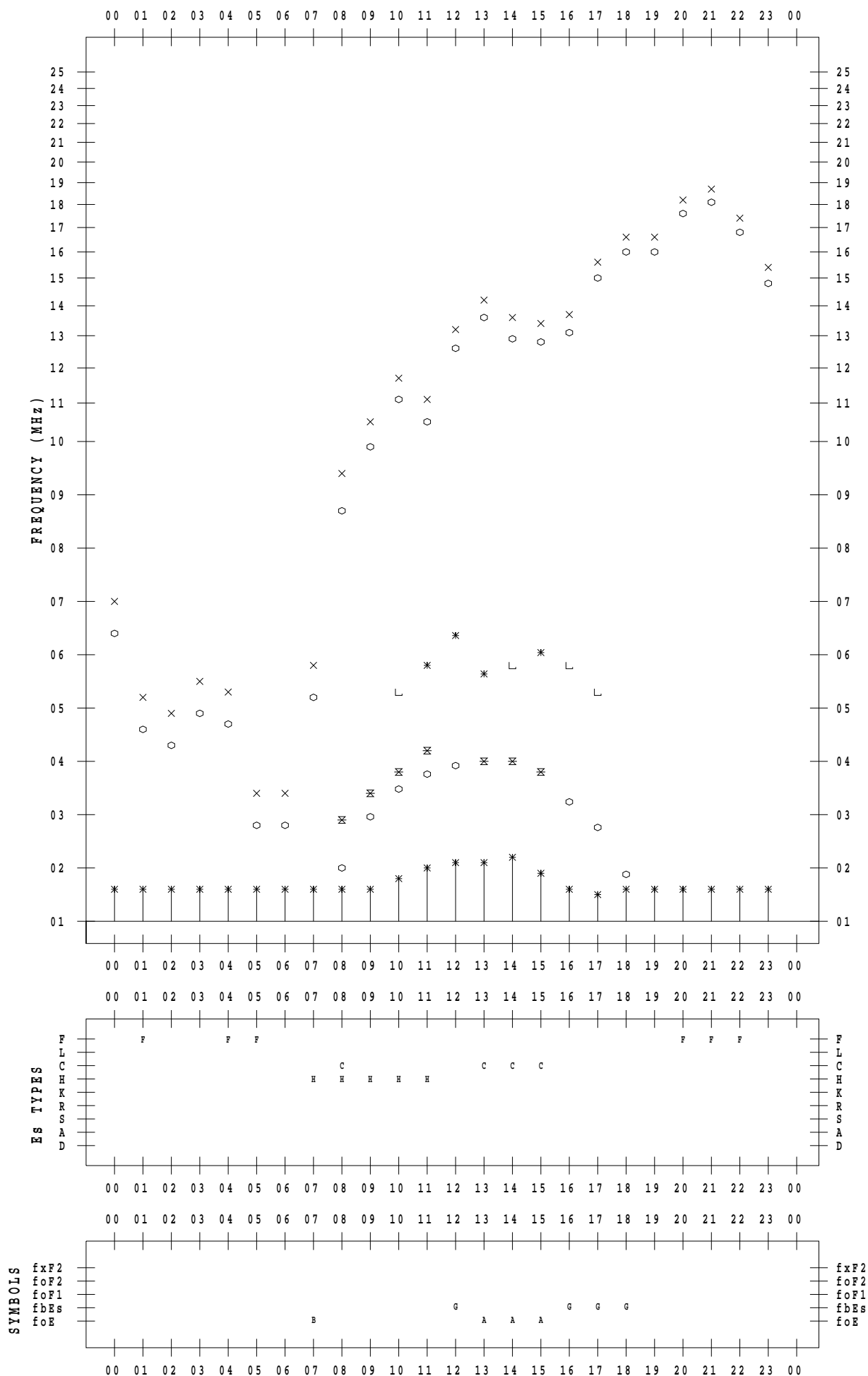
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 7

135 ° E MEAN TIME



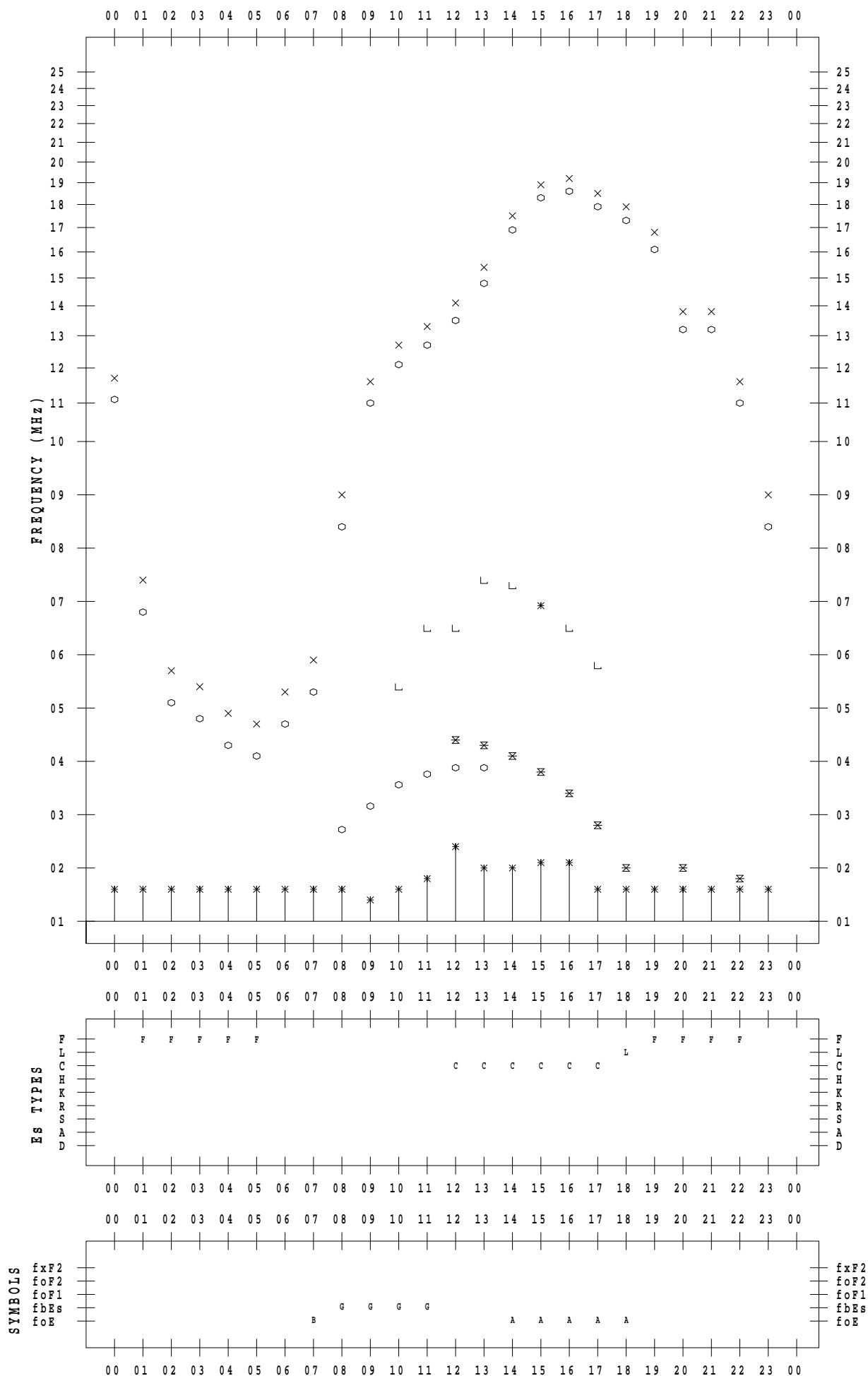
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 8

135 ° E MEAN TIME



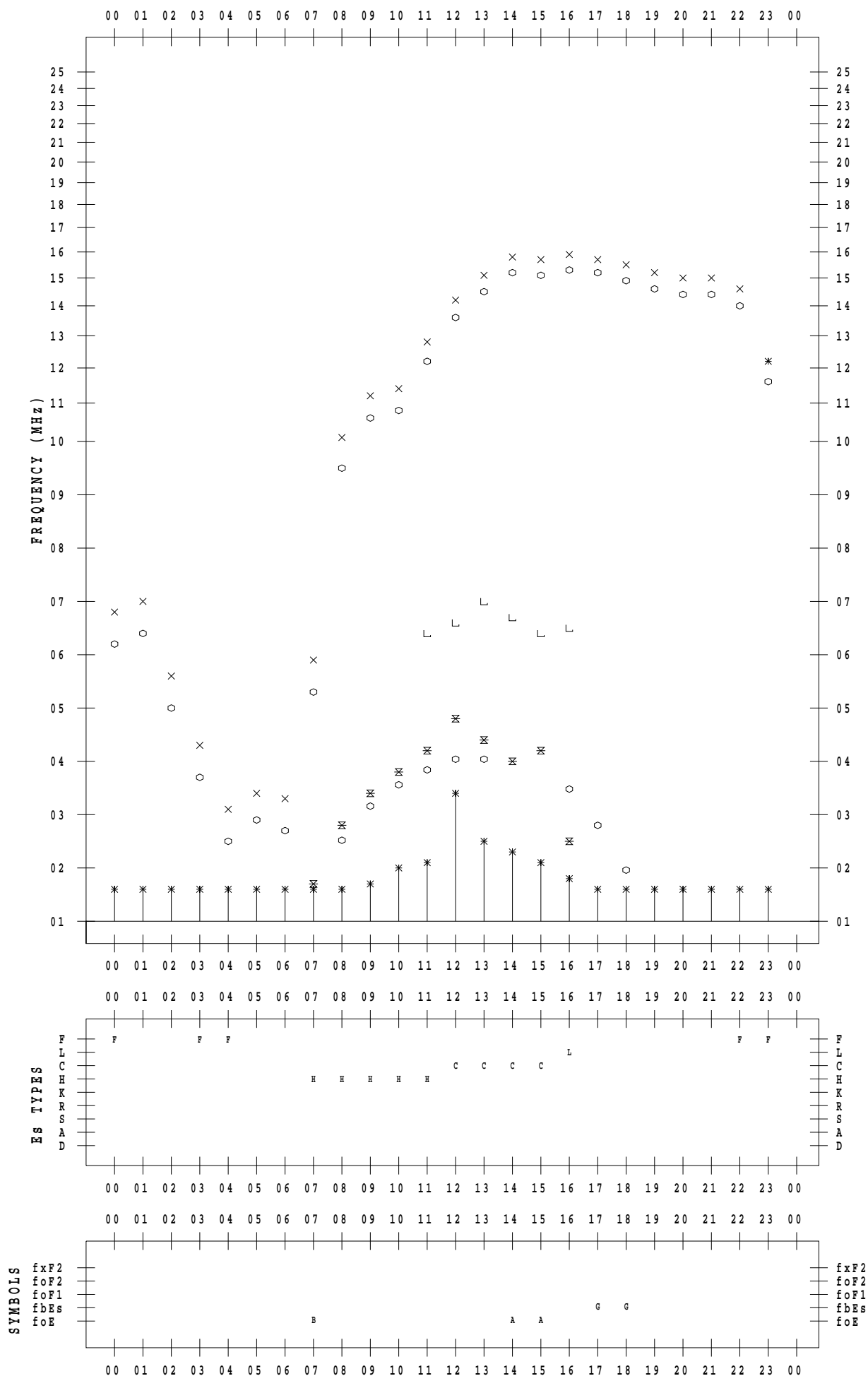
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 9

