

IONOSPHERIC DATA IN JAPAN

FOR June 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 (I) and solar radio emission (S) obtained at the following stations under the

National Institute of Information and Communications Technology, Japan.

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

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

IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

A Impossible measurement because of the presence of a lower thin layer, for example Es (for f_oF2).

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

of values.

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

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

d. Reliability of Automatic Scaling

The results of the comparison between automatically-scaled values and manually-scaled ones showed that hourly values of f_oF2 , fEs and $fmin$ were scaled within a difference of 1 MHz from about 90, 90 and 99%, respectively of the test ionograms.

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

(ii) Qualifying Letters

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

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

extraordinary component.

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

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

HOURLY VALUES OF fof2 AT Wakkanai

JUN. 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	65	68	69	71	70	65	75	86	80	89	89	87	77	84	84	87	87	76	81	77	81	91	94	87	
2	80	75	74	72	73	69	77	87	77	73	78	91	86	84	78	80	75	77	79	90	92	94	87	80	
3	78	A	77	68	70	78	80	81	78	78	79	79	79	74	75	68	75	74	81	88	87	84	86	95	
4	82	85	79	73	68	79	93	91	85	89	78	76	79	76	74	70	74	75	48	92	96	85	86	86	
5	83	79	77	78	81	73	97	101	90	79	76	77	77	77	81	79	76	76	75	79	A	A	85	79	
6	81	78	75	71	75	83	83	89	77	73	65	67	67	67	67	58	55	65	66	A	A	83	75	77	
7	71	73	68	69	73	81	83	85	83	77	A	55	71	70	66	69	70	71	76	79	83	97	97	95	
8	81	76	71	73	70	77	75	69	70	71	72	73	75	70	68	71	74	72	72	81	A	86	88	83	
9	84	81	78	79	71	74	76	82	87	81	71	66	A	51	73	77	75	88	48	53	A	89	94	93	
10	79	73	67	67	67	83	84	92	78	68	67	64	A	A	A	69	69	48	70	A	A	81	79	93	
11	76	79	76	73	73	80	87	128	81	A	68	63	66	69	71	76	69	69	50	A	89	89	86	75	
12	74	77	71	63	63	62	65	63	A	59	A	A	A	65	62	62	65	61	62	A	70	79	77	75	
13	73	71	74	67	61	65	64	77	80	54	68	66	66	67	71	66	72	72	69	75	81	85	83	79	
14	76	71	70	63	67	75	73	66	N 54	A	49	A	52	54	52	A	A	61	57	61	71	79	79	77	
15	75	75	72	69	70	74	81	88	85	77	71	70	77	75	73	76	79	78	78	89	85	84	87	84	
16	95	74	64	68	63	62	66	63	53	A	A	61	57	50	53	67	62	63	65	65	72	79	80	72	
17	72	74	72	66	70	73	A	A	62	A	A	A	130	61	63	61	63	61	65	71	77	81	80	78	
18	76	75	71	67	68	N 72	82	85	87	64	70	75	77	76	80	79	79	83	77	69	A	80	87	91	86
19	39	81	77	73	75	70	82	74	A	66	A	53	64	A	49	51	63	60	64	72	A	77	85	77	
20	75	71	70	67	68	69	79	85	81	73	83	A	80	74	66	78	71	73	78	86	93	85	77	81	
21	78	79	78	68	70	72	70	68	A	64	69	72	57	69	69	65	73	76	77	76	79	A	81	84	
22	81	83	78	73	72	74	76	76	79	71	76	70	80	72	67	67	69	71	77	79	87	86	83	79	
23	73	70	68	65	67	71	67	64	53	A	A	54	72	74	63	70	62	71	70	69	80	83	80	81	
24	80	78	71	67	63	66	67	77	76	74	77	85	83	83	80	A	74	76	81	88	84	93	84	A	
25	77	75	75	65	67	62	71	68	91	91	81	83	91	80	A	A	75	66	A	77	87	87	81	83	
26	81	72	70	A	71	75	90	79	76	77	82	85	84	83	78	78	75	80	64	A	92	A	81	79	
27	88	78	74	65	62	59	62	68	53	80	81	A	A	A	66	A	A	A	A	A	83	82	76	A	
28	79	75	73	65	63	67	71	73	72	73	67	67	A	68	67	72	72	69	69	71	77	83	82	77	
29	75	67	74	72	70	75	93	73	76	68	50	A	64	54	67	70	67	69	75	76	78	73	72	75	
30	75	78	68	65	A	36	67	65	61	65	55	67	55	63	67	67	66	68	69	69	75	82	84	81	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	29	30	29	29	30	29	29	27	25	24	24	25	27	28	27	28	29	29	24	26	28	30	28	
MED	78	75	72	68	70	72	76	77	78	73	72	70	77	70	68	70	72	71	70	76	82	84	83	80	
U Q	81	78	76	72	71	75	83	86	83	78	78	78	80	76	74	77	75	76	77	82	87	86	86	85	
L Q	75	72	70	65	67	66	68	68	70	67	67	65	65	65	66	67	66	65	64	70	78	81	80	77	

HOURLY VALUES OF fEs AT Wakkanai

JUN. 2023

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	32	G	27	G	G	40	49	54	G	52	53	43	52	110	54	55	40	28	60	32	44	41	24	G	
2	G	G	G	G	29	34	50	52	74	61	44	50	55	81	47	48	153	48	46	59	53	G	32	24	
3	28	106	G	G	46	50	56	175	70		44	47	98	104	46	65	40	52		56	40	91	103	55	
4	25	25	G	31	69	110	73	59	64	57	52	48	49	56	52	84	71		108	64	72	36	49	39	
5	24	G	28	G	G	32	47	58	96	65	58	129	41	43	40	37	38	116	60	G	30	34	G	40	
6	26	G	32	26	G	34	43	69	65	62	52	66	60	54	53	63	58	46	42	69	56	30	30	32	
7	30	59	41	32	28	38	39	37	52		69	55	45	46	41	36	41	35	40	40	29	27	G	26	
8	26	26	G	G	G	40	59	73	78	61	52	50	49	60	39	53	46	44	56	41	35		27	38	
9	G	35	G	G	G	38	50	58	52	57	52	56	86		148	64		86		130	150	52	72	87	
10	G	34	29	31	31	38	48	53	66	68	108	66	71	101	103	78	62	124	150	148	146	58	40	38	
11	35	G	33	40	32	52	106			121	89	117	64	76		36	51	72	96	75	55	37	28	G	
12	28	G	G	60	G	33	48	54	60	147	74	76	69	82	48	45	51	111	74	96	54	59	G	G	
13	G	G	G	G	G	139	45	38	57	96	63	56	56	65	57	63	49	55	65	45	26	G	29	38	
14	58	40	28	27	G	36	42	78	73	53	61	48	45	38		81	58	37	50	48	29	G	G	G	
15	G	G	G	26	28	24	33	55	74	64	56	56	50	48	48	59	59	45	59	36	41	38	26	G	
16	27	G	G	G	27	36	48	54	54	83	103	60	54	40	61	57	64	38	46	49	40	49	35	26	
17	25	32	25	40	53	58	71	71	95	150	59	74	114	127	64	60	62	40	40	52	58	29	28	32	
18	27	35	34	39	39	35	46	49	59	78	58	64	58	53	52	44	42	51	35	G	39	53	59	G	
19	32	30	G	G	G	35	46	57	70	62	89		65	92	78	104	91	116	116	73	92	61	40	50	
20	27	60	38	G	G	38	50	52	51	41	76	106	51	62	40	43	54	43	49	69	38	G	36	45	
21	G	G	26	133	116	54	46	59	96	86	54	48	40	51	44	62	45	45	65	55	28	70	43	33	
22	26	G	G	G	37	37	48	49	54	72	133	52	47	36	83	38	48	32	60	33	50	38	G	25	
23	G	28	G	G	G	29	50	56	56	76	103	56	47	46	39	108	40	37	38	31	27	26	G	35	
24	41	G	G	G	G	35	46	57	71	57	62	38	41	57	46	34	40	62	55	56	32	31	G	93	
25	50	35	G	G	G	38	52	59	73	60	56	48	63	52	112	115	96	46	92	136	82	39	32	G	
26	G	G	89	69	84	58	59	52	67	119	59	65	52	51	71	89	71	108	133	150	116	127	60	70	
27	48	33	40	28	G	32	48	55	56	53	101	85	81	112		100	73	136		149	36	G	G	60	
28	34	32	28	33	31	36	54	43	53	54	53	65	90	58	53	48	132	38	63	47	41	38	34	G	
29	G	25	49	32	32	36	43	64	61	65	98	74	N	56	40	46	54	40	59	53	G	25	G	G	
30	G	G	32	58	60	71	90	58	151	94	56	33	43	44	37	50	62	41	43	44	34	28	26	G	
31																									
CNT	30	30	30	30	30	30	30	29	29	28	30	29	29	29	27	30	29	29	27	30	30	29	30	30	
MED	26	25	26	26	28	38	48	56	65	64	59	56	54	56	52	58	54	46	59	54	40	37	28	32	
U Q	32	34	32	33	37	50	54	59	73	84	89	70	67	81	64	78	67	79	74	73	56	52	40	40	
L Q	G	G	G	G	G	35	46	52	55	57	53	48	47	47	41	45	43	39	46	41	32	26	G	G	

HOURLY VALUES OF fmin AT Wakkanai

JUN. 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	17	16	15	16	15	14	15	15	46	21	20	15	20	21	15	13	15	15	15	16	14	15	16	18
2	14	16	15	17	16	14	14	15	17	16	16	17	15	16	16	16	17	14	13	15	14	16	15	16
3	15	7	16	15	15	15	14	17	17	14	20	18	15	21	17	15	15	15	14	15	14	15	14	16
4	16	15	16	15	15	15	12	14	15	16	15	17	17	20	17	13	16	14	17	15	14	16	15	14
5	17	17	15	17	16	16	14	14	18	15	19	5	21	19	19	15	15	15	13	14	15	16	14	14
6	16	16	16	16	16	16	13	12	14	14	15	18	18	20	18	17	16	15	14	14	15	17	16	15
7	16	16	15	15	15	16	15	14	14	5	15	15	17	16	15	15	17	13	13	13	15	15	16	16
8	15	16	16	18	15	15	15	11	12	13	13	15	19	15	20	15	13	15	13	13	14	14	15	15
9	15	15	15	15	16	17	14	14	13	14	18	15	17	20	20	14	8	13	9	9	12	13	15	15
10	15	15	16	15	15	16	14	14	13	13	15	15	15	16	11	12	14	5	74	17	17	15	15	15
11	16	15	15	15	16	15	11	16	33	15	18	16	20	18	17	15	13	13	15	13	15	15	15	17
12	16	16	16	16	15	16	14	13	15	15	15	15	16	16	17	14	15	13	13	14	14	14	15	14
13	14	15	15	15	16	21	14	15	14	18	15	18	15	17	17	13	15	14	13	15	15	14	16	15
14	16	15	15	16	16	15	15	12	15	16	17	19	18	22	17	16	16	14	13	15	15	14	14	16
15	14	16	16	15	16	16	17	14	13	18	14	15	17	16	15	19	15	15	14	15	15	15	15	15
16	15	15	14	14	16	16	15	15	16	15	13	15	21	19	16	15	14	15	15	14	13	15	15	15
17	16	16	15	14	15	13	13	15	15	20	16	15	15	20	17	18	17	15	13	15	14	15	15	15
18	15	16	14	15	15	15	15	14	14	13	15	18	15	15	14	16	16	15	15	15	15	13	14	14
19	16	15	17	16	14	15	14	13	19	19	13	21	16	19	16	12	16	13	11	15	13	16	15	15
20	16	15	14	16	15	15	13	13	15	17	16	14	21	17	18	18	16	15	16	15	15	15	15	15
21	16	17	16	17	29	15	15	14	14	16	18	19	17	19	20	19	17	15	14	15	16	15	15	15
22	15	16	15	14	15	16	15	13	15	15	19	16	17	18	19	17	17	15	16	16	14	15	15	15
23	16	15	14	15	17	17	16	14	14	21	17	19	17	18	16	5	14	16	17	15	14	15	17	14
24	15	16	15	14	17	15	14	13	13	14	12	17	19	20	19	18	15	15	14	15	15	16	14	15
25	15	15	15	17	15	16	13	13	14	19	15	21	18	18	18	10	13	14	11	15	14	14	16	14
26	15	16	17	15	15	15	16	16	14	18	17	16	19	21	19	18	13	11	39	5	12	10	14	15
27	14	15	15	15	15	14	14	15	15	17	19	18	17	13	19	14	14	5	5	5	13	15	16	15
28	16	16	15	16	15	14	13	15	15	17	15	15	13	15	15	17	15	15	13	15	14	14	15	15
29	14	16	15	16	15	16	15	14	14	17	16	15	17	16	15	16	15	14	15	15	14	15	14	15
30	14	16	16	15	13	14	13	14	14	15	18	17	15	17	15	17	15	14	15	15	16	15	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	16	15	15	15	15	14	14	14	16	16	16	17	18	17	15	15	14	14	15	14	15	15	15
U Q	16	16	16	16	16	16	15	15	15	18	18	18	19	20	19	17	16	15	15	15	15	15	15	15
L Q	15	15	15	15	15	15	13	13	14	14	15	15	15	16	15	14	14	13	13	14	14	14	15	15

HOURLY VALUES OF fof2 AT Kokubunji

JUN. 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	73	73	73	78	69	71	77	84	87	86	91	97	91	96	105	105	104	92	77	70	80	83	85	84	
2	81	78	77	72	74	78	84	92	91	84	85	91	96	97	95	92	93	92	97	98	90	87	205	87	
3	86	84	73	78	82	92	94	86	88	90	179	A	A	99	96	96	100	105	105	96	A	93	92	95	
4	86	82	89	89	83	75	95	98	91		187	88	A	A	95	91			169	A	A	87	A	83	
5	88	90	86	86	83	83	91	107	99	82		A	A	102	97	95	90	90	92	95	85	A	88	90	
6	90	89	80	76	73	83	94	80	80	86	93	94	94	90	91	97	89	89	N	A	A	A	89	87	
7	A	73	76	76	74	81	105	105	91	102	86	91	91	95	94	90	87	89	87	85	86	91	91	87	
8	93	93	90	78	86	87	76	77	83	84	143	95	83	85		91	90	88	87	A	83	A	83	86	
9	95	103	90	91	86	82	92	182	110	A	81	85	88	87	93	97	100	93	85	84	82	84	A	96	
10	109	103	A	84	80	83	91	91	94	88	78	82	85	90	151	81	82	A	85	A	87	86	91	96	
11	93	87	85	85	85	87	89	95	93	A		86	81	83	86	87	85	83	87	95	90	88	91	102	
12	93	105	85	83	89	85	83	80	70	68	75	78	A	77	75	78	78	77	76	73	A	80	79	81	
13	A	83	77	68	69	69	80	93	94	A	80	77	82	82	159	86	83	80	80	84	71	A	89	72	
14	77	83	76	70	63	81	73	117	61	A		101	A	A	82	A	68	64	61	61	77	73	A	85	
15	82	84	78	72	72	77	83	87	83	A	A	80	83	89	95	99	100	94	97	96	93	92	89	94	
16	100	107	91	84	71	63	70	A	A	A		A	A	63	70	73	80	73	70	77	73	77	85	90	
17	85	85	83	90	75	76	78	80	67	65	68	68	68	188	150	80	77	75	73	85	83	75	77	72	
18	83	85	83	83	83	79	93	96	A	87	A	118	86	97	94	92	93	93	87	81	83	87	87	88	
19	86	87	95	92	85	88	94	89	A	71	A	A	A	77	78	77	A	70	73	78	81	77	87	90	
20	85	86	81	77	73	85	95	91	78	A		145	91	95	89	88	90	74	92	A	91	89		94	
21	94	106	94	83	79	84	92	86	82	227	69	72	77	83	92	93	A	143	93	109	A	90	89	91	
22	92	87	85	81	81	84	91	95	88	87	84	89	90	91	89	88	86	87	129	100	90	80	83	84	
23	89	85	86	78	73	71	A	80	66	A	A	A	77	80	80	79	A	89	141	79	92	A	A	A	
24	82	85	79	77	71	77	87	99	111	75	87	91	90	89	92	89	83	92	97	97	94	91	87	A	
25	95	91	92	85	79	71	78	115	89	96	92	A	115	109	102	92	81	A	84	87	A	76	82	A	
26	72	73	73	72	71	81	83	87	74	115		182	A	101	N	102		93	91	86	84	91	89	106	
27	92	93	86	73	84	85	66	73	77	84	A	N	88	77	81	89	86	80	73	77	A	86	93	91	
28	85	82	73	77	72	73	87	86	80	75	81	79	A	83	A	79	79	78	77	102	A	70	78	81	
29	77	80	74	69	68	72	92	102	A	N	81	80	75	77	80	91	101	97	86	91	83	A	77	79	84
30	90	88	88	85	71	70	73	81	87	83	A	79	A	79	A	76	126	187	75	A	80	84	82	84	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	30	29	30	30	30	29	29	26	21	18	23	20	28	26	29	25	27	30	24	21	25	25	27	
MED	87	86	83	78	74	81	87	91	87	84	84	88	87	89	92	90	87	89	87	85	84	86	87	87	
U Q	93	91	88	85	83	84	92	98	91	89	92	95	91	96	96	95	95	93	93	96	90	89	90	94	
L Q	82	83	76	76	71	73	78	82	78	78	80	79	81	81	86	80	81	78	76	78	80	77	82	84	

HOURLY VALUES OF fEs AT Kokubunji

JUN. 2023

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	38	38	28	G	G	G	46	64	77	88	83	83	49	61	70	56	55	86	43	47	49	59	39	41	
2	39	G	G	G	G	29	41	49	57	59	54	G	G	51	49	40	48	38	52	35	70	83	48	31	
3	G	G	39	29	G	31	38	59	150	159	123	196	186	165	101	123	47	66	71	48	129	83	93	93	
4	102	54	36	31	G	26	47	71	115	217	249	108	185	142	76	77	156	143	206	174	127	102	113	59	
5	76	37	31	G	35	33	49	77	85	103	124	193	131	184	68	79	107	83	74	103	104	174	94	29	
6	G	G	G	G	G	G	33	31	60	65	62	57	78	71	77	50	41	87	106	102	149	115	93	93	
7	95	56	44	37	G	35	54	134	77	101	71	53	53	79	59	47	55	56	69	55	59	52	120	107	
8	95	87	G	G	35	31	58	85	78	76	109	94	66	49	129	51	78	62	81	95	86	150	114	115	
9	95	86	71	43	G	33	43	78	79	109	103	105	123	151	101	78	69	88	71	39	40	29	117	81	
10	96	89	116	59	199	24	43	73	94	73	65	89	60	76	119	109	149	91	64	94	35	71	33	33	
11	26	50	49	48	28	41	50	86	58	89	166	77	70	71	79	75	48	50	40	59	78	42	59	59	
12	53	36	G	G	G	G	44	58	65	53	60	89	97	102	40	67	35	66	52	71	94	59	56	93	
13	95	77	93	53	59	32	38	58	87	95	57	76	62	75	115	63	38	40	59	G	G	70	59	58	
14	69	54	58	58	43	G	34	82	54	61	61	97	71	72	93	69	56	75	59	50	85	93	94	G	
15	G	G	G	G	G	31	39	65	63	90	107	63	54	G	58	58	59	59	38	39	49	37	85	56	
16	59	73	86	33	30	35	50	78	76	55		71	122	84	38	32	58	64	24	30	32	59	87	50	
17	27	37	28	27	45	33	44	64	62	76	65	55	77	206	148	47	G	G		G		66	91	69	71
18	28	33	39	33	29	52	41	54	78	76	127	90	101	63	50	64	75	58	57	60	32	59	31	32	
19	52	45	49	37	38	31	43	55	116	165	253	78	81	70	57	89	100	52	47	29	93	77	72	97	
20	103	83	59	91	69	77	84	60	73	84	91	99	65	55	G	79	89	90	96	93	88	93	116	37	
21	G	G	G	G	G	35	58	46	62	63	39	53	66	71	63	G	145	166	116	104	150	38	G	70	
22	48	87	41	27	26	G	28	45	52	52	54	60	75	69	59	59	52	63	121	55	151	85	55	86	
23	33	34	48	40	32	23	59	76	71	100	82	95	61	55	63	93	148	113	140	57	115	129	168	159	
24	39	G	G	G	G	32	54	95	108	68	79	69	59	59	59	53	40	39	32	G	G	31	67	155	
25	89	59	32	32	G	36	55	70	116	92	81	122	87	53	G	67	49	85	47	41	93	105	110	128	
26	40	39	35	27	32	G	39	62	94	113	162	157	207	95	135	108	173	89	96	92	114	57	57	59	
27	43	39	33	69	39	25	41	59	61	79	126	121	125	59	70	53	65	48	79	103	151	93	40	85	
28	42	37	57	36	39	40	49	57	51	77	75	76	92	75	115	82	47	86	59	145	109	53	59	84	
29	G	30	G	G	G	G		44	92	40	G	75	85	92	58	47	87	82	66	119	80	48	47	49	
30	55	92	72	92	64	45	60	43	70	96	78	71	106	56	126	143	117	116	42	103	46	39	56	27	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	46	39	38	32	28	31	44	63	76	82	81	80	78	71	69	66	58	70	62	58	86	70	68	64	
U Q	89	73	57	43	39	35	54	77	92	100	123	99	106	92	101	79	100	88	81	102	114	93	94	93	
L Q	28	33	G	G	G	23	39	55	62	65	61	69	62	59	58	51	48	56	47	39	49	52	55	41	

HOURLY VALUES OF fmin AT Kokubunji

JUN. 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	16	16	16	17	16	17	19	23	41	35	41	35	41	39	37	30	21	19	17	17	17	16	16	17
2	17	17	17	17	17	17	17	33	21	29	40	40	61	34	41	19	31	16	16	16	17	17	17	17
3	17	16	15	16	17	17	17	17	25	27	35	37	26	29	27	22	20	19	17	16	17	17	16	17
4	17	17	17	16	18	18	20	19	26	29	36	41	26	31	33	32	21	20	15	16	16	17	17	16
5	16	16	16	16	16	17	17	19	26	31	31	35	35	32	36	34	24	19	17	16	17	15	17	16
6	16	16	16	16	17	17	18	18	22	22	39	40	35	34	41	26	25	18	17	16	17	16	17	17
7	17	17	15	16	16	19	17	17	24	24	31	30	36	32	33	26	26	18	17	15	17	17	16	16
8	17	16	16	15	15	17	18	20	23	20	36	33	41	34	35	30	23	19	18	16	17	16	17	17
9	17	17	17	16	16	17	17	17	20	32	43	42	42	43	42	28	25	19	16	16	17	16	17	17
10	17	17	16	17	16	16	15	19	25	24	32	27	39	42	27	30	20	18	17	16	11	17	16	16
11	16	17	16	16	16	17	16	23	26	30	34	35	36	34	35	28	22	18	17	17	15	17	17	17
12	17	16	16	16	16	17	19	18	26	47	26	34	37	32	30	25	24	17	17	16	17	16	17	17
13	17	16	16	16	14	16	17	20	22	30	41	37	31	32	32	24	21	17	17	16	16	17	17	16
14	16	16	16	17	16	17	19	17	22	41	36	25	36	33	32	26	21	17	13	16	17	15	17	17
15	17	17	15	16	17	17	17	22	26	31	31	29	30	52	37	23	25	21	14	17	18	16	16	17
16	17	17	16	15	15	17	17	18	26	27		39	34	29	30	29	26	19	16	15	16	16	17	16
17	16	16	16	16	17	15	17	23	21	40	41	36	43	40	37	31	30	24	17	16	16	17	17	17
18	16	16	16	16	16	17	17	18	25	39	36	41	41	40	40	28	24	19	17	16	17	16	17	16
19	16	17	16	16	16	16	18	22	24	30	34	39	42	36	33	25	21	19	19	17	16	17	17	16
20	15	17	15	17	16	15	18	19	27	25	33	39	41	36	52	29	25	19	16	16	17	16	17	16
21	18	16	17	16	17	15	16	23	27	26	32	39	60	42	41	42	26	20	15	19	17	17	17	17
22	17	15	16	16	16	19	19	20	25	35	34	38	36	36	35	17	21	17	19	15	16	17	17	17
23	16	16	16	15	17	15	16	18	23	43	30	35	41	41	37	28	23	19	17	16	17	17	17	17
24	17	17	17	16	17	16	18	17	21	30	27	41	44	35	35	39	29	22	17	15	17	17	17	16
25	17	16	16	15	17	17	19	18	26	34	41	37	36	35	51	33	35	17	17	17	16	16	17	17
26	17	17	17	17	16	18	18	19	24	29	30	34	40	42	32	29	24	21	17	17	16	17	17	17
27	17	16	15	17	17	17	18	25	24	25	40	34	35	36	34	26	19	17	15	17	17	16	17	17
28	16	17	17	16	16	16	16	21	25	27	34	35	35	33	30	23	23	18	18	17	16	17	17	17
29	16	16	17	16	16	16	18	19	21	29	33	31	42	38	41	29	27	18	14	15	16	16	16	16
30	16	16	17	16	16	16	17	20	21	26	33	33	32	31	32	25	27	19	17	16	17	17	16	17
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	17	16	16	16	16	17	17	19	24	30	34	36	36	35	35	28	24	19	17	16	17	17	17	17
U Q	17	17	17	16	17	17	18	22	26	34	39	39	41	40	40	30	26	19	17	17	17	17	17	17
L Q	16	16	16	16	16	16	17	18	22	26	31	34	35	32	32	25	21	18	16	16	16	16	17	16

HOURLY VALUES OF fof2 AT Yamagawa

JUN. 2023

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	99	89	89	92	75	61	65	77	77	78	A	83	A	96	103	107	109	91	72	74	79	86	85	91	
2	87	82	79	78	77	64	68	89	85	93	79	88	102	113	110	107	102	100	104	97	90	81	A	91	
3	93	95	86	82	84	88	85	85	A	A	A	86	102	104	111	117	118	117	123	105	91	89	95	101	
4	96	98	95	92	86	77	78	85	A	82	89	89	98	98	99	102	102	97	99	A	96	A	84	76	
5	A	100	A	88	87	80	83	100	95	A	A	A	211	98	49	A	99	100	97	94	A	85	A	A	
6	96	96	99	91	77	81	91	88	A	A	90	91	101	98	A	112	108	102	100	A	88	102	A	101	
7	94	96	82	82	79	83	87	93	80	76	84	A	93	A	A	95	97	95	91	89	87	87	96	94	
8	100	95	92	93	93	86	74	79	79	A	A	A	A	A	A	99	99	99	A	95	87	A	A	81	
9	A	90	91	77	81	71	79	93	77	79	66	81	A	95	103	108	104	102	97	95	87	85	88	92	
10	97	97	96	92	87	79	72	85	87	A	A	A	95	97	91	85	95	95	95	99	95	99	94	95	
11	112	103	97	98	100	89	94	96	A	79	A	142	199	214	94	95	98	A	105	101	93	83	85	80	
12	97	101	90	85	79	73	60	86	78	A	A	A	87	83	87	95	94	92	86	79	72	72	A	75	
13	83	75	59	61	58	56	68	89	92	85	A	85	93	98	97	92	83	37	49	A	87	92	86	80	
14	64	89	84	89	77	61	67	66	75	79	75	A	A	A	77	81	A	A	71	66	79	84	85	85	
15	87	87	73	74	73	75	86	81	A	A	A	79	A	86	91	105	N	98	47	110	A	99	95	99	
16	103	111	97	89	A	73	82	83	A	49	45	A	A	A	70	A	81	A	A	71	67	76	79	73	
17	78	85	81	81	68	66	92	74	A	79	80	83	98	96	102	104	100	91	93	93	91	89	87	A	
18	63	105	96	98	93	86	95	85	67	74	72	77	85	94	188	99	100	97	94	87	86	85	89	82	
19	83	83	81	78	77	72	93	85	A	A	79	B	97	95	99	91	84	82	85	89	93	82	77	76	
20	77	72	A	77	68	73	81	64	70	77	73	84	95	99	95	99	98	99	97	A	A	92	99	105	
21	116	105	100	83	85	83	93	91	94	65	61	77	86	95	103	99	93	95	99	A	A	A	95	100	
22	96	93	89	84	78	79	84	77	87	83	87	A	97	99	104	102	100	82	107	106	92	84	83	92	
23	91	A	75	81	85	84	69	A	77	69	A	A	78	198	A	85	54	76	78	85	A	A	A	A	
24	76	76	72	89	81	70	71	73	A	77	88	89	A	169	110	A	A	A	105	111	101	86	83	86	
25	86	83	87	85	70	63	66	69	A	A	87	87	N	98	111	101	99	100	96	100	89	71	A	73	
26	83	81	77	70	68	65	A	74	74	A	85	95	95	101	113	113	98	95	98	90	87	97	93	96	
27	100	108	88	77	77	82	73	76	78	A	A	97	79	84	93	99	99	82	69	77	81	81	83	86	
28	87	95	77	75	65	64	79	92	A	78	A	A	100	97	93	82	A	86	82	A	74	A	76	88	
29	73	81	78	68	71	68	80	98	101	70	A	A	85	91	102	119	A	A	93	92	86	89	A	87	
30	94	99	96	95	81	77	75	89	80	A	65	74	A	89	88	92	97	78	A	A	87	85	89	86	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	29	28	30	29	30	29	29	19	18	17	18	22	25	26	27	26	25	27	22	26	25	22	27	
MED	92	95	88	84	78	74	79	85	79	78	79	86	96	97	99	99	98	95	96	92	87	85	86	87	
U Q	97	99	95	91	85	82	86	90	87	79	87	89	100	100	104	107	100	99	100	99	92	90	94	95	
L Q	83	83	78	77	72	66	70	76	77	74	69	81	87	94	91	92	95	82	85	85	86	82	83	80	

HOURLY VALUES OF fEs AT Yamagawa

JUN. 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	49	27	26	G	24	28	39	60	72	76	153	79	103	85	108	61	61	46	41	34	50	40	40	28	
2	53	G	G	30	28	G	34	45	54	57	59	48	47	48	38	51	34	37	85	88	129	36	54	45	
3	44	54	42	40	40	30	51	60	141	163	132	107	52	51	46	37	87	108	117	53	54	54	54	89	
4	82	36	44	33	30	28	52	73	164	75	57	97	56	69	85	56	56	50	46	109	76	115	84	43	
5	116	93	134	91	57	69	50	84		151	175	163	148	94		142	60	56	63	54	78	78	115	92	
6	71	48	36	27	G	G	34	56	115	130	74	70	67	65	110	38	51	54	60	89	46	83	109	59	
7	73	85	74	72	44	43	60	147	67	53	96	132	101	135	122	58	56	56	60	54	46	57	46	60	
8	39	53	60	70	60	43	69	108	107	179	110	101	106	184	144	45	41	38	153	176	71	134	179	82	
9	93	89	105	53	64	34	55	59	116	109	135	56	112	G	49	72	58	51	70	41	51	24	G	46	
10	78	78	59	35	54	29	29	45	57	175	131	124	72	84	110	172	53	71	48	36	56	39	47	39	
11	33	35	28	G	G	G	36	89	94	84	116	149	147	155	116	45	59	96	71	59	49	50	58	69	
12	61	53	49	53	46	45	48	44	64	88	150	151	54	50	43	47	42	36	40	40	52	40	91	70	
13	78	50	41	37	33	33	147	50	52	70	84	70	52	62	60	60	78	146	95	92	107	44	72	41	
14	41	40	46	61	29	32	34	40	66	54	61	109	95	78	69	100	82	73	55	54	43	41	32	58	
15	33	24	31	46	30	32	39	52	116	107	80	83	150	145	61	86	97		104	132	60	49	40	25	
16	53	48	39	84	116	31	60	65	88	94	96	135	165	117	56	88	82	77	70	58	60	58	32	71	
17	50	46	39	40	G	G	34	42	88	67	75	64	49	62	95	66	84	62	128	69	69	41	60	84	
18	72	89	45	53	52	50	36	44	51	54	92	67	66		120	61	58	75	40	46	42	31	58	G	
19	G	36	30	34	34	24	56	84	82	94	122	B	72	60	62	46	42	32	27	G	40	44	71	83	
20	35	72	108	53	58	34	60	84	67	66	50	60	59	62	52	48	34	51	57	93	115	108	57	60	
21	69	83	33	30	39	49	57	48	60	57	66	60	57	81	G	75	77	59	60	105	115	92	52	46	
22	50	32	29	24	25	G	35	36	44	50	54	96	58	56	57	N	79	138	83	71	60	29	40	46	
23	45	84	71	G	30	36	39	95	58	60	74	85	86	128	164	97	146		124	81	107	109	113	86	
24	49	60	59	74	34	G	36	70	88	69	81	79	162	141	124	134	175	107	83	88	57	46	29	39	
25	35	G	77	54	54	G	29	50	71	114	68	66	134		78	62	50	48	40	35	47	39	84	59	
26	60	66	32	40	43	44	110	52	60	103	54	54	53	58	66	69	64	62	26	36	56	71	58	46	
27	26	48	34	41	35	36	39	84	53	105	138	93	78	61	62	47	35	38	35	39	34	27	29	60	
28	71	56	70	55	28	31	32	44	86	74	129	161	112	76	81	52	95	70	65	166	151	114	48	59	
29	69	G	29	32	G	G	32	40	50	60	101	88	66	56	76	112	113	127	79	62	24	54	84	53	
30	39	28	G	32	49	64	34	54	61	100	65		124	63	116	55	72	57	104	138	61	57	39	29	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	29	30	30	28	30	28	29	29	30	28	30	30	30	30	30	30	
MED	52	49	42	40	34	32	39	55	67	80	88	86	75	67	76	61	60	58	64	60	56	50	56	58	
U Q	71	72	60	54	52	43	56	84	91	107	129	116	112	105	113	87	82	76	85	92	76	78	84	70	
L Q	39	35	31	32	28	G	34	45	57	60	66	66	57	59	56	47	51	49	46	41	47	40	40	43	

HOURLY VALUES OF fmin AT Yamagawa

JUN. 2023

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	16	16	16	16	16	15	17	21	18	9	15	21	18	18	21	19	15	14	16	15	15	15	17
2	15	15	15	16	15	15	15	14	17	16	18	21	21	21	24	22	17	16	15	15	18	16	15	15
3	15	16	15	15	15	16	15	13	16	12	19	20	17	22	21	19	22	17	10	15	15	15	15	15
4	15	15	16	15	15	15	15	15	15	19	18	20	22	43	16	21	19	18	15	14	15	14	16	15
5	9	16	14	14	16	16	15	16	15	115	15	145	21	22	71	11	20	17	15	13	15	15	13	12
6	15	15	15	16	15	15	16	15	14	20	21	21	23	16	19	17	18	17	14	15	15	15	14	15
7	15	13	17	16	15	15	13	15	16	17	16	19	20	24	23	20	17	17	14	14	16	15	15	15
8	15	14	15	15	15	15	15	13	19	83	19	17	14	19	15	19	19	15	5	16	15	12	13	15
9	7	14	9	15	15	16	15	14	17	18	22	21	19	42	19	17	18	14	13	15	15	17	15	15
10	13	14	16	15	15	14	15	15	17	13	12	20	19	20	21	17	16	17	15	15	15	16	15	15
11	16	15	16	16	15	15	16	15	13	19	17	18	21	63	18	19	19	17	15	13	15	16	15	16
12	15	14	15	15	15	14	15	15	17	17	5	21	21	20	20	19	17	15	15	14	15	15	6	15
13	16	16	15	15	15	16	16	14	15	17	21	22	19	20	20	21	17	5	15	10	14	15	15	15
14	15	15	15	16	15	16	16	15	17	15	17	21	21	17	22	17	16	14	15	15	15	15	16	15
15	15	16	15	15	16	16	15	13	13	16	19	20	14	22	17	19	15	17	14	5	15	15	15	16
16	15	15	15	16	5	16	15	15	17	17	20	25	22	25	20	21	17	14	13	13	15	15	16	15
17	16	15	15	15	16	15	16	15	16	17	19	19	19	16	20	19	16	15	16	13	16	15	15	13
18	16	16	15	14	15	15	15	14	16	20	20	19	20	23	19	17	19	15	15	15	15	16	14	16
19	16	15	15	15	15	14	15	15	16	17	20	^B	20	27	19	21	20	17	16	15	15	15	16	15
20	15	16	13	15	15	16	15	17	18	17	19	21	21	27	23	17	17	16	15	14	14	15	14	15
21	17	16	16	15	15	15	15	15	19	19	20	18	24	23	57	22	18	16	15	14	17	17	16	15
22	15	16	16	15	15	15	15	16	17	22	22	23	27	23	23	21	18	14	14	12	15	16	15	15
23	15	15	16	15	16	15	15	13	14	17	19	20	21	19	27	21	84	5	17	14	15	10	7	15
24	14	15	15	15	17	14	17	15	16	20	19	19	23	23	25	20	8	15	15	13	15	15	15	16
25	16	15	15	15	15	15	15	15	18	20	19	23	21	16	20	21	21	16	15	15	15	15	14	15
26	15	15	15	15	14	15	10	15	16	21	19	21	21	25	16	20	17	19	15	16	15	15	16	15
27	16	15	15	15	15	17	17	15	15	18	25	22	21	23	21	24	19	16	15	14	15	16	16	15
28	16	16	16	15	15	17	16	17	16	17	13	44	19	23	19	21	17	17	16	15	7	15	15	16
29	16	16	16	16	15	16	17	16	16	20	19	23	21	23	21	23	10	16	17	14	16	16	15	16
30	15	16	15	15	14	15	16	17	17	15	20	19	25	19	22	23	20	16	13	12	16	16	15	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	15	15	15	15	15	15	15	16	18	19	21	21	22	20	20	18	16	15	14	15	15	15	15
U Q	16	16	16	16	15	16	16	15	17	20	20	22	21	24	23	21	19	17	15	15	15	16	15	15
L Q	15	15	15	15	15	15	15	14	15	17	17	19	19	19	19	19	17	15	14	13	15	15	14	15

HOURLY VALUES OF foF2 AT Okinawa

JUN. 2023

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	102	109	111	111	100	81	79	78	75	74	A	A	A	109	114	123	112	105	82	75	80	83	84	83	
2	79	88	83	76	67	57	63	85	93	91	A	A	106	117	123	121	114	114	112	105	106	A	97	A	
3	120	119	115	97	95	89	80	89	88	98	89	116	119	127	125	137	138	133	132	119	100	107	95	100	
4	111	108	117	116	95	80	74	87	81	82	83	95	106	113	110	113	115	115	118	125	93	A	82	87	
5	91	119	99	95	81	74	79	96	90	81	A	A	96	105	106	110	112	111	108	102	91	88	A	A	
6	93	95	93	83	75	74	77	83	77	83	92	98	104	110	118	124	124	115	97	92	A	87	80	79	
7	92	91	91	83	81	78	78	83	A	A	A	99	100	105	104	105	111	103	A	98	A	78	A	85	
8	91	A	80	88	79	73	67	75	A	A	72	A	A	112	117	112	111	A	111	102	95	86	92	88	
9	90	94	95	77	72	76	73	78	82	82	75	79	A	97	110	105	111	121	121	104	100	90	89	88	
10	95	94	91	87	82	71	69	81	A	A	67	85	97	98	A	97	99	101	104	101	97	99	98	103	
11	102	124	135	139	114	99	103	95	79	A	A	A	A	101	107	111	113	113	121	114	95	90	93	91	
12	101	87	98	86	72	67	62	81	83	93	95	99	99	99	105	114	123	109	105	84	77	75	74	72	
13	77	71	65	60	57	54	59	79	84	78	A	86	100	98	100	94	A	90	94	95	95	87	89	85	
14	94	100	107	96	67	54	62	64	79	95	A	70	76	87	A	A	91	81	78	80	76	87	83	82	
15	73	85	87	79	77	76	80	67	63	60	71	85	88	91	100	105	105	107	104	117	106	108	107	106	
16	65	121	103	76	81	79	75	118	80	51	A	A	A	A	54	95	94	90	76	75	64	69	72	77	
17	65	78	77	66	63	67	71	80	79	88	88	98	111	121	133	136	137	145	136	135	122	127	129	111	
18	104	117	111	103	100	89	89	76	68	74	75	81	96	97	107	189	A	A	107	106	92	89	92	87	
19	85	85	86	80	69	77	84	A	A	129	A	A	110	103	96	101	102	100	96	88	90	90	89	89	
20	90	A	64	73	A	65	63	62	76	81	48	A	98	107	107	107	107	A	A	102	96	98	100	98	
21	107	98	97	87	80	76	81	97	A	85	A	89	A	112	118	104	A	105	102	105	96	95	109	110	
22	109	98	99	98	93	77	82	78	84	86	83	60	108	117	119	115	115	113	118	112	A	85	97	108	
23	120	131	123	118	102	100	73	81	A	A	78	53	84	92	189	184	A	84	85	93	A	A	76	A	
24	A	85	94	76	72	63	73	84	75	A	A	96	109	114	120	128	130	A	A	133	119	95	100	99	
25	94	96	91	90	73	67	59	65	73	95	94	90	A	123	121	126	119	121	136	121	98	67	77	77	
26	81	91	A	72	67	67	74	77	75	76	86	95	103	108	120	114	113	110	111	99	92	94	98	101	
27	98	93	86	79	73	76	77	73	74	92	A	95	94	103	114	119	105	91	82	86	91	89	87	84	
28	87	96	89	A	69	74	80	83	77	67	89	86	90	101	97	94	93	97	87	83	A	A	A	A	
29	74	A	73	74	67	68	76	104	82	59	80	88	88	98	113	117	106	107	110	A	92	93	96	97	
30	95	113	128	107	77	75	82	91	87	83	79	58	106	100	91	92	100	87	80	37	A	76	82	83	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	27	29	29	29	30	30	29	24	24	18	22	22	29	28	29	26	26	27	29	24	26	27	26	
MED	93	96	94	86	77	74	76	81	79	82	82	88	100	105	112	113	112	107	105	102	95	89	92	88	
U Q	102	113	109	97	87	78	80	88	83	91	89	96	106	112	119	123	115	114	118	113	99	95	98	100	
L Q	83	88	86	76	69	67	69	76	75	75	75	81	94	98	104	104	105	97	87	89	91	85	82	83	

HOURLY VALUES OF fEs AT Okinawa

JUN. 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	74	57	54	56	28	36	55	58	57	71	132	128	182	71	79	62	48	50	41	33	32	27	43	60			
2	57	60	46	33	33	G	29	49	59	60	150	108	130	105	52	98	100	109		34	34	135	90	136			
3	58	28	33	31	G	G	51	50	64	112	61	50	49	49	49	54	52	66	87	67	43	92	54	34			
4	35	39	30	G	31	50	45	35	58	53	66	62	57	56	60	56	72	84	66	108	42	87	34	69			
5	58	48	40	32	27	33	49	61	62	96	161	145	91	151	49	52	56	56	72	72	107	107	115	116			
6	70	56	70	35	52	G	38	56	72	76	66	69	50	100	48	60	88	50	60	37	116	54	G	G			
7	G	G		54	50	35	G	45	55	163	110	158	100	56	57	66	55	N		56	86	150	91	144	90	108	41
8	78	133	56	38	28	59	48	70	136	129	155	106	115	128	69		42	153	128	92	27	G	84	86			
9	29	34	32	25	38	G	32	60	72	50	64	76	88	55	54	61	84	55	91	34	46	30	30	24			
10	G	90	60	66	41	27	31	40	92	77	73	54	61	89	170	71	61	43	42	33	26	42	38	32			
11	32	G	38	G	G	G	32	47	60	110	112	167	146	89	58	74	70	82	62	26	27	33	25	G			
12	G	28	48	78	57	57	45	56	78	67	63	53	59	67	53	54	50	54	39	50	39	59	56	108			
13	59	55	49	26	36	28	180	57	56	71	92	74	92	51	63	66	116	76	55	45	43	28	34	45			
14	47	29	G	40	58	34	59	49	58	89	96	76	71	124	115	126	63	58	66	46	46	41	56	38			
15	72	58	53	33	28	36	34	44	58	60	72	184	67	62	61	106	71	56	71	56	46	30	40	31			
16	31	31	G	G	G	G	91	85	78	124	113	151	130	110	49	78	46	45	40	35	32	93	112	50			
17	28	90	39	34	26	27	38	53	58	61	56	76	96	92	100	83	74	53	106	56	28	53	56	54			
18	45	90	85	61	43	31	60	40	46	65	70	65	54	61	65	137	154	116	91	87	58	54	56	70			
19	39	32	36	29	28	28	40	84	86	105		168	98	83	62	62	52	44	57	40	28	30	G	53			
20	83	116	27	34	106	81	35	49	46	51	110	110	85	72	81	57	68	108	109	37	32	G	35	60			
21	58	115	71	52	49	32	67	59	132	148	80	116	172	54	71	83	111	80	43	56	53	57	39	45			
22	48	46	25	G	G	G	30	40	50	48	56	62	54	80	75	68	72	76	72	70	179	105	112	50			
23	84	132	114	70	71	43	129	60	91	144	164			58	127	139	136	58	41	34	135	117	60	115			
24	82	43	46	36	31	G	24	39	67	109	150	125	90	78	182	43	115	152	167	74	92	46	33	26			
25	27	34	G	G	G	G	G	40	71	60	77	79	116	64	74	76	46	40	92	39	39	31	G	G			
26	84	93	116	58	42	54	59	69	48	60	51	56	58	51	50	51	53	38	54	38	59	G	60	G			
27	25	40	G	G	29	44	35	46	60	54	162	65	59	51	48	46	44	41	28	31	27	28	G	G			
28	60	110	67	91	48	53	48	58	53	70	76	72	72	54	53	52	64	61	64	40	159	86	179	115			
29	46	92	111	38	27	33	40	41	52	47	57	46	54	56	44	56	60	57	169	153	109	50	G	60			
30	66	54	40	29	G	G	G	44	59	110	72	53	53	82	51	60	88	64	78	94	148	92	85	58			
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	30	30	30	30	30	30	30	30	29	29	29	30	30	29	30	30	29	30	30	30	30	30			
MED	52	54	46	34	31	30	42	52	60	71	77	76	72	69	62	62	66	58	66	46	44	52	48	50			
U Q	70	90	60	52	43	43	55	59	78	110	141	120	106	89	75	80	88	82	91	72	107	90	84	69			
L Q	31	34	32	26	27	G	32	44	57	60	65	62	56	56	51	54	52	50	48	35	32	30	33	31			

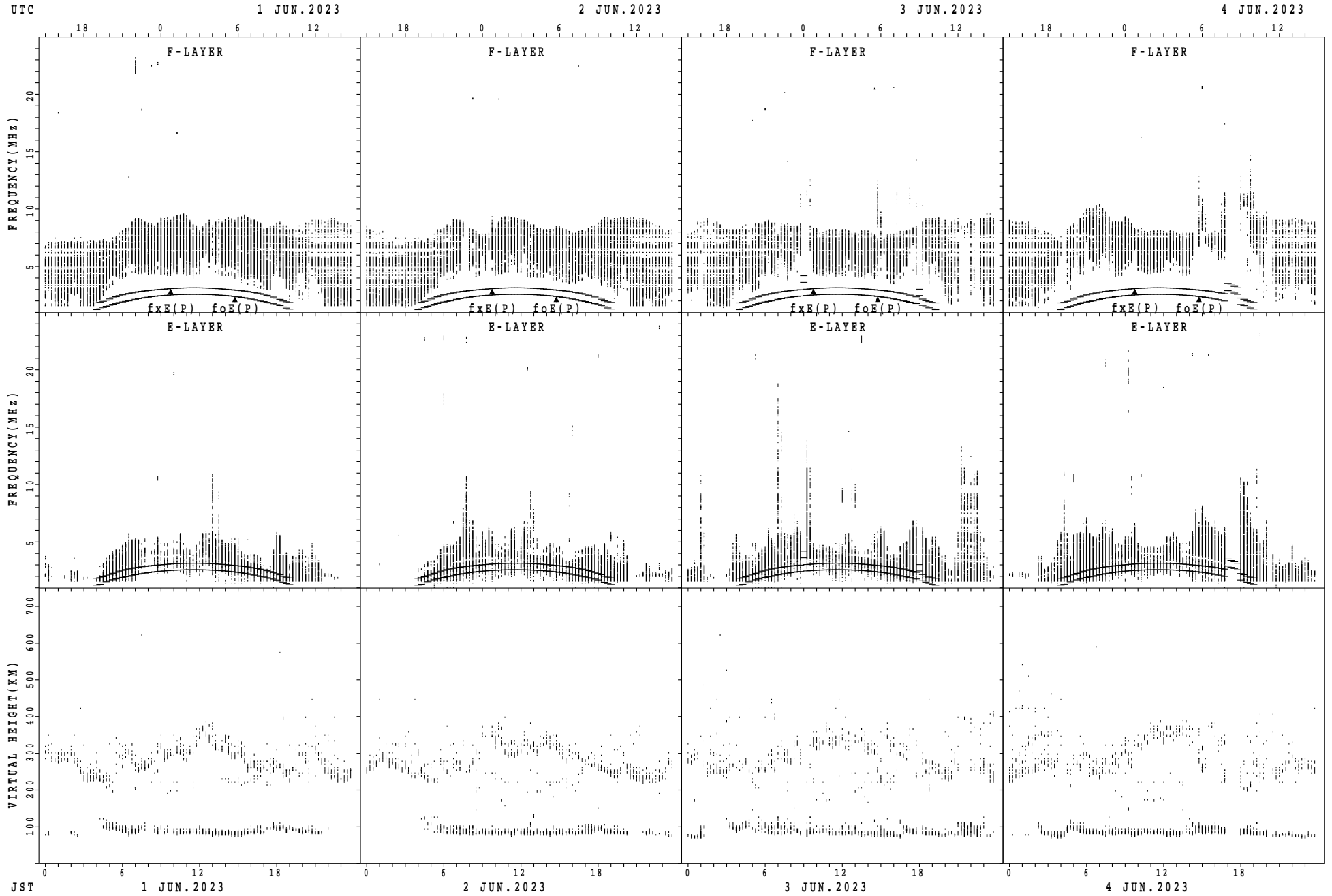
HOURLY VALUES OF fmin AT Okinawa

JUN. 2023

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

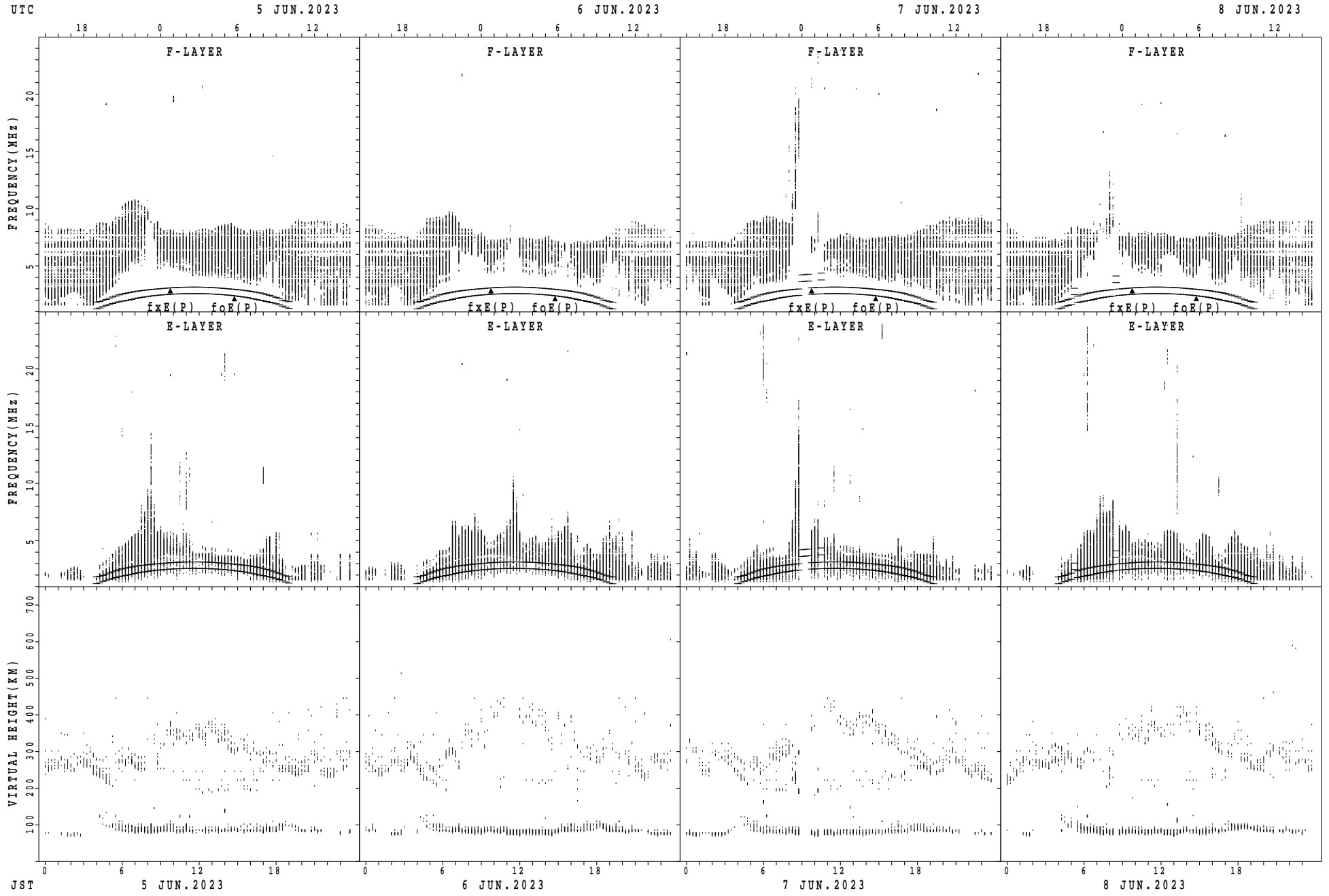
$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	14	16	16	15	15	14	20	19	16	23	20	20	19	18	20	14	15	16	14	15	15	15
2	15	15	15	15	16	14	15	15	14	15	13	21	21	24	20	18	19	14	16	14	15	5	15	9
3	15	16	15	16	16	16	15	15	15	15	21	21	21	20	19	19	17	14	15	13	15	12	16	16
4	15	16	16	14	15	16	15	15	16	19	22	19	22	28	19	23	16	15	15	16	15	15	15	15
5	15	15	15	15	15	16	16	15	19	17	136	16	19	19	19	22	17	18	14	15	12	14	12	12
6	15	15	15	15	15	15	14	13	15	19	19	22	21	18	21	17	16	15	13	15	12	15	16	15
7	16	15	14	15	16	15	14	15	12	18	55	18	21	18	19	21	21	16	57	13	14	12	8	15
8	16	14	15	15	15	16	15	15	7	18	17	67	17	26	21	19	20	12	7	14	15	14	8	14
9	15	15	16	16	15	14	15	14	16	17	22	17	19	20	17	17	17	15	12	15	14	16	15	15
10	15	16	15	14	15	15	15	15	15	15	19	17	18	18	15	15	19	16	14	15	13	15	16	16
11	16	15	15	15	15	16	16	13	17	19	19	82	19	22	23	19	19	15	13	15	15	16	15	15
12	14	15	15	14	14	13	15	14	15	14	17	21	25	19	17	16	15	17	13	12	15	15	15	15
13	15	14	14	15	15	15	15	14	12	16	18	19	18	19	21	15	17	14	13	14	15	16	16	17
14	17	16	16	15	15	15	15	12	13	15	19	18	16	23	23	19	20	14	13	14	16	16	15	15
15	17	15	15	15	15	15	16	15	18	17	15	9	19	21	19	17	17	14	13	13	16	15	14	16
16	16	15	15	15	16	15	16	14	15	18	18	58	75	18	19	13	19	15	14	15	16	16	14	15
17	16	14	16	15	16	16	14	14	17	19	19	18	17	18	12	17	16	15	11	14	16	15	16	15
18	15	17	7	16	16	15	17	15	17	18	21	20	17	14	20	19	134	17	11	15	15	16	15	16
19	15	16	16	15	15	16	15	15	16	13	41	53	21	20	16	17	17	16	13	13	15	15	16	15
20	16	13	17	14	8	13	15	15	17	19	18	17	21	19	22	19	18	17	15	15	16	15	15	16
21	15	15	16	15	14	16	11	12	15	17	19	18	64	21	22	18	18	15	14	15	14	16	17	17
22	15	17	15	15	15	15	15	14	16	19	21	18	20	21	21	21	16	11	12	12	97	14	14	16
23	14	15	11	13	15	15	16	15	14	20	21	39	21	22	16	6	6	17	14	15	9	8	16	11
24	16	15	15	15	16	15	16	16	14	17	8	18	20	19	17	19	21	60	5	13	15	16	16	15
25	16	15	14	15	15	14	16	15	14	20	14	21	19	22	19	19	18	15	41	13	15	15	15	14
26	16	13	6	16	15	15	14	15	18	18	19	19	21	29	20	20	16	18	14	15	17	16	15	15
27	15	15	15	14	16	16	16	15	14	16	108	21	19	21	20	21	19	15	15	14	15	16	15	17
28	15	17	16	18	15	15	14	15	15	18	17	20	23	23	20	19	15	16	15	14	14	13	15	11
29	16	12	13	15	14	16	15	15	14	17	19	21	21	17	19	20	15	18	14	11	15	15	16	15
30	15	16	15	16	15	16	15	16	15	16	17	17	18	18	19	17	16	15	14	15	13	14	11	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	15	15	15	15	15	15	15	15	15	18	19	20	20	20	19	19	17	15	14	14	15	15	15	15
U Q	16	16	16	15	16	16	16	15	17	19	21	21	21	22	21	19	19	17	15	15	15	16	16	16
L Q	15	15	14	15	15	15	15	14	14	16	17	18	19	18	19	17	16	14	13	13	14	14	15	15

SUMMARY PLOTS AT Wakkanai



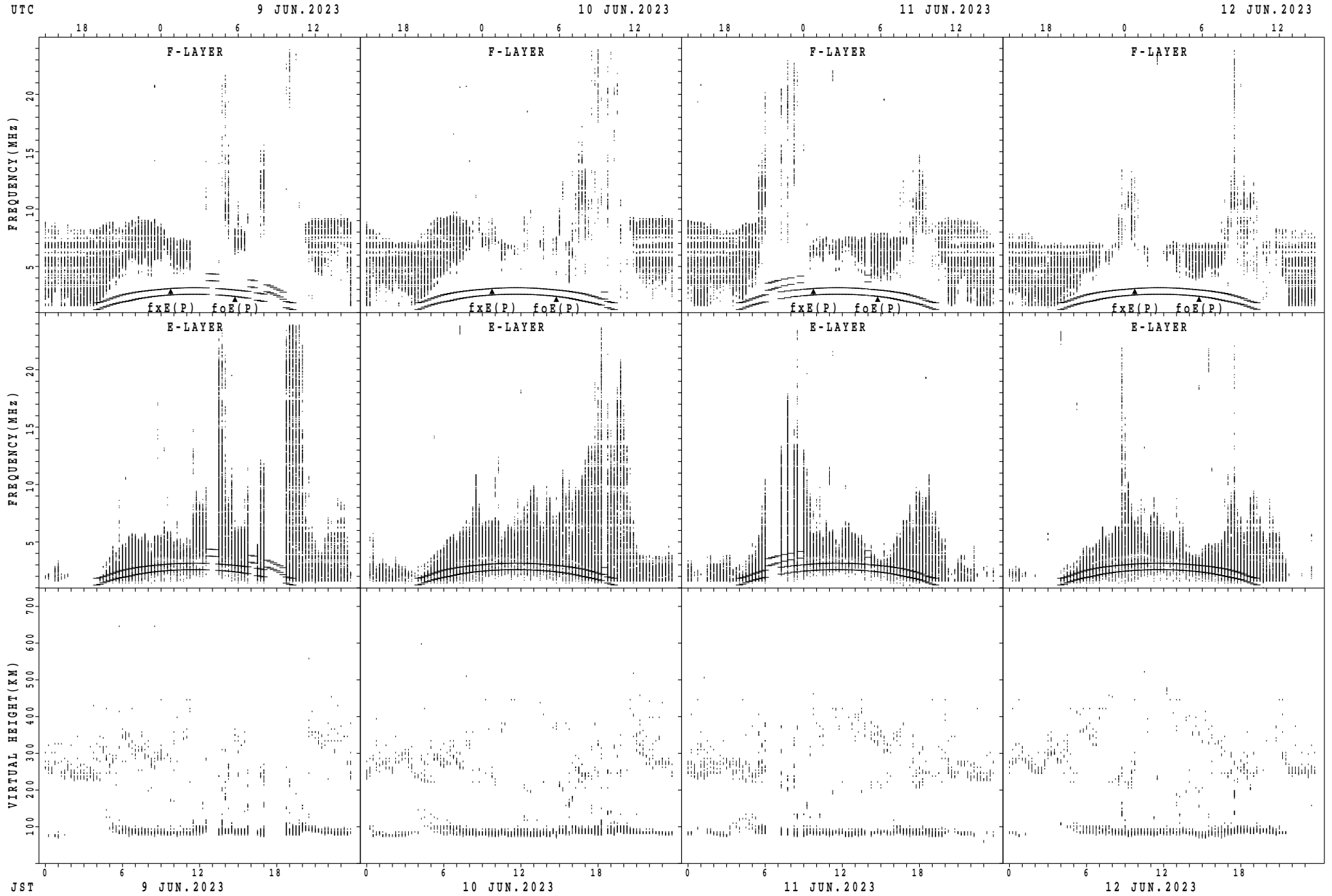
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



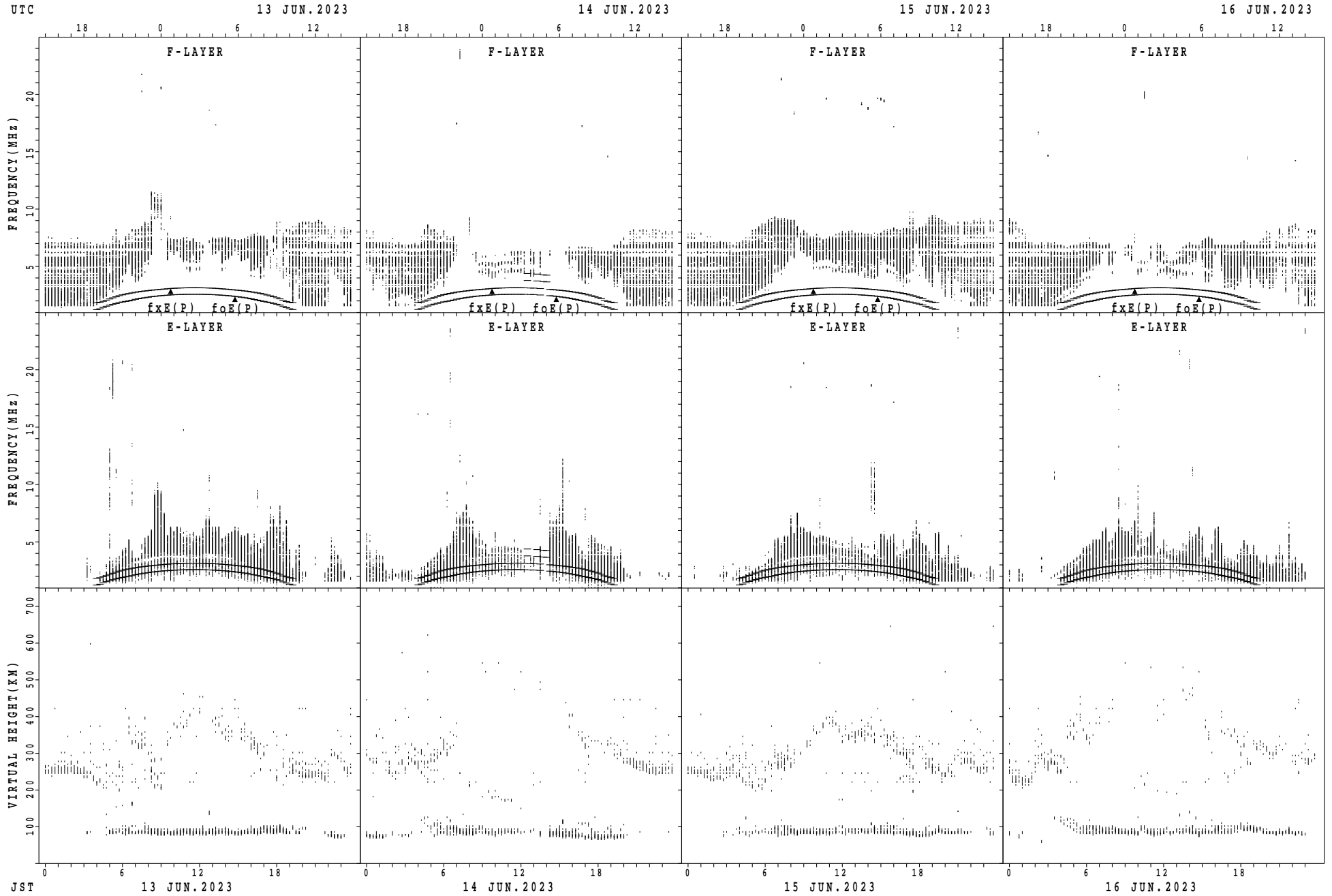
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



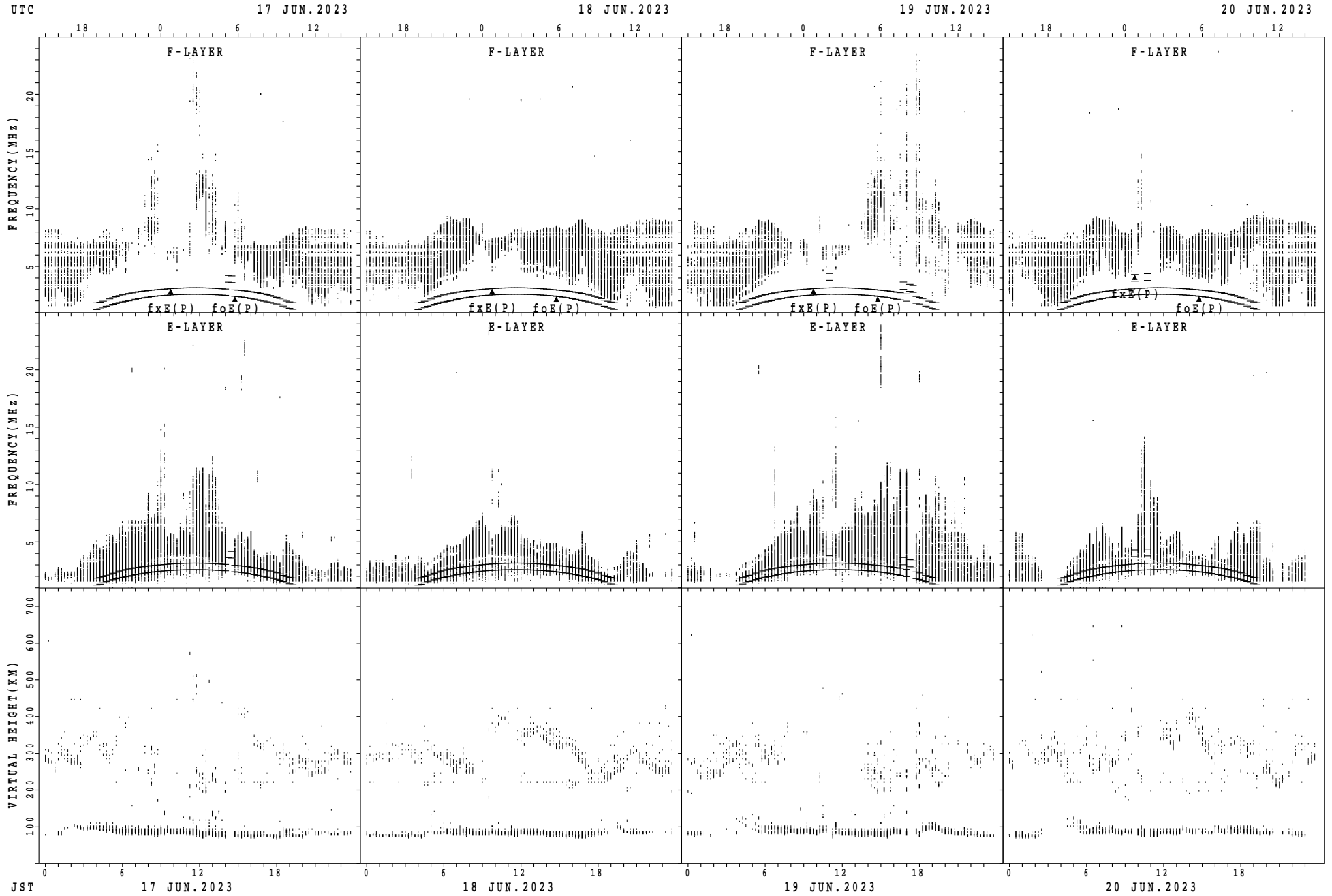
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



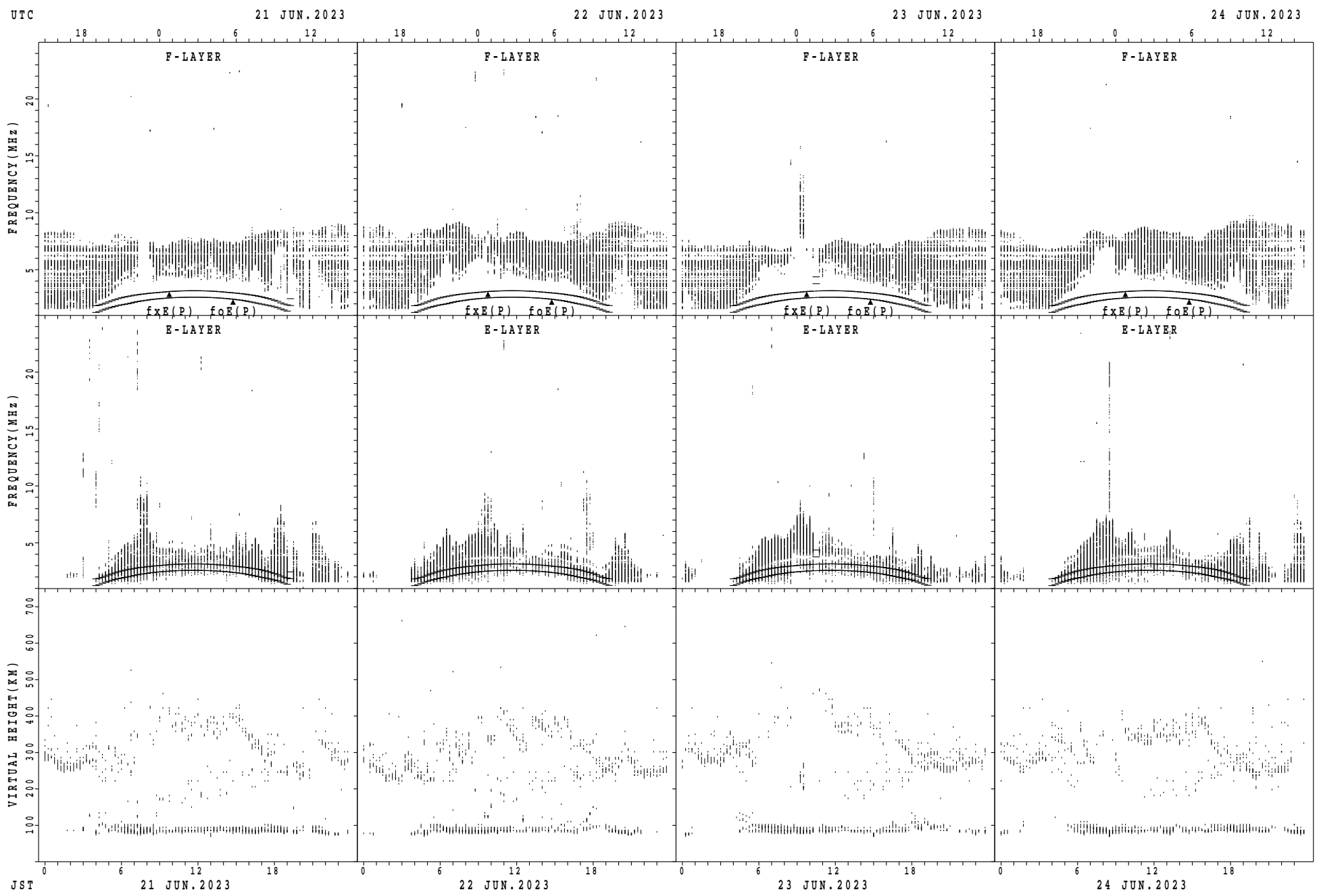
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



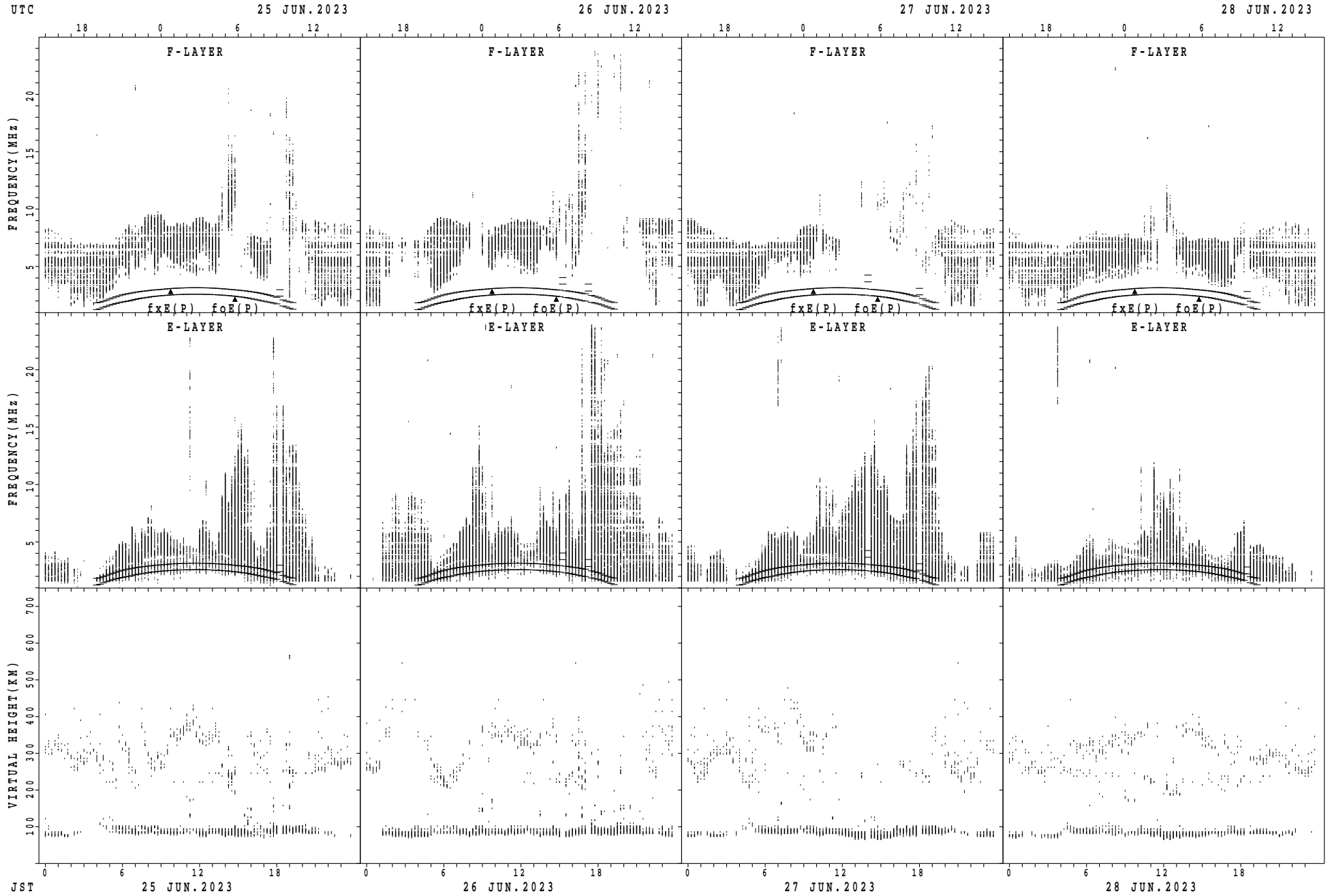
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



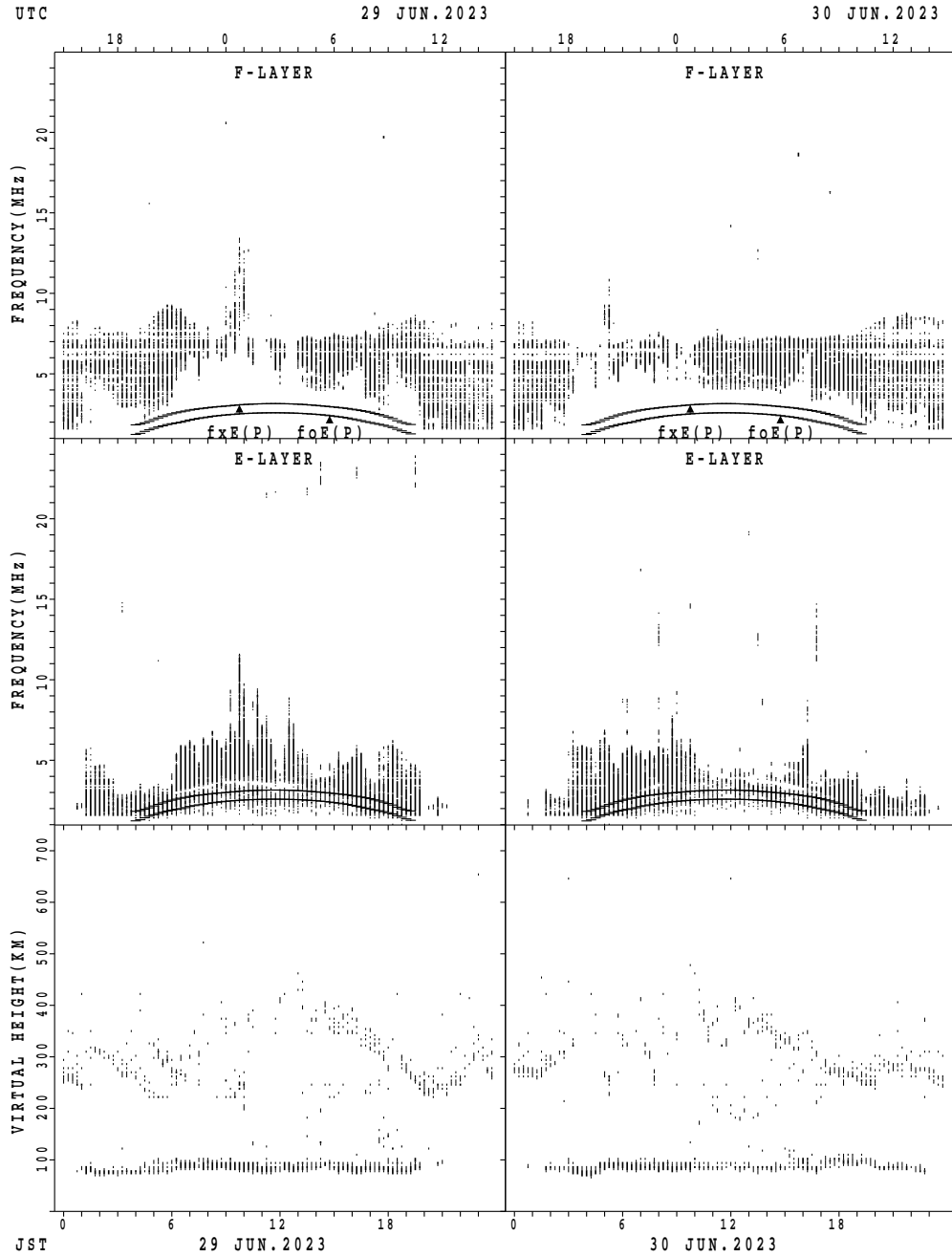
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



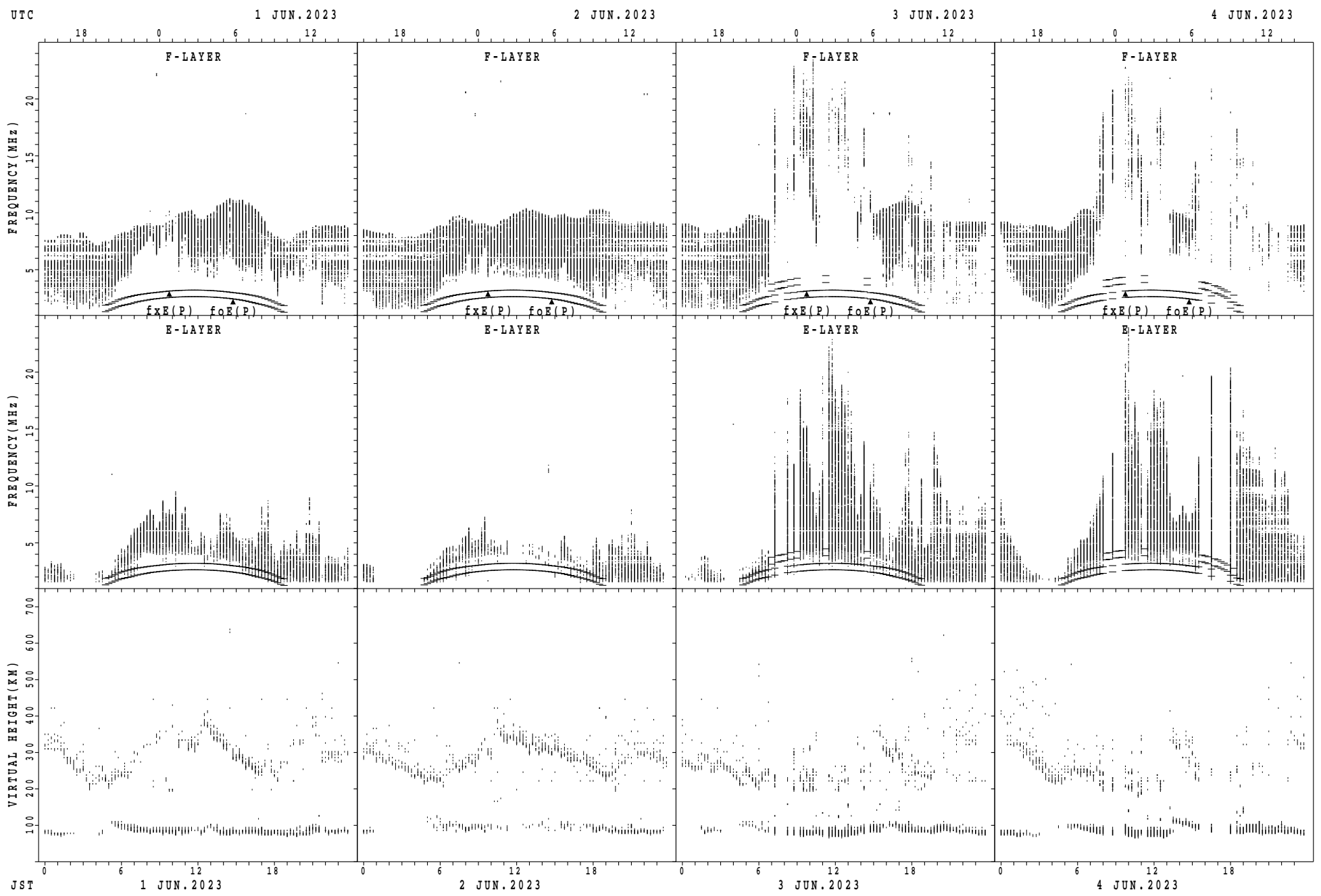
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



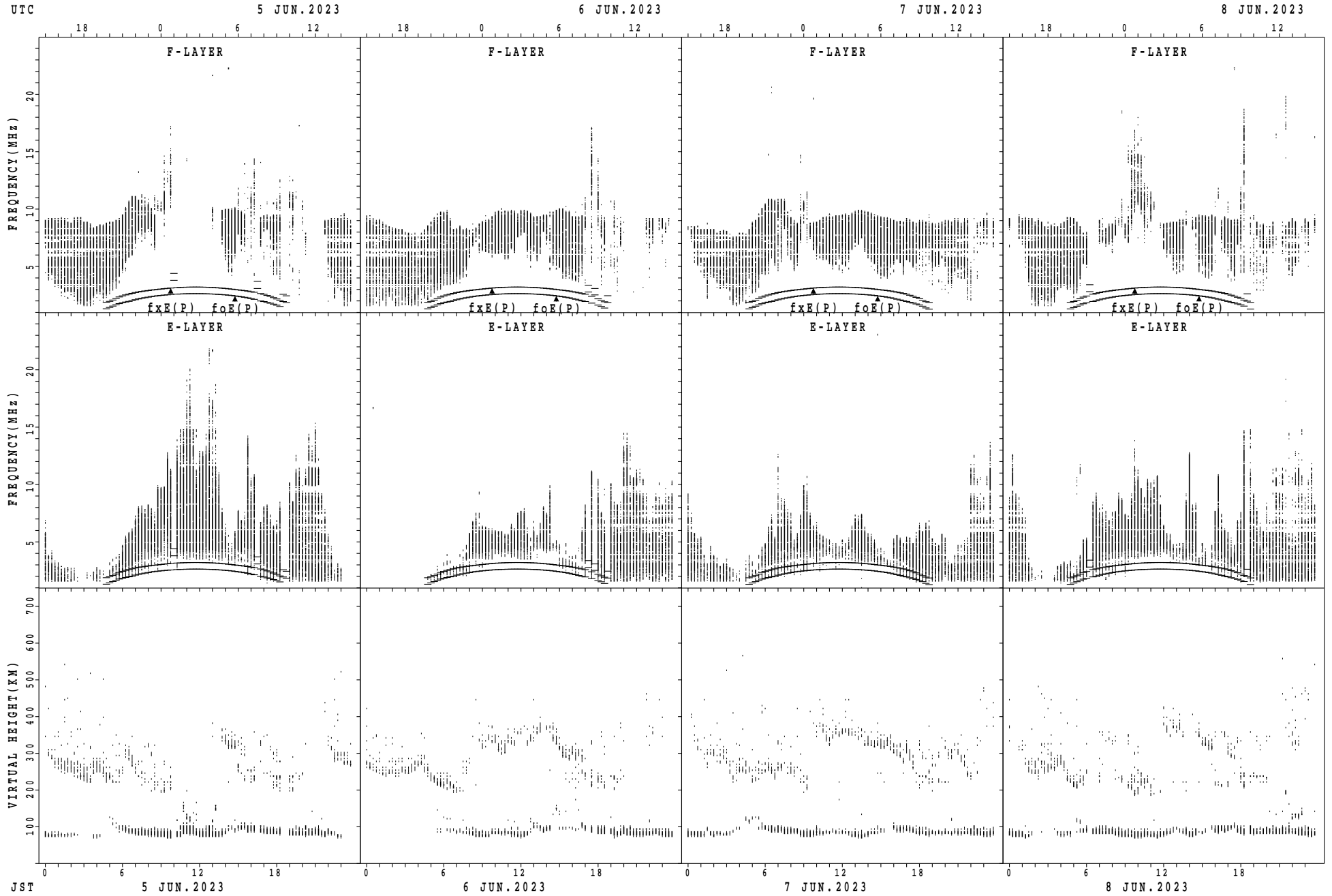
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



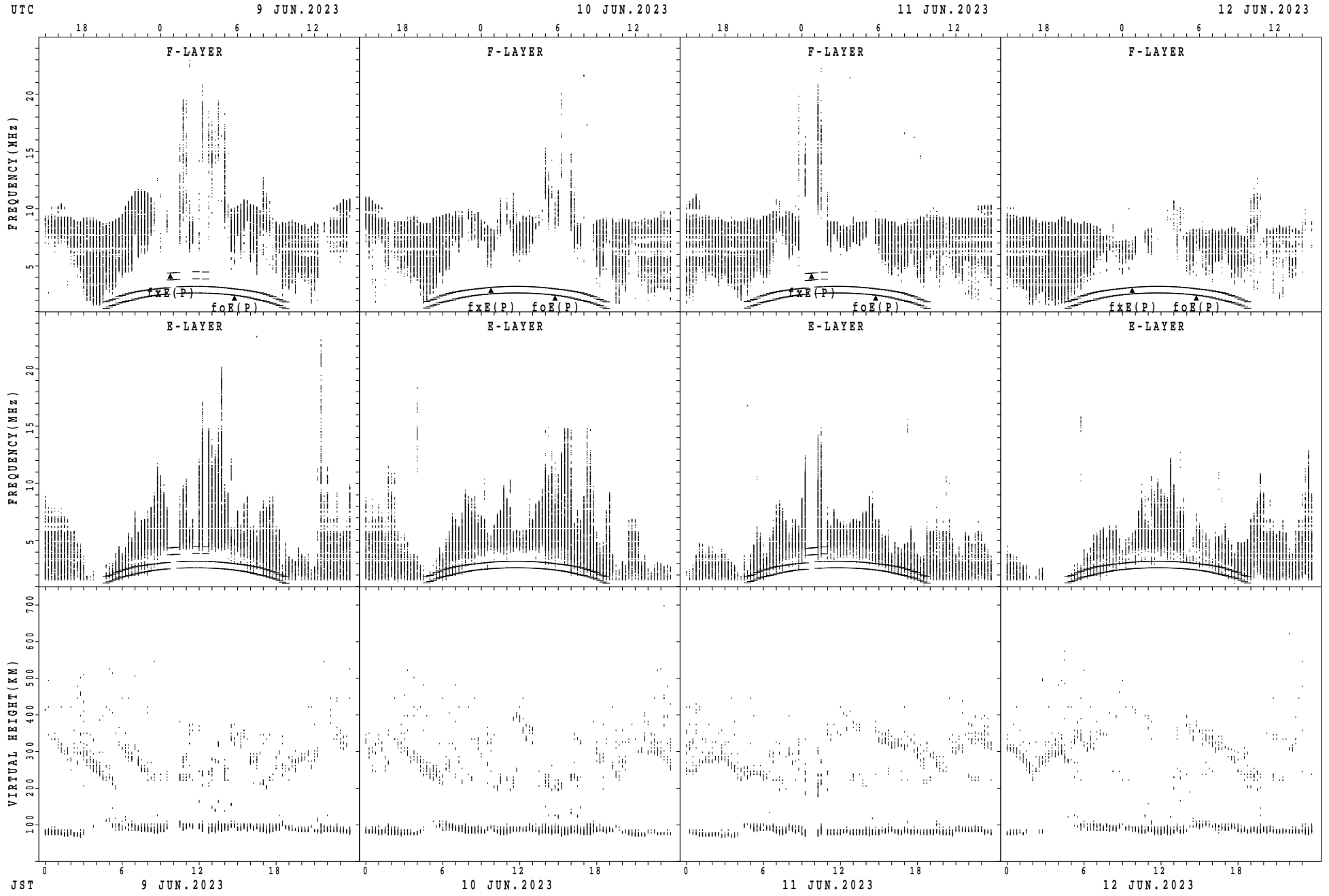
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



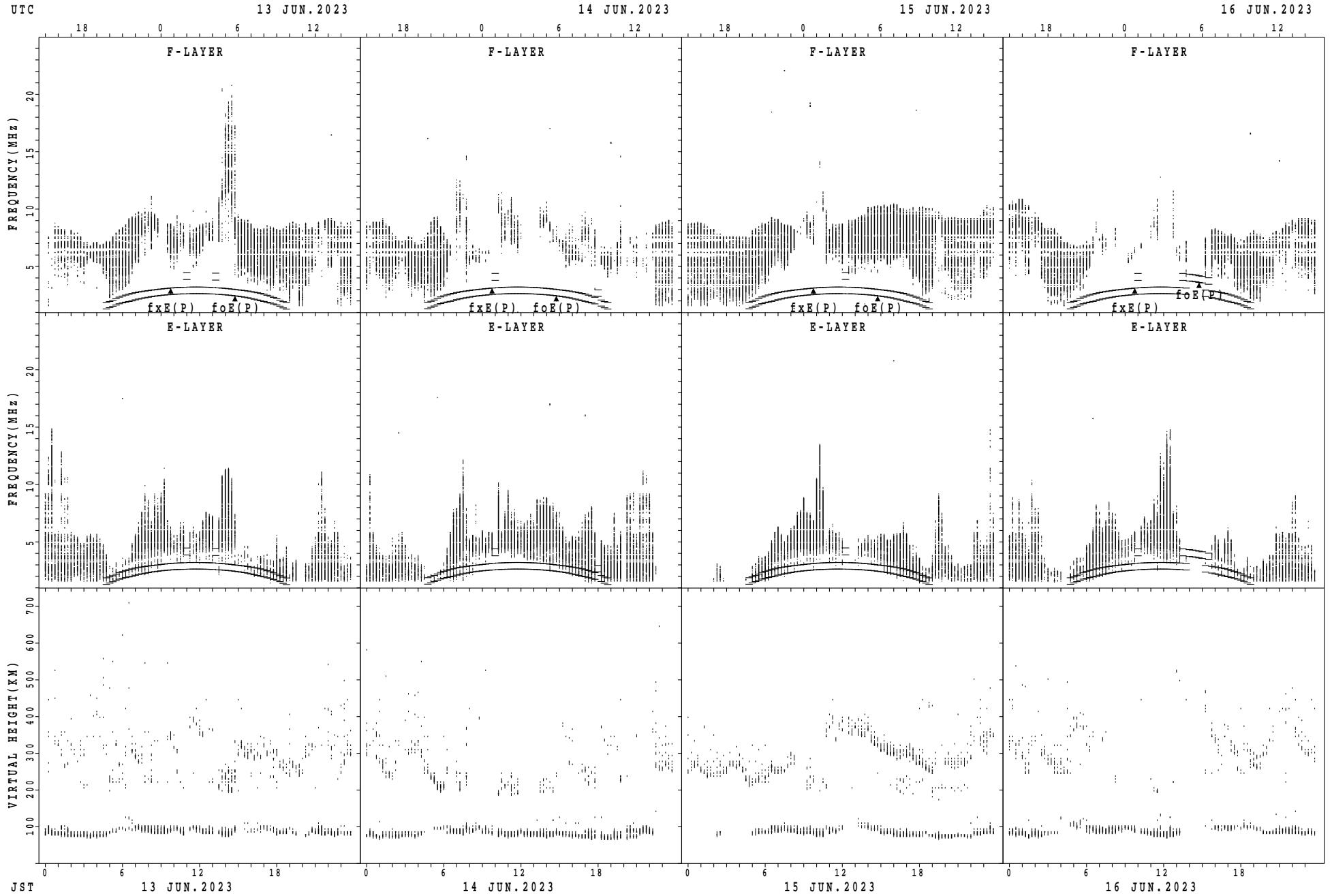
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



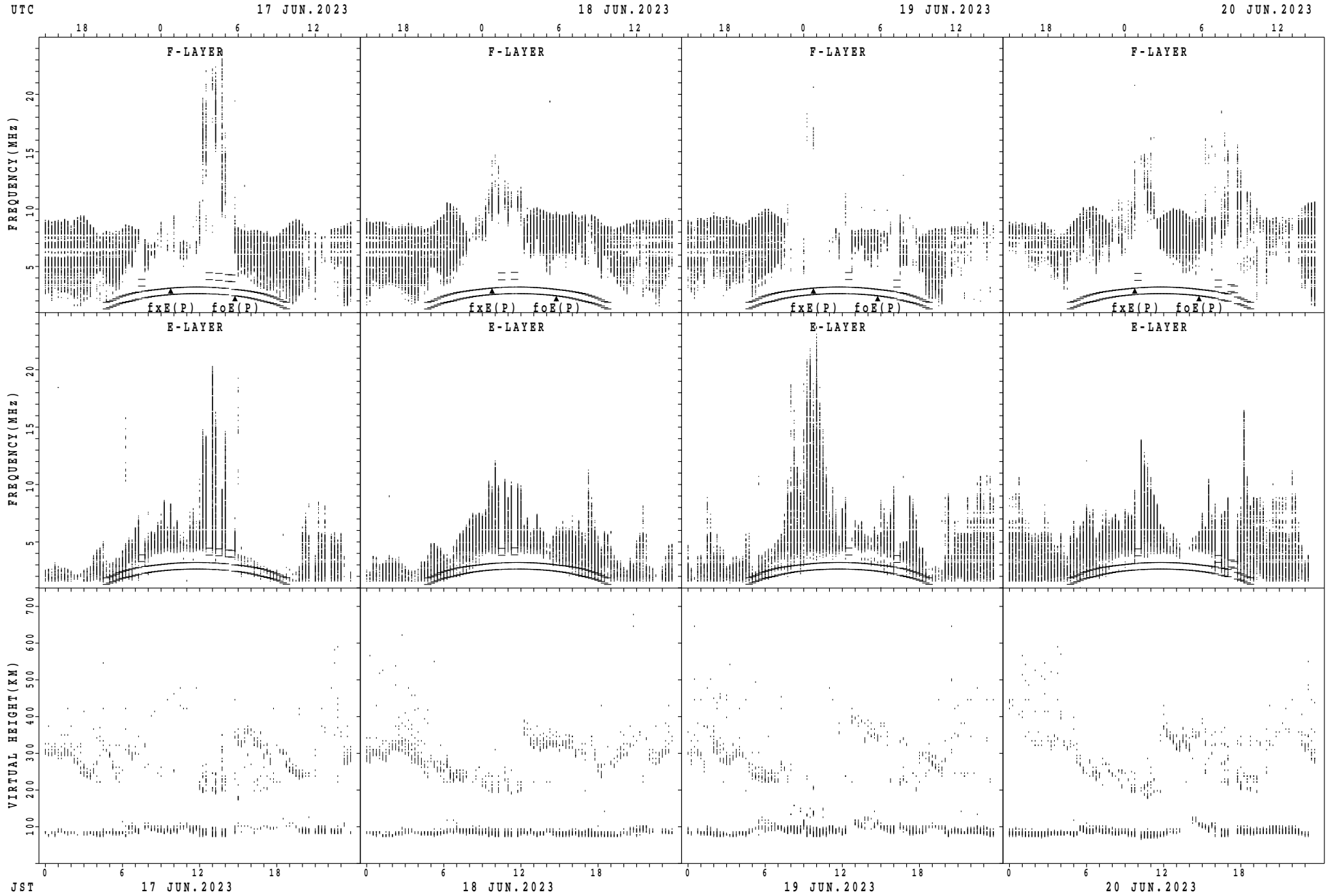
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



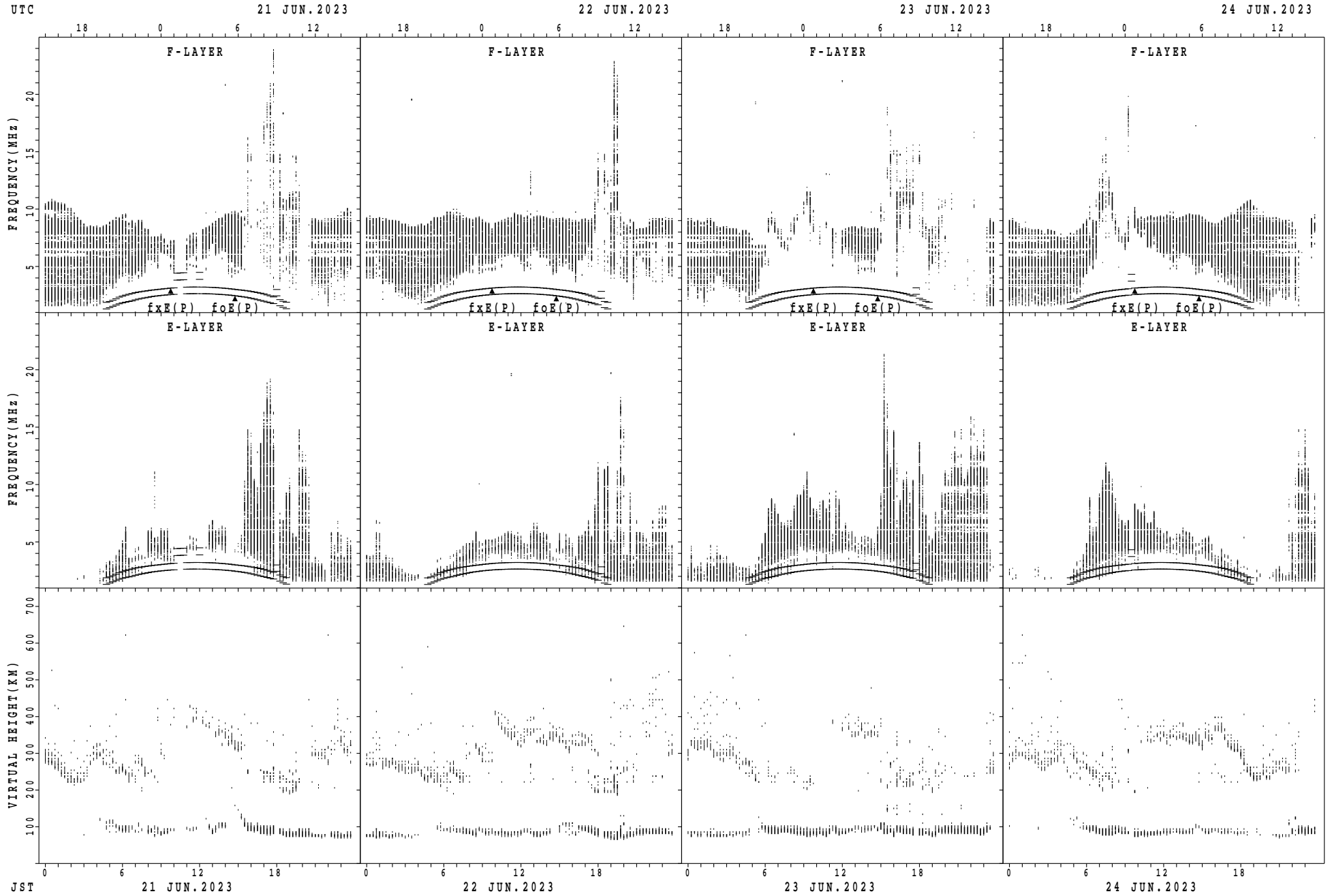
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