135 ° E MEAN TIME



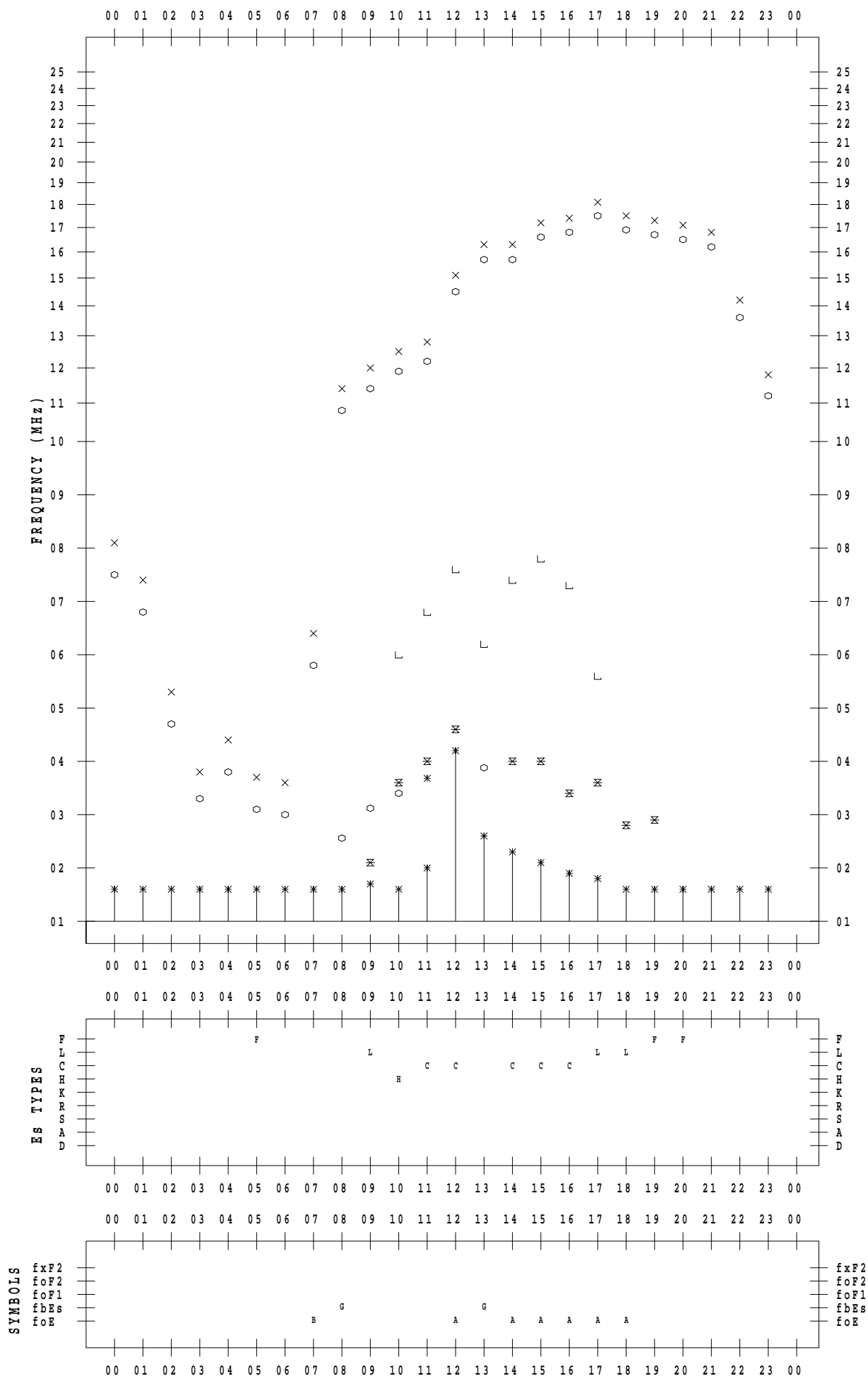
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 10

135 ° E MEAN TIME



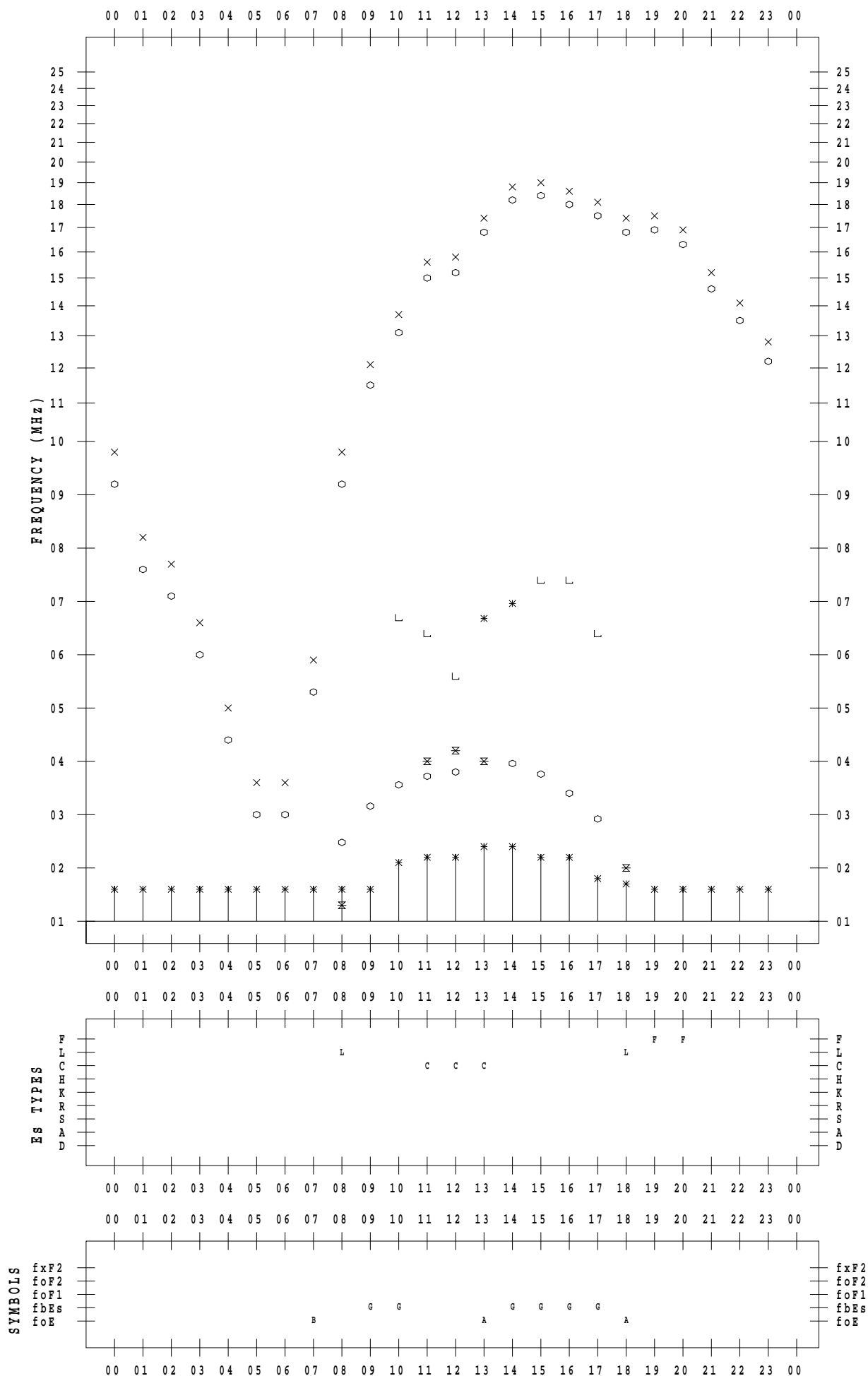
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 11

135 ° E MEAN TIME



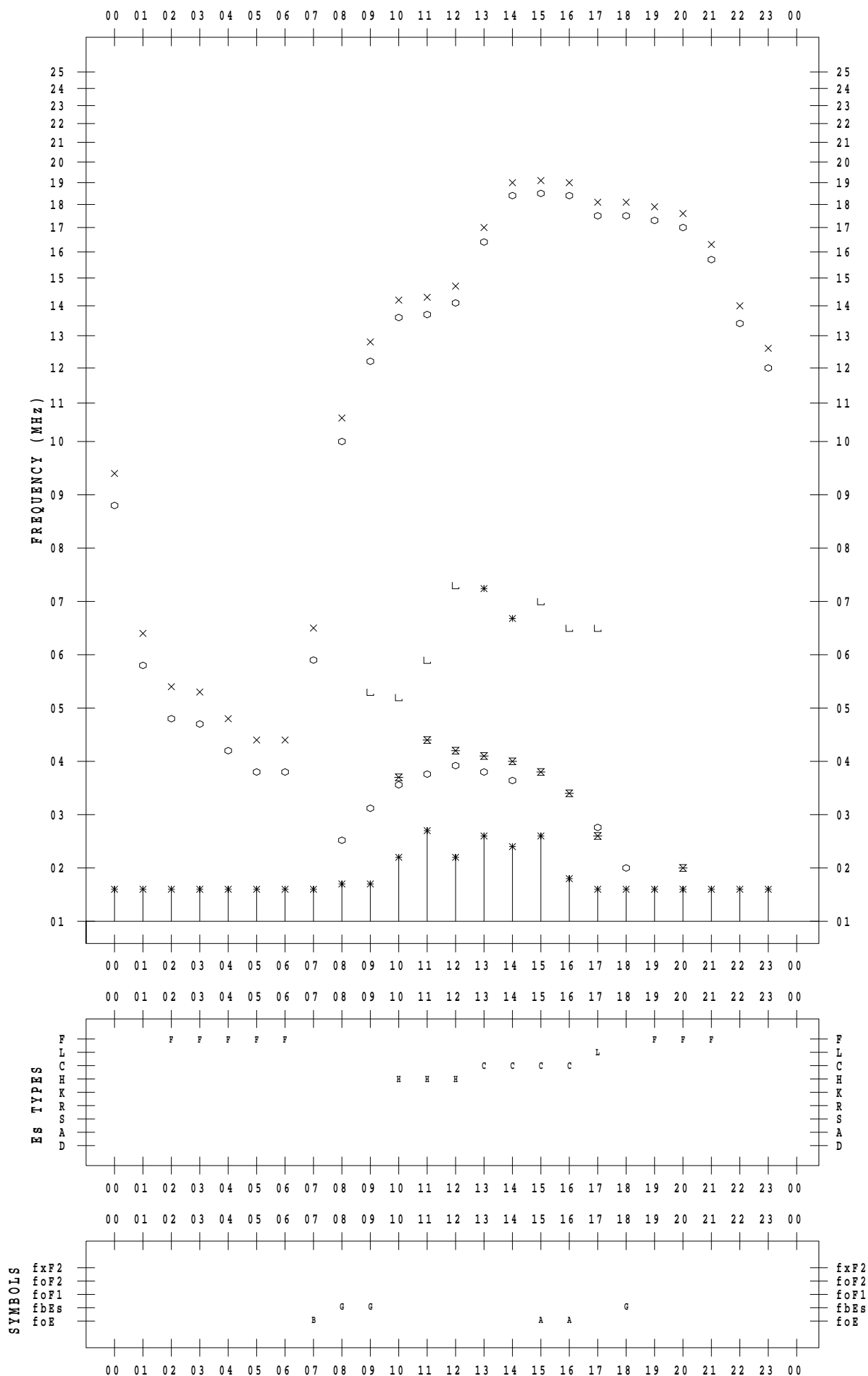
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 12

135 ° E MEAN TIME



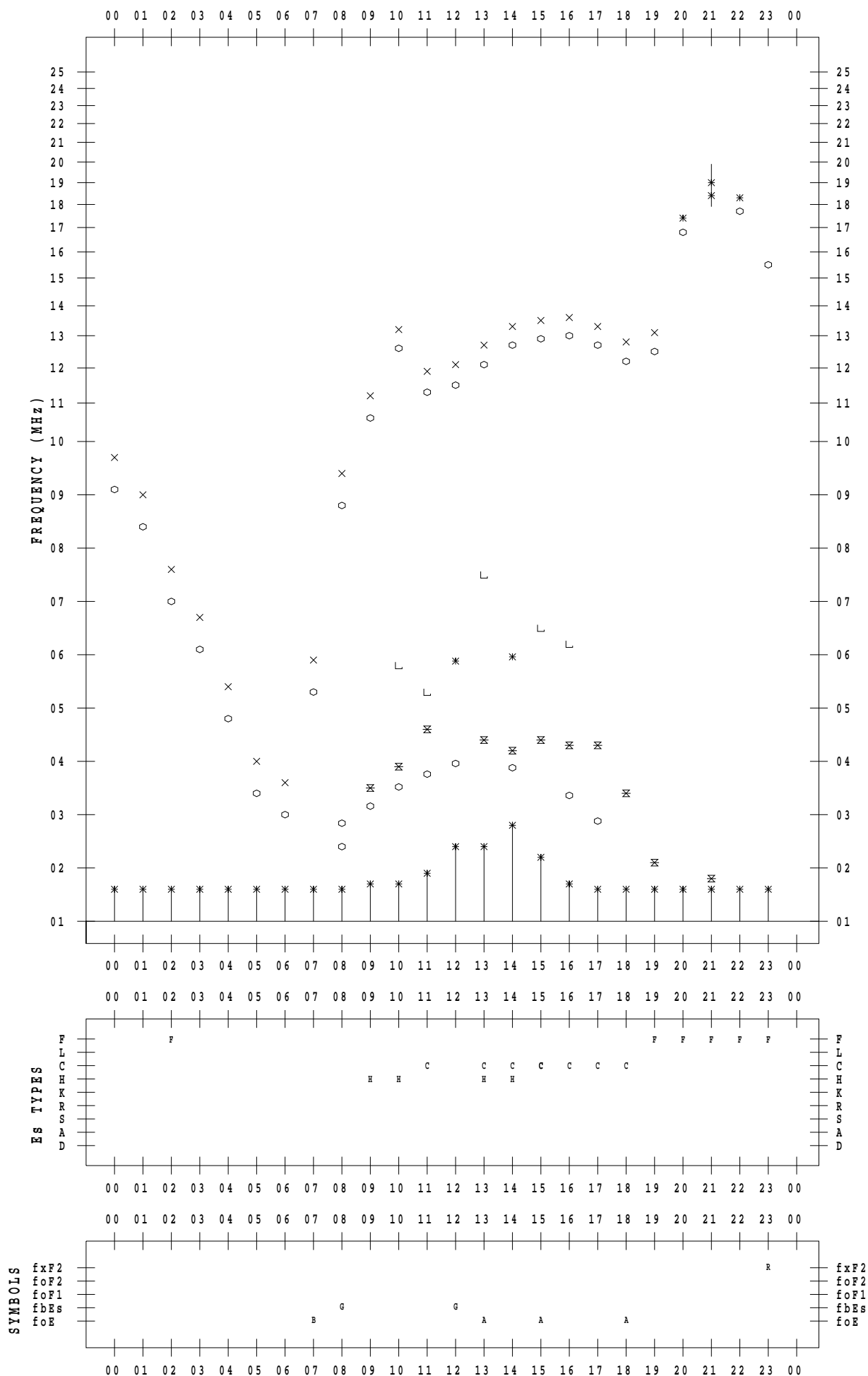
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 2/13

135 ° E MEAN TIME



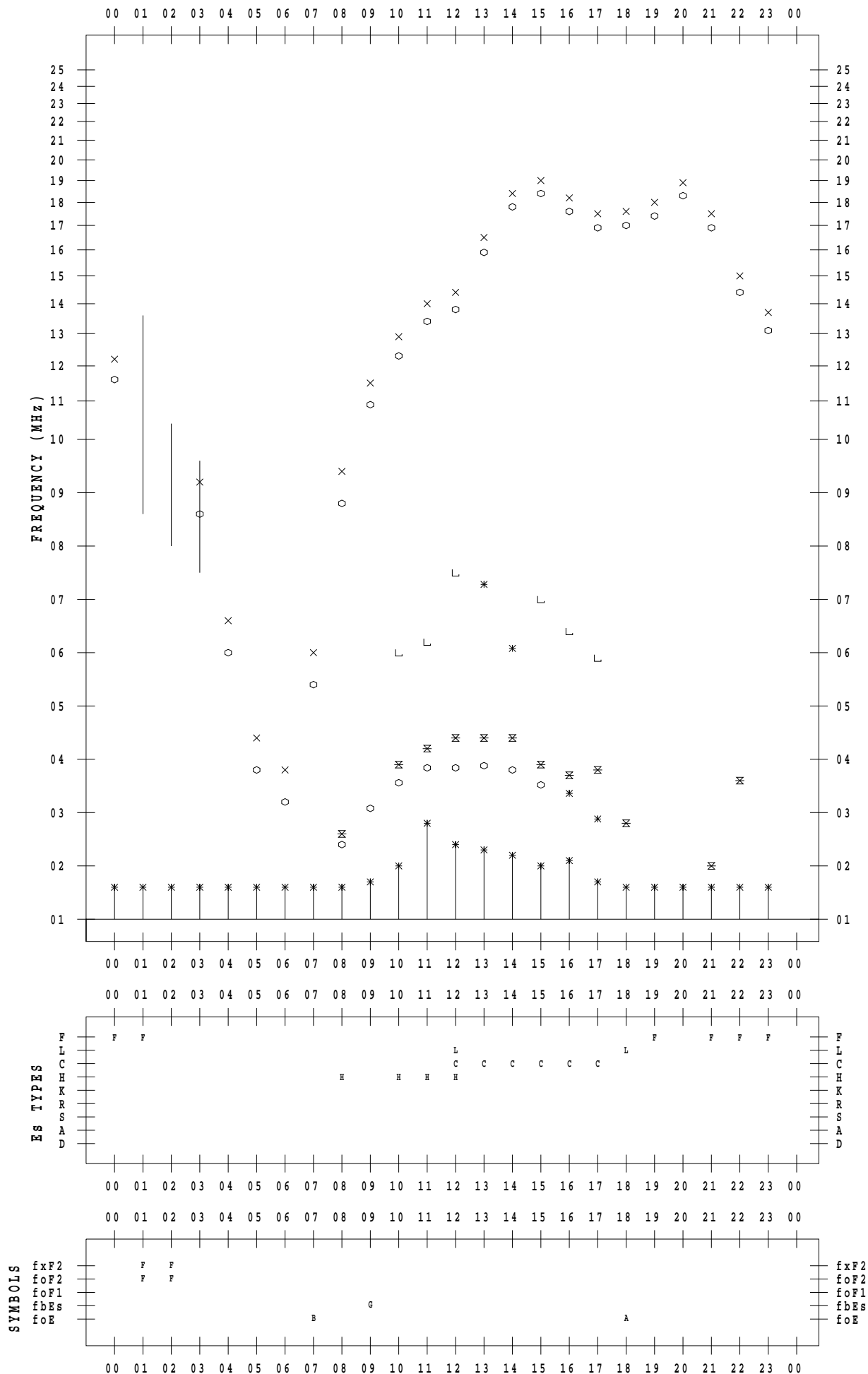
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 14