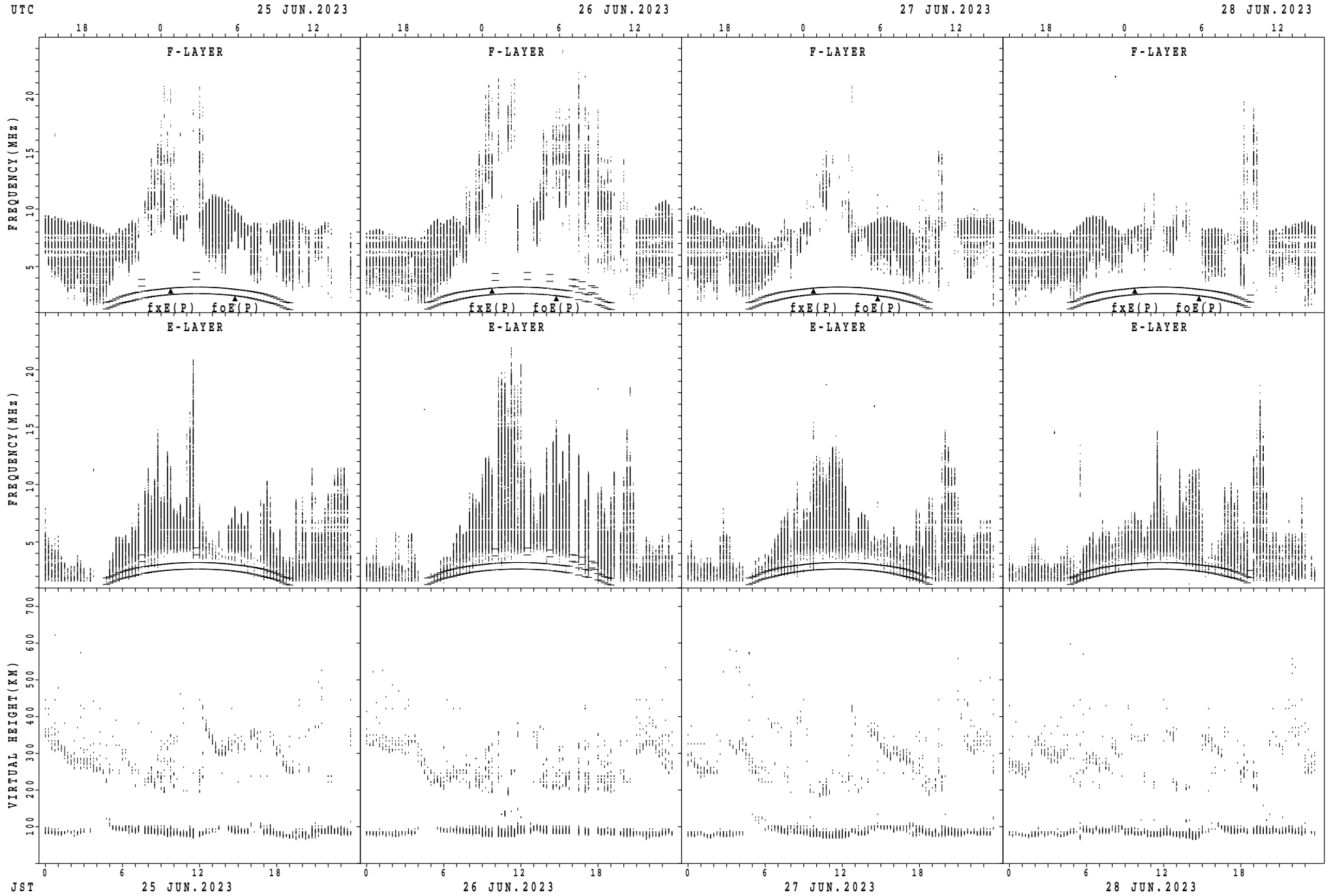
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



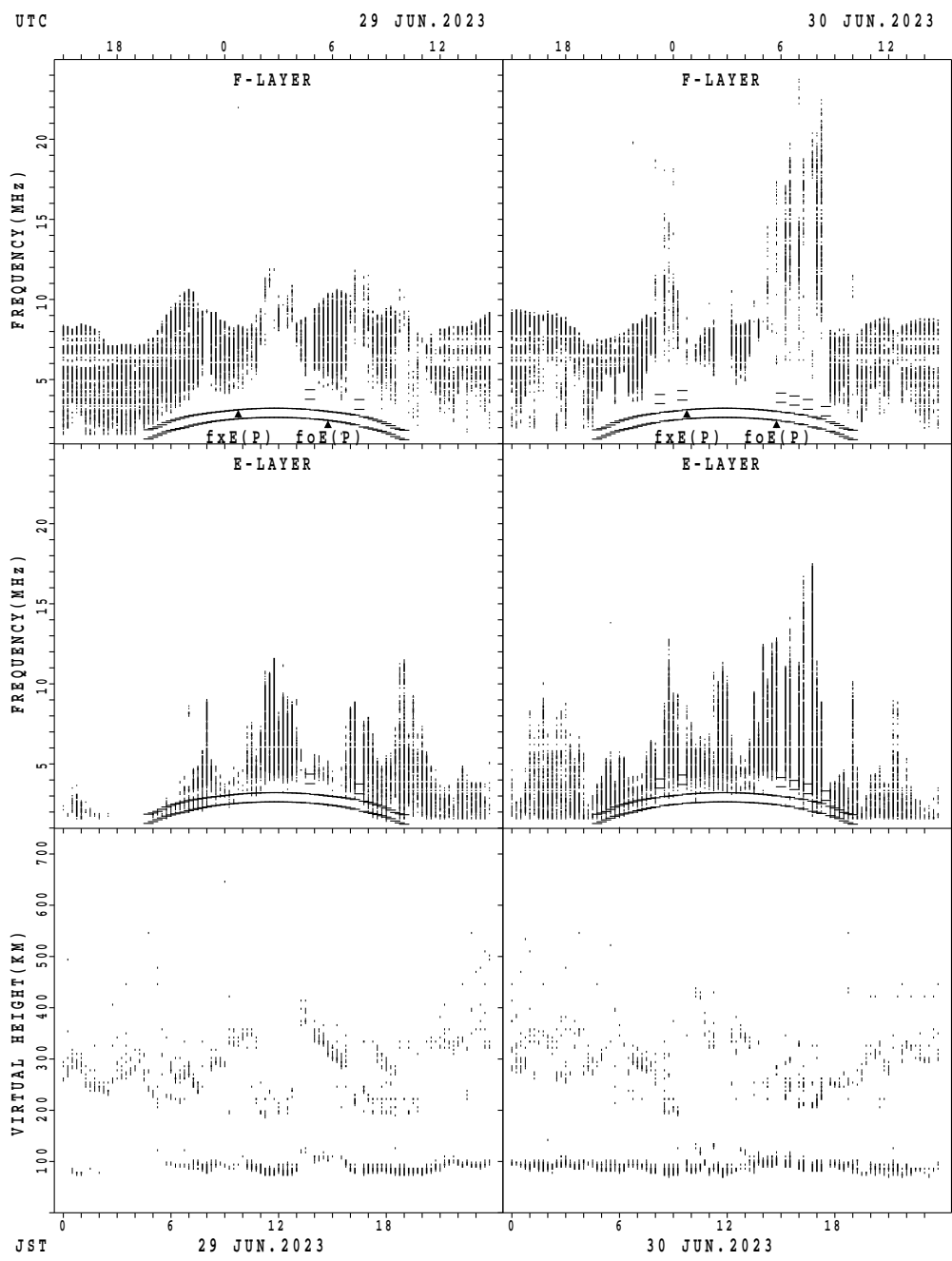
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



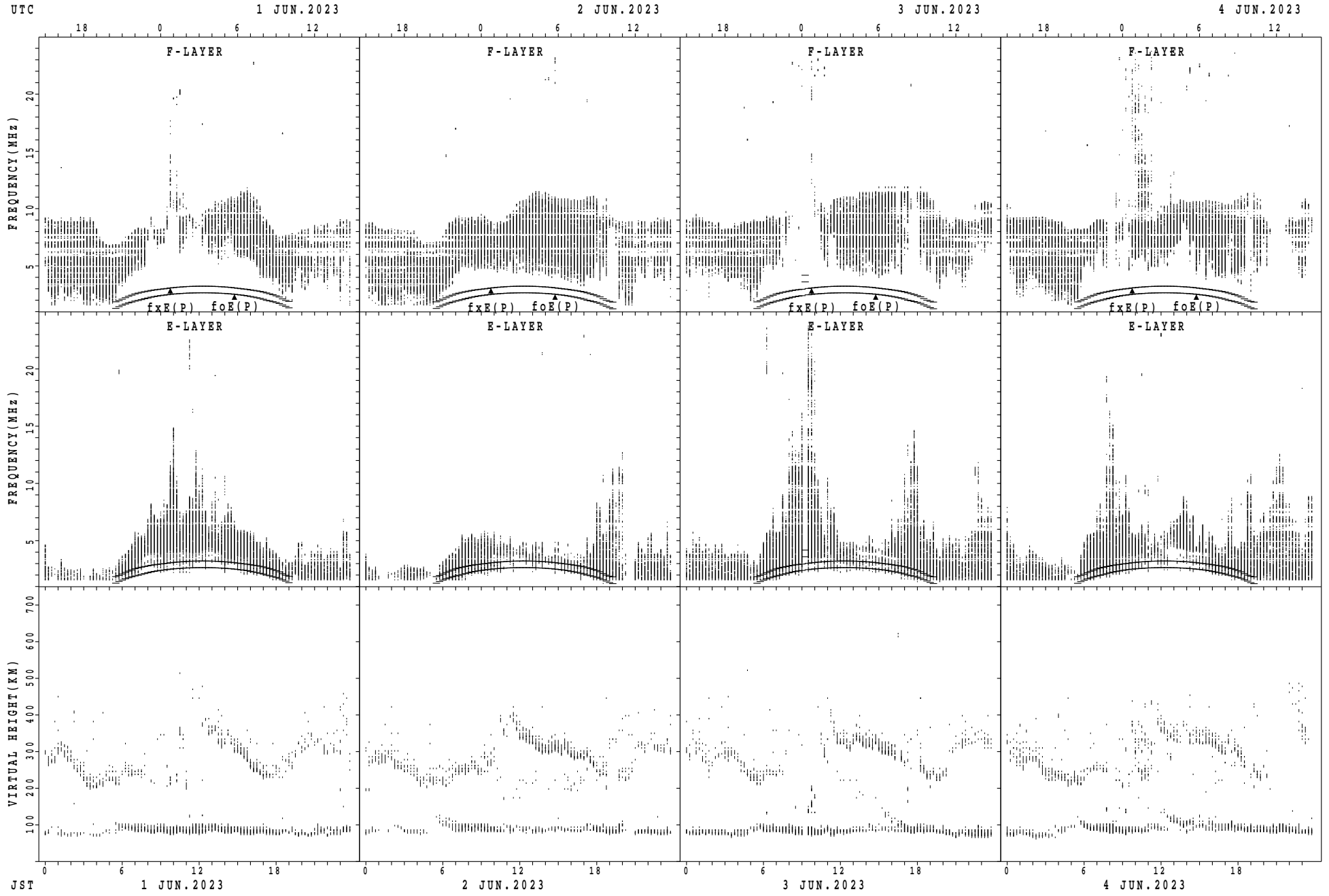
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



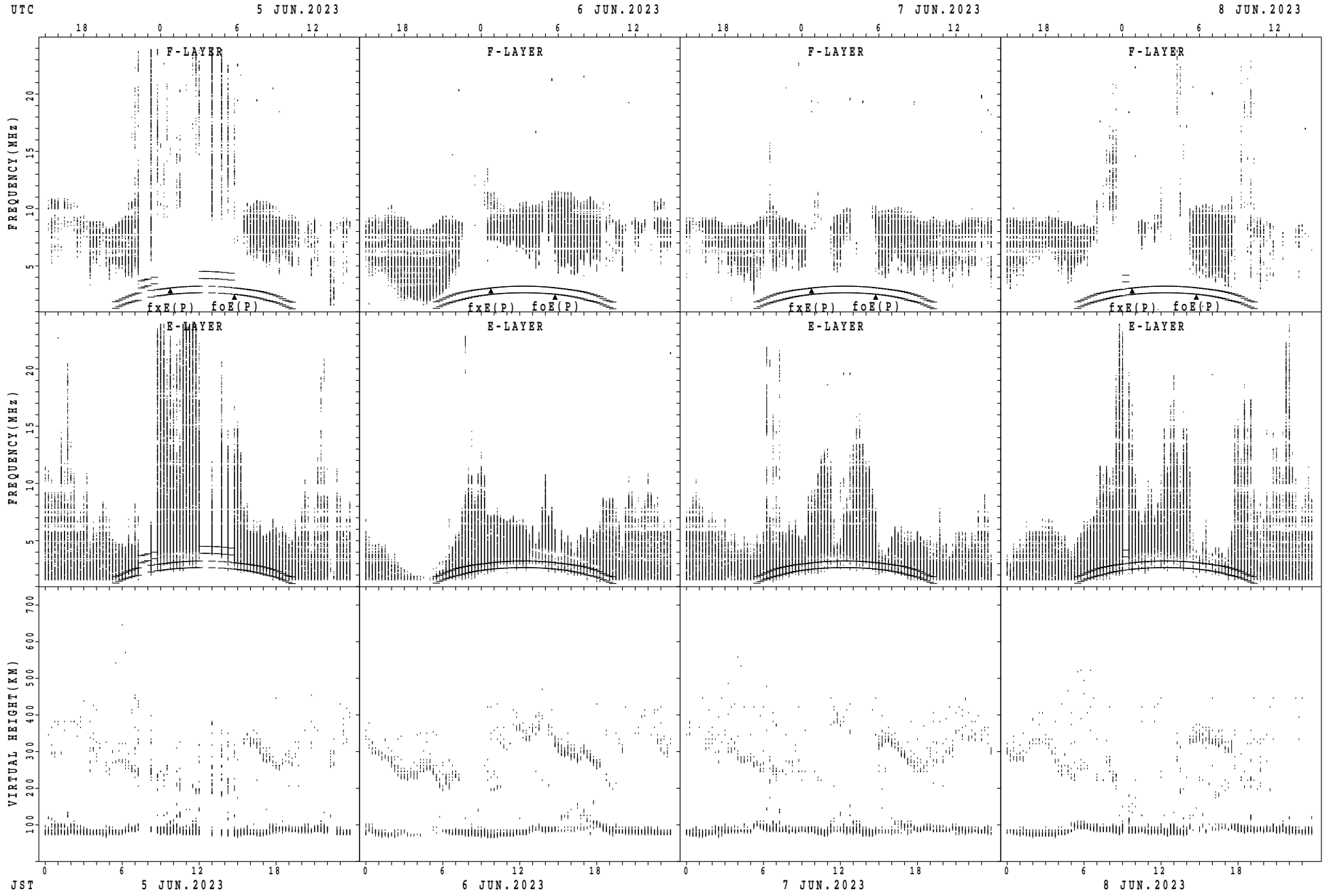
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



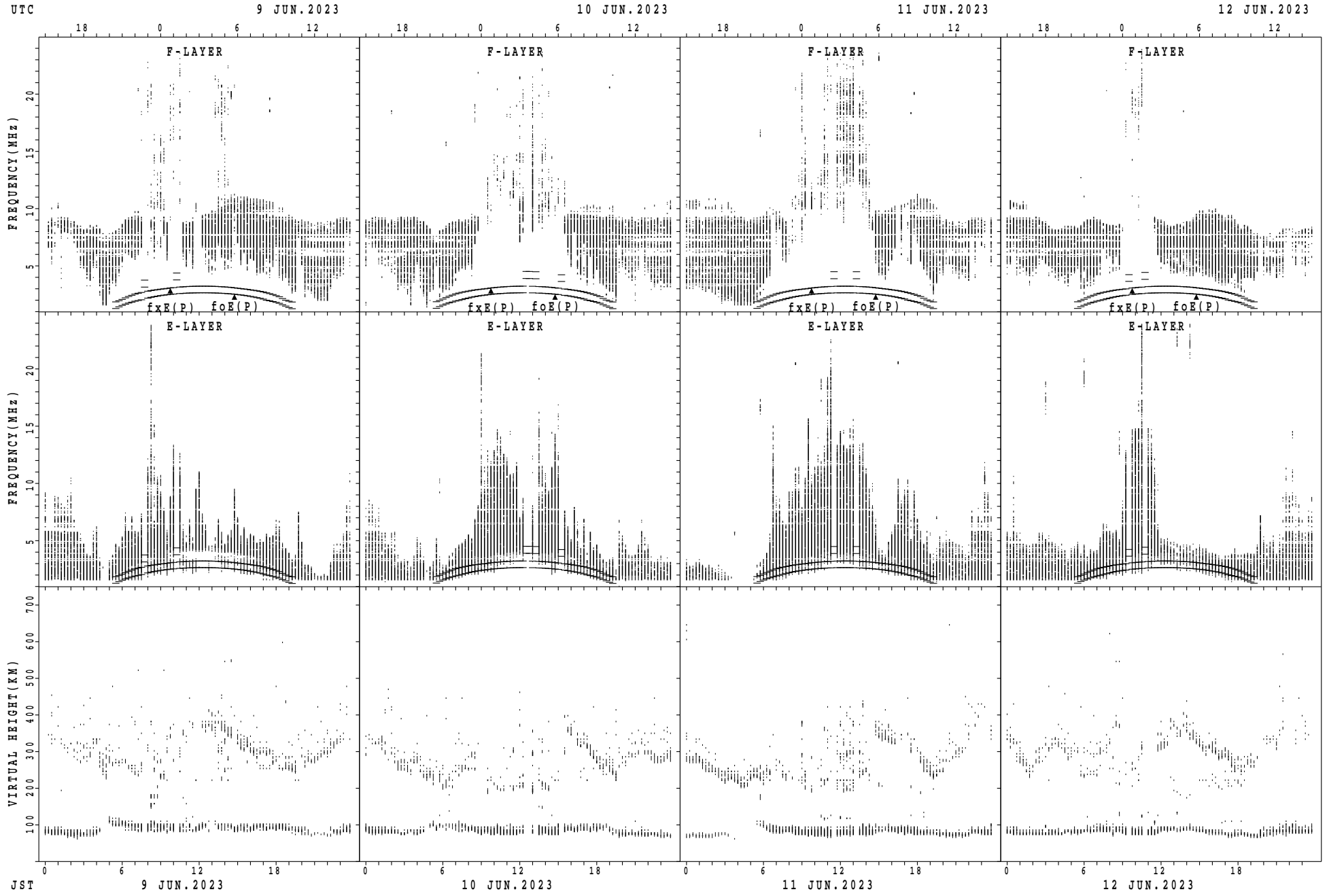
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



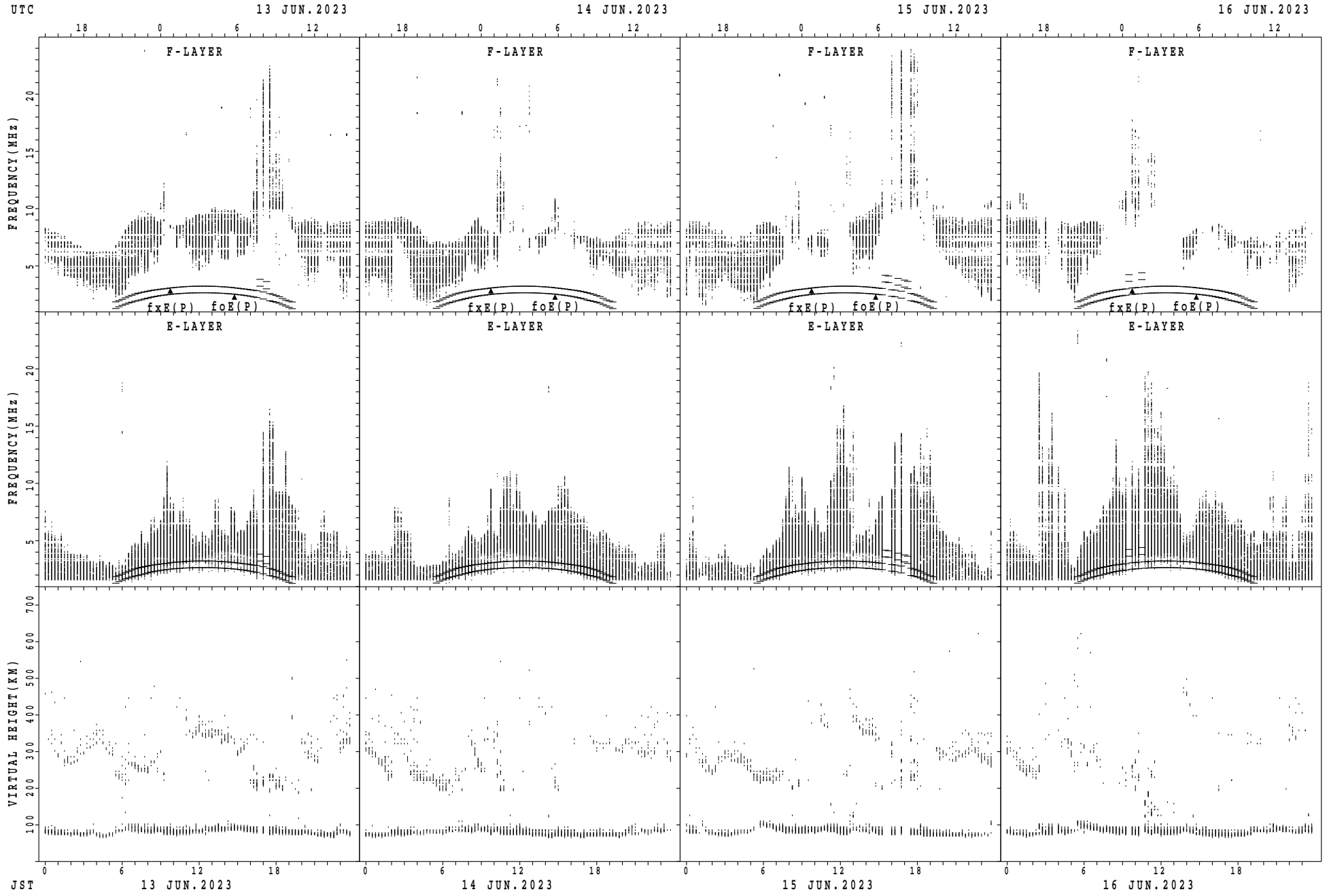
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



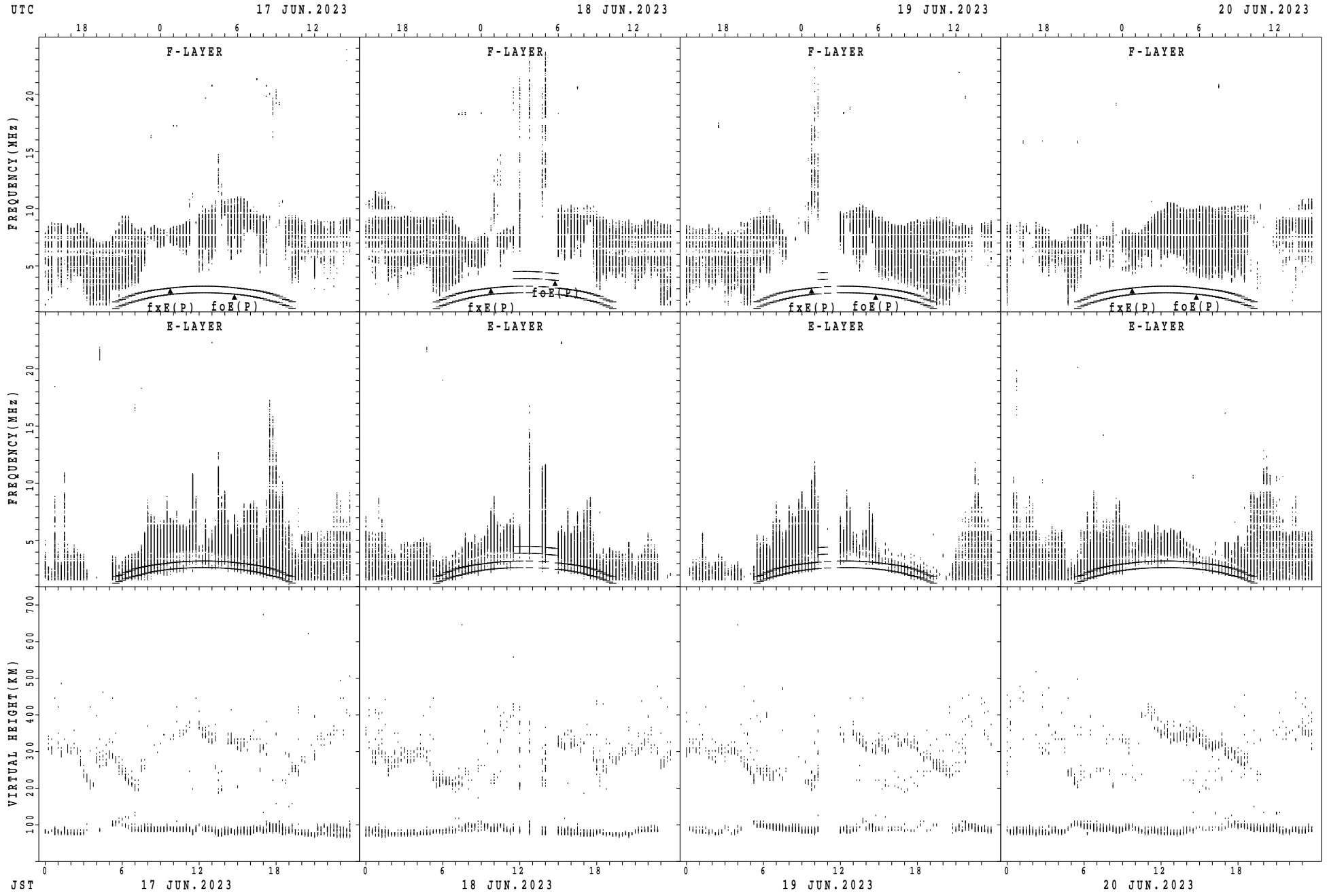
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



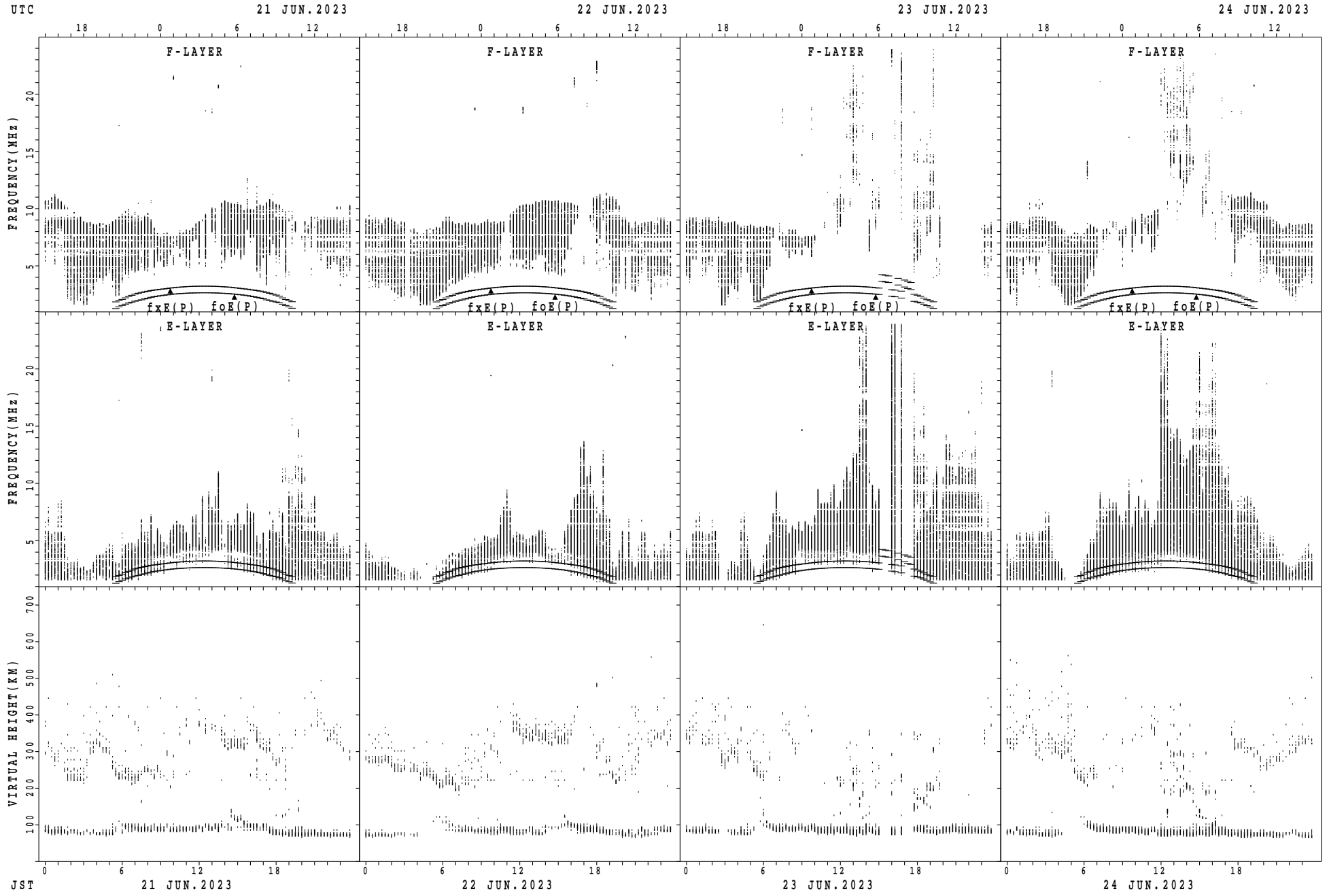
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



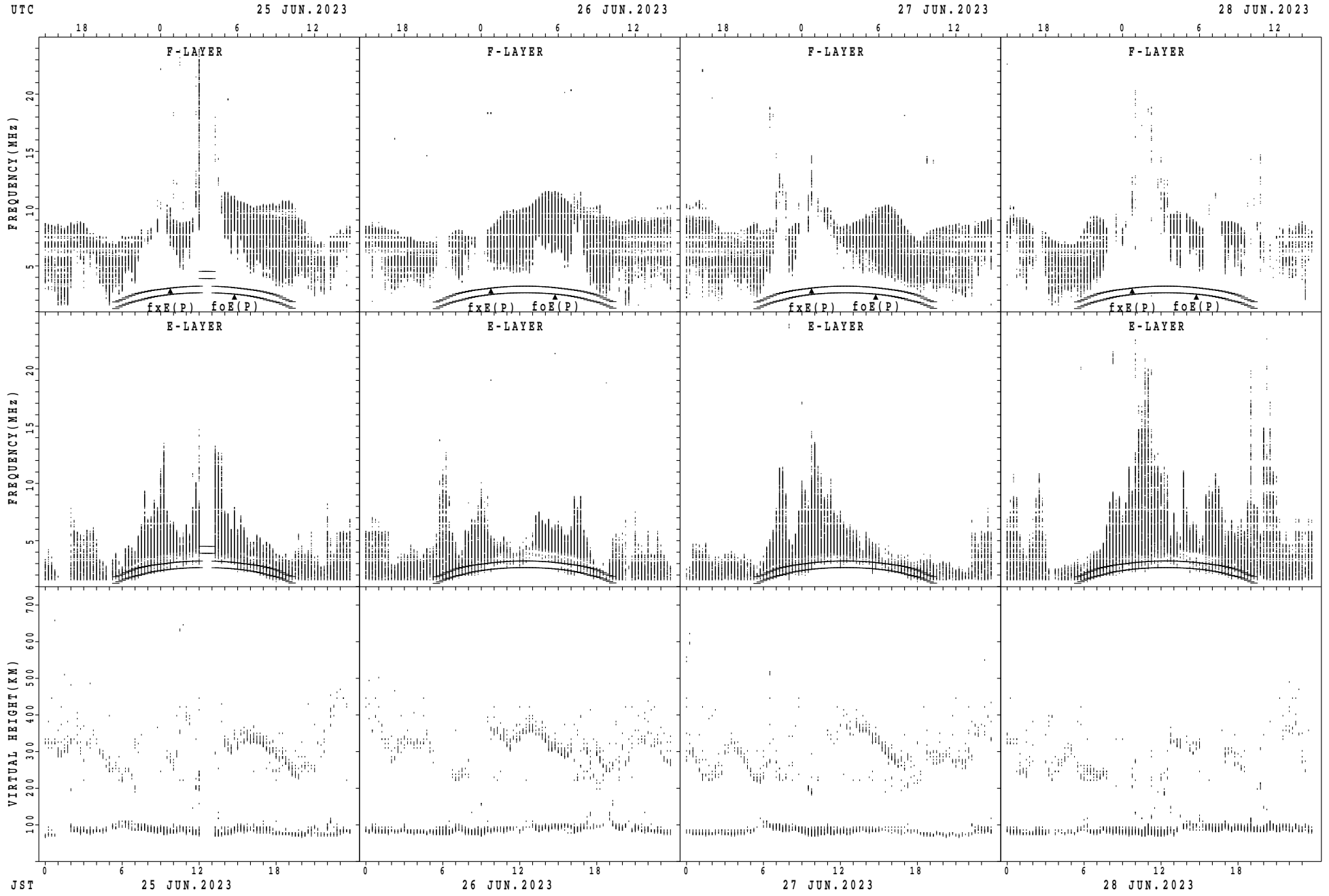
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



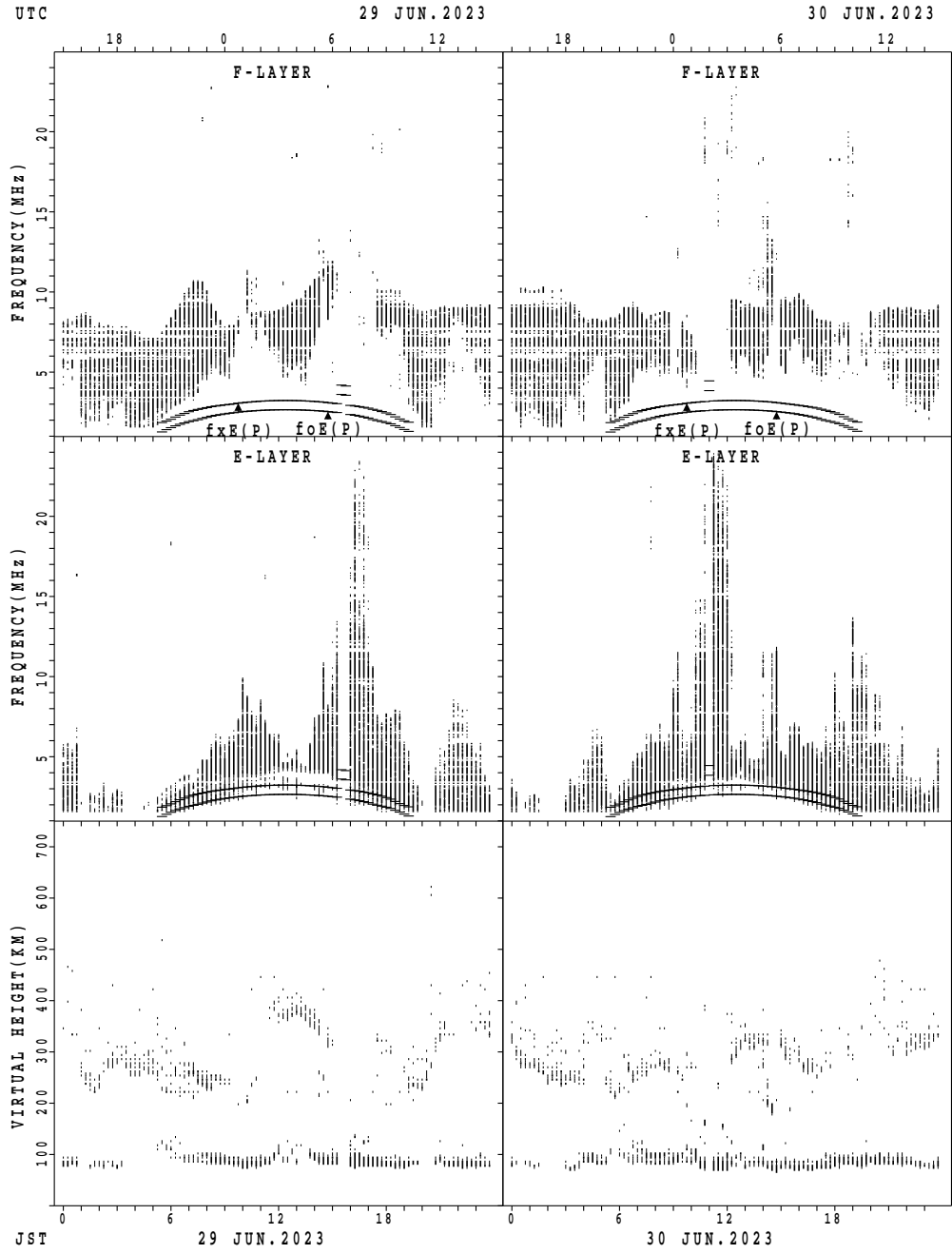
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



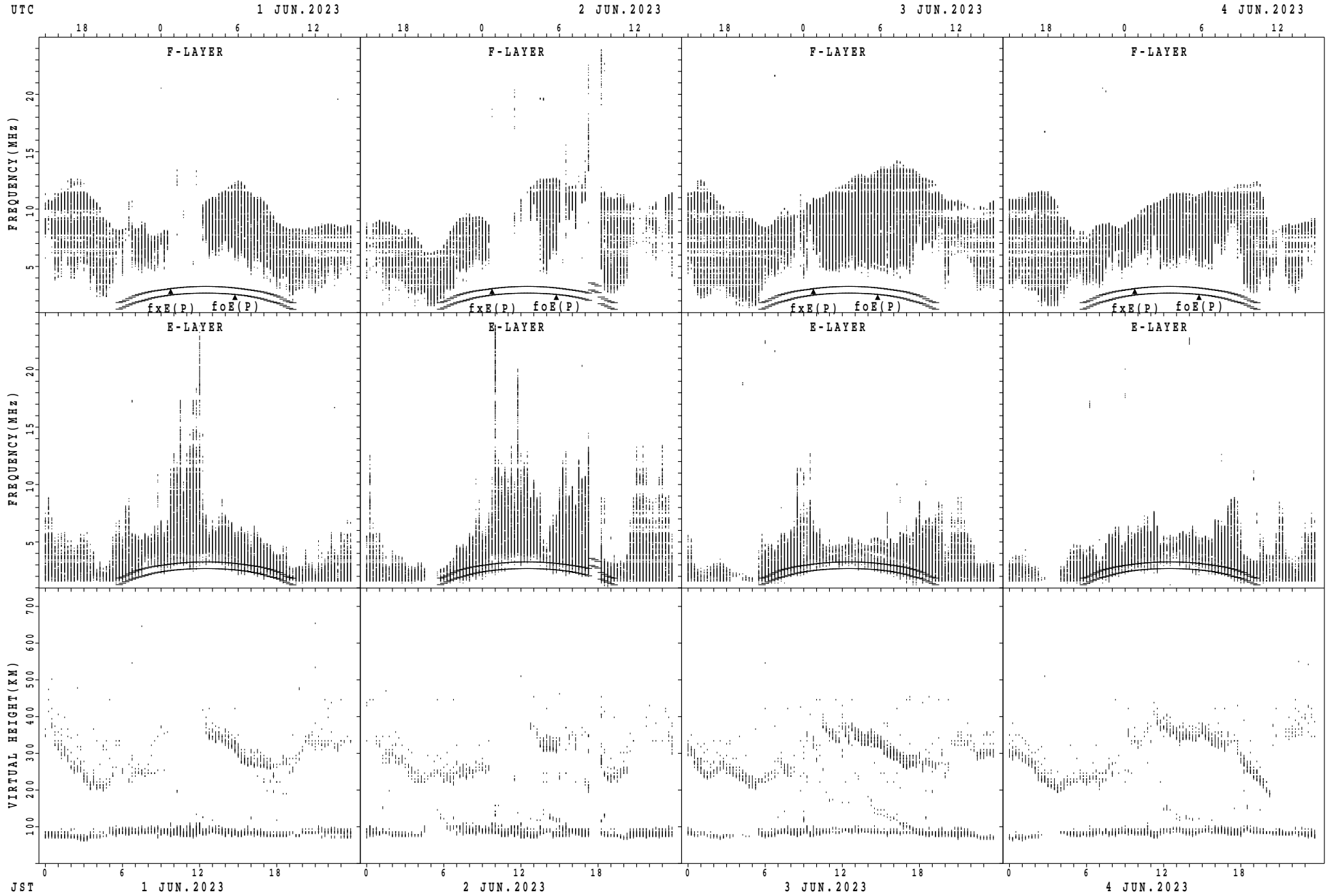
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



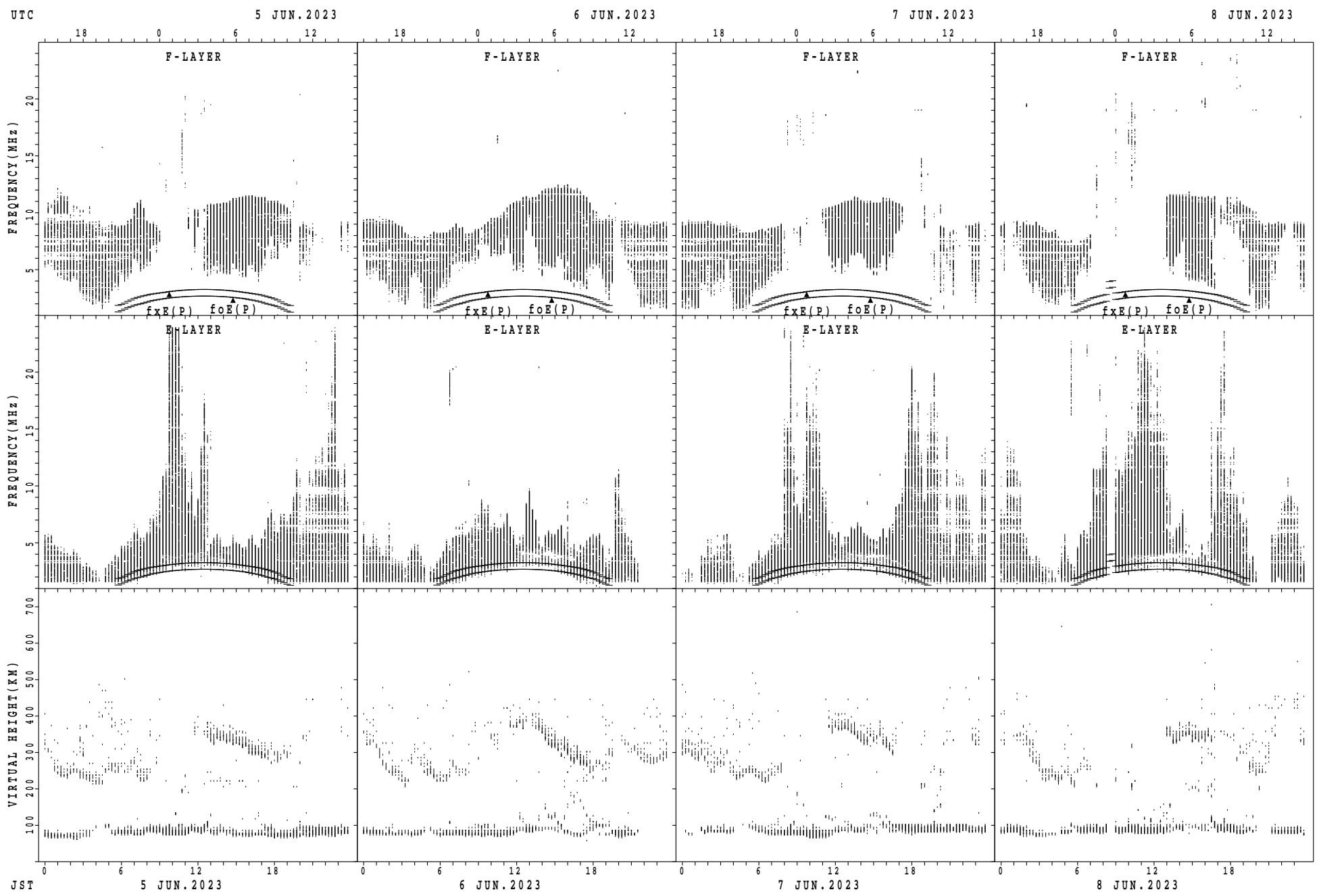
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



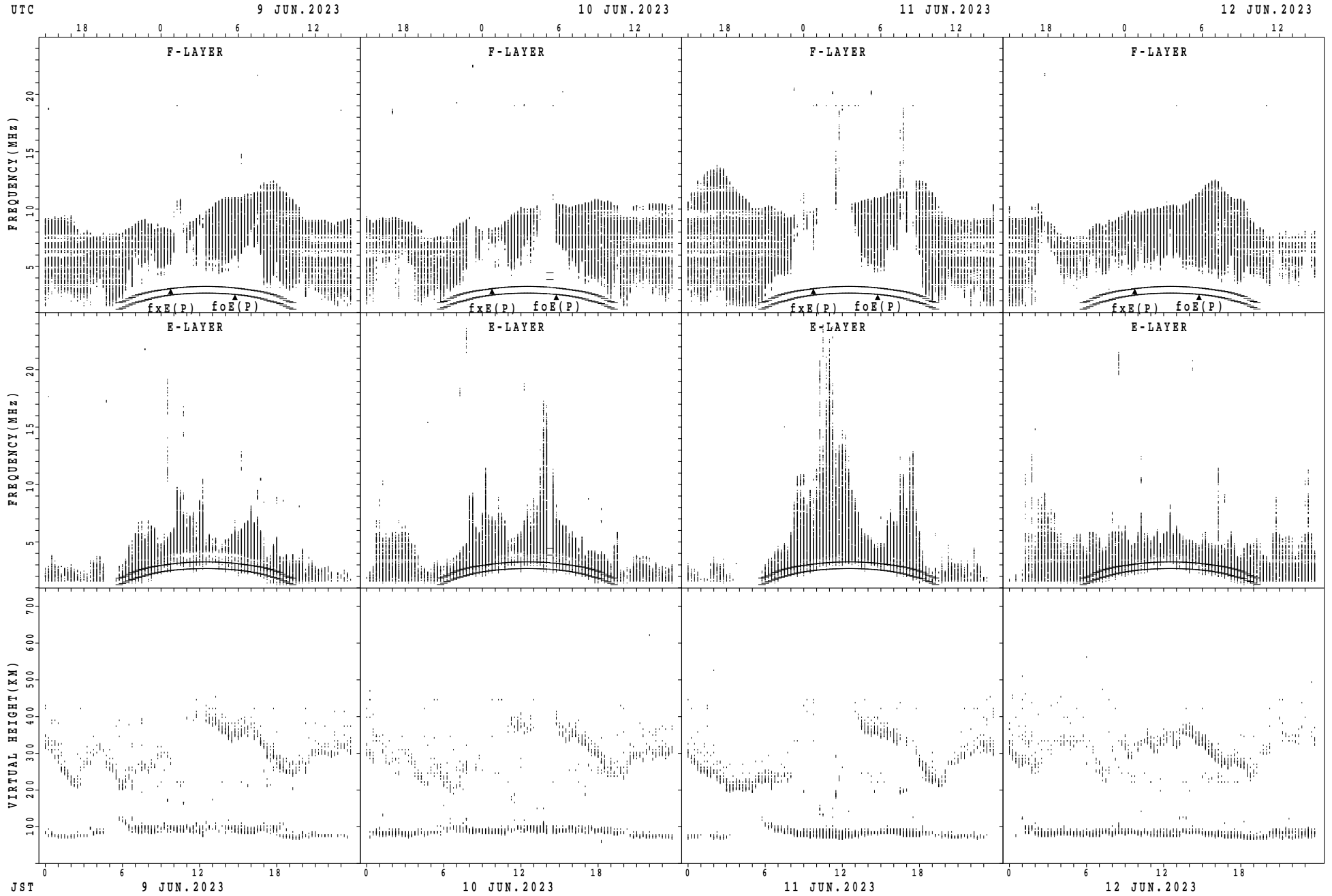
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



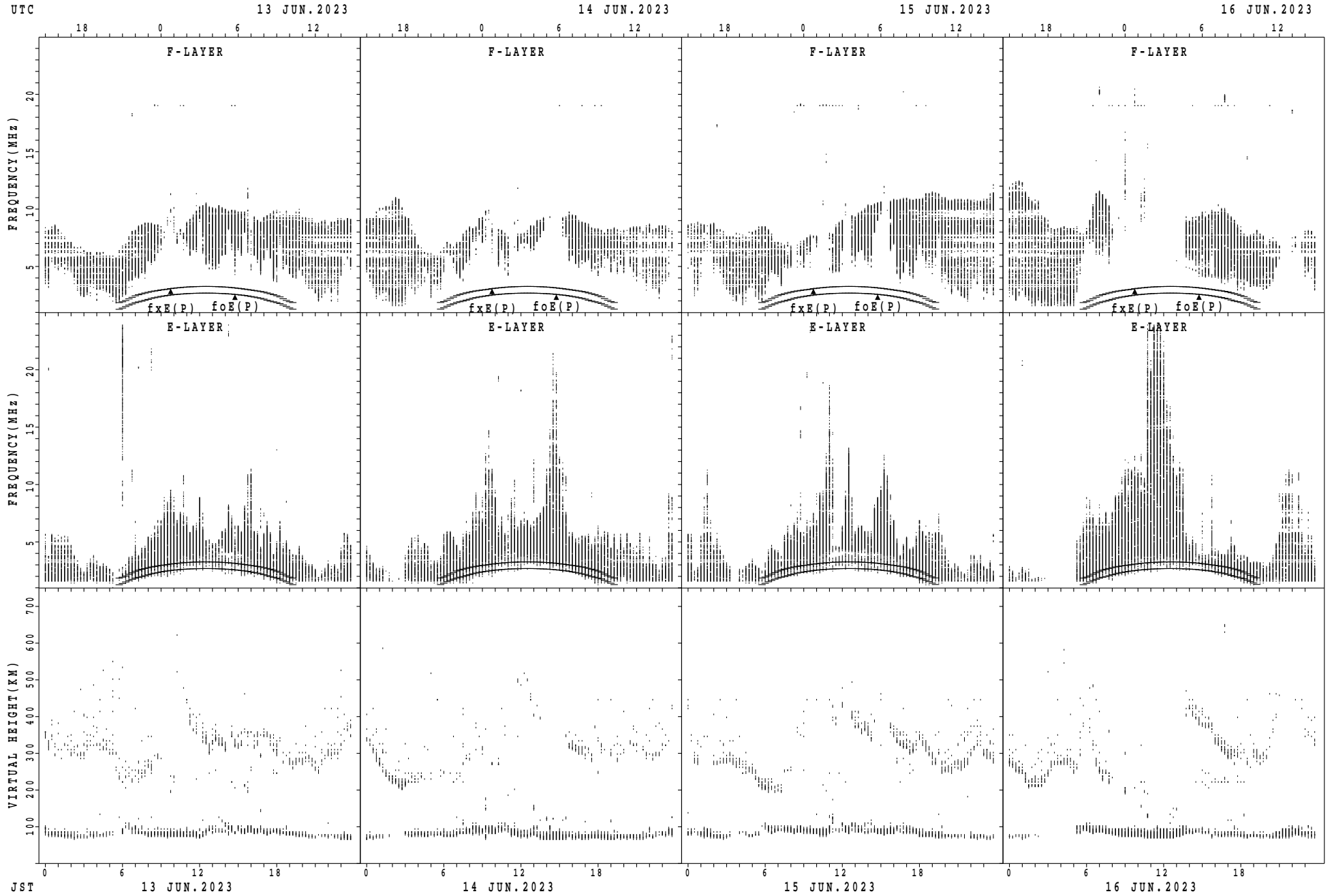
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



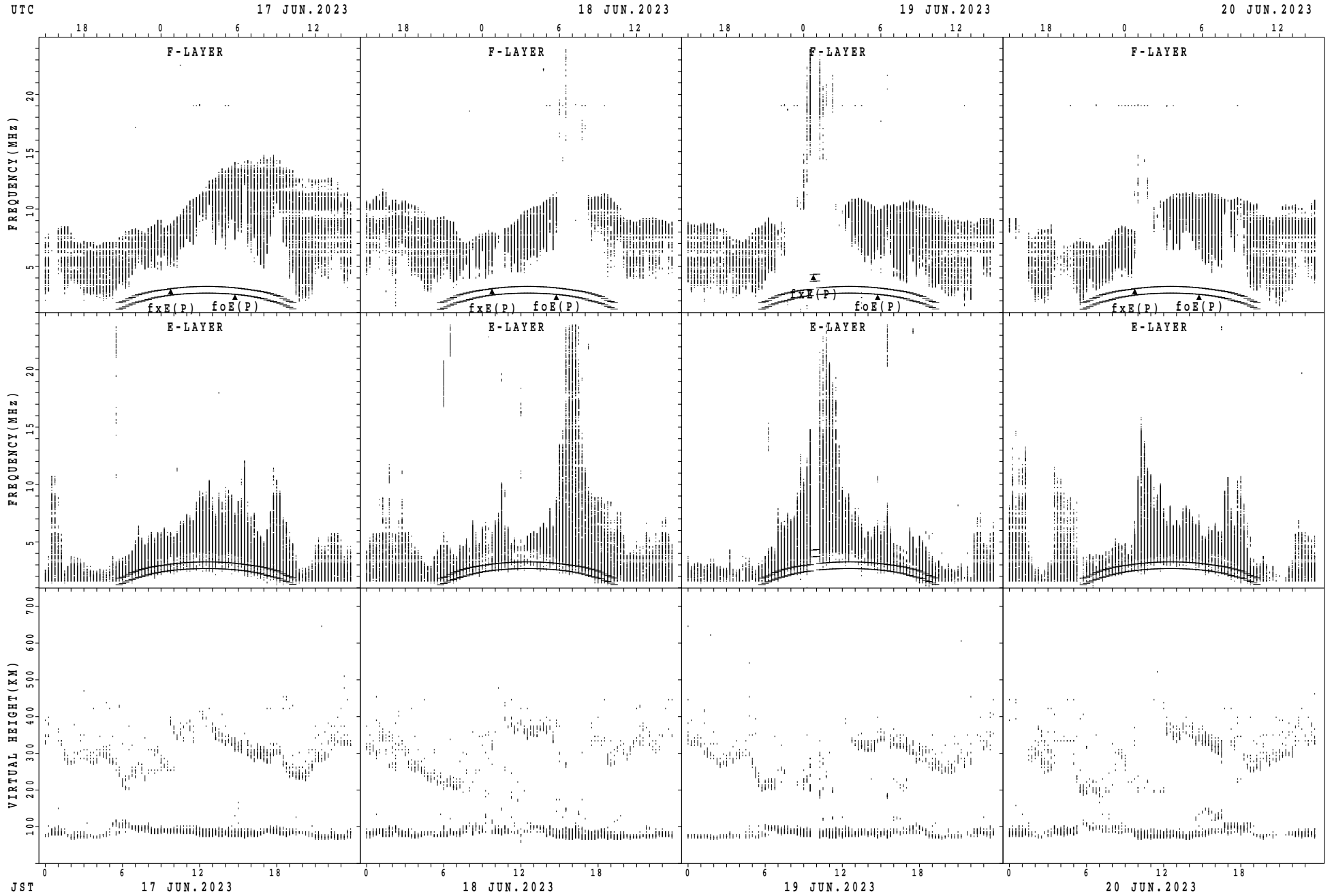
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



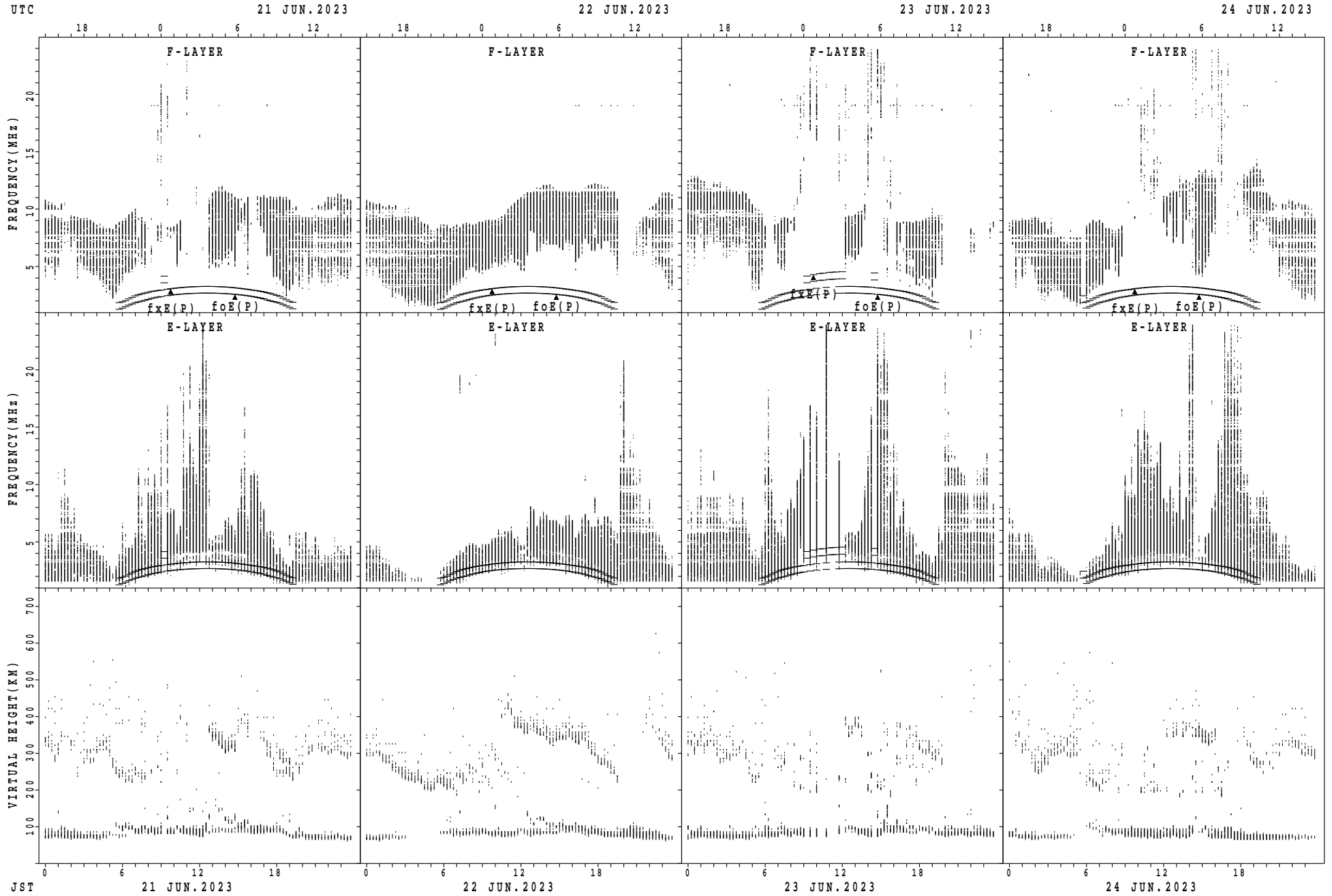
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



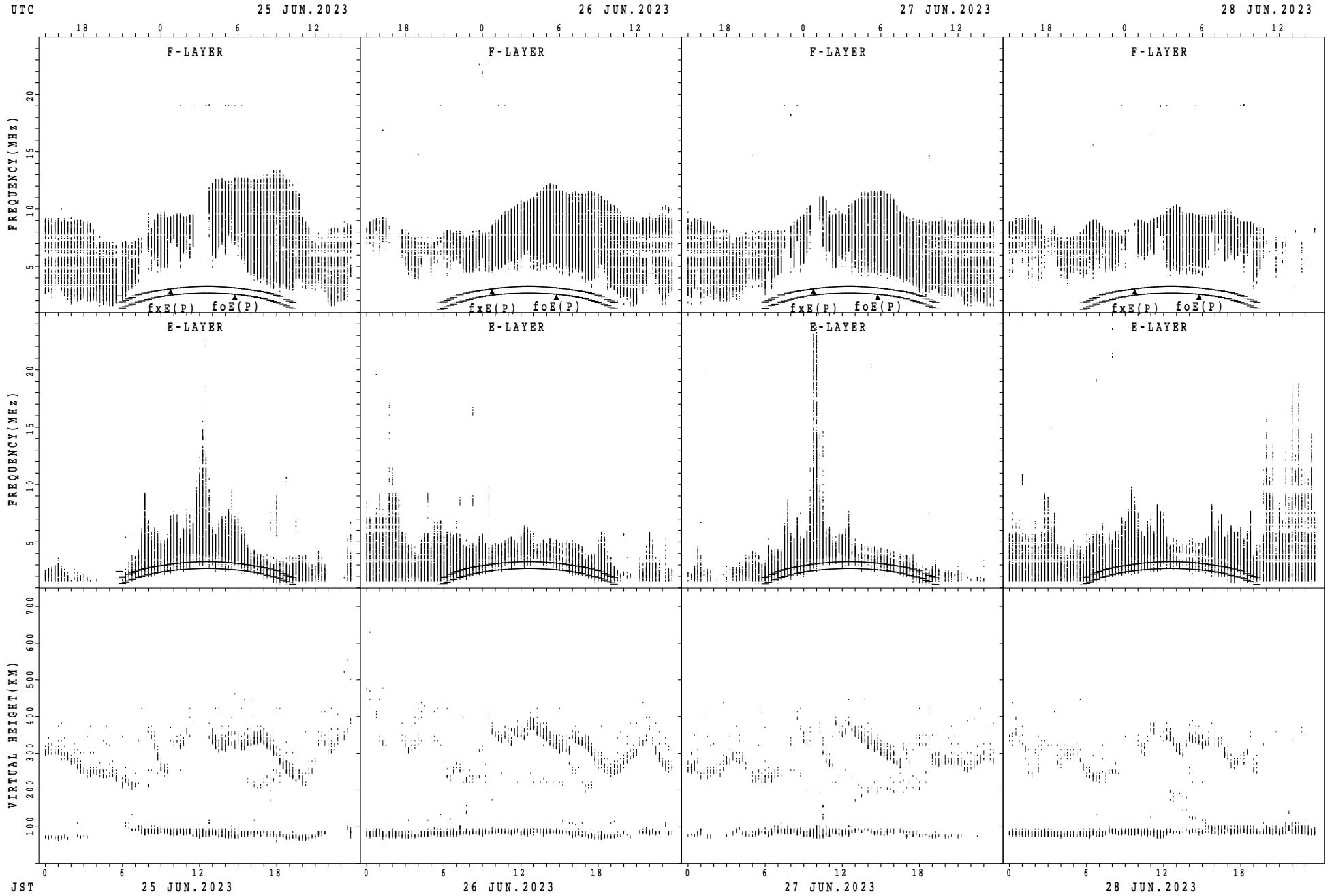
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



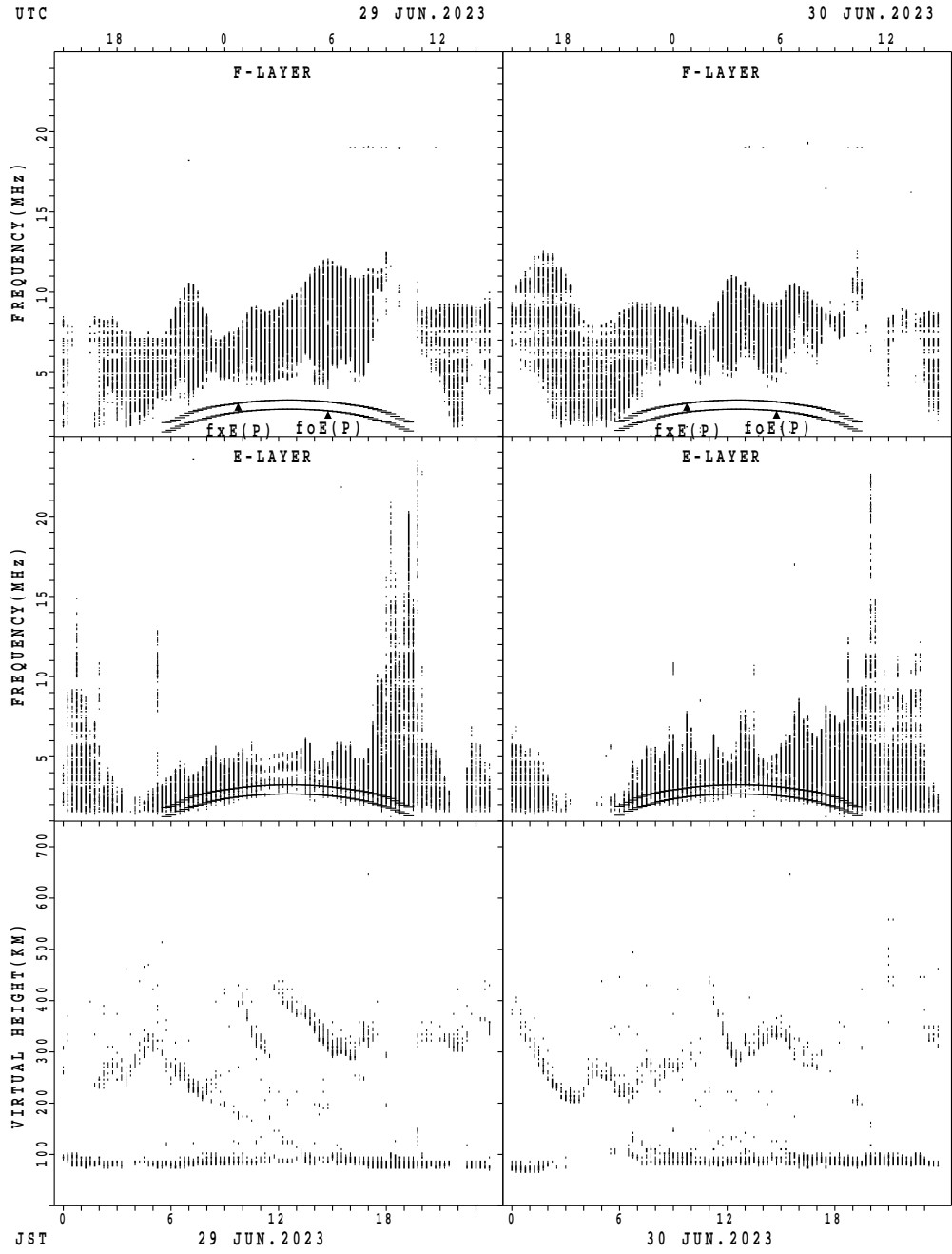
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $foE(P)$; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es
 JUN. 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	14	9	6	4	9	8	20											21	19	15	15	16	15	18
MED	303	308	310	333	296	288	300											296	284	262	292	299	312	309
U Q	314	323	336	373	321	296	322											322	308	288	330	319	346	316
L Q	290	294	290	300	284	270	268											208	216	208	266	290	290	292

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	24	30	27	27	29	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	28	26	25
MED	96	97	96	96	96	98	98	96	96	96	96	96	96	94	96	96	96	98	97	97	98	97	98	96
U Q	98	98	98	98	98	100	98	96	98	96	96	98	98	98	98	98	98	98	98	98	100	99	98	98
L Q	95	96	96	94	96	98	96	96	94	94	94	94	94	94	94	94	96	96	96	96	96	94	96	93

h'F STATION Kokubunji LAT. 35°43.0'N LON. 139°29.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	30	29	30	30	30	29	29	24	18	15	19	20	27	22	29	24	28	30	24	21	25	25	27
MED	284	271	262	261	264	239	234	258	293	322	330	356	351	348	335	322	301	288	258	256	266	296	302	294
U Q	313	296	294	278	286	268	263	292	364	360	352	382	390	380	360	354	334	314	286	266	302	329	320	322
L Q	261	252	243	252	244	232	221	237	262	266	264	328	313	326	320	301	263	243	248	244	245	261	277	270

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	26	27	28	27	24	26	30	30	30	30	28	29	28	29	27	28	30	29	30	30	29	30	30	29
MED	94	94	94	96	96	98	98	96	96	96	94	94	94	96	96	96	96	96	96	92	94	94	94	94
U Q	96	96	96	98	97	98	98	98	96	98	96	96	96	96	98	98	98	97	96	98	97	96	98	96
L Q	92	92	92	92	94	96	96	96	96	94	94	92	92	92	92	96	96	92	94	92	92	94	94	92

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	23	23	20	20	15	14	17	24	11									22	25	18	13	9	16	18
MED	314	312	297	291	302	277	264	237	252									294	264	273	296	328	354	350
U Q	348	354	333	306	330	360	279	265	300									310	291	288	313	334	366	378
L Q	304	290	280	281	280	260	235	219	232									278	211	240	267	314	334	328

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	30	30	30	30	29	26	30	30	30	30	30	29	30	29	29	30	30	30	30	30	30	30	30	30
MED	93	92	94	94	94	96	98	96	96	97	96	96	96	96	98	96	96	96	96	94	92	94	94	93
U Q	96	96	94	96	96	98	100	100	98	98	98	98	98	97	98	98	98	98	98	96	96	94	96	94
L Q	92	90	92	92	92	96	98	94	94	94	94	95	94	94	95	94	94	94	92	92	90	92	92	92

MONTHLY MEDIANS OF h'F AND h'Es
 JUN. 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	22	23	24	20	14	14	16	24	19									26	25	28	18	12	10	16
MED	341	320	287	288	283	306	259	263	244									291	278	276	285	335	359	341
U Q	354	330	313	311	312	354	284	280	282									318	303	291	310	354	386	368
L Q	312	304	266	255	264	258	233	236	230									262	206	248	270	316	322	317

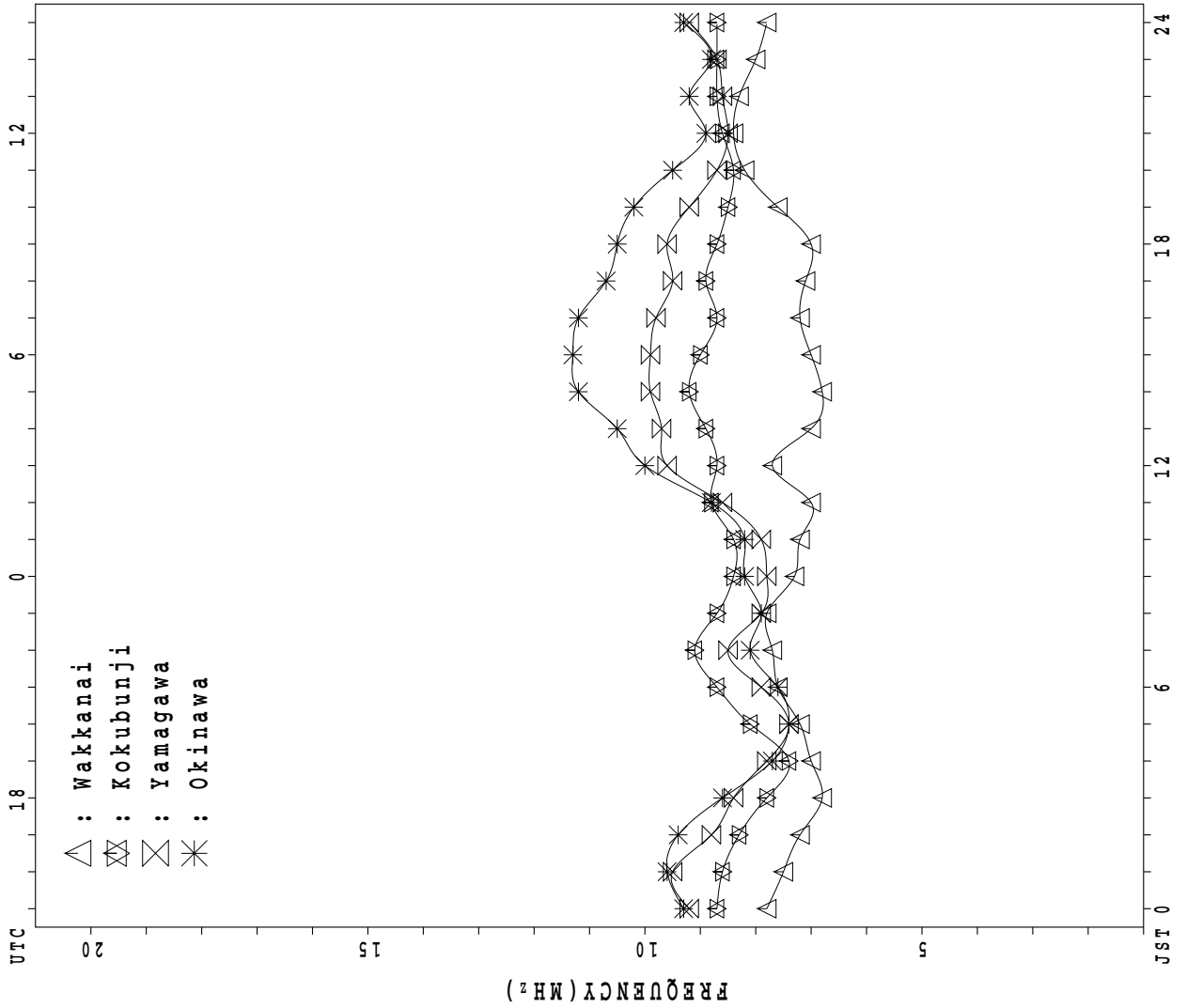
h'Es

	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	30	30	30	29	29	26	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	30
MED	94	92	92	94	94	96	96	96	95	96	96	96	96	94	96	96	96	96	94	94	95	94	94	92
U Q	96	96	96	96	97	98	98	98	96	98	98	98	98	98	96	96	98	98	98	96	96	97	96	96
L Q	92	90	90	91	92	94	94	94	94	94	96	94	94	94	94	94	94	94	92	92	90	92	92	90

MONTHLY MEDIANS PLOT OF fOF2

JUN. 2023

AUTOMATIC SCALING



UTC 18 12 6 0 6 12 18 24

FREQUENCY (MHz) 20 15 10 5

IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 77	X 77	X 77	X 78																	X 90	X 96	X 99	X 94	
2	X 88	X 83	X 80	X 80																		X 98	X 98	X 93	X 87
3	X 85	X 93	X 80	X 79																		X 95	X 92	102	106
4	X 94	X 92	X 79	X 80																		X 101	X 94	X 94	X 95
5	X 90	X 87	X 86	X 83																		X 92	X 93	X 93	X 89
6	X 89	X 86	X 81	X 79																		X 85	X 91	X 89	X 86
7	X 78	X 79	X 76	X 76																		X 94	X 100	X 104	X 100
8	X 90	X 82	X 79	X 79																		X 92	X 94	X 96	X 93
9	X 91	X 90	X 87	X 86																		A	100	102	101
10	X 92	X 80	X 75	X 74																		A	104	101	98
11	X 91	X 93	X 88	X 82																		X 95	X 95	X 94	X 87
12	X 82	X 82	X 77	X 73																		X 80	X 86	X 85	X 84
13	X 81	X 78	X 79	X 75																		X 91	X 93	X 91	X 86
14	X 86	X 80	X 77	X 71																		X 78	X 86	X 87	X 85
15	X 83	X 82	X 79	X 76																		X 93	X 92	X 95	X 95
16	X 98	X 88	X 75	X 77																		X 83	X 87	X 89	X 82
17	X 83	X 83	X 79	X 77																		X 87	X 88	X 87	X 86
18	X 84	X 82	X 78	X 75	X 74																	X 89	X 93	X 95	X 93
19	X 91	X 90	X 86	X 79																		X 88	X 89	X 92	X 87
20	X 85	X 79	X 79	X 74																		X 100	X 95	X 89	X 90
21	X 86	X 87	X 85	X 77																		X 87	X 87	X 91	X 92
22	X 91	X 91	X 89	X 79																		X 95	X 95	X 91	X 86
23	X 80	X 81	X 77	X 74																		X 88	X 89	X 90	X 88
24	X 86	X 85	X 78	X 75																		X 99	X 95	X 94	X 89
25	X 86	X 82	X 81	X 74																		X 93	X 93	X 91	X 91
26	X 88	X 82	X 78	X 77																		X 96	X 93	X 93	X 92
27	X 94	X 88	X 79	X 77	X 73																	X 89	X 90	X 86	X 85
28	X 86	X 81	X 79	X 74																		X 87	X 93	X 90	X 86
29	X 84	X 87	X 80	X 79																		X 88	X 85	X 80	X 84
30	X 85	X 85	X 78	X 74																		X 84	X 89	X 89	X 89
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	2																28	30	30	30	
MED	X 86	X 83	X 79	X 77	X 74																X 90	X 93	X 92	X 89	
U Q	X 91	X 88	X 81	X 79																	X 95	X 95	X 95	X 93	
L Q	X 84	X 81	X 78	X 74																	X 87	X 89	X 89	X 86	

JUN. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 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

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	70	70	70	71	70	70	77	87	83	87	88	87	78	85	86	87	86	79	82	80	83	89	92	86
2	81	76	73	73	72	71	82	87	80	74	81	90	86	82	78	80	75	77	83	89	91	91	86	80
3	78	^F 79	73	72	70	80	83	82	81	80	78	78	77	75	76	70	74	77	84	88	88	85	^F 92	^F 92
4	^F 83	^F 77	72	73	72	82	94	96	87	89	78	76	77	76	75	73	76	78	^A	94	94	87	87	88
5	83	80	79	76	82	83	97	104	94	78	76	76	77	77	82	78	76	76	75	80	85	86	86	82
6	82	79	74	72	76	88	91	90	79	^Z 74	68	70	71	70	71	66	66	66	67	72	78	84	82	79
7	71	72	69	69	76	84	87	86	83	^A	70	68	73	71	68	71	71	72	77	82	87	93	97	93
8	83	75	72	72	70	79	78	75	72	73	73	73	74	71	70	72	74	72	74	83	85	87	89	86
9	84	84	80	79	78	81	81	84	86	80	71	68	70	^A	74	77	78	^A	^A	^A	^A	^F 92	^F 92	^F 92
10	^F 82	^F 73	68	67	69	84	88	94	81	^H 73	70	66	66	64	68	71	71	^A	71	75	^A	^F 92	^F 92	^F 88
11	84	^F 76	75	76	82	^A	^A	86	73	71	68	71	71	71	74	75	71	72	^A	80	88	88	87	80
12	75	75	70	66	65	64	68	63	60	60	^A	58	62	66	66	64	66	^A	66	^A	73	79	78	77
13	74	71	72	68	67	72	71	78	83	^A	71	69	67	70	72	70	73	72	72	79	84	86	84	79
14	79	73	70	64	70	79	77	68	60	55	56	56	59	61	60	60	61	63	60	63	71	79	80	78
15	76	75	72	69	70	77	86	89	86	76	72	73	76	76	74	76	79	78	79	90	86	85	88	88
16	91	81	68	70	65	65	69	65	60	62	55	63	61	58	66	69	66	64	67	67	76	80	82	75
17	76	76	72	70	71	76	70	66	63	59	61	61	^A	62	66	65	66	64	68	74	80	81	80	79
18	77	75	71	68	68	75	84	86	86	69	71	75	77	76	79	79	80	83	77	76	82	86	88	86
19	84	83	79	72	75	79	84	78	67	68	62	63	64	^A	^A	^A	68	^A	65	72	81	82	85	80
20	^R 78	72	72	67	70	72	80	85	80	74	82	82	80	76	71	77	73	73	80	90	94	88	82	83
21	79	80	78	70	71	74	72	72	67	66	70	72	71	71	71	70	75	77	78	80	80	80	84	85
22	84	84	82	72	75	81	81	82	83	74	77	72	79	72	71	70	70	74	78	82	89	88	84	79
23	73	74	70	67	68	72	69	64	64	^A	65	65	72	70	66	68	65	69	71	72	81	82	83	81
24	79	78	71	68	64	67	70	78	76	75	78	82	81	79	78	74	75	82	88	88	92	88	87	82
25	79	75	74	67	69	67	75	79	91	93	82	82	89	82	^A	^A	74	69	71	81	86	86	84	84
26	81	75	71	70	71	78	91	83	84	77	81	84	85	85	79	79	77	81	^A	80	90	86	86	85
27	87	81	72	^F 64	^F 63	65	71	68	80	82	74	68	71	70	^A	70	65	70	75	82	83	79	78	
28	80	74	72	67	63	69	73	75	72	74	70	69	70	69	68	70	70	68	71	72	80	86	83	79
29	77	80	73	72	72	80	89	77	74	71	^A	67	66	66	68	70	68	71	76	80	81	78	73	77
30	78	78	71	67	60	^A	66	66	66	63	63	68	62	66	68	68	67	68	70	72	77	82	82	82
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	29	30	29	29	29	30	27	28	30	29	28	28	27	30	26	26	28	28	28	28	29
MED	79	76	72	70	70	77	80	79	80	74	71	71	72	71	71	71	72	72	73	80	84	86	84	82
U Q	83	80	74	72	72	81	86	86	84	78	78	76	78	76	76	77	75	77	78	82	88	88	87	86
L Q	77	74	71	67	68	70	70	72	67	68	69	67	66	68	68	69	68	68	70	73	80	82	82	79

JUN. 2023 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2023 foF1 (0.01MHz) 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	L	U	L	L	L	540	544	528	468	420						
2					L	L	448	476	480	L	528	532	536	552	552	536	524	496						
3							L	L	A	A	532	544	544	536	520	U	L	L	L	A				
4							L	472	508	540	564	560	532	556	532	A	A	A	A					
5							L	A	A	U	L	528	540	536	560	552	536	U	L	L				
6					L	L	L	A	A	A	532	540	528	540	524	524	552	504	500	U	L	L		
7						L	L	492	512	A	A	548	536	544	544	524	504	476	412	L	L			
8					L		A	A	A	L	540	536	548	532	552	540	536	496	L	A				
9						L	L	476	496	508	512	552	560	544	A	A	520	A	A	A	A			
10					L	L	460	492	A	A	A	A	552	A	A	A	A	A	A	A				
11							A	A	A	A	532	560	552	U	L	608	520	540	U	L	A	A		
12					U	L	444	412	464	A	A	A	548	536	520	528	484	496	A		A			
13					L	L	476	508	A	540	548	548	A	528	532	484	460	L	A					
14					392	432	A	484	492	496	496	504	504	500	496	480	448	A						
15					L		492	A	A	540	552	516	532	544	512	488	460	A						
16					384	428	460	484	A	520	504	528	496	508	496	A	U	L	A					
17					A	A	A	A	A	508	520	A	A	A	496	492	464	L						
18					L	428	460	484	504	A	U	L	572	544	548	520	516	500	L	L				
19					L	452	480	500	516	A	520	524	A	A	A	A	A	A	U	L	A	464		
20					L	L	464	500	512	528	568	U	L	572	596	596	552	500	L	U	L	L		
21					L	L	432	444	504	500	540	532	560	536	528	572	524	528	476	A				
22						L	488	528	548	524	576	540	620	508	548	504	484	408	L					
23					296	388	U	L	504	A	A	544	536	536	532	528	480	480	L					
24					L	316	408	U	L	504	496	532	564	568	596	552	536	540	512	476	A			
25					L	292	464	L	A	536	560	568	544	564	A	A	508	L	A					
26					L	L		L	528	560	560	556	568	A	A	A	512	A	A					
27					U	L	388	452	496	508	516	A	520	560	A	A	A	A	A					
28					L	396	436	480	496	484	540	540	A	540	524	520	500	464	A					
29					U	L	444	432	A	A	500	A	A	H	532	524	520	504	476	452	L			
30					A	A	A	A	A	500	532	528	U	L	548	528	532	512	U	L	L	L		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					4	11	18	19	17	19	23	27	28	24	23	24	24	17	4					
MED					294	396	454	492	504	528	540	548	544	542	532	524	498	464	412					
U Q					U	L	L																	
L Q					306	432	464	496	508	540	560	560	552	554	540	534	508	476	438					
					282	388	436	476	492	512	532	528	534	528	520	508	486	456	410					

JUN. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2023 foE (0.01MHz) 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					A 236	300	332		B 380	384		A	A	A	A	A	320		A 228						
2					A 232	296	328	352	368	368	376		A	A	A	A	336	292	232		A				
3					A 236	288	324	348	360			A	A	A	392	372	356		A 292	228					
4					A 252	284	332	340	336			A	A	A	A	384	360	336	292	224					
5					184	236	288	324		A 376		A	A	A	A		372	340	296	220					
6					172	232	288	328	356	360	372	364		A	A	A	372	340	300	252					
7					A 236	296	324	344	360			A	A	A	A	376	360	324	292	240					
8					A 244	292	320	352	364			A	A	A	A	A	A		A 296	244					
9					176	244	292	328	348	356		A	A	396	392	376	352	336		A 232					
10					188	232	296	332	348	364		A	A	A	A	A	372	332	284	220					
11					184	252	296	332	356	368	372		A	A	A	A	352		A 300	196					
12					A 252	304	336	364	380	388		A	A	A	A		368		A 288	232					
13					A 220	284	332	348	380	380	380	372	384	368	348	320		A		A 244					
14					A 216	276	332	344	376	376	392	396	392		A	A	A		A 296		A				
15					A 204	276	316	356	368	384	380	380		A	A	360	360	332		A					
16					A 200	284	328	352	364	376	376	364		A	A	A	A	336	292	252	180				
17					A 224	256	312	344	364	368	368	372		A	A	A	A	A	A		A				
18						216	288	324	344	372	380	376	372	352		A	A	A		A		256			
19					A 216	280	328	348	368	380	384		A	A	A	A		344	292	236					
20					A 240	284	324	356	372			A	A	A	A	A	348	344	300	240					
21					A 240	292	324		A 376	384		A	A	A	A	A	A	A	A		A				
22					A 300	336	356	368	376			A	388	396	388	380	344	320	260		A				
23					180	240	280	324	352	388	384	384	380	380	364	344	332	300	244		A				
24					A 224	296	336	352	376	376	392	396		A	A	364		A 308	240		A				
25					A 244	288	312	348	368	372		A	A	A	380		304	304		A					
26					A 292	336	352		A	A		A	A	A	A	A	A		A 300		A				
27					A 248	260	332		A 384	392		A	A	A	A	A	A		A 300	252					
28					A 300	328			A	376		A	A	A	A	A	A		A 300		A				
29					A 288	316	348	368	372	368	364		A	A	A	A	A		A		A				
30					A 240	288	312	352	368		A	368		388	372	360	324	292	244		A				
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT					6	26	29	30	26	28	20	14	11	8	10	16	17	22	23	1					
MED					182	236	288	328	350	368	376	376	380	390	374	360	336	296	240	180					
U Q					184	244	296	332	352	376	384	384	396	392	380	370	340	300	244						
L Q					176	224	284	324	348	364	372	368	372	382	368	352	324	292	228						

JUN. 2023 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

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

JUN. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E B	E B	E B	E B	18	31	39	44	E B	42	43	42	44	49	41	35	G	30	46	21	36	26	E B	E B	E B	
2	E B	E B	E B	E B	20	26	38	40	39	44	42	45	44	40	40	38	37	37	31	32	33	E B	E B	E B	E B	
3	E B	26	E B	E B	22	28	39	37	40	53	40	40	42	42	44	46	36	43	49	43	18	16	E B	E B	E B	
4	E B	E B	E B	E B	22	48	46	44	46	41	42	40	40	45	43	57	50	62	A A	A A	49	23	17	38	20	
5	E B	E B	E B	E B	G	28	38	48	57	42	42	42	42	41	40	G	35	35	38	20	E B	E B	E B	E B		
6	E B	E B	E B	E B	G	26	34	53	56	52	44	46	45	41	40	42	37	38	33	50	44	E B	16	E B		
7	17	18	27	E B	19	28	33	36	41	A A	138	55	41	40	40	40	38	35	32	30	21	18	E B	E B	E B	
8	E B	E B	E B	E B	19	30	45	56	61	49	40	42	42	48	40	43	38	35	46	31	22	31	E B	16	19	
9	E B	29	E B	E B	G	30	40	43	42	44	41	44	48	A A	123	66	46	54	A A	A A	A A	A A	23	45	23	
10	E B	E B	E B	E B	G	28	36	44	51	58	60	53	45	57	57	56	52	A A	116	56	54	A A	E B	E B	E B	
11	E B	E B	E B	E B	20	32	A A	A A	A A	62	62	44	49	46	51	40	G	42	61	A A	101	64	35	20	17	E B
12	E B	E B	E B	E B	18	G	38	44	50	56	A A	73	46	46	41	40	39	A A	106	41	A A	89	41	E B	E B	E B
13	E B	E B	E B	E B	18	26	35	36	44	A A	89	46	44	44	52	47	50	38	41	52	23	E B	E B	E B	21	
14	E B	20	E B	E B	18	28	33	46	44	38	40	G	44	G	40	40	40	32	32	39	18	E B	E B	E B	E B	
15	E B	E B	E B	E B	19	25	32	43	56	54	45	44	41	41	40	45	36	34	44	28	22	18	E B	E B	E B	
16	E B	E B	E B	E B	18	28	38	44	42	52	43	48	44	38	42	43	55	32	35	39	26	43	E B	E B	E B	
17	E B	E B	E B	E B	40	43	46	46	54	52	50	43	A A	107	53	51	43	48	32	32	43	22	18	E B	16	E B
18	17	21	E B	E B	29	26	35	40	48	62	48	55	45	42	42	37	34	42	21	21	17	39	E B	E B	E B	
19	E B	E B	E B	E B	20	28	36	43	40	46	54	43	46	A A	A A	A A	A A	A A	A A	29	50	55	36	E B	E B	E B
20	E B	E B	20	E B	19	28	33	42	40	40	48	50	43	50	40	38	41	34	32	42	19	E B	16	17	22	
21	E B	E B	E B	E B	19	12	37	39	41	G	40	41	42	43	44	38	36	33	38	27	E B	16	45	E B	E B	E B
22	E B	E B	E B	E B	23	28	40	38	42	47	49	42	42	42	41	40	40	G	G	22	21	26	16	E B	E B	E B
23	E B	E B	E B	E B	G	28	40	47	45	A A	69	57	44	46	45	41	38	36	G	30	22	E B	E B	E B	E B	
24	28	E B	E B	E B	18	27	36	44	58	46	51	G	G	42	39	40	34	35	43	23	E B	E B	E B	E B	30	
25	E B	E B	E B	E B	20	28	40	43	54	50	45	41	45	42	A A	A A	A A	43	36	56	24	50	20	19	E B	16
26	E B	E B	27	46	35	26	35	42	52	40	41	43	43	43	58	54	41	63	A A	174	26	46	46	18	34	
27	E B	E B	20	16	19	26	32	42	43	44	54	44	44	57	54	A A	89	60	52	61	40	18	E B	E B	E B	33
28	E B	E B	E B	E B	18	28	34	34	40	38	43	43	55	43	41	37	34	32	49	36	22	20	21	E B	16	16
29	E B	E B	33	16	20	26	35	56	52	46	A A	94	56	40	41	38	37	44	30	28	29	E B	E B	E B	E B	E B
30	E B	E B	E B	E B	A A	64	46	46	53	43	40	40	41	43	41	41	42	34	28	35	20	20	E B	E B	E B	E B
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	E B	E B	E B	E B	19	28	38	44	46	46	44	43	44	43	41	40	40	35	40	34	22	18	E B	E B	E B	
U Q	E B	16	16	16	20	28	40	46	54	54	51	46	45	50	47	46	44	52	52	43	36	26	17	20		
L Q	E B	E B	E B	E B	G	26	35	40	42	42	42	41	42	41	40	38	36	32	31	23	E B	E B	E B	E B	E B	

JUN. 2023 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

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

JUN. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	263	266	265	293	299	304	291	304	303	289	286	302	278	289	286	295	309	304	302	287	271	267	286	291
2	276	265	276	280	291	295	307	312	304	287	283	304	295	301	291	302	294	291	291	299	286	291	289	286
3	280	^F 268	293	278	280	289	295	298	297	296	299	295	291	290	304	287	292	295	300	301	297	286	^F 283	^F 283
4	^F 281	^F 280	287	285	282	303	302	312	305	288	293	277	287	286	283	288	291	302	^A 293	293	302	283	276	283
5	281	281	295	278	290	266	281	295	309	296	294	297	287	281	290	291	289	301	300	289	284	276	286	277
6	283	288	283	276	286	286	275	305	277	^Z 284	267	277	265	278	283	284	279	287	292	287	278	281	276	285
7	283	287	272	282	283	285	277	299	296	^A 285	263	276	284	277	282	290	295	295	291	279	273	287	298	
8	304	282	275	282	281	294	298	296	289	286	286	287	293	284	273	282	293	290	289	288	279	271	277	275
9	280	287	296	294	268	274	259	292	299	323	292	280	284	^A 278	295	302		^A	^A	^A	^A	^A	^F 272	^F 272
10	^F	282	287	278	272	279	289	300	293	^H 278	273	272	260	271	272	289	293	^A	308	281	^A	^F	^F	^F 289
11	293	^F	293	276	294	297	^A	^A	302	289	284	285	271	271	288	286	282	287	^A	272	280	279	284	283
12	270	276	279	263	273	247	265	261	267	^A	^A	337	258	289	276	293	297	^A	298	^A	274	276	287	285
13	285	277	281	288	270	275	285	288	293	^A	286	283	266	286	295	279	300	304	297	285	285	280	284	283
14	290	283	288	279	267	295	291	299	269	244	246	222	255	267	259	264	283	295	285	271	270	274	280	280
15	285	289	290	288	284	292	285	306	315	281	283	275	291	291	279	281	296	296	281	297	297	270	270	283
16	290	268	258	277	290	268	274	276	268	243	210	256	267	^A 230	260	262	279	265	276	266	262	269	276	261
17	265	269	269	259	271	283	269	285	280	251	273	264	^A 259	277	280	291	294	290	286	282	278	272	277	277
18	277	273	274	268	278	277	288	312	332	^A	284	279	287	281	287	292	291	315	294	270	274	276	274	284
19	276	281	273	274	267	254	293	306	285	294	277	262	275	^A	^A	^A	282	^A	273	276	278	279	281	273
20	^R 276	269	278	267	264	284	280	316	316	294	286	278	285	280	277	294	293	282	276	281	290	291	266	272
21	262	278	287	267	272	279	304	293	327	278	283	282	270	277	278	278	280	294	298	300	291	263	265	270
22	275	288	271	287	291	310	277	282	282	271	301	262	291	275	281	273	275	286	288	283	291	281	276	278
23	271	265	263	268	270	282	278	268	273	^A	264	250	282	287	279	291	287	286	301	280	271	272	269	277
24	267	277	266	265	260	278	283	296	306	312	291	284	279	291	294	281	267	285	287	280	297	285	273	282
25	269	261	275	270	281	267	286	278	308	313	271	271	281	271	^A	^A	296	294	280	284	283	278	270	271
26	273	267	258	260	277	287	333	302	309	295	282	283	287	292	290	298	285	305	^A	273	272	275	282	279
27	284	287	283	^F 273	^F 273	281	289	257	287	299	282	257	281	278	^A	307	287	294	290	279	290	276	271	271
28	284	288	290	268	286	270	274	290	294	294	286	279	289	282	288	287	295	289	305	290	273	282	276	285
29	279	292	283	283	276	271	305	294	301	299	^A	280	277	264	274	287	280	291	298	290	289	280	276	269
30	276	278	268	262	274	^A	301	269	298	316	259	285	273	291	288	295	291	298	306	291	279	273	272	274
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	29	30	29	29	29	30	25	28	30	29	28	28	27	30	26	26	28	28	28	28	29
MED	279	278	278	277	278	282	285	296	298	289	284	280	279	282	280	287	291	294	294	286	280	278	276	280
U Q	284	287	287	282	286	293	296	304	306	296	288	285	287	289	288	293	295	298	300	290	290	282	283	284
L Q	272	268	271	268	271	272	277	286	282	280	273	271	268	273	277	281	282	287	287	280	274	273	272	274

JUN. 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	L	U	L	L	A	342	349	371	L	A						
2					L	L	A	371	399	383	393	378	H	359	356	360	350	U	L	L					
3							L	L	L	A	A	A	384	386	383	372	365	A	L	L	A				
4							L	A	A	A	386	370	376	393	A	357	A	A	A	A					
5							L	A	A	U	L	384	382	383	361	375	366	U	L	L					
6					L	L	L	A	A	A	A	385	385	381	372	371	341	360	U	L	L				
7						L	L	369	366	A	A	377	388	371	350	347	353	343	L	L					
8					L	359	A	A	A	A	396	377	394	A	374	340	349	L	A						
9						L	A	352	397	398	389	391	372	A	A	A	A	A	A	A	A				
10					L	L	364	A	A	A	A	A	364	A	A	A	A	A	A	A	A				
11							A	A	A	A	401	361	374	A	377	345	331	U	L	A	A				
12					U	L	A	A	A	A	A	359	374	401	362	383	349	A			A				
13					L	L	373	346	A	A	382	386	A	358	A	366	A	A	A						
14					350	357	A	A	A	A	405	408	422	367	384	383	376	352	345						
15					L	A	A	A	A	A	379	408	380	343	A	366	358	A							
16					338	363	A	376	A	380	A	376	394	365	359	A	U	L	A						
17					A	A	A	A	A	A	399	A	A	A	368	A	349	L							
18					L	342	359	370	A	A	A	A	365	363	372	358	356	L	L						
19					L	371	378	A	A	A	383	372	A	A	A	A	A	A	U	L					
20					L	L	359	366	389	392	327	A	347	351	367	375	353	L	U	L	L				
21					L	L	333	366	367	367	396	405	371	386	397	334	373	L		A					
22						L	358	359	A	A	A	A	386	392	326	396	350	356	347	353	L				
23					322	340	A	A	A	A	A	395	370	358	374	356	U	L	L	L					
24					L	U	L	A	A	L	A	364	362	373	382	360	348	H	A						
25					329	L	348	L	A	A	371	375	380	356	A	A	363	L	A						
26						L	L	L	391	375	370	371	348	A	A	A	348	A	A	A					
27					L	U	L	A	376	402	A	408	366	A	A	A	A	A	A	A					
28					L	L	354	363	369	368	417	374	385	363	372	359	349	346	A						
29					U	L	341	347	A	A	A	A	A	H	377	379	365	364	A		L				
30					A	A	A	A	A	A	408	386	373	U	L	369	371	363	363	U	L	L			
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					4	11	13	9	13	13	17	25	28	20	23	20	22	16	4						
MED					326	341	359	369	376	392	384	382	373	372	365	358	353	346	356	L					
U Q					342	354	364	370	388	404	394	386	384	380	374	366	360	354	360	L					
L Q					320	338	348	362	366	384	372	374	366	357	358	350	349	344	334	L					