135 ° E MEAN TIME



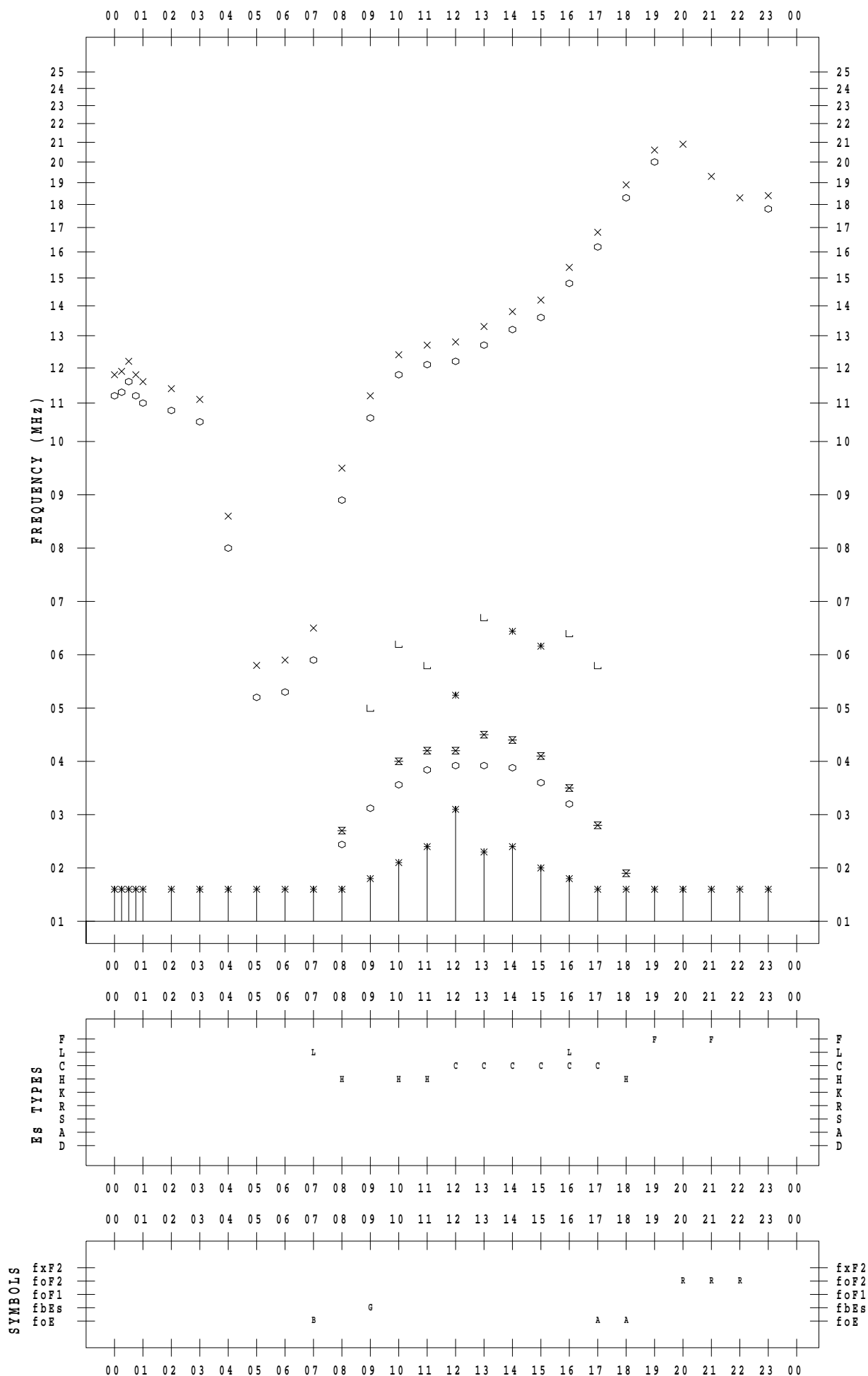
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 15

135 ° E MEAN TIME



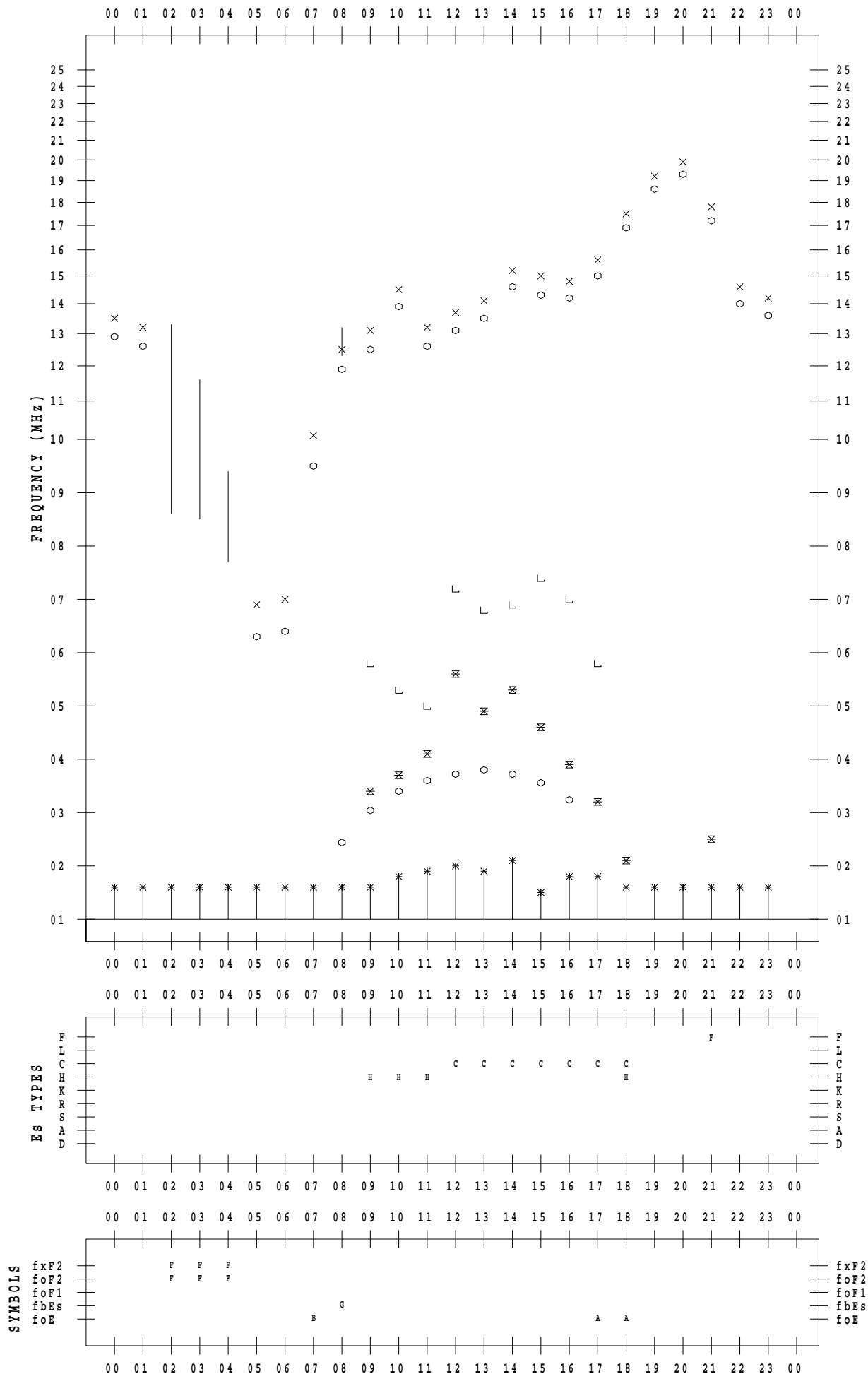
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 16

135 ° E MEAN TIME



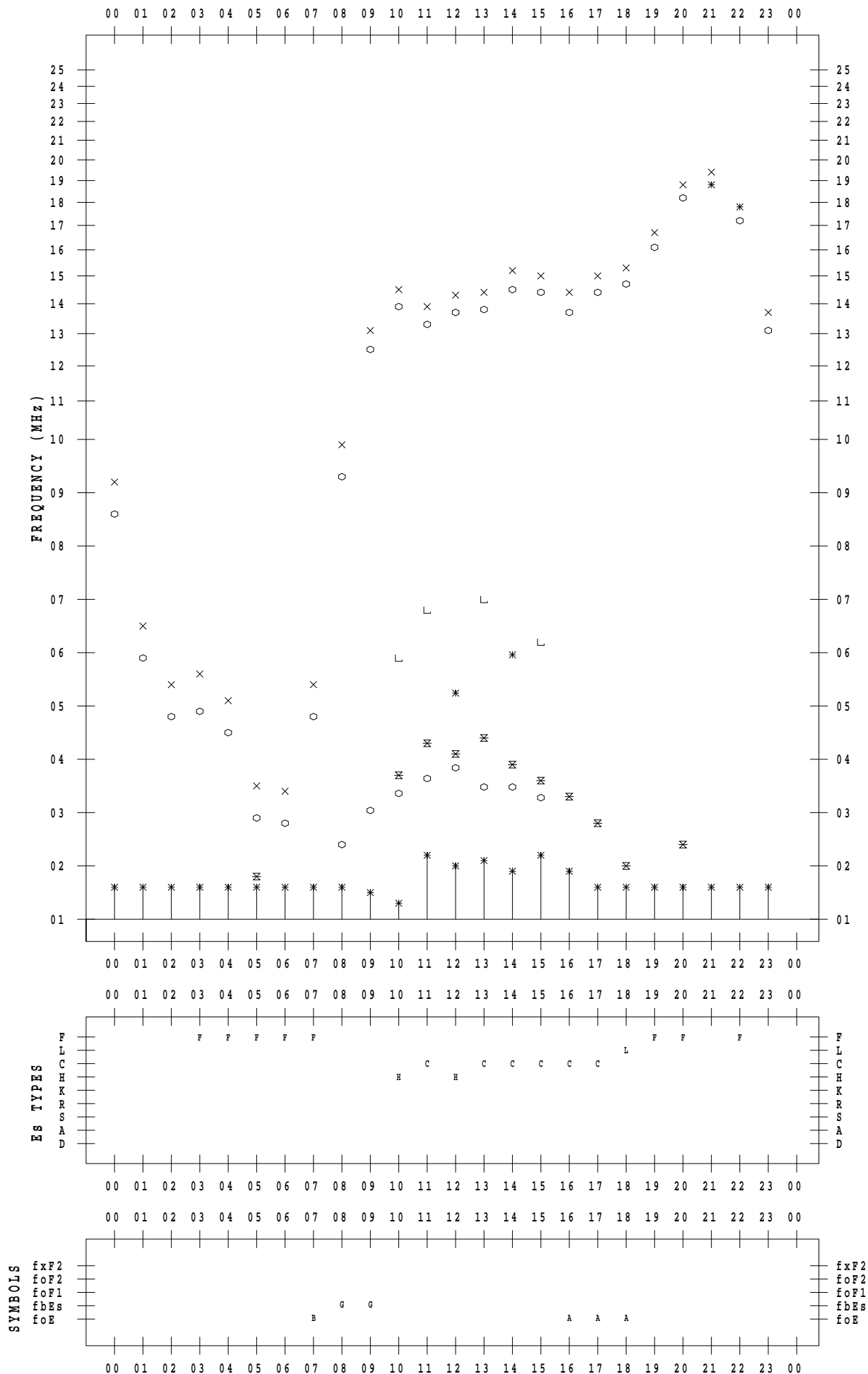
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 17

135 ° E MEAN TIME



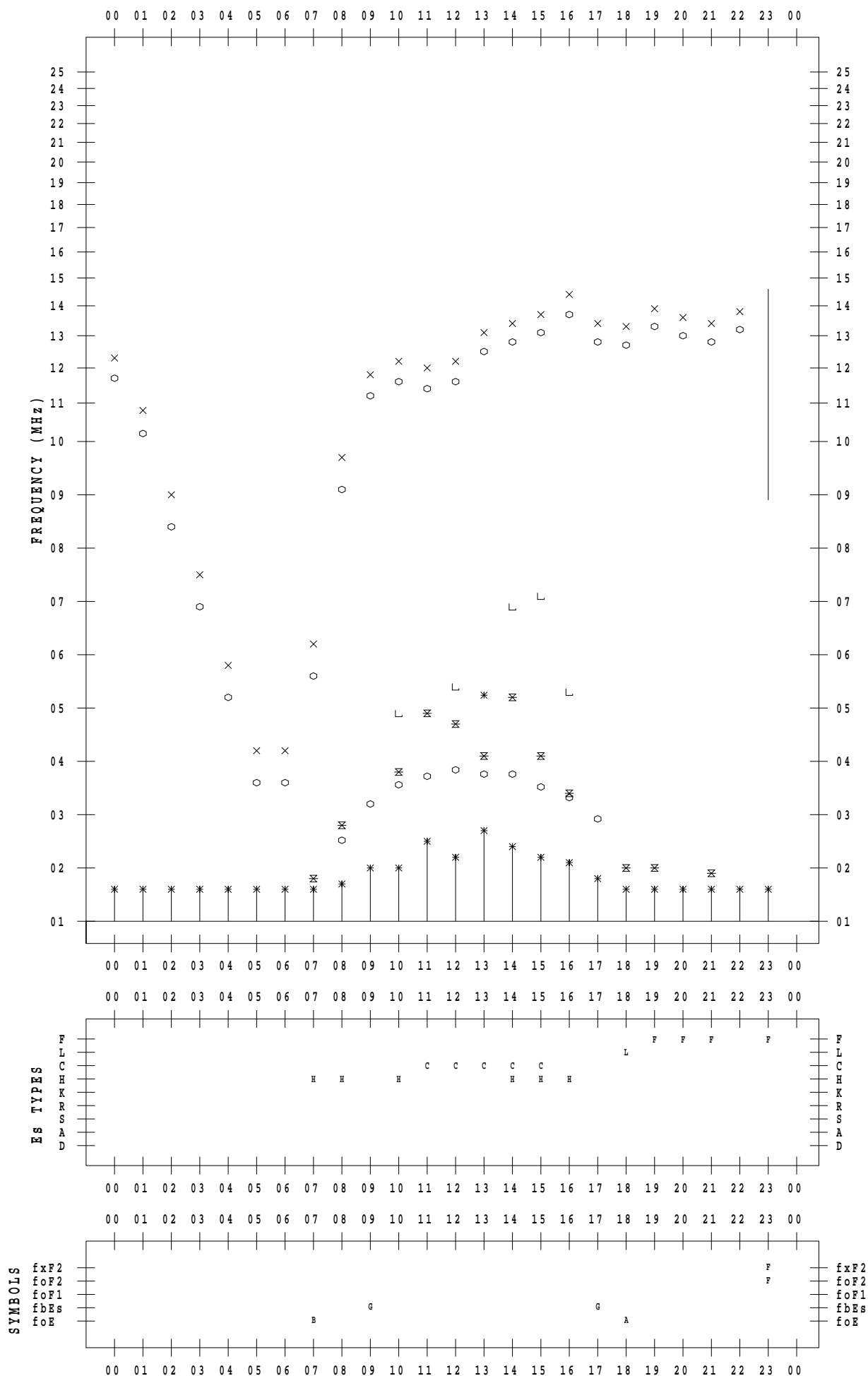
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 2/18

135 ° E MEAN TIME



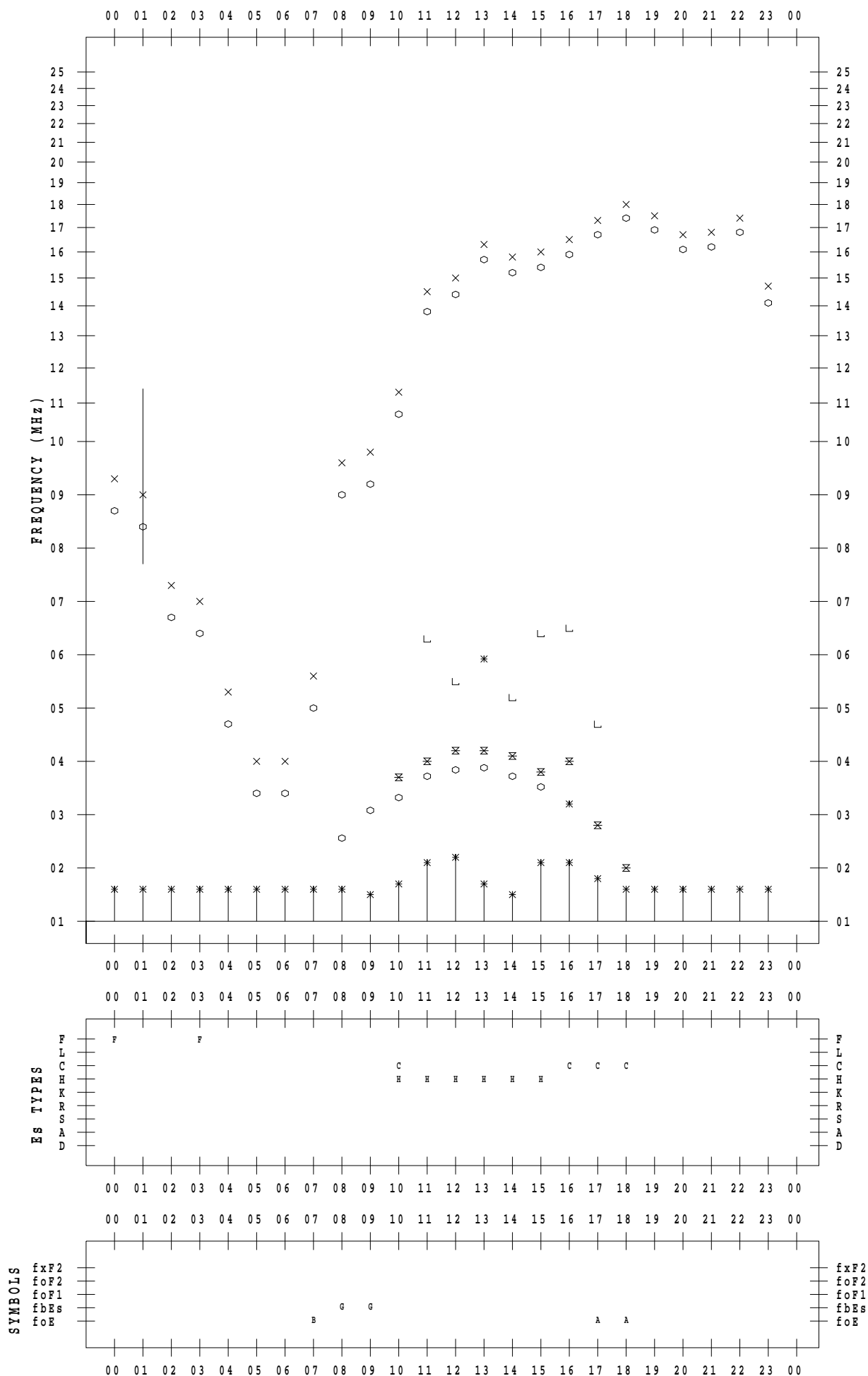
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 19