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NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2023 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 45°10.0'N LON. 141°45.0'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							296	276	276	326	312	290	356	330	340	306	272	270	266					
2					306	268	266	280	264	340	328	300	316	316	338	308	302	270						
3							262	288	276	308	318	334	350	344	308	338	328	294	274					
4							284	238	270	314	330	370	338	360	348	342	330	E A 314	A					
5							286	266	260	270	334	328	348	364	338	320	286	286						
6					276	264	274	276	344	386	406	386	400	386	366	392	378	330	292					
7					276	268	290	300	A		352	452	386	358	388	360	332	310	284					
8					284	286	280	298	E A 356	338	352	344	344	366	388	360	328	316	300					
9					276	352	296	300	294	338	356	374	A E A 398	A E A 322	314		A	A	A					
10					318	324	274	282	E A 302	348	406	398	464	E A 422	390	350	340	A	314					
11					A	A		288	362	372	372	406	410	352	354	356	356	A						
12					286	402	378	394	E A 416	470	A	746	472	370	404	348	330			A				
13					246	260	338	306	A		366	382	424	366	346	376	320	304	288					
14					288	320	318	402	E A 542	536	644	508	442	454	418	380	326							
15					270		270	276	E A 320	362	394	342	346	358	346	314	298	290						
16					344	348	382	420	518	718	472	408	578	434	424	392	382	304						
17					288	378	354	396	500	428	460	A	466	390	386	348	322	308						
18					316	284	254	254	E A 334	370	382	344	364	340	326	314	270	296						
19					306		298	280	342	358	426	462	416	A	A	A	374	A	332					
20					304	294	332	272	282	346	338	330	352	376	394	334	312	322	312					
21					286	310	278	296	276	396	380	372	416	386	390	382	348	306	274					
22					254	316	268	296	380	328	418	344	410	376	390	380	328	298						
23					330	320	354	384	408	A	442	484	380	366	388	360	308	338	280					
24					350	312	320	286	318	288	348	342	368	340	332	364	378	312	284					
25					292	270	318	286	286	266	356	374	342	344	A	A	334	294	368					
26					292	230		284	326	358	356	332	308	340	328	324	292	A						
27					284	306	362	340	430	336	324	314	434	388	386	A	320	344	E A 356					
28					284	344	300	316	328	340	364	386	366	376	360	352	328	328	282					
29					322	274	286	336	338	A	396	406	430	378	354	358	324	284						
30					A	310	E A 354	E A 294	E A 318	462	372	400	360	368	338	332	290	272						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					13	23	28	28	30	27	28	30	29	28	28	27	30	26	22					
MED					292	292	297	286	299	337	360	378	374	366	370	352	330	312	290					
U Q					312	320	326	328	344	380	406	418	412	399	390	376	356	328	308					
L Q					284	270	274	276	276	318	336	344	344	352	343	334	314	294	282					

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JUN. 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	276	280	282	232	244	214	E A 244	E A 252	E A 216	198	210	190	208	E A 302	228	208	216	204	A	234	286	292	252	232	
2	254	286	272	262	246	234	E A 256	A	222	194	204	184	220	196	196	194	208	216	246	260	246	262	236	232	238
3	262	E A 294	246	240	246	230	246	208	206	A	180	176	186	196	250	E A 266	200	A	A	A	256	236	256	242	228
4	230	Q 246	258	258	232	E A 272	E A 272	E A 228	E A 244	182	178	180	176	E A 238	226	A	A	A	A	E A 270	E A 238	E A 230	E A 284	E A 260	
5	246	264	244	264	246	220	232	A	A	198	168	180	206	196	200	214	200	228	264	256	246	266	242	E A 268	
6	262	242	242	248	256	224	212	A	E A 352	E A 196	222	208	208	220	226	216	234	262	E A 290	E A 302	E A 250	E A 232	E A 244		
7	252	254	E A 276	264	244	218	204	198	212	A	A	186	192	178	210	200	218	226	236	252	256	274	246	234	
8	220	250	256	266	272	234	A	A	A	E A 284	180	186	176	E A 260	190	244	228	236	A	264	256	E A 288	E A 256	E A 268	
9	258	274	240	240	240	256	E A 254	266	194	208	186	188	250	A	A	E A 294	A	A	A	A	A	E A 310	E A 304	E A 264	
10	Q 240	248	242	266	244	228	E A 236	E A 266	A	A	A	A	A	226	A	A	A	A	A	E A 302	E A 292	E A 260	Q 256		
11	244	244	Q 248	246	232	234	A	A	A	A	188	252	216	E A 320	216	216	226	A	A	E A 362	280	244	240	230	
12	252	284	248	290	266	220	E A 268	E A 290	A	A	A	234	220	194	204	202	230	A	282	A	E A 300	272	244	248	
13	250	252	260	242	226	218	220	202	262	A	232	194	186	A	250	316	206	296	A	244	248	242	236	264	
14	244	E A 250	236	234	270	226	198	A	E A 234	186	190	180	238	220	206	210	242	226	234	302	272	264	252	252	
15	250	248	230	242	240	214	222	E A 238	A	E A 208	194	174	182	212	232	214	246	A	A	260	240	268	268	254	
16	254	222	260	266	258	216	248	E A 278	242	A	200	294	210	E A 196	224	248	A	220	A	E A 310	E A 286	E A 310	E A 266	E A 256	
17	278	270	280	300	318	A	A	A	A	A	A	188	A	A	A	A	236	A	220	E A 254	E A 274	E A 254	E A 258	E A 264	
18	264	E A 278	268	280	266	214	226	210	A	E A 224	A	220	200	206	202	206	A	A	210	240	252	E A 300	E A 264	E A 246	
19	266	236	238	272	270	228	E A 220	E A 262	190	E A 274	A	210	240	A	A	A	A	A	A	232	E A 332	E A 312	E A 280	E A 252	E A 256
20	270	270	E A 256	282	276	232	208	E A 248	188	192	308	E A 258	188	258	198	184	230	218	250	E A 270	E A 244	E A 216	E A 252	E A 286	
21	284	264	254	276	258	210	232	208	212	180	164	174	208	194	234	190	218	206	A	252	238	E A 308	E A 286	E A 268	
22	268	256	230	228	240	224	224	220	E A 230	E A 236	A	170	172	222	206	228	220	216	226	246	254	266	240	240	
23	258	300	282	268	284	232	E A 264	E A 310	E A 256	A	A	188	246	240	202	216	204	212	236	254	268	252	268	260	
24	E A 294	262	256	288	250	234	E A 224	E A 262	A	E A 242	E A 292	184	182	190	182	214	200	230	A	266	E A 236	E A 244	E A 252	E A 282	
25	278	294	264	276	276	230	268	228	A	A	204	178	202	198	A	A	240	238	A	264	E A 292	E A 260	E A 266	E A 266	
26	256	264	E A 328	E A 370	326	230	218	218	260	186	186	190	202	214	A	A	232	A	A	230	E A 306	E A 316	E A 242	E A 272	
27	252	236	E A 270	E A 292	256	234	228	E A 278	218	212	A	182	226	A	A	A	A	A	A	282	264	238	E A 236	E A 302	
28	258	242	250	230	256	222	210	198	232	184	214	194	A	210	198	188	206	210	A	264	252	274	E A 258	240	
29	258	244	E A 294	254	258	222	250	A	E A 260	A	A	182	202	192	206	E A 278	212	234	266	240	244	246	286		
30	268	274	E A 264	290	330	A	A	A	A	188	180	198	196	206	212	216	250	218	226	260	248	276	272	264	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	28	26	22	17	18	21	27	28	24	23	24	23	20	14	28	28	30	30	30	
MED	258	256	252	262	256	226	226	U 216	212	194	187	188	204	200	206	212	217	222	236	256	U 251	255	250	250	
U Q	268	274	270	280	270	233	E A 250	E A 266	E A 243	E A 242	E A 212	210	220	E A 230	E A 224	E A 234	230	235	260	278	E A 283	E A 288	E A 266	E A 268	
L Q	250	246	244	242	244	219	220	210	200	186	180	180	186	196	198	204	206	214	232	252	245	244	242	244	

JUN. 2023 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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JUN. 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	106	102	102	B	102	102	A	A	A	A	A	96	A	106	A				
2					A	108	104	98	98	98	98	102	A	A	A	A	102	100	100	A				
3					A	100	100	100	98	98		A	A	A	98	106	104	A	100	98	A			
4					A	98	98	98	96	96		A	A	A	A	102	100	100	100	100	A			
5					134	104	100	98	A	100		A	A	A	A	100	100	100	100	A				
6					120	100	98	98	98	94	94	94	A	A	A	A	108	104	104	100	A			
7					A	100	96	98	98	94		A	A	A	A	100	100	96	98	100	A			
8					A	104	100	100	96	96		A	A	A	A	A	A	A	96	100	A			
9					130	100	100	98	98	98		A	A	98	98	98	96	96	A	100				
10					144	104	96	96	96	96		A	A	A	A	A	98	98	98	98	A			
11					90	102	100	100	100	98	98		A	A	A	A	98	A	94	94	A			
12					A	98	98	98	98	98	98		A	A	A	A	98	A	98	98	A			
13					A	104	102	100	98	96	96	96	96	96	96	96	96	96	A	96	A			
14						96	96	96	96	96	96	96	96	96	96	A	A	A	102	A	A			
15					A	96	94	94	94	98	96	96	96		A	96	98	98	A	A	A			
16					A	98	104	100	100	96	96	96	96		A	A	A	100	100	100	104			
17					A	102	94	92	96	96	96	96	96		A	A	A	A	A	A	A			
18						96	96	96	96	96	96	96	96	96	96	A	A	A	A	120	A			
19					A	100	100	102	102	100	100	98	A	A	A	A	A	A	102	96	A			
20					A	102	96	96	96	96		A	A	A	A	A	98	102	100	100	A			
21					A	100	96	96	A	96	96		A	A	A	A	A	A	A	100	A			
22					A	A	98	98	98	98	98		A	98	98	98	112	104	104	104	A			
23					128	100	100	98	98	98	98	96	96	96	96	96	96	96	98	100	A			
24					A	100	100	98	98	98	98	98	98	98	A	A	98	A	100	100	A			
25					A	122	100	100	100	98	96		A	A	A	96	A	98	98	A	A			
26					A	A	100	100	100		A	A	A	A	A	A	A	A	100	A	A			
27					A	110	98	100	A	100	98		A	A	A	A	A	A	98	98	A			
28					A	A	A	98	94		94		A	A	A	A	A	A	100	A	A			
29					A	A	116	98	98	98	98	98	98	98	A	A	A	A	A	A	A			
30					A	102	98	98	98	96		A	96		96	96	96	98	98	100	A			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					6	26	29	30	26	28	20	14	11	8	10	16	16	22	23	1				
MED					129	100	100	98	98	98	97	96	96	96	97	98	98	100	100	104				
U Q					134	104	100	100	98	98	98	98	98	98	100	100	101	100	100					
L Q					120	100	96	98	96	96	96	96	96	96	96	97	96	98	98					

JUN. 2023 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 2023 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	94	94	90	90	116	104	104	98	B	100	100	100	98	96	94	92	G	100	106	106	98	98	98	98
2	B	98	B	B	120	138	108	104	104	102	100	172	92	94	90	92	144	112	102	100	92	102	94	94
3	88	90	90	120	106	116	110	110	102	96	102	102	100	102	166	102	130	100	94	92	92	90	108	110
4	88	90	96	88	88	106	96	98	98	98	92	94	92	90	122	104	106	100	94	94	90	88	88	86
5	88	92	84	84	G	122	110	100	94	100	104	98	94	104	102	G	138	106	98	102	96	96	B	90
6	92	94	84	96	88	116	106	96	96	96	96	90	88	88	88	112	106	114	104	100	96	96	94	86
7	86	86	86	86	120	110	112	118	100	90	88	88	88	122	162	128	120	114	100	98	96	94	84	90
8	90	84	90	B	118	106	102	100	90	92	92	92	90	88	90	90	96	124	106	104	96	94	94	88
9	90	84	B	B	G	116	104	102	102	94	96	94	100	98	98	102	100	100	98	92	104	104	94	92
10	94	90	86	90	90	118	110	106	100	96	90	90	90	90	90	98	108	98	98	98	102	96	90	94
11	92	92	92	88	114	116	100	98	94	94	92	90	94	92	94	G	108	98	98	96	92	92	94	B
12	90	90	90	B	120	G	110	106	102	94	94	92	94	106	102	110	106	100	100	98	98	96	B	B
13	B	B	92	B	86	116	104	114	104	94	94	98	94	96	98	98	98	102	100	94	102	B	84	84
14	86	86	90	88	88	120	118	100	102	102	100	G	152	G	94	100	100	118	84	104	82	B	B	96
15	B	96	B	90	94	132	140	106	100	100	98	94	98	98	98	106	106	94	88	92	96	94	100	92
16	86	88	B	B	124	108	106	102	106	96	98	90	96	100	98	98	104	160	112	102	96	96	94	92
17	88	92	116	102	106	104	100	102	98	98	98	98	90	88	88	88	86	90	104	102	86	92	92	92
18	92	88	88	86	86	130	106	104	98	94	94	90	96	94	92	90	90	88	94	134	102	96	96	B
19	92	90	92	98	124	116	112	104	100	100	96	100	94	92	94	88	100	96	102	110	96	92	92	90
20	88	86	84	100	110	114	110	106	102	102	92	90	92	92	100	104	106	116	100	96	94	100	90	88
21	B	84	98	B	128	90	102	104	102	G	104	94	176	92	184	98	96	94	98	94	94	94	88	88
22	92	90	90	B	90	90	106	106	100	96	96	98	110	138	132	128	116	G	G	102	92	90	B	90
23	94	B	B	98	G	114	108	102	98	96	96	96	176	180	142	126	110	G	114	114	100	102	98	90
24	92	90	90	B	152	132	108	104	98	98	96	G	G	90	100	190	126	114	100	96	98	98	B	92
25	90	88	92	B	118	124	102	102	104	96	96	94	90	100	92	92	98	104	98	98	100	98	94	B
26	B	84	92	86	90	92	118	106	98	102	96	98	96	94	98	90	92	100	94	94	98	98	98	98
27	86	86	88	88	94	118	104	100	100	100	96	96	94	86	86	86	104	102	100	98	98	B	96	88
28	84	88	86	86	92	96	98	102	100	110	100	100	84	86	88	88	122	116	94	98	96	88	90	B
29	B	90	86	86	86	118	118	102	106	102	96	94	104	94	102	96	92	94	94	92	112	102	B	B
30	B	102	94	94	86	100	102	100	98	98	100	104	120	132	128	118	108	112	110	102	98	96	92	94
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	28	25	20	27	29	30	30	29	29	30	28	29	29	30	28	29	28	29	30	30	27	24	24
MED	90	90	90	89	106	116	106	102	100	98	96	94	94	94	98	98	106	101	100	98	96	96	94	91
U Q	92	92	92	97	120	119	110	106	102	100	100	98	100	101	102	108	113	114	103	102	98	98	96	94
L Q	88	86	86	86	88	105	102	100	98	95	94	91	91	90	92	91	98	98	94	94	94	92	90	88

JUN. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

JUN. 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

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	F2	F1	C1	C3	C4	C3		C1	C1	C1	C2	C2	L2		C1	C4	C3	F3	F8	F2	F1		
2		F1			C2	C2	C3	C2	C2	C1	HC11	L1	L1	L2	L2	H1	C4	C5	C5	F5	F1	F3	F1		
3	F3	FF24	F1	F1	C4	C2	C2	C1	C1	C1	C1	C1	C1	HL11	C2	HL13	C3	L6	L6	F5	F3	FF12	FQ11		
4	F2	F2	F1	F2	L5	C4	C4	C2	C2	C1	L2	L1	L2	C1	C3	C3	C4	L4	L4	F4	F4	F8	F9		
5	F1	F1	F4	F1		C2	C3	C3	L3	C1	C1	L1	L1	C1		H1	C4	C4	C3	F3	F4		F6		
6	F2	F1	F3	F1	L1	C2	C2	C3	C3	C2	C1	L2	L2	L2	L2	CL12	C2	C4	C5	C8	F7	F3	F4	F3	
7	F3	F3	F6	F3	C2	C2	C3	C2	C2	L5	L4	L1	L1	CL12	HL12	CL11	C1	C2	C3	C4	C3	F2	F1	F2	
8	F2	F2	F2		C2	C3	C3	C3	L4	L2	L1	L2	L2	L2	L1	CL32	L2	C2	C3	C4	F4	F4	F3	F3	
9	F2	F4				C2	C3	C2	C2	C2	L1	L1	L2	C4	C3	C2	C3	C7	C8	LQ71	FQ61	F6	F7	F6	
10	F1	FQ31	F4	F2	L1	C3	C3	C2	C2	C3	L2	L2	L2	L3	L3	C4	C2	C4	C4	CQ51	F6	F5	FQ31	FQ31	
11	FQ31	F1	FQ31	FF32	C1	C2	C6	C6	L5	L3	L1	L2	L2	L2	L2		C2	C5	C7	C4	F4	F4	F4		
12	F1	F1	F1		C1		C3	C2	C3	L3	L3	L2	L1	L1	C1	CL12	C2	C5	C4	L7	F8	F3			
13			F1		L1	C1	C4	C1	C2	L4	L2	C2	L2	C2	C2	C2	C2	C2	C6	L2	F2		F2	F4	
14	F2	F4	F2	F2	LC11	C3	C2	C4	C3	C1	C1		H1		L2	CL12	CL23	CL23	LC32	CL62	FF22			F1	
15		F1		F1	L2	H1	H1	C2	C2	C2	C2	C1	C1	C2	C2	C2	L3	L3	L4	F4	F4	F2	F1	F1	
16	F2	F2			C1	C2	C3	C2	C2	C2	C2	L2	C1	C1	C1	C2	C3	C1	C3	C6	F8	F5	F3	F2	
17	F2	F4	F2	F6	C5	C3	C5	C3	C4	C3	C2	L4	L2	L3	L2	L3	L3	CL23	CL83	F3	F5	F3	F3		
18	F3	F5	F5	F5	F3	H1	C2	C2	C2	C5	C2	L2	C2	L1	L2	L2	L3	L3	L2	HL11	F3	F8	F2		
19	F4	F2	F1	F1	CL21	C2	C2	C2	C2	C2	C2	L1	LQ11	LQ21	L3	L5	C4	C6	C4	C8	F8	FQ61	FQ31	F3	
20	F2	FQ31	F3	F1	C1	C2	C2	C3	C2	C1	L3	L3	L1	L2	C1	C1	C2	C2	C3	C5	F9	F1	F7	F5	
21		F1	F1		C1	LC12	C2	C2	C2		C1	L1	HL11	L1	HL11	C1	C2	L3	C4	L4	F2	F7	F4	F4	
22	F2	F1	F1		L2	L2	C2	C2	C2	C2	C2	C1	C1	H1	H1	C1	C1			C3	F5	F3		F1	
23	F1			F1		C2	C3	C2	C3	C3	C4	C4	HC11	HC11	HC11	C1	C1		C3	C2	F3	F2	F2	F4	
24	F4	F1	F1		H1	H2	C3	C3	C3	C2	C2			L1	C1	H1	HC11	C2	C4	C3	F3	F4		F3	
25	F3	F5	F2		C1	CL22	C2	C3	C3	C2	C2	L1	L2	C1	L6	LQ41	C2	CL21	CQ41	C3	F8	F5	F2		
26		F1	FQ31	FQ51	L4	L3	C1	C2	C3	C1	C1	C1	L2	C4	L3	L2	C3	L3	L3	F71	FQ41	F8	FQ41		
27	F6	F1	F5	F4	L1	CL21	C2	C2	C2	C2	C3	CQ21	L1	L3	LQ31	LQ41	CL32	C3	C4	CQ41	F5		F1	F5	
28	F4	F2	F3	F2	L1	C3	C2	C1	C2	C1	C1	C2	L3	L2	L2	L2	CL12	C2	L3	C6	F6	F5	F3		
29		F2	F4	F3	L3	CL23	CL22	C3	C3	C2	C4	L3	C1	L2	C1	C2	L2	L2	L4	L5	F1	F2			
30		F1	F3	F4	L4	C4	C4	C2	C3	C2	C1	C1	C1	H1	CL11	C1	C2	C2	C2	C6	F3	F3	F2	F1	
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																									

JUN. 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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 79	X 80	X 81	X 83	X 74																X 85	X 88	X 91	X 90		
2	X 87	X 84	X 84	X 81	X 80																	X 96	X 94	X 94	X 93	
3	X 92	X 90	X 86	X 86	X 88		99															X 89	X 90	98	102	
4	96	93	93	94	92	88																X 105	94	90	92	
5	93	107	94	92	86																A	A	X 91	95	96	
6	X 96	X 94	X 87	X 82	X 80																	X 90	X 94	X 92	X 93	
7	X 88	X 83	X 83	X 82	X 79																	X 94	X 98	X 98	X 90	
8	105	100	92	84	89																	X 90	X 90	93	96	
9	103	106	95	98	93	89	98															X 88	X 90	X 94	X 107	
10	112	105	95	92	89																	X 92	X 92	X 93	X 99	
11	X 99	X 104	X 91	X 90	X 93																	X 97	X 92	102	108	
12	X 100	X 96	X 91	X 89	X 91	92																X 82	X 86	X 86	X 80	
13	X 83	X 89	X 82	X 72	X 73	76																X 89	X 92	94	91	
14	92	93	82	76	74	91																X 76	X 80	X 86	X 92	
15	X 90	X 90	X 85	X 78	X 78																	X 100	X 98	X 94	X 105	
16	110	111	100	86	78						C											X 80	X 83	X 91	X 95	
17	X 91	X 91	X 90	X 96	X 82																	X 90	X 82	86	90	
18	95	89	88	90	90																	X 89	X 92	X 93	X 94	
19	X 92	X 94	107	95	92																	X 87	X 86	X 90	X 89	
20	90	91	91	92	84																	X 97	X 96	X 98	X 102	
21	110	108	101	88																		X 91	X 96	X 96	X 96	
22	X 99	X 92	X 90	X 88																		X 98	X 85	X 96	X 102	
23	102	92	94	87	83																	X 92	X 92	104	102	
24	95	86	86	83																		X 100	X 96	X 92	X 97	
25	102	97	91	89	86																	X 90	X 80	X 90	X 81	
26	82	81	79	77																		X 92	X 98	X 96	X 106	
27	X 99	X 99	X 86	X 79	88	88																A		X 94	X 98	X 96
28	94	88	85	84	80																	X 81	X 85	X 84	X 90	
29	X 84	X 86	X 81	X 73																		X 81	X 83	X 85	X 86	
30	X 96	X 94	X 94	90																		X 87	X 90	X 89	X 90	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	24	6	2														28	30	30	30		
MED	95	92	90	86	85	88	98														X 90	X 92	X 93	X 94		
U Q	100	99	94	90	90	91															X 95	X 94	X 96	X 102		
L Q	X 90	X 89	X 85	X 82	X 80	88																X 87	X 86	X 90	X 90	

JUN. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

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	73	74	75	77	68	71	78	84	88	87	91	98	92	96	105	106	104	92	77	74	80	F 81	85	84
2	81	78	78	75	74	79	84	93	91	87	85	91	96	98	96	93	93	92	99	98	90	88	88	87
3	F 86	F 84	F 79	80	F 82	F 92	F 91	86	88	89	A	94	94	100	97	96	101	106	104	98	83	F 84	F 88	F 84
4	F	F	F	F 82	F 82	F 77	95	98	91	A	A	89	88	96	96	91	A	A	A	106	99	F 83	F 80	F
5	F 83	F	F 83	F	80	82	91	106	100	82	A	87	95	102	97	96	90	91	93	A	A	85	F 86	90
6	90	88	81	76	74	84	94	82	81	86	93	94	96	91	92	98	90	90	A	A	84	88	86	F 85
7	F 82	77	F 77	76	F 73	80	100	105	92	A	87	91	91	94	94	90	88	88	86	85	88	92	92	F 84
8	F	94	F	78	F	87	77	78	84	83	A	83	84	86	A	91	90	88	87	87	83	84	F	F 87
9	F	F 96	F	F	F	F	F 90	110	109	84	A	85	89	89	95	99	100	93	86	84	82	84	88	101
10	F 104	F	F 87	F 82	F 80	83	90	93	94	89	79	82	86	90	A	82	81	82	85	90	86	86	87	F 93
11	93	98	85	84	87	F 87	88	94	92	A	A	86	82	83	86	87	86	84	87	95	90	86	89	F
12	94	90	85	82	85	F 82	83	79	71	69	72	79	80	77	75	78	78	78	76	74	76	80	80	F 74
13	F 77	F 80	76	66	F	F 67	80	92	94	86	81	77	83	84	A	88	84	79	80	84	83	86	88	F
14	F	F	72	69	F	F 82	74	A	64	61	A	A	62	65	A	70	67	63	60	62	70	74	80	86
15	F 84	F 84	F 79	F 72	72	78	83	87	82	A	A	80	83	89	96	100	101	96	97	98	93	92	88	F
16	F	F	F 90	F 76	72	64	69	73	A	55	C	62	70	65	70	70	80	75	70	78	74	77	85	F 89
17	F 85	85	84	90	76	76	80	80	67	66	68	69	68	A	A	80	77	77	73	84	84	76	F 76	F 79
18	F 83	83	F 79	F 77	F	78	92	95	74	70	A	A	86	96	94	92	93	93	88	80	83	86	87	88
19	F 86	F 88	F	F 88	F 80	88	95	89	71	71	A	74	76	79	78	78	71	71	74	79	81	80	84	83
20	F 76	F 82	F	F 76	F	83	94	92	80	74	A	A	91	96	90	89	90	87	94	96	91	90	92	96
21	F 96	F 99	F 95	F 82	80	83	92	83	78	74	69	73	78	84	92	94	89	A	92	A	85	90	90	90
22	F 93	F 86	F 84	F 80	80	84	91	94	88	87	84	89	91	91	90	88	86	88	A	100	92	79	83	F
23	F	F	F	F	F 72	70	66	A	67	A	74	76	79	82	80	80	A	A	A	81	86	86	F	F 86
24	F 81	80	80	77	70	77	87	78	A	75	88	90	91	89	92	90	84	92	98	99	94	90	86	91
25	F 92	F 91	F 82	83	F 78	71	78	84	A	96	92	92	94	109	104	93	82	84	84	87	84	74	80	75
26	F 73	75	73	71	68	80	83	86	76	A	A	A	101	102	A	102	A	94	93	87	86	91	90	100
27	F 93	F 93	F 80	F 73	F 70	F 79	69	72	78	84	88	A	88	78	83	90	88	81	72	79	A	84	92	90
28	F 84	81	F 72	F 72	F 70	73	86	87	82	74	81	79	80	83	85	79	79	78	78	A	75	79	78	84
29	78	80	75	67	67	72	92	101	90	81	80	78	78	83	92	101	97	87	92	84	75	77	79	80
30	90	88	88	F 80	71	70	73	81	87	87	67	80	84	82	82	A	83	A	76	74	81	84	83	84
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	24	24	27	24	29	30	28	27	24	17	25	30	29	24	29	27	26	26	26	28	30	28	25
MED	84	84	80	77	74	79	86	87	84	82	81	83	86	89	92	90	88	88	86	84	84	84	86	86
U Q	92	90	84	82	80	83	92	94	91	87	88	90	91	96	96	96	93	92	93	96	89	88	88	90
L Q	81	80	76	73	70	72	78	82	76	72	73	78	80	82	84	81	81	79	76	79	81	80	82	84

JUN. 2023 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	A	A	A	A	A	L	580	536	532	512	500	432	L				
2							L	L		L										L				
3						L		L	A	A	A	A	A	A	A	A		500	A	A				
4							L	A	A	A	A		A	A	A	A	A	A	A	A	A			
5								A	A	A	A		A	A		A	A	A	A					
6							L	U	L	A	A			U	A	A			A	A	A			
7								U	L	A	A	H								L	A			
8								A	A	A	A	A	A							A				
9							L	A	A	A	A	A	A							A	A			
10							L	A	A	A	A	A								A	A			
11									L	A	A	A	A	A	A	A		U	L	L				
12						L			A	U	L			A	A		A			A				
13							L	A	A	A	A									L				
14							L	A		A	A	A								A				
15							L		A	A	A									A	A	L		
16						U	L		A	A	C	A								U	L			
17							L	A	A	A	A									L				
18							L	A	A	A	A									A				
19						L	L		L	L	A									A	A			
20							A	A	A	U	L	A								A	A			
21						L	L	L	A	A										A	A	A	A	
22							L	H	L											A	A			
23							A	A	A	A	A									A	A	A		
24						L	A	A	A	A	A									L				
25								A	A	A	A									A				
26								A	A	A	A									A	A			
27								A	A	A	A									A	A			
28							L	A	L	L										L	L	A		
29							L	A	A	A										A	A	A		
30							A	A	A	A										A	A	L		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	3	8	6	8	10	13	13	15	16	17	17	11	3					
MED						L	432	498	502	536	556	556	556	536	542	520	512	464	416					
U Q						L	L	L	U	L									L	U	L			
L Q							452	528	568	560	592	566	576	560	552	526	522	476	472					
							416	474	496	524	540	548	546	532	534	512	498	460	404					

JUN. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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						224	288		A	A	A	A	A	A	A	A	A	A	A	A				
2						228	276	324	356	384		A	A	A	A	360	332	292		A	A			
3						A	276		A	U	A	A	A	A	408	368	332		196		A			
4						A	264	320	336		A	A	A	A	404	380	340	292		A	A			
5						200	284	328	340	372		A	A	A	A	404	344	288	192					
6						200	280	344	352		A	A	A	U	G	A	392	356	304	232				
7						192	268	336	348	364	360		A	A	A	A	A	352	300		A	A		
8						A	272	316	352	352		A	A	A	A	A	A	344	304		A	A		
9						A	264	328	348	376		A	A	A	A	A	364	336	288	220				
10						200	276	320	340	352	372	372		A	A	376		A	A	A	A			
11						A	268	308	340	356		A	A	A	A	A	A	A	A	A	A			
12						200	276	332	360			408		372		376	360	288	216		A			
13						A	276	324	352	368		A	392		A	A	368	332	292		A	A		
14						180	280	316	348	U	G	384		A	A	A	A	A	A	A	A			
15						A	A	320	348	376	380	384		A	A	A	A	A	A	A	A			
16						220	268	324	344	364		C	A	A	U	G	G	412	364	328	296	256		
17						A	A	328	348	376		A	400		A	A	A	A	304	228		A		
18						A	A	A	A	A		A	A	A	A	A	A	A	A	A	A			
19						A	276	328	356		A	A	A	A	A	368	348	300	224		A			
20						A	280	320	348	372		A	A	A	A	A	A	A	A		A			
21					B	A	272	320	352		A	408		A	B	A	A	A	304	228		A		
22					B	A	284		A	A		A	A	A	A	A	384	356	304		A	A		
23					A	236	284	316	364		A	A	A	A	A	A	364	324		A	A			
24					B	204	272	324	352	368	392		A	A	A	A	A	A	A	A	A			
25					B	A	260	324	364	376		A	A	A	A	412		340	300		A	A		
26					B	204		A	A	A		A	A	A	A	408	368	332	292	228		A		
27					B	192	284	340	368	372		A	A	A	A	A	352	336	304	236		A		
28					A	A	264	304	340	356		A	A	A	A	A	A	340	304	236		A		
29					B	204	252	316	348	364	368		A	A	A	A	368	324		A	A			
30					B	A	256	316	340	344	360		A	A	A	A	A	332	288	232		A		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						14	26	25	26	20	8	4	1	2	6	15	20	19	14					
MED						202	276	324	348	368	376	392	392	392	408	368	338	300	228					
U Q						220	280	328	352	374	388	404			412	380	346	304	236					
L Q						200	268	316	344	358	364	378			404	364	332	292	220					

JUN. 2023 foE (0.01MHz)

IONOSPHERIC DATA STATION kokubunji

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

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

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

JUN. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 2023 fbEs (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	E B 16	18	E B 16	E B 16	E B 16	G	37	54	67	60	62	56	48	43	52	47	42	35	30	25	20	34	E B 16	23	
2	E B 16	E B 16	E B 16	E B 16	E B 16	G	32	40	47	46	44	45	44	43	44	40	40	34	25	24	39	18	24	20	
3	E B 16	E B 16	E B 16	E B 16	E B 16		24	30	40	73	80	A A 116	61	56	76	73	62	39	49	51	32	62	62	42	42
4	45	31	23	E B 16	E B 16		24	40	52	83	A A 143	A A 203	52	68	58	63	61	A A 149	A A 137	A A 200	84	63	E B 16	E B 16	E B 16
5	27	E B 16	18	E B 16	E B 16		25	40	57	66	72	A A 125	45	62	66	48	63	71	63	44	98	A A 94	A A 25	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 16		22	32	G	51	58	52	49	68	48	56	43	39	50	A A 100	A A 95	21	62	32	43
7	50	42	18	24	E B 16		26	42	45	52	A A 95	46	45	45	56	48	39	45	47	56	44	46	E B 16	19	46
8	43	E B 16	E B 16	E B 14	22	23	44	58	52	63	A A 103	62	58	42	A A 124	43	68	38	59	70	51	28	29	28	
9	33	45	36	E B 16	E B 16		24	33	70	58	78	A A 98	66	61	84	60	64	44	51	44	30	30	E B 16	35	34
10	44	20	38	32	22	24	33	59	65	65	58	66	50	54	A A 116	68	58	72	30	35	E B 16	43	18	20	
11	E B 16	37	26	28	E B 16	28	41	50	47	A A 88	A A 161	61	59	64	67	50	40	39	31	46	31	22	36	34	
12	23	E B 16	E B 16	E B 16	E B 16	22	34	43	55	42	52	48	56	72	45	59	G		43	40	60	36	44	24	45
13	50	22	25	29	35	22	32	48	66	50	46	64	56	65	A A 110	41	36	34	32	19	E B 16	36	24	E B 16	
14	E B 16	29	22	20	19	22	30	A A 76	47	54	A A 55	A A 90	45	54	A A 87	59	47	51	44	30	56	37	56	E B 16	
15	E B 16	E B 16	E B 16	E B 16	E B 16	23	31	47	55	A A 85	A A 102	54	45	43	51	49	50	46	30	28	25	18	19	28	
16	27	E B 16	43	E B 16	E B 16	26	36	52	A A 70	44	C	56	60	46	G	G		47	40	G	20	25	28	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	32	35	54	44	59	56	46	62	A A 199	A A 142	40	36		G	25	19	18	E B 16	35	25
18	E B 16	20	26	E B 16	E B 16	42	33	45	59	67	A A 121	A A 85	76	55	42	44	44	45	34	34	20	37	22	18	
19	18	19	22	18	20	24	34	43	43	42	A A 247	48	69	60	49	46	56	44	36	22	30	39	36	36	
20	38	46	35	28	21	45	52	45	62	48	A A 86	A A 93	58	46	46	56	53	83	62	65	23	44	36	E B 16	
21	E B 16	E B 16	E B 16	E B 16	E B 16	25	42	36	50	56	G	46	E B 44	47	49	44	65	A A 161	A A 43	A A 98	45	E B 16	E B 16	32	
22	30	E B 16	E B 16	E B 16	E B 16	24	30	36	40	44	44	52	45	59	50	50	41	A A 51	A A 119	40	31	26	30	49	
23	E B 16	20	E B 16	26	20	G	18	A A 52	A A 70	A A 61	A A 94	64	52	52	45	44	60	A A 142	A A 106	A A 134	48	74	43	54	25
24	E B 16	E B 16	E B 16	E B 16	E B 16	26	43	74	A A 102	58	69	58	56	48	50	45	37	33	28	20	E B 16	21	19	E B 16	
25	35	E B 16	19	19	E B 16	27	49	50	A A 111	82	68	64	74	46	G	62	42	62	39	25	36	35	44	64	
26	E B 16	E B 16	23	E B 16	E B 16	23	31	48	70	A A 106	A A 128	A A 152	50	53	A A 129	92	A A 167	77	48	59	62	E B 16	18	24	
27	20	E B 16	20	26	E B 16	24	32	46	40	67	68	A A 114	68	52	62	46	55	40	35	52	A A 145	46	29	36	
28	E B 16	E B 16	27	E B 16	22	22	36	46	44	44	47	55	45	58	58	40	40	34	28	A A 120	E B 16	E B 16	34	E B 16	
29	E B 16	17	E B 16	E B 16	E B 16	G	29	36	68	40	41	56	71	46	47	40	72	64	52	54	42	E B 16	31	35	
30	E B 16	E B 16	E B 16	E B 16	E B 16	34	48	36	51	59	49	47	46	48	73	A A 137	A A 78	A A 110	33	32	25	22	E B 16	E B 16	
31																									
CNT	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	18	E B 16	E B 16	24	34	48	56	60	64	56	56	54	52	48	46	48	40	38	31	27	26	25	
U Q	33	20	25	20	19	26	42	54	67	A A 80	A A 110	64	62	60	A A 73	61	65	64	52	60	51	39	35	36	
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	22	32	43	47	48	48	48	46	46	47	43	40	39	30	25	E B 21	E B 16	E B 18	E B 16	

JUN. 2023 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

$\begin{matrix} H \\ D \end{matrix}$	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	18	22	40	40	40	35	40	38	36	33	22	19	16	16	16	16	16	16
2	16	16	16	16	16	16	16	25	20	28	39	39	37	34	41	19	21	16	16	16	16	16	16	16
3	16	16	16	16	16	16	17	15	18	27	34	34	34	26	28	21	21	18	17	16	16	16	16	16
4	16	16	16	16	16	17	19	19	23	24	28	34	33	30	30	31	25	19	14	16	16	16	16	16
5	16	16	16	16	16	16	17	18	19	30	30	34	35	32	35	33	23	18	16	16	16	16	16	16
6	16	16	16	16	16	16	18	18	22	22	38	40	35	33	41	25	24	17	16	16	16	16	16	18
7	16	16	16	16	16	16	16	16	20	22	24	29	36	31	33	26	25	18	16	15	16	16	16	16
8	16	16	16	14	14	16	18	16	21	19	36	32	40	33	34	30	20	20	14	16	16	16	16	16
9	16	16	16	16	16	16	16	16	20	31	42	40	41	41	42	28	24	18	15	16	16	16	16	16
10	16	16	16	16	16	15	15	18	19	24	31	26	39	38	25	28	19	17	16	16	16	16	16	16
11	16	16	16	16	16	16	16	22	26	30	27	34	36	34	35	28	22	18	16	17	16	16	16	16
12	16	16	16	16	16	16	18	18	25	31	26	30	37	31	30	24	22	16	16	15	16	16	16	16
13	16	16	16	16	15	15	14	19	22	28	40	36	25	24	28	23	20	21	18	16	16	16	16	16
14	16	16	16	16	16	16	19	16	21	28	35	41	36	29	29	26	20	16	13	16	16	15	16	16
15	16	16	16	16	16	16	16	22	25	28	26	22	27	32	36	25	25	22	14	16	17	17	16	16
16	16	16	16	16	16	18	16	18	25	26	C	38	34	30	30	29	24	18	16	14	16	16	16	16
17	16	16	16	16	16	15	16	21	21	34	40	34	43	40	36	30	30	22	17	16	16	16	16	16
18	16	16	16	16	16	16	16	18	20	38	35	40	40	40	33	28	24	19	16	16	16	16	16	16
19	16	16	16	16	16	16	17	22	23	28	34	36	42	41	30	24	21	19	18	16	16	16	16	16
20	16	16	16	16	16	15	17	18	22	24	33	32	40	36	43	40	24	18	16	16	16	16	16	16
21	16	16	16	16	16	15	16	23	26	34	32	37	44	42	41	41	23	20	14	18	16	16	16	16
22	16	16	16	16	16	18	18	20	23	34	33	37	35	35	35	26	21	16	20	15	16	16	16	16
23	16	16	16	16	16	15	16	18	22	43	29	30	40	40	39	27	21	18	16	16	16	16	16	16
24	16	16	16	16	16	16	17	17	20	28	26	40	44	35	36	36	28	22	16	14	16	16	16	16
25	16	16	16	16	16	17	19	16	24	32	40	37	37	35	36	34	29	16	16	16	16	16	16	16
26	16	16	16	16	16	18	18	20	24	25	26	34	41	41	32	24	20	20	16	16	16	16	16	16
27	16	16	16	16	16	16	17	19	24	24	36	34	35	36	34	25	18	17	15	17	16	16	16	16
28	16	16	16	16	16	16	16	20	24	22	34	34	34	34	30	22	22	17	17	16	16	16	16	16
29	16	16	16	16	16	16	17	18	22	25	25	30	41	38	40	28	26	15	14	14	16	16	16	16
30	16	16	16	16	16	16	16	18	20	24	32	33	32	32	42	38	22	18	17	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	17	18	22	28	33	34	37	34	35	28	22	18	16	16	16	16	16	16
U Q	16	16	16	16	16	16	18	20	24	31	37	37	40	38	39	31	24	19	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	18	20	24	28	32	35	32	30	25	21	17	15	16	16	16	16	16

JUN. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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 OSWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1		265	261	277	307	295	319	311	296	299	279	269	277	278	266	279	287	307	319	297	269	258	248	F 275	283					
2		273	266	278	278	294	299	324	296	305	296	286	275	272	286	292	288	300	287	295	297	285	276	276	F 275					
3		280	290	289	280	297	313	F 305	303	286	276		276	277	287	284	276	282	292	304	305	289	264	F 278	F 284					
4		F	F	F	F	291	301	F 295	F 312	317	281		A	280	267	274	280	291		A	A	A	305	F 319	F 272	F 263				
5		F	F	F	F	283	300	269	310	293	298		A	272	271	286	277	288	286	288	297		A	A	F 282	F 266	270			
6		277	288	291	288	283	300	313	281	291	289	280	273	274	270	271	283	293	297		A	A	267	263	279	F 281				
7		281	282	278	282	287	283	286	303	298		A	254	273	266	273	282	276	291	285	287	284	271	272	295	277				
8		F	292	F	284	F	330	284	285	299	288		A	277	264	271		280	284	289	289	293	274	267	F	F 265				
9		F	F	F	F	F	F	F	F	269	291	316		A	279	271		A	265	275	303	296	292	278	274	275	258	278		
10		F	F	F	F	F	F	F	F	298	280	281	273	306	269		A	276	264	290		281	288	286	280	281	275	280	273	277
11		289	290	280	288	288	304	282	302	297		A		280	281	282	280	287	283	270	281	286	301	272	260	F	F			
12		270	279	289	265	258	258	260	275	265	239	269	281	294		280	296	297	299	313	275	263	269	269	261	F	F			
13		278	287	313	291	F	265	268	291	295	298	299	264	279	285		A	298	299	291	287	272	272	272	273	F	F			
14		F	F	306	280	F	F	F	F		A		A		246	254		A	277	299	300	270	272	276	270	245	279	F		
15		273	289	291	284	282	294	313	329	309		A		270	267	259	260	279	289	281	283	290	276	276	265		F			
16		F	F	F	F	284	267	285	253	283	299		C	240	269	244	248	253	291	275	268	280	256	247	257	281	F	F		
17		266	270	266	302	278	282	267	304	285	262	263	269	256		A	A	292	282	285	275	285	297	267	249	F	F			
18		F	266	269	264	268	F	281	300	332	330		A		273	284	285	284	283	285	307	280	265	263	273	273	F	F		
19		275	284	F	F	279	271	F	293	311	298	325	289		A	246		A	269	284	296	284	282	283	278	278	271	268	276	
20		F	F	F	F	272	F	281	307	304	318	293		A		269	286	286	268	282		281	288	280	271	257	260	F	F	
21		F	F	F	F	272	272	309	295	310	324	272	261	269	271	270	282	282		A	293		264	266	272	262	F	F		
22		290	283	283	287	290	291	301	319	281	298	258	272	272	273	280	283	280	277		A	290	290	253	244	F	F			
23		F	F	F	F	268	300	265		A	A	A	278	274	277	272	280	281		A	A	A	276	262	241	F	F			
24		F	260	267	277	261	255	284	310		A	284	279	279	277	274	284	282	262	272	277	301	286	281	280	252	F	F		
25		F	F	F	F	279	290	298	309		A	A	A	264	252	276	283	288	279	275	287	292	285	261	271	265	F	F		
26		F	262	263	265	274	260	298	300	324		A	A	A	272	277		A	291		A	298	283	290	255	264	255	284	F	F
27		290	295	286	262	267	282	295	278	283	264	271		A	307	272	277	292	289	301	294	282		256	267	275	F	F		
28		F	290	302	269	272	279	269	288	310	296	269	286	279	280	284	297	302	284	301	298		270	262	247	289	F	F		
29		274	282	293	279	275	267	293	302	301	281	287	291		A	262	270	287	286	287	294	308	269	260	268	244	F	F		
30		271	276	280	290	272	273	274	310	294	311	265	295	291	290	301		A	A	A		309	278	270	286	266	270	F	F	
31																														
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT		24	23	24	27	24	29	30	27	25	22	17	25	28	27	24	29	26	25	26	26	28	30	28	24					
MED		274	283	284	280	280	291	296	302	296	288	272	275	272	274	280	284	286	287	288	284	274	268	268	276					
U Q		280	290	290	288	288	300	310	310	307	298	286	279	278	285	284	291	293	298	297	292	285	272	273	281					
L Q		F	266	269	277	272	270	277	280	291	284	269	267	270	267	270	274	280	282	282	281	278	266	262	258	265				

JUN. 2023 M(3000)F2 (0.01)

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IONOSPHERIC DATA STATION Kokubunji

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	A	A	A	A	A	A	370	A	A	359	367	L					
2							L	L	A	L	376	406	364	384	375	341	348	367	353	L				
3						L		L	A	A	A	A	A	A	A	A	351	A	A					
4							L	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
5								A	A	A	A	A	372	A	A	A	A	A	A	A	A			
6							L	U	L	A	A	A	A	A	A	A	342	345	A	A	A			
7								A	A	A	A	H	346	399	342	A	A	362	339	L	A			
8								A	A	A	A	A	A	A	370	A	351	A	348	A				
9							L	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
10							L	A	A	A	A	A	A	A	A	A	A	A	A	A	L			
11								L	A	A	A	A	A	A	A	A	A	352	U	L	L			
12						L		A	A	U	L	A	A	A	A	A	A	A	A	A	A			
13							L	A	A	A	A	405	A	A	A	A	376	344	331	L				
14							L	A	A	A	A	A	430	A	A	A	A	A	A	A				
15							L		A	A	A	A	A	365	365	A	A	A	A	L				
16						U	L	A	A	A	C	A	A	A	A	A	395	387	351	A	U	L		
17							L	A	A	A	A	401	A	A	A	A	372	343	354	L	L			
18							L	A	A	A	A	A	A	A	A	353	A	A	A	A				
19						L	L		L	L	A	A	A	A	A	A	A	A	A	A				
20							A	A	A	U	L	A	A	A	A	A	A	A	A	A				
21						L	L	L	A	A	A	L	387	392	380	376	A	A	A	A	A	A		
22							L	H	L	A	A	A	U	L	A	A	A	A	A	A				
23							A	A	A	A	A	A	A	A	391	360	A	A	A	A				
24						L	A	A	A	A	A	A	A	A	365	A	394	333	334	L	L			
25							A	A	A	A	A	A	A	400	362	A	357	A	A					
26								A	A	A	A	A	A	A	A	A	A	A	A					
27								A	A	A	A	A	A	A	A	A	A	A	A	A				
28							L	A	406	A	A	A	A	L	A	A	369	352	342	L	L	A		
29							L	A	332	329	366	A	A	A	A	A	A	A	A	A				
30							A	371	A	369	366	A	A	345	A	388	A	A	A	A	L			
31							A	376	A	A	343	A	U	L	364	346	A	A	A	A	L			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						2	2	6	4	8	8	8	8	12	7	10	13	10	3					
MED						L	332	354	366	L	L	366	381	382	372	362	366	352	350	L	L			
U Q								376	391	374	396	396	395	384	379	376	356	354	345	L	L			
L Q								L	L	U	L	361	339	354	344	348	364	365	353	351	344	342	331	

JUN. 2023 M(3000)F1 (0.01)

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JUN. 2023 h'F2 (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							248	274	294	320	352	328	330	360	320	286	274	246							
2							236	290	270	290	296	344	330	306	314	320	288	288	266						
3						256		244	E A 340	E A 404	A	342	342	336	330	330	300	292	268						
4							252	250	E A 422	A	A	346	378	344	322	316		A	A	A	E A 308				
5								262	290	E A 342	A	362	362	320	336	312	348	316	272						
6							224	334	274	324	340	338	338	342	350	318	310	292		A	A				
7								276	260		372	332	360	360	330	326	312	316	E A 304						
8								E A 302	296	336		346	392	370		330	338	306	302						
9							318	306	E A 254	E A 408		E A 354	E A 354	E A 486	E A 364	330	278	268	260						
10							230	276	324	276	330	378	392	330		E A 358	E A 332	E A 358	278						
11									302		A	352	316	362	352	326	316	316	292						
12						298	328	332	388	434	414	370	324	E A 416	E A 368	340	326	298	256						
13							276	300	296	300	320	420	360	348		A	300	314	330	278					
14							216		A 384	476		A	514	462		A	394	344	344						
15							242		284		A	378	372	376	372	316	306	296	282						
16						372	330	308		734	C	538	428	484	458	444	338	342	338						
17							326	290	246	454	448	422	480		A	332	360	298	326						
18							266	244	E A 254	E A 462	A	406	322	324	314	322	280								
19						256	236		E A 278	A 360	A	E A 476	E A 400	384	364	336	E A 346	E A 306							
20							262	236	E A 274	A 322	A	A	374	318	314	360	334	E A 458							
21						306	262	288	242	304	406	378	400	384	352	318	324		A	278					
22							258	246	306	286	420	358	328	366	334	340	338	328		A	A	A			
23							378		E A 408	E A A	E A A	386	392	372	356	356	356								
24						296	266	E A 394	A	362	E A 352	346	356	348	338	320	372	330	300						
25							250		E A 338	E A 316	A	372	422	338	306	306	348	348							
26								E A 376	A	A	A	A	344	338		E A 380	E A 316								
27							360	322	E A 394	E A 358	A	306	388	362	324	300	288	264							
28							290	260	324	398	338	358	318	352	322	320	324	304	256		A				
29							290	280	316	302	346	336	E A 424	388	346	310	320	E A 318	E A 290						
30							E A 330	296	270	252	474	334	304	344	E A 344	A	E A 364	A	262						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT						6	22	24	27	24	17	25	30	29	24	29	27	26	19	1					
MED						297	263	280	287	326	349	358	360	352	339	323	323	304	278	E A 308					
U Q						306	318	304	E A 324	A 406	410	378	400	384	359	340	344	330	300						
L Q						256	242	255	270	303	334	343	330	338	323	316	310	292	264						

JUN. 2023 h'F2 (KM)

IONOSPHERIC DATA STATION Kokubunji

JUN. 2023 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

Table with 32 columns (00-23) and 32 rows (1-31). Each cell contains numerical data or alphanumeric codes representing ionospheric measurements.

JUN. 2023 h'F (KM)

IONOSPHERIC DATA STATION Kokubunji

JUN. 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						116	110		A	A	A	A	A	A	A	A	A	A	A	A				
2						116	104	98	98	98		A	A	A	A	A	98	98	100		A	A		
3						A		A				A	A	A	A				A		A			
4						A	100		100	100		A	A	A	A	100	100	100		100		A	A	
5						126	104	100	100	98		A	A	A	A	A	102	104	106	100				
6						108		96	96			A	A	A	100		100	100	100	100				
7						112	106	100	100	98	96		A	A	A	A	A		100	102		A	A	
8						A	100	100	98	98		A	A	A	A	A		102	104		A	A		
9						A	100	102	98	104		A	A	A	A	A		102	102	102		A		
10						A	102	102	100	96	98	98		A	A	98		A	A	A	A			
11						A	100	98	98	98		A	A	A	A	A	A	A	A	A				
12						108	104	100	100			A	A	A	98		100	102	102	102		A		
13						A	102	102	102	102		A	A	100		A	100	100	100		A	A		
14						98	100	100	96	98	104		A	A	A	A	A	A	A	A				
15						A	A	100	96	100	100	100		A	A	A	A	A	A	A				
16						116	100	100	100	100		C	A	A	A		102	104	100	100	104			
17						A	A		98	98	112		A	102		A	A	A	A	104	106			
18						A	A	A	A	A	A		A	A	A	A	A	A	A	A				
19						A	102	100	100		A	A	A	A	A	A		102	102	102	102			
20						A	100	100	100	100		A	A	A	A	A	A	A	A					
21						B	A		102	100	100	A	100		A	B	A	A	A		102	102		
22						B	A		A	A	A		A		A	A		100	100	100		A	A	
23						A	122	100	100	100		A	A	A	A	A		100	100		A	A		
24						B	114	102	98	98	98	98		A	A	A	A	A	A	A				
25						B	A		102	100	100	100		A	A	A	100		100	102		A	A	
26						B	118		A	A	A	A		A	A	A		104	104	104	104	104		
27						B	118	102	102	98	98		A	A	A	A	A		100	100	104	106		
28						A	A		102	98	98	98		A	A	A	A		104	104	104			
29						B	112	100	98	98	98	98		A	A	A	A		100	104		A	A	
30						B	A		98	102	102	98	100		A	A	A	A		100	106	106		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						13	25	25	26	20	8	4	1	2	6	15	20	19	14					
MED						116	102	100	99	98	99	99	100	99	100	100	100	100	102	102				
U Q						118	102	100	100	100	100	101			102	102	102	104	104					
L Q						110	100	98	98	98	98	98			100	100	100	100	102					

JUN. 2023 h'E (KM)

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JUN. 2023 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	90	86	84	B	84	G	102	94	98	92	92	94	96	104	90	90	92	92	90	86	96	102	96	94
2	94	B	B	86	B	G	108	104	98	100	98	166	104	98	114	120	106	118	102	98	112	102	94	92
3	B	100	94	92	B	106	120	108	94	90	90	88	88	88	98	102	116	110	98	94	94	98	94	92
4	90	86	86	86	86	124	108	98	96	90	88	90	88	88	120	106	102	98	98	92	96	96	96	94
5	88	88	84	90	84	122	106	98	92	90	90	100	90	92	96	110	102	98	96	92	94	96	94	86
6	B	84	B	B	B	150	130	G	96	90	94	122	86	110	104	142	166	106	98	98	96	92	90	92
7	92	90	90	90	98	120	108	100	100	90	92	94	92	88	90	96	104	104	94	94	94	92	92	92
8	92	88	88	B	88	120	104	100	98	90	86	90	94	100	92	92	100	104	98	94	96	96	98	92
9	88	90	88	84	100	120	110	100	98	98	100	104	104	98	100	100	104	98	102	102	94	94	96	96
10	92	90	90	86	86	128	106	102	94	94	96	92	98	100	92	92	94	90	96	94	92	84	88	84
11	86	84	88	80	82	102	112	92	98	86	86	90	90	90	90	90	108	98	100	92	94	96	96	96
12	88	90	88	94	96	128	114	106	98	106	98	100	90	92	112	106	G	100	96	94	B	94	92	94
13	94	94	88	88	86	94	146	110	102	94	100	92	100	96	90	124	116	104	92	100	98	96	106	B
14	84	82	94	90	90	140	136	98	104	98	96	88	98	92	90	90	86	98	104	106	102	98	96	B
15	B	B	92	B	B	132	116	102	98	94	92	96	100	108	108	94	90	90	88	86	86	86	82	96
16	92	92	92	92	126	110	106	100	98	104	C	92	92	116	G	G	108	104	G	102	96	96	98	92
17	92	96	92	90	90	92	116	100	106	100	100	106	100	90	90	104	102	G	114	106	98	96	96	96
18	92	92	90	90	94	92	94	106	100	98	92	92	92	92	92	90	94	92	86	86	100	100	96	94
19	94	90	90	90	90	124	112	106	102	118	92	98	94	118	118	108	100	102	98	108	96	122	100	96
20	92	90	86	88	90	88	96	98	94	94	90	88	92	98	134	110	106	100	100	92	92	96	96	90
21	B	110	92	86	94	114	102	108	98	92	G	100	B	98	110	148	104	98	98	92	90	84	84	84
22	84	90	84	80	88	158	144	98	92	92	92	90	90	90	90	102	110	104	94	94	82	96	96	96
23	90	90	90	88	90	94	108	98	100	90	90	98	96	98	100	108	94	98	98	90	98	98	100	94
24	108	B	102	102	B	126	106	98	98	98	92	92	94	94	94	98	98	92	90	94	86	84	96	94
25	94	94	94	96	B	110	104	102	98	98	94	90	90	98	G	100	110	96	98	84	92	100	98	94
26	92	92	88	88	98	132	96	108	100	90	90	90	96	104	100	100	98	98	98	98	92	112	88	88
27	90	90	86	88	90	142	110	110	108	96	90	88	88	96	96	106	100	114	102	90	96	94	94	96
28	90	86	90	90	88	94	102	98	100	96	92	88	92	92	86	94	114	102	100	92	94	94	98	116
29	96	88	88	90	B	G	174	108	94	102	112	92	94	100	112	110	94	92	92	92	92	104	108	102
30	102	98	98	102	102	100	96	104	94	92	92	90	90	118	102	106	100	100	104	100	96	96	94	94
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	28	26	23	27	30	29	30	30	28	30	29	30	28	29	29	29	29	30	29	30	30	29
MED	92	90	90	90	90	120	108	100	98	94	92	92	92	98	97	102	102	98	98	94	94	96	96	94
U Q	94	92	92	90	96	128	116	106	100	98	96	98	97	100	109	109	108	104	100	98	96	98	96	96
L Q	90	88	88	86	86	100	104	98	96	90	90	90	90	92	90	94	96	97	94	92	92	94	94	92

JUN. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

LAT. 35°43.0'N LON. 139°29.0'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	F2	F4	F1		F1		C2	L2	C2	L2	L2	L2	L2	C1	L2	L2	L2	L2	L3	L3	FF33	FF52	F3	F2	
2	F2			F1			C1	C1	C2	C2	C1	HC11	C1	C1	C1	C2	C2	C1	C2	C3	FF24	FF24	F3	F3	
3		F1	F2	F4		C1	C1	C1	L3	L3	L3	L3	L4	L3	C3	C3	C1	CL32	C3	L4	F5	F5	F6	F6	
4	F4	F4	F2	F2	F1	C1	C1	C3	C5	L5	L4	L2	LQ31	L2	C3	C2	C5	C4	C4	L4	F5	F3	FQ21	F3	
5	F3	F4	F2	F1	F1	C1	C2	C3	L3	L3	LQ31	CQ11	LQ21	L2	C1	C2	C4	C3	C5	L6	F6	FQ41	F2	F4	
6		F1				H1	HL11		C2	L2	L2	CL12	LL32	C1	C2	H1	H1	C3	C6	C4	F3	F5	F4	FQ41	
7	FQ41	F4	F4	F5	F2	C1	C2	C2	C2	L3	L2	L2	L1	L2	L2	L1	C2	C2	L4	L5	F5	F3	F3	FQ41	
8	F3	F3	F1		F2		C3	C3	C3	L3	L3	L3	L2	C1	L2	L1	C2	C2	C3	L6	F4	FQ21	FQ51	FQ41	
9	F3	FQ41	FQ31	F2	F1	C1	C2	C4	C2	C4	C4	C2	C2	C2	C2	C2	C2	C3	C3	C4	F3	F2	FQ31	FQ41	
10	FQ31	FQ31	FQ41	F4	F3	CL11	C2	C3	L3	L3	C2	L3	C1	C2	L3	L3	L2	L4	L3	L3	F3	F4	F2	F4	
11	F1	F3	F2	F3	L2	C2	C2	L2	C2	L3	L4	L2	L2	L2	L2	L1	C2	C2	C2	L5	F4	F4	F4	F4	
12	F4	F2	F1	F1	F1	C1	C2	C2	C2	C1	C2	C1	L2	L2	CL11	C2		C2	C3	L6	F4	F6	F2	F4	
13	F4	F3	F3	F5	F4	L2	H1	C2	C3	L2	L1	L2	C2	C2	L3	C1	C1	C1	L3	C2		F5	F4	FF22	
14	F2	F3	FF12	F2	F2	H1	H1	C3	C2	C2	C2	L3	C2	L3	L3	L2	L2	CL23	CL23	CL23	FF53	FF22	F5		
15			F1			HL12	CL12	C3	C2	C3	L3	C2	C1	C1	C1	L2	L2	L2	L3	L3	F6	F3	F3	F5	
16	F4	F3	F4	F2	F1	C2	C2	C3	C2	C1		L2	LQ21	CL11			C2	C2		C2	F3	FQ31	FQ31	F3	
17	F2	F1	F2	F2	F4	L2	CL22	C3	C2	C2	C2	C1	C2	L4	L4	C1	C1		C1	C2	F5	F2	F6	F5	
18	F2	F3	F4	F1	F2	L3	L3	CL31	C3	C2	L3	L3	L3	L2	L1	L2	LQ11	L3	L3	L4	F2	FF32	F4	F2	
19	F3	F4	F5	F3	F4	CL21	C1	C2	C3	C1	LQ31	C1	L2	C2	C1	C2	C3	C2	C3	C2	F3	FF22	FQ41	FQ31	
20	FQ31	FQ51	FQ31	FQ21	F2	F2	C6	C3	L2	L2	L3	L3	L2	C1	L1	C2	C2	C4	C6	L5	F3	F4	F4	F4	
21		F1	F1	F1	L1	CL21	C2	C1	C2	L2		C1		C2	C2	H1	C4	C4	C3	L4	FQ41	F4	F1	F2	
22	F3	FF22	F2	F2	L1	HC11	H1	C2	L1	L1	L1	L2	L1	L2	L2	L2	C1	C3	L4	L3	F3	FQ31	F5	F5	
23	F2	F4	F2	F6	F3	L1	C3	C4	C2	L3	L3	L2	C2	L1	L1	L3	L3	L4	L6	L5	F5	FQ51	F7	FQ31	
24	F1		F1	F1		C3	C2	C4	C3	C2	L3	L2	L2	L1	L2	C1	L1	L1	L2	L1	F1	F3	F3	FQ31	
25	FQ41	F5	F3	F3		C3	C3	C3	C3	C3	L2	L2	L2	C1		C3	C1	C3	CL22	L2	FF22	FF22	F6	FQ51	
26	F3	FQ21	F3	F2	C2	C1	L1	CL22	C3	L4	L4	L4	LQ11	C1	C3	C3	C4	C4	C4	C5	F6	FF22	F3	F3	
27	F3	F3	F2	F4	L1	H1	C1	C2	C1	C2	L3	L3	L3	C2	L2	C1	C3	C1	C3	L4	F6	F4	F4	FQ41	
28	F2	F2	F2	F2	L4	L1	C3	C2	C1	C2	L2	L2	L2	L2	L2	L1	C2	C2	L6	L6	FQ21	F3	F2	FF12	
29	F1	F5	F2	F1			HC11	C2	L3	C1	L1	L2	L3	C2	L1	L1	L2	L3	L3	L3	F4	FF22	F3	F3	
30	F2	F2	F2	F3	C2	C4	C3	C1	L2	L2	L2	L2	L2	CL11	C2	C4	C5	C5	C3	C3	F4	FF52	FF23	FF22	
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																									

JUN. 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	X 108	X 93	X 88	X 96	X 79	72															X 86	X 89	X 90	X 93	
2	X 92	X 86	X 85	X 82	X 83																	X 96	X 92	X 94	X 96
3	X 97	X 98	X 90	X 85	X 86																	X 97	X 93	X 98	X 107
4	X 107	X 102	X 96	X 95	X 89																	X 104	X 85	X 92	X 111
5	X 108	X 114	X 117	X 104	X 92		93															X 95	X 96	X 102	X 98
6	X 101	X 101	X 98	X 94	X 84																	X 97	X 99	X 103	X 108
7	X 100	X 101	X 96	X 84	X 85																	X 94	X 93	X 97	X 105
8	X 105	X 103	X 96	X 98	X 100	92	88															X 96	X 91	X 92	X 91
9	X 94	X 110	X 101	X 92	X 92	83	88															X 94	X 90	X 94	X 95
10	X 103	X 108	X 100	X 93	X 93																	X 101	X 102	X 106	X 106
11	X 112	X 111	X 112	X 110	X 106																	X 98	X 92	X 92	X 99
12	X 107	X 112	X 94	X 88	X 86	87																X 79	X 80	X 86	X 84
13	X 84	X 80	X 72	X 66	X 64																	X 96	X 96	X 92	X 92
14	X 92	X 94	X 93	X 94	X 86																	X 84	X 89	X 92	X 93
15	X 93	X 93	X 88	X 80	X 78																	X 108	X 108	X 110	X 108
16	X 113	X 116	X 101	X 102	X 96	89																X 76	X 80	X 84	X 88
17	X 88	X 88	X 86	X 86	X 75																	X 98	X 95	X 101	X 101
18	X 114	X 122	X 109	X 101	X 96	94																X 92	X 92	X 94	X 90
19	X 88	X 87	X 87	X 82	X 82							C										X 97	X 89	X 89	X 93
20	X 93	X 98	X 93	X 86	X 76	84																A	X 95	X 102	X 109
21	X 114	X 112	X 103	X 91	X 88	89																X 94	X 97	X 99	X 104
22	X 103	X 98	X 94	X 91	X 84																	X 101	X 92	X 90	X 96
23	X 96	X 94	X 104	X 93	X 89	88																X 97	X 91	X 90	X 92
24	X 93	X 93	X 114	X 98	X 88	80																X 110	X 92	X 90	X 90
25	X 89	X 88	X 90	X 88	X 78																	X 94	X 78	X 78	X 84
26	X 89	X 93	X 85	X 79	X 74																	X 94	X 97	X 98	X 104
27	X 105	X 110	X 94	X 84	X 82																	X 88	X 89	X 88	X 92
28	X 96	X 98	X 86	X 81	X 73	72																X 82	X 84	X 90	X 92
29	X 87	X 89	X 82	X 81	X 77																	X 92	X 94	X 94	X 97
30	X 100	X 103	X 100	X 98	X 87																	X 89	X 92	X 92	X 90
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	11	3														29	30	30	30	
MED	X 98	X 98	X 94	X 91	X 86	87	88														X 95	X 92	X 92	X 96	
U Q	X 107	X 110	X 101	X 96	X 89	89	93														X 98	X 95	X 98	X 104	
L Q	X 92	X 93	X 88	X 84	X 78	80	88														X 90	X 89	X 90	X 92	

JUN. 2023 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	102 ^R	83	82	90	73	62	67	79	79	81		90 ^{AUR}	93	99	105	111	112	91	74	75	80	83	84	87	
2	86	80	79	76	77	66	75	89	89	92	85	92	103	112	112	107	106	105	106	98	90	86	88	90	
3	91	92	84	79	79	83	87	87	96	96	99	100	107	107	111	116	119	117	118	109	91	87	92	101 ^R	
4	101 ^R	96 ^R	90	89	83	74	77	86	84	85	91	92	98	102	103	104	104	101	106		98 ^{RJ}	79	86		
5																									
6	95	95 ^R	92	88	78	79	90	87	83	90	96	95	102	101											
7	94																								
8	99	97	88	88	92	83	77	81	82	88	88	88	94	98											
9																									
10	97	102	94	87	87	78	78	85	88	87															
11	106	105	108	104	100	88	95	99	87	85															
12	101	104	88	82	77	79	84	88	82	82															
13	78	74	66	60	58	57	72	90	94	88	80	87	92	95	94	93	87								
14	84	85	84	88	80	58	67	68	76	80	76														
15	87	87	82	74	72	76	84	81																	
16	107	110	95	81	82		84	84	68																
17	82	82	80	80	69	68	89	80	76	79	81	85	94	100	105	109	99	92	94	95	92	89	95	95	
18	108 ^R	106 ^F	95 ^F	95 ^F	87 ^F	83 ^F	91	84	69	73	74	80	88	96											
19	82	81	81	76	76	87	92	89																	
20	84 ^F																								
21	108	105	97	85	82	82	93	91	93	72	73	78	86	96	103	101	96	99	100	95	88	91	93	97	
22	97	92	88	85	78	77	85	82	84	84	86	90	100	100	104	103	100								
23	86																								
24																									
25	83	82	84	82	72	65	69	74	76	94	89	85	94	105	111	104	99	100	99	103	88	72	72	76	
26																									
27	99	104	88	78	76	80	78	80	81																
28																									
29	76 ^F	83	76	72	71	69	78	98	96	78	79	85	86	92	104	115	101	97	98	94	86	88	88	91	
30	94	97	94	92	80	77	81	87	81	82	69	77	94	88	88	91	94	80	75	77	83	86	86	84	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	25	26	26	28	30	29	30	29	28	25	24	25	24	27	26	28	29	27	28	26	29	30	27	26	
MED	94	92	87	82	78	76	80	86	82	82	84	87	94	96	99	101	99	98	98	94	89	86	88	87	
U Q	101	102	92	88	82	80	87	90	88	88	87	91	96	101	105	108	102	102	102	98	92	89	93	97	
L Q	84	82	81	76	72	67	77	80	76	78	76	81	86	92	92	94	96	85	84	78	84	83	84	84	

JUN. 2023 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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									A	A	A	A	A	A		A	492	448	U L						
2								L	L	U L	U L	L	556	556	564	548	524	500	H L						
3									L	A	U L	L	584	576	540	536		A	L	A					
4									A	A	L	580	556		A	A	524	564	492	428					
5								L		A	A	A	A	A	A	A	548	A	A						
6							L		A	A	A	A	588	612		A	568	512	L	A	A				
7									A	U L		A	576	544		A	536	A	A	A					
8								A	A		A	A	572		A	A	536	H	508	A					
9								U L	L	A	U L	L	A	544	564		A	524	528	L	A				
10							L	L	L	A	A	A	588		A	A	A	536	472	L					
11										A	A	A	A	A	A	528	552	A	A						
12							U L	L	L	A	A	A	548	564	540	L	532	532	488	L					
13								L	L	A	U L	588	548	588	548	540	A	A	A	A	A				
14								L	U L	L	L	A	528		A	A	A	A	A	L					
15							L		A	A	A	544	A	536		A	A	A	A	A	A				
16									A	A	A	A	532		A	512		A	A	A	A				
17							L			A	A	604	580	540		A	A	A	L	A					
18							L	L	L	U L	A	A	A	A	A	A	544	A	A	L					
19									A	A	A	C	580	556	548	536	U L	L	460	L					
20									U L	U L	L	612	560	584	600	L	H	H	A						
21							L	L	U L	U L	L	660	636	568	548	A	540	A	A	L					
22								L	L	U L	L	A	580	552	584	536		A	A	A					
23								A	A	L	A	A	A	A	A	A	A	A	L	L	A				
24								A	A	U L	A	A	A	A	A	A	560	A	A	A					
25								476	A	L	A	564	A	A	A	A	544	524	496	452					
26								L	U L	U L	L	556	556	568	580	A	A	A	A	L					
27								A	U L	A	A	552	560	536	544	536	504	456	U L	L	L				
28							L	L	A	A	L	A	A	A	A	A	540	A	492	L	A				
29							L	L	U L	A	A	U A	A	536	552	A	A	A	A	A					
30									L	A	U L	A	564	568	548	536	A	A	A						
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								2	6	12	13	12	18	16	13	16	15	17	9						
MED								484	U	L	U	L	556	570	554	544	536	532	492	440					
U Q								600	U	L	U	L	566	580	572	556	542	556	500	462					
L Q								508	L	A	U	L	550	556	544	540	534	512	478	422					

JUN. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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	A	U	A				A		A	A	A	A	A					
2						B	220	300	336	364	372	392	396	A	A	A			A	A				
3						B	192	288	336								400	380	356	316	248			
4						B	216	292	324	348	352		A	A	R	436	400	380	372	324	272			
5						A	A	296	344	380	396		A	A	A	A	A	A	A					
6						A	216		A	A	A	A	A	A	416	400	408	364	320	272				
7						A	208	288		A	360		A	A	A	A		380	372	328	256			
8						A	240	284	340	U	A	A	A	A	A			380	352	328	268			
9						A	220	288	332	368	388	400	408	400	388	372	352	320	264					
10						A	216	300	340	352	360		A	A	380	376	352	348	312	264	164			
11						B	208	280	332	352	348		A	A	A	A		380	360	308	192			
12						A	A	304		372		A	A	A			404			324	268			
13						A	A	288	332	360		A	A	A	A		396	380	360	312				
14						A	A	292	332	360		A	A	A	A	A	A	A	A	A	A			
15						B	228	284	336	356	372	396		A	364	380	356	336	312		A	A		
16						A	252	288	336	348		A	A	A	A	A	A	A	A	A	A			
17						B	232	288	344	360	380	392	404		A	A	A	A	A	A	A			
18						A	A	292	332	376	388	396		A	A	A		324			A	A	A	A
19						B	232	308	360	376	388		C	A	A	412	404	360	320	264				
20						A	220	288	328	352		A	A	A	A			384	364	340	280	188		
21						A	A	284	324	352	376	400		A	420	412	388	368	336		A	A		
22						B	240	292	340		A	A		A	A	A		396	376	332		A	A	
23						A	228	296	340	400	396	400		A	A	A		364		U	A	A	A	A
24						B	236	288	348		A	A	A	A	A	A		A	A	A	A			
25						B	224	288	344	372	U	A	A	A	A	A			368	324		A	A	
26						A	A	A	A	A	A		A	428	412	400	384	352	316	280	188			
27						A	228	292	340		A	A	A	A	A	A		360	316	280				
28						A	A	A	328	356		A	A	A		400	376	356	312	268				
29						B	224	280	324		A	A	A	404	396	396	360	328		A	A	A	A	
30						A	220	288	328	360	376		A	A	A	A		A	A		264			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							21	27	26	23	15	7	4	9	13	20	20	21	16	3				
MED							224	288	336	360	380	396	406	400	400	380	360	320	266	188				
U Q							232	296	340	372	388	400	418	418	402	384	366	326	272	188				
L Q							216	288	332	352	372	396	404	388	392	368	352	312	260	164				

JUN. 2023 foE (0.01MHz)

IONOSPHERIC DATA STATION Yamagawa

JUN. 2023 foEs (0.1MHz) 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	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
2	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
3	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
4	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
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
6	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
7	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
8	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
9	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
10	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
11	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
12	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
13	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
14	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
15	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
16	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
17	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
18	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
19	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
20	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
21	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
22	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
23	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
24	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
25	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
26	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
27	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
28	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
29	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
30	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30		
MED	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
UQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
LQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A

JUN. 2023 foEs (0.1MHz)

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IONOSPHERIC DATA STATION Yamagawa

JUN. 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

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		25	E B	E B	E B	E B	E B		29	43	58	61	A A		62	60	56	42	53	40	35	28	23	E B	18	19	19			
2		20	E B	E B	E B	E B	E B		25	35	44	40	41	41	42	42	43	44	G		37	37	62	E B	26	29	34			
3		29	35	26	21	22	E B		37	44	42	52	45	42	42	44		G		51	41	92	28	35	26	32	34			
4		38	18	28	21	E B	E B		36	35	55	63	44	46	55	59	59	46	47	38	34	71	66	50	22	26				
5		66	22	22	22	E B			29	38	46	A A	A A	A A	A A	A A	A A							E B	16	33				
6		23	26	22	18	E B			26	36	63	64	66	60	56	52	A A	G				A A		34	30	46	50			
7		50	62	44	29	24	24		44	37	48	44	46	65	44	52	75	42	52	47	44	32	36	21	27	45				
8	E B	16	20	33	22	30	22		36	65	55	44	62	65	48	62	A A										27			
9		53	51	29	26	E B			40	39	56	63	49	49	A A	43	44	64	48	43	46	29	40	E B	E B	E B	E B			
10	E B	16	33	E B	16	25	26	19	25	36	49	58	A A	A A	A A	A A	A A	A A									20			
11		24	22	E B	E B	E B	E B		27	64	44	53	A A	A A	A A	A A	A A	G							E B	34				
12		22	22	20	31	28	27		25	35	40	60	A A		66	45	42		G					E B	28	19				
13		21	21	20	20	21	19		25	39	39	60	49	48	45	50	48	52	68	A A	A A	A A	A A	45	24	40	21			
14		20	18	E B	16	36	E B		24	31	47	46	50	A A	102	51	66	60	58	62	53	34	31	E B	E B	21				
15	E B	16	E B	16	18	33	18	E B	30	36	A A	A A	A A	62	52	A A	42	52	66	87	A A	A A	A A	45	38	29	E B	16		
16	E B	16	29	20	E B	16	21	18	52	52	A A	A A	A A	48	57	54	48	51	66	62	58	41	52	E B	E B	E B	E B			
17	E B	16	E B	16	21	18	E B	E B	26	32	41	49	60	52	43	51	76	55	74	44	41	40	28	E B	32	24	16			
18		19	34	23	30	31	32		26	34	42	42	62	58	56	59	A A	52	50	56	31	38	29	22	24	E B	16			
19	E B	16	E B	16	20	E B	21	E B	34	49	A A	A A	A A		C	46	46	53	G				E B	34	E B	44	16			
20	E B	16	36	25	30	23	24		46	44	39	44	42	51	46	54	44		G				A A	34	24	33	16			
21		40	E B	E B	E B	E B	30		26	37	40	48	50	50	45	70	44	56	64	42	43	58	50	46	21	E B	16			
22		22	20	18	E B	E B	E B		27	31	37	40	45	73	47	45	45	42	58	A A	132	37	27	43	20	20	24			
23		28	45	35	E B	E B	23	A A	30	89	51	52	62	74	70	A A	67	80	A A				46	64	50	32	16			
24		29	E B	23	27	E B	E B		28	52	63	48	54	60	A A	A A	A A	185	136	94	93	48	82	48	67	22	21	E B	16	22
25		21	E B	E B	28	E B	16		26	34	62	51	60	50	71	93	67	49	40	40	32	23	28	E B	40	49	16			
26		51	46	E B	E B	16	22		31	32	46	45	43	42	37	G	50	58	58	55	55	G	25	35	21	34	22			
27		20	23	20	21	23	22		30	66	A A	A A	A A	44	49	44	44	39	39	33	G		28	22	E B	22	38	16		
28		41	18	22	26	E B	20		25	32	55	57	57	72	A A	62	63	42	74	40	44	37	18	E B	31	E B	16			
29		27	E B	E B	E B	E B	E B		27	32	40	42	66	72	54	48	58	69	74	46	68	32	E B	16	19	64	30			
30		22	E B	E B	20	E B	41		26	42	44	52	45	54	52	51	42	46	61	42	50	40	24	E B	20	16	18			
31																														
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT		30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30			
MED		22	20	20	21	E B	18	28	37	46	52	60	58	52	53	58	50	50	42	44	36	32	22	24	24					
U Q		29	33	23	27	23	24	34	44	55	A A	A A	A A	A A	72	70	62	67	58	64	55	54	62	43	32	32	34			
L Q		E B	E B	E B	E B	E B	E B	26	34	42	45	46	48	45	46	44	42	G	41	38	33	28	E B	E B	E B	E B	19			

IONOSPHERIC DATA STATION Yamagawa

JUN. 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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	19	28	22	22	22	26	31	21	24	22	19	15	16	16	16	16	16
2	16	16	16	16	16	16	16	15	20	22	19	24	28	21	27	25	22	18	16	16	16	16	16	16
3	16	16	16	16	16	16	16	16	18	21	24	23	22	24	26	22	20	17	14	16	16	16	16	16
4	16	16	16	16	16	16	16	18	18	22	22	23	23	33	26	24	21	18	17	16	16	16	16	16
5	16	16	16	16	16	16	16	16	19	23	23	32	29	29	29	24	22	19	19	16	16	16	16	16
6	16	16	16	16	16	16	16	16	17	22	22	22	28	27	26	23	21	19	14	17	16	16	16	16
7	16	16	16	16	16	16	15	16	18	22	22	22	24	26	30	21	23	18	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	18	19	21	22	26	28	34	22	20	19	16	14	16	16	16	16
9	16	16	16	16	16	16	16	16	17	21	20	24	21	28	25	23	20	18	17	16	16	16	16	16
10	16	16	16	16	16	16	16	16	20	22	22	25	23	28	27	25	21	18	16	16	16	16	16	16
11	16	16	16	16	16	16	16	16	20	21	21	26	30	24	24	23	22	18	16	13	16	16	16	16
12	16	16	16	16	16	16	16	16	19	19	21	22	28	28	22	22	20	16	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	18	22	25	25	22	23	24	24	20	16	16	14	16	16	16	16
14	16	16	16	16	16	16	16	18	19	20	22	24	25	24	26	24	21	17	15	16	16	16	16	16
15	16	16	16	16	16	16	16	16	21	20	22	24	23	26	24	24	21	19	17	16	16	16	16	16
16	16	16	16	16	16	16	16	16	17	20	23	26	29	27	32	22	21	16	14	13	16	16	16	16
17	16	16	16	16	16	16	16	17	16	21	21	22	26	24	24	22	20	18	19	15	16	16	16	16
18	16	16	16	16	16	16	16	16	20	23	23	25	26	27	27	20	20	17	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	21	22	23	C	24	37	28	30	22	19	17	17	16	16	16	16
20	16	16	16	16	16	16	16	17	21	21	25	25	30	35	31	26	21	19	17	16	16	16	16	16
21	16	16	16	16	16	16	16	17	20	22	30	30	34	32	26	24	22	18	15	16	16	16	16	16
22	16	16	16	16	16	16	16	16	20	22	27	30	35	30	29	31	20	18	16	13	16	16	16	16
23	16	16	16	16	16	16	16	16	18	32	25	29	28	27	38	27	24	20	17	16	16	16	16	16
24	16	16	16	16	16	16	17	16	17	22	23	21	23	26	30	30	22	19	16	14	16	16	16	16
25	16	16	16	16	16	16	16	16	22	23	31	27	28	31	30	25	24	19	16	16	16	16	16	16
26	16	16	16	16	16	16	16	16	17	23	25	26	27	36	28	23	20	22	18	16	16	16	16	16
27	16	16	16	16	16	16	16	17	16	20	25	30	26	24	27	30	23	20	15	16	16	16	16	16
28	16	16	16	16	16	16	16	18	20	20	23	25	30	27	31	21	21	19	17	16	16	16	16	16
29	16	16	16	16	16	16	16	17	18	22	23	30	29	23	26	23	18	18	16	16	16	16	16	16
30	16	16	16	16	16	16	16	18	20	20	22	26	30	30	24	27	23	17	14	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	16	19	22	23	25	26	27	27	24	21	18	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	17	20	22	25	26	29	30	30	25	22	19	17	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	18	20	22	22	24	24	25	22	20	18	15	16	16	16	16	16

JUN. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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 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	274 ^R	271	287	309	318	299	303	316	313	283		282 ^{AUR}	263	266	280	286	315	328	290	280	260	263	268	260
2	289	275	276	283	310	300	286	304	296	289	281	247	265	278	286	285	294	286	305	308	292	269	273	276
3	281	281	297	278	287	310	313	308	302	276	274	257	267	274	278	286	290	298	305	314	297	266	269	273 ^R
4	285 ^R	285 ^R	287	305	313	318	333	316	298	296	266	275	263	273	273	270	277	272	287		320 ^{RJR}	245	241	
5					304	310	290	302	301		285			272			268	293	302	286	279	257	273 ^{JR}	267
6	271	290 ^R	296	305	277	289	311	332	283	262	266	274	263	262		284	291	290	310		268	269	271	276
7	286		289 ^F	290	282	291	299	329	300	279	257	253	256	274	264	286	282	298	295	280	282	261	262	277
8	281	291	283	293	306	317	316	289	306	291	294	259	262	264		268	271	272	296 ^{UR}	283	273	254	269	257
9		281	316	280	279	291	306	315	283	306	272	266		264	265	277	276	275	297	281	279	272	271	261
10	282	261	301	297	298	307	292	312	284	300			262	280	269		265	278	285	289	286	285	276	282
11	281	285	293	305	315	297	293	321	274	292					264	279	278	263	285	305	299	279	256	
12	259	294	283	291	266	262	254	276	275	272		288	296	273	282	284	287	298	303	301	264	268	272	264
13	273	294	295	295	269	282	289	293	300	286	256	261	270	274	280	297	287				273	287	275	273
14	275	291	304	305	308	313	339	319	291	314	303		267		275	298	281	291	298	273	271	269	269	264
15	271	284	301	293	283	302	339	338			276	266		259	267	281	278				286	277	266	276
16	286	301	301	270	294		282	317	298			239	258	274	248	266	271	291	279	280	254	245	258	245
17	267	274	267	302	277	271	321	301	301	291	293	269	269	272	275	279	283	289	282	296	287	264	267	263
18	272 ^R	315	301	283	290	305	330	333	332	295	266	274	270	280		278	273	278	298	273	273	270	273	271
19	269	271	283	274	274	300	330	333			269		278	281	292	291	273	279	279	272	287	276		270
20	292			285	277	316	341	317	297	291	269	252	267	274	274	280	280	290	291	295		268	265	
21	299	302	296	281	267	279	301	316	327	273	248	280	265	279	283	286	268	276	293	277	273	263	259	276
22	288	286	288	295	298	301	307	308	309	278	278	252	264	266	274	278	273		287	296	293	266	257	257
23	260			275	284	281			277	279	262				278			282	277	269	283	273		270
24		262		307	274	258	327	330	310	296	295	260			276	281	252	262	277	296	289	273	260	266
25	266	264	264	290	277	273	301	291	273	284	320	263	263	267	280	279	275	277	281	296	292	277	264	240
26		278	278	274	267	280	319	311	323	284	277	280	268	263	279	291	278	276	287	290	261	260	262	276
27	290	309	298	275	273	298	289	273	271			288	271	253	273	286	304	313	281	271	273	278	274	254
28		315	291	294	286	273	305	323	298	289	289	268		292	297	293	289	300	301	298	275	265		302
29	272	285	294	292	284	278	288	307	345	278	242	272	269	257	269	297	290	281	284	291	279	260	266	264
30	266	278	294	303	272	284	271	319	299	318	315	279	311	295	296	296	313	304	300	281	279	268	274	267
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	26	26	28	30	29	30	29	28	25	24	24	23	26	26	27	29	27	28	26	29	30	27	26
MED	275	285	294	292	282	297	304	316	298	289	275	267	267	273	276	284	278	286	290	288	279	268	268	267
U Q	286	294	298	302	298	306	321	322	308	296	291	277	270	278	280	291	290	298	299	296	288	273	273	276
L Q	270	275	283	282	274	280	289	303	284	278	266	258	263	264	269	279	273	276	283	280	273	263	262	261

JUN. 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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									A	A	A	A	A	A	386	A	369	373	U L						
2								L	L	U L	U L	L	393	361	360	375	380	H L							
3									L	A	U L	L	358	376	386	369		A	A	A					
4									A	A	L	364	360	A	A	A	363	331	357	347					
5								L		A	A	A	A	A	A	A	342	A	A						
6							L		A	A	A	A	A	322	A	339	362	L	A	A					
7									A	U L	A	A	370	A	A	A	A	A	A						
8								A	A	383	A	A	368	A	A	366	366	H	337	A					
9								U L	L	A	A	L	A	395	347	A	A	A	L	A					
10							L	L	L	A	A	A	340	A	A	A	368	368	L						
11										A	A	A	A	A	A	374	A	A	A						
12							U L	L	L	A	A	A	383	372	387	L	361	350	350	L					
13							L	L	A	U L	A	A	353	375	345	A	A	A	A	A	A				
14							L	U L	L	L	A	A	A	A	A	A	A	A	A	L					
15							L		A	A	A	A	A	386	A	A	A	A	A	A	A				
16								A	A	A	A	A	A	A	A	A	A	A	A	A					
17							L		A	A	A	A	370	A	A	A	A	A	A	A					
18							L	L	L	U L	A	A	A	A	A	A	A	A	A	L					
19									A	A	A	C	337	357	A	369	U L	L	L	L					L
20									U L	U L	L	332	384	A	L	H	H	A	A	A					
21							L	L	U L	U L	L	378	402	A	411	A	A	L	L						
22								L	L	U L	L	A	377	389	347	378	A	A	347						
23								A	A	A	A	A	A	A	A	A	A	A	L	L	A				
24								A	A	U L	A	A	A	A	A	A	A	A	A	A					
25								383	A	A	A	370	A	A	A	A	363	A	352						
26								L	U L	U L	L	374	368	A	A	A	A	A	L						
27								A	U L	A	A	375	A	412	381	369	379	379	U L	L	L				L
28							L	L	A	A	A	A	A	A	A	373	A	352	L	A					
29							L	L	U L	A	A	A	A	A	A	A	A	A	A	A					
30									L	A	U L	A	A	A	A	366	A	A	A	A					
31											400														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								2	6	10	10	9	13	9	10	13	12	12	9						
MED								370	352	364	363	374	370	376	374	369	362	351	347						
U Q									U L	U L	L								L						
L Q									U L	U L	L								L						

JUN. 2023 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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									264	324	A	334	376	358	326	312	268	240	246					
2								264	250	252	288	346	348	332	308	310	298	292						
3									272	270	318	288	334	332	324	316	300	272	E A					
4									E A	284	288	346	320	366	340	334	330	330	306	294				
5								258		A E A	A	A	A		A	A		326	286	262				
6							272		E A E A E A	316	338	316	308	368	362	A	308	290	300	262	A			
7									266	328	358	E A	348	380	336	366	318	324	292	270				
8								E A	310	292	312	304	366	376	360	A	340	328	314	286				
9									382	282	320	330	A	368	364	330	310	300	284					
10							258	242	290	282	A	A	380	336	354	A	356	316	280					
11									268		A	A	A	A	382	348	328	E A E A	330	296				
12								310	320	368	A	334	320	376	364	322	306	296	278					
13								274	252	284	406	394	364	350	338	300	E A	A	A	A				
14								234	334	260	320	A	420	E A	478	380	328	E A	376	338	304			
15							232		A	A	384	366	A	386	360	326	E A	A	A	A	A			
16								274	342		A	532	440	378	460	394	388	326	E A	356				
17							256		270	E A	312	364	372	334	E A	344	318	E A	320	312	302			
18							228	222	226	322	414	368	362	342	A	324	322	310	262					
19									A	A	416	C	352	354	312	324	342	336	314	288				
20										318	354	416	352	338	340	332	312	302	282					
21								228	258	438	474	376	380	352	324	320	340	314						
22									292	260	332	E A	430	354	340	342	332	340	A	290				
23								A	348	344	414	E A E A	482	498	A	E A	A	E A	A	E A	E A			
24								228	E A	316	316	312	316	A	E A E A	404	378	368	398	302				
25								320	E A	358	312	262	396	384	E A	432	320	320	332	324	294			
26								222	298	350	364	322	342	364	338	308	310	318	300					
27								E A	370	326	A	A	318	342	350	364	330	288	262	330	290			
28							258	242	E A	270	288	E A	428	A	314	314	322	374	298	274				
29							274	264	E A	240	248	E A E A	492	386	366	384	348	298	312	312	304			
30								308	280	264	366	298	326	320	324	290	256	266						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	16	24	25	24	25	24	27	26	28	29	27	26	3				
MED							258	252	285	288	332	U	350	366	351	341	323	324	306	288	289			
U Q							272	292	323	326	395	395	380	368	364	331	341	324	304	E A	348			
L Q							232	231	265	270	314	326	350	336	324	317	308	292	274	288				

JUN. 2023 h'F2 (KM)

IONOSPHERIC DATA STATION Yamagawa

JUN. 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	E A 270	294	272	228	208	230	224	236	A	A	A	A	A	A	194	A	220	202	218	262	294	300	278	282			
2	264	274	284	244	226	224	222	220	238	190	172	168	174	206	204	208	200	228	258	270	234	E A 274	E A 296	E A 310			
3	E A 284	E A 288	E A 252	E A 272	E A 262	E A 230	E A 226	E A 228	E A 228	A	A	216	172	176	188	190	188	A	E A 248	A	E A 232	E A 236	E A 294	E A 324	E A 298		
4	E A 286	E A 264	E A 276	E A 234	E A 240	E A 218	E A 228	E A 240	A	A	A	186	230	A	A	A	254	280	238	240	E A 268	E A 254	E A 366	E A 344	E A 324		
5	E A 336	E A 240	E A 254	E A 254	E A 236	E A 216	E A 244	E A 238	E A 224	A	A	A	A	A	A	A	286	A	A	A	276	250	288	282	E A 336		
6	E A 302	E A 280	E A 262	E A 236	E A 228	E A 262	E A 198	E A 242	A	A	A	A	A	E A 300	A	A	226	236	278	A	A	E A 292	E A 316	E A 340	E A 296		
7	E A 284	E A 320	E A 280	E A 286	E A 272	E A 268	E A 246	E A 234	A	A	212	214	A	188	A	A	208	A	A	A	E A 262	E A 272	E A 296	E A 312	E A 318		
8	286	258	E A 298	E A 262	E A 244	E A 230	E A 242	A	A	204	A	A	A	216	A	A	210	192	198	A	246	274	E A 326	E A 326	E A 338		
9	E A 360	E A 310	E A 210	E A 254	E A 268	E A 244	E A 250	E A 240	E A 250	A	E A 252	E A 290	A	182	224	A	298	250	A	A	262	E A 276	E A 266	E A 294	E A 306		
10	258	E A 292	E A 246	E A 250	E A 262	E A 238	E A 208	E A 214	E A 242	A	A	A	A	288	A	A	A	206	232	272	252	E A 258	E A 278	E A 278	E A 262		
11	284	268	244	222	224	234	222	254	236	A	A	A	A	A	A	A	204	314	A	A	248	236	E A 276	E A 310	E A 314		
12	E A 296	E A 256	E A 222	E A 270	E A 308	E A 270	E A 218	E A 216	E A 214	A	A	A	A	204	196	184	190	232	202	216	266	E A 270	E A 280	E A 304	E A 320		
13	308	E A 264	E A 234	E A 262	E A 314	E A 286	E A 224	E A 250	E A 216	A	238	220	234	224	258	A	A	A	A	A	A	E A 294	E A 264	E A 270	E A 286		
14	Q 300	Q 264	E A 228	E A 272	E A 226	E A 218	E A 208	E A 196	E A 238	E A 246	E A 278	A	E A 322	A	A	A	A	A	A	A	262	E A 270	E A 286	E A 288	E A 272	E A 322	
15	272	264	236	E A 276	E A 262	E A 250	E A 220	E A 234	A	A	A	A	A	A	202	A	A	A	A	A	A	E A 272	E A 266	E A 292	E A 274		
16	274	248	228	E A 294	E A 246	E A 290	E A 300	A	A	A	A	E A 276	A	E A 328	A	A	A	A	A	A	A	302	E A 382	E A 372	E A 314	E A 304	
17	284	294	280	E A 234	E A 254	E A 292	E A 240	E A 210	E A 242	A	E A 266	E A 186	A	A	A	A	A	A	A	246	268	240	E A 272	E A 288	E A 310		
18	308	280	248	E A 272	E A 276	E A 250	E A 222	E A 198	E A 204	E A 184	A	A	A	A	A	A	A	A	A	A	226	E A 268	E A 276	E A 286	E A 296	E A 260	
19	294	280	264	284	288	248	226	208	A	A	A	C	232	232	A	198	208	194	214	252	252	E A 252	E A 288	E A 328			
20	Q 248	E A 310	E A 254	E A 284	E A 296	E A 242	E A 214	E A 228	E A 208	E A 222	E A 196	E A 256	E A 200	E A 284	E A 208	E A 190	E A 212	E A 258	A	E A 344	A	E A 294	E A 312	E A 318			
21	E A 288	E A 244	E A 232	E A 218	E A 298	E A 286	E A 224	E A 216	E A 206	E A 220	E A 232	E A 228	E A 196	A	168	A	A	A	A	276	264	E A 296	E A 300	E A 344	E A 320	E A 284	
22	E A 266	E A 262	E A 256	E A 246	E A 246	E A 244	E A 214	E A 206	E A 192	E A 194	E A 202	A	A	A	A	A	A	A	A	A	A	242	248	E A 234	E A 228	E A 308	E A 314
23	E A 324	E A 336	E A 292	E A 264	E A 270	Q 278	Q 230	A	A	E A 300	A	A	A	A	A	A	A	A	A	A	238	238	E A 280	E A 352	E A 336	E A 298	
24	E A 312	Q 302	Q 304	E A 250	E A 284	Q 274	Q 228	A	A	A	234	A	A	A	A	A	E A 318	A	A	A	E A 278	252	252	E A 278	E A 310		
25	306	298	296	E A 268	E A 282	E A 254	E A 228	E A 190	E A 288	A	238	A	A	A	A	E A 274	E A 216	E A 246	E A 222	E A 260	234	246	E A 348	E A 430			
26	E A 380	E A 332	E A 270	E A 278	E A 294	E A 286	E A 212	E A 200	E A 228	E A 230	E A 182	E A 180	E A 180	E A 254	A	A	A	A	A	A	204	248	E A 290	E A 308	E A 314	E A 282	
27	272	252	222	254	286	244	238	A	238	A	204	E A 232	E A 180	E A 204	E A 188	E A 214	E A 198	E A 202	E A 262	E A 268	E A 254	E A 272	E A 354				
28	E A 290	E A 232	E A 246	E A 252	E A 248	E A 280	E A 232	E A 220	A	E A 312	A	A	A	A	A	A	204	A	236	A	278	244	282	Q 326	E A 256		
29	E A 302	E A 258	E A 230	E A 264	E A 258	E A 272	E A 224	E A 224	E A 234	E A 196	A	A	A	E A 250	A	A	A	A	A	A	A	238	E A 238	E A 290	E A 366	E A 316	
30	316	268	246	240	238	276	228	262	252	A	206	A	A	E A 276	E A 194	E A 254	A	A	A	A	E A 270	296	274	284	306		
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	30	30	30	30	30	25	18	13	13	12	15	14	12	15	15	17	14	26	29	30	30	30			
MED	280	264	249	248	254	250	225	222	230	212	205	U 210	198	U 198	199	206	216	U 220	232	257	U 253	275	U 294	E A 310			
U Q	E A 308	E A 294	E A 276	E A 272	E A 284	E A 276	E A 232	E A 239	E A 238	E A 240	E A 245	E A 261	E A 232	E A 254	E A 221	E A 226	E A 286	E A 249	E A 258	E A 270	E A 288	E A 300	E A 324	E A 320			
L Q	274	258	234	244	240	234	220	209	214	195	191	192	186	194	192	190	208	202	216	252	242	266	284	286			

JUN. 2023 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2023 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	A						A		A	A	A	A	A	A				
2						B	110	106	100	100	98	A	A	A	A	100	100	100		A	A			
3						B	100	100	98		A	A	A	A		98	98	98	100	100		A		
4						B	100	100	100	96	96		A	A		98	98	102	102	102	102		A	
5						A	A		102	100	100	98		A	A	A	A	A	A		98		A	
6						A	96		A	A	A	A		A	A	98	98	98	102	102	102		A	
7						A	102	102		100		A	A	A	A		100	100	100	100		A		
8						A	104	100	98	98		A	A	A	A		98	102	102	102		A		
9						A	102	102	102	98	98	98	98	98	98	98	98	98	98	106		A		
10						A	106	104	102	100	100		A	A	100	100	100	100	100	104	92			
11						B	104	100	100	98	98		A	A	A	A	98	98	98	98		A		
12						A	A	98		98		A	A	A	A	98			106	106		A		
13						A	A		102	100	100		A	A	A	98	98	100	100		A	A		
14						A	A		100	98	98		A	A	A	A	A	A	A	A	A		A	
15						B	112	100	100	100	100	100		A	98	98	98	98	100		A	A		
16						A	116	102	102	98		A	A	A	A	A	A	A	A	A		A		
17						B	114	102	100	100	98	98	98		A	A	A	A	A	A	A		A	
18						A	A		98	98	104	100	100		A	A	A		A	A	A		A	
19						B	102	102	100	100	100		C	A	A	100	100	100	100	102		A		
20						A	104	102	100	98		A	A	A	A	A	100	100	102	102	110			
21						A	A		102	100	100	100	100		A	100	100	100	104		A	A		
22						B	116	102	102		A	A		A	A		102	102	102		A	A		
23						A	108	102	100	100	100	98		A	A	A		A		A	A		A	
24						B	116	100	100		A	A	A	A	A	A	A	A	A	A	A		A	
25						B	100	100	100	100	100		A	A	A	A		100	100		A	A		
26						A	A	A	A	A	A		A	100	100	100	104	104	104	102	130	E B		
27						A	108	102	98		A	A	A	A	A	A		98	102	106		A		
28						A	A	A		98	98		A	A	A		100	100	100	102	102		A	
29						B	102	102	100		A	A	A		98	98	98	104	98		A	A		A
30						A	116	104	100	100	100		A	A	A	A	A	A	A	100		A		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							21	27	26	23	15	7	4	9	13	20	20	21	16	3				
MED							104	102	100	100	100	100	98	98	98	100	100	100	102	101				
U Q							113	102	100	100	100	100	99	100	100	101	101	102	103	130	E B			
L Q							102	100	100	98	98	98	98	98	98	98	98	100	100	92				