135 ° E MEAN TIME



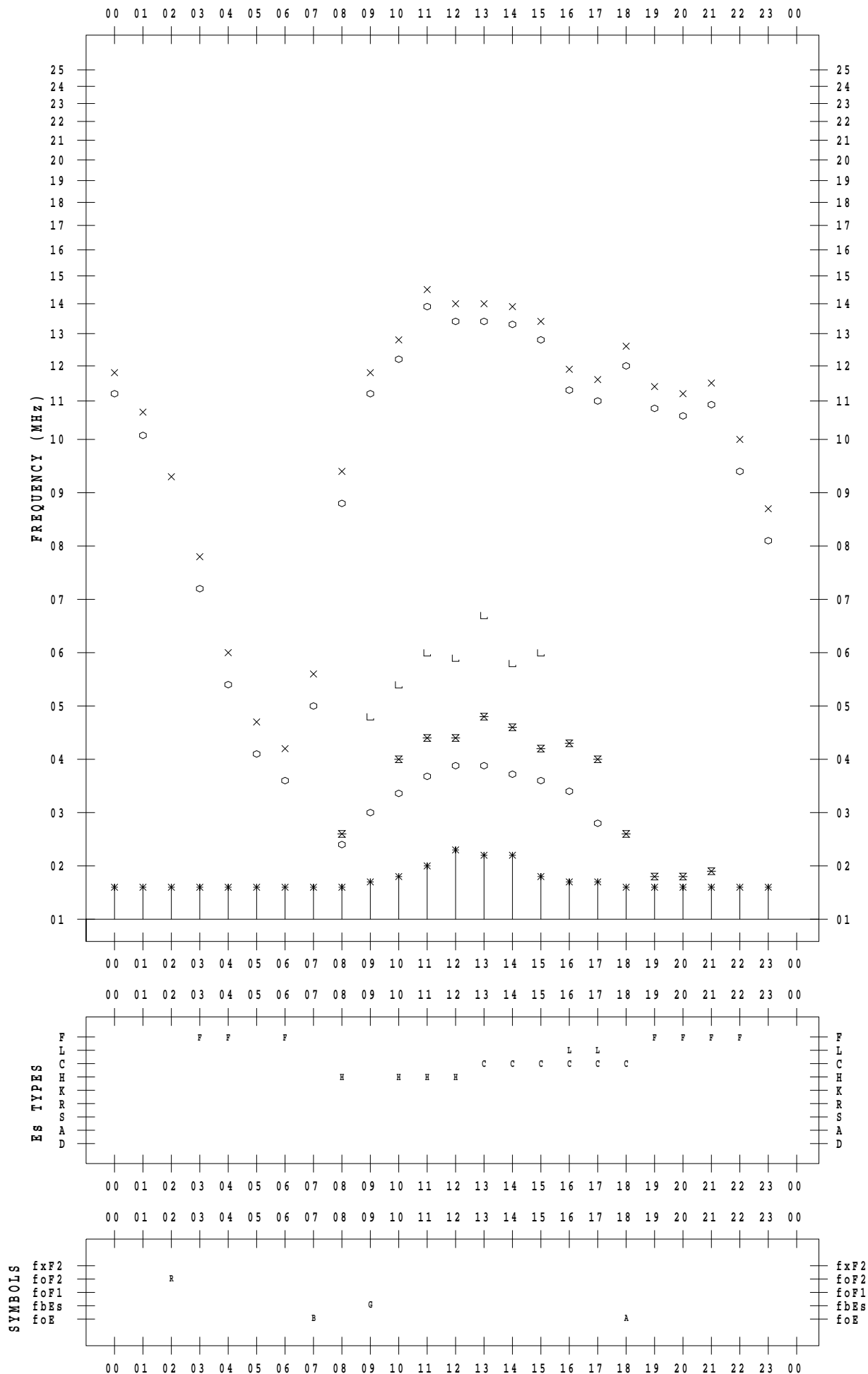
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 20

135 ° E MEAN TIME



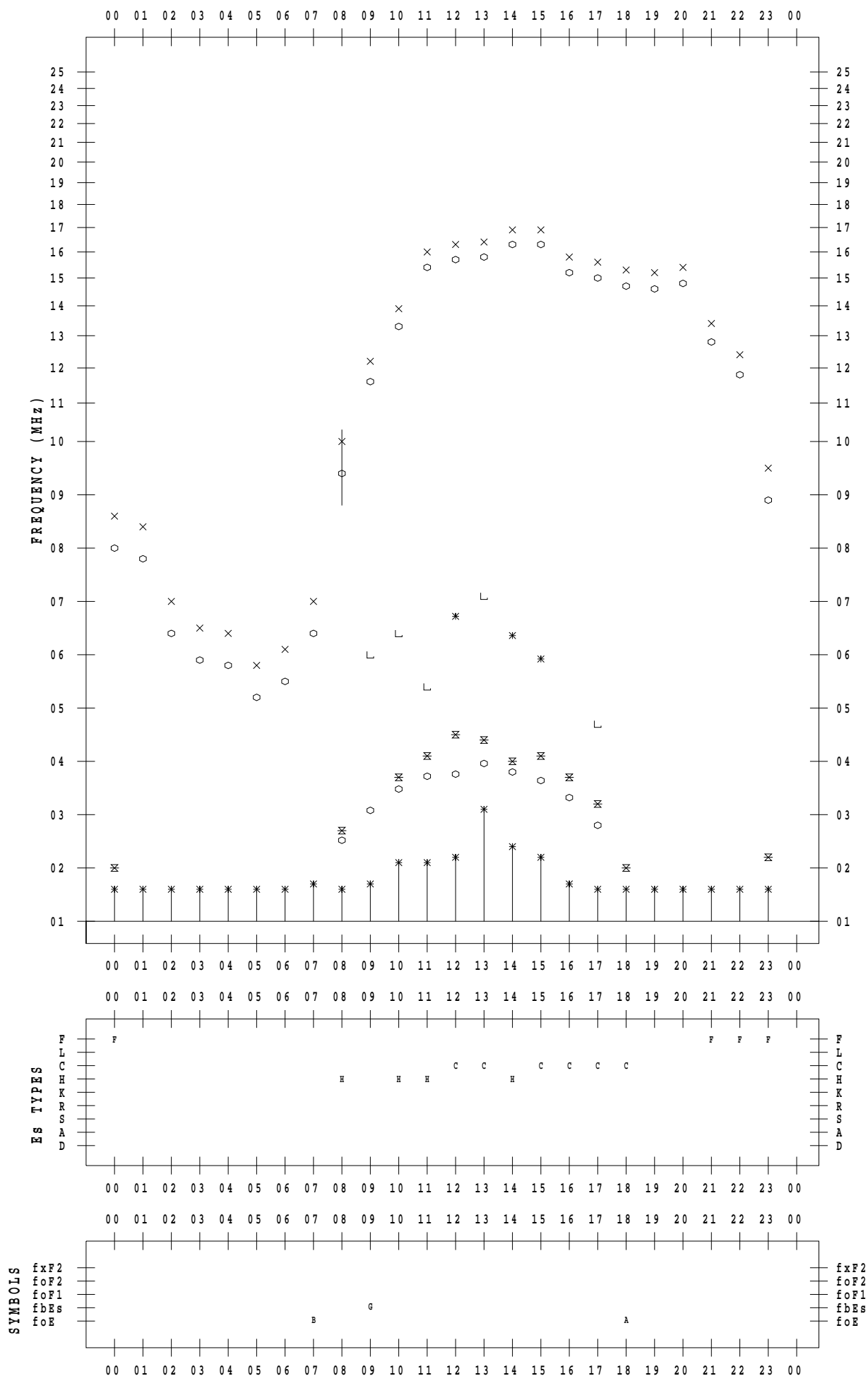
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 21

135 ° E MEAN TIME



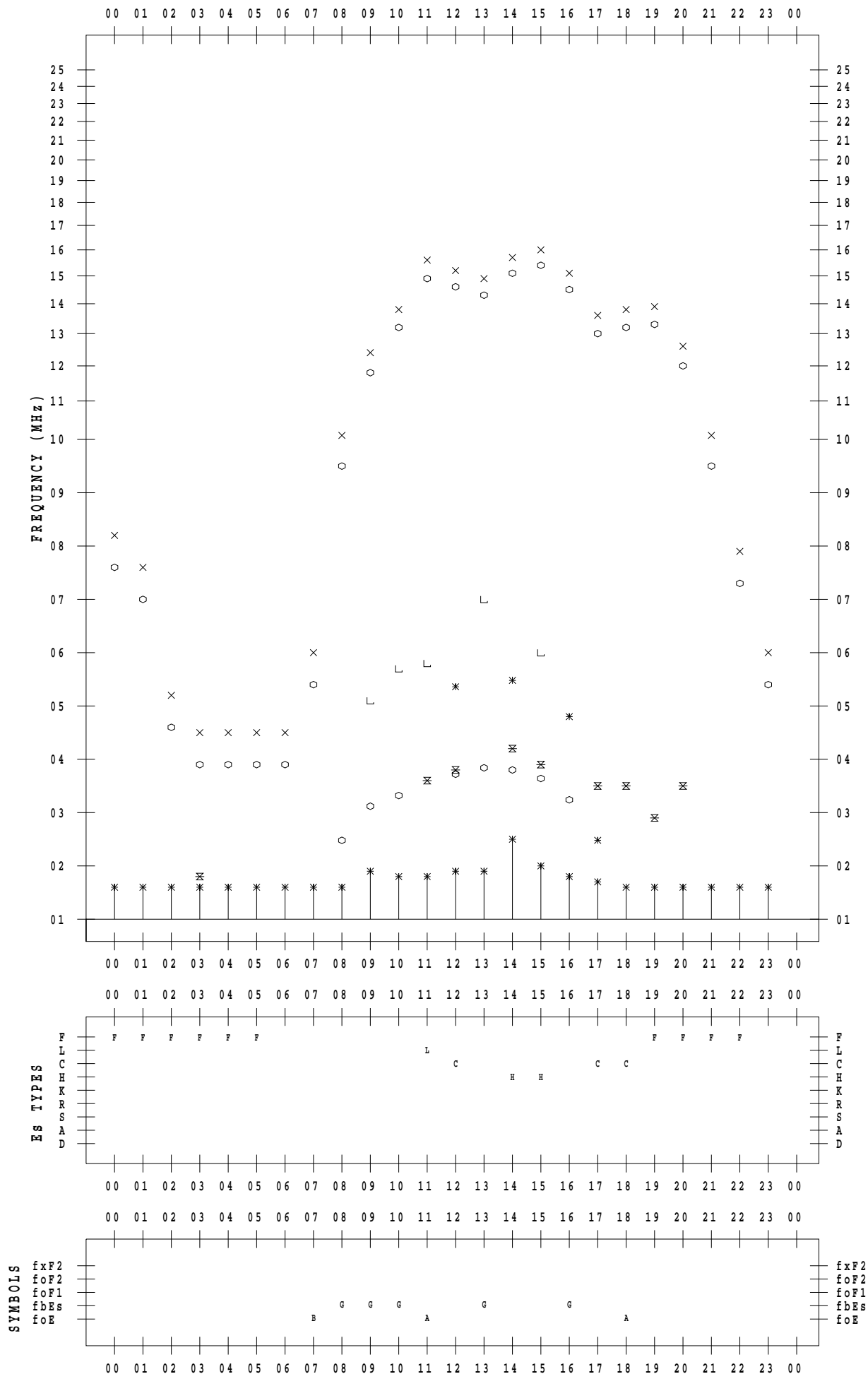
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 22