JUN. 2023 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 2023 h'Es (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	88	90	80	86	80	86	100	98	96	98	92	96	92	96	94	94	92	102	90	90	92	98	100	96
2	94	94	108	92	92	92	124	108	102	104	100	98	96	90	90	116	G	112	96	88	104	92	92	90
3	90	88	88	88	94	94	100	100	96	94	92	94	90	94	110	G	118	98	98	98	90	80	92	84
4	98	90	84	80	92	92	108	102	96	96	96	150	140	118	110	118	108	112	100	96	96	96	94	92
5	92	104	106	90	90	94	90	98	100	94	114	92	92	90	88	88	90	90	100	100	96	96	94	92
6	92	84	84	84	82	82	122	90	88	88	82	84	88	100	98	G	134	132	116	94	92	92	92	92
7	90	88	90	94	94	94	102	102	98	98	94	88	98	94	90	152	118	108	100	100	100	100	98	92
8	92	88	88	86	88	116	106	102	98	100	92	94	94	92	92	140	114	162	100	126	94	94	94	90
9	94	90	90	84	92	122	114	108	102	108	104	164	100	124	108	100	104	106	100	100	98	84	82	90
10	98	92	92	88	88	106	134	108	100	90	90	92	94	90	94	90	102	100	100	100	86	84	84	80
11	80	80	78	78	B	B	104	96	96	90	88	86	88	90	90	G	100	92	92	90	90	84	84	92
12	92	86	88	88	90	92	94	102	102	96	88	88	94	100	G	94	190	86	86	84	100	96	96	94
13	94	88	84	86	86	86	134	104	100	98	100	102	92	100	100	104	98	94	92	92	92	88	86	94
14	84	82	90	86	86	92	90	108	98	98	96	90	92	88	86	88	88	84	86	86	86	104	88	92
15	102	110	84	84	86	92	108	102	96	94	94	100	92	102	94	92	92	92	88	84	86	86	84	84
16	88	88	82	92	94	92	106	102	98	94	92	94	90	92	94	90	86	86	86	100	96	98	92	94
17	94	92	88	88	90	124	118	116	100	100	100	100	106	94	90	90	92	92	104	94	86	80	96	96
18	100	102	86	86	86	88	90	118	108	106	100	98	92	92	88	90	90	86	88	86	84	90	98	100
19	92	92	92	98	92	B	108	102	100	96	92	C	92	94	114	G	150	152	118	164	B	98	104	96
20	96	90	92	90	90	110	104	104	102	96	96	90	90	90	92	G	178	122	108	100	98	94	92	92
21	96	96	90	90	86	90	86	102	102	100	98	98	100	100	116	122	106	104	90	82	98	94	84	82
22	82	84	78	80	80	B	114	122	114	92	92	100	90	92	94	176	108	100	100	88	90	80	94	96
23	96	94	94	94	88	92	130	100	102	98	98	92	92	90	94	92	88	94	98	92	94	98	96	94
24	92	88	88	84	88	B	114	100	94	96	94	94	88	88	88	88	92	88	86	86	86	82	86	80
25	78	82	96	94	94	B	132	120	98	96	92	92	90	88	90	110	110	102	100	86	84	100	100	94
26	94	94	96	98	90	90	92	96	92	90	94	98	86	108	102	102	104	102	G	124	112	98	98	92
27	90	90	86	88	86	92	116	104	104	94	88	94	94	94	94	94	164	124	G	82	82	82	82	94
28	94	90	90	88	90	90	126	92	96	90	92	94	88	88	106	120	100	108	98	100	98	98	96	96
29	92	90	90	86	B	B	122	112	106	102	90	94	112	108	106	100	94	94	94	90	96	96	94	92
30	100	106	B	88	100	94	146	118	108	100	114	92	86	90	90	90	88	88	100	98	98	98	96	88
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	29	30	28	24	30	30	30	30	30	29	30	30	29	25	29	30	28	30	29	30	30	30
MED	92	90	88	88	90	92	108	102	100	96	94	94	92	93	94	94	102	100	98	93	94	94	94	92
U Q	96	94	92	90	92	94	122	108	102	100	98	98	94	100	104	117	116	108	100	100	98	98	96	94
L Q	90	88	84	86	86	90	100	100	96	94	92	92	90	90	90	90	92	92	90	86	86	84	86	90

JUN. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

JUN. 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

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	F4	F2	F2	F1	F2	LQ11	C2	C4	C2	C4	L4	C3	L2	L2	L3	L3	C2	L3	L4	F5	FF43	FF33	F3		
2	F4	F1	FQ11	FQ11	FQ21	L1	C2	C3	C2	C2	C1	C1	L1	L1	L1	C1		C2	C4	L7	FF24	F5	F4	F6	
3	F9	F5	F7	F5	FF22	L2	C4	C4	C3	C3	L2	L1	L1	L1	C1		C2	C3	C8	C6	F8	F5	FF32	F3	
4	FF22	F2	F4	F2	F4	L2	C3	C3	C3	C4	C2	HL11	H1	C1	CL31	CL11	C2	C1	C4	C6	F9	F4	F8	FQ61	
5	FQ71	FF15	FF16	FQ51	FQ41	LQ31	L3	C3	C3	L5	CL34	L4	L3	L5	L5	L2	L4	L6	C7	F5	F3	F3	F4		
6	FQ41	FQ31	F3	F2	F1	L1	C1	C4	L3	L4	L5	L4	L2	C1	C3		H2	H2	C5	L7	F6	F4	F5	F6	
7	F6	FQ51	FQ71	FQ71	FQ41	L5	C6	C2	C3	C3	L2	L4	L1	L1	L4	H1	C2	C4	C4	C8	F5	FQ41	F5	F9	
8	F4	FQ31	FQ21	FQ41	FQ31	CL22	C7	C5	C4	CQ21	L3	L3	L1	L3	L3	H1	C2	H1	C3	CL25	F4	FQ51	F5	F5	
9	FQ51	F6	FF32	F2	F3	C3	C2	C3	C3	C4	C3	HC11	C4	C1	C1	C2	C2	C2	C5	C4	FF52	F2	F2	F3	
10	F4	F4	F3	F4	F4	C3	H1	C2	C2	LC13	L4	L6	L2	L4	L4	L8	C2	C3	C2	C3	F8	F9	F5	F5	
11	F4	F2	F2	F1			C2	C6	C2	L3	L4	L5	L5	L5	L3		C2	L4	L4	L5	F3	F4	F4	FQ51	
12	FQ51	FQ51	FQ51	F6	F9	L5	L4	C3	C2	C3	C6	L3	L2	C1		L1	HL11	L2	L2	L4	FF34	FF32	FQ41	FQ41	
13	FQ41	FQ61	FQ41	FQ21	FQ21	L2	HL12	C2	C2	C3	C2	CL22	L2	C2	C3	C2	C3	L6	L9	L8	F8	F7	F7	FQ31	
14	FQ31	FQ31	FQ31	FQ41	F2	L3	L4	C1	C2	C2	C2	L4	L2	L3	L3	L4	L5	L4	L4	L3	F3	FF22	F2	F5	
15	FF23	FF11	F3	F3	F2	L3	C2	C3	C4	L5	L3	C2	L4	C1	L2	L5	L5	L9	L7	L7	FQ51	F8	F7	F4	
16	F3	F2	F3	F4	FQ51	L5	C6	C7	C4	C4	C3	LH21	L2	L2	L2	L2	L5	L7	L5	CL85	F9	FQ71	F3	F3	
17	F2	F4	F4	F2	F1	C1	C2	C2	C3	C3	C3	C2	C1	L1	L4	L3	L3	L2	CL45	L6	F6	F6	FF45	FF38	
18	FF85	FF44	FF65	FF53	FQ61	L9	L2	CL22	C2	C1	C3	C2	L2	L3	L6	L2	L4	L6	L3	L5	F8	F9	F4	F1	
19	F1	F3	F2	F1	F4		C4	C4	C4	C6	L3		L1	L1	C2		H1	H1	C1	HC11		F3	F3	F8	
20	F2	FQ31	FQ31	FQ51	FQ51	C4	C4	C3	C2	C2	C1	L2	L2	L2	L1		H1	C1	C2	C7	F7	F5	F4	F6	
21	F9	F6	F3	F4	F4	L2	LC12	C3	C2	C2	C2	C2	L1	L1	L1	C3	C4	C2	L4	L4	FF28	FF49	F5	F5	
22	F3	F4	F3	F2	F2		C2	C1	C1	L2	L2	CL31	L2	L2	L1	H1	C2	C4	C4	L4	FF43	F3	FF23	F7	
23	F8	F7	F4	F1	F4	LQ31	H3	C8	C3	C2	C3	L3	L3	L5	L3	L5	L9	LQ31	C3	C3	F6	F7	F4	FQ41	
24	F8	F5	F3	FQ31	FQ21		C3	C4	C6	C3	C4	L3	L6	L6	L5	L4	L3	L6	L4	L8	F5	F41	F1	F3	
25	F3	F1	F3	F9	F4		H1	C2	C3	C2	L2	L2	L3	L7	L3	CL21	C1	C2	CL12	L2	F4	F2	FF32	FF62	
26	F8	F9	F2	F2	F3	L5	LQ41	L3	L4	L3	L1	L1	L1	L1	C1	C2	C3	C4		C2	FF33	F4	F4	F3	
27	F2	F4	F3	F2	F2	L2	C1	C8	C3	C3	L5	L1	L2	L1	L1	L1	L1	L1	CL11		L4	F7	F2	FF51	
28	F5	FQ41	F6	F3	F3	L2	CL21	L2	C4	L5	L4	L4	L6	L2	C2	C1	C4	C2	C4	C5	F3	F2	F3	F2	
29	F3	F1	F3	F2			C2	C2	C2	C2	L3	L4	L2	L1	L2	CQ31	LQ41	L5	L9	L5	F1	F4	F8	FQ51	
30	FF25	FF12		F2	F2	L9	H2	C3	C3	C3	C1	L2	L5	L3	L2	L2	L4	LC32	CL52	L4	FQ81	FQ41	FQ31	F4	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

JUN. 2023 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

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	X	X	X	X																X	X	X	X
	116	113	116	116	109																86	88	90	87
2	X	X																			X	X	X	X
	88	94	90	84	75																115	104	102	111
3			X	X	X																X	X	X	X
	120	129	117	100	100																110	110	103	104
4	X	X	X	X	X																X	X	X	X
	112	114	120	118	98																100	86	89	92
5	X	X	X	X	X																X	X	X	X
	96	124	105	95	90		90	105													96	92	96	97
6			X	X																	X	X	X	X
	97	97	95	90	81	82															105	93	91	90
7	X	X	X																		X	X	X	X
	93	91	94	94	94	86	86														100	88	92	98
8	X				X																X	X	X	X
	93	96	95	93	85																101	94	95	93
9			X	X	X																X	X	X	X
	94	103	98	82	78	82															100	94	94	92
10	X	X	X	X	X																X	X	X	X
	91	93	94	91	85																101	105	106	107
11	X	X	X	X	X																X	X	X	X
	108	126	143	132	116																100	94	97	95
12			X																		X	X	X	X
	106	101	98	92	85	82	82														84	81	81	85
13			X																		X	X	X	X
	86	83	76	69	64	64	69														99	93	92	94
14	X	X	X	X	X																X	X	X	X
	96	104	112	99	76																84	89	90	89
15	X	X	X	X	X																X	X	X	X
	87	89	89	82	81																114	112	110	114
16	X	X	X	X	X																X	X	X	X
	126	125	115	87	86	86	86	118													77	77	79	83
17																					X	X	X	X
	81	87	84	76	75	75	79														131	133	136	122
18	X	X	X	X	X																X	X	X	X
	109	113	110	104	102		95														99	92	96	92
19	X	X	X	X	X																X	X	X	X
	89	88	90	82	76																97	95	95	94
20			X																		X	X	X	X
	95	90	90	92	82	76															103	101	104	103
21																					X	X	X	X
	111	111	111	95	90	88	91														100	104	111	118
22	X	X	X	X	X																X	X	X	X
	111	106	104	103	98																102	97	102	114
23	X	X																			X	X		
	122	127	125	122	113		84														91	87	89	101
24																					X	X	X	X
	101	100	97	93	90	94	87														122	109	110	111
25	X	X	X	X	X																X	X	X	X
	99	104	95	94	85																104	81	87	87
26																					X	X	X	X
	90	94	94	94	92	82															98	97	100	104
27	X	X	X	X	X																X	X	X	X
	101	96	88	84	78																97	95	94	90
28	X	X	X	X	X																X	X	A	
	91	96	94	82	77		88														81	78		88
29																					X	X	X	X
	92	90	91	86	79	80															100	97	98	100
30	X	X	X	X	X																X	X	X	X
	103	118	129	113	86																85	89	89	89
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	12	11	2													30	30	29	30
MED	X	X	X	X	X																X	X	X	X
	96	100	96	93	85	82	86	112													100	94	95	94
U Q	X	X	X	X	X																X	X	X	X
	109	113	112	100	94	86	90														103	101	102	104
L Q	X	X																			X	X	X	X
	91	93	91	84	78	78	82														96	88	90	90

JUN. 2023 fXI (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

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

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

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

JUN. 2023 foF2 (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

JUN. 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								A	A	A	L	A	L	560	540	516	512	L	L							
2								L	L	L	A	U	L	A	A	A	A	A								
3								L	A	U	L	L	H	H	L											
4								L	A	U	L	L	L	L	584	576	588	A	A	L						
5								L	A	A	A	A	A	588	564	568	516									
6									L	L	520	572	584	616	A	560	560	528								
7									A	A	A	A	600	580	A	560		A	A							
8								A	A	A	A	A	560	572	A	544	548	L								
9									464	552	U	U	L	A	556	520	552	A	L	L						
10								L	A	L	U	L	A	584	572	A	A	L	L	L	L					
11								L	L	L	A	A	A	580	572	544	532	A	L	L						
12									L	L	520	564	528	552	L	560	572	560	472	L						
13								L	L	L	U	L	A	A	616	528	560	548	468							
14									L	A	540	552	A	544	A	A	536	484	L							
15								L	A	U	L	L	L	576	576	564	572	544	532	A	A	528				
16										A	A	A	A	A	A	520	520	516	480	L	L					
17									548	580	A	A	A	A	A	A	A	L	L	L						
18								L	L	L	U	L	564	560	580	572	552	A	A	A						
19									A	A	A	A	A	556	552	576	572	L	508	L						
20									U	L	L	A	A	A	A	A	536	A	A							
21								A	A	A	A	A	A	560	A	A	A	L	L	L						
22								L	U	L	H	U	L	508	528	568	612	580	A	A	L					
23									A	A	A	A	A	568	592	L	A	A	A		L					
24									A	A	A	A	A	A	588	556	A	A	A							
25									L	L	A	584	A	568	552	556	556	520	472	A						
26									U	L	L	L	532	548	572	576	568	552	548	692	528	L				
27									U	L	L	A	580	552	536	572	572	556	536	520	H	L	U	L		
28									L	A	L	L	552	584	568	536	552	540	524	A	A					
29								L	L	L	L	L	460	604	584	540	572	528	524	520	L	A				
30								L	L	L	L	540	580	540	580	548	552	L	A	A	A					
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT									7	15	17	17	16	22	21	20	19	13	7							
MED									L	L	L	520	532	564	568	578	572	552	550	536	520	464				
U Q									U	L	L	U	L	L	L	548	552	578	584	602	580	560	560	560	528	472
L Q									L	L	L	464	520	540	552	570	556	534	536	520	490	452				

JUN. 2023 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1						A	A	272	352	380	396	A	U A	A	A	A	A	A	A	A					
2						B		204	280	324	348	376	A	A	A	A	356	A	A	A					
3						B	A	A		A	A	A	A	436	412	400	356	316	236	A					
4						A	A	A	A	A	A	A	A	A	A	388	360	324	A	A					
5						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A					
6						B	A	A	A	A	A	A	A	416	404	396	372	332	A	A					
7						B	A	A	A	A	A	A	A	408	396	380	372	320	252	A					
8						A	A	A				A		380	380	404	384	368	332	A	A				
9						B	A													A	A				
10						A	A	280	328	360	388	404	412	404	400	380	348	320	260	A	A				
11						B	A	276	332	364	372	372	396	A	A	388	380	364	324	A	A				
12						A	A	264	308	328	A	A	A	A	A	A	396	364	A	A	A				
13						A		192	272	272	A	A	A	A	A	400	392	368	328	252	A				
14						A	A	A						A	A	A	A	A	A	A					
15						A	A	320	376	392	404							328	A	A					
16						B	A	264	340	364	388	396	412	408	396	372	352	328	A	A					
17						A		276	340	356	376	A	A	A	A		A	328	A	A					
18						A	A	200	280	328	368	376	388	396	384	372	356	A	A	U A	A				
19						A	A	A				A	A	A	A	A	A	A	A	A					
20						A	A	276	328	372	380	A	A	A	A	A	A	320	276	A					
21						A	A	276	320	360		A	A	A	A	A	A	364	332	288	A				
22						B	A	264	324	356	380	396	404	412	420	396	364	328	268	A					
23						A		A	A	A	A	A	A	A	A		404	368	344	276	A				
24						B		192	280	332	356	U A	A	A	A	A	372	360	332	276	A				
25						B	A	192	280	332	356	384	380	A	A	A	392	A	A	A					
26						A	A	276	324	368		A	A	A	A	A	A	360	324	276	A				
27						A	A	A				A	A	A	A	A	A	A	A	A					
28						A	A	A	316	A	A	A	A	A	A	392	372		272	A					
29						A	A	A				U A	A	A	A	A	A	A	A	A					
30						A	A	A				380	A	408	412	392	376	356	292	A	A				
31								284	320	356	380						388	360	324	268	A				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							4	15	21	18	15	10	9	12	12	20	20	20	14						
MED							196	276	324	364	380	394	404	408	400	388	362	328	272						
U Q							202	280	330	372	388	400	412	412	404	394	368	330	276						
L Q							192	272	320	356	376	380	388	396	394	378	358	322	260						

JUN. 2023 foE (0.01MHz)

IONOSPHERIC DATA STATION Okinawa

JUN. 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 75	A 52	J 53	A 53	J 21	A 31	J 50	A 52	J 51	A 70	J 128	A 115	J 246	A 74	J 81	A 58	J 42	A 47	J 34	A 29	J 28	A 24	J 42	A 59
2	J 53	A 62	J 48	A 32	J 28	A 16	J 23	A 42	J 53	A 52	J 73	A 96	J 86	A 99	J 45	A 101	J 94	A 110	J 78	A 30	J 30	A 156	J 86	A 147
3	J 53	A 27	J 29	A 29	J 19	A 20	J 50	A 47	J 57	A 37	J 58	A 48	J 46	A	J	A	J 46	A 59	J 81	A 62	J 39	A 108	J 52	A 33
4	J 30	A 36	J 29	A 16	J 26	A 48	J 38	A 31	J 52	A 47	J 61	A 56	J 50	A 50	J 52	A 49	J 67	A 82	J 64	A 29	J 36	A 82	J 28	A 64
5	J 59	A 51	J 39	A 36	J 21	A 26	J 43	A 56	J 60	A 91	J 288	A 116	J 88	A 47	J 44	A 47	J 50	A 50	J 57	A 71	J 49	A 86	J 109	A 126
6	J 66	A 52	J 88	A 32	J 47	A 28	J 32	A 50	J 54	A 71	J 61	A 62	J 47	A 94	J 48	A 52	J 109	A 43	J 54	A 39	J 119	A 49	J 16	A 16
7	J 25	A 16	J 48	A 51	J 39	A 16	J 40	A 48	J 158	A 79	J 158	A 93	J 49	A 53	J 60	A 49	J 49	A 79	J 200	A 85	J 125	A 88	J 109	A 44
8	J 88	A 137	J 59	A 40	J 22	A 66	J 42	A 65	J 129	A 101	J 149	A 220	J 146	A 57	J 69	A 42	J 41	A 150	J 121	A 64	J 22	A 19	J 86	A 80
9	J 22	A 30	J 26	A 26	J 33	A 16	J 28	A 54	J 71	A 43	J 59	A 82	J 83	A 48	J 47	A 63	J 78	A 50	J 50	A 31	J 40	A 24	J 24	A 21
10	J 16	A 105	J 62	A 65	J 38	A 22	J 24	A 34	J 86	A 71	J 66	A 48	J 54	A 85	J 164	A 68	J 59	A 36	J 36	A 26	J 20	A 41	J 32	A 26
11	J 26	A 18	J 32	A 17	J 16	A 16	J 25	A 43	J 56	A 105	J 82	A 230	J 143	A 88	J 48	A 81	J 64	A 77	J 58	A 22	J 21	A 29	J 19	A 15
12	J 20	A 30	J 82	A 88	J 59	A 53	J 43	A 49	J 58	A 65	J 61	A 48	J 54	A 62	J 48	A 51	J 43	A 49	J 34	A 38	J 33	A 72	J 50	A 87
13	J 59	A 51	J 48	A 32	J 33	A 22	J 24	A 63	J 50	A 64	J 77	A 70	J 86	A 45	J 58	A 60	J 111	A 54	J 54	A 41	J 40	A 22	J 30	A 41
14	J 43	A 28	J 20	A 39	J 58	A 33	J 52	A 42	J 53	A 72	J 84	A 74	J 66	A 64	J 109	A 120	J 54	A 53	J 69	A 41	J 44	A 42	J 64	A 32
15	J 87	A 55	J 52	A 33	J 21	A 29	J 28	A 38	J 53	A 54	J 67	A 183	J 63	A 55	J 54	A 101	J 65	A 50	J 64	A 52	J 40	A 25	J 34	A 26
16	J 26	A 24	J 13	A 16	J 18	A 16	J 84	A 82	J 71	A 121	J 107	A 195	J 226	A 104	J 46	A 89	J 39	A 51	J 35	A 30	J 26	A 87	J 110	A 52
17	J 22	A 99	J 38	A 40	J 21	A 29	J 33	A 49	J 50	A 68	J 51	A 71	J 93	A 100	J 128	A 82	J 78	A 47	J 100	A 56	J 24	A 51	J 34	A 52
18	J 42	A 60	J 102	A 65	J 45	A 25	J 54	A 33	J 40	A 59	J 64	A 58	J	A	J 54	A 60	J 131	A 292	J 110	A 88	J 80	A 52	J 35	A 64
19	J 33	A 26	J 32	A 27	J 28	A 26	J 34	A 77	J 64	A 100	J 174	A 201	J 93	A 81	J 56	A 57	J 44	A 36	J 51	A 33	J 22	A 23	J 17	A 49
20	J 80	A 86	J 22	A 33	J 104	A 77	J 32	A 34	J 40	A 44	J 108	A 104	J 86	A 66	J 75	A 52	J 63	A 102	J 104	A 30	J 28	A 18	J 36	A 63
21	J 53	A 53	J 72	A 48	J 43	A 25	J 66	A 53	J 88	A 140	J 74	A 110	J 174	A 48	J 64	A 83	J 104	A 74	J 35	A 24	J 51	A 53	J 32	A 47
22	J 42	A 45	J 29	A 25	J 16	A 16	J 22	A 34	J 45	A 45	J 52	A 56	J 48	A 74	J 69	A 62	J 65	A 70	J 66	A 64	J 212	A 109	J 84	A 49
23	J 81	A 132	J 109	A 65	J 67	A 38	J 70	A 54	J 87	A 137	J 168	A 184	J 93	A 52	J 124	A 168	J 134	A 53	J 34	A 30	J 129	A 126	J 62	A 113
24	J 78	A 40	J 40	A 41	J 26	A 17	J 23	A 35	J 62	A 102	J 147	A 120	J 85	A 78	J 226	A 42	J 110	A 214	J 130	A 82	J 88	A 42	J 26	A 24
25	J 21	A 28	J 19	A 18	J 18	A 16	J 22	A 32	J 65	A 49	J 77	A 74	J 109	A 57	J 68	A 75	J 39	A 36	J 32	A 25	J 40	A 25	J 20	A 19
26	J 88	A 88	J 110	A 53	J 43	A 53	J 58	A 53	J 41	A 52	J 44	A 49	J 54	A 48	J 44	A 45	J 47	A 42	J 36	A 28	J 20	A 16	J 54	A 21
27	J 21	A 45	J 33	A 33	J 28	A 39	J 28	A 40	J 52	A 50	J 142	A 60	J 52	A 44	J 44	A	J 40	A 34	J 20	A 32	J 22	A 24	J 19	A 19
28	J 66	A 65	J 76	A 89	J 46	A 48	J 43	A 58	J 47	A 67	J 75	A 60	J 68	A 46	J 46	A 46	J 58	A 59	J 60	A 34	J 156	A 80	J 81	A 120
29	J 41	A 88	J 110	A 32	J 21	A 26	J 36	A 32	J 46	A 49	J 46	A 46	J 48	A 48	J 44	A 49	J 57	A 54	J 110	A 147	J 108	A 45	J 16	A 62
30	J 62	A 51	J 33	A 30	J 16	A 25	J 22	A 36	J 53	A 59	J 67	A 48	J 47	A 48	J 44	A 54	J 81	A 63	J 71	A 90	J 144	A 83	J 86	A 64
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	J 48	A 51	J 44	A 33	J 28	A 26	J 35	A 48	J 54	A 66	J 74	A 74	J 76	A 56	J 55	A 58	J 61	A 54	J 59	A 36	J 40	A 44	J 39	A 49
U Q	J 66	A 65	J 72	A 51	J 43	A 38	J 50	A 54	J 65	A 91	J 128	A 116	J 93	A 78	J 69	A 82	J 81	A 77	J 81	A 64	J 88	A 83	J 81	A 64
L Q	J 26	A 30	J 29	A 29	J 21	A 17	J 25	A 35	J 50	A 50	J 61	A 56	J 50	A 48	J 46	A 49	J 46	A 47	J 36	A 30	J 26	A 24	J 26	A 26

JUN. 2023 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

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

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	30	20	24	34	19	18	32	44	47	57	48	A A	115	46	44	46	43	40	34	30	24	20	E B	E B	E B		
2	E B	E B	E B	20	E B	E B	22	34	39	41	59	56	70	77	44	82	89	94	46	23	22	43	24	28			
3	E B	16	23	19	E B	E B	32	34	44	37	42	41	42	G	G	46	41	44	78	58	20	41	22	24			
4	24	25	E B	E B	E B	20	30	30	46	42	47	48	50	48	48	47	56	51	38	27	22	56	E B	35			
5	34	33	28	20	19	20	31	28	45	55	A A	288	68	57	44	42	46	44	47	54	55	29	26	42	51		
6	26	24	E B	20	E B	E B	26	33	37	42	49	50	46	70	43	46	G	41	39	20	64	26	E B	E B			
7	E B	E B	20	25	E B	E B	22	35	46	74	A A	158	68	48	47	56	45	49	76	A A	200	76	E B	E B			
8	24	44	E B	20	18	22	26	45	A A	129	55	57	78	52	51	58	41	40	39	50	37	E B	E B	E B			
9	E B	E B	E B	E B	E B	E B	22	37	43	40	52	55	60	48	46	48	71	34	35	22	32	22	20	E B			
10	E B	30	37	28	18	18	23	33	63	47	46	44	49	45	74	61	43	35	33	22	E B	E B	E B	E B			
11	20	E B	21	E B	E B	E B	24	34	42	45	55	A A	A A	49	45	33	G	50	66	33	20	19	22	E B			
12	E B	E B	E B	E B	E B	18	30	30	38	44	42	44	51	55	45	40	43	35	30	32	22	21	21	21			
13	E B	20	E B	19	E B	19	23	34	40	46	50	54	76	44	48	54	38	42	33	35	21	18	21	22			
14	30	E B	E B	E B	E B	30	28	36	38	58	43	42	58	45	72	55	50	G	27	36	33	26	E B	E B			
15	E B	18	26	22	E B	24	25	32	44	40	45	44	51	46	45	88	61	42	59	31	28	20	22	20			
16	E B	21	E B	E B	E B	E B	62	54	63	A A	A A	A A	A A	A A	57	41	42	38	28	G	30	27	21	35	37	18	
17	20	20	23	E B	E B	18	27	43	38	40	44	58	71	68	56	78	46	46	98	32	E B	16	21	20	26		
18	19	E B	20	24	28	19	39	30	38	49	51	46	G	52	54	A A	A A	A A	88	61	42	33	23	22	26		
19	23	21	E B	23	E B	20	30	55	A A	A A	A A	70	66	45	49	43	41	35	47	26	18	18	E B	24			
20	63	56	E B	E B	21	28	26	30	37	43	A A	A A	108	104	62	60	67	52	56	A A	102	66	27	19	16	22	24
21	22	27	41	33	20	21	28	48	62	64	60	63	59	46	56	60	70	50	32	22	20	32	20	28			
22	22	30	E B	E B	E B	E B	22	30	40	38	42	44	46	68	60	60	52	47	65	40	18	22	28	28			
23	22	34	29	31	47	21	34	40	75	A A	A A	A A	A A	A A	A A	44	49	124	88	61	36	31	23	74	67	45	25
24	20	20	29	E B	E B	E B	22	32	41	62	A A	147	64	76	66	50	41	62	78	54	49	67	32	23	E B		
25	E B	22	E B	E B	E B	E B	21	32	39	42	57	54	72	47	52	42	38	34	30	22	26	21	E B	E B			
26	44	33	40	29	24	28	34	29	35	46	42	47	45	45	43	44	42	34	30	24	E B	E B	30	E B			
27	E B	E B	E B	E B	E B	22	25	31	40	44	A A	142	46	50	43	43	G	40	33	19	21	E B	E B	E B			
28	E B	25	E B	22	24	24	31	39	39	49	46	53	53	43	45	42	43	48	54	30	E B	21	A A	81	23		
29	E B	34	E B	E B	E B	20	26	30	38	49	44	44	46	47	42	46	41	46	72	46	33	40	E B	E B			
30	28	34	E B	E B	E B	19	21	33	40	38	48	44	45	44	44	49	71	54	66	A A	90	22	E B	24	21		
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30			
MED	20	21	E B	19	E B	18	26	34	40	46	50	54	52	47	47	46	45	43	42	28	22	22	22	21			
U Q	24	30	24	23	20	21	31	39	46	57	A A	A A	66	55	56	60	61	51	61	40	28	32	28	26			
L Q	E B	E B	E B	E B	E B	E B	23	30	38	42	45	44	46	45	44	42	41	35	32	23	E B	E B	E B	E B			

JUN. 2023 fbEs (0.1MHz)

IONOSPHERIC DATA STATION Okinawa

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

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

$\frac{H}{D}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	18	28	23	25	26	27	29	24	22	20	18	17	15	14	16	16	16
2	16	16	16	16	16	16	16	18	16	16	21	29	29	25	25	22	24	21	14	13	16	17	16	16
3	16	16	16	16	16	16	16	17	20	21	26	28	26	28	25	23	20	14	18	14	16	16	16	16
4	16	16	16	16	16	16	16	19	20	22	26	26	29	36	23	26	22	18	15	16	16	16	16	16
5	16	16	16	16	16	16	16	17	21	22	25	25	26	25	24	26	22	20	14	16	16	16	16	16
6	16	16	16	16	16	16	14	14	16	20	22	28	29	28	28	25	22	15	15	12	16	16	16	16
7	16	16	16	16	14	16	16	16	18	21	24	23	28	25	26	24	24	19	14	15	14	16	16	16
8	16	16	16	16	16	16	16	17	20	23	22	26	28	25	31	25	24	22	15	14	16	16	16	16
9	16	16	16	16	16	16	16	14	20	22	30	28	29	26	23	19	23	18	14	14	14	16	16	16
10	16	16	16	16	16	14	14	17	21	20	25	27	23	23	24	21	22	20	14	15	16	16	16	16
11	16	16	16	16	16	16	16	16	21	22	24	30	28	30	31	25	23	18	14	15	16	16	16	16
12	16	16	16	16	16	14	16	16	16	20	23	28	36	26	22	21	20	18	14	11	16	16	16	16
13	16	16	16	16	16	16	18	15	17	19	22	28	29	25	22	22	22	17	14	14	16	16	16	16
14	16	16	16	16	16	16	16	15	16	16	23	25	24	28	29	26	22	17	13	16	16	16	16	16
15	16	16	16	16	16	16	16	17	20	21	24	25	26	26	24	22	21	19	14	14	16	16	16	16
16	16	16	16	16	16	16	16	16	17	20	24	23	24	25	25	25	22	17	16	13	16	16	16	16
17	16	16	16	16	16	16	16	18	18	20	22	24	28	23	25	24	19	17	13	16	16	16	16	16
18	16	16	16	16	16	16	16	16	19	25	24	22	25	26	25	22	22	22	14	14	16	16	16	16
19	16	15	16	16	16	16	16	17	20	21	33	29	31	28	23	21	22	21	14	13	16	16	16	16
20	16	16	16	16	16	16	16	16	22	23	24	28	26	26	27	24	22	19	14	16	16	16	16	16
21	16	16	16	16	14	15	16	14	18	20	24	25	29	28	25	22	20	19	15	15	13	16	16	16
22	16	16	16	16	16	16	16	15	20	23	24	24	28	30	28	27	22	20	14	14	16	15	16	16
23	16	16	16	16	16	16	16	15	18	26	26	28	25	32	26	24	22	19	16	16	16	16	16	16
24	16	16	16	16	16	16	16	20	19	21	24	29	28	33	26	24	26	22	14	13	16	16	16	16
25	16	16	16	16	16	16	16	18	18	20	22	26	28	30	24	24	22	18	14	12	16	16	16	16
26	16	16	16	16	16	15	16	15	22	22	23	25	29	36	28	24	20	20	16	14	16	16	16	16
27	16	16	16	16	16	16	16	17	16	20	24	30	25	27	28	26	24	20	14	14	16	16	16	16
28	16	16	16	16	16	16	16	18	20	22	21	23	30	27	23	23	22	16	18	16	16	16	16	16
29	16	16	16	16	16	16	16	16	17	19	25	26	26	29	22	26	22	20	19	16	16	16	16	16
30	16	16	16	16	16	17	16	17	19	21	23	22	25	25	26	22	19	20	17	17	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	16	19	21	24	26	28	27	25	24	22	19	14	14	16	16	16	16
U Q	16	16	16	16	16	16	16	17	20	22	25	28	29	29	27	25	22	20	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	15	17	20	23	25	26	25	24	22	21	18	14	14	16	16	16	16

JUN. 2023 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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	255 ^F	268	291	325	300	287	316	313	327	286	279	A	261	270	277	296	296	300	278	269	261	262	266	269		
2	273	286	283	285 ^F	313	283	292	316	325	313	248	238	260	275	280	285	277	291	291	281	282	266	267	268		
3	289 ^F	299 ^F	287 ^V	289 ^V	300	314	312	295	300	260	265	266	266	275	272	283	292	302	301	296	280	273	274	280		
4	275	277 ^V	297 ^V	322	317	328	336	324	324	269	260	252	257	271	271	264	274	278	293	311	321	254	250	262 ^F		
5	280	304	298	301	288	295	302	301 ^F	332	307	A	259	267	273	272	271	283	285	280	295	271	256	268	F		
6	274 ^F	280 ^F	294	294	287	F	314	312	332	294	274	250	259	259	267	278	294	300	295	264	278	263	254	255 ^F		
7	254	279	293	F	294	306	312	313	312	280	A	252	255	259	265	267	279	286	A	290	297	253	261	F		
8	277	F	F	F	294	299	301	306	315	A	312	276	241	244	267	270	271	266	276	284	286	289	260	260	263	
9	264 ^F	275 ^F	330	279	275	278	316	305	316	304	259	252	250	253	262	258	259	279	291	292	287	266	265	259		
10	264	278	297	300	302	289	307	306	316	289	252	246	258	258	260	257	261	269	284	285	277	278	266	272		
11	271	288	297	325	314	307	308	289	266	259	261	A	A	253	264	266	273	274	296	310	277	269	263	258 ^F		
12	F	F	296	306	264	272	F	303	280	282	285	283	273	280	267	276	299	306	292	298	269	256	260	F		
13	267 ^F	302	296	278 ^F	260	267	304	303	307	314	266	248	273	272	285	282	276	266	281	279	285	275	268	268		
14	267	293	319	339	309	279	325	294	300	303	319	270	249	259	265	268	287	280	279	276	272	270	272	264		
15	261	283	304	284	302	311	355	326	318	269	264	257	242	258	263	270	266	273	266	286	289	276	268	262		
16	283	310	288	275	282	291	265	335	382	A	A	A	A	262	235	251	273	285	273	266	261	250	250	256		
17	F	F	262	301	270	271	285	F	315	330	293	326	273	259	262	269	282	290	293	275	291 ^R	299	281	270	264	251
18	264	301	289	293	294	308	343	353	316	299	289	267	259	269	265	A	A	273	276	289	283	261	265	268		
19	260	270	295	293	270	287	340	337	325	A	A	265	278	288	289	271	269	278	273	264	284	275	278	269		
20	271 ^F	277	F	300	283	307	329	305	298	311	A	A	257	271	265	267	282	A	279	268	271	264	269	256		
21	F	F	284	288	F	266	316	328	328	317	265	262	246	270	286	264	267	273	273	295	270	259	264	262		
22	280	275	297	299	307	303	311	296	317	296	274	239	260	258	266	266	267	273	292	303	288	256	253	261 ^F		
23	273	283	278	281	277	289	295	295	315	A	A	A	257	250	A	282	280	273	284	274	301	260	F	F		
24	F	F	272	319	280	254	F	290	308	299	299	A	261	266	262	263	270	267	265	274	282	293	243	252	246 ^V	
25	265	262	268	288	280	275	294	286	277	326	295	265	240	273	273	271	265	267	280	299	326	259	254	250		
26	247 ^F	281 ^F	298	F	F	F	316	323	310	298	275	273	261	262	271	277	263	272	281	278	264	261	265	281		
27	299	291	283	278	274	314	309	280	255	263	A	299	269	256	281	289	299	280	253	262	276	276	268	266 ^F		
28	267	282	295	294	288	290	320	330	312	274	293	265	278	291	278	282	282	298	289	295	287	253	A	F		
29	F	F	F	303	280	F	301	335	338	262	263	288	249	256	274	287	282	264	274	282	275	261	259	264		
30	264	282	295	312	276	280	298	315	323	293	298	253	294	287	294	271	302	302	291	A	276	R	F	265	260	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	25	26	27	28	28	26	29	30	29	27	22	25	28	30	29	29	29	29	29	29	30	29	28	25		
MED	267	282	295	294	288	290	312	312	316	296	274	259	260	268	271	271	277	278	281	286	280	261	265	262		
U Q	276	291	298	302	301	307	318	326	325	311	285	266	266	273	279	282	290	288	291	296	288	270	268	268		
L Q	264	275	288	282	276	280	302	301	300	274	263	251	252	258	265	266	267	273	275	275	272	256	260	257		

JUN. 2023 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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								A	A	A	A	A	L	342	373	380	370	371	L	L				
2								L	L	L	A	A	A	A	A	A	A	A						
3								L	A	U	L	L	H	H	L									
4								L	A	U	L	A	L	A	H				A	A	L			
5								L	A	A	A	A	A	A	354	376	347	363						
6									L	L	A	A	L	A										
7									A	A	A	A	351	372		A			A	A				
8								A	A	A	A	A	A	A	A		368	346		L				
9									389	359	U	L	A	A	362	400	355	A	L	L				
10								L	A	A	U	L	A	A			A	L	L	L	L			
11								L	L	A	A	A	A	A	354	349	359	A	A					
12									L	L			L	A			L	L		L				
13								L	L	L	A	A	A	L			A	A	L	L				
14									L	A			A		A		A	A		L				
15								L	A	U	L	U	L	A			A	A	A	A				
16										A	A	A	A	A	389	358	354	343		L	L			
17										L		A	A	A	A	A	A	A						
18								L		L	A			A	A	A	A	A						
19									A	A	A	A	A	363	A	351	332	344		L				
20									U	L	U	L	A	A	A	A	A	A						
21								A	A	A	A	A	A		A	A	A	L	L	L				
22								L	U	L	H	U	L	A	A	A	A	A						
23									A	A	A	A	A		A	A	A				L			
24										A	A	A	A	A	A		364	A	A	A				
25									L	L	A	A	A		A		371	343	342	348		A		
26										A	L						L	L		L				
27									U	L	A	A	A		A		H	L	U	L	L			
28									334		A	A	A		397	390	395	384	391		335			
29									L	A	L				A		H		A	A				
30								L	393	359	346	L			415	386	360	366		L	A			
31									L	L	A						A	A	A	A	A			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									7	11	11	12	11	19	17	17	15	10	7					
MED									L	L	L													
U Q									360	368	353	379	366	370	380	358	354	343	339					
L Q									L	L	L													
									389	379	383	390	380	379	392	366	366	352	348					
									U	L	L	U	L				L	L						
									351	354	346	370	351	362	372	350	342	336	336					

JUN. 2023 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 2023 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								242	240	E A 328	350	A	368	350	332	304	282	274	270					
2								250	254	E A 264	E A 326	450	376	346	320	324	E A 340	E A 338						
3								280	246	268	292	356	374	348	330	324	296							
4								240	248	254	314	340	382	348	348	364	324	316	282					
5								252	222	276	A	402	332	344	346	336	308							
6									238	288	348	334	380	382	362	322	302							
7									E A 258	A 388	A	382	376	374	346	338		312	A					
8								258	A	E A 274	E A 314	E A 478	394	360	344	340	342	330						
9									244	304	374	394	396	382	364	346	364	326	282					
10								258	280	254	418	360	378	372	380	360	352	332	298	266				
11								230	242	262	328	A	A	392	364	352	338	306	280					
12									312	322	314	328	358	324	356	336	290	268	278					
13								264	256	274	326	382	362	338	318	326	334	358	306					
14									290	308	276	360	452	410	386	366	320	298	326					
15								212	230	386	388	396	438	384	360	E A 404	358	326	E A 330					
16										A	A	A	A		362	430	384	338	298	298	312			
17										282	364	346	362	366	332	320	298	290						
18								214		306	332	378	388	356	364		A	E A 364						
19									E A 268	A	A	A	410	342	322	314	346	334	316		274			
20									304	280		A	A	380	344	346	334	314						
21								252	264	E A 284	320	378	404	348	316	338	338	324	308	276				
22								252	262	278	298	432	378	362	350	348	350	338						
23									E A 312	A	A	A	416	388		E A 424	334	328	322	296				
24										306		A	354	368	356	348	342	344	364	306				
25									326	266	324	368	434	336	320	332	334	340	296	250				
26										300	358	340	354	378	344	312	354	326	268					
27											A	278	356	362	322	306	284	294	328	298				
28									264	248	326	370	334	314	344	326	328	296	270					
29								238	226	434	402	316	424	382	350	302	296	332	E A 334					
30								254	244		306	440	316	318	324	342	298	276	E A 324	A				
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								15	24	26	22	25	28	30	29	29	28	26	19	7				
MED								252	254	280	326	369	377	358	346	337	332	320	290	276				
U Q								258	285	308	358	399	395	378	361	350	341	332	E A 324	298				
L Q								238	243	268	314	343	360	344	327	324	300	298	280	266				

JUN. 2023 h'F2 (KM)

IONOSPHERIC DATA STATION Okinawa

JUN. 2023 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	E A	294	296	260	226	210	210	246		A	A	E A	264	212	196	216	210	192	202	216	252	292	300	300	284				
2		282	274	272	250	208	244	228	230	212	200	A	E A	336	A	A	218	A	A	A	278	230	238	E A	284	294	292		
3		276	252	246	244	236	220	228	216	A	188	196	174	168	174	188	240	214	274	E A	E A	234	E A	E A	292	294			
4		294	280	250	220	198	212	224	210	A	188	E A	232	244	E A	284	228	250	248	A	A	266	242	204	E A	E A	344		
5	E A	298	E A	246	242	232	220	254	242	222	A	A	A	A	A	222	190	256	236	298	278	276	E A	E A	E A	E A	E A		
6	E A	318	E A	292	242	222	272	248	230	228	218	196	E A	E A	252	266	208	198	246	232	278	240	238	E A	318	274	282	270	
7		298	290	260	268	250	246	224	222	A	A	A	A	220	196	A	226	326	A	A	A	322	234	246	E A	E A	302		
8		284	E A	300	276	242	236	250	228	A	A	A	A	E A	E A	E A	A	208	194	284	280	260	248	272	E A	E A	352		
9		318	268	220	250	260	266	210	232	230	186	E A	E A	A	E A	240	206	254	A	198	234	244	270	288	296	310			
10		296	E A	290	262	262	232	226	220	210	A	A	234	188	250	198	A	A	206	196	212	236	236	276	284	292			
11		288	256	238	210	208	200	228	210	216	228	A	A	A	218	220	198	A	A	A	238	228	232	266	296	312			
12		308	264	246	228	274	264	250	240	214	220	188	200	E A	230	188	184	254	200	220	240	288	328	304	326				
13	Q	298	248	262	E A	286	292	288	228	218	224	E A	E A	258	286	188	216	A	198	242	230	268	256	254	288	302			
14		326	270	226	214	E A	226	224	234	206	212	A	212	196	A	214	A	A	A	A	210	240	290	282	294	286	290		
15		330	264	260	270	264	248	214	190	A	176	214	180	E A	282	236	216	A	A	E A	254	270	248	260	290	300			
16		270	248	222	244	278	256	E A	362	252	206	A	A	A	A	A	A	204	228	206	212	232	266	272	E A	E A	318		
17	E A	328	E A	298	260	256	268	278	218	248	214	208	204	A	A	A	A	A	E A	E A	E A	248	272	302	246	240	262	284	314
18		296	250	254	270	256	224	208	202	188	E A	E A	254	260	214	164	A	A	A	A	A	296	258	270	E A	E A	308	310	
19		326	308	274	268	286	266	212	218	A	A	A	A	A	A	220	272	216	210	212	290	E A	256	248	264	270	286		
20	E A	358	E A	330	Q	286	254	196	194	206	220	A	A	A	A	A	A	A	A	A	A	308	254	274	288	290	306		
21	Q	308	E A	E A	E A	E A	E A	282	230	A	A	A	A	A	A	A	A	A	A	E A	310	212	240	244	E A	300	296	296	
22		280	292	264	236	232	206	222	192	198	170	176	200	202	A	A	A	A	A	A	312	284	242	220	292	E A	E A	318	
23		282	294	E A	282	274	276	218	244	238	A	A	A	A	196	228	E A	A	A	A	A	214	200	258	E A	E A	E A	E A	
24	E A	328	E A	288	Q	250	264	294	298	220	208	222	A	A	A	A	E A	264	202	A	A	A	262	262	276	316	296		
25		294	296	276	246	240	246	214	214	210	228	A	E A	298	204	A	208	198	212	222	A	228	242	308	332				
26	E A	398	E A	E A	E A	E A	E A	294	296	246	210	204	238	184	204	198	186	202	214	236	198	228	246	270	302	E A	328	274	
27		258	240	246	276	280	234	228	214	236	218	A	206	228	174	188	190	196	192	210	250	274	268	264	282	A	282		
28		294	266	230	244	244	288	246	232	218	A	236	300	308	164	190	224	224	A	A	A	262	240	296	A	302			
29	E A	264	318	236	242	262	296	Q	242	228	196	244	216	196	212	206	186	E A	256	230	310	A	254	E A	E A	E A	304		
30		334	304	244	208	218	252	226	226	214	208	E A	252	202	202	198	192	298	A	A	A	A	E A	E A	E A	E A	316		
31																													
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT		30	30	30	30	30	30	30	27	19	18	17	17	17	21	19	19	17	21	24	28	30	30	29	30				
MED	U	294	272	252	246	248	249	228	218	214	200	210	200	204	201	198	219	212	212	234	250	248	U	278	294	300			
U Q	E A	326	296	272	268	278	266	242	230	218	228	256	282	259	225	218	248	236	281	279	262	272	E A	E A	E A	318			
L Q		284	264	242	232	232	224	220	210	206	188	200	196	200	187	190	208	198	201	221	242	238	268	289	292				

JUN. 2023 h'F (KM)

IONOSPHERIC DATA STATION Okinawa

JUN. 2023 h'E (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						A	A					A		A	A	A	A	A	A						
2						B		102	102	100	100	A	100	A	A	A	A	A	A	A					
3						B	A	A		A	A	A	A		98	98	98	98	100	100					
4						A	A	A	A	A	A	A	A	A	A	A	100	100	100		A	A			
5						A	A	A	A		A	A	A	A	A	A	A	A	A	A					
6						B	A	A	A	A	A	A	A		98	98	98	102	102		A	A			
7						B	A	A	A	A	A	A	A		98	98	98	98	98	98		A			
8						A	A	A		98	98	96	A	96	98	98	98	98	102		A	A			
9						B	A															A			
10						A	A	104	100	100	100	100	100	100	100	100	100	100	100	100					
11						B	A	100	100	100	100	100	98	A	102	100	100	98		A	A				
12						A	A	98	94	94						102	100								
13						A	A	114	100	98		A	A	A	A	98	102	100	98	96					
14						A	A	A		100	98	100	100		A	A	A	A		110		A	A		
15						A	A															A			
16						B	A	102	100	100	98	98	100	100	100	100	100	100	100		A	A			
17						A		104	100	100	100					100		106				A			
18						A	A	114	104	104	100	102	100	100	98	96	96			98					
19						A	A	A		102	102	100	100	100	96					A	A	A			
20						A	A	102	100	100	98									98	100				
21						A	A	102	102	100								100	100	102					
22						B	A	100	100	98	98	98	98	98	102	102	100	100	100						
23						A		A	A	A	A	A	A	A	A	A	100	100	100	100					
24						B	112	102	98	98	98	98		92	A					A	A	A			
25						B	A	102	100	98															
26						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A					
27						A	A	A		A	A	A	A	A	A					A					
28						A	A	A	98	A	A			A			100	100		100					
29						A	A	A		A															
30						A	A	104		100	102	100	100	100	100	100	100	100	100						
31								104	98	98	98						102	102	102	102					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT							4	15	21	18	15	10	9	12	12	20	19	20	14						
MED							114	102	100	100	100	100	100	98	98	100	100	100	100						
U Q							116	104	101	100	100	100	100	99	100	100	100	100	102	102					
L Q							113	100	98	98	98	98	98	98	98	98	98	100	99	100					

JUN. 2023 h'E (KM)

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JUN. 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

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	86	84	100	80	80	102	96	96	98	96	98	94	110	116	94	90	92	90	88	90	98	96	96	96
2	94	94	88	88	88	B	142	110	104	100	100	98	88	88	140	116	102	98	94	100	82	92	92	92
3	92	92	84	114	86	84	90	94	98	100	94	94	94	G	G	138	124	112	96	92	94	94	88	84
4	78	78	78	B	94	92	92	126	94	98	94	90	148	126	122	112	108	96	90	96	92	94	92	90
5	84	82	82	80	96	106	92	90	100	98	92	90	98	90	132	196	88	116	86	84	96	98	92	92
6	94	90	92	86	86	122	88	88	88	104	112	88	150	100	122	132	90	164	120	108	92	88	B	B
7	104	B	98	94	92	B	100	104	90	92	84	86	118	108	96	130	122	102	102	100	98	102	98	94
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15	94	92	86	82	90	90	106	102	102	104	100	98	112	114	116	100	98	102	90	90	84	84	82	82
16	82	80	82	B	128	B	106	104	96	96	92	86	90	90	102	100	152	90	88	90	86	92	102	92
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31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	28	29	23	30	30	30	30	30	30	29	29	29	29	30	30	30	30	30	29	28	29
MED	90	90	88	85	88	92	104	104	99	99	94	94	96	104	108	112	103	102	97	92	90	88	92	90
U Q	94	94	92	90	94	102	116	116	104	104	100	98	111	114	122	125	122	112	102	100	96	95	96	93
L Q	82	82	82	81	84	90	92	96	96	94	92	90	89	90	93	99	96	96	90	86	84	84	84	84

JUN. 2023 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

JUN. 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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F4	FF33	FF13	F5	F2	CL12	C6	C4	C1	C3	C2	C4	CL11	CL11	L2	L2	L3	L3	L2	L3	F5	F3	F3	FF32	
2	FF22	F3	F3	F3	F2		H1	C2	C2	C1	C3	C2	L4	L5	HCL11	CL42	CL61	CL82	CL71	CL33	F6	FQ41	FQ41	FQ51	
3	F3	F1	F2	FF11	F1	L1	L4	L2	C3	C1	L2	L1	L1			H1	C1	C2	C9	L9	F5	F4	F4	F2	
4	F4	F2	F1		F3	L6	L3	CL11	L4	C2	L2	L2	HL11	CL11	CL11	C1	C4	C4	L4	C4	F6	F7	F4	F4	
5	FQ31	FQ31	FQ31	FQ21	F1	C4	L4	LQ41	C41	C3	C4	L6	L5	C2	L1	HL11	HL11	L3	CL34	L6	L8	FF35	FF25	FQ41	FQ51
6	FQ31	FQ21	F3	F3	F5	C1	L4	LQ41	LQ21	CL12	CL22	L3	HL11	C3	C	H2	LH11	HL12	C5	CL52	FF73	F3			
7	F1		F4	F7	F3		CL12	CL12	LQ61	L6	L7	L4	CL11	C1	C2	H2	C1	C7	C8	C8	F51	FQ31	F6	F2	
8	F2	FQ51	FQ21	F2	F1	L3	CL41	C4	C4	C4	C4	CQ31	CQ31	C2	C2	C	H1	C2	C3	C4	L6	F2	F1	F6	F5
9	F2	F4	F2	F1	F3		C2	C4	C2	C1	C2	C2	C2	HC11	C1	C	C3	C1	C3	C3	CL23	FF32	F3	F2	F1
10	F2	F4	F3	F5	F4	L3	HL11	H2	C5	C3	C2	C1	C1	CQ11	C4	C3	C	C	C	C3	F2	F3	F4	F3	
11	F3	F1	F2	F1			C1	C2	C2	L4	LQ41	L6	L7	L2	L11	LC11	C3	L5	L3	L2	F2	F5	F1	F2	
12	F1	F1	F3	F5	F3	L6	L4	L3	L2	L4	L2	L1	L2	L3	CL11	L1	HL12	L4	L3	L6	F5	FF43	FF22	F4	
13	F2	FQ41	F2	F3	FF12	L2	L1	C2	C3	L3	L3	L2	L4	C1	C1	C	C3	C2	C2	L3	F6	F3	F5	F6	
14	F6	F4	F1	F3	F5	L4	L6	L3	CL21	C4	C2	C1	L2	CL11	L4	LQ31	L3	LC33	CL24	L7	F7	F5	FF22	F3	
15	F3	F2	FQ31	FQ21	F1	L5	C3	C2	C3	C2	C2	C2	C2	C1	C1	C7	C3	C2	L5	L3	F4	F5	F5	F3	
16	F4	F2	F1		F1		C8	C5	C5	C6	C5	LQ61	LQ31	LQ31	C1	C	HC11	LC21	L2	L4	F5	FF35	FF16	FF33	
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19	F5	F4	F3	F3	F2	C1	C3	C5	C4	L8	L9	L4	L3	L1	L2	L2	C1	C1	C5	C4	F4	F4	F1	F4	
20	FF63	FQ51	FF11	F2	F8	L8	C3	H1	C1	C1	L8	L6	L3	L2	L3	HL11	HC21	C5	C8	CL11	F4	F1	F5	FF22	
21	FF23	FQ31	FQ41	FQ51	FQ31	L2	C3	C4	C4	C2	C2	C4	C5	C1	H2	C2	C3	C5	C5	CL11	FF13	F5	F5	F4	
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23	FF12	FF13	F4	FQ51	FQ61	LQ31	LQ71	CL25	CL62	C8	L7	L7	C2	C1	C6	C7	C	C2	C2	C3	F9	F6	F7	F4	
24	F6	F6	F6	F2	F4	L2	H1	C2	C4	C5	L4	L3	L2	L3	CL13	H1	L5	CL16	CL18	L9	F9	F7	F7	F3	
25	F2	FQ31	F1	F1	F1		H1	C1	C4	L1	L3	L2	L4	L2	L2	CL12	CL11	C1	CL12	L1	F3	F2	F1	F1	
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29	F2	F6	F2	F3	F2	L2	L3	CL12	C2	HL11	HC11	C1	H1	C1	C1	C2	C2	C2	L9	L6	F9	F9		F5	
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31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																									
MED																									
U Q																									
L Q																									

f-PLOTS OF IONOSPHERIC DATA

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

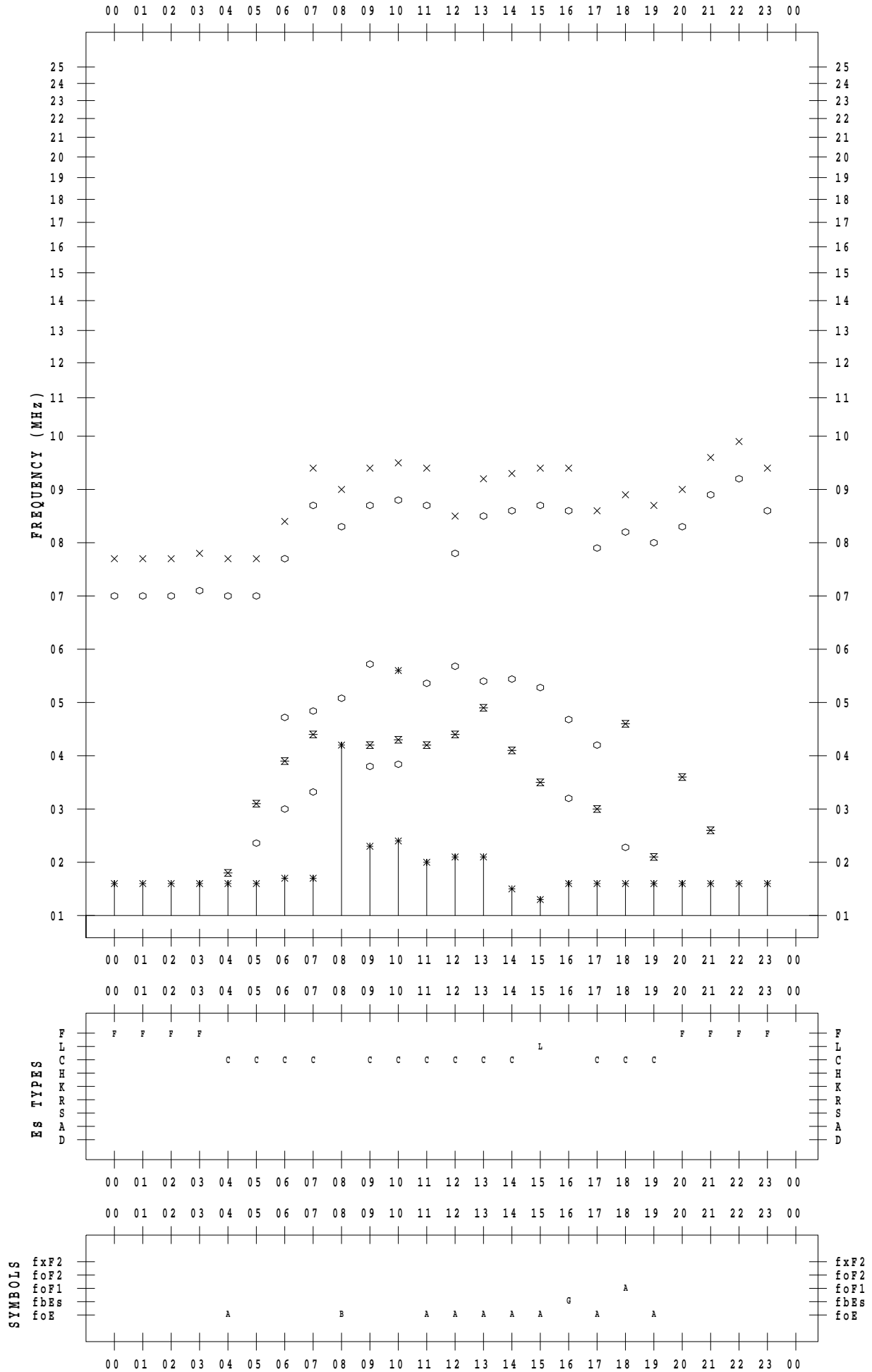
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 1

135 ° E MEAN TIME



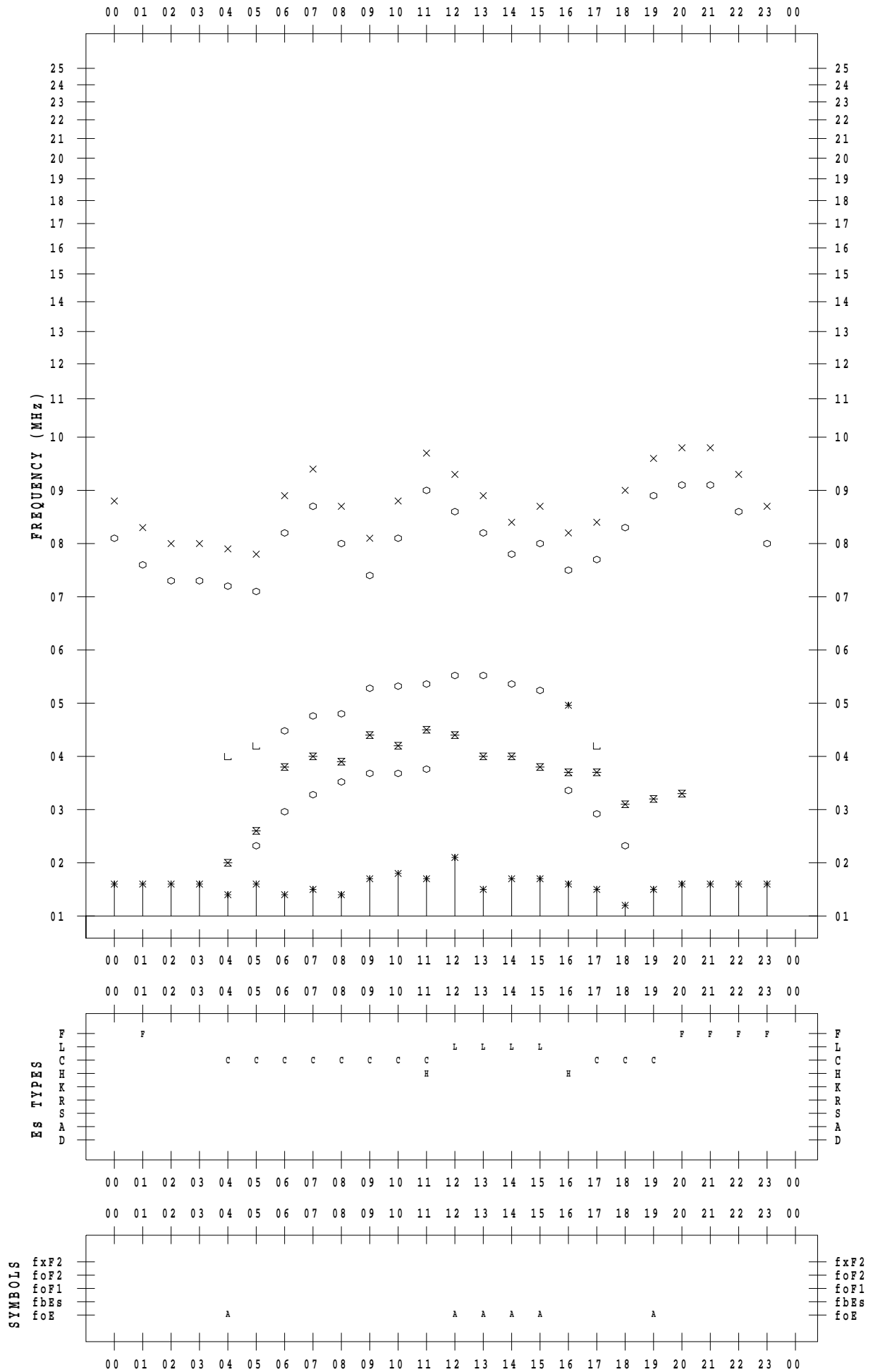
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 2

135 ° E MEAN TIME



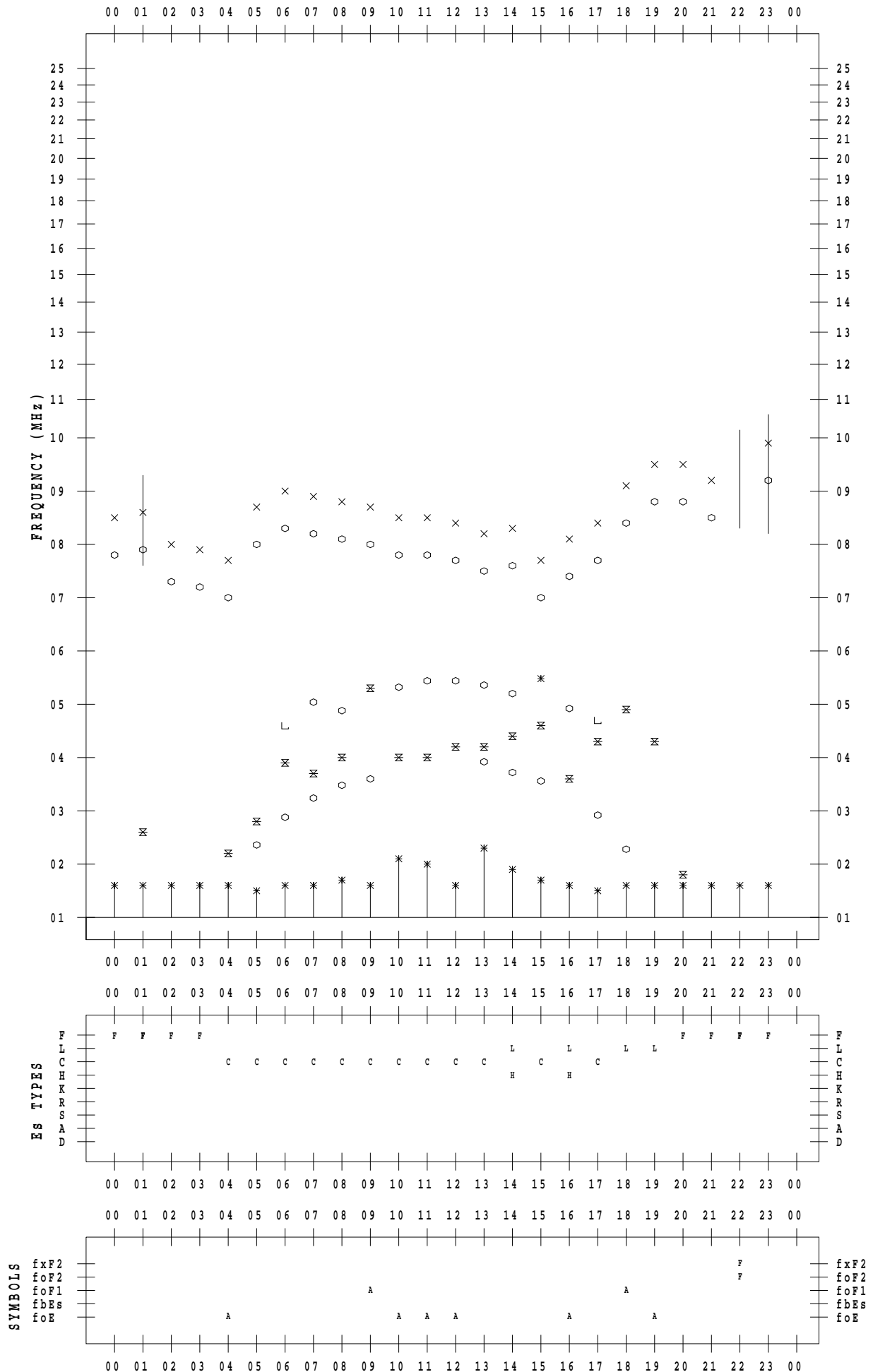
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 3

135 ° E MEAN TIME



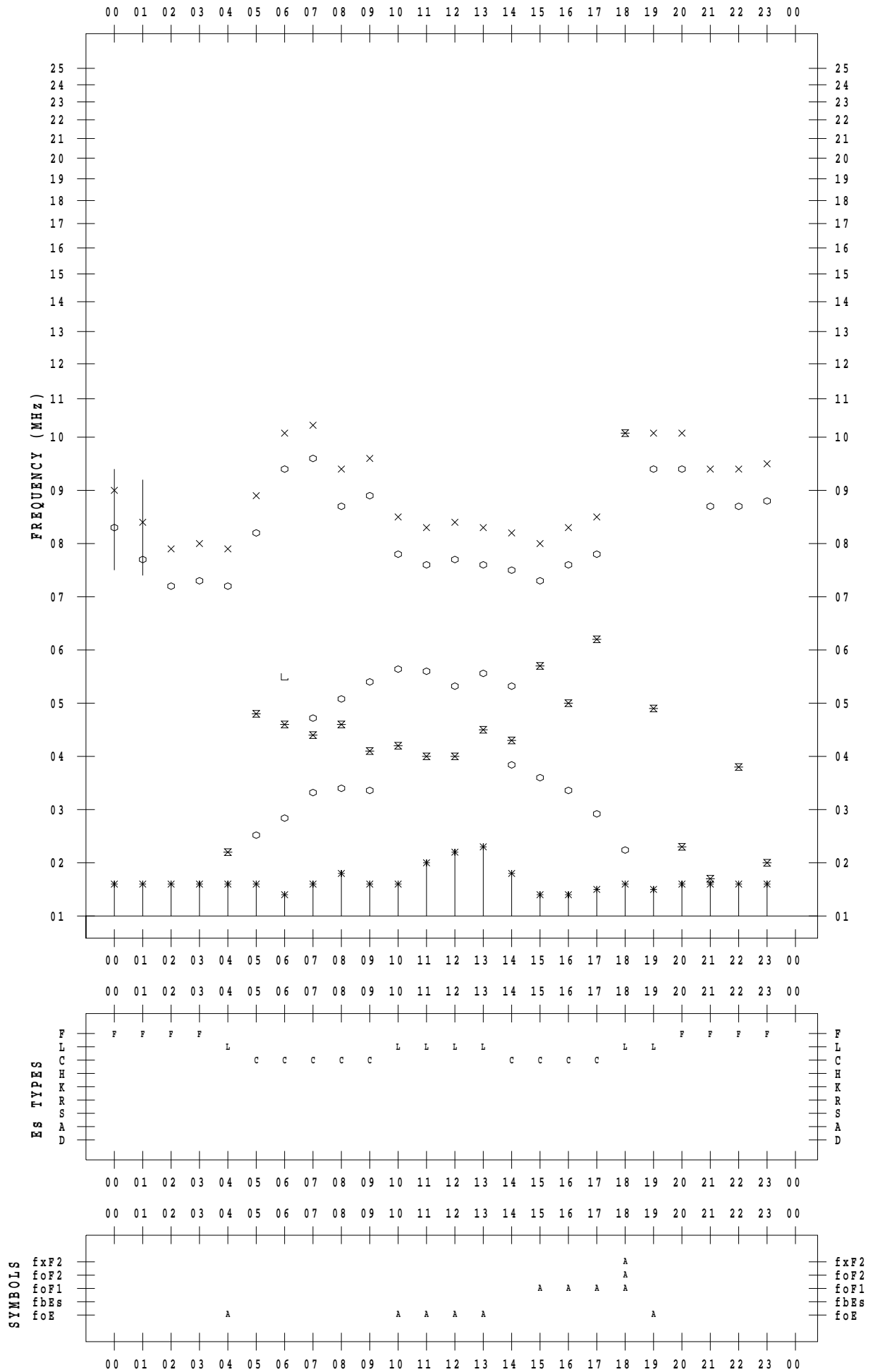
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 4

135 ° E MEAN TIME



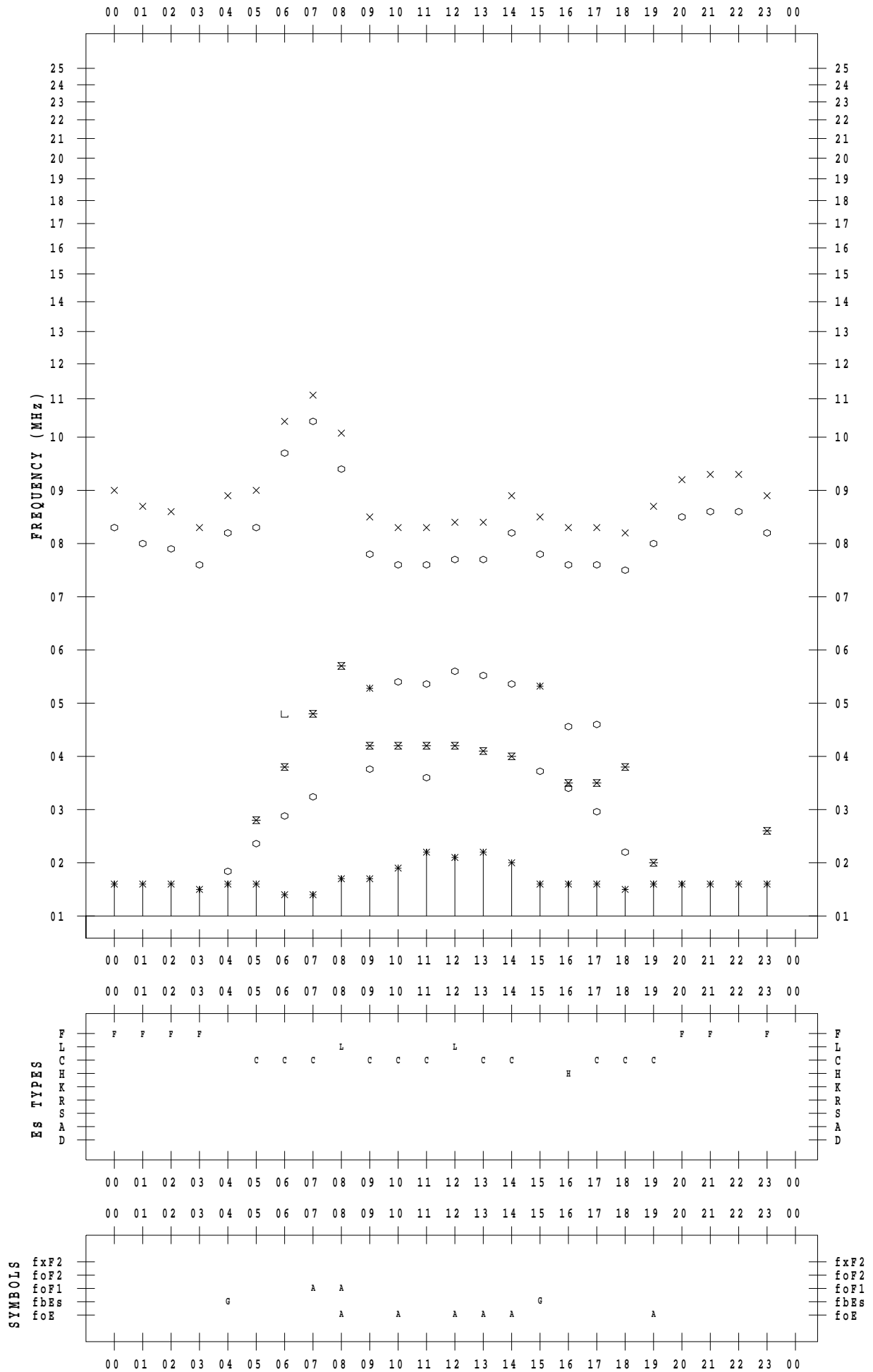
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 5

135 ° E MEAN TIME



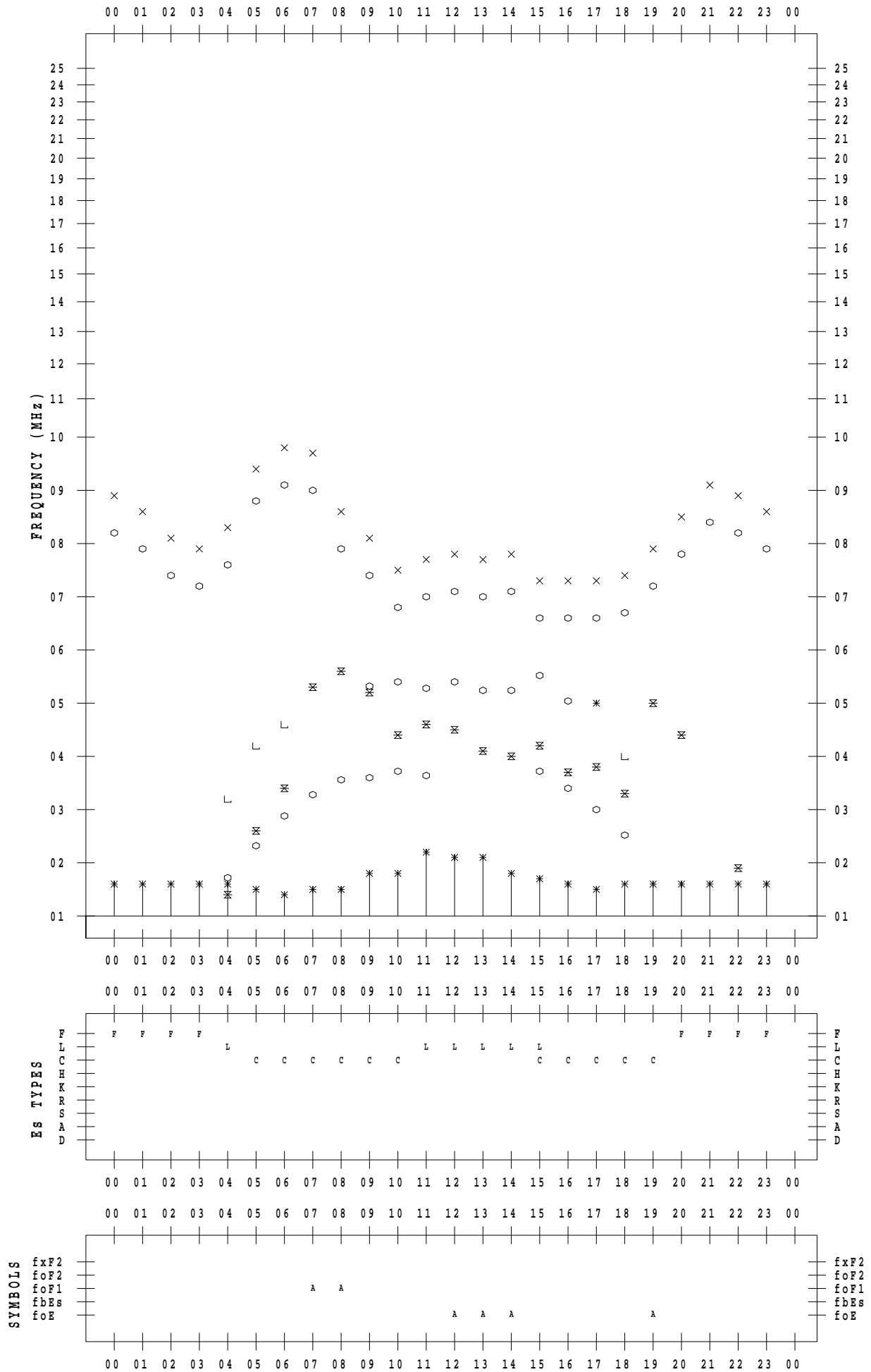
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 6

135 ° E MEAN TIME



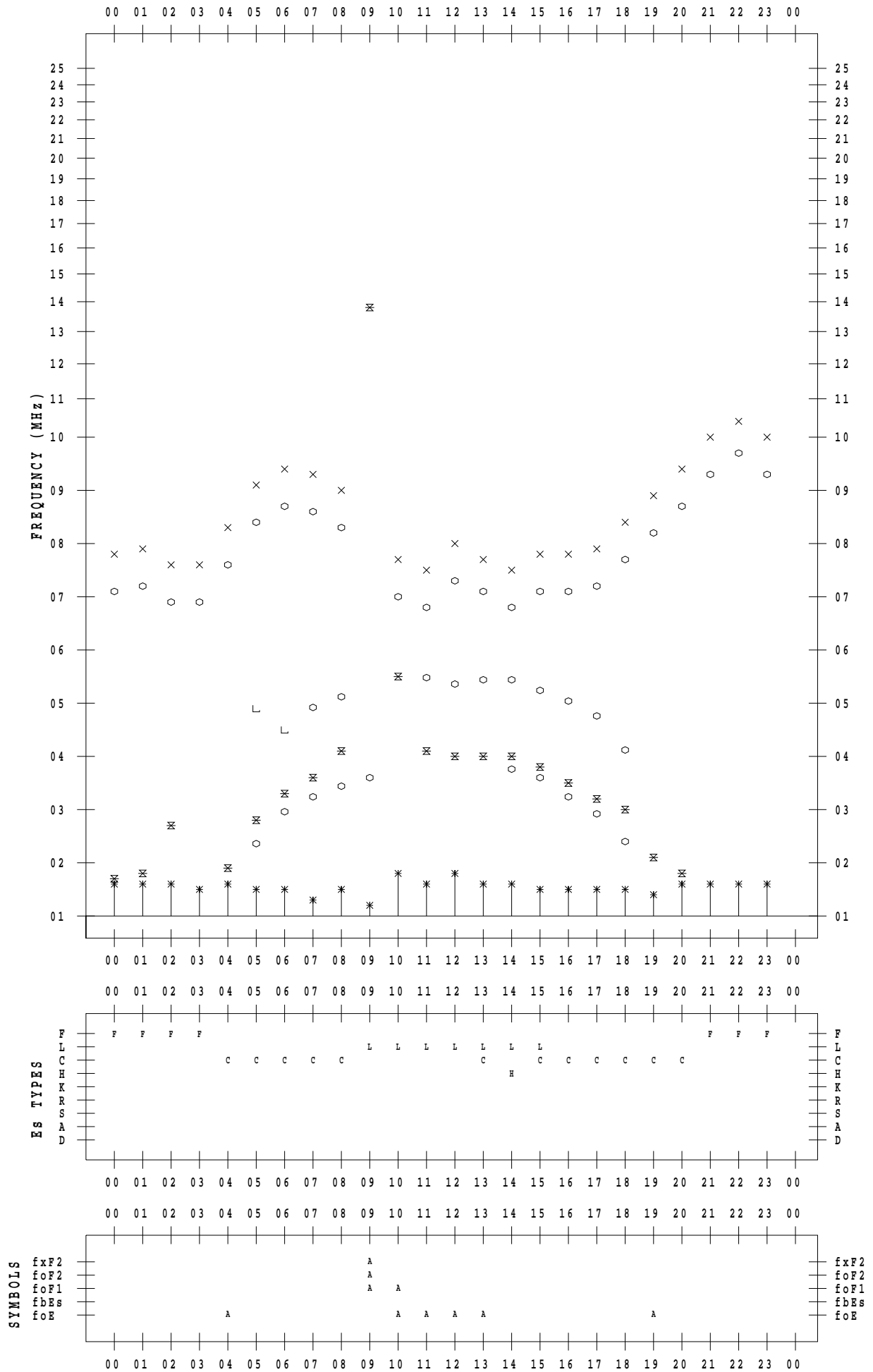
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 7

135 ° E MEAN TIME



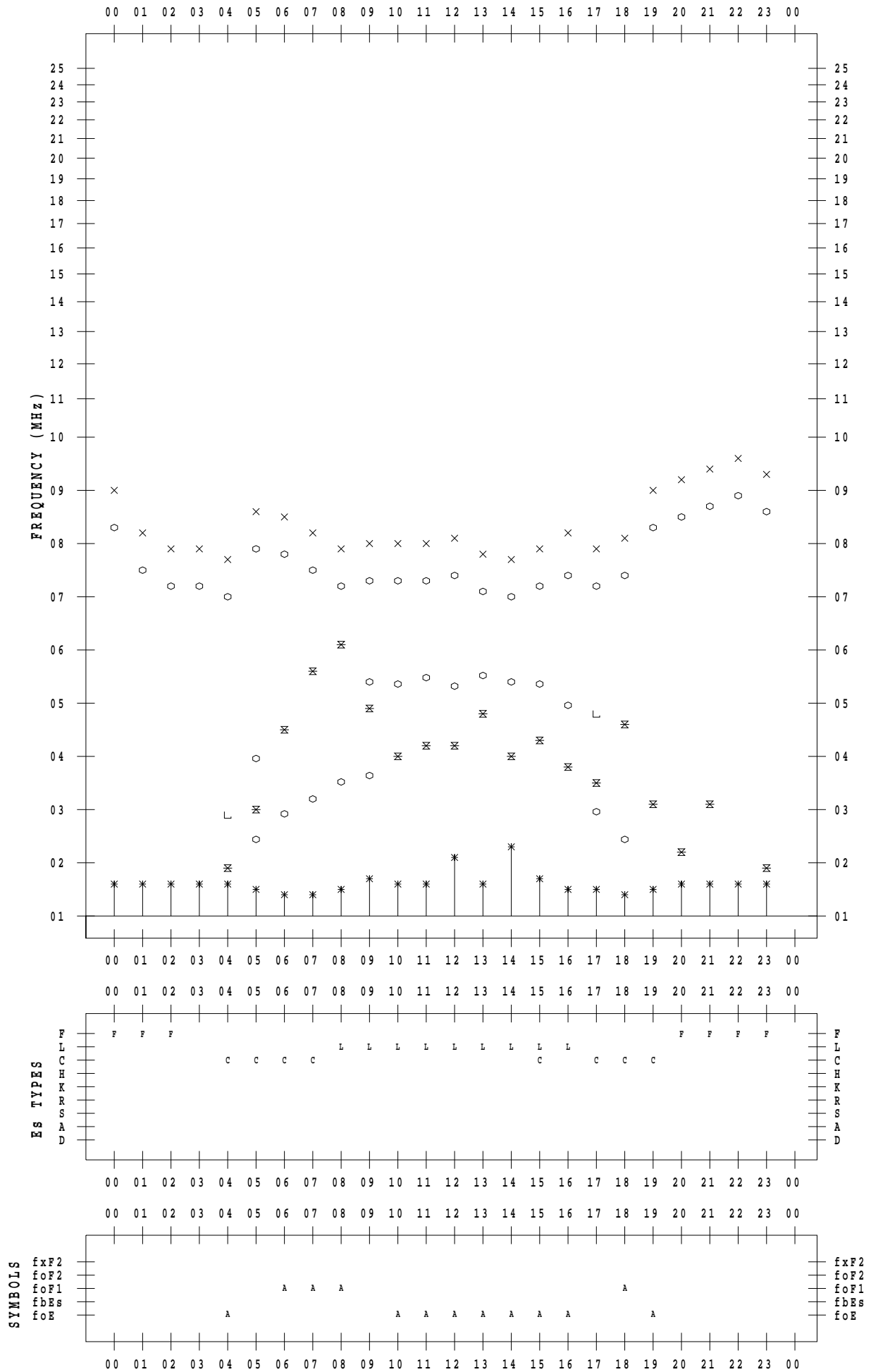
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 8

135 ° E MEAN TIME



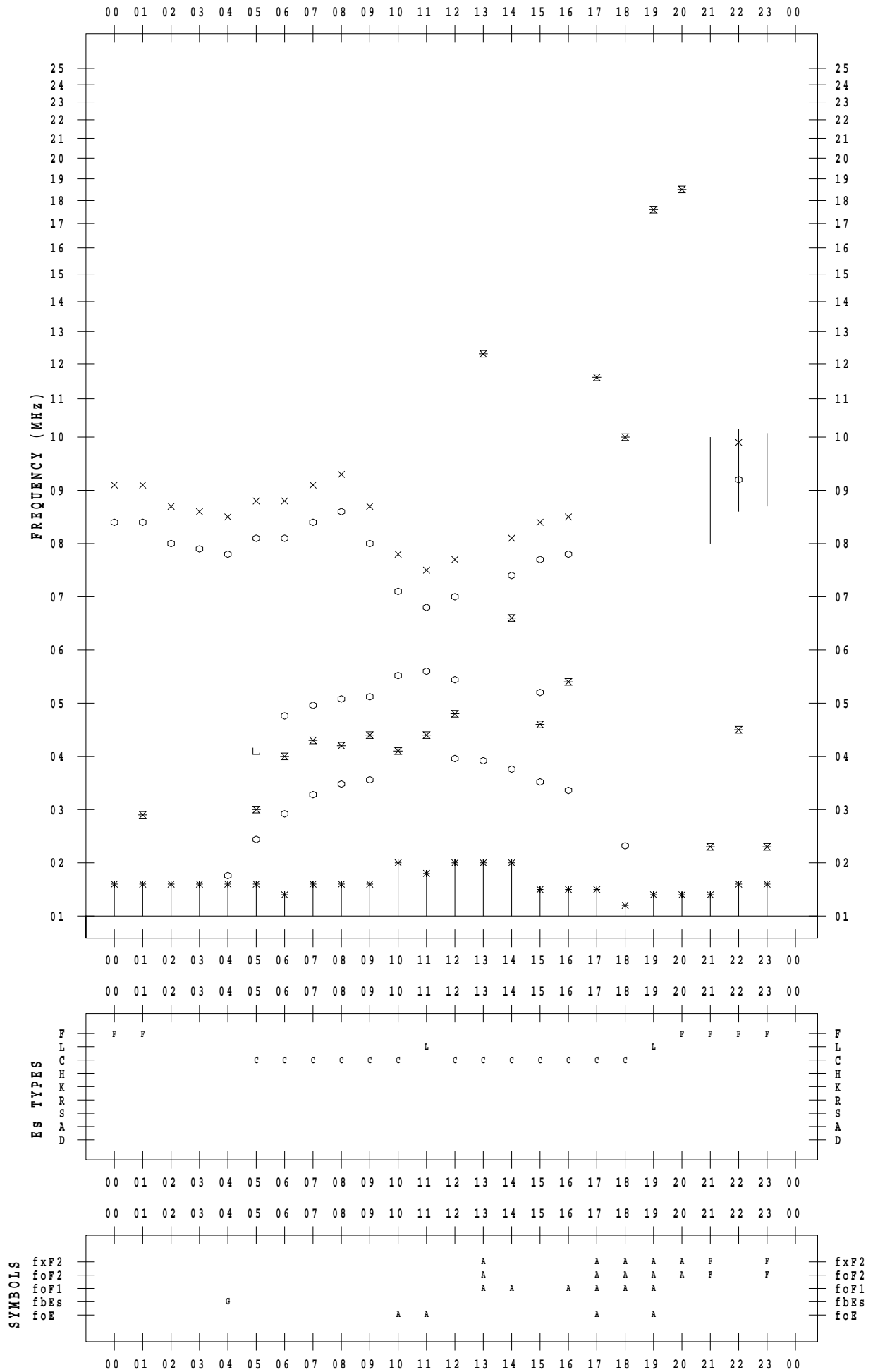
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 9

135 ° E MEAN TIME



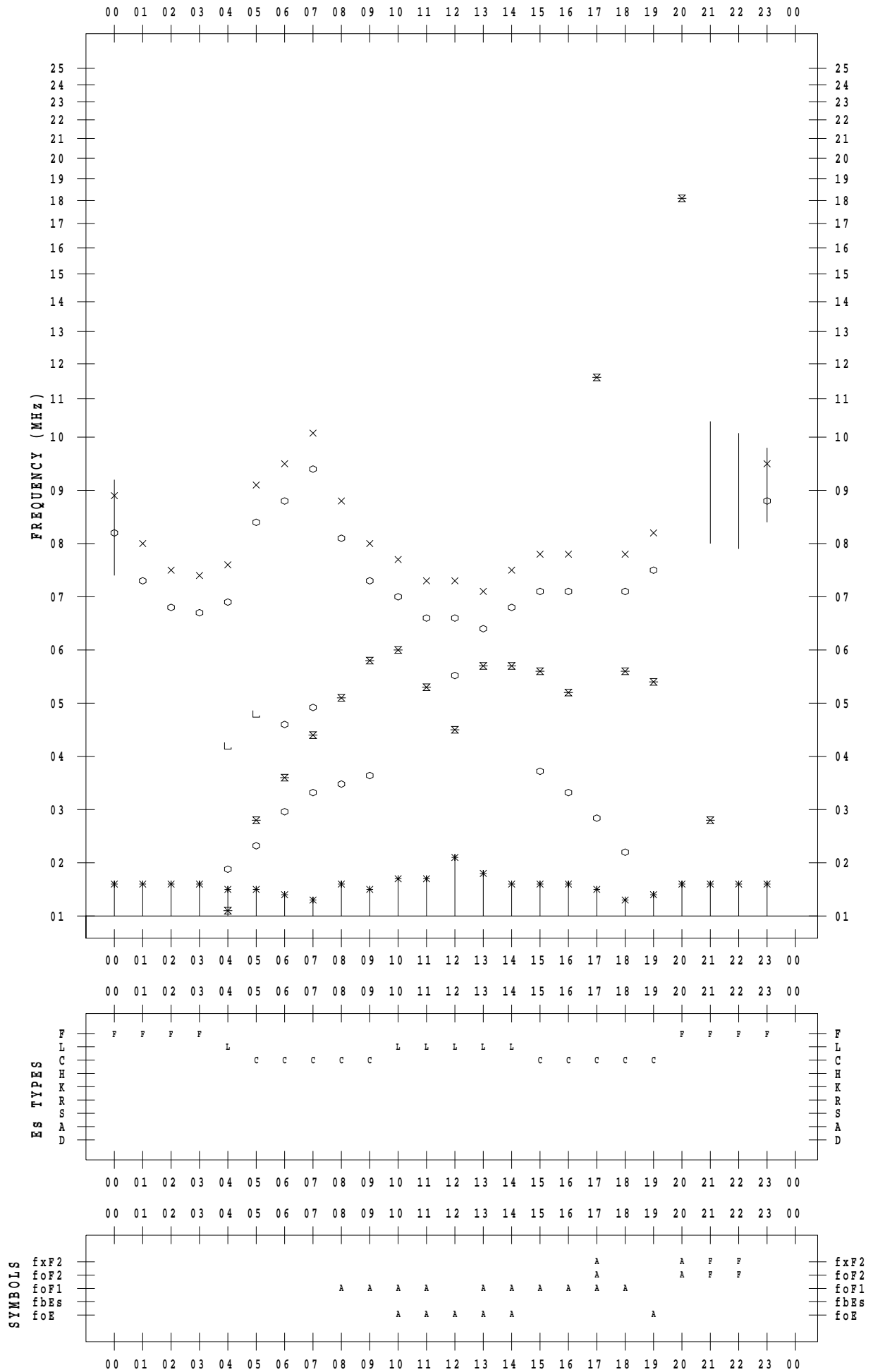
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 10

135 ° E MEAN TIME



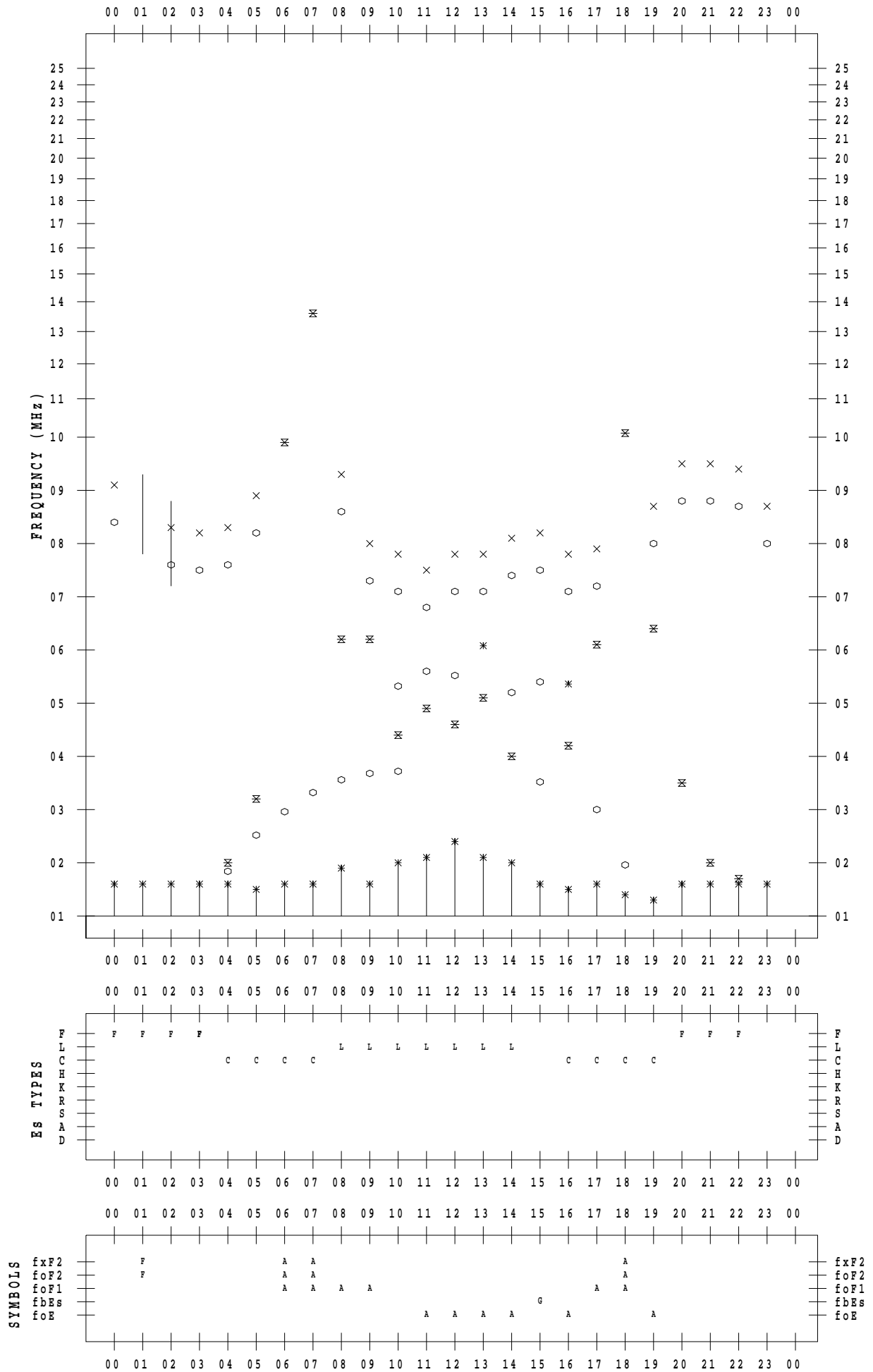
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 11

135 ° E MEAN TIME



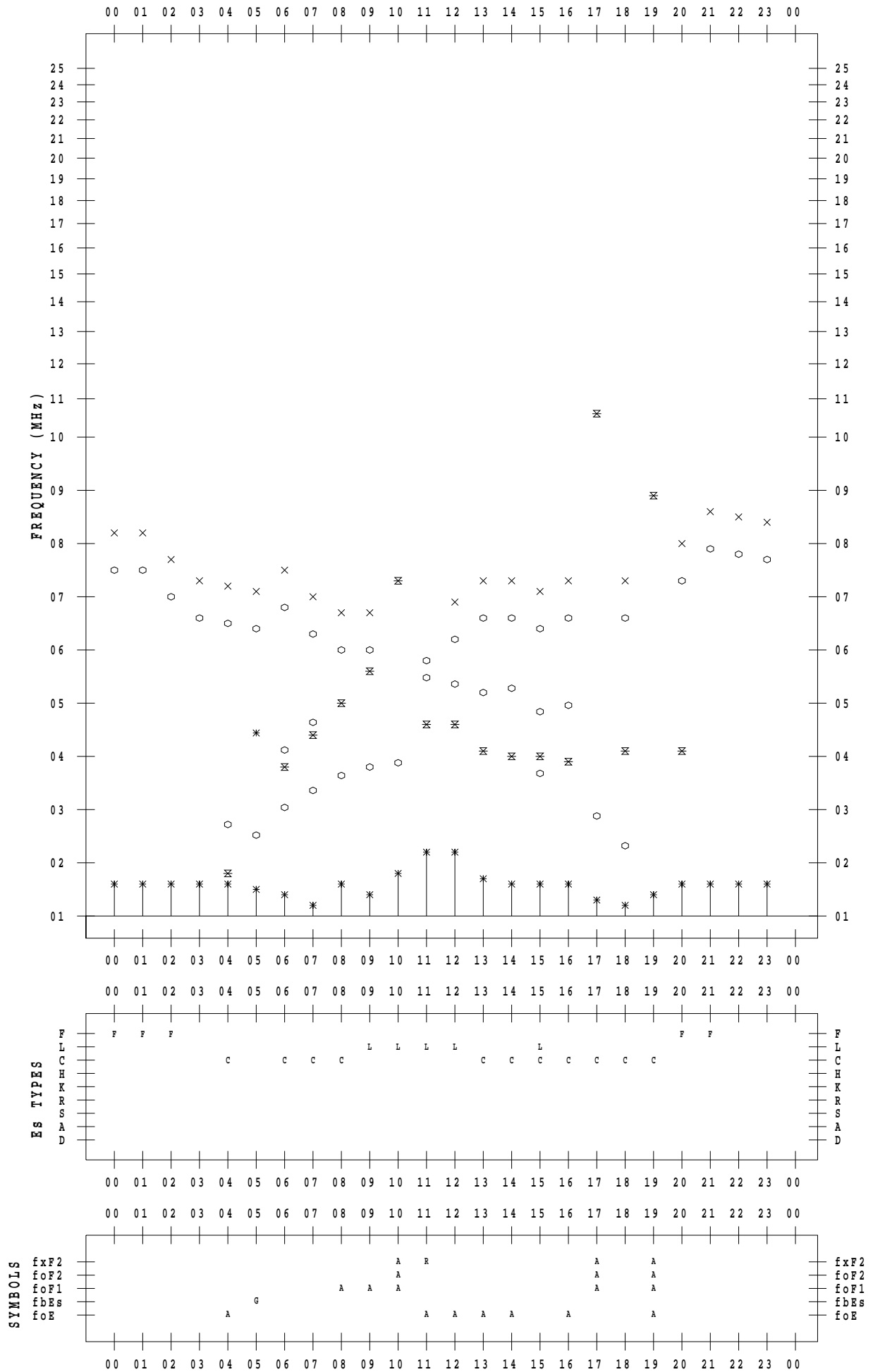
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 12

135 ° E MEAN TIME



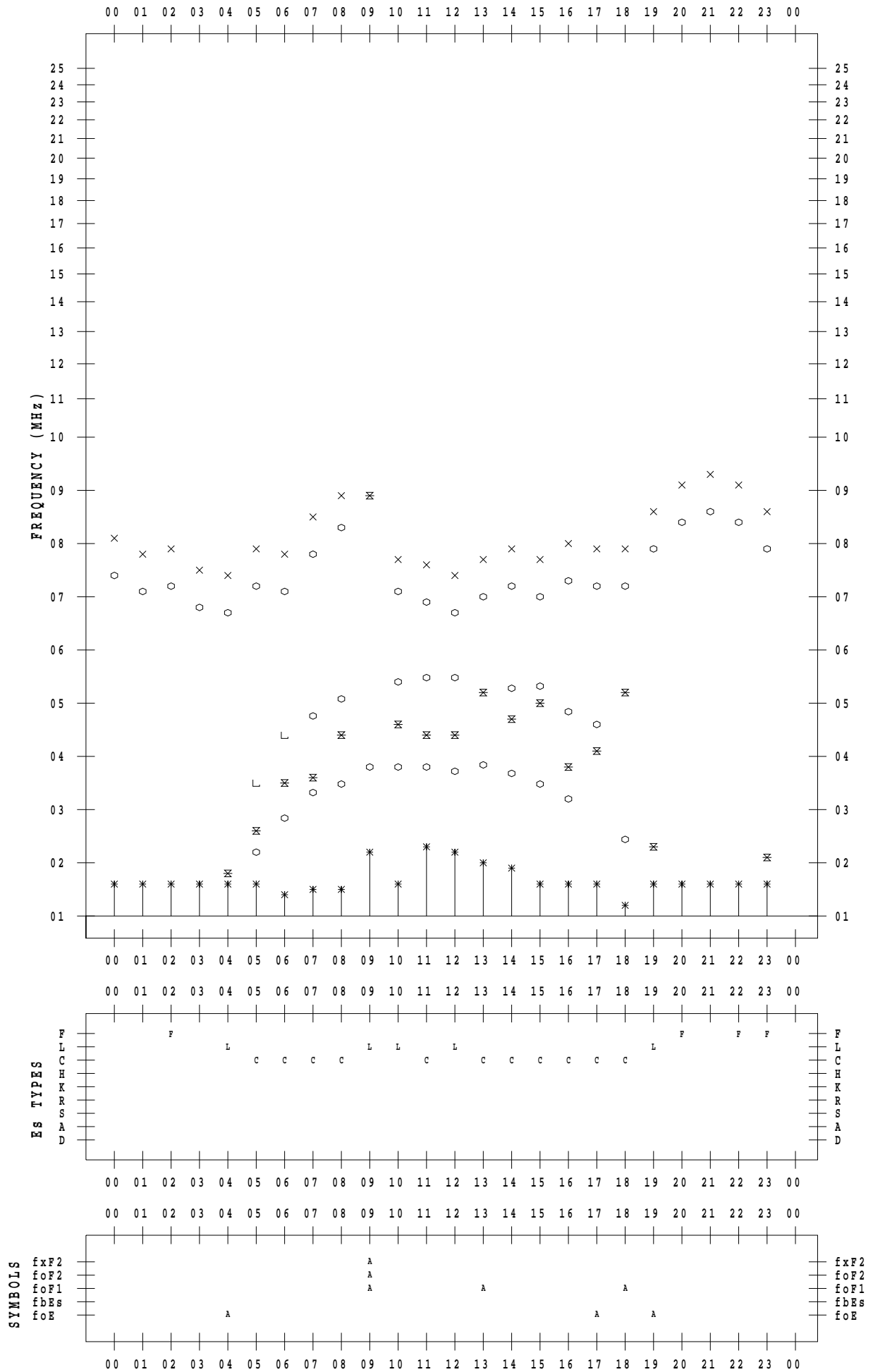
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 13

135 ° E MEAN TIME



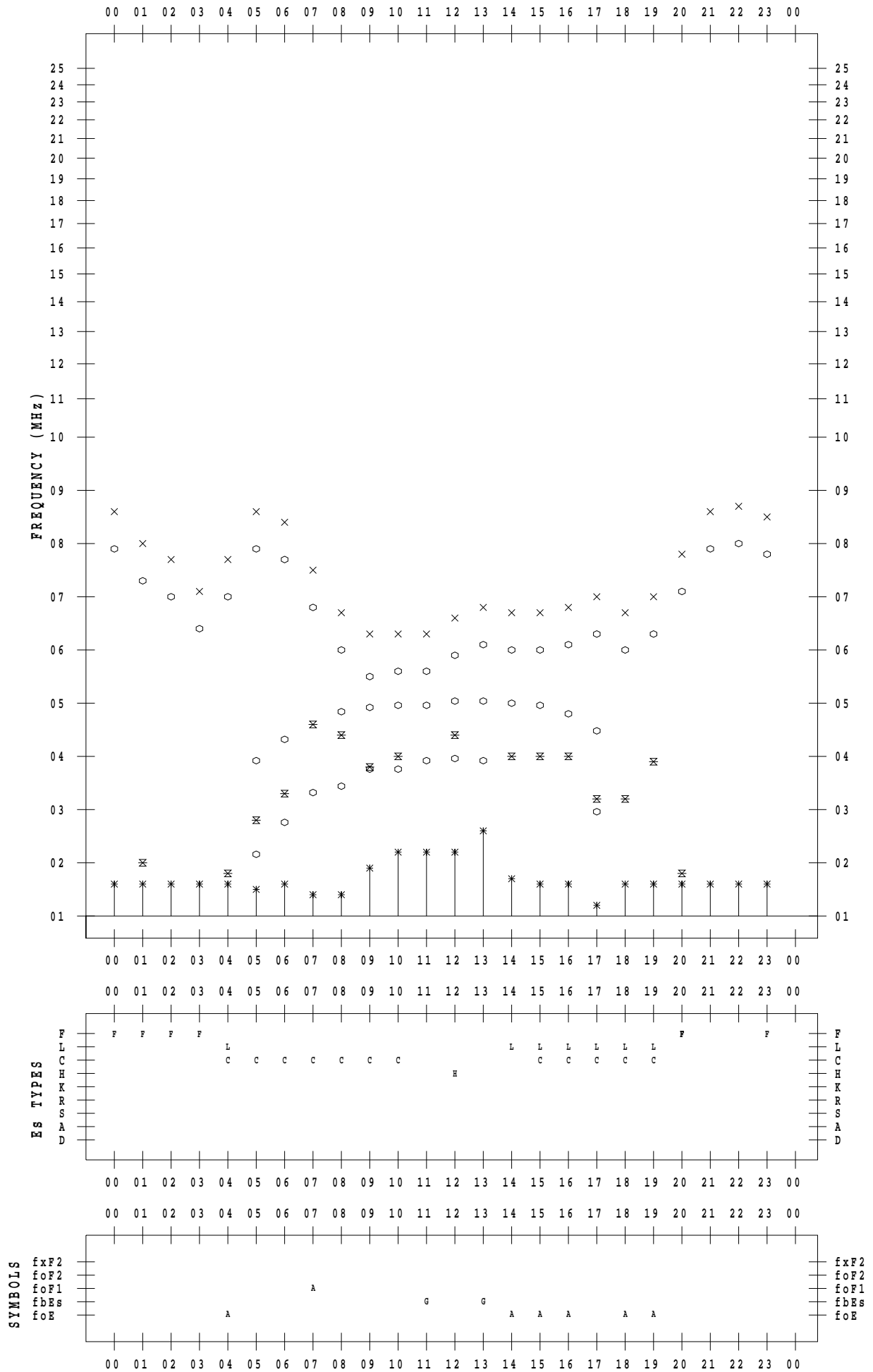
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 14

135 ° E MEAN TIME



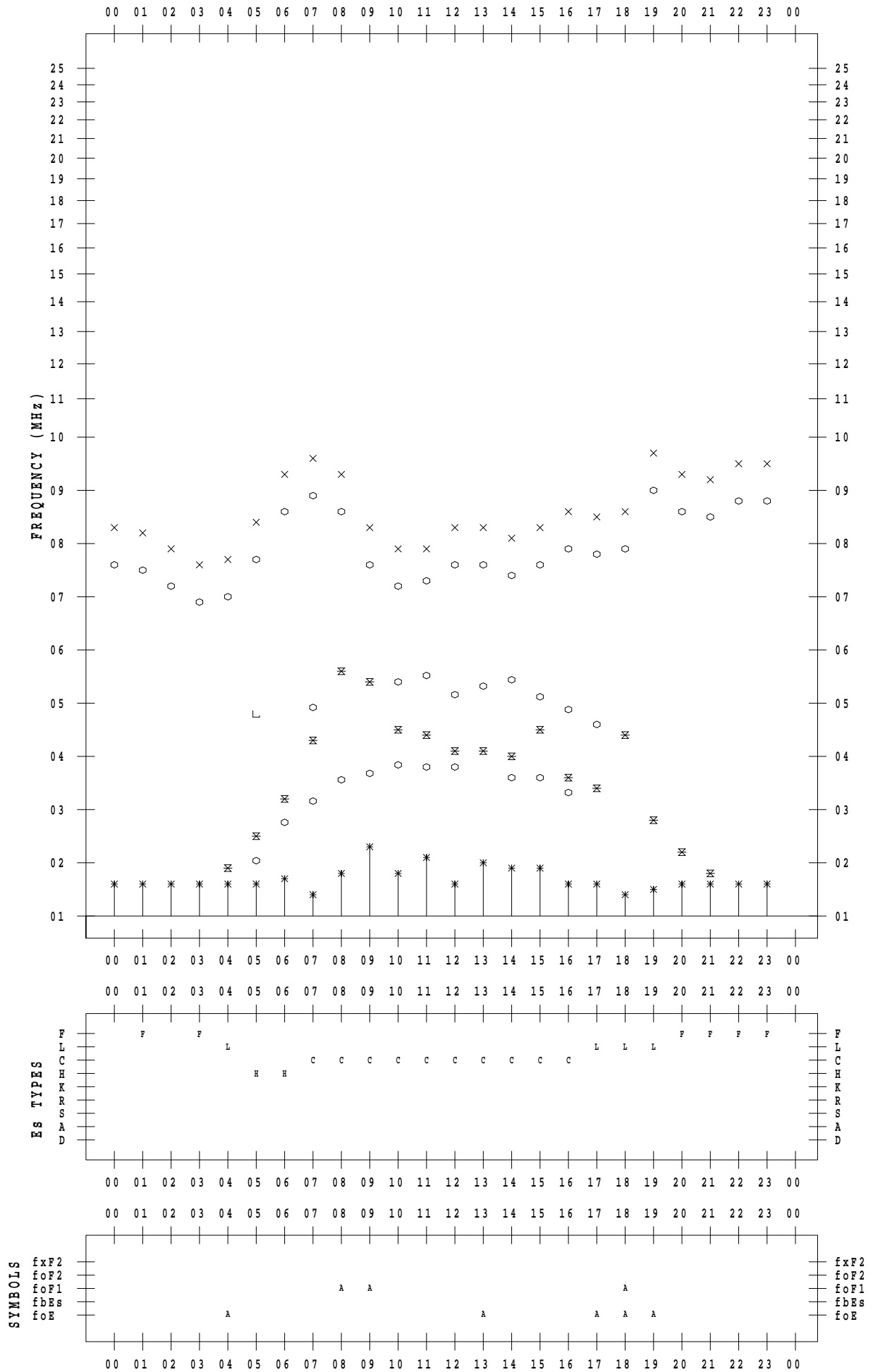
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 15

135 ° E MEAN TIME



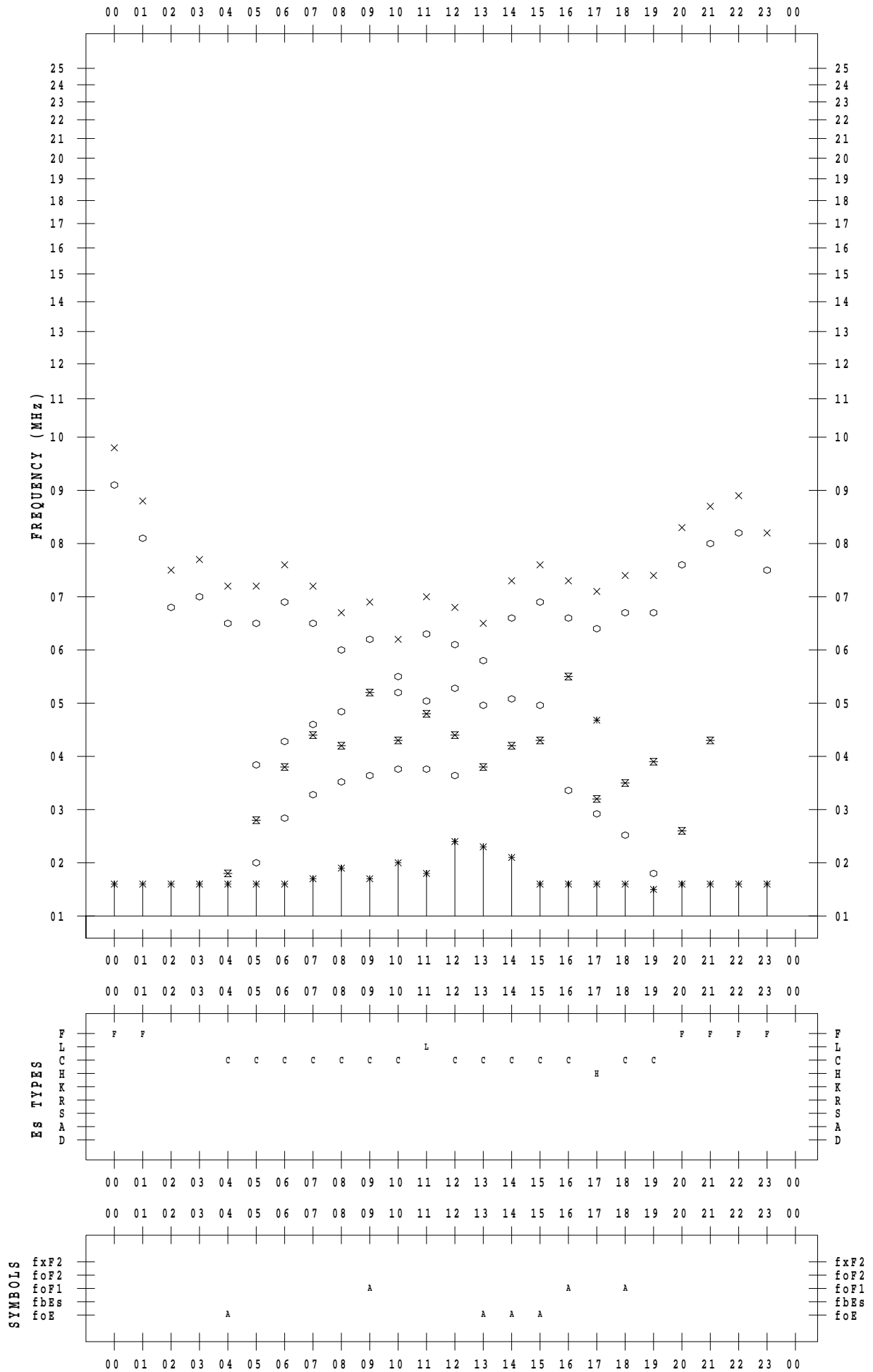
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 16

135 ° E MEAN TIME



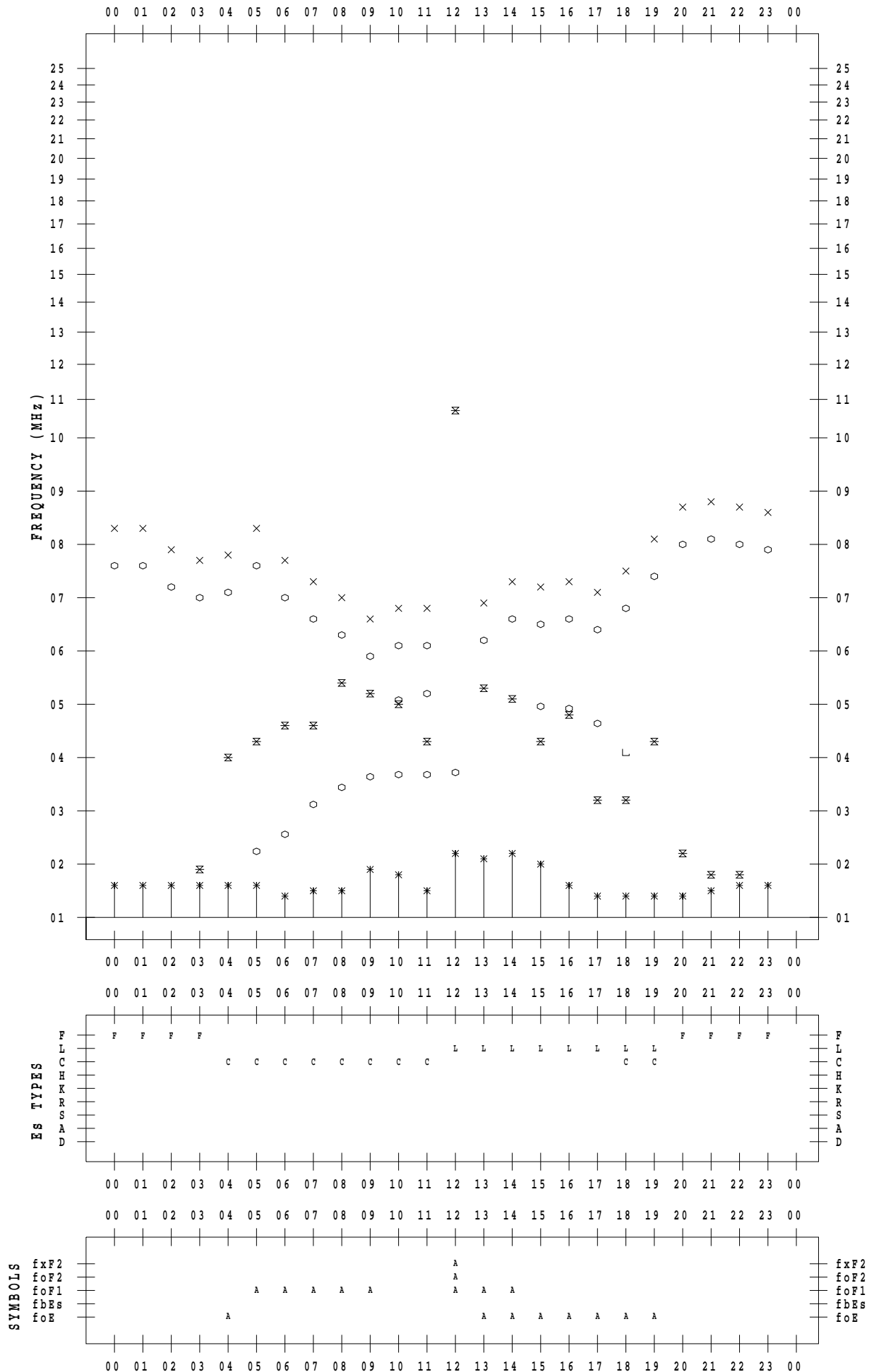
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 17

135 ° E MEAN TIME



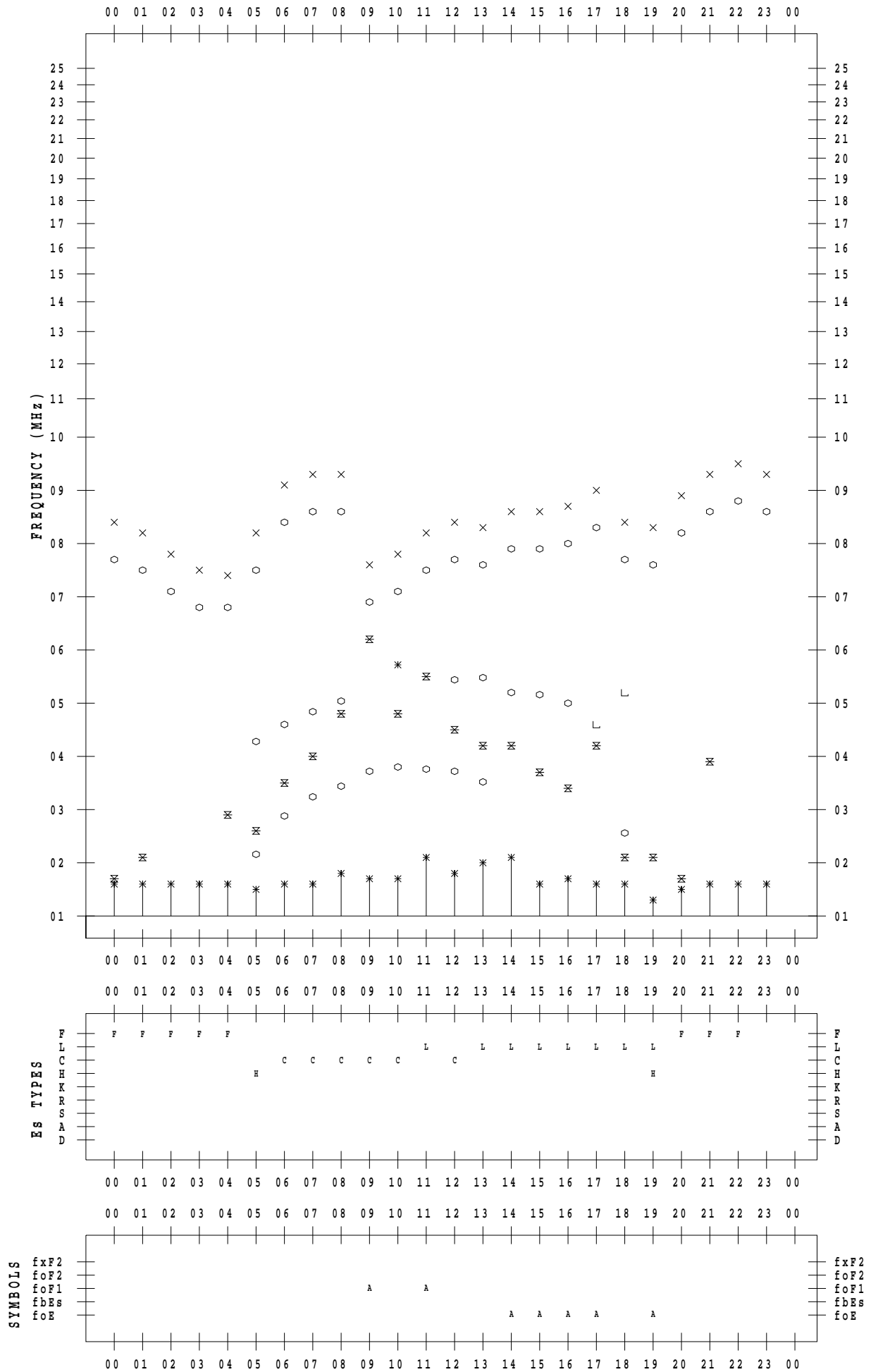
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 18

135 ° E MEAN TIME



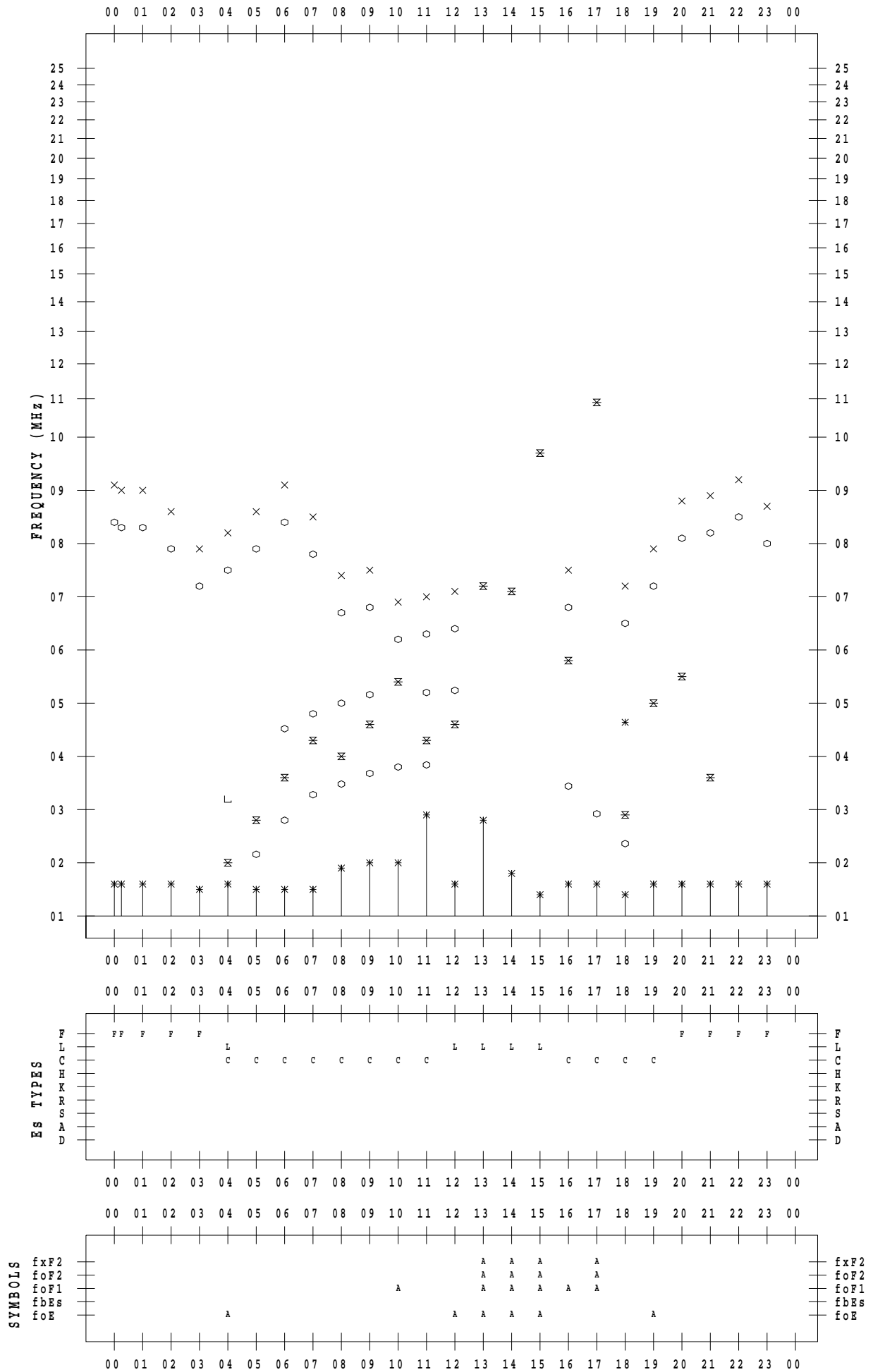
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 19

135 ° E MEAN TIME



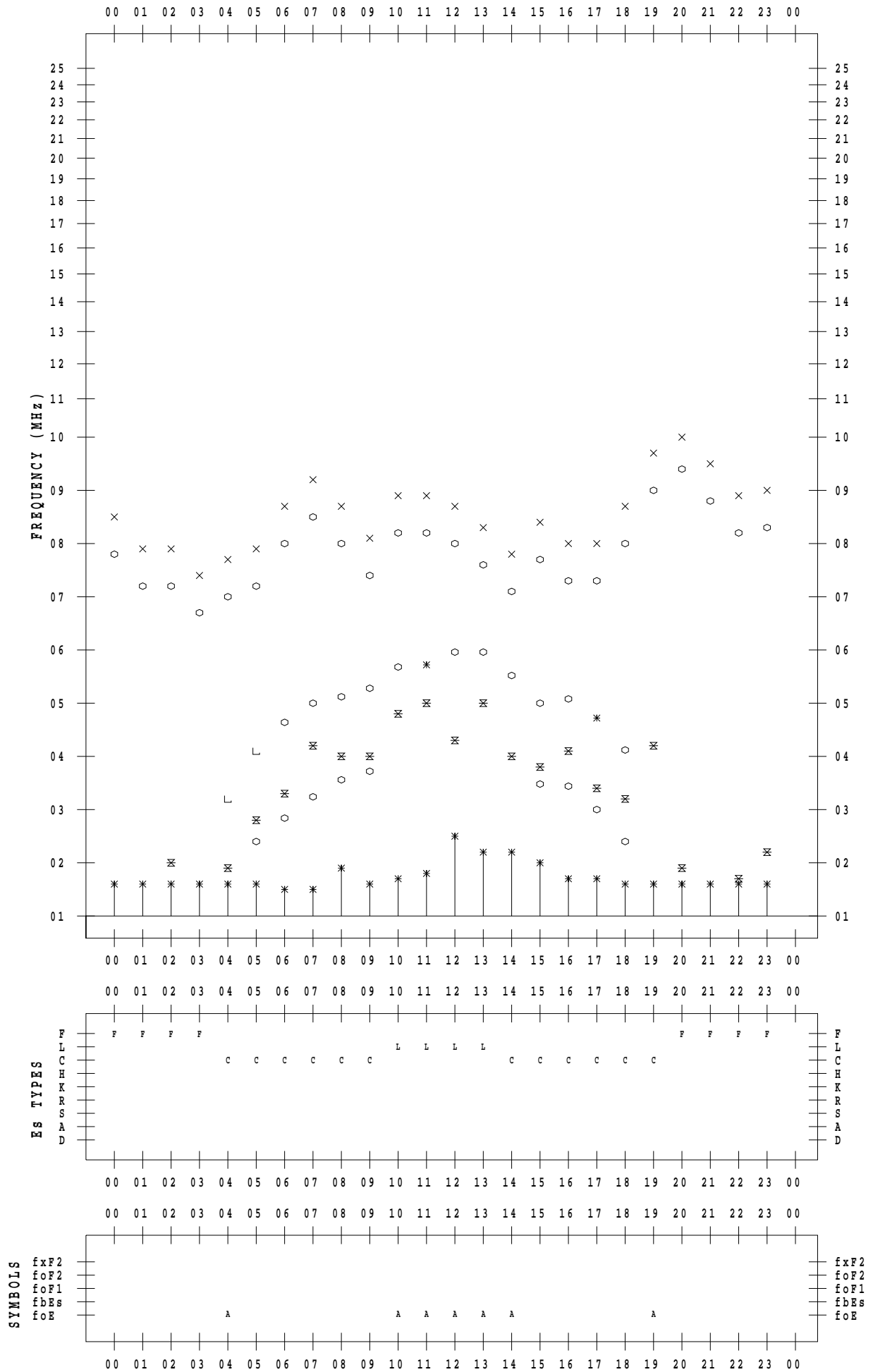
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 20

135 ° E MEAN TIME



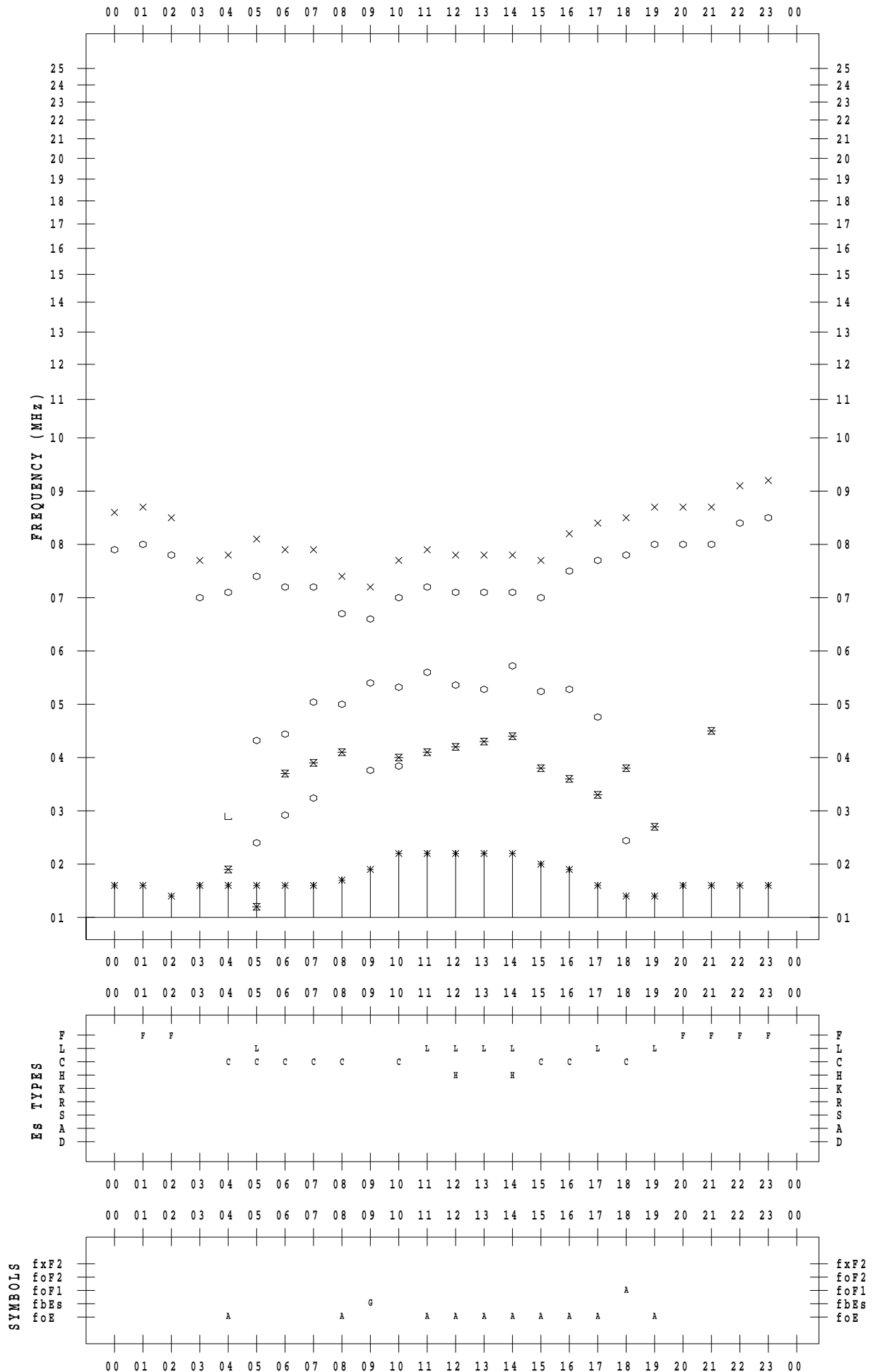
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 21

135 ° E MEAN TIME



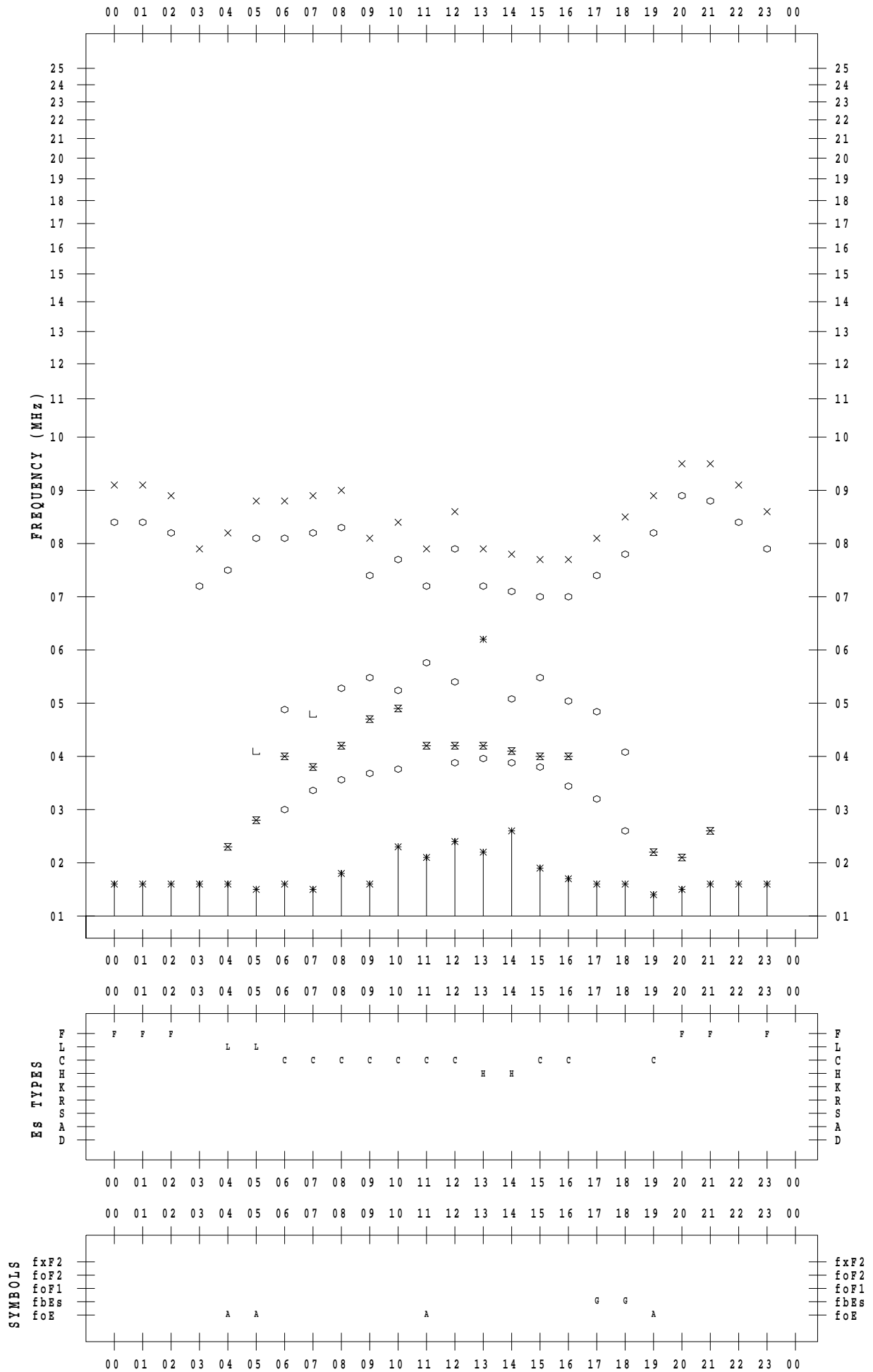
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 22

135 ° E MEAN TIME



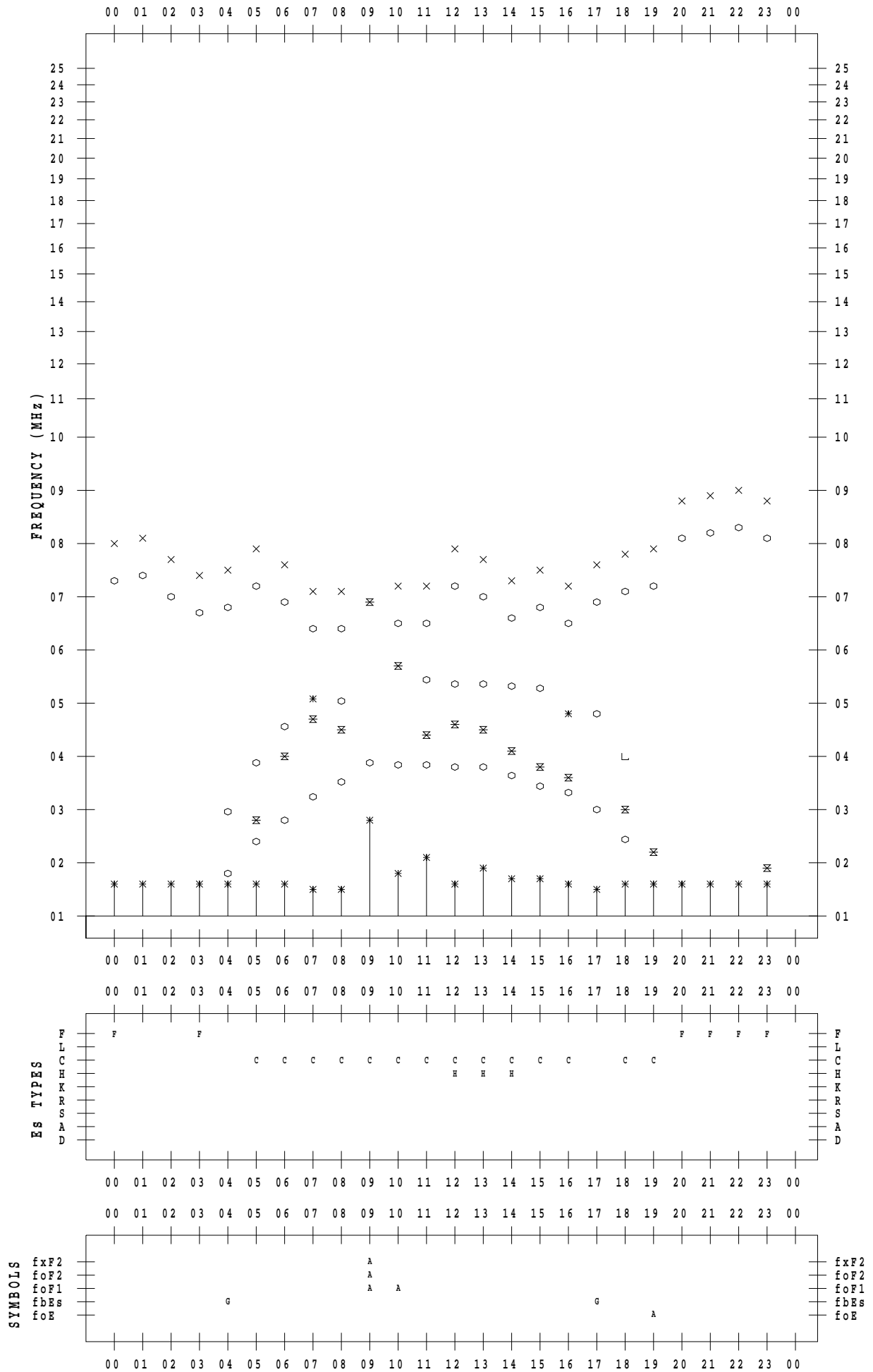
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 23

135 ° E MEAN TIME



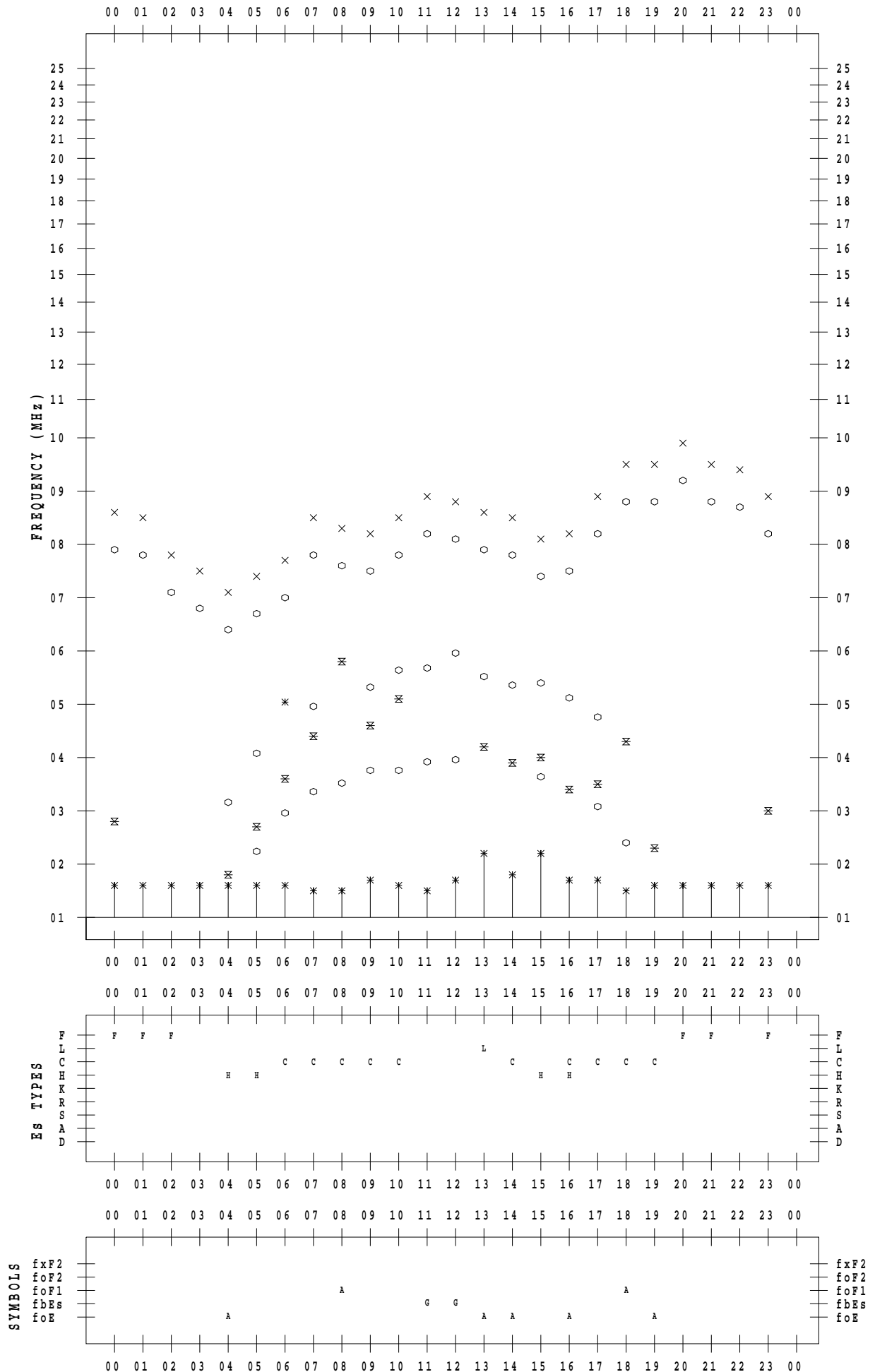
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 24

135 ° E MEAN TIME



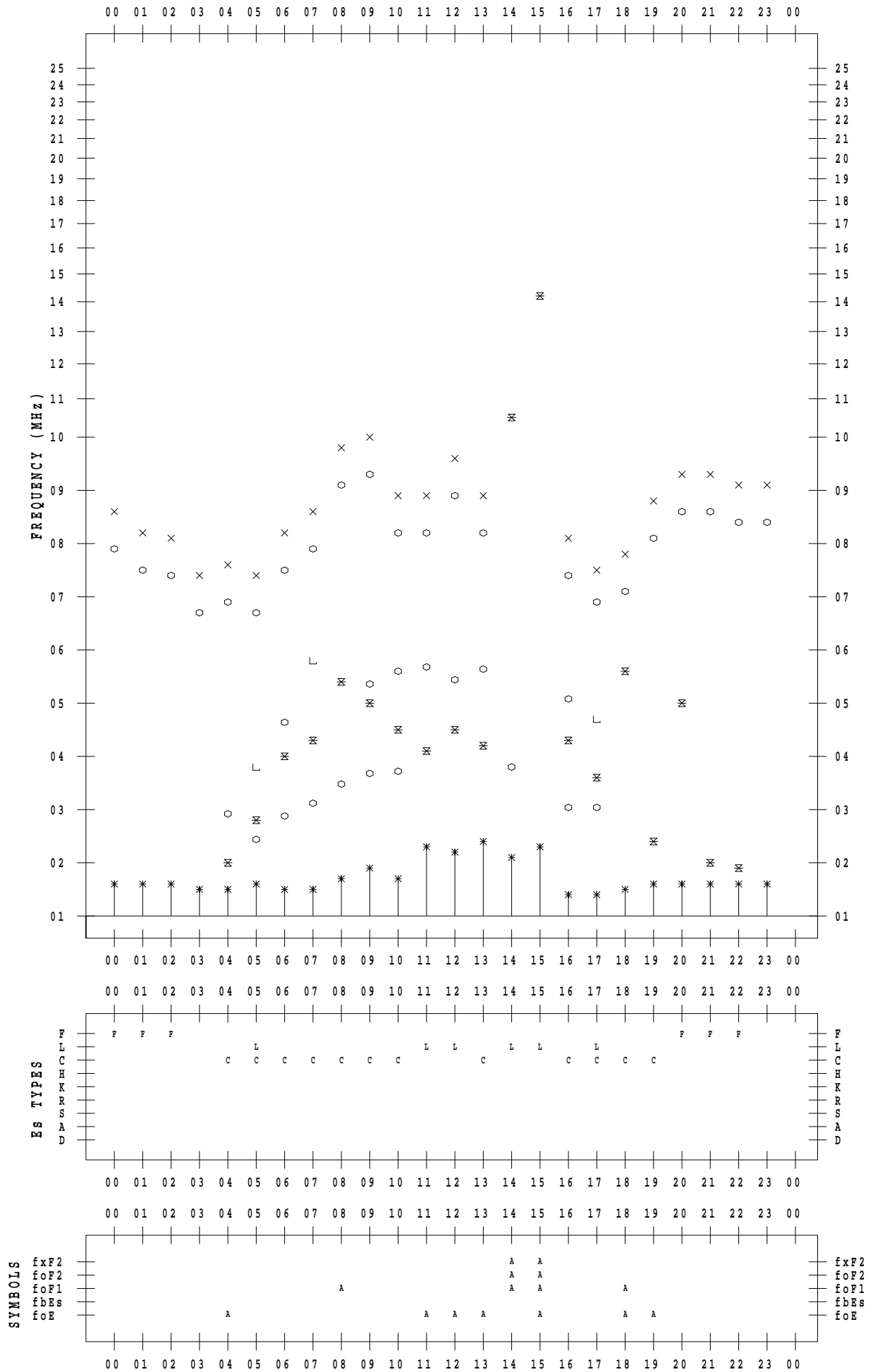
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 25

135 ° E MEAN TIME



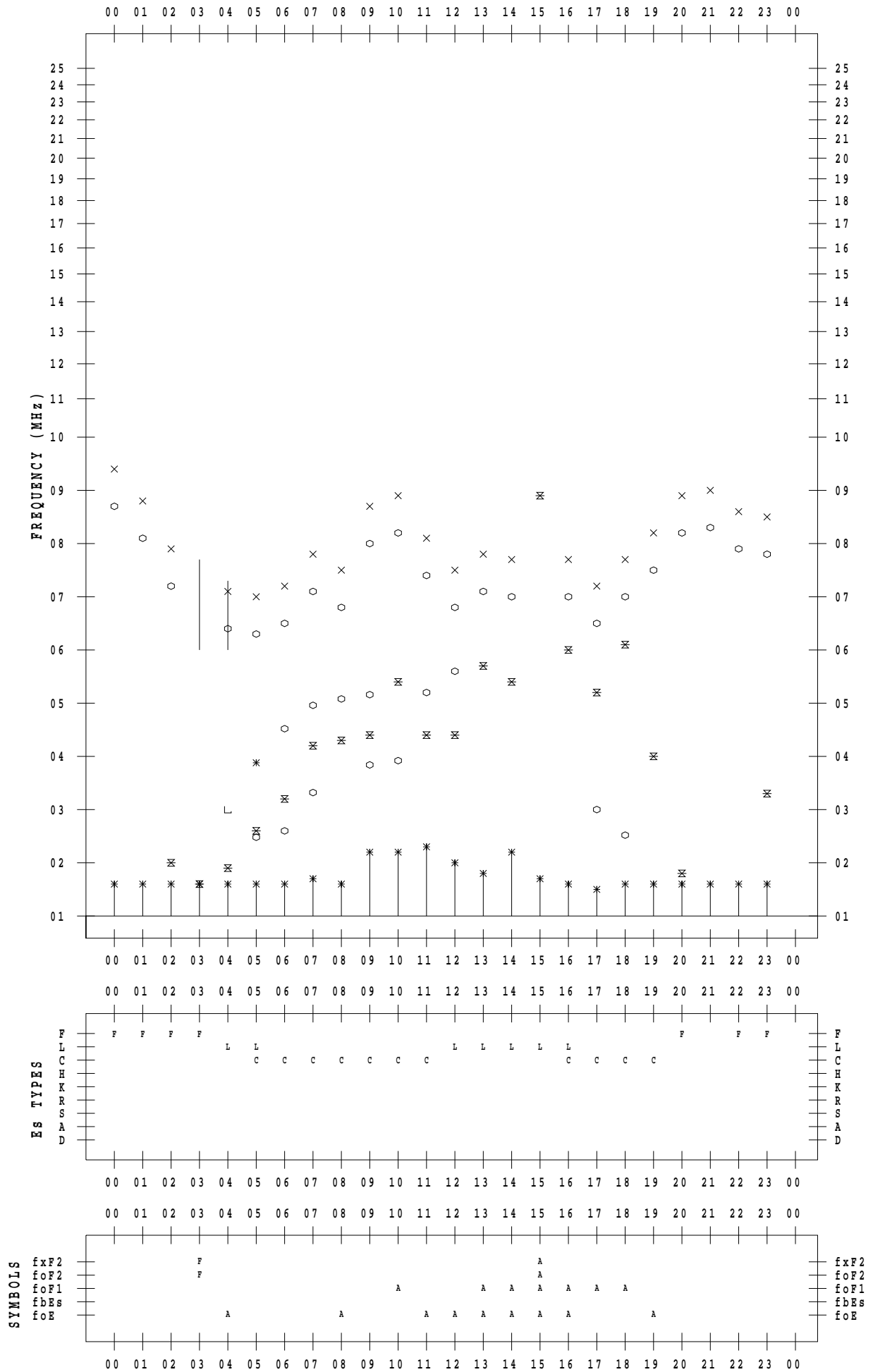
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 27

135 ° E MEAN TIME



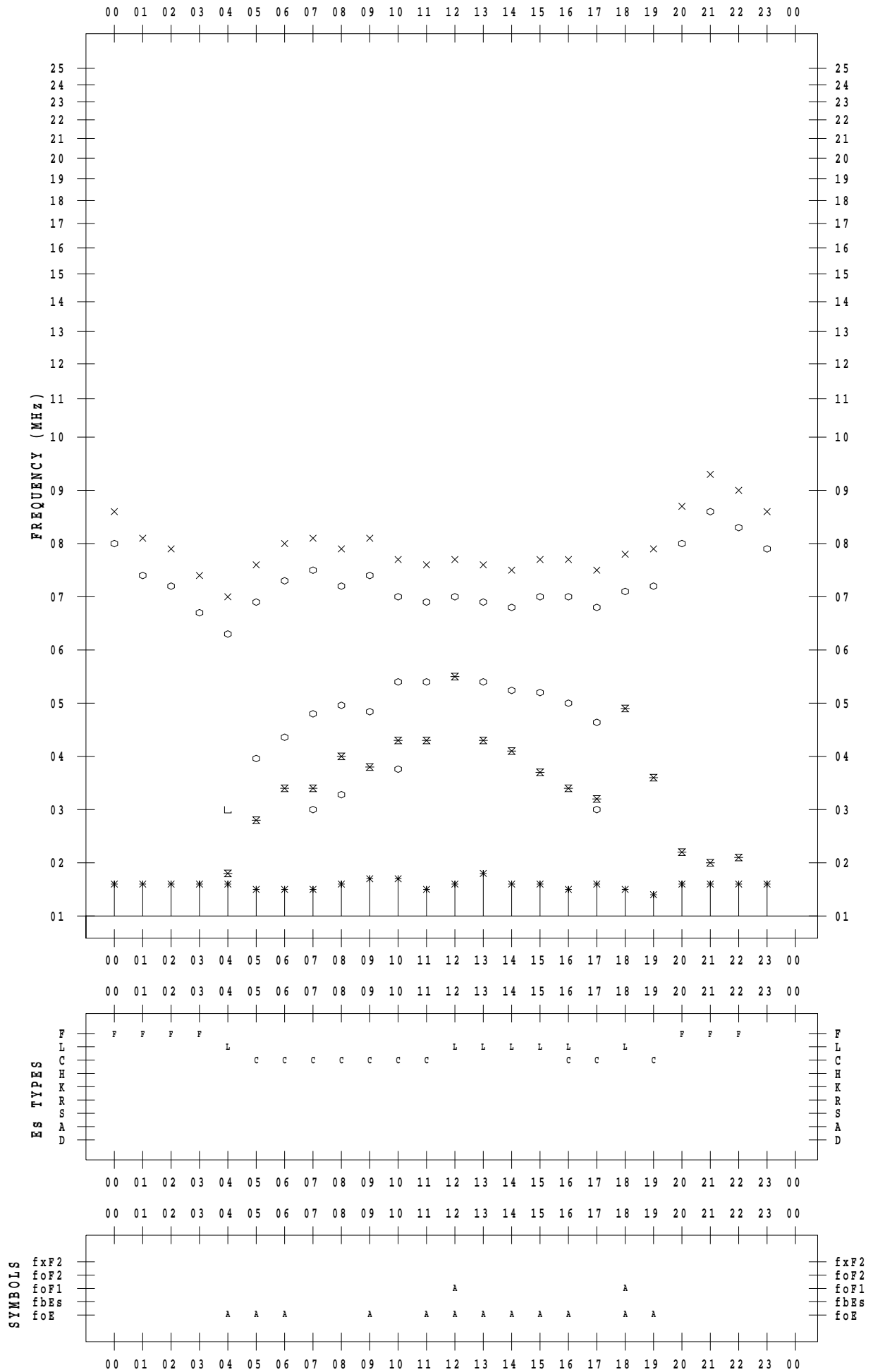
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 28

135 ° E MEAN TIME



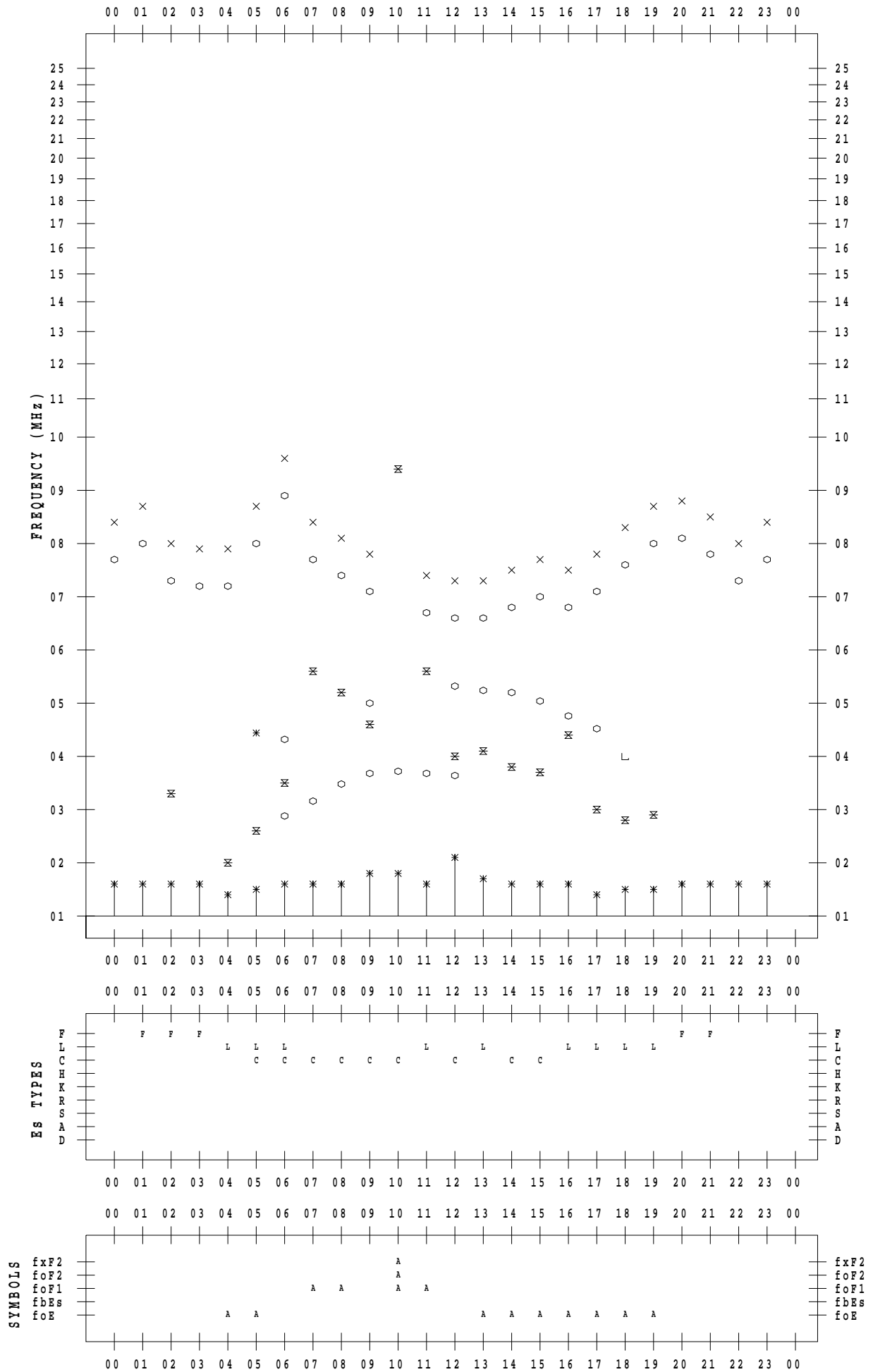
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SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 29

135 ° E MEAN TIME



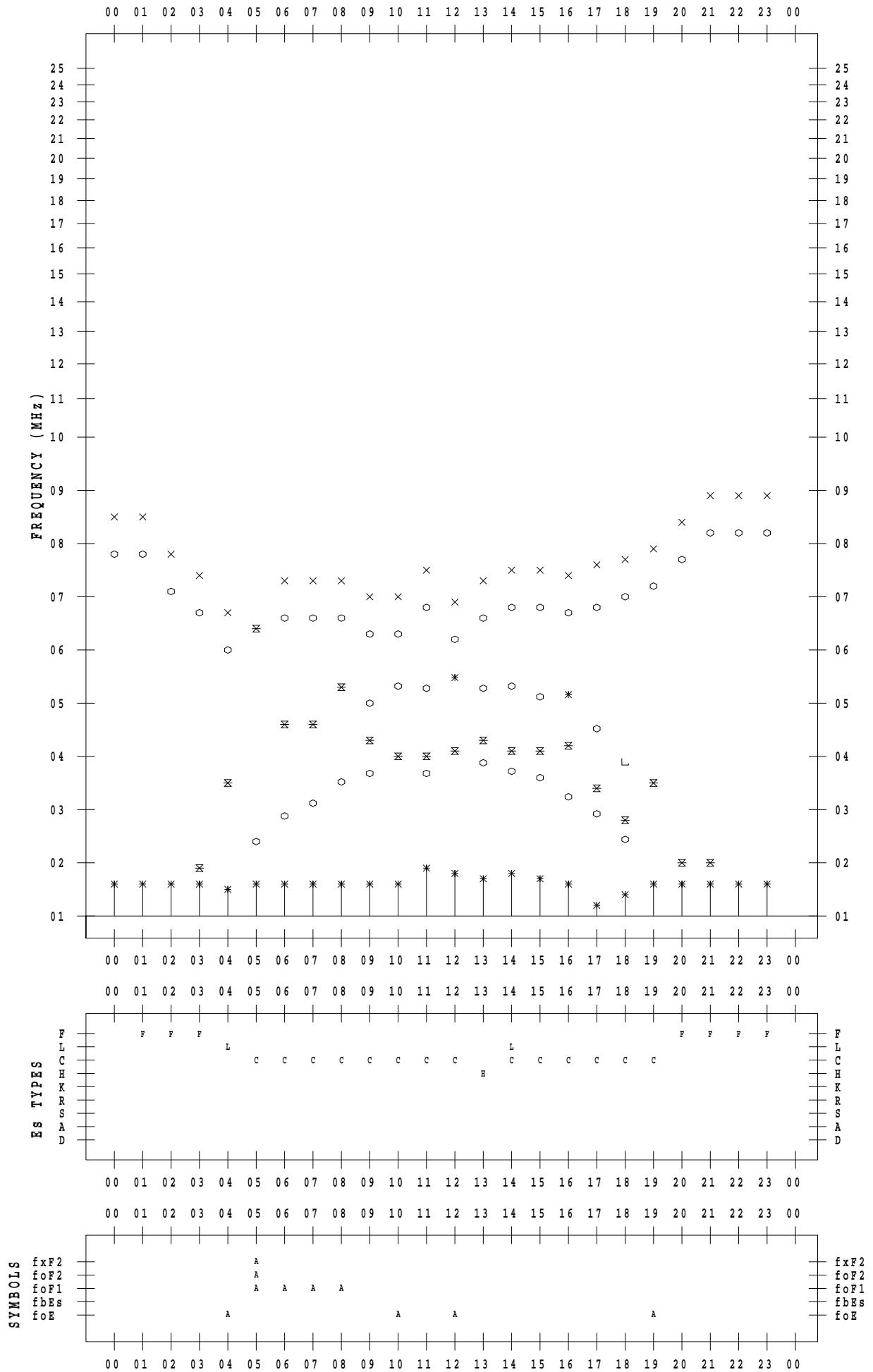
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Wakkanai

DATE : 2023 / 6 / 30

135 ° E MEAN TIME



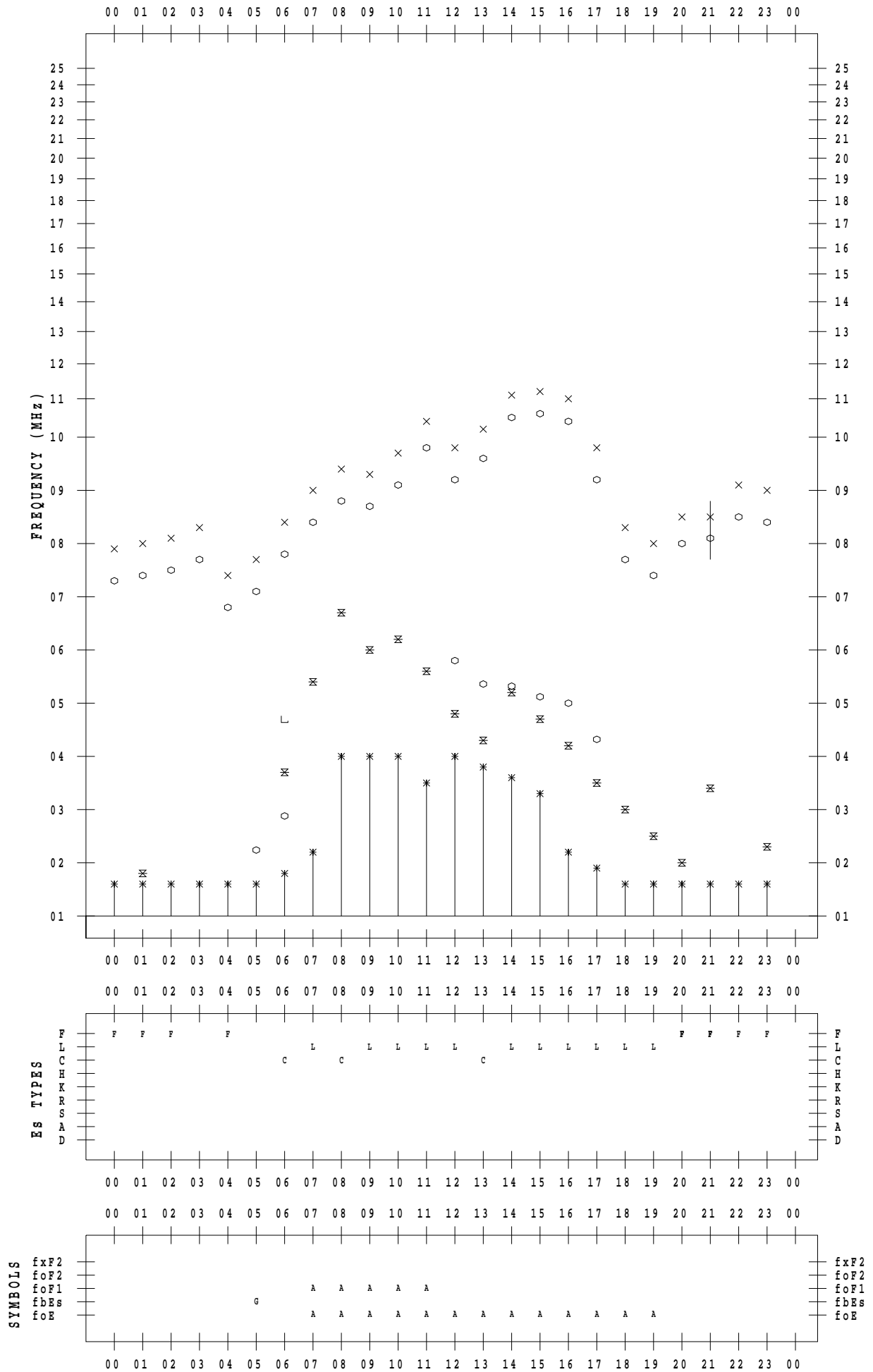
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 1

135 ° E MEAN TIME



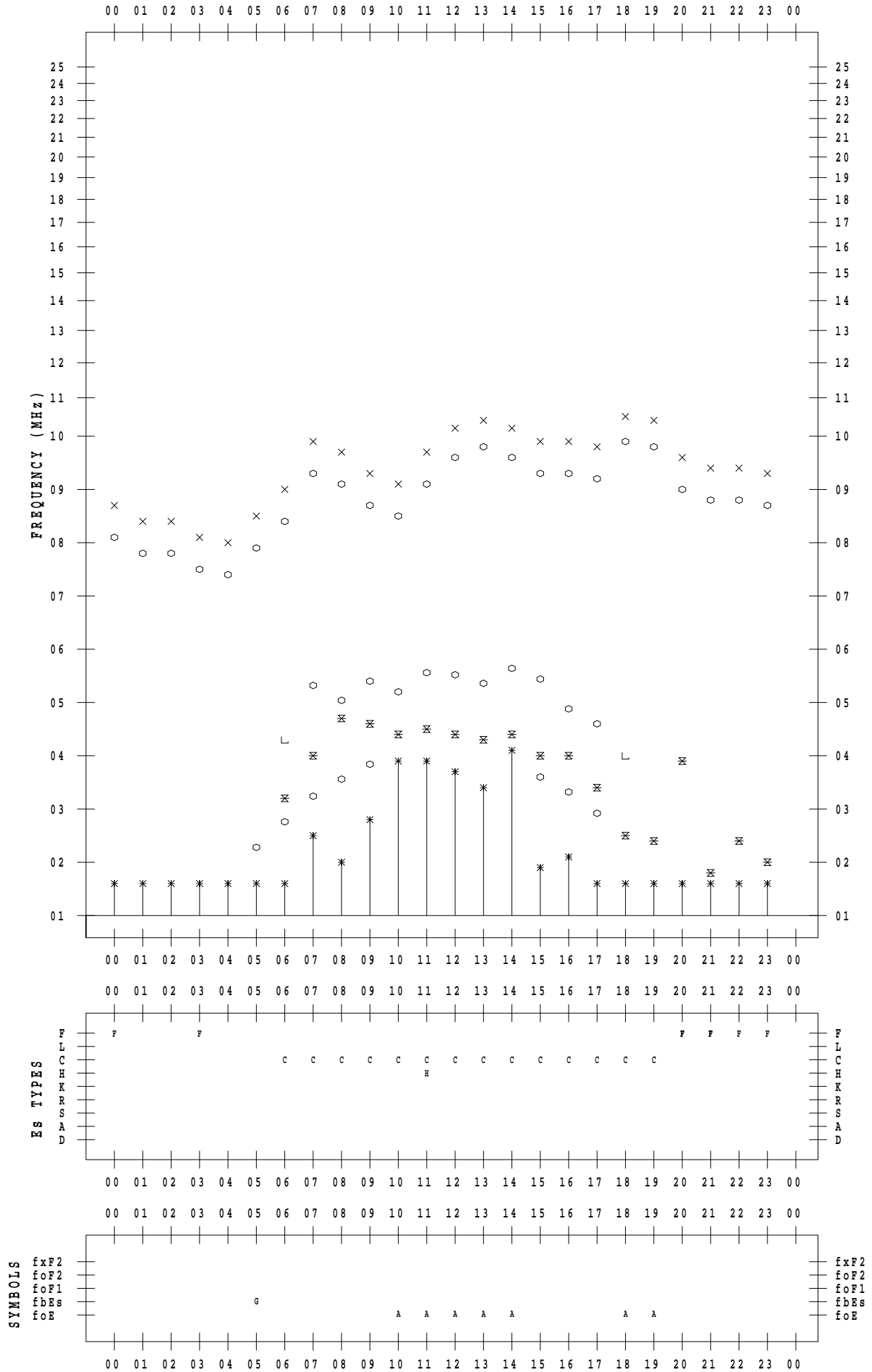
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 2

135 ° E MEAN TIME



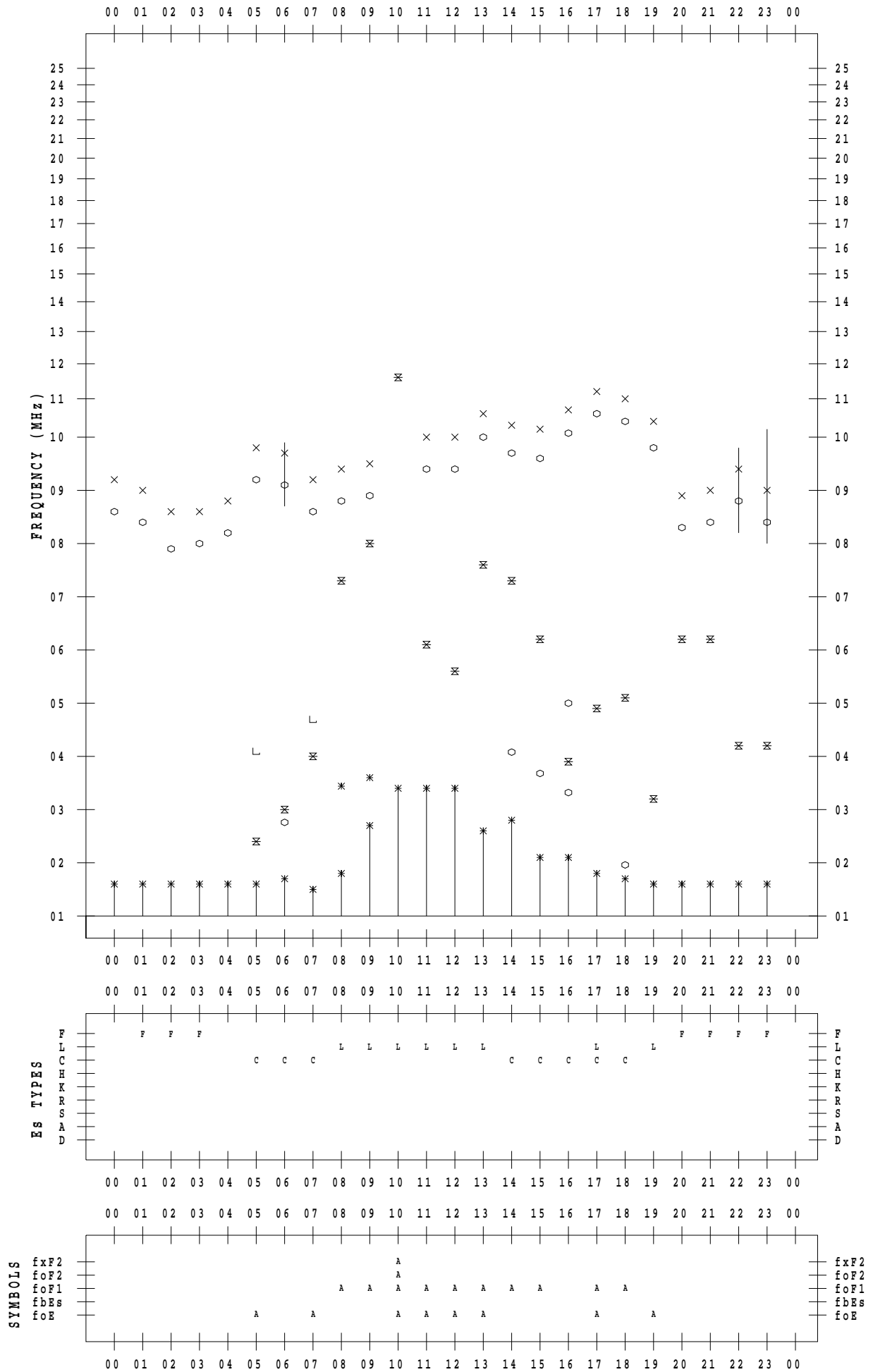
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 6/ 3

135 ° E MEAN TIME



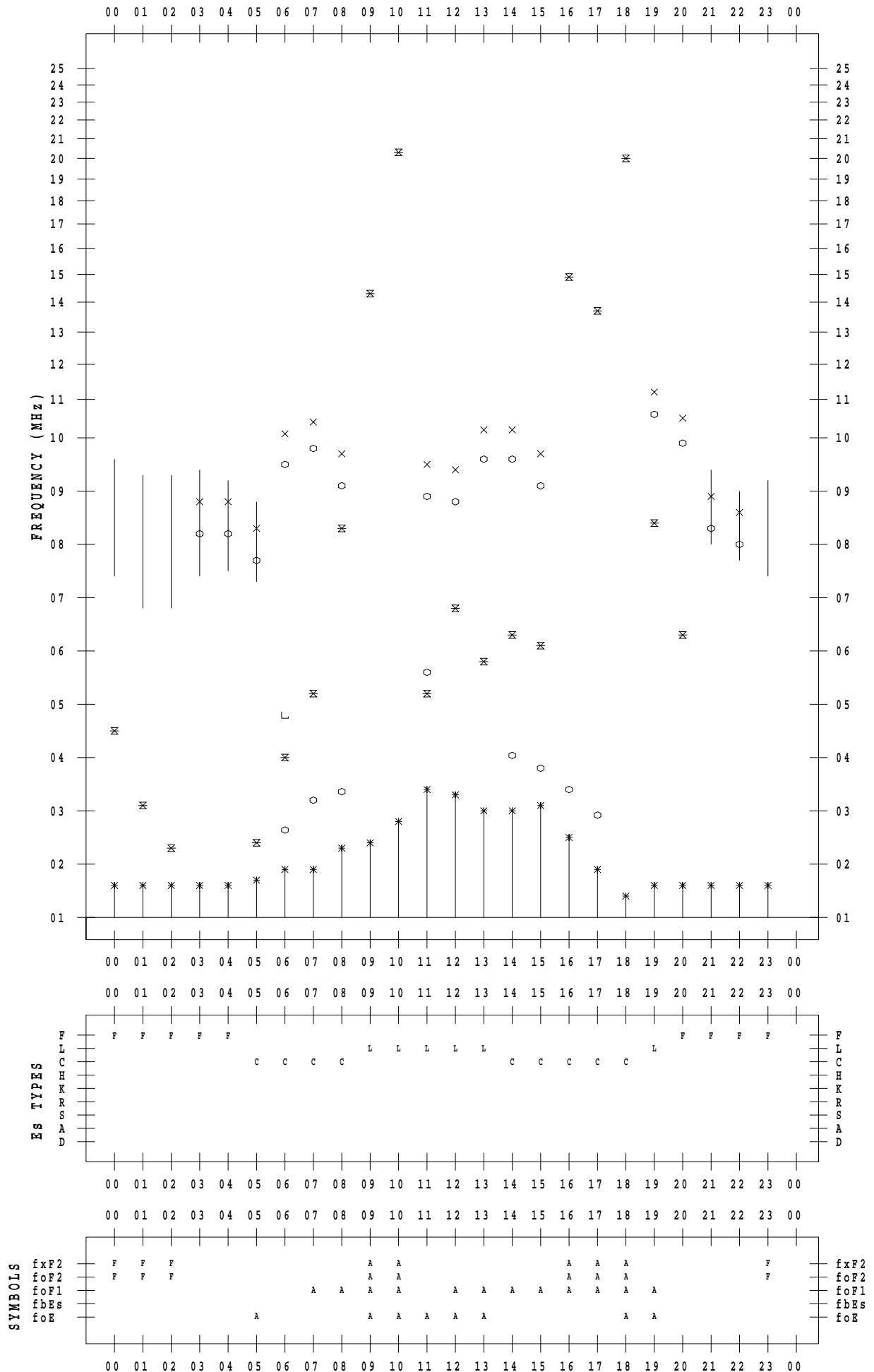
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 4

135 ° E MEAN TIME



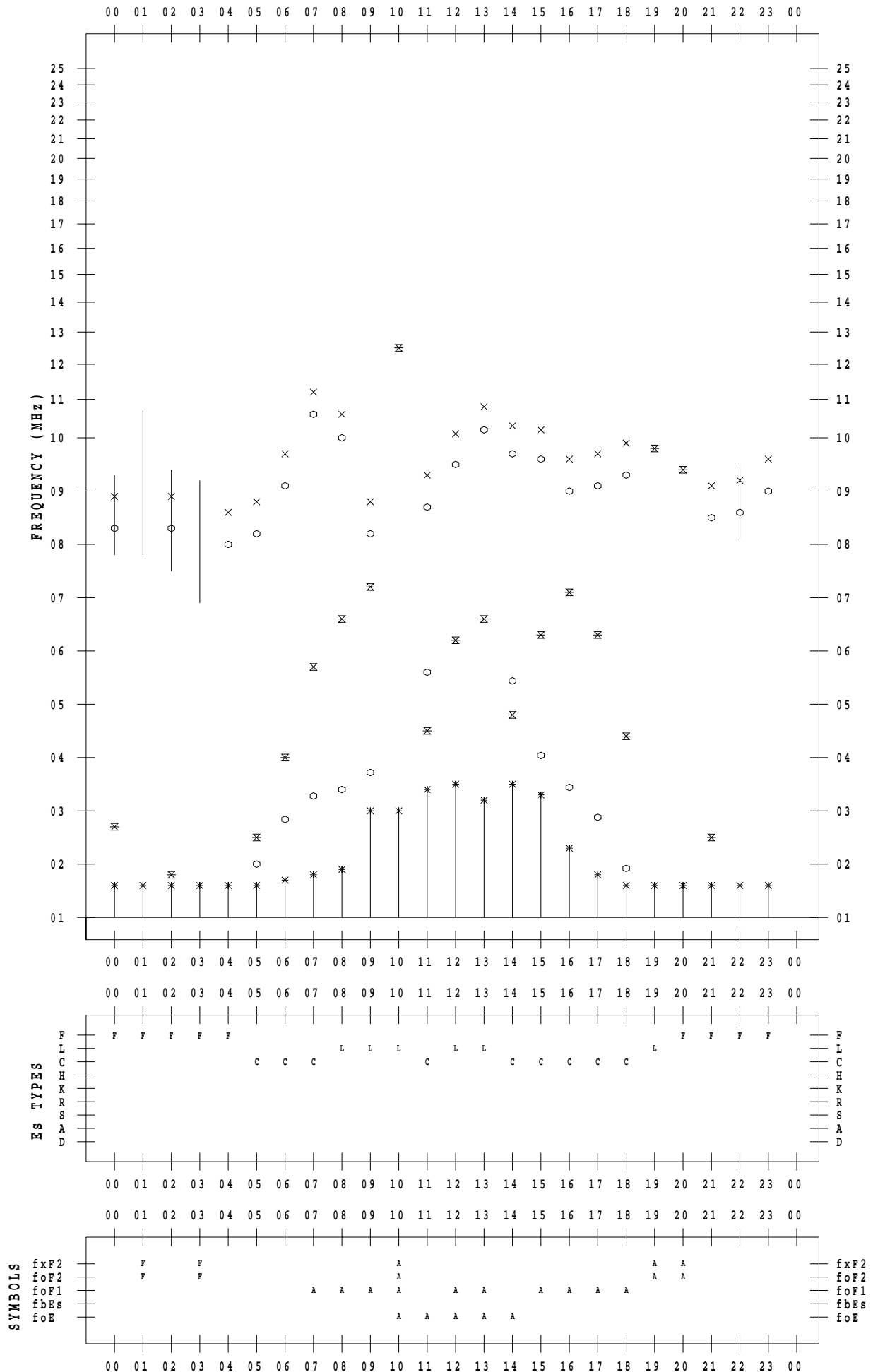
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 5

135 ° E MEAN TIME



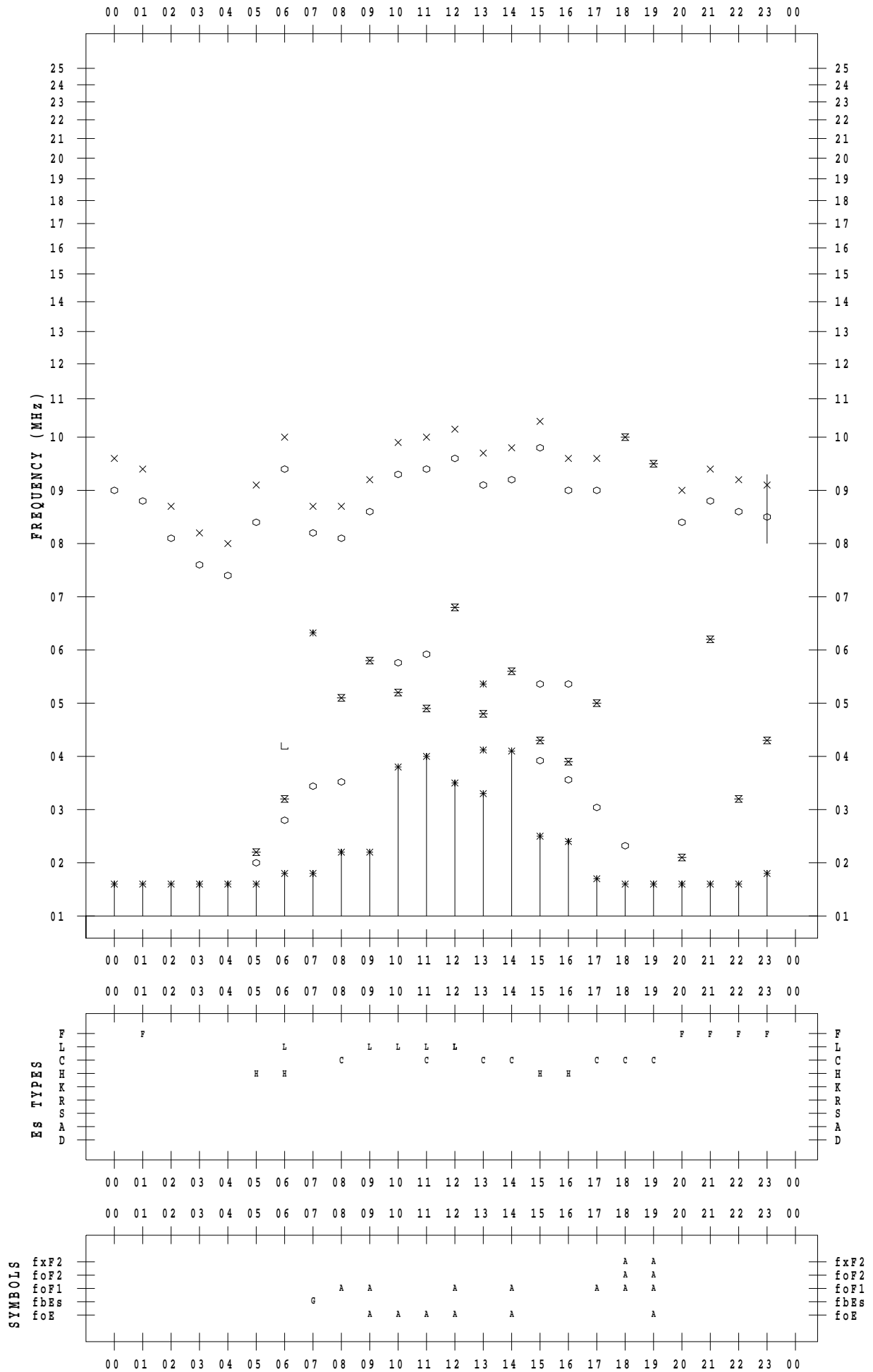
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 6

135 ° E MEAN TIME



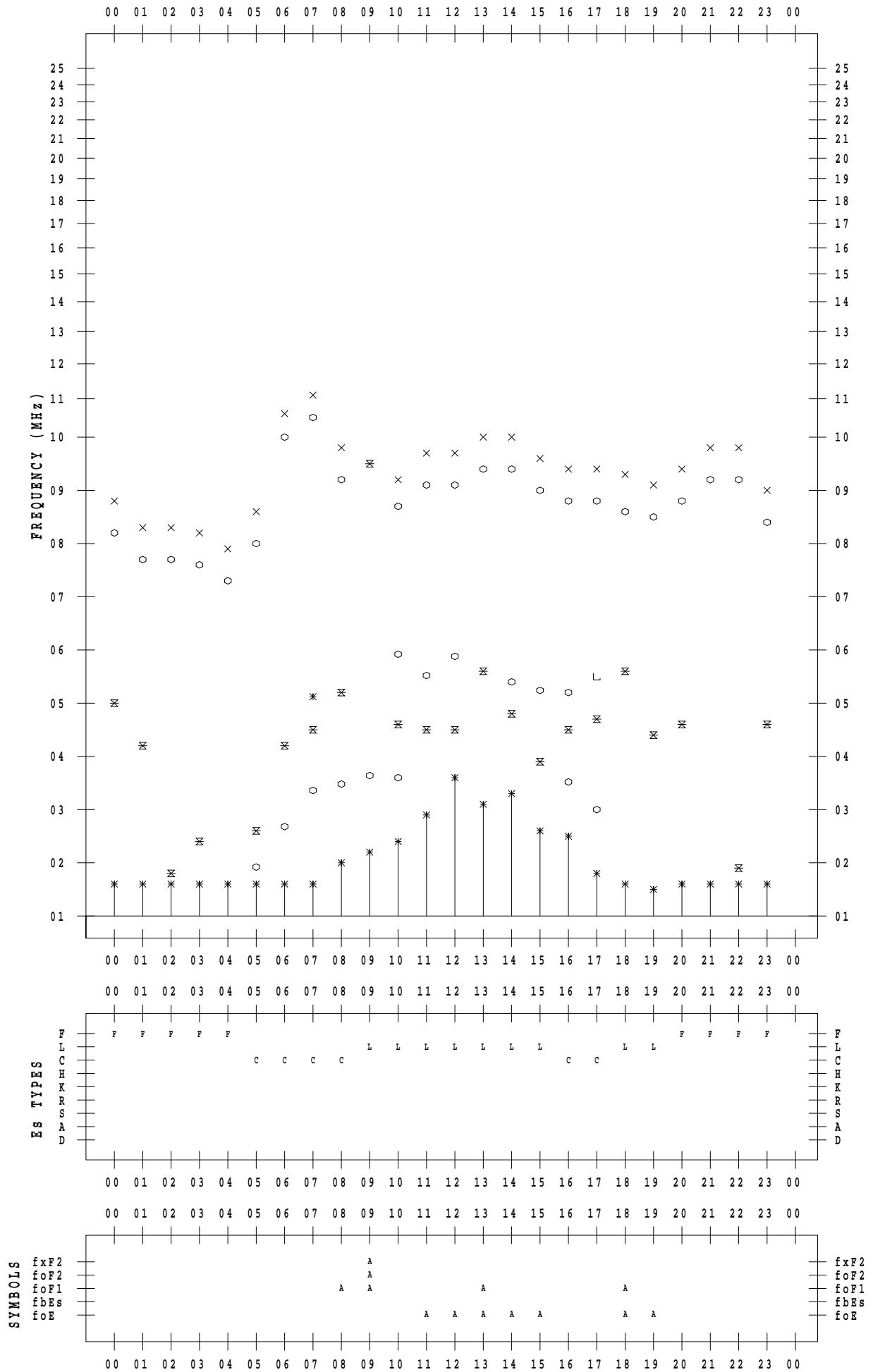
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 7

135 ° E MEAN TIME



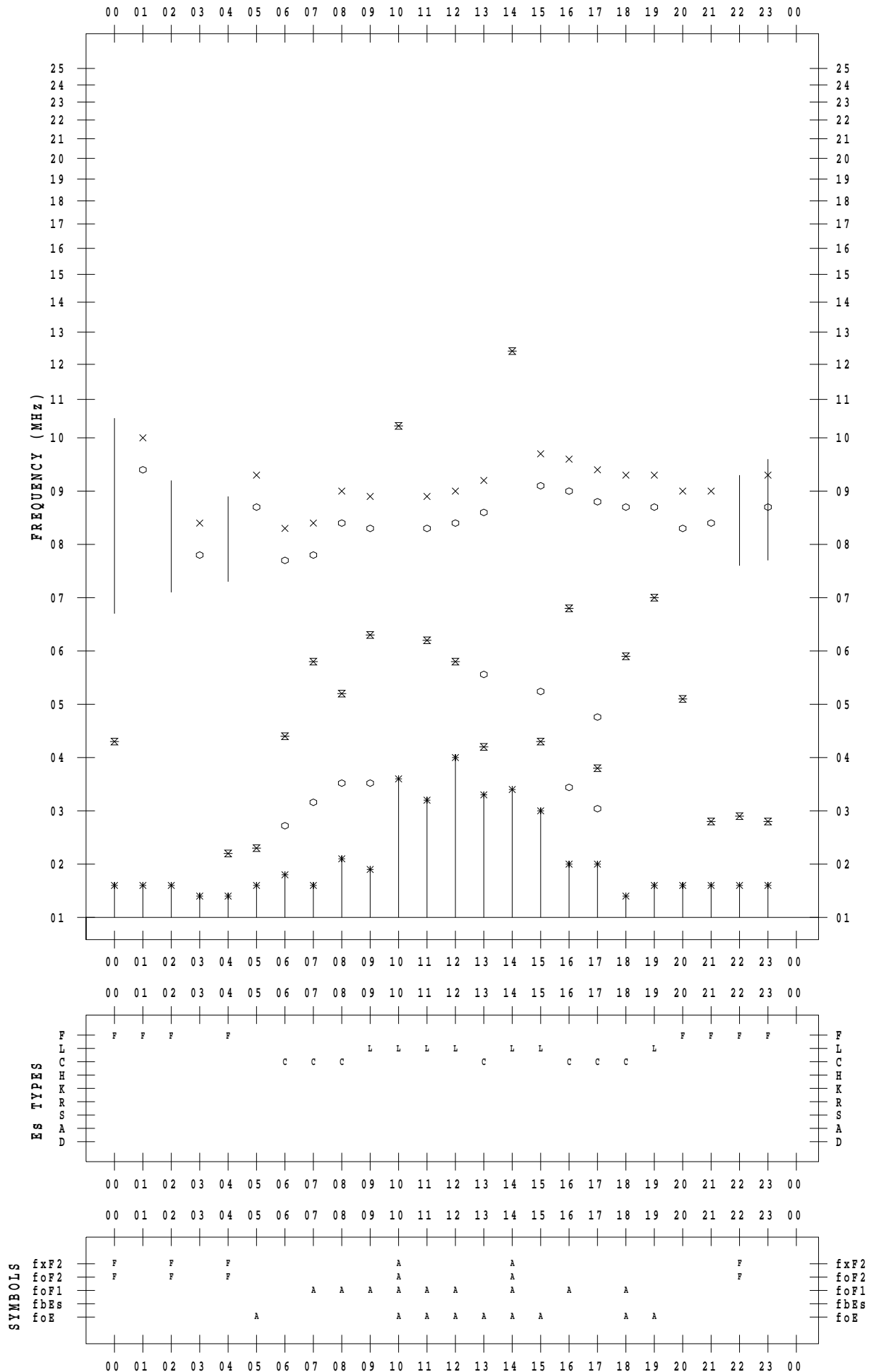
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 8

135 ° E MEAN TIME



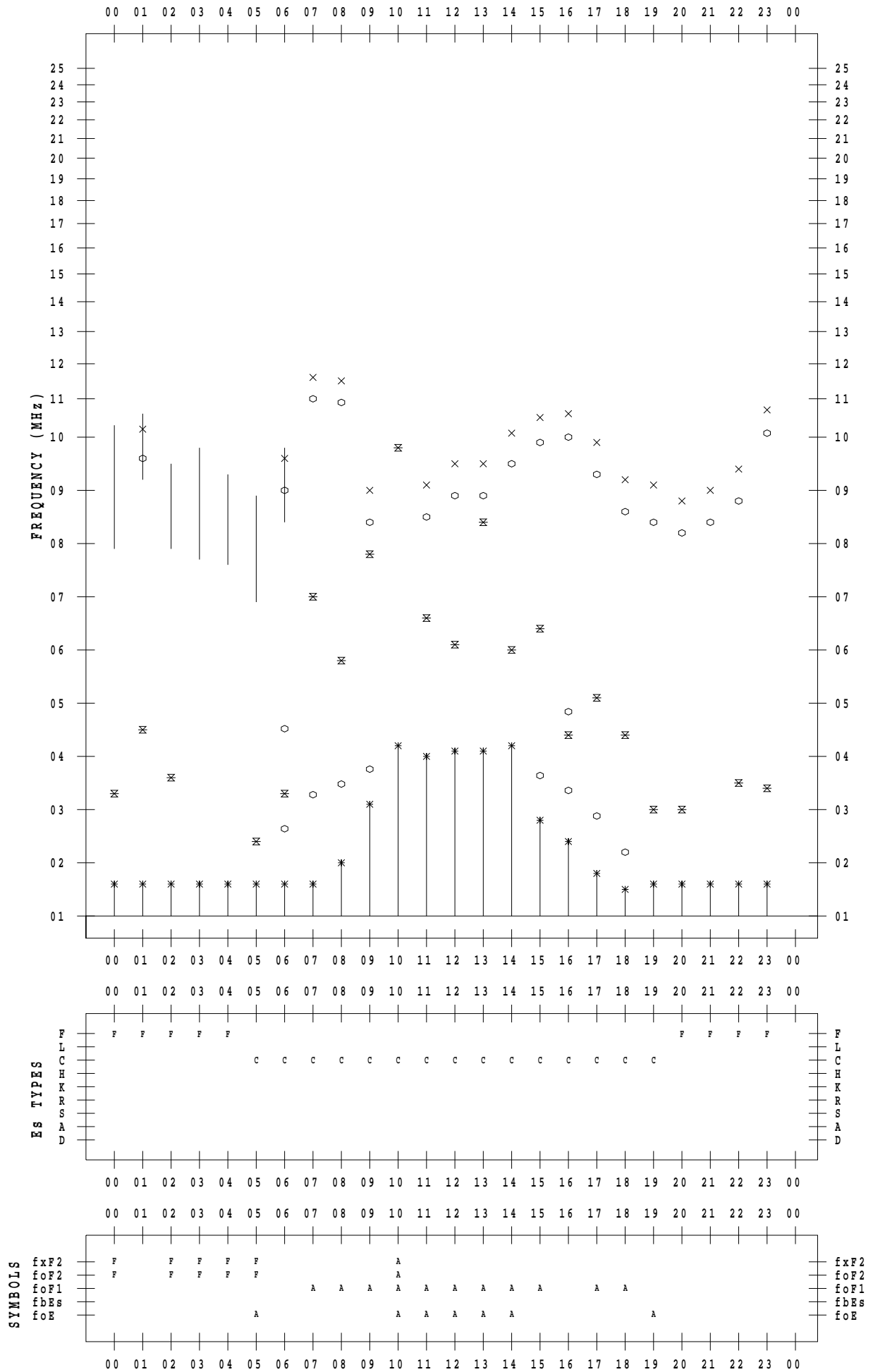
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 9