135 ° E MEAN TIME



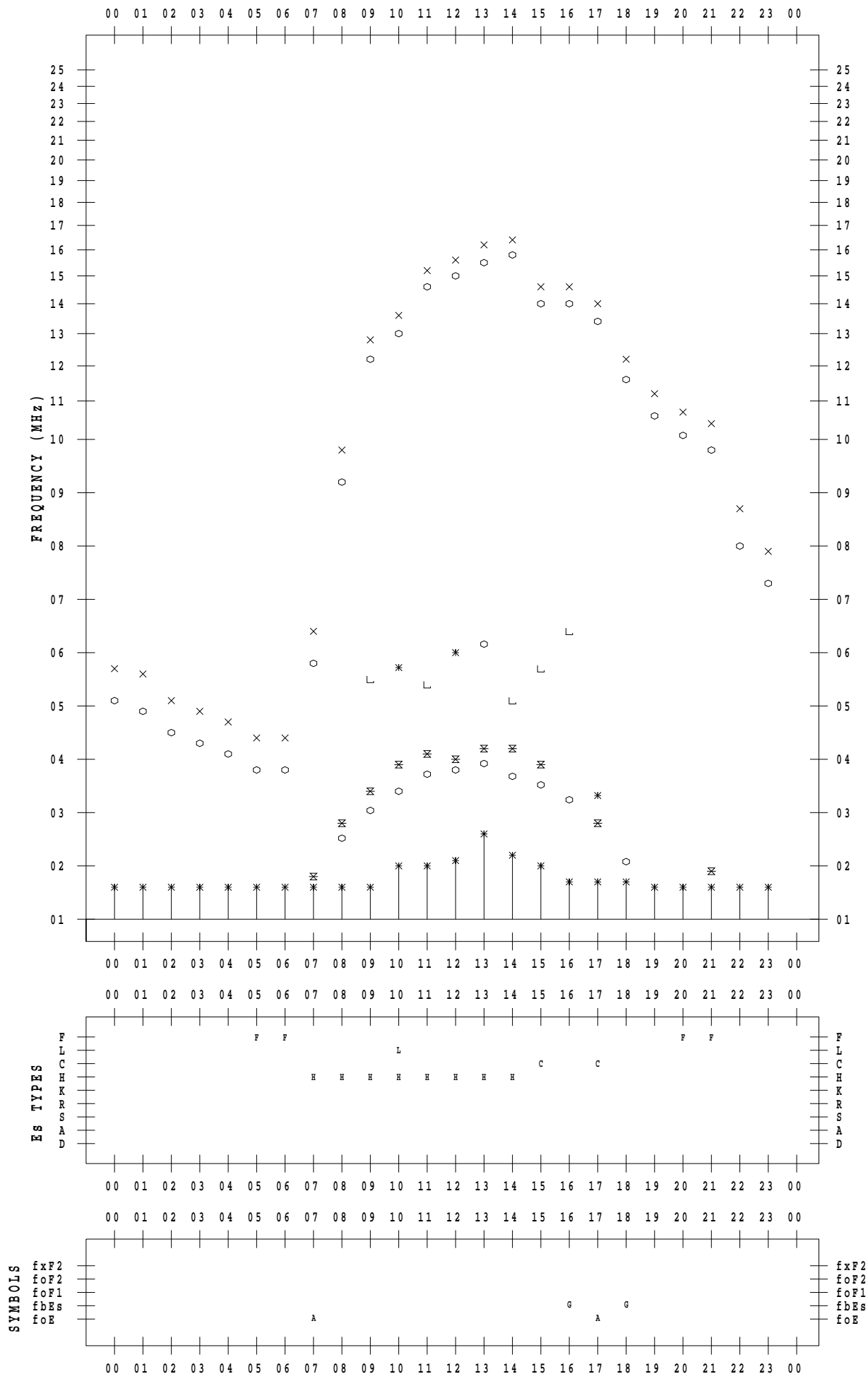
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 23

135 ° E MEAN TIME



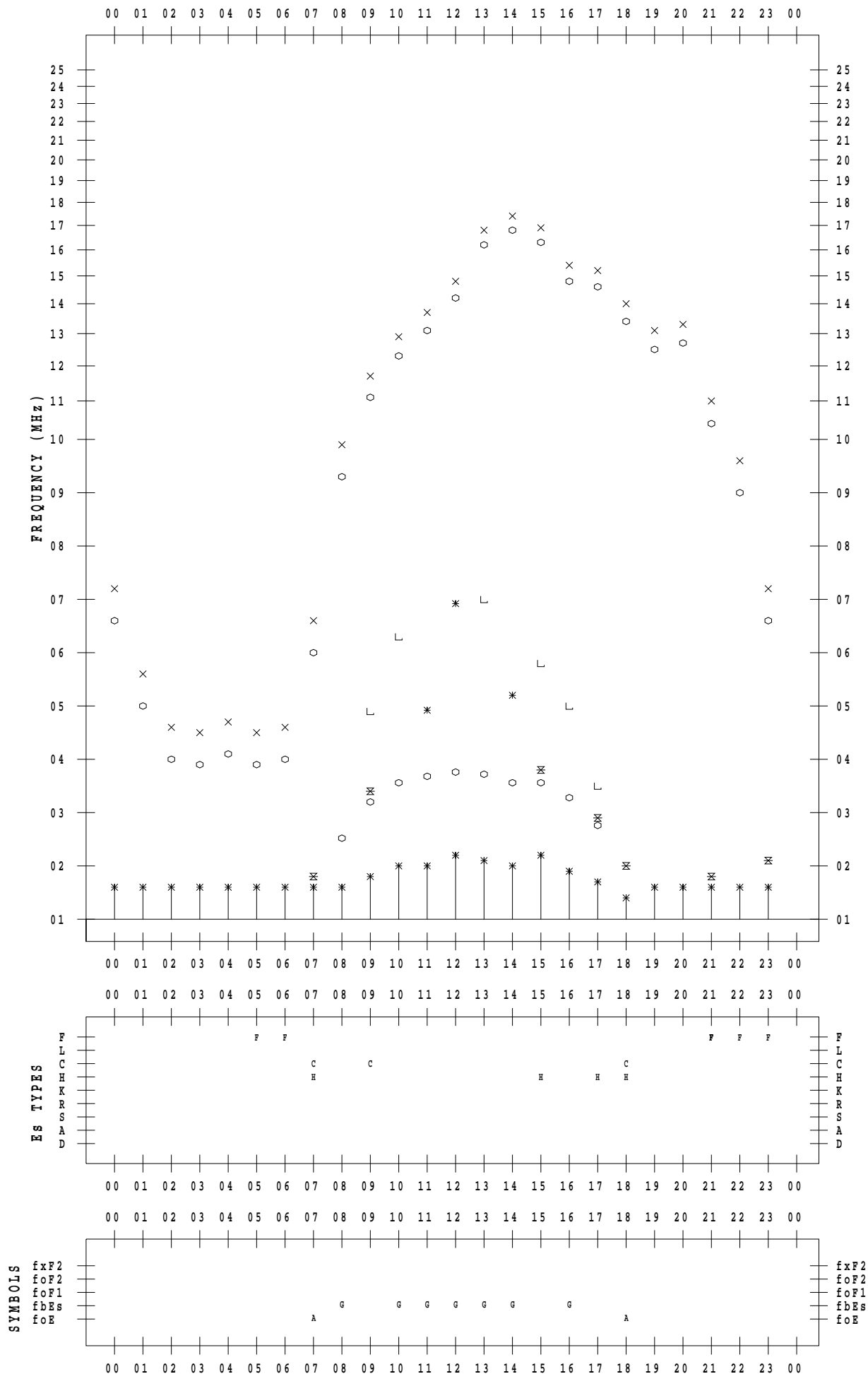
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 24