135 ° E MEAN TIME



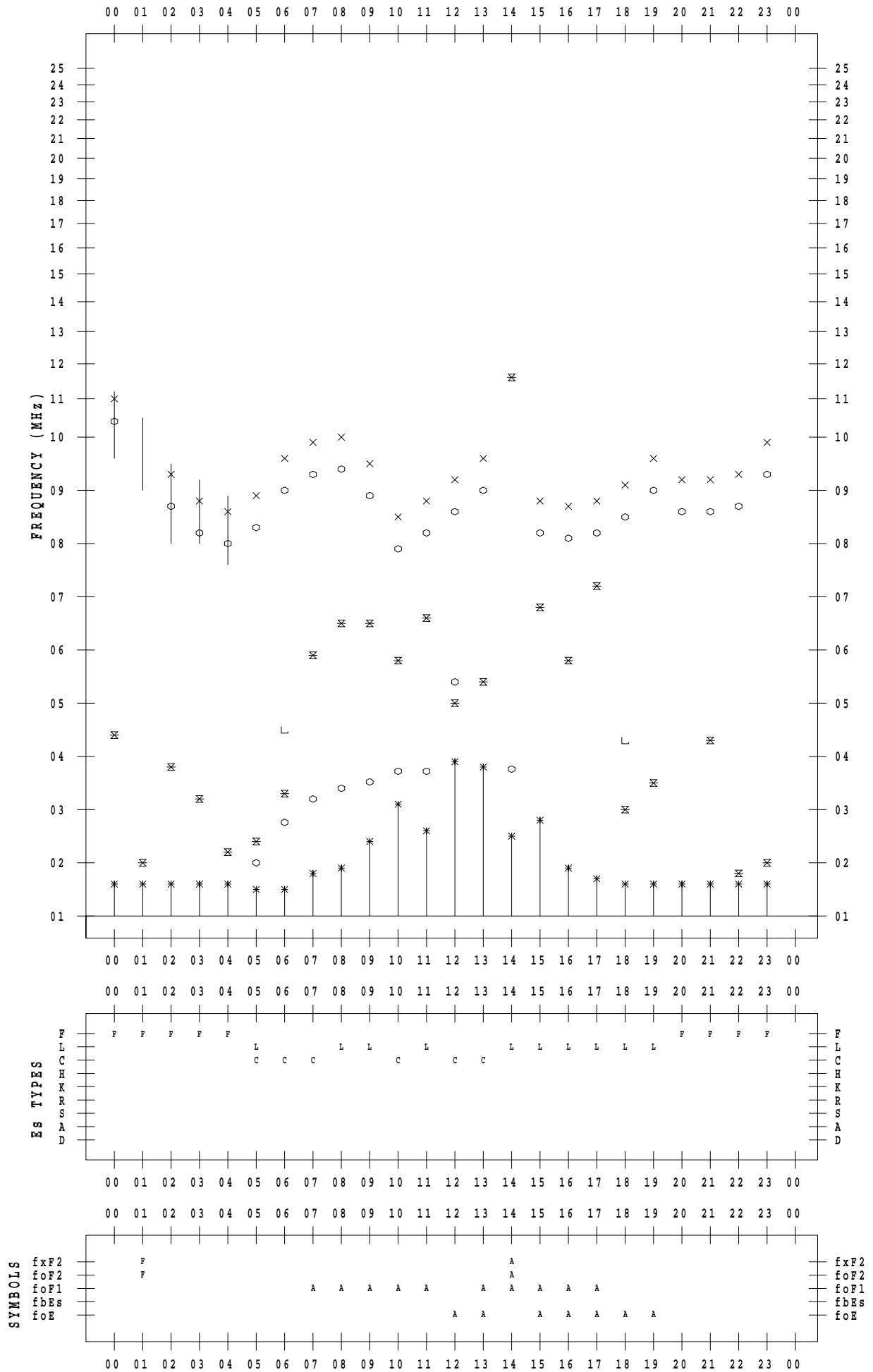
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 10

135 ° E MEAN TIME



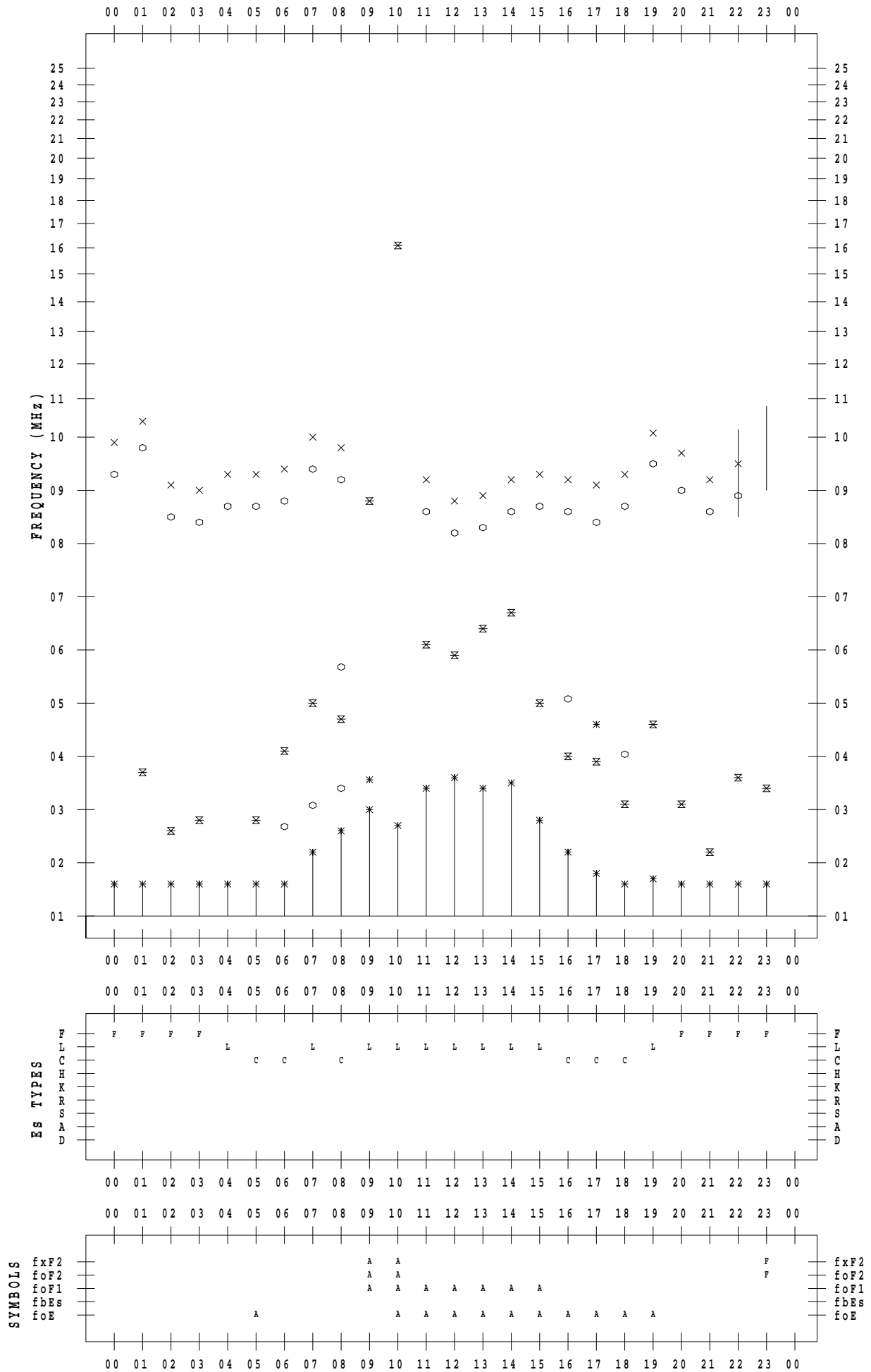
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 11

135 ° E MEAN TIME



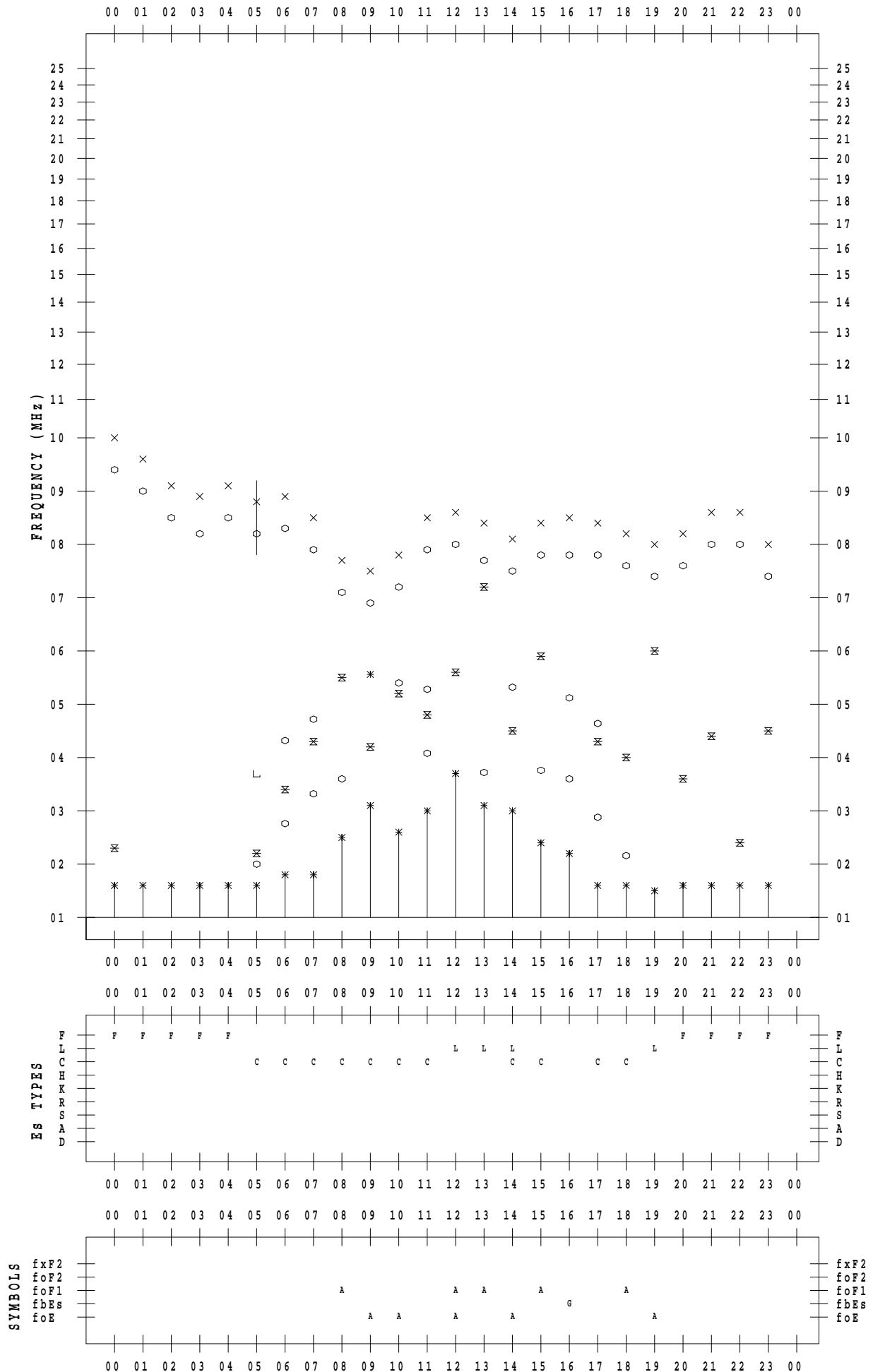
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 12

135 ° E MEAN TIME



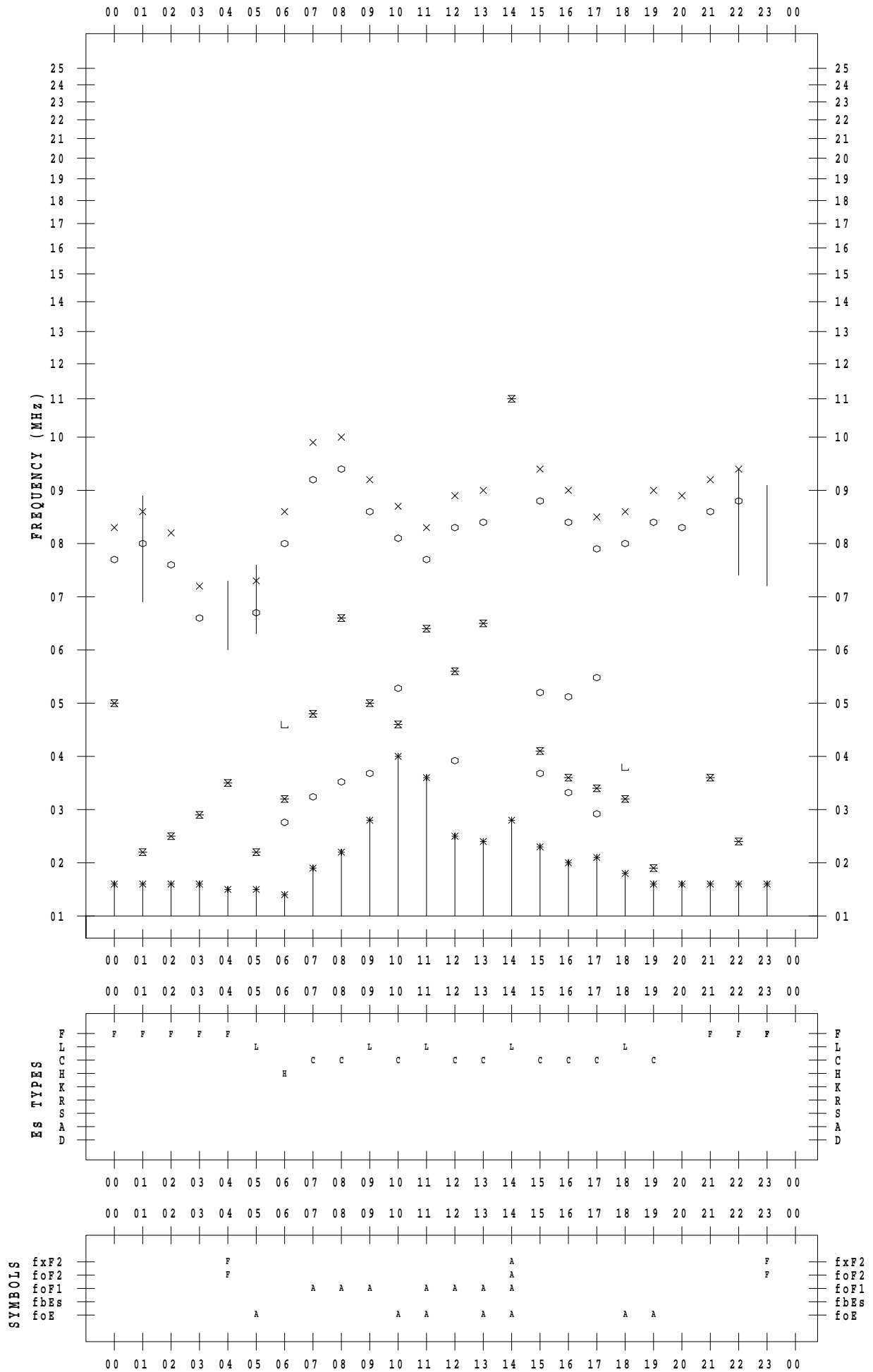
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 6/13

135 ° E MEAN TIME



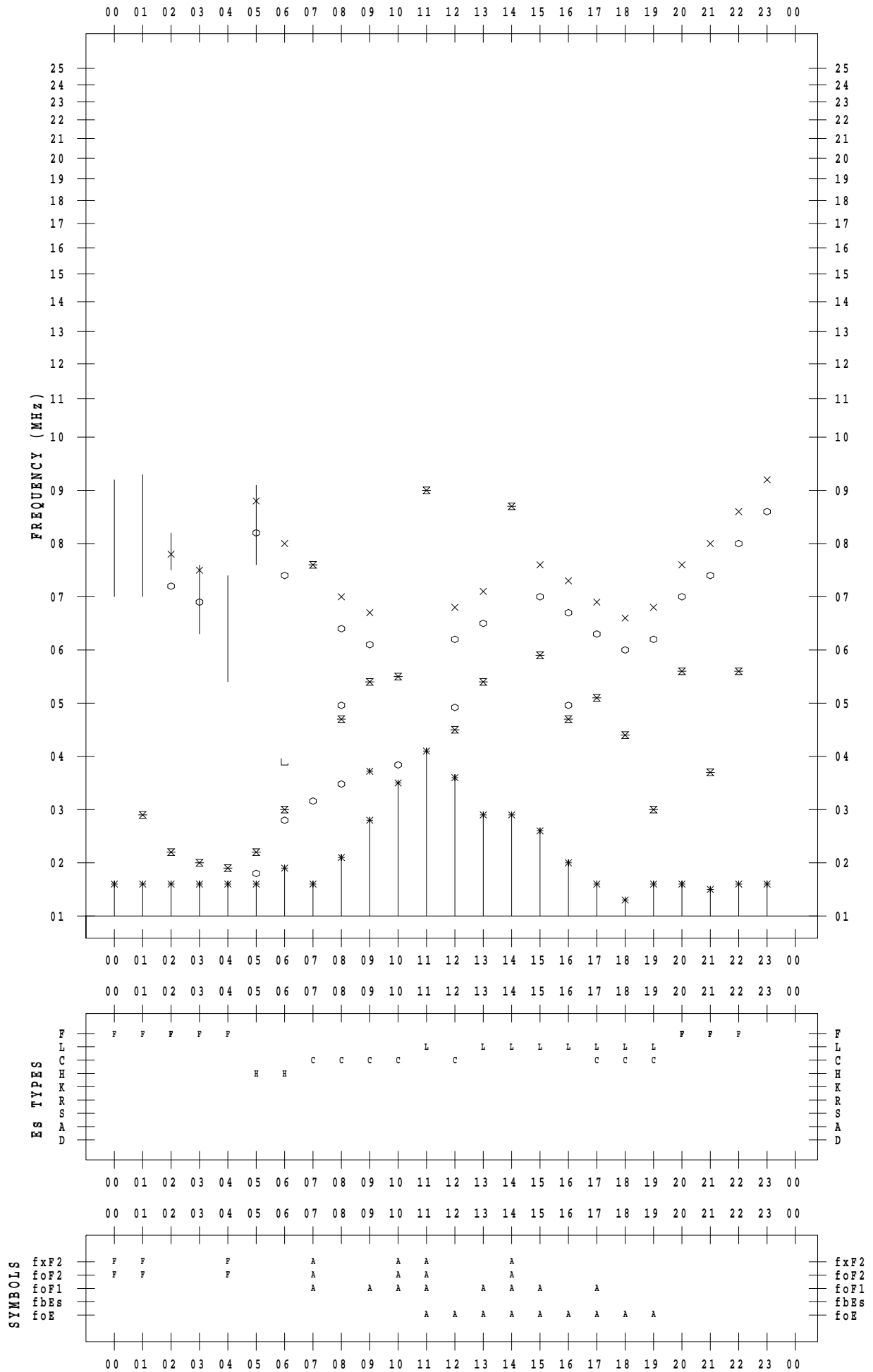
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 6/14

135 ° E MEAN TIME



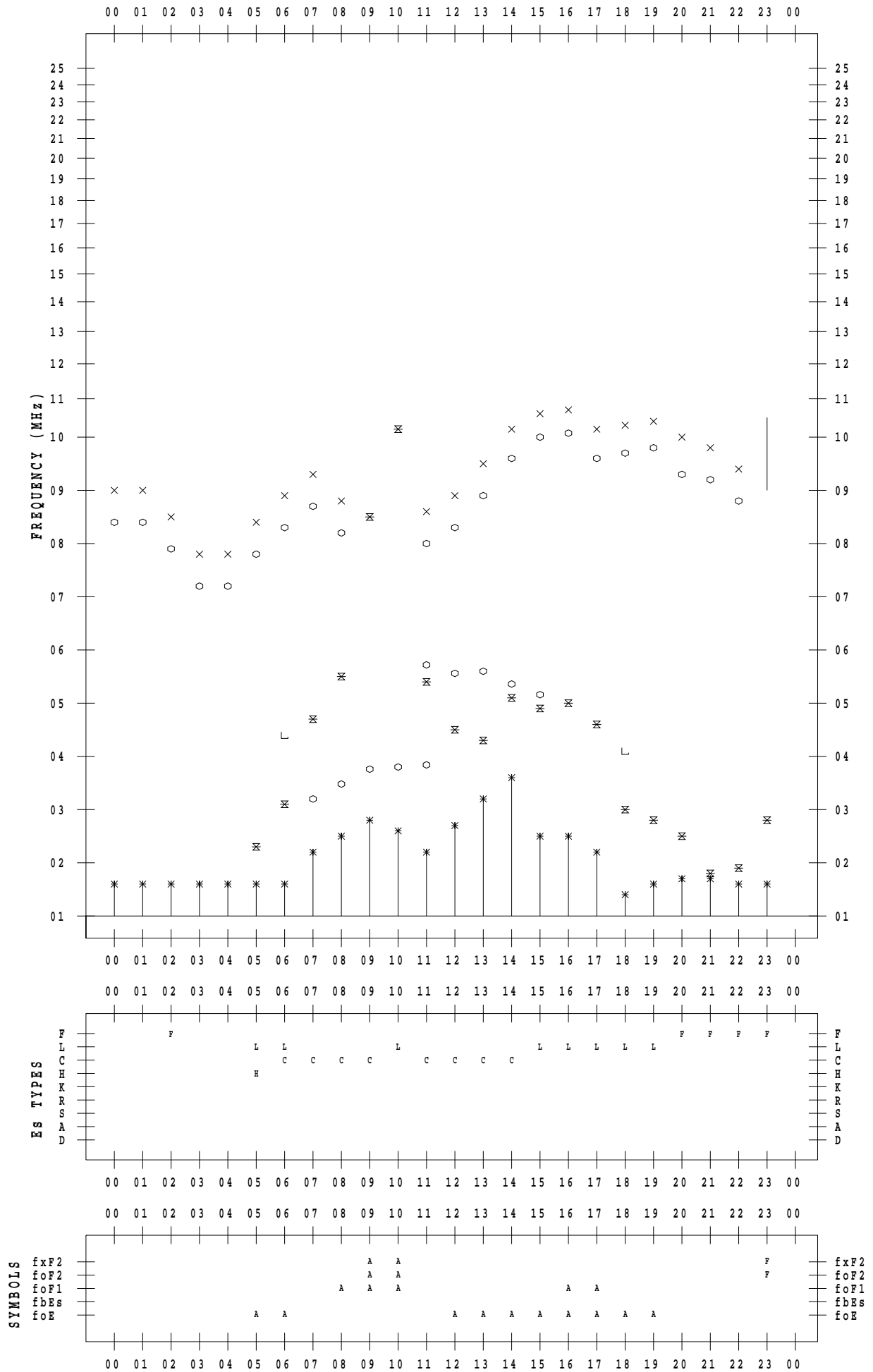
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 6/15

135 ° E MEAN TIME



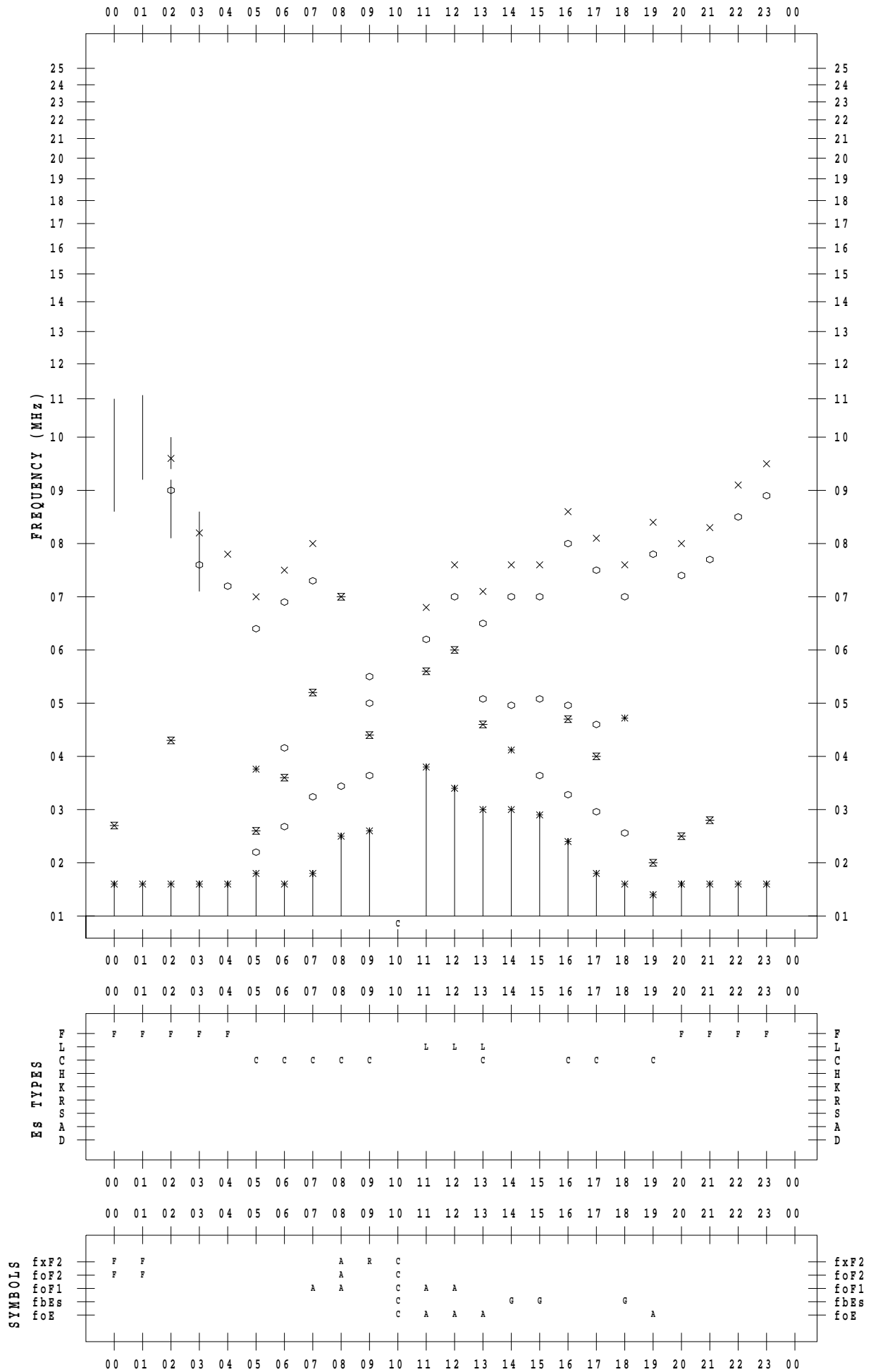
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 16

135 ° E MEAN TIME



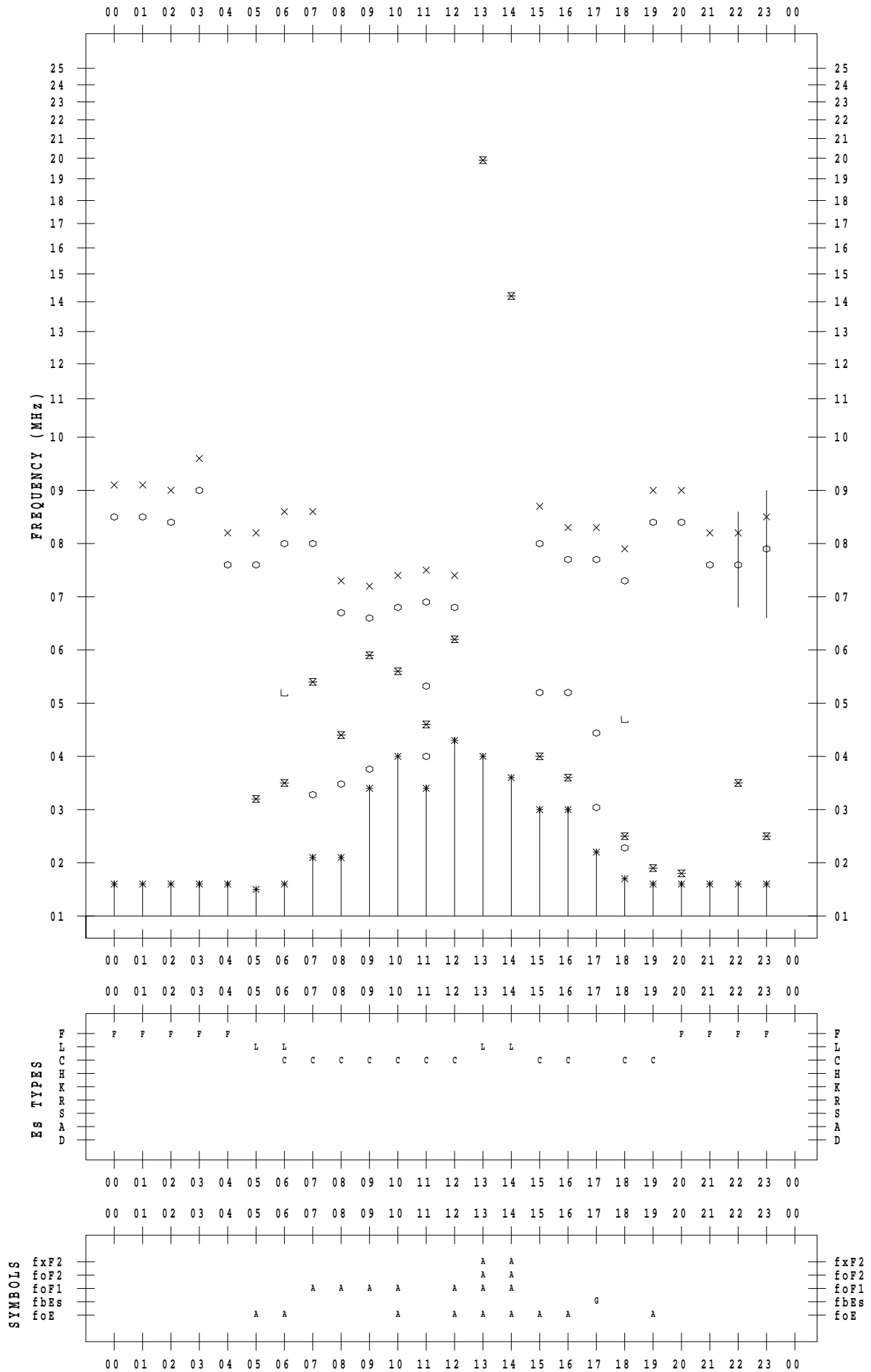
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 17

135 ° E MEAN TIME



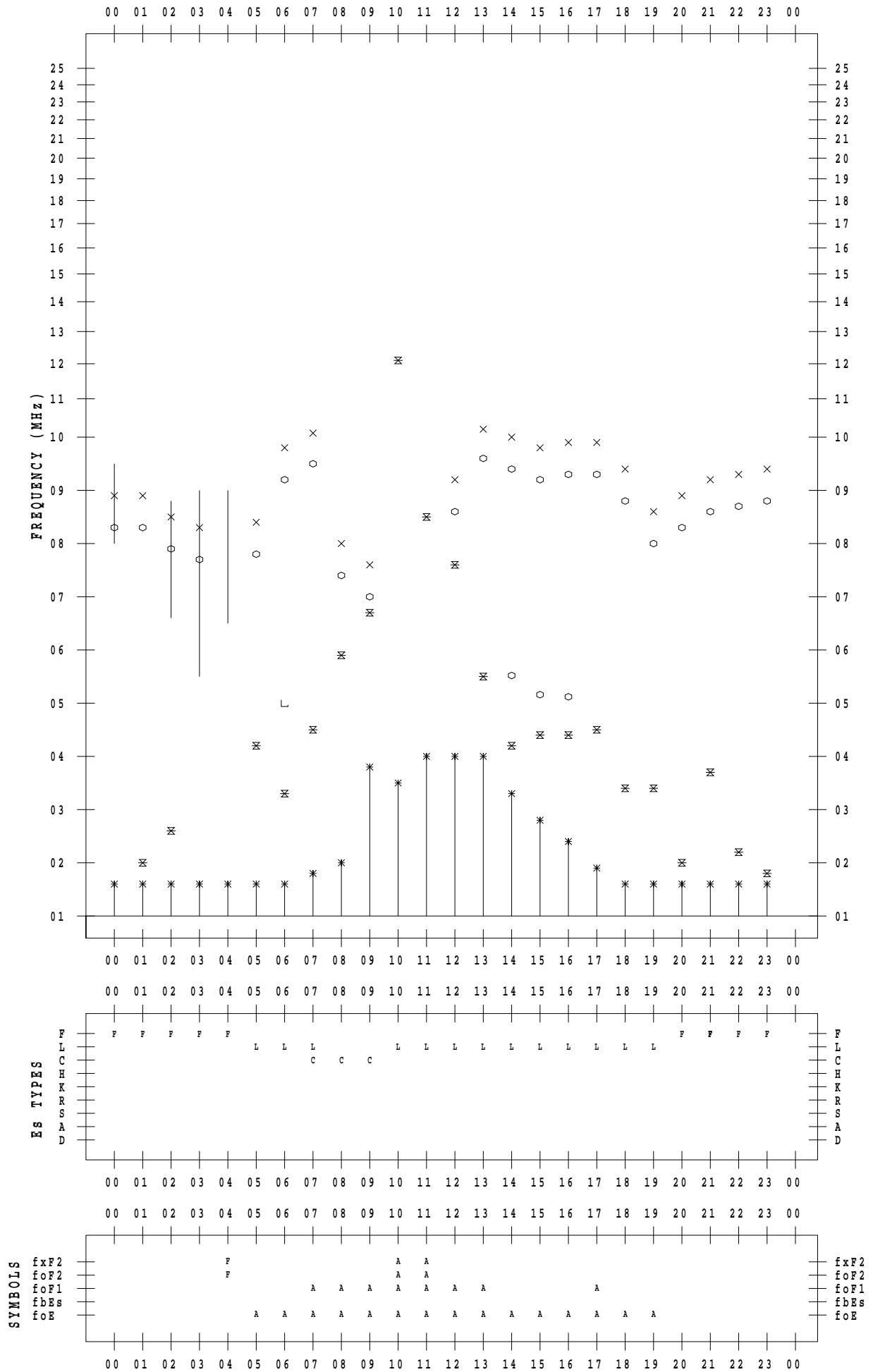
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 6/18

135 ° E MEAN TIME



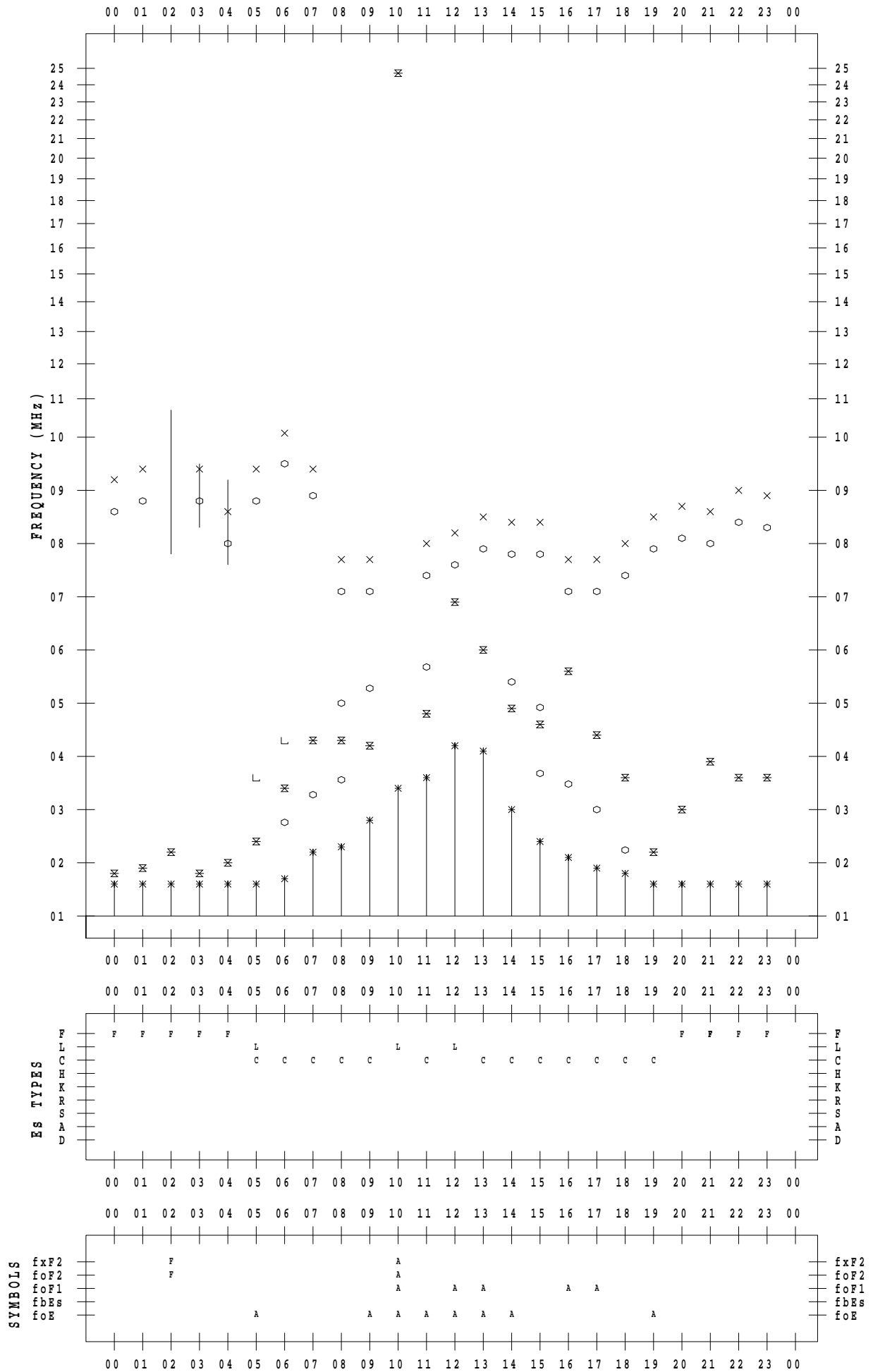
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 6/19

135 ° E MEAN TIME



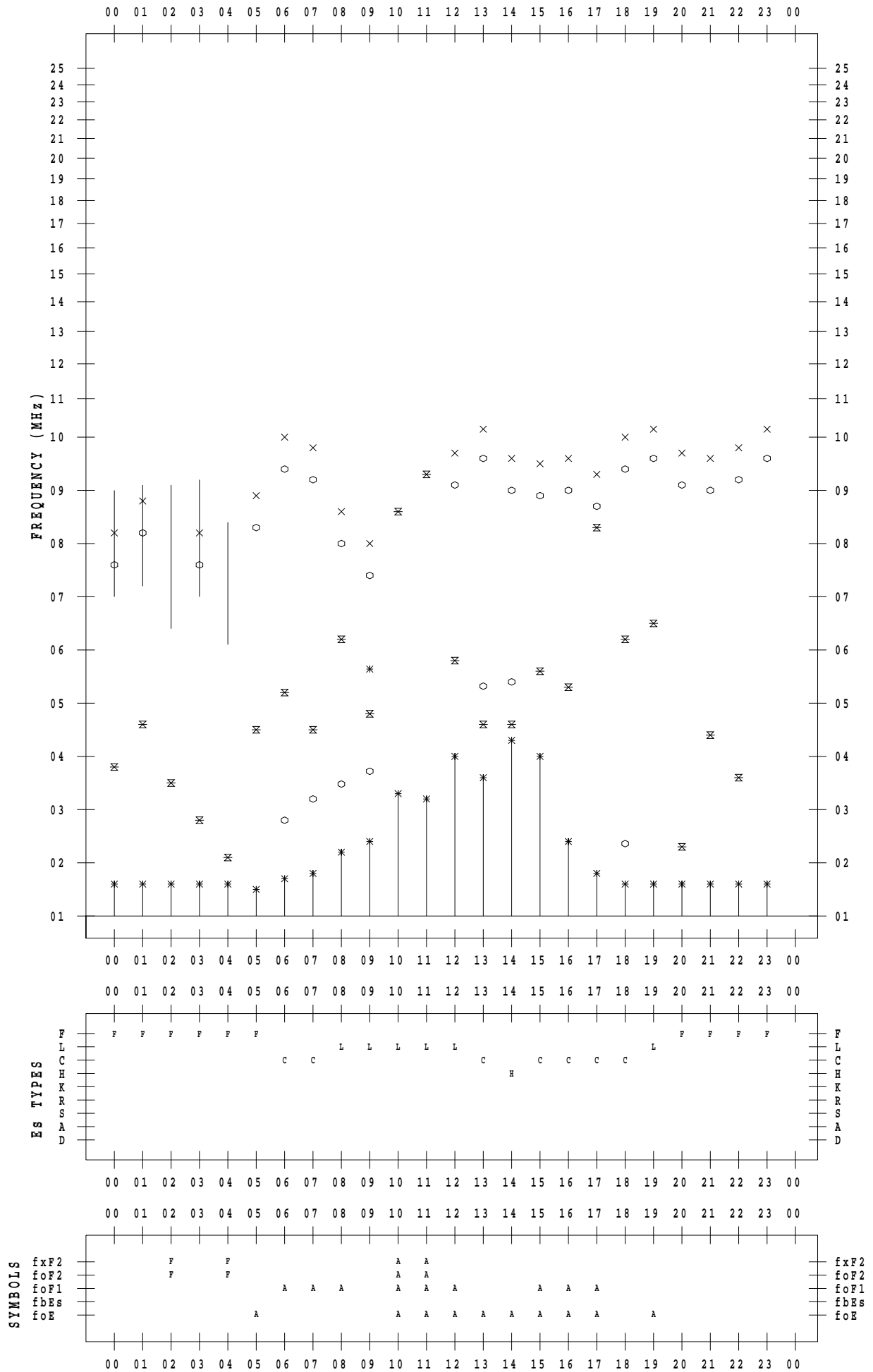
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 20

135 ° E MEAN TIME



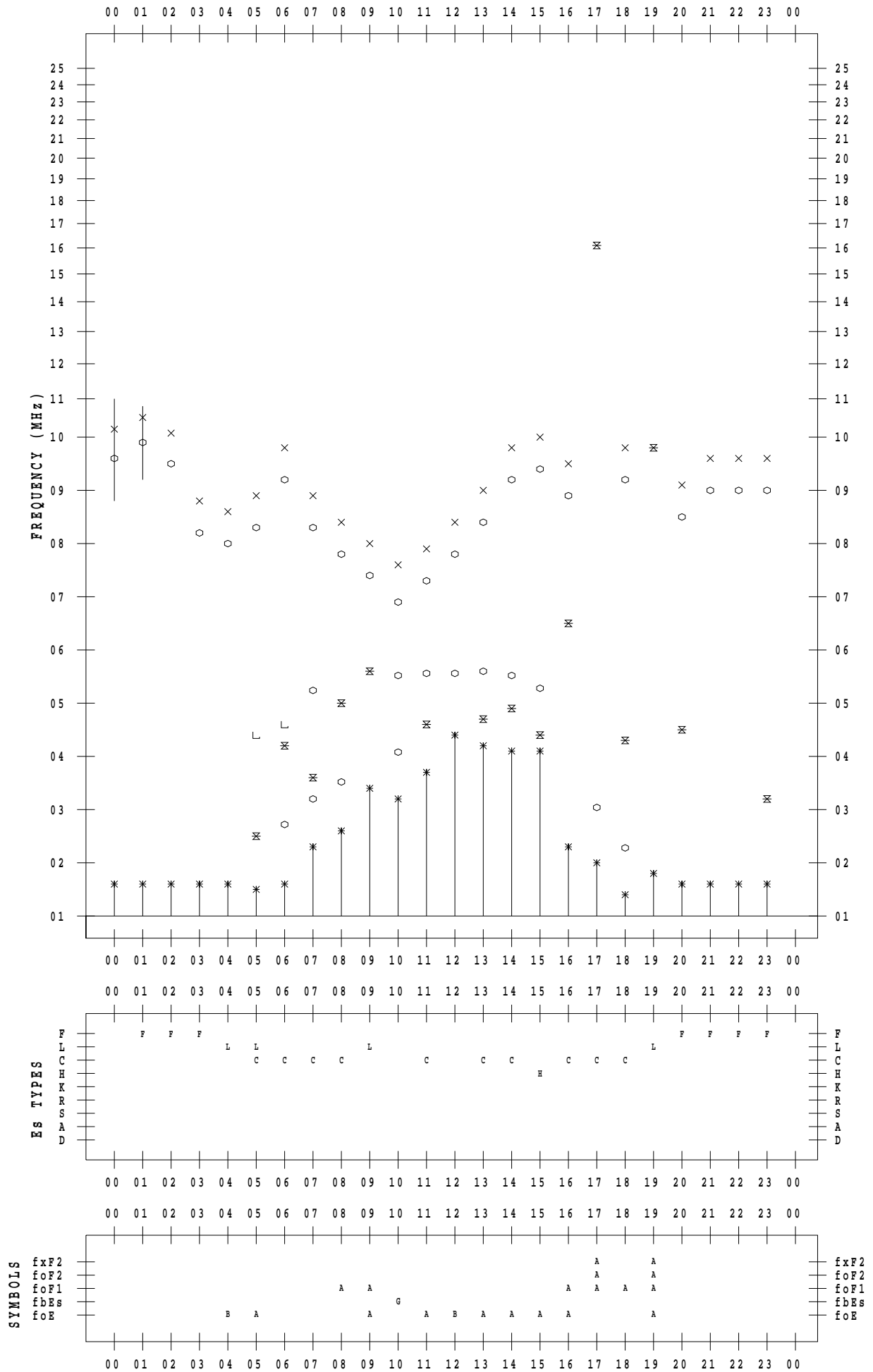
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 21

135 ° E MEAN TIME



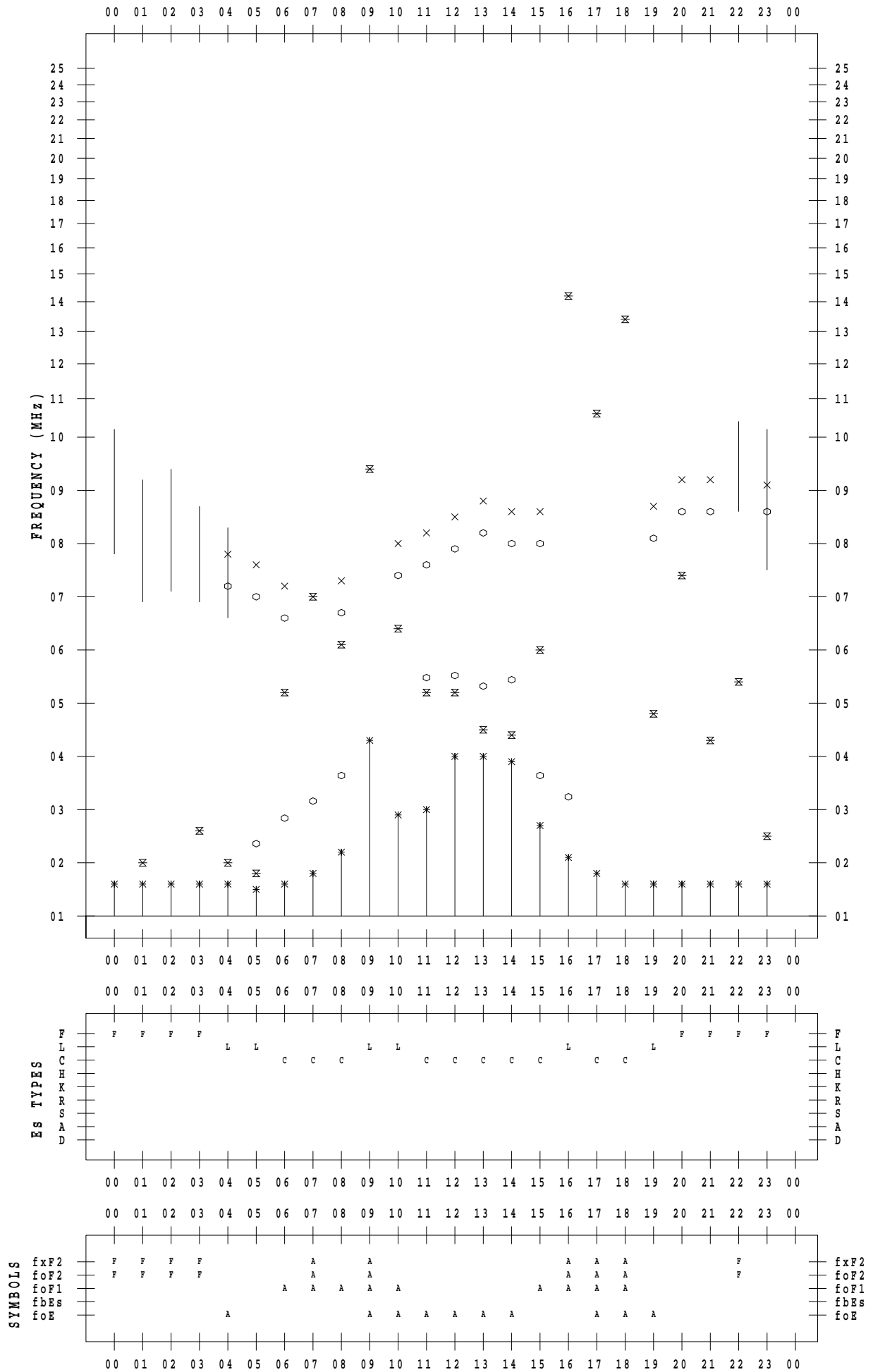
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 23

135 ° E MEAN TIME



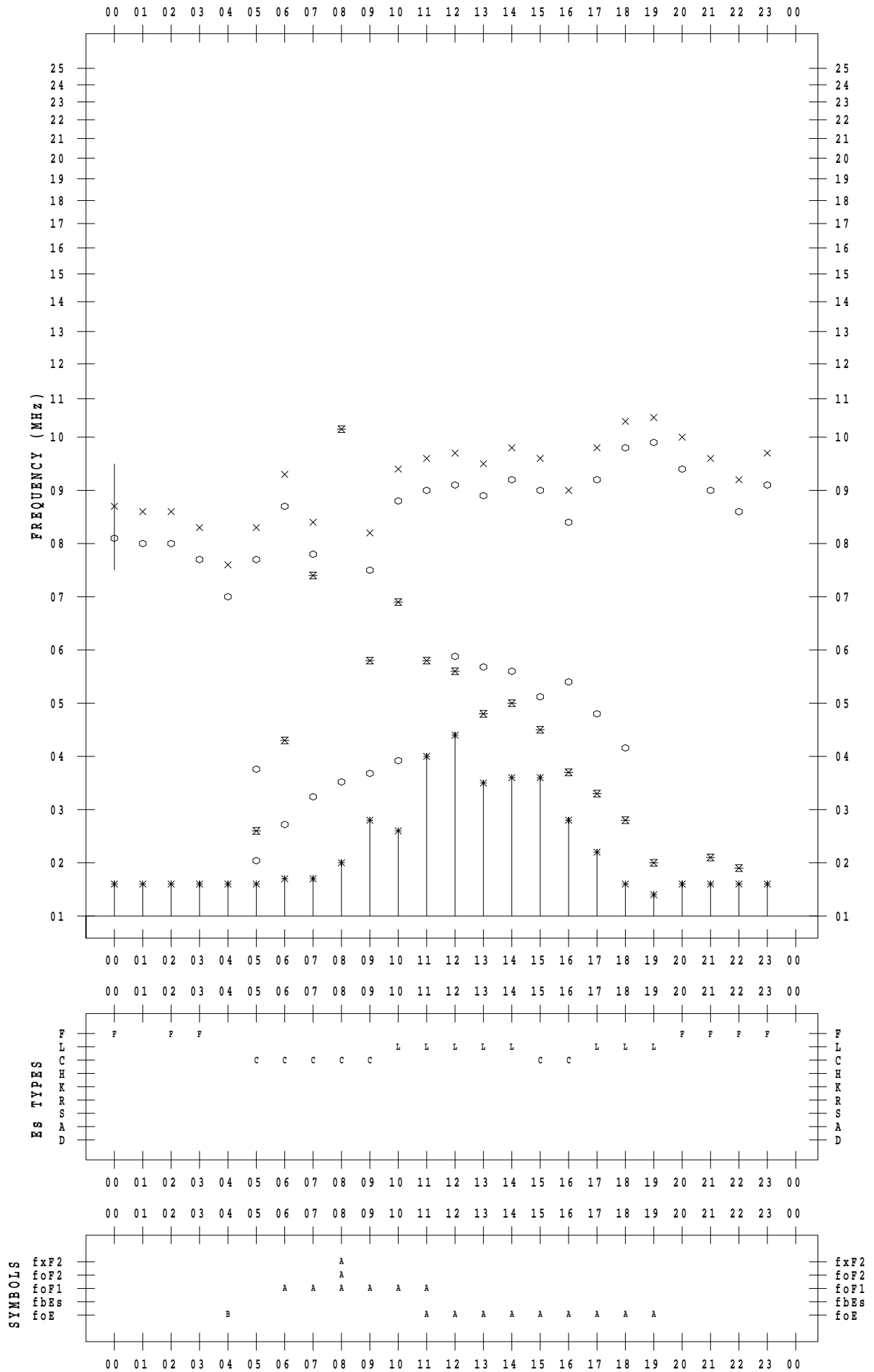
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 24

135 ° E MEAN TIME



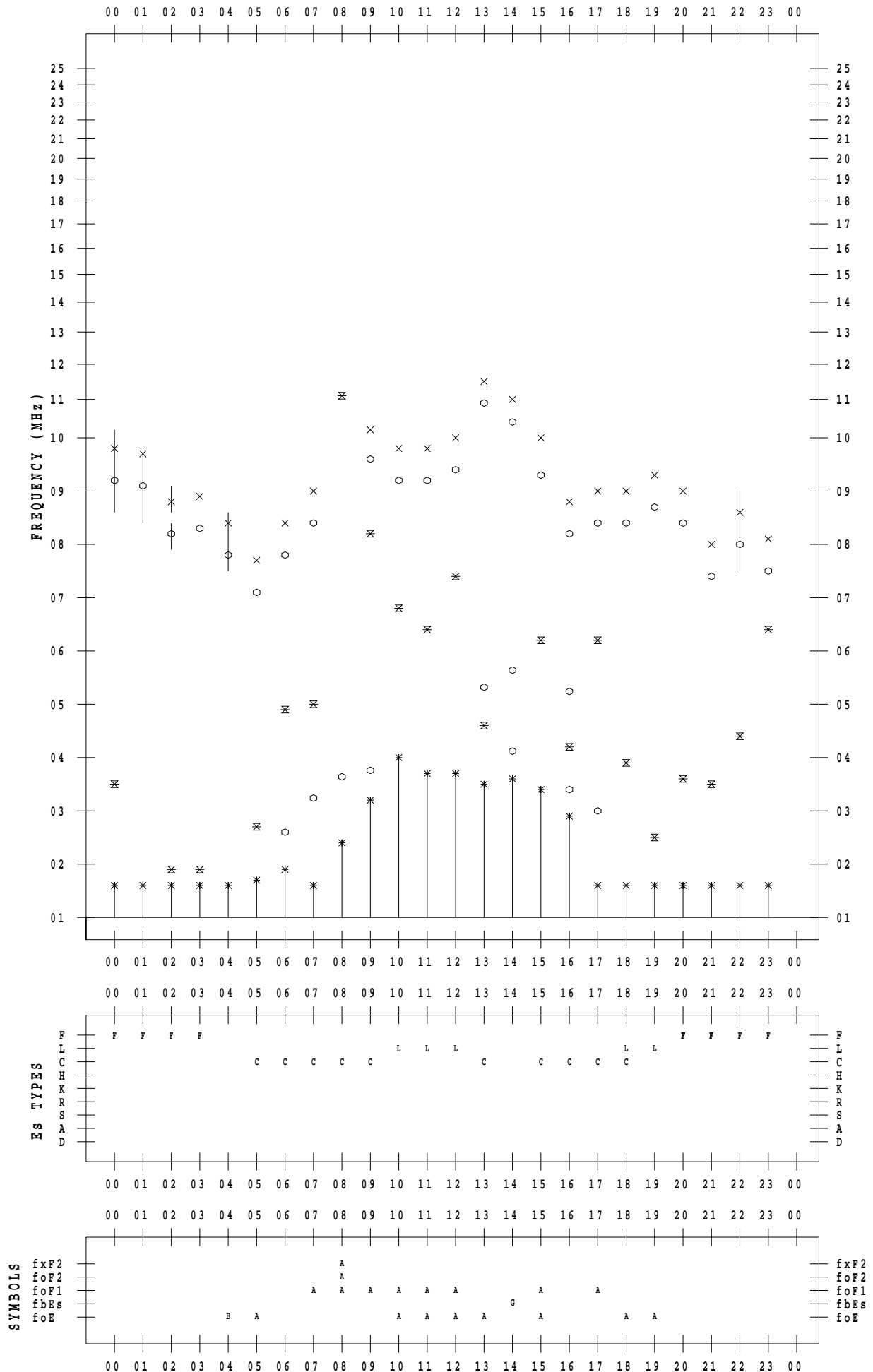
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 25

135 ° E MEAN TIME



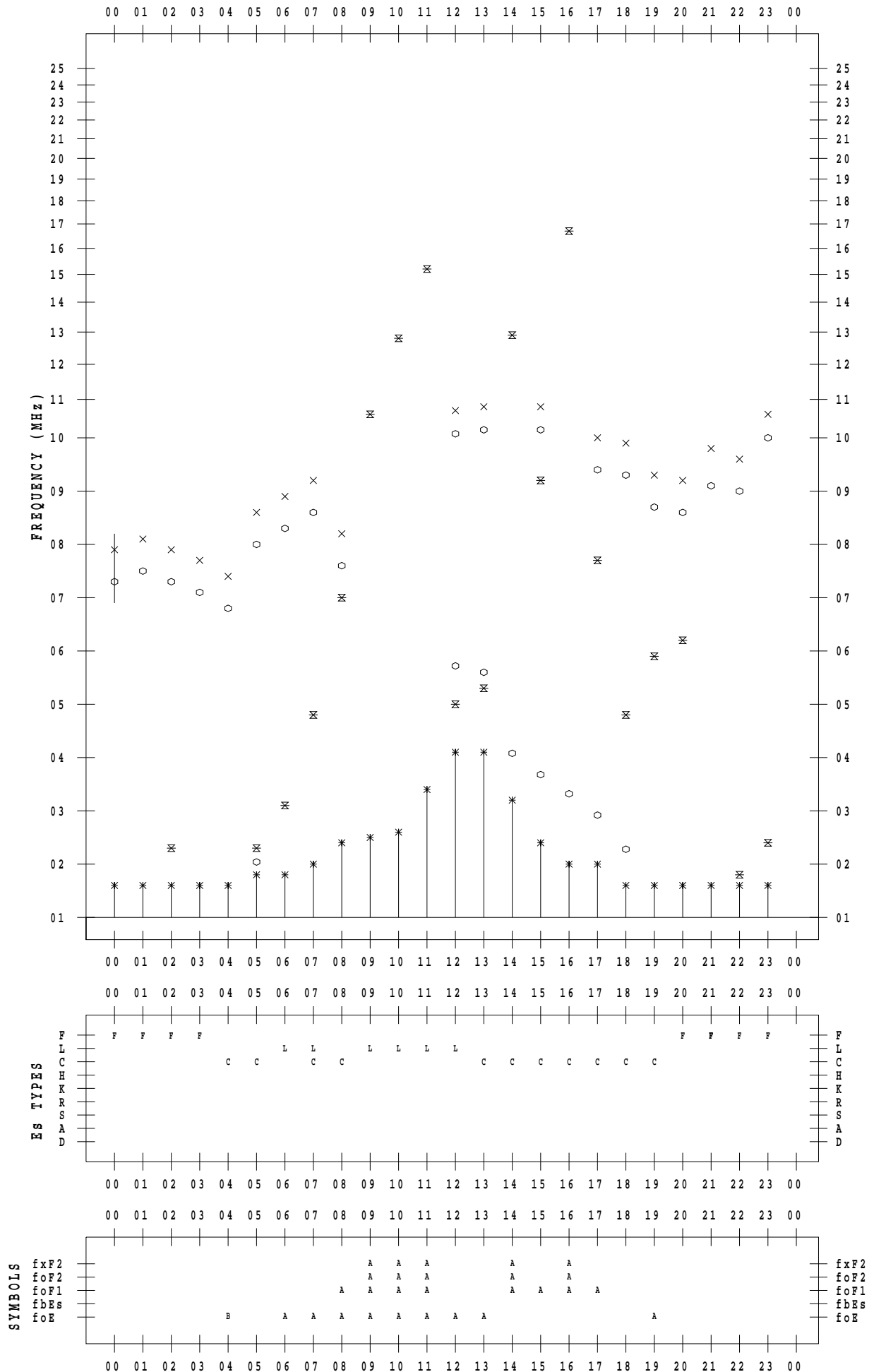
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023/ 6/26

135 ° E MEAN TIME



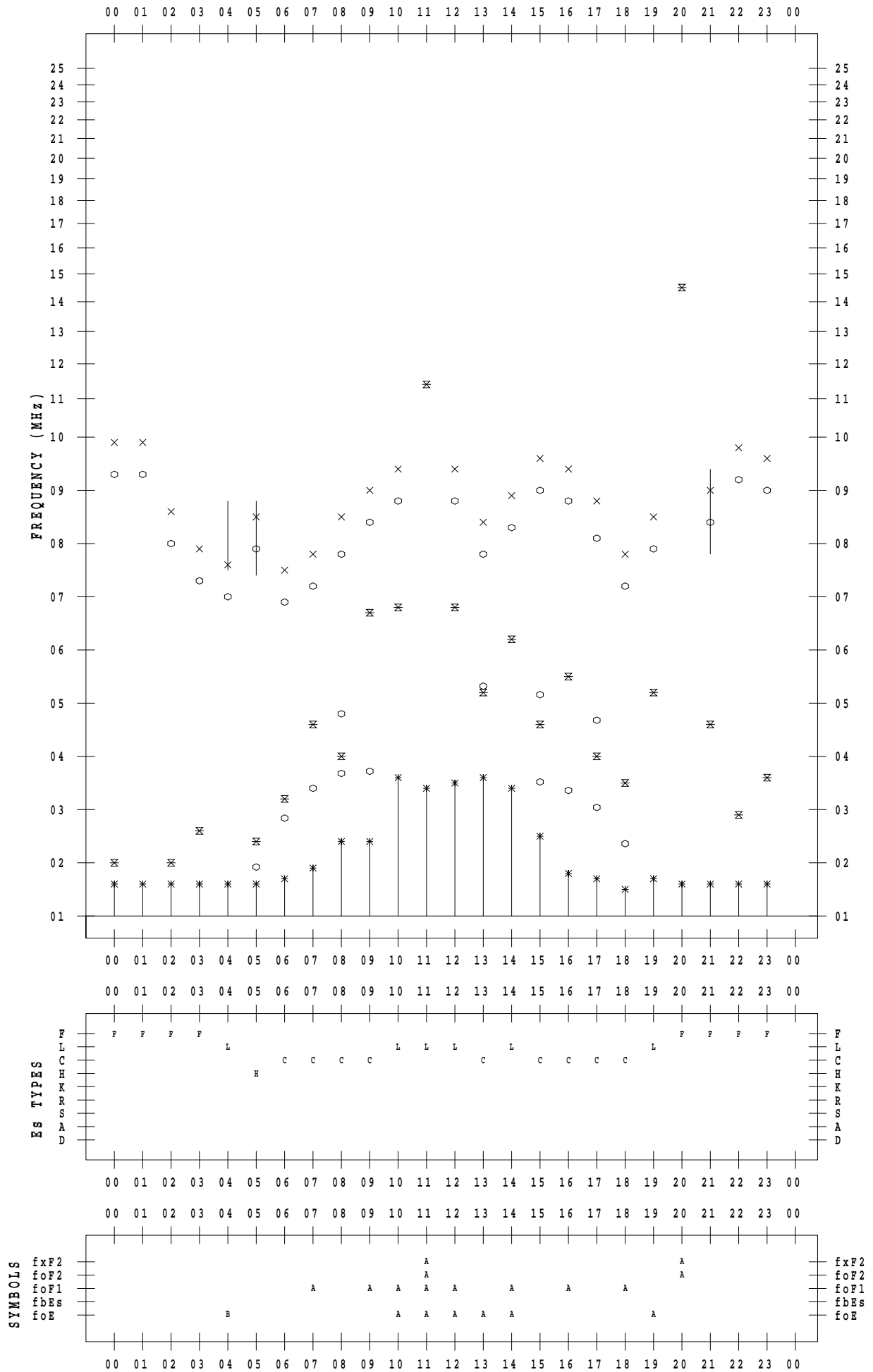
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 27

135 ° E MEAN TIME



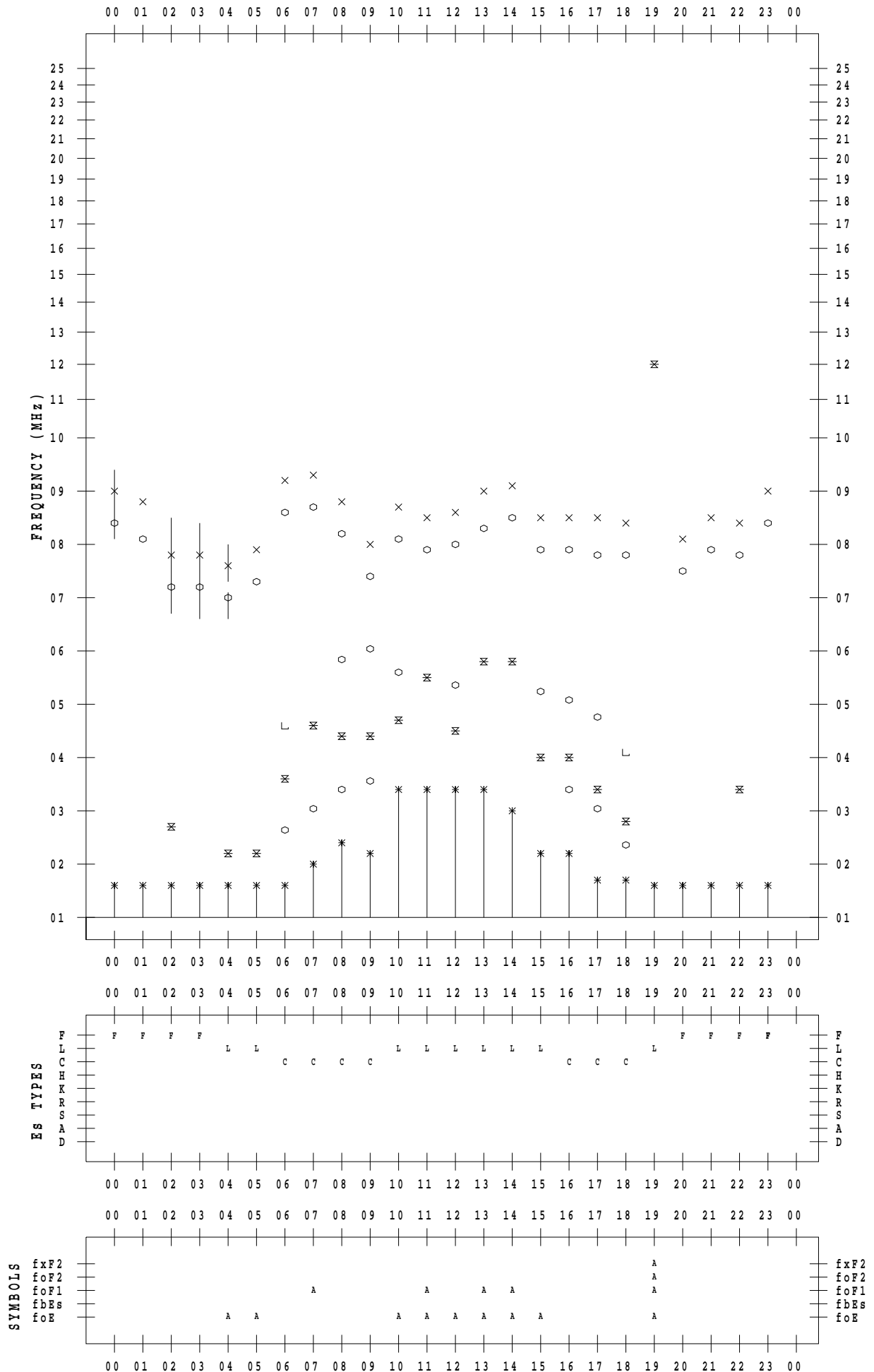
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SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 28

135 ° E MEAN TIME



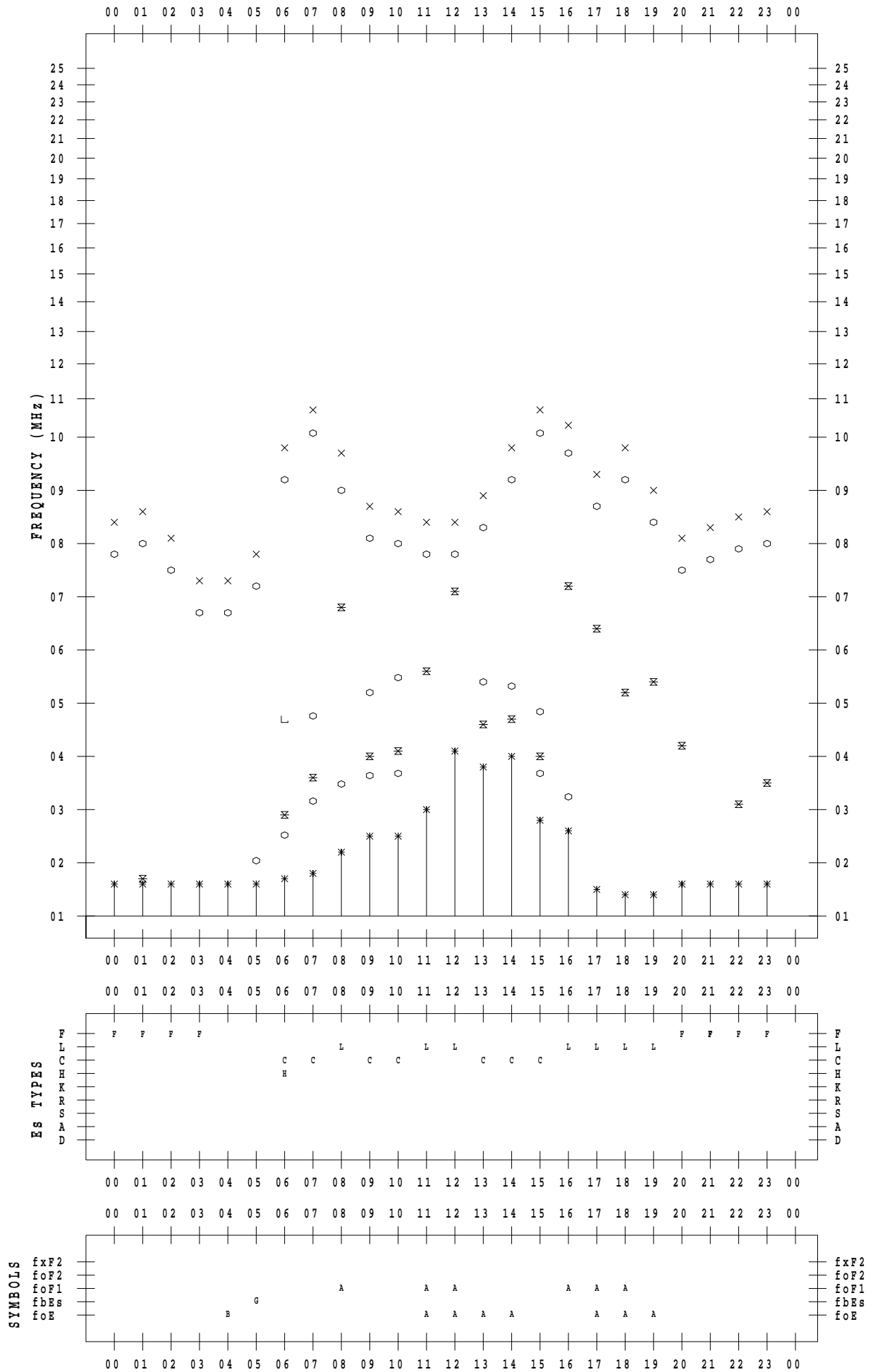
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 29

135 ° E MEAN TIME



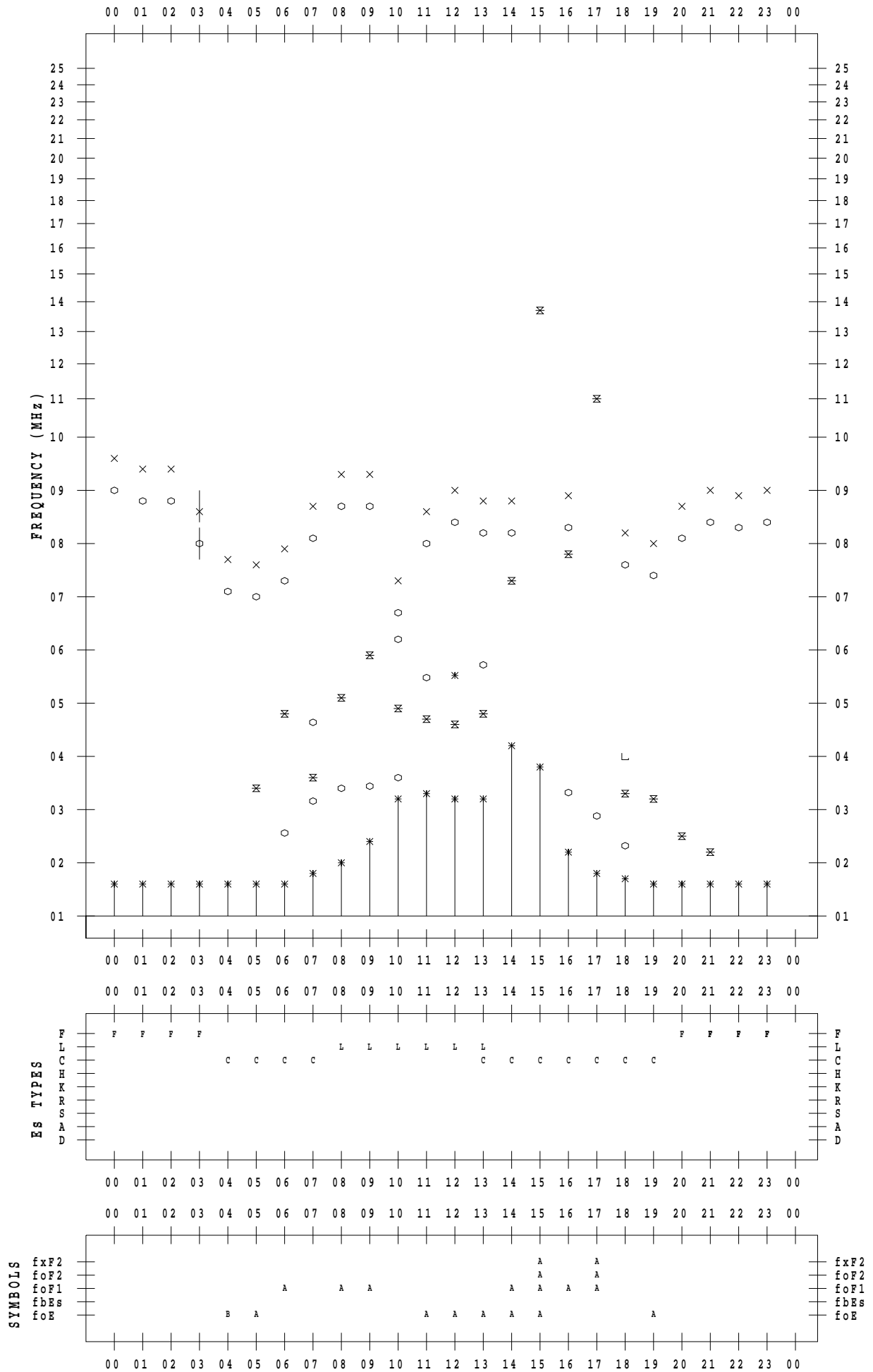
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Kokubunji

DATE : 2023 / 6 / 30

135 ° E MEAN TIME



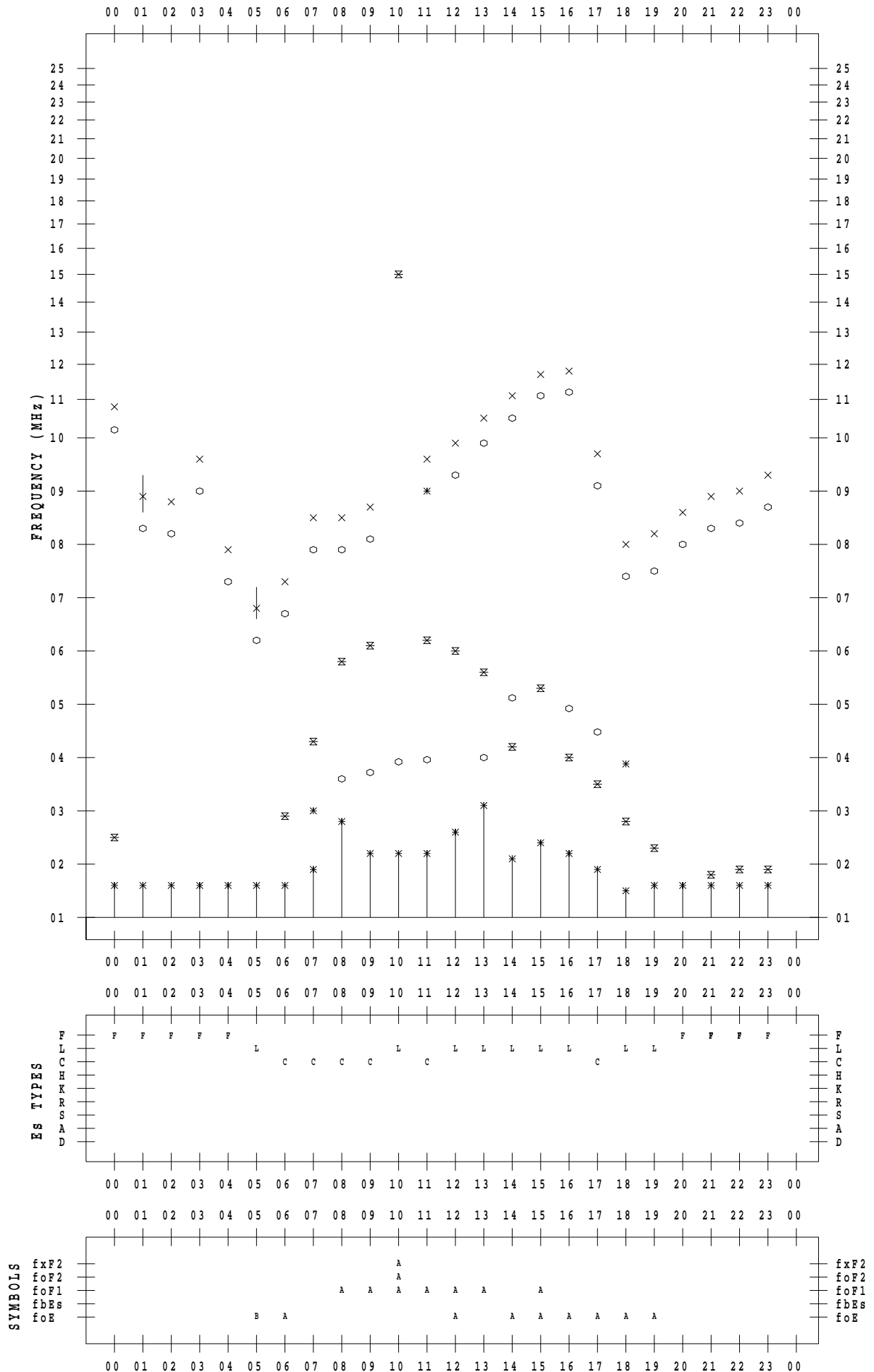
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 1

135 ° E MEAN TIME



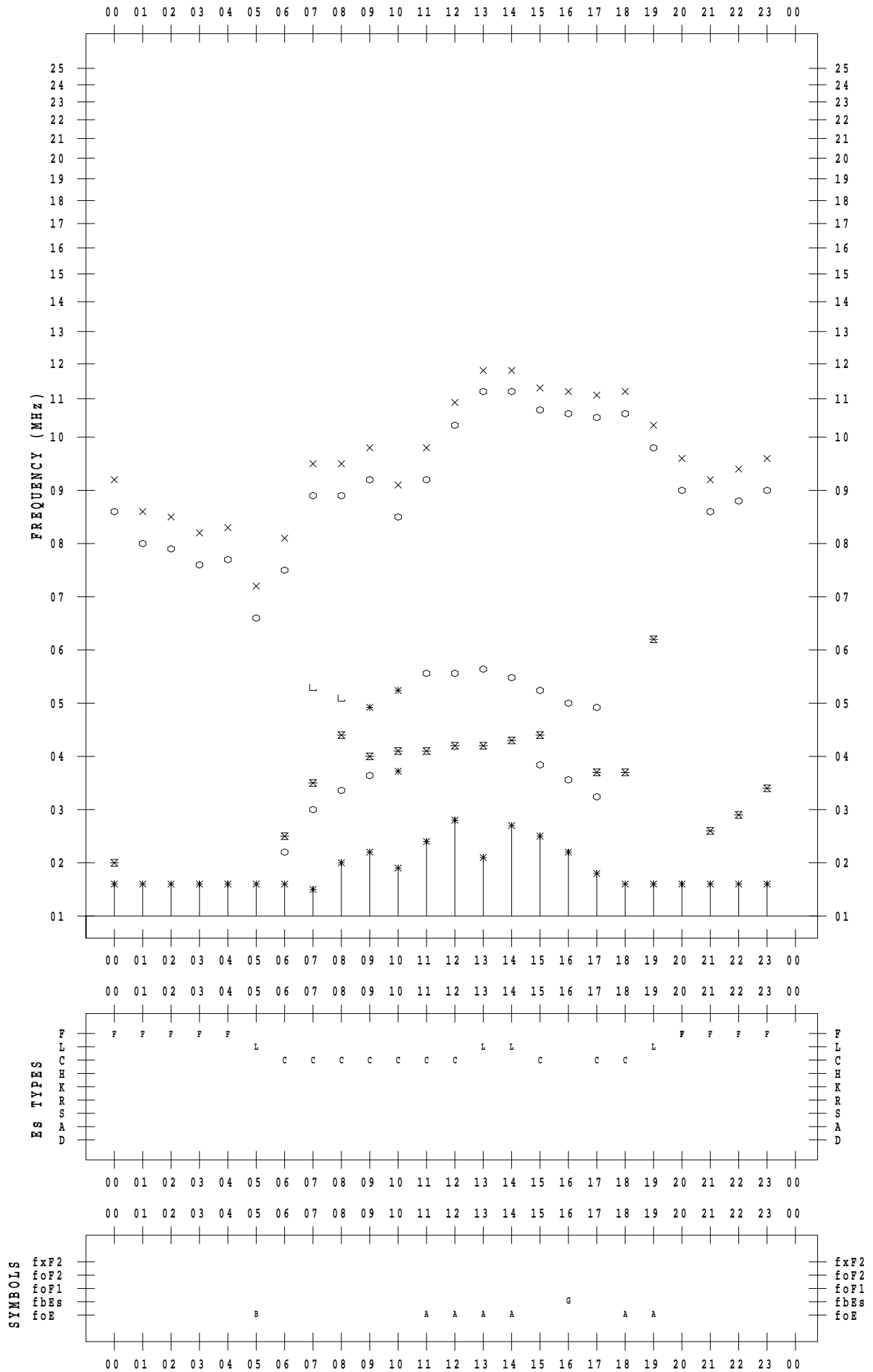
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 2

135 ° E MEAN TIME



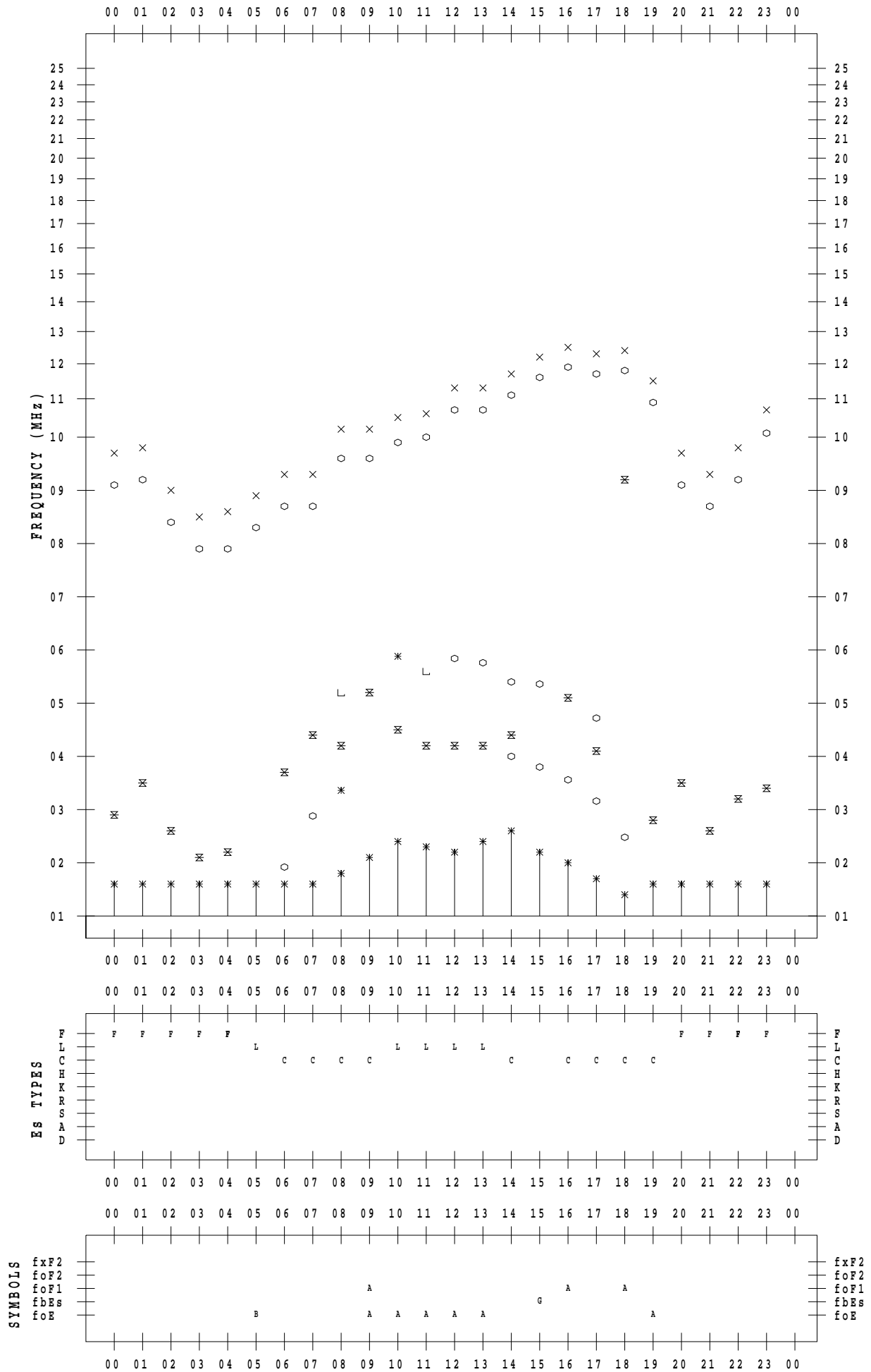
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 3

135 ° E MEAN TIME



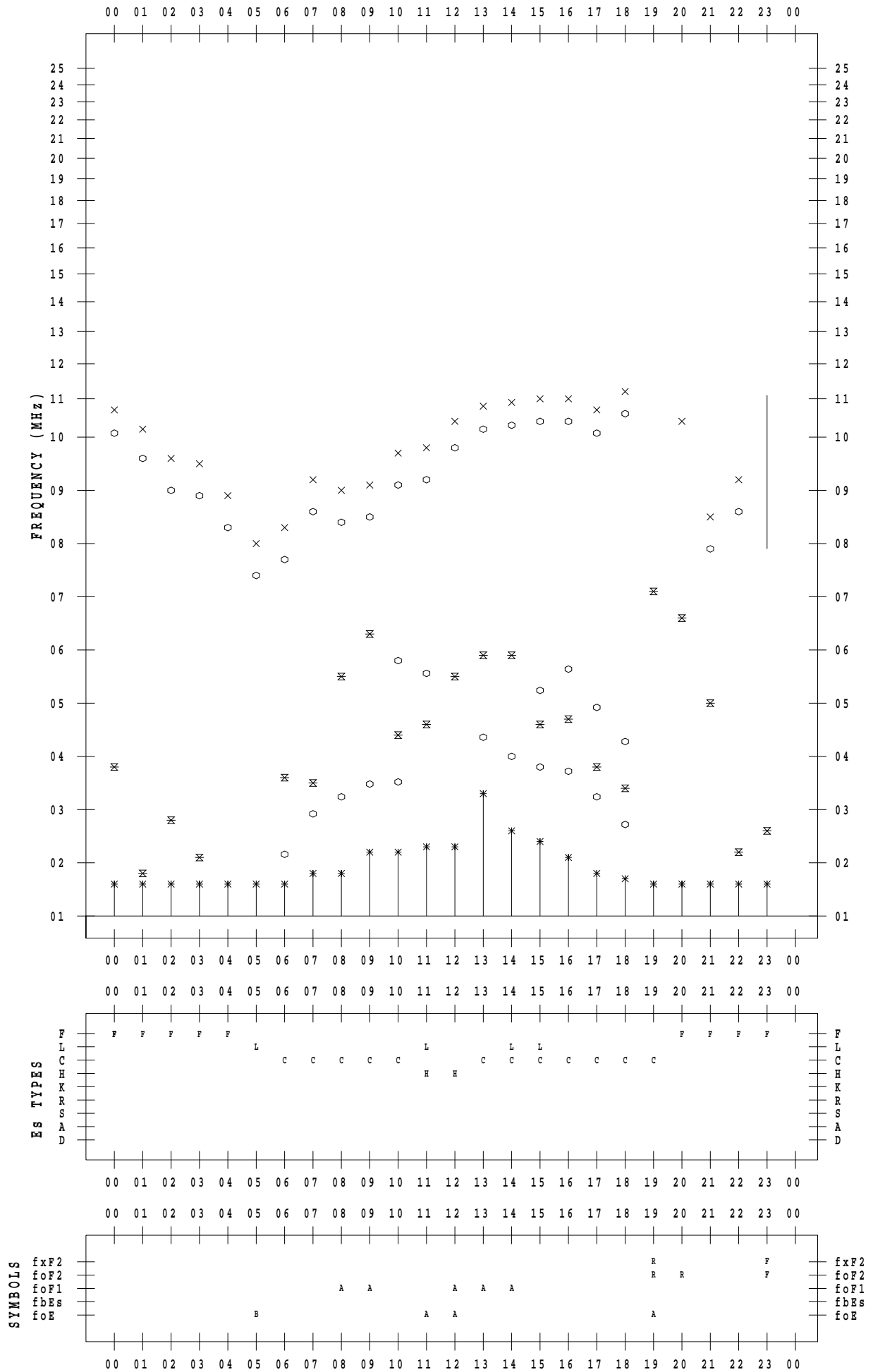
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 4

135 ° E MEAN TIME



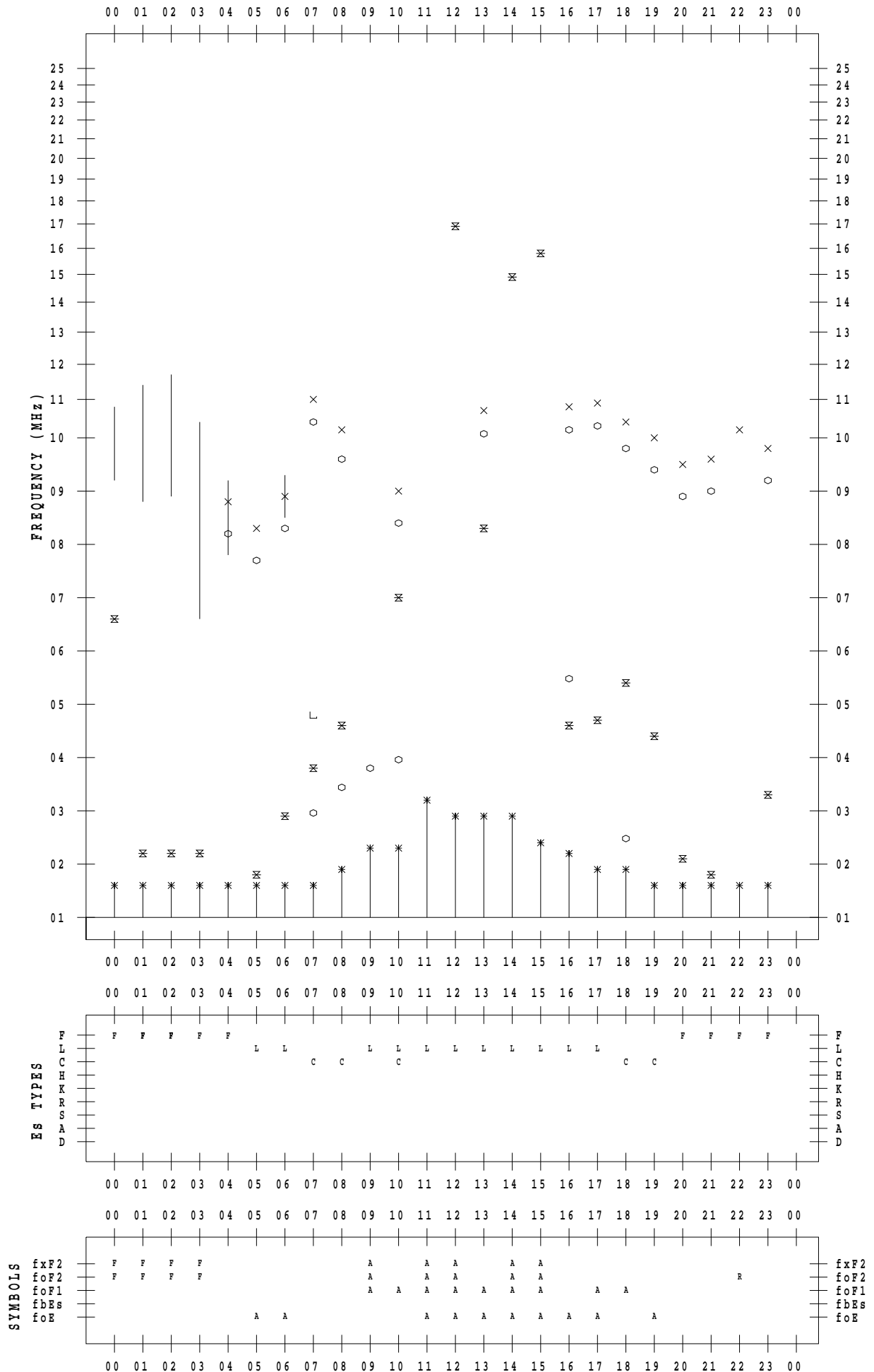
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 5

135 ° E MEAN TIME



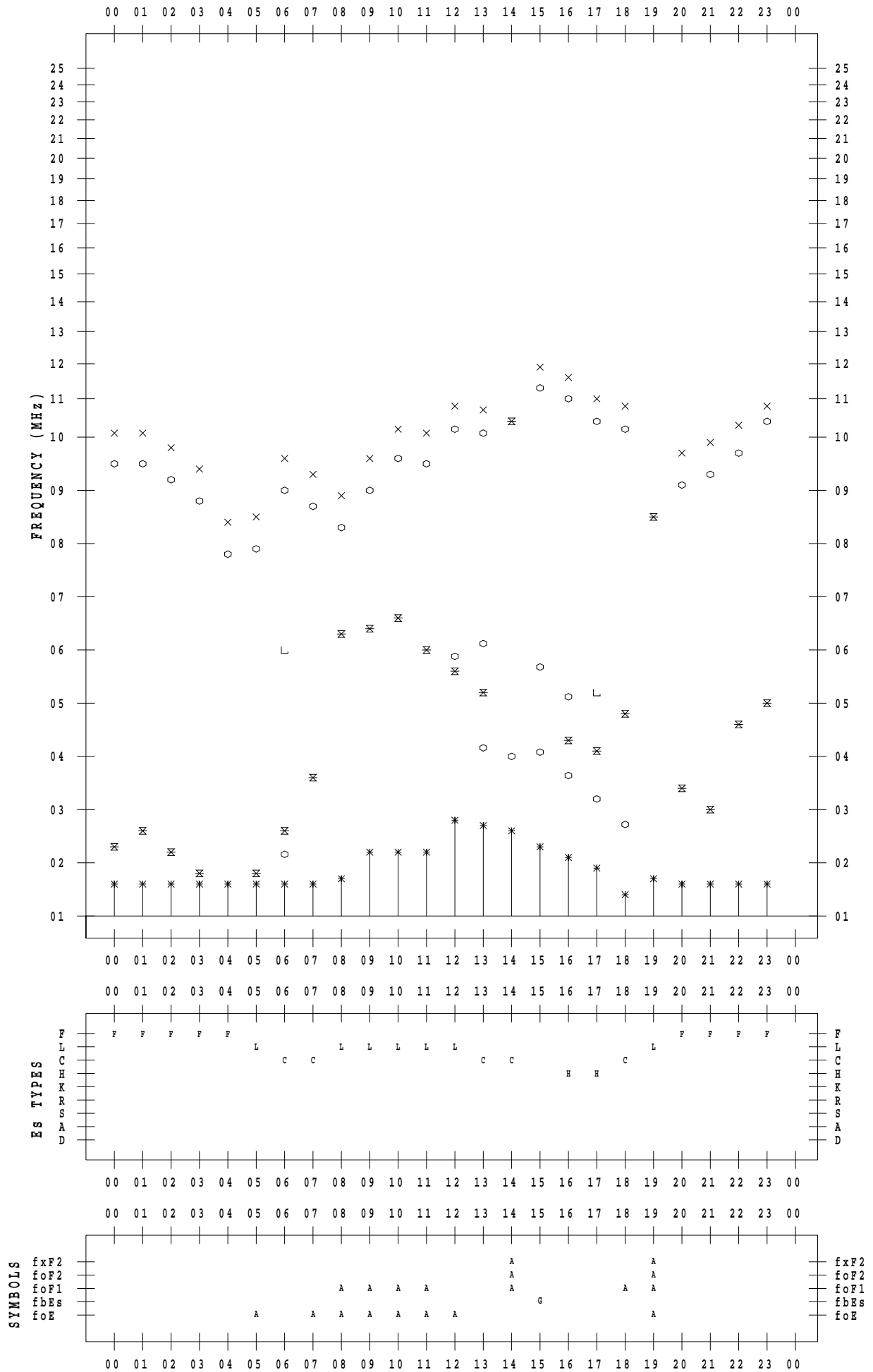
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 6

135 ° E MEAN TIME



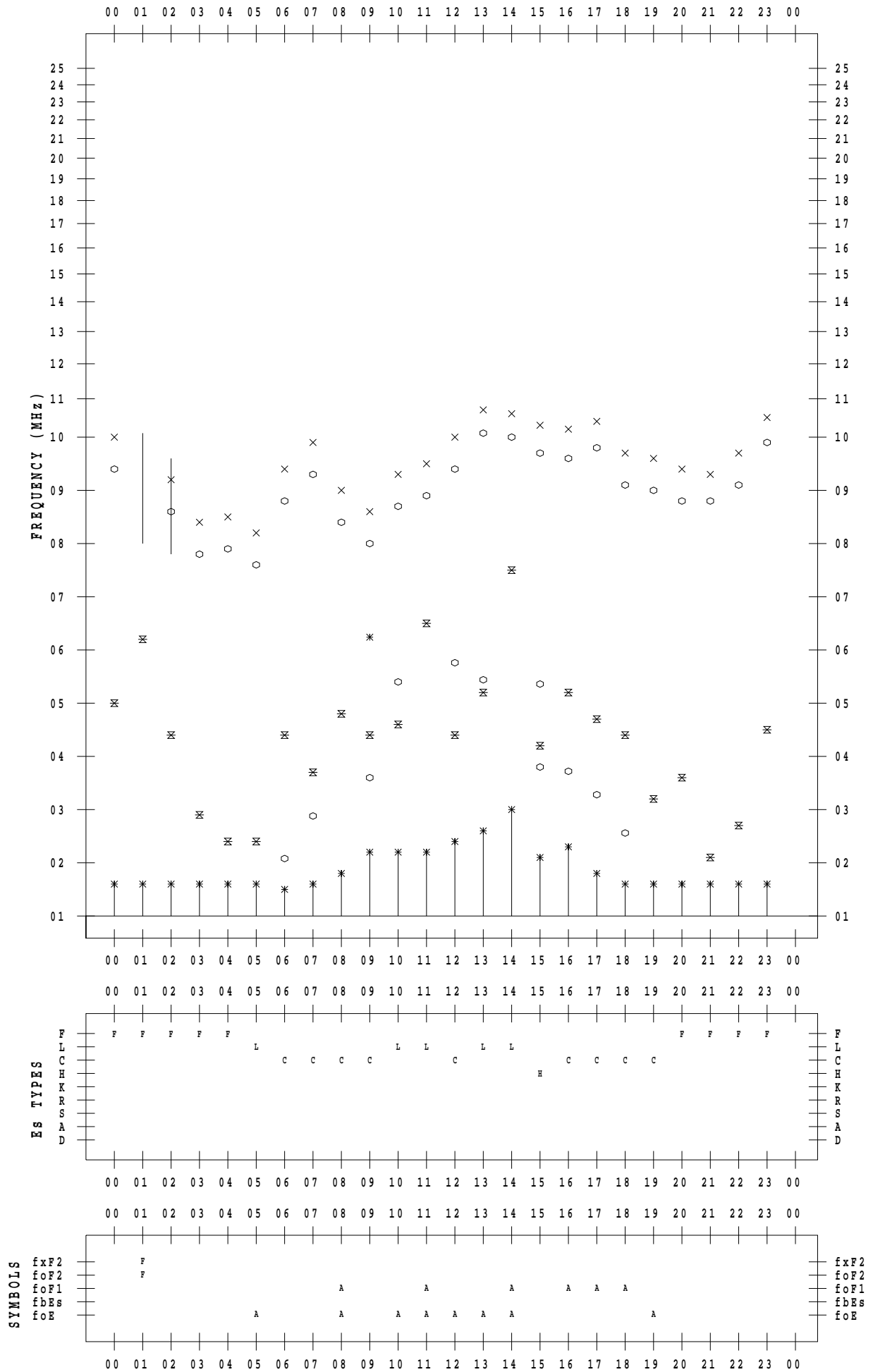
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 7

135 ° E MEAN TIME



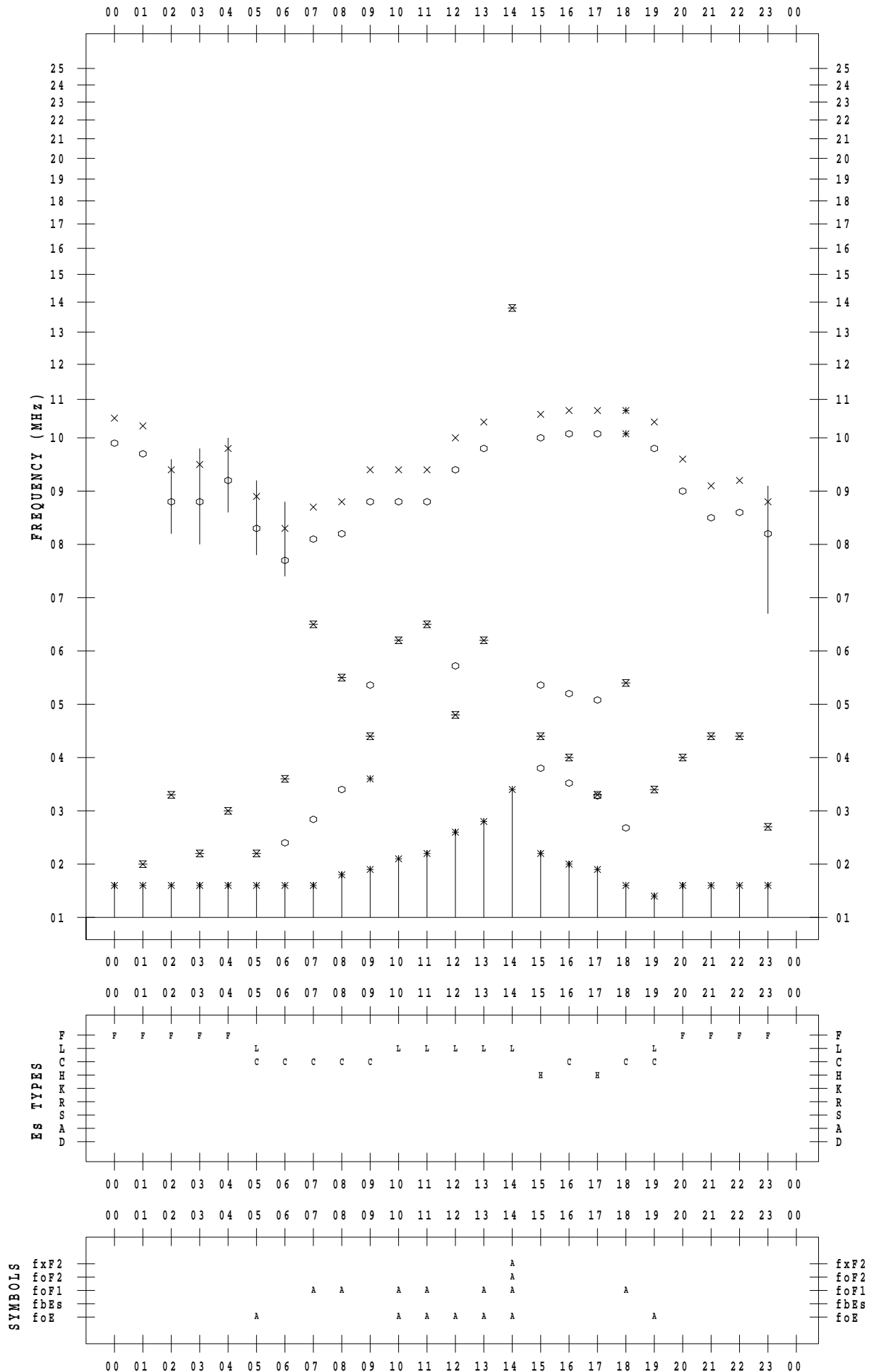
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 8

135 ° E MEAN TIME



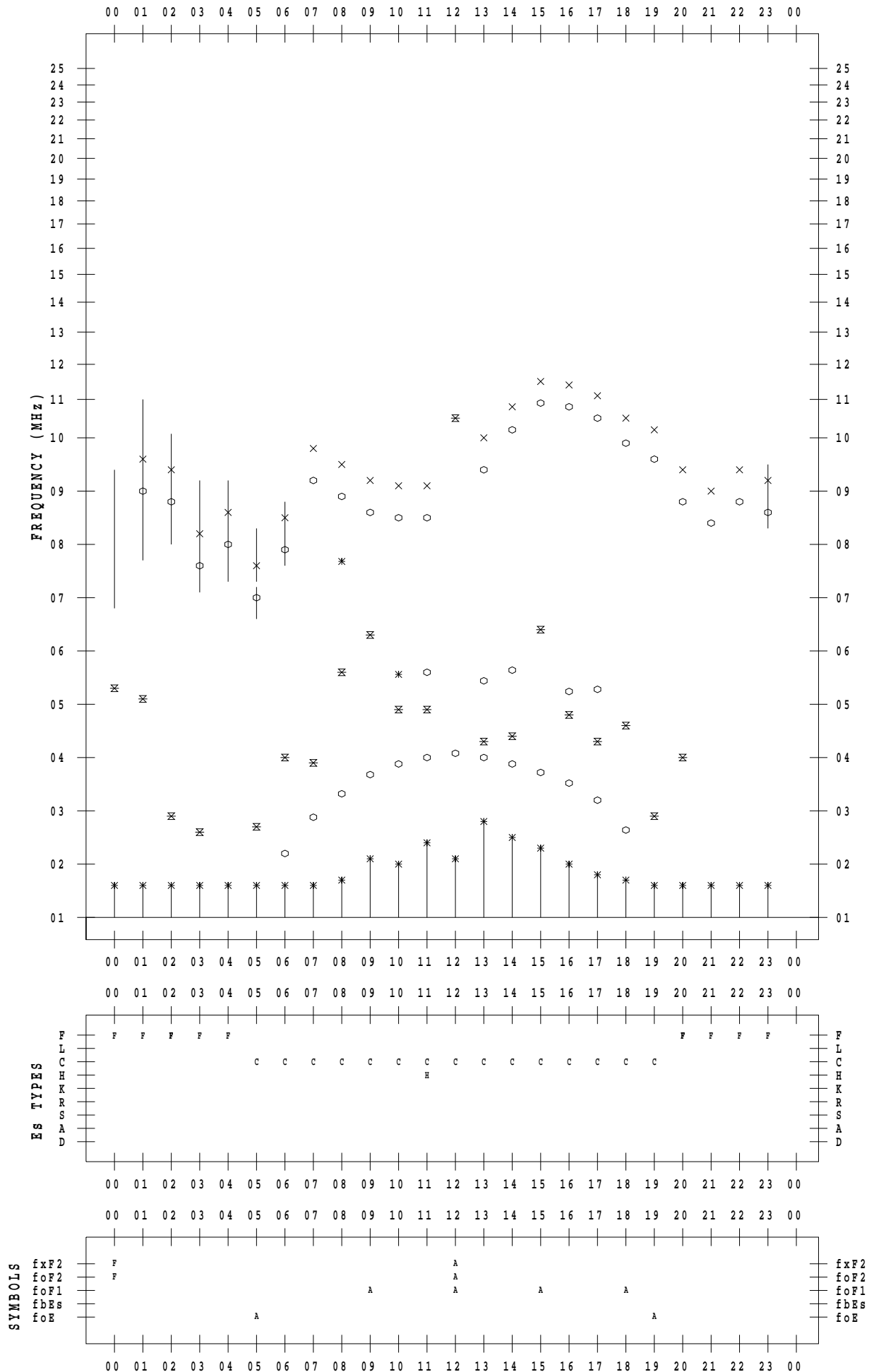
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 9

135 ° E MEAN TIME



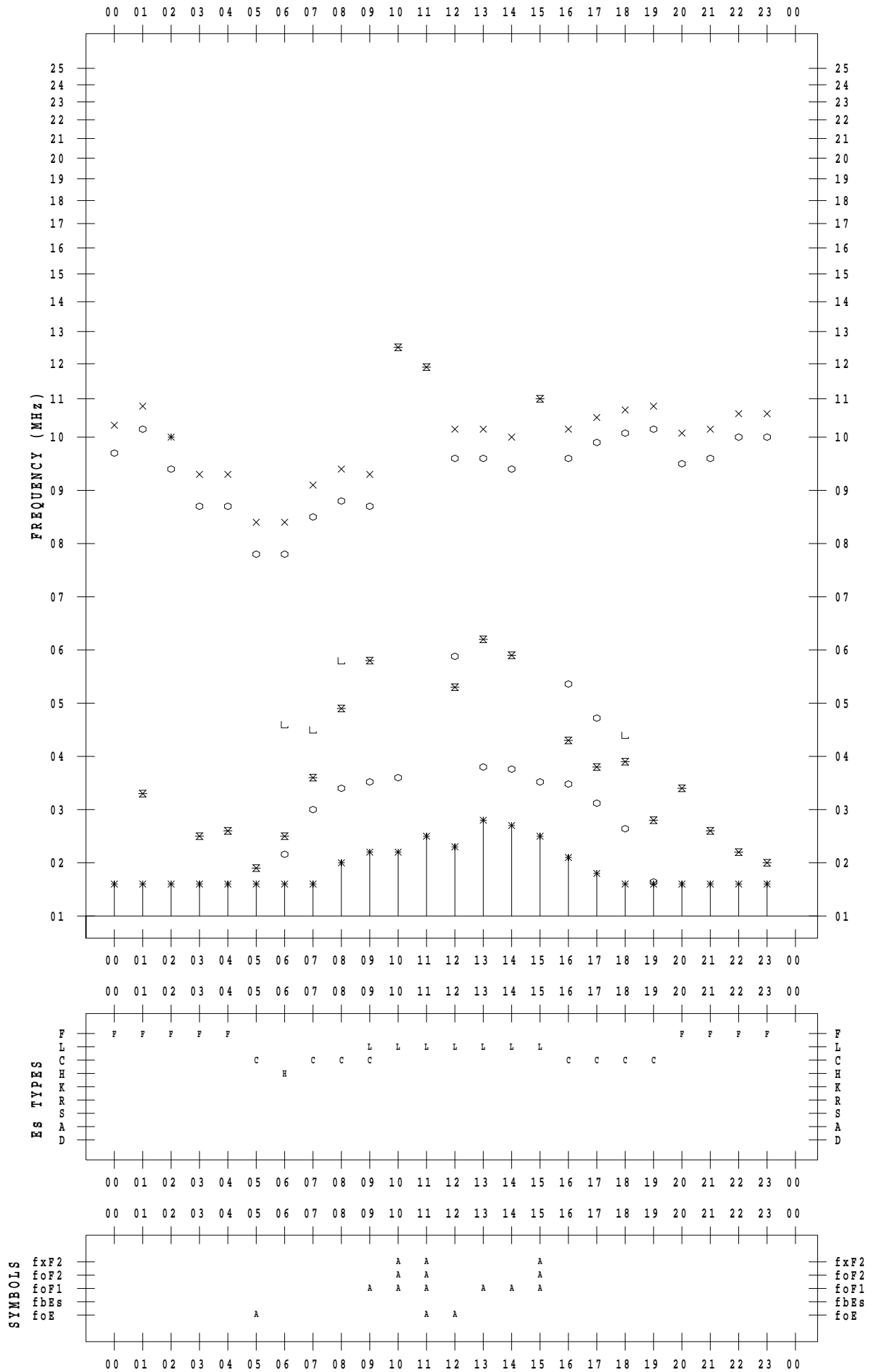
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 10

135 ° E MEAN TIME



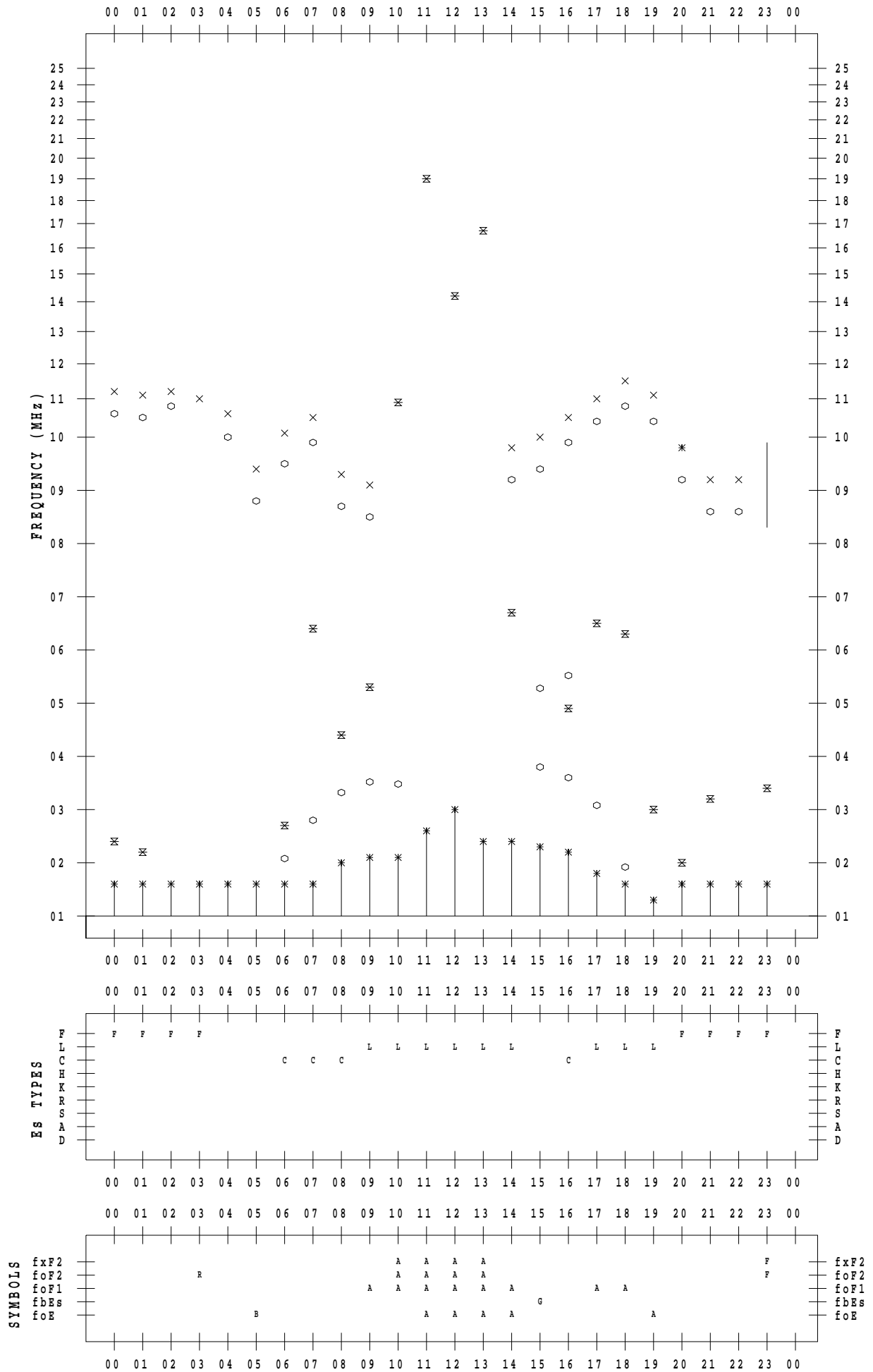
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 11

135 ° E MEAN TIME



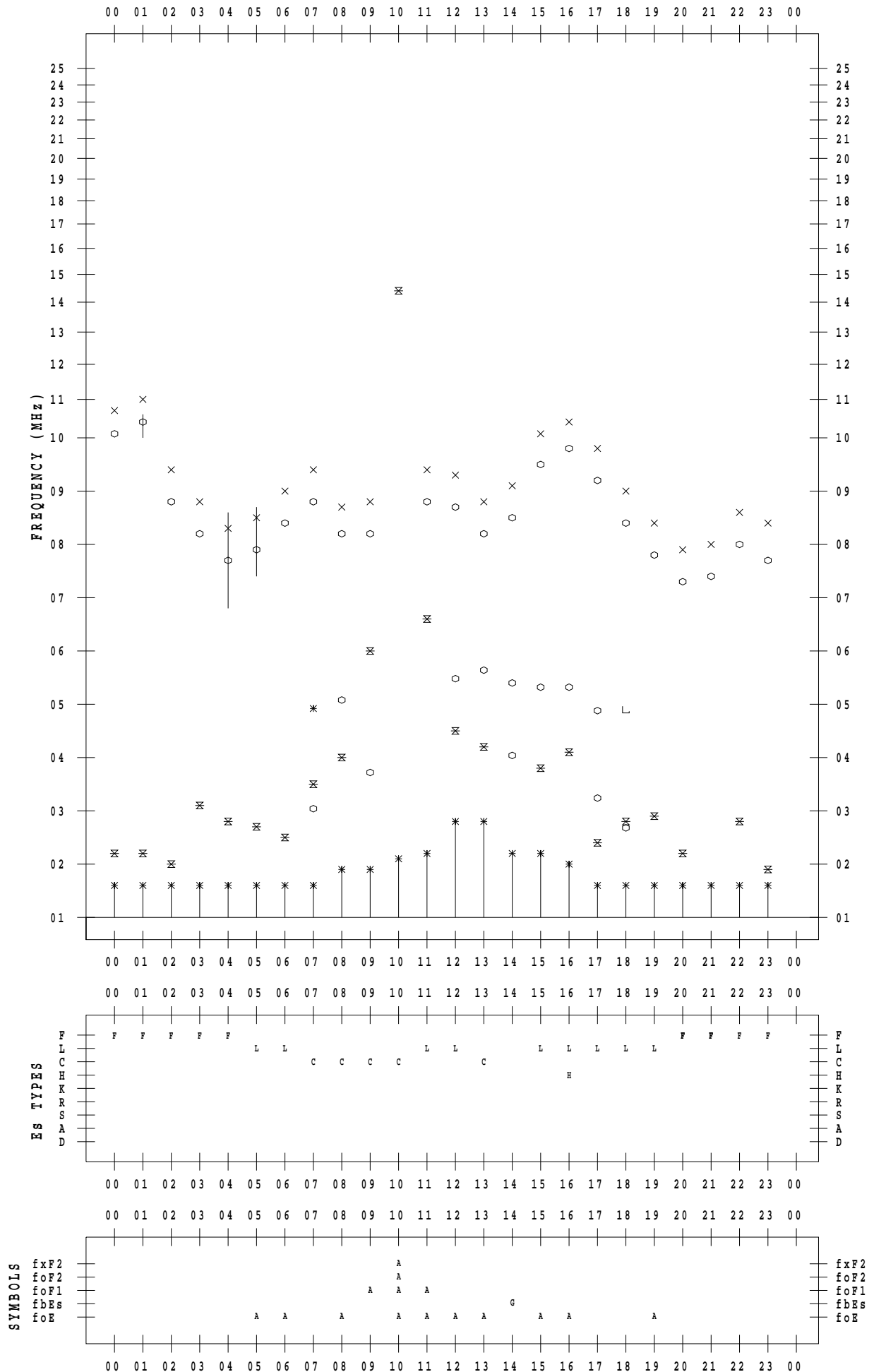
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 12

135 ° E MEAN TIME



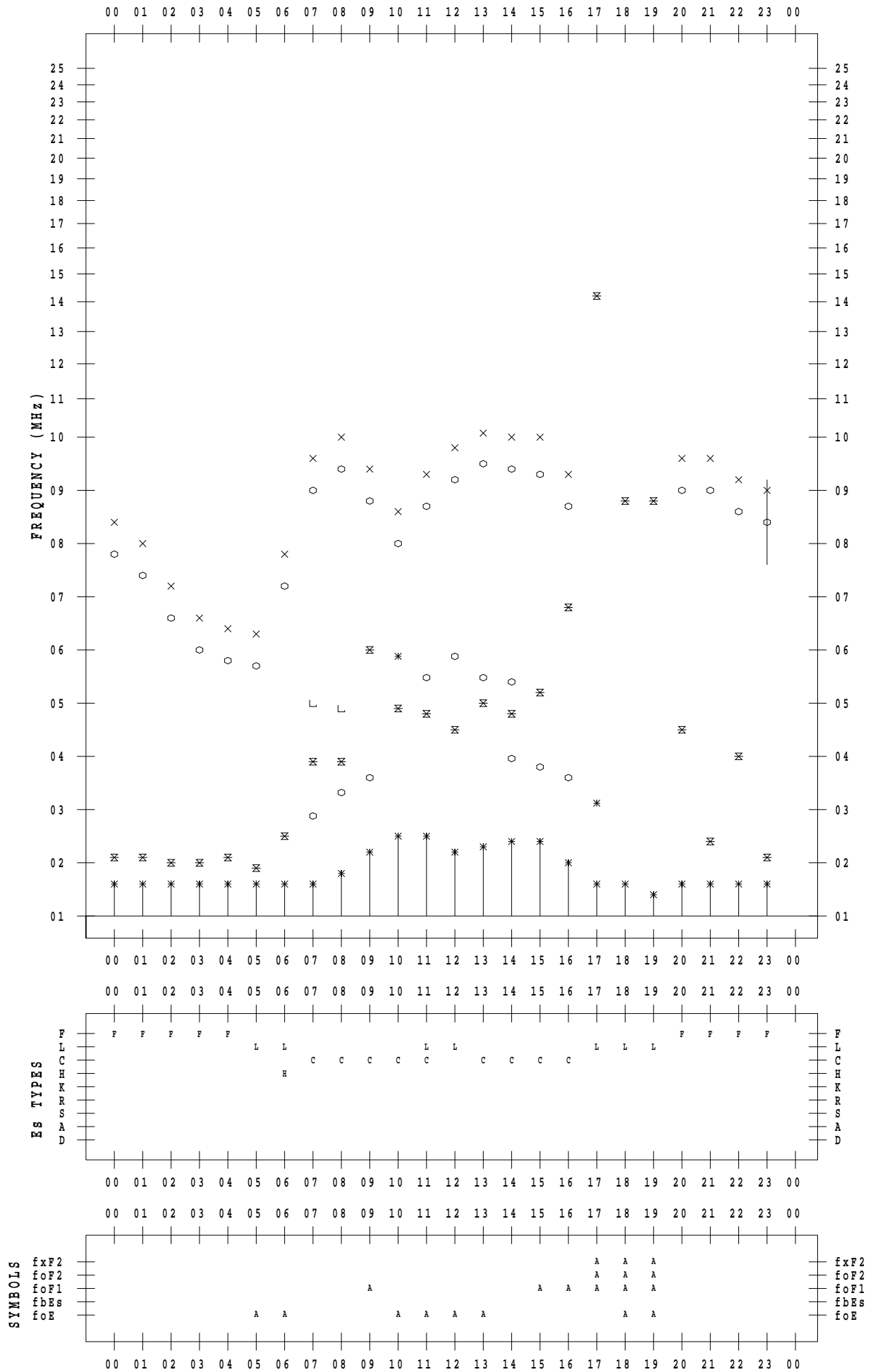
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 13

135 ° E MEAN TIME



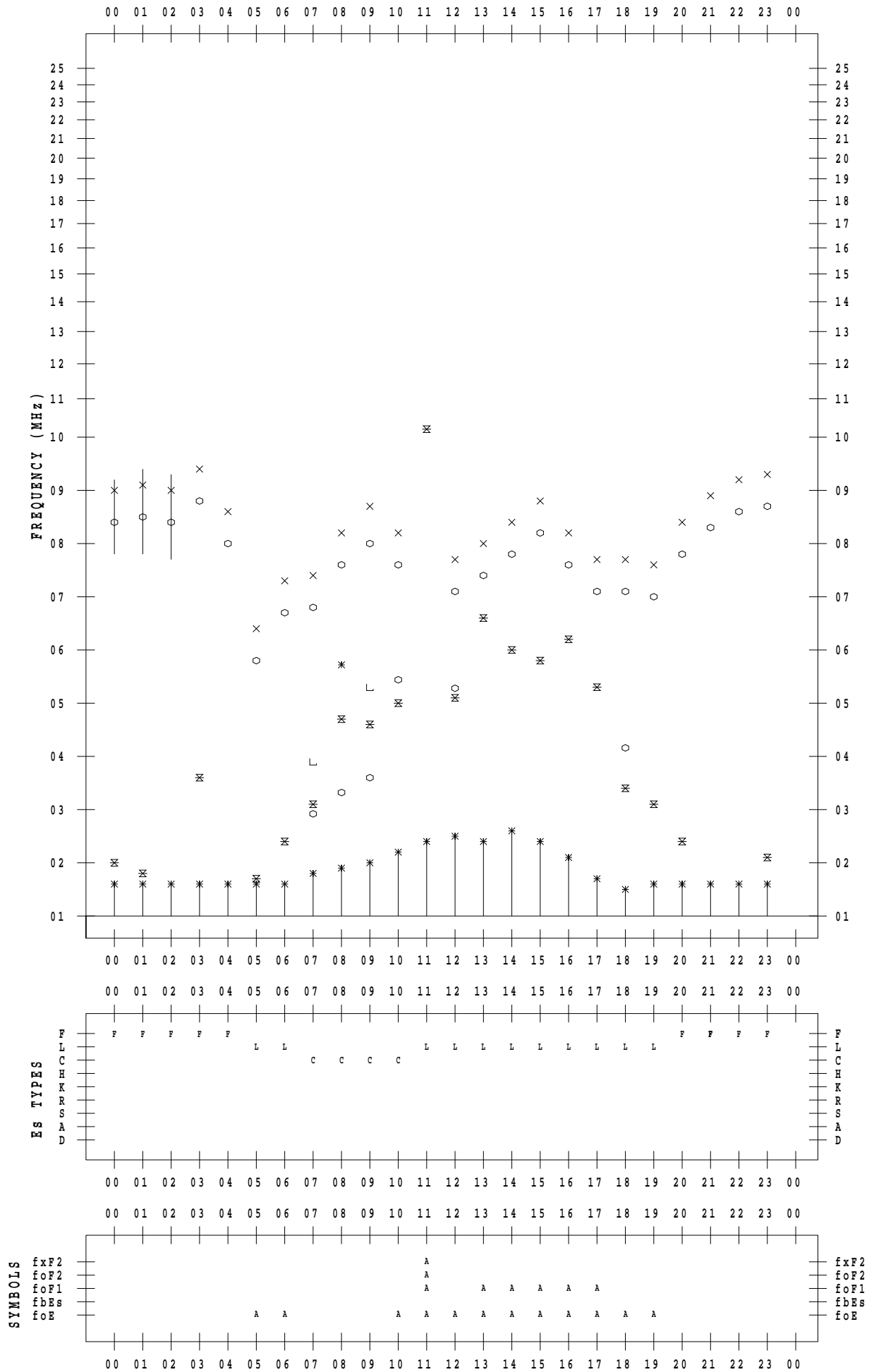
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 14

135 ° E MEAN TIME



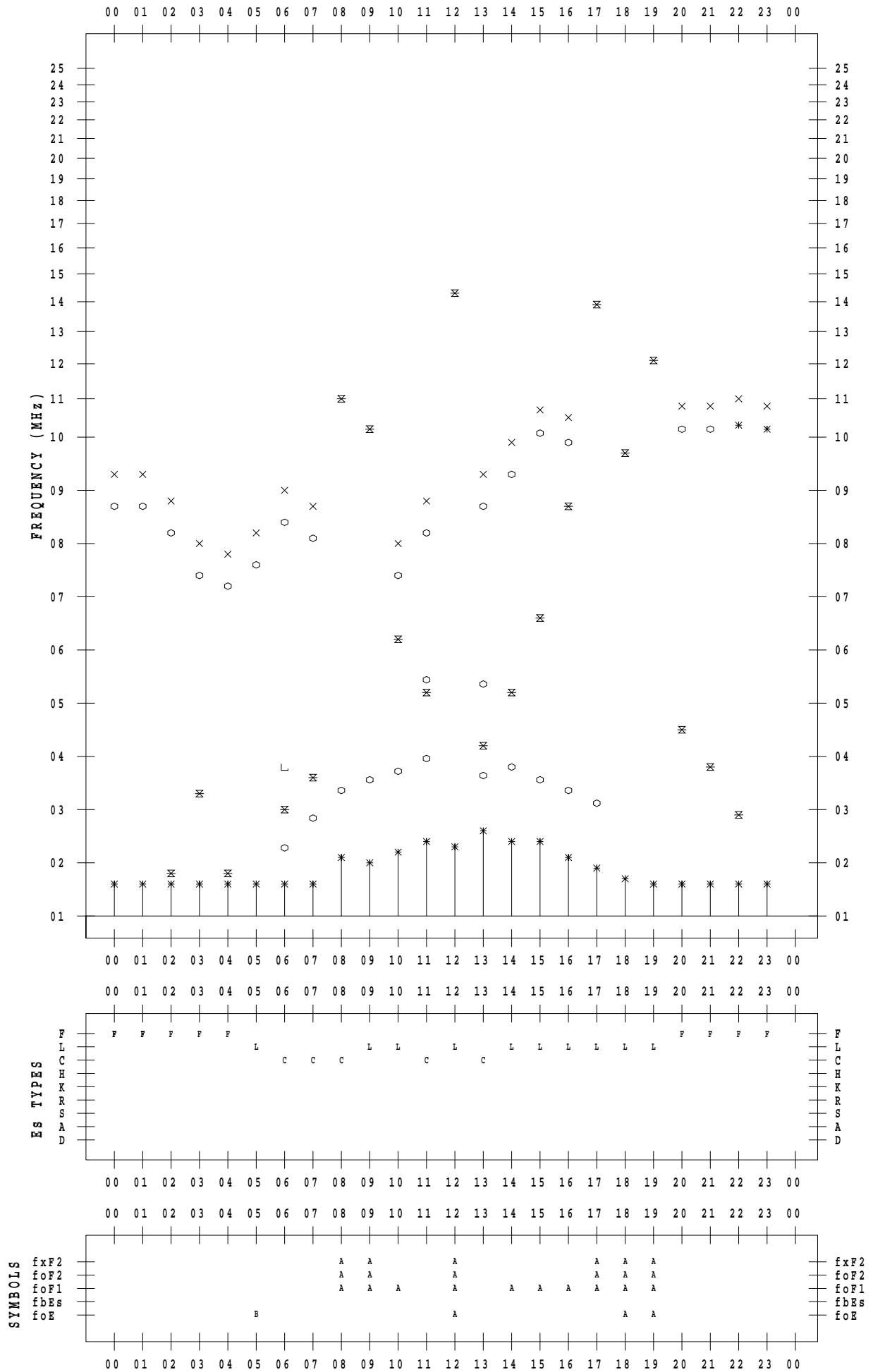
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 15

135 ° E MEAN TIME



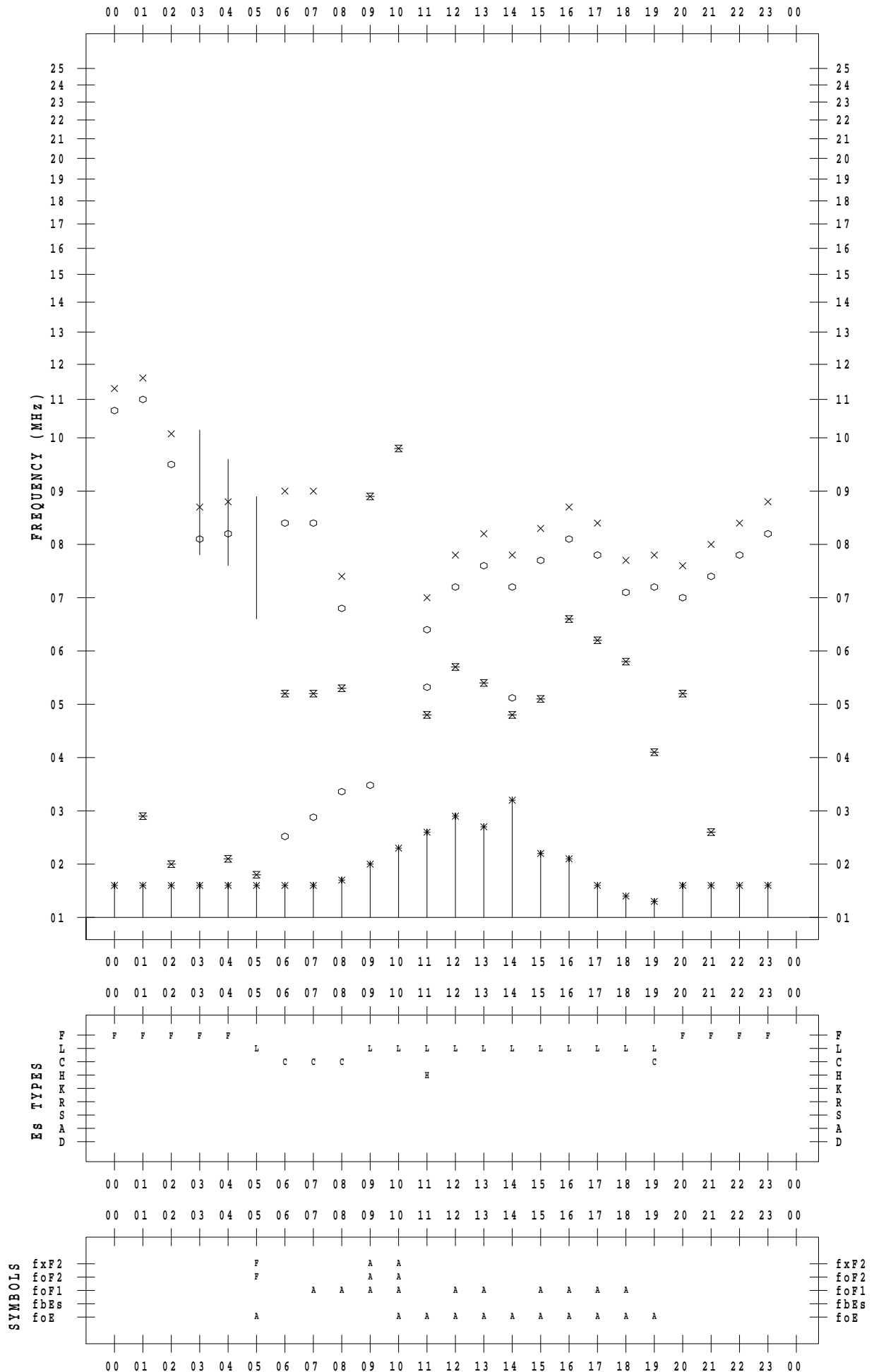
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 16

135 ° E MEAN TIME



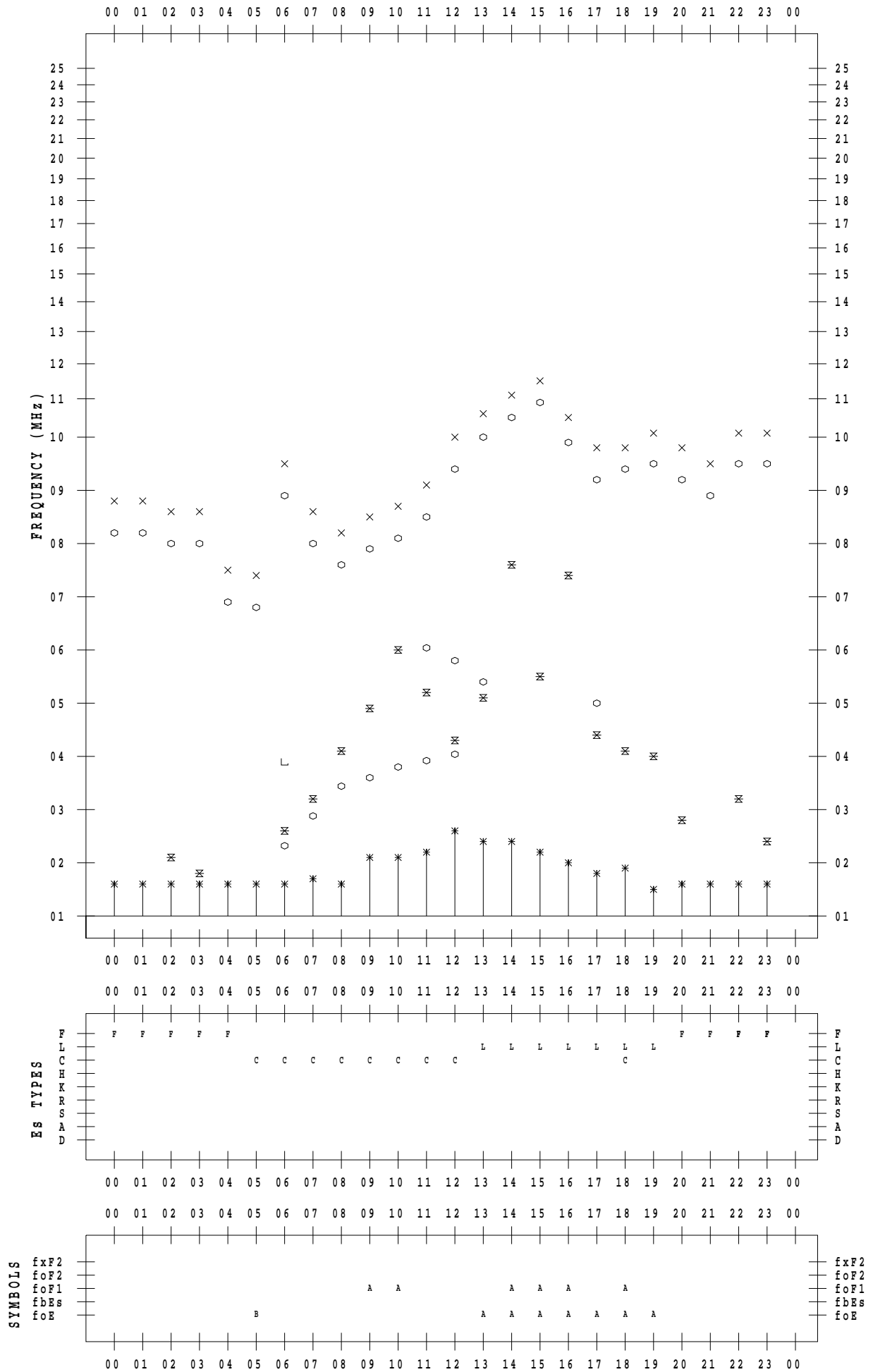
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 17

135 ° E MEAN TIME



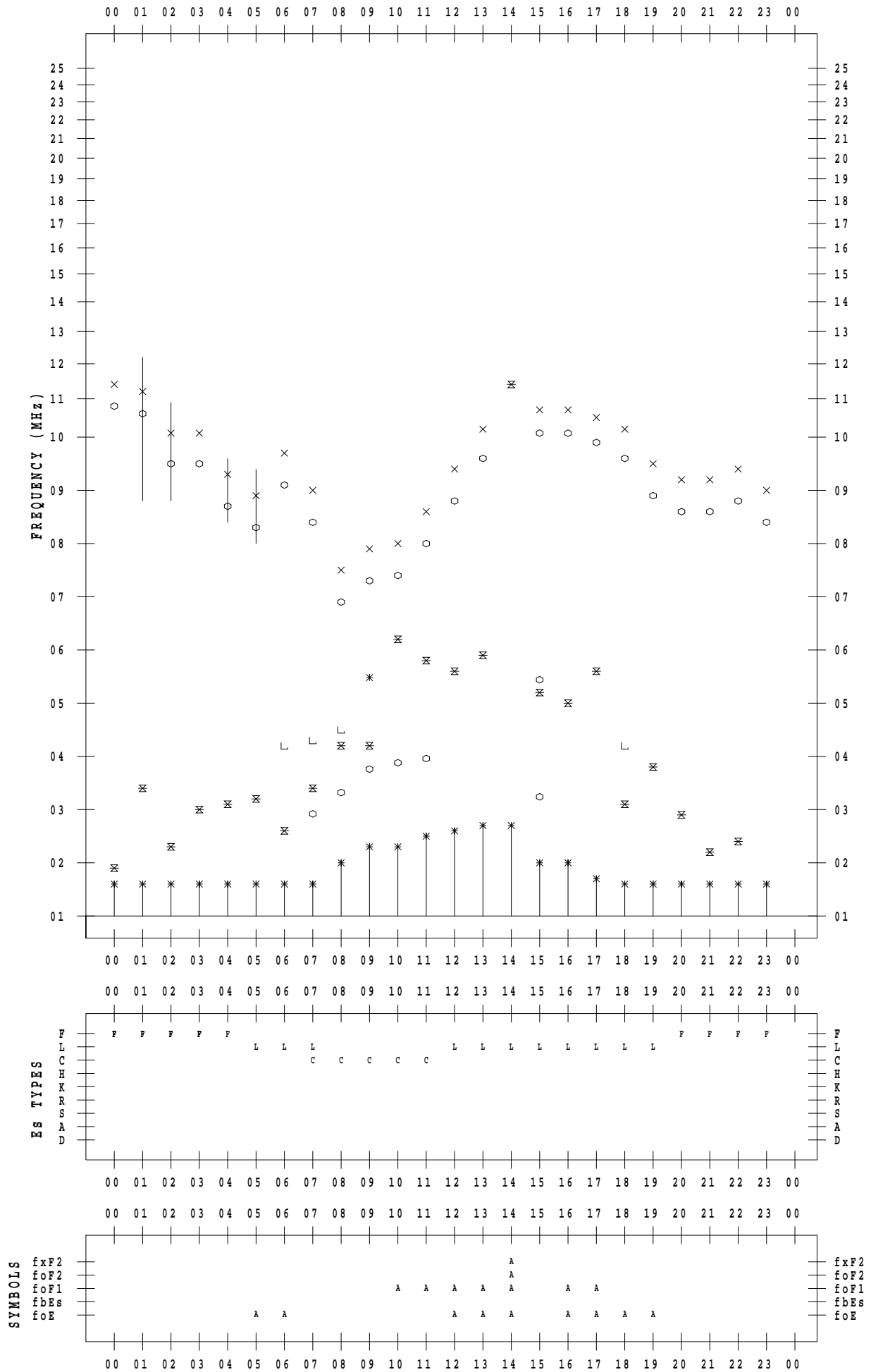
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 6/18

135 ° E MEAN TIME



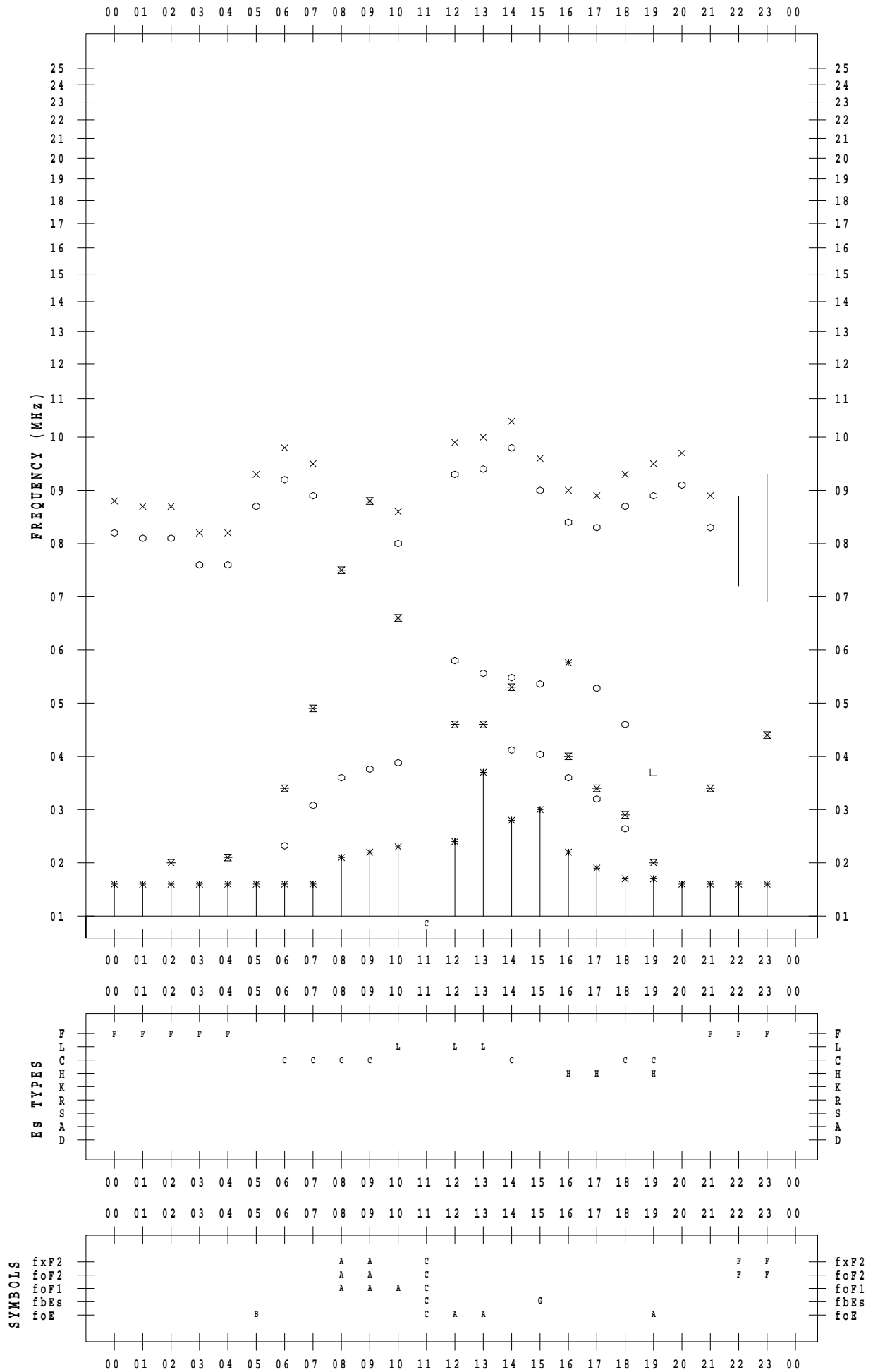
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 6/19

135 ° E MEAN TIME



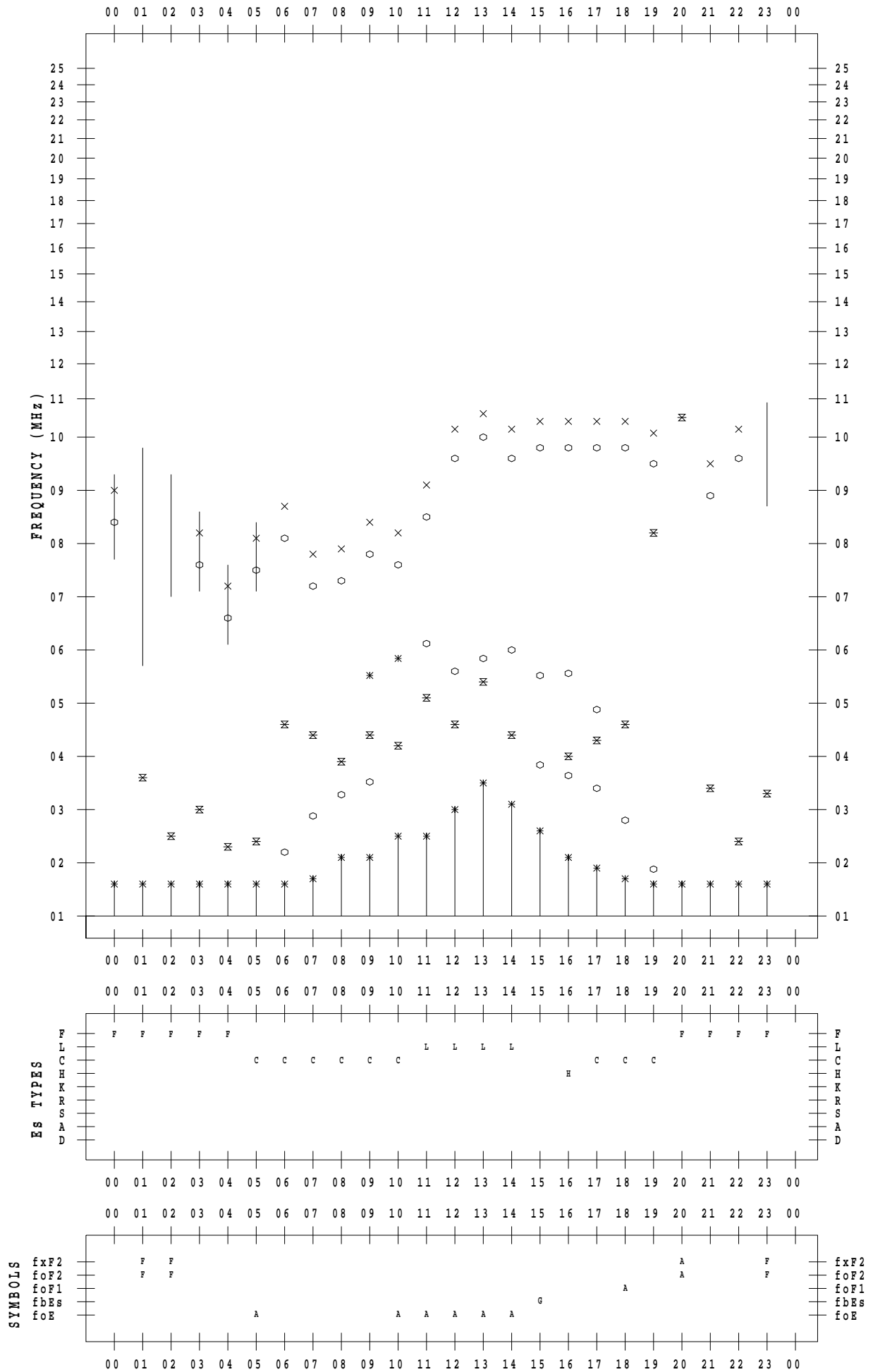
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 20

135 ° E MEAN TIME



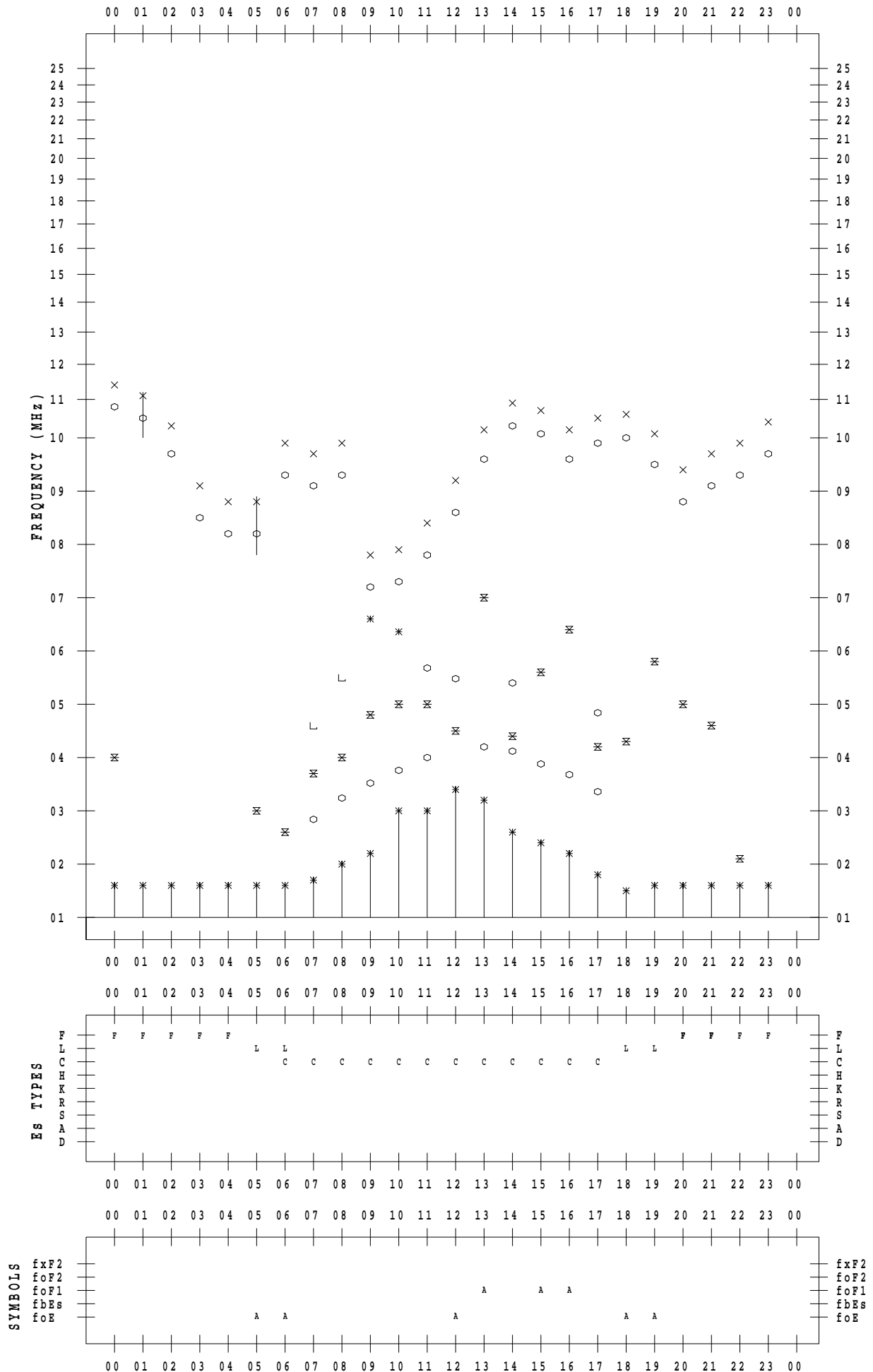
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 21

135 ° E MEAN TIME



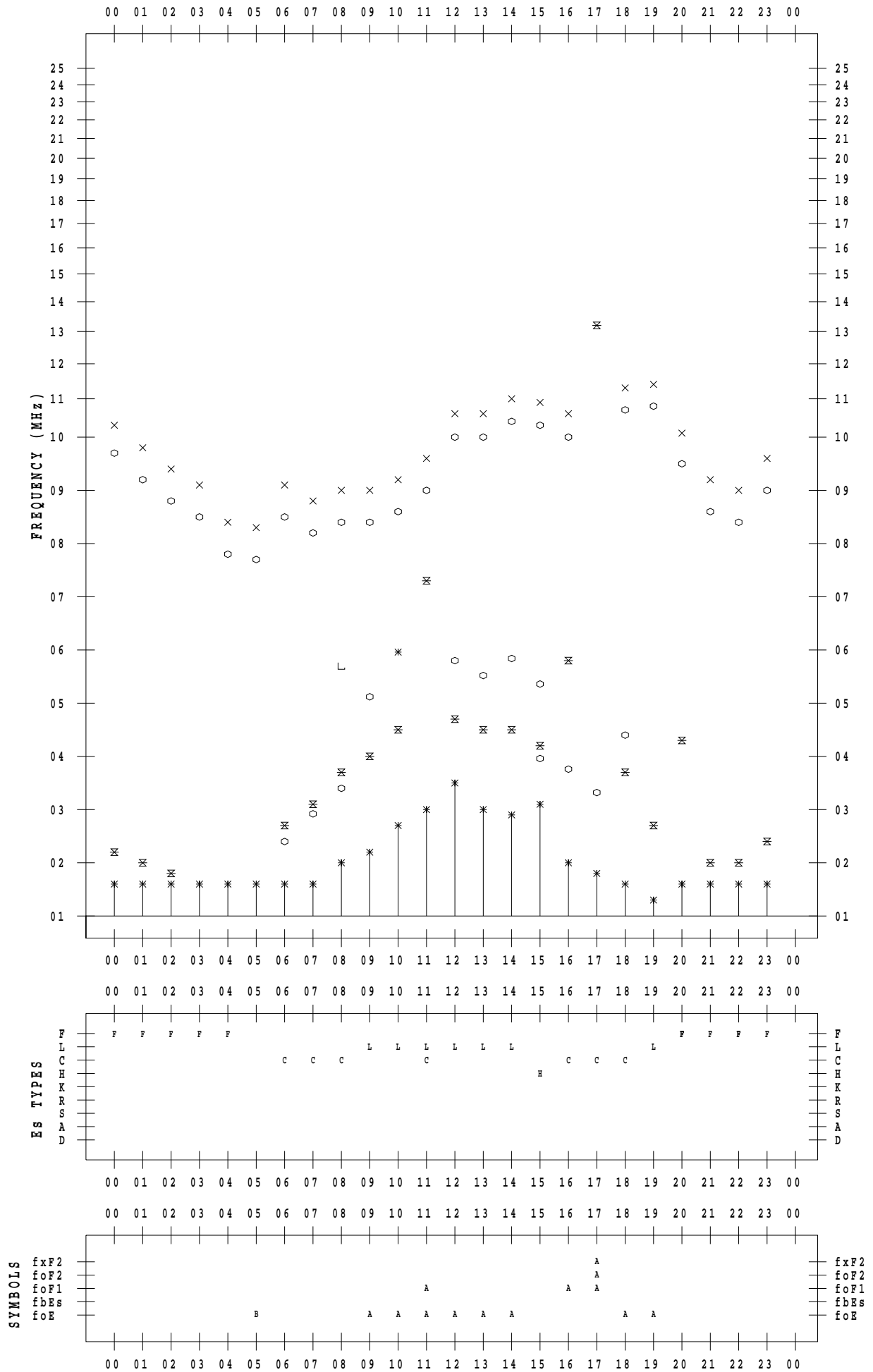
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 22

135 ° E MEAN TIME



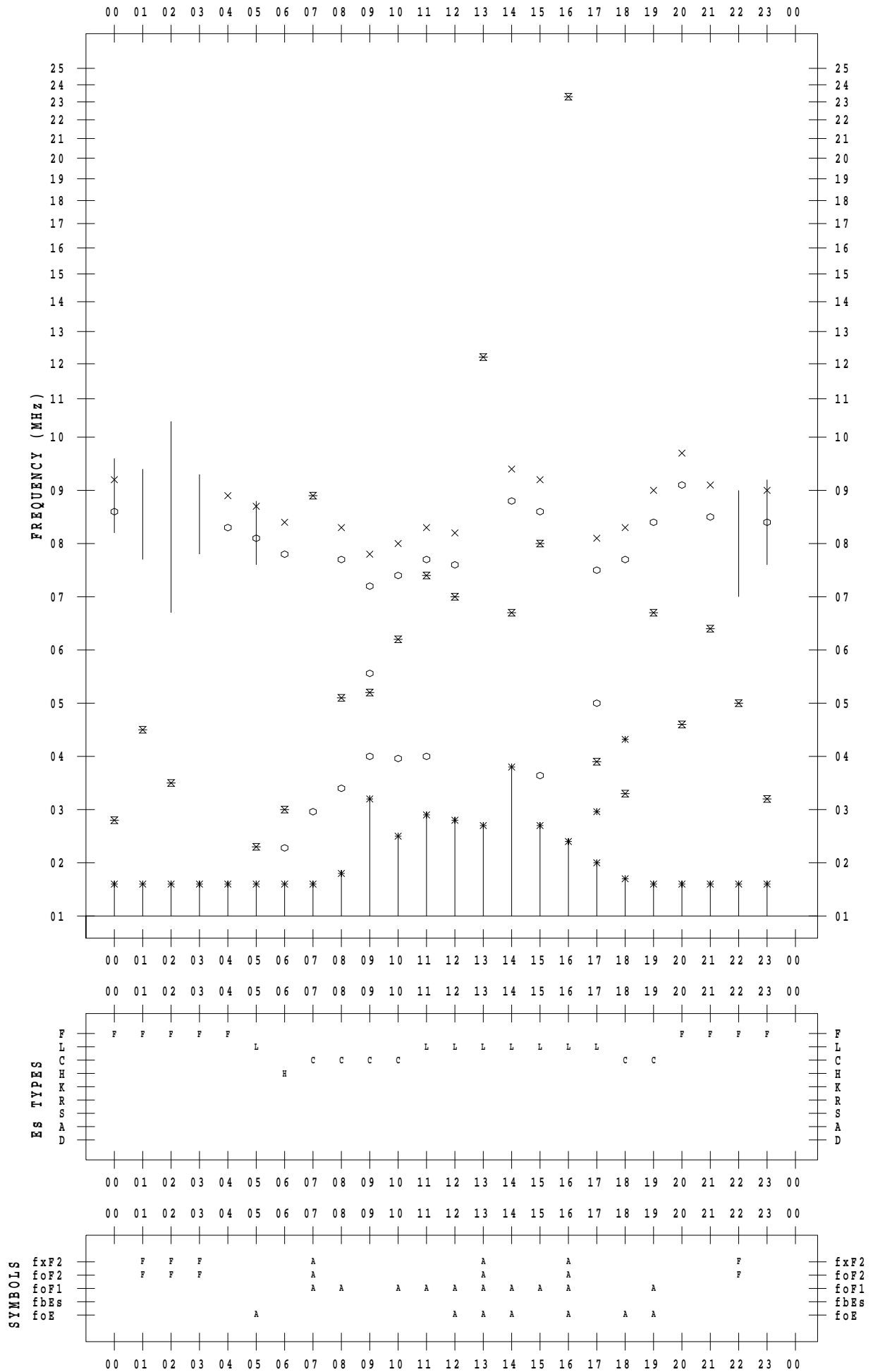
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 23

135 ° E MEAN TIME



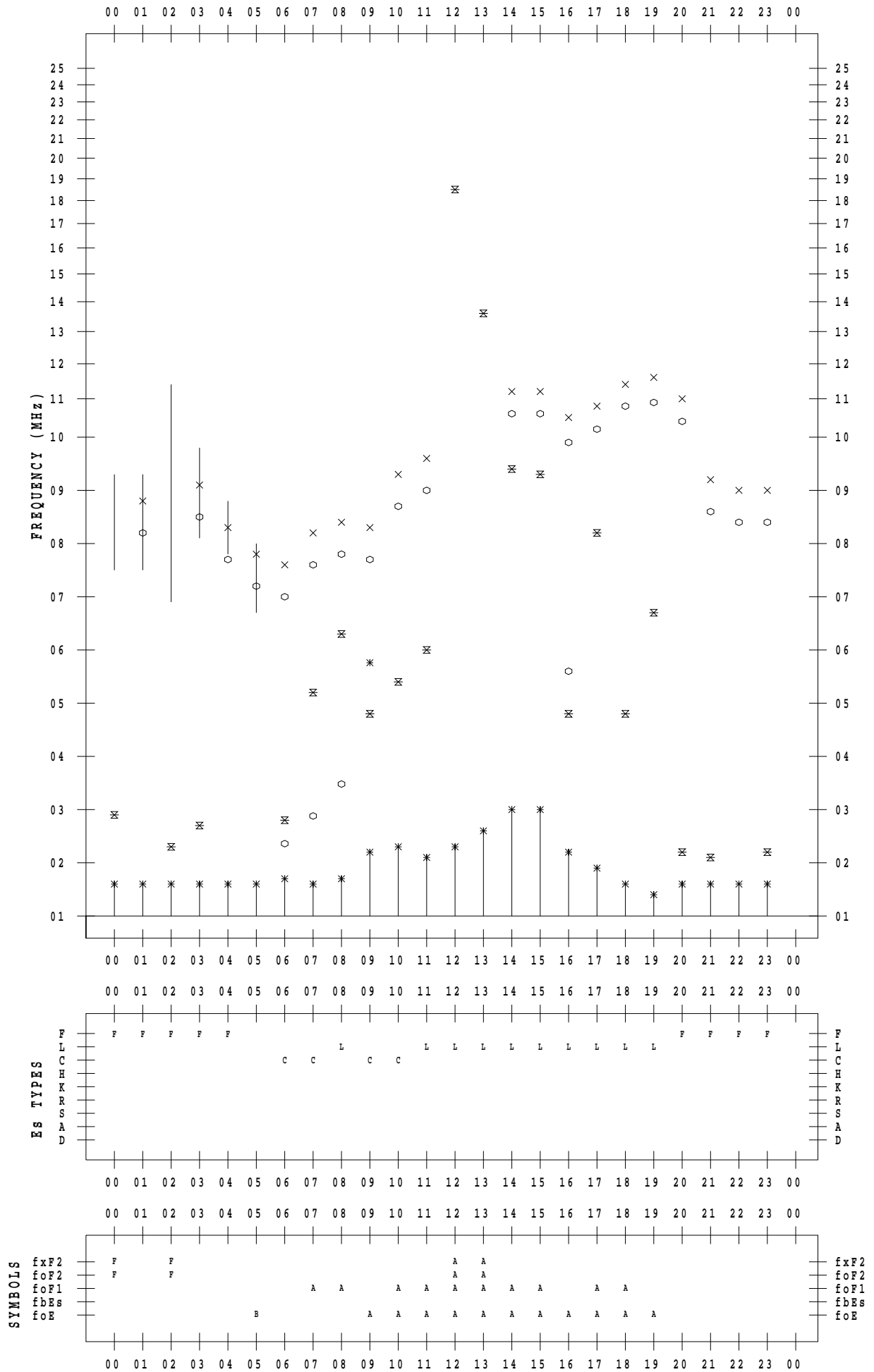
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 24

135 ° E MEAN TIME



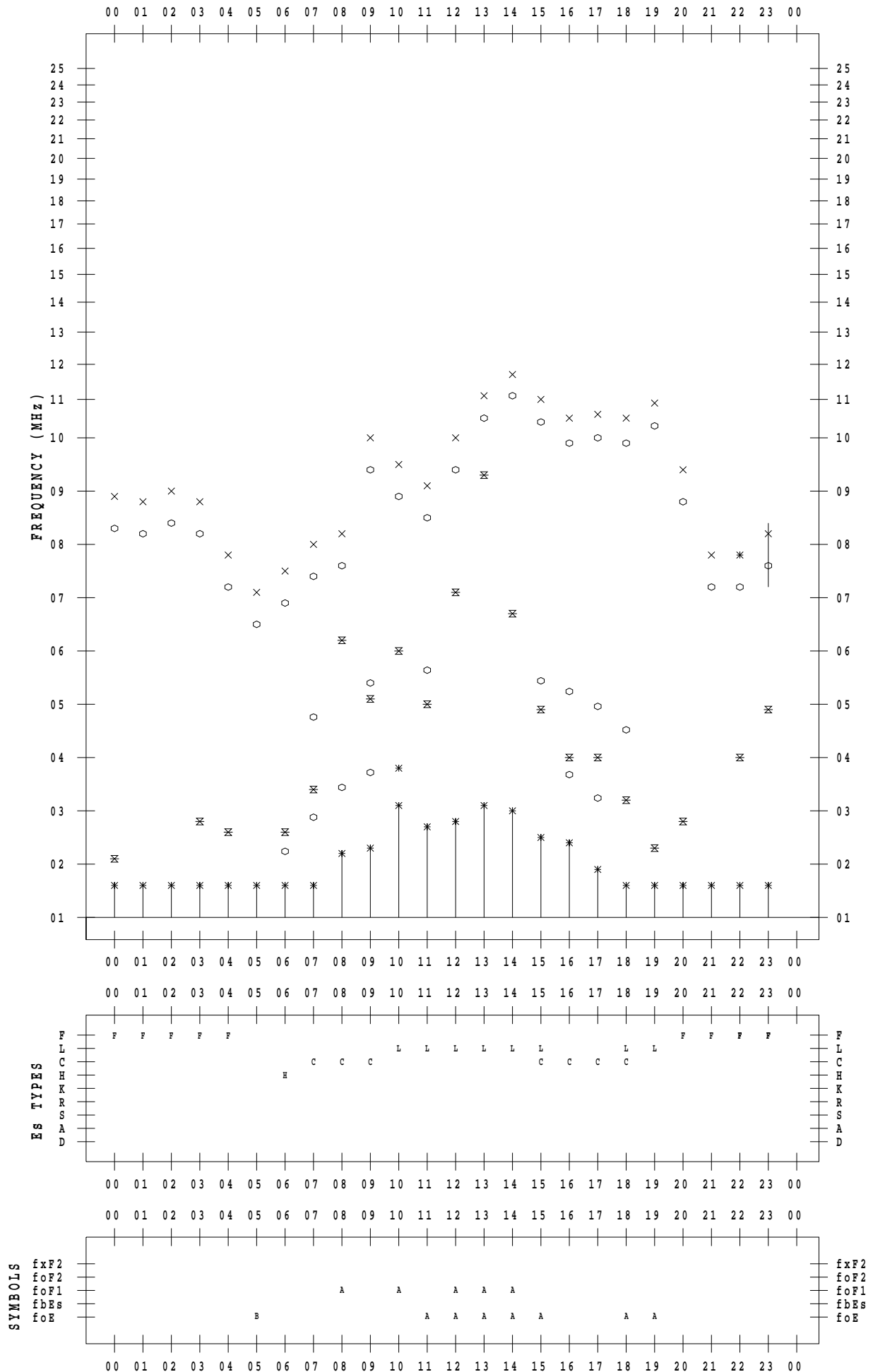
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 25

135 ° E MEAN TIME



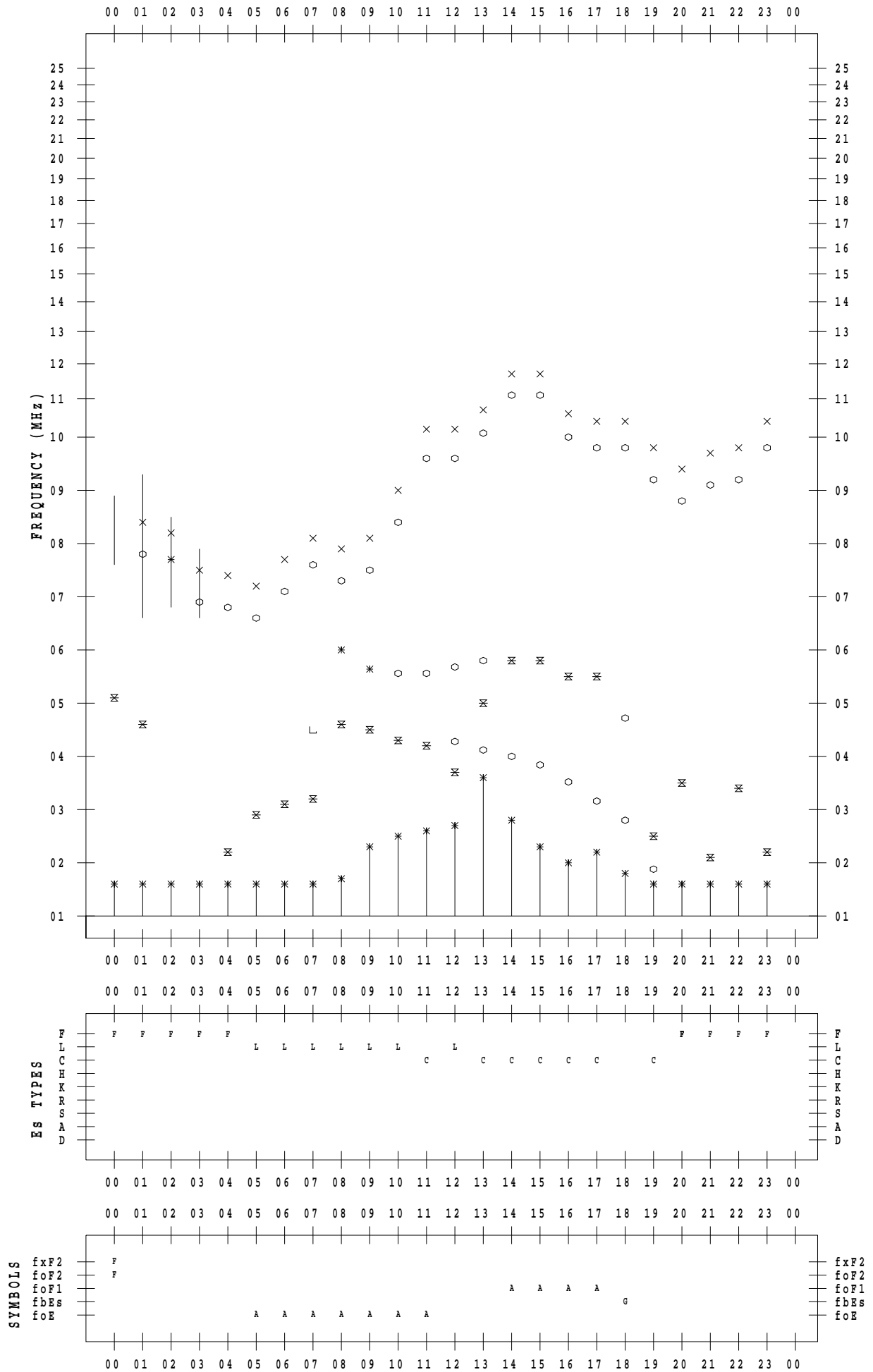
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023/ 6/26

135 ° E MEAN TIME



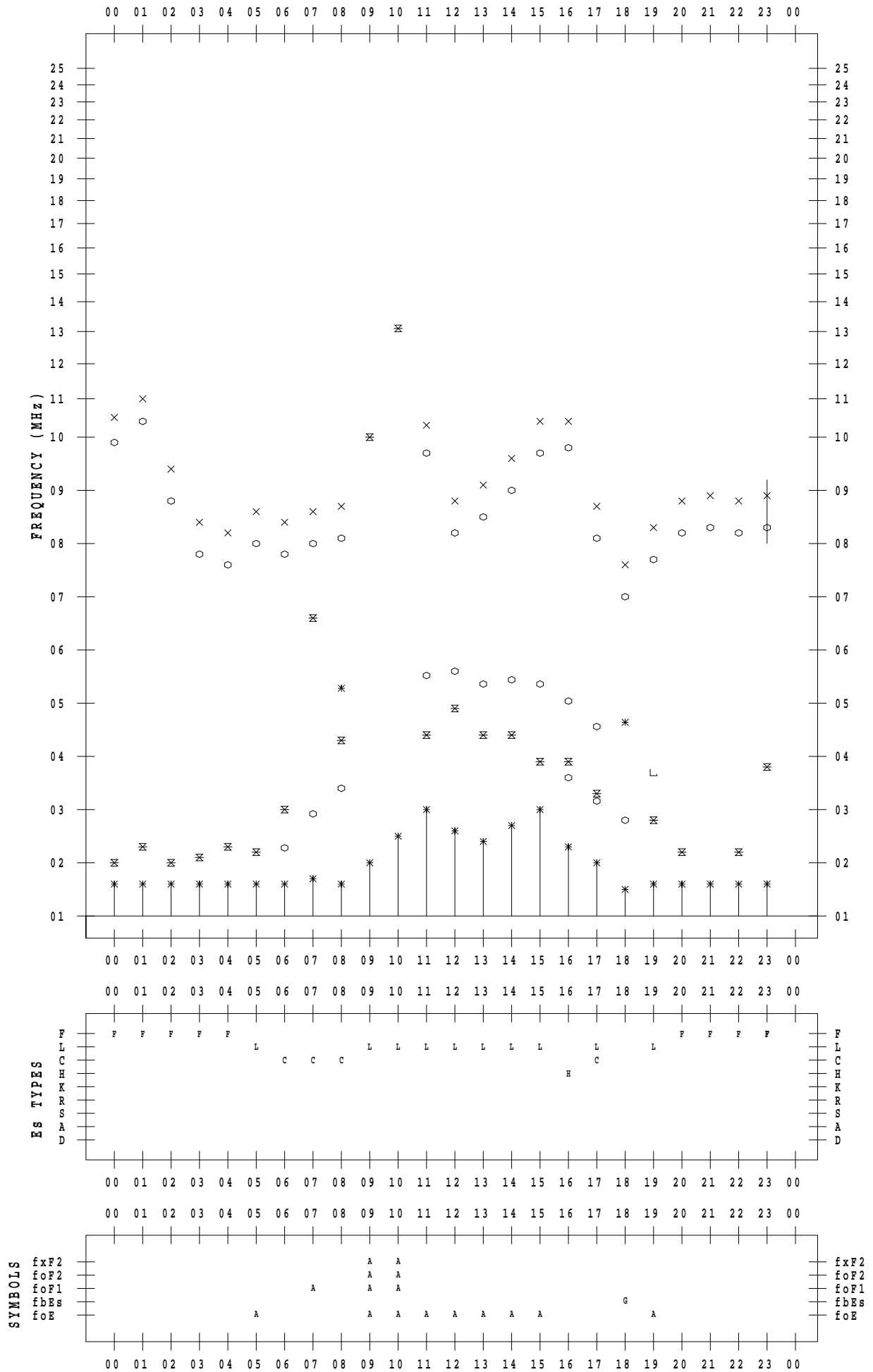
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 27

135 ° E MEAN TIME



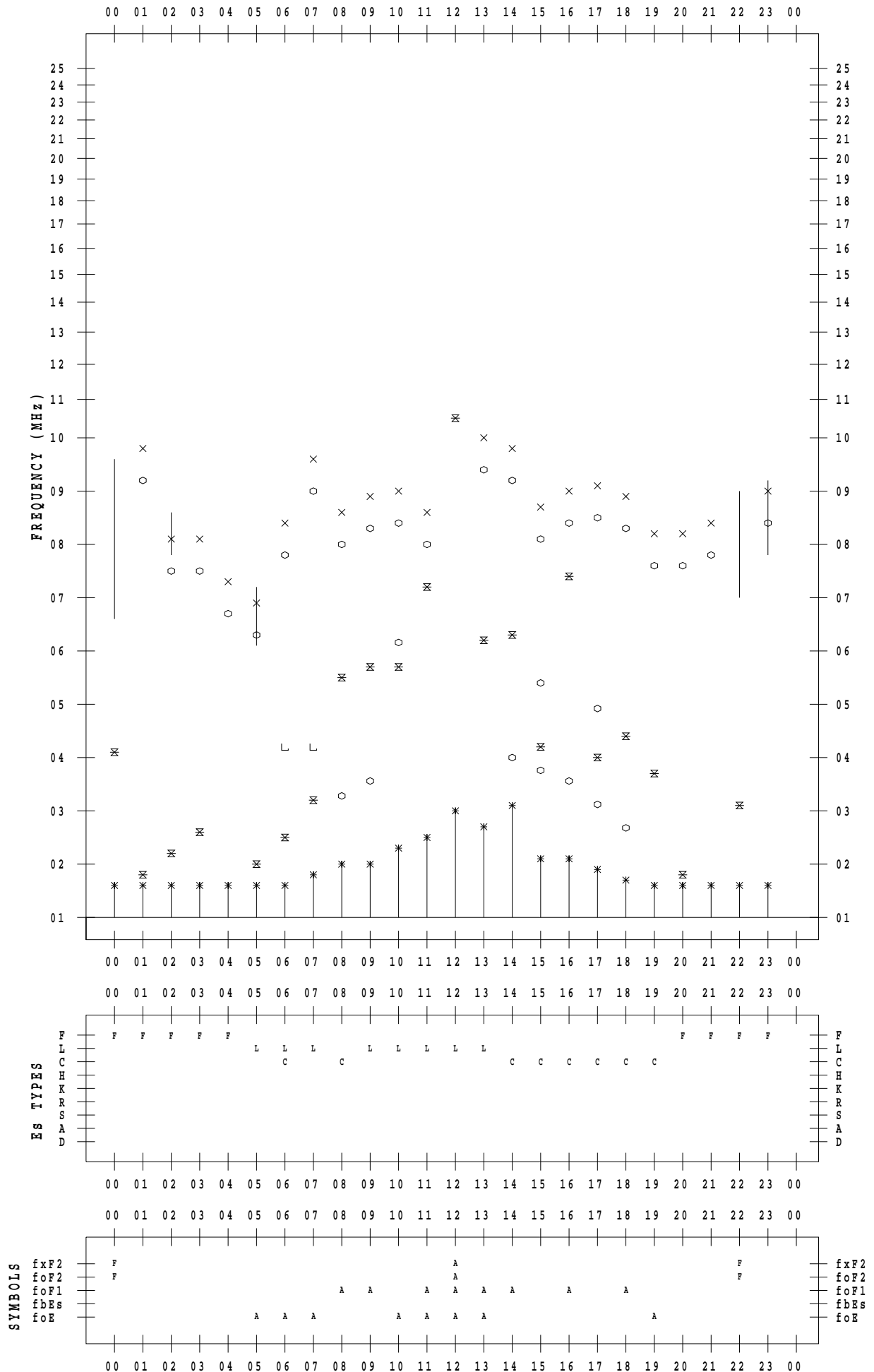
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 28

135 ° E MEAN TIME



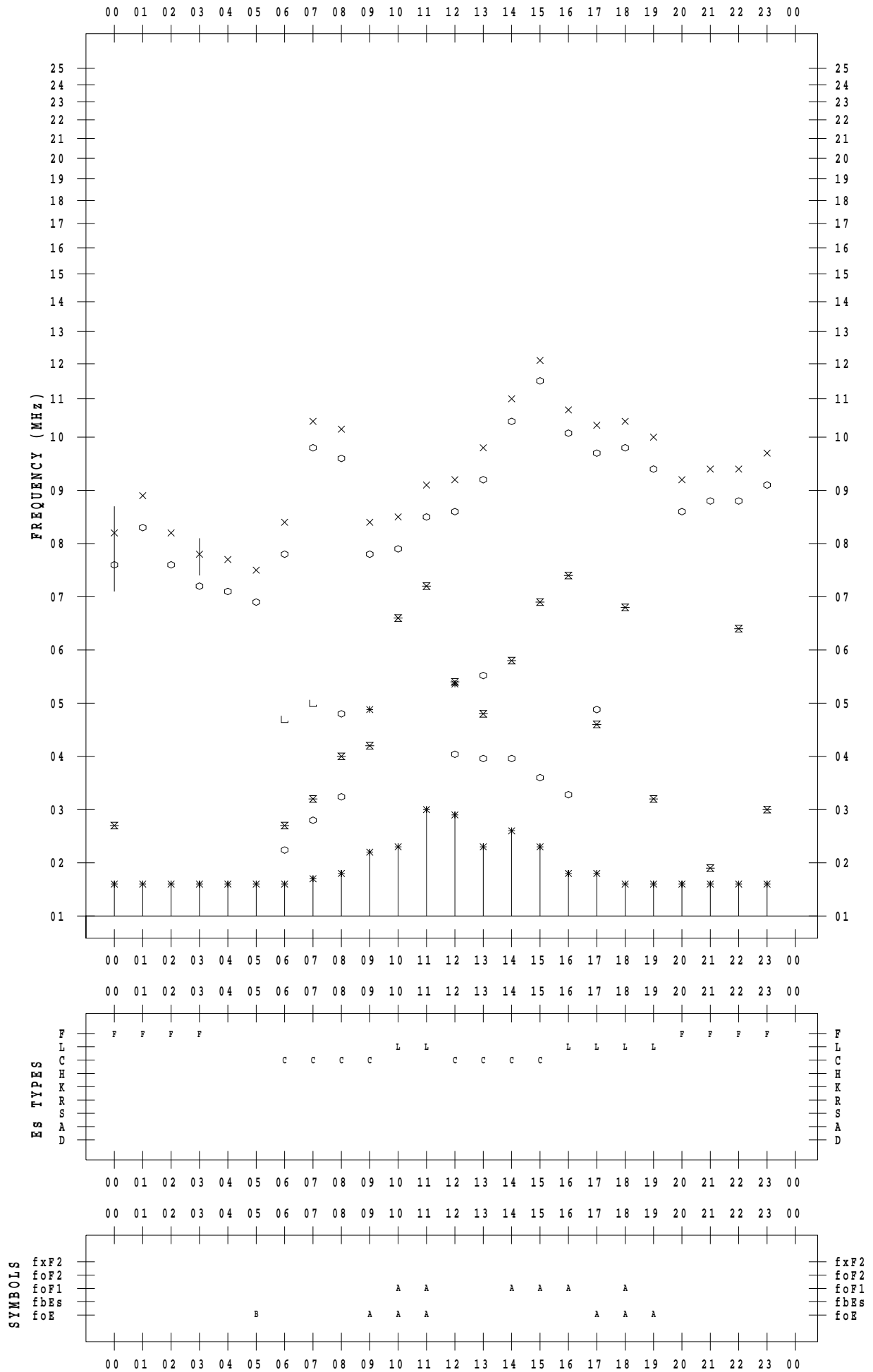
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 29

135 ° E MEAN TIME



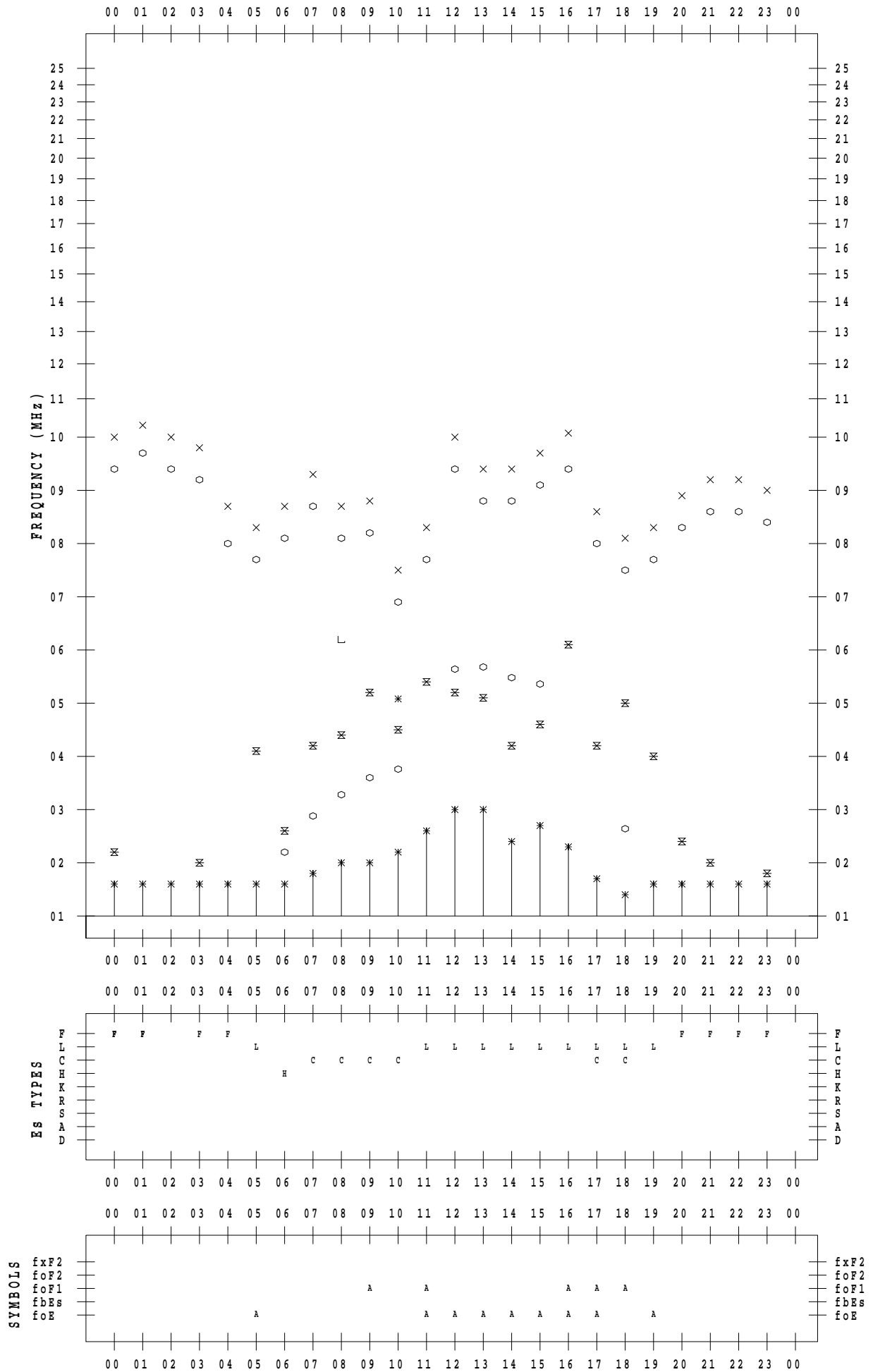
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SCALER : I.YAMAZAKI

STATION : Yamagawa

DATE : 2023 / 6 / 30

135 ° E MEAN TIME



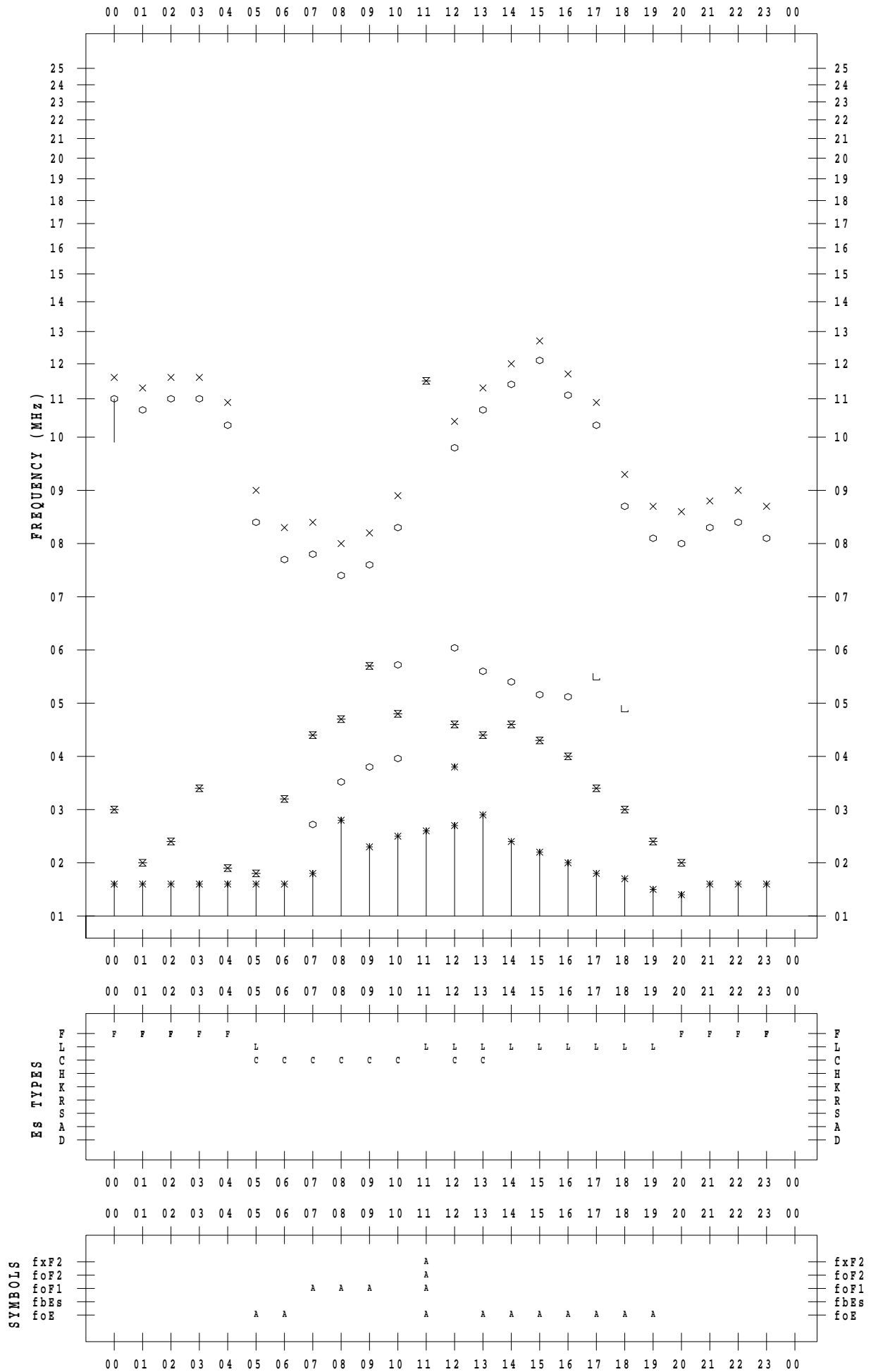
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 1

135 ° E MEAN TIME



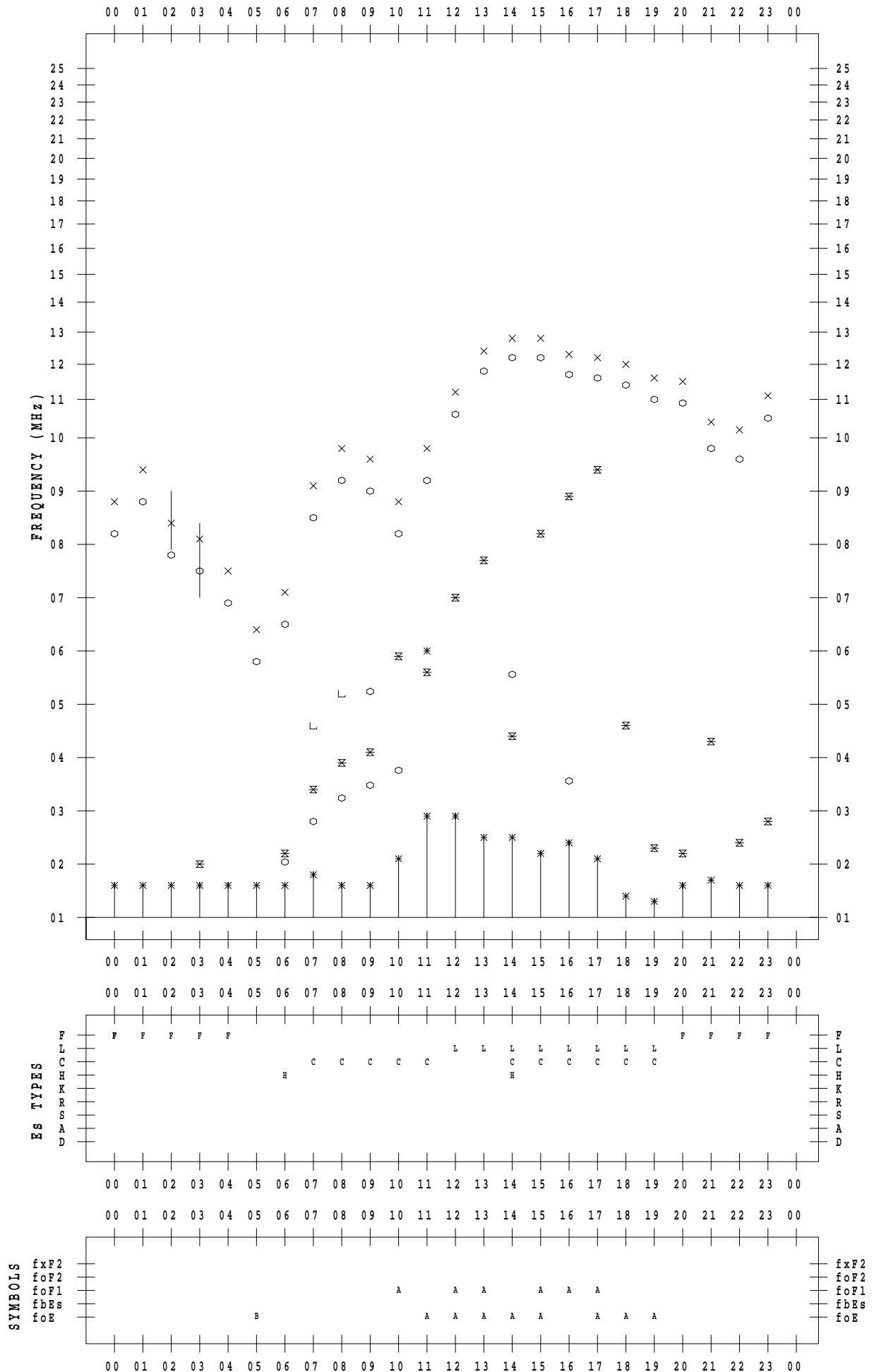
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 2

135 ° E MEAN TIME



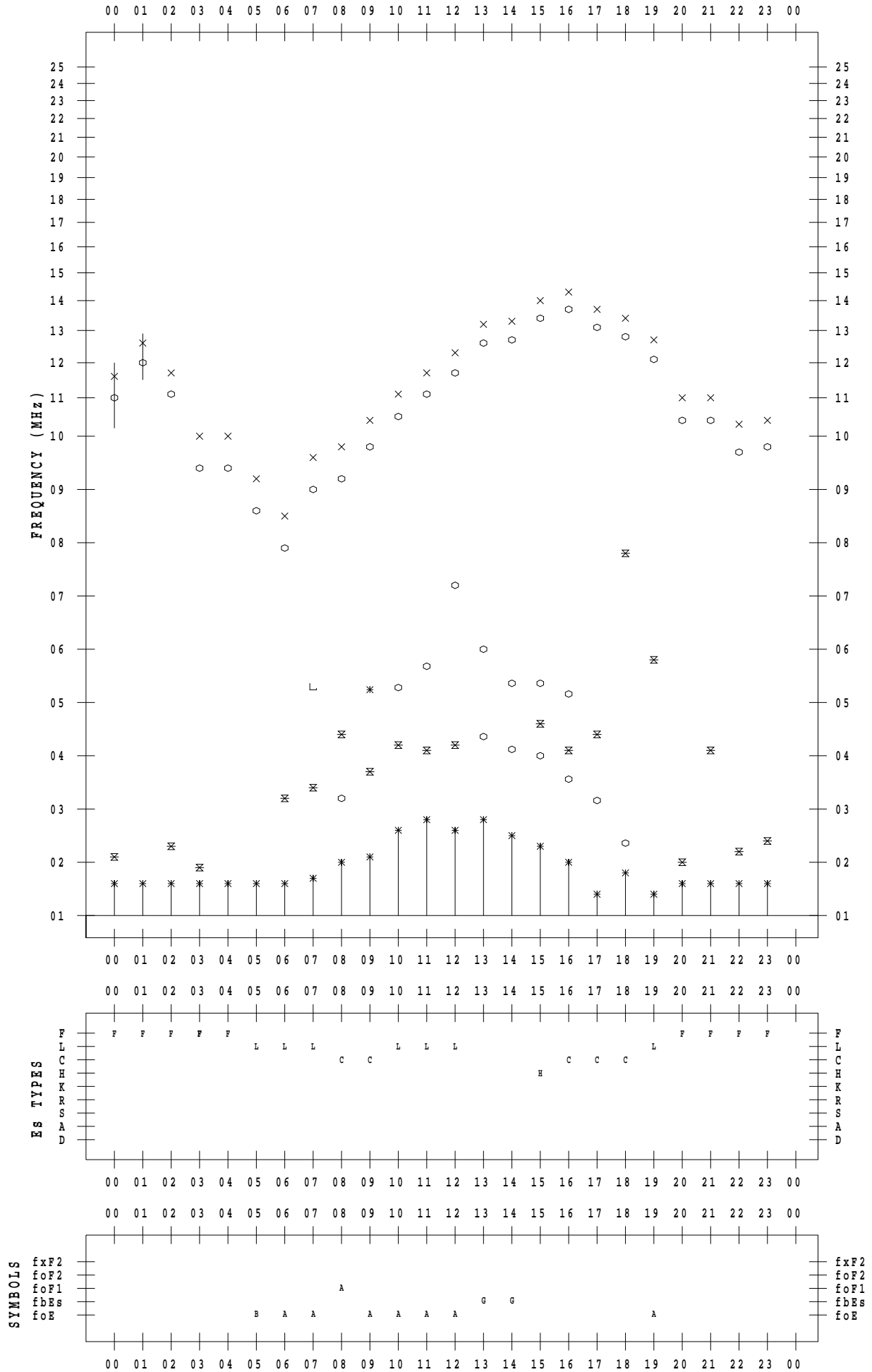
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SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 3