135 ° E MEAN TIME



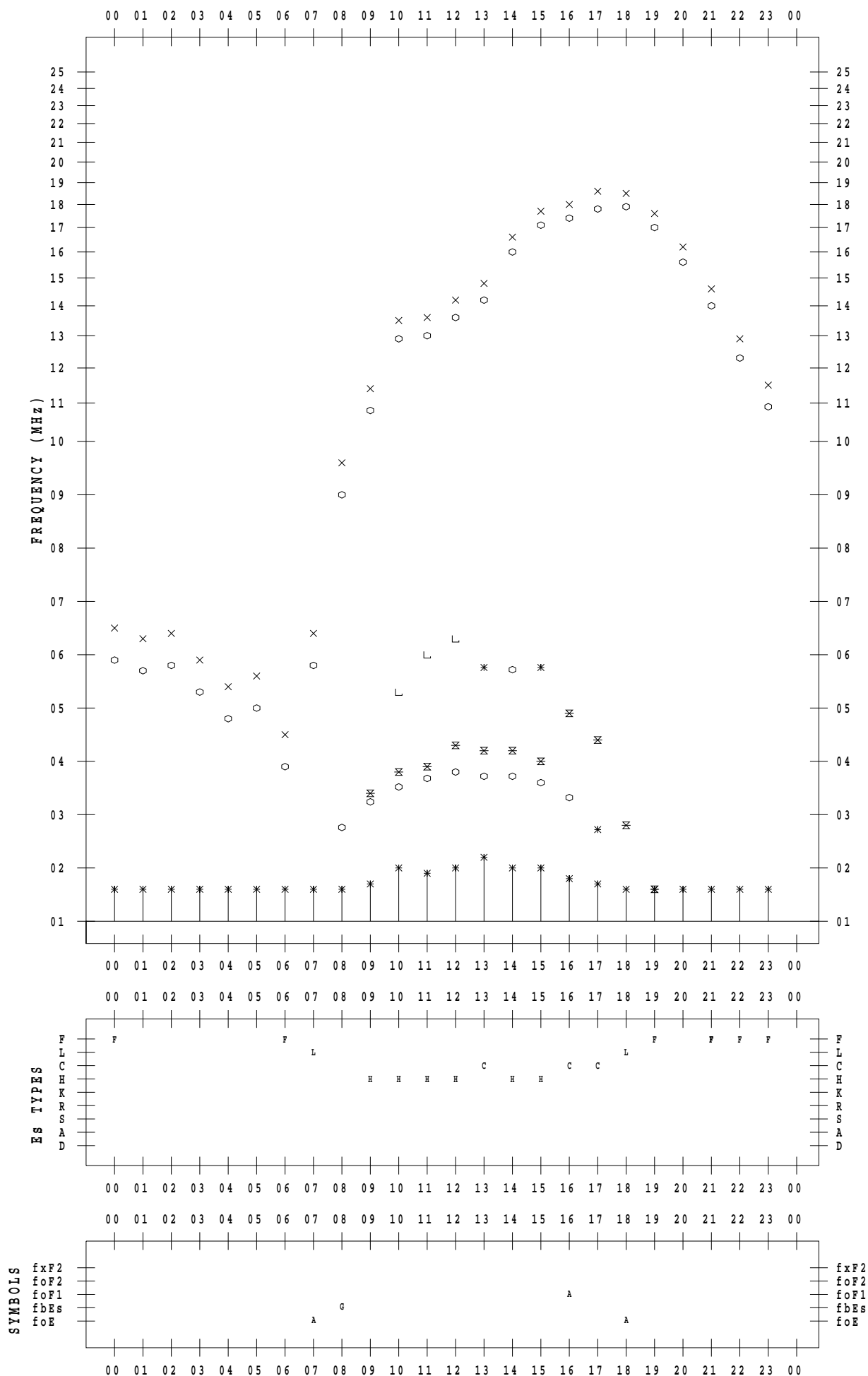
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 25

135 ° E MEAN TIME



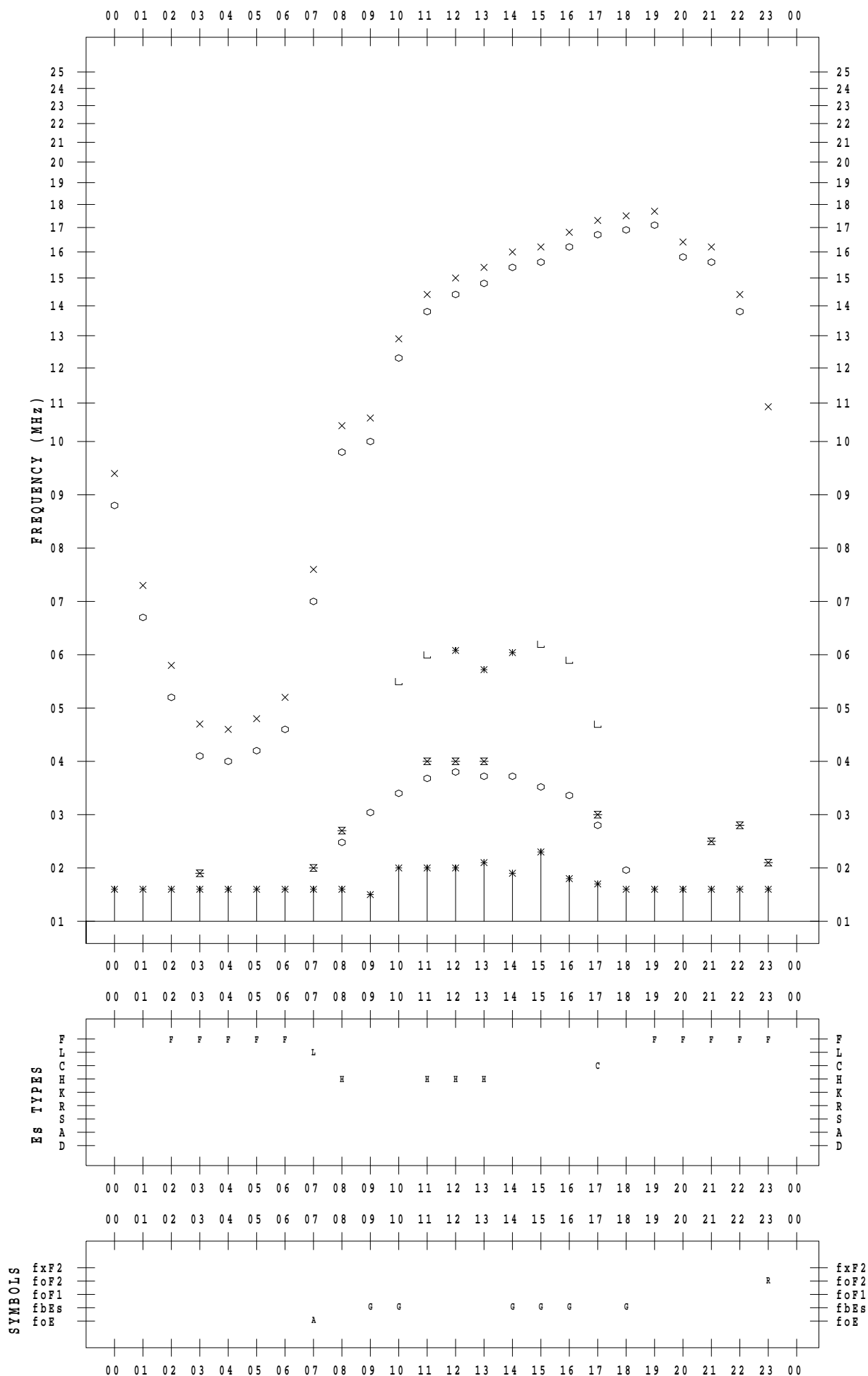
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 26

135 ° E MEAN TIME



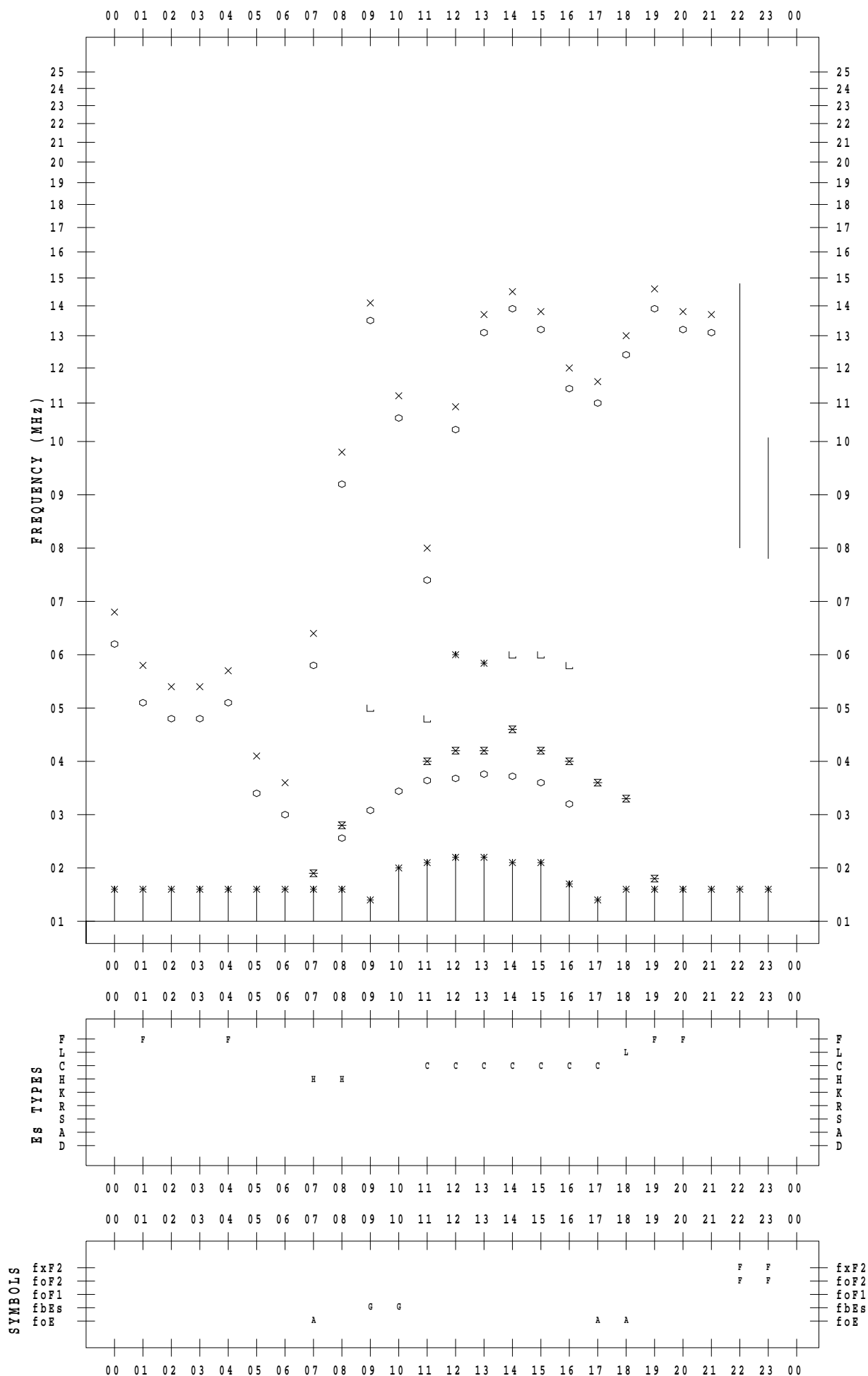
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 27

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 2 / 28

135 ° E MEAN TIME