135 ° E MEAN TIME



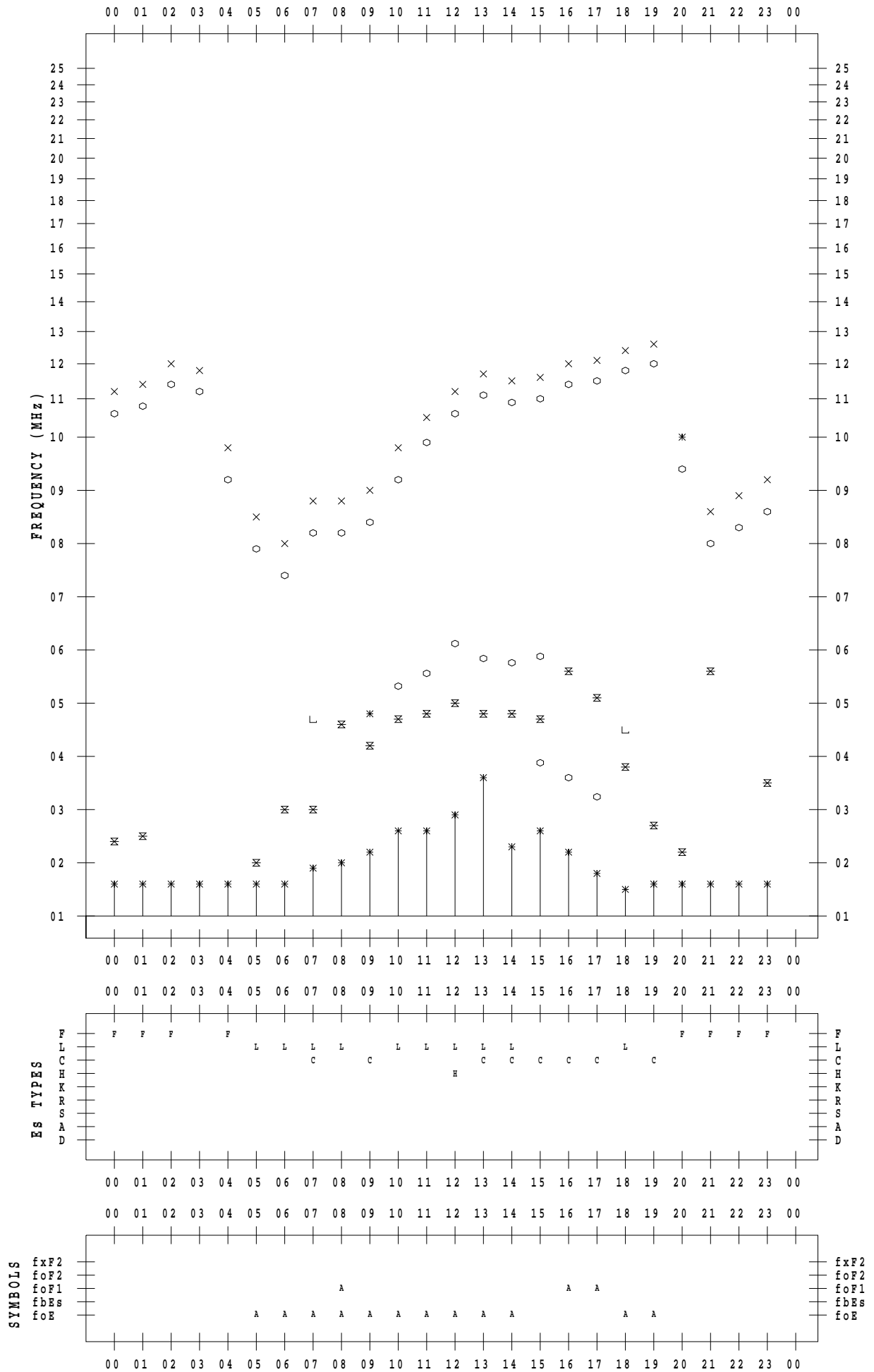
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 4

135 ° E MEAN TIME



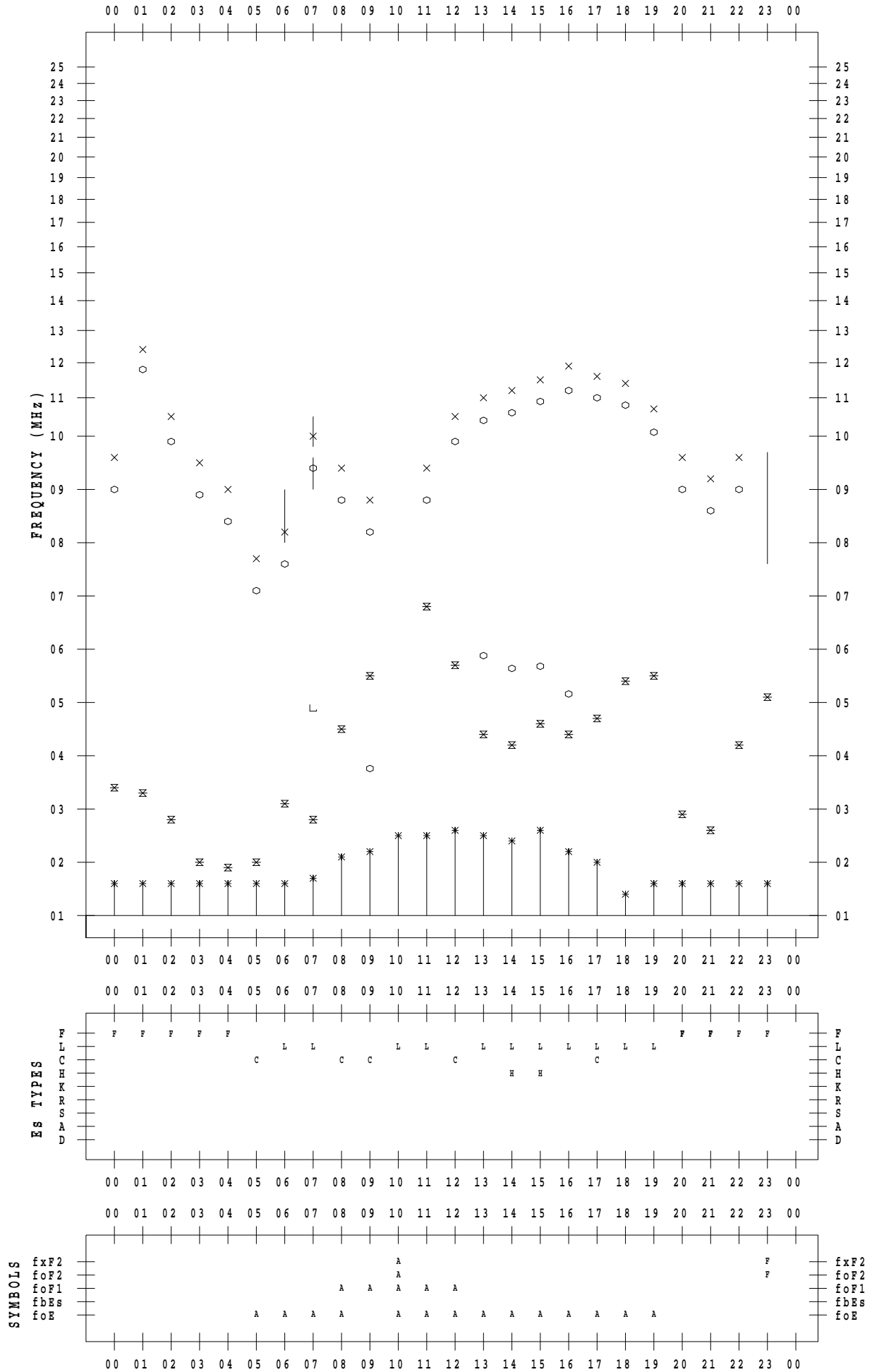
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 6/ 5

135 ° E MEAN TIME



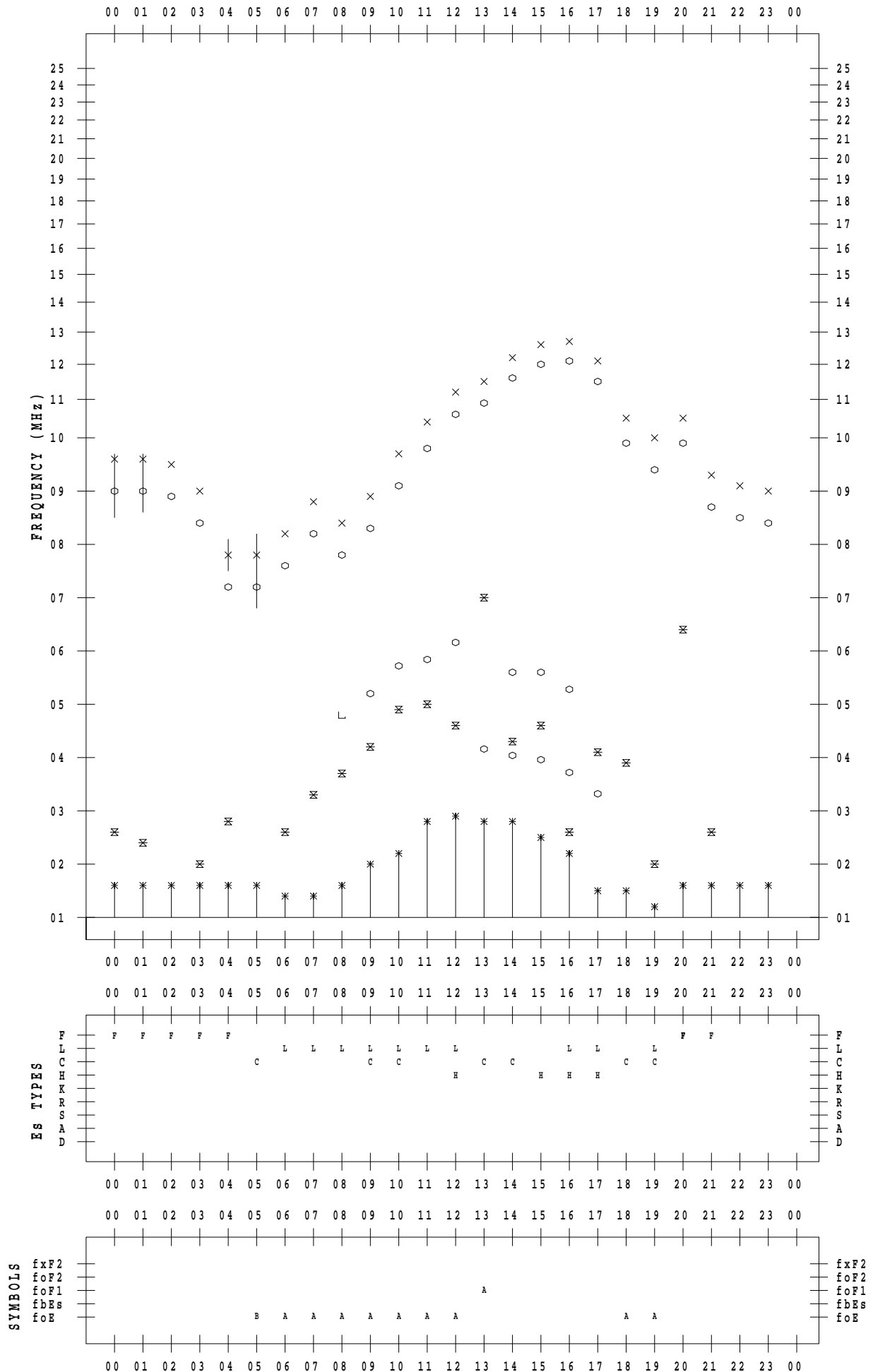
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 6/ 6

135 ° E MEAN TIME



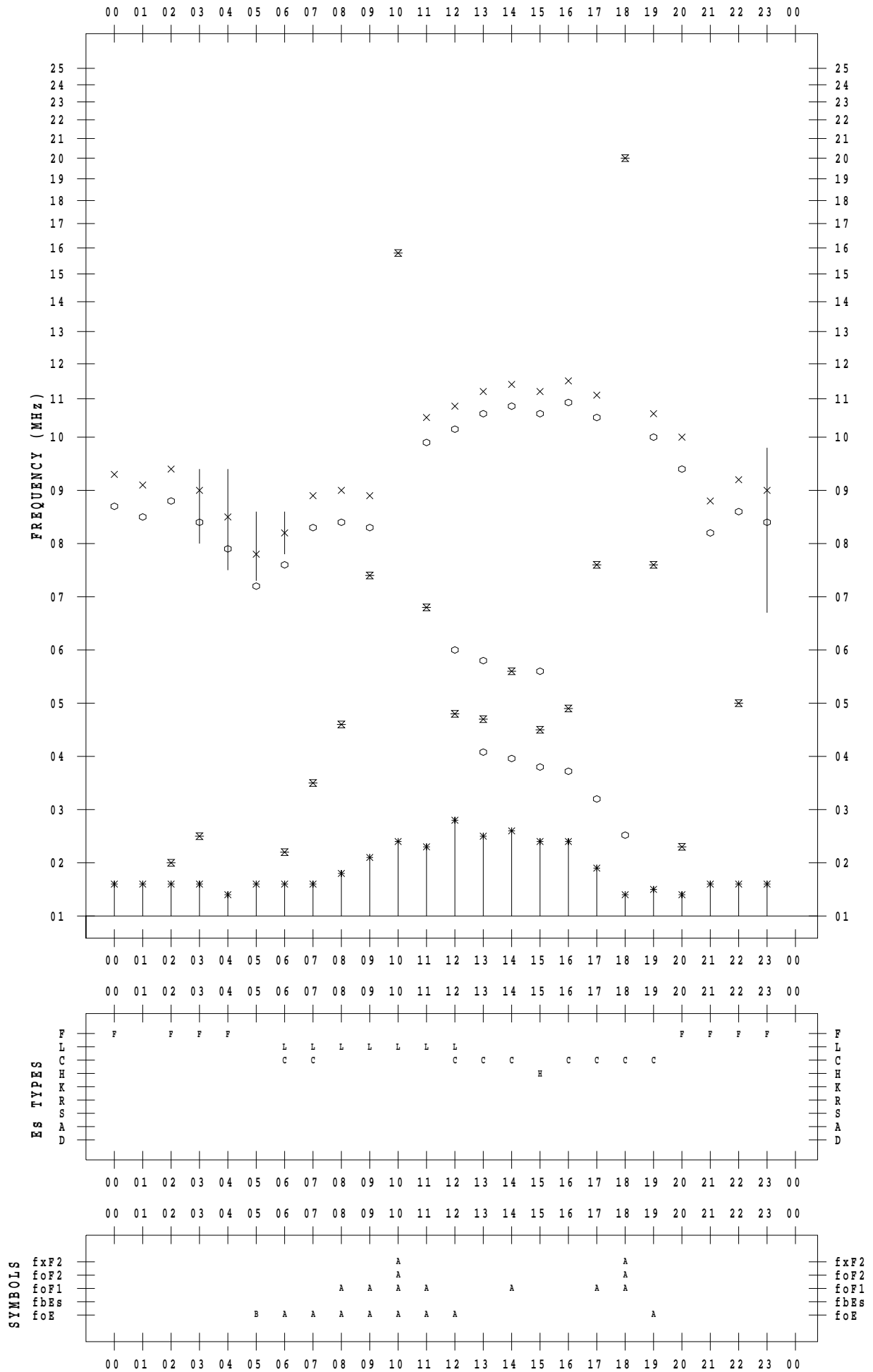
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 7

135 ° E MEAN TIME



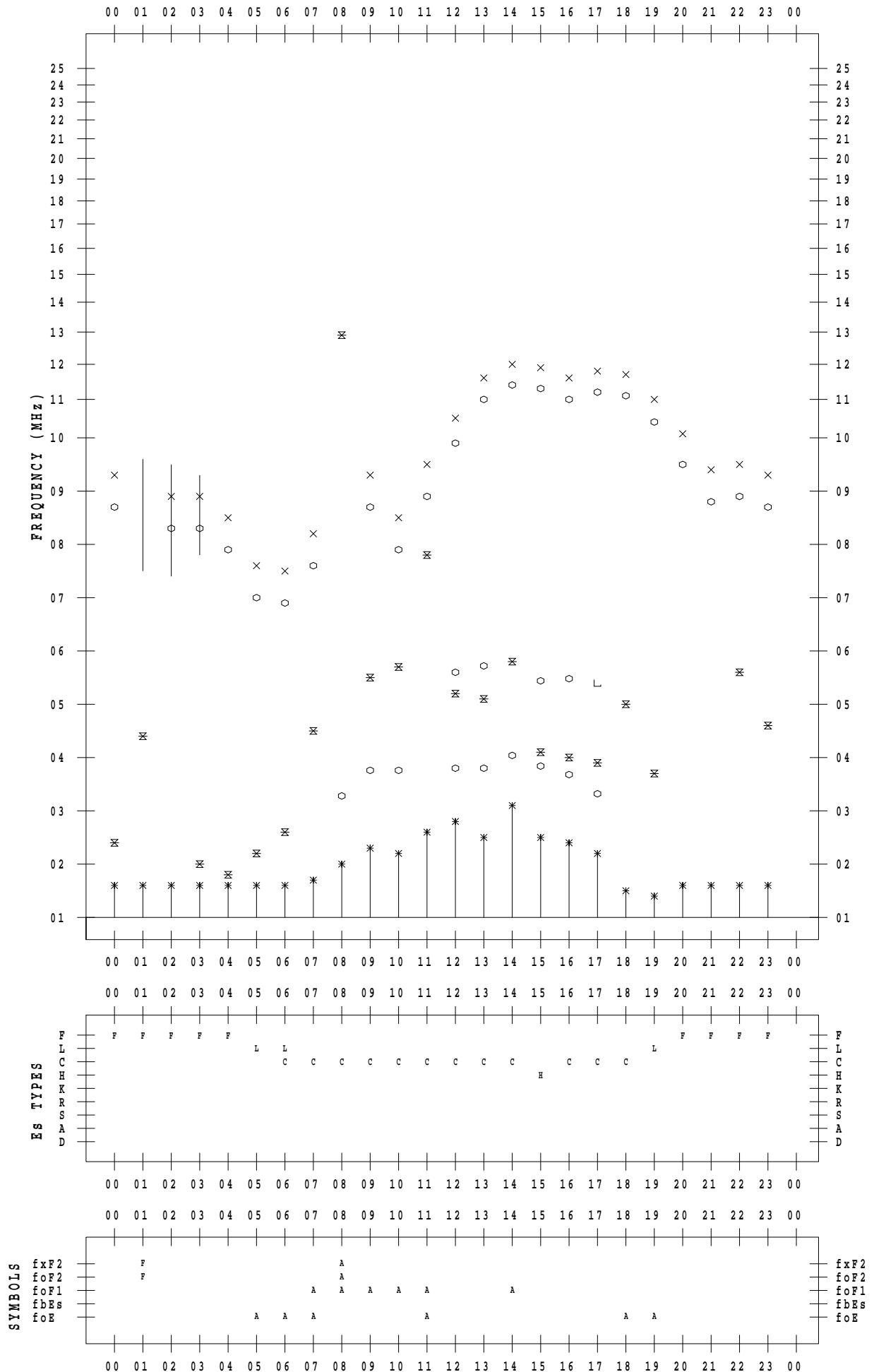
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 8

135 ° E MEAN TIME



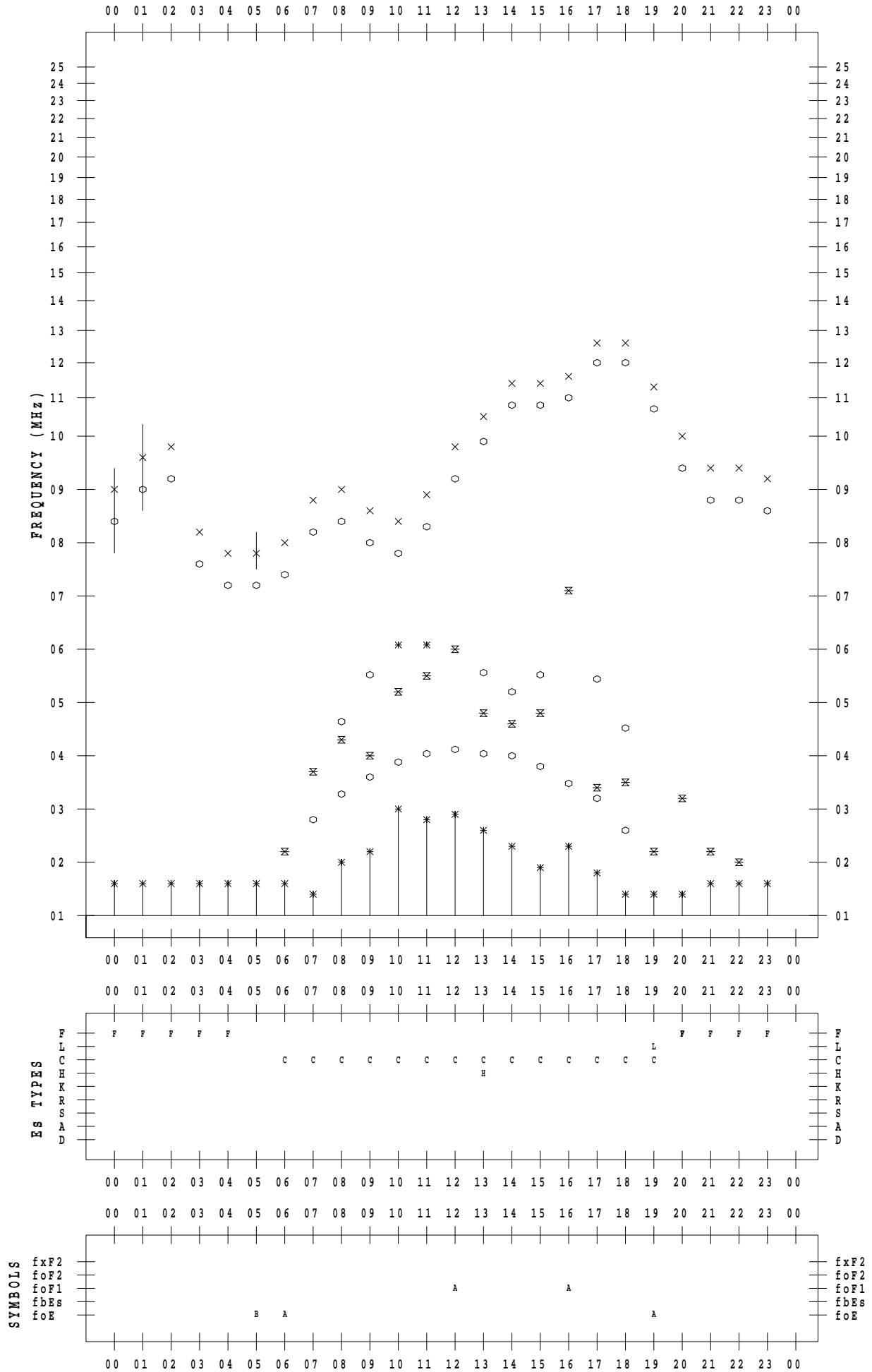
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 9

135 ° E MEAN TIME



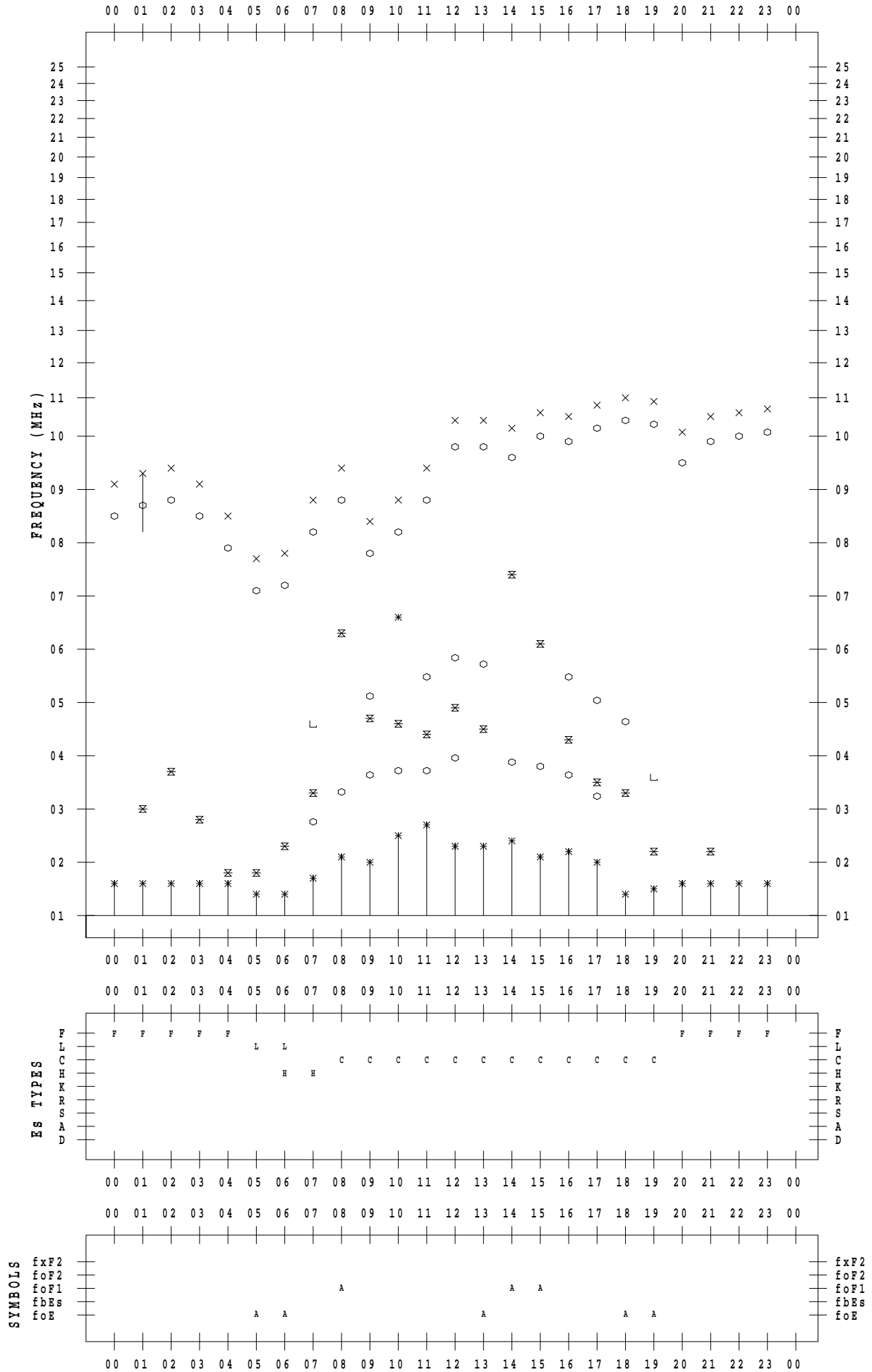
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 10

135 ° E MEAN TIME



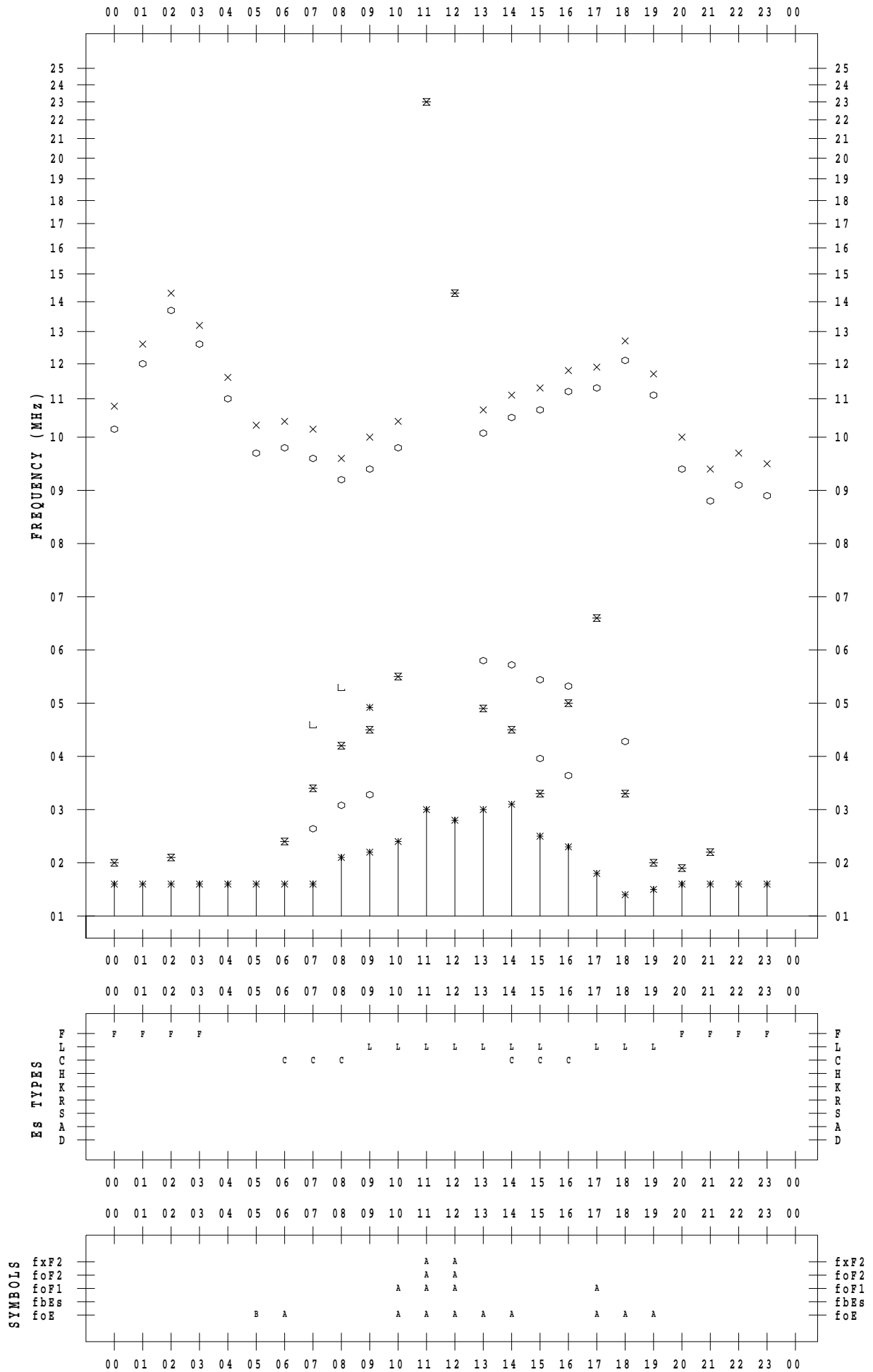
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 6/11

135 ° E MEAN TIME



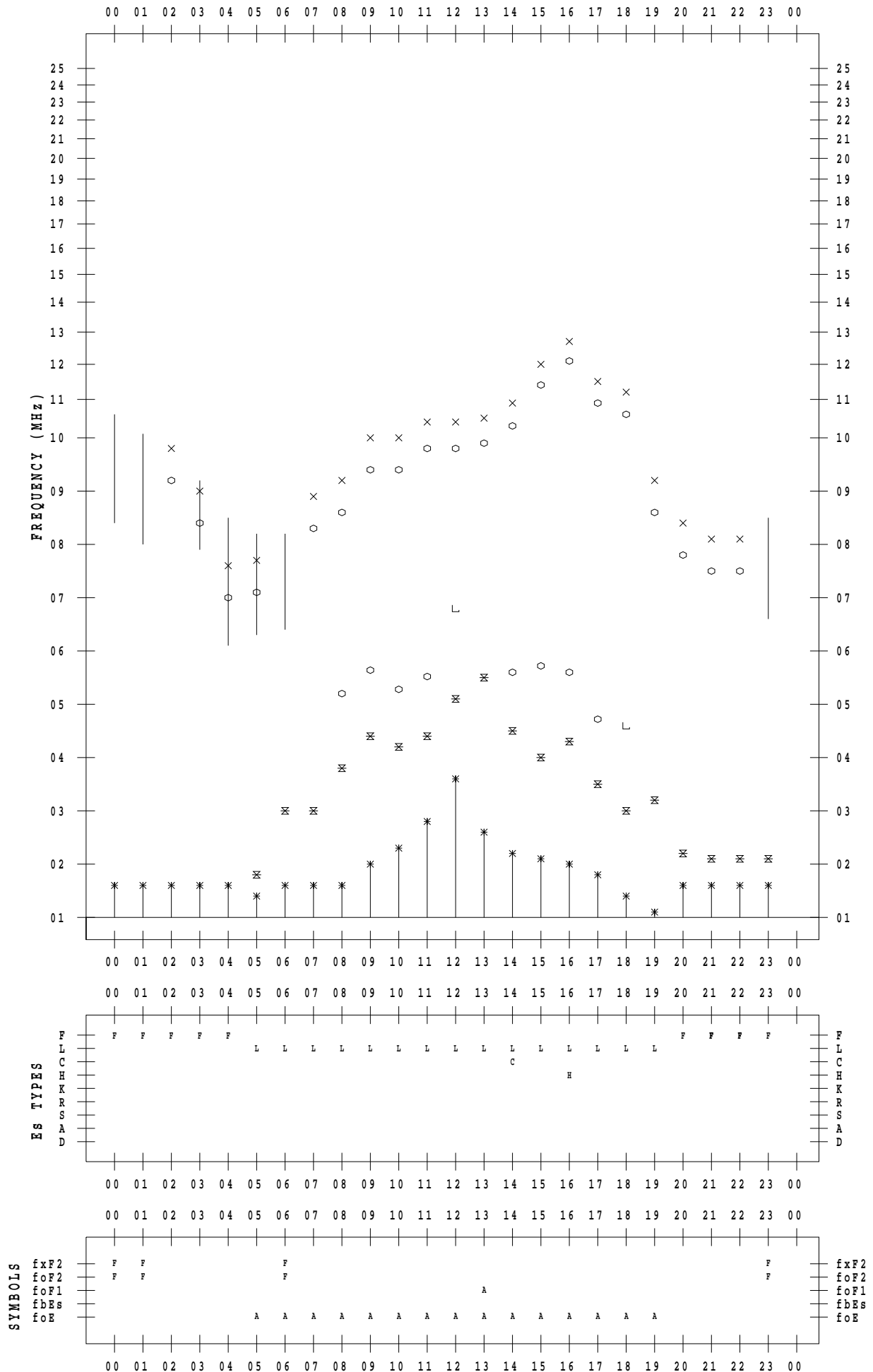
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 12

135 ° E MEAN TIME



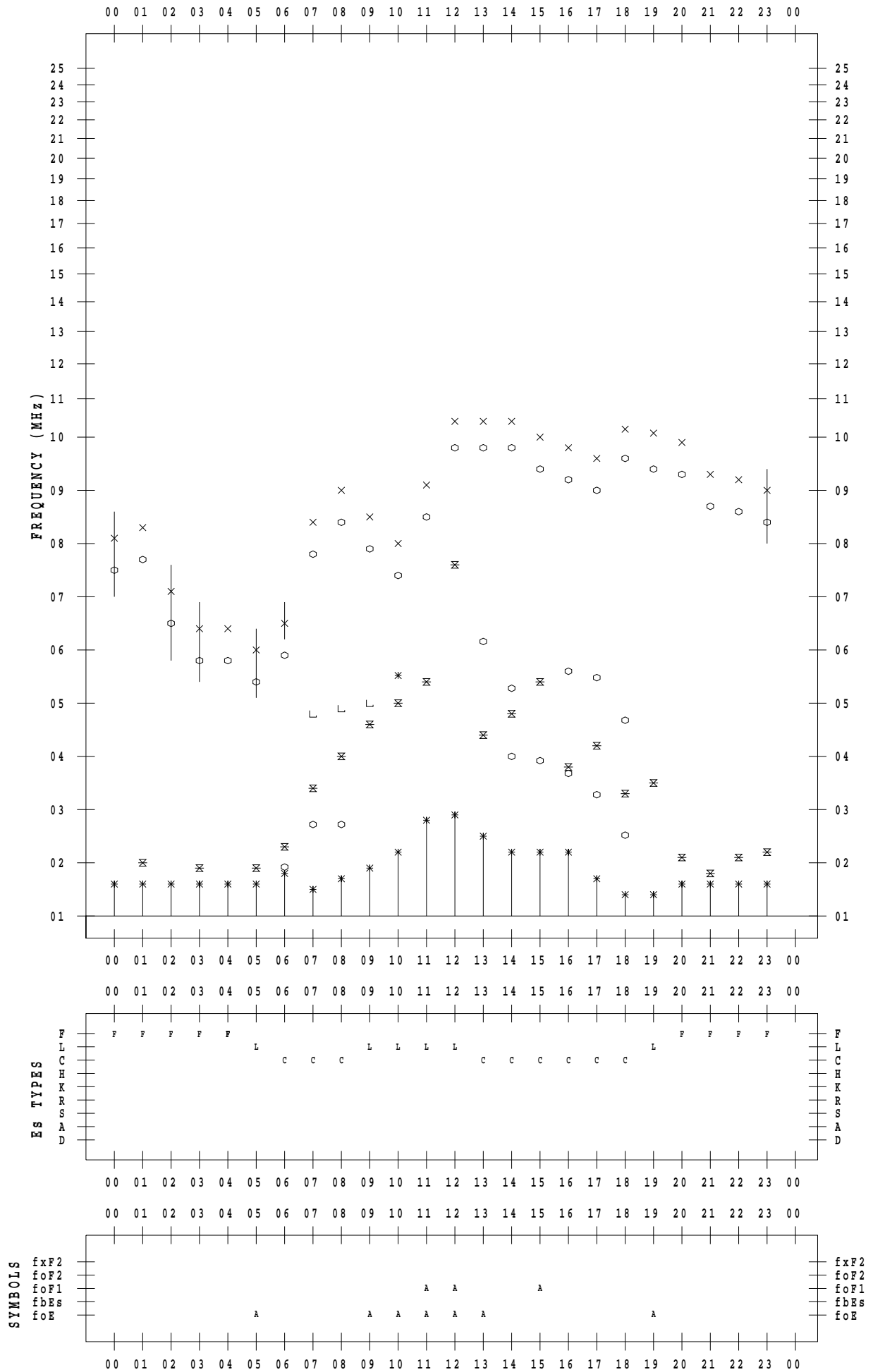
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 6/13

135 ° E MEAN TIME



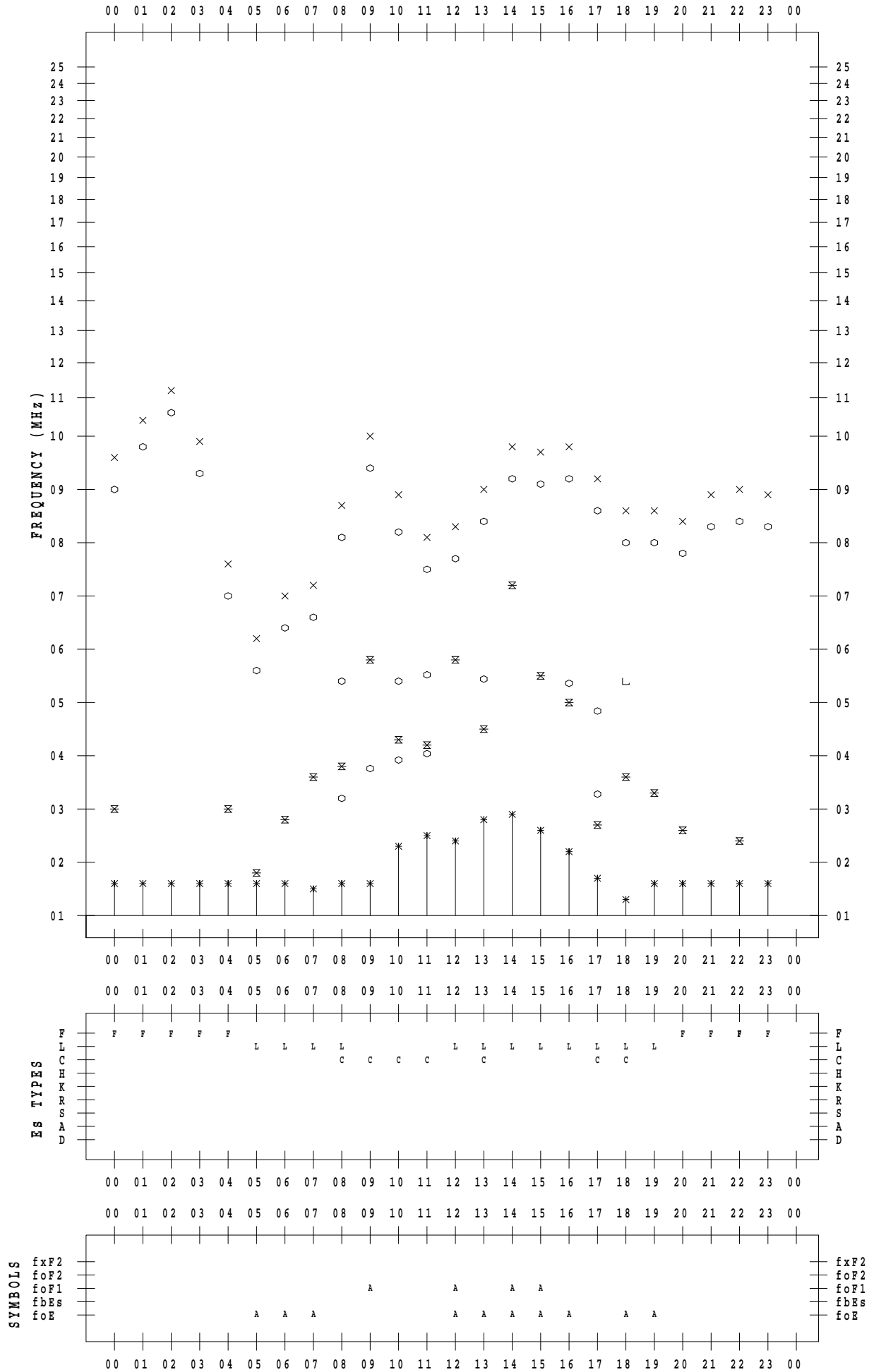
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 14

135 ° E MEAN TIME



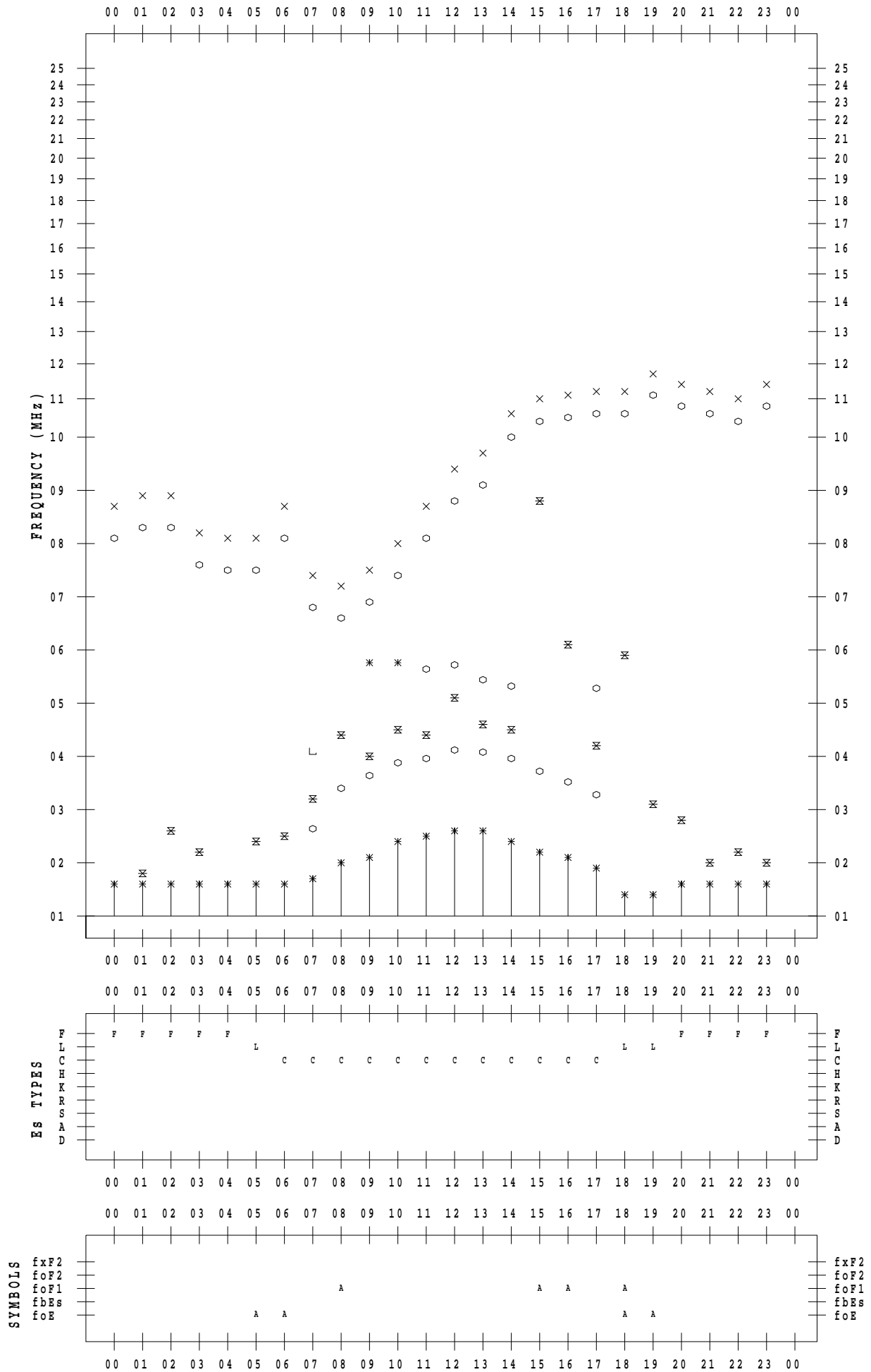
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 15

135 ° E MEAN TIME



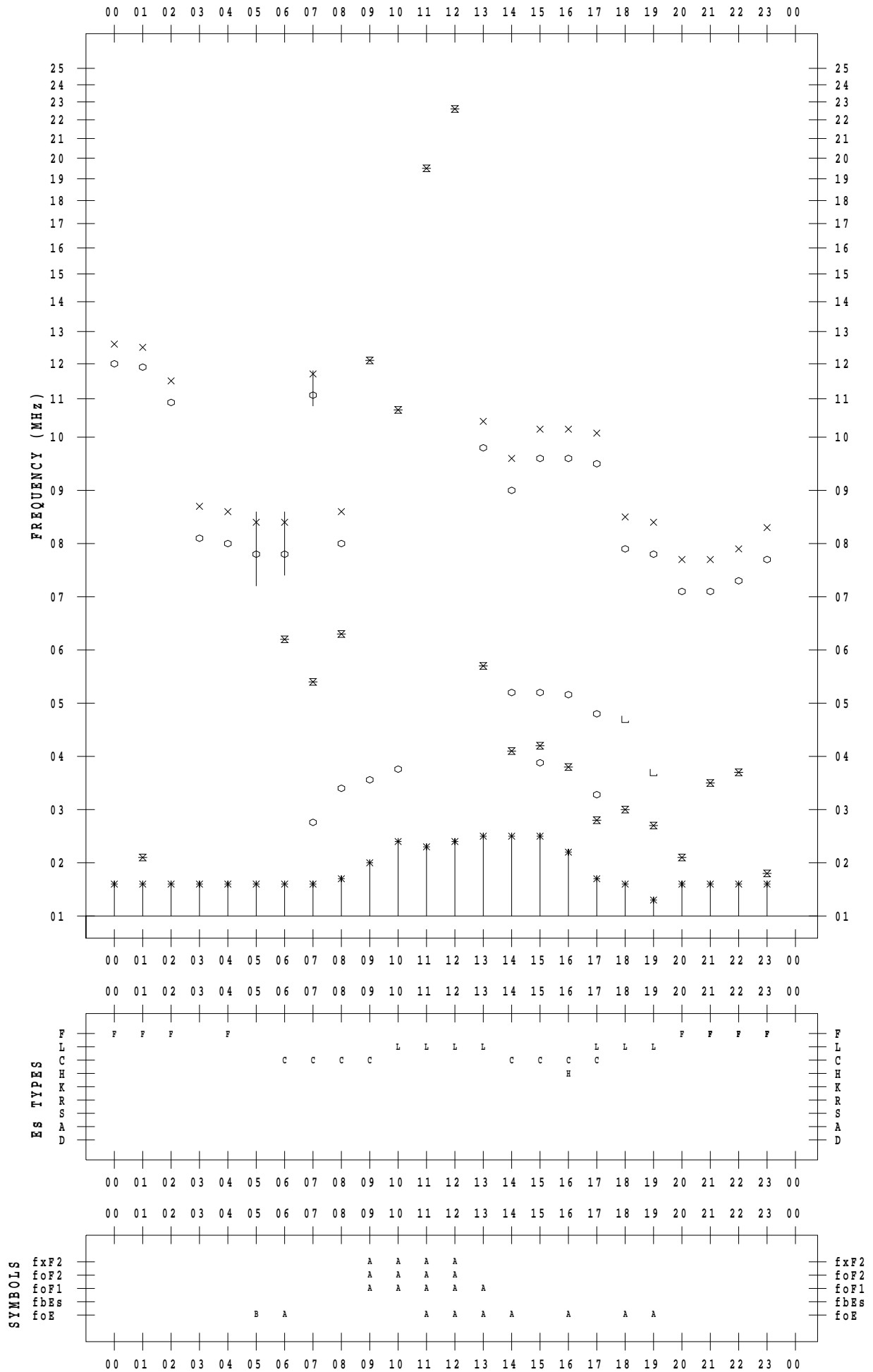
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 6/16

135 ° E MEAN TIME



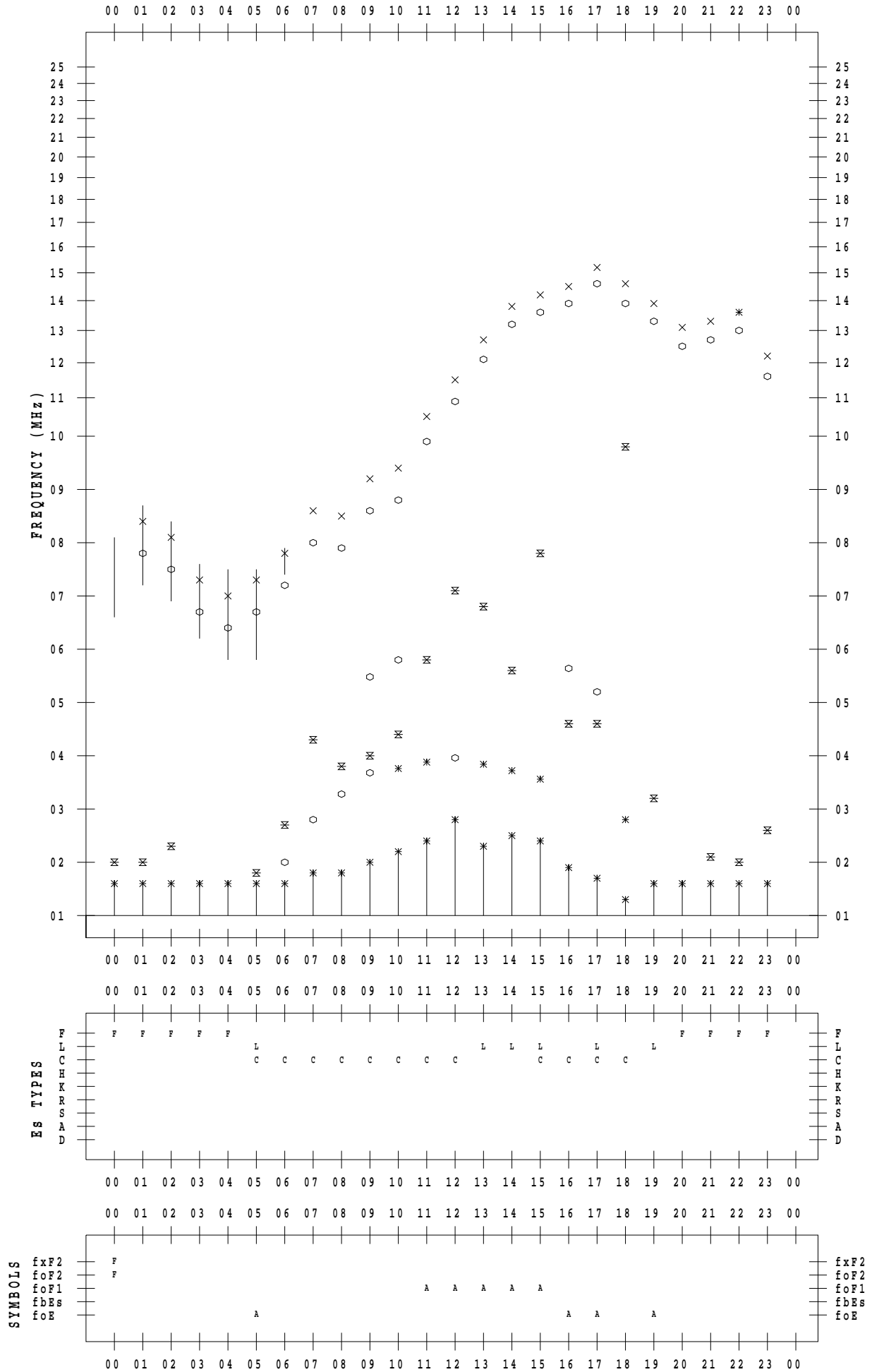
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023/ 6/17

135 ° E MEAN TIME



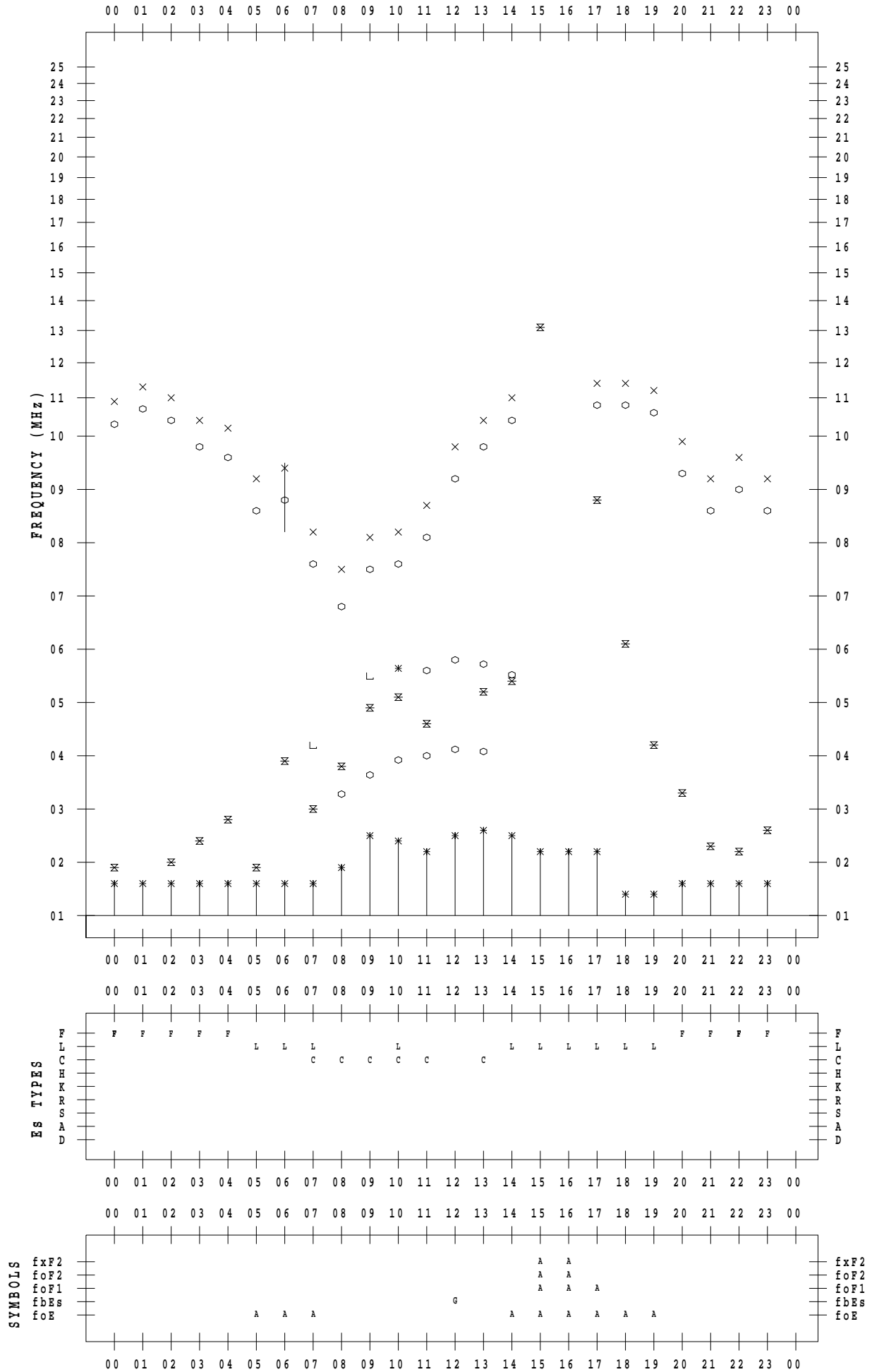
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 18

135 ° E MEAN TIME



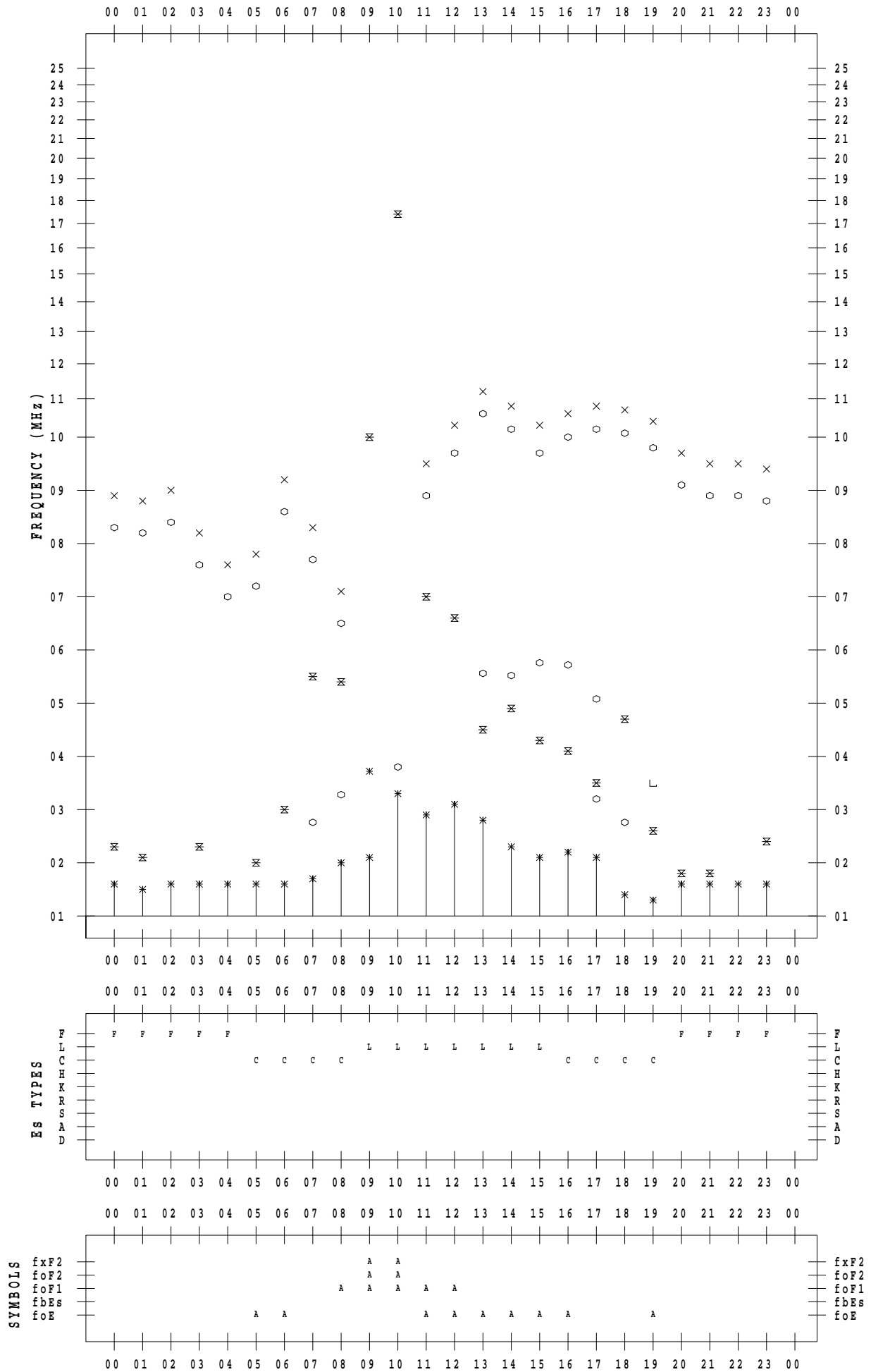
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 19

135 ° E MEAN TIME



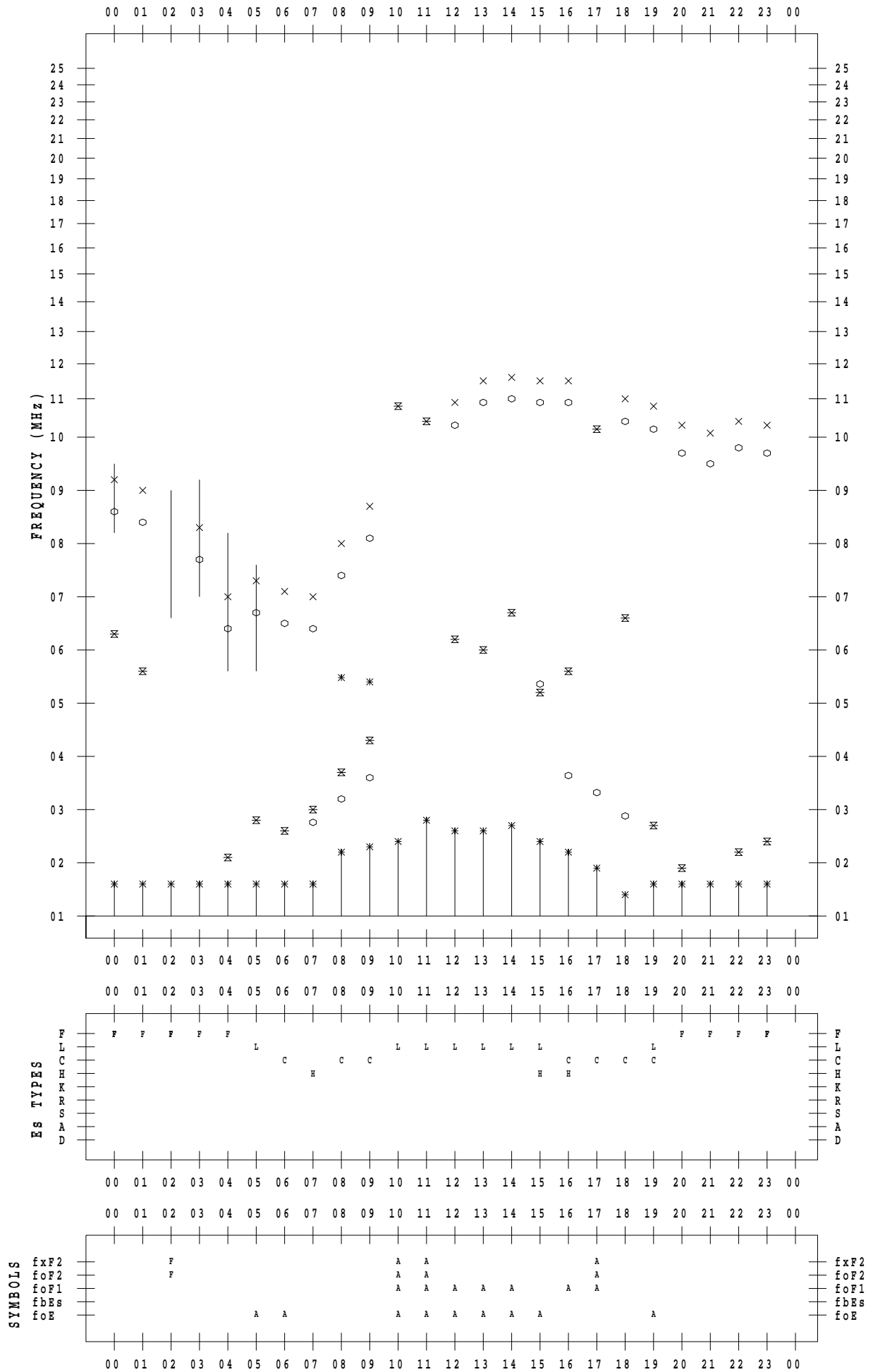
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 20

135 ° E MEAN TIME



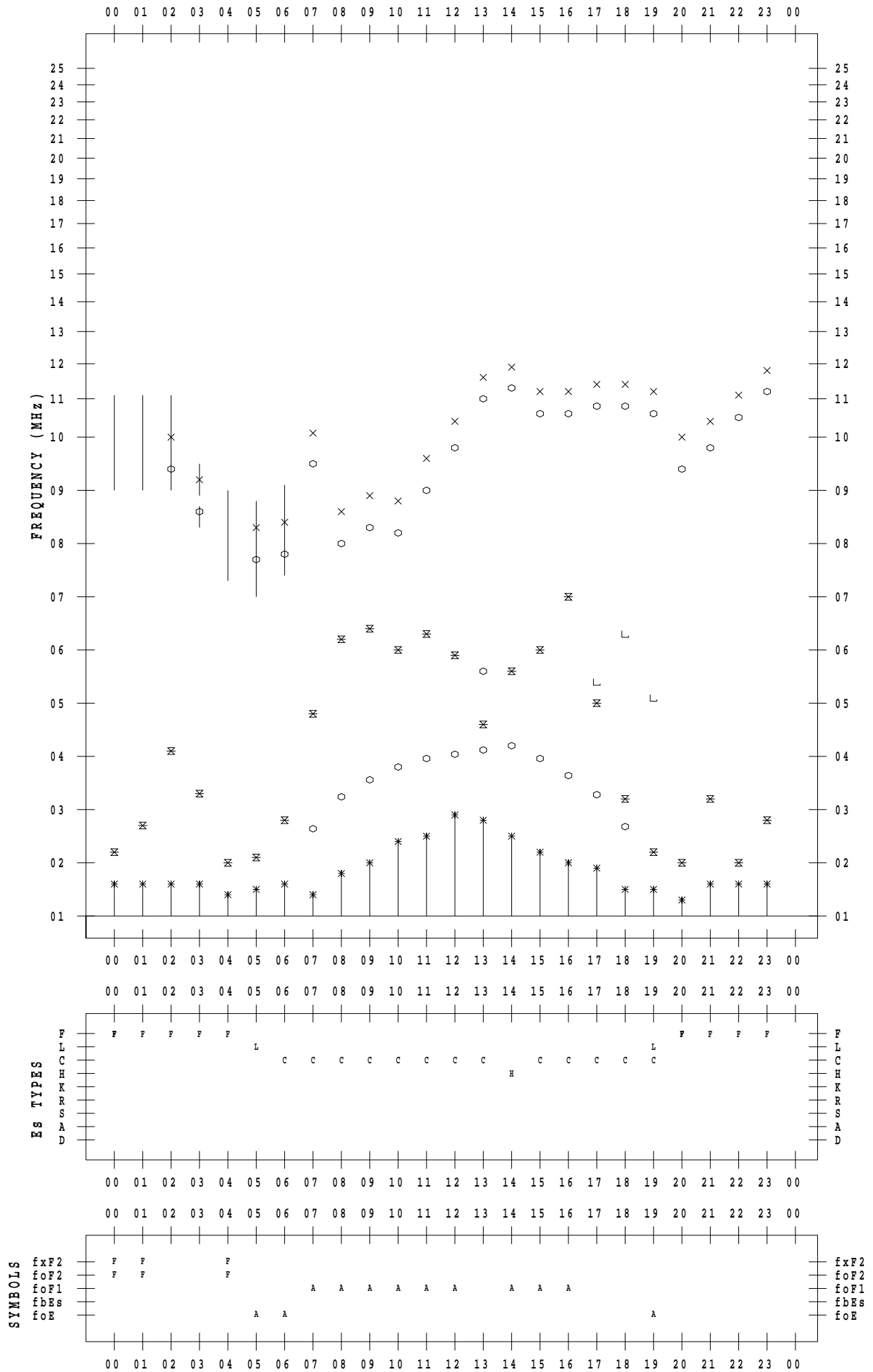
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 21

135 ° E MEAN TIME



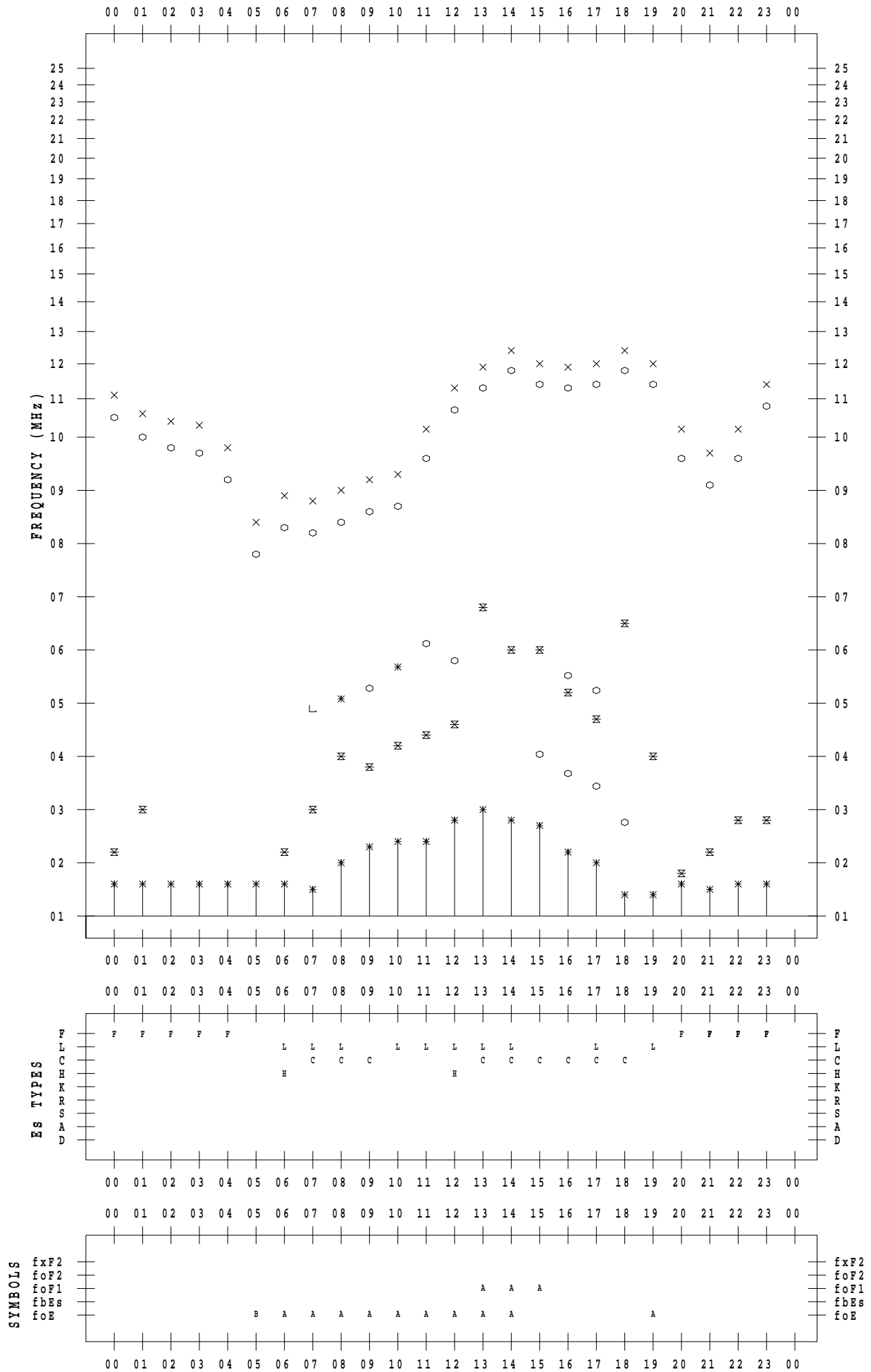
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 22

135 ° E MEAN TIME



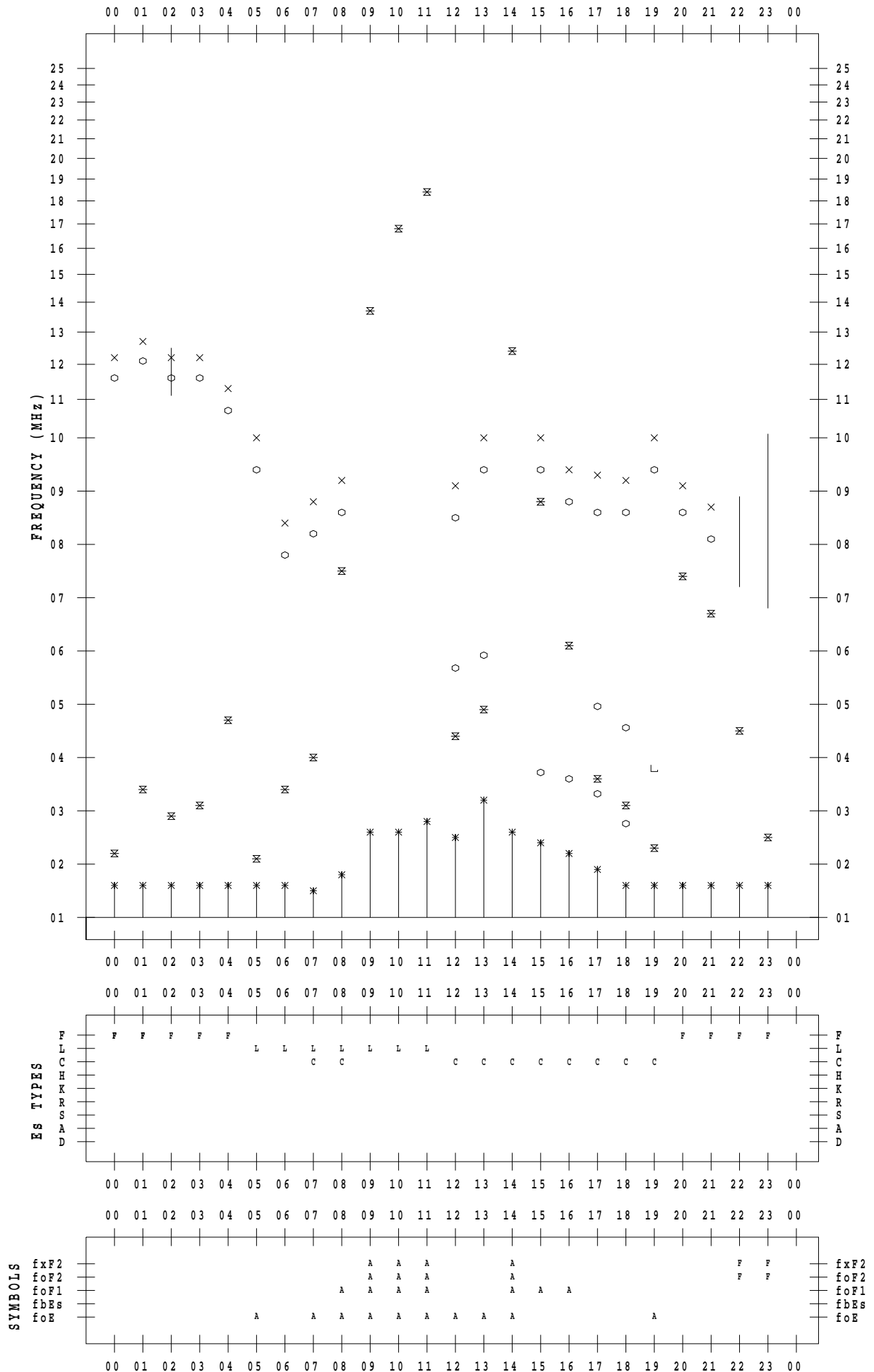
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 23

135 ° E MEAN TIME



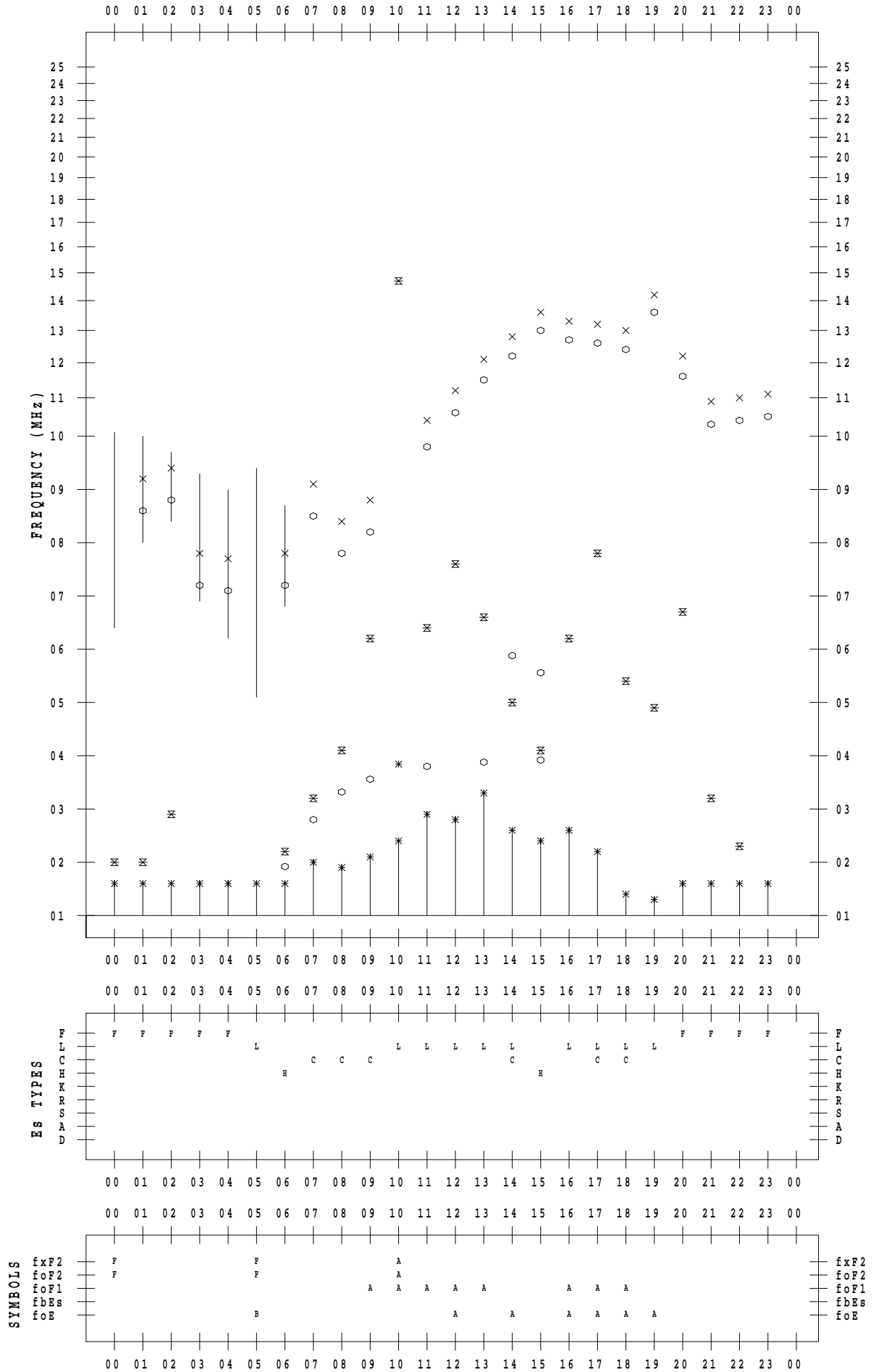
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 24

135 ° E MEAN TIME



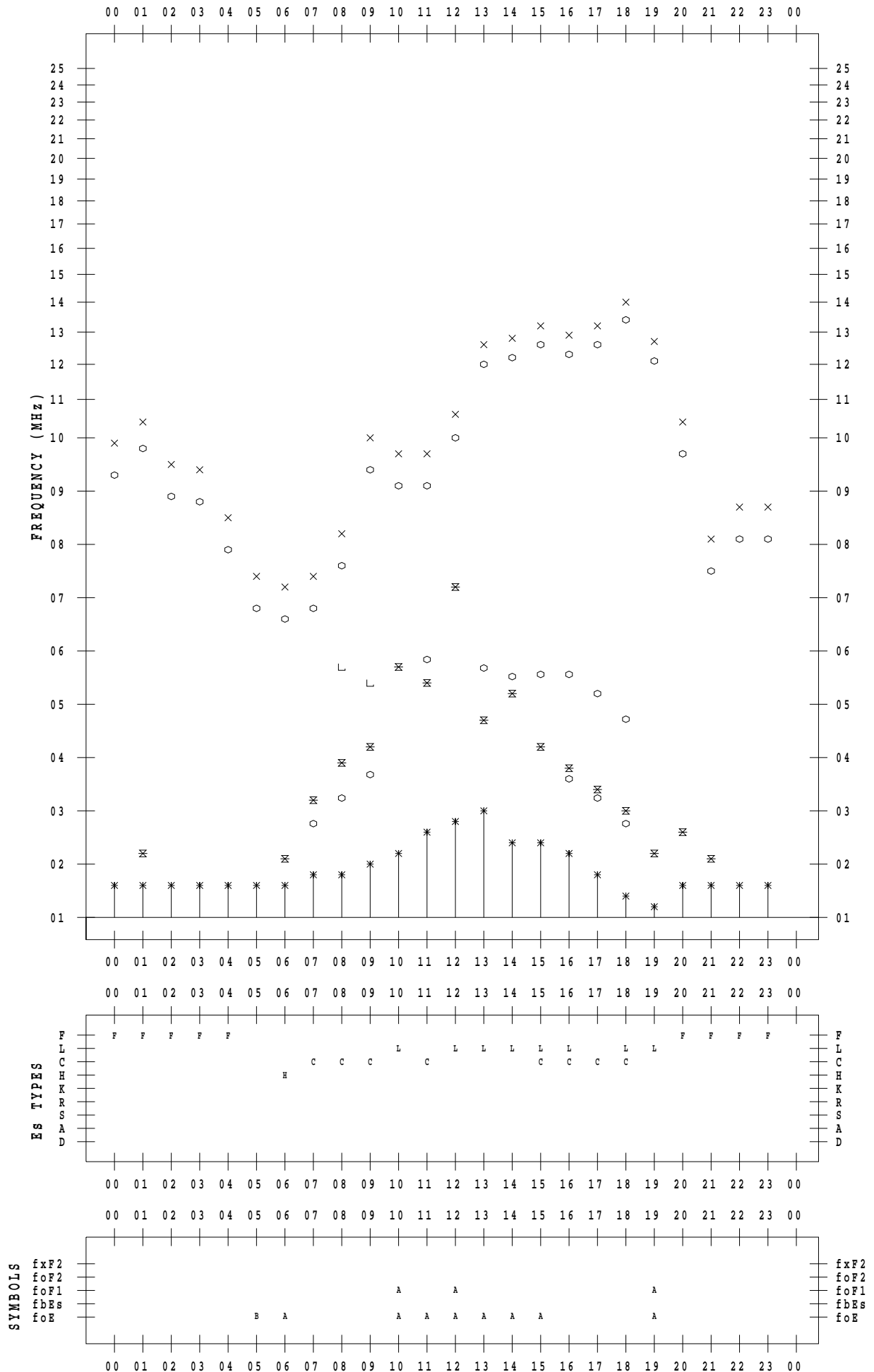
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 25

135 ° E MEAN TIME



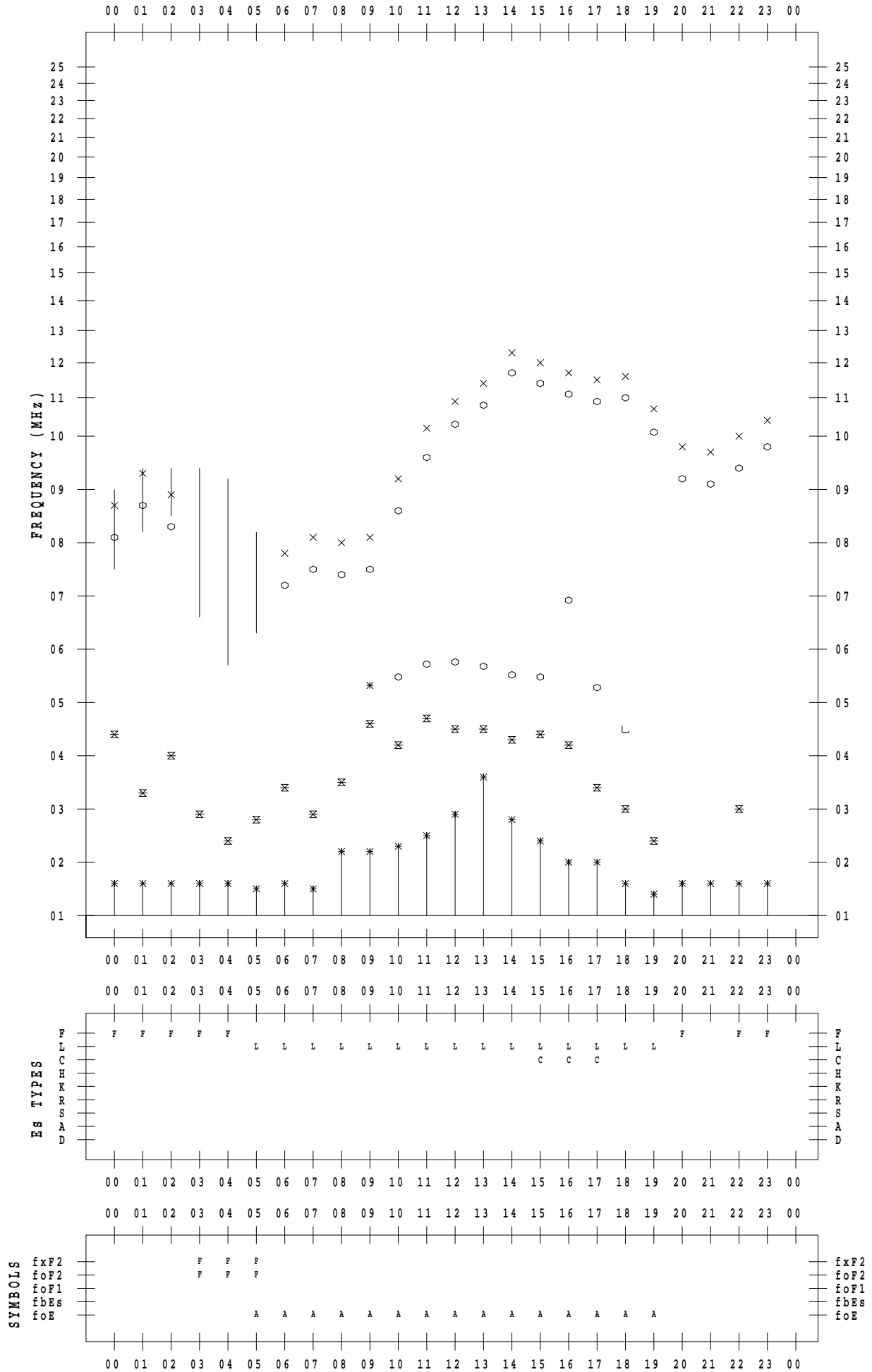
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 26

135 ° E MEAN TIME



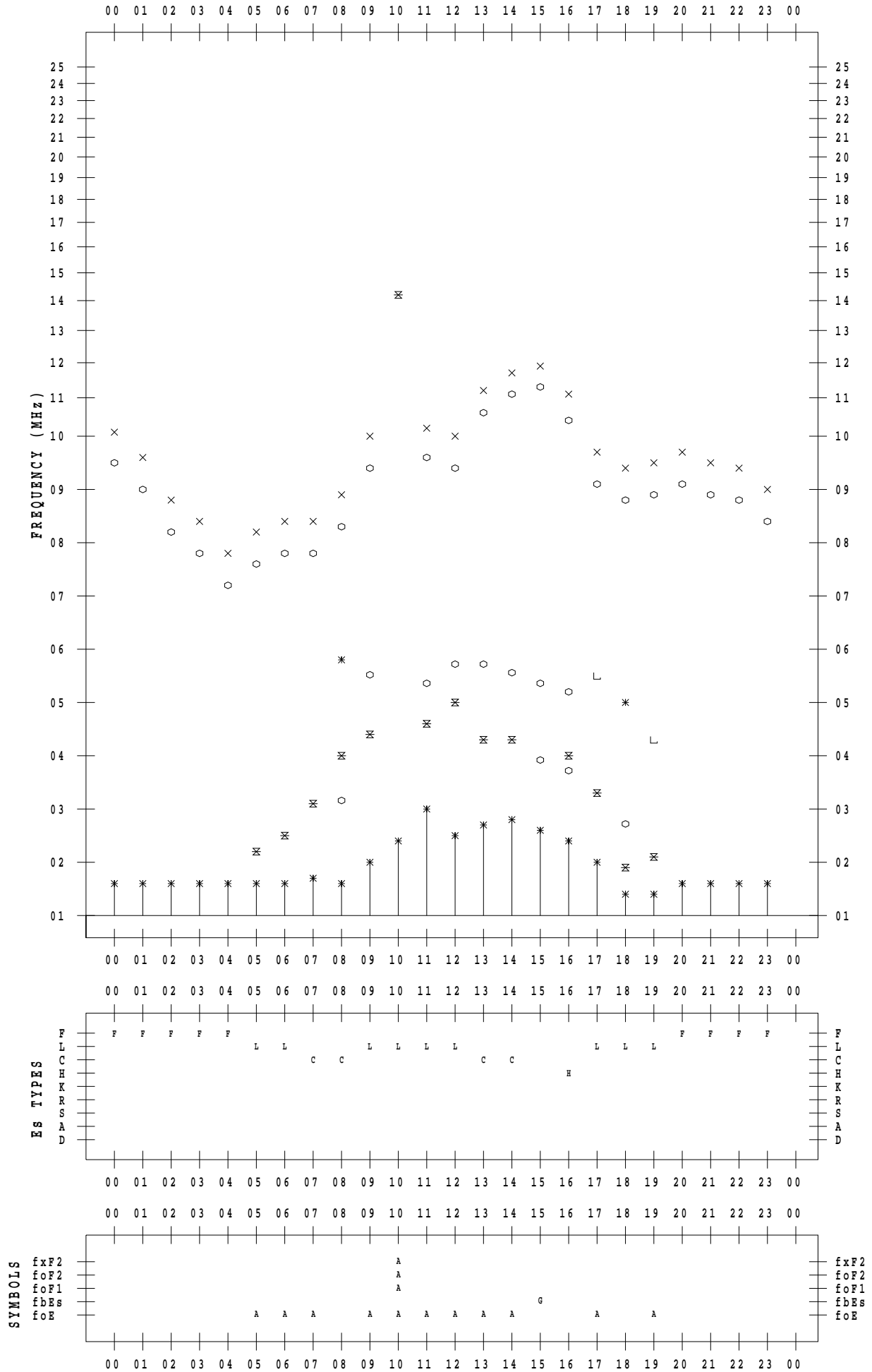
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 27

135 ° E MEAN TIME



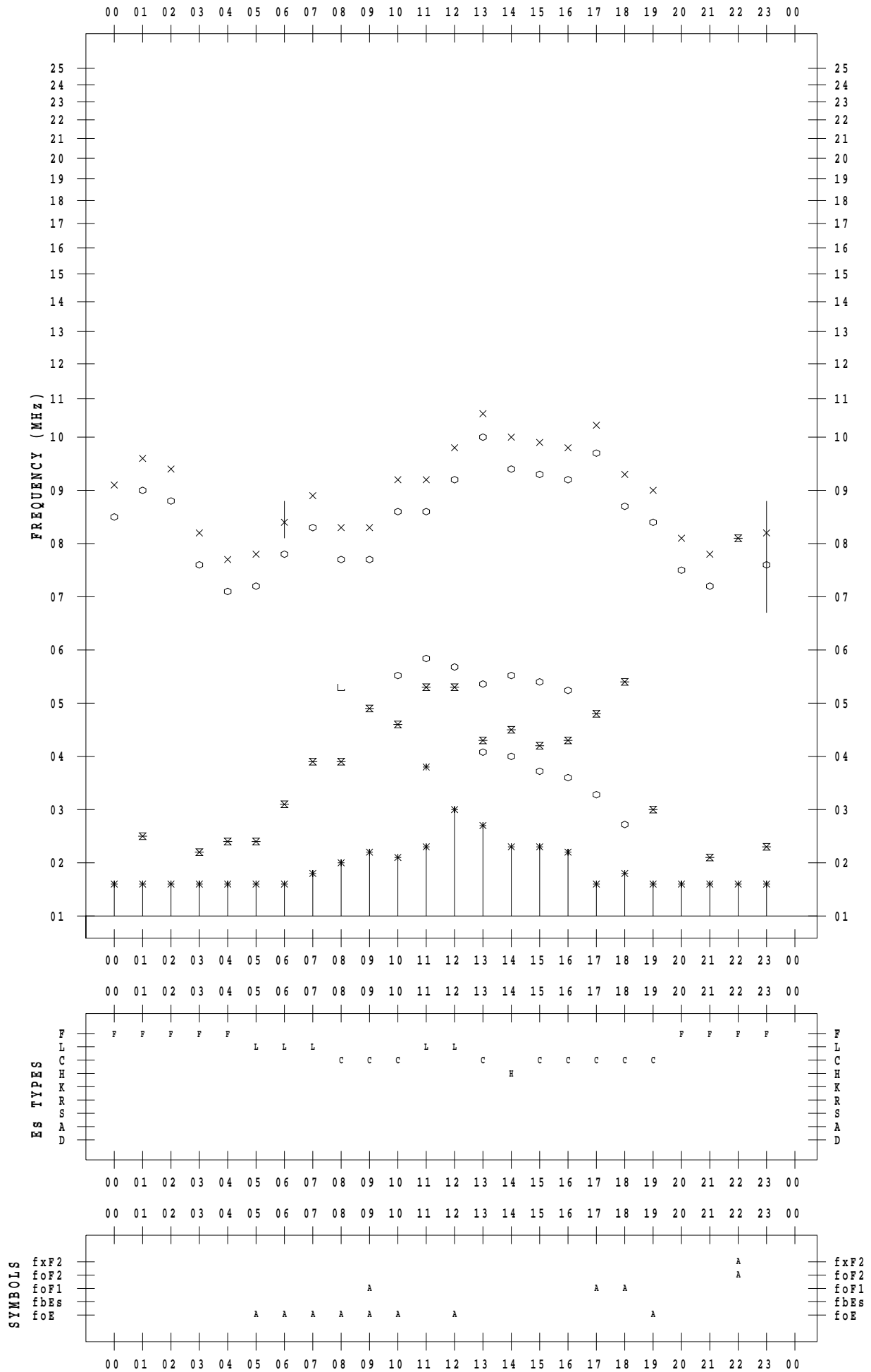
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 28

135 ° E MEAN TIME



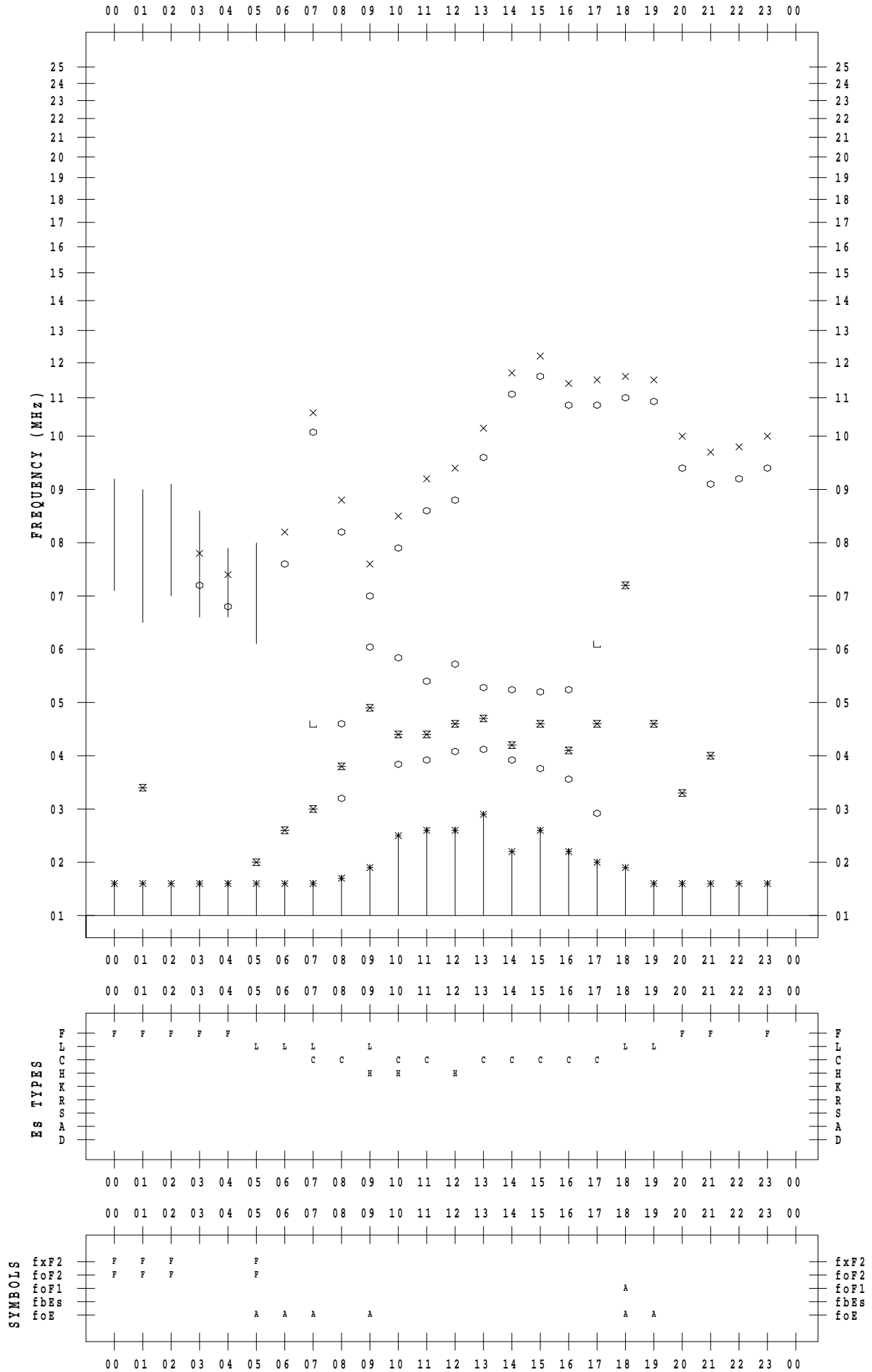
f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 29

135 ° E MEAN TIME



f - PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2023 / 6 / 30

135 ° E MEAN TIME

